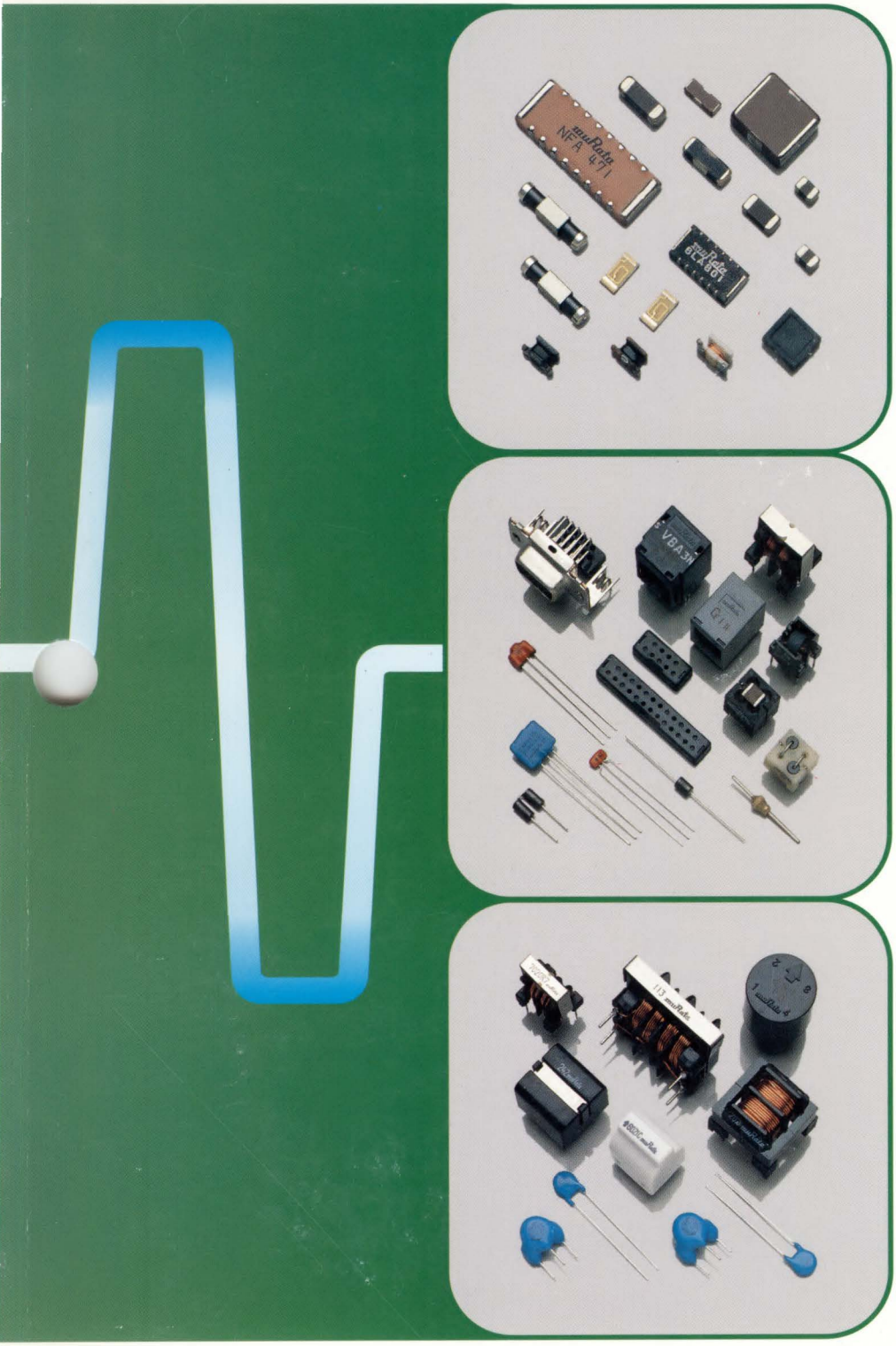
muRata®

Innovator in Electronics



EMI FILTER/CHIP INDUCTOR CATALOG

CATALOG NO. E-06-C

Murata Electronics
North America, Inc.

Electro-Magnetic Compatibility (EMC) has never been more important than in current times. The use of electronic equipment is increasing in industrial, commercial, and consumer markets. This, combined with the increasing operating frequencies and circuit density, requires EMI filtering components for various systems to work in close proximity without radiating noise or being affected by it.

Murata Electronics EMI Filters include components such as surface mount ferrite beads, feed-thru capacitors, "T" filters, "Pi" filters, and inductors. Leaded devices include ferrite beads, feed-thru capacitors, and varistor-capacitors, common mode choke coils, and filtered connectors. Also offered is a complete line of AC filters.

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ALPHA NUMERIC SERIES INDEX

SURFACE MOUNT EMI FILTERS

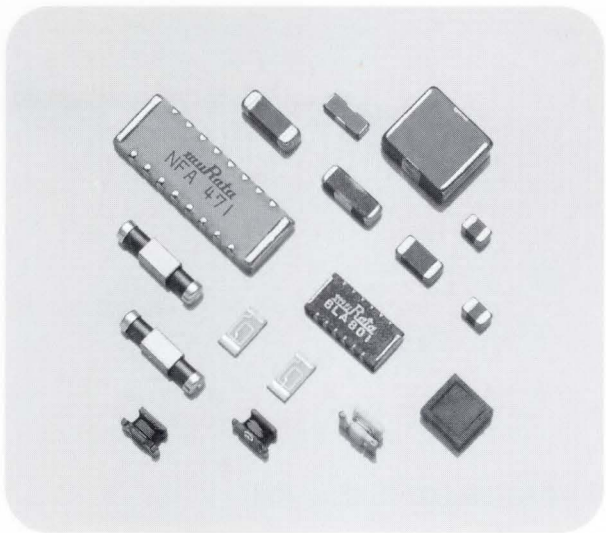
Murata Electronics classifies their surface mount ferrite beads into three categories: BLM□□A, BLM□□B and BLM□□P Series.

The BLM□□A Series is intended for standard type signals, as this series provides attenuation across a broad range of frequencies.

The BLM□□B Series is designed specifically for higher speed signals, providing a sharper roll off after the cut-off frequency.

The BLM□□P Series is specially adapted for power line applications due to low DC resistance and high rated current.

The BLA Series combine 4, 6 & 8 individual ferrite beads into one package, which is useful in conserving board space.



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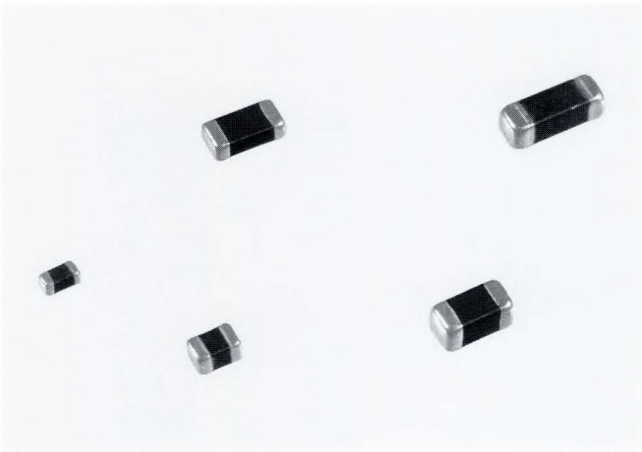
BLM□□A Series



The BLM□□A Series ferrite beads provide outstanding electrical characteristics in packages as small as 0603. For noise applications covering a wide frequency range.

FEATURES

- Suitable for flow and reflow soldering
- Wide temperature range
- High Z characteristics

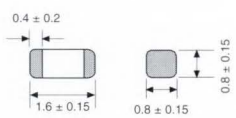
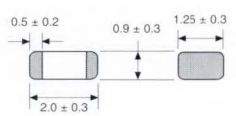
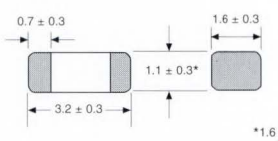
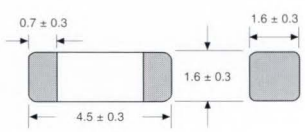
APPLICATIONS

- I/O ports, DC power lines, and Signal lines

PART NUMBERING SYSTEM

BLM	11	A	121	S	PT
CHIP FERRITE SERIES	SIZE 11: 1.6 x 0.8mm 21: 2.0 x 1.25mm 31: 3.2 x 1.6mm 41: 4.5 x 1.6mm	STANDARD SIGNAL	IMPEDANCE CODE at 100MHz	CHARACTERISTICS	PACKAGING PB: Bulk PT: Tape

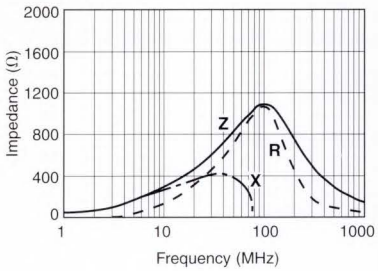
SPECIFICATIONS

Dimensions: mm	Part Number	Impedance (Ohms) (Typ.) at 100MHz	Rated Current (mA)	DCR (Ohms max.)	Operating Temperature Range	Previous P/N
0603 	★BLM11A121S	120	200	0.2	−55°C ~ +125°C	BLM11A05
	★BLM11A221S	220		0.3		BLM11A12
	★BLM11A601S	600		0.7		BLM11A20
	★BLM11A102S	1000	100	1.0		—
0805 	★BLM21A121S	120	200	0.6		BLM21A05
	★BLM21A401S	400		1.0		BLM21A11
	★BLM21A601S	600		1.5		BLM21A10
	★BLM21A102S	1000		0.6		—
1206 	★BLM31A260S	26	500	0.2		—
	★BLM31A700S	70	200	0.5		BLM31A02
	★BLM31A601S	600		1.0		BLM32A07
1806 	★BLM41A800S	80	500	0.3		BLM41A01
	★BLM41A151S	150	200	0.7		BLM41A04

★Available as standard through authorized Murata Electronics Distributors.

TYPICAL IMPEDANCE CHARACTERISTICS

BLM11A102S



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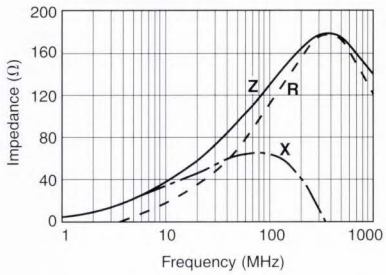

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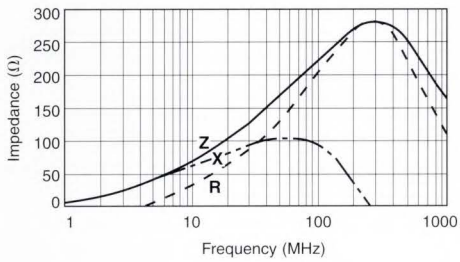

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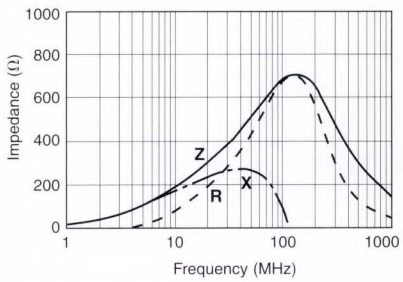

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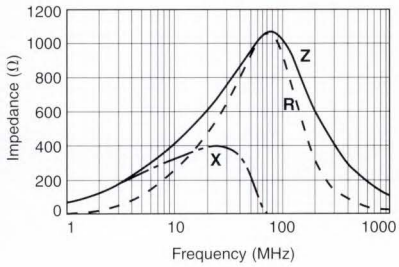

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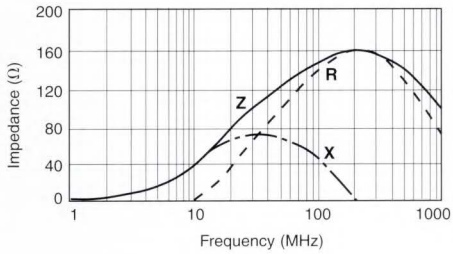

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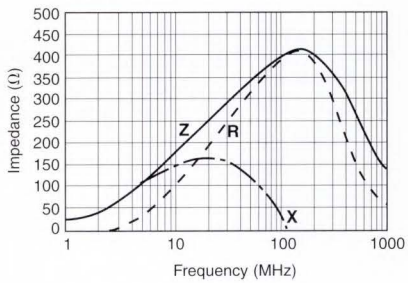
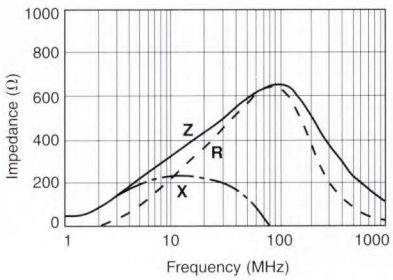


BLM21A601S (For low speed signal line)



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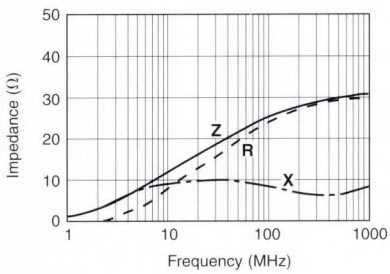

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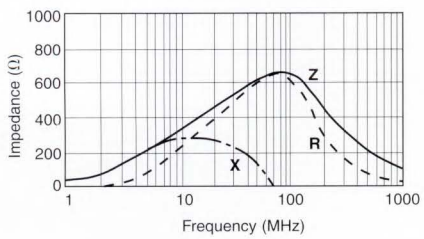

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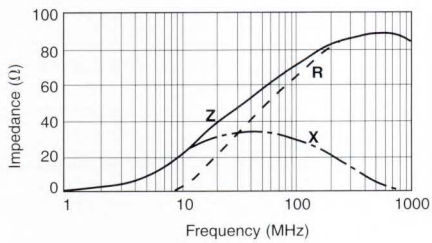
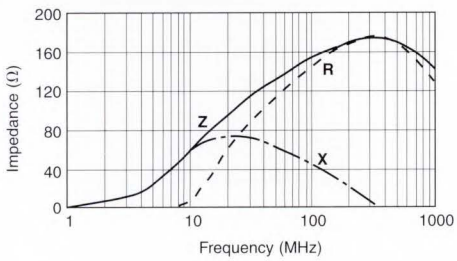


BLM41A151S



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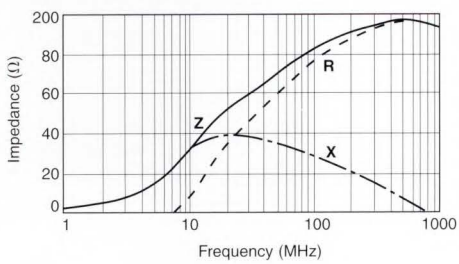


BLM□□B Series

The BLM□□B Series ferrite beads have been developed to pass signal frequencies from 10MHz to 100MHz while exhibiting high impedance characteristics to reduce EMI noise above these specific frequencies.

FEATURES

- Designed to reduce noise above operating frequencies from 10 to 100MHz
- High impedance characteristics
- Small size
- Suitable for flow and reflow soldering

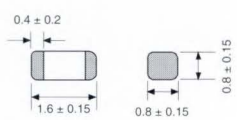
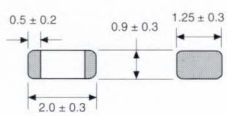
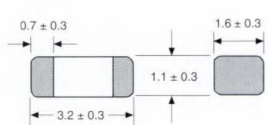
APPLICATIONS

- Computers and peripheral equipment
- Consumer products
- High speed circuits
- Suitable for circuits with unstable ground

PART NUMBERING SYSTEM

BLM	11	B	601	S	PT
CHIP FERRITE SERIES	SIZE 11: 1.6 x 0.8mm 21: 2.0 x 1.25mm 31: 3.2 x 1.6mm	HIGH SPEED SIGNALS	IMPEDANCE CODE at 100MHz	CHARACTERISTICS	PACKAGING CODE PB: Bulk PT : Tape

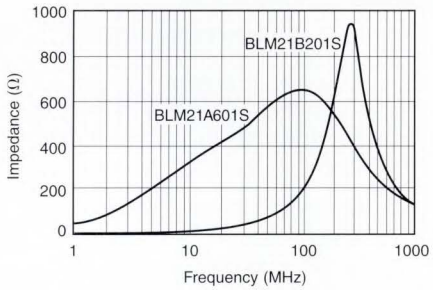
SPECIFICATIONS

Dimensions: mm	Part Number	Impedance (Ohms) (Typ.) at 100MHz	Rated Current (mA)	DCR (Ohms max.)	Operating Temperature Range	Previous P/N
0603 	★BLM11B750D	75	200	0.6	−55° C ~ +125° C	—
	★BLM11B141D	140		0.7		—
	★BLM11B421S	420				—
	★BLM11B601S	600		—		—
	★BLM11B102S	1000	100	1.2		—
0805 	★BLM21B050S	5	500	0.2		BLM21B03
	★BLM21B201S	200	200	0.7		BLM21B30
	★BLM21B601S	600		—		—
	★BLM21B751S	750		0.7		BLM21B20
	★BLM21B102S	1000		0.6		—
	★BLM21B222S	2200		0.8		BLM21B10
1206 	★BLM31B601S	600		1.0		BLM32A06

★Available as standard through authorized Murata Electronics Distributors.

TYPICAL IMPEDANCE CHARACTERISTICS

BLM Series Comparison



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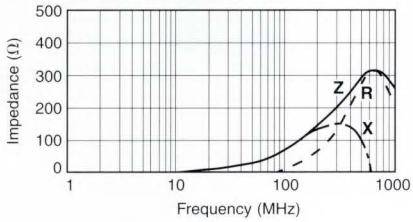

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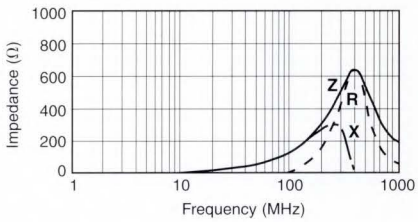

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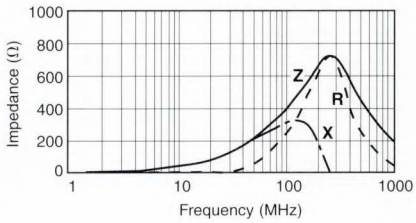

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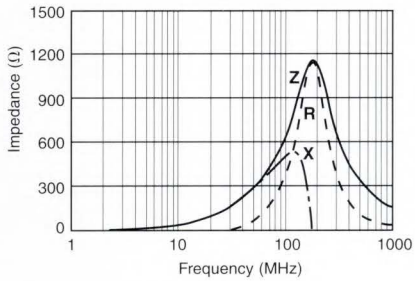

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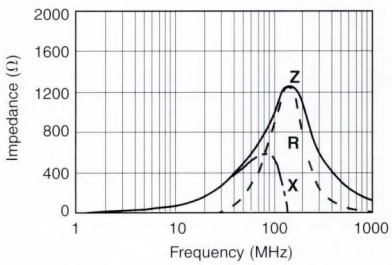

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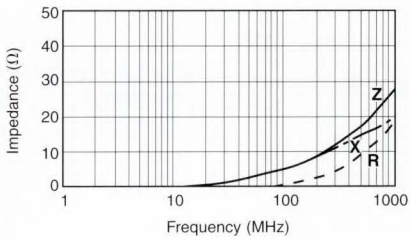

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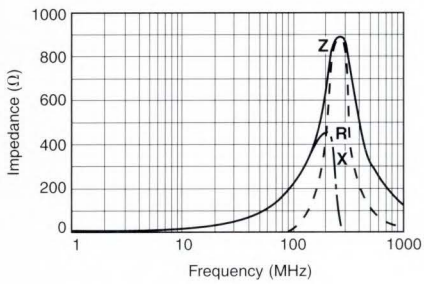

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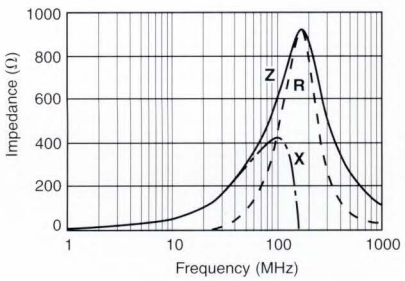

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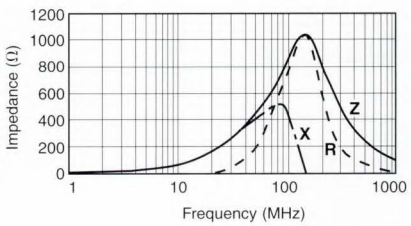

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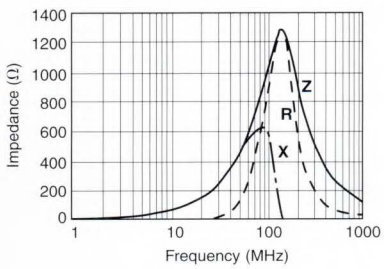
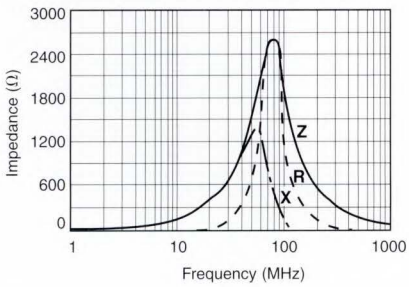
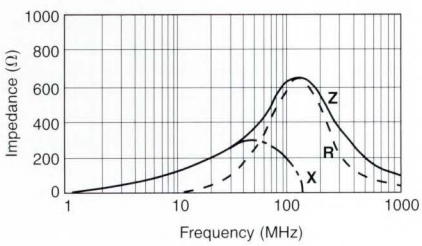


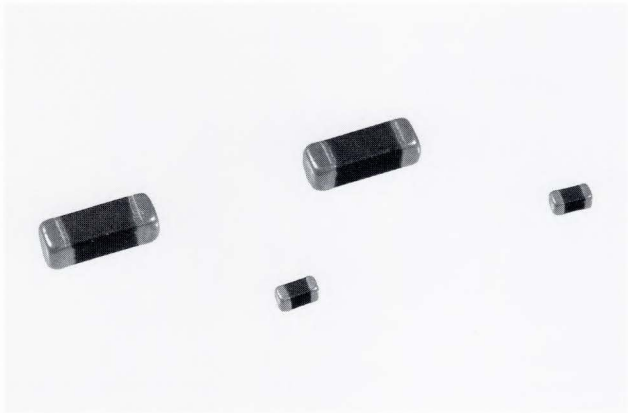
BLM21B222S



BLM31B601S



BLM□□P Series



The BLM□□P Series ferrite beads offer high frequency noise suppression with the capability of handling large currents for DC power line applications.

FEATURES

- Suitable high frequency noise suppression over wide frequency range
- Current rating up to 6 AMPS
- Small package size – EIA STD 0603/0805/1206 and 1806
- Nickel barrier terminations provide excellent solder heat resistance
- Low DCR

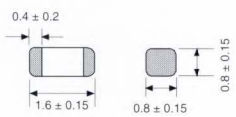
APPLICATIONS

- High current DC power lines
- Circuits where a stable ground is unavailable

PART NUMBERING SYSTEM

BLM	11	P	300	S	PT
CHIP FERRITE SERIES	SIZE 11: 1.6 x 0.8mm 21: 2.0 x 1.25mm 31: 3.2 x 1.6mm 41: 4.5 x 1.6mm	POWER	IMPEDANCE CODE at 100MHz	CHARACTERISTICS	PACKAGING PB: Bulk PT: Tape

SPECIFICATIONS

Dimensions: mm	Part Number	Impedance (Ohms) (Typ.) at 100MHz	Rated Current (mA)	DCR (Ohms max.)	Operating Temperature Range	Previous P/N
0603 	★BLM11P300S	30	1000	0.1		BLM11P20
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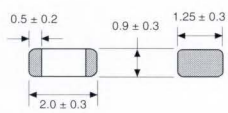
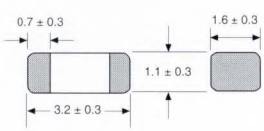
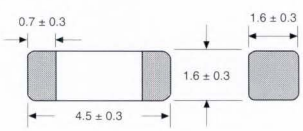
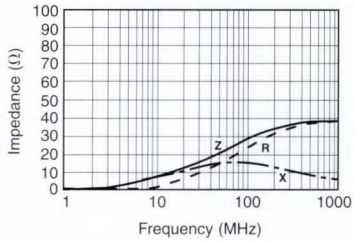
0805 	★BLM21P300S	30	3000	0.03	–55°C ~ +125°C	—
1206 	★BLM31P500S	50				—
1806 	★BLM41P600S	60	6000	0.01		BLM41P03
	★BLM41P750S	75	3000	0.03		BLM41P02
	★BLM41P800S	80	1000	0.15		BLM41P01

★Available as standard through authorized Murata Electronics Distributors.

TYPICAL IMPEDANCE CHARACTERISTICS

BLM11P300S



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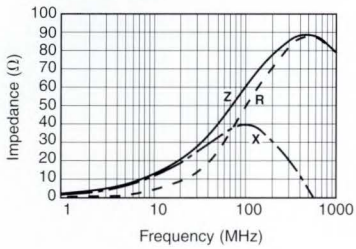

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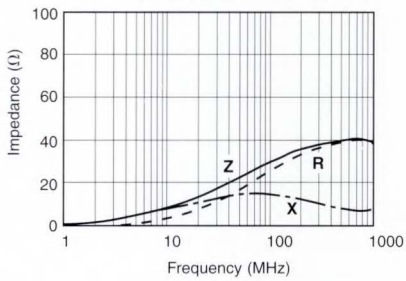

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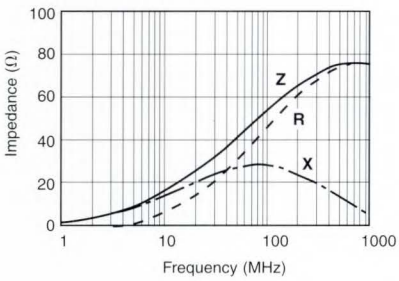
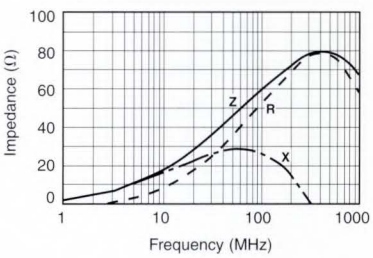
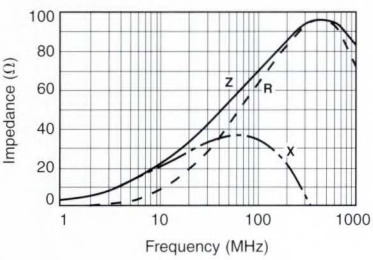


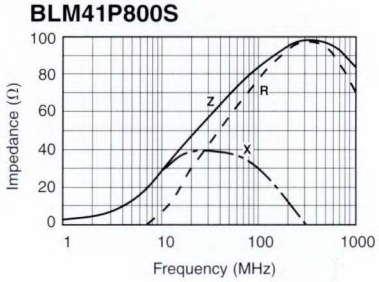
BLM41P600S



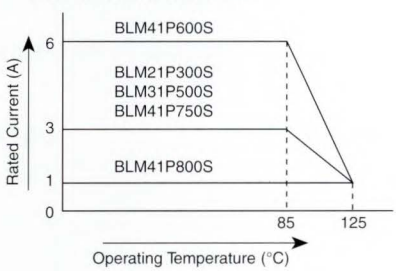
BLM41P750S



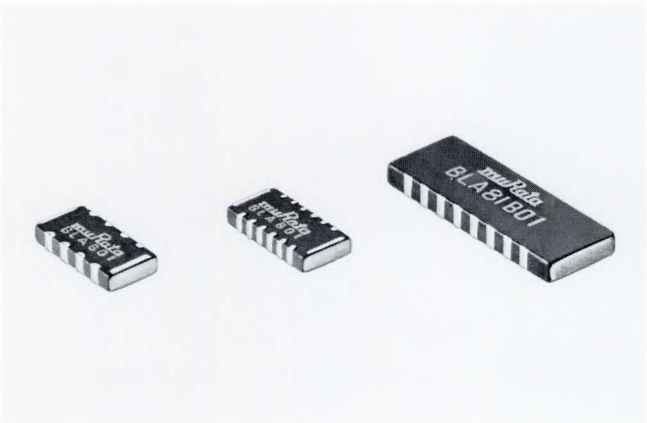
BLM41P800S



DERATING CURVE



BLA Series

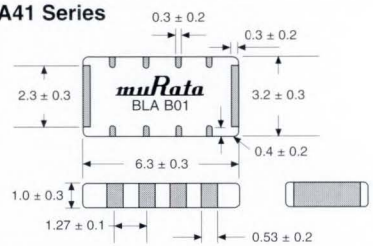
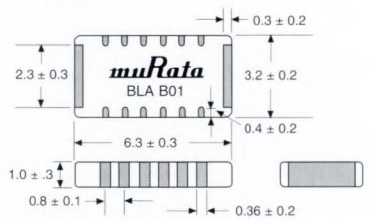
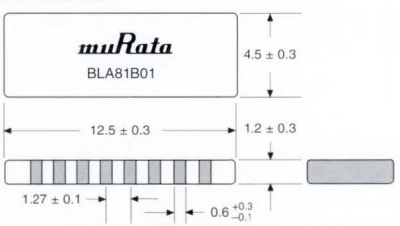


The BLA Series ferrite bead arrays use board space efficiently by incorporating 4, 6, or 8 ferrite beads into one package.

PART NUMBERING

BLA	81	B01	T1
CHIP FERRITE ARRAY	NUMBER OF CIRCUIT AND TERMINAL PITCH 81: 8 circuit 1.27mm pitch 62: 6 circuit 0.80mm pitch 41: 4 circuit 1.27mm pitch	CHARACTERISTICS	PACKAGING CODE T1=Tape & Reel B1=Bulk

SPECIFICATIONS

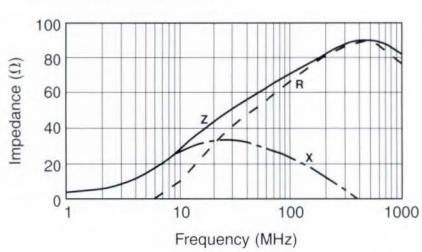
DIMENSIONS: mm	Series	Impedance (Ohms) (Typ.) at 100MHz	Rated Current (mA)	Operating Temp. Range
BLA41 Series 	**BLA41B01**	70	200	–55°C ~ +125°C
	BLA41B02	600	150	–55°C ~ +125°C*
BLA62 Series 	**BLA62B01**	70	200	–55°C ~ +125°C
	BLA62B02	600	100	–55°C ~ +125°C*
BLA81 Series 	★**BLA81B01**	70	300	–55°C ~ +125°C

★Available as standard through authorized Murata Electronics Distributors: Standard packaging is tape and reel.

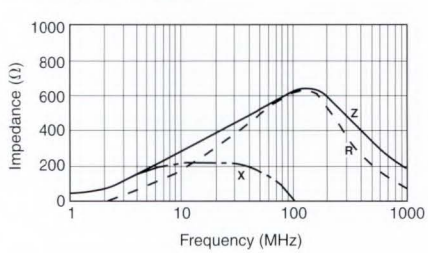
*See Derating Curve

TYPICAL IMPEDANCE CHARACTERISTICS

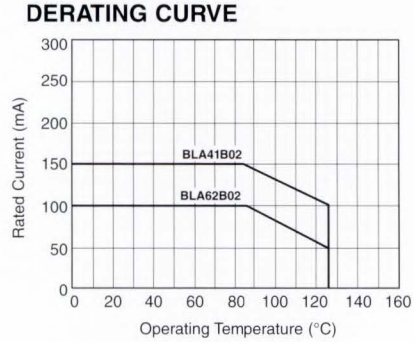
BLA41/62/81 B01



BLA62/41 B02



DERATING CURVE



SURFACE MOUNT EMI FILTERS

Murata Electronics' single and multi-element filters provide EMI suppression at higher frequencies and are typically used in wireless applications, telecommunications and high speed digital systems.

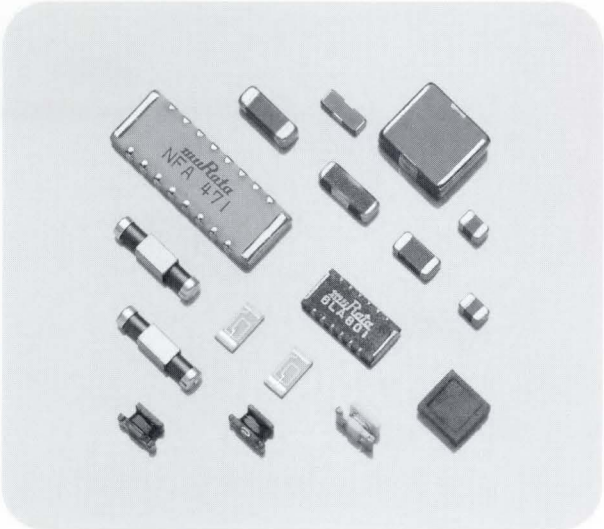
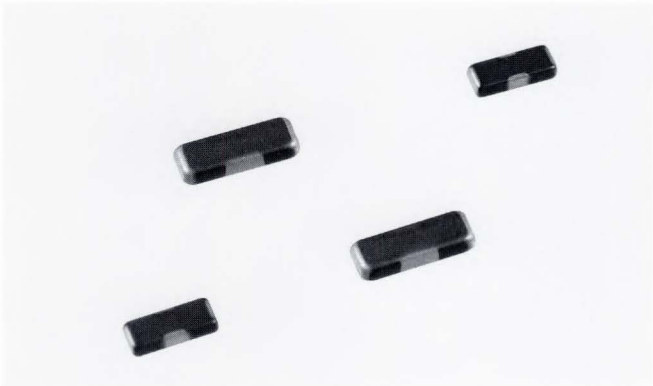


TABLE OF CONTENTS

NFM40/41R Series



The NFM40/41R Series is a minature chip type EMI Suppression filter based on feed-thru design. It is well suited for EMI suppression in digital circuit boards or in I/O lines of digital equipment where high density mounting is used.

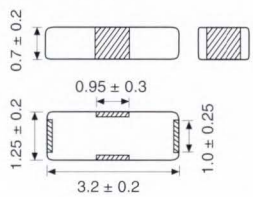
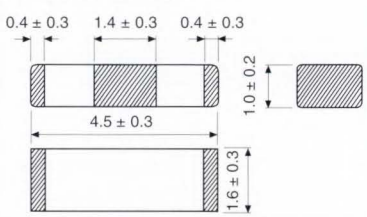
FEATURES

- Miniature size — 3.2mm x 1.25mm x .7mm
- Nickel barrier for solder heat resistance
- Wide frequency range of operation – to several hundred MHz
- Tape and reel for auto-placement

PART NUMBERING

NFM40R	11	C	223	T1
CHIP EMI FILTER SERIES	CLASS NO.	CIRCUIT STYLE	CAPACITANCE VALUE	PACKAGING T1=Tape B1=Bulk

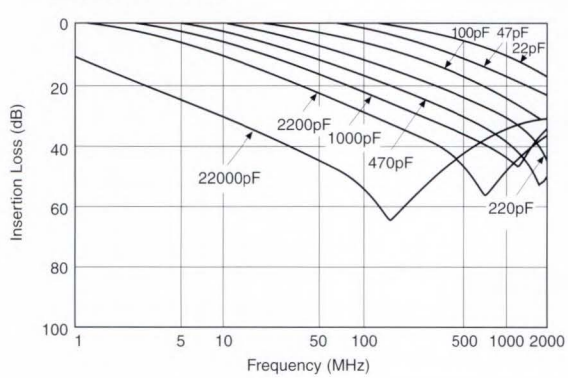
SPECIFICATIONS

Dimensions: mm	Part Number	Capacitance	Rated Voltage	Rated Current (mA)	Insulation Resistance	DCR (Ohms max.)	Operating Temp. Range
NFM40R Series 	★NFM40R01C220	22pF ± 50/20 %	25VDC	300	1000MΩmin.	0.6	−55°C ~ +125°C
	★NFM40R01C470	47pF ± 50/20 %					
	★NFM40R01C101	100pF ± 50/20 %					
	★NFM40R11C221	220pF ± 50/20 %					
	★NFM40R11C471	470pF ± 50/20 %					
	★NFM40R11C102	1000pF ± 50/20 %					
	★NFM40R11C222	2200pF ± 50/20 %					
	★NFM40R11C223	22000pF ± 80/20 %					−55°C ~ +85°C
NFM41R Series 	★NFM41R01C220	22pF ± 50/20 %	100VDC	300	10000MΩmin.	0.3	−55°C ~ +125°C
	★NFM41R01C470	47pF ± 50/20 %					
	★NFM41R01C101	100pF ± 50/20 %					
	★NFM41R01C221	220pF ± 50/20 %					
	★NFM41R01C471	470pF ± 50/20 %					
	★NFM41R11C102	1000pF ± 50/20 %					
	★NFM41R11C222	2200pF ± 50/20 %					
	★NFM41R11C223	22000pF ± 50/20 %					

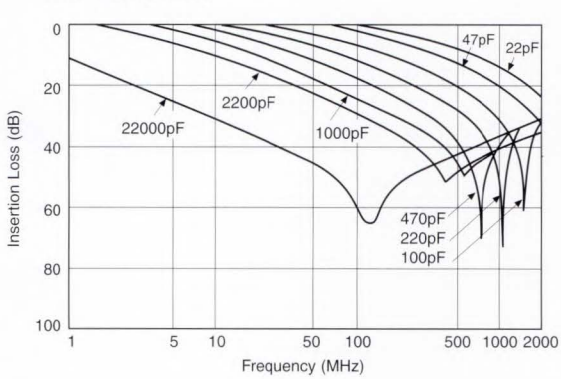
★Available as standard through authorized Murata Electronics Distributors.

TYPICAL INSERTION LOSS CHARACTERISTICS

NFM40R Series

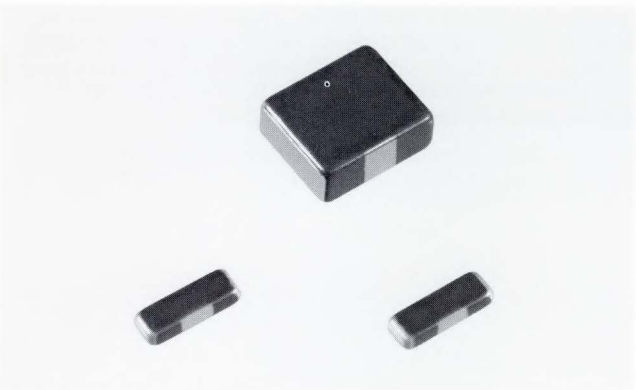


NFM41R Series



muRata

NFM41P/46P Series



The NFM41P/46P Series are high current surface mount three terminal capacitors designed for DC power line filtering. These filters provide excellent insertion loss characteristics over a broad frequency range.

FEATURES

- Excellent high frequency noise suppression beyond 1GHz
- Insertion loss of 30dB from 500KHz to 1GHz
- 6 AMP current rated
- Low profile

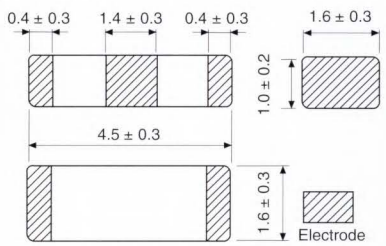
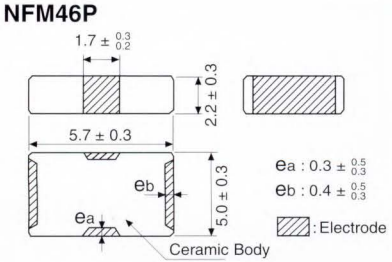
APPLICATIONS

- High current DC power lines
- Micro computers, peripheral equipment
- Switching power supplies

PART NUMBERING

NFM41	P	11	C	204	T1
CHIP EMI FILTER SERIES	POWER	CLASS NO.	CIRCUIT STYLE	CAPACITANCE VALUE	PACKAGING T1=Tape B1=Bulk

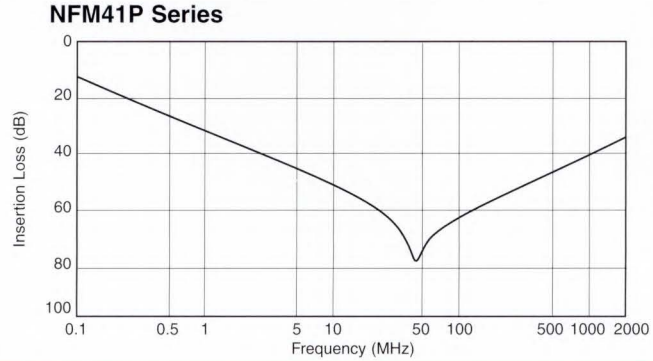
SPECIFICATIONS

Dimensions: mm	Part Number	Capacitance	Rated Voltage	Rated Current (A)	Insulation Resistance	DCR (Ohms max.)	Operating Temp. Range
NFM41P 	★NFM41P11C204	0.2μF $^{+80}_{-20}$ %	50VDC	2	1000MΩmin.	0.04	−55°C ~ +85°C
NFM46P 	★NFM46P11C155	1.5μF $^{+80}_{-20}$ %	50VDC	6	100MΩmin.	0.01	−55°C ~ +85°C

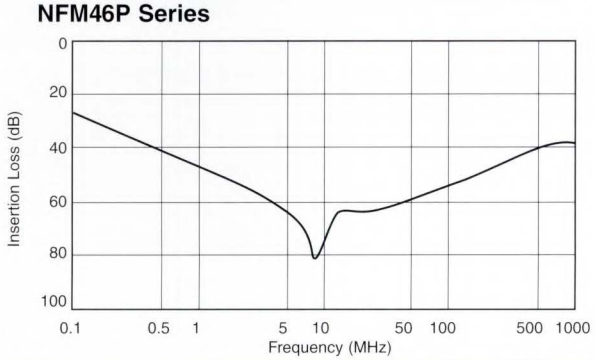
★Available as standard through authorized Murata Electronics Distributors: Standard packaging is tape and reel.

TYPICAL INSERTION LOSS CHARACTERISTICS

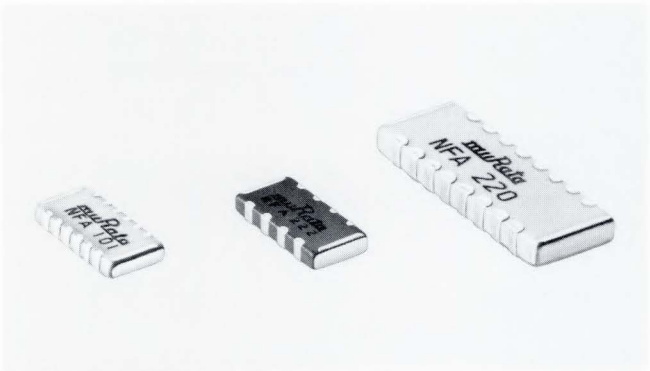
NFM41P Series



NFM46P Series



NFA Series



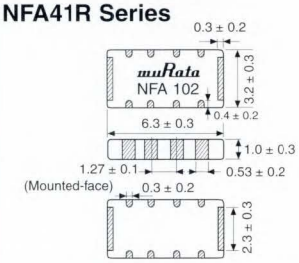
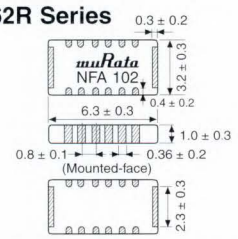
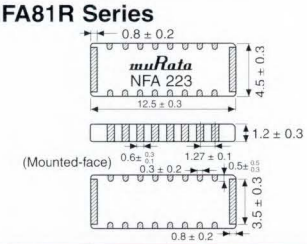
The NFA Series is a chip feed-thru capacitor filter array for surface mount applications and is excellent for high density mounting with a land pitch of 1.27mm or 0.8mm. It has only two ground terminals for 4 to 8 circuits, making it easy to design a ground pattern.

It is well suited for noise suppression in digital circuit boards or in I/O cables of digital instruments.

PART NUMBERING

NFA	81	R	00	C	221	T1
CHIP Solid Array	NUMBER OF CIRCUITS AND TERMINAL PITCH 81: 8 circuit (1.27mm pitch) 62: 6 circuit (0.80mm pitch) 41: 4 circuit (1.27mm pitch)	TYPE Monolithic	CLASS NUMBER	CIRCUIT COMPOSITION	CAPACITANCE	PACKAGING CODE T1: Tape & Reel B1=Bulk

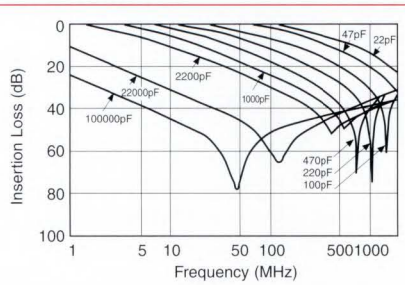
SPECIFICATIONS

Dimensions: mm	Part Number	Capacitance	Rated Voltage	Rated Current (mA)	Insulation Resistance	Operating Temp. Range	Number of Circuits
NFA41R Series 	★NFA41R00C220	22pF ± 50/20 %	50VDC	200	1000MΩmin.	−55°C ~ +85°C	4
	★NFA41R00C470	47pF ± 50/20 %					
	★NFA41R00C101	100pF ± 50/20 %					
	★NFA41R00C221	220pF ± 50/20 %					
	★NFA41R00C471	470pF ± 50/20 %					
	★NFA41R10C102	1000pF ± 50/20 %					
	★NFA41R10C222	2200pF ± 50/20 %					
	★NFA41R10C223	22000pF ± 50/20 %					
	★NFA41R10C104	100000pF ± 80/20 %					
NFA62R Series 	★NFA62R00C220	22pF ± 50/20 %	50VDC	200	1000MΩmin.	−55°C ~ +85°C	6
	★NFA62R00C470	47pF ± 50/20 %					
	★NFA62R00C101	100pF ± 50/20 %					
	★NFA62R00C221	220pF ± 50/20 %					
	★NFA62R00C471	470pF ± 50/20 %					
	★NFA62R00C102	1000pF ± 50/20 %					
	★NFA62R10C221	2200pF ± 50/20 %					
	★NFA62R10C223	22000pF ± 50/20 %					
NFA81R Series 	★NFA81R00C220	22pF ± 50/20 %	50VDC	300	1000MΩmin.	−55°C ~ +125°C	8
	★NFA81R00C470	47pF ± 50/20 %					
	★NFA81R00C101	100pF ± 50/20 %					
	★NFA81R00C221	220pF ± 50/20 %					
	★NFA81R00C471	470pF ± 50/20 %		200			
	★NFA81R10C102	1000pF ± 50/20 %					
	★NFA81R10C222	2200pF ± 50/20 %					
	★NFA81R10C223	22000pF ± 50/20 %		300			

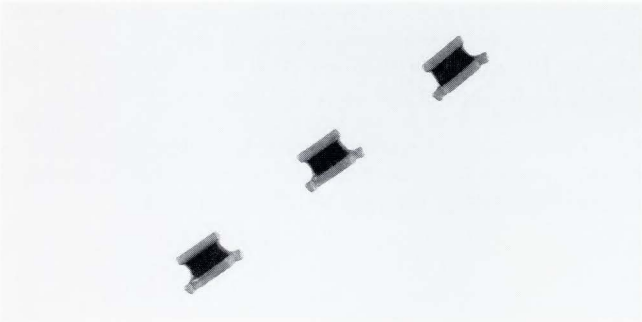
★Available as standard through authorized Murata Electronics Distributors: Standard packaging is tape and reel.

TYPICAL INSERTION LOSS CHARACTERISTICS

NFA81R/62R/41R Series



NFM51R Series



The NFM51R Series chip is an efficient signal line noise suppression filter for high-speed digital signal lines where base-band frequencies and noise band frequencies are very close.

Murata Electronics has combined its superior ceramic technologies with a unique circuit configuration to realize outstanding noise suppression effect in these applications. The NFM51R Series assures noise reduction to meet the specifications of CISPR, FCC, etc.

APPLICATIONS

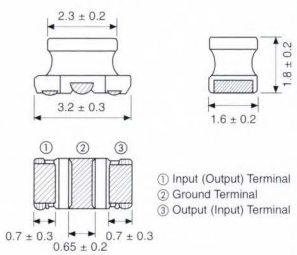
Noise suppression for compact digital instruments, laptop personal computers, HDTV, EDTV, portable VTR, etc.

PART NUMBERING

NFM51R	00	P	106	T1
CHIP SERIES	CLASS NUMBER	CIRCUIT STYLE	CUT-OFF FREQUENCIES	PACKAGING CODE T1=Tape & Reel

SPECIFICATIONS

Dimensions: mm	Part Number	Cut-off Frequency (MHz)	Minimum Attenuation (dB min.)							Rated Voltage (VDC)	Rated Current (mA)	Operating Temperature Range
			10MHz	20MHz	50MHz	100MHz	200MHz	500MHz	1GHz			
NFM51R Series	★NFM51R00P106	10	※	5	25	25	25	30	30	25	200	−40°C ~ +85°C
	★NFM51R00P206	20	—	※	5	25	25	30	30			
	★NFM51R00P506	50	—	—	※	10	30	30	30			
	★NFM51R10P107	100	—	—	—	※	5	20	30			
	★NFM51R20P207	200	—	—	—	—	※	10	30			
	★NFM51R30P507	500	—	—	—	—	—	※	10			



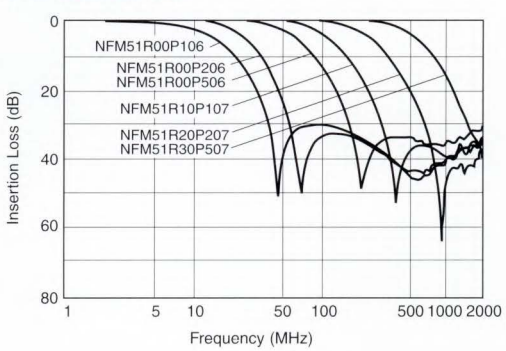
★Available as standard through authorized Murata Electronics Distributors: Standard packaging is tape and reel.

※ 6dB max.

※ The NFM51R Series has no polarity.

TYPICAL INSERTION LOSS CHARACTERISTICS

NFM51R Series



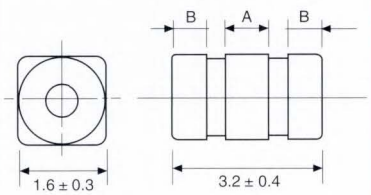
NFM60R Series

The NFM60R Series is an EIA standard 1206 size version of the NFM61R. Its large rated current (6A) and low voltage drop due to small DC resistance (Typ. 3 ~ 4mΩ) are suitable for DC power line use. The feedthrough capacitor provides excellent high-frequency characteristics. The series has excellent solder heat resistance. Both flow and reflow soldering method can be employed. (Only reflow soldering should be employed with the NFM60R20T152.)

PART NUMBERING

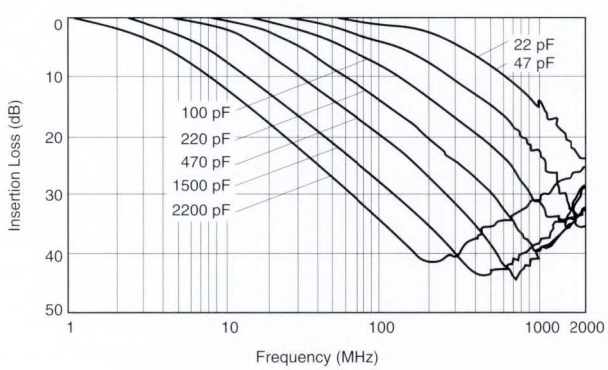
NFM60R	00	T	220	T1
CHIP EMI FILTER SERIES	CLASS NO.	CIRCUIT STYLE	CAPACITANCE	PACKAGING T1=Tape B1=Bulk

SPECIFICATIONS

Dimensions: mm	Part Number	Capacitance	Rated Voltage	Rated Current	Insulation Resistance	DC Resistance	Operating Temp. Range
 A : 1.0 ± 0.2 B : 0.7 ± 0.2	★NFM60R00T220	22pF ± 30%	25VDC	6A	1000MΩmin.	0.01Ωmax.	−40°C ~ +85°C
	★NFM60R00T470	47pF ± $^{50}_{20}$ %					
	★NFM60R00T101	100pF ± $^{80}_{20}$ %					
	★NFM60R00T221	220pF ± $^{50}_{20}$ %					
	★NFM60R10T471	470pF ± $^{50}_{20}$ %					
	★NFM60R20T152	1500pF ± 30%					
	★NFM60R30T222	2200pF ± 50%					

★Available as standard through authorized Murata Electronics Distributors.

TYPICAL INSERTION LOSS CHARACTERISTICS



NFM61R Series

The T-type chip, NFM61R/RH, is a 3 terminal capacitor capable of carrying the large currents (2A) required for use in DC power circuits. This chip series consists of a T-type filter circuit incorporating a ferrite bead inductor for the purpose of suppressing undesirable oscillation. The heavy duty NFM61RH is an improved version of the filter for use in harsh operating conditions.

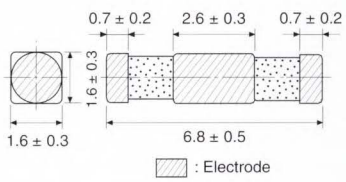
APPLICATIONS

- Switching power supplies
- Excellent high frequency noise suppression
- High current applications

PART NUMBERING

NFM61R	10	T	102	T1
CHIP EMI FILTER SERIES	CLASS NO.	CIRCUIT STYLE	CAPACITANCE	PACKAGING T1=Tape B1=Bulk

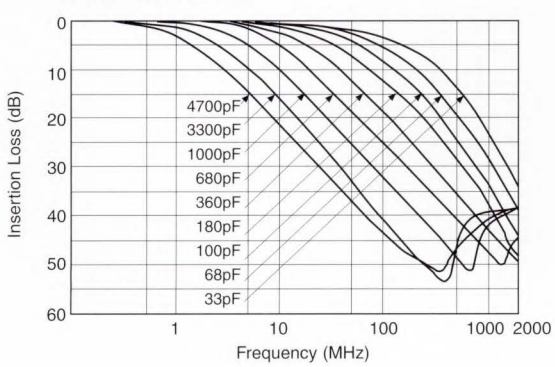
SPECIFICATIONS

Dimensions: mm	Part Number	Capacitance	Rated Voltage	Rated Current (A)	Insulation Resistance	Operating Temp. Range
	★NFM61R00T330	33pF ± 30%	50VDC	2	1000MΩmin.	–25C°~ + 85°C
	★NFM61R00T680	68pF ± 30%				
	★NFM61R00T101	100pF ± 30%				
	★NFM61R00T181	180pF ± 30%				
	★NFM61R00T361	360pF ± 20%				
	★NFM61R00T681	680pF ± 30%				
	★NFM61R10T102	1000pF ± $^{80}_{20}$%				
	★NFM61R30T472	4700pF ± $^{80}_{20}$%				
	★NFM61RH00T330	33pF ± 30%	100VDC	2	1000MΩmin.	–55C°~ + 125°C
	★NFM61RH00T680	68pF ± 30%				
	★NFM61RH00T101	100pF ± 30%				
	★NFM61RH00T181	180pF ± 30%				
	★NFM61RH00T361	360pF ± 20%				
	★NFM61RH00T681	680pF ± 30%				
	★NFM61RH10T102	1000pF ± $^{80}_{20}$%				
	★NFM61RH20T332	3300pF ± $^{80}_{20}$%				

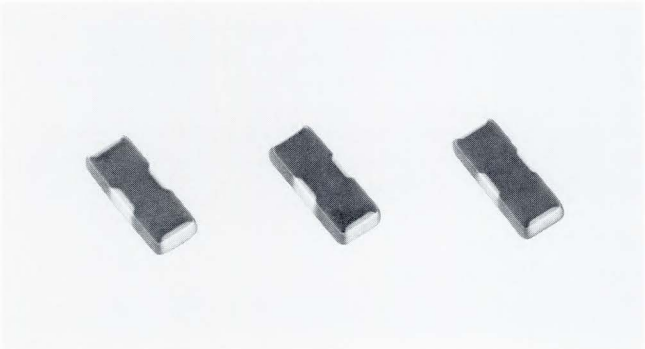
NFM61RH20T332 is specially adapted for reflow soldering. The flow soldering method should not be used.
★Available as standard through authorized Murata Electronics Distributors.

TYPICAL INSERTION LOSS CHARACTERISTICS

NFM61R/H Series



NFM840R Series



The NFM840R Series is a high performance EMI suppression filter which suppresses noise while limiting waveform distortion.

Available in three different values with cut-off frequencies ranging from 20MHz to 100MHz.

FEATURES

- Use of a distributed circuit constant allows a smooth change of impedance, preventing reflection of signal and distortion of wave shape
- The NFM840R Series is effective where ground is unstable, because the resistance element in the filter absorbs noise
- STD EIA size
- Steep attenuation characteristics

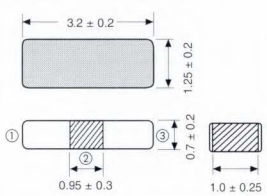
APPLICATIONS

Suppression of noise in interface line or clock line of digital equipment (such as personal computers, word processors).

PART NUMBERING

NFM840R	01	H	100
CHIP EMI FILTER	CLASS	CHARACTERISTIC	NOMINAL CUT-OFF FREQUENCY

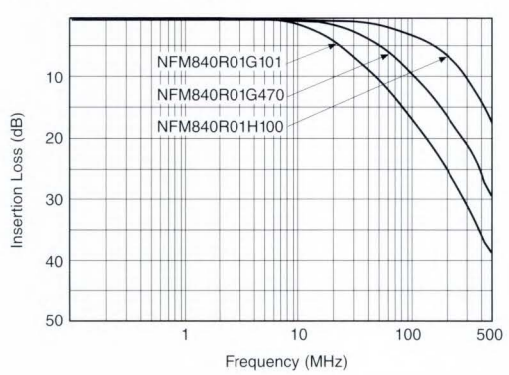
SPECIFICATIONS

Dimensions: mm	Part Number	Nominal Cut-off Frequency (MHz)	Attenuation (50-3kΩ line) (dB min.)						Rated Current ①-③ (mA)	Rated Voltage ①③-② (VDC)	Insulation Resistance ①③-② MΩ min.	Operating Temp. *2 (°C)
			20MHz	50MHz	100MHz	200MHz	500MHz	DCR (Typ.)				
NFM840R Series 	★NFM840R01G101	20	*1	6	10	15	25	100Ω	20	25	1000	−55 to +125
	★NFM840R01G470	50	—	*1	6	10	20	100Ω	20			
	★NFM840R01H100	100	—	—	*1	3	10	220Ω	15			

*1 : 6dB max.
*2 : Please derate the maximum current, as shown next page for temperatures above 85°C.

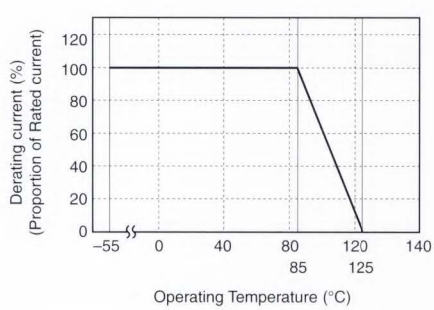
TYPICAL INSERTION LOSS CHARACTERISTICS

(Measured with 50Ω – 3kΩ line)



DERATING

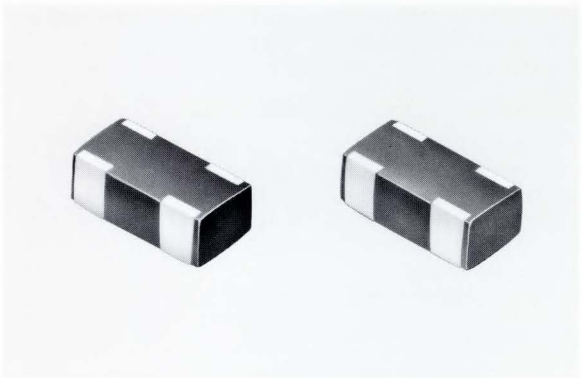
When operated at temperatures over 85°C, current derating is necessary as shown in chart below.



★Available as standard through authorized Murata Electronics Distributors.

muRata

PLM150R Series



The PLM150R SMT common mode choke uses Murata's unique monolithic technology process. High impedance characteristics provide excellent noise suppression in a small, compact size (3.2 x 1.6 x 1.15mm) to remove common mode noise.

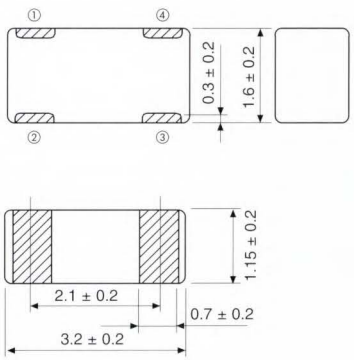
FEATURES

- Prevents common mode noise on signal lines in data communication equipment or digital equipment.
- Low leakage flux due to its full monolithic structure
- Suitable for auto-placement

APPLICATIONS

Prevention of common mode noise on signal lines in personal computers, computer peripheral equipment, facsimiles, digital telephones, etc.

DIMENSIONS: mm

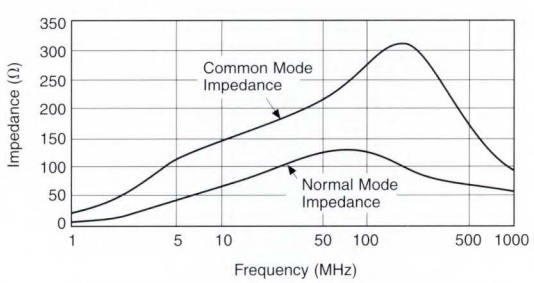


SPECIFICATIONS

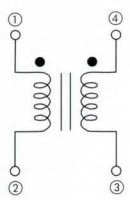
Part Number	Rated Current (mA)	Common Mode Impedance	Rated Voltage	Withstand Voltage	Insulation Resistance	Operating Temp. Range
★PLM150R01	200	280Ω (at 100MHz)	50VDC	125VDC (1 minute)	100MΩmin.	–55°C ~ +85°C

★Available as standard through authorized Murata Electronics Distributors.

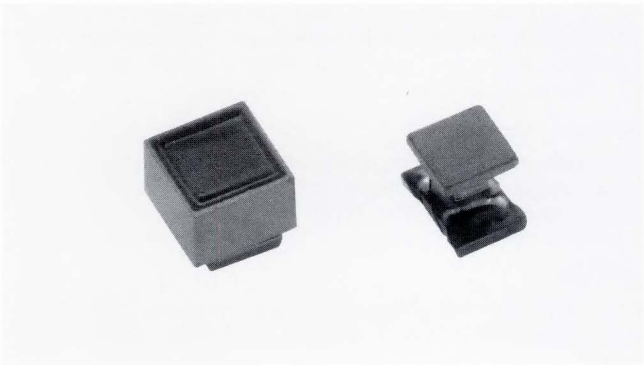
TYPICAL IMPEDANCE CHARACTERISTICS



EQUIVALENT CIRCUIT



PLM250H/S Series



The PLM250H/S is a series of wire wound chip common mode choke coils. Large current and high coupling are combined in a small chip structure to provide superior noise suppression while maintaining signal integrity.

FEATURES

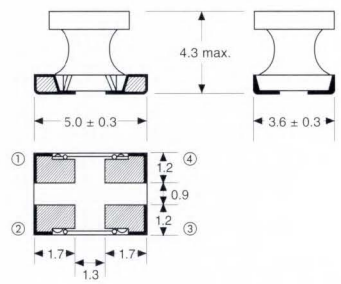
- High impedance enables great noise suppression
- Large rated current enables power line use
- Does not damage high speed signal due to high coupling common mode choke coil structure
- Automatic placement
- Specially adapted for reflow soldering

APPLICATIONS

- Common mode noise suppression of signal lines in high speed digital equipment
- Common mode noise suppression of DC power lines in AC adapter

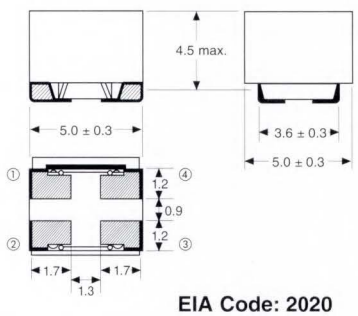
DIMENSIONS: mm

PLM250H



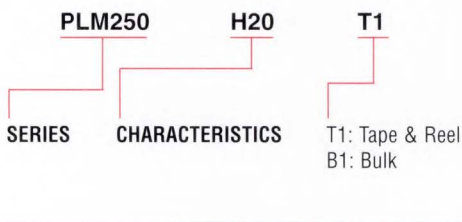
EIA Code: 2014

PLM250S



EIA Code: 2020

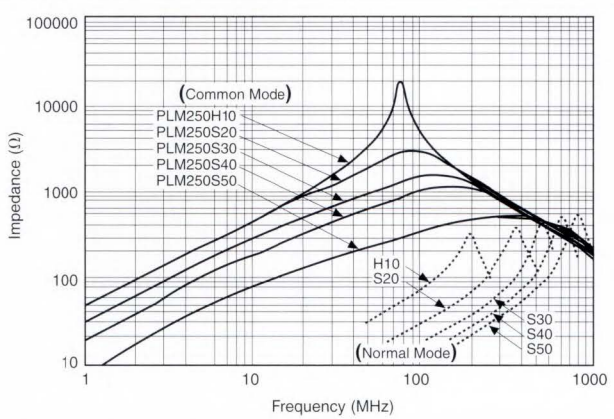
PART NUMBERING



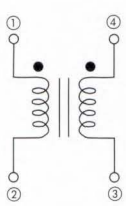
SPECIFICATIONS

Part Number	Rated Current (A)	Impedance (Ω) (Typ.) at 100MHz	DC Resistance (Ω) max.	Rated Voltage (VDC)	Withstand Voltage (VDC)	Insulation Resistance (MΩ) min.	Operating Temp. Range (°C)
★PLM250H10	0.2	4000	3.0	50	125 (1 minute)	10	–25° to +85°
★PLM250S20	0.5	3000	0.3				
★PLM250S30	1.0	1500	0.1				
★PLM250S40	1.5	1000	0.06				
★PLM250S50	2.0	350	0.04				

TYPICAL IMPEDANCE CHARACTERISTICS



EQUIVALENT CIRCUIT



★Available as standard through authorized Murata Electronics Distributors: Standard packaging is tape and reel.

VFM41R Series

The VFM41R Series is an 1806 size, three terminal varistor-capacitor designed to remove ESD surges as well as provide EMI filtering. This filter provides excellent insertion loss characteristics exceeding 1GHz.

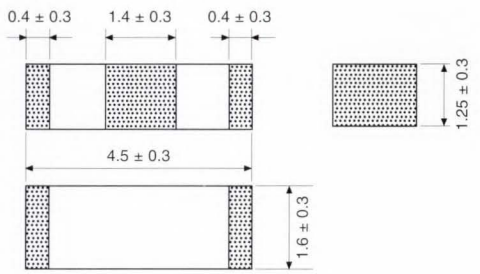
FEATURES

- Suitable for high frequency noise suppression exceeding 1GHz. The insertion loss performance is equivalent to conventional three terminal capacitors.
- Provides protection against surges and ESD in applications such as automotive equipment, portable electronic equipment, (such as notebook computers), telecommunications equipment, etc.

PART NUMBERING

VFM41R	01	C	222	N16	–	27	T1
SERIES	CLASS NO.	CIRCUIT STYLE	CAPACITANCE VALUE	RATED VOLTAGE		VARISTOR VOLTAGE	PACKAGING T1=Tape & Reel B1=Bulk

DIMENSIONS: mm



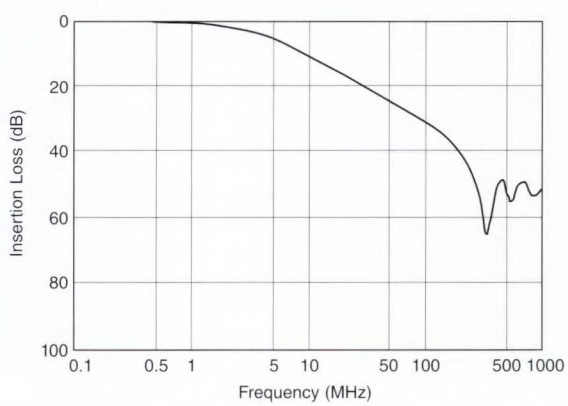
Unit : mm

SPECIFICATIONS

Part Number	Capacitance Value	Rated Voltage	Varistor Voltage	Rated Current (mA)	Insulation Resistance in Ohms	Operating Temperature Range
★VFM41R01C222N16-27	2200pF +/– 30%	16VDC	27V +/– 5V	200	10M min.	–40°C ~ +125°C

★Available as standard through authorized Murata Electronics Distributors.

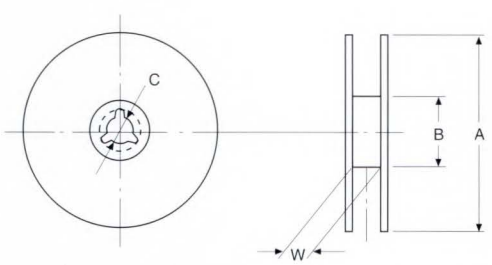
TYPICAL INSERTION LOSS CHARACTERISTICS



SURFACE MOUNT EMI FILTERS
PACKAGING & STORAGE

Product Name		Appearance	Dimensions (mm)			Soldering		Taping Width	Packaging Units		
			L	W	T	Flow Soldering	Reflow Soldering		ϕ180mm Reel	ϕ330mm Reel	Bulk (Bag)
Chip EMI Suppression Filter (EMIFIL®)	BLM11		1.6	0.8	0.8	○	○	8	4,000	—	1,000
	BLM21 (BLM21A222S/ BLM21B222S)		2.0	1.25	0.9	○	○	8	4,000 (3,000)	10,000 (—)	1,000
	BLM31 (BLM31P500S/ BLM31A700S)		3.2	1.6	1.1 (1.6)	○	○	8	3,000 (2,500)	10,000 (8,000)	1,000
	BLM41		4.5	1.6	1.6	○	○	12	2,500	8,000	1,000
	BLA81		12.5	4.5	1.2	○	○	24	1,000	—	100
	BLA62/41		6.3	3.2	1.0	○	○	12	1,000	—	100
	NFM40R		3.2	1.25	0.7	○	○	8	4,000	—	1,000
	NFM41R/41P		4.5	1.6	1.0	○	○	12	4,000	—	1,000
	NFA81R		12.5	4.5	1.2	○	○	24	1,000	—	100
	NFA62R/NFA41R		6.3	3.2	1.0	○	○	12	1,000	—	100
	NFM60R		3.2	1.6	1.6	○	○	8	2,000	—	500
	NFM61R/61RH		6.8	1.6	1.6	○	○	12	2,500	8000	500
	NFM51R		3.2	1.6	1.8	○	○	8	2,000	—	—
	NFM46P		5.7	5.0	2.2	—	○	12	500	—	100
	NFM840		3.2	1.25	0.7	○	○	8	4,000	—	100
	PLM150		3.2	1.6	1.2	○	○	8	3,000	—	100
	PLM250H		5.0	3.6	4.2	—	○	12	400	3,000	100
	PLM250S		5.0	5.0	4.5	—	○	12			100
	VFM41R		4.5	1.6	1.25	○	○	12	2,500	—	1,000

REEL DIMENSIONS



		ϕ 180mm Reel	ϕ 330mm Reel
A		178 ± 2	328 ± 2
B		50 (min.)	
C		ϕ 13 ± 0.5	
W	8mm Width Tape	10 ± 1.5	
	12mm Width Tape	14 ± 1.5	

ϕ : Diameter

Unit : mm

STORAGE REQUIREMENTS

Be sure to observe the following storage requirements to prevent damage to the soldering of exposed electrode.

1. The maximum ambient temperature and relative humidity in which these parts can be stored are 40°C and 70%, respectively. Please note that package deformation may result from storage in ambient temperature exceeding 40°C.
2. Do not unpack the polyethylene bag prior to using the product. Also, after unpacking, promptly reseal or store in a desiccant containing a drying agent.
3. Do not store in areas where harmful gases containing sulfur or chlorine are present.

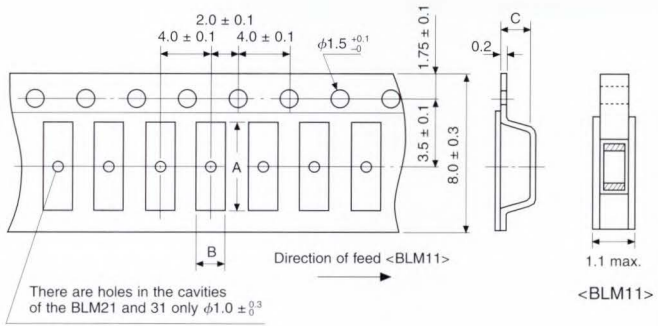
TAPE SPECIFICATIONS

1. All tape packaging conforms to JIS C 0806 specifications. Dimensions are described separately for each product.
2. Tape is wound clockwise.
   When tape is pulled toward the user, the feeding hole is observable on the right side of the tape.

PLASTIC TAPE DIMENSIONS (EIA-J : RC-1009B)

BLM/BLA/NFM/NFA/PLM/VFM

(8mm width Plastic tape, BLM11 uses Paper tape)



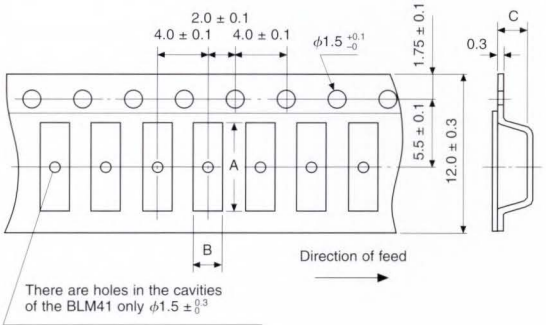
Unit : mm

Package Unit and Cavity Size

Part Number	Cavity Size			Packaging Unit (pcs/reel)	
	A	B	C	φ180mm	φ330mm
BLM11	1.85	1.05	1.1	4000	—
BLM21 (BLM21A222S/ BLM21B222S)	2.25	1.45	1.05 (1.3)	4000 (3000)	10000 (—)
BLM31 (BLM31P500S/ BLM31A700S)	3.5	1.9	1.3 (1.75)	3000 (2500)	10000 (8000)
NFM51R/60R	3.6	1.9	2.0	2000	—
PLM150R	3.5	1.9	1.3	3000	—
NFM40R	3.4	1.4	0.85	4000	—
NFM840R	3.4	1.4	0.85	4000	—

BLM41, NFM41R/41P, NFM61R/61RH, VFM41

(12mm width Plastic tape)



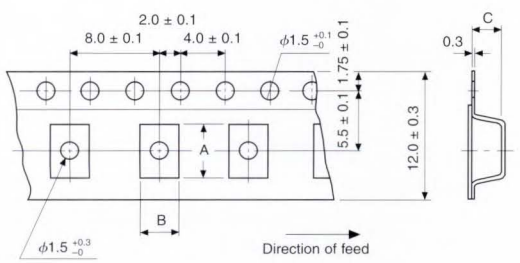
Unit : mm

Package Unit and Cavity Size

Part Number	Cavity Size			Packaging Unit (pcs/reel)	
	A	B	C	φ180mm	φ330mm
BLM41	4.8	1.9	1.75	2500	8000
NFM41R/41P	4.8	1.8	1.1	4000	—
NFM61R/61RH	7.2	1.9	1.75	2500	8000
VFM41R	4.8	1.8	1.35	2500	—

BLA62/41, NFA62R/41R, NFM46P, PLM250R/H

(12mm width Plastic tape)



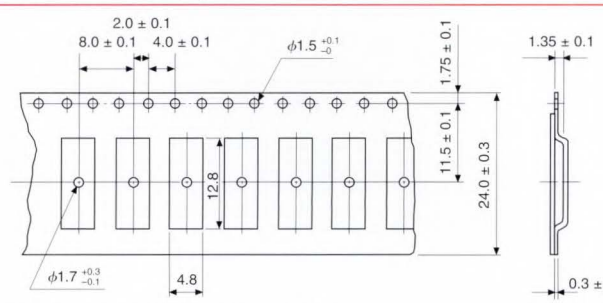
Unit : mm

Package Unit and Cavity Size

Part Number	Cavity Size			Packaging Unit (pcs/reel)	
	A	B	C	φ180mm	φ330mm
BLA62/41	6.6	3.5	1.13	1000	—
NFA62R/41R					
NFM46P	6.0	5.3	2.5	500	—
PLM250R (PLM250H)	5.5 (5.4)	5.4 (4.1)	4.7 (4.4)	400	3000

NFA81R, BLA81

(24mm width Plastic tape)



Packing Unit : 1000pcs/reel (φ 180)

Unit : mm

EMIFIL® MOUNTING INSTRUCTIONS®

1. Standard Land Pattern Dimensions

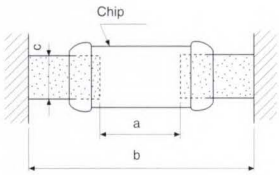
The capacitor type chip EMI suppression filters (NFM/NFA Series) suppress noise by conducting the high frequency noise element to ground. Therefore, to obtain maximum performance from these filters, the ground pattern should be made as large as possible during the PCB design stage.

As shown below, one side of the PCB is used for chip mounting, and the other is used for grounding. Small diameter feedthrough holes are then used to connect the grounds on each side of the PCB. This reduces the high-frequency impedance of the grounding and maximizes the filter's performance.

Resist **Copper Foil Pattern** **No Pattern** **Unit : mm**

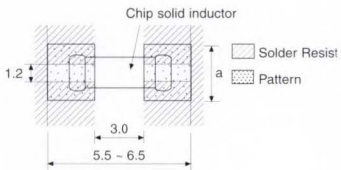
BLM11
BLM21
BLM31
BLM41

Reflow and flow for mounting individually



Type		BLM11	BLM21	BLM31	BLM41
Dimensions	L	1.6	2.0	3.2	4.5
	W	0.8	1.25	1.6	1.6
a		0.7	1.2	2.0	3.0
b		Flow 2.2 ~ 2.6 Reflow 1.8 ~ 2.0	3.0 ~ 4.0	4.2 ~ 5.2	5.5 ~ 6.5
c		0.7	1.0	1.2	1.2

BLM41P02/03



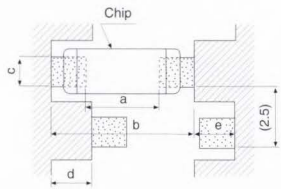
Land Pattern Thickness And Dimension A

Part Number	Land Pattern Thickness		
	18μm	35μm	70μm
BLM41P02	2.4	1.2	0.6
BLM41P03	6.4	3.3	1.65

The excessive heat by land pads may cause deterioration at joint of products with substrate.

Reflow and flow for high density mounting

BLM31/41

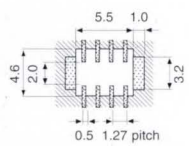


	BLM31	BLM41
a	2.0	3.0
b	4.2 ~ 5.2	5.5 ~ 6.5
c	1.2	1.2
d	1.3	1.8
e	1.35	1.5

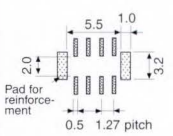
BLA41
BLA62
BLA81

Reflow and Flow

BLA41B01/BLA41B02

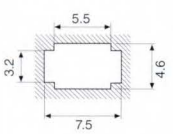


(Copper foil pattern)

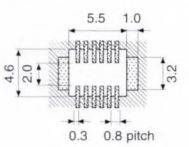


Pad for reinforcing electrode should be electrically isolated.

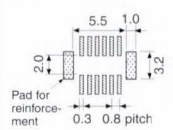
(Resist pattern)



BLA62B01/BLA62B02

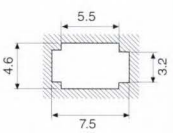


(Copper foil pattern)

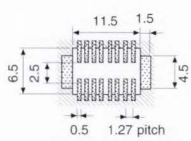


Pad for reinforcing electrode should be electrically isolated.

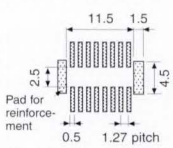
(Resist pattern)



BLA81B01

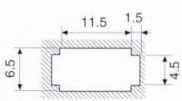


(Copper foil pattern)



Pad for reinforcing electrode should be electrically isolated.

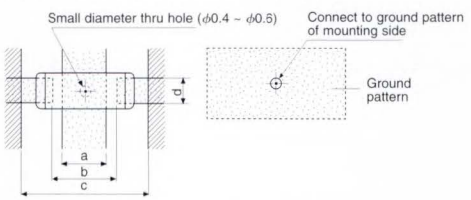
(Resist pattern)



NFM40R
NFM41R
NFM41P
NFM840
VFM41R

Reflow Soldering

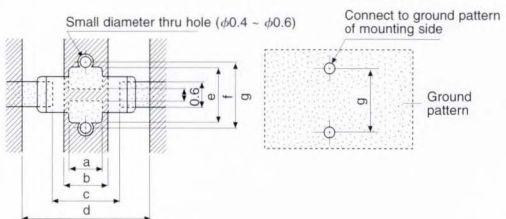
Chip mounting side Back side



	NFM40R/840R	NFM41R/41P	VFM41R
a	1.4	2.0	2.0
b	2.5	3.5	3.5
c	4.4	6.0	6.0
d	1.0	1.2	1.2

Flow Soldering

Chip mounting side Back side



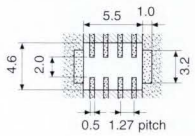
	NFM40R/840R	NFM41R/41P	VFM41R
a	1.0	1.5	1.5
b	1.4	2.0	2.0
c	2.5	3.5	3.5
d	4.4	6.0	6.0
e	1.0	1.2	1.2
f	2.0	2.6	2.6
g	2.4	3.0	3.0

Resist | Copper Foil Pattern | No Pattern | Unit : mm

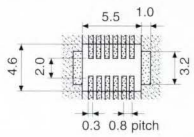
NFA41R / NFA62R / NFA81R

• **Reflow and Flow**

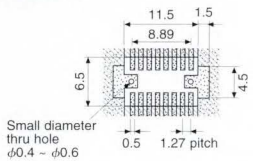
NFA41R



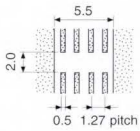
NFA62R



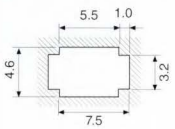
NFA81R



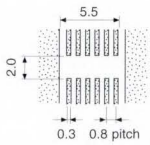
(Copper foil pattern)



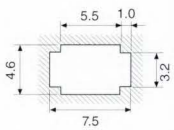
(Resist pattern)



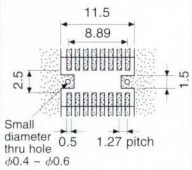
(Copper foil pattern)



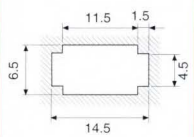
(Resist pattern)



(Copper foil pattern)



(Resist pattern)

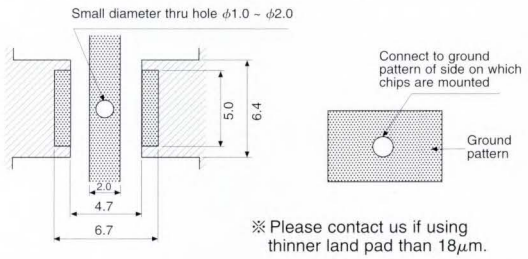


NFM46P / NFM51R / NFM60R

NFM46P (Reflow only)

Side on which chips are mounted

Back side Ground on back side should be designed to be as large as possible



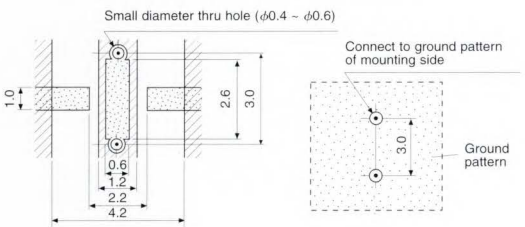
※ Please contact us if using thinner land pad than 18μm.

• **Reflow and Flow**

NFM51R/60R

Chip mounting side

Back side

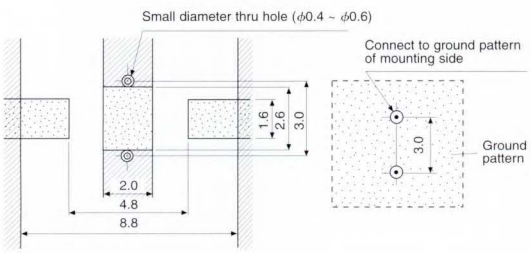


NFM61R / NFM61RH

• **Reflow Soldering**

Chip mounting side

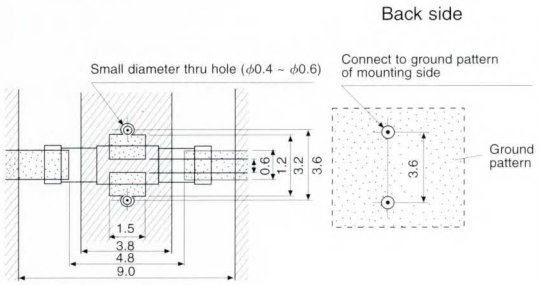
Back side



• **Flow Soldering**

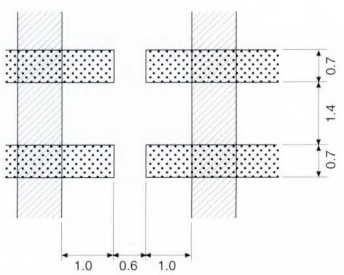
Chip mounting side

Back side



PLM150R / PLM250

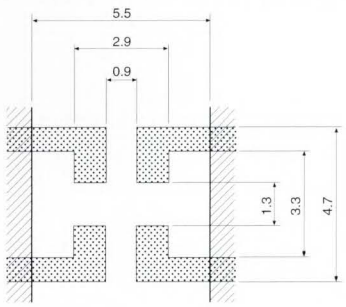
PLM150R



• **Reflow Soldering**

PLM250

(PLM250 is specially adapted for reflow soldering.)



2. Solder Paste Printing and Adhesive Application

When reflow soldering the chip EMI suppression filter, the printing must be conducted in accordance with the following cream solder printing conditions.

If too much solder is applied, the chip will be prone to receive mechanical and thermal stress from the PCB and may crack.

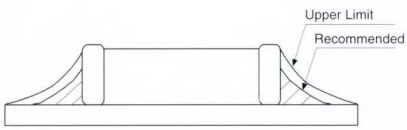
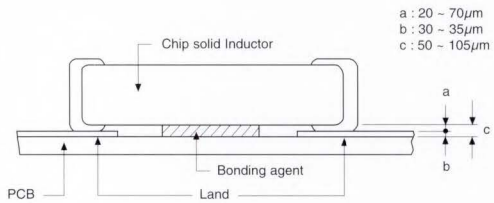
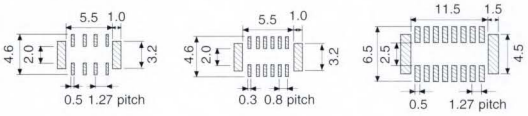
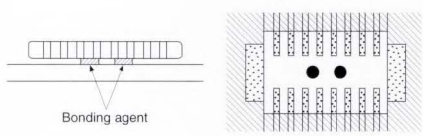
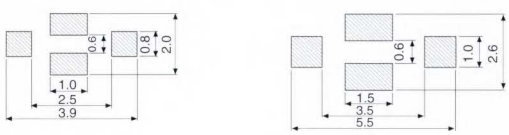
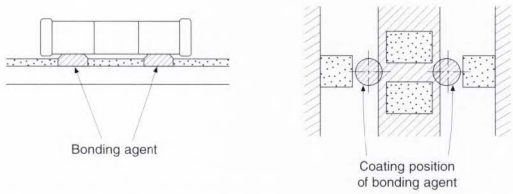
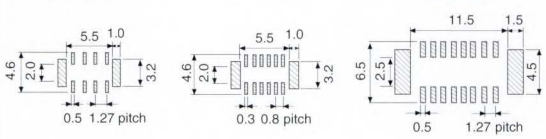
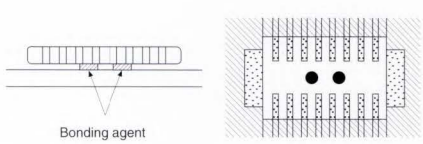
In contrast, if too little solder is applied, there is the potential that the termination strength will be insufficient, creating the potential for detachment.

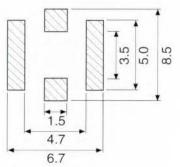
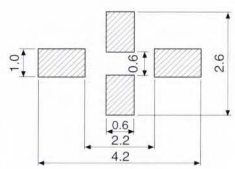
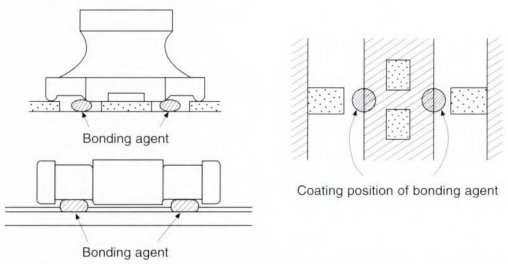
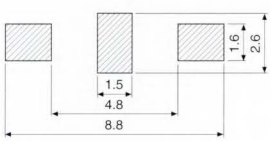
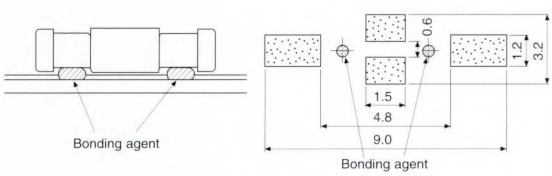
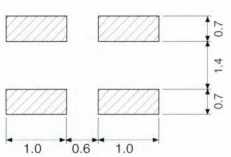
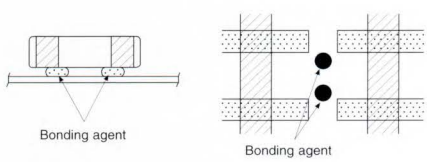
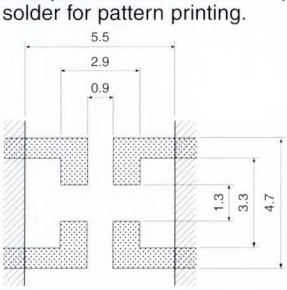
Standard land dimensions should be used for resist and copper foil patterns.

When flow soldering the EMI suppression filter, apply the adhesive in accordance with the following conditions.

If too much adhesive is applied, then it may overflow into the land or termination areas and yield poor solderability. In contrast, if insufficient adhesive is applied, or if the adhesive is not sufficiently hardened, then the chip may become detached during flow soldering.

Unit : mm

Series	Solder Paste Printing	Adhesive Application
BLM11 **BLM21** **BLM31** **BLM41**	• Ensure that solder is applied smoothly to a minimum height of 0.2mm–0.3mm at the end surface of the part. • Coat the solder paste a thickness of 100μm–200μm. 	• Coating amount is illustrated in the following diagram. 
BLA41 **BLA62** **BLA81**	• Coat the solder paste a thickness of 100μm–200μm (BLA41B01), 150μm (BLA62B01), and 200μm (BLA81B01). • Use 60 : 40 solder for pattern printing. **BLA41B01/ BLA41B02** **BLA62B01/ BLA62B02** **BLA81B01** 	• Apply 0.5mg to 0.9mg of bonding agent at each chip. 
NFM40R **NFM41R** **NFM41P** **NFM840R** **VFM41R**	• Coat the solder paste a thickness of 100μm–150μm (NFM40R) and 100μm–200μm (NFM41R/41P). • Use 60 : 40 solder for pattern printing. **NFM40R/840** **NFM41R/41P/VFM41R** 	• Apply 0.1mg for NFM41R/41P/VFM41R and 0.06mg for NFM40R of bonding agent at each chip. 
NFA41R **NFA62R** **NFA81R**	• Coat the solder paste a thickness of 150μm (NFA62R/41R) and 200μm (NFA81R). • Use 60 : 40 solder for pattern printing. **NFM41R** **NFA62R** **NFA81R** 	• Apply 0.5mg to 0.9mg for NFA81R and 0.25 to 0.6mg for NFA62R/41R of bonding agent at each chip, and ensure not to cover electrodes. 

Series	Solder Paste Printing	Adhesive Application
NFM46P	• Coat the solder paste a thickness of 200μm. • Use 60 : 40 solder for pattern printing. 	
NFM51R **NFM60R**	• Coat the solder paste a thickness of 200μm. • Use 60 : 40 solder for pattern printing. 	• Apply 0.2mg for NFM51R of bonding agent at each chip. 
NFM61R **NFM61RH**	• Coat the solder paste a thickness of 200μm. • Use 60 : 40 solder for pattern printing. 	• Apply 1.0mg of bonding agent at each chip. 
PLM150R	• Coat the solder paste a thickness of 150μm. • Use 60 : 40 solder for pattern printing. 	• Apply 0.2mg of bonding agent at each chip. 
PLM250	• Coat the solder paste a thickness of 200μm. • Use H60A solder for pattern printing. 	

SOLDERING METHODS

3. Standard Soldering Conditions

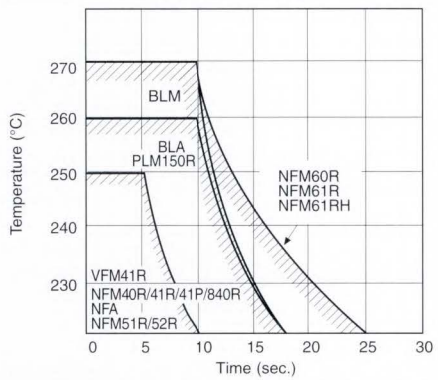
Use flow and reflow soldering methods only.
Use standard soldering conditions when soldering chip EMI suppression filters.

In cases where several different parts are soldered, each having different soldering conditions, use those conditions requiring the least heat and minimum time.

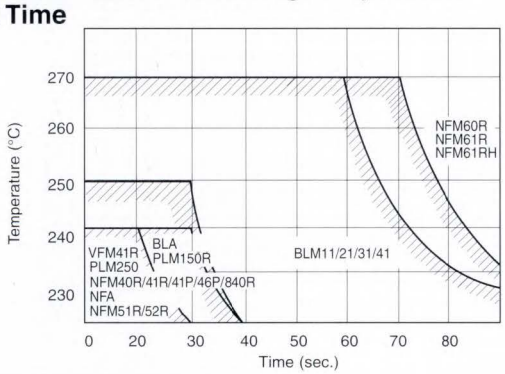
SOLDERING TEMPERATURE AND TIME

To prevent external electrode solder leaching and performance deterioration, solder within the temperature and time combinations illustrated in the following graphs. If soldering is repeated, please note that the allowed time is the accumulated time.

Allowable Flow Soldering Temperature and Time



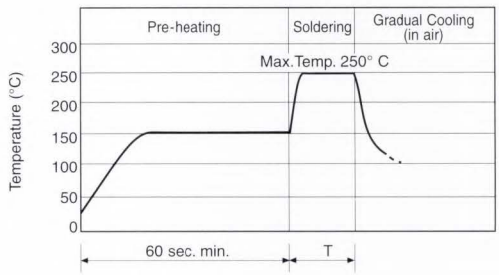
Allowable Reflow Soldering Temperature and Time



Solder : 60 : 40 solder.
Flux : Use Rosin-based flux, but not strong acidic flux– (with chlorine content exceeding 0.20wt%) when using RA type solder, clean products sufficiently to avoid remaining flux.

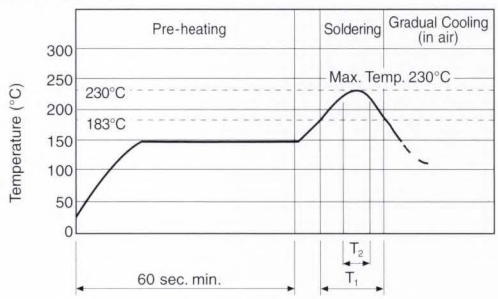
SOLDERING CONDITIONS

Flow Solder



Series	Pre-heating (150°C)	Soldering Time (T)	Soldering Temp. (°C)
BLM	60 sec. min.	10 sec. max.	250
BLA, NFA NFM40R/41R/41P/840R NFM51R NFM60R/61R(H) VFM41R PLM150R		5 sec. max.	
NFM52R		3 sec. max.	240

Reflow Solder



Series	Pre-heating (150°C)	Soldering Time	
		(T1)(183°C)	(T2)(230°C)
NFM60R/61R(H)	60 sec. min.	60 sec. max.	250°C, 20 sec. max.
BLM			20 sec. max.
BLA, NFA NFM40R/41R/840R NFM41P/46P NFM51R/52R VFM41R PLM150R/250			10 sec. max.

REWORKING WITH SOLDERING IRON

The following conditions must be strictly followed when using a soldering iron.
Soldering iron : 30W max.
Tip temperature : 280°C max.
Soldering time : 10 seconds max.
Do not allow the tip of the soldering iron to directly contact the chip.

4. Cleaning

The following conditions should be observed when cleaning chip EMIFIL®.

(1) Cleaning Temperature: 60°C max. (40°C max. for CFC alternatives and alcohol cleaning agents).

(2) Ultrasonic
Output: 20W/l max.
Duration: 5 minutes max.
Frequency: 28kHz to 40kHz

(3) Cleaning agent
The following list of cleaning agents have been tested on the individual components. Evaluation of final assembly should be completed prior to production.

1. CFC alternatives and alcohol cleaning agents.
   - Isopropyl alcohol (IPA)
   - HCFC-225
2. Aqueous cleaning agent
   - Surface active agent (Clean Thru 750H)
   - Hydrocarbon (Techno Cleaner 335)
   - High grade alcohol (Pine Alpha ST-100S)
   - Alkaline saponifier (Aqua Cleaner 240-cleaner should be diluted within 20% using deionized water).

(4) Ensure that flux residue is completely removed. Component should be thoroughly dried after aqueous agent has been removed with deionized water).

(5) Some products may become slightly whitened. However, product performance or usage is not affected. For additional cleaning methods, please contact Murata Engineering.

5. Operating Environment

Do not use products in a chemical atmosphere such as chlorine gas, acid or sulfide gas.

6. Storage and Handling Requirements

(1) Storage temperature: –10°C to +40°C
Relative humidity: 30 to 70%
Avoid sudden changes in temperature and humidity.

(2) Do not store products in a chemical atmosphere such as chlorine gas, acid or sulfide gas.

NOTES

Murata Electronics' Chip Inductors are ultra small, high performance inductors. They feature a low direct current resistance and outstanding high frequency characteristics. Each series has a unique structure specifically designed with a wide range of values suitable for various applications such as cellular mobile phone, pagers, radio communication equipment and audio equipment.

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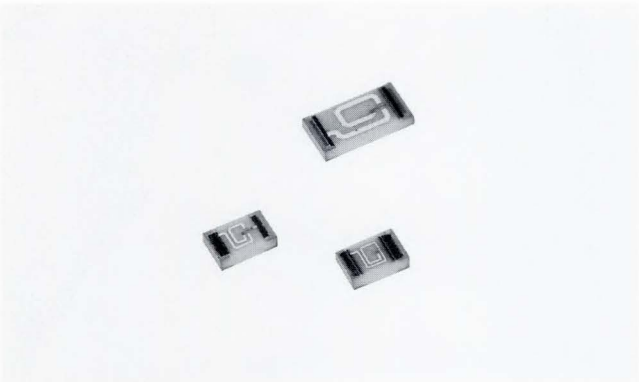
LQP11A/21A/31A Series



The LQP Series is comprised of chip coils with a tight inductance tolerance, ±2%, achieved in a small chip area. Murata achieves this by forming the coil with precision film technology.

This coil is excellent in the high-frequency circuits of radio communication equipment.

PART NUMBERING

LQP	31	A	10N	G	04	M00
TYPE LQP : Printed Thin Film	**SIZE** 21 : 2.0 x 1.25mm (0805) 31 : 3.2 x 1.6mm (1206)	**CORE MATERIAL** A : Alumina	**INDUCTANCE CODE** 4N7 : 4.7nH 15N : 15nH R10 : 100nH	**TOLERANCE** G : ±2% J : ±5%	**ELECTRICAL MATERIAL** 04 : Nickel Alloy Metallization	**UNMARKED**

SPECIFICATIONS

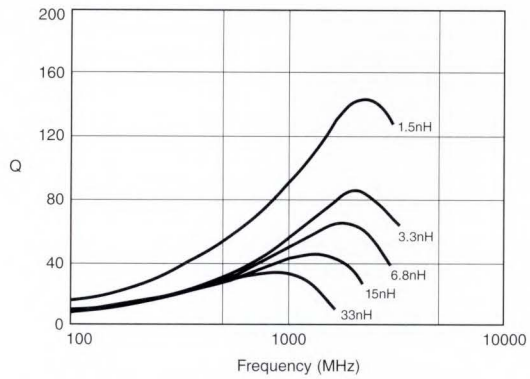
Dimensions: mm	Part Number	Inductance			Q			DC Resistance (Ω max.)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range (°C)
		Nominal Value (nH)	Tolerance (%)	Test Frequency (MHz)	Peak Value (Typ.)	Min. Value	Test Frequency (MHz)				
LQP11A Series	★LQP11A1N3C14	1.3	±0.2nH	500	180	17	500	0.3	6000	300	−40°C ~ +85°C
	★LQP11A1N5C14	1.5			140						
	★LQP11A1N8C14	1.8			120			0.4		250	
	★LQP11A2N2C14	2.2			95						
	★LQP11A2N7C14	2.7			90						
	★LQP11A3N3C14	3.3			85						
	★LQP11A3N9C14	3.9			80			0.5	5900	200	
	★LQP11A4N7C14	4.7			75				5200		
	★LQP11A5N6C14	5.6			65			0.6	4700		
	★LQP11A6N8C14	6.8						0.7	4300		
	★LQP11A8N2C14	8.2			57			0.8	3600	150	
	★LQP11A10NG(J)14	10.0	±2% (±5%)		55			1.0	3400		
	★LQP11A12NG(J)14	12.0			50				3000		
	★LQP11A15NG(J)14	15.0			45			1.3	2700		
	★LQP11A18NG(J)14	18.0			39			1.5	2300	100	
	★LQP11A22NG(J)14	22.0			38			1.9	2100		
	★LQP11A27NG(J)14	27.0			32			2.4	1900		
	★LQP11A33NG(J)14	33.0			30			2.8	1700		
LQP21A Series	★LQP21A22NG(J)14	22		300	42		300	0.9	1800	200	
	★LQP21A27NG(J)14	27			40			1.1	1600		
	★LQP21A33NG(J)14	33			39			1.5	1500	150	
	★LQP21A39NG(J)14	39			36				1300		
	★LQP21A47NG(J)14	47			35			1.7	1200		
	★LQP21A56NG(J)14	56			34			2.9	1100	100	
	★LQP21A68NG(J)14	68			32			3.7	1000		
	★LQP21A82NG(J)14	82			31			4.5	900		
	★LQP21AR10G(J)14	100			24			6.0	700	90	
LQP31A Series	★LQP31A4N7J04	4.7	±5	500	69	20	500	1	2000	250	
	★LQP31A6N8J04	6.8			63						
	★LQP31A10NG(J)04	10	± 2 (± 5)		62				1000	230	
	★LQP31A12NG(J)04	12									
	★LQP31A15NG(J)04	15			53			2		160	
	★LQP31A18NG(J)04	18									
	★LQP31A22NG(J)04	22			48						
	★LQP31A27NG(J)04	27		200		10	200	5	850	100	
	★LQP31A33NG(J)04	33			45						
	★LQP31A47NG(J)04	47			41						
	★LQP31A68NG(J)04	68			34						
	★LQP31AR10G(J)04	100			30			7	650	70	

★Available as standard through authorized Murata Electronics Distributors.

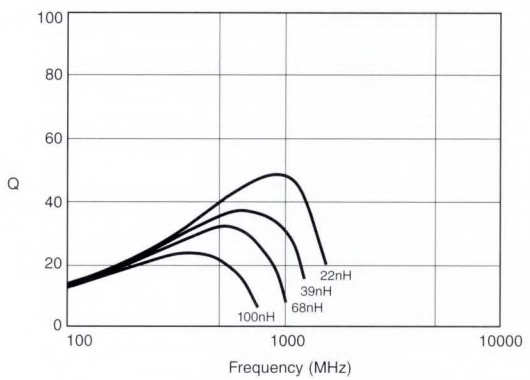
TYPICAL ELECTRICAL CHARACTERISTICS

Q-FREQUENCY CHARACTERISTICS

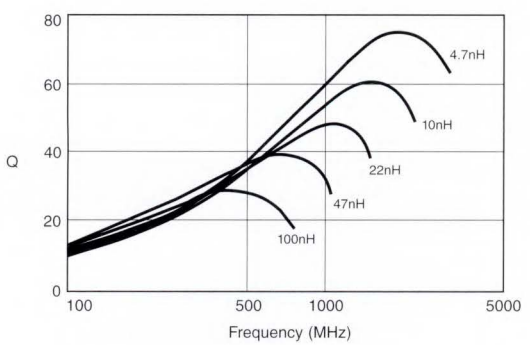
LQP11A Series



LQP21A Series

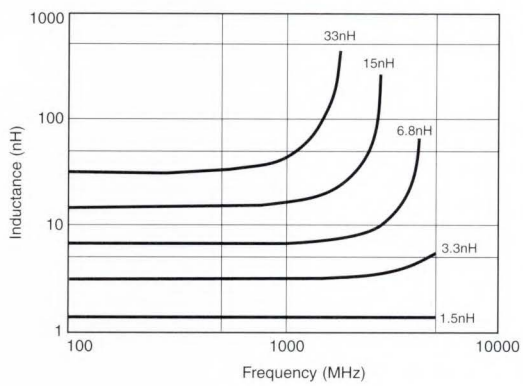


LQP31A Series

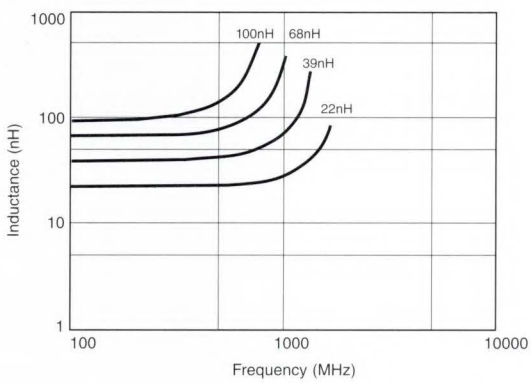


INDUCTANCE-FREQUENCY CHARACTERISTICS

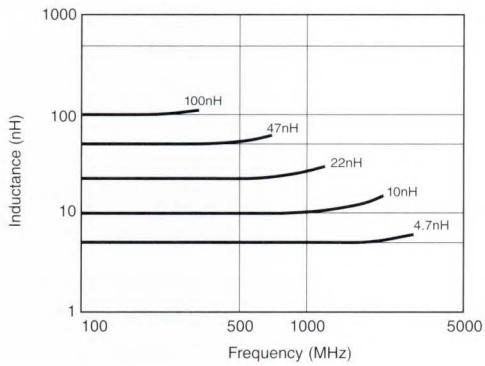
LQP11A Series



LQP21A Series



LQP31A Series



LQN21A Series

The LQN21A Series consists of air-core chip coils using a subminiature alumina core as a bobbin. The high Q value at high frequencies and high self-resonant frequencies make this coil perfect for use in the high frequency circuits of communications equipment.

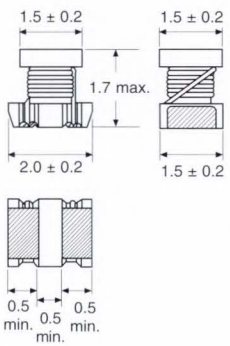
FEATURES

- Broad inductance range (3.3nH to 220nH)
- Tight inductance tolerance
- EIA standard 0805 size
- High self-resonant frequency
- High Q characteristics

PART NUMBERING

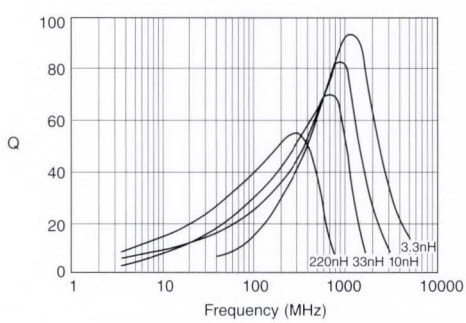
LQN	21	A	3N3	D	04
TYPE LQN: Non-epoxy coated	**SIZE** 21 : 2.0 x 1.5mm (0805)	**CORE MATERIAL** A : Alumina	**INDUCTANCE CODE** 3N3 : 3.3nH	**TOLERANCE** D : ± 0.5nH J : ± 5%	**ELECTRODE MATERIAL** 04 : Nickel Alloy Metalization

SPECIFICATIONS

Dimensions: mm	Part Number	Inductance			Q ※1			DC Resistance (Ω max.)	※2 Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
		Nominal Value (nH)	Tolerance	Test Frequency (MHz)	Peak Value (Typ.)	Minimum Value: Q Value	Minimum Value: Test Frequency (MHz)				
	★LQN21A3N3D04	3.3	± 0.5nH	100	70	10	250	0.07	6000	910	−25°C to +85°C
	★LQN21A6N8D04	6.8				20		0.11	5400	680	
	★LQN21A8N2D04	8.2						0.12	3900	630	
	★LQN21A10NJ04	10	± 5%		80	30		0.04	3300	1320	
	★LQN21A12NJ04	12			65			0.15	3200	680	
	★LQN21A15NJ04	15						0.17	2700	630	
	★LQN21A18NJ04	18			70			0.14	2600	690	
	★LQN21A22NJ04	22						0.10	2100	720	
	★LQN21A27NJ04	27				40		0.24	2300	540	
	★LQN21A33NJ04	33			65			0.20	1900	570	
	★LQN21A39NJ04	39			80			0.17	1700	600	
	★LQN21A47NJ04	47			55		200	0.31	1600	450	
	★LQN21A56NJ04	56			70			0.34	1500	430	
	★LQN21A68NJ04	68			65			0.31	1200	460	
	★LQN21A82NJ04	82			60		150	0.42	1100	320	
	★LQN21AR10J04	100						0.38	750	350	
	★LQN21AR12J04	120			50			0.51	750	280	
	★LQN21AR15J04	150			35	30		0.34	350	420	
	★LQN21AR18J04	180			35	25	100	0.64	300	250	
	★LQN21AR22J04	220			50	35		0.70	500	240	

※1: Measured with LCR meter YHP4191A, measuring tap 16193A.
※2: Measured with Network Analyzer HP8753C.
★Available as standard through authorized Murata Electronics Distributors.

TYPICAL Q-FREQUENCY CHARACTERISTICS



LQN1A/2A Series

The LQN1A and LQN2A Series are comprised of air-core chip coils having sub-miniature alumina core bobbins. These coils are excellent in high-frequency video and communication applications because of their high Q values at high frequencies and high self-resonant frequencies.

LQN1A

The sub-miniature dimensions (3.2 x 1.6 x 1.8mm) allow parallel mounting on 2.5mm centers. A high self-resonant frequency makes these coils effective for applications from 100MHz up to 3GHz.

LQN2A

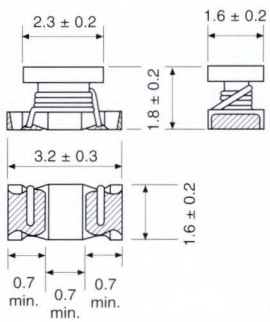
This series comprises a wound type chip coil with a minimum thickness of merely 1.6mm. A high self-resonant frequency makes these coils effective for applications ranging from 100MHz up to 1,000MHz.

PART NUMBERING

LQN	1	A	23N	J	04	M00
TYPE	**SIZE**	**CORE MATERIAL**	**INDUCTANCE CODE**	**TOLERANCE**	**ELECTRODE MATERIAL**	**MARKING**
LQN: Non-epoxy coated	1 : 3.2 x 1.6mm (1206) 2 : 3.2 x 2.5mm (1210)	A : Alumina	8N8 : 8.8nH 23N : 23nH R10 : 100nH	J : ± 5% K : ± 10% M : ± 20%	04 : Nickel Alloy Metallization	M00 : Unmarked

SPECIFICATIONS

Dimensions	Part Number	Inductance			Q			DC Resistance (Ω)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
		Nominal Value (nH)	Tolerance (%)	Measurement Frequency	Peak Value (typ.)	Min. Value	Measurement Frequency				
LQN1A Series	★LQN1A8N8J(K)04	8.8	± 5 (± 10)	100MHz	100	50	436MHz	0.029 ± 40%	1000	750	−25°C ~ +85°C
	★LQN1A15NJ(K)04	14.7				60		0.035 ± 40%		680	
	★LQN1A17NJ(K)04	17						0.037 ± 40%		650	
	★LQN1A23NJ(K)04	23						0.046 ± 40%		590	
	★LQN1A27NJ(K)04	27						0.051 ± 40%		560	
	★LQN1A33NJ(K)04	33						0.057 ± 40%		530	
	★LQN1A39NJ(K)04	39						0.067 ± 40%		490	
	★LQN1A47NJ(K)04	47			90			0.110 ± 40%		380	
	★LQN1A56NJ(K)04	56						0.140 ± 40%		330	
	★LQN1A64NJ(K)04	64			80			0.180 ± 40%		290	
	★LQN1A84NJ(K)04	84			70			0.280 ± 40%		240	
	★LQN1AR10J(K)04	100						0.300 ± 40%	900	230	

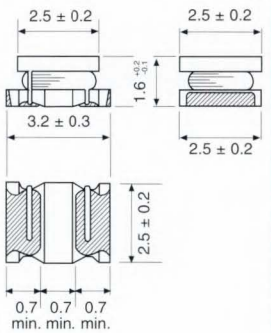


★Available as standard through authorized Murata Electronics Distributors.

LQN1A/2A Series

SPECIFICATIONS

Dimensions	Part Number	Inductance			Q			DC Resistance (Ω max.)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
		Nominal Value (nH)	Tolerance (%)	Measurement Frequency	Peak Value (typ.)	Min. Value	Measurement Frequency				
LQN2A Series	★LQN2A10NM(K)04	10	± 20 (± 10)	100MHz	90	30	200MHz	0.25	1000	770	−25°C ~ −85°C
	★LQN2A18NM04	18	± 20		85	40		0.25	1000	680	
	★LQN2A22NM(K)04	22	± 20 (± 10)		80	30		0.25	1000	410	
	★LQN2A33NM(K)04	33			80	40		0.25	900	490	
	★LQN2A39NM(K)04	39			75			0.25	900	370	
	★LQN2A47NM(K)04	47			80			0.3	600	550	
	★LQN2A56NM(K)04	56			75			0.3	800	340	
	★LQN2A68NM(K)04	68			60			0.3	500	500	
	★LQN2A82NM(K)04	82			50			0.3	600	300	
	★LQN2AR10K04	100	± 10	25MHz	55	30	100MHz	0.4	400	380	
	★LQN2AR12K04	120			50			0.4	350	410	
	★LQN2AR15K04	150			45			0.5	300	400	
	★LQN2AR18K04	180			45			0.5	300	370	
	★LQN2AR22K04	220			40			0.6	280	360	

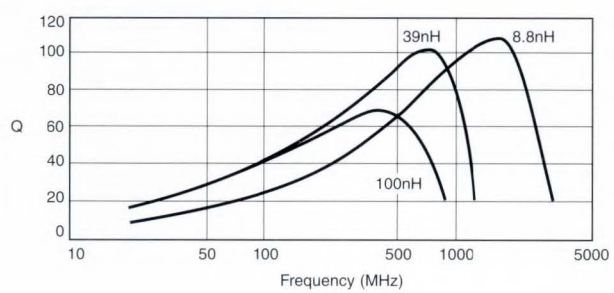


★Available as standard through authorized Murata Electronics Distributors.

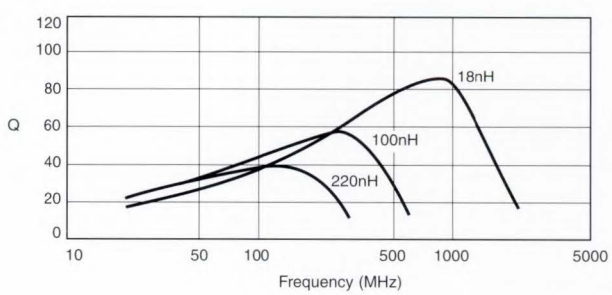
TYPICAL ELECTRICAL CHARACTERISTICS

Q-FREQUENCY CHARACTERISTICS

LQN1A Series



LQN2A Series



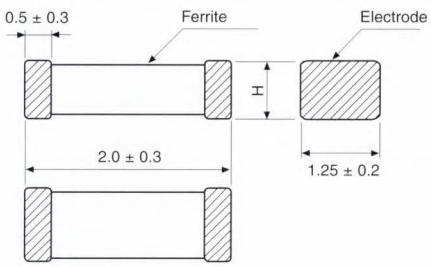
LQG21N Series

The LQG21N Series are magnetically shielded chip coils which were developed from Murata Electronics' multilayer process technology and magnetic materials. It is one-quarter the size of conventional chip coils and has high reliability.

PART NUMBERING

LQG	21	N	R10	K	04	T1
TYPE LQG : Monolithic	**SIZE** 21 : 2.0 x 1.25mm (0805)	**APPLICATION** Ferrite for General Use	**INDUCTANCE** R10 : 100nH 1R0 : 1μH	**TOLERANCE** K : ±10%	**ELECTRODE MATERIAL**	**T1 : TAPE** **B1 : BULK**

DIMENSIONS: mm



Unit : mm

Part Number	H
LQG21NR10~2R2	0.9 ± 0.2
LQG21N2R7~4R7	1.25 ± 0.2

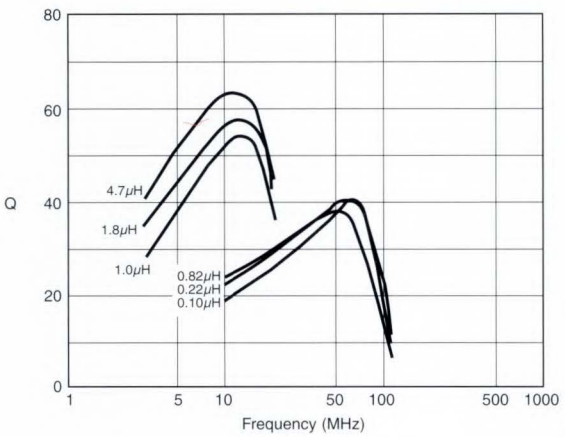
SPECIFICATIONS

Part Number	Inductance			Q		DC Resistance (Ω)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
	Nominal Value (μH)	Tolerance (%)	Measurement Frequency	Nominal Value (min.)	Measurement Frequency				
★LQG21NR10K04	0.10	± 10	25 MHz	20	25 MHz	0.17±50%	340	250	–25°C ~ +85°C
★LQG21NR12K04	0.12					0.19±50%	310		
★LQG21NR15K04	0.15					0.21±50%	270		
★LQG21NR18K04	0.18					0.23±50%	250		
★LQG21NR22K04	0.22					0.25±50%	220		
★LQG21NR27K04	0.27					0.28±50%	200		
★LQG21NR33K04	0.33					0.32±50%	180		
★LQG21NR39K04	0.39			25		0.35±50%	165	200	
★LQG21NR47K04	0.47					0.38±50%	150		
★LQG21NR56K04	0.56					0.42±50%	140	150	
★LQG21NR68K04	0.68					0.48±50%	125		
★LQG21NR82K04	0.82					0.54±50%	115		
★LQG21N1R0K04	1.0		10 MHz	30	10 MHz	0.28±50%	107	50	
★LQG21N1R2K04	1.2					0.31±50%	97		
★LQG21N1R5K04	1.5					0.34±50%	87		
★LQG21N1R8K04	1.8					0.38±50%	80		
★LQG21N2R2K04	2.2					0.42±50%	71	30	
★LQG21N2R7K04	2.7					0.46±50%	66		
★LQG21N3R3K04	3.3					0.54±50%	59		
★LQG21N3R9K04	3.9					0.59±50%	53		
★LQG21N4R7K04	4.7					0.70±50%	47		

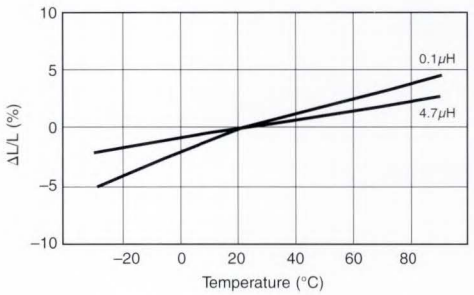
★Available as standard through authorized Murata Electronics Distributors.

TYPICAL ELECTRICAL CHARACTERISTICS

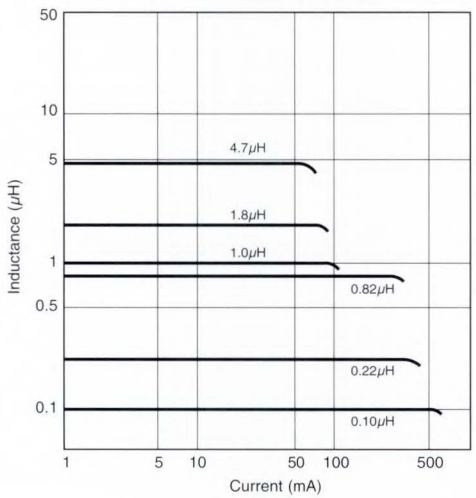
Q-FREQUENCY CHARACTERISTICS



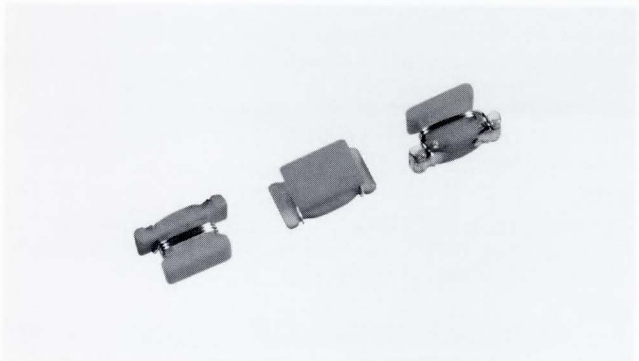
INDUCTANCE-TEMPERATURE CHARACTERISTICS



INDUCTANCE-CURRENT CHARACTERISTICS



LQN1H Series



Chip coil LQN1H Series is a wire wound type chip coil which applies a high frequency ferrite core. Its high Q value at 30MHz ~ 150MHz and low DC resistance are suitable for high frequency resonator circuits use.

APPLICATION

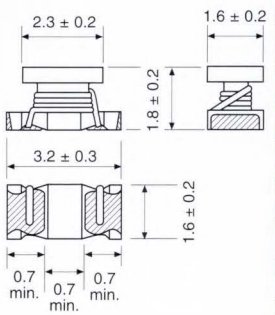
Voltage controlled oscillator, trap, filter circuit built-in mobile communication equipment, cordless phones, various radio equipment, FM radio tuners, TV tuners (VHF low), VIF circuits, etc.

PART NUMBERING

LQN	1	H	54N	K	04	M00
TYPE LQN: Without Coating	**SIZE** 1 : 3.2 x 1.6mm (1206)	**APPLICATION** H : High Frequency Application	**INDUCTANCE** 54N : 54nH	**TOLERANCE** K : ±10%	**ELECTRODE MATERIAL** 04 : Nickel Alloy Metalization	**MARKING** M00 : Unmarked

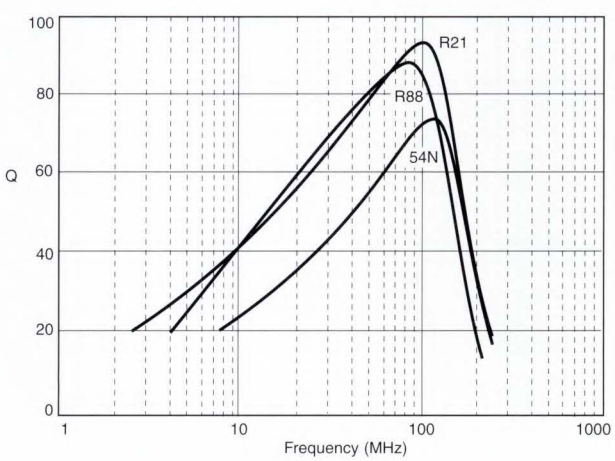
SPECIFICATIONS

Dimensions	Part Number	Inductance			Q			DC Resistance (Ω)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
		Nominal Value (nH)	Tolerance (%)	Measurement Frequency	Peak Value (typ.)	Nominal Value (min.)	Measurement Frequency				
LQN1H Series	★LQN1H54NK04	54	± 10 (± 5)	1MHz	65	50	100MHz	0.035 ± 30%	800	920	−25°C ~ +85°C
	★LQN1H95NK04	95			75	60		0.047 ± 30%	650	790	
	★LQN1HR14K(J)04	145			80			0.061 ± 30%	500	700	
	★LQN1HR21K(J)04	215			85			0.11 ± 30%	430	520	
	★LQN1HR29K(J)04	290						0.17 ± 30%	360	420	
	★LQN1HR39K(J)04	390						0.26 ± 30%	300	330	
	★LQN1HR50K(J)04	500						0.44 ± 30%	270	260	
	★LQN1HR61K(J)04	610						0.48 ± 30%	240	250	
	★LQN1HR75K(J)04	750						0.79 ± 30%	220	190	
	★LQN1HR88K(J)04	880			90			0.86 ± 30%	200	180	



★Available as standard through authorized Murata Electronics Distributors.

TYPICAL Q-FREQUENCY CHARACTERISTICS



LQH1N/3N/4N

The chip coil LQH/LQN Series comprises subminiature chip inductors wound on a special ferrite core made possible by an automatic winding technique developed by Murata Electronics. These inductors have a high Q at high frequencies and low DC resistance, making them suited for enhancing the performance of electronic circuits in video, communications and audio equipment.

LQH1N

The sub-miniature dimensions (3.2 x 1.6 x 1.8mm) allow parallel mounting on 2.5mm centers. This series is suitable for portable audio-visual equipment.

LQH3N

High Q value makes the series suitable for circuits up to 100MHz in frequency. This series is excellent for video equipment.

LQH(N)4N

This series is available with high inductance values and high current capacity. At 10μH, up to 450mA designs are possible, resulting in excellent performance when the series is used as a choke coil.

PART NUMBERING

LQH	3	N	101	K	04	M00

TYPE
LQH : Epoxy coating on winding

SIZE
1 : 3.2 x 1.6mm (1206)
3 : 3.2 x 2.5mm (1210)
4 : 4.5 x 3.2mm (1812)

APPLICATION
N : General Use

INDUCTANCE CODE
R22 : 0.22μH
2R2 : 2.2μH
220 : 22μH
221 : 220μH
102 : 1000μH

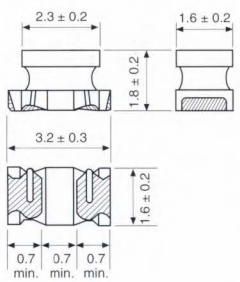
TOLERANCE
J : ± 5%
K : ±10%
M : ±20%

ELECTRODE MATERIAL
04 : Nickel Alloy Metallization

MARKING
M00 : Unmarked (Marking not available on LQH4N)

SPECIFICATIONS

Dimensions: mm	Part Number	Inductance			Q		DC Resistance (Ω)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
		Nominal Value (μH)	Tolerance (%)	Measurement Frequency	Nominal Value (min.)	Measurement Frequency				
LQH1N Series	★LQH1NR15M(K)04	0.15	± 20 (± 10)	1MHz	20	25MHz	0.39±40%	250	250	−25°C ~ +85°C
	★LQH1NR22M(K)04	0.22					0.43±40%	250	240	
	★LQH1NR33M(K)04	0.33			30		0.45±40%	250	230	
	★LQH1NR47M(K)04	0.47					0.83±40%	200	215	
	★LQH1NR56M(K)04	0.56					0.61±40%	180	200	
	★LQH1NR68M(K)04	0.68					0.67±40%	160	190	
	★LQH1NR82M(K)04	0.82					0.73±40%	120	185	
	★LQH1N1R0M(K)04	1.0			35	10MHz	0.49±30%	100	175	
	★LQH1N1R2M(K)04	1.2					0.9±30%	90	165	
	★LQH1N1R5M(K.J)04	1.5	★ ± 20 ★(± 10) ★(± 5)				1.0±30%	75	155	
	★LQH1N1R8M(K.J)04	1.8					1.6±30%	60	150	
	★LQH1N2R2M(K.J)04	2.2					0.7±30%	50	140	
	★LQH1N2R7M(K.J)04	2.7					0.55±30%	43	135	
	★LQH1N3R3M(K.J)04	3.3	★ ± 20 ★(± 10) (± 5)			8MHz	1.4±30%	38	130	
	★LQH1N3R9M(K.J)04	3.9					1.5±30%	35	125	
	★LQH1N4R7M(K.J)04	4.7					1.7±30%	31	120	
	★LQH1N5R6M(K.J)04	5.6					1.8±30%	28	115	
	★LQH1N6R8M(K.J)04	6.8					2.0±30%	25	110	
	★LQH1N8R2M(K.J)04	8.2					2.2±30%	23	105	
	★LQH1N100K(J)04	10	★± 10 (± 5)			5MHz	2.5±30%	20	100	
	★LQH1N120K(J)04	12					2.7±30%	18	95	
	★LQH1N150K(J)04	15					3.0±30%	16	90	
	★LQH1N180K(J)04	18					3.4±30%	15	85	
	★LQH1N220K(J)04	22			40	2.5MHz	3.1±30%	14	85	
	★LQH1N270K(J)04	27					3.4±30%	13	85	
	★LQH1N330K(J)04	33					3.8±30%	12	80	
	★LQH1N390K(J)04	39					7.2±30%	11	55	
	★LQH1N470K(J)04	47					8.0±30%	10	55	
	★LQH1N560K(J)04	56					8.9±30%	9.0	50	
	★LQH1N680K(J)04	68					9.9±30%	8.5	50	
	★LQH1N820K(J)04	82					11±30%	7.5	45	
	★LQH1N101K(J)04	100					12±30%	7.0	45	



★Available as standard through authorized Murata Electronics Distributors.

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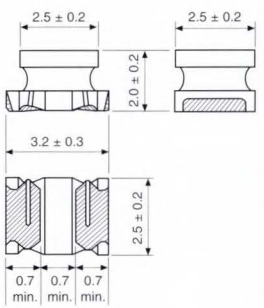
LQH1N/3N/4N Series

SPECIFICATIONS

Dimensions: mm	Part Number	Inductance			Q		DC Resistance (Ω) max.	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
		Nominal Value (μH)	Tolerance (%)	Measurement Frequency	Nominal Value (min.)	Measurement Frequency				
LQH3N Series	★LQH3NR10M04	0.10	± 20	1MHz	20	25.2MHz	0.25	200	700	−25°C ~ +85°C
	★LQH3NR18M04	0.18					0.25	200	650	
	★LQH3NR27M04	0.27			25		0.25	200	600	
	★LQH3NR39M04	0.39					0.25	200	530	
	★LQH3NR56M04	0.56			30		0.25	160	530	
	★LQH3NR68M04	0.68					0.25	160	470	
	★LQH3NR82M04	0.82					0.25	120	450	
	★LQH3N1R0M04	1.0			20	1MHz	0.5	100	445	
	★LQH3N1R2M04	1.2					0.6	100	425	
	★LQH3N1R5M(K)04	1.5	★± 20 (± 10)				0.6	75	400	
	★LQH3N1R8M(K)04	1.8					0.7	60	390	
	★LQH3N2R2M(K)04	2.2					0.8	50	370	
	★LQH3N2R7M(K)04	2.7					0.9	43	320	
	★LQH3N3R3M(K)04	3.3					1.0	38	300	
	★LQH3N3R9M(K)04	3.9					1.1	35	290	
	★LQH3N4R7M(K)04	4.7					1.2	31	270	
	★LQH3N5R6M(K)04	5.6					1.3	28	250	
	★LQH3N6R8M(K)04	6.8					1.5	25	240	
	★LQH3N8R2M(K)04	8.2					1.6	23	225	
	★LQH3N100K(J)04	10	★± 10 (± 5)		35		1.8	20	190	
	★LQH3N120K(J)04	12					2.0	18	180	
	★LQH3N150K(J)04	15					2.2	16	170	
	★LQH3N180K(J)04	18					2.5	15	165	
	★LQH3N220K(J)04	22					2.8	14	150	
	★LQH3N270K(J)04	27					3.1	13	125	
	★LQH3N330K(J)04	33			40		3.5	12	115	
	★LQH3N390K(J)04	39					3.9	11	110	
	★LQH3N470K(J)04	47					4.3	11	100	
	★LQH3N560K(J)04	56					4.9	10	85	
	★LQH3N680K(J)04	68					5.5	9.0	80	
	★LQH3N820K(J)04	82					6.2	8.5	70	
	★LQH3N101K(J)04	100				796kHz	7.0	8.0	80	
	★LQH3N121K(J)04	120					8.0	7.5	75	
	★LQH3N151K(J)04	150					9.3	7.0	70	
	★LQH3N181K(J)04	180					10.2	6.0	65	
	★LQH3N221K(J)04	220					11.8	5.5	65	
	★LQH3N271K(J)04	270					12.5	5.0	65	
	★LQH3N331K(J)04	330					13.0	5.0	65	
	★LQH3N391K(J)04	390			50		22.0	5.0	50	
	★LQH3N471K(J)04	470		1kHz			25.0	5.0	45	
	★LQH3N561K(J)04	560					28.0	5.0	40	

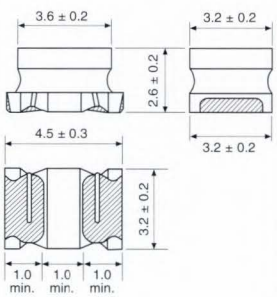


★Available as standard through authorized Murata Electronics Distributors.

LQH1N/3N/4N Series

SPECIFICATIONS

Dimensions: mm	Part Number	Inductance			Q		DC Resistance (Ω) max.	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
		Nominal Value (μH)	Tolerance (%)	Measurement Frequency	Nominal Value (min.)	Measurement Frequency				
LQH4N/LQN4N Series	LQH4N1R0M04	1.0	★ ± 20	1MHz	20	1MHz	0.20	120	500	–25°C ~ +85°C
	LQH4N1R2M04	1.2						100		
	LQH4N1R5M04	1.5					0.30	85		
	LQH4N1R8M04	1.8						75		
	LQH4N2R2M04	2.2						62		
	LQH4N2R7M04	2.7					0.32	53		
	LQH4N3R3M04	3.3					0.35	47		
	LQH4N3R9M04	3.9					0.38	41		
	LQH4N4R7M(K)04	4.7	★ ± 20 (± 10)		30		0.40	38		
	LQH4N5R6M(K)04	5.6					0.47	33		
	LQH4N6R8M(K)04	6.8					0.50	31	450	
	LQH4N8R2M(K)04	8.2					0.56	27		
	★LQH4N100K(J)04	10	★ ± 10 (± 5)		35		0.56	23	400	
	★LQH4N120K(J)04	12					0.62	21	380	
	★LQH4N150K(J)04	15					0.73	19	360	
	★LQH4N180K(J)04	18					0.82	17	340	
	★LQH4N220K(J)04	22					0.94	15	320	
	★LQH4N270K(J)04	27					1.1	14	300	
	★LQH4N330K(J)04	33					1.2	12	270	
	★LQH4N390K(J)04	39					1.4	11	240	
	★LQH4N470K(J)04	47					1.5	10	220	
	★LQH4N560K(J)04	56					1.7	9.3	200	
	★LQH4N680K(J)04	68					1.9	8.4	180	
	★LQH4N820K(J)04	82					2.2	7.5	170	
	★LQH4N101K(J)04	100			40	796kHz	2.5	6.8	160	
	★LQH4N121K(J)04	120					3.0	6.2	150	
	★LQH4N151K(J)04	150					3.7	5.5	130	
	★LQH4N181K(J)04	180					4.5	5.0	120	
	★LQH4N221K(J)04	220					5.4	4.5	110	
	★LQH4N271K(J)04	270					6.8	4.0	100	
	★LQH4N331K(J)04	330					8.2	3.6	95	
	★LQH4N391K(J)04	390					9.7	3.3	90	
	★LQH4N471K(J)04	470					11.8	3.0	80	
	★LQH4N561K(J)04	560					14.5	2.7	70	
	★LQH4N681K(J)04	680					17.0	2.5	65	
	★LQH4N821K(J)04	820					20.5	2.2	60	
	★LQH4N102K(J)04	1000		1kHz		252kHz	25.0	2.0	50	
	★LQH4N122K(J)04	1200					30.0	1.8	45	
	★LQH4N152K(J)04	1500					37.0	1.6	40	
	★LQN4N182K(J)04	1800					45.0	1.5	35	
	★LQN4N222K(J)04	2200					50.0	1.3	30	

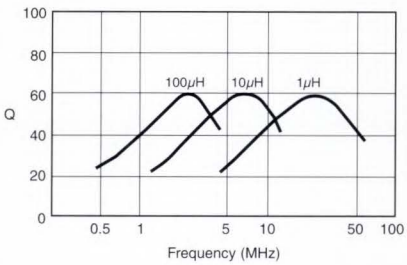


★Available as standard through authorized Murata Electronics Distributors.

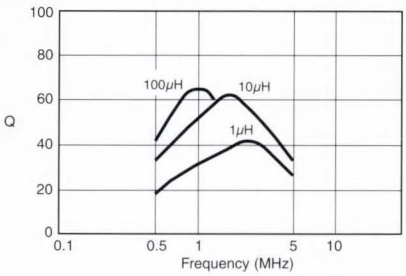
TYPICAL ELECTRICAL CHARACTERISTICS

Q-FREQUENCY CHARACTERISTICS

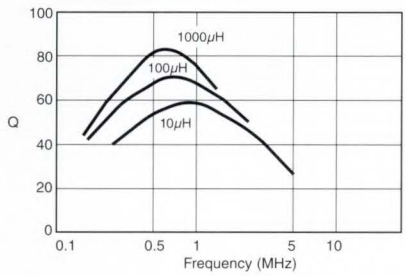
LQH1N Series



LQH3N Series

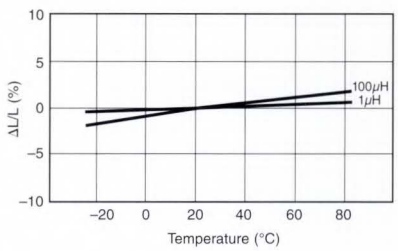


LQH4N/LQN4N Series

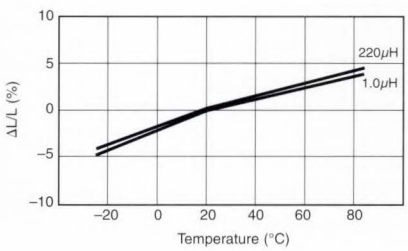


INDUCTANCE-TEMPERATURE CHARACTERISTICS

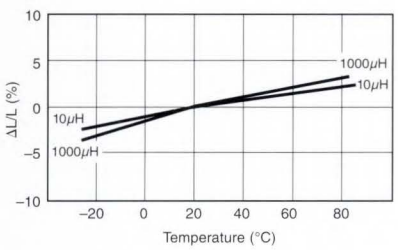
LQH1N Series



LQH3N Series

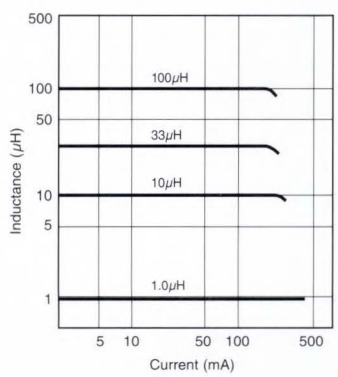


LQH4N/LQN4N Series

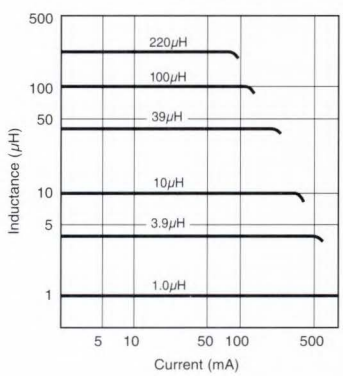


INDUCTANCE-CURRENT CHARACTERISTICS

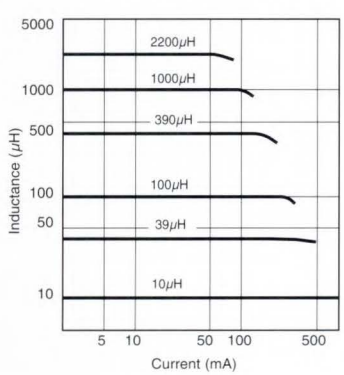
LQH1N Series



LQH3N Series

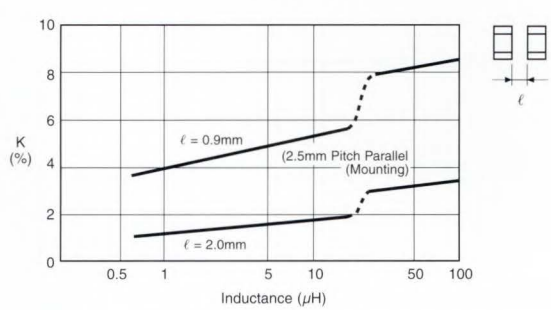


LQH4N/LQN4N Series

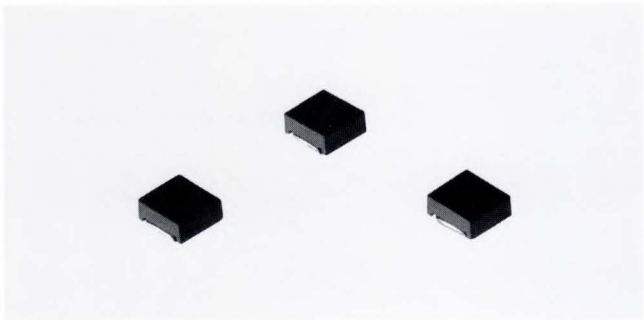


COUPLING FACTOR

LQH1N Series



LQS33N Series



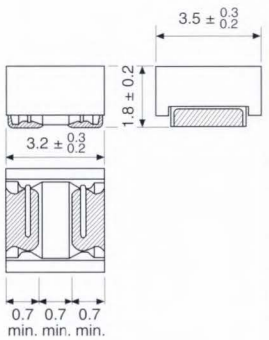
The LQS33N is a series of closed, magnetically shielded chip inductors wound on ferrite bobbins developed by Murata Electronics. Their high Q value virtually eliminates interference with nearby circuits. This, combined with their tight inductance tolerance; make's these chip inductors excellent in resonance circuits.

PART NUMBERING

LQS	33	N	1R0	G	04	M00
MAGNETIC SHIELDED	SIZE 33 : 3.2 x 3.5mm (1213)	APPLICATION General Use	INDUCTANCE 1R0 : 1μH	TOLERANCE G : ±2% K : ±5%	ELECTRODE MATERIAL 04 : Nickel Alloy Metallization	UNMARKED

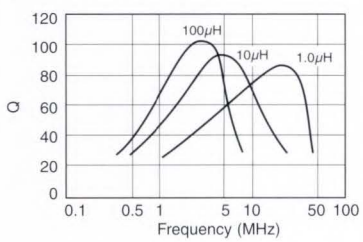
SPECIFICATIONS

Dimensions	Part Number	Inductance			Q			DC Resistance (Ω)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
		Nominal Value (μH)	Tolerance (%)	Measurement Frequency (MHz)	Peak Value (typ.)	Min. Value	Measurement Frequency				
LQS33 Series	LQS33N1R0G(J)04	1.0	±2 (±5)	7.96	85	60	7.96MHz	0.19 ± 30%	120	70	−25°C ~ +85°C
	LQS33N1R2G(J)04	1.2			85			0.22 ± 30%	100		
	LQS33N1R5G(J)04	1.5			85			0.26 ± 30%	80		
	LQS33N1R8G(J)04	1.8			85			0.28 ± 30%	70		
	LQS33N2R2G(J)04	2.2			90			0.33 ± 30%	60	50	
	LQS33N2R7G(J)04	2.7			90			0.39 ± 30%	55		
	LQS33N3R3G(J)04	3.3			90			0.43 ± 30%	50		
	LQS33N3R9G(J)04	3.9			90			0.45 ± 30%	45		
	LQS33N4R7G(J)04	4.7			90			0.52 ± 30%	40	30	
	LQS33N5R6G(J)04	5.6			90			0.56 ± 30%	37		
	LQS33N6R8G(J)04	6.8			90			0.62 ± 30%	35		
	LQS33N8R2G(J)04	8.2			90			0.69 ± 30%	32		
	LQS33N100G(J)04	10		2.52	90	70	2.52MHz	0.94 ± 30%	30	15	
	LQS33N120G(J)04	12			90			1.1 ± 30%	27		
	LQS33N150G(J)04	15			90			1.2 ± 30%	25		
	LQS33N180G(J)04	18			90			1.3 ± 30%	23		
	LQS33N220G(J)04	22			90			1.5 ± 30%	20	10	
	LQS33N270G(J)04	27			95			1.7 ± 30%	18		
	LQS33N330G(J)04	33			95	80		2.4 ± 30%	16		
	LQS33N390G(J)04	39			95			2.6 ± 30%	15		
	LQS33N470G(J)04	47			95			3.0 ± 30%	14		
	LQS33N560G(J)04	56			100			3.3 ± 30%	13		
	LQS33N680G(J)04	68			100			5.3 ± 30%	12		
	LQS33N820G(J)04	82			100			5.8 ± 30%	11		
	LQS33N101G(J)04	100			100			6.6 ± 30%	10		

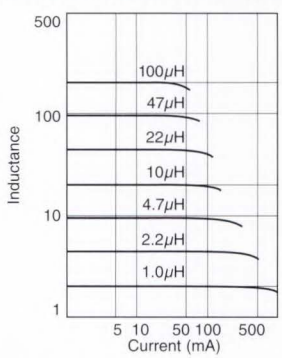


TYPICAL ELECTRICAL CHARACTERISTICS

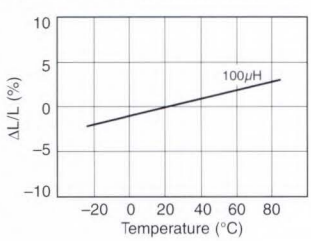
Q-FREQUENCY CHARACTERISTICS



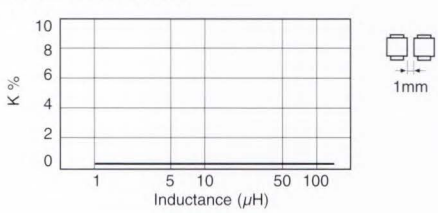
INDUCTANCE-CURRENT CHARACTERISTICS



INDUCTANCE-TEMPERATURE CHARACTERISTICS



COUPLING FACTOR



LQG21C Series

The LQG21C Series is a magnetically shielded chip coil developed with Murata's expertise in multilayer process technology and magnetic materials. With less than half the DC resistance of our conventional monolithic chip coils, it still achieves high inductance values.

FEATURES

- The inductor has ultra low DC resistance.
- This series covers an inductance range from 1.0μH to 47μH.
- Magnetically shielded construction provides excellent crosstalk characteristics.
- Compact (2.0mm x 1.25mm) and light weight
- Low inductance drift during soldering, environmental tests, etc.
- Outstanding solder heat resistance. Either flow or reflow soldering

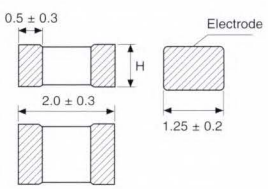
APPLICATIONS

- Low current power line (for choke use)

PART NUMBERING

LQG	21	C	1R0	N	00	T1	M00
MONOLITHIC	SIZE 21 : 2.0 x 1.25mm (0805)	CHOKE APPLICATIONS	INDUCTANCE 1R0 : 1μH 100 : 10μH	TOLERANCE N : ±30%	CHARACTERISTIC	PACKAGING T1 : Tape B1 : Bulk	UNMARKED

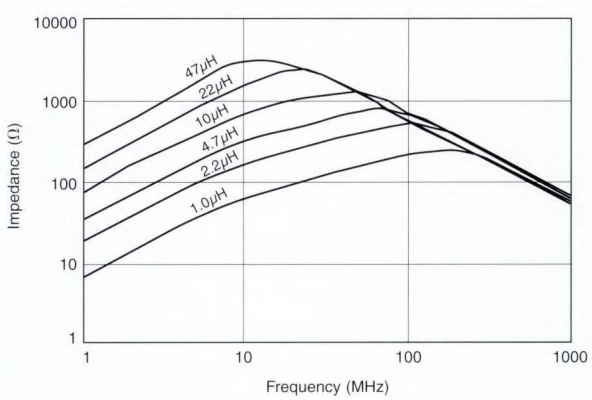
SPECIFICATIONS

Dimensions: mm	Part Number	Nominal Value (μH)	Inductance		DC Resistance (max. Ω)	Self-resonant Frequency		Allowable Current (mA)	Operating Temp. Range
			Tolerance	Measurement Frequency		Typical (MHz)	Minimum (MHz)		
	★LQG21C1R0N00	1.0	±30%	1 MHz	0.10	150	75	60	−40°C ~ +85°C
	★LQG21C2R2N00	2.2			0.17	100	50	40	
	★LQG21C4R7N00	4.7			0.30	70	35	30	
	★LQG21C100N00	10			0.50	45	24	15	
	★LQG21C220N00	22			0.65	20	16	13	
	★LQG21C470N00	47			1.20	—	7.5	7	

Part Number	H
LQG21C1R0N~100N	0.9 ± 0.2
LQG21C220N~470N	1.25 ± 0.2

★Available as standard through authorized Murata Electronics Distributors.

TYPICAL IMPEDANCE FREQUENCY CHARACTERISTICS



LQH1C/3C Series

The LQH1C and LQH3C Series are subminiature chip coils with low DC resistance, high current capacity and high impedance characteristics. These features are made possible by the development of Murata Electronics' own automatic winding and multilayer techniques. They are excellent for use as choke coils in DC power supply circuits.

LQH1C

The sub-miniature dimensions (3.2 x 1.6 x 1.8mm) allow parallel mounting on 2.5mm centers. Despite their small size, at 0.12μH these coils have a maximum current rating of 970mA.

LQH3C

The low DC resistance means high current and high inductance.

PART NUMBERING

LQH	1	C	R12	M	04	M00
TYPE LQH : With Coating	**SIZE** 1 : 3.2 x 1.6 (1206) 3 : 3.2 x 2.5 (1210)	**CHOKE APPLICATION**	**INDUCTANCE** R12 : 0.12μH 1R0 : 1.0μH	**TOLERANCE** K : ±10% M : ±20%	**ELECTRICAL MATERIAL** 04 : Nickel Alloy 24 : Metallization	**MARKING** M00 : Unmarked M01 : Marked

SPECIFICATIONS

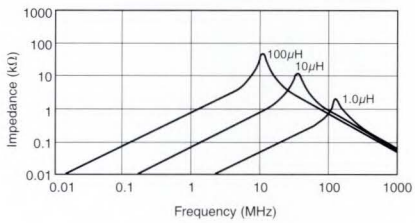
Dimensions: mm	Part Number	Inductance			DC Resistance (Ω)	Self-resonant Frequency		Allowable Current (mA)	Operating Temp. Range
		Nominal Value (μH)	Tolerance (%)	Measurement Frequency		Typical	Min. Value (MHz)		
LQH1C Series	★LQH1CR12M04	0.12	±20	1 MHz	0.08 ± 40%	900	250	970	−25°C ~ +85°C
	★LQH1CR22M04	0.22			0.10 ± 40%	570	250	850	
	★LQH1CR47M04	0.47			0.15 ± 40%	310	180	700	
	★LQH1C1R0M04	1.0			0.28 ± 30%	190	100	510	
	★LQH1C2R2M04	2.2			0.41 ± 30%	110	50	430	
	★LQH1C4R7M04	4.7			0.65 ± 30%	67	31	340	
	★LQH1C100K04	10	±10		1.3 ± 30%	42	20	230	
	★LQH1C220K04	22			3.0 ± 30%	26	14	160	
	★LQH1C470K04	47			8.0 ± 30%	18	10	100	
	★LQH1C101K04	100			12.0 ± 30%	12	7	80	
LQH3C Series	★LQH3C1R0M04	1.0	±20	1 MHz	0.09 ± 30%	150	96	800	−25°C ~ +85°C
	★LQH3C2R2M04	2.2			0.13 ± 30%	100	64	600	
	★LQH3C4R7M04	4.7			0.20 ± 30%	66	43	450	
	★LQH3C100K04	10	±10		0.44 ± 30%	40	26	300	
	★LQH3C220K04	22			0.71 ± 30%	27	19	250	
	★LQH3C470K04	47			1.3 ± 30%	19	15	170	
	★LQH3C101K04	100			3.5 ± 30%	13	10	100	
	★LQH3C221K04	220			8.4 ± 30%	8.5	6.8	70	
	★LQH3C331K04	330			10.0 ± 30%	7.0	5.6	60	
	★LQH3C391K04	390			17.0 ± 30%	6.6	5.0		
	★LQH3C471K04	470		1kHz	19.0 ± 30%	6.2			
	★LQH3C561K04	560			22.0 ± 30%	5.7			
	★LQH3CR15M24	0.15	±20%	1MHz	0.028 ± 30%	650	400	1450	−25°C ~ +85°C
	★LQH3CR27M24	0.27			0.034 ± 30%	450	250	1250	
	★LQH3CR47M24	0.47			0.042 ± 30%	300	150	1100	
	★LQH3C1R0M24	1.0			0.060 ± 30%	200	100	1000	
	★LQH3C2R2M24	2.2			0.097 ± 30%	120	64	790	
	★LQH3C4R7M24	4.7			0.15 ± 30%	77	43	650	
	★LQH3C100K24	10	±10		0.30 ± 30%	50	26	450	

★Available as standard through authorized Murata Electronics Distributors.

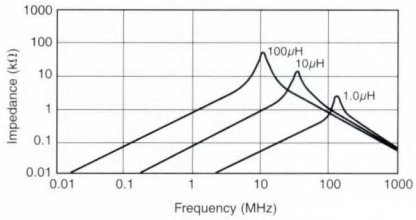
TYPICAL ELECTRICAL CHARACTERISTICS

IMPEDANCE FREQUENCY CHARACTERISTICS

LQH1C Series

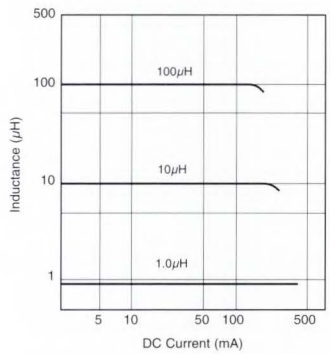


LQH3C Series

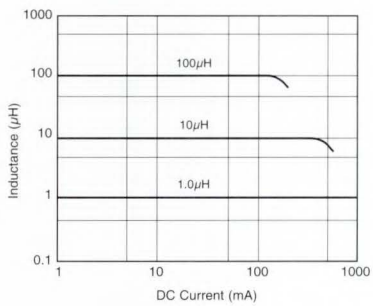


DIRECT CURRENT CHARACTERISTICS

LQH1C Series



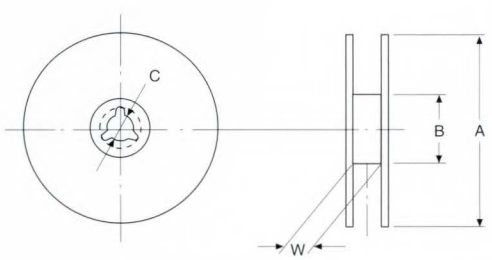
LQH3C Series



SURFACE MOUNT INDUCTORS
PACKAGING & STORAGE

Product Name		Appearance	Dimensions (mm)			Soldering		Taping Width	Packaging Units		
			L	W	T	Flow Soldering	Reflow Soldering		ϕ180mm Reel	ϕ330mm Reel	Bulk (Bag)
Chip Coil	LQG21N/C		2.0	1.25	0.9	○	○	8	4,000	—	1,000
	LQG21N (2.7 ~ 4.7μH)		2.0	1.25	1.25	○	○	8	3,000	—	1,000
	LQG21C (22 ~ 47μH)		2.0	1.25	1.25	○	○	8	3,000	—	1,000
	LQH1N/LQN1H/1C		3.2	1.6	1.8	○	○	8	2,000	—	—
	LQH3N/3C		3.2	2.5	2.0	○	○	8	2,000	—	—
	LQH (N) 4N		4.5	3.2	2.6	○	○	12	500	2,500	—
	LQS33N		3.2	3.5	1.8	—	○	12	1,000	—	—
	LQN1A		3.2	1.6	1.8	○	○	8	2,000	—	—
	LQN2A		3.2	2.5	1.6	○	○	8	2,500	—	—
	LQN21A		2.0	1.5	1.7	○	○	8	2,000	—	—
	LQP11A		1.6	0.8	0.5	—	○	8	2,000	—	—
	LQP21A		2.0	1.25	0.5	—	○	8	2,000	—	—
	LQP31A		3.2	1.6	0.5	—	○	8	2,000	—	—

REEL DIMENSIONS



		ϕ 180mm Reel	ϕ 330mm Reel
A		178 ± 2	328 ± 2
B		50 (min.)	
C		ϕ 13 ± 0.5	
W	8mm Width Tape	10 ± 1.5	
	12mm Width Tape	14 ± 1.5	

ϕ : Diameter

Unit : mm

STORAGE REQUIREMENTS

Be sure to observe the following storage requirements to prevent damage to the soldering of exposed electrode.

1. The maximum ambient temperature and relative humidity in which these parts can be stored are 40°C and 70%, respectively. Please note that package deformation may result from storage in ambient temperature exceeding 40°C.
2. Do not unpack the polyethylene bag prior to using product. Also, after unpacking, promptly reseal or store in a desiccant containing a drying agent.
3. Do not store in areas where harmful gases containing sulfur or chlorine are present.

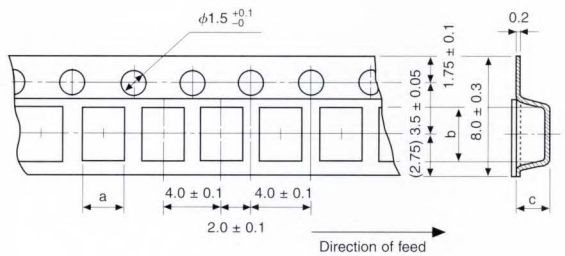
TAPE SPECIFICATIONS

1. All tape packaging conforms to JIS C 0806 specifications. Dimensions are described separately for each product.
2. Tape is wound clockwise.
   When tape is pulled toward the user, the feeding hole is observable on the right side of the tape.

PLASTIC TAPE DIMENSIONS

The Chip Coil Series are packaged in plastic tape.

LQG21N, LQH1N/1C, LQN1A/2A, LQN1H LQH3N/3C, LQP21A/31A, LQN21A

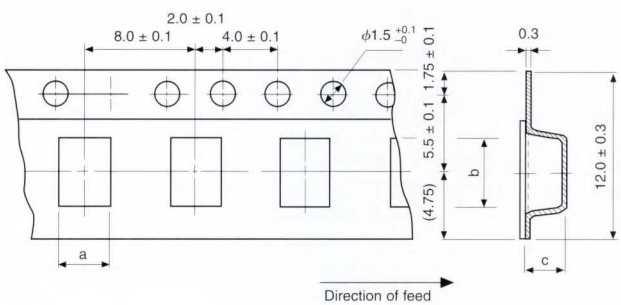


Series	a	b	c	Packaging Unit φ180mm Reel
LQG21N/C	1.55	2.3	1.05 /1.3	4000
LQH1N/LQH1C LQN1H/LQN1A	1.9	3.6	2.0	2000
LQN2A	2.9	3.6	1.8	2500
LQH3N/LQH3C	2.9	3.6	2.2	2000
LQP11A	1.6	2.4	0.75	2000
LQP21A	1.3	2.1	0.75	2000
LQP31A	1.9	3.6	0.9	2000
LQN21A	1.75	2.3	2.0	2000

8mm type

Unit : mm

LQS33N, LQH(N)4N



Series	a	b	c	Packaging Unit φ180mm Reel	Packaging Unit φ330mm Reel
LQS33N	3.9	3.7	1.9	1000	—
LQH(N)4N	3.6	4.9	2.9	500	2500

12mm type

Unit : mm

SOLDERING METHOD

2. Soldering Conditions

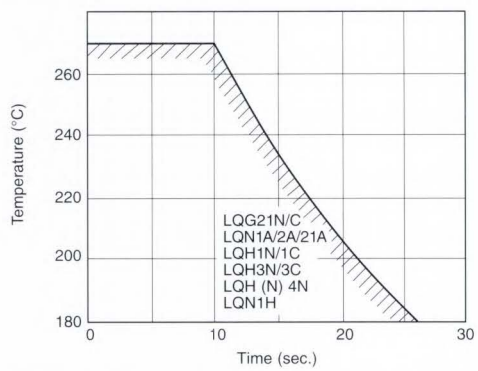
Chip coils can be flow or reflow soldered. (LQS33N and LQP21A/31A should be reflow soldered only.) Please contact Murata Electronics regarding other soldering methods.

The volume of solder can cause minor fluctuations in inductance value. Therefore, control the amount of solder carefully for LQP21A/31A soldering.

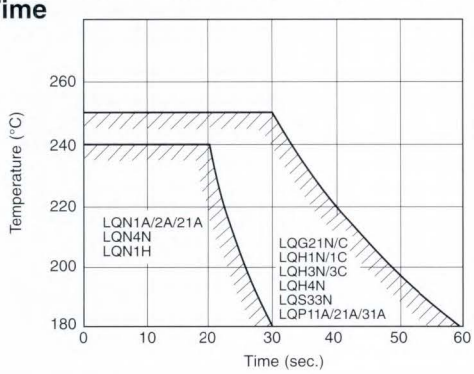
SOLDERING TEMPERATURE AND TIME

Solder within the temperature and time combinations illustrated in the following graphs. If soldering is repeated, please note that the allowed time is the accumulated time.

Allowable Flow Soldering Temperature and Time



Allowable Reflow Soldering Temperature and Time



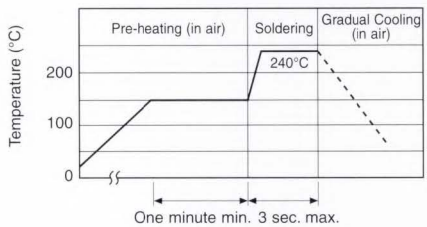
Recommended Solder : Use H60A, H63A, (JIS Z 3282) or equivalent. Use rosin-based flux, but not strongly acidic flux (with chlorine content exceeding 0.2wt%)

REWORKING WITH SOLDERING IRON

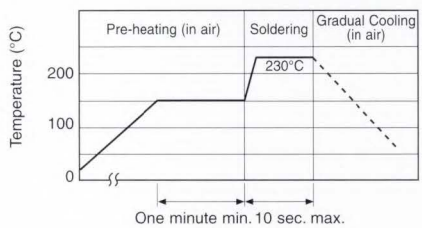
A preheating of 150°C for 1 minute is required.
Do not directly touch the ceramic element with the tip of the soldering iron. The reworking soldering conditions are as follows.

RECOMMENDED SOLDERING CONDITIONS

Flow Solder



Reflow Solder



Soldering Iron Power Output	: 30W max.
Temperature of soldering iron tip	: 280°C
Diameter of soldering iron end	: 3.0mm max.
Soldering time	: within 3 sec.

3. Cleaning Conditions

Cleaning liquid	: isopropyl alcohol.
Immersion cleaning	: Within 5 minutes at 40°C or lower temperature.
Vapor cleaning	: Within 3 minutes.
Ultrasonic cleaning	: Shall be applied with the following conditions. Please avoid making the resonance phenomenon at the mounted products and P.C.B.
Power	: 20w/ℓ max.
Frequency	: 28kHz~40kHz
Time	: 5 minutes max.

4. Resin Coating

When coating the chip with resin, the curing stress of the resin may change the coil's electrical or mechanical characteristics. Therefore, the resin material should be carefully selected to minimize its influence on coils.

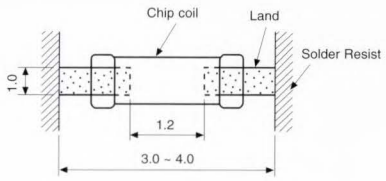
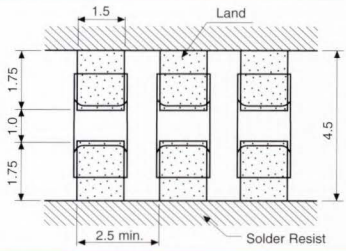
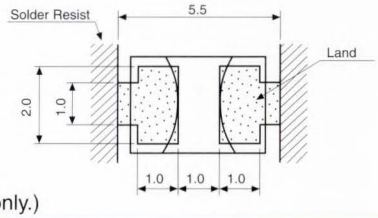
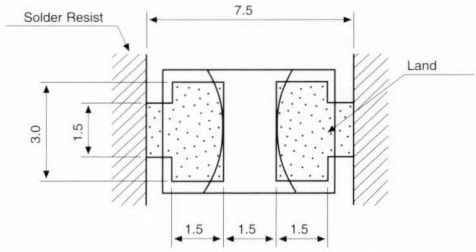
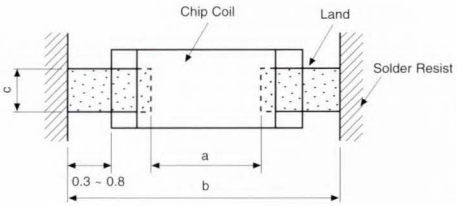
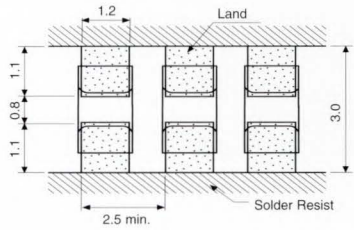
5. Operating Environment

Do not use products in chemical atmosphere such as chlorine gas, acid or sulfide gas.

6. Storage Conditions

Storage temperature : –10°C to +40°C
Relative humidity : 30 to 70%
Avoid sudden changes in temperature and humidity

STANDARD LAND DIMENSIONS

Series	Standard Land Dimensions (Flow and Reflow)
LQG21N/C	
LQH1N **LQH1C** **LQN1A** **LQN1H**	 If mounted on 2.5mm centers as indicated in the diagram at left, attention should be paid to potential magnetic coupling effects when using the coil as a resonator. Refer to the coupling factor graph in the typical electrical characteristics section.
LQN2A **LQH3N** **LQH3C** **LQS33N**	 Reflow soldering (LQS33 is reflow only.)
LQH4N	
LQP11A **LQP21A** **LQP31A**	 Reflow soldering only.
LQN21A	

Type	LQP11A	LQP21A	LQP31A
a	1.0~1.3	1.0~0.3	1.8~2.5
b	2.6~3.6	2.6~3.6	3.8~4.8
c	0.8~1.2	0.8~1.2	1.2~1.6

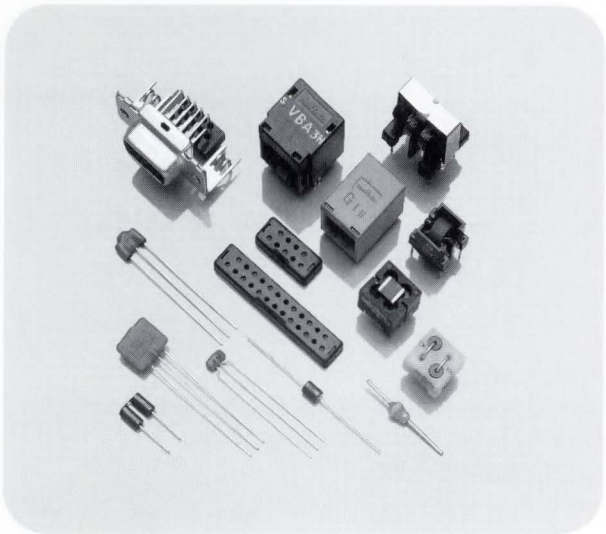
Unit : mm

NOTES

LEADED EMI FILTERS

Based on more than 30 years of ceramic and ferrite technology experience, Murata Electronics' full range of leaded EMI filters have been designed to meet today's electronic industry requirements.

Murata's leaded devices consist of ferrite bead inductors, feed-thru capacitors, 3 terminal capacitors, varistor/capacitors common mode chokes and block filters.



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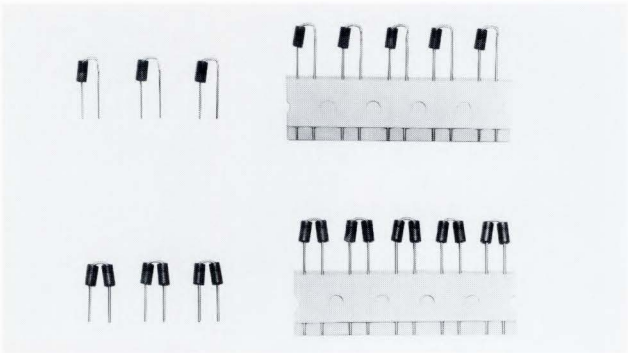
BL01, BL02 & BL03 Series



Ferrite beads are used for noise suppression in car radios, digital control equipment and for the prevention of spurious oscillation in radio frequency amplifiers. These ferrite bead inductors are devices which can effectively be used on printed circuit boards where high component density is essential. Taped and reeled types are also available for automatic insertion. Radial leaded units can be classified into two types — one using a single ferrite bead and the other using two ferrite beads.

APPLICATIONS

Micro computer, switching regulators, digital control equipment, car radios, car stereos, etc.

FEATURES

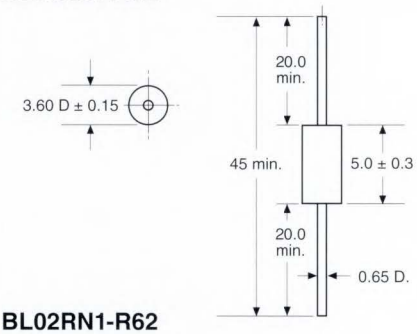
- High component density potential
- Double bead BL02RN2 types offered for more effective noise suppression
- Taped and reeled radial and axial types for automatic insertion can be provided as well as ammo packaging.
- Axial lead version BL01RN1-A62 available

PART NUMBERING

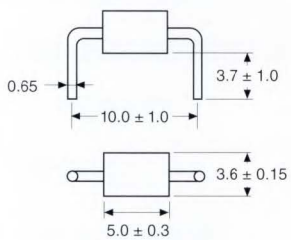
BL	01	RN	1	–	A	62	T5
BEAD INDUCTOR	BEAD TYPE 01=Axial 02=Radial 03=Compact Radial	MATERIAL	NUMBER OF BEADS		LEAD STYLE A=Axial R=Radial	LEAD CODE	TAPE STYLE

DIMENSIONS: mm

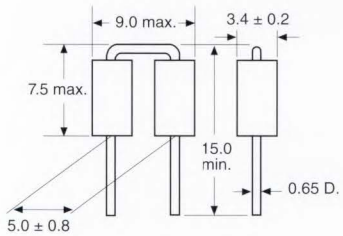
BL01RN1-A62



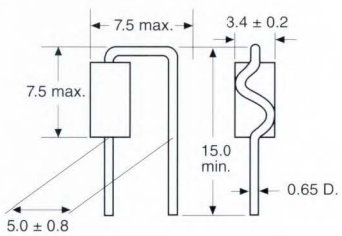
BL01RN1-A62B1



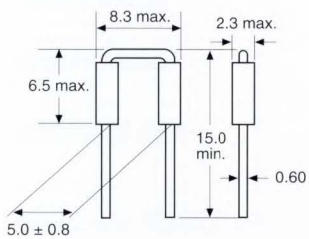
BL02RN2-R62



BL02RN1-R62



BL03RN2-R62



RADIAL UNIT LEAD LENGTH

	Suffix	Lead Length
Bulk	*R62	10.0 ± 0.8
	R63	6.0 ± 0.5
	R64	4.0 ± 0.8
Tape & Reel	R62-T2	16.5 ± 0.5
	R62-T3	20.0 ± 0.5
	*R62-T4	18.5 ± 0.5

*Standard

SPECIFICATIONS

Item		Characteristics
Permeability	(μi)	550
Saturation Magnetic	(Bs)	3100 (gauss)
Residual Magnetic Flux Density	(Brs)	1700 (gauss)
Coercive Force	(Hc)	0.3 (Oe)
Curie Point	(Tc)	130 (°C)
Temp. Coefficient	($\alpha\mu r$)	20 x 10^{-6}
Relative Loss Factor	(DF/μi)	13 x 10^{-6}
		0.5 (MHz)
Resistivity	(ρ)	10^7 (Ω^{-cm})
Max. Rated Current	BL01 and BL02 (A) (Bulk)	7A
	BL01 and BL02 (A) (Taped)	6A
	BL03 (Taped or Bulk)	6A

★Available as standard through authorized Murata Electronics Distributors.

CONFIGURATIONS

Part Number	Form
★BL01RN1-A62	Axial, Single bead
★BL01RN1-A62B1	Axial, Single bead, Bent
★BL01RN1-A62T5	Axial, Single bead, Taped
★BL01RN1-A63T6	Axial, Single bead, Taped
★BL02RN1-R62	Radial, Single bead
★BL02RN2-R62	Radial, Double bead
★BL02RN1-R62T4	Radial, Single bead, (Ammo)
★BL02RN2-R62T4	Radial, Double bead, (Ammo)
★BL03RN2-R62	Radial, Double bead
★BL03RN2-R62T4	Radial, Double bead, Ammo

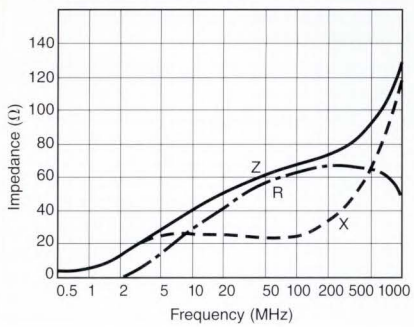
Operating Temperature: –25°C to +85°C

muRata

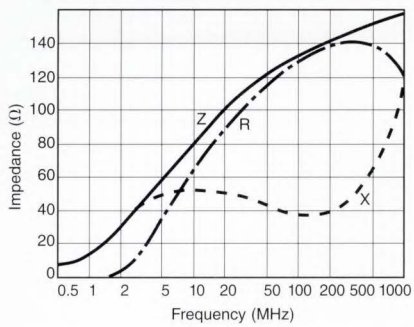
BL01, BL02 & BL03 Series

TYPICAL IMPEDANCE CHARACTERISTICS

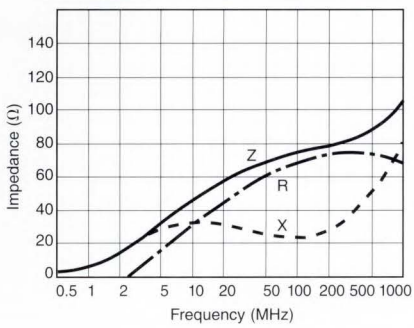
BL01RN1/BL02RN1



BL02RN2

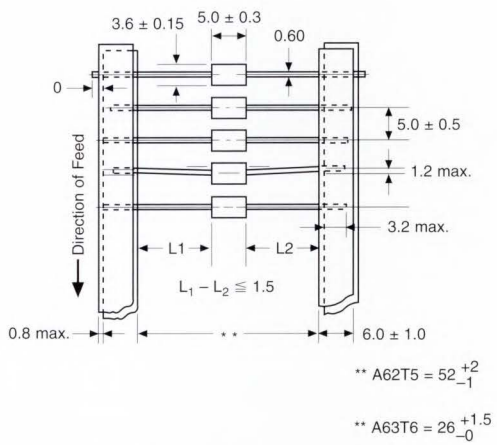


BL03RN2

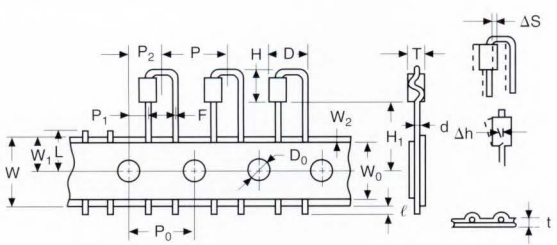


TAPE DIMENSIONS: mm

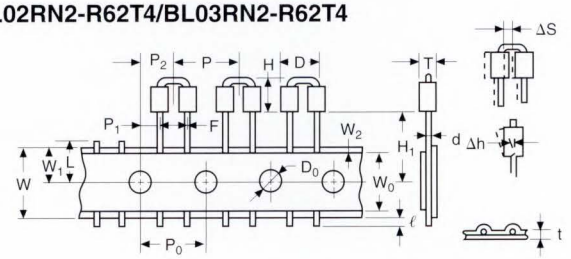
AXIAL LEAD TYPE BL01 SERIES
BL01RN1-A62T5/A63T6



RADIAL LEAD TYPE BL02/BL03 SERIES
BL02RN1-R62T4



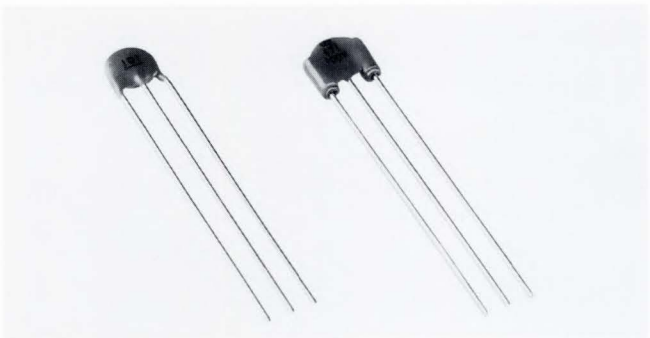
BL02RN2-R62T4/BL03RN2-R62T4



Item	Code	Dimensions: mm
Pitch of Component	P	.500 12.7
Pitch of Sprocket Hole	P_0	12.7 ± 0.2
Lead Spacing	F	$5.0^{+0.8}_{-0.2}$
Length from Hole Center to Lead	P_1	3.85 ± 0.7
Length from Hole Center to Component Center	P_2	6.35 ± 1.3
Width of Body	D	BL02RN1 7.5 max. BL02RN2 9.0 max. BL03RN2 8.3 max.
Height of Bead	H	BL02 7.5 max. BL03 6.5 max.
Deviation along Tape, Left or Right	ΔS	±1.0
Carrier Tape Width	W	18.0 ± 0.5
Position of Sprocket Hole	W_1	$9.0^{+0}_{-0.5}$
Lead Length	H_1	T2=16.5 ± 0.5 T3=20.0 ± 0.5 T4=18.5 ± 0.5
Protrusion Length	ℓ	+0.5 to −1.0
Diameter of Sprocket Hole	D_0	4.0 ± 0.1
Lead Diameter	d	0.60
Total Tape Thickness	t	0.7 ± 0.2
Deviation Across Tape	Δh	±1.0 max.
Portion to Cut in Case of Defect	L	$11.0^{+0}_{-1.0}$
Hold Down Tape Width	W_0	12.0 ± 0.5
Hold Down Tape Position	W_2	1.5 ± 1.5
Body Thickness	T	BL02 3.4 ± 0.2 BL03 2.3 max.

EMI SUPPRESSION FILTER
COMPACT DISC-TYPE

DS306 & DSS306 Series



APPLICATIONS

- Computer and peripherals interfaces
- Compact digital equipment
- Compact PPC, electronic typewriters, other electronic equipment and appliances
- Helps all electronic equipment and appliances meet FCC, VDE and CISPR regulations
- STD footprint for high density mounting

PART NUMBERING

DS □ 306 – 55 Y5S 271 M 100

- **DISC TYPE**
- **FERRITE BEAD** Blank=None, S=Inside
- **SERIES TYPE**
- **LEAD CONFIGURATION** 55=Bulk, 91=Taped, 351=Bulk (Inside Crimp), 431=Taped (Inside Crimp)
- **TEMPERATURE CHARACTERISTICS**
- **CAPACITANCE**
- **CAPACITANCE TOLERANCE**
- **RATED VOLTAGE**

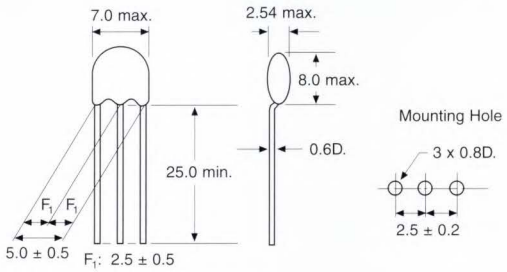
SPECIFICATIONS

Part Number	Capacitance	Capacitor		Ferrite Beads	Dimensions	Insertion Loss
		W.V.	T.C. –25 to +85°C			
★DS306-55Y5S220M50	22pF ± 20%	50VDC	±22%	None	Fig. 1	Fig. 4
★DS306-55Y5S330M50	33pF ± 20%		±22%			
★DS306-55Y5S470M50	47pF ± 20%		±22%			
★DS306-55Y5S101M50	100pF ± 20%		±22%			
★DS306-55Y5S271M50	270pF ± 20%		±22%			
★DS306-55Y5S102M50	1000pF ± 20%		±22%			
★DS306-55Y5S222M50	2200pF ± 20%		±22%			
★DS306-55FZ103Z50	10000pF + 80%, –20%		+30%, –85%			
★DSS306-55Y5S220M100	22pF ± 20%	100VDC	±22%	Internal	Fig. 2	Fig. 5
★DSS306-55Y5S330M100	33pF ± 20%		±22%			
★DSS306-55Y5S470M100	47pF ± 20%		±22%			
★DSS306-55Y5S101M100	100pF ± 20%		±22%			
★DSS306-55Y5S151M100	150pF ± 20%		±22%			
★DSS306-55Y5S221M100	220pF ± 20%		±22%			
★DSS306-55Y5S271M100	270pF ± 20%		±22%			
★DSS306-55Y5S471M100	470pF ± 20%		±22%			
★DSS306-55Y5S102M100	1000pF ± 20%		±22%			
★DSS306-55Y5U222Z100	2200pF + 80%, –20%		+22%, –56%			
★DSS306-55FZ103N100	10000pF ± 30%		+30%, –85%			
★DSS306-55F223Z16	22000pF + 80%, –20%	16VDC	+30%, –80%			
★DSS306-351Y5S220M100	22pF ± 20%	100VDC	±22%	Internal	Fig. 3	Fig. 6
★DSS306-351Y5S330M100	33pF ± 20%		±22%			
★DSS306-351Y5S470M100	47pF ± 20%		±22%			
★DSS306-351Y5S101M100	100pF ± 20%		±22%			
★DSS306-351Y5S151M100	150pF ± 20%		±22%			
★DSS306-351Y5S221M100	220pF ± 20%		±22%			
★DSS306-351Y5S271M100	270pF ± 20%		±22%			
★DSS306-351Y5S471M100	470pF ± 20%		±22%			
★DSS306-351Y5S102M100	1000pF ± 20%		±22%			
★DSS306-351Y5U222Z100	2200pF + 80%, –20%		+22%, –56%			
★DSS306-351FZ103N100	10000pF ± 30%		+30%, –85%			
★DSS306-351F223Z16	22000pF + 80%, –20%	16VDC	+30%, –80%			

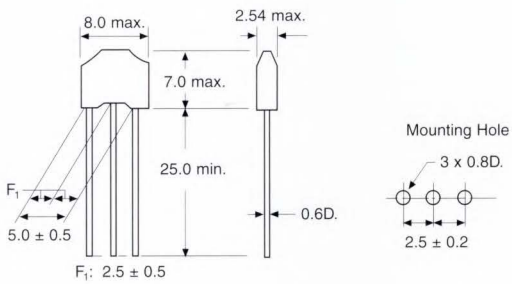
Note: "55" in part number denotes Bulk packaging. For Taped Product, replace with appropriate number from chart on page 60. All units are rated 6 amp.
★Available as standard through authorized Murata Electronics Distributors.

DIMENSIONS: mm

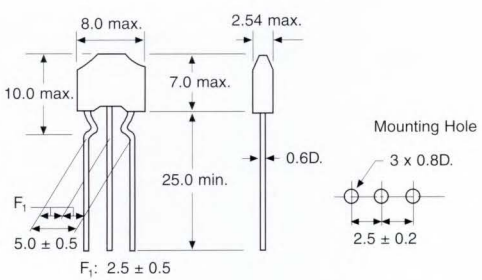
DS306-55 Series
Fig. 1



DSS306-55 Series
Fig. 2

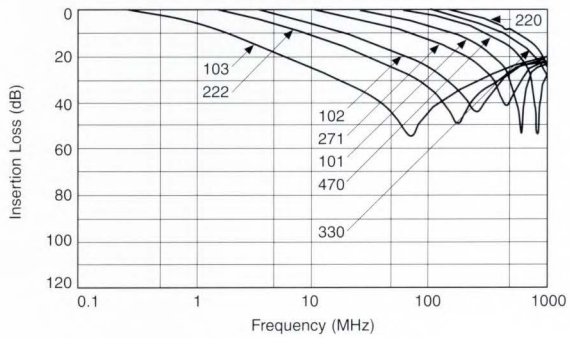


DSS306-351 Series
Fig. 3

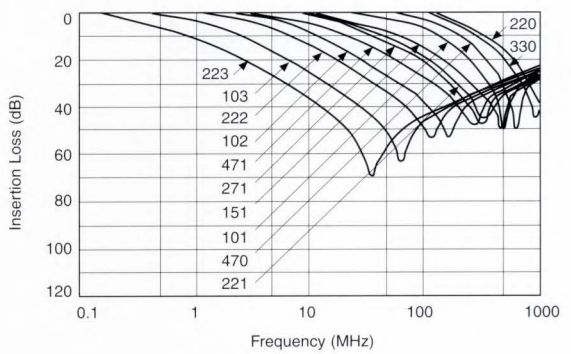


TYPICAL INSERTION LOSS CHARACTERISTICS

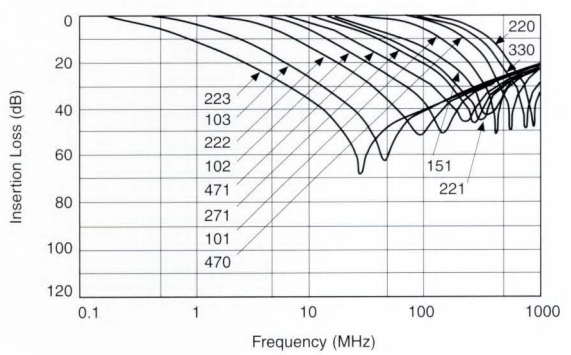
DS306-55 Series
Fig. 4



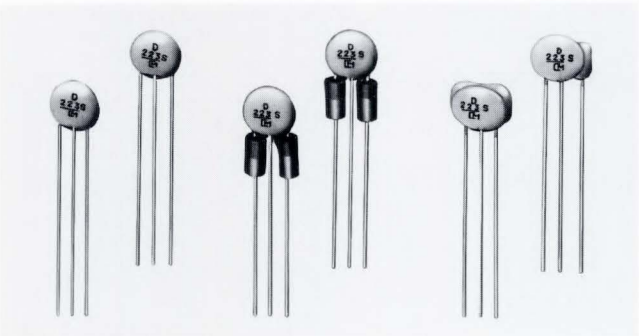
DSS306-55 Series
Fig. 5



DSS306-351 Series
Fig. 6



DS310/H, DST310/H & DSS310/H Series



Disc-type EMIFIL® DS310, DST310 and DSS310 are T-type EMI suppression filters. The disc-type EMIFIL increases the self-resonant frequency of the capacitor by attaching two lead wires to one of the electrodes of the capacitor and increases the insertion loss by adding inductance to the lead in the DST and DSS types only. Frequencies to be suppressed can be selected by choosing the capacitance. They are also recommended for use as by-pass capacitors.

PART NUMBERING

DS	□	310	–	55	Y5S	271	M	100
DISC TYPE	FERRITE BEAD Blank=None T=Outside S=Inside	SERIES TYPE		LEAD CONFIGURATION 55=Bulk 91=Taped	TEMPERATURE CHARACTERISTICS	CAPACITANCE	CAPACITANCE TOLERANCE	RATED VOLTAGE

SPECIFICATIONS

Part Number	Capacitance	Capacitor		Ferrite Beads	Dimensions	Insertion Loss
		W.V.	T.C. –25°C to +85°C			
FOR GENERAL APPLICATIONS						
★DS310-55Y5S271M100	270pF ± 20%	100V	±22%	None	Fig. 1	Fig. 4
★DS310-55Y5S222M100	2200pF ± 20%	100V				
★DS310-55Y5S223S50	22000pF + 50%, –20%	50V				
★DS310-55Y5S104M16	100000pF ± 20%	16V				
★DST310-55Y5S271M100	270pF ± 20%	100V	±22%	External	Fig. 2	Fig. 5
★DST310-55Y5S222M100	2200pF ± 20%	100V				
★DST310-55Y5S223S50	22000pF + 50%, –20%	50V				
★DSS310-55Y5S220M100	22pF ± 20%	100V	±22%	Internal	Fig. 3	Fig. 6
★DSS310-55Y5S470M100	47pF ± 20%	100V				
★DSS310-55Y5S101M100	100pF ± 20%	100V				
★DSS310-55Y5S271M100	270pF ± 20%	100V				
★DSS310-55Y5S222M100	2200pF ± 20%	100V				
★DSS310-55Y5S223S50	22000pF + 50%, –20%	50V				
FOR AUDIO CIRCUITS (LOW DISTORTION TYPE)						
★DSS310-55BL222M100	2200pF ± 20%	100V	±10%	Internally	Fig. 3	Fig. 9
★DSS310-55DL223S50	22000pF ± 50%, –20%	50V	+20%, –30%			

Part Number	Capacitance	T.C.		Ferrite Beads	Dimensions*	Insertion Loss
		–25°C to +85°C	–40°C to +105°C			
FOR HIGH TEMPERATURE APPLICATIONS						
★DS310H-55B220M250	22pF ± 20%	±10%	±20%	None	Fig. 1	Fig. 7
★DST310H-55B220M250				External	Fig. 2	Fig. 8
★DSS310H-55B220M250				Internal	Fig. 3	Fig. 10
★DS310H-55B101M250	100pF ± 20%			None	Fig. 1	Fig. 7
★DST310H-55B101M250				External	Fig. 2	Fig. 8
★DSS310H-55B101M250				Internal	Fig. 3	Fig. 10
★DS310H-55B271M250	270pF ± 20%			None	Fig. 1	Fig. 7
★DST310H-55B271M250				External	Fig. 2	Fig. 8
★DSS310H-55B271M250				Internal	Fig. 3	Fig. 10
★DS310H-55B222M250	2200pF ± 20%		±30%	None	Fig. 1	Fig. 7
★DST310H-55B222M250				External	Fig. 2	Fig. 8
★DSS310H-55B222M250				Internal	Fig. 3	Fig. 10

*Note: DS□310 Series Footprint for Bulk and Tape & Reel are different. Consult your local Murata Electronics Sales Office. Current rating is 7 Amps for bulk packaged units, 6 Amps for tape and reel.

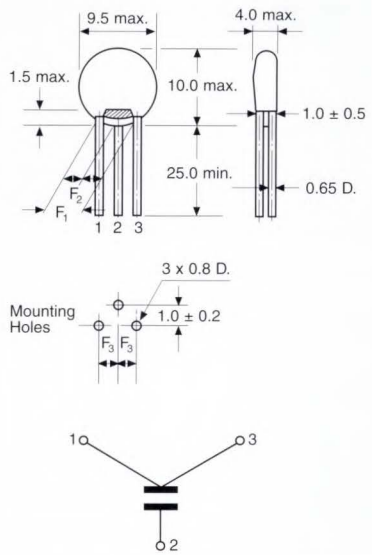
All DS□310H units are rated at 7A max. and 250 VDC.

★Available as standard through authorized Murata Electronics Distributors.

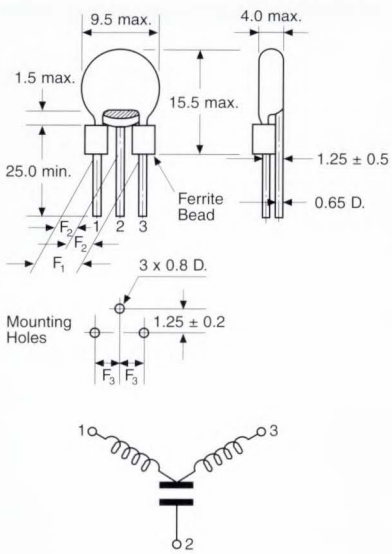
DS310/H, DST310/H & DSS310/H Series

DIMENSIONS: mm (See Note)

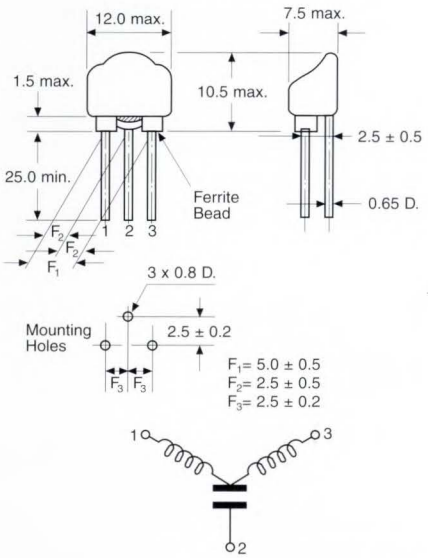
DS310/310H TYPE Fig. 1



DST310/310H TYPE Fig. 2



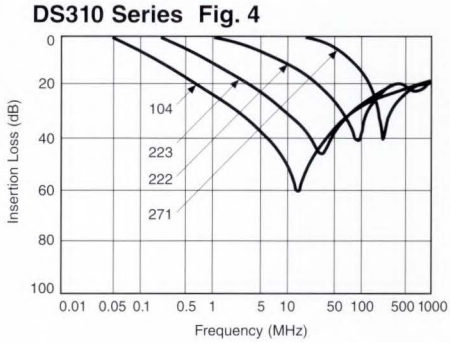
DSS310/310H TYPE Fig. 3



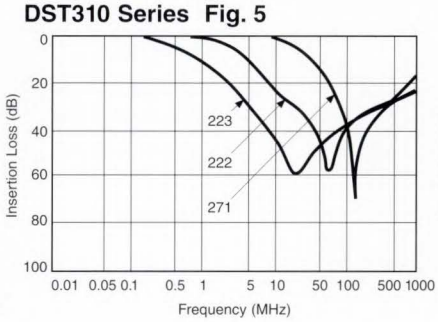
Note: DS□310 Series Footprint for Bulk and Tape are different.
Consult your local Murata Electronics Sales Office for details.

TYPICAL INSERTION LOSS CHARACTERISTICS

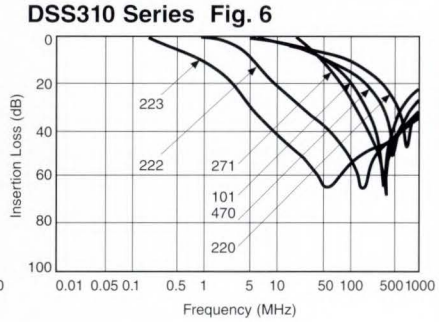
DS310 Series Fig. 4



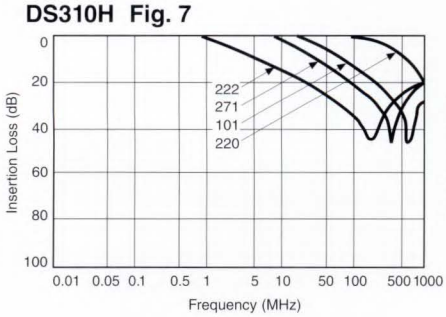
DST310 Series Fig. 5



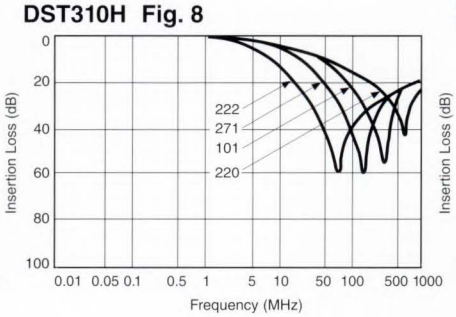
DSS310 Series Fig. 6



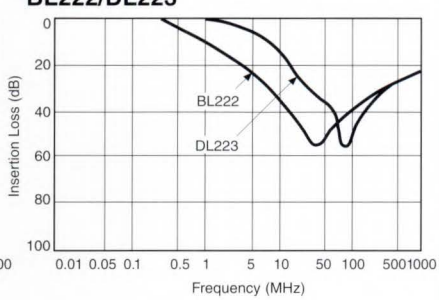
DS310H Fig. 7



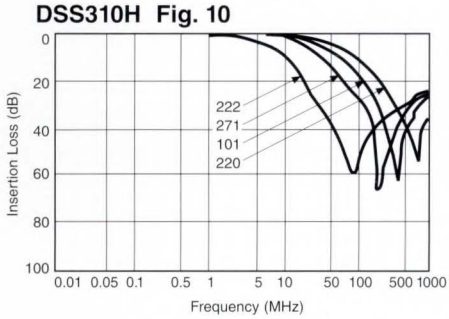
DST310H Fig. 8



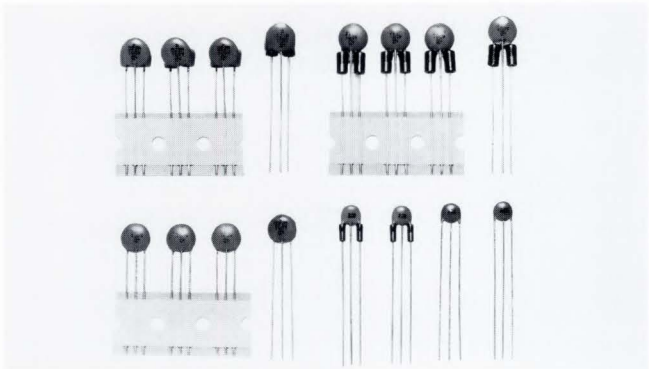
DSS310 Series Fig. 9
BL222/DL223



DSS310H Fig. 10



DS□306, DS□310/310H Series



PART NUMBERING, DS306 & DSS310 SERIES

DST	310	–	55	Y5S	271	M	100
T=Ferrite Bead Outside S=Ferrite Bead Inside	Series		55=Bulk Pkg. *=Tape & Reel (See Chart)	Temp. Char.	Cap. Value	Tolerance	Rated Voltage

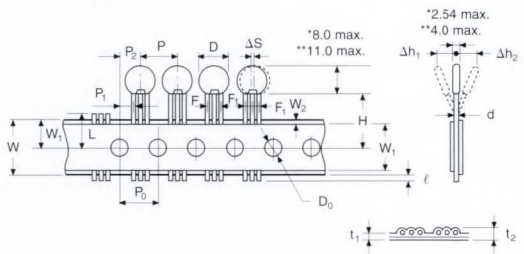
TAPE & REEL CODES

Code		H
Straight Leads	Crimped Leads	Tape & Reel
91	—	20.0
92	421	16.5
93	431	18.5

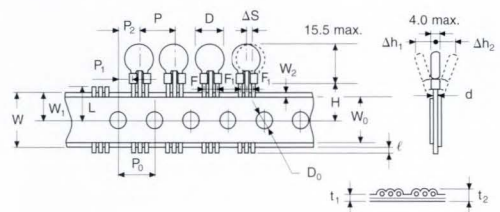
*Three types of H dimensions (lead length) are available for various types of insertion machines.

TAPE DIMENSIONS: mm

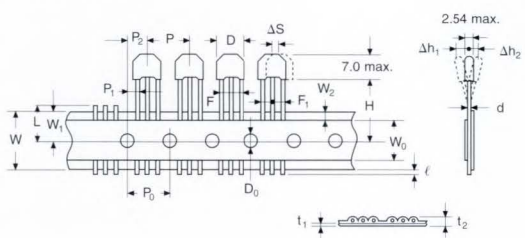
*DS306-91 Type
*DS310-91 Type



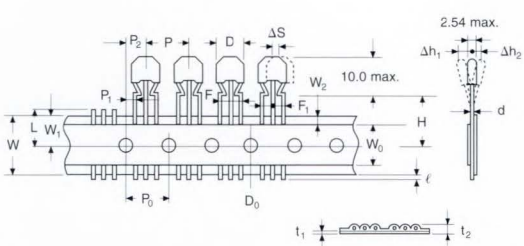
DST310-91 Type



*DSS306-91 Type

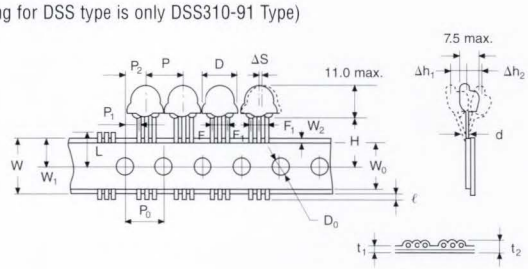


*DSS306-431 Type



*DSS310-91 Type

(Taping for DSS type is only DSS310-91 Type)



Item	Code	Dimensions: mm	Remarks
Taping Pitch	P	12.7	Product Inclination ΔS Determines Tolerance
Guide Pitch	P_0	12.7 ± 0.2	
Hole Center to Lead	P_1	3.85 ± 0.7	
Hole Center to Component Center	P_2	6.35 ±1.3	Shift in Tape in Direction of Feed
Diameter of Body	D	7.0 [9.5]	DS max.
		8.0 [9.5]	DST max.
		8.0 [12]	DSS max.
Deviation of Body Center	ΔS	0 ± 1.0	
Width of Base Tape	W	18.0 ± 0.5	
Feed Hole Position to Capacitor Lead	W_1	$9.0^{+0}_{-0.5}$	Tape Widthwise Shift
Protrusion Length	ℓ	+0.5 to −1.0	
Diameter of Feed Hole	D_0	4.0 ± 0.1	
Diameter of Lead	d	0.6	
Total Thickness of Tape	t_1	0.7 ± 0.2	Includes Thickness of Bonding Tape
	t_2	1.5 max.	
Deviation Across Tape	Δh_1	1.0 max.	
	Δh_2	1.0 max.	
Length of Snipped Lead	L	$11.0^{+0}_{-1.0}$	
Width of Hold Position	W_0	12.0 ± 0.5	
Hold-down Tape Position	W_2	1.5 ± 1.5	
Lead Distance Between Reference and Bottom Planes	H	18.5 ± 1.0	16.5 & 20.0mm Lengths are also available
Lead Spacing	F	$5.0^{+0.8}_{-0.2}$	
	F_1	$2.5^{+0.4}_{-0.2}$	

[ ].....DS□310 Series

PACKAGING TYPE AND NUMBERS

Part Number	Quantity (Pcs.)	
	Flat Pack	Reel
DS□306 Series	2000	—
DS310/310H Series	2000	—
DST310/310H Series	—	1000※
DSS310/310H Series	—	800

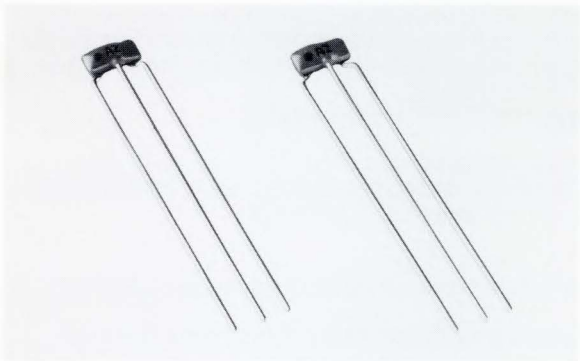
※ Non Standard

★Available as standard through authorized Murata Electronics Distributors.

EMI SUPPRESSION FILTER WITH SEMICONDUCTOR SURGE PROTECTION

muRata

VFR303 Series



The VFR303 Series is an EMI suppression filter with a built-in varistor function designed to protect semiconductors, such as C-MOS and TTI, from ESD surge rushes. The VFR303 series works well as EMI suppression filter.

FEATURES

- Absorbs ESD surges, provides IC protection.
- Excellent signal line EMI suppression filter.
- Thin and low height enables high density mounting.

APPLICATIONS

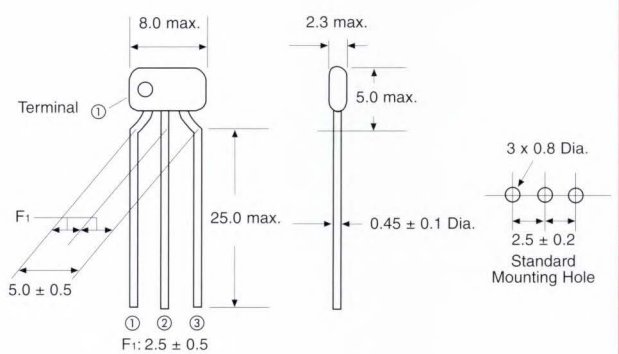
Elimination of noise and protection of semiconductors in office automation equipment, including computers and their peripheral equipment, copy machines, and communication terminals.

PART NUMBERING

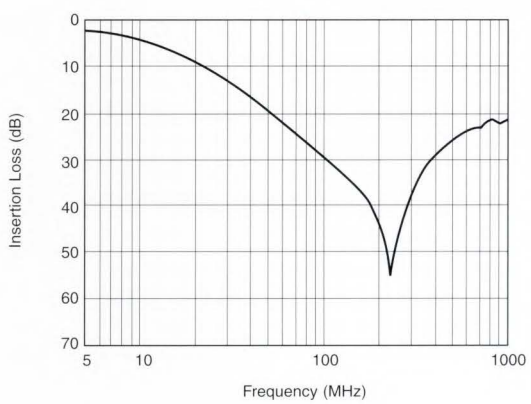
VFR303	—	351	AZ	25
SERIES		PACKAGING Bulk = 351 Taped = 431	TYPE	RATED VOLTAGE

DIMENSIONS: mm

VFR303-351



TYPICAL INSERTION LOSS CHARACTERISTICS (3KΩ)



SPECIFICATIONS

Part Number	Capacitance (1kHz) (Between Terminals 1-2)	Varistor Voltage	DC Resistance (Ω) (Between Terminals 1-3)	Rated Voltage (Between Terminals 1-2)	Rated Current (Between Terminals 1-3)	Operating Temp. Range
★VFR303-351 AZ 25	130pF ± 20%	50V ± 20%	200 to 500Ω	25VDC	20mA	–25 to +85°C

★Available as standard through authorized Murata Electronics Distributors.

EMI SUPPRESSION FILTERS
EMI-GUARD VARISTOR-CAPACITOR

DSS706 Series

The EMI-GUARD™ DSS706 Varistor-Capacitor is a three-terminal filter which suppresses noise emmission from electronic equipment while controlling incoming surges of static electricity. Its small size enables 2.5mm pitch mounting.

APPLICATIONS

Elimination of noise and protection of semiconductors in office automation equipment, including computers, peripheral equipment, copy machines, and communication terminals.

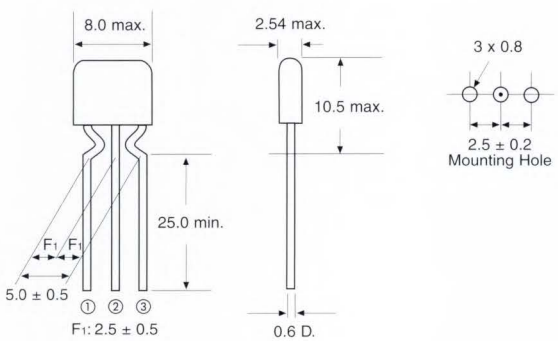
FEATURES

- Protects circuits from electrical surges and acts as a filter for signal lines.
- Effectively suppresses high-frequency noise from signal lines. (Performance equivalent to conventional three-terminal capacitor.)
- Small size enables it to be mounted at 2.5mm pitch. Three-terminal structure leads to superior high-frequency characteristics.
- Built-in ferrite bead provides excellent EMI suppression.

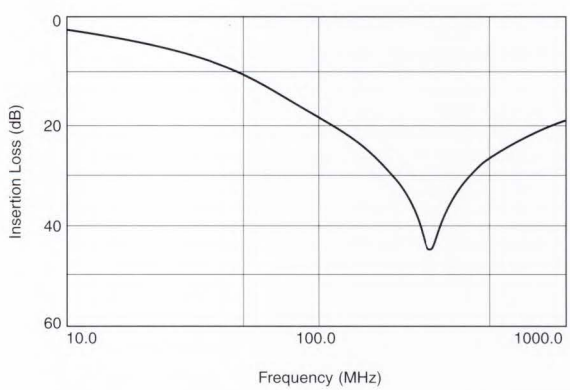
PART NUMBERING

DSS706	—	351	D	221M	25	—	50
SERIES		LEAD CONFIGURATION 351 = Bulk 431 = Taped	TEMP. CHAR.	CAPACITANCE AND TOLERANCE	RATED VOLTAGE		VARISTOR VOLTAGE

DIMENSIONS: mm



TYPICAL INSERTION LOSS CHARACTERISTICS



SPECIFICATIONS

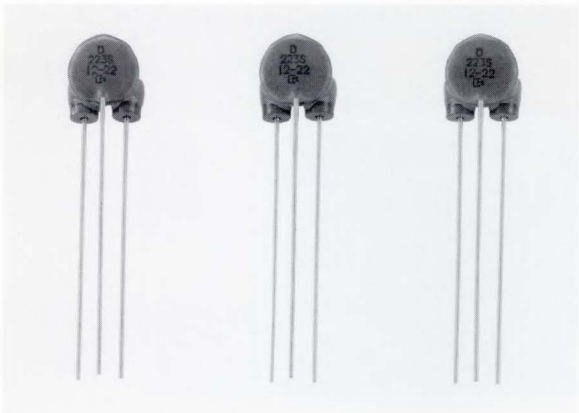
Part Number	Capacitance	Capacitance Temp. Char.	Rated Voltage	Max. Rated Current	Varistor Voltage	Peak Pulse Current	Operating Temp. Range
★DSS706-351D221M25-50	220pF ± 20%	+20%, −30%	25VDC	6 Amps	50 ± 20%	100A	−40 to +105°C

★Available as standard through authorized Murata Electronics Distributors.

EMI SUPPRESSION FILTERS
EMI-GUARD VARISTOR-CAPACITOR

muRata

DSS710 Series



The DSS710 EMI-GUARD uses a capacitor element which provides the varistor function. This varistor-capacitor not only works as a bypass capacitor but also lets high-voltage surges flow to ground.

The varistor-capacitor used in the DSS710 EMI-GUARD has a 3-lead structure, so that its high frequency functions are substantially better than those of conventional capacitors. Furthermore, it is combined with ferrite bead to form a T-shaped filter circuit that most effectively suppresses EMI.

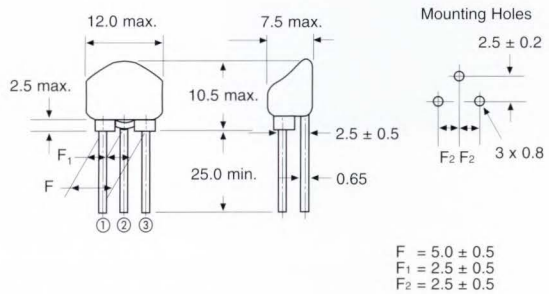
The DSS710 EMI-GUARD efficiently removes fast-rising transients and high-frequency EMI above 50 or 60 MHz which conventional capacitors and varistor-capacitors are incapable of removing.

Varistor-capacitors are used even where conventional EMI-filters fail. They are self-healing and effective in circuits having 500-600V impulses.

PART NUMBERING

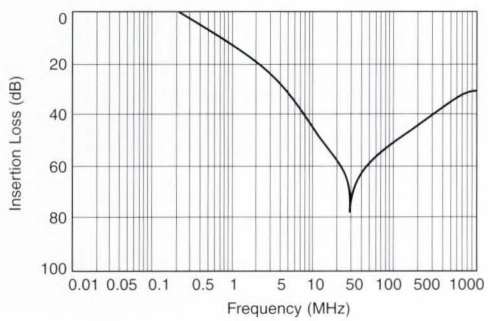
DSS710	D	223S	12	—	22
SERIES	TEMPERATURE CHARACTERISTICS	CAPACITANCE AND TOLERANCE	RATED VOLTAGE		VARISTOR VOLTAGE

DIMENSIONS: mm



Note: Footprint for Bulk and Tape & Reel are different. Consult your local Murata Electronics Sales Office.

TYPICAL INSERTION LOSS CHARACTERISTICS

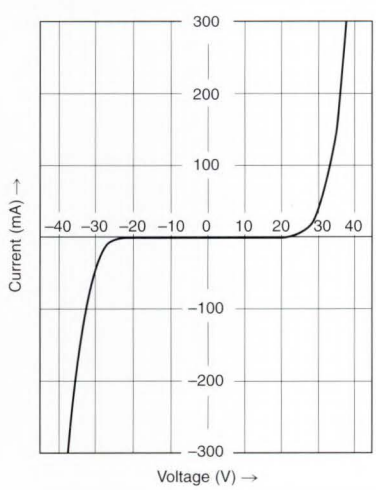


SPECIFICATIONS

Part Number	★DSS710 D223 S 12-22
Capacitance	22000pF $^{+50}_{-20}$%
DF	5.0% max.
Insulation Resistance	1 MΩ min.
Ic (max.)	7 A
Rated Voltage	12 VDC
Varistor Voltage	22 VDC ± 20% (V1mA)
Voltage Nonlinear Factor	1.25 max. (V10mA/V1mA)
Temperature Characteristics	$^{+20}_{-30}$% (–25°C to +85°C)
Operating Temperature Range	–40°C to +100°C
Inductance	0.8μH x 2 (1KHz)

★Available as standard through authorized Murata Electronics Distributors.

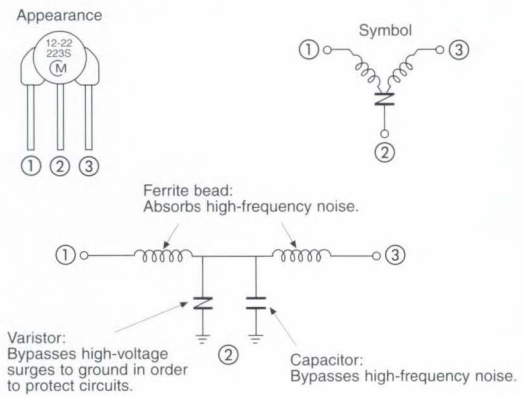
VOLTAGE – CURRENT CURVE



LEADED EMI FILTERS

DSS710 Series

3-TERMINAL STRUCTURE



The reason the 3-terminal structure provides excellent high frequency characteristics.

Bypass capacitors should logically be able to remove more noise as frequency increases. In actual fact, the electrodes and lead wires of the capacitor have series inductance as shown in Fig. 3, and this causes an LC resonance when the frequency is between 1 MHz and 50 MHz. As a result, when the frequency is higher than the self-resonance frequency, the noise suppression capability of the bypass capacitor is drastically reduced because the capacitor functions as inductor. To solve this problem, the DSS series has one side of the capacitor electrodes connected to two lead wires. This eliminates the series inductance to the capacitor. Furthermore, a ferrite bead is attached to each lead wire to form a T-shaped filter, thus providing efficient noise suppression.

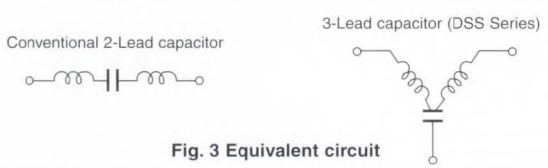
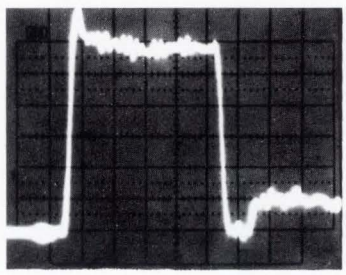


Fig. 3 Equivalent circuit

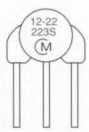
NOISE ABSORPTION EFFECT OF EMI-GUARD

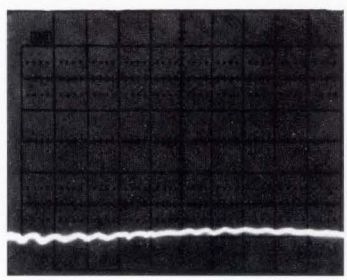


SCALE:
200V/Div.
10NS/Div.

Waveform when EMI-GUARD is not used. (surge from a noise simulator)

EMI-GUARD is used to suppress the surge shown below





Waveform after the noise passes through EMI-GUARD. Protection of circuitry is achieved.

The EMI-GUARD is capable of removing even 1200V surges and will withstand 2000V impulses.

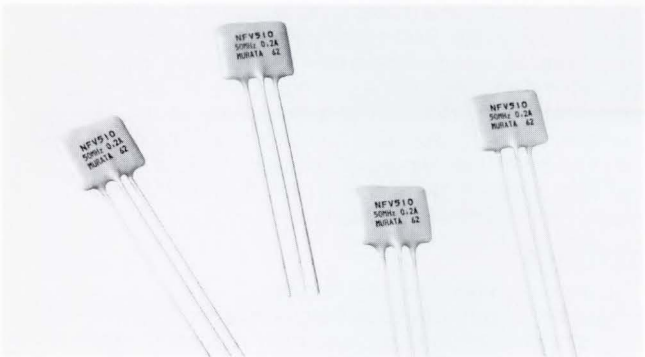
APPLICATIONS

Systems	Lines to be connected to	Effects
Engine Controllers	Power lines, I/O for low-frequency current	Protection of systems from excessive voltage. Prevents ignition noise, lightning surges, etc. from causing malfunctions.
Automobile Audio Equipment	Power lines, audio output lines	Protection of system from excessive voltage. Prevents ignition noise from influencing audio current.
Computers	Power lines, I/O lines for low-frequency current	Protection of systems from excessive voltage. Prevents radiation and conduction noise.
DC Motors	Power lines	Prevention of brush noise.

EMI SUPPRESSION FILTERS
for HIGH SPEED DIGITAL APPLICATIONS

muRata

NFV510 Series



The NFV510 Series is an effective noise suppression filter for high-speed digital signal lines where the frequencies of signal and noise components are very close.

Murata Electronics has combined its superior inductor and capacitor technologies with a unique circuit configuration to realize outstanding noise suppression characteristics.

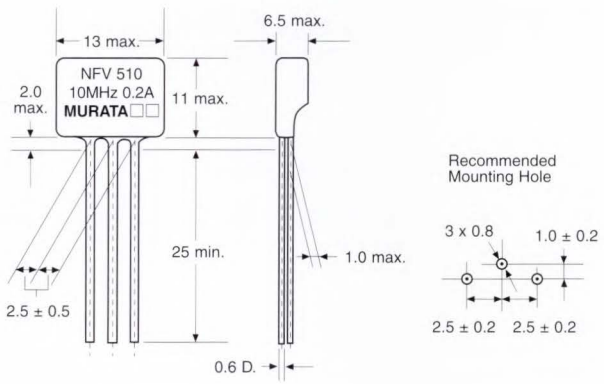
FEATURES

- Steep attenuation characteristics make this filter most suitable as a suppressor for unwanted radiation in signal lines. Insertion loss approaches 100dB per decade.
- High attenuation is obtained through the use of unique high performance inductors.
- 4 types classified by cut-off frequencies from 10MHz to 100MHz allow selection of optimum noise suppression.
- Shorter lead lengths are available.

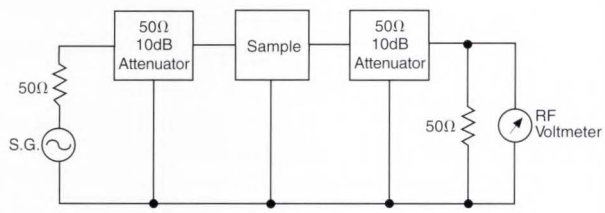
APPLICATIONS

Noise suppression for RGB signal lines, digital image equipment, computer terminals, digital TV's, etc.

DIMENSIONS: mm



INSERTION LOSS MEASURING CIRCUIT

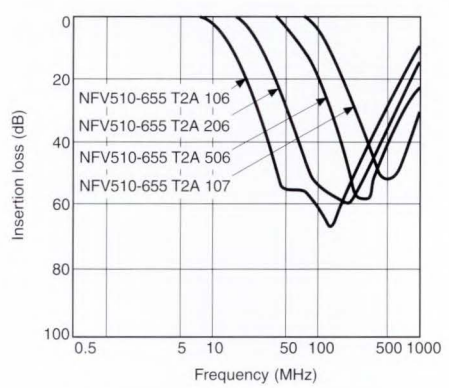


SPECIFICATIONS

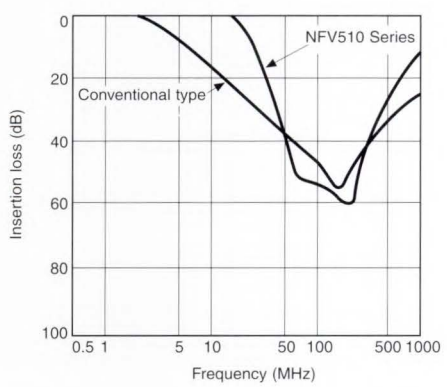
Part Number	Cut-off Frequency	Minimum Attenuation (dB)						Rated Voltage (V)	Rated Current (mA)
		10MHz	20MHz	50MHz	100MHz	200MHz	500MHz		
★NFV510-655 T2A 106	10MHz	*	15	40	45	40	15	100	200
★NFV510-655 T2A 206	20MHz	—	*	25	45	50	20	100	200
★NFV510-655 T2A 506	50MHz	—	—	*	15	40	20	100	200
★NFV510-655 T2A 107	100MHz	—	—	—	*	15	35	100	200

*6dB Temperature Range: –25°C to +85°C

TYPICAL INSERTION LOSS CHARACTERISTICS



COMPARISON WITH CONVENTIONAL THREE-TERMINAL CAPACITORS

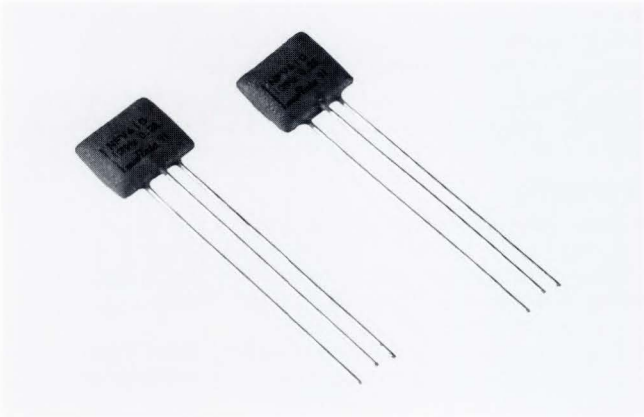


★Available as standard through authorized Murata Electronics Distributors.

LEADED EMI FILTERS

EMI SUPPRESSION FILTERS
for HIGH SPEED DIGITAL APPLICATIONS

NFV610 Series



This high performance noise suppression filter utilizes a unique circuit design and a total components concept to provide exceptional performance in high speed, high impedance digital signal lines. It uses considerably more components than previously available filters so that the high input and output impedances of digital IC's can be matched. This impedance matching greatly reduces the waveform distortions, created by reflections and ringing, that are apparent with conventional filters.

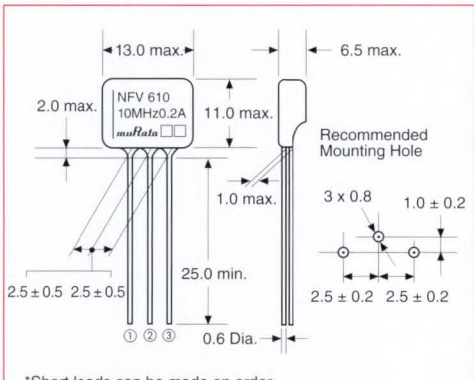
FEATURES

- Suppresses reflections and ringing
- High attenuation over wide frequency spectrum
- Undistorted waveform reduces high frequency noise generating signal components
- High voltage rating provides reliability in strong electro-magnetic fields
- Six models with cut-off frequencies from 10-200MHz allow circuit optimization
- Ideal for digital high impedance lines to separate noise from signal when frequencies are close

APPLICATIONS

Computers and peripherals, instrumentation and process controls, telecommunications equipment, consumer electronics.

DIMENSIONS: mm



*Short leads can be made on order.

❶ Input Terminal
❷ Ground Terminal
❸ Output Terminal

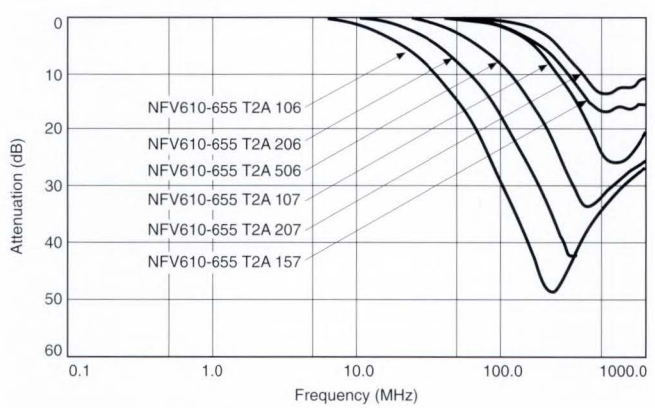
SPECIFICATIONS

Part Number	Cut-off Frequency	Minimum Attenuation (dB)						
		10MHz	20MHz	50MHz	100MHz	200MHz	500MHz	1000MHz
★NFV610-655 T2A 106	10MHz	*	3	10	20	35	25	—
★NFV610-655 T2A 206	20MHz	—	*	3	10	15	25	—
★NFV610-655 T2A 506	50MHz	—	—	*	3	10	25	—
★NFV610-655 T2A 107	100MHz	—	—	—	*	3	15	—
†NFV610-655 T2A 157	150MHz	—	—	—	**	—	6	10
†NFV610-655 T2A 207	200MHz	—	—	—	—	*	3	6

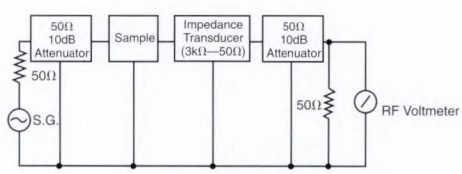
*6dB max. **6dB max. at 150MHz
†= Non-Standard

Rated Voltage: 100 VDC, Rated Current: 200mA
Temperature Range: –25°C to +85°C

TYPICAL INSERTION LOSS CHARACTERISTICS



INSERTION LOSS MEASURING CIRCUIT



*Measurement is performed by using 50Ω-3KΩ measuring circuits in order to match operating conditions of the digital signal circuit.

★Available as standard through authorized Murata Electronics Distributors.

muRata

BNP002/004 Series

Block-type BNP002 filters completely eliminate noise from extremely wide frequency bands. The BNP002 is ideal for eliminating noise in logic signal circuits and is designed to perform superbly through the use of through-type barrier layer capacitors, and bead inductors.

Each block contains a number of compact EMI suppression filters. In addition, the input/output terminals and the grounding terminal are aligned in the same direction, thus permitting fast and easy assembly on any type of PC board.

FEATURES

- The EMIFIL BNP002 incorporates feed-thru type barrier layer capacitors in Pi circuits, obtaining significantly large insertion losses over an extremely wide frequency range — from 15MHz up to 1GHz.
- The cut-off frequency is designed to be at several MHz, which is ideal for eliminating noise from any circuit in which the signal frequency and the noise frequency are relatively close together.

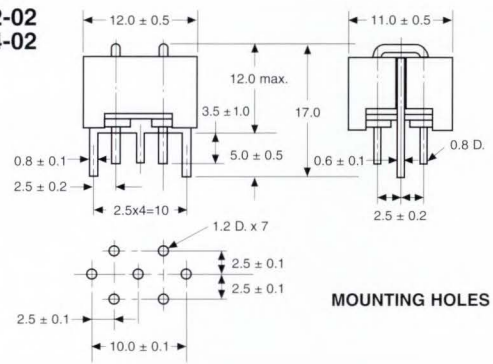
APPLICATIONS

Noise elimination from signal lines and DC power sources in engine control units, digital equipment and computer terminals.

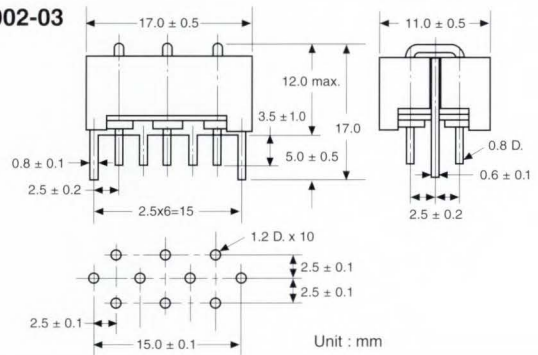
- Since all noise in parallel signal lines can be eliminated by one filter block, minimum board space is utilized.
- There are no connections in the feed-thru current circuits, thus ensuring highly reliable performance.
- Both the input/output terminals and the grounding terminal are aligned in the same direction, permitting fast and easy installation on any type of PC board.

DIMENSIONS: mm

BNP002-02
BNP004-02



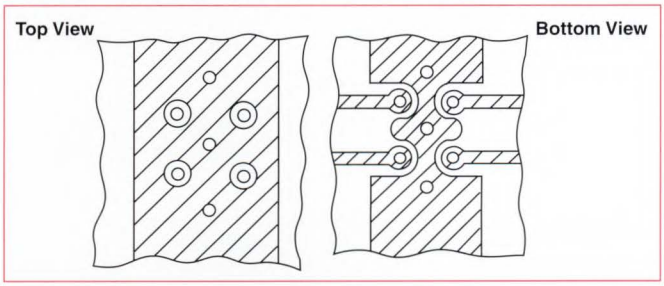
BNP002-03



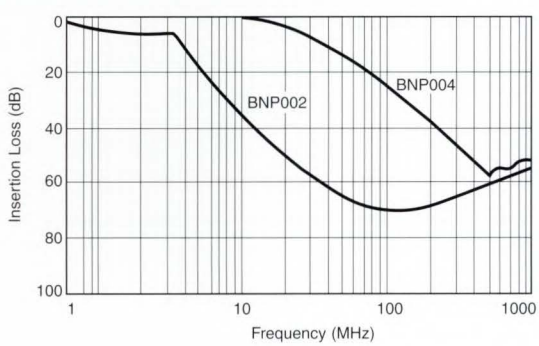
SPECIFICATIONS

Item	Specifications		
Part Number	★BNP002-02	★BNP002-03	★BNP004-02
Number of Circuits	2	3	2
Circuit Construction	π		
Operating Temperature Range	−40°C to +100°C		
Rated Voltage	50VDC		
Withstand Voltage	300VDC		125VDC
Maximum Current Capacity	10ADC		
Insulation Resistance	1000MΩ min.		
DC Resistance	0.05Ω max., (20°C to 25°C)		
Insertion Loss	20MHz to 500MHz: 40dB (20°C to 25°C) min.		300MHz to 1GHz 40dB min.

RECOMMENDED P.C. BOARD PATTERN

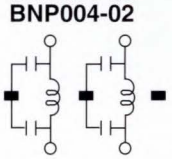


TYPICAL INSERTION LOSS CHARACTERISTICS



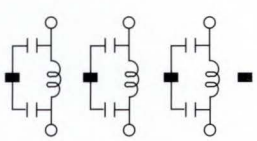
EQUIVALENT CIRCUIT

BNP002-02
BNP004-02



Capacitance value of each circuit (π) is 6600 pF min.

BNP002-03



■ : Ground Terminal
Non-Directional

★Available as standard through authorized Murata Electronics Distributors.

LEADED EMI FILTERS

BNX002/003/005 Series

Block-type BNX002 filters completely eliminate noise from extremely wide frequency bands. The BNX002 is perfect for use in DC power circuits and is designed to perform superbly—through the use of through-type barrier layer capacitors, monolithic chip capacitors and bead inductors.

Each block contains a number of compact EMI suppression filters. In addition, the input/output terminals and the grounding terminal are aligned in the same direction, thus permitting fast and easy assembly on any type of PC board.

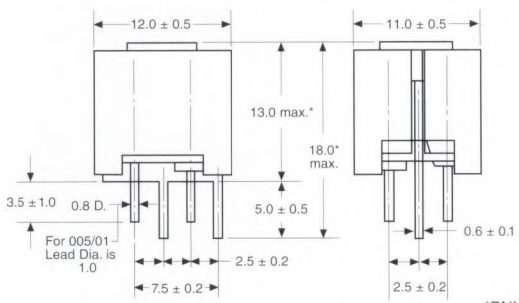
APPLICATIONS

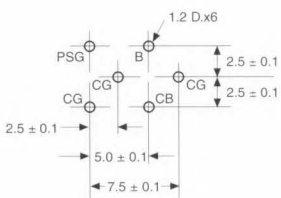
Noise elimination from signal lines and DC power sources in a variety of switching power sources, engine control units, digital equipment and computer terminals.

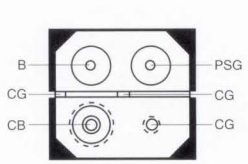
FEATURES

- The EMIFIL BN X002 incorporates feed-thru-type barrier layer capacitor and a chip capacitor which are interconnected. This combination enables the BNX002 to achieve a significantly large insertion loss throughout the extremely wide frequency range of 0.5MHz to 1GHz, which covers the AM and UHF-TV broadcast frequency bands.
- Non polarized – but care must be taken to ensure that terminal with inductor on ground line faces EMI source.
- The filter is extremely compact since only one filter block is needed to completely eliminate noise from both the positive and ground lines.
- There are no connections in the feed-thru current circuits, thus ensuring highly reliable performance.
- Both the input/output terminals and the grounding terminal are aligned in the same direction, permitting fast and easy installation on any type of PC board.

DIMENSIONS: mm





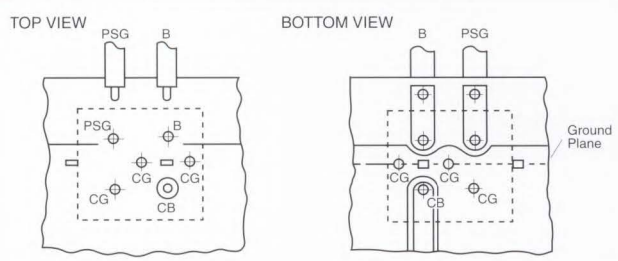


*BNX005-01 = 13.5 and 18.5

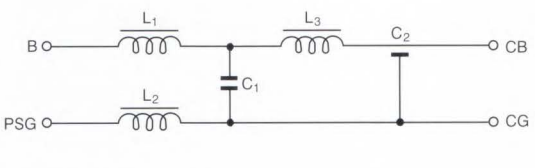
SPECIFICATIONS

Item	Specifications		
Part Number	★BNX002-01	★BNX003-01	★BNX005-01
Operating Temperature Range	−30°C to +85°C		
Rated Voltage	50VDC	150VDC	50VDC
Test Voltage	125VDC	375VDC	125VDC
Maximum Current Capacity	10ADC		15ADC
Insulation Resistance	1000MΩ min.		
Insertion Loss	1MHz to 1GHz 40dB min.	5MHz to 1GHz 40dB min.	1MHz to 1GHz 40dB min.
	20°C to 25°C Line Impedance=50Ω		

RECOMMENDED P.C. BOARD PATTERN

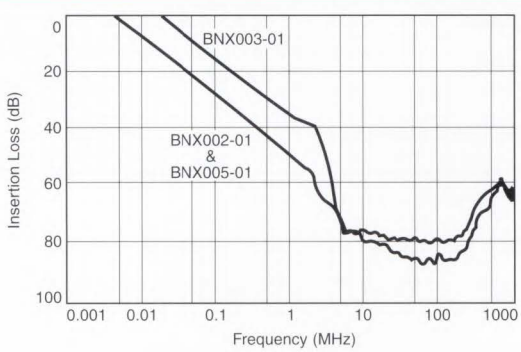


EQUIVALENT CIRCUIT



PSG: Power Supply Ground
CG: Circuit Ground
CB: Circuit B

TYPICAL INSERTION LOSS CHARACTERISTICS

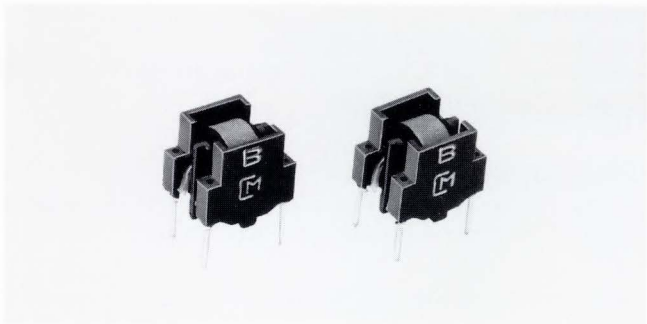


★Available as standard through authorized Murata Electronics Distributors.

EMI SUPPRESSION FILTERS
DC COMMON MODE CHOKE COIL

muRata

PLT Series



Compact, lightweight, common mode choke coil for DC power supplies for common mode noise suppression from several MHz to several hundred MHz.

FEATURES

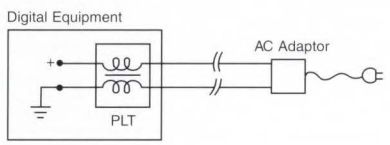
- Ideal for suppression of common mode noise in high frequencies ranging from several MHz to several hundred MHz.
- PCB mount type makes mounting simple.
- Only negligible influence on 10MHz high frequency signals (PLT0R53C only).

APPLICATIONS

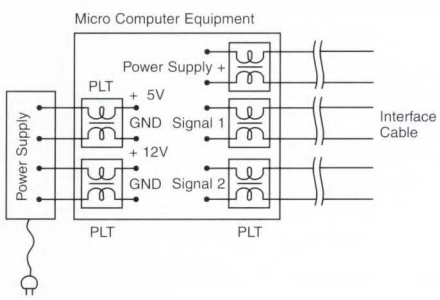
To meet FCC regulations on digital equipment such as computers and computer terminal equipment.

To meet VDE regulations on hand-held digital appliances using AC adaptors (suppression of unwanted radiation from power cords).

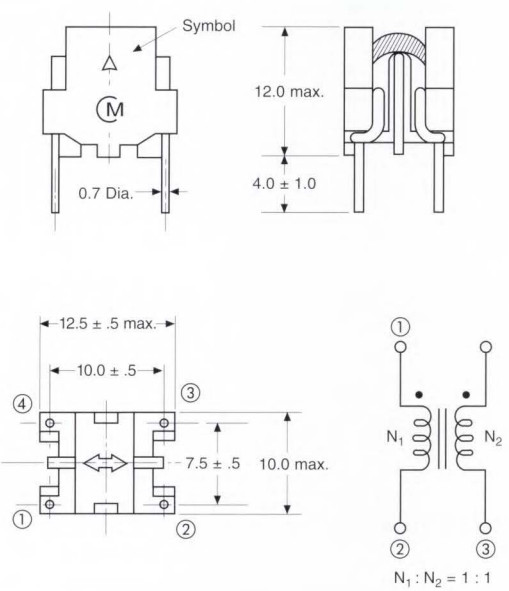
Suppression of radiated noise from cable between AC adaptors and sets.



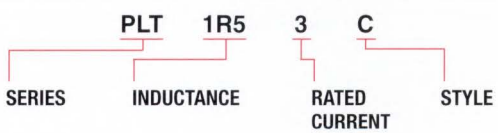
Suppression of radiated noise from DC power supply and interface cables.



DIMENSIONS: mm



PART NUMBERING



TYPES

Part Number	Inductance (μH) min.	Self-resonance Frequency (MHz)*	Code
★PLT0R53C	0.5	1000 min.	B
★PLT1R53C	1.5	250	A
★PLT2003C	20.0	10	C

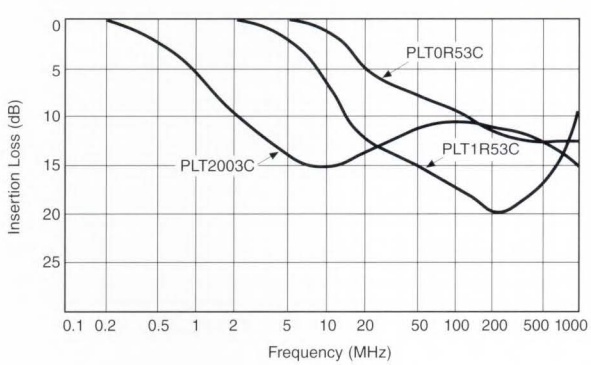
*Typical Value

SPECIFICATIONS

Item	Rating
Rated Voltage	50VDC
Rated Current	3A
Withstand Voltage	125VDC (1 to 5 seconds)
Operating Temp. Range	–25°C to +60°C

★Available as standard through authorized Murata Electronics Distributors.

TYPICAL INSERTION LOSS CHARACTERISTICS



NOISE FILTERS
DC COMMON MODE CHOKE COIL

PLT09H Series

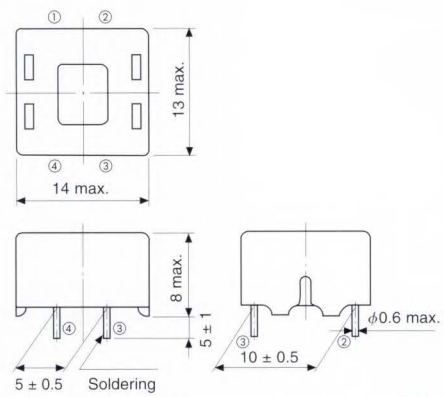
FEATURES

- Extended self-resonant frequency
- Meets FCC, CISPR, VCCI noise requirements
- High current rating – 3A max.
- High density mounting

APPLICATIONS

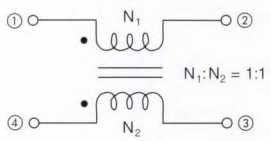
Switching power supplies, digital equipment, CTV, VCR, ECR and other electronic equipment and appliances.

DIMENSIONS: mm



Unit : mm

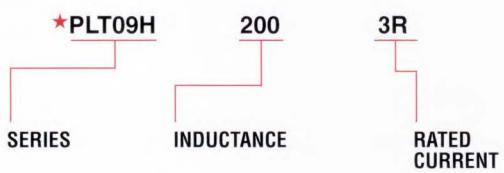
CIRCUIT DIAGRAM



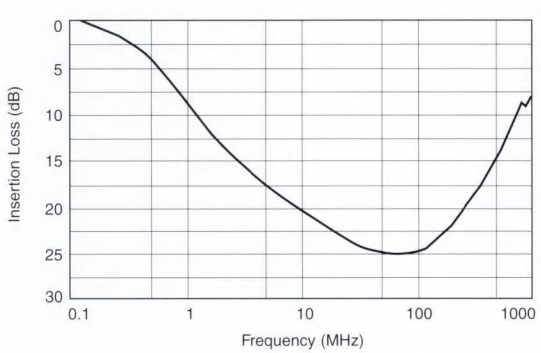
SPECIFICATIONS

Rated Voltage	50VDC
Withstand Voltage (between coils)	125VDC (1 min.)
Rated Current (Amps)	3.0
Insulation Resistance	10MΩ min. (100VDC 1 minute)
DC Resistance (Ω) max.	0.03
Inductance min.	20μH
Operating Temperature Range	–25°C to +60°C
Temperature Char. (Inductance)	20°C $^{+80}_{-50}$ % (–25°C ~ +60°C)

PART NUMBERING

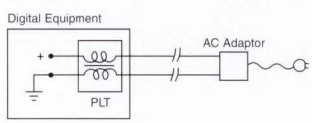


TYPICAL INSERTION LOSS CHARACTERISTICS

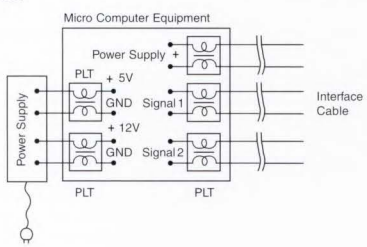


APPLICATIONS

Suppression of radiated noise from cable between AC adaptors and sets.



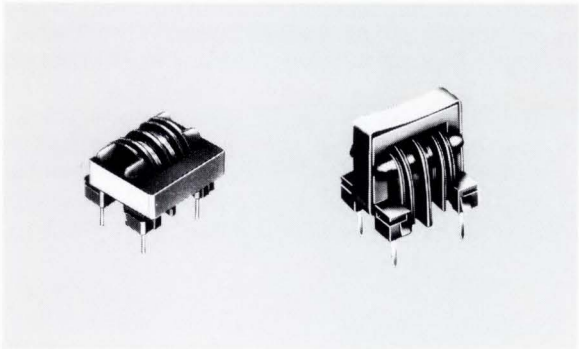
Suppression of radiated noise from DC power supply and interface cables.



★Available as standard through authorized Murata Electronics Distributors.

NOISE FILTERS
DC COMMON MODE CHOKE COIL

PLC11 Series



FEATURES

- Suppresses common mode noise in the AM band (525 to 1605KHz) and the FM band (76 to 108 MHz)
- Easily mounted
- Compact and light weight
- Very little inductance drop with increased load current

APPLICATIONS

Prevention of mixing of broadcast signals in circuits for multi-functional telephones, PBX and FAX.

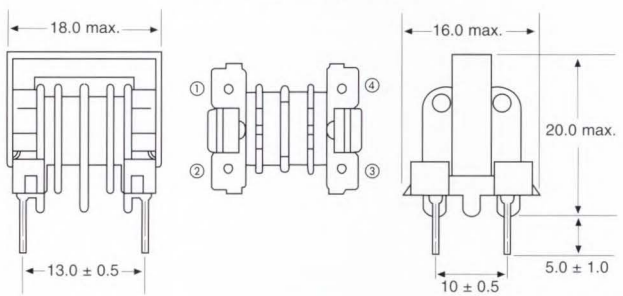
Suppression of EMI interference from AM and FM signals.

PART NUMBERING

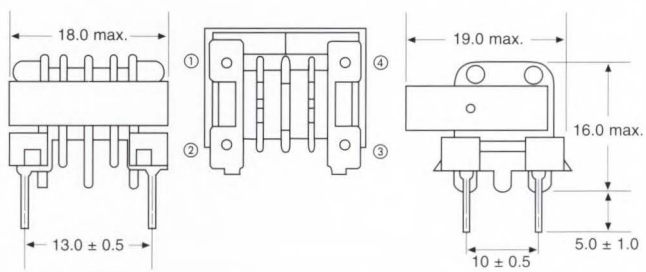
PLC11	A	152	0R3	D	01	B1
SERIES	STYLE A : Vertical Type B : Horizontal Type	INDUCTANCE 152 : 1.5mH	RATED CURRENT 0R3 : 0.3A	WINDING MODE D : Division	SERIAL NUMBER	PACKAGING CODE B1 : Bulk

DIMENSIONS: mm

★PLC11A1520R3D01B1



★PLC11B1520R3D01B1

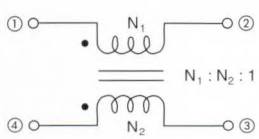


SPECIFICATIONS

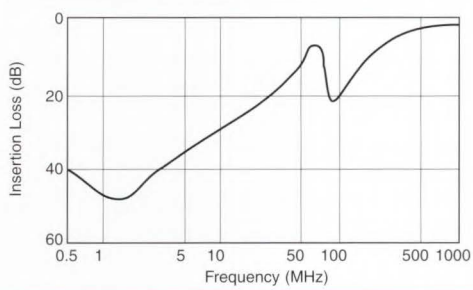
Rated Voltage		150VDC
Withstand Voltage		375VDC
Rated Current		300mA
Insulation Resistance		100MΩ min.
DC Resistance		0.5Ω max.
Inductance		1.5mH min.
Self-resonant Frequency*	first	1.5MHz
	second	95MHz
Operating Temperature Range		–25°C to +85°C

★Available as standard through authorized Murata Electronics Distributors.
*Typical value

CIRCUIT DIAGRAM

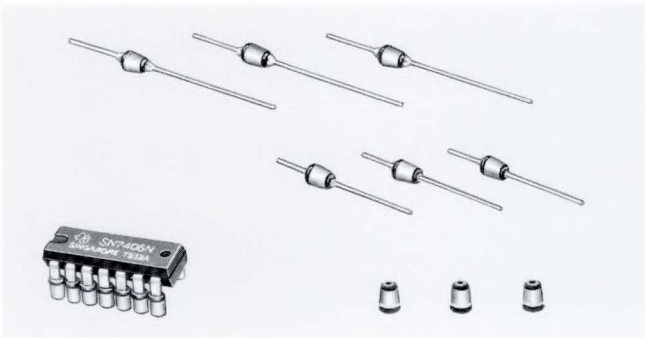


TYPICAL INSERTION LOSS CHARACTERISTICS



LEADED EMI FILTERS

SUBMINIATURE FEED-THRU CAPACITORS
DF220, DF221(H), DF430, TF240(H) & DF331(H) Series



Since the input and output terminals of these feed-thru capacitors are isolated and the inductance on the grounded side is very small, they can be used effectively to very high frequencies.

These devices are suitable for suppression of radiation from TV tuners, car radios, car stereos and transmission devices and provide enhanced protection from external noise sources.

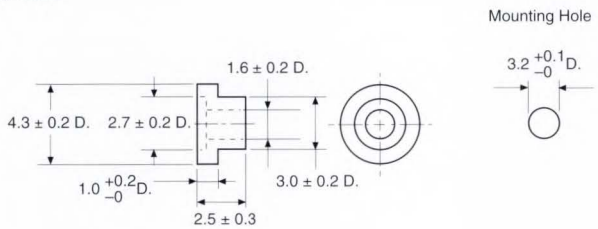
These subminiature feed-thrus, which may be incorporated in 2.54mm pitch connectors, are ideal for miniature electronic equipment.

FEATURES

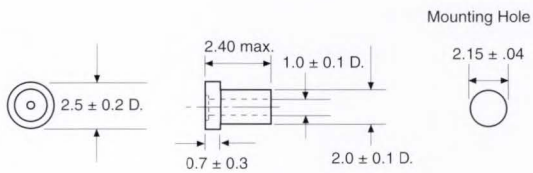
- The use of barrier layer capacitors has resulted in smaller size and larger capacity than possible with conventional capacitors.
- The nickel alloy electrode is resistant to soldering heat and is free from migration in high humidity environments.
- Compact electronic devices can be achieved by incorporating this capacitor with a 2.54mm pitch packaging density – such as installation in connectors.
- Simple construction allows mass production assembly techniques.

DIMENSIONS: mm

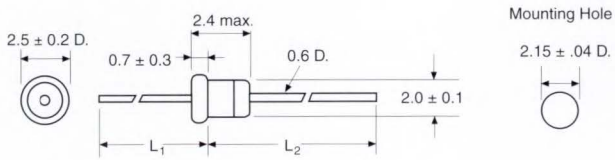
DF430



DF220-00

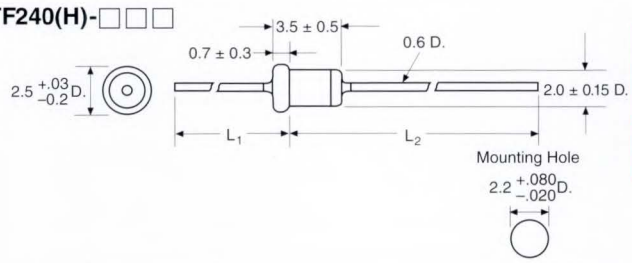


DF221(H)-□□□



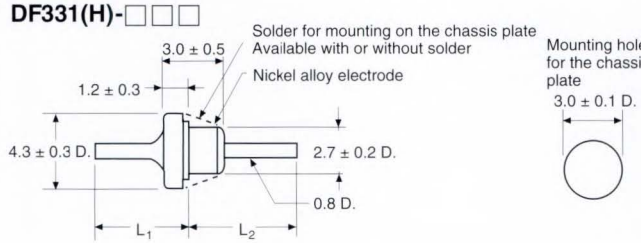
Part Number	Lead	
	L_1	L_2
DF221(H)-601	10.0 ± 1.0	20.0 ± 1.0
DF221(H)-602	20.0 ± 1.0	20.0 ± 1.0

TF240(H)-□□□



Part Number	Lead	
	L_1	L_2
TF240(H)-601	10.0 ± 1.0	20.0 ± 2.0
TF240(H)-602	5.0 ± 1.0	12.0 ± 1.0
TF240(H)-603	5.0 ± 1.0	7.0 ± 1.0

DF331(H)-□□□



Part Number	Lead		Solder for mounting on the chassis plate
	L_1	L_2	
DF331(H)-812	6.5 ± 1.0	9.5 ± 1.0	Provided
DF331(H)-895	6.5 ± 1.0	9.5 ± 1.0	None
DF331(H)-805	14.0 ± 1.0	20.0 ± 1.0	Provided

Note: Other lead wire lengths are available. Please contact your nearest Sales Office for more detail.

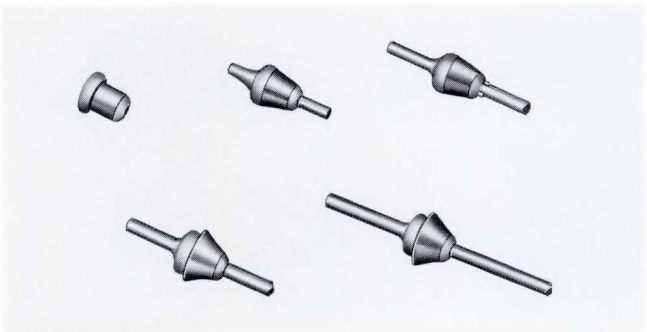
SUBMINIATURE FEED-THRU CAPACITORS
DF220, DF221(H), DF430, TF240(H) & DF331(H) Series

SPECIFICATIONS

Part Number*	Cap. Value	Cap. Tol.	WVDC	Insertion Loss at 25°C (Typ.)		
				10MHz	100MHz	1GHz
DF220						
★**DF220-00SL020U50**	2pF	+0, –100%	50V	—	—	—
★**DF220-00SL150M50**	15pF	±20%	50V	—	—	6
★**DF220-00SL220M50**	22pF	±20%	50V	—	—	7
★**DF220-00YN430M50**	43pF	±20%	50V	—	1	15
★**DF220-00B121M50**	120pF	±20%	50V	—	3	20
★**DF220-00B221M50**	220pF	±20%	50V	—	7	25
★**DF220-00B471M50**	470pF	±20%	50V	—	12	30
★**DF220-00E102Z50**	1000pF	+80, –20%	50V	3	18	35
★**DF220-00SS152GMV50**	1500pF	+200, –0%	50V	5	20	40
DF221(H)						
DF221-□□□SL020U50	2pF	+0, –100%	50V	—	—	—
DF221-□□□SL150M50	15pF	±20%	50V	—	—	6
DF221-□□□SL220M50	22pF	±20%	50V	—	—	7
DF221-□□□YN430M50	43pF	±20%	50V	—	1	15
DF221-□□□B121M50	120pF	±20%	50V	—	3	20
DF221-□□□B221M50	220pF	±20%	50V	—	7	25
DF221(H)-□□□B(E)471M50	470pF	±20%	50V	—	12	30
DF221(H)-□□□E(F)102Z50	1000pF	+80, –20%	50V	3	18	35
DF221-□□□SS152GMV50	1500pF	+200, –0%	50V	5	20	40
DF430						
★**DF430-0SS332GMV50**	3300pF	+200, –0%	50V	10	25	45
TF240(H)						
TF240-□□□SL020D50	2pF	±0.5pF	50V	—	—	—
TF240-□□□SL220M50	22pF	±20%	50V	—	—	7
TF240-□□□B331M50	330pF	±20%	50V	—	10	27
TF240(H)-□□□E(F)102GMV50	1000pF	+200, –0%	50V	3	18	35
TF240-□□□SS332Z50	3300pF	+80, –20%	50V	10	25	45
DF331(H)						
DF331-□□□SL010P50	1pF	+100, –0%	50V	—	—	—
DF331-□□□SL100G50	10pF	±2pF	50V	—	—	—
DF331-□□□SL220M50	22pF	±20%	50V	—	—	7
DF331-□□□SL330M50	33pF	±20%	50V	—	—	12
DF331-□□□YN470M50	47pF	±20%	50V	—	—	15
DF331-□□□YN101M50	100pF	±20%	50V	—	2	19
DF331(H)-□□□E(F)102GMV50	1000pF	+200, –0%	50V	3	18	35
DF331-□□□SS332GMV50	3300pF	+200, –0%	50V	10	25	45

• Operating Temp. Range: Std. = –25°C to +85°C, H = –55°C to +125°C • Insulation Resistance: 1000MΩ min. *□□□ — See DIMENSIONS
For other capacitance values, consult your local Muarata Electronics Sales Office.
★Available as standard through authorized Murata Electronics Distributors.

TF318(H) & TF418 Series



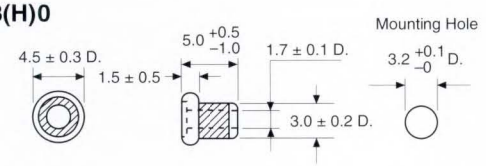
These feed-thru capacitors are designed for high frequency requirements, by-pass applications in VHF and UHF communications equipment and noise filters for car radios, car stereos and two-way radios.

These devices feature simple construction, small size and nickel plated electrodes.

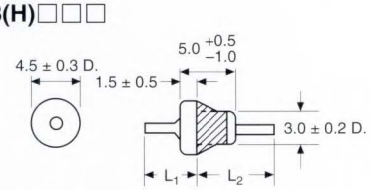
They are migration free and have high thermal strength, mechanical strength and resistance to soldering heat. Ease of mounting makes them ideal for new and conventional feed-thru applications.

DIMENSIONS: mm

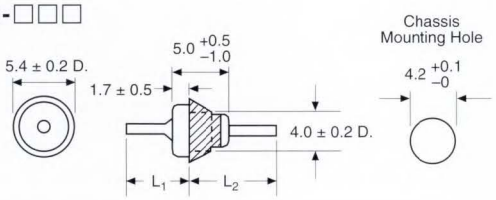
TF318(H)0



TF318(H)□□□



TF418-□□□



Type	Lead Dia.	L_1	L_2
★TF318(H)-850	0.8	25.0 ± 2.0	30.0 ± 2.0
★TF318(H)-853		14.0 ± 1.0	15.0 ± 1.0
★TF318(H)-855		9.5 ± 0.5	11.0 ± 0.5
★TF318(H)-053	1.0	11.0 ± 1.0	16.5 ± 1.0
★TF318(H)-055		7.0 ± 0.7	6.2 ± 0.7
★TF318(H)-450	1.4	$4.5^{+1.0}_{-0.5}$	7.5 ± 1.0
★TF318(H)-452		7.0 ± 1.0	9.0 ± 1.0

Type	Lead Dia.	L_1	L_2
★TF418-452	1.4	7.2 ± 1.0	8.8 ± 1.0
★TF418-454		10.2 ± 1.0	13.8 ± 1.0

SPECIFICATIONS

Part Number	Cap.	Cap. Tol.	Temp. Char.	Rated Voltage
★TF318-□SL100G50	10pF	± 2pF	SL	50VDC
★TF318-□SL220M50	22pF	± 20%	SL	50VDC
★TF318-□SL330M50	33pF	± 20%	SL	50VDC
★TF318-□SL470M50	47pF	± 20%	SL	50VDC
★TF318-□YN101M50	100pF	± 20%	YN	50VDC
★TF318-□B271M50	270pF	± 20%	B	50VDC
★TF318(H)-□B(F)471M50	470pF	± 20%	B	50VDC
★TF318-□E102GMV50	1000pF	$^{+200}_{-0}$ %	E	50VDC
★TF318-□E152P50	1500pF	$^{+100}_{-0}$ %	E	50VDC

Part Number	Cap.	Cap. Tol.	Temp. Char.	Rated Voltage
★TF418-□E102GMV300	1000pF	$^{+200}_{-0}$ %	E	300VDC
★TF418-□E152P300	1500pF	$^{+100}_{-0}$ %	E	300VDC

□ Denotes configurations shown above.
Examples:
TF318-450B271M50
TF418-452E102GMV300
Operating temperature:
Std: –25°C to +85°C
H Series: –55°C to +125°C

PART NUMBERING

TF318 450 E 102 GMV 50V

Type and Dimensions
Temperature Characteristic

Code	Max. Cap. Change	Temp. Range
B	±10%	–25°C to +85°C
E	$^{+20}_{-55}$ %	–25°C to +85°C

Code	Temp. Coefficient
SL	+350 to –1000ppm/°C
YN	–500 to –5800ppm/°C

Nominal Capacitance

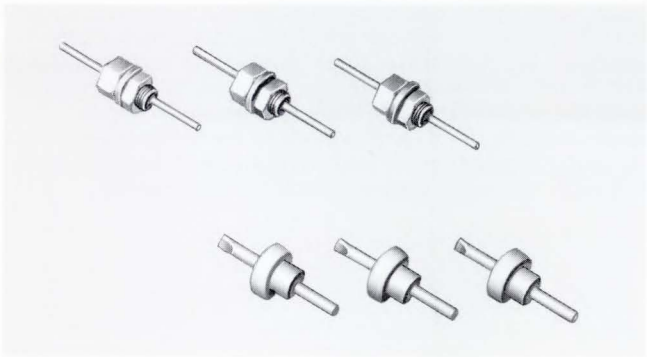
Cap. Tolerance

Rated Voltage
TF318–50V–ONLY
TF418–300V–ONLY

★Available as standard through authorized Murata Electronics Distributors.

FEED-THRU CAPACITORS
DISC TYPE FOR INDUSTRIAL APPLICATIONS

DF553 & DF572 Series



Feed-thru capacitors DF553 and DF572 for industrial application are disc-type feed-thrus mounted in a case and epoxy sealed. They are suitable for microwave repeaters and measuring instruments, and for preventing unnecessary feed-back between circuits, suppressing external noise, and preventing emission of radiation.

Unlike cylindrical capacitors, these disc-type capacitors do not exhibit reduction in insertion loss caused by coaxial resonance. They are applicable to a wide frequency range including the UHF band.

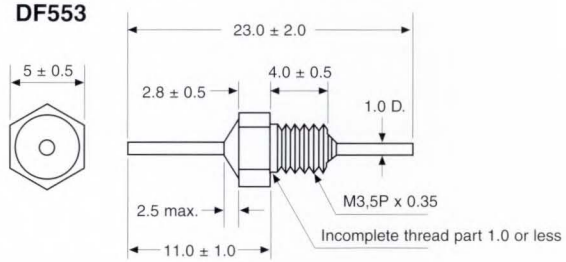
FEATURES

- Provide ideal separation of circuits with excellent shielding qualities.
- Eliminate reduction in insertion loss caused by coaxial resonance. The capacitor is effective in UHF band and above due to minimal lead inductance.
- Epoxy sealing has excellent moisture resistance and reliability characteristics
- Screw-mount DF553 type can be installed with the use of nuts or directly mounted on chassis with threaded holes. Solder-mount DF572 type can be directly solder mounted on chassis and PC boards.

DIMENSIONS: mm

Threaded Application

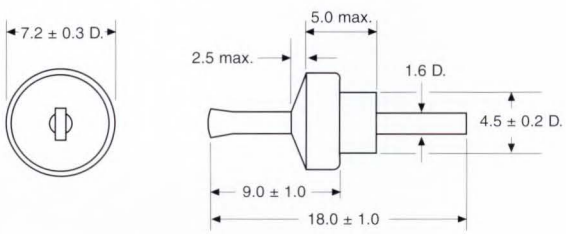
DF553



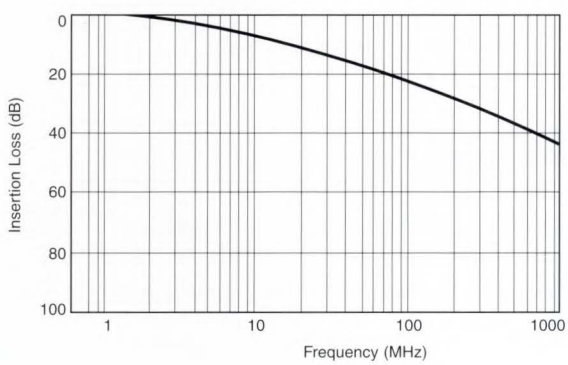
Mounting Torque: 5.0 Kg-cm max.

Note:
Accessory nut & washer supplied

Solder Application



TYPICAL INSERTION LOSS CHARACTERISTICS



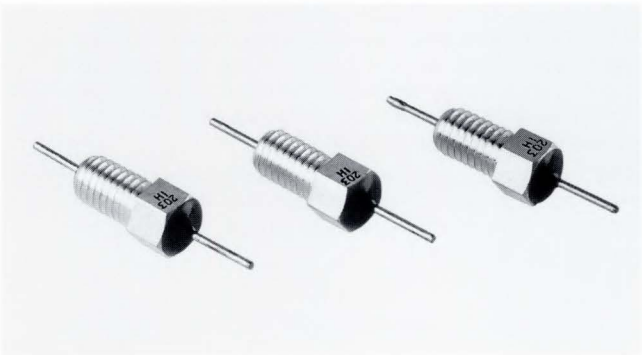
SPECIFICATIONS

Part Number	★DF553F102P50	★DF572-10F102P500
Capacitance Value	1000pF	1000pF
Capacitance Tolerance	$^{+100}_{-0}$ %	$^{+100}_{-0}$ %
Rated Voltage	50VDC	500VDC
Dielectric Strength	125VDC	1250VDC
Insulation Resistance	10000MΩ	10000MΩ
Temperature Characteristic	$^{+30}_{-80}$ %	$^{+30}_{-80}$ %
Maximum Feed-Thru Current	10A DC	15A DC
Operating Temperature Range	–25°C to +85°C	–25°C to +85°C

★Available as standard through authorized Murata Electronics Distributors.

FEED-THRU CAPACITORS
HIGH FREQUENCY APPLICATIONS

DFT301 & DFT304 Series



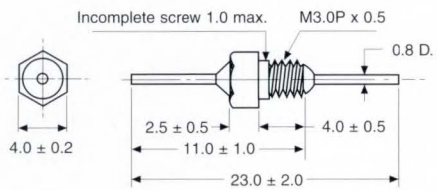
The DFT301 Series uses monolithic feed-thru capacitors and the DFT304 Series uses barrier layer feed-thru capacitors resulting in compact sized, large capacitance, high frequency devices. They are very suitable for applications in microwave repeaters, communications, broadcast equipment and measuring instruments for elimination of external noise, prevention of emission of radiated noise and for the prevention of unnecessary feedback between circuits.

FEATURES

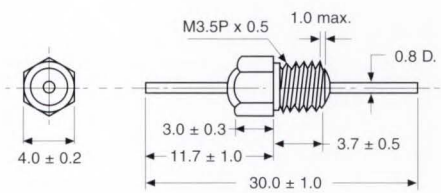
- Provides ideal separation of circuits with excellent shielding qualities.
- Provides large capacitance values in epoxy sealed metal bushings, minimizing reduction in insertion loss caused by coaxial resonance.
- Miniaturized screw mount styles that can be installed with mounting nuts or directly mounted on chassis with threaded holes.
- Provides high insertion loss to 1GHz and beyond in the case of the DFT301 and up to 10GHz in the DFT304 Series.
- Provides relatively high feed-thru current ratings.
- Ceramic capacitors utilized exhibit very stable temperature characteristics.

DIMENSIONS: mm

DFT301



DFT304



SPECIFICATIONS

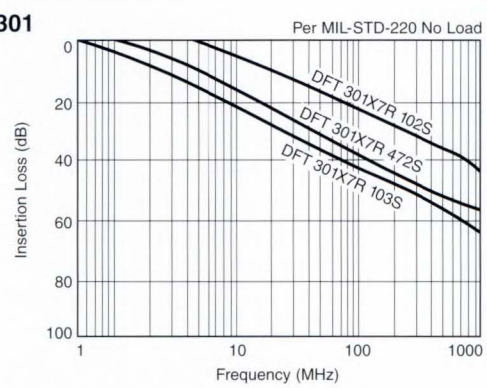
Part Number*	Marking	Cap. Value	Cap. Tolerance	Rated Voltage	Dielectric Strength	Rated Current	Insulation Resistance (min.)	Temperature Characteristics	Operating Temperature Range
★DFT301-801 X7R 103S 50	None	10000pF	+50, –20%	50VDC	125VDC	10ADC	10000MΩ	±15%	–55 °C to +125°C
★DFT301-801 X7R 472S 50	B	4700pF	+50, –20%	50VDC	125VDC	10ADC	10000MΩ	±15%	–55 °C to +125°C
★DFT301-801 X7R 102S 50	C	1000pF	+50, –20%	50VDC	125VDC	10ADC	10000MΩ	±15%	–55 °C to +125°C
★DFT304-803 SS332Z 50	None	3300pF	+80, –20%	50VDC	125VDC	7ADC	1000MΩ	±22%	–55 °C to +125°C

*801 — Without hardware; 851 — With hardware

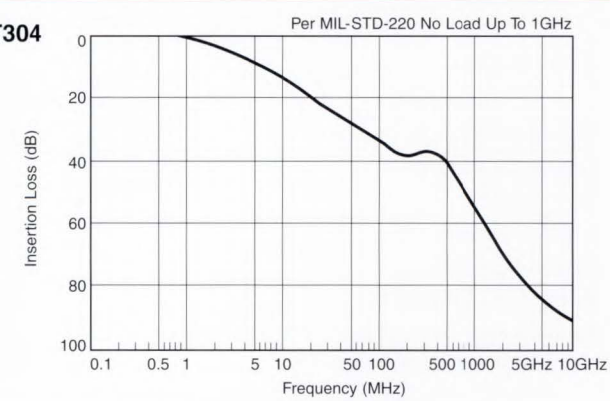
Torque for fastening nuts: DFT301 .....3.5 to 4.0 kg/cm²
DFT304 .....3.5 to 4.0 kg/cm²

TYPICAL INSERTION LOSS CHARACTERISTICS

DFT301



DFT304



★Available as standard through authorized Murata Electronics Distributors.

FSOC Series

The unique FSOC ferrite cores provide high frequency EMI noise suppression for split and flat cables and find wide application in computers and peripherals to several hundreds of MHz. They are exceptionally easy to install and extremely effective.

FEATURES

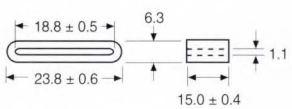
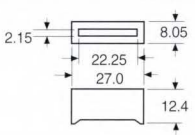
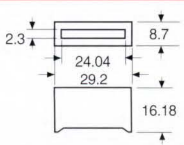
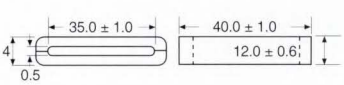
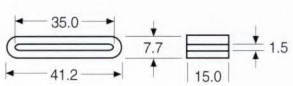
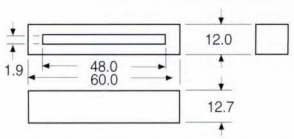
- Extremely effective EMI noise prevention
- Wide application in data processing equipment
- Simple installation
- No soldered connections

PART NUMBERING

FS	OH	04	1	RN	03
SOFT FERRITE	SHAPE OH=Bead Core OB =Ring Core OC =Flat Cable Core MA=Multi-Hole Core MC=Multi-Hole Core SA =Planar	DIAMETER "A" in mm	VARIATION	MATERIAL	VARIATION

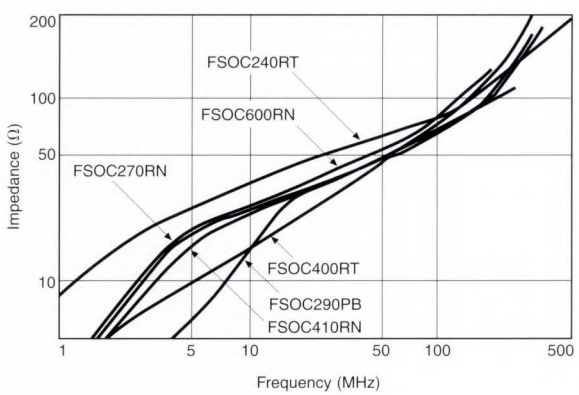
DIMENSIONS: mm

SPECIFICATIONS

	Part Number	Impedance (Ω) (100 MHz)
	★FSOC240RT	77
	★FSOC270RN	60
	★FSOC290PB	62
	★FSOC400RT	80
	★FSOC410RN	70
	★FSOC600RN	72

★Available as standard through authorized Murata Electronics Distributors.

FLAT CABLE CORES



NOTES

EMI FILTER CONNECTORS

Murata Electronics' connectors are used to remove unwanted EMI noise and voltage surges at the I/O ports in a convenient single package.

Widely used in products ranging from computers, POS equipment, telecommunication devices and peripheral equipment, eliminate the need for additional filtering on the PCB.

Products include miniature D-Sub connectors (industry std. size), VGA connectors and RJ-11/RJ-45 connectors for telecommunication applications.

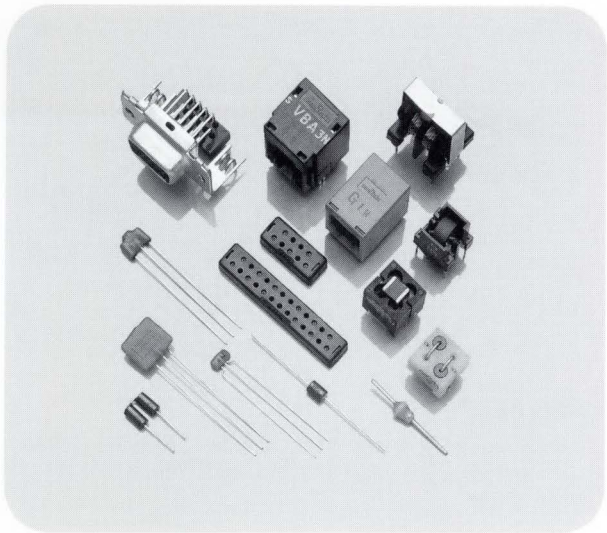


TABLE OF CONTENTS

CONNECTORS

CUBN09/15/25 Series

These filter connectors are low cost 'D' type subminiature designs, equipped with Murata Electronics feed-thru capacitors and shielding. They provide excellent noise suppression over a wide frequency range because of their unique construction. Dimensions are almost identical to ordinary 'D' subminiature designs without filters and are recommended for computer peripherals and other digital and communication equipment.

FEATURES

- Low cost
- Wide frequency range insertion loss
- Discrete feed-thru capacitor allows for incorporation of filters on only lines designated.
- Compatible with conventional 'D' connectors and has almost identical external dimensions as connectors without filters.
- When the noise suppression is required after circuit design is finished, it is easy to replace conventional connectors with the CUBN Series.
- Tabs on the shield assure good ground.
- UL recognized insulation material (UL94V-0) is used.

APPLICATIONS

Personal computers, displays, monitors, printers, modems, land and mobile communications, POS (bar-code reader control units).

PART NUMBERING

CUBN 25 S N 25 L 003 NC

CONNECTOR SERIES

NUMBER OF LINES
09: 9 Lines 25: 25 Lines
15: 15 Lines

CONTACT TYPE
P: Plug
S: Socket

PCB TERMINAL CONFIGURATION

Symbol	Configuration
T	Straight without PCB Standoffs
G	Right Angle Standard Footprint (STD)
N	Right Angle North American Footprint (NAF)
Y	Right Angle European Footprint (EF)*
H	Right Angle STD Footprint with PCB Snap-Lock

NUMBER OF FILTERED LINES

FILTER TYPE

Symbol	Filter Type
C	Feed-Thru Capacitor
L	F.T. Capacitor and BLR type Ferrite Retainer
V	F.T. Varistor-Capacitor (3300pF)
LV	F.T. Varistor-Capacitor and BLR type Ferrite Retainer
N	Non-Filtered, Shielded Connector
F	BLR type Ferrite Retainer

VARATION NUMBER
The Variation Numbers differ depending on the filter capacitance and the terminal configuration. (See charts below.)

MOUNTING HARDWARE

Part Number Suffix	Connector Flange Hole	Jack Screw Type
Blank	Straight: ϕ3.0mm	—
	Right Angle: M2.6	A
A	M2.6	A
D	4-40UNC	D
E	M2.6	E
F	4-40UNC	F
NA	M2.6	—
NC	4-40UNC	—
K	4-40UNC Self Locking Thread	—
ET	M2.6	E (Packaged Separately)
FT	4-40UNC	F (Packaged Separately)

FILTER TYPES C and L

North American	European Footprint* Row Pitch (mm)		Capacitance
Std.	2.84	2.54	
001	021	031	2000pF + 125%, –25%
002	022	032	1000pF + 80%, –20%
003	023	033	500pF ± 30%
004	024	034	250pF ± 30%
005	025	035	120pF ± 30%
006	026	036	43pF ± 30%

FILTER TYPES V and LV

North American	European Footprint Row Pitch (mm)		Capacitance
Std.	2.84	2.54	
001	021	031	3300pF +200%, –0% Varistor Voltage: 24VDC min.

FILTER TYPES N and F

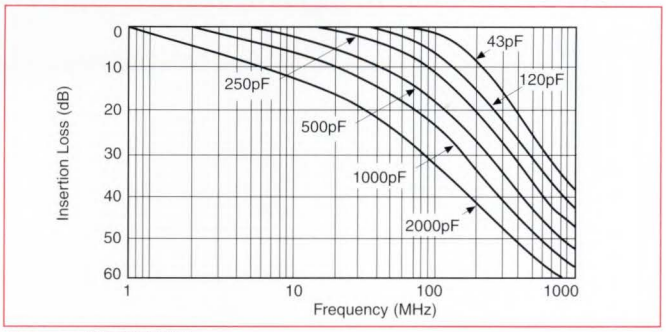
North American	European Footprint Row Pitch (mm)		Terminal Configuration
Std.	2.84	2.54	
001	021	031	

*See page 81 for pin configuration.
Note: 2.54mm Row Pitch not available for Filter Types L, LV and F.

ELECTRICAL (EXCEPT V/LV TYPE)

Number of Lines	CUBN 9, 15, 25
Operating Temperature	–25°C to +85°C
Rated Voltage	100VDC
Test Voltage	250VDC
Rated Current	5A max.
Insulation Resistance	1000MΩ min.

TYPICAL INSERTION LOSS CHARACTERISTICS



(Based on MIL-STD-220)

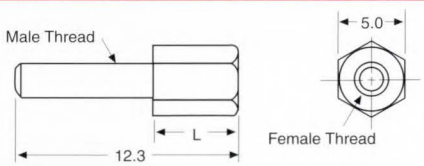
MECHANICAL

MATERIALS

Part	Material
Front Shell	Steel (Tin Plated)
Rear Shell	Steel (Nickel Plated)
Front Insert	Polyamide (UL94V-0)
Contracts*	Phosphor Bronze–Gold Plated, 0.2μm min. on contacts, Solder Coated over Nickel Plating on PCB terminals.
Retainer	Polyamide (UL94V-0)
Jack Screws	Steel (Nickel Plated)

*0.76μm Gold Plating available on special order.

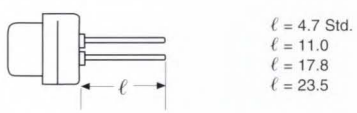
JACK SCREW



Name	Male	Female	L: mm
Jack Screw A	M2.6	M2.6	6.3
Jack Screw D	4-40 UNC	4-40 UNC	6.3
Jack Screw E	M2.6	M2.6	4.8
Jack Screw F	4-40 UNC	4-40 UNC	4.8

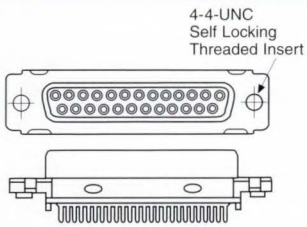
TERMINAL LENGTHS: mm

CUBN Series



ℓ = 4.7 Std.
ℓ = 11.0
ℓ = 17.8
ℓ = 23.5

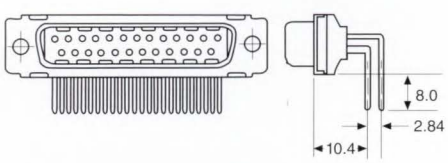
SELF-LOCKING HARDWARE (SYMBOL 'K')



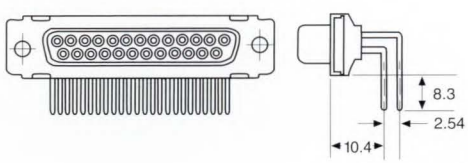
DIMENSIONS: mm

EUROPEAN FOOTPRINT (CUBN Series — Please contact Murata Electronics for further information.)

2.84mm Footprint



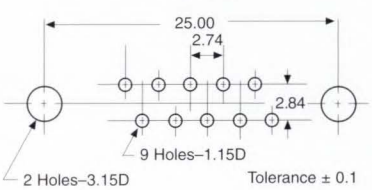
2.54mm Footprint



Unit: mm

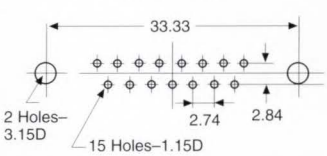
RECOMMENDED PC BOARD MOUNTING HOLES DIMENSIONS (STANDARD STRAIGHT AND RIGHT ANGLE)

CUBN09



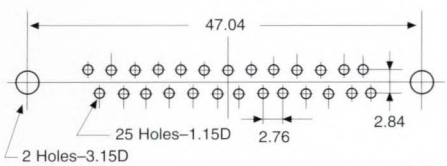
Tolerance ± 0.1

CUBN15



Tolerance ± 0.1

CUBN25



Tolerance ± 0.1

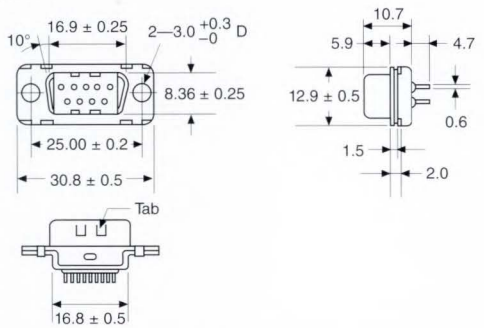
CONNECTORS

DIMENSIONS: mm

PIN

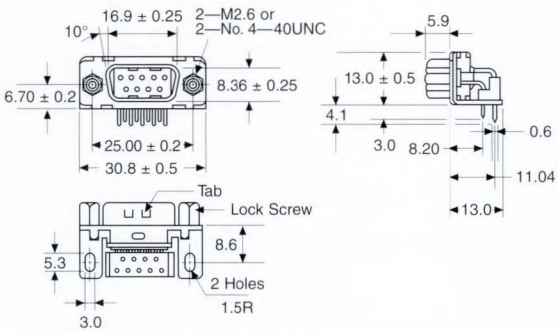
STRAIGHT

★**CUBN09PT**



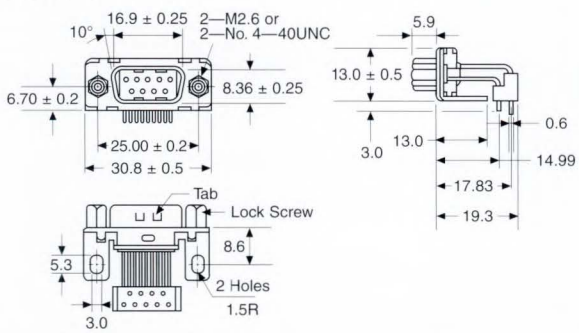
RIGHT ANGLE (STANDARD)

★**CUBN09PG**



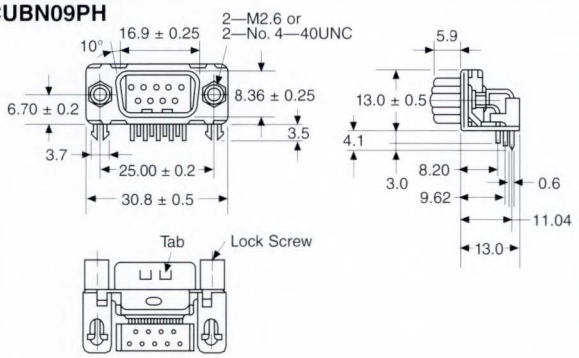
RIGHT ANGLE (NORTH AMERICAN FOOTPRINT)

★**CUBN09PN**



RIGHT ANGLE (STANDARD) PCB SNAPLOCK

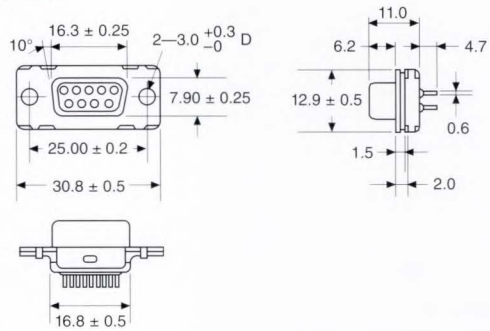
★**CUBN09PH**



SOCKET

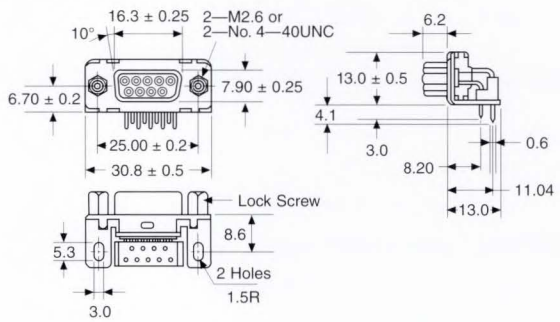
STRAIGHT

★**CUBN09ST**



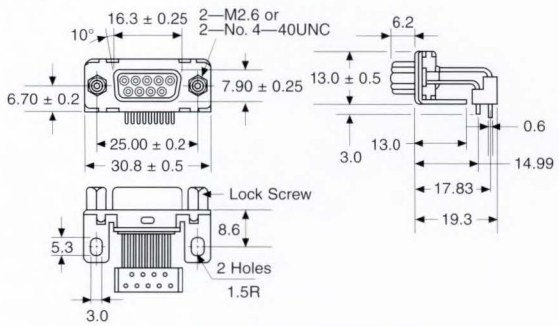
RIGHT ANGLE (STANDARD)

★**CUBN09SG**



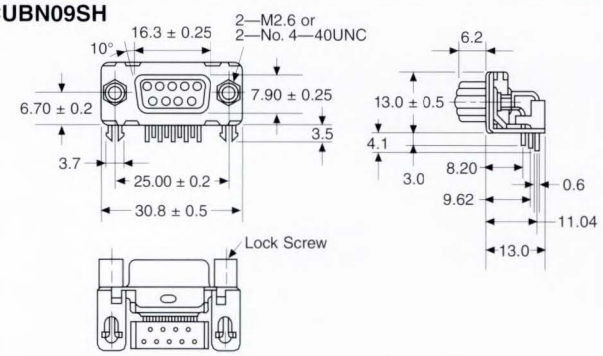
RIGHT ANGLE (NORTH AMERICAN FOOTPRINT)

★**CUBN09SN**



RIGHT ANGLE (STANDARD) PCB SNAPLOCK

★**CUBN09SH**

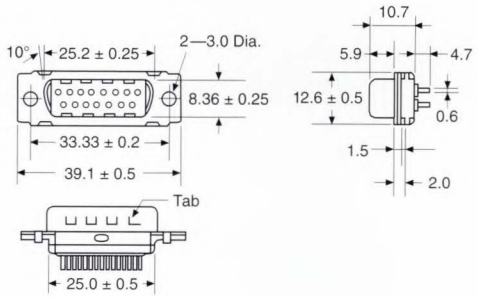
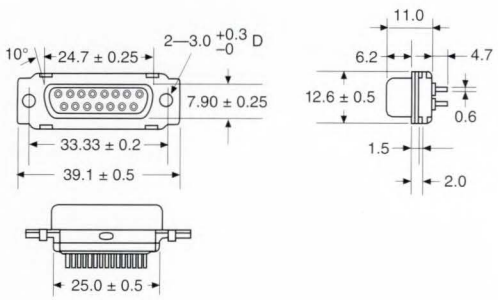
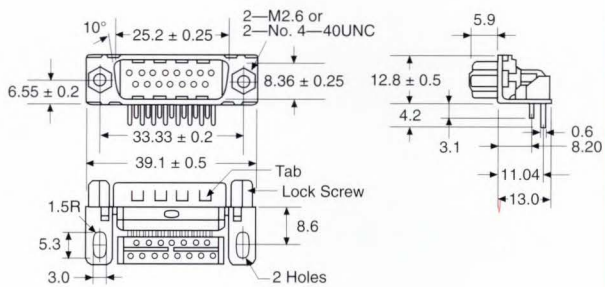
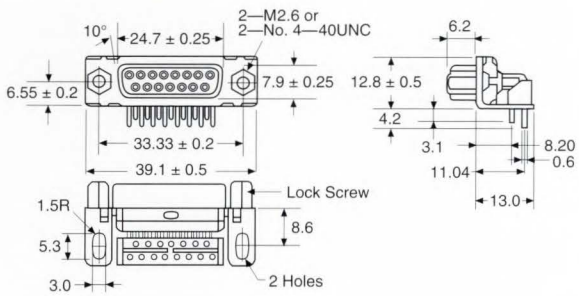
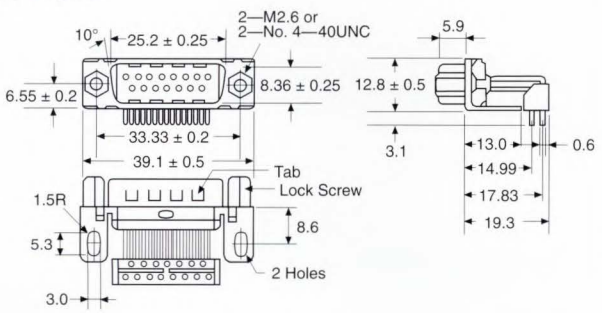
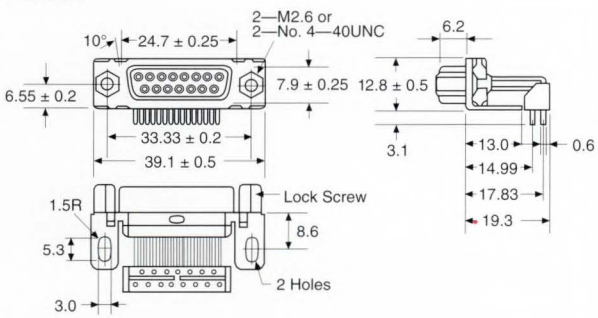
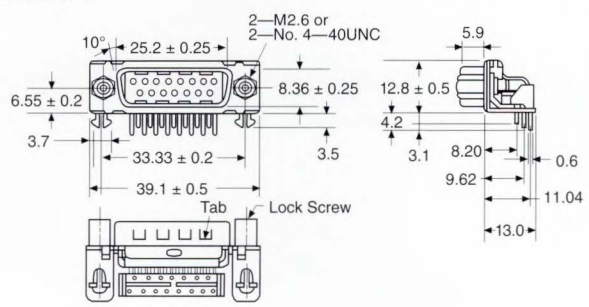
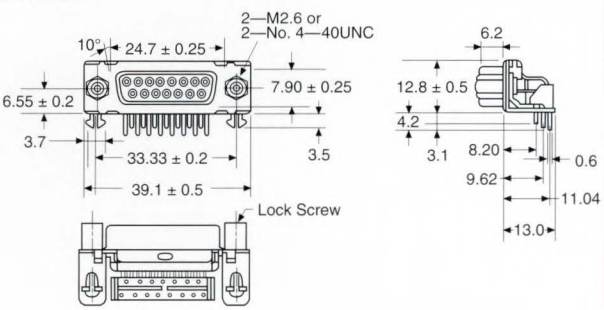


★Available as standard through authorized Murata Electronics Distributors.

muRata

CUBN15 Series

DIMENSIONS: mm

PIN	SOCKET
STRAIGHT (WITHOUT PCB STANDOFFS)	
★CUBN15PT	★CUBN15ST
	
RIGHT ANGLE (STANDARD)	
★CUBN15PG	★CUBN15SG
	
RIGHT ANGLE (NORTH AMERICAN FOOTPRINT)	
★CUBN15PN	★CUBN15SN
	
RIGHT ANGLE (STANDARD) PCB SNAPLOCK	
★CUBN15PH	★CUBN15SH
	

★Available as standard through authorized Murata Electronics Distributors.

CONNECTORS

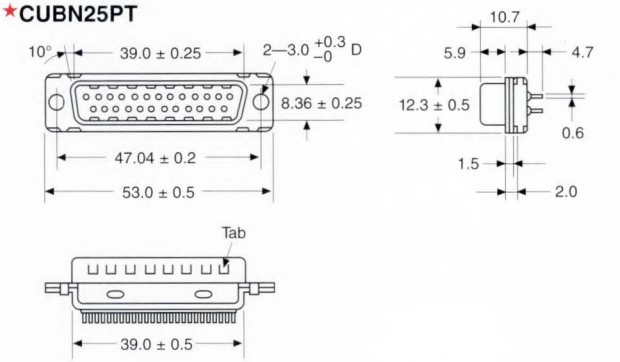
CUBN25 Series

DIMENSIONS: mm

PIN

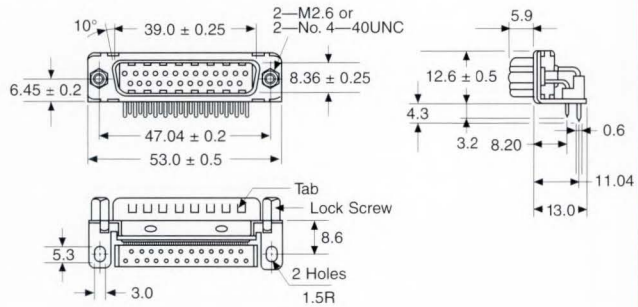
STRAIGHT

★**CUBN25PT**



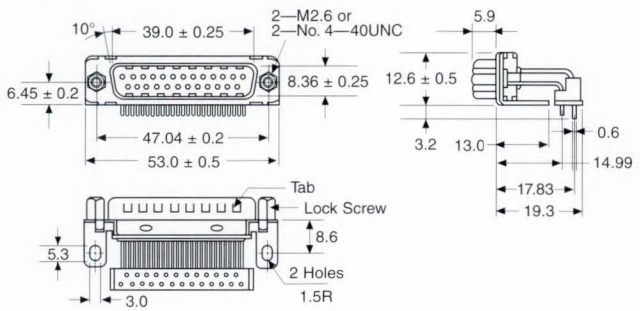
RIGHT ANGLE (STANDARD)

★**CUBN25PG**



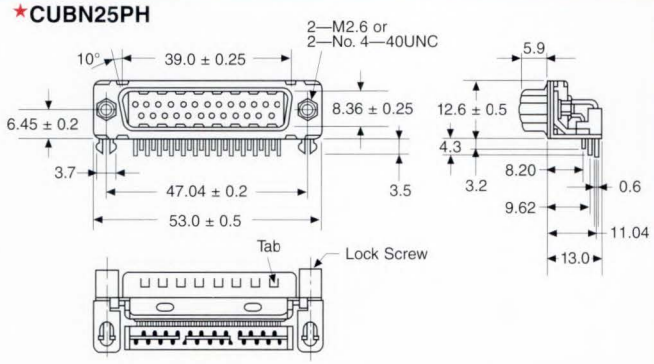
RIGHT ANGLE (NORTH AMERICAN FOOTPRINT)

★**CUBN25PN**



RIGHT ANGLE (STANDARD) PCB SNAPLOCK

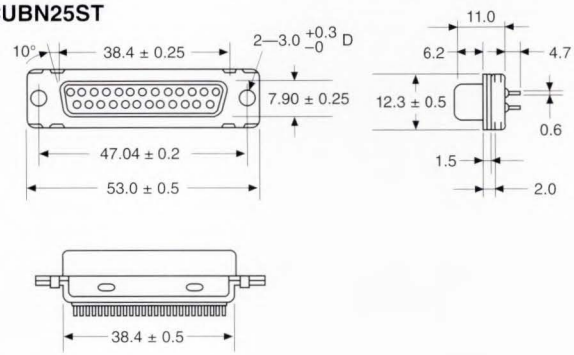
★**CUBN25PH**



SOCKET

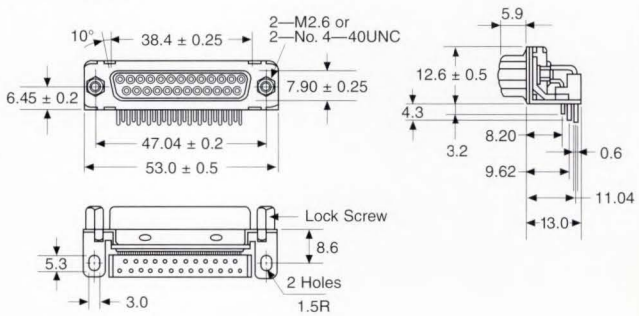
STRAIGHT

★**CUBN25ST**



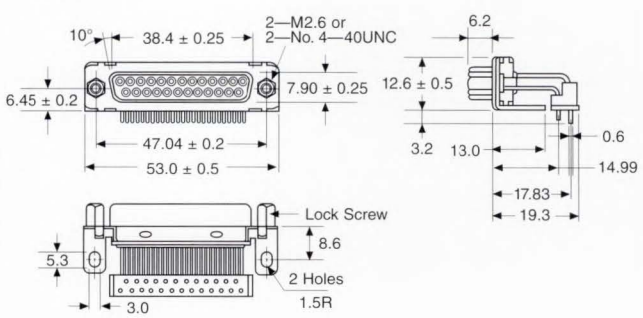
RIGHT ANGLE (STANDARD)

★**CUBN25SG**



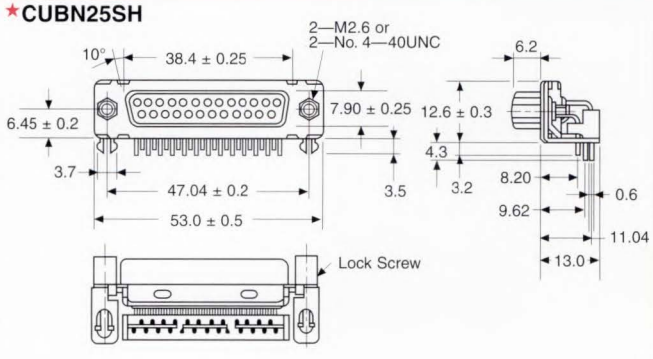
RIGHT ANGLE (NORTH AMERICAN FOOTPRINT)

★**CUBN25SN**



RIGHT ANGLE (STANDARD) PCB SNAPLOCK

★**CUBN25SH**



★Available as standard through authorized Murata Electronics Distributors.

EMI FILTER CONNECTORS
VARISTOR-CAPACITOR 'D' CONNECTORS

CUBN Series

The CUBN 'D' Connector Series is available with an integral varistor-capacitor on each line and with a shielded shell. They are highly recommended in those applications requiring both EMI filtering and high voltage surge protection.

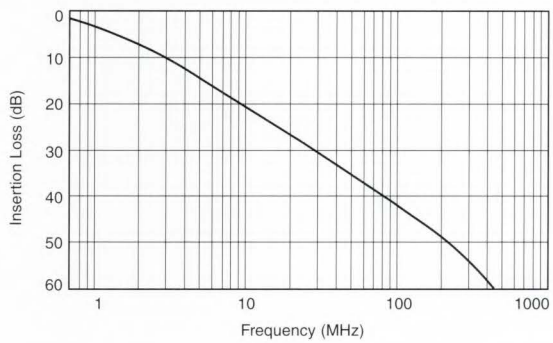
FEATURES

- Good insertion loss characteristics over a wide frequency range
- Provides circuit protection by passing high voltage surges to ground
- Dimensions almost identical to conventional non-filtered connectors
- Can directly replace conventional connector when filtering under surge protection is required
- UL94V-0 material is used as modulator

SPECIFICATIONS

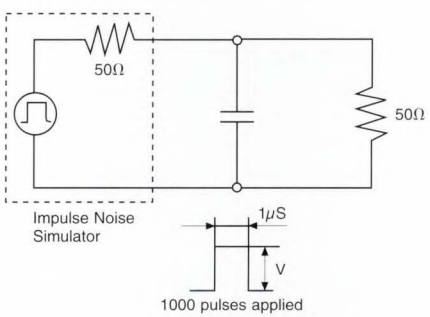
Number of Lines	9, 15, 25
Rated Voltage	16 VDC
Rated Current	5 ADC
Varistor Voltage (V1mA)	24 VDC min.
Capacitance	3300pF +200, −0%
Insulation Resistance	1 MΩ min.
Operating Temperature Range	−25°C to +85°C

TYPICAL INSERTION LOSS CHARACTERISTICS

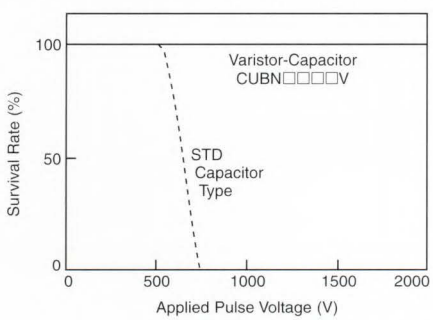


HIGH VOLTAGE PULSE CHARACTERISTICS

TEST CIRCUIT



PULSE-VOLTAGE BREAKDOWN CHARACTERISTICS

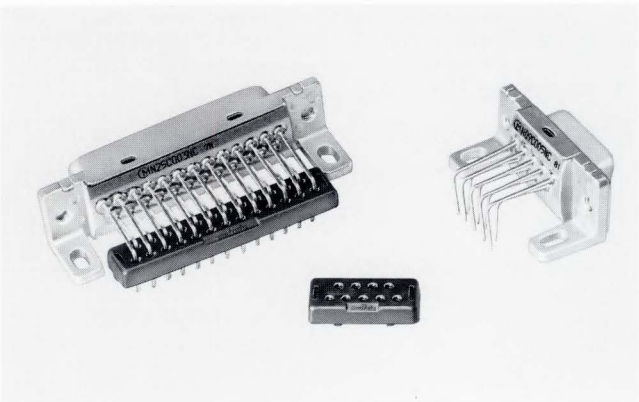


PRODUCT AVAILABILITY CHART

Number of Lines	9					15					25				
Terminal Configuration	PT ST	PG SG	PN SN	PY SY	PH SH	PT ST	PG SG	PN SN	PY SY	PH SH	PT ST	PG SG	PN SN	PY SY	PH SH
CUBN Series	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

○ = Available

BLR Series

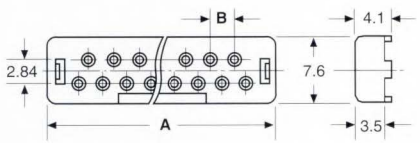


The new BLR EMI filtering device is designed to replace the retainer/pin alignment device on popular pcb-mounted 'D' connectors and provides a means of adding an inductor in series with each pin/lead for noise suppression. With its small overall size and easy installation, the BLR, in addition to improving performance, reduces pcb space requirements and costs.

FEATURES

- One device places an inductor in series with each connector pin
- Lines up connector pins
- Effective in both low and high impedance circuits
- UL recognized case (UL94V-0)

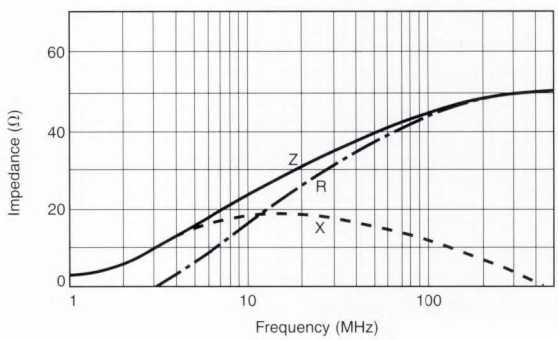
DIMENSIONS: mm



Applicable connector terminals are
☐ 0.64 D. or 0.6 D. (in cross section)

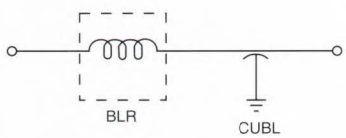
Part Number	A	B
★BLRB09RN001	18.0	2.74
★BLRB15RN001	26.0	2.74
★BLRB25RN001	40.0	2.76

TYPICAL IMPEDANCE CHARACTERISTICS

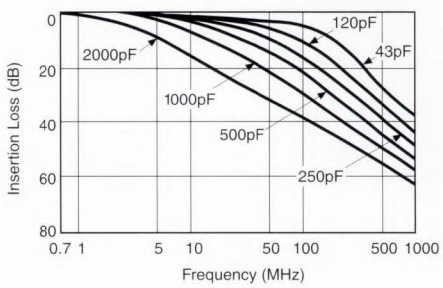


EXAMPLES OF APPLICATIONS AND INSERTION LOSS CHARACTERISTICS

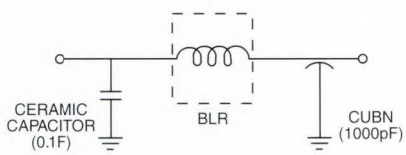
Combination with filter connector (CUBN)



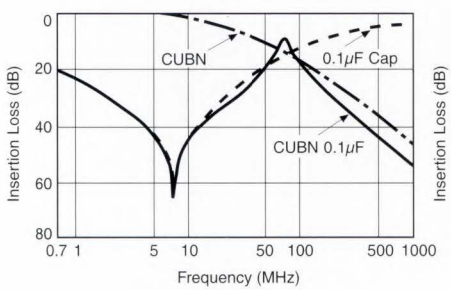
This combination offers excellent insertion loss characteristics.



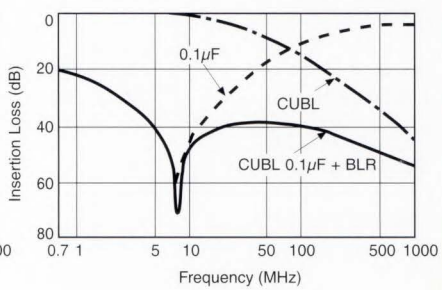
For improving on insertion loss when a combination of filter connector and large value capacitor is used.



Using the BLR Series prevents parallel resonance and offers excellent filtering effect from low to high frequencies.



Before using



After using

★Available as standard through authorized Murata Electronics Distributors.

muRata

CUBD Series

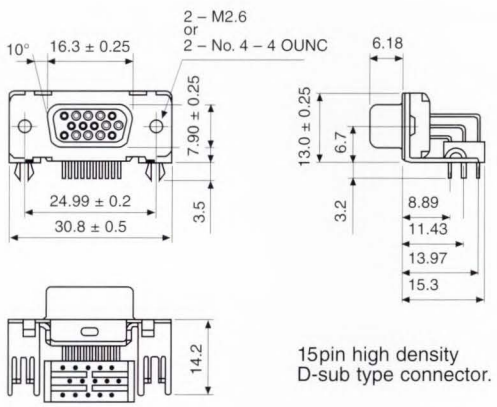
The CUBD double density D-Sub connector is equipped with Murata Electronics feed-thru capacitors, providing excellent noise suppression over a wide range.

Dimensions of this D-connector are almost identical to ordinary high density D-sub miniature designs without filters. They are recommended for noise suppression in minicomputers, personal computers; their peripherals, including VGA interface, modems and other communications equipment, also testers and other digital equipment.

FEATURES

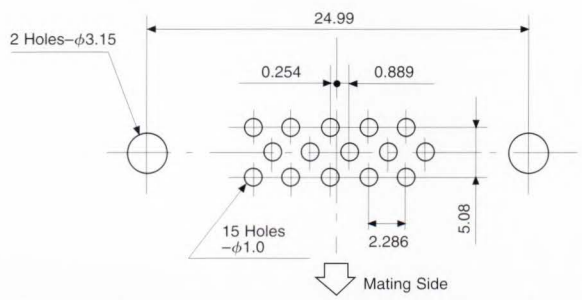
- Wide range insertion loss can be obtained with feed-thru capacitors design.
- This discrete feed-thru capacitor allows filters to be incorporated only on the lines designated.
- This D-connector is compatible with the conventional high density D-connector. CUBD Series can replace conventional type connectors.
- UL recognized material (UL94V-0)
- The snap-lock shape enables proper grounding when soldering.

DIMENSIONS: mm



15pin high density
D-sub type connector.

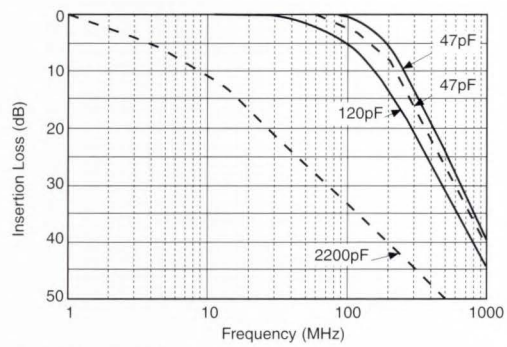
RECOMMENDED MOUNTING HOLE DIMENSIONS



※ View point : Mounting side

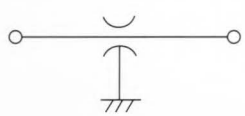
Unit=mm, Tolerance ± 0.1

TYPICAL INSERTION LOSS CHARACTERISTICS



—— = 50Ω Source/50Ω Load
– – = 75Ω Source/50Ω Load

EQUIVALENT CIRCUIT DIAGRAM (for single circuit)



(Ground is connected to the connector's outer shell.)

SPECIFICATIONS

Part Number	Capacitance	Operating Temp. Range	Number of Lines	Rated Voltage	Rated Current	Test Voltage	Insulation Resistance
CUBD15SH15C005NC	120pF 30%	–25°C ~ +85°C	15	50 VDC	1 ADC	125 VDC	500MΩ min.
CUBD15SH15C006NC	47pF 30%						
CUBD15SH15C101NC	47pF ± 30% (RGB lines – pins 1, 2 & 3) 2200pF $^{+60}_{-40}$% (pins 4, 5, ...15)						

EMI FILTER CONNECTORS
FOR TELEPHONE APPLICATIONS

CUJ Series

FEATURES

- Ideal for suppression of common mode noise at high frequencies
- Effective even with poor ground
- Decreases PCB space requirements
- UL recognized (UL94V-0) case material

APPLICATIONS

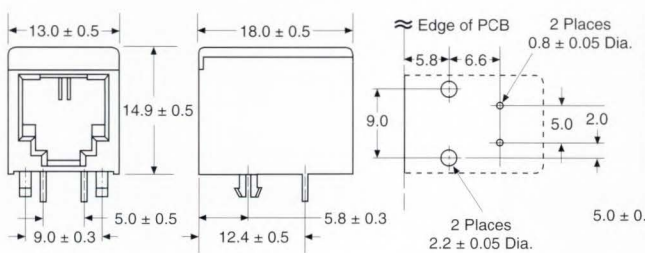
- Multi-function telephones
- Security telephones
- Modems
- Fax systems

SPECIFICATIONS

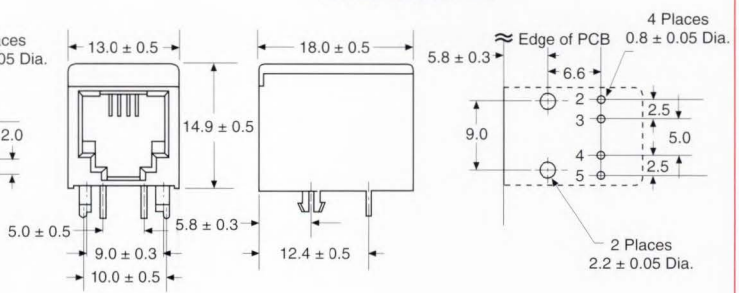
	CUJ62H02F005	CUJ64H04F005
Number of Lines	2 (Opening is for 6 line capability)	4 (Opening is for 6 line capability)
Operating Temperature	–25°C to +60°C	
Rated Voltage (Between Lines)	150VDC	
Rated Current	1ADC	
Tested Voltage (Between Lines)	375VDC	
Insulation Resistance (Between Lines)	10MΩ min.	
Impedance (Pin 3 & 4)	—	80Ω (at 100 MHz) min.

DIMENSIONS: mm

★CUJ62H02F005

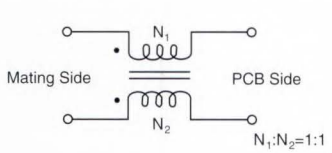


★CUJ64H04F005

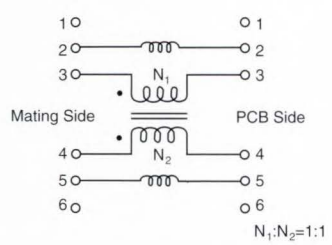


CIRCUIT DIAGRAMS

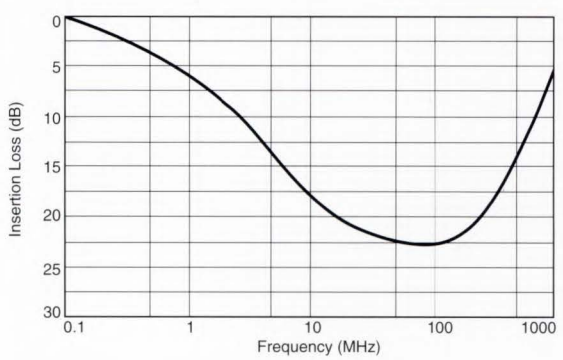
CUJ62



CUJ64



TYPICAL INSERTION LOSS*



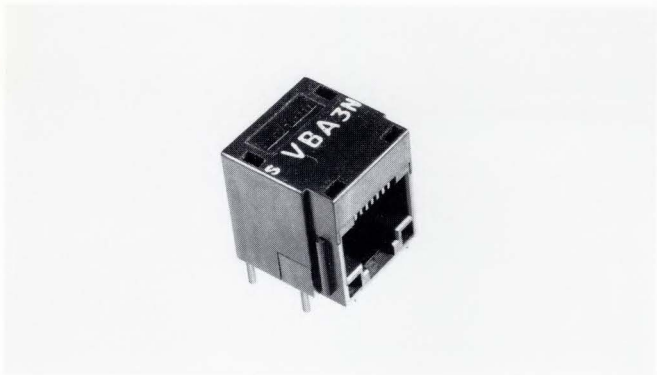
*For common mode filter portion of connector

★Available as standard through authorized Murata Electronics Distributors.

EMI FILTER CONNECTORS FOR TELEPHONE APPLICATIONS

muRata

CUJ88 Series



The CUJ88 modular jack has EMI noise suppression filters and surge absorption circuit. This provides noise suppression for ISDN equipment and surge protection at the interface connector simultaneously.

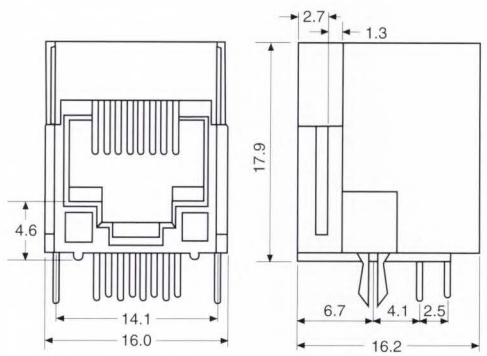
FEATURES

- Varistor protects equipment from high voltage surge conducted along cables and wiring.
- Built-in inductors provide effective noise suppression over a wide frequency range.
- UL94V-0 material
- Requires much less space than using non-filtered modular jack with discrete PCB filters for surge protection and noise suppression.

APPLICATIONS

Digital Telephone, FAX and ISDN equipment, LAN equipment.

DIMENSIONS: mm

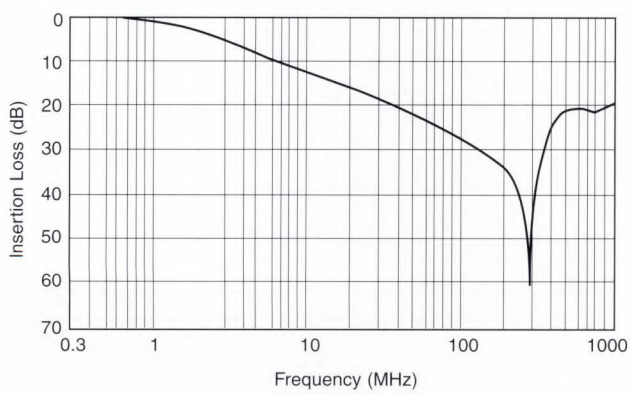


Tolerance : ± 0.3mm

SPECIFICATIONS

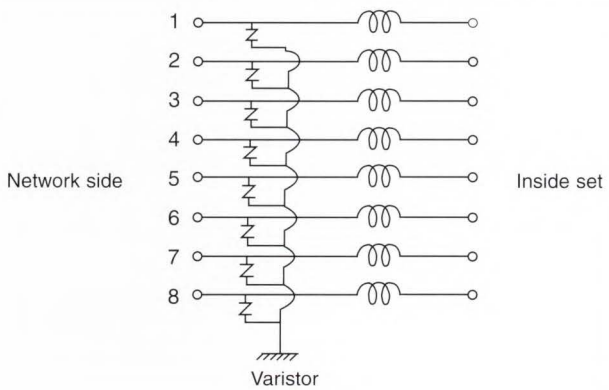
Part Number	★CUJ88H08VB001
Rated Voltage	50 VDC
Rated Current	200 mADC
Varistor Voltage	Between line and earth : 200V min.
Operating Temp. Range	−25°C ~ +60°C
Impedance (Typ.)	600Ω (at 100MHz)

TYPICAL INSERTION LOSS CHARACTERISTICS

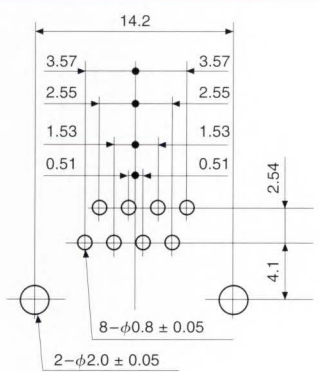


★Available as standard through authorized Murata Electronics Distributors.

EQUIVALENT CIRCUIT DIAGRAM



PCB LAYOUT



Standard PC board mounting holes dimensions (Tolerance ± 0.1)

t:1.6 $^{+0.05}_{-0.15}$

CONNECTORS

NOTES

AC EMI FILTERS

EMI (Electro Magnetic Interference) suppression filters for AC power lines eliminate noise entering equipment from commmercial power lines or noise generated from electronic equipment.

To eliminate these noise problems, Murata Electronics has combined its ceramic dielectric technology and ferrite technology to produce high-performance AC EMI suppression filters. Available in a variety of configurations, they allow the user to select the suitable filter to the level noise, frequency of noise and electrical requirements. The AC filter components include common mode chokes, normal mode chokes and AC 3 terminal capacitors.

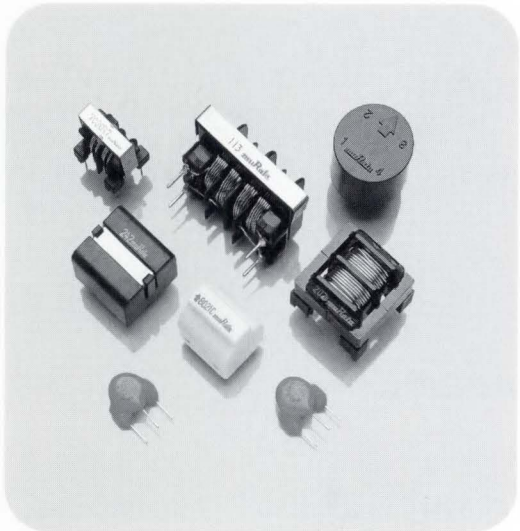
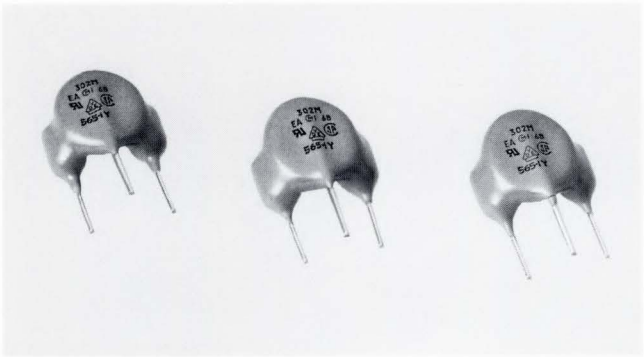


TABLE OF CONTENTS

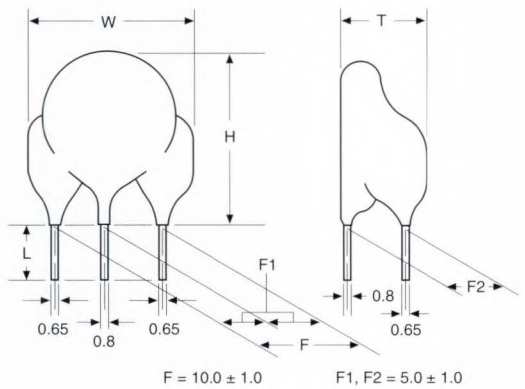
AC EMI FILTERS
SAFETY STANDARD RECOGNIZED EMIFIL®
FOR AC POWER SUPPLIES

DSR Series



The DSR Series is a 3-terminal capacitor (EMIFIL®) for AC power supplies. Its combination of 3-terminal structure and ferrite beads results in better attenuation (over 20dB in the radio frequency band) compared to conventional 2-terminal capacitors. They are also UL, CSA, VDE, SEMKO and BSI recognized.

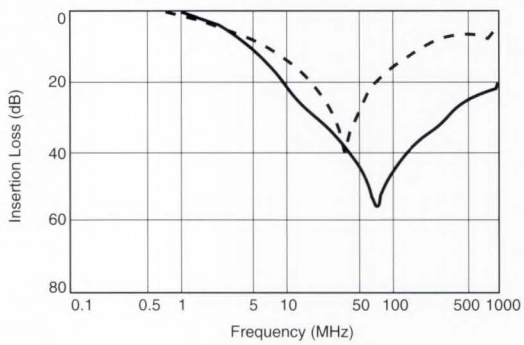
DIMENSIONS: mm



Part Number	W	H	T	L
DSR1100	16.0 max.	15.0 max.	11.0 max.	6.0 ± 0.2
DSR1120	16.0 max.	16.0 max.	11.0 max.	
DSR1150	18.0 max.	19.0 max.	11.0 max.	

INSERTION LOSS CHARACTERISTICS (TYP.)

Capacitance: 3000pF. The dotted line shows conventional capacitor.



MARKING

Item		Marking
VDE Approved Mark	565-1	EA 3 302M 84 Y 565-1
UL Recognized Mark		
CSA Monogram		
SEMKO Approved Mark		
Type Designation	EA	
Nominal Capacitance	3-Digits	
Capacitance Tolerance	Symbol	
Manufacturer's Name	3	

Standard Number	Recognition Number
VDE565-1	68365
UL 1414	E37921
CSA C22.2 No. 1	LR36214
SEMKO 101 SS443 0414	8736197 8736198
BS415	7354

RATINGS

Item	Ratings
Rated Current	7A (AC)
Insulation Resistance	10000 MΩ min.
Operating Temperature Range	–25°C to +85°C

Part Number	Temp. Char.	Cap. Value (pF)	Cap. Tol. (%)	Recognized Standards					Rated Voltage*
				UL 1414	CSA C22.2 No. 1	SEMKO	BS 415	VDE 565-1	
★DSR1100-56 E222MVA2-EA	E (+20% –55%)	2200	±20	•	•	•	•	•	VA2
★DSR1120-56 E302MVA2-EA	E	3000	±20	•	•	•	•	•	VA2
★DSR1150-56 E472MVA2-EA	E	4700	±20	•	•	•	•	•	VA2
★DSR1100-56 FZ472P VA2-EA	FZ (+30% –85%)	4700	+100, –0	•	•	•	•	—	VA2

*VA2: for VDE565-1, SEMKO, BSI ...250VAC
for UL1414, CSA C22.2 No. 1 ...125VAC

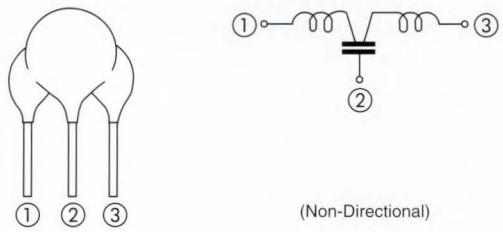
★Available as standard through authorized Murata Electronics Distributors.

AC EMI FILTERS
SAFETY STANDARD RECOGNIZED EMIFIL®
FOR AC POWER SUPPLIES

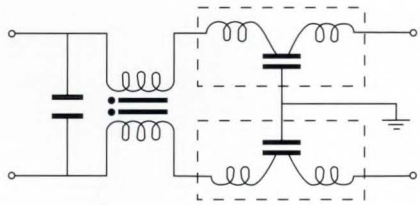
muRata

DSR Series

EQUIVALENT CIRCUIT



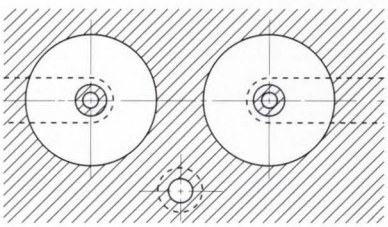
TYPICAL APPLICATION



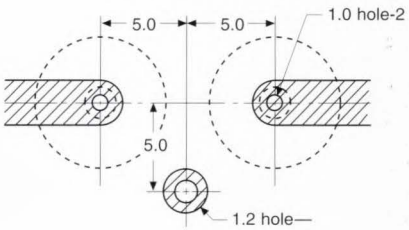
EA type can be used as line-by-pass (Y) capacitor

RECOMMENDED P.C. BOARD PATTERNS

TOP SIDE

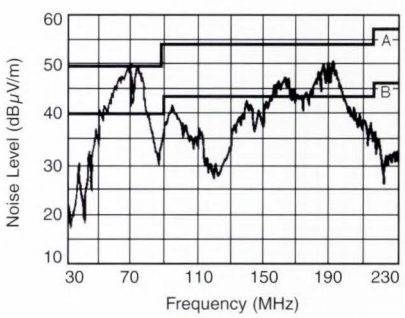


BOTTOM SIDE

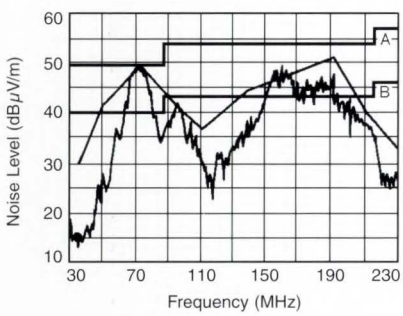


Make ground connection as wide as possible but with a distance as close as posssible to the chassis ground.

MOUNTING EFFECT (Procedure for suppression of radiated noise from power supply cord.)

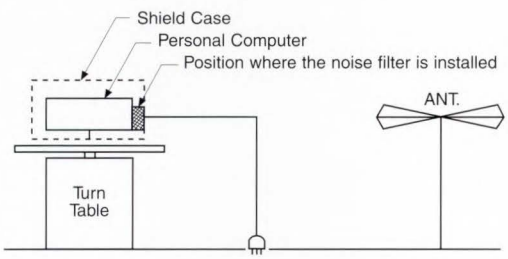


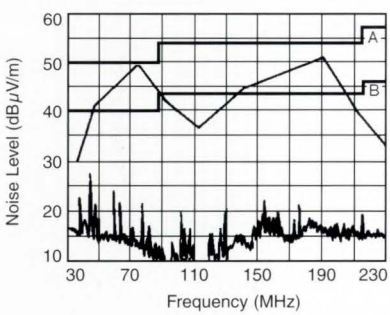
Initial Noise Level



Case mounted conventional 2-terminal capacitor on P.C.B. (There is only slight effect on noise over 30MHz.)

The diagram below shows test fixture for comparison charts illustrated.

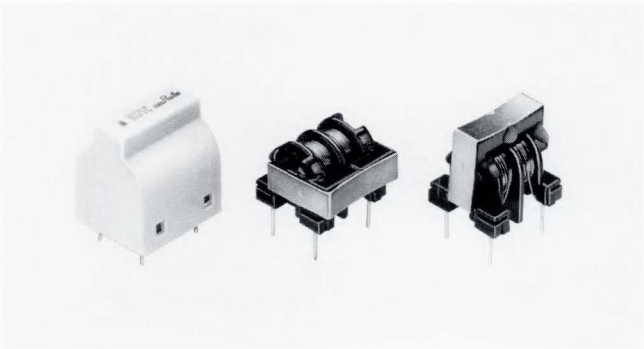




Case mounted PLI-C type AC noise filter incorporating EA type. (Noise over 30MHz is fully suppressed.)

NOISE FILTERS
AC COMMON MODE CHOKE COIL

PLA Series



The PLA Series is a common mode choke coil effective for asymmetric waves (unbalanced noise). This circuit is applicable to color TV's, VTR's, switching power supplies, power supply circuit boards and others. It is particularly effective for preventing even the slightest amount of noise in compact electronic equipment.

FEATURES

- Compact, lightweight construction incorporating a highly permeable ferrite core
- Operates effectively in a frequency range of 0.1 to 16MHz. Compared to toroidal cores, it attenuates a very wide range of low frequencies from 0.1 to 6MHz.
- Negligibly small reduction in inductance due to load current
- Flame-retardant materials and very simple construction assure safety and dependability.
- Suitable for noise reduction per FCC and CISPR requirements.

APPLICATIONS

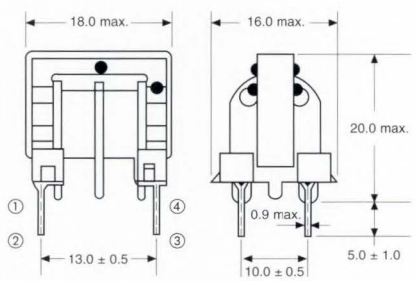
Switching power supplies, color TV's, VTR's, ECR and other electronic equipment.

PART NUMBERING

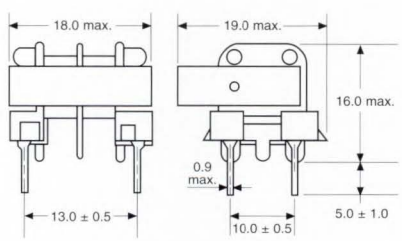
PLA	A	102	1R0	R	01	B1
TYPE	STYLE A=Vertical B=Horizontal C=Cased	INDUCTANCE 102=1.0mH 223=22mH	RATED CURRENT 1R0=1A 0R5=0.5A	WINDING MODE R=Multilayer	SERIAL NUMBER	PACKAGING B1=Bulk

DIMENSIONS: mm

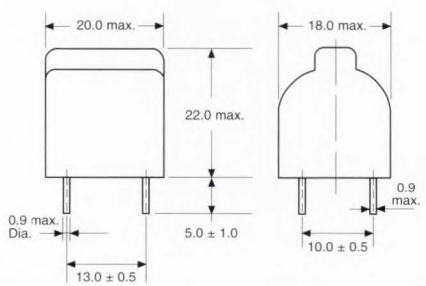
PLAA



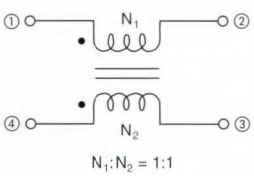
PLAB



PLAC

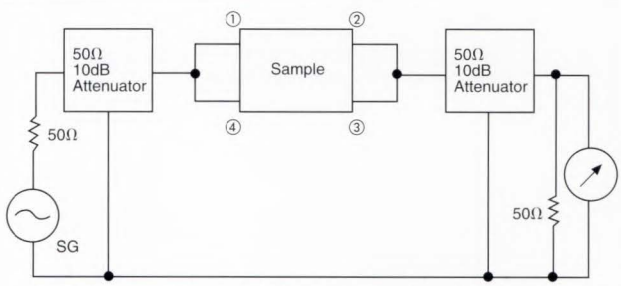


CIRCUIT DIAGRAM



$N_1:N_2 = 1:1$

TEST CIRCUIT



Measuring circuit (based on MIL-STD-220)

A=20 log (E_1/E_2)

A : Insertion Loss (dB)

E_1: Level with Common mode choke coil

E_2: Level without Common mode choke coil

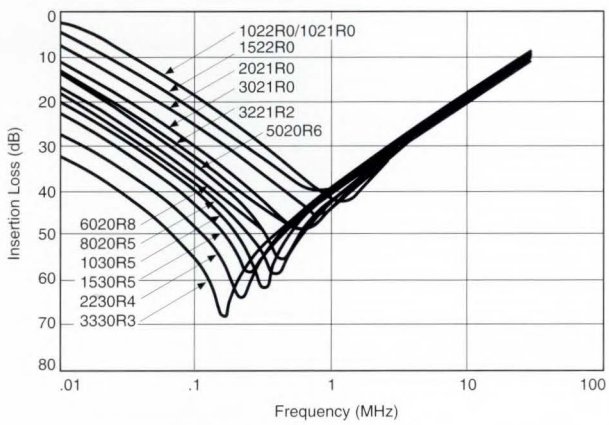
AC COMMON MODE CHOKE COIL

PLA Series

RATINGS

Item	Specification
Rated Voltage	250 VAC
Withstand Voltage (Between Coils)	2000 VAC, one minute
Insulation Resistance	100 MΩ min.
Temperature Characteristic (Inductance Change)	+80 % −50 %
Temperature Rise	60°C max.
Operating Temperature Range	−25°C to +60°C
Storage Temperature Range	−25°C to +85°C

TYPICAL INSERTION LOSS CHARACERISTICS



SPECIFICATIONS

Part Number	Rated Current (Arms)	Direct Current Resistance (Ω max.)	Inductance L_1, L_2 (mH min.)	Inductance Difference L_1 - L_2 (mH max.)	Self-resonant Frequency (MHz)*
★PLA□3330R3R01B1	0.3	3.5	33.0	0.3	0.15
★PLA□2230R4R01B1	0.4	2.0	22.0	0.25	0.2
★PLA□1530R5R01B1	0.5	1.5	15.0	0.15	0.25
★PLA□1030R5R01B1	0.5	1.5	10.0	0.15	0.3
★PLA□8020R5R01B1	0.5	1.0	8.0	0.1	0.3
★PLA□5020R6R01B1	0.6	0.7	5.0	0.1	0.4
★PLA□6020R8R01B1	0.8	0.5	6.0	0.1	0.4
★PLA□3021R0R01B1	1.0	0.35	3.0	0.05	0.5
★PLA□2021R0R01B1	1.0	0.3	2.0	0.05	0.7
★PLA□1021R0R01B1	1.0	0.25	1.0	0.05	1.0
★PLA□3221R2R01B1	1.2	0.3	3.2	0.08	0.5
★PLA□1522R0R01B1	2.0	0.2	1.5	0.05	0.9
★PLA□1022R0R01B1	2.0	0.15	1.0	0.05	1.0

★Available as standard through authorized Murata Electronics Distributors.

*Typical

NOISE FILTERS
AC COMMON MODE CHOKE COIL

PLE Series

FEATURES

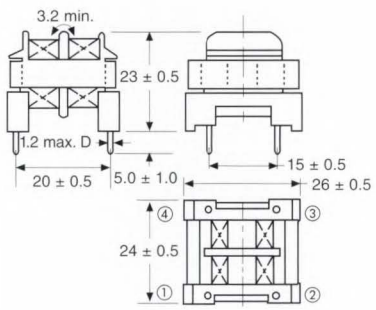
- Meets FCC, CISPR, VDE noise regulations.
- Compact yet with large inductance. Allows common noise suppression from 10KHz.
- Effective for noise suppression in wide bands.
- Horizontally installed ferrite cores reduce height and are extremely suitable for equipment where height is limited.

APPLICATIONS

Switching power supplies, equipment incorporating microcomputers, digital equipment, CTV, VTR, ECR and other electronic equipment and appliances.

DIMENSIONS: mm

PLE25H



SPECIFICATIONS

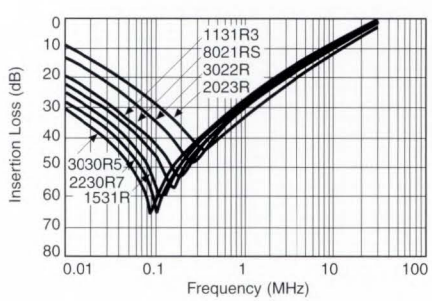
Part Number	Inductance (mH) min.	Rated Current (Arms)	DC Resistance (Ω) max.	Self Resonant Frequency (MHz)*
★PLE25H-3030R5	30	0.5	1.2	0.1
★PLE25H-2230R7	22	0.7	1.0	0.1
★PLE25H-1531R	15	1.0	0.7	0.1
★PLE25H-1131R3	11	1.3	0.6	0.15
★PLE25H-8021R5	8	1.5	0.4	0.2
★PLE25H-3022R	3	2.0	0.2	0.25
★PLE25H-2023R	2	3.0	0.1	0.4

*The self-resonant value is the typical value.

RATINGS

Item	Rating
Rated Voltage	250VAC
Withstand Voltage (between coils)	2000 VAC, one minute
Insulation Resistance (between coils: 500VDC 1 minute)	100MΩ min.
Operating Temperature Range	–25°C to +60°C
Temp. Characteristics (Inductance)	20°C $^{+80}_{-50}$% at the above temperature

TYPICAL INSERTION LOSS CHARACTERISTICS



★Available as standard through authorized Murata Electronics Distributors.

AC COMMON MODE CHOKE COIL

muRata

PLC Series

FEATURES

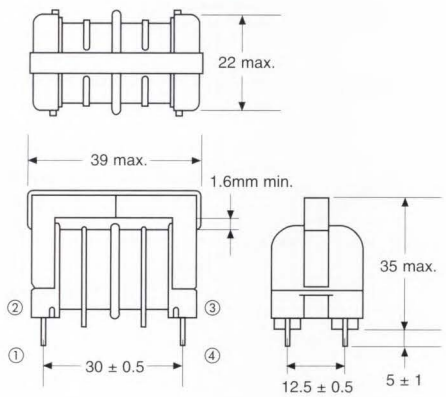
- Meets FCC, CISPR, VDE noise regulations.
- Compact yet with large inductance. Allows common noise suppression from 10KHz.
- Effective for noise suppression in wide bands.
- Horizontally installed ferrite cores reduce height and are extremely suitable for equipment where height is limited.

APPLICATIONS

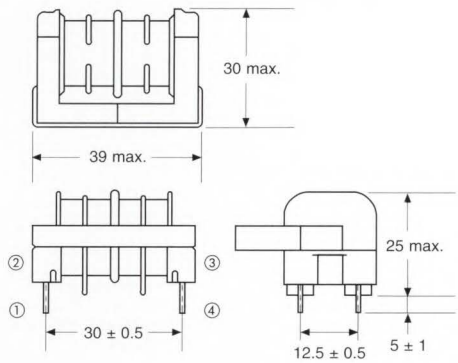
Switching power supplies, equipment incorporating microcomputers, digital equipment, CTV, VTR, ECR and other electronic equipment and appliances.

DIMENSIONS: mm

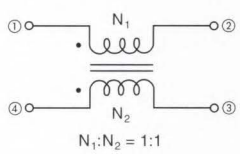
PLC20A



PLC20B



CIRCUIT DIAGRAM



RATINGS

Item	Rating
Rated Voltage	250VAC
Withstand Voltage (between coils)	2000VAC, one minute
Insulation Resistance (between coils : 500VDC 1 minute)	100MΩ min.
Operating Temperature Range	–25°C to +60°C
Temp. Characteristics (Inductance)	$^{+80}_{-50}$% (–25°C to +60°C, 20°C base)

SPECIFICATIONS – PLC Series

Part Number	Inductance (mH) min.	Rated Current (Arms)	DC Resistance (Ω) max.	Self-resonant Frequency (MHz)*
★PLC20A7030R5D01B1	70	0.5	3.0	0.1
★PLC20A3031R0D01B1	30	1.0	1.0	0.2
★PLC20A1131R5D01B1	11	1.5	0.4	0.3
★PLC20A6522R0D01B1	6.5	2.0	0.2	0.4
★PLC20A3023R0D01B1	3	3.0	0.1	0.7
★PLC20B7030R5D01B1	70	0.5	3.0	0.1
★PLC20B3031R0D01B1	30	1.0	1.0	0.2
★PLC20B1131R5D01B1	11	1.5	0.4	0.3
★PLC20B6522R0D01B1	6.5	2.0	0.2	0.4
★PLC20B3023R0D01B1	3	3.0	0.1	0.7

*The self-resonant value is the typical value.
★Available as standard through authorized Murata Electronics Distributors.

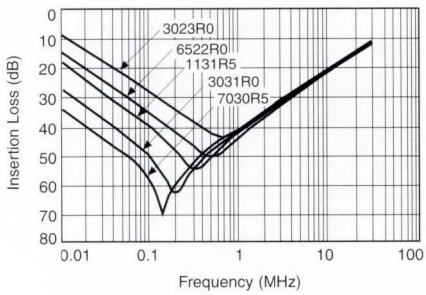
PART NUMBERING

PLC20 A 113 1R5 D 01 B1

- **TYPE**
- **STYLE**
  A=Vertical
  B=Horizontal
- **INDUCTANCE**
  102=1.0mH
  223=22mH
- **RATED CURRENT**
  1R0=1A
  0R5=0.5A
- **WINDING MODE**
  D=Division
- **SERIAL NUMBER**
- **PACKAGING**
  B1=Bulk

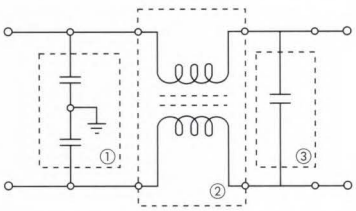
TYPICAL INSERTION LOSS CHARACTERISTICS

PLC20□



COMMON MODE CHOKE COIL SELECTION

HOW TO USE COMMON MODE CHOKE COIL



No.	Name	Purpose
①	Line bypass capacitor	Elimination of common mode noise and normal mode noise
②	Common mode choke coil	Elimination of common mode noise
③	Across-the-line capacitor	Elimination of normal mode noise

SELECTION METHOD

Selection by rated current and inductance

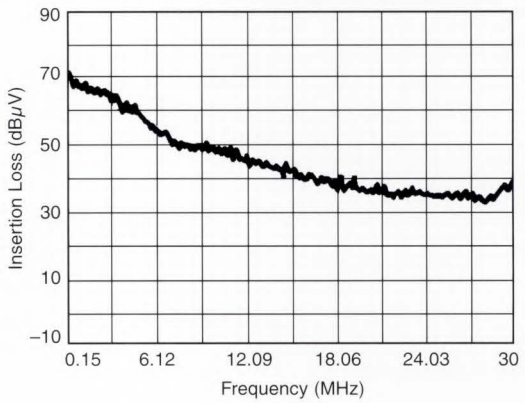
Inductance (mH)	Current [A]								
	0.5	0.6	0.7	1	1.3	1.5	2	2.5	3
0.8			FKOB TYPE						
1.5									
2		PLA TYPE							
3									
5									
6.5				PLE TYPE					
8									
11									
15									
22							CUSTOM MADE		
30		PLC20 TYPE							
70									

Selection by noise regulations

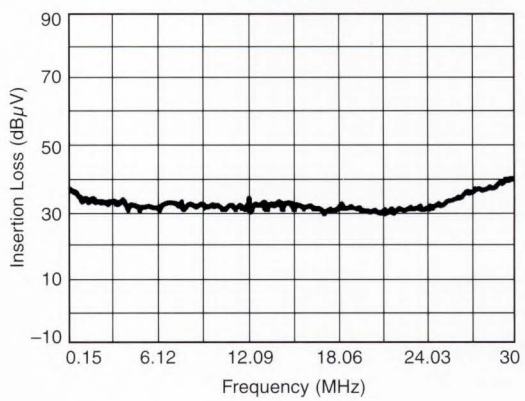
Series Name	Regulation		
	FCC	CISPR	VDE
PLA	○	○	
FKOB	○		
PLE	○	○	○
PLC	○	○	○

EFFECT OF MOUNTING OF COMMON MODE CHOKE COIL

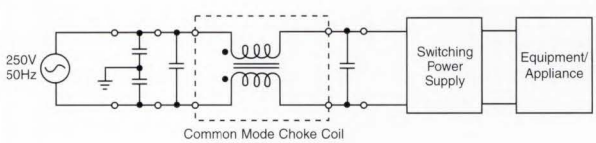
Noise level when not using common mode choke coil



Noise level when using common mode choke coil



OPERATING CIRCUIT



NOISE FILTERS
AC COMMON MODE CHOKE COIL

muRata

FKOB Series

The FKOB Series is a common mode choke coil, effective for asymmetric wave (unbalanced noise), used chiefly for preventing noise in color TV or VTR.

The filter is discretely mounted on the power source PC board together with a capacitor to serve as a noise prevention circuit. Filters of this type are also used in quantities for noise prevention in small electronic devices and power sources where use of a full-scale noise filter is impractical due to the limited space in such compact devices. Though the noise prevention of this kind of filter differs with the capacitor in parallel, it permits incorporation of a filter circuit consisting of at least one coil and capacitor on the board.

FEATURES

- Meets FCC noise requirements
- Compact design achieved by the use of highly permeable ferrite material
- Excellent frequency characteristics, useable from 100 KHz to several tens of MHz
- Less temperature and less effect on the environment with equipment temperature held to 30°C or less
- Negligible reduction to inductance due to load current
- The filter's construction and the insulation material used satisfy the requirements of applicable safety standards (i.e., UL standard).

APPLICATIONS

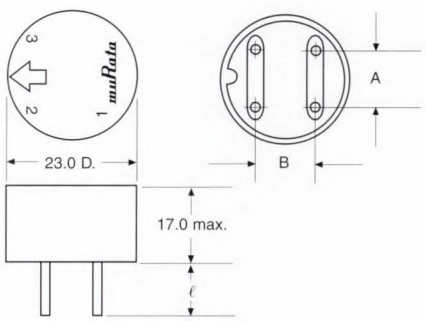
For prevention of internally generated noise
Switching sources, Thyristor control devices, Contact noise and Ultrasonic wave devices.

For prevention of external noise
Microcomputer (digital equipment), CTV, VTR, ECR. Electronic scales. POS.

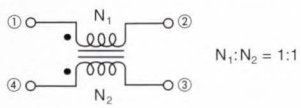
PART NUMBERING

FKOB160 — TYPE
MH — CORE MATERIAL
02 — SERIES

DIMENSIONS: mm

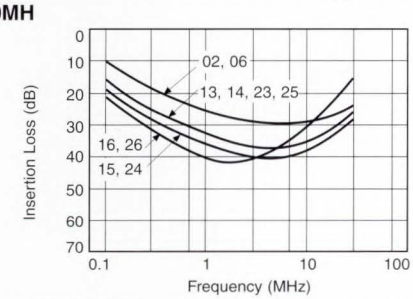


CIRCUIT DIAGRAM



TYPICAL INSERTION LOSS CHARACTERISTICS

FKOB160MH



SPECIFICATIONS

Part Number	Inductance μH (min.)	RDC (Ω max.)	Rated Voltage (VAC)	Rated Current (Arms)	Frequency at Self-resonance MHz (Typ.)	Lead Pitch A / B	Lead Length ℓ
★FKOB160MH02	250	< 0.05	250	2.5	5	8 / 10	10
★FKOB160MH06	250	< 0.05	250	2.5	5	13 / 10	4.5
★FKOB160MH25*	600	< 0.08	250	2.5	4	8 / 10	10
★FKOB160MH13*	600	< 0.08	250	2.5	4	13 / 10	4.5
★FKOB160MH23*	800	< 0.08	250	2.5	4	8 / 10	10
★FKOB160MH14	800	< 0.08	250	2.5	4	13 / 10	4.5
★FKOB160MH26*	1000	< 0.10	250	1.5	2.5	8 / 10	10
FKOB160MH16	1000	< 0.10	250	1.5	2.5	13 / 10	4.5
★FKOB160MH24*	1500	< 0.12	250	1.5	1.5	8 / 10	10
★FKOB160MH15	1500	0.12	250	1.5	1.5	13 / 10	4.5

★Available as standard through authorized Murata Electronics Distributors.

*Standard units

NOISE FILTERS
AC COMMON MODE CHOKE COIL

PLAM Series

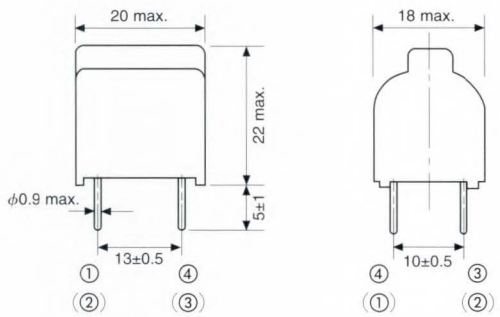
FEATURES

- Twice the inductance in same size package as currently available inductors.
- Meets or exceeds VCCI, FCC and CISPR EMI/RFI specifications. (TüV recognized)
- Unique case design allows high density packaging.
- High withstand voltage assures reliability and safety.

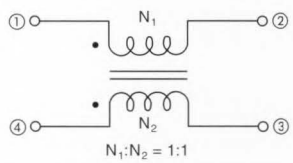
APPLICATIONS

Switching power supplies, microprocessor-controlled equipment and other industrial and consumer devices.

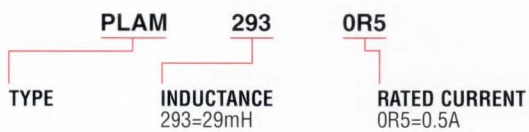
DIMENSIONS: mm



CIRCUIT DIAGRAM



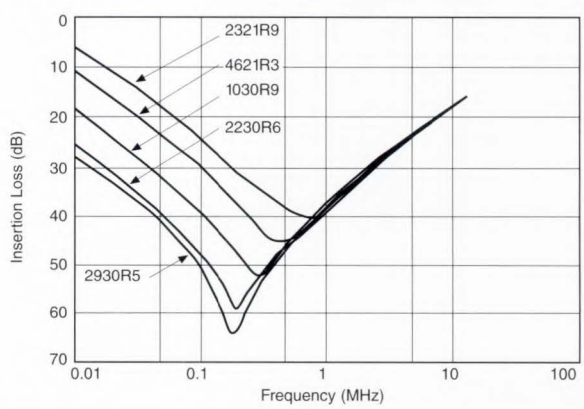
PART NUMBERING



SPECIFICATIONS

Item	Specification
Rated Voltage	250 VAC (UL, IEC) 125 VAC (CSA)
Withstand Voltage (Between Coils)	2000 VAC, one minute
Insulation Resistance	100 MΩ min. (500 VDC 1 minute)
Temperature Characteristic (Inductance Change)	$^{+80}_{-60}$ % (–25°C to +60°C, 20°C base)
Operating Temperature Range	–25°C to +60°C
Storage Temperature Range	–25°C to +85°C

TYPICAL INSERTION LOSS CHARACTERISTICS



SPECIFICATIONS

Part Number	Rated Current (Arms)	Direct Current Resistance (Ω) max.	Inductance L_1, L_2 (mH min.)	Inductance Difference L_1-L_2 (mH max.)	Self-resonant Frequency (MHz)*
★PLAM2930R5	0.5	3.0	29.0	0.25	0.2
★PLAM2230R6	0.6	2.0	22.0	0.20	0.2
★PLAM1030R9	0.9	0.9	10.0	0.15	0.3
★PLAM4621R3	1.3	0.5	4.6	0.10	0.5
★PLAM2321R9	1.9	0.2	2.3	0.05	0.7

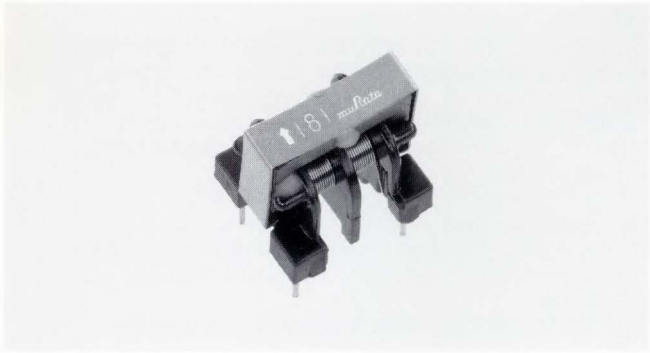
★Available as standard through authorized Murata Electronics Distributors.

* Typical

NOISE FILTERS
AC COMMON MODE CHOKE COIL HIGH FREQUENCY

muRata

PLH11 Series



FEATURES

- High-performance ferrite core provides excellent frequency characteristics
- Ideal for suppressing conduction and radiation noise to meet VCCI, FCC, CISPR, VDE noise regulations
- Suitable for application when no ground is available, when the ground is unstable or when a by-pass capacitor (e.g. a three-terminal capacitor) cannot be used because of leakage-current limitations
- Wide application possible for suppressing noise from AC power supplies, DC power supplies and signal lines
- Compact and lightweight
- Three configurations – vertical core, horizontal core, or cased core

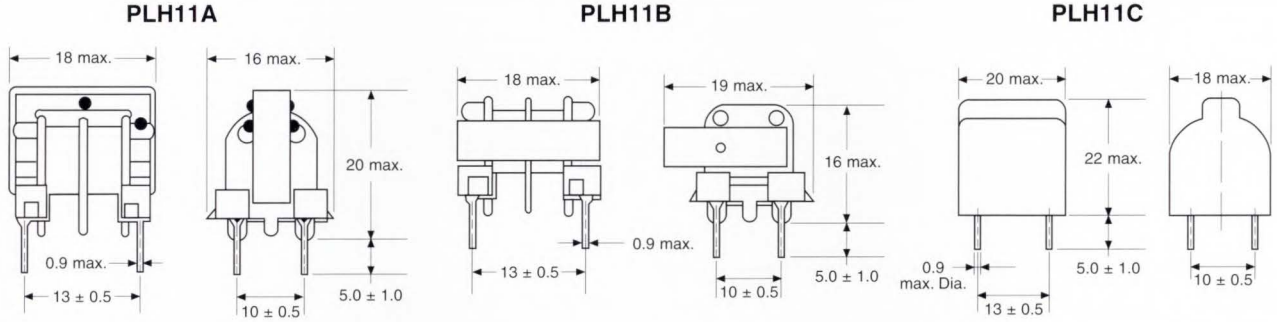
APPLICATIONS

TV's, VCR's. Equipment incorporating microcomputers (digital equipment). Communications systems

PART NUMBERING

PLH11	A	151	1R5	P	01	B1
TYPE	STYLE A=Vertical B=Horizontal C=Cased	INDUCTANCE 102=1.0mH 223=22mH	RATED CURRENT 1R0=1.0A 0R5=0.5A	WINDING MODE P=Parallel	SERIAL NUMBER	PACKAGING B1=Bulk

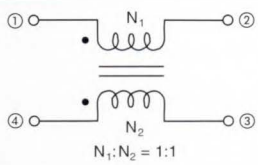
DIMENSIONS: mm



RATINGS

Item	Specifications
Rated Voltage	250 VAC
Withstand Voltage (Between Coils)	2000 VAC, one minute
Insulation Resistance (Between Coils : 500 VDC)	100 MΩ min.
Temperature Characteristic (Inductance Change)	$^{+80}_{-60}$ % (–25°C to +60°C, 20°C base)
Operating Temperature Range	–25°C to +60°C

CIRCUIT DIAGRAM

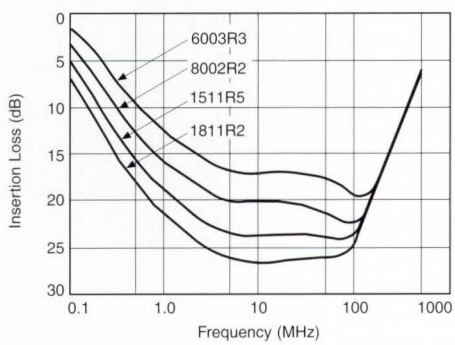


SPECIFICATIONS

Part Number	Rated Current (Arms)	Direct Current Resistance (Ω max.)	Inductance L_1, L_2 (μH min.)	Inductance Difference L_1-L_2 (μH max.)
★PLH11□1811R2P01B1	1.2	0.15	180	20
★PLH11□1511R5P01B1	1.5	0.10	150	15
★PLH11□8002R2P01B1	2.2	0.07	80	10
★PLH11□6003R3P01B1	3.3	0.05	60	10

★Available as standard through authorized Murata Electronics Distributors.

TYPICAL INSERTION LOSS CHARACTERISTICS



AC COMPONENTS

NOISE FILTERS
AC COMMON MODE CHOKE COIL BROAD BAND

PLH Series

FEATURES

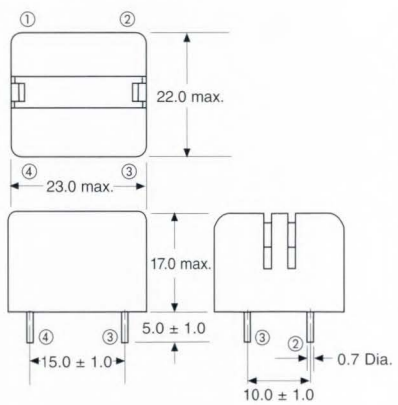
- Excellent noise suppression achieved by combining the best characteristics of conventional bobbin and toroidal types.
- Assembled with three-terminal (AC line) capacitor DSR Series, highly reliable filter circuits can be designed for effective suppression of noise ranging from several hundred KHz to several hundred MHz.
- Meets VCCI, FCC and CISPR noise regulations.
- Available in various rated currents to as high as 6A.
- Case structure allows sufficient insulation distance between other components, thus enabling high-densitymounting. (PLH20H Series)
- PLH20HM Series are magnetically shielded low leakage flux types.

APPLICATIONS

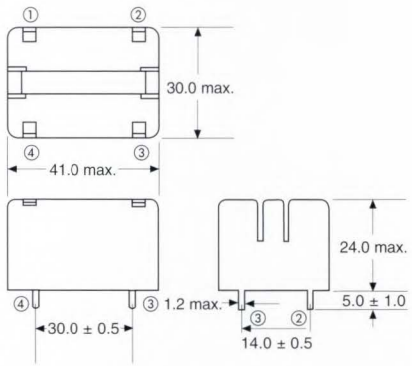
Switching power supplies, equipment incorporating microcomputers (digital equipment), and other electronic equipment and appliances.

DIMENSIONS: mm

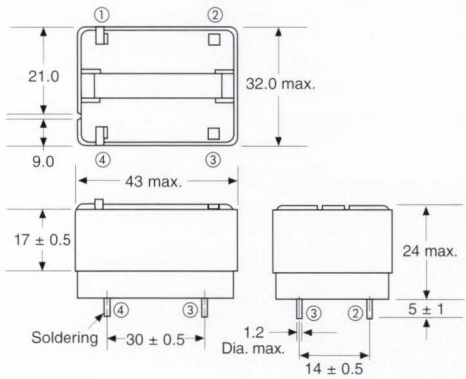
PLH14H



★PLH20H



★PLH20HM

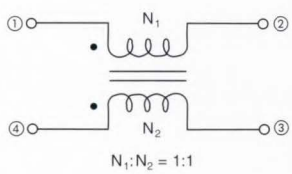


RATINGS

Item	Specifications
Rated Voltage	250 VAC
Withstand Voltage (between coils)	2000 VAC, one minute
Operating Temperature Range	–25°C to +60°C
Insulation Resistance (between coils : 500VDC)	100 MΩ min.
Temperature Characteristics (Inductance)	$^{+80}_{-50}$ % (–25°C to +60°C, 20°C base)

★Available as standard through authorized Murata Electronics Distributors.

CIRCUIT DIAGRAM



$N_1:N_2 = 1:1$

AC COMMON MODE CHOKE COIL BROAD BAND (continued)

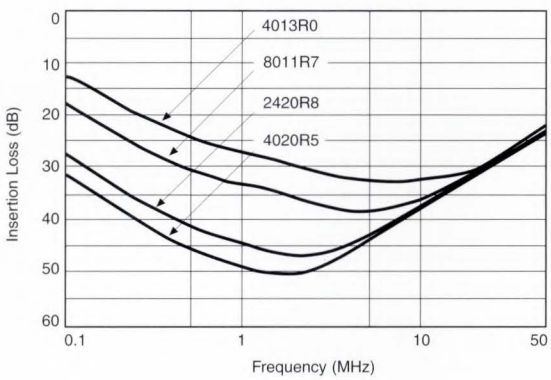
SPECIFICATIONS

Part Number	Inductance (mH) min.	Rated Current (Arms)	DC Resistance (Ω) max.
PLH14H-4020R5	4.0	0.5	3.0
PLH14H-2420R8	2.4	0.8	1.0
PLH14H-8011R7	0.8	1.7	0.5
PLH14H-4013R0	0.4	3.0	0.1
★PLH20H-9021R0 ★PLH20HM-9021R0	9.0	1.0	1.0
★PLH20H-4622R0 ★PLH20HM-4622R0	4.6	2.0	0.3
★PLH20H-2523R0 ★PLH20HM-2523R0	2.5	3.0	0.1
★PLH20H-8016R0 ★PLH20HM-8016R0	0.8	6.0	0.1

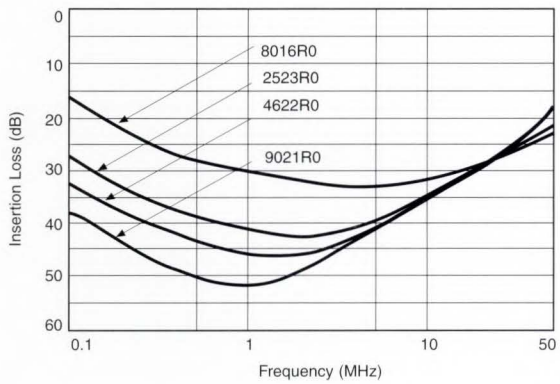
(PLH20HM Series are low leakage flux type).
★Available as standard through authorized Murata Electronics Distributors.

INSERTION LOSS CHARACTERISTICS (TYP.)

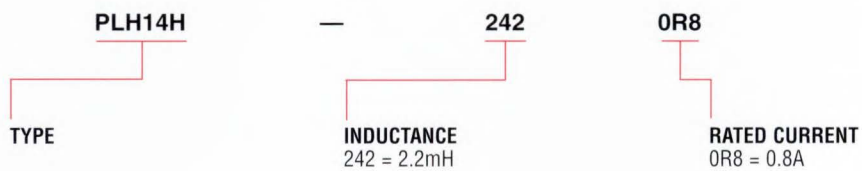
PLH14H



PLH20H/PLH20HM



PART NUMBERING



NOISE FILTERS
AC COMMON MODE CHOKE COIL

PLNE Series

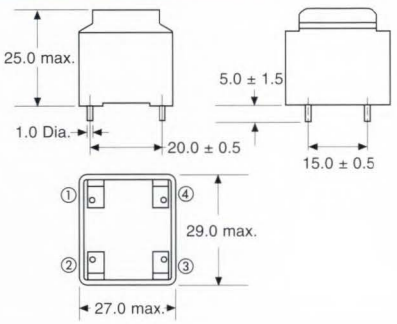
FEATURES

- High permeability core assures compliance to EMI specifications.
- Unique construction, inductance, bandwidth design replaces multiple series-connected toroidal inductors.
- Excellent impulse noise suppression characteristics.
- Four terminal construction provides high shock and vibration resistance.
- Unique case construction allows high density packaging.

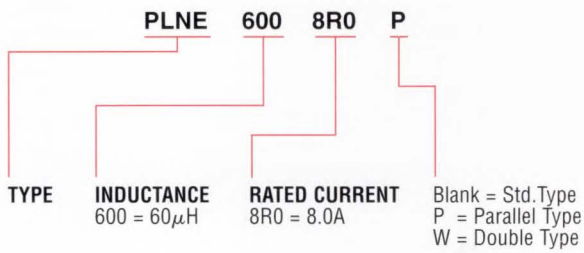
APPLICATIONS

Input line filtering for switching power supplies. DC line filtering in auto and similar applications. Suppression of differential-mode noise in thyristor phase control and other similar systems.

DIMENSIONS: mm



PART NUMBERING



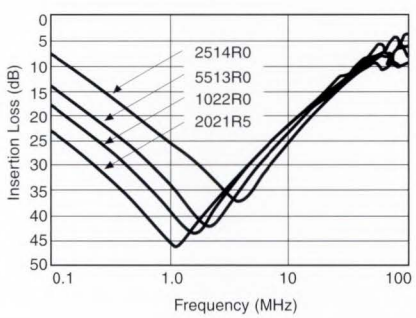
SPECIFICATIONS

	Part Number	Inductance (μH)	Rated Current (Arms)	Circuit Diagram
Standard Type	★PLNE-2021R5	2000	1.5	
	★PLNE-1022R0	1000	2.0	
	★PLNE-5513R0	550	3.0	
	★PLNE-2514R0	250	4.0	

★Available as standard through authorized Murata Electronics Distributors.

INSERTION LOSS CHARACTERISTICS (TYP.)

Standard Type



NOTES ON COMMON MODE CHOKE COIL/ NORMAL MODE CHOKE COIL

PRECAUTION

Operating Current

Operating current should not exceed components' rated value. Even if operating current is under the rated value, adequate ventilation is required to avoid excessive heat generated within the component and from surrounding heat sources. Maximum allowable temperature of components windings (ambient temperature + winding temperature rise) is 120°C.

Inrush Current

Inrush current should not exceed 10 times rated current within 1/4 cycle of 50/60Hz commercial power line. Inrush current should be limited to a maximum of 10 seconds between inrush intervals.

If these conditions are exceeded, excessive heat may cause fumes or permanent damage to the component.

NOTICE

Magnetic Flux Leakage

Common mode choke coils and normal mode choke coils generate small amounts of magnetic flux leakage that may adversely affect equipment operation according to component arrangement. Testing should be completed on final assembly to ensure equipment performance is not effected.

Coil Humming Noise

Magnetic flux generated between coil and core or between the common mode choke windings creates repulsive power between the coil windings. This repulsive power causes the coil winding to vibrate and create a humming noise. The amount of hum produced by the coil is proportionate to the amount of harmonic distortion generated by the operating current. This does not influence the electrical performance of the coils, but it should be considered and tested in actual circuit application.

Soldering Flux

Rosin-based flux is to be used. Do not use strong acidic flux with halide content exceeding 0.2 wt% (chlorine conversion value).

Soldering Conditions

(1) Flux, Solder
Rosin-based flux should be used.
Do not use strong acidic flux with halide content exceeding 0.2wt% (chlorine conversion value).

Use 63/37 solder (Sn 63%/Pb 37%) or 60/40 solder (Sn 60%/Pb 40%).

(2) Flow Soldering
Products should be soldered by flow method under the following conditions.

Item	Condition
Soldering Temp.	240 to 260°C
Soldering Time	less than 5 sec.

Cleaning

Avoid cleaning product due to non-waterproof construction.

Storage and Handling Requirement

(1) Storage period
Product should be used within 12 months after receiving. Solderability should be checked if this period is exceeded.

(2) Storage conditions
Storage temperature : –10°C to +40°C
Relative humidity : 30 to 70%
Avoid sudden changes in temperature and humidity. Chemical exposure to sulfur, chlorine gas or acid may cause oxidation of lead terminals resulting in poor solderability or corrosion of component windings.

(3) Handling conditions
Care should be taken when transporting or handling product to avoid excessive vibration or mechanical shock.

EMI FILTER DESIGN KITS

SURFACE MOUNT FILTERS

- For surface mount applications
- Extremely small size
- For DC applications

★KIT-EK115B

Part No.	Qty.	Product Type
BLM11A12	100	Chip Ferrite Bead
BLM21A05	100	
BLM21A10	100	
BLM21B03	20	
BLM32A06	40	
BLM41A01	40	
BLA81B01	5	Ferrite Bead Array
BLA62B01	5	
BLA41B01	5	
NFA81R10C222	5	Chip Feed-Thru Capacitor
NFA62R10C222	5	
NFA41R10C222	5	
NFM51R00P506	10	Chip Suppression Filter
NFM51R10P107	10	
NFM51R20P207	10	
NFM51R30P507	10	
NFM52R00P106	10	
NFM52R10P206	10	
NFM40R01C220	30	
NFM40R01C470	30	
NFM40R01C101	30	
NFM40R11C221	30	
NFM40R11C471	30	
NFM40R11C102	30	
NFM40R11C222	30	
NFM40R11C223	50	
NFM41P11C204	20	
NFM61R00T101	10	
NFM61R00T181	10	
NFM61R00T361	10	
NFM61R10T102	10	
NFM61R30T472	20	

LEADED PCB FILTERS

- PCB application
- Various applications
- Wide selection of values available
- AC/DC applications
- Leaded devices

★KIT-EK055A

Part No.		Qty.	Type
BLO1RN1-A62		30	Ferrite Bead Inductor
BLO2RN2-R62		30	
DSS306-55Y5S470M100	100VDC	20	Disc Type EMI/FIL
Y5S101M100	100VDC	20	
Y5S471M100	100VDC	20	
Y5S102M100	100VDC	20	
Y5U222Z100	100VDC	20	
FZ 103N100	100VDC	20	
F 223Z16	16VDC	20	
DSS710D223S12-22	12VDC	10	3Terminal Varistor-Capacitor
VFR303-351AZ25	25VDC	10	EMI GUARD for Semiconductor Protect Function
BNX002-01	50VDC	5	Broad Band Power Supply Filter
BNP002-02	50VDC	5	Block Type Filter
NFV510-655T2A106	100VDC	6	Signal Line Noise Filter
206	100VDC	6	
506	100VDC	6	
107	100VDC	6	
NFV610-655T2A106	100VDC	6	
206	100VDC	6	
506	100VDC	6	
107	100VDC	6	

★KIT-EK055A *(continued)*

Part No.		Qty.	Type
DVZ10-551A221	140VAC 180VDC	10	ZnO Surge Absorber
431	275VAC 350VDC	10	
DSR1100-56E222MVA2-EA *		10	AC Three Terminal Capacitor
DSR1150-56E472MVA2-EA *		10	
PLH20H-9021R0	250VAC	2	Common Mode Choke Coil
-2523R0	250VAC	2	
-8016R0	250VAC	2	
PLH14H-4020R5	250VAC	2	
-2420R8	250VAC	2	
-4013R0	250VAC	2	
PLH11A1811R2P01B1	250VAC	2	
1511R5P01B1	250VAC	2	
6003R3P01B1	250VAC	2	
PLAA3030R3D01B1	250VAC	2	
7020R7D01B1	250VAC	2	
1022R0RR1B1	250VAC	2	

*VDE, SEMKO, BS: 250VAC UL, CSA : 125VAC

★STANDARD DISTRIBUTOR ITEMS

COMPUTING DEVICES

- For PCB application
- For DC signal line filtering
- Wide selection of values

★KIT-EK015C

Part No.		Qty.	Type
BNX002-01		3	DC Powerline Filter
BNP002-03		3	Signal Line Filter
DF221-601SS152GMV50		30	Subminiature Semiconductor
BL01RN1-A62		50	Ferrite Bead Inductors
BL02RN2-R62		50	
BL03RN2-R62		50	
BLM31A02		20	Chip Ferrite Bead
BLM41A04		20	
DS306-55Y5S470M	50V	20	3 Lead Disc Filter
DS306-55Y5S101M	50V	20	
DS306-55Y5S271M	50V	20	
DS306-55Y5S102M	50V	20	
DS306-55Y5S222M	50V	20	
DS306-55FZ103Z	50V	20	
DSS306-55Y5S220M	100V	50	3 Lead Disc Filter With Ferrites
DSS306-55Y5S470M	100V	50	
DSS306-55Y5S101M	100V	50	
DSS306-55Y5S221M	100V	50	
DSS306-55Y5S471M	100V	50	3 Lead Disc Filter With Ferrites
DSS306-55Y5S102M	100V	50	
DSS306-55Y5U222Z	100V	50	
DSS306-55FZ103N	100V	50	
DSS306-55FZ223Z	16V	50	
DS310-55Y5S223S	50V	20	3 Lead Disc Filter
DS310-55Y5S104M	16V	20	
DSS310-55Y5S2220M	100V	20	3 Lead Disc Filter With Ferrites
DSS310-55Y5S470M	100V	20	
DSS310-55Y5S101M	100V	20	
DSS310-55Y5S271M	100V	20	
DSS310-55Y5S222M	100V	20	
DSS310-55Y5S223S	100V	20	
DSS710-D223S12-22		5	Varistor/Capacitor
NFV610-655T2A106	100V	5	Noise Suppression Filter
NFV610-655T2A206	100V	5	
NFV610-655T2A506	100V	5	
NFV610-655T2A107	100V	5	

★STANDARD DISTRIBUTOR ITEMS

POWERLINE

- For AC power line filtering
- Small size
- Broad selection of products

★KIT-EK025B

Part No.	Qty.	Type
PLAA1022R0R01B1	2	Compact Common Mode Choke Coil, Non-Case Type
PLAA3021R0R01B1	2	
PLAA5020R6R01B1	2	
PLAC8020R5R01B1	2	Case-Type
PLH11A6003R3P01B1	2	High Frequency Common Mode Choke Coil
PLH11A1511R5P01B1	2	
PLE25H-1531R	1	Common Mode Choke Coil
PLE25H-2023R	1	
PLC20A3031R0D01B1	1	
PLC20B7030R5D01B1	1	
DSR1100-56E222M VA2-EA	10	Safety Standard Recognized EMIFIL® For AC Power Supplies
DSR1120-56 E302M VA2-EA	10	
DSR1150-56 E472M VA2-EA	10	Safety Standard Recognized EMIFIL® For AC Power Supplies
DSR1100-56 FZ472P VA2-EA	10	
PLT1R53C	5	Common Mode Choke Coil
BNX002-01	5	DC Power Line Filter
BL02RN2-R62	50	Ferrite Bead

KIT-EK025C

Part No.	Qty.	Type
PLAA1522R0R01	2	Compact Common Mode Choke
PLAA3221R2R01	2	
PLAB1530R5R01	2	
PLAC3330R3R01	2	
PLAA8512R0D01	2	
PLAA3221R0D01	2	
PLAB1030R5D01	2	
PLAC3030R3D01	2	
PLAM2321R9	1	Common Mode Choke Coil
PLAM4621R3	1	
PLAM1030R9	1	
PLAM2930R5	1	
PLE25H-2023R	1	
PLC20A3023R0D01	1	
PLC20B3031R0D01	1	
PLH11A8002R2P01	1	
PLH11B1811R2P01	1	
PLH14H-4013R0	1	
PLH14H-8011R7	1	
PLH14H-2420R8	1	
PLH14H-4020R5	1	
PLH20H-2523R0	1	
PLH20H-9021R0	1	
PLNE-1022R0	2	Normal Mode Choke
PLT09H-2003R	4	DC Common Mode Choke
BNX002-01	4	Block Filter
BL02RN2-R62	50	Ferrite Beads
DSR1100-56E222M VA2	10	3 Terminal AC Filters
DSR1120-56E302M VA2	10	

INDUCTORS — CHIP

- Miniature Size
- Available in ferrite and ceramic cores
- Wide standard inductance range – 10nH to 2200μH
- High Q at frequencies to 100MHz for ferrite cores and to 1GHz for ceramic core.

★KIT-EKLQ015A

Part No.	Qty.	Type
LQN2A10NM04	50	1210 Chip Inductor
LQN2A18NM04	50	
LQN2A22NM04	50	
LQN2A33NM04	50	
LQN2A39NM04	50	
LQN2A47NM04	50	
LQN2A56NM04	50	
LQN2A68NM04	50	
LQN2A82NM04	50	
LQN2AR10K04	50	
LQN2AR12K04	50	
LQN2AR15K04	50	
LQN2AR18K04	50	
LQN2AR22K04	50	
LQH3NR10M04K	40	1210 Chip Inductor
LQH3NR18M04K	40	
LQH3NR27M04K	40	
LQH3NR39M04K	40	
LQH3NR56M04K	40	
LQH3NR68M04K	40	
LQH3NR82M04K	40	
LQH3C1R0M04	30	1210 Chip Inductor
LQH3C2R2M04	30	
LQH3C4R7M04	30	
LQH3C100K04	30	
LQH3C220K04	30	
LQH3C470K04	30	
LQH3C101K04	30	
LQH3C221K04	30	
LQH3C331K04	30	

★KIT-EKLQ016A

Part No.	Qty.	Type
LQP31A4N7J04	20	1206 Chip Inductor
LQP31A6N8J04	20	
LQP31A10NG04	20	
LQP31A15NG04	20	
LQP31A22NG04	20	
LQP31A33NG04	20	
LQP31A47NG04	20	
LQP31A68NG04	20	
LQP31AR10G04	20	
LQN1A8N8J04	20	1206 Chip Inductor
LQN1A15NJ04	20	
LQN1A17NJ04	20	
LQN1A23NJ04	20	
LQN1A27NJ04	20	
LQN1A33NJ04	20	
LQN1A39NJ04	20	
LQN1A47NJ04	20	
LQN1A56NJ04	20	
LQN1A64NJ04	20	
LQN1A84NJ04	20	
LQN1AR10J04	20	
LQH1NR15M04	20	1206 Chip Inductor
LQH1NR22M04	20	
LQH1NR33M04	20	
LQH1NR47M04	20	
LQH1NR56M04	20	

★STANDARD DISTRIBUTOR ITEMS

INDUCTORS—CHIP

★KIT-EKLQ016A *(continued)*

Part No.	Qty.	Type
LQH1NR68M04	20	1206 Chip Inductor
LQH1NR82M04	20	
LQH1N1R0M04	20	
LQH1N1R2M04	20	
LQH1N1R5K04	20	
LQH1CR12M04	20	1206 Chip Inductor
LQH1CR22M04	20	
LQH1CR47M04	20	
LQH1C1R0M04	20	
LQH1C2R2M04	20	
LQH1C4R7M04	20	
LQH1C100K04	20	
LQH1C220K04	20	
LQH1C470K04	20	
LQH1C101K04	20	

★KIT-EKLQ025A

Part No.	Qty.	Type
LQH3N1R0M04	30	1210 Chip Inductor
LQH3N1R2M04	30	
LQH3N1R5M04	30	
LQH3N1R8M04	30	
LQH3N2R2M04	30	
LQH3N2R7M04	30	
LQH3N3R3M04	30	
LQH3N3R9M04	30	
LQH3N4R7M04	30	
LQH3N5R6M04	30	
LQH3N6R8M04	30	
LQH3N8R2M04	30	
LQH3N100K04	30	
LQH3N120K04	30	
LQH3N150K04	30	
LQH3N180K04	30	
LQH3N220K04	30	
LQH3N270K04	30	
LQH3N330K04	30	
LQH3N390K04	30	
LQH3N470K04	30	
LQH3N560K04	30	
LQH3N680K04	30	
LQH3N820K04	30	
LQH3N101K04	30	
LQH3N121K04	30	
LQH3N151K04	30	
LQH3N181K04	30	
LQH3N221K04	30	
LQH3N271K04	30	
LQH3N331K04	30	
LQH3C1R0M04	20	1210 Chip Inductor
LQH3C2R2M04	20	
LQH3C4R7M04	20	
LQH3C100K04	20	
LQH3C220K04	20	
LQH3C470K04	20	
LQH3C101K04	20	
LQH3C221K04	20	
LQH3C331K04	20	

★KIT-EKLQ025A *(continued)*

Part No.	Qty.	Type
LQH4N391K04	20	1812 Chip Inductor
LQH4N471K04	20	
LQH4N561K04	20	
LQH4N681K04	20	
LQH4N821K04	20	
LQH4N102K04	20	
LQH4N122K04	20	
LQH4N152K04	20	
LQN4N182K04	20	
LQN4N222K04	20	

★KIT-EKLQ026A

Part No.	Qty.	Type
LQH1N1R0M04	20	1206 Chip Inductor
LQH1N1R2M04	20	
LQH1N1R5K04	20	
LQH1N1R8K04	20	
LQH1N2R2K04	20	
LQH1N2R7K04	20	
LQH1N3R3K04	20	
LQH1N3R9K04	20	
LQH1N4R7K04	20	
LQH1N5R6K04	20	
LQH1N6R8K04	20	
LQH1N8R2K04	20	
LQH1N100J04	20	
LQH1N120J04	20	
LQH1N150J04	20	
LQH1N180J04	20	
LQH1N220J04	20	
LQH1N270J04	20	
LQH1N330J04	20	
LQH1N390J04	20	
LQH1N470J04	20	
LQH1N560J04	20	
LQH1N680J04	20	
LQH1N820J04	20	
LQH1N101J04	20	
LQH1CR12M04	20	1206 Chip Inductor
LQH1CR22M04	20	
LQH1CR47M04	20	
LQH1C1R0M04	20	
LQH1C2R2M04	20	
LQH1C4R7M04	20	
LQH1C100K04	20	
LQH1C220K04	20	
LQH1C470K04	20	
LQH1C101K04	20	
LQH3C1R0M04	20	1210 Chip Inductor
LQH3C2R2M04	20	
LQH3C4R7M04	20	
LQH3C100K04	20	
LQH3C220K04	20	
LQH3C470K04	20	
LQH3C101K04	20	
LQH3C221K04	20	
LQH3C331K04	20	

★STANDARD DISTRIBUTOR ITEMS

TEMPERATURE CHARACTERISTICS/CODE

EIA TEMPERATURE CHARACTERISTICS/CODE

Min. Operating Temp.		Max. Operating Temp.		Cap. Tolerance	
X	−55°C	2	+45°C	C	±2.2%
Y	−30°C	4	+65°C	D	±3.3%
Z	−10°C	5	+85°C	E	±4.7%
		6	+105°C	F	±7.5%
		7	+125°C	P	±10%
				R	±15%
				S	±22%
				T	+22%, −33%
				U	+22%, −56%
				V	+22%, −82%

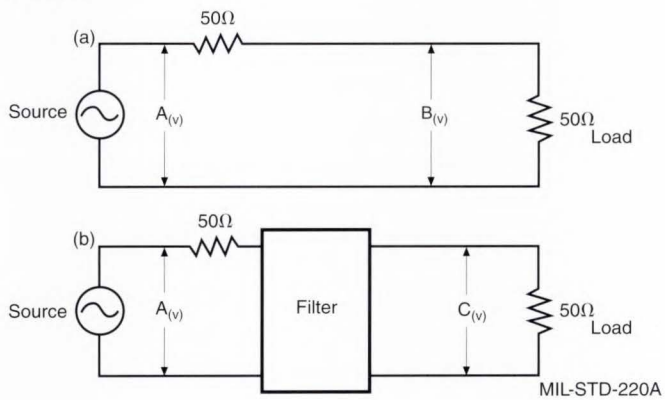
Note: 1. MMC uses "EIA-J" for the Japanese domestic market and EIA for the foreign market.

EIA-J TEMPERATURE CHARACTERISTICS

	Operating Temp. Range	Standard Temp.	Cap. Tolerance
B	−25°C to +85°C	20°C	±10%
C	−25°C to +85°C	20°C	±20%
D	−25°C to +85°C	20°C	+20, −30%
E	−25°C to +85°C	20°C	+20, −55%
F	−25°C to +85°C	20°C	+30, −80%

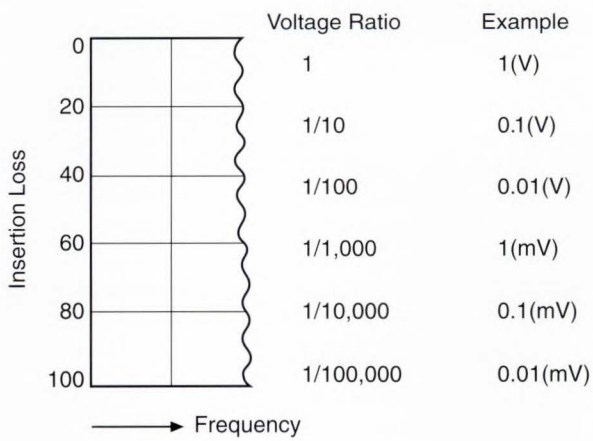
TYPICAL INSERTION LOSS

MEASURING CIRCUIT (MIL-STD-220A)



$$\text{INSERTION LOSS} = 20 \text{ LOG } \frac{B_{(v)}}{C_{(v)}} \text{ in dB}$$

(dB) AND INSERTION LOSS



Voltage Ratio	Example
1	1(V)
1/10	0.1(V)
1/100	0.01(V)
1/1,000	1(mV)
1/10,000	0.1(mV)
1/100,000	0.01(mV)

CIRCUIT MODULE (Hybrid IC)

COMPONENTS FOR MOUNTING ON HYBRID IC'S:

A highly functional and integrated circuit can be realized by integrating various chip components and semiconductors on one substrate. Murata Electronics not only has the technology to put these components together on the substrate, but Murata also supplies the components. Again, this relates to the vertical integration and known quality theme of Murata Hybrid IC. Murata now offers many existing circuit designs such as Current Detectors, DC/DC Converters, RC/C Modules, and Active Filters as well as custom circuit design support to meet specific customer needs.

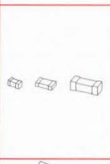
FEATURES

- Reduce PCB complexity and size
- Reduce assembly and testing time
- Increase flexibility of REDESIGN and NEXT GENERATION DESIGN
- Shipped as 100% fully tested module/function
- Good high frequency and heat dissipation characteristics
- Reduce TIME TO MARKET and INVENTORY LOGISTICS COSTS

Product Name			Appearance	Dimensions (mm)		
				L	W	T
Chip Monolithic Ceramic Capacitor	Nickel Barriered Termination Type	GRM36(0402)		1.0	0.5	0.5
		GRM39(0603)		1.6	0.8	0.8
		GRM40(0805)		2.0	1.25	0.7
						1.0
						1.25
		GRM42-6(1206)		3.2	1.6	0.7
						1.0
						1.25
	Low Distortion Series	GRM420(0603)		1.6	0.8	0.8
		GRM425(0805)		2.0	1.25	0.7
						1.0
		GRM430(1206)		3.2	1.6	0.7
						1.0
						1.25
	Silver Termination Type	GR39(0603)		1.6	0.8	0.8
		GR40(0805)		2.0	1.25	0.7
						1.0
						1.25
		GR42-6(1206)		3.2	1.6	0.7
						1.0
						1.25
		GR42-2(1210)		3.2	2.5	1.25
						1.5
		GR43-2(1812)		4.5	3.2	2.0
		GR44-1(2220)		5.7	5.0	2.0
	Smoothing Series	GR235(1210)		3.2	2.5	1.25
						1.5
						2.0
		GR240(1812)		4.5	3.2	2.0
						2.5

Product Name			Appearance	Dimensions (mm)		
				L	W	T
Chip Monolithic Ceramic Capacitor	Smoothing Series	GR245(2220)		5.7	5.0	2.0
						2.7
		GR250(3225)		8.0	6.3	2.0 / 2.7
		GR255(4032)		10.0	8.0	3.0
		GR260(5040)		12.5	10.0	3.0
	High Frequency Series	GRH706		1.25	1.0	1.2
		GRH708		2.0	1.25	1.45
		GRH710		3.2	2.5	1.9
		GRH110		1.4	1.4	1.65
		GRH111		2.8	2.8	2.8
Chip Ceramic Trimmer Capacitor		TZV02		3.2	2.3	1.4
		TZC03		4.5	3.2	1.6
		TZBX4		4.5	4.0	3.0
Chip Trimmer Potentiometer		RVG3A01/08		3.5	3.0	01 : 1.5 08 : 1.85
		RVG4J03/04		4.5	3.8	1.75
		RVG4H01		4.5	3.8	1.5
		RVG4M		4.7	4.0	2.0
Chip Coil		LQG21N		2.0	1.25	0.9 1.25
		LQH1N/1C		3.2	1.6	1.8
		LQH3N/3C		3.2	2.5	2.0
		LQH4N/LQN4N		4.5	3.2	2.6
		LQM32C		3.2	2.5	2.5
		LQS33N		3.2	3.5	1.8
		LQN1A		3.2	1.6	1.6
		LQN2A		3.2	2.5	1.6
		LQP21A		2.0	1.25	0.5
		LQP31A		3.2	1.6	0.5

CIRCUIT MODULE (Hybrid IC)

Product Name			Appearance	Dimensions (mm)		
				L	W	T
Chip EMI Suppression Filter (EMIFIL®)		BLM11		1.6	0.8	0.8
		BLM21		2.0	1.25	0.9
		BLM32		3.2	1.6	1.1
		BLM31		3.2	1.6	1.6
		BLM41		4.5	1.6	1.6
		BLA81		12.5	4.5	1.2
		BLA62/41		6.3	3.2	1.0
		BLM550R		3.2	2.5	2.5
		NFM40R		3.2	1.25	0.7
		NFM41R/41P		4.5	1.6	1.0
		NFA81R		12.5	4.5	1.2
		NFA62R/41R		6.3	3.2	1.0
		NFM61R/61RH		6.8	1.6	1.6
		NFM51R		3.2	1.6	1.8
		NFM52R		5.0	2.5	3.0
Chip Ceramic Filter (CERAFIL®)	AM	PFBF455JR		7.0	4.8	2.4
	FM	SFECA10.7		6.9	2.9	1.5
Chip Ceramic Discriminator		CDAC10.7		3.9	2.9	1.5
Chip Ceramic Resonator (CERALOCK®)		CSBF□J(429-500)		8.5	7.5	3.3
		CSBF□J(700-1250)		6.0	5.0	2.3
		CSAC□MGC		7.0	ϕ2.8	
		CSAC□MGCM		7.0	2.8	2.8
		CSACS□MT/MX		4.7	4.1	1.6
		CSTC□MG		8.0	2.5	1.9
		CSTCS□MG		6.4	2.8	1.6
		CSTCS□MT/MX		4.7	4.1	1.6
Chip Monolithic Delay Line		LDH36		6.3	5.0	2.5
		LDH46		10.0	6.3	4.0
Chip PTC Thermistor		PTH9C22		2.0	1.25	1.0
Chip NTC Thermistor		NTH5G		2.0	1.25	0.9
Chip Active Filter		AFZ□□□YM		5.0	4.0	1.0

Product Name			Appearance	Dimensions (mm)		
				L	W	T
SMD For Communication Equipment	Gigafil®	DFC2R886 P002-7A2 ※3	—	12.0	10.0	4.5
	Chip Monolithic LC Filter/ Chip Monolithic Micro Filter	LFD40		8.0	5.0	2.5
		LFC35		5.7	5.0	2.2
		LFE35		5.7	5.0	2.5
		LFH29		4.5	2.0	1.7
		LFC30		4.5	3.2	1.5
		LFJ30		4.5	3.2	2.0
		LFK30		4.5	3.2	2.0
	Chip SAW Filter	SAFC(SC45)		5.0	4.5	1.7
		SAFC(SC59)		9.1	4.8	1.8
		SAFC(SC79)		9.1	7.1	2.0
		SAFC(SC713)		13.3	6.5	2.0
	Chip Ceramic Filter (CERAFIL®)	CFBF455		7.0	6.0	3.0
		SFPC455		7.0	8.4	5.0
		CFUCG455		6.0	7.5	4.0
		SFGCG455		6.0	7.5	4.0
		CFEC10.7M		6.9	2.9	1.5
	Isolator	CE072		7.0	7.0	3.0
		CE070		7.0	7.0	4.0
		CE071/CE070A		7.0	7.0	3.0
	Chip Monolithic Hybrid Coupler	LDC35		5.7	5.0	2.2
		LDC33		5.0	4.0	2.2
		LDC30		4.5	3.2	2.2
	Coaxial Connector	MM4329-2700□□□		4.5	4.0	2.15
		MM6329-2700□□□		3.4	3.4	1.58
	VCO	MQE000/720		12.4	10.4	4.0
		MQE500		10.1	7.4	2.5
		MQE300		15.3	9.7	4.0
	PLL Module	HFQ350		13.5	11.4	2.7
	Mixer Module	HFQ130		15.8	11.7	3.7
	RF Amplifier	HFQ601		5.5	4.2	3.5

CUSTOM CIRCUIT MODULE DESIGN (Hybrid ICs)

Murata Electronics offers custom Thick Film Circuit Module design engineering and production capabilities. Our advanced computer aided design and manufacturing (CAD/CAM) systems allow us to respond to your various needs with quality and speed. If you have an application that could use our established Thick Film Technology, please contact us for engineering consultation.

ORDERING INFORMATION

Please provide the following information when inquiring about custom modules:

- Functional description of circuit
- Application
- Schematic
- Bill of materials
- Package type preferred (SIP or DIP or SMD)
- Package dimensions (L x W x H) (max.)
- Your target cost for module
- Your development schedule requirements
- Your production schedule
- Expected annual usage (EAU)
- Your technical contact, phone #, and fax #

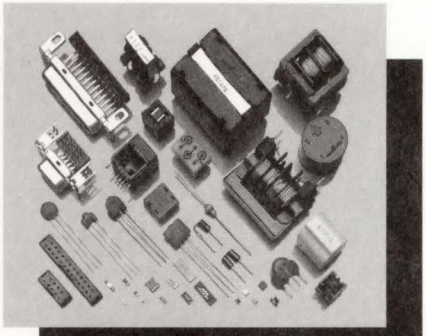
★Note: One of our design engineers will contact you to discuss the design following our own preliminary evaluation. We will suggest the most cost effective methods to achieve your objectives together with the applicable technology. The design up to final production remains flexible and changes may be made to meet changing requirements.

NOTES

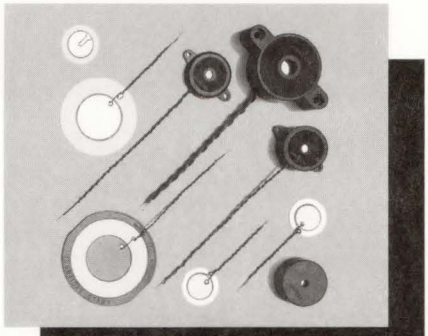
NOTES

NOTES

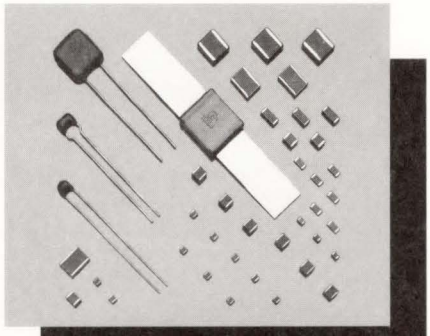
OTHER MURATA PRODUCTS



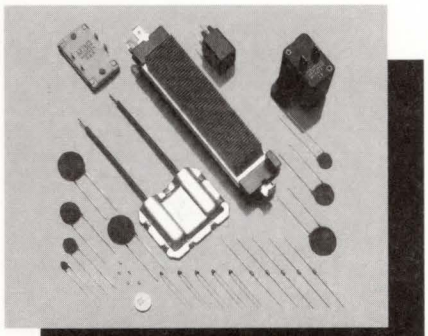
EMI/RFI FILTERS AND CHIP INDUCTORS



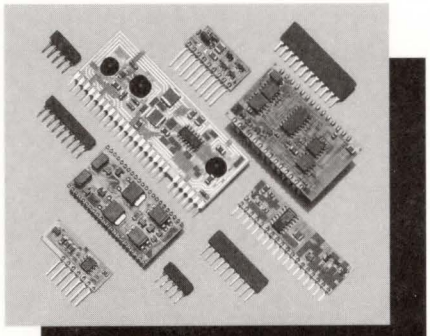
PIEZOELECTRIC ALARMS



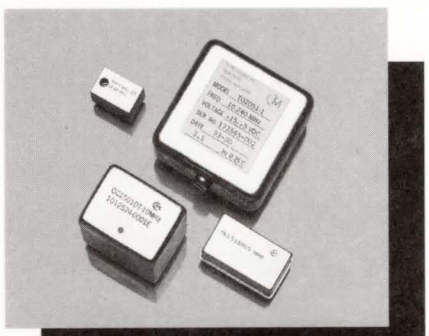
MONOLITHIC CERAMIC CAPACITORS



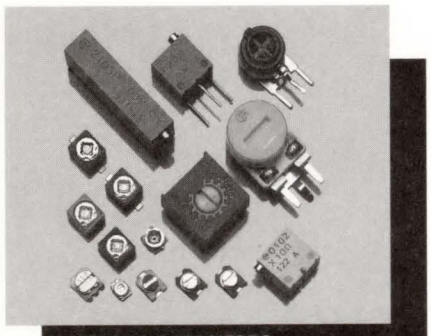
POSISTORS AND THERMISTORS



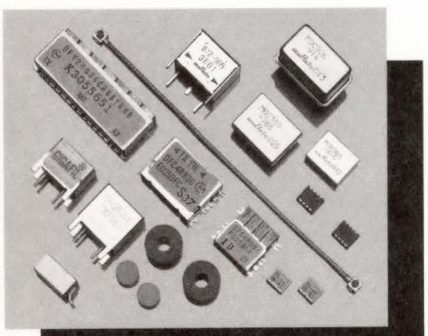
NETWORKS AND MODULES



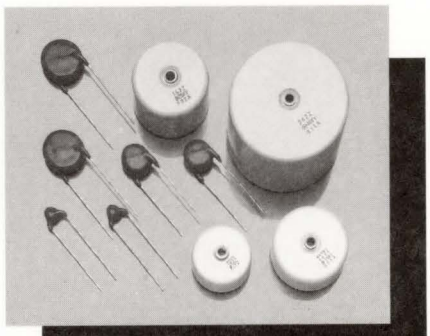
CRYSTAL OSCILLATORS



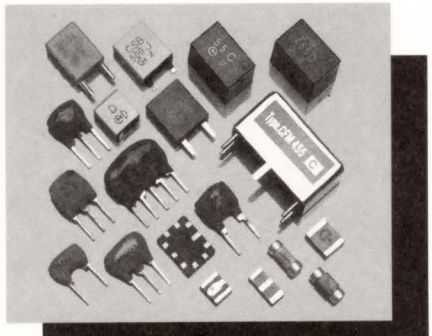
TRIMMING CAPACITORS
AND POTENTIOMETERS



DIELECTRIC RESONATORS AND
OTHER MICROWAVE PRODUCTS



MEDIUM AND
HIGH VOLTAGE CAPACITORS



CERAMIC FILTERS AND RESONATORS

For Technical Information, call—
Regional Sales Offices

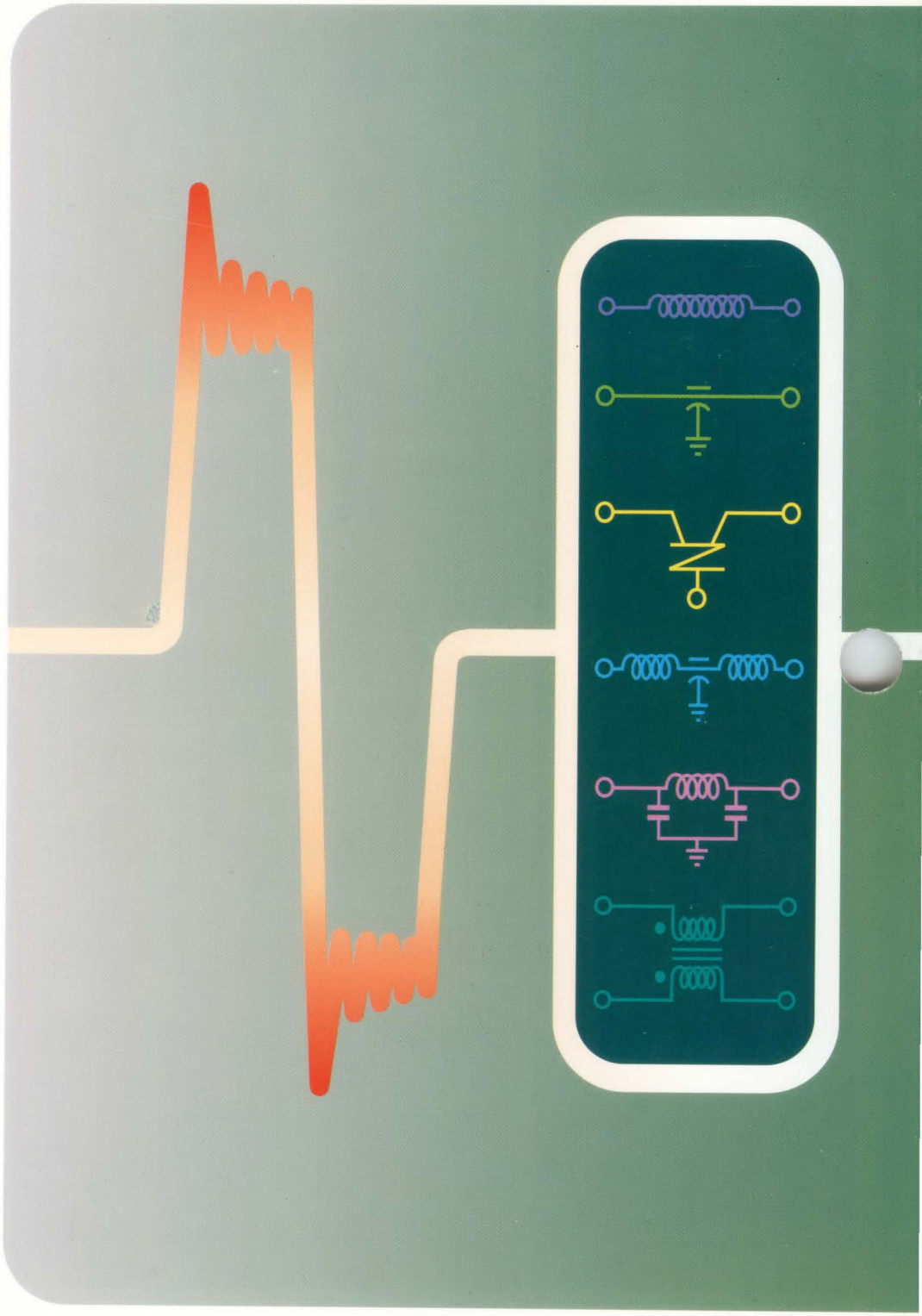
Midwest:
(810) 348-9975

Northwest:
(310) 436-8700

Southwest:
(310) 436-8700

Northeast:
(617) 356-4155

Southeast:
(404) 436-1300



For Catalog Information, call—
1-800-831-9172

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