Welcome to E-XFL.COM

What is "Embedded - Microcontrollers"?

"Embedded - Microcontrollers" refer to small, integrated circuits designed to perform specific tasks within larger systems. These microcontrollers are essentially compact computers on a single chip, containing a processor core, memory, and programmable input/output peripherals. They are called "embedded" because they are embedded within electronic devices to control various functions, rather than serving as standalone computers. Microcontrollers are crucial in modern electronics, providing the intelligence and control needed for a wide range of applications.

Applications of "Embedded - Microcontrollers"

Details	
Product Status	Active
Core Processor	PIC
Core Size	8-Bit
Speed	8MHz
Connectivity	-
Peripherals	POR, WDT
Number of I/O	5
Program Memory Size	1.5KB (1K x 12)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	38 x 8
Voltage - Supply (Vcc/Vdd)	2V ~ 5.5V
Data Converters	A/D 4x8b
Oscillator Type	Internal
Operating Temperature	-40°C ~ 85°C (TA)
Mounting Type	Surface Mount
Package / Case	8-SOIC (0.154", 3.90mm Width)
Supplier Device Package	8-SOIC
Purchase URL	https://www.e-xfl.com/product-detail/microchip-technology/pic12f510-i-sn

ESD-R Series Toroidal Cores

Overview

The KEMET ESD-R Series solid toroidal cores are designed for use on round cable. A wide range of MnZn and NiZn options are available in Bare, Coated, and Case types.

Benefits

- MnZn (≤ 100 MHz, AM band range) and NiZn (≤ 300 MHz, FM band range) options available
- Solid construction
- Bare, Coated, and Case types available

Applications

- Consumer electronics

Turns and Impedance Characteristics

When the desired performance of an EMI core cannot be obtained with a single pass through the core, the impedance characteristics can be changed with multiple turns.

A turn is counted by the number of lead-wire windings which pass through the inner hole of the core. Windings on the outside of the core do not count. See Figure 1 for examples of one, two, and three turns.

Adding turns will result in higher impedance while also lowering the effective frequency range. See Figure 2 for an example.

Figure 1 – How to count turns

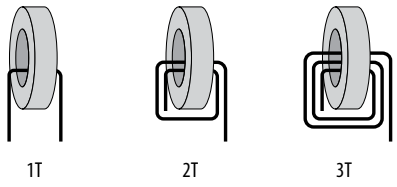
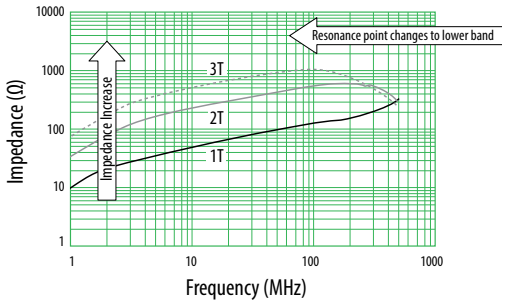


Figure 2 – Relationship between impedance and turn count. (Representative example: ESD-R-16C)



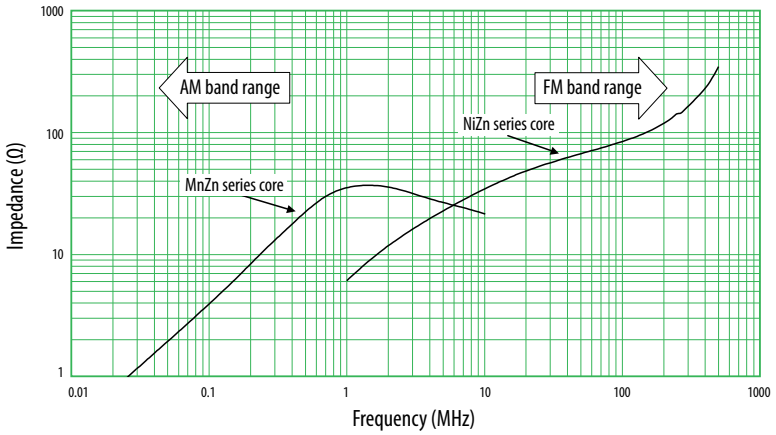
Core Material and Effective Frequency Range

There are two ferrite material options for KEMET EMI Cores: Nickel-Zinc (Ni-Zn) and Manganese-Zinc (Mn-Zn). Each core material has a different resistance and effective frequency range. The Mn-Zn core material has lower resistance compared to the Ni-Zn; therefore, be sure to provide adequate insulation before use.

For reference, the Ni-Zn core material is typically effective for the frequencies in the MHz band range such as the FM-band, while the Mn-Zn core material is typically effective for the kHz band range such as the AM-band. See Figure 3.

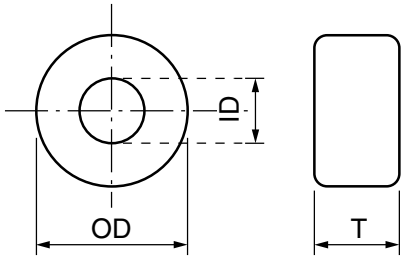
It is recommended to verify actual effectiveness in the target application with measurements.

Figure 3 – Effective band range of Mn-Zn and Ni-Zn ferrite core material. (Representative example, measured with same-dimension ring core)

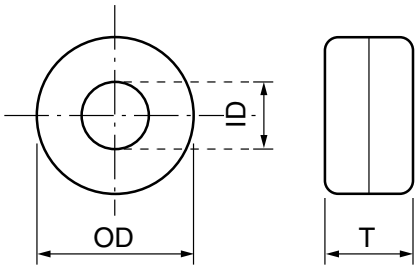


Dimensions – Millimeters

Bare and Coated Types

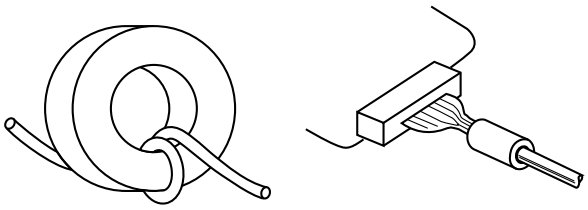


Case Type



See Table 1 for dimensions

Installation Examples



Environmental Compliance

All KEMET EMI cores are RoHS Compliant.

RoHS Compliant

Table 1 – Ratings & Part Number Reference

Part Number	Dimensions (mm)			Frequency Range[1]		Type	Color	Compatible Toroidal Core (Bare Type)
	OD	ID	T	≤ 100 MHz (AM band range)	≤ 300 MHz (FM band range)			
ESD-R-10D	9.5	5.0	10.0		X	Bare	–	–
ESD-R-10E	10.0	5.0	5.0		X	Bare	–	–
ESD-R-10S	10.5	5.5	20.0		X	Bare	–	–
ESD-R-12C	11.8	7.3	15.0		X	Bare	–	–
ESD-R-12E	11.8	7.3	8.0		X	Bare	–	–
ESD-R-12F	12.0	8.5	15.0		X	Bare	–	–
ESD-R-12S	12.0	7.0	5.5		X	Bare	–	–
ESD-R-14C	14.0	7.0	3.0		X	Bare	–	–
ESD-R-14E	14.0	10.0	8.0		X	Bare	–	–
ESD-R-14S	14.3	6.3	28.5		X	Bare	–	–
ESD-R-15C-1	15.0	10.5	12.0		X	Bare	–	–
ESD-R-16	15.8	11.6	8.4	X		Bare	–	–
ESD-R-16C	16.0	9.0	17.0		X	Bare	–	–
ESD-R-17S	17.5	9.5	28.5		X	Bare	–	–
ESD-R-18SD	18.0	10.0	6.0		X	Bare	–	–
ESD-R-19S	18.5	10.0	10.0	X		Bare	–	–
ESD-R-19SD	18.5	10.0	10.0		X	Bare	–	–
ESD-R-22SD	22.5	13.8	6.4		X	Bare	–	–
ESD-R-25SD	25.0	15.0	12.0		X	Bare	–	–
ESD-R-25S	25.0	15.0	12.0	X		Bare	–	–
ESD-R-26S	26.0	13.0	28.5		X	Bare	–	–
ESD-R-28C	28.0	16.0	13.0		X	Bare	–	–
ESD-R-31C	31.0	19.0	8.0		X	Bare	–	–
ESD-R-38D	38.1	19.0	12.7	X		Bare	–	–
ESD-R-12C-2	12.0	7.3	15.3		X	Coated	Blue	–
ESD-R-14A	15.0	6.2	3.5	X		Coated	Green	–
ESD-R-14C-2	14.0	7.0	3.0		X	Coated	Blue	ESD-R-14C
ESD-R-15C	15.2	10.5	12.5		X	Coated	Blue	ESD-R-15C-1
ESD-R-17S-1	17.7	9.4	28.8		X	Coated	Blue	ESD-R-17S
ESD-R-19E-1	19.0	10.7	5.3		X	Coated	Blue	–
ESD-R-25D-8	25.0	15.0	8.0		X	Coated	Blue	–
ESD-R-25L-A	25.3	15.1	12.1		X	Coated	Blue	ESD-R-25SD
ESD-R-28C-1	28.2	15.8	13.2		X	Coated	Blue	–
ESD-R-31C-1	32.0	18.5	9.0		X	Coated	Green	ESD-R-31C
ESD-R-31-P	32.0	19.0	15.8	X		Coated	Green	–
ESD-R-12D	12.9	6.0	6.4		X	Case[2]	Black	ESD-R-12S
ESD-R-19	19.0	9.0	11.0	X		Case[2]	White	ESD-R-19S
ESD-R-19D	19.0	9.0	11.0		X	Case[2]	Black	ESD-R-19SD
ESD-R-25	26.0	14.0	15.0	X		Case[2]	White	ESD-R-25S
ESD-R-25D	26.0	14.0	15.0		X	Case[2]	Black	ESD-R-25SD
ESD-R-38	39.0	17.5	14.0	X		Case[2]	White	ESD-R-38D
ESD-R-38C-1	39.0	17.5	14.0		X	Case[2]	White w/ tape (black)	–
ESD-R-47	48.0	25.5	16.0	X		Case[2]	White	–
ESD-R-47D-1	48.0	25.5	16.0		X	Case[2]	White w/ tape (black)	–
ESD-R-57	61.0	32.4	24.0	X		Case[2]	White	–
ESD-R-57D-1	61.0	32.4	24.0		X	Case[2]	White w/ tape (black)	–

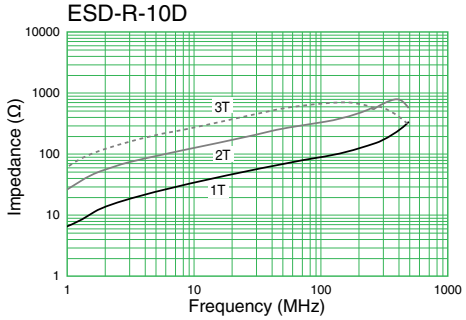
[1] Frequency range is for reference only. Please test with actual device before use.

[2] Case flame resistant rating: UL94V-2

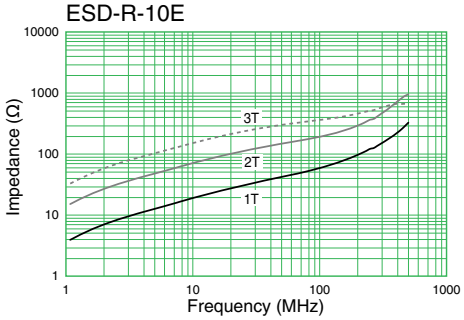
**Other sizes available. Please contact KEMET.*

Impedance vs. Frequency – Bare Type

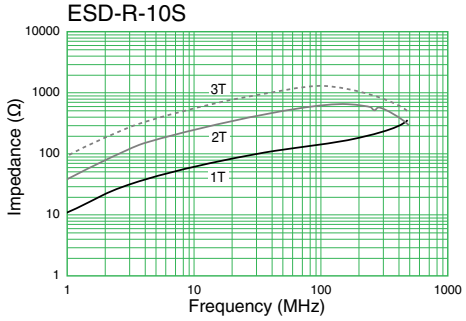
ESD-R-10D



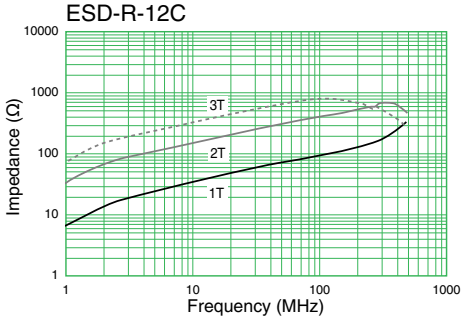
ESD-R-10E



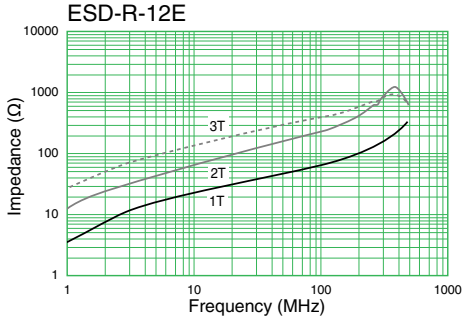
ESD-R-10S



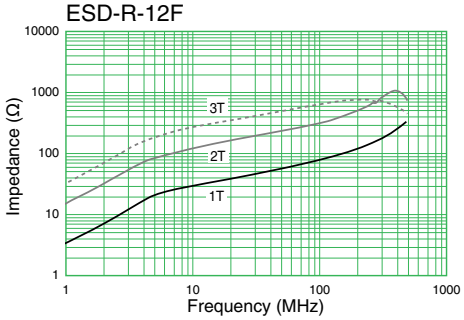
ESD-R-12C



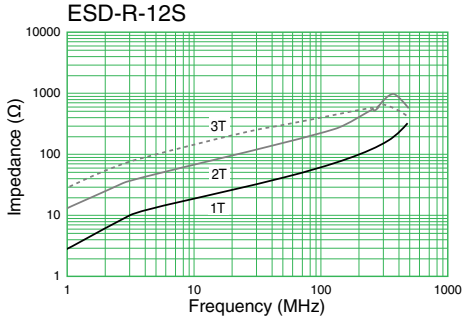
ESD-R-12E



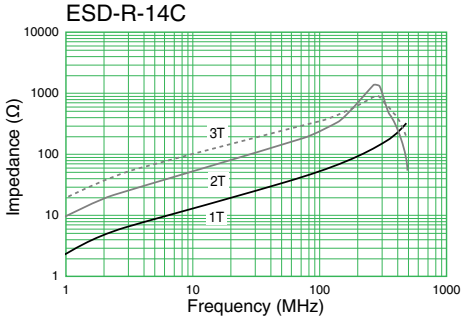
ESD-R-12F



ESD-R-12S

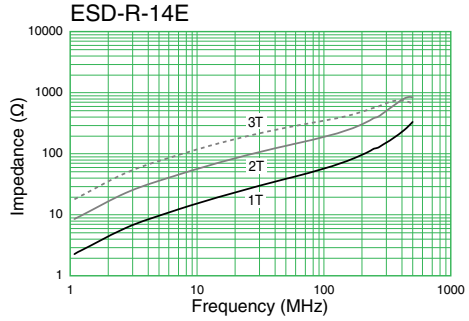


ESD-R-14C



Impedance vs. Frequency – Bare Type Cont'd

ESD-R-14E



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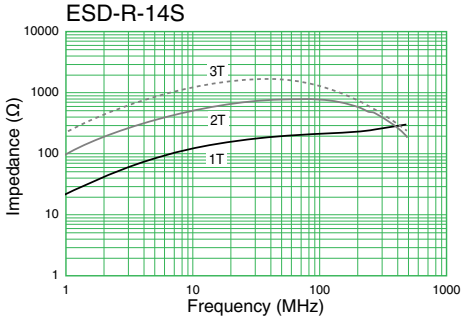
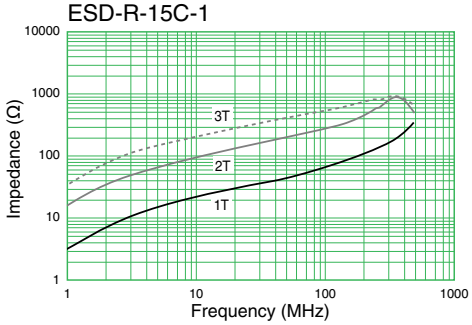


ESD-R-15C-1



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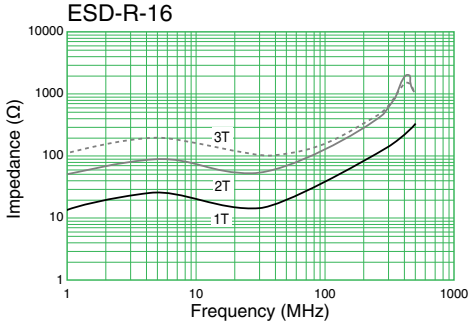
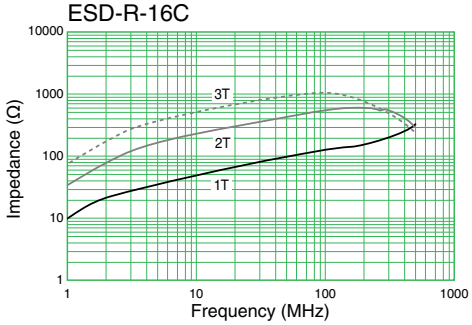
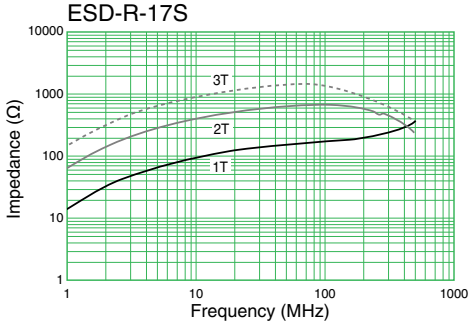


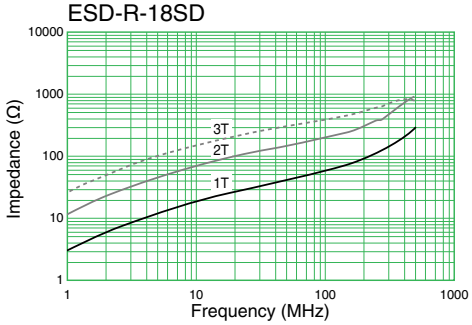
ESD-R-16C



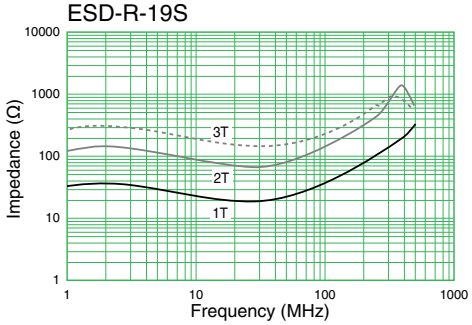
ESD-R-17S



ESD-R-18SD

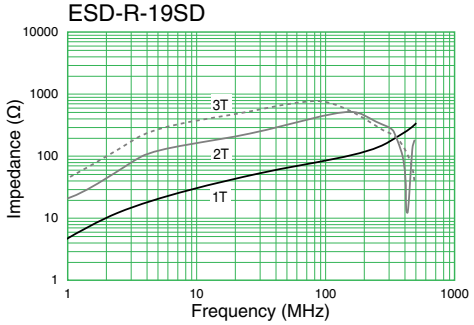


ESD-R-19S

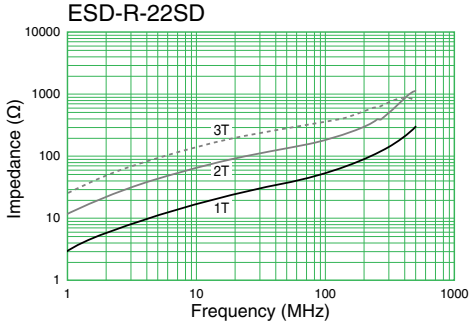


Impedance vs. Frequency – Bare Type Cont'd

ESD-R-19SD



ESD-R-22SD



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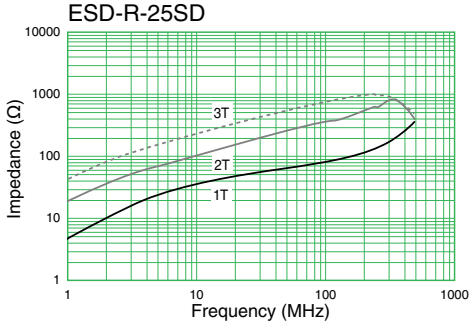

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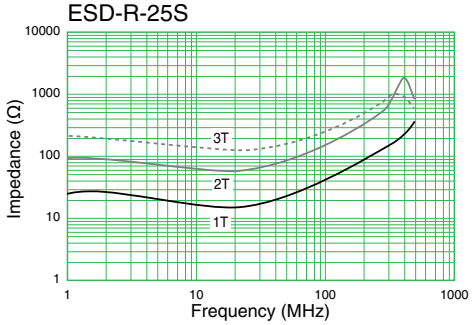
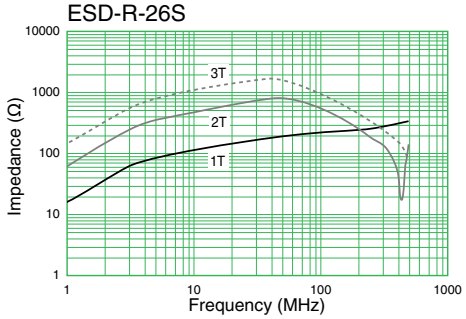


ESD-R-26S



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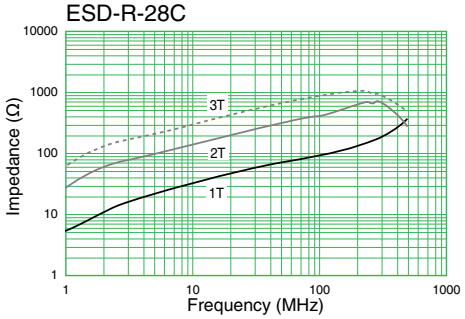
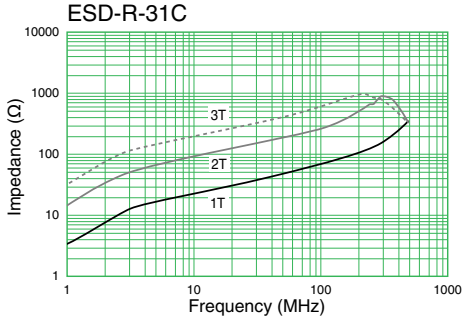
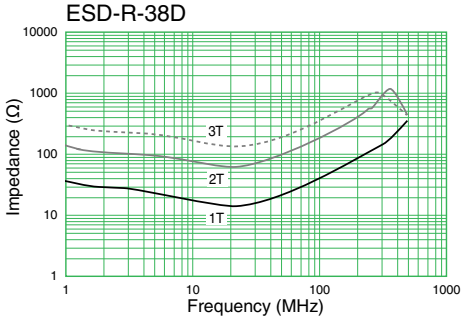


ESD-R-31C

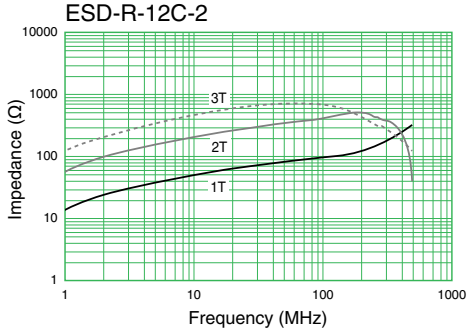


ESD-R-38D

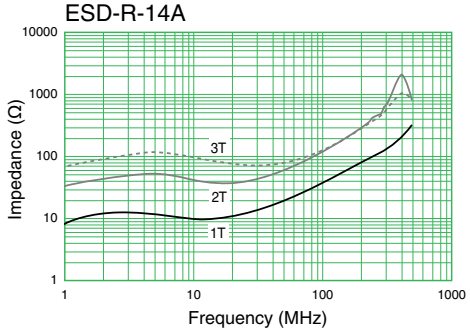


Impedance vs. Frequency – Coated Type

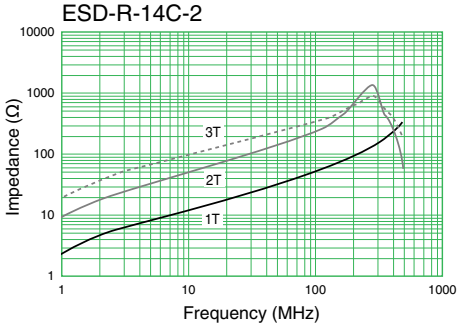
ESD-R-12C-2



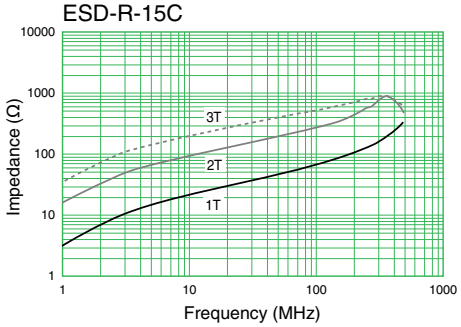
ESD-R-14A



ESD-R-14C-2



ESD-R-15C



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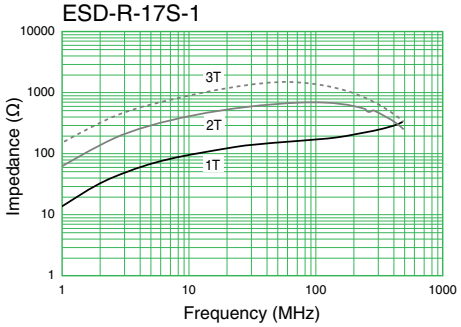
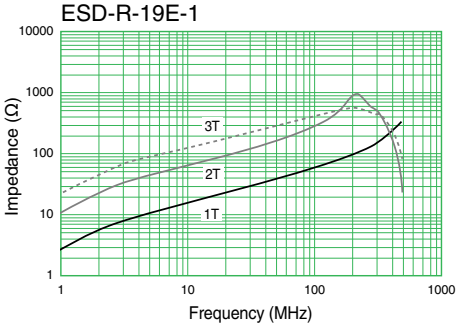
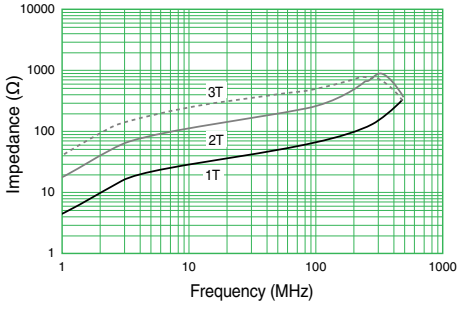


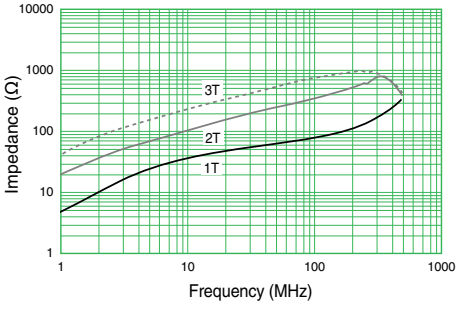
ESD-R-19E-1



ESD-R-25D-8

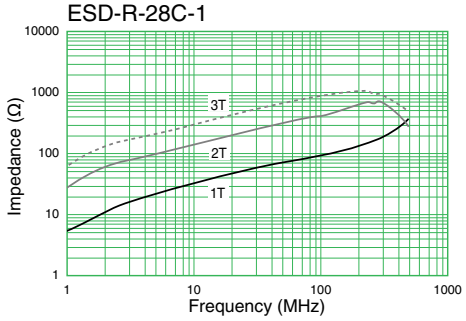


ESD-R-25L-A



Impedance vs. Frequency – Coated Type Cont'd

ESD-R-28C-1



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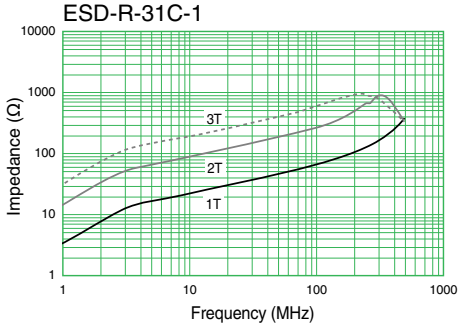
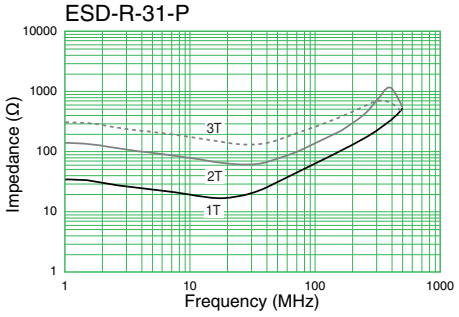
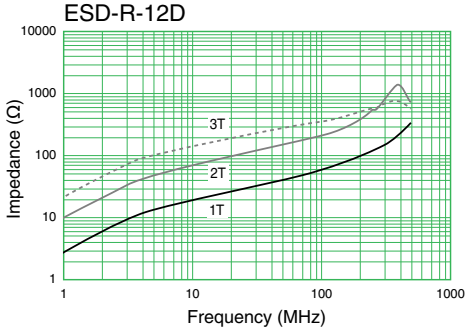


ESD-R-31-P

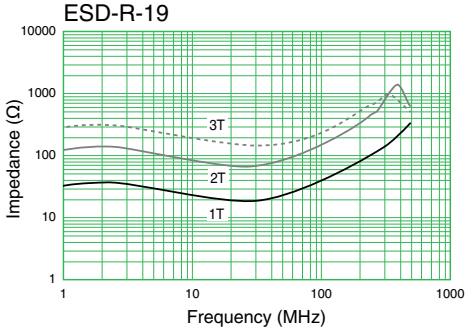


Impedance vs. Frequency – Case Type

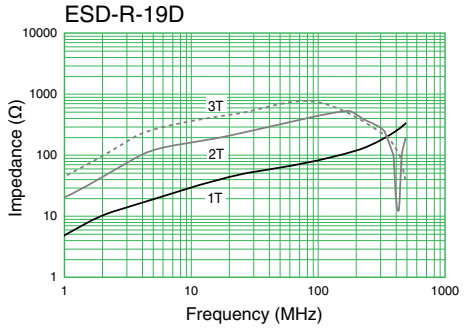
ESD-R-12D



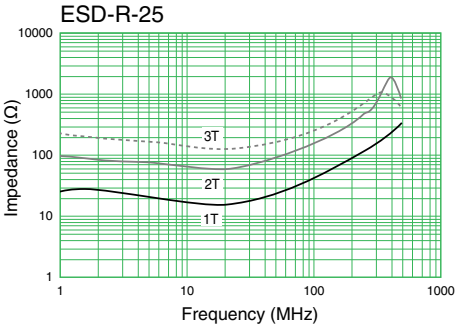
ESD-R-19



ESD-R-19D

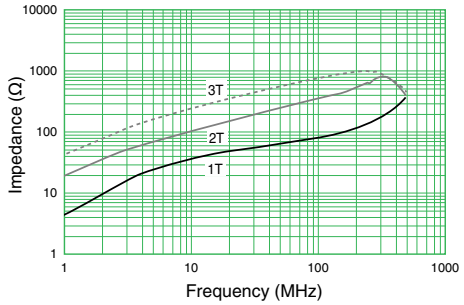


ESD-R-25

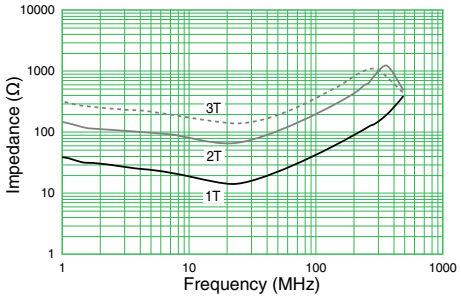


Impedance vs. Frequency – Case Type Cont'd

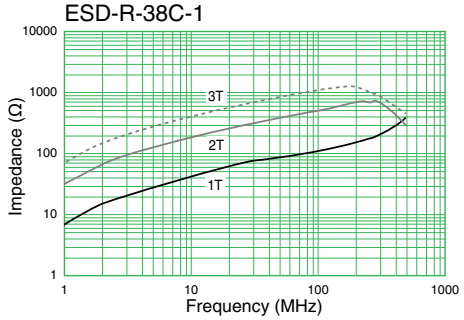
ESD-R-25D



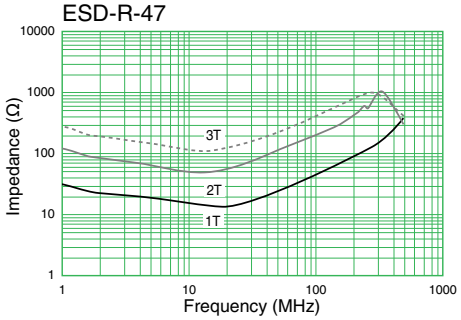
ESD-R-38



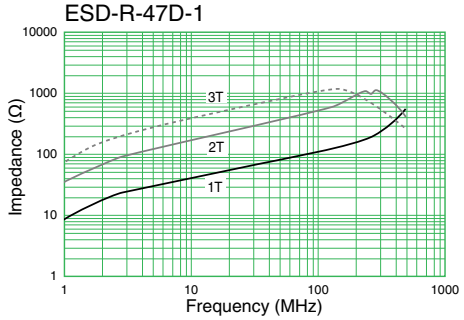
ESD-R-38C-1



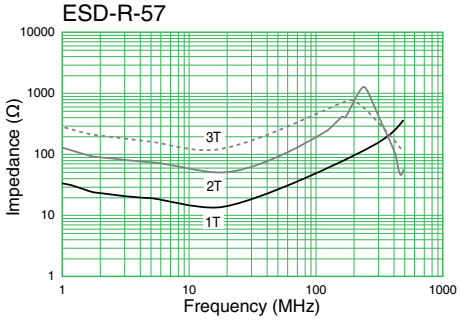
ESD-R-47



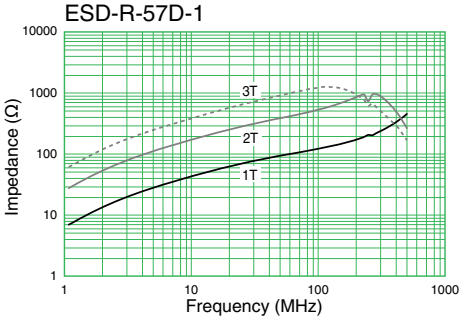
ESD-R-47D-1



ESD-R-57



ESD-R-57D-1



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