

Overview

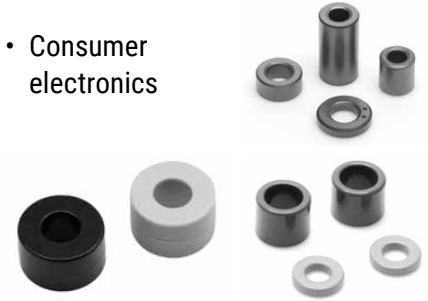
The KEMET ESD-R Series solid toroidal cores are designed for use on round cable. A wide range of MnZn and NiZn options are available in Bare, Coated, and Case types.

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.

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 1 – How to count turns

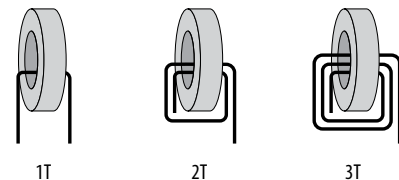


Figure 2 – Relationship between impedance and turn count. (Representative example: ESD-R-16C)

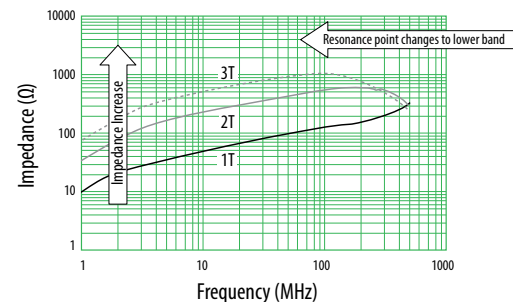
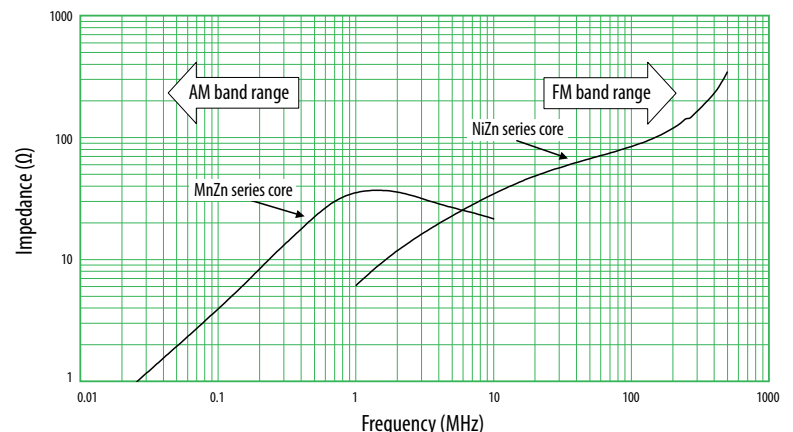
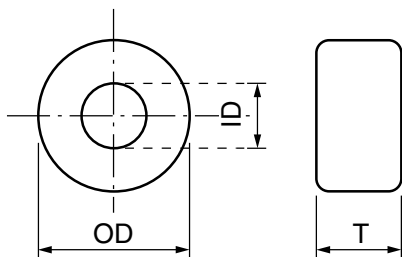


Figure 3 – Effective band range of Mn-Zn and Ni-Zn ferrite core material. (Representative example, measured with same-dimension ring core)

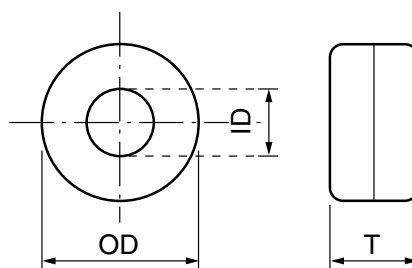


Dimensions – Millimeters

Bare and Coated Types

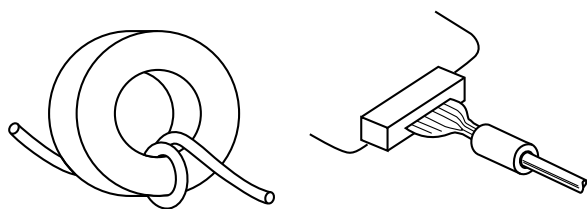


Case Type



See Table 1 for dimensions

Installation Examples



Environmental Compliance

All KEMET EMI cores are RoHS Compliant.



RoHS Compliant

Table 1 – Ratings & Part Number Reference

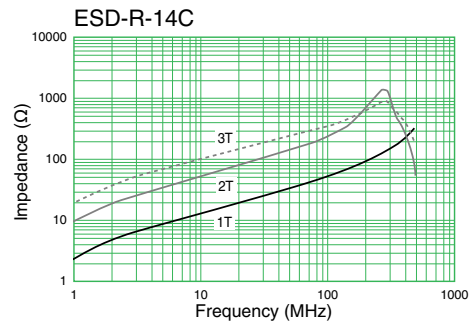
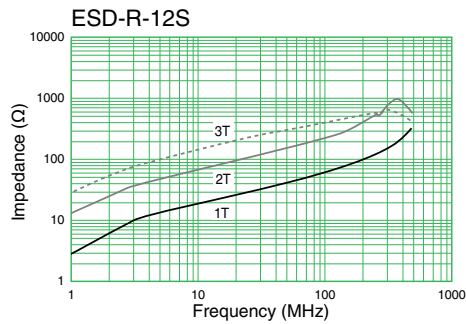
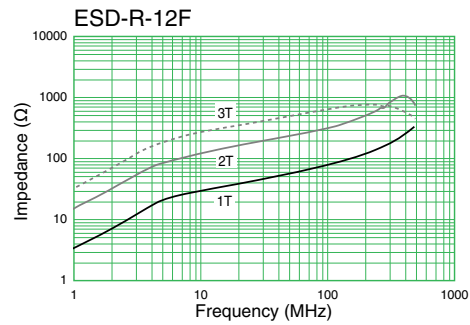
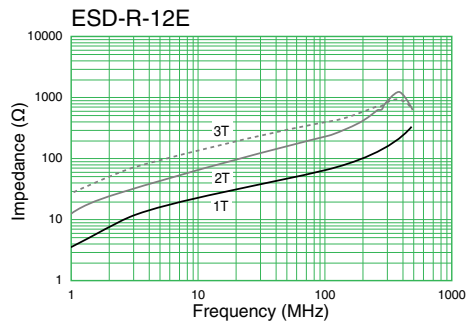
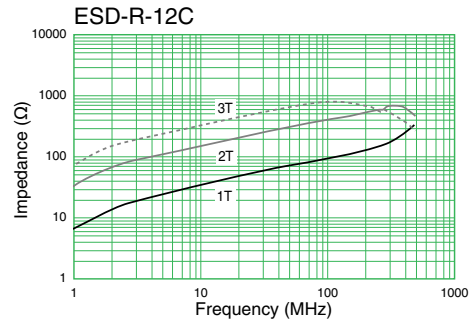
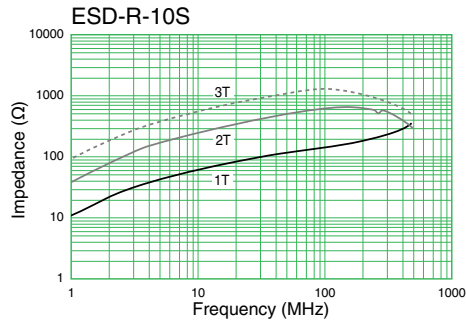
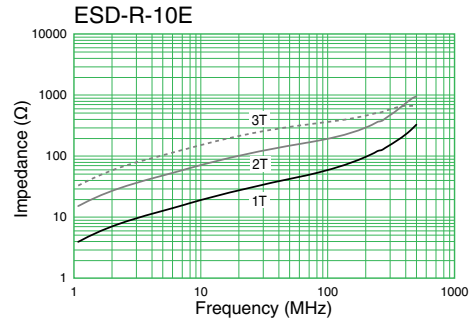
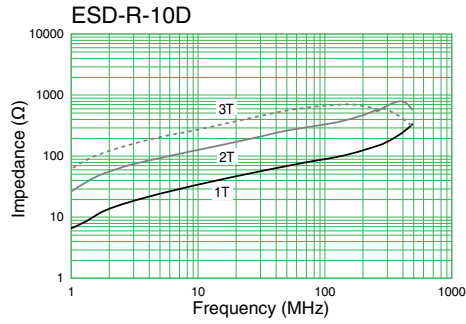
Part Number	Dimensions (mm)			Frequency Range ¹		Type	Color	Compatible Toroidal Core (Bare Type)
	OD	ID	T	≤ 100 MHz (AM band range)	≤ 300 MHz (FM band range)			
ESD-R-10D	9.5	5.0	10.0		X	Bare	–	–
ESD-R-10E	10.0	5.0	5.0		X	Bare	–	–
ESD-R-10S	10.5	5.5	20.0		X	Bare	–	–
ESD-R-12C	11.8	7.3	15.0		X	Bare	–	–
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.

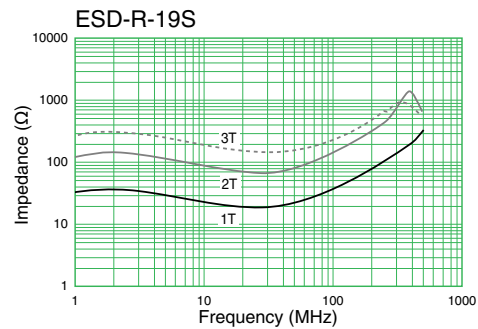
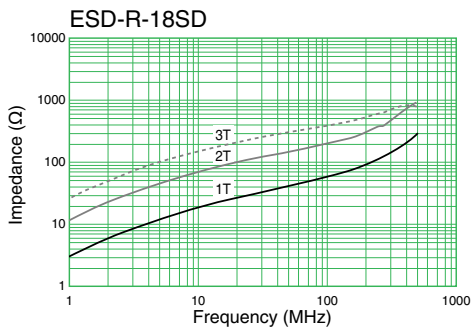
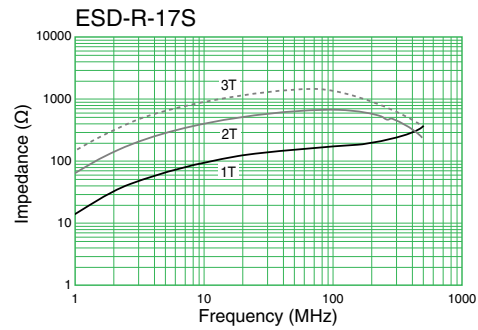
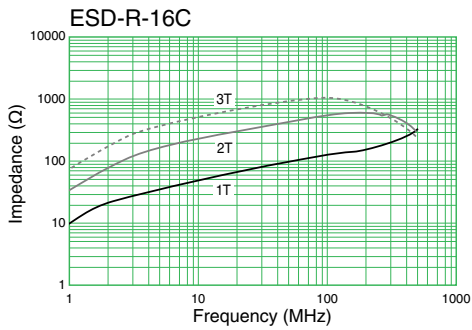
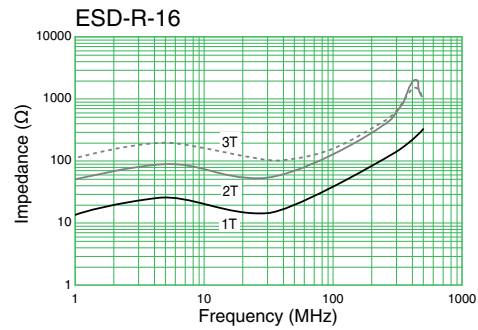
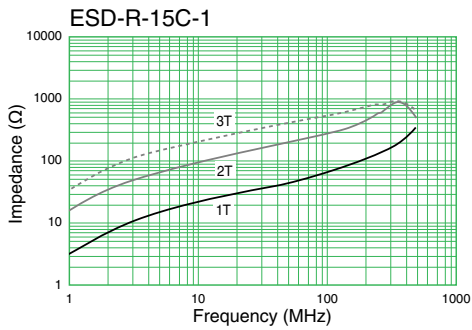
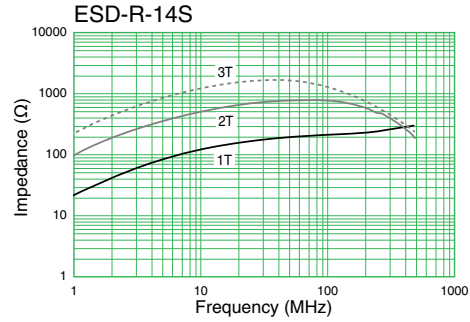
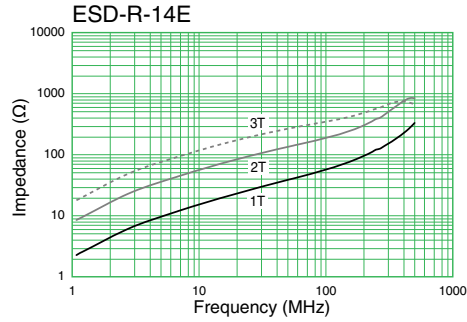
² Case flame resistant rating: UL94V-2

*Other sizes available. Please contact KEMET.

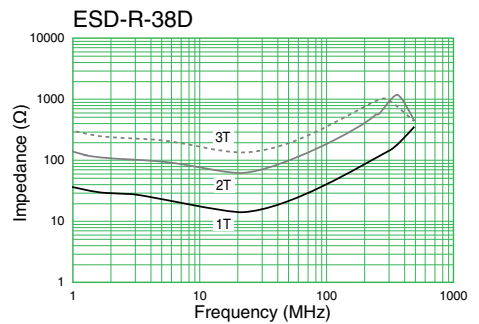
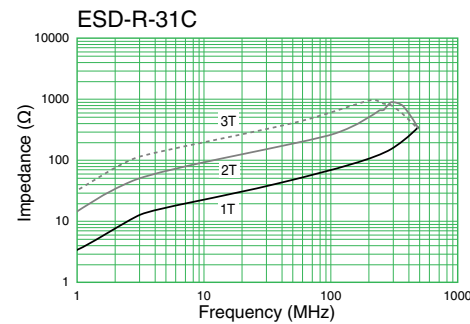
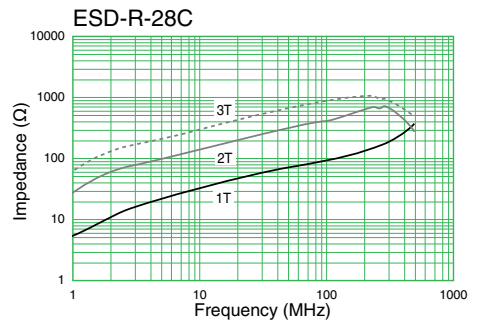
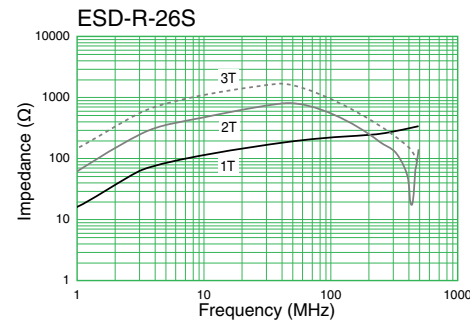
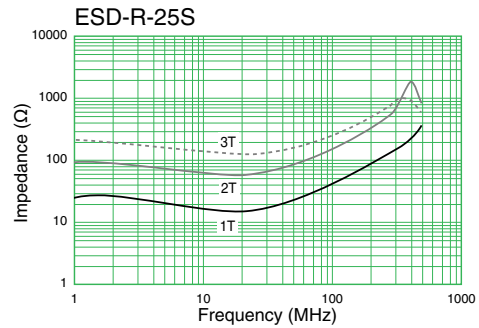
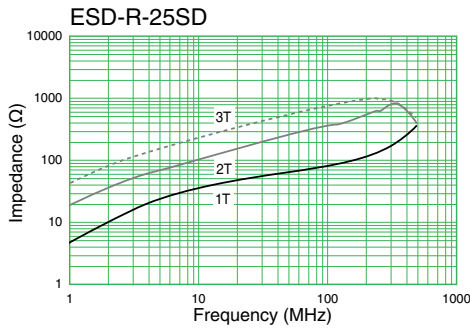
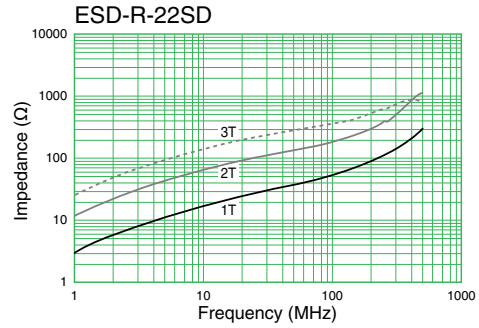
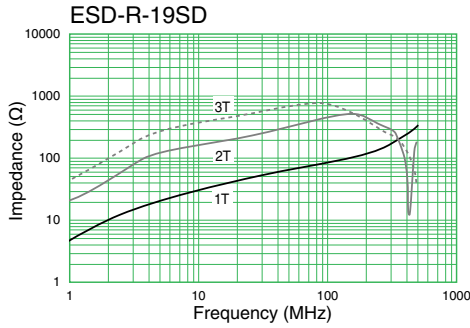
Impedance vs. Frequency – Bare Type



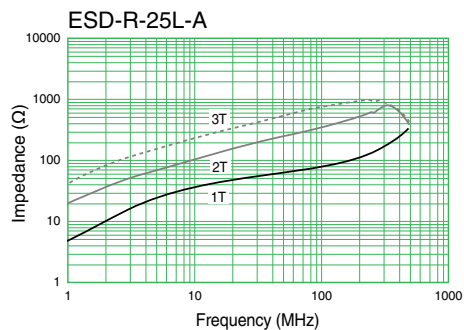
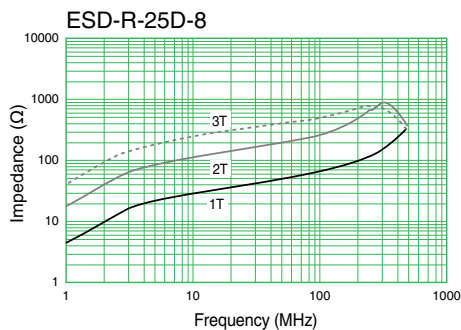
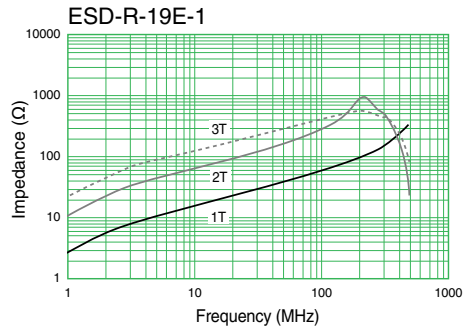
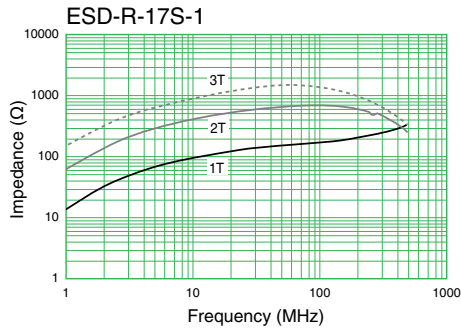
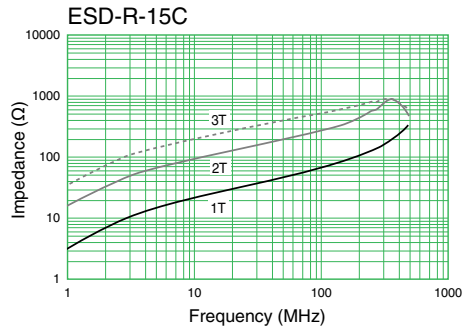
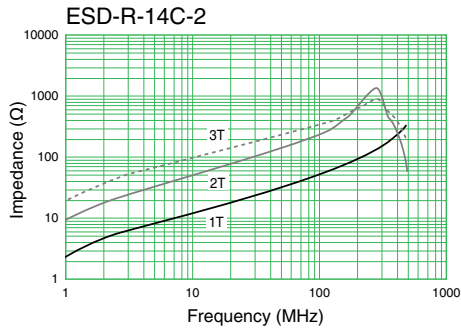
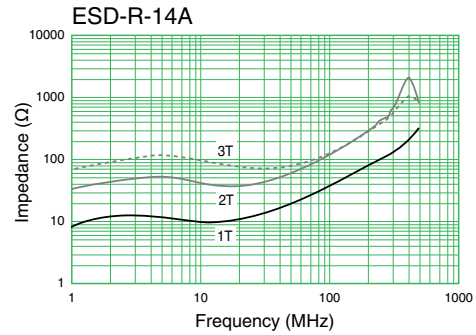
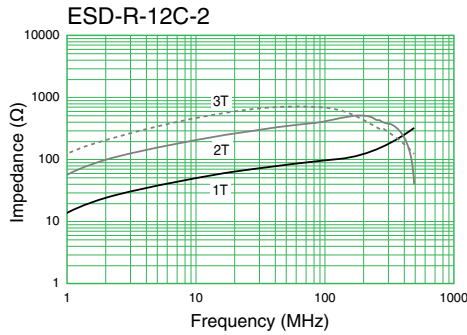
Impedance vs. Frequency – Bare Type Cont'd



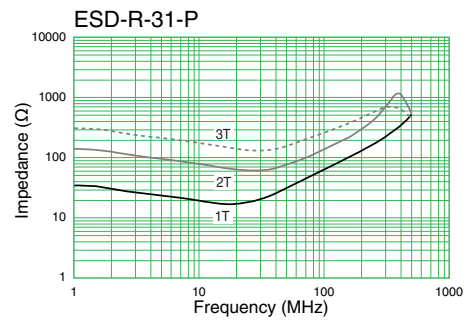
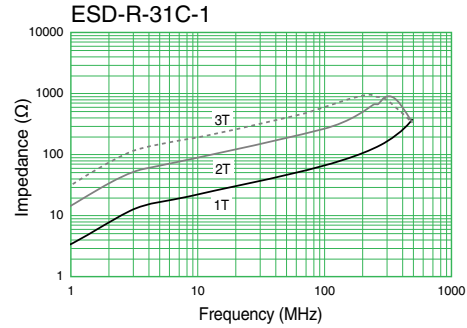
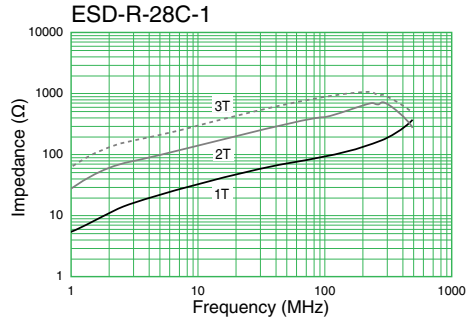
Impedance vs. Frequency – Bare Type Cont'd



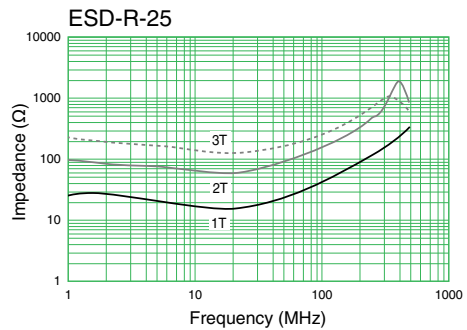
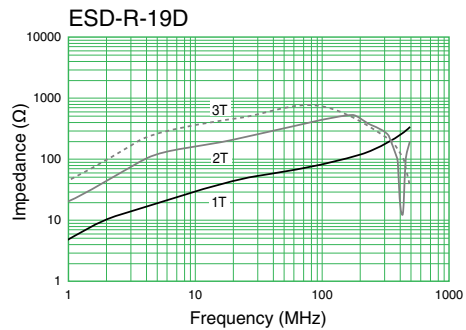
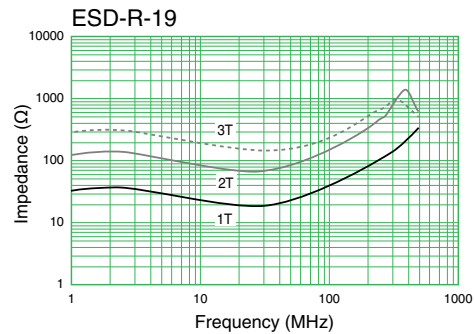
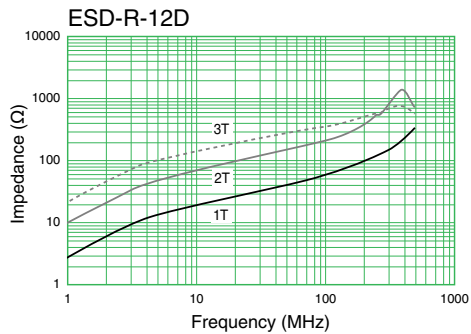
Impedance vs. Frequency – Coated Type



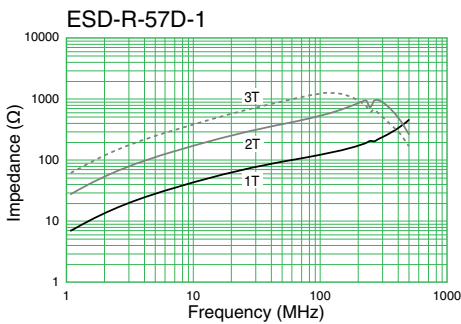
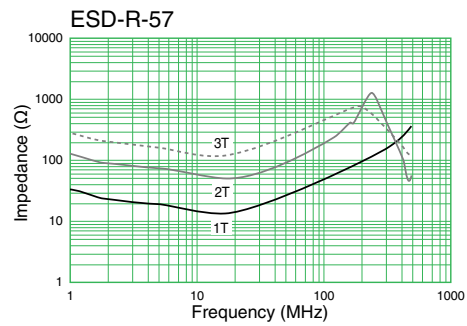
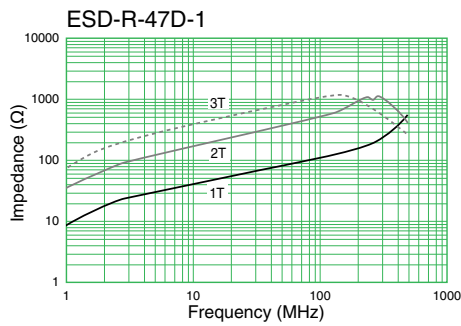
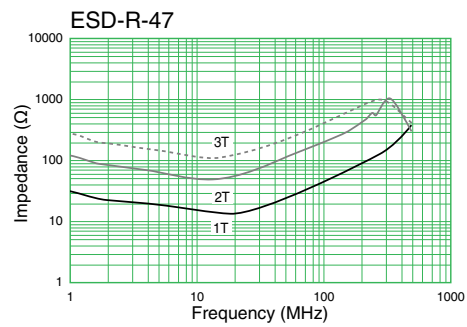
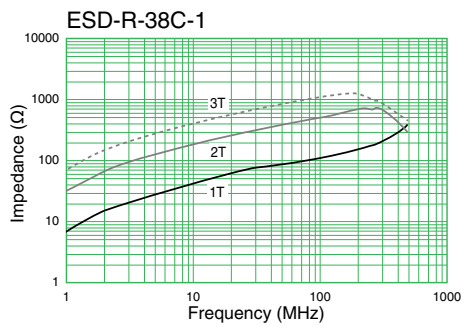
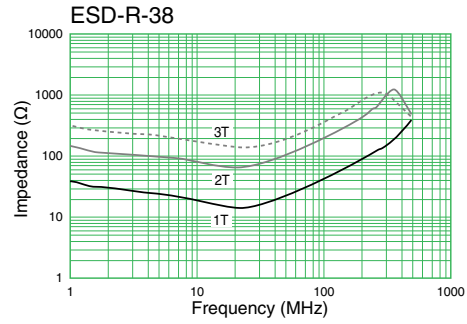
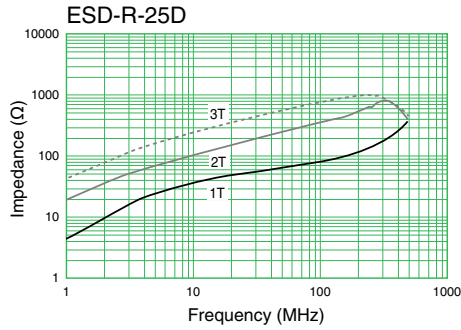
Impedance vs. Frequency – Coated Type Cont'd



Impedance vs. Frequency – Case Type



Impedance vs. Frequency – Case Type Cont'd



KEMET Electronic Corporation Sales Offices

For a complete list of our global sales offices, please visit www.kemet.com/sales.

Disclaimer

All product specifications, statements, information and data (collectively, the "Information") in this datasheet are subject to change. The customer is responsible for checking and verifying the extent to which the Information contained in this publication is applicable to an order at the time the order is placed.

All Information given herein is believed to be accurate and reliable, but it is presented without guarantee, warranty, or responsibility of any kind, expressed or implied.

Statements of suitability for certain applications are based on KEMET Electronics Corporation's ("KEMET") knowledge of typical operating conditions for such applications, but are not intended to constitute – and KEMET specifically disclaims – any warranty concerning suitability for a specific customer application or use. The Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application. Any technical advice inferred from this Information or otherwise provided by KEMET with reference to the use of KEMET's products is given gratis, and KEMET assumes no obligation or liability for the advice given or results obtained.

Although KEMET designs and manufactures its products to the most stringent quality and safety standards, given the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage.

Although all product-related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated or that other measures may not be required.

KEMET is a registered trademark of KEMET Electronics Corporation.