ESD-R-B Series Toroidal Cores with Snail-shaped Case

Overview

The KEMET ESD-R-B Series solid toroidal cores with snail-shaped case are designed for use on round cable. The wide range of MnZn and NiZn options allows for targeting of specific frequency ranges.

Benefits

- MnZn (≤ 100 MHz, AM band range) and NiZn (≤ 300 MHz, FM band range) options available
- Solid construction
- Case flame resistant rating: UL94V–2

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

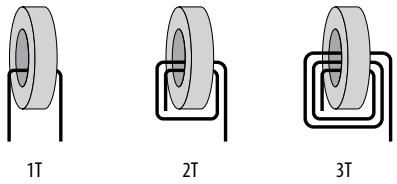
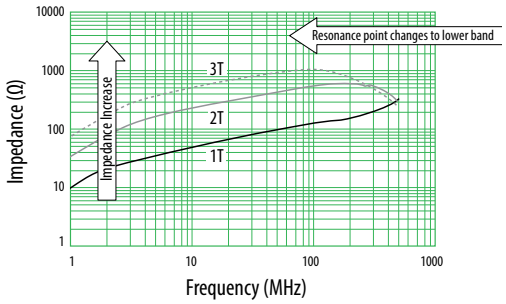


Figure 2 – Relationship between impedance and turn count. (Representative example: ESD-R-16C)



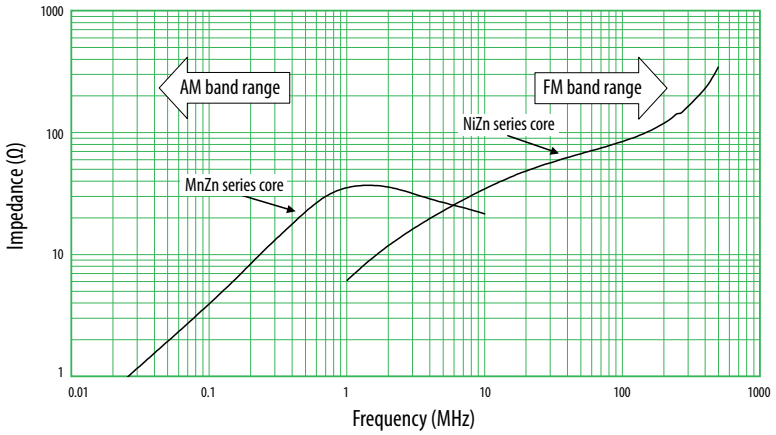
Core Material and Effective Frequency Range

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.

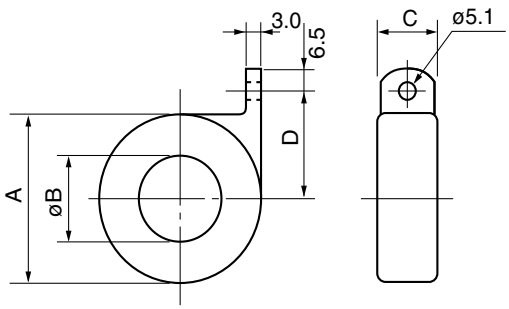
For reference, the Ni-Zn core material is typically effective for the frequencies in the MHz band range such as the FM-band, while the Mn-Zn core material is typically effective for the kHz band range such as the AM-band. See Figure 3.

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



See Table 1 for dimensions

Environmental Compliance

All KEMET EMI cores are RoHS Compliant.

RoHS Compliant

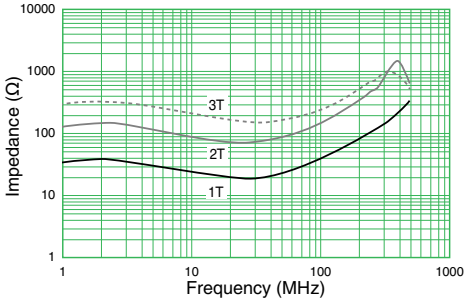
Table 1 – Ratings & Part Number Reference

Part Number	Dimensions (mm)				Frequency Range[1]		Case Color	Compatible Toroidal Core (Bare Type)
	A	B	C	D	≤ 100 MHz (AM band range)	≤ 300 MHz (FM band range)		
ESD-R-19B	21.5	8.8	13.0	18.5	X		White	ESD-R-19S
ESD-R-19D-B	21.5	8.8	13.0	18.5		X	Black	ESD-R-19SD
ESD-R-25B	29.3	13.9	15.0	23.0	X		White	ESD-R-25S
ESD-R-25D-B	29.3	13.9	15.0	23.0		X	Black	ESD-R-25SD
ESD-R-38B	42.4	17.9	16.0	28.0	X		White	ESD-R-38D
ESD-R-38D-B	42.4	17.9	16.0	28.0		X	Black	–
ESD-R-47B	51.5	25.5	17.5	34.0	X		White	–
ESD-R-47D-B	51.5	25.5	17.5	34.0		X	Black	–

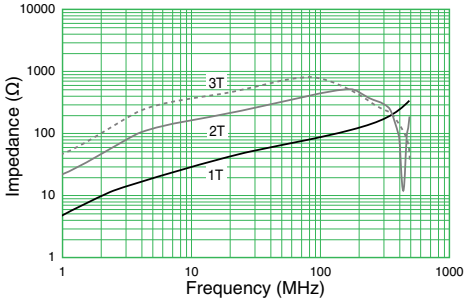
[1] *Frequency range is for reference only. Please test with actual device before use.*

Impedance vs. Frequency

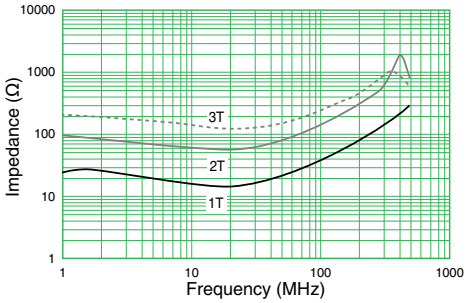
ESD-R-19B



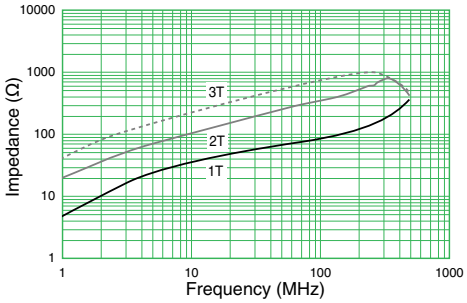
ESD-R-19D-B



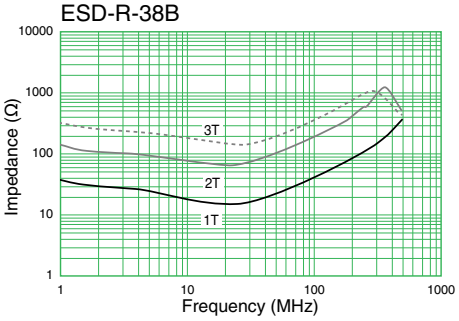
ESD-R-25B



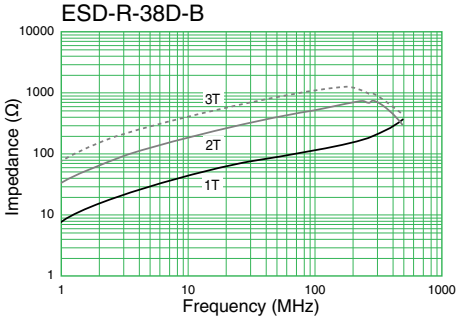
ESD-R-25D-B



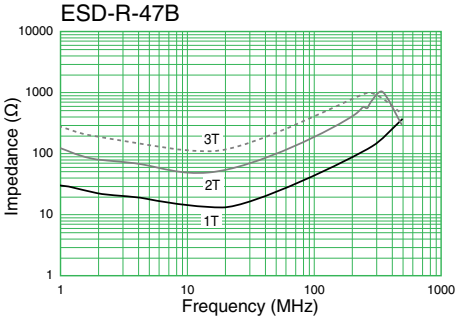
ESD-R-38B



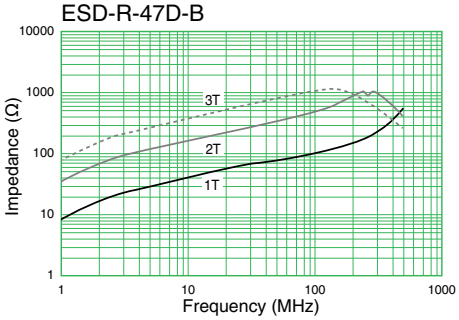
ESD-R-38D-B



ESD-R-47B



ESD-R-47D-B



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