

ESD-FPD-1 Series Split Cores with Plastic Clamp for Flat Cables for High Frequency (Bare)

Overview

The KEMET ESD-FPD-1 Series split cores are designed for use on flat cables. A wide range of Nickel Zinc (NiZn) options allow for targeting of specific high frequency ranges. Each product features two core parts and two nylon clamps.

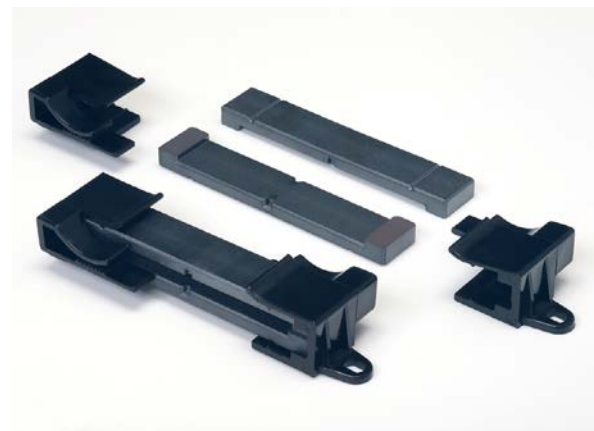
EMI cores are part of a family of passive components which address the issues of noise or electromagnetic interference (EMI) in circuits or systems.

Applications

- Office equipment
- Home appliances
- Inkjet printers
- Consumer electronics
- Industrial equipment
- Test and measurement equipment
- Medical equipment
- Audio-visual equipment

Benefits

- NiZn \leq 300 MHz (FM band range) options available
- Split construction
- Easy to install through its clamp mechanism
- Quick solution for post-cable assembly noise issue
- Nylon clamp



Each part number includes two ferrite parts and two clamps, as shown in the picture.

Part Number System

| ESD- | FPD- | 16- | 1 |
|--------|-----------|------------------|-----------------|
| Series | Form Type | Applicable Cable | Clamp Type |
| ESD- | Split | xx = xx Core | 1 = Nylon clamp |

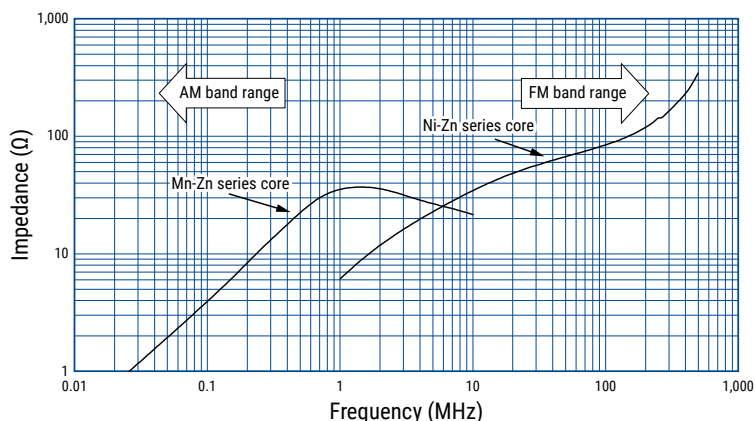
Core Material and Effective Frequency Range

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

The NiZn core material is typically effective for frequencies in the MHz band range such as the FM-band, while the MnZn core material is typically effective for the kHz band range such as the AM-band. See Figure 1.

It is recommended to measure the actual frequency range effectiveness in the target application.

Figure 1 – Effective band range of Mn-Zn and Ni-Zn ferrite core material. (Representative example, measured with same-dimension ring core)



Environmental Compliance

All KEMET EMI cores are RoHS compliant.



Magnetic Permeability of Ferrite Material

In order to achieve most efficient noise reduction, it is important to select the material according to the target frequency band. Depending on its magnetic permeability, a particular ferrite material will be effective in a certain frequency band. A schematic representation of the relationship between the magnetic permeability of each material and the corresponding effective band range is shown in Figure 1. Materials with higher magnetic permeability are effective in the lower frequency range, while those with lower magnetic permeability are effective in the higher frequency range. Thus, Mn-Zn products are mainly used for reducing conduction noise, while Ni-Zn products are commonly used for radiation noise countermeasures.

The effective frequency range varies depending on core shape, size and number of windings. This frequency dependence of the magnetic permeability as shown in the figure serves for reference purposes only and it should be tested on the actual device to determine its effectiveness.

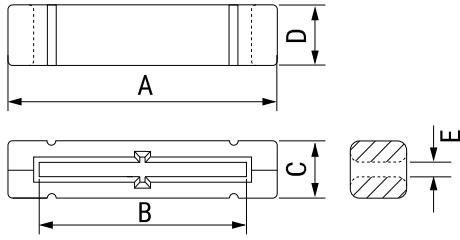
S18H, S15H, 10H, 7H, 5H, 1400L and 700L are KEMET's proprietary ferrite material names. Other materials can also be available on request.

Figure 2 - Relationship between the magnetic permeability of each material and its effective frequency range

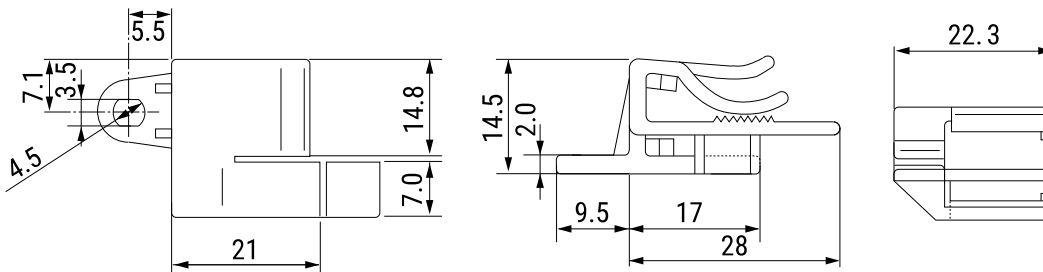


Dimensions – Millimeters

Core

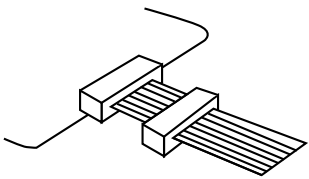


Clamp (Black nylon with cable stopper)



See Table 1 for dimensions

Installation Example



Performance Characteristics

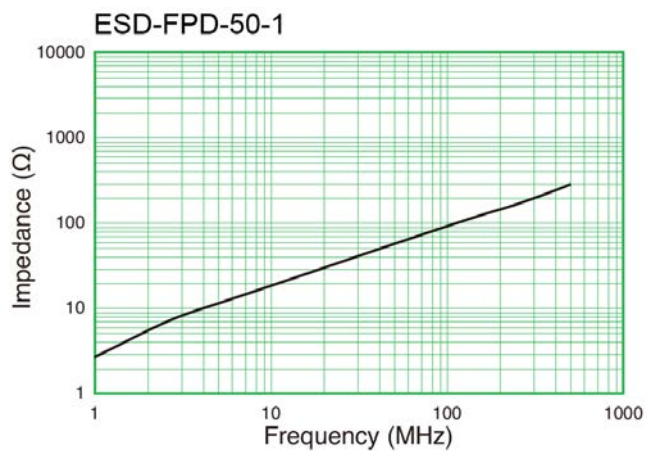
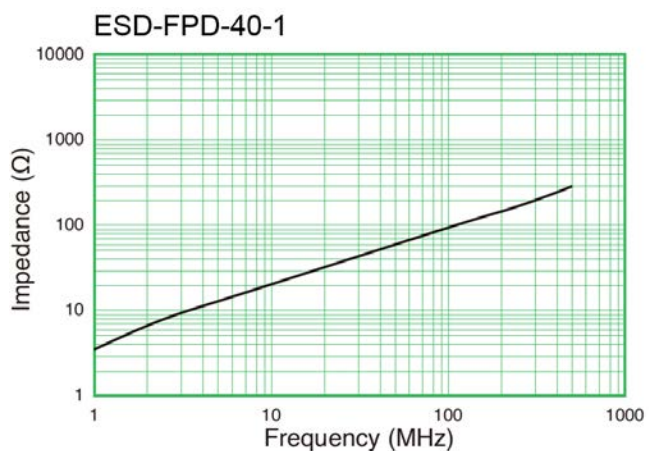
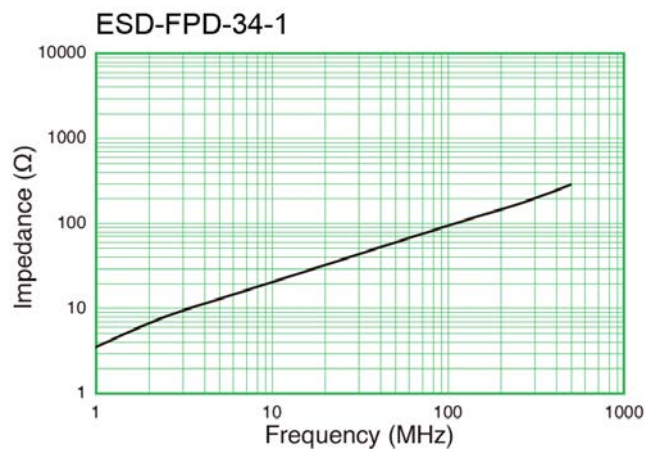
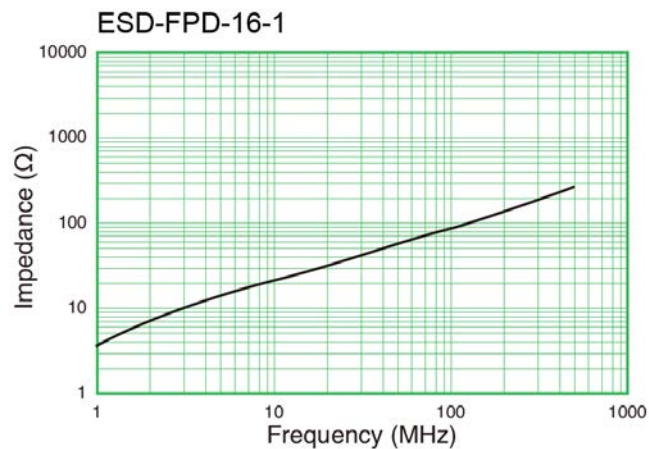
| Item | Performance Characteristics |
|-----------------------|-----------------------------|
| Operating temperature | -25°C to +85°C |
| Frequency range | High Frequency |
| Outer length | 37.0 – 80.0 mm |
| Outer width | 10.0 mm |
| Inner length | 25.4 – 68.6 mm |
| Inner width | 2.0 – 2.6 mm |
| Thickness | 12.7 mm |
| Type | Bare with nylon clamp |
| Material | NiZn 700L |

Table 1 – Ratings & Part Number Reference

| Part Number | Dimensions (mm) | | | | | Weight (g) | Applicable Cable | Frequency Range ¹ ≤ 300 MHz (FM band range) | Material | |
|--------------|-----------------|-----------|-----------|-----------|----------|------------|------------------|-----------------------------------------------------------|----------|------|
| | A | B | C | D | E | | | | MnZn | NiZn |
| ESD-FPD-16-1 | 37.0 ±1.0 | 25.4 ±1.0 | 10.0 ±2.0 | 12.7 ±1.0 | 2.6 ±1.0 | 23.84 | 16 Core | X | - | 700L |
| ESD-FPD-34-1 | 60.0 ±1.0 | 48.3 ±1.0 | 10.0 ±2.0 | 12.7 ±1.0 | 2.0 ±1.0 | 34.54 | 34 Core | X | - | 700L |
| ESD-FPD-40-1 | 68.0 ±1.0 | 56.0 ±1.0 | 10.0 ±2.0 | 12.7 ±1.0 | 2.0 ±1.0 | 39.34 | 40 Core | X | - | 700L |
| ESD-FPD-50-1 | 80.0 ±1.0 | 68.6 ±1.0 | 10.0 ±2.0 | 12.7 ±1.0 | 2.0 ±1.0 | 44.74 | 50 Core | X | - | 700L |

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

Impedance vs. Frequency



Packaging

| Part Number | Packaging Type | Pieces per Box |
|--------------|----------------|----------------|
| ESD-FPD-16-1 | Tray | 800 |
| ESD-FPD-34-1 | | 250 |
| ESD-FPD-40-1 | | 240 |
| ESD-FPD-50-1 | | |

Handling Precautions

EMI Cores should be stored in normal working environments. While the EMI Cores themselves are quite robust in other environments, avoid exposure to high temperatures, high humidity, corrosive atmospheres and long term storage for case, snap-on and split types.

KEMET recommends that maximum storage temperature not exceed 40°C and maximum storage humidity not exceed 75% relative humidity. Atmospheres should be free of chlorine, sulfur and alkali bearing compounds. Avoid also storage near strong magnetic fields as this might magnetize the product.

Temperature fluctuations should be minimized to avoid condensation or cracks on the parts. Mechanical shocks can bring to cracks as well.

Export Control

For customers in Japan

For products that are controlled items subject to the “Foreign Exchange and Foreign Trade Law” of Japan, the export license specified by the law is required for export.

For customers outside Japan

EMI Core products should not be used or sold for use in the development, production, stockpiling or utilization of any conventional weapons or mass-destructive weapons (nuclear weapons, chemical or biological weapons, or missiles), or any other weapons.

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