3M™ Flux Field Directional Materials AB5016RF and AB5016RF-B

Product Description

3M™ Flux Field Directional Materials (FFDM) AB5016RF and FFDM AB5016RF-B are magnetic sheets for radio frequency identification applications. Designed to have high magnetic permeability at 13.56MHz, these products effectively solve the interference effect of tag and reader in the metal surrounding atmosphere.

Features and Benefits

- Designed for RFID and NFC applications to de-couple the NFC or RFID antenna from metal surfaces by directing the antenna flux fields away from the metal object or surface.
- Products can also be evaluated for Wireless Power systems to enhance power transfer efficiency between primary sending and pick-up antenna coils.

Applications

3M FFDM AB5016RF and AB5016RF-B are typically used for the 13.56MHz NFC antenna tag or reader applications. The FFDM materials are normally attached to the NFC antenna and positioned between the antenna and the metal or other conductive surface that the antenna/FFDM is attached to. By inserting the 3M FFDM AB5016RF or AB5016RF-B between the antenna and conductor surface, it is possible to significantly limit occurrences of eddy current and correct for resonant frequency shifts to the antenna, which are caused by the interaction of the antenna and the conductor surface (i.e. metal surface).

An NFC antenna near a metal surface can induce eddy currents in the metal surface, which in turn can degrade the antenna performance for read range. The FFDM material redirects the flux field of the antenna away from the metal surface and limits the eddy current generation and associated negative performance impact.

3M FFDM AB5016RF Effectiveness

Many factors determine true communication range such as antenna size, sensitivity, field intensity, modulation algorithm and environment. To maximize the performance, it is necessary to take into account the fact that the inductance of antenna may be changed by 3M FFDM AB5016RF and surrounding material.

3M™ Flux Field Directional Materials AB5016RF and AB5016RF-B Typical Properties

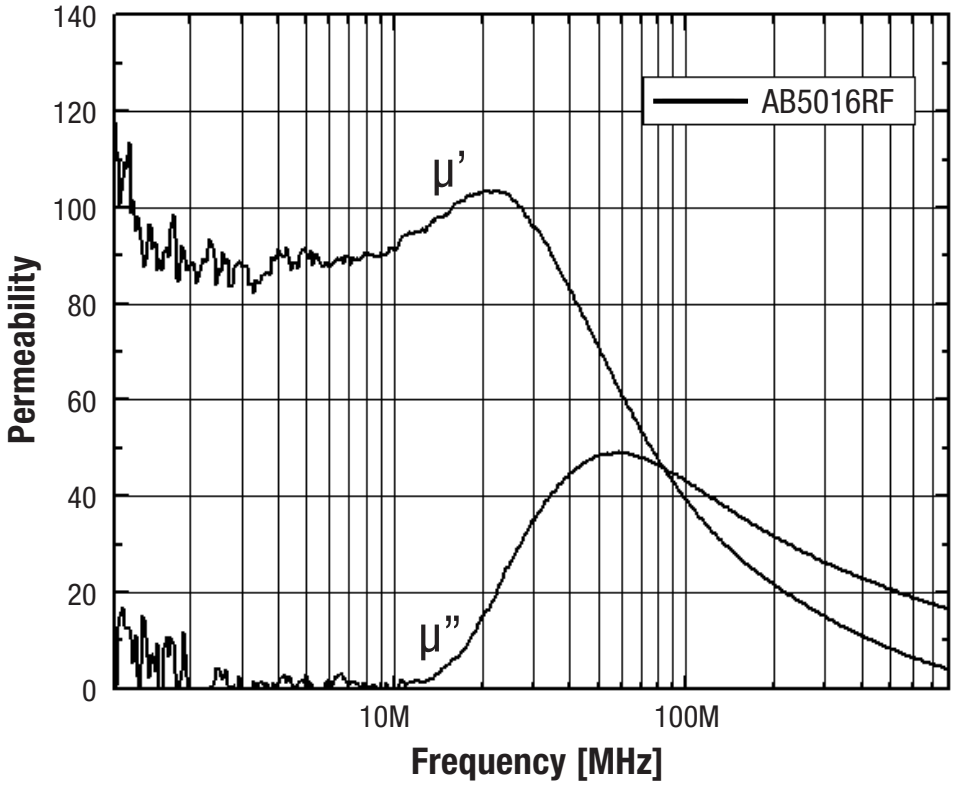
Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Properties	Typical Value
Type of Absorber Material	Sintered ferrite sheet
Total Thickness	0.18mm
Structure	AB5016RF: 0.01mm adhesive/0.16mm ferrite/0.01mm adhesive
	AB5016RF-B: 0.01mm adhesive/0.16mm ferrite/0.01mm black PET
Magnetic Permeability[1]	105 (at 13.56MHz)
Standard Size	115mm x 115mm
Resistivity[2]	1 x 10^6 Ω
Operating Temperature	-30 ~ +85°C

[1] This value was measured with Agilent E4991A RF Impedance/Material analyzer.

[2] Test method is ASTM D257.

Figure 1: Real and Imaginary Part of Permeability with Frequency



Storage and Shelf Life

The shelf life of 3M™ Flux Field Directional Materials AB5016RF and AB5016RF-B is 12 months from the shipment date from the manufacturing location when stored in original packaging at 21°C (70°F) and 50% relative humidity.

Safety Data Sheet

Please consult Safety Data Sheet prior to use.

Regulatory

For regulatory information about this product, contact your 3M representative.

Technical Information

The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

Product Use

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