

3M™ Flux Field Directional Materials AB5010RF and AB5010RF-B

Product Description

3M™ Flux Field Directional Materials AB5010RF and AB5010RF-B use magnetic ferrite tuned for radio frequency identification applications, with a different structure for different mounting purpose, that are designed to have high magnetic permeability at 13.56MHz.

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.

Product Structures

AB5010RF Structure

Liner
0.01 mm Double-Sided Adhesive Tape
Ferrite Sheet
0.01 mm Double-Sided Adhesive Tape
Liner

AB5010RF-B Structure

0.01 mm Black Polyester film tape
Ferrite Sheet
0.01 mm Double-Sided Adhesive Tape
Liner

Application Ideas

3M FFDM AB5010RF and AB5010RF-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 AB5010RF or AB5010RF-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.

Construction

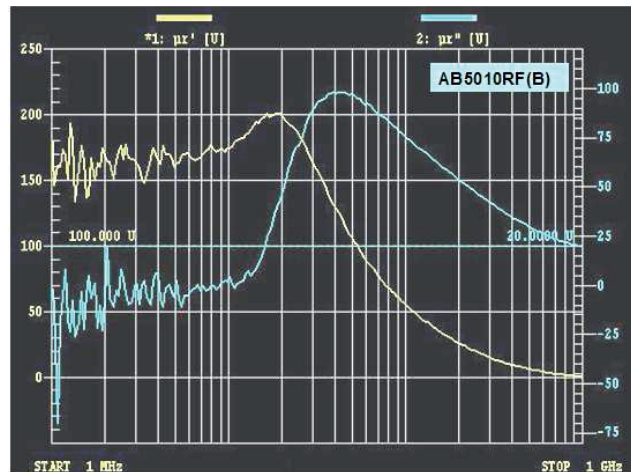
Properties	Typical Value
Type of Absorber Material	Sintered ferrite sheet
Product Structures	AB5010RF: Ferrite sheet with top & bottom side adhesive tape
	AB5010RF-B: Ferrite sheet with top PET cover & bottom D/C adhesive tape
Total Thickness	0.1mm (0.08mm ferrite)
Magnetic Permeability ¹	150 (at 13.56MHz)
Standard Size	125mm x 125mm
Resistivity ²	1 x 10 ⁶ Ω
Operating Temperature	-30 ~ +85°C

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

²Test method is ASTM D 257.

Typical Real and Imaginary part of Permeability with Frequency

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



Application Techniques

3M™ Flux Field Directional Materials AB5010RF and AB5010RF-B are designed for thin NFC/RFID antenna tag, its total thickness 0.1mm that allows thinner design for the whole anti-metal interference NFC antenna to lower to below 0.25mm, this provides a big space advantage to NFC smart phone design, that become NFC smart phone thinner real.

Many factors determine true communication range such as antenna size, sensitivity, field intensity, modulation algorithm and environment.

3M FFDM AB5010RF and AB5010RF-B can largely improve reading distance by improving permeability even with thinner thickness by comparison with other type of ferrite at the same thickness, detailed permeability can referred to permeability chart. Just simple inserting 3M FFDM AB5010RF and AB5010RF-B can increase communication distance. To maximize the performance, it is necessary to take into account the fact that the inductance of antenna may be increased by 3M FFDM AB5010RF and AB5010RF-B.

Storage and Shelf Life

The shelf life of 3M™ Flux Field Directional Materials AB5010RF and AB5010RF-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 the product Safety Data Sheet before 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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Electronics Materials Solutions Division

3M Center, Building 225-3S-06
St. Paul, MN 55144-1000
1-800-251-8634 phone
651-778-4244 fax
www.3M.com/electronics

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