

# 3M™ Flux Field Directional Material EM15TF

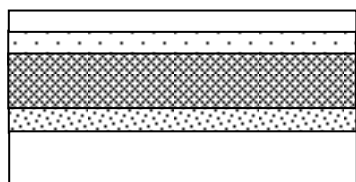
## Product Description

3M™ Flux Field Directional Material EM15TF Series is multi-layer construction consisting of a primary inner soft magnetic layer with protective PET cover film and an acrylic pressure sensitive adhesive.

- High permeability and low loss magnetic material
- Thin overall construction
- Black PET protection tape cover film
- Pressure sensitive acrylic adhesive
- Supplied on a removable liner for ease of handling

3M FFDM EM15TF Series is available in standard 125mm x 125mm sheet  
(\* Customized size and thickness are available)

## Product Construction/Material Description



Cover Film SCT  
Magnetic Layer  
PSA Adhesive Layer  
Release Liner

Product	Thickness(mm)			
	Cover	Magnetic	PSA	Total
EM15TF-007	0.010 (Customized thickness are available)	0.050	0.010 (Customized thickness are available)	0.070
EM15TF-008		0.060		0.080
EM15TF-010		0.080		0.100
EM15TF-012		0.100		0.120
EM15TF-014		0.120		0.140

\* Typical tolerance of each thickness: +/- 10 %

## Applications

3M™ Flux Field Directional Materials EM15TF Series is typically used for the 13.56MHz RFID reader and tag to be mounted directly upon highly conductive surface. This might be the reader antenna surrounded by metallic body or tag mounted on conductive substrate such as gas bottles. However, it is not possible to communicate each other under this metallic atmosphere. The magnetic fluxes through the conductive surface induce eddy current within the conductor, which opposes the field responsible for their creation. It reduces the magnetic field on the

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surface of the conductor to such a degree that communication between reader and tag becomes no longer possible. By inserting 3M FFDM EM15TF Series between antenna and conductor surface it is possible to largely prevent the occurrences of the eddy currents. This makes it possible to mount the antenna on metal surface. Many factors determine true communication range such as antenna size, sensitivity, field intensity, modulation algorithm and environment. As shown in Fig. 2, just simple inserting 3M FFDM EM15TF Series 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 EM15TF Series.

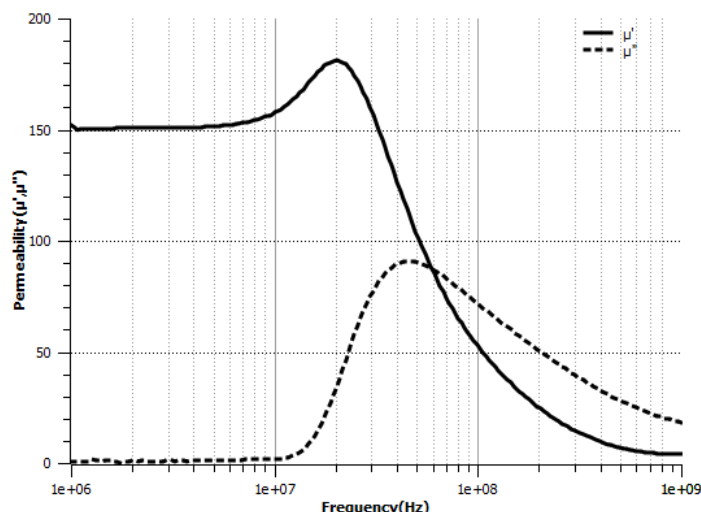


Figure1: Real and Imaginary part of Permeability with Frequency.

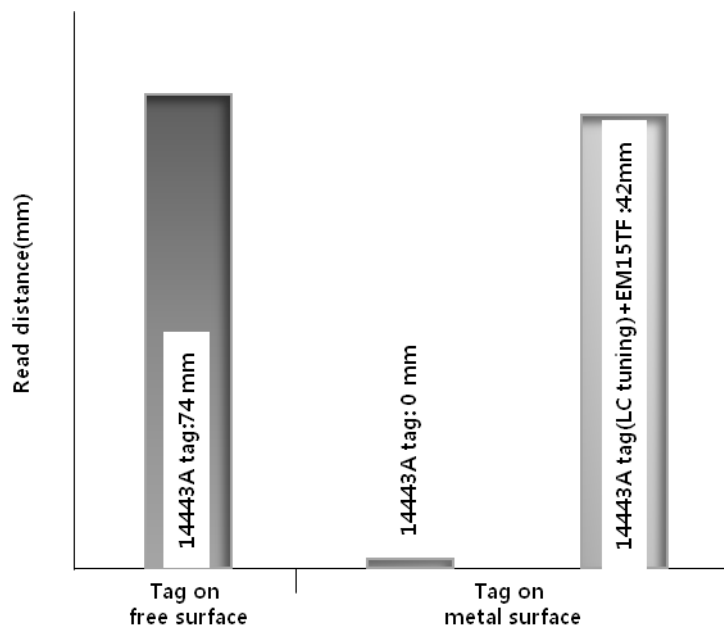


Figure 2: Data Communication Length between Reader and ISO 14443A Type.

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## Typical Physical Properties and Performance Characteristics

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
Magnetic permeability <sub>1</sub>	150 (@ 3 MHz)
Standard size (mm)	125 x 125
Resistivity <sub>2</sub> (Ω)	1 x 10 <sup>6</sup>

1. This value was measured with Agilent E4991A RF Impedance/Material Analyzer.(Fig.1)

2. Test method is ASTM D257

## Environmental Performance

### Agency Approvals & Self Certifications

RoHS Compliant 2011/65/EU” means that the product or part (“Product”) does not contain any of the substances in excess of the maximum concentration values in EU Directive 2011/65/EU, as amended by Commission Decision 2011/65/EU, unless the substance is in an application that is exempt under RoHS. This information represents 3M's knowledge and belief, which may be based in whole or in part on information provided by third party suppliers to 3M.

## Regulatory

For regulatory information about this product, refer to our website at [www.3M.com/electronics](http://www.3M.com/electronics).

## For Additional Information

To request additional product information or to arrange for sales assistance, call toll free 1-800-251-8634. In the U.S., address correspondence to: 3M, Electronics Markets Materials Division, 3M Korea Innovation Center, 2-5, Seoku-dong, Hwaseong-si, Gyeonggi-do, 445-170, Korea. Our phone number is 82-31-8058-8000 for reception transfer.

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