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Technical Data | September 2024

3M™ EMI Absorber AB8000 Series

Product Description

3M™ EMI Absorber AB8000 Series is a high-temperature magnetic EMI absorber for near-field applications from 300 MHz to 4 GHz. 3M absorber AB8000 series is a composite absorber consisting of a silicone carrier resin and magnetic fillers. This material helps suppress near-field EMI noise and interacts and/or influences an Electro-Magnetic (EM) field to help reduce EMI transmissions or reflections

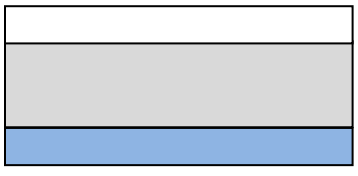
3M™ EMI Absorber AB8000 Series typical uses in the frequency range above the 5-10 MHz range is typically as an EMI EM field absorber as the higher loss (u") characteristics of the absorber provides excellent EM field reduction. 3M absorber AB8000 efficiently couples to the EM field or provides EM absorbing.

Key Features

- High permeability
- Absorbing performance from 300 MHz to 4 GHz
- High performance resin system for solder reflow stable performance
- High temperature resistance (150°C)
- Available without adhesive
- Multiple thickness options
- Supplied on removable liners for easy handling and die-cutting
- 2-year shelf life
- *Halogen Free

*Halogen Free is defined as having maximum 900 ppm bromine, maximum 900 ppm chlorine, and/ or maximum 1500 ppm total bromine and chlorine, per IEC 61249-2-21

3M™ EMI Absorber AB8000 Series



Transparent PET Film Release Liner

Composite Absorber Layer

Blue PET Film Release Liner

3M™ EMI Absorber AB8000 Series

Product Construction/ Materials Description

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

3M™ EMI Absorber AB8000 Product Code	Magnetic Layer Thickness Microns (mm)
AB8010-WO	100 um (0.1 mm)
AB8020-WO	200 um (0.2 mm)
AB8030-WO	300 um (0.3 mm)
AB8050-WO	500 um (0.5 mm)
Blue PET Release Liner	36 um (0.036 mm)
Transparent PET Release Liner	79 um (0.079 mm)

*WO = without adhesive

Application Ideas

3M™ EMI Absorber AB8000 Series can potentially be used for:

- Shield DC and low frequency magnetic field
- Mobile phones, computers, tablets, measurement and sensors devices.
- Protecting magnetic flux sensitive devices such as a hall sensor and a flux gate from external low frequency magnetic fields
- Electronic equipment protection for automobile applications

As an initial design, it is suggested to test the 3M absorber AB8000 series at the greatest thickness allowed (1x, 2x, 3x layers, etc.), largest XY dimension, in multiple locations or use multiple parts to determine a potential maximum performance level associated with the material and the end use assembly. Once a baseline level of performance is established, the 3M absorber AB8000 series XY shape, location, etc. can be reduced or changed to determine the minimum material needed to meet a specification.

It should be noted that once a maximum performance level is established for the end use device using 3M absorber AB8000 series, the overall design can be reviewed to understand if other absorber changes not initially considered, but now possible with the new performance level associated with using the 3M absorber AB8000 Series, materials could be considered. An example would be the absorber reducing EMI noise levels to allow for improved antenna Signal to Noise (SNR) ratio that could allow for higher data transfer speeds and/or longer-range performance.

Effectiveness

3M™ EMI Absorber AB8000 Series performance and effectiveness is based on several application considerations:

1) Permeability (u') and Loss (u") of this material at the frequency range or frequency peak of the intended application can affect the performance. Permeability and Loss of the 3M™ EMI Absorber AB8000 Series varies with frequency and is a measure of how well the EM material may couple with the EM field and impact performance.
2) Thickness of the 3M absorber AB8000 series product can be used to help optimize an application's performance.
3) End use application orientation and location affects the 3M EM products interaction with an EM field.

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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. Final product specifications and testing methods will be outlined in the product's Certificate of Analysis (COA) that is provided once the product is approved by 3M for general commercialization and development work is completed.

3M™ EMI Absorber AB8000 Property	Value
Electrical Resistivity****	2 x 10^6 Ωm
Typical Permeability (@3 MHz)*	110~130
Temperature Range / *****	1) -40 ~ 150°C ** 2) PASS short term typical Solder Reflow processing cycle***

*Permeability and noted results of Vibrating Sample Magnetometers (VSMs) can vary with test method and/or equipment used for testing at different test sites. Permeability can vary with thickness of 3M absorber AB8000.
** Based on general environmental performance characteristics of the polymer binder resin type. Each application should verify temperature and environmental performance in the end-use specific configuration.
***The product has been tested for a typical Solder Reflow temperature profile and the material properties have remained stable
*** ASTM D257 Type Test Method

Figure 1. Real and Imaginary Part of Permeability with Frequency

Test method: Short coax (Keysight magnetic test fixture 16454A) for 1-1000 MHz and 7-mm coax 1-6 GHz per ASTM D5568–01.

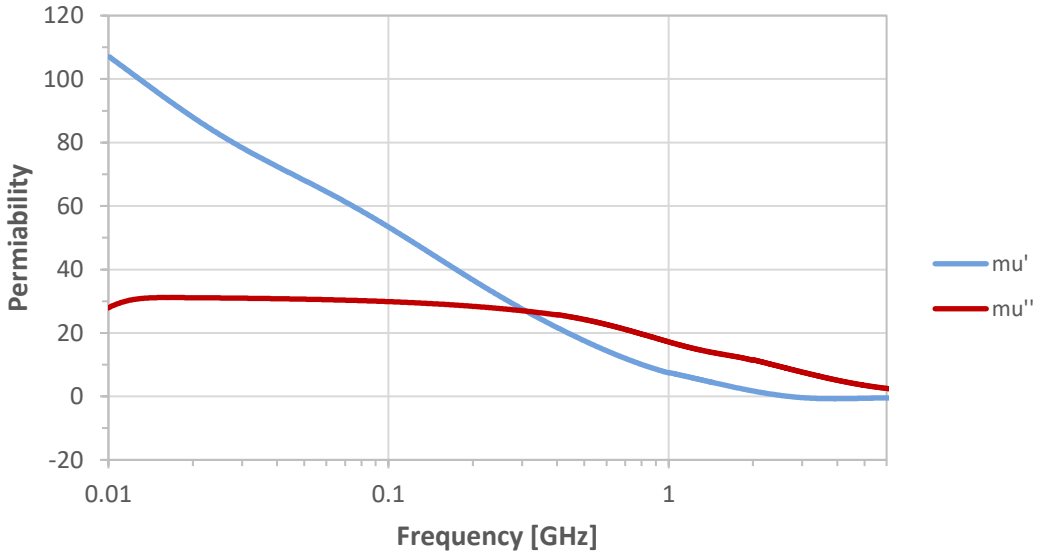

Figure 2. Power Loss

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Power loss was measured for each sample was in accordance with 3M internal test method TM-06-1078097.

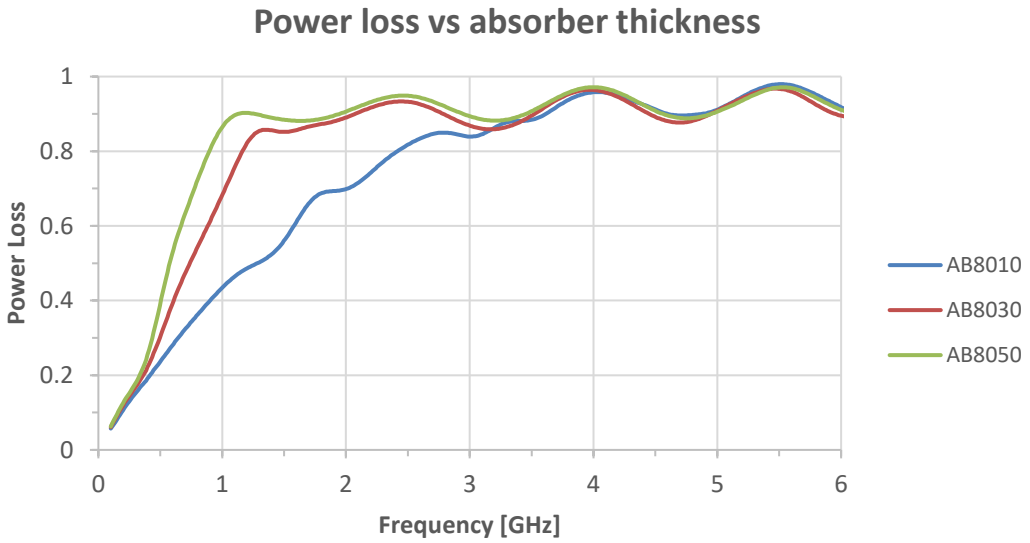
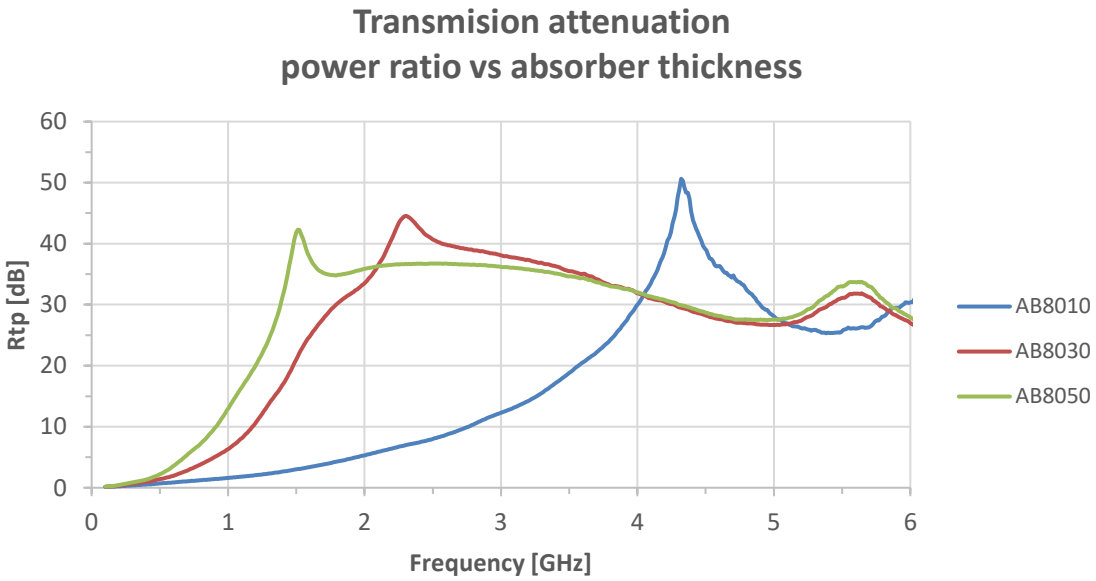


Figure 3. Transmission attenuation power ratio

Transmission attenuation power ratio Rtp was measured in accordance with section 4.3 of IEC62333-2. Lateral dimensions of the samples were chosen to be 100x75 mm.



Storage and Shelf Life

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The shelf life of 3M™ EMI Absorber AB8000 Series is 24 months from the date of manufacture when stored in the original packaging materials and stored at 0~35°C (32~95°F) and 70% relative humidity.

Certificate of Analysis (COA)

The 3M Certificate of Analysis (COA) for this product is established when the product is manufactured and deemed commercially available from 3M. The COA contains the 3M specifications, test methods and test results for the product's performance attributes that the product will be supplied against. Contact your local 3M representative for this product's COA.

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