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Technical Data | October 2022

3M™ External PIM Absorber 1000

Product Description

3M™ External PIM Absorber 1000 is a composite material consisting of a carrier resin, magnetic fillers and an acrylic pressure sensitive adhesive (PSA). This magnetic material is designed to help reduce radio frequency (RF) electrical currents associated with Passive Intermodulation (PIM), in wireless communications infrastructure. When 3M External PIM Absorber 1000 is applied adjacent to a PIM source, currents flowing to and from the PIM source can be significantly reduced, thereby increasing the Signal-to-Noise Ratio (SNR) of the radio access network.

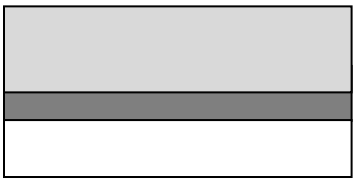
The 3M External PIM Absorber 1000 is intended for applications in the 700MHz – 2GHz frequency range as the higher loss (u") characteristics of the 3M External PIM Absorber provide for excellent EM (Electro-Magnetic) field reduction.

By helping reduce RF currents with 3M External PIM Absorber 1000 before they reach a PIM source, any resulting PIM products are significantly reduced. For every 1dB reduction of these currents before they reach a PIM source, third order PIM products are reduced by 3dB, fifth order PIM products are reduced by 5dB and so on.[1]

Key Features

- Excellent absorbing performance from 700MHz to 2GHz
- Pressure sensitive acrylic adhesive
- Thin, flexible film format
- Supplied on a removable liner for easy handling

3M™ External PIM Absorber 1000



Composite Magnetic Absorber Layer

Acrylic Adhesive

PET Film Release Liner

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™ External PIM Absorber 1000		
Structure	**Type**	**Thickness**
Absorber Type	Soft Magnetic Composite	150µm
Adhesive Type	Acrylic Adhesive	30µm
Total Thickness		180µm

[1] Sinclair Technologies. (2016). *Intermodulation Fundamentals* [White paper]. https://sinctech.com/intermodulation-fundamentals/

3M™ External PIM Absorber 1000

Application Recommendations

3M External PIM Absorber 1000 is intended to help reduce PIM levels at wireless network sites typically located on rooftops or towers. Common PIM sources can be antenna mounting brackets, rusty bolts or hose clamps, for example. 3M™ External PIM Absorber 1000 will be most effective when placed adjacent to the PIM source (e.g. antenna bracket) on both sides and wrapped entirely around the antenna mast. It is likely that additional PIM sources exist, and each will need to be individually addressed. It is not necessary to cover the PIM source with 3M External PIM Absorbers.

For long term reliability and environmental protection, apply 3M mastic and PVC tape over 3M External PIM Absorber 1000 as shown in the 3M External PIM Absorber installation guide.

Effectiveness

3M External PIM Absorber 1000 performance and effectiveness is based on several application considerations:

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 External PIM Absorber 1000 varies with frequency and is a measure of how well the EM material may couple with the EM field and impact performance.

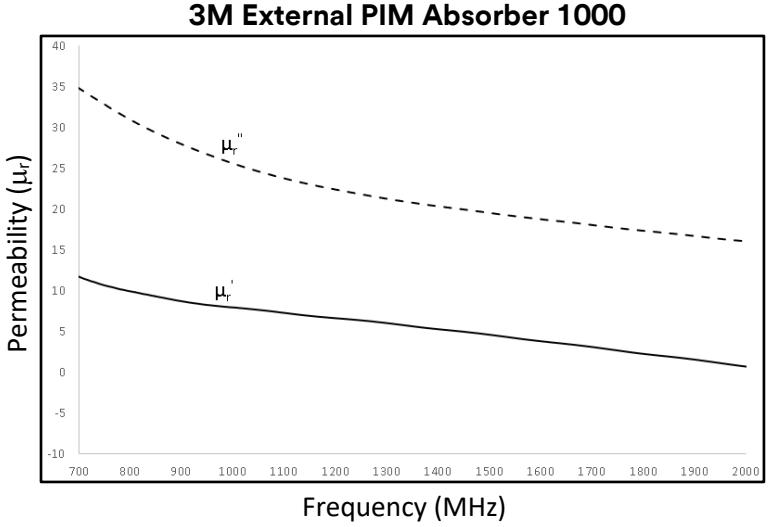
Typical Physical Properties and Performance Characteristics

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 products Certificate of Analysis (COA).

3M™ External PIM Absorber 1000	
Property	**Value**
Electrical Resistivity* **	2 x 10^4 Ωm
Typical Permeability (@1 MHz)*	250
Temperature Range**	-25 ~ 90°C

*Permeability and noted results of Wave Guide Measurements can vary with test method and/or equipment used for testing at different test sites
** 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.
*** ASTM D257 Type Test Method

Figure 1. Real and Imaginary Part of Permeability with Frequency



3M™ External PIM Absorber 1000

Storage and Shelf Life

The shelf life of 3M™ External PIM Absorber 1000 is 24 months from the date of manufacture when stored in the original packaging materials and stored at 21°C (70°F) and 50% 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 test methods, specifications limits 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.

3M™ External PIM Absorber 1000

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.

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