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Technical Data | June 2023

3M™ Electrically Conductive Double-Sided Tape 5113DFT Series

Product Description

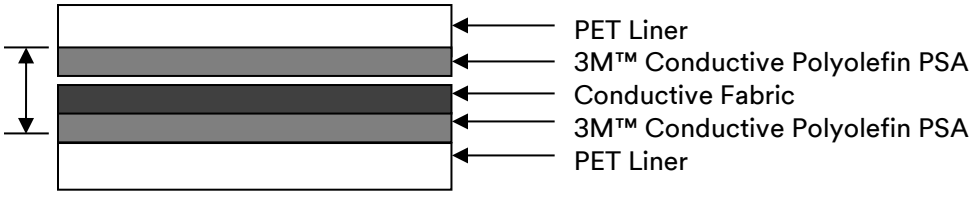
3M™ Electrically Conductive Double-Sided Tape 5113DFT Series is a family of XYZ-axis electrically conductive pressure sensitive adhesive (PSA) tapes. The tape consists of a conductive matrix carrier and a conductive PSA that is electrically conductive and is for PSA attachment to the desired grounding surfaces. The polyolefin PSA offers high adhesion, long shelf life and good grounding performance to many surface types. These tapes are useful for grounding, PSA attachment and EMI shielding designs.

Key Features

- XYZ-axis conductivity through the adhesive
- Excellent EMI shielding in bond line gap
- Excellent electrical contact to small size areas
- Long shelf-life and stable in humid environments

3M™ Electrically Conductive Double-Sided Tape 5113DFT

5113DFT-50: 50 µm
5113DFT-100: 100 µm



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Product Construction/Material Description

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

3M™ Electrically Conductive Double-Sided Tape 5113DFT	
Property	**Value**
Color	Metallic
Conductive Adhesive Type	Polyolefin conductive adhesive
Release Liner	75 µm clear PET release liner and 50 µm clear PET release liner

Note: The product is available in A4 sample sizes under Developmental Status. For other sizes, please contact your local 3M representative for more information.

Applications

- Typically used for applications requiring excellent electrical conductivity from the application substrate through the adhesive to a second substrate
- Grounding and EMI shielding in equipment and components

Application Techniques

Note: Carefully read and follow the manufacturer's precautions and directions for use when working with solvents. Tape application below 10°C (50°F) is not suggested. Once properly applied, low temperature holding power is generally satisfactory.

The bond strength of 3M™ Electrically Conductive Double-Sided Tape 5113DFT Series depends on the amount of adhesive-to-surface contact developed during application and substrate type and surface conditions.

1. Firm application pressure helps develop better wet-out and adhesive contact and may lead to improved bond strength as well as electrical conductivity. Pressure must be applied to the bond area after assembly to ensure sufficient wet-out of the adhesive to the substrates and to engage the conductive polyolefin adhesive fillers with the substrates to make electrical connection. Mechanical pressure (roller, metal bar) or finger pressure at 5-15 psi. (Optimally the application conditions are determined via a set of Design of experiments (DOE) using a range of application pressure, dwell time and temperatures (suggested initial range might include 5-15 psi, 2-5 seconds, 21°C-38°C).
2. Heat may be applied simultaneously with pressure to improve wetting, final bond strength and electrical conductivity. Suggested temperature range to evaluate is in the 38°C-60°C range. 3.
3. To obtain optimum adhesion, the bonding surfaces must be clean, dry, and well unified. Some typical surface cleaning solvents are isopropyl alcohol or heptane.

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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 shipped with the commercialized product once it is approved by 3M for general commercialization and development work is completed.

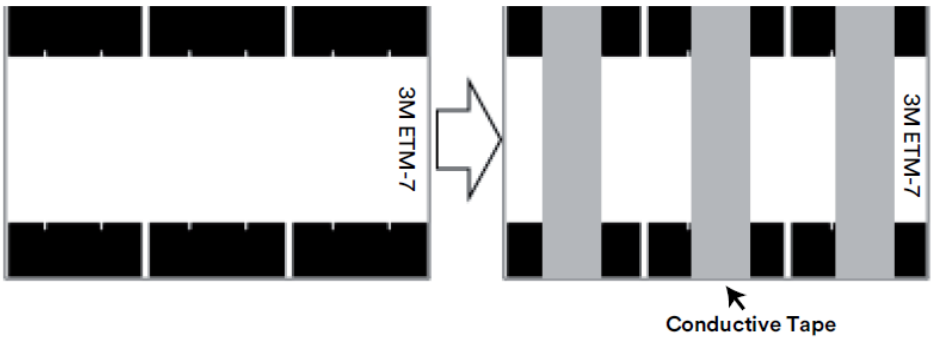
3M™ Electrically Conductive Double-Sided Tape 5113DFT Series		
Property	**Method***	
Thickness	ASTM D1000 *	50 µm / 100 µm
Adhesion to SUS (gf/inch)	ASTM D1000 *	
20 min dwell		1300
24 hour dwell		1500
7 day dwell		1700
Electrical Resistance through XY-Axis	3M ETM-7 **	0.07 Ω
Electrical Resistance through Z-axis	3M ETM-12 **	0.03 Ω

*Methods listed as ASTM are tested in accordance with the ASTM method noted

**3M test methods as described below

3M Test Method ETM-7: XY-Axis Electrical Resistance through Adhesive**

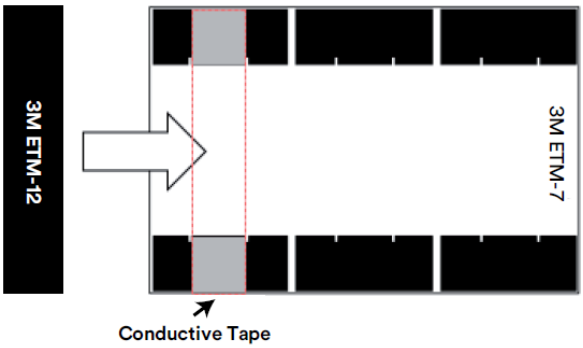
Place a strip of the single (double) side conductive tape in 10 mm x 40 mm with adhesive side down between the electrodes on 3M ETM-7 testing board. After initial hand lamination to provide for a 10 mm x 10 mm contact area between the tape and electrodes, apply a 2kg rubber roller across the tape one time. Application method simulates a typical manufacturing process that might be used to apply the tapes to a surface. After 20 minutes of dwell time, the DC resistance between the electrodes is measured with a micro-ohm meter. The resistance results are recorded after 5 ~ 30 seconds for initial resistance.



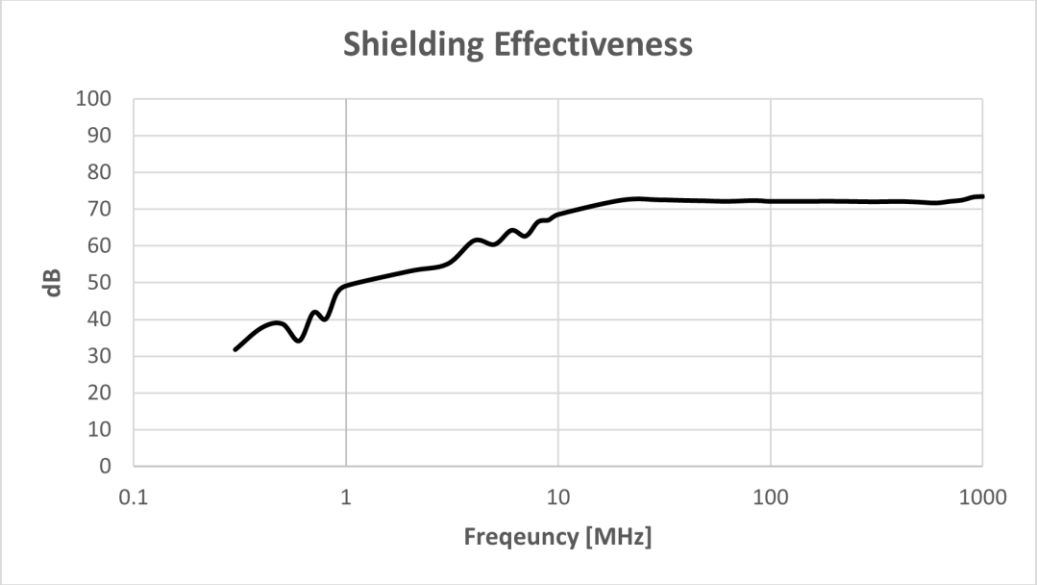
3M Test Method ETM-12: Z-Axis Electrical Resistance through Adhesive**

Place conductive tape pieces in 10 mm x 10 mm on the center of the electrodes on 3M ETM-7 testing board. Then place 3M ETM-12 testing board with the gold-plated side down on the tapes between electrodes. After initial hand lamination to provide for a 10 mm x 10 mm contact area between the tapes and electrodes, apply 2kg rubber roller across the tape one time. Application method simulates a typical manufacturing process that might be used to apply the tapes to a surface. After 20 minutes of dwell time, the DC resistance between the electrodes is measured with a micro-ohm meter. The resistance results are recorded after 5 ~ 30 seconds for initial resistance.

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3M™ Electrically Conductive Double-Sided Tape 5113DFT Shielding Effectiveness



Typical Operating Temperature Range* **	Long Term (days-weeks): 105°C (220°F) Short Term (minutes-hours): 121°C (250°F)	3M Test Method

***It is not suggested for excessive high or low temperature excursions where the application performance might be compromised. The user is recommended to conduct application evaluation to determine the fit-for-purpose of tape in their design or application

Storage and Shelf Life

The shelf life of 3M™ Electrically Conductive Double-Sided Tape 5113DFT is 48 months from the date of manufacture when stored in the original packaging materials and stored at 21°C (70°F) and 50% relative humidity.

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Certificate of Analysis (COA)

The 3M Certificate of Analysis (COA) for this product is established when the product is manufactured and is 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.

This technical data sheet may contain preliminary data and may not match the COA specification limits and/or test methods that may be used for COA purposes.

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

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