

3M™ Thermally Conductive Silicone Interface Pad 5549S

Product Description

3M™ Thermally Conductive Silicone Interface Pad (TCSIP) 5549S is designed to provide a preferential heat transfer path between heat generating components and heat sinks, heat spreaders or other cooling devices. 3M TCSIP 5549S consists of a highly conformable and slightly tacky silicone elastomeric sheet filled with thermally conductive ceramic particles which provide enhanced thermal conductivity and excellent electrical insulation performance. 3M TCSIP 5549S has permanent PEN film 6 micrometer thick on one side to provide for a non-tacky surface, increased puncture resistance, ease of handling and rework.

Key Features

- Very high thermal conductivity and good electrical insulation properties
- Good softness and conformability even to non-flat surfaces
- Good electrical insulation properties
- Compression relaxation properties reduces pressure to electric components
- Slight tack allows pre-assembly
- Good wet-ability for improved and lower thermal resistance

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™ Thermally Conductive Silicone Interface Pad 5549S | |
|---|-----------------|
| Property | Value |
| Color | Gray |
| Base resin | Silicone |
| Thickness | 0.5 – 2.0 mm* |
| Primary Filler Type | Ceramic |
| Product Liner | PET Film Liners |

*Standard thickness range. Custom thickness options available up to 10mm. Contact your local 3M Technical Representative for more information.

| Permanent Polymeric Film Carrier (0.006mm) |
|--|
| Filled Silicone Elastomer |
| PET Film Liner |

Applications

- Integrated circuit (IC) chip packaging heat conduction
- Heat sink interface
- Chip on film (COF) heat conduction
- LED board thermal interface material (TIM)
- HD TV IC chip
- General gap filling in electronic devices

Application Techniques

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Substrate surfaces should be clean and dry prior to the thermal pad application to ensure best thermal performance. A clean surface can improve the thermal performance of an application.

- Isopropyl alcohol (isopropanol) applied with a lint-free wipe or swab should be adequate for removing surface contamination such as dust or fingerprints. Do not use “denatured alcohol” or glass cleaners, which often contain oily components. Allow the surface to dry for several minutes before applying the thermal pad. More aggressive solvents (such as acetone, methyl ethyl ketone (MEK) or toluene) may be required to remove heavier contamination (grease, machine oils, solder flux, etc.) but should be followed by a final isopropanol wipe as described above.

Note: Be sure to read and follow the manufacturers’ precautions and directions when using solvents.

- Apply the thermal pad to one substrate at a modest angle with the use of a squeegee, rubber roller or finger pressure to help reduce the potential for air entrapment under the thermal pad during its application.
- Remove the release liner before application.
- Assemble the part by applying compression to the substrates to ensure a good wetting of the substrate surfaces with the thermal pads. Rigid substrates are more difficult to assemble without air entrapment as most rigid parts are not flat. Flexible substrates can be assembled to rigid or flexible parts with much less concern about air entrapment because one of the flexible substrate can conform to the other substrates during application.

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) that is provided once the product is approved by 3M for general commercialization and development work is completed.

| 3M™ Thermally Conductive Silicone Interface Pad 5549S | | |
|--|--|----------------------------------|
| Property | Method ^a | Value |
| Thermal Conductivity (W/m-K) ^b With Permanent Film Without Permanent Film | ASTM D5470 | 3.5 W/m-K 5 W/m-K |
| Density (g/cm ³ , @ 25°C) | ASTM D6111 | 2.8 |
| Operating Temperature Range Long Term (Weeks-Months) Short Term (Hours-Days) | 3M test method | -50°C to 125°C -50°C to 180°C |
| Hardness Shore 00 ^c | Modified ASTM D2240 | 70 ~ 80 |
| Dielectric Breakdown | Modified ASTM D149 (3M test method) | 3 KV/mm |
| Volume Resistivity | ASTM D257 | 1.7 x 10 ¹⁴ Ohms |

^a Methods listed as ASTM are tested in accordance with the ASTM method noted.

^b Thermal K without permanent film is 5 W/m-K (Based on testing of 3M TCSIP 5549). Effective Thermal K and Thermal Resistance will be somewhat reduced with the addition of the polymeric film construction of 3M tape 5549S.

^c Shore 00 results depend on test method and thickness of the sample tested. Typical results are in the 70-80 Shore 00 range @ 6 mm test thickness. Ask 3M for more details on pad softness.

Certificate of Analysis (COA)

The 3M Certificate of Analysis (COA) for this product is established when the product is commercially available from 3M. The COA contains the 3M specifications and test methods for the products performance limits that the product will be supplied against. The 3M product is supplied to 3M COA test specifications and the COA test methods. Inquire with 3M for the COA for this product.

The TDS data may contain preliminary data and is not within the COA specification limits and/or test methods that may be used for COA purposes.

Storage and Shelf Life

3M™ Thermally Conductive Silicone Interface Pad 5549S

The shelf life of 3M™ Thermally Conductive Silicone Interface Pad 5549S 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.

Safety Data Sheet: Consult 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: Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

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