GORE® Thermal Insulation

FOR 5G ANTENNAS

REDUCE 5G ANTENNA HOT SPOTS

INTRODUCING GORE® THERMAL INSULATION FOR 5G ANTENNAS

Together, improving life

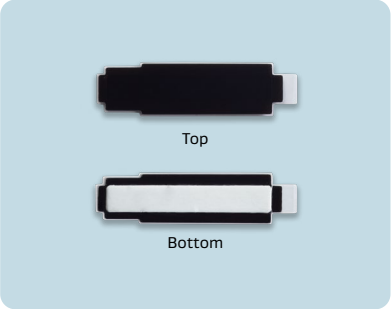
Reduce 5G Antenna Hot Spots

A new thermal insulator that's better than air

Today's sophisticated 5G mmWave antenna modules incorporate power amplifiers that generate heat close to the edge of the device. It is difficult to reduce surface temperatures by increasing the air gap due to space constraints and throttling hurts the 5G performance. Traditional thermal solutions are also not an option because they are electrically conductive and interfere with the RF signal.

Gore provides another option: GORE® Thermal Insulation for 5G Antennas are designed specifically to fit over the Qualcomm® QTM525 mmWave antenna module and are available in 3 thicknesses to fit the available air gap*. Gore can also provide custom parts to support OEMs using other 5G antenna modules. These parts feature insulation performance that is better than air and has extremely low RF signal transmission loss. GORE® Thermal Insulation for 5G Antennas helps maintain 5G signal duration by reducing surface temperatures for a superior user experience.

Figure 1: GORE® Thermal Insulation for 5G Antennas



Why use GORE® Thermal Insulation instead of air?

SUPERIOR THERMAL CONDUCTIVITY

at 0.020 W/mK reduces heat flow by 23% compared to an air gap at 25°C (0.026 W/mK)

IMPROVED PERFORMANCE FOR CONSUMERS

with longer duration of 5G mmWave signal before needing to throttle

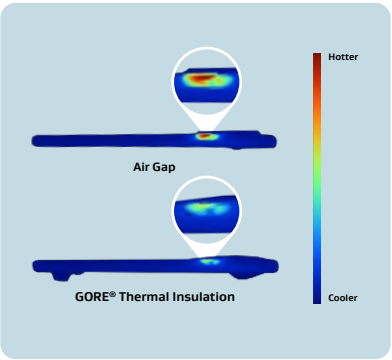
MORE STABLE THERMAL CONDUCTIVITY

compared to air when temperature changes

ELECTRICALLY INSULATED BARRIER

prevents antenna module from accidentally touching the case which leads to dropped signals

Figure 2: GORE® Thermal Insulation significantly reduces smartphone 5G antenna hot spots



Customer testing shows a surface temperature reduction of 1–4°C is achievable.

Powerful new tool in the thermal toolbox to solve 5G thermal problems quicker

- **OFF-THE-SHELF SOLUTION** can significantly improve performance late in development when redesign isn't an option
- **MINIMAL SIGNAL LOSS** across mmWave frequencies ensured by low dielectric constant
- **EASY TO FIT AND INSTALL** designed for Qualcomm® QTM525 mmWave antenna module with 3 thicknesses to fit available air gap*

*Qualcomm is a trademark or registered trademark of Qualcomm Incorporated. Qualcomm QTM525 is a product of Qualcomm Technologies, Inc. and/or its subsidiaries.

Closer look at GORE® Thermal Insulation for 5G Antennas

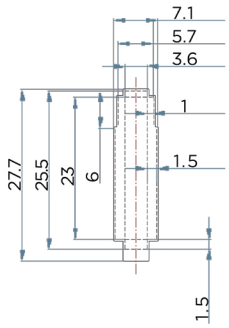
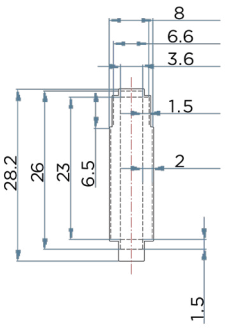
Material data

Thermal conductivity (k)[a]	0.020 W/m•K
Specific heat capacity[b]	1.8 J/g °C
Bulk density	0.37 g/cc
Dielectric constant[c]	1.43
Loss tangent[c]	0.017
Typical signal loss [with GTI350525B]	< 0.3dB
Compression @ 100 kPa (14.5 psi)	6%
Operating temperature[d]	-40 °C to 100 °C
Protective cover film	Black PET
Adhesive type	Acrylic
RoHS[e]	Meets threshold requirements

[a] nominal conductivity value based on a modified version of ASTM C518.
[b] nominal heat capacity measured according to ASTM E2716 Method B at 75°C.
[c] nominal values representative of frequency range from 6 GHz to 70 GHz.
[d] alternate adhesives required to exceed 100 °C.
[e] to the best of our knowledge, the part numbers listed above do not have any restricted substances above the maximum concentration values listed in RoHS Directive 2011/65/EU and meets the substance restrictions of Article 4 of RoHS Recast including Commission Delegated Directive 2015/863.

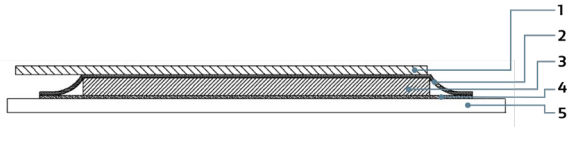
**All values based on nominal characteristic and do not represent the specification and tolerance.*

Standard part dimensions

	GTI250525B	GTI350525B	GTI500525B
Nominal thickness [a]	0.28 mm	0.38 mm	0.54 mm
Adhesive encapsulation width (minimum) [b]	1mm	1mm	1.5mm
Dimensions			

[a] nominal thickness based on reported values of thickness of each component of the stack up.
[b] nominal minimum width.

Figure 3: GORE® Thermal Insulation cross section



1. Pull Tab 2. Protective Film 3. GORE® Thermal Insulation 4. Base Adhesive 5. Base Liner

GORE® Thermal Insulation for 5G Antennas maintains 5G data rates and signal range by lowering surface temperature and minimizing 5G signal interference unlike air gaps or graphite.

GORE® Thermal Insulation for 5G Antennas

W. L. Gore & Associates

W. L. Gore & Associates is a global materials science company dedicated to transforming industries and improving lives. Since 1958, Gore has solved complex technical challenges in demanding environments — from outer space to the world's highest peaks to the inner workings of the human body. With more than 10,500 Associates and a strong, team-oriented culture, Gore generates annual revenues of $3.7 billion.

Contact Us

For additional assistance, please contact a Gore representative.

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PEV-132-DSH-US-RI-NOV20