

SPECIALIST IN SILICONE RUBBER TECHNOLOGY

C / o / n / t / e / n / t / s

Importance Thermal

Conductivity Silicone Rubber \_\_\_\_ 01

Thermal Conductivity k \_\_\_\_ 01

GT-TSP Series \_\_\_\_ 02

GT-TSP 2010

GT-TSP 6025

GT-TSP 8040

GT-TSP 4015

GT-TSP 7030

GT-TSP 8050

GT-TSP 6020

GT-TSP 8035

GT-TSP 7070

GT-TSP-Fi Series \_\_\_\_ 09

TSP-Fi-2010 TSP-Fi-4015

TSP-Fi-6020 TSP-Fi-7025 TSP-Fi-7030

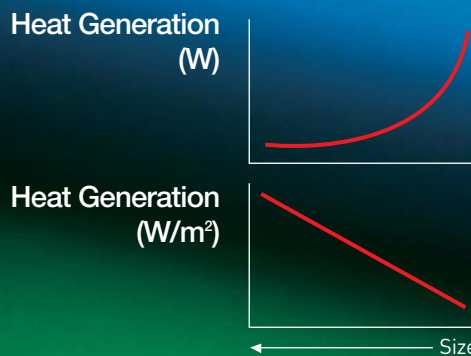
GT-TC Series \_\_\_\_ 18

GT-TC 3007

HR-TC 4010

HR-TC 5015

## Importance of Thermal Conductivity Silicone Rubber



*Technology Growing  
Frequency Higher  
Size Lighter*

## Thermal Conductivity k

Fourier's Law states that :  $Q = k$

$$K = \frac{Q}{A} \times \frac{A \Delta T}{L} = \frac{L}{\Delta T}$$

Q = Conducted heat (cal/sec)

k = Thermal conductivity (cal/cm sec °C)

A = Cross sectional area of test piece (cm²)

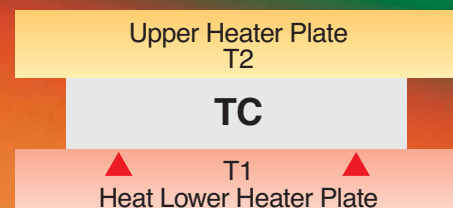
L = Thickness of test piece (cm)

T = Temperature difference between

\* SI-unit conversion factor 1 cal/cm sec °C

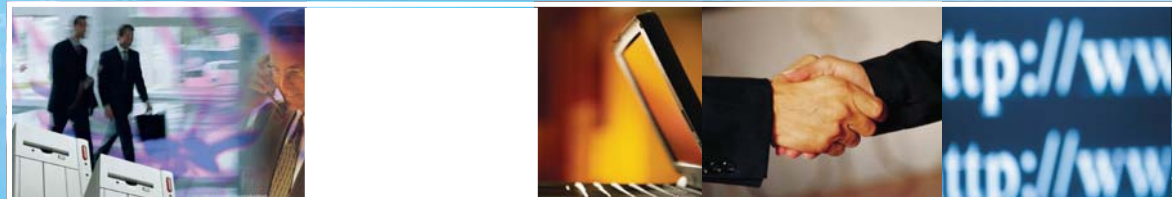
= 418.605 W/m °C

both sides of test piece(°C)



## >> *Soft Silicone Thermal Conductivity Products*

- GT-TSP is an advanced silicone rubber with high thermal conductivity and superior flame-retardant. By combining the inherent silicone rubber properties of heat resistance, electrical insulation and long-term aging into one compound, this universally applicable material can be made in an unlimited number of thermal management configurations.
- GT-TSP is highly conformable and high heat conducting gel materials in a versatile sheet form. They easily fit most all shapes and sizes of components, including protrusions and recessed area.



### Feature

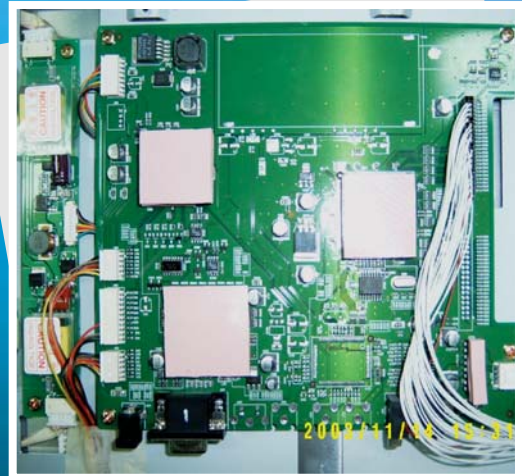
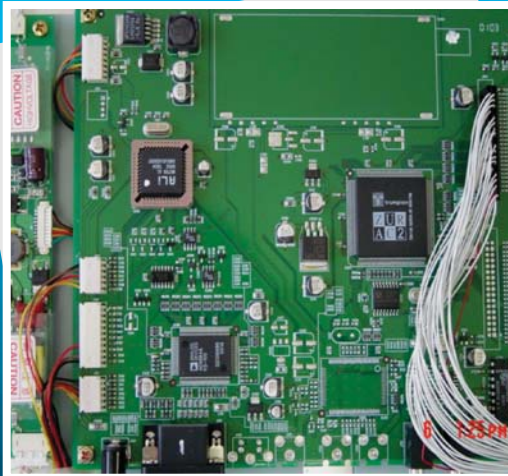
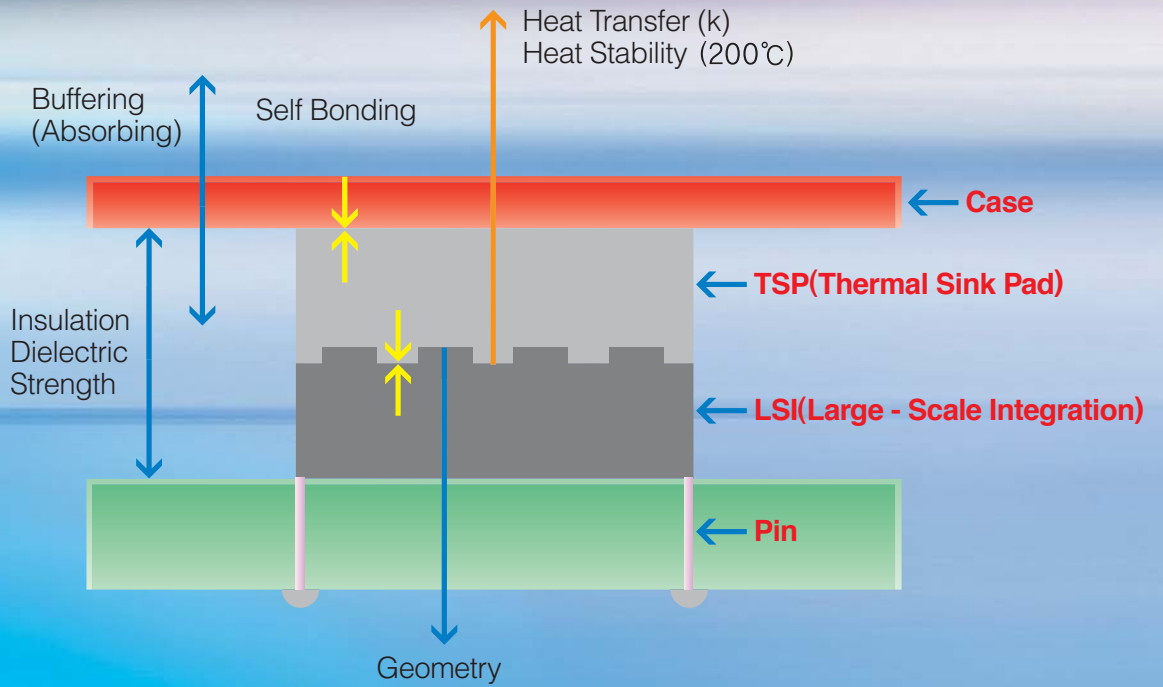
- Excellent thermal conductivity.
- Flexible and adhesive.
- Excellent flame retardant(UL94 V-0)
- Any thickness are available.
- Excellent electrical insulation.
- Retain good physical property in a wide range of temperature.

### Application

- Heat dissipation of MPU(Micro Processing Units)
- Heat dissipation of surface-mount Chips.
- Between a CPU and heat spreader.
- Between a CD ROM and a heat spreader.
- DVD and CD ROM Cooling.(6025/7030)
- RDRAM memory modules.(8035)

# GT-TSP SERIES

# TSP Characteristics

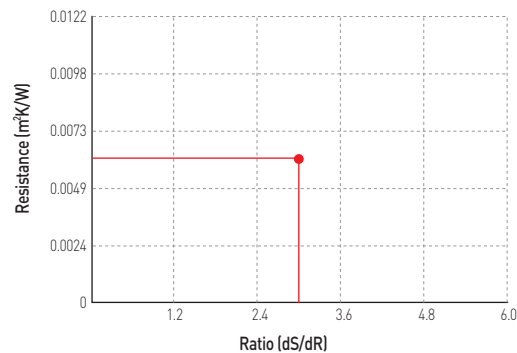


## TYPICAL PROPERTIES OF TSP-2010

Properties	Value	Test Method
Thickness (mm)	0.5 ~ 15	ASTM D 374
Color	White/ Blue/ Gray/ Pink	Visual
Hardness (Shore 00)	20 ~ 60	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	2.1	ASTM D 792
Continue Use (°C)	-60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ωcm)	3 x 10 <sup>14</sup>	ASTM D 257
Thermal Conductivity (W/mK)	1.0	ASTM 5470
Thermal Resistance (m <sup>2</sup> k/W)	6.0*10 <sup>-3</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94



| Thermal Resistance |

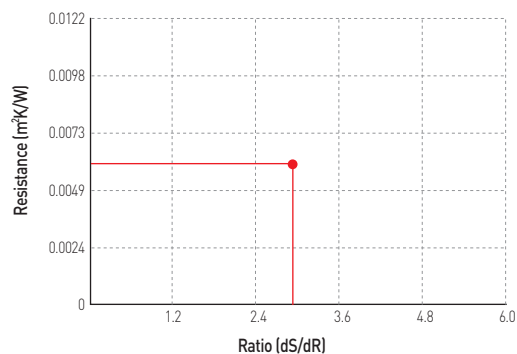


## TYPICAL PROPERTIES OF TSP-4015

Properties	Value	Test Method
Thickness (mm)	0.5 ~ 15	ASTM D 374
Color	White/ Blue/ Gray/ Pink	Visual
Hardness (Shore 00)	30 ~ 70	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	2.4	ASTM D 792
Continue Use (°C)	-60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ωcm)	3 x 10 <sup>13</sup>	ASTM D 257
Thermal Conductivity (W/mK)	1.5	ASTM 5470
Thermal Resistance (m <sup>2</sup> k/W)	5.5*10 <sup>-3</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94

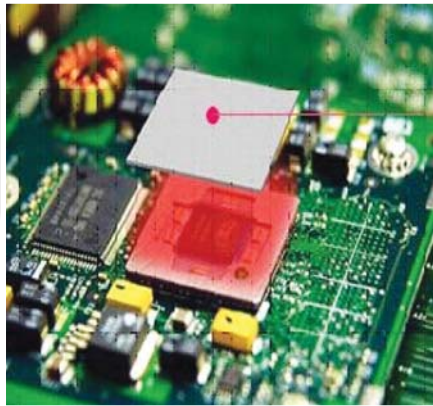


| Thermal Resistance |

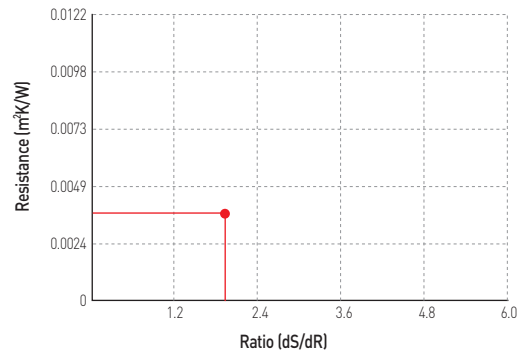


## TYPICAL PROPERTIES OF TSP-6020

Properties	Value	Test Method
Thickness (mm)	0.5 ~ 15	ASTM D 374
Color	White/ Blue/ Gray/ Pink	Visual
Hardness (Shore 00)	40 ~ 80	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	2.7	ASTM D 792
Continue Use (°C)	- 60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ωcm)	1 x 10 <sup>13</sup>	ASTM D 257
Thermal Conductivity (W/mK)	2.0	ASTM 5470
Thermal Resistance (m <sup>2</sup> k/W)	3.8*10 <sup>-3</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94

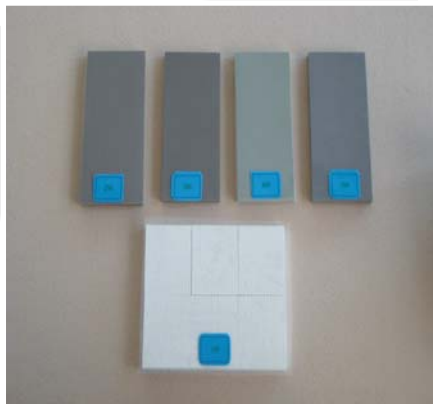


### Thermal Resistance

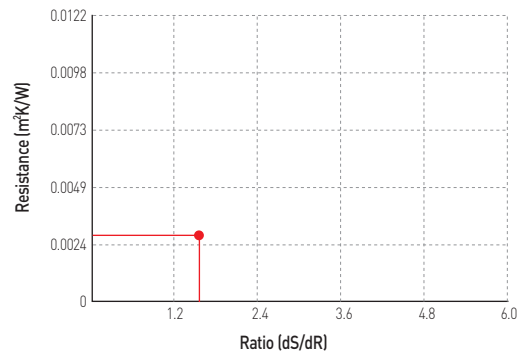


## TYPICAL PROPERTIES OF TSP-6025

Properties	Value	Test Method
Thickness (mm)	0.5 ~ 15	ASTM D 374
Color	White/ Blue/ Gray/ Pink	Visual
Hardness (Shore 00)	50 ~ 80	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	2.8	ASTM D 792
Continue Use (°C)	- 60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ωcm)	1 x 10 <sup>13</sup>	ASTM D 257
Thermal Conductivity (W/mK)	2.5	ASTM 5470
Thermal Resistance (m <sup>2</sup> k/W)	2.8*10 <sup>-3</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94

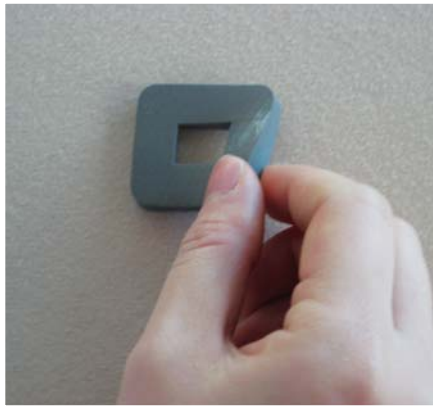


### Thermal Resistance

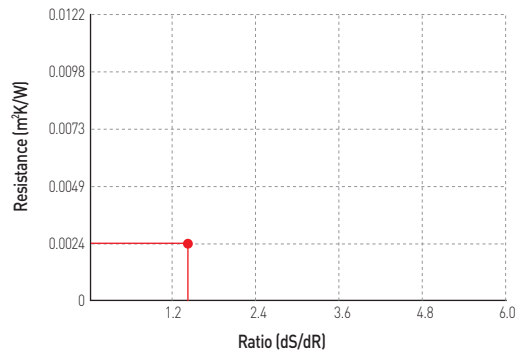


## TYPICAL PROPERTIES OF TSP-7030

Properties	Value	Test Method
Thickness (mm)	0.5 ~ 15	ASTM D 374
Color	Gray	Visual
Hardness (Shore 00)	60 ~ 80	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	2.9	ASTM D 792
Continue Use (°C)	-60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ωcm)	1 x 10 <sup>11</sup>	ASTM D 257
Thermal Conductivity (W/mK)	3.0	ASTM 5470
Thermal Resistance (m <sup>2</sup> k/W)	2.4*10 <sup>-3</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94



### | Thermal Resistance |

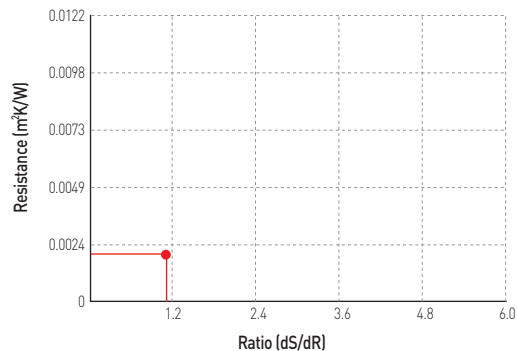


## TYPICAL PROPERTIES OF TSP-8035

Properties	Value	Test Method
Thickness (mm)	0.5 ~ 15	ASTM D 374
Color	Gray	Visual
Hardness (Shore 00)	60 ~ 80	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	3.0	ASTM D 792
Continue Use (°C)	-60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ωcm)	1 x 10 <sup>11</sup>	ASTM D 257
Thermal Conductivity (W/mK)	3.5	ASTM 5470
Thermal Resistance (m <sup>2</sup> k/W)	2.0*10 <sup>-3</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94



### | Thermal Resistance |

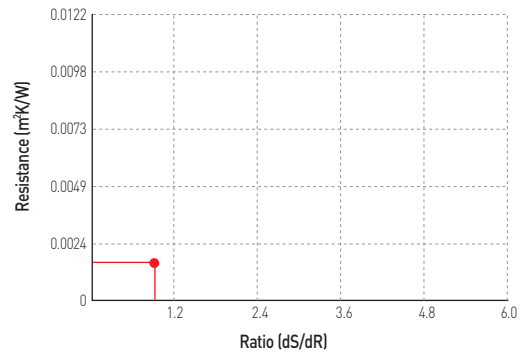


## TYPICAL PROPERTIES OF TSP-8040

Properties	Value	Test Method
Thickness (mm)	0.5 ~ 15	ASTM D 374
Color	Gray	Visual
Hardness (Shore 00)	60 ~ 80	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	3.1	ASTM D 792
Continue Use (°C)	-60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ωcm)	1 x 10 <sup>11</sup>	ASTM D 257
Thermal Conductivity (W/mK)	4.0	ASTM 5470
Thermal Resistance (m <sup>2</sup> k/W)	1.7*10 <sup>-3</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94



### Thermal Resistance

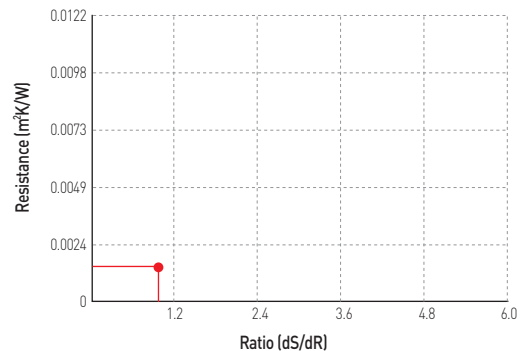


## TYPICAL PROPERTIES OF TSP-8050

Properties	Value	Test Method
Thickness (mm)	0.5 ~ 15	ASTM D 374
Color	Gray	Visual
Hardness (Shore 00)	60 ~ 80	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	3.2	ASTM D 792
Continue Use (°C)	-60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ωcm)	1 x 10 <sup>11</sup>	ASTM D 257
Thermal Conductivity (W/mK)	5.0	ASTM 5470
Thermal Resistance (m <sup>2</sup> k/W)	8.5*10 <sup>-4</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94

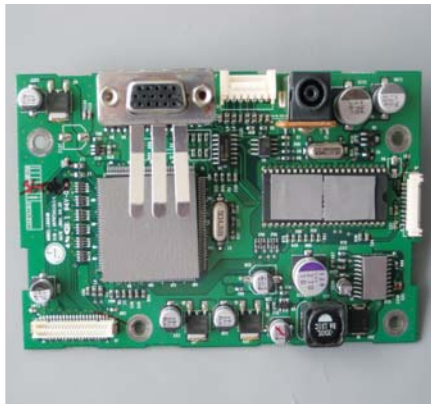


### Thermal Resistance

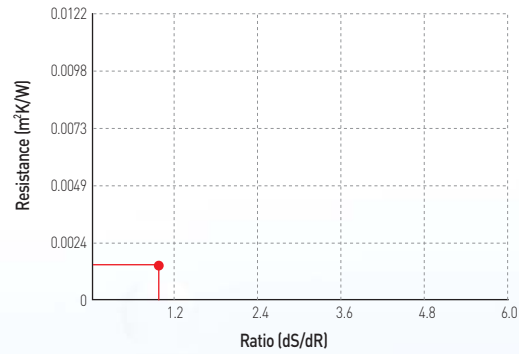


## TYPICAL PROPERTIES OF TSP-7070

Properties	Value	Test Method
Thickness (mm)	0.5 ~ 15	ASTM D 374
Color	Gray	Visual
Hardness (Shore 00)	60 ~ 80	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	2.9	ASTM D 792
Continue Use (°C)	-60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ωcm)	1 x 10 <sup>11</sup>	ASTM D 257
Thermal Conductivity (W/mK)	7.0	ASTM 5470
Thermal Resistance (m <sup>2</sup> k/W)	3.0*10 <sup>-4</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94



### | Thermal Resistance |



## >> Coated Glass Fiber Thermal Conductive Sheet

- GT-TSP-FI-SERIES are filled thermally conductive polymer supplied on a rubber coated fiber glass. GT-TSP-FI-SERIES are a highly conformable.
- Low modulus silicone polymer filled with special conductive filler that excellent heat conductivity and flame retardant UL94 V-0 level together with good electrical properties.



### Feature

- Special fillers to achieve specific performance and characteristics.
- Flexible and conformable.
- Good adhesive.
- Excellent flame retardant(UL94 V-0)
- Various thickness are available.
- Excellent electrical insulation.

### Application

- Heat dissipation of MPU(Micro Processing Units)
- Heat dissipation of surface-mount Chips.
- Between Power Sources and Heat Sink.
- Automotive systems.
- Isolate electrical components.
- Power supplies.
- Power semiconductors.

# GT-TSP-FI SERIES

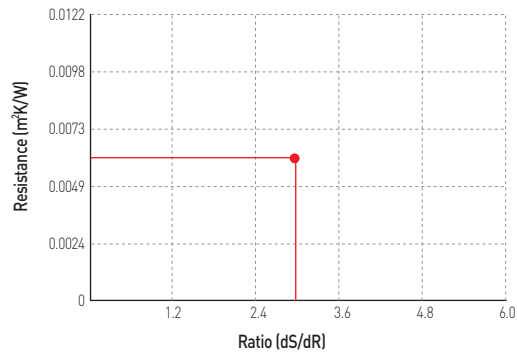
# GT-TSP-FI 2010 / GT-TSP-FI 4015

## TYPICAL PROPERTIES OF TSP-FI 2010

Properties	Value	Test Method
Thickness (mm)	0.3 ~ 2.0	ASTM D 374
Color	White/ Blue/ Gray/ Pink	Visual
Hardness (Shore 00)	20 ~ 60	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	2.1	ASTM D 792
Continue Use (°C)	-60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ωcm)	1 x 10 <sup>13</sup>	ASTM D 257
Thermal Conductivity (W/mK)	1.0	ASTM 5470
Thermal Resistance (m <sup>2</sup> k/W)	6.0*10 <sup>-3</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94



### | Thermal Resistance |

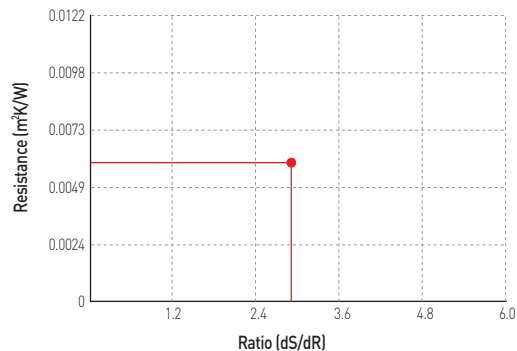


## TYPICAL PROPERTIES OF TSP-FI 4015

Properties	Value	Test Method
Thickness (mm)	0.3 ~ 2.0	ASTM D 374
Color	White/ Blue/ Gray/ Pink	Visual
Hardness (Shore 00)	30 ~ 60	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	2.4	ASTM D 792
Continue Use (°C)	-60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ωcm)	1 x 10 <sup>13</sup>	ASTM D 257
Thermal Conductivity (W/mK)	1.5	ASTM 5470
Thermal Resistance (m <sup>2</sup> k/W)	5.5*10 <sup>-3</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94

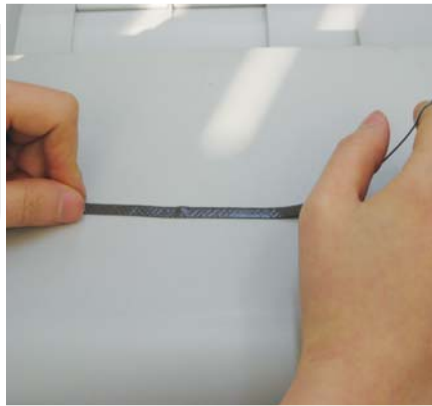


### | Thermal Resistance |

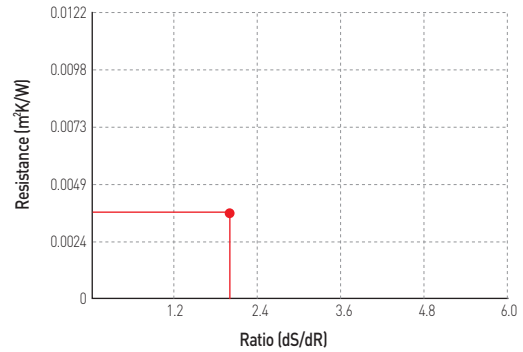


## TYPICAL PROPERTIES OF TSP-FI 6020

Properties	Value	Test Method
Thickness (mm)	0.3 ~ 2.0	ASTM D 374
Color	White/ Blue/ Gray/ Pink	Visual
Hardness (Shore 00)	50 ~ 70	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	2.7	ASTM D 792
Continue Use (°C)	- 60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ωcm)	1 x 10 <sup>13</sup>	ASTM D 257
Thermal Conductivity (W/mK)	2.0	ASTM 5470
Thermal Resistance (m <sup>2</sup> k/W)	3.8*10 <sup>-3</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94

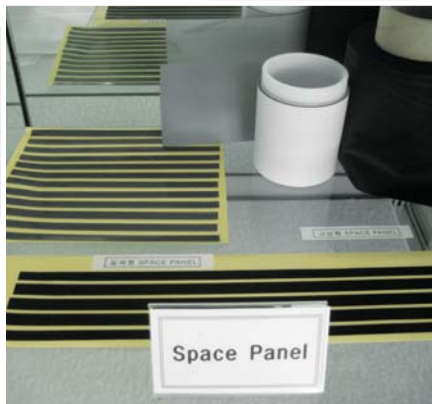


### Thermal Resistance

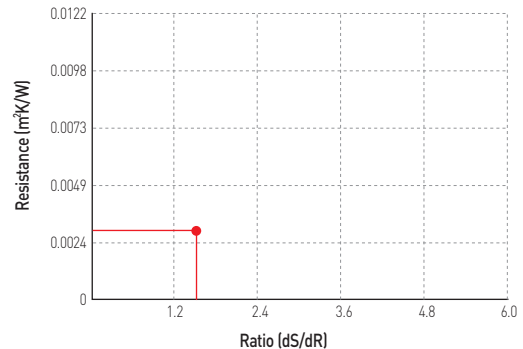


## TYPICAL PROPERTIES OF TSP-FI 7025

Properties	Value	Test Method
Thickness (mm)	0.5 ~ 2.0	ASTM D 374
Color	White/ Blue/ Gray/ Pink	Visual
Hardness (Shore 00)	50 ~ 80	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	2.8	ASTM D 792
Continue Use (°C)	- 60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ωcm)	1 x 10 <sup>13</sup>	ASTM D 257
Thermal Conductivity (W/mK)	2.5	ASTM 5470
Thermal Resistance (m <sup>2</sup> k/W)	2.8*10 <sup>-3</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94



### Thermal Resistance

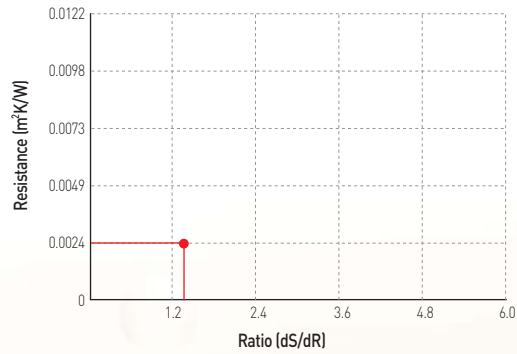


TYPICAL PROPERTIES OF TSP-FI 7030

Properties	Value	Test Method
Thickness (mm)	0.5 ~ 2.0	ASTM D 374
Color	White/ Blue/ Gray/ Pink	Visual
Hardness (Shore 00)	50 ~ 80	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	3.0	ASTM D 792
Continue Use (°C)	- 60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ωcm)	1 x 10 <sup>13</sup>	ASTM D 257
Thermal Conductivity (W/mK)	3.0	ASTM 5470
Thermal Resistance (m <sup>2</sup> k/W)	2.4*10 <sup>-3</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94



Thermal Resistance I



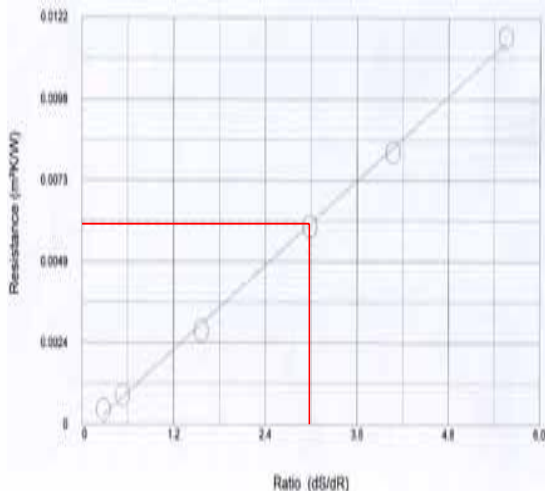
# TSP-Fi 7010



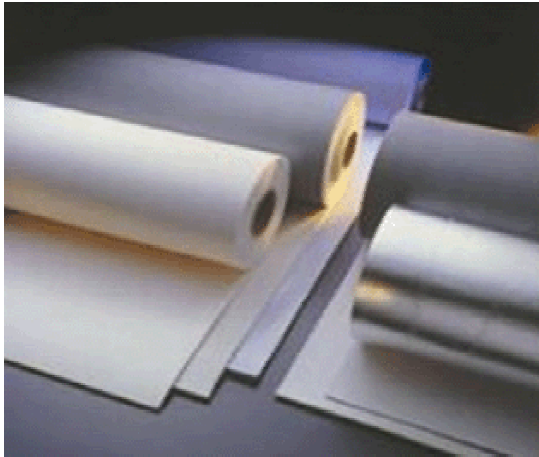
\* Typical property of TSP-Fi 2010.

Properties	Value	Test Method
Thickness (mm)	0.3 ~ 2.0	ASTM D 374
Color	White/ Blue/ Gray/ Pink	Visual
Hardness (Shore 00)	60~80	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	2.1	ASTM D 792
Continue Use (°C)	- 60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ω·cm)	1 × 10 <sup>13</sup>	ASTM D 257
Thermal Conductivity (W/mK)	1.0	ASTM 5470
Thermal Resistance(m <sup>2</sup> k/W)	6.0*10 <sup>-3</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94

Thermal Resistance



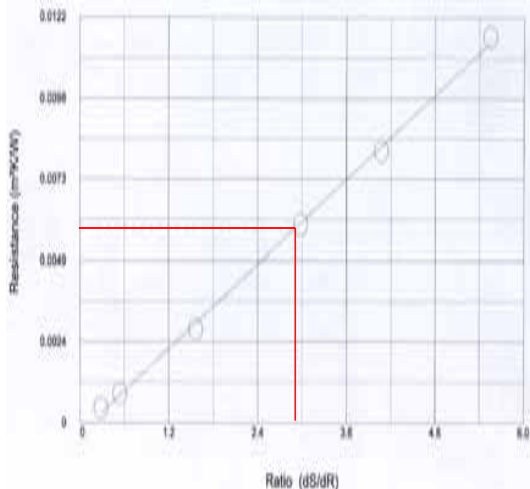
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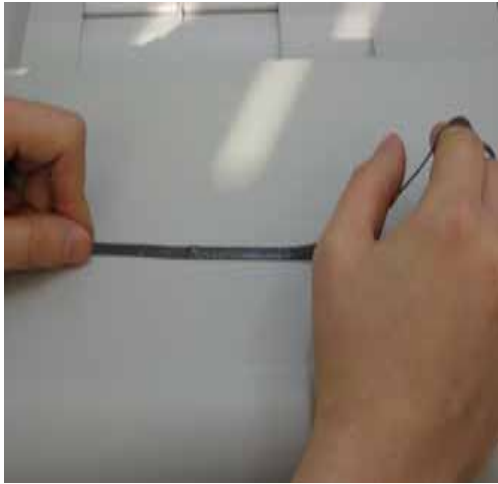
\* Typical property of TSP-Fi 4015.

Properties	Value	Test Method
Thickness (mm)	0.3 ~ 2.0	ASTM D 374
Color	White/ Blue/ Gray/ Pink	Visual
Hardness (Shore 00)	60~80	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	2.4	ASTM D 792
Continue Use (°C)	- 60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ω·cm)	1 × 10 <sup>13</sup>	ASTM D 257
Thermal Conductivity (W/mK)	1.5	ASTM 5470
Thermal Resistance(m <sup>2</sup> k/W)	5.5*10 <sup>-3</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94

Thermal Resistance



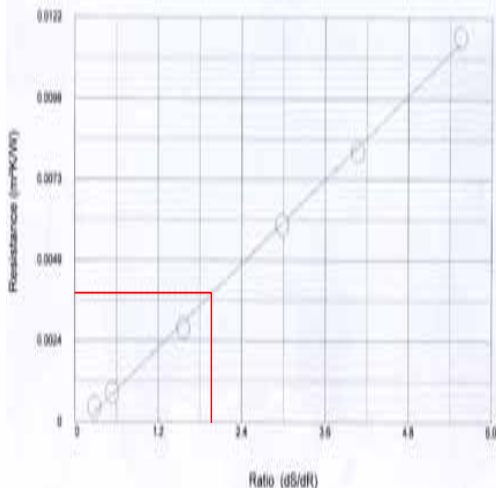
# TSP-Fi 7020



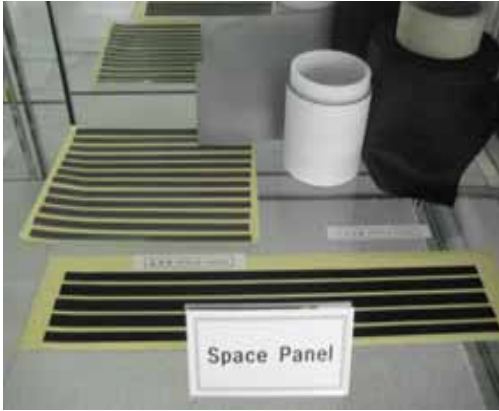
\* Typical property of TSP-Fi 6020.

Properties	Value	Test Method
Thickness (mm)	0.3 ~ 2.0	ASTM D 374
Color	White/ Blue/ Gray/ Pink	Visual
Hardness (Shore 00)	60~80	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	2.7	ASTM D 792
Continue Use (°C)	- 60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ω·cm)	1 × 10 <sup>13</sup>	ASTM D 257
Thermal Conductivity (W/mK)	2.0	ASTM 5470
Thermal Resistance(m <sup>2</sup> k/W)	3.8*10 <sup>-3</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94

Thermal Resistance



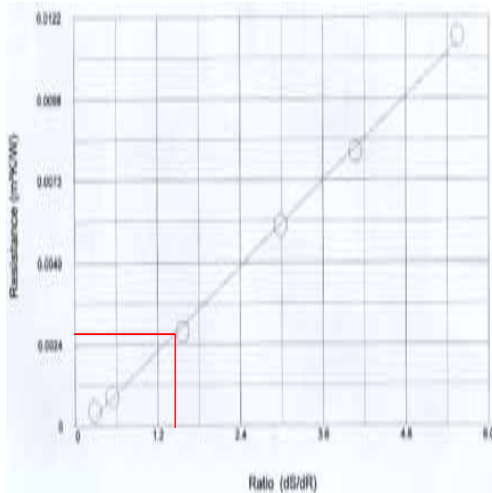
# TSP-Fi 8025



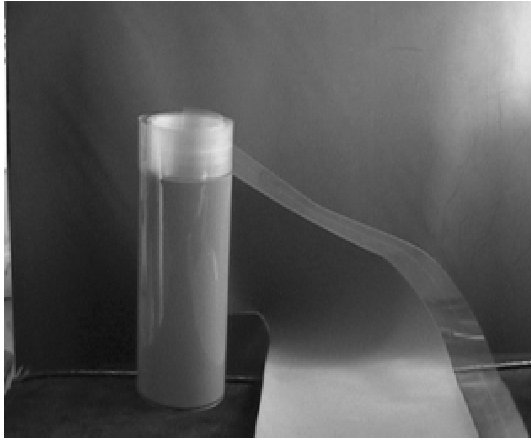
\* Typical property of TSP-Fi 7025.

Properties	Value	Test Method
Thickness (mm)	0.5 ~ 2.0	ASTM D 374
Color	White/ Blue/ Gray/ Pink	Visual
Hardness (Shore 00)	70~85	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	2.8	ASTM D 792
Continue Use (°C)	- 60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ω·cm)	1 × 10 <sup>13</sup>	ASTM D 257
Thermal Conductivity (W/mK)	2.5	ASTM 5470
Thermal Resistance(m <sup>2</sup> k/W)	2.8*10 <sup>-3</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94

## Thermal Resistance



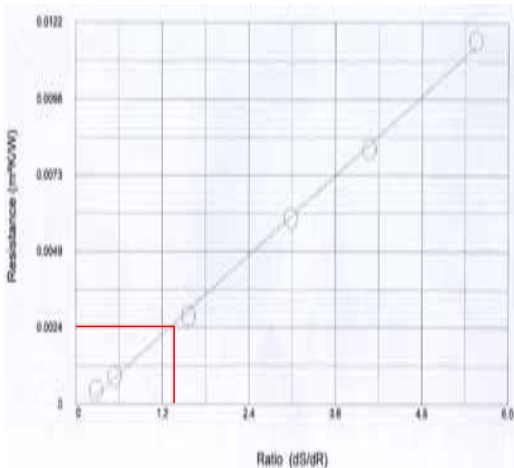
# TSP-Fi 8030



\* Typical property of TSP-Fi 7025.

Properties	Value	Test Method
Thickness (mm)	0.5 ~ 2.0	ASTM D 374
Color	White/ Blue/ Gray/ Pink	Visual
Hardness (Shore 00)	70~85	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	3.0	ASTM D 792
Continue Use (°C)	- 60 ~ 150	-
Dielectric Breakdown (kV)	6	ASTM D 149
Volume Resistivity (Ω·cm)	1 × 10 <sup>13</sup>	ASTM D 257
Thermal Conductivity (W/mK)	3.0	ASTM 5470
Thermal Resistance(m <sup>2</sup> k/W)	2.4*10 <sup>-3</sup>	ASTM D 150
Flame Retardant level	V-0	UL 94

## Thermal Resistance



>> **High Hardness**  
**Thermal conductivity silicone**

- GT-TC SERIES are high thermally conductivity rubber sheets. They provide excellent heat conductivity and cushioning effect.
- GT-TC SERIES are excellent mechanical and physical characteristics. They are available sheet, tape or as O-rings



**Feature**

- Excellent thermal conductivity.
- Excellent flame retardant(UL94 V-0)
- Various thickness are available.
- Excellent electrical insulation.
- Retain good physical property in a wide range of temperature.

**Application**

- Heat dissipation of surface-mount Chips.
- Between Power Sources and Heat Sink.
- Automotive systems.
- Isolate electrical components.
- Surface panel of LCD & PDP.

**GT-TC SERIES**

## TYPICAL PROPERTIES OF TC 3007

Properties	Value	Test Method
Thickness (mm)	0.3 ~ 20.0	ASTM D 374
Color	White/ Blue/ Gray/ Pink	Visual
Hardness (Shore 00)	35	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	1.9	ASTM D 792
Continue Use (°C)	- 60 ~ 150	-
Dielectric Breakdown (kV)	7	ASTM D 149
Volume Resistivity (Ωcm)	1 x 10 <sup>13</sup>	ASTM D 257
Thermal Conductivity (W/mK)	0.7	ASTM 5470
Flame Retardant level	V-0	UL 94



TC - 30 07

- 07 = Thermal conductivity(0.7W/mK)
- 30 = Hardness (Shore A)
- TC = Thermal Conductivity rubber

## TYPICAL PROPERTIES OF TC 4010

Properties	Value	Test Method
Thickness (mm)	0.3 ~ 20.0	ASTM D 374
Color	White/ Blue/ Gray/ Pink	Visual
Hardness (Shore 00)	45	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	2.4	ASTM D 792
Continue Use (°C)	- 60 ~ 150	-
Dielectric Breakdown (kV)	7	ASTM D 149
Volume Resistivity (Ωcm)	1 x 10 <sup>13</sup>	ASTM D 257
Thermal Conductivity (W/mK)	1.0	ASTM 5470
Flame Retardant level	V-0	UL 94



TC - 40 10

- 10 = Thermal conductivity(1.0W/mK)
- 40 = Hardness (Shore A)
- TC = Thermal Conductivity rubber

## TYPICAL PROPERTIES OF TC 5015

Properties	Value	Test Method
Thickness (mm)	0.3 ~ 20.0	ASTM D 374
Color	White/ Blue/ Gray/ Pink	Visual
Hardness (Shore 00)	50	ASTM D 2240
Specific Gravity (g/cm <sup>3</sup> )	2.4	ASTM D 792
Continue Use (°C)	- 60 ~ 150	-
Dielectric Breakdown (kV)	7	ASTM D 149
Volume Resistivity (Ωcm)	1 x 10 <sup>13</sup>	ASTM D 257
Thermal Conductivity (W/mK)	1.5	ASTM 5470
Flame Retardant level	V-0	UL 94



### TC - 50 15

