

# eGRAF® HITHERM™

## Natural Graphite Thermal Interface

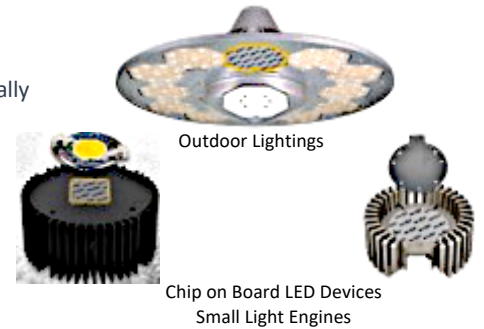
### OVERVIEW:

#### THE MOST RELIABLE THERMAL INTERFACE FOR THE MOST DEMANDING APPLICATIONS

eGRAF® HITHERM™ thermal interface materials (TIMs) are designed for long life, mission-critical applications that have extreme heat cycles. HITHERM™ TIMs are made of flexible graphite specifically engineered for demanding lighting, computing and power electronics applications.

### FEATURES AND BENEFITS:

- Consistent, reliable thermal performance enabling zero maintenance applications
- Will not flow or pump out under any thermal extremes, thermal cycles or part orientation
- Assembly-ready foil form factor eliminates dispensing and cleaning processes
- “NASA certified” minimal outgassing prevents fouling of optics in lighting applications
- Replace thermal grease, providing consistently unlimited application lifetime.



### APPLICATIONS:

- **Power modules such as IGBT, RF devices used in:**
  - UPS and Inverters
  - Motor Drives
  - Base Stations
  - Power Supply Modules, Rectifiers and Chargers
- Driving Lamps – Prevent Fogging of lens and optics, will not outgas
- LEDs
- Outdoor Lightings



Driving Lamp



Motor Drives  
Power Inverters



Telecommunications  
CPU/GPU Thermal Interface

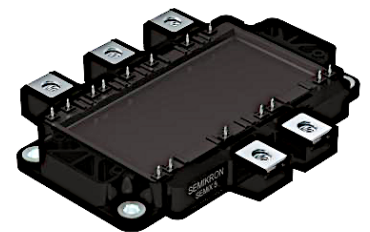
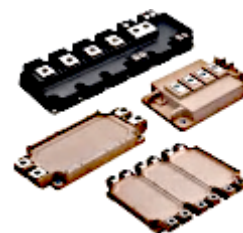
### HITHERM™ Pure Natural Graphite Thermal Interface

	Unit	HT 1205	HT 1210	HT 1220	HT C3200
Thickness	mm	0.127 +/-10%	0.250 +/-5%	0.508 +/-5%	0.200 +/-10%
Hardness	Shore A	85	85	85	-
Compressible - No Thickness Recovery After Compression	%	5	5	5	7
Thermal Conductivity In-Plane X-Y @ 700kPa	W/m-K	150	150	150	800
Thermal Conductivity Through-Plane Z @700kPa	W/m-K	10	10	10	7
Thermal Contact Impedance @ 200kPa	(K-cm <sup>2</sup> /W)	0.59	0.66	-	0.49
Thermal Contact Impedance @ 700kPa	(K-cm <sup>2</sup> /W)	0.30	0.40	-	0.18
Electrical Resistivity In-Plane (μΩm)	μΩm	60	60	60	-
Electrical Resistivity Through-Plane (μΩm)	μΩm	1230	1230	1230	-
Electrical Conductivity In-Plane X-Y	S/cm	-	-	-	19000
Electrical Conductivity Through-Plane Z	S/cm	-	-	-	5
Coefficient of Thermal Expansion In-Plane X-Y (ppm/°C)	ppm/°C	-0.4	-0.4	-0.4	0.4
Coefficient of Thermal Expansion Through-Plane Z (ppm/°C)	ppm/°C	27	27	27	27
UL Flammability Rating	U.L.	94V-0	94V-0	94V-0	94V-0
Operating Temperature (°C)	-	-40 to +400	-40 to +400	-40 to +400	-40 to +400
Specific Heat @ 25 °C	J/g-°C	0.77	0.77	0.77	0.8
RoHS Compliant		Yes	Yes	Yes	Yes
Lead/Halogen Free		Yes	Yes	Yes	Yes

### Part Number Reference

#### HITHERM™ HT C3200 In Power Electronics IGBT Modules

Manufacturer	Module	eGRAF® Part Number
Fuji Electric	62mm	G10118
	Dual XT	G10020
	PrimePack™ 2	G10019
	PrimePack™ 3	G10018
Infineon	62mm	G10118
	EconoDUAL™ 3	G10020
	EconoDUAL™ 4	G10121
	PrimePack 2	G10019
Semikron	PrimePack 3	G10018
	SEMIPACK	G10118
	SEMISTRANS 3	G10118
	SEMISTRANS 4	G10118
	SEMISTRANS 5	G10118
	SEMIX 3p/3s	G10020
	SEMIX 5	G10121
Various	SOT-227	TBA



Everjoy Industrial Supplies Pte. Ltd.

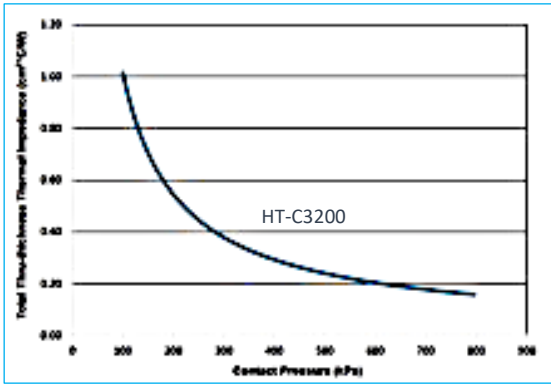
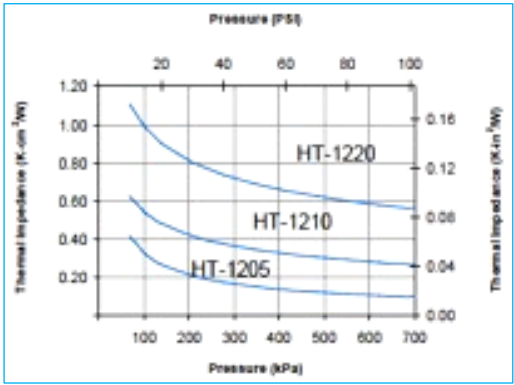
38 Woodlands Industrial Park E1, #04-11 Singapore 757700

Telephone: + 65 6748 3093

Fax: +65 6748 7202

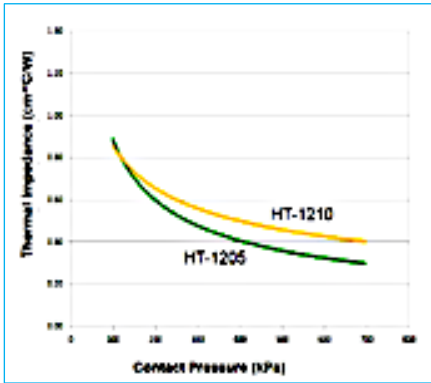
Email: admin@everjoy.com.sg

## Thermal Impedance Vs. Pressure



HITHERM™ Thermal Interface Material – Adhesive Coating	
Characteristic	Adhesive “A” Coating
Nominal Thickness (mm)	0.008
Operating Temperature °C	-40 to +150
Thermal Impedance Per Side (cm² °C/W @ 110 kPa)	0.16
Thermal Conductivity (W/m-K)	-
Dielectric Strength (V)	-
Adhesive Strength (g/cm²)	700 (Typical) 400 (Minimum)
Adhesive not available on HT-1220 Grade	

## Thermal Impedance Vs. Pressure ( Including Adhesive)



## Eliminate The Mess And Risk In Thermal grease

Property	No TIM “Dry Joint”	Grease	Silicon Pad	<b>HITHERM™ TIM</b>
<b>Material Price</b>	💰 Surface Finishing	💰	💰💰💰	💰💰
<b>Initial Thermal Performance</b>	🏆 Worst	🏆 Best	🏆 Worst	🏆 Good
<b>Long Term Thermal Performance</b>	🏆 Worst	🏆 Good	🏆 Worst	🏆 Best
<b>No Upfront Capital Cost (i.e. Dispensing Equipment)</b>	✅	❌	✅	✅
<b>Performance Consistency (Part to part variation)</b>	❌	❌	✅	✅
<b>Reworkable/Field Replaceable</b>	✅	❌	✅	✅
<b>Over 15 year rated life</b>	❌	❌	❌	✅
<b>NASA Outgassing Certified</b>	❌	❌	❌	✅