NEOGRAF™ SOLUTIONS

eGRAF® SpreaderShield™

SpreaderShield™ Heat Spreaders

TECHNICAL DATA SHEET 321

Product Overview

eGraf® SpreaderShield™ flexible graphite heat spreaders are a unique line of natural graphite products capable of cooling a hot component, protecting a temperature-sensitive component, reducing a thermal gradient, or preventing a surface hot spot. SpreaderShield flexible graphite is ideal for a wide range of electronic applications, from the thinnest and lightest smartphones to the fastest-charging EV batteries.

Natural Graphite Products[1]

CHARACTERISTIC	SS400	SS500	SS600
Graphite Thickness[7], mm Roll Width[4] (mm), Roll Length (m)	0.051 ±0.013 (355 ±4, 150 ±1)	0.076 ±0.013 (400 ±4, 100 ±1)	
	0.127 ±0.013 (610 ±6, 100 ±1)	0.127 ±0.013 (440 ±4, 100 ±1)	0.127 ±0.013 (182 ±2, 100 ±1)
	0.25 ±0.025 (584 ±6, 30.5 ±1)	0.20 ±0.025 (457 ±5, 50 ±1)	
	0.51 ±0.025 (610 ±6, 30.5 ±1)	0.40 ±0.025 (432 ±5, 30.5 ±1)	
	0.94 ±0.025 (610 ±6, 30.5 ±1)		
Thermal Conductivity, In-Plane[2] (W/m·K) Thermal Conductivity, Through-Plane[3] (W/m·K)	400 ±100 2.2 ±0.5	500 ±100 2.1 ±0.5	600 ±100 1.8 ±0.5
Density (g/cm^3)	1.75 ±0.1	1.80 ±0.1	1.85 ±0.1
Thermal Conductance[5] (mW/K)	50.8 @ 0.127mm	63.5 @ 0.127mm	76.2 @ 0.127mm
Electrical Conductivity In-Plane (S/m) Electrical Conductivity Through-Plane (S/m)	38 0.046	231 0.074	203 0.056

General SpreaderShield Product Characteristics[1]

Coefficient of Thermal Expansion, In-Plane (ppm/°C) Coefficient of Thermal Expansion, Through-Plane (ppm/°C)	-0.4 27.0
Specific Heat (J/g°C @ 50°C)	0.81
Operating Temperature: In any atmosphere with standard PET/adhesive coatings: long-term[6] (°C) In any atmosphere with standard PET/adhesive coatings: short-term[6] (°C) In an oxygen-containing atmosphere, without coatings (°C) In a reducing atmosphere, or vacuum, without coatings (°C)	 -30 to +140 -40 to +149 -250 to +400 -250 to +3000
UL Flammability Rating (with or without standard PET/adhesive coatings)	94-V0
RoHS /REACH Compliant?	Yes
Lead Free / Halogen-Free?	Yes

Part Designation

Every SpreaderShield flexible graphite heat spreader part number defines the grade, thickness, and coating options of the material. It is constructed based on the example below. **For additional information on standard coatings, please refer to Technical Data Sheet 322 - SpreaderShield Design Options.**

SpreaderShield Graphite Heat Spreader			Plastic/Adhesive Coatings				Envelope Seal
SS400	—	0.25	—	P1	G	P1A1	—	EN
Product Grade		Graphite Layer Thickness in mm (excludes coatings)		Top Coating Type (if any)	G (graphite)	Bottom Coating Type (if any)		Envelope Seal Designation (if used)

Notes:

[1] Properties listed are typical and cannot be used as acceptance or rejection criteria. Product characteristics are subject to change at any time without prior notice. Product characteristics exclude coatings and adhesives.

[2] In-plane thermal conductivity determined by 'NeoGraf Standard Method for Determination of Thermal Conductivity.'

[3] Through-plane thermal conductivity determined using ASTM D5470 method @700 kPa.

[4] The stated roll widths are for bare graphite. The finished roll width will decrease slightly with the addition of plastic and adhesive coatings.

[5] Thermal Conductance is defined as the Thickness of the spreader times its X-Y Thermal Conductivity. It is an easy way to compare the spreading ability of two different products. The larger the number, the more heat the product will spread.

[6] Short term refers to periods of minutes and hours. Long term refers to periods of days and weeks.

[7] Standard grades shown. Alternative thicknesses and conductivity specifications may be available for qualified volume programs. Contact your sales representative to discuss requirements.

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