RF/Microwave

IS680 AG345

PRELIMINARY

Data Sheet

Tg 200, Td 360
Dk 3.45, Df 0.0026
/17

IS680 AG345 Very Low-loss Antenna Grade Laminate Material

IS680 AG345 antenna grade laminate materials exhibit exceptional electrical properties which are very stable over a broad frequency and temperature range. IS680 AG345 materials are suitable for many of today's commercial RF/microwave designs. It features a Dielectric Constant (Dk) that is stable between -55°C and 125°C at up to W-band frequencies. In addition, IS680 AG345 offers a lower dissipation factor (Df) of 0.0026 making it a cost-effective alternative to PTFE and other commercial microwave laminate materials in double sided PCBs. Excellent PIM performance makes IS680 AG345 a perfect material for critical antenna applications.

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Features

- High Thermal Performance
  - Tg: 200°C (DSC)
  - Td: 360°C (TGA @ 5% wt loss)
  - Low CTE in the Z-axis – 2.90% (-55 to 288°C)
- T260: >60 minutes
- T288: >60 minutes
- RoHS Compliant
- Electrical Properties
  - Dk: 3.45 ±0.05
  - Df: 0.0026 ±0.0005
  - Exceptional dielectric properties over a broad frequency and temperature range per IPC-TM-650-2.5.5.5
- Core Material Standard Availability
  - Thickness: 0.030" & 0.060" (0.76 mm & 1.52 mm)
  - Available in full size sheet or panel form
- Copper Foil Type Availability
  - VLP-2 (2 micron)
  - RTF (Reverse Treat Foil)
- Copper Weights
  - ½, 1 and 2 oz (18, 35 and 70 µm) available
  - Heavier copper available upon request
  - Thinner copper foil available upon request
- Industry Approvals
  - IPC-4103 /17
  - UL – File Number E41625
  - UL-94 V-0

ORDERING INFORMATION:

Contact your local sales representative or visit **www.isola-group.com** for further information.

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IS680 AG345 Preliminary Specifications

Property		Typical Values			
				Units	Test Method
		Typical Value	Specification	Metric (English)	IPC-TM-650 (or as noted)
Glass Transition Temperature (Tg) by DSC		200	170-200	ºC	2.4.24
Decomposition Temperature (Td) by TGA @ 5% weight loss		360	–	ºC	ASTM D3850
T260		>60	–	Minutes	–
T288		>60	–	Minutes	–
CTE, Z-axis	A. Pre-Tg B. Post-Tg	44.7 191	AABUS –	ppm/ºC	2.4.41
CTE, X axis		19	AABUS	ppm/ºC	2.4.41
CTE, Y axis		20	AABUS	ppm/ºC	2.4.41
Z-axis Expansion (-55-260ºC)		2.90	–	%	2.4.41
Thermal Conductivity (-100-250ºC)		0.32	–	W/mK	ASTM F433
Thermal Stress 10 sec @ 288ºC (550.4ºF)	A. Unetched B. Etched	Pass	Pass Visual	Rating	2.4.13.1
Dk, Permittivity (Laminate & prepreg as laminated)	A. @ 2 GHz B. @ 5 GH C. @ 10 GHz	3.45 3.45 3.45	±0.05 – –	–	2.5.5.5
Df, Loss Tangent (Laminate & prepreg as laminated)	A. @ 2 GHz B. @ 5 GHz C. @ 10 GHz	0.0026 0.0026 0.0026	Nominal ±0.0005 – –	–	Bereskin Stripline
PIM*		< -155	–	dBc	Rosenberger PIM Analyzer 850 MHz - 1.9 GHz
Volume Resistivity	96/35/90	$1.33x10^7$	$1.0x10^6$	MΩ-cm	2.5.17.1
Surface Resistivity	96/35/90	$1.33x10^5$	$1.0x10^4$	MΩ	2.5.17.1
Dielectric Breakdown (0.060)		45.4	–	kV	2.5.6
Arc Resistance		139	60	Seconds	2.5.1
Electric Strength (Laminate & prepreg as laminated)		45 (1133)	30 (750)	kV/mm (V/mil)	2.5.6.2
Comparative Tracking Index (CTI)		2	–	Class (Volts)	UL-746A ASTM D3638
Peel Strength	1 oz. EDC foil	1.0 (5.5)	0.53 (3.0)	N/mm (lb/inch)	2.4.8.3
Flexural Strength	A. Lengthwise direction B. Crosswise direction	43,633 35,567	–	$lb/inch^2$	2.4.4 –
Tensile Strength	A. Lengthwise direction B. Crosswise direction	437,235 387,153	–	$lb/inch^2$	ASTM D638 –
Young's Modulus	A. Grain direction B. Fill direction	2559 2366	–	ksi	ww
Poisson's Ratio	A. Grain direction B. Fill direction	0.122 0.120	–	–	xx
Moisture Absorption		0.1	–	%	2.6.2.1
Flammability (Laminate & prepreg as laminated)		V-0	V-0	Rating	UL 94
Max Operating Temperature		110	UL Cert	ºC	–

* PIM values are influenced by copper foil treatment roughness. PIM values presented were achieved with the use of VLP-2 copper foil.

The data, while believed to be accurate and based on analytical methods considered to be reliable, is for information purposes only. Any sales of these products will be governed by the terms and conditions of the agreement under which they are sold.

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