

IPC-4103 /17 UL - File Number E41625

IS680 AG laminate materials exhibit exceptional electrical properties which are very stable over a broad frequency and temperature range.

PRODUCT FEATURES

Industry Recognition

- UL File Number: E41625
- RoHS Compliant

Processing Advantages

- FR-4 process compatible
- Reduced drill wear
- No plasma desmear required
- Consistent dielectric spacing

PRODUCT AVAILABILITY

Standard Material Offering: Laminate

- 20, 30, 60 mil (0.51, 0.76, 1.5 mm)
- Available in full size sheet or panel form

Copper Foil Type

- HVLP (VLP2) \approx 2.5 micron Rz JIS, 1 oz and below is standard

Copper Weight

- ½ to 2 oz (18 to 70 μ m) available

IS680 AG is suitable for many of today's commercial RF/ microwave printed circuit designs. It features a dielectric constant (Dk) that is stable between -55°C and +125°C up to W-band frequencies. In addition, IS680 AG offers an ultra-low dissipation factor (Df), making it an extremely cost-effective alternative to PTFE and other commercial microwave laminate materials in double sided applications.

PRODUCT ATTRIBUTES



TYPICAL MARKET APPLICATIONS



Typical Values Table

Property	Typical Value	Units		Test Method
		Metric (English)		IPC-TM-650 (or as noted)
Glass Transition Temperature (Tg) by DSC	200	°C		2.4.25C
Decomposition Temperature (Td) by TGA @ 5% weight loss	360	°C		2.4.24.6
Time to Delaminate by TMA (Copper removed)	A. T260 B. T288	>60	Minutes	2.4.24.1
Z-Axis CTE	A. Pre-Tg B. Post-Tg C. 50 to 260°C, (Total Expansion)	44.7 191 2.9	ppm/°C ppm/°C %	2.4.24C
X/Y-Axis CTE	Pre-Tg	12	ppm/°C	2.4.24C
Thermal Conductivity		0.38 - 0.53	W/m-K	ASTM E1952
Thermal Stress 10 sec @ 288°C (550.4°F)	A. Unetched B. Etched	Pass	Pass Visual	2.4.13.1
Dk, Permittivity	@ 10 GHz	3.00	–	2.5.5.5
Df, Loss Tangent	@ 10 GHz	0.0020	–	Bereskin Stripline
Dk, Permittivity	@ 10 GHz	3.38	–	2.5.5.5
Df, Loss Tangent	@ 10 GHz	0.0026	–	Bereskin Stripline
Dk, Permittivity	@ 10 GHz	3.45	–	2.5.5.5
Df, Loss Tangent	@ 10 GHz	0.0026	–	Bereskin Stripline
Dk, Permittivity	@ 10 GHz	3.48	–	2.5.5.5
Df, Loss Tangent	@ 10 GHz	0.0029	–	Bereskin Stripline
Volume Resistivity	C-96/35/90	1.33×10^7	MΩ-cm	2.5.17.1
Surface Resistivity	C-96/35/90	1.33×10^5	MΩ	2.5.17.1
Dielectric Breakdown		45.4	kV	2.5.6B
Arc Resistance		139	Seconds	2.5.1B
Electric Strength (Laminate & laminated prepreg)		45 (1133)	kV/mm (V/mil)	2.5.6.2A
Comparative Tracking Index (CTI)		2	Class (Volts)	UL 746A ASTM D3638
Peel Strength	1 oz. EDC foil	0.70 (4.01)	N/mm (lb/inch)	2.4.8.2A
Flexural Strength	A. Length direction B. Cross direction	37.5 28.5	ksi	2.4.4B
Tensile Strength	A. Length direction B. Cross direction	28.0 26.0	ksi	ASTM D3039
Poisson's Ratio	A. Length direction B. Cross direction	0.122 0.120	–	ASTM D3039
Moisture Absorption		0.10	%	2.6.2.1A
Flammability (Laminate & laminated prepreg)		V-0	Rating	UL 94
Relative Thermal Index (RTI)		130	°C	UL 796

NOTES

Revisions:

A: Initial release - 4/17

B: Corrected units for Flexural and Tensile Strength - 8/18

C: Change MOT to RTI 5/19

D: Changed VLP2 to HVLP to align with common industry terms 4/21

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