

IPC-4103 /17 UL - File Number E41625

IS680 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

- Reduced drill wear
- No plasma desmear required
- Consistent dielectric spacing
- Dimensional stability

#### 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

- HTE Grade 3

##### Copper Weight

- ½, 1 and 2 oz (18, 35 and 70 µm) available
- Square weave glass
- Mechanically spread glass

IS680 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 offers a very 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



#### ORDERING INFORMATION:

Contact your local sales representative or contact [info@isola-group.com](mailto:info@isola-group.com) for further information.

##### Isola Group

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##### Isola Asia Pacific

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##### Isola GmbH

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# 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	2.80	—	2.5.5.5
Df, Loss Tangent	@ 10 GHz	0.0025	—	Bereskin Stripline
Dk, Permittivity	@ 10 GHz	3.00	—	2.5.5.5
Df, Loss Tangent	@ 10 GHz	0.0030	—	Bereskin Stripline
Dk, Permittivity	@ 10 GHz	3.20	—	2.5.5.5
Df, Loss Tangent	@ 10 GHz	0.0030	—	Bereskin Stripline
Dk, Permittivity	@ 10 GHz	3.33	—	2.5.5.5
Df, Loss Tangent	@ 10 GHz	0.0030	—	Bereskin Stripline
Dk, Permittivity	@ 10 GHz	3.38	—	2.5.5.5
Df, Loss Tangent	@ 10 GHz	0.0035	—	Bereskin Stripline
Dk, Permittivity	@ 10 GHz	3.45	—	2.5.5.5
Df, Loss Tangent	@ 10 GHz	0.0035	—	Bereskin Stripline
Volume Resistivity	C-96/35/90	$1.33 \times 10^7$	MΩ-cm	2.5.17.1
Surface Resistivity	C-96/35/90	$1.33 \times 10^5$	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	259 (37.5) 197 (28.5)	MPa (kpsi)	2.4.4B
Tensile Strength	A. Length direction B. Cross direction	193 (28.0) 179 (26.0)	MPa (kpsi)	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)		110	°C	UL 796

## NOTES

Visit our site <http://www.isola-group.com> for more details.

Revisions:

A: Initial release - 4/17

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

C: Change MOT to RTI 5/19

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