



# IS680 AG

## Very Low-Loss Laminate Materials

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

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

RF/Microwave

### Typical Market Applications

Aerospace & Defense , RF / Microwave

#### ORDERING INFORMATION:

Contact your local sales representative or visit [www.isola-group.com](http://www.isola-group.com) for further information.

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RF/Microwave

## Data Sheet

Tg 200°C

Td 360°C

Dk 3.00 / 3.38 / 3.45 / 3.48

Df 0.0020 - 0.0029

IPC-4103/17

UL - File Number E41625

Last Updated December 8, 2017  
Revision No: 12

### Product Features

- Industry Recognition
  - UL File Number: E41625
  - RoHS Compliant
- Performance Attributes
- 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
  - VLP-2 (2 micron), 1 oz and below
- Copper Weight
  - ½, 1 oz (18 and 35 µm) available
  - Heavier copper available
  - Thinner copper foil available

# IS680 AG Typical Values

Last Updated Dec 8, 2017

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/mK	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	$1.33 \times 10^7$	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	37,500 28,500	ksi	2.4.4B
Tensile Strength	A. Length direction B. Cross direction	28,000 26,000	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	
Max Operating Temperature	130	°C	UL 796	

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.

[www.isola-group.com/products/all-printed-circuit-materials/is680-ag/](http://www.isola-group.com/products/all-printed-circuit-materials/is680-ag/)

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