



# IS680

## Very Low-Loss Laminate Materials

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

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

RF/Microwave

### Typical Market Applications

Aerospace & Defense , RF / Microwave

RF/Microwave

## Data Sheet

Tg 200°C

Td 360°C

Dk 2.80-3.45

Df 0.0025-0.0035

IPC-4103/17

UL - File Number E41625

Last Updated December 7, 2017  
Revision No: 14

## Product Features

## Product Availability

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	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 x 10 <sup>7</sup>	MΩ-cm	2.5.17.1
Surface Resistivity	C-96/35/90	1.33 x 10 <sup>5</sup>	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		2.4.4B
Tensile Strength	A. Length direction B. Cross direction	28,000 26,000		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	110	°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.

