RF/Microwave

IS680-300

Data Sheet

Tg 200, Td 360
Dk 3.00, Df 0.0030

IS680-300 Very Low-loss Laminate Material

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 at up to 20 GHz. In addition, IS680 offers a lower dissipation factor (Df) of 0.0030 making it a cost-effective alternative to PTFE and other commercial microwave laminate materials.

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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 – 2.9% (-55-288°C)
- T260: 60+ minutes
- T288: 60+ minutes
- RoHS Compliant
- Electrical Properties
  - Dk: 3.00 ±0.05
  - Df: 0.0030 ±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: 0.020", 0.030" & 0.060" (0.05 mm, 0.76 mm & 1.52 mm)
  - Available in full size sheet or panel form
- Copper Foil Type Availability
  - Standard HTE Grade 3
  - RTF (Reverse Treat Foil)
  - VLP-2 (2 micron)
- 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
  - UL – File Number E41625
  - UL-94 V-0

ORDERING INFORMATION:

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

Isola Group
3100 West Ray Road
Suite 301
Chandler, AZ 85226
Phone: 480-893-6527
Fax: 480-893-1409
info@isola-group.com

Isola Asia Pacific (Hong Kong) Ltd.
Unit 3512 - 3522, 35/F
No. 1 Hung To Road, Kwun Tong,
Kowloon, Hong Kong
Phone: 852-2418-1318
Fax: 852-2418-1533
info.hkg@isola-group.com

Isola GmbH
Isola Strasse 2
D-52348 Düren, Germany
Phone: 49-2421-8080
Fax: 49-2421-808164
info-dur@isola-group.com

IS680-300 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-, Y-axes	A. Pre-Tg B. Post-Tg	12 13	AABUS –	ppm/ºC	2.4.41
Z-axis Expansion (-55-260ºC)		2.9	–	%	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	3.00 3.00 3.00	±0.05 – –	–	2.5.5.5
Df, Loss Tangent (Laminate & prepreg as laminated)	A. @ 2 GHz B. @ 5 GHz C. @ 10 GHz	0.0030 0.0030 0.0030	Nominal ±0.0005 – –	–	Bereskin Stripline
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	0.70 (4.01)	0.53 (3.0)	N/mm (lb/inch)	2.4.8.3
Flexural Strength	A. Lengthwise direction B. Crosswise direction	37,500 28,500	–	$lb/inch^2$	2.4.4 –
Tensile Strength	A. Lengthwise direction B. Crosswise direction	28,000 26,000	–	$lb/inch^2$	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		0.01	–	%	2.6.2.1
Flammability (Laminate & prepreg as laminated)		V-0	V-0	Rating	UL 94
Max Operating Temperature		110	UL Cert	ºC	–

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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