



IS680 AG338 Very Low-loss Antenna Grade Laminate Material

IS680 AG338 antenna grade laminate materials exhibit exceptional electrical properties which are very stable over a broad frequency and temperature range. IS680 AG338 materials are suitable for many of today's commercial RF/microwave designs. It features a Dielectric Constant (Dk) that is stable between -55°C and 125°C at up to W-band frequencies. In addition, IS680 AG338 offers a lower dissipation factor (Df) of 0.0026 making it a cost-effective alternative to PTFE and other commercial microwave laminate materials in double sided PCBs. Excellent PIM performance makes IS680 AG338 a perfect material for critical antenna applications.

www.isola-group.com

ORDERING INFORMATION:

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

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RF/Microwave

IS680 AG338

Data Sheet

Tg 200, Td 360
Dk 3.38, Df 0.0026
/17

Features

- High Thermal Performance
 - ▶ Tg: 200°C (DSC)
 - ▶ Td: 360°C (TGA @ 5% wt loss)
 - ▶ Low CTE in the Z-axis – 2.90% (50 to >260°C)
- T260: >60 minutes
- T288: >60 minutes
- RoHS Compliant
- Electrical Properties
 - ▶ Dk: 3.38
 - ▶ Df: 0.0026
 - ▶ Exceptional dielectric properties over a broad frequency and temperature range per IPC-TM-650-2.5.5.5
- Core Material Standard Availability
 - ▶ Thickness: 0.030" & 0.060"
(0.76 mm & 1.52 mm)
 - ▶ Available in full size sheet or panel form
- Copper Foil Type Availability
 - ▶ VLP-2 (Rz = 2 micron)
 - ▶ RTF (Reverse Treat Foil)
- 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
 - ▶ IPC-4103/17
 - ▶ UL – File Number E41625
 - ▶ UL-94 V-0

IS680 AG338 Specifications

Property		Typical Values			
		Typical Value	Specification	Units	Test Method
				Metric (English)	IPC-TM-650 (or as noted)
Glass Transition Temperature (Tg) by DSC		200	170-200	°C	2.4.24
Decomposition Temperature (Td) by TGA @ 5% weight loss		360	–	°C	ASTM D3850
T260		>60	–	Minutes	–
T288		>60	–	Minutes	–
CTE, Z-axis	A. Pre-Tg	44.7	AABUS	ppm/°C	2.4.41
	B. Post-Tg	191	–		
CTE, X axis		19	AABUS	ppm/°C	2.4.41
CTE, Y axis		20	AABUS	ppm/°C	2.4.41
Z-axis Expansion (-55-260°C)		2.90	–	%	2.4.41
Thermal Conductivity (-100-250°C)		0.32	–	W/mK	ASTM F433
Thermal Stress 10 sec @ 288°C (550.4°F)	A. Unetched	Pass	Pass Visual	Rating	2.4.13.1
	B. Etched				
Dk, Permittivity (Laminate & prepreg as laminated)	A. @ 2 GHz	3.38	acc. IPC-4103 /17	–	2.5.5.5
	B. @ 5 GHz	3.38			
	C. @ 10 GHz	3.38			
Df, Loss Tangent (Laminate & prepreg as laminated)	A. @ 2 GHz	0.0026	acc. IPC-4103 /17	–	Bereskin Stripline
	B. @ 5 GHz	0.0026			
	C. @ 10 GHz	0.0026			
PIM (VLP-2 Cu)*		<-160	–	dBc	Rosenberger PIM Analyzer 850 MHz - 1.9 GHz
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	1.0 (5.5)	0.53 (3.0)	N/mm (lb/inch)	2.4.8.3
Flexural Strength	A. Lengthwise direction	43,633	–	lb/inch ²	2.4.4
	B. Crosswise direction	35,567			
Tensile Strength	A. Lengthwise direction	437,235	–	lb/inch ²	ASTM D638
	B. Crosswise direction	387,153			
Young's Modulus	A. Grain direction	2559	–	ksi	ww
	B. Fill direction	2366			
Poisson's Ratio	A. Grain direction	0.122	–	–	xx
	B. Fill direction	0.120			
Moisture Absorption		0.1	–	%	2.6.2.1
Flammability (Laminate & prepreg as laminated)		V-0	V-0	Rating	UL 94
Max Operating Temperature		110	UL Cert	°C	–

* PIM values are influenced by copper foil treatment roughness. PIM values presented were achieved with the use of VLP-2 copper foil.

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.