

## IS680 AG300 Very Low-loss Antenna Grade Laminate Material

**IS680 AG300** antenna grade laminate materials exhibit exceptional electrical properties which are very stable over a broad frequency and temperature range. IS680 AG300 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 AG300 offers a lower dissipation factor (Df) of 0.0020 making it a cost-effective alternative to PTFE and other commercial microwave laminate materials in double sided PCBs. Excellent PIM performance makes IS680 AG300 a perfect material for critical antenna applications.

[www.isola-group.com](http://www.isola-group.com)

### 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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# IS680 AG300 Data Sheet

**Tg 200, Td 360**  
**Dk 3.00, Df 0.0020**  
**/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: 3.00
  - ▶ Df: 0.0020
  - ▶ 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 AG300 Specifications

Property	Typical Values				
	Typical Value	Specification	Units	Test Method	
			Metric (English)	IPC-TM-650 (or as noted)	
<b>Glass Transition Temperature (Tg) by DSC</b>	200	170-200	°C	2.4.24	
<b>Decomposition Temperature (Td) by TGA @ 5% weight loss</b>	360	–	°C	ASTM D3850	
<b>T260</b>	>60	–	Minutes	–	
<b>T288</b>	>60	–	Minutes	–	
<b>CTE, Z-axis</b>	A. Pre-Tg B. Post-Tg	AABUS –	ppm/°C	2.4.41	
<b>CTE, X axis</b>		AABUS	ppm/°C	2.4.41	
<b>CTE, Y axis</b>		AABUS	ppm/°C	2.4.41	
<b>Z-axis Expansion (-55-260°C)</b>	2.90	–	%	2.4.41	
<b>Thermal Conductivity (-100-250°C)</b>	0.32	–	W/mK	ASTM F433	
<b>Thermal Stress 10 sec @ 288°C (550.4°F)</b>	A. Unetched B. Etched	Pass Pass Visual	Rating	2.4.13.1	
<b>DK, Permittivity (Laminate &amp; prepreg as laminated)</b>	A. @ 2 GHz B. @ 5 GHz C. @ 10 GHz	3.00 3.00 3.00	acc. IPC-4103 /17	–	2.5.5.5
<b>Df, Loss Tangent (Laminate &amp; prepreg as laminated)</b>	A. @ 2 GHz B. @ 5 GHz C. @ 10 GHz	0.0020 0.0020 0.0020	acc. IPC-4103 /17	–	Bereskin Stripline
<b>PIM (VLP-2 Cu)*</b>	<-160	–	dBc	Rosenberger PIM Analyzer 850 MHz - 1.9 GHz	
<b>Volume Resistivity</b>	96/35/90	1.33x10 <sup>7</sup>	1.0x10 <sup>6</sup>	MΩ-cm	2.5.17.1
<b>Surface Resistivity</b>	96/35/90	1.33x10 <sup>5</sup>	1.0x10 <sup>4</sup>	MΩ	2.5.17.1
<b>Dielectric Breakdown (0.060)</b>	45.4	–	kV	2.5.6	
<b>Arc Resistance</b>	139	60	Seconds	2.5.1	
<b>Electric Strength (Laminate &amp; prepreg as laminated)</b>	45 (1133)	30 (750)	kV/mm (V/mil)	2.5.6.2	
<b>Comparative Tracking Index (CTI)</b>	2	–	Class (Volts)	UL-746A ASTM D3638	
<b>Peel Strength</b>	1 oz. EDC foil	1.0 (5.5)	0.53 (3.0)	N/mm (lb/inch)	2.4.8.3
<b>Flexural Strength</b>	A. Lengthwise direction B. Crosswise direction	43,633 35,567	–	lb/inch <sup>2</sup>	2.4.4 –
<b>Tensile Strength</b>	A. Lengthwise direction B. Crosswise direction	437,235 387,153	–	lb/inch <sup>2</sup>	ASTM D638 –
<b>Young's Modulus</b>	A. Grain direction B. Fill direction	2559 2366	–	ksi	ww
<b>Poisson's Ratio</b>	A. Grain direction B. Fill direction	0.122 0.120	–	–	xx
<b>Moisture Absorption</b>		0.1	–	%	2.6.2.1
<b>Flammability (Laminate &amp; prepreg as laminated)</b>		V-0	V-0	Rating	UL 94
<b>Max Operating Temperature</b>		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.