



# IS680 AG -348

## Very Low-Loss Laminate Materials

IS680 AG-348 laminate materials exhibit exceptional electrical properties which are very stable over a broad frequency and temperature range.

IS680 AG-348 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-348 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.

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

RF/Microwave

## Data Sheet

Tg 200°C

Td 360°C

Dk 3.48

Df 0.0029

IPC-4103 - / 17

UL - File Number E41625

Last Updated May 8, 2019  
Revision No: C

### 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
  - 60 mil (1.5mm)
  - 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 -348 Typical Values

Last Updated May 8, 2019

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	3.48	—	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	37.5 28.5	ksi	2.4.4B
Tensile Strength	A. Length direction B. Cross direction	28.5 26.0	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
Relative Thermal Index (RTI)		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.

<https://www.isola-group.com/products/all-printed-circuit-materials/is680-ag-348/>

The Isola name and logo are registered trademarks of Isola Corp. USA in the USA and other countries. IS680 AG -348 is a registered trademark of Isola USA Corp. in the USA. All other trademarks mentioned herein are property of their respective owners.

© 2016, Isola Group, All rights reserved.



## NOTE

Visit our site <http://www.isola-group.com> for more details.

Revisions:

A: Initial release - 4/17

B: Corrected units for Flexural and Tensile Strength - 8/18

C: Change MOT to RTI 5/19