

Dielectric Solution for Improved Signal Performance

FR408 is a high-performance FR-4 epoxy laminate & prepreg systems designed for advanced circuitry applications. Its low dielectric constant and low dissipation factor make it an ideal candidate for broadband circuit designs requiring faster signal speeds or improved signal integrity. FR408 also brings the board reliability with its high Tg. FR408 is compatible with most FR-4 processes. This feature allows the use of FR408 without adding complexity to current fabrication techniques.

Performance and Processing Advantages

- **High Thermal Performance**
Tg of 180 °C (DSC)
Low CTE for reliability
- **Improved Dielectric Properties**
DK <3.8 (50MHz - 1GHz) - Supports increased signal speeds
DF <0.010 (50MHz - 1GHz) - Provides better signal integrity
- **UV Blocking and AOI Fluorescence**
High throughput and accuracy during PCB fabrication and assembly
- **Superior Processing**
Closest to conventional FR-4 processing of all high speed materials

Purchasing Information

- **Industry Approvals**
IPC-4101A /24, /26 and /28
UL Recognized - FR-4, File Number E41625
Qualified to UL's MCIL Program
- **Standard Availability**
Thickness: 0.002" [.05 mm] to 0.093" [2.4 mm]
Available in sheet or panel form
Copper Foil Cladding: Grade 3 (HTE), ½, 1 and 2 oz.
Foil Options: Reverse treat
Prepregs: Available in roll or panel form
Glass Styles: 106, 1080, 2113, 2116, 1652 and 7628

FR408 Typical Laminate Properties, 0.008" [0.20mm]

PROPERTY	UNITS	IPC-4101A Spec /24	FR408 Value	CONDITIONING
Thickness	inches	0.0197	.008	
	mm	[<0.50]	[0.20]	—
Glass Construction	—	—	2-2116	—
Retained Resin	%	—	44±2	—
Thermal				
Tg (DSC)	°C	150-200	180	E-2/105
CTE x-axis	ppm/°C	—	13	Ambient to Tg
y-axis	ppm/°C	—	13	Ambient to Tg
z-axis	ppm/°C	—	120	Ambient to 288°C
Thermal Stress, 10 s @, 288°C	seconds	pass visual	NA	Condition A
Thermal Stress, 10 s @, 288°C	seconds	—	>200	E-2/105
T-260	minutes	—	<60	Condition A
T-288	minutes	—	>10	Condition A
Electrical				
Permittivity (DK) @				
1 MHz (2 Fluid Cell)	—	5.4 max.	3.8	C-24/23/50
1GHz (HP4291)	—	—	3.7	C-24/23/50
Loss Tangent (DF) @				
1 MHz (2 Fluid Cell)	—	0.035 max.	0.010	C-24/23/50
1 GHz (HP4291)	—	—	0.010	C-24/23/50
Volume Resistivity	megohms-cm	1x10 ⁶ min.	1x10 ⁸	C-96/35/90
	megohms-cm	1x10 ³ min.	1x10 ⁸	E-24/125
Surface Resistivity	megohms	1x10 ⁴ min.	1x10 ⁶	C-96/35/90
	megohms	1x10 ³ min.	1x10 ⁸	E-24/125
Electric Strength	volt/mil	736 min.	1400	D-48/50
	[volts/mm]	[2.9x10 ⁴]	[5.5x10 ⁴]	D-48/50
Arc Resistance	seconds	60 min.	120	D-48/50
Physical				
Peel Strength, RTF ½ oz.	lb/in	4.0 min.	4.5	After Thermal Stress
	[Kg/M]	[70] min.	[80]	After Thermal Stress
Peel Strength, Std. 1 oz.	lb/in	4.5 min.	7.0	After Thermal Stress
	[Kg/M]	[80] min.	[125]	After Thermal Stress
	lb/in	4.0	6.0	E-1/125
	[Kg/M]	[70]	[105]	E-1/125
Flexural Strength				
LW	psi	—	78,000	Condition A
LW	[N/mm ²]	—	[538]	Condition A
CW	psi	—	55,000	Condition A
CW	[N/mm ²]	—	[427]	Condition A
Flammability	rating	V-1min.	V-0	UL94
Moisture Absorption	%	—	0.45*	D-24/23
Moisture Absorption.	%	0.80 max.	0.15**	D-24/23

* Material Thickness Tested 0.008"

** Material Thickness Tested 0.028"

ORDERING INFORMATION

Contact your local sales representative or the Customer Service Department in La Crosse, WI

Isola USA Corp.
230 North Front Street
La Crosse, WI 54601
Phone: 800/845-2904 or
608/784-6070
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