

Technical data
Standard

**Original Bungard presensitized base material FR4 with UV blocker
IPC 4101A**

Property		Test method IPC-TM-650 or as noted	Specification	Units	Typical Value
Glass Transition Temperature (Tg) by DSC, spec. Minimum		2.4.25	110-150	°C	150
Decomposition Temperature (Td)		ASTM D3850	-	°C	320
CTE, Z-Axis	pre TG	2.4.24	AABUS	ppm/°C	15
CTE, Z-Axis	post TG	2.4.24	-	ppm/°C	250
CTE, X-, Y-Axis	pre TG	2.4.24	AABUS	ppm/°C	15
CTE, X-, Y-Axis	post TG	2.4.24	-	ppm/°C	17
Thermal Conductivity		ASTM D5930	-	W/mK	0.36
Thermal Stress 10s @ 288°C spec minimum	unetched/ etched	2.4.13.1 2.4.13.1	Pass visual Pass visual	Rating Rating	Pass Pass
Permittivity, spec maximum	A. @ 1 MHz B. @ 100 MHz C. @ 1 GHz	2.5.5.3 2.5.5.9 2.5.5.5	5.4 - -	- - -	4.8 4.6 4.5
Loss tangent, spec maximum	A. @ 1 MHz B. @ 100 MHz C. @ 1 GHz	2.5.5.3 2.5.5.9 2.5.5.5	0.035 - -	- - -	0.015 0.015 0.015
Volume Resistivity spec minimum	After moisture resistance At elevated temperature	2.5.17.1 2.5.17.1	10 ⁶ 10 ³	MOhm cm MOhm cm	4.0x10 ⁸ 7.0x10 ⁷
Surface Resistivity spec minimum	After moisture resistance At elevated temperature	2.5.17.1 2.5.17.1	10 ⁴ 10 ³	MOhm MOhm	3.0x10 ⁶ 6.0x10 ⁶
Dielectric Breakdown, spec minimum		2.5.6	40	kV	60
Arc Resistance, spec minimum		2.5.1	60	Seconds	105
Comparative Tracking Index	CTI / ASTM D3638	UL-746A	-	Volts	205 (CL=3)
Peel strenght spec. minimum	After thermal stress At 125 °C After process solutions	2.4.8 2.4.8 2.4.8	105 105 105	N/mm N/mm N/mm	145 145 145
Flexural strength, minimum	lengthwise crosswise	2.4.4 2.4.4	415 345	G.Pa G. Pa	442 435
Moisture absorbtion spec maximum		2.6.2.1	0.80	%	0.20
UL Approval		E 45456			
Flammability, spec minimum		UL-94	V-1	Rating	V-0
Thickness tolerance dielectric		Class II		mm	1.55 +/- 0.08
Thickness tolerance copper				µm	35 +/- 5
Deformation rel. to diagonal length			< 3	%	< 3

