

Technical data

Material

Standard

UL Approval

**Original Bungard presensitized base material FR4**

FR4 - 86 V0 with UV blocker

DIN IEC 249, MIL-S-13949 H, CSA, ISO 9002, ISO 14001

E 98983

Property	Pre-treatment	Specification	Unit	Typ. measured
Flexural strength lengthwise	A	> 415	N/mm <sup>2</sup>	485 - 550
Flexural strenght crosswise	A	> 350	N/mm <sup>2</sup>	400 - 450
Dimension stability X/Y	E-2/150	< 0.05	%	< 0.03
Moisture absorbtion	D-24/23	< 0.35	%	< 0.10
Copper peeling strength (35 µm Cu)	A after 10s at 288 °C	1.4	N/mm	> 1.80
Thermal expansion coeff. in Z before Tg	TMA	-	mm/mm/°C	5 x 10 <sup>-5</sup>
in Z after Tg	TMA	-	mm/mm/°C	20 x 10 <sup>-5</sup>
Dielectric breakdown	D 48/50	> 40	kV	> 60
Dielectric constant $\epsilon_r$	1 MHz C-24/23/50	< 5.4	-	4.2 - 4.8
Dissipation factor tan $\delta$	1 MHz C-24/23/50	< 0.035	-	0.01 - 0.016
Surface Resistivity	C-96/35/90	> 10 <sup>4</sup>	MΩ	5 x 10 <sup>6</sup> - 5 x 10 <sup>7</sup>
Volume Resistivity	C-96/35/90	> 10 <sup>6</sup>	MΩ / cm	5 x 10 <sup>8</sup> - 5 x 10 <sup>9</sup>
Arc resistance	D-48/50+D-0.5/23	> 60	sec	> 120
Flammability rating (UL 94)	A	94 V-0	-	94 V-0
Glas transition temp. TG	DSC	-	°C	140 ± 5
Boiling test 30 min	288 °C dipped	-	sec	230
Lotbadfestigkeit	288 °C dipped	> 10	sec	> 200
Thickness tolerance dielectric	MIL Class II			1.55 +/- 0.08 mm
Thickness tolerance copper				35 µm +/- 5 µm
Deformation	rel. to diagonal length	< 3	%	< 3

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BEZ