

**Materials Default Values – FR4**

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In the following, we have listed the established default values for FR4 materials used at Multi Circuit Boards Ltd.

The quality of your PCBs is assured through the use of technical comparable materials (dependent on manufacturing inventory, global market). A specific material can be defined on request; this may lead to a longer production time and / or a price adjustment.

		FR4 Standard	FR4 High-TG	FR4 Halogen-free	FR4 KF	Polyimid
TG	°C	≥ 135	≥ 170	≥ 140	≥ 135	≥ 230
CTE-z	ppm/°C	60	45	45	50	20
Permittivity εr	bei 1MHz	4.6	4.8	4.7	4.7	3.4
Electrical strength	KV/mm	45	55	50	45	125
Surface resistivity	MΩ	10 <sup>6</sup>	10 <sup>7</sup>	10 <sup>7</sup>	10 <sup>7</sup>	10 <sup>6</sup>
Tracking resistance CTI	V	PLC3*	PLC3*	PLC3*	PLC1 / PLC0**	-
Td value	°C	301	345	360	310	***
Peel strength	N/mm	1,1 - 1,6	1.2	1.4	1.6	1.6
Flammability class	UL-94	V0	V0	V0	V0	V0
Standard		IPC-4101	IPC-4101	IPC-4101	IPC-4101	IPC-4204

Depending on availability and / or customer request

e.g.	Isola Duraver	Isola IS410	Isola Duraver 156	Isola Duraver KF	DuPont Pyralux
	Shengyi S1141	Shengyi S1000-2	Shengyi S1155	Shengyi S1600	Shengyi SF302
	KingBoard 6160	Iteq IT180-A	KingBoard 6162		
	Panasonic R-1766M	Panasonic R-1755V	Panasonic R-1566V		Panasonic R-F775
	NanYa FR4-86				

\* PLC 3 = 175V - 249V, ISOLA recommends the value of 200 for calculations

\*\* High Tracking Resistance - Standard: PLC 1 ≥ 400V, on request PLC 0 ≥ 600V

\*\*\* Recommended operating temperature: standard 105 °C, on request 210 °C (Arlon)

If you need a special material (e.g. halogen-free, high-Tg, metal-core, BT epoxy or PTFE), please contact us. You can find an overview on our website: [www.multi-circuit-boards.eu](http://www.multi-circuit-boards.eu)

*Text data contained in this data sheet represents typical values and does not constitute any warranty or guarantee. For review of critical specification tolerances, please contact our CAM department.*