

## Technical data sheet

### PROPERTIES THERMAL E

The values are measured on standard Thermal E, with copper surface of 35 $\mu$ , dielectric of 0.10mm, aluminium of 1.50 mm.

Produced with epoxy multifunctional and dysfunctional epoxy resin

#### DIELECTRIC LAYERS CHARACTERISTICS

DIELECTRIC CONSTANT 1 MHz	4.7
DISSIPATION FACTOR	0.018.
TMA-T260 Min	13
Tma-t300 Min	0
TDA – TD 5% WT loss °C	315
HPCT (2 h) + 20 sec dip.288°C	100% pass
Average Z CTE 40-200°C ppm/K	160
<i>Dielectric thickness available = 0.10mm – 0.20 mm</i>	

#### COMPOSITE LAMINATE DENOMINATION : THERMAL E

THERMAL E is a composite laminate with copper, prepreg, epoxy or modified epoxy resin and aluminium Alloy

APPLICATIONS	For all the applications where the thermal dissipation of the heat is needed, with or without SMD components
STANDARD CONSTRUCTION	ALUMINIUM thickness in mm : 0.8 – 1.0 – <b>1.5</b> – <b>2.0</b> – 3.0
INSULATING PREPREG	<b>0.10 mm</b> – 0.20 mm
STANDARD SIZES	400mm x 500mm – <del>460mm x 610mm</del> – <b>230mm x 380mm</b>
COPPER $\mu$	18 $\mu$ - <b>35<math>\mu</math></b> - 70 $\mu$ - 105 $\mu$ - <b>140<math>\mu</math></b> - 400 $\mu$
THERMAL E PROTECTION PURPOSES	Alu side protection with dry film Alu side protection with dry film and Mylar Alu and copper side protection with dry film

Options marked in red are available from Multi PCB:  
1.5mm thickness > 35 $\mu$ m copper  
2.0mm thickness > 140 $\mu$ m copper

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THERMAL E**

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	TEST METHOD	TEST CONDITIONS	UNITS	TYPICAL VALUE
THERMAL STRESS	IPC 2.4.1.3.1.	288°C (550,4°F)	min.	3
COPPER PEEL	IPC 2.4.8.2.	20s/288°C	N/cm <sup>2</sup>	16
DIEL BREAKDOWN	IPC 650	A	kV	> 6
DIEL BREAKDOWN AFTER 500h at 500°C	IPC 2.5.6.650	E 500/150	kV	> 4
DIEL BREAKDOWN AFTER WATER IMMERSION	IPC 2.5.6.650	D 48/50	kV	> 3
THERMAL CONDUCTIVITY	ASTM-D5470	60°C	W/m*k	0.666
SURFACE RESISTANCE	IPC 2.5.1.7.1	C 96/35/90	MΩ	1.10X10*6
RELATIVE PERMITTIVITY AU MHz	IPC 2.5.5.3		1 MHz	0.018
DISSIPATION FACTOR	IPC 2.5.5.3		1 MHz	4.7CM °K
COMPARATIVE TRACKING INDEX CTI			200	
GLASS TRANSITION . TEMPERATURE OF DIELECTRIC LAYER	IPC-TM150	A	°C	130
FLAMMABILITY UL 94			V0	
MOISTURE ABSORBTION	IPC 2.6.2.1	D 24/23	%	Max 0.15
THERMAL TEST CONDUCTIVITY	EVALUATED ON INSULATING THICKNESS OF 0.1mm			