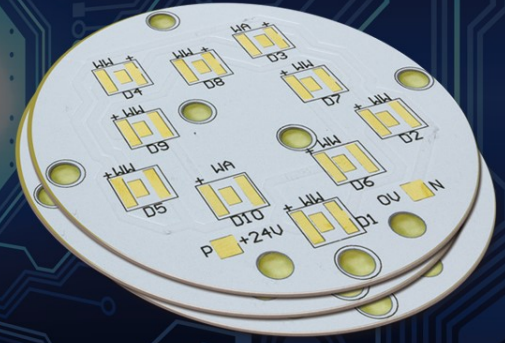


# Thermally Conductive Board (TCB)



Thermally Conductive Board (TCB), an Insulated Metal Substrate, provides the advantages of high thermal conductivity, reliability, and solder heat endurance. The TCB substrate is a sandwich structure, which includes a layer of copper for conductors, an insulation layer and metal base for heat dissipation. Traditional circuit substrates made of epoxy, epoxy filled glass fiber, polyimide or other dielectric materials can compromise the durability of modern high-power electronic devices. The heat from these devices needs to be dissipated to improve life cycle and reliability of the end product.

Polytronics' TCB boards are processed into printed circuit boards that offer a superior heat transfer interface. TCB is made with a unique polymer composite that combines epoxy resin and high thermal conductivity filler, and the thermal conductivity is up to 20 times higher than traditional epoxy filled glass fiber system.

Polytronics' TCB Products	TCB-2L	TCB-2AL	TCB-3	TCB-4	TCB-8	TCB-C	TEST METHOD
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### Thermal Properties

Product Thermal Conductivity w/M-K	2	2.7	3	4.2	8	12	TO-220
Thermal Resistance °C/W	<0.15	<0.13	<0.12	<0.11	<0.08	<0.06	ASTM D5470
Max Operating Temperature °C	90	110	130	110	130	150	UL 746E
Max Soldering Temperature °C	300	300	300	300	300	300	UL 746E
Glass Transition Temperature °C	110	130	140	140	150	180	IPC-TM-650 2.4.25

### Electrical Properties

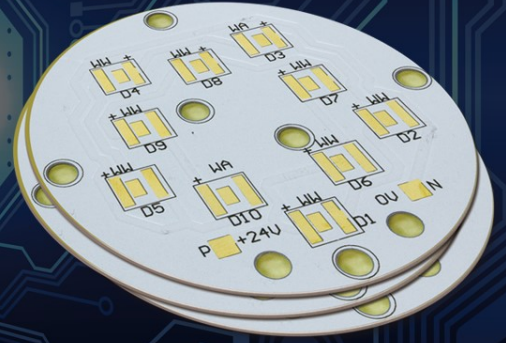
Permittivity/Dielectric Constant	4.6	4.8	5.1	4.9	5.2	8.3	IPC-TM-650-2.5.5.1
Dissipation Factor 1MHz	0.021	0.021	0.023	0.022	0.024	0.022	IPC-TM-650-2.5.5.1
Surface Resistance Ω	>10 <sup>15</sup>	>10 <sup>15</sup>	>10 <sup>15</sup>	>10 <sup>15</sup>	>10 <sup>15</sup>	>10 <sup>13</sup>	IPC-TM-650 2.5.17.1
Volume Resistance Ω-cm	>10 <sup>13</sup>	>10 <sup>13</sup>	>10 <sup>13</sup>	>10 <sup>13</sup>	>10 <sup>13</sup>	>10 <sup>13</sup>	IPC-TM-650 2.5.17.1
Breakdown Voltage kVAC	5	5	3	2.5	2.5	2.5	JIS C 2110

### Mechanical Properties

Color	Grey	Grey	Grey	Grey	Grey	Grey	Visual
Dielectric Thickness μm	100	100	100	100	100	100	Eddy Current
Thermal Expansion CTE in XY/Z Axis >Tg [PPM/°C]	37	30	32	25	35	18	IPC-TM-650 2.4.24.5
Thermal Expansion CTE in XY/Z Axis <Tg [PPM/°C]	24	20	25	16	28	15	IPC-TM-650 2.4.24.5

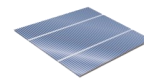
### Agency Ratings and Durability

U.L. Maximum Operating Temp.	90	110	130	110	130	150	UL 746E
Solder Limit Rating	300°C/ 60sec	300°C/ 60sec	300°C/ 60sec	300°C/ 60sec	300°C/ 60sec	300°C/ 60sec	UL 746E



### Applications:

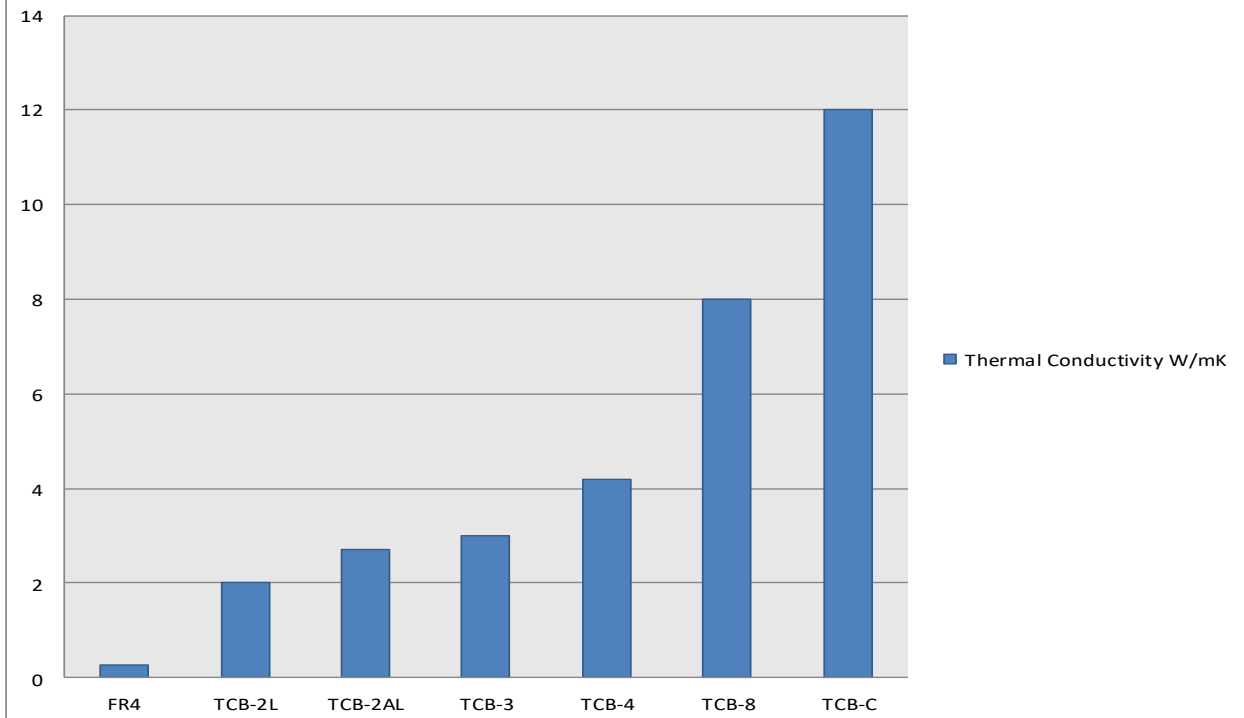
- High brightness LED lighting/backlight modules
- Automotive (regulator, power module)
- Power electronics (inverter, transistor, DC/DC converter, regulator)
- Audio (equalizer, amplifier)



### Features:

- Excellent thermal conductivity
- Excellent reliability & solder heat endurance
- RoHS compliance & Halogen Free
- Customized substrate structure available

**Thermal Conductivity W/mK**



For more information on any of our products, please contact:

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