PHOTOPOSITIF ALUMINIUM PCB

REF AAT10 20

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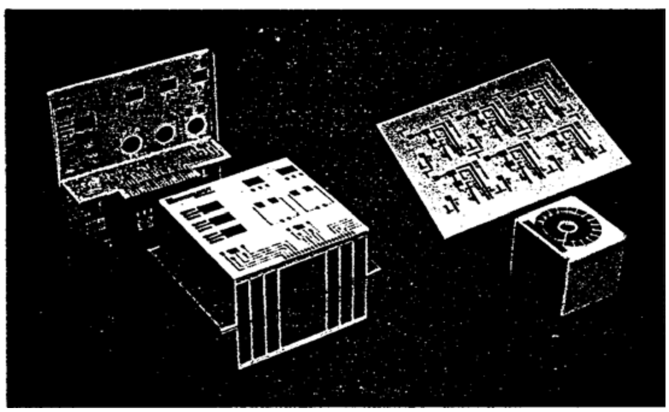
A NEW CONCEPT IN THERMAL MANAGEMENT.

Aluminum Base, Copper Clad Substrate
P.A PCB* is a thermal control substrate designed to manage heat created by power components. P . A PCB * offers several unique features for design engineers. Components can be soldered directly to the etched copper Layer of` P . A PCB* and they're isolated by the thermally conductive dielectric layer. Also, heat generated by power components is automatically transferred through this layer to the base plate of'- P . A P C B *_ . As a result, the thermal resistance of the circuit board is significantly reduced.



P.A P C B * **is a substrate, a heat sink and a printed circuit material.**
Applications include:

- Replacement for heat sinks and other hardware
- Replacement for fragile ceramic substrates
- Replacement for printed circuit board material
- Surface mount -layouts
- Custom material combinations and applications requiring specific thermal, dielectric and physical properties
- Smart power packages where power and logic are combined

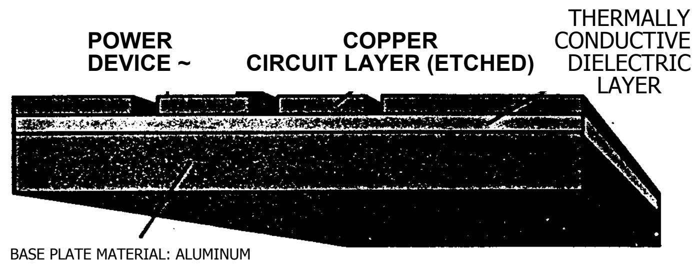
PRODUCT DATA. STANDARD CONFIGURATION

Circuit Layer	- Copper Foil - .0014 in. printed circuit grade
Dielectric	- .003 in.
Base plate	- .062 in. Aluminum (alloy 6061)

* P.A PCB Photopositif Aluminium PCB.

STANDARD CONSTRUCTION

P.A PCB* ,s a three layered substrate. The base plate (usually copper or aluminum) is bonded with a polymer based, thermally conductive dielectric to a circuit layer (either copper or aluminum clad copper foil).



TYPICAL PROPERTIES

Dielectric Strength	4000 Volts min.
Dielectric Constant	5-6
Thermal Conductivity	3 Watt Meter $^{-1°}$ K^{-1}
Surface Resistivity	1x10^{9} Megohms
Process Temperature	350°C
Continuous Use Temperature	180°C

THERMAL RESISTANCE

Case #1 TO-220 transistor mounted to an etched pad. 4" x 5" panel size.

Temperature measurement	junction and pane!
Operating power	25 watts, DC
Thermal resistance	1.0°C/watt (⊖, junction to sink)

Case #2. A surface mount power transistor (MJD 3055) mounted to an etched pad. 1" x 3" panel size.

Temperature measurement -	junction and panel
Operating power	25 watts, DC
Thermal resistance	1.8"C/watt (⊖, junction to sink)

Case #3. A 200 x 200 silicon die with a resistor network covering 70% of its surface is soldered directly to an etched pad. Junction temperature was sensed using diodes surrounding the resistor network. 4" x 5" panel size.

Temperature measurement -	junction and panel
Operating power	20 watts, DC
Thermal resistance	1.0°CJwatt (⊖, junction to sink)

THERMAL EXPANSION COEFFICIENTS*

cm/cm°C ($x10^{-6}$)

Epoxy-Glass PCB Material..10-30

Thermal Clad (Aluminum)...25

Thermal Clad (Copper)...18

Thermal Clad (CIC)...8

Alumina(99.5%)...7

Beryllia(99.5%)..8

*Approximate values

PEEL STRENGTH TESTING

Dielectric-Copper Foil

Peel Strength (Conductor width)

10 minutes at 550°F(Solder Bath).............................7 lbs/in

OPERATING TEMPERATURE VS. POWER DISSIPATED *Transistor junction temperature

(Data obtained using DPAK™ , 3055 Transistors)

This table shows how transistors run cooler on Thermal Clad compared with transistors mounted on epoxy-glass printed circuit board material.