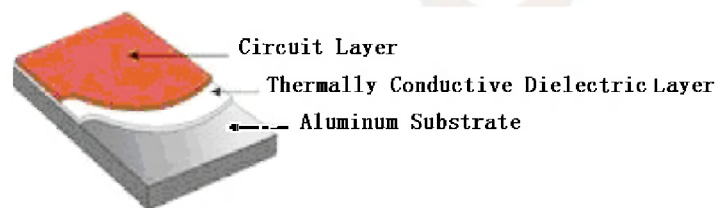


## LAMINATES AND MORE FOR PCB

### *IMS Al-Substrate HA50*

Type	Introduction
High Thermal Conductivity Type (HA50)	Thermal conductivity 1.0~3.0 W/M*K, It can fit the demand of high end and mid-range products; with high cost performance.

#### Basic Structure



#### Instruction

Circuit Layer – Electrolysis copper foil

Thermally Conductive Dielectric Layer – This offers electrical isolation with minimum thermal resistance.

Two types: Fiberglass support and non-fiberglass support.

Aluminum Substrate – supports the entire structure and conducts the heat.

The material is aluminum alloy plate.

# HA50

## IMS 'Al-Substrate CCL

### Properties I

Item	Test condition	Units	Spec	Typical Value			
				Type 1	Type 2	Type 3	Type 4
Thermal resistance (*)	ASTM E1461	K·m <sup>2</sup> /W	<1.0×10 <sup>-4</sup>	0.72×10 <sup>-4</sup>			
			<0.7×10 <sup>-4</sup>		0.51×10 <sup>-4</sup>		
			<0.5×10 <sup>-4</sup>			0.37×10 <sup>-4</sup>	0.27×10 <sup>-4</sup>
Thermal Conductivity (*)	ASTM E1461	W/m·K	>1.0	1.1			
			>1.5		1.6		
			>2.0			2.2	2.7
1 oz. Peel Strength	A	N/mm	>1.2	1.81	1.83	1.80	1.75
				1.75	1.73	1.72	1.70
Thermal Stress	288°C, solder dip	s	>120	180 s No delamination			
	300*10s/cycle Solder dip	cycle	--	>3			
Surface Resistivity	C96/35/90	MΩ	≥10 <sup>4</sup>	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>
	E-24/125		>10 <sup>3</sup>	10 <sup>5</sup>	10 <sup>5</sup>	10 <sup>5</sup>	10 <sup>5</sup>
Volume Resistivity	C96/35/90	MΩ·cm	≥10 <sup>6</sup>	10 <sup>7</sup>	10 <sup>7</sup>	10 <sup>7</sup>	10 <sup>7</sup>
	E-24/125		>10 <sup>3</sup>	10 <sup>5</sup>	10 <sup>5</sup>	10 <sup>5</sup>	10 <sup>5</sup>
(AC)Breakdown Voltage (*)	A	KV/mm V/mil	>30	35	35	35	35
	IPC-TM-650 2.5.6.2		>750	875	875	875	875
1MHz Dielectric Constant	C 24/23/50	—	—	5.4	5.6	5.9	6.2
	IPC-TM-650 2.5.5.2						
Arc Resistance	D48/50 + D0.5/23	s	>60	120	120	120	120
	IPC-TM-650 2.5.1						
Flammability	E-24/125	—	V-0	V-0	V-0	V-0	V-0
Tg	DSC	°C	>110	121.2	122.6	121.8	122.3
Water Absorption	D-24/23	%	<1.5	0.52	0.43	0.56	0.49
	IPC-TM-650 2.6.2.1						
CTI	IEC60112	V	>600	600	600	600	600

**HA50**

## **IMS Al-Substrate CCL**

(\*)Note: The thermal resistance samples use Aluminium Substrate with 1 mm aluminium alloy plate, 35 µm copper foil and 75 µm insulating layer, while using the laser (E1461) test method. According to CPCA4105-210 (Printed Circuit Metal Base Copper-Clad Laminate) the AL-Substrate CCL thermal resistance and its insulating layer thermal conductivity have the relation as follows in properties II. The insulating layer thermal conductivity value of properties I is calculated by the AL-Substrate CCL thermal resistance value. The electric strength test value refers to the value of the AL-Substrate CCL and not Al-Substrate PCB test value.



### **Properties II – The relation of thermal resistance and insulating layer thermal conductivity**

Item	class		
	Grade 1	Grade 2	Grade 3
Thermal Conductivity (W/m·K)	$\lambda > 1.0$	$\lambda > 1.5$	$\lambda > 2.0$
Thermal resistance (K·m <sup>2</sup> /W)	$R < 1.0 \times 10^{-4}$	$R < 0.7 \times 10^{-4}$	$R < 0.5 \times 10^{-4}$
Typical thermal resistance (K·m <sup>2</sup> /W)	$0.72 \times 10^{-4}$	$0.51 \times 10^{-4}$	$0.37 \times 10^{-4}$ $0.33 \times 10^{-4}$

**HA50**

## **IMS 'Al-Substrate CCL**



### **Specification**

Standard Size (mm)	500×600mm, 500×1200mm, 600×1200mm 1000×1200mm, 1100×1200mm
Circuit Layer (Copper foil)	18µm, 35µm, 70µm, 105µm (1/2 oz, 1oz, 2oz, 3oz)
Thermally Conductive Dielectric Layer Thickness	75µm, 100µm, 125µm, 150µm(3 mil, 4 mil, 5 mil, 6 mil)
Thickness	0.8mm, 1.0mm, 1.2mm, 1.5mm, 1.6mm, 2.0mm
Aluminum Substrate Type	5052 (H32), 1060 (H22) Anodisation
Masking film	PE, PET, PI

Our technical data are collected according to best knowledge and with a highest degree of accuracy, but are not binding and without any acceptance of liability. Our customers are responsible for testing of the conditions of the goods and ability for the own production, procedure and application of the designed products.

2011-10-20-001