GÖTTLE
LEITERPLATTENTECHNIK

LAMINATES AND MORE FOR PCB

CoolTherm HA80

Description:

- The laminate consists of three layers: conductive layer, insulating layer and metal base
- It is made of epoxy resin and high thermal conductivity filler
- Thermal conductivity is ≥ 1,0 – 3,0 W/m*K, which means it is four to fifteen times higher than normal FR4
- MOT (Maximum Operating Temperature) 130 °C
- Complies with RoHS and has UL94 V-0

Description

CoolTherm is an isolated metal substrate (IMS) for the production of PCB´s and components which need a good heat dissipation e.g. LED, transformers and transistors.

CoolTherm has an aluminium basis (if desired it can be made of copper), which has a one-sided dielectric layer.

This isolating layer shall excel in isolating electrically the copper foil from the aluminium layer while simultaneously having a heat transfer, which is comparatively high. Used for this scope are epoxy/glass woven fabrics up to ceramic layers, which have an especially high thermal conductivity. The isolating layers can be chosen regarding usage in thicknesses from 75 µm to 125 µm.

The copper foils are available in thicknesses 5 µm up to 210 µm.

The backside of **CoolTherm** is standardly provided with a masking film and can be optionally provided with a polyimide film, which is stable up to 260°C. All masking films are easily removeable after the production process, if the borderline temperature of the respective masking film has not been exceeded.

Standard Size	500 x 600 mm, 550 x 610 mm, 500 x 1220 mm 550 x 1220 mm, 1100 x 1220 mm, 1100 x 1220 mm					
Circuit Layer (Copper Foil)	5 µm, 9 µm, 12 µm, 18 µm, 35 µm, 50 µm, 70 µm 105 µm, 140 µm, 175 µm, 210 µm					
Dielectric Layer Thickness Typ 1-3 Typ 4	75µ, 100µ, 125µ, (4 mil/5 mil) + 150µ 100µ Ceramic Layer					
Thickness of 0,6 – 3,0mm	0,6 mm, 0,8 mm, 1.0 mm, 1,2 mm, 1,5 mm, 1,6 mm					
Thermal Conductivity		Type 1	Type 2	Type 3	Type 4	Type 5
	>1.0	1.1				
	>1.5		1.6			
	>2.0			2.2		1.0
	>3.0				3.0	
Aluminium type	5052 / 1060					
Masking film	PET-Film (green): 160°C up to 2 hrs. PI-Film (yellow): 260°C up to 30 min.					

The technical data serve only as a guideline and are no guaranteed values. We reserve the right to future changes.

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Technical Data

Properties	Test Condition	Unit	Spec.	Typical Value					
				TypeA 0.7	Type1 1.0	Type2 1.5	Type3 3.0	Type4 3.0	Type5 1.0
Insulating-layer (*1) Thermal Conductivity	ASTM D 5470	W/m*K	≥0,6	0.75					
			≥1.0		1.1				
			≥1.5			1.6			
			≥2.0				2.2		1.0
			≥3.0					3.0	
1oz Peel Strength		N/mm	≥1.2	1.86	1.82	1.83	1.80	1,75	1.80
				1.78	1.75	1.73	1.76	1.70	1.76
Thermal Stress	288°C, solder dip	S	≥120	180s No delamination					
	300*10s/cycle Lötmittelbad	cycle	≥6	6 s No delamination					
Surface Resistivity	C96/35/90	MΩ	$\geq 10^4$	10^6	10^6	10^6	10^6	10^6	10^6
	E-24/125		$\geq 10^3$	10^5	10^5	10^5	10^5	10^5	10^5
Volume Resistivity	C96/35/90	MΩ·cm	$\geq 10^6$	10^7	10^7	10^7	10^7	10^7	10^7
	E-24/125		$\geq 10^3$	10^5	10^5	10^5	10^5	10^5	10^5
Dielectric Breakdown (AC)(*2)	IPC-TM-650 2.5.6.2	KV	≥2.5/ 80µm	3.0	3.0	3.0	3.0	3.0	3.0
			≥3/ 100µm	4.0	4.0	4.0	4.0	4.0	4.0
			≥4 / 125µm	4.5	4.5	4.5	4.5	--	--
			≥5 / 150 µm	6.0	6.0	6.0	6.0	--	--
Arc Resistance	IPC-TM-650 2.5.1	S	≥60	120	120	120	120	120	120
Flammability	E-24/125	--	V-0	V-0	V-0	V-0	V-0	V-0	V-0
Tg	DSC	°C	≥110	122.2	121.2	122.6	121.8	122.3	121.8
Td	TGA (5%WT loss)	°C	≥360	400	400	400	400	400	400
Water Absorption	D-24/23	%	≤1.5	0.55	0.51	0.43	0.56	0.49	0.56
	IPC-TM-650 2.6.2.1								
CTI	IEC60112	V	--	250	600	600	600	600	250

Note 1: Dielectric Breakdown Voltage test value refers tot he value of Al-Substrate CCL, and not Al-Substrate PCB test value. Because of design and the air breakdown factor, the Al-Substrate PCB test value will be lower than the value of the substrate.

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