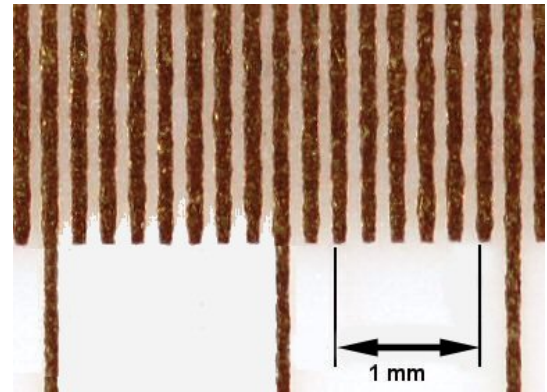


PRINTED CIRCUITS ON CERAMIC BOARDS

- *Very high insulation and thermal conductivity*
- *Fine-line technique – lines smaller than 0.1 mm*
- *Wide choice of conductor materials*
- *Double sided and multilayer construction*
- *Wide temperature range*
- *Safely and easily recyclable materials*

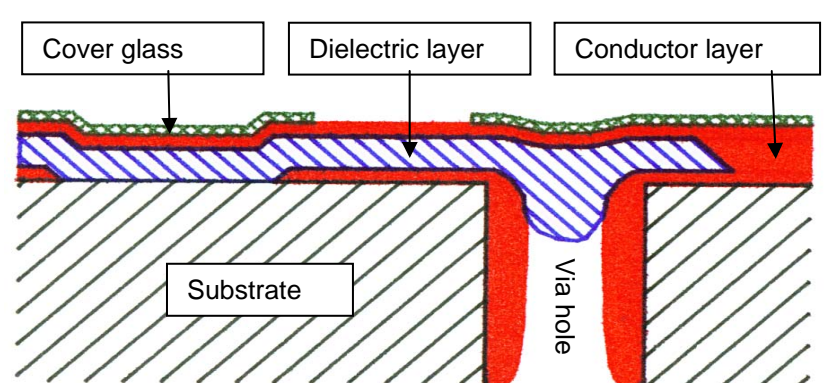


Electrical Data

Ceramic board			Notes
Al ₂ O ₃			Al ₂ O ₃ is preferred, but other material can be used
Dielectric strength	Volt/mm	800	
Insulation resistance	Ohm mm	1T	
Thermal conductivity	Watt/mm°C	0.017	0.003 can be reached with zirconiumoxide

Operating temperature range of the finished printed circuit board	°C	-273 to 250	Special circuits up to 500°C with degraded electrical specification
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Physical Data

Dimension (mm)					Typical cross-section of board with printed circuit	
Thick-ness	Size of board		Size of via-hole		Scale 100:1	
	Length	Width	Min	Nom		
0.25	50.8	50.8	0.10	0.20		
0.38	101.6	101.6	0.10	0.20		
0.635 *	101.6	152.4	0.10	0.20		
0.8	101.6	152.4	0.12	0.20		
1.0	101.6	152.4	0.15	0.20		
Larger thickness and size on request						
* preferred thickness for lowest price						

Construction

The ceramic board is prescribed and via holes are laser drilled. The conductor layer is screen-printed to the ceramic board. After a drying period further layers are screen-printed to the board. The circuit is then fired at 850°C, and the printed layers are then integrated in the ceramic structure of the board

Marking

An ink marking can be screen-printed to either side of the board.

Further processing

Hybrico can integrate resistors in the structure of the printed board. For further details, please refer to our M-series and H-series.

Components can be soldered, glued or bonded to the circuit either by Hybrico or by the customer.

For mounting and bonding of chips please refer to our C-series. Hybrico can also offer functional trimming of the circuits; please refer to our T-series for further details.

PRINTED CIRCUITS ON CERAMIC BOARDS

K SERIES

Performance Data

Adhesion of printed circuit to an 96% Al ₂ O ₃ board		Minimum peel force	A wire is soldered to an area of 2.0 X 2.0 mm
Adhesion directly to the board	N	20	Initial value
	N	20	After 1000 hours at 150°C
Adhesion to a dielectric layer	N	20	Initial value
	N	10	After 100 hours at 150°C

Application Notes

The low expansion coefficient of any ceramic material matches with most electronic components and this minimizes the risk of cracks and failures in the components at changing temperatures

The use of ceramic materials eliminates the need of hazardous flame retardant substances. Recycling of the boards is inexpensive, and the materials deriving from this can safely be reused.

The choice of conductor materials depends on the application of the circuit. The information below may guide you,

Layers type	Price	mΩ /□ typical	Fine-line	Solder-ability	Bond-ability	compatibility with gold	Adaptability to glueing technique
Silver/platinum	Low	4	Medium	Good	Bad	Bad	Good
Silver/palladium	Medium	25	Medium	Good	Acceptable	Good	Good
Gold	High	5	Good	Not app.	Good		Good
Platinum	High	75	Good	Acceptable	Bad	Good	Good

Testing

A test plan has to be agreed for each circuit. The test can include insulation between specified tracks, conductivity of tracks, and visual inspection.

On lot basis an AQL test of peel adhesion of tracks, solderability and bondability can be offered.

Quality

All procedures from design to final inspection and shipment are described and monitored. The quality system corresponds to ISO 9001

Packaging

The modules are put on anti-static foam and packed in cardboard boxes. Quantity per box is dependent on the dimensions of the circuit.

Any quantity can be ordered.

Ordering procedure

Before production orders can be entered, development and prototypes must be ordered. To quote, we need your circuit diagram, conductor material, dimensions of the circuit and test specifications.

When reordering please specify the K type number your module has been given.

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