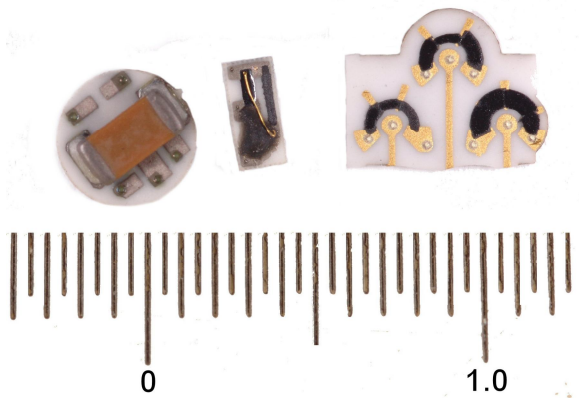
Hybrico

M SERIES

CERAMIC MICRO CIRCUITS



- *Size down to 1.6 X 0.8 mm (IEC 0603 size)*
- *Double-sided, multilayer circuits*
- *Insulation resistance 100 Gigaohm*
- *Manufactured to customer specification*
- *The quality system correspond to ISO 9001*

Electrical Data

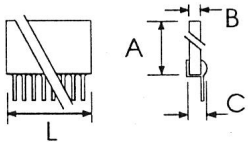
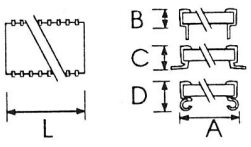
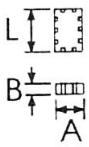
Standard-sized printed resistors			**Notes**
Power rating at 70°C	Watt	0.01	Standard resistors size is 0.5 x 0.3 mm, equivalent to IEC 0201 size
Resistive range	Ohm	100 – 10 M	
Limiting element voltage	Volt	400	
TCR	ppm/°C	250	
Tolerance	%	5, 10, 20	

Larger-sized printer resistors			**Notes**
Power rating at 70°C	Watt	0.25	Area of resistor equivalent to IEC 0805 size
Resistive range	Ohm	0.5 – 10G	Area of resistor equivalent to IEC 0805 size
Limiting element voltage	Volt	1000	Area of resistor equivalent to IEC 0805 size
TCR	ppm/°C	50	Only for resistors from 1K to 50 K ohm
Tolerance	%	0.25	

Substrate and insulation layers			**Notes**
Dielectric strength	Volt/mm	800	
Insulation resistance	Ohm	100 G	Minimum value. Higher value on request
Thermal conductivity	Watt/mm°C	0.017	

Finished circuit			**Notes**
Attached components			Consult manufacturers for data
Operating temperature range	°C	-55 to 125	Special circuits up to 200°C

Physical Data

Dimensions (mm) and weight (g)							**S**ingle-**I**n-**L**ine	**D**ual-**I**n-**L**ine	**C**hip
Type	L	A	B	C	D	Wt			
	Min	Min	Min	Min	Min	Min			
SIL	5.1	3.0	0.6	1.1		0.10			
DIL	3.8	5.0	1.3	1.5	3.2	0.12			
CHIP	1.6	0.8	0.3			0.01	Standard terminal spacing is 1.27 mm. Spacing of 0.63 is available		

Construction
The circuits are printed and fired at 850 °C, termination and other components are attached, and the circuit is encapsulated in phenol and sealed with wax.

Terminations
Tinned stamped brass contact

Marking
The circuits are marked with manufacturing reference, type number and manufacturing code.

Solvent Resistance
Circuit and marking withstand all standard industrial cleaning fluids

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Performance Data

All functions depend on resistor stability		Maximum	Typical	Notes
Load life stability	%	1.0	0.5	1,000 hours at 70 °C with load
Long-term stability	%	0.3	0.2	Shelf life in one year
Derating from rated power		Zero at 125°C		
Long term damp heat	%	0.5	0.2	40°C/93°RH/56 days
Temperature cycling	%	0.5	0.2	5 cycles -55 to 155°C in 5 hours
Resistance to solder heat	%	0.5	0.3	260°C in 10 seconds
Vibration	%	0.1	0.05	20G in 2 hours

All other functions			Notes
			Consult relevant data for attached components

Application Notes

The circuits have several layers on each side of the ceramic with connection between the layers and the connection from side to side.

SMD components and IC-chips can be attached to the circuit to achieve a complex function.

Capacitors down to IEC size 0402 and shrinked small outline package with lead spacing of 0.63 mm can be mounted.

Functional trimming and multichip layout can be incorporated. Consult special data sheet for specification of these features.

With special choice of design and materials a frequency range from dc up to more than 1 GHz can be achieved.

Jedec and IEC dimensions are preferred, but other dimensions are offered.

Testing

All circuits are 100% tested for all relevant functions either on pc-based test system or by specially made go no-go test boxes.

Quality

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

Packaging

The modules are antistatically handled and packed in cardboard or plastic boxes. The quantity per box depends on the size of the circuits.

The chip circuits can be supplied on tape and reel. Size of tape and quantity per reel depend on the size of the circuits.

Ordering procedure

Specify all dimension, the circuit diagram, the requested terminal style and positions and the test specification.

First-orders will have a tooling charge.

When reordering, please specify the manufacturing reference M-number of your circuit.

Any quantity can be ordered, but the cost of production start will make small quantities expensive

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