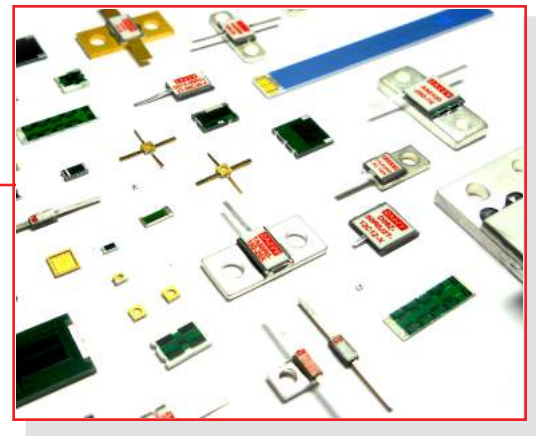




# Design Parameters



For decades, Barry Industries has been working with engineers to create precise ceramic component solutions. We can build ceramic components from your existing drawing or design a new component to fit your exact specifications. Barry has the inhouse capabilities and experience to fulfill almost any ceramic requirement.

Vertical Integration is the key to our quality and success. Unsurpassed quality standards, precise attention to detail, excellent customer service and in-house control of our manufacturing process are some of the reasons to choose Barry as your ceramic component supplier.

## Design & Simulation Software:

- Solidworks
- ANSYS Thermal Analysis
- Sonnet EM
- ANSYS HFSS 3D EM



ISO CERTIFIED



ITAR REGISTERED

## Ceramics:

### Ceramics & Properties (Typical):

	96% Alumina (Al <sub>2</sub> O <sub>3</sub> )	Aluminum Nitride (AlN)	Beryllium Oxide (BeO)
Thermal Conductivity @25°C (W/mK):	20 - 30	170 - 200	261
Dielectric Constant (at 1MHz):	9.5	8.6	6.5
CTE (PPM/° 25-150°C):	6.5	4.5	7.6

### Ceramic Standard Thicknesses:

	0.010 [.254]	0.015 [.381]	0.025 [.635]	0.040 [1.016]	0.060 [1.524]◇
96% Alumina (Al <sub>2</sub> O <sub>3</sub> )	•	•	•	•	
Aluminum Nitride (AlN)	•	•	•	•	•
Beryllium Oxide (BeO)	•	•	•	•	•

### Single Ceramic Piece Dimensions:

	Min.	Max.
A.	0.02 [0.508]	6.0 [152.4]
B.	0.02 [0.508]	6.0 [152.4]

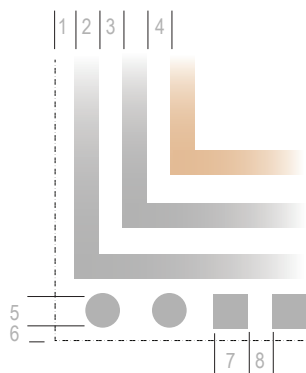


Dimensions in inches [mm]. Typical tolerance is ± 0.005 [0.127] unless otherwise stated. Tighter tolerances available.

## Conductors:

### Conductor & Via Guidelines:

Parameter:	Min.	Standard◇
1. Conductor-to-Edge	.003 [0.0762]	.005 [0.1270]
2. Conductor Width	.002 [0.0508]	.005 [0.1270]
3. Conductor-to-Conductor Space	.002 [0.0508]	.008 [0.2032]
4. Conductor-to-Conductor Space (Dissimilar Metallizations)	.006 [0.1524]	.010 [0.2540]
5. Via Diameter to Ceramic Thickness Ratio	0.3:1	1.0:1
6. Pad-to-Edge Space	.003 [0.0762]	.005 [0.1270]
7. Pad Dimension	.008 [0.2032]	.010 [0.2540]
8. Pad-to-Pad Space	.008 [0.2032]	.010 [0.2540]



### Conductor Edge Wrap Types:



Parameter:	Min.	Standard◇
9. Wrap onto Top† or Bottom Surface	.005 [0.1270]	.010 [0.2540]
10. Width of Wrap†	.015 [0.3810]	.020 [0.5080]
11. Castellations Diameter to Ceramic Thickness Ratio	0.3:1	1.0:1
12. Annular Ring Around Via	.010 [0.2540]	.020 [0.5080]

Barry Industries maintains an ISO9001 Certified Quality Management System.

◇ Greater Dimensions Available  
† Chip Size Dependant



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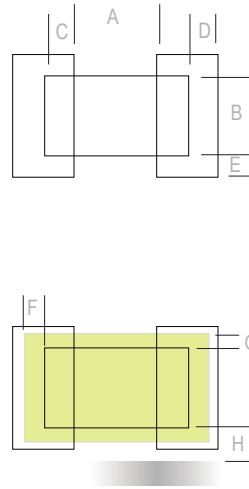
60 Walton St. Attleboro, MA 02703 • T (508) 226-3350 • F (508) 226-3317 • sales@barryind.com

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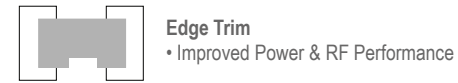
## Resistive Element:

### Resistor Element, Terminal & Passivation Guidelines:

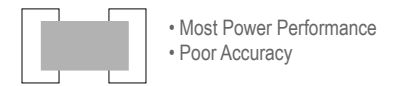
Parameter:	Min.	Standard◇
A. Resistor Length†	.008 [0.2032]	.010 [0.2540]
B. Resistor Width†	.008 [0.2032]	.010 [0.2540]
C. Resistor / Terminal Overlap	.003 [0.0762]	.005 [0.1270]
D. Terminal Extension (Lengthwise)	.003 [0.0762]	.010 [0.2540]
E. Terminal Extension (Widthwise)	.002 [0.0508]	.005 [0.1270]
F. Passivation Coverage (Lengthwise)	.003 [0.0762]	.005 [0.1270]
G. Passivation Coverage (Widthwise)	.003 [0.0762]	.005 [0.1270]
H. Resistor Edge to Nearby Conductor	.010 [0.2540]	.015 [0.3810]



### Laser Trim Types:



### No Trim Option:



### Resistor Electrical Parameters:

Al <sub>2</sub> O <sub>3</sub> & BeO Value Range:	0.1Ω to 1GΩ
AlN Value Range:	10Ω to 1KΩ
Resistor Tolerance:	To ±1% (Value Dependant)
TCR:	200PPM/°C (Typical)

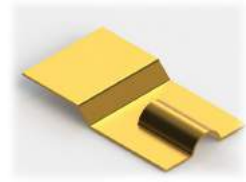
Dimensions in inches [mm]. Typical tolerance is ± 0.005 [0.127] unless otherwise stated. Tighter tolerances available.

## Flange & Leads:

### Flange Metal Properties (Typical):

Material:	Thermal Conductivity @25°C (W/mK):	Density (g/cm <sup>3</sup> ):	CTE (PPM/° 25-150°C):	Bend Strength (MPa):	Young's Modulus (GPa):
Copper (Cu)	398	8.96	17.8	330	131
Copper Tungsten (CuW)	180 - 200	15.7 - 17	6.5 - 8.3	1172	367

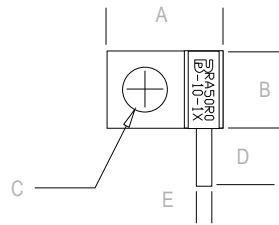
### Custom Lead Examples:



◇ Greater Dimensions Available  
† Chip Size Dependant

### Flange Guidelines:

Parameter:	Min.◇
A. Flange Length (Single Screw Hole)	.200 [5.080]
B. Flange Width (Single Screw Hole)	.100 [2.540]
C. Diameter of Screw Hole	.100 [2.540]
D. Length of Lead	.050 [1.270]
E. Width of Lead	.020 [0.508]



## Customer Defined Testing:



Vector Analyzer to 65GHz



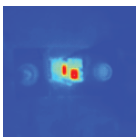
Optical CMM



Thermal Cycle Testing



Pulsed Power Testing



Thermal Imaging



XRF Imaging



High Voltage Testing



Hi-Rel Life Testing

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