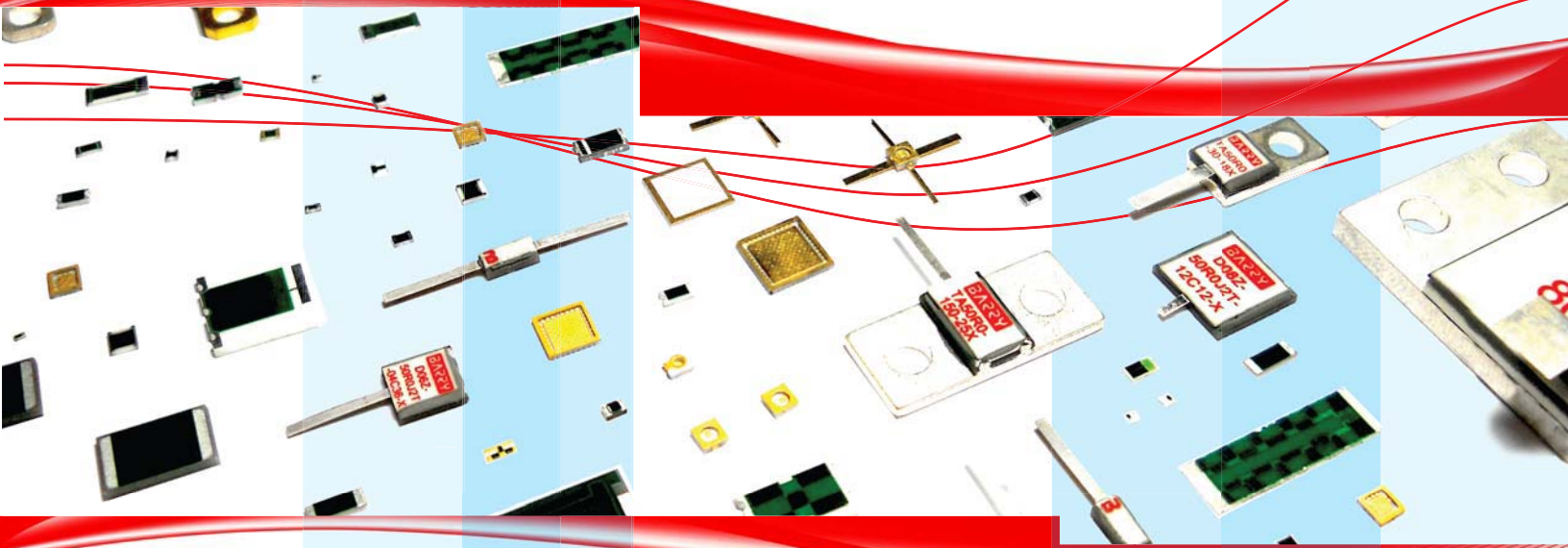


Attenuators

Resistors

Terminations

The **ART** of Passive Components



BARRY



ISO CERTIFIED



ITAR REGISTERED

Attenuators

Resistors

Terminations



Al₂O₃, AlN or BeO



Laser Scribing



Screen Printing

Barry Industries Inc. is a leading manufacturer of ceramic components including attenuators, resistors, terminations, semiconductor packaging and custom thick film circuits.

For decades, leading providers of mission-critical communication, military, medical, aerospace, detection, fiber-optic and industrial devices have relied on Barry components.

We keep large inventories of standard components for rapid delivery. For non-standard devices we are a start-to-finish component design partner.

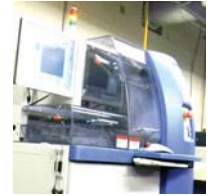
Vertical Integration is the key to our quality and success. Unsurpassed quality standards, precise attention to detail, excellent customer service and in-house control of our manufacturing process are some of the reasons to choose Barry as your ceramic component supplier.



Firing



Laser Trimming



Dicing



Plating



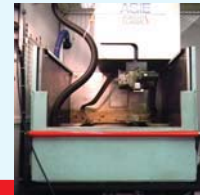
XRF Measuring



Brazing



CNC Machining



EDM Machining



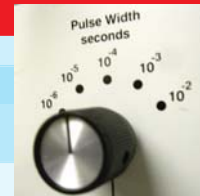
Thermal Analysis

“Vertical Integration is the key to our quality and success.”

Barry Industries, Inc. is an ISO9001 certified, ITAR registered company with headquarters and manufacturing operations in Attleboro, Massachusetts. We invite you to visit our facility. We know that you will like what we have to show you.



Thermal Cycling



Pulse Testing



High Power Testing



ISO CERTIFIED



ITAR REGISTERED



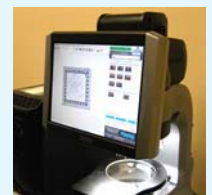
MADE IN USA



Life Testing



RF Testing to 60GHz



Optical CMM Measuring



The **ART** of Passive Components



Attenuator Overview

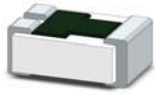
- Chip Sizes 0405 to 3737
- Al₂O₃, AlN or BeO
- Values 0dB to 32dB*, Accuracy to ±0.25dB
- Tape & Reel‡ and Waffle Pack Available
- Non-magnetic Available

- Chip, Leaded or Flanged Configurations
- Group A, B, C & Life Testing Available
- Robust Thick Film Construction
- Solder, Epoxy or Wirebond Attachment
- Operating Temperature -55 to +150°C

- RoHS Available, Sn62 Available
- Nickel Barrier Available

* Value, Size, Operating Frequency & Substrate Dependant.
‡ Available for sizes 0402 to 3725

Chip Attenuator Configurations:



Full Wraparound AP Type P



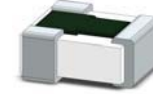
1/4 Wraparound AK Type K



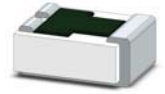
Single-Sided w/ Backplane AM Type M



Single-Sided AS Type S



3-Sided Wrap AT Type T



1/2 Wrap AV Type V

Chip Attenuator Sizes:

Actual footprint:

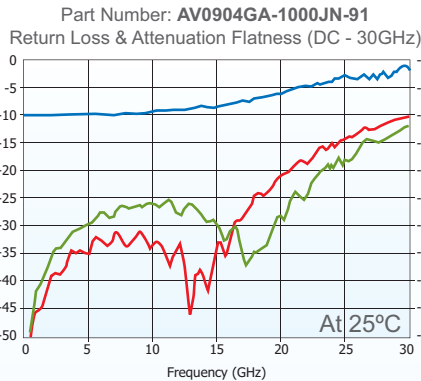
| | | | | | | | | | | | | |
|------------------------------------|--------------|--------------|--------------|------|---------|------|---------|------|---------|------|------|------|
| Size: | 0405 | 0706 | 0904 | 0905 | 1005 | 1007 | 1612 | 2010 | 2525 | 2335 | 3725 | 3737 |
| Available Terminal Configurations: | P, K, T V | P, M, S T | M, S, T V | M, S | P, M, S | P | P, M, S | T | S, T, V | V | V | V |

Power Rating is Value Dependant. See Individual Data Sheets or Contact Factory.

Attenuator Performance Examples:

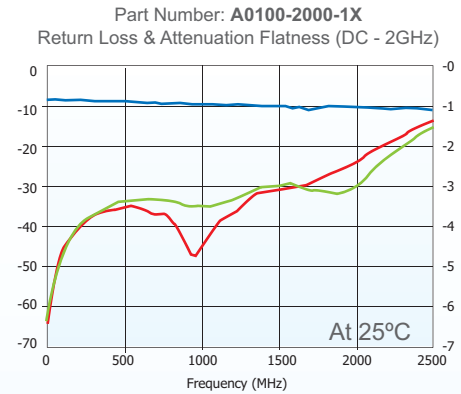
Rated Power: **3/4W**
Example Attenuation: **10dB**
Frequency Range: **DC - 30GHz**
Return Loss: **25dB (to 18GHz)**
Return Loss: **10dB (to 30GHz)**
Substrate: **0.015" Al₂O₃**
Metallization: **Au**
Footprint: **0.090" x 0.040"**

— Attenuation (right axis)
— S11 (left axis)
— S22 (left axis)



Rated Power: **2000W**
Example Attenuation: **1dB**
Frequency Range: **DC - 2GHz**
Return Loss: **25dB (to 1GHz)**
Return Loss: **20dB (to 2GHz)**
Substrate: **0.060" BeO**
Flange: **Ni Plated Cu**
Footprint: **1.10" x 0.50"**

— Attenuation (right axis)
— S11 (left axis)
— S22 (left axis)



Flanged Attenuator Examples:



Rated Power: **10W**
Example Attenuation: **1dB**
Frequency Range: **DC - 6GHz**
Typical Return Loss: **17dB**
Substrate: **0.040" AlN**
Flange: **Ni Plated Cu**
Footprint: **0.200" x 0.300"**



Rated Power: **20W**
Example Attenuation: **3dB**
Frequency Range: **DC - 3GHz**
Typical Return Loss: **17dB**
Substrate: **0.040" BeO**
Flange: **Ni Plated Cu**
Footprint: **0.250" x 0.515"**



Rated Power: **100W**
Example Attenuation: **30dB**
Frequency Range: **DC - 2.5GHz**
Typical Return Loss: **30dB**
Substrate: **0.040" AlN**
Flange: **Ni Plated Cu**
Footprint: **0.800" x 0.230"**



Rated Power: **100W**
Example Attenuation: **1dB**
Frequency Range: **DC - 4GHz**
Typical Return Loss: **20dB**
Substrate: **0.040" BeO**
Flange: **Ni Plated Cu**
Footprint: **0.800" x 0.230"**



Rated Power: **250W**
Example Attenuation: **5dB**
Frequency Range: **DC - 2.5GHz**
Typical Return Loss: **22dB**
Substrate: **0.060" AlN**
Flange: **Ni Plated Cu**
Footprint: **0.975" x 0.375"**

Many other options & configurations available. Custom requests are our specialty!

All part illustrations are for reference purposes only.



Resistor Overview

- Chip Sizes 0201 to 5050
- Al₂O₃, AlN or BeO
- Values 0.1Ω to 1GΩ*, Tolerances to ±1%
- Tape & Reel+ and Waffle Pack Available
- Non-magnetic Available
- Chip, Leaded or Flanged Configurations
- Group A, B, C & Life Testing Available
- Robust Thick Film Construction
- Solder, Epoxy or Wirebond Attachment
- Operating Temperature -55 to +150°C
- RoHS Available, Sn62 Available
- Nickel Barrier Available
- Zero Ω Jumpers Available
- TCR to ±100PPM

Chip Resistor Configurations:



Full Wraparound
RP Type
P



Wraparound w/ Isolated Center Pad
RY Type
Y



Wrap w/ Extended Mounting Pads
RE Type
E



1/4 Wraparound
RK Type
K



Single-Sided w/ Backplane
RM Type
M

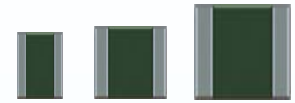


Single-Sided
RS Type
S

Chip Resistor Sizes & Typical Power Ratings†:

Actual footprint:

| | | | | | | | | |
|---|-------|------------|------------|------------|------------|------------|------------|------------------|
| Size: | 0202 | 0302 | 0402 | 0502 | 0504 | 0505 | 0603 | 0805 |
| Al ₂ O ₃ Rated Power: | 0.05W | 0.12W | 0.5W | 1.0W | 1.5W | 1.5W | 1.0W | 2.0W |
| AlN Rated Power: | 0.17W | 0.4W | 1.7W | 3.5W | 5.0W | 5.0W | 3.5W | 6.7W |
| BeO Rated Power: | 0.25W | 0.6W | 2.5W | 5.0W | 7.5W | 7.5W | 5.0W | 10.0W |
| Available Terminal Configurations: | M, S | P, K, M, S | P, K, M, S | P, K, M, S | P, K, M, S | P, K, M, S | P, K, M, S | P, Y, E, K, M, S |



| | | |
|------------------|------------------|------------------|
| 2335 | 3737 | 5050 |
| 30.0W | 50.0W | 80.0W |
| 100W | 170W | 270W |
| 150W | 250W | 400W |
| P, Y, E, K, M, S | P, Y, E, K, M, S | P, Y, E, K, M, S |

Actual footprint:

| | | | | | | | | |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Size: | 1005 | 1206 | 1505 | 1010 | 2010 | 2512 | 2525 | 3725 |
| Al ₂ O ₃ Rated Power: | 2.5W | 2.5W | 3.0W | 3.5W | 6.0W | 10.0W | 20.0W | 30.0W |
| AlN Rated Power: | 8.0W | 8.0W | 10.0W | 12.0W | 20.0W | 35.0W | 70.0W | 100W |
| BeO Rated Power: | 12.5W | 12.5W | 15.0W | 17.5W | 30.0W | 50.0W | 100.0W | 150W |
| Available Terminal Configurations: | P, Y, E, K, M, S | P, Y, E, K, M, S | P, Y, E, K, M, S | P, Y, E, K, M, S | P, Y, E, K, M, S | P, Y, E, K, M, S | P, Y, E, K, M, S | P, Y, E, K, M, S |

‡ Available for sizes 0402 to 3725
 * Ohmic Value, Size & Substrate Dependent.
 † Based on thinnest available substrate per size using 'RM Type' terminal configuration and rated at ≤100°C baseplate temperature. Rating may vary for other terminal configurations and mounting implementation.

Flanged Resistor Examples:



Rated Power: **20W**
Substrate: **BeO**
Flange: **Ni Plated Cu**
Footprint: **0.200" x 0.300"**



Rated Power: **50W**
Substrate: **AlN**
Flange: **Ni Plated Cu**
Footprint: **0.250" x 0.515"**



Rated Power: **80W**
Substrate: **BeO**
Flange: **Au Plated CuW**
Footprint: **0.250" x 0.515"**



Rated Power: **100W**
Substrate: **AlN**
Flange: **Ni Plated Cu**
Footprint: **0.800" x 0.230"**



Rated Power: **150W**
Substrate: **BeO**
Flange: **Au Plated CuW**
Footprint: **0.800" x 0.230"**



Rated Power: **250W**
Substrate: **AlN**
Flange: **Ni Plated Cu**
Footprint: **0.975" x 0.375"**



Rated Power: **400W**
Substrate: **BeO**
Flange: **Au Plated CuW**
Footprint: **1.100" x 0.500"**



Rated Power: **800W**
Substrate: **BeO**
Flange: **Au Plated CuW**
Footprint: **1.900" x 1.040"**

Many other options & configurations available. Custom requests are our specialty!

All part illustrations are for reference purposes only.



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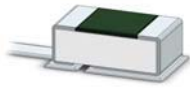


Termination Overview

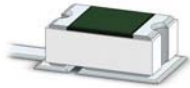
- Chip Sizes 0202 to 3737
- Al₂O₃, AlN or BeO
- Standard Values 50Ω & 100Ω. Others Available
- Tape & Reel[‡] and Waffle Pack Available
- Non-magnetic Available
- Chip, Leaded or Flanged Configurations
- Group A, B, C & Life Testing Available
- Robust Thick Film Construction
- Solder, Epoxy or Wirebond Attachment
- Operating Temperature -55 to +150°C
- RoHS Available, Sn62 Available
- Nickel Barrier Available

‡ Available for sizes 0402 to 3725
 Δ Sizes 1206 and larger
 ◇ Shown with input ribbon attached by customer
 † Based on thinnest available substrate per size using same sized 'RM Type' chip resistor terminal configuration and rated at ≤100°C baseplate temperature.

Chip Termination Configurations:



SMT TZ Type Z



SMT w/ Castellations^Δ TZC Type ZC



Half Wrap[◇] TV Type V



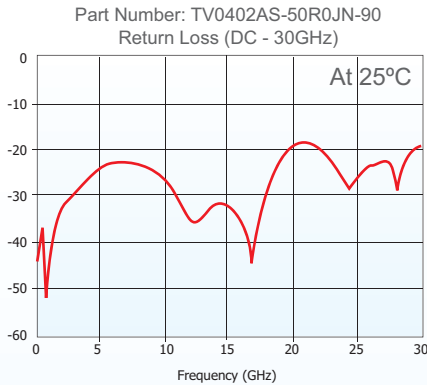
Half Wrap w/ Castellations^{Δ◇} TVC Type VC

Chip Termination Sizes & Typical Power Ratings†:

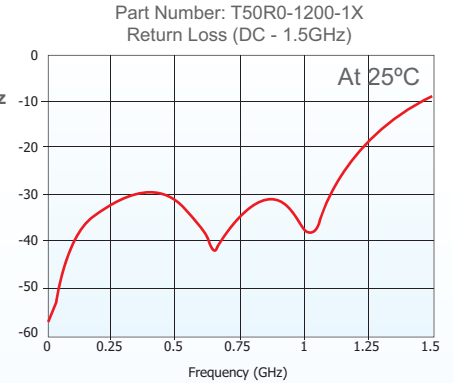
| Actual footprint: | - | - | - | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
|---|-------|------|------|------|------|-------|-------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Size: | 0202 | 0402 | 0502 | 0505 | 0605 | 0805 | 1005 | 1206 | 2010 | 2525 | 3725 | 2335 | 3737 | | | |
| Al ₂ O ₃ Rated Power: | 0.05W | 0.5W | 1.0W | 1.5W | 1.0W | 2.0W | 2.5W | 2.5W | 6.0W | 20.0W | 30.0W | 30.0W | 50.0W | | | |
| AlN Rated Power: | 0.17W | 1.7W | 3.5W | 5.0W | 3.5W | 6.7W | 8.0W | 8.0W | 20.0W | 70.0W | 100W | 100W | 170W | | | |
| BeO Rated Power: | 0.25W | 2.5W | 5.0W | 7.5W | 5.0W | 10.0W | 12.5W | 12.5W | 30.0W | 100W | 150W | 150W | 250W | | | |
| Available Configurations: | V | V | V | V | V | V, Z | V, Z | V, VC, Z ZC | V, VC, Z ZC | V, VC, Z ZC | V, VC, Z ZC | V, VC, Z ZC | V, VC, Z ZC | V, VC, Z ZC | V, VC, Z ZC | V, VC, Z ZC |

Termination Performance Examples:

Rated Power: **63mW**
 Example Impedance: **50Ω**
 Frequency Range: **DC - 26GHz**
 Return Loss: **15dB or better**
 Substrate: **0.010" Al₂O₃**
 Metallization: **SnPb Plated PdPtAg**
 Footprint: **0.040" x 0.020"**



Rated Power: **1200W**
 Example Impedance: **50Ω**
 Frequency Range: **DC - 1.5GHz**
 Return Loss: **20dB or better**
 Substrate: **0.120" BeO**
 Flange: **Ni Plated Cu**
 Footprint: **1.10" x 1.04"**



Flanged Termination Examples:



Rated Power: **10W**
 Frequency Range: **DC - 4GHz**
 Typical Return Loss: **18dB (to 2GHz)**
 Typical Return Loss: **14dB (to 4GHz)**
 Substrate: **0.040" BeO**
 Flange: **Ni Plated Cu**
 Footprint: **0.200" x 0.300"**



Rated Power: **30W**
 Frequency Range: **DC - 6GHz**
 Typical Return Loss: **17dB**
 Substrate: **0.040" BeO**
 Flange: **Ni Plated Cu**
 Footprint: **0.250" x 0.515"**



Rated Power: **250W**
 Frequency Range: **DC - 3GHz**
 Typical Return Loss: **19dB**
 Substrate: **0.040" AlN**
 Flange: **Ni Plated Cu**
 Footprint: **0.975" x 0.375"**



Rated Power: **1200W**
 Frequency Range: **DC - 1.5GHz**
 Typical Return Loss: **20dB**
 Substrate: **0.120" AlN**
 Flange: **Ni Plated Cu**
 Footprint: **1.90" x 1.04"**

Many other options & configurations available. Custom requests are our specialty!

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