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.

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.
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

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

Chip Attenuator Configurations:

- Full Wraparound
  - AP Type
- 1/4 Wraparound
  - AK Type
- Single-Sided w/ Backplane
  - AM Type
- Single-Sided
  - AS Type
- 3-Sided Wrap
  - AT Type
- 1/2 Wrap
  - AV Type

Chip Attenuator Sizes:

- Actual footprint:
- Size:
- Available Terminal Configurations:

<table>
<thead>
<tr>
<th>Size</th>
<th>Available Terminal Configurations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0405</td>
<td>P, K, T</td>
</tr>
<tr>
<td>0706</td>
<td>P, M, S</td>
</tr>
<tr>
<td>0905</td>
<td>M, S, T, V</td>
</tr>
<tr>
<td>1005</td>
<td>P, M, S</td>
</tr>
<tr>
<td>1007</td>
<td>T</td>
</tr>
<tr>
<td>1612</td>
<td>S, T, V, V</td>
</tr>
<tr>
<td>2010</td>
<td>V</td>
</tr>
<tr>
<td>2335</td>
<td>V</td>
</tr>
<tr>
<td>2525</td>
<td>V</td>
</tr>
<tr>
<td>3725</td>
<td>V</td>
</tr>
<tr>
<td>3737</td>
<td>V</td>
</tr>
</tbody>
</table>

Attenuator Performance Examples:

- Part Number: AV0904GA-1000JN-91
  - Return Loss & Attenuation Flatness (DC - 30GHz)

- Part Number: A0100-2000-1X
  - Return Loss & Attenuation Flatness (DC - 2GHz)

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" BeO
  - 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: 0.060" AlN
  - Flange: Ni Plated Cu
  - Footprint: 0.975" x 0.375"

- 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**
  - RP 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**:*

<table>
<thead>
<tr>
<th>Size:</th>
<th>0202</th>
<th>0302</th>
<th>0402</th>
<th>0502</th>
<th>0504</th>
<th>0505</th>
<th>0603</th>
<th>0805</th>
</tr>
</thead>
<tbody>
<tr>
<td>A12O3 Rated Power:</td>
<td>0.05W</td>
<td>0.12W</td>
<td>0.5W</td>
<td>1.0W</td>
<td>1.5W</td>
<td>1.0W</td>
<td>2.0W</td>
<td></td>
</tr>
<tr>
<td>A1N Rated Power:</td>
<td>0.17W</td>
<td>0.4W</td>
<td>1.7W</td>
<td>3.5W</td>
<td>5.0W</td>
<td>5.0W</td>
<td>3.5W</td>
<td>6.7W</td>
</tr>
<tr>
<td>BeO Rated Power:</td>
<td>0.25W</td>
<td>0.6W</td>
<td>2.5W</td>
<td>5.0W</td>
<td>7.5W</td>
<td>7.5W</td>
<td>5.0W</td>
<td>10.0W</td>
</tr>
</tbody>
</table>

**Actual footprint:**

<table>
<thead>
<tr>
<th>Size:</th>
<th>1005</th>
<th>1206</th>
<th>1505</th>
<th>1010</th>
<th>2010</th>
<th>2512</th>
<th>2525</th>
<th>3725</th>
</tr>
</thead>
<tbody>
<tr>
<td>A12O3 Rated Power:</td>
<td>2.5W</td>
<td>2.9W</td>
<td>3.0W</td>
<td>3.5W</td>
<td>6.0W</td>
<td>10.0W</td>
<td>20.0W</td>
<td>30.0W</td>
</tr>
<tr>
<td>A1N Rated Power:</td>
<td>8.0W</td>
<td>8.0W</td>
<td>10.0W</td>
<td>12.0W</td>
<td>20.0W</td>
<td>35.0W</td>
<td>70.0W</td>
<td>100W</td>
</tr>
<tr>
<td>BeO Rated Power:</td>
<td>12.5W</td>
<td>12.5W</td>
<td>15.0W</td>
<td>17.5W</td>
<td>30.0W</td>
<td>50.0W</td>
<td>100.0W</td>
<td>150W</td>
</tr>
</tbody>
</table>

**Actual footprint:**

<table>
<thead>
<tr>
<th>Size:</th>
<th>2335</th>
<th>3737</th>
<th>5050</th>
</tr>
</thead>
<tbody>
<tr>
<td>2335</td>
<td>30.0W</td>
<td>50.0W</td>
<td>80.0W</td>
</tr>
<tr>
<td>3737</td>
<td>100W</td>
<td>170W</td>
<td>270W</td>
</tr>
<tr>
<td>5050</td>
<td>150W</td>
<td>250W</td>
<td>400W</td>
</tr>
</tbody>
</table>

* 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.
**Termination Overview**

- Chip Sizes 0202 to 3737
- \( \text{Al}_2\text{O}_3 \), 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
\^ Sizes 1206 and larger
\( \oplus \) Shown with input ribbon attached by customer
\( \dagger \) Based on thinnest available substrate per size using same sized ‘SM Type’ chip resistor terminal configuration and rated at ≤100°C baseplate temperature.

**Chip Termination Configurations:**

- **SMT**
  - TZ Type
  - TV Type
  - Half Wrap
  - Half Wrap w/ Castellations
- **SMT w/ Castellations**
  - TZC Type
  - TVC Type
  - SMT w/ Castellations

**Chip Termination Sizes & Typical Power Ratings\( \dagger \):**

<table>
<thead>
<tr>
<th>Size</th>
<th>SMT Rated Power</th>
<th>SMT w/ Castellations Rated Power</th>
<th>SMT w/ Castellations Rated Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>0202</td>
<td>0.05W</td>
<td>V</td>
<td>Z</td>
</tr>
<tr>
<td>0402</td>
<td>0.5W</td>
<td>V</td>
<td>Z</td>
</tr>
<tr>
<td>0502</td>
<td>1.0W</td>
<td>V</td>
<td>Z</td>
</tr>
<tr>
<td>0505</td>
<td>1.5W</td>
<td>V</td>
<td>Z</td>
</tr>
<tr>
<td>0605</td>
<td>2.0W</td>
<td>V</td>
<td>Z</td>
</tr>
<tr>
<td>0805</td>
<td>2.5W</td>
<td>V</td>
<td>Z</td>
</tr>
<tr>
<td>1005</td>
<td>3.0W</td>
<td>V</td>
<td>Z</td>
</tr>
<tr>
<td>1206</td>
<td>3.9W</td>
<td>V</td>
<td>Z</td>
</tr>
<tr>
<td>2010</td>
<td>6.0W</td>
<td>V</td>
<td>Z</td>
</tr>
<tr>
<td>2525</td>
<td>20.0W</td>
<td>V</td>
<td>Z</td>
</tr>
<tr>
<td>3725</td>
<td>30.0W</td>
<td>V</td>
<td>Z</td>
</tr>
<tr>
<td>2335</td>
<td>50.0W</td>
<td>V</td>
<td>Z</td>
</tr>
</tbody>
</table>

**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: 16dB (to 2GHz)
  - 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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Attenuators
Resistors
Terminations

The ART of Passive Components

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