

PRODUCT INFORMATION

Resistors

Thermal Transfer Devices

RF Terminations

Attenuators

Power Splitters & Couplers

RF & Microwave Dividers



International Manufacturing Services, Inc.
www.ims-resistors.com

International Manufacturing Services, Inc. (IMS) is the Primary Source for Innovative Passive Components

We meet and exceed customer expectations with our quality, value, service and industry leading material management.

HISTORY

Since 1974, IMS has been a global leader offering thick and thin film electronic components including: resistors, thermal management devices, attenuators, RF terminations, splitters, couplers, and dividers.

INNOVATION

Our most innovative products are created as a result of close partnering and professional consultation with our customers, culminating in high quality custom solutions with short design lead times.

DELIVERY

We maintain a substantial inventory of standard components for same day shipment.

QUALITY

IMS, an AS9100D, ISO-9001:2015 registered company, maintains superior and comprehensive quality control assuring that our products conform to the highest standards. We offer additional testing services, including 100% Value/Visual and Thermal Shock.

SERVICE

Our dedicated and knowledgeable staff is always here to assist with creating the optimal solution for your application. In addition, IMS maintains a global network of representatives and distributors who can meet with you face to face to help with problem solving.

FLEXIBILITY

With design, development, manufacturing, sales and management personnel under one roof, IMS is positioned to respond quickly and effectively.

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Products by Industry

MEDICAL

Medical applications demand precision, quality, non-ferroresonant, and often micro and high voltage products to deliver the next generation devices.

- Non-Magnetic for MRI applications
- Small Package Sizes available 0201 and 01005
- Ultra Leach Resistant (ULR) metallization
- RoHS compliant options for all products

TPI SERIES

Thin Film Nickel Barrier Resistors

A SERIES

Thin Film Attenuators

RCI SERIES

Thick Film Nickel Barrier Resistors

HVI SERIES

High Voltage Resistors

RCX SERIES

Resistors for RF, Microwave and Low PIM

N-SERIES

High Power A_tN Resistors

AEROSPACE

IMS offers all products suitable for aerospace applications, but can also be customized for common requirements such as:

- Satellite Communications
- Commercial Space Applications
- 100% Value Testing

N-SERIES

High Power A_tN Resistors

ThermaBridge™

Thermal Management Device

AV-805

Temperature Variable Attenuator

IAX SERIES

Thick Film Attenuators

COMMUNICATIONS

IMS offers all products suitable for communication applications. Supporting the earthbound, airborne, underwater systems that make up the telecommunications infrastructure, base stations, transmission towers, satellites, submarine communications, line cards and mesh networks.

N-SERIES

High Power A_tN Resistors

A SERIES

Thin Film Attenuators

RCX SERIES

Resistors for RF, Microwave and Low PIM

IPS & IPT SERIES

Broadband Resistive Splitters

DEFENSE

IMS offers all products suitable for military and aerospace applications, but can also be customized for common requirements such as:

- 100% Value Testing
- Sn62 Leaded Solder Pre-Tin Option
- Application Support for Thermal Management Devices Available

N-SERIES

High Power A_tN Resistors

ThermaBridge™

Thermal Management Device

RCX PW SERIES

Resistors for RF & Microwave and Low PIM

IPS & IPT SERIES

Broadband Resistive Splitters

IAX SERIES

Thick Film Attenuators

INSTRUMENTATION

IMS offers a full complement of resistor and attenuator solutions for applications where data integrity and signal fidelity are integral in the design. IMS resistors can be offered from under 1 ohm to over 1 Trillion Ohms. The “High Megaohm” products are common to be seen in applications for metering devices.

N-SERIES

High Power A_tN Resistors

ThermaBridge™

Thermal Management Device

IPS & IPT SERIES

Broadband Resistive Splitters

RCX SERIES

Resistors for RF, Microwave and Low PIM

RCI

Thick Film Nickel Barrier Resistors

A SERIES

Thin Film Attenuators

QUICK SELECTION GUIDE

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| | Super RCX (WA) | | | | | | | 7 |
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| Best Options for High Voltage Applications | | 1kV | 1.5kV | 2kV | 2.5kV | | | |
| | HVX Series (WA) | | | | | | | 8 |
| | IMS Power (SS) | | | | | | | 10 |
| Best Options for Applications Needing High Ohmic Value | | 20MΩ | 100MΩ | 500MΩ | 1GΩ | 500GΩ | 1TΩ | |
| | HCX Series (WA) | | | | | | | 13 |
| | RCX Series (WA) | | | | | | | 11 |
| | IMS SS (SS) | | | | | | | 9 |
| | RCI Series (WA) | | | | | | | 12 |
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| Best Options for Applications Needing Low Value | | .9Ω | .5Ω | .1Ω | .07Ω | .05Ω | .01Ω | .003Ω |
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ATTACHMENT GUIDE

(Additional Terminal Materials Available)

| Attachment Method | Material Code |
|----------------------|--------------------------|
| Tin Solder | 3, 8*, C, D, P, H*, R, Q |
| Gold Eutectic Solder | 1, 4, 7 |
| Epoxy | 1, 3, 4, 7, 8* |
| Gold Wirebond | 1, 4, 7 |
| Aluminum Wirebond | 4 |

| Material Code | Terminal Material |
|---------------|--|
| 1 | Au |
| 3, 8* | PtAg |
| C, H* | Sn62 over PtAg |
| P, R* | Sn96 over PtAg |
| 4 | PtAu |
| D | Sn62 over PtAu |
| 7** | Input pad - Au over PtAu Backplane - PtAu |
| Q | Sn96 over PtAu |

*Ultra Leach Resistant PtAg (ULR)

**Available on ACN substrate products only.

Look for these buttons to help quickly identify key product attributes!



ULR

HI-OHM

HI PWR

RoHS

Sn62

NON-MAG

LOW TCR

BONDABLE

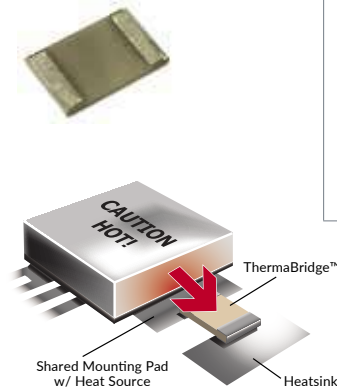
KIT



AlN Ceramic Thermal Transfer Devices ThermaBridge™

The **ThermaBridge™** provides the user with a simple, cost effective way to manage thermal issues at the board level. ThermaBridge™ moves heat from one area to another through an electrically isolated, thermally conductive ceramic chip device with metallized terminals.

- Electrically Isolated Thermal Conductor
- Thermal Design Tool
- Passive Thermal Control
- Extends Component Life
- Dramatic Temperature Reduction
- Epoxy or Solder Mountable



SAMPLE PN: B G 3 - 0805WA (0805 size, 0.025" Thickness ThermaBridge™, PtAg Terminals)

| PN Prefix | Thickness | Term Metals | Sizes | | | Configuration |
|---|---|---|-------|------|------|---|
| B | C = 0.010" ¹ | ✓ 3- PtAg | 0203 | 0612 | 2010 | WA= Wraparound |
| | D = 0.015" | ✓ 8- ULR PtAg | 0402 | 0805 | 2512 | |
| | G = 0.025" | C- PtAg with Sn62 Solder | 0505 | 1005 | 2525 | *DS= Double sided without wrap |
| | T = 0.040" ² | H- ULR PtAg with Sn62 Solder | 0510 | 1206 | 3725 | |
| | ¹ Available in sizes 0203, 0402 | ✓ P- PtAg w/ Sn96 Solder | 0603 | 1010 | | |
| | ² Available in sizes 1010 and larger | ✓ R- ULR PtAg with Sn96 RoHS Solder | 0605 | 1020 | | |
| Standard Sizes (Custom Sizes Available) | | | | | | |
| *DS only available in termination material 8, H & R | | | | | | |



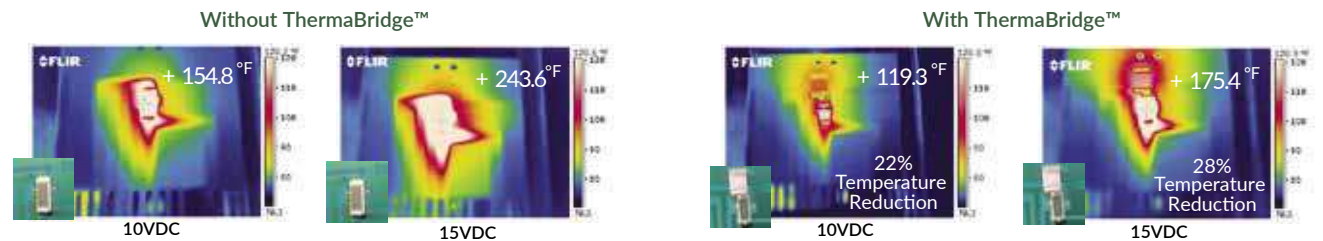
Applications include:

- RF Amplifiers
- Heat Sensing
- Conduction Cooled Computers
- Power Supplies & Converters
- JTRS, MIDS-J, GMR
- Temperature Controlled Oscillators
- Extracting Heat from Power FETS, LEDs, Pin & Laser Diodes
- Lighting Ballasts
- Protecting Neighboring Components
- Conduction Cooled Handheld Devices
- P25 Radios, Basestations & Repeaters
- Electrically Isolated Thermal Coupling
- Transformers



Thermal Image Heat Transfer Demonstration

Below is an actual test of the ThermaBridge™ showing a heat generating component mounted on an FR4 board. The images on the right show the temperature of the component being thermally aided by the ThermaBridge™ connected to a heat sink.



A/N Ceramic Thermal Transfer Devices ThermaPlane™

The **ThermaPlane™** uses the same concept as the ThermaBridge™ and consists of a high thermal conductivity ceramic with metallization on the top and bottom of the device.

- Electrically Isolated Thermal Conductor
- Thermal Design Tool
- Passive Thermal Control
- Extends Component Life
- Dramatic Temperature Reduction
- Epoxy or Solder Mountable

Applications include:

- RF Amplifiers
- Heat Sensing
- Transceivers
- Extracting Heat From Processors & Pin Diodes
- Transformers
- Power Supplies & Converters

SAMPLE PN: P D 3 - 2010 OS (2010 size, 0.025" Thickness ThermaPlane™, PtAg One Side)

| Prefix | Thickness | Metals | Sizes | | Configuration |
|--------|--|--|-------|------|---|
| P | D = 0.015" ¹ G = 0.025" T = 0.040" ² ¹ . Available in sizes 2512 and smaller. ² . Available in 2010 and larger. | <input checked="" type="checkbox"/> 3- PtAg <input checked="" type="checkbox"/> 7- Au over PtAu <input checked="" type="checkbox"/> 8- ULR PtAg <input checked="" type="checkbox"/> C- PtAg with Sn62 Solder <input checked="" type="checkbox"/> H- ULR PtAg with Sn62 Solder <input checked="" type="checkbox"/> R- ULR PtAg with Sn96 RoHS Solder | 0505 | 2010 | OS = One Sided DS = Double Sided |
| | | | 0805 | 2512 | |
| | | | 1005 | 2525 | * Custom Sizes Available |
| | | | 1206 | 3725 | |



OS
One sided



DS
Double sided



ULR

HI PWR

RoHS

Sn62

NON-MAG

High Power A/N Resistors N-Series

The **N-Series** resistors on A/N suit applications which require high power dissipation in a small size. The N-Series allows users to tailor the device to their specific power requirements with the choice of four thicknesses.

- Applications up to 35GHz[†]
- High Power Dissipation[‡]
- Sn62 Solder Available
- Non-Magnetic

Applications Include:

- Amplifier Circuits
- Power Converters
- Test & Measurement
- Handheld Devices



SAMPLE PN: **N D C - 1206 DE 1300 J** (1206 size, 0.015" Thickness 130Ω, 5%, PtAg w/ Sn62 Solder Dual Extended Terminals)

| PN Prefix | Thickness | Term Metals | Sizes* | Trim | Terminal Styles | Value Range ⁰ | Tolerances | | | | |
|-----------|--|---|--------|---|--|---------------------------|--|------------|------------------|---------------------------|------------------------|
| N | C = 0.010" ¹ D = 0.015" G = 0.025" ² T = 0.040" ¹ Available with sizes 0402, 0505, 0603, 0805, 0510, 1005, 1206 ² Not available with sizes 0402, 0603 | 3-PtAg ✓ 7-Au over PtAu¹ ✓ 8-ULR PtAg ✓ C-PtAg with Sn62 Solder P-PtAg with Sn96 Solder ✓ H-ULR PtAg with Sn62 Solder R-ULR PtAg with Sn96 Solder ✓ | 0402 | S = Scrub Cut Leave blank for normal Scrub cut is inherent for SZG & EZW | WA Wraparound | SS Single Sided | SB Single Sided w/ Backplane | 10Ω to 2KΩ | G = 2% J = 5% | | |
| | | | 0505 | | SG Single Wrap to Ground | CS Center Stripe | EW Extended Wrap | | | DE Dual Extended | PW Partial Wrap |
| | | | 0510 | | SZG Single Wrap to Ground w/ Tapered Resistor Element | SZG Reverse Aspect | EZW Extended Wrap w/ Tapered Resistor Element | | | EZW Reverse Aspect | |
| | | | 0603 | | | | | | | | |
| | | | 0805 | | | | | | | | |
| | | | 1005 | | | | | | | | |
| | | | 1020 | | | | | | | | |
| | | | 1206 | | | | | | | | |
| | | | 1225 | | | | | | | | |
| | | | 2010 | | | | | | | | |
| | | | 2512 | | | | | | | | |
| | | | 2525 | | | | | | | | |
| | | | 3725 | | | | | | | | |

CS, EW, DE available in sizes 0805 and higher | PW available in sizes 0805 and lower
 SZG available in sizes 1005 and higher | EZW available in sizes 1206 and higher
 ZG same as SG with tapered high frequency resistor style and edge trim for large case size
 Reverse aspect ratios available for most sizes

Power Ratings by Size and Thickness ‡

| Thickness | | 0.010" (C) | | | 0.015" (D) | | | 0.025" (G) | | | 0.040" (T) | | |
|----------------|-------------|------------|------|------|------------|------|------|------------|------|------|------------|------|------|
| Baseplate Temp | | 50C | 75C | 100C | 50C | 75C | 100C | 50C | 75C | 100C | 50C | 75C | 100C |
| Size | 0402 | 13W | 11W | 7.1W | 8.8W | 7.3W | 4.7W | N/A | N/A | N/A | N/A | N/A | N/A |
| | 0505 | 45W | 37W | 24W | 30W | 25W | 16W | 10W | 16W | 10W | N/A | N/A | N/A |
| | 0603 | 24W | 20W | 13W | 16W | 13W | 8.7W | N/A | N/A | N/A | N/A | N/A | N/A |
| | 0805 | 75W | 55W | 37W | 50W | 37W | 25W | 30W | 25W | 16W | N/A | N/A | N/A |
| | 1005 | 90W | 70W | 45W | 60W | 48W | 30W | 40W | 30W | 20W | N/A | N/A | N/A |
| | 1206 | 150W | 125W | 80W | 105W | 85W | 55W | 70W | 55W | 35W | N/A | N/A | N/A |
| | 2010 | N/A | N/A | N/A | 150W | 120W | 75W | 90W | 75W | 48W | 60W | 48W | 30W |
| | 2512 | N/A | N/A | N/A | 200W | 150W | 100W | 120W | 100W | 60W | 70W | 60W | 38W |
| 2525 | N/A | N/A | N/A | 400W | 300W | 200W | 240W | 190W | 120W | 150W | 120W | 75W | |
| 3725 | N/A | N/A | N/A | 640W | 500W | 340W | 380W | 310W | 200W | 250W | 200W | 125W | |

Assumed resistor max temp 150°C. Thermal Management is crucial for the operation of these devices. Please visit our website for more information.

† Performance based on mounting in matched continuous 50Ω system with proper application of RF principles.

◊ First 3 digits of value code are significant value. The 4th is the number of zeros following. An 'R' indicates a decimal when resistance is under 100Ω. For value under 10Ω contact IMS.

‡ Proper thermal management required



Extended Power
Wraparound Resistors

Super RCX Series

- Extra Power Density in the Same Footprint
- Not Limited to EIA Standard Values
- Sn62 Solder Available
- Non-Magnetic



SAMPLE PN: **RC3** - **0805S** - **11R4** **J** (Extended Power 0805 Size, 11.4Ω, 5%, PtAg terminals)

| Attachment/ Term Metal | Size | Rated Power [†] | Max RCW Voltage | Value Range [∅] | Tolerance Ranges |
|---|--------|--------------------------|-----------------|--------------------------|--|
| ✓ RC3 -PtAg Wraparound | 0402S* | 160mW | 50VDC | 10Ω to 1MΩ | F = 1% 10Ω to 1MΩ* G = 2% 10Ω to 1MΩ J = 5% 10Ω to 1MΩ K = 10% 10Ω to 1MΩ * 0402S not available in 1% tolerance. |
| ✓ RC8-ULR PtAg Wraparound | 0603S | 200mW | 50VDC | 10Ω to 1MΩ | |
| RC -PtAg Wraparound with Sn62 Solder | 0805S | 350mW | 150VDC | 10Ω to 1MΩ | |
| RC -PtAg Wraparound with Sn62 Solder | 1206S | 500mW | 200VDC | 10Ω to 1MΩ | |
| ✓ RC -PtAg Wraparound with Sn96 Solder | 2010S | 1W | 200VDC | 10Ω to 1MΩ | |
| ✓ RC -PtAg Wraparound with Sn96 Solder | 2512S | 2W | 200VDC | 10Ω to 1MΩ | |
| ✓ RC -ULR PtAg Wraparound with Sn96 Solder | | | | | |

[†] Free air rated at 70°C

[∅] First 3 digits of value code are significant value. The 4th is the number of zeros following. An 'R' indicates a decimal when resistance is under 100Ω.



ULR

RoHS

Sn62

NON-MAG

Resistors Optimized
for RF & Microwave

RCX Partial Wrap Series

- Improved Frequency Response
- Characterized to 40GHz †
- Sn62 Solder Available
- Non-Magnetic
- Improved Performance to 40GHz (0302 Size)

This design allows visual inspection of the terminal joint connection when mounted face down.



SAMPLE PN: RCC - 0402PW - 50R0 J (0402 Size, 50Ω, 5%, PtAg w/ Solder Partial Wrap Terminals)

| PN Prefix | Size | Frequency† | Rated Power** | Value Range‡ | Tolerances |
|--|--------|------------|---------------|--------------|----------------------------|
| ✓ RC3 -PtAg Partial Wrap | 0302PW | To 40GHz | 63mW | 10Ω to 10KΩ | F = 1% G = 2% J = 5% |
| ✓ RC8 -ULR PtAg Partial Wrap | 0402PW | To 36GHz | 80mW | | |
| RC -PtAg Partial Wrap with Sn62 Solder | 0502PW | To 26.5GHz | 100mW | | |
| ✓ RCP -PtAg Partial Wrap with Sn96 Solder | 0603PW | To 15GHz | 100mW | | |
| ✓ RC4 -*PtAu Partial Wrap | 0805PW | To 8GHz | 175mW | | |
| RCD -*PtAu Partial Wrap with Sn62 Solder | | | | | |
| RCH -ULR PtAg Partial Wrap with Sn62 Solder | | | | | |
| ✓ RCQ -*PtAu with Sn96 Solder | | | | | |
| ✓ RCR -ULR PtAg Partial Wrap with Sn96 Solder | | | | | |

* Applies to 0302 only.
 ‡ Other Values Available. Contact factory.
 † Based on smallest size & mounting in matched continuous 50Ω system with proper application of RF principles.
 ** Rated at 70°C free air temperature.

Modelithics data available



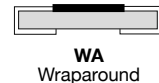
High Voltage Surface Mount
Chip Resistors

HVI Series

- High Rated Continuous Working Voltage
- High Stability Thick Film Resistor Element
- 96% Al₂O₃ Substrate Material Provides Excellent Solder Leach Resistance
- Trimmed to EIA Standard Values
- Tolerances to ± 1%
- Passivated Resistor Element
- Available in Cut Tape or on Tape and Reel Packaging



- Applications Include:**
- Power Supplies
 - Power Converters
 - Defibrillators
 - Pacemakers
 - Power Metering Devices



SAMPLE PN: HVI - 2010 - 4005 J (2010 Size, 40 MegΩ, 5%)

| Attachment/ Term Metal | Size | Rated Power† | Max RCW Voltage ¹ | Max Overload Voltage ¹ | Value Range F = 1% Tolerance | Value Range J = 5% Tolerance | Value Range K = 10% Tolerance |
|--|------|--------------|------------------------------|-----------------------------------|---------------------------------|---------------------------------|----------------------------------|
| ✓ HVI <small>Nickel barrier layer with 100% matte finish</small> | 0402 | 62.5mW | 100V | 200V | 39K to 10MΩ | 39K to 100MΩ | N/A |
| | 0603 | 100mW | 200V | 400V | 56K to 10MΩ | 56K to 100MΩ | N/A |
| | 0805 | 125mW | 400V | 800V | 100K to 10MΩ | 100K to 100MΩ | N/A |
| | 1206 | 250mW | 500V | 1kV | 100K to 10MΩ | 100K to 100MΩ | N/A |
| | 2010 | 500mW | 2kV | 3kV | 51K to 20MΩ | 51K to 100MΩ | N/A |
| | 2512 | 1W | 3kV | 4kV | 30K to 20MΩ | 30K to 100MΩ | N/A |

¹ Operating Voltage = √(P*R) or Max RCW Voltage, whichever is lower.

† Free air rated at 70°C.

‡ First 3 digits of value code are significant value. The 4th is the number of zeros following. An 'R' indicates a decimal when resistance is under 100Ω.

* Not all values are available in all tolerances. See datasheet on the website.



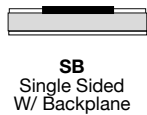
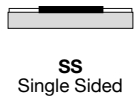
Single-Sided Resistors

IMS Single Sided

- Gold Terminals Provide Excellent Wire Bondability
- Ultra High Resistance Available
- PtAg or PtAg with Sn62 Solder Available
- Non-Magnetic PtAg Great for Epoxy Attachment

Larger bond pads and optional metallized backplane are available.

This series is ideal for hybrids and microstrip circuits.



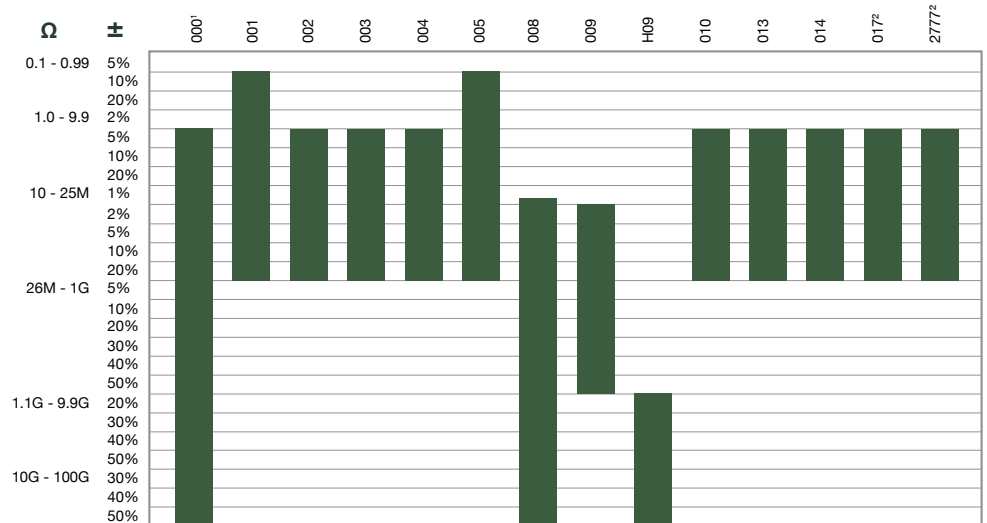
1. Available with Au (-1) terminals only.
 2. Available in 10% and higher tolerances only
- *1%, 2% not available over 1Mohm.

† Free air rated at 70°C.

◊ First 3 digits of value code are significant value. The 4th is the number of zeros following.
An 'R' indicates a decimal when resistance is under 100Ω. For 1 Teraohm use code 1.0T (if available).

SAMPLE PN: IMS017 - 1 - 1201 F (0.025" x 0.030" Size, 1.2KΩ, 1%, Au Terminals)

| PN Prefix | Size (inches) | Rated Power† | Max RCW Voltage | Term Metal | Value Range◊ | Tolerance Ranges* |
|----------------------|---------------|--------------|-----------------|--|--------------|-----------------------------------|
| IMS017 ¹ | 0.025 x 0.030 | 30mW | 40VDC | -1 ✓ Au Single-sided | 1Ω to 25MΩ | F = 1% 1Ω to 25MΩ |
| IMS000 | 0.045 x 0.030 | 125mW | 60VDC | | 1Ω to 1TΩ | G = 2% 1Ω to 25MΩ |
| IMS001 | 0.050 x 0.050 | 125mW | 60VDC | | 0.1Ω to 25MΩ | J = 5% 1Ω to 200MΩ |
| IMS014 ¹ | 0.035 x 0.035 | 125mW | 50VDC | -3 ✓ PtAg Single-sided | 1Ω to 25MΩ | K = 10% 1Ω to 1GΩ ² |
| IMS002 | 0.075 x 0.050 | 175mW | 100VDC | | 1Ω to 25MΩ | M = 20% 1Ω to 100GΩ ² |
| IMS009 | 0.080 x 0.050 | 175mW | 150VDC | -C PtAg Single-sided with Sn62 Solder | 10Ω to 1GΩ | N = 30% 1.2GΩ to 1TΩ ² |
| IMSH09 ² | 0.080 x 0.050 | 175mW | 150VDC | | 1.2GΩ to 1TΩ | P = 40% 1Ω to 100GΩ |
| IMS008 | 0.100 x 0.025 | 100mW | 175VDC | | 10Ω to 1TΩ | R = 50% 1.2GΩ to 1TΩ |
| IMS003 | 0.100 x 0.050 | 250mW | 160VDC | -P ✓ PtAg Single-sided with Sn96 Solder | 1Ω to 25MΩ | |
| IMS010 | 0.125 x 0.050 | 250mW | 230VDC | | 1Ω to 25MΩ | |
| IMS004 | 0.150 x 0.050 | 350mW | 350VDC | | 1Ω to 25MΩ | |
| IMS005 | 0.100 x 0.100 | 500mW | 160VDC | | 0.1Ω to 25MΩ | |
| IMS013 ¹ | 0.045 x 0.030 | 125mW | 60VDC | | 1Ω to 25MΩ | |
| IMS2777 ¹ | 0.030 x 0.020 | 30mW | 40VDC | | 1Ω to 25MΩ | |



Jumpers are available in all sizes.

1. Larger bond pads available for auto wirebonding.

2. Highest Value for 1% or 2% Tolerance is 1MΩ.



HI-OHM

RoHS

Sn62

NON-MAG

BONDABLE

High Power Single-Sided
Alumina Resistors

IMS Power Series

- High Power Dissipation
- Sn62 Solder Available
- Non-Magnetic

Optional metallized backplane is available on all sizes.

**For Higher Power Options
See Page 6**

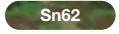


SAMPLE PN: IMS204 - C - 12R0 J (0.440" x 0.180" Size, 12Ω, 5%, PtAg w/ Sn62 Solder Terminals)

| PN Prefix | Length | | Width | | Rated Power† | Max RCW Voltage | Term Metal | Value Range◇ | Tolerance Ranges |
|-----------|--------|--------|-------|--------|--------------|-----------------|--|--------------|--|
| IMS024 | 0.240 | +0.008 | 0.120 | +0.008 | 1W | 350VDC | -1 ✓ Au Single-sided | 1Ω to 20MΩ | F = 1% 1Ω to 20MΩ G = 2% 1Ω to 20MΩ J = 5% 1Ω to 20MΩ K = 10% 0.05Ω to 20MΩ *IMS026 available in 10% tolerance only. |
| | | -0.002 | | -0.002 | | | | | |
| IMS026* | 0.120 | +0.008 | 0.240 | +0.012 | 1W | 1VDC | -3 ✓ PtAg Single-sided | 0.05Ω to 1Ω | |
| | | -0.002 | | -0.008 | | | | | |
| IMS202 | 0.360 | +0.008 | 0.140 | +0.008 | 2W | 800VDC | -C PtAg Single-sided with Sn62 Solder | 1Ω to 20MΩ | |
| | | -0.002 | | -0.002 | | | | | |
| IMS204 | 0.440 | +0.008 | 0.180 | +0.008 | 4W | 1100VDC | -P ✓ PtAg Single-sided with Sn96 Solder | 1Ω to 20MΩ | |
| | | -0.002 | | -0.002 | | | | | |
| IMS206 | 0.520 | +0.008 | 0.215 | +0.008 | 6W | 1400VDC | | 1Ω to 20MΩ | |
| | | -0.002 | | -0.002 | | | | | |
| IMS208 | 0.560 | +0.008 | 0.240 | +0.008 | 8W | 1500VDC | | 1Ω to 20MΩ | |
| | | -0.002 | | -0.002 | | | | | |
| IMS210 | 0.620 | +0.008 | 0.270 | +0.008 | 10W | 1800VDC | | 1Ω to 20MΩ | |
| | | -0.002 | | -0.002 | | | | | |

† Free air rated at 70°C.

◇ First 3 digits of value code are significant value. The 4th is the number of zeros following.
An 'R' indicates a decimal when resistance is under 100Ω. For 1Teraohm use code 1.0T (if available).



Full Wrap & Single Wrap to Ground Resistors RCX Series

- Values from 1Ω to 1TΩ
- Not Limited to EIA Standard Values
- Sn62 Solder Available
- Non-Magnetic



1. PtAu on wrap terminal (GND side), Au over PtAu on input terminal for 0302 and 0402 only
2. RCX-0302 available in 5% and 10% tolerances.
3. RCX-0402 through RCX-2512 available in 1%, 2%, 5% and 10% tolerances.
4. Values over 200MΩ available in 10%, 15%, 20%, 30%, 35%, 40%, and 50% tolerances.

* SG available in RCX-0302 and RCX-0402 only.

Substitute **SG** in place of dash after size to indicate Single Wrap to Ground terminal style.

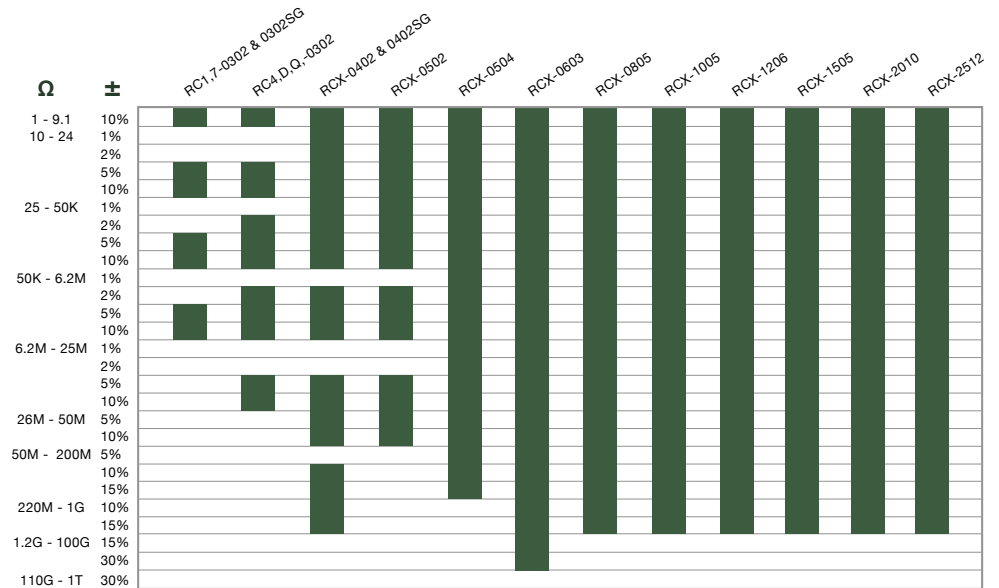
† Free air rated at 70°C

∅ First 3 digits of value code are significant value. The 4th is the number of zeros following.
An 'R' indicates a decimal when resistance is under 100Ω.

SAMPLE PN: **RCC** - **0805** - **2003** **J** (0805 Size, 200KΩ, 5%, PtAg w/ Sn62 Solder Terminals)

| Attachment/ Term Metal | Size | Rated Power† | Max RCW Voltage | Value Range ^{∅4} | Tolerance Ranges |
|--|-------------------|--------------|-----------------|---------------------------|---|
| ✓ RC1 -Au Wraparound | 0302 ² | 63mW | 50VDC | 1Ω to 25MΩ | F = 1% 10Ω to 25MΩ G = 2% 5Ω to 25MΩ J = 5% 1Ω to 200MΩ K = 10% 1Ω to 1GΩ L = 15% 1Ω to 50GΩ M = 20% 1Ω to 100GΩ N = 30% 1Ω to 100GΩ P = 40% 1Ω to 100GΩ |
| ✓ RC3 -PtAg Wraparound | 0402 ³ | 80mW | 50VDC | 1Ω to 1TΩ | |
| ✓ RC4 -*PtAu Single Wrap | 0502 | 100mW | 50VDC | 1Ω to 50MΩ | |
| ✓ RC7 -Au over PtAu ¹ | 0504 | 125mW | 50VDC | 1Ω to 200MΩ | |
| ✓ RC8 -ULR PtAg Wraparound | 0603 | 100mW | 50VDC | 1Ω to 1TΩ | |
| RCC -PtAg Wraparound with Sn62 Solder | 0805 | 175mW | 150VDC | 1Ω to 1GΩ | |
| RCD -*PtAu Single Wrap with Sn62 Solder | 1005 | 250mW | 160VDC | 1Ω to 1GΩ | |
| RCH -ULR PtAg Wraparound with Sn62 Solder | 1206 | 250mW | 200VDC | 1Ω to 1GΩ | |
| ✓ RCP -PtAg Wraparound with Sn96 Solder | 1505 | 250mW | 200VDC | 1Ω to 1GΩ | |
| ✓ RCQ -PtAu w/ Sn96 Solder | 2010 | 500mW | 200VDC | 1Ω to 1GΩ | |
| ✓ RCR -ULR PtAg Wraparound with Sn96 Solder | 2512 ³ | 1W | 200VDC | 1Ω to 1GΩ | |

Not all values and tolerances available in all sizes.



Consult factory for additional values, sizes and tolerances.



ULR

HI-OHM

RoHS

Sn62

NON-MAG

BONDABLE

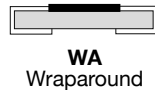
Thick Film Nickel Barrier
Solderable Resistors
RXI Series

- Large Inventory Available for Same-day Shipping
- Partial Reel Quantities Available
- Low Minimum Order Quantities
- 100% Matte Tin Finish over Nickel Barrier Terminals



SAMPLE PN: **RCI** - **0402** - **49R9 F** (0402 Size, 49.9Ω, 1%, Nickel Barrier Terminals)

| PN Prefix | Size | Rated Power† | Max RCW Voltage | Value Range∅ | Tolerances |
|---|---------------|---------------|-------------------------|--------------------------|------------|
| ✓ RCI- Nickel Barrier Layer with 100% Matte Tin Finish | 01005 | 30mW | 15VDC | E96 Values - 10Ω to 1MΩ | F = 1% |
| | | | | E24 Values - 1Ω to 10MΩ | J = 5% |
| | 0201 | 50mW | 25VDC | E96 Values - 10Ω to 1MΩ | F = 1% |
| | | | | E24 Values - 1Ω to 10MΩ | J = 5% |
| | 0402 | 63mW | 50VDC | E96 Values - 1Ω to 10MΩ | F = 1% |
| | | | | E24 Values - 1Ω to 10MΩ | J = 5% |
| | 0603 | 100mW | 50VDC | E96 Values - 1Ω to 10MΩ | F = 1% |
| | | | | E24 Values - 1Ω to 22MΩ | J = 5% |
| | 0805(S) | 175mW (350mW) | 150VDC | E96 Values - 1Ω to 10MΩ | F = 1% |
| | | | | E24 Values - 1Ω to 22MΩ | J = 5% |
| | 0805* | 125mW | 150VDC | E96 Values - 1Ω to 10MΩ | F = 1% |
| | | | | E24 Values - 1Ω to 22MΩ | J = 5% |
| 1206(S) | 250mW (500mW) | 200VDC | E96 Values - 1Ω to 10MΩ | F = 1% | |
| | | | E24 Values - 1Ω to 22MΩ | J = 5% | |
| 1206* | 250mW | 200VDC | E96 Values - 1Ω to 10MΩ | F = 1% | |
| | | | E24 Values - 1Ω to 22MΩ | J = 5% | |
| 2010(S)* | 750mW (1W) | 200VDC | E96 Values - 1Ω to 1MΩ | F = 1% | |
| | | | E24 Values - 1Ω to 1MΩ | J = 5% | |
| 2512(S)* | 1W (2W) | 200VDC | E96 Values - 1Ω to 1MΩ | F = 1% | |
| | | | E24 Values - 1Ω to 1MΩ | J = 5% | |
| ✓ RLI- Low Value Nickel Barrier Layer with 100% Matte Tin Finish | 0805 | 125mW | 150VDC | E24 Values - 0.1Ω to 1Ω | G = 2% |
| | | | | E24 Values - 0.1Ω to 1Ω | J = 5% |
| | 1206 | 250mW | 200VDC | E24 Values - 0.1Ω to 1Ω | G = 2% |
| | 1210 | 500mW | 200VDC | E24 Values - .068Ω to 1Ω | J = 5% |



† Free air rated at 70°C

∅ First 3 digits of value code are significant value. The 4th is the number of zeros following
An 'R' indicates a decimal when resistance is under 100Ω.

* User trimmable versions, non-EIA values and tolerances available, contact factory

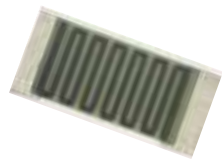


High Value Wraparound Resistors HCX Series

- Ultra High Resistance
- Not Limited to EIA Standard Values
- Sn62 Solder Available
- Non-Magnetic

Applications Include:

- Sensors
- Current Flow Management
- Test & Measurement
- Piezoelectrics



SAMPLE PN: HCC - 2010 - 3009 N (2010 Size, 300GΩ, 30%, PtAg w/ Sn62 Solder Terminals)

| Attachment/ Term Metal | Size ¹ | Rated Power [†] | Max RCW Voltage | Value Range [‡] | Tolerance Ranges |
|---|-------------------|--------------------------|-----------------|--------------------------|---|
| ✓ HC3- PtAg Wraparound | 0805 | 175mW | 150VDC | 1.2GΩ to 1TΩ | L = 15% 1.2G to 1TΩ M = 20% 1.2G to 1TΩ N = 30% 1.2G to 1TΩ P = 40% 1.2G to 1TΩ R = 50% 1.2G to 1TΩ |
| | 1206 | 250mW | 200VDC | 1.2GΩ to 1TΩ | |
| HCC- PtAg Wraparound with Sn62 Solder | 2010 | 500mW | 200VDC | 1.2GΩ to 1TΩ | |
| ✓ HCP- PtAg Wraparound with Sn96 Solder | | | | | |
| ✓ HCR- ULR PtAg Wraparound with Sn96 Solder | | | | | |

¹ Smaller sizes available. Please contact factory.

[†] Free air rated at 70°C

[‡] First 3 digits of value code are significant value. The 4th is the number of zeros following.
For 1Teraohm use code 1.0T. (if available).



HI-OHM

RoHS

Sn62

NON-MAG

Current Sensing Thin Film
Nickel Barrier Resistors

LCI Series


- Ultra Low Resistance
- 100% Matte Tin Finish over Nickel Barrier Terminals
- Values from 0.003Ω

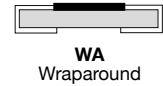
Applications Include:

- Stepping Motors
- Switching Power Supplies
- Voltage Regulation
- DC-DC Converters
- Battery Monitors



SAMPLE PN: LCI - 1225 - R047 J (1225 size, 0.047Ω, 5% with Nickel Barrier)

| PN Prefix | Size | Length | Width | Height (max) | Thickness (max) | Rated Power† | mΩ∅ | TCR | Max RCW Voltage | Tolerances |
|--|------|------------|------------|--------------|-----------------|--------------|--|------------------------------|-----------------|----------------------------|
| LCI-  Nickel Barrier Layer with 100% Matte Tin Finish | 0402 | 0.039±.002 | 0.020±.002 | 0.017 | 0.008±.004 | 63mW | 50-100 102-500 510-1000 | ±400 ±300 ±200 | = √PR | F = 1% G = 2% J = 5% |
| | 0603 | 0.063±.004 | 0.031±.004 | 0.022 | 0.012±.008 | 100mW | 20-50 50-100 102-500 510-1000 | ±600 ±400 ±300 ±200 | | |
| | 0805 | 0.079±.006 | 0.049±.006 | 0.026 | 0.016±.010 | 125mW | 20-50 51-100 102-500 510-1000 | ±600 ±400 ±300 ±200 | | |
| | 1206 | 0.120±.006 | 0.061±.006 | 0.026 | 0.016±.010 | 250mW | 10-20 21-50 51-91 100-1000 | ±600 ±400 ±300 ±200 | | |
| | 2010 | 0.197±.008 | 0.096±.006 | 0.030 | 0.020±.010 | 750mW | 10-20 21-50 51-91 100-1000 | ±600 ±400 ±300 ±200 | | |
| | 2512 | 0.250±.008 | 0.124±.006 | 0.028 | 0.022±.010 | 1W | 10-20 21-50 51-91 100-100 | ±600 ±400 ±300 ±200 | | |
| | 1225 | 0.122±.006 | 0.248±.006 | 0.041 | 0.022±.010 | 3W | 3-5 6-20 21-30 33-1000 | ±300 ±200 ±150 ±100 | | |



† Free air rated at 70°C.

∅ First 3 digits of value code are significant value. The 4th is the number of zeros following. An 'R' indicates a decimal when resistance is under 100Ω.



RoHS

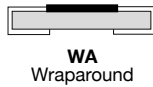
LOW TCR

Precision Thin Film
Nickel Barrier Resistors

TPI Series

- Low TCRs and Tight Tolerances
- Large Inventory for Same Day Shipping
- Partial Reel Quantities Available
- 100% Matte Tin Finish over Nickel Barrier Terminals
- Low Minimum Order Quantities

Tighter Tolerances to 0.01% Available.
Please contact factory.



SAMPLE PN: TPI - 0402 - 49R9 B (0402 Size, 49.9Ω, 0.1% with Nickel Barrier)

| PN Prefix | Size | Length | Width | Height (max) | Rated Power† | Max RCW Voltage | Value Range◇ | Tolerances |
|---|------------|-------------|------------|--------------|--------------|--------------------------|----------------------------|----------------------|
| TPI- Nickel Barrier Layer with 100% Matte Tin Finish | 0402 | 0.039 ±.002 | 0.020±.002 | 0.016 | 63mW | 25VDC | E96 Values - 10Ω to 205KΩ | B = 0.1% D = 0.5% |
| | 0603 | 0.063±.008 | 0.031±.008 | 0.022 | 63mW | 50VDC | E96 Values - 4.7Ω to 1MΩ | B = 0.1% |
| | | | | | | | E96 Values - 2Ω to 1MΩ | D = 0.5% |
| | 0805 | 0.079±.008 | 0.049±.008 | 0.026 | 100mW | 100VDC | E96 Values - 4.7Ω to 2MΩ | B = 0.1% |
| | | | | | | | E96 Values - 1Ω to 2MΩ | D = 0.5% |
| | 1206 | 0.124±.010 | 0.063±.008 | 0.026 | 125mW | 150VDC | E96 Values - 4.7Ω to 2.5MΩ | B = 0.1% |
| | | | | | | | E96 Values - 1Ω to 2.5MΩ | D = 0.5% |
| | 1210 | 0.124±.006 | 0.100±.006 | 0.026 | 250mW | 150VDC | E96 Values - 4.7Ω to 2.5MΩ | B = 0.1% |
| E96 Values - 1Ω to 2.5MΩ | | | | | | | D = 0.5% | |
| 2010 | 0.200±.006 | 0.100±.006 | 0.026 | 250mW | 150VDC | E96 Values - 4.7Ω to 3MΩ | B = 0.1% | |
| | | | | | | E96 Values - 1Ω to 3MΩ | D = 0.5% | |
| 2512 | 0.250±.006 | 0.122±.006 | 0.026 | 500mW | 150VDC | E96 Values - 4.7Ω to 3MΩ | B = 0.1% | |
| | | | | | | E96 Values - 1Ω to 3MΩ | D = 0.5% | |

* Available as special order only
Add "N" after size for 10PPM
Add "V" after size for 5PPM
(i.e. TPI-0805V-49R9B for 5PPM)

† Free air rated at 70°C.

◇ First 3 digits of value code are significant value. The 4th is the number of zeros following.
An 'R' indicates a decimal when resistance is under 100Ω.

TCR

| Part | 25 ppm/°C | 10 ppm/°C3 | 5 ppm/°C3 |
|----------|--------------|---------------|----------------|
| TPI-0402 | 10Ω to 205KΩ | 49.9Ω to 12KΩ | 49.9Ω to 3KΩ |
| TPI-0603 | 2Ω to 1MΩ | 4.7Ω to 332KΩ | 24.9Ω to 15KΩ |
| TPI-0805 | 1Ω to 2MΩ | 4.7Ω to 500KΩ | 24.9Ω to 30KΩ |
| TPI-1206 | 1Ω to 2.5KΩ | 4.7Ω to 1MΩ | 24.9Ω to 50KΩ |
| TPI-1210 | 1Ω to 2.5KΩ | 4.7Ω to 1MΩ | 24.9Ω to 100KΩ |
| TPI-2010 | 1Ω to 3MΩ | 4.7Ω to 1MΩ | 24.9Ω to 100KΩ |
| TPI-2512 | 1Ω to 3MΩ | 4.7Ω to 1MΩ | 24.9Ω to 100KΩ |

Available as special order. Add 'N' after size for 10 ppm. Add 'V' after size for 5 ppm.



RoHS

LOW TCR

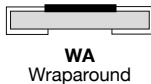
KIT

Metal Foil Current Sensing Surface Mount Chip Resistors MLI Series

- High Stability Metal Foil Technology
- Single Sided or Full Wraparound Terminals
- 100% Tin over Nickel Barrier for Solder Attachment
- Resistance Values from 0.001Ω to 0.500Ω
- Tolerances to ± 1%
- TCR to ± 50 PPM/°C
- Available in Cut Tape or on Tape and Reel Packaging



† Free air rated at 70°C.
 Highest resistor value is 500 mΩ (R500).
 † First 3 digits of value code are significant value. The 4th is the number of zeros following.
 An 'R' indicates a decimal when resistance is under 100Ω.
 For example: 0.005Ω is noted as R005, 0.05Ω is noted as R050.



SAMPLE PN: MLI - 1835WA - R005 F (1835 Size, wraparound, 5 milliohms, 1%)

| PN Prefix | Size | Length ± 0.008" | Width ± 0.008" | Thickness (max) | Terminal Width | Rated Power† | Value Range‡ | Tolerance | Attachment Method | Terminal Metallization |
|---|--------|--------------------|-------------------|--------------------|-------------------------------|-----------------|------------------------------|-------------------|----------------------|---------------------------|
| MLI ✓ Nickel Barrier Layer with 100% Matte Tin Finish | 1835SS | .180" | .350" | 0.028" | 2 mΩ up 0.028" 1 mΩ 0.063" | 5W | .001Ω .002Ω .003Ω - up | ±5% ±2% ±1% | Solder | NiCr/Ni/Sn |
| | 1835WA | .180" | .350" | 0.028" | 2 mΩ up 0.028" 1 mΩ 0.063" | 4W | .001Ω .002Ω .003Ω - up | ±5% ±2% ±1% | Solder | NiCr/Ni/Sn |
| | 2043SS | .200" | .430" | 0.028" | 2 mΩ up 0.031" 1 mΩ 0.063" | 6W | .001Ω .002Ω .003Ω - up | ±5% ±2% ±1% | Solder | NiCr/Ni/Sn |
| | 2043WA | .200" | .430" | 0.028" | 2 mΩ up 0.031" 1 mΩ 0.063" | 5W | .001Ω .002Ω .003Ω - up | ±5% ±2% ±1% | Solder | NiCr/Ni/Sn |

| Item | Specification |
|------------------------|---|
| Operating Temperature: | -55°C to +150°C |
| TCR: | 1 mΩ ± 200 ppm/°C 2 mΩ ± 100 ppm/°C 3 mΩ up ± 50 ppm/°C |
| Resistance Range | 1 mΩ - 9 mΩ (1 mΩ steps) 10 mΩ - 500 mΩ (E-6 values) |
| Substrate Material | 99.6% Alumina |



Thin Film Nickel Barrier Attenuators A-Series

- Characterized to 50GHz †
- 100% Matte Tin Finish over Nickel Barrier Terminals
- 50 Ohm Nominal Impedance
- Sample Kits Available
- Low Minimum Order Quantities
- Available in Cut Tape or on Tape and Reel Packaging



◊ Other Values Available. Contact factory.
 † Based on smallest size & mounting in matched continuous 50Ω system with proper application of RF principles.
 * Max RCW Voltage Based on $\sqrt{P \cdot R}$.
 ** Rated at 70°C free air temperature.

SAMPLE PN: A - 0805 - C - 03DB (0805 Size, 50Ω, 3dB, Nickel Barrier Terminals)

| | PN Prefix/Size | Length | Width | Height (max) | Terminal (mins) | Value Range◊ | Rated Power** |
|---|----------------------------|-------------|-------------|--------------|-----------------|------------------|---------------|
| ✓ | A-0402WA-C | 0.039 ±.002 | 0.020 ±.002 | 0.015" | 0.011 ±.002 | 00 to 10dB | 32mW |
| ✓ | IMS2652-C (0402 face down) | 0.039 ±.002 | 0.020 ±.002 | 0.015" | 0.011 ±.002 | | 32mW |
| ✓ | IMS2647 | 0.039 ±.002 | 0.020 ±.002 | 0.015" | 0.011 ±.002 | | 32mW |
| ✓ | A-0603-C | 0.063 ±.004 | 0.032 ±.004 | 0.020" | 0.020 ±.006 | | 63mW |
| ✓ | IMS2533 (0603 face down) | 0.063 ±.004 | 0.032 ±.004 | 0.020" | 0.020 ±.006 | | 63mW |
| ✓ | A-0805-C | 0.079 ±.008 | 0.049 ±.008 | 0.020" | 0.020 ±.008 | | 100mW |
| ✓ | IMS1141 (0805 face down) | 0.079 ±.008 | 0.049 ±.008 | 0.020" | 0.020 ±.0082 | 100mW | |
| ✓ | A-1206-C | 0.126 ±.008 | 0.063 ±.008 | 0.020" | 0.039 ±.010 | 00 to 10dB, 16dB | 125mW |
| ✓ | A-1612 | 0.165 ±.008 | 0.118 ±.008 | 0.038" | 0.035 ±.020 | 00 to 10dB, 16dB | 250mW |

Input Power

| | A-0402WA IMS2647 IMS2652 | A-0603 IMS2533 | A-0805 IMS1141 | A-1206 | A-1612 |
|-------------|--------------------------------|-------------------|-------------------|--------|--------|
| 1dB | 155mW | 300mW | 485mW | 607mW | 1.2W |
| 2dB | 87mW | 171mW | 271mW | 339mW | 678mW |
| 3dB | 64mW | 126mW | 200mW | 251mW | 501mW |
| 4dB | 53mW | 105mW | 166mW | 208mW | 415mW |
| 5dB | 47mW | 92mW | 146mW | 183mW | 365mW |
| 6dB | 43mW | 85mW | 134mW | 168mW | 336mW |
| 7dB | 40mW | 79mW | 125mW | 156mW | 313mW |
| 8dB | 38mW | 75mW | 119mW | 148mW | 297mW |
| 9dB | 37mW | 72mW | 114mW | 143mW | 286mW |
| 10dB | 36mW | 70mW | 111mW | 139mW | 278mW |

Modelithics data available



RoHS

KIT

High Power AlN Thick Film Attenuators V-Series

- High Power Dissipation†
- Aluminum Nitride Substrate
- Sn62 Solder
- Attenuation to 30dB
- Half dB Increments
- 50 Ohm Nominal Impedance



SAMPLE PN: V G 3 - 3725 SG - 05D0 (3725 Size, 22dB, PtAg Terminals)

| PN | Thickness | Term Metal | Size | 5db, T = 50°C | 3db, T = 100°C | Term Style | Value Range | Attenuation Accuracy | | |
|----|--------------------------|--|--------|---------------|----------------|-----------------------------|--------------|--|--|------------|
| V | D = 0.015" G = 0.025" | 3- ✓ PtAg 7- ✓ Au over PtAu (input) PtAu (ground) 8- ✓ ULR PtAg C- PtAg with Sn62 Solder H- ULR PtAg with Sn62 Solder R- ✓ ULR PtAg with Sn96 Solder | D-2010 | 56W | 37W | WA Wraparound | 00dB to 30dB | '0' indicates whole dB increments. '5' indicates 0.5dB increments up to 16.5dB. | 0 - 3dB | ±0.2dB |
| | | | D-2512 | 125W | 81W | | | | SG Single Wrap to Ground | 3.5 - 13dB |
| | | | D-3725 | 423W | 276W | 13.5 - 30dB | | | | ±0.5dB |
| | | | G-2010 | 34W | 22W | | | | | |
| | | | G-2512 | 75W | 49W | | | | | |
| | | | G-3725 | 254W | 165W | | | | | |

Other sizes, power ratings and values can be supplied.

† Based on smallest size & mounting in matched continuous 50Ω system with proper application of RF principles.
For pulsed power applications, a scan trim should be specified. Please contact factory for more information.

Modelithics data available

RoHS COMPLIANT

ULR

HI PWR

RoHS

Sn62

NON-MAG

BONDABLE

Thick Film Attenuators IAX Series

- Attenuation to 70dB
- Half dB Increments
- 50 Ohm Nominal Impedance



SAMPLE PN: IAC - 2512 WA - 06D5 (2512 Size, 6.5dB, PtAg w/ Sn 62 Terminals)

| PN Prefix/Term Metal | Size | Rated Power | Term Style | Value Range | Attenuation Accuracy | | | | |
|--|------|-------------|--------------------------------|--------------|--|--|-------------------------------|--------|--|
| ✓ IA1 -*Au | 0706 | 300mW | WA Wraparound | 00dB to 70dB | '0' indicates whole dB increments. '5' indicates 0.5dB increments up to 16.5dB. | 0 - 3.5dB | ±0.2dB | | |
| ✓ IA3 - PtAg | 0805 | 400mW | | | | SG Single Wrap to Ground | 4 - 13dB | ±0.3dB | |
| ✓ IA8 - ULR PtAg | 1206 | 1W | SS* Single Sided | | | | 13.5 - 70dB | ±0.5dB | |
| IAC- PtAg with Sn62 Solder | 2010 | 3W | | | | | PW Partial Wrap | | |
| IAH- ULR PtAg with Sn62 Solder | 2512 | 5W | | | | | | | |
| ✓ IAP- PtAg with Sn96 Solder | 3725 | 15W | | | | | | | |

*Single Sided & Au terminals available in 0706 size only.

Modelithics data available

RoHS COMPLIANT

ULR

RoHS

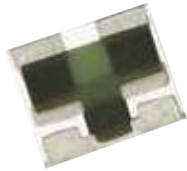
Sn62

NON-MAG

BONDABLE

Standard Size T-Pad Attenuators IMA Series

- 0.122" x 0.145" Size
- Characterized to 12.4GHz[†]
- Sn62 Solder Available
- Attenuation to 40dB
- Half dB Increments



SAMPLE PN: IMA2373 - 12 D0 (0.122" x 0.145" Size, 12dB, PtAg Terminals)

| PN Prefix | Term Style | Term Metal | Rated Power [‡] | Increment | Accuracy | Value Range [◊] |
|-----------|---------------------------|--------------|--------------------------|-----------|----------|---|
| IMA2314 | Wraparound | PtAg w/ Sn62 | 2W | 1 - 3.5dB | +/-0.2dB | dB Increment D0 denotes whole value D5 denotes whole value + 0.5dB, available up to 16.5 dB |
| IMA2370 | Single-Sided w/ Backplane | PtAg w/ Sn62 | 2W | 4 - 19dB | +/-0.3dB | |
| IMA2371 | Single Wrap to Ground | PtAg w/ Sn62 | 2W | 20 - 30dB | +/-0.5dB | |
| ✓ IMA2373 | Wraparound | PtAg | 2W | 31-40dB | +/-1.0dB | |
| ✓ IMA2381 | Single-Sided | PtAg | 2W | | | |
| ✓ IMA2609 | Wraparound | PtAg w/ Sn96 | 2W | | | |
| ✓ IMA2686 | Wraparound | ULR PtAg | 2W | | | |

[†] Based on smallest size & mounting in matched continuous 50Ω system with proper application of RF principles.

[‡] Rated at 70°C free air temperature. Rated at 100°C baseplate temperature. Proper thermal management required.



ULR

RoHS

Sn62

NON-MAG

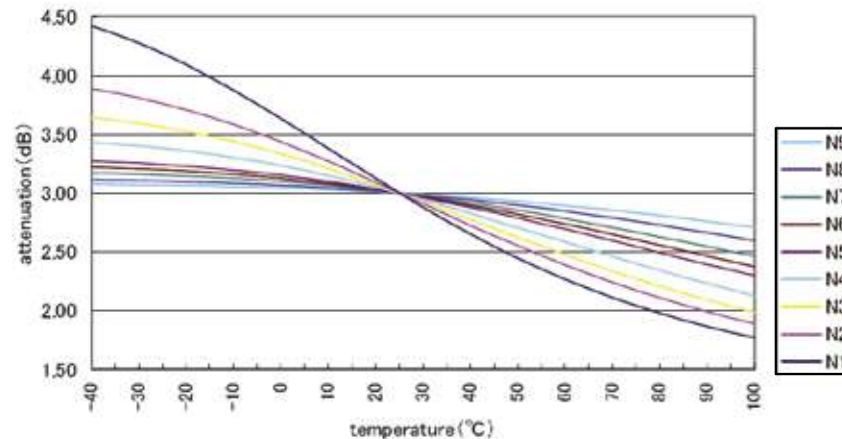
Temperature Variable Attenuators AV-0805

- NiCr Thin Film
- DC to 5GHz
- Impedance - 50Ω
- Power Rating - 63 mW
- Temperature Curves from N1 to N9
- Operating Temperature: -40°C to +100°C
- Available in Cut Tape or on Tape and Reel Packaging



SAMPLE PN: AV - 0805 C - 03 N6 (0805 Size, nickel barrier, tin, wraparound, 3 dB N6)

| PN Prefix | Size | Impedance | Attenuation | Temperature Curve |
|-----------|------|-----------|-------------|-------------------|
| ✓ AV | 0805 | C = 50Ω | 1 to 10 dB | N1 to N9 |



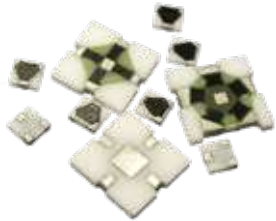
Temp vs Attenuation N1-N9 curves are also available for 1dB - 10dB values



RoHS

Wideband Resistive Splitters IPS Series

- Characterized to 20GHz†
- Two, Three or Four Way Split
- Alternative to Softboard Solutions
- Many Term Material and Presence of Backplane (BP) Available



SAMPLE PN: **IPS2345 - C** (2 Way, 1W, 50Ω Impedance, PtAg Terminals)

| PN Prefix | Split | Size | Term Style | Term Material | Frequency† | Rated Power‡ | Impedance | |
|-------------------|----------------|-----------------|-----------------|-----------------|------------------|--------------|----------------|----------------|
| ✓ IPS2290 | 2 Way | 0.098" x 0.098" | Single-Sided | PtAg/PtAg BP | To 20GHz | 1W | C=50Ω or D=75Ω | |
| ✓ IPS2331 | 2 Way | 0.098" x 0.098" | Single-Sided | Au/Au BP | To 20GHz | 1W | C=50Ω or D=75Ω | |
| ✓ IPS2346 | 2 Way | 0.098" x 0.098" | Wraparound | PtAg | To 20GHz | 1W | C=50Ω or D=75Ω | |
| ✓ IPS2480 | 3 Way | 0.240" x 0.240" | Single-Sided | Au/Au BP | To 7GHz | 3W | C=50Ω or D=75Ω | |
| ✓ IPS2481 | 3 Way | 0.240" x 0.240" | Single-Sided | PtAg/PtAg BP | To 7GHz | 3W | C=50Ω or D=75Ω | |
| ✓ IPS2521 | 3 Way | 0.240" x 0.240" | Wraparound | PtAg/PtAg BP | To 7GHz | 3W | C=50Ω or D=75Ω | |
| ✓ IPS2522 | 4 Way | 0.295" x 0.287" | Wraparound | PtAg/PtAg BP | To 7GHz | 3W | C = 50Ω | |
| | IPS2528 | 2 Way | 0.098" x 0.098" | Wraparound | PtAg w/Sn62 | To 20GHz | 1W | C=50Ω or D=75Ω |
| ✓ IIPS2640 | 2 Way | 0.098" x 0.098" | Wraparound | PtAg w/Sn96 | To 20GHz | 1W | C=50Ω or D=75Ω | |
| | IPS2645 | 2 Way | 0.098" x 0.098" | Single-Sided | PtAg w/Sn62 | To 20GH | 1W | C=50Ω or D=75Ω |
| ✓ IPS2649 | 2 Way | 0.098" x 0.098" | Wraparound | ULR PtAg w/Sn96 | To 20GHz | 1W | C=50Ω or D=75Ω | |
| ✓ IPS2656 | 2 Way | 0.098" x 0.098" | Wraparound | ULR PtAg | To 20GHz | 1W | C=50Ω or D=75Ω | |
| ✓ IPS2668 | 2 Way | 0.098" x 0.098" | Single-Sided | PtAg/marked BP | To 20GHz | 1W | C=50Ω or D=75Ω | |
| | IPS2669 | 2 Way | 0.098" x 0.098" | Partial Wrap | ULR PtAg w/ Sn62 | To 20GHz | 1W | C=50Ω or D=75Ω |

† Based on mounting in a matched continuous 50Ω system with proper RF techniques.

‡ Rated at 70°C free air temperature. Rated at 100°C baseplate temperature.
Proper thermal management required.



RoHS

Sn62

NON-MAG

BONDABLE

Thin Film Splitters IPT Series

SAMPLE PN: IPT - 0402WA C - U (0402 Size, 50Ω impedance, taped face down)

| PN Prefix | Size | Max Power | Rated Power | Impedance | Packaging |
|-----------|--------|-----------|-------------|-----------|----------------------------------|
| IPT | 0402WA | 200mW | 100mW | C = 50Ω | U - T/R face down |
| | 0603WA | 200mW | 100mW | C = 50Ω | Blank - T/R U - T/R face down |
| | 0805WA | 250mW | 125mW | C = 50Ω | Blank - T/R U - T/R face down |
| | 1206WA | 500mW | 250mW | C = 50Ω | Blank - T/R U - T/R face down |

- 96% Alumina Substrate
- NiCr Resistive Element
- Broadband to 30 GHz (face down mounting)
- 100% Matte Tin Terminals
- Sizes from 0402 to 1206

- Three Resistor “Y” Configuration
- Wraparound Terminals
- Available in Cut Tape or on Tape and Reel Packaging



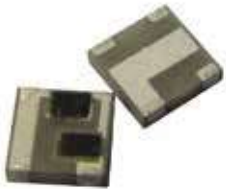
Wideband Resistive Couplers

IMK Series

- 0.120" x 0.120" Size
- Characterized to 15GHz†

Applications Include:

- RF Amplifiers
- Signal Analyzers
- Transmitters



SAMPLE PN: IMK2549 - 18dB (0.12" x 0.12" Size, 18dB coupler, PtAg Terminals)

| | PN Prefix | Direction | Term Style | Term Material | Impedance | Frequency | Rated Power† | Value Range |
|---|-----------|-----------|------------|------------------------|-----------|-----------|---------------|-------------|
| ✓ | IMK2549 | Right | Wraparound | PtAg | C = 50Ω | To 15GHz | 1W Dissipated | 06 to 30dB |
| ✓ | IMK2550 | Left | Wraparound | PtAg | C = 50Ω | To 15GHz | 1W Dissipated | 06 to 30dB |
| ✓ | IMK2574 | Right | Wraparound | Au (Inputs) PtAu (GND) | C = 50Ω | To 15GHz | 1W Dissipated | 06 to 30dB |
| ✓ | IMK2575 | Left | Wraparound | Au (Inputs) PtAu (GND) | C = 50Ω | To 15GHz | 1W Dissipated | 06 to 30dB |
| | IMK2637 | Right | Wraparound | PtAg w/Sn62 | C = 50Ω | To 15GHz | 1W Dissipated | 06 to 30dB |
| | IMK2638 | Left | Wraparound | PtAg w/Sn62 | C = 50Ω | To 15GHz | 1W Dissipated | 06 to 30dB |
| ✓ | IMK2650 | Left | Wraparound | PtAg w/Sn96 | C = 50Ω | To 15GHz | 1W Dissipated | 06 to 30dB |
| ✓ | IMK2658 | Left | Wraparound | ULR PtAg | C = 50Ω | To 15GHz | 1W Dissipated | 06 to 30dB |
| ✓ | IMK2659 | Left | Wraparound | ULR PtAg w/Sn96 | C = 50Ω | To 15GHz | 1W Dissipated | 06 to 30dB |

† Rated at 100°C Baseplate temperature.



ULR

RoHS

Sn62

NON-MAG

BONDABLE

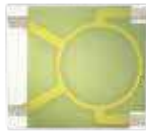
Power Dividers IMD Series

The **IMD Series** power dividers represent an advancement in board level signal processing technology. With alumina construction and highly conductive proprietary film, these devices exhibit low insertion loss, precision performance and repeatability not found in commodity type or LTCC devices.

- 2 to 20GHz Precise Devices Available
- Simple Thick Film Construction
- High Performance Repeatability



WILKINSON



RAT RACE



QUADRATURE

SAMPLE PN: IMD2417 (10GHz Center Frequency SMT Rat Race Divider)

Examples of off-the-shelf IMD Series Dividers

| PN | Construction | Center Freq. | Bandwidth | VSWR | Typ. Insertion Loss | Input Power | Size (inches) | Term Style |
|-----------|--------------|--------------|-----------|--------|---------------------|-------------|---------------|---------------------------|
| ✓ IMD2435 | Wilkinson | 6GHz | 20% | 1.3:1 | <0.5dB | 20W | 0.355 x 0.184 | SMT |
| ✓ IMD2365 | Wilkinson | 6GHz | 20% | 1.3:1 | <0.5dB | 20W | 0.274 x 0.184 | Microstrip |
| ✓ IMD2613 | Wilkinson | 7GHz | 20% | 1.3:1 | <0.5dB | 20W | 0.355 x 0.184 | Wraparound w/ backplane |
| ✓ IMD2660 | Wilkinson | 7GHz | 20% | 1.3:1 | <0.5dB | 20W | 0.355 x 0.184 | Single-Sided w/ backplane |
| ✓ IMD2417 | Rat Race | 9-11GHz | 10% | 1.3:1 | <0.5dB | 20W | 0.322 x 0.356 | SMT |
| ✓ IMD2402 | Quadrature | 4GHz | 10% | 1.25:1 | <0.4dB | 20W | 0.481 x 0.441 | SMT |
| ✓ IMD2403 | Quadrature | 4.5GHz | 10% | 1.25:1 | <0.4dB | 20W | 0.481 x 0.441 | SMT |

AsN Versions Also Available

| Term Style | Microstrip or Wraparound | | |
|----------------|--------------------------|------------------------|-------------------------|
| Construction | Quadrature - 90° Outputs | Wilkinson - 0° Outputs | Rat Race - 180° Outputs |
| Typ. Ins. Loss | 0.5dB | 0.5dB | 0.7dB |
| Design | 1/4 Wave | 1/4 Wave | 3/4 Wave |



HI PWR

RoHS

NON-MAG

CUSTOM SOLUTIONS

Since 1974, IMS has been building unique products based on customer supplied drawings to solve design challenges. Here are examples of custom designs and product variations.

- Design Assistance Available
- Rapid & Low Cost Prototyping
- Minimal NRE Cost
- Low Minimum Order Quantities
- Quick Turn Around

Heater Chips

Custom Resistors

Resistor Networks

Custom Attenuators

Jumpers

Dual-Sided Devices

Oversized Terminations

Ultra High Ohmic Values

Ultra Low Ohmic Values

Multi-Function Devices

Stand Alone Bonding Pads

Special Laser Trims

Custom Pad Sizes

High Isolation Splitters

ENGINEERING KITS

IMS offers engineering kits for many popular thick and thin film surface mount products at a reasonable cost. Below are standard engineering kits. Also available are custom kits of nearly any IMS product.

- Convenient source of components when you need them
- Available in 25, 50 or 100 pieces per value

RCI Series Resistor Kits

- RCI-0402 5%
- RCI-0603 1% & 5%
- RCI-0805 1% & 5%
- RCI-1206 1% & 5%
- RCI-2010 1% & 5%
- RCI-2512 1% & 5%

RCX Series PW Resistor Kits

- RCX-0302PW 5%
- RCX-0402PW 5%
- RCX-0502PW 5%
- RCX-0603PW 5%
- RCX-0805PW 5%

TPI Series Kits

- TPI-0603 0.5%
- TPI-0805 0.5%

A-Series Attenuator Kits

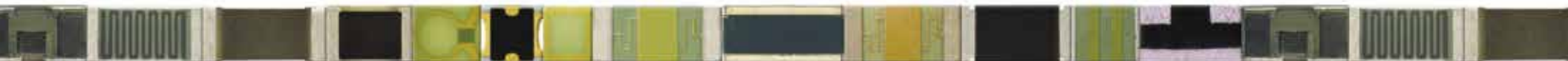
- A-0402WA-C/IMS2647
- A-0603-C
- A-0805-C
- A-1206-C

AS9100D CERTIFIED

International Manufacturing Services, Inc. (IMS) has achieved quality certification to AS9100D. The AS9100D certification is an internationally recognized quality management standard for aerospace, aviation and defense industries, managed by the International Aerospace Quality Group (IAQG). It encompasses the ISO 9001:2015 standards with additional requirements specific to the aerospace industry and is endorsed worldwide by all major aerospace OEMs and suppliers.

The AS9100D certification exhibits IMS's continued commitment to ensuring the highest level of operations and production standards, and enables the company to continue to exceed customer expectations.





International Manufacturing Services, Inc.
50 Schoolhouse Lane
Portsmouth, RI 02871

P: 401.683.9700

F: 401.683.5571

www.ims-resistors.com