Product Information

International
Manufacturing
Services, Inc.

Resistors

Thermal Transfer Devices

RF Terminations

Attenuators

Power Splitters & Couplers

RF & Microwave Dividers

Low Pass Filters

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 delivery.

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 • Dividers & Filters

QUALITY

IMS, an ISO-9001:2008 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.

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 lead times.

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 who can meet with you face to face to help with problem solving.

DELIVERY

IMS has the shortest lead times in the industry. We maintain a substantial inventory of standard components for same day shipment.

FLEXIBILITY

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

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ULR	HI-OHM	HI PWR	RoHS	Sn62	NON-MAG	LOW TCR	BONDABLE	KIT	RoHS COMPLIANT
Ultra Leach Resistant	High Value Available	High Power Device	RoHS Available	Lead Content Available	Non-Magnetic	Precision Product	Wirebondable	Standard Kit Available	

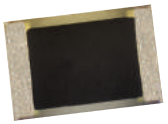
High Power AlN Resistors
N-Series

N-Series resistors on AlN 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.

- Characterized to 40GHz †
- High Power Dissipation ‡
- Sn62 Solder Available
- Non-Magnetic

Applications Include:

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



How to build an N-Series part number:

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*	Terminal Styles	Value Range◊	Tolerances
N	C = 0.010"[1] D = 0.015" G = 0.025" T = 0.040"[2] [1] Available with size 0805 and smaller [2] Available with size 2010 and larger	3- PtAg ☑ 8- ULR PtAg ☑ C- PtAg with Sn62 Solder H- ULR PtAg with Sn62 Solder R- ULR PtAg with Sn96 Solder ☑ 7- Au over PtAu ☑	0603 0505 0805 1005 1206 2010 2512 2525 3725	**WA** Wraparound **DE**** Dual Extended **CS**** Center Stripe **SS** Single Sided **PW** Partial Wrap **EW/EZW**** Extended Wrap **SB** SS w/ Backplane **SG/SZG***** Single wrap to ground	10Ω to 2KΩ	G = 2% J = 5%

*Reverse aspect ratios available for most sizes
**0805 size and larger only
***ZG the same as SG with tapered high frequency resistor style and edge trim for large case size

† 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
‡ Proper thermal management required
For value under 10Ω contact IMS

RoHS COMPLIANT | ULR | HI PWR | RoHS | Sn62 | NON-MAG | BONDABLE

Power Ratings by Size and Thickness‡

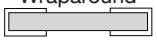
Thickness		0.010" (C)			0.015" (D)			0.025" (G)			0.040" (T)		
Baseplate Temp		ΔT=100	ΔT=85	ΔT=50	ΔT=100	ΔT=85	ΔT=50	ΔT=100	ΔT=85	ΔT=50	ΔT=100	ΔT=85	ΔT=50
Size	0505	45W	37W	24W	30W	25W	16W	20W	16W	10W	N/A	N/A	N/A
	0603	24W	20W	13W	16W	13W	8.7W	9.5W	7.7W	5.2W	N/A	N/A	N/A
	0805	75W	55W	37W	50W	37W	25W	30W	25W	16W	N/A	N/A	N/A
	1005	N/A	N/A	N/A	60W	48W	30W	40W	30W	20W	N/A	N/A	N/A
	1206	N/A	N/A	N/A	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 informaiton.

AlN Ceramic Thermal Transfer Devices

ThermaBridge™

WA
Wraparound



DS
Double sided

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

Applications include:

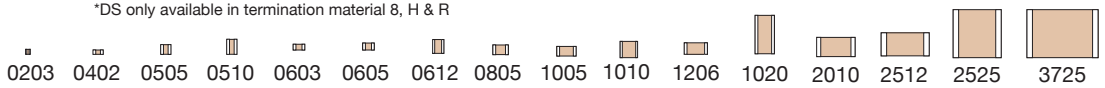
- **RF Amplifiers**
- **Conduction Cooled Computers**
- **Power Supplies & Converters**
- **JTRS, MIDS-J, GMR**
- **Temperature Controlled Oscillators**
- **Extracting Heat from Power FETS, LEDs, Pin & Laser Diodes**
- **Lighting Ballasts**
- **Protecting Neighboring Components**
- **Conduction Cooled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

How to build a ThermaBridge™ part number:

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] D = 0.015" G = 0.025" T = 0.040"2 [1] Available with size 1010 and larger	3- PtAg ☑ 8- ULR PtAg ☑ C- PtAg with Sn62 Solder H- ULR PtAg with Sn62 Solder P- ☑ PtAg w/ Sn96 Solder R- ☑ ULR PtAg with Sn96 RoHS Solder	0203	0612	2010	WA= Wraparound *DS= Double sided without wrap
			0402	0805	2512	
			0505	1005	2525	
			0510	1206	3725	
			0603	1010		
			0605	1020		

Standard Sizes (Custom Sizes Available)
*DS only available in termination material 8, H & R

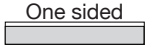


RoHS COMPLIANT · ULR · HI PWR · RoHS · Sn62 · NON-MAG

AlN Ceramic Thermal Transfer Devices

ThermaPlane™

OS
One sided



DS
Double sided

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**
- **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	C = 0.010"[1] D = 0.015"[1] G = 0.025" T = 0.040" [1] Available with size 2512 and smaller	3- PtAg ☑ 7- Au over PtAu ☑ 8- ULR PtAg ☑ C- PtAg with Sn62 Solder H- ULR PtAg with Sn62 Solder R- ☑ ULR PtAg with Sn96 RoHS Solder	0505	2010	OS= One Sided DS= Double Sided
			0603	2512	
			0805	2525	
			1005	3725	
			1206	*	

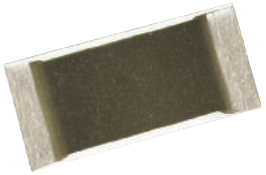
* Custom Sizes Available

RoHS COMPLIANT · HI PWR · RoHS · Sn62 · NON-MAG

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



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

Attachment/ Term Metal	Size**	Rated Power†	Max RCWVoltage	Value Range◊	Tolerance Ranges***
✓ **RC1-** Au Wraparound	0302	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 O = 35% 1Ω to 100GΩ P = 40% 1Ω to 100GΩ
✓ **RC3-** PtAg Wraparound	0402	80mW	50VDC	1Ω to 1TΩ	
✓ **RC8-** ULR PtAg Wraparound	0502	100mW	50VDC	1Ω to 50MΩ	
RCC- PtAg Wraparound with Sn62 Solder	0504	125mW	50VDC	1Ω to 200MΩ	
RCH- ULR PtAg Wraparound with Sn62 Solder	0603	100mW	50VDC	1Ω to 1TΩ	
✓ **RCP-** PtAg Wraparound with Sn96 Solder	0805	175mW	150VDC	1Ω to 1GΩ	
✓ **RCR-** ULR PtAg Wraparound with Sn96 Solder	1005	250mW	160VDC	1Ω to 1GΩ	
✓ **RC4-*** PtAu Single Wrap	1206	250mW	200VDC	1Ω to 1GΩ	
RCD-* PtAu Single Wrap with Sn62 Solder	1505	250mW	200VDC	1Ω to 1GΩ	
	2010	500mW	200VDC	1Ω to 1GΩ	
	2512	1W	200VDC	1Ω to 1GΩ	

† 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.

*Available on 0302 & 0302SG only.
Substitute **SG in place of dash after size to indicate Single Wrap to Ground terminal style.
***Not all values and tolerances available in all sizes.

RoHS COMPLIANT | ULR | HI-OHM | RoHS | Sn62 | NON-MAG | BONDABLE

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 50GΩ M = 20% 1.2G to 100GΩ N = 30% 1.2G to 1TΩ P = 40% 1.2G to 1TΩ R = 50% 1.2G to 1TΩ
HCC- PtAg Wraparound with Sn62 Solder	1206	250mW	200VDC	1.2GΩ to 1TΩ	
✓ **HCP-** PtAg Wraparound with Sn96 Solder	2010	500mW	200VDC	1.2GΩ to 1TΩ	

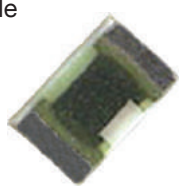
[1] Smaller sizes available. Please contact factory.
† Free air rated at 70°C
◊ First 3 digits of value code are significant value. The 4th is the number of zeros following. For 1Teraohm use code 1.0T. (if available).

RoHS COMPLIANT | HI-OHM | RoHS | Sn62 | NON-MAG

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
✓ **RC8-** **ULR** PtAg Wraparound	0603S	200mW	50VDC	10Ω to 1MΩ	
RCC- PtAg Wraparound with Sn62 Solder	0805S	350mW	150VDC	10Ω to 1MΩ	
RCH- **ULR** PtAg Wraparound with Sn62 Solder	1206S	500mW	200VDC	10Ω to 1MΩ	
✓ **RCR-** **ULR** PtAg Wraparound with Sn96 Solder	2010S	1W	200VDC	10Ω to 1MΩ	
	2512S	2W	200VDC	10Ω to 1MΩ	

† 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).

RoHS COMPLIANT RoHS Sn62 NON-MAG

High Voltage Surface Mount Chip Resistors

HVI Series

- High Rated Continuous Working Voltage
- High Stability Thick Film Resistor Element
- 96% Al_2O_3 Substrate Material Provide 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**	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 470MΩ	510K to 1GΩ
	2512	1W	3kV	4kV	30K to 20MΩ	30K to 470MΩ	510K to 1GΩ

[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.

RoHS COMPLIANT HI-OHM RoHS

Single-Sided Resistors

IMS Miniature Series

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

Larger bond pads and optional metallized backplane are available.

This series is ideal for hybrids and microstrip circuits.

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 G = 2% 1Ω to 25MΩ J = 5% 1Ω to 200MΩ K = 10% 1Ω to 1GΩ L = 15% 1Ω to 1GΩ M = 20% 1Ω to 100GΩ N = 30% 1.2GΩ to 1TΩ P = 40% 1.2GΩ to 1TΩ R = 50% 1.2GΩ to 1TΩ
IMS000-	0.045 x 0.030	125mW	60VDC		1Ω to 1TΩ	
IMS001-	0.050 x 0.050	125mW	60VDC	-3 PtAg Single-sided ☑	0.1Ω to 25MΩ	
IMS014-[1]	0.035 x 0.035	125mW	50VDC		1Ω to 25MΩ	
IMS002-	0.075 x 0.050	175mW	100VDC		1Ω to 25MΩ	
IMS009-	0.080 x 0.050	175mW	150VDC	-C PtAg Single-sided with Sn62 Solder	10Ω to 1GΩ	
IMSH09-	0.080 x 0.050	175mW	150VDC		1.2GΩ to 1TΩ	
IMS008-	0.100 x 0.025	100mW	175VDC	-P PtAg Single-sided with Sn96 Solder ☑	10Ω to 1TΩ	
IMS003-	0.100 x 0.050	250mW	160VDC		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	

[1] Available with Au (-1) Terminals 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 1Teraohm use code 1.0T. (if available).

RoHS COMPLIANT

HI-OHM RoHS Sn62 NON-MAG BONDABLE

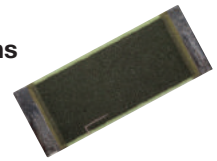
High Power Single-Sided Alumina Resistors

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 4



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

PN Prefix	Size (inches)	Rated Power†	Max RCW Voltage	Term Metal	Value Range◊	Tolerance Ranges
IMS024-	0.240 x 0.120	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-	0.120 x 0.240	1W	1VDC		0.05Ω to 1Ω	
IMS202-	0.360 x 0.140	2W	800VDC	-3 PtAg Single-sided ☑	1Ω to 20MΩ	
IMS204-	0.440 x 0.180	4W	1100VDC	-C PtAg Single-sided with Sn62 Solder	1Ω to 20MΩ	
IMS206-	0.520 x 0.215	6W	1400VDC		1Ω to 20MΩ	
IMS208-	0.560 x 0.240	8W	1500VDC	-P PtAg Single-sided with Sn96 Solder ☑	1Ω to 20MΩ	
IMS210-	0.620 x 0.270	10W	1800VDC		1Ω to 20MΩ	

† 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).

RoHS COMPLIANT

HI PWR 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	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*	125mW	150VDC	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*	500mW	200VDC	E96 Values - 1Ω to 1MΩ	F = 1%
				E24 Values - 1Ω to 1MΩ	J = 5%
	2512*	1W	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%

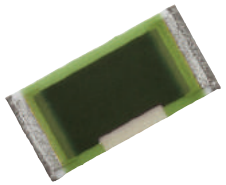
† Free air rated at 70°C
◊ First 3 digits of value code are significant value. The 4th is the number of zeros following An 'R' indicates a decimal when resistance is under 100Ω.
* User trimmable versions, non-EIA values and tolerances available, contact factory

RoHS COMPLIANT RoHS KIT

Extended Power Thick Film Nickel Barrier Resistors

Super RCI Version

- Extra Power Density in Same Footprint
- 100% Matte Tin Finish over Nickel Barrier Terminals



SAMPLE PN: RCI - 0805S - 1200 G (Extended Power 0805 Size, 120Ω, 2%, Nickel Barrier Terminals)

PN Prefix	Size	Rated Power†	Max RCWVoltage	Value Range◊	Tolerances
RCI- Nickel Barrier Layer with 100% Matte Tin Finish	0805S	350mW	150VDC	1Ω to 1MΩ	F = 1% G = 2% J = 5% K = 10%
	1206S	500mW	200VDC	1Ω to 1MΩ	
	2010S	1W	200VDC	1Ω to 1MΩ	
	2512S	2W	350VDC	1Ω to 1MΩ	

† 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.

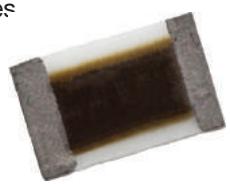
RoHS COMPLIANT RoHS KIT

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	Rated Power†	Max RCW Voltage	Value Range◊	Tolerances	TCR
TPI- Nickel Barrier Layer with 100% Matte Tin Finish	0402	63mW	25VDC	E96 Values - 10Ω to 205KΩ	B = 0.1% D = 0.5%	25PPM = All 10PPM* 5PPM* 2PPM**
	0603	63mW	50VDC	E96 Values - 4.7Ω to 1MΩ	B = 0.1%	
				E96 Values - 2Ω to 1MΩ	D = 0.5%	
	0805	100mW	100VDC	E96 Values - 4.7Ω to 2MΩ	B = 0.1%	
				E96 Values - 1Ω to 2MΩ	D = 0.5%	
	1206	125mW	150VDC	E96 Values - 4.7Ω to 2.5MΩ	B = 0.1%	
				E96 Values - 1Ω to 2.5MΩ	D = 0.5%	
	2010	250mW	150VDC	E96 Values - 4.7Ω to 3MΩ	B = 0.1%	
				E96 Values - 1Ω to 3MΩ	D = 0.5%	
	2512	500mW	150VDC	E96 Values - 4.7Ω to 3MΩ	B = 0.1%	
				E96 Values - 1Ω to 3MΩ	D = 0.5%	

† 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.

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

**Consult factory for 2PPM

RoHS COMPLIANT RoHS LOW TCR KIT

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	Rated Power†	Value Range◊	Max RCW Voltage	Tolerances
LCI- Nickel Barrier Layer with 100% Matte Tin Finish	0402	63mW	0.05Ω to 1Ω	= √PR	F = 1% G = 2% J = 5%
	0603	100mW	0.02Ω to 1Ω		
	0805	125mW	0.02Ω to 1Ω		
	1206	250mW	0.01Ω to 1Ω		
	2010	750mW	0.01Ω to 1Ω		
	2512	1W	0.01Ω to 1Ω		
	1225	3W	0.003Ω to .2Ω		

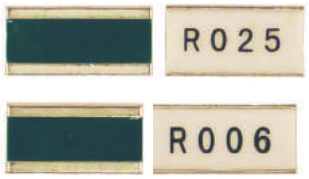
† Free air rated at 70°C
◊ First 3 digits of value code are significant value. The 4th is the number of zeros following. An 'R' indicates a decimal when resistance is under 100Ω.

RoHS COMPLIANT RoHS LOW TCR

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



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

PN Prefix	Size	Rated Power†	Value Range◊	Max RCW Voltage	Tolerances
MLI Nickel Barrier Layer with 100% Matte Tin Finish	1835SS	5W	1 mΩ - 9 mΩ (1 mΩ steps) 10 mΩ - 500 mΩ (E-6 values)	= √PR	F = 1% .003Ω and up G = 2% .002Ω J = 5% .001Ω
	1835WA	4W	1 mΩ - 9 mΩ (1 mΩ steps) 10 mΩ - 500 mΩ (E-6 values		
	2043SS	6W	1 mΩ - 9 mΩ (1 mΩ steps) 10 mΩ - 500 mΩ (E-6 values)		
	2043WA	5W	1 mΩ - 9 mΩ (1 mΩ steps) 10 mΩ - 500 mΩ (E-6 values)		

† 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.

RoHS COMPLIANT RoHS LOW TCR

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 2KΩ	F = 1% G = 2% J = 5%
✓ **RC8-** **ULR** PtAg Partial Wrap Wraparound	0402PW	To 36GHz	80mW		
RCC- 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

RoHS COMPLIANT · ULR · RoHS · Sn62 · NON-MAG · KIT

Thin Film Nickel Barrier Attenuators

A-Series

- Characterized to 40GHz †
- 100% Matte Tin Finish over Nickel Barrier Terminals
- 50 Ohm Nominal Impedance
- Low Minimum Order Quantities
- Available in Cut Tape or on Tape and Reel Packaging

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

PN Prefix/Size	Value Range◊	Rated Power**	Max RCWVoltage*
✓ All A-0402WA-C	00 to 10dB	32mW	1.3VDC
IMS2652-C (0402 face down)		32mW	1.3VDC
A-0603-C		63mW	1.8VDC
IMS2533 (0603 face down)		63mW	1.8VDC
A-0805-C		100mW	2.3VDC
IMS1141 (0805 face down)		100mW	2.3VDC
A-1206-C	00 to 10dB, 16dB	125mW	2.5VDC

◊ 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 √P*R
** Rated at 70°C free air temperature

RoHS COMPLIANT · RoHS · KIT

Temperature Variable Attenuators

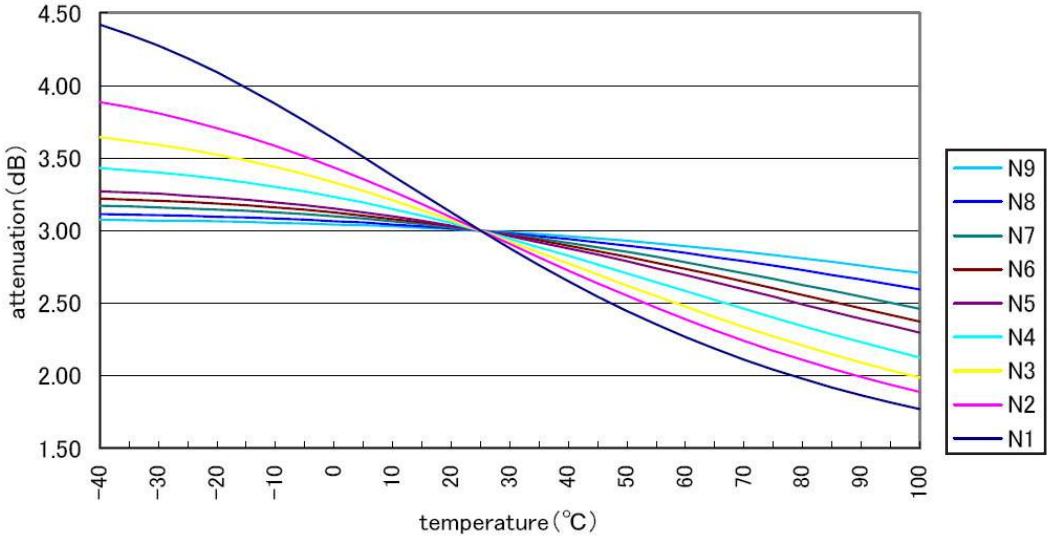
AV-0805

- 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

Typical temperature curves for an AV-0805-C-03NX.
Consult datasheet for other attenuation levels and temperature curves."

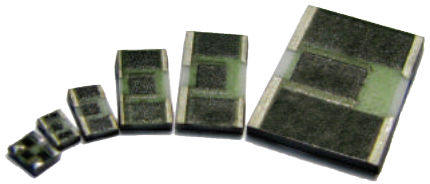


RoHS COMPLIANT

RoHS

Thick Film Attenuators
IAX Series

- Characterized to 40GHz†
- Sn62 Solder
- 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					
☑ **IAR-** ULR PtAg with SN96 Solder							

*Single Sided & Au Terminals Available in 0706 Size Only.
† Based on mounting in matched continuous 50 ohm system with proper RF principles.

RoHS COMPLIANT · ULR · RoHS · Sn62 · NON-MAG · BONDABLE

High Power AlN Thick Film Attenuators
V-Series

- High Power Dissipation‡
- Aluminum Nitride Substrate
- Characterized to 6GHz†
- 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 ΔT of 50°C	5db ΔT of 100°C	Term Style	Value Range		Attenuation Accuracy	
V	D = 0.015" G = 0.025"	☑ **3-** PtAg	D-2010	80W	155W	WA Wraparound	00dB to 30dB	'0' indicates whole dB increments. '5' indicates 0.5dB increments up to 16.5dB.	0 - 3dB	±0.2dB
		☑ **7-** Au over PtAu (input) PtAu (ground)	D-2512	175W	345W	SG Single Wrap to Ground			3.5 - 13dB	±0.3dB
		☑ **8-** ULR PtAg	D-3725	290W	590W	SB Single Sided w/ Backplane			13.5 - 30dB	±0.5dB
		C- PtAg with Sn62 Solder	G-2010	45W	90W					
		H- ULR PtAg with Sn62 Solder	G-2512	105W	210W					
		☑ **R-** ULR PtAg with Sn96 Solder	G-3725	175W	350W					

Other sizes, power ratings and values can be supplied.

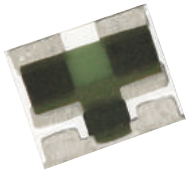
† Based on smallest size & mounting in matched continuous 50Ω system with proper application of RF principles.
For pulsed power applications, a scan trim should be specified. Please contact factory for more information.

RoHS COMPLIANT · ULR · HI PWR · 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‡	Attenuation	Accuracy	Value Range
IMA2314	Wraparound	PtAg w/ Sn62	2W	0 - 3.5dB	±0.2dB	00dB to 40dB
IMA2370	Single-Sided w/ Backplane	PtAg w/ Sn62	2W	0 - 40dB	±1.0dB	'0' indicates whole dB increments.
IMA2371	Single Wrap to Ground	PtAg w/ Sn62	2W	0 - 40dB	±1.0dB	
☑ **IMA2373**	Wraparound	PtAg	2W	0 - 30dB	±0.3dB	'5' indicates 0.5dB increments up to 16.5dB.
☑ **IMA2381**	Single-Sided	PtAg	2W	0 - 30dB	±0.5dB	

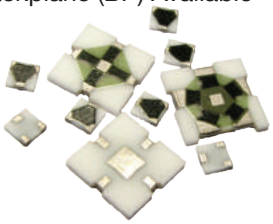
† Based on smallest size & mounting in matched continuous 50Ω system with proper application of RF principles.
‡ Rated at 70°C free air temperature.‡ Rated at 100°C baseplate temperature. Proper thermal management required.

RoHS COMPLIANT · ULR · RoHS · Sn62 · NON-MAG

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
☑ **IPS2331**	2 Way	0.098" x 0.098"	Single-Sided	Au/Au BP	To 20GHz	1W	D = 75Ω
☑ **IPS2346**	2 Way	0.098" x 0.098"	Wraparound	PtAg	To 20GHz	1W	
☑ **IPS2480**	3 Way	0.240" x 0.240"	Single-Sided	Au/Au BP	To 7GHz	3W	
☑ **IPS2481**	3 Way	0.240" x 0.240"	Single-Sided	PtAg/PtAg BP	To 7GHz	3W	
☑ **IPS2521**	3 Way	0.270" x 0.2470"	Wraparound	PtAg/PtAg BP	To 7GHz	3W	
☑ **IPS2522**	4 Way	0.295" x 0.287"	Wraparound	PtAg/PtAg BP	To 7GHz	3W	
IPS2528	2 Way	0.098" x 0.098"	Wraparound	PtAg w/Sn62	To 20GHz	1W	
☑ **IPS2541**	2 Way	0.098" x 0.098"	Single-Sided	PtAg	To 20GHz	1W	
☑ **IPS2542**	3 Way	0.098" x 0.098"	Single-Sided	Au	To 7GHz	3W	
☑ **IPS2640**	2 Way	0.098" x 0.098"	Wraparound	PtAg w/Sn96	To 20GHz	1W	
☑ **IPS2668**	2 Way	0.098" x 0.098"	Single-Sided	PtAg/marked BP	To 20GHz	1W	
☑ **IPS2669**	2 Way	0.098" x 0.098"	Partial Wrap	ULR PtAg	To 20GHz	1W	

† 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 COMPLIANT · RoHS · Sn62 · NON-MAG · BONDABLE

Thin Film Splitters
IPT Series

- 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

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

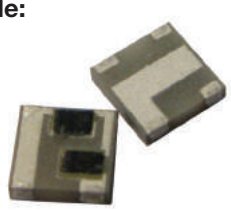
PN Prefix	Size	Impedance	Packaging
☑ IPT	0402WA	C = 50Ω	U - T/R face down
	0603WA	C = 50Ω	Blank - T/R U - T/R face down
	0805WA	C = 50Ω	Blank - T/R U - T/R face down
	1206WA	C = 50Ω	Blank - T/R U - T/R face down

RoHS COMPLIANT RoHS

Wideband Resistive Couplers
IMK Series

- 0.120" x 0.120" Size
- Characterized to 20GHz†

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

† Based on smallest size & mounting in matched continuous 50Ω system with proper application of RF principles.
‡ Rated at 100°C Baseplate temperature.

RoHS COMPLIANT RoHS 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
- Custom Designs Available

IMD Series Design Capabilities

A✓N Versions Also Available

Term Style	Microstrip or Wraparound		
Construction	Quadrature - 90° Outputs	Wilkinson - 0° Outputs	Rat Race - 180° Outputs
Center Freq. Range	2 - 16GHz/ 10% Bandwidth	3 - 13GHz/ 20% Bandwidth	6 - 20GHz/ 10% Bandwidth
Typ. Ins. Loss	0.5dB	0.5dB	0.7dB
Design	1/4 Wave	1/4 Wave	3/4 Wave

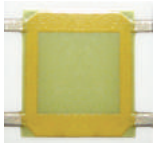
Examples of off-the-shelf IMD Series Dividers

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

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
☑ IMD2417	Rat Race	10GHz	10%	1.3:1	<0.5dB	20W	0.322 x 0.356	SMT
☑ IMD2403	Quadrature	4.5GHz	10%	1.25:1	<0.4dB	20W	0.481 x 0.441	SMT

WILKINSON

RAT RACE



QUADRATURE

RoHS COMPLIANT 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
Low Pass Filters

Engineering Kits

IMS offers engineering kits for many popular thick and thin film surface mount products at a reasonable cost. At right 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%**

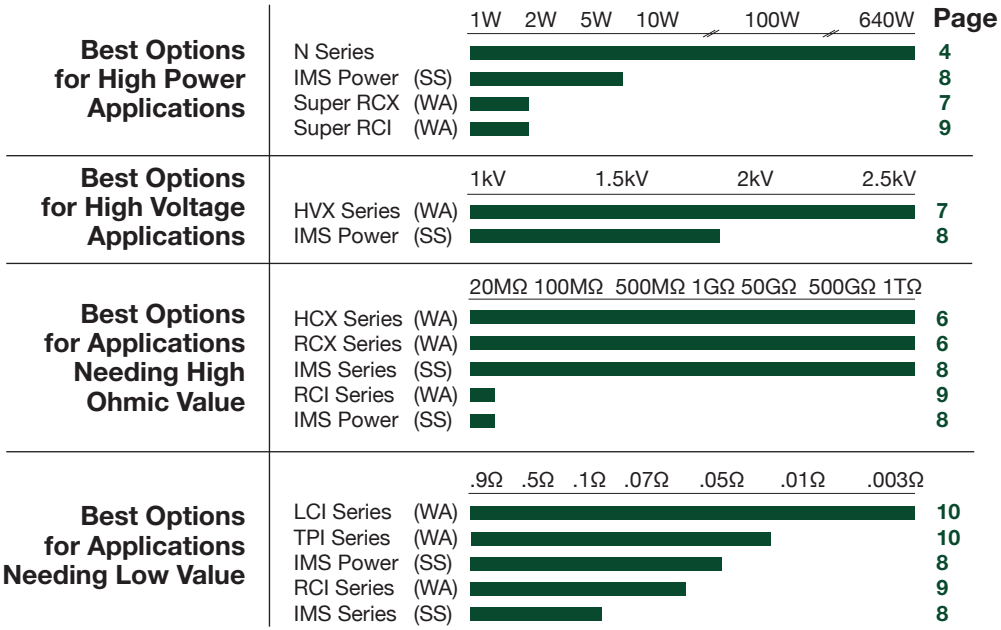
A-Series Attenuator Kits
- **A-0402WA-C**
- **A-0603-C**
- **A-0805-C**
- **A-1206-C**

Quick Selection Guide

Attachment Guide (Additional Terminal Materials Available)

Attachment Method	Option	Terminal Material
Solder	**C, H***	Platinum Silver (PtAg) with 62% Tin, 36% Lead, 2% Silver Solder Coat
	3, 8*	RoHS Compliant Platinum Silver (PtAg)
	P, R*	RoHS Compliant Platinum Silver (PtAg) with 96% Tin, 4% Silver Solder Coat
	RCI, TPI, LCI & A Series Nickel Barrier Components with 100% Matte Tin Finish also Suitable for Solder	
Epoxy	**3**	RoHS Compliant Platinum Silver (PtAg)
Gold Wirebond	**1**	RoHS Compliant Gold (Au)
	7	RoHS Compliant Gold (Au) over Platinum Gold (PtAu) for AℓN Devices

*ULR metalizations



CERTIFICATE

TUV Rheinland of North America, Inc.
295 Foster Street, Suite 100, Littleton, MA 01460

TÜVRheinland®
Precisely Right.

Hereby certifies that

International Manufacturing Services, Inc.

50 Schoolhouse Lane
Portsmouth, RI 02871
USA

has established and maintains a quality management system for the

Design and Manufacture of Resistors and Passive Components.

The audit was performed in accordance with the requirements of SAE AS9104/1:2012-01 by an ANAB-accredited Certification Body under the Aerospace Registration Management Program administered by the Americas Aerospace Quality Group (AAQG) in accordance with the Aerospace Sector Scheme and documented in Report No. 4248.

Proof has been furnished that the requirements according to

AS9100D

Based on the requirements of ISO 9001:2015

are fulfilled.
Further clarification regarding the scope of this certificate and the applicability of AS9100D / ISO 9001:2015 requirements may be obtained by contacting TRNA.

Certificate Registration No.

74 300 4248

Certificate Issue Date
December 20, 2017

Certificate Expiration Date
December 19, 2020

Site Structure: Single Site
Certificate Reissue Date: 12/20/2017

Certification of Management Systems

International
Manufacturing
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