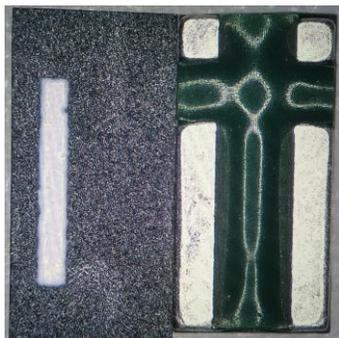




Product Family: 4-Terminal Current Sense Resistors

Part Number Series: CPA0612-Series



Construction:

- Metal foil resistive element
- Alumina Ceramic
- Epoxy-resin overcoat
- 100% matte tin over Ni terminations
- Halogen Free and Beryllium Free
- PFAS compliant
- RoHS compliant without exemptions

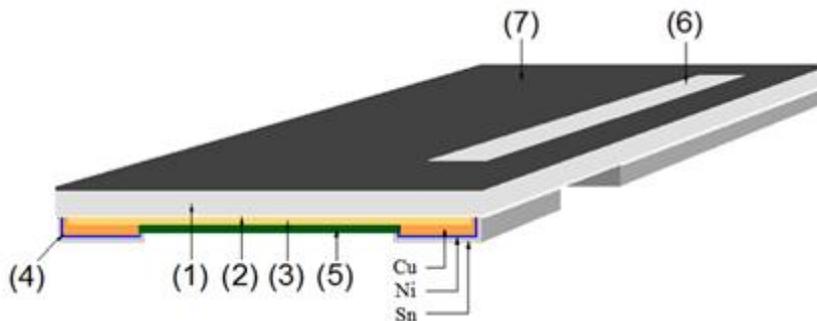
Features:

- 0612 English case size
- TCR down to $\pm 50\text{ppm}/^\circ\text{C}$
- Resistance Range: 0.5~25m Ω
- Power of 1.0W
- MSL = 1

Description:

These low resistance, high power chip resistors exhibit excellent performance in resistance, noise performance, surface heat distribution and have a lower surface temperature. They are designed and produced with a face (pattern) down construction. They are useful in many current sensing applications.

Product Construction

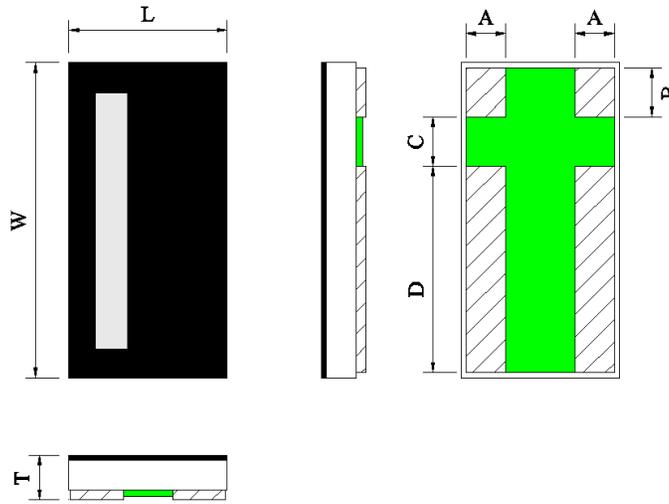


Number	Description
1	Substrate: Alumina Ceramic
2	Adhesion Layer: Epoxy
3	Resistive Element: Cu - alloy
4	Terminal Electrode: Sn, Ni, Cu
5	Protective Coating: Flame-retardant epoxy, meets UL94 V-0 requirements (green)
6	Marking: Epoxy (white)
7	Black Coating: Epoxy

Part Numbering: Ex: CPA0612RR001FF-T50

Series Name	English Size (metric size)	TCR	Resistance Value*	Resistance Tolerance	Internal Codes	Packaging
CPA	0612 (1632)	Q = 50ppm/°C R = 100ppm/°C G = 150ppm/°C S = 200ppm/°C	Ex. R001=1.00mΩ	D = ±0.50% F = ±1.0%	F = Face Down	-T5 = 5,000 pcs/reel

*Note: For resistance values of one milliohm or greater, use “R” to specify the decimal point (i.e. R010=0.010Ω). For resistance values less than one milliohm or those with 1/2 milliohm increments, use “M” to specify the decimal point (i.e. 2M50 = 0.0025Ω).

Product Dimensions

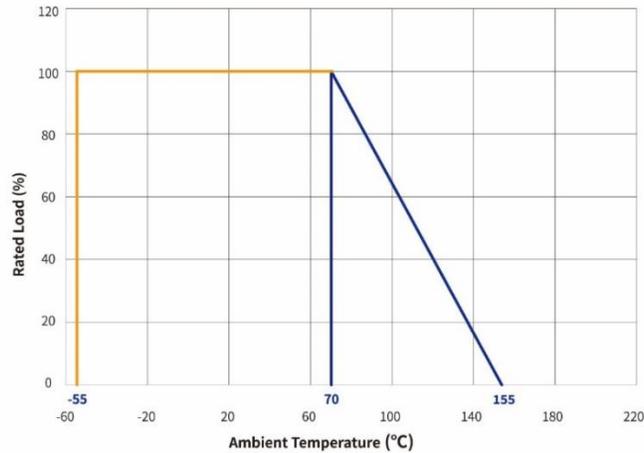
Unit: mm

Dimension (Metric)	Resistance Range	L	W	A	T	B	C	D
CPA0612 (1632) Mass = 11mg	0.5~25mΩ	0.061±0.008 (1.55±0.20)	0.126±0.008 (3.20±0.20)	0.016±0.008 (0.41±0.20)	0.020±0.008 (0.50±0.20)	0.018±0.008 (0.46±0.20)	0.020±0.008 (0.50±0.20)	0.085±0.008 (2.16±0.20)

Electrical Specifications

Type	CPA0612		
Metric Size (mm)	1632		
Power Rating (W)	1.0		
Resistance Range (mΩ)	0.50~0.75	1~4	5~25
Resistance Tolerance % (code)	±1.0(F)		±0.5(D), ±1.0(F)
TCR ppm/°C	±200(S), ±150(G)	±100(R)	±50(Q)
Operating Temp. Range (°C)	-55~+155		

Power Derating Curve



Reliability Specifications

Electrical Characteristics

Test Item	Test Method	Specification
Resistance Data IEC60115-1 6.1	Resistance data at 25°C.	Must meet datasheet requirements
TCR Data IEC60115-1 6.2	Tested at 25°C and 125°C, $TCR = (R_b - R_a) / R_a \times 1 / (T_b - T_a) \times 10^6$.	Must meet datasheet requirements
Short Time Overload IEC60115-1 8.1	Applied power: 2.5X rated power. Test duration: 5 seconds.	$\Delta R \leq \pm 1.0\%$

Mechanical Characteristics

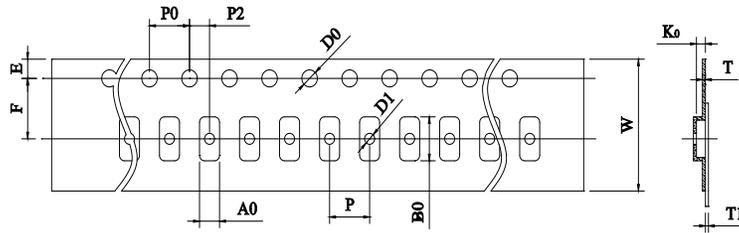
Test Item	Test Method	Specification
Substrate Bending IEC60115-1 9.8	90mm span between fulcrums, 2mm bend, Glass-Epoxy test board thickness: 1.6mm.	$\Delta R \leq \pm 1.0\%$
Mechanical Shock IEC60115-1 9.10	Force: 100G Test Duration: 6 ± 1 ms	$\Delta R \leq \pm 1.0\%$

Environmental Characteristics

Test Item	Test Method	Specification
Load Life IEC60115-1 7.1	Test Temperature: 70°C, Applied power: rated power, Test period: 1,000 hours with power cycling as follows: 90 min. power ON/30 min. power OFF.	$\Delta R \leq \pm 2.0\%$
Moisture Load Life IEC60115-1 10.4	Test Temperature: $60^\circ\text{C} \pm 2^\circ\text{C}$ Humidity: 95% Applied power: 10% rated power Test period: 1,000 hours with power cycling as follows: 90 min. power ON/30 min. power OFF	$\Delta R \leq \pm 1.0\%$
Thermal Shock IEC60115-1 10.1	-55°C 30min. → R.T. 3min. → +155°C 30min. → R.T. 3min. Repeat 100 cycles as follows.	$\Delta R \leq \pm 1.0\%$

High Temp. Exposure IEC60115-1 7.3	Test Temperature: +155°C±2°C, Test period: 1,000 hours.	$\Delta R \leq \pm 1.0\%$
Resistance to Solder Heat IEC60115-1 11.2	Parts are subjected to 3 reflow cycles.	$\Delta R \leq \pm 1.0\%$
Solderability IEC60115-1 11.1	Dipped into molten solder for 3 ± 1.0 seconds at $245 \pm 5^\circ\text{C}$.	New solder coverage of 95% minimum

Plastic Tape Dimensions

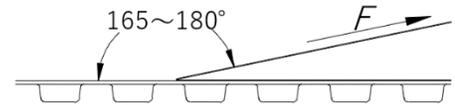


Unit: mm

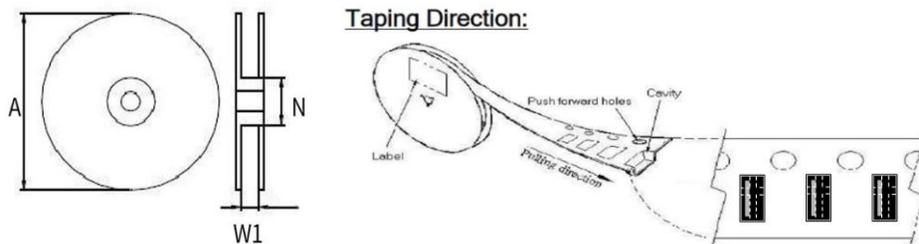
Size	W	P0	P	P2	A0	B0	D0	F	E	T	T1	K0
0612	8.00 ±0.30	4.00 ±0.10	4.00 ±0.10	2.00 ±0.10	1.90 ±0.20	3.50 ±0.20	1.50 ±0.10	3.50 ±0.10	1.75 ±0.10	0.20 ±0.10	Max. 0.10	0.85 ±0.20

Peeling Strength of Seal Tape

F = Peeling Strength: 0.1 – 1.0N (10 - 100gf)



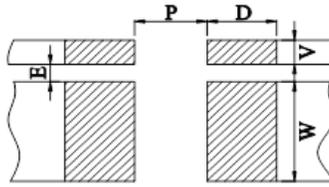
Reel Dimensions



Unit: mm

Size	0612
Quantity	5,000 pcs per reel
A	178.00±5.00
N	60.00±2.00
W1	9.00±1.00

Recommended Land Pattern

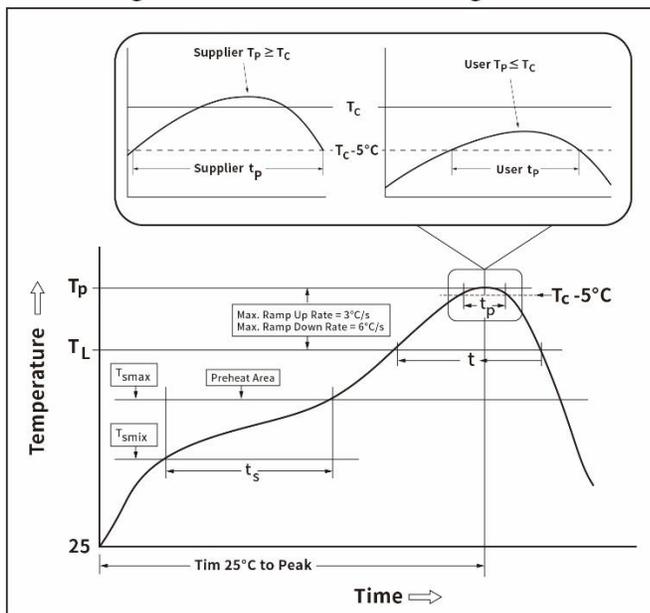


Unit: mm

Size	Resistance Range	P	W	D	V	E
0612	0.5~25mΩ	0.762	2.290	1.014	0.762	0.381

Soldering Profile

Soldering Parameters-Reflow Soldering



Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (T_{Smax} to T_p)	3 °C / second max
Preheat Temperature Minimum (T_{Smin})	150 °C
Temperature Maximum (T_{Smax})	200 °C
Time (T_{Smin} to T_{Smax})	60-120 seconds
Time maintained above Temperature Minimum (T_L) Time (t_l)	217 °C 60-150 seconds
Peak Temperature (T_p)	260 +0 °C
Time within 5 °C of Actual Peak Temperature (t_p)	30 seconds
Ramp-Down Rate	6 °C / second Maximum
Time 25 °C to Peak Temperature	8 minutes Maximum

Rework temperature (hot air equipment) : 350°C, 4~6seconds

Electric soldering iron, hot air oven

If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

Storage Conditions

Environment Conditions:

Products should be stored under the following environmental conditions.

- Temperature: +5 to +40°C
- Humidity: 10%~75% relative humidity
- Under airtight can store 2 years.
- Do not keep products in environments where they may be subject to particulate contamination or harmful gases such as sulfuric acid or hydrogen chloride as it may cause oxidization on electrodes, resulting in poor solderability.
- Products should be stored in a space that does not expose it to high temperatures, vibration, or direct sunlight.
- Products should be stored in the original airtight packaging until use.