PCS Series

Low Resistance Value Chip Resistors



FEATURES

- Low Resistance to 0.5mΩ
- Low TCR to ±50ppm
- Excellent long term stability
- RoHs compliant and halogen free
- Lead free
- High precision current sensing and voltage division

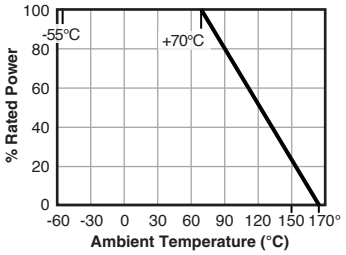
SERIES SPECIFICATIONS

Type	Power Rating @70°C	Max. Rated Current	Max. Overload Current	Resistance Range (mΩ) ±0.5%	Resistance Range (mΩ) ±1.0% (F), ±2.0% (G), ±5.0% (J)	Material
PCS1206	1W	31.62A	63.25A	7~50	1~50	R001: MnCuSn R002~R007: MnCu R008~R050: FeCrAl
PCS2512	1W 2W	44.72A 63.25A	100.00A 141.42A	7~450	0.5~500 0.5~450	R0005: MnCuSn R001~R006: MnCu R007~R500: FeCrAl
PCS2728	4W	31.62A	54.77A	7~450	4~450	R004~R450: FeCrAl

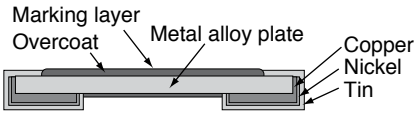
CHARACTERISTICS

Rated current	$\sqrt{P/R}$ may be used to determine the DC (Direct Current) or AC (Alternating Current) (RMS, root mean square value) of normal rated power. However, if the result value exceeds the highest current of regulated standards (paragraph 5), the highest normal rated power is to be used.
TCR	±50ppm/°C
Oper. Temp. Range	-55 ~ +170°C
Storage	25°C ±5; humidity 60% ±20%
Plating thickness	Ni: 2µm; Sn: 3µm

Derating



Construction



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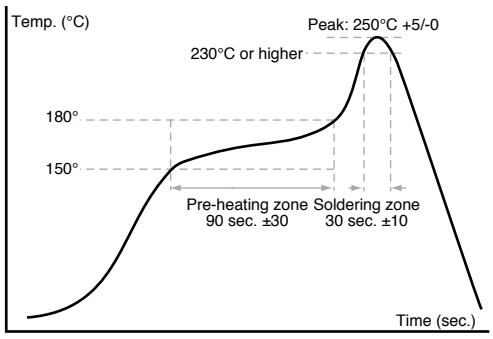
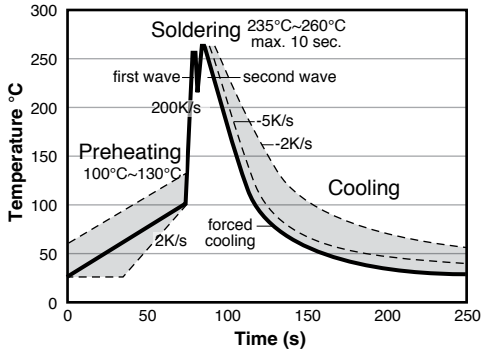
SOLDERING

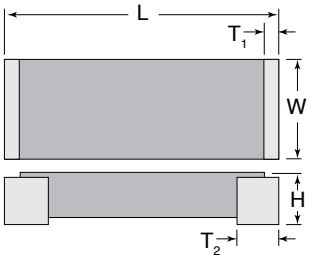
IR Reflow Soldering



Wave Soldering (Flow Soldering)

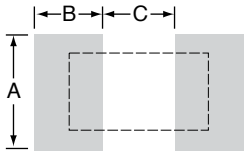


DIMENSIONS



Type	Power Rating	L	W	T1	Res. Range	H	T2
PCS1206	1W	3.200 ±.254	1.650 ±.254	0~0.200	1~2mΩ 3~50mΩ	0.630 ±.254 0.430 ±.254	0.508 ±.254 0.508 ±.254
PCS2512	1W, 2W	6.350 ±.254	3.050 ±.254	0.200~1.000	0.5~1mΩ 1.5mΩ 2mΩ 2.5~100mΩ 101~500mΩ	0.650 ±.254 0.410 ±.254 0.410 ±.254 0.410 ±.254 0.410 ±.254	2.200 ±.254 2.000 ±.254 1.400 ±.254 1.100 ±.254 0.850 ±.254
PCS2728	4W	6.600 ±.254	6.700 ±.254	0.200~1.000	4~450mΩ	0.620 ±.254	1.200 ±.254

Land pattern



Type	Res. Range	A	B	C
PCS1206	1mΩ~50mΩ	2.18	1.60	0.66
PCS2512	0.5mΩ~1.5mΩ 2mΩ~3.5mΩ 3.6mΩ~500mΩ	3.68 3.68 3.68	3.05 2.11 1.90	1.27 3.18 3.50
PCS2728	4mΩ~450mΩ	7.82	2.75	3.51

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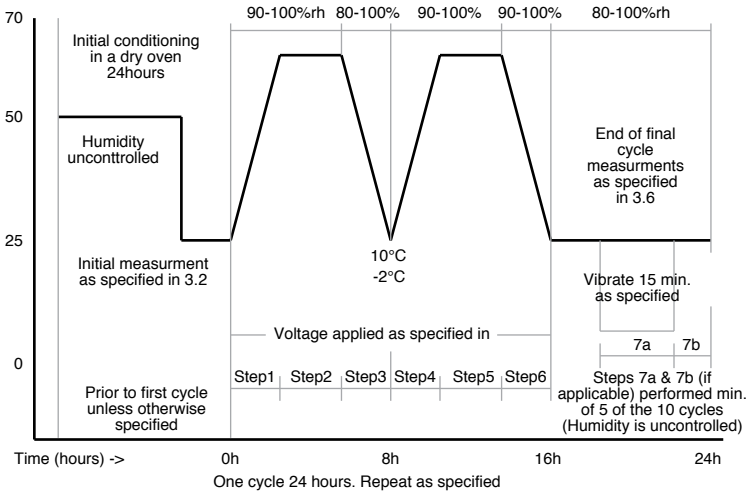
PERFORMANCE

TCR	JIS C 5201-1 clause 4.8 T.C.R. (ppm/°C) = ((R2-R1) / R1(T2-T1)) X 10^6 R1: resistance at room temperature (T1) R2: resistance at 150°C (T2)	Refer to Ratings, ±50ppm
Short Time Overload	JIS C 5201-1 clause 4.13 Overload power as follows: PCS1206: 4x; PCS2512-1W: 5x; PCS2512-2W: 5x; PCS2512-3W: 4x; PCS2728-4W: 3x; Rated power duration: 5secs	ΔR/R1 ±0.5%
High Temperature Exposure	JIS C 5201-1 clause 4.23.2; 1,000hrs at +170°C	ΔR/R1 ±1.0%
Soldering Heat	JIS C 5201-1 clause 4.18; 260°C ±5 for 10 seconds.	ΔR/R1 ±0.5%
Temperature Cycling	JIS C 5201-1 clause 4.19, -55°C to +150°C, 1,000cycles, 15min at each extreme	ΔR/R1 ±0.5%
Bias Humidity	JIS C 5201-1 clause 4.24, 1,000hrs@+85°C/85%RH, 10%Bias 1.5hrs "ON", 0.5hrs "OFF"	ΔR/R1 ±0.5%
Load at Rated Power	JIS C 5201-1 clause 4.25, 1,000hrs@70 °C, 1.5hrs "ON", 0.5hrs "OFF"	ΔR/R1 ±1.0%
Solderability	JIS C 5201-1 clause 4.17, 245±5°C for 2±0.5secs	>95% coverage
Dielectric Withstanding Voltage	JIS-C5201-1 clause 4.7, Applied 500VAC for 1 minute, and Limit surge current 50 mA (max.)	No short or burned appearance
Core Body Strength	JIS-C5201-1 clause 4.15, Central part pressurizing force 5N ,10 seconds	No breakage
Terminal Strength	JIS-C5201-1 clause 4.32, Pressurizing force 17.7N,10 seconds	No breakage
Terminal Bending Strength	JIS-C5201-1 clause 4.33, Bending once for 2mm,10 seconds	ΔR/R1 ±0.5%; No breakage
Moisture Resistance (Climatic Sequence)	MIL-STD 202 Method 106, T=24 hours/cycle ,10 cycles. Steps 7a& 7b not required. Unpowered. (see figure)	ΔR/R1 ±0.5%



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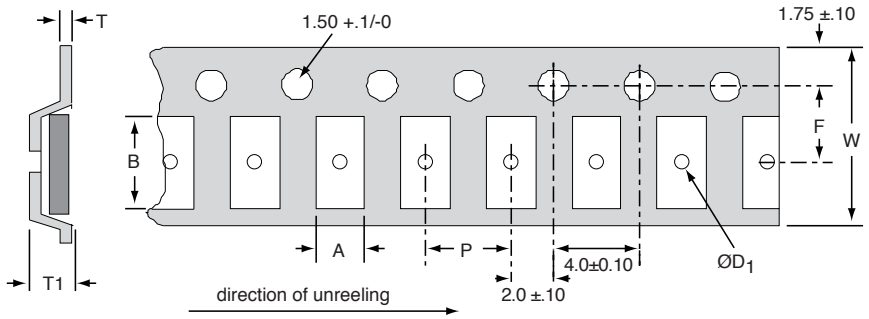
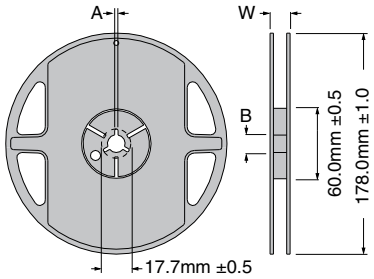
TAPE AND REEL

(mm)





Item	W	P	F	D1	H	A	B	T1	T	Qty./reel	tape size	A	B	W
PCS1206	8.0 ±.30	4.0 ±.10	3.5 ±.10	1.0 ±.10	2.0 ±.10	2.03 ±.10	3.55 ±.10	0.70 ±.10	0.20 ±.05	5,000	8mm	2.0 ±.5	13.2 ±.5	12.0 ±.5
PCS2512	12.0 ±.30	4.0 ±.10	5.5 ±.10	1.55 ±.10	2.0 ±.10	3.50 ±.10	6.75 ±.10	0.90 ±.10	0.20 ±.05	4,000	12mm	2.5 ±.5	13.5 ±.5	16.2 ±.5
PCS2728	12.0 ±.30	8.0 ±.10	5.5 ±.10	1.55 ±.10	2.0 ±.10	7.10 ±.10	7.05 ±.10	0.95 ±.10	0.20 ±.05	2,000	12mm	2.5 ±.5	13.5 ±.5	16.2 ±.5

ORDERING INFORMATION

P C S 1 2 0 6 F R 0 0 1 0 E T

Series	Size	Tolerance	Resistance	RoHS Compliant	Tape and reel
	1206 2512 2728	D = 0.5% F = 1%			

Standard part numbers

Part number	Wattage	Resistance	Tol.
PCS1206FR0010ET	1	1mΩ	1%
PCS1206FR0020ET	1	2mΩ	1%
PCS1206FR0030ET	1	3mΩ	1%
PCS1206FR0050ET	1	5mΩ	1%
PCS1206DR0100ET	1	10mΩ	0.50%
PCS1206DR0200ET	1	20mΩ	0.50%
PCS1206DR0500ET	1	50mΩ	0.50%
PCS2512FR0005ET	2	0.5mΩ	1%
PCS2512FR0010ET	2	1mΩ	1%
PCS2512FR0020ET	2	2mΩ	1%
PCS2512FR0050ET	2	5mΩ	1%
PCS2512DR0100ET	2	10mΩ	0.50%
PCS2512DR0200ET	2	20mΩ	0.50%
PCS2512DR0500ET	2	50mΩ	0.50%
PCS2512DR1000ET	2	100mΩ	0.50%
PCS2512FR5000ET	1	500mΩ	1%
PCS2728DR0100ET	4	10mΩ	0.50%
PCS2728DR0250ET	4	25mΩ	0.50%
PCS2728DR0500ET	4	50mΩ	0.50%
PCS2728DR1000ET	4	100mΩ	0.50%

Marking

"R" designates the decimal location in ohms, e.g. R001=1m, R025=25m, R100=100m

"m" designates the decimal location in milliohms, e.g. 0m25=0.25m, 0m50=0.5m, 5m50=5.5m, 25m5=25.5m

All the other products marking are 4 digits