DataSheet No: E16015 Version: V2

Date: 2024/03/24



PCSK2512

High-Precision Low-TCR Molded Alloy Current Sensing Resistor

Resistance $5m\Omega\sim100m\Omega$

Tolerance $\pm 0.5\%$

±25ppm/°C **TCR**

Rated Current 3A~14A







Automotive Electronics

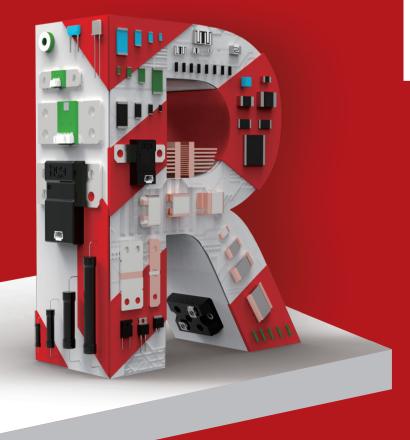
Precision Power Supply

Instrumentation

Sorting & Formation of Battery

Medical Equipment

Better Solution for Sustainable High End Manufacturing

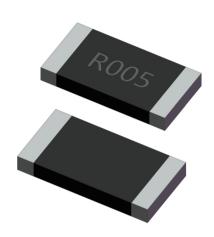




Tolerance of $\pm 0.5\%$ and TCR of ± 25 ppm

High Reliability and Stability

Introduction



High-precision low-TCR molded alloy current sensing resistor adopts a resistive alloy independently developed by C&B Electronics, which undergoes precision processing, then is welded by a dedicated electron beam welding equipment independently designed and manufactured by C&B Electronics to achieve continuous welding, and then is shaped by precision stamping. Based on the control ability of the resistance alloy's consistency, precision processing ability, process control ability, and precision welding ability, the product can achieve a maximum target tolerance of \pm 0.5% after precision trimming. Finally, the product is encapsulated through precision molding.

High-Precision Low-TCR Molded Alloy Current Sensing Resistor

The resistance range of PCSK2512 series of products is $5m\Omega\sim100m\Omega$. TCR of PCSK2512 series is ≤±25ppm/°C within the operating temperature range from -55°C to +125°C. By controlling the resistive alloy materials, precision electron beam welding processes and subsequent processes, the thermal EMF is significantly reduced, while significantly improving its long-term stability.







PCSK2512 series, from raw materials, core equipment, to core processes, achieves independent and controllable production, stable quality, and timely delivery. If the standard specifications cannot meet your needs, please contact our sales for consultation. Resi is committed to providing the best precision resistor solutions to meet the needs of customers in testing and measurement, power equipment, medical equipment, precision power supply, automotive electronics, formation & sorting of battery.

Electrical Parameters

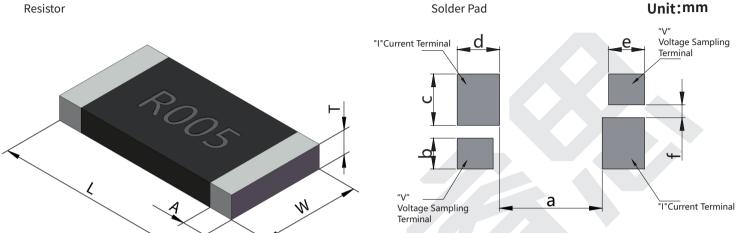
Size	Resistance	Rated Power (+70°C)	Max. Operating Current	Operating Temperature	TCR ppm/°C(+20°CRef)	Tolerance %
PCSK2512	5mΩ~9mΩ	1W	10A~14A	-55°C~+170°C	±25(-55°C~+125°C)	±0.5 ±1.0 ±5.0
PCSK2512	10mΩ~100mΩ	1W	3A~10A	-55°C~+170°C	±25(-55°C~+125°C)	±0.5 ±1.0 ±5.0

Applications

PCSK series is applicable to AC, DC, high and low-frequency sampling circuits.



Dimensions

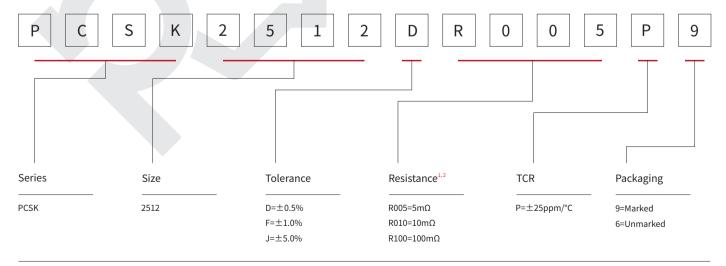


Not following the recommended solder pad design can seriously affect the temperature coefficient measurement results and current sensing accuracy!

Resistance	L	W	A	T	а	b
5mΩ~100mΩ	6.4±0.2	3.2±0.2	0.8±0.2	0.8±0.1	4.0	1.2
c	d	e	f	Packaging	Quantity Per Reel	Net Weight
2.0	1.65	1.4	0.5	Tape & Reel	4000pcs	0.07±0.02g

Part Number Information

Example: PCSK2512DR005P9 (PCSK 2512 $\pm 0.5\%$ 5m Ω ± 25 ppm/°C Marked)



- 1. There are situations where the expression of resistance value exceeds four digits. 49.9mohm expresses as R0499, and 49.99mohm expresses as R0499, etc.
- 2. For higher/lower resistance, tighter tolerance, higher power, lower TCR and larger size, please contact us.



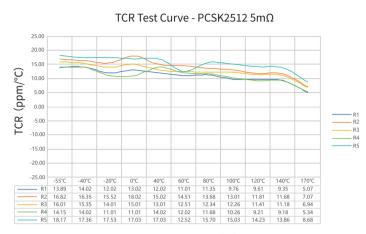


Performance

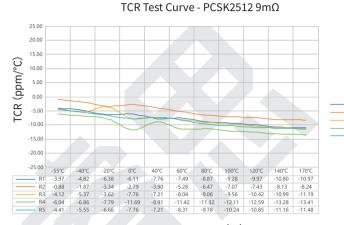
owered ent temperature<20s~+155°C, 15min, 1000	AEC-Q200 TEST 3 MIL-STD-202 Method 108	△R≤±0.1%	△R≤±0.5%
ent temperature<20s~+155°C. 15min. 1000			△K≪±0.5%
, , , , , , , ,	AEC-Q200 TEST 16 MIL-STD-202 Method 107	∆R≤±0.1%	△R≤±0.5%
ered no less than 10% rated power for	AEC-Q200 TEST 7 MIL-STD-202 Method 103	△R≤±0.05%	△R≤±0.5%
· ·	AEC-Q200 TEST 8 MIL-STD-202 Method 108	△R≤±0.5%	△R≤±1.0%
	AEC-Q200 TEST 12 MIL-STD-202 Method 215	Clear marking. No vis damage	ible
Half Sine Wave, peak acceleration 100g's, pulse duration 6ms, 3 times in each of six directions, on three different axes		△R≤±0.02%	△R≤±0.05%
n/cycle, 12 cycles in each directions of X Y Z	AEC-Q200 TEST 14 MIL-STD-202 Method 204	△R≤±0.02%	△R≤±0.05%
.0s	AEC-Q200 TEST 15 MIL-STD-202 Method 210	△R≤±0.05%	△R≤±0.1%
ds.	AEC-Q200 TEST 18 IEC 60115-1 4.17	No visible damage. 95% minimum covera	age
20°C Ref.	AEC-Q200 TEST 19 IEC 60115-1 4.8	· · · · · · · · · · · · · · · · · · ·	
	AEC-Q200 TEST 21 AEC-Q200-005	△R≤±0.1%	△R≤±0.5%
	IEC 60115-1 4.13	∆R≤±0.1%	△R≤±0.5%
wered	IEC 60068-2-1	△R≤±0.1%	△R≤±0.5%
	MIL-STD-202 Method 106	△R≤±0.02%	△R≤±0.2%
	directions, on three different axes n/cycle, 12 cycles in each directions of X Y Z 10s 3s 20°C Ref.	AEC-Q200 TEST 7 MIL-STD-202 Method 103 AEC-Q200 TEST 8 MIL-STD-202 Method 108 AEC-Q200 TEST 8 MIL-STD-202 Method 108 AEC-Q200 TEST 12 MIL-STD-202 Method 215 AEC-Q200 TEST 13 MIL-STD-202 Method 215 AEC-Q200 TEST 13 MIL-STD-202 Method 213 AEC-Q200 TEST 14 MIL-STD-202 Method 213 AEC-Q200 TEST 15 MIL-STD-202 Method 204 AEC-Q200 TEST 15 MIL-STD-202 Method 204 AEC-Q200 TEST 15 MIL-STD-202 Method 204 AEC-Q200 TEST 15 MIL-STD-202 Method 210 AEC-Q200 TEST 18 IEC 60115-1 4.17 AEC-Q200 TEST 19 IEC 60115-1 4.18 AEC-Q200 TEST 21 AEC-Q200 TEST 2	MIL-STD-202 Method 107 AEC-Q200 TEST 7 MIL-STD-202 Method 103 $\triangle R \leqslant \pm 0.05\%$ at ambient temperature after cleaning MIL-STD-202 Method 215 at ambient temperature after cleaning MIL-STD-202 Method 215 at ambient temperature after cleaning MIL-STD-202 Method 215 $\triangle R \leqslant \pm 0.02\%$ AEC-Q200 TEST 13 $\triangle R \leqslant \pm 0.02\%$ $\triangle R \leqslant \pm 0$



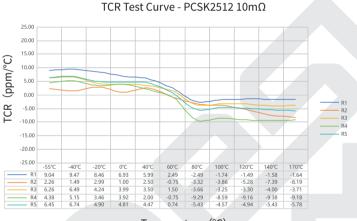
Temperature Coefficient of Resistance Test Curve



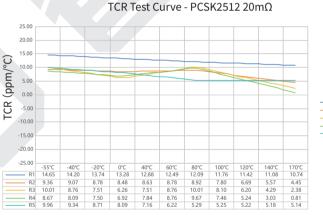




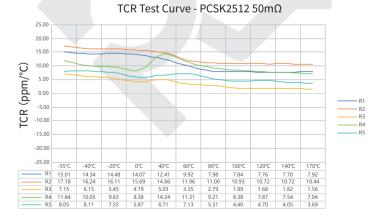
Temperature (°C)



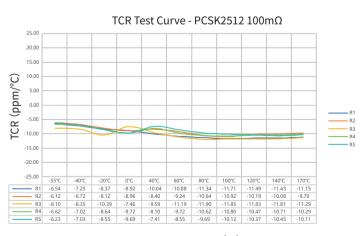
Temperature (°C)



Temperature (°C)

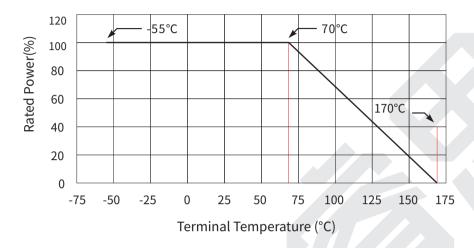


Temperature (°C)

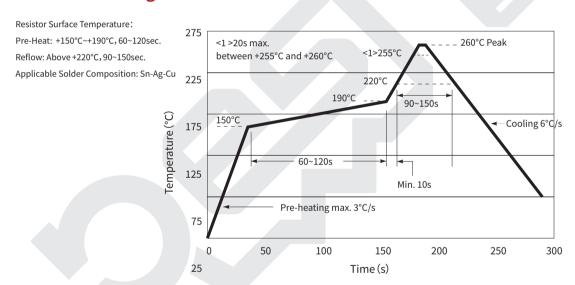


Temperature (°C)

Derating Curve

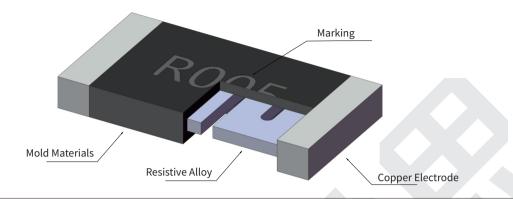


Reflow Soldering Profile





Construction



Marking

Marking: Resistance

Size	Illustration	Demonstration
2512	R005	R005: Resistance

Storage Instructions

- (1) Resistors should be stored at a temperature of 5 to 35 °C, with a humidity of <60% RH. The humidity should be kept as low as possible.
- (2) Resistors should be protected from direct sunlight.
- (3) Resistors should be stored in a clean and dry environment free of harmful gases (HCl, Sulfuric acid, H2S, etc.)
- (4) Do not move the resistor from the packaging unless use it.
- (5) Under the above storage conditions, the resistor can be stored for at least 1 year.

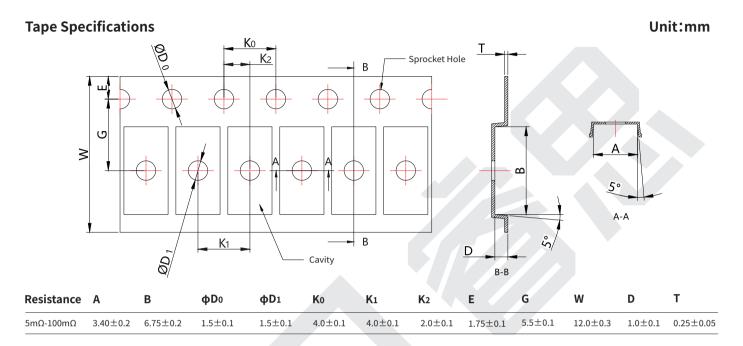
Usage Suggestions

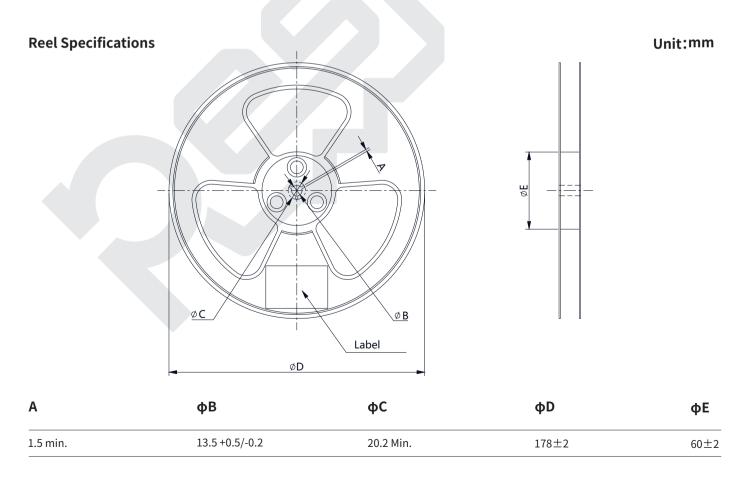
- (1) Please protect the surface of the resistor during use. Prevent defects such as scratches, bumps, and oil stains on the surface.
- (2) Do not use sharp tweezers to move the resistor. Scratches on the surface can cause resistance drift and resistor failure.
- (3) When installing and using resistors, avoid the impact of mechanical stress on the resistor.
- $(4) The long-term operating power of resistors should be \leqslant rated power to avoid resistance drift caused by long-term overload. \\$
- $(5) \ Please \ refer to \ the \ derating \ curve \ when \ operating \ under \ high \ temperature \ conditions \ or \ poor \ heat \ dissipation \ environment.$
- (6) If the operating conditions exceed the pulse specified in the pulse curve, a systematic evaluation is required.
- (7) If the resistor is not used after being moved from the packaging, it should be stored under vacuum to avoid risks such as poor welding caused by oxidation of the resistor.





Packaging

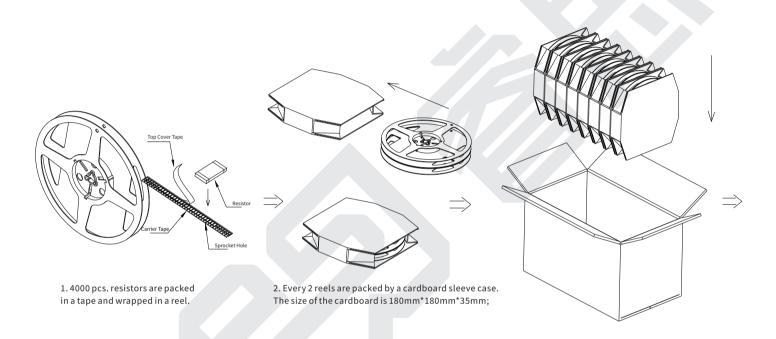


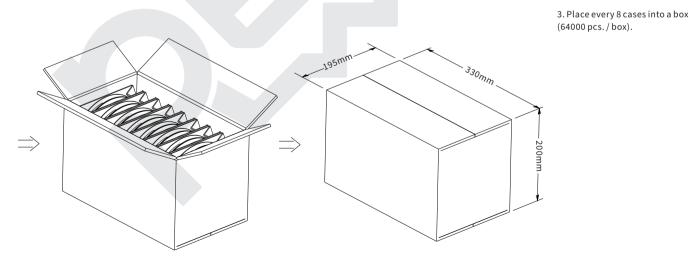




Packaging

- (1) 4000 pcs. resistors are packed in a tape and wrapped in a reel;
- (2) Every 2 reels are packed by a cardboard sleeve case. The size of the cardboard is 180mm*180mm*35mm;
- (3) Place every 8 cases into a box (64000 pcs. / box);
- (4) Box size: 330mm*195mm*200mm.





 $4. For the last box, 8\ cardboard\ sleeve\ cases should\ be\ placed\ regardless\ of\ quantity\ of\ the\ product,\ preventing\ shaking.$

5. Box size: 330mm*195mm*200mm





Popular Part Numbers

Part Number	Size	Tolerance	Resistance	Marking	TCR	Power	Max. Operating Current
PCSK2512DR005P9	2512	±0.5%	5.0mΩ	Marked	±25ppm/°C	1W	14A
PCSK2512FR005P9	2512	±1.0%	5.0mΩ	Marked	±25ppm/°C	1W	14A
PCSK2512JR005P9	2512	±5.0%	5.0mΩ	Marked	±25ppm/°C	1W	14A
PCSK2512DR006P9	2512	±0.5%	6.0mΩ	Marked	±25ppm/°C	1W	12A
PCSK2512FR006P9	2512	±1.0%	6.0mΩ	Marked	±25ppm/°C	1W	12A
PCSK2512JR006P9	2512	±5.0%	6.0mΩ	Marked	±25ppm/°C	1W	12A
PCSK2512DR007P9	2512	±0.5%	7.0mΩ	Marked	±25ppm/°C	1W	11A
PCSK2512FR007P9	2512	±1.0%	7.0mΩ	Marked	±25ppm/°C	1W	11A
PCSK2512JR007P9	2512	±5.0%	7.0mΩ	Marked	±25ppm/°C	1W	11A
PCSK2512DR008P9	2512	±0.5%	8.0mΩ	Marked	±25ppm/°C	1W	11A
PCSK2512FR008P9	2512	±1.0%	8.0mΩ	Marked	±25ppm/°C	1W	11A
PCSK2512JR008P9	2512	±5.0%	8.0mΩ	Marked	±25ppm/°C	1W	11A
PCSK2512DR009P9	2512	±0.5%	9.0mΩ	Marked	±25ppm/°C	1W	10A
PCSK2512FR009P9	2512	±1.0%	9.0mΩ	Marked	±25ppm/°C	1W	10A
PCSK2512JR009P9	2512	±5.0%	9.0mΩ	Marked	±25ppm/°C	1W	10A
PCSK2512DR010P9	2512	±0.5%	10mΩ	Marked	±25ppm/°C	1W	10A
PCSK2512FR010P9	2512	±1.0%	10mΩ	Marked	±25ppm/°C	1W	10A
PCSK2512JR010P9	2512	±5.0%	10mΩ	Marked	±25ppm/°C	1W	10A
PCSK2512DR015P9	2512	±0.5%	15mΩ	Marked	±25ppm/°C	1W	8A
PCSK2512FR015P9	2512	±1.0%	15mΩ	Marked	±25ppm/°C	1W	8A
PCSK2512JR015P9	2512	±5.0%	15mΩ	Marked	±25ppm/°C	1W	8A
PCSK2512DR018P9	2512	±0.5%	18mΩ	Marked	±25ppm/°C	1W	7A
PCSK2512FR018P9	2512	±1.0%	18mΩ	Marked	±25ppm/°C	1W	7A
PCSK2512JR018P9	2512	±5.0%	18mΩ	Marked	±25ppm/°C	1W	7A
PCSK2512DR020P9	2512	±0.5%	20mΩ	Marked	±25ppm/°C	1W	7A
PCSK2512FR020P9	2512	±1.0%	20mΩ	Marked	±25ppm/°C	1W	7A
PCSK2512JR020P9	2512	±5.0%	20mΩ	Marked	±25ppm/°C	1W	7A
PCSK2512DR025P9	2512	±0.5%	25mΩ	Marked	±25ppm/°C	1W	6A
PCSK2512FR025P9	2512	±1.0%	25mΩ	Marked	±25ppm/°C	1W	6A
PCSK2512JR025P9	2512	±5.0%	25mΩ	Marked	±25ppm/°C	1W	6A
PCSK2512DR030P9	2512	±0.5%	30mΩ	Marked	±25ppm/°C	1W	5A
PCSK2512FR030P9	2512	±1.0%	30mΩ	Marked	±25ppm/°C	1W	5A





Popular Part Numbers

Part Number	Size	Tolerance	Resistance	Marking	TCR	Power	Max. Operating Current
PCSK2512JR030P9	2512	±5.0%	30mΩ	Marked	±25ppm/°C	1W	5A
PCSK2512DR033P9	2512	±0.5%	33mΩ	Marked	±25ppm/°C	1W	5A
PCSK2512FR033P9	2512	±1.0%	33mΩ	Marked	±25ppm/°C	1W	5A
PCSK2512JR033P9	2512	±5.0%	33mΩ	Marked	±25ppm/°C	1W	5A
PCSK2512DR040P9	2512	±0.5%	40mΩ	Marked	±25ppm/°C	1W	5A
PCSK2512FR040P9	2512	±1.0%	40mΩ	Marked	±25ppm/°C	1W	5A
PCSK2512JR040P9	2512	±5.0%	40mΩ	Marked	±25ppm/°C	1W	5A
PCSK2512DR047P9	2512	±0.5%	47mΩ	Marked	±25ppm/°C	1W	4A
PCSK2512FR047P9	2512	±1.0%	47mΩ	Marked	±25ppm/°C	1W	4A
PCSK2512JR047P9	2512	±5.0%	47mΩ	Marked	±25ppm/°C	1W	4A
PCSK2512DR050P9	2512	±0.5%	50mΩ	Marked	±25ppm/°C	1W	4A
PCSK2512FR050P9	2512	±1.0%	50mΩ	Marked	±25ppm/°C	1W	4A
PCSK2512JR050P9	2512	±5.0%	50mΩ	Marked	±25ppm/°C	1W	4A
PCSK2512DR100P9	2512	±0.5%	100mΩ	Marked	±25ppm/°C	1W	3A
PCSK2512FR100P9	2512	±1.0%	100mΩ	Marked	±25ppm/°C	1W	3A
PCSK2512JR100P9	2512	±5.0%	100mΩ	Marked	±25ppm/°C	1W	3A
PCSK2512DR005P6	2512	±0.5%	5.0mΩ	Unmarked	±25ppm/°C	1W	14A
PCSK2512FR005P6	2512	±1.0%	5.0mΩ	Unmarked	±25ppm/°C	1W	14A
PCSK2512JR005P6	2512	±5.0%	5.0mΩ	Unmarked	±25ppm/°C	1W	14A
PCSK2512DR006P6	2512	±0.5%	6.0mΩ	Unmarked	±25ppm/°C	1W	12A
PCSK2512FR006P6	2512	±1.0%	6.0mΩ	Unmarked	±25ppm/°C	1W	12A
PCSK2512JR006P6	2512	±5.0%	6.0mΩ	Unmarked	±25ppm/°C	1W	12A
PCSK2512DR007P6	2512	±0.5%	7.0mΩ	Unmarked	±25ppm/°C	1W	11A
PCSK2512FR007P6	2512	±1.0%	7.0mΩ	Unmarked	±25ppm/°C	1W	11A
PCSK2512JR007P6	2512	±5.0%	7.0mΩ	Unmarked	±25ppm/°C	1W	11A
PCSK2512DR008P6	2512	±0.5%	8.0mΩ	Unmarked	±25ppm/°C	1W	11A
PCSK2512FR008P6	2512	±1.0%	8.0mΩ	Unmarked	±25ppm/°C	1W	11A
PCSK2512JR008P6	2512	±5.0%	8.0mΩ	Unmarked	±25ppm/°C	1W	11A
PCSK2512DR009P6	2512	±0.5%	9.0mΩ	Unmarked	±25ppm/°C	1W	10A
PCSK2512FR009P6	2512	±1.0%	9.0mΩ	Unmarked	±25ppm/°C	1W	10A
PCSK2512JR009P6	2512	±5.0%	9.0mΩ	Unmarked	±25ppm/°C	1W	10A
							10A
PCSK2512JR009P6 PCSK2512DR010P6	2512	±0.5%	10mΩ	Unmarked	±25ppm/°C ±25ppm/°C	1W	10/





Popular Part Numbers

Part Number	Size	Tolerance	Resistance	Marking	TCR	Power	Max. Operating Current
PCSK2512FR010P6	2512	±1.0%	10mΩ	Unmarked	±25ppm/°C	1W	10A
PCSK2512JR010P6	2512	±5.0%	10mΩ	Unmarked	±25ppm/°C	1W	10A
PCSK2512DR015P6	2512	±0.5%	15mΩ	Unmarked	±25ppm/°C	1W	8A
PCSK2512FR015P6	2512	±1.0%	15mΩ	Unmarked	±25ppm/°C	1W	8A
PCSK2512JR015P6	2512	±5.0%	15mΩ	Unmarked	±25ppm/°C	1W	8A
PCSK2512DR018P6	2512	±0.5%	18mΩ	Unmarked	±25ppm/°C	1W	7A
PCSK2512FR018P6	2512	±1.0%	18mΩ	Unmarked	±25ppm/°C	1W	7A
PCSK2512JR018P6	2512	±5.0%	18mΩ	Unmarked	±25ppm/°C	1W	7A
PCSK2512DR020P6	2512	±0.5%	20mΩ	Unmarked	±25ppm/°C	1W	7A
PCSK2512FR020P6	2512	±1.0%	20mΩ	Unmarked	±25ppm/°C	1W	7A
PCSK2512JR020P6	2512	±5.0%	20mΩ	Unmarked	±25ppm/°C	1W	7A
PCSK2512DR025P6	2512	±0.5%	25mΩ	Unmarked	±25ppm/°C	1W	6A
PCSK2512FR025P6	2512	±1.0%	25mΩ	Unmarked	±25ppm/°C	1W	6A
PCSK2512JR025P6	2512	±5.0%	25mΩ	Unmarked	±25ppm/°C	1W	6A
PCSK2512DR030P6	2512	±0.5%	30mΩ	Unmarked	±25ppm/°C	1W	5A
PCSK2512FR030P6	2512	±1.0%	30mΩ	Unmarked	±25ppm/°C	1W	5A
PCSK2512JR030P6	2512	±5.0%	30mΩ	Unmarked	±25ppm/°C	1W	5A
PCSK2512DR033P6	2512	±0.5%	33mΩ	Unmarked	±25ppm/°C	1W	5A
PCSK2512FR033P6	2512	±1.0%	33mΩ	Unmarked	±25ppm/°C	1W	5A
PCSK2512JR033P6	2512	±5.0%	33mΩ	Unmarked	±25ppm/°C	1W	5A
PCSK2512DR040P6	2512	±0.5%	40mΩ	Unmarked	±25ppm/°C	1W	5A
PCSK2512FR040P6	2512	±1.0%	40mΩ	Unmarked	±25ppm/°C	1W	5A
PCSK2512JR040P6	2512	±5.0%	40mΩ	Unmarked	±25ppm/°C	1W	5A
PCSK2512DR047P6	2512	±0.5%	47mΩ	Unmarked	±25ppm/°C	1W	4A
PCSK2512FR047P6	2512	±1.0%	47mΩ	Unmarked	±25ppm/°C	1W	4A
PCSK2512JR047P6	2512	±5.0%	47mΩ	Unmarked	±25ppm/°C	1W	4A
PCSK2512DR050P6	2512	±0.5%	50mΩ	Unmarked	±25ppm/°C	1W	4A
PCSK2512FR050P6	2512	±1.0%	50mΩ	Unmarked	±25ppm/°C	1W	4A
PCSK2512JR050P6	2512	±5.0%	50mΩ	Unmarked	±25ppm/°C	1W	4A
PCSK2512DR100P6	2512	±0.5%	100mΩ	Unmarked	±25ppm/°C	1W	3A
PCSK2512FR100P6	2512	±1.0%	100mΩ	Unmarked	±25ppm/°C	1W	3A
PCSK2512JR100P6	2512	±5.0%	100mΩ	Unmarked	±25ppm/°C	1W	3A





Revision

Version	Revised Content	Date	Approver
V0	Initial Issue	2023.02.14	LWW
V1	Add $\pm 5\%$ tolerance specifications.	2023.05.25	LWW
V2	Change datasheet to the new template. Add 5-9m Ω specifications. Add product reliability information and packaging information.	2024.03.24	LWW







Disclaimer

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- (1) All liabilities arising from the use of the product;
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