DataSheet No:E16018

Version:V0

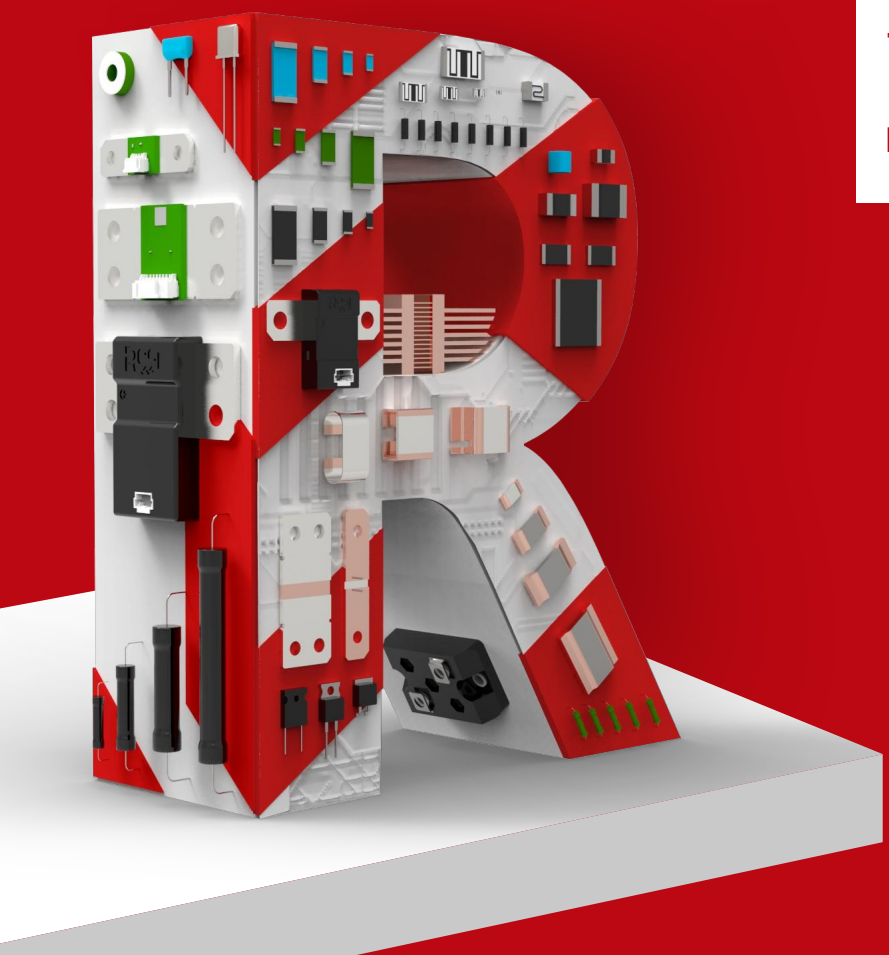
Date:2025/06/27

睿思

PEWM4026

Precision four-legged Kelvin structure pure alloy sense resistor

Resistance	0.2mΩ~1.0mΩ
Tolerance	±0.5%
TCR	±75ppm/℃ ±100ppm/℃
Rated current	83A~240A



Applications

Automotive Electronics
Precision Power Supply
Instrumentation
Formation & Sorting of Battery
Medical Equipment

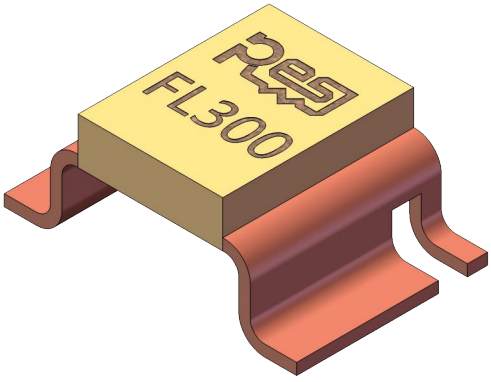
Better Solution for Sustainable High End Manufacturing

睿思

PEWM4026

Precision four-legged Kelvin structure pure alloy sense resistor

High-precision low-temperature coefficient pure alloy current-sensing resistor Trimming Free Technology, high precision, high reliability



Introduction

High-precision low-temperature coefficient pure alloy current-sensing resistors are manufactured by Kaibu Electronics using precision resistance alloys independently developed by the company, which are processed with precision and then welded by special electron beam welding equipment independently designed and manufactured by Kaibu Electronics. Based on the perfect combination of the control capability of resistance alloy consistency, precision processing capability, and high-efficiency welding level, the product can achieve the target accuracy of up to ±0.5% without resistance trimming after stamping. In the range of -55℃ to +170℃, the temperature coefficient of 0.2mΩ and 0.3mΩ in this series can reach within ±75ppm/℃, the temperature coefficient of 0.5mΩ and 1.0mΩ can reach ±100ppm/℃, and the inductance is less than 3nH.

The "Trimming Free" technology avoids the rated current loss caused by resistance trimming and the current concentration hotspots caused by resistance trimming notches, which greatly improves the reliability of the product. At the same time, due to the improvement of welding quality, the thermoelectric potential of the product is significantly reduced, and the long-term stability of the product is improved.

The raw materials, core equipment, and core processes of this series of products are all independently controllable, with stable quality and timely delivery. If the standard specifications cannot meet your needs, please contact our sales staff for consultation. Ruisi is committed to providing users with the best precision resistance solutions to meet the needs of customers in instruments, medical equipment, automotive electronics, precision power supplies, cell sorting and formation, testing and measurement equipment, etc.

RoHS　车规认证 AEC-Q200　3D

Electrical Parameters

Series	Resistance	Rated Power (+70℃)	Max. Operating Current	Operating Temperature	TCR ppm/℃(+20℃Ref)	Thermal Resistance[1] ℃/W	Tolerance %
PEWM4026	0.2mΩ	12W	240A	-55℃~+170℃	±75(-55℃～+170℃)	4.8	±0.5 ±1.0 ±5.0
PEWM4026	0.3mΩ	11W	190A	-55℃~+170℃	±75(-55℃～+170℃)	5.9	±0.5 ±1.0 ±5.0
PEWM4026	0.5mΩ	9W	134A	-55℃~+170℃	±100(-55℃～+170℃)	8.5	±0.5 ±1.0 ±5.0
PEWM4026	1.0mΩ	7W	83A	-55℃~+170℃	±100(-55℃～+170℃)	12.6	±0.5 ±1.0 ±5.0

1、Thermal Resistance (Internal): It represents the internal thermal resistance between the center of the resistance alloy and the copper electrode. Since the heat dissipation power of the product is largely affected by comprehensive factors such as the heat dissipation environment, connecting copper busbars, and PCB design, this parameter is for reference

Applications

PEWM inductance < 3nH,PEWM is suitable for AC and DC low and high frequency sampling circuits.

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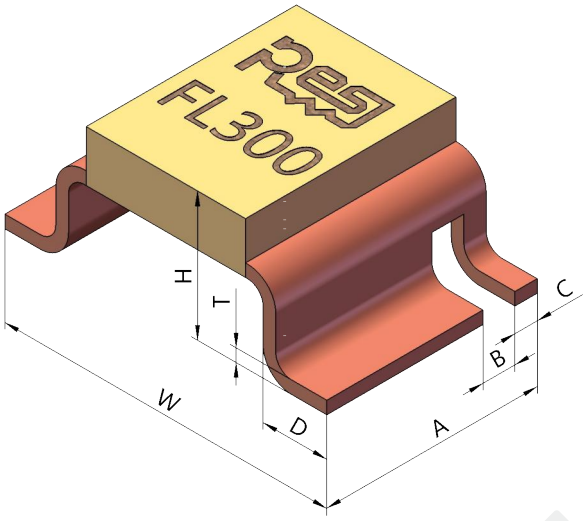
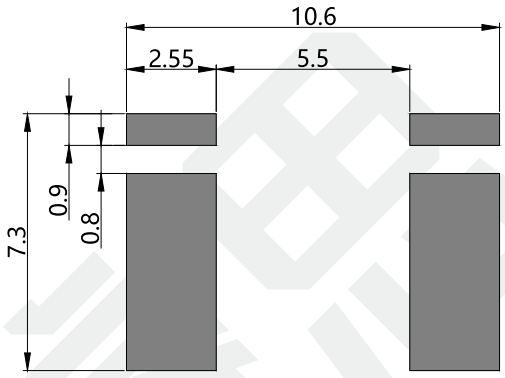
Dimensions

Unit:mm

Standard Drawing Dimensions



Land Pattern



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

Resistance	T	H	W	A	B	C	D	Packaging	Quantity Per Reel	Net Weight
0.2mΩ	0.4±0.2	3.75±0.5	10.1±0.3	6.6±0.3	1.0±0.3	0.7±0.3	2.0±0.3	Tape & Reel	1200pcs	0.54±0.2g
0.3mΩ	0.4±0.2	3.33±0.5	10.1±0.3	6.6±0.3	1.0±0.3	0.7±0.3	2.0±0.3	Tape & Reel	1200pcs	0.43±0.2g
0.5mΩ	0.4±0.2	3.10±0.5	10.1±0.3	6.6±0.3	1.0±0.3	0.7±0.3	2.0±0.3	Tape & Reel	1200pcs	0.36±0.1g
1.0mΩ	0.4±0.2	2.85±0.5	10.1±0.3	6.6±0.3	1.0±0.3	0.7±0.3	2.0±0.3	Tape & Reel	1200pcs	0.29±0.1g

Part Number Information

Example:PEWM4026FL200A9 (PEWM 4026 ±1.0% 0.2mΩ ±75ppm/°C Standard)

P	E	W	M	4	0	2	6	F	L	2	0	0	A	9

Series	Size	Tolerance	Resistance	TCR	Code
PEWM	4026	D=±0.5% F=±1.0% J=±5.0%	L200=0.2mΩ L300=0.3mΩ L500=0.5mΩ 1L00=1.0mΩ	A=±75ppm/°C K=±100ppm/°C	9=Standard

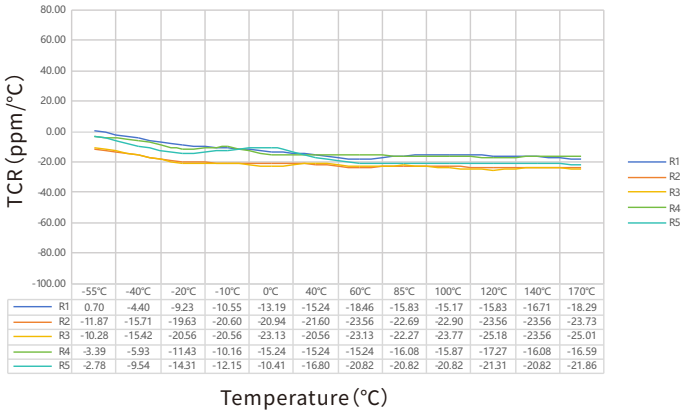
For higher/lower resistance, tighter tolerance, higher power, lower TCR and larger size, please contact us.

Performance

Test	Test Method	Standards	Typical	Max.
High Temperature Storage	1000h@+170°C, unpowered	AEC-Q200 TEST 3 MIL-STD-202 Method 108	△R≤±0.5%	△R≤±1.0%
Thermal Shock	-55°C, 15min~ambient<20s~+155°C, 15min, 1000cycles	AEC-Q200 TEST 16 MIL-STD-202 Method 107	△R≤±0.5%	△R≤±1.0%
Bias Humidity	+85°C, 85%RH, powered 10% rated power for 1000h	AEC-Q200 TEST 7 MIL-STD-202 Method 103	△R≤±0.2%	△R≤±0.5%
Load Life	2000 h @ +70°C*, rated power, 90min on, 30min off *70°C is the terminal temperature	AEC-Q200 TEST 8 MIL-STD-202 Method 108	△R≤±0.5%	△R≤±1.0%
Resistance to Solvent	Immerse in solvent for 3 min and wipe 10 times. Three cycles of three solvents. Dry at ambient temperature after cleaning	AEC-Q200 TEST 12 MIL-STD-202 Method 215	Clear marking. No visible damage	
Mechanical Shock	Sine half-sine wave, peak acceleration 100g's, pulse duration 6ms, triaxial six-directional 3 times each	AEC-Q200 TEST 13 MIL-STD-202 Method 213	△R≤±0.05%	△R≤±0.2%
Vibration	10-2KHz, 5g's, 20 min per cycle, 12 in each of the three directions of X.Y.Z loops	AEC-Q200 TEST 14 MIL-STD-202 Method 204	△R≤±0.05%	△R≤±0.2%
Resistance to Solder Heat	+260°C, 10s	AEC-Q200 TEST 15 MIL-STD-202 Method 210	△R≤±0.2%	△R≤±0.5%
Solderability	+245°C tin bath for 3s	AEC-Q200 TEST 18 IEC 60115-1 4.17	No visible damage. 95% minimum coverage	
TCR	+20°C and +170°C, +20°C Ref.	AEC-Q200 TEST 19 IEC 60115-1 4.8	In the range of ±100ppm/°C	
Substrate Bending	2mm, 60s	AEC-Q200 TEST 21 AEC-Q200-005	△R≤±0.1%	△R≤±0.5%
Short Time Overload	5x rated voltage, 5s	IEC 60115-1 4.13	△R≤±0.5%	△R≤±1.0%
Low Temperature Storage	-55°C, No Load, 96 h	IEC 60068-2-1	△R = 0	△R≤±0.1%
Moisture Resistance	Apply T = 24 hours/cycle, zero power, 7a and 7b are not required in the method	MIL-STD-202 Method 106	△R = 0	△R≤±0.2%

Temperature Coefficient of Resistance Test Curve

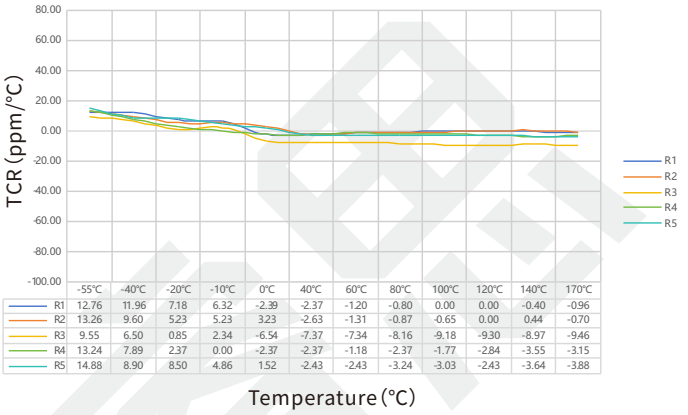
TCR Test Curve -PEWM4026 0.2mΩ



	-55℃	-40℃	-20℃	-10℃	0℃	40℃	60℃	85℃	100℃	120℃	140℃	170℃
R1	0.70	-4.40	-9.23	-10.55	-13.19	-15.24	-18.46	-15.83	-15.17	-15.83	-16.71	-18.29
R2	-11.87	-15.71	-19.63	-20.60	-20.94	-21.60	-23.56	-22.69	-22.90	-23.56	-23.56	-23.73
R3	-10.28	-15.42	-20.56	-20.56	-23.13	-20.56	-23.13	-22.27	-23.77	-25.18	-23.56	-25.01
R4	-3.39	-5.93	-11.43	-10.16	-15.24	-15.24	-15.24	-16.08	-15.87	-17.27	-16.08	-16.59
R5	-2.78	-9.54	-14.31	-12.15	-10.41	-16.80	-20.82	-20.82	-20.82	-21.31	-20.82	-21.86

Temperature (°C)

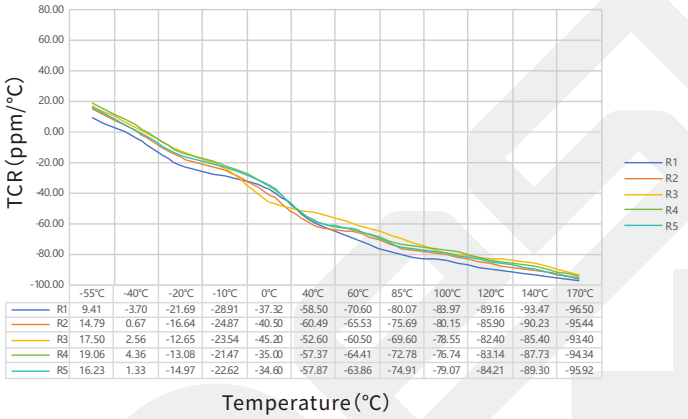
TCR Test Curve -PEWM4026 0.3mΩ



	-55℃	-40℃	-20℃	-10℃	0℃	40℃	60℃	80℃	100℃	120℃	140℃	170℃
R1	12.76	11.96	7.18	6.32	-2.39	-2.37	-1.20	-0.80	0.00	0.00	-0.40	-0.96
R2	13.26	9.60	5.23	5.23	3.23	-2.63	-1.31	-0.87	-0.65	0.00	0.44	-0.70
R3	9.55	6.50	0.85	2.34	-6.54	-7.37	-7.34	-8.16	-9.18	-9.30	-8.97	-9.46
R4	13.24	7.89	2.37	0.00	-2.37	-2.37	-1.18	-2.37	-1.77	-2.84	-3.55	-3.15
R5	14.88	8.90	8.50	4.86	1.52	-2.43	-2.43	-3.24	-3.03	-2.43	-3.64	-3.88

Temperature (°C)

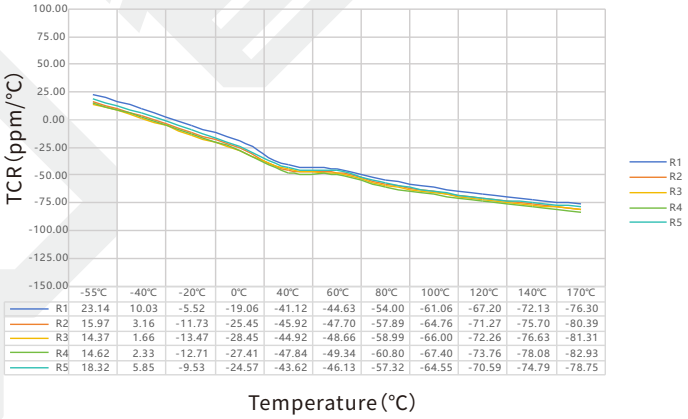
TCR Test Curve -PEWM4026 0.5mΩ



	-55℃	-40℃	-20℃	-10℃	0℃	40℃	60℃	85℃	100℃	120℃	140℃	170℃
R1	9.41	-3.70	-21.69	-28.91	-37.32	-58.50	-70.60	-80.07	-83.97	-89.16	-93.47	-96.50
R2	14.79	0.67	-16.64	-24.87	-40.50	-60.49	-65.53	-75.69	-80.15	-85.90	-90.23	-95.44
R3	17.50	2.56	-12.65	-23.54	-45.20	-52.60	-60.50	-69.60	-78.55	-82.40	-85.40	-93.40
R4	19.06	4.36	-13.08	-21.47	-35.00	-57.37	-64.41	-72.78	-76.74	-83.14	-87.73	-94.34
R5	16.23	1.33	-14.97	-22.62	-34.60	-57.87	-63.86	-74.91	-79.07	-84.21	-89.30	-95.92

Temperature (°C)

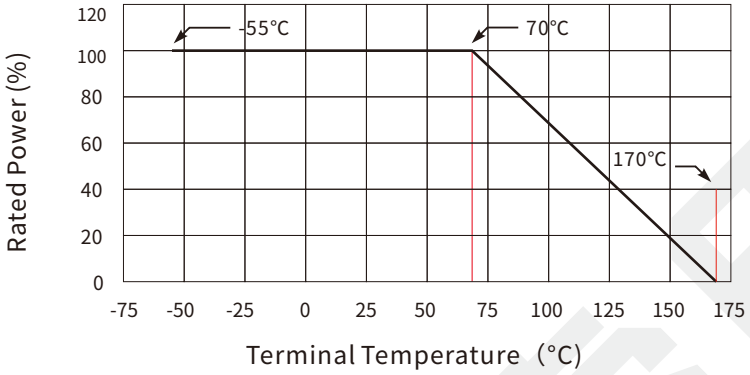
TCR Test Curve -PEWM4026 1.0mΩ



	-55℃	-40℃	-20℃	0℃	40℃	60℃	80℃	100℃	120℃	140℃	170℃
R1	23.14	10.03	-5.52	-19.06	-41.12	-44.63	-54.00	-61.06	-67.20	-72.13	-76.30
R2	15.97	3.16	-11.73	-25.45	-45.92	-47.70	-57.89	-64.76	-71.27	-75.70	-80.39
R3	14.37	1.66	-13.47	-28.45	-44.92	-48.66	-58.99	-66.00	-72.26	-76.63	-81.31
R4	14.62	2.33	-12.71	-27.41	-47.84	-49.34	-60.80	-67.40	-73.76	-78.08	-82.93
R5	18.32	5.85	-9.53	-24.57	-43.62	-46.13	-57.32	-64.55	-70.59	-74.79	-78.75

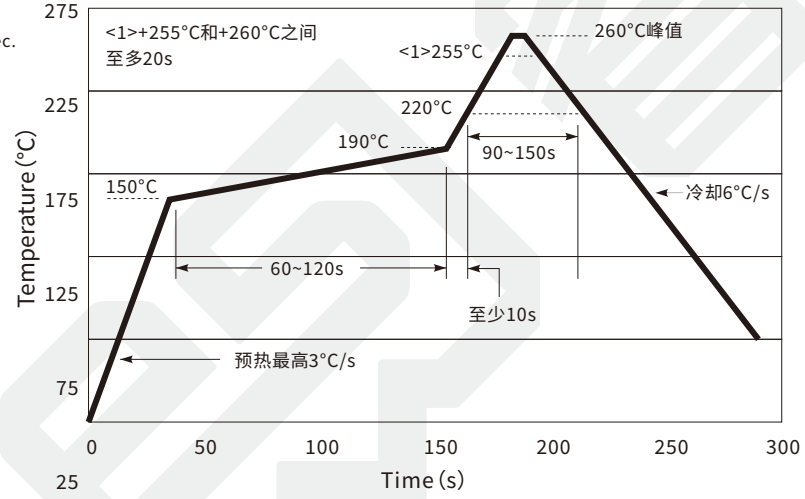
Temperature (°C)

Derating Curve

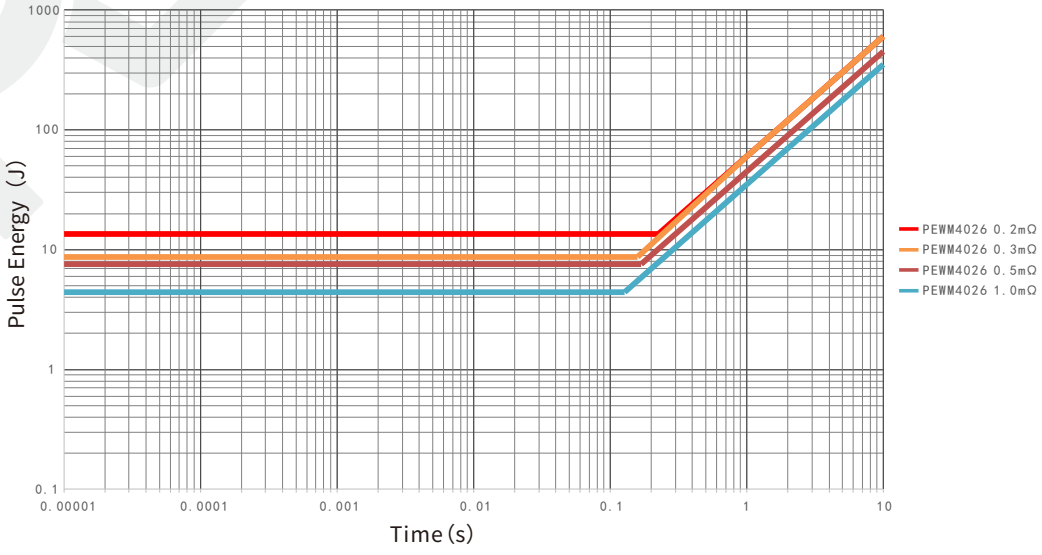


Reflow Soldering Profile

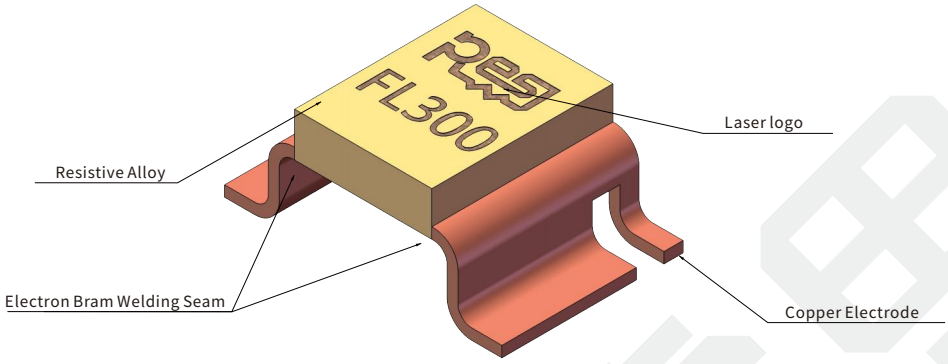
Resistor Surface Temperature:
Pre-Heat:+150℃~+190℃, 60~120sec.
Reflow:+220℃以上, 90~150sec.
Applicable Solder Composition:
Sn-Ag-Cu solder.



Maximum Pulse Energy Curve



Construction



Printing Marking Instructions

The printing marking on the product surface consists of: brand LOGO + product accuracy marking + resistance value marking.

Size	Illustration	Demonstration
4026		RESI：Brand Logo F：Tolerance L300：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 ⩽ 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.

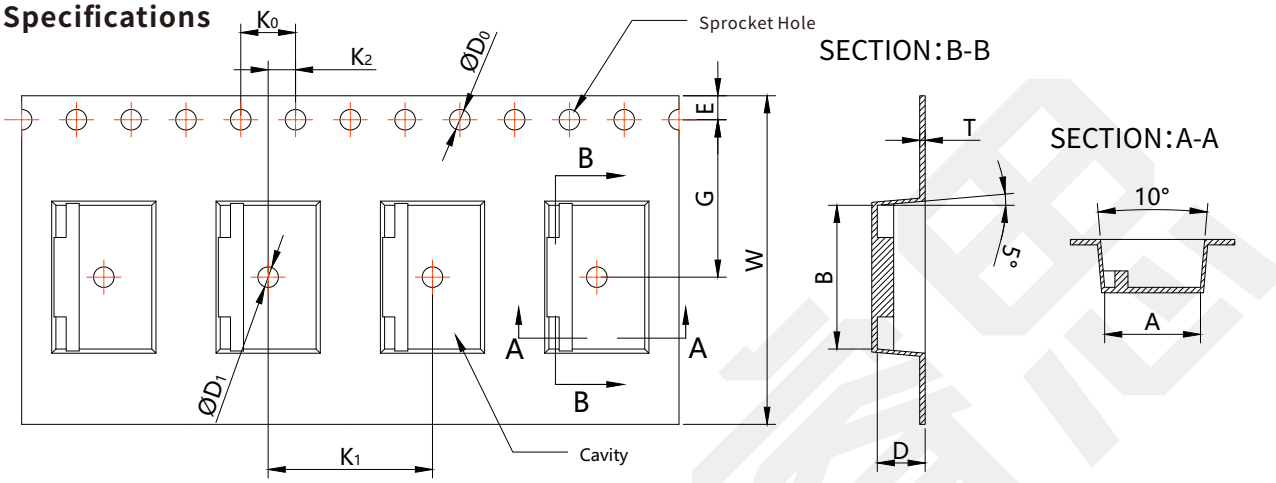
(6) If the operating conditions exceed the pulse specified in the pulse curve, a systematic evaluation is required.

(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

Unit:mm

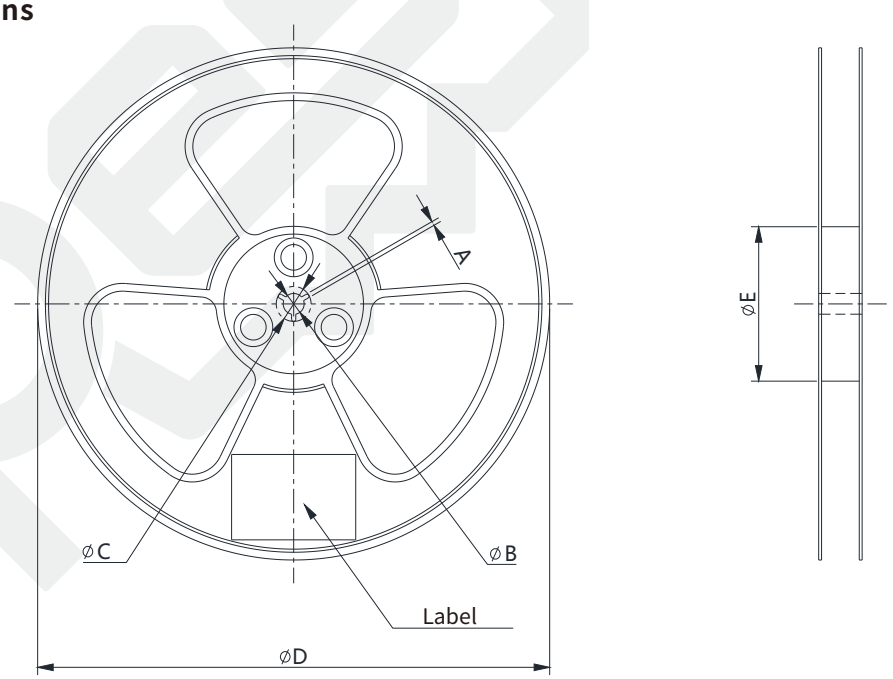
Tape Specifications



Resistance	A	B	ϕD0	ϕD1	K0	K1	K2	E	G	W	D	T
0.2mΩ	7.0±0.1	10.5±0.1	1.5±0.1	1.5±0.1	4.0±0.1	12.0±0.1	2.0±0.1	1.75±0.1	11.5±0.1	24.0±0.3	4.2±0.1	0.4±0.05
0.3mΩ	7.0±0.1	10.5±0.1	1.5±0.1	1.5±0.1	4.0±0.1	12.0±0.1	2.0±0.1	1.75±0.1	11.5±0.1	24.0±0.3	4.2±0.1	0.4±0.05
0.5mΩ	7.0±0.1	10.5±0.1	1.5±0.1	1.5±0.1	4.0±0.1	12.0±0.1	2.0±0.1	1.75±0.1	11.5±0.1	24.0±0.3	3.5±0.1	0.4±0.05
1.0mΩ	7.0±0.1	10.5±0.1	1.5±0.1	1.5±0.1	4.0±0.1	12.0±0.1	2.0±0.1	1.75±0.1	11.5±0.1	24.0±0.3	3.5±0.1	0.4±0.05

Reel Specifications

Unit:mm



A	ϕB	ϕC	ϕD	ϕE
1.5 Min.	13.0 +0.5/-0.2	20.2 Min.	330±2	100±2

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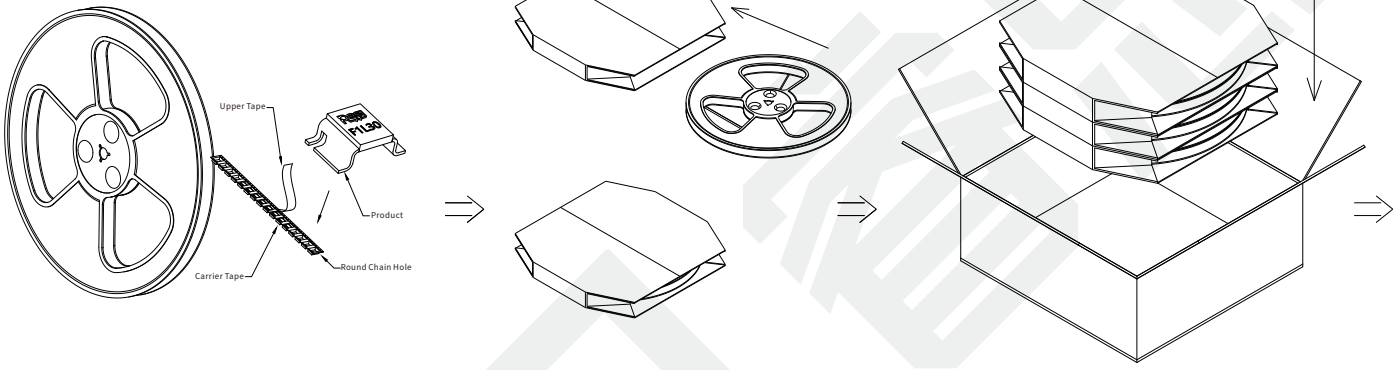
Packaging

(1) Every 1,200 resistor products are taped into one plastic tray.

(2) Each plastic tray is fixed with a paper clamp, and the size of the paper clamp is approximately 335mm×340mm×37mm.

(3) Every three paper clamps are placed into an outer carton, meaning the standard packaging per carton is 3,600 pcs.

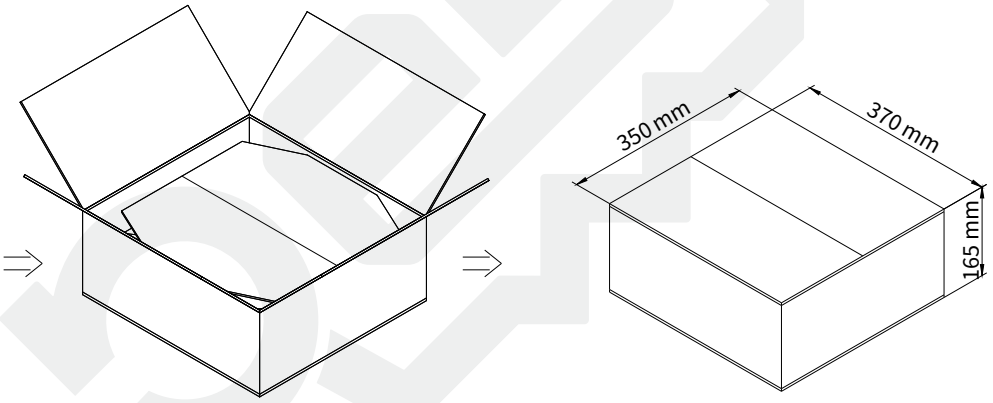
(4) The size of the standard outer carton is approximately 350mm×370mm×165mm.



1. Tape every 1,200 resistor products into one plastic tray.

2.Fix each plastic tray with a paper clamp, and the size of the paper clamp is approximately 335mm*340mm*37mm。

3.Place every three paper clamps into an outer carton for packaging, meaning the standard packaging per carton is 3,600 pcs.



4. It is required to fill with bubble film or pearl cotton before and after placing the paper clamps to prevent the products from shaking inside the carton.

5. The size of the standard outer carton is approximately 350mm×370mm×165mm.

Popular Part Numbers

Part Number	Size	Tolearance	Resistance	TCR	Power	Max. Operating Current
PEWM4026DL200A9	4026	±0.5%	0.2mΩ	±75ppm/°C	12W	240A
PEWM4026FL200A9	4026	±1.0%	0.2mΩ	±75ppm/°C	12W	240A
PEWM4026JL200A9	4026	±5.0%	0.2mΩ	±75ppm/°C	12W	240A
PEWM4026DL300A9	4026	±0.5%	0.3mΩ	±75ppm/°C	11W	190A
PEWM4026FL300A9	4026	±1.0%	0.3mΩ	±75ppm/°C	11W	190A
PEWM4026JL300A9	4026	±5.0%	0.3mΩ	±75ppm/°C	11W	190A
PEWM4026DL500K9	4026	±0.5%	0.5mΩ	±100ppm/°C	9W	134A
PEWM4026FL500K9	4026	±1.0%	0.5mΩ	±100ppm/°C	9W	134A
PEWM4026JL500K9	4026	±5.0%	0.5mΩ	±100ppm/°C	9W	134A
PEWM4026D1L00K9	4026	±0.5%	1.0mΩ	±100ppm/°C	7W	83A
PEWM4026F1L00K9	4026	±1.0%	1.0mΩ	±100ppm/°C	7W	83A
PEWM4026J1L00K9	4026	±5.0%	1.0mΩ	±100ppm/°C	7W	83A

Revision

Version	Revised Content	Date	Approver
V0	Initial Issue	2025.06.27	LWW

Disclaimer

All products, datasheets and data can be changed without prior notice.

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