DataSheet No:E19018

Version:V4

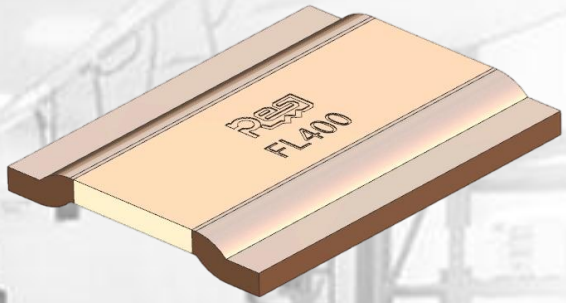
Date:2025/04/30

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High-Precision Low TCR
Alloy Current Sensing Resistor

SEWF3951

Resistance	0.3mΩ ~ 0.8mΩ
Tolerance	±0.5%
TCR	±25ppm/℃
Rated current	110-220A



Applicable to

Electric Vehicles | Precision Power Supplies | AI Servers

Lithium-Ion Battery and Semiconductor Test Equipment

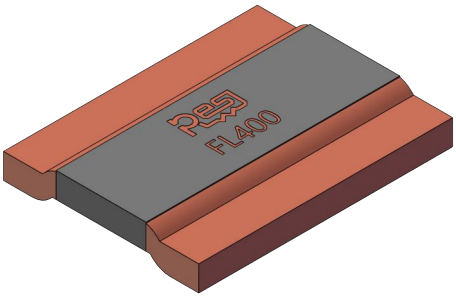
Energy Storage | Medical Equipment

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SEWF3951

High-Precision Low TCR Alloy Current Sensing Resistor

Low TCR Alloy Current Sensing Resistor
“Trimming Free” Technology, High Precision & Reliability



Introduction

SEWF3951 series is based on a precision resistive alloy, welded by a specialized electron beam welding equipment. Both resistive alloy and welding equipment are independently designed and manufactured by C&B Electronics. Because of controlling the consistency of resistive alloys, precision processing ability and efficient welding, SEWF3951 achieves a maximum target tolerance of ±0.5% after stamping without trimming. TCR of SEWF3951 series within the temperature range of +20 °C to +120 °C is ⩽ ±25ppm/°C.

"Trimming Free" technology avoids the loss of rated current caused by trimming and also avoids current accumulation hotspots caused by trimmed notch, greatly improving the reliability of the product. Meanwhile, due to the improvement of welding quality, thermal EMF of the product is significantly reduced, improving its long-term stability.

SEWF3951 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 instrumentation, medical equipment, automotive electronics, precision power supplies, formation & sorting of battery, testing and measurement equipment and other fields.

RoHS AEC-Q200 3D

Electrical Parameters

Series	Resistance	Rated Power (+70°C)	Max. Operating Current	Operating Temperature	TCR ppm/°C(+20°C Ref)	Thermal Resistance [1] °C/W	Tolerance %
SEWF3951	0.3mΩ	15W	220A	-55°C~+170°C	±25 (+20°C～+120°C)	2.3°C/W	±0.5 ±1.0 ±5.0
SEWF3951	0.4mΩ	15W	190A	-55°C~+170°C	±25 (+20°C～+120°C)	3.2°C/W	±0.5 ±1.0 ±5.0
SEWF3951	0.8mΩ	10W	110A	-55°C~+170°C	±25 (+20°C～+120°C)	6.1°C/W	±0.5 ±1.0 ±5.0

* Thermal Resistance: Refer to the internal thermal resistance between the center of the resistive alloy and the copper electrode.
As the heat dissipation efficiency is influenced by operating environment, copper bus bars, PCB design, etc., this parameter is only for reference.

Applications

This series of shunt resistors is intended solely for DC and low-frequency sampling circuits. For AC or high-frequency applications, please consult us.

C&B Eureka Innovations CO., LTD. | www.cb-resi.com | cbresi@cbeureka.com

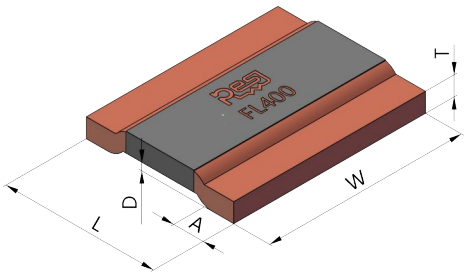
SEWF3951

High-Precision Low TCR Alloy Current Sensing Resistor

Dimensions

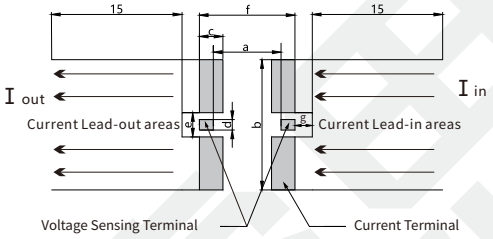
Unit:mm

Resistor



Land Pattern

The current lead-in and lead-out areas must be ⩾ 15 mm to provide sufficient buffering for uniform current flow across the resistor. Otherwise, the TCR and accuracy of the resistor will be significantly affected.



Non-compliance with pad design requirements degrades TCR and current sensing accuracy!

Resistance	L	W	A	T	D	a	b	c	d	e	f	g	Quantity Per Reel
0.3mΩ	10.0±0.3	13.0±0.5	2.0±0.3	1.7±0.2	0.5±0.2	7.8±0.1	15±0.2	2.7±0.2	1.2±0.2	2.8±0.2	11±0.2	1.2±0.2	1200pcs
0.4mΩ	10.0±0.3	13.0±0.5	2.0±0.3	1.3±0.2	0.5±0.2	7.8±0.1	15±0.2	2.7±0.2	1.2±0.2	2.8±0.2	11±0.2	1.2±0.2	1200pcs
0.8mΩ	10.0±0.3	13.0±0.5	2.0±0.3	0.65±0.2	0.5±0.2	7.8±0.1	15±0.2	2.7±0.2	1.2±0.2	2.8±0.2	11±0.2	1.2±0.2	1200pcs

Part Number Information

Example:SEWF3951FL400P9 (SEWF 3951 ±1.0% 0.4mΩ ±25ppm/°C Standard)

S	E	W	F	3	9	5	1	F	L	4	0	0	P	9

Series	Size	Tolerance	Resistance	TCR	Code
SEWF	3951	D=±0.5% F=±1.0% J=±5.0%	L300=0.3mΩ L400=0.4mΩ L800=0.8mΩ	P=±25ppm/°C	9=Standard 0-8=Custom products

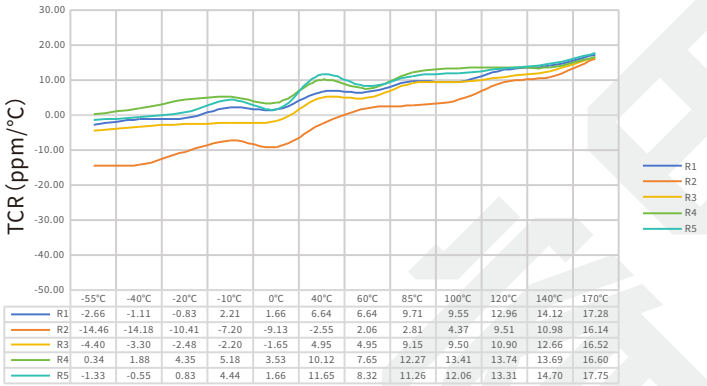
For higher/lower resistance, tighter tolerance, higher power, lower TCR and larger size, please contact us.

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	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	Half sine wave, peak acceleration 100g's, pulse duration 6ms, 3 times in each of six directions, on three different axes	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 constant temperature station for 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	
Board Flex	2mm. Duration: 60s.	AEC-Q200 TEST 21 AEC-Q200-005	△R≤±0.1%	△R≤±0.5%
Short Time Overload	5x rated power, 5s	IEC 60115-1 4.13	△R≤±0.5%	△R≤±1.0%
Low Temperature Storage	-55°C for 96h, unpowered	IEC 60068-2-1	△R = 0	△R≤±0.1%
Moisture Resistance	Apply T=24 h/cycle, zero power, method 7a and 7b are not required	MIL-STD-202 Method 106	△R = 0	△R≤±0.2%

Temperature Coefficient of Resistance Test Curve

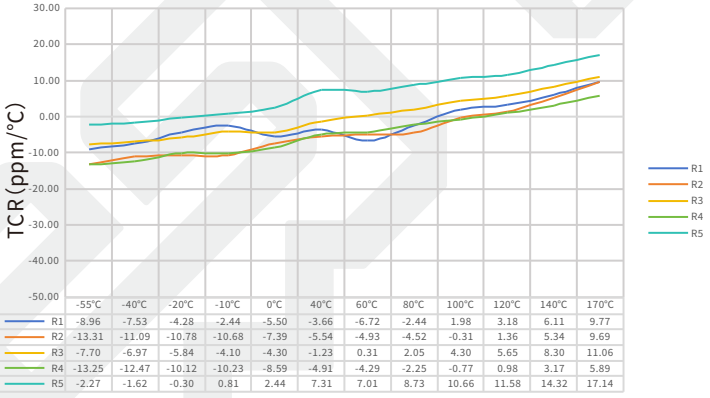
TCR Test Curve -SEWF3951 0.3mΩ



	-55°C	-40°C	-20°C	-10°C	0°C	40°C	60°C	85°C	100°C	120°C	140°C	170°C
R1	-2.66	-1.11	-0.83	2.21	1.66	6.64	6.64	9.71	9.55	12.96	14.12	17.28
R2	-14.46	-14.18	-10.41	-7.20	-9.13	-2.55	2.06	2.81	4.37	9.51	10.98	16.14
R3	-4.40	-3.30	-2.48	-2.20	-1.65	4.95	4.95	9.15	9.50	10.90	12.66	16.52
R4	0.34	1.88	4.35	5.18	3.53	10.12	7.65	12.27	13.41	13.74	13.69	16.60
R5	-1.33	-0.55	0.83	4.44	1.66	11.65	8.32	11.26	12.06	13.31	14.70	17.75

Temperature (°C)

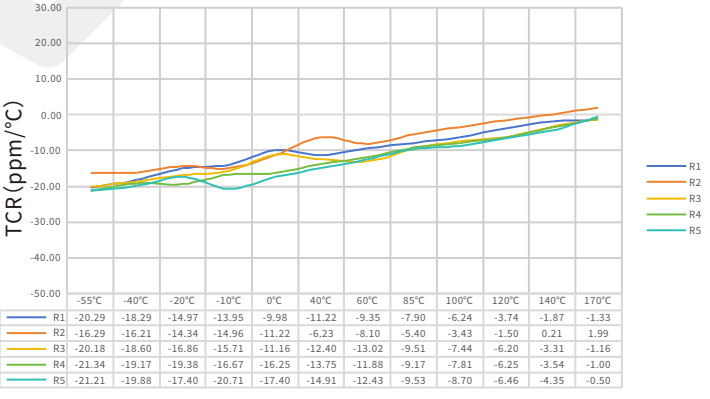
TCR Test Curve -SEWF3951 0.4mΩ



	-55°C	-40°C	-20°C	-10°C	0°C	40°C	60°C	80°C	100°C	120°C	140°C	170°C
R1	-8.96	-7.53	-4.28	-2.44	-5.50	-3.66	-6.72	-2.44	1.98	3.18	6.11	9.77
R2	-13.31	-11.09	-10.78	-10.68	-7.39	-5.54	-4.93	-4.52	-0.31	1.36	5.34	9.69
R3	-7.70	-6.97	-5.84	-4.10	-4.30	-1.23	0.31	2.05	4.30	5.65	8.30	11.06
R4	-13.25	-12.47	-10.12	-10.23	-8.59	-4.91	-4.29	-2.25	-0.77	0.98	3.17	5.89
R5	-2.27	-1.62	-0.30	0.81	2.44	7.31	7.01	8.73	10.66	11.58	14.32	17.14

Temperature (°C)

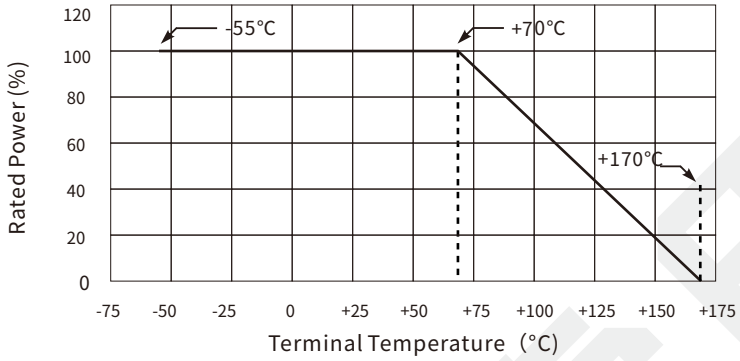
TCR Test Curve -SEWF3951 0.8mΩ



	-55°C	-40°C	-20°C	-10°C	0°C	40°C	60°C	85°C	100°C	120°C	140°C	170°C
R1	-20.29	-18.29	-14.97	-13.95	-9.98	-11.22	-9.35	-7.90	-6.24	-3.74	-1.87	-1.33
R2	-16.29	-16.21	-14.34	-14.96	-11.22	-6.23	-8.10	-5.40	-3.43	-1.50	0.21	1.99
R3	-20.18	-18.60	-16.86	-15.71	-11.16	-12.40	-13.02	-9.51	-7.44	-6.20	-3.31	-1.16
R4	-21.34	-19.17	-19.38	-16.67	-16.25	-13.75	-11.88	-9.17	-7.81	-6.25	-3.54	-1.00
R5	-21.21	-19.88	-17.40	-20.71	-17.40	-14.91	-12.43	-9.53	-8.70	-6.46	-4.35	-0.50

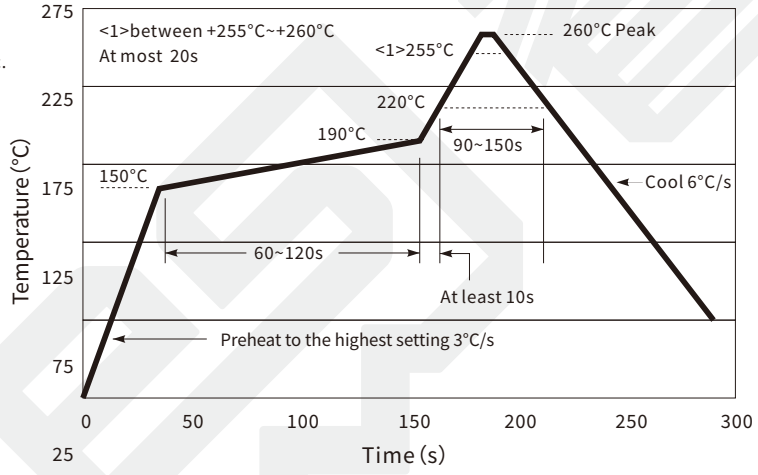
Temperature (°C)

Derating Curve

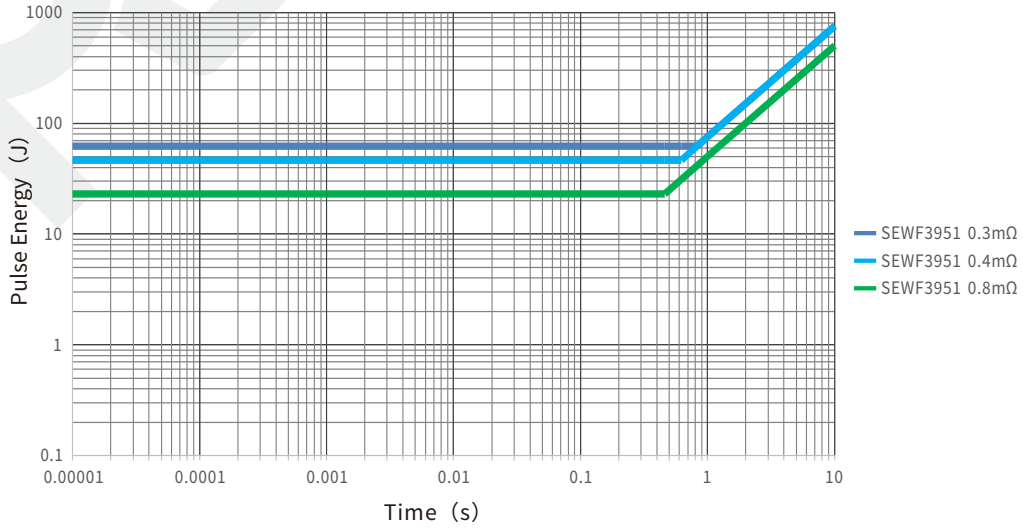


Reflow Soldering Profile

Resistor Surface Temperature:
Pre-Heat: +150°C~+190°C, 60~120sec.
Reflow: +220°C and above, 90~150sec.
Applicable Solder Composition:
Sn-Ag-Cu .



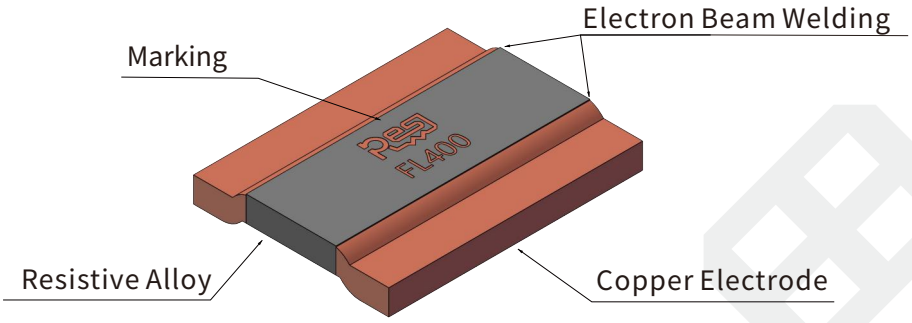
Max. Pulse Energy Curve



SEWF3951

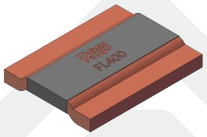
High-Precision Low TCR Alloy Current Sensing Resistor

Construction



Marking

Marking: LOGO+Tolerance+Resistance

Size	Illustration	Demonstration
3951		RESI：Brand F：Tolerance L400：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, H_2S, 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 less than the 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.

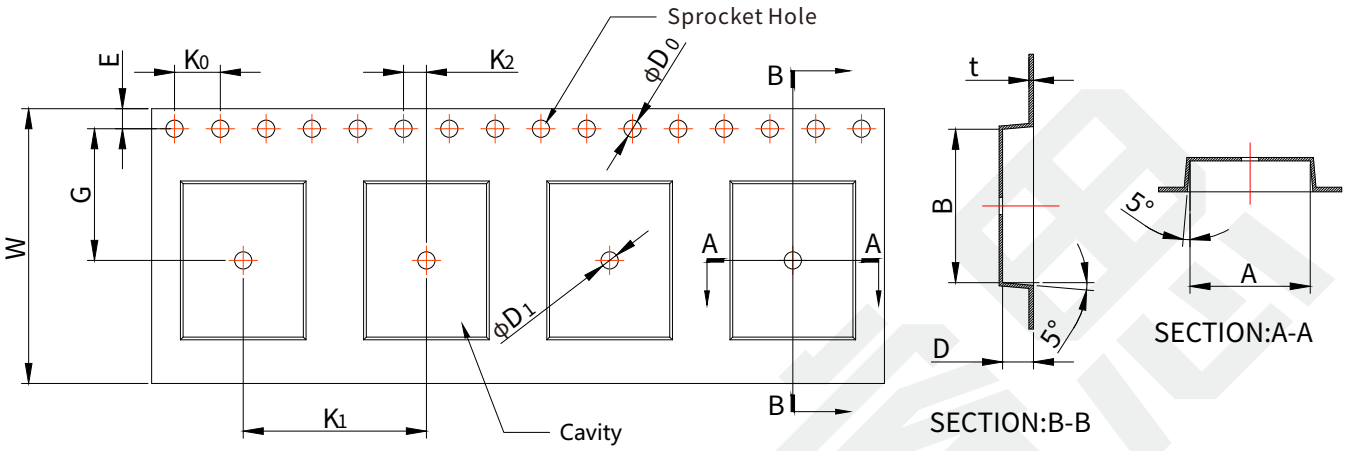
(6) If the operating conditions exceed the pulse specified in the pulse curve, a systematic evaluation is required.

(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 solderability caused by oxidation of the resistor.

Packaging

Tape Specifications

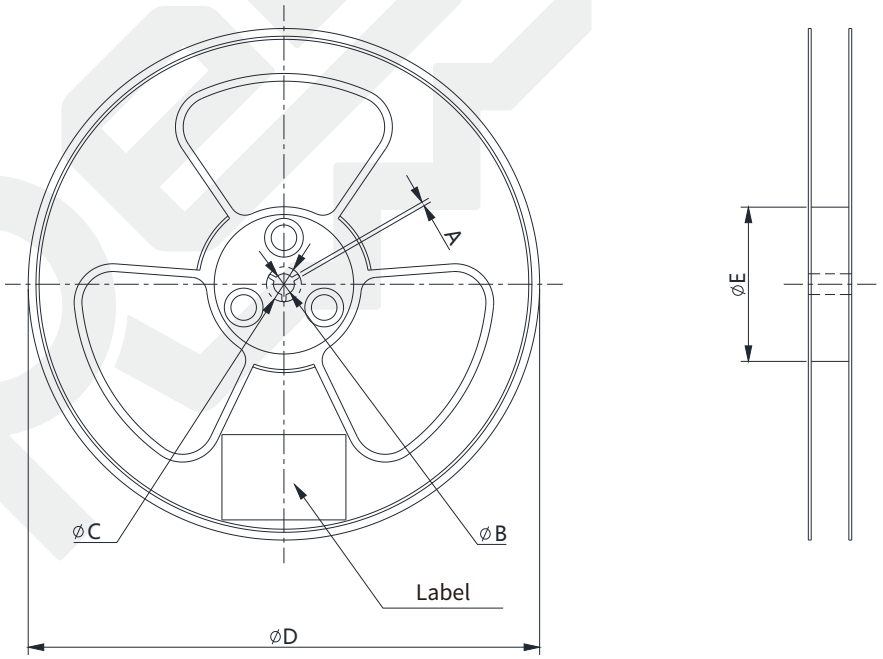
Unit:mm



Resistance	A	B	φD0	φD1	K0	K1	K2	E	G	W	D	t
0.3mΩ	10.5±0.2	13.4±0.2	$1.5^{+0.1}_{-0}$	$1.5^{+0.1}_{-0}$	4±0.1	16±0.1	2±0.1	1.75±0.1	11.5±0.1	24±0.3	2.7±0.1	0.4±0.05
0.4mΩ	10.5±0.2	13.4±0.2	$1.5^{+0.1}_{-0}$	$1.5^{+0.1}_{-0}$	4±0.1	16±0.1	2±0.1	1.75±0.1	11.5±0.1	24±0.3	2.7±0.1	0.4±0.05
0.8mΩ	10.5±0.2	13.4±0.2	$1.5^{+0.1}_{-0}$	$1.5^{+0.1}_{-0}$	4±0.1	16±0.1	2±0.1	1.75±0.1	11.5±0.1	24±0.3	2.7±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

Packaging

(1) 1200 pcs. resistors are packed in a tape and wrapped in a reel;

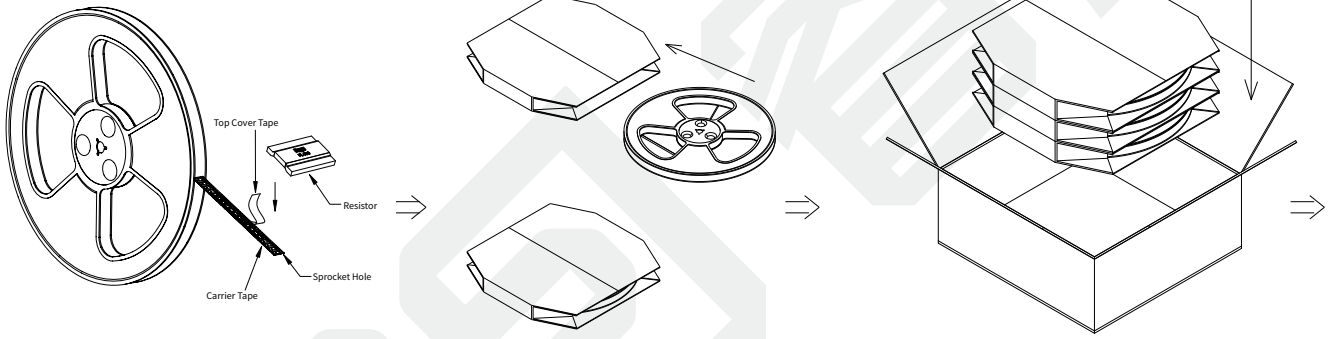
(2) Every 1 reel is packed by a cardboard sleeve case. The size of the cardboard is 335mm*340mm*37mm;

(3) Place every 3 cases into a box (3600 pcs. / box);

(4) Bubble wrap or EPE should be placed to prevent products from shaking or vibration.

(5) Box size: 350mm*370mm*165mm.

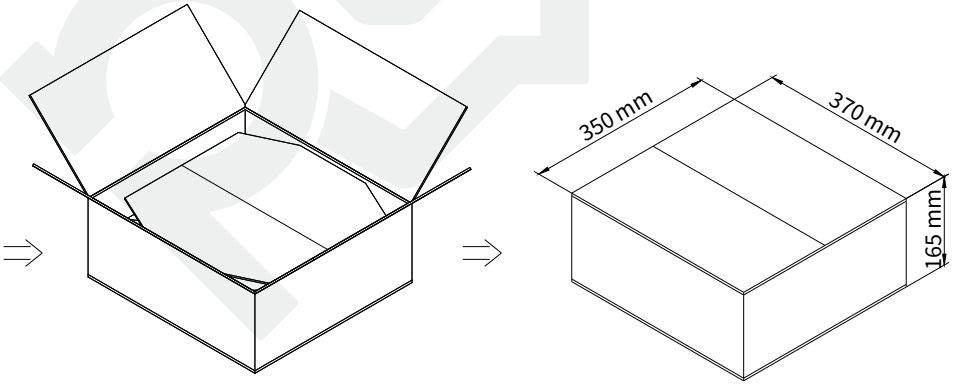
Note: If ordered quantity or partial cartons do not align with the standard quantities, the final shipping configuration shall be subject to our shipment packaging.



1. 1200 pcs. resistors are packed in a tape and wrapped in a reel.

2. Every 1 reel is packed by a cardboard sleeve case. The size of the cardboard is 335mm*340mm*37mm;

3. Place every 3 cases into a box (3600 pcs. / box).



4. Bubble wrap or EPE should be placed to prevent products from shaking or vibration.

5. Box size: 350mm*370mm*165mm

Popular Part Numbers

Part Number	Size	Tolerance	Resistance	TCR	Rated Power	Max. Operating Current
SEWF3951DL300P9	3951	±0.5%	0.3mΩ	±25ppm/°C	15W	220A
SEWF3951FL300P9	3951	±1.0%	0.3mΩ	±25ppm/°C	15W	220A
SEWF3951JL300P9	3951	±5.0%	0.3mΩ	±25ppm/°C	15W	220A
SEWF3951DL400P9	3951	±0.5%	0.4mΩ	±25ppm/°C	15W	190A
SEWF3951FL400P9	3951	±1.0%	0.4mΩ	±25ppm/°C	15W	190A
SEWF3951JL400P9	3951	±5.0%	0.4mΩ	±25ppm/°C	15W	190A
SEWF3951DL800P9	3951	±0.5%	0.8mΩ	±25ppm/°C	10W	110A
SEWF3951FL800P9	3951	±1.0%	0.8mΩ	±25ppm/°C	10W	110A
SEWF3951JL800P9	3951	±5.0%	0.8mΩ	±25ppm/°C	10W	110A

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SEWF3951

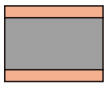
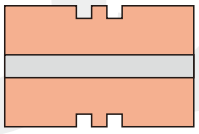
High-Precision Low TCR Alloy Current Sensing Resistor

Broad Portfolio of Current Sensing Resistors

Series	Product	Rated Power +70°C	Resistance Range	Tightest Tolerance	Best TCR
PCSR2512		1W~2W	5mΩ~100mΩ	±0.1%	±10ppm/°C
PCSR3637		2W~3W	1mΩ~200mΩ	±0.1%	±15ppm/°C
PCSK2512		1W	5mΩ~100mΩ	±0.5%	±25ppm/°C
PCSK3637		2W~5W	1mΩ~200mΩ	±0.5%	±25ppm/°C
MCSM2512		3W	0.5mΩ~2mΩ	±0.5%	±100ppm/°C
MCSF2512		2W~3W	3mΩ~100mΩ	±0.5%	±50ppm/°C
PEWM1206		6W	0mΩ~1mΩ	±1.0%	±100ppm/°C
PEWM1216		7W~10W	0.3mΩ~1.0mΩ	±1.0%	±100ppm/°C
PEWK1216		3W~5W	2.0mΩ~3.0mΩ	±1.0%	±50ppm/°C
PEWM2512		3W-6W	0mΩ~1mΩ	±0.5%	±100ppm/°C
SEWK2512		4W~5W	1mΩ~3mΩ	±0.5%	±10ppm/°C
EBWM2512		6W	0mΩ~1mΩ	±0.5%	±200ppm/°C
EBWK2512		2.5W~5W	2mΩ~5mΩ	±0.5%	±100ppm/°C
SEWF2512		2.5W~4W	3mΩ~5mΩ	±0.5%	±25ppm/°C
PEWF2512		2.5W~5W	1.5mΩ~5mΩ	±0.5%	±50ppm/°C
PEWM3920		8W~12W	0.2mΩ~1mΩ	±0.5%	±100ppm/°C
PEWK3920		3W~8W	1mΩ~5mΩ	±0.5%	±50ppm/°C
SEWF3920		3W~8W	1mΩ~5mΩ	±0.5%	±25ppm/°C
SEWK3920		5W~8W	1mΩ~3mΩ	±0.5%	±10ppm/°C
SEWM3920		8W~12W	0.2mΩ~1mΩ	±0.5%	±50ppm/°C

C&B Eureka Innovations CO., LTD. | www.cb-resi.com | cbresi@cbeureka.com

Broad Portfolio of Current Sensing Resistors

Series	Product	Rated Power +70°C	Resistance Range	Tightest Tolerance	Best TCR
SEWK3951		15W	0.25mΩ~0.4mΩ	±0.5%	±25ppm/°C
SEWF3951		10W~15W	0.3mΩ~0.8mΩ	±0.5%	±25ppm/°C
SEWF5930		6W~10W	1mΩ~3mΩ	±0.5%	±25ppm/°C
PEWM5930		6W~15W	0.1mΩ~1.5mΩ	±0.5%	±100ppm/°C
PEWK5930		10W	1mΩ	±0.5%	±50ppm/°C
SEWM5930		9W~15W	0.2mΩ~1mΩ	±0.5%	±50ppm/°C
PEWF4026		3W~7W	1mΩ~5mΩ	±0.5%	±50ppm/°C
PEWF2726		3W~7W	1mΩ~5mΩ	±0.5%	±50ppm/°C
PEWM4026		7W~12W	0.2mΩ~1mΩ	±0.5%	±75ppm/°C
PEWM2726		7W~12W	0.2mΩ~1mΩ	±0.5%	±75ppm/°C
SEWK6398		4W	0.1mΩ	±1.0%	±10ppm/°C

Revision

Version	Revised Content	Date	Approver
V0	Initial Issue	2023.12.27	LWW
V1	Add pad design tips	2024.03.13	LWW
V2	Resistance value 0.25mΩ discontinued	2024.11.08	LWW
V3	Recommend changes to pad size	2024.12.09	LWW
V4	Add new page of broad portfolio of curent sensing resistors	2026.04.30	LWW

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