Data Sheet No.: E05016
Version: V0
Date: 2023/09/09

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EOAR

High Precision Alloy Current Sensing Resistor

Resistance	25mΩ
Tolerance	±0.5%
TCR	±40ppm/℃
Rated Current	14A

Applications

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

Better Solution for Sustainable High End Manufacturing

High Precision Alloy Current Sensing Resistor
High Precision, High Reliability & High Stability

Introduction

EOAR 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, EOAR achieves a maximum target tolerance of ± 0.5% after stamping without trimming. TCR of EOAR series within the temperature range of +20 ℃ to +170 ℃ is ≤ ± 40ppm/℃.

"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.

EOAR 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.

Electrical Parameters

Series	Resistance	Rated Power (+70℃)	Max. Operating Current	Operating Temperature	TCR ppm/℃	Tolerance %
EOAR	25mΩ	5W	14A	-55℃~+170℃	±40 (+20℃~+170℃, 20℃Ref)	±0.5 ±1.0 ±5.0

Applications

EOAR series is only applicable to DC low-frequency sampling circuit. If needs of AC or high-frequency applications are present, please contact us.

Part Number Information

Example: EOAR0005FR025H9 (EOAR 5W ±1.0% 25mΩ ±40ppm/°C Standard)

E	O	A	R	0	0	0	5	F	R	0	2	5	H	9

Series	Power	Tolerance	Resistance	TCR	Code
EOAR	5W	D=±0.5% F=±1.0% J=±5.0%	R025=25mΩ	H=±40ppm/℃	9=Standard 0-8=Custom

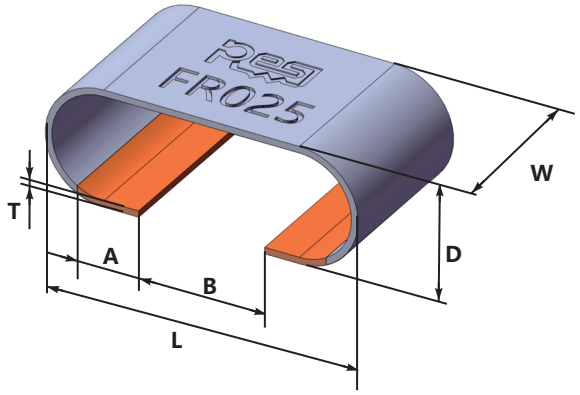
For higher/lower resistance, tighter tolerance, higher power, lower TCR and larger size, please contact us.

C&B Electronics Shenzhen CO., LTD. | www.resistor.today | resi@cbeureka.com | Tel:0755-83981080/83981010

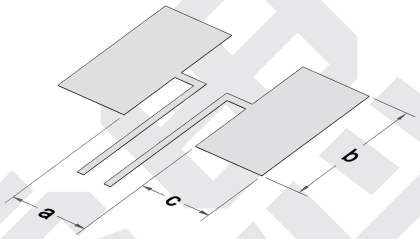
Dimensions

Unit: mm

Resistor



Recommended Solder Pad Size

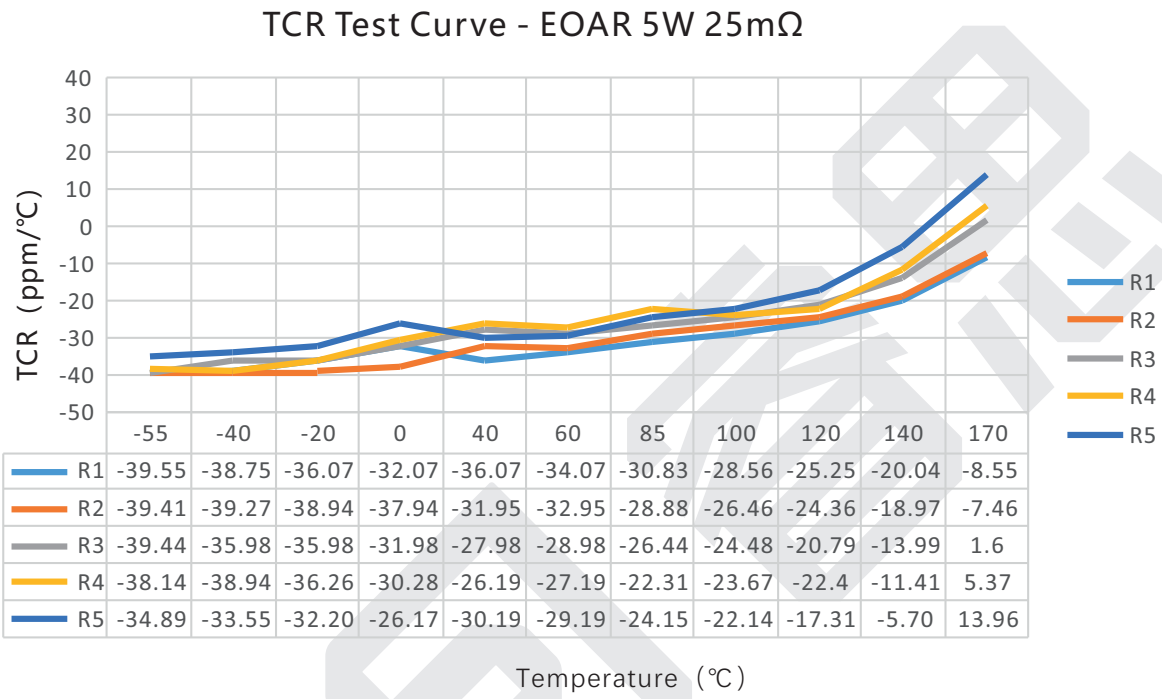


Resistance	L	W	A	B	T	D	a	b	c	Packaging	Quantity Per Reel	Net Weight
25mΩ	12±0.38	6.35±0.38	2.36±0.25	4.83±0.76	0.25	4.5±0.76	3.23	7.24	3.18	Tape&Reel	1200	0.22±0.1g

Performance

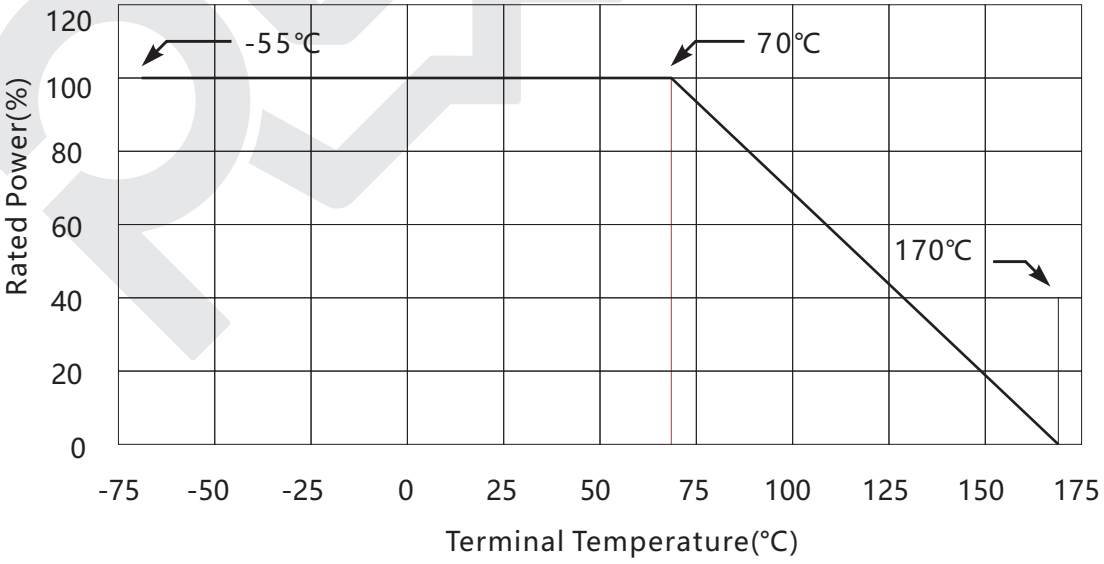
Test	Test Method	Standards	Typical	Max.
High Temperature Storage	1000h@+170°C, no load	AEC-Q200 TEST 3 MIL-STD-202 Method 108	▵R≤±0.5%	▵R≤±1.0%
Thermal Shock	-55°C, 15min~ambient temperature<20s~+155°C, 15min, 1000 Cycles	AEC-Q200 TEST 16 MIL-STD-202 Method 107	▵R≤±0.2%	▵R≤±0.75%
Bias Humidity	+85°C, 85%RH, load 10% rated power, 1000h	AEC-Q200 TEST 7 MIL-STD-202 Method 103	▵R≤±0.2%	▵R≤±0.5%
Load Life	2000h @ +70°C, rated power, 90min on, 30min off +70°C refers to 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≤±0.5%
Vibration	10-2KHz, 5g's, 20min/cycle, 12 cycles in each directions of X Y Z	AEC-Q200 TEST 14 MIL-STD-202 Method 204	▵R≤±0.05%	▵R≤±0.5%
Resistance to Solder Heat	+260°C tin bath for 10s	AEC-Q200 TEST 15 MIL-STD-202 Method 210	▵R≤±0.2%	▵R≤±0.5%
Solderability	+235°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	Refer to tested curve, max. value ≤ 40ppm/°C	
Short Time Overload	5 times rated voltage, 5s	IEC 60115-1 4.13	▵R≤±0.2%	▵R≤±1.0%
Low Temperature Storage	-55°C for 96h, unpowered	IEC 60068-2-1	▵R≤±0.1%	▵R≤±0.5%

Temperature Coefficient of Resistance Test Curve



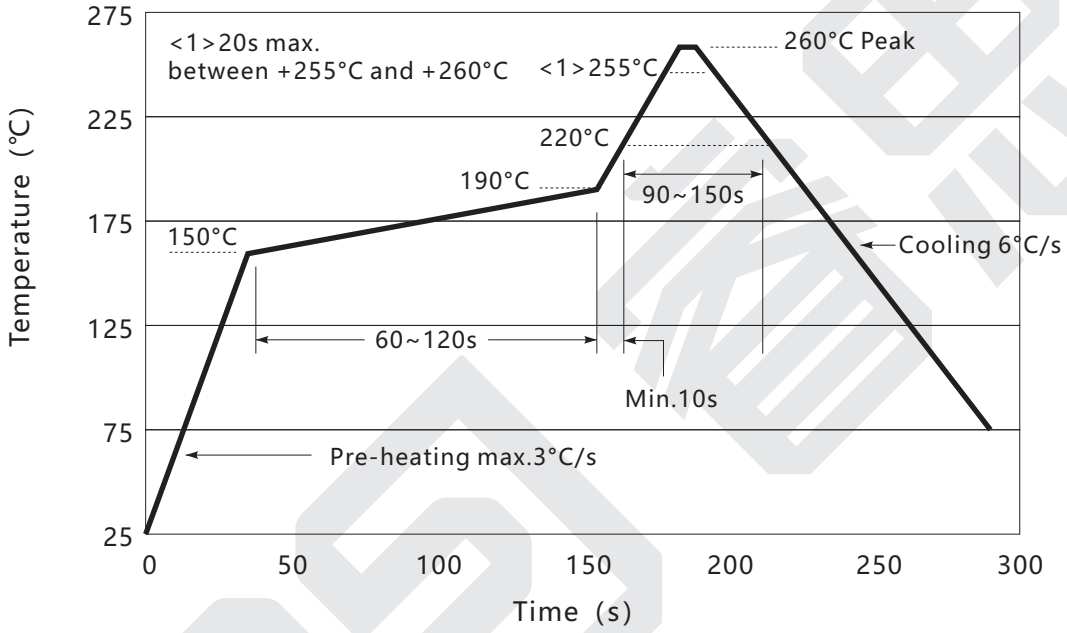
	-55	-40	-20	0	40	60	85	100	120	140	170
R1	-39.55	-38.75	-36.07	-32.07	-36.07	-34.07	-30.83	-28.56	-25.25	-20.04	-8.55
R2	-39.41	-39.27	-38.94	-37.94	-31.95	-32.95	-28.88	-26.46	-24.36	-18.97	-7.46
R3	-39.44	-35.98	-35.98	-31.98	-27.98	-28.98	-26.44	-24.48	-20.79	-13.99	1.6
R4	-38.14	-38.94	-36.26	-30.28	-26.19	-27.19	-22.31	-23.67	-22.4	-11.41	5.37
R5	-34.89	-33.55	-32.20	-26.17	-30.19	-29.19	-24.15	-22.14	-17.31	-5.70	13.96

Derating Curve

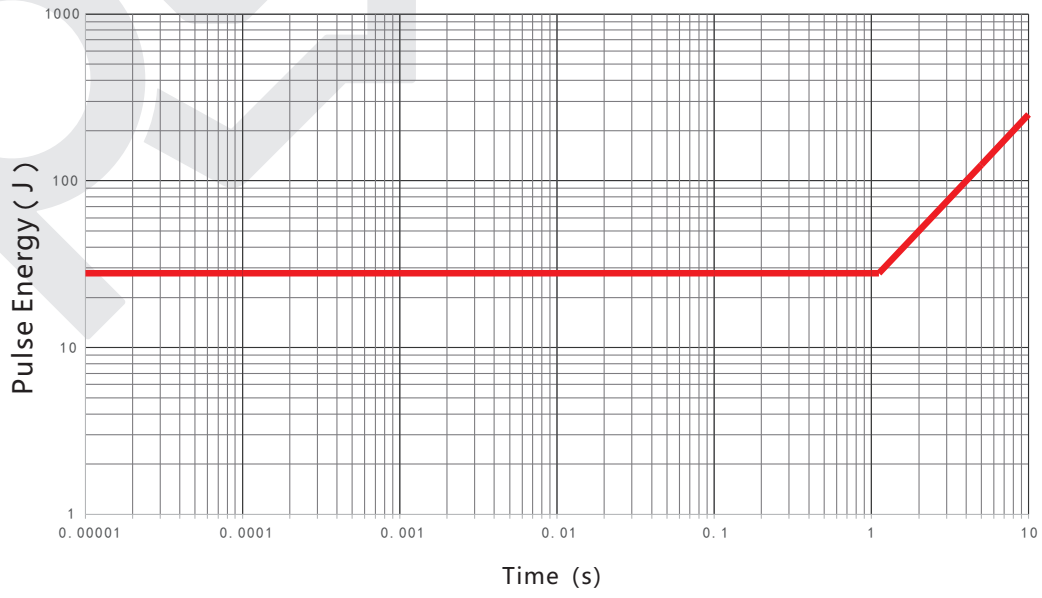


Reflow Soldering Profile

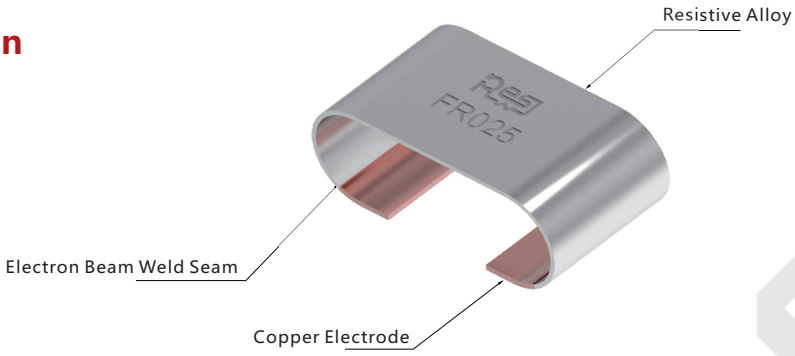
Resistor Surface Temperature:
Pre-Heat: +150℃~+190℃, 60~120sec.
Reflow: Above +220℃, 90~150sec.
Applicable Solder Composition: Sn-Ag-Cu



Maximum Pulse Energy Curve



Construction



Marking

The first line (four digits) represents brand. The second line (five digits) represents tolerance and resistance.

Series	Illustration	Demonstration
EOAR		RESI: Brand F: Tolerance R025: Resistance

Storage Instructions

(1) Resistors should be stored at a temperature of 5 to 35 ℃, 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.

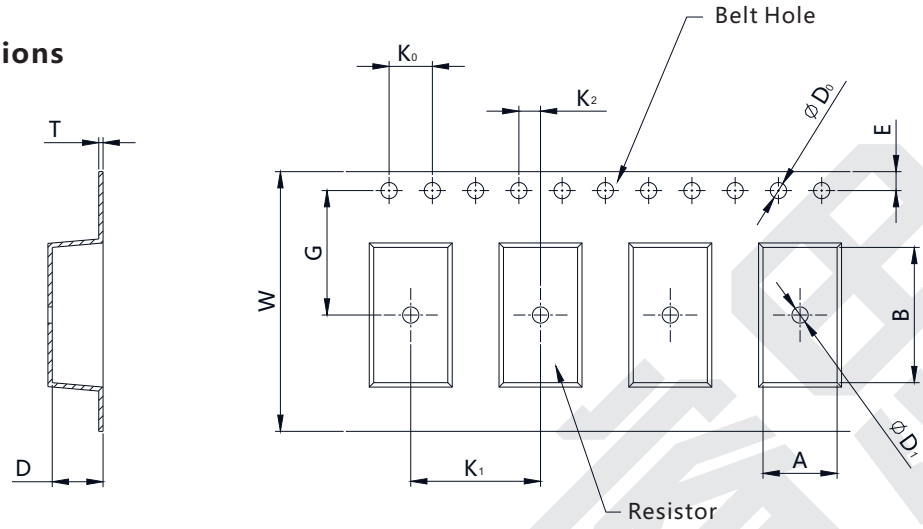
Usage Suggestions

(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

Tape Specifications

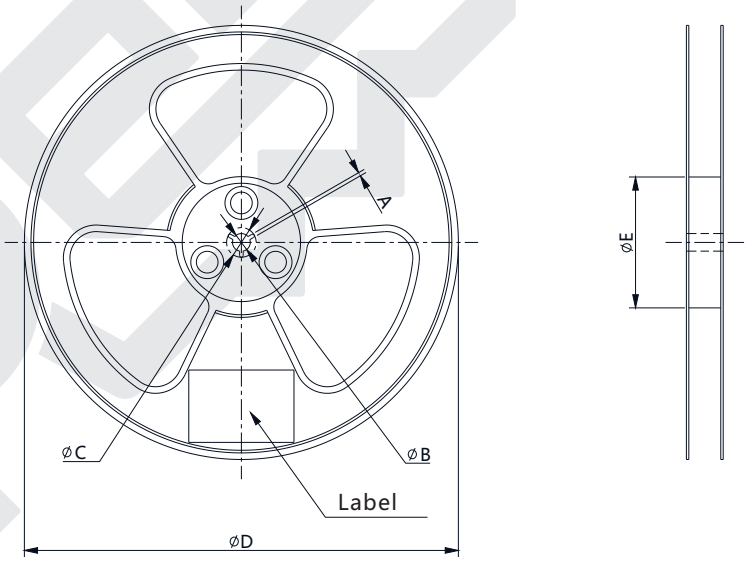
Unit: mm



Resistance	A	B	φD0	φD1	K0	K1	K2	E	G	W	D	T
25mΩ	6.85±0.1	12.50±0.1	1.5+0.1/-0	1.5+0.1/-0	4.00±0.1	12.00±0.1	2.00±0.1	1.75±0.1	11.50±0.1	24.00±0.3	4.7±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

Popular Part Numbers

Part Number	Tolerance	Resistance	TCR	Power	Max. Operating Current
EOAR0005DR025H9	±0.5%	25mΩ	±40ppm/℃	5W	14A
EOAR0005FR025H9	±1%	25mΩ	±40ppm/℃	5W	14A
EOAR0005JR025H9	±5%	25mΩ	±40ppm/℃	5W	14A

Revision

Version	Revised Content	Date	Approver
V0	Initial Issue	2023.09.09	LWW

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