No.：HoS20260331-80
Version：A0

Product Acknowledgement Letter

CustomerName：

ProductName: Bare Alloy Resistor

ProductSpecification: HoLRS2512-4mR-1%-K

ProductCode:

Dateofdocument: 2026-03-31

Approved Company Signature			
Edited by	Reviewed by	Approved by	CompanySeal
ZhenhuanLiao	YongkangHuang	WenyiLeng	

Shenzhen Milliohm Electronic Ltd
Engineering stamp

Customer confirmation seal			
Acknowledged by	Reviewed by	Approved by	Company Seal

Purpose

Through the description of sample characteristics and inspection standards in this acknowledg ement, we can better communicate with customers, reach an agreement, and avoid product qu ality disputes caused by insufficient communication.

Scopeofapplication

This Certificate of Acceptance applies to the samples provided by Shenzhen Haoou Electronics Co., Ltd., and covers product characteristics and inspection standards.

Orderassociation

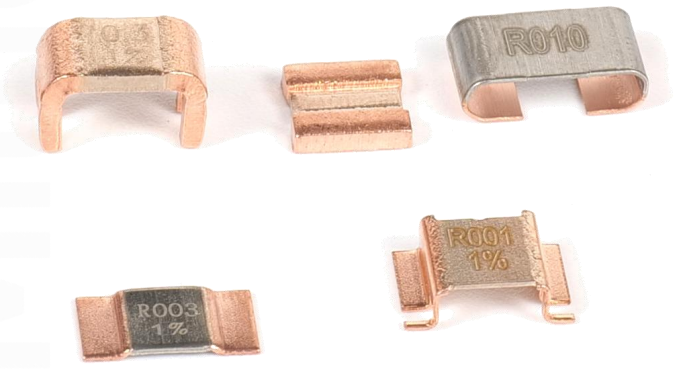
The Customer hereby acknowledges that the specifications and models of materials under all contractual orders with Shenzhen Haoou Electronics Co., Ltd. are consistent with the delivered products. If no objection or confirmation is received, this acknowledgement shall be deemed effective two weeks after the date of receipt by the Customer.

Product Features

1. Electron beam welding process, with dissimilar materials for welded terminals and resistive elements, ensuring excellent performance and ease of soldering;
2. High reliability, high overload capability, and high product precision;
3. Wide operating temperature range with non-inductive design;
4. Compliant with RoHS requirements;

Product ApplicationScope

1. Power supply modules;
2. Industrial instrumentation and equipment;
3. Variable frequency drives;
4. Servo drive systems;
5. Medical equipment;
6. Lighting systems;



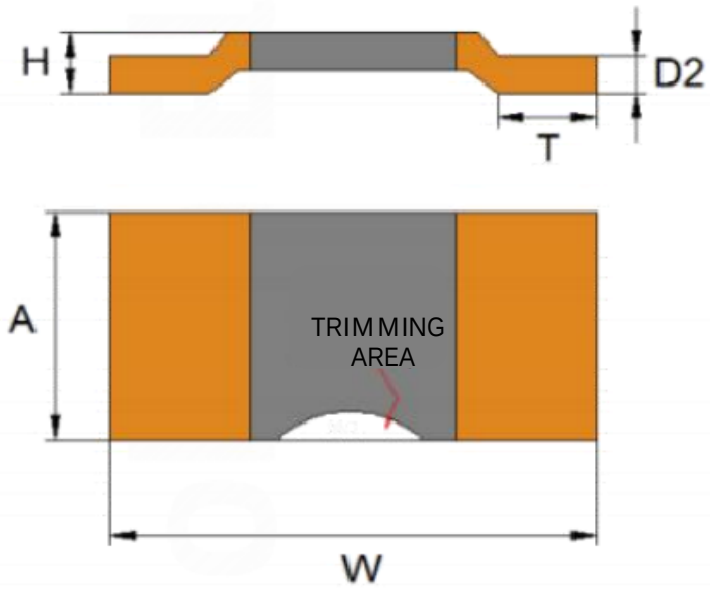
High-tech enterprises IATF16949 ISO9001 RoHS REACH

Selection Example: HoLRS2512-4mR-1%-K	Bare Alloy Resistor

H o | LRS | 2512 | 4mR | 1% | K

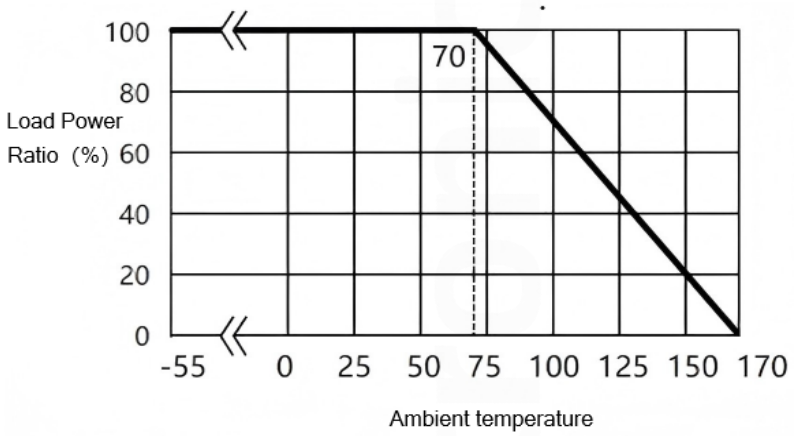
Manufacturer	Product Type	Dimensions (L×W)	Resistance value	Resistance Tolerance	Material
Ho	LRS	2512	4mR	1%	Karma

Product dimensions

Project	Parameter			
Dimensions (mm)	W（6.4±0.3）	A （3.2±0.3）	H（0.8±0.3）	D2(0.32±0.1）
	T（1.2±0.5）			
ProductCode:	**TRIMMING AREA:**Used to adjust product precision without affecting other product performance. If the original precision of some products meets the requirements, no notch adjustment is required. 			
Rated Power	3W			
Rated Current	27.38A			
Accuracy Range	±1%			
Resistance Temperature Coefficient	±50ppm/℃			
Material	Karma			
Operating temperature	-55℃~+170℃			
Customer confirmation	Customer Signature:		Signature date:	
Remarks				

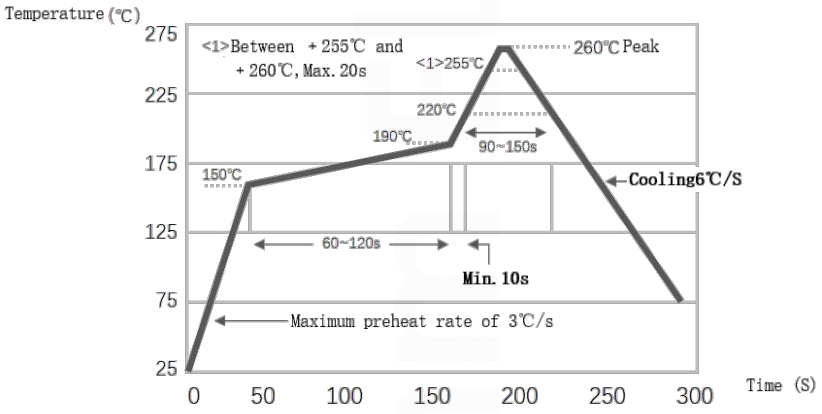
Shenzhen Milliohm Electronic Ltd
Controlled documents

Power Derating Curve



Power curve

Recommended Welding Parameters

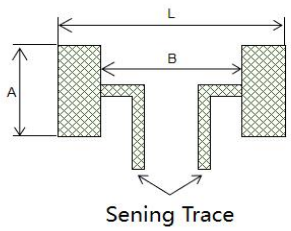


Reflow Soldering Temperature Profile Chart

■ Performance Test

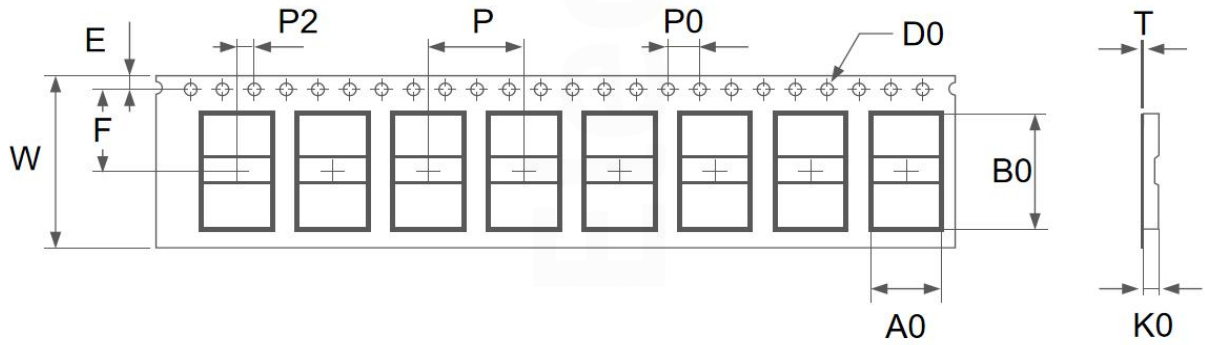
Item	Conditions of Tests	Standards	Test Limits
Short-time Overload	Apply 5 times the rated power for 5 seconds	JIS-C-5201	△R≤±0.5%
Temperature Coefficient of Resistance (TCR)	TCR (ppm/°C) = (R2-R1)/(R1×(T2-T1)) × 10 R1: Resistance measured at room temperature (Ω) R2: Resistance measured at 85°C (Ω) T1: Room temperature (°C) T2: 85°C	JIS-C-5201	Refer to the measured curve
Bending Strength Test	2mm bending specification, with at least 60 seconds of support time	AEC Q200-005	△R≤±0.5 %
Solderability	Soldering temperature: 245±5°C; Immersion time: 3 ±0.5 seconds	AEC-Q200 TEST18 J-STD-002	Solder coverage over than 95%
Solvent Resistance	Immerse in 20~25°C isopropyl alcohol solvent for 60±5 seconds, take it out and let it stand for more than 24 hours, then measure the resistance change rate	AEC-Q200 TEST 12 MIL-STD -202 Method 215	△R≤±0.5 %
Solder Heat Resistance Test	Immerse the resistor in a 260±5°C tin bath for 10±1 seconds, remove it, allow it to rest for at least 60 minutes, then measure the resistance change rate	AEC-Q200 TEST 15 MIL-STD -202 Method 210	△R≤±0.5 %
Temperatu re Cycling Test	1000 cycles (-55~155°C), dwell time at each temperature: 30min, transition time: 15°C/min. Perform electrical test within 24±4 hours after test completion	AEC-Q200 TEST 4 JESD22 Method JA- 104	△R≤±0.5%, No damage to appearance
High-temperature Storage Test	1000 hours at 155°C, no power applied. Measure the resistance change rate within 24±4 hours after test completion. Test duration: 1000 hours	AEC-Q200 TEST 3 MIL-STD-202 Method 108	△R≤±0.5 %
Biased Humidity Test	1000 hours at 85°C, 85% relative humidity, loaded with 10% rated power. Test duration: 1000 hours	AEC-Q200 TEST 7 MIL-STD-202 Method 103	△R≤±0.5 %
Load Life Test	Rated current, Ta=125°C, loaded at 100% power, 0.5 hours off, 1.5 hours on. Test duration: 1000 hours	AEC-Q200 TEST 8 MIL-STD-202 Method 108	△R≤±0.5 %
Low-temperature Storage Test	Test condition: -55°C, storage duration: 1000 hours	EC60115-1- 4.23.4 JIS-C5201-4.23.4	△R≤±0.5 %
Mechanical Shock Test	Half-sine pulse impact in X, Y, Z three directions, duration: 0.5ms, peak acceleration: 100g	AEC-Q200 TEST 13 MIL-STD -202 Method 213	△R≤±0.5 %
Vibration Test	Traverse the entire frequency range from 10 to 2000 Hz within 20 minutes and return to 10 Hz; perform this cycle 12 times in each of the three mutually perpendicular directions (36 times in total)	AEC-Q200 TEST 14 MIL-STD -202 Method 204	△R≤±0.5 %

Recommended Pad Dimensions



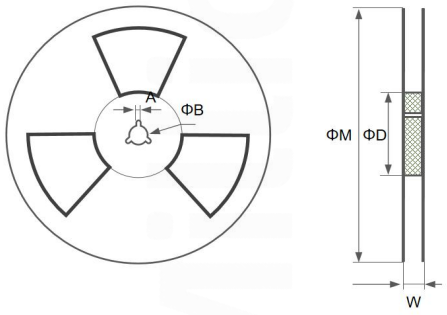
Series	Solder pad	L	A	B
LRS	2512	7	3.4	3.4

■ Tape Specifications (mm)



Size	A0±0.1	B0±0.1	W±0.3	F±0.1	E±0.1	T±0.05	K0±0.1	P±0.1	P0±0.1	P2±0.1
2512	3.75	6.9	12	5.5	1.75	0.3	2.2	8	4	2
	3.75	6.9	12	5.5	1.75	0.3	1.9	8	4	2

■ Reel Specifications （mm）



Size	ΦD	ΦM	Φ B	W	A	Quantity
2512	60±2	178±2.0	13.5±0.5	24±0.5	2.3±0.5	1000PCS

Instructions for Use:

1、Product User Manual

① During product use, ensure surface protection to prevent defects such as dents or scratches on the product surface.

② When handling the product, avoid using sharp tools to prevent surface scratches that may cause resistance drift and failure.

③ During installation and use, avoid subjecting the product to mechanical stress.

④ Long-term operating power must not exceed the rated power to prevent resistance drift caused by sustained overloading.

⑤ When operating under high temperatures or poor heat dissipation conditions, refer to the derating curve for power reduction applications.

⑥ Before use, avoid removing the product from the tape reel to prevent oxidation risks that could lead to soldering defects.

2、Product Storage Instructions

① Store the product at ambient temperatures between 5°C and 35°C, with relative humidity below 65%. Maintain humidity at the lowest possible level.

② Keep the product in a clean, dry environment free from harmful gases.

③ Avoid removing the product from its packaging until ready for use.

④ Under the specified storage conditions, the product remains viable for one year.

⑤ For products stored longer than one year, inspect the surface for oxidation and conduct solderability testing.