

Automotive Current Sensing Resistors

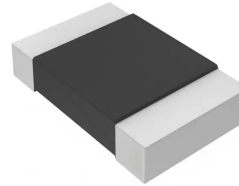
ALMP25 Series

PROSEMI offers AEC-Q200 qualified current Sensing Resistor

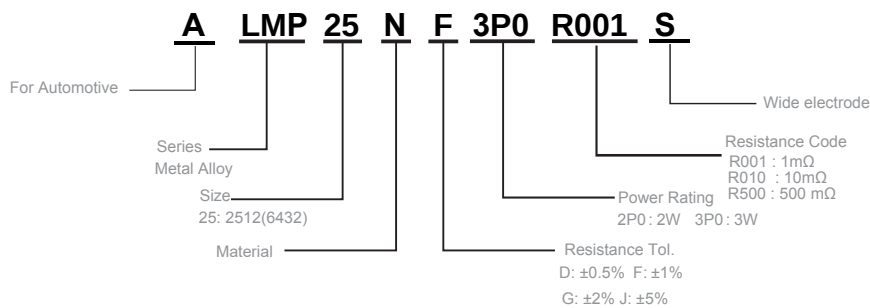


Features

- Proprietary processing technique produces extremely low resistance values
- Very low inductance
- Low thermal EMF
- Metallic Material
- AEC-Q200 qualified available



Part Numbering System



Parameter	Standard
Power Rating	1mΩ~100mΩ : 3W 1mΩ~500mΩ : 2W
Resistance Value	1~500mΩ
Operating Temperature Range	-55 to +170°C
Component Temperature Coefficient (TCR)	± 50 ppm/°C
Maximum Working Voltage (V)	$(P \times R)^{1/2}$
Rating Current (A)	$(P / R)^{1/2}$

P=Power Rating; R=Resistance Value

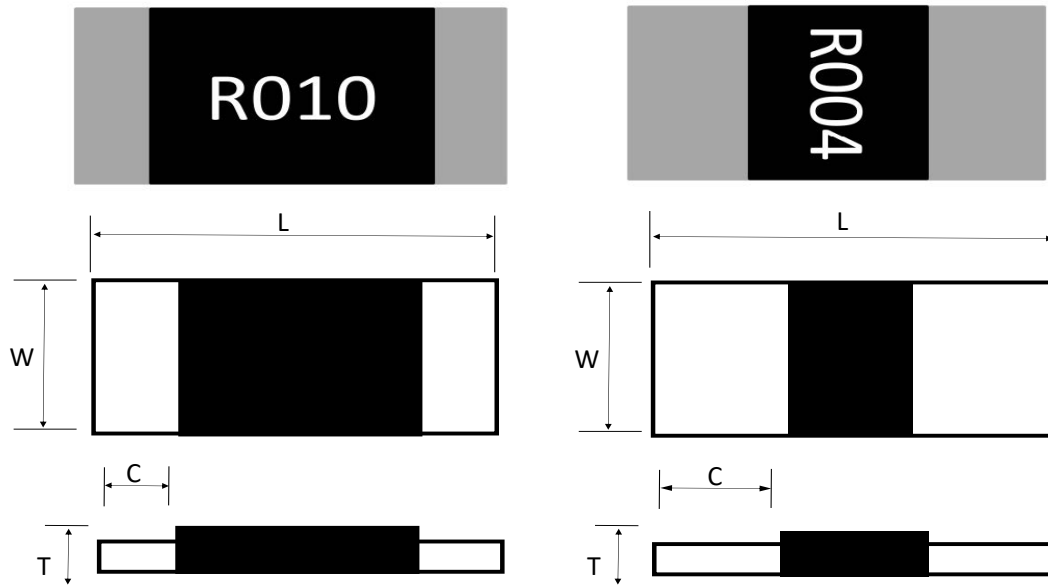
Standard Electrical Specifications

Type	Rating Power at 70°C	T.C.R. (ppm/°C)	Resistance Range(mΩ) 0.5% (D) ; 1.0% (F) 2.0% (G) ; 5.0% (J)	Material	Electrode	Operating Temperature(°C)
ALMP25	2W	50	101-500	R101-R500: Karma	R101-R500: Narrow	-55~+170°C
	2W&3W	50	1-4	R001-R004: Alloy	R001-R004: Wide	
			2-100	R002-R100: Alloy	R002-R100: Narrow	

Automotive Current Sensing Resistors

ALMP25 Series

Construction



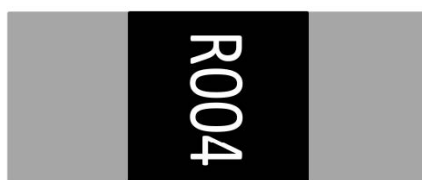
Unit: Millimeters

Type	Power	L	W	C	T
ALMP25	2W&3W	6.4±0.2	3.2±0.2	0.95±0.25 (Narrow)	0.9±0.2
				2.1±0.25(Wide)	

Marking

For ALMP25-S(Wide electrodes)

(1) $R \leq 4\text{m}\Omega$ & P/N with "-S", the marking pattern is as follows.



Resistance value is expressed by 4 digits.

E.G.:

R002 = $0.002\Omega = 2\text{m}\Omega$

R004 = $0.004\Omega = 4\text{m}\Omega$

Automotive Current Sensing Resistors

ALMP25 Series

For ALMP25(Narrow electrodes)

(1) $R > 1\text{m}\Omega$ & P/N without "-S", the marking pattern is as follows.



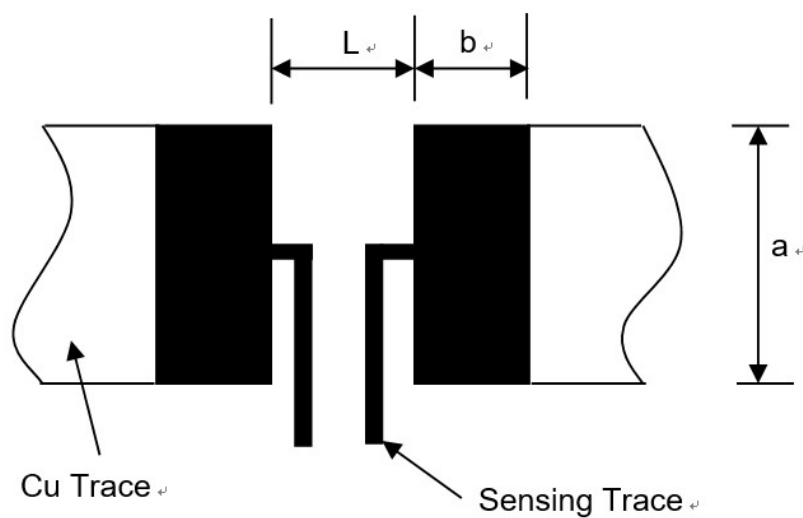
Resistance value is expressed by 4 digits.

E.G.:

$$R010 = 0.010\Omega = 10\text{m}\Omega$$

$$R020 = 0.020\Omega = 20\text{m}\Omega$$

Recommend land pattern



Unit: mm

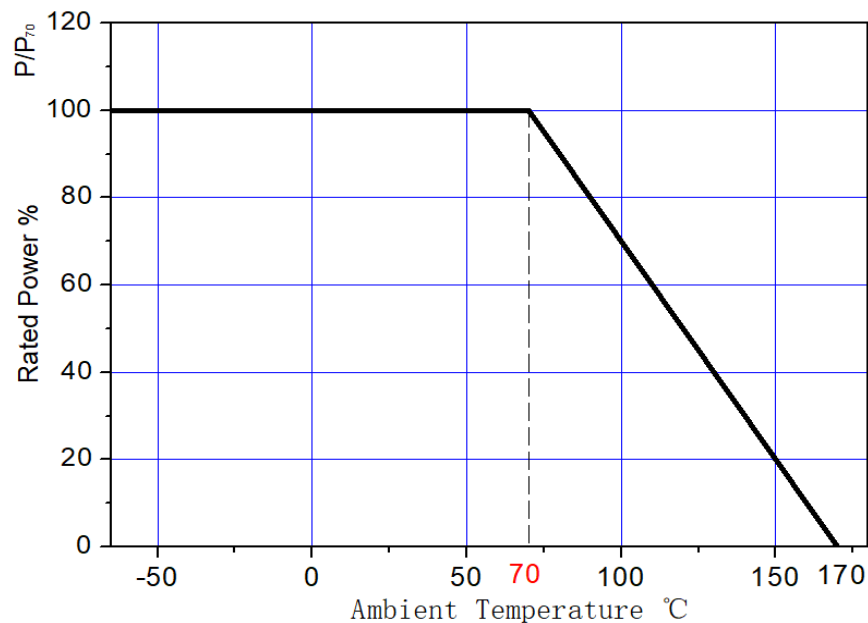
Resistance Range (Ω)	a	b	L
0.001~0.004(Wide)	4.0 ± 0.1	3.1 ± 0.1	1.3 ± 0.1
0.002~0.500(Narrow)	4.0 ± 0.1	2.1 ± 0.1	4.1 ± 0.1

Automotive Current Sensing Resistors

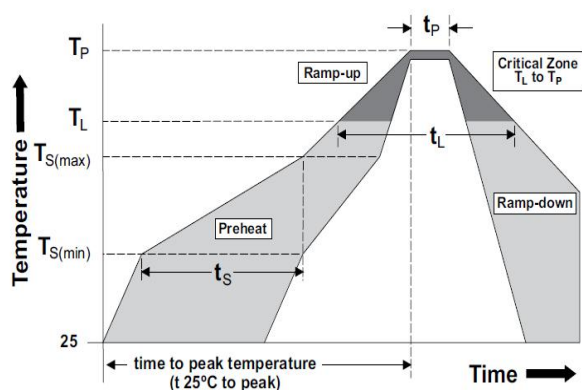
ALMP25 Series

Power Derating Curve

For resistors operated in ambient temperatures 70°C, power rating shall be derated in accordance with the curve below:



Recommended Solder Curve



Reflow Condition		Pb – Free assembly
Pre heat	- Temperature Min ($T_{S(min)}$)	150°C
	- Temperature Max ($T_{S(max)}$)	200°C
	- Time (Min to Max) (t_s)	60 – 120 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		5°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		5°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (t_L)	60 – 150 seconds
Peak Temperature (T_P)		260°C
Time within 5°C of actual peak Temperature (t_P)		20 – 40 seconds
Ramp-down Rate		5°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Wave Soldering		260°C, 10 seconds max.
Hand Soldering		350°C, 5 seconds max.

Automotive Current Sensing Resistors

ALMP25 Series

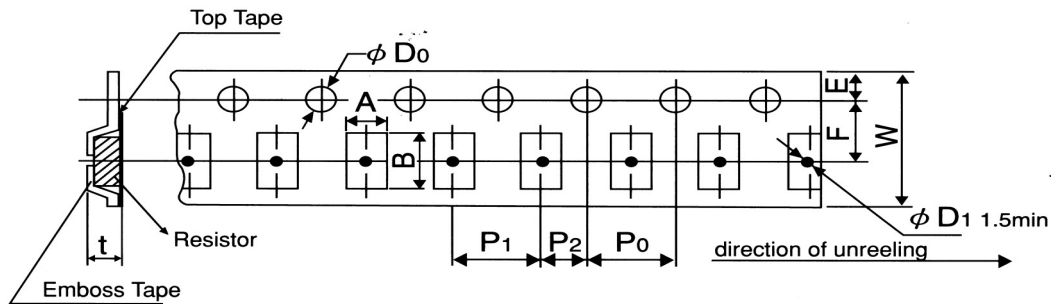
Product Characteristics

Item	Test condition/Methods	Limited	Standard									
Resistance	Measuring resistance value at room temperayure 25 ±5	Refer to Spec	IEC60115-1 4.5									
Temperature coefficient of resistance	TCR= (R-R ₀)/R ₀ (T2-T1)×10 ⁶ R ₀ : resistance of roomtemperature R : resistance of 125 T1 : Room temperature T2 : Temperature at 125	Refer to Spec	MIL-STD-202 Method 304									
Short time Overload	Apply overload for 5 seconds, then measure the change in resistance after 24 hours of rest.	≤ ±0.5%	JIS-C5201									
	<table><tr><td>Type</td><td>Power (W)</td><td># of rated power</td></tr><tr><td>2512</td><td>2</td><td>5 times</td></tr><tr><td>2512</td><td>3</td><td>0.5mR~100mR*5 times 101mR~500mR*4 times</td></tr></table>			Type	Power (W)	# of rated power	2512	2	5 times	2512	3	0.5mR~100mR*5 times 101mR~500mR*4 times
	Type			Power (W)	# of rated power							
	2512			2	5 times							
2512	3	0.5mR~100mR*5 times 101mR~500mR*4 times										
Biased Humidity	+85 , 85% RH , 10%bias,1.5h"NO",0.5h"OFF" ,1000hours	≤ ±0.5%	MIL-STD-202 Method 103									
Temperature Cycling	-55 (30min)/+125 (30min), 1000 cycles	≤ ±0.5%	JESD22 Method JA-104									
Operational Life	125 ± 3 , Apply rated current for 1000 hours	≤ ±0.5%	MIL-STD-202 Method 108									
Low Temperature Storage	-55±2 for 1000hours, No power	≤ ±0.5%	JIS C 5201									
High Temperature Storage	125 for 1000hours, No power	≤ ±1%	MIL-STD-202 Method 108									
Load Life	70 ± 2 , 1000 hours, at rated power 1.5 hours "ON", 0.5 hours "OFF"	≤ ±1%	MIL-STD-202 Method 210									
Resistance to Solder Heat	260±5 , 10±1s	≤ ±0.5%	MIL-STD-202 Method 210									
Solderability	Immerse in the furnace at 245 ± 5 for 3 ± 1 seconds, then take it out and put it under a magnifying glass to observe the solder area	The electrode shall cover more than 95% of new tin.	J-STD-002									
Joint Strength of Solder	Welded in the bending test plate, placed on the bending test machine, apply force in the center of the test plate, and measure the change rate of resistance value under load.	≤ ±0.5%	JIS-C5201									

Automotive Current Sensing Resistors

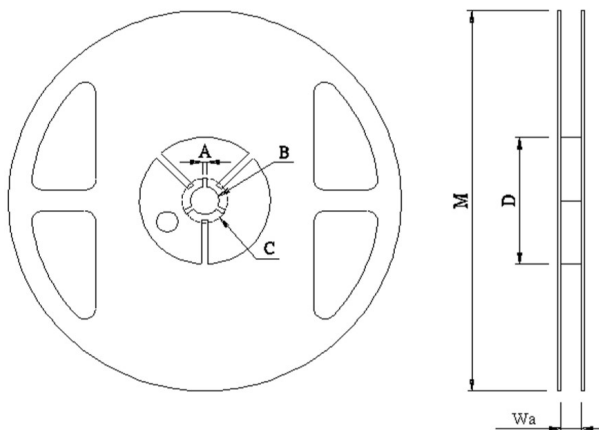
ALMP25 Series

Tapping & Package



Type	Pack	A ± 0.2	B ± 0.2	D0 $+0.5-0$	E ± 0.1	F ± 0.05	P0 ± 0.1	P1 ± 0.1	P2 ± 0.1	W ± 0.2	D1 ± 0.05	T ± 0.15
2512	Emboss	3.60	6.90	1.50	1.75	5.50	4.00	4.00	2.00	12.00	1.50	1.20

Reel Specification



Type	A	B	C	D	M	W
2512	2.00 ± 0.5	13.50 ± 0.5	21.00 ± 0.5	80.00 ± 1.0	178.00 ± 2.0	13.80 ± 0.5

Packaging

Quantity: 4, 000pcs

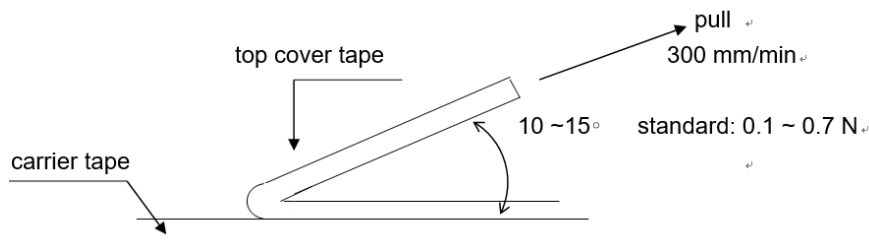
12mm wide tape on 178mm(7 inch)
diameter reel -specification EIA
Standard 481.

Automotive Current Sensing Resistors

ALMP25 Series

Peel strength of upper belt

Stripping speed: 300 mm / min; The peel force is between 0.1N and 0.7N.



Storage conditions & shelf life

It can be stored for 2 years under closed conditions with temperature of 5 ° C ~ 35 ° C and relative humidity of 40 ~ 75

Please avoid the following harsh environment during storage to avoid affecting the product performance and solder connectivity: the places with corrosive gases such as sea breeze, Cl₂, H₂S, NH₃, SO₂ and NO₂ shall be stored without direct sunlight.

Precautions for product use

When measuring the resistance value before welding, a special resistance meter with high precision shall be used. When measuring, a 4-wire probe or fixture must be used. 4. When measuring parts with a wire measuring needle, the 4 measuring needles must indeed contact the parts.

Avoid damaging the protective layer during manual welding or clamping with tweezers.

When the PCB is divided or fixed on the support, be careful to avoid excessive bending causing mechanical stress to the resistor.

It shall be used within the rated power range within the specification, especially when the power exceeds the rated value, which may affect the reliability of the product