

APSRP Series-Prosemi Shunt Resistors

APSRP Series

Features

- Metal Alloy Low-Resistance shunt resistor.
- Resistance value 0.4mΩ.
- Low thermal EMF.
- Low TCR.
- Very low inductance.
- Halogen free, lead free and RoHS compliant.
- AEC-Q200 qualified available.

Applications

- Power modules.
- Frequency converters.
- Current sensor for power hybrid sources high current for automotive.
- Lithium battery protection board.

Part Number

APSRP 25 S 6 F 0M40 - X

【1】 【2】 【3】 【4】 【5】 【6】 【7】

【1】Series Name: Prosemi Shunt Resistor for Automotive.

【2】Chip Size: 25: 2512;

【3】Material: S: CuMnSn.

【4】Power Rating: 6=6W.

【5】Resistance Precision: D:±0.5% ; F: ±1% ; G : ±2% ; J:±5% ;

【6】Resistance Code: 0M40: 0.4mΩ.

【7】Internal Code: X

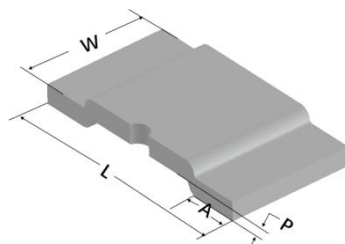
Electrical Characteristics

Size	Power Rating at 70°C* (W)	Resistance Range(mΩ)**	Element Material	Resistance Tolerance(%)	Operation Temperature Range	Temperature coefficient (ppm/°C)
2512	6	0.4	S	±0.5; ±1; ±2; ±5;	-65°C~+170°C	±175

“*” : Power at terminal temperature of 70°C.

“* *”: Development schedule will vary depending on resistance value. Please contact us for resistance values.

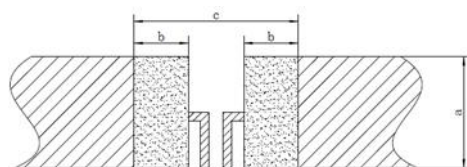
Physical Dimensions



Size	Resistance (mΩ)	L	W	A	P	Element Material
2512	0.4	6.4 ± 0.2	3.2 ± 0.2	1.10 ± 0.2	0.45 ± 0.1	S

Unit: mm

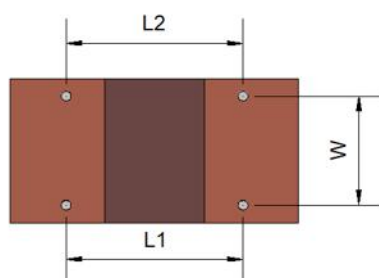
Recommended Solder Pad Layout



Unit: mm

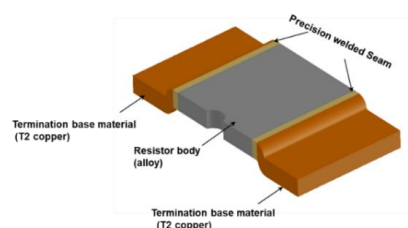
Type	Resistance (mΩ)	c	a	b
2512	0.4	7	3.4	1.8

Test Point



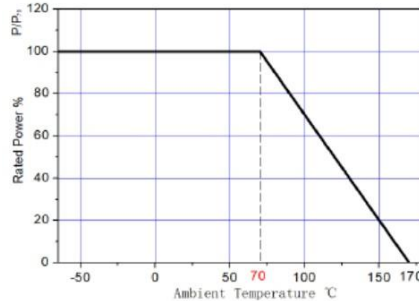
Type	Resistance (mΩ)	L1(mm)	L2(mm)	W(mm)
2512	0.4	5.6	5.6	1.4

Construction

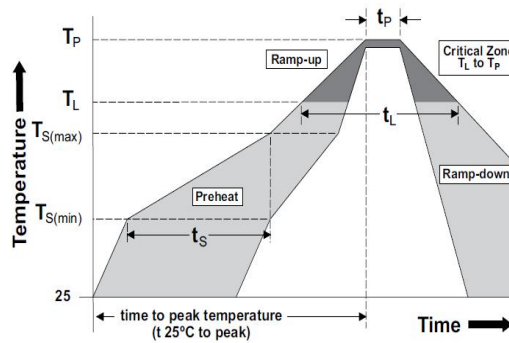


Power Derating Curve

For resistors operated in ambient temperatures 70°C, power rating shall be derated in according 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		Not applicable
Hand Soldering		350°C, 5 seconds max.

Product Marking



2512

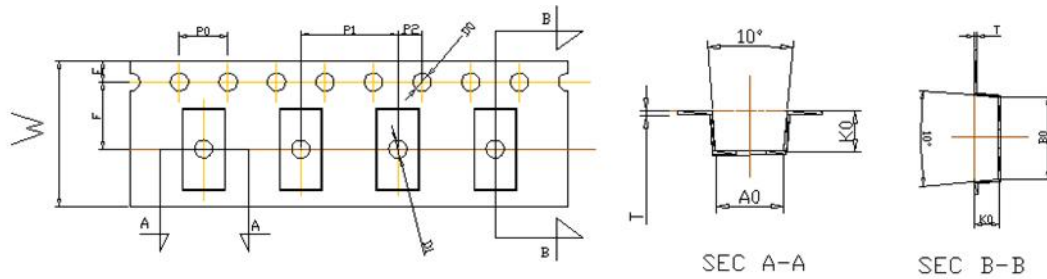
- 1、 The characters and directions are shown in the figure above:
- 2、 Encoding rules: "0M40": 0.4mΩ ;

Product Characteristics

Item	Test condition/ Methods	Limited	Standard
Resistance	Measuring resistance value at room temperature $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$	Refer to Spec	IEC60115-1 6.1
Temperature Coefficient of Resistance	$\text{TCR}(\text{ppm}/^{\circ}\text{C}) = (R2-R1/R1*(T2-T1)) \times 10^6$ R1: resistance value measured at room temperature (Ω) R2: Resistance measured at 125°C (Ω) T1: room temperature ($^{\circ}\text{C}$) T2: 125°C	Refer to Spec	MIL-STD-202 Method 304
Short Time Overload	Apply 5 times rated power for 5 seconds, and measure the resistance change after standing for 24 hours.	$\pm 1\%$	IEC 60115-1 8.1
High Temperature Storage	170°C for 1000 hours, No power	$\pm 1\%$	MIL-STD-202 Method 108
Temperature Cycling	-55°C , (15min)/ $+150^{\circ}\text{C}$ (15min), 1000 cycles, transition time less than 1 minute	$\pm 1\%$	JESD22 Method JA-104
Operational life	$70^{\circ}\text{C} \pm 2^{\circ}\text{C}$, 1000 hours, at rated power 1.5 hours "ON", 0.5 hours "OFF"	$\pm 1\%$	IEC 60115-1 7.1
Mechanical shock	Condition C ,100 g's ,6 msec, 3 mutually perpendicular axes, in 6 directions, three impacts each for a total of 18 times 18 shocks	$\pm 1\%$	MIL-STD-202 Method 213
Vibration	5g's for 20 minutes 12 cycles each of 3 orientations. Test from 10 Hz - 2000 Hz	$\pm 1\%$	MIL-STD-202 Method 204
Resistance to Soldering Heat	Condition K, temperature above 217°C , 60s – 150s	$\pm 0.5\%$	MIL-STD-202 Method 210
Solderability	$245 \pm 5^{\circ}\text{C}$ time: 5sec+0/-0.5sec.	$\geq 95\%$	J-STD-002
Bias Humidity	$+85^{\circ}\text{C}$, 85%RH, 10% of operating power, 1000 hours	$\pm 1\%$	MIL-STD-202 Method 103
Board Flex	Bending Distance: 2mm, 60+5s	$\pm 1\%$	AEC-Q200-005

Packaging

Tape Dimensions

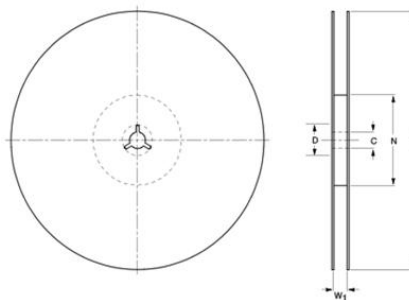


2512

Unit: mm

Series	Type	A(mm)	B(mm)	E(mm)	F (mm)	W (mm)	T(mm)
2512	0.4mΩ	3.50±0.10	6.70±0.10	1.75±0.10	5.50±0.10	12.00±0.10	0.20±0.05
Series	Type	P0(mm)	P1(mm)	P2(mm)	D0(mm)	D1(mm)	K0(mm)
2512	0.4mΩ	4.00±0.10	4.00±0.10	2.00±0.1	1.50±0.10	1.50±0.10	1.65±0.10

Reel Dimensions



2512

Unit: mm

Series	Type	A (mm)	N (mm)	C (mm)	D (mm)	W1 (mm)
2512	0.4mΩ	178.0±2.0	60.0±1.0	13.5±0.5	21±0.8	13.6±0.5

Quantity of Package

Series	Type	Quantity(pcs)
2512	0.4mΩ	2500

Storage

1. The temperature condition must be controlled at $25\pm 5^{\circ}\text{C}$, The R.H. must be controlled at $60\pm 15\%$ Store in accordance with this requirement, and the validity period is two years after the date of manufacture.
2. Please avoid the mentioned harsh environment below when storing to ensure product performance and its' solderability. Places exposed to sea breeze or other corrosive gas, such as Cl_2 , H_2S , NH_3 , SO_2 and NO_2 .
3. When the product is moved and stored, please ensure the correct orientation of the box. Do not drop or squeeze the box. Otherwise, the electrode or the body of the product may be damaged.