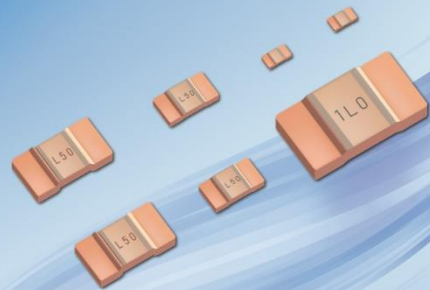


**PRODUCT  
DATASHEET**

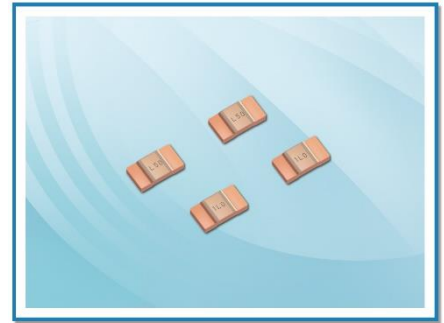


**MRP2512 Series Current Sensing Resistor**

## MRP2512 Series Current Sensing Resistor

### Description

MRP is an all-metal current sensing resistor. Welded metal strip construction carries long term stability is ideal for high current sensing. Precise resistance tolerance and wide operating temperature make this product suitable for various applications to meet the growing high-power electronics, servers, and electrical vehicles nowadays.





### Features

- Chip size from 1206 to 5930
- Resistance value from 0.2mΩ to 5mΩ
- Low thermal EMF
- Low TCR
- AEC-Q200 compliant
- Superior pulse tolerance

### Application

- Switching model power supply
- DC/DC & DC/AC converters
- Li-ion battery management
- Test Instrument and meters
- Motor controls

### Environmental Compliance

Regulation	Standard
 RoHS	2011/65/EU
 Halogen Free	IEC 61249-2-21:2003

### Electrical Characteristics

Size Type	Power Rating at 70 °C (W)	Resistance Range (mΩ)	TCR (ppm/°C)	Resistance tolerance	Operating Temp. Range
2512	6	0.25	±200	±1% (F)	-65 °C ~ +170 °C
		0.3	±150		
		0.5	±115		
	5	0.75	±115		
		1	±100		
		2	±50		
	4	3	±50		
	3	4			
2.5	5				

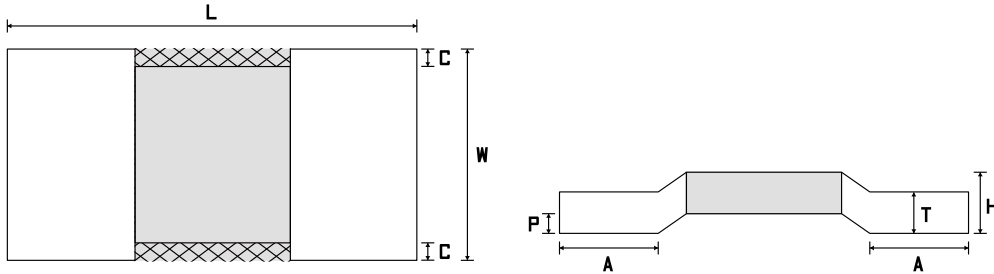
### Part Number System

**MRP 25 P 06 S F 0L25**  
[1] [2] [3] [4] [5] [6] [7]

- [1] Series name, Metal Resistor for current sensing, all-metal Power series  
 [2] Chip size, 12: 1206, 25:2512, 39:3920, 59:5930  
 [3] Polytronics symbol  
 [4] Power code, 2.5: 2.5W, 06: 6W  
 [5] Material code, M:MnCu, N:NiCrAl, S: SnMnCu, F: FeCrAl  
 [6] Resistance tolerance, F: ±1%  
 [7] Resistance code, 0L25=0.25 mΩ, R002=2 mΩ

## MRP2512 Series Current Sensing Resistor

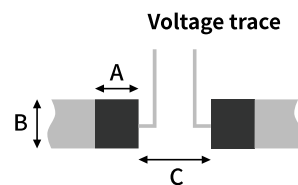
### Physical Dimensions (mm)



Size Type	Resistance (mΩ)	L	W	H	T	A	C (Max.)	P
2512	0.25	6.50±0.30	3.25±0.30	1.35±0.15	1.00±0.15	0.90±0.20	0.4	0.35±0.10
	0.3			1.17±0.15	0.82±0.15			
	0.5			1.07±0.15	0.72±0.15			
	0.75			0.95±0.15	0.60±0.15			
	1			0.73±0.15	0.38±0.15			
	2			0.96±0.15	0.61±0.15			
	3			0.76±0.15	0.41±0.15			
	4			0.70±0.15	0.35±0.15			
	5			0.66±0.15	0.31±0.15			

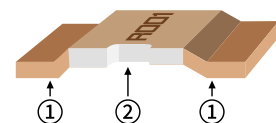
### Recommended Solder Pad Layout (mm)

Size Type	Resistance (mΩ)	A	B	C
2512	0.25 ~ 5	1.80	3.40	3.80



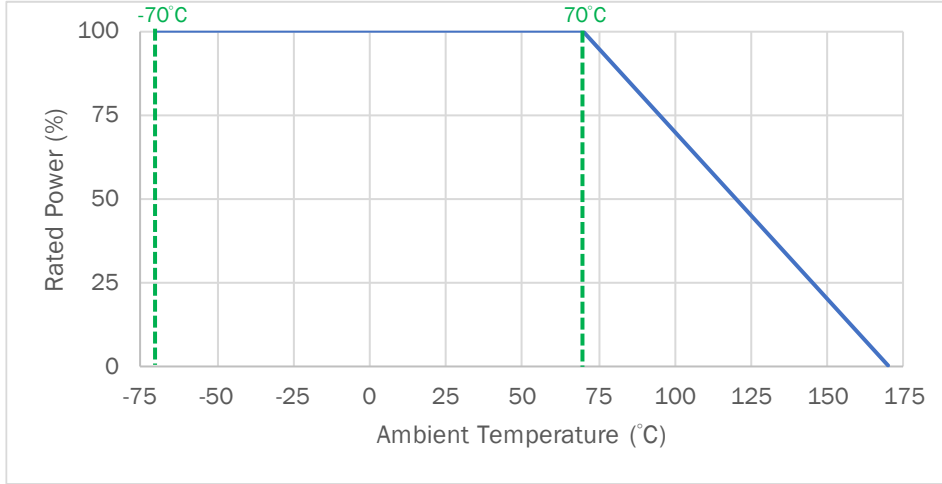
### Physical Specifications

<b>Materials</b>	Electrode: ① Copper Element: ② MnCu / FeCrAl / NiCrAl / SnMnCu
<b>Solderability</b>	MIL-STD-202



## MRP2512 Series Current Sensing Resistor

### Thermal Derating Curve



### Marking and Packaging Quantity

Size Type	Resistance (mΩ)	Part Number	Packing Quantity	Marking
2512	0.25	MRP25P06SF0L25	4000	L25
	0.3	MRP25P06SF0L30	4000	L30
	0.5	MRP25P05MF0L50	4000	L50
	0.75	MRP25P05MF0L75	4000	L75
	1	MRP25P05MFR001	4000	1L0
	2	MRP25P05NFR002	4000	2L0
	3	MRP25P04FFR003	4000	3L0
	4	MRP25P03FFR004	4000	4L0
	5	MRP25P2.5FFR005	4000	5L0

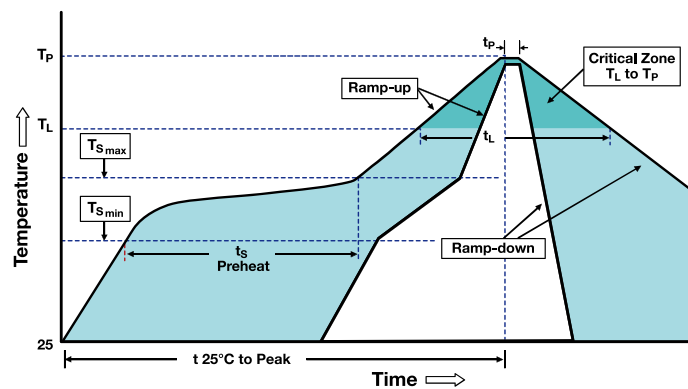
## MRP2512 Series Current Sensing Resistor

### Reliability Test

Test Item	Test Method	Procedure	Requirements
Temperature Coefficient of Resistance (T.C.R)	JIS-C-5201-1 4.8 IEC-60115-1 4.8	At 25°C /+150°C, 25°C is the reference temperature	As Spec
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	5 times of rated power	$\Delta R/R1 \leq \pm(1.0\%+0.0005\Omega)$
High Temperature Exposure (Storage)	JIS-C5201-1 4.25 IEC 60068-2-2	At 170°C for 1000 hours. Measurement at 24±4 hours after test conclusion.	$\Delta R/R1 \leq \pm(1.0\%+0.0005\Omega)$
Temperature Cycling	JESD22 Method JA-104	1000 Cycles (-55°C to +155°C) Measurement at 24±4 hours after test conclusion. 30min maximum dwell time at each temperature extreme.	$\Delta R/R1 \leq \pm(1.0\%+0.0005\Omega)$
Biased Humidity	MIL-STD-202 Method 103	1,000 hours; 85°C / 85% RH, 10% of operating power. Measurement at 24±4 hours after test conclusion.	$\Delta R/R1 \leq \pm(1.0\%+0.0005\Omega)$
Operation Life	MIL-STD-202 Method 108	Condition D Steady State TA=125 °C at derated power. Measurement at 24±4 hours after test conclusion.	$\Delta R/R1 \leq \pm(1.0\%+0.0005\Omega)$
Moisture resistance	MIL-STD 202 Method 106	T=24 hours per Cycle, 10 Cycles, unpowered. Steps 7a & 7b not required.	$\Delta R/R1 \leq \pm(1.0\%+0.0005\Omega)$
Mechanical Shock	MIL-STD-202 Method 213	Test ½ Sine Pulse, Peak value: 100g, normal duration: 6ms, Velocity change:12.3ft/sec.	$\Delta R/R1 \leq \pm(0.5\%+0.0005\Omega)$
Vibration	MIL-STD-202 Method 204	5 g's for 20 min., 12 cycles each of 3 orientations. Note: Test from 10-2000Hz	$\Delta R/R1 \leq \pm(0.5\%+0.0005\Omega)$
Board Flex	AEC Q200-005	Beading once for 60 seconds, 2mm	$\Delta R/R1 \leq \pm(1.0\%+0.0005\Omega)$
Solderability	J-STD-002	245±5°C for 3 seconds	> 95% coverage (electrode area)

### Soldering Parameters

Reflow Soldering	Pb-free assembly
Average Ramp-Up Rate ( $T_{S_{max}}$ to $T_P$ )	3°C/second max.
Preheat	
-Temperature Min ( $T_{S_{min}}$ )	150°C
-Temperature Max ( $T_{S_{max}}$ )	200°C
-Time ( $T_{S_{min}}$ to $T_{S_{max}}$ )	60-180 seconds
Time maintained above:	
-Temperature ( $T_L$ )	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 seconds max.
Ramp-Down Rate	6°C /second max.
Time 25°C to Peak Temperature	8 minutes max.



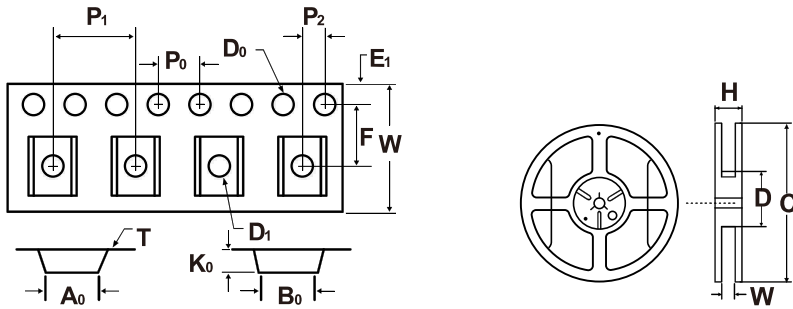
Hand Soldering 350°C peak temperature, 5 second max.

Note: If temperatures exceed the recommended profile, devices may not meet the performance requirements.

## MRP2512 Series Current Sensing Resistor

### Tape & Reel Specification (mm.)

Devices are packaged per EIA481 and EIA-2 standard



### Tape measurements

Size Type	Resistance (mΩ)	W	F	E <sub>1</sub>	D <sub>0</sub>	D <sub>1</sub>	P <sub>0</sub>
2512	0.25, 0.3, 0.5, 0.75, 2	12.00 ± 0.30	5.50 ± 0.10	1.75 ± 0.10	1.50 ± 0.10	1.50 ± 0.10	4.00 ± 0.10
2512	1, 3	12.00 ± 0.30	5.50 ± 0.10	1.75 ± 0.10	1.50 ± 0.10	1.50 ± 0.10	4.00 ± 0.10
2512	4, 5	12.00 ± 0.30	5.50 ± 0.10	1.75 ± 0.10	1.50 ± 0.10	1.50 ± 0.10	4.00 ± 0.10

Size Type	Resistance (mΩ)	P <sub>1</sub>	P <sub>2</sub>	A <sub>0</sub>	B <sub>0</sub>	T	K <sub>0</sub>
2512	0.25, 0.3, 0.5, 0.75, 2	4.00 ± 0.10	2.00 ± 0.10	3.55 ± 0.10	6.75 ± 0.10	-	1.40 ± 0.10
2512	1, 3	4.00 ± 0.10	2.00 ± 0.10	3.55 ± 0.10	6.75 ± 0.10	-	1.10 ± 0.10
2512	4, 5	4.00 ± 0.10	2.00 ± 0.10	3.55 ± 0.10	6.75 ± 0.10	-	0.80 ± 0.10

### Reel measurements

Size Type	H	W	D	C
2512	16.5 ± 0.5	-	62.0 ± 1.0	250.0 ± 2.0

### Storage

- The ambient temperature recommended for storage shall be between 5°C ~ 30°C.
- The relative humidity recommended for storage shall be between 25%RH ~ 60%RH.
- Sealed plastic bags with desiccant shall be used to reduce the oxidation of the terminals and shall only be opened prior to use.

## MRP2512 Series Current Sensing Resistor

- The products shall not be stored in areas where harmful gases containing sulfur or chlorine are present.