3W, 2512, Low Resistance Chip Resistor (Lead / Halogen Free)

1. Scope

   This specification applies to 6.35mm x 3.2mm size 3W.

2. Features / Applications

   – High power rating is up to 3W
   – Welding construction; excellent long-term stability
   – Ideal for all types of current sensing, voltage division and pulse applications
   – Industrial applications & Current Sensor Resistor
   – RoHS compliant

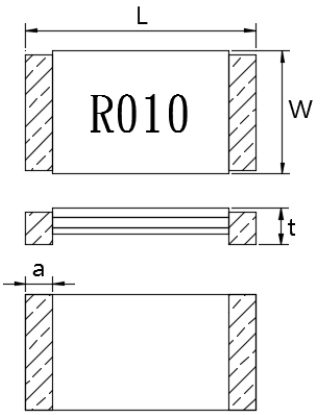
3. Type Designation

S C M M	2512	S	3	—	□ □ □ □	□
(1)	(2)	(3)	(4)	—	(5)	(6)

Where

(1) Series No.
(2) Size
(3) Terminal Type:
S = Short terminal type
(4) Power Rating:
3 = 3W
(5) Resistance value:
R010 = 0.01Ω, 0M30 = 0.0003Ω
(6) Tolerance
F = ±1%, G = ±2%, J = ±5%

4. Dimensions and schematic



Dimensions (mm)	Resistance Range[1]			
	0.3, 0.5, 0.75, 0.8 mΩ	1, 2, 3, 4 mΩ	5, 6 mΩ	7, 8, 9, 10, mΩ
L	6.35 ± 0.25			
W	3.20 ± 0.25			
t	0.60 ± 0.25			
a	2.55 ± 0.25	2.05 ± 0.25	1.15 ± 0.25	0.70 ± 0.25

Note: 1. Other resistance value required, please contact sales
2. 0.3, 0.5, 0.75, 0.8mΩ without marking

Figure 1. Construction and Dimensions

5. Specification

Characteristics	Feature		
Power Rating*	3W		
Resistance Value	0.3 ~ 10 mΩ		
Temperature Coefficient of Resistance	0.3 mΩ	0.5, 0.75, 0.8 mΩ	1, 2, 3, 4, 5, 6, 7, 8, 9, 10 mΩ
	± 125 ppm/℃	± 75 ppm/℃	± 50 ppm/℃
Operation Temperature Range	-65℃ ~ +170℃		
Resistance Tolerance	± 1%(F), ± 2%(G), ± 5%(J)		
Insulation Resistance	Over 100MΩ		
Maximum Working Voltage (V)	$(P*R)^{1/2}$		

Note * :

For resistors operated at ambient temperature in excess of 70℃, the maximum load shall be derated in accordance with the following curve.

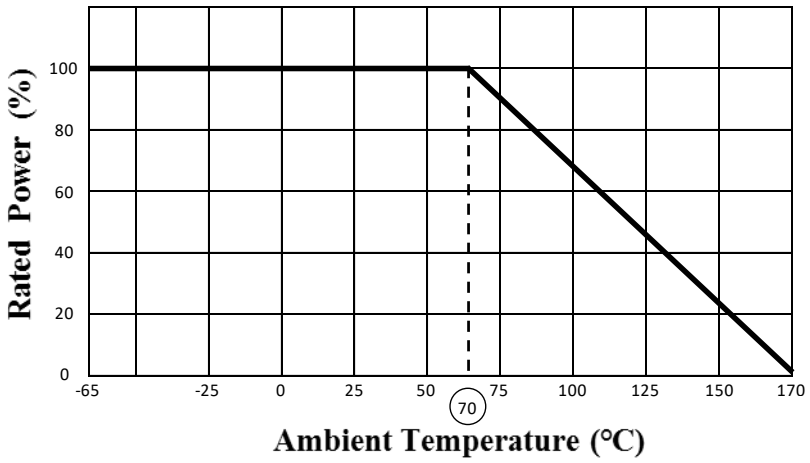


Figure 2.：Power Temperature Derating Curve

6. Characteristics

6-1 Electrical

Item	Specification and Requirement	Test Method
Temperature Coefficient (TCR)	As follow specification .	JIS-C-5201 +25℃/ +125℃
Short Time Overload	ΔR: ± 0.5% Without damage by flashover, spark, arcing, burning or breakdown	JIS-C-5201-1 4.13 2.5 x rated power for 5 seconds
Insulation Resistance	Over 100 MΩ on Overcoat layer face up	JIS-C-5201-1 4.6 $100V_{DC}$ for 60 +10/-0 seconds
Voltage Proof	ΔR: ± 1% Without damage by flashover, spark, arcing, burning or breakdown	JIS-C-5201-1 4.7 $400V_{AC}$(rms.) for 60 +10/ -0 seconds
ESD	ΔR: ± 1%	AEC-Q200-002 Human body, 3KV

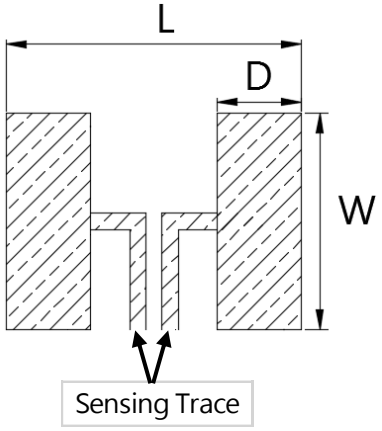
6-2 Mechanical

Item	Specification and Requirement	Test Method
Solderability	The surface of terminal immersed shall be minimum of 95% covered with a new coating of solder	JIS-C-5201-1 4.17 245 ± 5℃ for 5 ± 0.5 seconds
Resistance to Solder Heat	ΔR: ± 0.5% Without distinct deformation in appearance	JIS-C-5201-1 4.18 260±5℃ for 10± 1 seconds
Board Flex	ΔR: ± 1.0% Without mechanical damage such as break	AEC-Q200-005 Bending value: 2 mm for 60 ± 1 seconds
Resistance to solvent	Without mechanical and distinct damage in appearance	MIL-STD-202 Method 215 Add Aqueous wash chemical - OKEM Clean or equivalent. Do not use banned solvents
Vibration	ΔR: ± 0.5% Without mechanical damage such as break	MIL-STD-202 Method 204 5g's for 20 minutes,12 cycles each of 3 orientations. Test from 10-2000Hz
Mechanical Shock	ΔR: ± 0.5% Without mechanical damage such as break	MIL-STD-202 Method 213 100g's peak value, 6ms, Half-sine waveform, 12.3ft/sec
Terminal Strength (SMD)	ΔR: ± 1% Without mechanical damage such as break.	AEC-Q200-006 Force of 1.8Kg for 60 seconds.

6-3 Endurance

Item	Specification and Requirement	Test Method
Temperature Cycling	ΔR: ± 0.5% Without distinct damage in appearance	JESD22 Method JA-104 1000 cycles, (-55℃~150℃) 30min maximum dwell time at each temperature.
Biased Humidity	ΔR: ± 0.5%	MIL-STD-202 Method 103 1000 hours, 85℃/85%R.H, applied for 10% rated power Measurement at 24±4 hours after test conclusion.
Operational Life	ΔR: ± 1.0% Without distinct damage in appearance	MIL-STD-202 Method 108 70℃, 100% rated power 1.5 hours ON, 0.5 hours Off For total 1000 hours Measurement at 24±4 hours after test conclusion.
High Temperature Storage	ΔR: ± 1.0% Without distinct damage in appearance	MIL-STD-202 Method 108 170℃ for total 1,000 hours

7. Recommended Solder Pad Dimensions

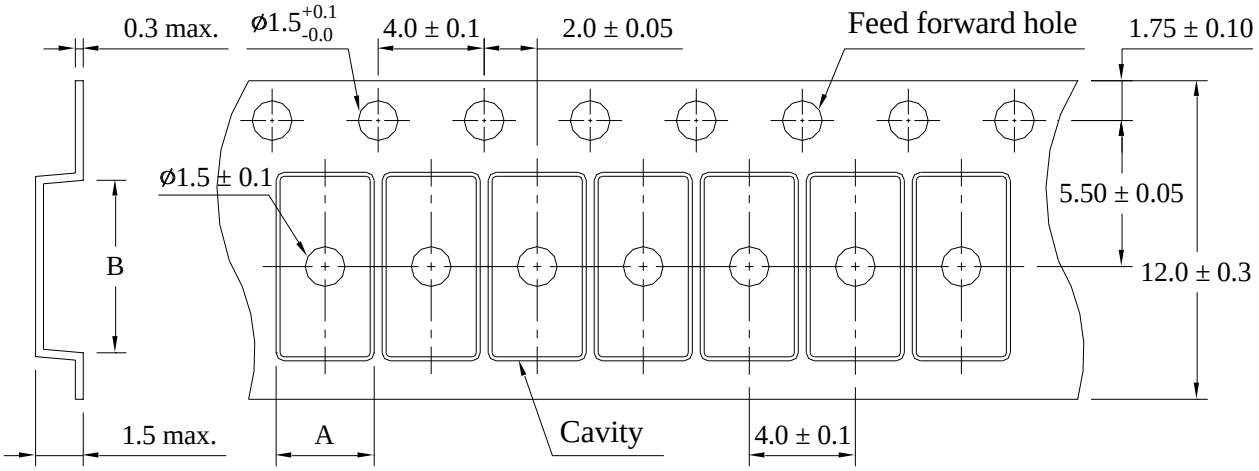


Resistance Range	Dimensions		
	W (mm)	L (mm)	D (mm)
0.3, 0.5, 0.75, 0.8, 1, 2, 3, 4 mΩ	3.7	7.35	3.20
5, 6 mΩ			2.10
7, 8, 9, 10 mΩ			1.65

8. Packaging

8-1 Dimensions

8-1-1 Tape packaging dimensions

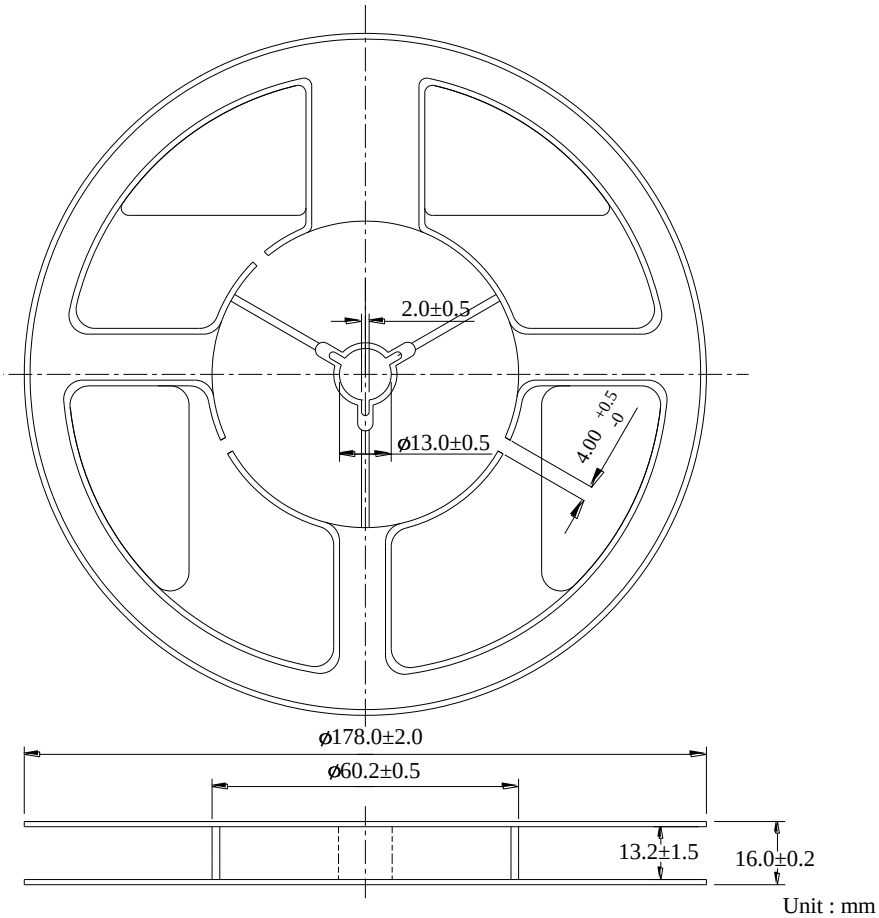


A = 3.60 ± 0.20

B = 6.80 ± 0.20

Unit : mm

8-1-2 Reel dimensions

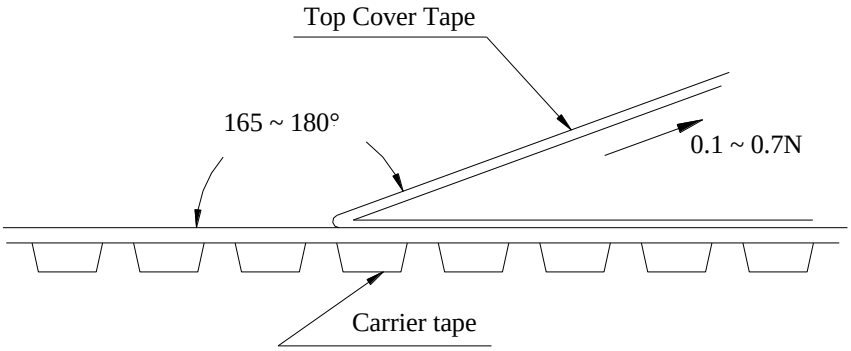


Unit : mm

8-2 Peel Strength of Top Cover Tape

The peel speed shall be about 300mm/min.

The peel force of top cover tape shall between 0.1 to 0.7N



8-3 Number of Taping

2,000 pieces / reel

8-4 Label marking

The following items shall be marked on the reel.

(1) Type designation
(2) Quantity
(3) Manufacturing date code
(4) Manufacturer’s name
(5) The country of origin

9. Care note

9-1 Care note for storage

(1) Chip resistor shall be stored in a room where temperature and humidity must be controlled. (temperature 5 to 35℃, humidity < 60% RH) However, a humidity keep it low, as it is possible.

(2) Chip resistor shall be stored as direct sunshine doesn't hit on it.

(3) Chip resistor shall be stored with no moisture, dust, a material that will make solderability inferior, and a harmful gas (Chloridation hydrogen, sulfurous acid gas, and sulfuration hydrogen)

9-2 Care note for operating and handling

(1) It is necessary to protect the edge and protection coat of resistors from mechanical stress.

(2) Handle with care when printing circuit board (PCB) is divided or fixed on support body, because bending of printing circuit board (PCB) mounting will make mechanical stress for resistors.

(3) Resistors shall be used with in rated range shown in specification. Especially, if voltage more than specified value will be loaded to resistor, there is a case it will make damage for machine because of temperature rise depending on generating of heat, and increase resistance value or breaks.

(4) In case that resistor is loaded a rated voltage, it is necessary to confirms temperature of a resistor and to reduce a load power according to load reduction curve, because a temperature rise of a resistor depends on influence of heat from mounting density and neighboring element.

(5) Observe Limiting element voltage and maximum overload voltage specified in each specification

(6) If there is possibility that a large voltage (pulse voltage, shock voltage) charge to resistor, it is necessary that operating condition shall be set up before use.