SPECIFICATION FOR APPROVAL

3W, 4527, SL Type Low Resistance Chip Resistor (Lead / Halogen Free)

1. Scope

   This specification applies to 7.1mm x 12mm size 3W, fixed metal foil current sensing resistors used in electronic equipment.

2. Features / Applications

   AEC-Q200 qualified / Power modules 、Switch mode power supplies 、Frequency converters 、Automotive grade

3. Type Designation

   RL–4527 –0W – □□□□ – □ – AQ – NH

   (1) (2) (3) (4) (5)

   Where (1) Series No.

   (2) Resistance value : Four digits of number

   For example

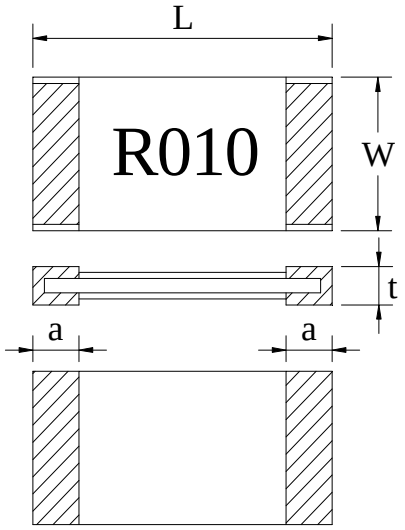
   R040 = 40mΩ

   (3) Tolerance : Refer to paragraph 5

   (4) AQ = AEC-Q200 qualified

   (5) NH = Sn plating (Lead free / Halogen free)

4. Dimensions and schematic



Code Letter	Dimensions (mm)
	4527
L	11.8 ± 0.20
W	7.10 ± 0.20
a	2.50 ± 0.30
t	0.80 ± 0.20

Figure 1. Construction and Dimensions

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5. Specification

Characteristics	Feature
Power Rating*	3W
Resistance Value	10~120mΩ
Temperature Coefficient of Resistance	± 75ppm/℃
Operation Temperature Range	-55℃ ~ +170℃
Resistance Tolerance	± 1%(F) , ± 2%(G) , ± 5%(J)
Insulation Resistance	Over 100MΩ
Maximum Working Voltage (V)	$(P*R)^{1/2}$

Note * :

Power rating is based on continuous full load operation at rated ambient temperature of 70℃. For resistors operated at ambient temperature in excess of 70℃, the maximum load shall be derated in accordance with the following curve.

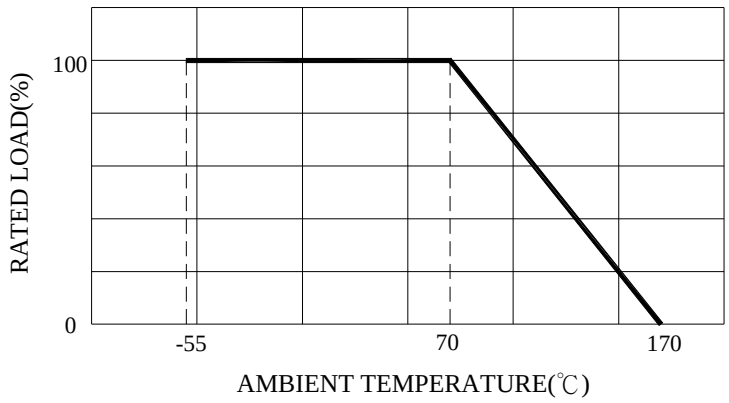

Figure 2.：Power Temperature Derating Curve

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6. Reliability Performance

Test Item	Condition of Test	Requirements
Short Time Overload	5 x Rated power for 5 seconds Refer to JIS C 5201-1 4.13	ΔR：± 1.0% Without significant damage by flashover(Spark, arching), burning or breakdown, etc.
High temperature Storage	Kept at 170℃, 1000hrs. Measurement at 24±4 hours after test conclusion. Refer to: MIL-STD-202 Method 108	ΔR：± 1% Without distinct damage in appearance.
Temperature Cycling	1000 cycles, (-55℃~125℃) 30min maximum dwell time at each temperature Measurement at 24±4 hours after test conclusion. Refer to: JESD22 Method JA-104	ΔR：± 0.5% Without distinct damage in appearance.
Biased Humidity	1000 hours, 85℃/85%R.H, applied for 10% rated power Measurement at 24±4 hours after test conclusion. Refer to: MIL-STD-202 Method 103	ΔR：± 1% Without distinct damage in appearance.ΔR：± 0.5%
Operational Life	1000 hours, 70℃, applied for 100% rated power Measurement at 24±4 hours after test conclusion. Refer to: MIL-STD-202 Method 108	ΔR：± 2% Without distinct damage in appearance.
Mechanical Shock	100g's peak value, 6ms, Half-sine waveform, 12.3ft/sec Refer to: MIL-STD-202 Method 213, (SMD type: Condition F)	ΔR：± 0.5% Without mechanical damage such as break.
Vibration	5g's for 20 minutes,12 cycles each of 3 orientations. Test from 10-2000Hz Refer to: MIL-STD-202 Method 204	ΔR：± 0.5% Without mechanical damage such as break.

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Resistance to Soldering Heat	Dipped into solder at 260℃, 10 seconds Refer to: MIL-STD-202 Method 210	ΔR：± 0.5% Without distinct deformation in appearance.
Solderability	Method D category 3 @ 260℃ Refer to: J-STD-002	Uniform coating of solder cover minimum of 95% surface being immersed
Board Flex	2mm for 60 seconds Refer to:AEC-Q200-005	ΔR：± 0.5% Without mechanical damage such as break.

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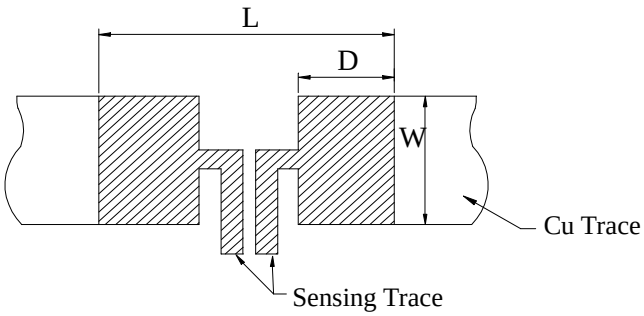
7. Recommend Land Pattern

	W (mm)	L (mm)	D (mm)	t (μ m)
4527	7.5	13.0	4.0	105



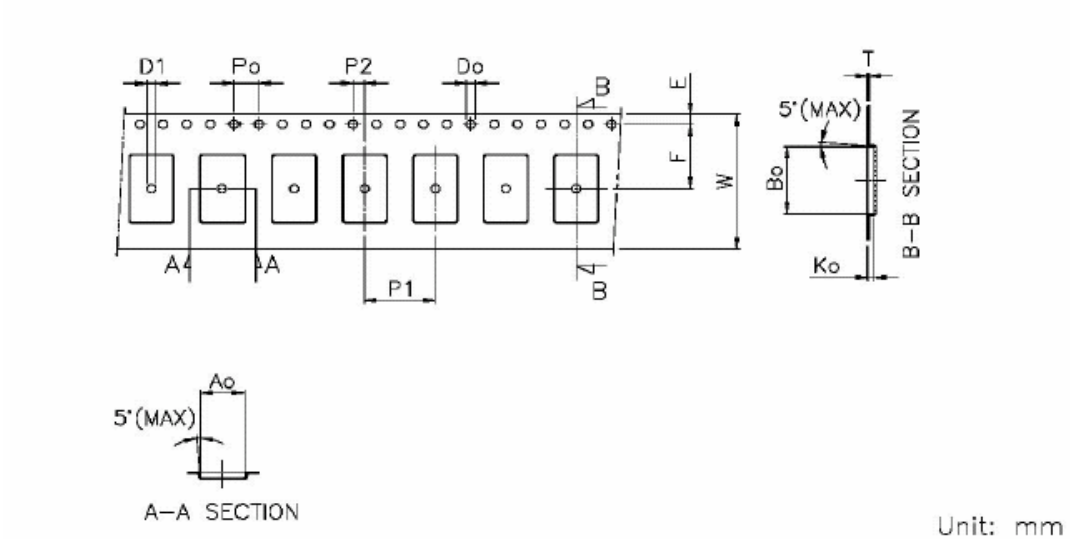
t: Copper foil minimum thickness of PCB

Note : We recommend there is no circuit design between pads to avoid circuit short

8. Packaging

8-1 Dimensions

8-1-1 Tape packaging dimensions



Unit: mm

Symbol	Ao	Bo	Ko	Po	P1	P2	T
Spec	7.38±0.10	12.00±0.10	1.05±0.10	4.0±0.10	12.0±0.10	2.0±0.10	0.30±0.10
Symbol	E	F	Do	D1	W	10Po	
Spec	1.75±0.10	11.50±0.10	1.55±0.05	1.50±0.10	24.0±0.30	40.0±0.20	

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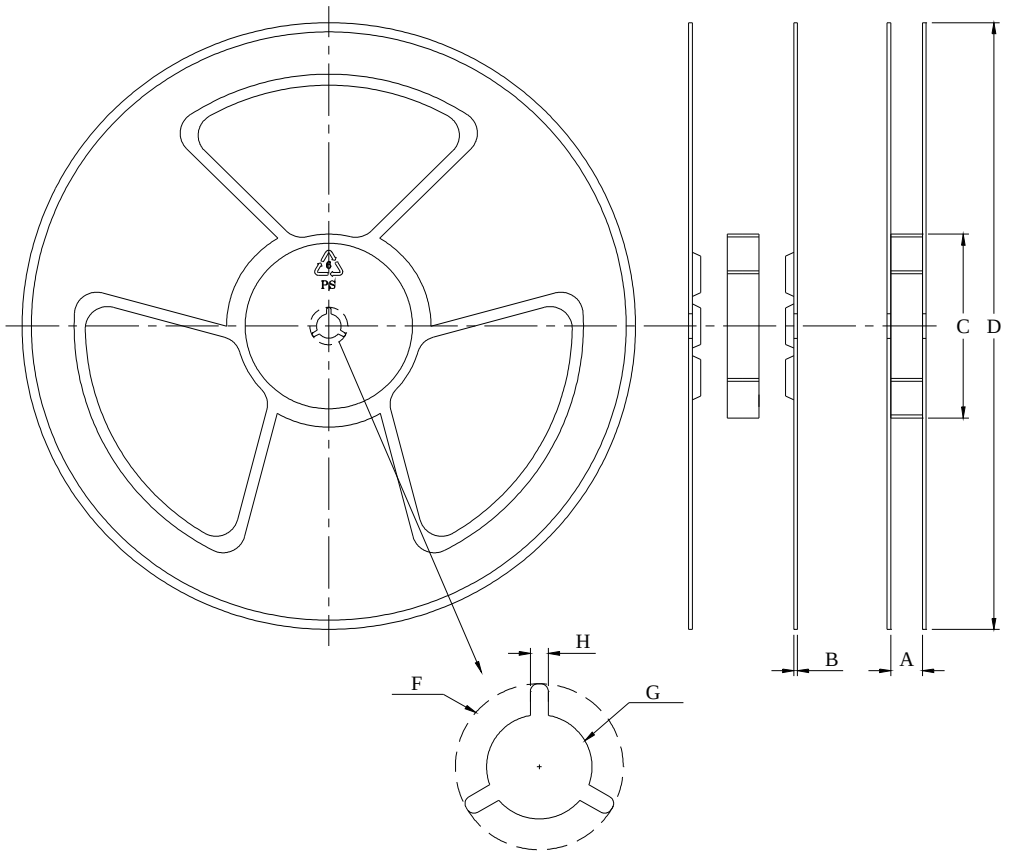
8-1-2 Reel dimensions



A	24.5 ± 0.5	F	20.2 ± 0.1
B	2.0 ± 0.2	G	$13.0^{+0.5}_{-1.0}$
C	100 ± 1.0	H	2.2 ± 0.1
D	330 ± 0.5		

Unit : mm

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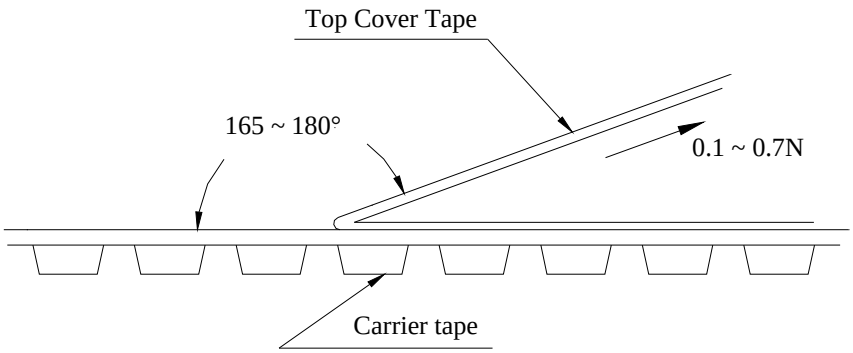
8-2 Peel Strength of Top Cover Tape

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

1,000 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