

Specifications

Products Name	Low Resistance Chip Resistor
Product Series	FLRH11050W*R***F
Classification	Generic Specification

FLRH11050W Low Resistance Chip Resistor Specification

1. Scope

This specification applies to FLRH11050W Series Low Resistance Chip Resistor for use in electric equipment.

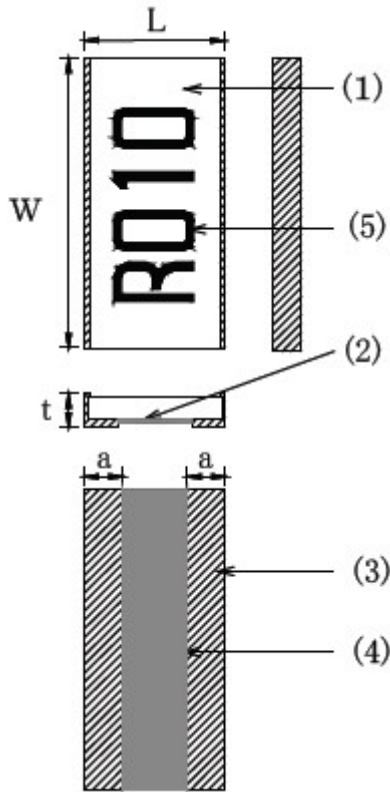
2. Part number

FLR	H11050	W	*	R***	F
(1)	(2)	(3)	(4)	(5)	(6)
(1) Product series					Foil Low Resistance
(2) Size					H11050: Long-side electrode 11.0*5.0mm size
(3) Electrode type					Wrap-up type
(4) Characteristic type					C: High operating temperature type M: Low thermoelectric power type
(5) Nominal resistance					(example) 10mΩ → R010
(6) Resistance tolerance					F (±1.0%) G(±2.0%) J(±5.0%)

3. Structure

The ceramic substrate is adhered to the metal foil (Ni-Cu) resistive element; terminals are formed on top of the foil.

4. Dimensions



No.	Components	Material / Process
(1)	Substrate	Alumina 96%
(2)	Resistor	Ni-Cu alloy
(3)	Terminals	Plated Sn+Ni (on Cu)
(4)	Protection coat	Epoxy resin (Green)
(5)	Marking	Epoxy resin (Black)

Symbol	Dimensions (mm)	
L	5.00±0.20	
W	11.00±0.20	
a	2mΩ ~ : 0.80±0.20	1mΩ : 1.60±0.20
t	0.50±0.20	

5. Marking

Resistance value code is marked on the top surface.

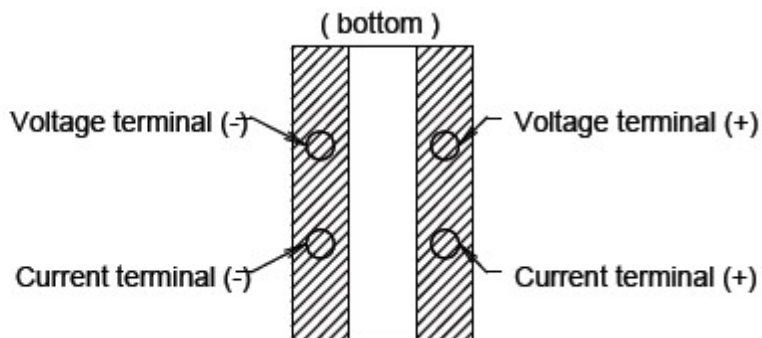
Example) 10mΩ → R010
20mΩ → R020

6. Schematic diagram, Measurement point

Schematic diagram



Measurement point

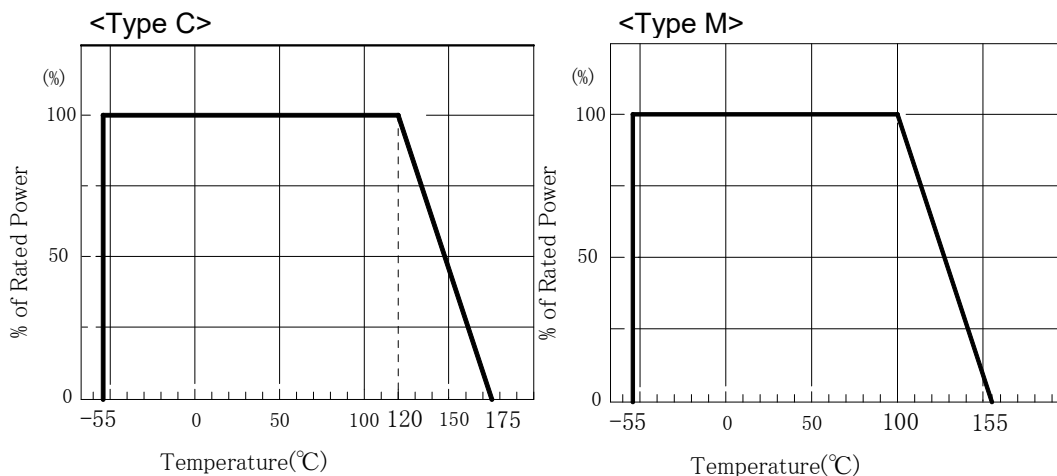


7. Specification

Parameter	Specification
Resistance Value	1m to 500mΩ (for standard resistances)
Resistance Tolerance	F (±1.0%) for 3mΩ~
Temperature Coefficient of Resistance	±50ppm/°C for 3mΩ~
Rated Load	6.0W
Operating Temperature Range	Type C: -55~+175°C, Type M: -55~+155°C
Rated ambient temperature	Type C: +120°C, Type M: +100°C
Rated Voltage	$\sqrt{\text{Power} \times \text{Resistance}}$ (V)
Maximum Over Current	when $\leq 10\text{m}\Omega$: which smaller between $\sqrt{(600\text{W} \div \text{resistance})}$ & 240A 10msec on, 60sec off in maximum of 10 times with recommended footprint set forth hereunder.
	When $> 10\text{m}\Omega$ & $< 100\text{m}\Omega$: which smaller between $\sqrt{(440\text{W} \div \text{resistance})}$ & 120A 10msec on, 60sec off in maximum of 10 times with recommended footprint set forth hereunder.

Refer to Figure-1

Figure-1 Derating Curve



8. Reliability testing

Test Item	Test Conditions		Specification
Short Time Over Load	Voltage of 1.5 times the rated voltage shall be applied for 5S.		$\pm(1.0\%+0.0005\Omega)$
Load life	Rated voltage for 90 min followed by a pause of 30 min at a temperature of $70\pm 3^{\circ}\text{C}$. Cycles shall be repeated for 1000h.		$\pm(2.0\%+0.0005\Omega)$
Moisture Load life	Rated voltage for 90 min followed by a pause of 30 min at a temperature of $60\pm 2^{\circ}\text{C}$ with relative humidity of 90%. Cycles shall be repeated for 1000h.		$\pm(2.0\%+0.0005\Omega)$
Temperature Cycle	[-55°C 30 min -> R.T. 3 min -> +155°C 30 min -> R.T. 3 min]	100 continuous cycles	$\pm(1.0\%+0.0005\Omega)$
		1000 continuous cycle	$\pm(2.0\% +0.0005\Omega)$
Soldering Heating	260 $\pm 5^{\circ}\text{C}$ solder, 10 ± 1 sec dip		$\pm(1.0\%+0.0005\Omega)$
Substrate Bending	Test board length: 90mm Bend depth: 2mm Test board: Glass-Epoxy t=1.6mm		$\pm(1.0\%+0.0005\Omega)$
Solderability	245 $\pm 5^{\circ}\text{C}$ solder, 3+1/-0 sec dip.		A new solder shall cover minimum of 90%

9. Packaging

Packing quantity: 1,000 pieces/reel.

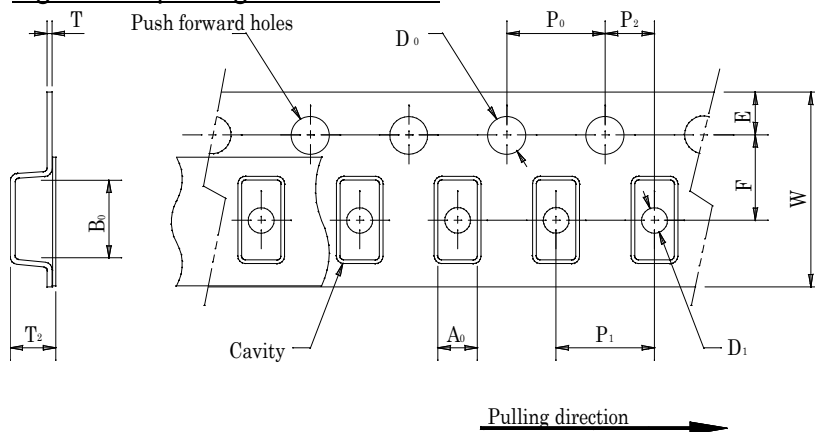
Tape diagram/dimension	Figure-2
Peeling strength of seal tape	Figure-3
Reel form·Labeling position	Figure-4
Taping direction	Figure-5

Marking The following items shall be printed on the reel label. (Figure-6)

Part number
Quantity for each reel
Manufacturing month code
Manufacturer
Inspection number (Lot number)
The country of origin
Lead free designation by double broken line

Figure-2 Tape diagram/dimension:

Material: Plastic



Symbol	Dimensions (mm)
A0	5.40 ± 0.10
B0	11.50 ± 0.10
W	24.00 ± 0.30
F	11.50 ± 0.10
E	1.75 ± 0.10
P0	4.00 ± 0.10
P1	8.00 ± 0.10
P2	2.00 ± 0.10
D0	1.50 ± 0.10
D1	1.50 ± 0.10
T	0.30 ± 0.05
T2	1.20 ± 0.15

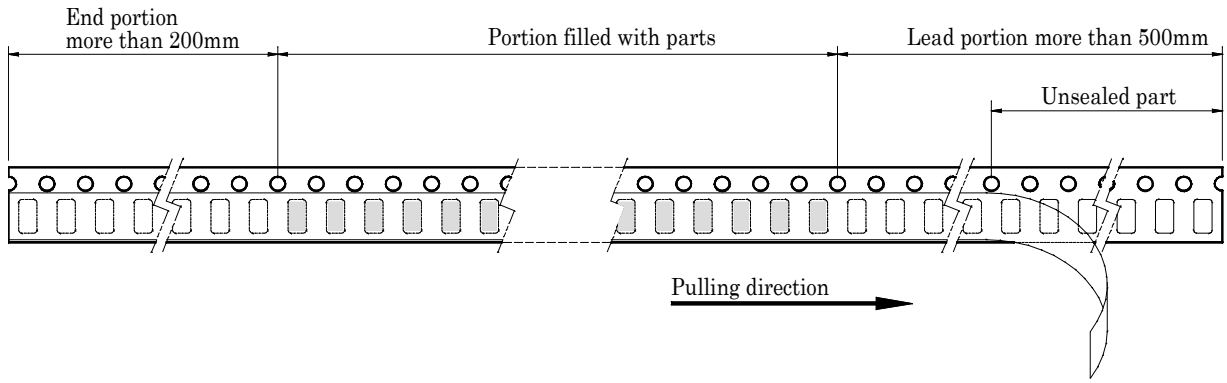


Figure-3 Peeling strength of seal tape:

F = peeling strength: 0.1~0.7N (10~71gf)

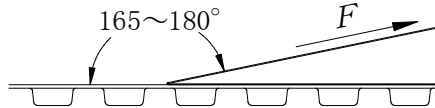


Figure-4 Reel form · Labeling position:

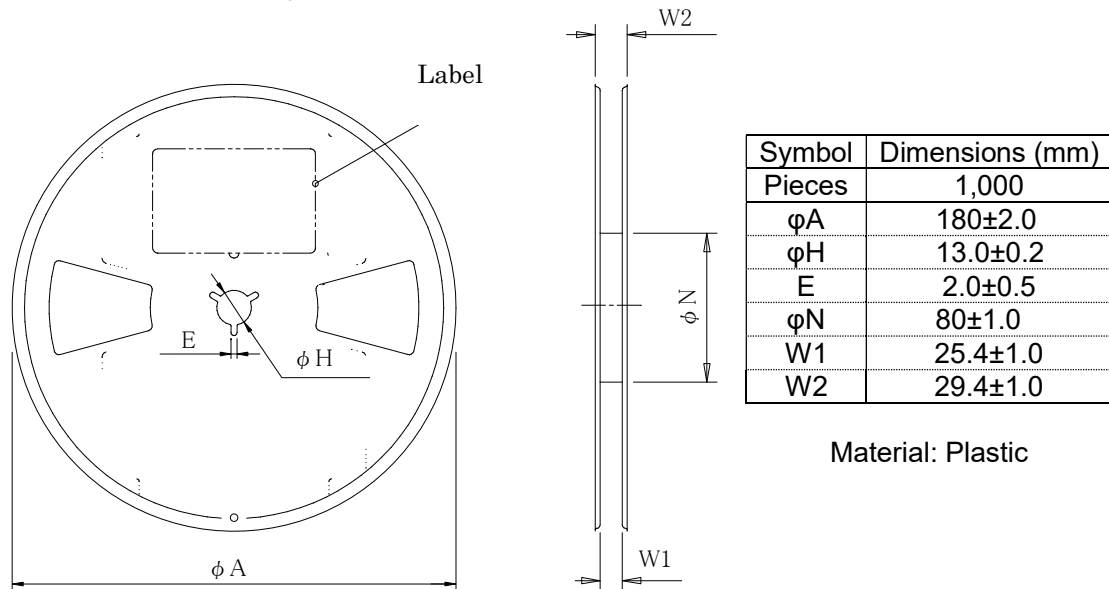


Figure-5 Taping direction:

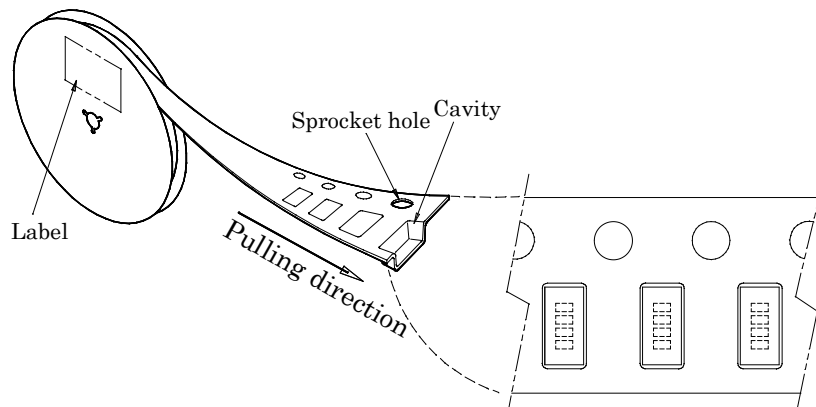


Figure-6 Label contents:

FLRH11050W*R***F

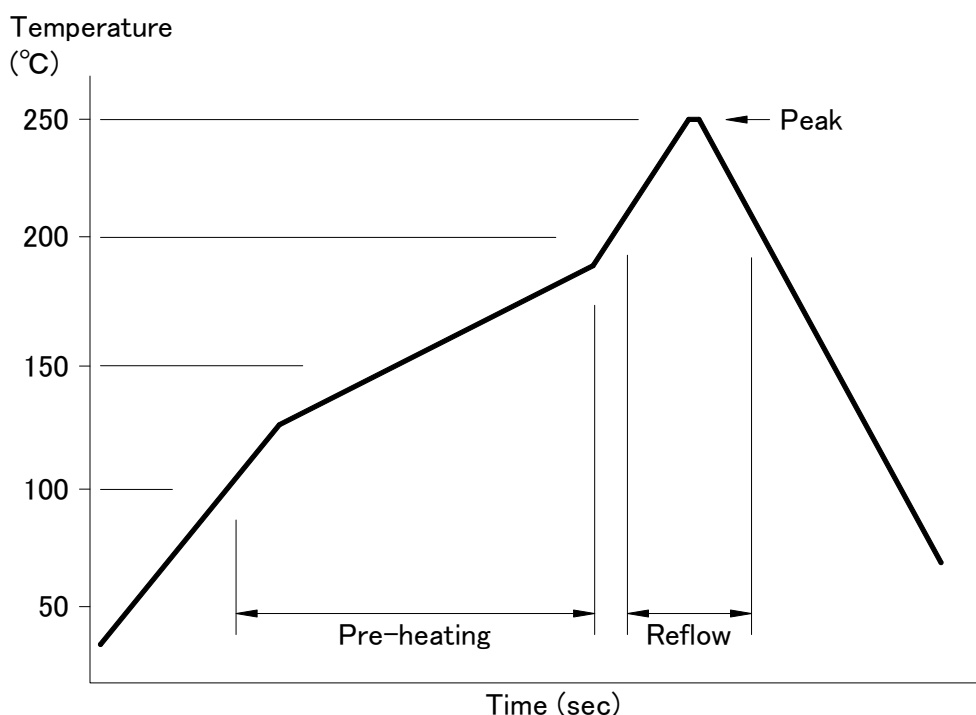
Q.T.Y 1,000 [PCS]
 INSPECTED **U**
 Y.E.D CO.,LTD.
 90101123
 MADE IN JAPAN
 =====

Part number _____
 Quantity for each reel _____
 Manufacturing month code _____
 Manufacturer _____
 Inspection number (Lot number) _____
 The country of origin _____
 Lead free designation by double broken line _____

10. Recommended implementation temperature profile

10.1 Reflow temperature profile

Twice reflows are allowed by the following temperature profile



Surface temperature of resistance and time

Pre-heating	130~180°C	60~90sec
Reflow	220°C Max	30~90sec
Peak	240~260°C	10sec Max

10.2 Flow temperature profile

Less than 260°C 10sec Max

10.3 Hand solder attachment conditions

Work in 3 seconds or less is [temperature of 350°C] possible.

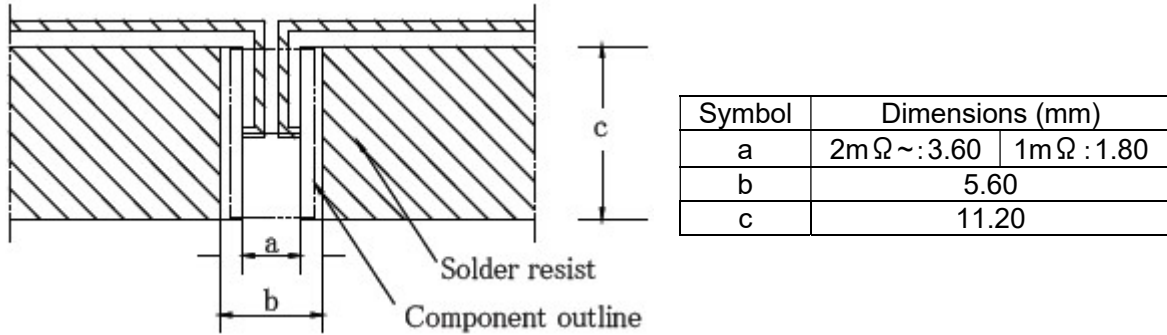
When soldering with a soldering iron, heating is performed on a land and the point does not hit the main part of a product. Please carry out.

11. Recommended land pattern (for current sensing)

Board materials: Glass epoxy (FR-4) $t=0.6\text{mm}$

Thickness of copper foil: 100 μm

Note: The terminal temperature should not exceed 120°C at the rated power.



12. Country of origin and Location

Country of origin : Japan

Location : Yokohama Electronic Devices Co.,Ltd.

Address : Shin-Yokohama, Kouhoku-Ku, Yokohama-city, 222-0033 Japan

13. Storage note

- (1) To maintain good solderability, Store the components in the temperature and humidity controlled room.
Temperature: $5\sim 35^{\circ}\text{C}$ Humidity: 45~85% RH
- (2) Store the components at the place avoiding moisture, dust and corrosive harmful gas (hydrogen chloride, sulfurous acid gas and hydrogen sulfide) that may cause the decrease in solderability.
- (3) Store the components at the place avoiding direct sunlight.