



炬鹿科技有限公司
RIDEE TECH COMPANY LIMITED

Revision Date : 2023 / 07 / 03

APPROVAL SHEET

Product Name : Metal Foil Four Terminal Low Resistance Chip Resistor

Part No. : RFL _4T

Description : Size 0306~1206

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For more contact information, please refer to our website: www.rideetech.com

■ Metal Foil Four Terminal Low Resistance Chip Resistor — RFL4

■ Application

- Entertainment
- Measuring instrument
- Industrial
- Battery management system

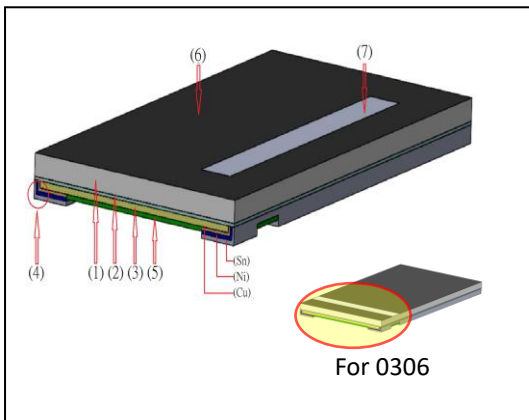
■ Features

- Low Resistance / TCR / EMF/Inductance
- RoHs compliant and halogen free.
- Lead free.

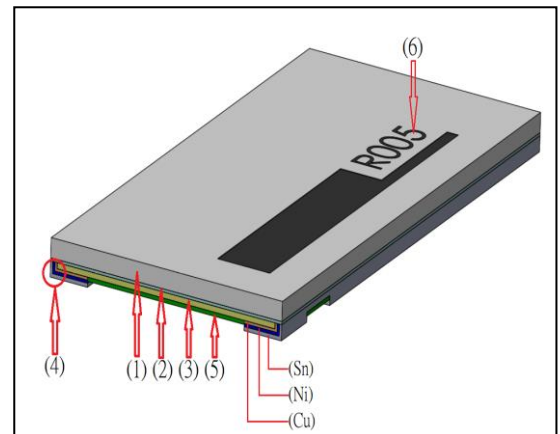
■ Product structure:

- (1) - Substrate : Alumina Ceramic
- (2) - Adhesive : Epoxy
- (3) - Resistive element : MnCu – alloy
- (4) - Terminal electrode : Cu、Ni、Sn
- (5) - Protective coating : Flame-retardant epoxy, meets UL- 94-V0 requirements(green)
- (6) - Marking coating : Flame-retardant epoxy, meets UL- 94-V0 requirements (black)
- (7) - Marking coating : Flame-retardant epoxy, meets UL- 94-V0 requirements (white)

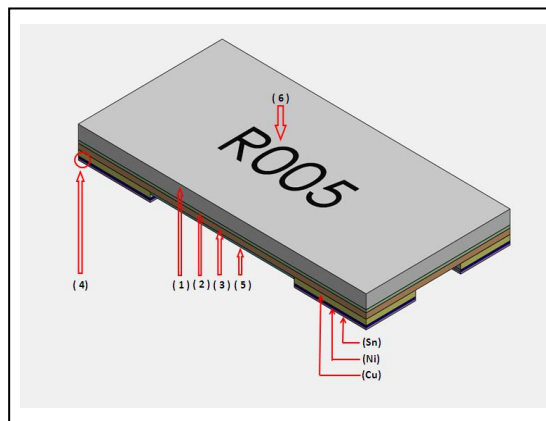
For 0306/0612 Type



For 1225/2139 Type



For 1206 Type



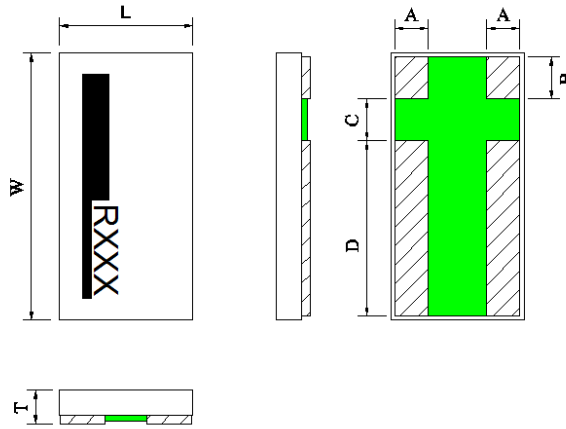
■ Parts Number Explanation

RFL	1225	20	F	R001	T	4T
Product Type	Size (Inch)	Rated Power	Tolerance	Resistance	Packaging	Functional
Metal Foil Low Resistance	0306 0612 1225 2139 1206	03=0.33W 05=0.50W 10=1.00W 20=2.00W 40=4.00W	C: ±0.3% D: ±0.5% F: ±1.0%	0M50=0.50mR R001=1.0mR R025=25mR R100=100mR	T : 7" Taped & Reeled	4T : Four Terminals

■ Standard Electrical Specifications

Type	Rating Power at 70°C	T.C.R. (ppm/°C)	Max. Rating Current	Max. Overload Current	Resistance Range (mΩ)			Material	Operating Temperature Range (°C)
					0.3% (C)	0.5% (D)	1.0% (F)		
RFL0306	0.33W	±100	18.16A	28.72A	—		1~4	MnCu	-55°C~155°C
		±50	8.12A	12.84A	—		5~25		
RFL0612	1W	±150	44.72A	70.71A	—		0.5~0.75		
		±100	31.62A	50A	—		1~4		
		±50	14.14A	22.36A	—	5~25			
RFL1225	2W	±100	44.72A	70.71A	—		1~4		
		±50	20A	31.62A	—	5~25			
RFL2139	4W	±100	63.24A	100A	—		1~4		
		±50	28.28A	44.72A	—	5~25			
RFL1206	0.5W	±100	31.62A	50A	—		0.5		
		±75	22.36A	35.35A	—	1~5			
		±50	9.12A	14.43A	—	6~9			
		±30	7.07A	11.18A	10~100		—		

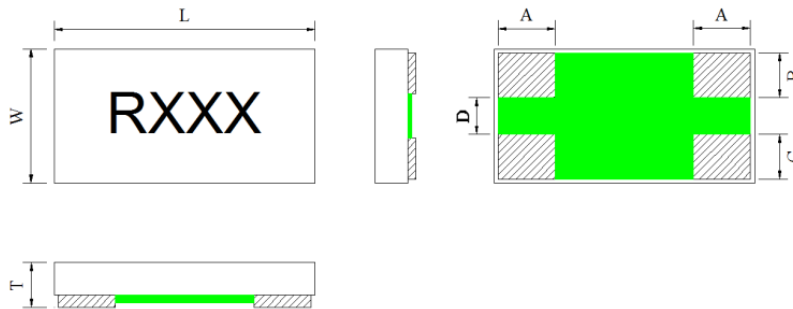
■ Type Dimension



■ Dimension

Unit : mm

Type	Power Rating	Resistance Range	W	L	A	B	C	D	T
RFL0306	0.33W	1~25mΩ	1.60±0.20	0.80±0.15	0.18±0.10	0.23±0.10	0.40±0.10	0.93±0.20	0.55±0.10
RFL0612	1W	0.5~25mΩ	3.20±0.20	1.60±0.20	0.41±0.20	0.46±0.20	0.50±0.20	2.16±0.20	0.50±0.20
RFL1225	2W	1~25mΩ	6.40±0.20	3.20±0.20	0.50±0.20	0.62±0.20	0.50±0.20	5.12±0.20	0.60±0.20
RFL2139	4W	1~25mΩ	11.0±0.30	5.00±0.30	0.70±0.20	1.40±0.20	1.05±0.20	8.50±0.30	0.60±0.20



■ Dimension

Unit : mm

Type	Power Rating	Resistance Range	W	L	A	B	C	D	T
RFL1206	0.5W	0.5~100mΩ	1.60±0.20	3.20±0.20	0.60±0.20	0.55±0.20	0.55±0.20	0.50±0.20	0.60±0.20



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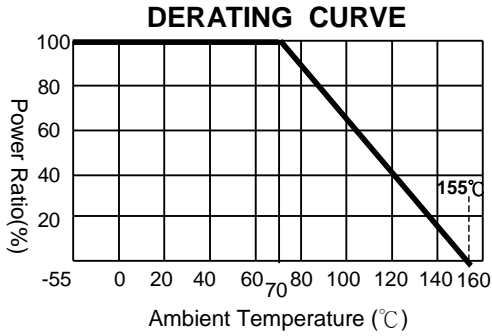
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■ Performance Characteristics

Power Derating Curve

The Operating Temperature Range: -55°C ~+155°C.

For resistors operated in ambient temperatures above 70°C, power rating must be derated in accordance with the curve below



■ Rating Current

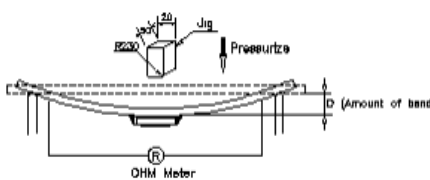
The following equation may be used to determine the DC (Direct Current) or AC (Alternating Current) (RMS, root mean square value) of normal rated power. However, if the result value exceeds the highest current of regulated standards (paragraph 5), the highest normal rated power is to be used

$$I = \sqrt{P/R}$$

I = Rating current (A)
 P = Rating Power (W)
 R = Resistance(Ω)

■ Reliability Test and Requirement

Test Item	Test Method	Procedure	Requirements
Temperature Coefficient of Resistance (T.C.R)	JIS C 5201-1 clause 4.8	$\bullet \text{ T.C.R. (ppm/}^\circ\text{C)} = \frac{(R2-R1)}{R1(T2-T1)} \times 10^6$ R1: resistance at room temperature (T1) R2: resistance at 125°C (T2)	Refer to Ratings
Short Time Overload	JIS C 5201-1 clause 4.13	The number of rated power are as follows: 2.5 times of rated power Rating power duration: 5secs	±1.0%+0.5mΩ
High Temperature Exposure	JIS C 5201-1 clause 4.23.2	1,000hrs at + 155 °C±2°C	±1.0%+0.5mΩ
Low Temp. Storage	JIS C 5201-1 clause 4.23.4	1,000hrs at -55 °C±2°C	±1.0%+0.5mΩ
Soldering Heat	JIS C 5201-1 clause 4.18	260±5°C for 10±1 seconds.	±1.0%+0.5mΩ
Moisture Load Life	JIS C 5201-1 clause 4.24	T=40±2°C, RH=90~95% ,Load with Rated Current 1.5hrs "ON", 0.5hrs "OFF", 1000h	±2.0%+0.5mΩ
Temperature Cycling	JIS C 5201-1 clause 4.19	-55°C to +155°C, 100 cycles	±1.0%+0.5mΩ

Load Life	JIS C 5201-1 clause 4.25	T=70±2 °C, Load with Rated Current 1.5hrs "ON", 0.5hrs "OFF", 1000h	±2.0%+0.5mΩ
Solderability	JIS C 5201-1 clause 4.17	245±5°C for 3±0.5secs	The covered area >95%
Mechanical Shock	JIS C 5202 clause 6.7	a =50G , t =11ms, 5 times shock	±1.0%+0.5mΩ
Substrate Bending	JIS-C5201-1 clause 4.33	Span between fulcrums : 90mm Bend Width : 2mm 	±1.0%+0.5mΩ

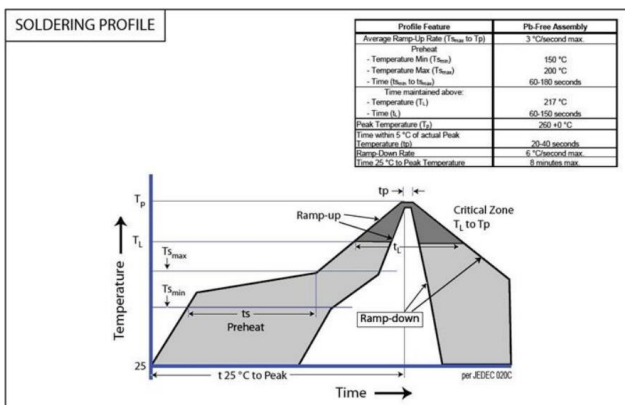
■ Marking Format:

- 0306/0612 type products no marking.
Other requirements can be contact with the business staff
- 1225/2139/1206 type products marking are 4 digits.
"R" designates the decimal location in ohms
e.g. 1mΩ the product marking is R001.
20mΩ the product marking is R020.
"M" designates the decimal location in milli-ohms
e.g. 0.5mΩ the product marking is 0M50.

- The criteria to distinguishing the mark on the surface of products are that characters can be identified.

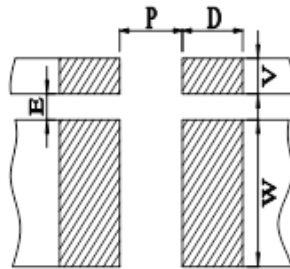
● Recommended Customer Soldering Parameters

■ Solder reflow Temperature condition



- Rework temperature (hot air equipment) : 350°C, 3~5seconds
 - Recommended reflow methods
IR, vapor phase oven, hot air oven
- If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

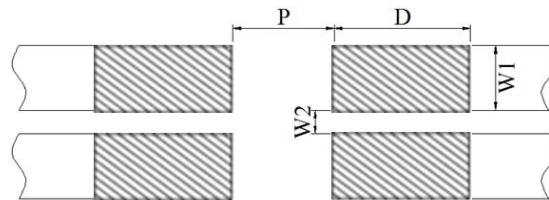
■ Recommend Land Pattern Design



■ Dimension

Unit: mm

TYPE	Resistance Range	P	W	D	V	E
RFL0306 – 0.33W	1mΩ~25mΩ	0.35	1.30	0.40	0.40	0.20
RFL0612 – 1W	0.5mΩ~25mΩ	0.762	2.29	1.014	0.762	0.381
RFL1225 – 2W	1mΩ~25mΩ	2.00	5.10	1.00	0.70	0.50
RFL2139– 4W	1mΩ~25mΩ	3.30	8.90	1.50	1.70	0.80



■ Dimension

Unit: mm

TYPE	Resistance Range	P	D	W1	W2
RFL1206 – 0.5W	0.5mΩ~100mΩ	1.20	1.80	1.10	0.30

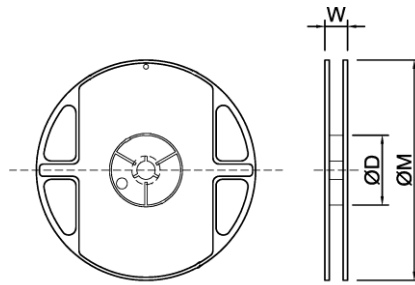
■ Packing Quantity

TYPE	PCS /Reel
RFL0306	5000
RFL0612 / RFL1206	5000
RFL1225	4000
RFL2139	2000

■ Appendix For SMD Chip Resistor

● Packaging Information

■ Reel Dimensions

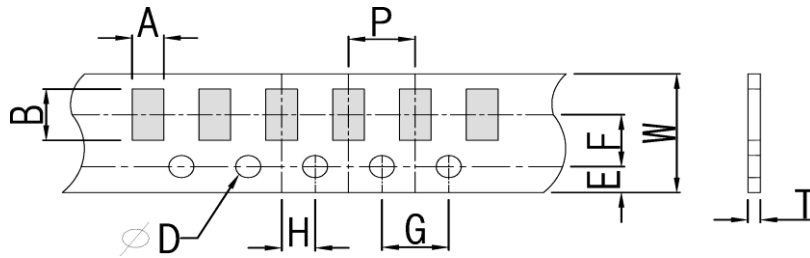


■ Dimension

Unit: mm

Type	ϕD	W	ϕM
RFL0306	60 ± 2	9.0 ± 1	178 ± 5
RFL0612 / RFL1206		9.0 ± 1	
RFL1225		13.0 ± 1	
RFL2139		24.5 ± 1	

■ Paper tape Dimensions

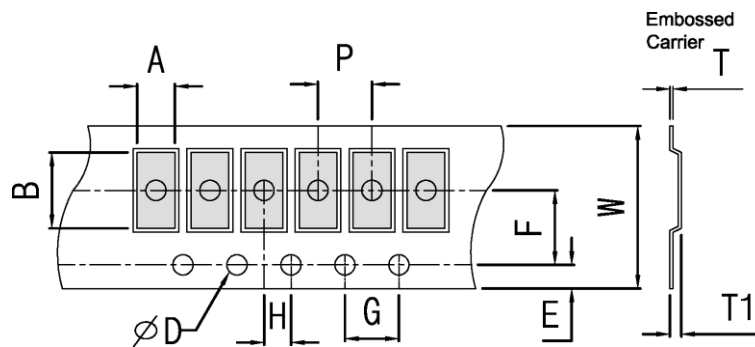


■ Dimension

Unit: mm

Item	W	P	E	F	ϕD	G	H	A	B	T
RFL 0306	8.0±0.30	4.0±0.10	1.75±0.10	3.5±0.10	1.50 ^{+0.1} ₀	4.0±0.10	2.0±0.10	1.18±0.20	1.98±0.20	0.75±0.20

■ Embossed Dimensions



■ Dimension

Unit: mm

Item	W	P	E	F	ϕD	G	H	A	B	T1	T
RFL0612 / RFL1206	8.0±0.30	4.0±0.10	1.75±0.10	3.50±0.10	1.50 ^{+0.1} ₀	4.0±0.10	2.0±0.10	2.05±0.20	3.65±0.20	0.85±0.20	0.20±0.10
RFL1225	12.0±0.30	4.0±0.10		5.5±0.10				3.40±0.20	6.75±0.20	1.00±0.20	0.25±0.10
RFL2139	24.0±0.30	8.0±0.10		11.50±0.10				5.50±0.20	11.50±0.20	0.90±0.20	0.30±0.10

■ Peeling Strength of Seal Tape

Peeling Strength: 0.1 – 1.0N (10 - 100gf)

■ Storage Temperature

Temperature : 25±5°C, Humidity : 60±20%