

RFM SERIES MELF TYPE NON-INDUCTANCE RESISTORS HIGH FREQUENCY RESISTORS

Feature

- Advanced thin film technology
- Excellent overall non-inductance function
- Non-inductance working up to 17GHz
- Very low noise and voltage coefficient
- Compliant to RoHS directive 2011/65/EU
- Compliant to REACH (EC No. 1907/2006)) (last updated: 27/06/2018)

Description

Production is strictly controlled and follows an extensive set of instructions established in production procedure for reproducibility. A homogeneous film of metal alloy is deposited on the surface of **CeramTec**'s ceramic cores (85%~96% AL_2O_3) and conditioned to achieve the desired stability and the temperature coefficients.

A professional smoothly cut specially treated to not only get the request resistance value but also get the perfect non-inductance performance in ultra-high frequency circumstances. The resistance layers are covered by a protective coating designed for electrical, mechanical and climatic protection. The resistors are tested in accordance with MIL-R-10509F which refers to MIL-STD-202 or IEC60115.



1. PART NUMBER:

Part number is identified by the series name, power rating, metric size, tolerance, temperature coefficient, packing type and resistance value.

Example:

RFM 73P 0204 J 2 T 1010

Series Name	Size Code	Metric Size	Resistance Tolerance	Temperature Coefficient	Packing Style	Resistance Value
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- (1) Style: RFM SERIES NON-INDUCTANCE RESISTORS
- (2) Power Rating: 73P=0.25W; 74P=0.50W
- (3) Metric size: DIN: 0204; 0207
- (4) Tolerance: F=±1%; J=±5%;
- (5) T.C.R.: 3=±25ppm/°C; 2=±50ppm/°C; 1=±100ppm/°C;
- (6) Packaging Type: B=BULK/BOX
T=Tape on Box Packing
- (7) Resistance Value: 25R(25R0) ; 50R (50R0); 100R(1000)



2. Marking: Color band code

Four color bands codes for size 0204

COLOR	1 st	2 nd	3 rd	Multiple
black	0	0	0	1
brown	1	1	1	10
red	2	2	2	10 ²
orange	3	3	3	10 ³
yellow	4	4	4	10 ⁴
green	5	5	5	10 ⁵
blue	6	6	6	10 ⁶
purple	7	7	7	10 ⁷
gray	8	8	8	
white	9	9	9	
golden				10 ⁻¹
silver				10 ⁻²

Five color bands codes for size 0207

COLOR	1 st	2 nd	3 rd	Multiple	tolerance
black	0	0	0	1	
brown	1	1	1	10	F(±1.0%)
red	2	2	2	10 ²	G(±2.0%)
orange	3	3	3	10 ³	
yellow	4	4	4	10 ⁴	
green	5	5	5	10 ⁵	D(±0.50%)
blue	6	6	6	10 ⁶	C(±0.25%)
purple	7	7	7		B(±0.10%)
gray	8	8	8		
white	9	9	9		
golden				10 ⁻¹	J(±5.0%)
silver				10 ⁻²	K(±10%)



3. ELECTRICAL CHARACTERISTICS

Types	RFM73	RFM74	RFM16M	型号		
Standard applied	Q/SLC010-2000			降功率曲线		
Metric sizes	DIN: 0204	DIN: 0207	DIN: 0207	公制型号		
Resistance range	25Ω to 200Ω			阻值范围		
Resistance tolerance	D(±0.5%); F(±1.0); J(±5.0)			精度		
Temperature coefficient	C3(±25ppm/°C); C2(±50ppm/°C)			温度系数		
Rated dissipation, P ₇₀	0.25W	0.50W	0.75W	额定功率		
Inductance free working frequency	normal up to 1G Hz, maximum up to 17G Hz			无感工作频率		
Endurance: rated power load	≤1% for Tol.= ±1% & ≤2% for Tol.= ±5%			70℃耐久性实验		
Max. resistance change at P ₇₀				1000小时后阻值变化量		
ΔR/R max., after 1000h						
Derating	linear from 70℃ to 125℃			降功率曲线		
Dimension	±0.3mm L=3.5; D=1.3 K≥0.6; D ₁ ≥D-0.2	L=5.7; D=2.1 K≥0.8; D ₁ ≥D-0.3	L=6.0; D=2.1 K≥0.8; D ₁ ≥D-0.3	±0.3mm 尺寸		
Soldering bath (recommended)	S=1.5; W=2; H=2.2	S=2.8; W=3; H=3	S=3.2; W=3.2; H=3.2	(mm) 建议焊盘尺寸		
Outlooks				外观		

- * Unless otherwise specified, all values are tested at the following condition:
Temperature: 21°C to 25°C; Relative humidity: 45% to 60%
- * Standard resistance is 10Ω~ 200Ω, below or over this resistance value is available on request.
- * MPQ is 3000pcs per reel.
- * Rated Continuous Working Voltage (RCWV)= $\sqrt{\text{Power Rating} \times \text{Resistance Value}}$
- * Resistance value out of range is available on request.
- * Terminal caps of the resistors are all with three electroplating: the inner is copper plating + nickel plating to minimize the tin whisker phenomenon and final plating is tin to improve the solderability. The thickness the 3 layers are Cu:>0.8μm+Ni:<1μm+Tin:>3μm.
- * The post high temperature treatment after final tin plating is strictly controlled by our production procedure to minimize the tin whisker phenomenon



4. ENVIRONMENTAL CHARACTERISTICS

(1) Temperature Coefficient Test

IEC 60115-1, 4.8: Test at room temperature and 60°C (or 100°C on request) above room temperature. Then measure the resistance. The Temperature Coefficient is calculated by the following equation and its value should be within the range requested.

$$\text{Resistor Temperature Coefficient} = \frac{R - R_0}{R_0} \times \frac{1}{t - t_0} \times 10^6$$

R = Resistance value under the testing temperature

R₀ = Resistance value at the room temperature

t = the 2nd testing temperature

t₀ = Room temperature

(2) Short Time Over Load Test

IEC60115-1 4.13: At 10 times rated voltage or 2 times the maximum working voltage whichever is lower for 5 seconds, the resistor should be free from defects. The change of the resistance value should be within ± (0.1%+0.05Ω) as compared with the value before the test.

(3) Solderability

IEC 60115-1, 4.17: 235±5°C for 3±0.5 Seconds, there are at least 95% solder coverage on the termination.

(4) Resistance to soldering heat:

IEC 60115-1, 4.18: 260±3°C for 10±1 Seconds, immersed to a point 3±0.5mm from the body. The change of the resistance value should be within ±(0.25%+0.05 Ω) as compared with the value before the test.

(5) Climatic sequence

IEC 60115-1, 4.19: -55°C to Room Temp. to +155°C to Room Temp. (5 cycles). The change of the resistance value shall be within ± (1%+0.05Ω) as compared with the value before the load. After the test the resistors shall be free from the electrical or mechanical damage.



(6) Damp Heat Steady State

IEC 60115-1, 4.24: $40\pm 2^{\circ}\text{C}$, 90-95% RH for 56 days, loaded with 0.1 times RCWV or the maximum working voltage whichever is lower. The change of the resistance value should be $\pm (1\%+0.05\Omega)$ as compared with the value before the load.

(7) Load Life Test

IEC 60115-1, 4.25: $70\pm 2^{\circ}\text{C}$ at RCWV or the maximum working voltage whichever is lower for 1,000+48/-0 Hr. (1.5Hr. on, 0.5Hr. off). The resistors shall be arranged not much effected mutually by the temperature of others and the excessive ventilation shall not be performed.

The change of the resistance value should be within $\pm (1\%+0.05\Omega)$ as compared with the value before the load.

(8) Accidental Overload Test

IEC 60115-1, 4.26: 4 times RCWV for 1 Minute. No evidence of flaming or arcing

(9) Resistance to Solvent

IEC 60115-1, 4.30: IPA for 5 ± 0.5 Min. with ultrasonic. No deterioration occurred.



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