



## HIGH PRECISION MELF RESISTORS

RJM73, RJM74  
RJM16, RJM17, RJM18

### FEATURES

- Advanced thin film technology
- **Low TCR: lower than  $\pm 5\text{ppm}/^\circ\text{C}$ .**
- **Tolerance up to  $\pm 0.05\%$**
- Power dissipation rating up to 3W
- Excellent overall stability: **Class 0.05**
- Wide resistance range:  **$0.1\Omega$  to  $22\text{M}\Omega$**  is available under request
- **very high ratio of performance to price**

### APPLICATIONS

- Test and measuring instruments
- Sensors
- Industrial electronics
- Medical equipments.
- Military electronics



### DESCRIPTION

RJM series professional metal film high precision MELF type resistors are the perfect choice for most fields of modern professional electronics where high precision, low temperature coefficient and high stability is of major concern as well as very high ratio of performance to price. It also used in a lot of power supply to meet the requirement of high reliability.

### PRODUCTION

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 a high grade ceramic rods (85%~96%  $\text{Al}_2\text{O}_3$ ) and conditioned to achieve the desired temperature coefficient and stability. A professional laser is used for high resistance to not only achieve the target value but also perfect electronics performance by smoothly cutting a helical groove in the resistance layer on the ceramic rods. The resistor elements are covered by a protective coating designed for electrical, mechanical and climatic protection. The terminals are covered with final pure tin plating for keeping perfect solderability and wonderful outlook. Four color code rings for 0204 size designate the resistance value and five color code rings for 0207 or larger size designate the resistance value and tolerance in accordance with IEC 60062.



### TEST

The resistors are tested in accordance with SJ/T51929 which is equivalent to MIL-R-10509F which refers to MIL-STD-202 or CECC 40401-803 which refers to EN 140000 (IEC60115) or DIN44061.



# THUNDER PRECISION RESISTORS



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### QUICK REFERENCE DATA

Type	RJM73P	RJM74M	RJM74P	RJM16M	RJM17M	RJM18M	
Metric type	DIN: 0204		DIN: 0207		DIN: 0411	DIN: 0516	
CECC type	RC 3715M		RC 6123M		RC8633		
Vishay' Type	MMA0204/SMM0204	MMA0204-P/HT	MMB0207	MMB0207-P/CMB0207			
Resistance range	10 Ω to 10M Ω						
Resistance tolerance (%)	W(±0.05); B(±0.10); C(±0.25); D(±0.5); F(±1); J(±5%)						
Temperature coefficient (ppm/°C)	C7(±5); C6(±10); C5(±15); C3(±25); C2(±50)						
Climatic category (LCT/UCT/days)	55/125/56						
Rated dissipation, $P_{70}$	0.25W	0.50W	0.50W	1.0W	2.0W	3.0W	
Operating voltage $U_{max}$	250V	300V	300V	350V	400V	450V	
Temperature range	-55°C to 125°C						
Insulation voltage	300V	500V	600V	700V	800V	900V	
Insulation resistance	1G						
Dimension	±0.2mm	L=3.5; D=1.3	L=3.5; D=1.3	L=5.7; D=2.1	L=6.0; D=2.1	L=8.7; D=3.1	L=11.8; D=3.6
		$K \geq 0.6; D_1 \geq D-0.2$	$K \geq 0.6; D_1 \geq D-0.2$	$K \geq 0.6; D_1 \geq D-0.3$	$K \geq 0.6; D_1 \geq D-0.3$	$K \geq 0.8; D_1 \geq D-0.4$	$K \geq 1.0; D_1 \geq D-0.4$
Soldering bath (recommended) (mm)	S=2; W=2.5; H=2.5	S=2; W=2.8; H=2.8	S=2.9; W=3.2; H=3.2	S=3.2; W=3.6; H=3.5	S=5.6; W=4.5; H=4.5	S=8.2; W=5; H=5	
Outlines							
Derating curve							

Tighten tolerane available under request




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### TEST PROCEDURE AND REQUIREMENTS

IEC 60115-1 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS		
				PERMISSIBLE CHANGE ( $\Delta R/R$ )		
		type		RJM73P, RJM74P	RJM16M	RJM17M, RJM18M
		resistance range		47 $\Omega$ to 332k $\Omega$	47 $\Omega$ to 332k $\Omega$	47 $\Omega$ to 332k $\Omega$
4.5		tolerance	(%)	$\pm 0.10; \pm 0.25; \pm 0.5; \pm 1.0; \pm 5.0$		
4.8	—	temperature coefficient	at 25/ 85/ 25°C or under request at 25/ -55/ 25°C or at 25 / 125 /25°C	$\pm 5\text{ppm}/^\circ\text{C}; \pm 10\text{ppm}/^\circ\text{C}; \pm 15\text{ppm}/^\circ\text{C}; \pm 25\text{ppm}/^\circ\text{C}; \pm 50\text{ppm}/^\circ\text{C}; \pm 100\text{ppm}/^\circ\text{C}$		
4.13	—	short time overload;	room temperature; $U = 2.5 \times \sqrt{P_{70} \times R} \leq 2U_{\text{max}}; 5\text{s}$	$\pm 0.10\% + 0.05 \Omega$ for normal tol. $\pm 0.05\% + 0.05 \Omega$ for ultra high precision	$\pm 0.10\% + 0.05 \Omega$ for normal tol.	$\pm 0.10\% + 0.05 \Omega$ for normal tol.
4.17.2	58 (Td)	solderability	solder bath method; 235°C; 5s $\pm$ 1s	good tinning ( $\geq 95\%$ covered); no visible damage		
4.18.2	58 (Td)	resistance to soldering heat	solder bath method; 260 $\pm$ 5°C; 5s $\pm$ 1s	$\pm 0.10\% + 0.05 \Omega$ for normal tol. $\pm 0.05\% + 0.05 \Omega$ for ultra high precision	$\pm 0.10\% + 0.05 \Omega$ for normal tol.	$\pm 0.10\% + 0.05 \Omega$ for normal tol.
4.19	14 (Na)	rapid change of temperature	30 minutes at LCT-55°C; 30 minutes at UCT+155°C; 5 cycles	$\pm 0.10\% + 0.05 \Omega$ for normal tol. $\pm 0.05\% + 0.05 \Omega$ for ultra high precision	$\pm 0.10\% + 0.05 \Omega$ for normal tol.	$\pm 0.10\% + 0.05 \Omega$ for normal tol.
4.22	6(B4)	vibration	6h 10 to 2000Hz 1.5mm or 196 m/s	$\pm 0.05\% + 0.05 \Omega$	$\pm 0.10\% + 0.05 \Omega$	$\pm 0.10\% + 0.05 \Omega$
4.23		climatic sequence;				
4.23.2	2(Ba)	dry heat	UCT; 16 h			
4.23.3	30(Db)	damp heat, cyclic	55°C; 24h; $\geq 90\%$ RH 1 cycle;			
4.23.4	1 (Aa)	cold	LCT; 2 h			
4.23.5	13 (M)	low air pressure	8.5 kPa 25 $\pm$ 10°C 2h;			
4.23.6	30(Db)	damp heat, cyclic	55°C; 24h; $\geq 90\%$ RH ; 5 cycles			
			LCT=-55°C; UCT=125°C			
4.24	3(Ca)	damp heat, steady state	40 $\pm$ 2°C; 56 days 93 $\pm$ 2/-3% RH	$\pm 0.25\% + 0.05 \Omega$ for normal tol. $\pm 0.10\% + 0.05 \Omega$ for ultra high precision	$\pm 0.25\% + 0.05 \Omega$	$\pm 0.25\% + 0.05 \Omega$
4.25.1	—	endurance; standard operation mode	$U = \sqrt{P_{70} \times R} \leq U_{\text{max}};$ 1.5 h on; 0.5h off; 70°C; 1000 h	$\pm 0.25\% + 0.05 \Omega$ for normal tol. $\pm 0.10\% + 0.05 \Omega$ for ultra high precision	$\pm 0.25\% + 0.05 \Omega$	$\pm 0.25\% + 0.05 \Omega$
4.29	45 (XA)	component solvent resistance	isopropyl alcohol; +23°C; toothbrush method	marking legible; no visible damage		

#### Remark

Unless otherwise specified, all values are tested at the following condition:  
Temperature: 21°C to 25°C; Relative humidity: 45% to 60%