

# RPM SERIES

## HIGE PULSE LOAD MELF RESISTORS

### Feature

- Advanced carbon film and thick film technology
- Excellent overall pulse load capability
- Compliant to RoHS directive 2011/65/EU
- Compliant to REACH (EC No. 1907/2006)) (last updated: 27/06/2018)

## 1. RPM series high pulse load melf resistors

## 2. PART NUMBER:

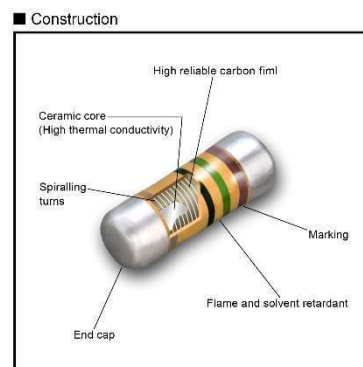
Part number of the melf resistor is identified by the series name, power rating, metric size code, resistance tolerance, temperature coefficient, packing type and resistance value.

For example :

RPM	73P	0204	J	0	T	473
Series Name	Power rating	Size code	Tolerance	TCR	Packing Style	Resistance Value

- (1) Style: RPM SERIES
- (2) Power Rating: please see the data sheet
- (3) DIN size: DIN: 0204, 0207
- (4) Tolerance: F=±1%; G=±2%; J=±5%
- (5) T.C.R.: 0= >100ppm/°C
- (6) Packaging Type: T=REEL/BOX
- (7) Resistance Value: 100K(104); 22K(223); 2K1(212); 120R(121); 10R(100); 1.8R(1R8); 0.33R(R99).....

## 3. Structure of the resistors:



#### 4. COLOR BAND-CODE:

There are 2 bands of color rings as significant figures for 0204 size with G( $\pm 2\%$ ) and J( $\pm 5\%$ ) tolerance resistors shown in the left figure without tolerance code. Tolerance code is available upon request.

There are 3 bands of color rings as significant figures for 0204 size with F( $\pm 1\%$ ) tolerance resistors shown in the right figure without tolerance code. Tolerance code is available upon request.

COLOR	1st	2nd	Multiple	tolerance
black	0	0	1	
brown	1	1	10	
red	2	2	$10^2$	G( $\pm 2.0\%$ )
orange	3	3	$10^3$	
yellow	4	4	$10^4$	
green	5	5	$10^5$	
blue	6	6	$10^6$	
purple	7	7		
gray	8	8		
white	9	9		
golden			$10^{-1}$	J( $\pm 5.0\%$ )
silver			$10^{-2}$	K( $\pm 10\%$ )

COLOR	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	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				$10^{-2}$

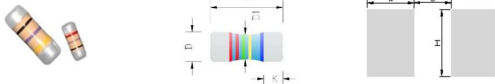
There are 2 bands for color rings for other sizes resistors with G( $\pm 2\%$ ) and J( $\pm 5\%$ ) shown in the left figure without tolerance code. Tolerance code is available upon request.

There are 3 bands of color rings as significant figures for for other size resistors with F( $\pm 1\%$ ) without tolerance code shown in the right figure. Tolerance code is available upon request.

COLOR	1st	2nd	Multiple	tolerance
black	0	0	1	
brown	1	1	10	
red	2	2	$10^2$	G( $\pm 2.0\%$ )
orange	3	3	$10^3$	
yellow	4	4	$10^4$	
green	5	5	$10^5$	
blue	6	6	$10^6$	
purple	7	7		
gray	8	8		
white	9	9		
golden			$10^{-1}$	J( $\pm 5.0\%$ )
silver			$10^{-2}$	K( $\pm 10\%$ )

COLOR	1st	2nd	3rd	Multiple	tolerance
black	0	0	0	1	
brown	1	1	1	10	F( $\pm 1.0\%$ )
red	2	2	2	$10^2$	G( $\pm 2.0\%$ )
orange	3	3	3	$10^3$	
yellow	4	4	4	$10^4$	
green	5	5	5	$10^5$	D( $\pm 0.50\%$ )
blue	6	6	6	$10^6$	C( $\pm 0.25\%$ )
purple	7	7	7		B( $\pm 0.10\%$ )
gray	8	8	8		W( $\pm 0.05\%$ )
white	9	9	9		
golden				$10^{-1}$	J( $\pm 5.0\%$ )
silver				$10^{-2}$	K( $\pm 10\%$ )

## 5. ELECTRICAL CHARACTERISTICS

Type	RPM73P0204	RPM74M0204	RPM74P0207	RPM16M0207	型号	
Cross to Vishay's P/N	CMA0204	CMA0204 power	CMB0207	CMB0207 power	对应于威世贵的产品型号	
Metric type	RC3715M	RC3715M	RC6123M	RC6123M	公制型号	
Resistance range	10Ω to 100kΩ	10Ω to 100kΩ	2.2Ω to 1.5MΩ	2.2Ω to 1.5MΩ	阻值范围	
Resistance tolerance	F(±1%); G(±2%); J(±5.0%);				精度	
Temperature coefficient	±250ppm/°C				温度系数	
Rated dissipation, $P_{70}$	0.25W	0.40W	0.5W	1.0W	70℃以下额定功率	
Max. operating voltage	200V	200V	300V	500V	最大工作电压	
Max Short time overload voltage	400V	400V	600V	1000V	最大短时间过载电压	
Operating Temperature range	-55℃ to 155℃				工作温度范围	
Insulation voltage	>300V	>300V	>500V	>500V	绝缘耐压	
ESD human body mode: up to	4000V	4000V	16000V	16000V	静电释放试验电压(人体模式)	
Max Surge compatibility (1.2/50 μs)	3000V	3000V	10000V	10000V	最高浪涌负荷试验(1.2/50 μs)	
Dimension	±0.2(mm)	L=3.5; D=1.3	L=3.5; D=1.3	L=5.8; D=2.25	L=5.9; D=2.25	外型尺寸
	(mm)	K≥0.6; D <sub>1</sub> ≥D-0.2	K≥0.6; D <sub>1</sub> ≥D-0.2	K≥0.8; D <sub>1</sub> ≥D-0.3	K≥0.8; D <sub>1</sub> ≥D-0.3	
Soldering pad (recommended in mm)	S=1.5; W=1.5; H=1.8	S=1.5; W=1.5; H=1.8	S=3.2; W=2.5; H=3	S=3.2; W=2.5; H=3	(mm)	建议焊盘尺寸
Outlines					外观	
Standard applied	Q/SLC032-2017				适用标准	

- \* Unless otherwise specified, all values are tested at the following condition:  
Temperature: 21℃ to 25℃; Relative humidity: 45% to 70%;
- \* Rated Continuous Working Voltage (RCWV)=  $\sqrt{\text{Power Rating} \times \text{Resistance Value}}$
- \* Resistance value out of range is available on request.

## 6. ENVIRONMENTAL CHARACTERISTICS

### (1) Temperature Coefficient Test

IEC 60115-1, 4.8: Test of resistors at room temperature and 60°C (or 100°C upon 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

R<sub>0</sub> = Resistance value at the room temperature

t = the 2<sup>nd</sup> testing temperature

t<sub>0</sub> = Room temperature

Typical temperature coefficient of resistance of RPM series resistors is around 250ppm/°C.

### (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 ± (0.25%+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.

Resistance to soldering heat:

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

### (4) ESD human body mode

IEC 60115-1, 4.38: 0204 size 6kV and 0207 size 16kV, 3 pos.+3 neg. (equivalent to MIL-STD-883, method 3015) The change of the resistance value should be within ±(0.50%+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  $\pm (2.0\% + 0.05\Omega)$  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 within  $\pm (5.0\% + 0.05\Omega)$  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  $\pm (5.0\% + 0.05\Omega)$  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  $5 \pm 0.5$  Min. with ultrasonic. No deterioration occurred.

(10) Surge compatibility test

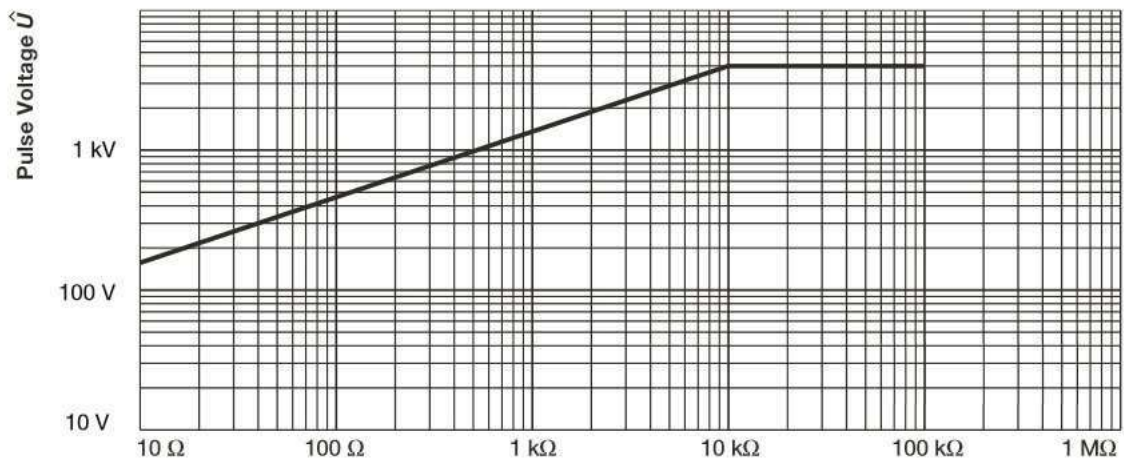
IEC 60115-1, 4.27: Surge voltage capability up to maximum 10 kV 1.2/50  $\mu\text{s}$  pulse, 5 pulses at 12 s intervals; for permissible resistance change  $\pm (0.5\% R + 0.05\Omega)$

IEC 60115-1, 4.27: Surge voltage capability up to maximum 10 kV 10/700  $\mu\text{s}$  pulse, 10 pulses at 1 m intervals; for permissible resistance change  $\pm (0.5\% R + 0.05\Omega)$   
The pulse loading voltage see the following graphs:



## Continuous Pulse : RPM74M0204

1.2/50 Pulse

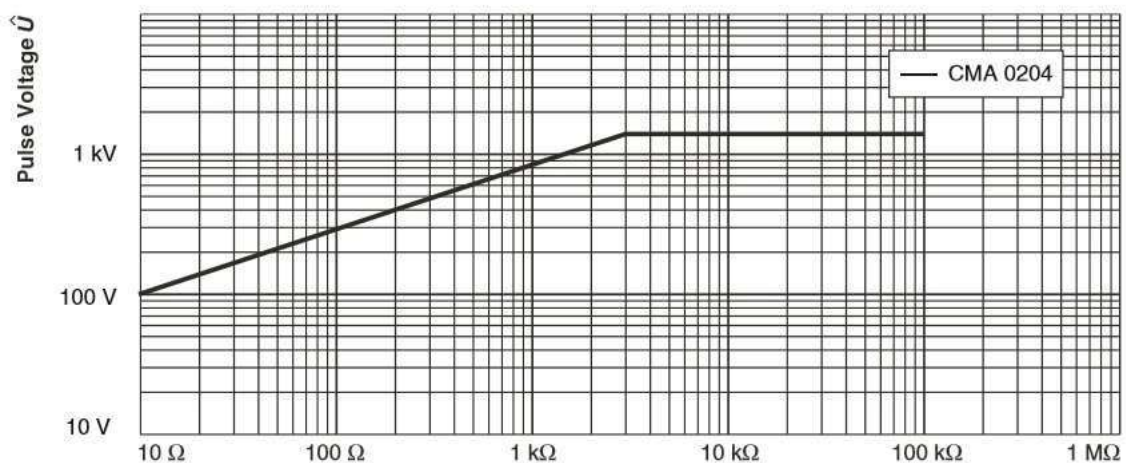


Resistance Value  $R$

Pulse load rating in accordance with IEC 60115-1, 4.27; 1,2  $\mu$ s/50  $\mu$ s; 5 pulses at 12 s intervals; for permissible resistance change  $\pm (0.5 \% R + 0.05 \Omega)$

## Continuous Pulse : RPM74M0204

10/700 Pulse

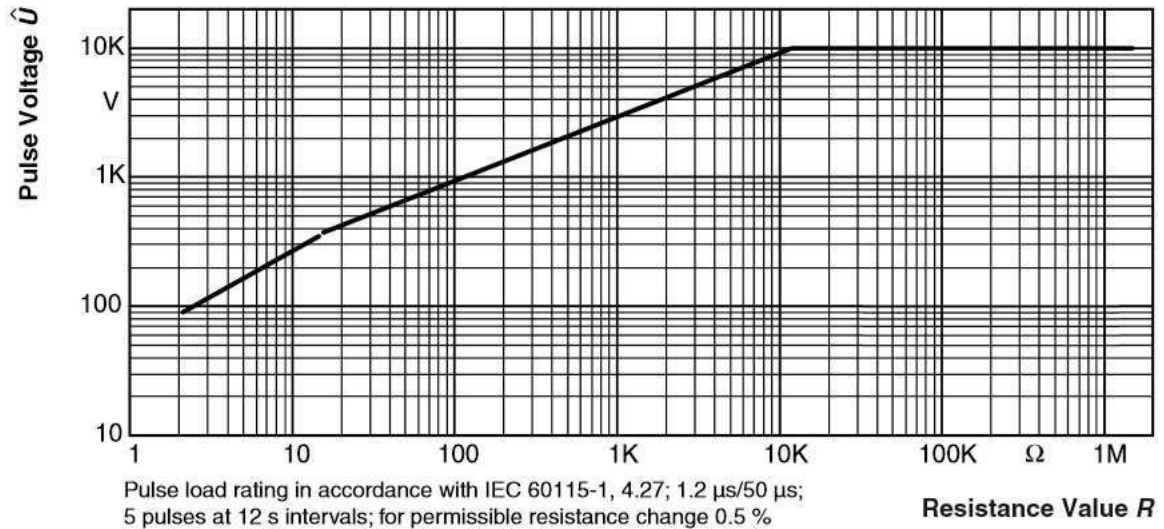


Resistance Value  $R$

Pulse load rating in accordance with IEC 60115-1, 4.27; 10  $\mu$ s/700  $\mu$ s; 10 pulses at 1 minute intervals; for permissible resistance change  $\pm (0.5 \% R + 0.05 \Omega)$

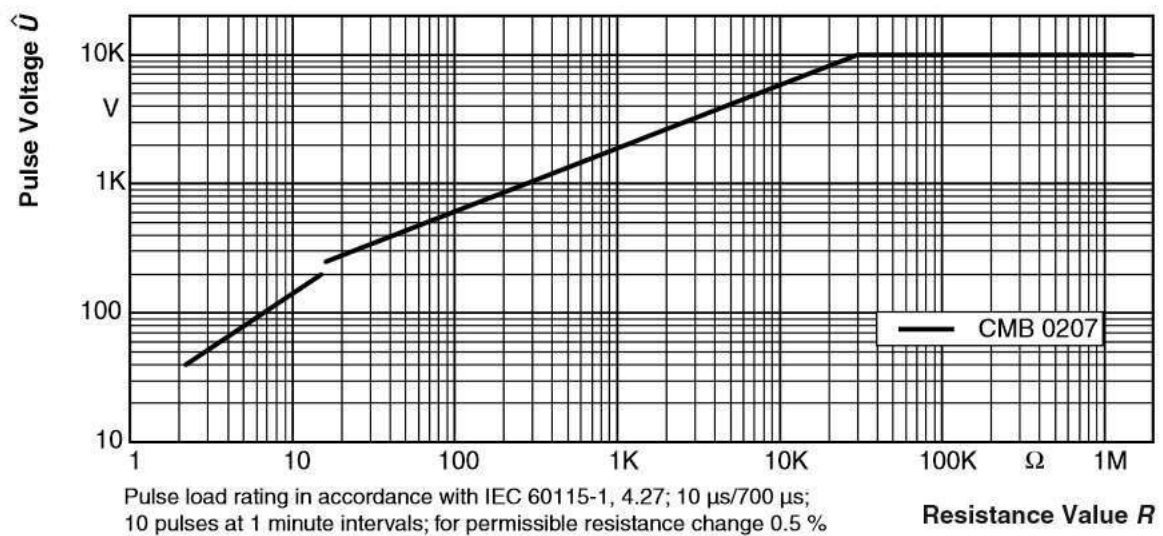
## Continuous Pulse :RPM16M0207

1.2/50 Pulse



## Continuous Pulse :RPM16M0207

10/700 Pulse





## Disclaimer

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