

# Wire-Wound Resistors

## Power Type

**multicomp** PRO

**RoHS  
Compliant**



**Scope:** This specification for approval relates to Power Type Wire-Wound Resistors

**Type designation:** The type designation shall be in the following form:

Type	Power Rating	Resistance tolerance	Nominal Resistance
MPQL	200W	J	100Ω

**Ratings:**

Type	Rated Power at 70°C	Resistance Range	Resistance Tolerance	Operating Temp. Range
MPQL 50W	50W	0.1Ω to 2.7kΩ	± 5% ± 10%	-55°C to +155°C
MPQL 100W	100W	1Ω to 2.7kΩ		
MPQL 120W	120W			
MPQL 150W	150W			
MPQL 200W	200W	10Ω to 2.7kΩ		
MPQL 300W	300W			
MPQL 400W	400W	16Ω to 2.7kΩ		
MPQL 500W	500W	21Ω to 2.7kΩ		
MPQL 750W	750W	76Ω to 2.7kΩ		
MPQL 1,000W	1,000W	101Ω to 2.7kΩ		
MPQL 1,500W	1,500W	121Ω to 2.7kΩ		
MPQL 2,000W	2,000W			
MPQL 2,500W	2,500W			

**Power rating:**

Resistors shall have a power rating based on continuous full load operation at an ambient temperature of 70°C. For temperature in excess of 70°C, the load shall be derated as shown in the figure 1.

**Voltage rating:**

Resistors shall have a rated direct-current (DC) continuous working voltage or an approximate sine-wave root-mean-square (RMS) alternating-current (AC) continuous working voltage at commercial line frequency and waveform corresponding to the power rating, as determined from the following formula :

$$RCWV = \sqrt{P \times R}$$

Note : Max. Working Voltage or  $\sqrt{P \times R}$  whichever is lesser

Max. Overload Voltage or  $2.5 \sqrt{P \times R}$  whichever is lesser

Where : RCWV = Rated DC or RMS AC continuous working voltage at commercial-line frequency and waveform (volt)

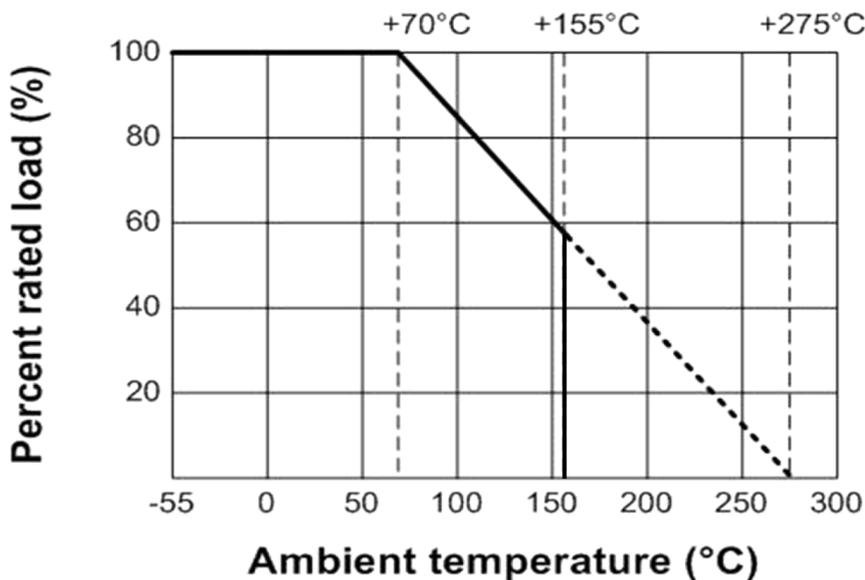
P = Power Rating (watt)

R = Nominal Resistance (ohm)

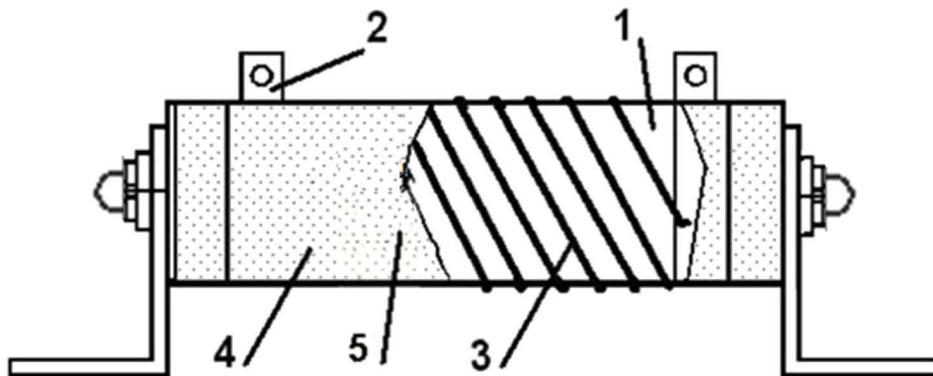
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### Derating Curve



### Construction



No.	Name	Material	Material Generic Name
1	Basic Body	Rod Type Ceramics	Al <sub>2</sub> O <sub>3</sub> , SiO <sub>2</sub>
2	Terminal lead	Terminal cap plated with Tin	Fe : 73%, Mn : 21%, C : 5%
3	Resistance Wire	Ni-Cr Alloy, Cu-Ni Alloy	Ni-Cr Alloy, Cu-Ni Alloy
4	Coating	Insulated & Non-Flame paint ( Color : Green )	Non-Flame paint
5	Marking	Marking Ink	---

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### Performance specification

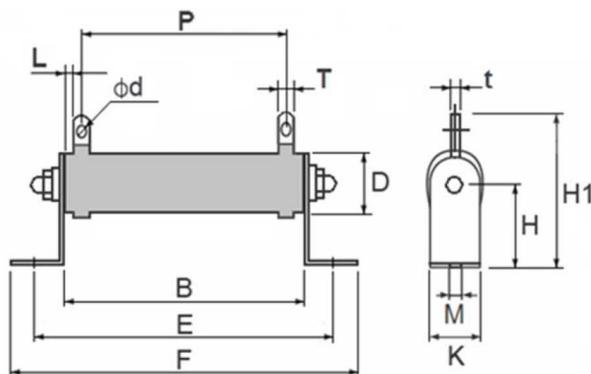
Characteristics	Limits	Test Methods (JIS C 5201-1)
DC. resistance	Must be within the specified tolerance.	The limit of error of measuring apparatus shall not exceed allowable range or 5% of resistance tolerance (Sub-clause 4.5)
Temperature coefficient	<20Ω : ± 400 PPM/°C Max. ≥20Ω : ± 300 PPM/°C Max.	Natural resistance change per temp. degree centigrade. $\frac{R2-R1}{R1(t2-t1)} \times 10^6 \quad (\text{PPM}/^\circ\text{C})$ R1: Resistance value at room temperature (t1) R2: Resistance value at room temp. plus 100°C (t2) (Sub-clause 4.8)
Short time overload	Resistance change rate is ± (2.0% + 0.05Ω) Max. with no evidence of mechanical damage	Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds (Sub-clause 4.13)
Terminal strength	No evidence of mechanical damage	<b>Direct load :</b> Resistance to a 2.5 kgs direct load for 10 secs. in the direction of the longitudinal axis of the terminal leads <b>Twist test :</b> Terminal leads shall be bent through 90° at a point of about 6mm from the body of the resistor and shall be rotated through 360° about the original axis of the bent terminal in alternating direction for a total of 3 rotations (Sub-clause 4.16)
Solderability	95 % coverage Min.	The area covered with a new, smooth, clean, shiny and continuous surface free from concentrated pinholes. Test temp. of solder : 245°C ± 3°C Dwell time in solder : 2 ~ 3 seconds (Sub-clause 4.17)
Soldering temp. reference	Electrical characteristics shall be satisfied. Without distinct defor- mation in appearance. (95 % coverage Min.)	The leads immersed into solder bath to 3.2 to 4.8 mm. from the body. Permanent resistance change shall be checked. Wave soldering condition: (2 cycles Max.) Pre-heat : 100 ~ 120°C, 30 ± 5 sec. Suggestion solder temp.: 235 ~ 255°C, 10 sec. (Max.) Peak temp.: 260°C Hand soldering condition: Hand Soldering bit temp. : 380 ± 10°C Dwell time in solder : 3 +1/-0 sec.
Resistance to soldering heat	Resistance change rate is ± (1% + 0.05Ω) Max. with no evidence of mechanical damage.	Permanent resistance change when leads immersed to 3.2 to 4.8 mm from the body in 350°C ± 10°C solder for 3 ± 0.5 seconds. (Sub-clause 4.18)

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Characteristics	Limits	Test Methods (JIS C 5201-1)
Load life in humidity	Resistance change rate is $\pm(5\% + 0.05\Omega)$ Max. with no evidence of mechanical damage	Resistance change after 1,000 hours (1.5 hours "on", 0.5 hour "off") at RCWV in a humidity test chamber controlled at $40^\circ\text{C} \pm 2^\circ\text{C}$ and 90 to 95 % relative humidity (Sub-clause 4.24.2.1)
Load life	Resistance change rate is $\pm(5\% + 0.05\Omega)$ Max. with no evidence of mechanical damage	Permanent resistance change after 1,000 hours operating at RCWV with duty cycle of (1.5 hours "on", 0.5 hour "off") at $70^\circ\text{C} \pm 2^\circ\text{C}$ ambient (Sub-clause 4.25.1)

### Dimension



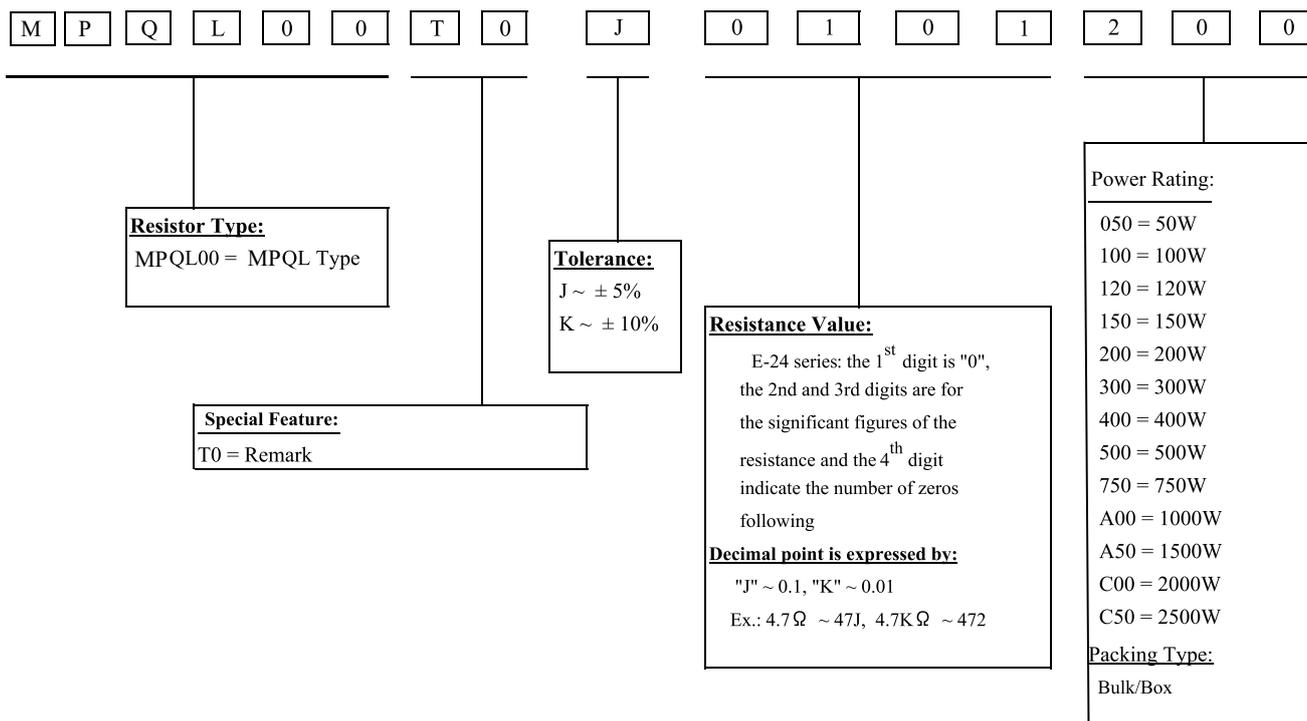
Type	Dimension												
	B	E $\pm$ 5	F $\pm$ 3	D $\pm$ 2	H $\pm$ 1	H1 $\pm$ 3	M $\pm$ 0.5	K $\pm$ 1	L $\pm$ 1	P $\pm$ 3	T $\pm$ 0.5	t $\pm$ 0.5	$\phi d \pm 0.5$
MPQL 50W	102 $\pm$ 2	124	146	28	28	61	6.5	28	3	76	8	1.8	4.5
MPQL 100W	182 $\pm$ 2	204	226							156			
MPQL 120W										179			
MPQL 150W	195 $\pm$ 2	217	239	40	41	81	8	40		266	10		5.5
MPQL 200W										294			
MPQL 300W	282 $\pm$ 2	304	326	50	45	101	50	279		15	2		6.5
MPQL 400W								394					
MPQL 500W	316 $\pm$ 3	338	360	60	60	119	8.5	60		489			
MPQL 750W										577			
MPQL 1,000W	300 $\pm$ 3	325	350	60	60	119	8.5	60		279	15		2
MPQL 1,500W	415 $\pm$ 3	440	465						394				
MPQL 2,000W	510 $\pm$ 3	535	560						489				
MPQL 2,500W	600 $\pm$ 3	625	650						577				

# Wire-Wound Resistors

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### Explanation of Part Number System

(Power Type Wire-Wound Resistors)



Sample: MPQL 200W +/- 5% 100Ω B/B → MPQL00T0J0101200

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