

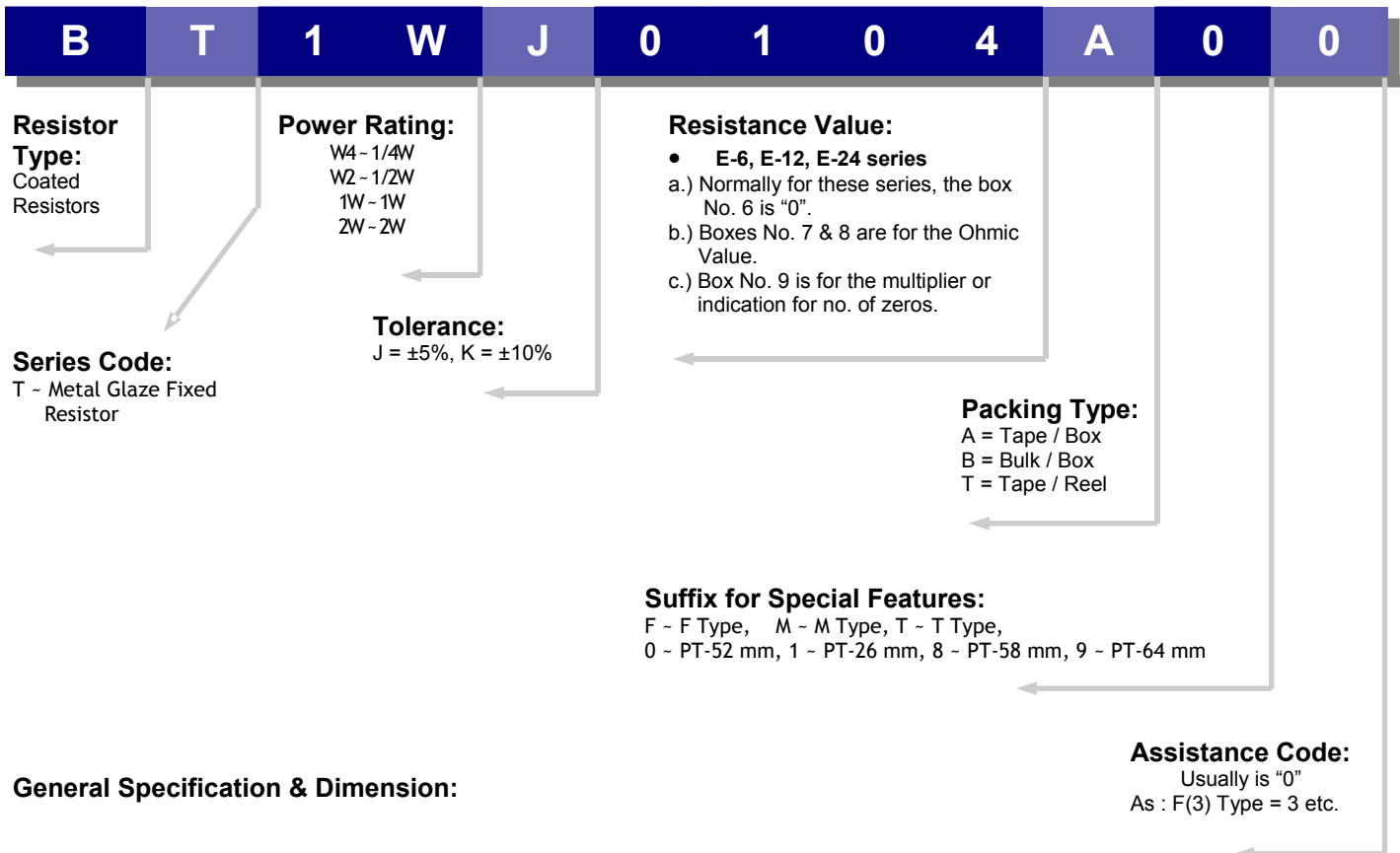
METAL GLAZE FILM FIXED RESISTOR

Features

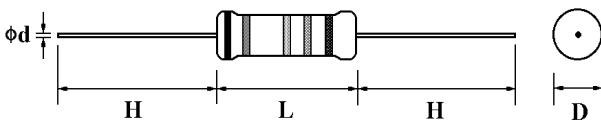
- Small in dimension and broad range in high resistance
- Metal glaze resistor elements provide high stable performance against environmental conditions and overload
- Excellent in absorption of electric shock (Pulse, surge voltage)



Explanation of Part Number & Ordering Procedure:



General Specification & Dimension:



* 5 band color code for ±5% tolerance and last band black color for identification.

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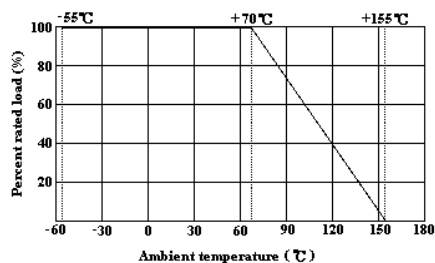
Dimension:

Part No.	Style	Power Rating at 70°C	Dimension (mm)			
			D Max.	L Max.	d $\begin{matrix} +0.02 \\ -0.05 \end{matrix}$	H ± 3
BTW4	MGR -25	1/4W (0.25 W)	2.7	7.0	0.6	28
BTW2	MGR -50	1/2W (0.5 W)	3.8	10.0	0.6	28
BT1W	MGR -100	1 W	5.2	13.0	0.8	28
BT2W	MGR -200	2 W	6.0	17.0	0.8	28

Rating:

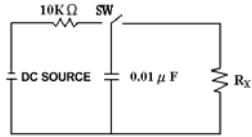
Style	Max. Working Voltage	Max. Overload Voltage	Dielectric Withstanding voltage	Surge withstanding voltage			Resistance range
				$\leq 1M\Omega$	1.1M Ω ~6.2M Ω	$\geq 6.8M\Omega$	
MGR -25	500 V	700 V	500 V	3,000 V	4,000 V	6,000 V	100K Ω ~33M Ω
MGR -50	700 V	1,000 V	700 V	4,000 V	5,000 V	8,000 V	100K Ω ~33M Ω
MGR -100	1,000 V	1,400 V	1,000 V	5,000 V	6,000 V	9,000 V	100K Ω ~33M Ω
MGR -200	1,000 V	1,400 V	1,000 V	8,000 V	9,000 V	10,000 V	100K Ω ~33M Ω

Derating Curve



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Performance Specifications:

Characteristics	Test Methods	Limits																				
Temperature coefficient JIS - C - 5202 5.2	Natural resistance change per temp. degree centigrade $\frac{R_2 - R_1}{R_1 (t_2 - t_1)} \times 10^6 \text{ (PPM / } ^\circ\text{C)}$ R ₁ : Resistance value at room temperature (t ₁) R ₂ : Resistance value at room temp. plus 100°C (t ₂)	± 200PPM / °C																				
Short - time overload JIS - C - 5202 5.5	Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds.	Resistance change rate is ± (1% + 0.05Ω) No evidence of mechanical damage																				
Dielectric withstanding voltage JIS - C - 5202 5.7	Resistors shall be clamped in the trough of a 90° metallic V-block and shall be tested at AC potential respectively specified in the table 1. for 60 + 10/ -0 seconds.	No evidence of flashover mechanical damage, arcing or insulation break down.																				
Pulse overload JIS - C - 5202 5.8	Resistance change after 10,000 cycles (1 second "on", 25 seconds "off") at 4 times RCWV or the max. pulse overload voltage.	Resistance change rate is ±(2.0% + 0.05Ω). With no evidence of mechanical damage																				
Temperature cycling JIS - C - 5202 7.4	Resistance change after continuous five cycles for duty cycle specified below: <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55 °C ± 3 °C</td> <td>30 mins.</td> </tr> <tr> <td>2</td> <td>Room temp.</td> <td>10 - 15 mins.</td> </tr> <tr> <td>3</td> <td>+155 °C ± 2 °C</td> <td>30 mins.</td> </tr> <tr> <td>4</td> <td>Room temp.</td> <td>10 - 15 mins.</td> </tr> </tbody> </table>	Step	Temperature	Time	1	-55 °C ± 3 °C	30 mins.	2	Room temp.	10 - 15 mins.	3	+155 °C ± 2 °C	30 mins.	4	Room temp.	10 - 15 mins.	Resistance change rate is ± (5%+0.05 Ω) No evidence of mechanical damage.					
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3	+155 °C ± 2 °C	30 mins.																				
4	Room temp.	10 - 15 mins.																				
Load life in humidity JIS - C - 5202 7.9	Resistance change after 1,000 hours operating at RCWV with duty cycle of (1.5 hours "on", 0.5 hour "off") in a humidity test chamber controlled at 40°C ± 2°C and 90 to 95% relative humidity.	Resistance change rate is ± (5% + 0.05Ω) No evidence of mechanical damage																				
Load life JIS - C - 5202 7.10	Permanent resistance change after 1,000 hours operating at RCWV with duty cycle of (1.5 hours "on", 0.5 hour "off") at 70°C ± 2°C ambient.	Resistance change rate is ± (5% + 0.05Ω) No evidence of mechanical damage																				
Terminal strength JIS-C-5202 6.1	Direct load: Resistance to a 2.5kgs direct load for 10 seconds in the direction of the longitudinal axis of the terminal leads. Twist test: Terminal leads shall be bent through 90° at a point of about 6 mm 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	No evidence of mechanical damage																				
Resistance to soldering heat JIS-C-5202 6.4	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.	Resistance change rate is ±(1% + 0.05Ω). With no evidence of mechanical damage.																				
Solderability JIS-C-5202 6.5	The area covered with a new, smooth, clean, shiny and continuous surface free from concentrated pinholes. Test temp of solder: 235°C ± 5°C Dwell time in solder: 3 + 0.5/ -0 seconds	95% coverage Min.																				
Surge Withstanding Voltage	The following discharge cycle is repeated in the circuit on the left fig. (2.5 sec. "on", 2.5 sec. "off") 10 cycles. Applied voltage (DC Source) <table border="1" style="margin: 10px auto;"> <thead> <tr> <th></th> <th>1/4W</th> <th>1/2W</th> <th>1W</th> <th>2W</th> </tr> </thead> <tbody> <tr> <td>100K-1M</td> <td>3000V</td> <td>4000V</td> <td>5000V</td> <td>8000V</td> </tr> <tr> <td>1.1M-6.2M</td> <td>4000V</td> <td>5000V</td> <td>6000V</td> <td>9000V</td> </tr> <tr> <td>≥6.8M</td> <td>6000V</td> <td>8000V</td> <td>9000V</td> <td>10000V</td> </tr> </tbody> </table>		1/4W	1/2W	1W	2W	100K-1M	3000V	4000V	5000V	8000V	1.1M-6.2M	4000V	5000V	6000V	9000V	≥6.8M	6000V	8000V	9000V	10000V	Allowable resistance change ±10% Test circuit: 
	1/4W	1/2W	1W	2W																		
100K-1M	3000V	4000V	5000V	8000V																		
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