

## Data Sheet

**Customer:**

**Product:** Molding E-Beam Welded Metal Strip Resistor — WMR Series

**Sizes.:** 1206/2010/2512/2725/2728/4527

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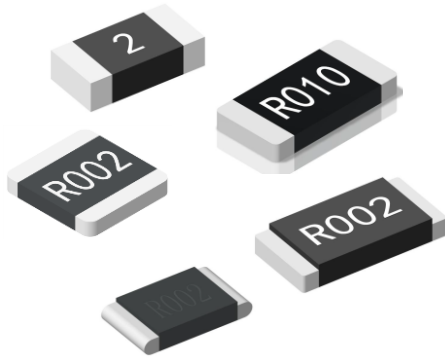
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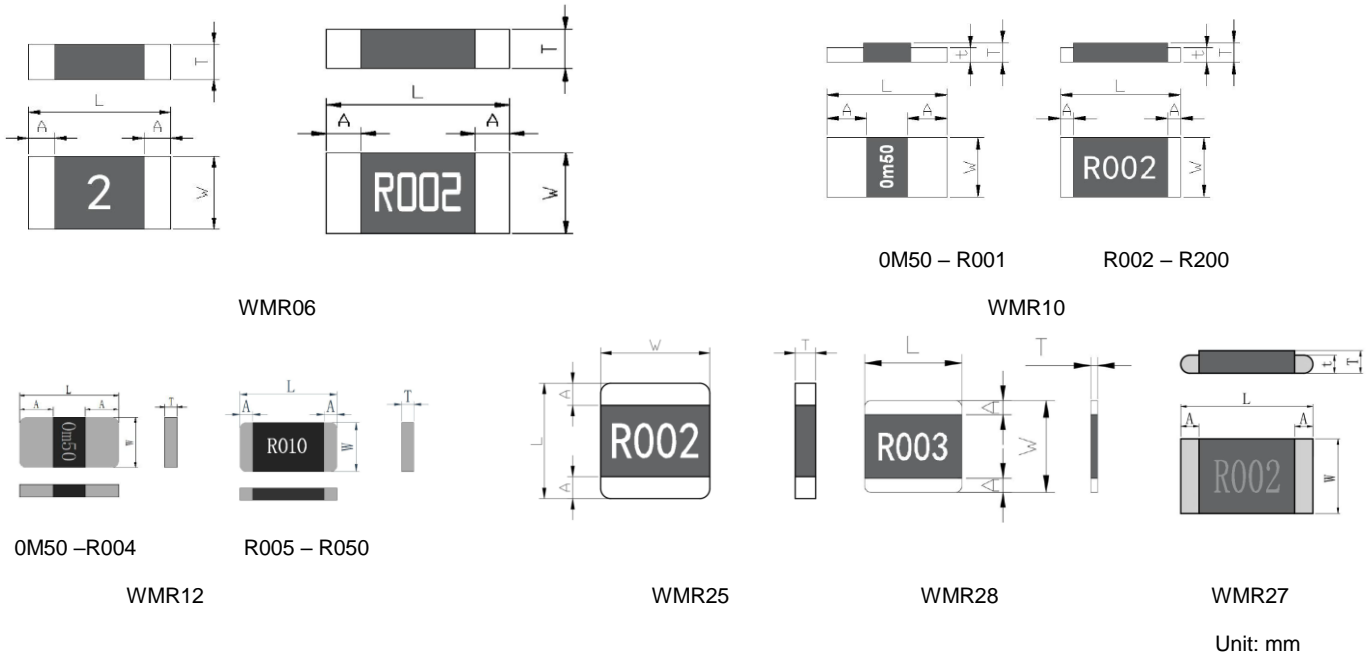
## Molding E-Beam Welded Metal Strip Resistor



### Features

- E-beam welded metal strip resistors, pure copper Electrodes are the ideal solution for current sensing applications
- Excellent reliability, stability, Anti-pulse capability
- Special welding process, all-metal construction, Supports low resistance , High temperature resistant resin molded encapsulation, strong weather resistance
- Low thermal EMF(<math><1 \mu V/^{\circ}C</math>)
- Ultra-low parasitic inductance , fast response, can be used for high frequency AC current detection.
- AEC-Q200 Reliability Testing passed
- RoHS compliant

### Dimensions



Type	Size (Inch)	Resistance (mΩ)	L	W	T	A	t
WMR06	1206	1	3.20±0.20	1.65±0.20	0.80±0.20	0.70±0.20	-
		2 – 25	3.20±0.20	1.65±0.20	0.80±0.20	0.60±0.20	-
WMR10	2010	0.5 – 1	5.10±0.20	2.50±0.20	0.80±0.15	1.70±0.20	0.60±0.10
		2 – 200	5.10±0.20	2.50±0.20	0.80±0.15	0.55±0.20	0.60±0.10
WMR12	2512	0.5 – 1	6.40±0.20	3.20±0.20	0.80±0.15	2.30±0.20	-
		1 – 4	6.40±0.20	3.20±0.20	0.80±0.15	1.50±0.20	-
		5 – 50	6.40±0.20	3.20±0.20	0.80±0.15	0.85±0.20	-
WMR25	2725	0.2, 0.25	6.80±0.25	6.50±0.25	1.20±0.10	1.70±0.15	-
		0.5, 1, 2, 2.5	6.80±0.25	6.50±0.25	1.20±0.10	1.20±0.15	-
		3	6.80±0.25	6.50±0.25	1.20±0.10	1.00±0.15	-
WMR28	2728	3 – 50	7.20±0.20	6.80±0.20	1.00±0.10	1.10±0.15	-
WMR27	4527	1 – 100	11.60±0.50	6.60±0.50	2.00±0.20	1.60±0.50	1.60±0.10

**Molding E-Beam Welded Metal Strip Resistor**

**Part Numbering**

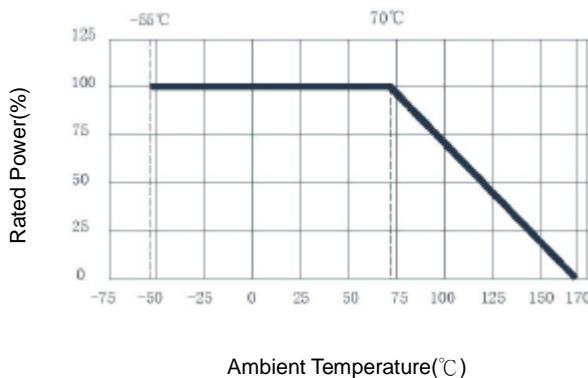
WMR	12	F	T	D	R	R005	K
Product Type	Dimensions	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Power Rating	Resistance	Material Code
	06: 1206 10: 2010 12: 2512 25: 2725 28: 2728 27: 4527	D: ±0.5% F: ±1% J: ±5%	T: Taping Reel	C: ±25 D: ±50 W: ±75 E: ±100 K: ±150 12: ±175	S: 2W R: 3W H: 4W D: 5W 9: 9W	0M50: 0.0005Ω R001: 0.001Ω R010: 0.01Ω R100: 0.1Ω	M: Manganin K: Kamar F: FeCrAl

**Standard Electrical Specifications**

Type	Power Rating	Material	Resistance Range(mΩ)			TCR (PPM/°C)
			±0.5%	±1%	±5%	
WMR06 (1206)	2W	Manganin	-	1		±150
			-	2 – 8		±100
		Kamar	-	9 – 25		±75
			-	9 – 25		±50
WMR10 (2010)	2W	Manganin	-	0.5 – 1		±175
		Manganin	-	2 – 7		±100
		Kamar	-	8 – 200		±75
WMR12 (2512)	3W	Manganin	0.5 -1			±150
		Manganin	1 -50			±100
		FeCrAl	3 -4			±50
		FeCrAl	5 -50			±25
		Kamar	3 -50			±50
WMR25 (2725)	4W	Manganin	-	0.2, 0.25, 0.5		±200
		FeCrAl	-	1, 2, 2.5, 3		±25
WMR28 (2728)	5W	FeCrAl	3 – 50			±50
WMR27 (4527)	9W	Manganin	-	1 -5		±75
		Kamar	-	6		±75
		Kamar	-	7 -100		±50

Operating Temperature: -55 ~ +170°C

**Derating Curve**

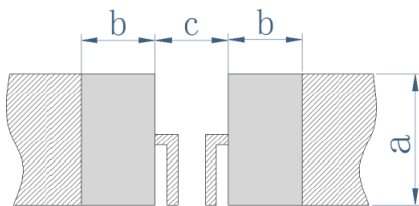


**Molding E-Beam Welded Metal Strip Resistor**

**Environmental Characteristics**

Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	Within the specified value	<b>IEC60115-1 4.8</b> Measured value 20°C ~ +130°C, reference value +20°C
Solderability	No visible damage, weldable area 95% minimum	<b>IEC60115-1 4.17</b> 245°C for 3 seconds
Short time overload	No visible damage, ΔR±1.0% maximum	<b>IEC60115-1 4.13</b> 2.5 times rated voltage, 5 sec
Resistance to solder heat	No visible damage, ΔR±0.5% maximum	<b>IEC60115-1 4.18</b> 260°C for 10 sec
Bending Strength	Within the specified value	<b>IEC60115-1 4.33</b> Bending amplitude 2 mm for 60+5 seconds
Flammability	No ignition of the tissue paper or scorching or the pinewood board	<b>UL-94</b> V-0 or V-1 are acceptable. Electrical test not required
Insulation Resistance	>1000MΩ	<b>IEC60115-1 4.6</b> Apply 100VDC for 1 minute
Dielectric Withstand Voltage	No breakdown or arcing	<b>IEC60115-1 4.7</b> Apply 100VAC for 1 minute
Resistance to solvents	Marking Unsmearred	<b>IEC60115-1 4.29</b> IPA, 23°C, 10 hrs
High temperature and humidity	No visible damage, ΔR±1.0% maximum	<b>AEC-Q200 Test 7/MIL-STD-202 method 103</b> temperature 85 °C, humidity 85% of the conditions applied 10% of the rated power (current) or component limit current (whichever is less), for 1000 hours
High temperature storage	No visible damage, ΔR±1.0% maximum	<b>IEC60115-1 4.25.3</b> 1000 hrs @ 170°C, without load
Low temperature load	No visible damage, ΔR±0.5% maximum	<b>IEC60115-1 4.36</b> -55°C, No load for one hour, rated voltage load for 45 min, no load for 15 min
Temperature cycling	No visible damage, ΔR±1.0% maximum	<b>IEC60115-1 4.19</b> -55°C @ 30 min ~ +155°C @ 30 min, 1000 cycles
Load life	No visible damage, ΔR±1.0% maximum	<b>IEC60115-1 4.25.1</b> 1000 h @ 70°C, rated current or component limit current (whichever is less), 90 min on, 30 min off

**Recommend Land Pattern**

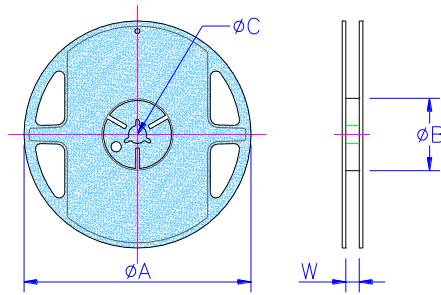


Type	Resistance (mΩ)	a (mm)	b (mm)	c (mm)
WMR06	1 – 25	2.18	1.2	1.8
WMR10	0.5 – 1	3.0	2.4	1.4
	2 – 200	3.0	1.6	3.0
WMR12	0.5 – 1	3.7	3.0	1.3
	1 – 4	3.7	2.3	2.8
	5 – 50	3.7	1.9	3.6
WMR25	0.2 – 0.25	6.86	3.18	1.32
	0.5 – 3	6.86	2.28	3.12
WMR28	3 – 50	7.82	2.75	3.51
WMR27	1 – 100	8.7	3.4	8.0

**Molding E-Beam Welded Metal Strip Resistor**

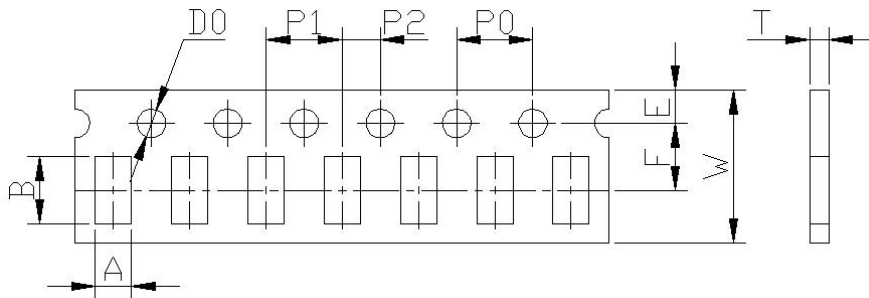
**■ Packaging**

Reel Specifications & Packaging Quantity



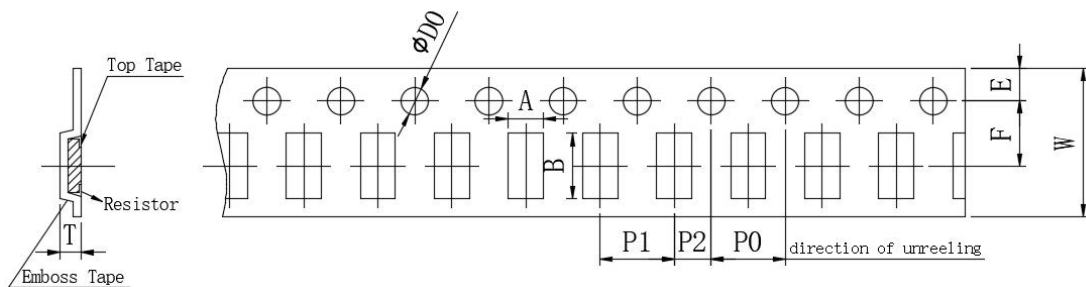
Type	Packaging Quantity	Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	
WMR06	Paper	5K	8mm	7 inch	178.0±2.0	60.0±1.0	13.5±0.5	8.3±0.5
WMR10	Embossed	4K	12mm	7 inch	178.0±2.0	60.0±1.0	13.5±0.5	12.3±0.5
WMR12	Embossed	4K	12mm	7 inch	178.0±2.0	60.0±1.0	13.5±0.5	12.3±0.5
WMR25	Embossed	1K	12mm	7 inch	178.0±2.0	60.0±1.0	13.5±0.5	12.0±0.3
WMR28	Embossed	1K	12mm	7 inch	178.0±2.0	60.0±1.0	13.5±0.5	12.0±0.3
WMR27	Embossed	0.5K	24mm	7 inch	178.0±2.0	60.0±1.0	13.5±0.5	25.0±0.5

Paper Tape Specifications



Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P0 (mm)	P1 (mm)	P2 (mm)	ΦD0 (mm)	T (mm)
WMR06	1.90	3.50	8.00	1.75	3.50	4.00	4.00	2.00	1.50	1.10

Embossed Plastic Tape Specifications



Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P0 (mm)	P1 (mm)	P2 (mm)	ΦD0 (mm)	T (mm)
WMR10	2.80	5.40	12.00	1.75	5.50	4.00	4.00	2.00	1.50	1.20
WMR12	3.50	6.80	12.00	1.75	5.50	4.00	4.00	2.00	1.50	1.20
WMR25	6.80	7.20	12.00	1.75	5.50	4.00	8.00	2.00	1.50	1.50
WMR28	7.70	7.20	12.00	1.75	5.50	4.00	12.00	2.00	1.50	1.45
WMR27	7.40	11.80	24.00	1.75	11.50	4.00	12.00	2.00	1.50	2.30