



“Trimming Free” Technology, High Precision, Reliability

■ MSRPM 4026 series

AEC-Q200 Compliant

Features

- The MSRPM series is based on precision resistive alloy and welded with vacuum electron beam welding equipment to ensure its characteristics and reliability.
- Precision machining and uniform welding provide a minimum tolerance of $\pm 0.5\%$ without trimming.
- The TCR achieves $\pm 75\text{ppm}/^\circ\text{C}$ ($0.2\text{m}\Omega\sim 0.3\text{m}\Omega$) and $\pm 100\text{ppm}/^\circ\text{C}$ ($0.5\text{m}\Omega\sim 1.0\text{m}\Omega$) over a wide temperature range of -55°C to $+170^\circ\text{C}$.
- The "Trimming-free" technology avoids current loss and is free of hot spots.
- The thermoelectric power is extremely low and thermal fluctuations are minimized.



Applications

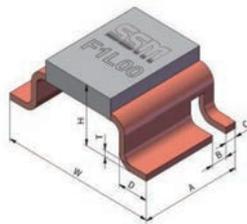
- Automotive Electronic
- Precision Power Supply
- Instrumentation
- Medical Equipment

◆ Electrical Specification

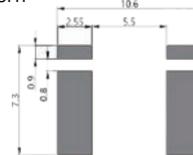
Series	Size inch. (mm)	Resistance Value	Power	Max. Operating Current	Operating Temperature	TCR (20°C R _{ref})	Tolerance	Thermal Resistance	PKG.
MSRPM	4026 (10166)	0.2 mΩ	12 W	240 A	$-55^\circ\text{C}\sim 170^\circ\text{C}$	$\pm 75\text{ ppm}/^\circ\text{C}$	$\pm 0.5\%$	4.8 $^\circ\text{C}/\text{W}$	1,200 pcs.
		0.3 mΩ	11 W	190 A				5.9 $^\circ\text{C}/\text{W}$	
		0.5 mΩ	9 W	134 A		$\pm 100\text{ ppm}/^\circ\text{C}$	$\pm 1.0\%$	8.5 $^\circ\text{C}/\text{W}$	
		0.7 mΩ	8 W	106 A				10.8 $^\circ\text{C}/\text{W}$	
		1.0 mΩ	7 W	83 A				12.6 $^\circ\text{C}/\text{W}$	

◆ Dimensions

Resistor



Land Pattern



Not following the recommended land pattern design can seriously affect the temperature coefficient measurement results and current sensing accuracy!

Series	Size inch. (mm)	Resistance Value	Unit:mm						
			T	H	W	A	B	C	D
MSRPM	4026 (10166)	0.2 mΩ	0.4 \pm 0.2	3.75 \pm 0.5	10.1 \pm 0.3	6.6 \pm 0.3	1.0 \pm 0.3	0.7 \pm 0.3	2.0 \pm 0.3
		0.3 mΩ	0.4 \pm 0.2	3.33 \pm 0.5	10.1 \pm 0.3	6.6 \pm 0.3	1.0 \pm 0.3	0.7 \pm 0.3	2.0 \pm 0.3
		0.5 mΩ	0.4 \pm 0.2	3.10 \pm 0.5	10.1 \pm 0.3	6.6 \pm 0.3	1.0 \pm 0.3	0.7 \pm 0.3	2.0 \pm 0.3
		0.7 mΩ	0.4 \pm 0.2	2.92 \pm 0.5	10.1 \pm 0.3	6.6 \pm 0.3	1.0 \pm 0.3	0.7 \pm 0.3	2.0 \pm 0.3
		1.0 mΩ	0.4 \pm 0.2	2.85 \pm 0.5	10.1 \pm 0.3	6.6 \pm 0.3	1.0 \pm 0.3	0.7 \pm 0.3	2.0 \pm 0.3

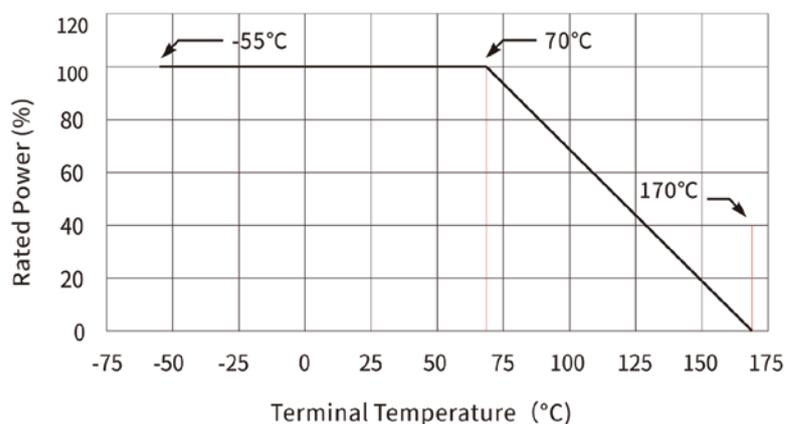
◆ Part Number information

Series (5 digits)	Size (4 characters)	TCR (1 character)	Resistance (4 characters)	Tolerance (1 character)	Quantity (3 character)
MSRPM	4026	A: $\pm 75\text{ ppm}/^\circ\text{C}$ R: $\pm 100\text{ ppm}/^\circ\text{C}$	0L20 = 0.2mΩ 0L30 = 0.3mΩ 0L50 = 0.5mΩ 0L70 = 0.7mΩ 1L00 = 1.0mΩ	D: $\pm 0.5\%$ F: $\pm 1\%$ J: $\pm 5\%$	1P2 = 1,200 pcs.

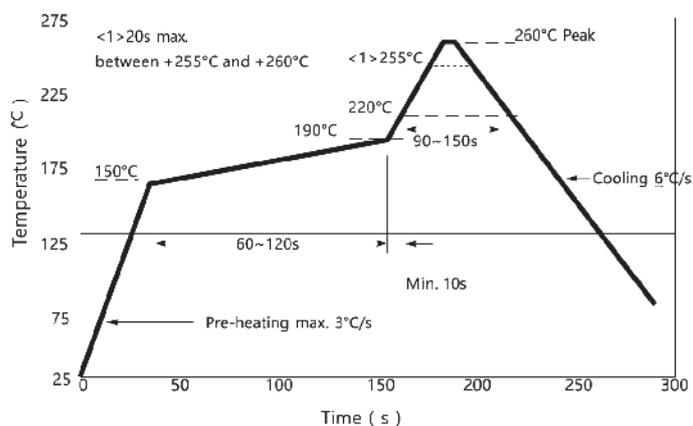
◆ Performance

Test	Test Method	Standards	Max.	
High Temperature Storage	+170°C for 1000 hours unpowered	AEC-Q200 TEST 3 MIL-STD-202 Method 108	$\Delta R \leq \pm 0.5\%$	$\Delta R \leq \pm 1.0\%$
Thermal Shock	-55°C, 15min ~ ambient temperature <20s ~ +155°C, 15min, 1000 cycles	AEC-Q200 TEST 16 MIL-STD-202 Method 107	$\Delta R \leq \pm 0.5\%$	$\Delta R \leq \pm 1.0\%$
Bias Humidity	+85°C, 85%RH, powered 10% rated power for 1000h	AEC-Q200 TEST 7 MIL-STD-202 Method 103	$\Delta R \leq \pm 0.2\%$	$\Delta R \leq \pm 0.5\%$
Load Life	+70°C for 2000 hours, rated power, 90min on, 30min off +70°C refers to terminal temperature	AEC-Q200 TEST 8 MIL-STD-202 Method 108	$\Delta R \leq \pm 0.5\%$	$\Delta R \leq \pm 1.0\%$
Resistance to Solvent	Immerse in solvent for 3 min and wipe 10 times. Three cycles of three solvents. Dry at ambient temperature after cleaning	AEC-Q200 TEST 12 MIL-STD-202 Method 215	Clear marking. No visible damage	
Mechanical Shock	Half sine wave, peak acceleration 100g's, pulse duration 6ms, 3 times in each of six directions, on three different axes	AEC-Q200 TEST 13 MIL-STD-202 Method 213	3920: $\Delta R \leq \pm 0.01\%$ 5930: $\Delta R \leq \pm 0.05\%$	$\Delta R \leq \pm 0.2\%$
Vibration	10-2KHz, 5g's, 20min/cycle, 12 cycles in each directions of X Y Z	AEC-Q200 TEST 14 MIL-STD-202 Method 204	3920: $\Delta R \leq \pm 0.01\%$ 5930: $\Delta R \leq \pm 0.05\%$	$\Delta R \leq \pm 0.2\%$
Resistance to Solder Heat	+260°C for 10s	AEC-Q200 TEST 15 MIL-STD-202 Method 210	$\Delta R \leq \pm 0.2\%$	$\Delta R \leq \pm 0.5\%$
Solderability	+245°C tin bath for 3s	AEC-Q200 TEST 18 IEC 60115-1 4.17	No visible damage. 95% minimum coverage	
TCR	-55°C and +170°C, +20°C Ref.	AEC-Q200 TEST 19 IEC 60115-1 4.8	Within the nominal TCR	
Substrate Bending	2mm. Duration: 60s.	AEC-Q200 TEST 21 AEC-Q200-005	$\Delta R \leq \pm 0.1\%$	$\Delta R \leq \pm 0.5\%$
Short Time Overload	5x rated voltage, 5s	IEC 60115-1 4.13	$\Delta R \leq \pm 0.1\%$	$\Delta R \leq \pm 0.5\%$
Low Temperature Storage	-55°C for 96h, unpowered	IEC 60068-2-1	$\Delta R \leq \pm 0.1\%$	$\Delta R \leq \pm 0.5\%$
Moisture Resistance	Apply T=24 h/cycle, zero power, method 7a and 7b are not required	MIL-STD-202 Method 106	$\Delta R \leq \pm 0.1\%$	$\Delta R \leq \pm 0.5\%$

◆ Derating Curve

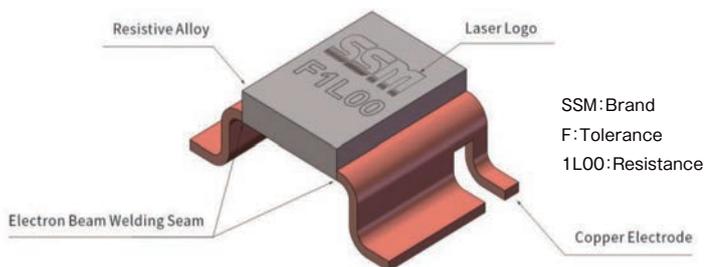


◆ Reflow Soldering Profile

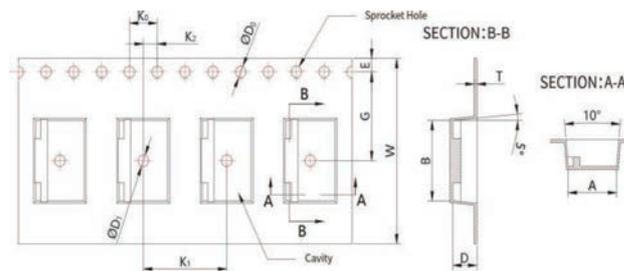


Resistor Surface Temperature:
 Pre-Heat: +150°C+190°C, 60~120sec.
 Reflow: Above +220°C, 90~150sec.
 Applicable Solder Composition: Sn-Ag-Cu

Construction & Marking

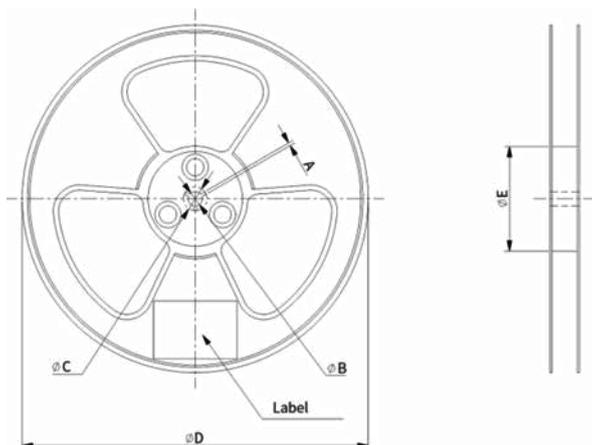


Tape Specification



Series	Size inch (mm)	Resistance Value	Unit:mm											
			A	B	φD0	φD1	K0	K1	K2	E	G	W	D	T
MSRPM	4026 (10166)	0.2mΩ	7.0±0.1	10.5±0.1	1.5±0.1	1.5±0.1	4.0±0.1	12.0±0.1	2.00±0.1	1.75±0.1	11.5±0.1	24.0±0.3	4.2±0.1	0.4±0.05
		0.3 mΩ	7.0±0.1	10.5±0.1	1.5±0.1	1.5±0.1	4.0±0.1	12.0±0.1	2.00±0.1	1.75±0.1	11.5±0.1	24.0±0.3	4.2±0.1	0.4±0.05
		0.5 mΩ	7.0±0.1	10.5±0.1	1.5±0.1	1.5±0.1	4.0±0.1	12.0±0.1	2.00±0.1	1.75±0.1	11.5±0.1	24.0±0.3	3.5±0.1	0.4±0.05
		0.7 mΩ	7.0±0.1	10.5±0.1	1.5±0.1	1.5±0.1	4.0±0.1	12.0±0.1	2.00±0.1	1.75±0.1	11.5±0.1	24.0±0.3	3.5±0.1	0.4±0.05
		1.0 mΩ	7.0±0.1	10.5±0.1	1.5±0.1	1.5±0.1	4.0±0.1	12.0±0.1	2.00±0.1	1.75±0.1	11.5±0.1	24.0±0.3	3.5±0.1	0.4±0.05

Reel Specification



Series	Size inch (mm)	Unit:mm				
		A	φB	φC	φD	φE
MSRPM	4026 (10166)	1.5 Min.	13.0+0.5/-0.2	20.2 Min.	330±2	100±2