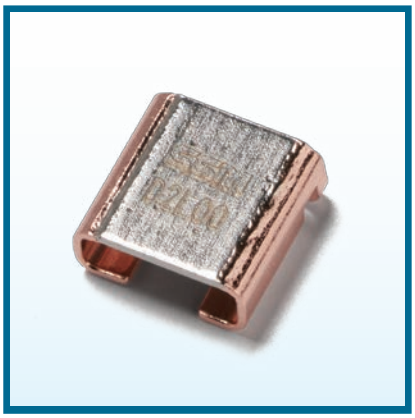


# "Trimming Free" Technology, High Precision, Reliability

## ■MSRPM 2726 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 ±0.5% without trimming.
- The TCR achieves ±75ppm/°C (0.2m~0.3mΩ) and ±100ppm/°C (0.5m~1.0mΩ) over a wide temperature range of -55°C to +170°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.

Lead free | Halogen free | RoHS Compliance

## Applications

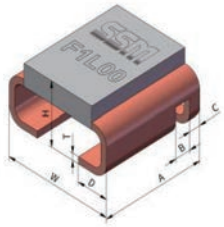
- Automotive Electronics
- Precision Power Supply
- Instrumentation
- Medical Equipment

## ◆Electrical Specification

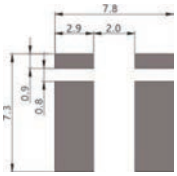
| Series | Size inch. (mm) | Resistance Value | Power | Max. Current | Operating Tempertature | TCR (20°CRsef) | Torelance | Thermal Resistance | PKG. |
|---|---|---|---|---|---|---|---|---|---|
| MSRPM | 2726 (6966) | 0.2 mΩ | 12 W | 240 A | -55~170 ℃ | ±75 ppm/℃ | ± 0.5 % | 4.8 ℃/W | 1,200 pcs. |
| | | 0.3 mΩ | 11 W | 190 A | | | ±1 % | 5.9 ℃/W | |
| | | 0.5 mΩ | 6 W | 134 A | | ±100 ppm/℃ | ±5 % | 8.5 ℃/W | |
| | | 1.0 mΩ | 7 W | 83 A | | | | 12.6 ℃/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 | 2726 (6966) | 0.2 mΩ | 0.4±0.2 | 3.75±0.5 | 6.9±0.3 | 6.6±0.3 | 1.0±0.3 | 0.7±0.3 | 2.0±0.3 |
| | | 0.3 mΩ | 0.4±0.2 | 3.33±0.5 | 6.9±0.3 | 6.6±0.3 | 1.0±0.3 | 0.7±0.3 | 2.0±0.3 |
| | | 0.5 mΩ | 0.4±0.2 | 3.10±0.5 | 6.9±0.3 | 6.6±0.3 | 1.0±0.3 | 0.7±0.3 | 2.0±0.3 |
| | | 1.0 mΩ | 0.4±0.2 | 2.85±0.5 | 6.9±0.3 | 6.6±0.3 | 1.0±0.3 | 0.7±0.3 | 2.0±0.3 |

## ◆ Part Number information

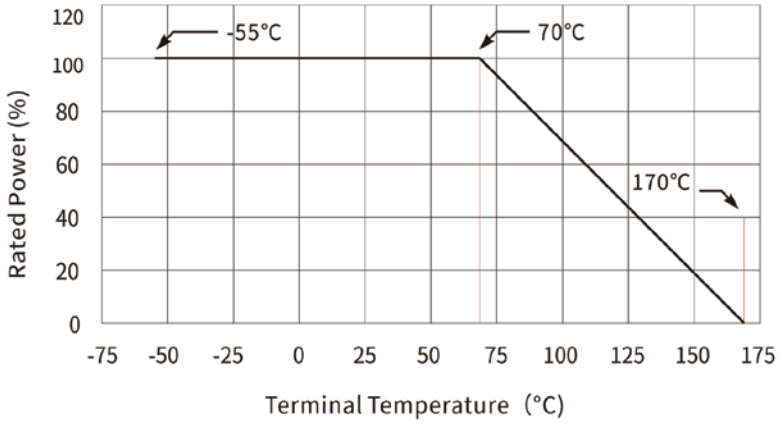
| M | S | R | P | M | 2 | 7 | 2 | 6 | A | - | 0 | L | 2 | 0 | - | F | 1 | P | 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Series (5 characters) | Size (5 characters) | TCR (1 character) | Resistance (4 characters) | Tolerance (1 characters) | Quantity (3 characters) |
|---|---|---|---|---|---|
| MSRPM | 2726 | A:±75 ppm/°C<br>R:±100 ppm/°C | 0L20=0.2mΩ<br>0L30=0.3mΩ<br>0L50=0.5mΩ<br>1L00=1.0mΩ | D: ± 0.5 %<br>F: ± 1 %<br>J: ± 5 % | 1P2 = 1,200 pcs. |

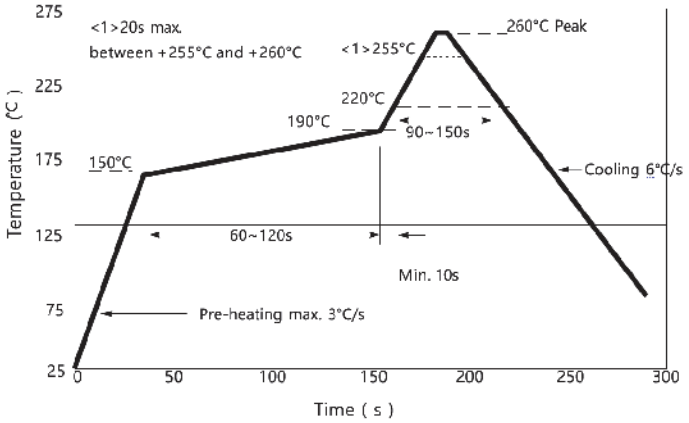
## ◆Performance

| Test | Test Method | | Standards | Max. |
|---|---|---|---|---|
| High Temperature Storage | +170℃ for 1000 hours unpowered | AEC-Q200 TEST 3<br>MIL-STD-202 Method 108 | ΔR≤±0.5% | ΔR≤±1.0% |
| Thermal Shock | -55°C, 15min~ambient temperature <20s~+155°C, 15min, 1000 cycles | AEC-Q200 TEST 16<br>MIL-STD-202 Method 107 | ΔR≤±0.1% | ΔR≤±0.5% |
| Bias Humidity | +85°C, 85%RH, powered 10% rated power for1000h | AEC-Q200 TEST 7<br>MIL-STD-202 Method 103 | ΔR≤±0.2% | ΔR≤±0.5% |
| Load Life | +70℃ for 2000 hours, rated power, 90min on, 30min off +70℃ refers to terminal temperature | AEC-Q200 TEST 8<br>MIL-STD-202 Method 108 | ΔR≤±0.5% | ΔR≤±1.0% |
| Resistance to Solvent | Immerse in solvent for 3 min and wipe 10 times.<br>Three cycles of three solvents.<br>Dry at ambient temperature after cleaning | AEC-Q200 TEST 12<br>MIL-STD-202 Method 215 | Clear marking.<br>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<br>MIL-STD-202 Method 213 | 3920:ΔR≤±0.01%<br>5930:ΔR≤±0.05% | ΔR≤±0.2% |
| Vibration | 10-2KHz, 5g's, 20min/cycle, 12 cycles in each directions of X Y Z | AEC-Q200 TEST 14<br>MIL-STD-202 Method 204 | 3920:ΔR≤±0.01%<br>5930:ΔR≤±0.05% | ΔR≤±0.2% |
| Resistance to Solder Heat | +260°C for 10s | AEC-Q200 TEST 15<br>MIL-STD-202 Method 210 | ΔR≤±0.2% | ΔR≤±0.5% |
| Solderability | +245°C tin bath for 3s | AEC-Q200 TEST 18<br>IEC 60115-1 4.17 | No visible damage.<br>95% minimum coverage | |
| TCR | -55℃ and +170℃, +20℃ Ref. | AEC-Q200 TEST 19<br>IEC 60115-1 4.8 | Within the nominal TCR | |
| Substrate Bending | 2mm. Duration: 60s. | AEC-Q200 TEST 21<br>AEC-Q200-005 | ΔR≤±0.1% | ΔR≤±0.5% |
| Short Time Overload | 5x rated voltage, 5s | IEC 60115-1 4.13 | ΔR≤±0.1% | ΔR≤±0.5% |
| Low Temperature Storage | -55℃ for 96h, unpowered | IEC 60068-2-1 | ΔR≤±0.1% | ΔR≤±0.5% |
| Moisture Resistance | Apply T=24 h/cycle, zero power,method 7a and 7b are not required | MIL-STD-202 Method 106 | ΔR≤±0.1% | ΔR≤±0.5% |

## ◆Derating Curve

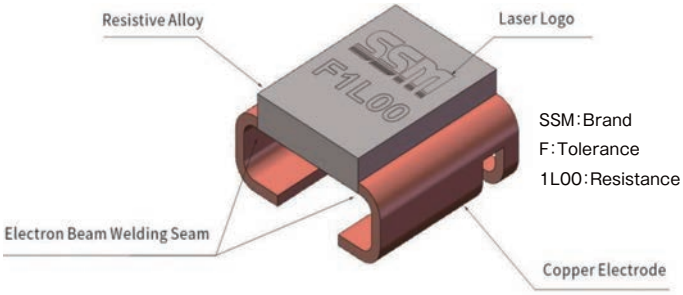



## ◆Reflow Soldering Profile

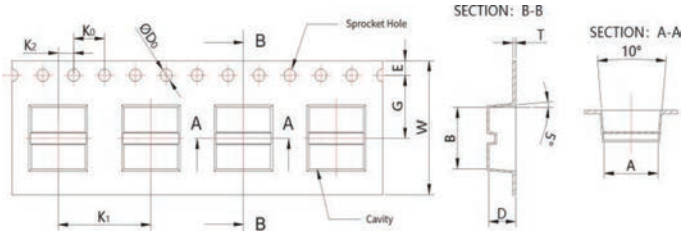



Resistor Surface Temperature:
Pre-Heat: +150℃+190℃,60~120sec.
Reflow: Above +220℃,90~150sec.
Applicable Solder Composition: Sn-Ag-Cu

## ◆Construction & Marking

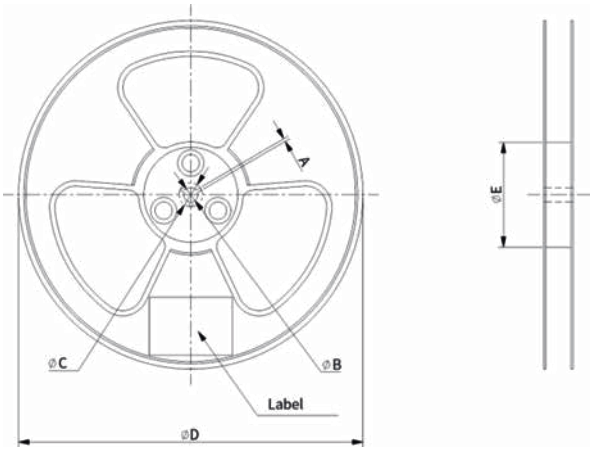



## ◆Tape Specification




| Series | Size inch. (mm) | Resistance Value | Unit:mm | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | A | B | φD0 | φD1 | K0 | K1 | K2 | E | G | W | D | T |
| MSRPM | 2726 (6966) | 0.2mΩ | 7.0±0.1 | 7.3±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 | 7.5±0.1 | 16.0±0.3 | 4.2±0.1 | 0.4±0.05 |
| | | 0.3 mΩ | 7.0±0.1 | 7.3±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 | 7.5±0.1 | 16.0±0.3 | 4.2±0.1 | 0.4±0.05 |
| | | 0.5 mΩ | 7.0±0.1 | 7.3±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 | 7.5±0.1 | 16.0±0.3 | 3.5±0.1 | 0.4±0.05 |
| | | 1.0 mΩ | 7.0±0.1 | 7.3±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 | 7.5±0.1 | 16.0±0.3 | 3.5±0.1 | 0.4±0.05 |

## ◆Reel Specification




| Series | Unit:mm | | | | | |
|---|---|---|---|---|---|---|
| | Size inch. (mm) | A | φB | φC | φD | φE |
| MSRPM | 2726 (6966) | 1.5 Min. | 13.0+0.5/-0.2 | 20.2 Min. | 330±2 | 100±2 |