



**THE DATASHEET OF
SPSX471M02R-4**



Type SPSX Solid Polymer Aluminum SMT Capacitors



The solid polymer SPSX aluminum capacitor is an ideal choice for audio/visual equipment, home appliances, computers, measuring equipment and industrial robots. Like the SPCX, the SPSX is a compact component. But SPSX offers a much lower ESR and a higher ripple current rating than the SPCX. The SPSX is a green product and RoHS compliant.



Complies with the EU Directive 2002/95/EC requirement restricting the use of Lead (Pb), Mercury (Hg), Cadmium (Cd), Hexavalent chromium (Cr(VI)), PolyBrominated Biphenyls (PBB) and PolyBrominated Diphenyl Ethers (PBDE).

Highlights

- A low-profile height of 1.9 mm
- Offered on tape and reel
- Can withstand 260 °C reflow for 10 s
- 4.5 - 9 mΩ ESR @ 100 kHz
- A great value in a small package

Specifications

Operating Temperature Range: -40 °C to +105 °C

Capacitance Range: 82 μF to 560 μF

Operating Working Range: 2.0, 2.5, 4.0, 6.3 Vdc

Capacitance Tolerance: ±20 % (120 Hz @ 20 °C)

Surge Voltage:

| | | | | |
|-------|-----|-----|-----|-----|
| Vdc | 2.0 | 2.5 | 4.0 | 6.3 |
| Surge | 2.5 | 3.1 | 5.0 | 8.0 |

Rated Ripple Current: See ratings table

Life Test:

Apply rated voltage at +105 °C ±2 °C for 1000 h

- * Leakage current: ≤ ratings table values
- * Capacitance: ±10% of initial measured value
- * DF: ≤ ratings table values
- * Appearance: No abnormal change to occur

Moisture Resistance:

+60 °C ±2 °C @ 90% RH; rated voltage for 500 h

- * Leakage current: ≤ rating table values
- * Capacitance: +70%, -20% (2V, 2.5V)
+60%, -20% (4V)
+50%, -20% (6.3V)
of initial measured value
- * DF: ≤200% of initial specified value
- * Appearance: No abnormal change to occur

Shelf Life Test:

+105 °C ±2 °C for 500 h

- Leakage current: ≤ rating table values
- Capacitance: ±10% of initial measured value
- DF: ≤ ratings table values
- Appearance: No abnormal change to occur

Surge Test:

Test temperature is +15 °C to +35 °C in series with a 1000 Ω resistor with the surge voltage applied for 1000 cycles of 30±5 s (ON) and 5 min 30 s (OFF)

- Leakage current: I ≤ 0.1CV
- Capacitance: ±10% of initial measured value
- DF: ≤ the values in the ratings table
- Appearance: No abnormal change to occur

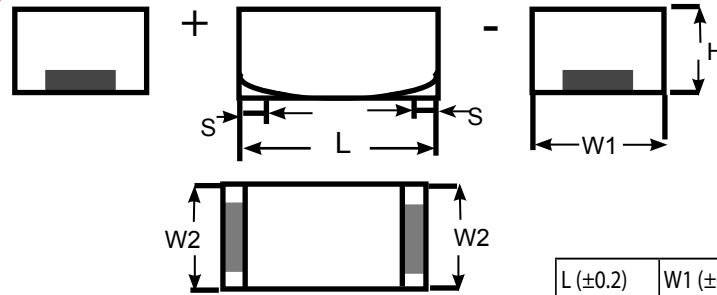
Vibration:

10 Hz to 2000 Hz to 10 Hz frequency applied one cycle per 20 min at a total amplitude of 1.5 mm. Direction and duration of vibration will be 2 h each in the X,Y and Z planes for total of 6 h with the capacitor soldered in place.

- Appearance; No abnormal change to occur.
- Capacitance: Measured value to be stabilized during test, when measured several times within 30 min before completion of test.

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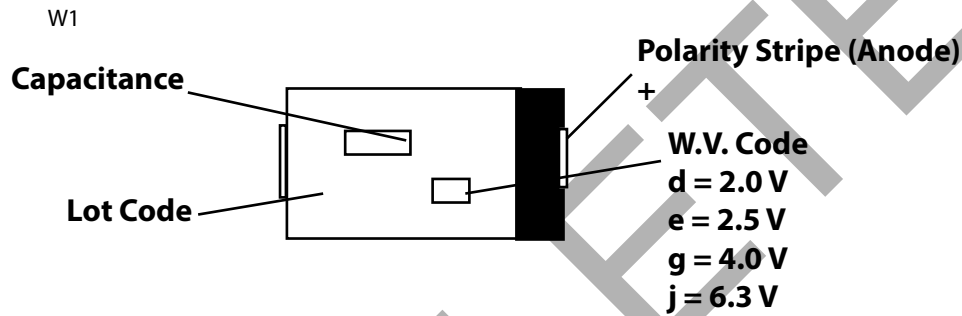
Outline Drawings



Surface finish of terminal; Tin (Sn)

| L (±0.2) | W1 (±0.2) | W2 (±0.1) | H (±0.2) | S (±0.3) |
|----------|-----------|-----------|----------|----------|
| 7.3 mm | 4.3 mm | 2.4 mm | 1.9 mm | 1.3 mm |

Marking



Part Numbering System

| | | | | | |
|-------------|------------------|-----------------------|--------------|------------------|------------------------------------------------------------------------|
| SPSX | 221 | M | 0E | R | -7 |
| Type | Capacitance Code | Capacitance Tolerance | Voltage Code | Packaging Code | Optional Lower ESR Value at 100 kHz (see tables for available options) |
| | 820 = 82 | M = ±20% | 02 = 2.0 Vdc | R = Tape & Reel: | |
| | 101 = 100 | | 0E = 2.5 VDC | 3500 pcs/reel | |
| | 221 = 220 | | 04 = 4.0 Vdc | B = Bulk | |
| | | | 06 = 6.3 Vdc | | |

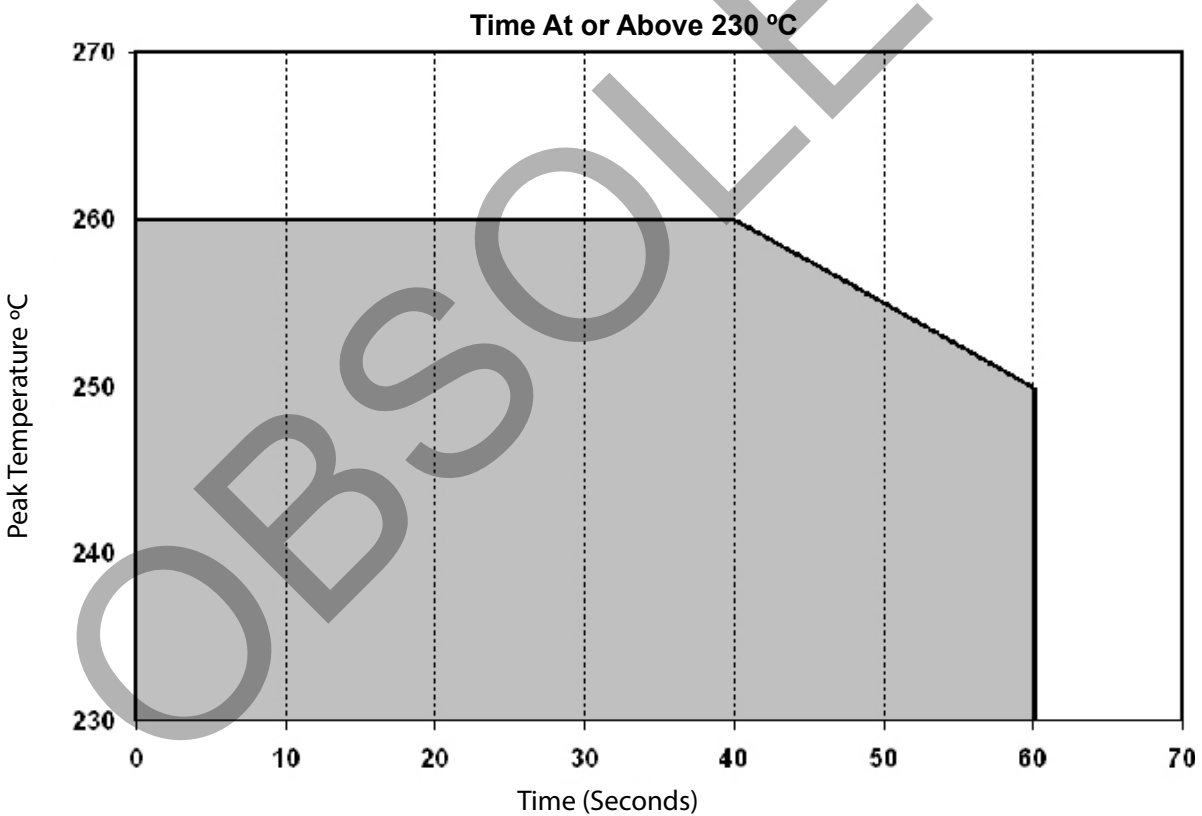
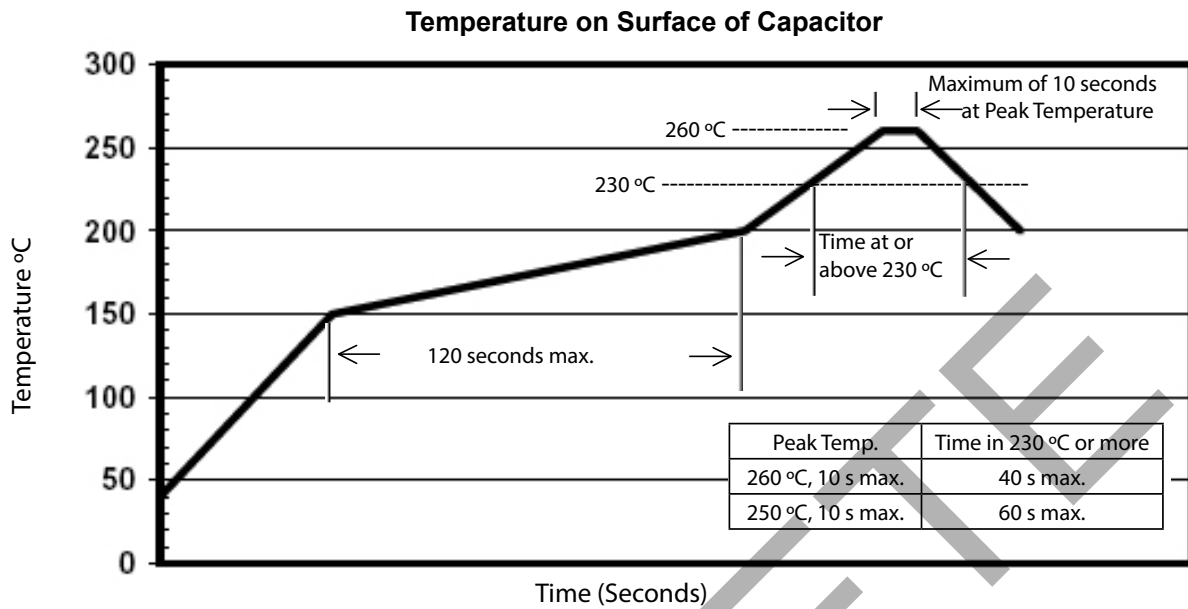
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Ratings

| Capacitance (μF) | Catalog Part Number | Max. D.F. @ 120 Hz | Max. DCL (μA) | Max. E.S.R. @ 100kHz/+20°C (mΩ) | Max. Ripple Current @ 100kHz/(+20°C to +105°C) (Arms) |
|--------------------------------|---------------------|--------------------|---------------|---------------------------------|-------------------------------------------------------|
| 2.0 Vdc (Surge 2.5 Vdc) | | | | | |
| 180 | SPSX181M02R | 0.06 | 36 | 9 | 3 |
| 220 | SPSX221M02R | 0.06 | 44 | 9 | 3 |
| 270 | SPSX271M02R | 0.06 | 54 | 9 | 3 |
| 270 | SPSX271M02R-6 | 0.06 | 54 | 6 | 3.5 |
| 270 | SPSX271M02R-4 | 0.06 | 54 | 4.5 | 3.8 |
| 330 | SPSX331M02R | 0.06 | 66 | 9 | 3 |
| 330 | SPSX331M02R-6 | 0.06 | 66 | 6 | 3.5 |
| 330 | SPSX331M02R-4 | 0.06 | 66 | 4.5 | 3.8 |
| 390 | SPSX391M02R | 0.06 | 78 | 9 | 3 |
| 390 | SPSX391M02R-6 | 0.06 | 78 | 6 | 3.5 |
| 390 | SPSX391M02R-4 | 0.06 | 78 | 4.5 | 4 |
| 470 | SPSX471M02R | 0.06 | 94 | 9 | 3 |
| 470 | SPSX471M02R-6 | 0.06 | 94 | 6 | 3.5 |
| 470 | SPSX471M02R-4 | 0.06 | 94 | 4.5 | 4 |
| 560 | SPSX561M02R-4 | 0.06 | 112 | 4.5 | 4 |
| 2.5 Vdc (Surge 3.1 Vdc) | | | | | |
| 150 | SPSX151M0ER | 0.06 | 37.5 | 9 | 3 |
| 180 | SPSX181M0ER | 0.06 | 45 | 9 | 3 |
| 220 | SPSX221M0ER | 0.06 | 55 | 9 | 3 |
| 220 | SPSX221M0ER-7 | 0.06 | 55 | 7 | 3.5 |
| 270 | SPSX271M0ER-7 | 0.06 | 67.5 | 7 | 3.5 |
| 330 | SPSX331M0ER | 0.06 | 82.5 | 9 | 3 |
| 330 | SPSX331M0ER-6 | 0.06 | 82.5 | 6 | 3.5 |
| 330 | SPSX331M0ER-4 | 0.06 | 82.5 | 4.5 | 4 |
| 390 | SPSX391M0ER | 0.06 | 97.5 | 9 | 3 |
| 390 | SPSX391M0ER-6 | 0.06 | 97.5 | 6 | 3.5 |
| 390 | SPSX391M0ER-4 | 0.06 | 97.5 | 4.5 | 4 |
| 470 | SPSX471M0ER | 0.06 | 117.5 | 9 | 3 |
| 470 | SPSX471M0ER-6 | 0.06 | 117.5 | 6 | 3.5 |
| 470 | SPSX471M0ER-4 | 0.06 | 117.5 | 4.5 | 4 |
| 4.0 Vdc (Surge 5.0 Vdc) | | | | | |
| 82 | SPSX820M04R | 0.06 | 32.8 | 9 | 3 |
| 100 | SPSX101M04R | 0.06 | 40 | 9 | 3 |
| 150 | SPSX151M04R | 0.06 | 60 | 9 | 3 |
| 150 | SPSX151M04R-7 | 0.06 | 60 | 7 | 3.5 |
| 180 | SPSX181M04R | 0.06 | 72 | 9 | 3 |
| 220 | SPSX221M04R | 0.06 | 88 | 9 | 3 |
| 6.3 Vdc (Surge 8.0 Vdc) | | | | | |
| 120 | SPSX121M06R-7 | 0.06 | 75.6 | 7 | 3.5 |
| 150 | SPSX151M06R | 0.06 | 94.5 | 9 | 3 |

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Reflow Soldering Profile





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OBSOLETE

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