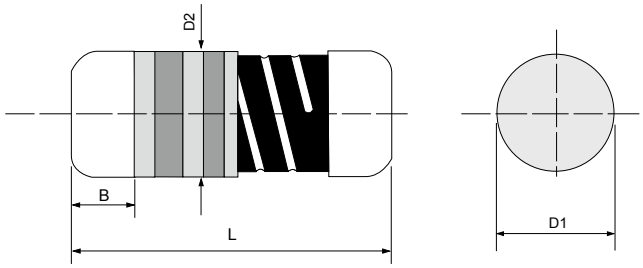
SFP – Stabilized Film Power MELF Resistor

Quality • Reliability
Cost-Down via Innovation



Specifications Per

• IEC 60115-1

Features

• Excellent in heat dissipation than chip resistor
• Anti-sulfuration test qualified
• Stronger mechanical structure to endure vibration and thermal shock
• Low temperature coefficient and tolerances
• Excellent stability
• Superior power handling
• Products meet RoHS requirements and do not contain substances of very high concern identified by European Chemicals Agency

DIMENSIONS

Type	Body Length (L, mm)	Cap Diameter (D1, mm)	Body Diameter (D2, mm)	Soldering Spot (B, mm)	Net Weight Per 1000 pcs
SFP204	3.52 ± 0.15	1.35 ± 0.1	D1+0.02/ -0.15	0.6 Min.	17 grams
SFP101	5.90 ± 0.20	2.20 ± 0.1	D1+0.02/ -0.15	1.0 Min.	80 grams
SFP201	8.50 ± 0.50	3.00 ± 0.2	D1+0.02/ -0.15	1.3 Min.	230 grams
SFP301	10.5 ± 0.50	4.00 ± 0.5	D1+0.02/ -0.15	1.6 Min.	520 grams

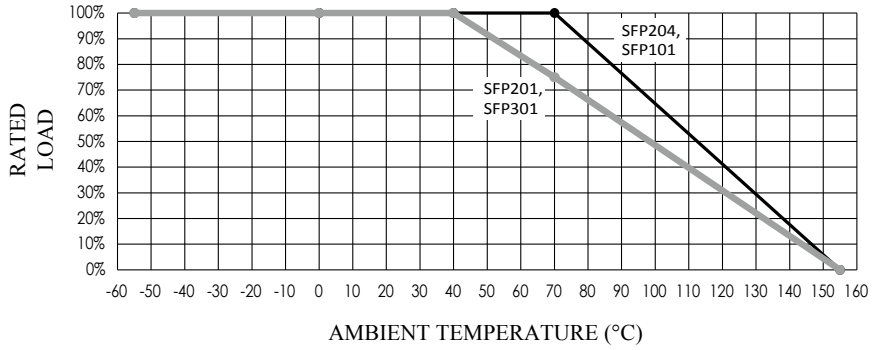
GENERAL SPECIFICATIONS

Type	Power Rating*	Maximum Working Voltage*	Maximum Overload Voltage**	Minimum Resistance	Maximum Resistance	Resistance Tolerance	Available Resistance Values
SFP204	0.4W	200V	400V	0, 0.5Ω	10MΩ	±0.5%~5%	E192 / E24
SFP101	1W	350V	700V	0, 0.5Ω	10MΩ	±0.5%~5%	E192 / E24
SFP201	2W***	400V	800V	0, 0.5Ω	1MΩ	±0.5%~5%	E192 / E24
SFP301	3W***	400V	800V	0, 0.5Ω	1MΩ	±0.5%~5%	E192 / E24

For a better life cycle under normal usage, 50% of the rated power is recommended.
At 70°C, with the exception of SFP201 and SFP301, derating of which starts at 40°C. Please refer to the Power Derating Curve.
Special sizes, values, and specifications not listed available on special order.

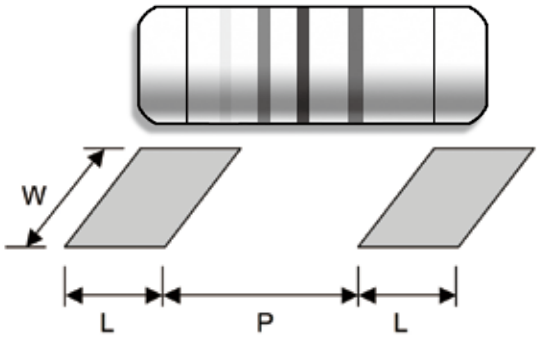
*** Rated Continuous Maximum Working Voltage (RCWV) should be determined from RCWV = $\sqrt{\text{Power Rating x Resistance Values}}$ Max. RCWV listed above.**
**** Short-time Overload (STOL) test should be determined from STOL=2.5 x $\sqrt{\text{Power Rating x Resistance Values}}$ or maximum overload voltage listed above, whichever is lower.**
***** Enhamced heat dissipation is recommended for power comsumption exceeding 1W.**

POWER DERATING CURVE



SFP – Stabilized Film Power MELF Resistor

SUGGESTED PAD LAYOUT

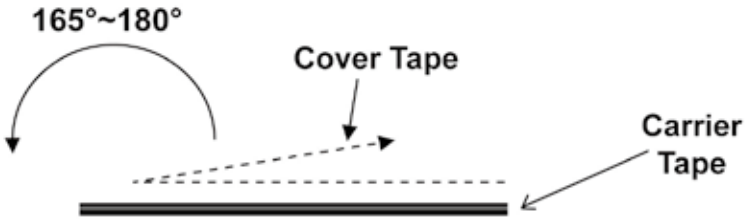


Type	Soldering Mode	Pad Length (L, mm, Min.)	Pad Spacing (P, mm)	Pad Width (W, mm, Min.)
SFP204	Reflow	1.3	1.6 ± 0.1	1.6
	Wave	1.5	1.5 ± 0.1	1.8
SFP101	Reflow	2.0	3.0 ± 0.1	3.0
	Wave	2.5	3.0 ± 0.1	3.0
SFP201	Reflow	3.0	4.9 ± 0.3	3.7
	Wave	3.5	4.8 ± 0.3	4.0
SFP301	Reflow	4.0	6.2 ± 0.4	5.0
	Wave	4.5	6.0 ± 0.4	5.0

For better heat dissipation / lower heat resistance, increase W & L.

COVER TAPE PEELING SPECIFICATION

Recommended peeling force: SFP204, SFP101: 50±5gf SFP201, SFP301: 70±10gf



SFP – Stabilized Film Power MELF Resistor

PART NUMBER

Example: SFP101F46R4TKSTR2K0

SFP101	F	46R4	TKS	TR2K0
Type	Tolerance*	Resistance	TCR*	Packaging
	Z (Jumper) D (0.5%) F (1%) G (2%) J (5%)	46.4Ω **4-character code** containing - 3 significant digits 1 letter multiplier OHM MULTIPLIER R = 1 K = 10^3 M = 10^6 G = 10^9	100ppm **3-character code** TKQ = ± 25 ppm TKR = ± 50 ppm TKS = ± 100 ppm TK2 = ± 200 ppm	**5-character code** TR = Tape Reel (pieces per reel) SFP204 3K0 = 3,000 pcs 6K0 = 6,000 pcs** 10K = 10,000 pcs** SFP101 2K0 = 2,000 pcs 6K0 = 6,000 pcs** 10K = 10,000 pcs** SFP201 2K5 = 2,500 pcs SFP301 2K0 = 2,000 pcs

*** Listed values may not be applicable across product types or to all resistance values. Please check with us before placing order.**
**** upon request**

TECHNICAL SUMMARY

Characteristics	Limits
Dielectric Withstanding Voltage, VAC or DC	SFP204: 200 SFP101: 500 SFP201: 700 SFP301: 1000
Operating Temperature Range, °C	-55 ~ +155
Insulation Resistance, MΩ	>10^4
Failure Rate in Time, pcs / 10^9 device hours	<5
Tin Whisker (JESD201 Temperature Cycling & High Temp. / Humidity Storage), µm	<5

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PERFORMANCE SPECIFICATIONS

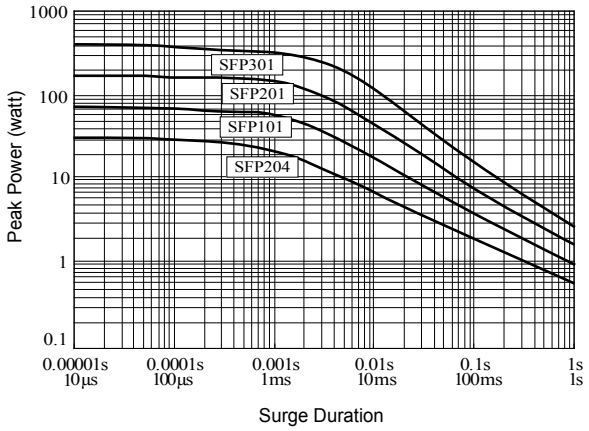
Characteristics	Test Conditions	Limits	
Short Time Overload	**IEC 60115-1 4.13** 2 seconds 2.5x rated voltage (not over max. working voltage)	±(0.5%+0.01Ω)	
Load Life In Humidity	**IEC 60115-1 4.24** 56 days rated load with 1.5 hours ON, 0.5 hours OFF (not over max. working voltage) at (40±2)°C and (93±3)% relative humidity	±(3.0%+0.01Ω)	
Load Life In Humidity (accelerated mode)	**IEC 60115-1 4.37** 1,000 hours at 85°C and 85% relative humidity with 0.1x rated voltage (not over 100V)	SFP204 SFP101	±(2.5%+0.01Ω)
		SFP201 SFP301	±(3.5%+0.01Ω)
Load Life	**IEC 60115-1 4.25.1** Rated load (not over max. working voltage) 1,000 hours with 1.5 hours ON, 0.5 hours OFF, at (70±2)°C for SFP204, SFP101 ; (40±2)°C for SFP201 and SFP301.	±(3.0%+0.01Ω)	
Periodic Electric Overload	**IEC 60115-1 4.39** 3.9x rated voltage (not over max. overload voltage) with 0.1s ON, 2.5s OFF for 1,000 cycles	±(0.75%+0.01Ω)	
Resistance To Soldering Heat	**IEC 60115-1 4.18.2** Dip the resistor into a solder bath measured (260±5)°C and hold it for a 10±1 seconds	±(0.5%+0.01Ω)	
Solderability	**IEC 60115-1 4.17.2** Solder area covered after (235±3)°C/(2±0.2) seconds with flux applied	95% min.coverage	
Vibration	**IEC 60115-1 4.22** Six hours in each parallel and axial direction with a simple harmonic motion having an amplitude of 0.75mm and 10 to 500 Hz.	±(0.25%+0.01Ω)	
Thermal Endurance	**IEC 60115-1 4.25.3** 1000 hours at 155°C without load	±(2.0%+0.01Ω)	
Thermal Shock	**IEC 60115-1 4.19** -55°C 30minutes, +155°C 30minutes, 5 cycles	±(0.25%+0.01Ω)	
Single pulse high voltage overload	**IEC 60115-1 4.27** 10 pulses of 10/700μs at 10x rated voltage (not over max. overload voltage) with interval of 60 sec.	±(0.5%+0.01Ω)	
Electrostatic discharge (Human body model)	**IEC 60115-1 4.38** 3 positive & 3 negative discharges with 2KV for SFP204 or 4KV for SFP101, SFP201 & SFP301 (For continuous surge application please see Surge Performance paragraph)	±(0.25%+0.01Ω)	
Bending test	**IEC 60115-1 4.33** Pressing depth 2mm, 3 times	±(0.25%+0.01Ω)	
Flammability	**IEC 60115-1 4.35** Needle flame test 10s	No burning after 30s	
Temperature Coefficient*	**IEC 60115-14.8** At -55℃ to +25℃ and +25℃ to +155℃ as the reference temperature.	±25, ±50, ±100, ±200PPM/℃	

*** Not applicable to all resistance values. Please check with us regarding the PPM of specific resistance value(s).**

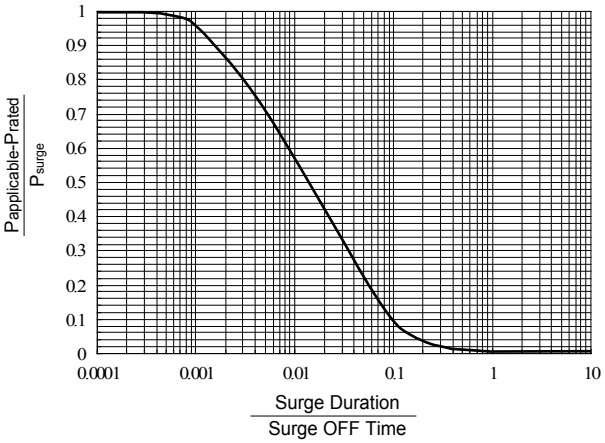
SFP – Stabilized Film Power MELF Resistor

SINGLE SURGE PERFORMANCE

SINGLE SURGE PERFORMANCE



SURGE POWER DERATING CURVE



Notes:

- SINGLE SURGE PERFORMANCE graph is good for NON REPETITIVE applications operating in an ambient temperature of 70°C or less. For temperatures above 70°C, the graph power must be derated further linearly down to zero at 155°C.
- To determine applicable surge power in continuous-surge applications:

1. Identify allowable duration and peak power P_{surge} of single surge;
2. Determine ratio of surge duration/surge OFF time in application;
3. Calculate $P_{applicable}$ backwardly according to Y-axis of SURGE POWER DERATING CURVE.