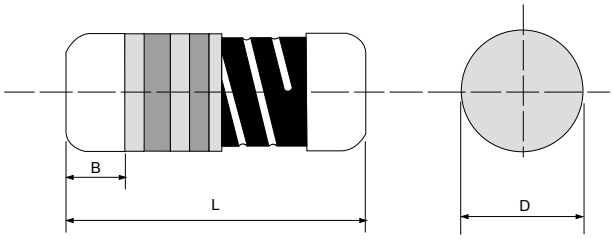
SFP - Stabilized Film Power MELF Resistor

Quality • Reliability
Cost-Down via Technology



Specifications Per

• IEC 60115-1

Features

• 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

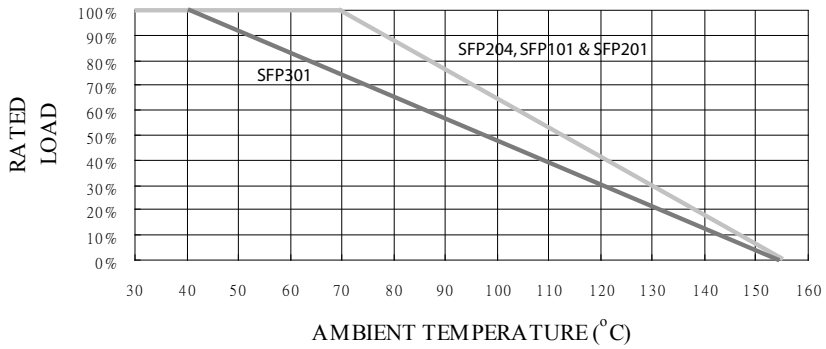
Type	Body Length (L, mm)	Body Diameter (D, mm)	Soldering Spot (B, mm)	Net Weight Per 1000 pcs
SFP204	3.52 ± 0.08	1.35 ± 0.1	0.6 Min.	17 grams
SFP101	5.90 ± 0.20	2.20 ± 0.1	1.0 Min.	66 grams
SFP201	8.50 ± 1.00	3.00 ± 0.2	1.3 Min.	186 grams
SFP301	10.5 ± 1.00	4.00 ± 0.5	1.6 Min.	446 grams

GENERAL SPECIFICATIONS

Type	Power Rating*	Maximum Working Voltage	Maximum Overload Voltage	Minimum Resistance	Maximum Resistance	Resistance Tolerance	Available Resistance Values
SFP204	1/2W	200V	400V	0.5Ω	10MΩ	±0.5%~5%	E-24 / E-96
SFP101	1W	350V	700V	0.5Ω	10MΩ	±0.5%~5%	E-24 / E-96
SFP201	2W	400V	800V	0.5Ω	1MΩ	±0.5%~5%	E-24 / E-96
SFP301	3W	400V	800V	0.5Ω	1MΩ	±0.5%~5%	E-24 / E-96

*** At 70°C, with the exception of 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.**

POWER DERATING CURVE



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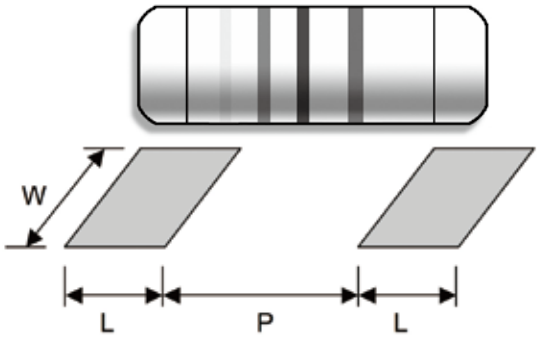
SUGGESTED PAD LAYOUT

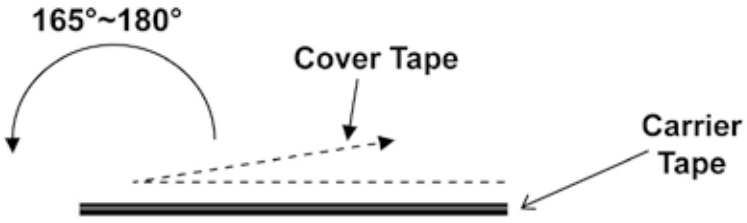


Type	Soldering Mode	Pad Length (L, mm, Min.)	Pad Spacing (P, mm)	Pad Width (W, mm, Min.)
SFP204	Reflow	1.0	2.0 ± 0.2	1.6
	Wave	1.2	2.0 ± 0.2	1.6
SFP101	Reflow	2.0	3.0 ± 0.3	3.0
	Wave	2.5	3.0 ± 0.3	3.0
SFP201	Reflow	3.0	4.9 ± 0.3	3.7
	Wave	3.5	4.8 ± 0.3	4.0
SFP301	Reflow (Not recommended)	4.0	6.2 ± 0.4	4.5
	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



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PART NUMBER

Example: SFP101F46R4TKSTR2K0

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

*** 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
Temperature Coefficient, PPM / °C*	±50, ±100, ±200
Operating Temperature Range, °C	-55 ~ +155
Insulation Resistance, MΩ	>10^5
Failure Rate	<5 pcs / 10^9 Device Hours
Tin Whisker (JESD201 Temperature Cycling & High Temp. / Humidity Storage), μm	<5

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

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PERFORMANCE SPECIFICATIONS

Characteristics	Test Conditions	Limits	
Short Time Overload	**IEC 60115-1 4.13** 5 seconds 2.5x rated voltage (not over max. overload voltage)	±0.5%	
Load Life In Humidity	**IEC 60115-1 4.24** 56 days rated load at (40±2)°C and (93±3)% relative humidity	SFP204, SFP101	±0.5%
		SFP201, SFP301	±3.0%
Load Life 1,000 hours	**IEC 60115-1 4.25.1** Rated load with 1.5 hours ON, 0.5 hours OFF, at (70±2)°C for SFP204, SFP101 and SFP 201;(40±2)°C for SFP301.	SFP204, SFP101	±0.5%
		SFP201, SFP301	±3.0%
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	±1.5%	
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%	
Solderability	**IEC 60115-1 4.17.2** Solder area covered after (235±3)°C/(2±0.2) seconds with flux applied	95% Min.	
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.	±1.0%	
Thermal Endurance	**IEC 60115-1 4.25.3** 1000 hours at 155°C without load	±0.5%	
Thermal Shock	**IEC 60115-1 4.19** -55°C 30minutes, +155°C 30minutes, 5 cycles	±1.0%	
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.	±1%	
Electrostatic discharge (Human body model)	**IEC 60115-1 4.38** 3 positive & 3 negative discharges with 4KV source	±2%	
Climatic test	**IEC 60115-1 4.23** 4.23.2 - dry heat: 16 hours 155°C 4.23.3 - damp heat: 24 hours 55°C with 95% relative humidity 4.23.4 - cold: 2 hours -55°C 4.23.5 - negative air pressure: 2 hour 8.5KPa at (25±10)°C 4.23.6 - damp heat cyclic: 5 days 55°C with 95% relative humidity 4.23.7 - DC load: rated voltage at -55°C and 155°C each 1 Min.	±1.0%	
Bending test	**IEC 60115-1 4.33** Pressing depth 2mm, 3 times	±0.5%	
Flammability	**IEC 60115-1 4.35** Needle flame test 10s	No burning after 30s	