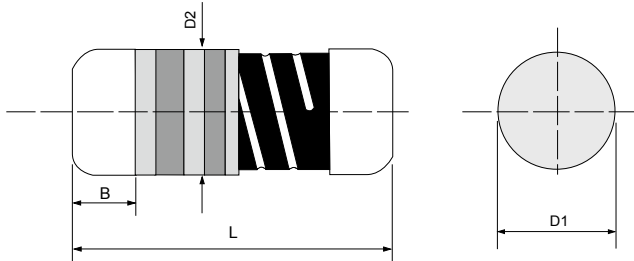


# SFP(V) - Stabilized Film Power MELF Resistor, Vehicle Grade

Quality • Reliability  
Cost-Down via Innovation.

SFP(V)



## Specifications Per

- IEC 60115-1
- AEC-Q200 Rev. D

## Features

- AEC-Q200 Compliant
- 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

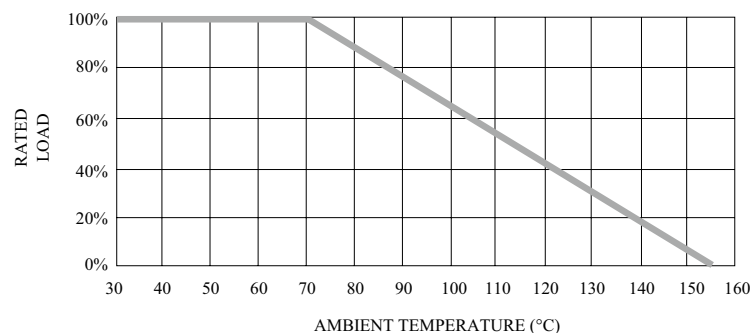
## DIMENSIONS

Type	Body Length (L, mm)	Cap Diameter (D1, mm)	Body Diameter (D2, mm)	Soldering Spot (B, mm)	Net Weight Per 1000 pcs
SFP204V	3.52 ± 0.15	1.35 ± 0.1	D1+0.02/ -0.15	0.6 Min.	17 grams
SFP101V	5.90 ± 0.20	2.20 ± 0.1	D1+0.02/ -0.2	1.0 Min.	66 grams
SFP201V	8.50 ± 0.50	3.00 ± 0.2	D1+0.05/ -0.35	1.3 Min.	186 grams
SFP301V	10.50 ± 0.50	4.00 ± 0.5	D1+0.05/ -0.45	1.6 Min.	446 grams

## GENERAL SPECIFICATIONS

Type	Power Rating (at 70°C)	Maximum Working Voltage	Maximum Overload Voltage	Minimum Resistance	Maximum Resistance	Resistance Tolerance	Available Resistance Values
SFP204V	1/2	200V	400V	0.5Ω	332KΩ	±1% ~ ±5%	E-24 / E-96
SFP101V	1W	350V	700V	0.5Ω	332KΩ	±1% ~ ±5%	E-24 / E-96
SFP201V	2W	400V	800V	0.5Ω	332KΩ	±1% ~ ±5%	E-24 / E-96
SFP301V	3W	400V	800V	0.5Ω	332KΩ	±1% ~ ±5%	E-24 / E-96

## POWER DERATING CURVE



Quality • Reliability  
Cost-Down via Innovation.

## ■ PART NUMBER

Example: SFP204VF33R0TKQTR3K0

SFP204V	F	33R0	TKQ	TR3K0
Type	Tolerance*	Resistance	TC*	Packaging
	F (1%) G (2%) J (5%)	33R <b>4-character code</b> containing - 3 significant digits 1 letter multiplier  <u>OHM MULTIPLIER</u> R = 1 K = 10 <sup>3</sup> M = 10 <sup>6</sup> G = 10 <sup>9</sup>	25ppm <b>3-character code</b> TKQ=±25PPM/°C TKR=±50PPM/°C	<b>5-character code</b> TR = Tape Reel (pieces per reel)  SFP204V 3K0 = 3,000 6K0 = 6,000 10K = 10,000  SFP101V 2K0 = 2,000 6K0 = 6,000 10K = 10,000  SFP201V 2K5 = 2,500  SFP301V 2K0 = 2,000

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

## ■ TECHNICAL SUMMARY

Characteristics	Limits
Dielectric Withstanding Voltage, VAC or DC	SFP204V: 200 SFP101V: 500 SFP201V: 700 SFP301V: 1000
Temperature Coefficient, PPM / °C*	±25, ±50
Operating Temperature Range, °C	-55 ~ +155
Insulation Resistance, MΩ	>10 <sup>4</sup>
Failure Rate	<5 pcs / 10 <sup>9</sup> 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).

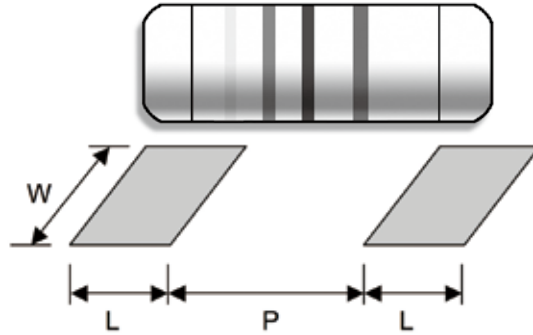
## PERFORMANCE SPECIFICATIONS

Characteristics	Test Conditions	Limits	
Short Time Overload	<b>IEC 60115-1 4.13</b> 5 seconds 2.5x rated voltage (not over max. working voltage)	±0.5%	
Load Life In Humidity	<b>IEC 60115-1 4.24</b> 56 days rated load (not over max. working voltage) at (40±2)°C and (93±3)% relative humidity	± 3.0%	
Periodic Electric Overload	<b>IEC 60115-1 4.39</b> 3.9x rated voltage (not over max. overload voltage) with 0.1s ON, 2.5s OFF for 1,000 cycles	± 1.0%	
Resistance To Soldering Heat	<b>IEC 60115-1 4.18.2</b> Dip the resistor into a solder bath measured (260±5)°C and hold it for a 10±1 seconds	± 0.5%	
Solderability	<b>IEC 60115-1 4.17.2</b> Solder area covered after (235±3)°C/(2±0.2) seconds with flux applied	95% Min.	
Mechanical Shock	<b>AEC-Q200 REV D. Stress NO.13 (refer to MIL-STD-202 Method 213 Condition C)</b> Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen. Peak value: 100 g's Duration: 6 ms Velocity change: 12.3 ft/s Waveform: Half sine	±0.5%	
Vibration	<b>AEC-Q200 REV D. Stress NO.14 (refer to MIL-STD-202 Method 204)</b> 5 g's for 20 min., 12 cycles each of 3 orientations Test from 10-2,000 Hz.	±0.5%	
Load Life	<b>IEC 60115-1 4.25.1</b> Rated load (not over max. working voltage) 1,000 hours with 1.5 hours ON, 0.5 hours OFF, at (70±2)°C	±3.0%	
	<b>AEC-Q200 REV D. Stress NO. 3 (refer to MIL-STD-202 Method 108)</b> Condition D Steady State TA=125°C at derated continuous working voltage. Measurement at 24±4 hours after test conclusion.	±5.0%	
Load Life In Humidity (accelerated mode)	<b>IEC 60115-1 4.37/ AEC-Q200 REV D. Stress NO. 7</b> (refer to MIL-STD-202 Method 103) 1,000 hours at 85°C and 85% relative humidity with 0.1x rated voltage (not over 100V)	10Ω to 10KΩ	±1.5%
		10KΩ to 332KΩ	±2.0%
Thermal Endurance	<b>IEC 60115-1 4.25.3</b> 1,000 hours at 155°C without load	± 2.0%	
	<b>AEC-Q200 REV D. Stress NO. 3</b> 1,000 hours at 125°C without load	± 1.5%	
Thermal Shock	<b>IEC 60115-1 4.19</b> -55°C 30minutes, +155°C 30 minutes, 5 cycles	± 0.25%	
	<b>AEC-Q200 REV D. Stress NO. 4 (refer to JESD22 Method JA-104)</b> -55°C 30minutes, +125°C 30 minutes, 1,000 cycles 30min maximum dwell time at each temperature extreme. 1min. Maximum transition time.	± 1.0%	
Single pulse high voltage overload	<b>IEC 60115-1 4.27</b> 10 pulses of 10/700µs at 10x rated voltage (not over max. overload voltage) with interval of 60 sec.	± 0.75%	
Electrostatic discharge (Human body model)	<b>IEC 60115-1 4.38</b> 3 positive & 3 negative discharges with 2KV for SFP204V or 4KV for SFP101V, SFP201V & SFP301V (For continuous surge application please see Surge Performance paragraph)	± 1.0%	
Climatic test	<b>IEC 60115-1 4.23</b> 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°C±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	<b>IEC 60115-1 4.33</b> Pressing depth 2mm, 3 times	± 0.5%	
Flammability	<b>IEC 60115-1 4.35</b> Needle flame test 10s	No burning after 30s	

Quality • Reliability  
Cost-Down via Innovation.

SFP(V)

■ SUGGESTED PAD LAYOUT



Type	Soldering Mode	Pad Length (L, mm, Min.)	Pad Spacing (P, mm)	Pad Width (W, mm, Min.)
SFP204V	Reflow	1.3	1.6 ± 0.1	1.6
	Wave	1.5	1.5 ± 0.1	1.8
SFP101V	Reflow	2.0	3.0 ± 0.1	3.0
	Wave	2.5	3.0 ± 0.1	3.0
SFP201V	Reflow	3.0	4.9 ± 0.3	3.7
	Wave	3.5	4.8 ± 0.3	4.0
SFP301V	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:

SFP204V, SFP101V: 50±5gf SFP201V, SFP301V: 70±10gf

