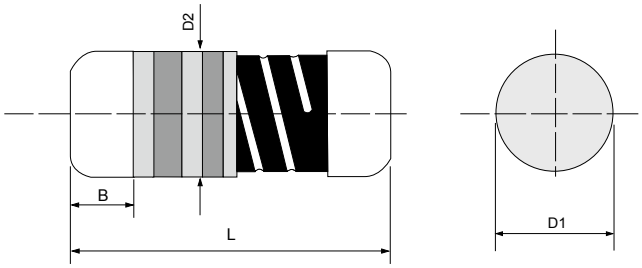
HVM
High Voltage MELF Resistor



Specifications Per

• IEC 60115-1

Features

• Excellent in heat dissipation than chip resistor
• Stronger mechanical structure to endure vibration and thermal shock
• Handles much higher working voltage than general purpose resistors
• Pure tin-plated termination for excellent solderability
• SMD enabled structure
• Anti-surge features available
• VDE0860 Compliance.
• 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
HVM16	3.52 ± 0.15	1.35 ± 0.1	D1+0.02/ -0.15	0.6 Min.	17 grams
HVM25	5.90 ± 0.20	2.20 ± 0.1	D1+0.02/ -0.2	1.0 Min.	66 grams
HVM50	8.50 ± 0.50	3.00 ± 0.2	D1+0.05/ -0.35	1.3 Min.	186 grams
HVM100	10.5 ± 0.50	4.00 ± 0.5	D1+0.05/ -0.45	1.6 Min.	446 grams
HVM200	12.6 ± 0.60	4.60 ± 0.5	D1+0.05/ -0.50	1.8 Min.	750 grams
HVM300	14.6 ± 0.60	5.10 ± 0.5	D1+0.05/ -0.50	2.0 Min.	1000 grams

GENERAL SPECIFICATIONS

Type	Power Rating (at 70°C)	Maximum Working Voltage	Maximum Overload Voltage	Minimum Resistance	Maximum Resistance	Resistance Tolerance	Available Resistance Values
HVM16	1/6W	600V	1,250V DC 900V RMS	56KΩ	22MΩ	±1%~±5%	E-24/E-96
HVM25	1/4W	1,250V DC 900V RMS	2,400V DC 1,800V RMS	91KΩ	24MΩ	±1%~±5%	E-24/E-96
HVM50	1/2W	2,800V DC 2,000V RMS	5,600V DC 4,000V RMS	100KΩ	33MΩ	±1%~±5%	E-24/E-96
HVM100	1W	4,200V DC 3,000V RMS	8,400V DC 6,000V RMS	100KΩ	68MΩ	±1%~±5%	E-24/E-96
HVM200	2W	6,300V DC 4,500V RMS	11,200V DC 8,000V RMS	100KΩ	68MΩ	±1%~±5%	E-24/E-96
HVM300	3W	8,400V DC 6,000V RMS	14,000V DC 10,000V RMS	100KΩ	68MΩ	±1%~±5%	E-24/E-96

Special sizes, values, and specifications not listed available on special order.

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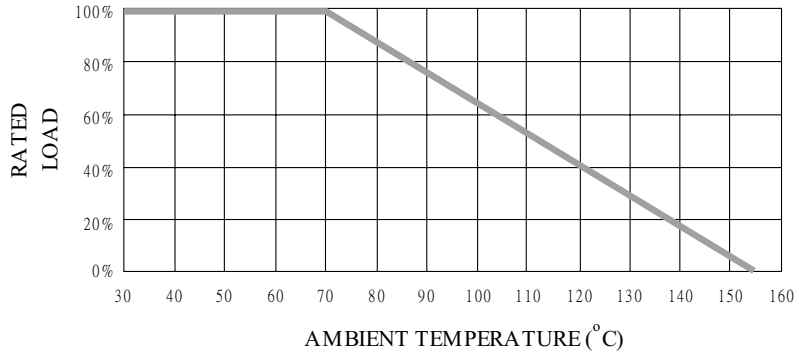
POWER DERATING CURVE



PART NUMBER

Example: HVM100J910KTKZTR2K0

HVM100	J	910K	TKZ	TR2K0
Type	Tolerance*	Resistance	TCR	Packaging
	F (1%) G (2%) J (5%)	910KΩ **4-character code** containing - 3 significant digits 1 letter multiplier OHM MULTIPLIER R = 1 K = 10^3 M = 10^6 G = 10^9	**3-character code** TKZ = Default Product Temperature Coefficient. Information of typical product temperature coefficient can be found in the Technical Summary section of the datasheet.**	**5-character code** TR = Tape Reel (pieces per reel) HVM16 3K0 = 3,000 6K0 = 6,000*** 10K = 10,000*** HVM25 2K0 = 2,000 6K0 = 6,000*** 10K = 10,000*** HVM50 2K5 = 2,500 HVM100 2K0 = 2,000 BK = Bulk HVM200/HVM300 BK + Quantity

*** Listed values may not be applicable to all resistance values. Please check with us before placing order.**
**** For the availabilities of non-default temperature coefficient, please check with us. Reference for TCR letter codes can be found in section (4) of Part Number Construction in the Appendices.**
***** upon request**

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TECHNICAL SUMMARY

Characteristics	Limits
Dielectric Withstanding Voltage, VAC or DC	HVM16: 300 HVM25: 500 HVM50: 700 HVM100, HVM200, HVM300: 1000
Temperature Coefficient, PPM / °C*	±200 ~ ±3000
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

*** 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	**IEC 60115-1 4.13** 5 seconds 2.5x rated voltage (not over max. overload voltage)	±2%
Load Life In Humidity	**IEC 60115-1 4.24** 56 days rated load (not over max. working voltage) at (40±2)°C and (93±3)% relative humidity	±3%
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	±3%
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	±2.5%
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	±1%
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%
Thermal Endurance	**IEC 60115-1 4.25.3** 1000 hours at 155°C without load	±5%
Thermal Shock	**IEC 60115-1 4.19** -55°C 30minutes, +155°C 30minutes, 5 cycles	±2%
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.	±2%
Electrostatic discharge (Human body model)	**IEC 60115-1 4.38** 3 positive & 3 negative discharges with 4KV source	±2.5%
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.	±2%
Bending test	**IEC 60115-1 4.33** Pressing depth 2mm, 3 times	±1%
Flammability	**IEC 60115-1 4.35** Needle flame test 10s	No burning after 30s

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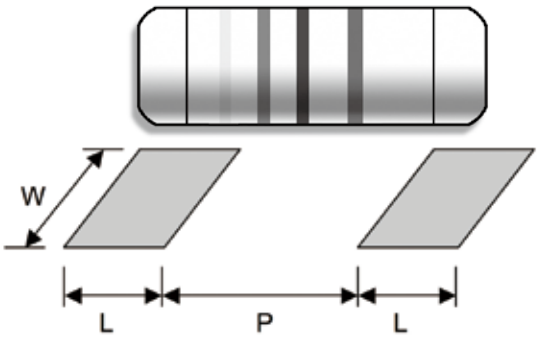
SUGGESTED PAD LAYOUT



Type	Soldering Mode	Pad Length (L, mm, Min.)	Pad Spacing (P, mm)	Pad Width (W, mm, Min.)
HVM16	Reflow	1.3	1.6 ± 0.1	1.6
	Wave	1.5	1.5 ± 0.1	1.8
HVM25	Reflow	2.0	3.0 ± 0.1	3.0
	Wave	2.5	3.0 ± 0.1	3.0
HVM50	Reflow	3.0	4.9 ± 0.3	3.7
	Wave	3.5	4.8 ± 0.3	4.0
HVM100	Reflow	4.0	6.2 ± 0.4	5.0
	Wave	4.5	6.0 ± 0.4	5.0
HVM200	Reflow	4.5	8.0 ± 0.4	5.5
	Wave	5.0	7.7 ± 0.4	5.5
HVM300	Reflow	5.0	9.3 ± 0.4	6.5
	Wave	5.0	9.0 ± 0.4	6.0

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

COVER TAPE PEELING SPECIFICATION

Recommended peeling force:

HVM16, HVM25: 50±5gf HVM50, HVM100: 70±10gf HVM200, HVM300: 80±10gf