Resistor Technology

HVM-Series
Precision High Voltage Resistors
Sizes: HVM 25, HVM 50

RoHS / ELV conform 2011/65/EC 2000/53/EC

e3

Non-Magnetic

Features:

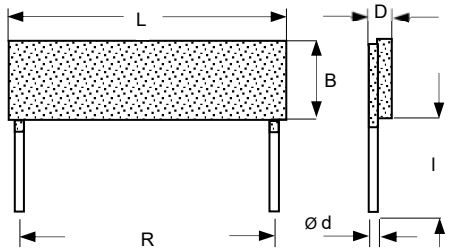
- High Voltage Resistors in thick film technology
- Resistance values up to 10 Tera-Ohm
- Low values of TCR and VCR
- Non-magnetic
- Climatic protection by Silicone coating (conformal coating, standard version)
- Standard version with radial wire leads / variable lead spacing by bending
- Axial type with wire leads as special version (not with conformal coating)
- Pin type with single-in-line (SIL) pins available
- Alternatively, glass or Silicone passivation of resistive element (one side, no conformal coat.)
- Unleaded version with solder pads available (with glass or Silicone passivation only, no conformal coating)

Dimensions: (in mm)

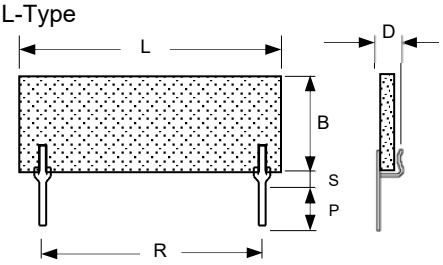
Size	Length L		Width B	Pitch R	
HVM 25	25.0	(1")	9.0	22.9	(0.9")
HVM 50	50.0	(2")	12.5	47.8	(1.9")

Wire Leads	Material: Cu / Surface finish: 100% Sn			
	Wire diameter (standard)	on stock	d	0.40 $^{\pm 0.05}$ mm
		new	d	0.60 $^{\pm 0.05}$ mm
	Applicable wire diameter		d	0.3; 0.4; 0.5; 0.6; 0.7; 0.8; 1.0 mm
	Thickness		D max	1.3 mm + d
	Wire length – radial (standard)	on stock	l	20 $^{+0/-2}$ mm
		new	l	20 $^{+0/-2}$ mm
	Wire length – axial (standard)		l	35 $^{+0/-2}$ mm *
SIL-Pin	Material: CuSn6 (2.1020) / Surface finish: 100% Sn			
	Stand off		S	1 $^{\pm 0.4}$ mm
	Pin length		P	9 $^{\pm 1}$ mm
	Pin cross section		A	0.5 * 0.25 mm^2
	Thickness		D max	2 mm

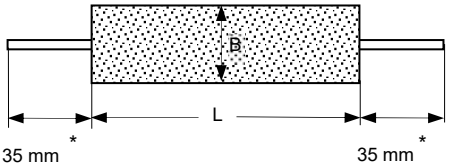
Standard Type (radial)



SIL-Type



Special Type (axial)
for G-,C- and B-Type only
not for L-Type (conformal coating)



* Custom specific wire lengths up to 70 mm on special request and agreement only

Tolerance of dimensions (if not specified): ± 0.5 mm

Packaging:

Cardboard boxes with foam spacer
(small amounts: bulk in plastic bags or cardboard boxes)

The labeling is made at the packing unit only.
The components are not marked
(only on request at individual cases).

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Ordering data:

Type	Size	Value Tolerance TCR	Coating	Termination	Wire diameter	Style/Specials
HVM	25 50		L – Silicone conformal coating G – Glass passivation of the resistive element C – Silicone passivation of the resistive element B – Bare / no passivation	D – Wire P – SIL Pin F – Solder pad	3 – 0,3 mm 4 – 0,4 mm 5 – 0,5 mm 6 – 0,6 mm 7 – 0,7 mm 8 – 0,8 mm 1 – 1,0 mm 0 – pin/solder pad	R – radial A – axial (Not for L-Version)

Examples:

HVM 25 10M 10% TCR100 L D6 R	HVM 25 with Silicone coating and radial 0.6 mm wires (Standard)
HVM 25 1G 20% TCR250 B F0	HVM 25 bare, without leads
HVM 50 10G 5% TCR100 G D4 A	HVM 50 with glazing (green) and axial 0.4 mm wires
HVM 50 50G 10% TCR250 C D6 R	HVM 50 with Silicone passivation (red, one side) and radial 0.6 mm wires

Without requirement for the temperature coefficient TCR, the standard value (highest value in table) will be supplied. The standard measuring voltage is 10V (50V for values >1G). Different measuring voltages on request and agreement (specify explicitly).

Standard versions are LD6R and LD4R (Silicone coating; 0.6/0.4 mm wire; radial).

General technical data:

Operating temperature range	-55°C ... +150°C
Climatic category to IEC 60068-1	55/150/56
Climatic protection of resistive element	Silicone conformal coating (L) [1] or Silicone passivation (C) [1] or Glass passivation (G)
Solderability acc. to IEC 60068-2-20	245°C, 3s
Max. soldering temperature	260°C, 10s, max. 3 cycles
Moisture Sensitivity Level acc. to J-STD-020	MSL 1 (unlimited)

Long term stability	≤ 1G	1 - 10G	> 10G
Storage 125°C/1000h	< 0.5%	< 1%	< 2%
Storage 25°C/1000h	< 0.1%	< 0.5%	< 1%
Max. voltage/1000h	< 0.25%	< 1%	< 2%

[1] The Silicone coating is resistant to most solvents. For cleaning the use of isopropyl alcohol (IPA) is recommended. The use of acetone and methylene chloride is **not** allowed. Some cleaning agents can cause discolorations or bleaching at the surface without any influence on the resistor element. The thickness of the coating is not specified. In the area of the resistor element only, a closed surface is required and the coating has to be free of pin holes. Coating voids in the area of the internal interconnections are no quality issues. Mechanical stress to coating should be avoided, no use of high pressure cleaning.

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Technical data – depending on size:

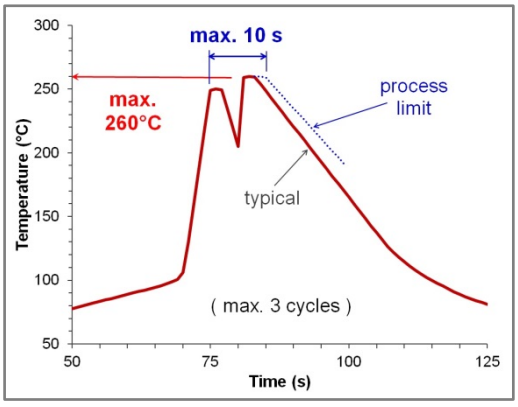
Size	HVM 25	HVM 50
Power rating P_{70} (P_{150} = 0W)	1.0 W	3.0 W
Operating voltage U_, U_{eff} [2)]	15 kV	30 kV

Resistance Value Range / Tolerance / Temperature coefficient TCR [3)] / VCR [4)]		
1M – 100M	0.25 / ... / 20% TCR 25/50/100 1 ppm/V	0.25 / ... / 20% TCR 25/50/100 1 ppm/V
>100M – 300M	0.25 / … / 20% TCR 25/50/100 2 ppm/V	0.25 / … / 20% TCR 25/50/100 1 ppm/V
>300M – 1G	1 / … / 20% TCR 25/50/100 2 ppm/V	1 / … / 20% TCR 25/50/100 1 ppm/V
>1G – 100G	5 / … / 30% TCR 100/250 10 ppm/V	5 / … / 30% TCR 50/100 5 ppm/V
>100G – 1T	5 / … / 30% TCR 250/500 50 ppm/V	5 / … / 30% TCR 100/250 25 ppm/V
>1T – 3T	10 / 20 / 30% TCR/VCR on request	10 / 20 / 30% TCR/VCR on request
>3T – 10T	10 / 20 / 30% TCR/VCR on request	10 / 20 / 30% TCR/VCR on request

[2)] Continuous operating voltage (U_, U_{eff}): $V \leq \sqrt{(P*R)}$ or max. working voltage (the lower value)
[3)] Temperature coefficient TCR: in ppm/K; +25°C...+125°C;
TCR values lower than standard (highest TCR) or resistance values >100G: 25°C...+85°C
[4)] VCR: typical values, all negative, not for all TCR values available

Closer values of tolerance, temperature coefficient, VCR, other dimensions or resistance values on request and agreement.

Recommended wave soldering profile:



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