

# HVR-Series High Voltage Resistors

Sizes: HVR 20, HVR 25, HVR 30, HVR 40, HVR 50, HVR 75, HVR 100

### Features:

- High Voltage Resistors in thick film technology
- Resistance values up to 10 Tera-Ohm
- Low values of temperature coefficient TK and VCR
- Non-magnetic
- Climatic protection by Silicone coating (conformal coating, standard version)
- Different lead versions available
- Standard version with radial wire leads / variable lead spacing by bending
- Various wire diameters available
- Pin type with single-in-line (SIL) pins available
- Axial type with wire leads as special version (not with Silicone conformal coating)
- Alternatively, glass passivation of resistive element (no conformal coating)
- Unleaded version with solder pads available (with glass passivation only)
- Customized sizes are possible

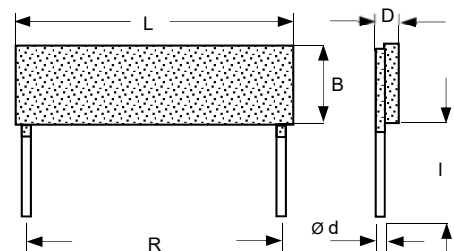


### Dimensions: (in mm)

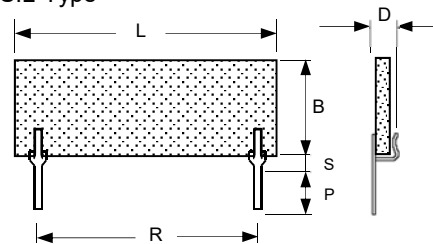
Size	Length L	Width B	Pitch R
HVR 20	20.0	5.0	17.0
HVR 25	25.0 (1")	9.0	22.9 (0.9")
HVR 30	30.0	6.0	27.5
HVR 40	40.0	6.0	37.8
HVR 50	50.0 (2")	12.5	47.8 (1.9")
HVR 75	75.0 (3")	9.0	72.8 (2.9")
HVR 100	100.0 (4")	12.5	97.8 (3.9")

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

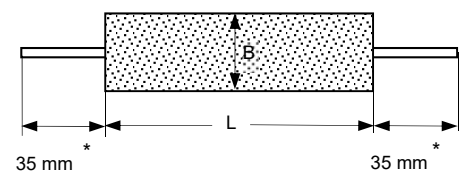
Standard Type (radial)



SIL-Type



Special Type (axial, no 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

## HVR-Series

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#### 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).

#### Ordering data:

Type	Size	Value	Tolerance	TK	Coating	Termination	Wire diameter	Style	Specials
HVR	20				L – Silicone	D – Wire	3 – 0,3 mm	R – radial	
	25				conformal coating	P – SIL Pin	4 – 0,4 mm	A – axial (no L version)	
	30				G – Glass passivation	F – Solder pad	5 – 0,5 mm		
	40				of the resistive		6 – 0,6 mm		
	50				element		7 – 0,7 mm		
	75				B – Bare /		8 – 0,8 mm		
	100				no passivation		1 – 1,0 mm		
							0 – pin / solder pad		

#### Examples:

*HVR 25 10M 10% TK100 L D6 R* HVR 25 with Silicone coating and radial 0.6 mm wires (Standard)

*HVR 30 1G 20% TK250 B F0* HVR 30 blank, bare, without leads

*HVR 50 10G 5% TK100 G D4 A* HVR 50 with glazing (green) and axial 0.4 mm wires

Without requirement for the temperature coefficient TK, the standard value (highest value in table) will be supplied. The standard measuring voltage is 10V (50V for values >1G). Different 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 <sup>1)</sup> or Glass Passivation	
Solderability acc. to IEC 60068-2-20	245°C, 3s	
Max. soldering temperature	260°C, 10s, max. 3 cycles	
Long term stability	≤10G	>10G
Storage 125°C/1000h	<1%	<2%
Max. voltage /1000h	<1%	<2%

<sup>1)</sup> 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	HVR 20	HVR 25	HVR 30	HVR 40	HVR 50	HVR 75	HVR 100
Power rating P <sub>70</sub> (W) (P <sub>150</sub> = 0W)	1.0	1.0	1.0	1.2	3.0	4.5	6.0
Operating voltage U <sub>-</sub> , U <sub>eff</sub> <sup>2)</sup>	10 kV	15 kV	10 kV	20 kV	30 kV	45 kV	65 kV

Resistance Value Range / Tolerance / Temperature coefficient TK <sup>3)</sup> / VCR <sup>4)</sup>							
1M – 100M	0.25/.../10% TK 25/50/100 5 ppm/V	0.25/.../10% TK 25/50/100 1 ppm/V	0.25/.../10% TK 25/50/100 2 ppm/V	0.25/.../10% TK 25/50/100 1 ppm/V	0.25/.../10% TK 25/50/100 1 ppm/V	0.25/.../10% TK 25/50/100 1 ppm/V	0.25/.../10% TK 25/50/100 1 ppm/V
>100M – 1G	1/2/5/10/20% TK 50/100/250 10 ppm/V	1/2/5/10/20% TK 50/100/250 2 ppm/V	1/2/5/10/20% TK 50/100/250 5 ppm/V	1/2/5/10/20% TK 50/100/250 2 ppm/V	1/2/5/10/20% TK 25/50/100 1 ppm/V	1/2/5/10/20% TK 25/50/100 1 ppm/V	1/2/5/10/20% TK 25/50/100 1 ppm/V
>1G – 100G	5/10/20/30% TK 250/500 50 ppm/V	5/10/20/30% TK 250/500 10 ppm/V	5/10/20/30% TK 250/500 20 ppm/V	5/10/20/30% TK 250/500 10 ppm/V	5/10/20/30% TK 100/250 5 ppm/V	5/10/20/30% TK 100/250 5 ppm/V	5/10/20/30% TK 50/250 2 ppm/V
>100G – 1T	5/10/20/30% TK 500/1000 100 ppm/V	5/10/20/30% TK 500/1000 50 ppm/V	5/10/20/30% TK 500/1000 100 ppm/V	5/10/20/30% TK 500/1000 50 ppm/V	5/10/20/30% TK 250/500 25 ppm/V	5/10/20/30% TK 250/500 25 ppm/V	5/10/20/30% TK 100/500 10 ppm/V
>1T – 10T	–	–	–	–	10/20/30% TK / VCR on request	10/20/30% TK / VCR on request	10/20/30% TK / VCR on request

<sup>2)</sup> Continuous operating voltage (U<sub>-</sub>, U<sub>eff</sub>):  $V \leq \sqrt{P \cdot R}$  or max. working voltage (the lower value)

<sup>3)</sup> Temperature coefficient TK: in ppm/K; +25°C...+125°C; lower than standard (highest TK) or value >100G: 25°C...+85°C

<sup>4)</sup> VCR: typical values, all negative, not for all TK values available

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

### Recommended wave soldering profile:

