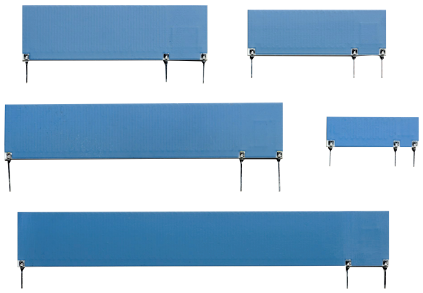
High Voltage Divider Resistors

HVD Series



Features

- Voltage ratings up to 30kV
- Non-inductive design
- Ratio tolerance down to 0.25%
- TCR tracking down to 25ppm/°C
- VCR down to -0.15ppm/V
- Custom design service available
- Printed or powder coat protection

All parts are Pb-free and comply with EU Directive 2011/65/EU amended by (EU) 2015/863 (RoHS3)

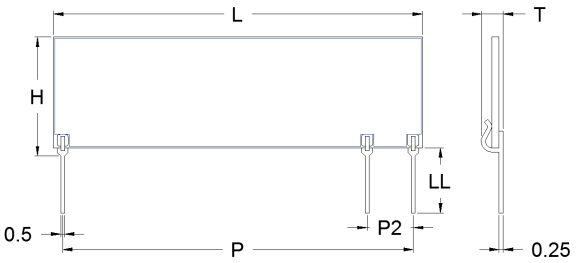
Electrical Data

		HVD08	HVD12	HVD15	HVD20	HVD30
Power rating at 70°C	watts	0.75	1.5	2.5	3.5	4.5
Limiting element voltage in air dc or ac pk	kV	7.5	10	15	20	30
Resistance value	ohms	10K – 1G	50K to 1G0	100K to 1G0		
Resistance tolerance	%	1, 5				
Ratio tolerance	%	0.25, 0.5, 1				
TCR (20°C to 70°C)	ppm/°C	50, 100				
Tracking TCR (20°C to 70°C)	ppm/°C	25, 50				
Standard values		E24 preferred for (R1 + R2) and R2				
Ambient temperature range	°C	-55 to +155				
Insulation resistance at 500V	ohms	>10G				
Dielectric strength of insulation	volts	Screen printed protection: >1000 Powder coated: >2000				

Other resistance, tolerance and TCR values are available on request.

Physical Data

Dimensions in mm, weight in g							
Type	L (±0.5)	H (±0.5)	T (Max)	P (±0.5)	P2 (±0.5)	LL Lead Length	Wt. nom
HVD08	25.4	9.37	2.5	22.86	5.08	5.08 ±0.75	0.66
HVD12	38.1	13.6	2.5	35.56	7.62		1.32
HVD15	50.8	16.14	2.5	48.26	10.16		2.09
HVD20	76.2	16.14	2.5	73.66	10.16		3.08
HVD30	101.6	16.14	2.5	99.06	10.16		4.07



For powder coat option add 0.25mm to L, H & T.

Construction

Termination conductors and ruthenium oxide resistive material are printed in a non-inductive pattern onto the surface of a 96% alumina substrate. The protection is either powder coating or a special screen printed material which gives excellent high voltage and climatic performance.

Terminations

Solder coated phosphor bronze leadframe terminations are solder dipped in SnAgCu and meet the following IEC requirements: IEC 68.2.21 – Strength, IEC 115-1, Clause 4.17.3.2 – Solderability.

Marking

Type reference, TCR codes, resistance values, tolerance codes and date code are legend marked. The resistance value code conforms to IEC 62.

Solvent Resistance

The body protection and marking are resistant to all normal industrial cleaning solvents suitable for printed circuits. .

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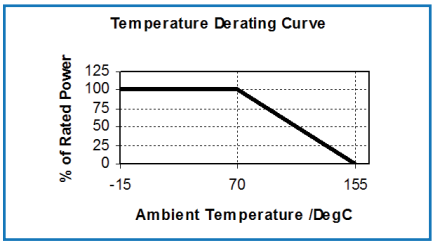
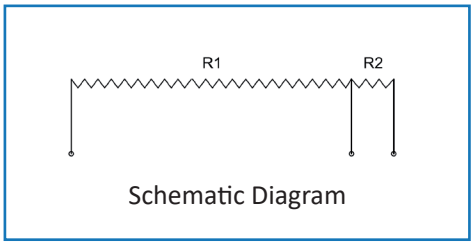
Performance Data

		Maximum	Typical
Load at rated power: 1000 hours at 70°C	ΔR%	<100M: 0.25, ≥100M: 0.5	0.1
Overload: 1.5 x rated power not exceeding LEV for 5 seconds	ΔR%	0.25	0.1
Dry heat: 1000 hours at 155°C	ΔR%	1	0.1
Shelf life: 12 months at room temperature	ΔR%	0.3	<0.1
Climatic	ΔR%	1	0.1
Climatic category		-55/155/56	
Biased humidity: 1000 hours, 85%RH, 85°C, 10%Pr	ΔR%	0.25	0.1
Temperature rapid change: 5 cycles -55/155°C	ΔR%	0.25	0.1
Resistance to solder heat	ΔR%	0.25	0.02
Moisture resistance: MIL Std. 202, method 106 (powder coat option)	ΔR%	0.25	0.1
Solderability		>95% coverage	

Type	Typical VCR (ppm/V)
HVD08	-0.50
HVD12	-0.35
HVD15	-0.25
HVD20	-0.20
HVD30	-0.15





Application Notes

Due to the high voltage, which can appear between the terminations and any adjacent metal part, resistors should be mounted at an adequate distance from other conductors.
For some ultra-high voltage applications designers may wish to immerse the components in oil or pot them in void-free silicone compound to reduce corona or surface tracking. The printed protection is recommended for such applications.
The divider consists of high value R_1 and low value R_2. The voltage division ratio of the divider is given by Ratio = $R_2 : (R_1 + R_2)$

Ordering Procedure

Example: H15CD-100M/100KFD (HVD15 with screen printed protection and a voltage ratio of 1:1000, with R1=99.9 megohms and R2=100 kilohms (total R1+R2=100 megohms) at ±50ppm/°C absolute and ±25ppm/°C tracking TCR, ±1% absolute and ±0.5% ratio tolerance, Pb-free).

H	1	5		C	D	-	1	0	0	M	/	1	0	0	K	F	D
1	2		3	4			5					6				7	

1 Series	2 Size	3 Coating (optional)		4 TCR ppm/°C (absolute & tracking)		5 Value (R1+R2)	6 Value (R2)	7 Tolerance % (absolute & ratio)	
H=HVD	08		screen printed protection	ZC	±100 absolute ±50 tracking	3/4 characters		JF	±5 absolute ±1 ratio
	12					K = kilohms M = megohms G = gigohms			
	15	P	powder coated protection	ZD	±100 absolute ±25 tracking			FD	±1 absolute ±0.5 ratio
	20								
	30			CD	±50 absolute ±25 tracking			FC	±1 absolute ±0.25 ratio