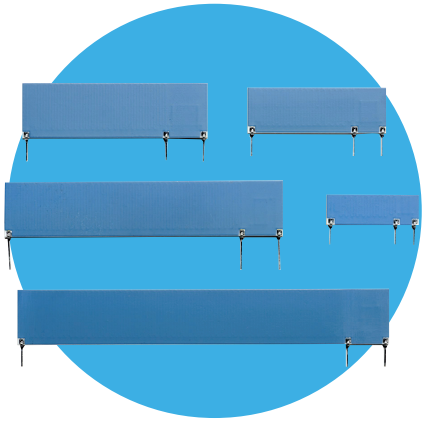
Resistors

High Voltage Divider Resistors



HVD Series

- 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
- RoHS compliant

All parts are Pb-free and comply with EU Directive 2011/65/EU (RoHS2)

Electrical Data

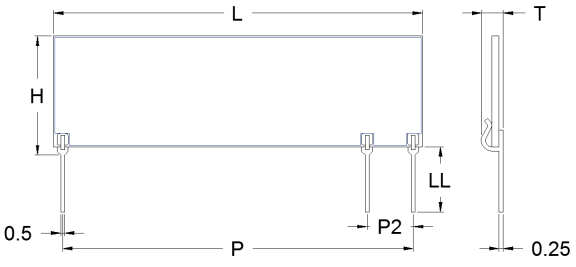
		HVD08	HVD12	HVD15	HVD20	HVD30
Power rating at 70°C	watts	0.75	1.5	2.5	3.5	4.5
Limiting element voltage in air dc or ac pk	kV	7.5	10	15	20	30
Resistance value	ohms	10K – 1G	50K – 2G	100K – 2G	100K – 5G	
Resistance tolerance	%	1, 5				
Ratio tolerance	%	0.25, 0.5, 1				
TCR (20°C to 70°C)	ppm/°C	50, 100				
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	>1000				

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



Construction
Termination conductors and ruthenium oxide resistive material are printed in a non-inductive pattern onto the surface of a 96% alumina substrate. A screen-printed protection is then applied and terminals are then attached.

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. .

General Note
TT Electronics reserves the right to make changes in product specification without notice or liability.
All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

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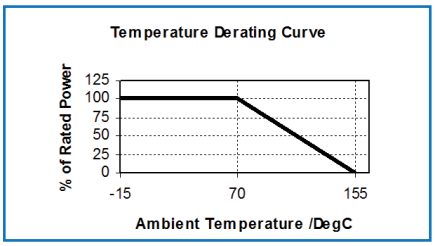
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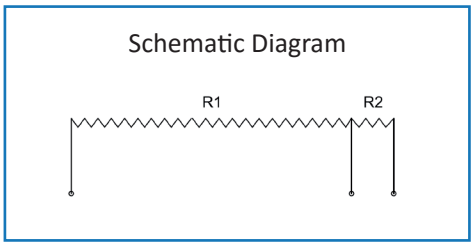
HVD Series

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
Moisture resistance: MIL Std. 202, method 106	ΔR%	0.25	0.1
Temperature rapid change: 5cycles -55 / 155°C	ΔR%	0.25	0.1

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 it is required to immerse the components in oil or SF6 gas or pot them in void-free silicone compound to reduce corona or surface tracking. The printed protection is suitable for these 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: HVD15 for a voltage ratio of 1:1000, with R1 = 99.9 megohms and R2 = 100 kilohms (total $R_1 + R_2$ = 100 megohms) at 50ppm/°C absolute and 25ppm/°C tracking TCR, 1% absolute and 0.5% ratio tolerance.

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

1 Type	2 Size	3 TCR (Absolute and Tracking)		4 Value (R1 + R2)	5 Value (R2)	6 Tolerance (Absolute and Ratio)	
H = HVD	08	ZC	100ppm absolute and 50ppm tracking	K = kilohms, M = megohms, G = gigohms		JF	5% absolute and 1% ratio
	12	ZD	100ppm absolute and 25ppm tracking			FD	1% absolute and 0.5% ratio
	15	CD	50ppm absolute and 25ppm tracking			FC	1% absolute and 0.25% ratio
	20						
	30						

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