HVL Precision Non-Inductive High-Voltage Resistors

High precision, high voltage, low voltage coefficient and high reliability



Resistance range 1KΩ~10GΩ	Best tolerance ±0.1%
Temperature coefficient ±100ppm/℃	Working voltage 48KVmax

Product Advantages

These precision non-inductive high-voltage resistors use precision thick-film technology, electronic pastes developed in-house by C&B Electronics, and alumina ceramic rods as the substrate. Precision manufacturing covers the full process from screen printing to encapsulation and testing. The series achieves a temperature coefficient within ±100ppm/°C from -25°C to +125°C, a target tolerance as tight as ±0.1%, and a typical voltage coefficient of 0.01ppm/V.

The voltage coefficient is a key electrical parameter for high-voltage resistors. Electronic pastes contain a mixture of conductive and nonconductive materials. Under high-voltage operation, the nonconductive medium becomes activated and forms a parallel resistance, causing the resistance value to change. A low voltage coefficient depends mainly on paste manufacturing quality and processing. 100% of resistors undergo high-voltage powered testing before shipment to verify its performance under high voltage.

The core materials and processes for this series are developed and controlled in-house, ensuring consistent quality and timely delivery. If standard specifications do not meet your needs, contact our sales team. We provide precision resistor solutions for instrumentation, medical equipment, automotive electronics, precision power supplies, defense and aerospace, electrical equipment, and test and measurement equipment.

Applications

- Medical equipment
- Electrical equipment
- Instrumentation
- Automotive electronics
- Test and measurement equipment

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Electrical Specifications

Series	Product size	Power (+125°C)	Max. working voltage*	Operating temp. range	Temperature coefficient ppm/°C	Resistance range (Ω)	Unit weight g	Tolerance %
HVL	1505	0.7W	2.5KV	-55℃~+175℃	±100 (-25℃~+125℃,+25℃ ref)	1K-100G	1.70±1	±0.1~±10.0
HVL	1905	1.0W	3.5KV	-55℃~+175℃	±100 (-25℃~+125℃,+25℃ ref)	1K-100G	1.93±1	±0.1~±10.0
HVL	2505	1.2W	5.5KV	-55℃~+175℃	±100 (-25℃~+125℃,+25℃ ref)	1K-100G	2.45±1	±0.1~±10.0
HVL	2408	2.0W	5.5KV	-55℃~+175℃	±100 (-25℃~+125℃,+25℃ ref)	1K-100G	5.16±2	±0.1~±10.0
HVL	3908	3.0W	10KV	-55℃~+175℃	±100 (-25℃~+125℃,+25℃ ref)	1K-100G	7.57±2	±0.1~±10.0
HVL	5208	5.0W	15KV	-55℃~+175℃	±100 (-25℃~+125℃,+25℃ ref)	1K-100G	9.58±2	±0.1~±10.0
HVL	7609	7.5W	22.5KV	-55℃~+175℃	±100 (-25℃~+125℃,+25℃ ref)	1K-100G	18.60±2	±0.1~±10.0
HVL	1029	10.0W	32KV	-55℃~+175℃	±100 (-25℃~+125℃,+25℃ ref)	1K-100G	23.63±2	±0.1~±10.0
HVL	1179	11.0W	35KV	-55℃~+175℃	±100 (-25℃~+125℃,+25℃ ref)	1K-100G	26.24±2	±0.1~±10.0
HVL	1279	12.0W	40KV	-55℃~+175℃	±100 (-25℃~+125℃,+25℃ ref)	1K-100G	28.56±2	±0.1~±10.0
HVL	1379	13.0W	45KV	-55℃~+175℃	±100 (-25℃~+125℃,+25℃ ref)	1K-100G	31.64±2	±0.1~±10.0
HVL	1529	15.0W	48KV	-55℃~+175℃	±100 (-25℃~+125℃,+25℃ ref)	1K-100G	34.34±2	±0.1~±10.0

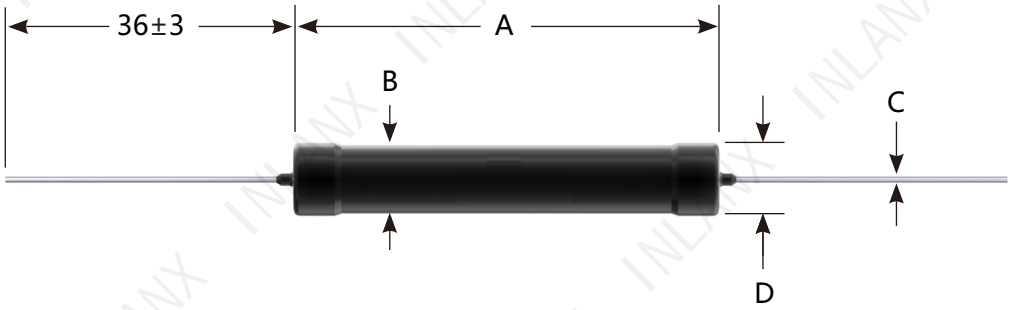
* Maximum working voltage is the lower of U=√(P*R) and Umax.

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Dimensional Drawing

Unit: mm



Series	Product size	Resistance range	Dimension A mm	Dimension B mm	Dimension C mm	Dim. D mm
HVL	1505	1K-100G	15±1.5	5±1.0	0.8±0.1	6.5±1.0
HVL	1905	1K-100G	19±1.5	5±1.0	0.8±0.1	6.5±1.0
HVL	2505	1K-100G	25.4±1.5	5±1.0	0.8±0.1	6.5±1.0
HVL	2408	1K-100G	24±1.5	8±1.0	1.0±0.1	9.5±1.0
HVL	3908	1K-100G	39±1.5	8±1.0	1.0±0.1	9.5±1.0
HVL	5208	1K-100G	52±1.5	8±1.0	1.0±0.1	9.5±1.0
HVL	7609	1K-100G	76±1.5	9±1.0	1.0±0.1	10.5±1.0
HVL	1029	1K-100G	102±1.5	10±1.0	1.0±0.1	10.5±1.0
HVL	1179	1K-100G	117±1.5	10±1.0	1.0±0.1	10.5±1.0
HVL	1279	1K-100G	127±1.5	9±1.0	1.0±0.1	10.5±1.0
HVL	1379	1K-100G	137±1.5	9±1.0	1.0±0.1	10.5±1.0
HVL	1529	1K-100G	152±1.5	9±1.0	1.0±0.1	10.5±1.0

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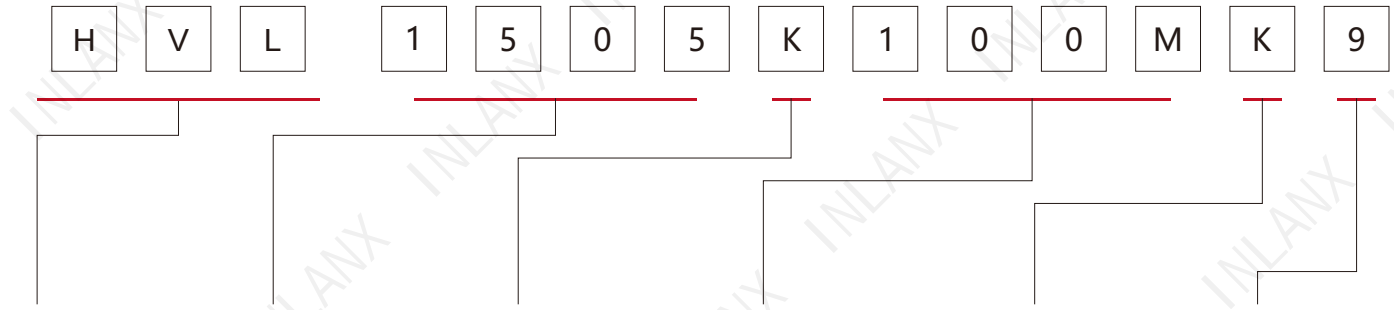
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Performance Specifications

Test	Test method	Reference standard	Performance
Voltage coefficient	At (25±5)°C, apply 10% and 100% of rated voltage separately; application time ≤0.5s, interval 5s.	MIL-STD-202 Method 309	Typical: 0.01ppm/V Maximum: 2ppm/V
Dielectric withstand	Apply 5000VAC between the leads and epoxy housing for 60s.	IEC 60115-1 4.7	No breakdown or flashover; ΔR≤±0.5%
Thermal shock	-55°C for 15min ~ room temperature for <20s ~ +150°C for 15min; 1000 cycles.	MIL-STD-202 Method 107	△R≤±1.0%
Short-time overload	5 times rated power, without exceeding 1.5 times maximum continuous working voltage, for 5s.	IEC60115-1-2008 4.13	△R≤±0.5%
High temp. / humidity	+85°C, 85%RH, 10% rated power, 1000h. Test within 24±4h after completion.	MIL-STD-202 Method 103	△R≤±1.0%
High-temp. storage	+150°C for 1000h, without load.	MIL-STD-202 Method 108	△R≤±1.0%
Moisture resistance	+85°C, 85%RH, 0.1 times rated power, 1000h.	MIL-STD-202 Method 106	△R≤±1.0%
Mechanical shock	Half-sine pulse, peak acceleration 100g, duration 6ms; 3 shocks in each of six directions on three axes.	MIL-STD-202 Method 213	△R≤±0.5%
Vibration	Sweep from 10Hz to 2000Hz in 1min; X, Y and Z axes; total duration 12h.	MIL-STD-202 Method 204	△R≤±0.5%
Load life	Rated power, 1.5h on / 0.5h off, for 1000h (ambient temperature 125°C).	MIL-STD-202 Method 108	△R≤±1.0%
Temperature coefficient	Measure at -25°C and +125°C; reference temperature +25°C.	AEC-Q200 TEST 18 IEC 60115-1 4.8	Maximum within ±100ppm/°C

Selection Guide

Selection example: HVL1505F100MK9 (HVL 1505, 100MΩ, ±1%, ±100ppm/°C, standard product)



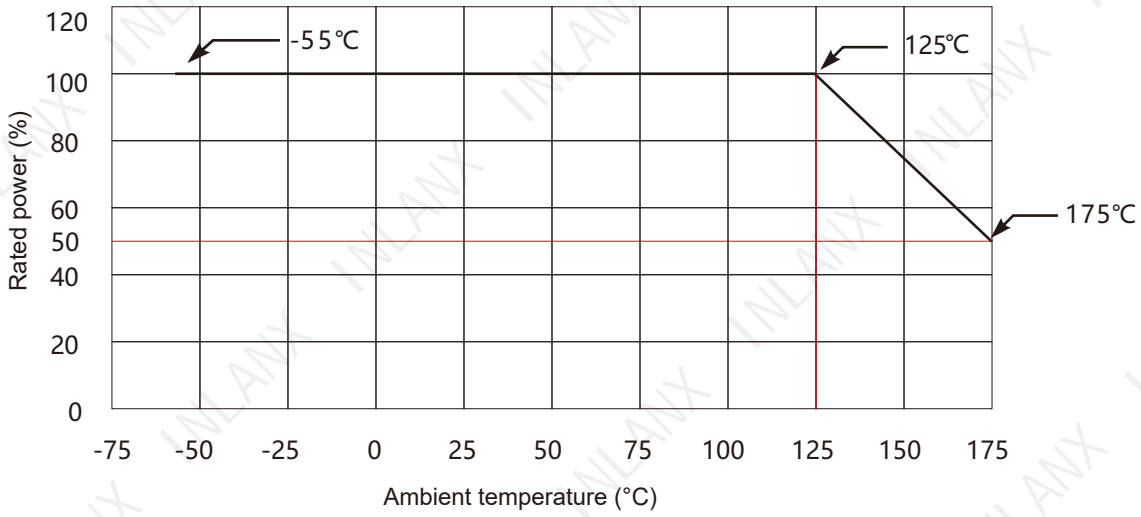
Series	Size (L × dia.)		Tolerance	Resistance	TCR	Packaging
HVL	1505	7609	B=±0.1%	1K00=1KΩ	K=100ppm/℃	9=Standard
	1905	1029	D=±0.5%	1M00=1MΩ		0-8=Custom
	2505	1179	F=±1.0%	1G00=1GΩ		
	2408	1279	G=±2.0%			
	3908	1379	J=±5.0%			
	5208	1529	K=±10%			

For smaller or larger sizes, higher voltage, tighter tolerance or lower TCR, contact us for custom development.

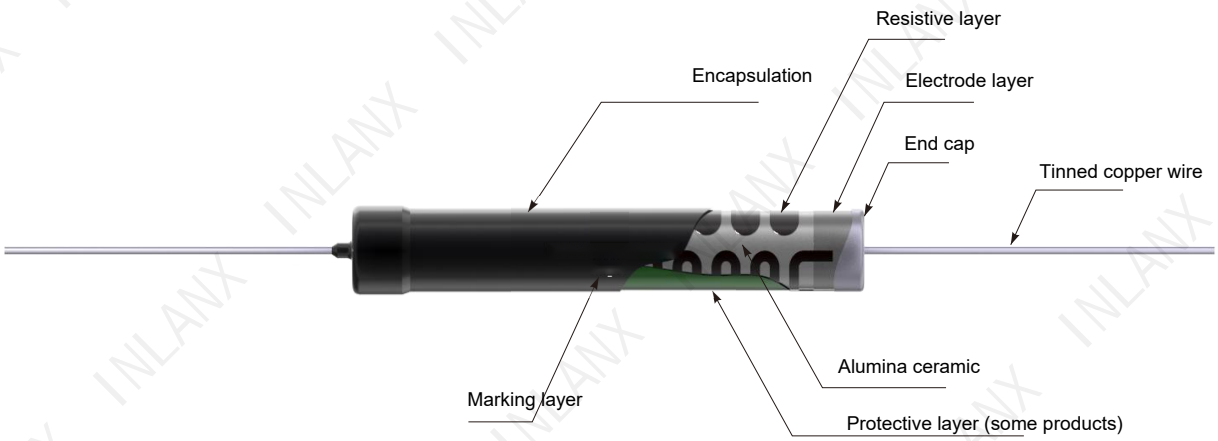
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HVL Precision Non-Inductive High-Voltage Resistors

Power Derating Curve



Resistor Construction



Marking Details

Product marking: brand mark + product model + production date code

Size	Illustration	Example explanation
HVL 5208		INLANX: Brand mark HVL5208K10M0K9: Product model 2330: Production date code

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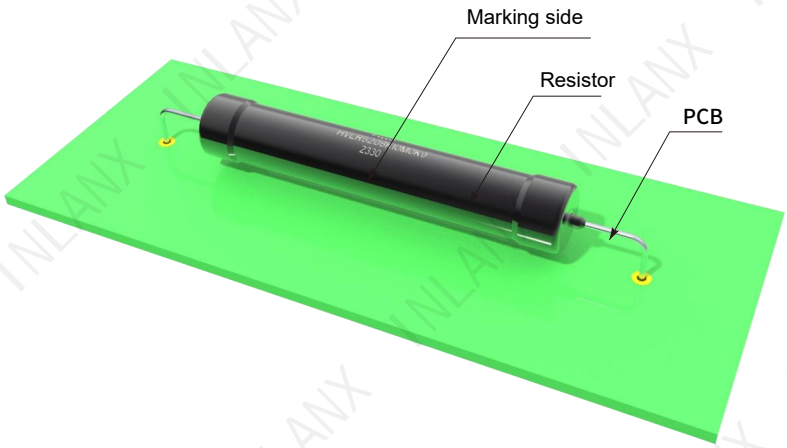
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Installation Recommendations

(1) Install the resistor horizontally between two PCB pads as shown. Keep both lead lengths equal.

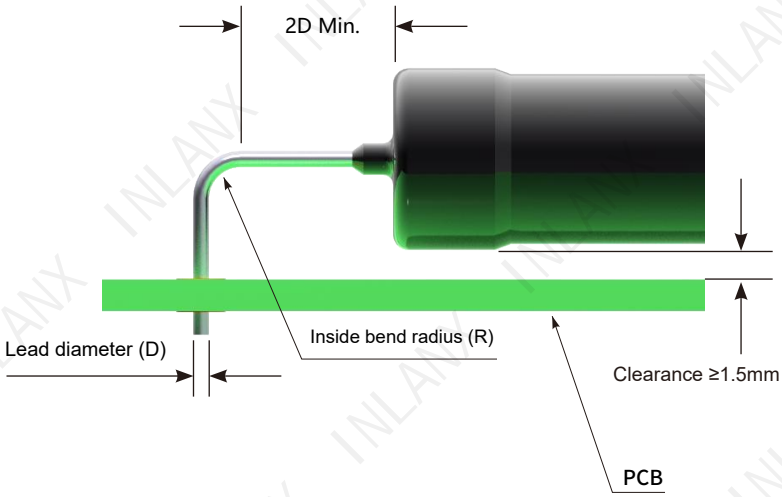
(2) Place the marking side upward so the product model and production date code can be read.

(3) For high-voltage operation, maintain a clearance of ≥1.5mm between the resistor housing and the PCB.



(4) Minimum inside lead bend radii are listed below.

Lead diameter (D)	Minimum inside lead bend radius (R)
< 0.6mm	1 × lead diameter
0.6mm ~ 1.2mm	1.5 × lead diameter
> 1.2mm	2 × lead diameter



(5) This resistor series can be encapsulated in transformer oil for use.

Packaging Details

This series is vacuum-sealed in antistatic bags. Refer to the stocked-model page for the minimum packing quantity of each size.

Safe Storage Instructions

(1) Store at 5°C to 35°C and ≤60%RH. Keep humidity as low as possible.

(2) Avoid direct sunlight.

(3) Store in a clean, dry environment free of harmful gases (hydrogen chloride, sulfuric acid vapor, hydrogen sulfide, etc.).

(4) Handle gently during installation and storage to prevent mechanical damage or lead deformation from impacts.

(5) Under these storage conditions, resistors retain their as-shipped condition for at least 1 year.