

## HVC Series

### Construction

Resistive thick film material, overglaze and organic protection are screen printed on a 96% alumina substrate. The design and laser adjustment of the resistive element optimises the limiting element voltage of the resistor.

### Terminations

The chips are supplied with wrap-around terminations suitable for soldering. Consult factory for alternative termination options.

### Solderability

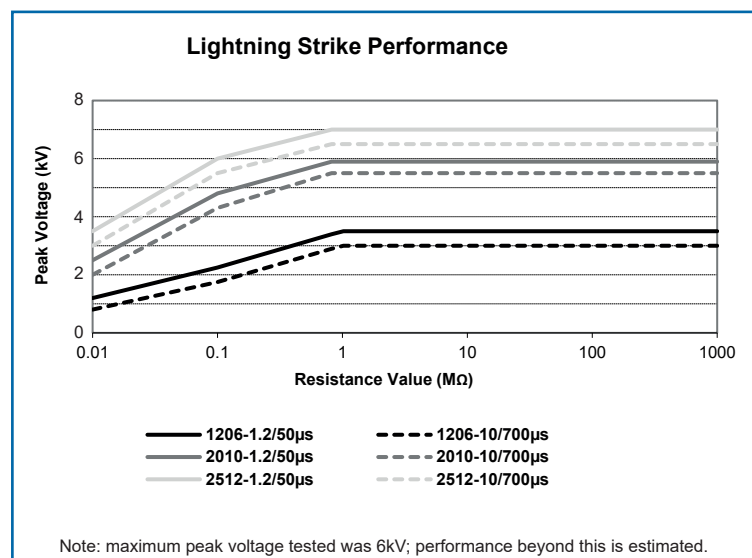
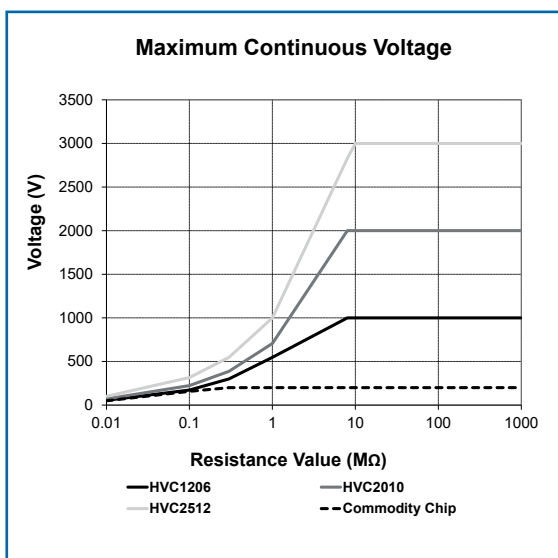
The terminations have an electroplated nickel barrier and tin finish. This ensures excellent 'leach' resistance properties and solderability.

### Marking

The body protection is resistant to all normal cleaning solvents suitable for printed circuits. The chips are not marked and the relevant information on type, value, tolerance date code and quantity are recorded on the reel.

## Performance Data

			Maximum	Typical
Load at rated power: 1000 hours at 70°C	$\Delta R\%$		<b>1206: 2</b> <b>2010/2512: 1</b>	<b>1206: 1</b> <b>2010/2512: 0.25</b>
Shelf life test: 12 months at room temperature	$\Delta R\%$		0.1	0.02
Derating from rated power at 70°C			Zero at 155°C	
Short term overload: Lesser of 6.25 x rated power or Maximum overload voltage	$\Delta R\%$		2	0.2
Lightning strike: 1.2/50 $\mu s$ & 10/700 $\mu s$ - see graph for peak voltage	$\Delta R\%$		0.5	0.2
Dry heat: 1000 hours at 155°C	$\Delta R\%$		0.5	0.1
Long term damp heat	$\Delta R\%$		1	0.25
Temperature rapid change	$\Delta R\%$		0.25	0.05
Resistance to solder heat	$\Delta R\%$		0.25	0.05
Anti-sulphur grade (AS)	ASTM-B-809 (1000 hours, 50°C, 91-93% RH)	$\Delta R\%$	0.25	0.05
	EIA-977 (750 hours, 105°C)	$\Delta R\%$	0.25	0.05
Sulphur-resistant grade (SR)	ASTM-B-809 (1000 hours, 50°C, 91-93% RH)	$\Delta R\%$	0.25	0.05
	Modified ASTM-B-809 (1000 hours, 105°C, 85% RH)	$\Delta R\%$	1	0.25
Voltage proof	volts		500	
Voltage coefficient of resistance		ppm/V	<b>1206: -25</b> <b>2010: -15</b>	<b>1206: -15</b> <b>2010: -5</b>
			<b>2512 <math>\leq</math>100M: -5</b> <b>2512 &gt;100M: -15</b>	<b>2512 <math>\leq</math>100M: -1.5</b> <b>2512 &gt;100M: -8</b>



### 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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### Application Notes

HVC resistors are ideally suited for handling by automatic methods due to their rectangular shape and the small dimensional tolerances. Electrical connection to a ceramic substrate or to a printed circuit board can be made by reflow or wave soldering of wrap-around terminations.

Wrap-around terminations provide good leach properties and ensure reliable contact. Due to the robust construction, the HVC can be immersed in the solder bath for 30 seconds at 260°C. This enables the resistor to be mounted on one side of a printed circuit board and wire-leaded components applied on the other side.

HVC resistors themselves can operate at a maximum

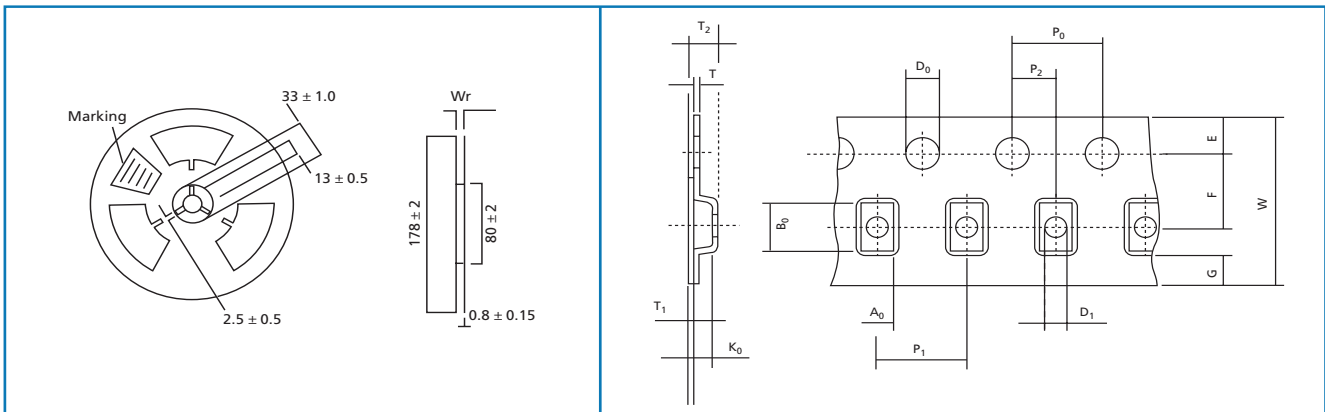
temperature of 155°C (see performance above). For soldered resistors, the joint temperature should not exceed 110°C. This condition is met when the stated power levels at 70°C are used.

The PCB layout should avoid tracks running between the HVC mounting pads, as this would compromise the LEV.

The LEV stated applies to operation at sea-level pressure, in a non-condensing atmosphere and non-contaminating environment. Voltage derating should be applied if low pressure, high humidity or contamination may be encountered. The termination clearance dimension (B) should be used in conjunction with the creepage limit applicable to the circuit application in order to determine the derated LEV.

### Packaging

HVC Resistors are supplied taped and reeled as per IEC 286-3.



Tape and reel dimensions (mm)

	Wr	W	P1	P0	P2	D0	D1	E	F	A0	B0	K0	T	T1	T2	Qty. per reel
	±0.5	±0.3	±0.1	±0.1	±0.05	±0.1	±0.2	±0.1	±0.05	±0.1	±0.1	±0.1	±0.05	Nom.	±0.15	
<b>1206</b>	9	8	4	4	2	1.5	1	1.75	3.5	1.95	3.55	1.0	0.2	0.05	1.3	3000
<b>2010</b>	13	12	4	4	2	1.5	1.5	1.75	5.5	2.79	5.89	0.91	0.28	0.06	1.21	3000
<b>2512</b>	13	12	8	4	2	1.5	1.5	1.75	5.5	3.61	6.96	1.17	0.28	0.06	1.45	1800

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### Ordering Procedure

**Example: HVC2512-4M7FT18** (2512, 4.7 megohms  $\pm 1\%$ , with  $\pm 100\text{ppm}/^\circ\text{C}$  TCR and standard grade and terminations, Pb-free)



1	2	3	4	5	6	7		
Type	Size	TCR	Sulphur Grade <sup>2</sup>	Value	Tolerance	Grade, Termination & Packing		
HVC	1206	Omit for	Omit for standard	E24 = 3/4 characters	D = $\pm 0.5\%$	Standard grade, Pb-free finish		
	2010	$\pm 100/500\text{ppm}/^\circ\text{C}$	AS = Anti-sulphur	E96 = 3/4 characters	F = $\pm 1\%$	T3	1206, 2010	3000/reel
	2512	C = $\pm 50\text{ppm}/^\circ\text{C}$	SR = Sulphur Resistant	K = kilohms	G = $\pm 2\%$	T18	2512	1800/reel
				M = megohms	J = $\pm 5\%$	Standard grade, SnPb finish		
				G = gigohms	K = $\pm 10\%$	PB	Quantities as for Pb-free	
						AEC-Q200 grade, Pb-free finish		
						A3	1206, 2010	3000/reel
						A18	2512	1800/reel
						AEC-Q200 grade, SnPb finish		
						PBA	Quantities as for Pb-free	

Note 1: The hyphen is omitted if necessary to keep the total character count below 19.

Note 2: For new designs requiring resistance to sulphur-bearing gas, SR grade is preferred.

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