

## GHVC Series

### Features:

- Completely free of Pb and its compounds
- RoHS compliant without exemption
- Anti-sulphur construction
- Continuous voltages up to 3kV
- Overload voltages up to 4kV
- Sizes 1206 to 2512

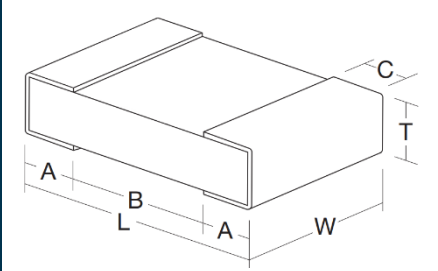


All parts are Pb-free and comply with EU Directive 2011/65/EU amended by (EU) 2015/863

## Electrical Data

		1206	2010	2512
Power rating @70°C	W	0.3	0.5	1
Limiting element voltage	V (dc or ac pk)	1000	2000	3000
Maximum 2s overload voltage	V (dc or ac pk)	1500	3000	4000
Resistance range	ohms	25K to 100M		
Resistance tolerance	%	≤10M: 1, 2, 5, 10 >10M: 2, 5, 10	1, 2, 5, 10	
TCR	ppm/°C	100		
Ambient temperature range	°C	-55 to 125		
Standard values		E24 & E96 preferred		
Thermal impedance	°C/W	200	80	70

## Physical Data

Dimensions in mm and weight in mg								
	L	W	T	A	B <sub>min</sub>	C	Wt. nom	
1206	3.2 ± 0.2	1.6 ± 0.2	0.6 ± 0.1	0.35 ± 0.2	1.95	0.35 ± 0.2	9.6	
2010	5.1 ± 0.3	2.5 ± 0.2	0.7 ± 0.1	0.45 ± 0.2	3.7	0.4 ± 0.25	31.5	
2512	6.5 ± 0.3	3.2 ± 0.2			5	0.4 ± 0.2	48.9	

### Construction

Pb-free 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 Pb-free wrap-around terminations suitable for soldering.

### Solderability

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

### Marking

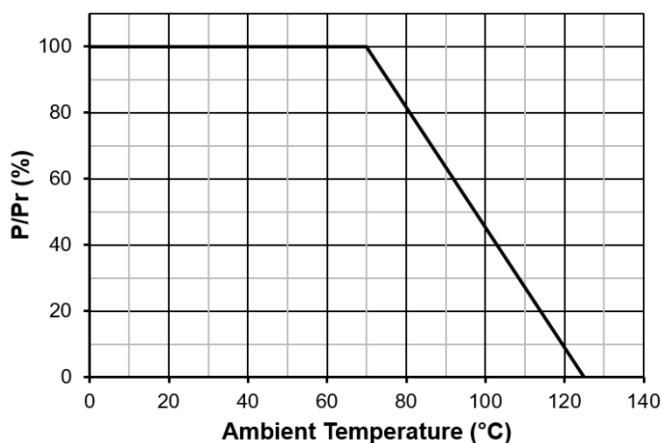
The body protection is resistant to all normal cleaning solvents suitable for printed circuits. The chips are not marked and the relevant information on type, value, tolerance, date code and quantity are recorded on the reel.

### Performance Data

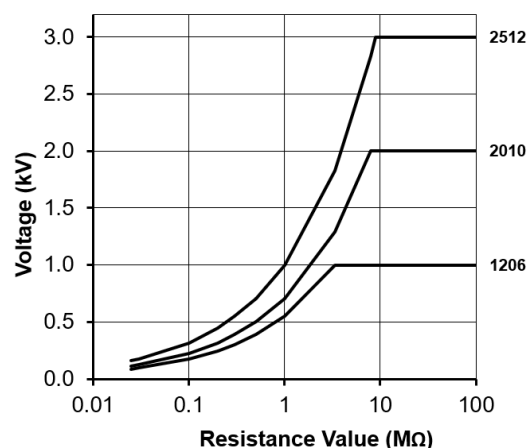
		Maximum	Typical
Load at rated power: 1000 hours at 70°C	±ΔR%	1206: 2, 2010 & 2512: 1	1206: 1, 2010 & 2512: 0.25
Shelf-life test: 12 months at room temperature	±ΔR%	0.3	0.04
Short-term overload: lesser of 6.25 x rated power and maximum overload voltage	±ΔR%	2	0.2
Lightning strike: 1.2/50μs & 10/700μs, see Lightning Strike Performance graph for peak voltage	±ΔR%	0.5	0.2
Dry heat: 1000 hours at 125°C	±ΔR%	0.5	0.1
Long term damp heat	±ΔR%	1	0.25
Temperature rapid change	±ΔR%	0.5	0.1
Resistance to solder heat	±ΔR%	0.25	0.05
Resistance to sulphur-bearing gas: ASTM-B-809: 1000 hours, 50°C, 91-93%RH	±ΔR%	0.25	0.05
Voltage proof	V	500	
Voltage coefficient of resistance	ppm/V	1206: -25, 2010: -15, 2512: -5	1206: -15, 2010: -5, 2512: -1.5

### Thermal, Continuous Voltage and Surge Data

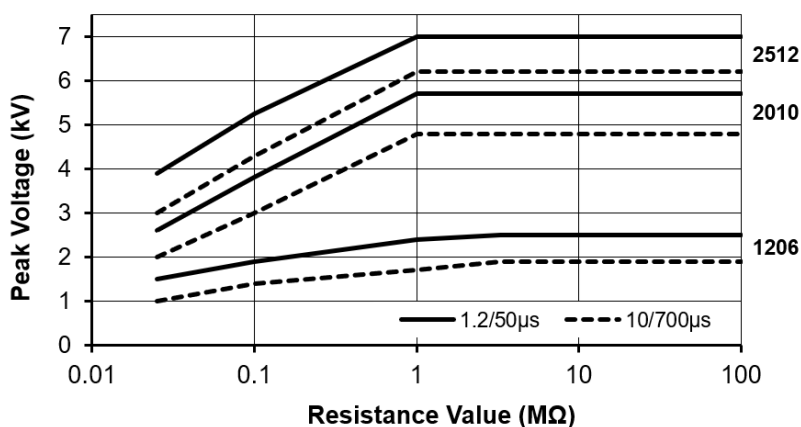
**Temperature Derating**



**Maximum Continuous Voltage**



**Lightning Strike Performance**



**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.

### Application Notes

GHVC 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 GHVC 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.

GHVC resistors themselves can operate at a maximum temperature of 125°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 GHVC mounting pads, as this would compromise the LEV.

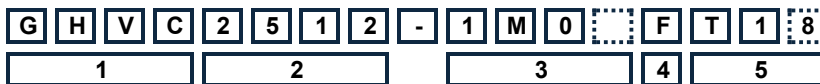
The LEV stated applies to operation at sea-level pressure, in a non-condensing atmosphere and non-contaminating environment. Voltage derating should be applied if low pressure, high humidity or contamination may be encountered. The termination clearance dimension (B) should be used in conjunction with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

### Packaging

GHVC resistors are supplied taped and reeled as per IEC 286-3. For full details of tape and reel dimensions see: <https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Application-Note/PS003-Packing-of-Specialist-Chip-Resistors.pdf>

### Ordering Procedure

**Example: GHVC2512-1M0FT18** (2512, 1 megohm ±1%, Pb-free)



1	2	3	4	5		
Type	Size	Value	Tolerance	Packing		
GHVC	1206	E24 = 3/4 characters	F = ±1%	T3	1206, 2010	3000/reel
	2010	E96 = 3/4 characters	G = ±2%	T18	2512	1800/reel
	2512	K = kilohms M = megohms	J = ±5% K = ±10%			