

## High Pulse Withstanding Chip Resistors

### HPWC Series

- Excellent pulse withstand performance
- Improved working voltage
- Improved power rating
- Anti-sulphur version available



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

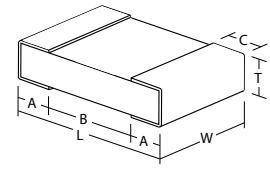
### Electrical Data

Size	HPWC0805	HPWC1206	HPWC2010	HPWC2512
Power @ 70°C W	0.25	0.33	0.5	0.75
Resistance range ohms		1R0 to 1M0		
Tolerance %		All values: 5, 10, 20		
LEV V	150	200	400	500
TCR ppm/°C		<10R:200 ≥ 10R:100		
Operating temperature °C		-55 to +155		
Thermal Impedance °C/W	220	160	145	80
Pad / trace area * mm <sup>2</sup>	40	50	125	60
Values	E24 or E96 preferred - other values to special order			
Pulse Capability	See graphs			

\*Recommended minimum pad & adjacent trace area for each termination for rated power dissipation on FR4 PCB

### Physical Data

Dimensions (mm) & weight (mg)							
	L	W	T max	A	B min	C	Wt.
0805	2.0±0.15	1.25±0.15	0.6	0.3±0.15	0.9	0.3±0.1	4.7
1206	3.2±0.2	1.6±0.2	0.7	0.4±0.2	1.7	0.4±0.15	8.5
2010	5.1±0.3	2.5±0.2	0.8	0.6±0.3	3.0	0.6±0.25	36
2512	6.5±0.3	3.2±0.2	0.8	0.6±0.3	4.4	0.6±0.25	55



Wrap-around terminations (3 faces)

### Construction

Thick film resistor material, overglaze and organic protection are screen printed on a 96% alumina substrate. Wrap-around terminations have an electroplated nickel barrier and solder coating, this ensures excellent 'leach' resistance properties and solderability.

Note that anti-sulphur version parts below 5R are produced in flip-chip format with the resistor element on the underside.

### Marking

Components are not marked. Reels are marked with type, value, tolerance, date code and quantity.

### Solvent Resistance

The body protection is resistant to all normal industrial cleaning solvents suitable for printed circuits.

### General Note

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## HPWC Series

### Performance Data

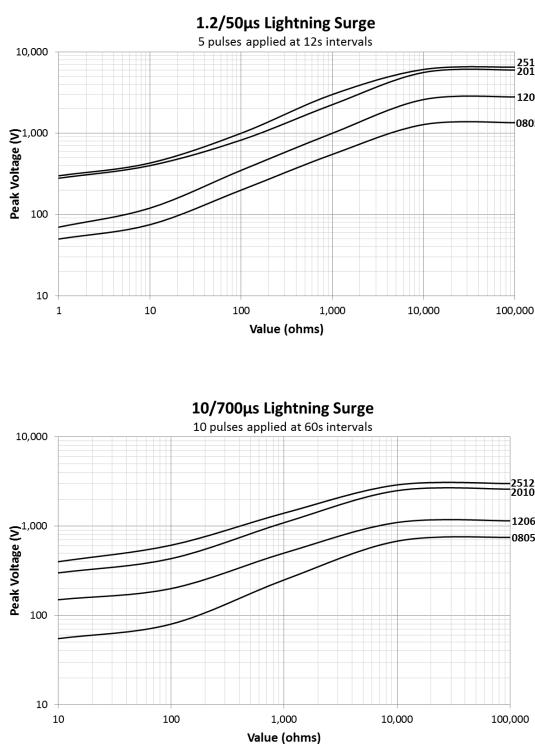
Size		Maximum	Typical
Load at rated power: 1000 hours at 70°C	ΔR%	1	0.25
Shelf life test: 12 months at room temperature	ΔR%	0.1	0.02
Derating from rated power at 70°C		Zero at 155°C	
Overload: 6.25 x rated power for 2 seconds	ΔR%	1	0.1
Dry heat: 1000 hours at 155°C	ΔR%	1	0.2
Long term damp heat	ΔR%	1	0.25
Temperature rapid change	ΔR%	0.25	0.05
Resistance to solder heat	ΔR%	0.25	0.05
Anti-sulphur grade (AS)	ASTM-B-809 (1000 hours, 50°C, 91-93% RH)	ΔR%	0.25
	EIA-977 (750 hours, 105°C)	ΔR%	0.25
Sulphur-resistant grade (SR)	ASTM-B-809 (1000 hours, 50°C, 91-93% RH)	ΔR%	0.25
	Modified ASTM-B-809 (1000 hours, 105°C, 85% RH)	ΔR%	1
Voltage proof	volts		500

Note: A 0.01 ohm addition to be added to the performance of all resistors <10 ohms.

### Pulse Performance Data

#### Lightning Surge

HPWC resistors are tested in accordance with IEC 60 115-1 using both 1.2/50μs and 10/700μs pulse shapes. The limit of acceptance is a shift in resistance of less than 1% from the initial value.



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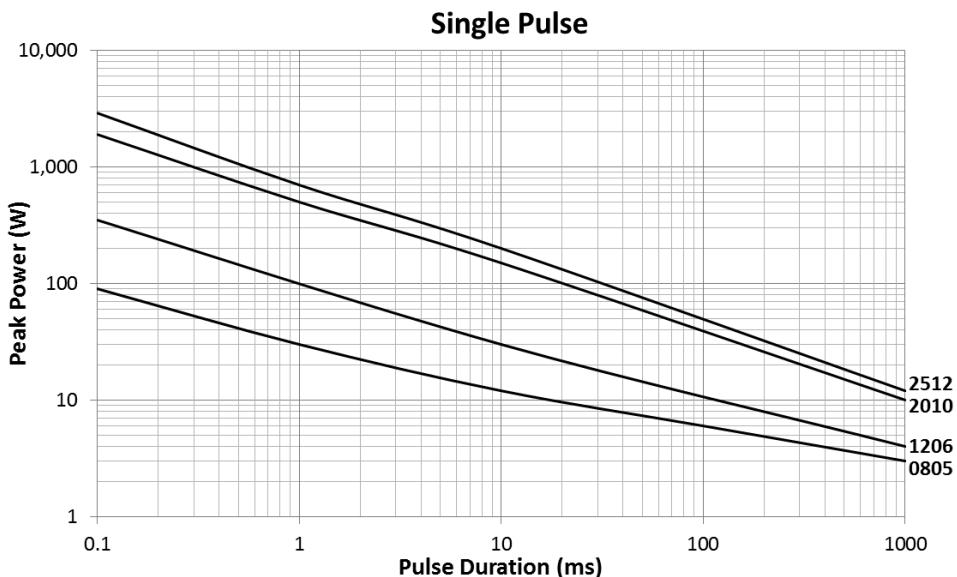
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## HPWC Series

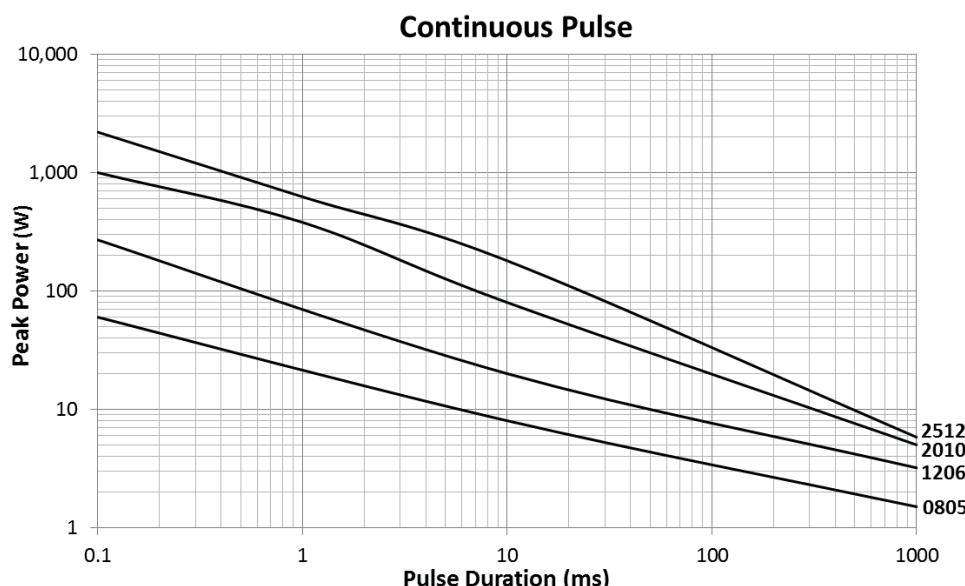
### Single Pulse

The single pulse graph is the result of 50 impulses of rectangular shape applied at one minute intervals. The limit of acceptance is a shift in resistance of less than 1% from the initial value.



### Continuous Pulse

The continuous pulse graph was obtained by applying repetitive rectangular pulses where the pulse period was adjusted so that the average power dissipated in the resistor was equal to its rated power at 70°C. The limit of acceptance is a shift in resistance of less than 1% from the initial value.



### General Note

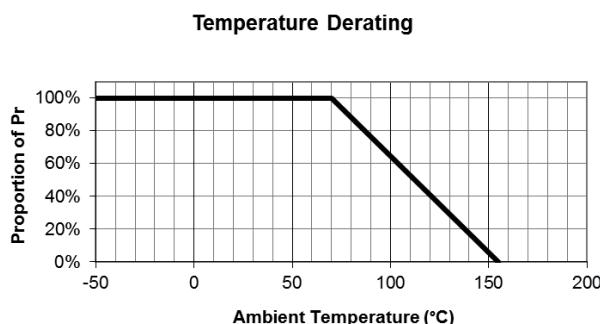
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## HPWC Series

### Thermal Performance Data



### Packaging

0805 and 1206 resistors are supplied on 8mm carrier tape and 2010 and 2512 resistors are supplied on 12mm carrier tape, all on 7 inch reels as per IEC 286-3.

### Application Note

HPWC resistors themselves can operate at a maximum temperature of 155°C. For soldered resistors, the joint temperature should not exceed 110°C. This condition is met when the stated power levels at 70°C and recommended pad and trace areas are used. Pad and trace area is defined as the total area of the solder pad plus all copper trace within two squares of the edge of the solder pad. Allowance should be made if smaller areas of copper are used.

### Ordering Procedure

**Example: HPWC2512-2K0JT18** (2512, 2 kilohms  $\pm 5\%$ , Pb-free)

H	P	W	C	2	5	1	2	3	-	2	K	0	J	T	1	8
1	2	3							4	5	6					

1 Type	2 Size	3 Sulphur Grade <sup>1</sup>	4 Value	5 Tolerance	6 Termination & Packing		
HPWC	0805	Omit for standard	E24 = 3/4 characters	J = $\pm 5\%$	Standard Pb-free finish		
	1206	AS = Anti-sulphur	E96 = 3/4 characters	K = $\pm 10\%$		0805	
	2010	SR = Sulphur Resistant	R = ohms	M = $\pm 20\%$	T3	1206	3000/reel standard
	2512		K = kilohms			2010	
					T18	2512	1800/reel standard
					T1	All sizes	1000/reel available
							SnPb finish
					PB	All sizes	Standard quantities as for Pb-free

Note 1 - For new designs requiring resistance to sulphur-bearing gas, SR grade is preferred.

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<a href="#">HPWC2512-10KJT1</a>	<a href="#">HPWC1206-100RJT1</a>	<a href="#">HPWC1206-3R3JT1</a>	<a href="#">HPWC2512-3K3JT1</a>	<a href="#">HPWC1206-33RJT1</a>
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<a href="#">HPWC1206-33KJT1</a>	<a href="#">HPWC1206-10RJT1</a>	<a href="#">HPWC0805-2K8JT1</a>	<a href="#">HPWC0805-29R4JT1</a>	<a href="#">HPWC2512-9R1JT1</a>
<a href="#">HPWC1206-1K24JT1</a>	<a href="#">HPWC1206-23K2JT1</a>	<a href="#">HPWC1206-19R6JT1</a>	<a href="#">HPWC0805-3K0JT1</a>	<a href="#">HPWC2010-8K06JT1</a>
<a href="#">HPWC0805-267RJT1</a>	<a href="#">HPWC2010-3R83JT1</a>	<a href="#">HPWC1206-21R5JT1</a>	<a href="#">HPWC1206-16K5JT1</a>	<a href="#">HPWC1206-6K19JT1</a>
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<a href="#">HPWC1206-14K3JT1</a>	<a href="#">HPWC2010-21RJT1</a>	<a href="#">HPWC2010-1K24JT1</a>	<a href="#">HPWC2010-31R6JT1</a>	<a href="#">HPWC0805-294RJT1</a>
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<a href="#">HPWC1206-18R2JT1</a>	<a href="#">HPWC1206-51KJT1</a>	<a href="#">HPWC2512-6R2JT1</a>	<a href="#">HPWC2010-11K8JT1</a>	<a href="#">HPWC2010-3K4JT1</a>
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