High Pulse Withstanding Chip Resistors

HPWC Series

Features

- 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

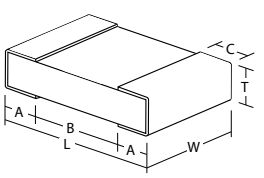
Size		HPWC0805	HPWC1206		HPWC2010		HPWC2512	
Power @70°C	W	0.25	0.33	0.5	0.75	1	1.5	2
Resistance range	ohms	1R0 to 1M0						
Tolerance	%	All values: 5, 10, 20						
LEV	V	150	200		400		500	
TCR	ppm/°C	<10R:200 ≥ 10R:100						
Operating temperature	°C	-55 to +155						
Thermal Impedance	°C/W	220	160	145	80	70	55	40
Pad / trace area *	mm^2	40	50	125	60	250	100	500
Values		E24 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.

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Performance Data

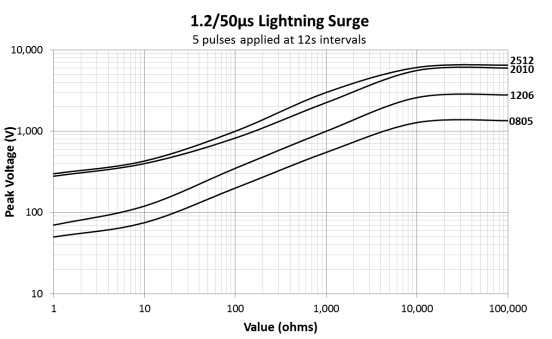
Size			Maximum	Typical
Load at rated power: 1000 hours at 70°C		ΔR%	1	0.25
Shelf life test: 12 months at room temperature		ΔR%	0.1	0.02
Derating from rated power at 70°C			Zero at 155°C	
Overload: 6.25 x rated power for 2 seconds		ΔR%	1	0.1
Dry heat: 1000 hours at 155°C		ΔR%	1	0.2
Long term damp heat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

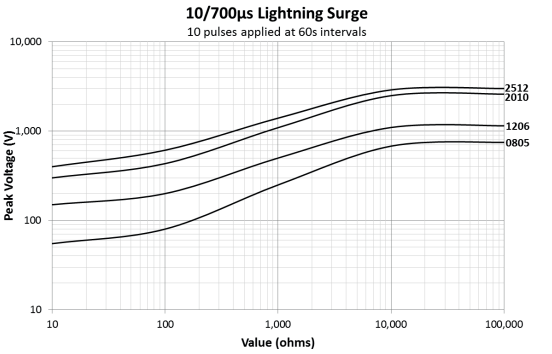
Note: A 0.01 ohm addition to be added to the performance of all resistors <10 ohms.

Pulse Performance Data

Lightning Surge

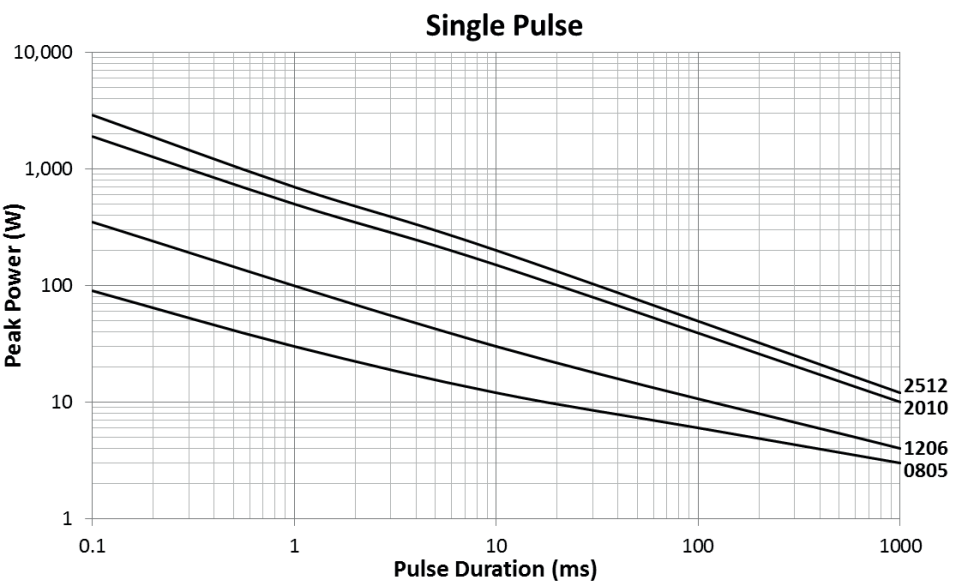
HPWC resistors are tested in accordance with IEC 60 115-1 using both 1.2/50µs and 10/700µs pulse shapes. The limit of acceptance is a shift in resistance of less than 1% from the initial value.





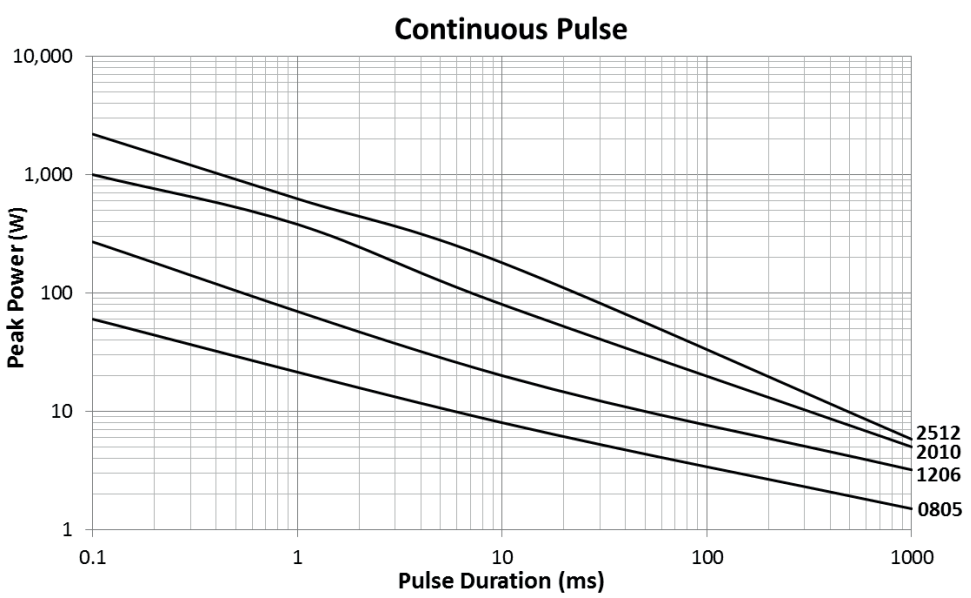
Single Pulse

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.

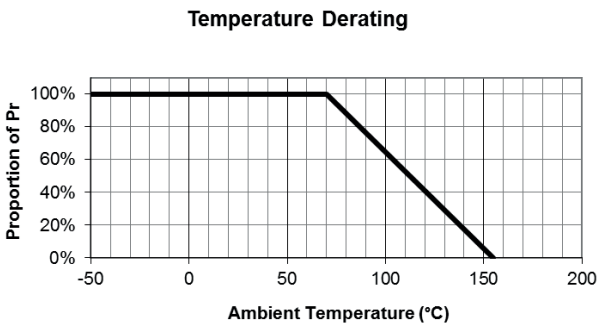


Continuous Pulse

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.



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 ±5%, Pb-free)

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

1 Type	2 Size	3 Sulphur Grade[1]	4 Value	5 Tolerance	6 Termination & Packing		
HPWC	0805	Omit for standard	E24 = 3/4 characters	J = ±5%	Standard Pb-free finish		
	1206	AS = Anti-sulphur	E96 = 3/4 characters	K = ±10%	T3	0805	3000/reel standard
	2010	SR = Sulphur Resistant	R = ohms	M = ±20%		1206	
	2512		K = kilohms			2010	
			M = megohms		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.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

TT Electronics:

HPWC2512-10RJT1 HPWC1206-1K0JT1 HPWC2512-33KJT1 HPWC2512-330RJT1 HPWC2512-1R0JT1
HPWC2512-10KJT1 HPWC1206-100RJT1 HPWC1206-3R3JT1 HPWC2512-3K3JT1 HPWC1206-33RJT1
HPWC2512-100RJT1 HPWC2512-33RJT1 HPWC1206-330RJT1 HPWC1206-3K3JT1 HPWC1206-10KJT1
HPWC1206-1R0JT1 HPWC1206-100KJT1 HPWC2512-3R3JT1 HPWC2512-1K0JT1 HPWC2512-100KJT1
HPWC1206-33KJT1 HPWC1206-10RJT1 HPWC0805-2K8JT1 HPWC0805-29R4JT1 HPWC2512-9R1JT1
HPWC1206-1K24JT1 HPWC1206-23K2JT1 HPWC1206-19R6JT1 HPWC0805-3K0JT1 HPWC2010-8K06JT1
HPWC0805-267RJT1 HPWC2010-3R83JT1 HPWC1206-21R5JT1 HPWC1206-16K5JT1 HPWC1206-6K19JT1
HPWC1206-3K9JT1 HPWC2010-82K5JT1 HPWC2512-374RJT1 HPWC1206-1R74JT1 HPWC1206-715RJT1
HPWC1206-14K3JT1 HPWC2010-21RJT1 HPWC2010-1K24JT1 HPWC2010-31R6JT1 HPWC0805-294RJT1
HPWC0805-76R8JT1 HPWC0805-28R7JT1 HPWC2010-26R1JT1 HPWC2512-15K4JT1 HPWC0805-4K42JT1
HPWC2512-1R96JT1 HPWC2010-8K87JT1 HPWC0805-511RJT1 HPWC1206-84K5JT1 HPWC2010-44K2JT1
HPWC0805-9R53JT1 HPWC2512-9K76JT1 HPWC1206-40K2JT1 HPWC0805-93K1JT1 HPWC2512-681RJT1
HPWC2010-2R67JT1 HPWC2010-10K5JT1 HPWC2512-4K22JT1 HPWC1206-1R24JT1 HPWC2010-249RJT1
HPWC2010-51R1JT1 HPWC0805-12R1JT1 HPWC2512-13K7JT1 HPWC2010-220RJT1 HPWC1206-3K65JT1
HPWC2512-3R57JT1 HPWC0805-1R6JT1 HPWC0805-3R92JT1 HPWC2512-56R2JT1 HPWC1206-4K3JT1
HPWC1206-18R2JT1 HPWC1206-51KJT1 HPWC2512-6R2JT1 HPWC2010-11K8JT1 HPWC2010-3K4JT1
HPWC2010-97R6JT1 HPWC2512-1R54JT1 HPWC0805-21R5JT1 HPWC2512-26R1JT1 HPWC0805-27K4JT1
HPWC2512-267RJT1 HPWC2010-30K9JT1 HPWC2010-470RJT1 HPWC0805-1K87JT1 HPWC1206-2R1JT1
HPWC2010-7R68JT1 HPWC2512-1R07JT1 HPWC2010-42K2JT1 HPWC2512-12K4JT1 HPWC2512-48K7JT1
HPWC0805-97R6JT1 HPWC2010-301RJT1 HPWC0805-499RJT1 HPWC0805-64R9JT1 HPWC0805-1K07JT1