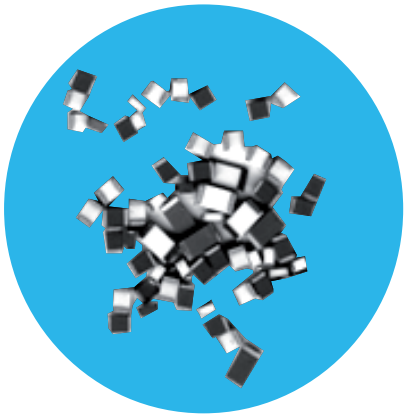
Resistors

Thick Film High Power Chip Resistor



WHPC Series

- Double the standard power for size
- Inverse terminated versions
- Small footprint
- Excellent pulse performance
- RoHS compliant
- AEC-Q200 Qualified

All parts are Pb-free and comply with EU Directive 2011/65/EU (RoHS2)

Electrical Data

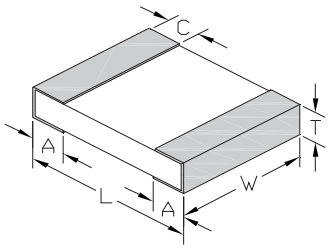
		1206	2010	0612	1020	1218	1225
Power rating @70°C	watts	0.5	1.0	0.5	1.0		1.5
Resistance range	ohms	1R0 to 10M		1R0 to 1M			10R to 1M
Limiting element voltage	volts	200					
Standard values		E24 (1% & 5%) & E96 (1%)					
Tolerance	%	1, 5		≤10R:5 >10R:1, 5		1, 5	
TCR(-55ºC to 155ºC)	ppm/°C	≤10R: 200 >10R-1M0: 100 >1M0: 200		<10R: 400 10R-100R: 200 >100R: 100			
Ambient temperature range	°C	-55 to +155					
Pad / trace area *	mm²	50	60	40	50	50	90

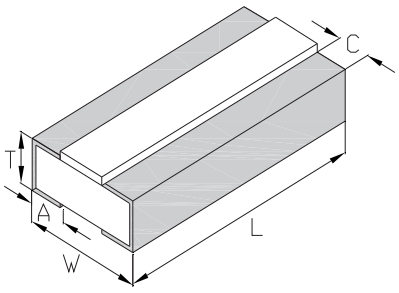
*Recommended minimum pad & adjacent trace area for each termination for rated power dissipation on FR4 PCB

Physical Data

Dimensions (mm) & weight (mg)

	L	W	T	A	C	wt.
1206	3.1±0.1	1.55±0.1	0.55±0.1	0.5±0.2	0.5±0.25	9
2010	5.0±0.2	2.5±0.15	0.55±0.1	0.5±0.2	0.6±0.25	25
0612	3.2±0.15	1.6±0.15	0.55±0.1	0.3±0.2	0.45±0.2	10
1020	5.0±0.15	2.5±0.15	0.55±0.1	0.4±0.2	0.6±0.2	26
1218	4.6±0.15	3.1±0.1	0.55±0.1	0.4±0.2	0.45±0.2	27
1225	6.25±0.15	3.1±0.15	0.55±0.1	0.65±0.2	0.45±0.2	39





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.

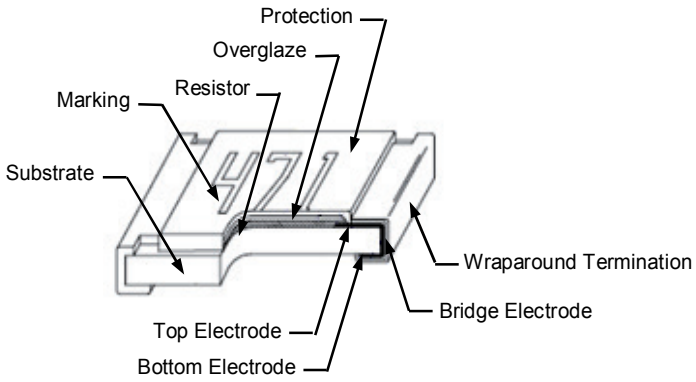
Bi technologies IRC Welwyn

www.ttelectronicsresistors.com

Construction

WHPC 1206 and 2010 Size

Thick-film electrodes, resistor material, overglaze and organic protection are screen printed on an alumina substrate. Wrap-around terminations have an electroplated nickel barrier and matt tin plating; this ensures excellent leach resistance properties and solderability.



Marking

5% parts are marked with 3 digits. The first two digits are significant figures and the third digit is the number of zeros to follow. The letter “R” represents a decimal point.

1% parts have four digits, the first three digits are significant figures and the fourth digit is the number of zeros to follow. The letter “R” represents a decimal point.

Solvent Resistance

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

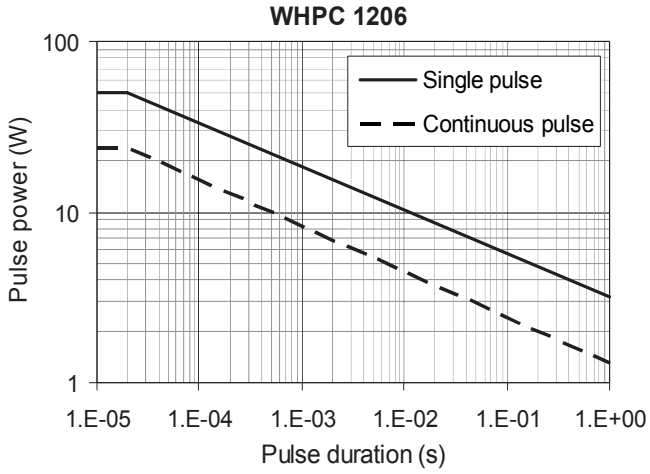
Performance Data

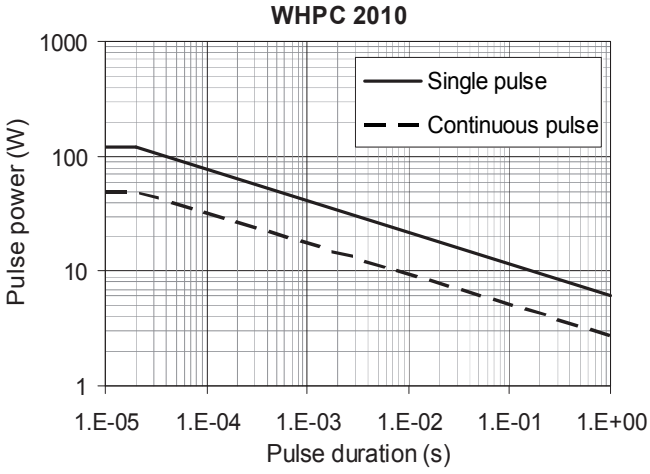
AEC-Q200 Table 7 ref.	Test	Method	Max. Tol:	Max. F	Max. J	Typ.
3	High Temp. Exposure *	MIL-STD-202 Method 108	ΔR%	1	3	0.15
4	Temperature Cycling	JESD22 Method JA-104	ΔR%	0.5 +0.05Ω	1.5 +0.1Ω	0.1
6	Moisture Resistance	MIL-STD-202 Method 106	ΔR%	2 +0.1Ω	3 +0.1Ω	0.05
7	Biased Humidity *	MIL-STD-202 Method 103	ΔR%	2	3 +0.1Ω	0.2
8	Operational Life (Cyclic Load) *	MIL-STD-202 Method 108	ΔR%	2	3 +0.1Ω	0.2
14	Vibration	MIL-STD-202 Method 204	ΔR%	0.5 +0.05Ω	1 +0.05Ω	0.1
15	Resistance to Soldering Heat *	MIL-STD-202 Method 210	ΔR%	1		0.05
16	Thermal Shock *	MIL-STD-202 Method 107	ΔR%	0.5	1	0.05
18	Solderability *	J-STD-002	>95% coverage			
21	Board Flex *	AEC-Q200-005	ΔR%	1		0.25
22	Terminal Strength	AEC-Q200-006	no damage			
	Climatic *	Category 55/155/42	ΔR%	2	3	0.2
	Short Term Overload *	6.25 x Pr or 2 x LEV for 5s	ΔR%	1.5	2 +0.1Ω	0.15
	Pulse Loading Capability	10,000 pulses @70°C See graphs below	ΔR%	2		0.5
	Insulation Resistance *	400V for 1 minute	≥10G			

1. Full AEC-Q200 qualification applies to 1206 and 2010 sizes. Other sizes received the tests marked *.

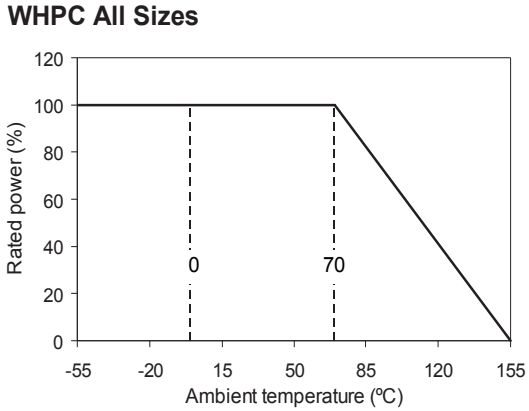
Pulse Loading Capability

Test condition: 10,000 pulses at 70ºC. Single pulse condition has mean power ≤ 10% of Pr. Continuous pulse condition has mean power = Pr.

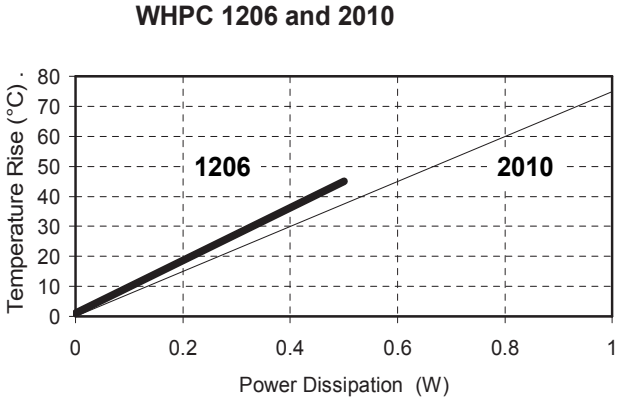




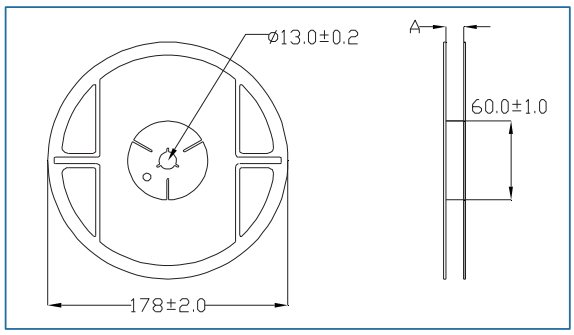
De-Rating Curve

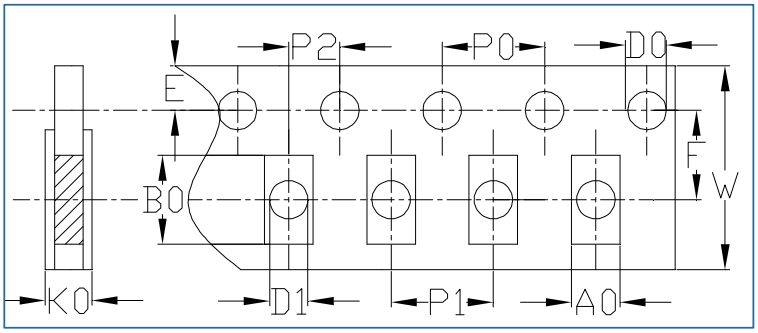


Temperature Rise (hotspot)



Packaging





Tape dimensions in mm												
Type	**W** ±0.3	**P1** ±0.1	**P0** ±0.1	**P2** ±0.05	**D0** ±0.1	**D1** ±0.2	**E** ±0.1	**F** ±0.05	**A0** ±0.2	**B0** ±0.2	**K0** ±0.1	**A** ±1
1206	8.0	4.0	4.0	2.0	1.5	1.0	1.75	3.5	1.9	3.5	0.85	9
2010	12.0	4.0	4.0	2.0	1.5	1.5	1.75	5.5	2.79	5.5	1.2	13.0
0612	8.0	4.0	4.0	2.0	1.5	N.A	1.75	3.5	2.0	3.60	0.81	10.0
1020	12.0	4.0	4.0	2.0	1.5	N.A	1.75	5.5	2.8	5.40	0.75	13.8
1218	12.0	4.0	4.0	2.0	1.5	1.5	1.75	5.5	3.5	4.80	1.0	13.8
1225	12.0	4.0	4.0	2.0	1.5	1.5	1.75	5.5	3.5	6.70	1.0	13.8

Ordering Procedure

Example: WHPC1206 at 10 kilohms and 1% tolerance on a reel of 5000 pieces -

W H P C 1 2 0 6 – 1 0 K F T 5

Type

Size

Value (use IEC62 code)

Tolerance (use IEC62 code)

F	1%
J	5%

Packing

T5	Tape	1206, 0612	5000/reel	Standard
T4		2010, 1020, 1218, 1225	4000/reel	