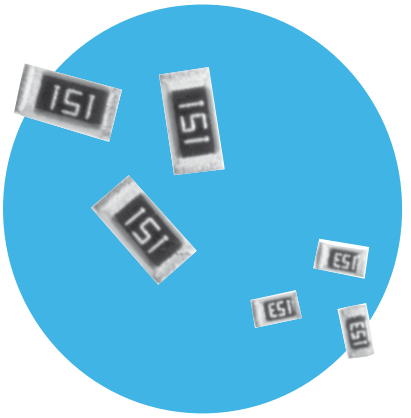
Resistors

General Purpose Surface Mounted Resistors



WCR Series

- Excellent reliability
- Wide range of sizes and ohmic values
- Wrap around terminations
- Inner electrode protection
- AEC-Q200 grade available

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

Electrical Data

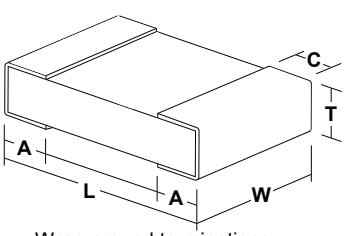
		0201	0402	0603	0805	1206	1210	2010	2512
Power rating @ 70°C	watts	0.05	0.063	0.1	0.125	0.25	0.25	0.5	1.0
Resistance range	ohms	10R to 1M0	1R0 to 1M0	1R0 to 10M					
Limiting element votage	volts	25	50		150	200			
TCR*	ppm/°C	250	100					200	
Resistance Tolerance	%	1							
Standard values		E24 or E96							
Ambient temperature range	°C	-55 to 155							
Zero-ohm Jumper Chip Rating	amps	0.5	1		1.5	2			
Zero-ohm Jumper Chip Resistance	milliohms	<50							

* Notes – TCR for low values 1R to 10R: -400 to +600ppm/°C, 11R to 100R: ±200ppm/°C
TCR for high values 3M3 to 10M: ±300ppm/°

Physical Data

Dimensions (mm)

Style	L	W	T	C	A
0201	0.6 ± 0.03	0.3 ± 0.03	0.23 ± 0.03	0.12 ± 0.05	0.15 ± 0.05
0402	1.0 ± 0.1	0.5 ± 0.05	0.35 ± 0.05	0.2 ± 0.1	0.25 ± 0.1
0603	1.6 ± 0.15	0.8 ± 0.15	0.5 ± 0.15	0.25 ± 0.2	0.25 ± 0.2
0805	2.0 ± 0.2	1.25+ 0.2 -0.1	0.5 + 0.15 -0.10	0.4 ± 0.2	0.4 ± 0.2
1206	3.2 +0.1 -0.25	1.6 + 0.1 -0.15	0.55 +0.15 -0.1	0.5 + 0.2-0.25	0.5+ 0.2 -0.25
1210	3.2 + 0.1 -0.2	2.6 ± 0.15	0.55 +0.15 -0.1	0.5 ± 0.25	0.5 ± 0.2
2010	5.0 ± 0.15	2.5 ± 0.15	0.56 ± 0.15	0.60 ± 0.25	0.60 ± 0.25
2512	6.3 ± 0.15	3.2 ± 0.15	0.56 ± 0.15	0.60 ± 0.25	1.2 ± 0.85



Wrap-around terminations
(3 faces)

Construction

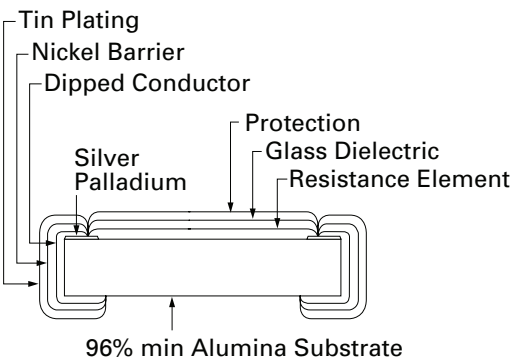
The chips have a high alumina substrate (96% minimum) with a ruthenium oxide resistance element and silver palladium, nickel and tin plated terminations. A glazed protection coat is applied to the resistive element (See Fig.1)

Terminations

Solderability The terminations meet the requirements of IEC 115-1, Clause 4.17.3.2.

Strength The terminations meet requirements of IEC 68.2.21.

Figure 1



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

Marking

All resistors are individually marked with 3 digits. The first two digits are the significant figures and the third defines the number of added zeros. Jumpers are marked 000. Types 0201 and 0402 have no marking.

E96 1% components that can not be marked with 4 digits will be marked with a standard 3 digit code. Details can be supplied upon request.

Solvent Resistance

The protective epoxy lacquer and marking are resistant to all normal industrial cleaning fluids suitable for printed circuits.

Table 1

Resistance value ohms	Noise dB
≤100R	-10
>100R, ≤10K	0
>10K, ≤100K	+15
>100K, ≤1M0	+20
>1M0	+30

Performance Data

		Maximum Change							
		0201	0402	0603	0805	1206	1210	2010	2512
Load: 1000 hrs at 70°C	ΔR%	10R-100K : 1 >100K : 2	4R7-100K : 1 >100K : 2	1R-100K : 1 >100K : 2	1R-100K : 1 >100K : 2	1R-100K : 1 >100K : 2	1R-100K : 1 >100K : 2	1R-100K : 1 >100K : 2	3% + 0.1R
Shelf life: 12 months at room temp.	ΔR%	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Derate linearly to zero from 70°C		zero @ 155 °C							
Short term overload (6.25 x rated power)	ΔR%	2	2	2.5	2.5	2.5	2.5	2.5	5
Max voltage	volts	50	100	100	200	400	400	400	400
Climatic	ΔR%	3	3	3	3	3	3	3	3
Climatic Catagory		55/125/56							
Long term damp heat	ΔR%	1							
Temperature rapid change	ΔR%	1	1	1	1	1	1	1	1
Resistance to solder heat	ΔR%	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Vibration and bump	ΔR%	1	1	1	1	1	1	1	1
Noise		see table 1							
Insulation resistance	ohms		> 1G						
Voltage proof	volts		100	300	500	500	500	500	500

Packaging

All chips are tape mounted and supplied on standard 8mm tape reel, as IEC publication 286-3.
180mm (7 inch) reel is standard
250mm (10 inch) reel carrying double the standard quantity can be supplied by agreement.

Chip Resistor Labstock For Designers

WCR chip resistors are available in a special package of the most popular sizes containing 50 each of the E24 values.
Please contact the sales desk for full details of this excellent solution for designers and your prototype build requirements.

Ordering Procedure

This product has two valid part numbers:

European (Welwyn) Part Number: WCR1206-10KFI (1206, 10 kilohms ±1%, Pb-free)

W	C	R	1	2	0	6	-	1	0	K	F	I
1			2					3			4	5

1 Type	2 Size	3 Value[1]	4 Tolerance[1]	5 Grade / Packing	
WCR	0201	E24 = 3 characters	F = ±1%	I = Standard	
	0402	E96 = 4 characters		A = AEC-Q200 grade[2]	
	0603	R = ohms		Both grades use standard packing as follows:	
	0805	K = kilohms		0201	20000/reel
	1206	M = megohms		0402	10000/reel
	1210			0603, 0805, 1206, 1210	5000/reel
	2010			2010, 2512	4000/reel
	2512				

Note 1: For zero ohm jumper chips use the dummy value & tolerance code **R005J**

Note 2: AEC-Q200 grade on resistor chips is not available in 0201 size, and on zero ohm jumper chips it is not available in 0201, 0402 or 2512 sizes

USA (IRC) Part Number: WCR-WCR1206LF-1002FPLT (1206, 10 kilohms ±1%, Pb-free)

W	C	R	-	W	C	R	1	2	0	6	L	F	1	0	0	2	F	P	L	T
1				2			3				4		5				6	7		

1 Family	2 Model	3 Size	4 Termination	5 Value	6 Tolerance	7 Packing	
WCR	WCR	0201	LF = Pb-free	3 digits + multiplier	F = ±1%	PLT = Paper Tape	
		0402		R = ohms for values <100 ohms		0201	20000/reel
		0603				0402	10000/reel
		0805				0603, 0805, 1206, 1210	5000/reel
		1206					
		1210				2010	4000/reel
		2010				ELT = Plastic Tape	
		2512				2512	4000/reel