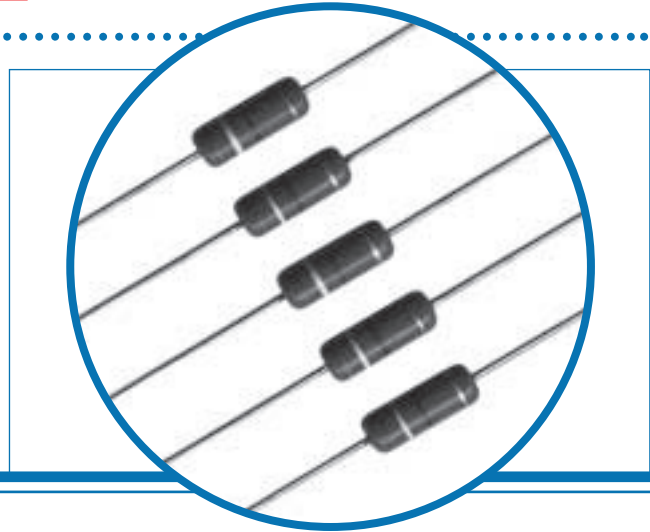


# Carbon Ceramic Resistors

## OBSOLETE

### CCR Series

- Replacement for hot moulded carbon composition
- High pulse voltage and energy capability
- Non-inductive
- Surface mount option
- UL94-V0 approved coating

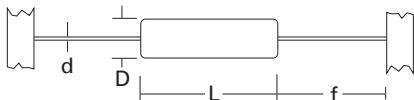


## Electrical Data

		CCR 1
Power rating at 25°C	watts	1
Resistance range	ohms	220R – 22K
Maximum pulse voltage	volts	See pulse graphs
TCR	ppm/°C	<1KΩ : -700±200    ≥1KΩ : -1000±300
Resistance Tolerance	%	10 or 20 *
Standard Values		E12
Ambient temperature range	°C	-40 to 80
Thermal Impedance	°C/W	100

\* Tolerance applies to date of manufacture. As in all carbon composition parts value drift in storage is possible. This is typically 3% in one year and 5% in 2 years.

## Physical Data

Dimensions (mm)					
Type	L max	D max	D norm	F min	
CCR 1	15.5	5.5	0.8	30	

## Construction

CCR series resistors are produced from a carbon ceramic composite material, the composition of which is varied to produce the required resistance value. The ceramic rods are fitted with end caps to which are welded the termination wires. Finally, a specially formulated high voltage epoxy coating is applied and the resistors are marked.

## Solvent Resistance

The body protection and marking are resistant to all normal industrial cleaning solvents suitable for printed circuits.

## Marking

CCR series resistors are colour coded. Resistors with 20% tolerance have three bands indicating value, and resistors with 5% and 10% tolerance have four bands indicating value and tolerance in accordance with IEC62.

### General Note

Welwyn Components reserves the right to make changes in product specification without notice or liability. All information is subject to Welwyn's own data and is considered accurate at time of going to print.

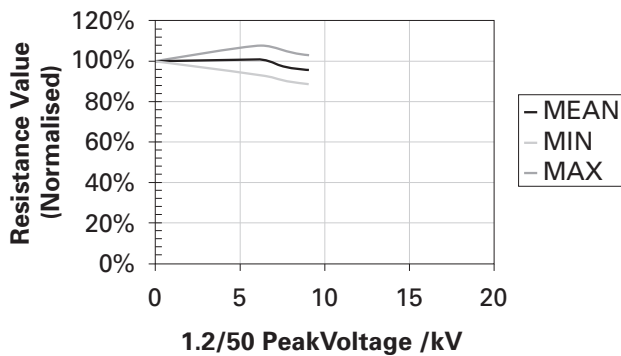
## Performance Data

		Typical Change
Load at rated power: 1000hrs @ 25°C	ΔR%	±5%
Dry heat: 1000hrs @ 125°C	ΔR%	±5%
Long Pulse: 100mS at 60 x Rated Power	ΔR%	±2%
Short term overload: 2s at 6.25 x Rated Power	ΔR%	±2%
Derating from rated power @ 25°C		Zero at 125°C
Climatic sequence	ΔR%	±8%
Vibration	ΔR%	±2%
Temperature rapid change	ΔR%	±2%
Resistance to solder heat	ΔR%	±2%
Isolation voltage	V	500V

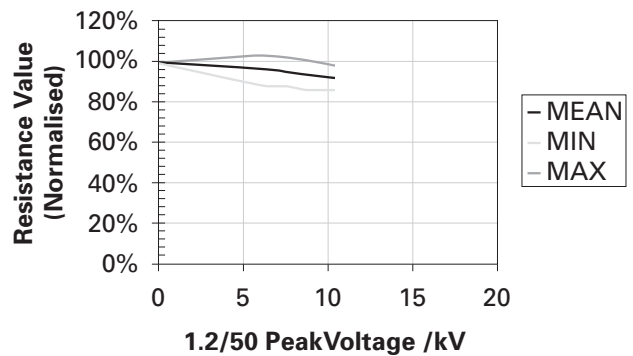
## Pulse Performance

The graphs below show the value changes resulting from applying multiple pulses of increasing peak voltage. The pulse shape was 1.2/50μS as defined in IEC 6100-4-5 / ANSI C62.41. The highest voltage plotted on each graph represents the maximum peak voltage for that resistance value.

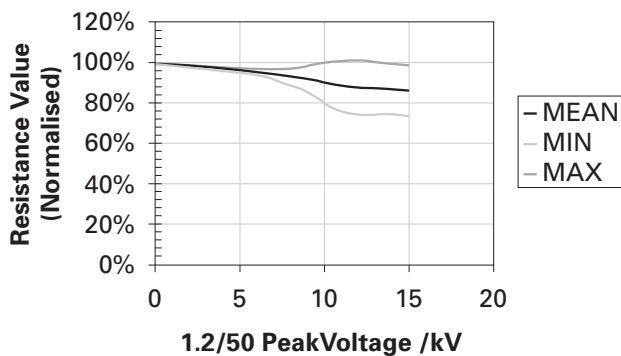
**CCR1-240R**



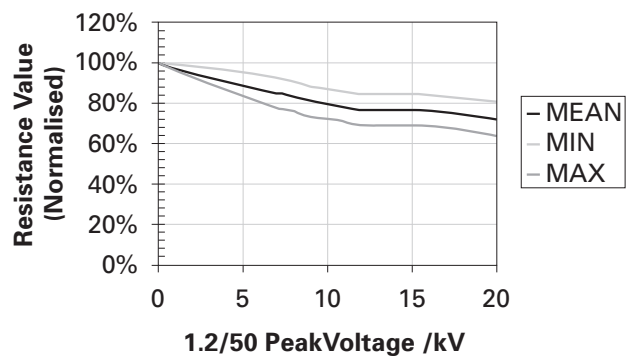
**CCR1-1K0**



**CCR1-2K2**



**CCR1-15K**

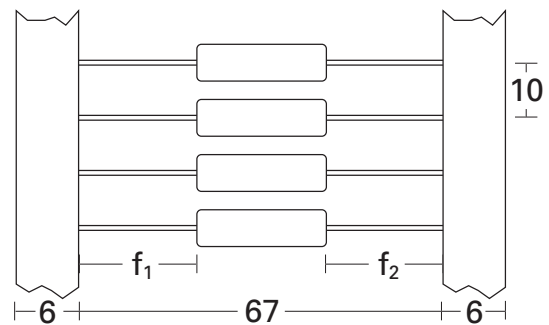


**OBSOLETE**

## Packaging – Axial Version

CCR axial products are supplied tape packed ready for loading onto automatic sequencing and insertion machines. Component leads will not protrude beyond the outside edge of the tapes. Standard taping method and critical dimensions are shown below.

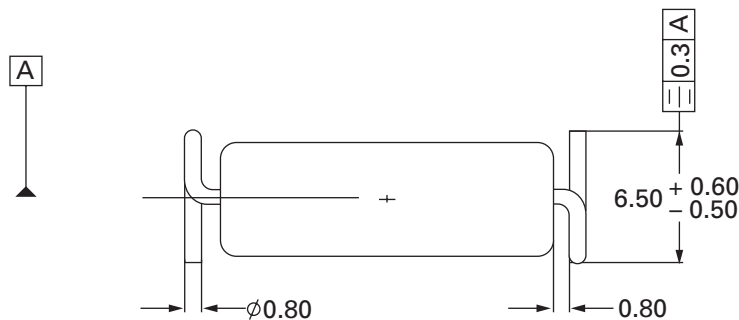
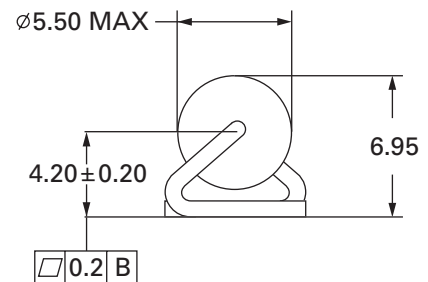
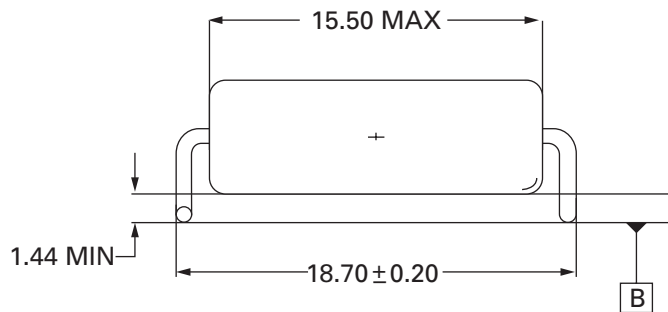
Standard pack size: 1000 parts.



Body location  $f_1 - f_2 \leq 1.4$  mm

## Surface Mount Option

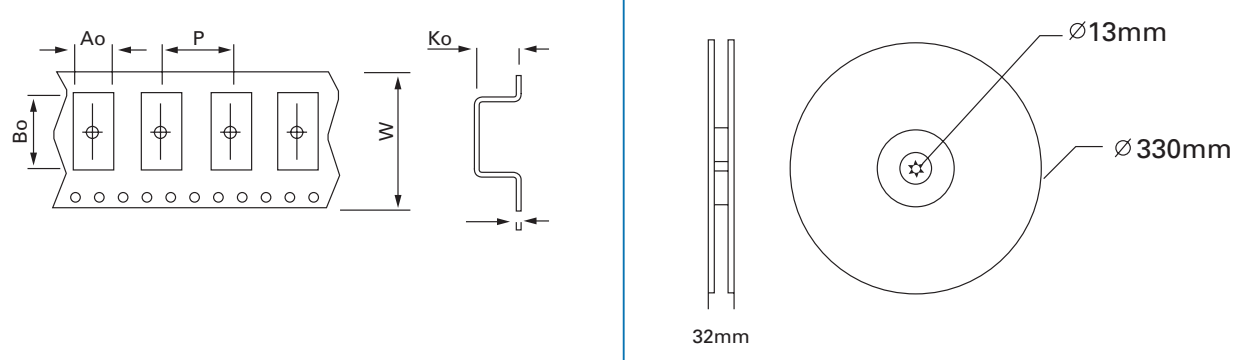
CCR series resistor can be supplied with formed leads suitable for pick and place surface mounting as shown below. For this option add suffix Z to the type, e.g. CCR1Z.



## OBSOLETE

## Packaging – Surface Mount Version

Products are supplied on standard carrier tape and 330mm diameter reels suitable for automatic pick and place machines. Carrier tape dimensions and standard reels quantities are given below.



Dimensions (mm)							Quantity Per Reel
Type	Ao	Bo	Ko	W	P	T	
<b>CCR 1Z</b>	7.3	19.2	7.7	32	12	0.4	750

## Ordering Procedure

Specify type reference etc as shown in this example of CCR1 6.8K ohms 10%, taped and reeled.

Type ..... CCR1   - 6K8 K I

Lead form .....

Blank	Axial
Z	Surface mount

Value (use IEC62 code) .....

Tolerance (use IEC 62 code) .....

K	10%
M	20%