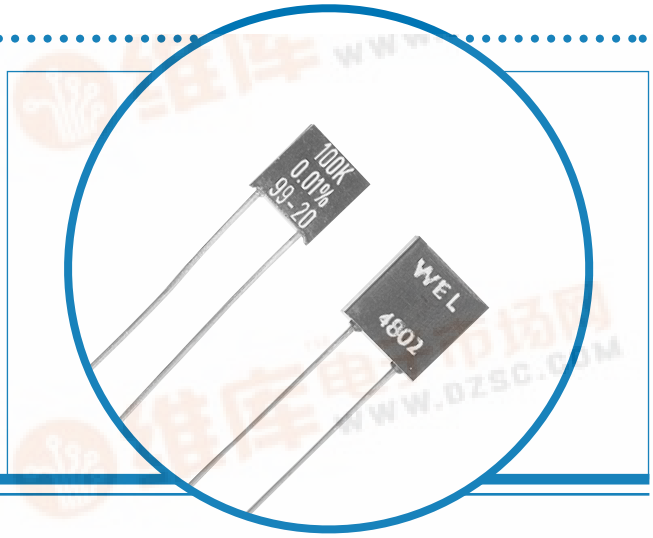
Ultra Precision Bulk Metal Film Resistors

TT electronics
Welwyn Components

4800 Series

- **BS/CECC approved**
- **Tolerances down to 0.005%**
- **Current noise and distortion below level of practible measurement**
- **Low thermal e.m.f**
- **Ideal resistor for precision instrumentation**
- **Use of bulk metal gives superior stability**
- **Planar construction gives low residual capacitance and inductance**



Electrical Data

Commercial		4802/12/32	4804	4805	Notes
Power Rating at 20°C	watts	0.5	1	1.5	
Resistance Range	ohms	1R0 to 100K	0R5 to 200K	33R0 to 300K	
Limiting element voltage	volts	200	350	500	
TCR (20 to 70°C)	ppm/°C	5	5	5	
Resistance tolerance					See table 1 below

Approved BS CECC 40-302-002*		4802/12			
Power rating at 70°C	watts	0.25			
Resistance range	ohms	100 to 56K			
Limiting element voltage	volts	200			
TCR (-55 to 125°C)	ppm/°C	5			

Resistance tolerance					See table 1 below
Thermal impedance	°C/watt	250	130	80	
Values		E24 and E96 preferred			Any value to order
Ambient temperature range	°C	-55 to 155			All styles and products

* BS CECC 40 Style reference: 4802 BX; 4812 CX

Table 1. Resistance Range (ohms) and Tolerance (%)

Tolerance (code)	4802/12/32	4804	4805
0.005 (E)	200R to 100K	100R to 200K	65R to 300K
0.01 (L)	100R to 100K	50R to 200K	33R to 300K
0.02 (P)	50R to 100K	25R to 200K	17R to 300K
0.05 (W)	25R to 100K	10R to 200K	8R to 300K
0.1 (B)	10R to 100K	5R to 200K	3.3R to 300K
0.25 (C)	5R to 100K	2R to 200K	1.7R to 300K
0.5 (D)	2R to 100K	10R to 200K	0.6R to 300K
1.0 (F)	1R to 100K	0.5R to 200K	0.33R to 300K

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.

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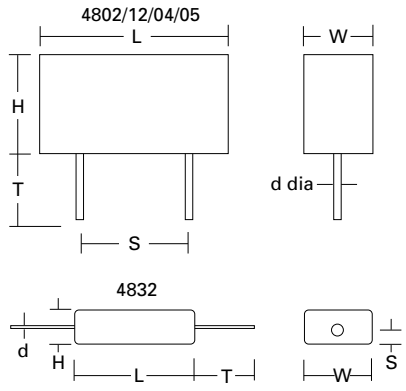
Physical Data

Dimensions (mm) & Weight (g)							
Type	L max	H max	W max	T min	d nom	S nom	Wt. nom
4802	8.9	10.2	3.8	30	0.6	5.1	1
4812	7.5	8	2.5	30	0.6	5.1	0.6
4804	15.2	13.2	3.8	30	0.6	10.2	1.5
4805	22.6	13.2	3.8	30	0.6	17.8	2
4832	9.7	5.4	9.7	30	0.6	1.5	1.1



Construction

The resistor element is an etched bulk metal foil, bonded to an alumina substrate. Connections to the foil are made by copper wires welded to the foil to minimise thermal e.m.f. Before encapsulation, the resistor element is coated with silicone rubber to isolate the element from mechanical stress which would adversely affect the carefully balanced construction and result in poor resistance/temperature characteristics.

Terminations

Material Solder coated copper wire

Strength The terminations meet the requirements of IEC 68.2.21.

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

Marking

Type reference, resistance value, tolerance and date code are legend marked. The resistance value conforms to IEC 62.

Solvent Resistance

The protection will withstand all normal industrial solvents suitable for cleaning printed circuit boards.

Performance Data

		Actual	
		Maximum	**Typical**
Load at commercial rating: 1000 hours at 70°C	ΔR%	0.05	0.02
Dry heat: 1000 hours at 155°C	ΔR%	0.05	0.02
Shelf life: 12 months at room temperature	ΔR%		0.0025
Derating from rated power at 70°C		Zero at 155°C	
Short term overload	ΔR%	0.01	0.005
Climatic category		55/155/56	
Climatic	ΔR%	0.05	0.03
Long term damp heat	ΔR%	0.05	0.03
Temperature rapid change	ΔR%	0.01	0.005
Resistance to solder heat	ΔR%	0.01	0.005
Vibration and bump	ΔR%	0.01	0.005
Noise. (in a decade of frequency)	μV/V	Below level of	
Voltage coefficient of resistance	ppm/V	practicable measurement	
Insulation Resistance	ohms	>1000M	
Inductance	μH	0.2	0.08
Capacitance	pF	1	0.5

Packaging

All components are supplied loose packed in either plastic bags or panel boxes. Quantity per box will depend on resistor size.