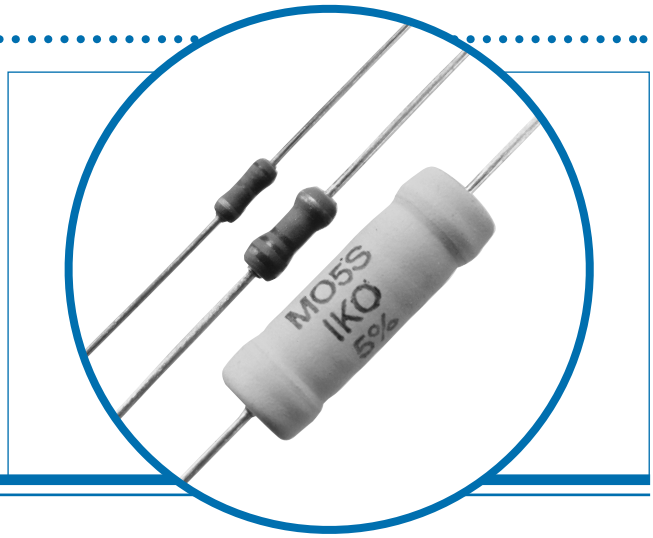
# Power Metal Oxide Film Resistors

TT electronics
Welwyn Components

MO-S Series

- **Small size for power rating**
- **Can replace carbon composition in many pulse handling applications**
- **Flameproof protection**



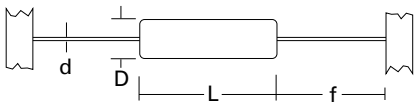

## Electrical Data

| | | MO1/2S | MO1S | MO2S | MO3S | MO5S |
|---|---|---|---|---|---|---|
| Power rating at 70°C | watts | 0.5 | 1.0 | 2.0 | 3.0 | 5.0 |
| Restance range | ohms | 10R - 50K | 10R - 100K | | | 10R - 100K |
| Limiting element voltage | volts | 250 | 350 | | | 500 |
| TCR | ppm/°C | 350 | | | | |
| Isolation voltage | volts | 350 | 500 | | | 700 |
| Resistance tolerance | % | 5, 10 | | | | |
| Standard values | | E24 preferred | | | | |
| Thermal impedance | °C/watt | 140 | 110 | 80 | 60 | 35 |
| Ambient temperature range | °C | -55 to +155 | | | | |

## Physical Data

**Dimensions (mm) and Weight (g)**

| Type | L max. | D max. | f min. | d nom. | pcb mounting centres | Min bend radius | Wt. nom. |
|---|---|---|---|---|---|---|---|
| **MO1/2S** | 6.2 | 2.5 | 21.0 | 0.6 | 10.0 | 0.6 | 0.3 |
| **MO1S** | 9.0 | 3.6 | 19.6 | 0.8 | 12.5 | 1.2 | 0.5 |
| **MO2S** | 12.5 | 4.2 | 17.8 | 0.8 | 15.0 | 1.2 | 0.9 |
| **MO3S** | 14.5 | 5.3 | 23.8 | 0.8 | 20.0 | 1.2 | 1.1 |
| **MO5S** | 25.0 | 8.5 | 27.6 | 0.8 | 30.0 | 1.2 | 4.3 |




### Construction
The tin oxide resistance element is deposited onto a high purity ceramic rod. End caps are force fitted and termination wires are welded to the end caps. The element is adjusted to the required resistance value by a helical cut; finally a cement protection is applied to the resistor body prior to marking with indelible ink.

### Terminations
**Material** Resistor sizes up to and including the MO3S use solder coated copper terminations. MO4S and MO5S use solder coated steel cored terminations.

**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
MO1/2S, MO1S, MO2S and MO3S resistors are colour coded with four bands. IEC 62 colours are used. For larger sizes type reference, resistance value and tolerance are legend marked. The resistance value marking conforms to IEC 62.

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

### Flammability
The resistor coating will not burn or emit incandescent particles under any condition of applied temperature or power overload.

**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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Telephone: +44 (0) 1670 822181 · Facsimile: +44 (0) 1670 829465 · Email :info@welwyn-tt.com · Website: www.welwyn-tt.com

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Issue C · 07.04

# Performance Data

| | | Maximum |
|---|---|---|
| Load at rated power: 1000 hrs at 70°c | ΔR% | 5 |
| Shelf life: 12 months at room temperature | ΔR% | 2 |
| Derating | | See derating curve |
| Climatic | ΔR% | 1 |
| Climatic category | | 40/125/56 |
| Temperature rapid change | ΔR% | 0.5 |
| Resistance to solder heat | ΔR% | 0.5 |

# Application Notes

1. If the resistors are to dissipate full rated power, it is recommended that the terminations should not be soldered closer than 4mm from the body.

2. Due to operating temperature limitations imposed by some pcb materials, derating may be necessary. An estimate of the temperature rise to be expected can be calculated using the thermal impedance figures given under Electrical Data.

3. MO-S resistors can also be supplied pre-formed. See lead form section for details.

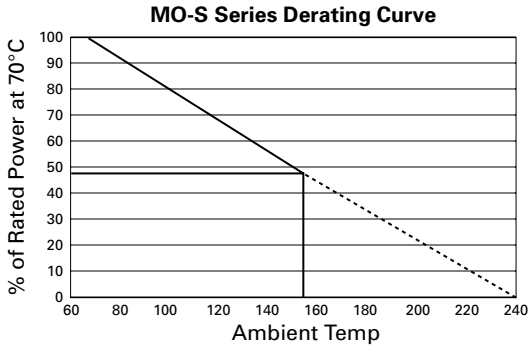



Figure 1

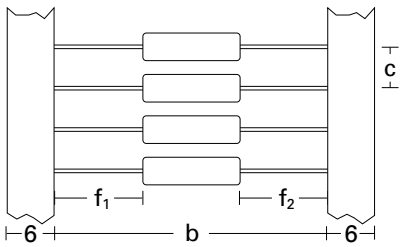
## Packaging

Our standard packaging for MO1/2S, MO1S, MO2S and MO3S is taped and ammo packed, MO5S is taped and reeled. The critical dimensions are shown in Figure 1.

The component wires will not protrude beyond the outside edge of the tapes.

Pre-formed resistors are supplied loose packed in plastic bags or boxes.

Alternative packaging available by request.




Body Location $f_1 - f_2 \leq 1.4$ mm

| Type | MO1/2S | MO1S | MO2S | MO3S | MO5S |
|---|---|---|---|---|---|
| b | 52 | 52 | 52 | 67 | 85 |
| c | 5 | 5 | 5 | 10 | 10 |

## Standard Quantities Per Package

| Type | MO1/2S | MO1S | MO2S | MO3S | MO5S |
|---|---|---|---|---|---|
| Reel | 5000 | 2500 | 2500 | 1000 | 700 |
| Ammo pack | 5000 | 2500 | 1500 | 1000 | n/a |

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Telephone: +44 (0) 1670 822181 · Facsimile: +44 (0) 1670 829465 · Email: info@welwyn-tt.com · Website: www.welwyn-tt.com