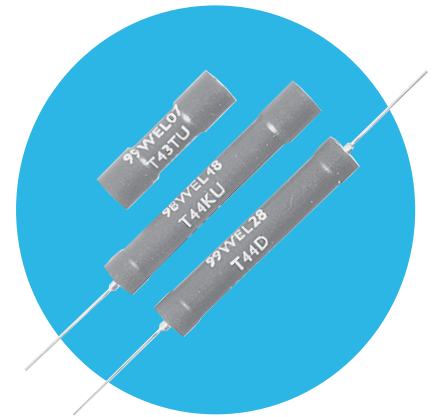


High Voltage Precision Thick Film Resistors

T Series

- Working voltage up to 100kV
- Resistances up to 50G
- TCR down to 25ppm
- Termination variants
- Sets of resistors with matched characteristics



All Pb-free parts comply with EU Directive 2011/65/EU amended by (EU) 2015/863 (RoHS3)

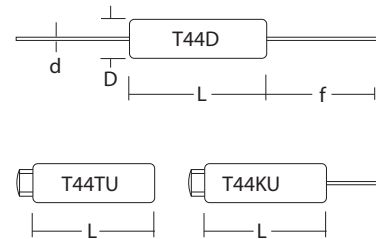
Electrical Data

| | | T43 | T44 | T48 | Notes |
|---------------------------|---------|----------------------|------------|------------|---|
| Power rating at 20°C | watts | 1.5 | 3.5 | 10 | |
| Resistance range | ohms | 10K to 10G | 10K to 50G | 33K to 50G | |
| Limiting element voltage | volts | 4K | 14K | 50K | In air |
| | | 8K | 28K | 100K | In oil |
| TCR | ppm/°C | 100 * | | | Values > 1G: TCR is 250ppm/°C |
| Resistance tolerance | % | 1, 2, 5 | | | Closer tolerances over restricted range |
| Values | | E24 preferred values | | | Any value to special order |
| Thermal impedance | °C/watt | 31 | 27 | 13 | |
| Ambient temperature range | °C | | -55 to 150 | | |

* Contact factory for 25 or 50ppm/°C

Physical Data

| Dimensions (mm) & Weight (g) | | | | | | | |
|------------------------------|-------|-------|-------|-------|----------------------|-----------------|---------|
| Type | L max | D max | f min | d nom | PCB mounting centres | Min Bend Radius | Wt. nom |
| T43D | 25.4 | 8.4 | 32.0 | 0.8 | 31.8 | 1.2 | 3.1 |
| T44D | 50.8 | 8.4 | 32.0 | 0.8 | 57.2 | 1.2 | 5.6 |
| T48D | 150.0 | 8.4 | 32.0 | 0.8 | 156.4 | 1.2 | 18.5 |
| T43KU | 30.2 | 8.5 | 32.0 | 0.8 | | | 3.9 |
| T44KU | 53.2 | 8.5 | 32.0 | 0.8 | | | 7.4 |
| T48KU | 152.2 | 8.5 | 32.0 | 0.8 | | | 19.3 |
| T43TU | 32.6 | 8.5 | | | | | 5.8 |
| T44TU | 55.6 | 8.5 | | | | | 8.2 |
| T48TU | 154.8 | 8.5 | | | | | 20.2 |



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.

T Series

Construction

A ruthenium oxide based resistive film is fired onto the surface of a high quality former. Turned brass end caps are fitted. A Helical cut is made into the film to adjust its resistive value and finally a protective sleeve is fitted to provide mechanical protection and electrical insulation. Resistors for use in oil or SF6, can be supplied with a lacquer protection instead of the sleeve.

Terminations

Three styles of termination are available to permit resistors to be screwed together in a series chain, with the end members having axial wires for soldering.

Wire Terminations: Styles D and KU.
Non standard terminations available upon request.

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.

Screw Terminations: Styles TU and KU.

Material: Turned brass.

Screw Thread: All caps are tapped UNF – 10 x 4.2 deep. UNF – 10 is 32 TPI, 60°C thread angle, 4.72±0.07 mm outside diameter, 3.83 mm core diameter.

Coupling Stud: All KU & TU resistors are supplied with 8 mm long screwed brass studs.

Marking

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

Solvent Resistance

The lacquer and the protective sleeve provide excellent resistance to all normal industrial cleaning solvents suitable for printed circuits.

Performance Data

| | | Maximum | Typical |
|---|-------|---------------|---------|
| Load at rated power: 1000 hours at 20°C | ΔR% | ≤ IG:3, >IG:5 | 0.3 |
| Shelf life: 12 months at room temperature | ΔR% | 0.3 | 0.1 |
| Derating from rated power at 20°C | | Zero at 150°C | |
| Noise (in a decade of frequency) | μV/V | | <2.5 |
| Voltage coefficient of resistance | ppm/V | | <1 |

Matched Sets

Matched sets can be supplied for use as precision voltage dividers. These may be screwed together to form sticks and, by selecting the KU type of termination, a wire connection can be provided at each end of the stick.

Enquiries are welcomed for special resistors and sets when resistor length, operating voltage or resistance value are outside the catalogued range.

Application Notes

Due to the high voltage which can appear between the end cap and any adjacent metal part, resistors should be mounted at an adequate distance from other conductors.

An appropriate number of resistors may be screwed together as a stick to provide an assembly which will be capable to withstanding any desired voltage, providing no individual resistor is subject to a greater stress or power dissipation than is recommended in this data sheet, and that appropriate anti-corona devices are fitted.

The axial termination should not be bent closer than twice the diameter of the terminal wire from the body of the resistor.

When resistors are required to be potted, the preferred encapsulant is a silicone compound.

For voltage dividers with a low resistance section below the minimum available value of 1kΩ, it is normal practice to use a Welwyn resistor, RC Series, obtainable down to 1 ohm.

Oil Immersion

For some high voltage applications it is required to immerse the components in oil or gas to reduce the effects of corona and surface tracking. A special lacquer protected version of the resistor is available, suitable for immersion in transformer oil or SF6.

Packaging

Resistors are supplied packed in boxes.

Standard Quantities Per Box

| | |
|-----------|------------------|
| All Types | 10 or 20 per box |
|-----------|------------------|

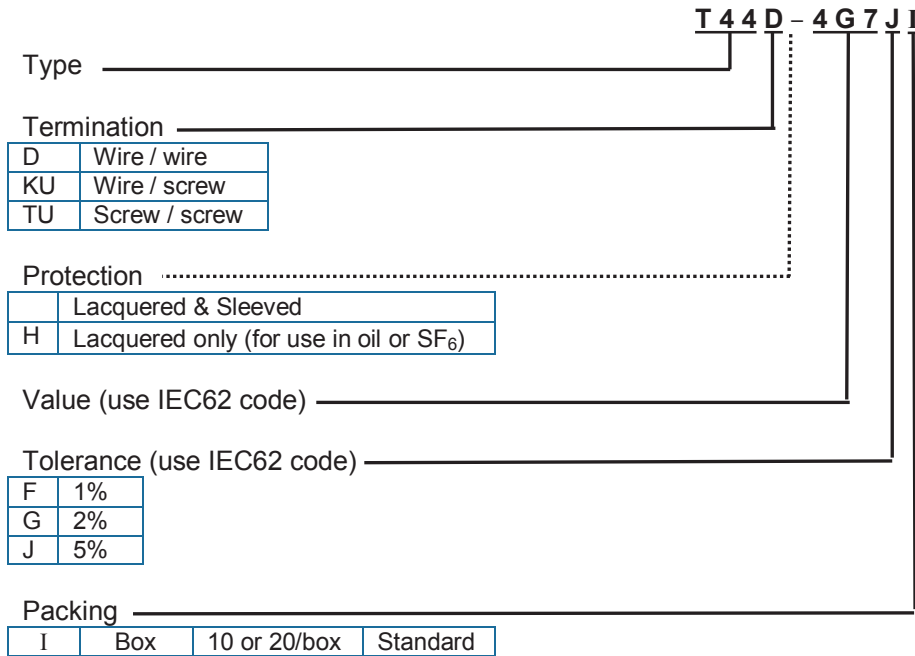
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T Series

Ordering Procedure

Example: T44 wire-ended and sleeved at 4.7 gigohms and 5% tolerance -



Note: Standard TCR is 100ppm/°C. Contact factory for 50 and 25ppm/°C grades.

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