

## Multi-Turn Surface Mount 1/4" Square Cermet Trimmers, Fully Sealed



### FEATURES

- 0.25 W at 70 °C
- Industrial grade
- Multi-turn operation
- A low contact resistance variation (down to 2 % Rn)
- Low end contact resistance (1 Ω typical)
- Full sealing
- Tests according to CECC 41000 or IEC 60393-1
- Compliant to RoHS Directive 2002/95/EC



The TS63 multiturn trimmer has been designed for use in PCB surface mounting applications.

Three variations are available according to the positioning of the control screw and contact positions.

The cermet track gives a high stability performance with an extended ohmic capacity of 10 Ω to 2 MΩ.

| DIMENSIONS in millimeters (± 0.5 mm) |   |
|--------------------------------------|---|
| <p><b>TS63X</b></p>                  | <p><b>RECOMMENDED SOLDERING AREAS</b></p> |
| <p><b>TS63Z</b></p>                  |   |
| <p><b>TS63Y</b></p>                  |   |

| <b>ELECTRICAL SPECIFICATIONS</b>       |  |            |
|--|--|------------|
| Resistive Element                      | Cermet                                     |            |
| Electrical Travel                      | 14 turns $\pm$ 2                           |            |
| Resistance Range                       | 10 $\Omega$ to 2 M $\Omega$                |            |
| Standard Series                        | 1 - 2 - 5                                  |            |
| Tolerance                              | Standard                                   | $\pm$ 10 % |
|  | On Request                                 | $\pm$ 5 %  |
| Circuit Diagram                        |  |            |
| Power Rating                           | Linear<br>0.25 W at 70 °C<br>              |            |
| Temperature Coefficient                | See Standard Resistance Element Data table |            |
| Limiting Element Voltage               | 250 V                                      |            |
| Contact Resistance Variation (Typical) | 2 % R <sub>n</sub> or 2 $\Omega$           |            |
| End Resistance Typical)                | 1 $\Omega$                                 |            |
| Dielectric Strength (RMS)              | 1000 V                                     |            |
| Insulation Resistance                  | 10 <sup>6</sup> M $\Omega$                 |            |

| <b>MECHANICAL SPECIFICATIONS</b> |                            |
|----------------------------------|----------------------------|
| Mechanical Travel                | 15 turns $\pm$ 5           |
| Operating Torque (max. Ncm)      | 1.5                        |
| End Stop Torque                  | Clutch action              |
| Unit Weight (max. g)             | 0.5                        |
| Wiper (Actual Travel)            | Positioned at approx. 50 % |

| <b>ENVIRONMENTAL SPECIFICATIONS</b> |                          |
|-------------------------------------|--------------------------|
| Temperature Range                   | - 55 °C to + 155 °C      |
| Climatic Category                   | 55/125/56                |
| Sealing                             | Sealed container<br>IP67 |
| MSL Level                           | 1                        |

| <b>SOLDERING RECOMMENDATIONS</b>  |  |
|---|--|
| Recommended reflow profile 2, see Application Note <a href="http://www.vishay.com/doc?52029">www.vishay.com/doc?52029</a> |  |



| <b>PERFORMANCES</b>    |  |                           |                              |   |
|------------------------|--|---------------------------|------------------------------|---|
| TESTS                  | CONDITIONS   | TYPICAL VALUES AND DRIFTS |                              |   |
|                        |  | $\Delta R_T/R_T$ (%)      | $\Delta R_{1-2}/R_{1-2}$ (%) | OTHER   |
| Electrical Endurance   | 1000 h at rated power<br>90'/30' - ambient temp. 70 °C   | ± 1 %                     | ± 2 %                        | Contact res. variation: < 1 % Rn  |
| Climatic Sequence      | Phase A dry heat 125 °C<br>Phase B damp heat<br>Phase C cold - 55 °C<br>Phase D damp heat 5 cycles | ± 2 %                     | ± 3 %                        |   |
| Damp Heat Steady State | 40 °C 93 % RH<br>56 days   | ± 2 %                     | ± 3 %                        | Dielectric strength: 1000 V <sub>RMS</sub><br>Insulation resistance: > 10 <sup>4</sup> MΩ |
| Charge of Temperature  | - 55 °C to + 125 °C<br>5 cycles  | ± 1 %                     |                              | $\Delta V_{1-2}/\Delta V_{1-3} \leq \pm 2 \%$   |
| Mechanical Endurance   | 200 cycles at rated power  | ± (2 % + 3 Ω)             |                              | Contact res. variation: < 3 % Rn  |
| Shock                  | 50 g's at 11 ms<br>3 successive shocks in 3 directions   | ± 1 %                     |                              | $\Delta V_{1-2}/\Delta V_{1-3} \leq 1 \%$   |
| Vibration              | 10 Hz to 55 Hz<br>0.75 mm or 10 g's<br>for 6 h   | ± 1 %                     |                              | $\Delta V_{1-2}/\Delta V_{1-3} \leq \pm 2 \%$   |

| <b>STANDARD RESISTANCE ELEMENT DATA</b> |                     |                      |                            |  |
|---|---------------------|----------------------|----------------------------|--|
| STANDARD RESISTANCE VALUES              | LINEAR LAW          |                      |                            | TYPICAL TCR<br>- 55 °C<br>+ 125 °C<br><br>ppm/°C |
|   | MAX. POWER AT 70 °C | MAX. WORKING VOLTAGE | MAX. CURRENT THROUGH WIPER |  |
| Ω                                       | W                   | V                    | mA                         |  |
| 10                                      | 0.25                | 1.58                 | 158                        | ± 100  |
| 20                                      | 0.25                | 2.23                 | 112                        |  |
| 50                                      | 0.25                | 3.53                 | 77                         |  |
| 100                                     | 0.25                | 5.00                 | 50                         |  |
| 200                                     | 0.25                | 7.07                 | 35                         |  |
| 500                                     | 0.25                | 11.2                 | 22                         |  |
| 1K                                      | 0.25                | 15.8                 | 15.8                       |  |
| 2K                                      | 0.25                | 22.3                 | 11.2                       |  |
| 5K                                      | 0.25                | 35.3                 | 7.1                        |  |
| 10K                                     | 0.25                | 50.0                 | 5.0                        |  |
| 20K                                     | 0.25                | 70.7                 | 3.5                        |  |
| 25K                                     | 0.25                | 79.0                 | 3.2                        |  |
| 50K                                     | 0.25                | 112                  | 2.2                        |  |
| 100K                                    | 0.25                | 158                  | 1.6                        |  |
| 200K                                    | 0.25                | 224                  | 1.1                        |  |
| 250K                                    | 0.25                | 250                  | 1.1                        |  |
| 500K                                    | 0.13                | 250                  | 0.50                       |  |
| 1M                                      | 0.06                | 250                  | 0.25                       |  |
| 2M                                      | 0.03                | 200                  | 0.125                      |  |

| <b>MARKING</b>   |
|--|
| Printed: VISHAY trademark, model, style, ohmic value (in Ω, kΩ, MΩ), tolerance (in %) only if non standard, manufacturing date, marking of terminal 3. |

**PACKAGING** in millimeters

- X, Y and Z types: on tape and reel (dia. 330 mm) of 500 pieces, code TR500
- On request in magazine pack by 50 pieces (Tube) code TU


**ORDERING INFORMATION** (Part Number)

|   |   |   |   |   |   |   |   |   |   |   |   |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|
| T | S | 6 | 3 | Y | 5 | 0 | 4 | K | R | 1 | 0 |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|

| MODEL | STYLE       | OHMIC VALUE                          | TOLERANCE                             | PACKAGING   | SPECIAL NUMBER  |
|-------|-------------|--------------------------------------|---------------------------------------|---|---|
| TS63  | X<br>Y<br>Z | From<br>10 Ω to 2 MΩ<br>504 = 500 kΩ | K = ± 10 %<br>On request<br>J = ± 5 % | R10 =<br>Reel 500 pieces<br>On request<br>T20 =<br>Tube 2000 pieces | (If applicable)<br>Given by<br>Vishay<br>for custom<br>design |

**DESCRIPTION** (for information only)

|       |       |       |           |         |           |             |
|-------|-------|-------|-----------|---------|-----------|-------------|
| TS63  | Y     | 500K  | 10 %      |         | TR        | e3          |
| MODEL | STYLE | VALUE | TOLERANCE | SPECIAL | PACKAGING | LEAD FINISH |



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