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# SuperTan® Wet Tantalum Capacitors With Hermetic Seal, Extended Range, Improved Vibration Capability



### **LINKS TO ADDITIONAL RESOURCES**



#### PERFORMANCE CHARACTERISTICS

Refer to: Typical Performance Characteristics **Operating Temperature:** -55 °C to +85 °C (to +125 °C with voltage derating)

Capacitance Tolerance: ± 10 %, ± 20 % standard

DC Leakage Current (DCL Max.): at  $+25~^{\circ}$ C and above: leakage current shall not exceed the values listed in the Standard Ratings table.

## **FEATURES**

- Enhanced performance, high reliability design
- Terminations: axial, standard tin / lead (SnPb), 100 % tin available

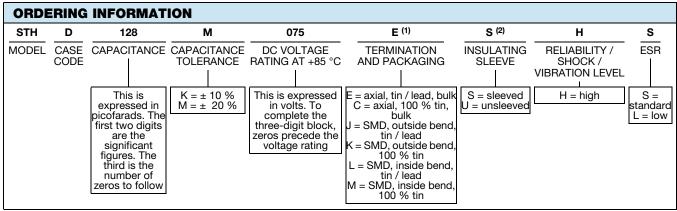




- Increased thermal shock capability of up to 300 cycles
- Designed for the avionics and aerospace applications
- Material categorization: for definitions of compliance please see <a href="https://www.vishav.com/doc?99912"><u>www.vishav.com/doc?99912</u></a>

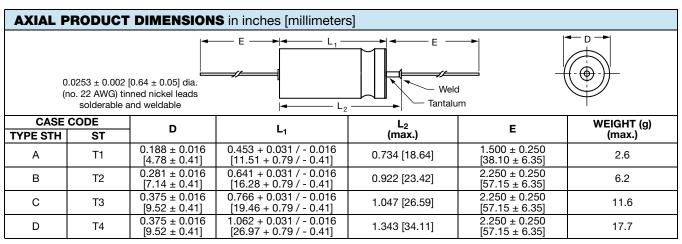
#### Note

This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details



#### Notes

- · Packaging: the use of formed plastic trays for packing bulk components is standard
- (1) J, K, L, M are available in T4. For all other case sizes, check with marketing
- (2) Sleeve on J, K, L, M terminations shall be Kapton only



#### Note

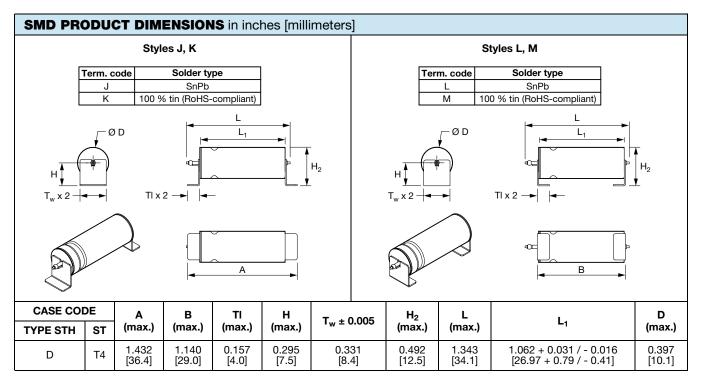
For insulated parts, add 0.015" [0.38 mm] to the diameter. The insulation shall lap over the ends of the capacitor body



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| STANDARD RATINGS   |  |                       |                     |                         |                     |                     |                                   |        |         |  |              |
|--|--|-----------------------|---------------------|-------------------------|---------------------|---------------------|-----------------------------------|--------|---------|--|--------------|
| CAPACITANCE<br>AT +25 °C                                   | CASE   | PART NUMBER           | ESR<br>AT<br>+25 °C | MAX.<br>IMP.<br>AT      | MAX. DCL<br>(μΑ) AT |                     | MAX. CAPACITANCE<br>CHANGE AT (%) |        |         | AC<br>RIPPLE                             | THERMAL      |
| 120 Hz<br>(μF)   | CODE   |                       |                     | -55 °C<br>120 Hz<br>(Ω) | 0 Hz +25 °C         | +85 °C /<br>+125 °C | -55 °C                            | +85 °C | +125 °C | +85 °C<br>40 kHz<br>(mA <sub>RMS</sub> ) | OF<br>CYCLES |
|  | 75 V <sub>DC</sub> AT 85 °C, 50 V <sub>DC</sub> AT 125 °C  |                       |                     |                         |                     |                     |                                   |        |         |  |              |
| 1200   | D  | STHD128(1)075(2)(3)HS | 0.50                | 8.00                    | 30                  | 300                 | -70                               | 25     | 30      | 4000                                     | 300          |
| 1500   | D (1)  | STHD158(1)075(2)(3)HS | 0.50                | 8.00                    | 30                  | 300                 | -75                               | 25     | 30      | 4000                                     | 300          |
|  | 100 V <sub>DC</sub> AT 85 °C, 65 V <sub>DC</sub> AT 125 °C |                       |                     |                         |                     |                     |                                   |        |         |  |              |
| 880  | D  | STHD887(1)100(2)(3)HS | 0.60                | 10.00                   | 30                  | 300                 | -75                               | 30     | 30      | 4000                                     | 300          |
| 125 V <sub>DC</sub> AT 85 °C, 85 V <sub>DC</sub> AT 125 °C |  |                       |                     |                         |                     |                     |                                   |        |         |  |              |
| 470  | D  | STHD477(1)125(2)(3)HS | 1.00                | 18.00                   | 30                  | 300                 | -70                               | 30     | 30      | 3500                                     | 300          |
| 560  | D (1)  | STHD567(1)125(2)(3)HS | 0.70                | 20.00                   | 35                  | 350                 | -75                               | 30     | 30      | 3500                                     | 300          |

#### Notes

- · Part number definitions:
  - (1) Capacitance tolerance: K, M
  - (2) Termination / packaging: C = 100 % tin, bulk; E = standard, tin / lead, bulk; J = SMD, outside bend, tin / lead; K = SMD, outside bend, 100 % tin; L = SMD, inside bend, tin / lead; M = SMD, inside bend, 100 % tin
  - (3) Insulating sleeve: S = sleeved; U = unsleeved
- (1) Rating in development, contact factory for availability



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## TYPICAL PERFORMANCE CHARACTERISTICS OF STH CAPACITORS

| ELECTRICAL CHARACTERISTICS      |  |  |  |  |  |
|---------------------------------|--|--|--|--|--|
| ITEM                            | PERFORMANCE CHARACTERISTICS  |  |  |  |  |
| Operating temperature range     | -55 °C to +85 °C (to +125 °C with voltage derating)  |  |  |  |  |
| Capacitor tolerance             | ± 20 %, ± 10 % at 120 Hz, at +25 °C  |  |  |  |  |
| Capacitor change by temperature | Limit per Standard Ratings table   |  |  |  |  |
| ESR                             | Limit per Standard Ratings table, at +25 °C, 120 Hz  |  |  |  |  |
| Impedance                       | Limit per Standard Ratings table, at -55 °C, 120 Hz  |  |  |  |  |
| DCL (leakage current)           | Limit per Standard Ratings table   |  |  |  |  |
| AC ripple current               | Limit per Standard Ratings table, at +85 °C and 40 kHz   |  |  |  |  |
| Reverse voltage                 | There shall be no continuous reverse voltage. Transient reverse voltage surges are acceptable under the following conditions:  a) The peak reverse voltage is equal to or less than 1.5 V and the product of the peak current times the duration of the reverse transient is 0.05 A or less  b) The repetition rate of the reverse voltage surges is less than 10 Hz   |  |  |  |  |
| Surge voltage                   | Surge voltage shall be in accordance with MIL-PRF-39006. The DC rated surge voltage is the maximum voltage to which the capacitors can be subjected under any conditions including transients and peak ripple at the highest line voltage.  The DC surge voltage is 115 % of rated DC voltage, except the applicable surge voltage for 125 V ratings and ratings above 1000 μF is rated DC voltage.  After the test, the capacitors shall meet the following requirements:  a) DC leakage shall not exceed the specified value in catalog  b) Capacitance change shall be within +5 %, -20 % (-35 % for capacitance above 1000 μF) of initial measured value |  |  |  |  |

| PERFORMANCE CHARACTERISTICS |  |  |  |  |
|-----------------------------|--|--|--|--|
| ITEM                        | PERFORMANCE CHARACTERISTICS  |  |  |  |
| Life testing                | Capacitors shall be capable of withstanding a 2000 h life test at a temperature +85 °C at rated voltage, or a 2000 h life test at 125 °C test at derated voltage.  After the test, the capacitors shall meet the following requirements:  a) DC leakage at 85 °C and 125 °C shall not exceed 125 % of the specified value  b) DC leakage at 25 °C shall not exceed the specified value  c) Capacitance shall be within +10 %, -20 % of initial value  d) ESR shall not exceed 200 % of the specified value |  |  |  |

| ENVIRONMENTAL CHARACTERISTICS |                                      |  |  |  |
|-------------------------------|--------------------------------------|--|--|--|
| ITEM                          | CONDITION                            | COMMENTS   |  |  |
| Seal                          | MIL-PRF-39006                        | When the capacitors are tested as specified in MIL-PRF-39006, there shall be no evidence of leakage.     |  |  |
| Moisture resistance           | MIL-PRF-39006                        | Moisture resistance shall be in accordance with MIL-PRF-39006.<br>Number of cycles: 10 continuous cycles |  |  |
| Barometric pressure (reduced) | MIL-STD-202, method 105, condition E | Altitude 150 000 feet  |  |  |



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| MECHANICAL CHARACTERISTICS |   |  |  |  |  |
|----------------------------|---|--|--|--|--|
| ITEM                       | CONDITION   | COMMENTS   |  |  |  |
| Shock (specified pulse)    | MIL-STD-202, method 213, condition D (500 g)            | The capacitors shall meet the requirements of MIL-PRF-39006.   |  |  |  |
| Vibration, high frequency  | MIL-STD-202, method 204, condition H (80 <i>g</i> peak) | The capacitors shall meet the requirements of MIL-PRF-39006.   |  |  |  |
| Random vibration           | MIL-STD-202, method 214, condition II-K (53.79 g RMS)   | The capacitors shall meet the requirements of MIL-PRF-39006.   |  |  |  |
| Thermal shock              | MIL-STD-202, method 107, condition A                    | Thermal shock shall be in accordance with MIL-PRF-39006.  Maximum number of cycles is according to Standard Ratings table.   |  |  |  |
| Solderability              | MIL-STD-202, method 208,<br>ANSI/J-STD-002, condition A | Solderability shall be in accordance with MIL-PRF-39006.   |  |  |  |
| Terminal strength          | MIL-STD-202, method 211                                 | Terminal strength shall be in accordance with MIL-PRF-39006.   |  |  |  |
| Resistance to solder heat  | MIL-STD-202, method 210, condition C                    | The capacitors shall meet the requirements of MIL-PRF-39006.   |  |  |  |
| Terminals                  | MIL-STD-1276  | Terminals shall be as specified in MIL-STD-1276. The length and diameter of the terminals shall be as specified in Dimensions table. All terminals shall be permanently secured internally and externally, as applicable. All external joints shall be welded. |  |  |  |
| Marking                    | MIL-STD-1285  | Marking of capacitors conforms to method I of MIL-STD-1285 and include capacitance (in μF), capacitance tolerance letter, rated voltage, date code, lot symbol, and Vishay trademark.  |  |  |  |

| SELECTOR GUIDES            |                          |  |  |  |
|----------------------------|--------------------------|--|--|--|
| Tantalum Selector Guide    | www.vishay.com/doc?49054 |  |  |  |
| Parameter Comparison Guide | www.vishay.com/doc?42088 |  |  |  |



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