

# CHIP TANTALUM CAPACITOR - SMD

Suntan®

SOLID ELECTROLYTE, HIGH VOLUMETRIC EFFICIENCY, STABLEELECTRIC PERFORMANCES

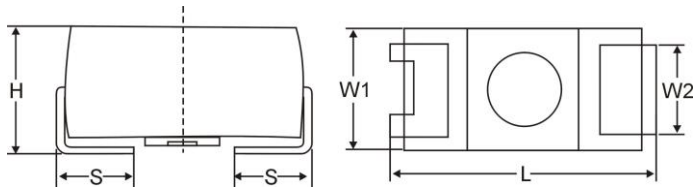
## TS20

### FEATURES

- Molded case available in six case codes
- Compatible with all popular “High Volume” automatic pick and equipment
- Optical character recognition qualified
- RoHS Compliance & Lead Free Terminations.

### SPECIFICATIONS

|                             |   |
|-----------------------------|---|
| Rated Voltage               | D.C. 4V ~ 50V   |
| Operating Temperature Range | -55 °C to +125 °C (>85 °C with rated voltage derating.)   |
| Capacitance Range           | 0.1µF to 470µF  |
| Capacitance Tolerance       | ±20%(M), ±10%(K), ±5%(J) (For special order)  |
| DC Leakage Current          | $I_o \leq 0.01 C_R V_R$ or 0.5µA (whichever is greater)   |
| Load Life                   | 85°C, After applying rated voltage for 2000 hours at 85 °C, Capacitance change: within ±10% of the initial value<br>Dissipation factor: Not more than 150% of the specified value |
| Case Sizes and Dimensions   | Please see Table 2  |
| Dissipation Factor at 20 °C | Please see Table 1  |
| Temperature Characteristics | Please see Table 1  |



### TEMPERATURE CHARACTERISTICS

Table 1

| Capacitance (µF) | Capacitance Change (%) |       |        | DF Max. (%) |       |       |        | DCL Max. (µA)      |                    |
|------------------|------------------------|-------|--------|-------------|-------|-------|--------|--------------------|--------------------|
|                  | -55°C                  | +85°C | +125°C | -55°C       | +25°C | +85°C | +125°C | +85°C              | +125°C             |
| ≤1.0             | ±10                    | ±10   | ±12    | 6           | 4     | 6     | 6      | +10 I <sub>o</sub> | +12 I <sub>o</sub> |
| 1.5 ~ 68         |                        |       |        | 10          | 6     | 10    | 10     |                    |                    |
| 100 ~ 470        |                        |       |        | 14          | 12    | 14    | 14     |                    |                    |

### DIMENSIONS - MILLIMETERS

Unit:mm Table 2

| Case Size | L ±0.4 | W1 ±0.4 | H ±0.4 | S ±0.3 | W2  |         |
|-----------|--------|---------|--------|--------|-----|---------|
| P         | 2012   | 2.0     | 1.2    | 1.2    | 0.5 | 1.0±0.2 |
| A         | 3216   | 3.2     | 1.6    | 1.6    | 0.8 | 1.2±0.2 |
| B         | 3528   | 3.5     | 2.8    | 1.9    | 0.8 | 2.2±0.2 |
| C         | 6032   | 6.0     | 3.2    | 2.5    | 1.3 | 2.2±0.2 |
| D         | 7343   | 7.3     | 4.3    | 2.8    | 1.3 | 2.4±0.2 |
| E         | 7343   | 7.3     | 4.3    | 4.1    | 1.3 | 2.4±0.5 |

### LOAD VOLTAGE

| Product model | Main materials of cathode | Load requirements after derating | Explain                                |
|---------------|---------------------------|----------------------------------|--|
| TS20          | MnO <sub>2</sub>          | ≤50%U <sub>R</sub>               | General application                    |
|               |                           | ≤30%U <sub>R</sub>               | Power circuit or low impedance circuit |

Note: UR is the rated voltage under the condition of temperature ≤ 85 °C, When the temperature is higher than 85 °C, temperature derating should be considered.

### TEMPERATURE DERATING

| Temperature range | Derating calculation formula        | Explain        |  |
|-------------------|-------------------------------------|----------------|--|
| 85°C ~ 125°C      | $U_T = (U_R - U_C) * (T - 85) / 40$ | U <sub>R</sub> | It is the rated voltage under the condition of temperature ≤ 85 °C |
|                   |                                     | U <sub>C</sub> | It is the rated voltage at 125 °C                                  |
|                   |                                     | U <sub>T</sub> | It is the voltage to be reduced between 85 °C and 125 °C           |

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Rated Voltage, Nominal Capacitance and Case Sizes

Table 3

| $U_R$  | $V \leq +85^\circ\text{C}$ | 4  | 6.3   | 10    | 16    | 20    | 25    | 35    | 50  |
|--|----------------------------|--|-------|-------|-------|-------|-------|-------|-----|
| Rated Voltage Marking                                |                            | G  | J     | A     | C     | D     | E     | V     | T   |
| Voltage Derating ( $V_C$ ) $\leq +125^\circ\text{C}$ |                            | 2.7  | 4     | 6.3   | 10    | 15    | 17    | 23    | 33  |
| Surge Voltage $\leq +85^\circ\text{C}$ ( $V_S$ )     |                            | 5.2  | 8     | 13    | 20    | 26    | 32    | 46    | 65  |
| Surge Voltage $\leq +125^\circ\text{C}$ ( $V_S$ )    |                            | 3.4  | 5     | 8     | 13    | 16    | 20    | 28    | 40  |
| Capacitance ( $\mu\text{F}$ )                        | Marking                    | Case Size (standard / miniature / Super miniature) |       |       |       |       |       |       |     |
| 0.1  | 104                        |  |       |       |       |       |       | A     | A/B |
| 0.15   | 154                        |  |       |       |       |       |       | A     | A/B |
| 0.22   | 224                        |  |       |       |       |       |       | A     | A/B |
| 0.33   | 334                        |  |       |       |       |       | A     | A     | A/B |
| 0.47   | 474                        |  |       |       | P     | P     | A     | A/B   | A/C |
| 0.68   | 684                        |  |       | P     | A/P   | A/P   | A     | A/B   | A/C |
| 1.0  | 105                        | A  | A     | A/P   | A/P   | A     | A     | A/B   | C   |
| 1.5  | 155                        | A/P  | A     | A/P   | A     | A/B   | A/B   | A/B/C | D   |
| 2.2  | 225                        | A/P  | A     | A/P   | A/B   | A/B   | A/B   | B/C   | C/D |
| 3.3  | 335                        | A/P  | A     | A/P   | A/B   | A/B   | B/C   | C/D   | D   |
| 4.7  | 475                        | A/P  | A     | A/B/P | A/B   | A/B/C | B/C   | C/D   | D   |
| 6.8  | 685                        | A/P  | A     | A/B   | A/B   | B/C   | B/C   | C/D   | D   |
| 10   | 106                        | A/P  | A/B   | A/B   | A/B/C | B/C/D | B/C/D | C/D   |     |
| 15   | 156                        | A/B  | A     | A/B/C | B/C   | C     | C/D   | D/E   |     |
| 22   | 226                        | A/B  | A/B/C | A/B/C | B/C/D | C/D   | D     |       |     |
| 33   | 336                        | B/C  | A/B   | B/C/D | C/D   | C/D   | D/E   |       |     |
| 47   | 476                        | B/C  | B/C   | B/C/D | C/D   | D/E   | D/E   |       |     |
| 68   | 686                        | B/C  | B/C/D | C/D   | D     | D/E   |       |       |     |
| 100  | 107                        | B/C  | B/C   | C/D   | D/E   |       |       |       |     |
| 150  | 157                        | C/D/E  | C/D   | D/E   | E     |       |       |       |     |
| 220  | 227                        | C/D/E  | C/D   | D     |       |       |       |       |     |
| 330  | 337                        | E  | D     |       |       |       |       |       |     |

Note: Specifications are subject to change without notice. For more details and updates, please visit our website.