

Series: **TES**  
Type: **T**

Surface Mount Type Tantalum Solid  
Electrolytic Capacitors

Japan

Surface mount type

Low profile

■ Features

● Low profile

Height: H=1.2 mm max.

Product line up of size Z (2.0×1.25×1.2)

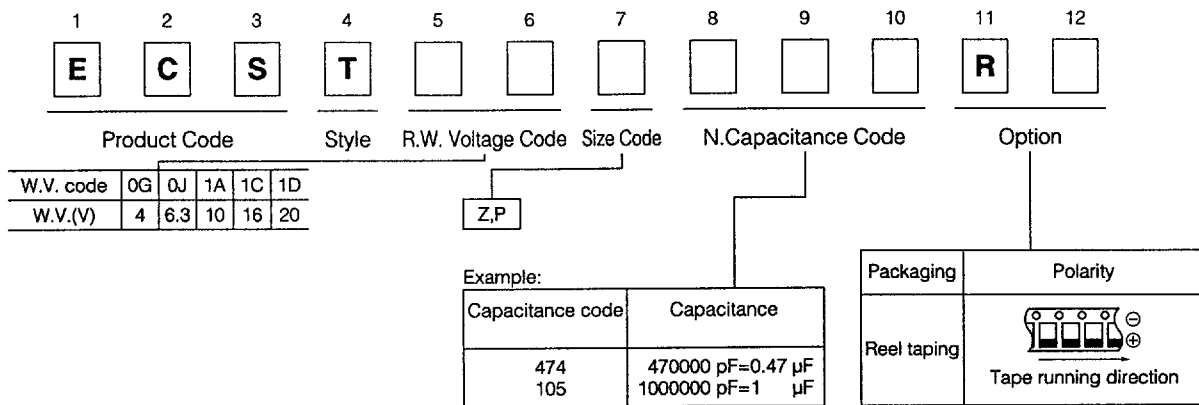
■ Recommended Applications

- Handy headphones stereo, pager, camcorder.

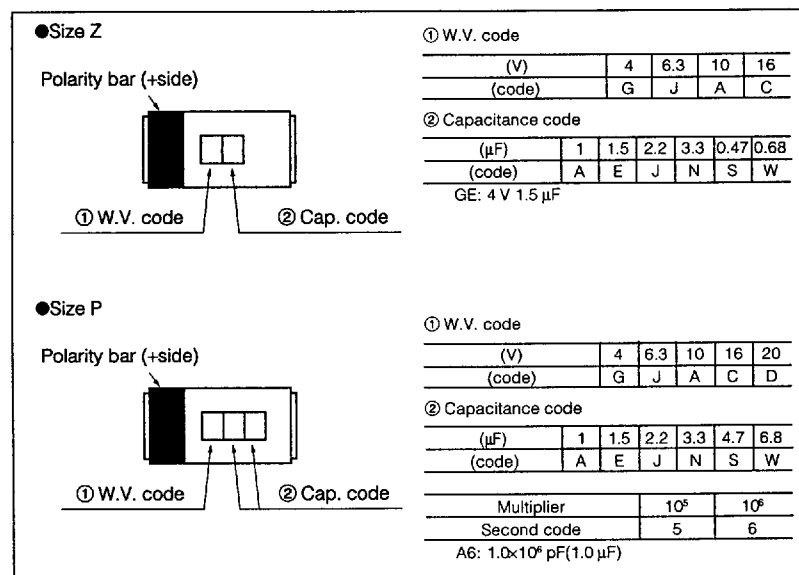
■ Specifications

|                              |                                                                                                                                                                                                                                                                                                                                                                                      |                 |  |                    |                                 |       |                           |                    |                                    |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--|--------------------|---------------------------------|-------|---------------------------|--------------------|------------------------------------|
| Operating Temp. Range        | -55 to +125 °C                                                                                                                                                                                                                                                                                                                                                                       |                 |  |                    |                                 |       |                           |                    |                                    |
| Rated W.V. Range             | 4 to 20 V.DC                                                                                                                                                                                                                                                                                                                                                                         |                 |  |                    |                                 |       |                           |                    |                                    |
| Nominal Cap. Range           | 0.1 to 3.3 µF                                                                                                                                                                                                                                                                                                                                                                        |                 |  |                    |                                 |       |                           |                    |                                    |
| Capacitance Tolerance        | ±20 % (120 Hz/+20 °C)                                                                                                                                                                                                                                                                                                                                                                |                 |  |                    |                                 |       |                           |                    |                                    |
| DC Leakage Current           | I ≤ 0.5 (µA) after 2 minutes application of rated working voltage at +20 °C                                                                                                                                                                                                                                                                                                          |                 |  |                    |                                 |       |                           |                    |                                    |
| tan δ                        | Size P:    ≤ 3.3 µF ..... 0.04 max.                                                                                                                                                                                                                                                                                                                                                  | (120 Hz/+20 °C) |  |                    |                                 |       |                           |                    |                                    |
|                              | Size Z:    ≤ 2.2 µF ..... 0.10 max.                                                                                                                                                                                                                                                                                                                                                  |                 |  |                    |                                 |       |                           |                    |                                    |
| Resistance to Soldering Heat | The capacitor shall withstand dipping into solder for 5±1 seconds at +260±5 °C                                                                                                                                                                                                                                                                                                       |                 |  |                    |                                 |       |                           |                    |                                    |
| Moisture Resistance          | After 500 hours exposure at +40 °C and 90 to 95 % R.H. without load, the capacitor shall meet the following limits. <table><tr><td>Capacitance change</td><td>±10 % of initial measured value</td></tr><tr><td>tan δ</td><td>≤ Initial specified value</td></tr><tr><td>DC leakage current</td><td>≤ Initial specified value</td></tr></table>                                       |                 |  | Capacitance change | ±10 % of initial measured value | tan δ | ≤ Initial specified value | DC leakage current | ≤ Initial specified value          |
| Capacitance change           | ±10 % of initial measured value                                                                                                                                                                                                                                                                                                                                                      |                 |  |                    |                                 |       |                           |                    |                                    |
| tan δ                        | ≤ Initial specified value                                                                                                                                                                                                                                                                                                                                                            |                 |  |                    |                                 |       |                           |                    |                                    |
| DC leakage current           | ≤ Initial specified value                                                                                                                                                                                                                                                                                                                                                            |                 |  |                    |                                 |       |                           |                    |                                    |
| Endurance                    | After 2000 hours application of rated DC working voltage at +85 °C or derated voltage at +125 °C, the capacitor shall meet the following limits. <table><tr><td>Capacitance change</td><td>±10 % of initial measured value</td></tr><tr><td>tan δ</td><td>≤ Initial specified value</td></tr><tr><td>DC leakage current</td><td>≤ 125 % of initial specified value</td></tr></table> |                 |  | Capacitance change | ±10 % of initial measured value | tan δ | ≤ Initial specified value | DC leakage current | ≤ 125 % of initial specified value |
| Capacitance change           | ±10 % of initial measured value                                                                                                                                                                                                                                                                                                                                                      |                 |  |                    |                                 |       |                           |                    |                                    |
| tan δ                        | ≤ Initial specified value                                                                                                                                                                                                                                                                                                                                                            |                 |  |                    |                                 |       |                           |                    |                                    |
| DC leakage current           | ≤ 125 % of initial specified value                                                                                                                                                                                                                                                                                                                                                   |                 |  |                    |                                 |       |                           |                    |                                    |

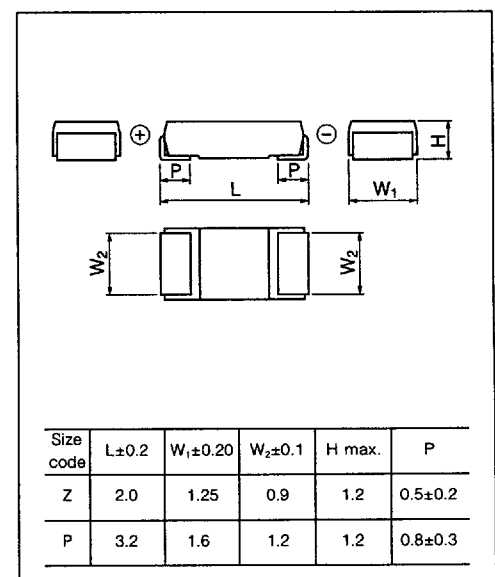
### ■ Explanation of Part Numbers



### ■ Marking



### ■ Dimensions in mm (not to scale)



### ■ Case size

| W.V.(V.DC)     | 4 (0G) | 6.3 (0J) | 10 (1A) | 16 (1C) | 20 (1D) |
|----------------|--------|----------|---------|---------|---------|
| Cap.( $\mu$ F) |        |          |         |         |         |
| 0.10 (104)     |        |          |         |         | P       |
| 0.15 (154)     |        |          |         |         | P       |
| 0.22 (224)     |        |          |         |         | P       |
| 0.33 (334)     |        |          |         |         | P       |
| 0.47 (474)     |        |          |         | Z       | P       |
| 0.68 (684)     |        |          |         | P, Z    | P       |
| 1.0 (105)      |        |          | P, Z    | P       |         |
| 1.5 (155)      |        | P, Z     | P       |         |         |
| 2.2 (225)      | P, Z   | P        |         |         |         |
| 3.3 (335)      | P      |          |         |         |         |

Note: 1. ( ) shows W.V. and capacitance code.  
 2. When selecting W.V., see the page 153.  
 3. Other rating upon request (voltage, capacitance, tolerance, size)