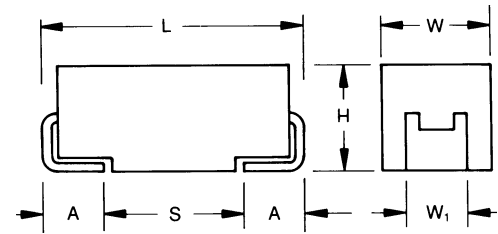


## FEATURES

- The six case sizes of the 522Z conform to the sizes most required by the major OEMs throughout Europe and America. These sizes conform to the Electronics Industry Associations of U.S. and Japan recommended standards for Tantalum Chip Capacitors.
- Available with capacitance tolerances of  $\pm 10\%$  and  $\pm 20\%$ .
- Operational temperature  $-55^{\circ}\text{C} \sim +85^{\circ}\text{C}$  at rated voltage and up to  $+125^{\circ}\text{C}$  with voltage derating.
- 522Z is now available in standard and extended ranges.
- Note on sizes:  
A, B, C, D – EIA standard EIA-535BAAC  
E – Extended range (high profile D case).
- Test frequency is 120Hz.



## PART NUMBERING

| Part Number Example: 522Z-016/101KTRD0125F  |   |                  |   |                                     |                |                |           |          |                |
|---|---|------------------|---|-------------------------------------|----------------|----------------|-----------|----------|----------------|
| 522Z  | - | 016              | / | 101                                 | K              | TR             | D         | 0125     | F              |
| Type  |   | Rated DC Voltage |   | Capacitance Code ( $\mu\text{F}$ )* | Tolerance Code | Package Code** | Case Code | Max: ESR | RoHs Compliant |
| * Capacitance Code: First two digits represent significant figure, third digit represents multiplier (number of zeros). |   |                  |   |                                     |                |                |           |          |                |
| ** Package Code: TR = Tape & Reel.  |   |                  |   |                                     |                |                |           |          |                |

## SPECIFICATIONS

| Performance Characteristics          |                             |  |    |    |    |    |    |    |    |    |
|--------------------------------------|-----------------------------|--|----|----|----|----|----|----|----|----|
| Operating Temperature Range          |                             | $-55^{\circ}\text{C} \sim +85^{\circ}\text{C}$ ( $125^{\circ}\text{C}$ with voltage derating).             |    |    |    |    |    |    |    |    |
| Rated Voltage (WVDC)                 | $\leq +85^{\circ}\text{C}$  | 6.3  | 10 | 16 | 20 | 25 | 35 | 25 | 35 | 50 |
| Surge Voltage (VDC)                  | $\leq +85^{\circ}\text{C}$  | 8  | 13 | 20 | 26 | 32 | 46 | 32 | 46 | 65 |
|                                      | $\leq +125^{\circ}\text{C}$ | 5  | 8  | 12 | 16 | 20 | 28 | 20 | 28 | 40 |
| Category Voltage (VDC)               | $\leq +125^{\circ}\text{C}$ | 4  | 7  | 10 | 13 | 17 | 23 | 17 | 23 | 33 |
| Capacitance Range (120Hz)            |                             | 0.1 $\mu\text{F}$ ~ 680 $\mu\text{F}$ .  |    |    |    |    |    |    |    |    |
| Capacitance Tolerance                |                             | $\pm 10\%$ & $\pm 20\%$ .  |    |    |    |    |    |    |    |    |
| Maximum Dissipation Factor % (120Hz) |                             | 4 (CR $\leq 1 \mu\text{F}$ ).<br>6 (CR $> 1 \mu\text{F}$ ).<br>8 (E case with CR $100 \geq \mu\text{F}$ ). |    |    |    |    |    |    |    |    |
| Environmental Classification         |                             | 55/125/56 (IEC 68-2).  |    |    |    |    |    |    |    |    |
| Technical Data                       |                             | All technical data relates to an ambient temperature of $20^{\circ}\text{C}$ .                             |    |    |    |    |    |    |    |    |

See Type 522 for technical data.

## CASE DIMENSIONS INCHES (mm)

| Code | $L \pm 0.008$<br>( $\pm 0.2$ ) | $W + 0.008 (+0.2),$<br>$-0.004 (-0.1)$ | $H + 0.008 (+0.2),$<br>$-0.004 (-0.1)$ | $W_1 \pm 0.008$<br>( $+0.2$ ) | $A + 0.012 (+0.3),$<br>$-0.008 (-0.2)$ | P Minimum   |
|------|--------------------------------|--|--|-------------------------------|--|-------------|
| A    | 0.126 (3.2)                    | 0.063 (1.6)                            | 0.063 (1.6)                            | 0.047 (1.2)                   | 0.031 (0.8)                            | 0.043 (1.1) |
| B    | 0.138 (3.5)                    | 0.11 (2.8)                             | 0.075 (1.9)                            | 0.087 (2.2)                   | 0.031 (0.8)                            | 0.055 (1.4) |
| C    | 0.236 (6.0)                    | 0.126 (3.2)                            | 0.102 (2.6)                            | 0.087 (2.2)                   | 0.051 (1.3)                            | 0.114 (2.9) |
| D    | 0.287 (7.3)                    | 0.169 (4.3)                            | 0.114 (2.9)                            | 0.094 (2.4)                   | 0.051 (1.3)                            | 0.173 (4.4) |
| E    | 0.287 (7.3)                    | 0.169 (4.3)                            | 0.162 (4.1)                            | 0.094 (2.4)                   | 0.051 (1.3)                            | 0.173 (4.4) |

W1 dimension applies to the termination width for A dimensional area only.

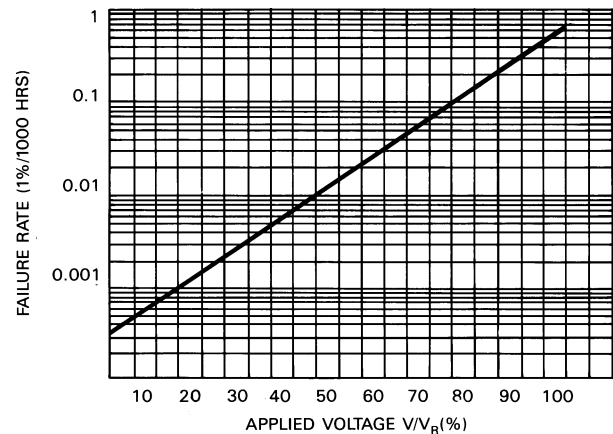
STANDARD RANGE (EIA AND EIA-J SIZES; LETTER DENOTES CODE)

| Capacitance $\mu\text{F}$ | WVDC @ 85°C |       |     |    |    |     |
|---------------------------|-------------|-------|-----|----|----|-----|
|                           | 6.3         | 10    | 16  | 20 | 25 | 35  |
| 1.5                       |             |       |     |    | A  |     |
| 3.3                       |             |       | A   |    |    |     |
| 4.7                       |             |       |     | A  | B  | C   |
| 6.8                       |             |       |     |    |    |     |
| 10                        |             | A     |     | B  | C  | D/E |
| 15                        | A           | A     | B   | C  |    | C/D |
| 22                        |             | B     | C   |    | D  | D/E |
| 33                        | B           | C     | C   | D  | E  | D   |
| 47                        |             | C     | C/D | E  | D  |     |
| 68                        |             |       | D   | E  |    |     |
| 100                       | C           | C/D/E | D/E |    |    |     |
| 150                       | D           | D     | D   |    |    |     |
| 220                       | D           | D/E   |     |    |    |     |
| 330                       | E           | D/E   |     |    |    |     |
| 470                       | E           | E     |     |    |    |     |

50V values available upon request.

**OPERATING VOLTAGE/VOLTAGE DERATING**

- If a capacitor with a higher voltage rating than the maximum line voltage is used, then the operating reliability will be improved. This is known as voltage derating. The graph at right shows the relationship between voltage derating (the ratio between applied and rated voltage) and failure rate. The graph gives the correction factor  $F(V)$  for any operating voltage.
- Where less than  $0.1\Omega$  per volt series resistance is employed, a 70% derating factor is recommended. Consult factory for further information under these conditions.



Effect of applied voltage on basic failure rate for typical component (60% confidence level).

RATINGS AND PART NUMBER REFERENCE

| Tecate Part Number   | Case Size | Capacitance $\mu$ F | Rated Voltage | DCL ( $\mu$ A) Max. | DF % Max. | ESR Max. (m $\Omega$ ) @ 100kHz | 100kHz Ripple Current (mA) Ratings |      |       |
|----------------------|-----------|---------------------|---------------|---------------------|-----------|---------------------------------|------------------------------------|------|-------|
|                      |           |                     |               |                     |           |                                 | 25°C                               | 85°C | 125°C |
| 522Z-6R3/150*TRA1500 | A         | 15                  | 6.3           | 0.9                 | 6         | 1500                            | 224                                | 200  | 89    |
| 522Z-6R3/330*TRB0600 | B         | 33                  | 6.3           | 2.1                 | 6         | 600                             | 376                                | 337  | 151   |
| 522Z-6R3/101*TRC0150 | C         | 100                 | 6.3           | 6.3                 | 6         | 150                             | 856                                | 766  | 343   |
| 522Z-6R3/151*TRD0125 | D         | 150                 | 6.3           | 9.5                 | 6         | 125                             | 1095                               | 980  | 438   |
| 522Z-6R3/221*TRD0100 | D         | 220                 | 6.3           | 13.9                | 6         | 100                             | 1225                               | 1095 | 490   |
| 522Z-6R3/331*TRE0100 | E         | 330                 | 6.3           | 20.8                | 8         | 100                             | 1285                               | 1149 | 514   |
| 522Z-6R3/331*TRE0125 | E         | 330                 | 6.3           | 20.8                | 8         | 125                             | 1149                               | 1028 | 460   |
| 522Z-6R3/331*TRE0150 | E         | 330                 | 6.3           | 20.8                | 8         | 150                             | 1049                               | 938  | 420   |
| 522Z-6R3/471*TRE0050 | E         | 470                 | 6.3           | 29.6                | 10        | 50                              | 1817                               | 1625 | 727   |
| 522Z-6R3/471*TRE0100 | E         | 470                 | 6.3           | 29.6                | 10        | 100                             | 1285                               | 1149 | 514   |
| 522Z-6R3/471*TRE0200 | E         | 470                 | 6.3           | 29.6                | 10        | 200                             | 908                                | 812  | 363   |
| 522Z-010/100*TRA1800 | A         | 10                  | 10            | 1.0                 | 6         | 1800                            | 204                                | 183  | 82    |
| 522Z-010/150*TRA1000 | A         | 15                  | 10            | 1.5                 | 6         | 1000                            | 274                                | 245  | 110   |
| 522Z-010/220*TRB0700 | B         | 22                  | 10            | 2.2                 | 6         | 700                             | 348                                | 312  | 139   |
| 522Z-010/330*TRC0375 | C         | 33                  | 10            | 3.3                 | 6         | 375                             | 542                                | 484  | 217   |
| 522Z-010/330*TRC0500 | C         | 33                  | 10            | 3.3                 | 6         | 500                             | 469                                | 420  | 188   |
| 522Z-010/470*TRC0350 | C         | 47                  | 10            | 4.7                 | 6         | 350                             | 561                                | 501  | 224   |
| 522Z-010/101*TRC0200 | C         | 100                 | 10            | 10.0                | 6         | 200                             | 742                                | 663  | 297   |
| 522Z-010/101*TRD0065 | D         | 100                 | 10            | 10.0                | 6         | 65                              | 1519                               | 1359 | 608   |
| 522Z-010/101*TRD0080 | D         | 100                 | 10            | 10.0                | 6         | 80                              | 1369                               | 1225 | 547   |
| 522Z-010/101*TRD0100 | D         | 100                 | 10            | 10.0                | 6         | 100                             | 1225                               | 1095 | 490   |
| 522Z-010/101*TRD0125 | D         | 100                 | 10            | 10.0                | 6         | 125                             | 1095                               | 980  | 438   |
| 522Z-010/101*TRD0140 | D         | 100                 | 10            | 10.0                | 6         | 140                             | 1035                               | 926  | 414   |
| 522Z-010/101*TRD0150 | D         | 100                 | 10            | 10.0                | 6         | 150                             | 1000                               | 894  | 400   |
| 522Z-010/101*TRE0125 | E         | 100                 | 10            | 10.0                | 6         | 125                             | 1149                               | 1028 | 460   |
| 522Z-010/151*TRD0100 | D         | 150                 | 10            | 15.0                | 6         | 100                             | 1225                               | 1095 | 490   |
| 522Z-010/221*TRD0150 | D         | 220                 | 10            | 22.0                | 8         | 150                             | 1000                               | 894  | 400   |
| 522Z-010/221*TRE0060 | E         | 220                 | 10            | 22.0                | 8         | 60                              | 1658                               | 1483 | 663   |
| 522Z-010/221*TRE0100 | E         | 220                 | 10            | 22.0                | 8         | 100                             | 1285                               | 1149 | 514   |
| 522Z-010/221*TRE0125 | E         | 220                 | 10            | 22.0                | 8         | 125                             | 1149                               | 1028 | 460   |
| 522Z-010/221*TRE0150 | E         | 220                 | 10            | 22.0                | 8         | 150                             | 1049                               | 938  | 420   |
| 522Z-010/331*TRD0150 | D         | 330                 | 10            | 33.0                | 8         | 150                             | 1000                               | 894  | 400   |
| 522Z-010/331*TRE0060 | E         | 330                 | 10            | 33.0                | 8         | 60                              | 1658                               | 1483 | 663   |
| 522Z-010/331*TRE0100 | E         | 330                 | 10            | 33.0                | 8         | 100                             | 1285                               | 1149 | 514   |
| 522Z-010/471*TRE0050 | E         | 470                 | 10            | 47.0                | 10        | 50                              | 1817                               | 1625 | 727   |
| 522Z-010/471*TRE0100 | E         | 470                 | 10            | 47.0                | 10        | 100                             | 1285                               | 1149 | 514   |
| 522Z-010/471*TRE0200 | E         | 470                 | 10            | 47.0                | 10        | 200                             | 908                                | 812  | 363   |

\*Indicates capacitance tolerance code: K( $\pm$ 10%) or M( $\pm$ 20%).

NOTE: Voltage ratings are minimum values. We reserve the right to supply higher voltage ratings in the same case size.

RATINGS AND PART NUMBER REFERENCE (CONT.)

| Tecate Part Number   | Case Size | Capacitance $\mu$ F | Rated Voltage | DCL ( $\mu$ A) Max. | DF % Max. | ESR Max. (m $\Omega$ ) @ 100kHz | 100KHz Ripple Current (mA) Ratings |      |       |
|----------------------|-----------|---------------------|---------------|---------------------|-----------|---------------------------------|------------------------------------|------|-------|
|                      |           |                     |               |                     |           |                                 | 25°C                               | 85°C | 125°C |
| 522Z-016/3R3*TRA3500 | A         | 3.3                 | 16            | 0.5                 | 6         | 3500                            | 146                                | 131  | 59    |
| 522Z-016/150*TRB0800 | B         | 15                  | 16            | 2.4                 | 6         | 800                             | 326                                | 292  | 130   |
| 522Z-016/220*TRC0375 | C         | 22                  | 16            | 3.5                 | 6         | 375                             | 542                                | 484  | 217   |
| 522Z-016/330*TRC0300 | C         | 33                  | 16            | 5.3                 | 6         | 300                             | 606                                | 542  | 242   |
| 522Z-016/470*TRC0350 | C         | 47                  | 16            | 7.5                 | 6         | 350                             | 561                                | 501  | 224   |
| 522Z-016/470*TRD0150 | D         | 47                  | 16            | 7.5                 | 6         | 150                             | 1000                               | 894  | 400   |
| 522Z-016/470*TRD0200 | D         | 47                  | 16            | 7.5                 | 6         | 200                             | 866                                | 775  | 346   |
| 522Z-016/680*TRD0150 | D         | 68                  | 16            | 10.9                | 6         | 150                             | 1000                               | 894  | 400   |
| 522Z-016/101*TRD0125 | D         | 100                 | 16            | 16.0                | 6         | 125                             | 1095                               | 980  | 438   |
| 522Z-016/101*TRD0150 | D         | 100                 | 16            | 16.0                | 6         | 150                             | 1000                               | 894  | 400   |
| 522Z-016/101*TRE0100 | E         | 100                 | 16            | 16.0                | 6         | 100                             | 1285                               | 1149 | 514   |
| 522Z-016/101*TRE0125 | E         | 100                 | 16            | 16.0                | 6         | 125                             | 1149                               | 1028 | 460   |
| 522Z-016/101*TRE0150 | E         | 100                 | 16            | 16.0                | 6         | 150                             | 1049                               | 938  | 420   |
| 522Z-016/151*TRD0150 | D         | 150                 | 16            | 24.0                | 8         | 150                             | 1000                               | 894  | 400   |
| 522Z-016/221*TRE0100 | E         | 220                 | 16            | 35.2                | 8         | 100                             | 1285                               | 1149 | 514   |
| 522Z-020/4R7*TRA1800 | A         | 4.7                 | 20            | 0.9                 | 6         | 1800                            | 204                                | 183  | 82    |
| 522Z-020/100*TRB1000 | B         | 10                  | 20            | 2.0                 | 6         | 1000                            | 292                                | 261  | 117   |
| 522Z-020/150*TRC0450 | C         | 15                  | 20            | 3.0                 | 6         | 450                             | 494                                | 442  | 198   |
| 522Z-020/330*TRD0200 | D         | 33                  | 20            | 6.6                 | 6         | 200                             | 866                                | 775  | 346   |
| 522Z-020/470*TRE0150 | E         | 47                  | 20            | 9.4                 | 6         | 150                             | 1049                               | 938  | 420   |
| 522Z-020/680*TRE0125 | E         | 68                  | 20            | 13.6                | 6         | 125                             | 1149                               | 1028 | 160   |
| 522Z-020/680*TRE0150 | E         | 68                  | 20            | 13.6                | 6         | 150                             | 1049                               | 938  | 420   |
| 522Z-025/1R5*TRA3000 | A         | 1.5                 | 25            | 0.5                 | 6         | 3000                            | 158                                | 141  | 63    |
| 522Z-025/4R7*TRB1500 | B         | 4.7                 | 25            | 1.2                 | 6         | 1500                            | 238                                | 213  | 95    |
| 522Z-025/100*TRC0500 | C         | 10                  | 25            | 2.5                 | 6         | 500                             | 469                                | 420  | 188   |
| 522Z-025/220*TRD0200 | D         | 22                  | 25            | 5.5                 | 6         | 200                             | 866                                | 775  | 346   |
| 522Z-025/330*TRE0175 | E         | 33                  | 25            | 8.3                 | 6         | 175                             | 971                                | 868  | 388   |
| 522Z-025/330*TRE0200 | E         | 33                  | 25            | 8.3                 | 6         | 200                             | 908                                | 812  | 363   |
| 522Z-025/330*TRE0300 | E         | 33                  | 25            | 8.3                 | 6         | 300                             | 742                                | 663  | 297   |
| 522Z-025/470*TRD0250 | D         | 47                  | 25            | 11.8                | 6         | 250                             | 775                                | 693  | 310   |
| 522Z-035/4R7*TRC0600 | C         | 4.7                 | 35            | 1.6                 | 6         | 600                             | 428                                | 383  | 171   |
| 522Z-035/100*TRD0300 | D         | 10                  | 35            | 3.5                 | 6         | 300                             | 707                                | 632  | 283   |
| 522Z-035/100*TRE0200 | E         | 10                  | 35            | 3.5                 | 6         | 200                             | 908                                | 812  | 363   |
| 522Z-035/150*TRC0450 | C         | 15                  | 35            | 5.3                 | 6         | 450                             | 494                                | 442  | 198   |
| 522Z-035/150*TRD0300 | D         | 15                  | 35            | 5.3                 | 6         | 300                             | 707                                | 632  | 283   |
| 522Z-035/220*TRD0400 | D         | 22                  | 35            | 7.7                 | 6         | 400                             | 612                                | 548  | 245   |
| 522Z-035/220*TRE0200 | E         | 22                  | 35            | 7.7                 | 6         | 200                             | 908                                | 812  | 363   |
| 522Z-035/220*TRE0300 | E         | 22                  | 35            | 7.7                 | 6         | 300                             | 742                                | 663  | 297   |
| 522Z-035/330*TRE0300 | D         | 33                  | 35            | 11.6                | 6         | 300                             | 707                                | 632  | 283   |

\*Indicates capacitance tolerance code: K( $\pm$ 10%) or M( $\pm$ 20%).

NOTE: Voltage ratings are minimum values. We reserve the right to supply higher voltage ratings in the same case size.