

TCQ Series

Automotive Conductive Polymer Chip Capacitors



FEATURES

- Conductive Polymer Electrode
- Low ESR with high ripple current capability
- Robust Design for Automotive Applications
- 100% Surge Current Tested
- Meets Requirements of AEC-Q200
- -55 to +125°C Operation Temperature
- Full Voltage Range: 2.5-50V
- 3x reflow cycles according to J-STD-020

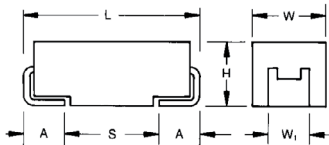


APPLICATIONS

DC/DC converters, Telecommunication (coupling/decoupling), Industrial & special, Automotive (body electronics, cabin controls, infotainment, comfort, after market etc)

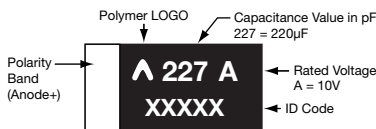
Not recommended for use of conductive polymer parts in high power applications. For more information please see KYOCERA AVX [automotive application guide](#) at [kyocera-avx.com](#), or contact manufacturer.

KYOCERA AVX's qualification of TCQ capacitors meets requirements of AEC-Q200. TCQ series is manufactured in an IATF 16949 certified facility.



MARKING

B, D, E, U, Y CASE



CASE DIMENSIONS:

millimeters (inches)

| Code | EIA Code | EIA Metric | L±0.20 (0.008) | W+0.20 (0.008) -0.10 (0.004) | H+0.20 (0.008) -0.10 (0.004) | W _i ±0.20 (0.008) | A+0.30 (0.012) -0.20 (0.008) | S Min. |
|------|----------|------------|----------------|------------------------------|------------------------------|------------------------------|------------------------------|--------------|
| B | 1210 | 3528-21 | 3.50 (0.138) | 2.80 (0.110) | 1.90 (0.075) | 2.20 (0.087) | 0.80 (0.031) | 1.40 (0.055) |
| D | 2917 | 7343-31 | 7.30 (0.287) | 4.30 (0.169) | 2.90 (0.114) | 2.40 (0.094) | 1.30 (0.051) | 4.40 (0.173) |
| E | 2917 | 7343-43 | 7.30 (0.287) | 4.30 (0.169) | 4.10 (0.162) | 2.40 (0.094) | 1.30 (0.051) | 4.40 (0.173) |
| U | 2924 | 7361-43 | 7.30 (0.287) | 6.10 (0.240) | 4.10 (0.162) | 3.10 (0.122) | 1.30 (0.051) | 4.40 (0.173) |
| Y | 2917 | 7343-20 | 7.30 (0.287) | 4.30 (0.169) | 2.00 (0.079) max | 2.40 (0.094) | 1.30 (0.051) | 4.40 (0.173) |

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

HOW TO ORDER

| TCQ | B | 476 | M | 006 | # | 0070 | E |
|------|------------------------------|--|-----------------------|--|---|-----------|---|
| Type | Case Size See table above | Capacitance Code pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow) | Tolerance M = ±20% | Rated DC Voltage 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc 016 = 16Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc | Packaging R = Pure Tin 7" Reel S = Pure Tin 13" Reel A = NiPdAu 7" Reel B = NiPdAu 13" Reel A, B = please contact manufacturer | ESR in mΩ | Additional Character E = Black resin (single) M = Black resin (multi) |

TECHNICAL SPECIFICATIONS

| | |
|------------------------|--|
| Technical Data: | All technical data relate to an ambient temperature of +25°C |
| Capacitance Range: | 2.2 µF to 680 µF |
| Capacitance Tolerance: | ±20% |
| Leakage Current DCL: | 0.1CV |
| Temperature Range: | -55°C to +125°C |
| | Meets requirements of AEC-Q200 |

NOTE: Conductive Polymer Capacitors are designed to operate within the limits of the environmental conditions specified for each series. If operated continuously at their maximum temperature and / or humidity limit, or beyond these limits, capacitors may exhibit a parametric shift in capacitance and increases in ESR. These changes may occur earlier if the specified environmental conditions are exceeded. Similarly, their normal operational time period will be significantly extended if their general duty cycle includes operation below maximum temperature within humidity controlled environments. Careful attention should be paid to maximum temperature with associated high humidity environments as well as voltage derating, ripple current and current surges. Please reference the KYOCERA AVX Conductive Polymer Capacitor Guidelines for more information or contact factory for application assistance.

TCQ Series

Automotive Conductive Polymer Chip Capacitors



CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

| Capacitance | | Rated Voltage DC (V _R) @ 105°C | | | | | | | | |
|-------------|------|--|-------------|-----------|-----------|-------------|--------------|--------------|---------------|---------|
| µF | Code | 2.5 (e) | 4V (G) | 6.3V (J) | 10V (A) | 16V (C) | 20V (D) | 25V (E) | 35V (V) | 50V (T) |
| 2.2 | 225 | | | | | | | | | B(300) |
| 3.3 | 335 | | | | | | | | | B(300) |
| 4.7 | 475 | | | | | | | | B(150,200) | |
| 10 | 106 | | | | | | B(150) | B(150) | B(200), D(70) | D(90) |
| 15 | 156 | | | | | B(90) | B(150) | D(70) | D(125) | |
| 22 | 226 | | | B(70) | B(70) | B(70) | B(150),D(70) | D(100) | D(65), D(100) | |
| 33 | 336 | | | B(70) | B(70) | D(70),Y(70) | D(70) | D(60,100) | E(65), U(70) | |
| 47 | 476 | | | B(70) | B(70) | D(70),Y(70) | D(70),Y(70) | D(65), E(50) | E(75), U(70) | |
| 68 | 686 | | | B(70) | D(25,40) | D(70) | | E(60) | | |
| 100 | 107 | B(55,70) | B(55,70) | B(45) | D(25,40) | | E(40) | U(70) | | |
| 150 | 157 | | | D(25,40) | D(25) | E(25,40) | | | | |
| 220 | 227 | | D(25),Y(25) | D(25) | D(25) | | | | | |
| 330 | 337 | | D(25) | D(25) | E(25, 50) | | | | | |
| 470 | 477 | D(6) | D(25) | E(25, 50) | E(25, 50) | | | | | |
| 680 | 687 | D(6,9) | | E(25, 50) | | | | | | |

Released ratings, (ESR ratings in mOhms in parentheses)

Engineering samples - please contact KYOCERA AVX

Note: Voltage ratings are minimum values. KYOCERA AVX reserves the right to supply higher voltage ratings in the same case size, to the same reliability standards.

RATINGS & PART NUMBER REFERENCE

| Part Number | Case Size | Capacitance (µF) | Rated Voltage (V) | Maximum Operating Temp. (°C) | DCL Max (µA) | DF Max (%) | ESR Max @ 100kHz (mΩ) | 100kHz RMS Current (mA) | | | | Humidity 85°C/85% RH, Vr (hrs) | MSL |
|-------------------|-----------|------------------|-------------------|------------------------------|--------------|------------|-----------------------|-------------------------|------|-------|--------|--------------------------------|-----|
| | | | | | | | | 45°C | 85°C | 105°C | 125°C | | |
| 2.5 Volt | | | | | | | | | | | | | |
| TCQB107M002#0055E | B | 100 | 2.5 | 125 | 25 | 6 | 55 | 1508 | 1055 | 678 | 377 | 1000 | 3 |
| TCQB107M002#0070E | B | 100 | 2.5 | 125 | 25 | 6 | 70 | 1336 | 935 | 601 | 334 | 1000 | 3 |
| TCQD477M002#0006M | D | 470 | 2.5 | 125 | 117.5 | 10 | 6 | 8660 | 8660 | 6062 | 2165 | 1000 | 3 |
| TCQD687M002#0006M | D | 680 | 2.5 | 125 | 170 | 10 | 6 | 8660 | 8660 | 6062 | 2165 | 1000 | 3 |
| TCQD687M002#0009M | D | 680 | 2.5 | 125 | 170 | 10 | 9 | 7070 | 7070 | 4949 | 1768 | 1000 | 3 |
| 4 Volt | | | | | | | | | | | | | |
| TCQB107M004#0055E | B | 100 | 4 | 125 | 40 | 6 | 55 | 1508 | 1055 | 678 | 377 | 1000 | 3 |
| TCQB107M004#0070E | B | 100 | 4 | 125 | 40 | 8 | 70 | 1336 | 935 | 601 | 334 | 1000 | 3 |
| TCQD227M004#0025E | D | 220 | 4 | 125 | 88 | 6 | 25 | 3000 | 2100 | 1350 | 750 | 1000 | 3 |
| TCQY227M004#0025E | Y | 220 | 4 | 125 | 88 | 6 | 25 | 2720 | 1904 | 1224 | 680 | 1000 | 3 |
| TCQD337M004#0025E | D | 330 | 4 | 125 | 132 | 6 | 25 | 4240 | 4240 | 2970 | 1060 | 1000 | 3 |
| TCQD477M004#0025E | D | 470 | 4 | 125 | 188 | 6 | 25 | 3000 | 2100 | 1350 | 750 | 1000 | 3 |
| 6.3 Volt | | | | | | | | | | | | | |
| TCQB226M006#0070E | B | 22 | 6.3 | 125 | 13.2 | 6 | 70 | 1336 | 935 | 601 | 334 | 1000 | 3 |
| TCQB336M006#0070E | B | 33 | 6.3 | 125 | 19.8 | 6 | 70 | 1336 | 935 | 601 | 334 | 1000 | 3 |
| TCQB476M006#0070E | B | 47 | 6.3 | 125 | 28.2 | 6 | 70 | 1336 | 935 | 601 | 334 | 1000 | 3 |
| TCQB686M006#0070E | B | 68 | 6.3 | 125 | 40.8 | 8 | 70 | 1336 | 935 | 601 | 334 | 1000 | 3 |
| TCQB107M006#0045E | B | 100 | 6.3 | 125 | 60 | 8 | 45 | 1667 | 1167 | 750 | 417 | 1000 | 3 |
| TCQD157M006#0025E | D | 150 | 6.3 | 125 | 90 | 6 | 25 | 3000 | 2100 | 1350 | 750 | 1000 | 3 |
| TCQD157M006#0040E | D | 150 | 6.3 | 125 | 90 | 6 | 40 | 2372 | 1660 | 1067 | 593 | 1000 | 3 |
| TCQD227M006#0025E | D | 220 | 6.3 | 125 | 132 | 6 | 25 | 3000 | 2100 | 1350 | 750 | 1000 | 3 |
| TCQD337M006#0025E | D | 330 | 6.3 | 125 | 198 | 6 | 25 | 4240 | 4240 | 2970 | 1060 | 1000 | 3 |
| TCQE477M006#0025E | E | 470 | 6.3 | 125 | 296.1 | 10 | 25 | 4470 | 4470 | 3129 | 1117.5 | 1000 | 3 |
| TCQE477M006#0050E | E | 470 | 6.3 | 125 | 296.1 | 10 | 50 | 3160 | 3160 | 2214 | 791 | 1000 | 3 |
| TCQE687M006#0025E | E | 680 | 6.3 | 125 | 428.4 | 10 | 25 | 4470 | 4470 | 3129 | 1117.5 | 1000 | 3 |
| TCQE687M006#0050E | E | 680 | 6.3 | 125 | 428.4 | 10 | 50 | 3160 | 3160 | 2214 | 791 | 1000 | 3 |
| 10 Volt | | | | | | | | | | | | | |
| TCQB226M010#0070E | B | 22 | 10 | 125 | 22 | 6 | 70 | 1336 | 935 | 601 | 334 | 1000 | 3 |
| TCQB336M010#0070E | B | 33 | 10 | 125 | 33 | 6 | 70 | 1336 | 935 | 601 | 334 | 1000 | 3 |
| TCQB476M010#0070E | B | 47 | 10 | 125 | 47 | 6 | 70 | 1336 | 935 | 601 | 334 | 1000 | 3 |
| TCQD686M010#0025E | D | 68 | 10 | 125 | 68 | 6 | 25 | 3000 | 2100 | 1350 | 750 | 1000 | 3 |
| TCQD686M010#0040E | D | 68 | 10 | 125 | 68 | 6 | 40 | 2372 | 1660 | 1067 | 593 | 1000 | 3 |
| TCQD107M010#0025E | D | 100 | 10 | 125 | 100 | 6 | 25 | 3000 | 2100 | 1350 | 750 | 1000 | 3 |
| TCQD107M010#0040E | D | 100 | 10 | 125 | 100 | 6 | 40 | 2372 | 1660 | 1067 | 593 | 1000 | 3 |
| TCQD157M010#0025E | D | 150 | 10 | 125 | 150 | 6 | 25 | 3000 | 2100 | 1350 | 750 | 1000 | 3 |
| TCQD227M010#0025E | D | 220 | 10 | 125 | 220 | 6 | 25 | 3000 | 2100 | 1350 | 750 | 1000 | 3 |
| TCQE337M010#0025E | E | 330 | 10 | 125 | 330 | 10 | 25 | 4470 | 4470 | 3129 | 1117.5 | 1000 | 3 |
| TCQE337M010#0050E | E | 330 | 10 | 125 | 330 | 10 | 50 | 3160 | 3160 | 2214 | 791 | 1000 | 3 |
| TCQE477M010#0025E | E | 470 | 10 | 125 | 470 | 10 | 25 | 4470 | 4470 | 3129 | 1117.5 | 1000 | 3 |
| TCQE477M010#0050E | E | 470 | 10 | 125 | 470 | 10 | 50 | 3160 | 3160 | 2214 | 791 | 1000 | 3 |
| 16 Volt | | | | | | | | | | | | | |
| TCQB156M016#0090E | B | 15 | 16 | 125 | 24 | 8 | 90 | 1179 | 825 | 530 | 295 | 1000 | 3 |
| TCQB226M016#0070E | B | 22 | 16 | 125 | 35.2 | 8 | 70 | 1336 | 935 | 601 | 334 | 1000 | 3 |
| TCQD336M016#0070E | D | 33 | 16 | 125 | 52.8 | 6 | 70 | 1793 | 1255 | 807 | 448 | 1000 | 3 |

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Automotive Conductive Polymer Chip Capacitors

RATINGS & PART NUMBER REFERENCE

| Part Number | Case Size | Capacitance (μF) | Rated Voltage (V) | Maximum Operating Temp. (°C) | DCL Max (μA) | DF Max (%) | ESR Max @ 100kHz (mΩ) | 100kHz RMS Current (mA) | | | | Humidity 85°C/85% RH, Vr (hrs) | MSL |
|-------------------|-----------|------------------|-------------------|------------------------------|--------------|------------|-----------------------|-------------------------|------|-------|-------|--------------------------------|-----|
| | | | | | | | | 45°C | 85°C | 105°C | 125°C | | |
| TCQY336M016#0070E | Y | 33 | 16 | 125 | 52.8 | 6 | 70 | 1626 | 1138 | 732 | 406 | 1000 | 3 |
| TCQD476M016#0070E | D | 47 | 16 | 125 | 75.2 | 6 | 70 | 1793 | 1255 | 807 | 448 | 1000 | 3 |
| TCQY476M016#0070E | Y | 47 | 16 | 125 | 75.2 | 6 | 70 | 1626 | 1138 | 732 | 406 | 1000 | 3 |
| TCQD686M016#0070E | D | 68 | 16 | 125 | 109 | 8 | 70 | 1793 | 1255 | 807 | 448 | 1000 | 3 |
| TCQE157M016#0025E | E | 150 | 16 | 125 | 240 | 8 | 25 | 3162 | 2214 | 1423 | 791 | 1000 | 3 |
| TCQE157M016#0040E | E | 150 | 16 | 125 | 240 | 10 | 40 | 2500 | 1750 | 1125 | 625 | 1000 | 3 |
| 20 Volt | | | | | | | | | | | | | |
| TCQB106M020#0150E | B | 10 | 20 | 125 | 20 | 8 | 150 | 913 | 639 | 411 | 228 | 1000 | 3 |
| TCQB156M020#0150E | B | 15 | 20 | 125 | 30 | 8 | 150 | 913 | 639 | 411 | 228 | 1000 | 3 |
| TCQB226M020#0150E | B | 22 | 20 | 125 | 44 | 8 | 150 | 913 | 639 | 411 | 228 | 1000 | 3 |
| TCQD226M020#0070E | D | 22 | 20 | 125 | 44 | 6 | 70 | 1793 | 1255 | 807 | 448 | 1000 | 3 |
| TCQD336M020#0070E | D | 33 | 20 | 125 | 66 | 8 | 70 | 1793 | 1255 | 807 | 448 | 1000 | 3 |
| TCQD476M020#0070E | D | 47 | 20 | 125 | 94 | 6 | 70 | 1793 | 1255 | 807 | 448 | 1000 | 3 |
| TCQY476M020#0070E | Y | 47 | 20 | 125 | 94 | 6 | 70 | 1626 | 1138 | 732 | 406 | 1000 | 3 |
| TCQE107M020#0040E | E | 100 | 20 | 125 | 200 | 10 | 40 | 2500 | 1750 | 1125 | 625 | 1000 | 3 |
| 25 Volt | | | | | | | | | | | | | |
| TCQB106M025#0150E | B | 10 | 25 | 125 | 25 | 8 | 150 | 913 | 639 | 411 | 228 | 1000 | 3 |
| TCQD156M025#0070E | D | 15 | 25 | 125 | 37.5 | 6 | 70 | 1793 | 1255 | 807 | 448 | 1000 | 3 |
| TCQD226M025#0100E | D | 22 | 25 | 125 | 55 | 8 | 100 | 1500 | 1050 | 675 | 375 | 1000 | 3 |
| TCQD336M025#0060E | D | 33 | 25 | 125 | 82.5 | 8 | 60 | 1936 | 1356 | 871 | 484 | 1000 | 3 |
| TCQD336M025#0100E | D | 33 | 25 | 125 | 82.5 | 8 | 100 | 1500 | 1050 | 675 | 375 | 1000 | 3 |
| TCQD476M025#0065E | D | 47 | 25 | 125 | 117.5 | 10 | 65 | 2631 | 2631 | 1842 | 658 | 1000 | 3 |
| TCQE476M025#0050E | E | 47 | 25 | 125 | 117.5 | 10 | 50 | 2236 | 1565 | 1006 | 559 | 1000 | 3 |
| TCQE686M025#0060E | E | 68 | 25 | 125 | 170 | 10 | 60 | 2041 | 1429 | 919 | 510 | 1000 | 3 |
| TCQU107M025R0070E | U | 100 | 25 | 125 | 250 | 12 | 70 | 2330 | 1631 | 1048 | 582 | 1000 | 3 |
| 35 Volt | | | | | | | | | | | | | |
| TCQB475M035#0150E | B | 4.7 | 35 | 125 | 16.5 | 8 | 150 | 913 | 639 | 411 | 228 | 1000 | 3 |
| TCQB475M035#0200E | B | 4.7 | 35 | 125 | 16.5 | 8 | 200 | 791 | 553 | 356 | 198 | 1000 | 3 |
| TCQB106M035#0200E | B | 10 | 35 | 125 | 35 | 8 | 200 | 791 | 553 | 356 | 198 | 1000 | 3 |
| TCQD106M035#0070E | D | 10 | 35 | 125 | 35 | 6 | 70 | 1793 | 1255 | 807 | 448 | 1000 | 3 |
| TCQD156M035#0125E | D | 15 | 35 | 125 | 52.5 | 8 | 125 | 1342 | 939 | 604 | 335 | 1000 | 3 |
| TCQD226M035#0065E | D | 22 | 35 | 125 | 77 | 8 | 65 | 1861 | 1302 | 837 | 465 | 1000 | 3 |
| TCQD226M035#0100E | D | 22 | 35 | 125 | 77 | 8 | 100 | 1500 | 1050 | 675 | 375 | 1000 | 3 |
| TCQU336M035R0070E | U | 33 | 35 | 125 | 115.5 | 12 | 70 | 2330 | 1631 | 1048 | 582 | 1000 | 3 |
| TCQE336M035#0065E | E | 33 | 35 | 125 | 115.5 | 10 | 65 | 1961 | 1373 | 883 | 490 | 1000 | 3 |
| TCQE476M035#0075E | E | 47 | 35 | 125 | 164.5 | 10 | 75 | 1826 | 1278 | 822 | 456 | 1000 | 3 |
| TCQU476M035R0070E | U | 47 | 35 | 125 | 164.5 | 12 | 70 | 2330 | 1631 | 1048 | 582 | 1000 | 3 |
| 50 Volt | | | | | | | | | | | | | |
| TCQB225M050#0300E | B | 2.2 | 50 | 125 | 11 | 8 | 300 | 645 | 452 | 290 | 161 | 1000 | 3 |
| TCQB335M050#0300E | B | 3.3 | 50 | 125 | 16.5 | 8 | 300 | 645 | 452 | 290 | 161 | 1000 | 3 |
| TCQD106M050#0090E | D | 10 | 50 | 125 | 50 | 10 | 90 | 1581 | 1107 | 712 | 395 | 1000 | 3 |

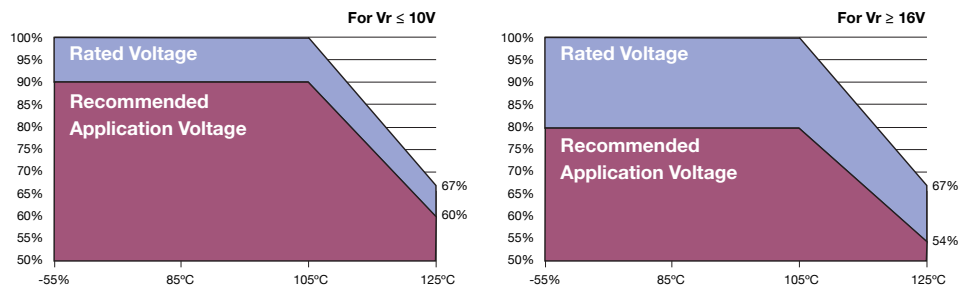
Moisture Sensitivity Level (MSL) is defined according to J-STD-020. All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5RMS with DC bias of 2.2 volts. DCL is measured at rated voltage after 5 minutes.

ESR allowed to move up to 1.25 times catalog limit post mounting. For typical weight and composition, refer to the *Product Safety Information Datasheet* at the end of the Polymer, Tantalum and Niobium Oxide Capacitors catalog. **NOTE: KYOCERA AVX reserves the right to supply higher voltage ratings or tighter tolerance part in the same case size, to the same reliability standards.**

RECOMMENDED DERATING FACTOR

Voltage and temperature derating as percentage of Vr

| Rated voltage | Operating Temperature | | |
|---------------|-----------------------|-------|-------|
| | ≤85°C | 105°C | 125°C |
| ≤10V | 90% | 90% | 60% |
| ≥16V | 80% | 80% | 54% |



TCQ Series

Automotive Conductive Polymer Chip Capacitors



QUALIFICATION TABLE

| TEST | TCQ series (Temperature range -55°C to 125°C) | | | | | | | | | |
|------------------------------|--|---------------|---------------|--------------------|--|------------|-----------|------------|------------|-----------|
| | Condition | | | Characteristics | | | | | | |
| Endurance | Apply 2/3 rated voltage (Ur) at 125°C for 2000 hours through a circuit impedance of $\leq 0.1\Omega/V$. Stabilize at room temperature for 1-2 hours before measuring. | | | Visual examination | no visible damage | | | | | |
| | | | | DCL | 2 x initial limit | | | | | |
| | | | | $\Delta C/C$ | within +10/-20% of initial value | | | | | |
| | | | | DF | 2 x initial limit | | | | | |
| | | | | ESR | 2 x initial limit | | | | | |
| Storage Life | Store at 125°C, no voltage applied, for 2000 hours. Stabilize at room temperature for 1-2 hours before measuring. | | | Visual examination | no visible damage | | | | | |
| | | | | DCL | 2x initial limit | | | | | |
| | | | | $\Delta C/C$ | within +10/-20% of initial value | | | | | |
| | | | | DF | 2 x initial limit | | | | | |
| | | | | ESR | 2 x initial limit | | | | | |
| Biased Humidity | Apply rated voltage (Ur) at 85°C, 85% relative humidity for 1000 hours. Stabilize at room temperature and humidity for 1-2 hours before measuring. | | | Visual examination | no visible damage | | | | | |
| | | | | DCL | 2 x initial limit | | | | | |
| | | | | $\Delta C/C$ | within +35/-5% of initial value | | | | | |
| | | | | DF | 1.5 x initial limit | | | | | |
| | | | | ESR | 2 x initial limit | | | | | |
| Temperature Stability | Step | Temperature°C | Duration(min) | | +20°C | -55°C | +20°C | +85°C | +125°C | +20°C |
| | 1 | +20 | 15 | | | | | | | |
| | 2 | -55 | 15 | DCL | IL* | n/a | IL* | 10 x IL* | 12.5 x IL* | IL* |
| | 3 | +20 | 15 | | | | | | | |
| | 4 | +85 | 15 | $\Delta C/C$ | n/a | $\pm 20\%$ | $\pm 5\%$ | $\pm 20\%$ | $\pm 30\%$ | $\pm 5\%$ |
| | 5 | +125 | 15 | DF | IL* | IL* | IL* | 1.2 x IL* | 1.5 x IL* | IL* |
| | 6 | +20 | 15 | | | | | | | |
| Surge Voltage | Apply 1.3x 2/3x rated voltage (Ur) at 125°C for 1000 cycles of duration 6 min (30 sec charge, 5 min 30 sec discharge) through a charge / discharge resistance of 1000 Ω | | | Visual examination | no visible damage | | | | | |
| | | | | DCL | initial limit | | | | | |
| | | | | $\Delta C/C$ | within +10/-20% of initial value for Vr \leq 10V within +20/-30% of initial value for Vr \geq 16V | | | | | |
| | | | | DF | initial limit for Vr \leq 10V 1.25x initial limit for Vr \geq 16V | | | | | |
| | | | | ESR | 1.25 x initial limit | | | | | |
| Mechanical Shock | MIL-STD-202, Method 213, Condition F | | | Visual examination | no visible damage | | | | | |
| | | | | DCL | initial limit | | | | | |
| | | | | $\Delta C/C$ | within $\pm 10\%$ of initial value | | | | | |
| | | | | DF | initial limit | | | | | |
| | | | | ESR | 1.25 x initial limit | | | | | |
| Vibration | MIL-STD-202, Method 204, Condition D | | | Visual examination | no visible damage | | | | | |
| | | | | DCL | initial limit | | | | | |
| | | | | $\Delta C/C$ | within $\pm 10\%$ of initial value | | | | | |
| | | | | DF | initial limit | | | | | |
| | | | | ESR | 1.25 x initial limit | | | | | |

*Initial Limit

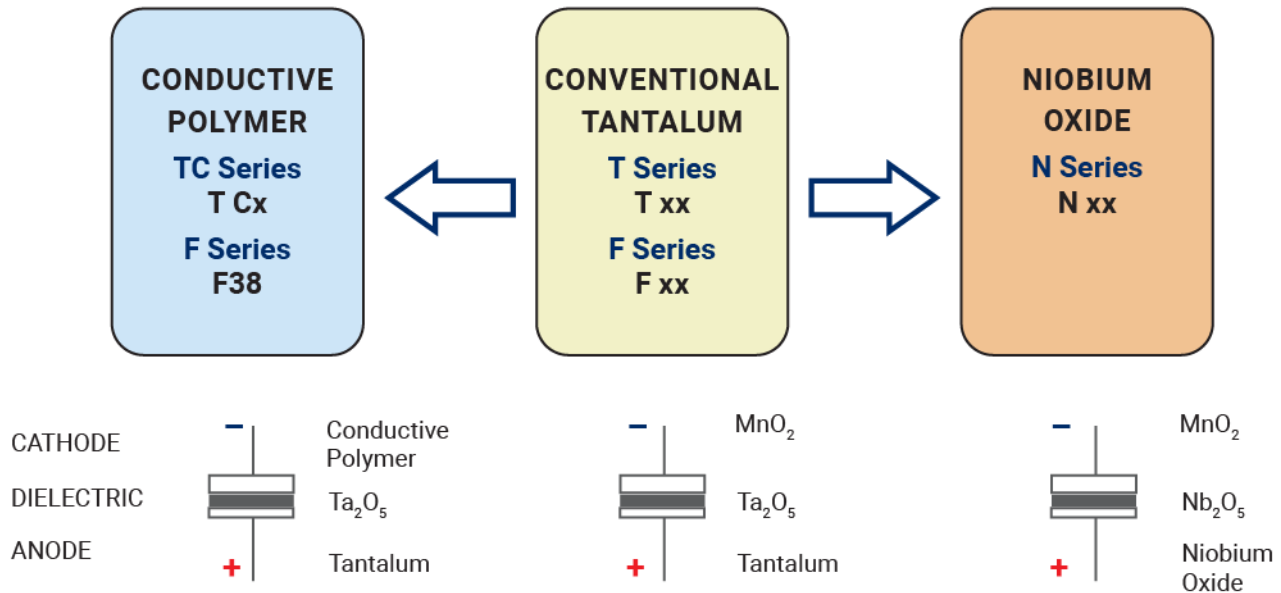
For use outside of recommended conditions and special request, please contact KYOCERA AVX.

Initial measurement max. 1hr after the removal from dry pack or after pretreatment at 85°C for 24 hours.

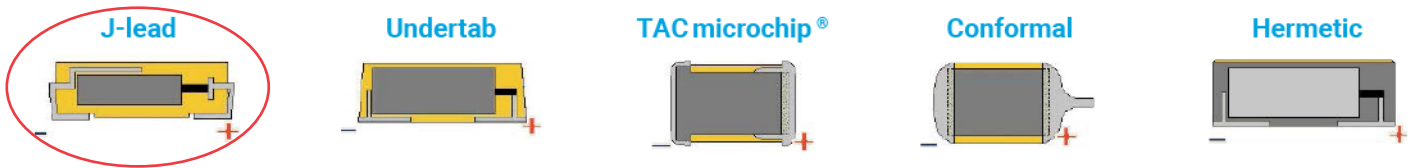
TCQ Series

Automotive Conductive Polymer Chip Capacitors

SOLID ELECTROLYTIC CAPACITOR ROADMAP



FIVE CAPACITOR CONSTRUCTION STYLES



SERIES LINE UP : Conductive Polymer

