

Tantalum Capacitors

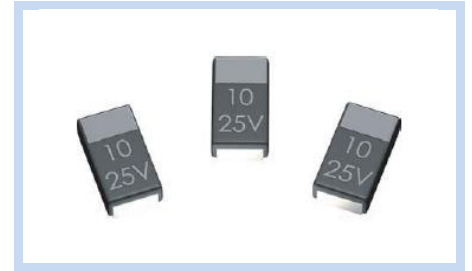
SMD Type

TC Series

MERITEK

FEATURE

- Operating Temperature: -55°C ~ +125°C
- Compatible with automatic pick and place equipment.
- Comply with EIA 535BAAC standard
- Molded case available in A, B, C, D, E, P type



PART NUMBERING SYSTEM

TC 105 M 35 B
 (1) (2) (3) (4) (5)



| No | item | Digit | Part Description | Series Reference |
|-----|----------------|-------|--------------------------|---|
| (1) | Meritek Series | TC | Chip Tantalum Capacitors | SMD Type |
| (2) | Capacitance | 105 | 105: 1000000pF (1μF) | First 2 digits: Significant Third: Multiplier |
| (3) | Tolerance | M | M: ±20% | K: ±10% |
| (4) | Rated Voltage | 35 | 35: 35VDC | 2.5~50VDC, 02: 2.5VDC, 06:6.3VDC, 50: 50VDC |
| (5) | Case Size | B | B: 3528 | A:3216, C:6032, D:7343, E:7343, P:2012 |

SPECIFICATIONS

| Item | Characteristic |
|----------------------------|---|
| Operation Temp. Range | -55°C ~ +125°C |
| Rated Working Voltage | 2.5 ~ 50VDC |
| Capacitance Tolerance | ±20%(M), ±10%(K) |
| Dissipation Factor (tan δ) | See (Temperature Performance) below, Measured at 100 (120) Hz, Voltage: 0.3±0.02V |

RELIABILITY

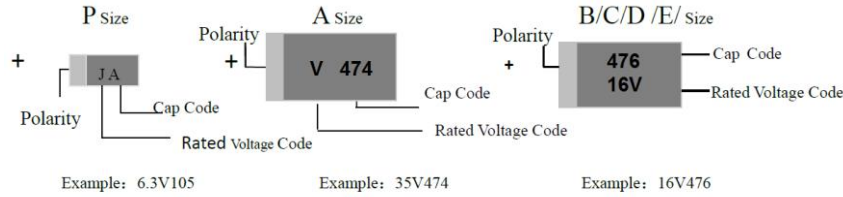
| Item | Characteristic | | | Testing Condition | | | | | | |
|-------------------------|--|------------------------|-------|--|-----------------|-------------------------|-----------------|-----------------|-----------------------|-------------------------|
| Appearance | Complete Marking, Clear, Centered | | | Visual | | | | | | |
| ESR | See Table 2 | | | Measurement Frequency: 100(120)KHz | | | | | | |
| Leakage Current | Less than 0.01CV or 0.5μA (whichever is greater) | | | Pressurize related voltage between two poles (Series connecting 1k current-limiting resistor) Read | | | | | | |
| Solderability | Soldering Coverage Rate ≥ 95% | | | Dip Capacitor into flux for two seconds, then remove excessive amount of flux, dip capacitor into 245±3°C welding slot with 10mm depth for three seconds, withdraw capacitor, clean capacitor with proper amount of solution, use ten times the microscope to observe. | | | | | | |
| Temperature Performance | Capacitance (μF) | Capacitance Change (%) | | | Max D.F (%) | | | | Max DCL(μF) | |
| | | -55°C | +85°C | +125°C | -55°C | +25°C | +85°C | +125°C | +85°C | +125°C |
| | ≤1.0 | -10 | +10 | +12 | 1.5* (+25°C) | See Table 2 Below | 1.5* (+25°C) | 1.5* (+25°C) | 10* I ₀ | 12.5* I ₀ |
| | 1.5 ~ 68 | | | | | | | | | |
| | 100~220 | | | | | | | | | |
| 330~470 | | | | | | | | | | |
| ≥470 | | | | | | | | | | |

Tantalum Capacitors SMD Type

TC Series

MERITEK

PRODUCT MARK AND CODE



| Code | e | G | J | A | C | D | E | V | T |
|---------------|------|----|------|-----|-----|-----|-----|-----|-----|
| Rated Voltage | 2.5V | 4V | 6.3V | 10V | 16V | 20V | 25V | 35V | 50V |

| Cap (μF) | Cap Code | Cap (μF) | Cap Code | Cap (μF) | Cap Code | Cap (μF) | Cap Code |
|----------|----------|----------|----------|----------|----------|----------|----------|
| 0.1 | <u>A</u> | 0.47 | <u>S</u> | 2.2 | J | 10 | <u>A</u> |
| 0.15 | <u>E</u> | 0.68 | <u>W</u> | 3.3 | N | 15 | <u>E</u> |
| 0.22 | <u>J</u> | 1 | A | 4.7 | S | 22 | <u>J</u> |
| 0.33 | <u>N</u> | 1.5 | E | 6.8 | W | 33 | <u>N</u> |

CAPACITANCE RANGE AND CASE CODE (TABLE 1)

| VR (≤ +85°C) | 2.5 | 4 | 6.3 | 10 | 16 | 20 | 25 | 35 | 50 |
|---------------|----------|-----------|---------|---------|---------|-------|-------|-------|-------|
| VC (≤ +125°C) | 1.7 | 2.5 | 4 | 6.3 | 10 | 13 | 16 | 23 | 33 |
| VS (≤ +85°C) | 3.2 | 5 | 8 | 13 | 20 | 26 | 32 | 46 | 65 |
| VR (≤ +125°C) | 2.2 | 3.4 | 5 | 8 | 12 | 16 | 20 | 26 | 38 |
| Cap (μF) | Cap Code | Case Size | | | | | | | |
| 0.1 | 104 | | | | | P | | A | A |
| 0.15 | 154 | | | | | P | | A | A/B |
| 0.22 | 224 | | | | | P | | A | A/B |
| 0.33 | 334 | | | | | P | A | A | A/B |
| 0.47 | 474 | | | | P | P | A | A/B | A/B/C |
| 0.68 | 684 | | | P | P | P/A | A | A/B | A/B/C |
| 1 | 105 | | | P | P | P/A | A | A/B | B/C |
| 1.5 | 155 | | P | P | P/A | P/A | A/B | A/B | A/B/C |
| 2.2 | 225 | | P | P/A | P/A/B | A/B | A/B | A/B/C | B/C |
| 3.3 | 335 | | P/A | P/A | P/A/B | A/B | A/B/C | A/B/C | B/C |
| 4.7 | 475 | | P/A | P/A | P/A/B | A/B | A/B/C | A/B/C | C/D |
| 6.8 | 685 | | P/A | P/A/B | P/A/B | A/B/C | A/B/C | B/C/D | C/D |
| 10 | 106 | | A/B | P/A/B | A/B/C/P | A/B/C | B/C/D | B/C/D | C/D/E |
| 15 | 156 | | A/B | P/A/B/C | A/B/C | A/B/C | B/C/D | C/D | D/E |
| 22 | 226 | | A/B/C | P/A/B/C | A/B/C/I | B/C/D | B/C/D | C/D | D/E |
| 33 | 336 | A | A/B/C | A/B/C | A/B/C/D | B/C/D | C/D | D/E | E |
| 47 | 476 | A | A/B/C | A/B/C/D | A/B/C/D | C/D | D/E | D/E | E |
| 68 | 686 | A | A/B/C/D | A/B/C/D | B/C/D | C/D/E | D/E | E | |
| 100 | 107 | B | A/B/C/D | A/B/C/D | C/D | D/E | D/E | E | |
| 150 | 157 | B | B/C/D | B/C/D/E | C/D/E | D/E | E | | |
| 220 | 227 | B/C | B/C/D | C/D/E | D/E | E | | | |
| 330 | 337 | B/C/D | C/D/E | C/D/E | D/E | E | | | |
| 470 | 477 | C/D | C/D/E | D/E | E | | | | |
| 680 | 687 | D/E | D/E | D/E | | | | | |
| 1000 | 108 | D/E | | | | | | | |

Tantalum Capacitors

SMD Type

TC Series

MERITEK

STANDARD RATINGS (TABLE 2)

| Part Number | Rated VDC | Case Size | Cap (μF) | DCL (μA) Max | DF (%) Max | ESR (Ω) Max (100KHz) |
|-------------------------------|-----------|----------------------|----------|--------------|------------|----------------------|
| 2.5V 85°C (1.7V 125°C) | | | | | | |
| TC336□02A | 2.5 | A | 33 | 0.8 | 6 | 3 |
| TC476□02A | 2.5 | A | 47 | 1.2 | 6 | 3 |
| TC686□02A | 2.5 | A | 68 | 1.7 | 6 | 1.5 |
| TC107□02B | 2.5 | B | 100 | 2.5 | 8 | 1.4 |
| TC157□02B | 2.5 | B | 150 | 3.8 | 8 | 1.6 |
| TC227□02B | 2.5 | B | 220 | 5.5 | 8 | 1.6 |
| TC227□02C | 2.5 | C | 220 | 5.5 | 8 | 0.9 |
| TC337□02B | 2.5 | B | 330 | 8.3 | 12 | 1.6 |
| TC337□02C | 2.5 | C | 330 | 8.3 | 12 | 0.9 |
| TC337□02D | 2.5 | D | 330 | 8.3 | 12 | 0.9 |
| TC477□02C | 2.5 | C | 470 | 11.8 | 12 | 0.9 |
| TC477□02D | 2.5 | D | 470 | 11.8 | 12 | 0.9 |
| TC687□02D | 2.5 | D | 680 | 17 | 14 | 0.9 |
| TC687□02E | 2.5 | E | 680 | 17 | 14 | 0.5 |
| TC108□02D | 2.5 | D | 1000 | 25 | 14 | 0.5 |
| TC108□02E | 2.5 | E | 1000 | 25 | 14 | 0.5 |
| 4.0V 85°C (2.5V 125°C) | | | | | | |
| TC155□04P | 4.0 | P | 1.5 | 0.5 | 6 | 20 |
| TC225□04P | 4.0 | P | 2.2 | 0.5 | 6 | 18 |
| TC335□04P | 4.0 | P | 3.3 | 0.5 | 6 | 15 |
| TC475□04P | 4.0 | P | 4.7 | 0.5 | 6 | 12 |
| TC685□04P | 4.0 | P | 6.8 | 0.5 | 6 | 10 |
| TC335□04A | 4.0 | A | 3.3 | 0.5 | 6 | 8 |
| TC475□04A | 4.0 | A | 4.7 | 0.5 | 6 | 8 |
| TC685□04A | 4.0 | A | 6.8 | 0.5 | 6 | 6 |
| TC106□04A | 4.0 | A | 10 | 0.5 | 6 | 6 |
| TC106□04B | 4.0 | B | 10 | 0.5 | 6 | 3.5 |
| TC156□04A | 4.0 | A | 15 | 0.6 | 6 | 4 |
| TC156□04B | 4.0 | B | 15 | 0.6 | 6 | 3.5 |
| TC226□04A | 4.0 | A | 22 | 0.9 | 6 | 4 |
| TC226□04B | 4.0 | B | 22 | 0.9 | 6 | 3.5 |
| TC226□04C | 4.0 | C | 22 | 0.9 | 6 | 1.8 |
| TC336□04A | 4.0 | A | 33 | 1.3 | 6 | 4 |
| TC336□04B | 4.0 | B | 33 | 1.3 | 6 | 3.5 |
| TC336□04C | 4.0 | C | 33 | 1.3 | 6 | 1.8 |
| TC476□04A | 4.0 | A | 47 | 1.9 | 6 | 3 |
| TC476□04B | 4.0 | B | 47 | 1.9 | 6 | 2.5 |
| TC476□04C | 4.0 | C | 47 | 1.9 | 6 | 1.8 |
| TC686□04A | 4.0 | A | 68 | 2.7 | 8 | 3 |
| TC686□04B | 4.0 | B | 68 | 2.7 | 6 | 1.8 |
| TC686□04C | 4.0 | C | 68 | 2.7 | 6 | 1.6 |
| TC686□04D | 4.0 | D | 68 | 2.7 | 6 | 0.8 |
| TC107□04A | 4.0 | A ^(NOTE2) | 100 | 4 | 16 | 4.5 |
| TC107□04B | 4.0 | B ^(NOTE1) | 100 | 4 | 8 | 1.8 |

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STANDARD RATINGS (CONTINUE TABLE 2)

| Part Number | Rated VDC | Case Size | Cap (μF) | DCL (μA) Max | DF (%) Max | ESR (Ω) Max (100KHz) |
|--|-----------|----------------------|----------|--------------|------------|----------------------|
| Continue 4.0V 85°C (2.5V 125°C) | | | | | | |
| TC107□04C | 4.0 | C | 100 | 4 | 8 | 1.2 |
| TC107□04D | 4.0 | D | 100 | 4 | 8 | 0.8 |
| TC157□04B | 4.0 | B ^(NOTE1) | 150 | 6 | 8 | 1.5 |
| TC157□04C | 4.0 | C | 150 | 6 | 8 | 1.2 |
| TC157□04D | 4.0 | D | 150 | 6 | 8 | 1.2 |
| TC227□04B | 4.0 | B ^(NOTE2) | 220 | 8.8 | 18 | 2 |
| TC227□04C | 4.0 | C | 220 | 8.8 | 8 | 1.2 |
| TC227□04D | 4.0 | D | 220 | 8.8 | 8 | 0.9 |
| TC337□04C | 4.0 | C | 330 | 13.2 | 12 | 0.9 |
| TC337□04D | 4.0 | D | 330 | 13.2 | 12 | 0.9 |
| TC337□04E | 4.0 | E | 330 | 13.2 | 12 | 0.9 |
| TC477□04C | 4.0 | C | 470 | 18.8 | 12 | 0.9 |
| TC477□04D | 4.0 | D | 470 | 18.8 | 12 | 0.9 |
| TC477□04E | 4.0 | E | 470 | 18.8 | 12 | 0.5 |
| TC687□04D | 4.0 | D ^(NOTE2) | 680 | 27.2 | 14 | 0.5 |
| TC687□04E | 4.0 | E ^(NOTE2) | 680 | 27.2 | 14 | 0.5 |
| 6.3V 85°C (4.0V 125°C) | | | | | | |
| TC105□06P | 6.3 | P | 1 | 0.5 | 6 | 25 |
| TC155□06P | 6.3 | P | 1.5 | 0.5 | 6 | 10 |
| TC225□06P | 6.3 | P | 2.2 | 0.5 | 6 | 20 |
| TC225□06A | 6.3 | A | 2.2 | 0.5 | 6 | 8 |
| TC335□06P | 6.3 | P | 3.3 | 0.5 | 6 | 10 |
| TC335□06A | 6.3 | A | 3.3 | 0.5 | 6 | 8 |
| TC475□06P | 6.3 | P | 4.7 | 0.5 | 6 | 7 |
| TC475□06A | 6.3 | A | 4.7 | 0.5 | 6 | 6 |
| TC685□06P | 6.3 | P | 6.8 | 0.5 | 8 | 6 |
| TC685□06A | 6.3 | A | 6.8 | 0.5 | 6 | 6 |
| TC685□06B | 6.3 | B | 6.8 | 0.5 | 6 | 3.5 |
| TC106□06P | 6.3 | P | 10 | 0.6 | 6 | 8 |
| TC106□06A | 6.3 | A | 10 | 0.6 | 6 | 4 |
| TC106□06B | 6.3 | B | 10 | 0.6 | 6 | 3.5 |
| TC156□06P | 6.3 | P | 15 | 0.9 | 12 | 5 |
| TC156□06A | 6.3 | A | 15 | 0.9 | 6 | 3.5 |
| TC156□06B | 6.3 | B | 15 | 0.9 | 6 | 3.5 |
| TC156□06C | 6.3 | C | 15 | 0.9 | 6 | 1.8 |
| TC226□06P | 6.3 | P | 22 | 1.4 | 18 | 10 |
| TC226□06A | 6.3 | A | 22 | 1.4 | 6 | 4 |
| TC226□06B | 6.3 | B | 22 | 1.4 | 6 | 3.5 |
| TC226□06C | 6.3 | C | 22 | 1.4 | 6 | 1.8 |
| TC336□06A | 6.3 | A | 33 | 2.1 | 8 | 2.5 |
| TC336□06B | 6.3 | B | 33 | 2.1 | 6 | 2.5 |
| TC336□06C | 6.3 | C | 33 | 2.1 | 6 | 1.8 |
| TC476□06A | 6.3 | A | 47 | 4 | 10 | 3.5 |
| TC476□06B | 6.3 | B | 47 | 4 | 6 | 2 |

Tantalum Capacitors

SMD Type

TC Series

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STANDARD RATINGS (CONTINUE TABLE 2)

| Part Number | Rated VDC | Case Size | Cap (μF) | DCL (μA) Max | DF (%) Max | ESR (Ω) Max (100KHz) |
|--|-----------|----------------------|----------|--------------|------------|----------------------|
| Continue 6.3V 85°C (4.0V 125°C) | | | | | | |
| TC476□06C | 6.3 | C | 47 | 4 | 6 | 1.6 |
| TC476□06D | 6.3 | D | 47 | 4 | 6 | 0.8 |
| TC686□06A | 6.3 | A ^(NOTE2) | 68 | 4.3 | 16 | 4 |
| TC686□06B | 6.3 | B | 68 | 4.3 | 6 | 0.9 |
| TC686□06C | 6.3 | C | 68 | 4.3 | 6 | 1.2 |
| TC686□06D | 6.3 | D | 68 | 4.3 | 6 | 0.8 |
| TC107□06A | 6.3 | A ^(NOTE2) | 100 | 6.3 | 30 | 4 |
| TC107□06B | 6.3 | B ^(NOTE1) | 100 | 6.3 | 10 | 3 |
| TC107□06C | 6.3 | C | 100 | 6.3 | 8 | 0.9 |
| TC107□06D | 6.3 | D | 100 | 6.3 | 8 | 0.8 |
| TC157□06B | 6.3 | B ^(NOTE2) | 150 | 9.5 | 15 | 1.5 |
| TC157□06C | 6.3 | C | 150 | 9.5 | 8 | 1.2 |
| TC157□06D | 6.3 | D | 150 | 9.5 | 8 | 0.9 |
| TC157□06E | 6.3 | E | 150 | 9.5 | 8 | 0.5 |
| TC227□06B | 6.3 | B | 220 | 13.9 | 18 | 1.0 |
| TC227□06C | 6.3 | C | 220 | 13.9 | 8 | 1.2 |
| TC227□06D | 6.3 | D | 220 | 13.9 | 8 | 0.9 |
| TC227□06E | 6.3 | E | 220 | 13.9 | 8 | 0.9 |
| TC337□06D | 6.3 | D | 330 | 20.8 | 12 | 0.9 |
| TC337□06E | 6.3 | E | 330 | 20.8 | 12 | 0.9 |
| TC477□06D | 6.3 | D ^(NOTE1) | 470 | 29.6 | 12 | 0.4 |
| TC477□06E | 6.3 | E ^(NOTE1) | 470 | 29.6 | 12 | 0.4 |
| TC687□06D | 6.3 | D ^(NOTE2) | 680 | 42.8 | 14 | 0.5 |
| TC687□06E | 6.3 | E ^(NOTE2) | 680 | 42.8 | 14 | 0.5 |
| 10V 85°C (6.3V 125°C) | | | | | | |
| TC684□10P | 10 | P | 0.68 | 0.5 | 4 | 28 |
| TC105□10P | 10 | P | 1 | 0.5 | 4 | 25 |
| TC155□10P | 10 | P | 1.5 | 0.5 | 6 | 15 |
| TC155□10A | 10 | A | 1.5 | 0.5 | 6 | 8 |
| TC225□10P | 10 | P | 2.2 | 0.5 | 6 | 10 |
| TC225□10A | 10 | A | 2.2 | 0.5 | 6 | 8 |
| TC225□10B | 10 | B | 2.2 | 0.5 | 6 | 3.5 |
| TC335□10P | 10 | P | 3.3 | 0.5 | 8 | 10 |
| TC335□10A | 10 | A | 3.3 | 0.5 | 6 | 6 |
| TC335□10B | 10 | B | 3.3 | 0.5 | 6 | 5 |
| TC475□10P | 10 | P | 4.7 | 0.5 | 8 | 6 |
| TC475□10A | 10 | A | 4.7 | 0.5 | 6 | 5 |
| TC475□10B | 10 | B | 4.7 | 0.5 | 6 | 3.5 |
| TC685□10A | 10 | A | 6.8 | 0.7 | 6 | 4 |
| TC685□10P | 10 | P | 6.8 | 0.7 | 8 | 6 |
| TC685□10B | 10 | B | 6.8 | 0.7 | 6 | 3.5 |
| TC106□10P | 10 | P | 10 | 1 | 14 | 6 |
| TC106□10A | 10 | A | 10 | 1 | 6 | 4 |
| TC106□10B | 10 | B | 10 | 1 | 6 | 3.5 |

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STANDARD RATINGS (CONTINUE TABLE 2)

| Part Number | Rated VDC | Case Size | Cap (μF) | DCL (μA) Max | DF (%) Max | ESR (Ω) Max (100KHz) |
|---------------------------------------|-----------|----------------------|----------|--------------|------------|----------------------|
| Continue 10V 85°C (6.3V 125°C) | | | | | | |
| TC106□10C | 10 | C | 10 | 1 | 6 | 1.8 |
| TC156□10A | 10 | A | 15 | 1.5 | 6 | 6 |
| TC156□10B | 10 | B | 15 | 1.5 | 6 | 2.8 |
| TC156□10C | 10 | C | 15 | 1.5 | 6 | 1.8 |
| TC226□10A | 10 | A | 22 | 2.2 | 8 | 6 |
| TC226□10B | 10 | B | 22 | 2.2 | 6 | 2.4 |
| TC226□10C | 10 | C | 22 | 2.2 | 6 | 1.8 |
| TC336□10A | 10 | A ^(NOTE2) | 33 | 3.3 | 15 | 3.0 |
| TC336□10B | 10 | B | 33 | 3.3 | 6 | 1.8 |
| TC336□10C | 10 | C | 33 | 3.3 | 6 | 1.6 |
| TC336□10D | 10 | D | 33 | 3.3 | 6 | 0.8 |
| TC476□10A | 10 | A | 47 | 4.7 | 12 | 2.5 |
| TC476□10B | 10 | B | 47 | 4.7 | 8 | 1 |
| TC476□10C | 10 | C | 47 | 4.7 | 6 | 1.2 |
| TC476□10D | 10 | D | 47 | 4.7 | 6 | 0.8 |
| TC686□10B | 10 | B ^(NOTE2) | 68 | 6.8 | 10 | 3 |
| TC686□10C | 10 | C | 68 | 6.8 | 6 | 1.2 |
| TC686□10D | 10 | D | 68 | 6.8 | 6 | 0.8 |
| TC107□10C | 10 | C | 100 | 10 | 8 | 1.2 |
| TC107□10B | 10 | B ^(NOTE2) | 100 | 10 | 15 | 1.2 |
| TC107□10D | 10 | D | 100 | 10 | 8 | 0.9 |
| TC157□10C | 10 | C ^(NOTE2) | 150 | 15 | 10 | 1.5 |
| TC157□10D | 10 | D | 150 | 15 | 8 | 0.9 |
| TC157□10E | 10 | E | 150 | 15 | 8 | 0.9 |
| TC227□10D | 10 | D | 220 | 22 | 8 | 0.5 |
| TC227□10E | 10 | E | 220 | 22 | 8 | 0.5 |
| TC337□10D | 10 | D ^(NOTE1) | 330 | 33 | 12 | 0.5 |
| TC337□10E | 10 | E ^(NOTE1) | 330 | 33 | 12 | 0.5 |
| TC477□10E | 10 | E ^(NOTE1) | 470 | 47 | 12 | 0.5 |
| 16V 85°C (10V 125°C) | | | | | | |
| TC474□16P | 16 | P | 0.47 | 0.5 | 4 | 25 |
| TC684□16P | 16 | P | 0.68 | 0.5 | 4 | 25 |
| TC105□16P | 16 | P | 1 | 0.5 | 4 | 20 |
| TC105□16A | 16 | A | 1 | 0.5 | 4 | 11 |
| TC155□16P | 16 | P | 1.5 | 0.5 | 6 | 20 |
| TC155□16A | 16 | A | 1.5 | 0.5 | 6 | - |
| TC225□16A | 16 | A | 2.2 | 0.5 | 6 | 6 |
| TC225□16B | 16 | B | 2.2 | 0.5 | 6 | 4.6 |
| TC335□16A | 16 | A | 3.3 | 0.5 | 6 | 5 |
| TC335□16B | 16 | B | 3.3 | 0.5 | 6 | 3.5 |
| TC475□16A | 16 | A | 4.7 | 0.8 | 6 | 4 |
| TC475□16B | 16 | B | 4.7 | 0.8 | 6 | 3.5 |
| TC685□16B | 16 | B | 6.8 | 1.1 | 6 | 2.5 |
| TC685□16A | 16 | A | 6.8 | 1.1 | 6 | 3.5 |

Tantalum Capacitors

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TC Series

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STANDARD RATINGS (CONTINUE TABLE 2)

| Part Number | Rated VDC | Case Size | Cap (μF) | DCL (μA) Max | DF (%) Max | ESR (Ω) Max (100KHz) |
|--------------------------------------|-----------|----------------------|----------|--------------|------------|----------------------|
| Continue 16V 85°C (10V 125°C) | | | | | | |
| TC685□16C | 16 | C | 6.8 | 1.1 | 6 | 1.9 |
| TC106□16A | 16 | A ^(NOTE1) | 10 | 1.6 | 8 | 7 |
| TC106□16B | 16 | B | 10 | 1.6 | 6 | 2.8 |
| TC106□16C | 16 | C | 10 | 1.6 | 6 | 2 |
| TC156□16A | 16 | A ^(NOTE2) | 15 | 2.4 | 10 | 3.5 |
| TC156□16B | 16 | B | 15 | 2.4 | 6 | 2.5 |
| TC156□16C | 16 | C | 15 | 2.4 | 6 | 1.8 |
| TC226□16B | 16 | B | 22 | 3.5 | 8 | 2.2 |
| TC226□16C | 16 | C | 22 | 3.5 | 6 | 1.6 |
| TC226□16D | 16 | D | 22 | 3.5 | 6 | 1.1 |
| TC336□16B | 16 | B ^(NOTE1) | 33 | 5.3 | 8 | 2.1 |
| TC336□16C | 16 | C | 33 | 5.3 | 6 | 1.5 |
| TC336□16D | 16 | D | 33 | 5.3 | 6 | 0.9 |
| TC476□16C | 16 | C | 47 | 7.5 | 6 | 1.4 |
| TC476□16D | 16 | D | 47 | 7.5 | 6 | 0.9 |
| TC686□16C | 16 | C | 68 | 10.9 | 6 | 1.3 |
| TC686□16D | 16 | D | 68 | 10.9 | 6 | 0.9 |
| TC107□16C | 16 | C | 100 | 16 | 8 | 1.2 |
| TC107□16D | 16 | D | 100 | 16 | 8 | 0.9 |
| TC107□16E | 16 | E | 100 | 16 | 8 | 0.9 |
| TC157□16D | 16 | D ^(NOTE1) | 150 | 24 | 10 | 0.9 |
| TC157□16E | 16 | E ^(NOTE1) | 150 | 24 | 10 | 0.5 |
| TC227□16E | 16 | E ^(NOTE2) | 220 | 35.2 | 10 | 0.5 |
| 20V 85°C (13V 125°C) | | | | | | |
| TC104□20P | 20 | P | 0.1 | 0.5 | 4 | 25 |
| TC154□20P | 20 | P | 0.15 | 0.5 | 4 | 25 |
| TC224□20P | 20 | P | 0.22 | 0.5 | 4 | 25 |
| TC334□20P | 20 | P | 0.33 | 0.5 | 4 | 25 |
| TC474□20P | 20 | P | 0.47 | 0.5 | 4 | 25 |
| TC684□20P | 20 | P | 0.68 | 0.5 | 4 | 25 |
| TC684□20A | 20 | A | 0.68 | 0.5 | 4 | 12 |
| TC105□20A | 20 | A | 1 | 0.5 | 4 | 9 |
| TC155□20A | 20 | A | 1.5 | 0.5 | 6 | 6.5 |
| TC155□20B | 20 | B | 1.5 | 0.5 | 6 | 5 |
| TC225□20A | 20 | A | 2.2 | 0.5 | 6 | 7 |
| TC225□20B | 20 | B | 2.2 | 0.5 | 6 | 3.5 |
| TC335□20A | 20 | A | 3.3 | 0.7 | 6 | 4.5 |
| TC335□20B | 20 | B | 3.3 | 0.7 | 6 | 3 |
| TC335□20C | 20 | C | 3.3 | 0.7 | 6 | 2.5 |
| TC475□20A | 20 | A | 4.7 | 0.9 | 6 | 4 |
| TC475□20C | 20 | C | 4.7 | 0.9 | 6 | 2.4 |
| TC475□20B | 20 | B | 4.7 | 0.9 | 6 | 3 |
| TC685□20A | 20 | A | 6.8 | 1.4 | 6 | 6 |
| TC685□20B | 20 | B | 6.8 | 1.4 | 6 | 2.5 |

Tantalum Capacitors

SMD Type

TC Series

MERITEK

STANDARD RATINGS (CONTINUE TABLE 2)

| Part Number | Rated VDC | Case Size | Cap (μ F) | DCL (μ A) Max | DF (%) Max | ESR (Ω) Max (100KHz) |
|--------------------------------------|-----------|----------------------|----------------|--------------------|------------|-------------------------------|
| Continue 20V 85°C (13V 125°C) | | | | | | |
| TC685□20C | 20 | C | 6.8 | 1.4 | 6 | 2 |
| TC106□20C | 20 | C | 10 | 2 | 6 | 1.8 |
| TC106□20D | 20 | D | 10 | 2 | 6 | 1.3 |
| TC156□20B | 20 | B | 15 | 3 | 6 | 2 |
| TC156□20C | 20 | C | 15 | 3 | 6 | 1.7 |
| TC156□20D | 20 | D | 15 | 3 | 6 | 1 |
| TC226□20B | 20 | B ^(NOTE2) | 22 | 4.4 | 8 | 2.5 |
| TC226□20C | 20 | C | 22 | 4.4 | 6 | 1.6 |
| TC226□20D | 20 | D | 22 | 4.4 | 6 | 0.9 |
| TC336□20C | 20 | C | 33 | 6.6 | 6 | 1.5 |
| TC336□20D | 20 | D | 33 | 6.6 | 6 | 0.9 |
| TC476□20D | 20 | D | 47 | 9.4 | 6 | 0.9 |
| TC476□20E | 20 | E | 47 | 9.4 | 6 | 0.9 |
| TC686□20D | 20 | D ^(NOTE1) | 68 | 13.6 | 6 | 0.9 |
| TC686□20E | 20 | E | 68 | 13.6 | 6 | 0.9 |
| TC107□20D | 20 | D ^(NOTE1) | 100 | 20 | 8 | 0.9 |
| TC107□20E | 20 | E ^(NOTE1) | 100 | 20 | 8 | 0.5 |
| TC157□20E | 20 | E ^(NOTE1) | 150 | 30 | 8 | 0.5 |
| 25V 85°C (16V 125°C) | | | | | | |
| TC334□25A | 25 | A | 0.33 | 0.5 | 4 | 15 |
| TC474□25A | 25 | A | 0.47 | 0.5 | 4 | 14 |
| TC684□25A | 25 | A | 0.68 | 0.5 | 4 | 10 |
| TC105□25A | 25 | A | 1 | 0.5 | 4 | 8 |
| TC105□25B | 25 | B | 1 | 0.5 | 4 | 5 |
| TC155□25A | 25 | A | 1.5 | 0.5 | 6 | 7.5 |
| TC155□25B | 25 | B | 1.5 | 0.5 | 6 | 5 |
| TC225□25A | 25 | A | 2.2 | 0.6 | 6 | 7 |
| TC225□25B | 25 | B | 2.2 | 0.6 | 6 | 4.5 |
| TC225□25C | 25 | C | 2.2 | 0.6 | 6 | 3.5 |
| TC335□25A | 25 | A | 3.3 | 0.8 | 6 | 4.5 |
| TC335□25B | 25 | B | 3.3 | 0.8 | 6 | 3.5 |
| TC475□25A | 25 | A ^(NOTE2) | 4.7 | 1.2 | 8 | 2.5 |
| TC475□25B | 25 | B | 4.7 | 1.2 | 6 | 2.8 |
| TC475□25C | 25 | C | 4.7 | 1.2 | 6 | 2.4 |
| TC685□25B | 25 | B | 6.8 | 1.7 | 6 | 2.8 |
| TC685□25C | 25 | C | 6.8 | 1.7 | 6 | 2 |
| TC156□25C | 25 | C | 15 | 3.8 | 6 | 1.6 |
| TC156□25D | 25 | D | 15 | 3.8 | 6 | 1 |
| TC226□25C | 25 | C | 22 | 5.5 | 6 | 1.4 |
| TC226□25D | 25 | D | 22 | 5.5 | 6 | 0.9 |
| TC336□25E | 25 | E | 33 | 8.3 | 6 | 0.9 |
| TC476□25D | 25 | D ^(NOTE1) | 47 | 11.8 | 6 | 0.9 |
| TC476□25E | 25 | E ^(NOTE1) | 47 | 11.8 | 6 | 0.9 |
| TC686□25E | 25 | E ^(NOTE1) | 68 | 18 | 6 | 0.9 |

Tantalum Capacitors

SMD Type

TC Series

MERITEK

STANDARD RATINGS (CONTINUE TABLE 2)

| Part Number | Rated VDC | Case Size | Cap (μ F) | DCL (μ A) Max | DF (%) Max | ESR (Ω) Max (100KHz) |
|--------------------------------------|-----------|----------------------|----------------|--------------------|------------|-------------------------------|
| Continue 25V 85°C (16V 125°C) | | | | | | |
| TC107□25E | 25 | E ^(NOTE1) | 100 | 25 | 8 | 0.6 |
| 35V 85°C (23V 125°C) | | | | | | |
| TC104□35A | 35 | A | 0.1 | 0.5 | 4 | 24 |
| TC154□35A | 35 | A | 0.15 | 0.5 | 4 | 21 |
| TC224□35A | 35 | A | 0.22 | 0.5 | 4 | 18 |
| TC334□35A | 35 | A | 0.33 | 0.5 | 4 | 15 |
| TC474□35A | 35 | A | 0.47 | 0.5 | 4 | 12 |
| TC474□35B | 35 | B | 0.47 | 0.5 | 4 | 10 |
| TC684□35A | 35 | A | 0.68 | 0.5 | 4 | 8 |
| TC684□35B | 35 | B | 0.68 | 0.5 | 4 | 8 |
| TC105□35A | 35 | A | 1 | 0.5 | 6 | 7.5 |
| TC105□35B | 35 | B | 1 | 0.5 | 6 | 6.5 |
| TC155□35A | 35 | A | 1.5 | 0.5 | 6 | 7.5 |
| TC155□35B | 35 | B | 1.5 | 0.5 | 6 | 5.2 |
| TC155□35C | 35 | C | 1.5 | 0.5 | 6 | 4.5 |
| TC225□35B | 35 | B | 2.2 | 0.8 | 6 | 4.2 |
| TC225□35C | 35 | C | 2.2 | 0.8 | 6 | 3.5 |
| TC335□35B | 35 | B | 3.3 | 1.2 | 6 | 3.5 |
| TC335□35C | 35 | C | 3.3 | 1.2 | 6 | 2.5 |
| TC475□35D | 35 | D | 4.7 | 1.6 | 6 | 1.5 |
| TC685□35C | 35 | C | 6.8 | 2.4 | 6 | 1.8 |
| TC685□35D | 35 | D | 6.8 | 2.4 | 6 | 1.3 |
| TC106□35C | 35 | C | 10 | 3.5 | 6 | 1.6 |
| TC106□35D | 35 | D | 10 | 3.5 | 6 | 1 |
| TC106□35E | 35 | E | 10 | 3.5 | 6 | 0.9 |
| TC156□35D | 35 | D | 15 | 5.3 | 6 | 0.9 |
| TC156□35E | 35 | E | 15 | 5.3 | 6 | 0.8 |
| TC226□35D | 35 | D | 22 | 7.7 | 6 | 0.9 |
| TC226□35E | 35 | E | 22 | 7.7 | 6 | 0.7 |
| TC336□35E | 35 | E | 33 | 11.6 | 6 | 0.6 |
| TC476□35E | 35 | E | 47 | 16.5 | 8 | 0.6 |
| 50V 85°C (33V 125°C) | | | | | | |
| TC104□50A | 50 | A | 0.1 | 0.5 | 4 | 22 |
| TC154□50A | 50 | A | 0.15 | 0.5 | 4 | 15 |
| TC154□50B | 50 | B | 0.15 | 0.5 | 4 | 16 |
| TC224□50A | 50 | A | 0.22 | 0.5 | 4 | 18 |
| TC224□50B | 50 | B | 0.22 | 0.5 | 4 | 14 |
| TC334□50A | 50 | A | 0.33 | 0.5 | 4 | 12 |
| TC334□50B | 50 | B | 0.33 | 0.5 | 4 | 12 |
| TC474□50A | 50 | A | 0.47 | 0.5 | 4 | 9.5 |
| TC474□50B | 50 | B | 0.47 | 0.5 | 4 | 9.5 |
| TC474□50C | 50 | C | 0.47 | 0.5 | 4 | 8 |
| TC684□50A | 50 | A | 0.68 | 0.5 | 4 | 8 |
| TC684□50B | 50 | B | 0.68 | 0.5 | 4 | 8 |

Tantalum Capacitors SMD Type

TC Series

MERITEK

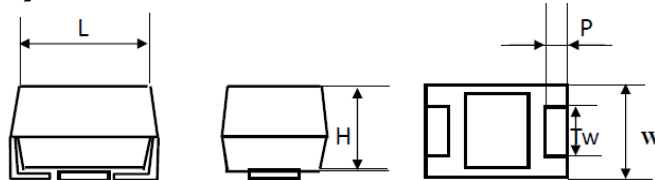
STANDARD RATINGS (CONTINUE TABLE 2)

| Part Number | Rated VDC | Case Size | Cap (μF) | DCL (μA) Max | DF (%) Max | ESR (Ω) Max (100KHz) |
|-------------------------------|-----------|-----------|----------|--------------|------------|----------------------|
| Continue 50V 85°C (33V 125°C) | | | | | | |
| TC684□50C | 50 | C | 0.68 | 0.5 | 4 | 7 |
| TC105□50B | 50 | B | 1 | 0.5 | 4 | 7 |
| TC105□50C | 50 | C | 1 | 0.5 | 4 | 5.5 |
| TC155□50C | 50 | C | 1.5 | 0.8 | 6 | 4.5 |
| TC155□50D | 50 | D | 1.5 | 0.8 | 6 | 4 |
| TC225□50C | 50 | C | 2.2 | 1.1 | 6 | 3 |
| TC225□50D | 50 | D | 2.2 | 1.1 | 6 | 2.5 |
| TC335□50C | 50 | C | 3.3 | 1.7 | 6 | 2.5 |
| TC335□50D | 50 | D | 3.3 | 1.7 | 6 | 2 |
| TC475□50C | 50 | C | 4.7 | 2.4 | 6 | 1.4 |
| TC475□50D | 50 | D | 4.7 | 2.4 | 6 | 1.4 |
| TC106□50D | 50 | D | 10 | 5 | 6 | 0.8 |
| TC106□50E | 50 | E | 10 | 5 | 6 | 0.7 |
| TC156□50E | 50 | E | 15 | 7.5 | 6 | 0.7 |

Notes:

1. Indicates capacitance change of ±15% at 125°C
2. Indicates capacitance change of ± 20% at 125°C, (M-Class Only)
3. "□" Indicates the tolerance: K: ±10%, M: ±20%
4. All technical data measured at 25°C.
5. Capacitance and loss test conditions: U=1.7~2.2V, U partial = 0 ~ 1V (RMS), the measurement frequency: 100(120) Hz
6. The leakage current should be measured after 5 minutes application of rated voltage should ±125°C with voltage derating.

DIMENSIONS (Unit: mm)



| CASE | EIA SIZE | L | W | H | P | Tw |
|------|----------|---------|---------|---------|---------|---------|
| A | 3216 | 3.2±0.2 | 1.6±0.2 | 1.6±0.2 | 0.8±0.3 | 1.2±0.1 |
| B | 3528 | 3.5±0.2 | 2.8±0.2 | 1.9±0.2 | 0.8±0.3 | 2.2±0.1 |
| C | 6032 | 6.0±0.3 | 3.2±0.3 | 2.5±0.3 | 1.3±0.3 | 2.2±0.1 |
| D | 7343 | 7.3±0.3 | 4.3±0.3 | 2.8±0.3 | 1.3±0.3 | 2.4±0.1 |
| E | 7343 | 7.3±0.3 | 4.3±0.3 | 4.0±0.3 | 1.3±0.3 | 2.4±0.1 |
| P | 2012 | 2.0±0.2 | 1.2±0.2 | 1.2±0.2 | 0.5±0.3 | 1.2±0.1 |

Unit: mm

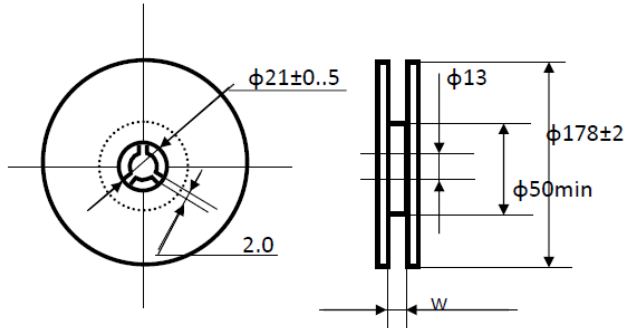
Tantalum Capacitors SMD Type

TC Series

MERITEK

PACKAGING DIMENSION

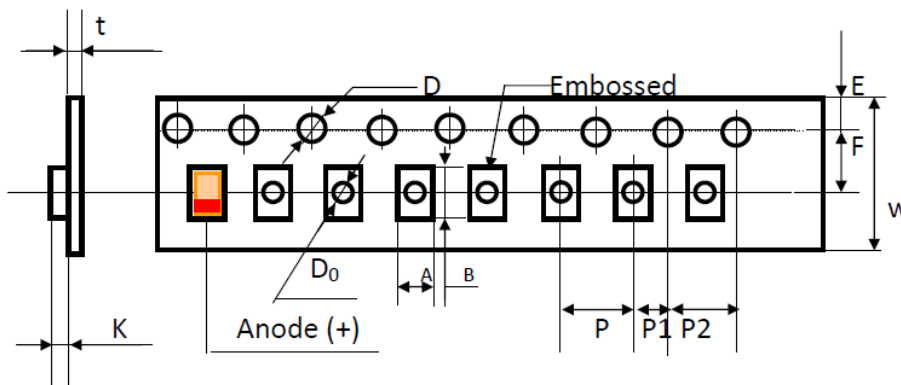
A. REEL DIMENSION



| Case | W | QTY / Reel |
|------|---------|------------|
| A, B | 8.4±1.5 | 2000 |
| C, D | 12.4±2 | 500 |
| E | 12.4±2 | 400 |
| P | 8.4±1.5 | 3000 |

Unit: mm

B. CARRIER TAPE DIMENSION



| Case | W±0.3 | F±0.1 | E±0.1 | P±0.1 | P1±0.1 | P2±0.1 | D+0.1 | D ₀ MIN | t±0.3 | A±0.2 | B±0.2 | K±0.2 |
|------|-------|-------|-------|-------|--------|--------|-------|--------------------|-------|-------|-------|-------|
| A | 8 | 3.5 | 1.75 | 4 | 2 | 4 | Ø1.5 | Ø1.0 | 0.2 | 1.9 | 3.5 | 1.9 |
| B | 8 | 3.5 | 1.75 | 4 | 2 | 4 | Ø1.5 | Ø1.0 | 0.3 | 3.3 | 3.8 | 2.1 |
| C | 12 | 5.5 | 1.75 | 8 | 2 | 4 | Ø1.5 | Ø1.5 | 0.3 | 3.7 | 6.4 | 3.0 |
| D | 12 | 5.5 | 1.75 | 8 | 2 | 4 | Ø1.5 | Ø1.5 | 0.3 | 4.8 | 7.7 | 3.3 |
| E | 12 | 5.5 | 1.75 | 8 | 2 | 4 | Ø1.5 | Ø1.5 | 0.3 | 4.8 | 7.7 | 4.1 |
| P | 8 | 3.5 | 1.75 | 4 | 2 | 4 | Ø1.5 | Ø1.0 | 0.2 | 1.4 | 2.2 | 1.2 |

Unit: mm

APPLICATION NOTES

1. Power Dissipation

The actual power dissipated in capacitor is calculated using formula1.

formula1: $P=I^2 \times \text{ESR}$, Where: P: power dissipation (Watts), I: ripple current (A rms), ESR: Equivalent Series Resistance (Ω)

Table:3

| Case Code | Max. Power Dissipation Watts, 100KHz, at 25°C |
|-----------|---|
| P | 0.025 |
| A | 0.075 |
| B | 0.085 |
| C | 0.110 |
| D | 0.150 |
| E | 0.150 |

APPLICATION NOTES (CONTINUE)

2. Ripple Current

Using P Max from Table:3, maximum ripple current (A rms) may be determined as follow: formula2: $I = \sqrt{P/(ESR \times K \times F)}$
 where: K: Temperature Derating Factor (Table: 4), F: Frequency Derating Factor (Table: 5), ESR: Refer to Ratings

Table: 4 (Temperature Derating Factor)

| Temperature | Temperature Derating Factor, K |
|-------------|--------------------------------|
| 25°C | 1 |
| 85°C | 0.9 |
| 125°C | 0.4 |

Ripple voltage E is Calculated using formula3: formula3: $E = Z \times I$
 Where: E: Ripple Voltage, Z: Impedance at specified frequency

Table: 5 (Frequency Derating Factor)

| Type | 10KHz | 100KHz | 500KHz | 1MHz |
|---------|-------|--------|--------|------|
| MnO2 | 0.80 | 1.00 | 1.15 | 1.20 |
| Polymer | 0.75 | 1.00 | 1.10 | 1.30 |

3. Ripple Voltage

The ripple voltage that may be applied is limited by three creiteria

- The power dissipated in the ESR of the capacitor must not exceed the appropriate value specified in Table:3
- The sum of DC voltage and peak value of the ripple voltage must no exceed the rated voltage.
- The negative peak value of the ripple voltage must not exceed the permissible reverse voltage value specified in the follow section: Reverse Voltage

4. Reverse Voltage

Because the solid tantalum capacitor is of polar type, do not apply a reverse voltage to it. If reverse voltage cannot be avoided, it must be applied for a short time and must not exceed the following values:

- 25°C, 10%max. of rated voltage or 1VDC, whichever is smaller.
- 85°C, 5% max. of rated voltage or 0.5VDC, whichever is smaller.
- 125°C, 1% max. of rated voltage or 0.1VDC, whichever is smaller.
- The capacitors should not be operated continuously in reverse mode, even within these limits.

5. Applied voltage

- For general application, apply 70% or less of the rated voltage to the capacitor.
- When the capacitor is used in power line or a low-impedance circuit, keep the applied voltage within 30% (50%max) of the rated voltage to avoid the adverse influence of inrush current.
- When using a chip-type capacitor at a temperature of 85°C or higher, calculate reduced voltage U_T from the following expression. Note, however, that the ambient temperature must not exceed 125°C.

$$U_T = V_0(U_R - U_C)(T - 85)/40$$

Where: U_R = rated voltage (V), U_C = derated voltage at 125°C, T: ambient temperature (°C)

6. Current (Series Resistance)

Reliability of tantalum capacitor is increased by inserting a series resistance of at least 3Ω/V into circuits where current flow is momentary (Switching circuit, charge/discharge circuits, etc) If the capacitor is in a low-impedance circuit, the voltage applied to the capacitor should be less than 1/2 to 1/3 or DC rated voltage.

7. In the Case of Short-Circuit

Manganese oxide tantalum capacitor (conventional tantalum capacitor) is heated and may generate fire and be burned depending upon its excess current, time and other factors. When designing the circuit, provide as much margin as possible to maintain capacitor reliability.

8. Product Soldering

SMT tantalum capacitor is suitable for reflow soldering, not suitable for wave flow soldering and hand soldering. Reflow soldering temperature must be ≤ 260°C for 5 seconds < seconds. If hand soldering is necessary, soldering iron power should be ≤ 25W, temperature < 300°C, soldering time < 3 seconds, it is prohibited to contact soldering iron top with product leads and main product, use melted tin solder to contact leaded soldering.