

TANTALUM ELECTROLYTIC CAPACITORS

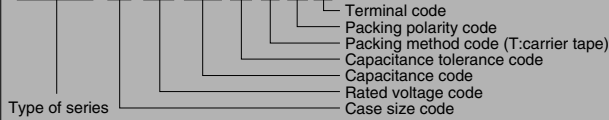
TMCM Series (Miniaturized Tantalum Chip Capacitors with Extended Capacitance Range)

Features

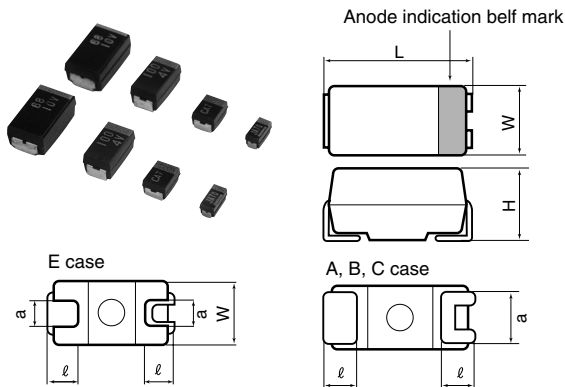
- A model type miniaturized chip capacitor developed on the basis of TMCS production technology ideal for high density component mounting applied in AV equipment.
- Super compact : Reduced size 1/2 to 1/3 in comparison with TMCS.

Product symbol : (Example) TMCM Series A case 7V 10 μ F \pm 20%

TMCM A 0J 106 M T R F



Outline of drawings and dimensions



Dimensions (Unit : mm)

| Case code | Case size | | | | |
|-----------|-------------|---------------|-------------|------------------|-------------|
| | L \pm 0.2 | W \pm 0.2 | H \pm 0.2 | ϕ \pm 0.3 | a \pm 0.2 |
| A | 3.2 | 1.6 | 1.6 | 0.7 | 1.2 |
| B | 3.5 | 2.8 | 1.9 | 0.8 | 2.2 |
| C | 5.8 | 3.2 | 2.5 | 1.3 | 2.2 |
| E | 7.3 | 4.3 \pm 0.3 | 2.8 | 1.3 | 2.4 |

Standard value and case size

| Capacitance | Code | Rated voltage (V.DC) | | | | | | | |
|-------------|------|----------------------|--------|---------|-----|-----|------|-----|-----|
| | | 2.5 | 4 | 6.3 (7) | 10 | 16 | 20 | 25 | 35 |
| μ F | | 0E | 0G | 0J | 1A | 1C | 1D | 1E | 1V |
| 0.47 | 474 | | | | | | | | A |
| 0.68 | 684 | | | | | | | A | A |
| 1.0 | 105 | | | | | | | A | A |
| 1.5 | 155 | | | | | | | A | B |
| 2.2 | 225 | | | | | | A | A,B | B |
| 3.3 | 335 | | | | | A | A | B | B |
| 4.7 | 475 | | | | A | A | A,B | B | C |
| 6.8 | 685 | | | | A | A | B | C | C |
| 10 | 106 | | | | A | A,B | B,C | C | C,E |
| 15 | 156 | | A | | A | A,B | C | C,E | E |
| 22 | 226 | | A | A | A,B | B,C | C,E | E | E |
| 33 | 336 | A | A | A | B | B,C | (C)E | E | |
| 47 | 476 | A | A | A,B | B,C | C,E | E | | |
| 68 | 686 | A,B | A,B | B,C | B,C | E | (E) | | |
| 100 | 107 | (A)B,C | (A)B,C | B,C | C | E | | | |
| 150 | 157 | B,C | B,C | C | E | | | | |
| 220 | 227 | B,C | B,C | C,E | E | | | | |
| 330 | 337 | C,E | C,E | E | (E) | | | | |
| 470 | 477 | E | E | E | | | | | |

(): Under Developing

For ratings not covered the table, consult Hitachi AIC.

| Product specifications | TMCM | | | | Test conditions JIS C5101-3-1998 | |
|-----------------------------|--|-------------------------|----------------------------------|---------------------------------------|--|----------------|
| | | | | | | |
| Operating temperature range | -55°C ~ +125°C | | | | | |
| Rated voltage | DC2.5 ~ 35V | | | | 85°C | |
| Surge voltage | DC3.2 ~ 45V | | | | 85°C | |
| Derated voltage | DC1.6 ~ 22V | | | | 125°C | |
| Capacitance | 0.47 ~ 470 μ F | | | | | |
| Capacitance tolerance | \pm 10% or 20% | | | | Paragraph 7.8, 120 Hz | |
| Leakage current | Refer to table standard product table | | | | Paragraph 7.7, in 5 minutes after the rated voltage is applied. | |
| tan δ | Refer to table standard product table | | | | Paragraph 7.9, 120Hz | |
| Surge withstanding voltage | Δ C/C \pm 5% or less tan δ Specified initial value or less LC Specified initial value or less | | | | Paragraph 7.14 | |
| Temperature characteristics | | Specified initial value | -55 | 85 | 125 | Paragraph 7.12 |
| Δ C/C | - | -10 - 0% | 0 - +10% | 0 - +12% | | |
| tan δ | 0.04 | 0.09 | 0.07 | 0.09 | | |
| Leakage current or less | 0.06 | 0.10 | 0.08 | 0.10 | | |
| | 0.08 | 0.12 | 0.10 | 0.12 | | |
| | 0.10 | 0.14 | 0.12 | 0.14 | | |
| | 0.12 | 0.16 | 0.14 | 0.16 | | |
| | 0.16 | 0.20 | 0.18 | 0.20 | | |
| | 0.18 | 0.34 | 0.20 | 0.22 | | |
| LC | 0.01CV or 0.5 μ A or less | - | 0.1CV or 5 μ A or less | 0.125CV or 6.25 μ A or less | | |
| Solder heat resistance | Δ C/C \pm 5% or less tan δ Specified initial value or less LC Specified initial value or less | | | | Dip 260 \pm 5°C A, B case C, E case 10 \pm 1 sec. 5 \pm 0.5 sec. Reflow-260°C 10 \pm 1 sec. | |
| Moisture resistance leaving | Δ C/C \pm 10% or less tan δ Specified initial value or less LC Specified initial value or less | | | | Paragraph 9.5, 40°C 90 ~ 95%RH, 500h | |
| High-temperature load | Δ C/C \pm 10% or less tan δ Specified initial value or less LC 125% Specified initial value or less | | | | Paragraph 9.10, 85°C The rated voltage is applied for 2000 hours. | |
| Thermal shock | Δ C/C \pm 10% or less tan δ Specified initial value or less LC Specified initial value or less | | | | Leave at -55°C, normal temperature, 125°C, and normal temperature for 30 min., 3 min., 30 min., and 3 min. Repeat this operation 20 times running. | |
| Moisture resistance load | Δ C/C \pm 10% or less tan δ 150% Specified initial value or less LC 200% Specified initial value or less | | | | 40°C, humidity 90 to 95%RH The rated voltage is applied for 500 hours. | |
| Failure rate | 1% / 1000h | | | | 85°C. The rated voltage is applied (through a protective resistor of 1 Ω /V). | |

TANTALUM ELECTROLYTIC CAPACITORS

Standard product tables - TCMC series

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| Rated voltage V. DC | Capacitance μF | tanδ | Leakage current μA | Case code | Product name | |
|------------------------|-------------------|--------|-----------------------|--------------|--------------|------------|
| 2.5 | 33 | 0.08 | 0.8 | A | TMCMA0E336 | |
| | | 0.12 | 1.2 | A | TMCMA0E476 | |
| | 68 | 0.08 | 0.18 | 1.7 | A | TMCMA0E686 |
| | | | 1.7 | B | TMCMB0E686 | |
| | 100 | (0.18) | (5.0) | (A) | TMCMA0E107 | |
| | | | 0.12 | 2.5 | B | TMCMB0E107 |
| | | | 0.08 | 2.5 | C | TMCMB0E107 |
| | 150 | 0.08 | 3.8 | B | TMCMB0E157 | |
| | | | 3.8 | C | TMCMB0E157 | |
| | | | 3.8 | E | TMCME0E157 | |
| | 220 | 0.08 | 5.5 | B | TMCMB0E227 | |
| | | | 5.5 | C | TMCMB0E227 | |
| | | | 5.5 | E | TMCME0E227 | |
| | 330 | 0.08 | 8.3 | C | TMCME0E337 | |
| | | | 10 | 8.3 | E | TMCME0E337 |
| | 470 | 0.10 | 11.8 | E | TMCME0E477 | |
| 4 | 15 | 0.08 | 0.6 | A | TMCMA0G156 | |
| | | | | A | TMCMA0G226 | |
| | 33 | 0.08 | 1.3 | A | TMCMA0G336 | |
| | | | | A | TMCMA0G476 | |
| | 68 | 0.12 | 5.4 | A | TMCMA0G686 | |
| | | | | B | TMCMB0G686 | |
| | 100 | 0.12 | 4.0 | B | TMCMB0G107 | |
| | | | | C | TMCMB0G107 | |
| | 150 | 0.18 | 6.0 | B | TMCMB0G157 | |
| | | | | C | TMCMB0G157 | |
| | 220 | 0.18 | 17.6 | B | TMCMB0G227 | |
| | | | | C | TMCMB0G227 | |
| | 330 | 0.18 | 13.2 | C | TMCMB0G337 | |
| | | | | E | TMCME0G337 | |
| | 470 | 0.10 | 18.8 | E | TMCME0G477 | |
| | 6.3 (7) | 22 | 0.08 | 1.5 | A | TMCMA0J226 |
| A | | | | | TMCMA0J336 | |
| 47 | | 0.12 | 5.9 | A | TMCMA0J476 | |
| | | | | B | TMCMB0J476 | |
| 68 | | 0.10 | 4.8 | B | TMCMB0J686 | |
| | | | | C | TMCMB0J686 | |
| 100 | | 0.12 | 7.0 | B | TMCMB0J107 | |
| | | | | C | TMCMB0J107 | |
| 150 | | 0.08 | 7.0 | C | TMCMB0J157 | |
| | | | | C | TMCMB0J157 | |
| 220 | | 0.18 | 15.4 | C | TMCMB0J227 | |
| | | | | E | TMCME0J227 | |
| 330 | 0.10 | 23.1 | E | TMCME0J337 | | |
| | | | E | TMCME0J477 | | |
| 470 | 0.20 | 32.9 | E | TMCME0J477 | | |
| 10 | 4.7 | 0.06 | 0.5 | A | TMCMA1A475 | |
| | | | | A | TMCMA1A685 | |
| | 10 | 0.08 | 1.0 | A | TMCMA1A106 | |
| | | | | A | TMCMA1A156 | |
| | 22 | 0.12 | 4.4 | A | TMCMA1A226 | |
| | | | | B | TMCMB1A226 | |
| | 33 | 0.08 | 3.3 | B | TMCMB1A336 | |
| | | | | B | TMCMB1A476 | |
| | 47 | 0.08 | 4.7 | C | TMCMB1A476 | |
| | | | | C | TMCMB1A686 | |
| | 68 | 0.08 | 6.8 | C | TMCMB1A686 | |
| | | | | C | TMCMB1A107 | |
| 100 | 0.10 | 10.0 | C | TMCMB1A107 | | |
| 220 | 0.08 | 22.0 | E | TMCME1A227 | | |

| Rated voltage V. DC | Capacitance μF | tanδ | Leakage current μA | Case code | Product name |
|------------------------|-------------------|------|-----------------------|--------------|--------------|
| 16 | 3.3 | 0.06 | 0.5 | A | TMCMA1C335 |
| | | | | A | TMCMA1C475 |
| | 6.8 | 0.06 | 1.1 | A | TMCMA1C685 |
| | | | | A | TMCMA1C106 |
| | 10 | 0.08 | 1.6 | B | TMCMB1C106 |
| | | | | B | TMCMB1C156 |
| | 15 | 0.08 | 2.4 | B | TMCMB1C226 |
| | | | | C | TMCMB1C226 |
| | 22 | 0.08 | 3.5 | C | TMCMB1C226 |
| | | | | C | TMCMB1C336 |
| | 33 | 0.08 | 5.3 | C | TMCMB1C476 |
| | | | | E | TMCMB1C476 |
| | 47 | 0.08 | 7.5 | E | TMCMB1C476 |
| | | | | E | TMCMB1C686 |
| | 100 | 0.08 | 16.0 | E | TMCMB1C107 |
| | 20 | 2.2 | 0.06 | 0.5 | A |
| A | | | | | TMCMA1D335 |
| 4.7 | | 0.06 | 0.9 | A | TMCMA1D475 |
| | | | | B | TMCMB1D475 |
| 6.8 | | 0.06 | 1.4 | B | TMCMB1D685 |
| | | | | B | TMCMB1D106 |
| 10 | | 0.08 | 2.0 | C | TMCMB1D106 |
| | | | | C | TMCMB1D226 |
| 22 | 0.08 | 4.4 | E | TMCMB1D226 | |
| | | | E | TMCMB1D476 | |
| 25 | 0.68 | 0.04 | 0.5 | A | TMCMA1E684 |
| | | | | A | TMCMA1E105 |
| | 1.0 | 0.04 | 0.5 | A | TMCMA1E155 |
| | | | | B | TMCMB1E225 |
| | 2.2 | 0.06 | 0.6 | B | TMCMB1E335 |
| | | | | B | TMCMB1E475 |
| | 4.7 | 0.06 | 1.2 | B | TMCMB1E685 |
| | | | | C | TMCMB1E106 |
| | 10 | 0.08 | 3.8 | C | TMCMB1E156 |
| | | | | E | TMCMB1E156 |
| | 22 | 0.08 | 3.8 | E | TMCMB1E226 |
| | | | | E | TMCMB1E336 |
| 35 | 0.47 | 0.04 | 0.5 | A | TMCMA1V474 |
| | | | | A | TMCMA1V684 |
| | 1.0 | 0.04 | 0.5 | A | TMCMA1V105 |
| | | | | B | TMCMB1V155 |
| | 2.2 | 0.06 | 0.8 | B | TMCMB1V225 |
| | | | | B | TMCMB1V335 |
| | 3.3 | 0.06 | 1.2 | B | TMCMB1V475 |
| | | | | C | TMCMB1V685 |
| | 6.8 | 0.06 | 2.4 | C | TMCMB1V685 |
| | | | | C | TMCMB1V106 |
| | 10 | 0.08 | 3.5 | E | TMCMB1V106 |
| | | | | E | TMCMB1V156 |
| 15 | 0.08 | 5.3 | E | TMCMB1V156 | |
| | | | E | TMCMB1V226 | |

Lot indication

| Year | Month | | | | | | | | | | | |
|------|-------|---|---|---|---|---|---|---|---|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 2002 | N | P | Q | R | S | T | U | V | W | X | Y | Z |
| 2003 | a | b | c | d | e | f | g | h | i | j | k | l |
| 2004 | n | p | q | r | s | t | u | v | w | x | y | z |
| 2005 | A | B | C | D | E | F | G | H | J | K | L | M |

Marking indication TCMC series

| | TCMC * △△□□□○○○ | TCMC * △△□□□○○○F |
|-----------|---|---|
| A, B case | <p>Simplified code of rated voltage (G : 4V) Anode indication belt mark Lot indication (for manufacturing in January, 2001) Simplified code of nominal capacitance (A7 : 10μF) *The simplified code is subject to JIS C 5143, paragraph 10 and EIAJ RC-3813, paragraph 7.</p> | <p>Anode indication belt mark Simplified code of rated voltage (G : 4V) Lot indication (for manufacturing in January, 2001) Simplified code of nominal capacitance (A7 : 10μF) *The simplified code is subject to JIS C 5143, paragraph 10 and EIAJ RC-3813, paragraph 7.</p> |
| C, E case | <p>Nominal capacitance Value (15μF) Anode indication belt mark Lot indication (for manufacturing in January, 2001) Rated voltage (16V)</p> | <p>Anode indication belt mark Nominal capacitance Value (15μF) Lot indication (for manufacturing in January, 2001) Rated voltage (16V)</p> |