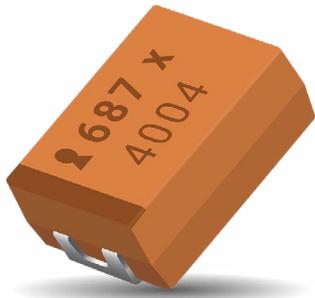


# OxiCap® NOM Low ESR Multianodes

## Niobium Oxide Capacitor



### FEATURES

- Multi-anode Construction
- Super Low ESR
- 100% Surge Current Tested
- Non-Burn Safe Technology
- CV Range: 220-680µF / 1.8-6.3V
- IBM Global Approval Received in 2004
- Elektra Award Received in 2005

### APPLICATIONS

- High Power Low Voltage Industrial Power Supplies



LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT



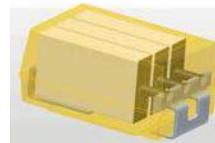
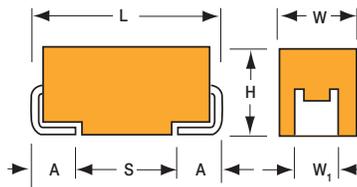
RoHS COMPLIANT



NON-BURN  
NON-SMOKE



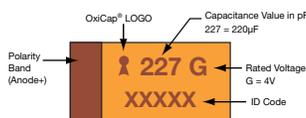
Elektra Award  
2005



NOM MULTIANODE  
CONSTRUCTION

### MARKING

#### E CASE



### CASE DIMENSIONS:

millimeters (inches)

| Code | EIA Code | EIA Metric | L±0.20 (0.008) | W+0.20 (0.008)<br>-0.10 (0.004) | H+0.20 (0.008)<br>-0.10 (0.004) | W <sub>1</sub> ±0.20 (0.008) | A+0.30 (0.012)<br>-0.20 (0.008) | S Min.       |
|------|----------|------------|----------------|---------------------------------|---------------------------------|------------------------------|---------------------------------|--------------|
| 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) |

W<sub>1</sub> dimension applies to the termination width for A dimensional area only.

### HOW TO ORDER

|             |                                     |  |                              |   |   |                  |
|-------------|-------------------------------------|--|------------------------------|---|---|------------------|
| <b>NOM</b>  | <b>E</b>                            | <b>227</b>   | <b>M</b>                     | <b>006</b>  | <b>R</b>  | <b>0040</b>      |
| <b>Type</b> | <b>Case Size</b><br>See table above | <b>Capacitance Code</b><br>1st two digits represent significant figures, 3rd digit represents multiplier in pF | <b>Tolerance</b><br>M = ±20% | <b>Rated DC Voltage</b><br>001 = 1.8Vdc<br>002 = 2.5Vdc<br>004 = 4Vdc<br>006 = 6.3Vdc | <b>Packaging</b><br>R = Pure Tin 7" Reel<br>S = Pure Tin 13" Reel | <b>ESR in mΩ</b> |

### TECHNICAL SPECIFICATIONS

|                                    |   |     |     |     |     |  |
|------------------------------------|---|-----|-----|-----|-----|--|
| Technical Data:                    | All technical data relate to an ambient temperature of +25°C is not stated  |     |     |     |     |  |
| Capacitance Range:                 | 220 µF to 680 µF  |     |     |     |     |  |
| Capacitance Tolerance:             | ±20%  |     |     |     |     |  |
| Leakage Current DCL:               | 0.02CV  |     |     |     |     |  |
| Rated Voltage DC (V <sub>R</sub> ) | ≤ +85°C:  | 1.8 | 2.5 | 4   | 6.3 |  |
| Category Voltage (V <sub>C</sub> ) | ≤ +125°C:   | 0.9 | 1.3 | 2   | 3   |  |
| Surge Voltage (V <sub>S</sub> )    | ≤ +85°C:  | 2.3 | 3.3 | 5.2 | 8   |  |
| Surge Voltage (V <sub>S</sub> )    | ≤ +125°C:   | 1.2 | 1.7 | 2.6 | 4   |  |
| Temperature Range:                 | -55°C to +125°C   |     |     |     |     |  |
| Reliability:                       | 0.2% per 1000 hours at 85°C, V <sub>R</sub> 0.1Ω/V series impedance, 60% confidence level<br>Meets requirements of AEC-Q200 |     |     |     |     |  |

# OxiCap® NOM Low ESR Multianodes

## Niobium Oxide Capacitor



### CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

| Capacitance |      | Rated Voltage DC (V <sub>R</sub> ) to 85°C |          |          |          |
|-------------|------|--|----------|----------|----------|
| µF          | Code | 1.8V (x)                                   | 2.5V (e) | 4.0V (G) | 6.3V (J) |
| 220         | 227  |  |          |          | E(40)    |
| 330         | 337  |  |          | E(35)    | E(23,35) |
| 470         | 477  |  | E(30)    | E(23,30) |          |
| 680         | 687  | E(23)                                      | E(23)    |          |          |

Released ratings, (ESR ratings in mOhms in parentheses)

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) | Rated Temperature (°C) | Category Voltage (V) | Category Temperature (°C) | DCL Max. (µA) | DF Max. (%) | ESR Max. @ 100kHz (mΩ) | 100kHz RMS Current (A) |       |       | MSL |
|------------------------|-----------|------------------|-------------------|------------------------|----------------------|---------------------------|---------------|-------------|------------------------|------------------------|-------|-------|-----|
|                        |           |                  |                   |                        |                      |                           |               |             |                        | 25°C                   | 85°C  | 125°C |     |
| <b>1.8 Volt @ 85°C</b> |           |                  |                   |                        |                      |                           |               |             |                        |                        |       |       |     |
| NOME687M001#0023       | E         | 680              | 1.8               | 85                     | 0.9                  | 125                       | 24.5          | 6           | 23                     | 3.753                  | 3.378 | 1.501 | 3   |
| <b>2.5 Volt @ 85°C</b> |           |                  |                   |                        |                      |                           |               |             |                        |                        |       |       |     |
| NOME477M002#0030       | E         | 470              | 2.5               | 85                     | 1.3                  | 125                       | 23.5          | 10          | 30                     | 3.286                  | 2.958 | 1.315 | 3   |
| NOME687M002#0023       | E         | 680              | 2.5               | 85                     | 1.3                  | 125                       | 34            | 6           | 23                     | 3.753                  | 3.378 | 1.501 | 3   |
| <b>4 Volt @ 85°C</b>   |           |                  |                   |                        |                      |                           |               |             |                        |                        |       |       |     |
| NOME337M004#0035       | E         | 330              | 4                 | 85                     | 2                    | 125                       | 26.4          | 8           | 35                     | 3.043                  | 2.738 | 1.217 | 3   |
| NOME477M004#0023       | E         | 470              | 4                 | 85                     | 2                    | 125                       | 37.6          | 6           | 23                     | 3.753                  | 3.378 | 1.501 | 3   |
| NOME477M004#0030       | E         | 470              | 4                 | 85                     | 2                    | 125                       | 37.6          | 6           | 30                     | 3.286                  | 2.958 | 1.315 | 3   |
| <b>6.3 Volt @ 85°C</b> |           |                  |                   |                        |                      |                           |               |             |                        |                        |       |       |     |
| NOME227M006#0040       | E         | 220              | 6.3               | 85                     | 3                    | 125                       | 26.4          | 12          | 40                     | 2.846                  | 2.561 | 1.138 | 3   |
| NOME337M006#0023       | E         | 330              | 6.3               | 85                     | 3                    | 125                       | 39.6          | 6           | 23                     | 3.753                  | 3.378 | 1.501 | 3   |
| NOME337M006#0035       | E         | 330              | 6.3               | 85                     | 3                    | 125                       | 39.6          | 6           | 35                     | 3.043                  | 2.738 | 1.217 | 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, 0.5V RMS with a maximum DC bias of 2.2 volts.

DCL is measured at rated voltage after 5 minutes.

ESR allowed to move up to 125 times catalog limit post mounting.

For typical weight and composition see page 259.

**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.**

# OxiCap® NOM Low ESR Multianodes Niobium Oxide Capacitor



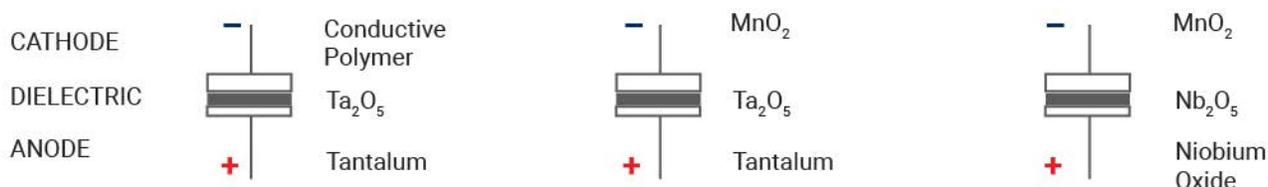
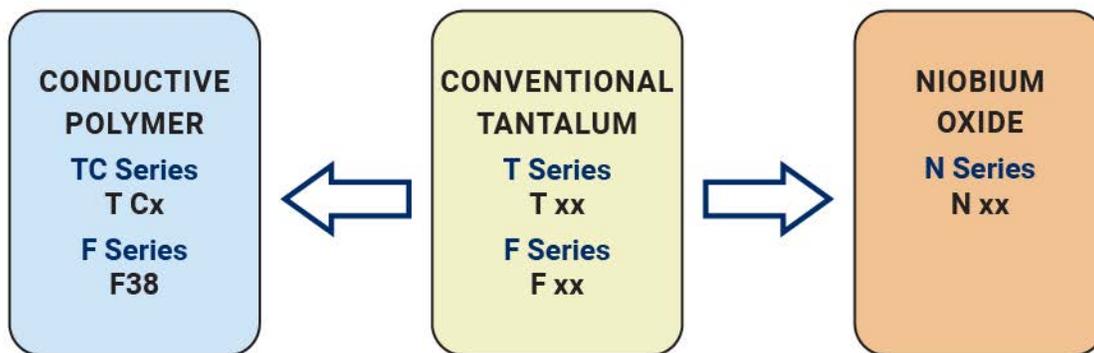
## QUALIFICATION TABLE

| TEST                         | NOM series (Temperature range -55°C to +125°C)  |               |               |                    |                                    |           |            |            |            |            |
|------------------------------|---|---------------|---------------|--------------------|------------------------------------|-----------|------------|------------|------------|------------|
|                              | Condition   |               |               | Characteristics    |                                    |           |            |            |            |            |
| <b>Endurance</b>             | Apply rated voltage (Ur) at 85°C and / or category voltage (Uc) 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                | initial limit                      |           |            |            |            |            |
|                              |   |               |               | $\Delta C/C$       | within $\pm 10\%$ of initial value |           |            |            |            |            |
|                              |   |               |               | DF                 | initial limit                      |           |            |            |            |            |
|                              |   |               |               | ESR                | 1.25 x initial limit               |           |            |            |            |            |
| <b>Storage Life</b>          | 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                | initial limit                      |           |            |            |            |            |
|                              |   |               |               | $\Delta C/C$       | within $\pm 10\%$ of initial value |           |            |            |            |            |
|                              |   |               |               | DF                 | initial limit                      |           |            |            |            |            |
|                              |   |               |               | ESR                | 1.25 x initial limit               |           |            |            |            |            |
| <b>Humidity</b>              | Store at 65°C and 95% relative humidity for 500 hours, with no applied voltage. Stabilize at room temperature and humidity for 1-2 hours before measuring.  |               |               | Visual examination | no visible damage                  |           |            |            |            |            |
|                              |   |               |               | DCL                | 1.5 x initial limit                |           |            |            |            |            |
|                              |   |               |               | $\Delta C/C$       | within $\pm 10\%$ of initial value |           |            |            |            |            |
|                              |   |               |               | DF                 | 1.2 x initial limit                |           |            |            |            |            |
|                              |   |               |               | ESR                | 1.25 x initial limit               |           |            |            |            |            |
| <b>Biased Humidity</b>       | 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 $\pm 10\%$ of initial value |           |            |            |            |            |
|                              |   |               |               | DF                 | 1.2 x initial limit                |           |            |            |            |            |
|                              |   |               |               | ESR                | 1.25 x initial limit               |           |            |            |            |            |
| <b>Temperature Stability</b> | Step  | Temperature°C | Duration(min) |                    | +20°C                              | -55°C     | +20°C      | +85°C      | +125°C     | +20°C      |
|                              | 1   | +20           | 15            | DCL                | IL*                                | n/a       | IL*        | 12 x IL*   | 15 x IL*   | IL*        |
|                              | 2   | -55           | 15            | $\Delta C/C$       | n/a                                | +0/-10%   | $\pm 5\%$  | +10/-0%    | +12/-0%    | $\pm 5\%$  |
|                              | 3   | +20           | 15            | DF                 | IL*                                | 1.5 x IL* | IL*        | 1.5 x IL*  | 2 x IL*    | IL*        |
|                              | 4   | +85           | 15            | ESR                | 1.25 x IL*                         | 2.5 x IL* | 1.25 x IL* | 1.25 x IL* | 1.25 x IL* | 1.25 x IL* |
|                              | 5   | +125          | 15            |                    |                                    |           |            |            |            |            |
|                              | 6   | +20           | 15            |                    |                                    |           |            |            |            |            |
| <b>Surge Voltage</b>         | Apply 1.3x category voltage (Uc) 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 $\Omega$                              |               |               | Visual examination | no visible damage                  |           |            |            |            |            |
|                              |   |               |               | DCL                | initial limit                      |           |            |            |            |            |
|                              |   |               |               | $\Delta C/C$       | within $\pm 5\%$ of initial value  |           |            |            |            |            |
|                              |   |               |               | DF                 | initial limit                      |           |            |            |            |            |
|                              |   |               |               | ESR                | 1.25 x initial limit               |           |            |            |            |            |
| <b>Mechanical Shock</b>      | MIL-STD-202, Method 213, Condition F  |               |               | Visual examination | no visible damage                  |           |            |            |            |            |
|                              |   |               |               | DCL                | initial limit                      |           |            |            |            |            |
|                              |   |               |               | $\Delta C/C$       | within $\pm 5\%$ of initial value  |           |            |            |            |            |
|                              |   |               |               | DF                 | initial limit                      |           |            |            |            |            |
|                              |   |               |               | ESR                | 1.25 x initial limit               |           |            |            |            |            |
| <b>Vibration</b>             | MIL-STD-202, Method 204, Condition D  |               |               | Visual examination | no visible damage                  |           |            |            |            |            |
|                              |   |               |               | DCL                | initial limit                      |           |            |            |            |            |
|                              |   |               |               | $\Delta C/C$       | within $\pm 5\%$ of initial value  |           |            |            |            |            |
|                              |   |               |               | DF                 | initial limit                      |           |            |            |            |            |
|                              |   |               |               | ESR                | 1.25 x initial limit               |           |            |            |            |            |

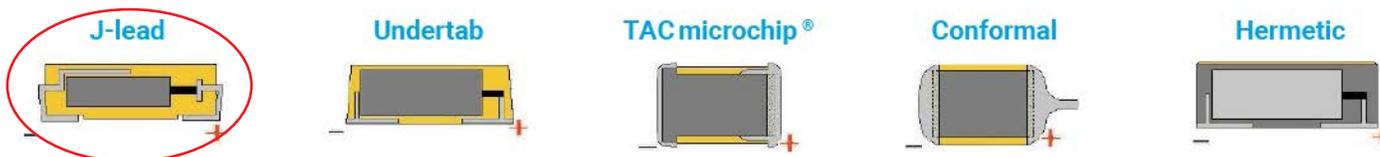
\*Initial Limit

# OxiCap® NOM Low ESR Multianodes Niobium Oxide Capacitor

## SOLID ELECTROLYTIC CAPACITOR ROADMAP



## FIVE CAPACITOR CONSTRUCTION STYLES



## SERIES LINE UP : NIOBIUM OXIDE OxiCap® CAPACITORS

