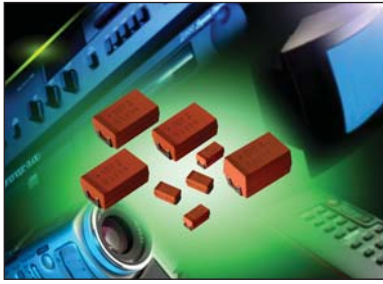


OxiCap® NOJ Series



Niobium Oxide Capacitor

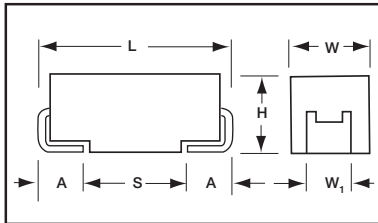


Cost versus Performance is a key requirement for consumer electronic products. A new solid electrolyte capacitor **OxiCap®** has been developed by AVX in standard EIA case sizes in order to meet this requirement as a higher performance alternative to aluminum and other SMT capacitor technologies currently on the market. The **OxiCap® non-burn¹** technology is based on **NbO niobium oxide ceramic material** as the anodic material processed through the same manufacturing process as tantalum capacitors. Nb₂O₅ dielectric in

combination to self-healing MnO₂ cathode is a basis for a good reliability level **0.5%/1000 hrs.** within a temperature range up to **105°C** and rated voltage **<6V** (rail voltage <5V). Electrical parameters are similar to general tantalum specifications. NbO and MnO₂ are widely available materials. The laser coded **orange molded body** gives total traceability.

- Reduced Voltage Derating
- Failed OxiCap® will not burn up to category voltage

CASE DIMENSIONS: millimeters (inches)



| Code | EIA Code | L±0.20 (0.008) | W+0.20 (0.008) -0.10 (0.004) | H+0.20 (0.008) -0.10 (0.004) | W ₁ ±0.20 (0.008) | A+0.30 (0.012) -0.20 (0.008) | S Min. |
|------|----------|----------------|---------------------------------|---------------------------------|------------------------------|---------------------------------|--------------|
| A | 3216-18 | 3.20 (0.126) | 1.60 (0.063) | 1.60 (0.063) | 1.20 (0.047) | 0.80 (0.031) | 1.10 (0.043) |
| B | 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) |
| C | 6032-28 | 6.00 (0.236) | 3.20 (0.126) | 2.60 (0.102) | 2.20 (0.087) | 1.30 (0.051) | 2.90 (0.114) |
| D | 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 | 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) |
| V | 7361-38 | 7.30 (0.287) | 6.10 (0.240) | 3.45 ±0.30 (0.136±0.012) | 3.10 (0.120) | 1.40 (0.055) | 4.40 (0.173) |
| Z | 7361-45 | 7.30 (0.287) | 6.10 (0.240) | 4.30 (0.169) | 3.10 (0.120) | 1.40 (0.055) | 4.40 (0.173) |

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

HOW TO ORDER

NOJ

Type

D

Case Size

107

Capacitance Code
1st two digits represent significant figures, 3rd digit represents multiplier in pF

M

Capacitance Tolerance
M = ±20%

006

Rated DC Voltage
001 = 1.8Vdc
002 = 2.5Vdc
004 = 4Vdc
006 = 6.3Vdc
010 = 10Vdc

R

Packaging
R = Lead Free 7" Reel
S = Lead Free 13" Reel

WJ

Additional Characters

TECHNICAL SPECIFICATIONS

| | | | | | | | |
|------------------------------------|---|-----|-----|-----|-----|----|--|
| Technical Data: | All technical data relate to an ambient temperature of +25°C is not stated | | | | | | |
| Capacitance Range: | 4.7 μF to 2200 μF | | | | | | |
| Capacitance Tolerance: | ±20% | | | | | | |
| Leakage Current DCL: | 0.02CV | | | | | | |
| Rated Voltage DC (V _R) | ≤+85°C: | 1.8 | 2.5 | 4 | 6.3 | 10 | |
| Category Voltage (V _C) | ≤+105°C: | 1.2 | 1.7 | 2.7 | 4 | 7 | |
| Surge Voltage (V _S) | ≤+85°C: | 2.3 | 3.3 | 5.2 | 8 | 13 | |
| | ≤+105°C: | 1.6 | 2.2 | 3.4 | 5 | 8 | |
| Temperature Range: | -55°C to +105°C | | | | | | |
| Reliability: | 0.5% per 1000 hours at 85°C, V _R , 0.1Ω/V series impedance, 60% confidence level Meets requirements of AEC-Q200 | | | | | | |



OxiCap® NOJ Series



Niobium Oxide Capacitor

CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

| Capacitance | | Rated Voltage DC (V _R) to 85°C / 0.66 DC to 105°C | | | | |
|-------------|------|---|----------|--------|----------|---------|
| μF | Code | 1.8V (x) | 2.5V (e) | 4V (G) | 6.3V (J) | 10V (A) |
| 4.7 | 475 | | | | A | A |
| 6.8 | 685 | | | | A | A |
| 10 | 106 | | | | A | A/B |
| 15 | 156 | | | A | A/B | A/B |
| 22 | 226 | | A | A/B | A/B | B/C |
| 33 | 336 | | A/B | A/B | B/C | C |
| 47 | 476 | A | A/B | B/C | B/C | C |
| 68 | 686 | B | B/C | B/C | B/C | C/D |
| 100 | 107 | B/C | B/C | B/C | C/D | D |
| 150 | 157 | B/C | C | C/D | C/D | E |
| 220 | 227 | C | C | C/D | C/D/E | V |
| 330 | 337 | C | C/D | D | D/E | |
| 470 | 477 | C/D | D/E | D/E | E/V | |
| 680 | 687 | D | E | E/V | Z | |
| 1000 | 108 | E | V | V/Z | | |
| 1500 | 158 | V | Z | | | |
| 2200 | 228 | Z | | | | |

Developmental Ratings - subject to change

Z case = 4.5mm height V



LEAD-FREE

LEAD-FREE COMPATIBLE
COMPONENT



RoHS
COMPLIANT



NON-BURN
NON-SMOKE

Niobium Oxide Capacitor

RATINGS & PART NUMBER REFERENCE

| AVX Part No. | Case Size | Capacitance (µF) | Rated Voltage (V) | DCL (µA) Max. | DF % Max. | ESR Max. (Ω) @100kHz | 100kHz Ripple Current (A) | | | 100kHz Ripple Voltage (V) | | |
|---|-----------|------------------|-------------------|---------------|-----------|----------------------|---------------------------|-------|-------|---------------------------|-------|-------|
| | | | | | | | 25°C | 85°C | 105°C | 25°C | 85°C | 105°C |
| 1.8 Volt @ 85°C (1.2 Volt @ 105°C) | | | | | | | | | | | | |
| NOJA476M001# | A | 47 | 1.8 | 1.7 | 8 | 1.6 | 0.237 | 0.213 | 0.095 | 0.379 | 0.342 | 0.152 |
| NOJB476M001# | B | 47 | 1.8 | 1.7 | 6 | 1.6 | 0.252 | 0.227 | 0.101 | 0.404 | 0.364 | 0.162 |
| NOJB686M001# | B | 68 | 1.8 | 2.5 | 6 | 1.5 | 0.261 | 0.235 | 0.104 | 0.391 | 0.352 | 0.156 |
| NOJB107M001# | B | 100 | 1.8 | 3.6 | 6 | 1.4 | 0.270 | 0.243 | 0.108 | 0.378 | 0.340 | 0.151 |
| NOJC107M001# | C | 100 | 1.8 | 3.6 | 6 | 0.4 | 0.574 | 0.517 | 0.230 | 0.230 | 0.207 | 0.092 |
| NOJC157M001# | C | 150 | 1.8 | 5.4 | 8 | 0.4 | 0.574 | 0.517 | 0.230 | 0.230 | 0.207 | 0.092 |
| NOJC227M001# | C | 220 | 1.8 | 8.0 | 8 | 0.4 | 0.574 | 0.517 | 0.230 | 0.230 | 0.207 | 0.092 |
| NOJC337M001# | C | 330 | 1.8 | 11.9 | 8 | 0.3 | 0.663 | 0.597 | 0.265 | 0.199 | 0.179 | 0.080 |
| 2.5 Volt @ 85°C (1.7 Volt @ 105°C) | | | | | | | | | | | | |
| NOJA226M002# | A | 22 | 2.5 | 1.1 | 6 | 1.9 | 0.218 | 0.196 | 0.087 | 0.414 | 0.372 | 0.165 |
| NOJA336M002# | A | 33 | 2.5 | 1.7 | 6 | 1.7 | 0.230 | 0.207 | 0.092 | 0.391 | 0.352 | 0.156 |
| NOJB336M002# | B | 33 | 2.5 | 1.7 | 6 | 1.7 | 0.245 | 0.220 | 0.098 | 0.416 | 0.375 | 0.167 |
| NOJA476M002# | A | 47 | 2.5 | 2.4 | 8 | 1.6 | 0.237 | 0.213 | 0.095 | 0.379 | 0.342 | 0.152 |
| NOJB476M002# | B | 47 | 2.5 | 2.4 | 6 | 1.6 | 0.252 | 0.227 | 0.101 | 0.404 | 0.364 | 0.162 |
| NOJB686M002# | B | 68 | 2.5 | 3.4 | 6 | 1.5 | 0.261 | 0.235 | 0.104 | 0.391 | 0.352 | 0.156 |
| NOJC686M002# | C | 68 | 2.5 | 3.4 | 6 | 0.5 | 0.514 | 0.462 | 0.206 | 0.257 | 0.231 | 0.103 |
| NOJB107M002# | B | 100 | 2.5 | 5.0 | 6 | 1.4 | 0.270 | 0.243 | 0.108 | 0.378 | 0.340 | 0.151 |
| NOJC107M002# | C | 100 | 2.5 | 5.0 | 6 | 0.4 | 0.574 | 0.517 | 0.230 | 0.230 | 0.207 | 0.092 |
| NOJC157M002# | C | 150 | 2.5 | 7.5 | 6 | 0.4 | 0.574 | 0.517 | 0.230 | 0.230 | 0.207 | 0.092 |
| NOJC227M002# | C | 220 | 2.5 | 11.0 | 8 | 0.4 | 0.574 | 0.517 | 0.230 | 0.230 | 0.207 | 0.092 |
| NOJC337M002# | C | 330 | 2.5 | 16.5 | 10 | 0.3 | 0.663 | 0.597 | 0.265 | 0.199 | 0.179 | 0.080 |
| NOJD337M002# | D | 330 | 2.5 | 16.5 | 10 | 0.3 | 0.775 | 0.697 | 0.310 | 0.232 | 0.209 | 0.093 |
| NOJD477M002# | D | 470 | 2.5 | 23.5 | 10 | 0.3 | 0.775 | 0.697 | 0.310 | 0.323 | 0.209 | 0.093 |
| NOJE477M002# | E | 470 | 2.5 | 23.5 | 10 | 0.3 | 0.812 | 0.731 | 0.325 | 0.244 | 0.219 | 0.097 |
| NOJE687M002# | E | 680 | 2.5 | 34.0 | 12 | 0.3 | 0.812 | 0.731 | 0.325 | 0.244 | 0.219 | 0.097 |
| NOJV108M002# | V | 1000 | 2.5 | 50.0 | 18 | 0.3 | 1.000 | 0.900 | 0.400 | 0.300 | 0.270 | 0.120 |
| 4 Volt @ 85°C (2.7 Volt @ 105°C) | | | | | | | | | | | | |
| NOJA156M004# | A | 15 | 4 | 1.2 | 6 | 2 | 0.212 | 0.191 | 0.085 | 0.424 | 0.382 | 0.170 |
| NOJA226M004# | A | 22 | 4 | 1.8 | 6 | 1.9 | 0.218 | 0.196 | 0.087 | 0.414 | 0.372 | 0.165 |
| NOJB226M004# | B | 22 | 4 | 1.8 | 6 | 1.9 | 0.232 | 0.209 | 0.093 | 0.440 | 0.396 | 0.176 |
| NOJA336M004# | A | 33 | 4 | 2.6 | 10 | 1.7 | 0.230 | 0.207 | 0.092 | 0.391 | 0.352 | 0.156 |
| NOJB336M004# | B | 33 | 4 | 2.6 | 6 | 1.7 | 0.245 | 0.220 | 0.098 | 0.416 | 0.375 | 0.167 |
| NOJB476M004# | B | 47 | 4 | 3.8 | 6 | 1.6 | 0.252 | 0.227 | 0.101 | 0.404 | 0.364 | 0.162 |
| NOJC476M004# | C | 47 | 4 | 3.8 | 6 | 0.5 | 0.514 | 0.462 | 0.206 | 0.257 | 0.231 | 0.103 |
| NOJB686M004# | B | 68 | 4 | 5.4 | 6 | 1.5 | 0.261 | 0.235 | 0.104 | 0.391 | 0.352 | 0.156 |
| NOJC686M004# | C | 68 | 4 | 5.4 | 6 | 0.5 | 0.514 | 0.462 | 0.206 | 0.257 | 0.231 | 0.103 |
| NOJB107M004# | B | 100 | 4 | 8.0 | 16 | 1.4 | 0.270 | 0.243 | 0.108 | 0.378 | 0.340 | 0.151 |
| NOJC107M004# | C | 100 | 4 | 8.0 | 6 | 0.4 | 0.574 | 0.517 | 0.230 | 0.230 | 0.207 | 0.092 |
| NOJC157M004# | C | 150 | 4 | 12.0 | 6 | 0.4 | 0.574 | 0.517 | 0.230 | 0.230 | 0.207 | 0.092 |
| NOJD157M004# | D | 150 | 4 | 12.0 | 6 | 0.3 | 0.775 | 0.697 | 0.310 | 0.232 | 0.209 | 0.093 |
| NOJC227M004# | C | 220 | 4 | 17.6 | 8 | 0.4 | 0.574 | 0.517 | 0.230 | 0.230 | 0.207 | 0.092 |
| NOJD227M004# | D | 220 | 4 | 17.6 | 8 | 0.4 | 0.671 | 0.604 | 0.268 | 0.268 | 0.241 | 0.107 |
| NOJD337M004# | D | 330 | 4 | 26.4 | 8 | 0.3 | 0.775 | 0.697 | 0.310 | 0.232 | 0.209 | 0.093 |
| NOJD477M004# | D | 470 | 4 | 37.6 | 12 | 0.3 | 0.775 | 0.697 | 0.310 | 0.232 | 0.209 | 0.093 |
| NOJE477M004# | E | 470 | 4 | 37.6 | 12 | 0.3 | 0.812 | 0.731 | 0.325 | 0.244 | 0.219 | 0.097 |
| NOJE687M004# | E | 680 | 4 | 54.4 | 14 | 0.3 | 0.812 | 0.731 | 0.325 | 0.244 | 0.219 | 0.097 |
| NOJV687M004# | V | 680 | 4 | 54.4 | 14 | 0.3 | 1.000 | 0.900 | 0.400 | 0.300 | 0.270 | 0.120 |
| NOJV108M004# | V | 1000 | 4 | 80.0 | 18 | 0.3 | 1.000 | 0.900 | 0.400 | 0.300 | 0.270 | 0.120 |
| 6.3 Volt @ 85°C (4 Volt @ 105°C) | | | | | | | | | | | | |
| NOJA475M006# | A | 4.7 | 6.3 | 1.1 | 6 | 3.2 | 0.168 | 0.151 | 0.067 | 0.537 | 0.483 | 0.215 |
| NOJA685M006# | A | 6.8 | 6.3 | 1.1 | 6 | 2.6 | 0.186 | 0.167 | 0.074 | 0.484 | 0.435 | 0.193 |
| NOJA106M006# | A | 10 | 6.3 | 1.2 | 6 | 2.2 | 0.202 | 0.182 | 0.081 | 0.445 | 0.400 | 0.178 |
| NOJB156M006# | B | 15 | 6.3 | 1.8 | 6 | 2 | 0.226 | 0.203 | 0.090 | 0.452 | 0.406 | 0.181 |
| NOJA156M006# | A | 15 | 6.3 | 1.8 | 8 | 2 | 0.212 | 0.191 | 0.085 | 0.424 | 0.382 | 0.170 |
| NOJB226M006# | B | 22 | 6.3 | 2.6 | 6 | 1.9 | 0.232 | 0.209 | 0.093 | 0.440 | 0.396 | 0.176 |
| NOJA226M006# | A | 22 | 6.3 | 2.6 | 8 | 1.8 | 0.224 | 0.201 | 0.089 | 0.402 | 0.362 | 0.161 |
| NOJB336M006# | B | 33 | 6.3 | 4.0 | 6 | 1.7 | 0.245 | 0.220 | 0.098 | 0.416 | 0.375 | 0.167 |
| NOJC336M006# | C | 33 | 6.3 | 4.0 | 6 | 0.5 | 0.514 | 0.462 | 0.206 | 0.257 | 0.231 | 0.103 |
| NOJB476M006# | B | 47 | 6.3 | 5.6 | 6 | 1.6 | 0.252 | 0.227 | 0.101 | 0.404 | 0.364 | 0.162 |
| NOJC476M006# | C | 47 | 6.3 | 5.7 | 6 | 0.5 | 0.514 | 0.462 | 0.206 | 0.257 | 0.231 | 0.103 |
| NOJB686M006# | B | 68 | 6.3 | 8.2 | 20 | 1.5 | 0.261 | 0.235 | 0.104 | 0.391 | 0.352 | 0.156 |

All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5RMS with DC bias of 2.2V. DCL is measured at rated voltage after 5 minutes. MSL level: see packaging and reel label.

NOTE: AVX reserves the rights to supply higher voltage rating in the same case size, to the same reliability standards.

OxiCap® NOJ Series



Niobium Oxide Capacitor

RATINGS & PART NUMBER REFERENCE

| AVX Part No. | Case Size | Capacitance (µF) | Rated Voltage (V) | DCL (µA) Max. | DF % Max. | ESR Max. (Ω) @100kHz | 100kHz Ripple Current (A) | | | 100kHz Ripple Voltage (V) | | |
|---|-----------|------------------|-------------------|---------------|-----------|----------------------|---------------------------|-------|-------|---------------------------|-------|-------|
| | | | | | | | 25°C | 85°C | 105°C | 25°C | 85°C | 105°C |
| 6.3 Volt @ 85°C (4 Volt @ 105°C) | | | | | | | | | | | | |
| NOJC686M006# | C | 68 | 6.3 | 8.2 | 6 | 0.5 | 0.514 | 0.462 | 0.206 | 0.257 | 0.231 | 0.103 |
| NOJC107M006# | C | 100 | 6.3 | 12.0 | 8 | 0.4 | 0.574 | 0.517 | 0.230 | 0.230 | 0.207 | 0.092 |
| NOJD107M006# | D | 100 | 6.3 | 12.0 | 6 | 0.4 | 0.671 | 0.604 | 0.268 | 0.268 | 0.241 | 0.107 |
| NOJC157M006# | C | 150 | 6.3 | 18.0 | 6 | 0.4 | 0.574 | 0.517 | 0.230 | 0.230 | 0.207 | 0.092 |
| NOJD157M006# | D | 150 | 6.3 | 18.0 | 6 | 0.4 | 0.671 | 0.604 | 0.268 | 0.268 | 0.241 | 0.107 |
| NOJC227M006# | C | 220 | 6.3 | 26.4 | 14 | 0.4 | 0.574 | 0.517 | 0.230 | 0.230 | 0.207 | 0.092 |
| NOJD227M006# | D | 220 | 6.3 | 26.4 | 8 | 0.4 | 0.671 | 0.604 | 0.268 | 0.268 | 0.241 | 0.107 |
| NOJE227M006# | E | 220 | 6.3 | 26.4 | 12 | 0.4 | 0.704 | 0.633 | 0.281 | 0.281 | 0.253 | 0.113 |
| NOJD337M006# | D | 330 | 6.3 | 39.6 | 10 | 0.3 | 0.775 | 0.697 | 0.310 | 0.232 | 0.209 | 0.093 |
| NOJE337M006# | E | 330 | 6.3 | 39.6 | 12 | 0.3 | 0.812 | 0.731 | 0.325 | 0.244 | 0.219 | 0.097 |
| NOJE477M006# | E | 470 | 6.3 | 56.4 | 10 | 0.3 | 0.812 | 0.731 | 0.325 | 0.244 | 0.219 | 0.097 |
| NOJV477M006# | V | 470 | 6.3 | 56.4 | 12 | 0.3 | 1.000 | 0.900 | 0.400 | 0.300 | 0.270 | 0.120 |
| 10 Volt @ 85°C (7 Volt @ 105°C) | | | | | | | | | | | | |
| NOJA475M010# | A | 4.7 | 10 | 1.0 | 6 | 3.1 | 0.170 | 0.153 | 0.068 | 0.528 | 0.475 | 0.211 |
| NOJA685M010# | A | 6.8 | 10 | 1.4 | 6 | 2.6 | 0.186 | 0.167 | 0.074 | 0.484 | 0.435 | 0.193 |
| NOJA106M010# | A | 10 | 10 | 2.0 | 6 | 2.2 | 0.202 | 0.182 | 0.081 | 0.445 | 0.400 | 0.178 |
| NOJB106M010# | B | 10 | 10 | 2.0 | 6 | 2.2 | 0.215 | 0.194 | 0.086 | 0.474 | 0.426 | 0.189 |
| NOJA156M010# | A | 15 | 10 | 3.0 | 6 | 2 | 0.212 | 0.191 | 0.085 | 0.424 | 0.382 | 0.170 |
| NOJB156M010# | B | 15 | 10 | 3.0 | 6 | 2 | 0.226 | 0.203 | 0.090 | 0.452 | 0.406 | 0.181 |
| NOJB226M010# | B | 22 | 10 | 4.4 | 6 | 1.8 | 0.238 | 0.214 | 0.095 | 0.428 | 0.386 | 0.171 |
| NOJC226M010# | C | 22 | 10 | 4.4 | 6 | 0.5 | 0.514 | 0.462 | 0.206 | 0.257 | 0.231 | 0.103 |
| NOJC336M010# | C | 33 | 10 | 6.6 | 6 | 0.5 | 0.514 | 0.462 | 0.206 | 0.257 | 0.231 | 0.103 |
| NOJC476M010# | C | 47 | 10 | 9.4 | 6 | 0.4 | 0.574 | 0.517 | 0.230 | 0.230 | 0.207 | 0.092 |
| NOJC686M010# | C | 68 | 10 | 13.6 | 12 | 0.5 | 0.514 | 0.462 | 0.206 | 0.257 | 0.231 | 0.103 |
| NOJD107M010# | D | 100 | 10 | 20.0 | 12 | 0.4 | 0.671 | 0.604 | 0.268 | 0.268 | 0.241 | 0.107 |

All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5RMS with DC bias of 2.2V. DCL is measured at rated voltage after 5 minutes. MSL level: see packaging and reel label.

NOTE: AVX reserves the rights to supply higher voltage rating in the same case size, to the same reliability standards.