



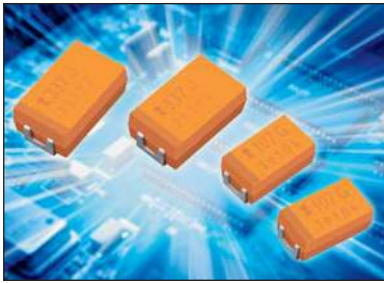
**THE DATASHEET OF  
NOJD337M004RWJ**



# OxiCap® NOJ Series



## Standard and Low Profile Niobium Oxide Capacitors



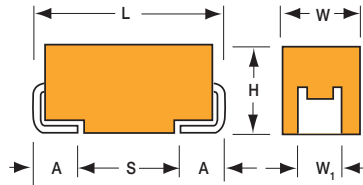
Elektra Award  
2005

### FEATURES

- Non-burn safe technology
- Reliability level: 0.5%/1000 hours at 85°C
- 13 case sizes available, standard and low profile
- Environmentally friendly, RoHS Compliant
- CV range: 2.2-1000µF / 1.8-10V
- Elektra Component of the Year Award, 2005

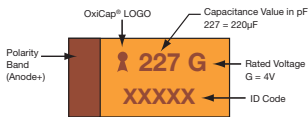
### APPLICATIONS

- Automotive, Avionics, Digital, FPGA, Industrial low voltage control circuits
- Downsized industrial and automotive DC/DC converters

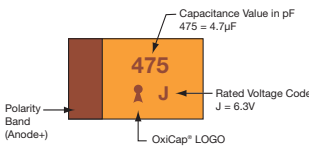


### MARKING

A, B, C, D, E, F, S, T, V, W, X, Y  
CASE



### P CASE



### HOW TO ORDER

<b>NOJ</b>	<b>D</b>	<b>107</b>	<b>M</b>	<b>006</b>	<b>R</b>	<b>WJ</b>	<b>-</b>
Type	Case Size See tables above	Capacitance Code 1st two digits represent significant figures, 3rd digit represents multiplier in pF	Tolerance M=±20%	Rated DC Voltage 001 = 1.8Vdc 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc	Packaging R = Pure Tin 7" Reel S = Pure Tin 13" Reel	Specification Suffix WJ = Standard WB = Low ESR	Additional characters may be added for special requirements V = dry pack option (selected ratings only - dry pack is standard for all D, E, V, X, Y case size ratings)

### TECHNICAL SPECIFICATIONS

Technical Data:		All technical data relate to an ambient temperature of +25°C is not stated						
Capacitance Range:		2.2 µF to 1000 µF						
Capacitance Tolerance:		±20%						
Leakage Current DCL:		0.02CV or 1.0µA whichever is the greater						
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		
Surge Voltage ( $V_S$ )	≤ +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						



## Standard and Low Profile Niobium Oxide Capacitors

### STANDARD NIOBIUM OXIDE 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)	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/B(700)
33	336		A/B	A/B	B/C/B(700)	C
47	476	A	A/B	A/B/C	B/C	C
68	686	B	B/C	B/C	B/C	C
100	107	B/C	B/C	B/C/B(250)	B/C/D/B(400)	D/D(150)
150	157	C	C	C/D	C/D	
220	227	C	C	C/D	C/D/E	
330	337	C	C/D	D	D/E	
470	477		D/E	D/E	E/V/E(75)	
680	687		E	E/V		
1000	108		V	V		

### LOW PROFILE NIOBIUM OXIDE 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)	4V (G)	6.3V (J)	10V (A)
1.0	105					
1.5	155					
2.2	225					P
3.3	335					P
4.7	475				P/S	T
6.8	685			P/S	P/S/T	T
10	106		P/S	P/S/T	P/T	T
15	156	P/S	P/S/T	P/T		
22	226	P/S/T	P/T	T	T	
33	336	T	T	T	W	
47	476	T	T	W	W	
68	686		W	W	X/Y	
100	107	W	W	W/X	F/Y	
150	157		X	Y	F/Y	
220	227	X	Y	F/Y	Y	
330	337	Y	Y	Y		
470	477	Y				

Released ratings (ESR ratings in mOhms in parentheses)

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





# OxiCap<sup>®</sup> NOJ Series



## Standard and Low Profile Niobium Oxide Capacitors

### RATINGS & PART NUMBER REFERENCE

AVX Part No.	Case Size	Capacitance (μF)	Rated Voltage (V)	Rated Temperature (°C)	Category Voltage (V)	Category Temperature (°C)	DCL Max. (μA)	DF Max. (%)	ESR Max. @ 100kHz (Ω)	100kHz RMS Current (A)			MSL
										25°C	85°C	105°C	
<b>10 Volt @ 85°C</b>													
NOJP225M010#WJ	P	2.2	10	85	7	105	1.0	8	8.3	0.093	0.084	0.037	1
NOJP335M010#WJ	P	3.3	10	85	7	105	1.0	8	7	0.101	0.091	0.041	1
NOJA475M010#WJ	A	4.7	10	85	7	105	1.0	6	3.1	0.170	0.153	0.068	1
NOJT475M010#WJ	T	4.7	10	85	7	105	1.0	6	3.1	0.176	0.158	0.070	1
NOJA685M010#WJ	A	6.8	10	85	7	105	1.4	6	2.6	0.186	0.167	0.074	1
NOJT685M010#WJ	T	6.8	10	85	7	105	1.4	6	2.6	0.192	0.173	0.077	1
NOJA106M010#WJ	A	10	10	85	7	105	2.0	6	2.2	0.202	0.182	0.081	1
NOJB106M010#WJ	B	10	10	85	7	105	2.0	6	1	0.319	0.287	0.128	1
NOJT106M010#WJ	T	10	10	85	7	105	2.0	6	2.2	0.209	0.188	0.084	1
NOJA156M010#WJ	A	15	10	85	7	105	3.0	6	2	0.212	0.191	0.085	1
NOJB156M010#WJ	B	15	10	85	7	105	3.0	6	2	0.226	0.203	0.090	1
NOJB226M010#WJ	B	22	10	85	7	105	4.4	6	1.8	0.238	0.214	0.095	1
NOJB226M010#WB	B	22	10	85	7	105	4.4	6	0.7	0.382	0.344	0.153	3
NOJC226M010#WJ	C	22	10	85	7	105	4.4	6	0.5	0.514	0.462	0.206	1
NOJC336M010#WJ	C	33	10	85	7	105	6.6	6	0.5	0.514	0.462	0.206	1
NOJC476M010#WJ	C	47	10	85	7	105	9.4	6	0.4	0.574	0.517	0.230	1
NOJC686M010#WJ	C	68	10	85	7	105	13.6	12	0.5	0.514	0.462	0.206	1
NOJD107M010#WJ	D	100	10	85	7	105	20.0	12	0.4	0.671	0.604	0.268	3
NOJD107M010#WB	D	100	10	85	7	105	20.0	12	0.15	1.095	0.986	0.438	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.

The EIA & CECC standards for capacitors allow an ESR movement to 1.25 times catalog limit post mounting.

For typical weight and composition see page 274.

**NOTE: AVX reserves the right to supply higher voltage ratings in the same case size, to the same reliability standards.**

## Standard and Low Profile Niobium Oxide Capacitors

### QUALIFICATION TABLE

TEST	NOJ series (Temperature range -55°C to +105°C)										
	Condition			Characteristics							
<b>Endurance</b>	Apply rated voltage (Ur) at 85°C and / or category voltage (Uc) at 105°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 105°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	+105°C	+20°C	
	1	+20	15	DCL	IL*	n/a	IL*	10 x IL*	12.5 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	+105	15								
	6	+20	15								
<b>Surge Voltage</b>	Apply 1.3x category voltage (Uc) at 105°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

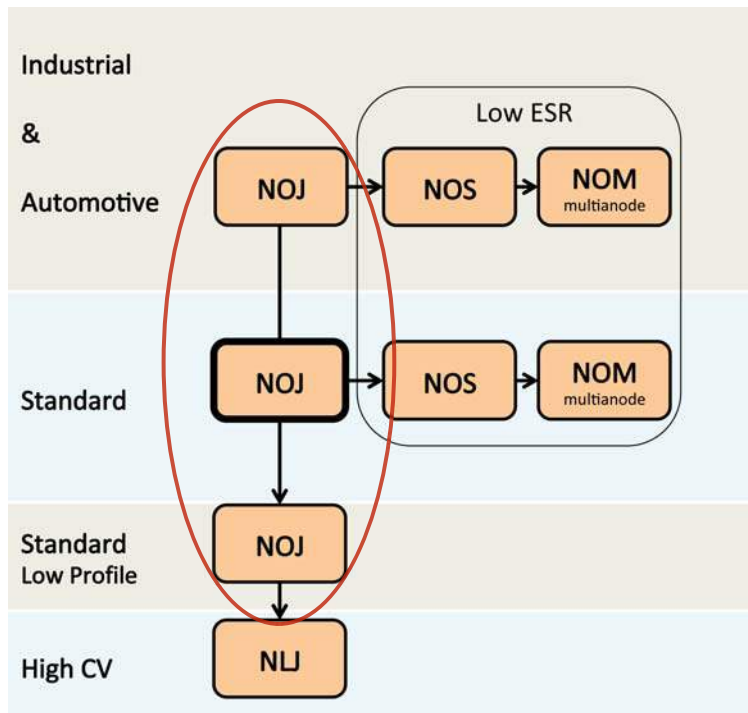
### AVX SOLID ELECTROLYTE CAPACITOR ROADMAP



### Five Capacitor Construction Styles



### SERIES LINE UP: NIOBIUM OXIDE OXICAP® CAPACITORS



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