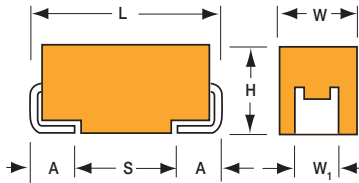




**THE DATASHEET OF  
NOJY227M004RWJ**

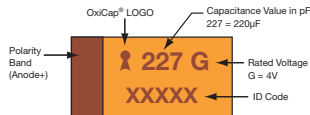


## Low Profile

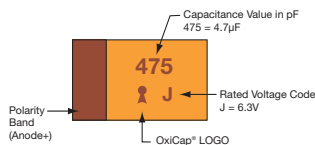


### MARKING

#### F, S, T, W, X, Y CASE



#### P CASE



### HOW TO ORDER

NOJ	Y	107	M	006	R	WJ	-
<b>Type</b>	<b>Case Size</b> See table above	<b>Capacitance Code</b> 1st two digits represent significant figures, 3rd digit represents multiplier in pF	<b>Tolerance</b> M=±20%	<b>Rated DC Voltage</b> 001 = 1.8Vdc 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc	<b>Packaging</b> R = Pure Tin 7" Reel S = Pure Tin 13" Reel	<b>Specification Suffix</b> WJ = Standard Suffix	<b>Additional characters may be added for special requirements</b> V = Dry pack Option (selected codes only) with exception of X, Y cases

### TECHNICAL SPECIFICATIONS

Technical Data:	All technical data relate to an ambient temperature of +25°C is not stated						
Capacitance Range:	2.2 µF to 470 µF						
Capacitance Tolerance:	±20%						
Leakage Current DCL:	0.02CV or 1.0µA whichever is the greater						
Rated Voltage DC (V <sub>R</sub> )	≤ +85°C:	1.8	2.5	4	6.3	10	
Category Voltage (V <sub>C</sub> )	≤ +105°C:	1.2	1.7	2.7	4	7	
Surge Voltage (V <sub>S</sub> )	≤ +85°C:	2.3	3.3	5.2	8	13	
Surge Voltage (V <sub>S</sub> )	≤ +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 <sub>R</sub> , 0.1Ω/V series impedance, 60% confidence level Meets requirements of AEC-Q200						

### FEATURES

- Non-burn safe technology
- Reliability level: 0.5%/1000 hrs.
- CV range: 2.2-470µF / 1.8-10V
- 7 case sizes in low profile available
- IBM global approval received in 2004
- Elektra Award received in 2005

### APPLICATIONS

- Downsized industrial and automotive DC/DCs



Elektra Award 2005

### CASE DIMENSIONS: millimeters (inches)

Code	EIA Code	EIA Metric	L±0.20 (0.008)	W+0.20 (0.008) -0.10 (0.004)	H Max	W <sub>1</sub> ±0.20 (0.008)	A+0.30 (0.012) -0.20 (0.008)	S Min.
F	2312	6032-20	6.00 (0.236)	3.20 (0.126)	2.00 (0.079)	2.20 (0.087)	1.30 (0.051)	2.90 (0.114)
P	0805	2012-15	2.05 (0.081)	1.35 (0.053)	1.50 (0.059)	1.00±0.10 (0.039±0.004)	0.50 (0.020)	0.85 (0.033)
S	1206	3216-12	3.20 (0.126)	1.60 (0.063)	1.20 (0.047)	1.20 (0.047)	0.80 (0.031)	1.10 (0.043)
T	1210	3528-12	3.50 (0.138)	2.80 (0.110)	1.20 (0.047)	2.20 (0.087)	0.80 (0.031)	1.40 (0.055)
W	2312	6032-15	6.00 (0.236)	3.20 (0.126)	1.50 (0.059)	2.20 (0.087)	1.30 (0.051)	2.90 (0.114)
X	2917	7343-15	7.30 (0.287)	4.30 (0.169)	1.50 (0.059)	2.40 (0.094)	1.30 (0.051)	4.40 (0.173)
Y	2917	7343-20	7.30 (0.287)	4.30 (0.169)	2.00 (0.079)	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.  
Pad Stand-off is 0.1±0.1.

## Low Profile

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

Capacitance		Rated Voltage DC ( $V_r$ ) to 85°C				
$\mu\text{F}$	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				

#### Available Ratings

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

## Low Profile

### 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)	MSL	100kHz RMS Current (A)		
											25°C	85°C	105°C
<b>1.8 Volt @ 85°C</b>													
NOJP156M001#WJ	P	15	1.8	85	1.2	105	1.0	10	4.1	1	0.133	0.119	0.053
NOJS156M001#WJ	S	15	1.8	85	1.2	105	1.0	6	2	1	0.197	0.178	0.079
NOJP226M001#WJ	P	22	1.8	85	1.2	105	1.0	10	3.8	1	0.138	0.124	0.055
NOJS226M001#WJ	S	22	1.8	85	1.2	105	1.0	8	1.9	1	0.203	0.182	0.081
NOJT226M001#WJ	T	22	1.8	85	1.2	105	1.0	6	1.8	1	0.231	0.208	0.092
NOJT336M001#WJ	T	33	1.8	85	1.2	105	1.2	6	1.7	1	0.238	0.214	0.095
NOJT476M001#WJ	T	47	1.8	85	1.2	105	1.7	10	1.6	1	0.245	0.220	0.098
NOJW107M001#WJ	W	100	1.8	85	1.2	105	3.6	6	0.4	1	0.520	0.468	0.208
NOJX227M001#WJ	X	220	1.8	85	1.2	105	8.0	8	0.4	3	0.548	0.493	0.219
NOJY337M001#WJ	Y	330	1.8	85	1.2	105	11.9	8	0.3	3	0.707	0.636	0.283
NOJY477M001#WJ	Y	470	1.8	85	1.2	105	17.0	8	0.3	3	0.707	0.636	0.283
<b>2.5 Volt @ 85°C</b>													
NOJP106M002#WJ	P	10	2.5	85	1.7	105	1.0	6	4.5	1	0.126	0.114	0.051
NOJS106M002#WJ	S	10	2.5	85	1.7	105	1.0	6	2.2	1	0.188	0.169	0.075
NOJP156M002#WJ	P	15	2.5	85	1.7	105	1.0	6	4	1	0.134	0.121	0.054
NOJS156M002#WJ	S	15	2.5	85	1.7	105	1.0	8	2	1	0.197	0.178	0.079
NOJT156M002#WJ	T	15	2.5	85	1.7	105	1.0	6	2	1	0.219	0.197	0.088
NOJP226M002#WJ	P	22	2.5	85	1.7	105	1.1	10	3.8	1	0.138	0.124	0.055
NOJT226M002#WJ	T	22	2.5	85	1.7	105	1.1	6	1.9	1	0.225	0.202	0.090
NOJT336M002#WJ	T	33	2.5	85	1.7	105	1.7	6	1.7	1	0.238	0.214	0.095
NOJT476M002#WJ	T	47	2.5	85	1.7	105	2.4	10	1.6	1	0.245	0.220	0.098
NOJW686M002#WJ	W	68	2.5	85	1.7	105	3.4	6	0.4	1	0.520	0.468	0.208
NOJW107M002#WJ	W	100	2.5	85	1.7	105	5.0	6	0.4	1	0.520	0.468	0.208
NOJX157M002#WJ	X	150	2.5	85	1.7	105	7.5	6	0.4	3	0.548	0.493	0.219
NOJY227M002#WJ	Y	220	2.5	85	1.7	105	11.0	8	0.4	3	0.612	0.551	0.245
NOJY337M002#WJ	Y	330	2.5	85	1.7	105	16.5	10	0.3	3	0.707	0.636	0.283
<b>4 Volt @ 85°C</b>													
NOJP685M004#WJ	P	6.8	4	85	2.7	105	1.0	6	5.3	1	0.117	0.105	0.047
NOJS685M004#WJ	S	6.8	4	85	2.7	105	1.0	6	2.6	1	0.173	0.156	0.069
NOJP106M004#WJ	P	10	4	85	2.7	105	1.0	20	4.5	1	0.126	0.114	0.051
NOJS106M004#WJ	S	10	4	85	2.7	105	1.0	8	2.2	1	0.188	0.169	0.075
NOJT106M004#WJ	T	10	4	85	2.7	105	1.0	6	2.2	1	0.209	0.188	0.084
NOJP156M004#WJ	P	15	4	85	2.7	105	1.2	10	4.1	1	0.133	0.119	0.053
NOJT156M004#WJ	T	15	4	85	2.7	105	1.2	6	2	1	0.219	0.197	0.088
NOJT226M004#WJ	T	22	4	85	2.7	105	1.8	6	1.8	1	0.231	0.208	0.092
NOJT336M004#WJ	T	33	4	85	2.7	105	2.6	14	2	1	0.219	0.197	0.088
NOJW476M004#WJ	W	47	4	85	2.7	105	3.8	6	0.5	1	0.465	0.418	0.186
NOJW686M004#WJ	W	68	4	85	2.7	105	5.4	6	0.4	1	0.520	0.468	0.208
NOJW107M004#WJ	W	100	4	85	2.7	105	8.0	8	0.4	1	0.520	0.468	0.208
NOJX107M004#WJ	X	100	4	85	2.7	105	8.0	6	0.4	3	0.548	0.493	0.219
NOJY157M004#WJ	Y	150	4	85	2.7	105	12.0	6	0.4	3	0.612	0.551	0.245
NOJF227M004#WJ	F	220	4	85	2.7	105	17.6	10	0.4	1	0.548	0.493	0.219
NOJY227M004#WJ	Y	220	4	85	2.7	105	17.6	10	0.4	3	0.612	0.551	0.245
NOJY337M004#WJ	Y	330	4	85	2.7	105	26.4	12	0.3	3	0.707	0.636	0.283
<b>6.3 Volt @ 85°C</b>													
NOJP475M006#WJ	P	4.7	6.3	85	4	105	1.0	6	6.1	1	0.109	0.098	0.043
NOJS475M006#WJ	S	4.7	6.3	85	4	105	1.0	6	3.2	1	0.156	0.141	0.062
NOJP685M006#WJ	P	6.8	6.3	85	4	105	1.0	10	5.2	1	0.118	0.106	0.047
NOJS685M006#WJ	S	6.8	6.3	85	4	105	1.0	8	2.7	1	0.170	0.153	0.068
NOJT685M006#WJ	T	6.8	6.3	85	4	105	1.0	6	2.6	1	0.192	0.173	0.077
NOJP106M006#WJ	P	10	6.3	85	4	105	1.2	10	4.5	1	0.126	0.114	0.051
NOJT106M006#WJ	T	10	6.3	85	4	105	1.2	6	2.2	1	0.209	0.188	0.084
NOJT226M006#WJ	T	22	6.3	85	4	105	2.6	8	1.8	1	0.231	0.208	0.092
NOJW336M006#WJ	W	33	6.3	85	4	105	4.0	6	0.5	1	0.465	0.418	0.186
NOJW476M006#WJ	W	47	6.3	85	4	105	5.7	6	0.5	1	0.465	0.418	0.186
NOJX686M006#WJ	X	68	6.3	85	4	105	8.2	6	0.5	3	0.490	0.441	0.196
NOJY686M006#WJ	Y	68	6.3	85	4	105	8.2	6	0.5	3	0.548	0.493	0.219
NOJF107M006#WJ	F	100	6.3	85	4	105	12	8	0.4	1	0.548	0.493	0.219
NOJY107M006#WJ	Y	100	6.3	85	4	105	12.0	6	0.4	3	0.612	0.551	0.245
NOJF157M006#WJ	F	150	6.3	85	4	105	18.0	8	0.4	1	0.548	0.493	0.219
NOJY157M006#WJ	Y	150	6.3	85	4	105	18.0	6	0.4	3	0.612	0.551	0.245
NOJY227M006#WJ	Y	220	6.3	85	4	105	26.4	10	0.4	3	0.612	0.551	0.245
<b>10 Volt @ 85°C</b>													
NOJP225M010#WJ	P	2.2	10	85	7	105	1.0	8	8.3	1	0.093	0.084	0.037
NOJP335M010#WJ	P	3.3	10	85	7	105	1.0	8	7	1	0.101	0.091	0.041
NOJT475M010#WJ	T	4.7	10	85	7	105	1.0	6	3.1	1	0.176	0.158	0.070
NOJT685M010#WJ	T	6.8	10	85	7	105	1.4	6	2.6	1	0.192	0.173	0.077
NOJT106M010#WJ	T	10	10	85	7	105	2.0	6	2.2	1	0.209	0.188	0.084

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 223.

**NOTE: AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.**

## Low Profile

### QUALIFICATION TABLE

TEST	NOJ low profile series (Temperature range -55°C to +105°C)										
	Condition			Characteristics							
<b>Endurance</b>	Determine after application of rated voltage for 2000 +48/-0 hours at 85±2°C and then leaving 1-2 hours at room temperature. Also determine of 105°C temperature, category voltage for 2000 +48/-0 hours and then leaving 1-2 hours at room temperature. Power supply impedance to be ≤0.1Ω/V.			Visual examination	no visible damage						
				DCL	initial limit						
				ΔC/C	within ±10% of initial value						
				DF	initial limit						
				ESR	1.25 x initial limit						
<b>Storage Life</b>	105°C, 0V, 2000h			Visual examination	no visible damage						
				DCL	initial limit						
				ΔC/C	within ±10% of initial value						
				DF	initial limit						
				ESR	1.25 x initial limit						
<b>Humidity</b>	Determine after storage without applied voltage at 65±2°C and 95±2% relative humidity for 500 hrs and then recovery 1-2 hours at room temperature.			Visual examination	no visible damage						
				DCL	1.5 x initial limit						
				ΔC/C	within ±10% of initial value						
				DF	1.2 x initial limit						
				ESR	1.25 x initial limit						
<b>Biased Humidity</b>	Determine after leaving for 1000 hours at 85±2°C, 85% relative humidity and rated voltage and then recovery 1-2 hours at room temperature.			Visual examination	no visible damage						
				DCL	2 x initial limit						
				ΔC/C	within ±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±2	15	DCL	IL*	n/a	IL*	10 x IL*	12.5 x IL*	IL*	
	2	-55+0/-3	15		ΔC/C	n/a	+0/-10%	±5%	+10/-0%	+12/-0%	±5%
	3	+20±2	15	DF		IL*	1.5 x IL*	IL*	1.5 x IL*	2 x IL*	IL*
	4	+85+3/-0	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+3/-0	15								
	6	+20±2	15								
<b>Surge Voltage</b>	Test temperature: 105°C+3/0°C Test voltage: 1.3 x category voltage at 105°C Series protection resistance 1000±100Ω Discharge resistance: 1000Ω Number of cycles: 1000x Cycle duration: 6 min; 30 sec charge, 5 min 30 sec discharge			Visual examination	no visible damage						
				DCL	initial limit						
				ΔC/C	within ±5% of initial value						
				DF	initial limit						
				ESR	1.25 x initial limit						

\*Initial Limit

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