

# Hybrid Surface Mount Aluminum Electrolytic Capacitors

NSPE Series

## FEATURES

- CYLINDRICAL V-CHIP CONSTRUCTION FOR SURFACE MOUNTING
- SUPER LOW ESR & HIGH RIPPLE CURRENT
- CAPACITANCE VALUES UP TO 820 $\mu$ F
- 6.3x6.3mm ~ 10x10.8mm CASE SIZES
- DESIGNED FOR REFLOW SOLDERING

**RoHS Compliant**  
includes all homogeneous materials

\*See Part Number System for Details



## CHARACTERISTICS

Rated Voltage Range	4 ~ 10Vdc			
Rated Capacitance Range	22 ~ 820 $\mu$ F			
Operating Temp. Range	-55 ~ +105°C			
Capacitance Tolerance	$\pm$ 20% (M)			
Max. Leakage Current After 2 Minutes @ 20°C	Less than 0.1CV or 50 $\mu$ A whichever is greater			
Working and Surge Voltage Ratings	W.V. (Vdc)	4	6.3	10
	S.V. (Vdc)	4.6	7.2	11.5
Tan $\delta$ @ 120Hz/20°C	All Case Sizes	0.24	0.22	0.20
Impedance Ratio	Z -55°C/Z +20°C	2.5		
	Z +105°C/Z +20°C	1.0		
Load Life Test @ 105°C 6.3mm Dia. and All 4Vdc parts = 1,000 Hours 8mm ~ 10mm Dia. parts = 2,000 Hours	Capacitance Change	Within $\pm$ 20% of initial measured value		
	Tan $\delta$	Less than 200% of specified max. value		
	Leakage Current	Less than specified max. value		

**LOW ESR COMPONENT**  
HYBRID ELECTROLYTE  
For Performance Data see [www.LowESR.com](http://www.LowESR.com)

## MAXIMUM PERMISSIBLE RIPPLE CURRENT (mA rms AT 100KHz AND 105°C)

Cap. ( $\mu$ F)	Working Voltage (Vdc)		
	4.0	6.3	10
22	-	-	1,020
33	-	-	1,020
47	-	-	1,020
100	-	1,120	1,550
150	-	-	1,550
220	-	1,550	1,550
330	-	1,550	1,550*
			2090
390	-	1,550	2,090
470	1,550	2,090	2,090*
560	-	2,090	-
680	2,090	-	-
820	2,180	-	-

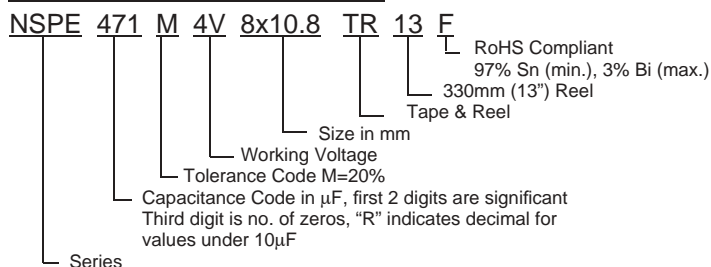
\*Low temperature reflow soldering only

## MAXIMUM ESR (m $\Omega$ AT 100KHz AND 20°C)

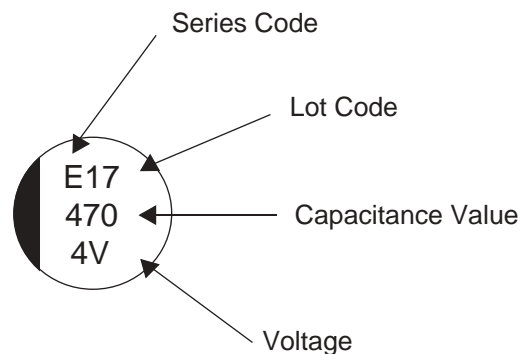
Cap. ( $\mu$ F)	Working Voltage (Vdc)		
	4.0	6.3	10
22	-	-	60
33	-	-	60
47	-	-	60
100	-	50	30
150	-	-	30
220	-	30	30
330	-	30	30*
			25
390	-	30	25
470	30	25	25*
560	-	25	-
680	25	-	-
820	23	-	-

\*Low temperature reflow soldering only

## PART NUMBER SYSTEM



## Part Marking



## PRECAUTIONS

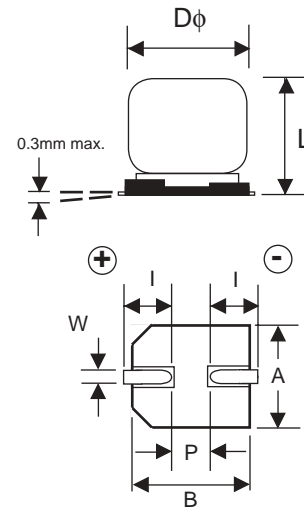
Please review the notes on correct use, safety and precautions found on pages T10 & T11 of NIC's Electrolytic Capacitor catalog. Also found at [www.niccomp.com/precautions](http://www.niccomp.com/precautions). If in doubt or uncertainty, please review your specific application - process details with NIC's technical support personnel: [tpmg@niccomp.com](mailto:tpmg@niccomp.com)



### STANDARD PRODUCT AND CASE SIZE TABLE D $\phi$ x L (mm)

Cap ( $\mu$ F)	Code	Working Voltage (Vdc)		
		4.0	6.3	10
22	220	-	-	6.3 x 6.3
33	330	-	-	6.3 x 6.3
47	470	-	-	6.3 x 6.3
100	101	-	6.3 x 6.3	8 x 10.8
150	151	-	-	8 x 10.8
220	221	-	8 x 10.8	8 x 10.8
330	331	-	8 x 10.8	8 x 10.8*
				10 x 10.8
390	391	-	8 x 10.8	10 x 10.8
470	471	8 x 10.8	10 x 10.8	10 x 10.8*
560	561	-	10 x 10.8	-
680	681	10 x 10.8	-	-
820	821	10 x 10.8	-	-

\*Low temperature reflow soldering only



### DIMENSIONS (mm)

D $\phi$ $\pm$ 0.5	L max.	A/B $\pm$ 0.2	W	I $\pm$ 0.2	P $\pm$ 0.2
6.3	6.3	6.8	0.5 ~ 0.8	2.55	2.2
8.0	10.8	8.3	0.7 ~ 1.0	2.9	3.2
10	10.8	10.3	1.1 ~ 1.4	3.2	4.6

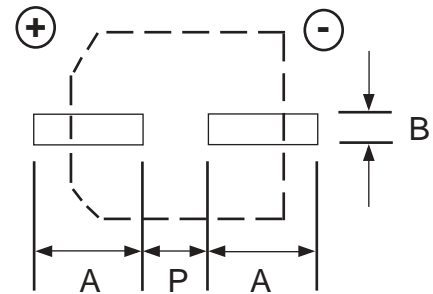
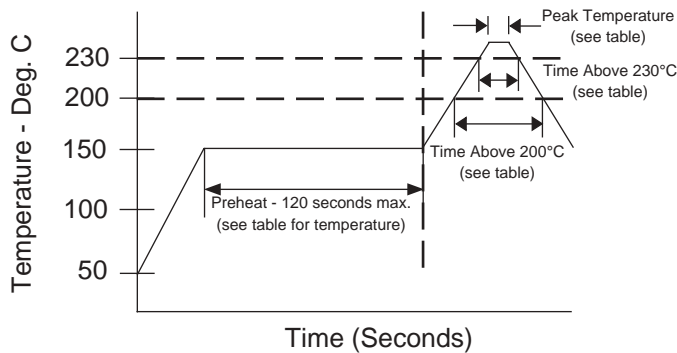
### PEAK TEMPERATURE AND DURATION

Diameter/Voltage	Preheat (120 sec. max.)	Peak Temperature	Time above 200°C	Time above 230°C
6.3mm/4V ~ 10V	150°C ~ 180°C	250°C/5 sec.	60 sec. max.	40 sec. max.
8.0mm/4V ~ 10V	150°C ~ 180°C	240°C/5 sec.	60 sec. max.	30 sec. max.
10mm/4V ~ 10V	150°C ~ 180°C	235°C/5 sec.	50 sec. max.	5 sec. max.
NSPE471M6.3V10x10.8TRxxF	150°C ~ 180°C	240°C/5 sec.	60 sec. max.	30 sec. max.
NSPE331M10V8x10.8TRxxF	<150°C	230°C/5 sec.	30 sec. max.	-
NSPE471M10V10x10.8TRxxF				

### LAND PATTERN DIM. (mm)

Case Dia.	A	B	P
6.3	3.5	1.6	1.9
8	4.2	2.2	3.1
10	4.4	2.2	4.5

### RECOMMENDED REFLOW SOLDERING PROFILE



Review & Compare Reflow Soldering Heat Limits  
V-chip SMT Aluminum Electrolytic Capacitors  
[www.niccomp.com/RSL](http://www.niccomp.com/RSL)