

# Hybrid Aluminum Electrolytic Capacitors

NSPE-S Series

- CYLINDRICAL V-CHIP CONSTRUCTION FOR SURFACE MOUNTING
- EXTENDED LOAD LIFE (3,000 ~ 5,000 HOURS)
- **ULTRA LOW ESR**, HIGH RIPPLE CURRENT
- CAPACITANCE VALUES UP TO 1000 $\mu$ F
- 6.3x6.3mm ~ 10x10.8mm CASE SIZES
- **REFLOW SOLDERING RATED TO +260°C** (see reflow specifications)



## CHARACTERISTICS

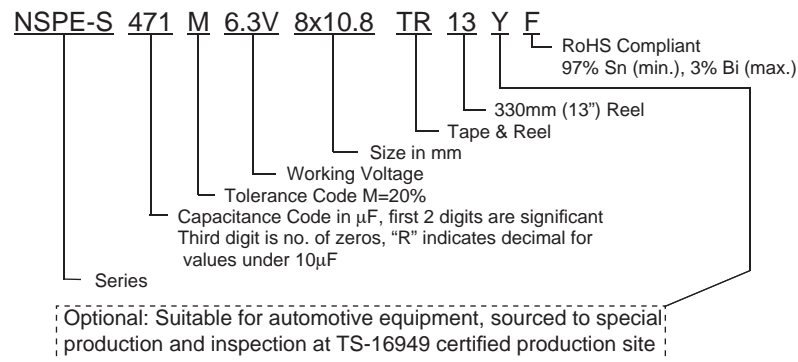
Rated Voltage Range	6.3 ~ 16Vdc		
Rated Capacitance Range	10 ~ 1000 $\mu$ F		
Operating Temp. Range	-55 ~ +105°C		
Capacitance Tolerance	$\pm$ 20% (M)		
Max. Leakage Current After 2 Minutes @ 20°C	Less than 0.2CV or 100 $\mu$ A whichever is greater		
Working and Surge Voltage Ratings	W.V. (Vdc)	6.3      10      16	
	S.V. (Vdc)	8.2      13      20	
Tan $\delta$ @ 120Hz/20°C		0.18      0.16      0.14	
Impedance Ratio	Z -55°C/Z +20°C	1 ~ 2.5	
	Z +105°C/Z +20°C	0.6 ~ 1.0	
Load Life Test @ 105°C 6.3mm Dia. = 3,000 Hours 8mm ~ 10mm Dia. parts = 5,000 Hours	Capacitance Change	Within $\pm$ 30% of initial measured value	
	Tan $\delta$ and ESR	Less than 200% of specified max. value	
	Leakage Current	Less than specified max. value	

**RoHS Compliant**

includes all homogeneous materials

\*See Part Number System for Details

## PART NUMBER SYSTEM



## STANDARD PRODUCTS AND CASE SIZES D $\phi$ x L (mm)

PART NUMBER	Cap. ( $\mu$ F)	Working Voltage	Case Size (D X L) mm	Max. ESR (m $\Omega$ ) AT 100kHz/20°C	Max. Ripple Current (mA rms) AT 100kHz/105°C
NSPE-S101M6.3V6.3X6.3TR13F	100	6.3	6.3X6.3	36	1630
NSPE-S151M6.3V6.3X6.3TR13F	150		6.3X6.3	36	1630
NSPE-S181M6.3V6.3X8TR13F	180		6.3X8	32	2020
NSPE-S221M6.3V6.3X8TR13F	220		6.3X8	32	2020
NSPE-S221M6.3V8X10.8TR13F			8X10.8	16	3150
NSPE-S331M6.3V8X10.8TR13F	330		8X10.8	16	3150
NSPE-S471M6.3V8X10.8TR13F	470		8X10.8	16	3150
NSPE-S561M6.3V8X10.8TR13F	560		8X10.8	16	3150
NSPE-S681M6.3V10X10.8TR13F	680		10X10.8	15	3890
NSPE-S102M6.3V10X10.8TR13F	1000		10X10.8	15	3890

For Automotive Applications See Part Numbering System



### STANDARD PRODUCTS AND CASE SIZES D $\phi$ x L (mm)

PART NUMBER	Cap. ( $\mu$ F)	Working Voltage	Case Size (D X L) mm	Max. ESR (m $\Omega$ ) AT 100kHz/20°C	Max. Ripple Current (mA rms) AT 100kHz/105°C
NSPE-S330M10V6.3X6.3TR13F	33	10	6.3X6.3	40	1510
NSPE-S470M10V6.3X6.3TR13F	47		6.3X6.3	40	1510
NSPE-S680M10V6.3X6.3TR13F	68		6.3X6.3	40	1510
NSPE-S101M10V6.3X8TR13F	100		6.3X8	35	1910
NSPE-S101M10V8X10.8TR13F			8x10.8	18	2800
NSPE-S151M10V8X10.8TR13F	150		8X10.8	18	2800
NSPE-S221M10V8X10.8TR13F	220		8X10.8	18	2800
NSPE-S271M10V8X10.8TR13F	270		8x10.8	18	2800
NSPE-S331M10V8X10.8TR13F	330		8X10.8	18	2800
NSPE-S471M10V10X10.8TR13F	470		10X10.8	16	3650
NSPE-S561M10V10X10.8TR13F	560		10X10.8	16	3650
NSPE-S100M16V6.3X6.3TR13F	10		16	6.3X6.3	54
NSPE-S220M16V6.3X6.3TR13F	22	6.3X6.3		54	1130
NSPE-S330M16V6.3X6.3TR13F	33	6.3X6.3		54	1130
NSPE-S470M16V6.3X8TR13F	47	6.3X8		45	1480
NSPE-S470M16V8X10.8TR13F	47	8X10.8		22	2290
NSPE-S680M16V8X10.8TR13F	68	8X10.8		22	2290
NSPE-S820M16V8X10.8TR13F	82	8X10.8		22	2290
NSPE-S101M16V8X10.8TR13F	100	8X10.8		22	2290
NSPE-S151M16V10X10.8TR13F	150	10X10.8		20	2920

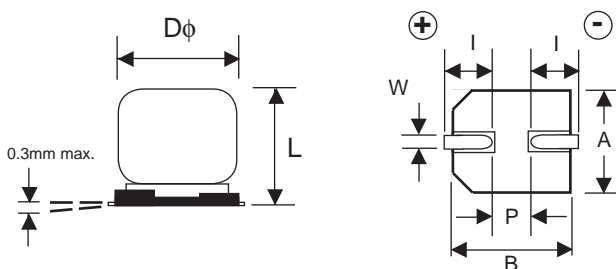
For Automotive Applications See Part Numbering System

### RIPPLE CURRENT FREQUENCY CORRECTION FACTORS

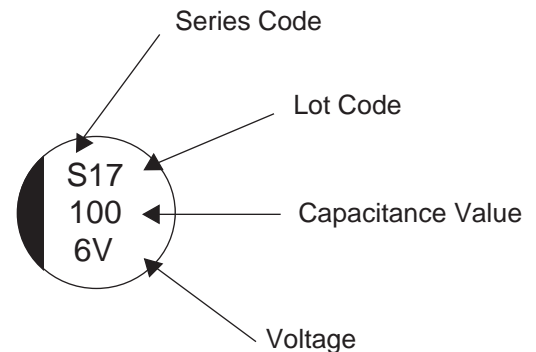
Cap. $\mu$ F	100Hz	1KHz	10KHz	100KHz
C $\leq$ 10	0.03	0.20	0.50	1.00
> 10	0.05	0.20	0.50	1.00

### DIMENSIONS (mm)

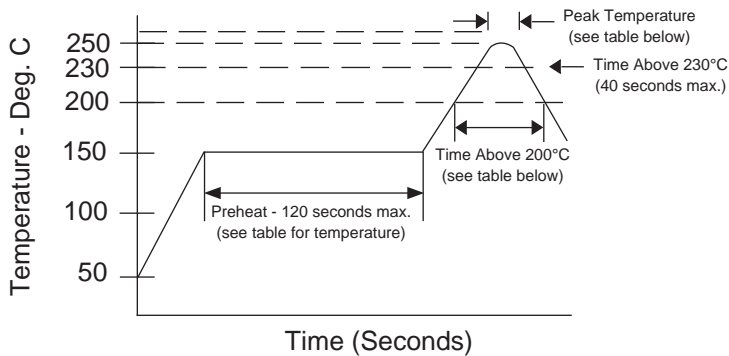
Case Size	D $\phi$ $\pm$ 0.5	L max.	A, B $\pm$ 0.2	W	I $\pm$ 0.2	P $\pm$ 0.2
6.3x6.3	6.3	6.3	6.6	0.5 ~ 0.8	2.5	2.2
6.3x8	6.3	8.0	6.6	0.5 ~ 0.8	2.5	2.2
8x10.8	8.0	10.8	8.3	0.7 ~ 1.0	2.9	3.2
10x10.8	10	10.8	10.3	1.0 ~ 1.4	3.2	4.6



### Part Marking

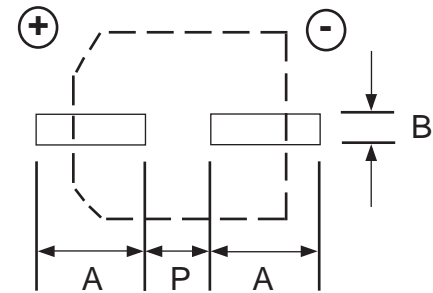


### RECOMMENDED REFLOW SOLDERING PROFILE



### LAND PATTERN DIM. (mm)

Case Dia.	A	B	P
6.3	3.5	1.8	2.1
8	4.1	2.1	2.8
10	4.4	2.5	4.3



### PEAK TEMPERATURE AND DURATION

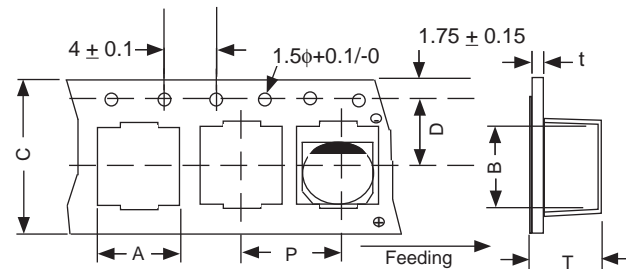
Diameter	Preheat (120 sec. max.)	Time above 200°C	Time above 230°C	Peak Temperature	Number of Reflow Passes
6.3 ~ 10mm	150°C ~ 190°C	90 sec. max.	40 sec. max.	250°C/5 sec.	2x*
	150°C ~ 180°C	60 sec. max.	40 sec. max.	260°C/5 sec.	1x

\*Two reflow passes are permissible with a cool down to room temperature required between the first and second pass.

### TAPING SPECIFICATIONS (mm)

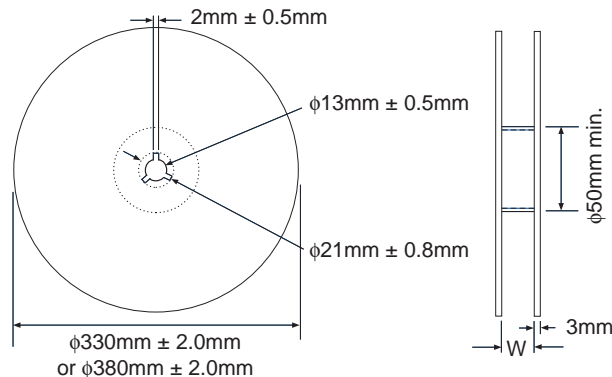
- Both Leader and Trailer tape: Minimum 40mm (1.57") empty carrier tape pockets.
- Leader tape: Approximately 20cm of cover tape at leader.
- Connection: Maximum 3 connections (slices) per reel.

Case Size	A	B	C	D	P	T	t
6.3x6.3	±0.5	±0.5	±0.3	±0.1	±0.1	±0.2	max.
6.3x8	7.0	7.0	16.0	7.5	12.0	6.5	0.4
8x10.8	8.7	8.7	24.0	11.5	16.0	11.1	0.4
10x10.8	10.7	10.7	24.0	11.5	16.0	11.2	0.4



### REEL DIMENSIONS (mm)

Case Size	W	Qty per Reel
6.3x6.3	±1.0	13" (330mm)
6.3x8	18	800
8x10.8	26	500
10x10.8	26	300



### 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)