

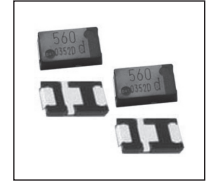
# Surface Mount Specialty Polymer Solid Aluminum Electrolytic Capacitors

NSPL Series

## FEATURES

- LOW ESL WITH THREE TERMINAL CONSTRUCTION
- ULTRA LOW ESR & HIGH RIPPLE CURRENT
- LONG LIFE AT +105°C (2,000 HOURS)
- Pb-FREE AND COMPATIBLE WITH REFLOW SOLDERING

**LOW ESL &  
ULTRA LOW ESR**



## CHARACTERISTICS

Rated Working Range	2.0 ~ 6.3VDC		
Rated Capacitance Range	68 ~ 560 $\mu$ F		
Operating Temperature Range	-55 ~ +105°C		
Capacitance Tolerance	$\pm$ 20% (M)		
Max. Leakage Current ( $\mu$ A) After 2 Minutes (+20°C)	All Case Sizes	$\leq$ 0.1CV	
Max. Tan $\delta$ , 120Hz, +20°C		0.06 max.	
High Temperature Load Life 2,000 Hours @ 105°C at Rated Working Voltage	Capacitance Change	Within $\pm$ 20% of initial measured value	
	Tan $\delta$	Less than 120% specified max. value	
	Leakage Current	Less than 300% specified max. value	
Damp Heat Test 500 Hours @ +60°C at 90% RH and Rated Working Voltage	Capacitance Change	6.3V	Within -20%/+50% of initial measured value
		4V	Within -20%/+60% of initial measured value
		2V, 2.5V	Within -20%/+70% of initial measured value
	Tan $\delta$	Less than 200% of specified max. value	
	Leakage Current	Less than specified max. value	

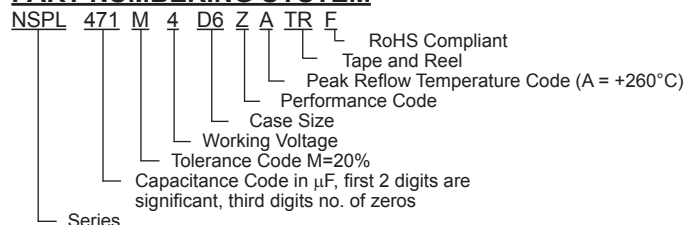
## STANDARD PRODUCTS AND SPECIFICATIONS

NIC Part Number	WV (Vdc)	Cap. ( $\mu$ F)	Max. LC ( $\mu$ A)	Tan $\delta$	Max. Ripple Current +45°C & 100KHz (mArms)	Max. ESR +20°C & 100KHz ( $\Omega$ )	Height (H)	
NSPL221M2D5YATRF	2.0	220	44	0.06	7,500	0.006	1.1 $\pm$ 0.1	
NSPL221M2DYATRF		220	44	0.06	7,500	0.006	1.0 max.	
NSPL221M2DUATRF		220	44	0.06	8,500	0.0045	1.0 max.	
NSPL331M2D1YATRF		330	66	0.06	7,500	0.006	1.4 $\pm$ 0.1	
NSPL331M2D6YATRF		330	66	0.06	7,500	0.006	1.9 $\pm$ 0.1	
NSPL331M2D6UATRF		330	66	0.06	8,500	0.0045	1.9 $\pm$ 0.1	
NSPL471M2D6YATRF		470	94	0.06	7,500	0.006	1.9 $\pm$ 0.1	
NSPL471M2D6UATRF		470	94	0.06	8,500	0.0045	1.9 $\pm$ 0.1	
NSPL471M2D6VATRF		470	94	0.06	10,200	0.003	1.9 $\pm$ 0.1	
NSPL561M2D6YATRF		560	112	0.06	7,500	0.006	1.9 $\pm$ 0.1	
NSPL561M2D6UATRF		560	112	0.06	8,500	0.0045	1.9 $\pm$ 0.1	
NSPL561M2D6VATRF		560	112	0.06	10,200	0.003	1.9 $\pm$ 0.1	
NSPL181M2.5D5YATRF		2.5	180	45	0.06	7,500	0.006	1.1 $\pm$ 0.1
NSPL181M2.5DYATRF			180	45	0.06	7,500	0.006	1.0 max.
NSPL181M2.5DUATRF	180		45	0.06	8,500	0.004	1.0 max.	
NSPL271M2.5D1YATRF	270		67.5	0.06	7,500	0.006	1.4 $\pm$ 0.1	
NSPL331M2.5D6YATRF	330		82.5	0.06	7,500	0.006	1.9 $\pm$ 0.1	
NSPL331M2.5D6UATRF	330		82.5	0.06	8,500	0.0045	1.9 $\pm$ 0.1	
NSPL471M2.5D6YATRF	470		117.5	0.06	7,500	0.006	1.9 $\pm$ 0.1	
NSPL471M2.5D6UATRF	470		117.5	0.06	8,500	0.0045	1.9 $\pm$ 0.1	
NSPL471M2.5D6VATRF	470		117.5	0.06	10,200	0.003	1.9 $\pm$ 0.1	
NSPL121M4DZATRF	4.0		120	48	0.06	6,300	0.009	1.0 max.
NSPL680M6.3DZATRF	6.3	68	42.8	0.06	6,300	0.009	1.0 max.	

## RIPPLE CURRENT TEMPERATURE CORRECTION FACTORS

Case Code	$\leq$ +45°C	>+45°C ~ $\leq$ +85°C	>+85°C ~ +105°C
All	1.0	0.7	0.25

## PART NUMBERING SYSTEM



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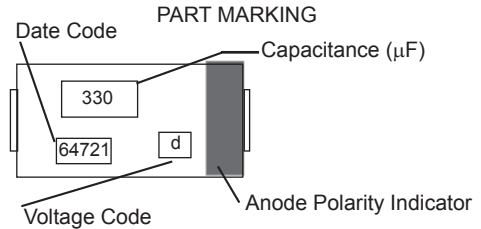
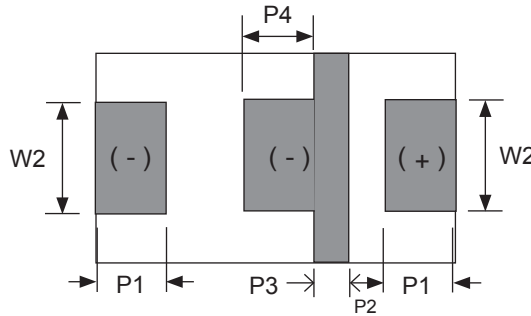
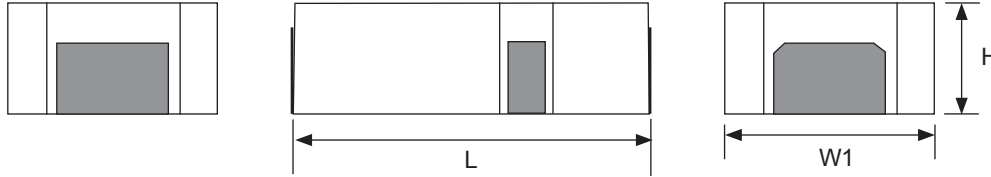
NSPL Series

## DIMENSIONS (mm)

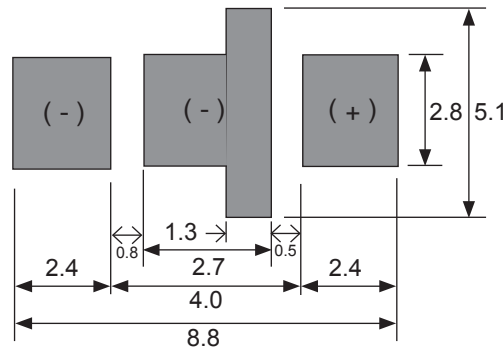
Case Code	L ±0.2	W1 ±0.2	H	W2 ±0.1	P1 ±0.3	P2 ±0.1	P3 ±0.2	P4 ±0.2
D, D1, D5, D6	7.3	4.3	see values table	2.4	1.3	1.1	0.7	1.4

## VOLTAGE CODES

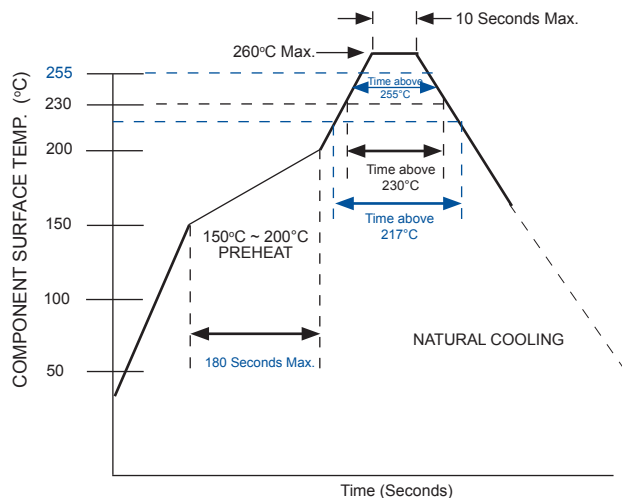
Voltage	Code
2.0Vdc	d
2.5Vdc	e
4.0Vdc	g
6.3Vdc	j



## RECOMMENDED LAND PATTERN DIMENSIONS (mm)



## RECOMMENDED 260°C REFLOW SOLDERING PROFILE



Item	Maximum Duration
Peak Temperature +260°C	10 seconds max.
Time above +255°C	30 seconds max.
Time above +230°C	130 seconds max.
Time above +217°C	150 seconds max.

Notes: Compliant to IPC/J-STD-020D standard

1. SAC alloy (+217°C) reflow soldering compatible
2. Soldering heat limits apply to the top surface of component
3. If you have concerns about your reflow soldering profile review them with NIC to insure compatible [tpmg@niccomp.com]
4. Three reflow passes are allowed (cooling down period to room temperature between each pass).

Storage Conditions:

Temperature: +5°C ~ +30°C

Humidity: <60% RH

Packaging: Moisture barrier bag

Storage Time: Parts should be soldered within 2 years of the production date and/or within 7 days of opening the moisture barrier bag.

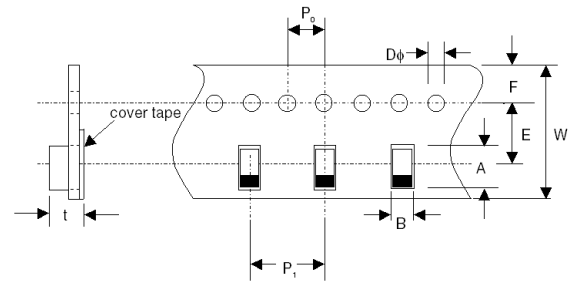


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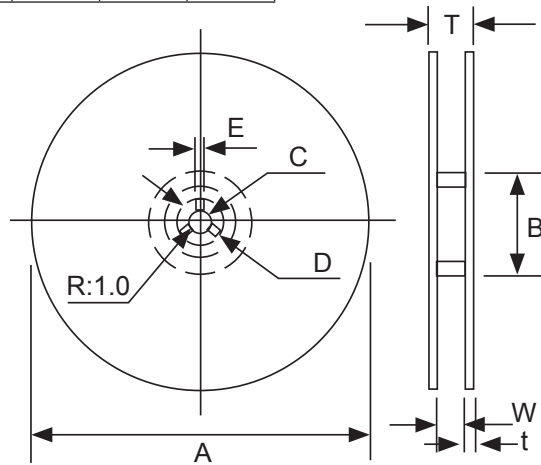
## CARRIER TAPE DIMENSIONS (mm)

Case Code	A±0.2	B±0.2	Dφ	E±0.1	F±0.1	P <sub>0</sub> ±0.1	P <sub>1</sub> ±0.1	t±0.2	W±0.3
D, D5 D1, D6	7.6	4.5	1.5 <sup>+0.1</sup>	5.50	1.75	4.0	8.0	$\frac{1.5}{2.4}$	12.0



## REEL DIMENSIONS (mm)

A±2.0	B min.	C±0.5	D±0.8	E±0.5	T±1.0	t	W±1.0
φ330	φ80	φ13.0	φ21.0	2.0	20.0	3.0	14



Case Code	Reel Quantity
All	3,500

