

# Surface Mount Solid Polymer Aluminum Electrolytic Capacitors

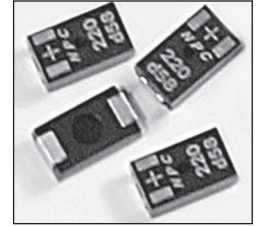
NPC Series

## FEATURES

- LOW IMPEDANCE & ESR AT HIGH FREQUENCY
- HIGH RIPPLE CURRENT
- REPLACES MULTIPLE TANTALUM CHIPS IN POWER SUPPLIES
- FITS EIA (7343) "D" LAND PATTERNS
- Pb-FREE (GOLD TERMINATION PLATING)
- COMPATIBLE WITH +260°C\* REFLOW SOLDERING

**RoHS Compliant**  
includes all homogeneous materials

\*See Part Number System for Details



## CHARACTERISTICS

Rated Working Range	2.0 ~ 10VDC						
Rated Capacitance Range	22 ~ 470μF						
Operating Temperature Range	-55 ~ +105°C						
Capacitance Tolerance	± 20% (M)						
Max. Leakage Current (μA) After 5 Minutes (+20°C)	≤0.04CV						
Surge Voltage (1000 cycles, 30 sec. on, 5 min. 30 sec. off, 1KΩ)	Working Voltage (Vdc)	2.0	2.5	4.0	6.3	8.0	10
	Surge Voltage (Vdc)	2.6	3.2	5.2	8.2 7.8**	10.4	11.5
Max. Tan δ, 120Hz, +20°C	D1, D6	≤0.05					
	D5, D7, D8	≤0.1					
High Temperature Load Life 2,000 Hours @ 105°C at Rated Working Voltage after 2x recommended reflow profile	Capacitance Change	Within ±20% of initial measured value **/**/****Within ±30% of initial measured value					
	Tan δ	D7, D8	Less than 150% of specified max. value				
		D1, D5, D6	Less than 200% of specified max. value				
	Leakage Current	Less than specified max. value					
Moisture Resistance 500 Hours @ +60°C at 90 ~ 95% RH and No Voltage Applied after 2x recommended reflow profile (JEDEC MSL-3)	Capacitance Change	Within -20%/+40% of initial measured value D5, **/**/****Within -20%/+60% of initial measured value					
	Tan δ	D7, D8	Less than 150% of specified max. value				
		D1, D5, D6	Less than 200% of specified max. value				
	Leakage Current	Less than 300% of specified max. value					

## STANDARD PRODUCTS AND SPECIFICATIONS

\*\*/\*\*/\*\*\*\*Applies to values with asterisk in column "NIC Part Number"

NIC Part Number (+260°C Reflow)	WV (Vdc)	Cap. (μF)	Max. LC (μA)	Tan δ	Max. Ripple Current (mArms) @ 100KHz			Max. ESR +20°C @ 100KHz (Ω)	Height H ± 0.1	
					≤45°C	45°C < T ≤85°C	85°C < T ≤105°C			
NPC101M2D5ZATRF	2	100	8.0	0.10	6,300	4,400	2,700	0.009	1.1	
NPC101M2D1UATRF		100	8.0	0.05	8,100	5,600	3,000	0.005	1.4	
NPC101M2D1ZATRF		100	8.0	0.05	6,300	4,400	3,000	0.009	1.4	
NPC101M2D6XATRF		100	8.0	0.05	5,400	3,700	3,000	0.013	1.9	
NPC101M2D6ZATRF		100	8.0	0.05	6,300	4,400	3,000	0.009	1.9	
NPC121M2D6ZATRF		120	9.6	0.05	6,300	4,400	3,000	0.009	1.9	
NPC151M2D5ZATRF		150	12.0	0.10	6,300	4,400	2,700	0.009	1.1	
NPC151M2D1UATRF		150	12.0	0.05	8,100	5,600	3,000	0.005	1.4	
NPC151M2D6ZATRF		150	12.0	0.05	6,300	4,400	3,000	0.009	1.9	
NPC181M2D5ZATRF		180	14.4	0.10	6,300	4,400	2,700	0.009	1.1	
NPC181M2D6ZATRF		180	14.4	0.05	6,300	4,400	3,000	0.009	1.9	
NPC221M2D5ZATRF		220	17.6	0.10	6,300	4,400	2,700	0.009	1.1	
NPC221M2D6YATRF		220	17.6	0.05	7,000	4,900	3,000	0.007	1.9	
NPC221M2D6ZATRF		220	17.6	0.05	6,300	4,400	3,000	0.009	1.9	
NPC221M2D7XATRF		220	17.6	0.10	6,000	4,200	3,500	0.010	2.7	
NPC271M2D6ZATRF*		270	21.6	0.05	6,300	4,400	3,000	0.009	1.9****	
NPC271M2D6YATRF*		270	21.6	0.05	7,500	5,200	3,500	0.006	1.9****	
NPC271M2D8YATRF		270	21.6	0.10	7,000	4,900	3,500	0.007	2.9	
NPC331M2D6ZATRF*		330	26.4	0.05	6,300	4,400	3,000	0.009	1.9****	
NPC331M2D6YATRF*		330	26.4	0.05	7,500	5,200	3,500	0.006	1.9****	
NPC331M2D6UATRF*		330	26.5	0.05	8,500	5,900	3,500	0.0045	1.9****	
NPC331M2D8YATRF		330	26.4	0.10	7,000	4,900	3,500	0.007	2.9	
NPC391M2D8YATRF		390	31.2	0.10	7,000	4,900	3,500	0.007	2.9	
NPC471M2D6UATRF***		470	37.6	0.05	8,500	5,900	3,500	0.0045	1.9****	
NPC471M2D8YATRF		470	37.6	0.10	7,000	4,900	3,500	0.007	2.9	
NPC820M2.5D1ZATRF		2.5	82	8.2	0.05	6,300	4,400	3,000	0.009	1.4
NPC820M2.5D6XATRF			82	8.2	0.05	5,400	3,700	3,000	0.013	1.9
NPC820M2.5D6ZATRF			82	8.2	0.05	6,300	4,400	3,000	0.009	1.9
NPC101M2.5D5ZATRF			100	10.0	0.10	6,300	4,400	2,700	0.009	1.1
NPC101M2.5D1UATRF			100	10.0	0.05	8,100	5,600	3,000	0.005	1.4

\*\*/\*\*/\*\*\*\*See note regarding capacitance change in characteristics table (Endurance & Moisture Resistance).  
\*\*\*\*height dimension tolerance ±0.2mm



NIC COMPONENTS CORP. www.niccomp.com | www.lowESR.com | www.RFpassives.com | www.SMTmagnetics.com

SPECIFICATIONS ARE SUBJECT TO CHANGE

# Surface Mount Solid Polymer Aluminum Electrolytic Capacitors

NPC Series

## STANDARD PRODUCTS AND SPECIFICATIONS

NIC Part Number (+260°C Reflow)	WV	Cap.	Max. LC	Tan δ	Max. Ripple Current (mArms) @ 100KHz			Max. ESR +20°C @ 100KHz (Ω)	Height H ± 0.1	
	(Vdc)	(μF)	(μA)		≤45°C	45°C < T ≤85°C	85°C < T ≤105°C			
NPC101M2.5D6ZATRF	2.5	100	10.0	0.05	6,300	4,400	3,000	0.009	1.9	
NPC121M2.5D1UATRF		120	12.0	0.05	8,100	5,600	3,000	0.005	1.4	
NPC121M2.5D6ZATRF		120	12.0	0.05	6,300	4,400	3,000	0.009	1.9	
NPC151M2.5D5ZATRF		150	15.0	0.10	6,300	4,400	2,700	0.009	1.1	
NPC151M2.5D6ZATRF		150	15.0	0.05	6,300	4,400	3,000	0.009	1.9	
NPC181M2.5D5ZATRF		180	18.0	0.10	6,300	4,400	2,700	0.009	1.1	
NPC181M2.5D6ZATRF		180	18.0	0.05	6,300	4,400	3,000	0.009	1.9	
NPC181M2.5D7XATRF		180	18.0	0.10	6,000	4,200	3,500	0.010	2.7	
NPC221M2.5D6YATRF*		220	22.0	0.05	7,500	5,200	3,500	0.006	1.9****	
NPC221M2.5D6ZATRF*		220	22.0	0.05	6,300	4,400	3,000	0.009	1.9****	
NPC221M2.5D8YATRF		220	22.0	0.10	7,000	4,900	3,500	0.007	2.9	
NPC271M2.5D6ZATRF*		270	27.0	0.05	6,300	4,400	3,000	0.009	1.9****	
NPC271M2.5D6YATRF*		270	27.0	0.05	7,500	5,200	3,500	0.006	1.9****	
NPC271M2.5D8YATRF		270	27.0	0.10	7,000	4,900	3,500	0.007	2.9	
NPC331M2.5D6YATRF*		330	33.0	0.05	7,500	5,200	3,500	0.006	1.9****	
NPC331M2.5D8YATRF		330	33.0	0.10	7,000	4,900	3,500	0.007	2.9	
NPC391M2.5D6YATRF*		390	39.0	0.05	7,500	5,200	3,500	0.006	1.9****	
NPC391M2.5D8ZATRF		390	39.0	0.10	6,300	4,400	3,500	0.009	2.9	
NPC471M2.5D8YATRF		470	47.0	0.10	7,000	4,900	3,500	0.007	2.9	
NPC471M2.5D6UATRF***		470	47.0	0.10	8,500	5,900	3,500	0.0045	1.9****	
NPC680M4D5XATRF	4.0	68	10.9	0.10	5,100	3,500	2,100	0.015	1.1	
NPC680M4D1ZATRF		68	10.9	0.05	6,300	4,400	3,000	0.009	1.4	
NPC680M4D6XATRF		68	10.9	0.05	5,400	3,700	3,000	0.013	1.9	
NPC680M4D6ZATRF		68	10.9	0.05	6,300	4,400	3,000	0.009	1.9	
NPC820M4D6XATRF		82	13.1	0.05	6,000	4,200	3,000	0.010	1.9	
NPC101M4D6XATRF		100	16.0	0.05	6,000	4,200	3,000	0.010	1.9	
NPC121M4D6XATRF		120	19.2	0.05	6,000	4,200	3,000	0.010	1.9	
NPC151M4D6XATRF		150	24.0	0.05	6,000	4,200	3,000	0.010	1.9	
NPC151M4D7XATRF		150	24.0	0.10	6,000	4,200	3,500	0.010	2.7	
NPC181M4D6ZATRF*		180	28.8	0.05	6,300	4,400	3,000	0.009	1.9****	
NPC181M4D8ZATRF		180	28.8	0.10	6,300	4,400	3,500	0.009	2.9	
NPC221M4D6ZATRF*		220	35.2	0.05	6,300	4,400	3,000	0.009	1.9****	
NPC221M4D8ZATRF		220	35.2	0.10	6,300	4,400	3,500	0.009	2.9	
NPC271M4D8ZATRF		270	43.2	0.10	6,300	4,400	3,500	0.009	2.9	
NPC331M4D8ZATRF		330	52.8	0.10	6,300	4,400	3,500	0.009	2.9	
NPC471M4D8ZATRF		470	75.2	0.10	6,300	4,400	3,500	0.009	2.9	
NPC330M6.3D6XATRF		6.3	33	8.3	0.05	5,100	3,500	3,000	0.015	1.9
NPC470M6.3D5XATRF			47	11.8	0.10	5,100	3,500	2,100	0.015	1.1
NPC470M6.3D1XATRF			47	11.8	0.05	6,000	4,200	3,000	0.010	1.4
NPC470M6.3D6XATRF			47	11.8	0.05	5,400	3,700	3,000	0.013	1.9
NPC470M6.3D6ZATRF	47		11.8	0.05	6,300	4,400	3,000	0.009	1.9	
NPC560M6.3D6XATRF	56		14.1	0.05	6,000	4,400	3,000	0.010	1.9	
NPC680M6.3D6XATRF	68		17.1	0.05	6,000	4,400	3,000	0.010	1.9	
NPC820M6.3D6XATRF	82		20.7	0.05	6,000	4,200	3,000	0.010	1.9	
NPC101M6.3D6XATRF	100		25.2	0.05	6,000	4,200	3,000	0.010	1.9	
NPC101M6.3D7XATRF	100		25.2	0.10	6,000	4,200	3,500	0.010	2.7	
NPC121M6.3D6ZATRF*	120		30.2	0.05	6,300	4,400	3,000	0.009	1.9****	
NPC121M6.3D8ZATRF	120		30.2	0.10	6,300	4,400	3,500	0.009	2.9	
NPC151M6.3D6ZATRF*	150		37.8	0.05	6,300	4,400	3,000	0.009	1.9****	
NPC151M6.3D8ZATRF	150		37.8	0.10	6,300	4,400	3,500	0.009	2.9	
NPC181M6.3D8ZATRF	180		45.4	0.10	6,300	4,400	3,500	0.009	2.9	
NPC221M6.3D8ZATRF	220		55.4	0.10	6,300	4,400	3,500	0.009	2.9	

\*/\*\*\*See note regarding capacitance change in characteristics table (Endurance & Moisture Resistance).

\*\*\*\*height dimension tolerance ±0.2mm



# Surface Mount Solid Polymer Aluminum Electrolytic Capacitors

NPC Series

## STANDARD PRODUCTS AND SPECIFICATIONS

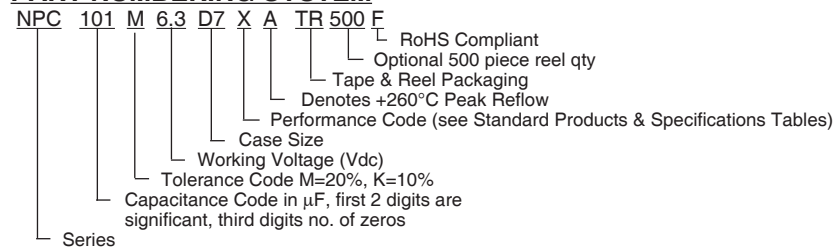
NIC Part Number (+260°C Reflow)	WV	Cap.	Max. LC	Tan δ	Max. Ripple Current (mArms) @ 100KHz			Max. ESR +20°C @ 100KHz (Ω)	Height H ± 0.1
	(Vdc)	(μF)	(μA)		≤45°C	45°C < T ≤85°C	85°C < T ≤105°C		
NPC220M8D6ATRF	8	22	7.0	0.05	4,700	3,200	2,500	0.018	1.9
NPC330M8D6ATRF		33	10.6	0.05	4,700	3,200	2,500	0.018	1.9
NPC330M8D7XATRF		33	10.6	0.10	5,400	3,700	3,000	0.013	2.7
NPC470M8D6ATRF		47	15.1	0.05	4,700	3,200	2,500	0.018	1.9
NPC680M8D7ATRF		68	21.8	0.10	4,700	3,200	2,500	0.018	2.7
NPC101M8D7ATRF		100	32.0	0.10	4,700	3,200	2,500	0.018	2.7
NPC101M8D7XATRSF		100	32.0	0.10	5,600	3,900	3,300	0.012	2.7
NPC220M10D6ATRF	10	22	8.8	0.10	3,700	2,500	1,600	0.030	1.9
NPC470M10D6ATRF*		47	18.8	0.10	4,000	2,800	1,800	0.025	1.9****

NPC101M8D7XATRSF 1,000 hour load life

\*/\*\*\*See note regarding capacitance change in characteristics table (Endurance & Moisture Resistance).

\*\*\*\*height dimension tolerance ±0.2mm

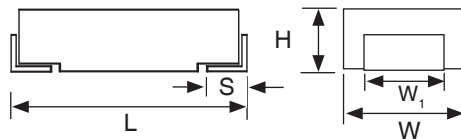
### PART NUMBERING SYSTEM



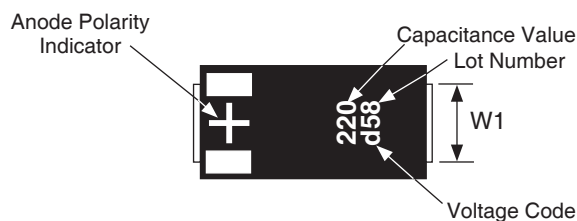
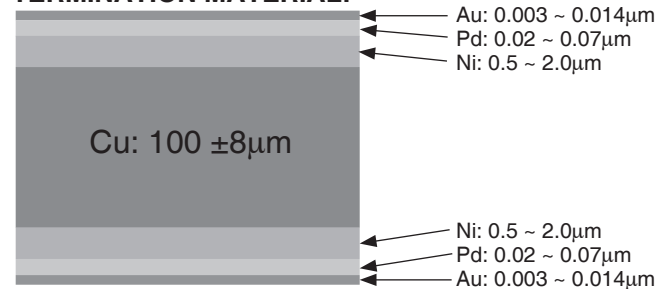
### DIMENSIONS (mm)

Case Code	L ±0.2	W ±0.2	H ±0.1	W1 ±0.1	S ±0.2
D1	7.3	4.3	1.4	2.4	1.2
D5			1.1		
D6			1.9*		
D7			2.7		
D8			2.9		

\*D6 - See Standard Products & Specifications Tables for height tolerance.



### TERMINATION MATERIAL:



### VOLTAGE CODES

Voltage	Code
2.0VDC	d
2.5VDC	e
4.0VDC	g
6.3VDC	j
8.0VDC	k
10VDC	A

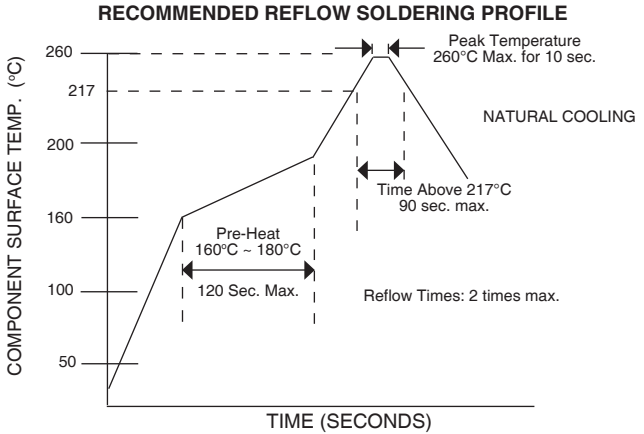
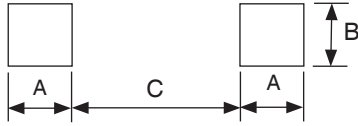


# Surface Mount Solid Polymer Aluminum Electrolytic Capacitors

NPC Series

## RECOMMENDED LAND PATTERNS (mm)

Case Code	a	b	c
D1, D5, D6, D7, D8	2.4	2.9	3.7



### APPLICATION NOTES:

1. NPC Series cannot be used in coupling, time-constant or other circuits that are greatly affected by leakage current.
2. NPC parts are polarized so be sure to verify component orientation when mounting components.
3. Do not apply over voltage exceeding the rated voltage.
4. Do not apply ripple current over the specified maximum ripple current rating.

### NOTES ON REFLOW SOLDERING:

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]

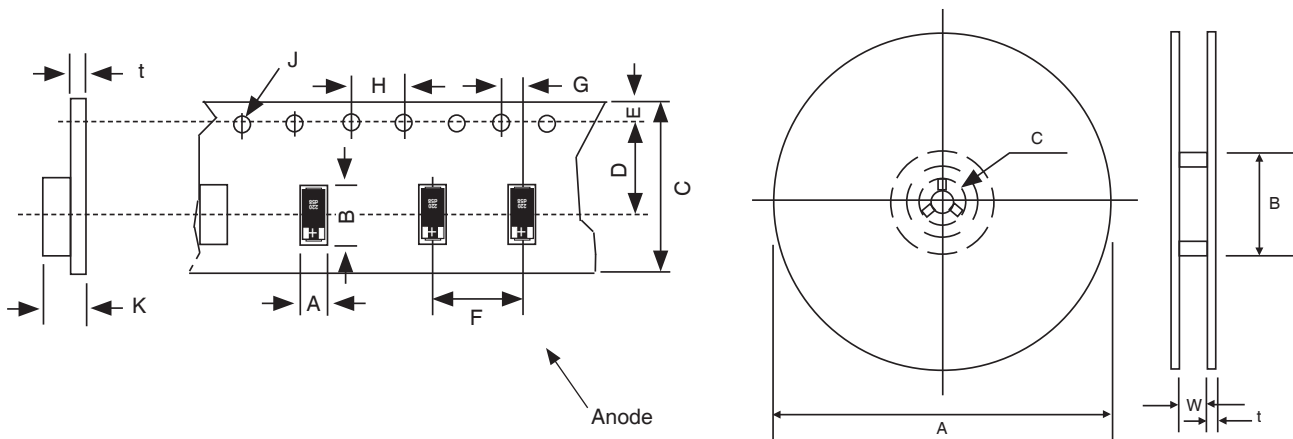
## REEL TAPE DIMENSIONS (mm)

Case Code	A ±2.0	B ±1.0	C ±0.2	W ±1.0	t ±0.5	Reel Quantity	
D1, D5, D6	330	80	13	13.5	2.0	3,500	500*
D7, D8						2,000	

\*See part number system for details on designating reel quantity

## TAPE DIMENSIONS (mm)

Case Code	A ±0.1	B ±0.2	C ±0.3	D ±0.05	E ±0.1	F ±0.1	G ±0.05	H ±0.1	J -0/+0.1	K ±0.1	t ±0.05
D1	4.50	7.70	12.0	5.5	1.75	8.0	2.0	4.0	1.5	1.6	0.3
D5											
D6											
D7											
D8											



### PRECAUTIONS

Please review the notes on correct use, safety and precautions 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)

