Surface Mount Specialty Polymer Solid Aluminum Electrolytic Capacitors

NSP Series

SURFACE MOUNT

FEATURES

- NEW “X” & “Y” TYPE HIGH RIPPLE CURRENT/VERY LOW ESR
- LOW PROFILE (1.1MM HEIGHT), RESIN PACKAGE
- REPLACES MULTIPLE TANTALUM CHIPS IN HIGH CURRENT POWER SUPPLIES AND VOLTAGE REGULATORS
- FITS EIA (7343) “D” AND “E” TANTALUM CHIP LAND PATTERNS
- COMPATIBLE WITH REFLOW SOLDERING

EXPANDED

CHARACTERISTICS

Rated Voltage Range	2.0 ~ 16VDC		
Rated Capacitance Range	8.2 ~ 470µF		
Operating Temperature Range	-40 ~ 105°C		
Capacitance Tolerance	+/-20%(M)		
Max. Leakage Current (µA) After 2 Minutes (+20°C)	2 ~ 4Vdc	0.06CV	
	6.3V	0.06CV Z: Ultra Low ESR	
	6.3 ~ 16Vdc	0.04CV or 3µA, whichever is greater	
Max. Tan δ, 120Hz, +20°C	D5, D6, D2	0.06	
	D3, D4	0.10	
High Temperature Load Life 1000 Hours At +105°C At Rated WVDC	Capacitance Change	Within +/-10% of initial measured value	
	Tan δ	Less than specified max. value	
	Leakage Current	Less than specified max. value	
Damp Heat Test 500 Hours At +60°C at 90~95%RH At Rated WVDC	Capacitance Change	8V-16V	Within -20%/+40% of initial measured value
		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 δ	Less than 200% of specified max. value	
	Leakage Current	Less than specified max. value	

STANDARD PRODUCTS AND SPECIFICATIONS

NIC Part Number	WV (Vdc)	Cap. (µF)	Max. LC (µA)	Tan δ	Max. Ripple Current +105°C & 100Khz (mA)	Max. ESR +20°C & 100Khz (Ω)	Height H ±0.1
NSP680M2D5TR	2.0	68	8.1	0.06	2000	0.028	1.1
NSP101M2D2TR	2.0	100	12.0	0.06	2500	0.018	1.8
NSP101M2D2XTR	2.0	100	12.0	0.06	2700	0.015	1.8
NSP121M2D2TR	2.0	120	14.4	0.06	2500	0.015	1.8
NSP121M2D2XTR	2.0	120	14.4	0.06	2700	0.015	1.8
NSP121M2D2ZTR	2.0	120	14.4	0.06	3000	0.009	1.8
NSP151M2D2TR	2.0	150	18.0	0.06	2000	0.018	1.8
NSP151M2D2ZTR	2.0	150	18.0	0.06	3000	0.009	1.8
NSP181M2D6ZTR	2.0	180	21.6	0.06	3000	0.009	1.9
NSP181M2D3TR	2.0	180	21.6	0.10	3000	0.015	2.8
NSP181M2D3XTR	2.0	180	21.6	0.10	3300	0.012	2.8
NSP221M2D3TR	2.0	220	32.4	0.10	3000	0.015	2.8
NSP221M2D3XTR	2.0	220	32.4	0.10	3300	0.012	2.8
NSP271M2D3TR	2.0	270	32.4	0.10	3000	0.015	2.8
NSP271M2D3XTR	2.0	270	32.4	0.10	3300	0.012	2.8
NSP271M2D3ZTR	2.0	270	32.4	0.10	3500	0.007	2.8
NSP271M2D4TR	2.0	270	32.4	0.10	3300	0.012	4.2
NSP271M2D4XTR	2.0	270	32.4	0.10	3500	0.010	4.2
NSP331M2D3TR	2.0	330	39.6	0.10	3000	0.015	2.8
NSP331M2D4ZTR	2.0	330	39.6	0.10	3500	0.007	2.8
NSP331M2D4TR	2.0	330	39.6	0.10	3300	0.012	4.2
NSP331M2D4XTR	2.0	330	39.6	0.10	3500	0.010	4.2
NSP391M2D4TR	2.0	390	46.8	0.10	3300	0.012	4.2
NSP391M2D4XTR	2.0	390	46.8	0.10	3500	0.010	4.2
NSP391M2D4ZTR	2.0	390	46.8	0.10	4000	0.005	4.2
NSP471M2D4TR	2.0	470	56.4	0.10	3300	0.012	4.2
NSP471M2D4ZTR	2.0	470	56.4	0.10	4000	0.005	4.2

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NIC Part Number	WV (Vdc)	Cap. (µF)	Max. LC (µA)	Tan δ	Max. Ripple Current +105°C & 100Khz (mA)	Max. ESR +20°C & 100Khz (Ω)	Height H ±0.1
NSP820M2.5D2TR	2.5	82	12.3	0.06	2500	0.018	1.8
NSP820M2.5D2XTR	2.5	82	12.3	0.06	2700	0.015	1.8
NSP101M2.5D2TR	2.5	100	15.0	0.06	2500	0.018	1.8
NSP101M2.5D2XTR	2.5	100	15.0	0.06	2700	0.015	1.8
NSP101M2.5D2ZTR	2.5	100	15.0	0.06	3000	0.009	1.8
NSP121M2.5D2TR	2.5	120	18.0	0.06	2500	0.018	1.8
NSP121M2.5D2ZTR	2.5	120	18.0	0.06	3000	0.009	1.8
NSP151M2.5D6ZTR	2.5	150	22.5	0.06	3000	0.009	1.9
NSP151M2.5D3TR	2.5	150	22.5	0.10	3000	0.015	2.8
NSP151M2.5D3XTR	2.5	150	22.5	0.10	3300	0.012	2.8
NSP181M2.5D3TR	2.5	180	33.0	0.10	3000	0.015	2.8
NSP181M2.5D3XTR	2.5	180	33.0	0.10	3300	0.012	2.8
NSP221M2.5D3TR	2.5	220	33.0	0.10	3000	0.015	2.8
NSP221M2.5D3XTR	2.5	220	33.0	0.10	3300	0.012	2.8
NSP221M2.5D3ZTR	2.5	220	33.0	0.10	3500	0.007	2.8
NSP221M2.5D4TR	2.5	220	33.0	0.10	3300	0.012	4.2
NSP221M2.5D4XTR	2.5	220	33.0	0.10	3500	0.010	4.2
NSP271M2.5D3TR	2.5	270	40.5	0.10	3000	0.015	2.8
NSP271M2.5D3ZTR	2.5	270	40.5	0.10	3500	0.007	2.8
NSP271M2.5D4TR	2.5	270	49.5	0.10	3300	0.012	4.2
NSP271M2.5D4XTR	2.5	270	49.5	0.10	3500	0.010	4.2
NSP331M2.5D4TR	2.5	330	49.5	0.10	3300	0.012	4.2
NSP331M2.5D4XTR	2.5	330	49.5	0.10	3500	0.010	4.2
NSP331M2.5D4ZTR	2.5	330	49.5	0.10	4000	0.005	4.2
NSP391M2.5D4TR	2.5	390	58.5	0.10	3300	0.012	4.2
NSP391M2.5D4ZTR	2.5	390	58.5	0.10	4000	0.005	4.2
NSP390M4D5TR	4.0	39	9.3	0.06	2000	0.028	1.1
NSP560M4D2TR	4.0	56	13.4	0.06	2500	0.018	1.8
NSP560M4D2XTR	4.0	56	13.4	0.06	2700	0.015	1.8
NSP680M4D2TR	4.0	68	16.3	0.06	2500	0.018	1.8
NSP680M4D2XTR	4.0	68	16.3	0.06	2700	0.015	1.8
NSP820M4D2TR	4.0	82	19.7	0.06	2500	0.018	1.8
NSP820M4D2ZTR	4.0	82	19.7	0.06	3000	0.009	1.8
NSP101M4D6ZTR	4.0	100	24.0	0.06	3000	0.009	1.9
NSP121M4D3TR	4.0	120	28.8	0.10	3000	0.015	2.8
NSP121M4D3XTR	4.0	120	28.8	0.10	3300	0.012	2.8
NSP151M4D3TR	4.0	150	28.8	0.10	3000	0.015	2.8
NSP151M4D3XTR	4.0	150	36.0	0.10	3300	0.012	2.8
NSP151M4D3ZTR	4.0	150	36.0	0.10	3500	0.007	2.8
NSP181M4D4TR	4.0	180	43.2	0.10	3300	0.012	4.2
NSP181M4D4XTR	4.0	180	43.2	0.10	3500	0.010	4.2
NSP221M4D4TR	4.0	220	52.8	0.10	3300	0.012	4.2
NSP221M4D4XTR	4.0	220	52.8	0.10	3500	0.010	4.2
NSP221M4D4ZTR	4.0	220	52.8	0.10	4000	0.005	4.2
NSP100M6.3D2TR	6.3	10	3.0	0.06	1400	0.055	1.8
NSP220M6.3D2TR	6.3	22	5.5	0.06	1600	0.040	1.8
NSP330M6.3D5TR	6.3	33	8.3	0.06	2000	0.028	1.1
NSP330M6.3D2TR	6.3	33	8.3	0.06	2000	0.028	1.8
NSP470M6.3D2TR	6.3	47	11.8	0.06	2500	0.018	1.8
NSP470M6.3D2XTR	6.3	47	11.8	0.06	2700	0.015	1.8
NSP560M6.3D2ZTR	6.3	56	21.2	0.06	3000	0.009	1.8
NSP680M6.3D2TR	6.3	68	17.1	0.06	2500	0.018	1.8
NSP680M6.3D2XTR	6.3	68	17.1	0.06	2700	0.015	1.8
NSP680M6.3D2ZTR	6.3	68	25.7	0.06	3000	0.009	1.9
NSP101M6.3D3TR	6.3	100	25.2	0.10	3000	0.015	2.8
NSP101M6.3D3XTR	6.3	100	25.2	0.10	3300	0.012	2.8

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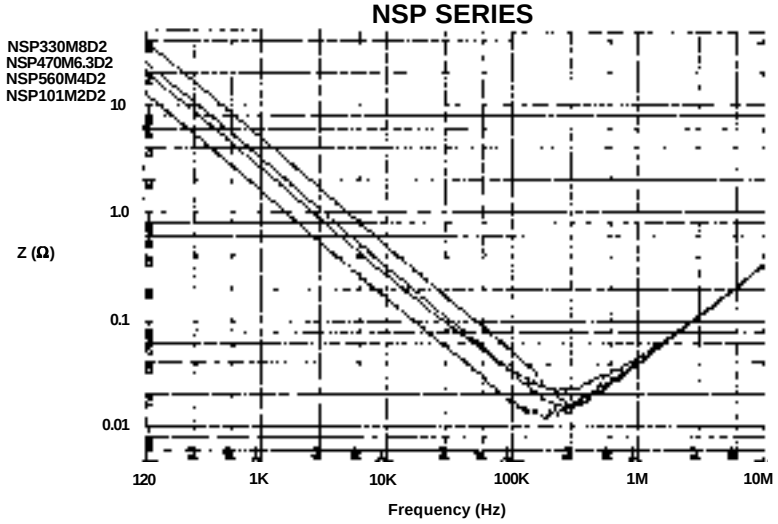
STANDARD PRODUCTS AND SPECIFICATIONS

NIC Part Number	WV (Vdc)	Cap. (µF)	Max. LC (µA)	Tan δ	Max. Ripple Current +105°C & 100Khz (mA)	Max. ESR +20°C & 100Khz (Ω)	Height H +0.1
NSP121M6.3D3TR	6.3	120	30.2	0.10	3000	0.015	2.8
NSP121M6.3D3XTR	6.3	120	30.2	0.10	3300	0.012	2.8
NSP121M6.3D3ZTR	6.3	120	45.4	0.10	3300	0.007	2.8
NSP151M6.3D4TR	6.3	150	37.8	0.10	3300	0.012	4.2
NSP151M6.3D4XTR	6.3	150	37.8	0.10	3500	0.010	4.2
NSP181M6.3D4TR	6.3	180	45.4	0.10	3300	0.012	4.2
NSP181M6.3D4XTR	6.3	180	45.4	0.10	3500	0.010	4.2
NSP181M6.3D4ZTR	6.3	180	68.1	0.10	3500	0.005	4.2
NSP8R2M8D2TR	8	8.2	3.0	0.06	1400	0.055	1.8
NSP150M8D2TR	8	15	4.8	0.06	1600	0.040	1.8
NSP220M8D5TR	8	22	7.0	0.06	2800	0.020	1.1
NSP330M8D2TR	8	33	10.5	0.06	1800	0.025	1.8
NSP680M8D3TR	8	68	21.7	0.10	3000	0.015	2.8
NSP101M8D4TR	8	100	48.0	0.10	3300	0.012	4.2
NSP150M12.5D5TR	12.5	15	7.5	0.06	1400	0.040	1.1
NSP220M12.5D2TR	12.5	22	11.0	0.06	1600	0.030	1.8
NSP8R2M16D2TR	16	8.2	5.2	0.06	1300	0.045	1.8

TYPICAL IMPEDANCE OVER FREQUENCY CHARACTERISTICS NSP SERIES



PART NUMBERING SYSTEM

NSP 101 M 12.5 D2 X TR F

- F — Lead Free Optional (100% Sn)
- TR — Tape and Reel
- X — High Performance
- D2 — Case Size
- 12.5 — Working Voltage
- M — Tolerance Code M=20%, K=10%
- 101 — Capacitance Code in µF, first 2 digits are significant, third digits no. of zeros
- NSP — Series

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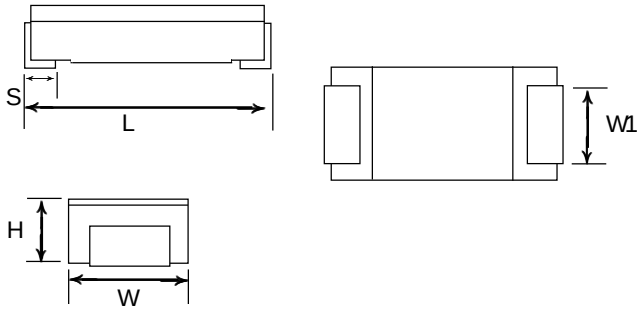
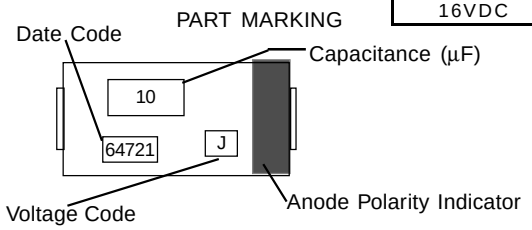
DIMENSIONS (mm)

Case Code	L +0.4	W +0.3	H	W1 +0.2	S +0.3
D2- D6	7.3	4.3	see values table	2.4	1.3



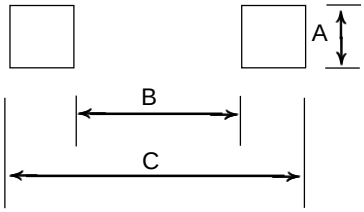
VOLTAGE CODES

Voltage	Code
2.0VDC	D
2.5VDC	E
6.3VDC	J
8VDC	K
12.5VDC	A
16VDC	C



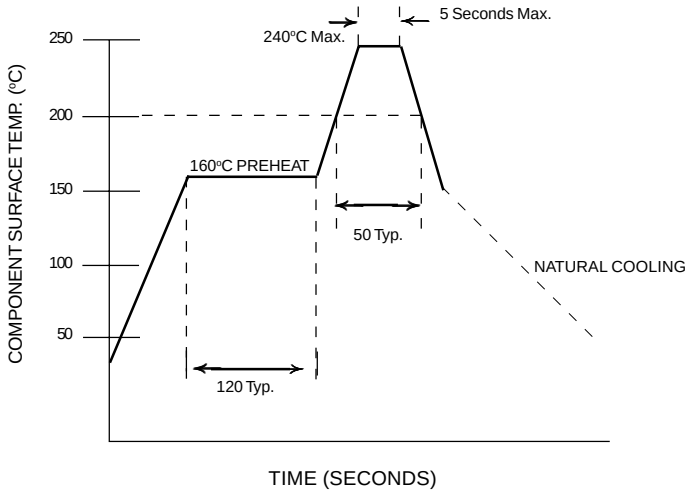
RECOMMENDED LAND PATTERNS (mm)

Case Code	A	B	C
D2-D5	2.8	4.0	8.8



Please note the NSP series will fit on standard "D" and "E" size (7343) tantalum chip capacitor land patterns

RECOMMENDED REFLOW SOLDERING PROFILE



RIPPLE CURRENT CORRECTION FACTOR OVER FREQUENCY

Frequency (Hz)	10KHz	20KHz	50KHz	100KHz	250KHz	500KHz	1MHz
Correction Factor +25°C ~ +105°C	0.6	0.7	0.8	1.0	1.1	1.2	1.3

REEL TAPE DIMENSIONS (mm)

A ± 2.0	B min.	C ± 0.5	D ± 0.8	E ± 0.5	T ± 1.0	t	W ± 1.0
330	50	13.0	21.0	2.0	20.0	3.0	14

TAPE DIMENSIONS (mm)

Case Code	A ± 0.2	B ± 0.2	Dϕ	E ± 0.1	F ± 0.1	P_0 ± 0.1	P_1 ± 0.1	t ± 0.2	W ± 0.3
D5	7.7	4.6	1.5 +0.1	1.75	5.5	4.0	8.0	1.5	12.0
D2, D6								2.1	
D3								3.4	
D4								4.5	

Case Code	Reel Quantity
D5, D6, D2	3,500
D3, -D4	2,000