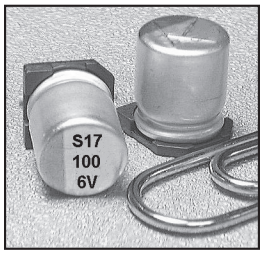
NSPE-S Series
Hybrid Aluminum Electrolytic Capacitors

- CYLINDRICAL V-CHIP CONSTRUCTION FOR SURFACE MOUNTING
- EXTENDED LOAD LIFE (3,000 ~ 5,000 HOURS)
- AVAILABLE WITH WIDE TERMINATION & ANTI-VIBRATION SKIRT
- ULTRA LOW ESR, HIGH RIPPLE CURRENT
- CAPACITANCE VALUES UP TO 1000µF
- 6.3x6.3mm ~ 10x10.8mm CASE SIZES
- REFLOW SOLDERING RATED TO +260°C (see reflow specifications)
- MEETS THE REQUIREMENTS OF AEC-Q200*

*Contact NIC for supporting test data



CHARACTERISTICS

Rated Voltage Range	6.3 ~ 16Vdc			
Rated Capacitance Range	10 ~ 1000µF			
Operating Temp. Range	-55 ~ +105°C			
Capacitance Tolerance	±20% (M)			
Max. Leakage Current After 2 Minutes @ 20°C	See Specifications Tables			
Working and Surge Voltage Ratings	W.V. (Vdc)	6.3	10	16
	S.V. (Vdc)	8.2	13	20
Tan δ @ 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 ±30% of initial measured value		
	Tan δ and ESR	Less than 200% of specified max. value		
	Leakage Current	Less than specified max. value		

PART NUMBER SYSTEM

NSPE-S 471 M 6.3V 8x10.8 TR 15 WT Y F

- F — RoHS Compliant, 97% Sn (min.), 3% Bi (max.)
- Y — Optional: Suitable for automotive equipment, sourced to special production and inspection at IATF-16949 certified production site
- WT — WT = Wide Terminations
- 15 — **Standard:** 15=15" (380mm) Reel
- TR — Tape & Reel
- 8x10.8 — Size in mm
- 6.3V — Working Voltage
- M — Tolerance Code M=20%
- 471 — Capacitance Code in µF, first 2 digits are significant Third digit is no. of zeros, "R" indicates decimal for values under 10µF
- NSPE-S — Series

STANDARD PRODUCTS AND CASE SIZES Dϕ x L (mm)

PART NUMBER	Cap. (µF)	Working Voltage	Case Size (D X L) mm	Max. Leakage Current (µA) After 2 minutes*	Max. ESR (mΩ) AT 100kHz/20°C	Max. Ripple Current (mA rms) AT 100kHz/105°C
NSPE-S101M6.3V6.3X6.3TR15F	100	6.3	6.3X6.3	126	36	1630
NSPE-S151M6.3V6.3X6.3TR15F	150		6.3X6.3	189	36	1630
NSPE-S221M6.3V6.3X8TR15F	220		6.3X8	278	32	2020
NSPE-S221M6.3V8X10.8TR15F			8X10.8	278	16	3150
NSPE-S331M6.3V8X10.8TR15F	330		8X10.8	416	16	3150
NSPE-S391M6.3V8X10.8TR15F	390		8X10.8	492	16	3150
NSPE-S471M6.3V8X10.8TR15F	470		8X10.8	593	16	3150
NSPE-S561M6.3V8X10.8TR15F	560		8X10.8	706	16	3150
NSPE-S681M6.3V10X10.8TR15F	680		10X10.8	857	15	3890
NSPE-S821M6.3V10X10.8TR15F	820		10X10.8	1034	15	3890
NSPE-S102M6.3V10X10.8TR15F	1000		10X10.8	1260	15	3890

For Automotive Applications See Part Numbering System

*Please review typical leakage current performance, as shown on NIC load life endurance test report.

STANDARD PRODUCTS AND CASE SIZES Dϕ x L (mm)

PART NUMBER	Cap. (µF)	Working Voltage	Case Size (D X L) mm	Max. Leakage Current (µA) After 2 minutes*	Max. ESR (mΩ) AT 100kHz/20°C	Max. Ripple Current (mA rms) AT 100kHz/105°C
NSPE-S330M10V6.3X6.3TR15F	33	10	6.3X6.3	100	40	1510
NSPE-S470M10V6.3X6.3TR15F	47		6.3X6.3	100	40	1510
NSPE-S680M10V6.3X6.3TR15F	68		6.3X6.3	136	40	1510
NSPE-S101M10V6.3X8TR15F	100		6.3X8	200	35	1910
NSPE-S101M10V8X10.8TR15F			8x10.8	200	18	2800
NSPE-S151M10V6.3X8TR15F	150		6.3x8	300	35	1910
NSPE-S151M10V8X10.8TR15F			8X10.8	300	18	2800
NSPE-S221M10V8X10.8TR15F	220		8X10.8	440	18	2800
NSPE-S331M10V8X10.8TR15F	330		8X10.8	660	18	2800
NSPE-S471M10V10X10.8TR15F	470		10X10.8	940	16	3650
NSPE-S561M10V10X10.8TR15F	560		10X10.8	1120	16	3650
NSPE-S100M16V6.3X6.3TR15F	10	16	6.3X6.3	100	54	1130
NSPE-S220M16V6.3X6.3TR15F	22		6.3X6.3	100	54	1130
NSPE-S330M16V6.3X6.3TR15F	33		6.3X6.3	106	54	1130
NSPE-S470M16V6.3X8TR15F	47		6.3X8	151	45	1480
NSPE-S470M16V8X10.8TR15F	47		8X10.8	151	22	2290
NSPE-S680M16V8X10.8TR15F	68		8X10.8	218	22	2290
NSPE-S101M16V8X10.8TR15F	100		8X10.8	320	22	2290
NSPE-S151M16V10X10.8TR15F	150		10X10.8	480	20	2920

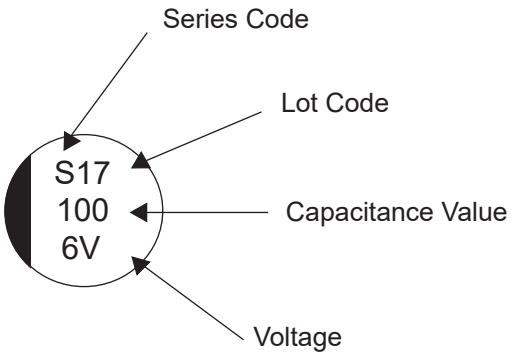
For Automotive Applications See Part Numbering System

*Please review typical leakage current performance, as shown on NIC load life endurance test report.

RIPPLE CURRENT FREQUENCY CORRECTION FACTORS

Cap. µF	100Hz	1KHz	10KHz	100KHz
C ≤ 10	0.03	0.20	0.50	1.00
> 10	0.05	0.20	0.50	1.00

Part Marking



PRECAUTIONS

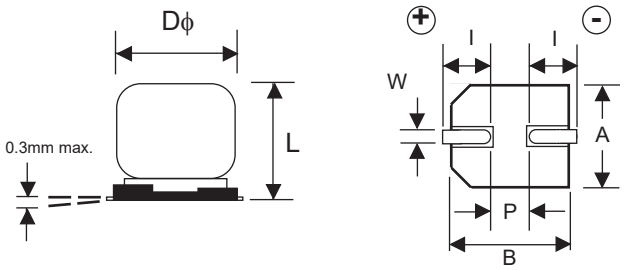
Please review the notes on correct use, safety and precautions found at
https://www.niccomp.com/resource/files/aluminum/AlumApplInfoCautions.pdf
If in doubt or uncertainty, please review your specific application - process details with NIC's technical support personnel: **tpmg@niccomp.com**

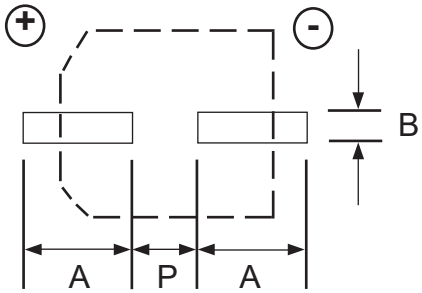
DIMENSIONS (mm)

Case Size	Dϕ ±0.5	L max.	A, B ±0.2	W	I ±0.2	P ±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

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



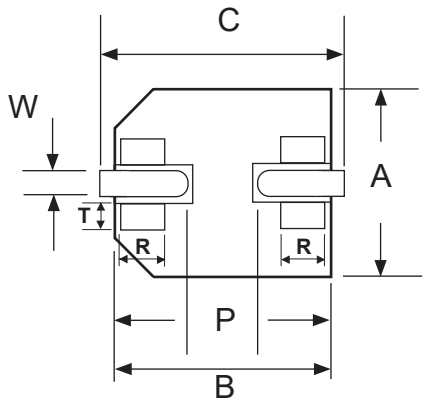


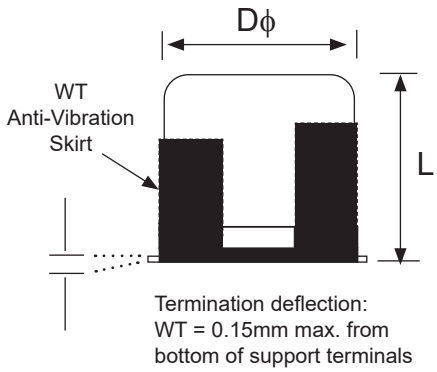
WIDE TERMINATION DIM. (mm)

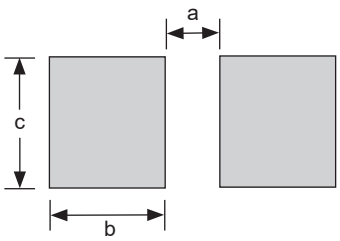
Case Size	Dϕ ±0.5	L ± 0.5	A, B	C ±0.2	P	W	R	T
6.3x6.3WT	6.3	6.5	6.6 ± 0.2	7.3	(2.2)	0.5 ~ 0.8	(1.7)	(0.7)
6.3x8WT	6.3	8.2	6.6 ± 0.2	7.3	(2.2)	0.5 ~ 0.8	(1.7)	(0.7)
8 x 10.8WT	8.0	10.5	8.3 ± 0.2	9.0	(3.2)	0.7 ~ 1.0	(0.7)	(1.3)
10 x 10.8WT	10.0	10.5	10.3 ± 0.2	11.0	(4.6)	1.0 ~ 1.4	(0.7)	(1.3)

WIDE TERMINATION LAND PATTERN DIM. (mm)

Case Size	a	b	c
6.3x6.3	1.6	4.0	3.0
6.3x8	1.6	4.0	3.0
8x10.8	2.5	4.5	4.7
10x10.8	3.8	4.8	4.7

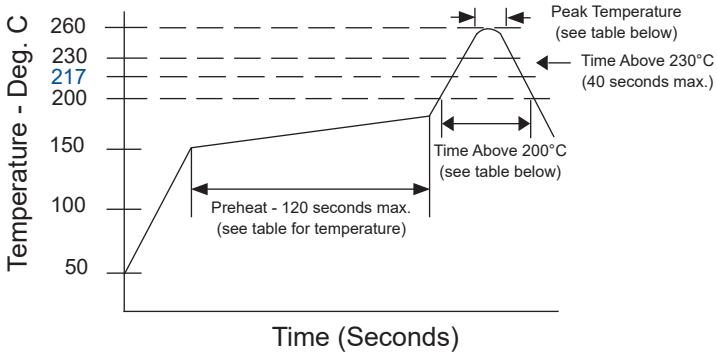






WT (Wide Terminations) Anti-Vibration Test	
Test Method	Direction: X, Y, Z axis Frequency & Duration: 5 to 2000Hz reciprocation for 20 minutes, 2 hours each direction Peak to Peak Amplitude: 5mm Peak Acceleration: 30G Sweep Type: Log
Δ Capacitance	Within ± 10% of initial value
Tangent of Loss	≤ Specified value
Leakage Current	≤ Specified value

RECOMMENDED REFLOW SOLDERING PROFILE



PEAK TEMPERATURES AND DURATIONS

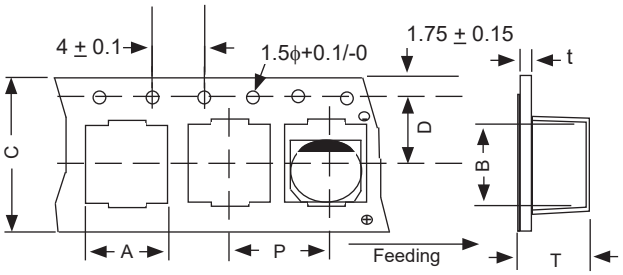
Diameter	Preheat (120 sec. max.)	Time above 200°C	Time above 217°C	Time above 230°C	Peak Temperature	Number of Reflow Passes
6.3 ~ 10mm	150°C ~ 190°C	100 sec. max.	80 sec. max.	40 sec. max.	250°C/5 sec.	2x*
	150°C ~ 180°C	60 sec. max.	50 sec. max.	40 sec. max.	260°C/instantaneous	1x

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

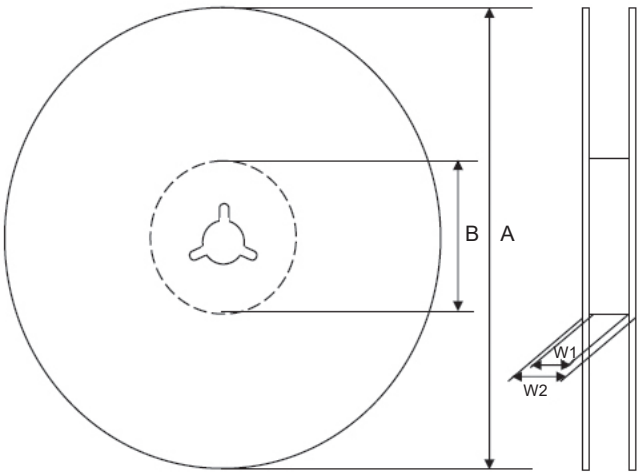
TAPING SPECIFICATIONS (mm)

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

Case Size	A ±0.5	B ±0.5	C ±0.3	D ±0.1	P ±0.1	T ±0.2	t max.
6.3x6.3	7.0	7.0	16.0	7.5	12.0	6.5	0.4
6.3x8	7.0	7.0	16.0	7.5	12.0	8.2	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



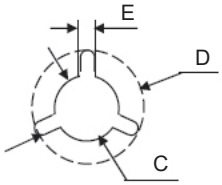
V-Chip 15" (380mm) Reels (TR15 suffix)



Dimensions (mm)

Case Size	Tape Width	W1	W2
6.3x6.3, 6.3x8	16.0	16.5 ~ 18.5	19.5 ~ 24.0
8x10.5, 10x10.5	24.0	24.5 ~ 26.5	27.5 ~ 32.0

Case Size	Tape Width	A	B	C	D	E
6.3x6.3, 6.3x8	16.0	ϕ380 ±2	ϕ80~105	ϕ13 ±0.5	ϕ21 ±1.0	2.0 ±0.5
8x10.5, 10x10.5	24.0					



Case Size	W ±1.0	Quantity per Reel 15" (380mm)
6.3x6.3	18	1,000
6.3x8	18	900
8x10.8	26	500
10x10.8	26	500