

# Surface Mount Aluminum Electrolytic Capacitors NATK Series

## FEATURES

- EXTENDED TEMPERATURE +125°C & LONG LIFE (TO 3,000 HOURS)
- AVAILABLE WITH ANTI-VIBRATION WIDE TERMINATIONS
- CYLINDRICAL V-CHIP CONSTRUCTION FOR SURFACE MOUNTING
- DESIGNED FOR AUTOMATIC MOUNTING AND REFLOW SOLDERING

*Expanded  
Value  
Range*

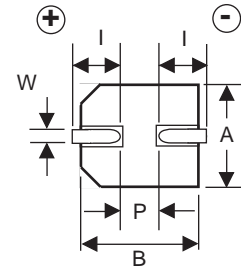
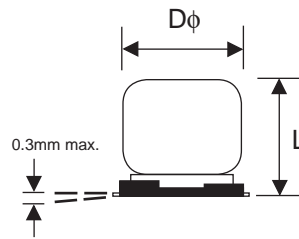


## CHARACTERISTICS

Rated Voltage Range	16 ~ 35VDC			
Rated Capacitance Range	100 ~ 2200 $\mu$ F			
Operating Temp. Range	-40 ~ +125°C			
Capacitance Tolerance	$\pm$ 20% (M)			
Max. Leakage Current After 2 Minutes @ 20°C	0.01CV or 3 $\mu$ A whichever is greater			
Tan $\delta$ @ 120Hz/20°C	W.V. (Vdc)	16	25	35
	S.V. (Vdc)	20	32	44
	Tan $\delta$ @ 120Hz/20°C	0.20	0.16	0.14
Low Temperature Stability Impedance Ratio @ 120Hz	W.V. (Vdc)	16	25	35
	Z -25°C/Z +20°C	2	2	2
	Z -40°C/Z +20°C	4	3	3
Load Life Test at W.V. @ 125°C 8 ~ 12.5mm Diameter: 2,000 Hours 16mm Diameter: 3,000 Hours	Capacitance Change	Within $\pm$ 30% of initial measured value		
	Tan $\delta$	Less than 300% of specified max. value		
	Leakage Current	Less than specified max. value		

## STANDARD PRODUCT AND CASE SIZE D $\phi$ xL (mm)

Cap.( $\mu$ F)	Code	Working Voltage (Vdc)		
		16	25	35
100	101	-	-	8X10.8
160	161	-	-	8X10.8
220	221	-	8X10.8	10X10.8
270	271	-	8X10.8	-
300	301	-	-	10X10.8
330	331	8X10.8	10X10.8	-
390	391	8X10.8	-	-
470	471	-	10X10.8	-
620	621	-	-	12.5X14
680	681	10X10.8	12.5X14	16X17
910	911	-	12.5X14	-
1000	102	12.5X14	16X17	16X17
1500	152	12.5X14	16X17	-
2200	222	16X17	-	-



## DIMENSIONS (mm)

Case Size	D $\phi$ $\pm$ 0.5	L max.	A, B $\pm$ 0.2	I $\pm$ 0.3	P $\pm$ 0.3	W
8 x 10.8	8.0	10.8	8.3	2.9	3.2	0.7 ~ 1.0
10 x 10.8	10.0	10.8	10.3	3.2	4.6	1.0 ~ 1.4
12.5 x 14	12.5	14.0	12.8	4.5	4.6	1.0 ~ 1.4
16 x 17	16.0	17.0	16.3	16.3	7.0	1.8 ~ 2.1

Reflow Code
J = +240°C
K = +245°C
L = +250°C
N = +260°C

Termination / Packaging Code
B = Sn-Bi / 13" reel
S = Sn / 13" reel

## 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)



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## STANDARD VALUES, CASE SIZES & SPECIFICATIONS

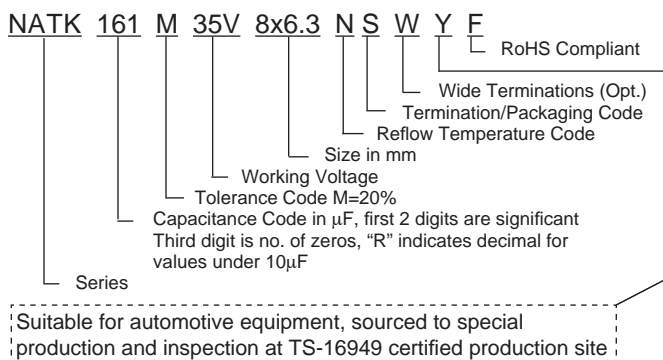
Part Number	Cap. (μF)	Working Voltage	Dissipation Factor @ 120Hz/20°C	Max. ESR (Ω) AT 100KHz/20°C	Max. Ripple Current (mA rms) AT 100KHz/125°C	Load Life Hours @ +125°C
NATK331M16V8X10.8NSYF	330	16	0.20	0.18	300	2,000
NATK391M16V8X10.8NSYF	390		0.20	0.18	300	2,000
NATK471M16V10X10.8LSYF	470		0.20	0.11	500	2,000
NATK681M16V10X10.8LSYF	680		0.20	0.11	500	2,000
NATK102M16V12.5X14KSYF	1000		0.20	0.08	1200	2,000
NATK152M16V12.5X14KSYF	1500		0.20	0.08	1200	2,000
NATK222M16V16X17JSYF	2200		0.20	0.05	1800	3,000
NATK221M25V8X10.8NSYF	220	25	0.16	0.18	300	2,000
NATK271M25V8X10.8NSYF	270		0.16	0.18	300	2,000
NATK331M25V10X10.8LSYF	330		0.16	0.11	500	2,000
NATK471M25V10X10.8LSYF	470		0.16	0.11	500	2,000
NATK681M25V12.5X14KSYF	680		0.16	0.08	1200	2,000
NATK911M25V12.5X14KSYF	910		0.16	0.08	1200	2,000
NATK102M25V16X17JSYF	1000		0.16	0.05	1800	3,000
NATK152M25V16X17JSYF	1500	0.16	0.05	1800	3,000	
NATK101M35V8X10.8NSYF	100	35	0.14	0.18	300	2,000
NATK161M35V8X10.8NSYF	160		0.14	0.18	300	2,000
NATK221M35V10X10.8LSYF	220		0.14	0.11	500	2,000
NATK301M35V10X10.8LSYF	300		0.14	0.11	500	2,000
NATK471M35V12.5X14KSYF	470		0.14	0.08	1200	2,000
NATK621M35V12.5X14KSYF	620		0.14	0.08	1200	2,000
NATK681M35V16X17JSYF	680		0.14	0.05	1800	3,000
NATK102M35V16X17JSYF	1000	0.14	0.05	1800	3,000	

New Expanded Values

## RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

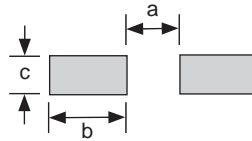
Frequency (Hz)	100 ≤ f < 1K	1K ≤ f < 10K	10K ≤ f < 100K	100K ≤ f
100μF ~ 2200μF	0.6	0.85	0.93	1.00

## PART NUMBER SYSTEM



## STANDARD TERMINATIONS - LAND PATTERN DIMENSIONS (mm)

Case Size	a	b	c
8x10.8	2.8	4.1	2.1
10x10.8	4.3	4.4	2.5
12.5x14	4.3	5.8	2.5
16x17	6.6	6.5	5.0

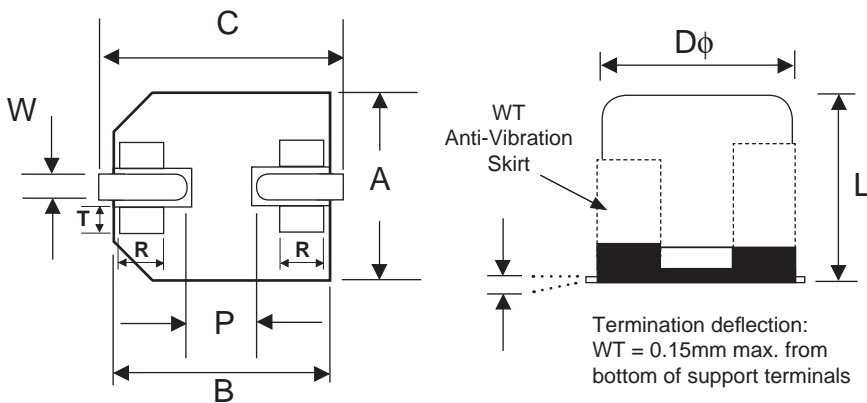


## WIDE TERMINATION (WT) DIM. (mm)

Case Size	D $\phi$ $\pm$ 0.5	L max.	A, B	C $\pm$ 0.2	P $\pm$ 0.2	W	R	T
8 x 10.5WT	8.0	10.5	8.3 $\pm$ 0.2	9.0	3.2	0.7 ~ 1.0	(0.7)	(1.3)
10 x 10.5WT	10.0	10.8	10.3 $\pm$ 0.2	11.0	4.6	1.0 ~ 1.4	(0.7)	(1.3)
12.5 x 14WT	12.5	14.0	13.5 $\pm$ 0.2	14.2	4.6	1.0 ~ 1.4	(2.2)	(2.4)
16 x 17WT	16.0	17.0	17.0 $\pm$ 0.2	18.0	7.0	1.8 ~ 2.1	(3.0)	(2.0)

## WT LAND PATTERN DIM. (mm)

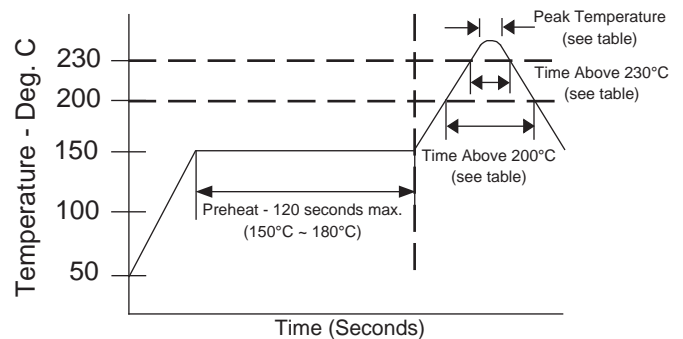
Case Size	a	b	c
8x10.5	2.5	4.5	4.7
10x10.5	3.8	4.8	4.7
12.5x14	3.8	6.1	6.9
16x17	5.0	8.0	9.5



## PEAK REFLOW TEMPERATURES AND DURATION

Diameter	Time above 200°C	Time above 230°C	Peak Temperature 5 seconds
8mm $\phi$	80 sec. max.	40 sec. max.	260°C
10mm $\phi$	70 sec. max.	40 sec. max.	250°C
12.5mm $\phi$	50 sec. max.	30 sec. max.	245°C
16mm $\phi$	50 sec. max.	20 sec. max.	240°C

Capacitors can withstand two reflow passes under the specified conditions. Capacitors must be allowed to cool to room temperature before the second reflow pass.



Review & Compare Reflow Soldering Heat Limits  
V-chip SMT Aluminum Electrolytic Capacitors  
[www.niccomp.com/RSL](http://www.niccomp.com/RSL)