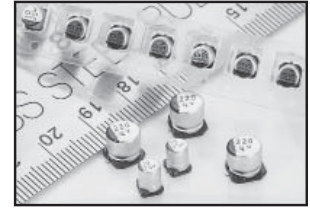


Surface Mount Aluminum Electrolytic Capacitors NATK Series

FEATURES

- EXTENDED TEMPERATURE +125°C & LONG LIFE (TO 5,000 HOURS)
- AVAILABLE WITH ANTI-VIBRATION WIDE TERMINATIONS
- CYLINDRICAL V-CHIP CONSTRUCTION FOR SURFACE MOUNTING
- DESIGNED FOR AUTOMATIC MOUNTING AND REFLOW SOLDERING
- MEETS THE REQUIREMENTS OF AEC-Q200*



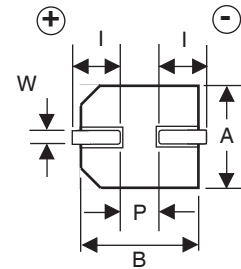
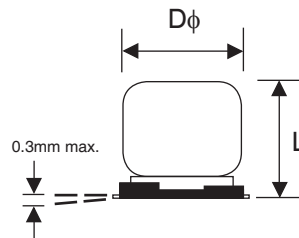
*Contact NIC for supporting test data

CHARACTERISTICS

Rated Voltage Range	16 ~ 35VDC			
Rated Capacitance Range	47 ~ 3900 μ F			
Operating Temp. Range	-40 ~ +125°C			
Capacitance Tolerance	\pm 20% (M)			
Max. Leakage Current After 2 Minutes @ 20°C	0.01CV or 3 μ A whichever is greater			
Tan δ @ 120Hz/20°C	W.V. (Vdc)	16	25	35
	S.V. (Vdc)	20	32	44
	Tan δ @ 120Hz/20°C	See specifications table (page 2)		
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 ~ 10mm Diameter: 2,000 Hours 12.5mm Diameter: 3,000 Hours 16mm Diameter: 5,000 Hours	Capacitance Change	Within \pm 30% of initial measured value		
	Tan δ	Less than 300% of specified max. value		
	Leakage Current	Less than specified max. value		

STANDARD PRODUCT AND CASE SIZE D ϕ xL (mm)

Cap. (μ F)	Code	Working Voltage (Vdc)		
		16	25	35
47	470	-	-	6.3X8
100	101	6.3X8	6.3X8	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	12.5X14
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	18X17.5
2200	222	16X17	18X17.5	18X22
3300	332	18X17.5	18X22	-
3900	392	18X22	-	-



DIMENSIONS (mm)

Case Size	D ϕ \pm 0.5	L max.*	A, B \pm 0.2	I \pm 0.3	P \pm 0.3	W
6.3 x 8	6.3	8.0	6.6	2.5	2.2	0.5 ~ 0.8
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	5.2	7.0	1.8 ~ 2.1
18X17.5	18.0	17.5	19.0	6.5	7.0	1.7 ~ 2.1
18X22	18.0	*21.5 ^{+0.5} / _{-1.0}	19.0	6.5	7.0	1.7 ~ 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
LB = Sn-Bi / 15" reel
LS = Sn / 15" reel

Note: 16mm & 18mm diameter parts are only available with Sn finish

PRECAUTIONS

Please review the notes on correct use, safety and precautions found at 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



Surface Mount Aluminum Electrolytic Capacitors NATK Series

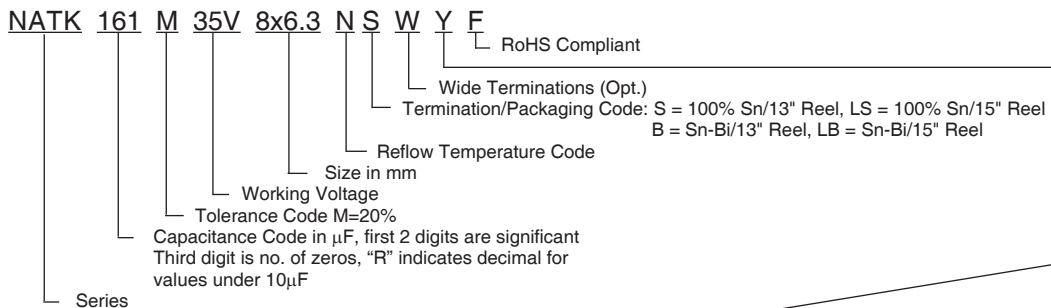
STANDARD VALUES, CASE SIZES & SPECIFICATIONS

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
NATK101M16V6.3X8NBYF	100	16	0.20	0.45	200	2,000
NATK331M16V8X10.8NBYF	330		0.20	0.18	300	2,000
NATK391M16V8X10.8NBYF	390		0.20	0.18	300	2,000
NATK471M16V10X10.8LBYF	470		0.20	0.11	500	2,000
NATK681M16V10X10.8LBYF	680		0.20	0.11	500	2,000
NATK102M16V12.5X14KLYF	1000		0.20	0.08	1200	3,000
NATK152M16V12.5X14KLYF	1500		0.20	0.08	1200	3,000
NATK222M16V16X17JLSYF	2200		0.20	0.05	1800	5,000
NATK332M16V18X17.5JLSYF	3300		0.24	0.045	2000	5,000
NATK392M16V18X22JLSYF	3900		0.24	0.040	2200	5,000
NATK101M25V6.3X8NBYF	100	25	0.16	0.45	200	2,000
NATK221M25V8X10.8NBYF	220		0.16	0.18	300	2,000
NATK271M25V8X10.8NBYF	270		0.16	0.18	300	2,000
NATK331M25V10X10.8LBYF	330		0.16	0.11	500	2,000
NATK471M25V10X10.8LBYF	470		0.16	0.11	500	2,000
NATK681M25V12.5X14KLYF	680		0.16	0.08	1200	3,000
NATK911M25V12.5X14KLYF	910		0.16	0.08	1200	3,000
NATK102M25V16X17JLSYF	1000		0.16	0.05	1800	5,000
NATK152M25V16X17JLSYF	1500		0.16	0.05	1800	5,000
NATK222M25V18X17.5JLSYF	2200		0.18	0.045	2000	5,000
NATK332M25V18X22JLSYF	3300	0.20	0.040	2200	5,000	
NATK470M35V6.3X8NBYF	47	35	0.14	0.45	200	2,000
NATK101M35V8X10.8NBYF	100		0.14	0.18	300	2,000
NATK161M35V8X10.8NBYF	160		0.14	0.18	300	2,000
NATK221M35V10X10.8LBYF	220		0.14	0.11	500	2,000
NATK301M35V10X10.8LBYF	300		0.14	0.11	500	2,000
NATK331M35V12.5X14KLYF	330		0.14	0.08	1200	3,000
NATK471M35V12.5X14KLYF	470		0.14	0.08	1200	3,000
NATK621M35V12.5X14KLYF	620		0.14	0.08	1200	3,000
NATK681M35V16X17JLSYF	680		0.14	0.05	1800	5,000
NATK102M35V16X17JLSYF	1000		0.14	0.05	1800	5,000
NATK152M35V18X17.5JLSYF	1500		0.14	0.045	2000	5,000
NATK222M35V18X22JLSYF	2200		0.16	0.040	2200	5,000

RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

Frequency (Hz)	100 ≤ f < 1K	1K ≤ f < 10K	10K ≤ f < 100K	100K ≤ f
47μF ~ 3900μF	0.60	0.85	0.93	1.00

PART NUMBER SYSTEM

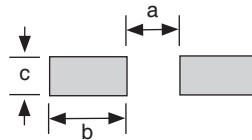


Suitable for automotive equipment, sourced to special production and inspection at TS-16949 certified production site



STANDARD TERMINATIONS - LAND PATTERN DIMENSIONS (mm)

Case Size	a	b	c
6.3x8	1.8	3.6	1.8
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
18x17, 22	6.6	7.7	5.0

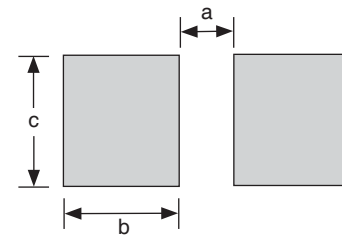
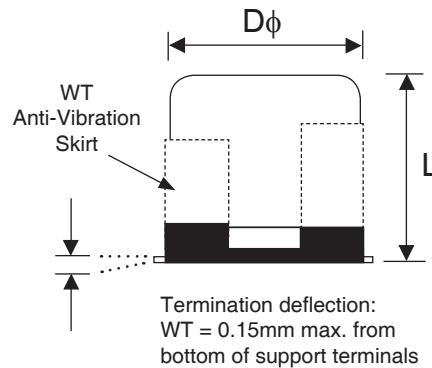
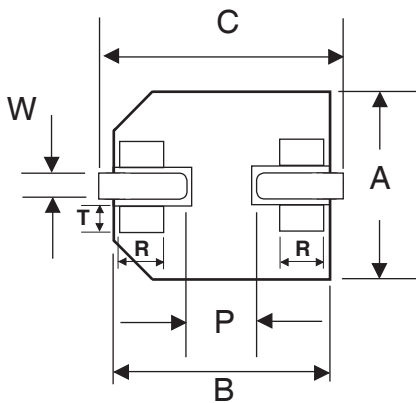


WIDE TERMINATION (WT) DIM. (mm)

Case Size	D ϕ \pm 0.5	L max.	A, B	C \pm 0.2	P \pm 0.2	W	R	T
8 x 10.8WT	8.0	10.5	8.3 \pm 0.2	9.0	3.2	0.7 ~ 1.0	(0.7)	(1.3)
10 x 10.8WT	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
8x10.8	2.5	4.5	4.7
10x10.8	3.8	4.8	4.7
12.5x14	3.8	6.1	6.9
16x17	5.0	8.0	9.5

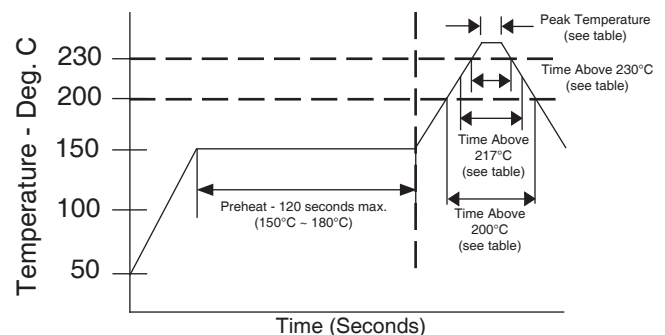


PEAK REFLOW TEMPERATURES AND DURATION

Diameter	Time above 200°C	Time above 217°C	Time above 230°C	Peak Temperature 5 seconds
6.3mm & 8mm ϕ	80 sec. max.	70 sec. max.	40 sec. max.	260°C
10mm ϕ	70 sec. max.	60 sec. max.	40 sec. max.	250°C
12.5mm ϕ	60 sec. max.	50 sec. max.	30 sec. max.	245°C
16mm & 18mm ϕ	50 sec. max.	40 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



Surface Mount Aluminum Electrolytic Capacitors NATK Series

WT Anti-Vibration Test	
Test Method	Direction: X, Y, Z axis Frequency & Duration: 5 to 2000Hz for 20 minutes 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

CARRIER TAPE

Case Size	A ±0.2	B ±0.2	C ±0.3	D ±0.1	P ±0.1	T ±0.2	t max.	s ±0.1
6.3x8	7.0	7.0	16.0	7.5	12.0	8.2	0.6	-
8x10.8	8.7	8.7	24.0	11.5	16.0	11.1	0.6	-
10x10.8	10.7	10.7	24.0	11.5	16.0	11.2	0.6	-
12.5x14	13.2	13.2	32.0	14.2	24.0	14.3	0.6	28.4
16x17	17.5	17.5	44.0	20.2	28.0	17.3	0.6	40.4
18x17	19.5	19.5	44.0	20.2	32.0	17.8	0.6	40.4
18x22	19.5	19.5	44.0	20.2	32.0	22.5	0.6	40.4

TR13 330mm (13") REEL TR15 380mm (15") REEL

Case Size	W ±1.0	Qty per Reel	
		13" (330mm)	15" (380mm)
6.3x8	18	500	900
8x10.8	26	300	500
10x10.8	26	300	500
12.5x14	34	-	250
16x17	46	-	200
18x17	46	-	175
18x22	46	-	125

TAPING SPECIFICATIONS (mm)

- Both Leader and Trailer tape: Minimum 10 empty carrier tape pockets.
- Leader tape: Approximately 20cm of cover tape at leader.
- Connection: Maximum 3 connections (slices) per reel.

