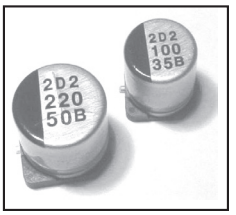
Surface Mount Aluminum Electrolytic Capacitors NACKA Series



FEATURES

- CYLINDRICAL V-CHIP CONSTRUCTION FOR SURFACE MOUNTING
- LOW IMPEDANCE AND WIDE TEMPERATURE
- LONG LIFE (5,000 HOURS @ 105°C)
- AVAILABLE WITH ANTI-VIBRATION WIDE TERMINATIONS
- DESIGNED FOR AUTOMATIC MOUNTING AND REFLOW SOLDERING

CHARACTERISTICS

RoHS Compliant
includes all homogeneous materials

*See Part Number System for Details

Rated Voltage Range	6.3 ~ 100Vdc									
Rated Capactance Range	47 ~ 6,800µF									
Operating Temperature Range	-55°C ~ +105°C									
Capacitance Tolerance	±20%(M)									
Maximum Leakage Current after 2 minutes @ 20°C	0.01CV whichever is greater									
Maximum Tanδ @ 120Hz/20°C	W.V. (Vdc)		6.3	10	16	25	35	50	63	80	100
	S.V. (Vdc)		8.0	13	20	32	44	63	79	100	125
	All Case Sizes	C ≤ 1,000µF	0.26	0.19	0.16	0.14	0.12	0.12	0.10	0.08	0.07
		C = 1,500µF	-	-	0.16	0.16	0.12	-	-	-	-
		C = 2,200µF	-	0.21	-	0.16	-	-	-	-	-
		C = 3,300µF	0.30	-	0.20	0.18	-	-	-	-	-
		C = 4,700µF	-	0.25	0.22	-	-	-	-	-	-
		C = 6,800µF	0.36	0.29	-	-	-	-	-	-	-
Low Temperature Stability Impedance Ratio @ 120Hz	Z -25°C/Z +20°C		2	2	2	2	2	2	2	2	2
	Z -40°C/Z +20°C		3	3	3	3	3	3	3	3	3
	Z -55°C/Z +20°C		4	4	4	3	3	3	3	3	3
Load Life Test @ 105°C 5,000 Hours	Capacitance Change		Within ±30% of initial measured value								
	Tanδ		Less than 200% of specified value								
	Leakage Current		Less than specified maximum value								
Shelf Life Test @ 105°C 1,000 Hours	Capacitance Change		Within ±30% of initial measured value								
	Tanδ		Less than 200% of specified value								
	Leakage Current		Less than specified maximum value								
Resistance to Soldering Heat Within Recommended Reflow Conditions	Capacitance Change		Within ±10% of initial measured value								
	Tanδ		Less than specified maximum value								
	Leakage Current		Less than specified maximum value								

STANDARD PRODUCT AND CASE SIZE Dϕ xL (mm)

Cap (µF)	Code	Working Voltage (Vdc)								
		6.3	10	16	25	35	50	63	80	100
47	470	-	-	-	-	-	-	-	-	12.5x14
68	680	-	-	-	-	-	-	-	12.5x14	12.5x14
100	101	-	-	-	-	-	-	-	12.5x14	16x17
150	151	-	-	-	-	-	-	12.5x14	12.5x14	16x17
220	221	-	-	-	-	-	-	12.5x14	-	18x17
330	331	-	-	-	-	-	12.5x14	-	16x17	18x17
390	391	-	-	-	-	-	12.5x14	-	-	-
470	471	-	-	-	-	12.5x14	16x17	16x17	18x17	-
560	561	-	-	-	-	-	16x17	-	-	-
680	681	-	-	-	-	12.5x14	16x17	18x17	-	-
1000	102	-	-	-	12.5x14	16x17	16x17	-	-	-
1500	152	-	-	12.5x14	16x17	16x17	-	-	-	-
2200	222	-	12.5x14	-	16x17	-	-	-	-	-
3300	332	12.5x14	-	16x17	18x17	-	-	-	-	-
4700	472	-	16x17	18x17	-	-	-	-	-	-
6800	682	16x17	18x17	-	-	-	-	-	-	-

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**

STANDARD VALUES, CASE SIZES AND SPECIFICATIONS

NIC Part Number*	Cap. (μF)	W.V. (Vdc)	Dissipaton Factor (Tan δ)	Max. Ripple Current (mA) +105°C/100KHz	Max. Impedance (Ω) +20°C/100KHz	Load Life Hours @ +105°C
NACKA332M6.3V12.5X14TR13F	3300	6.3	0.30	1100	0.060	5,000
NACKA682M6.3V16X17TR13F	6800		0.36	1800	0.035	5,000
NACKA222M10V12.5X14TR13F	2200	10	0.21	1100	0.060	5,000
NACKA472M10V16X17TR13F	4700		0.25	1800	0.035	5,000
NACKA682M10V18X17TR13F	6800		0.29	2060	0.033	5,000
NACKA152M16V12.5X14TR13F	1500	16	0.16	1100	0.060	5,000
NACKA332M16V16X17TR13F	3300		0.20	1800	0.035	5,000
NACKA472M16V18X17TR13F	4700		0.22	2060	0.033	5,000
NACKA102M25V12.5X14TR13F	1000	25	0.14	1100	0.060	5,000
NACKA152M25V16X17TR13F	1500		0.16	1800	0.035	5,000
NACKA222M25V16X17TR13F	2200		0.16	1800	0.035	5,000
NACKA332M25V18X17TR13F	3300		0.18	2060	0.033	5,000
NACKA471M35V12.5X14TR13F	470	35	0.12	1100	0.060	5,000
NACKA681M35V12.5X14TR13F	680		0.12	1100	0.060	5,000
NACKA102M35V16X17TR13F	1000		0.12	1800	0.035	5,000
NACKA152M35V16X17TR13F	1500		0.12	1800	0.035	5,000
NACKA331M50V12.5X14TR13F	330	50	0.12	900	0.120	5,000
NACKA391M50V12.5X14TR13F	390		0.12	900	0.120	5,000
NACKA471M50V16X17TR13F	470		0.12	1610	0.073	5,000
NACKA561M50V16X17TR13F	560		0.12	1610	0.073	5,000
NACKA681M50V16X17TR13F	680		0.12	1610	0.073	5,000
NACKA102M50V16X17TR13F	1000		0.12	1610	0.073	5,000
NACKA151M63V12.5X14TR13F	150	63	0.10	800	0.160	5,000
NACKA221M63V12.5X14TR13F	220		0.10	800	0.160	5,000
NACKA471M63V16X17TR13F	470		0.10	1410	0.082	5,000
NACKA681M63V18X17TR13F	680		0.10	1680	0.080	5,000
NACKA680M80V12.5X14TR13F	68	80	0.08	500	0.320	5,000
NACKA101M80V12.5X14TR13F	100		0.08	500	0.320	5,000
NACKA151M80V12.5X14TR13F	150		0.08	500	0.320	5,000
NACKA331M80V16X17TR13F	330		0.08	793	0.170	5,000
NACKA471M80V18X17TR13F	470		0.08	917	0.153	5,000
NACKA470M100V12.5X14TR13F	47	100	0.07	500	0.320	5,000
NACKA680M100V12.5X14TR13F	68		0.07	500	0.320	5,000
NACKA101M100V16X17TR13F	100		0.07	793	0.170	5,000
NACKA151M100V16X17TR13F	150		0.07	793	0.170	5,000
NACKA221M100V18X17TR13F	220		0.07	917	0.153	5,000
NACKA331M100V18X17TR13F	330		0.07	917	0.153	5,000

RIPPLE CURRENT FREQUENCY CORRECTION FACTORS

120Hz	1KHz	10KHz	100KHz
0.75	0.90	0.95	1.00

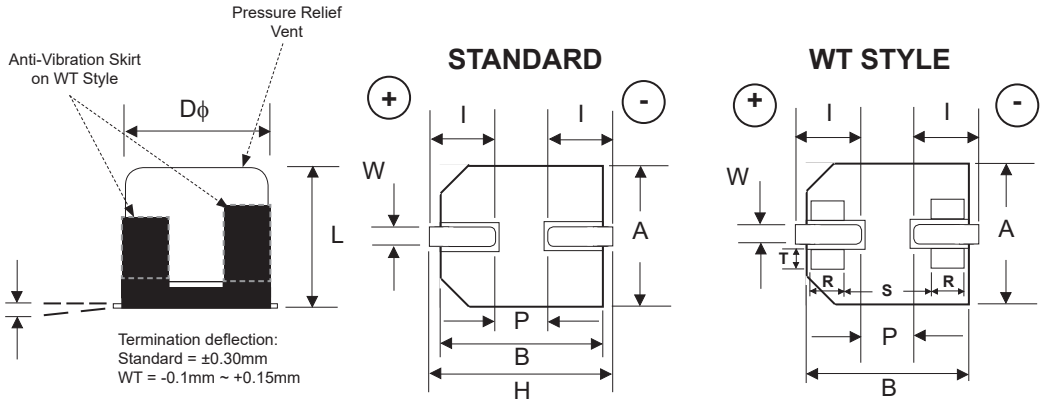
PART NUMBER SYSTEM

NACKA 102 M 35V 16x17 TR 13 P WT F

- NACKA — Series
- 102 — Capacitance Code in μF, first 2 digits are significant. Third digit is no. of zeros, "R" indicates decimal for values under 10μF
- M — Tolerance Code M=20%
- 35V — Working Voltage
- 16x17 — Size in mm
- TR — Tape & Reel
- 13 — 330mm (13") Reel
- P — Optional plastic reel (standard material is cardboard). See page 4 & 5
- WT — Optional WT = Wide Terminal
- F — RoHS Compliant

DIMENSIONS (mm)

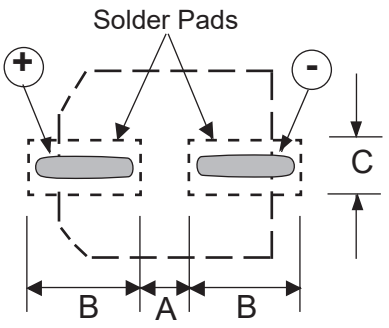
Case Size	Dϕ ±0.5	L max.	A, B ± 0.2	H max.	I ± 0.3	P ± 0.3	W	R	S	T
12.5 x 14	12.5	14.0	13.5	15.0	4.7	4.4	0.90 ± 0.30	-	-	-
16 x 17	16.0	17.0	17.0	19.0	5.5	6.7	1.20 ± 0.30	-	-	-
18 x 17	18.0	17.0	19.0	21.0	6.7	6.7	1.20 ± 0.30	-	-	-
12.5 x 14WT	12.5	14.3	13.5	15.0	4.7	4.4	1.20 ± 0.30	2.2 ± 0.2	7.1 ± 0.2	2.4 ± 0.2
16 x 17WT	16.0	17.3	17.0	19.0	5.5	6.7	1.40 ± 0.20	3.0 ± 0.2	9.0 ± 0.2	1.9 ± 0.2
18 x 17WT	18.0	17.3	19.0	21.0	6.7	6.7	1.40 ± 0.20	3.0 ± 0.2	11.0 ± 0.2	1.9 ± 0.2



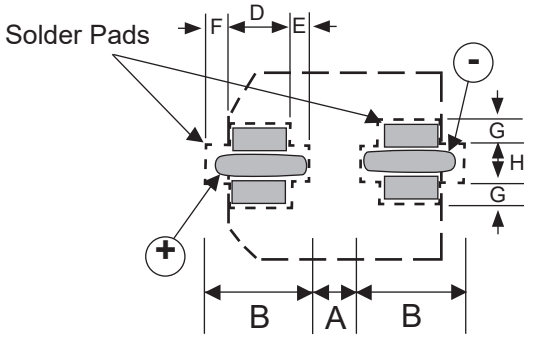
LAND PATTERN DIMENSIONS (mm)

Case Size	A	B	C	D	E	F	G	H
12.5x14	4.0	5.7	2.0	-	-	-	-	-
16x17	6.0	6.5	2.5	-	-	-	-	-
18x17	6.0	7.5	2.5	-	-	-	-	-
12.5x14WT	3.9	6.0	6.9	2.8	1.3	1.9	2.2	2.5
16x17WT	5.8	6.8	6.2	3.6	1.3	1.9	1.7	2.8
18x17WT	5.8	7.3	6.2	3.6	1.8	1.9	1.7	2.8

STANDARD TERMINATION



WT STYLE TERMINATION



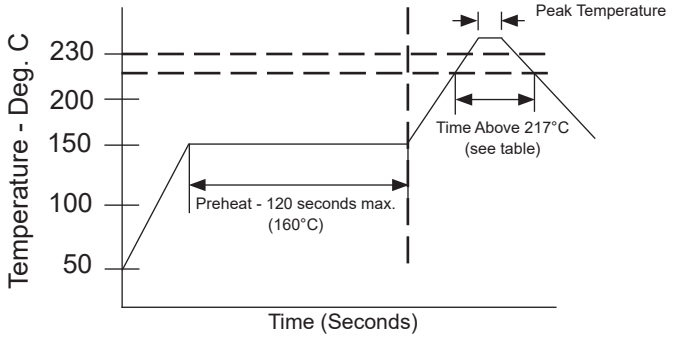
WT (Wide Terminations) Anti-Vibration Test	
Test Method	Direction: X, Y, Z axis Frequency & Duration: 5 to 2000Hz reciprocation for 20 minutes, 2 hours each direction Peak to Peak Amplitude: 5mm Peak Acceleration: 30G Sweep Type: Log
Δ Capacitance	Within ± 10% of initial value
Tangent of Loss	≤ Specified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

Review & Compare Reflow Soldering Heat Limits
V-chip SMT Aluminum Electrolytic Capacitors
www.niccomp.com/RSL

PEAK REFLOW TEMPERATURE AND DURATION

Diameter	Rated Voltage	Time above 217°C	Time above 240°C	Peak Temperature	Max. Number of Reflow Passes
ϕ12.5~18	6.3V~35V	90 sec. max.	30 sec. max.	245°C max.	2*
	50V~63V	30 sec. max.	5 sec. max.	245°C max.	2*
	80V~100V	30 sec. max.	5 sec. max.	245°C max.	1

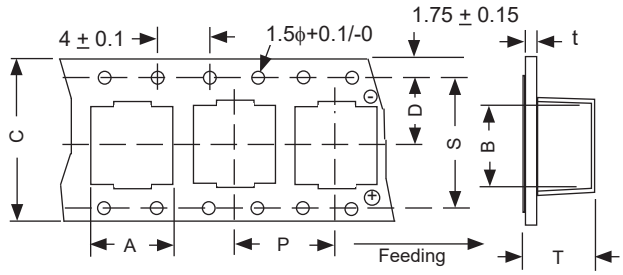
*Second reflow shall be at least one hour after natural cool to room temperature.
Note: VPS Soldering is not recommended



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.

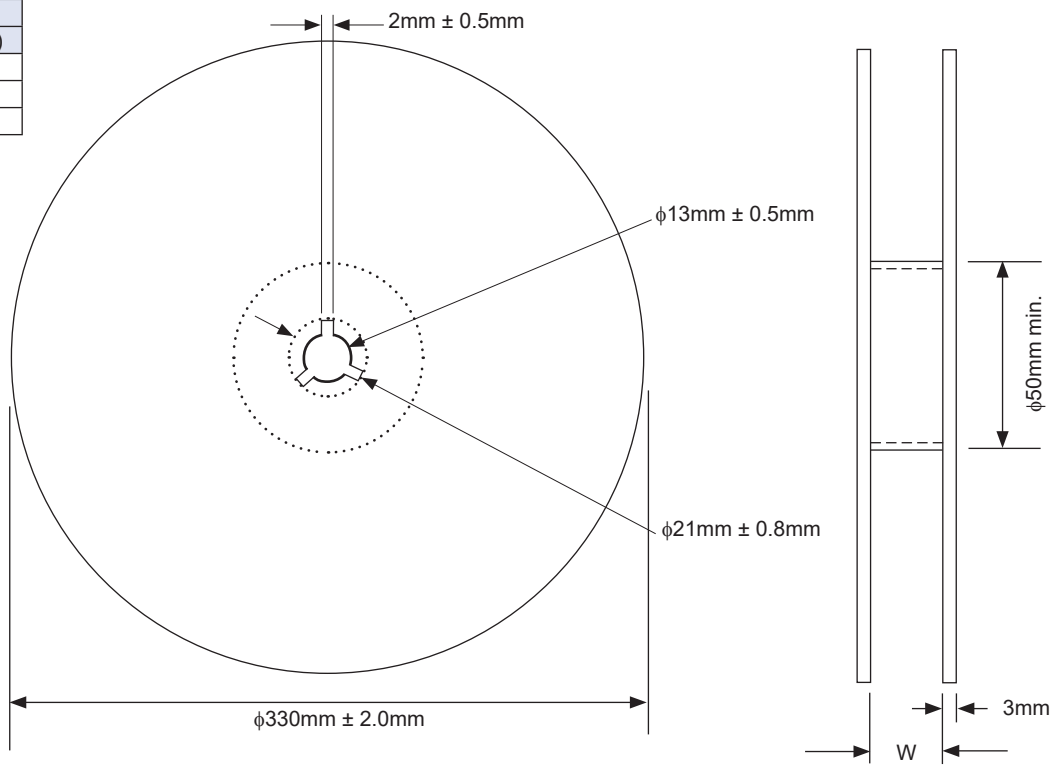
Case Size	A ±0.5	B ±0.5	C ±0.3	F ±0.1	P ±0.1	T ±0.2	t ±0.1
12.5x14	14.0	14.0	32.0	14.2	24.0	14.5	0.5
16x17	17.5	17.5	44.0	20.2	28.0	17.5	0.5
18x17	19.5	19.5	44.0	20.2	32.0	17.5	0.5



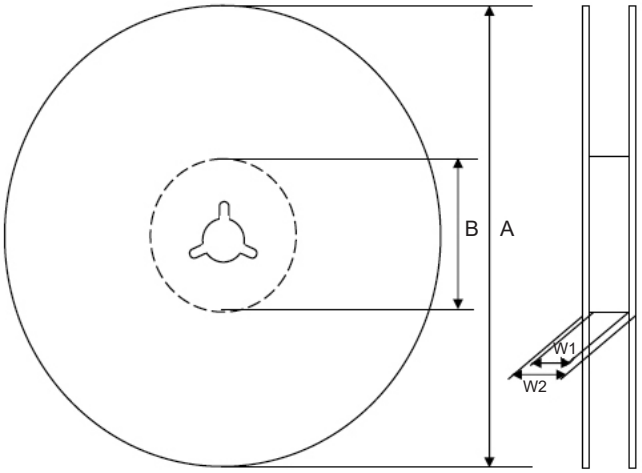
CARDBOARD REEL DIMENSIONS (mm)

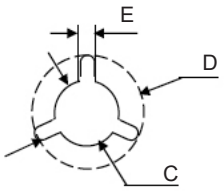
(see page 5 for plastic reel dimensions)

Case Size	W ±1.0	Qty per Reel 13" (330mm)
12.5x14	34	200
16x17	46	125
18x17	46	125



Optional V-Chip 13" (330mm) Plastic Reels (TR13P suffix)





Dimensions (mm)

Case Size	Tape Width	W1	W2
12.5x14	32.0	32.4 ~ 35.0	36.5 ~ 38.4
16x17, 18x17	44.0	44.4 ~ 47.0	48.2 ~ 50.4

Case Size	Tape Width	A	B	C	D	E
12.5x14	32.0	ϕ330 ±2.0	ϕ50~105	ϕ13 ±0.5	ϕ21 ±1.0	2.0 ±0.5
16x17, 18x17	44.0					

Color
Black or Blue

Case Size	Qty per Reel
	13" (330mm)
12.5x14	200
16x17	125
18x17	125