

FEATURES

- CYLINDRICAL V-CHIP CONSTRUCTION
- LOW COST, GENERAL PURPOSE, 2000 HOURS AT 85°C
- NEW EXPANDED CV RANGE (up to 6800µF)
- ANTI-SOLVENT (2 MINUTES)
- DESIGNED FOR AUTOMATIC MOUNTING AND REFLOW SOLDERING



CHARACTERISTICS

Rated Voltage Range	4.0 ~ 100Vdc
Rate Capacitance Range	0.1 ~ 6,800µF
Operating Temp. Range	-40°C ~ +85°C
Capacitance Tolerance	±20% (M), ±10%
Max. Leakage Current After 2 Minutes @ 20°C	0.01CV or 3µA whichever is greater

**RoHS
Compliant**
includes all homogeneous materials

*See Part Number System for Details

Tan δ @ 120Hz/20°C	W.V. (Vdc)	4.0	6.3	10	16	25	35	50	63	100
	3mm Dia.	0.40	0.35	0.24	0.19	0.16	0.14	0.14	-	-
	4 ~ 6.3mm Dia.	0.35	0.26	0.20	0.16	0.14	0.12	0.10	0.10	0.10
	8x6.5mm Dia.	-	0.25	0.26	0.20	0.16	0.14	0.12	-	0.10
	8mm Dia. ~ up	C<1000µF	0.40	0.30	0.24	0.20	0.16	0.14	0.12	0.10
		C<1500µF	-	0.31	0.25	0.21	-	0.15	-	-
		C<2200µF	-	0.32	0.32	-	0.18	-	-	-
		C<3300µF	-	0.34	-	0.24	-	-	-	-
		C<4700µF	-	-	0.36	-	-	-	-	-
		C<6800µF	-	0.40	-	-	-	-	-	-
Low Temperature Stability Impedance Ratio @ 120Hz	W.V. (Vdc)	4.0	6.3	10	16	25	35	50	63	100
	Z-25°C/Z+20°C	7	3	3	2	2	2	2	2	2
	Z-40°C/Z+20°C	15	8	6	4	4	3	3	3	3
Load Life Test 85°C 2,000 Hours	Capacitance Change	Within ± 25% of initial measured value								
	Tan δ	Less than 200% of specified max. value								
	Leakage Current	Less than specified max. value								

*See standard products and case size table for items available in 10% tolerance

PART NUMBER SYSTEM

NACE 101 M 16V 6.3x5.5 TR 13 F

NACE: Series
 101: Capacitance Code in µF, first 2 digits are significant
 M: Tolerance Code M=20%, K=10%
 16V: Working Voltage
 6.3x5.5: Size in mm
 TR: Tape & Reel
 13: RoHS Compliant
 F: 97% Sn (min.), 3% Bi (max.)
 330mm (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
 If in doubt or uncertainty, please review your specific application - process details with NIC's technical support personnel: tpmg@niccomp.com



MAXIMUM RIPPLE CURRENT (mA rms AT 120Hz AND 85°C)

Cap (μF)	Working Voltage (Vdc)								
	4.0	6.3	10	16	25	35	50	63	100
0.1	-	-	-	-	-	-	1.0	1.0	-
0.22	-	-	-	-	-	-	2.3	2.3	-
0.33	-	-	-	-	-	-	3.5	3.5	-
0.47	-	-	-	-	-	-	4.0* 5.5	5.0	-
1.0	-	-	-	-	-	-	8* 10	10	10
2.2	-	-	-	-	-	8*	15	15	20
3.3	-	-	-	-	-	10*	15	15	28* 50†
4.7	-	-	-	-	12* 19	20	23	23	35
10	-	-	-	20* 25	28	30	34	34	50
15	-	16*	-	-	-	-	-	-	-
22	19*	21* 31	35	39	52	54	58 120†	70	120
33	26	39	43	57	63	60 130†	65† 85	160	190
47	34	47	59	68	68	70 165†	90	170	330
68	52	63	66	75	80	110	120	-	-
100	61	71	76	86 200†	91 130†	130	200	280	-
150	74	78	88	135	200	220	-	-	560
220	82	95	150 250†	150	250	270	320	410	-
330	80	150 300†	280	280	310	340	520	-	-
470	150	300	300	330	430	590	925	700	-
680	-	300	-	450	-	610	-	-	-
1000	330	330	450	-	660	-	940	-	-
1500	-	450	-	710	-	1060	-	-	-
2200	-	-	730	-	1150	-	-	-	-
3300	-	750	-	1200	-	-	-	-	-
4700	-	-	1200	-	-	-	-	-	-
6800	-	1330	-	-	-	-	-	-	-

*3x5.5mm Case Size, †8x6.5mm Case Size

MAXIMUM ESR (Ω AT 120Hz AND 20°C)

Cap (μF)	Working Voltage (Vdc)								
	4.0	6.3	10	16	25	35	50	63	100
0.1	-	-	-	-	-	-	1660	1660	-
0.22	-	-	-	-	-	-	754	754	-
0.33	-	-	-	-	-	-	503	503	-
0.47	-	-	-	-	-	-	353	353	-
1.0	-	-	-	-	-	-	166	166	166
2.2	-	-	-	-	-	90.4	75.4	75.4	75.4
3.3	-	-	-	-	-	60.3	50.3	50.3	50.3 90.4†
4.7	-	-	-	-	49.4	42.3	35.3	35.3	35.3
10	-	-	-	26.5	23.2	19.9	16.6	16.6	16.6
15	-	33.1	-	-	-	-	-	-	-
22	30.1	26.5* 18.1	15.1	12.1	10.6	9.05	7.54 9.05†	7.54	7.54
33	17.6	12.6	10.1	8.04	7.04	6.04 7.04†	5.03 6.04†	6.04	5.03
47	12.4	8.47	7.06	5.65	4.95	4.24 4.95†	3.53	4.24	3.53
68	8.54	5.86	4.88	3.91	3.42	2.93	2.44	-	-
100	5.80	3.98	3.32	2.66 3.32†	2.32 2.66†	1.99	1.99	1.99	-
150	3.87	2.66	2.21	1.77	1.55	1.33	-	-	1.11
220	2.64	1.96	1.51 1.99†	1.21	1.21	1.06	0.91	0.91	-
330	1.76	1.31 1.76†	1.21	1.01	0.81	0.71	0.60	-	-
470	1.42	1.06	0.85	0.71	0.57	0.49	0.43	0.43	-
680	-	0.59	-	0.49	-	0.34	-	-	-
1000	0.67	0.50	0.40	-	0.27	-	0.20	-	-
1500	-	0.35	-	0.24	-	0.17	-	-	-
2200	-	-	0.24	-	0.14	-	-	-	-
3300	-	0.17	-	0.12	-	-	-	-	-
4700	-	-	0.13	-	-	-	-	-	-
6800	-	0.10	-	-	-	-	-	-	-

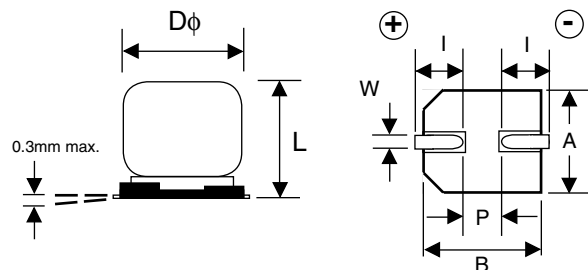
RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

Frequency Hz	100<f≤1K	1K<f≤10K	10K<f≤100K	f ≥100K
C≤4.7μF	1.0	1.3	1.5	2.0
4.7μF<C≤33μF	1.0	1.2	1.3	1.45
C>33μF	1.0	1.1	1.2	1.3

STANDARD PRODUCT AND CASE SIZE TABLE D ϕ xL (mm)

Cap (μ F)	Code	Working Voltage (Vdc)								
		4.0	6.3	10	16	25	35	50	63	100
0.1	R10	-	-	-	-	-	-	3X5.5 4X5.5*	4X5.5*	-
0.22	R22	-	-	-	-	-	-	3X5.5 4X5.5*	4X5.5*	-
0.33	R33	-	-	-	-	-	-	3X5.5 4X5.5*	4X5.5*	-
0.47	R47	-	-	-	-	-	-	3X5.5 4X5.5*	4X5.5*	-
1.0	1R0	-	-	-	-	-	-	3X5.5 4X5.5*	4X5.5*	4x6.3*
2.2	2R2	-	-	-	-	-	3X5.5	4X5.5*	4X5.5*	6.3x6.3*
3.3	3R3	-	-	-	-	-	3X5.5	4X5.5*	5X5.5*	6.3x6.3* 8x6.5
4.7	4R7	-	-	-	-	3X5.5 4X5.5	4X5.5*	5X5.5*	5X5.5*	6.3x6.3*
10	100	-	-	-	3X5.5 4X5.5*	5X5.5	5X5.5*	6.3X5.5*	6.3X5.5*	6.3x8*
15	150	-	3X5.5	-	-	-	-	-	-	-
22	220	3X5.5	3X5.5 4X5.5*	5X5.5*	5X5.5*	6.3X5.5	6.3X5.5*	6.3X6.3* 8x6.5	6.3X8*	8x10.5*
33	330	4X5.5*	5X5.5*	5X5.5*	6.3X5.5*	6.3X5.5	6.3X6.3* 8x6.5	6.3X8* 8x6.5	8x10.5*	10x10.5*
47	470	4X5.5*	5X5.5*	6.3X5.5	6.3X5.5*	6.3X6.3	6.3X6.3* 8x6.5	6.3X8*	8x10.5*	12.5x14
68	680	5X5.5*	6.3X5.5*	6.3X5.5*	6.3X5.5*	6.3X6.3	6.3X8	8x10.5*	-	-
100	101	5X5.5*	6.3X5.5*	6.3X5.5*	6.3X5.5* 8x6.5	6.3X8 8x6.5	6.3X8	8x10.5*	10x10.5*	-
150	151	6.3X5.5*	6.3X5.5*	6.3X6.3*	6.3X8*	8x10.5*	8x10.5* 10x8*	-	-	16x17
220	221	6.3X5.5*	6.3X6.3*	6.3X8* 8x6.5	6.3X8*	8x10.5 10x8	8x10.5	10x10.5	12.5x14	-
330	331	6.3X6.3	6.3X8* 8x6.5	8x10.5*	8x10.5 10x8	8x10.5	10x10.5	12.5x14	-	-
470	471	6.3X8*	8x10.5	8x10.5 10x8	8x10.5	10x10.5	12.5x14	16x17	16x17	-
680	681	-	10x8*	-	10x10.5*	-	12.5x14	-	-	-
1000	102	10X8	8x10.5*	10x10.5*	-	12.5x14	-	16x17	-	-
1500	152	-	10x10.5*	-	12.5x14	-	16x17	-	-	-
2200	222	-	-	12.5x14	-	16x17	-	-	-	-
3300	332	-	12.5x14	-	16x17	-	-	-	-	-
4700	472	-	-	16x17	-	-	-	-	-	-
6800	682	-	16x17	-	-	-	-	-	-	-

*Items available in optional 10% tolerance



DIMENSIONS (mm)

Case Size	D ϕ ± 0.5	L max.	A ± 0.2	B ± 0.2	I ± 0.2	W	P ± 0.2
3 x 5.5	3.0	5.5	3.3	3.3	1.5	0.45 ~ 0.8	0.6
4 x 5.5	4.0	5.5	4.3	4.3	1.8	0.5 ~ 0.8	1.0
5 x 5.5	5.0	5.5	5.3	5.3	2.1	0.5 ~ 0.8	1.4
6.3 x 5.5	6.3	5.5	6.6	6.6	2.5	0.5 ~ 0.8	2.2
6.3 x 6.3	6.3	6.3	6.6	6.6	2.5	0.5 ~ 0.8	2.2
6.3 x 8	6.3	8.0	6.6	6.6	2.5	0.5 ~ 0.8	2.2
8 x 6.5	8.0	6.5	8.3	8.3	3.4	0.5 ~ 0.8	2.2
8 X 10.5	8.0	10.5	8.3	8.3	2.9	0.7 ~ 1.0	3.2
10 x 8	10.0	8.0	10.3	10.3	3.2	0.7 ~ 1.4	4.6
10 x 10.5	10.0	10.5	10.3	10.3	3.2	0.7 ~ 1.4	4.6
12.5 x 14	12.5	14.0	12.8	12.8	4.5	0.6 ~ 1.4	4.6
16 x 17	16.0	17.5	17.0	17.0	5.5	0.9 ~ 1.5	6.7