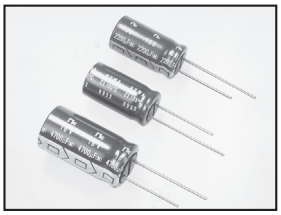
Miniature Aluminum Electrolytic Capacitors

NRE-H Series

HIGH VOLTAGE, RADIAL LEADS, POLARIZED

RoHS Compliant
includes all homogeneous materials

*See Part Number System for Details



FEATURES

- HIGH VOLTAGE (UP THROUGH 450VDC)
- NEW REDUCED SIZES

CHARACTERISTICS

Rated Voltage Range	160 ~ 450Vdc						
Capacitance Range	0.47 ~ 330µF						
Operating Temperature Range	-40 ~ +85°C: 160 ~ 250V or -25 ~ +85°C: 350 ~ 450V						
Capacitance Tolerance	±20%(M)						
Max. Leakage Current @ 20°C after 2 minutes	CV ≤ 1000µF = 0.03CV + 15µA						
	CV > 1000µF = 0.02CV + 25µA						
Max. Tan δ @ 120Hz/20°C	W.V. (Vdc)	160	200	250	350	400	450
	Tan δ	0.20	0.20	0.20	0.25	0.25	0.25
Low Temperature Stability Inpedance Ratio @ 120Hz	Z-25°C/Z+20°C	3	3	3	4	6	12
	Z-40°C/Z+20°C	6	6	6	-	-	-
Load Life Test at Rated W.V. +85°C 2,000 Hours	Capacitance Change	Within ±20% of initial measured value					
	Tan δ	Less than 200% of specified maximum value					
	Leakage Current	Less than specified maximum value					
Shelf Life Test 85°C 1,000 Hours No Load	Capacitance Change	Within ±20% of initial measured value					
	Tan δ	Less than 200% of specified maximum value					
	Leakage Current	Less than specified maximum value					

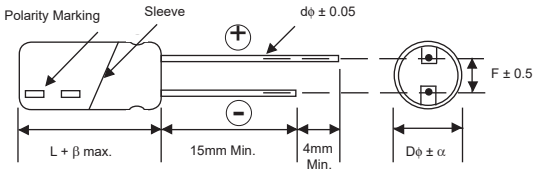
STANDARD PRODUCT AND CASE SIZE TABLE Dϕ x L (mm)

Cap. (µF)	Code	Working Voltage (Vdc)					
		160	200	250	350	400	450
0.47	R47	5x11	5x11	5x11	-	-	-
1.0	1R0	5x11	5x11	5x11	6.3x11	-	-
2.2	2R2	6.3x11	6.3x11	6.3x11	8x11.5	8x11.5	-
3.3	3R3	6.3x11	6.3x11	8x11.5	8x12.5	10x12.5	-
4.7	4R7	6.3x11	8x11.5	8x11.5	10x12.5	10x16	-
10	100	8x11.5	8x12.5	10x12.5	10x16	10x20	-
22	220	10x12.5	10x16	10x20	12.5x20	12.5x25	16x25
33	330	10x20	10x20	12.5x20	12.5x25	16x25	16x31.5
47	470	12.5x20	12.5x20	12.5x25	16x25	16x31.5	18x35.5
68	680	12.5x20	12.5x25	16x25	16x35.5	16x35.5	18x41
82	820	12.5x25	-	16x31.5	18x31.5	18X35.5	-
100	101	12.5x25	16x25	16x31.5	18x35.5	18x41	-
150	151	16x31.5	16x35.5	18x35.5	-	-	-
220	221	16x35.5	18x35.5	18x41	-	-	-
330	331	18x41	-	-	-	-	-

LEAD SPACING & DIAMETER (mm)

Case Dia. (Dϕ)	5	6.3	8	10	12.5	16	18
Lead Dia. (dϕ)	0.5	0.5	0.6	0.6	0.6	0.8	0.8
Lead Spacing (F)	2.0	2.5	3.5	5.0	5.0	7.5	7.5
Dim. α	0.5	0.5	0.5	0.5	0.5	0.5	0.5
dim. β	1.5	1.5	1.5	1.5	1.5	2.0	2.0

DIMENSIONS (mm)



Drawing is representative of parts as supplied in bulk or straight lead format, please see taping specification for details on taped format packaging.

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 PRODUCT, SPECIFICATIONS AND CASE SIZES D ϕ x L (mm)

Part Number	Cap. (µF)	W.V. (Vdc))	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +85°C/120Hz	Max. ESR (Ω) +20°C/120Hz	Load Life Hours @ +85°C
NRE-HR47M160V5X11F	0.47	160	0.20	10	706	2,000
NRE-H1R0M160V5X11F	1.0		0.20	21	332	2,000
NRE-H2R2M160V6.3X11F	2.2		0.20	31	151	2,000
NRE-H3R3M160V6.3X11F	3.3		0.20	40	101	2,000
NRE-H4R7M160V6.3X11F	4.7		0.20	55	70.6	2,000
NRE-H100M160V8X11.5F	10		0.20	90	33.2	2,000
NRE-H220M160V10X12.5F	22		0.20	153	15.1	2,000
NRE-H330M160V10X20F	33		0.20	195	10.1	2,000
NRE-H470M160V12.5X20F	47		0.20	245	7.06	2,000
NRE-H680M160V12.5X20F	68		0.20	310	4.88	2,000
NRE-H820M160V12.5X25F	82		0.20	380	4.05	2,000
NRE-H101M160V12.5X25F	100		0.20	410	3.32	2,000
NRE-H151M160V16X31.5F	150		0.20	550	2.21	2,000
NRE-H221M160V16X35.5F	220		0.20	745	1.51	2,000
NRE-H331M160V18X41F	330		0.20	800	1.01	2,000
NRE-HR47M200V5X11F	0.47	200	0.20	11	706	2,000
NRE-H1R0M200V5X11F	1.0		0.20	23	332	2,000
NRE-H2R2M200V6.3X11F	2.2		0.20	34	151	2,000
NRE-H3R3M200V6.3X11F	3.3		0.20	46	101	2,000
NRE-H4R7M200V8X11.5F	4.7		0.20	57	70.6	2,000
NRE-H100M200V8X12.5F	10		0.20	92	33.2	2,000
NRE-H220M200V10X16F	22		0.20	160	15.1	2,000
NRE-H330M200V10X20F	33		0.20	210	10.1	2,000
NRE-H470M200V12.5X20F	47		0.20	250	7.06	2,000
NRE-H680M200V12.5X25F	68		0.20	325	4.88	2,000
NRE-H101M200V16X25F	100		0.20	430	3.32	2,000
NRE-H151M200V16X35.5F	150		0.20	575	2.21	2,000
NRE-H221M200V18X35.5F	220		0.20	760	1.51	2,000
NRE-HR47M250V5X11F	0.47	250	0.20	12	706	2,000
NRE-H1R0M250V5X11F	1.0		0.20	25	332	2,000
NRE-H2R2M250V6.3X11F	2.2		0.20	35	151	2,000
NRE-H3R3M250V8X11.5F	3.3		0.20	48	101	2,000
NRE-H4R7M250V8X11.5F	4.7		0.20	59	70.6	2,000
NRE-H100M250V10X12.5F	10		0.20	94	33.2	2,000
NRE-H220M250V10X20F	22		0.20	170	15.1	2,000
NRE-H330M250V12.5X20F	33		0.20	220	10.1	2,000
NRE-H470M250V12.5X25F	47		0.20	260	7.06	2,000
NRE-H680M250V16X25F	68		0.20	335	4.88	2,000
NRE-H820M250V16X31.5F	82		0.20	400	4.05	2,000
NRE-H101M250V16X31.5F	100		0.20	432	3.32	2,000
NRE-H151M250V18X35.5F	150		0.20	588	2.21	2,000
NRE-H221M250V18X41F	220		0.20	760	1.51	2,000
NRE-H1R0M350V6.3X11F	1.0	350	0.25	29	415	2,000
NRE-H2R2M350V8X11.5F	2.2		0.25	40	188	2,000
NRE-H3R3M350V8X12.5F	3.3		0.25	52	126	2,000
NRE-H4R7M350V10X12.5F	4.7		0.25	67	86.2	2,000
NRE-H100M350V10X16F	10		0.25	100	41.5	2,000
NRE-H220M350V12.5X20F	22		0.25	175	18.8	2,000
NRE-H330M350V12.5X25F	33		0.25	225	12.6	2,000
NRE-H470M350V16X25F	47		0.25	260	8.82	2,000
NRE-H680M350V16X35.5F	68		0.25	340	6.10	2,000
NRE-H820M350V18X31.5F	82		0.25	405	5.06	2,000
NRE-H101M350V18X35.5F	100		0.25	440	4.15	2,000
NRE-H2R2M400V8X11.5F	2.2	400	0.25	40	188	2,000
NRE-H3R3M400V10X12.5F	3.3		0.25	52	126	2,000
NRE-H4R7M400V10X16F	4.7		0.25	67	86.2	2,000
NRE-H100M400V10X20F	10		0.25	100	41.5	2,000

STANDARD PRODUCT, SPECIFICATIONS AND CASE SIZES D ϕ x L (mm)

Part Number	Cap. (µF)	W.V. (Vdc))	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +85°C/120Hz	Max. ESR (Ω) +20°C/120Hz	Load Life Hours @ +85°C
NRE-H220M400V12.5X25F	22	400	0.25	180	18.8	2,000
NRE-H330M400V16X25F	33		0.25	230	12.6	2,000
NRE-H470M400V16X31.5F	47		0.25	270	8.82	2,000
NRE-H680M400V16X35.5F	68		0.25	345	6.10	2,000
NRE-H820M400V18X35.5F	82		0.25	420	5.06	2,000
NRE-H101M400V18X41F	100		0.25	450	4.15	2,000
NRE-H220M450V16X25F	22	450	0.25	180	18.8	2,000
NRE-H330M450V16X31.5F	33		0.25	220	12.6	2,000
NRE-H470M450V18X35.5F	47		0.25	245	8.82	2,000
NRE-H680M450V18X41F	68		0.25	270	6.10	2,000

RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

Frequency (Hz)		100≤F<1K	1K≤F<10K	10K≤F<100K
Correction Factor	<100µF	1.0	1.30	1.50
	100 ~ 1,000µF	1.0	1.20	1.30

PART NUMBER SYSTEM

NRE-H 100 M 350V 10X16 TB F

- F — RoHS Compliant
- TB = Tape & Box*
- 10X16 — Case Size (Dϕ x L)
- 350V — Working Voltage (Vdc)
- M — Tolerance Code (M=20%)
- 100 — Capacitance Code: First 2 characters significant, third character is multiplier
- NRE-H — Series

*see taping specifications for details