

Miniature Aluminum Electrolytic Capacitors

NRE-H Series

HIGH VOLTAGE, RADIAL LEADS, POLARIZED

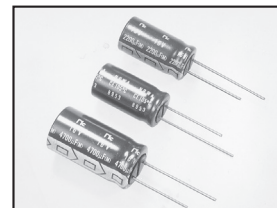
FEATURES

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

**RoHS
Compliant**

includes all homogeneous materials

*See Part Number System for Details



CHARACTERISTICS

Rated Voltage Range	160 ~ 450Vdc						
Capacitance Range	0.47 ~ 330 μ F						
Operating Temperature Range	-40 ~ +85°C: 160 ~ 250V or -25 ~ +85°C: 350 ~ 450V						
Capacitance Tolerance	$\pm 20\%$ (M)						
Max. Leakage Current @ 20°C after 2 minutes	CV \leq 1000 μ F = 0.03CV + 15 μ A						
	CV > 1000 μ F = 0.02CV + 25 μ A						
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 Impedance 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 $\pm 20\%$ 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 $\pm 20\%$ of initial measured value					
	Tan δ	Less than 200% of specified maximum value					
	Leakage Current	Less than specified maximum value					

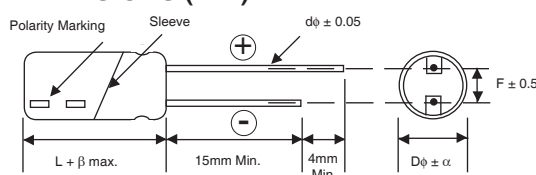
STANDARD PRODUCT AND CASE SIZE TABLE D ϕ x L (mm)

Cap. (μ F)	Code	Working Voltage (Vdc)					
		160	200	250	350	400	450
0.47	R47	5x11	5x11	5x11	6.3x11	6.3x11	-
1.0	1R0	5x11	5x11	5x11	6.3x11	8x11.5	8x12.5
2.2	2R2	6.3x11	6.3x11	6.3x11	8x11.5	8x11.5	10x16
3.3	3R3	6.3x11	6.3x11	8x11.5	8x12.5	10x12.5	10x20
4.7	4R7	6.3x11	8x11.5	8x11.5	10x12.5	10x16	12.5x20
10	100	8x11.5	8x12.5	10x12.5	10x16	10x20	12.5x25
22	220	10x12.5	10x16	10x20	12.5x20	12.5x25	16x25
33	330	10x20	10x20	12.5x20	12.5x25	16x25	16x30
47	470	12.5x20	12.5x20	12.5x25	16x25	16x30	18x35.5
68	680	12.5x20	12.5x25	16x25	16x35.5	16x35.5	18x41
82	820	12.5x25	-	16x30	18x30.5	18x35.5	-
100	101	12.5x25	16x25	16x30	18x35.5	18x41	-
150	151	16x30	16x35.5	18x35.5	-	-	-
220	221	16x36	18x35.5	18x41	-	-	-
330	331	18x41	-	-	-	-	-

LEAD SPACING & DIAMETER (mm)

Case Dia. (D ϕ)	5	6.3	8	10	12.5	16	18
Lead Dia. (d ϕ)	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 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



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

Part Number	Cap. (μ F)	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-H151M160V16X30F	150		0.20	550	2.21	2,000	
NRE-H221M160V16X36F	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	45	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		58	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-H820M250V16X30F	82	0.20		400	4.05	2,000	
NRE-H101M250V16X30F	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-HR47M350V6.3X11F	0.47	350	0.25	14	882	2,000	
NRE-H1R0M350V6.3X11F	1.0		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-H820M350V18X30.5F	82		0.25	405	5.06	2,000	
NRE-H101M350V18X35.5F	100		0.25	440	4.15	2,000	
NRE-HR47M400V6.3X11F	0.47		400	0.25	14	882	2,000
NRE-H1R0M400V8X11.5F	1.0			0.25	29	415	2,000
NRE-H2R2M400V8X11.5F	2.2	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	



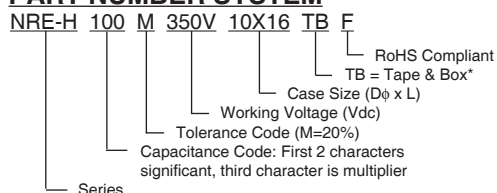
STANDARD PRODUCT, SPECIFICATIONS AND CASE SIZES D ϕ x L (mm)

Part Number	Cap. (μ F)	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-H470M400V16X30F	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-H1R0M450V8X12.5F	1.0	450	0.25	26	415	2,000
NRE-H2R2M450V10X16F	2.2		0.25	40	188	2,000
NRE-H3R3M450V10X20F	3.3		0.25	52	126	2,000
NRE-H4R7M450V12.5X20F	4.7		0.25	67	86.2	2,000
NRE-H100M450V12.5X25F	10		0.25	100	41.5	2,000
NRE-H220M450V16X25F	22		0.25	190	18.8	2,000
NRE-H330M450V16X30F	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)	120	1K	10k	100K	
Correction Factor	$\leq 33\mu$ F	1.0	1.3	1.45	1.45
	$> 33\mu$ F	1.0	1.2	1.30	1.30

PART NUMBER SYSTEM



*see taping specifications for details

