

# 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

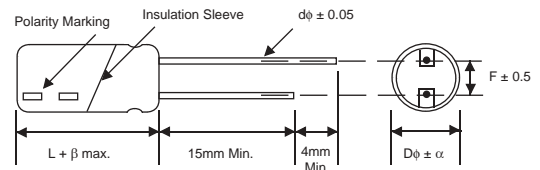
Rated Voltage Range		160 ~ 450Vdc					
Capacitance Range		0.47 ~ 330μF					
Operating Temperature Range		-40 ~ +85°C: 160 ~ 250V or -25 ~ +85°C: 315 ~ 450V					
Capacitance Tolerance		±20%(M)					
Max. Leakage Current @ 20°C	After 1 min.	CV ≤ 1000μF = 0.03CV + 15μA					
	After 2 min.	CV > 1000μF = 0.02CV + 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 Impedance Ratio @ 120Hz	Z-25°C/Z+20°C	3	3	3	10	12	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	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	16x31
47	470	12.5x20	12.5x20	12.5x25	16x25	16x31	18x36
68	680	12.5x20	12.5x25	16x25	16x36	16x36	18x41
100	101	12.5x25	16x25	16x31	18x36	18x41	-
150	151	16x31	16x36	18x36	-	-	-
220	221	16x36	18x36	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



## 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](http://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](mailto:tpmg@niccomp.com)



### STANDARD PRODUCT, SPECIFICATIONS AND CASE SIZES D $\phi$ x L (mm)

Part Number	Cap. ( $\mu$ F)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +85°C/120Hz	Max. ESR ( $\Omega$ ) +20°C/120Hz	Load Life Hours @ +85°C	
NREHR47M160V5X11F	0.47	160	0.20	10	706	2,000	
NREH1R0M160V5X11F	1.0		0.20	21	332	2,000	
NREH2R2M160V6.3X11F	2.2		0.20	31	151	2,000	
NREH3R3M160V6.3X11F	3.3		0.20	40	101	2,000	
NREH4R7M160V6.3X11F	4.7		0.20	55	70.6	2,000	
NREH100M160V8X11.5F	10		0.20	90	33.2	2,000	
NREH20M160V10X12.5F	22		0.20	153	15.1	2,000	
NREH330M160V10X20F	33		0.20	195	10.1	2,000	
NREH470M160V12.5X20F	47		0.20	245	7.06	2,000	
NREH680M160V12.5X20F	68		0.20	310	4.88	2,000	
NREH101M160V12.5X25F	100		0.20	410	3.32	2,000	
NREH151M160V16X31F	150		0.20	550	2.21	2,000	
NREH221M160V16X36F	220		0.20	745	1.51	2,000	
NREH331M160V18X41F	330		0.20	800	1.01	2,000	
NREHR47M200V5X11F	0.47	200	0.20	11	706	2,000	
NREH1R0M200V5X11F	1.0		0.20	23	332	2,000	
NREH2R2M200V6.3X11F	2.2		0.20	34	151	2,000	
NREH3R3M200V6.3X11F	3.3		0.20	45	101	2,000	
NREH4R7M200V8X11.5F	4.7		0.20	57	70.6	2,000	
NREH100M200V8X12.5F	10		0.20	92	33.2	2,000	
NREH220M200V10X16F	22		0.20	160	15.1	2,000	
NREH330M200V10X20F	33		0.20	210	10.1	2,000	
NREH470M200V12.5X20F	47		0.20	250	7.06	2,000	
NREH680M200V12.5X25F	68		0.20	325	4.88	2,000	
NREH101M200V16X25F	100		0.20	430	3.32	2,000	
NREH151M200V16X36F	150		0.20	575	2.21	2,000	
NREH221M200V18X36F	220		0.20	760	1.51	2,000	
NREHR47M250V5X11F	0.47		250	0.20	12	706	2,000
NREH1R0M250V5X11F	1.0	0.20		25	332	2,000	
NREH2R2M250V6.3X11F	2.2	0.20		35	151	2,000	
NREH3R3M250V8X11.5F	3.3	0.20		48	101	2,000	
NREH4R7M250V8X11.5F	4.7	0.20		58	70.6	2,000	
NREH100M250V10X12.5F	10	0.20		94	33.2	2,000	
NREH220M250V10X20F	22	0.20		170	15.1	2,000	
NREH330M250V12.5X20F	33	0.20		220	10.1	2,000	
NREH470M250V12.5X25F	47	0.20		260	7.06	2,000	
NREH221M250V16X25F	68	0.20		335	4.88	2,000	
NREH101M250V16X31F	100	0.20		432	3.32	2,000	
NREH151M250V18X36F	150	0.20		588	2.21	2,000	
NREH221M250V18X41F	220	0.20		760	1.51	2,000	
NREHR47M350V6.3X11F	0.47	350		0.25	14	882	2,000
NREH1R0M350V6.3X11F	1.0		0.25	29	415	2,000	
NREH2R2M350V8X11.5F	2.2		0.25	40	188	2,000	
NREH3R3M350V8X12.5F	3.3		0.25	52	126	2,000	
NREH4R7M350V10X12.5F	4.7		0.25	67	86.2	2,000	
NREH100M350V10X16F	10		0.25	100	41.5	2,000	
NREH220M350V12.5X20F	22		0.25	175	18.8	2,000	
NREH330M350V12.5X25F	33		0.25	225	12.6	2,000	
NREH470M350V16X25F	47		0.25	260	8.82	2,000	
NREH680M350V16X36F	68		0.25	340	6.10	2,000	
NREH101M350V18X36F	100		0.25	440	4.15	2,000	
NREHR47M400V6.3X11F	0.47		400	0.25	14	882	2,000
NREH1R0M400V8X11.5F	1.0			0.25	29	415	2,000
NREH2R2M400V8X11.5F	2.2			0.25	40	188	2,000
NREH3R3M400V10X12.5F	3.3	0.25		52	126	2,000	
NREH4R7M400V10X16F	4.7	0.25		67	86.2	2,000	
NREH100M400V10X20F	10	0.25		100	41.5	2,000	
NREH220M400V12.5X25F	22	0.25		180	18.8	2,000	
NREH330M400V16X25F	33	0.25		230	12.6	2,000	
NREH470M400V16X31F	47	0.25		270	8.82	2,000	

### STANDARD PRODUCT, SPECIFICATIONS AND CASE SIZES D $\phi$ x L (mm)

Part Number	Cap. ( $\mu$ F)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +85°C/120Hz	Max. ESR ( $\Omega$ ) +20°C/120Hz	Load Life Hours @ +85°C
NREH680M400V16X36F	68	400	0.25	345	6.10	2,000
NREH101M400V18X41F	100		0.25	450	4.15	2,000
NREH1R0M450V8X12.5F	1.0		0.25	26	415	2,000
NREH2R2M450V10X16F	2.2	450	0.25	40	188	2,000
NREH3R3M450V10X20F	3.3		0.25	52	126	2,000
NREH4R7M450V12.5X20F	4.7		0.25	67	86.2	2,000
NREH100M450V12.5X25F	10		0.25	100	41.5	2,000
NREH220M450V16X25F	22		0.25	190	18.8	2,000
NREH330M450V16X31F	33		0.25	220	12.6	2,000
NREH470M450V18X36F	47		0.25	245	8.82	2,000
NREH680M450V18X41F	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

