Miniature Aluminum Electrolytic Capacitors

NRB-XS Series

HIGH TEMPERATURE, EXTENDED LOAD LIFE, RADIAL LEADS, POLARIZED

FEATURES

- HIGH RIPPLE CURRENT AT HIGH TEMPERATURE (+105°C)
- IDEAL FOR HIGH VOLTAGE LIGHTING BALLAST
- LONG LIFE 8,000 ~ 12,000 HOURS (500WV: 10,000 HOURS)
- REDUCED SIZE (FROM NRBX)

EXPANDED VALUE RANGE

CHARACTERISTICS

Rated Voltage Range		160 ~ 500VDC						
Capacitance Range		1.0 ~ 220µF						
Operating Temperature Range		-25°C ~ +105°C						
Capacitance Tolerance		±20% (M)						
Maximum Leakage Current @ +20°C		CV ≤ 1,000µF			CV > 1,000µF			
		0.1CV +40µA (1 minute) 0.03CV +15µA (5 minutes)			0.04CV +100µA (1 minute) 0.02CV +25µA (5 minutes)			
Max. Tan δ at 120Hz/20°C	W.V. (Vdc)	160	200	250	350	400	450	500
	S.V. (Vdc)	200	250	300	400	450	500	550
	Tan δ	0.15	0.15	0.15	0.20	0.20	0.20	0.24
Low Temperature Stability Impedance Ratio @ 120Hz	Z-25°C/Z+20°C	3	3	3	6	6	6	6
Load Life at W.V. & 105°C 8x11.5mm, 10x12.5mm: 8,000 Hours 10x16mm, 10x20mm: 10,000 Hours φD ≥ 12.5mm: 12,000 Hours* *500W.V.: 10,000 Hours	Δ Capacitance	Within ±20% of initial measured value						
	Δ Tan δ	Less than 200% of specified value						
	Δ LC	Less than specified value						

PART NUMBER SYSTEM

NRB-XS 1R0 M 400V 8X11.5 TB F

- F — RoHS Compliant
- TB = Tape & Box*
- 8X11.5 — Case Size (DφxL)
- 400V — Working Voltage (Vdc)
- M — Tolerance Code (M=20%)
- 1R0 — Capacitance Code: First 2 characters significant, third character is multiplier
- NRB-XS — Series

*see taping specifications for details

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 AND CASE SIZE TABLE DϕxL (mm)

Cap. (µF)	Code	Working Voltage (Vdc)						
		160	200	250	350	400	450	500
1.0	1R0	-	-	-	-	8X11.5 10X12.5	-	-
1.5	1R5	-	-	-	-	8X11.5 10X12.5	-	-
1.8	1R8	-	-	-	-	8X11.5 10X12.5	-	-
2.2	2R2	-	-	-	-	8X11.5 10X12.5	-	-
3.3	3R3	-	-	-	-	10X12.5 10X16	-	-
4.7	4R7	-	-	8X11.5	10X12.5	10X16	10X16 10X20	-
5.6	5R6	-	-	-	10X12.5	10X16	10X16 10X20	- -
6.8	6R8	-	-	10X12.5	10X16	10X16	10X16 10X20	- -
8.2	8R2	-	-	-	-	-	10X20	-
10	100	10X16	10X16	10X16	10X20	10X20	10X20 12.5X16 12.5X20	12.5X20
15	150	-	-	-	-	12.5X20	12.5X20 12.5X25 16X16	12.5X25 16X20
22	220	10X20	10X20	10X16 10X20	12.5X20	12.5X25 16X20	12.5X25 16X20	12.5X35 16X25 18X20
33	330	10X20	10X20	12.5X16 12.5X20	16X20	16X20	16X20 16X25 18X20	16X31.5 18X25
47	470	10X20	12.5X20	12.5X20	16X20	16X25 18X20	18X25	18X31.5
56	560	-	-	12.5X20 18X16	-	-	-	-
68	680	12.5x20	12.5x25 16x20	12.5X25 16x20	18x25	18x25	-	-
82	820	-	16x20	12.5X30 16x20	18x25	-	-	-
100	101	12.5x25 16x20	16x20	16x25 18X20	-	-	-	-
120	121	-	-	18X20	-	-	-	-
150	151	16x25	16x25	18x25	-	-	-	-
220	221	18x25	-	-	-	-	-	-

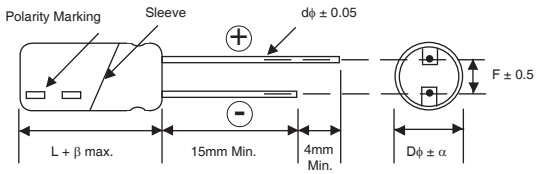
Expanded Values

Special items, 100uF @ 400VDC / 10x16mm and 100uF @ 450VDC / 10x16mm are available under special order, contact NIC to review your requirements

LEAD SPACING AND DIAMETER (mm)

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

STANDARD VALUES, SPECIFICATIONS AND CASE SIZES (mm)

Part Number	Cap. (µF)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +105°C/100KHz	Max. ESR (Ω) +20°C/120Hz	Load Life Hours @+105°C
NRB-XS100M160V10X16F	10	160	0.15	320	24.9	10,000
NRB-XS220M160V10X20F	22		0.15	500	11.3	10,000
NRB-XS330M160V10X20F	33		0.15	650	7.54	10,000
NRB-XS470M160V10X20F	47		0.15	750	5.29	10,000
NRB-XS680M160V12.5x20F	68		0.15	1180	3.66	12,000
NRB-XS101M160V12.5x25F	100		0.15	1420	2.49	12,000
NRB-XS101M160V16x20F	100		0.15	1420	2.49	12,000
NRB-XS151M160V16x25F	150		0.15	1890	1.66	12,000
NRB-XS221M160V18x25F	220		0.15	2370	1.13	12,000
NRB-XS100M200V10X16F	10	200	0.15	320	24.9	10,000
NRB-XS220M200V10X20F	22		0.15	500	11.3	10,000
NRB-XS330M200V10X20F	33		0.15	650	7.54	10,000
NRB-XS470M200V12.5X20F	47		0.15	980	5.29	12,000
NRB-XS680M200V12.5x25F	68		0.15	1300	3.66	12,000
NRB-XS680M200V16x20F	68		0.15	1300	3.66	12,000
NRB-XS820M200V16x20F	82		0.15	1380	3.03	12,000
NRB-XS101M200V16x20F	100		0.15	1420	2.49	12,000
NRB-XS151M200V16x25F	150		0.15	1890	1.66	12,000
NRB-XS4R7M250V8X11.5F	4.7	250	0.15	160	52.9	8,000
NRB-XS6R8M250V10X12.5F	6.8		0.15	250	36.6	8,000
NRB-XS100M250V10X16F	10		0.15	320	24.9	8,000
NRB-XS220M250V10X16V	22		0.15	470	11.3	10,000
NRB-XS220M250V10X20F	22		0.15	500	11.3	10,000
NRB-XS330M250V12.5X16F	33		0.15	760	7.54	12,000
NRB-XS330M250V12.5X20F	33		0.15	800	7.54	12,000
NRB-XS470M250V12.5X20F	47		0.15	980	5.29	12,000
NRB-XS560M250V12.5X20F	56		0.15	1080	4.45	12,000
NRB-XS560M250V18X16F	56		0.15	960	4.45	12,000
NRB-XS680M250V12.5X25F	68		0.15	1300	3.66	12,000
NRB-XS680M250V16x20F	68		0.15	1300	3.66	12,000
NRB-XS820M250V12.5X30F	82		0.15	1500	3.03	12,000
NRB-XS820M250V16x20F	82		0.15	1440	3.03	12,000
NRB-XS101M250V16x25F	100		0.15	1530	2.49	12,000
NRB-XS101M250V18X20F	100		0.15	1440	2.49	12,000
NRB-XS121M250V18X20F	120		0.15	1500	2.08	12,000
NRB-XS151M250V18x25F	150		0.15	1940	1.66	12,000
NRB-XS4R7M350V10X12.5F	4.7	350	0.20	150	70.6	8,000
NRB-XS5R6M350V10X12.5	5.6		0.20	180	59.2	8,000
NRB-XS6R8M350V10X16F	6.8		0.20	280	48.8	10,000
NRB-XS100M350V10X20F	10		0.20	350	33.2	10,000
NRB-XS220M350V12.5X20F	22		0.20	650	15.1	12,000
NRB-XS330M350V16X20F	33		0.20	900	10.1	12,000
NRB-XS470M350V16X20F	47		0.20	1080	7.06	12,000
NRB-XS680M350V18x25F	68		0.20	1470	4.88	12,000
NRB-XS820M350V18x25F	82		0.20	1530	4.05	12,000
NRB-XS1R0M400V8X11.5F	1.0	400	0.20	60	332	8,000
NRB-XS1R0M400V10X12.5F	1.0		0.20	70	332	8,000
NRB-XS1R5M400V8X11.5F	1.5		0.20	90	221	8,000
NRB-XS1R5M400V10X12.5F	1.5		0.20	100	221	8,000
NRB-XS1R8M400V8X11.5F	1.8		0.20	95	184	8,000
NRB-XS1R8M400V10X12.5F	1.8		0.20	120	184	8,000
NRB-XS2R2M400V8X11.5F	2.2		0.20	95	151	8,000
NRB-XS2R2M400V10X12.5F	2.2		0.20	140	151	8,000
NRB-XS3R3M400V10X12.5F	3.3		0.20	150	101	8,000
NRB-XS3R3M400V10X16F	3.3		0.20	180	101	10,000
NRB-XS4R7M400V10X16F	4.7		0.20	220	70.6	10,000
NRB-XS5R6M400V10X16F	5.6		0.20	250	59.2	10,000
NRB-XS6R8M400V10X16F	6.8		0.20	280	48.8	10,000

Expanded Values

STANDARD VALUES, SPECIFICATIONS AND CASE SIZES (mm)

Part Number	Cap. (µF)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +105°C/100KHz	Max. ESR (Ω) +20°C/120Hz	Load Life Hours @+105°C
NRB-XS100M400V10X20F	10	400	0.20	350	33.2	10,000
NRB-XS150M400V12.5X20F	15		0.20	550	22.1	12,000
NRB-XS220M400V12.5X25F	22		0.20	760	15.1	12,000
NRB-XS220M400V16X20F			0.20	760	15.1	12,000
NRB-XS330M400V16X20F	33		0.20	900	10.1	12,000
NRB-XS470M400V16X25F	47		0.20	1180	7.06	12,000
NRB-XS470M400V18X20F			0.20	1180	7.06	12,000
NRB-XS680M400V18x25F	68		0.20	1470	4.88	12,000
NRB-XS4R7M450V10X16F	4.7	450	0.20	180	70.6	10,000
NRB-XS4R7M450V10X20F	4.7		0.20	220	70.6	10,000
NRB-XS5R6M450V10X16F	5.6		0.20	200	59.2	10,000
NRB-XS5R6M450V10X20F	5.6		0.20	250	59.2	10,000
NRB-XS6R8M450V10X16F	6.8		0.20	230	48.8	10,000
NRB-XS6R8M450V10X20F	6.8		0.20	280	48.8	10,000
NRB-XS8R2M450V10X20F	8.2		0.20	280	40.5	10,000
NRB-XS100M450V10X20F	10		0.20	330	33.2	10,000
NRB-XS100M450V12.5X16F	10		0.20	360	33.2	12,000
NRB-XS100M450V12.5X20F	10		0.20	450	33.2	12,000
NRB-XS150M450V12.5X20F	15		0.20	450	22.1	12,000
NRB-XS150M450V12.5X25F	15		0.20	600	22.1	12,000
NRB-XS150M450V16X16F	15		0.20	600	22.1	12,000
NRB-XS220M450V12.5X25F	22		0.20	600	15.1	12,000
NRB-XS220M450V16X20F	22		0.20	730	15.1	12,000
NRB-XS330M450V16X20F	33		0.20	730	10.1	12,000
NRB-XS330M450V16X25F	33		0.20	980	10.1	12,000
NRB-XS330M450V18X20F	33		0.20	780	10.1	12,000
NRB-XS470M450V18X25F	47		0.20	1200	7.06	12,000
NRB-XS100M500V12.5X20F	10	500	0.24	320	39.8	10,000
NRB-XS150M500V12.5X25F	15		0.24	440	26.6	10,000
NRB-XS150M500V16X20F	15		0.24	440	26.6	10,000
NRB-XS220M500V12.5X35F	22		0.24	560	18.1	10,000
NRB-XS220M500V16X25F	22		0.24	560	18.1	10,000
NRB-XS220M500V18X20F	22		0.24	560	18.1	10,000
NRB-XS330M500V16X31.5F	33		0.24	700	12.1	10,000
NRB-XS330M500V18X25F	33		0.24	700	12.1	10,000
NRB-XS470M500V18X31.5F	47		0.24	880	8.47	10,000

Expanded Values

RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

Cap. (µF)	120Hz	1KHz	10KHz	100KHz ~ up
1 ~ 4.7	0.2	0.4	0.8	1.0
6.8 ~ 15	0.3	0.6	0.9	1.0
22 ~ 82	0.4	0.7	0.9	1.0
100 ~ 220	0.45	0.75	0.9	1.0