NFR Series

• 105℃ 8,000~12,000Hrs assured.

- Non-solvent proof.
- High Ripple, Long Life.
- For Ballasts stabilizer and other long life required applications.
- RoHS compliant.
- Halogen-free capacitors are also available.

NFL → NFR

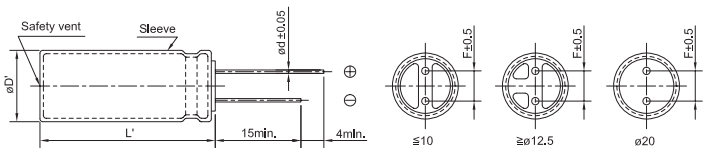
High Ripple

SPECIFICATIONS

Item	Characteristics	
Rated Voltage Range	160~400 V_{DC}	420~500 V_{DC}
Operating Temperature Range	-40~+105℃	-25~+105℃
Capacitance Tolerance	±20%(M) (at 20℃, 120Hz)	
Leakage Current	C·V \ Time: After 1 minute / After 5 minutes ≦ 1000: I=0.1CV+40 / I=0.03CV+15 〉1000: I=0.04CV+100 / I=0.02CV+25 Where, I:Max. Leakage current(μA) C:Nominal capacitance(μF) V:Rated voltage(V_{DC}) (at 20℃)	
Dissipation Factor(Tanδ)	Rated Voltage(V_{DC}): 160~250 / 350~500 Tanδ(Max.): 0.20 / 0.24 (at 20℃, 120Hz)	
Temperature Characteristics (Max. Impedance ratio)	Rated Voltage(V_{DC}): 160~250 / 350~400 / 420~500 Z(-25℃)/Z(20℃): 3 / 5 / 6 Z(-40℃)/Z(20℃): 6 / 6 / - (at 120Hz)	
Load Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage with the rated ripple current is applied (the peak voltage shall not exceed the rated voltage) for 12,000 hours at 105℃. (where, 8,000 hours for ø8, 10,000 hours for ø10, ø8x50L) Capacitance change ≦ ±20% of the initial value Tanδ ≦ 200% of the initial specified value Leakage current ≦ The initial specified value	
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements. Capacitance change ≦ ±20% of the initial value Tanδ ≦ 200% of the initial specified value Leakage current ≦ 500% of the initial specified value	
Others	Satisfied characteristics KS C IEC 60384-4	

DIMENSIONS OF NFR Series

Unit(mm)



Marking : DARK BROWN SLEEVE, SILVER INK

øD	8	10	12.5	16	18	20
ød	0.6	0.6	0.6	0.8	0.8	0.8
F	3.5	5.0	5.0	7.5	7.5	7.5
øD'	øD+0.5 max.					
L'	L+2.0 max.					

※ ø8×11.5~20L, L' ≦ L+1.5

RATINGS OF NFR Series

WVDC	160		200	
Items / μF	ø D×L(mm)	Rated Ripple Current (mArms/105℃, 100kHz)	ø D×L(mm)	Rated Ripple Current (mArms/105℃, 100kHz)
10	10×16	320	10×16	320
22	10×16	450	10×16	450
25	10×16	478	8×20	465
			10×16	478
27	10×16	500	10×16	500
33	10×16	600	10×20	650
39	10×16	613	10×20	670
47	10×20	750	12.5×20	850
56	10×20	788	12.5×25	1,013
68	10×20	900	10×33	1,200
	12.5×20	950	12.5×25	1,070
82	12.5×25	1,025	16×20	1,250
100	12.5×25	1,125	16×25	1,300
	16×20	1,125		
120	16×25	1,339	16×25	1,339
150	16×25	1,510	16×25	1,510
220	16×31.5	1,933	18×31.5	2,030
	18×25	1,870		
270	16×35.5	2,189	18×35.5	2,300
330	16×40	2,516	18×40	2,586
	18×31.5	2,446		
390	18×35.5	2,745		
470	18×40	3,064		

WVDC	250		350	
Items / μF	ø D×L(mm)	Rated Ripple Current (mArms/105℃, 100kHz)	ø D×L(mm)	Rated Ripple Current (mArms/105℃, 100kHz)
4.7	8×11.5	160		
6.8	8×11.5	180		
	10×12.5	250		
10	8×15	240	8×20	350
	10×16	350	10×16	330
22	10×16	470	12.5×20	650
	10×20	500		
33	12.5×16	613	10×33	700
			12.5×25	750
	12.5×20	688	16×20	750
47	8×50	875	10×50	950
	12.5×20	850	16×20	950
68	10×40	1,125	16×31.5	1,300
	12.5×25	1,070	18×25	1,300
82	12.5×30	1,340	18×25	1,400
	16×20	1,340		
100	16×25	1,400	18×31.5	1,550
	18×20	1,400		
120	18×20	1,450		
150	18×25	1,740		
180	12.5×50	1,910		
	18×31.5	1,960		
220	18×31.5	2,040		

RATINGS OF NFR Series

WV	400		420	
Items / μF	ø D×L(mm)	Rated Ripple Current (mArms/105℃, 100kHz)	ø D×L(mm)	Rated Ripple Current (mArms/105℃, 100kHz)
1	8×11.5	60		
2.2	8×11.5	100		
3.3	8×11.5	130		
	10×12.5	150		
4.7	8×11.5	145		
	10×12.5	170		
6.8	8×15	180		
	10×16	280		
10	8×20	350	10×20	360
	10×16	350		
15	10×20	410	12.5×20	450
	12.5×16	410		
22	10×25	500	12.5×25	580
	12.5×20	550	16×20	725
33	12.5×25	780	12.5×30	750
	16×20	800	16×25	920
47	16×25	980	12.5×40	920
	18×20	980	16×25	980
56			18×20	950
68	18×25	1,350	18×25	1,100
82	18×31.5	1,500	18×31.5	1,300
100	18×35.5	1,650	18×35.5	1,400
120	18×40	1,850	18×35.5	1,600
			18×40	1,750
150	18×45	1,900		
180	18×45	2,000		

WV	450		500	
Items / μF	ø D×L(mm)	Rated Ripple Current (mArms/105℃, 100kHz)	ø D×L(mm)	Rated Ripple Current (mArms/105℃, 100kHz)
4.7	8×20	220		
	10×16	220		
6.8	10×16	250		
	10×20	280		
10	10×20	360	12.5×20	440
15	10×20	400	12.5×25	500
	12.5×20	450	16×20	500
22	12.5×25	580	12.5×30	600
	16×20	725	16×25	600
			18×20	600
33	12.5×30	750	16×31.5	700
	16×25	920	18×25	700
40			12.5×50	860
47	10×50	900	18×31.5	880
	12.5×40	920		
	16×25	980		
60			12.5×60	1,180
68	18×25	1,100	18×35.5	1,200
82	18×31.5	1,300	18×40	1,300
100	18×35.5	1,400	18×45	1,500
			20×40	1,500
120	18×40	1,650		
150	18×45	1,800		
	20×40	1,800		

RATED RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Freq.(Hz) / Cap.(μF)	120	1k	10k	50k	100k
1~15	0.35	0.65	0.90	0.95	1.00
22~82	0.40	0.70	0.90	0.95	1.00
100~470	0.45	0.75	0.90	0.95	1.00