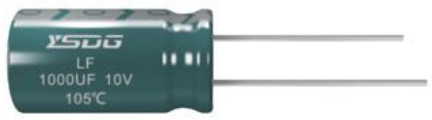
LF Series



- Low impedance for high frequency
- Life time: +105 ℃ 2,000 to 4,000 hours
- Suitable for switching power, UPS, power sources etc
- RoHS Compliant

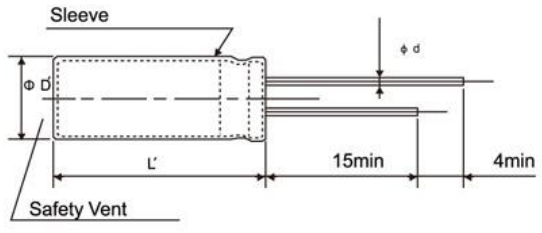
SPECIFICATIONS

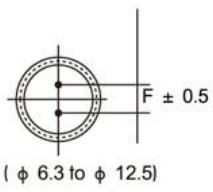
Items	Characteristics									
Category Temperature Range	−40 to +105 ℃ (6.3 to 100Vdc)									
Rated Voltage Range	6.3 to 100Vdc									
Capacitance Tolerance	± 20%(M)									(at 20 ℃ 120Hz)
Leakage Current	1 ≤ 0.01CVor 3 μ A , whichever is greater Where, I:Max.leakage current(μ A), C:Nominal capacitance (μ F) V:Rated voltage(V)									(at 20 ℃ ,after 2minutes)
Dissipation Factor (tan §)	Rated voltage(Vdc)	6.3	10	16	25	35	50	63	100	
	tan § (Max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	
	When nominal capacitance exceeds 1,000 μ F add 0.02 to the value above for each 1,000uF increase									(at 20 ℃ 120Hz)
Low Temperature Characteristics (Max.Impedance Ratio)	Rate Voltage(Vdc)	6.3	10	16	5	35	50	63	100	
	Z(−25 ℃)/Z(+20 ℃)	4	3	2						
	Z(−40 ℃)/Z(+20 ℃)	8	6	4	3					(at 120Hz)
Endurance	The following specification shall be satisfied when the capacitors are restored to 20 ℃ after subjected to DC voltage with the rated ripple current is applied for the specified period of time at 105 ℃									
	Capacitance Change	≤ ± 25% of the initial value								
	D.F. (tan §)	≤ 200% of the initial specified value								
	Leakage Current	≤ The initial specified value								

Case Dia	Life time(hours)
	6.3–100WV
Φ D=6.3	2000
Φ D=8&10	3000
Φ D ≥ 12.5	4000

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	
	Capacitance Change	≤ ± 25% of the initial value
	D.F. (tan §)	≤ 200% of the initial specified value
	Leakage current	≤ 200% The initial specified value

DIMENSIONS[mm]





Φ D	6.3	8		10	12.5
Φ d	0.5	0.5	0.6	0.6	0.6
F	2.5	3.5		5.0	5.0
Φ D'	Φ D+0.5max				
L'	L+2max				

RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

CAP(μF) \ Freq (Hz)	120	1k	10k	100k
CAP < 220	0.40	0.75	0.90	1.00
220 ≤ Cap < 680	0.60	0.85	0.94	1.00
680 ≤ Cap < 2200	0.60	0.87	0.95	1.00
2200 ≤ Cap < 4700	0.75	0.90	0.95	1.00
Cap ≥ 4700	0.85	0.95	0.98	1.00

The endurance of capacitors is shorted with internal heating produced by ripple current at the rate of halving the lifetime with every 5 ℃ rise. When long life performance is required in actual use, the rms ripple current has to be reduced

LF Series

STANDARD RATINGS

(Impedance:at 20 ℃ 100kHz/ Ω max, Ripple current; mArms/105 ℃ 100kHz)

WV (Vdc)	Cap (μ F)	Case Size ϕ D × L(mm)	tan §	Impedance (Ω max)	Ripple current (mArms)
6.3(OJ)	180	6.3 × 11 8 × 9	0.22	0.25 0.33	340 300
	220	6.3 × 11 8 × 9	0.22	0.25 0.33	340 300
	270	6.3 × 11 8 × 9	0.22	0.25 0.33	340 300
	330	8 × 11 10 × 9	0.22	0.13 0.17	650 580
	470	8 × 11 10 × 9	0.22	0.13 0.17	650 580
	560	8 × 11 10 × 9	0.22	0.13 0.17	650 580
	680	8 × 11 10 × 9	0.22	0.13 0.17	650 580
	820	10 × 12	0.22	0.08	870
	1000	10 × 9 10 × 12	0.22	0.17 0.08	580 870
	1200	10 × 12	0.22	0.08	870
	1500	8 × 20 10 × 16	0.22	0.068 0.060	1050 1210
	1800	10 × 20	0.22	0.045	1400
	2200	10 × 20	0.24	0.045	1400
	2700	10 × 25 12.5 × 20	0.24	0.042 0.035	1650 1900
	3300	10 × 25 12.5 × 20	0.26	0.042 0.036	1860 1900
	3900	12.5 × 20	0.26	0.035	1900
	4700	12.5 × 25	0.28	0.030	2130
10(1A)	150	6.3 × 11 8 × 9	0.19	0.25 0.33	340 300
	180	6.3 × 11 8 × 9	0.19	0.25 0.33	340 300
	220	6.3 × 11 8 × 9	0.19	0.25 0.33	340 300
	270	8 × 9 10 × 9	0.19	0.33 0.17	300 580
	330	10 × 9	0.19	0.17	580
	470	10 × 9	0.19	0.17	580
	560	10 × 9	0.19	0.17	580
	680	10 × 9	0.19	0.17	580
	820	10 × 12	0.19	0.08	870
	1000	8 × 16 10 × 16	0.19	0.087 0.06	850 1210
	1200	10 × 20	0.19	0.045	1400
	1500	10 × 20	0.19	0.045	1400
	1800	10 × 20	0.19	0.045	1400
	2200	10 × 20	0.21	0.045	1400
	2700	10 × 25 12.5 × 20	0.21	0.042 0.035	1650 1900
	3300	12.5 × 25	0.23	0.030	2130
16(1C)	100	8 × 9	0.16	0.33	300
	120	8 × 9	0.16	0.33	300
	150	8 × 9 10 × 9	0.16	0.33	300 580
	180	8 × 9 10 × 9	0.16	0.33	300 580
	220	8 × 9 10 × 9	0.16	0.33	300 580
	270	10 × 9	0.16	0.17	580
	330	10 × 9	0.16	0.17	580
	470	10 × 9 10 × 12	0.16	0.17 0.08	580 870
	560	10 × 12	0.16	0.08	870
	680	8 × 16 10 × 12	0.16	0.087 0.08	850 870
	820	10 × 16	0.16	0.06	1210
	1000	10 × 16	0.16	0.06	1210
	1200	10 × 20	0.16	0.045	1400
	1500	10 × 20	0.16	0.045	1400
	1800	10 × 25 12.5 × 20	0.16	0.042 0.035	1650 1800
	2200	12.5 × 20	0.18	0.035	1900
	2700	12.5 × 20	0.18	0.030	2130

WV (Vdc)	Cap (μ F)	Case Size ϕ D × L(mm)	tan §	Impedance (Ω max)	Ripple current (mArms)
25(1E)	82	6.3 × 11 8 × 9	0.14	0.25 0.33	340 300
	100	6.3 × 11 8 × 9	0.14	0.25 023	340 300
	120	8 × 11 10 × 9	0.14	0.13 0.17	650 580
	150	8 × 11 10 × 9	0.14	0.13 0.17	650 580
	180	8 × 11 10 × 9	0.14	0.13 0.17	650 580
	220	8 × 11 10 × 9	0.14	0.13 0.17	650 580
	270	10 × 9 10 × 12	0.14	0.17 0.08	580 870
	330	10 × 9 10 × 12	0.14	0.17 0.08	580 870
	470	8 × 16 10 × 12	0.14	0.087 0.080	840 870
	560	10 × 16	0.14	0.060	1210
	680	10 × 16	0.14	0.060	1210
	820	10 × 20	0.14	0.045	1400
	1000	10 × 20	0.14	0.045	1400
	1200	10 × 20	0.14	0.045	1400
	1500	10 × 25 12.5 × 20	0.14	0.042 0.035	1650 1900
	1800	12.5 × 25	0.14	0.030	2130
	2200	12.5 × 25	0.16	0.030	2130
35(1V)	47	6.3 × 11 8 × 9	0.12	0.25 0.33	340 300
	56	6.3 × 11 8 × 9	0.12	0.25 0.33	340 300
	68	6.3 × 11 8 × 9	0.12	0.25 0.33	340 300
	82	8 × 11 10 × 9	0.12	0.13 0.17	650 580
	100	8 × 11 10 × 9	0.12	0.13 0.17	650 580
	120	8 × 11 10 × 9	0.12	0.13 0.17	650 580
	150	8 × 11 10 × 9	0.12	0.13 0.17	650 580
	180	10 × 12	0.12	0.080	870
	220	8 × 11 10 × 9 8 × 16 10 × 12	0.12	0.13 0.17 0.087 0.080	650 580 840 870
	270	10 × 15	0.12	0.06	1210
	330	8 × 20 10 × 12 10 × 16	0.12	0.069 0.080 0.060	1000 870 1210
	470	10 × 16	0.12	0.060	1210
	560	10 × 20	0.12	0.045	1400
	680	10 × 20	0.12	0.045	1400
	820	10 × 25 12.5 × 20	0.12	0.042 0.035	1650 1900
	1000	12.5 × 20 12.5 × 25	0.12	0.035 0.030	1900 2130
50(1H)	33	6.3 × 11 8 × 9	0.10	0.30 0.40	295 260
	39	6.3 × 11 8 × 9	0.10	0.30 0.40	295 260
	47	6.3 × 11 8 × 9	0.10	0.30 0.40	295 260
	56	8 × 11 10 × 9	0.10	0.17 0.23	560 500
	68	8 × 11 10 × 9	0.10	0.17 0.23	560 500
	82	8 × 11 10 × 9	0.10	0.17 0.23	560 500
	100	10 × 12	0.10	0.12	760
	120	8 × 16 10 × 12	0.10	0.12 0.12	730 760
	150	10 × 16	0.10	0.084	1050
	180	8 × 20 10 × 16	0.10	0.090 0.084	1050
	220	10 × 16	0.10	0.084	1050
	270	10 × 25	0.10	0.055	1440
	330	12.5 × 20	0.10	0.045	1660
	470	12.5 × 25	0.10	0.034	1950
	580	12.5 × 25	0.10	0.034	1950

LF Series

STANDARD RATINGS

(Impedance:at 20 ℃ 100kHz/ Ω max, Ripple current; mArms/105 ℃ 100kHz)

WV (Vdc)	Cap (μ F)	Case Size ϕ D × L(mm)	tan §	Impedance (Ω max)	Ripple current (mArms)
63(1J)	22	6.3 × 11 8 × 9	0.09	0.95 1.24	120 100
	27	6.3 × 11 8 × 9	0.09	0.95 1.24	120 100
	33	6.3 × 11 8 × 9	0.09	0.95 1.24	120 100
	39	8 × 11 10 × 9	0.09	0.51 0.67	235 210
	47	8 × 11 10 × 9	0.09	0.51 0.67	235 210
	56	8 × 11 10 × 9	0.09	0.51 0.67	235 210
	68	8 × 11 10 × 9	0.09	0.51 0.67	235 210
	82	10 × 12	0.09	0.340	315
	100	8 × 16 10 × 12	0.09	0.350 0.340	300 315
	120	10 × 16	0.09	0.245	360
	150	8 × 20	0.09	0.265	360
	180	10 × 20	0.09	0.165	470
	220	10 × 20	0.09	0.165	470
	270	12.5 × 20	0.09	0.125	700
	330	12.5 × 20	0.09	0.125	700
	390	12.6 × 25	0.09	0.095	930

WV (Vdc)	Cap (μ F)	Case Size ϕ D × L(mm)	tan §	Impedance (Ω max)	Ripple current (mArms)
100(2A)	15	6.3 × 11 8 × 9	0.08	0.95 1.24	120 100
	27	8 × 11 10 × 9	0.08	0.51 0.67	235 210
	39	8 × 16	0.08	0.36	300
	47	10 × 12	0.08	0.34	315
	56	8 × 20	0.08	0.265	360
	68	10 × 16	0.08	0.245	360
	82	10 × 20	0.08	0.165	470
	100	10 × 20	0.08	0.165	470
	120	12.5 × 20	0.08	0.125	700
	180	12.5 × 25	0.08	0.095	930
	220	12.5 × 25	0.08	0.095	930

LF Series

- High frequency, low impedance
- Endurance; +105 ℃ 2,000 ~ 3,000 hours
- RoHS Compliant

SPECIFICATIONS

Items	Characteristics							
Category Temperature Range	−25 to +105 ℃ (160V−450Vdc)							
Rated Voltage Range	160 to 450Vdc							
Capacitance Tolerance	± 20%(M)							(at20 ℃ 120Hz)
Leakage Current	1 ≤ 0.02CVor 10 μ A , whichever is greater Where, I:Max.leakage current(μ A), C:Nominal capacitance (μ F) V:Rated voltage(V)							(at 20 ℃ ,after 2minutes)
Dissipation Factor (tan §)	Rated voltage(Vdc)	160	200	250	350	400	450	(at20 ℃ 120Hz)
	tan § (Max)	0.12	0.12	0.12	0.15	0.15	0.20	
Low Temperature Characteristics (Max.Impedance Ratio)	Rate Voltage(Vdc)	160	200	250	350	400	450	(at120Hz)
	Z(−25 ℃)/Z(+20 ℃)	3	5				6	
	Z(−40 ℃)/Z(+20 ℃)	4	7				–	

Endurance

The following specification shall be satisfied when the capacitors are restored to 20 ℃ after subjected to DC voltage with the rated ripple current is applied for the specified period of time at 105 ℃

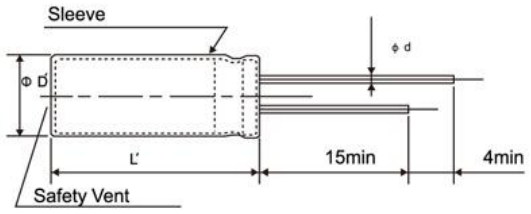
		Case Dia	Life time(hours)
Capacitance Change	≤ ± 20% of the initial value	Φ D ≤ 8	2000
D.F. (tan §)	≤ 200% of the initial specified value	Φ D ≥ 10	3000
Leakage Current	≤ The initial specified value		

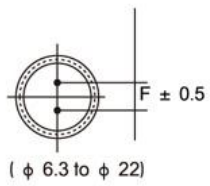
Shelf Life

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

Capacitance Change	≤ ± 20% of the initial value
D.F. (tan §)	≤ 200% of the initial specified value
Leakage Current	≤ 200%The initial specified value

DIMENSIONS[mm]





Φ D	6.3	8		10	12.5	16	18	22
Φ d	0.5	0.5	0.6	0.6	0.6	0.8	0.8	0.8
F	2.5	3.5		5.0	5.0	7.5	7.5	10.0
Φ D'	Φ D+0.5max							
L'	L+2max							

RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Freq (Hz) / CAP(μF)	120	1k	10k	100k
CAP < 18	0.59	0.85	0.97	1.00
18 ≤ Cap. < 100	0.62	0.89	0.97	1.00
Cap ≥ 100	0.72	0.90	0.98	1.00

The endurance of capacitors is shorted with internal heating produced by ripple current at the rate of halving the lifetime with every 5 ℃ rise,When long life performance is required in actual use,the rms ripple current has to be reduced

LF Series

STANDARD RATINGS

WV (V_{dc})	Cap (μ F)	Case Size ϕ D × L(mm)	tan §	Ripple current (mArms/105 ℃ ,100kHZ)
160(2C)	2.2	6.3 × 11	0.12	54
	3.3	6.3 × 11	0.12	70
	4.7	8 × 12	0.12	82
	10	10 × 12	0.12	142
	22	10 × 16	0.12	206
	33	10 × 20	0.12	265
	47	12.5 × 20	0.12	332
	100	12.5 × 25	0.12	546
	220	16 × 30	0.12	822
200(2D)	1	5 × 11	0.12	34
	2.2	6.3 × 11	0.12	52
	3.3	6.3 × 11	0.12	70
	4.7	8 × 12	0.12	82
	10	10 × 12	0.12	144
	22	10 × 16	0.12	206
	22	10 × 20	0.12	215
	33	10 × 20	0.12	288
	33	12.5 × 20	0.12	330
	47	12.5 × 20	0.12	366
	56	12.5 × 25	0.12	430
	68	12.5 × 25	0.12	488
	82	10 × 30	0.12	518
	100	16 × 25	0.12	720
	120	16 × 25	0.12	745
	150	18 × 25	0.12	845
	180	12.5 × 35	0.12	882
	220	18 × 30	0.12	960
250(2E)	0.47	6.3 × 11	0.12	35
	1	6.3 × 11	0.12	40
	2.2	6.3 × 11	0.12	52
	3.3	8 × 12	0.12	72
	4.7	8 × 12	0.12	84
	10	10 × 12	0.12	144
	22	10 × 20	0.12	220
	33	12.5 × 20	0.12	335
	47	12.5 × 25	0.12	382
	56	12.5 × 25	0.12	426
	82	16 × 25	0.12	575
	100	16 × 30	0.12	740
	220	18 × 35	0.12	1010
	330	18 × 45	0.12	1100
	470	22 × 45	0.12	1200
350(2V)	0.47	6.3 × 11	0.15	35
	1	6.3 × 11	0.15	40
	2.2	8 × 12	0.15	54
	3.3	8 × 12	0.15	74
	3.3	10 × 12	0.15	80
	4.7	10 × 16	0.15	104
	10	10 × 16	0.15	170
	22	12.5 × 25	0.15	285
	33	16 × 25	0.15	330
	47	16 × 30	0.15	480

WV (V_{dc})	Cap (μ F)	Case Size ϕ D × L(mm)	tan §	Ripple current (mArms/105 ℃ ,100kHZ)
400(2G)	1	8 × 12	0.15	40
	2.2	8 × 12	0.15	62
	3.3	8 × 12	0.15	85
	3.3	10 × 12	0.15	90
	4.7	10 × 12	0.15	106
	10	10 × 16	0.15	175
	10	10 × 20	0.15	200
	22	12.5 × 20	0.15	300
	27	10 × 30	0.15	385
	33	10 × 35	0.15	450
	33	16 × 20	0.15	440
	39	10 × 40	0.15	490
	47	12.5 × 30	0.15	595
	47	16 × 25	0.15	584
	56	10 × 45	0.15	655
	56	12.5 × 35	0.15	650
	68	12.5 × 40	0.15	815
	68	16 × 30	0.15	780
	82	12.5 × 40	0.15	850
	82	18 × 30	0.15	835
	100	12.5 × 50	0.15	890
	100	18 × 30	0.15	870
	120	22 × 31	0.15	895
	150	12.5 × 60	0.15	950
	150	22 × 31	0.15	940
450(2W)	1	8 × 12	0.20	40
	2.2	10 × 12	0.20	65
	3.3	10 × 16	0.20	92
	4.7	10 × 20	0.20	108
	10	12.5 × 20	0.20	160
	18	10 × 30	0.20	200
	22	16 × 20	0.20	305
	27	10 × 30	0.20	385
	33	10 × 35	0.20	460
	33	16 × 25	0.20	455
	39	10 × 40	0.20	500
	47	10 × 45	0.20	635
	47	12.5 × 30	0.20	630
	47	18 × 25	0.20	620
	56	12.5 × 35	0.20	705
	56	18 × 25	0.20	695
	68	12.5 × 40	0.20	750
	68	18 × 30	0.20	730
	82	12.5 × 45	0.20	800
	82	18 × 30	0.20	770
	100	18 × 35	0.20	860
	120	18 × 40	0.20	1050
	150	22 × 40	0.20	1260
	220	22 × 46	0.20	1430