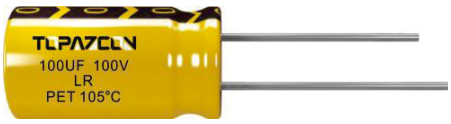
LR Series

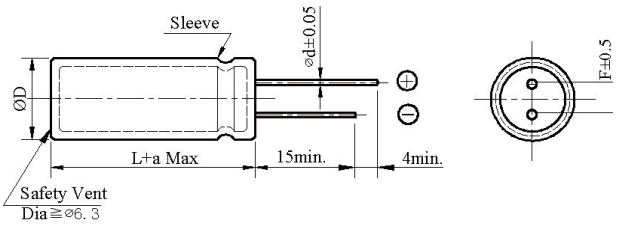
- **High performance, high reliability.**
- **Low impedance, high ripple current, long life**
- **Load life 8,000～10,000 hours at 105℃**
- **RoHS Compliant**



◆ SPECIFICATIONS

Item	Performance Characteristics
Category Temperature Range	-40 ~ +105℃
Working Voltage Range	6.3 ~ 120Vdc
Capacitance Range	6.8 ~ 18,000μF
Capacitance Tolerance	±20% (at 20℃ and 120Hz)
Dissipation Factor (tanδ) (at 20℃, 120Hz)	Rated Voltage (V): 6.3 / 10 / 16 / 25 / 35 / 50 / 63 / 80 / 100 / 120 tanδ(Max): 0.22 / 0.19 / 0.16 / 0.14 / 0.12 / 0.10 / 0.09 / 0.09 / 0.08 / 0.12 The above values should be increased by 0.02 for every additional 1000μF
Leakage Current	I=0.01CV or 3μA whichever is greater I : Leakage current (μA) C : Rated capacitance (μF) V : Rated voltage (V) Impress the rated voltage for 2 minutes
Low Temperature Characteristics Impedance Ratio(MAX)	Rated voltage (V): 6.3 / 10 / 16 / 25 / 35 / 50 / 63 / 80 / 100 / 120 Z(-25℃)/Z(+20℃): 5 / 4 / 4 / 3 / 2 / 2 / 2 / 2 / 2 / 3 Z(-40℃)/Z(+20℃): 8 / 6 / 6 / 5 / 4 / 3 / 3 / 3 / 3 / 6 (at 120Hz)
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 8,000 to 10,000 hours at 105°C. Capacitance change: ≦ ±25% of the initial value Dissipation factor(tanδ): ≦ 200% of the specified value Leakage current: ≦ specified value Size / Life time (hours): ≤6.3 Φ / 8,000; ≥8 Φ / 10,000
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 1,000 hours at 105℃ without voltage applied. Capacitance change: ≦ ±25% of the initial value Dissipation factor(tanδ): ≦ 200% of the specified value Leakage current: ≦ 200% of the specified value

◆ DIMENSIONS (mm)



ΦD	5	6.3	8	10	12.5	16	18
ΦD	ΦD +0.5 Max						
Φd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
a	L+2.0 Max						

◆ PART NUMBER SYSTEM(Example : 100V 100μF)

E	L	R	2	A	1	0	1	M	1	0	2	5	0	0	Y

- Sleeve code(Yellow)
- Lead length code
- Lead forming Type code
- Size code(1025 : 10×25)
- Capacitance tolerance code(M:±20%)
- Capacitance code (100μF)
- Voltage code(100V)
- Series code(LR)
- Category code(E)

LR Series

◆ **Case size & Permissible rated ripple current**

Nominal capacitance (μF)	6.3V				10V			
	Case size ΦD×L (mm)	Impedance (Ωmax/100KHz)		Max. Rated ripple current @105℃ 100KHz (mA rms)	Case size ΦD×L (mm)	Impedance (Ωmax/100KHz)		Max. Rated ripple current @105℃ 100KHz (mA rms)
		20℃	-10℃			20℃	-10℃	
100					5×11	0.580	2.300	215
150	5×11	0.570	2.300	210	5×11	0.580	2.300	230
220	6.3×11	0.250	0.900	320	6.3×11	0.220	0.870	340
330	6.3×11	0.210	0.870	340	6.3×11	0.220	0.870	380
470	8×12	0.150	0.580	345	8×12	0.130	0.520	640
680	8×12	0.130	0.520	645	8×16	0.086	0.350	845
820	10×12	0.080	0.320	865	10×16	0.070	0.280	1015
1000	8×16	0.085	0.350	870	10×16	0.062	0.240	1215
1200	10×16	0.062	0.240	1215	10×20	0.045	0.180	1410
1500	10×20	0.045	0.180	1410	12.5×16	0.049	0.160	1450
1800	12.5×16	0.048	0.160	1460	12.5×20	0.039	0.150	1710
2200	10×25	0.042	0.170	1650	12.5×20	0.035	0.120	1910
2700	10×30	0.030	0.120	1900	10×35	0.029	0.110	2080
3300	12.5×20	0.034	0.120	2100	12.5×25	0.026	0.089	2230
3900	12.5×25	0.026	0.088	2240	12.5×30	0.023	0.078	2660
4700	12.5×30	0.023	0.078	2650	12.5×35	0.020	0.065	2890
5600	16×20	0.026	0.077	2540	16×25	0.020	0.060	2940
6800	16×25	0.020	0.060	2940	16×30	0.016	0.050	3460
8200	16×30	0.016	0.050	3450	16×35	0.015	0.044	3610
10000	18×25	0.018	0.049	3150	18×35	0.012	0.038	4150
12000	18×30	0.014	0.040	4180	18×40	0.011	0.032	4290
15000	18×35	0.013	0.038	4230				
18000	18×40	0.012	0.032	4290				

Nominal capacitance (μF)	16V				25V			
	Case size ΦD×L (mm)	Impedance (Ωmax/100KHz)		Max. Rated ripple current @105℃ 100KHz (mA rms)	Case size ΦD×L (mm)	Impedance (Ωmax/100KHz)		Max. Rated ripple current @105℃ 100KHz (mA rms)
		20℃	-10℃			20℃	-10℃	
10	5×11	1.100	3.020	96	5×11	1.100	3.020	100
22	5×11	0.750	2800	120	5×11	0.700	2.800	140
47	5×11	0.600	2.600	180	5×11	0.570	2.300	205
56	5×11	0.570	2.300	220	5×11	0.570	2.300	240
100	6.3×11	0.210	0.870	310	6.3×11	0.210	0.870	340
120	6.3×11	0.200	0.860	340	8×12	0.180	0.750	420
220	6.3×11	0.190	0.850	650	8×12	0.120	0.520	680
330	8×12	0.120	0.520	760	8×16	0.087	0.350	850
470	8×16	0.086	0.350	840	8×20	0.075	0.290	1050
680	8×20	0.069	0.270	1060	10×20	0.046	0.190	1410
820	10×20	0.052	0.220	1310	10×25	0.041	0.170	1660
1000	10×20	0.045	0.180	1410	10×30	0.038	0.150	1920
1200	10×25	0.043	0.170	1650	12.5×20	0.030	0.100	2100
1500	12.5×20	0.035	0.120	1910	12.5×25	0.026	0.089	2240
1800	12.5×25	0.028	0.095	2140	12.5×30	0.024	0.078	2660
2200	12.5×25	0.026	0.089	2240	12.5×35	0.020	0.065	2890
2700	12.5×30	0.023	0.077	2650	16×25	0.021	0.060	2940
3300	12.5×35	0.020	0.066	2890	16×30	0.016	0.050	3460
3900	16×25	0.021	0.060	2930	16×35	0.014	0.043	3620
4700	16×30	0.016	0.050	3450	16×40	0.012	0.038	4090
5600	16×35	0.015	0.044	3620	18×40	0.011	0.032	4290
6800	16×40	0.012	0.038	4080				
8200	18×35	0.014	0.038	4230				
18000	18×40	0.011	0.032	4290				

LR Series

◆ **Case size & Permissible rated ripple current**

Nominal capacitance (μF)	35V				50V			
	Case size ΦD×L (mm)	Impedance (Ωmax/100KHz)		Max. Rated ripple current @105℃ 100KHz (mA rms)	Case size ΦD×L (mm)	Impedance (Ωmax/100KHz)		Max. Rated ripple current @105℃ 100KHz (mA rms)
		20℃	-10℃			20℃	-10℃	
10					5×11	1.300	2.800	135
22					5×11	0.700	2.500	180
33	5×11	0.560	2.300	220	6.3×11	0.600	1.900	205
47	6.3×11	0.350	1.400	280	6.3×11	0.380	1.500	220
56	6.3×11	0.210	0.860	340	8×12	0.300	1.200	300
100	8×12	0.150	0.560	510	8×12	0.200	0.710	560
150	8×12	0.130	0.520	650	8×16	0.180	0.550	740
220	8×16	0.086	0.350	850	10×16	0.150	0.500	1050
330	10×16	0.070	0.300	1210	10×25	0.130	0.460	1450
470	10×20	0.065	0.250	1410	12.5×20	0.108	0.430	1670
560	10×25	0.056	0.180	1650	12.5×25	0.085	0.360	1950
680	10×30	0.042	0.155	1920	12.5×30	0.075	0.320	2320
820	12.5×25	0.038	0.100	2050	12.5×35	0.058	0.280	2520
1000	12.5×25	0.035	0.095	2230	16×25	0.045	0.220	2555
1200	12.5×30	0.025	0.088	2660	16×30	0.036	0.190	3020
1500	12.5×35	0.022	0.070	2880	18×35	0.032	0.150	3150
2200	16×30	0.018	0.062	3350	18×35	0.029	0.120	3690
2700	18×35	0.016	0.050	3620	18×40	0.025	0.100	3810
3300	16×40	0.014	0.045	4090				
3900	18×40	0.013	0.038	4290				

Nominal capacitance (μF)	63V				80V			
	Case size ΦD×L (mm)	Impedance (Ωmax/100KHz)		Max. Rated ripple current @105℃ 100KHz (mA rms)	Case size ΦD×L (mm)	Impedance (Ωmax/100KHz)		Max. Rated ripple current @105℃ 100KHz (mA rms)
		20℃	-10℃			20℃	-10℃	
12								
15	5×11	2.200	9.200	56	6.3×11	1.600	7.200	100
33	6.3×11	1.200	5.000	120	8×12	0.800	3.600	140
47	8×12	0.680	3.100	190	8×16	0.600	2.900	235
68	8×12	0.600	2.900	245	8×16	0.420	2.000	290
100	10×16	0.350	1.800	320	10×20	0.280	1.600	450
120	10×16	0.300	1.500	555	10×25	0.200	0.940	650
180	10×20	0.200	0.940	670	12.5×20	0.160	0.760	870
220	10×25	0.180	0.880	950	12.5×25	0.130	0.640	1180
330	12.5×25	0.120	0.450	1220	12.5×30	0.100	0.380	1350
470	12.5×30	0.100	0.420	1410	16×25	0.085	0.350	1650
560	12.5×35	0.082	0.350	1690	16×30	0.075	0.300	1880
680	12.5×40	0.070	0.300	1820	18×30	0.060	0.250	2050
820	16×30	0.053	0.250	2020	18×35	0.046	0.190	2160
1000	18×35	0.040	0.190	2130	18×40	0.039	0.160	2270
1200	16×40	0.035	0.180	2300				
1500	18×40	0.033	0.140	2480				

LR Series

◆ **Case size & Permissible rated ripple current**

Nominal capacitance (μF)	100V				120V			
	Case size ΦD×L (mm)	Impedance (Ωmax/100KHz)		Max. Rated ripple current @105℃ 100KHz (mA rms)	Case size ΦD×L (mm)	Impedance (Ωmax/100KHz)		Max. Rated ripple current @105℃ 100KHz (mA rms)
		20℃	-10℃			20℃	-10℃	
6.8	5×11	2.200	9.200	56				
15	6.3×11	1.200	5.000	135	6.3×11	3.800	15.80	125
33	8×16	0.580	2.800	180	8×20	0.850	3.800	160
47	10×12	0.430	1.800	290	10×16	0.680	3.000	260
68	10×16	0.300	1.500	350	10×16	0.500	2.300	330
100	10×25	0.200	0.840	535	10×25	0.400	1.700	510
120	10×30	0.150	0.710	780	12.5×20	0.350	1.550	720
180	12.5×25	0.120	0.450	950	12.5×30	0.280	1.300	890
220	12.5×30	0.100	0.420	1230	16×25	0.250	1.200	1150
330	12.5×40	0.090	0.360	1450	16×30	0.180	0.820	1360
470	18×30	0.075	0.220	1730	18×35	0.150	0.710	1660
560	16×40	0.065	0.180	1960	18×40	0.120	0.450	1890
680	18×35	0.052	0.160	2120				
820	18×40	0.045	0.140	2340				

◆ **RIPPLE CURRENT MULTIPLIERS**

Frequency Multipliers

Vdc	Cap(uF)	Frequency (Hz)			
		120	1K	10K	100K
6.3 ~ 120	6.8～68	0.30	0.55	0.80	1.00
	82～220	0.40	0.60	0.85	1.00
	330～820	0.50	0.65	0.90	1.00
	1000～18000	0.60	0.70	0.95	1.00