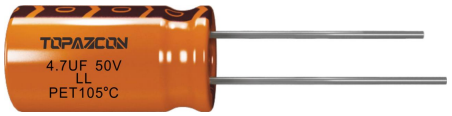
LL Series

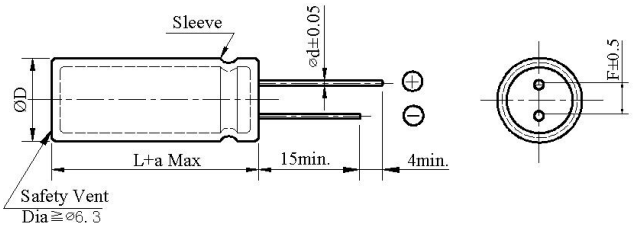


- **Extremely low and stable leakage current characteristics.**
- **Endurance: 2000 hours at 105℃.**
- **RoHS Compliant**

◆ SPECIFICATIONS

Item	Performance Characteristics
Category Temperature Range	-40 ~ +105℃
Working Voltage Range	6.3 ~ 100Vdc
Capacitance Range	0.47 ~ 2200 μF
Capacitance Tolerance	±20% (at 20℃ and 120Hz)
Dissipation Factor (tanδ) (at 20℃, 120Hz)	Rated Voltage (V): 6.3 / 10 / 16 / 25 / 35 / 50 / 63 / 100 tanδ(Max): 0.22 / 0.19 / 0.16 / 0.14 / 0.12 / 0.10 / 0.10 / 0.10 The above values should be increased by 0.02 for every additional 1000μF
Leakage Current	I=0.002CV or 0.4μA 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 / 100 Z(-25℃)/Z(+20℃): 4 / 3 / 3 / 3 / 2 / 2 / 2 / 2 Z(-40℃)/Z(+20℃): 8 / 6 / 6 / 4 / 4 / 3 / 3 / 3 （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 2,000 hours at 105°C. Capacitance change: ≦ ±20% of the initial value Dissipation factor(tanδ): ≦ 200% of the specified value Leakage current: ≦ specified value
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20℃ after the rated voltage applied for 500 hours at 105℃ without voltage applied. Capacitance change: ≦ ±20% 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
ΦD	ΦD +0.5 Max				
Φd	0.5	0.5	0.5/0.6	0.6	0.6
F	2.0	2.5	3.5	5.0	5.0
a	L+2.0 Max				

◆ PART NUMBER SYSTEM(Example : 50V 4.7μF)

E	L	L	1	H	4	R	7	M	0	5	1	1	0	0	O

- Sleeve code(Orange)
- Lead length code
- Lead forming Type code
- Size code(0511 : 5×11)
- Capacitance tolerance code(M:±20%)
- Capacitance code (4.7μF)
- Voltage code(50V)
- Series code(LL)
- Category code(E)

LL Series

◆ **Standard Ratings & Permissible rated ripple current**

WV (Vdc)	Cap (μF)	Case Size ΦD×L (mm)	Max.Rated ripple current mArms@105℃ 120Hz
6.3	22	5×11	36
	33	5×11	44
	47	5×11	53
	100	5×11	74
	220	6.3×11	131
	330	6.3×11	161
	470	8×12	242
	1000	10×12	390
	2200	12.5×20	665
10	22	5×11	50
	33	5×11	66
	47	5×11	75
	100	5×11	104
	220	8×12	193
	330	8×12	256
	470	8×12	319
	1000	10×16	605
	2200	12.5×20	860
16	10	5×11	39
	22	5×11	62
	33	5×11	68
	47	5×11	105
	100	6.3×11	138
	220	8×12	220
	330	8×12	268
	470	10×12	407
	1000	10×20	704
	2200	12.5×25	890
25	4.7	5×11	32
	10	5×11	43
	22	5×11	65
	33	5×11	76
	47	6.3×11	116
	100	8×12	149
	220	10×12	246
	330	10×12	352
	470	10×16	484
	1000	12.5×20	847
35	4.7	5×11	33
	10	5×11	48
	22	6.3×11	71
	33	6.3×11	83
	47	6.3×11	125
	100	8×12	187
	220	10×12	330
	330	10×16	440
	470	12.5×20	590
	1000	12.5×25	1012

WV (Vdc)	Cap (μF)	Case Size ΦD×L (mm)	Max.Rated ripple current mArms@105℃ 120Hz
50	0.47	5×11	12
	1	5×11	17
	2.2	5×11	24
	3.3	5×11	29
	4.7	5×11	36
	10	5×11	52
	22	6.3×11	77
	33	6.3×11	99
	47	8×12	138
	100	10×12	217
	220	10×20	380
	330	12.5×20	506
	470	12.5×25	705
63	0.47	5×11	12
	1	5×11	17
	2.2	5×11	24
	3.3	5×11	32
	4.7	5×11	39
	10	6.3×11	58
	22	6.3×11	94
	33	8×12	110
	47	8×12	152
	100	10×16	260
	220	10×20	440
	330	12.5×20	594
100	0.47	5×11	12
	1	5×11	17
	2.2	5×11	24
	3.3	5×11	32
	4.7	6.3×11	39
	10	8×12	61
	22	8×12	106
	33	10×12	142
	47	10×16	184
	100	12.5×20	300
	220	12.5×30	533

◆ **RIRIPPLE CURRENT MULTIPLIERS**

Frequency Multipliers

Cap(μF)	Frequency (Hz)				
	50/60	120	1K	10K	100K
0.47 ~ 82	0.60	1.00	1.45	1.65	1.70
100 ~ 820	0.80	1.00	1.36	1.48	1.53
1000 ~ 2200	0.85	1.00	1.25	1.35	1.45