

## Low Leakage Current Electrolytic Caps

### Features

- Radial leads, cylindrical aluminum case
- Low leakage current characteristics
- Lifetime: 1000 hours at 85°C
- RoHS compliant



### Specification

Description		Value										Conditions
Operation Temperature Range		-40 ~ +85°C										
Rated Voltage Range (WV)		6.3 ~ 100VDC										
Rated Capacitance Range		0.1 ~ 15,000 uF										
Capacitance Tolerance		±20%										at 120Hz, 20 °C
Max. Leakage current at 20°C		I ≤ 0.002 CV or 0.4 μA, whichever is greater (I= Leakage Current(μA), C=Nominal Capacitance(μF), V=Rated Voltage(V))										After 2 minutes applied Rated Voltage
Working Voltage (V)		6.3	10	16	25	35	50	63	80	100		
Surge Voltage (V)		8	13	20	32	44	63	79	100	125	at 20°C	
Max. Dissipation Factor tan δ (Note)		0.24	0.20	0.16	0.14	0.12	0.10	0.10	0.08	0.07	at 20°C, 120Hz	
Low Temperature Stability Impedance Ratio at 120Hz		4	3	2	2	2	2	2	1.5	1.5	Z(-25°C)/ Z(+20°C)	
		8	6	4	4	3	3	3	2	2	Z(-40°C)/ Z(+20°C)	
Load Life	Cap. Change	Within ±20% of the initial value										After 1000 Hours applied Rated Voltage at 85°C
	Dissipation Factor	200% or less of initial specified value										
	Leakage Current	Not more than the specified value										
Shelf Life		Meet the same requirement as load life test										After placing at 85° C without voltage applied for 500 hours

Note: When rated capacitance is over 1000uF, tan δ shall be added 0.02 to the listed value with increase of every 1000uF.

**Not recommend for new design.**

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## TLL Series

### Case Size & Rated Ripple Current

C(μF)	Rated Voltage (V)									
	6.3		10		16		25		35	
	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple
4.7							5x11	35	5x11	40
10					5x11	45	5x11	50	5x11	55
22			5x11	60	5x11	65	5x11	70	5x11	75
33	5x11	65	5x11	70	5x11	80	5x11	85	5x11	90
47	5x11	80	5x11	85	5x11	95	5x11	100	6.3x11	120
100	5x11	110	5x11	120	6.3x11	160	6.3x11	170	8x11	210
220	6.3x11	190	6.3x11	210	8x11	270	8x11	290	10x12.5	360
330	6.3x11	230	8x11	290	8x11	330	10x12.5	410	10x17	520
470	8x11	320	8x11	350	10x12.5	460	10x17	570	10x20	660
1000	10x12.5	550	10x17	700	10x17	780	13x20	1040	13x25	1230
2200	13x20	1090	13x20	1180	13x25	1420	16x26	1810	16x32	1980
3300	13x20	1290	13x25	1520	16x26	1890	16x32	2170	18x36	2590
4700	16x26	1870	16x26	2000	16x32	2370	18x36	2780	18x40	3060
6800	16x26	2120	16x32	2470	18x36	2970	18x40	3230		
10000	16x32	2600	18x36	3090	18x40	3430				
15000	18x36	3230								

C(μF)	Rated Voltage (V)							
	50		63		80		100	
	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple
0.10	5x11	1						
0.22	5x11	2						
0.33	5x11	3						
0.47	5x11	5					5x11	5
1.0	5x11	10					5x11	10
2.2	5x11	20					5x11	20
3.3	5x11	30					5x11	30
4.7	5x11	40	5x11	40			5x11	45
10	5x11	60	5x11	55	6.3x11	70	6.3x11	75
22	5x11	85	6.3x11	100	8x11	120	8x11	130
33	6.3x11	110	6.3x11	120	8x11	150	10x12.5	180
47	6.3x11	135	8x11	160	10x12.5	210	10x17	260
100	8x11	225	10x12.5	270	10x17	350	13x20	460
220	10x17	460	10x20	500	13x20	650	16x26	880

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C(μF)	Rated Voltage (V)							
	50		63		80		100	
	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple
30	10x20	610	13x20	710	13x25	880	16x26	1080
470	13x20	850	13x25	930	16x26	1200	16x32	1400
1000	16x26	1560	16x32	1710	18x36	2140		
2200	18x36	2400						

**Note:** 1. Case Size: φD X L (mm);  
2. Max Permissible Ripple Current (RC) at 120Hz, 85°C, (mA/rms);

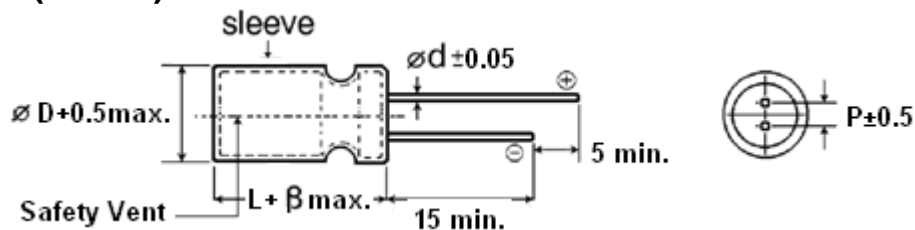
### Ripple Current Multiplier Frequency coefficient

Freq. (Hz) WV (VDC)	50	120	1000	10,000
6.3 ~ 10	0.8	1.0	1.1	1.2
16 ~ 25	0.8	1.0	1.2	1.3
35 ~ 50	0.8	1.0	1.5	1.7
63 ~ 100	0.8	1.0	1.6	1.9

### Temperature coefficient

Ambient Temperature (°C)	≤ 50	70	85
coefficient	1.36	1.25	1.00

### Dimensions (in mm)



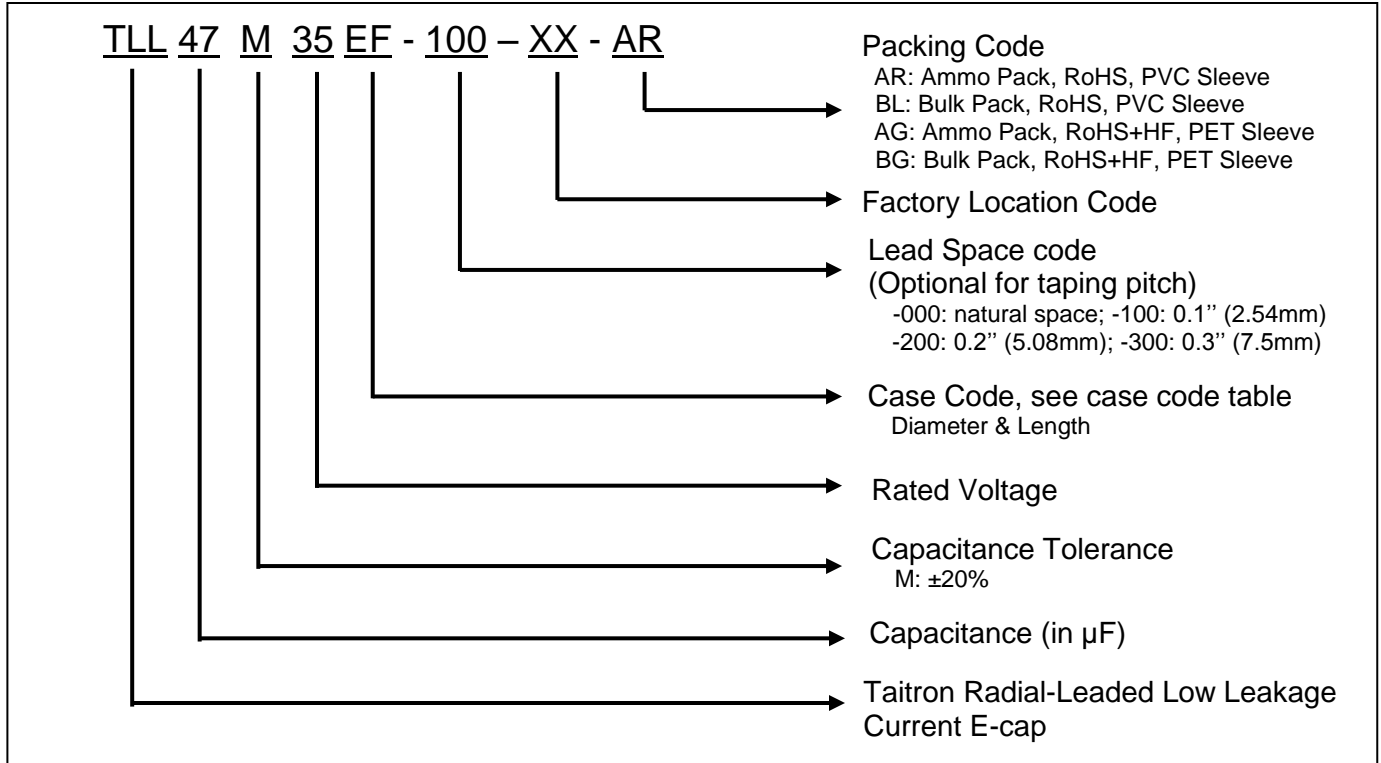
φD	5	6.3	8	10	13	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φd	0.5	0.5	0.6	0.6	0.6/0.8*	0.8	0.8
β	1.0	1.0	1.0	1.0	2.0	2.0	2.0

**Note:** \*φd=0.8mm when L ≥ 30mm.

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## TLL Series

### How to Order



### Case code table

Diameter (mm)	5	6	6.3	8	10	12	13	16	18
Code	C	D	E	F	G	H	J	K	L

Length (mm)	11	11.5	12	12.5	13	15	16	17	19	20	21	24	25	25.5	26
Code	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V
Length (mm)	27	28	30	31.5	32	33	35	35.5	36	37	38	40	41	42	43
Code	W	X	Y	Z	AA	BB	CC	DD	EE	FF	GG	HH	JJ	KK	LL

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