FEATURES

LOW IMPEDANCE @ 100KHz
HIGH RIPPLE CURRENT
LOAD LIFE 4,000 TO 10,000 HOURS @ 105°C
RoHs COMPLIANT

PART NUMBERING

Part Number Example: TLL-016/101M6X11F						
TLL	**-**	**016**	**/**	**101**	**M**	**6X11**	**F**
Type		Rated DC Voltage		Capacitance Code (μF)*	Tolerance Code	Size	RoHs Compliant

* Capacitance Code: First two digits represent significant figures, third digit represents multiplier (number of zeros).

SPECIFICATIONS

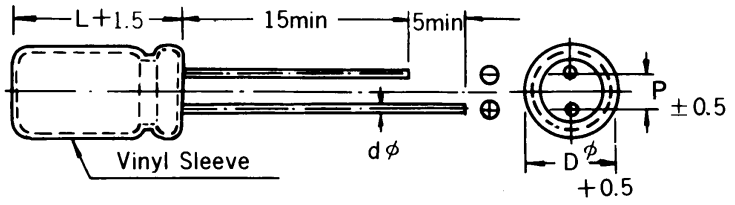
Operating Temperature Range	-40°C ~ +105°C								
Rated Voltage Range	6.3 ~ 100vdc								
Capacitance Range	22 ~ 5,600μF								
Capacitance Tolerance	±20% (120Hz 20°C)								
Leakage Current Max	I= 0.01 CV or 3 μA whichever is greater after 2 minutes @ rated voltage								
DF (%) @ +20°C 120Hz max	Working Voltage	6.3	10	16	25	35	50	63	100
	DF (%)	14	12	10	9	12	10	9	9
Low Temperature Characteristics Impedance Ratio Max @ 120Hz	Working Voltage	6.3	10	16	25	35	50	63	100
	Z-25°C / Z+20°C	4	3	2	2	2	2	2	2
	Z-40°C / Z+20°C	8	6	4	3	3	3	3	3
Load Life TEST @ 105°C and rated voltage	TEST CONDITIONS DURATION	SIZE (diam. mm)		D ≤6.3	D=8,10	D≥13			
		VOLTAGE	6.3~100WV	4K Hrs	6K Hrs	8K Hrs			
			16~100WV	5K Hrs	7K Hrs	10K Hrs			
	Cap change DF Leakage current	≤ 25% of Initial measured value ≤ 200% of Initial measured value ≤ Initial specified value							
Shelf Life 1,000Hrs @ 105°C	Cap change DF Leakage current	≤ 25% of Initial measured value ≤ 200% of Initial measured value ≤ Initial specified value							

MULTIPLIER FOR RIPPLE CURRENT VS. FREQUENCY

CAP(μF)\FREQ. (Hz)	50(60)	120	400	1K	10K	100K
CAP >22~100 μF	0.52	0.62	0.80	0.89	0.97	1.0
CAP >100~1,000 μF	0.58	0.72	0.84	0.90	0.98	1.0
CAP ≥1,000	0.63	0.78	0.87	0.91	0.98	1.0

DIMENSIONS (UNIT: mm)

DIAM.	P	dØ
5	2	0.5
6.3	2.5	0.5
8	3.5	0.5
10	5	0.6
13	5	0.6
16	7.5	0.8
18	7.5	0.8



CAP. (µF)	6.3vdc				10vdc			
	SIZE	RIPPLE (mA)	Impedance Ω		SIZE	RIPPLE (mA)	Impedance Ω	
			20C°	-10°C			20°C	-10°C
100					5X11	215	0.580	2.300
150	5X11	190	0.550	2.300				
220	6.3X11	290	0.260	0.900	6.3X11	340	0.230	0.870
330	6.3X11	330	0.210	0.870	6.3X11	380	0.220	0.870
470	8X11.5	325	0.140	0.580	8X11.5	600	0.130	0.520
680	8X11.5	520	0.130	0.520	8X16	770	0.096	0.350
					10X12.5	800	0.085	0.310
820	10X12.5	800	0.090	0.320	10X16	920	0.075	0.280
1,000	8X16	850	0.080	0.350	8X20	1,050	0.072	0.270
					10X16	1,110	0.064	0.240
1,200	8X20	1,000	0.075	0.260	10X20	1,380	0.045	0.180
	10X16	1,020	0.064	0.240				
1,500	10X20	1,340	0.050	0.180	10X25	1,550	0.043	0.170
2,200	10X25	1,550	0.046	0.170	10X30	1,880	0.030	0.120
					13X20	1,800	0.035	0.120
3,300	13X20	1,720	0.038	0.120	13X25	2,120	0.029	0.089
3,900	13X25	1,840	0.029	0.088	13X30	2,400	0.025	0.078
4,700	13X30	2,400	0.027	0.078				
5,600	13X35	2,650	0.024	0.065				

Ripple @ 100KHz 105°C
Impedance @ 100KHz

CAP. (µF)	16vdc				25vdc			
	SIZE	RIPPLE (mA)	Impedance Ω		SIZE	RIPPLE (mA)	Impedance Ω	
			20°C	-10°C			20°C	-10°C
47					5X11	160	0.560	2.300
56	5X11	200	0.560	2.300	5X11	240	0.560	2.300
100	6.3X11	280	0.220	0.820	6.3X11	350	0.250	0.870
120	6.3X11	310	0.215	0.870				
220	8X11.5	480	0.180	0.850	8X11.5	590	0.150	0.520
330	8X11.5	600	0.140	0.520	8X16	810	0.092	0.350
					10X12.5	826	0.082	0.320
470	8X16	780	0.095	0.350	8X20	1,020	0.074	0.270
560	10X12.5	800	0.085	0.320	10X16	1,210	0.068	0.240
680	8X20	1,000	0.080	0.270	10X20	1,400	0.050	0.180
820	10X20	1,280	0.052	0.220	10X25	1,580	0.041	0.170
1,000	10X20	1,380	0.046	0.180	10X30	1,820	0.032	0.120
	13X16	1,420	0.050	0.160	13X20	1,800	0.036	0.120
1,200	10X25	1,560	0.044	0.170				
1,500	13X20	1,720	0.037	0.120	13X25	2,240	0.028	0.089
1,800	13X25	2,030	0.030	0.095	13X30	2,640	0.024	0.078
2,200	13X25	2,200	0.026	0.089	13X35	2,880	0.023	0.065
2,700	13X30	2,600	0.023	0.077	16X25	2,820	0.022	0.060
3,300	13X35	2,860	0.022	0.066				
4,700	18X25	3,000	0.020	0.049				

Ripple @ 100KHz 105°C
Impedance @ 100KHz

	35vdc				50vdc			
	SIZE	RIPPLE (mA)	Impedance Ω		SIZE	RIPPLE (mA)	Impedance Ω	
			20°C	-10°C			20°C	-10°C
22					5X11	220	0.650	2.800
33	5X11	230	0.550	2.300				
47					6.3X11	260	0.370	1.500
56	6.3X11	360	0.210	0.860	6.3X11	300	0.290	1.200
100					8X11.5	680	0.160	0.670
120					8X16	760	0.120	0.480
150	8X11.5	680	0.140	0.520	10X12.5	800	0.120	0.480
180					8X20	1,000	0.090	0.360
220	8X16	1,000	0.090	0.350	10X16	1,300	0.082	0.340
	10X12.5	1,060	0.080	0.320				
270	8X20	1,180	0.070	0.260	10X20	1,350	0.060	0.240
330	10X16	1,380	0.062	0.240	10X25	1,600	0.057	0.220
470	10X20	1,800	0.048	0.180	10X30	1,800	0.048	0.170
560	10X25	1,900	0.042	0.160	13X25	1,950	0.042	0.110
680	10X30	2,000	0.035	0.120				
	13X20	2,100	0.034	0.120				
1,000	13X25	2,400	0.028	0.088				
1,200	13X30	2,800	0.024	0.078	16X31.5	2,870	0.030	0.066
	16X20	2,850	0.028	0.078				
1,500	13X35	3,000	0.022	0.065				
1,800	16X25	2,800	0.020	0.060				
2,700	16X35.5	3,500	0.018	0.044				
	18X31.5	3,850	0.016	0.040				

Ripple @ 100KHz 105°C Impedance @ 100KHz

	63vdc				100vdc			
	SIZE	RIPPLE (mA)	Impedance Ω		SIZE	RIPPLE (mA)	Impedance Ω	
			20°C	-10°C			20°C	-10°C
27					8X11.5	300	0.610	2.80
33	6.3X11	260	1.200	5.00				
47	8X11.5	360	0.660	3.10	10X12.5	400	0.420	1.80
56	8X11.5	380	0.600	2.80				
68					10X16	460	0.300	1.50
82	8X16	460	0.440	2.10	10X20	600	0.210	0.94
	10X12.5	500	0.430	1.80				
100	10X12.5	640	0.340	1.80	10X25	800	0.200	0.84
120	8X20	700	0.320	1.60				
	10X16	760	0.300	1.50	13X20	900	0.160	0.64
180	10X20	880	0.190	0.94				
220	10X25	1100	0.185	0.84				
270	13X20	1200	0.160	0.64	16X25	1480	0.073	0.27
330	13X25	1600	0.120	0.45	13X40	1600	0.071	0.30
390					16X31.5	1700	0.055	0.20
					18X25	1740	0.054	0.21
470	13X30	1800	0.100	0.42	16X35.5	1880	0.047	0.17
					18X31.5	1600	0.047	0.17
560	16X25	2000	0.073	0.27				
680	13X40	2200	0.070	0.30	18X335.5	1720	0.042	0.15
820	16X31.5	2400	0.054	0.20	18X41	2340	0.040	0.13
1000	16X35.5	2500	0.048	0.17				
	18X31.5	2800	0.047	0.17				
1200	16X40	2920	0.040	0.15				
	18X35.5	3000	0.039	0.15				
1500	18X41	3200	0.036	0.13				

Ripple @ 100KHz 105°C Impedance @ 100KHz