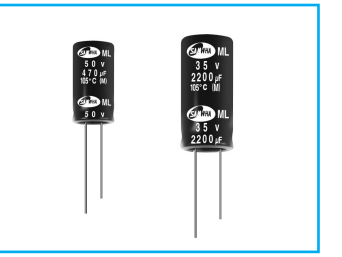
MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

NEW

ML

Ultra Low Impedance, Long Life Series

Low Impedance | Miniaturized | Solvent Proof



- Long Life compared with MZ series
- Enabled high ripple current by a reduction of impedance at high frequency
- High reliability withstanding 10000 hours load life at 105˚C
- Complied to the RoHS directive

MZ ⇨ ML
Miniature
Long life

Item	Characteristics
Operating temperature range	-40 ~ +105˚C
Leakage current max.	I = 0.01CV or 3μA whichever is greater (after 2 minutes) I = 0.03CV or 4μA whichever is greater (after 1 minute)
Capacitance tolerance	±20% at 120Hz, 20˚C
Dissipation factor max. (at 120Hz, 20˚C)	Capacitance > 1000μF : tanδ increases by 0.02 for each 1000μF from below value.

WV	6.3	10	16	25	35	50	63	100
tanδ	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08

Low temperature characteristics (Impedance ratio at 120Hz)

Z-40˚C / Z+20˚C	Z-25˚C / Z+20˚C
3	2

Load life (after application of the rated voltage for 10000 hours at 105˚C)

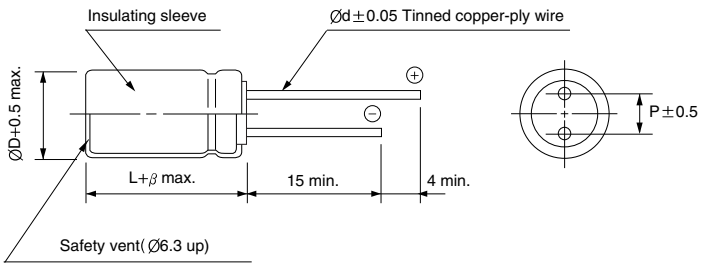
Leakage current	Less than specified value
Capacitance change	Within ±25% of initial value
tanδ	Less than 200% of specified value

ø5, 6.3 : 6000 hours, ø8 : 8000 hours

Shelf life (at 105˚C) — After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value.

DRAWING

Unit : mm



ØD	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
Ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8
β	1.5			2.0			

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

μF \ Frequency(Hz)	120	1k	10k	100k≦
~ 33μF	0.42	0.70	0.90	1.00
39 ~ 270μF	0.50	0.73	0.92	1.00
330 ~ 680μF	0.55	0.77	0.94	1.00
820 ~ 1800μF	0.60	0.80	0.96	1.00
2200 ~ 15000μF	0.70	0.85	0.98	1.00

ML series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV / Item / μF	6.3			10			16			25		
	ØD×L (mm)	Impedance (Ω)max. 20℃ 100kHz	Ripple current (mA rms) 105℃ 100kHz	ØD×L (mm)	Impedance (Ω)max. 20℃ 100kHz	Ripple current (mA rms) 105℃ 100kHz	ØD×L (mm)	Impedance (Ω)max. 20℃ 100kHz	Ripple current (mA rms) 105℃ 100kHz	ØD×L (mm)	Impedance (Ω)max. 20℃ 100kHz	Ripple current (mA rms) 105℃ 100kHz
4.7										5×11	0.35	250
10							5×11	0.35	250	5×11	0.35	250
22	5×11	0.35	250	5×11	0.35	250	5×11	0.35	250	5×11	0.35	250
33	5×11	0.35	250	5×11	0.35	250	5×11	0.35	250	5×11	0.35	250
47	5×11	0.30	250	5×11	0.30	250	5×11	0.30	250	5×11	0.30	250
100	5×11	0.30	250	5×11	0.30	250	6.3×11	0.15	405	6.3×11	0.15	405
150	6.3×11	0.15	405	6.3×11	0.15	405	6.3×11	0.15	405	8×11.5	0.072	760
220	6.3×11	0.15	405	6.3×11	0.15	405	8×11.5	0.072	760	8×11.5	0.072	760
330	6.3×11	0.15	405	8×11.5	0.072	760	8×11.5	0.072	760	10×12.5	0.053	1030
470	8×11.5	0.072	760	8×11.5	0.072	760	10×12.5	0.053	1030	10×16	0.038	1430
680	10×12.5	0.053	1030	10×12.5	0.053	1030	10×16	0.038	1430	10×20	0.027	1820
1000	10×12.5	0.053	1030	10×16	0.038	1430	10×20	0.027	1820	12.5×20	0.025	2360
1500	10×20	0.027	1820	10×20	0.027	1820	12.5×20	0.025	2360	16×20	0.015	3460
2200	12.5×20	0.025	2360	12.5×20	0.025	2360	12.5×25	0.018	2770	16×25	0.015	3460
3300	12.5×20	0.025	2360	12.5×25	0.018	2770	16×25	0.015	3460	16×31.5	0.015	3680
4700	16×25	0.015	3460	16×25	0.015	3460	16×31.5	0.015	3680	18×35.5	0.014	3800
6800	16×25	0.015	3460	16×31.5	0.015	3680	18×35.5	0.014	3800			
10000	16×31.5	0.015	3680	18×35.5	0.014	3800						
15000	18×35.5	0.014	3800									

WV / Item / μF	35			50			63			100		
	ØD×L (mm)	Impedance (Ω)max. 20℃ 100kHz	Ripple current (mA rms) 105℃ 100kHz	ØD×L (mm)	Impedance (Ω)max. 20℃ 100kHz	Ripple current (mA rms) 105℃ 100kHz	ØD×L (mm)	Impedance (Ω)max. 20℃ 100kHz	Ripple current (mA rms) 105℃ 100kHz	ØD×L (mm)	Impedance (Ω)max. 20℃ 100kHz	Ripple current (mA rms) 105℃ 100kHz
0.47				5×11	2.0	250						
1.0				5×11	2.0	250						
2.2				5×11	2.0	250				5×11	2.0	125
3.3				5×11	1.0	250	5×11	2.0	165	5×11	2.0	125
4.7	5×11	0.35	250	5×11	1.0	250	5×11	2.0	165	5×11	2.0	125
10	5×11	0.35	250	5×11	0.50	250	5×11	0.45	165	6.3×11	0.50	205
22	5×11	0.35	250	5×11	0.26	250	6.3×11	0.30	265	8×11.5	0.30	355
33	5×11	0.30	250	6.3×11	0.17	405	6.3×11	0.30	265	10×12.5	0.25	450
47	6.3×11	0.15	405	6.3×11	0.14	405	8×11.5	0.20	500	10×16	0.20	580
100	8×11.5	0.072	760	8×11.5	0.072	760	10×16	0.10	945	12.5×20	0.10	1045
150	8×11.5	0.072	760	10×12.5	0.061	1030	10×20	0.08	1100	12.5×25	0.070	1195
220	10×12.5	0.053	1030	10×16	0.038	1430	10×25	0.07	1300	16×25	0.060	1600
330	10×16	0.038	1430	10×20	0.032	1820	12.5×20	0.04	1495	16×31.5	0.040	1750
470	10×20	0.027	1820	12.5×20	0.025	2360	16×20	0.035	1990	18×40	0.030	2060
680	12.5×20	0.025	2360	12.5×25	0.020	2770	16×25	0.030	2780			
1000	12.5×25	0.018	2770	16×25	0.018	3460	16×35.5	0.020	2835			
1500	16×25	0.015	3460	16×31.5	0.015	3680						
2200	16×31.5	0.015	3680	18×35.5	0.014	3800						
3300	18×35.5	0.014	3800									