

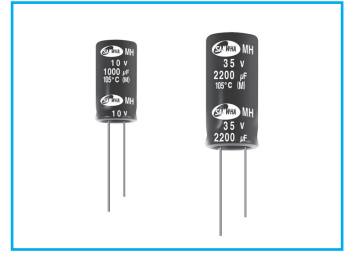
MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS



Upgrade

MH Low Imp., Long Life Series

I Low Impedance **M** Miniaturized **S** Solvent Proof



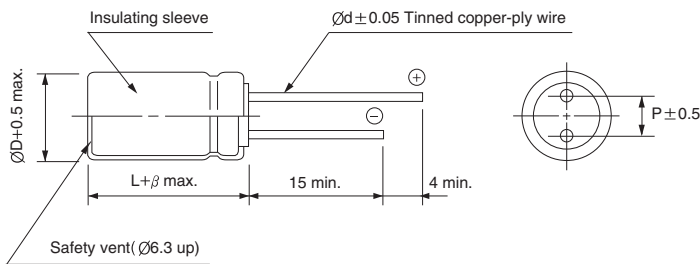
- Long Life compared with ML series
- High reliability withstanding 12000 hours load life at 105°C (7000/9000 hours for as specified below)
- Complied to the RoHS directive

ML → MH
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. <table border="1"> <tr> <td>WV</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>tanδ</td> <td>0.22</td> <td>0.19</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> </tr> </table>	WV	6.3	10	16	25	35	50	tanδ	0.22	0.19	0.16	0.14	0.12	0.10
WV	6.3	10	16	25	35	50									
tanδ	0.22	0.19	0.16	0.14	0.12	0.10									
Low temperature characteristics (Impedance ratio at 120Hz)	<table border="1"> <tr> <td>Z-40°C / Z+20°C</td> <td>Z-25°C / Z+20°C</td> </tr> <tr> <td>3</td> <td>2</td> </tr> </table>	Z-40°C / Z+20°C	Z-25°C / Z+20°C	3	2										
Z-40°C / Z+20°C	Z-25°C / Z+20°C														
3	2														
Load life	<p>After an application of DC bias voltage plus the rated AC ripple current for 12000 hours at 105°C. The measurement shall meet the following limits. The DC voltage plus the peak AC voltage combined must not exceed the rated voltage.</p> <table border="1"> <tr> <td>Leakage current</td> <td>Less than specified value</td> </tr> <tr> <td>Capacitance change</td> <td>Within ±25% of initial value</td> </tr> <tr> <td>tanδ</td> <td>Less than 200% of specified value</td> </tr> </table> <table border="1"> <tr> <td>∅D</td> <td>∅D = 5, 6.3</td> <td>∅D = 8</td> <td>∅D ≥ 10</td> </tr> <tr> <td>Life time</td> <td>7000 hours</td> <td>9000 hours</td> <td>12000 hours</td> </tr> </table>	Leakage current	Less than specified value	Capacitance change	Within ±25% of initial value	tanδ	Less than 200% of specified value	∅D	∅D = 5, 6.3	∅D = 8	∅D ≥ 10	Life time	7000 hours	9000 hours	12000 hours
Leakage current	Less than specified value														
Capacitance change	Within ±25% of initial value														
tanδ	Less than 200% of specified value														
∅D	∅D = 5, 6.3	∅D = 8	∅D ≥ 10												
Life time	7000 hours	9000 hours	12000 hours												
Shelf life (at 105°C)	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at 20°C by the KS C IEC 60384 - 4														

DRAWING

Unit : mm



∅D	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
∅d	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	120Hz	1kHz	10kHz	50kHz	100kHz ≤
~ 33	0.42	0.70	0.90	0.95	1.00
47 ~ 270	0.50	0.73	0.92	0.96	1.00
330 ~ 680	0.55	0.77	0.94	0.97	1.00
820 ~ 1800	0.60	0.80	0.96	0.98	1.00
2200 ~	0.70	0.85	0.98	0.99	1.00

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

MH series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV Item μF	6.3			10			16		
	$\varnothing\text{D} \times \text{L}$ (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	$\varnothing\text{D} \times \text{L}$ (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	$\varnothing\text{D} \times \text{L}$ (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz
10							5 × 11	0.35	250
22	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
47	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	0.25	405
150	6.3 × 11	0.15	405	6.3 × 11	0.15	405	6.3 × 11	0.20	405
220	6.3 × 11	0.15	405	6.3 × 11	0.15	405	8 × 11.5	0.15	760
330	6.3 × 11	0.15	405	8 × 11.5	0.13	760	8 × 11.5	0.10	760
390	6.3 × 11	0.15	405	8 × 11.5	0.11	760	8 × 11.5	0.10	760
470	8 × 11.5	0.11	630	8 × 11.5	0.11	760	10 × 12.5	0.053	1030
560	8 × 11.5	0.11	760	10 × 12.5	0.053	760	10 × 12.5	0.053	1100
680	10 × 12.5	0.053	1030	10 × 12.5	0.053	1030	10 × 16	0.038	1430
1000	10 × 12.5	0.053	1030	10 × 12.5	0.053	1330	10 × 16	0.038	1760
1500	10 × 20	0.027	1820	10 × 20	0.030	1820	10 × 20	0.030	1960
2200	12.5 × 20	0.025	2360	12.5 × 20	0.027	2360	12.5 × 25	0.023	2770
3300	12.5 × 20	0.025	2360	12.5 × 20	0.027	2480	16 × 20	0.020	3250
4700	16 × 25	0.015	3460	16 × 25	0.022	3250	16 × 25	0.018	3630
6800	16 × 25	0.015	3460	16 × 25	0.018	3630			
10000	16 × 31.5	0.015	3680	18 × 31.5	0.015	3700			

WV Item μF	25			35			50		
	$\varnothing\text{D} \times \text{L}$ (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	$\varnothing\text{D} \times \text{L}$ (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	$\varnothing\text{D} \times \text{L}$ (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz
10	5 × 11	0.35	250	5 × 11	0.55	250	5 × 11	0.60	250
22	5 × 11	0.35	250	5 × 11	0.50	250	5 × 11	0.45	250
33	5 × 11	0.35	250	5 × 11	0.45	250	6.3 × 11	0.25	405
47	5 × 11	0.30	250	6.3 × 11	0.30	405	6.3 × 11	0.20	405
56	6.3 × 11	0.27	405	6.3 × 11	0.20	405	6.3 × 11	0.20	405
68	6.3 × 11	0.27	405	8 × 11.5	0.10	540	8 × 11.5	0.15	540
100	6.3 × 11	0.20	405	8 × 11.5	0.10	760	8 × 11.5	0.12	760
150	8 × 11.5	0.14	760	8 × 11.5	0.10	760	10 × 12.5	0.061	1030
220	8 × 11.5	0.12	760	10 × 12.5	0.053	1030	10 × 16	0.038	1430
330	10 × 12.5	0.053	1030	10 × 12.5	0.053	1330	10 × 20	0.032	1820
390	10 × 12.5	0.053	1250	10 × 16	0.048	1550	12.5 × 20	0.031	2000
470	10 × 12.5	0.050	1330	10 × 16	0.041	1760	12.5 × 20	0.030	2360
560	10 × 16	0.050	1800	10 × 20	0.037	2100	12.5 × 25	0.027	2450
680	10 × 16	0.040	1760	12.5 × 20	0.026	2360	12.5 × 25	0.022	2770
1000	10 × 20	0.033	1960	12.5 × 20	0.026	2480	16 × 25	0.018	3460
1500	12.5 × 20	0.029	2550	16 × 20	0.022	3250	16 × 31.5	0.015	3680
2200	16 × 20	0.022	3250	16 × 25	0.018	3630			
3300	16 × 25	0.018	3630						