

# General Purpose Capacitors

## MCRH Series



### Features

- For general purpose.
- Wide CV value range.
- Safely vent construction products, RH series are guaranteed 2,000 hours at 105°C.

### Specification Table

Item	Performance																																																											
Operating Temperature Range	-40°C to +105°C	-25°C to +105°C																																																										
Rated Working Voltage Range	6.3V DC - 100V DC	160V DC - 450V DC																																																										
Nominal Capacitance Range	0.1 - 15,000µF	0.47 - 330µF																																																										
Capacitance Tolerance	±20% (at +20°C, 120Hz)																																																											
Leakage Current	I ≤ 0.01CV or 3(µA) max	I ≤ 0.03CV + 20(µA) max																																																										
	Whichever is greater after 3 minutes.	I: Leakage Current (µA) C: Rated Capacitance (µF) V: Working Voltage(V)																																																										
Dissipation Factor(tanδ) (120Hz/+20°C)	<table border="1"> <thead> <tr> <th>Working Voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> <th>160</th> <th>200</th> <th>250</th> <th>350</th> <th>400</th> <th>450</th> </tr> </thead> <tbody> <tr> <td>tanδ max.</td> <td>0.22</td> <td>0.19</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.1</td> <td>0.1</td> <td>0.07</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.20</td> <td>0.24</td> <td>0.24</td> </tr> </tbody> </table>														Working Voltage (V)	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450	tanδ max.	0.22	0.19	0.16	0.14	0.12	0.1	0.1	0.07	0.15	0.15	0.15	0.20	0.24	0.24																
	Working Voltage (V)	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450																																													
tanδ max.	0.22	0.19	0.16	0.14	0.12	0.1	0.1	0.07	0.15	0.15	0.15	0.20	0.24	0.24																																														
Add 0.02 per 1000 µF for more than 1000µF.																																																												
Maximum Permissible Ripple Current	Refer to standard products table(120Hz,+105°C) Correction factor for frequency																																																											
	Freq.(Hz)		60	120	1K	10K	100K																																																					
	W.V.(V.DC)																																																											
	6.3~50	0.1-330	0.85	1	1.3	1.4	1.55																																																					
		470-3300	0.95	1	1.15	1.2	1.25																																																					
		≥4700	0.95	1	1.1	1.2	1.2																																																					
	63~100	0.47-33	0.75	1	1.55	1.65	1.8																																																					
47-220		0.75	1	1.4	1.6	1.65																																																						
≥330		0.8	1	1.3	1.35	1.4																																																						
≥160	1-220	0.7	1	1.3	1.7	1.7																																																						
Characteristics at low temperature (stability at 120 Hz)	<table border="1"> <thead> <tr> <th>Working Voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> <th>160</th> <th>200</th> <th>250</th> <th>350</th> <th>400</th> <th>450</th> </tr> </thead> <tbody> <tr> <td>-25°C/+20°C</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>3</td> <td>3</td> <td>3</td> <td>6</td> <td>6</td> <td>15</td> </tr> <tr> <td>-40°C/+20°C</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>															Working Voltage (V)	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450	-25°C/+20°C	4	3	2	2	2	2	2	2	3	3	3	6	6	15	-40°C/+20°C	8	6	4	3	3	3	3	3						
	Working Voltage (V)	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450																																													
	-25°C/+20°C	4	3	2	2	2	2	2	2	3	3	3	6	6	15																																													
-40°C/+20°C	8	6	4	3	3	3	3	3																																																				
For capacitance value >1000µF, Add 0.5 per another 1000µF for -25°C /+25°C. Add 1.0 per another 1000µF for -40°C/+20°C.																																																												
High Temperature Loading	After 2000hrs. Application of DC rated working voltage at +105°C, The capacitor shall meet the following limits: Post test requirements at +20°C.																																																											
	Leakage current		≤ the Initial specified value																																																									
	Capacitance change		≤±20% of initial measured value																																																									
	Dissipation Factor(tanδ)		≤200% of initial specified value																																																									



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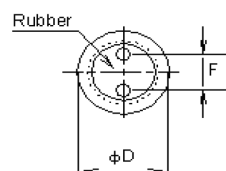
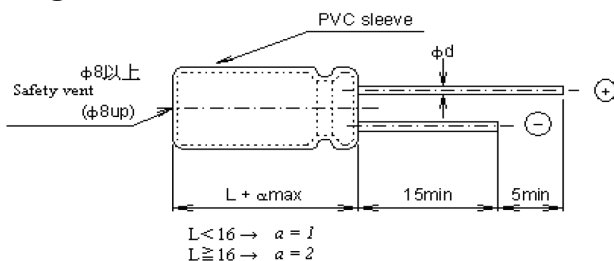
Item	Performance
Shelf Life	After storage for 500hrs. at +105°C with no voltage applied. Post test requirements at +20°C Same limits as high temperature loading.

### Permissible Ripple Current

Max ripple current: mA (rms) (at 105°C.120Hz)

W.V(SV) μF	6.3 (8)	10 (13)	16 (20)	25 (32)	35 (44)	50 (63)	63 (79)	100 (125)	160 (200)	200 (250)	250 (300)	350 (400)	400 (450)	450 (500)
0.1						7		8	8	8	8	9	9	10
0.22						7		8	8	8	8	9	9	10
0.33						7		8	8	8	8	9	9	10
0.47						8		10	9	9	9	10	9	18
1.0						12		15	12	12	12	18	18	18
2.2						17		23	19	19	21	30	30	30
3.3						21		29	26	26	30	37	40	43
4.7				26	28	30	32	34	31	36	36	48	52	56
10			35	38	41	46	50	56	59	59	64	79	79	79
22		49	54	57	61	68	82	96	95	95	110	130	145	150
33	54	60	64	69	75	90	100	140	125	140	140	175	185	190
47	65	70	99	82	100	110	135	180	165	165	180	230	230	
100	95	105	125	135	170	180	223	320	270	285	310	350		
220	160	175	215	230	300	345	400	570	450	550				
330	195	245	260	335	400	460	540	700	850					
470	270	290	370	440	520	610	700	880						
680					750									
1,000	460	550	640	770	920	1080	1210							
2,200	810	860	1000	1170	1340	1530								
3,300	960	1100	1300	1460	1650	1850								
4,700	1330	1400	1600	1780	1900									
6,800	1500	1690	1900	1950										
10,000	1765	1950	2000											
15,000	2075	2100												

### Diagram of Dimensions



Dø (+ 0.5Max)	5	6.3	8	10	13	16	18	22
F (±0.5)	2	2.5	3.5	5	5	7.5	7.5	10
dø (±0.02)	0.5	0.5	0.5	0.6	0.6	0.8	0.8	0.8

Dimensions : Millimetres



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**Case Size Table**

D×L(mm)

W.V. (SV) μF	6.3 (8)	10 (13)	16 (20)	25 (32)	35 (44)	50 (63)	63 (79)	100 (125)
0.1					→	5×11	5×11	5×11
0.22					→	5×11	5×11	5×11
0.33					→	5×11	5×11	5×11
0.47					→	5×11	5×11	5×11
1.0					→	5×11	5×11	5×11
2.2					→	5×11	5×11	5×11
3.3					→	5×11	5×11	5×11
4.7					→	5×11	5×11	5×11
10			→	5×11	5×11	5×11	5×11	6.3×11
22			→	5×11	5×11	5×11	6.3×11	8×11
33		→	5×11	5×11	5×11	6.3×11	6.3×11	8×11
47	→	5×11	5×11	5×11	6.3×11	6.3×11	8×11	10×16
100	→	5×11	6.3×11	6.3×11	8×11	8×11	10×13	13×21
220	→	6.3×11	8×11	8×11	10×13	10×16	10×21	16×26
330	6.3×11	8×11	8×11	10×13	10×16	10×20	13×21	16×26
470	8×11	8×11	10×13	10×16	10×21	13×21	13×26	16×26
680					13×21			
1,000	10×13	10×16	10×21	13×21	13×21	16×26	16×32	
2,200	10×21	13×21	13×21	13×26	16×32	18×36		
3,300	13×21	13×21	13×26	16×32	18×36	18×42		
4,700	13×26	16×26	16×32	16×36	18×36			
6,800	16×26	16×32	18×36	18×42				
10000	16×32	18×36	18×42					
15000	18×36	18×42						

All blank voltage on sleeve marking is the same voltage as “→” point to.

**Case Size Table**

D×L(mm)

WV(SV) μF	160 (200)	200 (250)	250 (300)	350 (400)	400 (450)	450 (500)
0.47	6.3×11	6.3×11	6.3×11	8×11	8×11	8×11
1.0	6.3×11	6.3×11	6.3×11	8×11	8×11	10×16
2.2	6.3×11	6.3×11	6.3×11	8×11	10×13	10×21
3.3	6.3×11	6.3×11	8×11	10×13	10×13	13×21
4.7	6.3×11	8×11	8×11	10×13	10×16	13×21
10	8×11	10×13	10×16	10×21	13×21	16×26
22	10×16	10×21	13×21	13×26	13×26	16×32



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WW(SV) μF	160 (200)	200 (250)	250 (300)	350 (400)	400 (450)	450 (500)
33	10×21	13×21	13×21	16×26	16×32	18×32
47	13×21	13×21	13×26	16×36	18×36	
100	13×26	16×26	16×32	18×42		
220	16×36	18×42				
330	18×42					

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