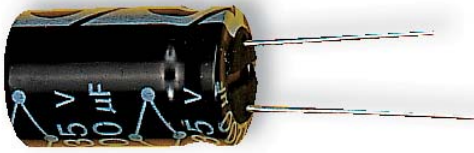


# MCRH Series

## High Temp. Electrolytic Capacitors



### Features:

- General purpose.
- Wide CV value range.
- Safety vent construction products, ECRH series are guaranteed for 2000 hours at 105°C.
- High temperature radial leaded electrolytic.
- Supplied loose with straight leads.

### Electrical Specifications

Item	Performance																																																				
Operating Temperature Range	-40 to +105°C																																																				
Rated Working Voltage Range	10 - 100V dc																																																				
Nominal Capacitance Range	0.47 - 4700μF																																																				
Capacitance Tolerance	±20% (at +20°C, 120Hz)																																																				
Leakage Current	$I \leq 0.01CV$ or $3(\mu A)$ maximum 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>10</th> <th>16</th> <th>25</th> <th>35</th> <th>63</th> <th>100</th> </tr> </thead> <tbody> <tr> <td><b>tanδ maximum</b></td> <td>0.19</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.07</td> </tr> </tbody> </table> <p>Add 0.02 per 1000μF for more than 1000μF.</p>	Working Voltage (V)	10	16	25	35	63	100	<b>tanδ maximum</b>	0.19	0.16	0.14	0.12	0.10	0.07																																						
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Maximum Permissible Ripple Current	<table border="1"> <thead> <tr> <th rowspan="2">WV (V dc)</th> <th colspan="2">Frequency (Hz)</th> <th rowspan="2">60</th> <th rowspan="2">120</th> <th rowspan="2">1K</th> <th rowspan="2">10K</th> <th rowspan="2">100K</th> </tr> <tr> <th>0.47 - 330</th> <th>470 - 3300</th> </tr> </thead> <tbody> <tr> <td rowspan="2">10 - 35</td> <td>0.47 - 330</td> <td>470 - 3300</td> <td rowspan="2">0.85</td> <td rowspan="2">1</td> <td>1.30</td> <td>1.40</td> <td>1.55</td> </tr> <tr> <td colspan="2">C ≥ 4700</td> <td>0.95</td> <td>1.15</td> <td>1.20</td> <td>1.25</td> </tr> <tr> <td rowspan="3">63 - 100</td> <td>0.47 - 33</td> <td>47 - 220</td> <td rowspan="2">0.75</td> <td rowspan="3">1</td> <td>1.10</td> <td rowspan="2">1.65</td> <td>1.20</td> </tr> <tr> <td>47 - 220</td> <td>C ≥ 330</td> <td>0.80</td> <td>1.55</td> <td>1.60</td> <td>1.80</td> </tr> <tr> <td colspan="2">C ≥ 330</td> <td>0.80</td> <td>1.40</td> <td>1.60</td> <td>1.65</td> </tr> <tr> <td colspan="2"></td> <td></td> <td></td> <td></td> <td>1.30</td> <td>1.35</td> <td>1.40</td> </tr> </tbody> </table>	WV (V dc)	Frequency (Hz)		60	120	1K	10K	100K	0.47 - 330	470 - 3300	10 - 35	0.47 - 330	470 - 3300	0.85	1	1.30	1.40	1.55	C ≥ 4700		0.95	1.15	1.20	1.25	63 - 100	0.47 - 33	47 - 220	0.75	1	1.10	1.65	1.20	47 - 220	C ≥ 330	0.80	1.55	1.60	1.80	C ≥ 330		0.80	1.40	1.60	1.65						1.30	1.35	1.40
WV (V dc)	Frequency (Hz)		60	120						1K	10K		100K																																								
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# MCRH Series

## High Temp. Electrolytic Capacitors



### Electrical Specifications

Item	Performance																					
Characteristics at Low Temperature (stability at 120Hz)	<table border="1" data-bbox="454 452 1485 580"> <thead> <tr> <th data-bbox="454 452 865 497">Working Voltage (V)</th> <th data-bbox="865 452 967 497">10</th> <th data-bbox="967 452 1069 497">16</th> <th data-bbox="1069 452 1171 497">25</th> <th data-bbox="1171 452 1273 497">35</th> <th data-bbox="1273 452 1375 497">63</th> <th data-bbox="1375 452 1485 497">100</th> </tr> </thead> <tbody> <tr> <td data-bbox="454 497 865 533">-25°C/ +20°C</td> <td data-bbox="865 497 967 533">3</td> <td colspan="5" data-bbox="967 497 1485 533">2</td> </tr> <tr> <td data-bbox="454 533 865 580">-40°C/+20°C</td> <td data-bbox="865 533 967 580">6</td> <td data-bbox="967 533 1069 580">4</td> <td colspan="4" data-bbox="1069 533 1485 580">3</td> </tr> </tbody> </table> <p data-bbox="550 604 1404 667">For capacitance value &gt;1000µF, Add 0.5 per another 1000µF for -25°C/ +25°C, Add 1.0 per another 1000µF for -40°C/+20°C.</p>	Working Voltage (V)	10	16	25	35	63	100	-25°C/ +20°C	3	2					-40°C/+20°C	6	4	3			
Working Voltage (V)	10	16	25	35	63	100																
-25°C/ +20°C	3	2																				
-40°C/+20°C	6	4	3																			
High Temperature Loading	<p data-bbox="454 728 1189 817">After 2000 hours application of DC rated working voltage at +105°C, The capacitor shall meet the following limits: Post test requirements at +20°C.</p> <table border="1" data-bbox="462 851 1361 1032"> <tbody> <tr> <td data-bbox="462 851 906 911">Leakage Current</td> <td data-bbox="906 851 1361 911">≤ the initial specified value</td> </tr> <tr> <td data-bbox="462 911 906 972">Capacitance Change</td> <td data-bbox="906 911 1361 972">≤ ±20% of initial measured value</td> </tr> <tr> <td data-bbox="462 972 906 1032">Dissipation Factor (tanδ)</td> <td data-bbox="906 972 1361 1032">≤ 200% of initial specified value</td> </tr> </tbody> </table>	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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Capacitance Change	≤ ±20% of initial measured value																					
Dissipation Factor (tanδ)	≤ 200% of initial specified value																					
Shelf Life	<p data-bbox="454 1131 1129 1220">After storage for 500 hours at +105°C with no voltage applied. Post test requirements at +20°C. Same limits for high temperature loading.</p>																					

# MCRH Series

## High Temp. Electrolytic Capacitors



### Permissible Ripple Current

Maximum Ripple Current: mA (rms) (at 105°C, 120Hz)

$\mu\text{F}$ \diagdown VV (SV)	10 (13)	16 (20)	25 (32)	35 (44)	63 (79)	100 (125)
0.47	—	—	—	—	—	10
1.0	—	—	—	—	—	15
2.2	—	—	—	—	—	23
3.3	—	—	—	—	—	29
4.7	—	—	26	28	32	34
10	—	35	38	41	50	56
22	49	54	57	61	82	96
33	60	64	69	75	100	140
47	70	99	82	100	135	180
100	105	125	135	170	223	320
220	175	215	230	300	400	570
330	245	260	335	400	540	700
470	290	370	440	520	700	880
1000	550	640	770	920	1210	—
2200	860	1000	1170	1340	—	—
3300	1100	1300	1460	1650	—	—
4700	1400	1600	1780	1900	—	—

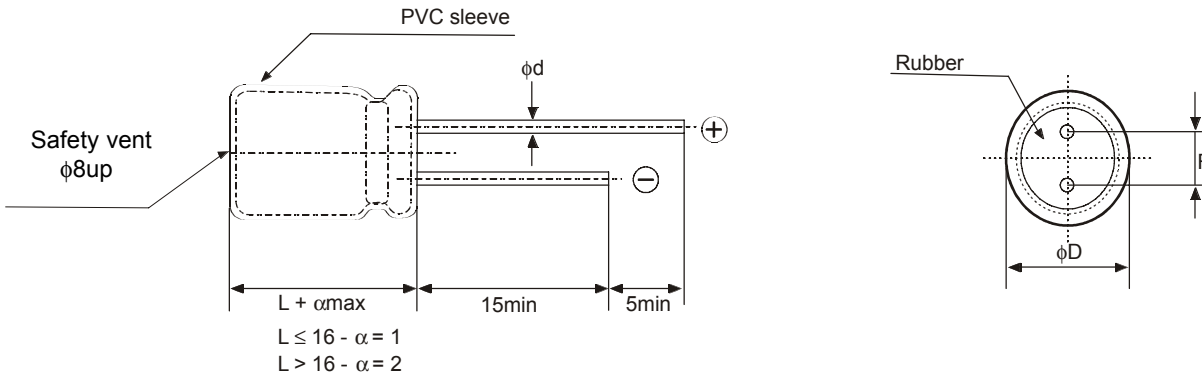


# MCRH Series

## High Temp. Electrolytic Capacitors



### Diagram of Dimensions



<b>Dφ (+ 0.5 Maximum)</b>	5	6.3	8	10	13	16	18
<b>F (± 0.5)</b>	2	2.5	3.5	5		7.5	
<b>dφ (±0.02)</b>	0.5		0.6			0.8	

Dimensions : Millimetres

### Case Size Table

WV (SV) μF	φDiameter x Length					
	10 (13)	16 (20)	25 (32)	35 (44)	63 (79)	100 (125)
0.47	—	—	—	—	—	5 x 11
1.0	—	—	—	—	—	
2.2	—	—	—	—	—	
3.3	—	—	—	—	—	
4.7	—	—	—	—	—	
10	—	—	5 x 11	5 x 11	5 x 11	6.3 x 11
22	—	—			6.3 x 11	8 x 11
33	—	5 x 11			8 x 11	10 x 13
47	5 x 11	6.3 x 11	6.3 x 11	8 x 11	10 x 13	10 x 16
100						
220	6.3 x 11	8 x 11	8 x 11	10 x 13	10 x 21	16 x 26
330	8 x 11		10 x 13	10 x 16	13 x 21	
470			10 x 13	10 x 16	10 x 21	
1000	10 x 16	10 x 21	13 x 21	13 x 21	16 x 32	—
2200	13 x 21	13 x 21	13 x 26	16 x 32	—	—
3300		13 x 26	16 x 32	18 x 36	—	—
4700		16 x 26	16 x 32	18 x 36	18 x 42	—

Dimensions : Millimetres



# MCRH Series

## High Temp. Electrolytic Capacitors



### Part Numbers

Capacitance ( $\mu$ F)	Voltage (V dc)	Ripple (mA)	Dimensions				Part Number
			Length	Diameter (D)	Diameter (d)	Pitch	
22	10	49	11	5	0.5	2	920-988
33		56					920-990
47		80					921-002
100		105					921-014
220		171	6.3	2.5	921-026		
330		246	12	8	0.6	3.5	921-038
470		328					921-040
1000		570	16	10	5	921-051	
2200		960	21	13		921-063	
3300		1194				921-075	
4700		1423	26	16	0.8	7.5	921-087
10		16	39	11	5	0.5	2
22	49		921-105				
33	56		921-117				
47	76		921-129				
100	129		12	6.3	2.5	921-130	
220	225			8	3.5	921-142	
330	295		11	10	0.6	5	921-154
470	370		13				921-166
1000	577		21				13
2200	1053			921-180			
3300	1586		26	16	0.8	7.5	921-191
4700	1889		32				921-208
33	25	88	11	5	0.5	2	921-210
47		81					921-221
100		137					6.3
220		200	8	3.5	921-245		
330		347	13	10	0.6	5	921-257
470		458					16
1000		505	21	13	0.6	5	921-270
2200		1234	26				921-282
3300		1630	32				16

Dimensions : Millimetres



# MCRH Series

## High Temp. Electrolytic Capacitors



### Part Numbers

Capacitance (mF)	Voltage (V dc)	Ripple (mA)	Dimensions				Part Number	
			Length	Diameter (D)	Diameter (d)	Pitch		
4.7	35	22	11	5	0.5	2	921-300	
10		39					921-312	
22		60					921-324	
33		72		921-336				
47		101		2.5		921-348		
100		172		3.5		921-350		
220		300	13	10	0.6	5	921-361	
330		417	14				921-373	
470		535	21				921-385	
1000		869	13	921-397				
2200		1362	32	16		0.8	7.5	921-403
1		63	12	11		5	0.5	2
2.2	20		921-427					
3.3	27		921-439					
4.7	30		921-440					
10	50		921-452					
22	85		2.5		921-464			
33	105		3.5	921-476				
47	146		12	8	0.6	5	921-488	
100	285		13	10			921-490	
220	460		21	13			921-506	
330	551		26	13	921-518			
470	768		32	16	0.8	7.5	921-520	
1000	1435		32	16	0.8	7.5	921-531	
0.47	100		10	11	5	0.5	2	921-543
1			15					921-555
2.2		22	921-567					
3.3		27	921-579					
4.7		36	921-580					
10		61	2.5		921-592			
22		106	3.5	921-609				
33		142	13	10	0.6	5	921-610	
47		190	16				921-622	
100		320	21				13	921-634
220		665	26	16	0.8	7.5	921-646	
330		702	26	16	0.8	7.5	921-658	

Dimensions : Millimetres



# MCRH Series

## High Temp. Electrolytic Capacitors



### Notes:

### International Sales Offices:

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