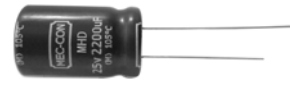


MHD series

- Standard
- Low Profile
- RoHS compliant
- Solvent Proof

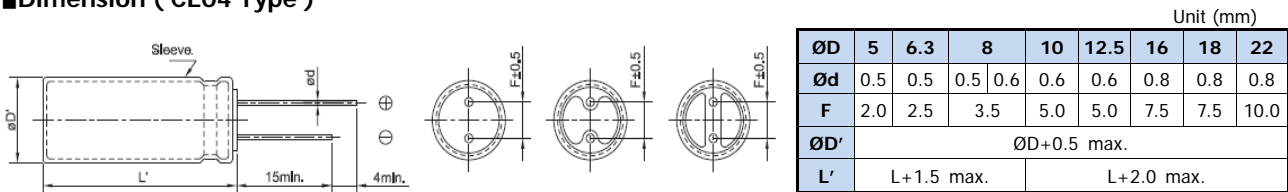
- 105°C 1,000Hrs(Ø5~Ø8), 2,000hrs(Ø10~Ø22) assured.
- Solvent Proof (6.3Vdc~100Vdc), Non-solvent proof (160Vdc~500Vdc)
- Halogen-free capacitors are also available.



Specifications

Item	Characteristics																																										
Rated Voltage Range	6.3 ~ 100Vdc	160 ~ 250Vdc	350 ~ 500Vdc																																								
Operating Temperature Range	-55 ~ +105°C	-40 ~ +105°C	-25 ~ +105°C																																								
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)																																										
Leakage Current	After 1 minute:0.03 CV(µA)or 4µA,whichever is greater After 2 minute:0.03 CV(µA)or 3µA,whichever is greater																																										
	<table border="1"> <thead> <tr> <th colspan="2">After 1 minute</th> <th colspan="2">After 2 minutes</th> </tr> <tr> <th>Cv≤1,000</th> <th>Cv>1,000</th> <th>Cv≤1,000</th> <th>Cv>1,000</th> </tr> </thead> <tbody> <tr> <td>0.1cv+40</td> <td>0.04cv+100</td> <td>0.03cv+15</td> <td>0.02cv+25</td> </tr> </tbody> </table>			After 1 minute		After 2 minutes		Cv≤1,000	Cv>1,000	Cv≤1,000	Cv>1,000	0.1cv+40	0.04cv+100	0.03cv+15	0.02cv+25																												
After 1 minute		After 2 minutes																																									
Cv≤1,000	Cv>1,000	Cv≤1,000	Cv>1,000																																								
0.1cv+40	0.04cv+100	0.03cv+15	0.02cv+25																																								
Where, C:Nominal capacitance(µF), V:Rated voltage(VDC) (at 20°C, 2 minutes)																																											
Dissipation Factor(Tanδ)	<table border="1"> <thead> <tr> <th>Rated Voltage(VDC)</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>160~250</th> <th>350~500</th> </tr> </thead> <tbody> <tr> <td>Tanδ(Max.)</td> <td>0.30</td> <td>0.24</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.09</td> <td>0.20</td> <td>0.24</td> </tr> </tbody> </table>										Rated Voltage(VDC)	6.3	10	16	25	35	50	63	100	160~250	350~500	Tanδ(Max.)	0.30	0.24	0.20	0.16	0.14	0.12	0.10	0.09	0.20	0.24											
	Rated Voltage(VDC)	6.3	10	16	25	35	50	63	100	160~250	350~500																																
Tanδ(Max.)	0.30	0.24	0.20	0.16	0.14	0.12	0.10	0.09	0.20	0.24																																	
When the capacitance exceeds 1,000µF, 0.02 shall be added every 1,000µF increase. (at 20°C, 120Hz)																																											
Temperature characteristics (Max,impedance ratio)	<table border="1"> <thead> <tr> <th>Rated Voltage(VDC)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63~100</th> <th>160</th> <th>200~250</th> <th>350~500</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(20°C)</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>3</td> <td>3</td> <td>6</td> </tr> <tr> <td>Z(-40°C)/Z(20°C)</td> <td>12</td> <td>10</td> <td>8</td> <td>5</td> <td>4</td> <td>3</td> <td>4</td> <td>4</td> <td>4</td> <td>-</td> </tr> </tbody> </table>										Rated Voltage(VDC)	6.3	10	16	25	35	50	63~100	160	200~250	350~500	Z(-25°C)/Z(20°C)	5	4	3	2	2	2	2	3	3	6	Z(-40°C)/Z(20°C)	12	10	8	5	4	3	4	4	4	-
	Rated Voltage(VDC)	6.3	10	16	25	35	50	63~100	160	200~250	350~500																																
	Z(-25°C)/Z(20°C)	5	4	3	2	2	2	2	3	3	6																																
Z(-40°C)/Z(20°C)	12	10	8	5	4	3	4	4	4	-																																	
(at 120Hz)																																											
Load life	<p>The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 105°C.(where 1,000hrs about Ø5~Ø8)</p> <p>Capacitance change≤±20% of the initial value Tanδ ≤200% of the initial specified value Leakage current ≤The initial specified value</p>																																										
Shelf life	<p>The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements.</p> <p>Capacitance change≤±20% of the initial value Tanδ ≤200% of the initial specified value Leakage current ≤The initial specified value (where, 200% for ≥WV 160 VDC)</p>																																										

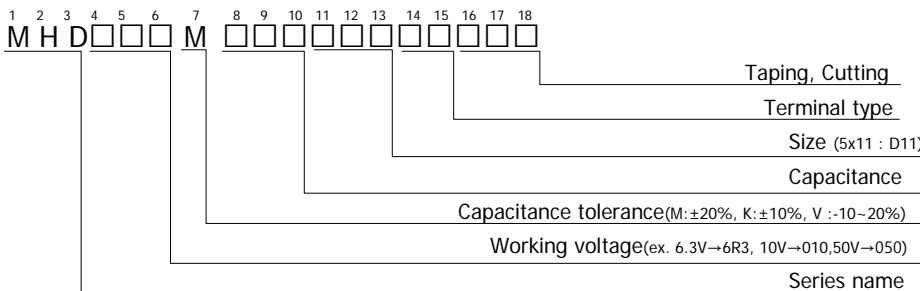
Dimension (CE04 Type)



•Printed white color letter on PET/PVC brown sleeve

※Ø8 X 9L,ØD'≤D+0.5 and L'≤L+1.0

Code numbering system



Ø5	D
Ø6.3	E
Ø8	F
Ø10	G
Ø12.5	X
Ø16	J
Ø18	K
Ø20	L
Ø22	M

MHD series ■ Standard Ratings

VV (Vdc)	Cap (uF)	Size ØxL (mm)	Tanδ	Ripple Current (mA rms/105°C, 120Hz)	Code No
6.3	1,000	8 x 11.5	0.30	390	MHD6R3□102F12CS□□□
	2,200	10 x 16	0.32	635	MHD6R3□222G16CS□□□
	3,300	10 x 20	0.34	840	MHD6R3□332G20CS□□□
	4,700	12.5 x 20	0.34	1,090	MHD6R3□472X20CS□□□
	6,800	12.5 x 25	0.38	1,350	MHD6R3□682X25CS□□□
	10,000	16 x 25	0.46	1,650	MHD6R3□103J25CS□□□
	15,000	16 x 31.5	0.56	1,820	MHD6R3□153J32CS□□□
	22,000	18 x 35.5	0.70	2,280	MHD6R3□223K36CS□□□
	33,000	20 x 40	0.90	2,500	MHD6R3□333L40CS□□□
47,000	22 x 50	1.20	2,780	MHD6R3□473M50CS□□□	
10	220	5 x 11	0.24	155	MHD010□22D11CS□□□
	330	6.3 x 11	0.24	210	MHD010□33E11CS□□□
	470	6.3 x 11	0.24	250	MHD010□47E11CS□□□
	680	8 x 11.5	0.24	340	MHD010□68F12CS□□□
	1,000	10 x 12.5	0.24	460	MHD010□102G13CS□□□
	2,200	10 x 16	0.26	705	MHD010□222G16CS□□□
	3,300	12.5 x 20	0.28	1,000	MHD010□332X20CS□□□
	4,700	12.5 x 25	0.30	1,260	MHD010□472X25CS□□□
	6,800	16 x 25	0.34	1,570	MHD010□682J25CS□□□
	10,000	16 x 31.5	0.42	1,820	MHD010□103J32CS□□□
	15,000	16 x 35.5	0.52	2,050	MHD010□153J36CS□□□
	22,000	18 x 40	0.66	2,420	MHD010□223K40CS□□□
33,000	22 x 40	0.88	3,210	MHD010□333M40CS□□□	
16	220	6.3 x 11	0.20	190	MHD016□22E11CS□□□
	330	6.3 x 11	0.20	225	MHD016□33E11CS□□□
	470	8 x 11.5	0.20	315	MHD016□47F12CS□□□
	680	8 x 16	0.20	420	MHD016□68F16CS□□□
	1,000	10 x 12.5	0.20	500	MHD016□102G13CS□□□
	2,200	10 x 20	0.20	710	MHD016□222G20CS□□□
	3,300	12.5 x 25	0.24	1,170	MHD016□332X25CS□□□
	4,700	16 x 25	0.26	1,500	MHD016□472J25CS□□□
	6,800	16 x 25	0.30	1,600	MHD016□682J25CS□□□
	10,000	16 x 35.5	0.38	1,930	MHD016□103J36CS□□□
	15,000	18 x 40	0.48	2,210	MHD016□153K40CS□□□
	22,000	22 x 40	0.62	2,700	MHD016□223M40CS□□□
25	100	5 x 11	0.16	125	MHD025□10D11CS□□□
	220	6.3 x 11	0.16	200	MHD025□22E11CS□□□
	330	8 x 11.5	0.16	310	MHD025□33F12CS□□□
	470	10x 12.5	0.16	380	MHD025□47G13CS□□□
	680	10 x 16	0.16	480	MHD025□68G16CS□□□
	1,000	10 x 20	0.16	610	MHD025□102G20CS□□□
	2,200	12.5 x 25	0.18	1,090	MHD025□222X25CS□□□
	3,300	16 x 25	0.20	1,400	MHD025□332J25CS□□□
	4,700	16 x 25	0.22	1,570	MHD025□472J25CS□□□
	6,800	16 x 35.5	0.26	1,850	MHD025□682J36CS□□□
	10,000	18 x 40	0.34	2,000	MHD025□103K40CS□□□
	15,000	22 x 40	0.44	2,750	MHD025□153M40CS□□□
35	47	5 x 11	0.14	93	MHD035□47D11CS□□□
	68	6.3 x 11	0.14	110	MHD035□68E11CS□□□
	100	6.3 x 11	0.14	150	MHD035□10E11CS□□□
	220	8 x 11.5	0.14	270	MHD035□22F12CS□□□
	330	10 x 12.5	0.14	350	MHD035□33G13CS□□□
	470	10 x 16	0.14	460	MHD035□47G16CS□□□
	680	10 x 20	0.14	680	MHD035□68G20CS□□□
	1,000	12.5 x 20	0.14	810	MHD035□102X20CS□□□
	2,200	16 x 25	0.16	1,260	MHD035□222J25CS□□□
	3,300	16 x 31.5	0.18	1,500	MHD035□332J32CS□□□
	4,700	16 x 35.5	0.20	1,780	MHD035□472J36CS□□□
	6,800	18 x 40	0.24	2,000	MHD035□682K40CS□□□
10,000	22 x 50	0.32	2,650	MHD035□103M50CS□□□	

VV (Vdc)	Cap (uF)	Size ØxL (mm)	Tanδ	Ripple Current (mA rms/105°C, 120Hz)	Code No	
50	1.0	5 x 11	0.12	13	MHD050□1R0D11CS□□□	
	2.2	5 x 11	0.12	20	MHD050□2R2D11CS□□□	
	3.3	5 x 11	0.12	25	MHD050□3R3D11CS□□□	
	4.7	5 x 11	0.12	30	MHD050□4R7D11CS□□□	
	10	5 x 11	0.12	46	MHD050□10D11CS□□□	
	22	5 x 11	0.12	68	MHD050□22D11CS□□□	
	33	5 x 11	0.12	90	MHD050□33D11CS□□□	
	47	6.3 x 11	0.12	115	MHD050□47D11CS□□□	
	68	6.3 x 11	0.12	150	MHD050□68D11CS□□□	
	100	8 x 11.5	0.12	190	MHD050□101F12CS□□□	
	220	10 x 12.5	0.12	300	MHD050□221G13CS□□□	
	330	10 x 16	0.12	410	MHD050□331G16CS□□□	
	470	10 x 20	0.12	540	MHD050□471G20CS□□□	
	1,000	12.5 x 25	0.12	950	MHD050□102X25CS□□□	
	2,200	16 x 31.5	0.14	1,410	MHD050□222J32CS□□□	
	3,300	18 x 35.5	0.16	1,770	MHD050□332K36CS□□□	
	4,700	20 x 40	0.18	2,100	MHD050□472L40CS□□□	
	6,800	22 x 50	0.22	2,500	MHD050□682M50CS□□□	
63	22	5 x 11	0.10	71	MHD063□22D11CS□□□	
	33	6.3 x 11	0.10	100	MHD063□33D11CS□□□	
	47	6.3 x 11	0.10	120	MHD063□47D11CS□□□	
	68	8 x 11.5	0.10	155	MHD063□68D11CS□□□	
	100	8 x 11.5	0.10	200	MHD063□101F12CS□□□	
	220	10 x 16	0.10	335	MHD063□221G16CS□□□	
	330	10 x 20	0.10	510	MHD063□331G20CS□□□	
	470	12.5 x 20	0.10	640	MHD063□471X20CS□□□	
	1,000	16 x 25	0.10	930	MHD063□102J25CS□□□	
	2,200	18 x 35.5	0.11	1,650	MHD063□222K36CS□□□	
	3,300	20 x 40	0.13	1,950	MHD063□332L40CS□□□	
	4,700	22 x 50	0.15	2,450	MHD063□472M50CS□□□	
100	1.0	5 x 11	0.08	15	MHD100□1R0D11CS□□□	
	2.2	5 x 11	0.08	21	MHD100□2R2D11CS□□□	
	3.3	5 x 11	0.08	29	MHD100□3R3D11CS□□□	
	4.7	5 x 11	0.08	32	MHD100□4R7D11CS□□□	
	6.8	5 x 11	0.08	41	MHD100□6R8D11CS□□□	
	10	5 x 11	0.08	50	MHD100□10D11CS□□□	
	22	6.3 x 11	0.08	93	MHD100□22D11CS□□□	
	33	8 x 11.5	0.08	130	MHD100□33D11CS□□□	
	47	8 x 11.5	0.08	140	MHD100□47D11CS□□□	
	68	10 x 12.5	0.08	190	MHD100□68D11CS□□□	
	100	10 x 16	0.08	240	MHD100□101G16CS□□□	
	220	12.5 x 20	0.08	390	MHD100□221X20CS□□□	
330	12.5 x 25	0.08	540	MHD100□331X25CS□□□		
470	16 x 25	0.08	715	MHD100□471J25CS□□□		
680	16 x 31.5	0.08	820	MHD100□681J32CS□□□		
1,000	18 x 35.5	0.08	960	MHD100□102K36CS□□□		
2,200	22 x 50	0.10	1,750	MHD100□222M50CS□□□		
160	10	8 x 11.5	0.20	41	MHD160□10F12CS□□□	
	22	10 x 12.5	0.20	92	MHD160□22G13CS□□□	
	33	10 x 16	0.20	125	MHD160□33G16CS□□□	
	47	10 x 20	0.20	150	MHD160□47G20CS□□□	
	68	12.5 x 20	0.20	250	MHD160□68X20CS□□□	
	100	12.5 x 25	0.20	310	MHD160□101X25CS□□□	
	220	16 x 31.5	0.20	540	MHD160□221J32CS□□□	
	330	18 x 35.5	0.20	705	MHD160□331K36CS□□□	
	470	18 x 40	0.20	855	MHD160□471K40CS□□□	
	200	1.0	6.3 x 11	0.20	16	MHD200□1R0E11CS□□□
		2.2	6.3 x 11	0.20	25	MHD200□2R2E11CS□□□
		3.3	6.3 x 11	0.20	30	MHD200□3R3E11CS□□□
4.7		6.3 x 11	0.20	35	MHD200□4R7E11CS□□□	
10		8 x 11.5	0.20	57	MHD200□10F12CS□□□	
22		10 x 16	0.20	105	MHD200□22G16CS□□□	
33		10 x 20	0.20	140	MHD200□33G20CS□□□	
47		12.5 x 20	0.20	195	MHD200□47X20CS□□□	
68		12.5 x 25	0.20	250	MHD200□68X25CS□□□	



MHD series

■ Standard Rating

VV (Vdc)	Cap (uF)	Size ØxL (mm)	Tanδ	Ripple Current (mA _{rms} /105°C, 120Hz)	Code No
200	100	16 x 25	0.20	335	MHD200□101J25CS□□□
	220	16 x 35.5	0.20	500	MHD200□221J36CS□□□
	330	18 x 40	0.20	675	MHD200□331K40CS□□□
250	3.3	6.3 x 11	0.20	28	MHD250□3R3E11CS□□□
	4.7	6.3 x 11	0.20	35	MHD250□4R7E11CS□□□
	10	10 x 12.5	0.20	71	MHD250□100G13CS□□□
	22	10 x 20	0.20	105	MHD250□220G20CS□□□
	33	10 x 20	0.20	140	MHD250□330G20CS□□□
	47	12.5 x 20	0.20	190	MHD250□470X20CS□□□
	68	16 x 25	0.20	270	MHD250□680J25CS□□□
	100	16 x 25	0.20	310	MHD250□101J25CS□□□
	220	18 x 35.5	0.20	485	MHD250□221K36CS□□□
	350	2.2	6.3 x 11	0.24	21
3.3		8 x 11.5	0.24	30	MHD350□3R3F12CS□□□
4.7		8 x 11.5	0.24	39	MHD350□4R7F12CS□□□
10		10 x 12.5	0.24	64	MHD350□100G13CS□□□
22		12.5 x 20	0.24	130	MHD350□220X20CS□□□
33		12.5 x 25	0.24	170	MHD350□330X25CS□□□
47		16 x 25	0.24	230	MHD350□470J25CS□□□
68		16 x 25	0.24	285	MHD350□680J25CS□□□
100		18 x 31.5	0.24	375	MHD350□101K32CS□□□
400	1.0	6.3 x 11	0.24	15	MHD400□1R0E11CS□□□
	2.2	8 x 11.5	0.24	27	MHD400□2R2F12CS□□□
	3.3	8 x 11.5	0.24	34	MHD400□3R3F12CS□□□
	4.7	10 x 12.5	0.24	42	MHD400□4R7G13CS□□□
	6.8	10 x 16	0.24	52	MHD400□6R8G16CS□□□
	10	10 x 16	0.24	64	MHD400□100G16CS□□□
	22	12.5 x 25	0.24	145	MHD400□220X25CS□□□
	33	16 x 25	0.24	195	MHD400□330J25CS□□□
	47	16 x 25	0.24	200	MHD400□470J25CS□□□
	68	16 x 31.5	0.24	240	MHD400□680J32CS□□□
100	18 x 35.5	0.24	310	MHD400□101K36CS□□□	
450	2.2	8 x 11.5	0.24	20	MHD450□2R2F12CS□□□
	3.3	10 x 12.5	0.24	28	MHD450□3R3G13CS□□□
	4.7	10 x 12.5	0.24	32	MHD450□4R7G13CS□□□
	6.8	10 x 16	0.24	43	MHD450□6R8G16CS□□□
	10	10 x 20	0.24	56	MHD450□100G20CS□□□
	22	12.5 x 25	0.24	100	MHD450□220X25CS□□□
	33	16 x 25	0.24	125	MHD450□330J25CS□□□
	47	16 x 31.5	0.24	155	MHD450□470J32CS□□□
	68	18 x 35.5	0.24	185	MHD450□680K36CS□□□
	100	18 x 40	0.24	200	MHD450□101K40CS□□□

VV (Vdc)	Cap (uF)	Size ØxL (mm)	Tanδ	Ripple Current (mA _{rms} /105°C, 120Hz)	Code No
500	1.0	8 x 11.5	0.24	12	MHD500□1R0F11CS□□□
	2.2	8 x 16	0.24	18	MHD500□2R2F16CS□□□
	3.3	10 x 12.5	0.24	22	MHD500□3R3G13CS□□□
	4.7	10 x 16	0.24	26	MHD500□4R7G16CS□□□
	6.8	10 x 20	0.24	32	MHD500□6R8G20CS□□□
	10	12.5 x 20	0.24	42	MHD500□100X20CS□□□
	22	16 x 20	0.24	88	MHD500□220J20CS□□□
	33	16 x 31.5	0.24	108	MHD500□330J32CS□□□
	47	18 x 31.5	0.24	132	MHD500□470K32CS□□□
68	18 x 35.5	0.24	158	MHD500□680K36CS□□□	

■ RATED RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers (≤ 180)

Freq.(Hz) / Cap.(uF)	60	120	300	1k	10k ~
~6.8	0.65	1.00	1.35	1.75	2.30
10~68	0.75	1.00	1.25	1.50	1.75
100~1,000	0.80	1.00	1.15	1.30	1.40
2,000~	0.85	1.00	1.03	1.05	1.08

Frequency Multipliers (200 ≤)

Freq.(Hz) / Cap.(uF)	60	120	300	1k	10k ~
6.3 ~50	0.95	1.00	1.03	1.05	1.08
63 ~ 100	0.92	1.00	1.07	1.13	1.19