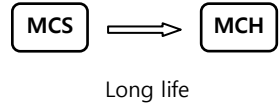


MCH series

Standard Long life RoHS Compliant

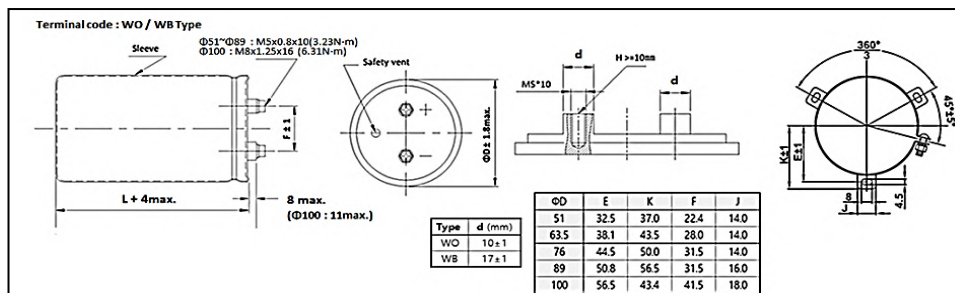
- 105 °C 5,000Hrs assured. (2,000Hrs for 10~250V,500V)
- Long life, High ripple
- RoHS compliant
- Halogen-free capacitors are also available.



Specifications

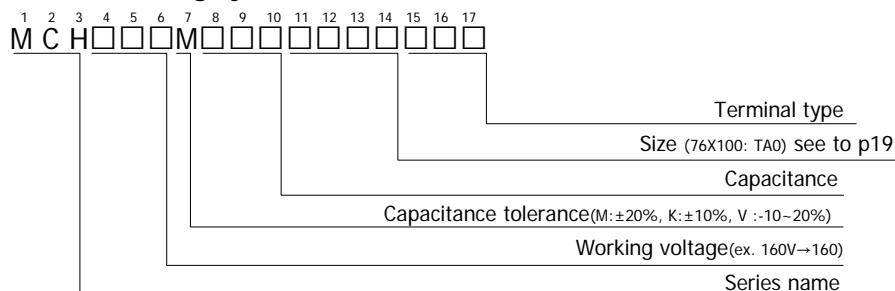
Item	Characteristics	
Rated Voltage Range	10 ~ 100 Vdc	160 ~ 500 Vdc
Operating Temperature Range	-40 ~ +105 °C	-25 ~ +105 °C
Capacitance Tolerance	±20% (M) (at 20 °C, 120Hz)	
Leakage Current	After 5 minutes application of rated voltage, leakage current not more than $I=3\sqrt{CV}$ or 5mA whichever is smaller Where, I:Max. Leakage current(µA), C:Nominal capacitance(µF), V:Rated voltage(Vdc) (at 20 °C, 5min)	
Dissipation Factor(Tanδ)	The dissipation factor (Tanδ) shall not exceed the values shown in the ratings. (at 20 °C, 120Hz)	
Temperature characteristics (Max,impedance ratio)	Rated voltage (Vdc)	10 ~ 100 160 ~ 500
	Z(-25°C)/Z(20°C)	- 8
	Z(-40°C)/Z(20°C)	12 -
	(at 120Hz)	
Load life	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for specified life times at 85°C 5,000hrs. Capacitance change ≤±20% of the initial value Tan δ ≤200% of the initial specified value Leakage current ≤The initial specified value	
Shelf life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°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. Capacitance change ≤±20% of the initial value Tanδ ≤200% of the initial specified value Leakage current ≤The initial specified value	

Dimensions



- Printed gold color letter on black sleeve

Code numbering system



Ø35	P
Ø51	R
Ø63.5	S
Ø76	T
Ø89	U
Ø100	V

MCH series

■ Standard Ratings

Note1) Ripple current = Arms/105°C, 120Hz

WV (Vdc)	Cap (µF)	Size ØxL (mm)	Tan δ	Ripple ¹⁾	Code No
10	33,000	35 x 80	0.65	4.8	MCH010□333P80WOR
	47,000	35 x 100	0.65	6.2	MCH010□473PA0WOR
	68,000	51 x 80	0.80	6.8	MCH010□683R80WOR
	100,000	51 x 100	0.80	8.6	MCH010□104RA0WOR
	150,000	51 x 120	0.85	10.8	MCH010□154RC0WOR
	220,000	63.5 x 120	1.20	13.2	MCH010□224SC0WOR
	330,000	76 x 120	2.00	15.8	MCH010□334TC0WOR
	470,000	90 x 140	2.40	17.0	MCH010□474UE0WOR
	680,000	90 x 170	2.40	18.4	MCH010□684UH0WOR
	1,000,000	90 x 220	2.40	20.0	MCH010□105UM0WOR
1,500,000	100 x 250	2.40	22.0	MCH010□155VP0WOR	
16	33,000	35 x 80	0.45	5.2	MCH016□333P80WOR
	47,000	35 x 100	0.45	6.8	MCH016□473PA0WOR
	68,000	51 x 80	0.60	7.1	MCH016□683R80WOR
	100,000	51 x 100	0.60	9.6	MCH016□104RA0WOR
	150,000	51 x 120	0.60	11.0	MCH016□154RC0WOR
	220,000	63.5 x 120	0.80	14.1	MCH016□224SC0WOR
	330,000	76 x 120	1.20	20.6	MCH016□334TC0WOR
	470,000	90 x 140	2.00	22.1	MCH016□474UE0WOR
	680,000	90 x 170	2.00	24.0	MCH016□684UH0WOR
	1,000,000	90 x 220	2.00	26.1	MCH016□105UM0WOR
1,500,000	100 x 250	2.00	28.8	MCH016□155VP0WOR	
25	22,000	35 x 80	0.40	4.9	MCH025□223P80WOR
	33,000	35 x 100	0.40	6.2	MCH025□333PA0WOR
	47,000	51 x 80	0.50	8.2	MCH025□473R80WOR
	68,000	51 x 120	0.50	10.1	MCH025□683RC0WOR
	100,000	63.5 x 100	0.65	11.5	MCH025□104SA0WOR
	150,000	63.5 x 120	0.70	13.5	MCH025□154SC0WOR
	220,000	76 x 120	0.90	17.0	MCH025□224TC0WOR
	330,000	90 x 140	1.50	20.8	MCH025□334UE0WOR
	470,000	90 x 170	1.50	22.4	MCH025□474UH0WOR
	680,000	90 x 220	1.50	24.2	MCH025□684UM0WOR
1,000,000	100 x 220	1.50	26.4	MCH025□105VM0WOR	
35	10,000	35 x 80	0.30	4.7	MCH035□103P80WOR
	15,000	35 x 80	0.30	5.1	MCH035□153P80WOR
	22,000	35 x 100	0.30	5.6	MCH035□223PA0WOR
	33,000	51 x 80	0.40	7.4	MCH035□333R80WOR
	47,000	51 x 100	0.40	8.4	MCH035□473RA0WOR
	68,000	51 x 120	0.40	12.3	MCH035□683RC0WOR
	100,000	63.5 x 120	0.50	13.6	MCH035□104SC0WOR
	150,000	76 x 120	0.70	15.0	MCH035□154TC0WOR
	220,000	90 x 140	1.00	17.4	MCH035□224UE0WOR
	330,000	90 x 170	1.00	21.3	MCH035□334UH0WOR
470,000	90 x 220	1.00	25.4	MCH035□474UM0WOR	
680,000	100 x 250	1.00	17.5	MCH035□684VP0WOR	
50	10,000	35 x 80	0.25	4.9	MCH050□103P80WOR
	15,000	35 x 100	0.25	5.3	MCH050□153PA0WOR
	22,000	51 x 80	0.25	6.1	MCH050□223R80WOR
	33,000	51 x 120	0.30	8.0	MCH050□333RC0WOR
	47,000	63.5 x 100	0.35	9.9	MCH050□473SA0WOR
	68,000	63.5 x 120	0.35	12.8	MCH050□683SC0WOR
	100,000	76 x 120	0.55	16.8	MCH050□104TC0WOR
	150,000	90 x 140	0.75	19.5	MCH050□154UE0WOR
	220,000	90 x 170	0.75	22.0	MCH050□224UH0WOR
	330,000	90 x 220	0.75	24.3	MCH050□334UM0WOR
470,000	100 x 250	0.75	26.0	MCH050□474VP0WOR	

WV (Vdc)	Cap (µF)	Size ØxL (mm)	Tan δ	Ripple ¹⁾	Code No
63	10,000	35 x 100	0.25	5.0	MCH063□103PA0WOR
	15,000	51 x 80	0.25	5.9	MCH063□153R80WOR
	22,000	51 x 100	0.25	6.9	MCH063□223RA0WOR
	33,000	63.5 x 100	0.30	9.4	MCH063□333SA0WOR
	47,000	63.5 x 120	0.30	11.2	MCH063□473SC0WOR
	68,000	76 x 120	0.50	13.5	MCH063□683TC0WOR
	100,000	90 x 140	0.60	17.8	MCH063□104UE0WOR
	150,000	90 x 170	0.60	21.0	MCH063□154UH0WOR
	220,000	90 x 220	0.60	23.7	MCH063□224UM0WOR
	330,000	100 x 250	0.60	26.1	MCH063□334VP0WOR
80	4,700	35 x 80	0.20	3.5	MCH080□472P80WOR
	6,800	35 x 100	0.20	3.9	MCH080□682PA0WOR
	10,000	51 x 80	0.20	5.4	MCH080□103R80WOR
	15,000	51 x 100	0.20	6.4	MCH080□153RA0WOR
	22,000	63.5 x 100	0.25	8.4	MCH080□223SA0WOR
	33,000	76 x 100	0.30	9.9	MCH080□333TA0WOR
	47,000	76 x 120	0.35	13.4	MCH080□473TC0WOR
	68,000	90 x 140	0.40	17.0	MCH080□683UE0WOR
	100,000	90 x 170	0.40	18.6	MCH080□104UH0WOR
	150,000	90 x 220	0.40	21.6	MCH080□154UM0WOR
220,000	100 x 250	0.40	24.8	MCH080□224VP0WOR	
100	2,200	35 x 80	0.12	2.4	MCH100□222P80WOR
	3,300	35 x 80	0.12	3.3	MCH100□332P80WOR
	4,700	35 x 100	0.12	3.8	MCH100□472PA0WOR
	6,800	51 x 80	0.15	5.2	MCH100□682R80WOR
	10,000	51 x 100	0.15	6.7	MCH100□103RA0WOR
	15,000	63.5 x 100	0.20	7.8	MCH100□153SA0WOR
	22,000	76 x 100	0.30	9.9	MCH100□223TA0WOR
	33,000	76 x 140	0.30	12.7	MCH100□333TE0WOR
	47,000	90 x 140	0.30	17.0	MCH100□473UE0WOR
	68,000	90 x 170	0.30	18.1	MCH100□683UH0WOR
100,000	90 x 220	0.30	20.6	MCH100□104UM0WOR	
150,000	100 x 220	0.30	23.4	MCH100□154VM0WOR	
160	1,000	35 x 80	0.15	1.6	MCH160□102P80WOR
	1,500	35 x 80	0.15	2.1	MCH160□152P80WOR
	2,200	35 x 100	0.15	2.7	MCH160□222PA0WOR
	3,300	51 x 80	0.15	3.8	MCH160□332R80WOR
	4,700	51 x 100	0.15	4.5	MCH160□472RA0WOR
	6,800	63.5 x 100	0.20	6.8	MCH160□682SA0WOR
	10,000	63.5 x 120	0.20	7.8	MCH160□103SC0WOR
	15,000	76 x 120	0.20	9.8	MCH160□153TC0WOR
	22,000	76 x 140	0.20	12.5	MCH160□223TE0WOR
	33,000	90 x 140	0.25	13.4	MCH160□333UE0WOR
47,000	90 x 220	0.25	17.2	MCH160□473UM0WOR	
68,000	100 x 250	0.25	19.2	MCH160□683VP0WOR	
200	1,000	35 x 80	0.15	1.7	MCH200□102P80WOR
	1,500	35 x 100	0.15	2.3	MCH200□152PA0WOR
	2,200	51 x 80	0.15	2.9	MCH200□222R80WOR
	3,300	51 x 100	0.15	3.9	MCH200□332RA0WOR
	4,700	63.5 x 100	0.20	5.1	MCH200□472SA0WOR
	6,800	63.5 x 120	0.20	7.0	MCH200□682PC0WOR
	10,000	76 x 120	0.20	8.2	MCH200□103TC0WOR
	15,000	76 x 140	0.20	10.4	MCH200□153TE0WOR
	22,000	90 x 140	0.25	15.1	MCH200□223UE0WOR
	33,000	90 x 220	0.25	16.6	MCH200□333UM0WOR
47,000	90 x 250	0.25	19.8	MCH200□473UP0WOR	



MCH series

Standard Ratings

Note1) Ripple current = Arms/105°C, 120Hz

WV (Vdc)	Cap (µF)	Size ØxL (mm)	Tan δ	Ripple ¹⁾	Code No
250	680	35 x 80	0.15	1.4	MCH250□681P80WOR
	1,000	35 x 100	0.15	1.9	MCH250□102PA0WOR
	1,500	51 x 80	0.15	2.4	MCH250□152R80WOR
	2,200	51 x 100	0.15	3.2	MCH250□222RA0WOR
	3,300	63.5 x 100	0.20	4.3	MCH250□332SA0WOR
	4,700	63.5 x 120	0.20	5.9	MCH250□472SC0WOR
	6,800	76 x 120	0.20	7.1	MCH250□682TC0WOR
	8,200	76 x 155	0.20	8.5	MCH250□822TF5WOR
	10,000	90 x 140	0.25	9.5	MCH250□103UE0WOR
	15,000	90 x 170	0.25	12.7	MCH250□153UH0WOR
	22,000	90 x 220	0.25	15.4	MCH250□223UM0WOR
	33,000	100 x 250	0.25	17.0	MCH250□333VP0WOR
350	330	35 x 80	0.20	2.0	MCH350□331P80WOR
	470	35 x 80	0.20	2.8	MCH350□471P80WOR
	680	51 x 80	0.20	4.1	MCH350□681R80WOR
	1,000	51 x 80	0.20	6.4	MCH350□102R80WOR
	1,500	51 x 100	0.20	8.7	MCH350□152RA0WOR
	2,200	51 x 120	0.20	11.0	MCH350□222RC0WOR
	2,700	63.5 x 100	0.20	12.7	MCH350□272SA0WOR
	3,300	63.5 x 110	0.20	14.4	MCH350□332SB0WOR
	3,900	63.5 x 130	0.20	16.8	MCH350□392SD0WOR
	4,700	63.5 x 150	0.20	19.8	MCH350□472SF0WOR
		76 x 120	0.20	19.7	MCH350□472TC0WOR
		63.5 x 170	0.20	22.7	MCH350□562SH0WOR
		76 x 130	0.20	22.2	MCH350□562TD0WOR
	6,800	76 x 150	0.20	26.2	MCH350□682TF0WOR
	8,200	76 x 170	0.20	30.3	MCH350□822TH0WOR
		90 x 150	0.20	29.2	MCH350□822UF0WOR
	10,000	90 x 150	0.20	32.4	MCH350□103UF0WOR
	12,000	90 x 190	0.20	36.0	MCH350□123UJ0WOR
15,000	90 x 220	0.20	42.9	MCH350□153UM0WOR	
22,000	100 x 250	0.20	48.0	MCH350□223VP0WOR	
400	680	51 x 80	0.20	4.1	MCH400□681R80WOR
	1,000	51 x 80	0.20	6.6	MCH400□102R80WOR
	1,500	51 x 120	0.20	9.1	MCH400□152RC0WOR
	2,200	63.5 x 100	0.20	11.5	MCH400□222SA0WOR
	2,700	63.5 x 110	0.20	13.1	MCH400□272SB0WOR
	3,300	63.5 x 130	0.20	15.4	MCH400□332SD0WOR
	3,900	63.5 x 150	0.20	17.9	MCH400□392SF0WOR
		76 x 110	0.20	18.2	MCH400□392TB0WOR
	4,700	63.5 x 170	0.20	20.6	MCH400□472SH0WOR
		76 x 130	0.20	20.3	MCH400□472TD0WOR
	5,600	76 x 150	0.20	23.7	MCH400□562TF0WOR
		76 x 170	0.20	27.6	MCH400□682TH0WOR
	6,800	90 x 150	0.20	26.8	MCH400□682UF0WOR
		90 x 170	0.20	31.0	MCH400□822UH0WOR
	10,000	90 x 190	0.20	32.8	MCH400□103UJ0WOR
	12,000	90 x 220	0.20	38.3	MCH400□123UM0WOR
	15,000	100 x 220	0.20	44.5	MCH400□153V2MWOR

WV (Vdc)	Cap (µF)	Size ØxL (mm)	Tan δ	Ripple ¹⁾	Code No
450	470	51 x 80	0.20	3.4	MCH450□471R80WOR
	680	51 x 100	0.20	4.4	MCH450□681RA0WOR
	1,000	51 x 100	0.20	7.0	MCH450□102RA0WOR
	1,500	51 x 120	0.20	9.2	MCH450□152RC0WOR
	2,200	63.5 x 110	0.20	11.8	MCH450□222SB0WOR
	2,700	63.5 x 130	0.20	13.8	MCH450□272SD0WOR
		76 x 110	0.20	14.5	MCH450□272TB0WOR
	3,300	63.5 x 150	0.20	16.5	MCH450□332SF0WOR
		76 x 130	0.20	17.0	MCH450□332TD0WOR
	3,900	63.5 x 170	0.20	18.2	MCH450□392SH0WOR
	4,700	76 x 150	0.20	21.7	MCH450□472TF0WOR
	5,600	76 x 190	0.20	26.4	MCH450□562TJ0WOR
		90 x 150	0.20	24.1	MCH450□562UF0WOR
	6,800	90 x 170	0.20	28.3	MCH450□682UH0WOR
	8,200	90 x 190	0.20	32.5	MCH450□822UJ0WOR
10,000	90 x 220	0.20	35.1	MCH450□103UM0WOR	
12,000	90 x 230	0.20	39.2	MCH450□123UN0WOR	
15,000	90 x 250	0.20	45.6	MCH450□153VP0WOR	
500	330	51 x 80	0.20	2.7	MCH500□331R80WOR
	470	51 x 80	0.20	3.2	MCH500□471R80WOR
	680	51 x 100	0.20	4.2	MCH500□681RA0WOR
	1,000	51 x 120	0.20	5.3	MCH500□102RC0WOR
	1,500	63.5 x 110	0.20	7.1	MCH500□152SB0WOR
	2,200	63.5 x 130	0.20	9.3	MCH500□222SD0WOR
	2,700	63.5 x 150	0.20	11.0	MCH500□272SF0WOR
		76 x 130	0.20	11.0	MCH500□272TD0WOR
	3,300	63.5 x 170	0.20	12.9	MCH500□332SH0WOR
		76 x 150	0.20	13.0	MCH500□332TF0WOR
	3,900	76 x 150	0.20	14.1	MCH500□392TF0WOR
	4,700	76 x 190	0.20	17.2	MCH500□472TJ0WOR
		90 x 150	0.20	16.3	MCH500□472UF0WOR
	5,600	90 x 150	0.20	17.8	MCH500□562UF0WOR
	6,800	90 x 170	0.20	20.7	MCH500□682UH0WOR
8,200	90 x 220	0.20	25.5	MCH500□822UM0WOR	
10,000	90 x 250	0.20	29.8	MCH500□103UN0WOR	

Rated ripple current multipliers

Frequency (Hz)	50	60	120	1K	10K
10 ~ 100 V	0.88	0.90	1.00	1.15	1.15
160 ~ 250 V	0.86	0.88	1.00	1.15	1.20
350 ~ 500 V	0.80	0.82	1.00	1.35	1.40