

# MF series

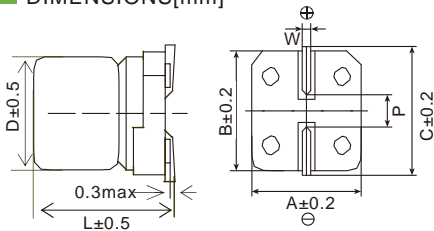
- Endurance: +105°C 6,000 hours
- Designed for surface mounting on high density PC board
- RoHS Compliant



**SPECIFICATIONS**

Items	Characteristics	
Category Temperature Range	-40~+105°C(6.3 ~450 V <sub>dc</sub> )	
Rated Voltage Range	6.3~450 V <sub>dc</sub>	
Capacitance Tolerance	±20%(M)	
Leakage Current	6.3~100 V <sub>dc</sub>	160~450 V <sub>dc</sub>
	I 0.03CV or 4μA, whichever is greater. (2 minutes)      I 0.04CV+100μA (1 minute)	
Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C)		
Dissipation Factor (tan δ)	Rated Voltage(V <sub>dc</sub> )	6.3 10 16 25 35 50 63 80 100 160~250 400~450
	tan δ (max.)	0.32 0.28 0.26 0.16 0.14 0.14 0.12 0.12 0.10 0.20 0.24 (at 20°C,120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage(V <sub>dc</sub> )	6.3 10 16 25 35 50 63 80 100 160~250 400~450
	Z(-25°C)/Z(+20°C)	4 3 2 2 2 2 2 2 2 6 6
	Z(-40°C)/Z(+20°C)	10 8 6 4 3 3 3 3 3 10 18 (at 120Hz)
Endurance	The specifications listed below shall be met when the capacitors are restored to 20°C after rated voltage is applied for 6,000 hours at 105°C.	
	Rated Voltage(V <sub>dc</sub> )	6.3~100      160~450
	Capacitance Change	±30% of the initial value      ±20% of the initial value
	Dissipation Factor (tan δ)	300% of the initial specified value      200% of the initial specified value
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after leaving them under no load at 105°C for 1,000 hours.	
	Rated Voltage(V <sub>dc</sub> )	6.3~100      160~450
	Capacitance Change	±30% of the initial value      ±20% of the initial value
	Dissipation Factor (tan δ)	300% of the initial specified value      200% of the initial specified value
	Leakage Current	200% of the initial specified value      200% of the initial specified value

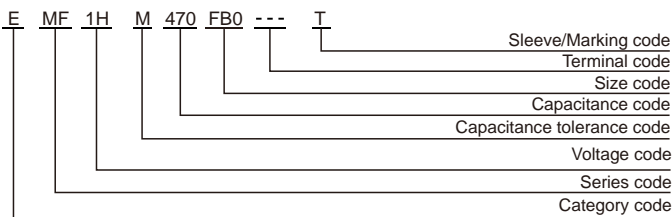
**DIMENSIONS[mm]**



Size code	D	L	A	B	C	W	P
D80	5	7.7	5.5	5.3	5.9	0.5~0.8	1.4
E80	6.3	7.7	6.6	6.6	7.2	0.5~0.8	1.9
E83	6.3	8.0	6.6	6.6	7.2	0.5~0.8	1.9
EB0	6.3	10.5	6.6	6.6	7.2	0.5~0.8	1.9
FB0	8	10.5	8.3	8.3	9.0	0.7~1.1	3.1
FD0	8	12.5	8.3	8.3	9.0	0.7~1.1	3.1
FE0	8	13.5	8.3	8.3	9.0	0.7~1.1	3.1
FG0	8	15.5	8.3	8.3	9.0	0.7~1.1	3.1
G80	10	7.7	10.3	10.3	11.0	0.7~1.1	4.5
GB0	10	10.5	10.3	10.3	11.0	0.7~1.1	4.5
GD0	10	12.5	10.3	10.3	11.0	0.7~1.1	4.5
GE0	10	13.5	10.3	10.3	11.0	0.7~1.1	4.5
WG5	12.5	16.0	13.0	13.0	13.7	1.0~1.3	4.5
WM5	12.5	21.0	13.0	13.0	13.7	1.0~1.3	4.5
LH0	16	16.5	17.0	17.0	18.0	1.0~1.3	6.5
LN0	16	21.5	17.0	17.0	18.0	1.0~1.3	6.5

Note: Tolerance shall be L+1.3(max.) for G80.

**PART NUMBERING SYSTEM**



**RATED RIPPLE CURRENT MULTIPLIERS**

Frequency correction factor for ripple current

Rated voltage(V <sub>dc</sub> ) \ Freq.(Hz)	120	1k	10k	100k
6.3~450	0.50	0.80	0.90	1.00

Surface Mount Type

**MF series**

■ STANDARD RATINGS (Rated ripple current:mArms/105°C 100kHz)

WV (Vdc)	Cap (µF)	Size code	Rated ripple current	Part Number
6.3(0J)	47	D80	90	EMF0JM470D80D00T
	100	E83	145	EMF0JM101E83D00T
	220	E83	180	EMF0JM221E83D00T
	330	FB0	280	EMF0JM331FB0D00T
	470	FB0	360	EMF0JM471FB0D00T
10(1A)	33	D80	71	EMF1AM330D80D00T
	150	E83	105	EMF1AM151E83D00T
	220	FB0	280	EMF1AM221FB0D00T
	330	GB0	400	EMF1AM331GB0D00T
16(1C)	470	GB0	545	EMF1AM471GB0D00T
	47	D80	90	EMF1CM470D80D00T
	100	E83	145	EMF1CM101E83D00T
	220	FB0	475	EMF1CM221FB0D00T
	330	FD0	510	EMF1CM331FD0D00T
25(1E)	470	GB0	720	EMF1CM471GB0D00T
	33	D80	90	EMF1EM330D80D00T
	47	E83	165	EMF1EM470E83D00T
	100	E83	175	EMF1EM101E83D00T
	220	FB0	535	EMF1EM221FB0D00T
35(1V)	330	GB0	750	EMF1EM331GB0D00T
	10	D80	90	EMF1VM100D80D00T
	22	E83	145	EMF1VM100E83D00T
		D80	96	EMF1VM220D80D00T
	E83	160	EMF1VM220E83D00T	
	33	E83	175	EMF1VM330E83D00T
	47	E80	190	EMF1VM470E80D00T
100	FB0	560	EMF1VM101FB0D00T	
220	GB0	800	EMF1VM221GB0D00T	
50(1H)	10	D80	86	EMF1HM100D80D00T
	22	E83	145	EMF1HM220E83D00T
	47	FB0	520	EMF1HM470FB0D00T
	100	GB0	680	EMF1HM101GB0D00T
	220	WE0	875	EMF1HM221WE0D00T
	330	WG5	1020	EMF1HM331WG5D00T
63(1J)	22	E83	140	EMF1JM220E83D00T
	33	FB0	320	EMF1JM330FB0D00T
	47	FB0	380	EMF1JM470FB0D00T
	100	GB0	530	EMF1JM101GB0D00T
	220	WE0	840	EMF1JM221WE0D00T
	330	LH0	1040	EMF1JM331LH0D00T
	470	LNO	1700	EMF1JM471LNO00T
80(1B)	10	E83	130	EMF1BM100E83D00T
	22	FB0	360	EMF1BM220FB0D00T
	33	FB0	410	EMF1BM330FB0D00T
	47	GB0	490	EMF1BM470GB0D00T
	100	GD0	530	EMF1BM101GD0D00T
220	WG5	1020	EMF1BM221WG5D00T	
100(1K)	10	E83	290	EMF1KM100E83D00T
	22	FB0	320	EMF1KM220FB0D00T
	33	GB0	360	EMF1KM330GB0D00T
	47	GB0	540	EMF1KM470GB0D00T
	100	WE0	550	EMF1KM101WE0D00T
220	LH0	1090	EMF1KM221LH0D00T	

WV (Vdc)	Cap (µF)	Size code	Rated ripple current	Part Number
160(2C)	10	G80	155	EMF2CM100G80D00T
		GB0	176	EMF2CM100GB0D00T
	15	FD0	204	EMF2CM150FD0D00T
		GD0	260	EMF2CM220GD0D00T
	33	GE0	340	EMF2CM330GE0D00T
	47	GH0	420	EMF2CM470GH0D00T
	68	WM5	560	EMF2CM680WM5D00T
	100	WM5	610	EMF2CM101WM5D00T
	200(2D)	10	G80	170
GB0			185	EMF2DM100GB0D00T
15		FE0	210	EMF2DM150FE0D00T
		GE0	272	EMF2DM220GE0D00T
33		GH0	340	EMF2DM330GH0D00T
		WE0	340	EMF2DM330WE0D00T
47		WM5	480	EMF2DM470WM5D00T
68	WM5	540	EMF2DM680WM5D00T	
250(2E)	4.7	FB0	90	EMF2EM4R7FB0D00T
	10	FD0	150	EMF2EM100FD0D00T
	22	GH0	312	EMF2EM220GH0D00T
	33	WM5	440	EMF2EM330WM5D00T
400(2G)	47	WM5	510	EMF2EM470WM5D00T
	1	E80	34	EMF2GM010E80D00T
		E80	44	EMF2GM1R5E80D00T
	1.5	E80	44	EMF2GM1R5E80D00T
	2.2	E80	48	EMF2GM2R2E80D00T
	3.3	FB0	72	EMF2GM3R3FB0D00T
	4.7	FD0	100	EMF2GM4R7FD0D00T
		GB0	100	EMF2GM4R7GB0D00T
	5.6	FD0	108	EMF2GM5R6FD0D00T
		GB0	114	EMF2GM5R6GB0D00T
6.8	GE0	140	EMF2GM6R8GE0D00T	
10	GE0	194	EMF2GM100GE0D00T	
15	GH0	235	EMF2GM150GH0D00T	
22	WM5	350	EMF2GM220WM5D00T	
450(2W)	2.2	GB0	60	EMF2WM2R2GB0D00T
	3.3	GB0	75	EMF2WM3R3GB0D00T
	4.7	GE0	98	EMF2WM4R7GE0D00T
	10	GH0	192	EMF2WM100GH0D00T
	15	WM5	240	EMF2WM150WM5D00T
22	WM5	320	EMF2WM220WM5D00T	