

MF series

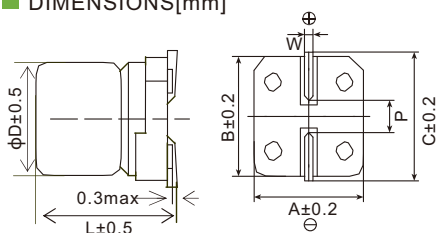
- Endurance: 6,000 hours at 105°C
- Designed for surface mounting on high density PC board
- Compliant to AEC-Q200
- **RoHS Compliant**



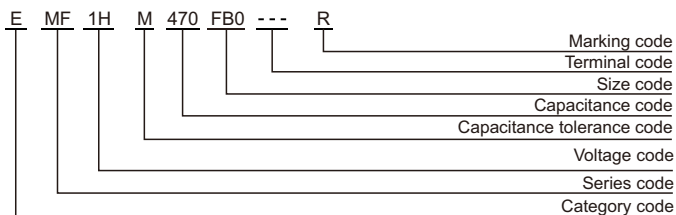
SPECIFICATIONS

Items	Characteristics										
Category Temperature Range	-55~+105°C(6.3~100 V _{dc})					-40~+105°C(160~450 V _{dc})					
Rated Voltage Range	6.3~450 V _{dc}										
Capacitance Tolerance	±20%(M)										
Leakage Current	6.3~100 V _{dc}					160~450 V _{dc}					
	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 (tanδ)	Rated Voltage(V _{dc})	6.3	10	16	25	35~50	63~80	100	160~250	400~450	
	Dissipation Factor(Max.)	0.32	0.28	0.26	0.16	0.14	0.12	0.10	0.20	0.24	(at 20°C, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage(V _{dc})	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	6	6	
	Z(-40°C)/Z(+20°C)	6	4	3	3	3	3	3	10	18	
	Z(-55°C)/Z(+20°C)	8	6	4	3	3	3	3	-	-	(at 120Hz)
Endurance	The specifications listed below shall be satisfied when the capacitors are restored to 20°C after rated voltage is applied for 6,000 hours at 105°C.										
	Rated Voltage(V _{dc})	6.3~100					160~450				
	Capacitance Change	≤±30% of the initial value					≤±20% of the initial value				
	Dissipation Factor	≤300% of the initial specified value					≤200% of the initial specified value				
	Leakage Current	≤The initial specified value					≤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 _{dc})	6.3~100					160~450				
	Capacitance Change	≤±30% of the initial value					≤±20% of the initial value				
	Dissipation Factor	≤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]



PART NUMBERING SYSTEM



Size code	D	L	A	B	C	W	P
D80	5	7.7	5.3	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
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
GH0	10	16.5	10.3	10.3	11.0	0.7~1.1	4.5
WE0	12.5	13.5	13.0	13.0	13.7	1.0~1.3	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

Note: 1)Tolerance shall be L+1.3(max.) for G80.
2)M type forming is available for Size E83 ~ GH0.

RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Freq.(Hz)	120	1k	10k	100k
Rated voltage(V _{dc})				
6.3~450	0.50	0.80	0.90	1.00

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■ STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size code	Rated ripple current (mA rms/105°C, 100kHz)	Part Number
6.3	47	E80	90	EMF0JM470D80---R
	100	E83	145	EMF0JM101E83---R
	220	E83	180	EMF0JM221E83---R
	330	FB0	280	EMF0JM331FB0---R
	470	FB0	360	EMF0JM471FB0---R
	1000	GB0	600	EMF0JM102GB0---R
10	33	D80	71	EMF1AM330D80---R
	150	E83	105	EMF1AM151E83---R
	220	FB0	280	EMF1AM221FB0---R
	330	GB0	400	EMF1AM331GB0---R
	470	GB0	545	EMF1AM471GB0---R
	680	GD0	600	EMF1AM681GD0---R
	1000	GH0	800	EMF1AM102GH0---R
16	47	D80	90	EMF1CM470D80---R
	100	E83	145	EMF1CM101E83---R
	220	FB0	475	EMF1CM221FB0---R
	330	FD0	510	EMF1CM331FD0---R
	470	GB0	720	EMF1CM471GB0---R
	1000	GH0	1050	EMF1CM102GH0---R
25	33	D80	90	EMF1EM330D80---R
	47	E83	165	EMF1EM470E83---R
	100	E83	175	EMF1EM101E83---R
	220	FB0	535	EMF1EM221FB0---R
	330	GB0	750	EMF1EM331GB0---R
	470	GD0	840	EMF1EM471GD0---R
35	10	D80	90	EMF1VM100D80---R
	22	E83	160	EMF1VM220E83---R
	33	E83	175	EMF1VM330E83---R
	47	E83	190	EMF1VM470E83---R
	100	FB0	560	EMF1VM101FB0---R
	220	GB0	800	EMF1VM221GB0---R
50	10	E83	95	EMF1HM100E83---R
	22	E83	145	EMF1HM220E83---R
	47	FB0	520	EMF1HM470FB0---R
	100	FB0	350	EMF1HM101FB0---R
	100	GB0	680	EMF1HM101GB0---R
	220	GD0	760	EMF1HM221GD0---R
	220	WE0	875	EMF1HM221WE0---R
	330	WG5	1020	EMF1HM331WG5---R
63	22	E83	140	EMF1JM220E83---R
	33	EB0	260	EMF1JM330EB0---R
	33	FB0	320	EMF1JM330FB0---R
	47	FB0	380	EMF1JM470FB0---R
	100	GB0	530	EMF1JM101GB0---R
80	220	WE0	840	EMF1JM221WE0---R
	10	E83	130	EMF1BM100E83---R
	22	FB0	360	EMF1BM220FB0---R
	33	FB0	410	EMF1BM330FB0---R
	47	GB0	490	EMF1BM470GB0---R
	100	GD0	530	EMF1BM101GD0---R
100	220	WG5	1020	EMF1BM221WG5---R
	10	E83	140	EMF1KM100E83---R
	22	FB0	320	EMF1KM220FB0---R
	33	GB0	360	EMF1KM330GB0---R
	47	GB0	540	EMF1KM470GB0---R
160	100	WE0	550	EMF1KM101WE0---R
	10	G80	156	EMF2CM100G80---R
	10	FB0	156	EMF2CM100FB0---R
	15	FD0	204	EMF2CM150FD0---R
	22	GD0	260	EMF2CM220GD0---R
	33	GE0	340	EMF2CM330GE0---R
	47	GH0	420	EMF2CM470GH0---R
	68	WM5	560	EMF2CM680WM5---R
	100	WM5	610	EMF2CM101WM5---R

WV (Vdc)	Cap (μF)	Size code	Rated ripple current (mA rms/105°C, 100kHz)	Part Number
200	2.2	E80	45	EMF2DM2R2E80---R
	3.3	E80	58	EMF2DM3R3E80---R
	4.7	EB0	80	EMF2DM4R7EB0---R
	6.8	FB0	110	EMF2DM6R8FB0---R
	8.2	FD0	130	EMF2DM8R2FD0---R
	10	GB0	185	EMF2DM100GB0---R
	15	FE0	210	EMF2DM150FE0---R
	22	GE0	272	EMF2DM220GE0---R
	33	GH0	340	EMF2DM330GH0---R
	33	WE0	340	EMF2DM330WE0---R
	47	WM5	480	EMF2DM470WM5---R
	68	WM5	540	EMF2DM680WM5---R
250	2.2	EB0	50	EMF2EM2R2EB0---R
	3.3	EB0	68	EMF2EM3R3EB0---R
	4.7	FB0	90	EMF2EM4R7FB0---R
	5.6	FB0	104	EMF2EM5R6FB0---R
	8.2	FD0	130	EMF2EM8R2FD0---R
	10	FD0	150	EMF2EM100FD0---R
	15	GD0	220	EMF2EM150GD0---R
	22	GH0	312	EMF2EM220GH0---R
	33	WM5	440	EMF2EM330WM5---R
	47	WM5	510	EMF2EM470WM5---R
	2.2	EB0	48	EMF2GM2R2EB0---R
	3.3	FB0	72	EMF2GM3R3FB0---R
400	4.7	FD0	100	EMF2GM4R7FD0---R
	4.7	GB0	100	EMF2GM4R7GB0---R
	5.6	FD0	108	EMF2GM5R6FD0---R
	5.6	GB0	114	EMF2GM5R6GB0---R
	6.8	FE0	126	EMF2GM6R8FE0---R
	6.8	GE0	140	EMF2GM6R8GE0---R
	8.2	GE0	168	EMF2GM8R2GE0---R
	10	GE0	194	EMF2GM100GE0---R
	12	GH0	225	EMF2GM120GH0---R
	15	GH0	235	EMF2GM150GH0---R
	22	WM5	350	EMF2GM220WM5---R
	2.2	GB0	60	EMF2WM2R2GB0---R
450	3.3	GB0	75	EMF2WM3R3GB0---R
	4.7	GE0	98	EMF2WM4R7GE0---R
	10	GH0	192	EMF2WM100GH0---R
	15	WM5	240	EMF2WM150WM5---R
	22	WM5	320	EMF2WM220WM5---R

※ Specifications subject to change without notice.