

## MK series

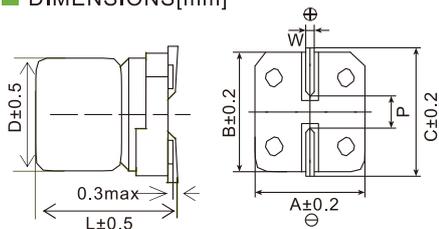
- Endurance: +105°C 2,000 ~ 3,000 hours
- Designed for surface mounting on high density PC board
- RoHS Compliant



### 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) (at 20°C, 120Hz)	
Leakage Current	6.3~100 V <sub>dc</sub>	160~450 V <sub>dc</sub>
	I 0.01CV or 3μA, 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 <sub>dc</sub> )	6.3 10 16 25 35 50 63 80 100 160~250 400~450
	tanδ (max.)	D80~E80 0.30 0.24 0.20 0.16 0.14 0.12 0.12 0.12 0.12 0.15 0.20 EB0~WM5 0.40 0.30 0.26 0.16 0.14 0.12 0.12 0.12 0.12 0.15 0.20 (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 a specified period of time at 105°C.	
	Load Life	2,000 hours( 160~450V <sub>dc</sub> 3,000 hours)
	Capacitance Change	≤±20% of the initial value
	Dissipation Factor (tanδ)	≤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 leaving them under no load at 105°C for 1,000 hours (6.3~100V <sub>dc</sub> : 500 hours).	
	Capacitance Change	≤±20% of the initial value
	Dissipation Factor (tanδ)	≤200% of the initial specified value
	Leakage Current	≤200% of the initial specified value

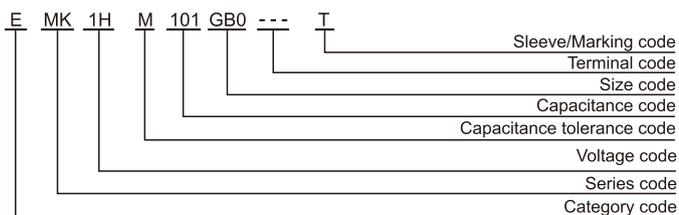
### DIMENSIONS[mm]



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
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
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: 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

**MK series**

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

WV (Vdc)	Cap (μF)	Size code	Rated ripple current	Part Number	
6.3(0J)	100	D80	105	EMK0JM101D80D00T	
	220	E83	160	EMK0JM221E83D00T	
	330	FB0	340	EMK0JM331FB0D00T	
	1000	GB0	860	EMK0JM102GB0D00T	
10(1A)	33	D80	105	EMK1AM330D80D00T	
	100	E83	175	EMK1AM101E83D00T	
	220	E83	180	EMK1AM221E83D00T	
	330	FB0	340	EMK1AM331FB0D00T	
	470	FB0	360	EMK1AM471FB0D00T	
16(1C)	820	GB0	860	EMK1AM821GB0D00T	
	47	D80	105	EMK1CM470D80D00T	
	100	E83	175	EMK1CM101E83D00T	
	150	E83	190	EMK1CM151E83D00T	
	220	FB0	500	EMK1CM221FB0D00T	
25(1E)	330	FB0	545	EMK1CM331FB0D00T	
	470	GB0	800	EMK1CM471GB0D00T	
	33	D80	105	EMK1EM330D80D00T	
	47	E83	180	EMK1EM470E83D00T	
	100	E83	205	EMK1EM101E83D00T	
35(1V)	220	FB0	550	EMK1EM221FB0D00T	
	330	GB0	780	EMK1EM331GB0D00T	
	470	GD0	875	EMK1EM471GD0D00T	
	10	D80	105	EMK1VM100D80D00T	
	22	D80	110	EMK1VM220D80D00T	
50(1H)	47	E83	210	EMK1VM470E83D00T	
	100	FB0	575	EMK1VM101FB0D00T	
	220	GB0	835	EMK1VM221GB0D00T	
	330	GD0	900	EMK1VM331GD0D00T	
	63(1J)	10	D80	90	EMK1HM100D80D00T
22		E83	175	EMK1HM220E83D00T	
33		E83	180	EMK1HM330E83D00T	
47		FB0	540	EMK1HM470FB0D00T	
100		GB0	700	EMK1HM101GB0D00T	
220		WE0	900	EMK1HM221WE0D00T	
80(1B)	330	WG5	1180	EMK1HM331WG5D00T	
	10	D80	85	EMK1JM100D80D00T	
	22	E83	150	EMK1JM220E83D00T	
	33	FB0	375	EMK1JM330FB0D00T	
	47	FB0	450	EMK1JM470FB0D00T	
	100	GB0	575	EMK1JM101GB0D00T	
100(1K)	220	WE0	890	EMK1JM221WE0D00T	
	10	E80	140	EMK1BM100E80D00T	
	22	FB0	375	EMK1BM220FB0D00T	
	33	FB0	450	EMK1BM330FB0D00T	
	47	GB0	575	EMK1BM470GB0D00T	
	100	GD0	600	EMK1BM101GD0D00T	
160(2C)	150	WE0	800	EMK1BM151WE0D00T	
	220	WG5	960	EMK1BM221WG5D00T	
	4.7	D80	70	EMK1KM4R7D80D00T	
	10	E83	135	EMK1KM100E83D00T	
	22	FB0	345	EMK1KM220FB0D00T	
200(2D)	33	GB0	560	EMK1KM330GB0D00T	
	47	GB0	575	EMK1KM470GB0D00T	
	100	WE0	680	EMK1KM101WE0D00T	
	250(2E)	10	D80	110	EMK2DM100G80D00T
		15	GB0	130	EMK2DM100GB0D00T
22		GD0	170	EMK2DM220GD0D00T	
33		GE0	215	EMK2DM330GE0D00T	
47		GH0	380	EMK2DM470GH0D00T	
400(2G)	68	WM5	630	EMK2CM680WM5D00T	
	100	WM5	700	EMK2CM101WM5D00T	
	2.2	E80	52	EMK2DM200G80D00T	
	15	FE0	170	EMK2DM150FE0D00T	
	22	GE0	200	EMK2DM220GE0D00T	
450(2W)	33	GH0	260	EMK2DM330GH0D00T	
	47	WM5	440	EMK2DM470WM5D00T	
	68	WM5	640	EMK2DM680WM5D00T	
	2.2	E80	52	EMK2EM2R2E80D00T	
	3.3	E80	68	EMK2EM3R3E80D00T	
160(2C)	4.7	FB0	96	EMK2EM4R7FB0D00T	
	10	FD0	166	EMK2EM100FD0D00T	
	22	GH0	300	EMK2EM220GH0D00T	
	33	WM5	420	EMK2EM330WM5D00T	
	47	WM5	460	EMK2EM470WM5D00T	
	200(2D)	1	E80	28	EMK2EM010E80D00T
		1.5	E80	36	EMK2EM1R5E80D00T
		2.2	E80	44	EMK2EM2R2E80D00T
		3.3	FB0	64	EMK2EM3R3FB0D00T
		4.7	FB0	78	EMK2EM4R7FB0D00T
5.6		FD0	96	EMK2EM5R6FD0D00T	
6.8		FE0	108	EMK2EM6R8FE0D00T	
8.2		FG0	130	EMK2EM8R2FG0D00T	
10		GE0	140	EMK2GM100GE0D00T	
15		GH0	174	EMK2GM150GH0D00T	
250(2E)	22	WM5	235	EMK2GM220WM5D00T	
	2.2	GB0	50	EMK2WM2R2GB0D00T	
	3.3	GB0	72	EMK2WM3R3GB0D00T	
	4.7	GE0	90	EMK2WM4R7GE0D00T	
	10	GH0	136	EMK2WM100GH0D00T	
	15	WM5	180	EMK2WM150WM5D00T	
	22	WM5	218	EMK2WM220WM5D00T	