

WK series

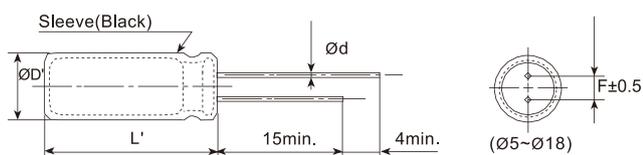
- Standard series for general purpose
- Endurance : +85 °C 2,000 hours
- RoHS Compliant



SPECIFICATIONS

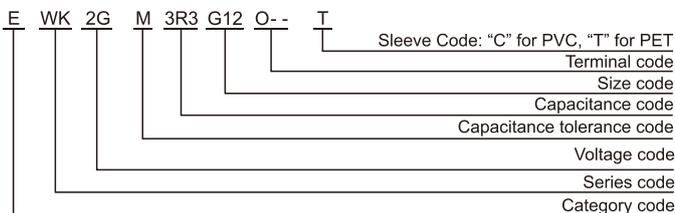
Items	Characteristics														
Category Temperature Range	-40~+85°C(6.3 to 100 V _{dc})							-25~+85°C(160 to 450 V _{dc})							
Rated Voltage Range	6.3~450 V _{dc}														
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)														
Leakage Current	6.3~100 V _{dc} I 0.01CV or 3μA, whichever is greater.			160~450 V _{dc} I 0.03CV+10μA				Where, I: Max.leakage current (μA),C:Nominal capacitance (μF), V: Rated voltage (V) (at 20°C after 2 minutes)							
	Dissipation Factor (tanδ)														
Dissipation Factor (tanδ)	Rated Voltage(V _{dc})	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
	tanδ (max.)	0.24	0.20	0.16	0.14	0.12	0.10	0.09	0.08	0.20	0.20	0.20	0.24	0.24	0.24
When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C,120Hz)															
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage(V _{dc})	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
	Z(-25°C)/Z(+20°C)	5	4	3	2			3			6				
	Z(-40°C)/Z(+20°C)	12	10	8	5	4	3			-			-		
(at 120Hz)															
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after DC voltage plus the rated ripple current is applied for 2,000 hours at 85°C.														
	Capacitance Change	≤±20% of the initial value													
	D.F. (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 exposing them for 1,000 hours at 85°C without voltage applied.														
	Capacitance Change	≤±20% of the initial value													
	D.F. (tanδ)	≤200% of the initial specified value													
	Leakage Current	≤200% of the initial specified value													

DIMENSIONS[mm]



ØD	5	6.3	8	10	12.5	16	18
Ød	0.5	0.5	0.5	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ØD'	ØD+0.5max.						
L'	L+2max.						

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Freq.(Hz)	50	120	300	1k	10k	100k
Cap.<10	0.65	1.00	1.35	1.75	2.30	2.50
10 Cap.<100	0.75	1.00	1.25	1.50	1.75	1.80
100 Cap. 1000	0.80	1.00	1.15	1.30	1.40	1.50
Cap.>1000	0.85	1.00	1.03	1.05	1.08	1.08

The endurance of capacitors is shortened with internal heating produced by ripple current at the rate of halving the lifetime with every 5 °C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

WK series

■ STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size D×L(mm)	tanδ	Rated ripple current (mA _{RMS} /85°C, 120Hz)	Part Number
6.3(0J)	33	5×11	0.24	65	EWK0JM330D11OT
	47	5×11	0.24	80	EWK0JM470D11OT
	100	5×11	0.24	135	EWK0JM101D11OT
	220	5×12	0.24	220	EWK0JM221D12OT
	330	6.3×11	0.24	280	EWK0JM331E11OT
	470	6.3×12	0.24	360	EWK0JM471E12OT
	1000	8×12	0.24	590	EWK0JM102F12OT
	2200	10×20	0.26	1000	EWK0JM222G20OT
	3300	10×25	0.28	1200	EWK0JM332G25OT
	4700	12.5×20	0.30	1550	EWK0JM472W20OT
	6800	12.5×25	0.34	1920	EWK0JM682W25OT
	10000	16×25	0.42	2370	EWK0JM103L25OT
	15000	16×35	0.52	2880	EWK0JM153L35OT
	22000	18×40	0.66	3350	EWK0JM223M40OT
10(1A)	22	5×11	0.20	60	EWK1AM220D11OT
	33	5×11	0.20	75	EWK1AM330D11OT
	47	5×11	0.20	95	EWK1AM470D11OT
	100	5×11	0.20	140	EWK1AM101D11OT
	220	5×12	0.20	240	EWK1AM221D12OT
	330	6.3×11	0.20	310	EWK1AM331E11OT
	470	6.3×12	0.20	400	EWK1AM471E12OT
	1000	10×12.5	0.20	660	EWK1AM102G1BOT
	2200	10×20	0.22	1090	EWK1AM222G20OT
	3300	12.5×20	0.24	1450	EWK1AM332W20OT
	4700	12.5×25	0.26	1800	EWK1AM472W25OT
	6800	16×25	0.30	2250	EWK1AM682L25OT
	10000	16×35	0.38	2710	EWK1AM103L35OT
	15000	18×35	0.48	3120	EWK1AM153M35OT
16(1C)	10	5×11	0.16	50	EWK1CM100D11OT
	22	5×11	0.16	65	EWK1CM220D11OT
	33	5×11	0.16	80	EWK1CM330D11OT
	47	5×11	0.16	115	EWK1CM470D11OT
	100	5×11	0.16	175	EWK1CM101D11OT
	220	6.3×11	0.16	280	EWK1CM221E11OT
	330	8×11	0.16	380	EWK1CM331F11OT
	470	8×11	0.16	460	EWK1CM471F11OT
	1000	10×16	0.16	800	EWK1CM102G16OT
	2200	12.5×20	0.18	1320	EWK1CM222W20OT
	3300	12.5×25	0.20	1670	EWK1CM332W25OT
	4700	16×25	0.22	2120	EWK1CM472L25OT
	6800	16×30	0.26	2550	EWK1CM682L30OT
	25(1E)	4.7	5×11	0.14	30
10		5×11	0.14	45	EWK1EM100D11OT
22		5×11	0.14	70	EWK1EM220D11OT
33		5×11	0.14	98	EWK1EM330D11OT
47		5×11	0.14	120	EWK1EM470D11OT
100		6.3×11	0.14	190	EWK1EM101E11OT
220		8×11	0.14	330	EWK1EM221F11OT
330		8×12	0.14	440	EWK1EM331F12OT
470		10×12.5	0.14	550	EWK1EM471G1BOT
1000		10×20	0.14	970	EWK1EM102G20OT
2200		12.5×25	0.16	1570	EWK1EM222W25OT
3300		16×25	0.18	2000	EWK1EM332L25OT
4700		16×30	0.20	2450	EWK1EM472L30OT

WV (Vdc)	Cap (μF)	Size D×L(mm)	tanδ	Rated ripple current (mA _{RMS} /85°C, 120Hz)	Part Number	
35(1V)	4.7	5×11	0.12	40	EWK1VM47R7D11OT	
	10	5×11	0.12	55	EWK1VM100D11OT	
	22	5×11	0.12	90	EWK1VM220D11OT	
	33	5×11	0.12	110	EWK1VM330D11OT	
	47	5×11	0.12	135	EWK1VM470D11OT	
	100	6.3×11	0.12	215	EWK1VM101E11OT	
	220	8×12	0.12	385	EWK1VM221F12OT	
	330	10×12.5	0.12	500	EWK1VM331G1BOT	
	470	10×16	0.12	680	EWK1VM471G16OT	
	1000	12.5×20	0.12	1180	EWK1VM102W20OT	
	2200	16×25	0.14	1810	EWK1VM222L25OT	
	3300	16×35	0.16	2300	EWK1VM332L35OT	
	4700	18×35	0.18	2750	EWK1VM472M35OT	
	50(1H)	0.1	5×11	0.10	1.3	EWK1HMR10D11OT
0.22		5×11	0.10	2.9	EWK1HMR22D11OT	
0.33		5×11	0.10	4.3	EWK1HMR33D11OT	
0.47		5×11	0.10	7.0	EWK1HMR47D11OT	
1		5×11	0.10	17	EWK1HM010D11OT	
2.2		5×11	0.10	28	EWK1HM2R2D11OT	
3.3		5×11	0.10	35	EWK1HM3R3D11OT	
4.7		5×11	0.10	41	EWK1HM4R7D11OT	
10		5×11	0.10	60	EWK1HM100D11OT	
22		5×11	0.10	95	EWK1HM220D11OT	
33		6.3×11	0.10	130	EWK1HM330E11OT	
47		6.3×11	0.10	160	EWK1HM470E11OT	
100		8×11	0.10	270	EWK1HM101F11OT	
220		10×16	0.10	435	EWK1HM221G16OT	
330	10×20	0.10	590	EWK1HM331G20OT		
470	10×20	0.10	760	EWK1HM471G20OT		
1000	12.5×25	0.10	1350	EWK1HM102W25OT		
2200	16×35	0.12	2110	EWK1HM222L35OT		
3300	18×35	0.14	2550	EWK1HM332M35OT		
63(1J)	4.7	5×11	0.09	45	EWK1JM47R7D11OT	
	10	5×11	0.09	70	EWK1JM100D11OT	
	22	6.3×11	0.09	110	EWK1JM220E11OT	
	33	6.3×11	0.09	140	EWK1JM330E11OT	
	47	6.3×12	0.09	190	EWK1JM470E12OT	
	100	10×12.5	0.09	300	EWK1JM101G1BOT	
	220	10×16	0.09	490	EWK1JM221G16OT	
	330	10×20	0.09	710	EWK1JM331G20OT	
	470	12.5×20	0.09	900	EWK1JM471W20OT	
	1000	16×25	0.09	1350	EWK1JM102L25OT	
	2200	18×35	0.11	2330	EWK1JM222M35OT	
	100(1K)	0.1	5×11	0.08	2.1	EWK1KMR10D11OT
		0.22	5×11	0.08	4.7	EWK1KMR22D11OT
		0.33	5×11	0.08	7.0	EWK1KMR33D11OT
0.47		5×11	0.08	10	EWK1KMR47D11OT	
1		5×11	0.08	21	EWK1KM010D11OT	
2.2		5×11	0.08	35	EWK1KM2R2D11OT	
3.3		5×11	0.08	45	EWK1KM3R3D11OT	
4.7		5×11	0.08	50	EWK1KM4R7D11OT	
10		6.3×11	0.08	75	EWK1KM100E11OT	
22		8×11	0.08	135	EWK1KM220F11OT	
33		8×12	0.08	185	EWK1KM330F12OT	

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WV (Vdc)	Cap (μF)	Size DxL(mm)	tanδ	Rated ripple current (mA _{RMS} /85°C, 120Hz)	Part Number	
100(1K)	47	10×12.5	0.08	235	EWK1KM470G1BOT	
	100	10×20	0.08	380	EWK1KM101G20OT	
	220	12.5× 25	0.08	630	EWK1KM221W25OT	
	330	12.5× 30	0.08	760	EWK1KM331W30OT	
	470	16×30	0.08	1000	EWK1KM471L30OT	
	1000	18×40	0.08	1350	EWK1KM102M40OT	
160(2C)	0.47	6.3×11	0.20	10	EWK2CMR47E11OT	
	1	6.3×11	0.20	15	EWK2CM010E11OT	
	2.2	6.3×11	0.20	30	EWK2CM2R2E11OT	
	3.3	6.3×11	0.20	40	EWK2CM3R3E11OT	
	4.7	6.3×11	0.20	48	EWK2CM4R7E11OT	
	10	8×12	0.20	80	EWK2CM100F12OT	
		10×12	0.20	94	EWK2CM100G12OT	
	22	10×12	0.20	130	EWK2CM220G12OT	
		10×16	0.20	150	EWK2CM220G16OT	
	33	10×20	0.20	170	EWK2CM220G20OT	
		10×16	0.20	180	EWK2CM330G16OT	
	47	10×20	0.20	210	EWK2CM330G20OT	
		10×20	0.20	240	EWK2CM470G20OT	
	160(2C)	12.5×20	0.20	280	EWK2CM470W20OT	
		12.5×20	0.20	360	EWK2CM680W20OT	
		12.5×25	0.20	470	EWK2CM101W25OT	
		16×20	0.20	520	EWK2CM151L20OT	
		16×25	0.20	600	EWK2CM181L25OT	
		16×30	0.20	780	EWK2CM221L30OT	
		18×30	0.20	860	EWK2CM271M30OT	
18×35		0.20	1000	EWK2CM331M35OT		
18×35		0.20	1020	EWK2CM391M35OT		
18×40		0.20	1220	EWK2CM471M40OT		
200(2D)		0.47	6.3×11	0.20	10	EWK2DMR47E11OT
		1	6.3×11	0.20	15	EWK2DM010E11OT
	2.2	6.3×11	0.20	34	EWK2DM2R2E11OT	
	3.3	6.3×11	0.20	45	EWK2DM3R3E11OT	
	4.7	6.3×11	0.20	55	EWK2DM4R7E11OT	
	8×12	0.20	60	EWK2DM4R7F12OT		
		0.20	100	EWK2DM100G12OT		
	10	10×12	0.20	170	EWK2DM220G20OT	
	22	10×20	0.20	205	EWK2DM330G20OT	
	47	12.5×20	0.20	270	EWK2DM470W20OT	
	68	12.5×25	0.20	370	EWK2DM680W25OT	
	100	16×25	0.20	475	EWK2DM101L25OT	
	150	16×25	0.20	550	EWK2DM151L25OT	
	180	18×25	0.20	620	EWK2DM181M25OT	
	220	18×35	0.20	810	EWK2DM221M35OT	
	270	18×35	0.20	870	EWK2DM271M35OT	
330	18×35	0.20	1000	EWK2DM331M35OT		
	18×40	0.20	1020	EWK2DM331M40OT		
250(2E)	0.47	6.3×11	0.20	10	EWK2EMR47E11OT	
	1	6.3×11	0.20	16	EWK2EM010E11OT	
	2.2	6.3×11	0.20	34	EWK2EM2R2E11OT	
	3.3	6.3×11	0.20	42	EWK2EM3R3E11OT	
	8×12	0.20	46	EWK2EM3R3F12OT		
		0.20	50	EWK2EM4R7E11OT		
	4.7	8×12	0.20	55	EWK2EM4R7F12OT	
		10×12	0.20	100	EWK2EM100G12OT	
	10	10×16	0.20	105	EWK2EM100G16OT	
		10×20	0.20	170	EWK2EM220G20OT	

WV (Vdc)	Cap (μF)	Size DxL(mm)	tanδ	Rated ripple current (mA _{RMS} /85°C, 120Hz)	Part Number
250(2E)	33	10×20	0.20	200	EWK2EM330G20OT
		12.5×20	0.20	230	EWK2EM330W20OT
	47	12.5×20	0.20	270	EWK2EM470W20OT
		12.5×25	0.20	295	EWK2EM470W25OT
	68	16×25	0.20	382	EWK2EM680L25OT
	100	16×25	0.20	450	EWK2EM101L25OT
		16×30	0.20	515	EWK2EM101L30OT
	120	16×30	0.20	530	EWK2EM121L30OT
150	16×30	0.20	570	EWK2EM151L30OT	
180	18×30	0.20	620	EWK2EM181M30OT	
350(2V)	0.47	6.3×11	0.24	15	EWK2VMR47E11OT
	1	6.3×11	0.24	22	EWK2VM010E11OT
	2.2	8×12	0.24	38	EWK2VM2R2F12OT
	3.3	8×12	0.24	46	EWK2VM3R3F12OT
	4.7	10×12	0.24	65	EWK2VM4R7G12OT
		10×12	0.24	90	EWK2VM100G12OT
	10	10×16	0.24	100	EWK2VM100G16OT
		10×20	0.24	120	EWK2VM100G20OT
	22	12.5×20	0.24	185	EWK2VM220W20OT
	33	16×25	0.24	275	EWK2VM330L25OT
	47	16×25	0.24	325	EWK2VM470L25OT
	68	16×25	0.24	405	EWK2VM680L25OT
	100	18×30	0.24	530	EWK2VM101M30OT
	400(2G)	1	6.3×11	0.24	22
2.2		8×12	0.24	38	EWK2GM2R2F12OT
3.3		10×12	0.24	54	EWK2GM3R3G12OT
4.7		10×12	0.24	60	EWK2GM4R7G12OT
		10×16	0.24	75	EWK2GM4R7G16OT
10		10×16	0.24	100	EWK2GM100G16OT
		10×20	0.24	120	EWK2GM100G20OT
22		12.5×25	0.24	205	EWK2GM220W25OT
33		16×25	0.24	275	EWK2GM330L25OT
47		16×25	0.24	325	EWK2GM470L25OT
		16×30	0.24	350	EWK2GM470L30OT
56		16×30	0.24	385	EWK2GM560L30OT
68	18×25	0.24	420	EWK2GM680M25OT	
82	18×30	0.24	475	EWK2GM820M30OT	
100	18×35	0.24	545	EWK2GM101M35OT	
450(2W)	1	8×12	0.24	16	EWK2WM010F12OT
	2.2	8×12	0.24	32	EWK2WM2R2F12OT
		10×12	0.24	35	EWK2WM2R2G12OT
	3.3	10×12	0.24	40	EWK2WM3R3G12OT
		10×16	0.24	44	EWK2WM3R3G16OT
	4.7	10×12	0.24	50	EWK2WM4R7G12OT
		10×16	0.24	58	EWK2WM4R7G16OT
	10	10×20	0.24	65	EWK2WM4R7G20OT
		10×20	0.24	80	EWK2WM100G20OT
	22	12.5×20	0.24	92	EWK2WM100W20OT
		12.5×25	0.24	150	EWK2WM220W25OT
	33	16×25	0.24	165	EWK2WM220L25OT
		16×30	0.24	215	EWK2WM330L30OT
	47	16×30	0.24	260	EWK2WM470L30OT
16×35		0.24	280	EWK2WM470L35OT	
68	18×30	0.24	370	EWK2WM680M30OT	
82	18×35	0.24	390	EWK2WM820M35OT	
100	18×40	0.24	420	EWK2WM101M40OT	

Radial Type