

WK Series

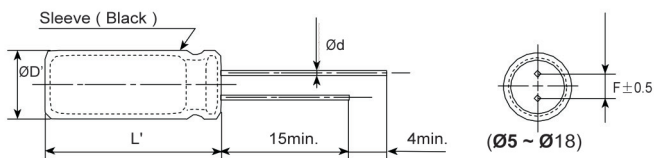
- Standard series for general purpose
- Endurance: +85°C 2,000 hours
- RoHS Compliant



SPECIFICATIONS

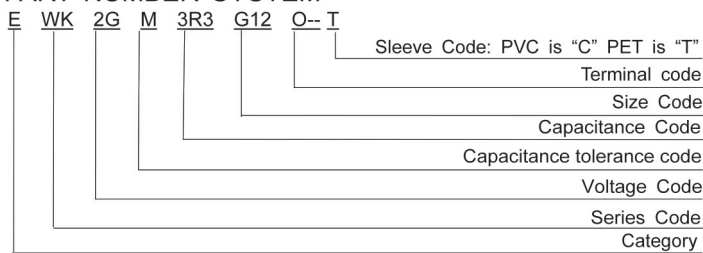
Items	Characteristics															
Category																
Temperature Range	-40 to +85℃(6.3 to 100V _{dc})								-25 to +85℃(160 to 450V _{dc})							
Rated Voltage Range	6.3 to 450V _{dc}															
Capacitance Tolerance	±20%(M) (at 20℃, 120Hz)															
Leakage Current	6.3 to 100V _{dc}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

DIMENSIONS [mm]



ΦD	5	6.3	8	10	12.5	16	18
Φd	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
ΦD'	ΦD+0.5max.						
L'	L+2max.						

PART NUMBER SYSTEM



※Sleeve code and Terminal Code should follow the part number system

RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current Φ5 to Φ18

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.

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◆ STANDARD RATINGS

WV (Vdc)	Cap (μ F)	Case size $\Phi D \times L$ (mm)	$\tan \delta$	Ripple current (mA rms/85°C, 120Hz)
6.3(0J)	33	5×11	0.24	65
	47	5×11	0.24	80
	100	5×11	0.24	135
	220	5×12	0.24	220
	330	6.3×11	0.24	280
	470	6.3×12	0.24	360
	1000	8×12	0.24	590
	2200	10×20	0.26	1000
	3300	10×25	0.28	1200
	4700	13×20	0.30	1550
	6800	13×25	0.34	1920
	10000	16×25	0.42	2370
	15000	16×35	0.52	2880
	22000	18×40	0.66	3350
10(1A)	22	5×11	0.20	60
	33	5×11	0.20	75
	47	5×11	0.20	95
	100	5×11	0.20	140
	220	5×12	0.20	240
	330	6.3×11	0.20	310
	470	6.3×12	0.20	400
	1000	10×13	0.20	660
	2200	10×20	0.22	1090
	3300	13×20	0.24	1450
	4700	13×25	0.26	1800
	6800	16×25	0.30	2250
	10000	16×35	0.38	2710
	15000	18×35	0.48	3120
16(1C)	10	5×11	0.16	50
	22	5×11	0.16	65
	33	5×11	0.16	80
	47	5×11	0.16	115
	100	5×11	0.16	175
	220	6.3×11	0.16	280
	330	8×11	0.16	380
	470	8×11	0.16	460
	1000	10×16	0.16	800
	2200	13×20	0.18	1320
	3300	13×25	0.20	1670
	4700	16×25	0.22	2120
	6800	16×30	0.26	2550
25(1E)	4.7	5×11	0.14	30
	10	5×11	0.14	45
	22	5×11	0.14	70
	33	5×11	0.14	98
	47	5×11	0.14	120
	100	6.3×11	0.14	190
	220	8×11	0.14	330
	330	8×12	0.14	440
	470	10×13	0.14	550
	1000	10×20	0.14	970
	2200	13×25	0.16	1570
	3300	16×25	0.18	2000
	4700	16×30	0.20	2450

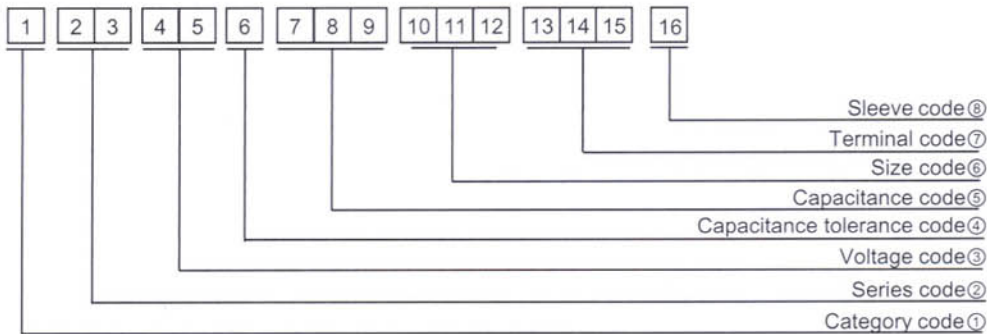
WV (Vdc)	Cap (μ F)	Case size $\Phi D \times L$ (mm)	$\tan \delta$	Ripple current (mA rms/85°C, 120Hz)
35(1V)	4.7	5×11	0.12	40
	10	5×11	0.12	55
	22	5×11	0.12	90
	33	5×11	0.12	110
	47	5×11	0.12	135
	100	6.3×11	0.12	215
	220	8×12	0.12	385
	330	10×13	0.12	500
	470	10×16	0.12	680
	1000	13×20	0.12	1180
	2200	16×25	0.14	1810
	3300	16×35	0.16	2300
	4700	18×35	0.18	2750
50(1H)	0.1	5×11	0.10	1.3
	0.22	5×11	0.10	2.9
	0.33	5×11	0.10	4.3
	0.47	5×11	0.10	7.0
	1	5×11	0.10	17
	2.2	5×11	0.10	28
	3.3	5×11	0.10	35
	4.7	5×11	0.10	41
	10	5×11	0.10	60
	22	5×11	0.10	95
	33	6.3×11	0.10	130
	47	6.3×11	0.10	160
	100	8×11	0.10	270
	220	10×16	0.10	435
63(1J)	330	10×20	0.10	590
	470	10×20	0.10	760
	1000	13×25	0.10	1350
	2200	16×35	0.12	2110
	3300	18×35	0.14	2550
	4.7	5×11	0.09	45
	10	5×11	0.09	70
	22	6.3×11	0.09	110
	33	6.3×11	0.09	140
	47	6.3×12	0.09	190
	100	10×13	0.09	300
	220	10×16	0.09	490
	330	10×20	0.09	710
	470	13×20	0.09	900
100(1K)	1000	16×25	0.09	1350
	2200	18×35	0.11	2330
	0.1	5×11	0.08	2.1
	0.22	5×11	0.08	4.7
	0.33	5×11	0.08	7.0
	0.47	5×11	0.08	10
	1	5×11	0.08	21
	2.2	5×11	0.08	35
	3.3	5×11	0.08	45
	4.7	5×11	0.08	50
	10	6.3×11	0.08	75
	22	8×11	0.08	135
	33	8×12	0.08	185

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◆ STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size ΦD×L(mm)	tanδ	Ripple current (mA _{rms} /85℃,120Hz)	WV (Vdc)	Cap (μF)	Case size ΦD×L(mm)	tanδ	Ripple current (mA _{rms} /85℃,120Hz)
100(1K)	47	10×13	0.08	235	250(2E)	33	10×20	0.20	200
	100	10×20	0.08	380		33	12.5×20	0.20	230
	220	13×25	0.08	630		47	12.5×20	0.20	270
	330	13×30	0.08	760		47	12.5×25	0.20	295
	470	16×30	0.08	1000		68	16×25	0.20	382
	1000	18×40	0.08	1350		100	16×25	0.20	450
160(2C)	0.47	6.3×11	0.20	10		100	16×30	0.20	515
	1	6.3×11	0.20	15		120	16×30	0.20	530
	2.2	6.3×11	0.20	30		150	16×30	0.20	570
	3.3	6.3×11	0.20	40		180	18×30	0.20	620
	4.7	6.3×11	0.20	48	350(2V)	0.47	6.3×11	0.24	15
	10	8×12	0.20	80		1	6.3×11	0.24	22
	10	10×12	0.20	94		2.2	8×12	0.24	38
	22	10×12	0.20	130		3.3	8×12	0.24	46
	22	10×16	0.20	150		4.7	10×12	0.24	65
	22	10×20	0.20	170		10	10×12	0.24	90
	33	10×16	0.20	180		10	10×16	0.24	100
	33	10×20	0.20	210		10	10×20	0.24	120
	47	10×20	0.20	240		22	12.5×20	0.24	185
	47	12.5×20	0.20	280		33	16×25	0.24	275
	68	12.5×20	0.20	360		47	16×25	0.24	325
	100	12.5×25	0.20	470		68	16×25	0.24	405
	150	16×20	0.20	520		100	18×30	0.24	530
	180	16×25	0.20	600	400(2G)	1	6.3×11	0.24	22
	220	16×30	0.20	780		2.2	8×12	0.24	38
	270	18×30	0.20	860		3.3	10×12	0.24	54
	330	18×35	0.20	1000		4.7	10×12	0.24	60
	390	18×35	0.20	1020		4.7	10×16	0.24	75
	470	18×40	0.20	1220		10	10×16	0.24	100
200(2D)	0.47	6.3×11	0.20	10		10	10×20	0.24	120
	1	6.3×11	0.20	15		22	12.5×25	0.24	205
	2.2	6.3×11	0.20	34		33	16×25	0.24	275
	3.3	6.3×11	0.20	45		47	16×25	0.24	325
	4.7	6.3×11	0.20	55		47	16×30	0.24	350
	4.7	8×12	0.20	60		56	16×30	0.24	385
	10	10×12	0.20	100		68	18×25	0.24	420
	22	10×20	0.20	170		82	18×30	0.24	475
	33	10×20	0.20	205		100	18×35	0.24	545
	47	12.5×20	0.20	270	450(2W)	1	8×12	0.24	16
	68	12.5×25	0.20	370		2.2	8×12	0.24	32
	100	16×25	0.20	475		2.2	10×12	0.24	35
	150	16×25	0.20	550		3.3	10×12	0.24	40
	180	18×25	0.20	620		3.3	10×16	0.24	44
	220	18×35	0.20	810		4.7	10×12	0.24	50
	270	18×35	0.20	870		4.7	10×16	0.24	58
	330	18×35	0.20	1000		4.7	10×20	0.24	65
	330	18×40	0.20	1020		10	10×20	0.24	80
250(2E)	0.47	6.3×11	0.20	10		10	12.5×20	0.24	92
	1	6.3×11	0.20	16		22	12.5×25	0.24	150
	2.2	6.3×11	0.20	34		22	16×25	0.24	165
	3.3	6.3×11	0.20	42		33	16×30	0.24	215
	3.3	8×12	0.20	46		47	16×30	0.24	260
	4.7	6.3×11	0.20	50		47	16×35	0.24	280
	4.7	8×12	0.20	55		68	18×30	0.24	370
	10	10×12	0.20	100		82	18×35	0.24	390
	10	10×16	0.20	105		100	18×40	0.24	420
	22	10×20	0.20	170					

● Part Number System



①Category

Type	Code
	1th
Electrolytic Capacitor	E

②Series code

Series name	Code	
	2 th	3 th
WH	W	H
CD11GE	G	E

③Voltage code

WV (V)	Code	
	4th	5th
4	0	G
6.3	0	J
10	1	A
16	1	C
25	1	E
35	1	V
40	1	G
50	1	H
63	1	J
80	1	B
100	1	K
160	2	C
180	2	L
200	2	D
220	2	N
250	2	E
315	2	F
350	2	V
380	2	P
400	2	G
420	2	T
450	2	W
500	2	H

④ Capacitance Tolerance

Tol. (%)	Code
	6th
-10 ~ +10	K
-20 ~ +20	M
-10 ~ +30	Q
-10 ~ +50	T
-10 ~ +20	V
-0 ~ +20	A
-0 ~ +30	
-5 ~ +20	C
-10 ~ -20	B
-5 ~ +5	D
-0 ~ +10	E
-5 ~ +20	F
-15 ~ +5	N

⑤Capacitance code

Cap (μF)	Code		
	7th	8th	9th
0.10	0	R	1
0.22	R	2	2
0.33	R	3	3
0.47	R	4	7
0.68	R	6	8
1	0	1	0
2.2	2	R	2
3.3	3	R	3
4.7	4	R	7
6.8	6	R	8
10	1	0	0
22	2	2	0
33	3	3	0
47	4	7	0
68	6	8	0
100	1	0	1
220	2	2	1
330	3	3	1
470	4	7	1
680	6	8	1
1000	1	0	2
2200	2	2	2
3300	3	3	2
4700	4	7	2
6800	6	8	2
10000	1	0	3
22000	2	2	3
33000	3	3	3
68000	6	8	3

⑥ Size code

ΦD	Code	L	Code	
	10th		11th	12th
4	C	5	0	5
5	D	7	0	7
6.3	E	11	1	1
8	F	12	1	2
10	G	16	1	6
11	H	20	2	0
12	J	25	2	5
12.5	W	30	3	0
13	K	35	3	5
14	X	40	4	0
16	L	46	4	6
18	M	50	5	0
19	Z	60	6	0
20	N	80	8	0
22	O	100	A	0
25	P	115	B	5
30	Q	120	C	0
35	R	130	D	0
40	Y	140	E	0
51	S	160	G	0
63.5	T	200	K	0
76	U			
89	V			

⑦Terminal Code

Specification	Code	Size	
	13th	14th	15th
Bulk packing	O	-	-
Taping F=5.0mm	P	5	0
Lead Cut L=3.5mm	C	3	5
Lead Cut L=11.0mm	C	B	0
Lead Forming & cut L=4.5mm	F	4	5
Kink & cut L=4.5mm	J	4	5
Snap-in type	K	4	0
Terminal 4.0mm in Length			
Horizontal mounting Terminal	M	-	-
Screw Terminal	S	-	-
Lug Terminal	L	-	-
Three terminals	T	-	-
Four terminals	Q	-	-
Five terminals	Y	-	-

⑧Sleeve Code

Sleeve	Code
	16th
PVC	C
PET	T