

RF series

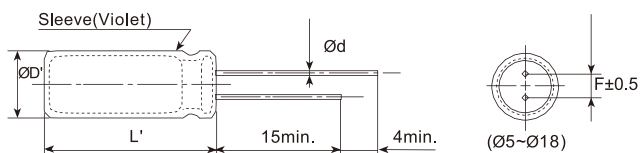
- Ultra-low impedance, high ripple current
- Endurance: +105°C 3,000~6,000 hours
- RoHS Compliant



SPECIFICATIONS

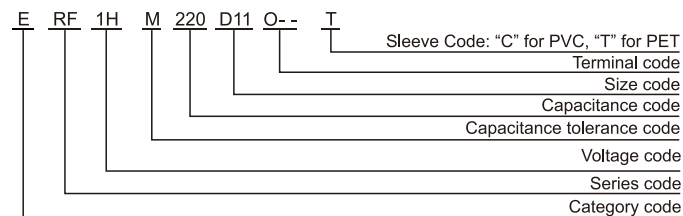
Items	Characteristics										
Category Temperature Range	-40~+105°C										
Rated Voltage Range	6.3~120 V _{dc}										
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)										
Leakage Current	I≤0.01CV or 3μA, whichever is greater. Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)										
Dissipation Factor (tanδ)	Rated Voltage(V _{dc})	6.3	10	16	25	35	50	63	80	100	120
	tanδ (max.)	0.15	0.14	0.12	0.10	0.10	0.08	0.08	0.08	0.08	0.12
	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	80	100	120
	Z(-25°C)/Z(+20°C)	5	4	3						3	
	Z(-40°C)/Z(+20°C)	10	8	5	4						6 (at 120Hz)
Endurance	The following specifications shall be met when the capacitors are restored to 20°C after DC voltage plus rated ripple current is applied for a specified period of time at 105 °C.										
	Capacitance Change		≤±25% of the initial value						Dia.		Load life (hours)
	D.F. (tanδ)		≤200% of the initial specified value						ØD≤6.3		3,000
	Leakage Current		≤The initial specified value						ØD=8		4,000
									ØD=10		5,000
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.										
	Capacitance Change		≤±25% of the initial value						ØD≥12.5		6,000
	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)	120	1k	10k	100k
Cap.(μF)				
Cap.<220	0.40	0.75	0.90	1.00
220≤Cap.<680	0.50	0.85	0.94	1.00
680≤Cap.<2200	0.60	0.87	0.95	1.00
2200≤Cap.<4700	0.75	0.90	0.95	1.00
Cap.≥4700	0.85	0.95	0.98	1.00

RF series

■ STANDARD RATINGS

WV (V _{dc})	Cap (μF)	Size ΦDxL(mm)	tanδ	Impedance (Ω _{max} /20°C, 100kHz)	Rated ripple current (mA _{rms} /105°C, 100kHz)
6.3(0J)	150	5*11	0.15	0.29	300
		6.3*9	0.15	0.37	270
	220	6.3*11	0.15	0.205	377
		8*9	0.15	0.26	337
	330	6.3*11	0.15	0.12	455
		8*9	0.15	0.15	408
	470	8*11	0.15	0.09	632
		10*9	0.15	0.12	565
	820	8*16	0.15	0.055	1045
	1000	8*16	0.15	0.052	1000
	1200	8*20	0.15	0.04	1300
		10*16	0.15	0.037	1480
	1500	10*20	0.15	0.022	1870
	2200	10*20	0.17	0.021	2200
	2700	10*25	0.17	0.02	2250
	3300	12.5*20	0.19	0.02	2410
	3900	12.5*25	0.19	0.017	2820
	4700	12.5*30	0.21	0.015	3340
10(1A)	100	5*11	0.14	0.29	300
		6.3*9	0.14	0.37	270
	220	6.3*11	0.14	0.12	455
		8*9	0.14	0.15	408
	470	8*11	0.14	0.071	810
		10*9	0.14	0.092	720
	680	8*16	0.14	0.055	1046
		10*12.5	0.14	0.052	1080
	1000	8*20	0.14	0.04	1300
		10*16	0.14	0.037	1480
	1200	10*20	0.14	0.022	1870
	1500	10*20	0.14	0.021	2220
	2200	12.5*20	0.16	0.02	2410
	3300	12.5*25	0.18	0.017	2820
	3900	12.5*30	0.18	0.015	3340
	4700	12.5*35	0.20	0.014	3450
	5600	16*25	0.22	0.015	3510
16(1C)	56	5*11	0.12	0.29	300
		6.3*9	0.12	0.37	270
	120	6.3*11	0.12	0.12	455
		8*9	0.12	0.15	408
	150	6.3*11	0.12	0.096	632
		8*9	0.12	0.12	565
	220	6.3*12	0.12	0.084	721
		8*9	0.12	0.1	650
	330	8*11	0.12	0.071	810
		10*9	0.12	0.092	720
	470	8*16	0.12	0.055	1045
		10*12.5	0.12	0.052	1080
	680	8*20	0.12	0.04	1300
		10*16	0.12	0.04	1480
	1000	10*20	0.12	0.022	1870
	1200	10*25	0.12	0.021	2200
	1500	12.5*20	0.12	0.02	2410
	2200	12.5*25	0.14	0.017	2820
		12.5*30	0.14	0.015	3340
	2700	16*20	0.14	0.017	3190
		12.5*35	0.16	0.014	3450
	3300	16*25	0.16	0.016	3350
	3900	16*25	0.16	0.015	3510

WV (V _{dc})	Cap (μF)	Size ΦDxL(mm)	tanδ	Impedance (Ω _{max} /20°C, 100kHz)	Rated ripple current (mA _{rms} /105°C, 100kHz)
25(1E)	47	5*11	0.10	0.29	300
		6.3*9	0.10	0.37	270
	100	6.3*11	0.10	0.12	455
		8*9	0.10	0.15	408
	220	8*11	0.10	0.071	810
		10*9	0.10	0.092	720
	330	8*16	0.10	0.055	1045
		10*12.5	0.10	0.052	1080
	390	8*20	0.10	0.044	1236
	470	10*16	0.10	0.037	1480
	560	10*16	0.10	0.03	1675
	680	10*20	0.10	0.022	1870
	820	10*25	0.10	0.021	2200
	1000	12.5*20	0.10	0.019	2550
	1500	12.5*25	0.10	0.017	2820
	1800	12.5*30	0.10	0.015	3340
		16*20	0.10	0.017	3190
	2200	12.5*35	0.12	0.014	3450
35(1V)	33	5*11	0.10	0.29	300
		6.3*9	0.10	0.37	270
	56	6.3*11	0.10	0.12	455
		8*9	0.10	0.15	408
	100	8*11	0.10	0.095	632
		10*9	0.10	0.12	565
	150	8*11	0.10	0.071	810
		10*9	0.10	0.092	720
	220	8*16	0.10	0.055	1045
		10*12.5	0.10	0.052	1080
	270	8*20	0.10	0.04	1300
	330	10*16	0.10	0.037	1480
	470	10*20	0.10	0.022	1870
	560	10*25	0.10	0.021	2200
	680	12.5*20	0.10	0.02	2410
	1000	12.5*25	0.10	0.017	2820
	1200	12.5*30	0.10	0.015	3340
50(1H)	22	5*11	0.08	0.33	288
		6.3*9	0.08	0.43	260
	56	6.3*11	0.08	0.13	435
		8*9	0.08	0.17	390
	100	8*11	0.08	0.073	774
		10*9	0.08	0.095	695
	120	8*16	0.08	0.06	1000
	150	10*12.5	0.08	0.06	1029
	180	8*20	0.08	0.045	1240
	220	10*16	0.08	0.041	1420
	270	10*20	0.08	0.029	1630
	330	10*25	0.08	0.027	1920
	470	12.5*20	0.08	0.026	2100
	560	12.5*25	0.08	0.022	2460
	680	12.5*30	0.08	0.02	2910
	820	12.5*35	0.08	0.018	3010
		16*20	0.08	0.022	2780
	1000	16*25	0.08	0.02	3060

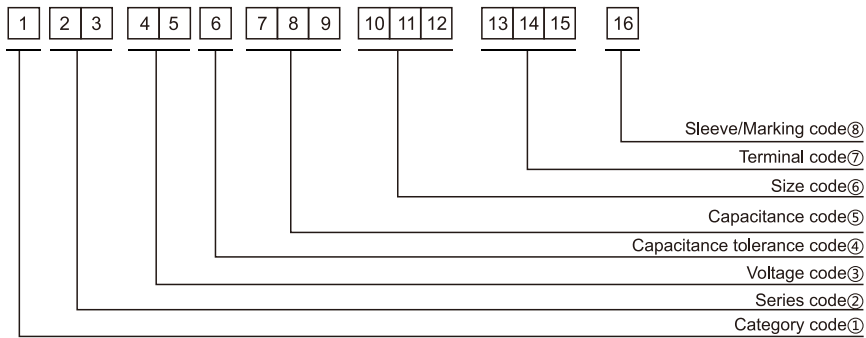
RF series

STANDARD RATINGS

WV (V _{dc})	Cap (μF)	Size ΦDxL(mm)	tanδ	Impedance (Ω _{max} /20°C, 100kHz)	Rated ripple current (mA _{rms} /105°C, 100kHz)
63(1J)	15	5*11	0.08	0.88	165
		6.3*9	0.08	1.14	148
	33	6.3*11	0.08	0.35	265
		8*9	0.08	0.45	235
	56	8*11	0.08	0.22	500
		10*9	0.08	0.28	450
	82	8*16	0.08	0.16	665
		10*12.5	0.08	0.11	690
	120	8*20	0.08	0.12	820
		10*16	0.08	0.076	950
	180	10*20	0.08	0.056	1150
		12.5*16	0.08	0.072	1150
	220	10*25	0.08	0.046	1350
	270	12.5*20	0.08	0.041	1500
	390	12.5*25	0.08	0.031	1900
		12.5*30	0.08	0.028	2300
	470	16*20	0.08	0.032	2000
		12.5*35	0.08	0.024	2500
	680	12.5*40	0.08	0.021	2800
		16*25	0.08	0.025	2600
	820	18*20	0.08	0.03	2500
		16*30	0.08	0.021	2850
	1000	18*25	0.08	0.024	2800
		16*35	0.08	0.019	2900
	1200	16*40	0.08	0.018	3400
		18*30	0.08	0.02	3300
	1500	18*35	0.08	0.018	3400
	1800	18*40	0.08	0.017	3500
80(1B)	68	10*12.5	0.08	0.17	480
	100	10*16	0.08	0.11	600
	120	10*20	0.08	0.084	800
		10*25	0.08	0.069	900
	150	12.5*16	0.08	0.11	750
		12.5*20	0.08	0.062	1100
	330	12.5*25	0.08	0.047	1250
		16*20	0.08	0.048	1350
	390	12.5*30	0.08	0.042	1500
		12.5*35	0.08	0.036	1650
	470	16*25	0.08	0.038	1700
		18*20	0.08	0.045	1500
	560	12.5*40	0.08	0.032	1800
		16*30	0.08	0.032	1850
	680	18*25	0.08	0.036	1750
		16*35	0.08	0.029	2000
	820	18*30	0.08	0.03	1900
		16*40	0.08	0.027	2200
	1000	18*35	0.08	0.027	2200
		18*40	0.08	0.026	2700

WV (V _{dc})	Cap (μF)	Size ΦDxL(mm)	tanδ	Impedance (Ω _{max} /20°C, 100kHz)	Rated ripple current (mA _{rms} /105°C, 100kHz)
100(1K)	6.8	5*11	0.08	1.4	125
		6.3*9	0.08	1.8	110
	15	6.3*11	0.08	0.57	205
		8*9	0.08	0.74	180
	27	8*12	0.08	0.36	355
		10*9	0.08	0.47	320
	39	8*16	0.08	0.25	450
	47	10*12.5	0.08	0.17	480
	56	8*20	0.08	0.19	565
	68	10*16	0.08	0.11	600
	82	10*20	0.08	0.084	800
	100	12.5*16	0.08	0.11	750
	120	10*25	0.08	0.069	900
	150	12.5*20	0.08	0.062	1100
	220	12.5*25	0.08	0.047	1250
		16*20	0.08	0.048	1350
	270	12.5*30	0.08	0.042	1500
		12.5*35	0.08	0.036	1650
	330	16*25	0.08	0.038	1700
		18*20	0.08	0.045	1500
	390	12.5*40	0.08	0.032	1800
	470	16*30	0.08	0.032	1850
		18*25	0.08	0.036	1750
	560	16*35	0.08	0.029	2000
		18*30	0.08	0.03	1900
	680	16*40	0.08	0.027	2200
		18*35	0.08	0.027	2200
	820	18*40	0.08	0.026	2700
120(2B)	10	6.3*11	0.12	5.5	80
	15	6.3*12	0.12	4.5	100
	18	8*9	0.12	4.0	120
	22	8*12	0.12	3.5	130
		8*16	0.12	3.0	220
	33	10*12.5	0.12	3.0	220
		8*20	0.12	2.5	270
	47	10*16	0.12	2.5	270
		10*16	0.12	2.2	285
	68	10*16	0.12	2.0	285
	82	10*20	0.12	1.8	300
	100	10*25	0.12	1.5	380
	120	12.5*20	0.12	1.3	520
	150	12.5*25	0.12	1.0	570
	220	13*30	0.12	0.75	700
		16*20	0.12	0.75	700
	270	16*25	0.12	0.55	800
		18*20	0.12	0.55	800
	330	16*30	0.12	0.42	860
		18*25	0.12	0.42	860
	470	16*40	0.12	0.30	960
		18*30	0.12	0.30	960

Part Numbering System



① Category code

Type	Code
	1
Electrolytic Capacitor	E
Conductive Polymer	S

③ Voltage code

WV (V _{dc})	Code	
	4	5
2.5	0	E
3	0	D
4	0	G
6.3	0	J
6.8	0	C
7	0	Q
7.5	0	A
10	1	A
12	1	T
16	1	C
25	1	E
35	1	V
40	1	G
50	1	H
63	1	J
80	1	B
100	1	K
120	2	B
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
550	2	J
600	2	K

④ Capacitance tolerance code

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

⑤ Capacitance code

Cap (μF)	Code		
	7	8	9
0.10	R	1	0
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

② Series code

Series name	Code	
	2	3
WH	W	H
CD11GE	G	E
CD11GES	G	X
CD11GAS	G	W
CD11GHS	G	S
NR	N	R
PZ	P	Z

⑥ Size code

ΦD (mm)	Code
4	C
5	D
6.3	E
8	F
10	G
11	H
12	J
12.5	W
13	K
14	X
16	L
18	M
19	Z
20	N
22	O
25	P
30	Q
35	R
40	Y
51.6	S
64.3	T
76.9	U
91	V
100	A

L (mm)	Code	
	11	12
5	0	5
7	0	7
11	1	1
12	1	2
16	1	6
20	2	0
25	2	5
30	3	0
35	3	5
40	4	0
46	4	6
50	5	0
60	6	0
80	8	0
100	A	0
115	B	5
120	C	0
130	D	0
140	E	0
160	G	0
200	K	0
220	M	0
236	N	6
250	P	0

⑦ Terminal code

Specification	Code	Size	
	13	14	15
Bulk packing	O	-	-
Taping (SMD Type)	D	0	0
Φ4~8 Taping F=5.0mm	P	5	0
Φ10~12.5 Taping F=5.0mm	B	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	-	-
Kink & Cut L=4.5mm	J	-	-
Snap-in type Terminal 4.0mm in length	K	-	-
Three Terminals	T	-	-
Ring clip mounting standard design	A	0	0
Ring clip mounting special design	S	-	-

⑧ Sleeve/Marking code

Sleeve/Marking	Code
	16
PVC	C
PET	T
Dark blue	B
Bright red	R
Sky-blue	S
Light blue	T
Pink	Z
Black	H
Purple-blue	V
Red	O