Upgrade!

RS SERIES

- High performance, high reliability
- Low impedance, high ripple current, long life
- Lifetime +105℃4,000 to 10,000 hours
- RoHS Compliant

◆SPECIFICATIONS

Items	Characteristics
Category Temperature Range	-40 to +105℃
Rated Voltage Range	6.3 to 100Vdc
Capacitance Tolerance	±20%(M) (at 20℃, 120Hz)
Leakage Current	I≤0.01CVor 3μA , whichever is greater. Where, I : Max. leakage Current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 2 minutes)

Dissipation Factor (tan δ)

Rated voltage (Vdc)	6.3	10	16	25	35	50	63	100
tan δ (Max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08

When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase (at 20℃ 120Hz)

Low Temperature Characteristics (Max. Impedance Ratio)

Rated voltage (Vdc)	6.3	10	16	25	35	50	63	100
Z(-25℃)/Z(+20℃)	4	3	2					
Z(-40℃)/Z(+20℃)	8	6	4	3				

(at, 120Hz)

Endurance

The following specification shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for the specified period of time at 105℃.

Capacitance change	≤±20% of the initial value(6.3V,10V: ≤±30%)
D.F. (tan δ)	≤200% of the initial specified value
Leakage current	≤The initial specified value

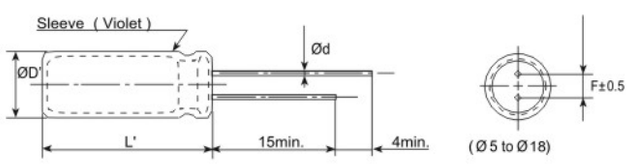
Case Dia.	Lifetime (hours)	
	6.3~10V	16~100V
ØD≤ 6.3	4,000	5,000
ØD= 8 &10	6,000	7,000
ØD≥12.5	8,000	10,000

Shelf Life

The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1000 hours at 105℃ without voltage applied.

Capacitance change	≤±20% of the initial value(6.3V,10V: ≤±30%)
D.F. (tan δ)	≤200% of the initial specified value
Leakage current	≤200%The initial specified value

◆DIMENSIONS [mm]



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

◆PART NUMBERING SYSTEM

E RS 1H M 220 D11 O-- T

- T — Sleeve Code: PVC is "C" PET is "T"
- O-- — Terminal code
- D11 — Size code
- 220 — Capacitance code
- M — Capacitance tolerance code
- 1H — Voltage code
- RS — Series code
- E — Category

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

◆RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Freq.(Hz) / Cap(μF)	50/60	120	1K	10K	100K
6.8 to 33	0.45	0.55	0.75	0.90	1.00
39 to 330	0.60	0.70	0.85	0.95	1.00
390 to 1000	0.65	0.75	0.90	0.98	1.00
1200 to 1800	0.75	0.80	0.95	1.00	1.00

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

RS SERIES

Upgrade!

◆STANDARD RATINGS (Impedance : at 20℃100KHz /Ωmax , Ripple current :mArms/ 105℃ -100KHz)

WV (Vdc)	Cap (μF)	Case size ΦD×L(mm)	tanδ	Impedance (Ωmax)	Ripple current (mArms)
6.3(0J)	150	5×11	0.22	0.57	200
	330	6.3×11	0.22	0.21	350
	680	8×12	0.22	0.13	660
	1000	8×16	0.22	0.086	850
	1200	8×20	0.22	0.070	1050
	820	10×12	0.22	0.080	870
	1200	10×16	0.22	0.060	1230
	1500	10×20	0.22	0.046	1400
	2200	10×20	0.24	0.042	1650
	2700	10×30	0.24	0.030	1920
	1800	12.5×16	0.22	0.049	1450
	3300	12.5×20	0.26	0.035	1910
	3900	12.5×25	0.26	0.026	2230
	4700	12.5×30	0.28	0.024	2650
	5600	12.5×35	0.30	0.020	2880
	6800	12.5×40	0.32	0.017	3350
	2700	16×16	0.24	0.041	1950
	5600	16×20	0.30	0.027	2530
	6800	16×25	0.32	0.020	2930
	8200	16×31.5	0.36	0.017	3450
	10000	16×35.5	0.40	0.015	3610
	12000	16×40	0.44	0.013	4100
	3900	18×16	0.26	0.043	2210
	6800	18×20	0.32	0.026	2860
	10000	18×25	0.40	0.019	3140
	12000	18×31.5	0.44	0.015	4170
	15000	18×35.5	0.50	0.014	4220
	18000	18×40	0.56	0.012	4300
10(1A)	100	5×11	0.19	0.57	200
	220	6.3×11	0.19	0.21	350
	470	8×11.5	0.19	0.13	660
	680	8×16	0.19	0.086	850
	1000	8×20	0.19	0.069	1050
	680	10×12.5	0.19	0.080	870
	1000	10×16	0.19	0.060	1230
	1200	10×20	0.19	0.046	1400
	1500	10×25	0.19	0.042	1650
	2200	10×30	0.19	0.030	1920
	1500	12.5×16	0.19	0.049	1450
	2200	12.5×20	0.21	0.035	1910
	3300	12.5×25	0.23	0.026	2230
	3900	12.5×30	0.23	0.024	2650
	4700	12.5×35	0.25	0.020	2880
	5600	12.5×40	0.27	0.017	3350
	2200	16×16	0.21	0.041	1950
	3900	16×20	0.23	0.027	2530
	5600	16×25	0.27	0.021	2930
	6800	16×31.5	0.29	0.017	3450
	8200	16×35.5	0.33	0.015	3610
	10000	16×40	0.37	0.013	4100
	2700	18×16	0.21	0.043	2210
	5600	18×20	0.27	0.026	2860
	6800	18×25	0.29	0.019	3140
	8200	18×31.5	0.33	0.015	4170
	10000	18×35.5	0.37	0.014	4220
	12000	18×40	0.41	0.012	4300

WV (Vdc)	Cap (μF)	Case size ΦD×L(mm)	tanδ	Impedance (Ωmax)	Ripple current (mArms)
16(1C)	56	5×11	0.16	0.57	200
	120	6.3×11	0.16	0.21	350
	330	8×11.5	0.16	0.13	660
	470	8×16	0.16	0.087	850
	680	8×20	0.16	0.069	1050
	470	10×12.5	0.16	0.080	870
	680	10×16	0.16	0.060	1230
	1000	10×20	0.16	0.046	1400
	1200	10×25	0.16	0.042	1650
	1500	10×30	0.16	0.031	1920
	1000	12.5×16	0.16	0.049	1450
	1500	12.5×20	0.16	0.035	1910
	2200	12.5×25	0.18	0.027	2230
	2700	12.5×30	0.18	0.024	2650
	3300	12.5×35	0.18	0.020	2880
	3900	12.5×40	0.18	0.017	3350
	1500	16×16	0.16	0.041	1950
	2700	16×20	0.16	0.027	2530
	3900	16×25	0.18	0.021	2930
	4700	16×31.5	0.20	0.017	3450
	5600	16×35.5	0.20	0.015	3610
	6800	16×40	0.22	0.013	4100
	2200	18×16	0.16	0.043	2210
	3900	18×20	0.18	0.026	2860
	4700	18×25	0.20	0.019	3140
	5600	18×31.5	0.20	0.015	4170
	8200	18×35.5	0.22	0.014	4220
	10000	18×40	0.24	0.012	4300
25(1E)	47	5×11	0.14	0.57	200
	100	6.3×11	0.14	0.21	350
	220	8×12	0.14	0.13	660
	330	8×16	0.14	0.086	850
	470	8×20	0.14	0.069	1050
	330	10×12.5	0.14	0.080	870
	470	10×16	0.14	0.060	1230
	680	10×20	0.14	0.046	1400
	820	10×25	0.14	0.042	1650
	1000	10×30	0.14	0.030	1920
	680	12.5×16	0.14	0.049	1450
	1000	12.5×20	0.14	0.035	1910
	1500	12.5×25	0.14	0.026	2230
	1800	12.5×30	0.14	0.024	2650
	2200	12.5×35	0.16	0.020	2880
	2700	12.5×40	0.16	0.017	3350
	1000	16×16	0.14	0.041	1950
	1800	16×20	0.14	0.027	2530
	2700	16×25	0.16	0.021	2930
	3300	16×31.5	0.18	0.017	3450
	3900	16×35.5	0.18	0.015	3610
	4700	16×40	0.20	0.013	4100
	1200	18×16	0.14	0.043	2210
	2200	18×20	0.16	0.026	2860
	3300	18×25	0.18	0.019	3140
	3900	18×31.5	0.18	0.015	4170
	4700	18×35.5	0.20	0.014	4220
	5600	18×40	0.22	0.012	4300

RS SERIES

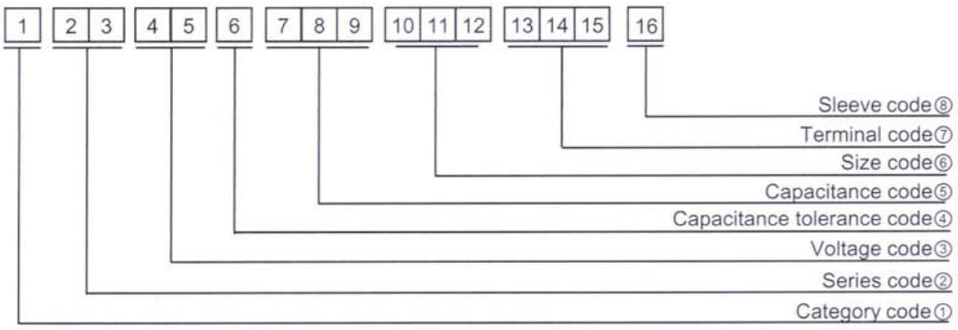
Upgrade!

◆STANDARD RATINGS (Impedance : at 20°C100KHz /Ωmax , Ripple current :mArms/ 105C 100KHz)

WV (Vdc)	Cap (μF)	Case size ΦD×L(mm)	tanδ	Impedance (Ωmax)	Ripple current (mArms)
35(1V)	33	5×11	0.12	0.57	200
	56	6.3×11	0.12	0.21	350
	150	8×11.5	0.12	0.13	660
	220	8×16	0.12	0.086	850
	270	8×20	0.12	0.069	1050
	220	10×12.5	0.12	0.080	870
	330	10×16	0.12	0.060	1230
	470	10×20	0.12	0.046	1400
	560	10×25	0.12	0.042	1650
	680	10×30	0.12	0.030	1920
	470	12.5×16	0.12	0.049	1450
	680	12.5×20	0.12	0.035	1910
	1000	12.5×25	0.12	0.026	2230
	1200	12.5×30	0.12	0.024	2650
	1500	12.5×35	0.12	0.020	2880
	1800	12.5×40	0.12	0.017	3350
	680	16×16	0.12	0.041	1950
	1200	16×25	0.12	0.027	2530
	1800	16×20	0.12	0.021	2930
	2200	16×31.5	0.14	0.017	3450
	2700	16×35.5	0.14	0.015	3610
	3300	16×40	0.16	0.012	4100
	1000	18×16	0.12	0.043	2210
	1800	18×20	0.12	0.026	2860
	2200	18×25	0.14	0.019	3140
	2700	18×31.5	0.14	0.015	4170
	3300	18×35.5	0.16	0.014	4220
	3900	18×40	0.16	0.011	4300
50(1H)	22	5×12	0.10	0.68	190
	56	6.3×11	0.10	0.30	300
	100	8×11.5	0.10	0.17	560
	120	8×16	0.10	0.12	740
	180	8×20	0.10	0.090	910
	150	10×12.5	0.10	0.12	760
	220	10×16	0.10	0.084	1050
	270	10×20	0.10	0.058	1230
	330	10×25	0.10	0.055	1440
	470	10×30	0.10	0.043	1700
	270	12.5×16	0.10	0.061	1260
	470	12.5×20	0.10	0.045	1660
	560	12.5×25	0.10	0.034	1960
	680	12.5×30	0.10	0.030	2310
	820	12.5×35	0.10	0.025	2510
	1000	12.5×40	0.10	0.021	2920
	470	16×16	0.10	0.055	1690
	820	16×20	0.10	0.034	2210
	1000	16×25	0.10	0.025	2560
	1200	16×31.5	0.10	0.021	3010
	1500	16×35.5	0.10	0.019	3150
	1800	16×40	0.10	0.016	3710
	560	18×16	0.10	0.054	1930
	1000	18×20	0.10	0.036	2490
	1200	18×25	0.10	0.026	2740
	1800	18×31.5	0.10	0.021	3640
	2200	18×35.5	0.12	0.017	3680
	2700	18×40	0.12	0.014	3800

WV (Vdc)	Cap (μF)	Case size ΦD×L(mm)	tanδ	Impedance (Ωmax)	Ripple current (mArms)
63(1J)	15	5×11	0.09	0.88	165
	33	6.3×12	0.09	0.35	265
	56	8×11.5	0.09	0.22	500
	82	8×16	0.09	0.16	665
	120	8×20	0.09	0.12	820
	82	10×12.5	0.09	0.11	690
	120	10×16	0.09	0.076	950
	180	10×20	0.09	0.056	1150
	180	12.5×16	0.09	0.072	1150
	220	10×25	0.09	0.046	1350
	330	12.5×20	0.09	0.041	1500
	390	12.5×25	0.09	0.031	1900
	470	12.5×30	0.09	0.028	2300
	470	16×20	0.09	0.032	2000
	560	12.5×35	0.09	0.024	2500
	680	12.5×40	0.09	0.021	2800
	680	16×25	0.09	0.025	2600
	680	18×20	0.09	0.030	2500
	820	16×31.5	0.09	0.021	2850
	820	18×25	0.09	0.024	2800
	1000	16×35.5	0.09	0.019	2900
	1200	16×40	0.09	0.018	3400
	1200	18×31.5	0.09	0.020	3300
	1500	18×35.5	0.09	0.018	3400
	1800	18×40	0.09	0.017	3500
100(1K)	6.8	5×11	0.08	1.4	125
	15	6.3×12	0.08	0.57	205
	27	8×11.5	0.08	0.36	355
	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
	220	16×20	0.08	0.048	1350
	270	12.5×30	0.08	0.042	1500
	330	12.5×35	0.08	0.036	1650
	330	16×25	0.08	0.038	1700
	330	18×20	0.08	0.045	1500
	390	12.5×40	0.08	0.032	1800
	470	16×31.5	0.08	0.032	1850
	470	18×25	0.08	0.036	1750
	560	16×35	0.08	0.029	2000
	560	18×31.5	0.08	0.030	1900
	680	16×40	0.08	0.027	2200
	680	18×35.5	0.08	0.027	2200
	820	18×40	0.08	0.026	2700

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
	10th
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	S
63.5	T
76	U
89	V

L	Code	
	11th	12th
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

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 Terminal 4.0mm in Length	K	4	0
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