

RS Series 85°C



Features

Extremely Long useful life

Applications

- ◆ Professional power supplies
- ◆ Frequency converters
- ◆ Uninterruptible power supplies

Features

- ◆ Wide temperature range
- ◆ All-welded construction ensures reliable electrical contact
- ◆ Self-extinguishing electrolyte
- ◆ RoHS-compatible

Construction

- ◆ Charge-discharge proof, polar
- ◆ Aluminum case with insulating sleeve
- ◆ Poles with screw terminal connections
- ◆ Mounting with ring clips, clamps or threaded stud

Specifications

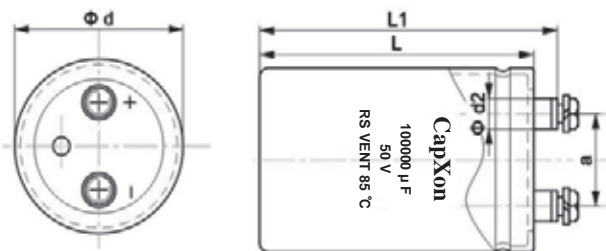
Item	Performance Characteristics					
Operating Temperature Range	-40 to +85°C					
Rated voltage V_R	10 to 100 V DC					
Surge voltage V_S	1.15 V_R					
Rated capacitance C_R	1800 to 1000000 μF					
Capacitance tolerance	$\pm 20\%$ (120Hz, +20°C)					
Leakage Current I_{leak} (+20°C.max.)	$I_{\text{leak}} = 0.018x(CxV)^{0.85} + 4$ or 5mA, whichever is smaller (after 5 minutes) Where, I_{leak} : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)					
Dissipation Factor ($\tan \delta$, at 20°C, 120Hz)	Less than the value under table(%)					
	ϕ D	35	51	63.5	76.2	89
	WV					
	10	75	100	120	150	180
	16	60	70	80	120	140
	25	40	50	70	80	130
	35	30	50	60	70	90
	40	30	50	60	70	90
	50	25	30	50	60	80
	63	20	25	30	40	60
80	20	20	25	30	50	
100	15	20	25	30	30	
Self-inductance ESL	d = 35 mm: approx. 10 nH					
	d = 51 mm: approx. 15 nH					
	d \geq 63.5 mm: approx. 20 nH					
Useful life 85°C; $V_R, I_{AC,R}$	>12000 h	Requirements:				
		$\Delta C/C \leq \pm 45\%$ of initial value $\tan \delta \leq 3$ times initial specified limit $I_{\text{leak}} \leq$ initial specified limit Failure rate $\leq 1\%/1000$ hour				
Voltage Endurance test 85°C; V_R	2000 h	Post test requirements:				
		$\Delta C/C \leq \pm 15\%$ of initial value $\tan \delta \leq 1.3$ times initial specified limit $I_{\text{leak}} \leq$ initial specified limit				
Vibration Resistance test	To IEC 60068-2-6, test Fc:					
	Displacement amplitude 0.75 mm, frequency range 10 ... 55 Hz, acceleration max. 10 g, duration 3x2 h. Capacitor mounted by its body which is rigidly clamped to the work surface.					
Characteristics at low temperature	Max. impedance ratio at 120 Hz					
	$Z_{25^\circ\text{C}} / Z_{20^\circ\text{C}}$	3				
	$Z_{-40^\circ\text{C}} / Z_{20^\circ\text{C}}$	12				
Sectional specification	IEC 60384-4 and JIS-C-5101					

Multiplier for Ripple Current vs. Frequency

Rated voltage (V)	Case diameter (Φ)	Frequency(Hz)				
		50	120	1K	10K	≥50K
10 to 50	35 to 89	0.95	1	1.05	1.09	1.12
63 & 80	35	0.9	1	1.1	1.18	1.22
	50 to 89	0.95	1	1.05	1.09	1.12
100	35	0.8	1	1.22	1.3	1.33
	50	0.9	1	1.1	1.18	1.22
	63.5 to 89	0.95	1	1.05	1.09	1.12

Dimensional drawings

Ring clip/clamp mounting:



M5:Min.reach of screw = 8mm
 M6:Min.reach of screw = 12mm
 M8:Min.reach of screw = 16mm

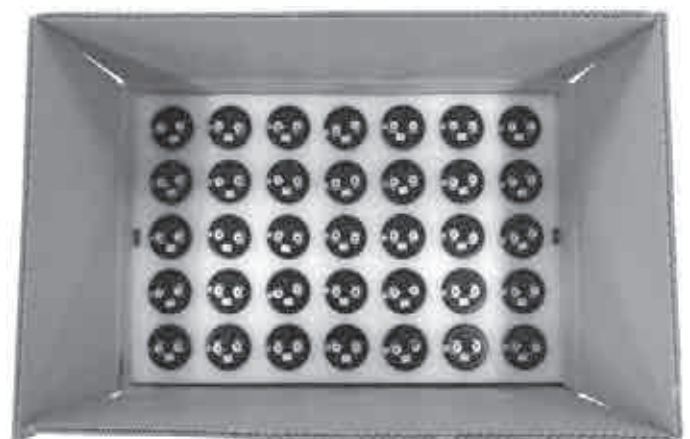
Dimensions

Terminal	Dimensions(mm) with insulating sleeve				
	d±2	L±3	L ₁ ±3	d ₂ max.	a±0.5
M5	35	50~120	56.5~126.5	10.3	12.7
M5	51	80~140	86.5~146.5	10.3	22
M5	63.5	80~140	86.5~146.5	10.3	28.6
M5	76.2/89	100~240	106.4~246.5	10.3	31.8
M6	76.2/89	100~240	106.4~246.5	17.5	31.8
M8	100	100~240	110~250	17.5	41.5

Packing

Capacitor diameter d(mm)	length l(mm)	Packing units (pcs.)
35	≤70mm	120
	>70mm	60
42	≤70mm	120
	>70mm	60
51	≤70mm	70
	>70mm	35
63.5	all	24
76.2	all	15
89	all	12
100	all	6

Packing of screw



Accessories

The following items are included in the delivery package, but are not fastened to the capacitors.

	Thread	Maximum torque
For terminals	M5	2 Nm
	M6	2.5 Nm
	M8	5.0 Nm
For mounting	M12	10 Nm

Case Size

WV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
10	33000	35x50	4.5	15	28
10	39000	35x50	4.8	13	24
10	47000	35x65	5.4	11	21
10	56000	35x65	6.0	10	18
10	68000	35x80	7.6	9	15
10	82000	35x80	7.7	8	12
10	100000	35x100	9.3	7	10
10	120000	35x120	9.5	6	10
10	150000	51x80	10.1	5	8.5
10	180000	51x80	10.8	5	8.6
10	220000	51x100	13.0	5	8.6
10	270000	51x120	14.0	4	7.6
10	330000	63.5x96	15.6	4	7.0
10	390000	63.5x100	16.2	4	6.7
10	470000	63.5x120	18.1	3	6.1
10	560000	76.2x100	18.4	3	5.7
10	680000	76.2x120	19.0	3	5.7
10	820000	76.2x155	24.0	3	5.7
16	22000	35x50	5.0	14	25
16	27000	35x50	6.3	12	22
16	33000	35x60	8.5	11	19
16	33000	35x80	9.5	11	19
16	47000	35x100	10.0	8	15
16	47000	35x80	9.0	8	15
16	56000	35x80	9.8	7	13
16	68000	35x100	10.5	7	13
16	68000	35x105	10.8	7	13
16	68000	51x80	12.0	7	13
16	82000	35x100	12.0	6	11
16	100000	35x120	12.5	5	10
16	100000	51x100	14.0	5	10
16	100000	51x80	13.0	5	10
16	120000	35x120	14.2	5	10
16	120000	51x80	14.8	5	10
16	150000	51x100	16.0	5	8.6
16	150000	51x140	17.2	5	8.6
16	150000	51x80	15.0	5	8.6
16	220000	51x120	14.5	4	7.6
16	220000	51x140	15.6	4	7.6
16	220000	63.5x105	17.0	4	7.6
16	220000	63.5x120	18.0	4	7.6
16	270000	63.5x100	18.5	4	6.7
16	270000	63.5x96	18.2	4	6.7
16	330000	63.5x105	19.0	4	6.7
16	330000	63.5x120	20.1	4	6.7
16	330000	63.5x140	21.5	4	6.7
16	330000	76.2x120	22.0	4	6.7
16	390000	63.5x130	22.5	3	5.7
16	390000	76.2x100	22.8	3	5.7
16	390000	76.2x120	24.7	3	5.7
16	470000	76.2x115	25.0	3	5.7
16	470000	76.2x120	25.5	3	5.7
16	470000	76.2x140	27.3	3	5.7
16	560000	76.2x130	27.6	3	5.5
16	560000	76.2x140	28.5	3	5.5
16	680000	76.2x145	28.7	3	5.5
16	680000	76.2x160	30.1	3	5.5
16	820000	76.2x220	31.0	3	5.0
16	1000000	89x160	32.0	3	5.0
16	1000000	89x200	35.3	3	5.0
25	15000	35x50	4.0	18.0	35
25	18000	35x50	4.5	16.0	29
25	22000	35x60	5.5	13.0	24

WV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
25	27000	35x65	6.9	12.0	20
25	33000	35x80	8.2	10.0	19
25	39000	35x80	9.0	9.0	17
25	47000	35x100	9.5	8.0	15
25	47000	35x105	9.7	8.0	15
25	47000	35x120	10.3	8.0	15
25	56000	35x100	10.5	7.0	13
25	56000	35x120	11.4	7.0	13
25	68000	35x120	12.0	6.0	11
25	68000	51x80	12.3	6.0	11
25	82000	35x120	12.5	6.5	12
25	82000	51x80	12.8	6.5	12
25	100000	51x100	13.4	5.0	10
25	100000	51x105	13.7	5.0	10
25	120000	51x115	14.0	4.5	8.6
25	120000	51x120	14.3	4.5	8.6
25	150000	51x120	15.0	4.0	7.6
25	150000	51x140	16.1	4.0	7.6
25	150000	63.5x105	16.2	4.0	7.6
25	180000	63.5x120	16.8	3.8	7.2
25	220000	63.5x105	17.0	3.5	6.7
25	220000	63.5x120	18.0	3.5	6.7
25	270000	63.5x130	18.8	3.3	6.3
25	270000	76.2x100	19.3	3.3	6.3
25	330000	76.2x120	21.0	3.2	6.1
25	330000	76.2x140	22.5	3.2	6.1
25	390000	76.2x115	22.8	3.0	5.7
25	390000	76.2x140	24.8	3.0	5.7
25	470000	76.2x150	25.3	3.0	5.7
25	560000	89x130	26.0	3.0	5.7
25	560000	89x140	26.8	3.0	5.7
25	680000	89x160	27.5	3.0	5.7
25	820000	89x190	30.0	3.0	5.7
25	1000000	89x220	33.0	3.0	5.7
35	10000	35x50	4.0	19.0	40
35	12000	35x50	4.3	17.0	33
35	15000	35x50	4.5	14.0	27
35	15000	35x80	5.5	14.0	27
35	18000	35x80	6.0	12.0	22
35	22000	35x100	7.0	10.0	18
35	22000	35x80	6.3	10.0	18
35	27000	35x100	8.0	9.0	17
35	27000	35x80	7.2	9.0	17
35	33000	35x100	9.3	8.0	15
35	33000	35x80	8.4	8.0	15
35	39000	35x100	10.0	7.0	13
35	39000	35x120	10.9	7.0	13
35	47000	35x120	11.5	6.0	11
35	47000	51x96	12.8	6.0	11
35	56000	51x96	13.3	5.5	10
35	68000	51x100	15.4	5.0	10
35	68000	51x80	14.0	5.0	10
35	82000	51x100	16.0	4.5	9
35	82000	63.5x96	17.7	4.5	9
35	100000	51x120	18.5	4.0	8
35	100000	63.5x100	19.3	4.0	8
35	100000	63.5x115	20.5	4.0	8
35	120000	51x120	21.0	3.5	6.7
35	120000	63.5x120	23.0	3.5	6.7
35	150000	63.5x100	23.7	3	5.7
35	150000	63.5x120	25.7	3	5.7
35	180000	63.5x120	26.2	3	5.7
35	180000	76.2x115	27.0	3	5.7

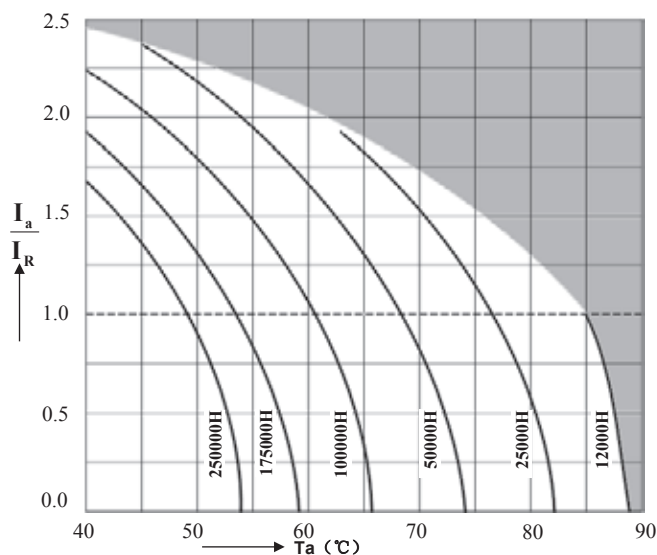
WV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
35	220000	76.2x100	27.6	3	5.5
35	220000	76.2x140	31.9	3	5.5
35	220000	76.2x145	32.4	3	5.5
35	270000	76.2x120	32.7	3	5.4
35	330000	76.2x140	33.1	3	5.3
35	330000	76.2x160	35.1	3	5.3
35	330000	89x130	35.5	3	5.3
35	390000	89x155	36.0	3	5.2
35	470000	89x140	37.0	3	5.1
35	470000	89x170	40.3	3	5.1
35	680000	89x220	43.0	3	5.0
40	10000	35x55	6.3	19	37
40	15000	35x80	9.0	14	27
40	22000	35x80	11.0	10	18
40	33000	35x105	12.0	8	15
40	47000	51x80	14.2	6	11
40	68000	51x105	15.5	5	10
40	100000	63.5x105	17.0	4	7.6
40	150000	76.2x105	19.0	3	5.7
40	220000	76.2x140	21.0	3	5.7
50	6800	35x50	3.7	22	42
50	10000	35x50	6.4	16	30
50	10000	35x60	6.6	16	30
50	12000	35x65	6.9	13	25
50	12000	35x80	7.2	13	25
50	15000	35x80	8.7	11	21
50	18000	35x100	8.8	10	18
50	18000	35x80	8.5	10	18
50	22000	35x100	10.0	8	15
50	22000	35x120	10.5	8	15
50	27000	35x120	10.0	7	13
50	33000	51x100	11.0	6	11
50	33000	51x80	11.8	6	11
50	39000	51x100	12.5	6	10
50	39000	51x80	12.0	6	10
50	47000	51x100	12.8	5	10
50	47000	51x115	13.0	5	10
50	56000	51x100	13.0	4	7.6
50	56000	63.5x96	13.5	4	7.6
50	68000	51x120	13.0	3	7.5
50	68000	51x140	13.5	3	7.5
50	68000	63.5x96	13.5	3	7.5
50	82000	63.5x100	14.0	3	7.0
50	82000	63.5x115	14.0	3	7.0
50	100000	63.5x120	14.5	3	6.8
50	100000	63.5x140	15.5	3	6.8
50	100000	76.2x100	14.0	3	6.8
50	100000	76.2x115	15.0	3	6.8
50	120000	63.5x120	16.0	3	6.5
50	120000	63.5x145	17.0	3	6.5
50	120000	76.2x115	17.0	3	6.5
50	150000	76.2x120	18.2	3	6.2
50	150000	76.2x130	18.8	3	6.2
50	150000	76.2x140	19.0	3	6.2
50	180000	76.2x140	20.0	3	6.0
50	180000	76.2x145	21.0	3	6.0
50	180000	76.2x155	22.0	3	6.0
50	220000	76.2x160	21.5	3	5.5
50	220000	89x130	21.5	3	5.5
50	270000	89x140	24.7	3	5.2
50	270000	89x155	25.5	3	5.2
50	330000	89x160	26.0	3	5.0
63	3900	35x50	2.6	42	68
63	4700	35x50	4.7	30	56
63	4700	35x55	4.8	30	56

WV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
63	5600	35x50	5.0	24	47
63	5600	35x55	5.3	24	47
63	6800	35x50	5.2	22	39
63	6800	35x55	5.9	22	39
63	6800	35x65	6.2	22	39
63	8200	35x65	6.5	18	32
63	8200	35x80	6.8	18	32
63	10000	35x60	6.9	16	27
63	10000	35x80	7.5	16	27
63	12000	35x100	8.8	14	22
63	12000	35x80	8.0	14	22
63	15000	35x105	10.0	11	21
63	18000	35x100	10.0	10	19
63	18000	35x120	10.5	10	19
63	22000	51x80	11.0	8.0	15
63	27000	51x80	11.5	7.0	13
63	27000	51x96	12.0	7.0	13
63	33000	51x100	13.5	6.0	11
63	33000	51x105	14.0	6.0	11
63	39000	51x100	14.0	5.5	10
63	39000	51x115	14.5	5.5	10
63	39000	51x120	15.0	5.5	10
63	47000	51x120	16.5	5.0	10
63	47000	51x130	17.0	5.0	10
63	47000	63.5x100	17.0	5.0	10
63	47000	63.5x105	19.0	5.0	10
63	56000	63.5x100	17.0	4.0	7.6
63	56000	63.5x115	18.5	4.0	7.6
63	68000	63.5x120	19.0	3.0	7.4
63	68000	63.5x145	20.5	3.0	7.4
63	68000	76.2x105	20.2	3.0	7.4
63	82000	63.5x130	20.5	3.0	7.2
63	82000	63.5x145	21.0	3.0	7.2
63	100000	76.2x115	22.0	3.0	7.0
63	100000	76.2x120	23.0	3.0	7.0
63	100000	76.2x130	24.0	3.0	7.0
63	100000	76.2x140	25.0	3.0	7.0
63	120000	76.2x130	26.0	3.0	6.8
63	120000	76.2x140	27.0	3.0	6.8
63	120000	76.2x145	27.5	3.0	6.8
63	150000	76.2x155	28.5	3.0	6.5
63	150000	76.2x220	31.0	3.0	6.5
63	150000	89x140	28.5	3.0	6.5
63	180000	89x130	29.0	3.0	6.0
63	220000	89x155	31.0	3.0	5.5
63	220000	89x160	31.5	3.0	5.5
63	270000	76.2x220	32.0	3.0	5.2
63	330000	89x220	34.0	3	5.0
80	3300	35x50	2.5	50.0	80
80	3900	35x50	2.8	36	68
80	4700	35x60	5.0	25	46
80	5600	35x65	5.5	22	40
80	5600	35x80	6.0	22	40
80	6800	35x60	6.3	19	35
80	6800	35x80	6.5	19	35
80	8200	35x80	7.2	17	32
80	10000	35x100	8.5	13	23
80	10000	35x80	8.0	13	23
80	12000	35x100	9.2	11.0	20
80	12000	35x120	9.5	11.0	20
80	15000	35x120	10.5	9.0	17
80	15000	51x80	10.5	9.0	17
80	18000	35x120	11.0	8.0	15
80	18000	51x80	11.0	8.0	15
80	22000	51x100	12.0	7.0	12

WV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
80	22000	51x96	11.8	7.0	12
80	27000	51x96	13.0	6.5	11
80	27000	63.5x100	15.0	6.5	11
80	33000	51x115	14.8	6.0	11
80	33000	51x120	15.2	6.0	11
80	33000	63.5x100	15.2	6.0	11
80	39000	51x130	16.0	5.8	11.0
80	39000	63.5x120	16.5	5.8	11.0
80	47000	63.5x115	20.0	5.5	10.5
80	47000	63.5x120	20.5	5.5	10.5
80	47000	63.5x145	21.0	5.5	10.5
80	56000	63.5x130	22.0	5.2	9.5
80	56000	63.5x145	23.0	5.2	9.5
80	68000	76.2x115	22.0	5.0	9.5
80	68000	76.2x120	23.0	5.0	9.5
80	68000	76.2x145	24.0	5.0	9.5
80	82000	76.2x130	24.0	4.5	8.6
80	82000	76.2x140	24.5	4.5	8.6
80	82000	76.2x145	25.0	4.5	8.6
80	100000	76.2x155	25.5	4.0	7.6
80	100000	76.2x160	26.0	4.0	7.6
80	100000	89x140	26.0	4.0	7.6
80	120000	89x130	23.0	3.8	7.2
80	150000	89x155	29.0	3.5	6.7
80	150000	89x160	30.0	4	7
80	220000	89x230	33.0	3	6
100	1800	35x50	3.5	50	90
100	2200	35x50	4.3	40	75
100	2700	35x50	4.5	35	65
100	3300	35x65	4.8	28	53
100	3300	35x80	5.3	28	53
100	3900	35x80	5.6	24	42
100	4700	35x80	6.7	20	36
100	5600	35x100	7.2	18	29
100	6800	35x100	7.5	15	24
100	6800	35x105	8.7	15	24
100	6800	35x80	8.0	15	24
100	8200	35x120	9.5	12	20
100	8200	51x80	9.5	12	20

WV (Vdc)	Cap (uF)	Size (mm)	Rated Ripple current (Arms/85°C /120Hz)	Typ. ESR 20°C 120Hz (mΩ)	MAX ESR 20°C 120Hz (mΩ)
100	10000	35x120	10.0	12	18
100	10000	51x80	10.0	9	18
100	12000	51x80	10.5	9	16
100	15000	51x100	12.4	8	15
100	15000	51x105	13.0	8	15
100	15000	51x80	11.0	8.0	15
100	15000	51x96	11.5	8.0	15
100	18000	51x100	12.6	7.0	14
100	18000	51x115	14.0	7.0	14
100	18000	51x120	14.5	7.0	14
100	18000	63.5x100	15.0	7.0	14
100	22000	51x100	13.3	6.0	11
100	22000	51x120	15.5	6.0	11
100	22000	51x130	16.0	6.0	11
100	22000	63.5x100	16.5	6.0	11
100	22000	63.5x105	17.0	6.0	11
100	27000	63.5x115	18.0	5.5	10.0
100	27000	63.5x120	18.5	5.5	10.0
100	33000	51x140	18.5	5.0	9.0
100	33000	63.5x130	18.8	5.0	9.0
100	33000	63.5x145	19.0	5.0	9.0
100	33000	76.2x100	18.8	5.0	9.0
100	33000	76.2x105	19.0	5.0	9.0
100	39000	76.2x115	20.2	4.8	8.8
100	39000	76.2x120	20.5	4.8	8.8
100	39000	76.2x145	21.0	4.8	8.8
100	47000	63.5x140	22.0	4.5	8.6
100	47000	76.2x130	24.0	4.5	8.6
100	47000	76.2x140	25.0	4.5	8.6
100	47000	76.2x145	25.2	4.5	8.6
100	56000	76.2x155	26.0	4.3	8.2
100	68000	76.2x140	26.4	4.0	7.6
100	68000	89x130	26.5	4.0	7.6
100	68000	89x140	26.7	4.0	7.6
100	82000	89x155	27.0	3.8	7.2
100	100000	89x160	27.2	3.5	6.7
100	100000	89x170	27.5	4	7
100	150000	89x230	31.0	3	6

Useful life



depending on ambient temperature T_a versus under ripple current operating conditions