

RX Series 85°C

Features

Extremely Long useful life

Applications

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

Features

- ◆ Long useful life
- ◆ High ripple current capability
- ◆ Version with low-inductance design available
- ◆ All-welded construction ensures reliable electrical contact
- ◆ Self-extinguishing electrolyte
- ◆ RoHS-compatible
- ◆ High reliability

Construction

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

Specifications

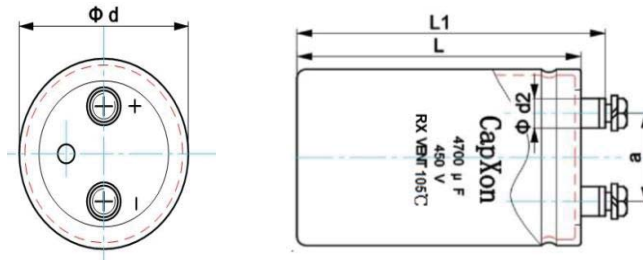
Item	Performance Characteristics			
Operating Temperature Range	-40 to +85°C(160Vdc~450Vdc) -25 to +85°C(500Vdc~650Vdc)			
Rated voltage V_R	160 to 650 V DC			
Surge voltage V_S	VR≤315V 1.15 VR VR > 315V 1.10 VR			
Rated capacitance C_R	220 to 100000 μF			
Capacitance tolerance	±20%(120Hz,+20°C)			
Leakage Current I_{leak} (+20°C.max.)	$I_{leak} = 0.018 * (C * V)^{0.85} + 4$ 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 (tanδ, at 20°C, 120Hz)	Less than the value under table(%)			
	Working Voltage(VDC)	160~450	500~550	≥600
	D.F. (%)max.	15	20	25
Self-inductance ESL	d = 51 mm: approx. 17 nH			
	d ≥ 63.5 mm: approx. 20 nH			
	Capacitors with low-inductance design:			
	d ≥ 63.5 mm: approx. 15 nH			
Useful life 85 °C; $V_R, I_{AC,R}$	>20000 h	Requirements: $\Delta C/C \leq 15\%$ of initial value $ESR \leq 1.75$ times initial specified limit $I_{leak} \leq$ initial specified limit Failure rate : ≤1%/1000 hour		
	5000 h	Post test requirements: $DC/C \leq 10\%$ of initial value $ESR \leq 1.3$ times initial specified limit $I_{leak} \leq$ initial specified limit		
Voltage Endurance test 85 °C; V_R				
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 3×2 h. Capacitor mounted by its body which is rigidly clamped to the work surface.			
Characteristics at lowtemperature	Max. impedance ratio at 120 Hz			
	$V_R(V)$	160~450	≥500	
	$Z_{-25°C} / Z_{20°C}$	4	4	
	$Z_{-40°C} / Z_{20°C}$	10	-	
Sectional specification	IEC 60384-4 and JIS-C-5101			

Multiplier for Ripple Current vs. Frequency

Frequency(Hz)	50	120	300	1K	≥3K
Multiplier	0.8	1	1.2	1.3	1.4

Dimensional drawings

Ring clip/clamp mounting:



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

Dimensions

Terminal	Dimensions(mm) with insulating sleeve				
	$d \pm 2$	$L \pm 3$	$L_1 \pm 3$	$d_2 \text{max.}$	$a \pm 0.5$
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
M6	100	100~240	110~250	17.5	41.5

Packing

Capacitor diameter d(mm)	length l(mm)	Packing units (pcs.)
35	≤ 70 mm	120
	> 70 mm	60
42	≤ 70 mm	120
	> 70 mm	60
51	≤ 70 mm	70
	> 70 mm	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
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
160	1000	35×60	2.5	110	200
160	1500	35×80	3.3	68	130
160	2200	35×80	3.45	48	90
160	2200	35×100	3.5	48	90
160	3300	35×120	4.72	32	60
160	3300	51×80	4.8	32	60
160	4700	51×80	5.1	22	42
160	4700	51×100	6	22	42
160	6800	51×100	6.4	15	29
160	6800	51×140	7	15	29
160	6800	63.5×100	7	15	29
160	10000	63.5×100	9.11	10	20
160	10000	63.5×120	10	10	20
160	15000	76.2×100	12.1	7	13
160	15000	76.2×120	13	7	13
160	22000	76.2×140	17	6.0	11
160	22000	89×130	18	6.0	11
160	33000	89×140	19.3	5.0	9
160	47000	89×170	20.7	4.0	7
160	47000	89×220	23	4.0	7
160	68000	89×220	23.2	3.5	6
160	100000	100×250	24.5	3.0	5
200	680	35×50	1.9	150	290
200	1000	35×60	2.6	110	200
200	1500	35×80	3.4	68	130
200	2200	35×100	3.6	48	90
200	2200	35×120	4	48	90
200	2200	51×80	4	48	90
200	3300	51×80	4.82	32	60
200	3300	51×100	5	32	60
200	4700	51×140	6.5	22	42
200	4700	63.5×100	6.48	22	42
200	6800	51×140	7.4	15	29
200	6800	63.5×120	8	15	29
200	10000	63.5×120	10.3	10	20
200	10000	76.2×120	13.1	10	20
200	15000	76.2×120	13.4	7	13
200	15000	76.2×140	15	7	13
200	15000	76.2×160	16.1	7	13
200	22000	76.2×160	17.4	6	9
200	22000	89×140	17.8	6	9
200	33000	89×170	19.55	4	7
200	47000	89×220	21	3	5.8
200	68000	100×250	22.7	3	5
250	470	35×60	2.7	220	420
250	680	35×80	2.8	150	290
250	1000	35×80	2.98	110	200
250	1000	35×100	3.3	110	200
250	1500	35×100	3.6	68	130
250	1500	51×80	3.7	68	130
250	2200	51×80	4.1	48	90
250	2200	51×100	5.5	48	90
250	3300	51×100	5.5	32	60
250	3300	51×140	6	32	60
250	3300	63.5×100	6	32	60
250	4700	63.5×100	7.35	22	42
250	4700	63.5×120	8	22	42
250	6800	63.5×120	8.95	15	29
250	6800	76.2×120	10	15	29
250	10000	76.2×120	13.3	10	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
250	10000	76.2×160	14	10	20
250	10000	89×140	14	10	20
250	15000	89×140	16.5	7	13
250	15000	89×170	18	7	13
250	22000	89×170	18.3	5	9
250	22000	89×220	22.4	5	9
250	33000	89×220	22.5	3	6
250	47000	100×250	28.5	3	5
350	330	35×60	2.1	320	600
350	470	35×80	3	220	420
350	680	35×100	3.8	150	290
350	820	35×80	4.1	130	240
350	1000	35×100	4.5	110	200
350	1000	51×60	4	110	200
350	1000	51×80	5.7	110	200
350	1200	51×60	4.95	89	170
350	1200	51×83	5.8	89	170
350	1500	51×75	6	68	130
350	1500	51×100	7	68	130
350	1800	51×75	6.8	58	110
350	1800	51×90	7.35	58	110
350	1800	63.5×96	8.5	58	110
350	2200	51×105	8.5	48	90
350	2200	51×120	9	48	90
350	2700	51×105	9.4	39	74
350	2700	51×115	10.6	39	74
350	2700	63.5×80	9.8	39	74
350	2700	63.5×85	10.1	39	74
350	3300	51×115	10.8	32	60
350	3300	51×130	12.5	32	60
350	3300	63.5×90	12	32	60
350	3300	63.5×100	12.5	32	60
350	3900	63.5×100	13	27	51
350	3900	63.5×115	13.9	27	51
350	3900	76.2×80	13	27	51
350	4700	63.5×105	14	22	42
350	4700	63.5×115	14.5	22	42
350	4700	76.2×90	14	22	42
350	4700	76.2×120	16	22	42
350	5600	63.5×130	17.4	19	36
350	5600	63.5×150	19	19	36
350	5600	76.2×100	16.8	19	36
350	5600	76.2×115	18	19	36
350	6800	63.5×140	19	15	29
350	6800	63.5×155	19.6	15	29
350	6800	76.2×105	19	15	29
350	6800	76.2×115	20	15	29
350	6800	89×100	20	15	29
350	8200	63.5×170	20.7	13	24
350	8200	63.5×190	22	13	24
350	8200	76.2×120	20	13	24
350	8200	76.2×143	21	13	24
350	8200	76.2×155	22.5	13	24
350	8200	89×105	20	13	24
350	8200	89×120	22	13	24
350	10000	76.2×140	24	10	20
350	10000	76.2×155	25	10	20
350	10000	89×130	27	10	20
350	10000	89×155	29	10	20
350	12000	76.2×170	27.6	9	17

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
350	12000	89×130	27.5	9	17
350	12000	89×155	29.5	9	17
350	12000	89×170	31	9	17
350	15000	76.2×220	35.4	7	13
350	15000	89×155	33.8	7	13
350	15000	89×170	35.1	7	13
350	15000	89×190	36	7	13
350	18000	89×180	43.8	6	11
350	18000	89×220	44.6	6	11
350	18000	100×190	48	6	11
350	22000	89×220	46.7	5	9
350	22000	100×250	48	5	9
400	220	35×50	1.9	470	900
400	330	35×60	2.3	320	600
400	470	35×80	4.4	220	420
400	680	35×80	4.5	150	290
400	680	35×120	5	150	290
400	680	51×80	6	150	290
400	820	35×100	4.7	130	240
400	1000	51×60	4.8	110	200
400	1000	51×80	6.2	110	200
400	1200	51×70	5	89	170
400	1200	51×83	6.5	89	170
400	1500	51×80	6.4	68	130
400	1500	51×95	7	68	130
400	1500	63.5×95	8	68	130
400	1800	51×85	7	58	110
400	1800	51×95	7.4	58	110
400	2200	51×105	8.8	48	90
400	2200	51×115	10	48	90
400	2200	63.5×85	10.1	48	90
400	2200	63.5×100	11.5	48	90
400	2200	76.2×105	12.5	48	90
400	2700	51×115	10.8	39	74
400	2700	51×130	11	39	74
400	2700	63.5×90	11	39	74
400	2700	63.5×105	12	39	74
400	2700	76.2×75	11.6	39	74
400	3300	51×130	12.8	32	60
400	3300	51×150	14	32	60
400	3300	63.5×95	13	32	60
400	3300	63.5×115	14	32	60
400	3300	76.2×90	14	32	60
400	3300	76.2×105	14.3	32	60
400	3300	76.2×120	15	32	60
400	3900	63.5×100	14.2	27	51
400	3900	63.5×115	15.2	27	51
400	3900	76.2×90	15.1	27	51
400	3900	76.2×120	16.5	27	51
400	4700	63.5×120	16	22	42
400	4700	63.5×155	17.5	22	42
400	4700	76.2×105	15.5	22	42
400	5600	63.5×145	18	19	36
400	5600	63.5×155	18.2	19	36
400	5600	63.5×170	19	19	36
400	5600	76.2×105	17	19	36
400	5600	76.2×130	19	19	36
400	5600	89×92	18	19	36
400	6800	63.5×160	23.5	15	29
400	6800	63.5×190	24.2	15	29

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
400	6800	76.2×130	19.2	15	29
400	6800	76.2×150	21.5	15	29
400	6800	89×105	21.2	15	29
400	6800	89×120	22.3	15	29
400	8200	76.2×135	24	13	24
400	8200	76.2×155	25	13	24
400	8200	76.2×170	26.2	13	24
400	8200	89×120	25	13	24
400	8200	89×140	26	13	24
400	10000	76.2×160	31.6	10	20
400	10000	76.2×180	33	10	20
400	10000	89×130	31	10	20
400	10000	89×155	34	10	20
400	12000	76.2×220	34	9	17
400	12000	89×155	30	9	17
400	12000	89×170	31.3	9	17
400	15000	89×180	39.9	7	13
400	15000	89×200	40.7	7	13
400	18000	89×210	43	6	11
400	18000	89×240	45	6	11
400	22000	100×240	47	5	9
420	820	51×60	3.8	130	240
420	1000	51×70	5.1	110	200
420	1200	51×80	6.6	89	170
420	1800	51×95	7.6	58	110
420	1800	51×105	8	58	110
420	2200	51×115	10.1	48	90
420	2700	51×120	11	39	74
420	2700	63.5×90	11	39	74
420	3300	51×130	13	32	60
420	3300	63.5×105	13.5	32	60
420	3300	76.2×105	14.6	32	60
420	3900	63.5×115	15.8	27	51
420	3900	63.5×130	16.4	27	51
420	3900	76.2×90	15.5	27	51
420	4700	63.5×143	17	22	42
420	4700	63.5×155	17.8	22	42
420	4700	76.2×105	15.7	22	42
420	4700	76.2×143	17.5	22	42
420	5600	63.5×170	19.2	19	36
420	5600	76.2×115	17.5	19	36
420	5600	76.2×130	19.2	19	36
420	5600	89×90	18.1	19	36
420	6800	76.2×143	21.1	15	29
420	6800	76.2×155	22	15	29
420	6800	89×105	19.9	15	29
420	6800	89×115	20.5	15	29
420	8200	76.2×170	27.1	13	24
420	8200	89×115	25	13	24
420	8200	89×130	26.2	13	24
420	10000	76.2×180	34	10	20
420	10000	76.2×220	37	10	20
420	10000	89×143	33	10	20
420	10000	89×155	35	10	20
420	12000	76.2×220	35	9	17
420	12000	89×155	31.1	9	17
420	12000	89×170	31.7	9	17
420	15000	89×190	40.1	7	13
420	18000	89×220	43.3	6	11
450	220	35×50	2	470	900

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
450	330	35×60	2.5	320	600
450	470	35×80	4.5	220	420
450	470	51×75	4.5	220	420
450	680	35×100	4.6	150	290
450	680	35×120	5.2	150	290
450	680	51×80	6.2	150	290
450	820	35×110	6.4	130	240
450	820	51×60	6	130	240
450	1000	51×70	6.3	110	200
450	1000	51×80	6.5	110	200
450	1200	51×80	7	89	170
450	1200	51×95	7.3	89	170
450	1200	63.5×95	8.3	89	170
450	1500	51×95	7.5	68	130
450	1500	51×115	7.8	68	130
450	1800	51×105	8.2	58	110
450	1800	51×115	8.4	58	110
450	1800	63.5×80	8	58	110
450	1800	63.5×105	8.5	58	110
450	2200	51×115	10.2	48	90
450	2200	51×130	11	48	90
450	2200	63.5×90	10	48	90
450	2200	63.5×120	12.1	48	90
450	2200	76.2×85	11	48	90
450	2700	51×115	11.2	39	74
450	2700	51×130	12	39	74
450	2700	63.5×95	12	39	74
450	2700	63.5×115	13	39	74
450	2700	76.2×80	12	39	74
450	2700	76.2×130	14.8	39	74
450	3300	63.5×105	13.6	32	60
450	3300	63.5×115	14	32	60
450	3300	76.2×100	15.5	32	60
450	3300	76.2×120	16	32	60
450	3900	63.5×125	16	27	51
450	3900	63.5×150	16.6	27	51
450	3900	76.2×90	15	27	51
450	3900	76.2×115	17	27	51
450	3900	89×90	17	27	51
450	4700	63.5×145	18.7	22	42
450	4700	63.5×170	20	22	42
450	4700	76.2×105	18	22	42
450	4700	76.2×130	20	22	42
450	4700	89×110	20	22	42
450	5600	63.5×165	21.7	19	36
450	5600	63.5×190	23.2	19	36
450	5600	76.2×115	20.5	19	36
450	5600	76.2×130	21.6	19	36
450	5600	89×90	20.2	19	36
450	5600	89×120	22.8	19	36
450	6800	89×105	22.8	15	29
450	6800	89×130	25	15	29
450	8200	76.2×165	27	13	24
450	8200	76.2×180	30	13	24
450	8200	89×130	29	13	24
450	8200	89×155	31	13	24
450	10000	76.2×220	37.5	10	20
450	10000	89×155	36.1	10	20
450	10000	89×170	37.6	10	20
450	12000	76.2×220	39.1	9	17

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
450	12000	89×155	36.4	9	17
450	12000	89×190	39.9	9	17
450	12000	100×190	42.5	9	17
450	15000	89×220	43.5	7	13
450	15000	89×240	45.3	7	13
450	15000	100×195	43.9	7	13
450	18000	100×237	48	6	11
450	22000	89×236	48	5	9
500	1000	51×95	5.6	140	270
500	1000	51×110	6	140	270
500	1000	63.5×80	6	140	270
500	1200	51×95	7.1	120	220
500	1200	51×115	8	120	220
500	1200	63.5×85	8.1	120	220
500	1500	51×100	7.2	95	180
500	1500	51×115	7.5	95	180
500	1500	63.5×90	7.5	95	180
500	1500	63.5×105	7.8	95	180
500	1800	51×130	8.3	79	150
500	1800	63.5×90	8.2	79	150
500	1800	63.5×115	8.6	79	150
500	2200	51×143	12.1	63	120
500	2200	51×150	12.5	63	120
500	2200	63.5×105	11.5	63	120
500	2200	63.5×115	12.2	63	120
500	2700	63.5×115	13.2	52	98
500	2700	63.5×143	13.8	52	98
500	2700	76.2×90	12.2	52	98
500	2700	76.2×110	13.1	52	98
500	3300	63.5×130	14.3	42	80
500	3300	63.5×150	15.1	42	80
500	3300	76.2×105	15.1	42	80
500	3300	76.2×115	16	42	80
500	3900	63.5×170	17.2	36	68
500	3900	76.2×115	17.5	36	68
500	3900	76.2×130	18.2	36	68
500	3900	89×90	17.8	36	68
500	3900	89×120	19.5	36	68
500	4700	76.2×135	20.5	30	56
500	4700	76.2×150	21.8	30	56
500	4700	89×105	20	30	56
500	4700	89×130	22	30	56
500	5600	76.2×143	20	25	47
500	5600	76.2×170	20.8	25	47
500	5600	89×115	18.2	25	47
500	5600	89×130	19.5	25	47
500	6800	76.2×180	31	21	39
500	6800	76.2×190	31.5	21	39
500	6800	89×143	30.6	21	39
500	6800	89×170	31.8	21	39
500	8200	76.2×220	31.8	17	32
500	8200	89×155	32	17	32
500	8200	89×175	33	17	32
500	8200	100×175	34.1	17	32
500	10000	89×190	38.3	14	27
500	10000	89×220	39.5	14	27
500	10000	100×190	41.5	14	27
500	12000	89×220	39.1	12	22
500	12000	89×240	40.5	12	22
500	12000	100×210	41.6	12	22

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
500	12000	100×240	42.4	12	22
500	15000	89×220	41.8	9	18
500	15000	100×250	43.5	9	18
550	1200	51×110	6.4	120	220
550	1200	63.5×110	8	120	220
550	1500	51×130	7.7	95	180
550	1500	63.5×130	9	95	180
550	1800	63.5×105	8.7	79	150
550	1800	63.5×120	9	79	150
550	1800	76.2×110	10	79	150
550	2200	63.5×120	10.3	63	120
550	2200	76.2×130	13	63	120
550	2700	63.5×150	12.5	52	98
550	2700	76.2×105	12.3	52	98
550	2700	76.2×155	16	52	98
550	3300	63.5×170	15.2	42	80
550	3300	76.2×130	15.6	42	80
550	3300	76.2×155	17	42	80
550	3900	76.2×140	18.4	36	68
550	3900	89×150	21	36	68
550	4700	76.2×170	22.2	30	56
550	4700	89×130	23.2	30	56
550	4700	89×170	25	30	56
550	5600	76.2×190	25	25	47
550	5600	89×150	24.5	25	47
550	5600	89×190	27.2	25	47
550	6800	89×170	27.5	21	39
550	6800	89×190	28.9	21	39
550	8200	89×220	36.5	17	32
550	8200	100×170	35	17	32
550	8200	100×220	40	17	32
550	10000	89×240	42.5	14	27
550	10000	100×200	42.4	14	27
550	10000	100×250	43	14	27
600	1200	63.5×95	7	150	280
600	1500	63.5×110	8.4	120	220
600	1800	63.5×125	9.7	95	180
600	1800	76.2×95	9.5	95	180
600	2200	63.5×145	11.4	79	150
600	2200	76.2×110	11.2	79	150
600	2700	63.5×170	13.5	63	120
600	2700	76.2×125	13.2	63	120
600	3300	76.2×145	15.5	53	100
600	3900	76.2×170	21.1	45	85
600	3900	89×130	19.8	45	85
600	4700	76.2×190	22.5	37	71
600	4700	89×150	24	37	71
600	5600	89×170	26	31	59
650	1000	63.5×100	7.2	170	330
650	1200	63.5×110	8	150	280
650	1500	63.5×130	9.2	120	220
650	1800	63.5×150	10.5	95	180
650	2200	63.5×170	12.3	79	150
650	2700	76.2×150	14.5	63	120
650	3300	76.2×170	16.8	53	100
650	3900	89×155	22	45	85
650	4700	89×190	28	37	71

Useful life

depending on ambient temperature T_a versus under ripple current operating conditions

