

## RM Series 105°C

### Features

#### Long useful life

#### Applications

- ◆ Frequency converters
- ◆ Professional power supplies
- ◆ Hybrid electric vehicles(HEV)
- ◆ Traction

#### Construction

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



#### Features

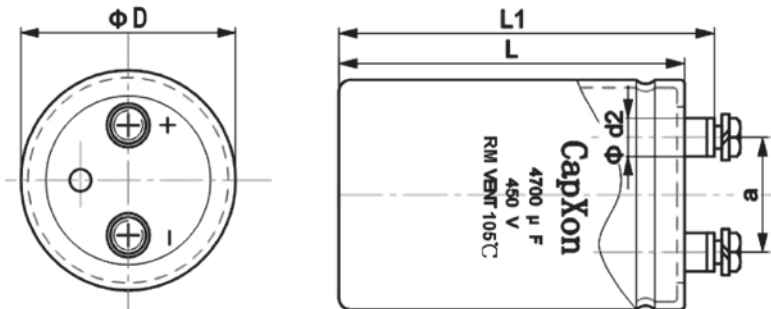
- ◆ High reliability     ◆ long useful life
- ◆ Extremely high ripple current capability
- ◆ Wide temperature range
- ◆ All-welded construction ensures reliable electrical contact
- ◆ Low-inductance design
- ◆ Self-extinguishing electrolyte
- ◆ RoHS-compatible

### Specifications

Item	Performance Characteristics					
Rated voltage $V_R$	160... 450 V DC					
Surge voltage $V_S$	1.15 $V_R$ ( for $V_R \leq 315$ V ) or 1.10 $V_R$ ( for $V_R > 315$ V )					
Rated capacitance $C_R$	220 ...47000 $\mu$ F					
Capacitance tolerance	$\pm 20\%$					
tan $\delta$ (at 20°C · 120Hz)	Less than the value under table(%)					
	$\Phi$ D	35	51	63.5	76.2	89
	WV	15	15	20	20	20
Leakage Current $I_{leak}$ (20 °C, 5 min)	$I_{leak} \leq 0.3\mu A * (C*V)^{0.7} + 4\mu A$					
Self-inductance ESL	d = 51 mm: approx. 16 nH					
	d $\geq$ 63.5 mm: approx. 18 nH					
	Capacitors with low-inductance design: d $\geq$ 63.5 mm: approx. 14 nH					
Useful life 105 °C; $V_R, I_{AC^*R}$	> 6000 h	Requirements: $\Delta C/C \leq \pm 40\%$ of initial value ESR $\leq$ 4 times initial specified limit $I_{leak} \leq$ initial specified limit				
Voltage Endurance test 105 °C; $V_R$	2000 h	Post test requirements: $\Delta C/C \leq \pm 20\%$ of initial value ESR $\leq$ 2 times initial specified limit $I_{leak} \leq$ 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.					
Low Temperature Characteristics	Max. impedance ratio at 120 Hz					
	$V_R$	$\leq 400$ V	$\geq 450$ V			
	$Z_{-25^\circ C} / Z_{20^\circ C}$	4	4			
	$Z_{-40^\circ C} / Z_{20^\circ C}$	10	10			
Sectional specification	IEC 60384-4 and JIS-C-5101					

## 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	10.5	31.8
M6	76.2/89	100~240	106.4~246.5	17.5	31.8

## Packing

Diameter D(mm)	Length L(mm)	Packing (pcs.)
35	$\leq 70\text{mm}$	120
	$> 70\text{mm}$	60
42	$\leq 70\text{mm}$	120
	$> 70\text{mm}$	60
51	$\leq 70\text{mm}$	70
	$> 70\text{mm}$	35
63.5	all	24
76.2	all	15
89	all	12

## Accessories

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

	Thread	Maximum torque
For terminal	M5	2 Nm
	M6	2.5 Nm

## Case Size

φ D×L(mm)

WV(V) Cap(μF)	160		200		250	
	Size	Ripple	Size	Ripple	Size	Ripple
470					35×60	1.1
680			35×50	1.3	35×80	1.5
1000	35×60	1.7	35×60	1.8	35×100	2.1
1500	35×80	2.1	35×80	2.3	51×80	2.6
2200	35×100	3.0	35×120	3.3	51×100	3.5
			51×80	3.3		
3300	35×120	4.0	51×80	4.1	51×140	4.8
	51×80	4.0	51×100	4.2	63.5×100	4.6
4700	51×100	5.0	51×140	5.8	63.5×120	6.0
			63.5×100	5.6		
6800	51×140	7.0	63.5×120	7.0	76.2×120	7.5
	63.5×100	6.8				
10000	63.5×120	7.9	76.2×120	9.0	76.2×160	10.0
					89×140	10.3
15000	76.2×120	9.8	76.2×140	10.5	89×170	13.0
			76.2×160	11.0		
22000	76.2×140	12.5	76.2×160	14.0	89×220	15.5
	89×130	13.2	89×140	15.0		
33000	89×140	14.0				
47000	89×220	17.5				

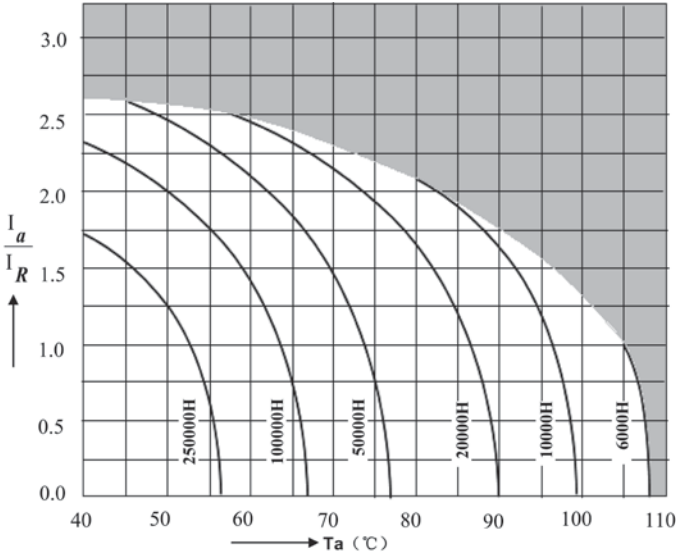
Ripple Current(A,rms) at 105°C 120Hz

WV(V) Cap(μF)	350		400		450	
	Size	Ripple	Size	Ripple	Size	Ripple
220			35×50	1.2	35×50	1.2
330	35×60	1.5	35×60	1.5	35×60	1.5
470	35×80	2.0	35×80	3.0	35×80	3.0
680	35×100	3.0	35×120	3.5	35×120	3.6
			51×80	3.7	51×80	3.8
1000	35×120	4.0	51×80	4.3	51×80	4.2
	51×80	4.2			51×105	4.7
1500	51×80	5.2	51×105	5.8	51×120	6.2
	51×100	6.2	51×120	6.3		
2200	51×105	7.0	51×130	8.3	63.5×100	7.3
	51×120	7.5	63.5×100	7.5	63.5×120	8.0
	51×140	8.0				
2700	63.5×80	7.9	63.5×105	9.0	63.5×130	9.8
3300	63.5×100	9.1	63.5×130	10.4	63.5×145	11.5
	63.5×120	9.8	76.2×105	10.6	76.2×120	11.0
			76.2×120	11.0		
3900	63.5×120	10.0	76.2×120	12.0	76.2×145	13.0
4700	63.5×145	11.5	76.2×120	13.2	76.2×120	13.0
	76.2×105	11.5	76.2×130	13.7	76.2×160	14.7
	76.2×120	12.0				
5600	76.2×130	13.4	76.2×145	15.5	76.2×160	15.5
					89×145	17.3
6800	76.2×140	15.0	76.2×160	17.5	76.2×160	17.3
			89×145	18.3	76.2×220	19.7
					89×170	20.0
8200	76.2×160	18.4	89×160	20.0	89×180	21.0
	89×145	19.5				
10000	76.2×160	19.5	89×160	22.0	89×200	24.0
	76.2×190	21.0				
12000	89×140	21.0				
	76.2×220	25.0	89×180	26.0		
15000	89×170	26.0				
	89×190	27.0	89×200	28.0		
18000	89×220	31.0				

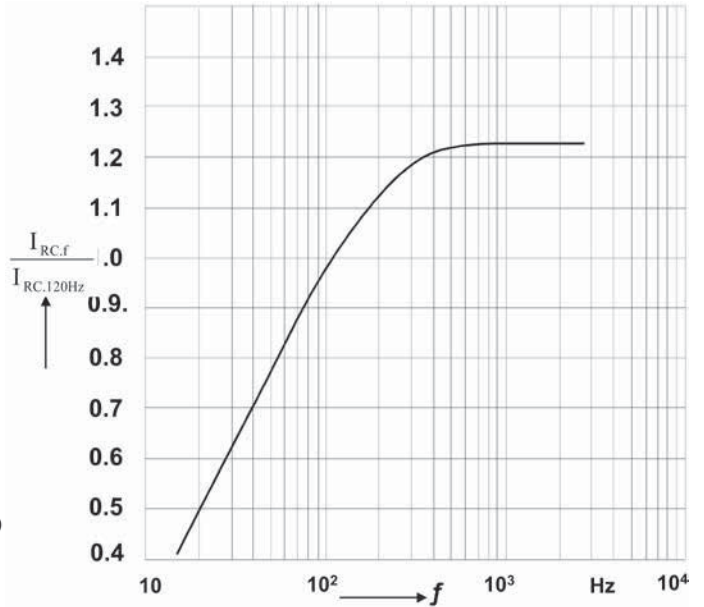
Ripple Current(A,rms) at 105°C 120Hz

## Useful life

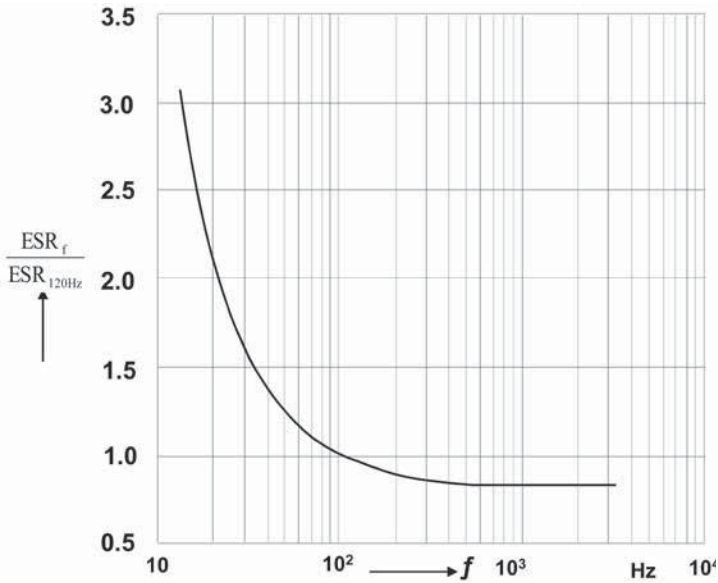
depending on ambient temperature  $T_a$  versus under ripple current operating conditions



Frequency factor of permissible ripple current  $I_{RC}$  versus frequency  $f$



Frequency characteristics of ESR Typical behavior



Impedance Z versus frequency f

