

Features

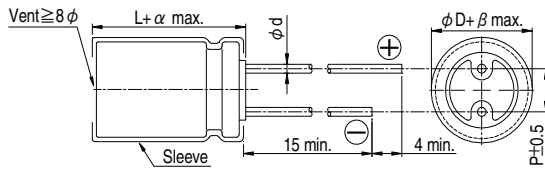
- 130°C, 2,000 ~ 3,000 hours assured
- For automobile modules and other high temperature applications
- RoHS compliance



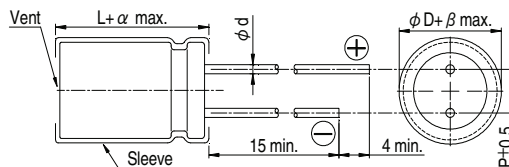
Specifications

Items	Performance													
Category Temperature Range	10 ~ 250V	350 ~ 450V												
	-40°C ~ +130°C	-25°C ~ +130°C												
Capacitance Tolerance	±20% (at 120 Hz, 20°C)													
Leakage Current (at 20°C)	Rated voltage	≤ 100V	> 100V											
	Time	after 2 minutes	after 1 minutes											
	Leakage Current	$I = 0.01CV$ or $3 (\mu A)$ whichever is greater	$CV \leq 1,000$ $I = 0.1CV + 40(\mu A)$	$CV > 1,000$ $I = 0.04CV + 100(\mu A)$										
Where, C = rated capacitance in μF , V = rated DC working voltage in V														
Tan δ (at 120 Hz, 20°C)	Rated Voltage	10	16	25	35	50	63	160	200	250	350	400	450	
	Tan δ (max)	0.15	0.12	0.10	0.10	0.08	0.08	0.20	0.20	0.20	0.24	0.24	0.24	
Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below.													
	Impedance Ratio	Rated Voltage	10	16	25	35	50	63	160	200	250	350	400	450
		Z(-25°C) / Z(+20°C)	3	2	2	2	2	2	3	3	3	6	6	6
	Z(-40°C) / Z(+20°C)	6	4	4	4	4	4	6	6	6	-	-	-	
Endurance	Test Time	2,000 Hrs for $\phi D \leq 8$ mm; 3,000 Hrs for $\phi D \geq 10$ mm												
	Capacitance Change	Within ±20% of initial value												
	Tan δ	Less than 200% of specified value												
	Leakage Current	Within specified value												
* The above specifications shall be satisfied when the capacitors are restored to 20°C after applied with rated subjected to DC voltage with the rated ripple current is applied for 2,000 / 3,000 hours at 130°C.														
Shelf Life Test	Test Time	1,000 hrs												
	Capacitance Change	Within ±20% of initial value												
	Tan δ	Less than 200% of specified value												
	Leakage Current	Less than 500% of specified value												
* The above specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 130°C without voltage applied. The rated voltage shall be applied to the capacitors before the measurements for 160 ~ 450V (Refer to JIS C 5101-4 4.1).														
Ripple Current and Frequency Multipliers	Rated Voltage (V)	Cap. (μF)	Freq. (Hz)											
			120	1k	10k	100k up								
	10 ~ 63	0.47 ~ 100	1.00	1.85	2.25	2.50								
		150 ~ 470	1.00	1.70	1.88	2.00								
160 ~ 450	1,000	1.00	1.45	1.58	1.65									
	≤ 33	1.00	1.50	1.75	1.80									
	47 ≤	1.00	1.30	1.40	1.50									

Diagram of Dimensions



The case size of 16×20 is suitable for below diagram:



Lead Spacing and Diameter

	8	10	12.5	16
ϕD	8	10	12.5	16
P	3.5	5.0	5.0	7.5
ϕd	0.6			0.8
α	L<20: 1.5, L≥20: 2.0			
β	0.5			

Dimension: $\phi D \times L$ (mm)
Ripple Current: mA/rms at 120 Hz, 130°C

Dimension and Permissible Ripple Current

Cap.(μ F)	Rated Volt. (V _{DC}) Contents	10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)	
		$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA
10	100									8x11.5	84	8x11.5	84
22	220							8x11.5	113	10x12.5	149	10x12.5	149
33	330					8x11.5	138	10x12.5	162	10x16	200	10x16	200
47	470			8x11.5	150	10x12.5	194	10x16	213	10x16	239	10x20	260
100	101	10x12.5	231	10x16	285	10x16	312	10x20	338				
220	221	10x16	378	10x20	458	12.5x20	557	12.5x25	605	12.5x20	419	12.5x20	419
330	331	10x16	462	12.5x20	621	12.5x25	740	16x20	755				
470	471	10x20	599	12.5x25	806	16x20	902			16x20	689		
1,000	102	16x20	1073										

Cap.(μ F)	Rated Volt. (V _{DC}) Contents	160V (2C)		200V (2D)		250V (2E)		350V (2V)		400V (2G)		450V (2W)	
		$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA
4.7	4R7							10x20	53	10x20	53	10x25	58
10	100			10x20	78	10x20	78	10x25	85	10x25	86	12.5x20	86
22	220	10x20	115	10x25	126	12.5x20	128	12.5x25	139	12.5x25	142	16x25	154
33	330	10x25	154	12.5x20	157	12.5x25	171	16x25	189	16x25	189	16x31.5	203
47	470	12.5x20	187	12.5x25	204	16x25	225	16x31.5	243	16x31.5	243		
68	680	12.5x25	245	16x20	250	16x31.5	292						
100	101	16x25	329	16x25	329								
150	151	16x31.5	434										

Part Numbering System

RUA Series 470 μ F $\pm 20\%$ 16V Bulk Package Gas Type 12.5 ϕ x 25L

RUA **471** **M** **1C** **BK** **-** **1325** **XX**

Series Name Capacitance Capacitance Tolerance Rated Voltage Lead Configuration and Package Rubber Type Case Size

S = Standard
KS = AEC-Q200 Qualified,
Safety Critical Application
LS = AEC-Q200 Qualified,
Non-Safety Critical Application