

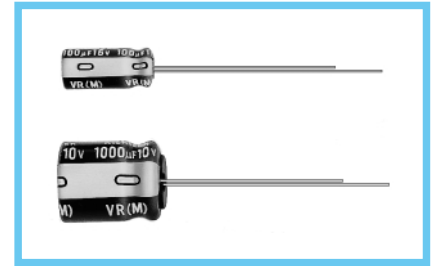
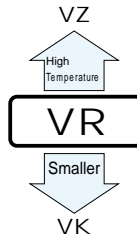
ALUMINUM ELECTROLYTIC CAPACITORS



VR Miniature Sized series



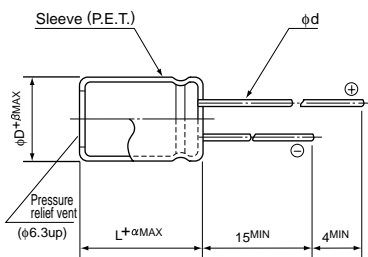
- One rank smaller case sizes than VX series.
- Adapted to the RoHS directive (2002/95/EC).



Specifications

Item	Performance Characteristics																										
Category Temperature Range	-40 ~ +85°C (6.3V ~ 400V), -25 ~ +85°C (450V)																										
Rated Voltage Range	6.3 ~ 450V																										
Rated Capacitance Range	0.1 ~ 33000μF																										
Capacitance Tolerance	±20% at 120Hz, 20°C																										
Leakage Current	Rated voltage (V)	6.3 ~ 100V																									
		<p>After 1 minute's application of rated voltage, leakage current is not more than 0.03CV or 4 (μA), whichever is greater.</p> <p>After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3 (μA), whichever is greater.</p>																									
tan δ	Rated voltage (V)	160 ~ 450V																									
		<p>After 1 minute's application of rated voltage, CV ≤ 1000 : I = 0.1CV+40μA or less</p> <p>After 1 minute's application of rated voltage, CV > 1000 : I = 0.04CV+100 (μA) or less</p>																									
Stability at Low Temperature	For capacitance of more than 1000μF, add 0.02 for every increase of 1000μF. Measurement frequency : 120Hz, Temperature : 20°C																										
		<table border="1"> <thead> <tr> <th>Rated voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> <th>160 ~ 200</th> <th>250 ~ 350</th> <th>400</th> <th>450</th> </tr> </thead> <tbody> <tr> <td>tan δ (MAX.)</td> <td>0.28</td> <td>0.24</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.08</td> <td>0.20</td> <td>0.25</td> <td></td> <td></td> </tr> </tbody> </table>	Rated voltage (V)	6.3	10	16	25	35	50	63	100	160 ~ 200	250 ~ 350	400	450	tan δ (MAX.)	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.08	0.20	0.25	
Rated voltage (V)	6.3	10	16	25	35	50	63	100	160 ~ 200	250 ~ 350	400	450															
tan δ (MAX.)	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.08	0.20	0.25																	
Endurance	After 2000 hours' application of rated voltage at 85°C, capacitors meet the characteristic requirements listed at right.	Capacitance change	Within ±20% of initial value																								
		tan δ	200% or less of initial specified value																								
Shelf Life	After storing the capacitors under no load at 85°C for 1000 hours, and after performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they will meet the specified value for endurance characteristics listed above.	Leakage current	Initial specified value or less																								
Marking	Printed with white color letter on black sleeve.																										

Radial Lead Type

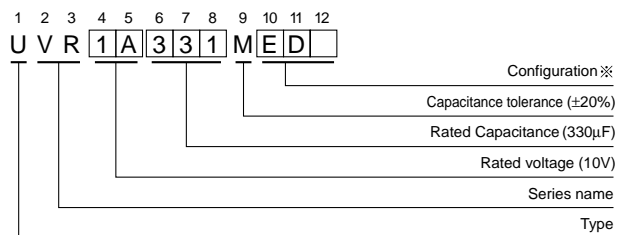


	(mm)										
φD	4	5	6.3	8	10	12.5	16	18	20	22	25
P	1.5	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0	10.0	12.5
φd	0.45	0.5	0.5	0.6	0.6	0.6	0.8	0.8	1.0	1.0	1.0
β	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0

α	(L < 20)	1.5
	(L ≥ 20)	2.0

- Please refer to page 21 about the end seal configuration.

Type numbering system (Example : 10V 330μF)



※ Configuration	
φ D	Pb-free leadwire Pb-free PET sleeve
4	DD6
5	DD
6.3	ED
8 - 10	PD
12.5 - 18	HD
20 - 25	RD

Please refer to page 21, 22, 23 about the formed or taped product spec.
Please refer to page 3 for the minimum order quantity.

• Dimension table in next page.

ALUMINUM ELECTROLYTIC CAPACITORS

VR series

■ Dimensions

Cap.(μF)	V Code	6.3		10		16		25		35		50		63		100	
		0J		1A		1C		1E		1V		1H		1J		2A	
0.1	0R1											• 5 × 11	1.3			5 × 11	2.1
0.22	R22											• 5 × 11	2.9			5 × 11	4.7
0.33	R33											• 5 × 11	4.3			5 × 11	7
0.47	R47											• 5 × 11	6.2			5 × 11	10
1	010											• 5 × 11	17			5 × 11	21
2.2	2R2											• 5 × 11	28			5 × 11	30
3.3	3R3											• 5 × 11	35			5 × 11	40
4.7	4R7							• 5 × 11	35	• 5 × 11	40	• 5 × 11	40			5 × 11	45
10	100					• 5 × 11	50	• 5 × 11	55	• 5 × 11	60	• 5 × 11	60	5 × 11	65	6.3 × 11	75
22	220	• 5 × 11	65	• 5 × 11	65	• 5 × 11	75	• 5 × 11	80	• 5 × 11	90	5 × 11	95	5 × 11	100	6.3 × 11	130
33	330	• 5 × 11	80	• 5 × 11	85	• 5 × 11	90	• 5 × 11	95	5 × 11	105	5 × 11	125	6.3 × 11	140	8 × 11.5	180
47	470	• 5 × 11	95	• 5 × 11	100	• 5 × 11	110	• 5 × 11	115	5 × 11	130	6.3 × 11	155	6.3 × 11	170	10 × 12.5	230
100	101	• 5 × 11	135	• 5 × 11	145	5 × 11	160	6.3 × 11	190	6.3 × 11	210	8 × 11.5	260	10 × 12.5	300	10 × 20	370
220	221	5 × 11	200	6.3 × 11	240	6.3 × 11	260	8 × 11.5	330	10 × 12.5	385	10 × 12.5	430	10 × 16	490	12.5 × 25	620
330	331	6.3 × 11	270	6.3 × 11	290	8 × 11.5	370	10 × 12.5	440	10 × 12.5	490	10 × 16	590	10 × 20	710	12.5 × 25	760
470	471	6.3 × 11	320	6.3 × 11	350	8 × 11.5	440	10 × 12.5	550	10 × 16	650	12.5 × 20	760	12.5 × 20	900	16 × 25	1000
1000	102	8 × 11.5	540	10 × 12.5	650	10 × 16	790	10 × 20	960	12.5 × 20	1150	12.5 × 25	1350	16 × 25	1300	18 × 40	1380
2200	222	10 × 20	1000	10 × 20	1100	12.5 × 20	1300	12.5 × 25	1550	16 × 25	1800	16 × 35.5	2100	18 × 35.5	2300	22 × 50 ▲ 25 × 40	2400 2400
3300	332	10 × 20	1190	12.5 × 20	1450	12.5 × 25	1700	16 × 25	1980	16 × 35.5	2280	18 × 35.5 ▲ 22 × 30	2500 2450	20 × 40 ▲ 25 × 30	2700 2600	25 × 50	2900
4700	472	12.5 × 20	1550	12.5 × 25	1800	16 × 25	2100	16 × 31.5	2450	18 × 35.5 ▲ 20 × 31	2700	20 × 40 ▲ 25 × 30	2900 2900	22 × 50 ▲ 25 × 40	3400 3200		
6800	682	12.5 × 25	1920	16 × 25	2250	16 × 35.5	2650	18 × 35.5 ▲ 20 × 31	2900 2700	20 × 40 ▲ 25 × 30	3000 2900	22 × 50 ▲ 25 × 40	3500 3300	25 × 50	3900		
10000	103	16 × 25	2350	16 × 35.5	2700	18 × 35.5 ▲ 20 × 31	2950 3000	20 × 40 ▲ 25 × 30	3000 2900	22 × 50 ▲ 25 × 40	3700 3600	25 × 50	4000				
15000	153	16 × 35.5	2850	18 × 35.5	3100	20 × 40 ▲ 25 × 30	3400 3300	22 × 50 ▲ 25 × 40	3800 3600	25 × 50	4300						
22000	223	18 × 40 ▲ 22 × 30	3350 3200	20 × 40 ▲ 25 × 30	3700 3300	22 × 50 ▲ 25 × 40	4200 4000	25 × 50	4500								
33000	333	22 × 50 ▲ 25 × 40	3900 3800	22 × 50 ▲ 25 × 40	4500 4800	25 × 50	4800									Case size φ D × L (mm)	Rated ripple

Cap.(μF)	V Code	160		200		250		315		350		400		450		
		2C		2D		2E		2F		2V		2G		2W		
0.47	R47	6.3 × 11	15	6.3 × 11	15	6.3 × 11	15									
1	010	6.3 × 11	22	6.3 × 11	22	6.3 × 11	22	6.3 × 11	22	6.3 × 11	22	8 × 11.5	25	8 × 11.5	23	
2.2	2R2	6.3 × 11	33	6.3 × 11	33	6.3 × 11	33	8 × 11.5	33	8 × 11.5	38	10 × 12.5	45	10 × 12.5	35	
3.3	3R3	6.3 × 11	40	6.3 × 11	40	8 × 11.5	46	10 × 12.5	55	10 × 12.5	55	10 × 12.5	55	10 × 16	45	
4.7	4R7	6.3 × 11	50	8 × 11.5	55	8 × 11.5	55	10 × 12.5	65	10 × 12.5	65	10 × 16	70	10 × 20	55	
10	100	8 × 11.5	80	10 × 12.5	95	10 × 16	105	10 × 20	115	10 × 20	115	12.5 × 20	130	12.5 × 20	90	
22	220	10 × 16	155	10 × 20	170	12.5 × 20	190	12.5 × 20	190	12.5 × 25	200	16 × 25	240	16 × 25	165	
33	330	10 × 20	205	12.5 × 20	230	12.5 × 20	230	16 × 25	275	16 × 25	275	16 × 31.5	300	16 × 35.5	230	
47	470	12.5 × 20	270	12.5 × 20	270	12.5 × 25	300	16 × 25	340	16 × 35.5	380	16 × 35.5	370	18 × 40 ▲ 22 × 30	300 290	
100	101	12.5 × 25	430	16 × 31.5	530	16 × 31.5	520	18 × 35.5	560	18 × 40 ▲ 22 × 30	590 570	20 × 40 ▲ 25 × 30	550 530	22 × 40	350	
220	221	16 × 35.5	800	18 × 35.5	810	20 × 40 ▲ 22 × 30	740 820	22 × 50 ▲ 25 × 30	850 770	22 × 50 ▲ 25 × 40	850 890	25 × 50	750			
330	331	18 × 40 ▲ 22 × 30	940 900	20 × 40 ▲ 25 × 30	1130 1090	22 × 50 ▲ 25 × 30	1170 970	25 × 50	1250							
470	471	22 × 40 ▲ 25 × 30	1410 1290	22 × 50 ▲ 25 × 40	1490 1550	25 × 50	1600								Case size φ D × L (mm)	Rated ripple
1000	102	25 × 50	1900													

Size 4×11 is available for capacitors marked "•"

In this case, [6] will be put at 12th digit of type numbering system "▲"

Rated Ripple (mArms) at 85°C 120Hz

● Frequency coefficient of rated ripple current

V	Cap.(μF)	Frequency				
		~ 47	50Hz	120Hz	300Hz	1 kHz
6.3 ~ 100	~ 47	0.75	1.00	1.35	1.57	2.00
	100 ~ 470	0.80	1.00	1.23	1.34	1.50
	1000 ~ 33000	0.85	1.00	1.10	1.13	1.15
160 ~ 450	0.47 ~ 220	0.80	1.00	1.25	1.40	1.60
	330 ~ 1000	0.90	1.00	1.10	1.13	1.15