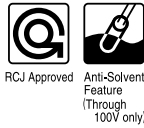


ALUMINUM ELECTROLYTIC CAPACITORS

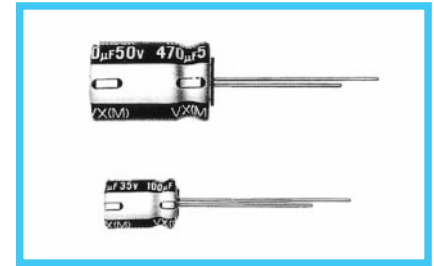
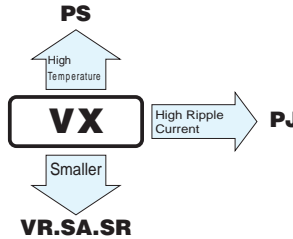
VX Standard, For General Purposes
(04 type) series



Approved by Reliability Center for Electronic Component, Japan-Certification No. RCJ-03-22C

- Standard series for general purposes.

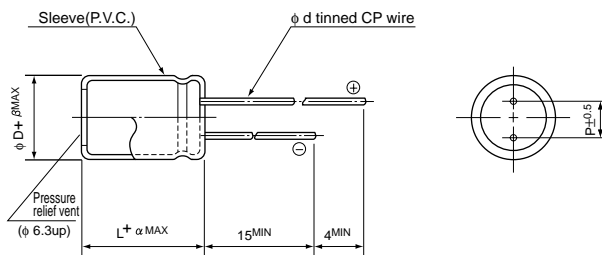
Not for New Design.
Please refer to VR series .



Specifications

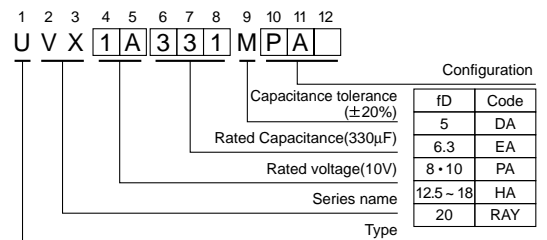
Item	Performance Characteristics																																	
Category Temperature Range	-40 ~ +85°C (6.3 ~ 400V), -25 ~ +85°C(450V)																																	
Rated Voltage Range	6.3 ~ 450V																																	
Rated Capacitance Range	0.1 ~ 22000µF																																	
Capacitance Tolerance	±20% at 120Hz, 20°C																																	
Leakage Current	<table border="1"> <tr> <th>Rated voltage(V)</th> <th>6.3 ~ 100</th> <th>160 ~ 450</th> </tr> <tr> <td>φ D ≤ 18</td> <td>After 1 minute's application of rated voltage, not more than 0.03CV or 4µA ,whichever is greater. After 2 minutes' application of rated voltage, not more than 0.01CV or 3µA, whichever is greater.</td> <td>In case of CV ≤ 1000 After 1 minute's application of rated voltage, not more than 0.1CV+40(µA). In case of CV>1000 After 1 minute's application of rated voltage, not more than 0.04CV+100(µA).</td> </tr> <tr> <td>φ D=20</td> <td>After 5 minutes' application of rated voltage, not more than 3√CV (µA).</td> <td>After 5 minutes' application of rated voltage, not more than 3√CV (µA).</td> </tr> </table>	Rated voltage(V)	6.3 ~ 100	160 ~ 450	φ D ≤ 18	After 1 minute's application of rated voltage, not more than 0.03CV or 4µA ,whichever is greater. After 2 minutes' application of rated voltage, not more than 0.01CV or 3µA, whichever is greater.	In case of CV ≤ 1000 After 1 minute's application of rated voltage, not more than 0.1CV+40(µA). In case of CV>1000 After 1 minute's application of rated voltage, not more than 0.04CV+100(µA).	φ D=20	After 5 minutes' application of rated voltage, not more than 3√CV (µA).	After 5 minutes' application of rated voltage, not more than 3√CV (µA).																								
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φ D=20	After 5 minutes' application of rated voltage, not more than 3√CV (µA).	After 5 minutes' application of rated voltage, not more than 3√CV (µA).																																
tan δ	<p>For capacitance of more than 1000 µF, add 0.02 for every increase of 1000 µF. Measurement frequency : 120Hz, Temperature : 20°C</p> <table border="1"> <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 ~ 100</th> <th>160 ~ 315</th> <th>350 ~ 450</th> </tr> <tr> <td>tan δ (MAX.)</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> </tr> </table>	Rated voltage(V)	6.3	10	16	25	35	50	63 ~ 100	160 ~ 315	350 ~ 450	tan δ (MAX.)	0.24	0.20	0.16	0.14	0.12	0.10	0.08	0.20	0.25													
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Stability at Low Temperature	<p>Measurement frequency : 120Hz</p> <table border="1"> <tr> <th>Rated voltage(V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35 ~ 100</th> <th>160 ~ 200</th> <th>250</th> <th>315 ~ 350</th> <th>400</th> <th>450</th> </tr> <tr> <td>Impedance ratio Z-25°C / Z+20°C</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>3</td> <td>3</td> <td>6</td> <td>6</td> <td>15</td> </tr> <tr> <td>ZT/Z20(MAX.)</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>4</td> <td>6</td> <td>6</td> <td>6</td> <td>—</td> </tr> </table>	Rated voltage(V)	6.3	10	16	25	35 ~ 100	160 ~ 200	250	315 ~ 350	400	450	Impedance ratio Z-25°C / Z+20°C	4	3	2	2	2	3	3	6	6	15	ZT/Z20(MAX.)	10	8	6	4	3	4	6	6	6	—
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ZT/Z20(MAX.)	10	8	6	4	3	4	6	6	6	—																								
Endurance	<p>After 2000 hours' application of rated voltage at 85°C, capacitors meet the characteristics requirements listed at right.</p> <table border="1"> <tr> <td>Capacitance change</td> <td>Within ±20% of initial value</td> </tr> <tr> <td>tan δ</td> <td>200% or less of initial specified value</td> </tr> <tr> <td>Leakage current</td> <td>Initial specified value or less</td> </tr> </table>	Capacitance change	Within ±20% of initial value	tan δ	200% or less of initial specified value	Leakage current	Initial specified value or less																											
Capacitance change	Within ±20% of initial value																																	
tan δ	200% or less of initial specified value																																	
Leakage current	Initial specified value or less																																	
Shelf Life	After leaving capacitors under no load at 85°C for 1000 hours, they meet the specified value for endurance characteristics listed above.																																	
Marking	Printed with white color letter on purple blue sleeve.																																	

Radial Lead Type



φ D	5	6.3	8	10	12.5	16	18	20
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0
φ d	0.5	0.5	0.6	0.6	0.6	0.8	0.8	1.0
α	~ 100V	1.0	1.0	1.0	1.5	1.5	1.5	2.0
	160V ~	—	1.5	1.5	2.0	2.0	2.0	2.0
β	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0

Type numbering system(Example : 10V 330µF)



Please refer to page 18, 19, 20 about the formed or taped product spec.
Please refer to page 3 for the minimum order quantity.

Dimension table in next page.



■ Dimensions

D×L(mm)

Cap.(μF)	V Code	6.3		10		16		25		35		50		63		100	
		OJ		1A		1C		1E		1V		1H		1J		2A	
0.1	0R1											5×11	1.1			5×11	2.1
0.22	R22											5×11	2.3			5×11	4.7
0.33	R33											5×11	3.5			5×11	7
0.47	R47											5×11	5			5×11	10
1	010											5×11	10			5×11	21
2.2	2R2											5×11	23			5×11	30
3.3	3R3											5×11	35			5×11	40
4.7	4R7							5×11	30	5×11	35	5×11	40	5×11	45	5×11	45
10	100					5×11	40	5×11	50	5×11	55	5×11	65	5×11	70	6.3×11	75
22	220	5×11	35	5×11	55	5×11	75	5×11	80	5×11	85	5×11	95	6.3×11	115	8×11.5	130
33	330	5×11	55	5×11	80	5×11	90	5×11	95	5×11	105	6.3×11	125	6.3×11	140	10×12.5	170
47	470	5×11	75	5×11	95	5×11	110	5×11	115	6.3×11	140	6.3×11	150	8×11.5	190	10×15	230
100	101	5×11	130	5×11	145	6.3×11	175	6.3×11	185	8×11.5	230	8×11.5	250	10×12.5	300	12.5×20	400
220	221	6.3×11	215	6.3×11	230	8×11.5	300	8×11.5	320	10×12.5	370	10×15	440	10×20	490	16×25	710
330	331	6.3×11	265	8×11.5	330	8×11.5	360	10×12.5	420	10×15	490	10×20	580	12.5×20	680	16×25	860
470	471	8×11.5	360	8×11.5	390	10×12.5	470	10×15	540	10×20	640	12.5×20	760	12.5×25	880	16×31.5	1100
1000	102	10×12.5	570	10×15	630	10×20	790	12.5×20	950	12.5×25	1100	16×25	1350	16×31.5	1550	18×40 20×35	1690 1720
2200	222	12.5×20	1050	12.5×20	1100	12.5×25	1350	16×25	1550	16×31.5	1800	18×35.5 20×31	2090 2060	18×40 20×35	2200 2250		
3300	332	12.5×20	1250	12.5×25	1400	16×25	1700	16×31.5	1950	18×35.5 20×31	2220 2190	20×40	2360				
4700	472	16×25	1700	16×25	1800	16×31.5	2100	18×35.5 20×31	2360	18×40 20×35	2490 2460						
6800	682	16×25	1900	16×31.5	2150	18×35.5 20×31	2500 2470	20×40	2590								
10000	103	16×31.5	2250	18×35.5 20×31	2500 2470	18×40 20×35	2640 2610										
12000	123	16×35.5	2450	18×35.5 20×31	2600 2560	20×40	2730										
15000	153	18×35.5 20×31	2680 2650	18×40 20×35	2720 2680												
18000	183	18×40 20×35	2750 2720	20×40	2850												
22000	223	20×40	2850														

Cap.(μF)	V Code	160		200		250		315		350		400		450		
		2C		2D		2E		2F		2V		2G		2W		
0.47	R47	6.3×11	12	6.3×11	12	6.3×11	12									
1	010	6.3×11	17	6.3×11	17	6.3×11	17	6.3×11	17	8×11.5	18	8×11.5	18	10×12.5	19	
2.2	2R2	6.3×11	26	6.3×11	26	8×11.5	30	8×11.5	30	10×12.5	28	10×12.5	28	10×15	29	
3.3	3R3	8×11.5	35	8×11.5	35	10×12.5	35	10×12.5	35	10×15	35	10×15	35	10×20	35	
4.7	4R7	8×11.5	40	10×12.5	45	10×12.5	45	10×15	45	10×15	40	10×20	45	12.5×20	50	
10	100	10×12.5	65	10×15	70	10×20	70	10×20	70	12.5×20	70	12.5×20	70	12.5×25	75	
22	220	10×20	110	10×20	110	12.5×25	130	12.5×25	120	12.5×25	110	16×25	110	16×31.5	110	
33	330	12.5×20	150	12.5×25	160	12.5×25	160	16×25	150	16×31.5	140	16×31.5	140	18×35.5 20×31	150 140	
47	470	12.5×25	180	12.5×25	180	16×25	210	16×31.5	190	18×35.5 20×31	220 210	18×35.5 20×31	220 210	20×40	230	
100	101	16×25	300	16×31.5	330	18×35.5 20×31	340 330	18×40 20×35	340 330	20×40	360					
150	151	16×35.5	420	18×35.5 20×31	450 440	18×40 20×35	460 460	20×40	450							
220	221	18×35.5 20×31	510 500	18×40 20×35	520 510	20×40	530									
270	271	18×40 20×35	540 540	20×40	570											
330	331	20×40	60												Case size	Rated ripple

Rated Ripple (mA rms)at 85°C 120Hz

■ Frequency coefficient of rated ripple current

V	Cap(μF)	Frequency				
		50Hz	120Hz	300Hz	1kHz	10kHz ~
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 ~ 22000	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
	270 ~ 330	0.90	1.00	1.10	1.13	1.15