

VR Miniature Sized
series


- One rank smaller case sizes than VX series.
- Compliant to the RoHS directive (2011/65/EU).



Specifications

Item	Performance Characteristics													
Category Temperature Range	-40 to +85°C (6.3V to 400V), -25 to +85°C (450V)													
Rated Voltage Range	6.3 to 450V													
Rated Capacitance Range	0.1 to 33000μF													
Capacitance Tolerance	±20% at 120Hz, 20°C													
Leakage Current	Rated voltage (V)	6.3 to 100V					160 to 450V							
	_____	After 1 minute's application of rated voltage at 20°C, leakage current is not more than 0.03CV or 4 (μA), whichever is greater.					After 1 minute's application of rated voltage at 20°C, CV ≤ 1000 : I = 0.1CV+40μA or less							
		After 2 minutes' application of rated voltage at 20°C, leakage current is not more than 0.01CV or 3 (μA), whichever is greater.					After 1 minute's application of rated voltage at 20°C, CV > 1000 : I = 0.04CV+100 (μA) or less							
Tangent of loss angle (tan δ)	For capacitance of more than 1000μF, add 0.02 for every increase of 1000μF.													
	Measurement frequency : 120Hz at 20°C													
	Rated voltage (V)	6.3	10	16	25	35	50	63	100	160 to 315	350 to 450			
tan δ (MAX.)	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.08	0.20	0.25				
Stability at Low Temperature	Measurement frequency : 120Hz													
	Rated voltage (V)	6.3	10	16	25	35	50	63	100	160 to 200	250 to 350	400	450	
	Impedance ratio ZT / Z20 (MAX.)	Z-25°C / Z+20°C	5	4	3	2	2	2	2	3	4	6	15	
		Z-40°C / Z+20°C	12	10	8	5	4	3	3	3	4	8	10	—
Endurance	The specifications listed at right shall be met when the capacitors are restored to 20°C after the rated voltage is applied for 2000 hours at 85°C.													
	Capacitance change		Within ±20% of the initial capacitance value											
	tan δ		200% or less than the initial specified value											
Shelf Life	Leakage current		Less than or equal to the initial specified value											
Shelf Life	After storing the capacitors under no load at 85°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.													
Marking	Printed with white color letter on black sleeve.													

Radial Lead Type

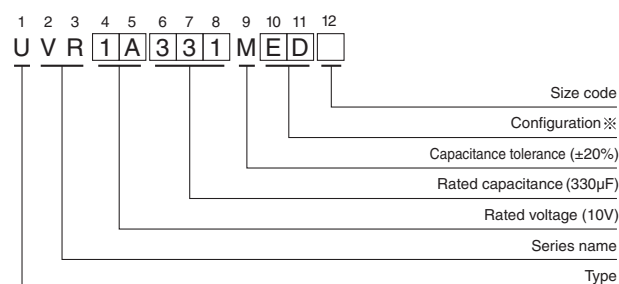


	φD	4	5	6.3	8	10	12.5	16	18	20	22	25
P	1.5	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0	10.0	10.0	12.5
φd	0.45	0.5	0.5	0.6	0.6	0.6	0.8	0.8	1.0	1.0	1.0	1.0
β	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0

α	(L < 20) 1.5
	(L ≥ 20) 2.0

- Please refer to page 20 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 to 18	HD
20 to 25	RD

Please refer to page 20, 21, 22 about the formed or taped product spec.
Please refer to page 4 for the minimum order quantity.

■ Dimensions

V Cap.(μF) Code	6.3	10	16	25	35	50	63	100
	0J	1A	1C	1E	1V	1H	1J	2A
0.1 0R1						• 5 × 11 13		5 × 11 21
0.22 R22						• 5 × 11 29		5 × 11 47
0.33 R33						• 5 × 11 43		5 × 11 7
0.47 R47						• 5 × 11 62		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 2400 ▲25 × 40 2400
3300 332	10 × 20 1190	12.5 × 20 1450	12.5 × 25 1700	16 × 25 1980	16 × 35.5 2280	18 × 35.5 2500 ▲22 × 30 2450	20 × 40 2700 ▲25 × 30 2600	25 × 50 2900
4700 472	12.5 × 20 1550	12.5 × 25 1800	16 × 25 2100	16 × 31.5 2450	18 × 35.5 2700 ▲20 × 31 2700	20 × 40 2900 ▲25 × 30 2900	22 × 50 3400 ▲25 × 40 3200	
6800 682	12.5 × 25 1920	16 × 25 2250	16 × 35.5 2650	18 × 35.5 2900 ▲20 × 31 2700	20 × 40 3000 ▲25 × 30 2900	22 × 50 3500 ▲25 × 40 3300	25 × 50 3900	
10000 103	16 × 25 2350	16 × 35.5 2700	18 × 35.5 2950 ▲20 × 31 3000	20 × 40 3000 ▲25 × 30 2900	22 × 50 3700 ▲25 × 40 3600	25 × 50 4000		
15000 153	16 × 35.5 2850	18 × 35.5 3100	20 × 40 3400 ▲25 × 30 3300	22 × 50 3800 ▲25 × 40 3600	25 × 50 4300			
22000 223	18 × 40 3350 ▲22 × 30 3200	20 × 40 3700 ▲25 × 30 3300	22 × 50 4200 ▲25 × 40 4000	25 × 50 4500				
33000 333	22 × 50 3900 ▲25 × 40 3800	22 × 50 4500 ▲25 × 40 4800	25 × 50 4800					Case size φ D × L (mm) Rated ripple

V Cap.(μF) 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 × 40 300 ▲22 × 30 290
100 101	12.5 × 25 430	16 × 31.5 530	16 × 31.5 520	18 × 35.5 560	18 × 40 590 ▲22 × 30 570	20 × 40 550 ▲25 × 30 530	22 × 40 350
220 221	16 × 35.5 800	18 × 35.5 810	20 × 40 740 ▲22 × 30 820	22 × 50 850 ▲25 × 30 770	22 × 50 850 ▲25 × 40 890	25 × 50 750	
330 331	18 × 40 940 ▲22 × 30 900	20 × 40 1130 ▲25 × 30 1090	22 × 50 1170 ▲25 × 30 970	25 × 50 1250			
470 471	22 × 40 1410 ▲25 × 30 1290	22 × 50 1490 ▲25 × 40 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 current (mA rms) at 85°C 120Hz

● Frequency coefficient of rated ripple current

V	Cap.(μF)	Frequency	50Hz	120Hz	300Hz	1 kHz	10kHz or more
6.3 to 100	0.1 to 47		0.75	1.00	1.35	1.57	2.00
		100 to 470	0.80	1.00	1.23	1.34	1.50
		1000 to 33000	0.85	1.00	1.10	1.13	1.15
160 to 450	0.47 to 220		0.80	1.00	1.25	1.40	1.60
		330 to 1000	0.90	1.00	1.10	1.13	1.15