ALUMINUM ELECTROLYTIC CAPACITORS

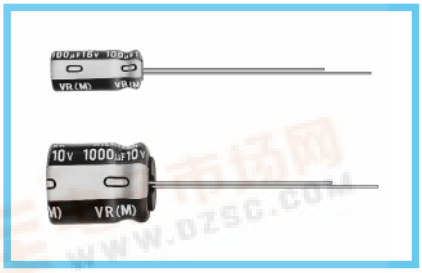
nichicon

VR Miniature Sized series

Anti-Solvent Feature (Through 100V only)

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

VZ
High Temperature
VR
Smaller
VK



■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: After 1 minute's application of rated voltage, leakage current is not more than 0.03CV or 4 (μA), whichever is greater. After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3 (μA), whichever is greater. | 160 ~ 450V: After 1 minute's application of rated voltage, CV ≦ 1000 : I = 0.1CV+40μA or less; After 1 minute's application of rated voltage, CV > 1000 : I = 0.04CV+100 (μA) or less
tan δ	For capacitance of more than 1000μF, add 0.02 for every increase of 1000μF. Measurement frequency : 120Hz, Temperature : 20˚C

Rated voltage (V)	6.3	10	16	25	35	50	63	100	160 ~ 315	350 ~ 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 ~ 200	250 ~ 350	400	450
Impedance ratio	Z–25˚C / Z+20˚C	5	4	3	2	2	2	2	2	3	4	6	15
ZT / Z20 (MAX.)	Z–40˚C / Z+20˚C	12	10	8	5	4	3	3	3	4	8	10	—

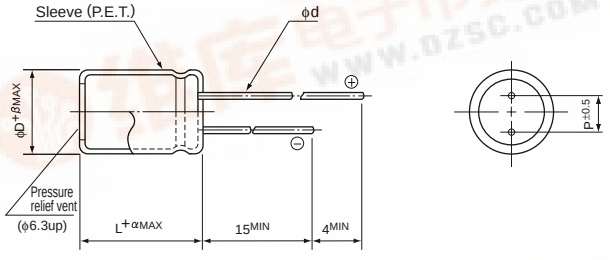
Endurance — After 2000 hours' application of rated voltage at 85˚C,capacitors meet the characteristic requirements listed at right.

Capacitance change	Within ±20% of initial value
tan δ	200% or less of initial specified value
Leakage current	Initial specified value or less

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.

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 configulation.

Type numbering system (Example : 10V 330μF)

1	2	3	4	5	6	7	8	9	10	11	12
U	V	R	1	A	3	3	1	M	E	D	

Configuration※
Capacitance tolerance (±20%)
Rated Capacitance (330μF)
Rated voltage (10V)
Series name
Type

※ 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.

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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 φD×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 φD×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	50Hz	120Hz	300Hz	1 kHz	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 ~ 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