ALUMINUM ELECTROLYTIC CAPACITORS

nichicon

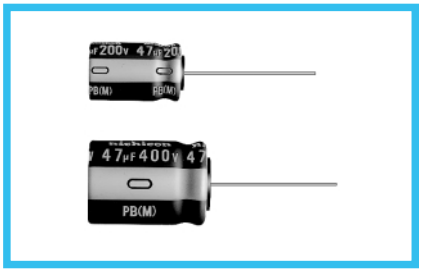
PB

Miniature Sized, High Ripple Current High Reliability series

Smaller | High Ripple Current | Long Life | Anti-Solvent Feature (Through 100V only)

- High ripple current load life of 5000 / 7000 hours at +105°C.
- Suited for ballast application.
- Compliant to the RoHS directive (2002/95/EC).

CA ← Long Life — PB — Smaller → PT



■Specifications

Item	Performance Characteristics
Category Temperature Range	−40 to +105°C (10 to 50V), −25 to +105°C (160 to 450V)
Rated Voltage Range	10 to 450V
Rated Capacitance Range	0.47 to 3300μF
Capacitance Tolerance	±20% at 120Hz, 20°C
Leakage Current	Rated Voltage (V): 10 to 50V — After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3 (μA) , whichever is greater.; 160 to 450V — After 2 minutes' application of rated voltage, leakage current is not more than 0.06CV+10 (μA) .
Tangent of loss angle (tan δ)	Measurement frequency : 120Hz, Temperature : 20°C

Rated voltage (V)	10	16	25	35	50	160	200	250	350	400	450
tan δ (MAX.)	0.30	0.25	0.22	0.18	0.15	0.15	0.15	0.15	0.20	0.24	0.24

Stability at Low Temperature — Measurement frequency : 120Hz

Rated voltage (V)		10	16	25	35	50	160	200	250	350	400	450
Impedance ratio ZT / Z20 (MAX.)	Z−25°C / Z+20°C	3	2	2	2	2	3	3	3	4	6	6

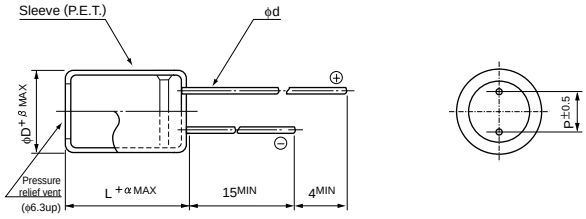
Endurance — The specifications listed at right shall be met when the capacitors are restored to 20°C after D.C. bias plus rated ripple current is applied for 5000 hours (7000 hours for φD=10 and 12.5 (10 to 50V)) at 105°C, the peak voltage shall not exceed the rated voltage.

Capacitance change	Within ±30% of the initial capacitance value (10 to 50V) Within ±20% of the initial capacitance value (160 to 450V)
tan δ	300% or less than the initial specified value (10 to 50V) 200% or less than the initial specified value (160 to 450V)
Leakage current	Less than or equal to the initial specified value

Shelf Life — After storing the capacitors under no load at 105˚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 dark brown sleeve.

■Radial Lead Type



(mm)

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

α	
	(φD ≦ 18) 1.5
	(φD ≧ 22) 2.0

• Please refer to page 20 about the end seal configulation.

Type numbering system (Example : 160V 22μF)

1	2	3	4	5	6	7	8	9	10	11	12
U	P	B	2	C	2	2	0	M	P	D	

Size code
Configuration※
Capacitance tolerance (±20%)
Rated capacitance (22μF)
Rated voltage (160V)
Series name
Type

※Configuration

φD	Pb-free leadwire Pb-free PET sleeve
5	DD
6.3	ED
8 · 10	PD
12.5 to 18	HD
22 · 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.

● Dimension table in next page.

PB series

■Dimensions

Cap.(μF) \ V	Code	10		16		25		35		50	
		1A		1C		1E		1V		1H	
0.47	R47									5×11	5
1	010									5×11	10
2.2	2R2									5×11	15
3.3	3R3									5×11	20
4.7	4R7									5×11	25
10	100									5×11	30
22	220									5×11	40
33	330							5×11	50	6.3×11	55
47	470					5×11	55	6.3×11	60	6.3×11	65
100	101	5×11	70	6.3×11	85	6.3×11	95	8×11.5	100	8×11.5	100
220	221	6.3×11	100	8×11.5	130	8×11.5	195	10×12.5	200	10×16	235
330	331	8×11.5	150	8×11.5	195	10×12.5	255	10×16	280	10×20	295
470	471	8×11.5	180	10×12.5	270	10×16	325	10×20	350	12.5×20	370
1000	102	10×16	350	10×20	430	12.5×20	500	12.5×25	570		
2200	222	12.5×20	550	12.5×25	710						Rated
3300	332	12.5×25	810							Case size φD×L(mm)	ripple

Rated ripple current (mArms) at 105°C 120Hz

Cap.(μF) \ V	Code	160		200		250		350		400		450	
		2C		2D		2E		2V		2G		2W	
10	100							10 × 20	125 250	10 × 20	125 250	12.5 × 20	150 300
22	220	10 × 20	250 500	10 × 20	250 500	12.5 × 20	300 600	12.5 × 20	175 350	12.5 × 25	200 400	16 × 25	275 550
33	330	10 × 20	250 500	12.5 × 20	300 600	12.5 × 20	300 600	16 × 20	250 500	16 × 25	300 600	18 × 25	350 700
47	470	12.5 × 20	300 600	12.5 × 20	300 600	12.5 × 25	350 700	16 × 25	325 650	18 × 25	375 750	18 × 31.5	425 850
56	560											18 × 35.5	475 950
68	680	12.5 × 25	375 750	12.5 × 25	375 750	16 × 25	500 1000	18 × 25	400 800	18 × 31.5	450 900	18 × 40	500 1000
82	820									18 × 35.5	500 1000	22 × 40	550 1100
100	101	16 × 25	550 1100	16 × 25	550 1100	18 × 25	600 1200	18 × 31.5	500 1000	18 × 40	550 1100		
120	121							18 × 35.5	575 1150	22 × 40	600 1200	22 × 50 ▲25 × 40	700 1400
150	151	18 × 25	650 1300	18 × 25	650 1300	18 × 31.5	750 1500	18 × 40	650 1300			25 × 50	800 1600
180	181					18 × 35.5	850 1700	22 × 40	750 1500	22 × 50 ▲25 × 40	800 1600		
220	221			18 × 31.5	850 1700	18 × 40	950 1900			25 × 50	900 1800		
270	271			18 × 31.5	950 1900	22 × 40	1050 2100	22 × 50 ▲25 × 40	950 1900				
330	331	18 × 31.5	850 1700	18 × 40	1050 2100			25 × 50	1050 2100				
390	391	18 × 35.5	950 1900	22 × 40	1150 2300	22 × 50 ▲25 × 40	1150 2300						
470	471	18 × 40	1050 2100			25 × 50	1400 2800						
560	561	22 × 40	1150 2300	22 × 50 ▲25 × 40	1350 2700								
680	681	22 × 50 ▲25 × 40	1350 2700	25 × 50	1500 3000								
820	821	25 × 50	1500 3000									Case size φD×L(mm)	Rated ripple ● △

●Frequency coefficient of rated ripple current

V	Cap.(μF) \ Frequency	50Hz	120Hz	300Hz	1kHz	10k to 50kHz	100kHz
10 to 50	0.47 to 10	0.75	1.00	1.20	1.40	1.55	1.65
	22 to 470	0.85	1.00	1.10	1.20	1.25	1.30
	1000 to 3300	0.95	1.00	1.03	1.05	1.10	1.15
160 to 450	10 to 820	0.60	1.00	1.20	1.60	1.80	2.00

●: Rated ripple current (mArms) at 105°C 120Hz
△: Rated ripple current (mArms) at 105°C 100kHz
▲: In this case, 6 will be put at 12th digit of type numbering system.