BREL INTERNATIONAL COMPONENTS
1621 WEST UNIVERSITY PARKWAY, SARASOTA, FL 34243
SALES: (800) 237-4564 PHONE: (941) 355-9791 FAX: (941) 355-1530

Wide Temperature Type – (General Purpose 105°C) Radial – Type MSR/ET (105° C)

ALUMINUM ELECTROLYTIC CAPACITORS

* Same size, same specification as general purpose miniature aluminum capacitor and have wide temperature range.
* For switching regulator and automotive application.

Operating temperature range: -55°C~+105°C.

Capacitance and tolerance: Capacitance measurements shall be made by the bridge method at a frequency of $120Hz^{+10}_{-5}$ Hz.

The capacitance shall be within the specified tolerance of ±20%.

Leakage current: A current-limiting resistor of 1,000 ohms shall be connected in series with each capacitor under test. Rated DC working voltage shall be applied to the capacitor for 5 minute before making the leakage current measurements.

The maximum leakage current for the capacitors shall not exceed the value determined from the following equation or 4UA, whichever is greater.

$I = 0.03CV$

where I = Leakage current (UA)
C = Nominal capacitance (UF)
V = Rated DC voltage (V.DC)

Dissipation factor: Measured at a frequency of $120Hz^{+10}_{-5}$ Hz, the dissipation factor shall be less than the values in Table 1.

Table 1.

Rated Voltage (V.DC)	Dissipation Factor (%)
6.3	22
10	19
16	16
25	14
35	12
50	10
63	9
80	9
100	8

In case the nominal capacitance of capacitor exceeds 1000μF, 2% per each 1000μF shall be added to the corresponding value listed in Table 1.

Low-temperature characteristics: The ratio of the impedance of -25°C or -40°C to that of +20°C shall be less than the values listed in Table 2.

Table 2.

Rated voltage (V.DC)	Ratio of Impedance	
	Z @ -25°C / Z @ +20°C	Z @ -40°C / Z @ +20°C
6.3	3	6
10	2	5
16	2	3
25	2	3
35	2	3
50	2	3
63	2	3
80	2	3
100	2	3

Life test: Full-rated voltage shall be applied to the capacitor through a series protective resistor (1,000 ohms) for a period of 1,000 hours ±12 hours, while the capacitors are maintained at an ambient temperature of 105°C±2°C (shielded from direct heat radiation).

The capacitors shall then be removed from the test chamber and stabilized at room temperature for 2 hours after which they shall meet each of the values listed in Table 3.

Table 3.

Capacitance	≤16 W.V., within ±25% of initial measurements
	≥25 W.V., within ±20% of initial measurements
Leakage current	Same as specified under Leakage Current
Dissipation factor	200% less of values in Table 1.
Appearance	Free from leakage of electrolyte and/or other noticeable deformation

Shelf life test: Prior to testing, each capacitor in the test group is measured for capacitance, dissipation factor and DC leakage current.

The capacitors are then stored with no voltage applied at a temperature of 105°C ±2°C for 1,000 hours ±12 hours. Following this period the capacitors shall be removed from the test chamber and be allowed to stabilize at room temperature. Next they shall be connected to a series limited resistor with DC rated voltage applied for 30 minutes after which the capacitors shall be discharged. After completion of these procedures, the capacitors shall meet each of the requirements as listed in Table 3.

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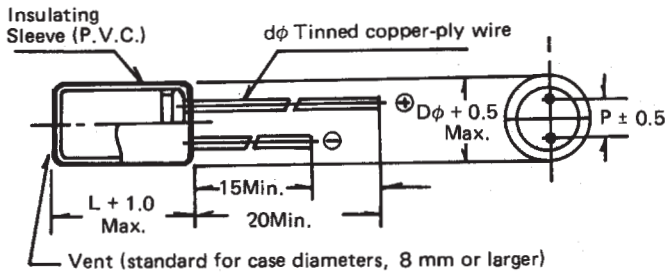
● CONFIGURATION



Dimension: mm

Outside Diameter	Dø	5	6	8	10	13	16	18	22	25
Lead Spacing	P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10	12
Lead Wire	dø	0.5	0.5	0.6	0.6	0.6	0.8	0.8	0.8	1.0

DIMENSIONS: Diameter (Dϕ) x Length (L): mm

Rated Voltage (V)	6.3	10	16	25	35	50	63	80	100
Surge Voltage (V)	8	13	20	32	44	63	79	100	125
CAP. (μF)									
0.47	5x11	5x11	5x11	5x11	5x11	5x11	5x11	5x11	5x11
1	5x11	5x11	5x11	5x11	5x11	5x11	5x11	5x11	5x11
2.2	5x11	5x11	5x11	5x11	5x11	5x11	5x11	5x11	5x11
3.3	5x11	5x11	5x11	5x11	5x11	5x11	5x11	5x11	5x11
4.7	5x11	5x11	5x11	5x11	5x11	5x11	5x11	5x11	5x11
10	5x11	5x11	5x11	5x11	5x11	5x11	5x11	6x11	6x11
22	5x11	5x11	5x11	5x11	5x11	6x11	6x11	8x11.5	8x11.5
33	5x11	5x11	5x11	5x11	5x11	6x11	6x11	10x12.5	10x12.5
47	5x11	5x11	5x11	5x11	6x11	6x11	8x11.5	10x16	10x16
100	5x11	5x11	6x11	6x11	8x11.5	8x11.5	10x12.5	13x20	13x20
220	6x11	6x11	8x11	8x11.5	10x12.5	10x16	10x20	13x25	16x25
330	8x11.5	8x11.5	8x11.5	10x12.5	10x16	10x20	13x20	16x25	16x25
470	8x11.5	8x11.5	10x12.5	10x16	10x20	13x21.5	13x25	16x31.5	16x31.5
1000	10x16	10x16	10x18	13x20	13x20	16x25	16x31.5	18x40	22x40
2200	10x20	10x20	13x20	16x25	16x31.5	16x41	22x40	25x50	
3300	13x20	13x20	13x25	16x31.5	16x41	22x40	25x40	25x50	
4700	13x25	13x25	16x31.5	16x41	18x41	22x41	25x50		
10000	16x34.5	16x34.5	18x41	25x40					

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RIPPLE CURRENT IN mA-RMS (at 120 Hz, 85°C)—peak voltage not to exceed rated DC voltage—

Rated Voltage (V) / Surge Voltage (V) / CAP. (μF)	6.3	10	16	25	35	50	63	80	100
	8	13	20	32	44	63	79	100	125
0.47	6	6	6	6	6	6	10	10	10
1.0	12	12	12	12	12	12	15	15	15
2.2	18	18	18	18	18	18	22	22	22
3.3	22	22	22	22	22	22	27	27	27
4.7	27	27	27	27	27	27	30	34	36
10	39	39	39	39	39	39	50	57	61
22	49	49	49	49	60	65	85	101	106
33	56	56	56	68	73	93	105	133	142
47	60	60	76	81	101	112	145	158	184
100	99	99	129	137	172	207	252	280	300
220	155	171	225	260	306	371	414	450	533
330	225	246	298	347	417	455	551	651	702
470	265	326	392	458	535	652	725	808	809
1000	462	570	677	805	869	1021	1220	1370	1375
2200	790	960	1053	1234	1362	1735	2070	2320	
3300	1033	1194	1586	1630	2310	2940	3510	3940	
4700	1275	1423	1889	2770	3920	4990	5960		
10000	2044	2410	3210	4700					

Ripple current calculations: Electrolytic capactors will withstand RMS ripple current at the frequency of 120Hz and a temperature of +105°C, as listed above.

1. When capacitors are operated at a temperature other than +105°C, the allowable RMS ripple current listed above must be multiplied by the factor shown below:

+70°C or less	+85°C	+105°C
2.8	2.2	1.0

2. If capacitors are used at a frequency other than 120Hz, the rated 120Hz RMS ripple current listed above must be multiplied by the appropriate factor shown below:

The CV Product (Cap. in μF x Rated V)	120Hz	300Hz	1kHz	100kHz
CV<1,000	1.0	1.28	1.66	2.0
1,000≤CV<10,000	1.0	1.18	1.36	1.5
CV≥10,000	1.0	1.14	1.22	1.3