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

ALUMINUM ELECTROLYTIC CAPACITORS

Operating temperature range: -40°C + 125°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 minutes before making the leakage current measurements.

The maximum leakage current for the capacitors shall not exceed the value determined from the following equation or 2μA, whichever is greater:

$I = 0.002CV$ where: I = Leakage Current (μA)
C = Nominal Capacitance (μF)
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 (%)
10	15
16	12
25	10
35	10
50	8

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

Table 2.

Rated Voltage (V.DC)	Ratio of Impedance	
	$\frac{Z\ @\ -25°C}{Z\ @\ +20°C}$	$\frac{Z\ @\ -40°C}{Z\ @\ +20°C}$
10	3	6
16	2	4
25	2	4
35	2	4
50	2	4

Life test: The capacitors shall be placed in an air circulating thermostatic test chamber and be exposed to full rated DC voltage through a series protective resistor (100 ohms) for a period of 1,000 hours±12 hours at a temperature of +125°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.

Leakage current	Same as specified under Leakage Current
Capacitance	Within ±20% of initial measurements
Dissipation factor	200% less of value 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 +125°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 limiting 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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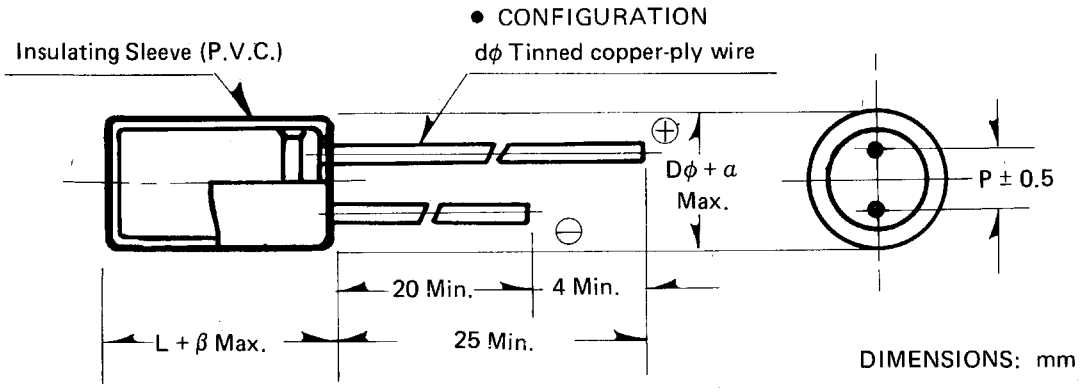
High Temperature +125°C – Type MSR/ET (125C) & MSA/ET (125C)



DIMENSIONS: mm

Outside Diameter (Dϕ)	Lead Spacing (P)
8.0	3.5
10.0	5.0
13.0	5.0
16.0	7.5

RADIAL TYPE

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

Rated Voltage (V) / Surge Voltage (V) / CAP. (μF)	10 / 13	16 / 20	25 / 32	35 / 44	50 / 63
0.47	8x12.5	8x12.5	8x12.5	8x12.5	8x12.5
1.0	8x12.5	8x12.5	8x12.5	8x12.5	8x12.5
2.2	8x12.5	8x12.5	8x12.5	8x12.5	8x12.5
3.3	8x12.5	8x12.5	8x12.5	8x12.5	8x12.5
4.7	8x12.5	8x12.5	8x12.5	8x12.5	8x12.5
10	8x12.5	8x12.5	8x12.5	8x12.5	8x12.5
22	8x12.5	8x12.5	8x12.5	8x12.5	10x12.5
33	8x12.5	8x12.5	8x12.5	10x12.5	10x16
47	8x12.5	8x12.5	10x12.5	10x16	10x20
100	10x12.5	10x16	10x20	13x20	13x25
220	10x20	13x20	13x25	16x25	
330	13x20	13x25	16x25		
470	13x25	16x25			

RIPPLE CURRENT in mA-RMS (at 120Hz, +85°C)—peak voltage not to exceed rated DC voltage.
RADIAL TYPE

Rated Voltage (V) / Surge Voltage (V) / CAP. (μF)	10 / 13	16 / 20	25 / 32	35 / 44	50 / 63
0.47	28	28	28	28	28
1.0	47	47	47	47	47
2.2	62	62	62	62	62
3.3	76	76	76	76	76
4.7	91	91	91	91	91
10	120	120	120	120	120
22	175	175	175	175	190
33	200	200	200	220	230
47	220	220	240	260	290
100	290	330	370	400	430
220	450	510	580	630	
330	560	650	710		
470	670	770			

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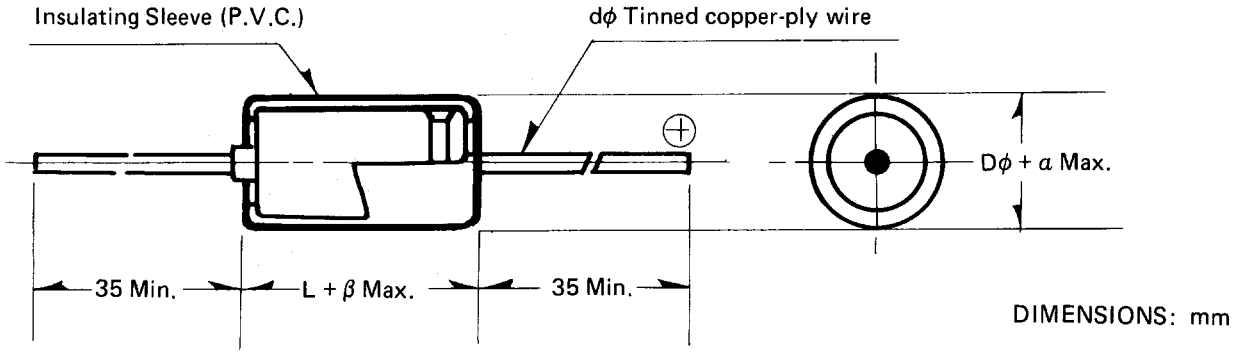
High Temperature +125°C – Type MSR/ET (125C) & MSA/ET (125C)

● CONFIGURATION



DIMENSIONS: mm

AXIAL TYPE

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

Rated Voltage (V) / Surge Voltage (V) / CAP. (μF)	10 / 13	16 / 20	25 / 32	35 / 44	50 / 63
0.47	6x16	6x16	6x16	6x16	6x16
1.0	6x16	6x16	6x16	6x16	6x16
2.2	6x16	6x16	6x16	6x16	6x16
3.3	6x16	6x16	6x16	6x16	6x16
4.7	6x16	6x16	6x16	6x16	6x16
10	6x16	6x16	6x16	6x16	6x16
22	6x16	6x16	6x16	8x16	8x20
33	6x16	8x16	8x20	8x20	10x21
47	6x16	8x16	8x20	10x21	10x26
100	8x20	10x21	10x21	10x26	13x26
220	10x21	10x26	13x26	13x31.5	16x31.5
330	13x26	13x26	13x31.5	16x31.5	
470	13x31.5	13x31.5	16x31.5		

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

AXIAL TYPE

Rated Voltage (V) / Surge Voltage (V) / CAP. (μF)	10 / 13	16 / 20	25 / 32	35 / 44	50 / 63
0.47	28	28	28	28	28
1.0	47	47	47	47	47
2.2	62	62	62	62	62
3.3	76	76	76	76	76
4.7	91	91	91	91	91
10	120	120	120	120	120
22	165	165	165	175	190
33	185	185	200	220	230
47	195	220	240	260	290
100	290	330	370	400	430
220	450	510	580	630	650
330	560	650	710	780	
470	670	770	870		