

# Type AXLH -40 °C to +150 °C

## High Temperature Axial Leaded Aluminum Electrolytic Capacitors

HIGH PERFORMANCE AXIAL LEADED ALUMINUM ELECTROLYTIC CAPACITORS



Type AXLH capacitors are a new generation of high performance aluminum electrolytic capacitors rated up to 2000 hours at 150 °C. They are designed for applications that place high demands on a capacitor. The capacitor's outstanding features include low ESR, low leakage current, a long shelf life and a high ripple current capability.

### Highlights

- 150 °C Operating Temperature
- Up to 28 Amps RMS Continuous Ripple Current
- Capacitance Range: 470 µF to 4700 µF
- High Vibration Resistance
- Very Long Shelf Life
- Low Leakage Current

### Specifications

Capacitance Range (100 Hz/+20 °C)	470 to 4700 µF												
Capacitance Tolerance (100 Hz/+20 °C)	-10/+30%												
Rated Voltage	25, 40, 63 Vdc												
Operating Temperature	-40 °C to +150 °C												
Leakage Current (at 20°C)	$I = 0.003 CV + 4.0 \mu A$ ; after 5 minutes at rated voltage I = leakage current in µAmps C = rated capacitance in µF V = rated DC Working voltage in Volts												
Ripple Current vs. Frequency Correction Factors	<table border="1"><thead><tr><th>Frequency (Hz)</th><th>100</th><th>300</th><th>1000</th><th>5000</th><th>100 kHz</th></tr></thead><tbody><tr><td>Ripple Current Correction Factor</td><td>0.35</td><td>0.57</td><td>0.8</td><td>1</td><td>1.04</td></tr></tbody></table>	Frequency (Hz)	100	300	1000	5000	100 kHz	Ripple Current Correction Factor	0.35	0.57	0.8	1	1.04
Frequency (Hz)	100	300	1000	5000	100 kHz								
Ripple Current Correction Factor	0.35	0.57	0.8	1	1.04								
Shelf Life	(+105 °C/0 Vdc): 5000 hours (+40 °C/0 Vdc): 10 years												
Standard	IEC 60384-4 long life grade 40/125/56												
RoHS Compliant													

### Part Numbering System

<b>AXLH</b>	<b>222</b>	<b>P</b>	<b>025</b>	<b>E</b>	<b>D</b>
Type	Capacitance	Capacitance Tolerance	Voltage Code	Case Dia.Code	Case Length Code
	222 = 2200 µF	P = -10/+30%	025 = 25 Vdc 040 = 40 Vdc 063 = 63 Vdc	E = 20 mm	D = 27 mm H = 35 mm L = 43 mm

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Load Life Test	Test	Mount the capacitor on a heat sink with a low thermal resistance path. Apply the maximum rated voltage for 2000 hrs at +150°C with the +150°C maximum ripple current applied to the capacitor. After the test, measure the capacitance, ESR, and DCL at +20°C.
	$\Delta C$	Capacitance will be within $\pm 15\%$ of the initial value
	ESR	ESR will be less than 2 times the initial value
	DCL	The leakage current will be within the specified value
	Appearance	No electrolyte leakage or other visible damage. The markings will be legible.
Vibration Test	Test	Clamp the case to the test fixture. Frequency range is 10 - 2000 Hz. Amplitude of 1.5mm or 20 g acceleration. Duration of test is 22 hours in each of three directions. After the test, measure the capacitance at +20°C.
	$\Delta C$	Capacitance change from the initial measurement must not exceed 5%.
	Appearance	No electrolyte leakage or other visible damage.
Surge Voltage Test	Test	Subject the capacitor to 1000 surge voltage cycles at +150°C. For each cycle, apply 1.15 times the rated voltage for 30 seconds followed by no voltage for 5 min. and 30 seconds. The time constant for charging is 0.1 seconds. After one to two hours, measure the capacitance and esr.
	$\Delta C$	Capacitance change from the initial measurement must not exceed 15%.
	ESR	The ESR will be $< 2x$ initial value.
	Appearance	No electrolyte leakage or other visible damage.
Storage at Low Temperature Test	Test	Subject the capacitor to 72 hours at -55°C. After 16 hours at room temperature, measure the capacitance and DCL.
	$\Delta C$	Capacitance change from the initial measurement must not exceed 10%.
	DCL	Leakage current will meet the initial specification.
	Appearance	No electrolyte leakage or other visible damage. The markings are to be legible.
Charge and Discharge Test	Test	Subject the capacitor to 1 million charge/discharge cycles at +20°C. For each cycle, apply the rated voltage for 0.5 seconds using a 0.1 second charge/discharge time constant. After the test, the following will apply;
	$\Delta C$	Capacitance will be within $\pm 10\%$ of the initial value.
	Appearance	No electrolyte leakage or other visible damage.

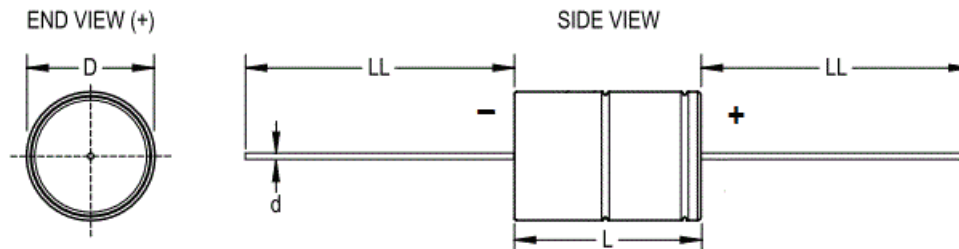
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## High Temperature Axial Leaded Aluminum Electrolytic Capacitors

### Ratings

Rated Capacitance 100Hz/+20°C (μF)	Capacitance Tolerance (%)	VDC	Cornell Dubilier Part Number	Case Size D x L (mm)	Max. ESR 100 Hz/+20°C (mΩ)	Max. ESR 100 kHz/+20°C (mΩ)	Rated Ripple Current ≥ 5kHz/+125°C (A)	Maximum Ripple Current ≥ 5kHz/+125°C (A)
2200	-10/+30	25	AXLH222P025ED	20 x 27	50	25	7.1	9.1
3300	-10/+30	25	AXLH332P025EH	20 x 35	34	17	8.9	11.3
4700	-10/+30	25	AXLH472P025EL	20 x 43	25	13	10.3	13.1
1500	-10/+30	40	AXLH152P040ED	20 x 27	57	22	7.3	9.3
2200	-10/+30	40	AXLH222P040EH	20 x 35	41	17	8.9	11.2
2700	-10/+30	40	AXLH272P040EL	20 x 43	32	13	10.1	12.8
470	-10/+30	63	AXLH471P063ED	20 x 27	125	32	5.5	7.0
680	-10/+30	63	AXLH681P063EH	20 x 35	87	23	6.9	8.7
900	-10/+30	63	AXLH901P063EL	20 x 43	67	18	8.1	10.2

### Outline Drawings & Dimensions Table



Size Code	Dimensions in mm				Approximate Weight (grams)
	D	L	d	LL	
	± 0.5	± 1	± 0.03	± 2	
ED	20	26.5	1	40	13
EH	20	34.5	1	40	20
EL	20	42.5	1	40	24

Note: Bend leads at least 3.5 mm from the case.

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### Heat-Sinked Ratings

Cornell Dubilier Part Number	Max. ESR 5-100 kHz 125-150°C (mΩ)	Maximum Ripple Current *		
		≥ 5 kHz/+125°C (A)	≥ 5 kHz/+140°C (A)	≥ 5 kHz/+150°C (A)
AXLH222P025ED	10.6	22.2	14	6.3
AXLH332P025EH	7.8	25.8	16.3	7.3
AXLH472P025EL	6.4	28.5	18	8.1
AXLH152P040ED	10	22.8	14.4	6.5
AXLH222P040EH	7.9	25.7	16.2	7.3
AXLH272P040EL	6.7	27.9	17.6	7.9
AXLH471P063ED	17.5	17.3	10.9	4.9
AXLH681P063EH	13	20	12.7	5.7
AXLH901P063EL	10.6	22.2	14	6.3

\* When the capacitor is mounted to a heat-sink using low thermal resistance path.

### Capacitor Markings

#### Marking

-- CDM ++  
AXLH222P025ED  
2200 uF 25VDC  
160603

#### Description

Logo, Polarity Marks  
CDE Part Number  
Capacitance, Rated Voltage (VDC)  
Date Code (Year, Week), Batch Number

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