

ARCHIMEDES SERIES

Hexagonal Arrays X010-10P0L-30

Complete solution on a rigid substrate

X010-10P0L-30 is a complete and thoroughly integrated evaluation board that features the **LS9100X** direct-AC LED driver. The Archimedes Series is designed to be driven directly off the 120VAC line voltage, eliminating the standard power supply and extending the long-term life of the product. The high-power factor can provide enhanced energy savings to the end application. The smaller form factor provides significant flexibility in creative fixture design and reduces development time. This all-inclusive solution provides impressive performance for distributed light source applications in conjunction with the quality of light. The new board will simplify the evaluation process and development time by providing those who are interested with a premium design ready for testing.



Primary Applications

- Troffer
- Low-bay
- High-bay
- Factory Ceiling Light
- Light Fixtures

**Custom Available for
Your Specific Application**

Features and Benefits

- 1100 lumens offering efficacies of up to 110 lm/W
- Eliminates the need for a power supply. Connects directly to the AC line voltage
- Fully compatible with most Dimmers. Leading/Trailing Edge Triac Dimmers
- Driver On Board. Patented Monolithic IC (Archimedes Series)
- >0.97 Power Factor
- <20% Total Harmonic Distortion
- <25% Percent Flicker <0.06 Flicker Index
- Zero Electromagnetic Interference
- Long Lifetime
- 2700K-5000K CCT Dim-To-Warm based on dimmer's settings
- Thermal Aluminum rigid PCB substrate for mechanical robustness and heat dissipation
- RoHS Compliant

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X010-10P0L-30

Product Selection Guide

Table 1. Product performance at VAC 120V, Ta 25°C

Nominal CCT	Minimum CRI	Luminous Flux (lm)		Typical Efficacy (lm/W)	Part Number
		Minimum	Typical		
2700-5000K	80	980	1000	100	X010-10P0L-30

Absolute Maximum Ratings

Table 2. Product performance

Symbol	Parameter	Value	Units
V_{max}	Maximum Input Voltage	340	V
P_{max}	Maximum Input Power	20.0	W
T_{op}	Operating Temperature	-40~+80	°C
T_{stg}	Storage Temperature	-50~100	°C
ESD	ESD Voltage (HBM)	+/-2000	V

Optical and Electrical Characteristics

Table 3. Product performance at VAC 120V, Ta 25°C

Symbol	Parameter	Typ.	Ratings			Units
			Min.	Typical	Max.	
Φ_L	Luminous Flux(1)	5000K	980	1000	1100	lm
CCT	Color Temp.	CIE 1931	2700K	4000K	5700K	K
Ra	CRI		80			-
$2\theta_{1/2}$	View Angle			120		Degree
V_{in}	Input AC Voltage			120		Vrms
P_{in}	Input Power			10.0	13.0	W
f	Frequency			50/60		Hz
PF	Power Factor			>0.98		-
Vs	Surge Protection	IEC 61000-4-5	500			V
Vt	Transient Protection	ANSI/IEEE C62.41.2-2002 Category A	2500			V

Note:

(1) The total luminous flux (Φ_L) of the light engine was measured with an integrated sphere.

Thermal Characteristics

Table 4. Product performance

Symbol	Parameter	Value	Units
P_{max}	Maximum Package Power Dissipation	15.0	W
T_{jmax}	Maximum Junction Temperature	125	°C

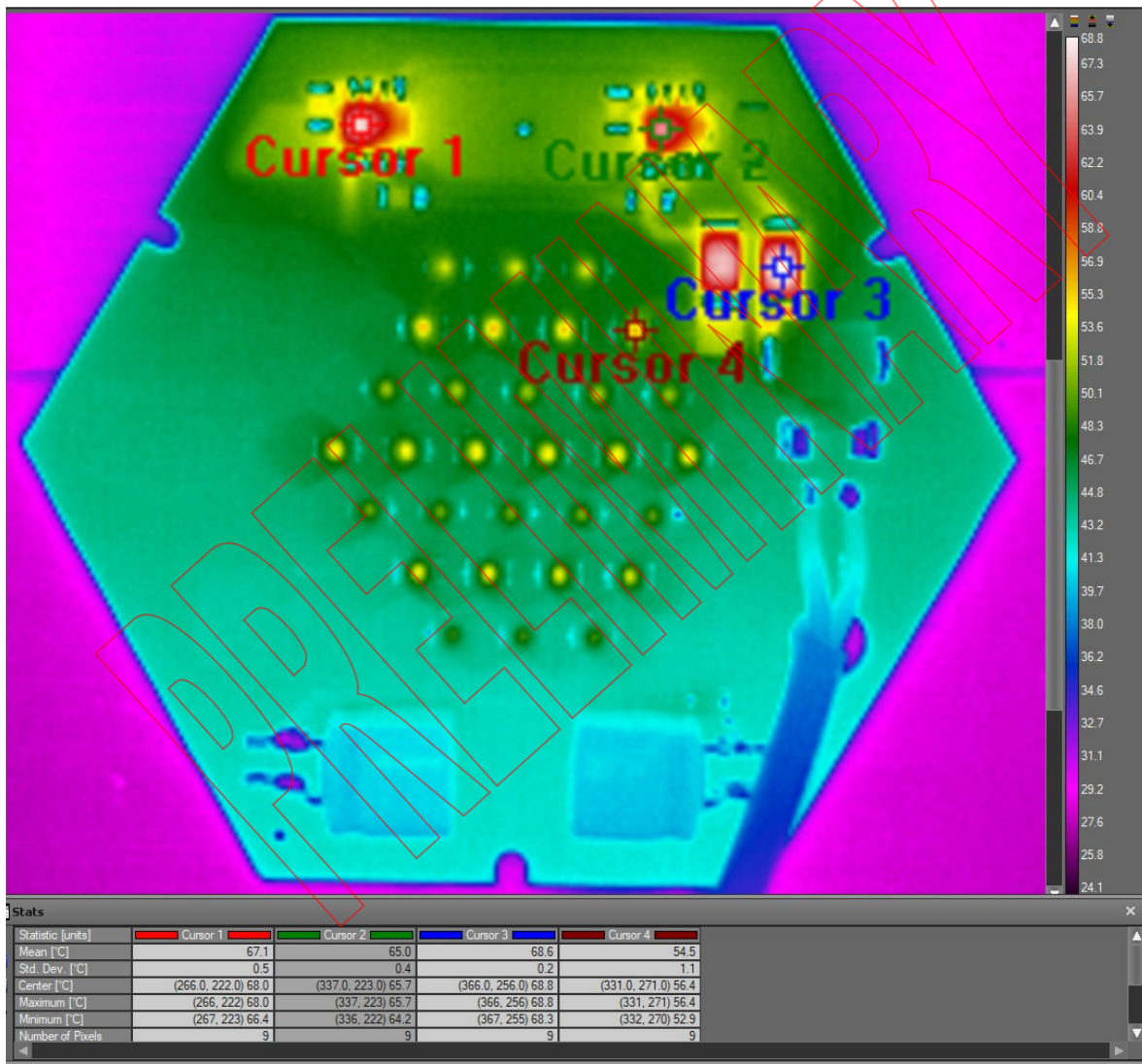


Figure 1. Thermal Camera image. X010-10POL-30 thermal image when attached to a proper heat-sink at VAC 120V, Ta 25°C

Note: Despite the fact the maximum junction temperature of the IC drivers and LEDs is 125°C, it is recommended to maintain their temperature below 85°C.

Characteristic Curves

Product performance at Ta 25°C

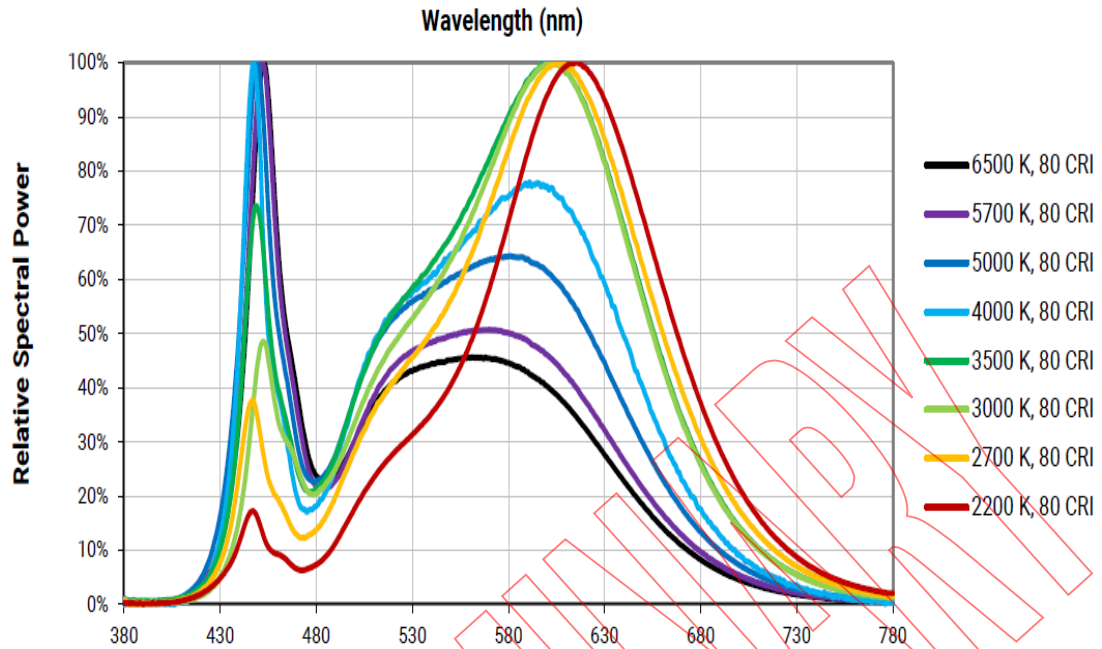


Figure 2. LED Spectral Distribution

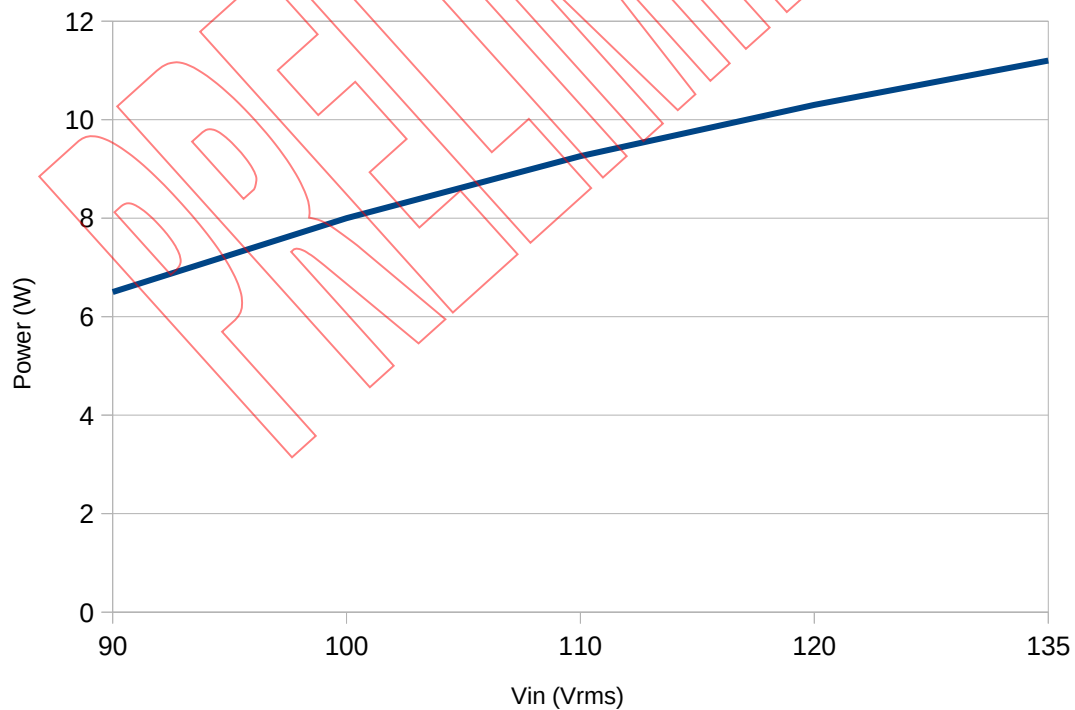
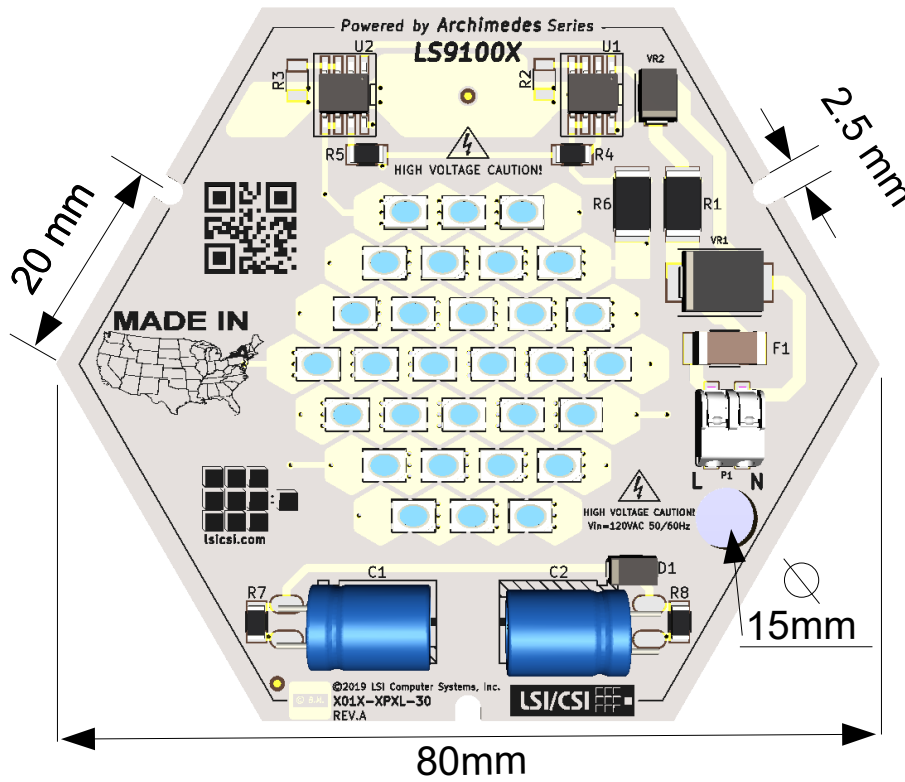


Figure 3. Power Variations vs. Input Voltage

Mechanical Dimensions



Light Engine Placement and Connection Instructions

1. Assembly precautions

- a. The LEDs and ICs are sensitive to Electro-Static Discharge (ESD). The Light Engine should not be installed in end equipment without ESD protection. Make sure proper discharge prior to starting work.
- b. The Light Engine uses line voltages to function, therefore caution must be taken when working with this device. Do not touch any Light Engine's components while active.
- c. Do not use in conditions of high moisture and/or oxidizing gases.
- d. Do not use in high temperature, high humidity, direct sunlight or ultra violet light since this Light Engine is sensitive to those conditions.
- e. Do not touch the LED's silicone resin area (LED's top).
- f. Do not paint the LED's top with any type of material.

2. Surface requirements

The surface must be smooth and even, without marked lumps or indentation that can decrease the contact area increasing thermal resistance. For perfect results ensure the surface is clean of all dust, dirt and fat. Use a lint-free cloth with alcohol or a silicone-free cleanser.

3. Drill mounting holes

Use #50 bit to drill the 3 light engine's mounting holes. Make sure to drill the hole perpendicular and to the center of the existing PCB hole.

4. Screw-down Light Engine to heat-sink

Use three (3) #2-56 1/4" thread cutting screws to firmly attach the Light Engine to the heat-sink.

5. AC Line Wires.

Use recommended wire size #18-22 AWG to connect the Light Engine's AC input P1.
P1-L pin must be connected to the utility line phase.
P1-N pin must be connected to the utility line neutral.

CAUTION!: THE READER IS WARNED THAT CAUTION MUST BE USED IN THE USE OF THIS LIGHT ENGINE. LETHAL HIGH VOLTAGE POTENTIALS ARE PRESENT. EXTREME CAUTION MUST BE USED IN WORKING WITH, AND MAKING CONNECTIONS TO THIS LIGHT ENGINE. USE CAUTION.

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