

**Low-Power Light Engine Assembly**
**NOTE**


All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters [and inches]. Unless otherwise specified, dimensions have a tolerance of  $\pm 0.13$  [ $\pm .005$ ] and angles have a tolerance of  $\pm 2^\circ$ . Figures and illustrations are for identification only and are not drawn to scale.

**1. INTRODUCTION**

This specification covers the requirements for application of Low-Power Light Engine Assembly used to project a band of light along the entire length of a light pipe with one or more light emitting diodes (LED).

The light engine assembly consists of a circuitry housing that contains a printed circuit (pc) board assembly (includes LED and  $\frac{1}{2}$ -watt LED constant current driver circuitry) and a 5-mm or 10-mm diameter light pipe housing. The engine assembly is available with or without an optical-grade clear acrylic light pipe. The light pipe is available in lengths up to 2 m [6.5 ft]. The light pipes are also available separately.

The engine assembly is available with a regulated direct current (DC) input (7 through 27 VDC) constant current drive or non-regulated DC input (5 VDC) resistor drive. With the regulated input, variation in voltage within the specified range will not cause variation in the intensity of the LED; and with the non-regulated input, variation in voltage will cause variation in the intensity of the LED. The overall efficacy of the engine assembly (without the light pipe) is approximately 32 lumens per watt.

The input connection accepts a 2-position common termination (CT) connector (available separately). The light pipe housing features slots that allow the light pipe to be installed in one of four orientations so that the light beam emits in one of four directions. The light emitted from the light pipe has a viewing angle of approximately 30 degrees (50% relative intensity) with a 180-degree radial direction from the reflector strip. The vents of the light pipe housing provide adequate cooling for the LED; therefore, heat sink or forced air cooling is not required.

When corresponding with personnel, use the terminology provided in this specification to facilitate your inquiries for information. Basic terms and features of this product are provided in Figure 1.

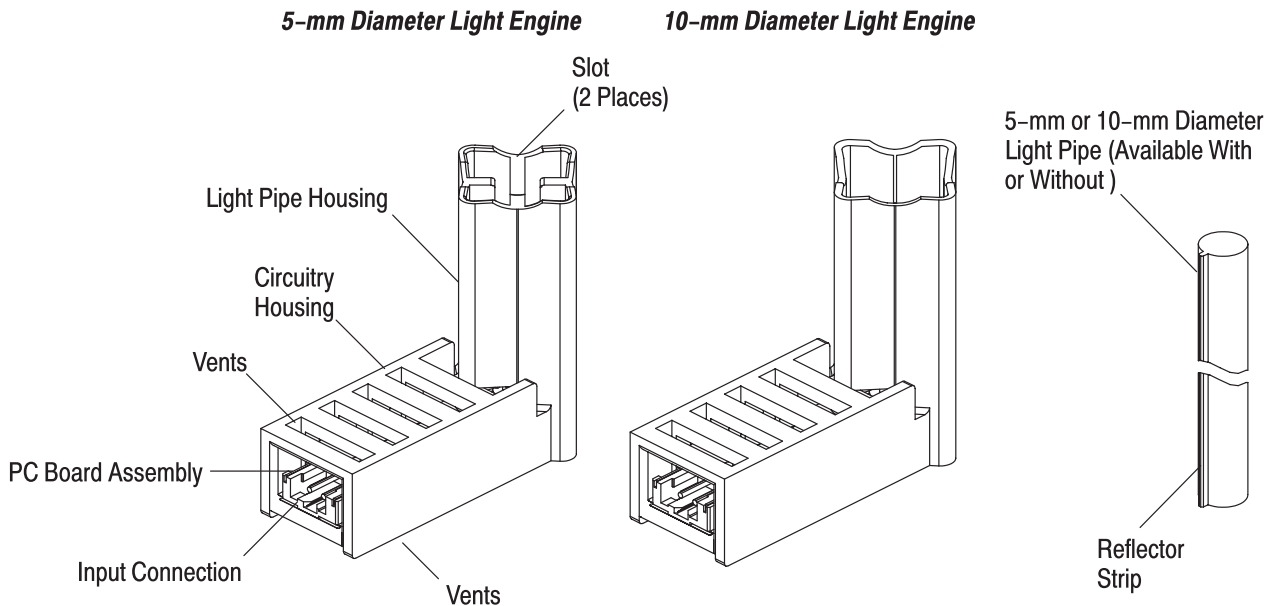


Figure 1

## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

- Initial release of application specification

### 2.2. Customer Assistance

Reference Product Base Part Number 2008876 and Product Code L012 are representative of Low-Power Light Engine Assembly. Use of these numbers will identify the product line and expedite your inquiries through a service network established to help you obtain product and tooling information. Such information can be obtained through a local Representative or, after purchase, by calling PRODUCT INFORMATION at the number at the bottom of this page.

### 2.3. Drawings

Customer Drawings for product part numbers are available from the service network. If there is a conflict between the information contained in the Customer Drawings and this specification or with any other technical documentation supplied, call PRODUCT INFORMATION at the number at the bottom of this page.

### 2.4. Specifications

Design Objective (status at time of publication) 108-2347 provides expected product performance and test information.

### 2.5. Instructional Material

Instruction Sheets (408-series) provide product assembly instructions or tool setup and operation procedures. Documents available which pertain to this product are:

408-10277 Low-Power Light Engine Assemblies 2008876-[ ], 2008877-[ ], and 2008878-[ ]

408-10297 AMP LIGHT GUIDES\* Light Pipes 2058295-[ ] and 2058296-[ ]

## 3. REQUIREMENTS

### 3.1. Material

The light pipe housing is made of polyester polybutylene terephthalate (PBT). The light pipe is made of acrylic.

### 3.2. Safety

Do not stack product shipping containers so high that the containers buckle or deform.

### 3.3. Limitations

The engine assembly is designed to operate in a temperature range of  $-30^{\circ}$  to  $70^{\circ}\text{C}$  [ $-22^{\circ}$  to  $158^{\circ}\text{F}$ ].

### 3.4. Storage

#### A. Temperature

The engine assembly must be stored in a temperature range of  $-40^{\circ}$  to  $120^{\circ}\text{C}$  [ $-40^{\circ}$  to  $248^{\circ}\text{F}$ ].

#### B. Shelf Life

Product should remain in the shipping containers until ready for use to prevent deformation. Product should be used on a first in, first out basis to avoid storage contamination that could adversely affect performance.

#### C. Chemical Exposure

Do not store product near any chemical listed below as they may cause stress corrosion cracking.

Alkalies	Ammonia	Citrates	Phosphates	Citrates	Sulfur Compounds
Amines	Carbonates	Nitrites	Sulfur	Nitrites	Tartrates

### 3.5. Thermal Performance

The thermal performance of the overall system is paramount to the life of the LED. The engine assembly supports a  $1/2$ -watt of input to the LED without using forced air cooling or additional heat sink AS LONG AS the vents are free to ambient air circulation. IT IS IMPORTANT that the thermal management is adequate for the LED.

### 3.6. Assembly

The engine assembly must be assembled using the following requirements (refer to Figure 2):

1. The light pipe must be inserted into the light pipe housing until it contacts the LED lens. The reflector strip should be in the desired orientation (the output light beam will be directed opposite the reflector strip).



*Caution must be used when inserting the light pipe into the light pipe housing. Excessive force could damage the lens of the LED.*

2. The vents of the light pipe housing must be free from obstruction for ambient air circulation.



*Obstructive air vents will cause inadequate cooling for the LED.*

3. The CT connector must be inserted into the input connection using correct polarity.



*Correct polarity must be observed. Reverse polarity will permanently damage the LED driver.*

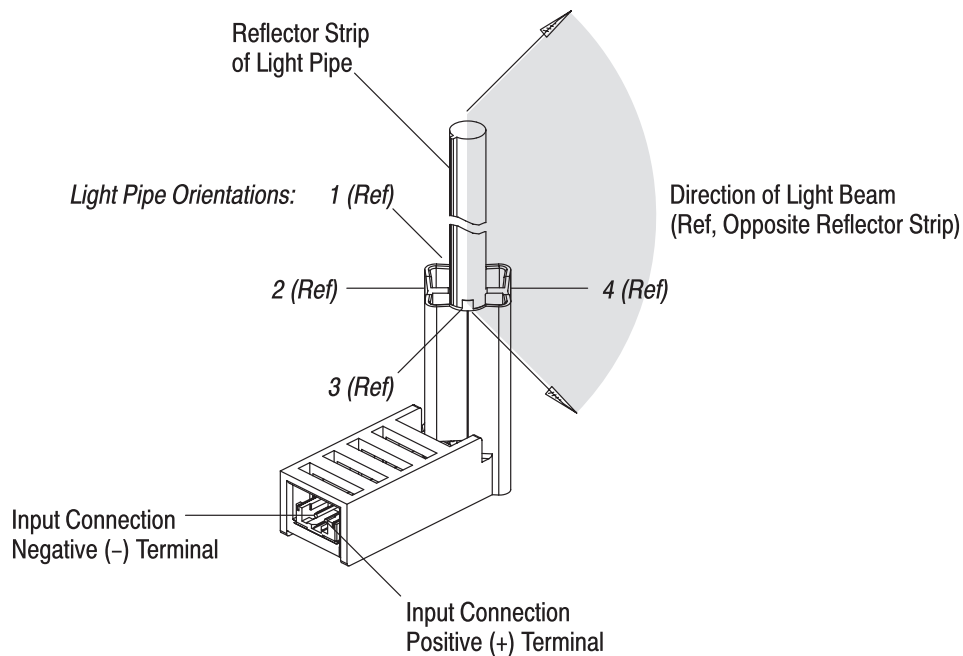


Figure 2

### 3.7. Mounting

The engine assembly can be mounted to a surface by attaching appropriately-sized pipe clamps to the light pipe housing or the circuitry housing. Pipe clamp sizes are given in Figure 3. Alternately, double-sided foam tape can be secured to the sides (without the vents) of the circuitry housing for mounting the engine assembly.

The mounting scheme should have minimal contact with the light pipe to prevent light loss. Any object that touches the light pipe will cause some light loss.

DIAMETER OF LIGHT PIPE HOUSING	PIPE CLAMP SIZE	
	For Light Pipe Housing	For Circuitry Housing
5 mm	$\frac{3}{8}$ -in.	$\frac{5}{8}$ -in.
10 mm	$\frac{3}{16}$ -in.	

Figure 3

### 3.8. Replacement and Repair

The engine assembly is not repairable. Damaged, defective, or worn-out product MUST NOT be used.

## 4. QUALIFICATION

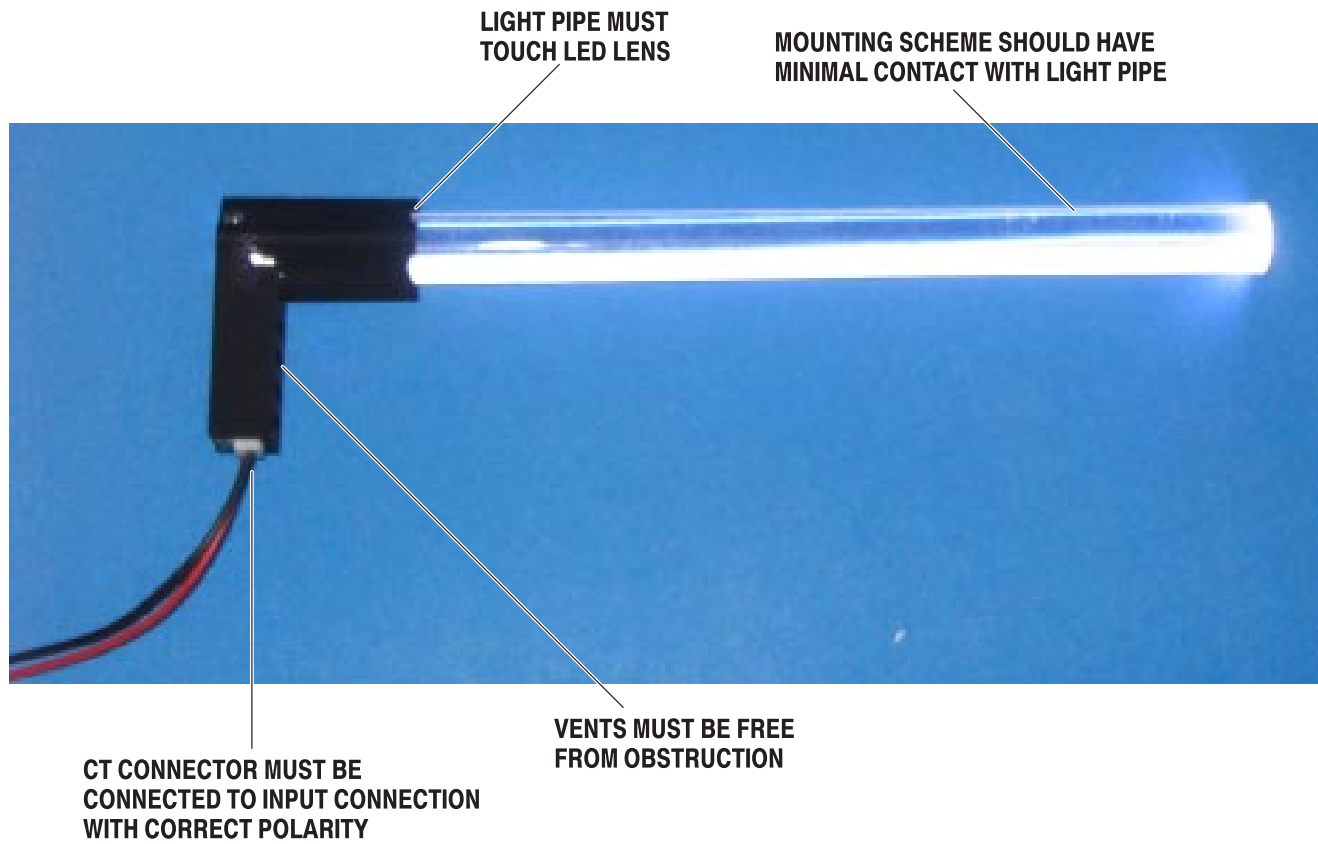
No qualifying support for Low-Power Light Engine Assembly was defined at the time of publication of this document.

## 5. TOOLING

No tooling is required for assembly or installation.

**6. VISUAL AID**

The illustration below shows a typical application of Low-Power Light Engine Assembly. This illustration should be used by production personnel to ensure a correctly applied product. Applications which DO NOT appear correct should be inspected using the information in the preceding pages of this specification and in the instructional material shipped with the product or tooling.



**FIGURE 4. VISUAL AID**