ASDL-4860
High Power Infrared Emitter (850nm) in Surface Mount Package

AVAGO TECHNOLOGIES

Data Sheet

Description

ASDL-4860 Infrared emitter is encapsulated in a compact SMT package that is specially catered for High Power application. This device represents best performance for light output, fast switching and low thermal resistance for heat dissipation. It utilizes AlGaAs LED technology and is optimized with high efficiency at emissive wavelength of 850nm.

Applications

- High Speed Machine Automated System
- Non-Contact Position Sensing
- Optical Sensing
- Infrared Data Transmission
- Security Applications

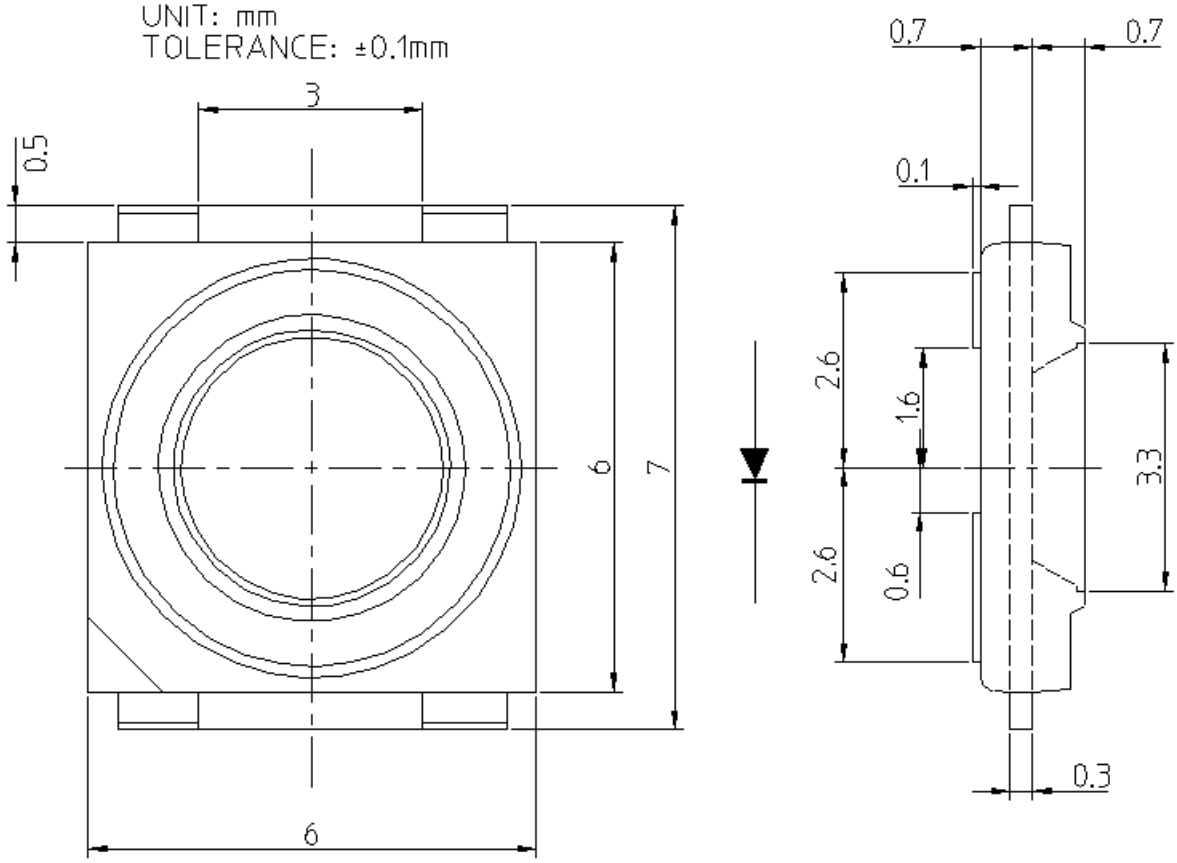
Features

- Top Emitting Surface Mount Infrared LED
- Ultra-Low Height Profile:
  H = 1.5mm, W=6.0mm, L=6.0mm
- High Power
- High Speed
- Low Thermal Resistance
- 850nm Wavelength
- Design for High Power Application
- Design to Drive High Current
- Wide Viewing Angle
- Lead-Free and RoHS Compliant
- Tape & Reel for automation placement

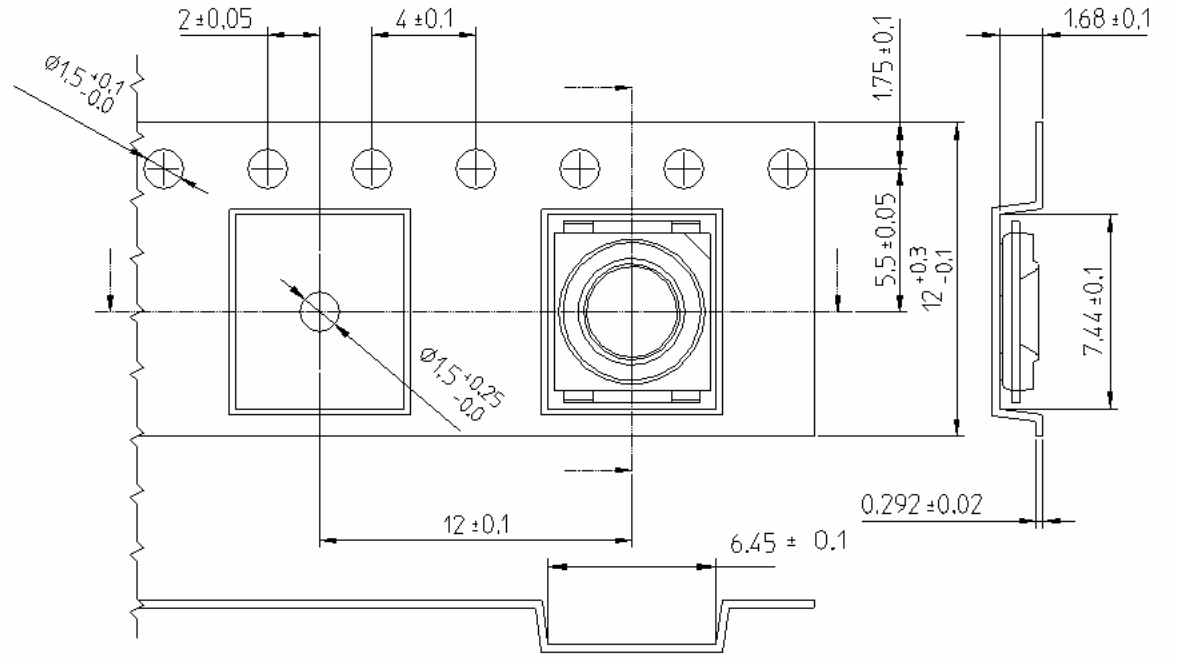
Ordering Information

Part Number	Packaging	Shipping Option
ASDL-4860-C22	Tape & Reel	2000pcs

Package Outline



Tape and Reel Dimensions



All Dimensions are in Millimeters

Absolute Maximum Ratings at 25°C

Parameter	Symbol	Min.	Max	Unit	Reference
Peak Forward Current	I_{FPK}		1	A	T_p<10us Duty Cycle=10%
Continuous Forward Current	I_{FDC}		500	mA	
Power Dissipation	P_{DISS}		1.2	W	
Reverse Voltage	V_r		5	V	
Operating Temperature	T_O	-40	100	℃	
Storage Temperature	T_S	-40	100	℃	
LED Junction Temperature	T_J		125	℃	
Lead Soldering Temperature			260 for 5 sec	℃	

Electrical Characteristics at 25°C

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Voltage	V_F		1.4	2.2	V	I_F =500mA
Reverse Voltage	V_r	5			V	I_R=100uA
Diode Capacitance	C_O		350		pF	V_r=0V, f=1MHz
Thermal Resistance, Junction/Base	$R\Theta_{js}$		20		°C/W	

Optical Characteristics at 25°C

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Average On-Axis Intensity (1)	I_E	40	45		mW/Sr	I_F =500mA
Viewing Angle	$2\theta_{1/2}$		120		deg	
Peak wavelength	λ_{PK}		850		nm	I_F = 500mA
Spectral Width	$\Delta\lambda$		40		nm	I_F = 20mA
Optical Rise Time	t_r		15		ns	I_F = 20mA
Optical Fall Time	t_f		10		ns	I_F = 20mA

Note (1): IE is measured with accuracy of + 11%

Typical Electrical / Optical Characteristics Curve (T_A = 25°C Unless Otherwise Stated)

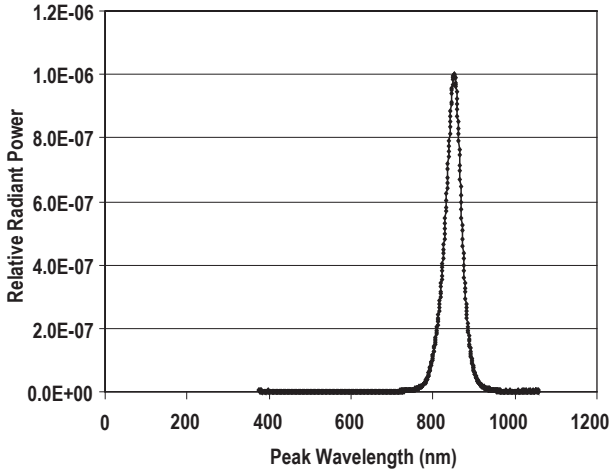


Figure 1. Peak Wavelength Vs Relative Radiant Power

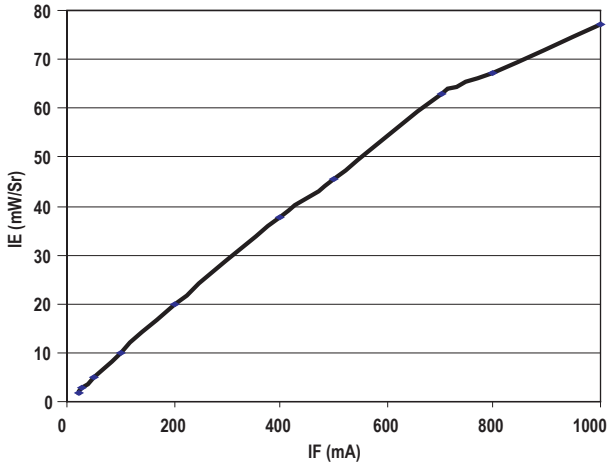


Figure 2. Forward Current Vs Radiant Intensity

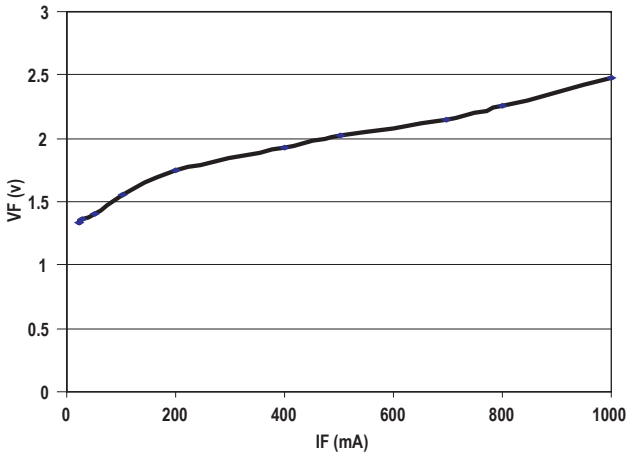


Figure 3. Forward Current Vs Forward Voltage

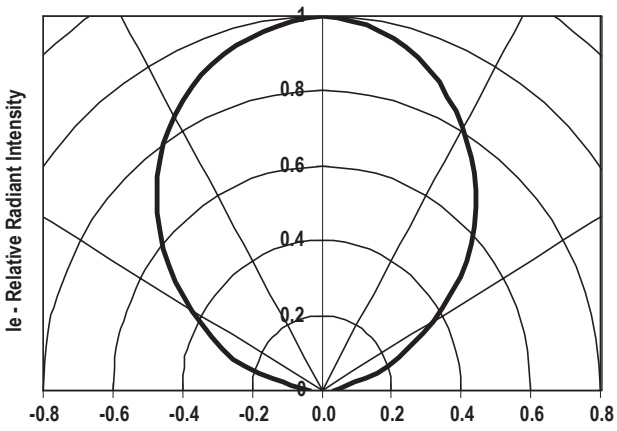


Figure 4. Angular Displacement Vs Relative Radiant Intensity

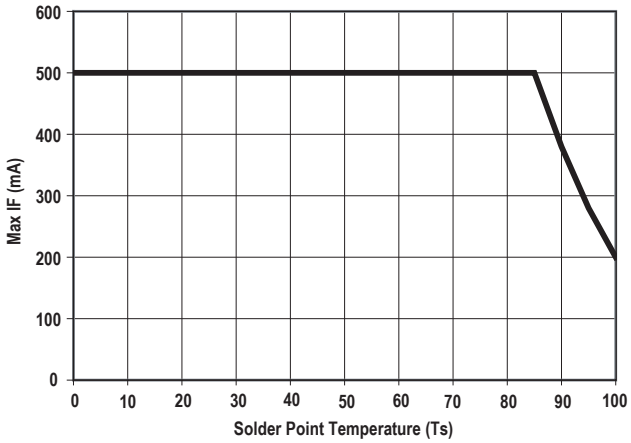
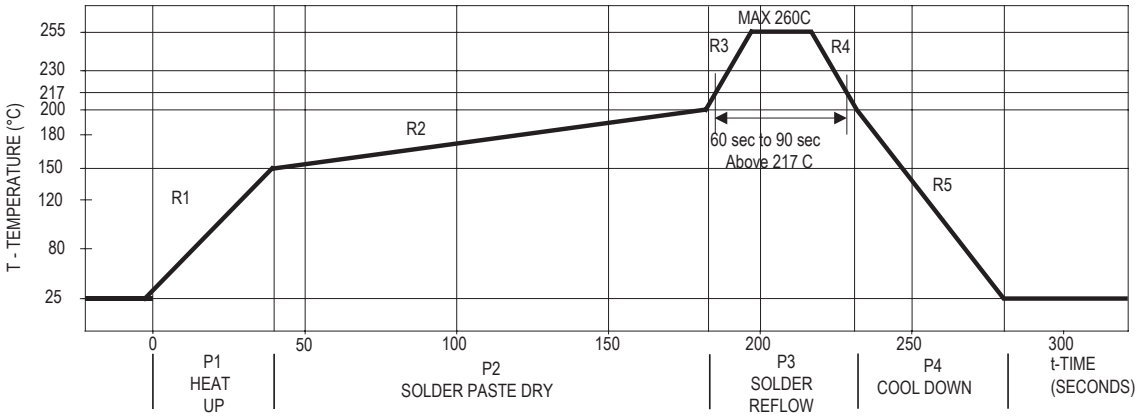


Figure 5. Maximum Forward Current Vs Solder Point Temperature

Recommended Reflow Profile



Process Zone	Symbol	ΔT	Maximum ΔT/Δtime or Duration
Heat Up	P1, R1	25°C to 150°C	3°C/s
Solder Paste Dry	P2, R2	150°C to 200°C	100s to 180s
Solder Reflow	P3, R3 P3, R4	200°C to 260°C 260°C to 200°C	3°C/s -6°C/s
Cool Down	P4, R5	200°C to 25°C	-6°C/s
Time maintained above liquidus point , 217°C		> 217°C	60s to 90s
Peak Temperature		260°C	-
Time within 5°C of actual Peak Temperature		-	20s to 40s
Time 25°C to Peak Temperature		25°C to 260°C	8mins

The reflow profile is a straight-line representation of a nominal temperature profile for a convective reflow solder process. The temperature profile is divided into four process zones, each with different ΔT/Δtime temperature change rates or duration. The ΔT/Δtime rates or duration are detailed in the above table. The temperatures are measured at the component to printed circuit board connections.

In process zone P1, the PC board and component pins are heated to a temperature of 150°C to activate the flux in the solder paste. The temperature ramp up rate, R1, is limited to 3°C per second to allow for even heating of both the PC board and component pins.

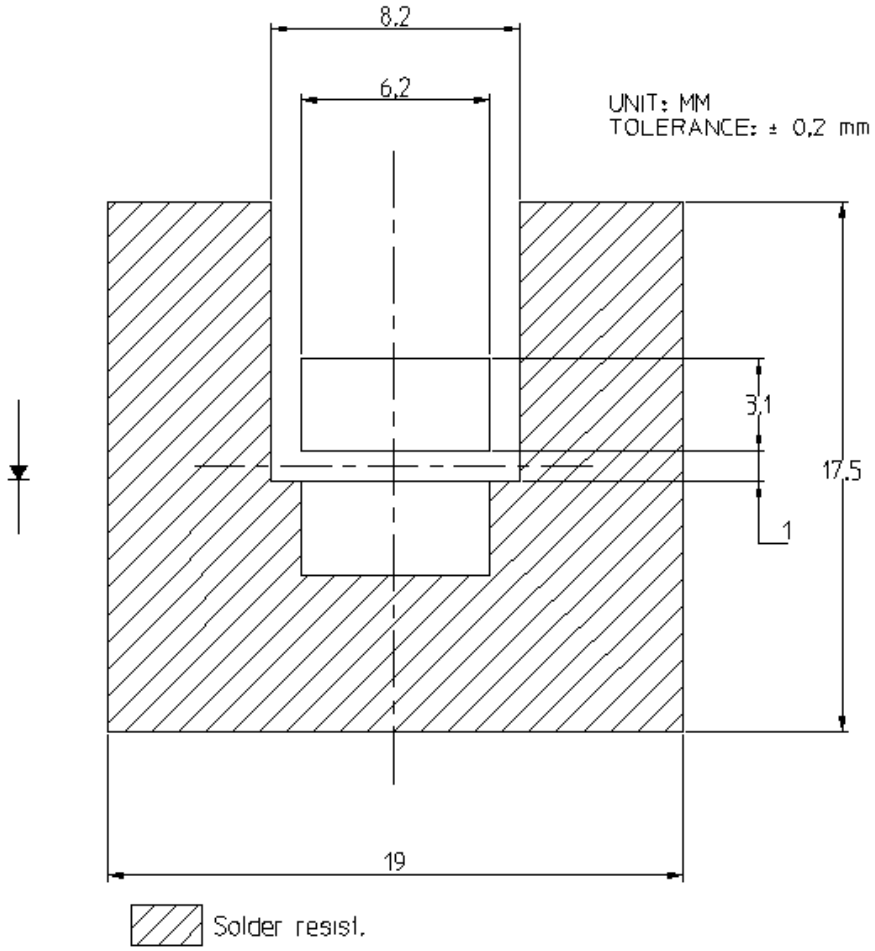
Process zone P2 should be of sufficient time duration (100 to 180 seconds) to dry the solder paste. The temperature is raised to a level just below the liquidus point of the solder.

Process zone P3 is the solder reflow zone. In zone P3, the temperature is quickly raised above the liquidus point of solder to 260°C (500°F) for optimum results. The dwell time above the liquidus point of solder should be between 60 and 90 seconds. This is to assure proper coalescing of the solder paste into liquid solder and the formation of good solder connections. Beyond the recommended dwell time the intermetallic growth within the solder connections becomes excessive, resulting in the formation of weak and unreliable connections. The temperature is then rapidly reduced to a point below the solidus temperature of the solder to allow the solder within the connections to freeze solid.

Process zone P4 is the cool down after solder freeze. The cool down rate, R5, from the liquidus point of the solder to 25°C (77°F) should not exceed 6°C per second maximum. This limitation is necessary to allow the PC board and component pins to change dimensions evenly, putting minimal stresses on the component.

It is recommended to perform reflow soldering no more than twice.

Recommended Land Pattern



Note:

The additional solder resist is to improve heat dissipation. The bigger the surface area, the better is the thermal dissipation. The surface area depends on the substrate and total power used. If MC (Metal Core) PCB is used, the additional area will not be needed as the whole MC PCB conducts heat.

For product information and a complete list of distributors, please go to our web site: **www.avagotech.com**

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