

**$\Phi$ 10.5mm 650nm Laser Module*****Power set by user*****Features**

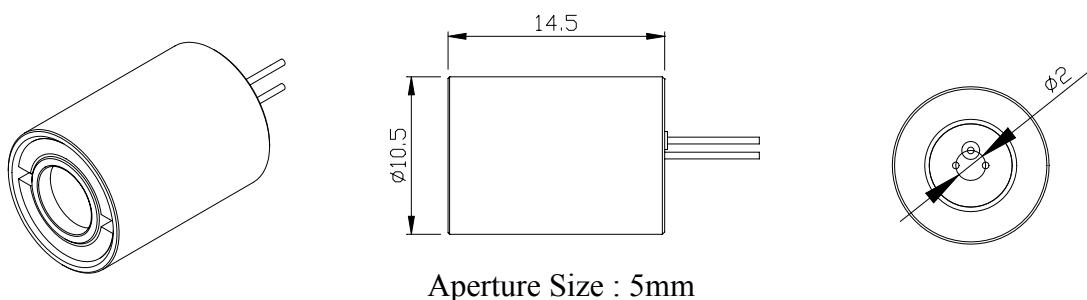
1. APC (auto power control) IC inside
2. Low current consumption of the APC circuit
3. Surge current protection
4. High quality glass lens for output beam
5. Adjustable focus

**Absolute maximum ratings**

Item	Symbol	Rating	Unit
Power supply voltage	$V_{cc}$	3.3	V
Laser Module optical output power	$P_o$	<3	mW
Operation temperature	$T_{opr}$	-5~50	°C
Storage temperature	$T_{stg}$	-20~70	°C

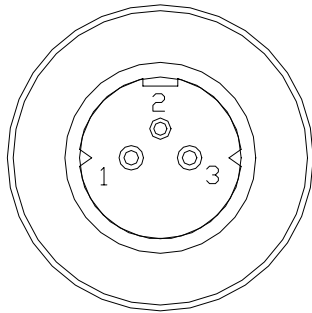
**Electrical and optical characteristics ( $T_c=25^\circ\text{C}$ )**

Item	Symbol	Min.	Typ.	Max	Unit	Condition
Wavelength	$\lambda$	-	655	-	nm	$P_o=3\text{mW}$
Operation current	$I_{op}$	-	-	35	mA	$P_o=3\text{mW } V_{cc}=3\text{V}$
Operation voltage	$V_{op}$	2.5	-	3.3	Volt	
Laser Beam spot size at 10m						<8mm
Divergence angle						0.9 mrad
Mean time to failure (MTTF) 25°C						>10000 hrs

**Outline dimensions (Units: mm)****Laser Safety Precautions**

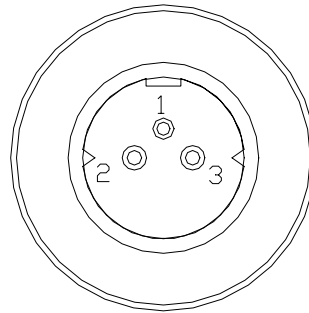
1. Do not look into the laser beam directly by eyes. The laser beam may cause severe damage to human eyes.
2. Optical Lens is made of plastic or glass. Do not contaminate lens by soiling, oil or chemical.

**PIN Assignment:**



**A type** : Heat sink stand (-)

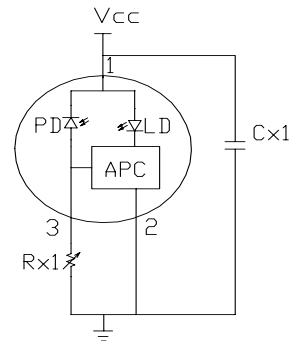
- Pin 1** : Vcc
- Pin 2** : GND
- Pin 3** : PD



**B type** :Heat sink stand (+)

**Laser power Adjustment Procedure**

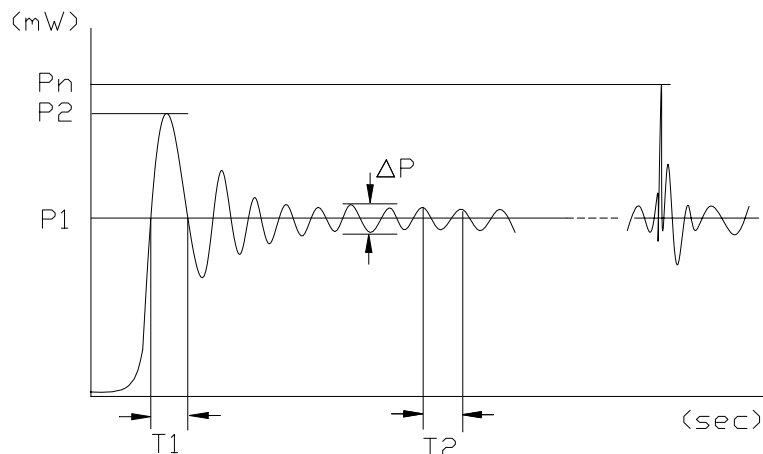
1. Connect 1 uF capacitor (Cx1) between Pin1 and Pin2.
2. Connect 20~50K ohm variable resistor (Rx1) between Pin2 and Pin3.
3. Set Vcc to the designed value.
4. Adjust Rx1 to obtain the desired output power.
5. Laser Safety Precautions



- (1) Do not increase Vcc value when the laser module is working near the maximum power . That is to protect laser from overdriving condition and make sure power is under 3 mW.
- (2) Do not operate the device above the maximum rating condition, even momentarily. It may cause unexpected permanent damage to the device.

**Laser power stability**

- P1 : 2.5mW
- P2 : < 3mW
- Pn : <3mW
- $\Delta P$  : < 0.5mW
- T1 : < 0.1us
- $f2=(1/T2)$  : 3MHz



- NOTE:**
- P1 : Mean power
  - P2 : Max power from turning on power
  - Pn : Max power from Vcc noise
  - $\Delta P$  : Power Amplitude of vibration
  - T1 : Time between trigger and convergence
  - $f2=(1/T2)$  : Frequency of output power