

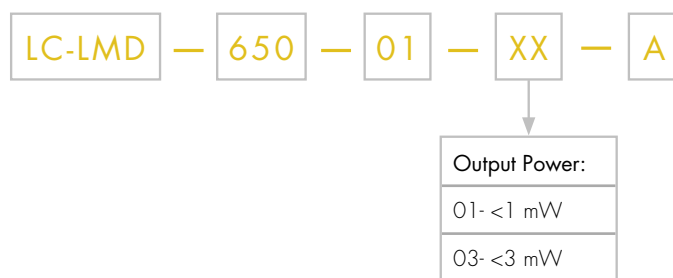
# Laser Module LC-LMD-650-01

Ø 4 mm, 650 nm Laser Module

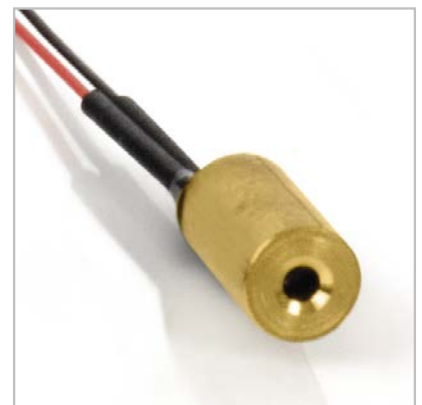
## Features

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

## Part No. Indications



## Part No. with 100 mm Flying Leads (1 mW Version only)



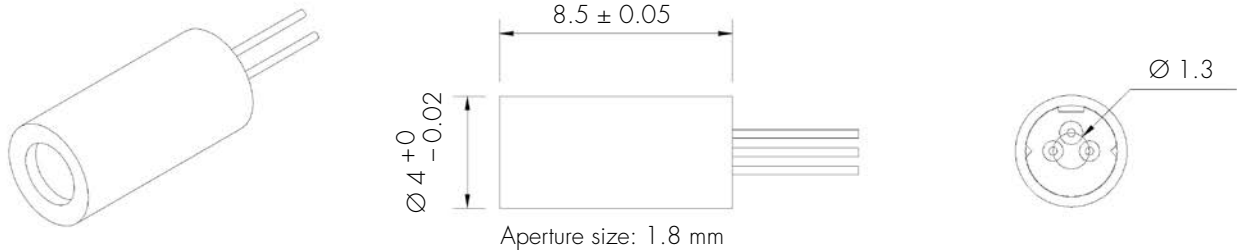
## Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Power supply voltage	$V_{CC}$	3.3	V
Laser Module optical output power	$P_o$	01	< 1
		03	< 3
Operation temperature	$T_{opr}$	0 ~ 40	°C
Storage temperature	$T_{stg}$	0 ~ 60	°C

### Electrical and Optical Characteristics ( $T_c = 25\text{ }^\circ\text{C}$ )

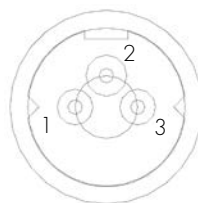
Item	Symbol	Min.	Typ.	Max	Unit	Condition	
Wavelength	$\lambda$	01	-	655	-	nm	$P_o = < 1\text{ mW}$
		03					$P_o = < 3\text{ mW}$
Operation current	$I_{op}$	01	-	-	-	mA	$P_o = 1\text{ mW } V_{cc} = 3\text{ V}$
		03					$P_o = 3\text{ mW } V_{cc} = 3\text{ V}$
Operation voltage	$V_{op}$	2.5	-	3.3	Volt		
Laser beam spot size at 10 m							< 20 mm
Divergence angle							2.0 mrad
Mean time to failure (MTTF) 2 mW 25 °C							>10000 hrs

### Outline Dimensions (Units: mm)



### Pin Assignment

Pin 1:  $V_{cc}$   
Pin 2: GND  
Pin 3: NC



A type: Heat sink stand (-)

## Laser Module LC-LMD-650-02

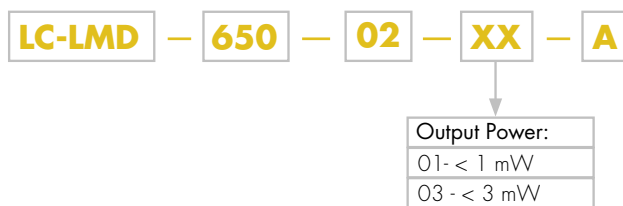
Ø 6.2 mm, 650 nm Laser Module

### Features

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



### Part No. Indications



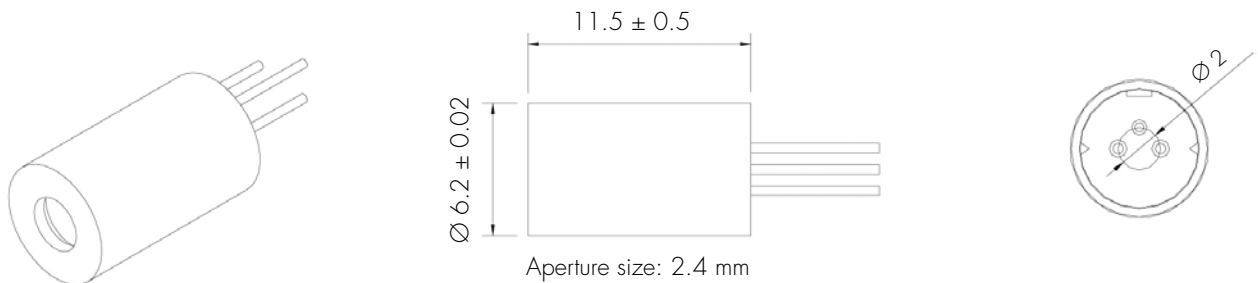
### Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Power supply voltage	$V_{CC}$	3.3	V
Laser module optical output power	$P_o$	01	< 1
		03	< 3
Operation temperature	$T_{opr}$	0 ~ 40	°C
Storage temperature	$T_{stg}$	0 ~ 60	°C

### Electrical and Optical Characteristics ( $T_c = 25\text{ }^\circ\text{C}$ )

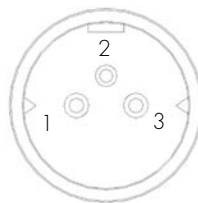
Item	Symbol	Min.	Typ.	Max	Unit	Condition	
Wavelength	$\lambda$	01	-	655	-	nm	$P_o = < 1\text{ mW}$
		03	-	-	-	-	$P_o = < 3\text{ mW}$
Operation current	$I_{op}$	01	-	-	35	mA	$P_o = 1\text{ mW}$ $V_{cc} = 3\text{ V}$
		03	-	-	-	-	$P_o = 3\text{ mW}$ $V_{cc} = 3\text{ V}$
Operation voltage	$V_{op}$	2.5	-	3.3	Volt		
laser beam spot size at 10 m						< 10 mm	
Divergence angle						1.1 mrad	
Mean time to failure (MTTF) 3 mW 25 °C						>10000 hrs	

### Outline Dimensions (Units: mm)



### Pin Assignment

Pin 1:  $V_{cc}$   
Pin 2: GND  
Pin 3: NC



A type: Heat sink stand (-)

## Laser Module LC-LMD-650-03

Ø 8 mm, 650 nm Laser Module

### Features

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

### Part No. Indications

LC-LMD – 650 – 03 – XX – A

Output Power:

01- < 1 mW

03- < 3 mW



### Part No. with 100 mm Flying Leads (1 mW Version only)

LC-LMD – 650 – 03 – 01 – A – C

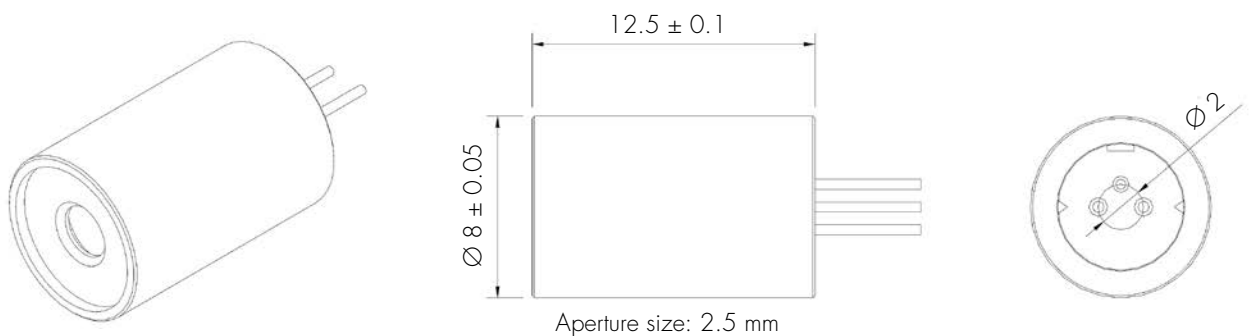
### Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Power supply voltage	$V_{CC}$	3.3	V
Laser module optical output power	$P_o$	01	< 1
		03	< 3
Operation temperature	$T_{opr}$	0 ~ 40	°C
Storage temperature	$T_{stg}$	0 ~ 60	°C

### Electrical and Optical Characteristics ( $T_c = 25\text{ }^\circ\text{C}$ )

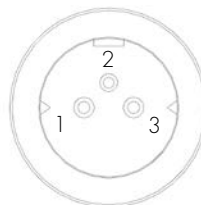
Item	Symbol	Min.	Typ.	Max	Unit	Condition	
Wavelength	$\lambda$	01	-	655	-	nm	$P_o < 1\text{ mW}$
		03	-	-	-	-	nm
Operation current	$I_{op}$	01	-	-	35	mA	$P_o = 1\text{ mW}$ $V_{cc} = 3\text{ V}$
		03	-	-	-	-	mA
Operation voltage	$V_{op}$	2.5	-	3.3	Volt		
Laser beam spot size at 10 m						< 10 mm	
Divergence angle						1.1 mrad	
Mean time to failure (MTTF) 25 °C						>10000 hrs	

### Outline Dimensions (Units: mm)



### Pin Assignment

Pin 1:  $V_{cc}$   
Pin 2: GND  
Pin 3: NC



A type: Heat sink stand (-)

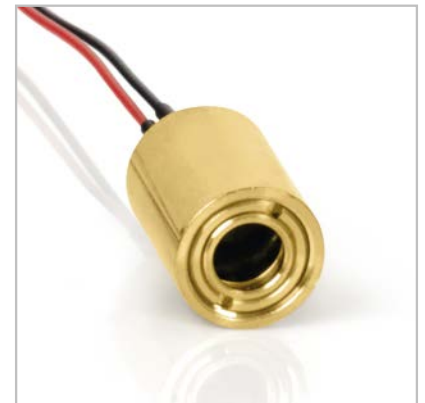
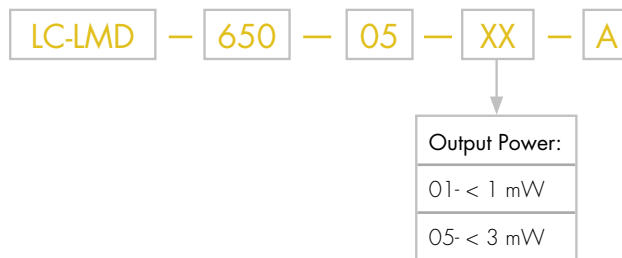
## Laser Module LC-LMD-650-05

Ø 10.5 mm, 650 nm Laser Module

### 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

### Part No. Indications



### Part No. with 100 mm Flying Leads (1 mW Version only)



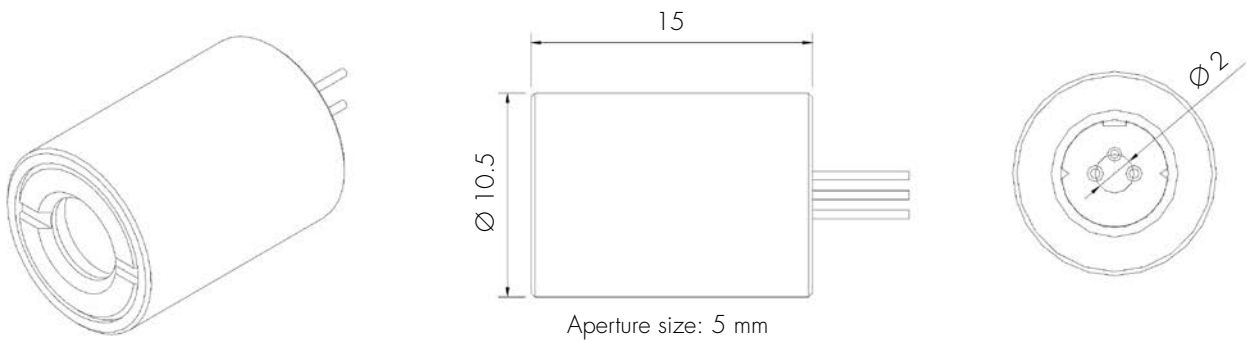
### Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Power supply voltage	$V_{CC}$	3.3	V
Laser module optical output power	P <sub>o</sub>	01	< 1
		05	< 3
Operation temperature	$T_{opr}$	-5 ~ 50	°C
Storage temperature	$T_{stg}$	-20 ~ 70	°C

### Electrical and Optical Characteristics ( $T_c = 25\text{ }^\circ\text{C}$ )

Item	Symbol	Min.	Typ.	Max	Unit	Condition
Wavelength	$\lambda$	01	655	-	nm	$P_o = 1\text{ mW}$
		05				$P_o = 3\text{ mW}$
Operation current	$I_{op}$	-	-	30	mA	$P_o = 1\text{ mW}$ $V_{cc} = 3\text{ V}$
				35		$P_o = 3\text{ mW}$ $V_{cc} = 3\text{ V}$
Operation voltage	$V_{op}$	2.5	-	3.3	Volt	
Laser beam spot size at 10 m	< 8 mm					
Divergence angle	0.9 mrad					
Mean time to failure (MTTF) 25 °C	>10000 hrs					

### Outline Dimensions (Units: mm)



### Pin Assignment

Pin 1:  $V_{cc}$   
Pin 2: GND  
Pin 3: NC



A type: Heat sink stand (-)



## Laser Module LC-LMD-650-06

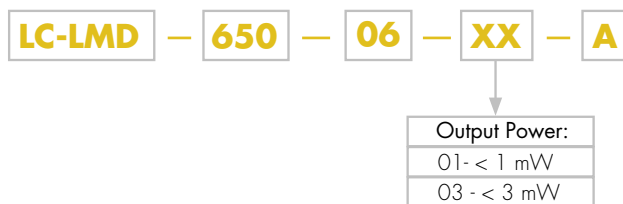
Ø 6.5 mm, 650 nm Laser Module

### Features

1. APC (auto power control) IC inside
2. Low current consumption of the APC circuit
3. Superior laser beam profile



### Part No. Indications



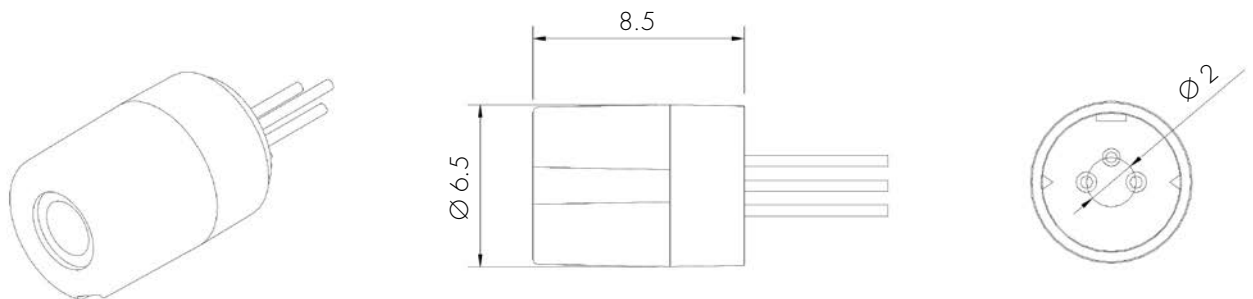
### Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Power supply voltage	$V_{CC}$	3.3	V
Laser module optical output power	P <sub>o</sub>	01	< 1
		03	< 3
Operation temperature	$T_{opr}$	0 ~ 40	°C
Storage temperature	$T_{stg}$	0 ~ 60	°C

### Electrical and Optical Characteristics ( $T_c = 25\text{ }^\circ\text{C}$ )

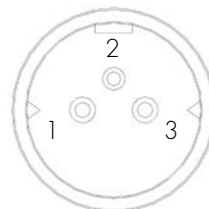
Item	Symbol	Min.	Typ.	Max	Unit	Condition	
Wavelength	$\lambda$	01	655		nm	$P_o = 1\text{ mW}$	
		03				$P_o = 3\text{ mW}$	
Operation current	$I_{op}$	01	-	-	35	mA	$P_o = 1\text{ mW}$ $V_{cc} = 3\text{ V}$
		03					$P_o = 3\text{ mW}$ $V_{cc} = 3\text{ V}$
Operation voltage	$V_{op}$	2.5	-	3.3	Volt		
Laser beam spot size at 10 m						< 10 mm	
Divergence angle						1.1 mrad	
Mean time to failure (MTTF) 25 °C						>10000 hrs	

### Outline Dimensions (Units: mm)



### Pin Assignment

- Pin 1:  $V_{cc}$
- Pin 2: GND
- Pin 3: NC (No external connection)



A type: Heat sink stand (-)

# Laser Module LC-LMD-650-07

Ø 3.3 mm, 650 nm Laser Module

## Features

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

## Part No. Indications

LC-LMD – 650 – 07 – XX – A

Output Power:

01- < 1 mW

03- < 3 mW

## Part No. with 100 mm Flying Leads (1 mW Version only)

LC-LMD – 650 – 07 – 01 – A – C



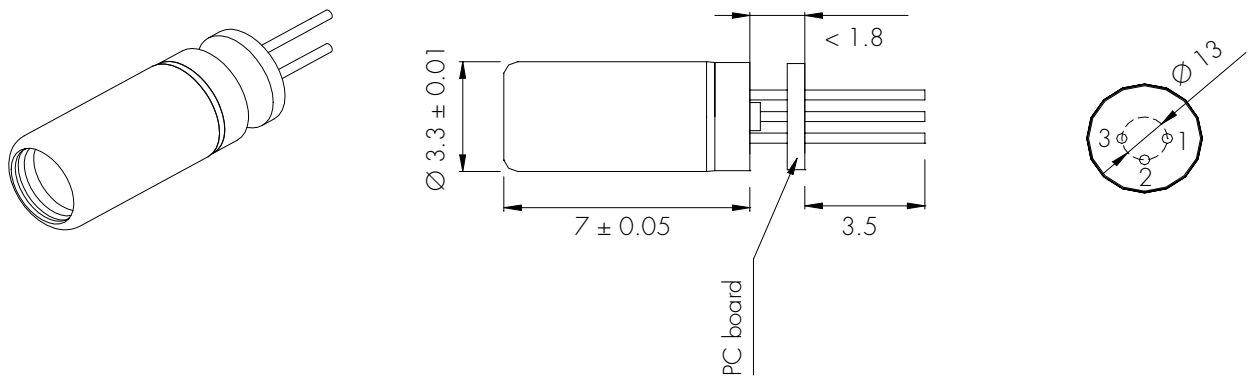
## Absolute Maximum Ratings

Item	Symbol		Rating	Unit
Power supply voltage	$V_{CC}$	01	3.3	V
		03	3.5	
Laser module optical output power	$P_o$	01	< 1	mW
		03	< 3	
Operation temperature	$T_{opr}$		0 ~ 40	°C
Storage temperature	$T_{stg}$		0 ~ 60	°C

### Electrical and Optical Characteristics ( $T_C = 25\text{ }^\circ\text{C}$ )

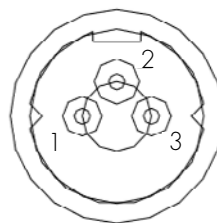
Item	Symbol	Min.	Typ.	Max	Unit	Condition
Wavelength	$\lambda$	01	-	655	-	$P_o = 1\text{ mW}$
		03	-	-	-	$P_o = 3\text{ mW}$
Output power	$P_{out}$	01	0.4	0.6	0.9	mW
		03	2.2	-	2.5	mW
Operation current	$I_{op}$	01	-	-	35	mA
		03	-	-	-	$P_o = 1\text{ mW}$ $V_{cc} = 3\text{ V}$ $P_o = 2.5\text{ mW}$ $V_{cc} = 3\text{ V}$
Operation voltage	$V_{op}$	2.5	-	3.3	Volt	
Laser beam spot size at 10 m	< 20 mm					
Divergence angle	2 mrad					
Mean time to failure (MTTF) 25 °C	>10000 hrs					

### Outline Dimensions (Units: mm)



### Pin Assignment

Pin 1:  $V_{cc}$   
Pin 2: GND  
Pin 3: NC



A type: Heat sink stand (-)

# Laser Module

## LC-LMD-650-07-01-TM

Ø 3.3 mm, 650 nm Laser Module

### Features

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



### Part No. Indications

LC-LMD - 650 - 07 - 01 - TM

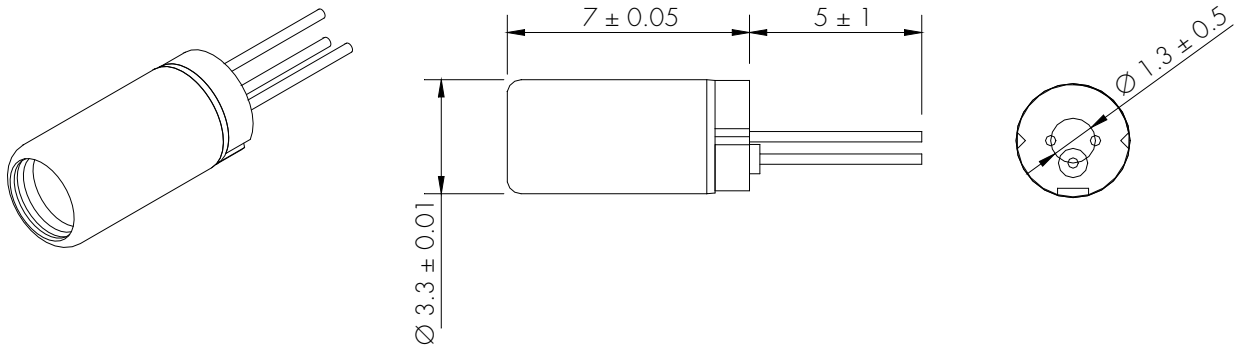
### Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Power supply voltage	$V_{CC}$	5	V
Laser module optical output power	$P_o$	< 1	mW
Operation temperature	$T_{opr}$	0 ~ 40	°C
Storage temperature	$T_{stg}$	0 ~ 60	°C

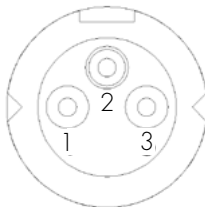
Electrical and Optical Characteristics ( $T_c = 25\text{ }^\circ\text{C}$ )

Item	Symbol	Min.	Typ.	Max	Unit	Condition
Wavelength	$\lambda$	645	655	-	nm	$P_o = 1\text{ mW}$
Output power	$P_{out}$	0.5	-	0.9	mW	
Operation current	$I_{op}$	-	-	30	mA	$P_o = 1\text{ mW}$ $V_{cc} = 3\text{ V}$
Operation voltage	$V_{op}$	2.7	3.3	5	Volt	
PWM Control mode	PWM	100	-	2000	KHz	Add 10 $\mu\text{f}$ capacitance Duty cycle = 50%
Laser beam spot size at 10 m				< 20 mm		
Divergence angle				2 mrad		

Outline Dimensions (Units: mm)

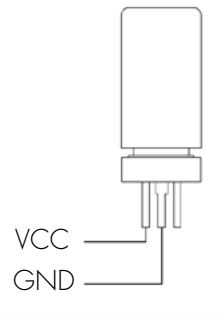


Pin Assignment

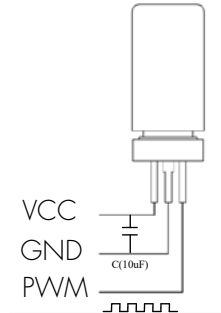


Pin 1:  $V_{cc}$   
 Pin 2: GND  
 Pin 3: PWM

CW mode



PWM mode



## Laser Module LC-LMD-650-17

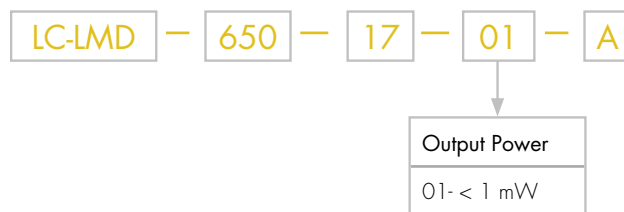
Ø 3.3 mm, 650 nm Laser Module

### Features

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



### Part No. Indications



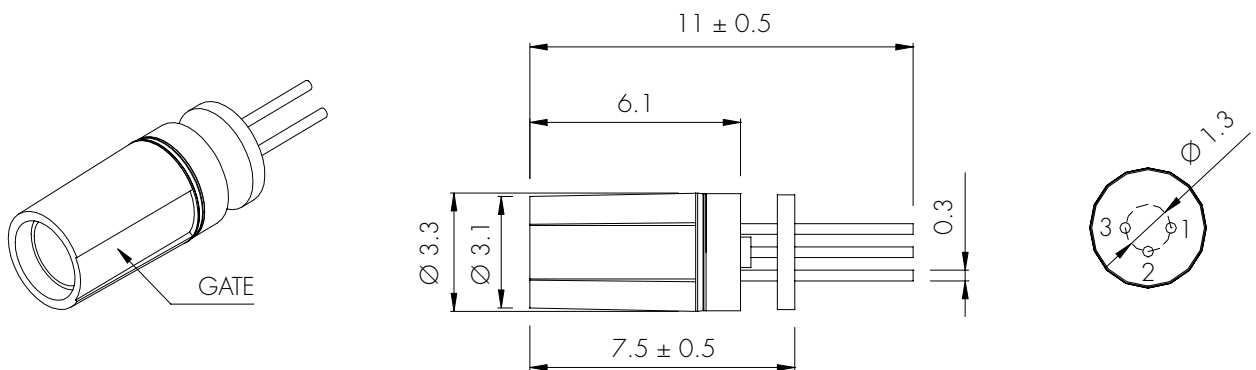
### Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Power supply voltage	$V_{CC}$	3.3	V
Laser module optical output power	$P_o$	< 1	mW
Operation temperature	$T_{opr}$	0 ~ 40	°C
Storage temperature	$T_{stg}$	0 ~ 60	°C

### Electrical and Optical Characteristics ( $T_c = 25\text{ }^\circ\text{C}$ )

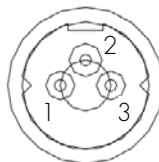
Item	Symbol	Min.	Typ.	Max	Unit	Condition
Wavelength	$\lambda$	-	655	-	nm	$P_o = < 1\text{ mW}$
Output power	$P_{out}$ 01	0.4	-	0.9	mW	$V_{cc} = 3\text{ V}$
Operation current	$I_{op}$	-	-	35	mA	$P_o = 1\text{ mW}$ $V_{cc} = 3\text{ V}$
Operation voltage	$V_{op}$	2.5	-	3.3	Volt	
Laser beam spot size at 10 m				< 20 mm		
Divergence angle				2 mrad		
Mean time to failure (MTTF) 25 °C				>10000 hrs		

### Outline Dimensions (Units: mm)



### Pin Assignment

Pin 1:  $V_{cc}$   
Pin 2: GND  
Pin 3: NC



A type: Heat sink stand (-)