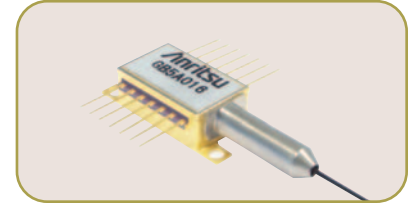
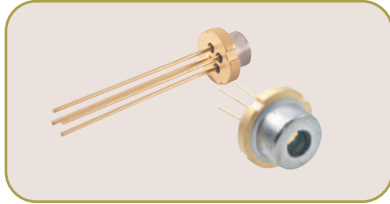


# LASER DIODE OVERVIEW

- 5.6mm, 9mm, and VCSEL Laser Diodes
- Fiber Bragg Stabilized Pump Laser Diodes
- DFB C and L-Band Butterfly Laser Pigtailed
- Fiber Pigtailed Laser Diodes



## 5.6mm, 9mm and VCSEL Laser Diodes

Thorlabs offers an extensive selection of discreet laser diodes in 5.6mm, 9mm and VCSEL packages. Ranging in wavelengths from 405nm to 1550nm, we have a diode to work in nearly any application. Our selection of 5.6mm and 9mm diodes includes both Fabry-Perot and DFB lasers in a variety of standard pin configurations. Most of our lasers are fully compatible with our entire line of laser diode and TEC controllers as well as our selection of Laser Diode Mounts (See Pages 459).

- Output Powers Up to 1W
- Standard Pin Configurations
- Fabry-Perot and DFB
- VCSEL Diodes
- 405nm to 1550nm
- Compatible with Thorlabs' Laser Diode and TEC Controllers

## Fiber Pigtailed 5.6 & 9mm Laser Diodes

Thorlabs' full line of fiber pigtailed laser diodes (manufactured by either Thorlabs or our customers) are assembled at our extensive pigtailling facilities in the United States.

A high-quality alignment process ensures maximum efficiency at an affordable price.

Our selection includes both single mode and multimode pigtailed, whose typical high-coupling efficiency delivers more power from the diode.

- 8° Angled-Cleaved Fiber at Laser Diode
- Visible to Near IR Models
- Single Mode and Multimode Fibers
- Angle-Cleaved Fiber to Minimize Intensity Noise (Single Mode Only)
- Pigtailling of Customer-Supplied Diodes Available
- DFB Pigtailed Include In-Line Isolator

## DFB Laser C-and L-Band Butterfly Laser Pigtailed

Thorlabs offers a full range of pigtailed lasers with wavelengths centered on the ITU grid (100GHz spacing). These lasers include polarization maintaining (PM) fiber, with an extinction ratio of better than 20dB and a side mode suppression ratio of 40dB (typ.). These DFB lasers meet the stringent reliability standards for the telecom industry. With their built-in 30dB optical isolation, thermoelectric cooler (TEC) and thermistor, these 20mW lasers will provide many hours of reliable operation when operated with our laser diode current controllers/TEC controllers.

- Wavelength: ITU Grid, 100GHz Steps
- Single Longitudinal Mode
- Accurate Peak Wavelength ( $\pm 0.5$ nm)
- Built-In Optical Isolator (30dB)
- Built-In Cooler and Thermistor

All laser diodes are extremely electrostatic sensitive; see page 496 for our selection of antistatic products.

## Laser Diode Selection Guide

ITEM#	WAVELENGTH (nm)	P (mW)	PACKAGE (mm)	PIN CODE	PAGE
DL3146-151	405	7	5.60	5B	466
DL5146-152	405	35	5.60	5B	466
LPS-635-FC	635	2.5	Pigtailed	9A	492
HL6314MG <sup>1,2</sup>	635	3	5.60	5A	466
HL6312G <sup>1,2</sup>	635	5	9.00	9A	467
HL6335G	635	5	9.00	9A	467
DL3148-025	635	6	5.60	5A	467
HL6320G <sup>1,2</sup>	635	10	9.00	9A	468
HL6344G	635	10	9.00	9A	468
HL6322G	635	15	9.00	9A	468
DL4038-026	635	20	9.00	9A	469
DL5038-021	635	35	9.00	9A	469
LPM-635-SMA	635	7.5	Pigtailed	9A	492
DL3147-060	650	7	5.60	5A	469
GH06510B2A	654	10	5.60	5B	470
RLD65MZT2	655	10	5.6	5B	470
HL6501MG <sup>1</sup>	658	35	5.60	5C	470
DL6147-040	658	40	5.60	5A	471
HL6512MG	658	50	5.60	OPEN	471
DL7147-201	658	60	5.60	OPEN	471
ML120G21	658	80	5.60	OPEN	472

<sup>1</sup> Single Mode - Longitudinal

<sup>2</sup> Single Mode - Transverse

# Laser Diode Selection Guide

ITEM#	WAVELENGTH (nm)	P (mW)	PACKAGE (mm)	PIN CODE	PAGE
HL6535MG <sup>1</sup>	658	90	5.60	OPEN	472
LPS-660-FC	660	7.5	Pigtailed	5C	492
LPM-660-SMA	660	22.5	Pigtailed	5C	492
ML101J8	660	45	5.60	OPEN	472
HL6548FG	660	90	9.00	9D	473
ML101J27	660	130	5.60	OPEN	473
HL6722G <sup>1,2</sup>	670	5	9.00	9A	473
HL6724MG <sup>1,2</sup>	670	5	5.60	5A	474
DL3149-057	670	7	5.60	5A	474
HL6714G <sup>1,2</sup>	670	10	9.00	9A	474
LPS-675-FC	675	2.5	Pigtailed	9A	492
FLD6A2TK	685	35	5.60	OPEN	475
HL6738MG <sup>1,2</sup>	690	35	5.60	5C	475
VCSEL-780	780	1.65	—	—	475
L780P010	780	10	5.60	5A	476
GH0781JA2C	784	120	5.60	OPEN	476
RLD78MA-E	785	5	5.6	5B	476
LPS-785-FC	785	6.25	Pigtailed	5A	492
DL4140-001S	785	25	5.60	5A	477
HL7851G <sup>1,2</sup>	785	50	9.00	9A	477
DL7140-201S	785	80	5.60	5C	477
L785P100	785	100	5.60	5A	478
L808P010	808	10	5.60	5A	478
L808P030	808	30	5.60	5A	478
L808P200	808	200	5.60	5A	479
L808P1WJ	808	1WATT	9	9A	479
LPS-830-FC	830	10.0	Pigtailed	9C	492
DL5032-001	830	30	9.00	9A	479
HL8325G <sup>1,2</sup>	830	40	9.00	9C	480
DL7032-001 <sup>1,2</sup>	830	100	9.00	9A	480
DL8142-201	830	180	5.60	5C	481
VCSEL-850	850	1.85	—	—	481
L850P010	850	10	5.60	5A	481
L850P030	850	30	5.60	5A	482
L850P100	850	100	5.60	5A	482
L904P010	904	10	5.60	5A	482
L904P030	904	30	5.60	5A	483
L915P1WJ	915	1WATT	9.00	9A	483
L975P1WJ	975	1 WATT	9.00	9A	483
VCSEL-980	980	1.85	—	—	484
L980P010	980	10	5.60	5A	484
L980P030	980	30	5.60	5A	484
L9805E2P5 <sup>2</sup>	980	50	5.60	5A	485
L980P100	980	100	5.60	5A	485
PL980P200	980	200	Pigtailed	BFY-14Pin	485
L980P200J	980	200	9	9A	491
L980P300J	980	300	9	9A	486
L1060P100J	1060	100	9	9A	486
LPS-1310-FC	1310	2.5	Pigtailed	5D	492
ML725B11F	1310 DFB	6	5.60	5D	486
ML725B8F <sup>2</sup>	1310	10	5.60	5D	487
ML925B45F	1550	6	5.60	5D	487
ML925B11F	1550 DFB	6	5.60	5D	492
LPS-1550-FC	1550	1.5	Pigtailed	5D	492
LPS-1550DFB-FC	1550DFB	1.5	Pigtailed	5D	492

1 Single Mode - Longitudinal      2 Single Mode - Transverse

- Benchtop Drivers
- Platform Drivers
- OEM Drivers
- Laser Diode Mounts
- Laser Diodes**
- Pigtailed Lasers
- Laser Modules
- Accessories

All laser diodes are extremely electrostatic sensitive; see page 496 for our selection of antistatic products.

DFB  
DFB  
DFB

**PIN CODES**

Style A

Style B

Style C

Style D

- All specifications are typical; see individual items for complete details.
- Pin code is based on laser pin configuration and is used to help select socket cable assemblies.

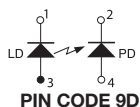
Note: The 5 and 9 of the pin code designate 5.6mm or 9mm packages, respectively.

## λ = 660nm P = 90mW, Single Mode Hitachi HL6548FG



- 9mm Package
- AlGaInP Structure
- Single Longitudinal Mode

**Pin Description**  
 1 laser cathode  
 2 monitor diode cathode/case  
 3 laser anode  
 4 monitor diode anode



### Absolute Maximum Ratings (T<sub>C</sub>=25°C)

CHARACTERISTIC	SYMBOL	RATING
Optical Output Power (CW)	P <sub>o</sub>	100mW
LD Reverse Voltage	V <sub>R(LD)</sub>	2V
PD Reverse Voltage	V <sub>R(PD)</sub>	30V
Storage Temperature	T <sub>stg</sub>	-40 to 85°C
Operation Case Temperature	T <sub>c</sub>	-10 to 60°C

### Optical-Electrical Characteristics (T<sub>C</sub>=25°C, P=90mW)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.
Threshold Current	I <sub>th</sub>	-	55mA	70mA
Operation Current	I <sub>op</sub>	-	140mA	180mA
Operation Voltage	V <sub>op</sub>	-	2.4V	2.8V
Lasing Wavelength	λ	654nm	660nm	665nm
Beam Divergence	θ//	7°	10°	13°
(FWHM)	θ <sub>⊥</sub>	15°	17°	20°
Monitor Current	I <sub>m</sub>	-	0.6mA	-

ITEM #	£* 1-5 PCS	€* 1-5 PCS	RMB* 1-5 PCS
HL6548FG	£ 124.70	€ 184,10	¥ 1,890.90

\*For quantities over 5 pieces, please call a local office for pricing.

ITEM #	PRICE 1-5 PCS	PRICE 6-10 PCS	PRICE 11-20 PCS	DESCRIPTION
HL6548FG	\$ 198.00	\$ 173.54	\$ 159.74	Hitachi 660nm, 90mW

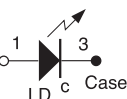
## λ = 660nm P = 130mW, Single Mode Mitsubishi ML101J27



5.6mm  
PACKAGE

- 5.6mm Package
- High Output Power: 350mW (Pulse Operation)
- Low Aspect Ratio: 1.7 (Typ.)
- Low Astigmatic Distance: 1μm (Typ.)

**Pin Description**  
 1 laser anode  
 2 no connection  
 3 laser cathode/case



**OPEN PIN CODE  
 COMPATIBLE WITH  
 SYLE A, B AND C**

### Absolute Maximum Ratings (T<sub>C</sub>=25°C)

CHARACTERISTIC	SYMBOL	RATING
Optical Output Power (CW)	P <sub>o</sub>	130mW
Optical Output Power (Pulse)	P <sub>o(pulse)</sub>	350mW
LD Reverse Voltage	V <sub>R(LD)</sub>	2V
CW Operating Temperature	T <sub>opr (CW)</sub>	-10 to 75°C
Storage Temperature	T <sub>stg</sub>	-40 to 100°C

### Optical-Electrical Characteristics (T<sub>C</sub>=25°C, P=120mW)

Characteristic	Symbol	Min.	TYP.	Max.
Threshold Current	I <sub>th</sub>	-	80mA	-
Operation Current (CW)	I <sub>op</sub>	-	200mA	-
Slope Efficiency (mW/mA)	η <sub>s</sub>	-	0.95	-
Lasing Wavelength	λ <sub>p</sub>	654nm	660nm	664nm
Beam Divergence	θ//	7°	10°	12°
(FWHM)	θ <sub>⊥</sub>	14°	17°	20°
Operating Voltage	V <sub>op</sub>	-	2.5V	3.0V

ITEM #	£* 1-5 PCS	€* 1-5 PCS	RMB* 1-5 PCS
ML101J27	£ 109.70	€ 161,90	¥ 1,662.70

\*For quantities over 5 pieces, please call a local office for pricing.

ITEM #	PRICE 1-5 PCS	PRICE 6-10 PCS	PRICE 11-20 PCS	DESCRIPTION
ML101J27	\$ 174.10	\$ 152.35	\$ 120.53	Mitsubishi 660nm, 130mW

## λ = 670nm P = 5mW, Single Mode Hitachi HL6722G

### Maximum Ratings (T<sub>C</sub>=25°C)

CHARACTERISTIC	SYMBOL	RATING
Optical Output Power (CW)	P <sub>o</sub>	5mW
Optical Output Power(Pulse)	P <sub>o</sub>	6mW*
LD Reverse Voltage	V <sub>R(LD)</sub>	2V
PD Reverse Voltage	V <sub>R(PD)</sub>	30V
Operation Case Temperature	T <sub>c</sub>	-10 to 50°C
Storage Temperature	T <sub>stg</sub>	-40 to 85°C

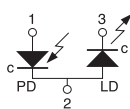
\*Note: Pulse width ≤ 1μs, duty ≤ 50%

### Optical-Electrical Characteristics (T<sub>C</sub>=25°C, P= 5mW)

Characteristic	Symbol	Min.	TYP.	Max.
Threshold Current	I <sub>th</sub>	20mA	32mA	55mA
Operation Current	I <sub>op</sub>	-	42mA	70mA
Operation Voltage	V <sub>op</sub>	-	-	2.7V
Lasing Wavelength	λ <sub>p</sub>	660nm	670nm	680nm
Beam Divergence	θ//	5°	8°	11°
(FWHM)	θ <sub>⊥</sub>	22°	30°	38°
Monitor Current	I <sub>m</sub>	1mA	2mA	3mA

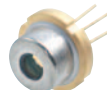
Note: All data is presented as typical unless otherwise specified.

**Pin Description**  
 1 monitor diode anode  
 2 common case  
 3 laser cathode



**PIN CODE 9A**

9mm  
PACKAGE



- 9mm Package
- AlGaInP Index-Guided Laser Diode with a Multi-Quantum Well (MQW) Structure
- Pulsed Optical Power 6mW with a 50% Duty Cycle and a Maximum Pulse Width of 1μs
- Single Longitudinal Mode
- 8μm Astigmatism @ 5mW

ITEM #	£* 1-5 PCS	€* 1-5 PCS	RMB* 1-5 PCS
HL6722G	£ 23.10	€ 34,10	¥ 350.00

\*For quantities over 5 pieces, please call a local office for pricing.

ITEM #	PRICE 1-5 PCS	PRICE 6-10 PCS	PRICE 11-20 PCS	DESCRIPTION
HL6722G	\$ 36.65	\$ 32.05	\$ 26.23	Hitachi 670nm, 5mW

Benchtop Drivers

Platform Drivers

OEM Drivers

Laser Diode Mounts

Laser Diodes

Pigttailed Lasers

Laser Modules

Accessories

All laser diodes are extremely electrostatic sensitive; see page XXX470 for our selection of antistatic products.

Laser Diode Drivers



See Page 414