HL6335G/36G

Circular Beam Low Operating Current

HITACHI

ADE-208-1419C (Z)

Rev.3
Mar. 2002

Description

The HL6335/36G are 0.63 μm band AlGaInP laser diodes can be operated with low operating current. These products were designed by self aligned refractive index (SRI) active layer structure. These are suitable as a light source for laser levelers, laser scanners and optical equipment for measurement.

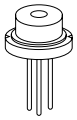
Application

- Laser leveler
- Laser scanner
- Measurement

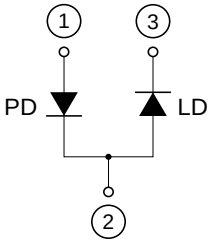
Features

- Optical output power : 5 mW CW
- Visible light output : 635 nm Typ
- Low operating current : 25 mA Typ
- Low aspect ratio : 1.2 Typ (almost circular beam)
- Operating temperature : +50°C
- TM mode oscillation

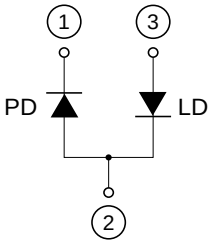
Package Type
• HL6335/36G: G2



Internal Circuit
• HL6335G



Internal Circuit
• HL6336G



Hitachi semiconductor

Absolute Maximum Ratings

(T_C = 25°C)

Item	Symbol	Value	Unit
Optical output power	P_O	5	mW
Pulse optical output power	$P_{O(Pulse)}$	6 *	mW
LD reverse voltage	$V_{R(LD)}$	2	V
PD reverse voltage	$V_{R(PD)}$	30	V
Operating temperature	Topr	–10 to +50	°C
Storage temperature	Tstg	–40 to +85	°C

Note: Pulse condition : Pulse width ≤ 1 μs, duty = 50%

Optical and Electrical Characteristics

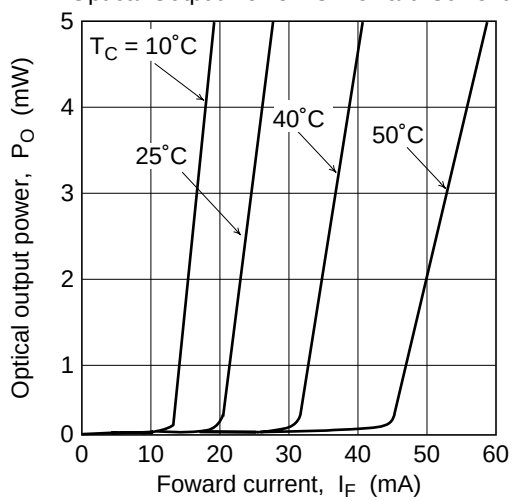
(T_C = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Condition
Optical output power	P_O	5	—	—	mW	Kink free
Threshold current	Ith	—	20	30	mA	
Slope efficiency	ηs	0.5	0.8	1.1	mW/mA	3 (mW) / ($I_{(4mW)}$ – $I_{(1mW)}$)
Operating current	I_{OP}	—	25	40	mA	P_O = 5 mW
Operating voltage	V_{OP}	—	2.4	2.7	V	P_O = 5 mW
Lasing wavelength	λp	630	635	640	nm	P_O = 5 mW
Beam divergence parallel to the junction	θ//	13	17	25	deg.	P_O = 5 mW
Beam divergence parpendicular to the junction	θ⊥	16	20	25	deg.	P_O = 5 mW
Aspect ratio	θ⊥/θ//	—	1.2	1.5	—	P_O = 5 mW
Monitor current	I_S	0.03	0.07	0.12	mA	P_O = 5 mW, $V_{R(PD)}$ = 5 V

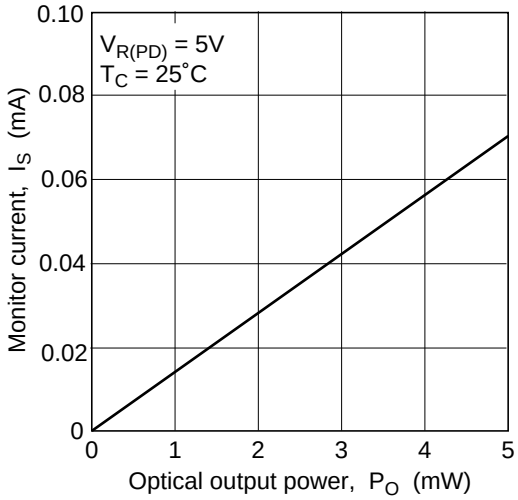
Notes: 1. Care must be taken in laser diodes handling to prevent optical damage caused by forward surges as well as by ESD.
2. The wavefront performance is not guaranteed.
3. The beam has 12 deg offset against the package reference plane. Please take account it mounted on a board.

Typical Characteristic Curves

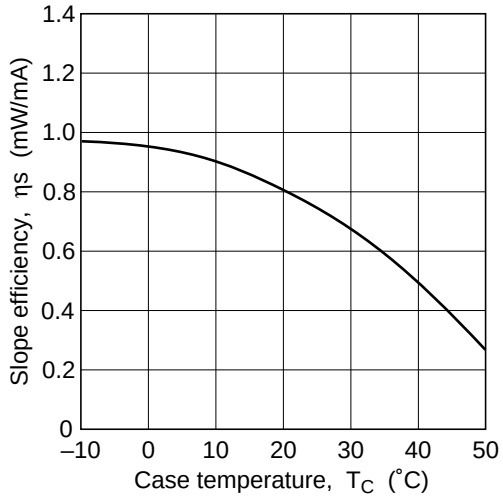
Opticai Output Power vs. Foward Current



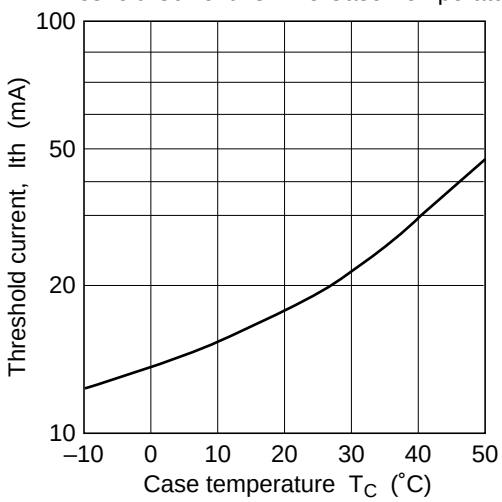
Monitor Current vs.Optical Output Power



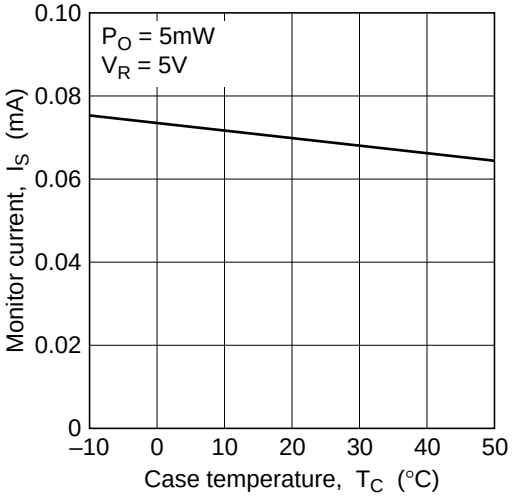
Slope Efficiency vs. The Case Temperature



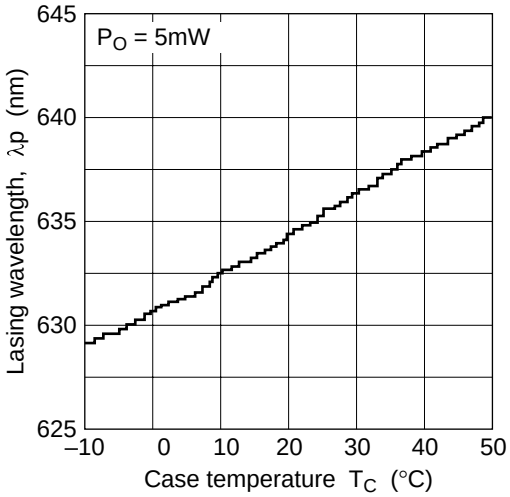
Threshold Current vs. The Case Temperature



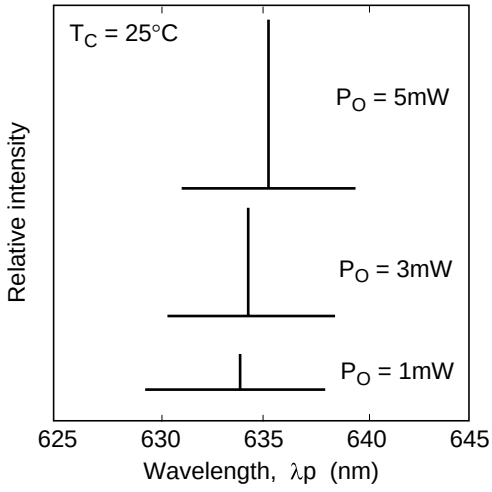
Monitor Current vs. The Case Temperature



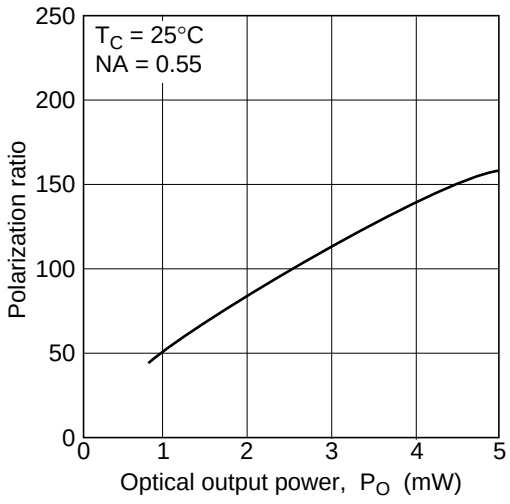
Lasing Wavelength vs. The Case Temperature



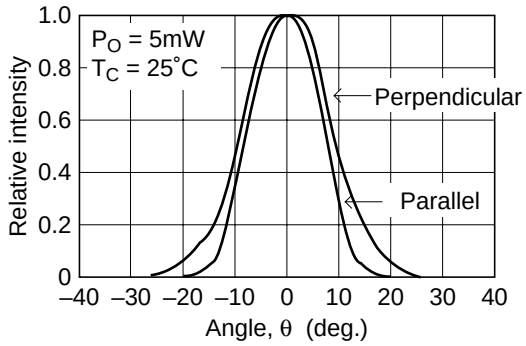
Lasing Spectrum



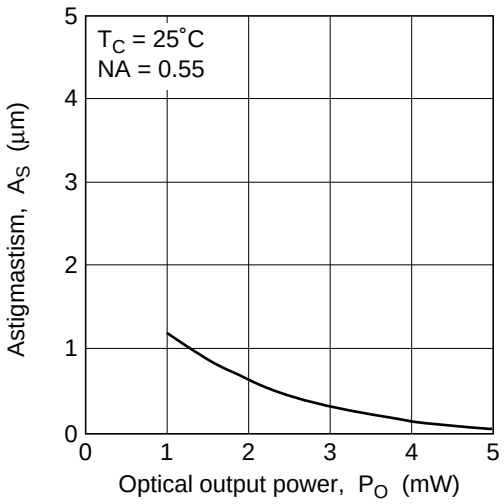
Polarization Ratio vs. Optical Output Power



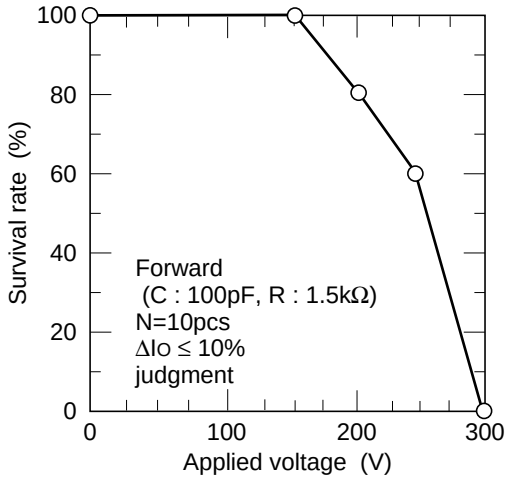
Far Field Pattern



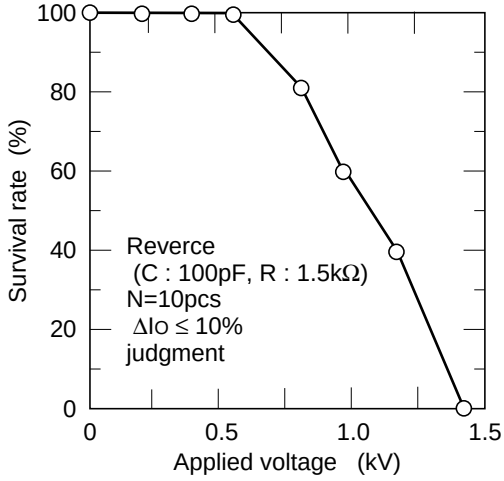
Astigmastism vs. Optical Output Power



Electrostatic Destruction

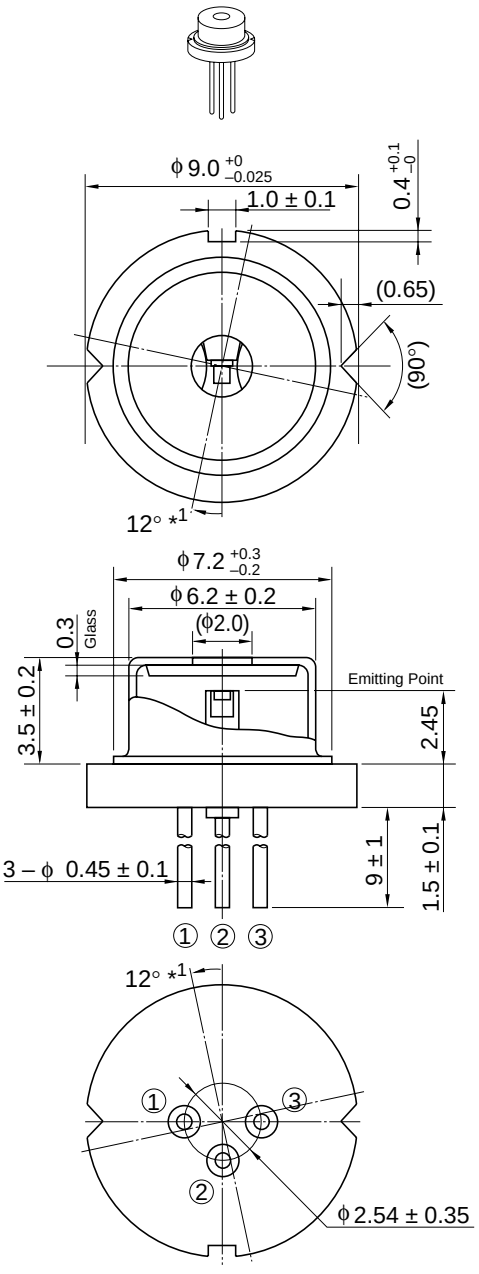


Electrostatic Destruction



Package Dimensions

Unit: mm



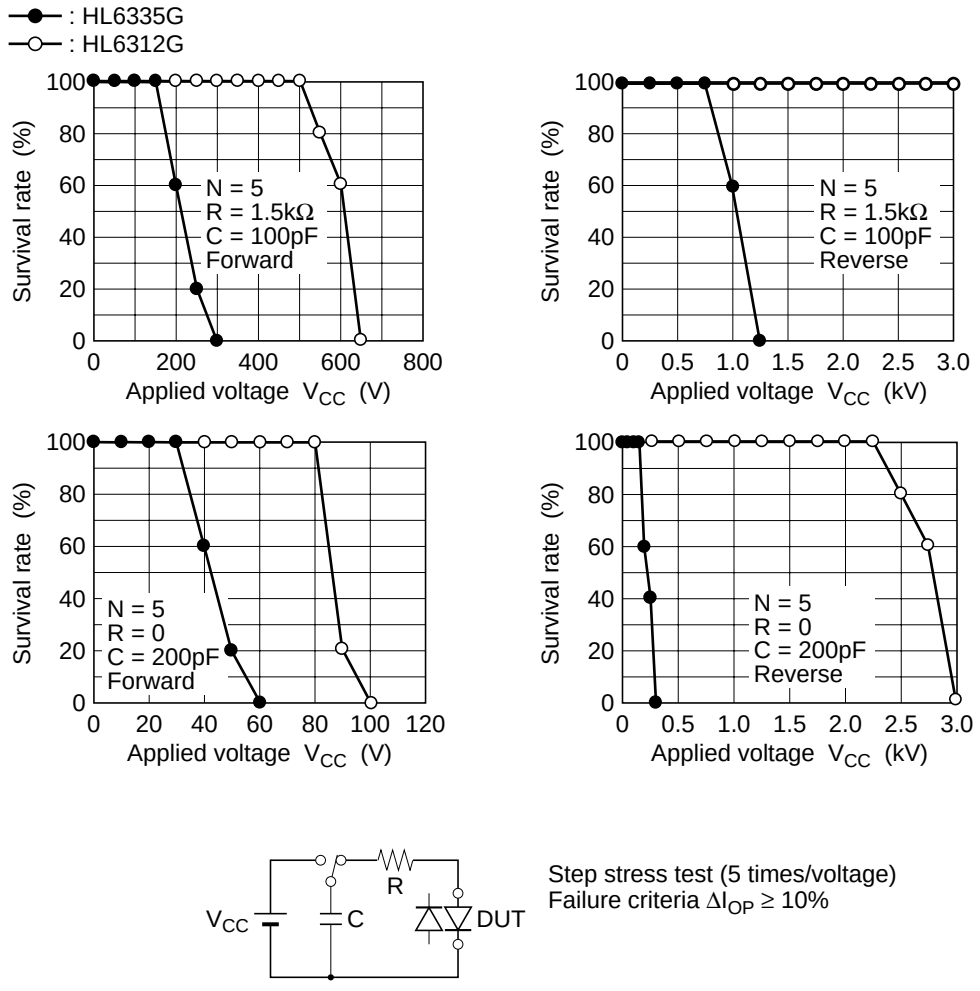
Note: 1. The beam has 12 deg offset against the package reference plane.
Please take account it mounted on a board.

Hitachi Code	LD/G2
JEDEC	—
JEITA	—
Mass (reference value)	1.1 g

The Cautions on the Handing of HL6335G/36G

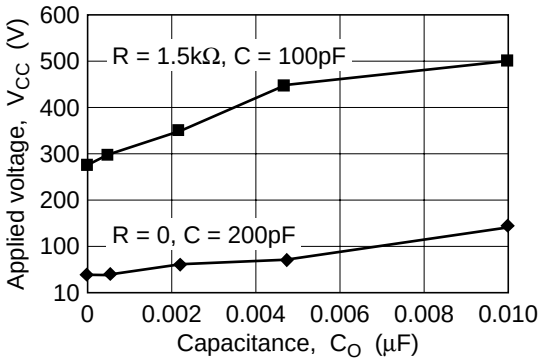
As laser diode differ from silicon devices, the area of safe operation (ASO) of laser diodes is not decided by power consumption alone, but optical output must be considered from view point of optical damage. These products are more sensitive to static electricity or an surge current than the conventional product. The following is test data of ESD (electric static damage). The operating condition should be within 5 mW and the working please should be keep small static electricity level such as 20 V less and small surge current such as 40 mA less from out.

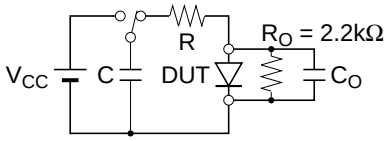
1. Electrostatic destructive examination data



Step stress test (5 times/voltage)
Failure criteria $\Delta I_{OP} \geq 10\%$

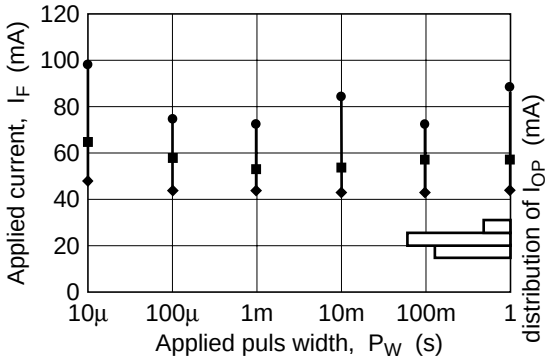
2. Clamp Capacitance vs. ESD of HL6335G/36G

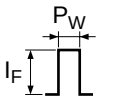




Step stress tast (5 times/voltage)
Failure criteria $\Delta I_{OP} \geq 10\%$

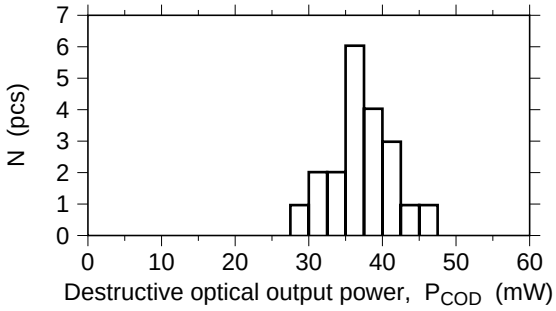
3. Applied puls width vs. Applied current





T_C = 25˚C
1 shot
n = 10pcs

4. Catastrophic optical damage of HL6335G/36G



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1. The laser light is harmful to human body especially to eye no matter what directly or indirectly. The laser beam shall be observed or adjusted through infrared camera or equivalent.

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