HLJ Technology Co., Ltd.

Specification

Project Code : 1307C

Product : 1307C-5G

Specification

The specification applies to GaAs infrared chip for 850nm wavelength range.

The 1307C-5G is a 850nm 10 mil Vertical Cavity Surface Emitting Laser (VCSEL) chip. The product characterized by the infrared wavelength and unique oxide-confined process of VCSELs.

Part Number : VC854C10000-R006

Features

- GaAs based infrared chip
- 850nm center optical wavelength
- 850nm multi-mode beam profile
- Data rates up to 5Gbps
- Low threshold and operating currents
- Low spectral width
- Narrow beam divergence
- Single chips

Applications

- Fiber optic communication links and AOC
- HDMI
- Data Center
- Datacom

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Electrical Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Operating Current	I_{op}	-	6	-	mA	
Threshold Current	I_{th}		1	-	mA	
Forward Voltage	V_f		2		V	
Output Power	P_o	-	2.5	-	mW	
Center Wavelength	λ_c	840	850	860	nm	
Spectral Bandwidth	$\Delta\lambda$	-	0.28	-	nm	
Beam Divergence	θ	-	25	-	degree	Full Width $1/e^2$
Slope Efficiency	ηs	-	0.4	-	W/A	
Differential Resistance	R_s	-	50	-	Ω	
Reverse-Leakage Current	I_r	-	-	0.5	μA	
Rise Time (20~80%)	T_r	-	60	-	ps	
Fall Time (80~20%)	T_f	-	60	-	ps	
3dB Bandwidth	F3db	5		-	GHz	

Note:

- Any quality management (final quality control, outgoing quality control, etc.) used I_f = 6mA, Ta = 25℃, CW as the testing conditions, unless specified otherwise.
- Forward Voltage (Vf) measurement allowance is ±0.1V.
- Center Wavelength (λc) measurement allowance is ±1.5nm.
- Other measurement allowances are ±5%.

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Absolute Maximum Rating

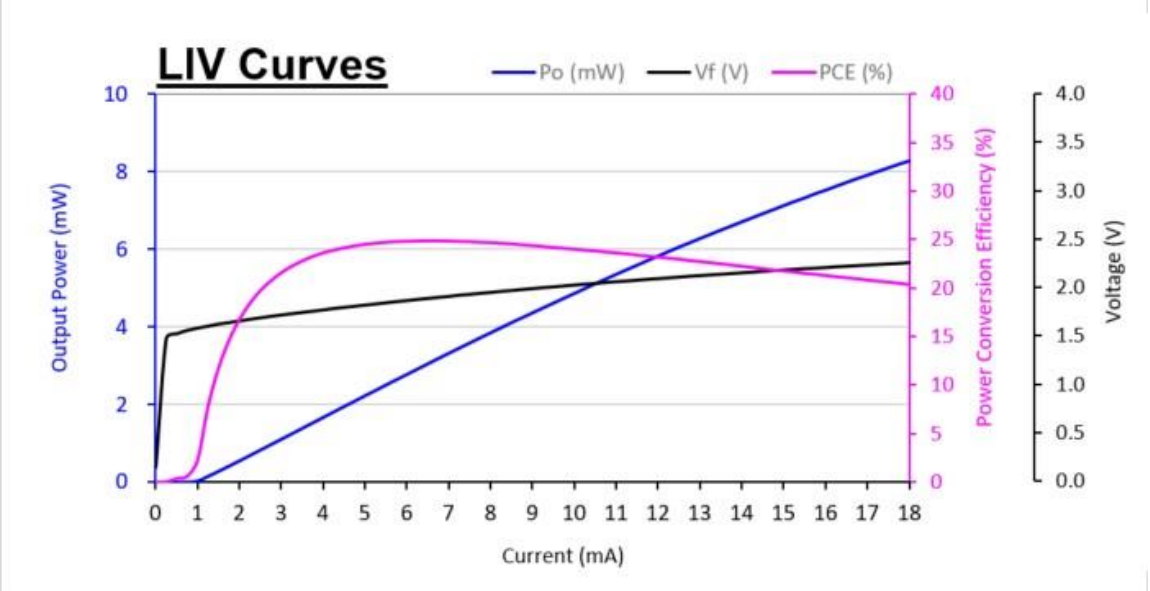
Parameter	Symbol	Range	Notes
Storage Temperature	T_{stg}	-40℃ to 150℃	
Operating Temperature (VCSEL)	T_{op}	-40℃ to 85℃	
Maximum CW Current	-	12mA	
Human-Body Model	-	100V	JESD22-A114
Machine Model	-	30V	JESD22-A115
Maximum Package SMT Solder Reflow Temperature	-	260℃, < 10 seconds	

Note:

- Different package type will affect the Absolute Maximum Ratings data, and for HLJ the lasers are mounted on TO-46 headers for burn-in and characteristic test.
- The maximum pulse laser current in the Absolute Maximum Ratings shall valid along with the operating temperature noted at the table above. GaAs based VCSEL is sensitive to temperature; if stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device.
- These are stress ratings only, functional operation of the device at these or any other conditions beyond those indicated under “Recommended Operating Conditions” shall not be applied.
- Absolute Maximum Ratings are limiting values that shall not be exceeded, even instantaneously. Exposure to absolute-maximum-rating conditions for extended periods may affect reliability of the device, and electrical parameters are guaranteed only within the recommended operating temperature range.
- Electrostatic discharge (ESD) damage is major source affecting the lifetime of oxide VCSEL, excessive ESD could damage the VCSEL chip and result in performance degradation and reliability failure, make sure during the whole usage and installation process that no ESD exists.

Typical Performance Curves

■ Typical Electrical-Optical Characteristics (T_a = 25℃)



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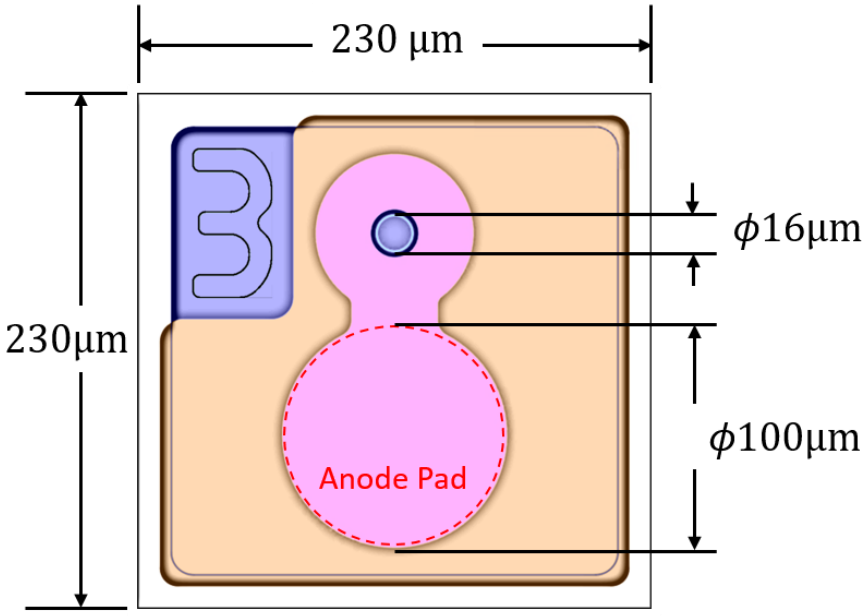
Dimensions



Specification	Unit	Min.	Typ.	Max.	Condition
Number of emitters	ea		1		-
Length(x), Width(Y)	µm	215	230	245	-
Thickness	µm	135	150	165	-
Emitter Surface Area Diameter	µm	-	16	-	-
Anode Pad Size	µm	-	100	-	Emitter Side
Cathode Pad Size	µm	215	230	245	Backside

Note:

- Dimension unit is in micrometer.
- Dimension tolerance is ± 3µm unless specified otherwise.

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Other Information

- **RoHs Compliance:**
  HLJ committed to environment protection and sustainable development, this part complies with EU 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment) and the relevant of held as part of our controlled documentation.
- **Packaging Q'ty:**
  8K ea/Die sheet, 8 Die sheet/Antistatic bag, 6 Antistatic bag/Box, 6 Box/Carton box.
- **ESD Protection:**
  VCSEL is very sensitive to Electrostatic discharge (ESD) and Electrical over stress (EOS), excessive ESD have damage the chip and result in performance degradation. Make sure during the whole usage and installation process that no ESD exist and electrical circuits are equipped with surge protection.
- **Important Notice:**
  The data provided in this data sheet shall be typical. In accordance with the HLJ policy of continuous improvement, specifications may change without notice.

Revision History

Revision	Description	Author	Release Date
1	Establish a Datasheet	Tommy_Li	2022/10/31
2	Format revision Add Revision History	Tommy_Li	2022/11/10

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