HLJ Technology Co., Ltd.

Specification

Project Code : 1C310

Product : 850nm 25Gb/sDual Top ContactMultimode VCSEL Array

Specification

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

The 1C310-200G is an 850nm 1x4 Vertical Cavity Surface Emitting Laser (VCSEL) chips are designed for high-speed optical data communication applications. The product characterized by the unique VCSELs oxide-confined aperture process design and provides stable electro-optical characteristic and high reliability.

Part Number : VC854C40000-R001

Features

- 850nm center optical wavelength
- 3dB Bandwidth 16GHz
- Data rates from DC to 50 Gbps
- Multi-mode beam profile
- Other configurations available on request

Applications

- Consumer electronics
- Single channel and parallel fiber optical communication links
- Transceivers, active optical cables, HDMI

Electrical Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Threshold Current	I_{th}	***	0.6	1	mA	T=25℃
Output Power	P_o	***	4	***	mW	I_f = 7.5mA
Slope Efficiency (S.E.)	η_s	***	0.6	***	mW/mA	I_f = 7.5mA
Forward Voltage	V_f	***	2.1	2.3	V	I_f = 7.5mA
Resistance	R_s	***	65	90	Ω	I_f = 7.5mA
Center Wavelength	λ_c	840	850	860	nm	I_f = 7.5mA
Spectral Bandwidth	$\Delta\lambda$	***	***	0.6	nm	I_f = 7.5mA , Full Width $1/e^2$

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Beam Divergence	θ	***	27	***	deg.	I_f = 7.5mA
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**	**Condition**
Rise Time (20~80%)	T_r	***	15	***	ps	I_f = 7.5mA
Fall Time (80~20%)	T_f	***	15	***	ps	I_f = 7.5mA
Wavelength Tuning over Temp.	***	***	0.07	***	nm/K	
3dB Bandwidth	f_{3dB}	***	16	***	GHz	I_f = 7.5mA
Relative Intensity Noise	RIN	***	-130	***	dB/Hz	I_f = 7.5mA

Note:

- All parameters except mentioned are measured at If = 7.5mA, Ta = 25℃, CW.
- Forward Voltage (Vf) measurement allowance is ±0.1V.
- Center Wavelength (λc) measurement allowance is ±1.5nm.
- Others measurement allowance is ±5%.

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Absolute Maximum Rating

Parameter	Symbol	Rating	Unit	Condition
Storage Temperature	T_{stg}	-40 ~ 100	℃	
Operating Temperature	T_{op}	0 ~ 85	℃	
Peak forward current (max. 10sec)	I_f	12	mA	
Maximum Package SMT Solder Reflow	T_{sol}	260	℃	Solder Time < 10 seconds
Human Body Model	HBM	100	V	

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 CW laser current in the Absolute Maximum Ratings is valid for the operating temperature noted at the table above. 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.

Dimensions

Specification (1x1)	Unit	Min.	Typ.	Max.	Condition
Number of emitters	ea		1		-
Length(X), Width(Y)	µm	220	235	250	Included die saw street.
Thickness	µm	135	150	165	-
Emitter surface area diameter	µm	-	12	-	-
Bond pad size	µm	-	70	-	Emitter side

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Specification (1x4)	Unit	Min.	Typ.	Max.	Condition
Number of emitters	ea		4		-
Length(X)	µm	970	985	1000	Included die saw street.
Width(Y)	µm	220	235	35	Included die saw street.
Thickness	µm	135	150	165	-
Emitter surface area diameter	µm	-	12	-	-
Bond pad size	µm	-	70	-	Emitter side

Note:

- All dimensions are in micrometers.
- Length, Width and Thickness tolerance are ± 15µm
- Emitter & Bond pad size tolerance are ± 1.5µm

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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:**

  1.5K 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	Ethan_Wang	2022/04/08
2	If change	Ethan_Wang	2022/10/13
3	Add product code	Ethan_Wang	2022/10/17
4	Revised file format	Ethan_Wang	2022/11/09

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