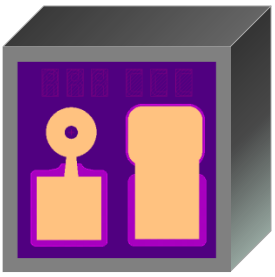
10Gbps 850nm VCSEL Chip/Array

P/N: DO314_VCSEL

Known Good Die™

PRELIMINARY DATASHEET



Introduction

GCS high speed 850nm multimode Vertical Cavity Surface Emitting Laser (VCSEL) chips are primarily designed to meet performance for 10Gbps data communications with specially tailored in consumer-based active optical cable (AOC) and optical USB (OUSB) applications. This high performance device has high reliability and is engineered with low electrical parasitics for data rates up to 10Gb/s. The VCSEL has a circular low divergence beam that can be efficiently coupled into a 50/125 or 62.5/125µm multimode fiber. The device can also be laid out into a linear 1x4, 1x8, or 1x12 array in common cathode configuration with 250µm pitch between each channel for up to 120Gbps applications.

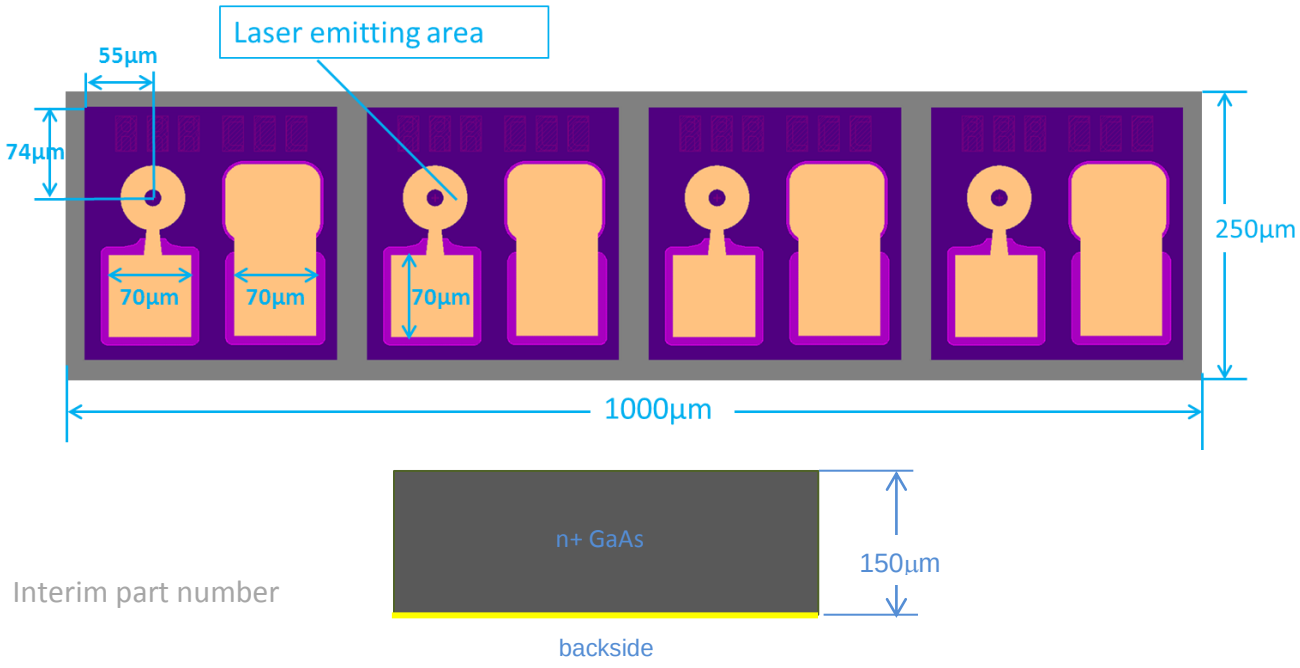
Key Features

- 850nm multimode emission
- Low threshold and operation current
- Excellent reliability
- Data rates up to 10 Gb/s for singlet chip
- Optimized for -5C to 70C operation
- High reliability with GCS robust 4" wafer manufacturing with fast cycle-time
- Deliverable in GCS Known Good Die™ with 100% testing and inspection
- Customized 1x4 array or other arrays layout available
- RoHS compliant

Applications

- 10Gbps data communication
- Active Optical Cable
- Optical USB
- HDMI

Dimensions



* Interim part number

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SPECIFICATIONS

Parameter	Symbol	MIN	TYP	MAX	Units	Test condition
Emission Wavelength	λ	840	850	860	nm	I_{OP} = 6mA
Threshold current	I_{th}	0.5	1	1.5	mA	Temp = 25°C
Threshold voltage	V_{TH}	1.4		1.8	V	
Slope efficiency	η_s	0.3	0.4	0.5	W/A	Temp = 25°C
Differential resistance	R_d	45	60	75	Ω	Temp = 25°C, I_{OP} = 6mA
Operating power	P_{OP}	1	1.5	2	mW	Temp = 25°C, I_{OP} = 6mA
Beam divergence (FWHM)	θ		20		deg	I_{OP} = 6mA
Spectral bandwidth (RMS)	$\Delta\lambda_{RMS}$		0.4	0.6	nm	Temp = 25°C, I_{OP} = 6mA
3dB modulation bandwidth	f_{3dB}		7.5		GHz	I_{OP} = 6mA
Rise and fall time	$t_R/t_{F\ 20/80}$		45	55	ps	I_{OP} = 6mA
Relative intensity noise	RIN		-128		dB/Hz	
Wavelength tuning over current			0.3		nm/mA	
Wavelength tuning over temp			0.07		nm/K	
Thermal resistnace	$R_{Thermal}$		2		°C/mW	

ABSOLUTE MAXIMUM RATING

Parameter	Symbol	MIN	TYP	MAX	Units
Optical output power	P_{max}			8	mW
Peak forward current	I_f			16	mA
VCSEL reverse voltage	V_{rv}			8	V
Operating temperature	T_{OP}	-40		85	°C
Storage Temperature	T_{st}			100	°C

UNIFORMITY OF ARRAY PRODUCTS

Parameter	Symbol	MIN	TYP	MAX	Units
Threshold current	ΔI_{th}			0.15	mA
Slope efficiency	$\Delta\eta_s$			0.1	W/A
Series resistance	R_s			8	%

About GCS:

GCS has a long history manufacturing and shipping both GaAs and InGaAs based photo diodes since 2000. Our state of art manufacturing facility is located in Torrance, California, and has about 10,000 square feet of fab space with a capability of about 1200 4-inch wafers per month and expandable to 2000 wafers per month. GCS as a world-class semiconductor device manufacturer has been delivering a total of over 30 million photo diodes with various date rates and applications used for optical communications, which have been deployed in field by top tier optical transceiver companies worldwide.

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