

# 10Gbps 850nm VCSEL Chip/Array

P/N: DO188\_VCSEL



*Known Good Die*

## Introduction

## PRELIMINARY DATASHEET



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 62.5/125 $\mu$ m multimode fiber. The device can also be laid out into a linear 1x4, 1x8, or 1x12 array in common cathode configuration with 250 $\mu$ m pitch between each channel for up to 120Gbps applications.

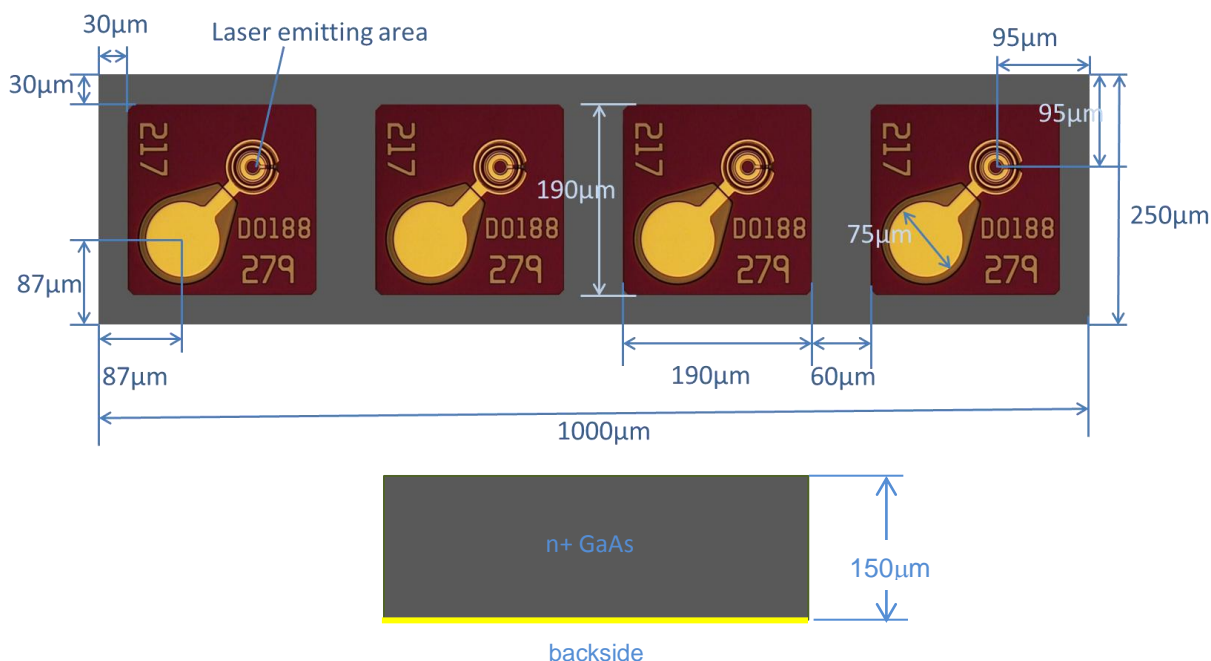
## Key Features

- 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



## Global Communication Semiconductors, LLC

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## SPECIFICATIONS

Parameter	Symbol	MIN	TYP	MAX	Units	Test condition
Emission Wavelength	$\lambda$	840	850	860	nm	$I_{OP} = 6\text{mA}$
Threshold current	$I_{th}$	0.5	1	1.5	mA	Temp = 25°C
Threshold voltage	$V_{TH}$	1.4		1.8	V	
Slope efficiency	$\eta_s$	0.3	0.4	0.5	W/A	Temp = 25°C
Differential resistance	$R_d$	45	60	75	$\Omega$	Temp = 25°C, $I_{OP} = 6\text{mA}$
Operating power	$P_{OP}$	1	1.5	2	mW	Temp = 25°C, $I_{OP} = 6\text{mA}$
Beam divergence (FWHM)	$\theta$		20		deg	$I_{OP} = 6\text{mA}$
Spectral bandwidth (RMS)	$\Delta\lambda_{RMS}$		0.4	0.6	nm	Temp = 25°C, $I_{OP} = 6\text{mA}$
3dB modulation bandwidth	$f_{3dB}$		7.5		GHz	$I_{OP} = 6\text{mA}$
Rise and fall time	$t_R/t_F$ 20/80		45	55	ps	$I_{OP} = 6\text{mA}$
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	$\Delta I_{th}$			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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