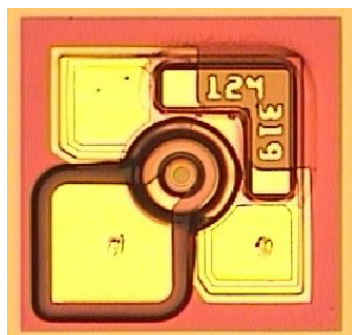


56 Gbs (28GBd) 850nm VCSEL Chip/Array

P/N: DO385_VCSEL_28G_1xN (1x1, 1x4, 1x8, or 1x12)



Introduction

The DO385_VCSEL_28G high speed products are 850nm multimode Vertical Cavity Surface Emitting Laser (VCSEL) devices that feature low electrical parasitics and proven high reliability. These products are engineered to meet data communication rates up to 28 GBd per channel. They have top side ohmic contacts with Signal-Ground (SG) configurations. The devices are available in singlet or array configurations (1x4, 1x8 or 1x12).

Key Features

- 850nm multimode emission
- Low threshold and operation current
- Excellent reliability
- Data rates up to 56Bbs (28 GBd) per channel
- Customization for 1x4, 1x8 and 1x12 array configuration
- Highly robust 4" IC wafer FAB with fast cycle-time
- Deliverable in GCS Known Good Die™ with 100% testing and inspection
- RoHS compliant

Applications

- Active Optical Cable
- High speed optical interconnects
- Infiniband EDR
- Short-reach 100G Ethernet
- Short-reach 400G Ethernet

Electro-optical characteristics

	Symbol	Min.	Typical	Max.	Unit	Test condition (T=0 to 85°C)
Emission Wavelength	λ	840	850	860	nm	$I_{OP} = 4mA$
Maximum data rate	Gbits/s		25	28		NRZ
3dB modulation bandwidth	f_{3dB}	15	18	22	GHz	Min 15GHz at 85C
Threshold current	I_{th}	0.4	0.5	1.0	mA	
Operating voltage	V_{OP}	2.3	2.5	2.7	V	$I_{OP} = 4mA$
Slope efficiency	η_s	0.6	0.8	1.0	W/A	$I_{OP} = 4mA$
Differential resistance	R_d	100	120	140	Ω	$I_{OP} = 4mA$
Operating power	P_{OP}	1.5	2.5	4	mW	
Beam divergence (FWHM)	θ	18	20	25	deg	
Spectral bandwidth (RMS)	$\Delta\lambda_{RMS}$		0.4	0.6	nm	$I_{OP} = 4mA$
Rise and fall time	t_R/t_F 20/80		16	20	ps	

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Known Good Die

	Symbol	Min.	Typical	Max.	Unit	Test condition (T=0 to 85°C)
Relative intensity noise	RIN		-128		dB/Hz	
Wavelength tuning over current			0.3		nm/mA	
Wavelength tuning over temp			0.07		nm/K	
Thermal impedance	Z _{Thermal}		2		°C/mW	

UNIFORMITY OF ARRAY PRODUCTS

	Symbol	Min.	Typical	Max.	Unit
Threshold current	ΔI_{th}			0.1	mA
Slope efficiency	$\Delta \eta_s$			0.1	W/A

ABSOLUTE MAXIMUM RATING

	Symbol	Min.	Test Condition	Max.	Unit
Optical output power	P _{max}			8	mW
Peak forward current	I _f			9	mA
VCSEL reverse voltage	V _{rv}			10	V
Operating temperature	T _{OP}	-5		105	°C
Storage temperature	T _{st}	-40		105	°C
Soldering temperature	T _{sl}		Max 260 sec	150	°C

Mechanical Dimensions

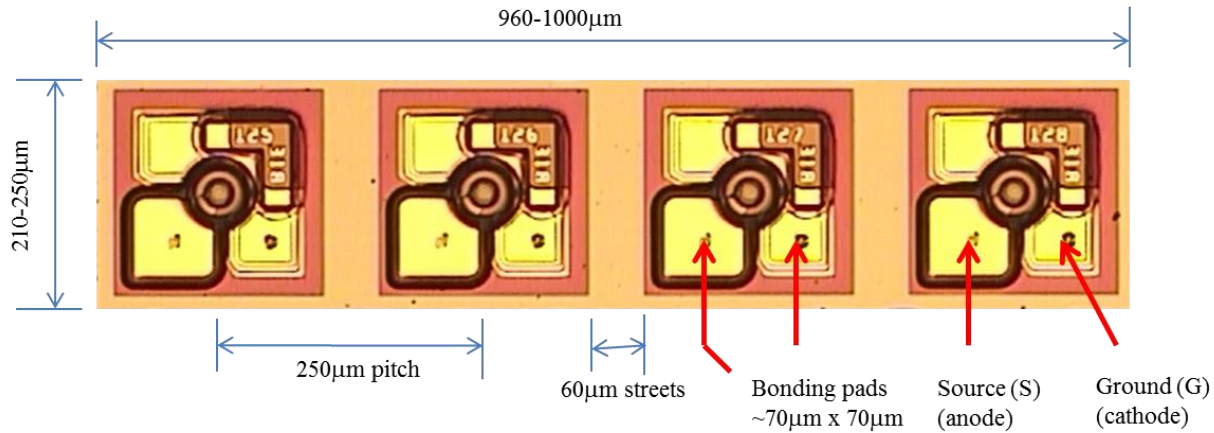
Parameter	Type	Min.	Typical	Max.	Unit
VCSEL pitch	All		250		μm
Length 1x1 VCSEL chip	DO385_VCSEL_28G_1x1	190	210	250	μm
Length 1x4 VCSEL chip	DO385_VCSEL_28G_1x4		960	1000	μm
Length 1x12 VCSEL chip	DO385_VCSEL_28G_1x12		2960	3000	μm
Thickness	All	135	150	165	μm
Width	All		210	250	μm

Global Communication Semiconductors, LLC

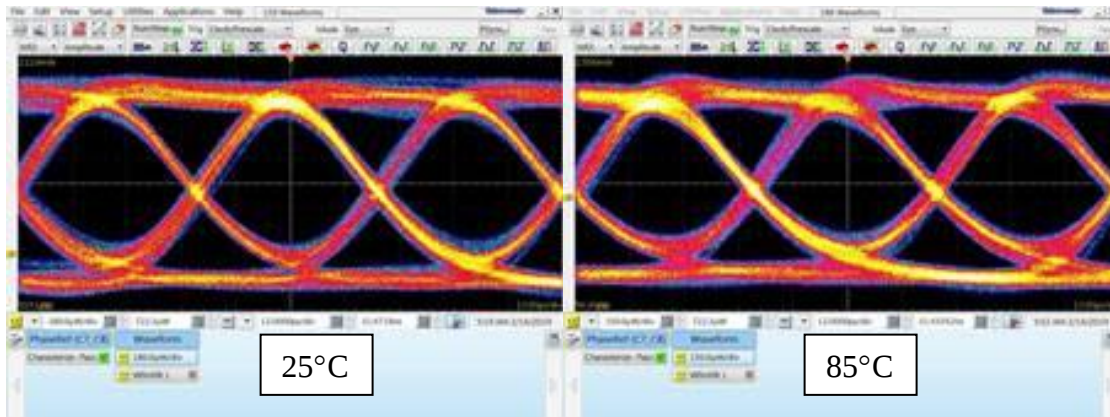
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Eye diagram at 25 Gbits/s 5 mA



Receiver: Tektronix 80C15-32 GHz

Qualification Notification

The DO385_VCSEL_28G_1xN has undergone qualification testing and characterization. Reliability tests are currently in progress. Preliminary reliability test results are available upon request.

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