

### 100 Gbit/s VCSEL (910 nm)

### Contact type: GSG

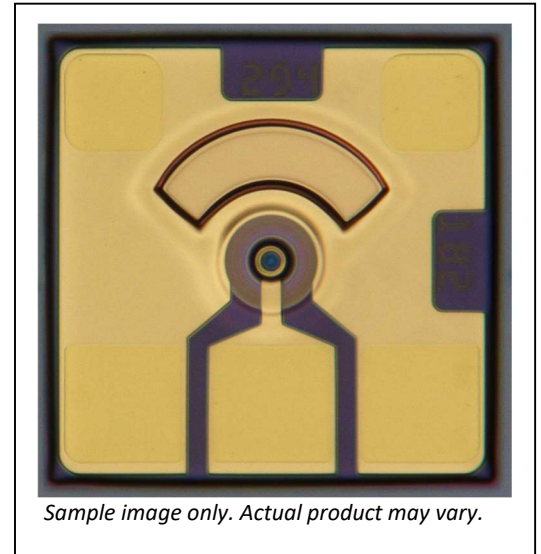
#### Product Code:

VM100-910-GSG-C1 1x1

VM100-910-GSG-C4 4x1

#### Engineering Samples

*Preliminary datasheet*



### Product Description

These compact and very high modulation rate top-emitting GaAs-based vertical cavity surface emitting laser (VCSEL) chips are available as engineering samples for use in the development and evaluation of optical interconnections, optical backplanes and integrated waveguides, and next-generation optical data communications systems. The VCSELs are contacted on the top-surface individually using ground-source-ground (GSG) microprobes or wire bonds.

Optical aperture: ~5-7 $\mu$ m

#### Features

- Up to 112 Gbit/s (PAM-4 modulation)
- Single chip size 250 x 250  $\mu$ m
- Suitable for wire bonding

#### Applications

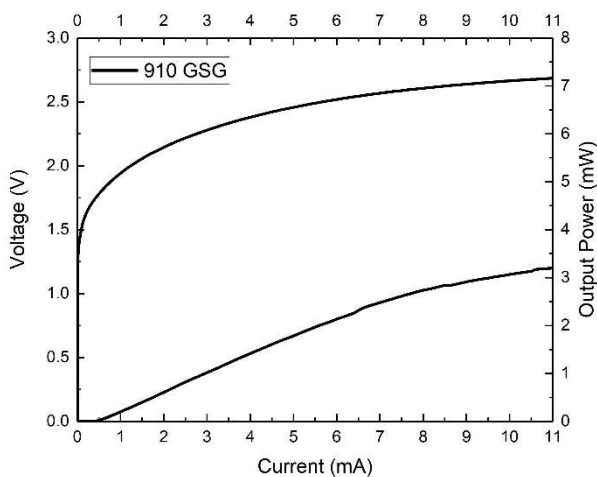
- 200G / 400G in SWDM
- Proprietary optical interconnects
- Active Optical Cables (AOC)

Parameter	Typical	Notes
Emission wavelength	910 nm	(range 900 – 920 nm)
Data rate	Up to 112 Gbit/s	56 GBaud/s PAM-4
Threshold current	< 0.6 mA	
Peak output power	4 mW	

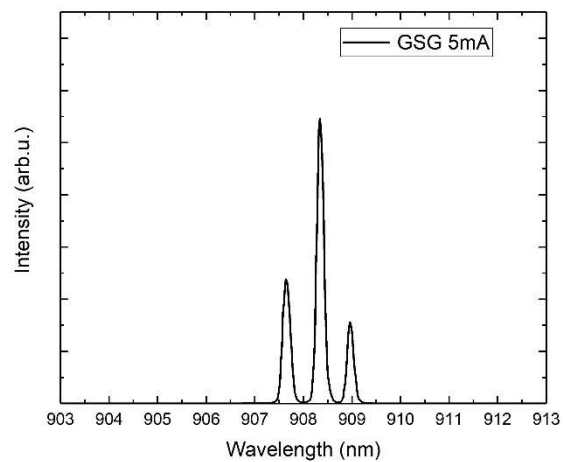
### Electro-Optical Specifications (T = 0 to 85°C)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Emission wavelength	$\lambda$		900		920	nm
Data rate	BR	PAM-4		50	56	GBaud/s
Optical bandwidth	BW (f3dBo)	6 mA		24	28	GHz
Slope efficiency	$\eta$	5-10 mA		0.45		W/A
Threshold current	$I_{th}$			0.5	0.6	mA
Differential resistance	$R_d$	5-10 mA		50		$\Omega$
Beam divergence	$\Theta$	$1/e^2$		30		$^\circ$
Peak output power	$P_{max}$			3		mW
Spectral bandwidth (RMS)	$\Delta\lambda_{RMS}$			0.5	0.65	nm

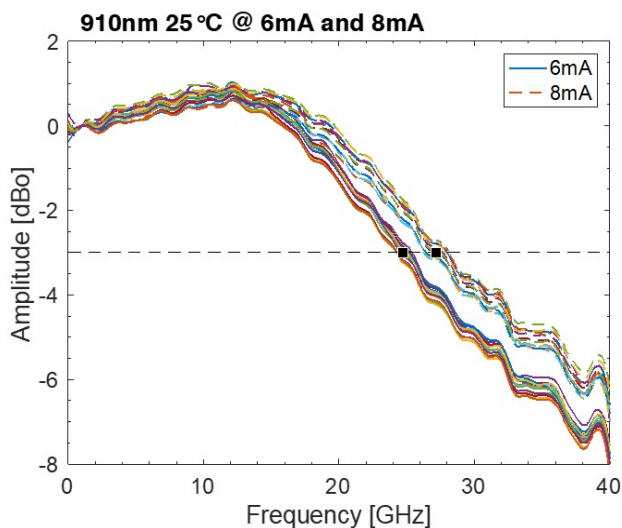
### LIV Characteristics



### Optical Spectrum

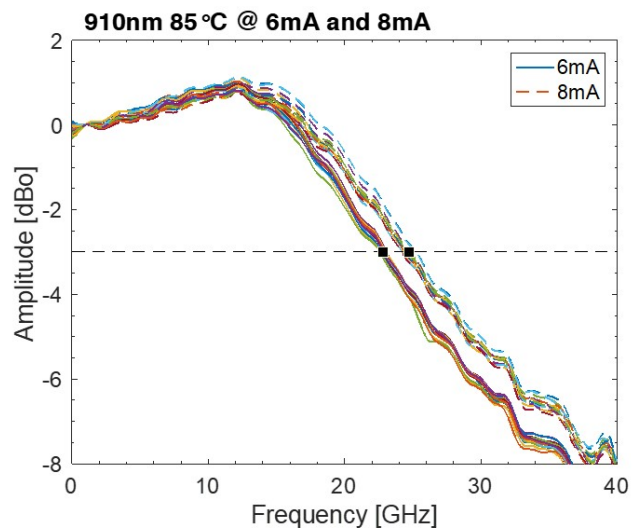


### Frequency response (optical) at 25°C



Measurement of 13 chips across the wafer

### Frequency response (optical) at 85°C



Measurement of 13 chips across the wafer

Test Equipment: Keysight VNA

### Absolute Maximum Ratings

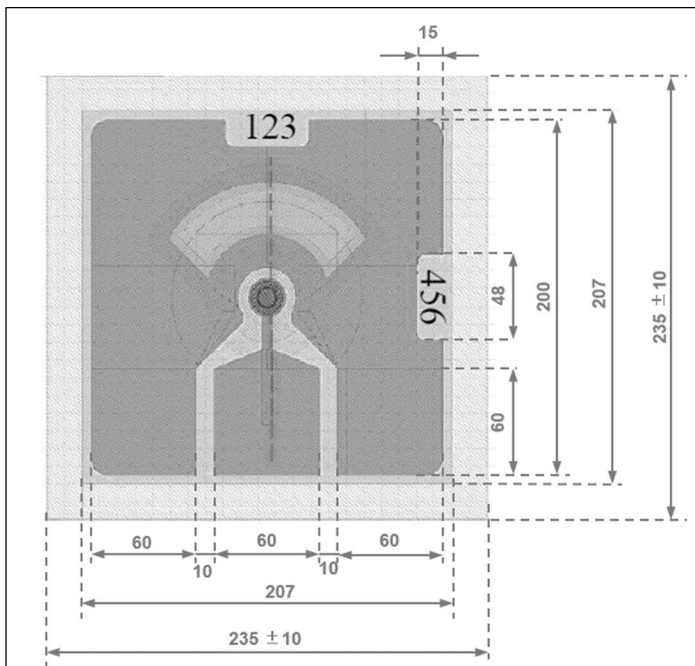
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Peak forward current	$I_f$				8	mA
Maximum reverse voltage	$V_{rv}$				5	V
Operating temperature	$T_{op}$				85	°C
Storage temperature	$T_{st}$		-40		100	°C
Soldering temperature	$T_{sl}$	max 260 sec			150	°C

Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate irreversible damage to the component even if all other parameters are within the electro-optical specifications. Exposure to any of the Absolute Maximum Ratings for extended periods can adversely affect the reliability of these chips.

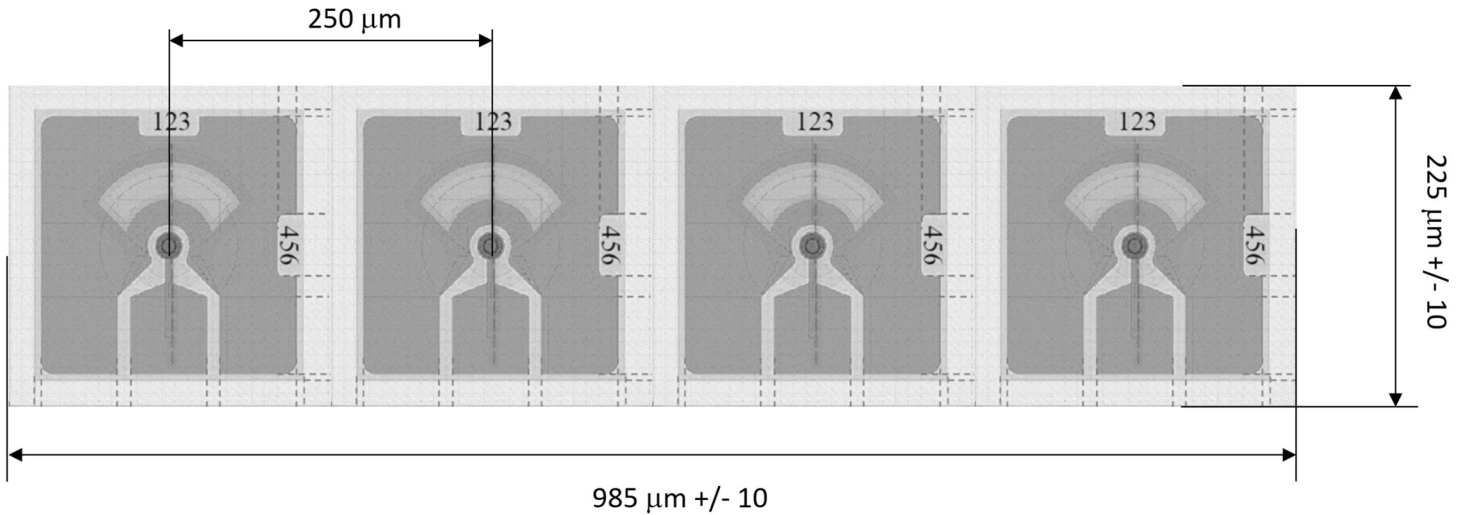
### Mechanical Dimensions

Parameter	Type	Min	Typ	Max	Unit
VCSEL pitch			250		$\mu\text{m}$
Length			210	250	$\mu\text{m}$
Height		140	150	160	$\mu\text{m}$
Width			210	250	$\mu\text{m}$

### Dimensions

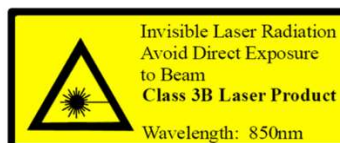


### VM100-910-GSG-C4 Array dimensions



### Qualification Notification

The VM100-910-GSG-Cxx has been tested to meet specifications outlined in this data sheet at room temperature. However, it has not undergone full qualification testing or characterization and therefore may not meet the performance specifications over all extremes.



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