

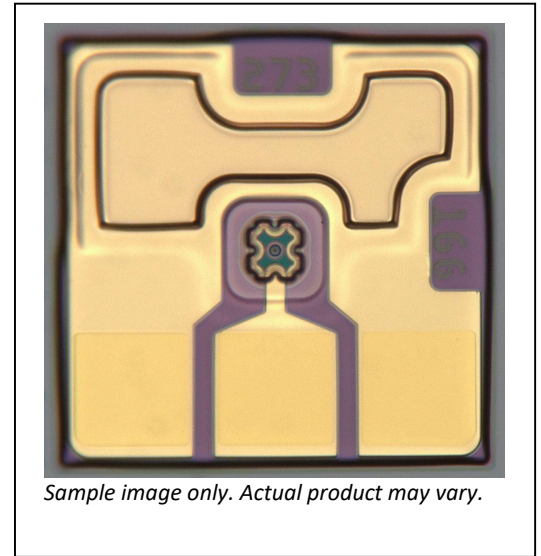
100 Gbit/s VCSEL SM (910 nm)

Contact type: GSG

Chip type: Multi-aperture

Product Code:

VM100-910-GSG-MA-SM-C1 1x1



Engineering Samples

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.

New multi-aperture design enables single mode emission and high-speed operation at high output power.

Equivalent optical aperture diameter: ~6µm

Features

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

Applications

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

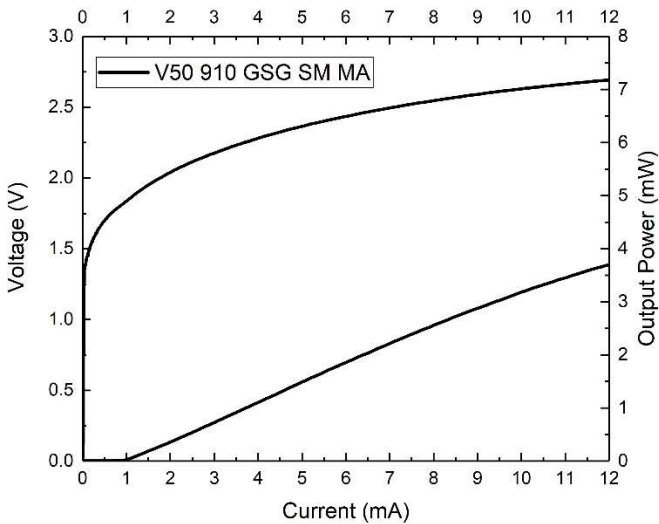
Parameter	Typical	Notes
Emission wavelength	910 nm	(range 900 – 920 nm)
Data rate	Up to 112 Gbit/s	56 GBaud/s PAM-4
RMS	< 0.1 nm	
Peak output power	4 mW	

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

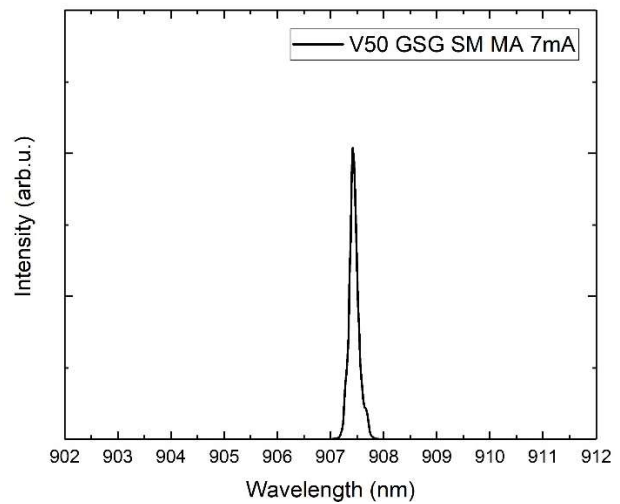
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Emission wavelength	λ		900		920	nm
Data rate	BR	PAM-4		50	56	GBaud/s
Optical bandwidth	BW (f3dBo)	6 mA		23	25	GHz
Slope efficiency	η	5-10 mA		0.4		W/A
Threshold current	I_{th}			1		mA
Differential resistance	R_d	5-10 mA		60		Ω
Beam divergence	Θ	86%		20		$^\circ$
Peak output power	P_{max}			4		mW
Spectral bandwidth (RMS)	$\Delta\lambda_{RMS}$			0.1	0.2	nm

*anti-reflection coating is optimized for <1% reflectivity within the range 840 nm - 960 nm

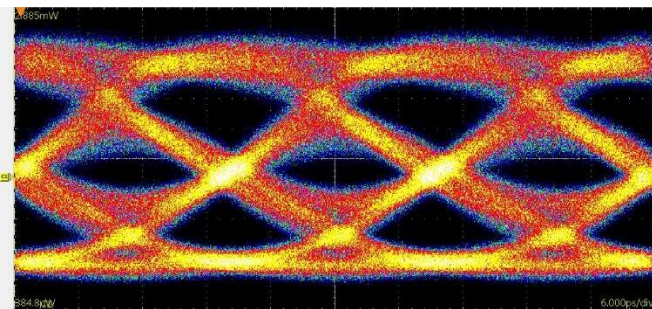
LIV Characteristics



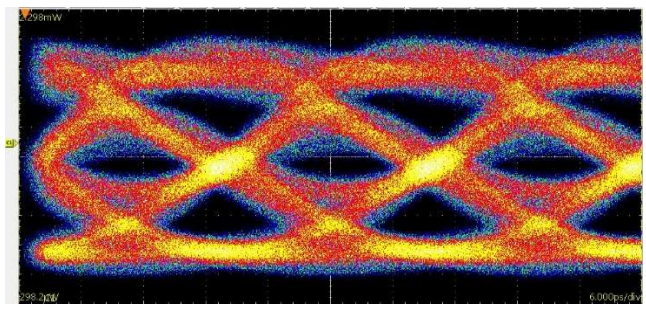
Optical Spectrum



50 Gbit/s NRZ 7 mA 500 mVpp 25°C



50 Gbit/s NRZ 7 mA 400 mVpp 85°C

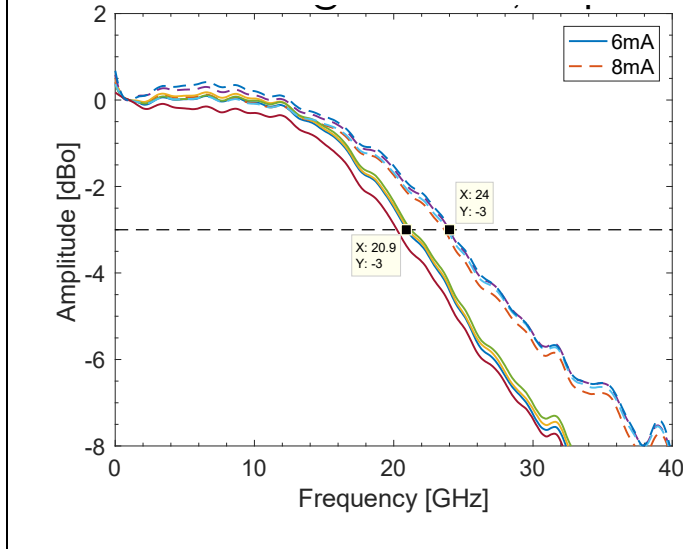


Transmitter: SHF BPG 12104A. Receiver: Tektronix DSA8300 w. 80C15 Optical Sampling Module.

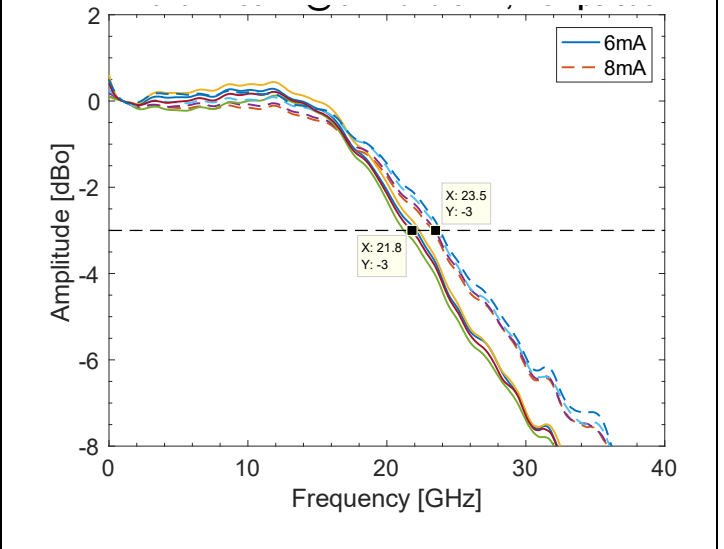
Eye diagrams show intrinsic performance of the chip. No equalization or signal processing was applied.

If the eye-diagram is open at 50Gbaud NRZ without equalization, one can expect good 100Gbit/s PAM4 transmission quality if appropriate PAM driver or/and pre-equalized signal is applied.

Frequency response (optical) at 25°C



Frequency response (optical) at 85°C



Test Equipment: Keysight VNA

Absolute Maximum Ratings

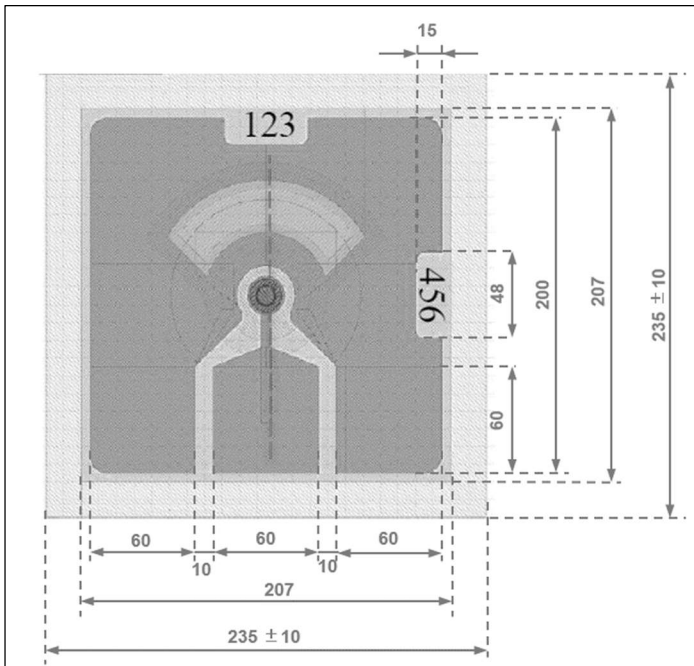
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Peak forward current	I_f				8	mA
Maximum reverse voltage	V_{rv}				5	V
Operating temperature	T_{op}				85	°C
Storage temperature	T_{st}		-40		100	°C
Soldering temperature	T_{sl}	max 260 sec			150	°C

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		μm
Length			210	250	μm
Height		140	150	160	μm
Width			210	250	μm

Dimensions



Qualification Notification

The V50-910-GSG-MA-SM-C1 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.



VI Systems GmbH

Hardenbergstrasse 7
10623 Berlin

Tel.: +49 30 3083143 30

Fax: +49 30 3083143 59

sales@v-i-systems.com

www.v-i-systems.com