

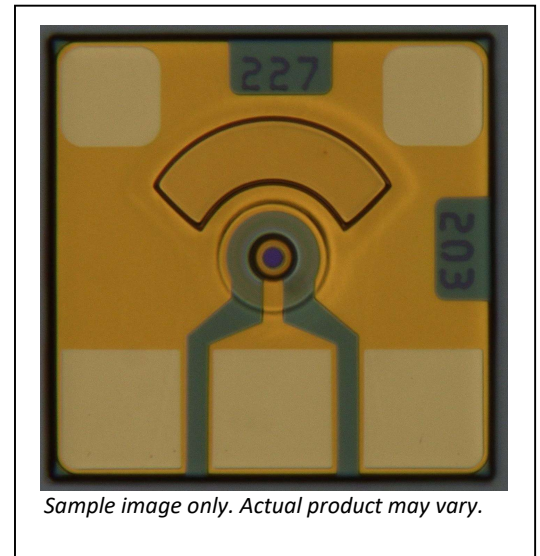
50 Gbit/s VCSEL (940 nm)

Contact type: GSG

Product Code:

VM50-940-GSG-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.

Optical aperture: ~5-7µm

Features

- Up to 56 Gbit/s (PAM-4 modulation)
- Single chip size 250 x 250 µm
- Suitable for wire bonding

Applications

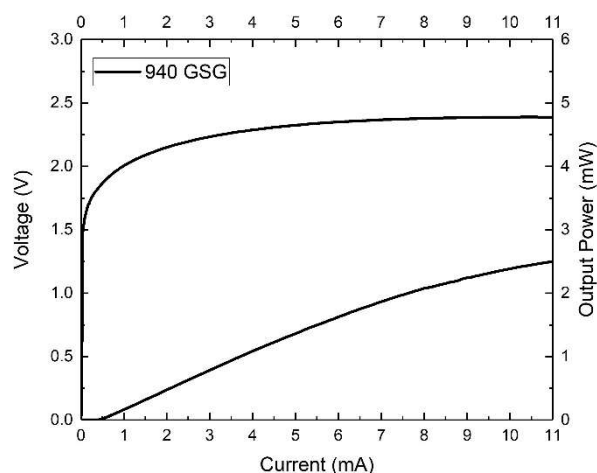
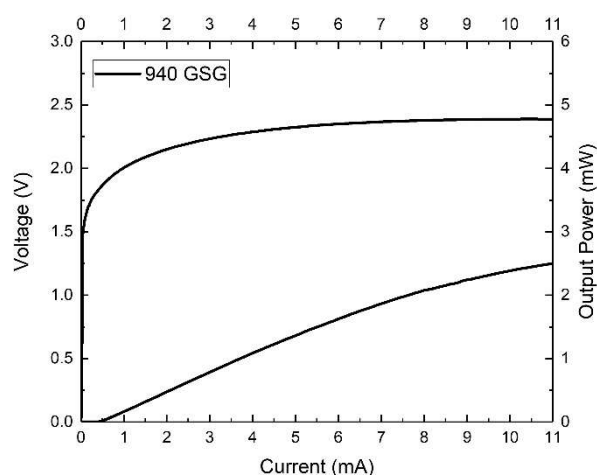
- 100G / 200G in SWDM
- Proprietary optical interconnects
- Active Optical Cables (AOC)

Parameter	Typical	Notes
Emission wavelength	940 nm	(range 930 – 950 nm)
Data rate	Up to 56 Gbit/s	23 GBaud/s PAM-4
Threshold current	< 0.5 mA	
Peak output power	3 mW	

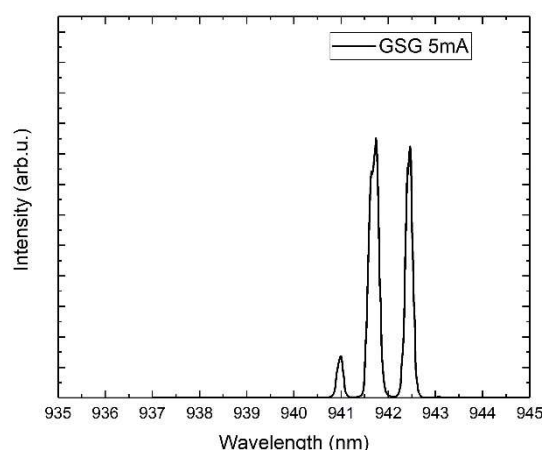
Electro-Optical Specifications (T = 0 to 85°C)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Emission wavelength	λ		930		950	nm
Data rate	BR	PAM-4		50	56	GBaud/s
Optical bandwidth	BW (f3dBo)	6 mA		18	23	GHz
Slope efficiency	η	5-10 mA		0.3		W/A
Threshold current	I _{th}			0.5		mA
Differential resistance	R _d	5-10 mA		30		Ω
Beam divergence	Θ	86%		30		°
Peak output power	P _{max}			3		mW
Spectral bandwidth (RMS)	$\Delta\lambda_{RMS}$			0.6	1	nm

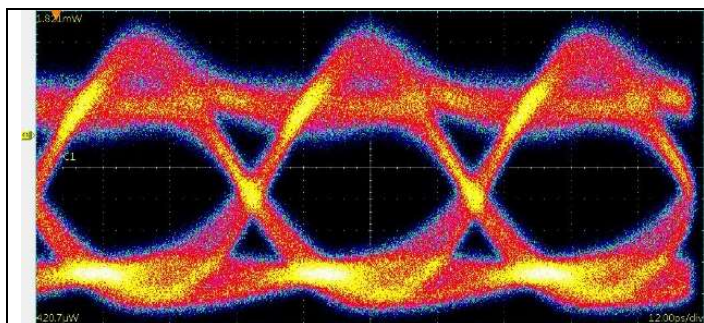
LIV Characteristics



Optical Spectrum



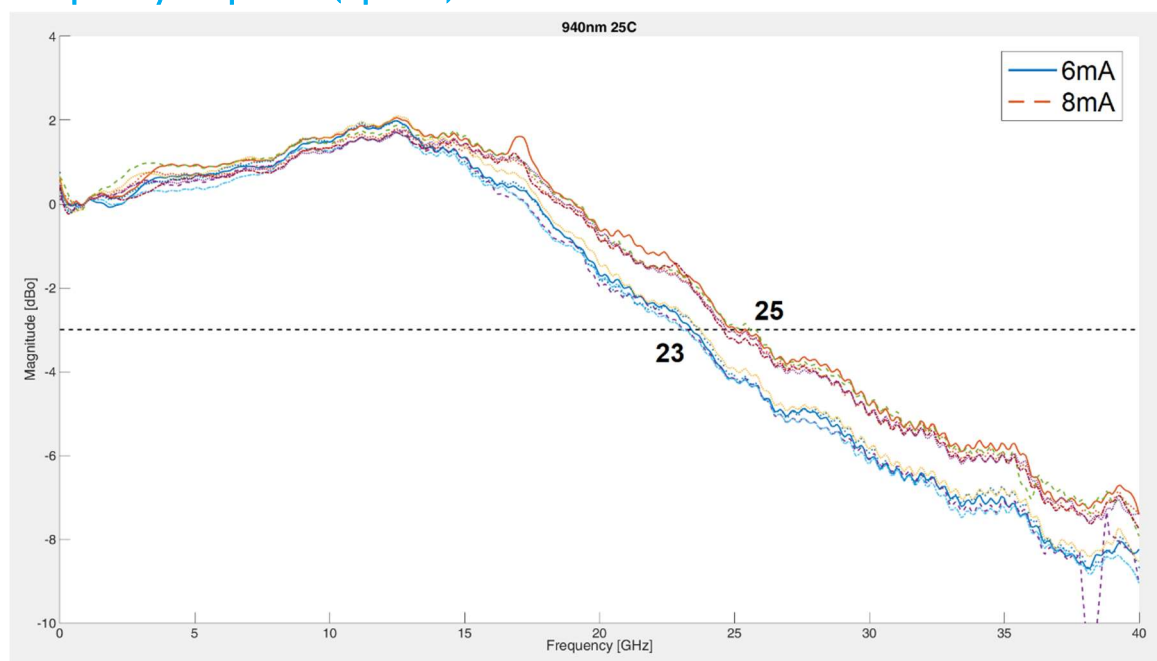
25 Gbit/s NRZ 9 mA 400 mVpp 25°C



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.

Frequency response (optical) at 25°C @



Test Equipment: Keysight VNA

Absolute Maximum Ratings

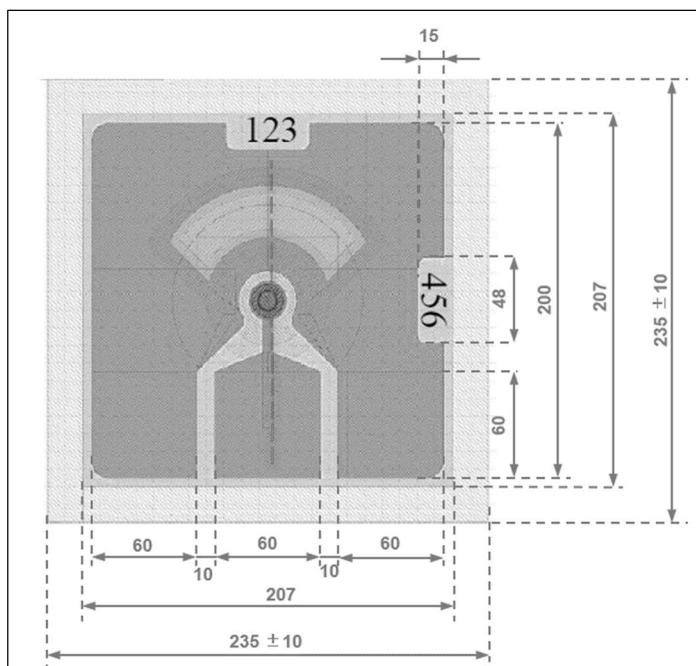
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Peak forward current	I _f				8	mA
Maximum reverse voltage	V _{rv}				5	V
Operating temperature	T _{op}				85	°C
Storage temperature	T _{st}		-40		100	°C
Soldering temperature	T _{sl}	max 260 sec			150	°C

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

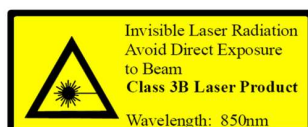
Parameter	Type	Min	Typ	Max	Unit
VCSEL pitch			250		μm
Length			210	250	μm
Height		140	150	160	μm
Width			210	250	μm

Dimensions



Qualification Notification

The VM50-940-GSG-Cxx has been tested to meet specifications outlined in this data sheet at room temperature. Preliminary reliability data is available upon request.



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