

# 14Gb/s 970nm Multi-Mode VCSEL

S-VW14SD1-001

[Draft version]



A TYPICAL WAFER PROBER TESTED VCSEL

## FEATURES

- 970 nm multi-mode top-emitter
- Data rates from DC to 14Gb/s
- Low threshold and operating currents
- Low electrical parasitic
- Top-anode and Bottom-cathode configuration
- Low spectral width
- Narrow beam divergence
- Single chips

## APPLICATIONS

- Fiber optic communication links and AOC
- HDMI
- Datacom 10Gb/s SFP+

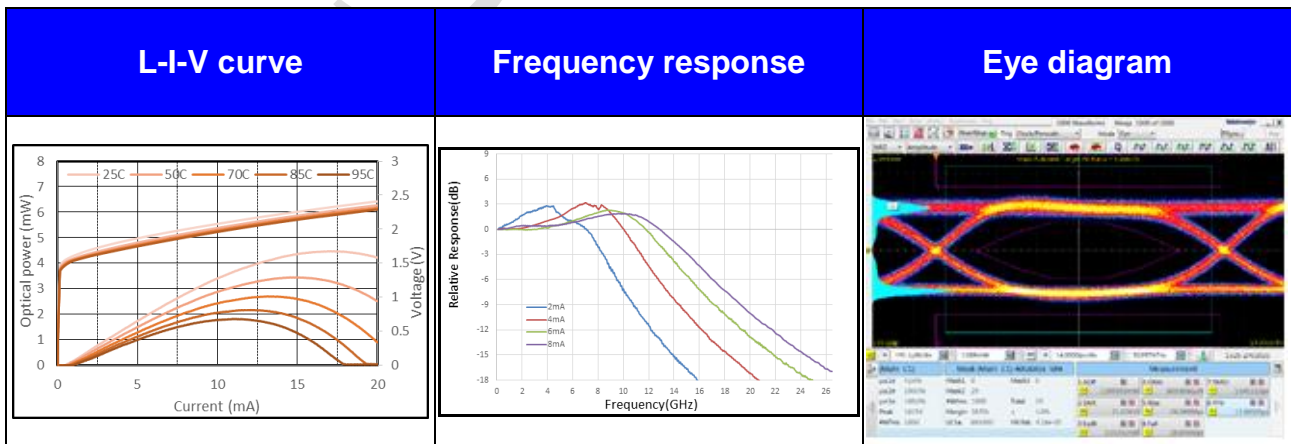
## ELECTRO OPTICAL CHARACTERISTICS

Parameters	Symbol	Conditions	Specification/Rating			Unit
			Min.	Typ.	Max.	
Threshold current	$I_{th}$	T=25 °C			0.9	mA
Operating voltage	$V_{op}$	T=25 °C, $I_{op}$ =6.0mA		2.0		V
Series resistance	$R_s$	T=25 °C, $I_{poe}$ :4 – 8mA*		50		$\Omega$
Slope efficiency	$\eta$	T=25 °C, Slope:4 – 8mA*	0.3		0.55	W/A
Output power	LOP	T=25 °C, $I_{op}$ =6.0mA	1.5	2.1	3.6	mW
Beam divergence	$\theta_{FW1/e2}$ max	T=25 °C, $I_{op}$ =6.0mA		26		deg.
Spectral width	$\Delta\lambda_{RMS}$	T=25-85 °C, $I_{op}$ =6.0mA			0.60	nm
Emission wavelength	$\lambda$	T=25-85 °C, $I_{op}$ =6.0mA	960	970	980	nm
3dB Bandwidth	$f_{-3dB}$	T=25 °C, $I_{op}$ =6.0mA	10			GHz
		T=85 °C, $I$ =7.0mA	10			
Rise time	$T_r$	T=25°C, $I_{op}$ =6.0mA, 20-80% *			45	Ps
Fall time	$T_f$				45	Ps
Relative intensity noise	$RIN_{OMA}$	$I_{op}$ =6.0mA, ER =5.0dB, 7.7GHz bandwidth			-128	dB/Hz

Note: The testing condition is CW mode.

\*This region is calculated by linear regression or summarize.

## LIV CHARACTERISTICS



## THERMAL CHARACTERISTICS

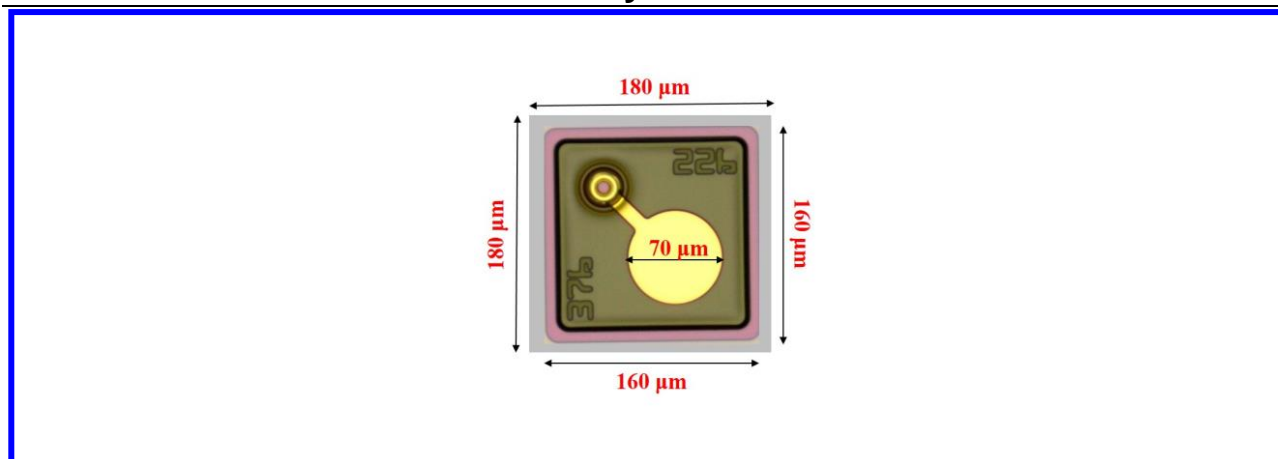
Parameter	Symbol	Min.	Typ.	Max.	Unit
Wavelength tuning coefficient	$d\lambda/dT$		0.07		nm/°C
Threshold current variation (0-85 °C)	$dI_{th}/dT$		0.005		mA/°C
Slope efficiency variation (0-85 °C)	$d\eta/dT$		-0.002		W/A-°C

## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Max.	unit
Peak forward current	$I_{max}$	15.0	mA
Optical output power	$P_{max}$	4.0	mW
Reverse Voltage	$V_r$	-9.0	V
Operating Temperature	$T_{op}$	0 to 85	°C
Storage Temperature	$T_{st}$	-40 to 100	°C
Mounting Temperature (max. 10 sec)	$T_m$	260	°C

## VCSEL CHIP DIMENSIONS

Parameter	Symbol	Min.	Typ.	Max.	Unit
Die Length	$L$	170	180	190	$\mu\text{m}$
Die Width	$W$	170	180	190	$\mu\text{m}$
Die Thickness	$T$	135	150	165	$\mu\text{m}$
Bonding pad width	$W_{pad}$		70		$\mu\text{m}$



### RoHS Compliance

Xiamen Sanan Integrated Circuit is fully committed to environment protection and sustainable development and has set in place a comprehensive program for removing polluting and hazardous substances from all of its products. The relevant evidence of RoHS compliance is held as part of our controlled documentation for each of our compliant products. RoHS compliance parts are available to order, please refer to the ordering information section for further details.

### Ordering Information

Product Code	Data Rate	Description
S-VW14SD1-001	14Gb/s (NRZ)	970 nm Multi-Mode VCSEL Chip (Singlet)

### Customer Contact Information

Website: <http://www.sanan-ic.com/>  
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### Important Notice

Performance data, figures, tables, charts, and any illustrative material provided in this data sheet are typical and must be specifically confirmed in writing with Sanan before they become applicable to any particular order or contract. In accordance with the Sanan policy of continuous improvement specifications may change without notice. Further details are available from Sanan customer contact.

### Quality Certifications

- 0016Q35695R0M/3502(ISO9001:2015)
- 00217E31547R0M(ISO14001:2015)

### Safety Labels

