

10Gb/s 850 nm Multi-Mode VCSEL

S-VS10ST1-000 / S-VS10FT1-000 / S-VS10TT1-000



A TYPICAL WAFER PROBER TESTED VCSEL

FEATURES

- 850nm multi-mode top-emitter
- Data rates from DC to 10Gb/s
- Low threshold and operating currents
- Low electrical parasitic
- Top-anode and Top-cathode configuration
- Narrow spectral width
- Narrow beam divergence
- Single / 1x4 / 1x12 chips

APPLICATIONS

- Fiber optic communication links and AOC
- HDMI
- Datacom 10Gb/s / 40Gb/s / 120Gb/s SFP+

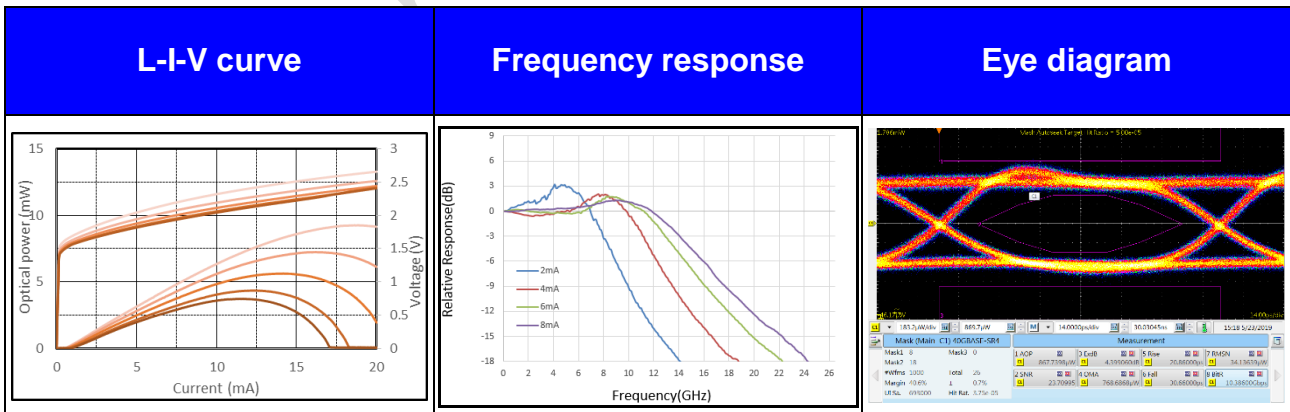
ELECTRO OPTICAL CHARACTERISTICS

Parameters	Symbol	Conditions	Specification/Rating			Unit
			Min.	Typ.	Max.	
Threshold current	I_{th}	T=25 °C	0.3		0.9	mA
		T=85 °C			1.2	
Operating voltage	V_{op}	T=25 °C, I_{op} =6.0mA		2.0	2.3	V
Series resistance	R_s	T=25 °C, Slope:4–8mA*		55	85	Ω
Slope efficiency	η	T=25 °C, Slope:4–8mA*	0.55		0.75	W/A
Output power	LOP	T=25 °C, I_{op} =6.0mA	2.8	3.5	4.3	mW
Beam divergence	$\theta_{FW1/e2}$ max	T=25 °C, I_{op} =6.0mA		22	28	deg.
Spectral width	$\Delta\lambda_{RMS}$	T=25-85 °C, I_{op} =6.0mA		0.3	0.45	nm
Emission wavelength	λ	T=25-85 °C, I_{op} =6.0mA	840	850	860	nm
3dB Bandwidth	f_{-3dB}	T=25 °C, I_{op} =6.0mA	10	13		GHz
		T=85 °C, I =7.0mA	10	13		
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

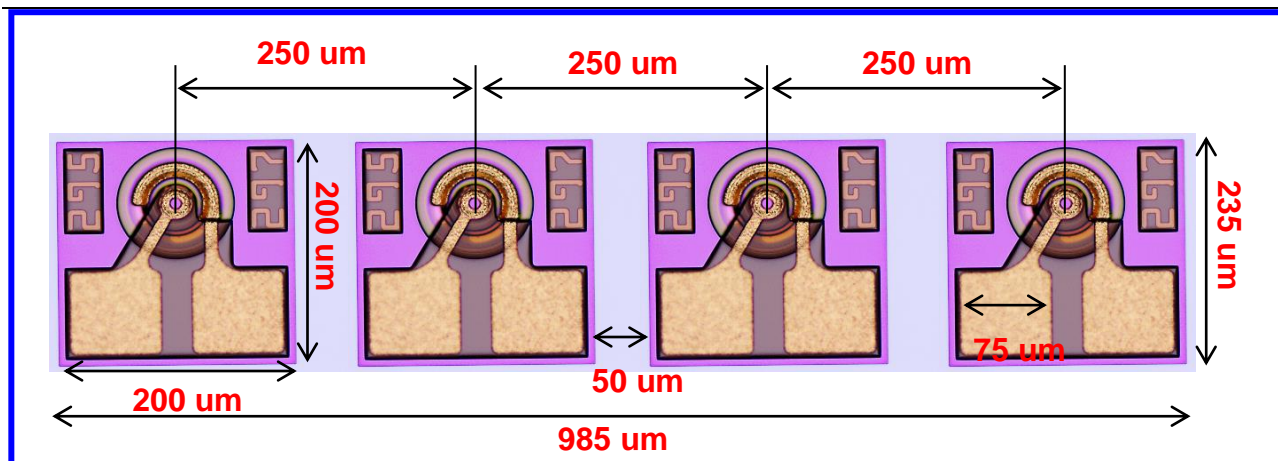
Parameter	Symbol	Min.	Typ.	Max.	unit
Wavelength tuning coefficient	$d\lambda/dT$		0.072		nm/°C
Threshold current variation (0-85 °C)	di_{th}/dT		0.006		mA/°C
Slope efficiency variation (0-85 °C)	$d\eta/dT$		-0.0038		W/A-°C

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Max.	unit
Peak forward current	I_{max}	15.0	mA
Optical output power	P_{max}	8.5	mW
Reverse Voltage	V_r	-10.0	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 (1x1)	L_{1x1}	225	235	245	um
Die Length (1x4)	L_{1x4}	975	985	995	um
Die Length (1x12)	L_{1x12}	2975	2985	2995	um
Die Width	W	225	235	245	um
Die Thickness	T	135	150	165	um
Bonding pad width	W_{pad}		75		um



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-VS10ST1-000	10Gb/s (NRZ)	850 nm Multi-Mode VCSEL Chip (Single)
S-VS10FT1-000	40Gb/s (NRZ)	850 nm Multi-Mode VCSEL Chip (1x4 Array)
S-VS10TT1-000	120Gb/s (NRZ)	850 nm Multi-Mode VCSEL Chip (1x12 Array)

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

