

High Temperature 80mW DFB laser (DFB-1310-80-XX-65C)

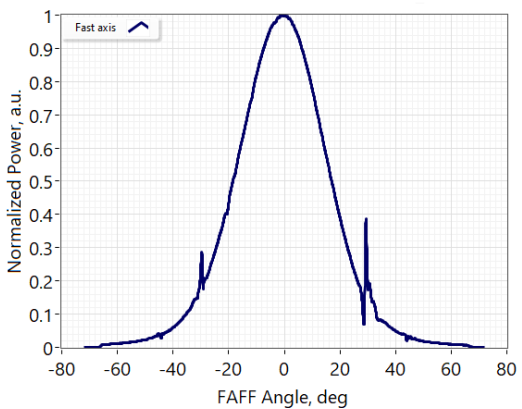
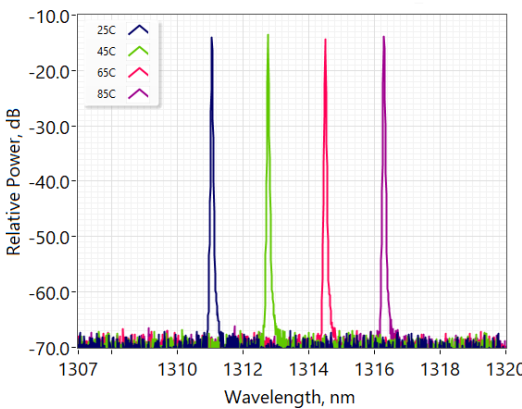
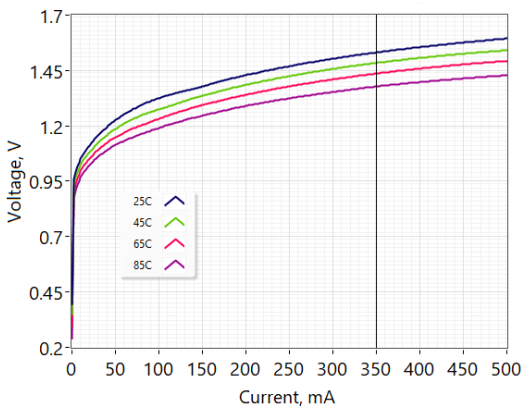
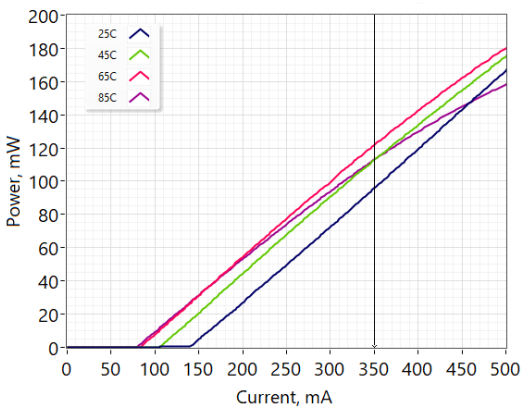


- High output power >80 mW
- Temperature range: 25-85°C
- High SMSR > 30 dB
- Tolerant to parasitic feedback up to -30dB
- Bare dies, Chip on Carrier or fiber-coupled package

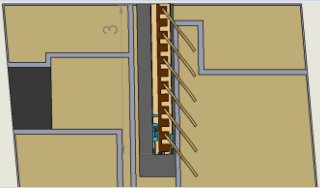
Preliminary Specifications, 2mm chip

Parameter	Conditions	Min	Typ.	Max	Unit
Optical power	Carrier temperature range 25-85°C	80			mW
Operating current (Iop)			300	350	mA
Forward voltage (Vop)	@ Iop		1.5	1.7	V
Peak wavelength	@ 25°C , λ_0 =1310nm or custom in 1270-1330nm range	λ_0 -3	λ_0	λ_0 +3	nm
SMSR		30	45		dB
Far field, fast axis	FWHM	43	45	47	Deg
Far field, slow axis	FWHM	6	7	8	Deg
Averaged RIN	In bandwidth DC-10GHz		-145	-140	dB/Hz
Feedback resistivity	RIN < -135dB/Hz	-30			dB
Polarization			TE		

Test results



High Temperature 120mW DFB laser (DFB-1310-XX-120-65C)

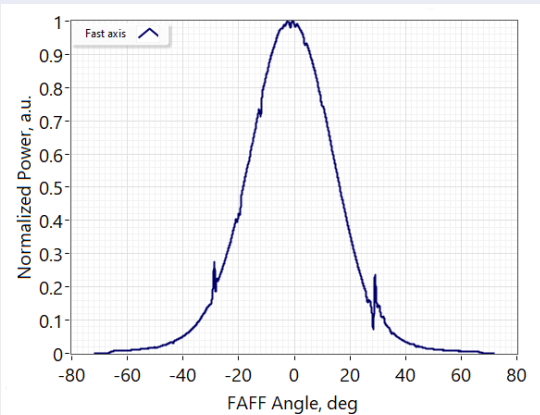
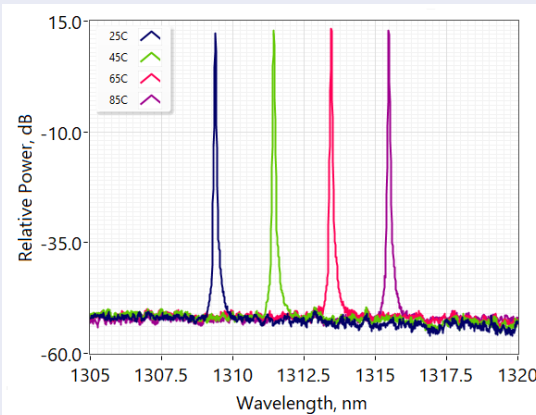
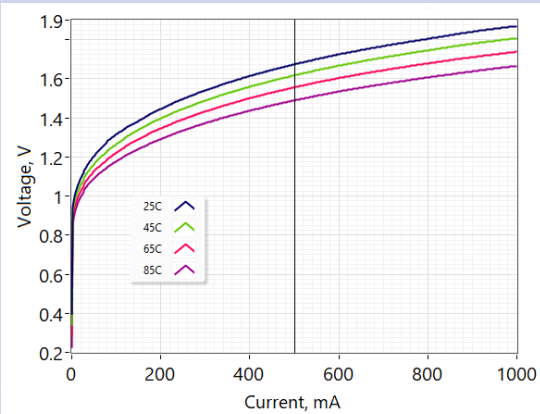
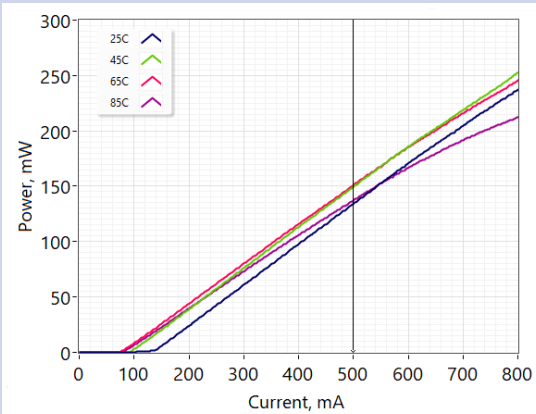


- High output power >120 mW
- Temperature range: 25-85°C
- High SMSR > 30 dB
- Tolerant to parasitic feedback up to -30dB
- Bare dies, Chip on Carrier or fiber-coupled package

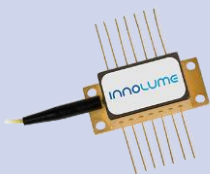
Preliminary Specifications, 3mm chip

Parameter	Conditions	Min	Typ.	Max	Unit
Optical power	Carrier temperature range 25-85°C	120			mW
Operating current (Iop)			450	500	mA
Forward voltage (Vop)	@ Iop		1.5	1.9	V
Peak wavelength	@ 25°C , λ_0 =1310nm or custom in 1270-1330nm range	λ_0 -3	λ_0	λ_0 +3	nm
SMSR		30	45		dB
Far field, fast axis	FWHM	33	35	37	Deg
Far field, slow axis	FWHM	6	7	8	Deg
Averaged RIN	In bandwidth DC-10GHz		-145	-140	dB/Hz
Feedback resistivity	RIN < -135dB/Hz	-30			dB
Polarization			TE		

Test results



Narrow linewidth 50mW DFB laser (DFB-1310-PM-50-NL)

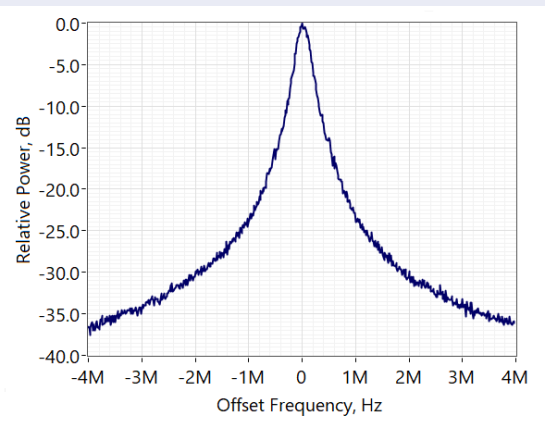
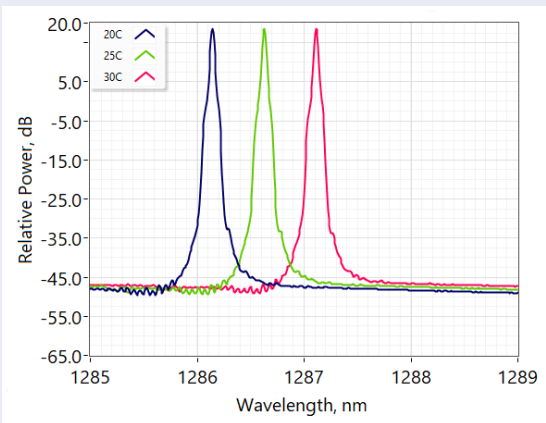
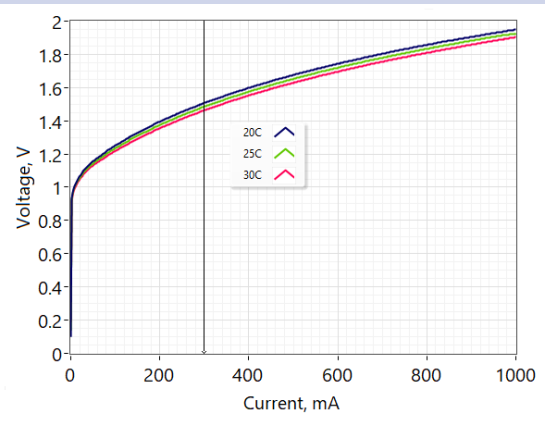
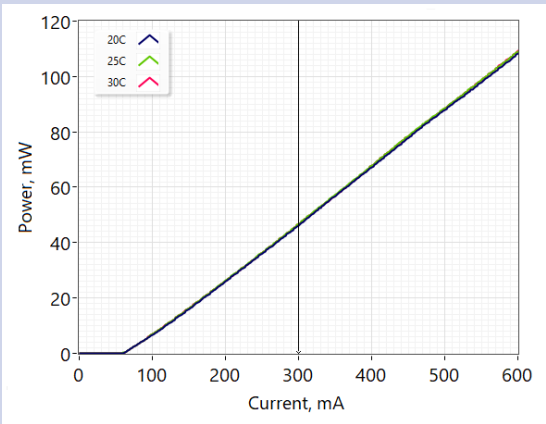


- Ultra-narrow optical line
 - High SMSR > 30 dB
 - 14-pin package with built-in optical isolator
- Applications:
- LiDAR, coherent communications

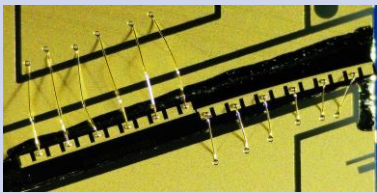
Preliminary Specifications, ex fiber

Parameter	Conditions	Min	Typ.	Max	Unit
Optical linewidth	FWHM, self-heterodyning test		150	250	kHz
Output power	Ex-fiber	50			mW
Operating current			300	400	mA
Forward voltage (Vop)	@ Iop		1.5	2.0	V
Chip temperature		20	25	40	°C
Peak wavelength	@ 25°C , λ_0 =1310nm or custom in 1270-1330nm range	λ_0 -3	λ_0	λ_0 +3	nm
Wavelength tunability	By temperature control		0.1		nm/°C
Wavelength tunability	By current control		0.003		nm/mA
SMSR		40	45		dB
PER	TE mode	15	20		dB

Test results, ex fiber



Frequency-Modulated DFB laser

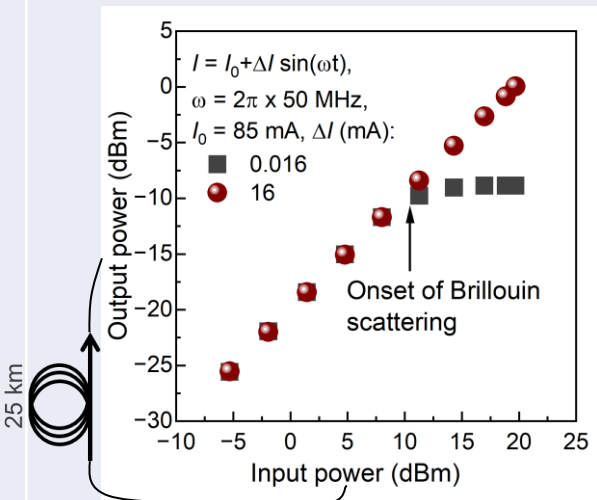
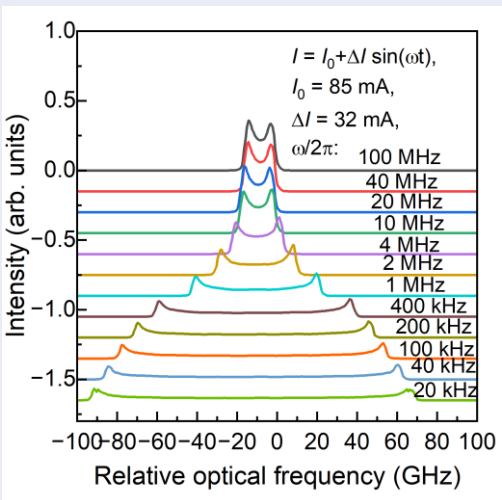
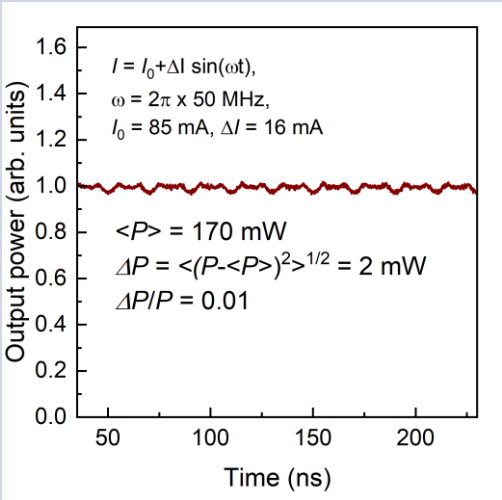
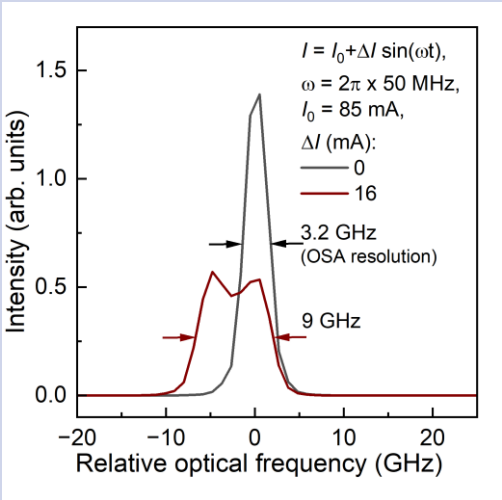


- Applications:
- **FMCW LiDAR**
 - **Seeding:** Frequency modulation suppresses Brillouin scattering in fiber and thus prevents output-power saturation.

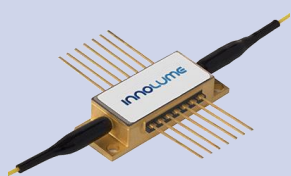
Preliminary Specifications

Parameter	Conditions / Comments	Min	Typ.	Max.	Unit
DFB operation current (I_0)			85		mA
Central wavelength	Other wavelengths are possible		1060		nm
Output power	After amplification		170		mW
Current modulation amplitude (ΔI)			16		mA
Spectral range	Modulation frequency 50 MHz		9		GHz
Spectral range	Modulation frequency 100 kHz		100		GHz

Test results



Broad-Band Semiconductor Optical Amplifier (BOA-1280-60nm-PM-500mW)

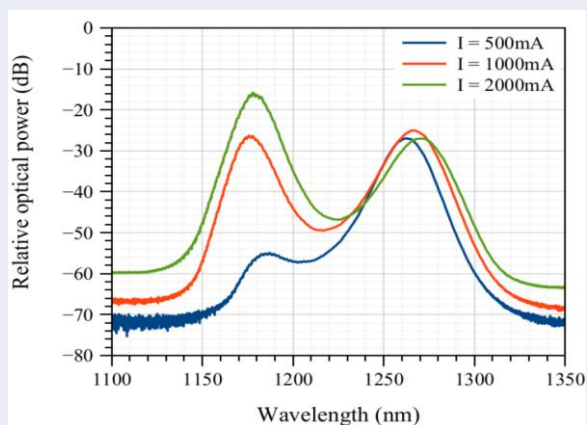
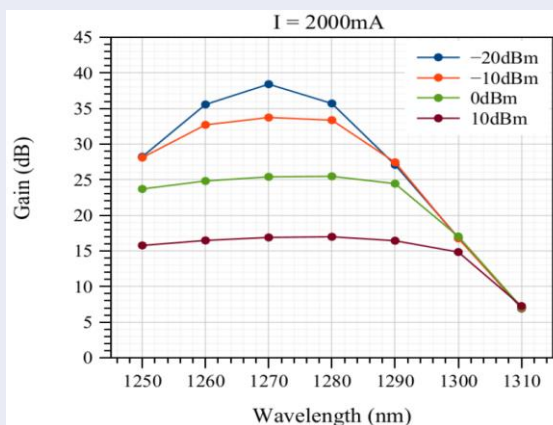
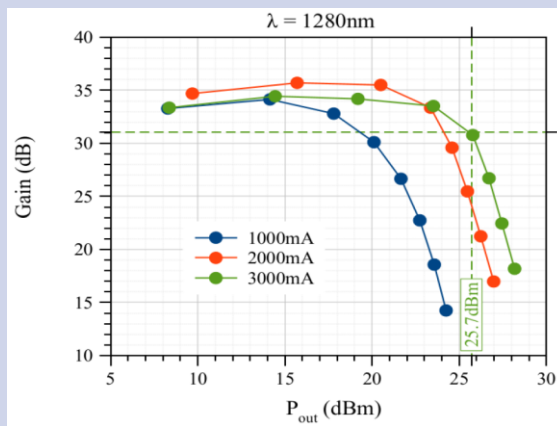
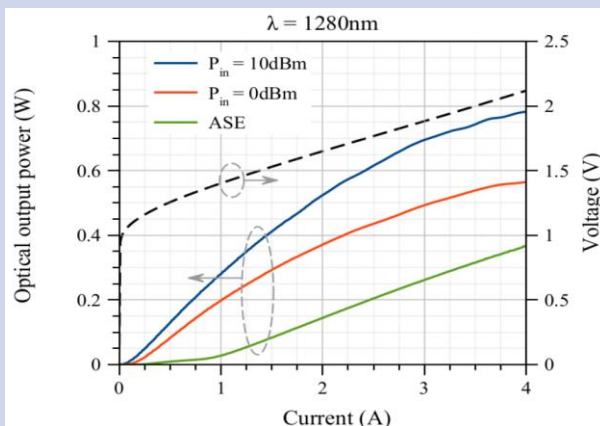


- High output power >500 mW @ 1280nm, 2A, Pin=10dBm
- High saturation output power >25dBm @ 1280nm, 3A
- Small Signal Gain >35dB @ 2A
- Wide bandwidth ~60nm @ Pin=10dBm
- Polarization maintaining PM980 or PM1300 fiber

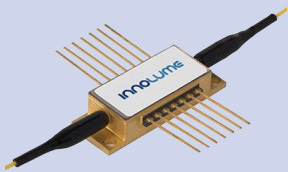
Preliminary Specifications @ typical Iop, 25°C

Parameter	Conditions	Min	Typ.	Max.	Unit
Operating current (Iop)			2000	3000	mA
Forward voltage (Vop)			2.2	3.0	V
Small signal gain	input signal: -20dBm, 1280 nm	30	35		dB
Gain central wavelength	input signal: 10dBm	1270	1280	1300	nm
Gain bandwidth	@-3dB, input signal: 10dBm		60		nm
Output power	input signal: 10dBm, 1280 nm	400	500		mW
Gain saturation output power	@-3dB, 1280 nm	23	24		dBm
Noise Figure				6	dB
ASE optical power	at each port			150	mW
ASE PER	at each port	15			dB

Test results



Tx SOA optimized for WDM data transmission

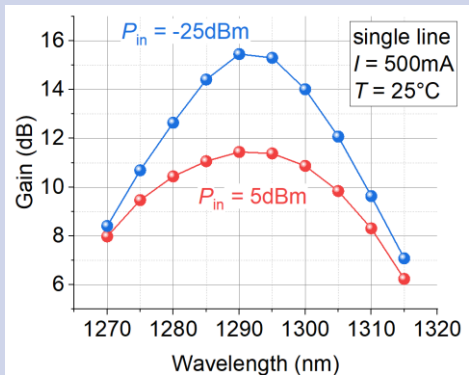
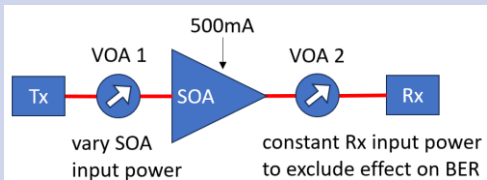
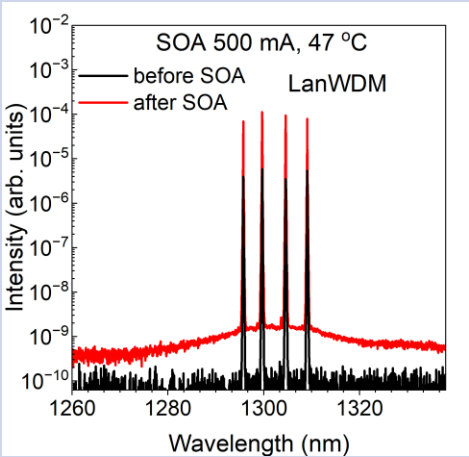
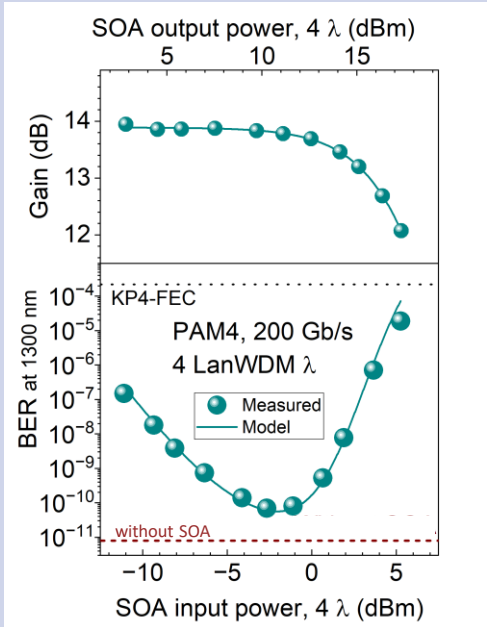


- Low noise figure and high saturation power are the main prerequisites for low Bit Error Rate (BER) after SOA.
- Innolume GmbH offers quantum dot SOAs with best combination of output saturation power (20 dBm) and noise figure (below 4 dB ex. chip).

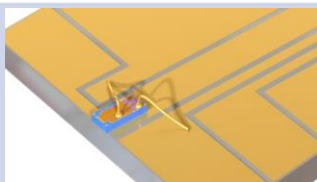
Preliminary Specifications, use case: 4 LanWDM λ

Parameter	Conditions	Min	Typ.	Max.	Unit
Operating current, I_{op}			500		mA
Operating temperature, T_{op}			47		°C
Central wavelength of gain spectra			1303		nm
Gain bandwidth	input signal: 5dBm		35		nm
Gain, small signal	input signal: -25dBm, 1300nm		14		dB
Output saturation power			19		dBm
Noise figure	for $\lambda_{in} = 1300nm$		5		dB
Input powers for BER < 2.2×10^{-4}	PAM4, 400 Gb/s	-12		6	dBm
	PAM4, 200 Gb/s	-15		5	dBm
Input powers for BER < 10^{-12}	NRZ, 100 Gb/s	-15		6	dBm

Test Results & BER Setup



50GHz Comb-Laser Diode (COMB-1310-50-COC-19)

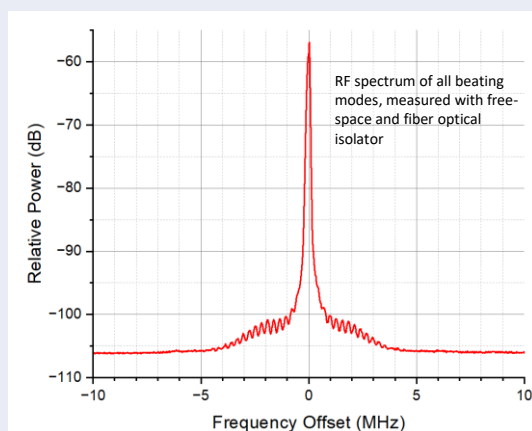
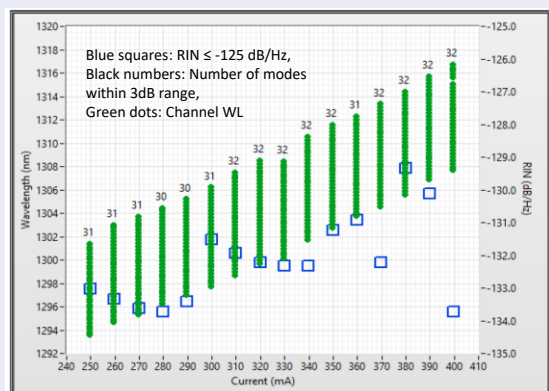
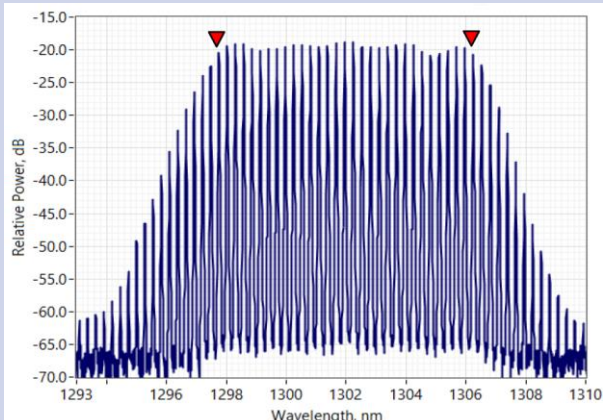
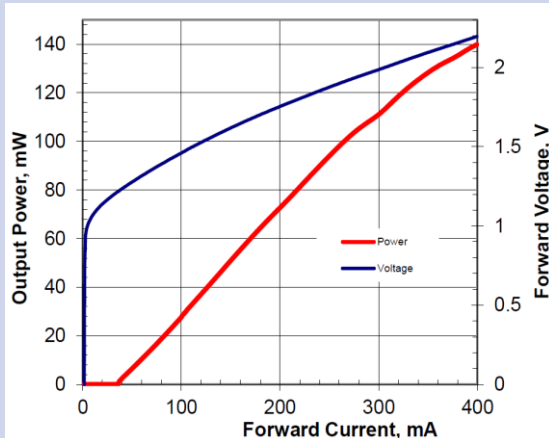


- O-band DWDM signal source
- up to 32 channels
- mode locking
- low relative intensity noise (RIN)
- fiber-coupled package with optical isolator (OI) possible

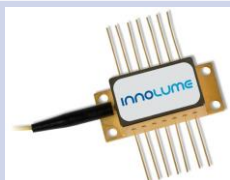
Preliminary Specifications @ Iop, 5V Bias, 25°C

Parameter	Conditions	Min	Typ.	Max.	Unit
Operating current (Iop)			300		mA
Bias voltage		0	3	5	V
Optical power	at recommended operating point		120		mW
Number of channels	at -3dB power level and low noise	19	22	32	
Interval between adjacent modes			50		GHz
Average optical power / channel	at recommended operating point		5		mW
Slow axis far-field, FWHM			12		deg
Fast axis far-field, FWHM			38		deg
Polarization extinction ratio			20		dB
Individual mode RIN	averaged in DC-10GHz range			-125	dB/Hz

Test results @ 25°C, 5V bias, Iop = 300mA



100GHz Comb-Laser Diode (COMB-1310-100-PM-8)

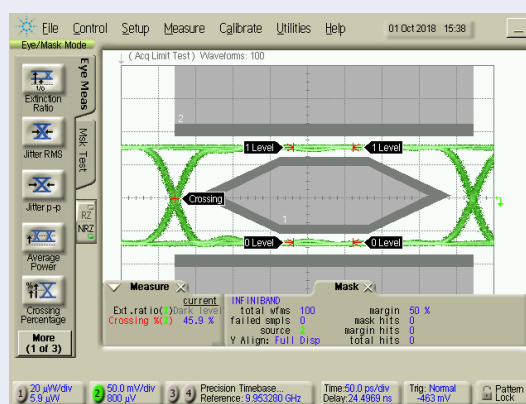
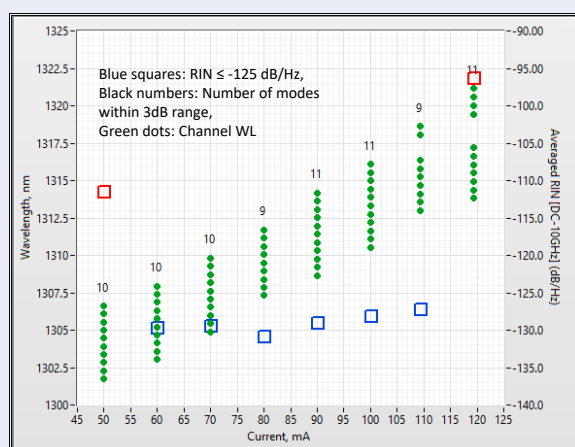
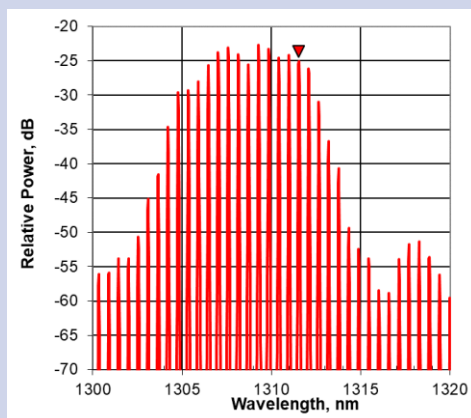
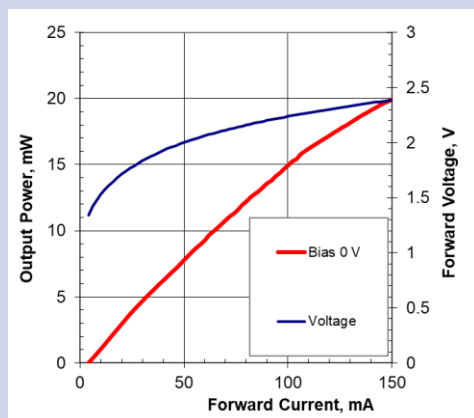


- O-band DWDM signal source
- 8 channels and more
- mode locking
- low relative intensity noise (RIN)
- fiber-coupled package with optical isolator

Preliminary Specifications

Parameter	Conditions	Min	Typ.	Max.	Unit
Optical power	at recommended operating point	7	8		mW
Operating current (Iop)			80	100	mA
Bias voltage		0	1	4	V
Forward voltage	at recommended operating point		2.3	2.7	V
Number of channels	at -3dB power level and low noise	8			
Interval between adjacent modes		97	100	103	GHz
Average optical power / channel	at recommended operating point		1		mW
Central wavelength	at 25C	1300	1310	1320	nm
Polarization extinction ratio			18		dB
Individual mode RIN	averaged in DC-10GHz range			-125	dB/Hz

Test results @ 25°C, 5V bias, Iop = 300mA



Bismuth doped fiber amplifier (BDFA-1310-60)



- Broadband amplification: 60nm @ Pin=-10dBm
- Small signal gain: >19dBm @ Pin=-20dBm
- Saturated output power >16dBm @ Pin=0dBm
- Polarization insensitive: <0.3dB
- Modified MSA package
- SMF-28 FC/APC connectors

Preliminary Specifications

Parameter	Conditions	Min	Typ.	Max.	Unit
Small signal gain	input signal: -20dBm, 1310 nm	19	21.2		dB
Gain central wavelength	input signal: -10dBm	1305	1310	1315	nm
Gain bandwidth	@-3dB, input signal: -10dBm	60	63		nm
Saturated output power	@ 1310 nm	16	16.4		dBm
Noise figure	input signal: -20dBm, 1310 nm		5.5	6	dB
Polarisation dependent gain				0.3	dB
Differential group delay				0.35	ps
Operating temperature range		-5	25	50	°C
Operating voltage			+5		V
Dimensions		90x70x35			mm
Input/output fiber length			0.8		m

Test results

