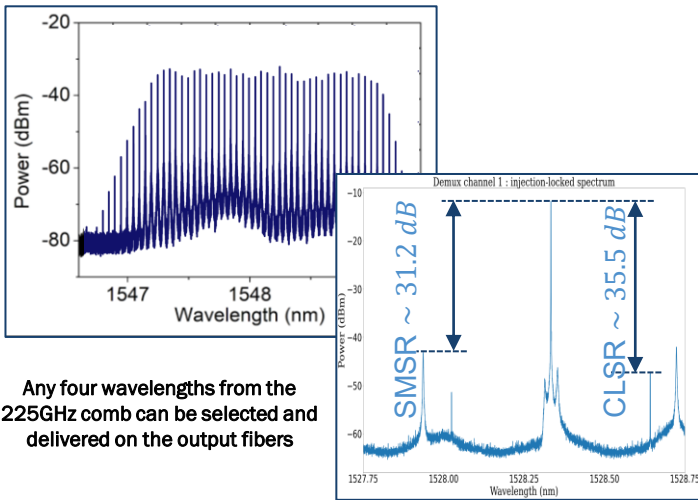


The iCLA is a monolithic InP PIC combining a comb laser with a demultiplexer to deliver 4 coherent wavelengths on individual fibers for modulation



Any four wavelengths from the 225GHz comb can be selected and delivered on the output fibers

iCLA

Integrated Comb Laser Assembly

Pilot Photonics' iCLA incorporates a monolithically integrated comb laser and demultiplexer that supplies four or more simultaneously generated coherent, phased matched outputs on separate fibres, replacing up to 4 integrated tunable laser assemblies (iTLAs). It is designed for driving multiple 400G/800G coherent optical engines on individual fibers from a single laser module. The patented comb source technology is unique in the market and offers the ability to tune the wavelength separation of the four outputs, while maintaining the coherent and phase-matched characteristics, reducing the required DSP complexity. The device is provided on a software controlled evaluation platform providing all required current and temperature control. The RF signal to set the channel spacing of the comb can be internally, or externally provided.

Features

- Four configurable coherent wavelengths up to 4 x 75GHz can be selected and delivered on individual fibers (4 x 150GHz in Q1 2024)
- Output power of 16 dBm per channel
- Per channel SMSR >30 dB
- Linewidth 100 kHz (Q1 2024)
- Enables DSP complexity reduction & spectral efficiency benefits of a comb laser
- Reduced thermal and electronic control complexity
- Evaluation platform with required driving electronics

Applications

- iTLA/Laser array replacement
- 1.6T/3.2T superchannel Tx & Rx LO
- Software defined optics/Elastic optical networking
- Data centre interconnect
- Generation of millimetre-wave and THz signals
- Generation of 5G signals
- Spectral slicing

Target Specifications

Output Wavelength Spacing	Configurable, up to 75 GHz (multiples of Comb FSR)
Comb FSR	3.125 - 12.5 GHz
Total Comb Bandwidth	225 GHz @ -40 dB
No. of Selectable Comb Tones	Any 4 from comb
Output power Per Tone	16 dBm
Per Tone SMSR	> 30 dB
Linewidth	100 kHz





iCLA

Integrated Comb Laser Assembly

Optical Specifications	Min.	Typ.	Max.	Unit	Notes
Number of outputs/Channel count		4			Independent fibers
Operating wavelength	1548.8	1550	1551.2	nm	4 ch, 75 GHz spacing
Comb Bandwidth	125	-	250	GHz	At -40 dB
Comb Free Spectral Range	3.125	6.25	12.5	GHz	
Output Channel spacing	3.125	37.5	75	GHz	4 channel, equally spaced. Many combinations with equal/unequal spacing possible
Individual Channel tuning	-	-	1	nm	
Output Power	0	-	16	dBm	
Side-mode suppression ratio	30	40	60	dB	
Adjacent Channel Rejection	25	30	40	dB	
Linewidth		0.7	1	MHz	100 kHz in Q1 2024
Relative Intensity Noise	-	-	-125	dBc/Hz	
Operating Specifications					
Reverse Voltage (any section)	-	-	2	V	
Total Power Consumption		8.5		W	PIC and TEC
TEC Voltage	-2.5		2.5	V	
TEC Current	-2.2	0	2.2	A	
Chip Temperature	15	20	50	°C	
Case Temperature	-5	25	75	°C	
Storage Temperature (Non-operational)	-40		60	°C	
Thermistor Resistance at 25 C		10		kΩ	NTC, Beta 3575 k
Physical Specifications					
Dimensions		8 x 4		mm	Bare die
Fiber type		Corning PANDA PM			In butterfly packages, slow axis aligned
Fiber connector		FC/APC			In butterfly packages, narrow key