Single Angled Facet (SAF) Laser Diode

1550 nm semiconductor gain chip

Quantum Photonics®

(Preliminary)

DESCRIPTION

Quantum Photonics' Single Angled Facet (SAF) gain chip is based on high-power InP ridge waveguide laser diode technology. Laser cavity oscillation is prevented by active waveguide engineering to produce a front angled facet which in combination with anti-reflection coating ensures a broadband low facet reflectivity. Optional mode transformers monolithically incorporated at the facets using Quantum Photonics' patented Passive Active Resonant Coupler (PARC) integration technology provide nearly circular beam characteristics enhancing chip coupling efficiency. This unique combination of ridge waveguide laser design, broadband low angled facet reflectivity, and integrated mode transformers make the SAF ideally suited for use as the gain component in high-power widely-tunable external cavity lasers.

FEATURES

- MQW optimized for C-band or L-band laser wavelengths
- High output power based on 100 mW Fabry-Perot laser diode design
- Low front facet reflectivity ($R<10^{-4}$)
- Integrated mode transformer for circular output beam pattern
- Numerous packaging options including SAF heatsink, chip-on-submount (CoS), TO-can, and bare die

APPLICATION

- Gain medium for widely tunable external cavity semiconductor lasers
- Gain medium for narrow linewidth fiber Bragg grating lasers
- High-power amplified spontaneous emission (ASE) superluminescent sources

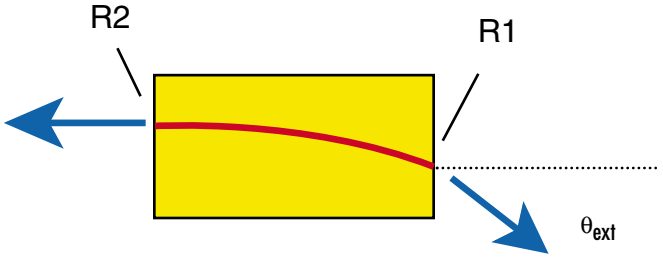

Fig. 1: Top View of Single Angled Facet (SAF) Gain Chip

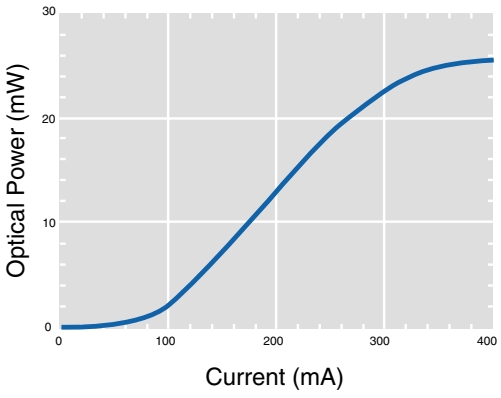

Fig. 2: Typical ASE Output Power

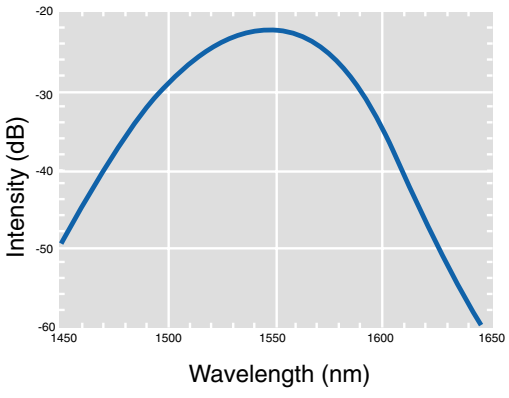

Fig. 3: Optical Spectrum (I = 200 mA)

ELECTRICAL/OPTICAL CHARACTERISTICS (CW, T = 25° C)

Parameter	Symbol	Test Condition	Typical Specification	Unit	Comments	
ASE peak wavelength	λpeak	I = 200 mA	1550	nm	L-band, 1300 nm, optional	
ASE spectral bandwidth (-3 dB)	$\Delta\lambda$	I = 200 mA	50	nm		
Operating Current	I_{op}		300	mA		
Operating Voltage	V_{op}	I_{op}	1.5	V		
Front (angled) facet reflectance	R1	1520-1580	<0.01	%	L-band, 1300 nm, optional	
Rear facet reflectance	R2	1520-1580	>5	%	Customer specified	
Lateral Beam Exit Angle	θ_{ext}		26	degrees	See Fig. 1, other angles optional	
Chip Length	L		1.0	mm	L = 0.6 mm optional	
Beam Divergence Angle (FWHM)					Mode Trans A*	Mode Trans B*
-transverse	θ_t	I_{op}	36	degrees	30	26
-parallel	θ_p	I_{op}	14	degrees	30	25
Fabry-Perot Laser Diode Equiv.					**L = 1 mm, HR = 90%, AR= 2% (no angled facet)**	
Threshold Current	I_{th}		50	mA		
Slope efficiency	S		0.4	W/A		
Output power	P_0	I = 300 mA	100	mW		

PACKAGING OPTIONS: SAF heatsink, chip-on-submount (CoS), TO-9*, TO-5.6*, bare die

* Available 2Q'02

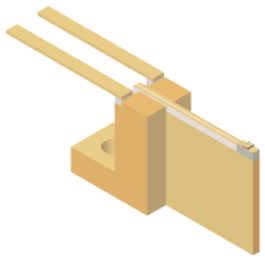

Fig. 4: SAF mounted flush on SAF heatsink

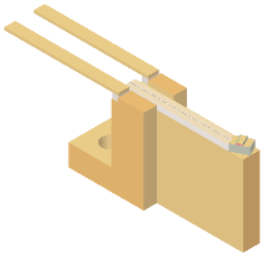

Fig. 5: SAF mounted at 26° angle on SAF heatsink

Quantum Photonics®

10335 Guilford Road ▲ Jessup, Maryland 20794
240-456-7100 ▲ www.quantumphotonics.com