Tunable Laser Gain Chip with TEC

SAF1174S

Description

The SAF1174S 1320 nm Single-Angled-Facet (SAF) gain chip (AR-coated laser diode) features an angled waveguide, AR coating, and a proven gain structure, which gives designers of external cavity lasers (ECLs) the highest power and widest tuning range available in the market. The butterfly assembly features a TEC and an optical isolator to improve the stability of the laser.

Laser Cavity Performance*

*Different external laser cavities will produce different performance specifications. The data given here is only valid for the specified reference cavity.

		SAF1174S		
		Min	**Typical**	**Max**
Reference Laser Cavity		Littrow Cavity: TLK-L1300R		
Center Wavelength		1290 nm	1310 nm	1320 nm
Tuning Range[a]		100 nm	130 nm	-
Peak Power		30 mW	70 mW	-
Wavelength Tuning Resolution		1 pm	-	-
Tuning Speed		-	-	25 nm/s
Linewidth		-	100 kHz	130 kHz
Side Mode Suppression Ratio (SMSR)		30 dB	45 dB	-
Polarization Extinction Ratio		-	-	-
Power Stability[b]	30 s	1%	-	-
	24 hr	10%	-	-
Wavelength Stability[b]	30 s	-	-	1 pm
	24 hr	-	-	50 pm

[a] 10 dB, [b] Running open loop, measured using ITC4020 current controller.

ASE Performance

T_{OP} = 28 °C

	SAF1174S		
	Min	**Typical**	**Max**
Center Wavelength	1290 nm	1320 nm	1340 nm
3 dB Bandwidth	60 nm	80 nm	-
Operating Current	-	600 mA	-
Chip Forward Voltage	-	-	1.8 V
Gain Ripple, RMS[a]	-	0.35 dB	1 dB
Power, Front Facet[b]	10 mW	-	-

[a] @ I_{OP}, Measured using OSA with 0.1 nm resolution bandwidth; [b] Free-space output power

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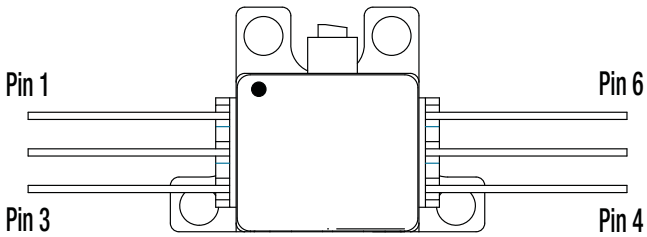
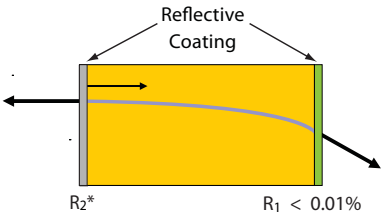
Pin Identification
1. TEC +
2. Thermistor
3. Thermistor
4. Dev. Anode
5. Dev Cathode
6. TEC –



Additional Specifications

		SAF1174S		
		Min	Typical	Max
Chip Gain[a]		-	35 dB	-
Angled Facet Reflectivity[b] (R_1)		-	0.005%	0.01%
Normal Facet Reflectivity (R_2)		8%	10%	12%
Lateral Beam Exit Angle		-	26.5°	-
Beam Divergence (FWHM)	Θ_T	20°	30°	40°
	Θ_L	-	20°	30°
Operating Current[c]		-	500 mA	800 mA
Operating Temperature (Non-Condensing)		-	25 °C	-
TEC Forward Voltage		-	-	3.6 V
TEC Forward Current		-	-	2.1 A
Chip Length		-	2 mm	-
Waveguide Refractive Index		-	3.2	-
Astigmatism		-	1 µm	3 µm
Fiber Type		SMF-28e, 1.5 m Long		
Fiber Connector		FC/APC		
Peak Optical Isolation		50 dB[d]	-	-
Fiber Coupling Efficiency		-	50%	-

SAF Gain Chip



*R_2 is between 10 and 30%, depending on model

[a] Single pass optical gain at center of gain curve; [b] SAF chip reflectivity diagram (see above); [c] @ T_{OP}; [d] @ 1310 nm

Graphs

SAF1174S Gain Chip Lasing Performance Using Littman Tunable Laser Kit