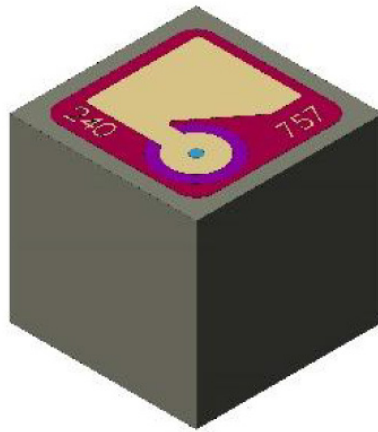


850 nm SINGLE MODE VCSEL WITH POLARIZATION LOCK

APA850101yy01

Our single mode VCSEL is designed to meet stringent specifications for a broad range of optical sensing applications. This product offers polarization stable single mode emission with a symmetrical Gaussian beam profile and output powers of typically 0.55mW. Bias currents range from 2.3 to 6mA.



FEATURES

- Single transverse and longitudinal mode
- Polarization stable emission
- Gaussian beam profile
- High reliability
- Low power consumption
- Backside cathode and topside anode configuration
- RoHS & REACH compliant

APPLICATIONS

- Optical sensor applications
- Optical encoder

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Specification

Electro-Optical Performance

Operating conditions: $T_{op} = 5^{\circ}\text{C} - 45^{\circ}\text{C}$; $I_{op} = \text{const.}$, $P_{out} = 0.55 \text{ mW}$ (unless otherwise noted). $T = 25^{\circ}\text{C}$ unless otherwise noted.

Parameter	Symbol	Min	Typical	Max	Unit	Condition
Threshold current	I_{th}	1	3	5	mA	
Slope efficiency	η	0.20	0.40	0.65	W/A	$I = I_{th} + 1 \text{ mA}$
Operating current	I_{op}	2.3		6	mA	
Operating voltage	U_{op}			2.3	V	
Differential resistance	R_d	20		90	Ω	
Minimum Optical power over temperature variation ¹	$P(T)@I_{1000}$	170			μW	from 5°C to 85°C at I_{1000}
Single mode optical output power	P_{SM}	0.9			mW	
Side mode suppression ratio	SMSR	10			dB	$P_{out} = 0.9 \text{ mW}$
Emission wavelength	λ	840	850	860	nm	
Beam divergence ²	$\theta_{FW1/e2}$	13	17	21	$^{\circ}$	$P_{op} = 0.5 \text{ mW}$
Accuracy of Polarization Direction ³	δ_{pol}	-15		+15	$^{\circ}$	$P_{op} = 0.2...0.9 \text{ mW}$

¹ Current set at 1mW at 25 °C, then power measured at 85 °C.

² FW1/e2 = full width 1/e2.

³ Polarization direction relative to the vertical chip edge. Laser operates with stable linear polarization. No polarization flips in the single mode operating range.

Absolute Maximum Ratings

The absolute maximum ratings are applied conditions for which the units are expected to fully recover their specified performance. The environment is normal laboratory or manufacturing area ambient conditions.

Parameter	Symbol	Min	Max	Unit	Condition
Forward current	IF		8	mA	
Reverse bias	UR		8	V	
Mounting temperature	Tmount		260	$^{\circ}\text{C}$	for max 10s

Mechanical Dimensions

Parameter	Min	Typ	Max	Unit
Die length	135	155	175	μm
Die width	135	155	175	μm
Die height	135	150	165	μm

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Safety

Caution: Laser light emitted from this device is invisible and may be harmful to the human eye. Do not stare into the beam or view directly with optical instruments when the device is in operation.



RoHS and Reach Compliance

Coherent is fully committed to environment protection, human health and sustainable development and has set in place a comprehensive program for removing polluting and hazardous substances from all its products. The relevant evidence of RoHS and REACH compliance is held as part of our controlled documentation for each of our compliant products.

Revision History

Revision	Date	Description of Change
A	10.03.2022	Initial issue of document.
B	03.10.2022	Sections 2.4, 2.5 & 2.6 added.