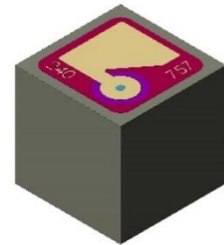


850nm Single Mode VCSEL with Polarization lock

Product Code: APA850101yy01

1 PRODUCT DESCRIPTION

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.



Features

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

Applications

- Optical Sensor
- Optical Encoder
- Optical Finger Navigation
- Computer Mouse

2 SPECIFICATION

2.1 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).

Parameter	Symbol	Min	Typical	Max	Unit	Condition
Threshold current	I_{th}		3		mA	
Slope efficiency	η		0.40		W/A	$I = I_{th} + 1\text{mA}$
Operating current	I_{op}			6	mA	
Operating voltage	U_{op}			2.3	V	
Differential resistance	R_d	20		90	Ω	
Side mode suppression ratio	SMSR	10			dB	$P_{out} = 0.9\text{mW}$
Emission wavelength	λ	840	850	860	nm	
Beam divergence ¹	$\theta_{FW1/e2}$	13	17	21	$^{\circ}$	$P_{op} = 0.5\text{mW}$
Accuracy of Polarization Direction ²	δ_{pol}	-15		+15	$^{\circ}$	$P_{op} = 0.2 \dots 0.9\text{mW}$

¹ FW1/e2 = full width 1/e2.

² Polarization direction relative to the vertical chip edge. Laser operates with stable linear polarization. No polarization flips in the single mode operating range.

2.2 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.

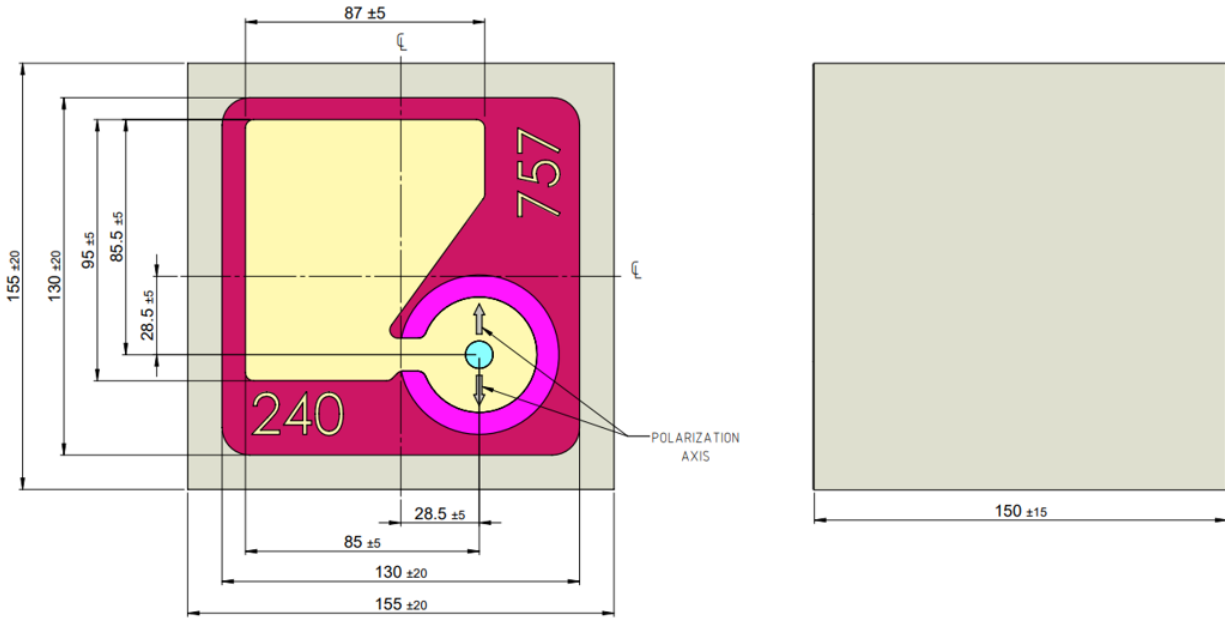
Parameter	Symbol	Min	Max	Unit	Condition
Forward current	I_F		8	mA	
Reverse bias	U_R		8	V	
Mounting temperature	T_{mount}		260	$^{\circ}\text{C}$	for max 10s

2.3 Mechanical Dimensions

The mechanical outer chip dimensions are:

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

All dimensions in the following drawing are given in μm . The accuracy is $\pm 3 \mu\text{m}$ if not noted otherwise.



2.4 ESD Sensitivity Classification

Parameter	Value	Unit
Human Body Model	> 120	V

3 ORDERING INFORMATION

The configuration for product APA850101yy01 is as follows:

Product Code Part	Available Options
yy = Shipment format	01 Known Good Dies on UV tape on grip ring Ø 150mm (medium volume)
	02 Known Good Dies in 2inch Gel-Pak (low volume)
	03 Diced 6inch wafer on UV tape on metal lead frame Ø 230mm, electronic wafer map provided (standard high volume)
	04 Recon wafer on UV tape on Grip ring Ø 150mm (39'990 pcs/ring)

4 SAFETY

This classification refers exclusively to our component and serves only as an indication for the classification according to EN 60825-1.

It is in the system manufacturer's responsibility to classify the integrated product.



5 ROHS AND REACH COMPLIANCE

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