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SPECIFICATION

1550nm Polarization-Maintaining Semiconductor Optical Amplifier Chip-on-Submount DL-SOA55020C-320-HDP-45-2

A. PRODUCT DESCRIPTION

This product is a polarization-maintaining semiconductor optical amplifier (SOA) chip mounted p-side down onto a customized heat-dissipating submount. It is designed to have high gain and high output power when operated at stabilized temperature of 45°C. The single channel SOA chip-on-submount (CoS) has an optical gain of at least 20dB.

B. FEATURES

- Broad ASE bandwidth of ≥45nm
- Low ASE ripple of ≤0.3dB
- High output power of ≥20dBm
- P-down assembly onto AlN submount
- Optimized FF divergence for optical coupling

C. APPLICATIONS

- SOA for tunable laser of ITLA for Coherent Comms
- Booster amplifier for optical networks
- Booster amplifier for Auto-LiDAR

D. ABSOLUTE MAXIMUM RATINGS

Operation beyond the absolute maximum ratings can cause degradation in device performance leading to permanent damage to the device.

Parameter	Symbol	Condition	Min	Max	Unit
Max operating current	$I_{op,max}$	CW	-	600	mA
Reverse voltage	V_R	-	-	2.0	V
Operating chip temperature	T_{chip}	CW	15	55	°C
Storage temperature	T_{stg}	Unbiased	-40	85	°C
Electro static discharge (ESD)	V_{ESD}	Human body model	-	500	V
Submount soldering temperature	S_{temp}	Max 20s	-	300	°C
		Max 2hrs	-	200	°C
		Max 100hrs	-	120	°C

E. ELECTRO-OPTICAL CHARACTERISTICS

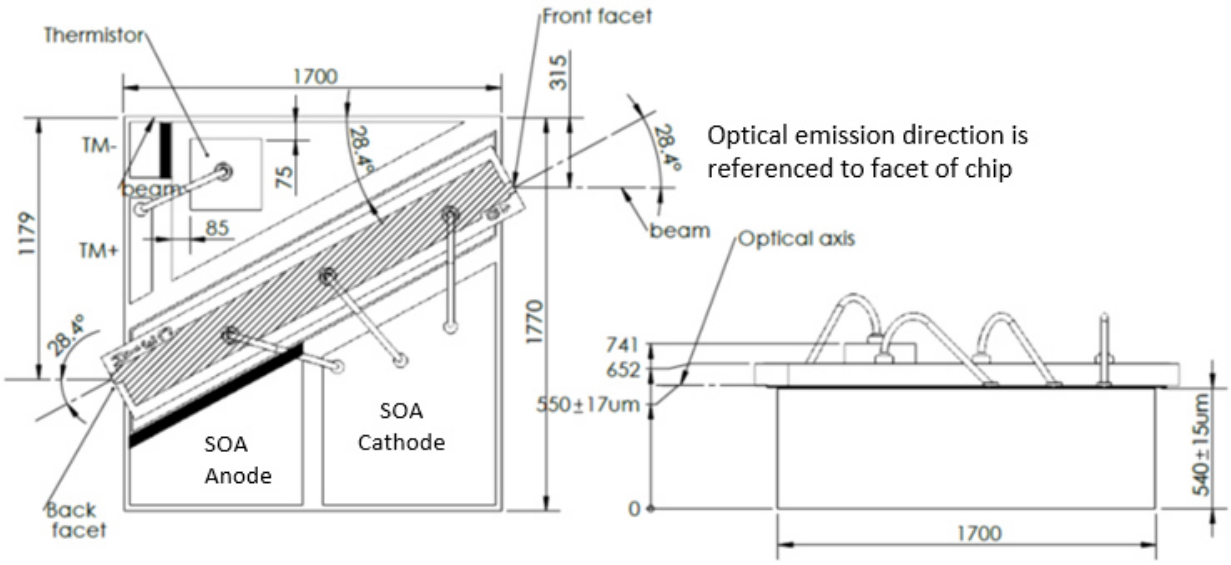
T_{chip}* at 45°C; all parameters are chip specifications; performance will change with fiber coupling.

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Operating current	I_{op}	–	–	100	500	mA
Forward voltage	V_f	500mA	–	–	1.5	V
ASE center wavelength	λ_c	100mA	1540	1550	1560	nm
ASE bandwidth	$\Delta\lambda$	100mA	45	–	–	nm
ASE ripple	R_{ASE}	100mA	–	–	0.3	dB
ASE output power	P_{ASE}	100mA	0.5	–	–	mW
Polarization extinction ratio	PER	100mA	20	–	–	dB
Small signal gain	G	100mA, P_{in} = -15dBm	20	–	–	dB
Noise figure	NF	100mA, P_{in} = -15dBm	–	–	8	dB
Output power	P_{out}	500mA, 1527 ~ 1567nm P_{in} = +10dBm	20	–	–	dBm
Beam divergence angle (Transverse)	θ_T	100mA	23	27	31	°
Beam divergence angle (Lateral)	θ_L	100mA	17	21	25	°
Facet reflectance	R	1527 ~ 1567nm	–	–	10^{-4}	-
Optical exit angle	θ_e	I_{op}	24.4	28.4	32.4	°
Thermistor resistance	R_{therm}	25°C	9.9	10	10.1	kΩ
Thermistor B-value	$B_{25/50}$	–	–	3930	–	K

* T_{chip} refers to temperature sensed by thermistor mounted next to SOA chip-on-submount

F. PHYSICAL CHARACTERISTICS

Parameter	Typ	Unit
CoS length	1770 ± 50	µm
CoS width	1700 ± 50	µm
Optical axis height	550 ± 17	µm
Chip length	2.0 ± 0.04	mm
Chip width	0.3 ± 0.02	mm
Chip thickness	0.1 ± 0.01	mm
Mounting	P-down	–



G. DEVICE HANDLING

1. The chip is inherently fragile and easily damaged. Special handling precautions of the CoS must be taken to avoid contact with the chip.
2. This device has ESD withstand voltage of 500V. EOS may result from improper ESD handling.

H. DISCLAIMER FOR CUSTOMER SPECIFIC APPLICATIONS

DenseLight product is not intended for use other than stated on the application note or as defined in the product specification. The performance of the product should always be tested in the actual application conditions. As our products are used in conditions beyond our control, we cannot assume any liability for damage caused through their use. Users of DenseLight products are solely responsible to thoroughly test and qualify their system and / or application for their intended application and have determined such at their sole discretion. DenseLight cannot assume any liability for the use of our products in conjunctions with other. Customer assumes the sole risk and liability of the product performance other than specified by the product specific data sheet or application notes without DenseLight's specific written consent.

I. PRODUCT NAMING