EXC250002-01

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Combi-3 SLED 14-pin Butterfly Module 135nm

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1. SCOPE

PURPOSE

The purpose of this document is to specify the electro-optical performance and dimensions of a module with combined superluminescent light emitting diodes (SLED).

RESPONSIBILITY

EXALOS is responsible for establishing, implementing and maintaining this procedure. The Quality representative shall ensure that a timely Engineering Change Notice (ECN) is issued in accordance with EXALOS procedure for any changes.

2. REFERENCE DOCUMENTS

- EXS-WI-0001 Visual Inspection Criteria SLED Chip on Submount Procedure
- MIL STD 883 C method
- Bellcore GR-468-CORE

3. ELECTRO-OPTICAL PERFORMANCE (T_{SLED} = 25°C)

Parameter	Symbol	Cond.	Min	Typ	Max	Unit
Combined Wavelengths: SLED A SLED B SLED C	 λ_A λ_B λ_C			 800 840 880		nm
Operating current: SLED A SLED B SLED C	 $I_{op,\,A}$ $I_{op,\,B}$ $I_{op,\,C}$			 115 120 200	 130 130 210	mA
Total power ex-fiber	P_{tot}	$I_{op,max}$	9	12		mW
Center wavelength	λ_{center}	$I_{op,max}$	835	845	855	nm
Bandwidth at 3dB	BW_{3dB}	$I_{op,max}$	130	135		nm
Bandwidth at 10dB	BW_{10dB}	$I_{op,max}$	150	160		nm
Spectral ripple [RB=0.1nm]	SR	$I_{op,max}$		0.2	0.5	dB
Polarization extinction ratio	PER	$I_{op,max}$	13	20		dB
Secondary peak suppression[1]	SPSR	$I_{op,max}$	30	35		dB
Monitor PD current[2]	I_{MPD}	$I_{op,max}$	0.1			mA
Monitor PD bias voltage	V_{MPD}		0		-10	V

Table 1: Electrical-optical characteristics

[1] Suppression of residual peaks of the coherence function (point spread function, PSF) on a 10-log vertical scale when plotted versus optical path length difference (OPD) in air up to 8.0 mm, which is corresponding to an OCT imaging range of 4.0 mm in air

[2] Measured with 0V bias voltage on monitor photodiode (PD) and termination resistance of 10-50 Ohm.

4. ABSOLUTE MAXIMUM RATINGS

Stresses beyond the absolute maximum ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Parameter	Symbol	Cond.	Min	Max	Unit
Forward current: SLED A SLED B SLED C	 $I_{F,A}$ $I_{F,B}$ $I_{F,C}$			 150 140 220	mA
Reverse voltage: SLED A SLED B SLED C	 $V_{R,A}$ $V_{R,B}$ $V_{R,C}$			 -2.0 -2.0 -2.0	V
Forward voltage: SLED A SLED B SLED C	 $V_{F,A}$ $V_{F,B}$ $V_{F,C}$			 2.5 2.5 3.0	V
Operating temperature	T_{op}	$I_{F,max}$	-20	65	°C
Storage temperature	T_{stg}		-40	85	°C
Storage humidity	<30°C >30°C		5	85 95	% r.h. % r.h.
Thermoelectric cooler voltage	V_{tec}	50°C[3]		4.0	V
Thermoelectric cooler current	I_{tec}	50°C		1.8	A
Thermistor Resistance	R_{th}	25°C	9.5	10.5	kΩ
Thermistor constant	B		3892		K
Lead soldering temperature				260	°C
Lead soldering duration				10	s
ESD		human b.m		500	V

Table 2: Absolute maximum ratings

5. SCREENING

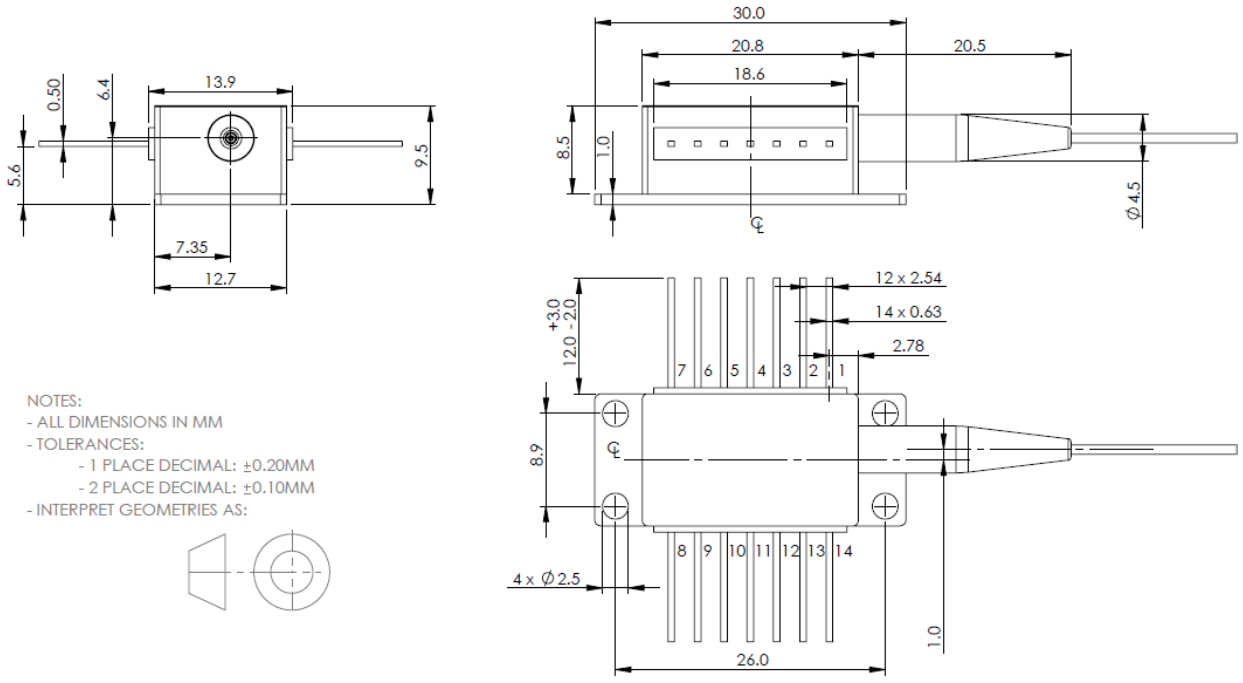
The produced Module is required to meet all operating conditions specified in Table 3, Electro-Optical Performance Specifications after being subjected to the following screening tests:

Test Item	Test Conditions	Reference
Seal	Fine: Condition A1 Gross: Condition C	MIL-STD-883, Method 1014 Temperature max 85°C

Table 3: Screening tests

[3] Performance values with hot-side temperatures of 50°C (housing or case temperature at base)

6. PACKAGE DIMENSIONS AND PINOUT



Butterfly Package			
Pin	**Function**	**Pin**	**Function**
1	**TEC (+)**	**8**	**SLED A ANODE (+)**
2	**THERMISTOR**	**9**	**SLED A CATHODE (-)**
3	**MONITOR DIODE ANODE (+)**	**10**	**SLED B ANODE (+)**
4	**MONITOR DIODE CATHODE (-)**	**11**	**SLED B CATHODE (-)**
5	**THERMISTOR**	**12**	**SLED C ANODE (+)**
6	**NC**	**13**	**SLED C CATHODE (-)**
7	**NC**	**14**	**TEC (-)**

Table 4: 14pin Butterfly Pinout

7. FIBER AND CONNECTOR

Part	Description
SM Fiber	SM 5/125 Corning HI780
Fiber cut-off wavelength	< 733 nm
Tight buffer secondary coating	900 µm
Fiber pigtail length (min.)	1 m
Optical connector	FC/APC Narrow Key (2.0mm)

Table 5: Fiber and connector

8. IMPORTANT NOTES

1. Avoid electrostatic discharges, which may destroy the SLEDs.
2. Never use the SLED module without heat sinking.
3. Adequate eye protection against laser radiation should be used while handling and operating the module.
4. EXALOS declines any responsibility if the device is used in applications where human life may be endangered.
5. Back-reflections may influence the output power and spectral characteristics of the SLEDs. An optical return loss of less than -30 dB is recommended.

9. ORDERING INFORMATION

Please use the following **part number** to order product from EXALOS:

E	X	C	2	5	0	0	0	2	–	0	1

Description of technical code:

E	X	C	-	0	8	0	0	-	0	8	4	0	-	0	8	8	0	-	1	2	-	0	2	0	4	1	3	0
				Wavelength A					Wavelength B					Wavelength C					Total outpour power			Package			Fiber		Connector	MPD	Option

10. REVISION HISTORY

Revision History				
Rev.	**Description**	**ECN**	**Date**	**Released**
0.1	Preliminary version	-	04.12.2018	SGL
0.2	Updated drive currents and PER	-	16.01.2019	SGL
0.3	Updated technical description due to new 800nm wafer; updated optical specification in table 3 and 4 with revised output power and bandwidth	-	16.05.2019	SGL
0.4	Updated electro-optical performance parameters in Table 3 and 4. Added SPSR as new specification in Table 3.	-	29.08.2019	SGL
0.5	New BTF housing; Updated nomenclature for SLEDs; updated drive current, output power and forward voltage ratings	-	06.11.2020	SGL
1.0	First release version (after qualification of EXC250018-01)	1403	10.05.2022	SGL
1.01	Updated product code (08→ 04)		11.07.2022	SGL
1.1	New Pinout, new SLED nomenclature, add fiber cut-off WL, remove temp cycling, new technical code (remove empty channel)	1484	17.12.2022	SGL