EXC250018-03

EXC-0760-0800-0840-0880-15-0204130

Combi-4 SLED 14-pin Butterfly Module 165nm

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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 (SLEDs).

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

- 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 SLED D	 λ_A λ_B λ_C λ_D			 760 800 840 880		nm
Operating current: SLED A SLED B SLED C SLED D	 $I_{op,\,A}$ $I_{op,\,B}$ $I_{op,\,C}$ $I_{op,\,D}$			 120 140 120 205	 140 160 140 210	mA
Total power ex-fiber	P_{tot}	$I_{op,max}$	12	15		mW
3dB center wavelength	λ_c	$I_{op,max}$	825	830	835	nm
3dB bandwidth	BW_{3dB}	$I_{op,max}$	155	165		nm
10dB bandwidth	BW_{10dB}	$I_{op,max}$	180	190		nm
Polarization extinction ratio	PER	$I_{op,max}$	13	18		dB
Secondary peak suppression 0.3-4.0mm[1]	$SPSR_{4mm}$	$I_{op,max}$	35			dB
Secondary peak suppression 4-8mm[2]	$SPSR_{8mm}$	$I_{op,max}$	30			dB
Monitor PD current[3]	I_{MPD}	$I_{op,max}$	100	300	500	µA
Monitor PD bias voltage	V_{MPD}		0		-10	V
Power stability[4]	ΔP_{tot}	$I_{op,max}$			3	%

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 from 0.3 mm to 4.0 mm
[2] 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 from 4.0 mm to 8.0 mm
[3] Measured with 0V bias voltage on monitor photodiode (PD) and termination resistance of 10-50 Ohm.
[4] Power change at 25°C case temperature, measured over 1h continuous operation

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 SLED D	 $I_{F,A}$ $I_{F,B}$ $I_{F,C}$ $I_{F,D}$			 150 170 150 220	mA
Reverse voltage: SLED A SLED B SLED C SLED D	 $V_{R,A}$ $V_{R,B}$ $V_{R,C}$ $V_{R,D}$			 -2.0 -2.0 -2.0 -2.0	V
Forward voltage: SLED A SLED B SLED C SLED D	 $V_{F,A}$ $V_{F,B}$ $V_{F,C}$ $V_{F,D}$			 2.5 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[5]		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

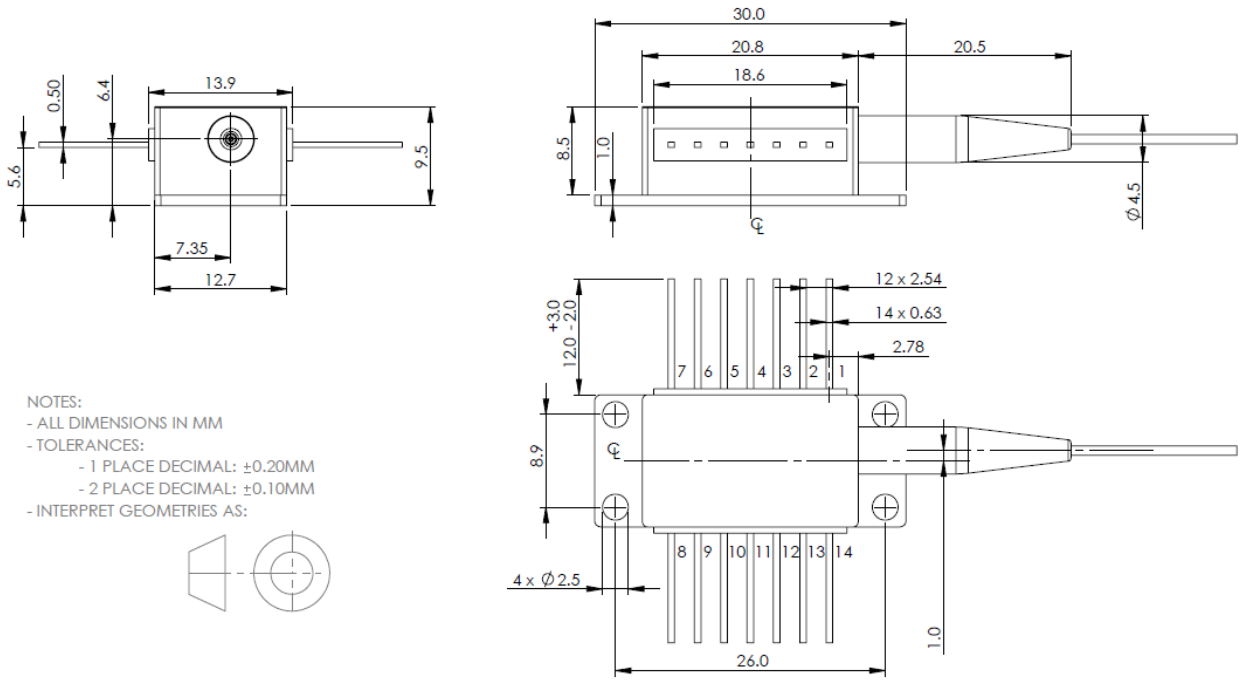
The produced Module is required to meet all operating conditions specified in Table 3, Electro-Optical Performance Specifications after being subjected to the following screening tests:

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

[5] Performance values with hot side temperatures of 50°C (housing base)

6. PACKAGE DIMENSIONS AND PINOUT



Butterfly Package			
Pin	**Function**	**Pin**	**Function**
1	**TEC (+)**	**8**	**SLED B ANODE (+)**
2	**THERMISTOR**	**9**	**SLED B CATHODE (-)**
3	**MONITOR DIODE ANODE (+)**	**10**	**SLED C ANODE (+)**
4	**MONITOR DIODE CATHODE (-)**	**11**	**SLED C CATHODE (-)**
5	**THERMISTOR**	**12**	**SLED D ANODE (+)**
6	**SLED A CATHODE (-)**	**13**	**SLED D CATHODE (-)**
7	**SLED A ANODE (+)**	**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	1	8	–	0	3

Description of technical code:

E	X	C	-	0	7	6	0	-	0	8	0	0	-	0	8	4	0	-	0	8	8	0	-	1	5	-	0	2	0	4	1	3	0
				Wavelength A					Wavelength B					Wavelength C					Wavelength D					Total output power			Package			Fiber		Connector	MPD	Option

10. REVISION HISTORY

Revision History				
Rev.	**Description**	**ECN**	**Date**	**Released**
0.1	Preliminary version EXC250018-00	-	12.10.2020	SGL
0.2	New BTF housing	-	03.11.2020	SGL
0.3	Change SLED nomenclature; updated drive current	-	06.11.2020	SGL
0.4	Change SLED nomenclature	-	07.05.2021	SGL
1.0	First release version (for qualification of EXC250018-01)	1400	10.05.2022	SGL
1.01	Updated product code (fiber: 08→04)		11.07.2022	SGL
2.0	New Pinout, new SLED nomenclature, new 760nm drive parameter, add fiber cut-off WL, remove temp cycling,	1484	17.12.2022	SGL
3.0	New revision for new 760nm SLED; Updated currents	1484	03.03.2023	SGL
3.1	Updated operating currents and absolute max. currents for SLED A (new 760nm SLED) and SLED B (new 800nm SLED); increased MPD current range from 100-400 µA to 100-500 µA; changed description for this EXC25 product by replacing ‘170nm’ with ‘165nm’ as 3dB BW indicator	1574	02.11.2023	SGL