EXC250019-00

EXC-1300-1380-1450-1550-40-0203130

1225-1615nm Combi-4 SLED 14-pin BTF Module

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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} = 20°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			 1300 1380 1450 1580		nm
Operating current: SLED A SLED B SLED C SLED D	 $I_{op,\,A}$ $I_{op,\,B}$ $I_{op,\,C}$ $I_{op,\,D}$			 600 250 550 550	 600 250 550 550	mA
Total power ex-fiber	P_{tot}	$I_{op,max}$	35	45		mW
3dB center wavelength	λ_c	$I_{op,max}$	1435	1445	1455	nm
3dB bandwidth	BW_{3dB}	$I_{op,max}$	340	360		nm
10dB bandwidth	BW_{10dB}	$I_{op,max}$	410	430		nm
PSD range at -30dBm/0.1nm[1] Min WL Max WL	$BW\text{-}_{30dBm}$	$I_{op,max}$		 1230 1670		nm
PSD range at -25dBm/0.1nm[2] Min WL Max WL	$BW\text{-}_{25dBm}$	$I_{op,max}$		 1240 1660		nm
PSD range at -22dBm/0.1nm[3] Min WL Max WL	$BW\text{-}_{22dBm}$	$I_{op,max}$		 1250 1640		nm
Polarization extinction ratio	PER	$I_{op,max}$	15	25		dB
Monitor PD current[4]	I_{MPD}	$I_{op,max}$	100	400		µA
Monitor PD bias voltage	V_{MPD}		0		-10	V

Table 1: Electrical-optical characteristics

[1] Wavelength range with power spectral density (PSD) being continuously at least -30 dBm/0.1nm
[2] Wavelength range with PSD being at least -25 dBm/0.1nm, except for 1405-1420 nm
[3] Wavelength range with PSD being at least -22 dBm/0.1nm, except for 1400-1440 nm
[4] 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 SLED D	 $I_{F,A}$ $I_{F,B}$ $I_{F,C}$ $I_{F,D}$			 650 250 600 600	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 -4.0	V
Forward voltage: SLED A SLED B SLED C SLED D	 $V_{F,A}$ $V_{F,B}$ $V_{F,C}$ $V_{F,D}$			 2.0 2.0 2.0 4.0	V
Operating temperature	T_{op}	$I_{F,max}$	-20	45	°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

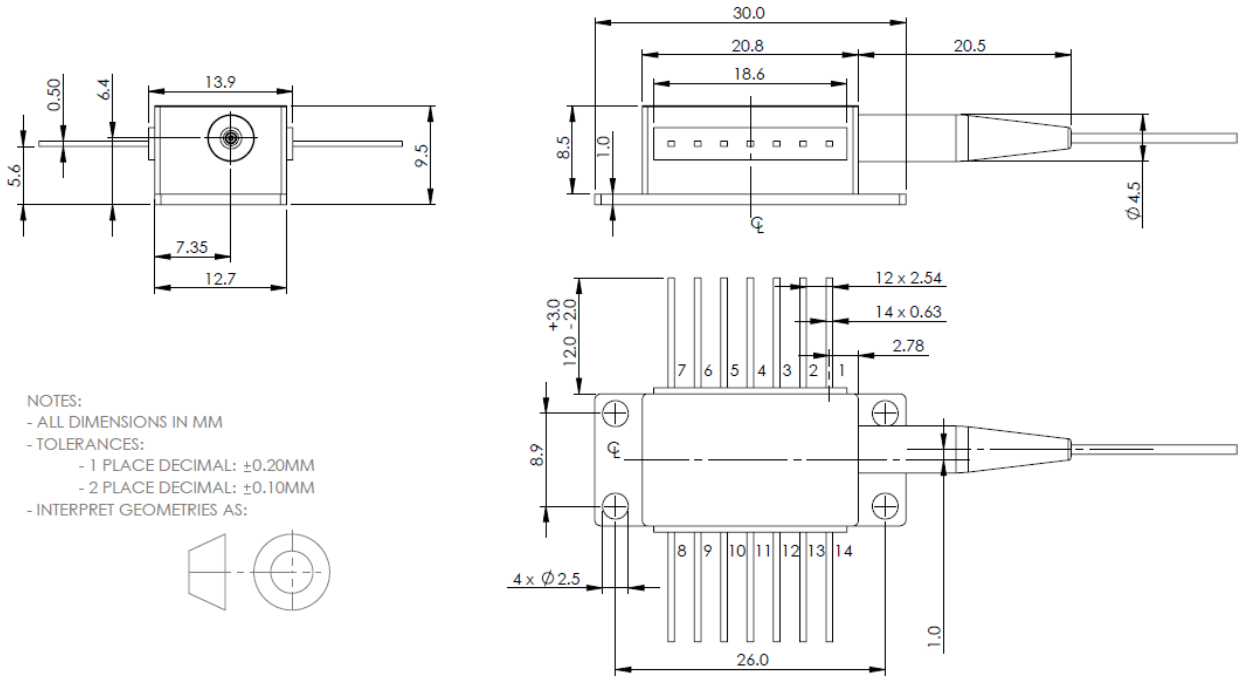
The produced Module is required to meet all operating conditions specified in Table 3, Electro-Optical Performance Specifications after being subjected to the following screening tests:

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	SMF-28, 9/125 um
Tight buffer secondary coating	900 µm
Fiber pigtail length (min.)	1 m
Optical connector	FC/APC Narrow Key (2.0mm)

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. Backreflections 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	9	–	0	0

Description of technical code:

E	X	C	-	1	3	0	0	-	1	3	8	0	-	1	4	5	0	-	1	5	8	0	-	4	0	-	0	2	0	3	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 EXC250019-00	-	05.05.2021	SGL
0.2	Updated product code (fiber: 08→03)	-	11.07.2022	SGL
0.3	Updated nomenclature for SLEDs; New pinout (4-channel drive); Removed T-cycling; shifted BTF snout position (+0.5mm)	-	21.04.2023	SGL
0.4	Updated drive conditions and spectral performance for new gain chips	-	25.01.2024	SGL