

EXC250019-00

EXC-1300-1380-1450-1550-35-0208130

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

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Confidentiality: **Confidential**

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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 ($T_{SLED} = 20^{\circ}\text{C}$)

Parameter	Symbol	Cond.	Min	Typ	Max	Unit
Combined Wavelengths: SLED B SLED C SLED D1 SLED D2	λ_B λ_C λ_{D1} λ_{D2}			1300 1380 1450 1550		nm
Operating current: SLED B SLED C SLED D1,D2 ¹	$I_{op, B}$ $I_{op, C}$ $I_{op, D1,D2}$			600 250 550	600 250 550	mA
Total power ex-fiber	P_{tot}	$I_{op,max}$	30	40		mW
3dB center wavelength	λ_c	$I_{op,max}$	1410	1420	1430	nm
3dB bandwidth	BW_{3dB}	$I_{op,max}$	300	320		nm
10dB bandwidth	BW_{10dB}	$I_{op,max}$	360	380		nm
PSD range at $-30\text{dBm}/0.1\text{nm}^2$ Min WL Max WL	BW_{-30dBm}	$I_{op,max}$		1225 1615		nm
PSD range at $-25\text{dBm}/0.1\text{nm}^3$ Min WL Max WL	BW_{-25dBm}	$I_{op,max}$		1235 1605		nm
PSD range at $-22\text{dBm}/0.1\text{nm}^4$ Min WL Max WL	BW_{-22dBm}	$I_{op,max}$		1245 1595		nm
Polarization extinction ratio	PER	$I_{op,max}$	15	25		dB
Monitor PD current ⁵	I_{MPD}	$I_{op,max}$	100	400		μA
Monitor PD bias voltage	V_{MPD}		0		-10	V

Table 1: Electrical-optical characteristics

¹ SLED D1 (1450nm) and SLED D2 (1550nm) are internally wired in series and can therefore only be driven with one and the same current through pins 12 and 13. The forward voltage seen on those pins is accumulated from both SLEDs.

² Wavelength range with power spectral density (PSD) being continuously at least $-30\text{ dBm}/0.1\text{nm}$

³ Wavelength range with PSD being at least $-25\text{ dBm}/0.1\text{nm}$, except for 1405-1420 nm

⁴ Wavelength range with PSD being at least $-22\text{ dBm}/0.1\text{nm}$, except for 1400-1440 nm

⁵ 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 B SLED C SLED D1,D2	$I_{F, B}$ $I_{F, C}$ $I_{F, D1, D2}$			650 250 600	mA
Reverse voltage: SLED B SLED C SLED D1,D2	$V_{R, B}$ $V_{R, C}$ $V_{R, D1, D2}$			-2.0 -2.0 -4.0	V
Forward voltage: SLED B SLED C SLED D1,D2	$V_{F, B}$ $V_{F, C}$ $V_{F, D1, D2}$			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 ⁶		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

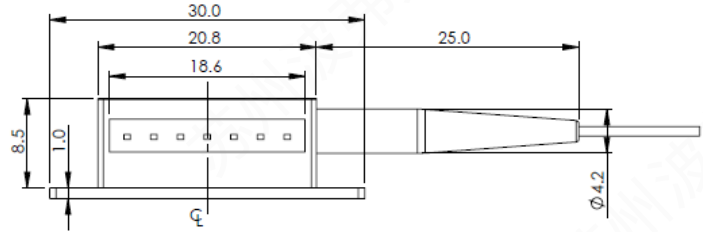
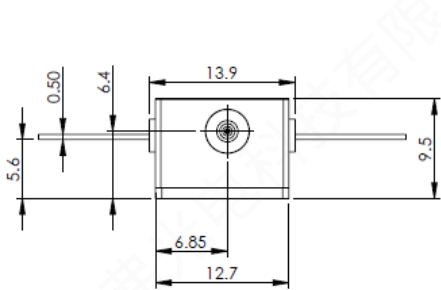
The produced Module is required to meet all operating conditions specified in Table 3, Electro-Optical Performance Specifications after being subjected to the following screening tests:

Test Item	Test Conditions	Reference
Seal	Fine: Condition A1 Gross: Condition C	MIL-STD-883, Method 1014 Temperature max 85°C
Temperature Cycling	-40°C to +85°C, ramp rate \geq 5°C/min 10 cycles	MIL-STD-883, Method 1010

Table 3: Screening tests

⁶ Performance values with hot side temperatures of 50°C (housing base)

6. PACKAGE DIMENSIONS AND PINOUT



NOTES:

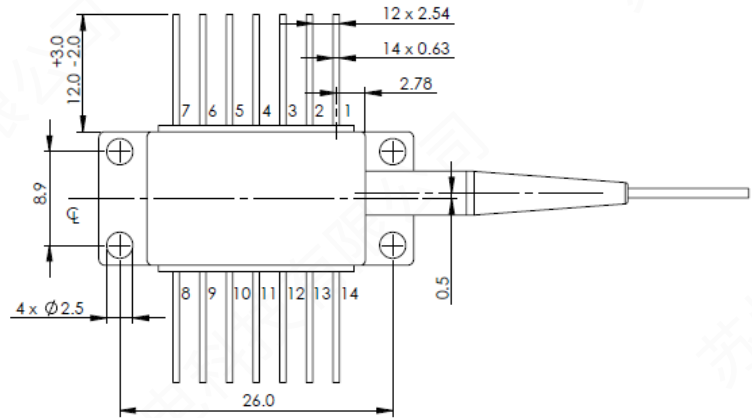
- ALL DIMENSIONS IN MM

- TOLERANCES:

- 1 PLACE DECIMAL: $\pm 0.10\text{MM}$

- 2 PLACE DECIMAL: $\pm 0.10\text{MM}$

- INTERPRET GEOMETRIES AS:



Butterfly Package			
Pin	Function	Pin	Function
1	TEC (+)	8	SLED B ANODE (+)
2	NC	9	SLED B CATHODE (-)
3	MONITOR DIODE ANODE (+)	10	SLED C ANODE (+)
4	MONITOR DIODE CATHODE (-)	11	SLED C CATHODE (-)
5	THERMISTOR (+)	12	SLED D1,D2 ANODE (+)
6	THERMISTOR (-)	13	SLED D1,D2 CATHODE (-)
7	NC	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:

EXC250019-00

Description of technical code:

E	X	C	-	1	3	0	0	-	1	3	8	0	-	1	4	5	0	-	1	5	5	0	-	4	0	-	0	2	0	8	1	3	0
				Wavelength B					Wavelength C					Wavelength D1					Wavelength D2				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