EXS210189-01

UNCOOLED TO-9 with MPD

High-Power 100mW 840nm SLED

Revision: 1.0

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Confidentiality: None

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1. SCOPE

1.1 PURPOSE

The purpose of this document is to specify the electro-optical performance and dimensions of a near-infrared superluminescent diode (SLED) packaged in a TO-9 can.

1.2 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 DOCUMENT

- 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	Min	Typ	Max	Unit
ASE power ex-window	P_o	100		120	mW
Operating current*	I_{op}		300	340	mA
3dB center wavelength	CWL	830	840	850	nm
3dB bandwidth	BW	24	27	-	nm
Polarization extinction ratio	PER	12	15	-	dB
MPD current	I_{MPD}	30	350	-	µA
Vertical centricity offset	ΔY	-	-	300	µm
Horizontal centricity offset	ΔX	-	-	500	µm
Emission angle relative to TO base	Δ φ	-	-	5	degrees
Vertical Far Field Angle FWHM	VFF	25	28	31	degrees
Horizontal Far Field Angle FWHM	HFF	8	10	13	degrees

* Operating current at a case temperature of 25°C to deliver an ex-window output power of 100 mW

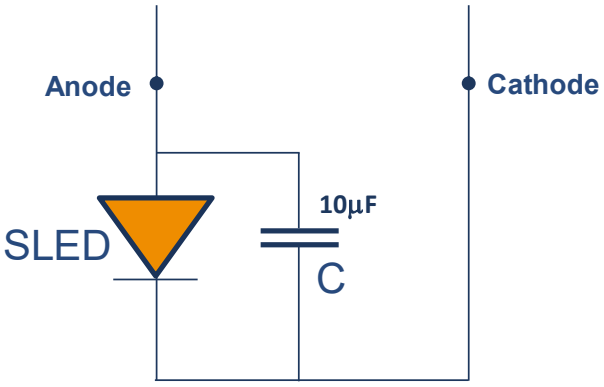
4. ABSOLUTE MAXIMUM RATINGS

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	I_F	$P_o \leq P_{max}$		360	mA
Reverse voltage	V_R			-2	V
Forward voltage	V_F	$I_{F,max}$		3.0	V
Storage temperature	T_{stg}		-40	85	°C
Operating temperature	T_{op}	$P_o \leq P_{max}$	-20	65	°C
Max Power ex-window†	P_{max}			120	mW
Lead soldering temperature				260	°C
ESD		human b.m		300	V

4.1 ELECTRICAL TURN-ON CHARACTERISTICS

These devices are sensitive to current spikes or turn-on ramps with a fast rise-time. In order to operate the devices safely, it is recommended that the electrical drive circuit has a rise time longer than 10µs and that a minimum 10µF capacitor is placed in parallel with the SLED as shown below.



5. SCREENING

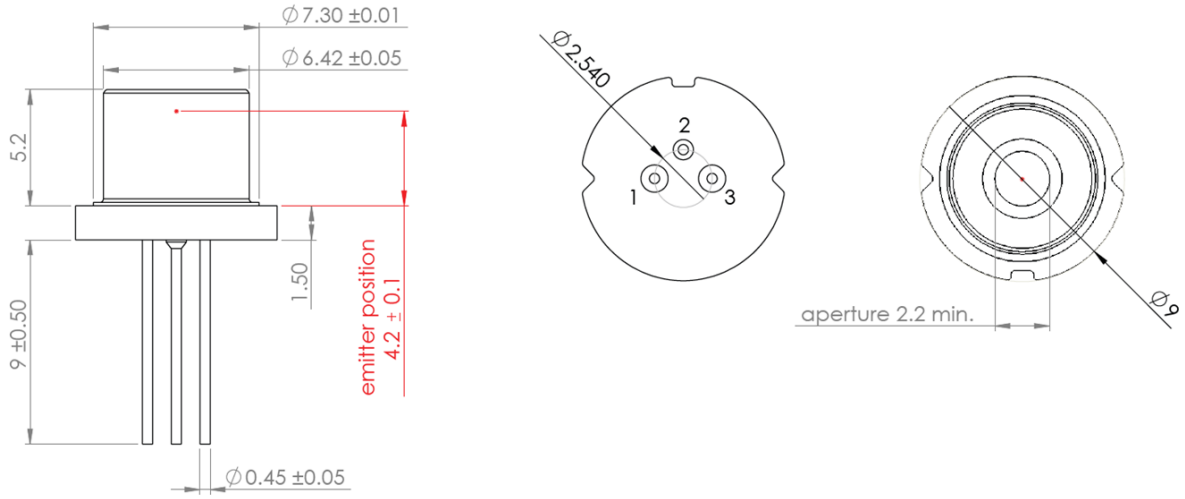
The 840nm SLED Module is required to meet all operating conditions and performance specifications reported in the tables of section 3 and 4, after being subjected to the following screening tests.

Test Item	Test Conditions	Reference	Sample
Hermetic Seal	Fine leak: Max. leak rate $5x10^{-8}$ atm.cc/sec Gross leak:	MIL-STD-883, Method 1014 Condition A MIL-STD-883, Method 1014 Condition C	100 % 100 %
Temperature Cycling	-40°C to +85°C, ramp rate >= 5°C/min 20 cycles	MIL-STD-883, Method 1010	100%

† The drive current may need to be adjusted in order not to exceed the maximum power rating for low ambient temperature.

6. PACKAGE DIMENSIONS [mm]

Tolerances : .X ± 0.25 mm
.XX ± 0.05 mm



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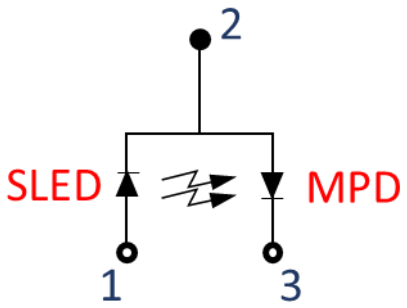
Pin	**Function**
1	SLED ANODE (+)
2	SLED CATHODE (-), MPD ANODE (+), CASE
3	MPD CATHODE (-)

SCHEMATIC PIN LAYOUT



7. IMPORTANT NOTES

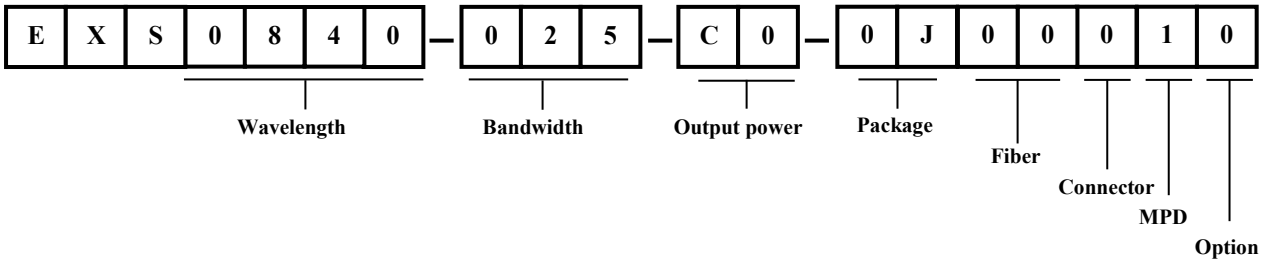
1. Avoid electrostatic discharges, which may destroy the SLED.
2. Never use the TO-CAN die without heat sinking.
3. Adequate eye protection against laser radiation should be used while handling and operating the module.
4. EXALOS declines any responsibility if the device is used in applications where human life may be endangered.
5. Back-reflections may influence the output power and spectral characteristics of this SLED chip.

8. ORDERING INFORMATION

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

E	X	S	2	1	0	1	8	9	–	0	1

8.1 TECHNICAL DESCRIPTION



9. REVISION HISTORY

Revision History				
Rev.	**Description**	**ECN**	**Date**	**Released**
0.1	Preliminary version	--	26-Feb-24	Rossetti
0.2	• Updated HFF and VFF values in section 3 • Updated pointing accuracy in section 3 • Updated minimum MPD current in section 3	--	13-Mar-24	Rossetti
1.0	• Defined minimum output power of 100 mW (section 3) • Defined typical/maximum current of 300 mA/340 mA (section 3) • Updated bandwidth and MPD current values (section 3) • Defined maximum output power of 120 mW (section 4) • Updated package code (section 8.1)	EXS-EC-01672	27-Oct-24	Rossetti