

TSM-3E20

VCSEL for general purpose

FEATURES:

- Surface mount package with flat emission surface.
- Miniature, epoxy molded.
- Driving current between 8 to 15 mA.
- Nominal 10° emission angle.
- Ideal for sensing applications.

ELECTRO-OPTICAL CHARACTERISTICS:

PARAMETERS	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS ⁽¹⁾
Threshold Current	I _{th}		5	10	mA	
Output Power	P _o	1	2	4	mW	I _F =15 mA ⁽²⁾
Operating Current	I _{OP}		12		mA	Adjustable to establish 1.5 mW output power
Slope Efficiency	η		0.20		mW/mA	I _F =15 mA ⁽³⁾
Wavelength	λ _p	820	850	870	nm	I _F =15 mA
Forward Voltage	V _F	2	2.2	2.5	V	I _F =15 mA
Breakdown voltage	V _{BD}	10	15		V	I _R =10 μA
Series Resistance	R _S		40		Ω	I _F =15 mA
Beam Divergence	θ		10		degree	I _F =15 mA ⁽⁴⁾

- Notes:
1. All parameters except mentioned are measured at I_F=15 mA, 25°C, CW.
 2. Higher power can be provided under request.
 3. Slope efficiency is defined as ΔP/(15-I_{th}) at 25°C.
 4. Beam divergence is defined as the angle of light intensity at Full Width at Half Maximum (FWHM).

THERMAL CHARACTERISTICS:

PARAMETERS	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS
Thermal Resistance	R _{th}		900		°C /W	T _A =25°C
I _{th} Temperature Variation	ΔI _{th}	-1.5		1.5	mA	T _A =0~70°C
V _F Temperature Coefficient	ΔV _F /ΔT		-3.0		mV/°C	T _A =0~70°C, I _F =15mA
η Temperature Coefficient	Δη/ΔT		-0.25		%/°C	T _A =0~70°C
λ _p Temperature Coefficient	Δλ _p /ΔT		0.07		nm/°C	T _A =0~70°C, I _F =15mA

ABSOLUTE MAXIMUM RATINGS:

PARAMETERS	MIN	MAX	UNIT	CONDITIONS
Storage Temperature	-40	100	°C	
Operating Temperature	-20	85	°C	
Lead Solder Temperature		260	°C	5 seconds
Continuous Forward Current		40	mA	
Continuous Reverse Voltage		10	V	

Fig. 1 Typical Optical Characteristics

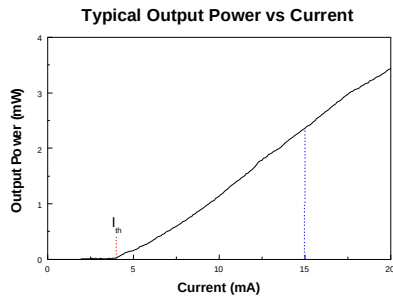


Fig. 2 Typical Electrical Characteristics

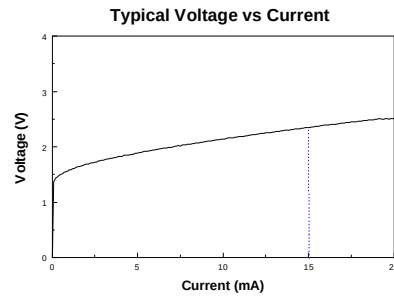
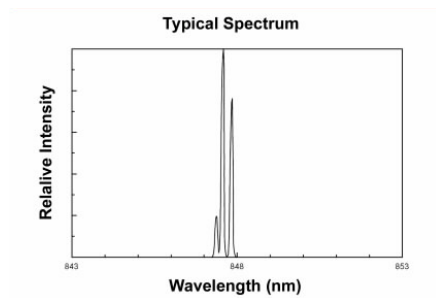
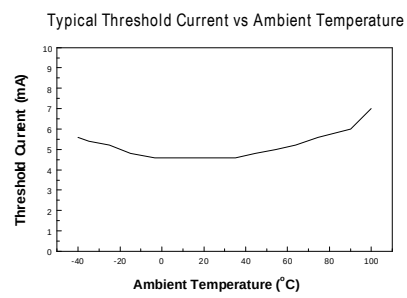


Fig. 3 Spectrum When Driving Current 15 mA



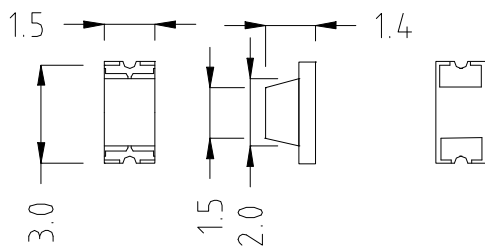
3 transverse modes typically.

Fig. 4 Temperature Dependence of Threshold Current

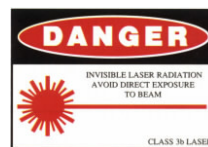


OUTLINE DIMENSIONS:

- Unit: mm



The VCSEL is a class IIIb laser in the safety standard ANSI Z136.1 and should be treated as a potential eye hazard.



WARNING: