Preliminary

TSM-3F20

VCSEL for general purpose

FEATURES:

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

ELECTRO-OPTICAL CHARACTERISTICS:

PARAMETERS	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS[1]
Threshold Current	I_{th}	1	3	5	mA	
Output Power	P_o	1	2	4	mW	I_F =12 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=12 mA
Wavelength	λ_P	820	850	870	nm	I_F=12 mA
Forward Voltage	V_F	1.70	2.0	2.5	V	I_F=12 mA
Breakdown voltage	V_{BD}		17		V	I_R=10 μA
Series Resistance	R_S		25		Ω	I_F =12 mA
Beam Divergence	θ		8		degree	I_F=12 mA[3]

Notes:
1. All parameters except mentioned are measured at I_F=12 mA, 25°C, CW.
2. Higher power can be provided under request.
3. 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}		1000		°C /W	T_A=25°C
I_{th} Temperature Variation	ΔI_{th}	-0.5		2.5	mA	T_A=0~70°C
V_F Temperature Coefficient	$\Delta V_F/\Delta T$		-2.5		mV/°C	T_A=0~70°C, I_F=15mA
η Temperature Coefficient	$\Delta\eta/\Delta T$		-0.30		%/°C	T_A=0~70°C
λ_P Temperature Coefficient	$\Delta\lambda_P/\Delta T$		0.06		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	70	°C	
Lead Solder Temperature		260	°C	10 seconds
Continuous Forward Current		40	mA	
Continuous Reverse Voltage		10	V	

Fig. 1 Typical Optical Characteristics

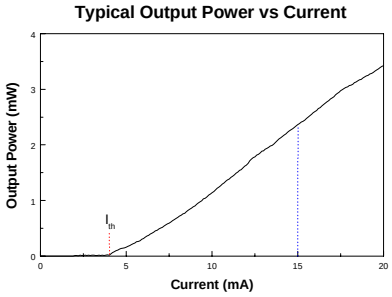


Fig. 2 Typical Electrical Characteristics

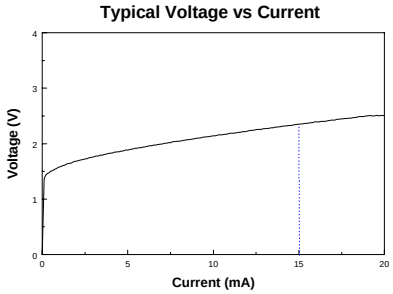
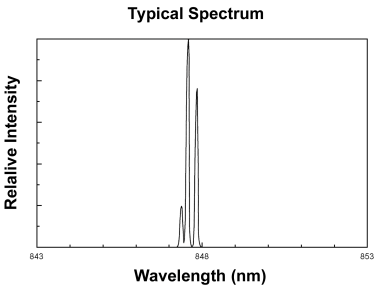
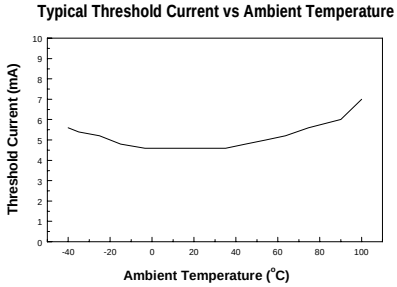


Fig. 3 Spectrum When Driving Current 15 mA



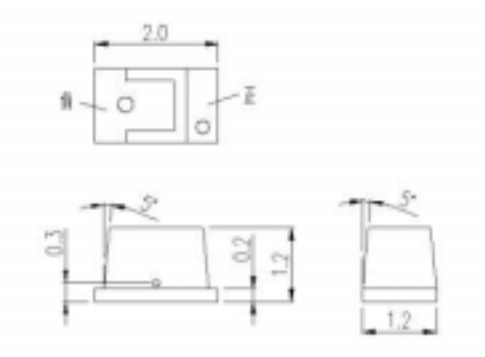
3 transverse modes typically.

Fig. 4 Temperature Dependence of Threshold Current



OUTLINE DIMENSIONS:

• Unit: mm



WARNING:

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