

# TMC-4F20

## VCSEL TO-46 metal can for general purpose

### FEATURES:

- Industry standard TO-46 package with flat window glass.
- Low dependence of power output over temperature.
- Symmetrical beam.
- Cost-effective laser light source.



### ELECTRO-OPTICAL CHARACTERISTICS:

PARAMETERS	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITIONS <sup>(1)</sup>
Threshold Current	I <sub>th</sub>		5	10	mA	
Output Power	P <sub>o</sub>	1	2	4	mW	I <sub>F</sub> =15 mA <sup>(2)</sup>
Operating Current	I <sub>OP</sub>		12		mA	Adjustable to establish 1.5 mW output power
Slope Efficiency	η		0.20		mW/mA	I <sub>F</sub> =15 mA <sup>(3)</sup>
Wavelength	λ <sub>p</sub>	820	850	870	nm	I <sub>F</sub> =15 mA
Forward Voltage	V <sub>F</sub>	2	2.2	2.5	V	I <sub>F</sub> =15 mA
Breakdown voltage	V <sub>BD</sub>	10	15		V	I <sub>R</sub> =10 μA
Series Resistance	R <sub>S</sub>		40		Ω	I <sub>F</sub> =15 mA
Beam Divergence	θ		8		degree	I <sub>F</sub> =15 mA <sup>(4)</sup>

Notes:

1. All parameters except mentioned are measured at I<sub>F</sub>=15 mA, 25°C, CW.
2. Higher power can be provided under request.
3. Slope efficiency is defined as ΔP/(15-I<sub>th</sub>) 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 <sub>th</sub>		900		°C /W	T <sub>A</sub> =25°C
I <sub>th</sub> Temperature Variation	ΔI <sub>th</sub>	-1.5		1.5	mA	T <sub>A</sub> =0~70°C
V <sub>F</sub> Temperature Coefficient	ΔV <sub>F</sub> /ΔT		-3.0		mV/°C	T <sub>A</sub> =0~70°C, I <sub>F</sub> =15 mA
Temperature Coefficient	Δη/ΔT		-0.20		%/°C	T <sub>A</sub> =0~70°C, I <sub>F</sub> =15 mA
λ <sub>p</sub> Temperature Coefficient	Δλ <sub>p</sub> /ΔT		0.06		nm/°C	T <sub>A</sub> =0~70°C, I <sub>F</sub> =15 mA

### ABSOLUTE MAXIMUM RATINGS:

PARAMETERS	MIN	MAX	UNIT	CONDITIONS
Storage Temperature	-40	125		
Operating Temperature	-20	85		
Lead Solder Temperature		260		5 seconds
Continuous Forward Current		40	mA	
Continuous Reverse Voltage		10	V	

Fig. 1 Typical Optical Characteristics

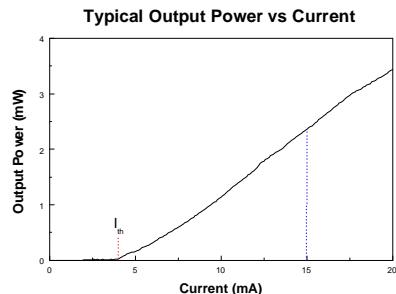


Fig. 2 Typical Electrical Characteristics

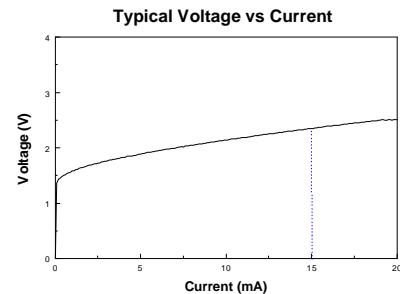
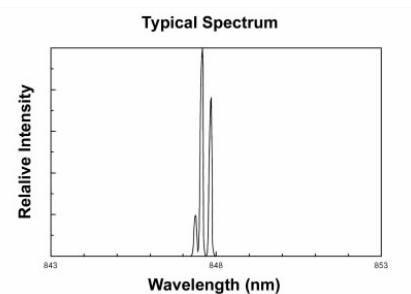
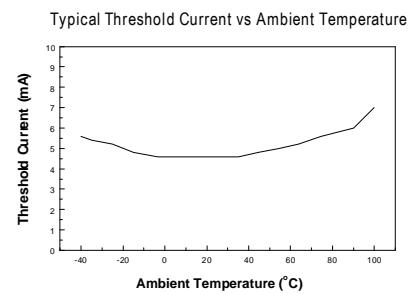


Fig. 3 Spectrum When Driving Current 15 mA



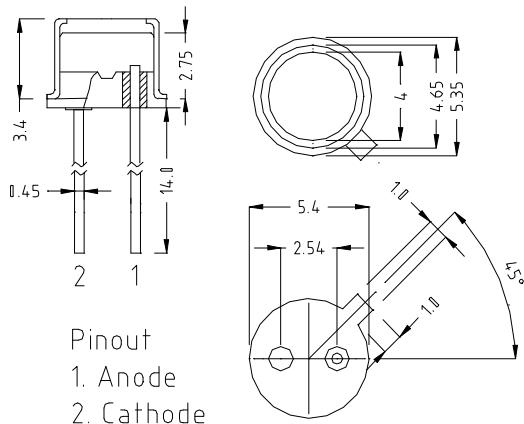
3 transverse modes typically.

Fig. 4 Temperature Dependence of Threshold Current



## OUTLINE DIMENSIONS:

- Unit: mm



## WARNING:

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

