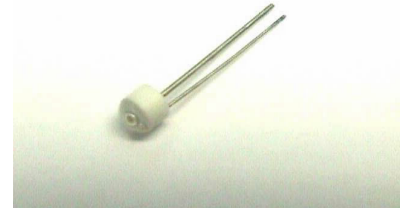


# TEL-2A20

## VCSEL for general purpose

### FEATURES:

- Epoxy molded with round emission surface.
- Ceramic heat sink.
- Low dependence of power output over temperature.
- Miniature, easy for mounting.
- Driving current between 8 to 15 mA.
- Symmetrical beam.



### ELECTRO-OPTICAL CHARACTERISTICS:

| PARAMETERS        | SYMBOL      | MIN | TYP  | MAX | UNIT     | TEST CONDITIONS <sup>(1)</sup>              |
|-------------------|-------------|-----|------|-----|----------|---|
| Threshold Current | $I_{th}$    |     | 5    | 10  | mA       |   |
| Output Power      | $P_o$       | 1   | 2    | 4   | mW       | $I_F=15\text{ mA}$ <sup>(2)</sup>           |
| Operating Current | $I_{OP}$    |     | 12   |     | mA       | Adjustable to establish 1.5 mW output power |
| Slope Efficiency  | $\eta$      |     | 0.20 |     | mW/mA    | $I_F=15\text{ mA}$ <sup>(3)</sup>           |
| Wavelength        | $\lambda_p$ | 820 | 850  | 870 | nm       | $I_F=15\text{ mA}$                          |
| Forward Voltage   | $V_F$       | 2   | 2.2  | 2.5 | V        | $I_F=15\text{ mA}$                          |
| Breakdown voltage | $V_{BD}$    | 10  | 15   |     | V        | $I_R=10\text{ }\mu\text{A}$                 |
| Series Resistance | $R_S$       |     | 40   |     | $\Omega$ | $I_F=15\text{ mA}$                          |
| Beam Divergence   | $\theta$    |     | 7    |     | degree   | $I_F=15\text{ mA}$ <sup>(4)</sup>           |

Notes:

1. All parameters except mentioned are measured at  $I_F=15\text{ mA}$ ,  $25^\circ\text{C}$ , CW.
2. Higher power can be provided under request.
3. Slope efficiency is defined as  $\Delta P/(15-I_{th})$  at  $25^\circ\text{C}$ .
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   |     | $^\circ\text{C}/\text{W}$ | $T_A=25^\circ\text{C}$                            |
| $I_{th}$ Temperature Variation      | $\Delta I_{th}$             | -1.5 |       | 1.5 | mA                        | $T_A=0\sim 70^\circ\text{C}$                      |
| $V_F$ Temperature Coefficient       | $\Delta V_F/\Delta T$       |      | -3.0  |     | mV/ $^\circ\text{C}$      | $T_A=0\sim 70^\circ\text{C}$ , $I_F=15\text{ mA}$ |
| $\eta$ Temperature Coefficient      | $\Delta \eta/\Delta T$      |      | -0.25 |     | %/ $^\circ\text{C}$       | $T_A=0\sim 70^\circ\text{C}$ , $I_F=15\text{ mA}$ |
| $\lambda_p$ Temperature Coefficient | $\Delta \lambda_p/\Delta T$ |      | 0.07  |     | nm/ $^\circ\text{C}$      | $T_A=0\sim 70^\circ\text{C}$ , $I_F=15\text{ mA}$ |

### ABSOLUTE MAXIMUM RATINGS:

| PARAMETERS                 | MIN | MAX | UNIT             | CONDITIONS |
|----------------------------|-----|-----|------------------|------------|
| Storage Temperature        | -40 | 100 | $^\circ\text{C}$ |            |
| Operating Temperature      | -20 | 85  | $^\circ\text{C}$ |            |
| Lead Solder Temperature    |     | 260 | $^\circ\text{C}$ | 5 seconds  |
| Continuous Forward Current |     | 40  | mA               |            |
| Continuous Reverse Voltage |     | 10  | V                |            |

Fig. 1 Typical Optical Characteristics

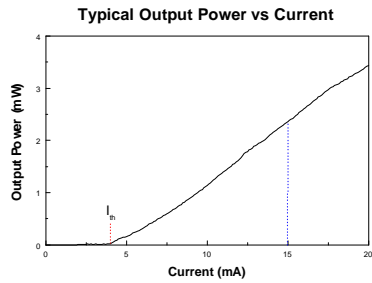


Fig. 2 Typical Electrical Characteristics

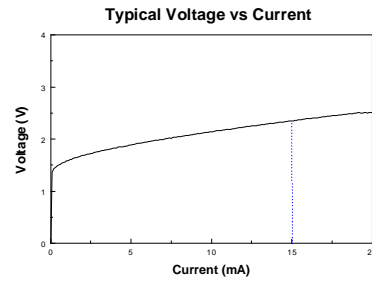
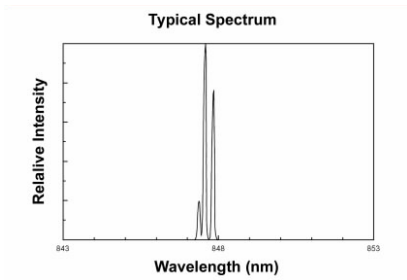
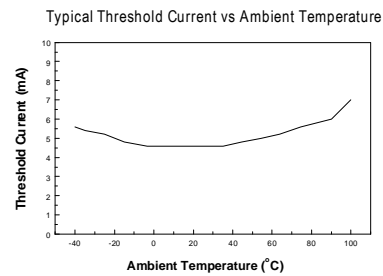


Fig. 3 Spectrum When Driving Current 15 mA



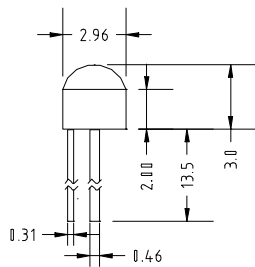
3 transverse modes typically.

Fig. 4 Temperature Dependence of Threshold Current



**OUTLINE DIMENSIONS:**

• Unit: mm



Pinout



- 1. Anode
- 2. Cathode

**WARNING:**

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

