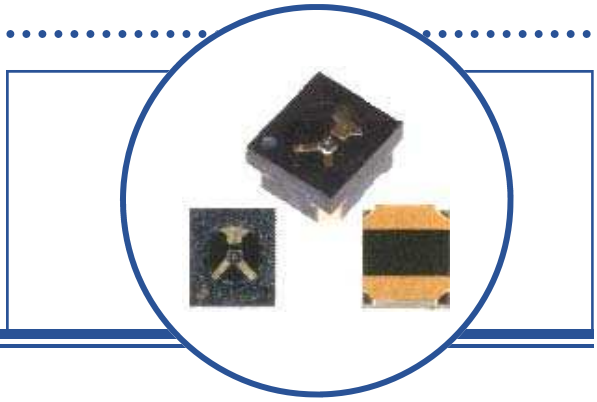
# Infrared Light Emitting VCSEL

## OPR2800V

TT electronics
OPTEK Technology

### Features:

- High speed VCSEL
- High output power
- Narrow beam angle
- Suitable for all types of high-speed data communications equipment
- Also available as diode (OPR2800, OPR2800T)



### Description:

The **OPR2800V** is a high performance 850 nm invisible VCSEL (Class 1M) with a flat lens window. Its high speed, high output power and concentric beam pattern make it an ideal transmitter for all types of high-speed data equipment applications.

*Please refer to Application Bulletins 221 and 224 for additional design information and reliability (degradation) data.*

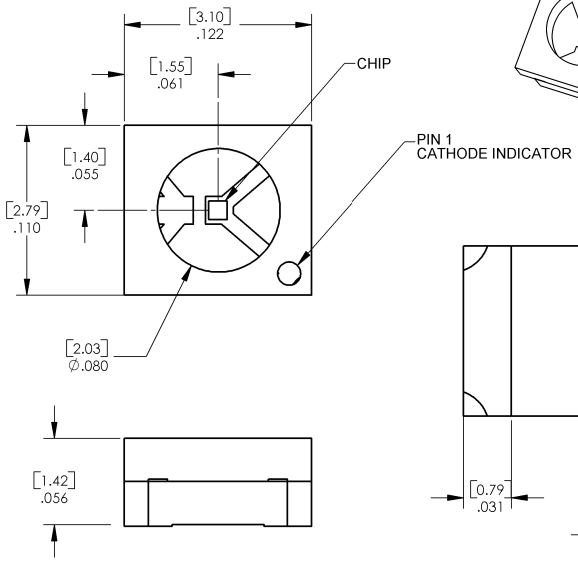
Refer to Application Bulletin 237

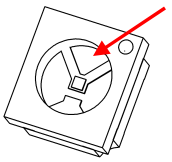
### Applications:

- Fibre channel
- Gigabit Ethernet
- ATM
- VSR (Very Short Reach)
- Intra-system links
- Optical backplane interconnects

| Ordering Information | | | | |
|---|---|---|---|---|
| Part Number | LED Peak Wavelength | Total Beam Angle | Laser Class | Packaging |
| OPR2800V | 850 nm | 24° | Class 1M | Chip Tray |

**OPR2800V**



**Warning**: Front Window is pressure sensitive. Do not apply pressure or high vacuum to window.


| Pin # | LED |
|---|---|
| 1 | Cathode |
| 2 | Anode |


ESD
(Human Body Model)

MOISTURE
(Level-4)

Pb-Free
(RoHS)

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

### Absolute Maximum Ratings ($T_A$ = 25° C unless otherwise noted)

| | |
|---|---|
| Storage Temperature Range | -40° C to +100° C |
| Operating Temperature Range | 0° C to +85° C |
| Maximum Forward Peak Current | 20 mA |
| Maximum Reverse Voltage | 10 V |
| Maximum Continuous Optical Power at 70° C | 1.1 mW |
| Solder reflow time within 5°C of peak temperature is 20 to 40 seconds | 250° C(1) |

Notes:
1. Solder time less than 5 seconds at temperature extreme.

### Electrical Characteristics ($T_A$ = 25° C unless otherwise noted)

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|---|---|---|---|---|---|---|
| $V_F$ | Forward Voltage | 1.60 | - | 2.20 | V | $I_F$ = 7 mA |
| $I_R$ | Reverse Current | - | - | 35 | µA | - |
| $t_r$, $t_f$ | Output Rise Time, Output Fall Time | - | 100 | - | ps | 20% to 80% |
| $P_{OT}$ | Total Power Out | 1.50 | - | - | mW | $I_F$ = 7 mA |
| $I_{TH}$ | Threshold Current(1) | 0.80 | - | 3 | mA | |
| $R_S$ | Series Resistance(2) | 20 | - | 55 | ohms | |
| η | Slope Efficiency(3) | 0.28 | - | - | mW/mA | |
| - | Linearity(4) | 0.00 | - | - | - | |
| $\lambda_P$ | Wavelength at Peak Emission | 840 | 850 | 860 | nm | - |
| Δλ | Optical Bandwidth | - | - | 0.85 | nm | - |
| θ | Beam Divergence | - | 24 | - | Degree | $I_F$ = 7 mA |
| $N_{RI}$ | Relative Intensity Noise | - | -123 | - | db/Hz | - |
| $\Delta I_{TH}/\Delta T$ | Temp Coefficient of Threshold Current | - | ±1.0 | - | mA | 0° - 70°(1) |
| $\Delta\lambda/\Delta T$ | Temp Coefficient of Wavelength | - | 0.06 | - | %/°C | 0° - 70°, $I_F$ = 7 mA |
| $\Delta V_F/\Delta T$ | Temperature Coefficient for $V_F$ | - | -2.5 | - | mW%/°C | 0° - 70°, $I_F$ = 7 mA |
| $\Delta\eta/\Delta T$ | Temperature Coefficient for Efficiency(3) | - | -0.5 | - | %/C | 0° - 70° |

Notes:
1. Threshold current is based on the two line intersection method specified in Telcordia GR468-Core. Line 1 from 4 mA to 6mA. Line 2 from 0 mA to 0.5 mA.
2. Series resistance is the slope of the voltage-current line from 5 to 8 mA.
3. Slope efficiency is the slope of the best-fit LI line from 5 mA to 8 mA, using no larger than 0.25 mA test interval points.
4. Using data points taken for slope efficiency above, ΔL/ ΔI shall be calculated for each adjacent pair of points.

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## OP2800V - Normalized Output Power vs Forward Current