



# VCS-F85S20-S

## 850nm Single Mode VCSEL Diode 1608 SMD Package

Data Sheet

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### Description

The Lasermate VCS-F85S20-S is a single-mode 850nm Vertical-Cavity Surface-Emitting Laser (VCSEL) diode, housed in a compact 1608 metric (0603 imperial) surface-mount package with a flat surface design for easy integration. It supports single transverse and longitudinal mode operation, providing a clean and stable beam ideal for precision sensing and IR optical systems. Designed with a focus on cost-efficiency and reliability, this VCSEL is an excellent choice for mass-market applications such as laser printers, laser mice, consumer electronics, automotive engine management, and safety sensors.

### Features

- 850nm VCSEL diode
- Single transverse mode and single longitudinal mode
- Flat-surface 1608 (0603) surface-mount package
- High reliability
- Cost-effective design
- Ideal for high-volume consumer and industrial use

### Applications

- Safety sensor
- Engine management system
- Laser printer
- Laser mouse
- Consumer electronics

## Absolute Maximum Ratings

Parameters	Min.	Max.	Unit	Conditions
Storage Temperature	-40	85	°C	
Operating Temperature	-10	70	°C	
Lead Solder Temperature		260	°C	5 seconds
Continuous Forward Current		6	mA	
Continuous Reverse Voltage		5	V	10uA

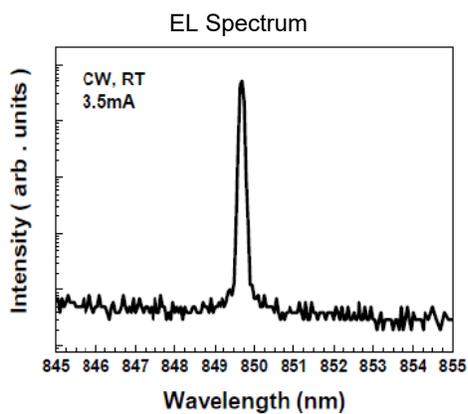
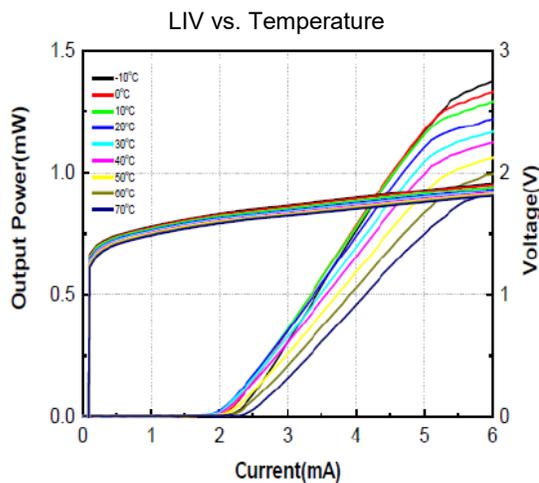
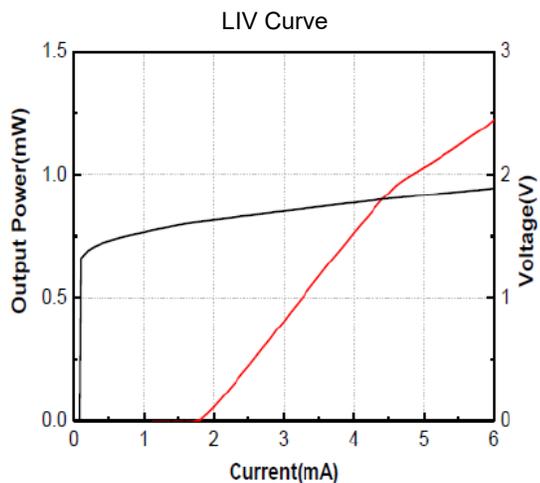
## Electrical-Optical Characteristics

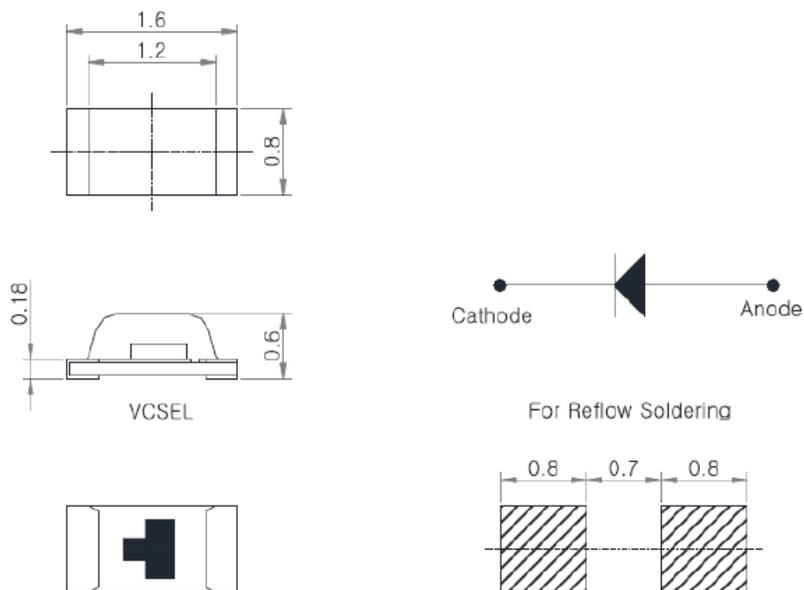
Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
Threshold Current	$I_{th}$		2	3	mA	CW
Slope Efficiency	$\eta$	0.2	0.35		W/A	$I_f=3.5mA$
Optical Output Power	$P_o$	0.25	0.5		mW	$I_f=3.5mA$
Peak Wavelength	$\lambda$	840	850	860	nm	$I_f=3.5mA$
Beam Divergence	$\Theta$	6	8		°	$I_f=3.5mA$ , (FWHM)
Operating Voltage	$V_f$		1.8	2.1	V	$I_f=3.5mA$
Breakdown Voltage	$V_b$		-10		V	
Dynamic Resistance	$R_d$		70	100	Ohm	$I_f=3.5mA$
Side Mode Suppression Ratio	SMSR	15	30		dB	$I_f=3.5mA$
			10		dB	$I_f=4mA$
Max. Single-mode Power	$P_{SM}$			0.35	mW	SMSR>15dB

## Thermal Characteristics

Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
$I_{th}$ Temperature Variation	$\Delta I_{th}$		1.5		mA	$T_a=-10$ to $70^\circ C$
$\eta$ Temperature Coefficient	$\Delta\eta/\Delta T$		-0.5		%/°C	$T_a=-10$ to $70^\circ C$ , $I_f=3.5mA$
$\lambda$ Temperature Coefficient	$\Delta\lambda/\Delta T$		0.06		nm/°C	$T_a=-10$ to $70^\circ C$ , $I_f=3.5mA$

Typical Characteristics



**Outline Dimensions (unit: mm)****Additional Notes**

- The inherent design of this component causes it to be sensitive to electrostatic discharge (ESD). To prevent ESD-induced damage and/or degradation to equipment, take normal ESD precautions when handling this product.
- Specifications are subject to change without notice.