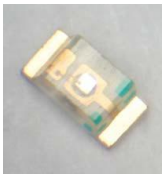
VCS-F85S20-MM

850nm Multimode VCSEL Diode 1608 SMD Package

Data Sheet



Description

The Lasermate VCS-F85S20-MM is a compact, low-power 850nm multimode Vertical-Cavity Surface-Emitting Laser (VCSEL) diode designed for continuous-wave (CW) operation, delivering 2.2mW of optical output. Housed in an ultra-small 1608 metric (0603 imperial) surface-mount package, this VCSEL is ideal for high-density board layouts and compact optical modules. It features low operating current and voltage, as well as a wide operating temperature range (-40°C to +85°C), making it highly suitable for consumer electronics, optical proximity sensing, and other space-constrained applications.

Features

- Multimode 850nm VCSEL diode
- Output power: 2.2mW (CW)
- Ultra-compact 1608 (0603) SMD package
- Low operating current and voltage
- Wide operating temperature: -40°C to +85°C
- High reliability and easy SMT integration

Applications

- Proximity and gesture sensing
- Consumer electronics
- Wearables and mobile devices
- Optical encoders
- High-density sensor modules

Absolute Maximum Ratings

Parameters	Min.	Max.	Unit	Conditions
Storage Temperature	-40	85	°C	
Operating Temperature	-40	85	°C	
Lead Soldering Temperature		260	°C	5 seconds
Continuous Forward Current		12	mA	
Continuous Reverse Voltage		5	V	@10uA

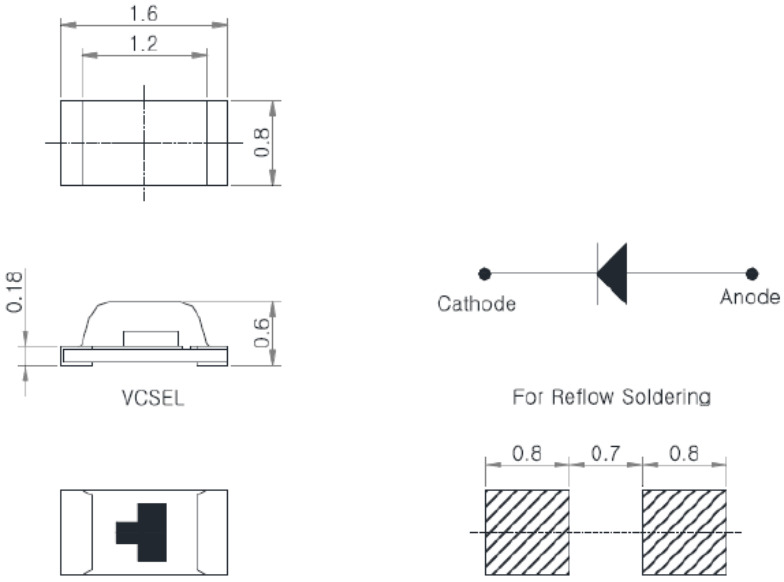
Electrical-Optical Characteristics

Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
Threshold Current	I_{th}	-	1	2	mA	CW
Slope Efficiency	η	0.2	0.35	0.5	mW/mA	I_F=7mA
Optical Output Power	P_o	-	2.2	-	mW	I_F=7mA
Wavelength	λ_P	840	850	860	nm	I_F=7mA
Forward Voltage	V_F	-	1.8	2.3	V	I_F=7mA
Breakdown Voltage	V_B	-	-10	-	V	
Dynamic Resistance	R_d	20	35	70	Ω	I_F=7mA
Spectral Bandwidth (RMS)	$\Delta\lambda$	-	-	0.85	Nm	I_F=7mA
Beam Divergence	Θ	14	-	30	degree	I_F=7mA (Full width, $1/e^2$)

Thermal Characteristics

Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
I_{th} Temperature Variation	ΔI_{th}		1.5		mA	T_a=-40 to 85°C
η Temperature Coefficient	$\Delta\eta/\Delta T$		-0.5		%/°C	T_a=-40 to 85°C, I_f=7mA
λ Temperature Coefficient	$\Delta\lambda/\Delta T$		0.06		nm/°C	T_a=-40 to 85°C, I_f=7mA

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.