

V00002

**Assy; 2222; 680; M; 3R; M15; 5.5mW;
0.22X0.22; PLCC; 3020; 2L; Encaps; ESD**



Applications

- Biometric Sensor
- Low Light Laser Therapy
- Industrial Sensors
- Pulse Oximetry

Features:

- Package Description: SMD Plastic Package with encapsulant
- Chip Technology: GaAs VCSEL
- Laser Wavelength: 680 nm
- Optical Power Class: 5.5 mW
- Radiation Profile: Multi-Mode
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)

Ordering Information

Description	Operating Mode:	Ordering Code
	T _a = 25°C; I _F = 9 mA; DC = 100%	
Assy; 2222; 680; M; 3R; M15; 5.5mW; 0.22X0.22; PLCC; 3020; 2L; Encaps; ESD	5.5 mW	V00002



COMPLIES WITH IEC 60825-1, 3rd EDITION MAY 2014.
COMPLIES WITH 21 CFR 1040.10 AND 1040-10.11 EXCEPT FOR DEVIATIONS PURSUANT TO LASER
NOTICE NO.50 DATED 27 MAY 2001.

Maximum Ratings

$T_a = 25^\circ\text{C}$

Parameter	Symbol		Values
Operation/Solder temperature	T_S	min.	-20°C
DC = 100%		max.	50°C
Storage temperature	T_{stg}	min.	-40°C
		max.	125°C
Forward current	I_f	max.	10 mA
Direct current operation; DC = 100%; $T_S = 25^\circ\text{C}$			
Reverse Voltage	Not designed for reverse operation		
Reflow soldering temperature	T_{Ref}	max.	260°C
ESD withstand voltage	V_{ESD}	max.	2 kV
acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)			

Note: Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device.

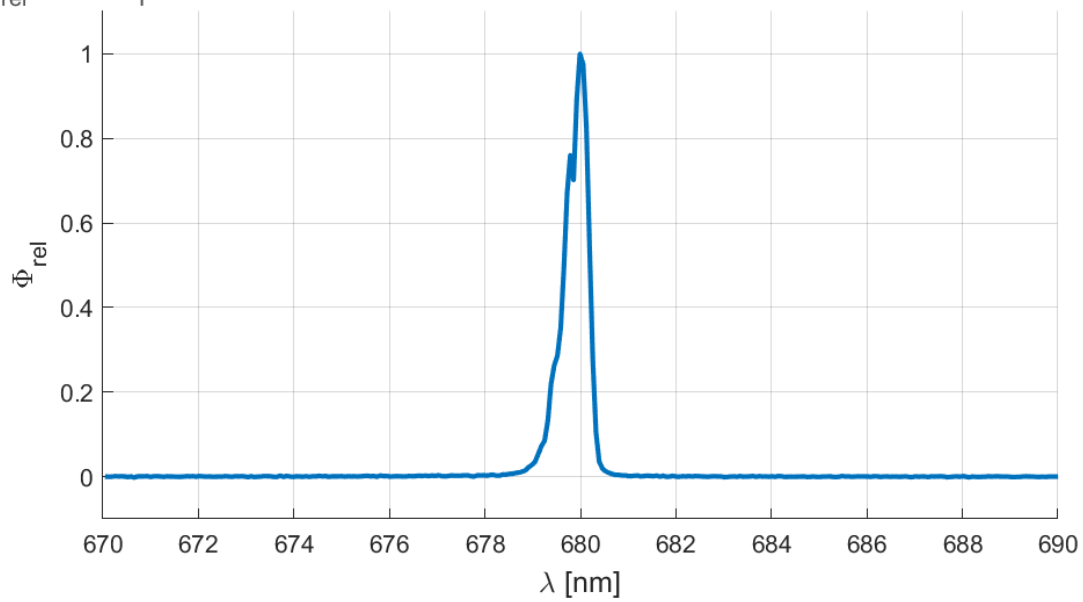
Characteristics

$T_a = 25^\circ\text{C}$, $I_F = 9 \text{ mA}$; DC = 100%

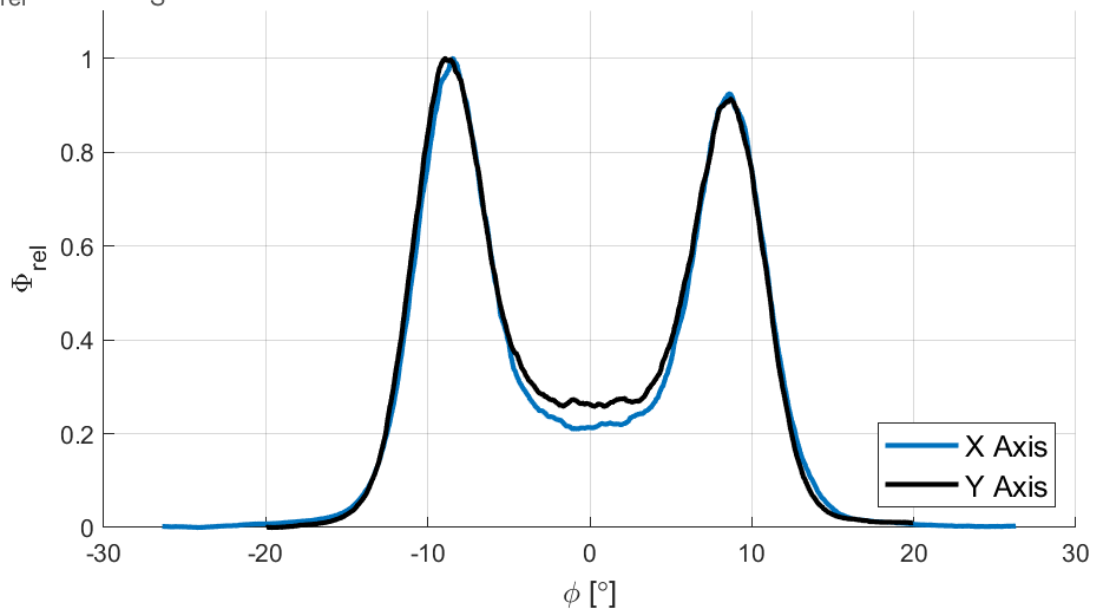
Parameter	Symbol		Values
Forward voltage	V_F	typ.	2.4 V
		max.	2.8 V
Output power	Φ	min.	4.5 mW
		typ.	5.5 mW
Threshold current	I_{th}	typ.	2.5 mA
		max.	4.0 mA
Slope efficiency	SE	typ.	0.75 W / A
Peak wavelength	λ_{peak}	min.	670 nm
		typ.	680 nm
		max.	690 nm
Spectral bandwidth at FWHM (50% of Φ_{max})	λ_{FWHM}	typ.	2 nm
Temperature coefficient of wavelength	TC_λ	typ.	0.045 nm / K
Field of view at FWHM (50% of Φ_{max})	ϕ_x	typ.	20°
	ϕ_y	typ.	20°

Relative Spectral Emission ¹⁾

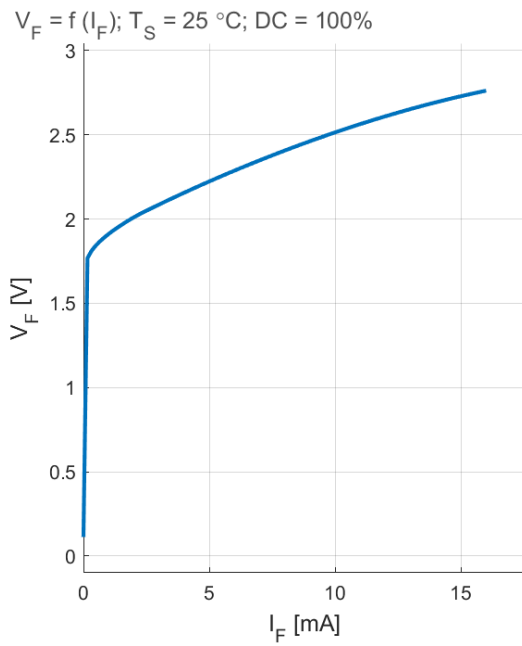
$$\Phi_{\text{rel}} = f(\lambda); I_F = 9 \text{ mA}$$

**Radiation Characteristics ¹⁾**

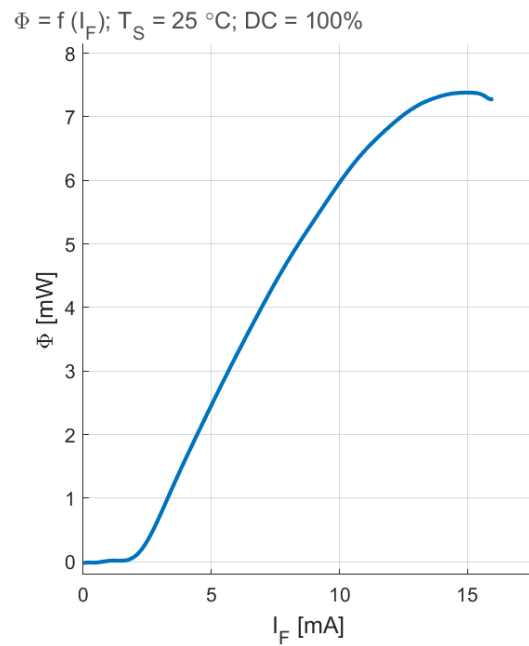
$$\Phi_{\text{rel}} = f(\phi); T_S = 25 \text{ }^\circ\text{C}$$



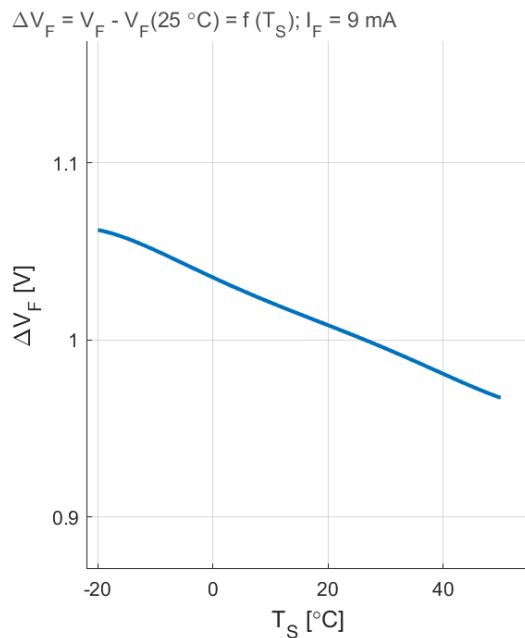
Forward Voltage ^{1) 2)}



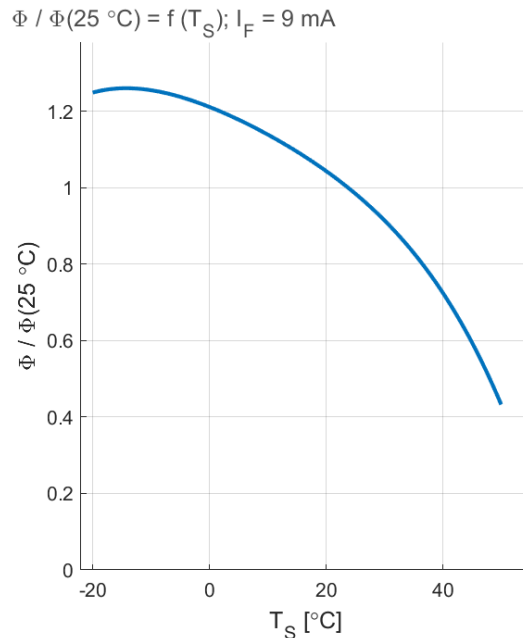
Optical Output Power ^{1) 2)}



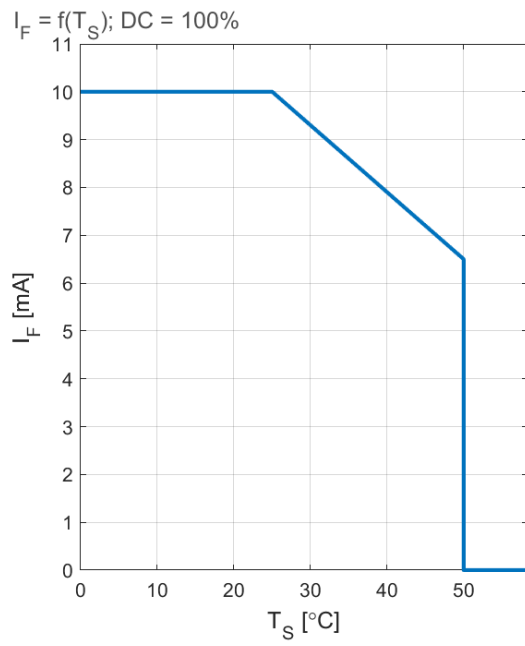
Relative Forward Voltage ¹⁾



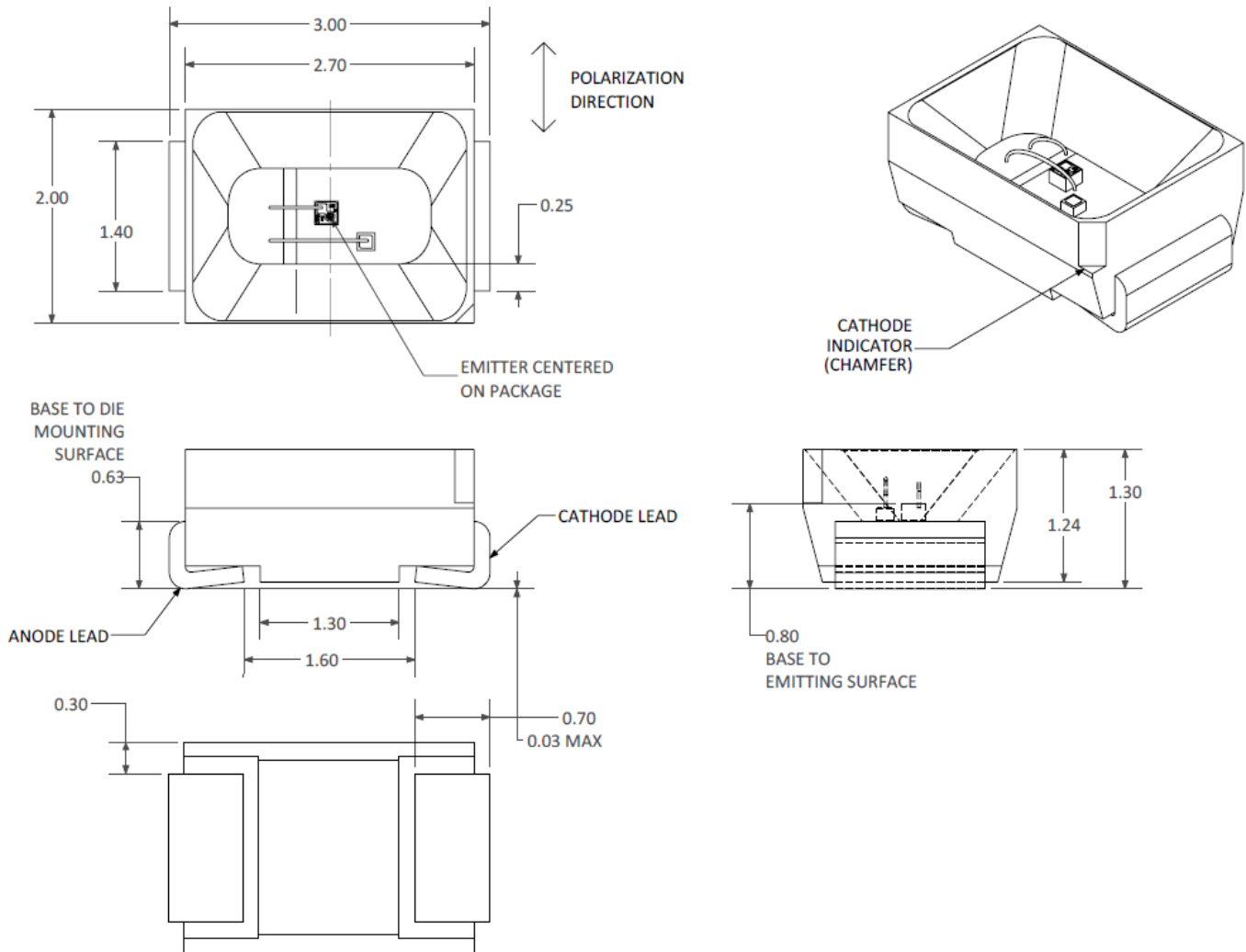
Relative Radiant Power ¹⁾



Max Permissible Current



Dimension Drawings ³⁾



MOISTURE SENSITIVITY CLASSIFICATION & HANDLING

The package should be treated as Moisture Sensitivity Level 5a (MSL 5a) prior to assembly. The shelf life in the sealed bag is 12 months at 5°C-30°C and < 60% R.H.

After the package is opened it is recommended to bake before the first use:

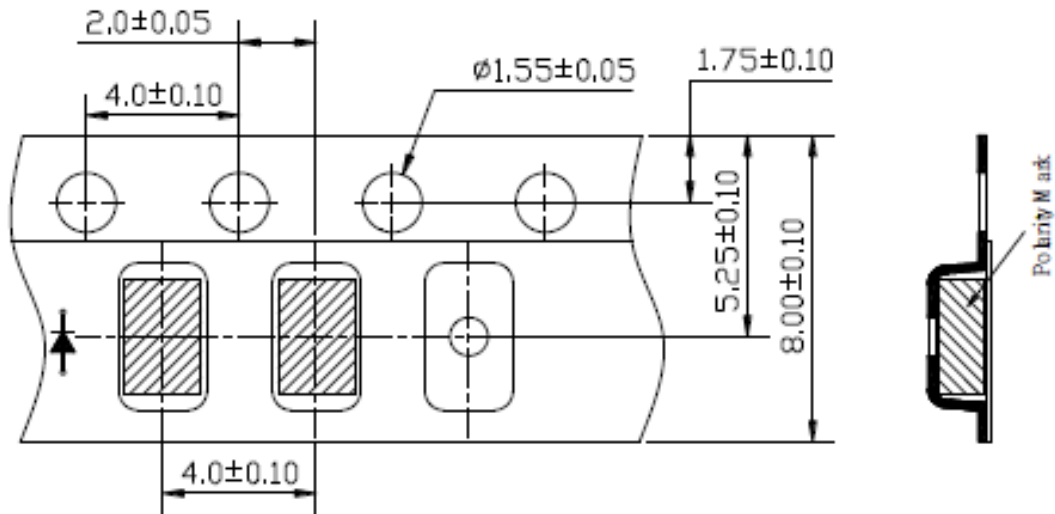
Baking condition:

1. 60°C ± 5°C for 24-48 hours and <5% R.H. in tape and reel
2. 110°C ±5°C for 8-16 hours in bulk type

The devices should be used within a week and to be stored at <20% R.H. with zip lock sealed:

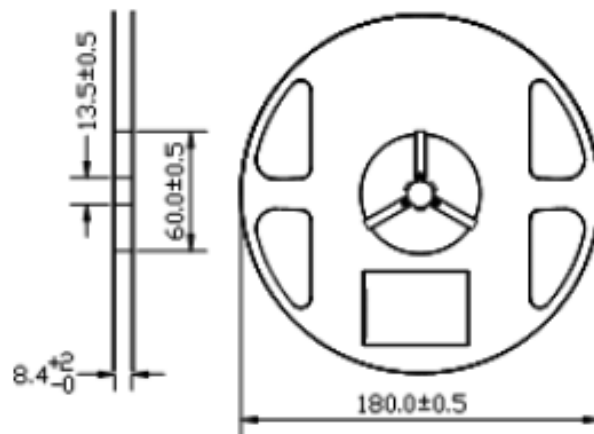
1. Baking is required before soldering when the pack is unsealed after 24 hours
2. Bake conditions as described above.

Taping ^{3) 4)}



Unit: mm

Tape and Reel ⁴⁾



Unit: mm

Pieces per PU

2500

Barcode-Product-Label (BPL)

VIXAR Vertical Cavity Surface Emitting Laser (VCSEL) Product

Model: _____

Manufacturer: VIXAR
2355 Polaris AVE N. SUITE 100
Plymouth, MN 55447 USA

Manufactured: Bare Die by VIXAR,
Fabricated or Packaged by: _____
City: _____, Country: _____

Wafer #: _____
Date Code: _____
Manufacturer Lot No.: _____
Quantity: _____

Complies with FDA/CDRH 21 CFR 1040.10 and 1040.11 except for deviations
pursuant to Laser Notice No. 50, dated June 24, 2007.

CDRH Accession No.: 1210159-000 Product Code: RDW

Notes

Depending on the mode of operation, these devices emit highly concentrated visible and non-visible light which can be hazardous to the human eye. Products which incorporate these devices must follow the safety precautions given in IEC 60825-1.

Subcomponents of this device contain, in addition to other substances, metal filled materials including silver. Metal filled materials can be affected by environments that contain traces of aggressive substances. Therefore, we recommend that customers minimize device exposure to aggressive substances during storage, production, and use. Devices that showed visible discoloration when tested using the described tests above did show no performance deviations within failure limits during the stated test duration. Respective failure limits are described in the IEC60810.

For further application related information please visit www.vixarinc.com/applications/application-notes

Glossary

- 1) **Typical Values:** Due to the special conditions of the manufacturing processes of semiconductor devices, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.
- 2) **Testing temperature:** TA = 25°C
- 3) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with ± 0.1 and dimensions are specified in mm.
- 4) **Tape and Reel:** All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.

Revision History

Version	Date	Change
0.0	April 08 - 2020	Initiation of preliminary datasheet
1.0	September 29 - 2020	Datasheet Version 1.0



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