

## Features

- 5630 IR VCSEL
- ROHS and REACH Compliant
- ESD(HBM) 8KV

## Applications

- Industrial facility applications
- Consumer Mobile
- Automotive Interior & Exterior
- 3D Sensing(TOF, Structure Light)
- Bio recognition



## Description

The INV-P53CTRIR is a low-power IR VCSEL. It is a SMD type package which can be used in various applications.

## Recommended Solder Pattern (Suggest Stencil t=0.12 mm)

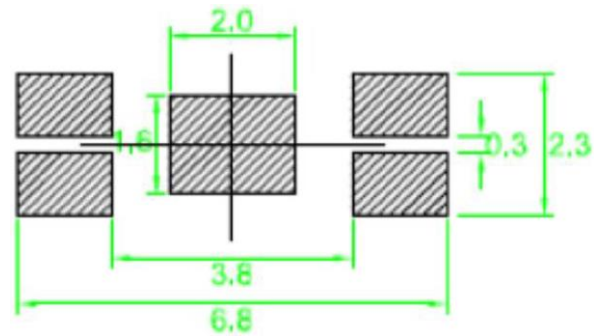


Figure1. INV-P53CTRIR Solder Pattern

## Package Dimensions in mm

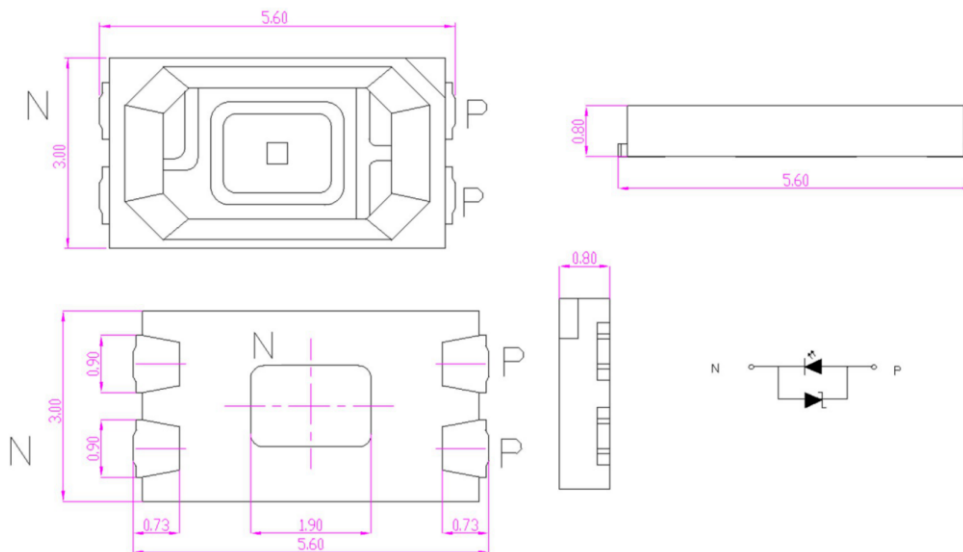


Figure 2. INV-P53CTRIR Package Dimensions

### \*Note

All dimensions are in millimeters.  
Tolerance is  $\pm 0.1$ mm unless other specified.

**Absolute Maximum Rating at 25°C** (Note 1)

Product	I <sub>FP</sub> (mA) max	P <sub>d</sub> (W) max	V <sub>R</sub> (V) Typ.	T <sub>J</sub> (°C) Typ.	T <sub>ST</sub> (°C)	R <sub>th</sub> (°C/W)	Soldering Temp. T <sub>sol</sub> (°C)	ESD HBM (V)
INV-P53CTRIR	240	0.56	-5	110 °C	-40°C~+120°C	60	260 °C	8000

**Notes**

1. For other ambient, limited setting of current will depend on de-rating curves.
2. D=0.01s duty 1/10.
3. When drive on maximum current , T<sub>J</sub> must be kept below 110°C
4. Viewing angle(2θ 1/2) ± 10°

**Electrical Characteristics** T<sub>A</sub> = 25°C (Note 1)

Product	V <sub>F</sub> (V)@200mA		Radiometric Power (mW) @200mA		Peak Wavelength (nm)		I <sub>R</sub> (μA)	View Angle
	min	max	min	max	min	max	max	2θ 1/2
INV-P53CTRIR	1.8	3.0	120	160	840	860	3	30

**\*Notes**

1. Performance guaranteed only under conditions listed in above tables.
2. Viewing angle(2θ1/2) ± 10°

**ESD Precaution**

**ATTENTION:** Electrostatic Discharge (ESD) protection



The symbol above denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based chips is necessary even though they are relatively safe in the presence of low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaN based chips are STATIC SENSITIVE devices. ESD precaution must be taken during design and assembly. If manual work or processing is needed, please ensure the device is adequately protected from ESD during the process.

Please be advised that normal static precautions should be taken in the handling and assembly of this device to prevent damage or degradation which may be induced by electrostatic discharge (ESD).

**Binning Definition (Binning@200mA)****Power Bin**

Bin Code	Min.	Max.	Unit
P84	120	160	mW

**Wavelength Bin**

Bin Code	Min.	Max.	Unit
W84	840	860	nm

**Voltage Bin**

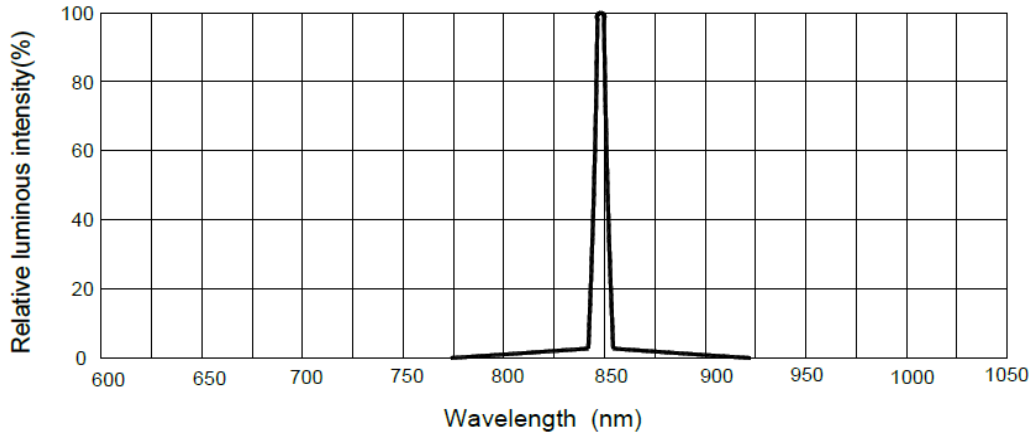
Bin Code	Min.	Max.	Unit
V1	1.8	2.2	V
V2	2.2	2.6	
V3	2.6	3.0	

**\*Notes:**

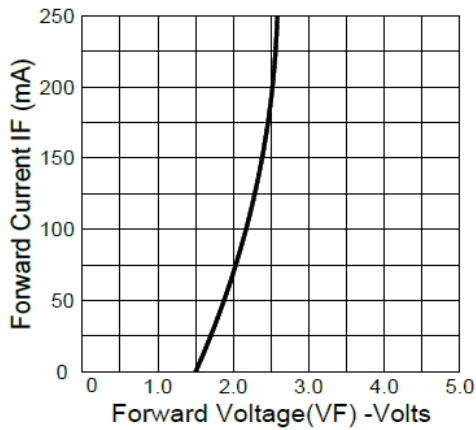
1. Radiometric Power ( $P_o$ )  $\pm 10\%$ .
2. Wavelength ( $W_p$ )  $\pm 2.0\text{nm}$
3. Forward voltage ( $V_f$ )  $\pm 0.12\text{V}$

**Electronic-Optical Characteristics**

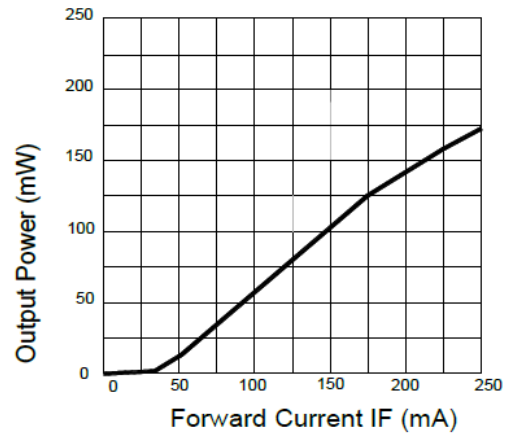
Spectrum Distribution



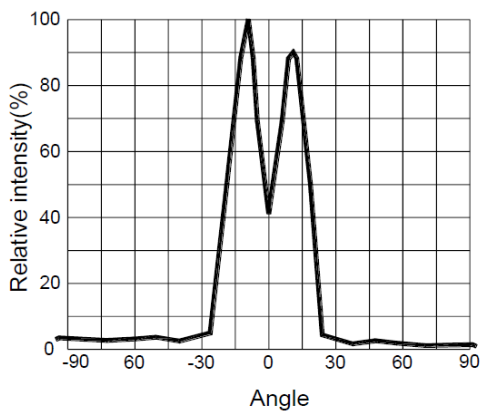
Forward Current VS. Forward Voltage



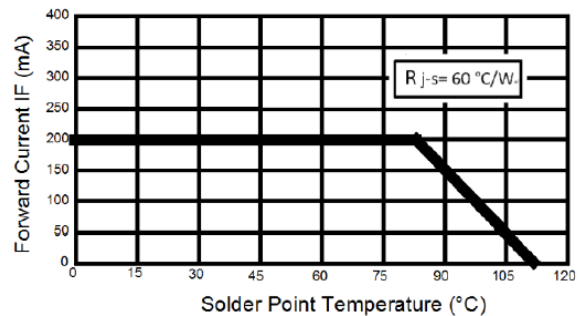
Luminous Intensity VS. Forward Current



Beam angle (2θ1/2) 30D



Thermal Design for De-rating



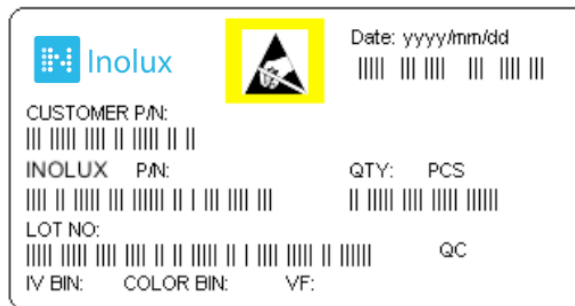
**\*Notes:**

Viewing angle (2θ1/2) ± 10°

## Ordering Information

Orderable Part Number	Peak Wavelength (nm)	Radiometric Power (mW) @200mA		Forward Voltage (V) @200mA		Viewing Angle
		Min	Max	Min	Max	
INV-P53CTRIR	840-860	120	160	1.8	3.0	30°

## Label Specifications



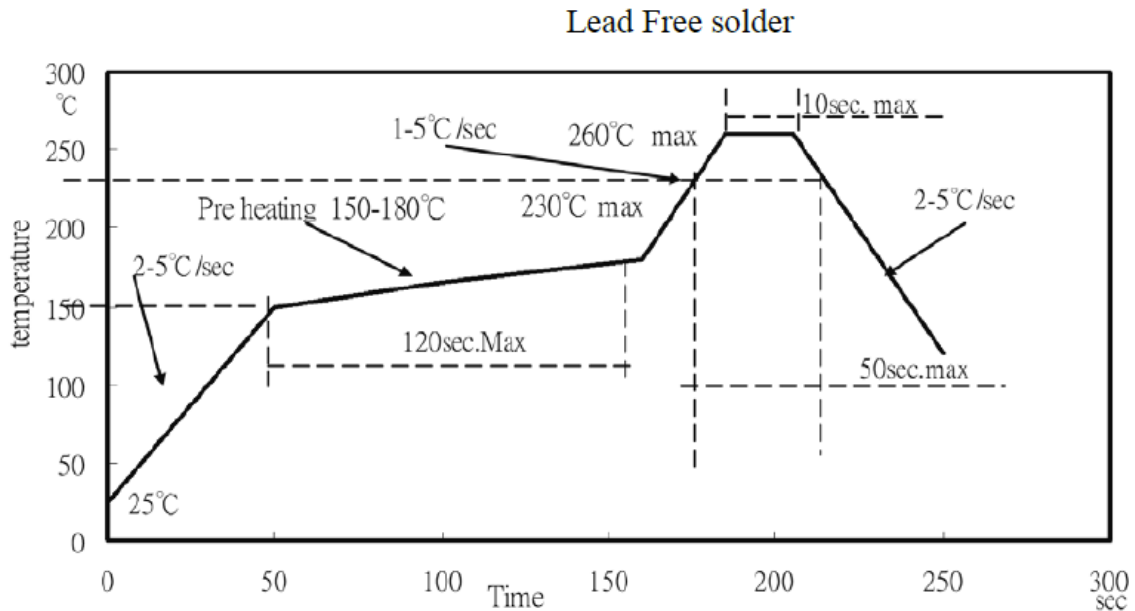
## Inolux P/N:

INV	-	P	5	3	C	T	R		IR	-	X	X	X	X
		Material	Package		Variation	Orientation	Current	Lens	Color		Customized Stamp-off			
Inolux VCSEL		P = PLCC Type	53C = 5.6 x 3.0, 120 Deg.			T = Top Mount	R = 200mA	(Blank) = Clear	IR = 850nm					

## Lot No.:

Z	2	0	1	7	01	24	001
Internal Tracker	Year (2017, 2018, .....)				Month	Date	Serial

## Reflow Soldering



### Soldering Iron

Basic Spec is  $\leq 4$  sec. when  $260^{\circ}\text{C}$  ( $+10^{\circ}\text{C} \rightarrow -1$  second). Power dissipation of Iron should be less than 15W. Surface temperature should be under  $230^{\circ}\text{C}$

### Rework

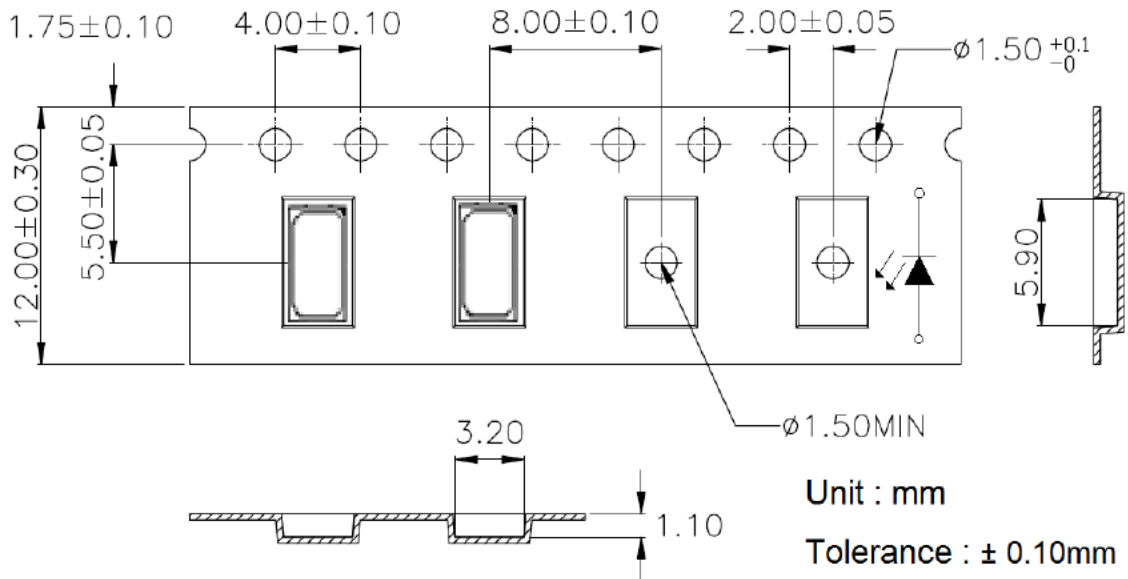
Rework should be completed within 4 second under  $245^{\circ}\text{C}$

### Notes

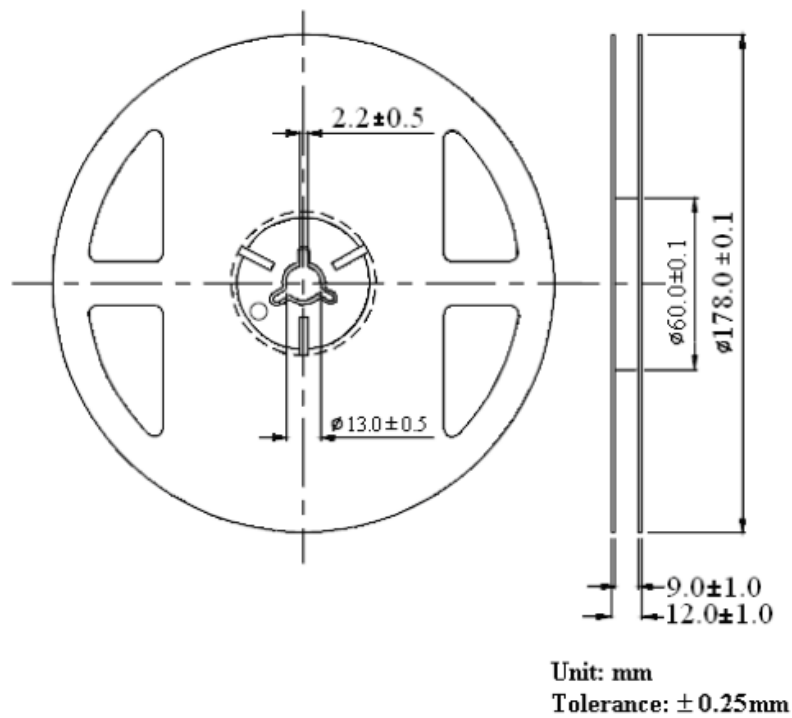
1. Do not stress the silicone resin while it is exposed to high temperature.
2. The number of reflow process should not exceed 3 times.

## Packing

**Carrier Tape Dimensions: Loaded quantity 3000pcs per reel.**



## Reel Dimensions:



## Test Items and Results of Reliability

Test Item	Test Conditions	Duration/ Cycle	Number of Damage	Reference
Thermal Shock	-40°C 30min ↑↓5min 125°C 30min	100 cycles	0/22	AECQ101
High Temperature Storage	Ta=100°C	1000 hrs	0/22	EIAJ ED-4701 200 201
Humidity Heat Storage	Ta=85°C RH=85%	1000 hrs	0/22	EIAJ ED-4701 100 103
Low Temperature Storage	Ta=-40°C	1000 hrs	0/22	EIAJ ED-4701 200 202
Life Test	Ta=25°C If=200mA	1000 hrs	0/22	Tested with Inolux standard
High Humidity Heat Life Test	85°C RH=85% If=200mA	1000 hrs	0/22	Tested with Inolux standard
High Temperature Life Test	Ta=85°C	1000 hrs	0/22	Tested with Inolux standard
ESD(HBM)	2KV at 1.5kΩ;100pf	3 Times	0/22	MIL-STD-883

Criteria for Judging the Damage				
Item	Symbol	Condition	Criteria for Judgment	
			Min	Max
Forward Voltage	VF	If=200mA	-	USL <sup>1</sup> ×1.1
Reverse Current	IR	VR =5V	-	100μA
Luminous Intensity	Iv	If=200mA	LSL <sup>2</sup> ×0.7	-

### Notes:

1. USL: Upper specification level
2. LSL: Lower specification level



## Revision History

Changes since last revision	Page	Version No.	Revision Date
Initial Release		1.0	02-03-2019
Update the Drawing and Parameter	1,2,3,4	1.1	05-13-2019
Update the Drawing	1	1.2	03-05-2021

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.