

SD100-14-21-021

High Speed 5.1mm² Silicon Photodiode

The SD100-14-21-021 is a silicon PIN photodiode with an active area of 5.1 mm² and packaged in a hermetic TO-5 metal package. This high-performance device exhibits excellent rise time and responsitivity, covering a spectral range from 350 to 1100nm, making it ideal for both visible and near-infrared applications. Its low dark current, low capacitance, and high shunt resistance ensure optimal performance in a variety of demanding applications.

Applications

- Pulse Detectors
- Optical Communications
- Bar Code Readers
- Optical Remote Control
- Medical Equipment
- High Speed Photometry

Features

- High Speed Response
- Low Capacitance
- Low Dark Current
- Wide Dynamic Range
- High Responsivity
- 5.1mm² Active Area

Absolute Maximum Ratings

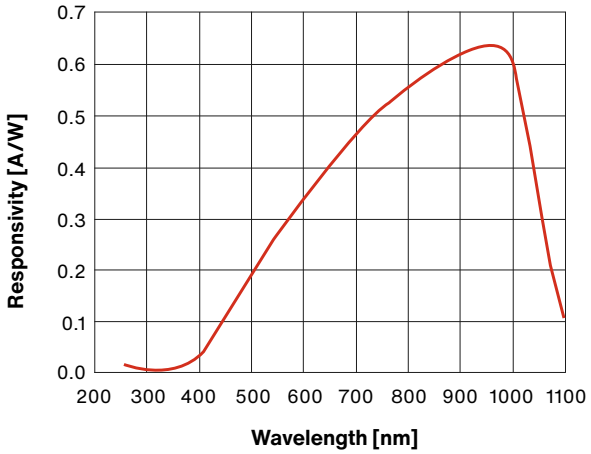
Parameter	Symbol	Min	Max	Unit
Reverse Voltage	V_R	-	50	V
Operating Temperature	T_{OP}	-40	+125	°C
Storage Temperature	T_{STG}	-55	+150	°C
Package		TO-5		

Typical Electro-Optical Specifications at T_A=23 °C

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Active Area	-	A.A.	-	5.1	-	mm^2
Active Area Dimension	-	$A.A._D$	-	2.54	-	mm
Spectral Range	Spot Scan	Δλ	350	-	1100	nm
Responsivity	λ=633nm, V_R=0V	R_λ	0.32	0.36	-	A/W
	λ=900nm, V_R=0V	R_λ	0.50	0.55	-	A/W
Capacitance	V_R=0V, F=1MHz	C_J	-	87	-	pF
	V_R=5V, F=1MHz	C_J	-	18	-	pF
Dark Current	V_R=5V	I_D	-	1.6	6.4	nA
Shunt Resistance	V_R=10mV	R_{SH}	300	-	-	MΩ
Noise Equivalent Power	V_R=5V@ λ=950nm	NEP	-	$4.0x10^{-14}$	-	W/√HZ
Rise Time*	R_L=50Ω, V_R=0V	t_R	-	190	-	ns
	R_L=50Ω, V_R=10V	t_R	-	13	-	ns

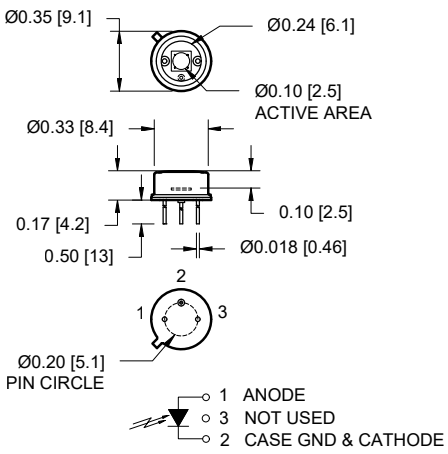
*Rise time of 10% to 90% is specified at 660nm wavelength light.

Typical Spectral Response



Mechanical Specifications

Units are in inches [mm]



General Care and Handling Instructions

Photodiodes:

Handling and Storage

- Handle Photodiodes gently to prevent damage.
- Avoid exposing Photodiodes to temperatures exceeding the storage temperature rating of the device.
- Maintain a non-condensing environment for optimum performance and lifetime.

Cleaning

- Gently clean the glass (borosilicate or quartz window) using a 50/50 mixture of Methanol and isopropyl alcohol and a soft, optical-grade pad.

Special Considerations for Plastic or Epoxy Encapsulated Photodiodes

- Protect from intense light sources such as direct sunlight.
- Avoid exposure to harsh chemicals like THINNERS, ACETONE, and TRICHLOROETHYLENE.
- Cleaning with a 50/50 mixture of Methanol and isopropyl alcohol (IPA) is recommended. Cleaning in an ultrasonic bath is generally not recommended.

CdS Photocells:

Handling and Storage

- Handle CdS Photocells gently to prevent damage.
- Avoid exposing CdS Photocells to temperatures exceeding the storage temperature rating of the device.
- Maintain a non-condensing environment for optimum performance and lifetime.

Cleaning

- Gently clean the glass or plastic covering using a 50/50
- mixture of Methanol and isopropyl alcohol and a soft, optical-grade pad.

Special Considerations

- DO NOT use Vapor Phase Soldering or Reflow Soldering for CdS components.

Optocouplers and LEDs:

Handling and Storage

- Handle Optocouplers and LEDs gently to prevent damage.
- Avoid exposing the devices to temperatures exceeding the storage temperature rating of the device.
- Maintain a non-condensing environment for optimum performance and lifetime.

Cleaning

- For plastic molded devices, cleaning with a 50/50 mixture of Methanol and isopropyl alcohol is recommended. Cleaning in an ultrasonic bath is generally not recommended.

Special Considerations

- Avoid exposing plastic molded devices or epoxy glob top devices to harsh chemicals like THINNERS, ACETONE, and TRICHLOROETHYLENE.

Electrostatic Discharge (ESD) Sensitivity:

- All devices are considered ESD-sensitive. They are shipped in ESD protective packaging. When unpacking and using these products, anti-ESD precautions should be observed.

Lead Trimming and Bending:

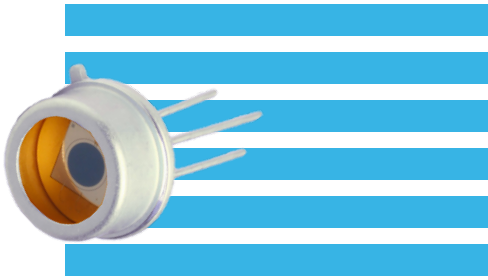
- Standard lead trimming after soldering is an acceptable practice; however, do not attempt to bend or modify the leads incorrectly, as it can damage the glass feed-through or the plastic encapsulant.

Soldering Instructions:

- Use a soldering iron with a tip temperature of 300°C max.
- Consult with your preferred solder manufacturer to determine a solder alloy and flux combination, as well as the reflow profile appropriate for your application.

General Precautions for all Devices

1. **Moisture Prevention:**
   Ensure devices are stored in a dry environment to prevent moisture ingress, which can cause damage during soldering. Refer to J-STD-20 for guidance on proper baking procedures to prevent moisture related damage.
2. **Lead Splaying:**
   If required, carefully splay the leads of the devices according to the specific application needs. Be cautious when splaying leads, as improper techniques may damage the device. Consult technical support or device datasheets for guidance on lead splaying.
3. **Mechanical Stress:**
   Handle devices with care throughout the installation process to prevent damage.
4. **Circuit Protection and Layout:**
   Optimize the circuit design and layout to ensure proper functioning and prevent damage to the devices. Include appropriate protection measures like ESD protection diodes, current-limiting resistors, and voltage regulation.
5. **After-Sale Support:**
   For troubleshooting and device-specific inquiries, please consult with our technical support team. They can offer valuable guidance and suggestions on handling, operation, and application-related questions. To reach them, please contact the Advanced Photonix Applications group at Techsupport@advancedphotonix.com.



Legal Disclaimer

Information in this data sheet is believed to be correct and reliable. However, no responsibility is assumed for possible inaccuracies or omission. Specifications are subject to change without notice.

RoHS COMPLIANT

Most of our standard catalog products are RoHS Compliant. Please contact us for details.

Unikeyic Electronics

Global Electronic Components Distributor

Click to view pricing, inventory, delivery, and lifecycle information:

Advanced Photonix:

PDV-P8006 NSL-4960 0090-3111-185 APX-SC0010 NSL-32SR3 PDB-C154SM 0050-3111-111 NORPS-12
NSL-19M51 NSL-5150 118-23-21-021 PDV-P5002 PDV-P9008 NSL-32SR2 PDB-V615-2 PDV-P9002
PDV-P9200 PDV-P9203 SD200-12-22-041 PDV-P8101 100-12-22-021 NSL-5540 NSL-5910
SD019-141-411-G 100-41-21-231 PDV-P9004 019-111-411 019-141-411-G 076-14-21-011 PDB-C613-2