



# Silicon APD Detection Module ST-APD



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## Silicon APD Detection Module-ST-APD

Our photon counting module ST-APD is an ultra-sensitive photon counting module based on Si-APD electric detector. The detection band covers 200 -1060 nm, ST-APD can work in linear mode and geiger mode and the gain is over 60 dB in geiger mode. The unique high-performance active suppression circuit of ST-APD can realize continuous single-photon detection, and can be loaded with detection gates of arbitrary width and period. The circuit achieves avalanche suppression greater than 20 dB , maximizing the performance state of the ST-APD. The detection efficiency at 700 nm band exceeds 60%, with dark count 200-500 cps and dead time less than 50ns.

The effective photosensitive detection area of ST-APD standard model can reach up to 500  $\mu\text{m}$ , The single photon counting signal is converted into a digital TTL signal inside the module and sent out through the SMA interface. Highly integrated modular design facilitates OEM application and industrial integration.



ST-APD works at as low as  $-20^{\circ}\text{C}$  low temperature environment through internal cooling module to achieve the best signal-to-noise ratio. The refrigeration module is controlled by a highly efficient TEC and the control accuracy can reach  $\pm 0.2^{\circ}\text{C}$ .

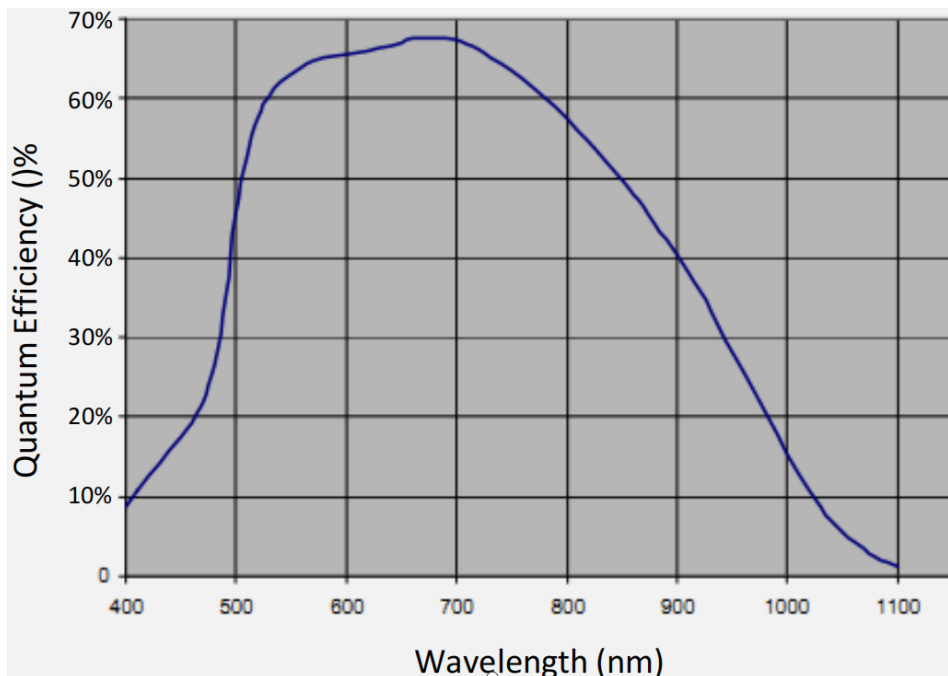
### Feature

- High detection efficiency: 65% @ 700 nm
- 500  $\mu\text{m}$  photosensitive area
- LVTTTL digital signal output
- Low dark count
- Low afterpulse
- Low timing jitter

### Application

- Fluorescence measurement
- Laser ranging
- Quantum communication
- Quantum optics
- Spectral measurement
- Photon correlation
- Adaptive optics

## Spectral Response



## Terms of Use

- Incorrect voltage may damage the module, please ensure that the power supply is connected correctly.
- APD is a high-sensitivity photodetection device. In the avalanche state, the intensity of the input light signal should be controlled. Excessive light intensity may damage the APD, which may reduce the detection sensitivity of the APD, and even cause diode breakdown in severe cases.
- In special application scenarios, it should be ensured that the operating temperature of the module does not exceed 50 °C. Excessive temperature may cause a temperature increase in APD operating temperature, which causes dark count levels to increase.
- The default dead time of ST-APD is 50ns . The dead time setting will affect the maximum count rate of the module. When the dead time is set at 50ns, the standard value of the count rate is 10Mcps. If your application has special requirements for the dead time setting, please contact us when ordering.
- Similarly, the pulse width of the output signal will also affect the maximum count rate, the typical pulse width is 30ns, if your application has special requirements on the output signal, please contact us when ordering.
- ST-APD supports space and optical fiber interface access.

## Specification

| Parameter                                    | Minimum Value | Typical Value                                       | Maximum Value | Unit |
|--|---------------|---|---------------|------|
| Supply Voltage                               | /             | 12  | /             | V    |
| Supply Current                               | /             | 0.5   | /             | A    |
| Spectral Response Range                      | 200           | /   | 1060          | nm   |
| Detection Efficiency                         | /             | @200nm: 2<br>@700nm: 65<br>@850nm: 45<br>@1060nm: 3 | /             | %    |
| Dark Count                                   | 200           | /   | 500           | cps  |
| Dead Time                                    | /             | 50  | /             | ns   |
| Afterpulse                                   | 3             | 5   | 8             | %    |
| Saturation Count Rate                        | /             | 10  | 15            | Mcps |
| Photosensitive Area                          | /             | 500   | /             | μm   |
| APD Refrigeration Temperature                | /             | -20   | /             | °C   |
| Operating Temperature                        | -15           | /   | 50            | °C   |
| Output Signal Level Standard                 | /             | LVTTL   | /             | /    |
| Output Signal Pulse Width                    | 5             | 30  | /             | ns   |
| Gate Pulse Input Level (Disable = LVTTL Low) | 0             | /   | 0.4           | V    |
| Gate Pulse Input Level (Enable = LVTTL High) | 2             | /   | 3.3           | V    |
| Gate Pulse Frequency                         | /             | /   | 5000          | kHz  |
| Power Consumption                            | /             | 5   | 8             | W    |

**Note:**

1.5V voltage input can be customized

2. The given saturation count rate is the result of the default setting , changing the output pulse width or dead time will change the saturation count rate.