

# APD430 Series Avalanche Photodetector



## ❖ OVERVIEW

Avalanche Photodetector (APD) Offer Higher Sensitivity and Lower Noise Than Standard PIN Detectors for Low Optical Power Applications, Our detectors integrate a temperature sensor to adjust the bias voltage to compensate for the effect of temperature changes on the M factor. The detector is powered by a single power supply, easy to use, designed for spatial coupling, and can be equipped with FC optical connectors.

## ❖ FEATURES

- ◆ M-factor temperature compensation
- ◆ APD overcurrent protection
- ◆ Low noise
- ◆ DC9-12V single supply operation
- ◆ All-metal shell with excellent shielding performance
- ◆ M6 threaded holes for easy installation
- ◆ Free space coupling, 30mm optical cage system mounting holes

## ❖ APPLICATIONS

- ◆ Detect ultra-weak light signals
- ◆ Detect fast laser pulses

- ◆ Lidar
- ◆ Non-destructive testing
- ◆ Industrial testing
- ◆ Analytical instruments

## ❖ SPECIFICATIONS

| Item                          | APD430A-400M                          | APD430C-400M                 |
|-------------------------------|---------------------------------------|------------------------------|
| Detector                      | Si                                    | InGaAs                       |
| Wavelength Range              | 400-1100nm                            | 1000-1700nm                  |
| Optical Input                 | Free-Space                            | Free-Space                   |
| Active Area                   | 230um                                 | 200um                        |
| Peak Response                 | 55A/W @ 905nm (M = 100)               | 18A/W @ 1550nm (M = 20)      |
| Bandwidth                     | DC-400MHz                             | DC-400MHz                    |
| Rise Time                     | 0.9ns                                 | 0.9ns                        |
| Maximum conversion gain       | $5.5 \times 10^5 \text{V/W}$          | $1.8 \times 10^5 \text{V/W}$ |
| Comprehensive noise           | 15nW (RMS)                            | 40nW (RMS)                   |
| Saturated optical power       | 5.5uW                                 | 16.7uW                       |
| Noise voltage @ 50 $\Omega$   | <18mVpp                               | <18mVpp                      |
| Maximum output amplitude@ HiZ | 3V                                    | 3V                           |
| Work voltage                  | 9-12VDC                               |                              |
| Work current                  | <200mA                                |                              |
| Output connector              | SMA                                   |                              |
| Output impedance              | 50 $\Omega$                           |                              |
| Output coupling mode          | DC                                    |                              |
| Work temperature              | -20~60℃                               |                              |
| Storage temperature           | -40~85℃                               |                              |
| Package Size                  | 60mm x 50mm x 32mm (长 x 宽 x 厚, 不含连接器) |                              |

| Item                          | APD430A-200M                 | APD430C-200M                 |
|-------------------------------|------------------------------|------------------------------|
| Detector                      | Si                           | InGaAs                       |
| Wavelength Range              | 400-1100nm                   | 1000-1700nm                  |
| Optical Input                 | Free-Space                   | Free-Space                   |
| Active Area                   | 230um                        | 200um                        |
| Peak Response                 | 55A/W @ 905nm (M = 100)      | 18A/W @ 1550nm (M = 20)      |
| Bandwidth                     | DC-200MHz                    | DC-200MHz                    |
| Rise Time                     | 1.8ns                        | 1.8ns                        |
| Maximum conversion gain       | $1.2 \times 10^6 \text{V/W}$ | $4.0 \times 10^5 \text{V/W}$ |
| Comprehensive noise           | 7nW (RMS)                    | 21nW (RMS)                   |
| Saturated optical power       | 2.5uW                        | 7.5uW                        |
| Noise voltage @ 50 $\Omega$   | <12mVpp                      | <12mVpp                      |
| Maximum output amplitude@ HiZ | 3V                           | 3V                           |
| Work voltage                  | 9-12VDC                      |                              |
| Work current                  | <200mA                       |                              |

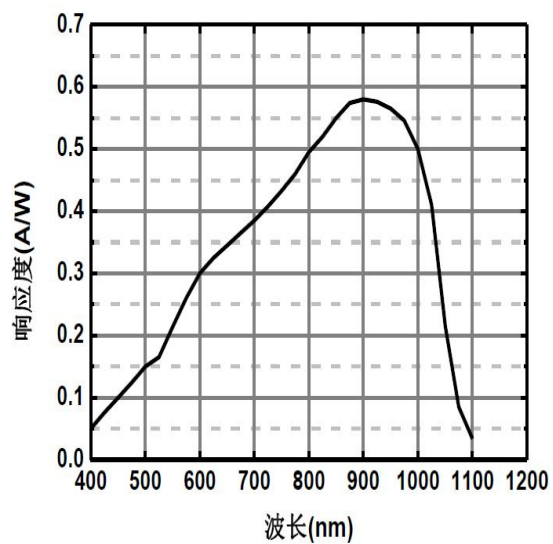
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|----------------------|---------------------------------------|
| Output connector     | SMA                                   |
| Output impedance     | 50 $\Omega$                           |
| Output coupling mode | DC                                    |
| Work temperature     | -20~60℃                               |
| Storage temperature  | -40~85℃                               |
| Package Size         | 60mm x 50mm x 32mm (长 x 宽 x 厚, 不含连接器) |

| Item                          | APD130A-50M                           | APD130C-50M             |
|-------------------------------|---------------------------------------|-------------------------|
| Detector                      | Si                                    | InGaAs                  |
| Wavelength Range              | 400-1100nm                            | 1000-1700nm             |
| Optical Input                 | Free-Space                            | Free-Space              |
| Active Area                   | 500um                                 | 500um                   |
| Peak Response                 | 27A/W @ 905nm (M = 50)                | 18A/W @ 1550nm (M = 20) |
| Bandwidth                     | DC-50MHz                              | DC-50MHz                |
| Rise Time                     | 9ns                                   | 9ns                     |
| Maximum conversion gain       | 3.0x10 <sup>6</sup> V/W               | 2.0x10 <sup>6</sup> V/W |
| Comprehensive noise           | 3.7nW (RMS)                           | 5.5nW (RMS)             |
| Saturated optical power       | 1.0uW                                 | 1.5uW                   |
| Noise voltage @ 50 $\Omega$   | <15mVpp                               | <15mVpp                 |
| Maximum output amplitude@ HiZ | 3V                                    | 3V                      |
| Work voltage                  | 9-12VDC                               |                         |
| Work current                  | <200mA                                |                         |
| Output connector              | SMA                                   |                         |
| Output impedance              | 50 $\Omega$                           |                         |
| Output coupling mode          | DC                                    |                         |
| Work temperature              | -20~60℃                               |                         |
| Storage temperature           | -40~85℃                               |                         |
| Package Size                  | 60mm x 50mm x 32mm (长 x 宽 x 厚, 不含连接器) |                         |

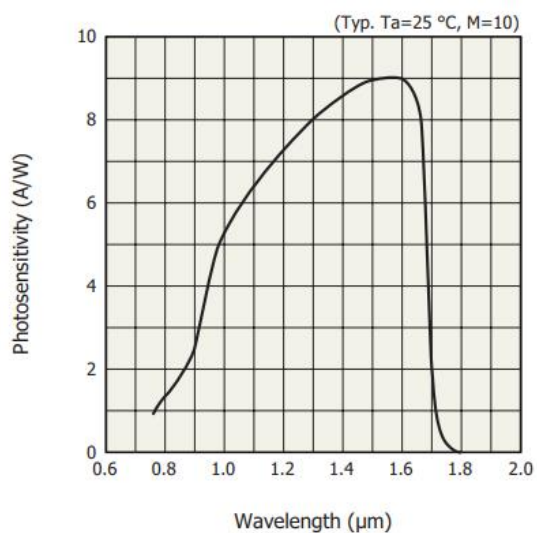
| Item                          | APD410A-10M             | APD410C-10M             |
|-------------------------------|-------------------------|-------------------------|
| Detector                      | Si                      | InGaAs                  |
| Wavelength Range              | 400-1100nm              | 1000-1700nm             |
| Optical Input                 | Free-Space              | Free-Space              |
| Active Area                   | 500um                   | 500um                   |
| Peak Response                 | 55A/W @ 905nm (M = 100) | 18A/W @ 1550nm (M = 20) |
| Bandwidth                     | DC-10MHz                | DC-10MHz                |
| Rise Time                     | 36ns                    | 36ns                    |
| Maximum conversion gain       | 3.0x10 <sup>7</sup> V/W | 9.8x10 <sup>6</sup> V/W |
| Comprehensive noise           | 0.8nW (RMS)             | 2.3nW (RMS)             |
| Saturated optical power       | 0.1uW                   | 0.3uW                   |
| Noise voltage @ 50 $\Omega$   | <18mVpp                 | <18mVpp                 |
| Maximum output amplitude@ HiZ | 3V                      | 3V                      |
| Work voltage                  | 9-12VDC                 |                         |
| Work current                  | <200mA                  |                         |
| Output connector              | SMA                     |                         |

|                      |                                       |
|----------------------|---------------------------------------|
| Output impedance     | 50 $\Omega$                           |
| Output coupling mode | DC                                    |
| Work temperature     | -20~60℃                               |
| Storage temperature  | -40~85℃                               |
| Package Size         | 60mm x 50mm x 32mm (长 x 宽 x 厚, 不含连接器) |

## ❖ RESPONSE CURVE



Response curve of Si detector



Response curve of InGaAs detector

## ❖ MECHANICAL DRAWING

