Avalanche Photodiodes

For Industrial
& Analytical Applications

Avalanche Photodiodes – Silicon APDs

Applications

- Laser range finder
- Scanning video imager
- Confocal microscope
- Free space communication
- Spectrophotometers
- Fluorescence detection
- Luminometer
- DNA sequencer
- Particle sizing

Features and Benefits

- Low noise
- High gain
- High quantum efficiency
- Built-in TE-cooler option
- Various optical input options
- Customization available upon request

Product Description

These rear entry "reach-through" silicon APDs offer the best compromise in terms of cost and performance for applications requiring high speed and low noise photon detection from 400 nm up to 1100 nm. They feature low noise, high quantum efficiency and high gain while maintaining reasonably low operating voltage. The active area varies from 0.5 mm to 3 mm to accommodate a large variety of applications.

The "S" series of the C30902 family of APDs can be used in either their normal linear mode ($V_R < V_{BR}$) or for photon counter in the Geiger mode ($V_R > V_{BR}$). This series is particularly well-suited for ultra-sensitive photon measurements in biomedical and analytical instruments. Precise temperature control can be achieved with a thermo-electric cooler which can be used to improve noise and responsivity or to maintain constant responsivity over a wide range of ambient temperature.

These APDs can also be incorporated into a hermetically-sealed TO-8 package with ultra-low noise preamplifier (C30659 series APD receivers) and thermo-electric cooler (LLAM series receivers) for optimum signal to noise performance.

Technical Specification

Avalanche Photodiodes – Silicon APDs

Unit	Active Diameter mm	Capacitance pF	Rise/Fall Time ns	Dark Current nA	Breakdown Voltage min V	Breakdown Voltage max V	Temp. Coefficient V/°C	Typical Gain	Responsivity 830 nm A/W	Responsivity 900 nm A/W	Responsivity 1060 nm A/W	NEP fW/√Hz	Package
C30817EH	0.8	2	2	50	300	475	2.2	120	-	75	-	13	TO-5
C30884E	0.8	4	1	100	190	290	1.1	100	-	63	8	13	TO-5
C30902BH	0.5	1.6	0.5	15	185	265	0.7	150	77	60	-	3	Ball lens TO-18
C30902EH	0.5	1.6	0.5	15	185	265	0.7	150	77	60	-	3	TO-18, flat window
C30902EH-2	0.5	1.6	0.5	15	185	265	0.7	150	77	60	-	3	TO-18, built-in 905 nm filter
C30902SH	0.5	1.6	0.5	15	185	265	0.7	250	128	108	-	0.9	TO-18, flat window
C30902SH-2	0.5	1.6	0.5	15	185	265	0.7	250	128	108	-	0.9	TO-18, built-in 905 nm filter
C30916EH	1.5	3	3	100	315	490	2.2	80	-	50	12	20	TO-5
C30954EH	0.8	2	2	50	300	475	2.4	120	-	75	36	13	TO-5
C30955EH	1.5	3	2	100	315	490	2.4	100	-	70	34	14	TO-5
C30956EH	3	10	2	100	325	500	2.4	75	-	45	25	25	TO-8

Product Table

Silicon APD – TE-Cooled

Unit	Active Diameter mm	Active Area mm²	Total Capacitance pF	Rise/Fall Time ns	Dark Current nA	Breakdown Voltage min V	Breakdown Voltage max V	Temperature Coefficient	Typical Gain	Responsivity 830 nm A/W	Responsivity 900 nm A/W	Responsivity 1060 nm A/W	Noise Current pA/sqrt(Hz)	Package
C30902SH-TC	0.5	0.2	1.6	0.5	2	225	-	0.7	250	128	108	-	0.04	TO-8 flange
C30902SH-DTC	0.5	0.2	1.6	0.5	1	225	-	0.7	250	128	108	-	0.02	TO-8 flange
C30954EH-TC	0.8	0.5	2	2	8	300	475	2.4	120	-	75	-	0.2	TO-8 flange
C30955EH-TC	1.5	1.8	3	2	15	315	490	2.4	100	-	70	-	0.2	TO-8 flange
C30956EH-TC	3	7	10	2	15	325	500	2.4	75	-	45	-	0.2	TO-8 flange

TC stands for single stage cooler, operating temperature 0° C
DTC stands for double stage cooler, operating temperature -20° C

Graph 1

Typical Spectral Responsivity @ 22° C

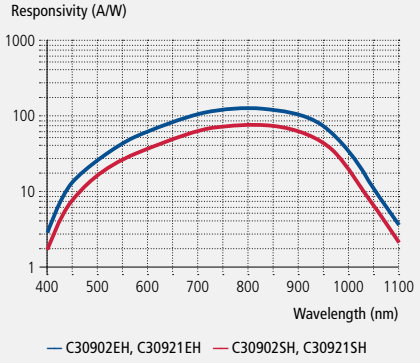


Figure 1

Package Drawing – TO-8 Flange

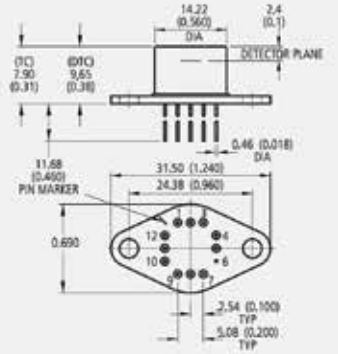


Figure 2

Typical TO-5 Package*

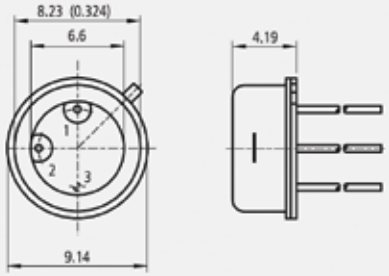


Figure 3

Typical TO-8 Package*

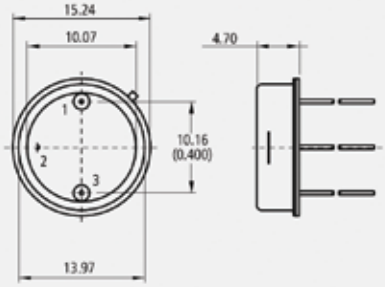
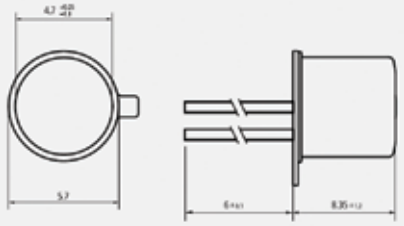


Figure 4

Typical TO-18 Package*



*Note: Package dimensions for indication only. Exact package dimensions can be found on products datasheets.