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25-GHz photodetectors

Responsivity
Frequency Response
Model 141X Impulse Response
Model 143X Impulse Response

Model 14XX-15XX
Model 14XX

Model 14XX

Model 1411
Model 1414
Model 1417_PT1
Model 1417_PT2
Model 1431
Model 1434
Model 1437_PT1
Model 1437_PT2

Model 1411M
Model 1414M
Model 1417M_PT1
Model 1417M_PT2
Model 1431M
Model 1434M
Model 1437M_PT1
Model 1437M_PT2

Comparison of Fast Photodetector Response Measurements by Optical Heterodyne and Pulse Response Techniques

Monolithic Integrated Circuits for Millimeter Wave Instrumentation

Selection and Application of High-Speed Photodetectors

High-Speed Detectors: Faster Measurements for Today's Laboratory

go to characteristics

See Model 148X for 850 nm optimized versions.

New Focus Model 14XX photodetectors were designed to offer the ideal combination of high-speed performance (up to 25 GHz) and optical-input flexibility. These high-speed photodetectors show flat response in both amplitude and phase up to 25 GHz and are optimized for frequency-domain applications. For time-domain applications, we recommend our 144X and 145X photodetectors.

An internal microwave housing suppresses noise, pick-up, and other artifacts. Moreover, to limit damage due to excessive voltage or mishandling, these photodiodes have damage-resistant bias circuits and are powered by an easily replaceable internal 9-V battery. All these detectors come equipped with a DC-bias monitor that has a transimpedance gain of 1 mV/µA and a 50-kHz bandwidth. By combining these detectors with our Model 1422 traveling-wave amplifier, you can detect microwatt optical signals with 20-GHz bandwidth and minimal distortion.

Choose from ST and FC single-mode or multimode fiber-optic connectors, or a free-space option. With optical-fiber input, the photodiode module can be connected directly to an electronic instrument, eliminating the need for an expensive high-frequency microwave cable. Multimode versions have fiber-optic input with 50-µm core fiber and an internal GRIN lens focusing onto the detector. (Just specify "-50" after the model number for the multimode option.) In these versions, chromatic dispersion of the GRIN lens decreases the usable wavelength range.

25-GHz Near-IR Photodetectors

141X

The high-sensitivity 141X Series near-IR photodetectors use 25-µm-diameter back-illuminated InGaAs Schottky photodiodes with peak responsivities of 0.6 A/W at 1300 nm. The active layer is twice as thick as in our ultrahigh-speed 101X module, producing a 50% greater responsivity between 950 nm and 1650

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Application Note 1: Insights Into High-Speed Detectors and High-Frequency Techniques

Demand for High-Speed Detectors Drives Research

Photodiode-Based Detector Operates at 60 GHz

aspheric lenses
20-GHz traveling-wave amplifiers
electrical accessories
Triple-Divide translation stages
pint-sized Triple-Divide translation stages
fixed pedestal system

nm. The conversion gain with a 50-W load is 15 V/W.

25-GHz Broadband Photodetectors

143X

The broadband 143X Series photodetectors use 25-µm-diameter photodiodes with greater than 0.1-A/W responsivity from 400 to 1650 nm. The front-illuminated semi-transparent InGaAs Schottky diodes are anti-reflection-coated for peak transmission near 530 nm. This design eliminates the short wavelength cutoff found in InGaAs PIN detectors. For multimode versions, the wavelength range is 550-1330 nm. NOTE: for 850 nm applications, see our new Models 148X.

25-GHz Near-IR Photodetectors

Model#	1411	1414	1417
Wavelength Range	950-1650 nm	950-1650 nm	950-1650 nm
Wavelength Range (multimode versions)	950-1650 nm	950-1650 nm	950-1650 nm
3-dB Bandwidth	25 GHz	25 GHz	25 GHz
Rise Time	17 ps	17 ps	17 ps
Maximum Conversion Gain	15 V/W	15 V/W	15 V/W
Typical Maximum Responsivity	0.6 A/W	0.6 A/W	0.6 A/W
Output Impedance	50 W	50 W	50 W
Minimum NEP	30 pW/	30 pW/	30 pW/
cw Saturation Power	2 mW	2 mW	2 mW
Maximum Pulse Power	100 mW	100 mW	100 mW
Detector Material/Type	InGaAs/Schottky	InGaAs/Schottky	InGaAs/Schottky
Detector Diameter	25 µm	25 µm	25 µm
Power Requirements	internal 9-V battery	internal 9-V battery	internal 9-V battery
Optical Input	ST	FC	FS
Electrical Output	Wiltron K	Wiltron K	Wiltron K
Price (Domestic)	US$4,300.00	US$4,300.00	US$3,800.00

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Price (International)	US$4,730.00	US$4,730.00	US$4,180.00
50 Micron Multimode Version	add -50 to Model # and US$250.00 ($275.00 International)	add -50 to Model # and US$250.00 ($275.00 International)	add -50 to Model # and US$250.00 ($275.00 International)
Metric Version	add M to Model #	add M to Model #	add M to Model #

25-GHz Broadband Photodetectors

Model#	**1431**	**1434**	**1437**
Wavelength Range	400-1650 nm	400-1650 nm	400-1650 nm
Wavelength Range (multimode versions)	550-1330 nm	550-1330 nm	550-1330 nm
3-dB Bandwidth	25 GHz	25 GHz	25 GHz
Rise Time	17 ps	17 ps	17 ps
Maximum Conversion Gain	5 V/W	5 V/W	5 V/W
Typical Maximum Responsivity	0.2 A/W	0.2 A/W	0.2 A/W
Output Impedance	50 W	50 W	50 W
Minimum NEP	90 pW/	90 pW/	90 pW/
cw Saturation Power	10 mW	10 mW	10 mW
Maximum Pulse Power	200 mW	200 mW	200 mW
Detector Material/Type	InGaAs/Schottky	InGaAs/Schottky	InGaAs/Schottky
Detector Diameter	25 µm	25 µm	25 µm
Power Requirements	internal 9-V battery	internal 9-V battery	internal 9-V battery
Optical Input	ST	FC	FS
Electrical Output	Wiltron K	Wiltron K	Wiltron K
Price (Domestic)	US$4,300.00	US$4,300.00	US$3,600.00
Price (International)	US$4,730.00	US$4,730.00	US$3,960.00
50 Micron Multimode Version	add -50 to Model # and US$250.00 ($275.00 International)	add -50 to Model # and US$250.00 ($275.00 International)	add -50 to Model # and US$250.00 ($275.00 International)
Metric Version	add M to Model #	add M to Model #	add M to Model #

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