



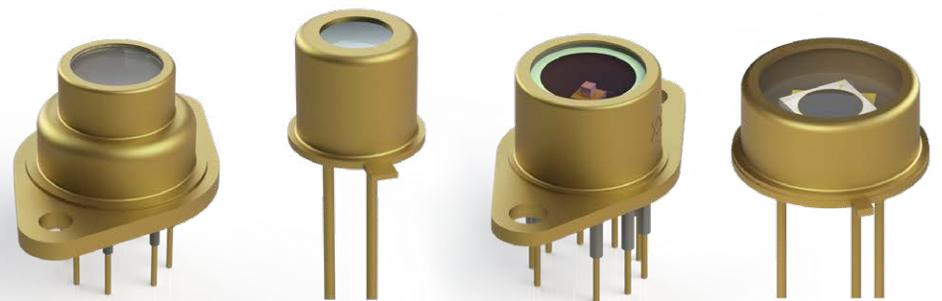
Teledyne Judson Technologies

InAs Detectors

A Guide to InAs Detectors



Room Temperature: To 3.8 μm
TE Cooled: To 3.8 μm



ADVANTAGES OF InAs ROOM-TEMPERATURE AND TE-COOLED DETECTORS

Teledyne Judson Technologies' InAs (Indium Arsenide) detectors are available in both room temperature and TE-cooled configurations, operate with a cut-off wavelength of 3.8 μm . Unlike photoconductive sensors used in the 1.0-3.8 μm wavelength region, InAs operates in the photovoltaic mode and does not require a bias for operation. This makes InAs the better choice for DC and low-frequency applications, as it does not exhibit the low-frequency or "1/f" noise characteristic of HgCdTe photoconductors.

KEY TECHNOLOGY FEATURES & APPLICATIONS

Features

- Diode sensitivity, speed of response, impedance, and peak wavelength can be optimized by operation at the proper temperature
- Available in a variety of convenient packages for room temperature and thermoelectrically cooled operation
- Can be ordered integrated with an amplifier and TE controller for easy integration

Applications

- InAs offers superior pulse response for applications in monitoring and detecting high-speed pulsed lasers
- Laser Warning Receivers
- Process Control Monitors
- Temperature Sensors
- Pulsed Laser Monitors
- Infrared Spectroscopy
- Power Meters

CUSTOM DESIGN SERVICES

For more demanding applications, Teledyne Judson's team of engineers will provide custom design services.

Please contact us with your special requirements.



PRECISION AND PERFORMANCE

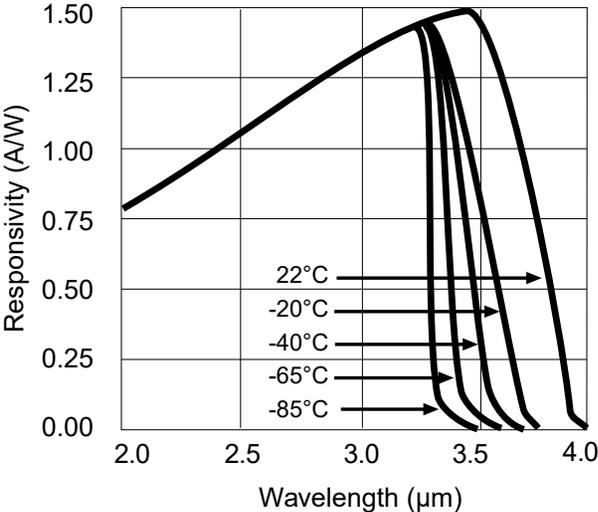
J12 series

The **J12 series** are high-performance Indium Arsenide (InAs) detectors that operate with a longwave cutoff near 3.8 μm . These detectors provide fast rise time, uniform response, excellent sensitivity, and long-term reliability for a wide range of applications.

DEVICE OPTIONS

Teledyne's InAs detectors, the **J12 series**, offer high reliability and performance in the spectral range from 1.0 to 3.8 μm . The **J12TE** series features a one- to four-stage thermoelectric cooler for optimum device temperature and performance. These detectors are designed for applications requiring high signal-to-noise or sensitivity to low signals, such as process temperature monitoring and infrared spectroscopy.

The diagram below shows the typical response for the J12 series at various temperatures.



Package Options

The **J12 series** offers several packaging options:

TO-18, 37, 66, 3: Compact design for space-constrained applications encompassing room temperature to four-stage TE cooling.

We also offer different window materials, lenses, or optical filter options to enhance the detector's performance by modifying the light that reaches it. For more demanding applications, Teledyne's team of engineers can provide custom design services. Please contact us with your special requirements.

Accessories

For a complete system, Teledyne offers a range of accessories to enhance the performance of InAs sensors. These include the TC9 temperature controller, a RoHS compliant, self-contained unit for single and multistage TEC-cooled photodetectors. For TO-66 and TO-3 packaged sensors, Teledyne offers heat sink assemblies such as the HSAMP (heatsink and amplifier), CM Assembly (heatsink and temperature controller), and CMAMP package (heatsink, temperature control, and amplifier). These accessories ensure optimal operating conditions and improved signal quality for your detectors.

For further details, please visit our website.



InAs

ROOM TEMPERATURE AND TE-COOLED

Description	Active Size Diameter (mm)	Operating Temperature	50% Cutoff Wavelength (μm), $\pm 0.1 \mu\text{m}$	Peak Responsivity (A/W) min	Package	Shunt Impedance (Ohm) typ	Capacitance (pF) @ 0V typ	Peak D* (cm Hz ^{1/2} / W) @ 1K Hz min	NEP (W/r t-Hz) @ peak wavelength max
J12-18C-R250U	0.25	22	3.6	1.5	18C 	300	50	3.70E+09	6E-12
J12-18C-R01M	1	22	3.6	1		25	400	2.70E+09	3.3E-11
J12-5AP-R02M	2	22	3.6	0.8	5AP	10	1600	2.50E+09	7.1E-11
J12TE1-37S-R250U	0.25	-20	3.5	1.5	37S	3000	50	1.30E+10	1.8E-12
J12TE1-66D-R250U	0.25	-20	3.5	1.5	66D	3000	50	1.30E+10	1.8E-12
J12TE1-37S-R01M	1	-20	3.5	1.5	37S	300	400	1.60E+10	5.6E-12
J12TE1-66D-R01M	1	-20	3.5	1.5	66D	300	400	1.60E+10	5.6E-12
J12TE1-37S-R02M	2	-20	3.5	1.25	37S	90	1600	1.30E+10	1.3E-11
J12TE2-66D-R250U	0.25	-40	3.45	1.5	66D 	2.40E+04	50	3.20E+10	6.9E-13
J12TE2-66D-R01M	1	-40	3.45	1.5		2.40E+03	400	4.10E+10	2.2E-12
J12TE2-66D-R02M	2	-40	3.45	1.5		500	1600	4.10E+10	4.4E-12
J12TE3-66D-R250U	0.25	-65	3.4	1.5		3.20E+05	50	1.20E+11	1.8E-13
J12TE3-66D-R01M	1	-65	3.4	1.5		2.00E+04	400	1.20E+11	7.1E-13
J12TE3-66D-R1.5M	1.5	-65	3.4	1.5		1.00E+04	800	1.30E+11	1E-12
J12TE3-66D-R02M	2	-65	3.4	1.5	5.00E+03	1600	1.20E+11	1.4E-12	
J12TE4-3CN-R250U	0.25	-85	3.3	1.5	3CN 	8.00E+05	50	2.10E+11	1.1E-13
J12TE4-3CN-R01M	1	-85	3.3	1.5		5.00E+04	400	2.10E+11	4.3E-13
J12TE4-3CN-R02M	2	-85	3.3	1.5		1.30E+04	1600	2.10E+11	8.4E-13

A wealth of knowledge and broad product line to help address today's pressing challenges in the infrared.

All of our semiconductor fabrication and product manufacture operations are located in our Montgomeryville, Pennsylvania facility. We are proud to be a US-based semiconductor company, providing our customers the highest standards of quality, performance, and value.

In addition to Teledyne Judson InAs products, we offer a wide range of high-performance standard, custom and space-qualified detectors and accessories.

FOCUSED ON INFRARED SENSING

Teledyne Judson Technologies is a world leader in the design and manufacture of high-performance infrared (IR) sensors. Some of the most prestigious and challenging scientific space missions, such as the James Webb Space Telescope (JWST) and the Perseverance Mars Rover, benefit from our superior performance and reliability. Beyond these missions, Teledyne sensors have been helping OEMs and researchers solve challenging problems across the infrared spectrum since 1969.

DEVELOPING TOP-QUALITY PRODUCTS FOR LEADING OEMs

When working with Teledyne Judson Technologies, clients benefit from our ability to handle the entire value chain in IR sensor technology, from the wafer substrate to packaging and software. Our customers rely on us for solutions ranging from standard imaging products to custom products integrated with electronics and camera systems.



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