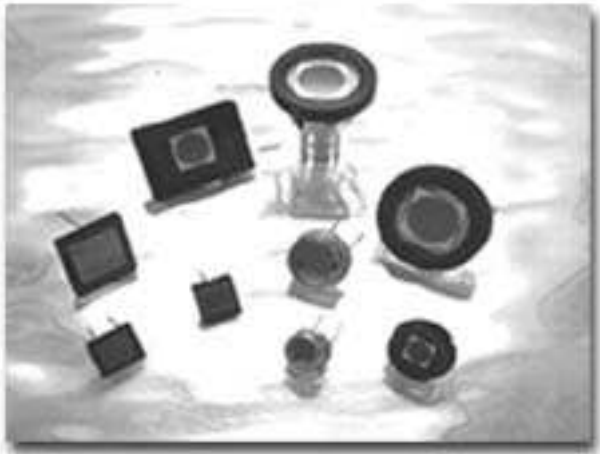


# UV ENHANCED SERIES

## INVERSION LAYERS AND PLANAR DIFFUSED SILICON PHOTODIODES



UDT Sensors offers two distinct families of UV enhanced silicon photodiodes. Inversion channel series and planar diffused series. Both families of devices are especially designed for low noise detection in the UV region of electromagnetic spectrum.

Inversion layer structure UV enhanced photodiodes exhibit 100% internal quantum efficiency and are well suited for low intensity light measurements. They have high shunt resistance, low noise and high breakdown voltages. The response uniformity across the surface and quantum efficiency improves with 5 to 10 volts applied reverse bias. In photovoltaic mode (unbiased), the capacitance is higher than diffused devices but decreases rapidly with an applied reverse bias. Photocurrent non-linearity sets in at lower photocurrents for inversion layer devices compared to the diffused ones. They represent highly stable responsivity under temperature changes up to 700 nm.

Planar diffused structure UV enhanced photodiodes show significant advantages over inversion layer devices, such as lower capacitance and higher response time. These devices exhibit linearity of photocurrent up to higher light

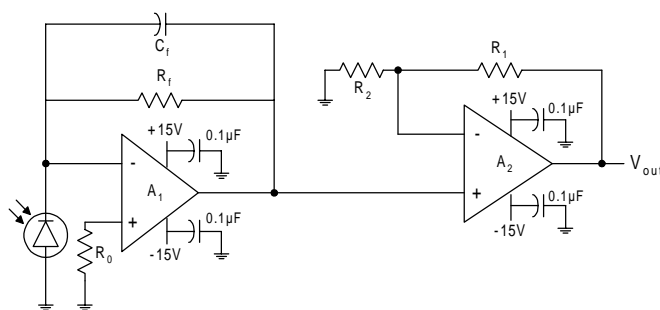
APPLICATIONS	FEATURES
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| <ul style="list-style-type: none"><li>• Pollution Monitoring</li><li>• Medical Instrumentation</li><li>• UV Exposure Meters</li><li>• Spectroscopy</li><li>• Water Purification</li><li>• Fluorescence</li></ul> | <ul style="list-style-type: none"><li>• Inversion series:<ul style="list-style-type: none"><li>100% Internal QE</li></ul></li><li>• Ultra High <math>R_{SH}</math></li><li>• Planar Diffused Series:<ul style="list-style-type: none"><li>IR Suppressed</li><li>High Speed Response</li><li>High Stability</li></ul></li><li>• Excellent UV response</li></ul> |
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input power compared to inversion layer devices.

They have relatively lower responsivities and quantum efficiencies compared to inversion layer devices. There are two types of planar diffused UV enhanced photodiodes available: UVD and UVE. Both series have almost similar electro-optical characteristics, except in the UVE series, where the near IR responses of the devices are suppressed. This is especially desirable if blocking the near IR region of the spectrum is necessary. UVD devices peak at 970 nm and UVE devices at 720 nm (see graph). Both series may be biased for lower capacitance, faster response and wider dynamic range. Or they may be operated in the photovoltaic (unbiased) mode for applications requiring low drift with temperature variations. The UVE devices have a higher shunt resistance than their counterparts of UVD devices, but have a higher capacitance.

These detectors are ideal for coupling to an OP-AMP in the current mode configuration as shown below.



For further details, refer to the "Photodiode Characteristics" section of the catalog.

Model No.	Active Area		Responsivity (A/W)		Capacitance (pF)	Shunt Resistance (MΩ)		NEP (W/√Hz)	Reverse Voltage (V)	Rise Time (μs)	Operating Current (mA)	Temp Range (°C)		Package Style ¶
	Area (mm²)	Dimension (mm)	254 nm		0 V	-10 mV		0V 254 nm		0 V 254 nm 50 Ω		Operating	Storage	
			min	typ	typ	min	typ	typ		max				

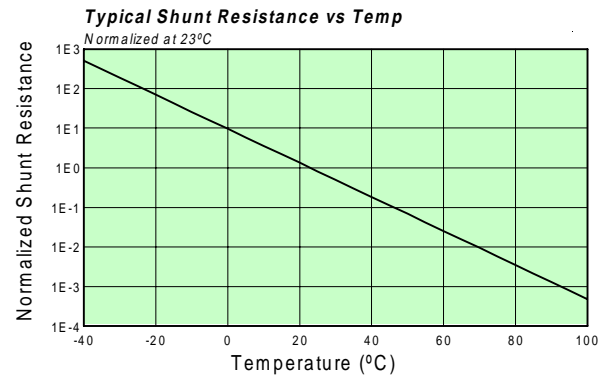
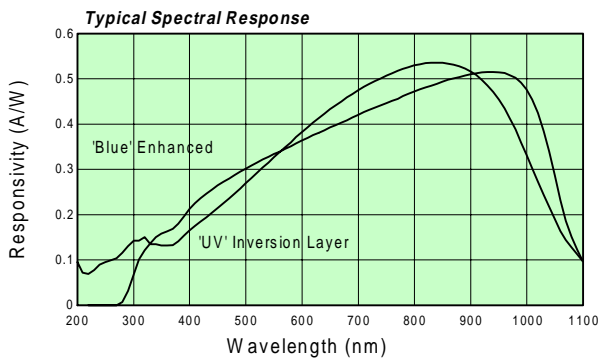
**UV ENHANCED SERIES, METAL PACKAGE**

UV-001	0.8	1.0 φ	.09	.14	60	250	500	6.4 e -14	5	0.2	0.1	-20 ~ +60	-55 ~ +80	5 / TO-5															
UV-005	5.1	2.54 φ			300	80	200	1.0 e -13		0.9																			
UV-015	15	3.05 x 3.81			800	30	100	1.4 e -13		2.0																			
UV-20	20	5.08 φ			1000	25	50	2.0 e -13		2.0																			
UV-35	35	6.60 x 5.33			1600	20	30	1.7 e -13		3.0																			
UV-50	50	7.87 φ			.09	.14	2500	10		20				2.6 e -13	5	0.1	-10 ~ +60	-20 ~ +70	11 / BNC										
UV-50L *																			10 / LoProf										
UV-100	100	11.28 φ																	.09	.14	4500	5	10	4.5 e -13	5	0.1	-10 ~ +60	-20 ~ +70	11 / BNC
UV-100L																													10 / LoProf

**UV ENHANCED SERIES, PLASTIC PACKAGE §**

FIL-UV005	5.1	2.54 φ	.09	.14	300	50	100	9.2 e -14	5	0.9	0.1	-10 ~ +60	-20 ~ +70	14 / Plastic
FIL-UV20	20	5.08 φ			1000	20	50	1.3 e -13		2.0				
UV-35P	35	6.60 x 5.33			1600	15	30	1.7 e -13		3.0				
FIL-UV50	50	7.87 φ			2500	10	20	2.1 e -13		3.5				
FIL-UV100	100	11.28 φ			4500	5	10	2.9 e -13		5.9				15 / Plastic

\* The I or L suffix on the model number is indicative of the photodiode chip being isolated from the package by an additional pin connected to the case.  
 § The photodiode chips in FIL series are isolated in a low profile plastic package. They have a large field of view as well as in line pins.



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Model No.	Active Area		Peak Wavelength (nm)	Responsivity (A/W)			Capacitance (pF)		Shunt Resistance (GΩ)		NEP (W/√Hz)	Reverse Voltage (V)	Rise Time (μs)		Temp Range (°C)		Package Style †	
	Area (mm²)	Dimension (mm)		254 nm	633 nm	930 nm	0 V	-10 mV	0V	254 nm			0 V	254 nm	50Ω	Operating		Storage
				typ	typ	typ	typ	min	typ	typ			max	typ				

**UVE SERIES METAL PACKAGE**

Model No.	Area (mm²)	Dimension (mm)	Peak Wavelength (nm)	254 nm	633 nm	930 nm	Capacitance (pF) @ 0V	Capacitance (pF) @ -10mV	Shunt Resistance (GΩ)	NEP (W/√Hz)	Reverse Voltage (V)	Rise Time (μs) @ 0V	Rise Time (μs) @ 254nm	Temp Range (°C)	Package Style †					
UV-005E	5.7	2.4 sq	720	0.10	0.33	0.17	200	0.50	10	1.3 e -14	5	0.15	-20 ~ +60	-55 ~ +80	5 / TO-5					
UV-013E	13	3.6 sq														400	0.40	5	1.8 e -14	0.30
UV-035E	34	5.8 sq														1000	0.20	1	4.1 e -14	0.80

**UVE SERIES CERAMIC PACKAGE**

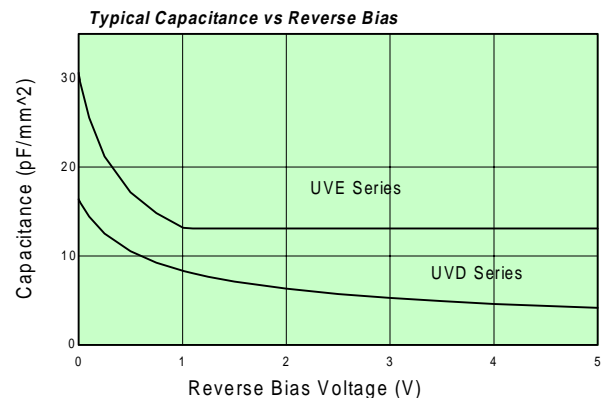
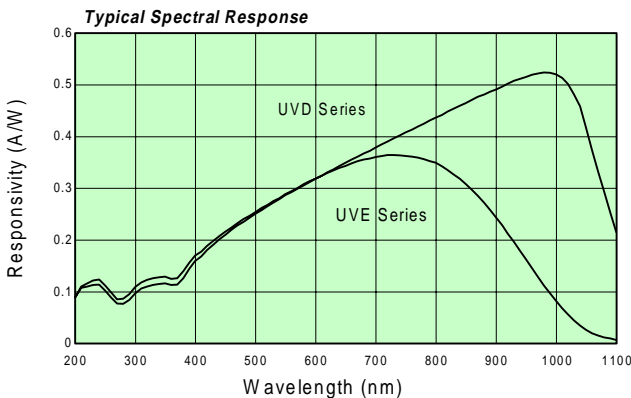
Model No.	Area (mm²)	Dimension (mm)	Peak Wavelength (nm)	254 nm	633 nm	930 nm	Capacitance (pF) @ 0V	Capacitance (pF) @ -10mV	Shunt Resistance (GΩ)	NEP (W/√Hz)	Reverse Voltage (V)	Rise Time (μs) @ 0V	Rise Time (μs) @ 254nm	Temp Range (°C)	Package Style †					
UV-005EC	5.7	2.4 sq	720	0.10	0.33	0.17	200	0.50	10	1.3 e -15	5	0.15	-20 ~ +60	-20 ~ +80	24/Ceramic					
UV-035EC	34	5.8 sq														1000	0.20	1	4.1 e -14	0.80
UV-100EC	100	10 sq														2500	0.10	0.50	5.8 e -14	1.00

**UVD SERIES METAL PACKAGE**

Model No.	Area (mm²)	Dimension (mm)	Peak Wavelength (nm)	254 nm	633 nm	930 nm	Capacitance (pF) @ 0V	Capacitance (pF) @ -10mV	Shunt Resistance (GΩ)	NEP (W/√Hz)	Reverse Voltage (V)	Rise Time (μs) @ 0V	Rise Time (μs) @ 254nm	Temp Range (°C)	Package Style †					
UV-005D	5.7	2.4 sq	970	0.10	0.33	0.50	100	0.30	4	2.0 e -14	5	0.10	-20 ~ +60	-55 ~ +80	5 / TO-5					
UV-013D	13	3.6 sq														225	0.20	2	2.8 e -14	0.20
UV-035D	34	5.8 sq														550	0.10	0.50	5.6 e -14	0.40

**UVD SERIES CERAMIC PACKAGE**

Model No.	Area (mm²)	Dimension (mm)	Peak Wavelength (nm)	254 nm	633 nm	930 nm	Capacitance (pF) @ 0V	Capacitance (pF) @ -10mV	Shunt Resistance (GΩ)	NEP (W/√Hz)	Reverse Voltage (V)	Rise Time (μs) @ 0V	Rise Time (μs) @ 254nm	Temp Range (°C)	Package Style †					
UV-005DC	5.7	2.4 sq	970	0.10	0.33	0.50	100	0.30	4	2.0 e -14	5	0.10	-20 ~ +60	-20 ~ +80	24/Ceramic					
UV-035DC	34	5.8 sq														550	0.10	0.5	5.6 e -14	0.20
UV-100DC	100	10 sq														1750	0.04	0.20	9.1 e -14	1.00



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