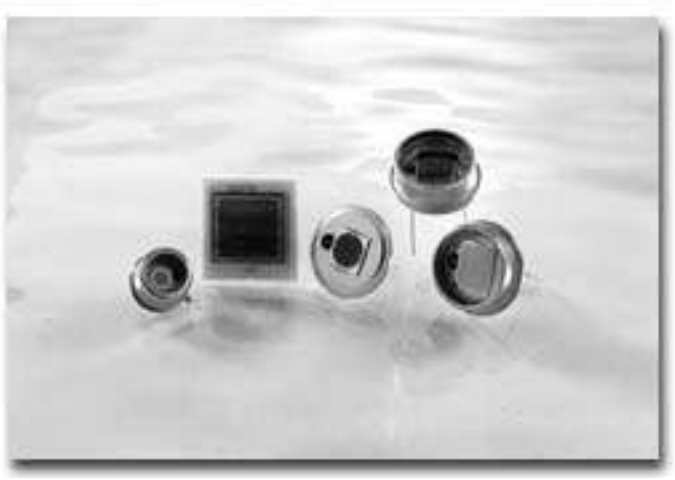
SOFT X-RAY, FAR UV ENHANCED SERIES

INVERSION LAYER SILICON PHOTODIODES



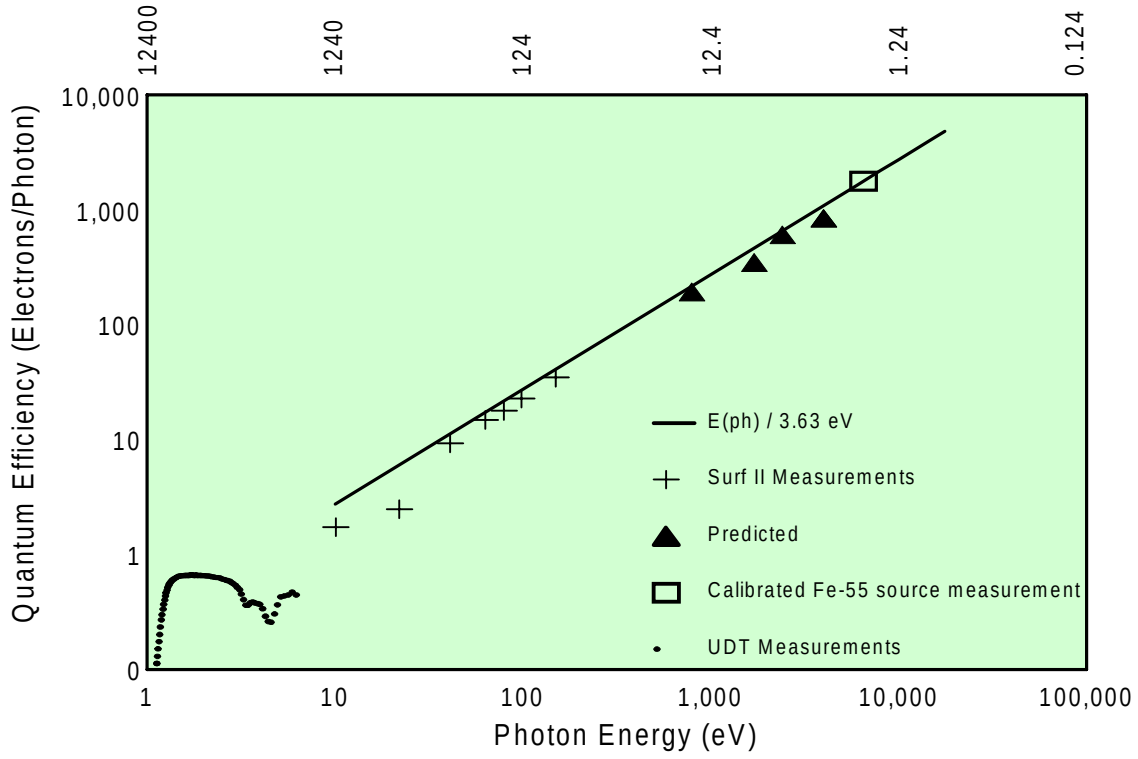
APPLICATIONS	FEATURES
• Electron Detection	• Direct Detection
• Medical Instrumentation	• No Bias Needed
• Dosimetry	• High Quantum Efficiency
• Radiation Monitoring	• Low Noise
• X-ray Spectroscopy	• High Vacuum Compatible
• Charged Particle Detection	• Cryogenically Compatible
	• 0.070 nm to 1100 nm Wavelength Range

UDT Sensors' 1990 R&D 100 award winning X-UV detector series are a unique class of silicon photodiodes designed for additional sensitivity in the X-Ray region of the electromagnetic spectrum without use of any scintillator crystals or screens. Over a wide range of sensitivity from 200 nm to 0.07 nm (6 eV to 17,600 eV), one electron-hole pair is created per 3.63eV of incident energy which corresponds to extremely high stable quantum efficiencies predicted by Eph/3.63eV (See graph below). For measurement of radiation energies above 17.6 keV, refer to the "Fully Depleted High Speed and High Energy Radiation Detectors" section.

A reverse bias can be applied to reduce the capacitance and increase speed of response. In the unbiased mode, these detectors can be used for applications requiring low noise and low drift. These detectors are also excellent choices for detecting light wavelengths between 350 to 1100 nm.

The detectors can be coupled to a charge sensitive preamplifier or low-noise op-amp as shown in the circuit on the next page.

Typical Quantum Efficiency



Model No.	Active Area		Capacitance (nF)		Shunt Resistance (MΩ)		NEP (W/√Hz)		Temp Range (°C)		Package Style ¶
	Area (mm^2)	Dimension (mm)	0 V		-10 mV		0V 200 nm		Operating	Storage	
			typ	max	min	typ	typ	max			
XUV SERIES METAL PACKAGE											
XUV-005	5	2.565 ϕ	0.3	0.5	200	2000	2.9 e -15	9.1 e -15	-20 ~ +60	-20 ~ +80	21 / TO-5
XUV-020	20	5.00 ϕ	1.2	1.6	50	500	5.8 e -15	1.8 e -14			22 / TO-8
XUV-035	35	6.78 x 5.59	2	3	30	300	7.4 e -15	2.3 e -14			
XUV-100	100	11.33 ϕ	6	8	10	100	1.3 e -14	4.1 e -14			27 / BNC
XUV SERIES CERAMIC PACKAGE											
XUV-50C	50	8.02 ϕ	2	3	20	200	9.1 e -15	2.9 e -14	-20 ~ +60	-20 ~ +80	24 / Ceramic
XUV-100C	100	10.00 sq	6	8	10	100	1.3 e -14	4.1 e -14			

All XUV devices are supplied with removable windows.

For MECHANICAL DRAWINGS Click Here

In this circuit example, the pre-amplifier is a FET input op-amp or a commercial charge sensitive preamplifier. They can be followed by one or more amplification stages, if necessary. The counting efficiency is directly proportional to the incident radiation power. The reverse bias voltage must be selected so that the best signal-to-noise ratio is achieved.

For low noise applications, all components should be enclosed in a metal box. Also, the bias supply should be either simple batteries or a very low ripple DC supply.

Amplifier: OPA-637, OP-27 or similar

R_f: 10 MΩ to 10GΩ
R_s: 1 MΩ; Smaller for High Counting Rates
C_f: 1pF
C_d: 1pF to 10 µF

OUTPUT $V_{out} = Q / C_f$

Q, is the Charge Created by One Photon or One Particle