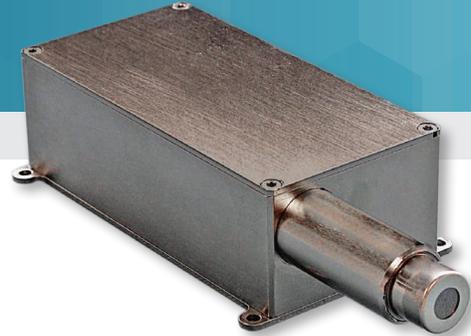




SXD30M-150-500

X-PIPS™ Detector (SDD)



KEY FEATURES

Detector System Includes:

- Silicon Drift Detector (SDD)
- Be Window
- Preamplifier
- HV Bias Supply
- Peltier Cooler
- Temperature Controller

APPLICATIONS

- X-ray Spectroscopy
- X-ray Fluorescence
- X-ray Diffraction
- Mössbauer Spectroscopy
- Densitometry
- Many More

PERFORMANCE

- Active Area – 30 mm²
- Thickness – 0.5 mm
- Resolution <145 eV (FWHM)*
- Energy Range – 1 to 30 keV

DESCRIPTION

The X-PIPS Detector is a spectroscopy sub-system sensitive to X-rays and low-energy gamma rays. It comprises a hermetically sealed silicon drift detector (SDD) element with a low noise FET assembly and Peltier cooler, a reset type preamplifier, a HV bias supply, and a temperature controller. The detector element and FET are cooled and regulated to a stable temperature, ensuring stable operation in changing environmental conditions. The Beryllium entrance window is standard 0.5 mil.

The preamplifier has a digitally controlled reset mechanism providing fast reset time and excellent count rate performance. A reset inhibit signal is available to prevent storage of spurious pulses due to transient reset effects. The width of the inhibit output pulse can be set from 10 µs to 650 µs.

The energy resolution is guaranteed within an ambient temperature range of +10 °C to +30 °C with the default factory settings.

The X-PIPS Detector has an internal multilayer collimator for improved peak to background.

Model	Active Area (mm ²)	Collimator	PTB		Energy Resolution FWHM (eV)*	
			Typical	Min	Typical	Max
					@ Optimum Rise Time	
SXD30M-150-500	30	Multilayer	15000	>12000	135 eV	145 eV

* Energy resolution is given at 5.9 keV (Mn-Kα), with an ambient temperature ranging from +10 °C to +30 °C, on a digital spectroscopy system with trapezoid shaping filter. Cooled at -35°C.

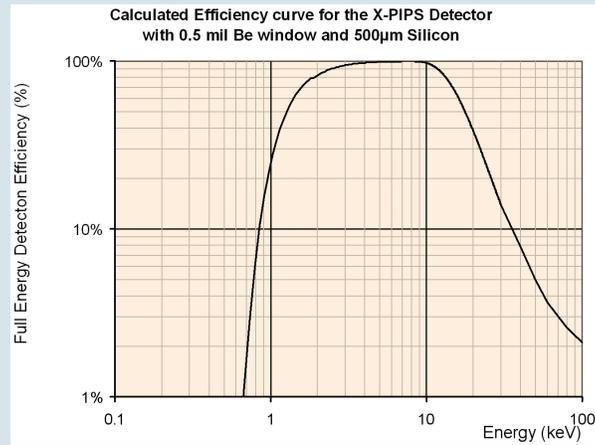


Figure 1 - Calculated efficiency curve.

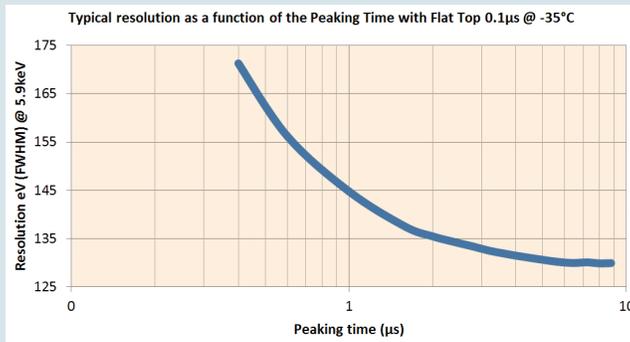


Figure 2 - Typical resolution as a function of rise time at -35 °C.

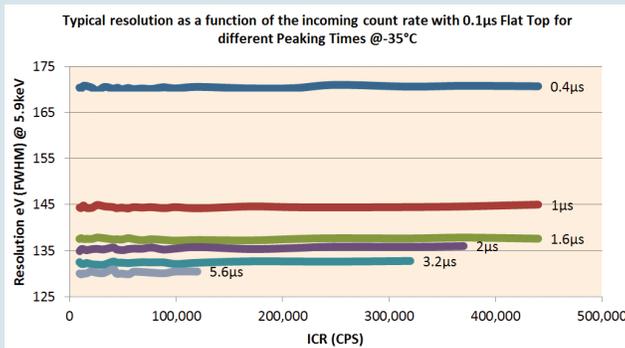


Figure 3 - Typical resolution as a function of the incoming count rate with 0.1 µs Flat Top for different Peaking Times at -35 °C.

SPECIFICATIONS

PERFORMANCE

GAIN STABILITY

- <25 ppm/°C over a range of +10 °C to +30 °C.
- <50 ppm over 24 h at constant temperature with 1 h stabilization.

CHARGE SENSITIVITY

- Gain is 0.9 mV/keV.
- Gain tolerance is $\pm 25\%$.

POWER REQUIREMENTS

- POWER INPUT - 9 pin male sub-D connector for power supply cable from associated main amplifier or digital spectroscopy system.
- +12 V dc: max 200 mA, typical 70 mA.
- -12 V dc: max 10 mA.

OUTPUTS AND INDICATORS

- ENERGY OUTPUT - Provides staircase output function with step amplitude proportional to the absorbed photon energy. The output swing range is from -2.5 V to +2.5 V open circuit. The reset is a transistor reset. Output impedance is 50 Ω , series connected, dc coupled. BNC connector.
- INHIBIT OUTPUT - Provides a +5 V TTL compatible pulse that is active when the preamplifier is resetting, or when the output is not within normal range. This signal can be used to gate off the ADC when the energy output is not valid. The width of the inhibit pulse can be adjusted using an internal PW control. Output impedance is 200 Ω , series connected, BNC connector.
- TEMPERATURE INDICATOR - Amber LED in the rear panel of the X-PIPS Detector housing illuminates when the detector does NOT reach the set-point temperature and therefore is not stabilized.

CONTROLS

- PW CONTROL - Potentiometer that controls the width of the inhibit pulse, used to gate off the ADC when the preamplifier is resetting. The pulse width can be set from 10 μ s to 650 μ s. Inside screwdriver control.

PHYSICAL

- CASE SIZE - 100 x 50 x 33 mm (L x W x H) excluding finger and fixation brackets. Front end is mounted on a 16-pin TO8 header. 0.5 mil Be window. Finger diameter is 17.8 mm, finger axis is located 10.5 mm from side and 12 mm from bottom of case. Finger length including detector front-end is approximately 45 mm, depending on collimator option.
- NET WEIGHT - 0.24 kg (0.5 lb).

ENVIRONMENTAL

- OPERATING TEMPERATURE - 0 to 50 °C (32 to 122 °F).
- OPERATING HUMIDITY - 0 to 80%, non-condensing.

ORDERING INFORMATION

- SXD30M-150-500.

ACCESSORIES

- S502 Genie™ 2000 Basic Spectroscopy Software for Single Input Applications.
- DSA-LX® Desktop Spectrum Analyzer.
- Lynx® Digital Signal Analyzer.
- Multiport II™ Multichannel Analyzer.
- Model 2016 Amplifier-TCA.



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