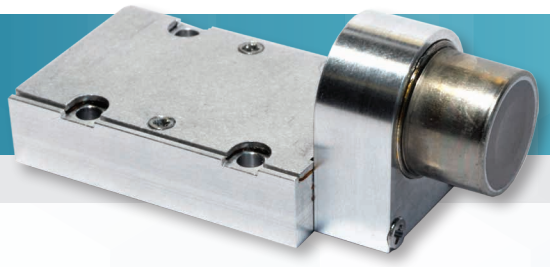
MIRION TECHNOLOGIES

Radiation Safety. **Amplified.**

Model SXD15M-500-PA

X-PIPS™ Detector (SDD)



Nuclear | Healthcare | Homeland Security & Defense | Labs and Education | Industrial and Manufacturing

KEY FEATURES

Detector System Includes:

- Silicon Drift Detector (SDD)
- Be Window
- Low noise FET
- Low Power Peltier Cooler

PERFORMANCE

- Active Area – 25 mm^2
- Collimated Active Area – 15 mm^2
- Thickness – 0.5 mm
- Typical Resolution – 135 eV (FWHM)*
- Energy Range – 1 to 30 keV
- ΔT>75K at 30 °C heat sink temperature

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. The detector element and FET preamplifier are cooled. The Beryllium entrance window is standard 0.5 mil.

The preamplifier has a reset mechanism providing fast reset time and excellent count rate performance.

The energy resolution is guaranteed at typical operating temperature within an ambient temperature range of +10 °C to + 30 °C.

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	Max
			Typical	Min	@ Optimum Rise Time	
SXD15M-500-PA	15	Multilayer	15000	>12000	>135	>146

* 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 typical operating temperature of -35°, maximal cooling at room temperature is -55 °C.

CANBERRA

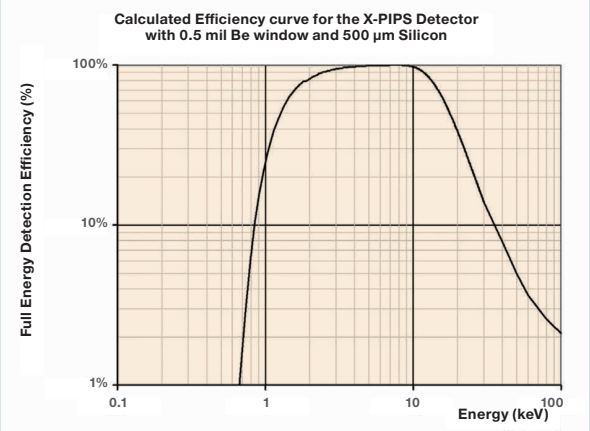


Figure 1 - Calculated efficiency curve.

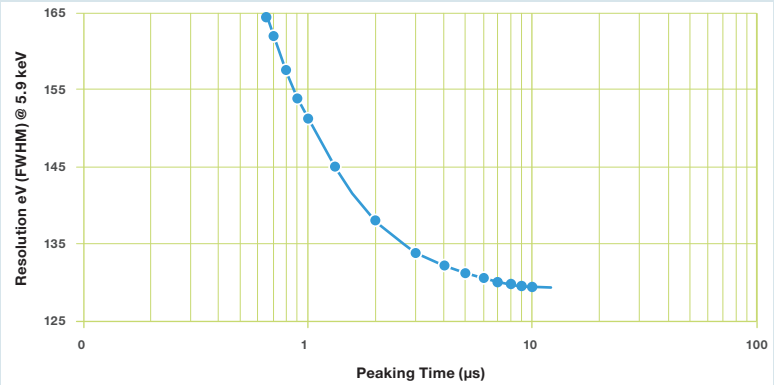


Figure 2 - Typical resolution as a function of the Peaking Time with Flat Top 0.1 µs @ -35 ° C.

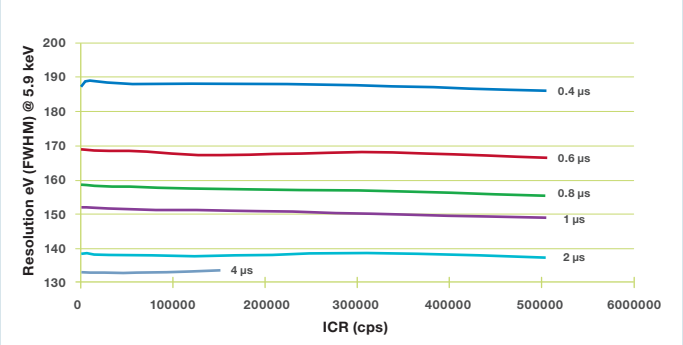


Figure 3 - Typical resolution as a function of the incoming count rate with 0.1 µs Flat Top for different Peaking Times at -35 ° C.

X-PIPS Detector (SDD) Model SXD15M-500-PA

SPECIFICATIONS

PERFORMANCE

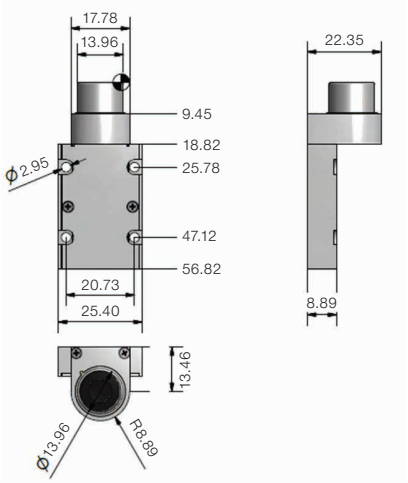
GAIN STABILITY

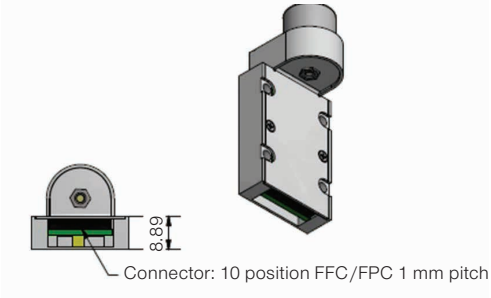
- <25 ppm/°C over a range of +10 °C to +30 °C.
- <50 ppm over 24 h at constant temperature with 1 h stabilization.

CHARGE SENSITIVITY

- Gain is 3 mV/keV.
- Gain tolerance is ±25%.

PHYSICAL



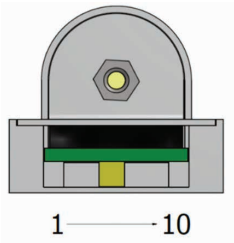


Connector: 10 position FFC/FPC 1 mm pitch

POWER REQUIREMENTS

The connector on the preamplifier is a 10 position, 1 mm pitch FFC/FPC right angle connector (FCI part number SFW10R-2STE1LF). The pinout of the preamp (connector is on topside of the board, left to right) is:

1	TEC -
2	TEC +
3	+5 V
4	-5 V
5	Temp. GND
6	Signal Out
7	Temp. Diode
8	GND
9	No Connect
10	HV



THE PREAMP REQUIRES TWO POWER SUPPLIES

- +5 V (nominal 15 mA, average 12 mA). Absolute maximum voltage is 6.3 V.
- -5 V (nominal 15 mA, average 10 mA). Absolute maximum voltage is -6.3 V.
- HV – -225 V (recommended).

TEMP READOUT

- Use connections Temp. Diode and Temp. GND.
- Temp. Diode (Bias) – 45 µA.
- SLOPE – -2.183 mV/°C
- V (0 °C) – 636 mV.

COOLER CONTROL

- MAX VOLTAGE – 3.6 V.
- MAX CURRENT – 0.4 A.

HEAT SINK

It is advisable to mount the detector housing to a heat sink in order to guarantee good dissipation of the heat generated by the Peltier cooler.

OUTPUTS

- GAIN – 3 mV/keV ±25%.
- DYNAMIC RANGE – -2.5V to 2.5V.

ENVIRONMENTAL

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

ORDERING INFORMATION

- SXD15M-500-PA.

CANBERRA