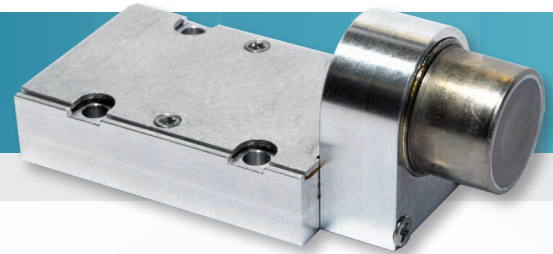




# Model SXD30M-500-PA

## 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 – 45 mm<sup>2</sup>
- Collimated Active Area – 30 mm<sup>2</sup>
- Thickness – 0.5 mm
- Typical Resolution – 135 eV (FWHM)\*
- Energy Range – 1 to 30 keV
- $\Delta T > 75K$  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 <sup>2</sup> )	Collimator	PTB		Energy Resolution FWHM (eV)*	
			Typical	Min	Typical	Max
					@ Optimum Rise Time	
SXD30M-500-PA	30	Multilayer	15000	>12000	<135	<145

\* Energy resolution is given at 5.9 keV (Mn-Ka), 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.

# X-PIPS Detector (SDD) Model SXD30M-500-PA

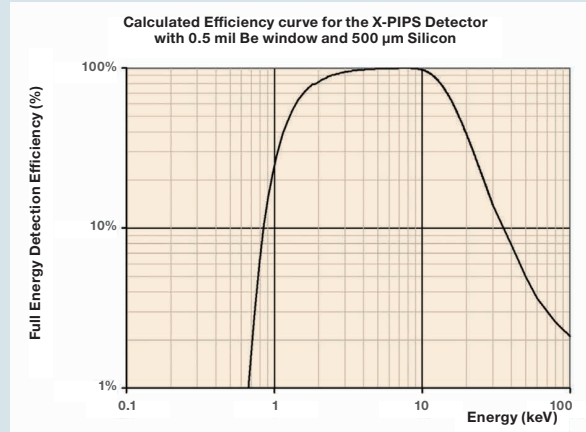


Figure 1 - Calculated efficiency curve.

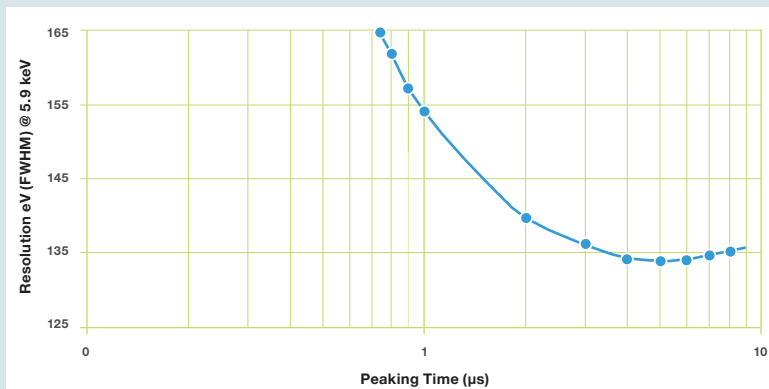


Figure 2 - Typical resolution as a function of the Peaking Time with Flat Top 0.1  $\mu\text{s}$  @  $-35^\circ\text{C}$ .

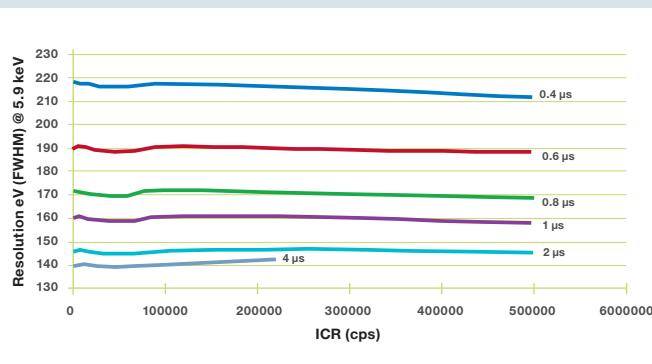


Figure 3 - Typical resolution as a function of the incoming count rate with 0.1  $\mu\text{s}$  Flat Top for different Peaking Times at  $-35^\circ\text{C}$ .

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## SPECIFICATIONS

### PERFORMANCE

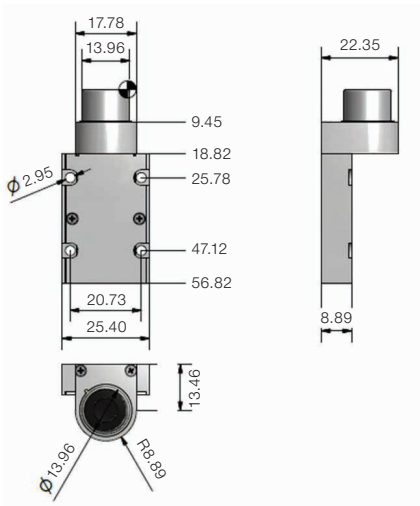
#### GAIN STABILITY

- <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  $\pm 25\%$ .

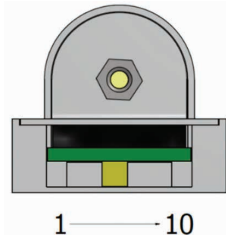
### PHYSICAL



### 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



### TEMP READOUT

- Use connections Temp. Diode and Temp. GND.
- Temp. Diode (Bias) – 45  $\mu$ A.
- 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  $\pm 25\%$ .
- DYNAMIC RANGE – -2.5V to 2.5V.

### ENVIRONMENTAL

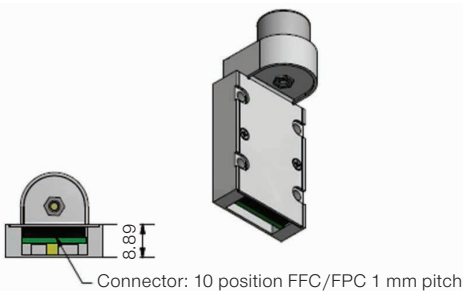
- OPERATING TEMPERATURE – 0 to 50 °C (32 to 122 °F).
- OPERATING HUMIDITY – 0 to 80%, non-condensing.

### ORDERING INFORMATION

- SXD30M-500-PA.

### 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).



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