

SXD15M-500-CM-PA

X-PIPS[™] Detector (SDD)



KEY FEATURES

Detector System Includes:

- Silicon Drift Detector (SDD)
- Be Window
- CMOS Preamplifier
- · Low Power Peltier Cooler

PERFORMANCE

- Active Area 25 mm²
- Collimated Active Area –
 15 mm²
- Thickness 0.5 mm
- Typical Resolution 127 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 CMOS reset type preamplifier and Peltier cooler. The detector element and CMOS preamplifier are cooled. The Beryllium entrance window is standard 0.5 mil.

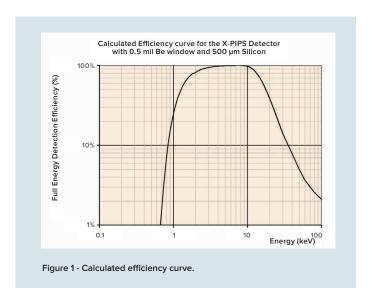
The preamplifier has a reset mechanism providing fast reset time and excellent count rate performance.

The energy resolution is guaranteed at typical operating temperature within an ambient temperature range of +10 $^{\circ}\text{C}$ to +30 $^{\circ}\text{C}$.

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

Model	Active Area (mm²)	Collimator	РТВ		Energy Resolution FWHM (eV)*	
					Typical	Max
			Typical	Min	@ Optimum Rise Time	
SXD15M-500-CM-PA	15	Multilayer	15000	>12000	127	132

^{*} 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.



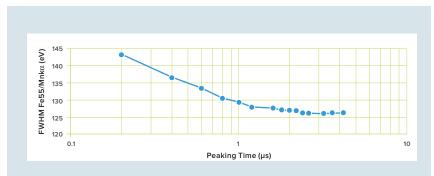


Figure 2 - Typical resolution as a function of the Peaking Time with Flat Top 0.1 μs @ -35 $^{\circ}C.$

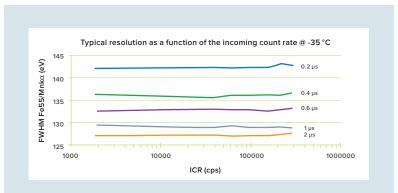


Figure 3 - Typical resolution as a function of the incoming count rate with 0.1 μs Flat Top for different Peaking Times at -35 °C.

SPECIFICATIONS

PERFORMANCE

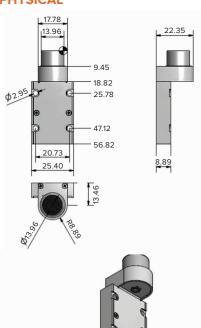
GAIN STABILITY

- <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 4 mV/keV.
- Gain tolerance is ±25%.

PHYSICAL

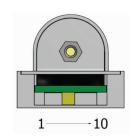


Connector: 10 position FFC/FPC 1 mm pitch

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 -260 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 4 mV/keV ±25%.
- DYNAMIC RANGE -2V to 2V.

ENVIRONMENTAL

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

ORDERING INFORMATION

SXD15M-500-CM-PA.



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