ADVASPACE
radiation data

MiniPIX SPACE

Datasheet

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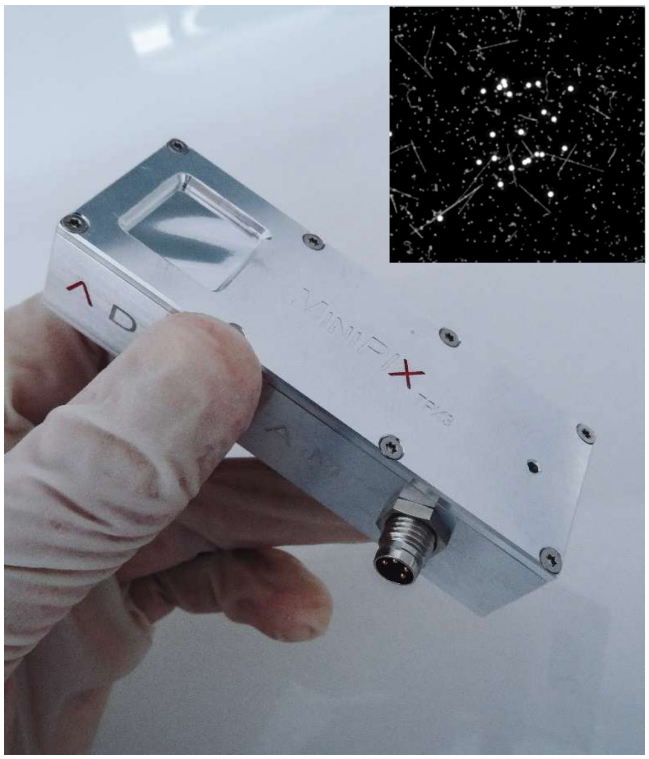
ADVASPACE
member of AdVisiones Technologies
powered by ADVACAM

General features

The MiniPIX SPACE is a miniaturized, low power radiation camera equipped with Timepix3 chip for particle tracking and imaging.

The Timepix3 detector is position, energy and time sensitive: For each ionizing particle (e.g. X-ray photon), it digitally registers its position, energy, time of arrival, and track shape - basically all information you can want. The other measures can be calculated from the track shape (particle type, direction of flight, LET, charge...). The information on each detected particle is either read-out immediately (pixel mode) or accumulated in images (frame mode) and read out later.

The MiniPIX SPACE uses LVCMOS 2V5 for communication with a M8 connector.



SPACE Features

- 256 x 256 square pixels
- 55 μm pixel pitch.
- Timepix3 chip technology
- Up to 16 fps
- Several sensor materials according to customer preference (usually 500 μm thick silicon).
- LVCMOS 2V5
- M8 or Micro-D connector
- Robust housing

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- Conformal coating
- Low weight (usually <140 g)
- Low power (2 W)
- Heritage environmental test information Optional:
- ECSS Soldering
- ISO 8 clean room
- Custom calibration

Device parameters

Operating conditions

Symbol	Parameter	Min	Typ.	Max	Units	Comment
TA	Temperature Range (non-operational)	-25	22	80	°C	
Φ	Humidity (non-operational)	0	55	95	%	Not condensing
TA	Temperature Range (operational)	-20	22	60	°C	
Φ	Humidity (operational)	0	55	70	%	Not condensing

Warning: Disconnect the device from power during pumping down or venting the vacuum chamber!

Electrical Specification

T_A = 25°C, USB voltage V_{cc} = 4.8V

Symbol	Parameter	Min	Typ.	Max	Units	Comment
VCC	Supply Voltage	4.0	5.0	5.5	V	
P1	Power Dissipation		2	3	W	
Bias Voltage Source for Sensor Diode						
VBIAS	Bias Voltage (positive version)	3	80	450	V	With Si sensor
VBIAS	Bias Voltage (negative version)	-4	80	-450	V	With CdTe or CZT

Enhanced mechanical properties

The SPACE version of the MiniPIX camera incorporates several enhancements to ensure robustness for space applications. The camera has undergone rigorous environmental testing in accordance with ECSS standards, including humidity testing, random vibration testing along all three axes (X, Y, Z), and thermal ambient testing. The tests were conducted with the camera configured with a 500 µm silicon sensor.

Vacuum operation

ADVACAM detectors are vacuum compatible out of the box. Operate only at air pressures below 10^-3 Pa. In case of a sudden pressure drop, the MiniPIX must be switched off. For indoor vacuum experiments. Make sure to disconnect the device from power during pumping down or venting the vacuum chamber!

External Cooling

Temperature stabilization is strongly recommended for consistent results. Passive cooling of the device is necessary and can be done by mechanical design. For active cooling, attaching a Peltier cooler or a cooling plate to the back of the detector should suffice. The temperature should be set to the calibration temperature.