

CMOS SPACE CAMERA

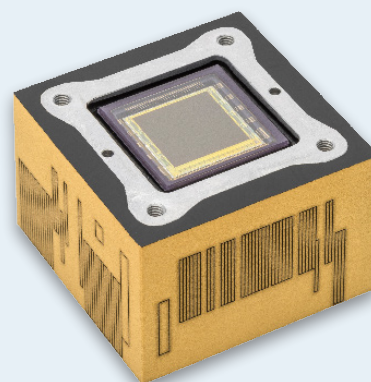
4Mpx HIGH RESOLUTION IMAGE SENSOR
BAYER (RGB) / MONOCHROME CONFIGURATION
RADIATION HARDENED DESIGN



3DCM739-1 / 3DCM734-1

KEY FEATURES

- 2048 (H) * 2048 (V) active pixels on 5.5µm pitch
- User re-configurable FPGA
- Frame rate:
 - 7 frames/s @ full resolution (12-bit mode)
 - 16 frames/s @ full resolution (10-bit mode)
- Embedded 2x512Mb SDRAM and 8Gb NAND Flash
- Integrated clock and Timing generator
- Integrated Image Signal Processor
- Programmable gain amplifier and offset regulation
- 13 general purpose signals
- 10 LVDS output pairs and 2 LVDS input pairs
- Space Qualified Technology
- Radiation Hardened design
 - TID > 40 krad(Si)
 - SEL LET > 60 MeV.cm²/mg
- Operating Temperature Range -40°C / +70°C
- 55-pin PGA
- ITAR Free Product - Worldwide delivery guaranty
- Size: 35 x 35 x 23 mm
- Mass: 64 g



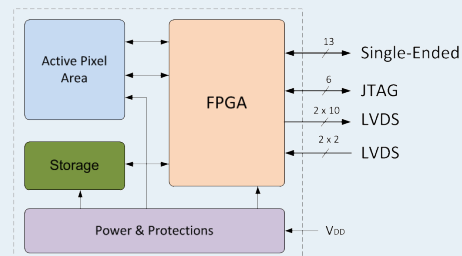
PRODUCT OVERVIEW

The space camera module has been designed based on the 3D PLUS technology and includes 4 stacked levels in order to obtain a 3D cube with a reduced volume of 35x35x23 mm³. The top level contains the 2048x2048 pixels CMOS image sensor which is the key element of the camera. Images are provided by the CMOS sensor through the 10 LVDS multiplexable output pairs.

The input supply voltage of the microcamera module can be set from 4.5V to 9V. Four different voltages (3.3V, 2.5V, 2.1V and 1.5V) are internally generated by four voltage regulators in order to feed the sensor, the oscillator, the FPGA and the memories. Volatile and non-volatile memories are also included and can be used, among other applications, for video data streaming or to load the register state.

The FPGA can store images in the volatile memory placed on the same level and perform preliminary image processing as averaging, adding, windowing etc...

The bottom of the camera contains a PGA array where a rigid-flex pcb can be connected to ensure the link to the system. The PGA array is able to cover a wide range of connections, from LVDS to SpaceWire depending on the FPGA code.



As the CMOS sensor is sensitive to Single Event Effects, current limitation capability is integrated in the module in order to be able to switch-off the power supply to the sensor in case of SEL or SET. This instrument has been integrated using the 3D PLUS technology in order to be as compact as possible. Particular attention has been paid to ensure a good radiation tolerance to cover a wide range of scientific applications such as planetology, but also platforms or launchers monitoring and star trackers.

