

Proton200k™ Lite Processor Board

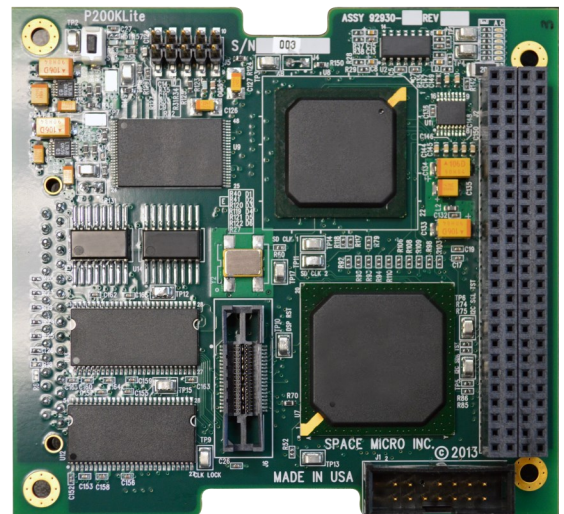
Space Micro celebrates its 13-year anniversary in 2015 and continues to support the Space Industry with innovative, affordable and high performance Digital/Image Processing, RF Communication and Attitude Determination Sensor Products.

Space Micro's Digital product line includes radiation hardened Single Board Computers and Peripherals, ProtonX-Box/Proton2X-Box Avionics Systems, and Image Processing Systems. The ProtonX-Box impressive modularity supports low mission requirements, with the Proton2X-Box targeted for higher performance applications. Our flight-proven Image Processing systems (IPC-5000/7000) are under contract for several missions and has been recently selected for a long term science mission. All of our Digital products feature scalable parts programs up to full NASA level 1/Military Class S.

The Proton 200k™ Lite is based on the flight-proven P200k DSP Processor retaining many of the heritage design features in a standard CubeSat form factor. It is scheduled for launch in CY2016.

FEATURES

- Low power for CubeSat missions (1.5W Standard)
- Radiation hardening utilizes Space Micro's patented mitigation technologies
- Optimized Processing Speed of 900 MFLOPS
- Industry Standard, upwardly compatible DSP Processor
- Compatible with CubeSat standards
- Applications include C&DH, Payload electronics, custom missions
- On-board Digital Signal Processing (DSP) of sensor data for speedy and efficient transfer to ground.
- DSP Software Optimization



Proton200k™ Lite Processor Board

SPECIFICATIONS

Radiation Tolerance

SEL SEU

Threshold >36 (MeV-cm²/mg)
Error Detection and correction on all critical data
SEU mitigation on internal and external memories
SEU < 1 per 1,000 days in GEO
TTMR™ technology for SEU detection/mitigation.
30krad (Si),
100% recoverable
Patented H-Core™ technology for SEFI detection/mitigation

TID SEFI

Performance

66 MHz Floating Point, 1,800 GFLOPS native
900 MFLOPS/ 1,200 MIPS at 1E-4 unrecoverable errors/day
L1 8 KB (4/4KB) Program/Data Cache
L2 256KB (64KB Cache/Mapped +192KB Mapped RAM)
Timers: 32-bit (two)

Memory

512 Mbyte SDRAM w/EDAC
1 µbyte EEPROM to 8 Mbyte (option)
32 Gb radiation hardened NAND Flash

Power

1.5W nominal, low power and ultra-low sleep mode available

External Interfaces (31 Pin micro-D sub-miniature Connector)

x2, Asynchronous w/ RS422
x1, unbuffered 3.3 Volt GPIO
x1, I2C interface
x2 ADC inputs
Additional DIO available

Internal Interfaces (104 Pin Cubesat Stacking Connector)

X2, Asynchronous w/ RS422
x4, DAC outputs (16 bit)
x12, unbuffered 3.3 Volt GPIO
x1, I2C interface
x6 ADC inputs

Data Converter

8-Channel 12-bit Analog to Digital Converter (ADC)
4-Channel 16-bit Delta-Sigma Digital to Analog Converter (DAC)

Mechanical Options Mass

Standard CubeSat form factor (3.55 × 3.78 in)
< 200 g

Operating System and Software Support

TI DSP/BIOS RTOS (option)
TI Code Composer Studio (option)
JTAG debugging support

Parts Level Options

High reliability, space grade EEE parts,
Options for NASA levels I, II, III

Environmental

Operating Temp Random Vibe

-24 to +61°C
>10 Grms, 3-Axis

MTBF

> 6.6 Million Hours (+55C, space flight)

Hardware Models

Software Development Unit (SDU)
Engineering Model, same form factor and I/O as Flight
Flight (Conduction cooled)

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