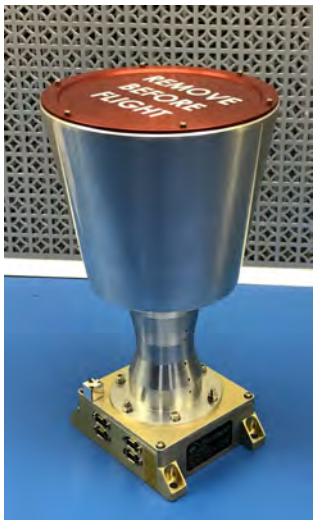
µSTAR Tracker

SPACE MICRO

µSTAR™ STELLAR ATTITUDE DETERMINATION SYSTEMS

Digital Processing Electronics

- Flight Heritage Design
- Qualified Packaging
- Radiation Tolerant



Camera Head Unit

- Flight Qualified
- APS CMOS Imager (HAS2)
- Precision Alignment
- Stray Light Baffle
- SpaceWire Interface

APPLICATIONS

- Satellite Attitude and Rate Determination
- GEO and LEO Satellite Orbits
- Long Duration/High Reliability Missions

SOFTWARE FEATURES

- Star Identification Based on Pyramid Code
- Real Time Quaternion Output
- Integrated Systematic Error Correction Allows for High Accuracy
- Real-Time On-orbit Calibration Accounts for Degradation
- Less Sensitive to Spurious Signals and Upsets

CONFIGURATION OPTIONS

Feature	MIST	µSTAR-100M	µSTAR-200M	µSTAR-200H	µSTAR-400M
FPA	Ruby	HAS2	HAS2	HAS2	HAS2
Accuracy (1σ)	30 arcsec	1-5 arcsec	1-5 arcsec	<1 arcsec	1-5 arcsec
Average Power	<3 W	<5 W	8-10 W	<10 W	< 18 W
Update Rate	10 Hz	1 Hz	10 Hz	10 Hz	100 Hz
DPE Mass (kg)	0.5 (Integrated Unit)	0.9	1.2	1.2	1.2
CHU Mass (kg)		0.9	0.9	1.5	2.1
Total (kg)	0.5	1.8	2.1	2.7	3.3

SUPPORTING ELECTRONICS

The µSTAR™ features proven, high-performance, radiation hardened supporting electronics to ensure accurate, reliable functionality in the harsh space environment.

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SPECIFICATIONS

Dimensions	
Digital Processing Electronics	179 x 75 x 112 mm
Camera Head Unit w/Baffle	150 x 150 x 232 mm
Mass	
DPE	1150 grams
CHU	922 grams
Optical Design	
Lens	50mm F#1.8 Rad-Hard Glass
APS CMOS Detector	OnSemi HAS2
Radiation Tolerance	
Total Ionizing Dose (TID)	> 100 krads and 300 krads (option)
Single Event Latchup (SEL)	> 80 MeV/mg/cm^2
Single Event Upset (SEU)	< 10^{-3} errors/system-day
Single Event Functional Interrupt	100% recoverable, H-Core™ technology
Neutrons	> 2 x10^{12} n/cm^2
Mission Assurance	
Temperature Range	-24 to +61C baseplate
Vibration	Up to10 Grms Acceptance
Parts Level Options	Commercial Space, NASA Level I, II, III
Design Life	Up to 18 years GEO
FIT Rate	140 (MIL-HDBK 217, @ 30 C, Level II)

PROTON 200K™ RADIATION HARDENED SPACE COMPUTER

The Proton200k™ space computer is flight-proven, high speed, and radiation hardened to provide extraordinary performance benefits by removing the barriers associated with commercial processor offerings. It is a qualified space computer for onboard data processing with 1.8 GFLOPS @ 200 MHz Floating Point, 900 MFLOPS @ 200 MHz with SEU mitigated to 1E-4 errors/day.

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