ATmegaS64M1 Microcontroller

Summary
Microchip’s ATmegaS64M1 AVR® microcontroller (MCU) brings the automotive-leading AVR core with CAN capabilities to the aerospace industry. The ATmegaS64M1 MCU is designed for enhanced radiation, extended temperature and increased reliability in critical aerospace applications. It takes advantage of the mature Microchip tools which have been used in designs for the mass market worldwide. The CAN controller, power stage controller, ADC, DAC and analog comparators make the ATmegaS64M1 microcontroller a great choice for many of the most common space applications, which typically require a small footprint and low power like motor control and remote terminal units.

Key Features

High-Performance, Low-Power 8-bit AVR MCU
- Advanced RISC architecture/up to 8 MIPs
- On-chip 2-cycle multiplier
- 3.0–3.6V/8 MHz operating voltage and speed grade
- Temperature: −55°C to +125°C

High-Endurance Memory
- 64 KB of Flash program memory
- 4 KB of internal SRAM
- 2 KB of internal EEPROM

Special Microcontroller Features
- Low-power idle, noise reduction and power-down modes
- Power-on reset and programmable brown-out detection
- In-system programmable via SPI port
- 8 MHz Internal calibrated RC oscillator
- On-chip PLL for fast PWM
- On-chip debug interface (debugWire)

Peripheral Features
- 8-bit and 16-bit timers/counter
- CAN 2.0A/B with 6 message objects – ISO 16845 certified
- 8-bit UART/master and slave SPI
- 12-bit high-speed Power Stage Controller (PSC)
- 11 channels - 10-bit ADC
- 10-bit DAC
- 4 analog comparators
- Programmable watchdog timer with separate on-chip oscillator
- Interrupt and wake-up on pin change
- On-chip temperature sensor
**ATmegaS64M1 Starter Kit**
To ease your design process and reduce time to market, Microchip delivers a complete starter kit (ATSTK600) and development system for the ATmegaS64M1 AVR microcontroller. With its advanced features for prototyping and testing new designs, the kit gives you a head start for developing code on AVR devices. The starter kit is based on the automotive version, the ATmega64M1 which shares the same functionality as the space version and same pin-out distribution.

**Space Environment**
- Full wafer lot traceability
- 32-lead hermetic ceramic package
- Space grade screening and qualification
- Total ionizing dose: up to 30 Krad (Si), QML and ESCC
- Heavy ions and protons
- Single event latch-up LET > 62.5 MeV.cm²/mg
- SEU full characterization at 125°C for all functional blocks
- Estimated SER: 1 event every 1,000 days (LEO)

**Other Aerospace Applications**
- Full wafer lot traceability
- 32-lead plastic package
- Extended temperature –55°C/125°C
- QMLN/AQEC/AEC-Q100 equivalent
- Unitary burn in and temperature cycling (opt.)
- Neutrons latch up immune
- SEU full characterization

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