Data Sheet

ADuCM451

Precision Analog Microcontroller, 12-Bit Analog Input/Output with I3C Interface, Arm Cortex-M33

FEATURES

- Analog input/output
- Multichannel, 12-bit, 2MSPS ADC
  - Up to 16 external channels
  - On-chip die temperature monitor
  - AVDD, IOVDD0/1/2, DVDD, VDDVADC power monitor channels
  - VDAC voltage monitor channels
  - Single-ended modes
  - 0V to VREF analog input range
- 12-bit voltage output DACs
  - 0V to 2.5V/VDDVDAC voltage output
  - Support 30mA source current and 10mA sink current
- On-chip low-drift voltage reference, 1.25V or 2.5V
  - Buffered 1.25V or 2.5V output
- 4 voltage comparators
- Microcontroller
  - 32-bit Arm Cortex-M33 core, 32-bit RISC architecture, FPU
  - Serial wire port supports code download and debug
- Clocking options
  - 16MHz on-chip oscillator
  - 240MHz PLL output with programmable divider
  - External clock source
- Memory
  - 2× 1024kB independent Flash/EE memories
    - 10,000-cycle Flash/EE endurance
    - 2× 256KB support 100K cycles Flash/EE endurance
    - 10-year Flash/EE retention
  - 512kB SRAM with ECC
- Software triggered, in circuit reprogrammability via MDIO or I^2C
- On-chip peripherals
  - 2× UART, 3× SPI, 3× I^2C, 1× QSPI serial input/output
  - 2× I3C supporting legacy I^2 C static address mode
  - Multilevel voltage (3.3V, 1.8V, 1.2V) GPIOs
  - MDIO target up to 10MHz
  - 5 general-purpose timers
  - Wake-up timer (WUTs)
  - Watchdog timers (WDTs)
  - 32-element PLA
  - 16-bit PWM
  - 10 external Interrupts
- Power
  - Multiple supplies: 3.3V for voltage DACs and ADCs, and 3.3V, 1.8V, or 1.2V for digital inputs/outputs
  - Flexible operating modes for low-power applications
  - POR and BOR
- Packages and temperature range
  - 3.5mm × 4.5mm, 0.4mm pitch, 90-ball WLCSP
  - Fully specified for T_A = −40°C to +105°C (T_J ≤ +125°C) operation
- Tools
  - Low-cost, quick start development system
  - Full third-party support

APPLICATIONS

- Optical networking 400G/800G/1.6T and higher frequency modules
- Industrial control, automation, and instrumentation systems

For more information about the ADuCM451, contact InfoOpticalNetwork@analog.com.

NOTES