

ADuCM430/ADuCM431/ADuCM433

Precision Analog Microcontroller, 12-Bit Analog Input and Output with PMIC and TECC, Arm Cortex-M3

FEATURES

- ▶ Analog input and output
 - ▶ Multichannel, 12-bit, 2 MSPS ADC
 - ▶ Up to 16 external channels
 - ▶ Power, VDAC, IDAC, and temperature monitor internal channels
 - ▶ Single-ended and differential modes
 - ▶ 0 V to V_{REF} analog input range
 - ▶ Input buffer included
 - ▶ Digital comparators
- ▶ Up to nine, 12-bit voltage output VDACs
 - ▶ 4-channel, selectable output range
 - ▶ 0 V to 2.5 V or $AVDDx - 0.1$ V (4-channel on the ADuCM430/ADuCM431 and 3-channel on the ADuCM433)
 - ▶ $AVDDNEG + 0.2$ V to 0 V or -2.5 V to 0 V (4-channel on the ADuCM430 and 1-channel on the ADuCM433)
 - ▶ 4-channel, 0 V to 2.5 V or $AVDDx - 0.2$ V
 - ▶ 1-channel, 0 V to 2.5 V (ADuCM430/ADuCM431)
- ▶ Up to 4 low noise, 12-bit IDACs
 - ▶ 4-channel, configurable output range: 50 mA, 100 mA, or 150 mA (ADuCM430)
 - ▶ 1-channel, configurable output range: 50 mA, 100 mA, or 150 mA (ADuCM433)
- ▶ Up to 4 voltage comparators with adjustable hysteresis voltage
- ▶ TEC controller (ADuCM430/ADuCM433)
 - ▶ Optional Buck or LDO regulator modes if not using TEC
 - ▶ Maximum heating and cooling current: 1.3 A
 - ▶ Current and voltage monitoring and protection
 - ▶ Soft start function
- ▶ Microcontroller
 - ▶ 32-bit Arm Cortex-M3 core, RISC architecture
 - ▶ Serial wire port supports code download and debug
- ▶ Clocking options
 - ▶ 16 MHz on-chip oscillator
 - ▶ 80 MHz PLL output
 - ▶ External clock source
- ▶ Memory
 - ▶ Up to 2× 512 kB independent Flash/EE memories
 - ▶ 48 kB SRAM
- ▶ Software triggered, in circuit reprogrammability via I²C
- ▶ On-chip peripherals
 - ▶ 1× UART, 2× SPI, 2× I²C serial input and output
 - ▶ GPIO with multilevel voltage (3.3 V, 1.8 V, and 1.2 V) digital inputs
 - ▶ MDIO target up to 4 MHz (open drain)
 - ▶ 3× 16-bit and 1× 32-bit general-purpose timers
 - ▶ Wake-up timer (WUT)
 - ▶ Watchdog timers (WDT)
 - ▶ 32 element PLA
 - ▶ 16-bit PWM
 - ▶ Manchester encoder and decoder
 - ▶ All GPIOs support external interrupt
- ▶ Power
 - ▶ Multiple supplies
 - ▶ $AVDDx$, $IOVDDx$, $DVDD$, and $PVDDTECx$ (ADuCM430/ADuCM433): 2.85 V to 3.63 V
 - ▶ $AVDDNEG$ (ADuCM430/ADuCM433): -1.8 V to -3.63 V
 - ▶ $PVDDIDACxx$ / $PVDDIDAC$ (ADuCM430/ADuCM433): 1.60 V to $AVDDx$
 - ▶ Flexible operating modes for low power applications
- ▶ Packages and temperature range
 - ▶ 5 mm x 5 mm, 0.4 mm pitch, 121-ball CSP_BGA
 - ▶ 5 mm x 5 mm, 0.4 mm pitch, 72-ball CSP_BGA
 - ▶ Fully specified for $T_J = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$
- ▶ Tools
 - ▶ Low cost QuickStart development system, which is available upon request from InfoOpticalNetwork@analog.com
 - ▶ Full third-party support

APPLICATIONS

- ▶ Optical networking—100G/200G/400G and higher frequency modules

For more information on the ADuCM430/ADuCM431/ADuCM433, contact InfoOpticalNetwork@analog.com.

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