

## 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/ADuCM432 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/ADuCM432)
- ▶ 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/ADuCM432/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  $2 \times 512$  kB independent Flash/EE memories
  - ▶ 48 kB SRAM
- ▶ Software triggered, in circuit reprogrammability via I<sup>2</sup>C
- ▶ On-chip peripherals
  - ▶ 1× UART, 2× SPI, 2× I<sup>2</sup>C 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/ADuCM432/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](mailto:InfoOpticalNetwork@analog.com)
  - ▶ Full third-party support

### APPLICATIONS

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

For more information on the ADuCM430/ADuCM431/ADuCM432/ADuCM433, contact [InfoOpticalNetwork@analog.com](mailto:InfoOpticalNetwork@analog.com).

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