

Product Brief

Apollo Ultra-Low Power Microcontroller Family

Ambiq Micro is the leader in ultra-low power design with the Apollo microcontroller family providing the lowest active and sleep mode power on the market. With Apollo MCUs, designers of next generation wearables and IoT devices can take their innovative products to the next level by increasing battery life, adding more intelligent sensor processing, and fitting into smaller form factors.

Specifications and Features

- **Ultra-low supply current:**
 - EEMBC ULPBench score of 377
 - 35 μ A/MHz executing from flash at 3.3 V
 - 143 nA deep sleep mode at 3.3 V
 - 419 nA deep sleep mode with XTAL-assisted RTC at 3.3 V
- **High-performance ARM Cortex-M4F Processor:**
 - Up to 24 MHz clock frequency
 - Floating point unit
 - Memory protection unit
- **Wake-up interrupt controller with 12 interrupts**
- **Ultra-low power memory:**
 - Up to 512 KB of flash memory for code/data
 - Up to 64 KB of low leakage RAM for code/data
- **Ultra-low power interface for off-chip sensors:**
 - 10 bit, 13-channel, up to 800 kSps ADC
 - Temperature sensor
- **Flexible serial peripherals:**
 - I² C/SPI master for communication with sensors, radios, and other peripherals
 - I² C/SPI slave for host communications
 - UART for communication with peripherals and legacy devices
- **Rich set of clock sources:**
 - 32.768 kHz XTAL oscillator
 - Low frequency RC oscillator – 1.024 kHz
 - High frequency RC oscillator – 24 MHz
 - RTC based on Ambiq's AM08X5/18X5 families
- **Compact package options:**
 - 2.49 x 2.90 mm 41-pin CSP with 27 GPIO
 - 4.5 x 4.5 mm 64-pin BGA with 50 GPIO

Applications

- Wearable electronics
- Wireless sensors
- Activity and fitness monitors
- Consumer electronics
- Consumer medical devices
- Smart watches

Description

The Apollo microcontroller family includes ultra-low power, highly integrated MCUs designed for battery powered devices including wearable electronics, activity & fitness monitors, IoT devices, and wireless sensors. By combining ultra-low power sensor conversion electronics with the powerful ARM Cortex-M4F processor, the Apollo MCU enables complex sensor processing tasks to be completed with unprecedented battery life. Weeks, months, and years of battery life are achievable while doing complex context detection, gesture recognition, and activity monitoring. All Apollo MCUs take full advantage of Ambiq Micro's patented Subthreshold Power Optimized Technology (SPOT) Platform, setting a new industry benchmark in low power design.

