



Scalable and
power-efficient
multi-market MCUs

LPC54000 Series of MCUs

Offering a wide range of performance and feature scalability, the LPC54000 series of single and dual core MCUs delivers improved power-efficiency for a variety of always-on applications.

TARGET APPLICATIONS

- ▶ Portable fitness and activity trackers
- ▶ Health and wellness monitoring
- ▶ Intelligent sensing and motion tracking
- ▶ Home and building automation
- ▶ Industrial/commercial sensor nodes
- ▶ Mobile handsets and tablets
- ▶ Fleet management and asset tracking
- ▶ Gaming and USB accessories
- ▶ Home and building automation

OVERVIEW

The LPC54000 series represents the next-generation of industry-leading power efficiency. With added scalability and feature integration, these breakthrough devices enable continued growth for always-on applications.

The LPC54100 and LPC54110 families, based on the ARM® Cortex®-M4 core, offer an optional Cortex®-M0+ co-processor for added flexibility.

The LPC54110 family finds the right balance between feature integration and power efficiency with the ARM® Cortex®-M4 achieving an active mode current of 80 $\mu\text{A}/\text{MHz}$. With an industry-leading dual-core option, the LPC5411x MCU can shut down the Cortex®-M4 for a tiered power approach and use the Cortex®-M0+ to perform less taxing tasks, achieving an even lower active mode of 60 $\mu\text{A}/\text{MHz}$.

The optional on-chip digital microphone (DMIC) subsystem on the LPC54110 family dramatically reduces power consumed in applications that demand voice input and processing, achieving the stringent power efficiencies needed for always-on voice-activation in battery-operated products.



LOW-POWER ARCHITECTURE

The LPC54000 series is architected for power efficiency. In addition to the dual-core optimization, the low-power interfaces can wake the CPU from power down once data is received. The 12-bit, 12-channel ADC delivers 5 Msps operation at full spec, including 1.62 V, which performs conversion while the CPU is asleep.

The low-power flash is writable at 1.62 V. Core and peripheral voltages are automatically scaled for reduced power consumption at any frequency. An asynchronous peripheral bus enables reduced peripheral clock speed without affecting the CPU clock, which minimizes peripheral power consumption.

COMPREHENSIVE ENABLEMENT SOLUTIONS

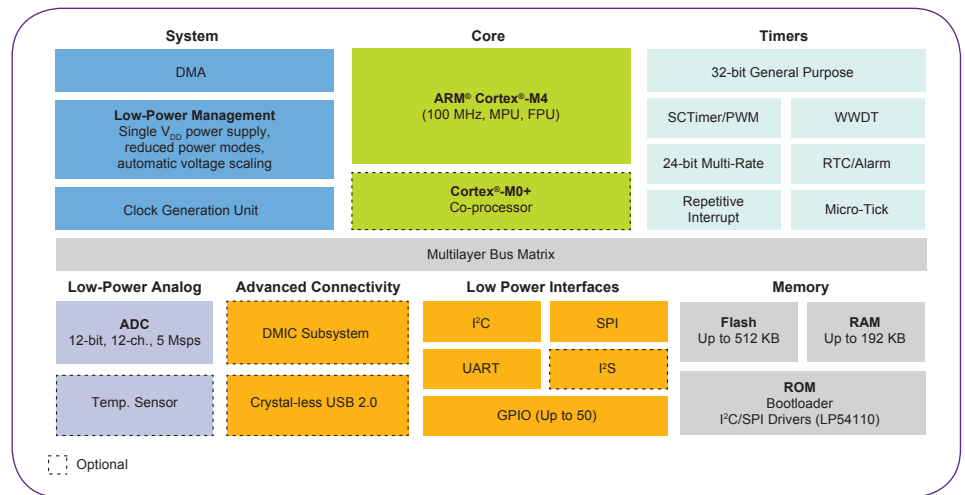
LPCOpen

- ▶ Extensive suite of robust peripheral drivers, stacks and middleware
- ▶ Includes software examples demonstrating use of peripheral drivers and middleware
- ▶ Operating system abstraction (OSA) layer with FreeRTOS application examples

Integrated Development Environments (IDE)

- ▶ IAR Embedded Workbench®
- ▶ ARM Keil® Microcontroller Development Kit
- ▶ LPCXpresso
 - No-cost, as well as a professional integrated development environment (IDE) for LPC MCUs
 - Eclipse and GCC-based IDE for C/C++ editing, compiling and debugging

LPC54000 SERIES BLOCK DIAGRAM



LPC54000 SERIES OF POWER-EFFICIENT MCUS

| Parts | Core | Flash (kbit) | RAM (kbit) | Crystal-less FS USB | Digital Microphone Subsystem | Package name | Recommended Development Board |
|------------------|--------|--------------|------------|---------------------|------------------------------|--------------|-------------------------------|
| LPC54113J128BD64 | M4 | 128 | 96 | Yes | Yes | LQFP64 | OM13089 |
| LPC54113J256BD64 | M4 | 256 | 192 | Yes | Yes | LQFP64 | OM13089 |
| LPC54113J256UK49 | M4 | 256 | 192 | Yes | Yes | WLCSP49 | OM13089 |
| LPC54114J256BD64 | M4/M0+ | 256 | 192 | Yes | Yes | LQFP64 | OM13089 |
| LPC54114J256UK49 | M4/M0+ | 256 | 192 | Yes | Yes | WLCSP49 | OM13089 |
| LPC54101J256UK49 | M4 | 256 | 104 | No | No | WLCSP49 | OM13077 |
| LPC54101J512UK49 | M4 | 512 | 104 | No | No | WLCSP49 | OM13077 |
| LPC54101J256BD64 | M4 | 256 | 104 | No | No | LQFP64 | OM13077 |
| LPC54101J512BD64 | M4 | 512 | 104 | No | No | LQFP64 | OM13077 |
| LPC54102J256UK49 | M4/M0+ | 256 | 104 | No | No | WLCSP49 | OM13077 |
| LPC54102J512UK49 | M4/M0+ | 512 | 104 | No | No | WLCSP49 | OM13077 |
| LPC54102J256BD64 | M4/M0+ | 256 | 104 | No | No | LQFP64 | OM13077 |
| LPC54102J512BD64 | M4/M0+ | 512 | 104 | No | No | LQFP64 | OM13077 |

ROM

- ▶ Common bootloader for the LPC54000 Series
- ▶ In-system flash programming over a serial connection: erase, program, verify
- ▶ ROM or flash-based bootloader with open-source software and host-side programming utilities
- ▶ Providing commonly used I²C and SPI drivers in the LPC54110 family of products

Development Hardware

- ▶ LPCExpresso development boards
 - Low-cost evaluation
 - Arduino™ R3 compatible shields

www.nxp.com/LPC54000