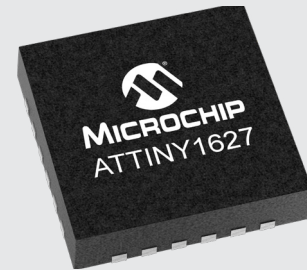


tinyAVR® 2 Microcontroller Family

Summary

The ATtiny1627 family of AVR® microcontrollers (MCUs) is equipped with high-speed integrated analog, hardware-based Core Independent Peripherals (CIPs) and low-power performance for efficient real-time control and sensor node applications. For design flexibility and to optimize your board layout, this family of 16 KB Flash devices is available in SOIC, SSOP and VQFN packages ranging from 14 to 24 pins.. These tinyAVR® MCUs simplify sophisticated analog sensing in a wide range of industrial, consumer, appliance, automotive and other applications.



Small and Powerful with Intelligent Analog

Designers of reliable sensor end node applications require an MCU that can quickly and accurately measure and convert signals in harsh environments while also using power efficiently. Featuring a 12-bit differential Analog-to-Digital Converter (ADC) and a Programmable Gain Amplifier (PGA) with up to 16x gain, the ATtiny1627 family enables measurement of smaller amplitude signals, reclaims signals from noisy environments and performs fast conversion of the signals.

The accurate and temperature-stable internal 20 MHz RC oscillator, Configurable Custom Logic (CCL), Event System and Core Independent Peripherals significantly reduce the need for external components. The small 3 × 3 mm 20-pin VQFN package option further reduces the PCB footprint, enabling you to create extremely compact and cost-efficient designs.

Key Features

- High-performance low-power AVR CPU with multiple clock options, running at up to 20 MHz
- 16 KB Flash, 2 KB SRAM, 256B EEPROM
- 12-bit differential ADC with Programmable Gain Amplifier (PGA) with up to 16x gain
- Analog Comparator (AC) with scalable reference input
- Event System for CPU independent and predictable inter-peripheral communication
- Configurable Custom Logic (CCL) with four programmable Look-Up Tables (LUT)
- 16-bit Timer/Counter type A (TCA) with dedicated period register and three PWM channels
- 16-bit Timer/Counters type B (TCB) with overflow interrupt, input capture and simple PWM functionality
- 16-bit Real-Time Counter (RTC)
- Serial communication interfaces: USART, SPI, TWI
- Power-on Reset (POR) and Brown-out Detection (BOD) with voltage level monitoring
- Watchdog Timer (WDT) with Window Mode, with a separate on-chip oscillator
- Automated Cyclic Redundancy Check (CRC) Flash memory scan
- Three sleep modes: idle, standby, power-down with full data retention
- Wide operating voltage range: 1.8V to 5.5V
- Available in 14, 20 and 24 pins
- 14-pin (SOIC, TSSOP), 20-pin (SOIC, SSOP, VQFN), 24-pin VQFN
- Temperature ranges: -40°C to +85°C (standard) and -40°C to +125°C (extended)

Applications and Functions

- High-accuracy sensors like smoke, PIR, thermocouple, moisture, light, pressure, gas and force
- Sensors in noisy environments benefiting from noise suppression capabilities
- Real-time control systems such as power converters and secondary safety monitoring
- Analog interface chip for larger MCU/MPUs with limited analog performance

Getting Started



The ATtiny1627 Curiosity Nano Evaluation Kit is the ideal platform for rapid prototyping with the tinyAVR 2 family of MCUs, connecting seamlessly to the MPLAB® X, Studio and IAR Embedded Workbench IDEs. Our intuitive, web-based graphical configuration tools, MPLAB Code Configurator (MCC) and Atmel START, will significantly reduce your development time.

The tinyAVR 2 family is supported by the GCC, MPLAB XC8 and IAR compilers. For the tinyAVR 2 family we also offer a XC8 Functional Safety Compiler License, certified by TÜV SÜD.

Functional Safety Ready

The tinyAVR 2 family is recommended for safety critical applications. Documents such as FMEDA reports and safety manuals are available on request. Safety-certified development tools are also available for this product. Please contact your local Microchip sales office or your distributor for more information.



Products

Part Number	Flash (KB)	EEPROM (B)	SRAM (B)	Pins	I/O Pins	12-bit diff ADC (ch)	Programmable Gain Amplifier (PGA)	Analog Comparator	Internal DAC Reference	16-bit Timers	Event System Channels	Window WDT	32.768 kHz crystal Osc.	Configurable Custom Logic (LUTs)	USART/ I ² C/SPI	Packages
ATTINY1627	16	256	2 048	24	22	1 (15)	1	1	1	3	6	Y	1	1 (4)	2/1/1	VQFN
ATTINY1626	16	256	2 048	20	18	1 (15)	1	1	1	3	6	Y	1	1 (4)	2/1/1	VQFN, SOIC, SSOP
ATTINY1624	16	256	2 048	14	12	1 (9)	1	1	1	3	6	Y	1	1 (4)	2/1/1	SOIC, TSSOP