

AB08XX Real-Time Clock Family

Introducing the world's most energy- efficient real-time clock chip!

The AB08XX is a feature-rich ultra-low power real time clock (RTC) family. With typical active current of only 15 to 55 nA, the AB08XX is ideal for applications requiring maximum possible battery life and the smallest, least expensive battery.

The AB08XX includes on-chip oscillators to provide minimum power consumption, full RTC functions including battery backup, and programmable counters and alarms for timer and watchdog functions.

The AB08XX product family is footprint compatible with many existing RTC products. Combined with a simple memory map, this enables fast and low cost software/hardware development.

Applications

- Real-time backup
- Wireless sensors and tags
- Smart cards and security tokens
- Medical electronics
- Utility meters
- Data loggers
- Handsets
- Consumer electronics
- Appliances
- ...and many more

Features

Ultra-low supply current: 15 nA with integrated RC oscillator, 20 nA with XTAL-assisted RC oscillator, and 55 nA with XTAL oscillator

- **Baseline timekeeping**
 - 32 KHz crystal oscillator
 - Counters for 100ths, seconds, minutes, hours, date, month, year, century, weekday
 - Alarm capability on all counters
 - Countdown timer with repeat function
 - Automatic leap year calculator
- **Advanced timekeeping**
 - Integrated RC oscillator with automatic calibration
 - Programmable XTAL compensation
 - Automatic switchover to battery
 - Watchdog timer with external interrupt input
 - Output clock generator
 - Unique ID up to 30 bits
 - Up to 256 bytes of general purpose
- **Power management**
 - Programmable analog voltage comparator
 - External interrupt monitoring
 - Reset output generator
 - Programmable brown-out detector
 - Trickle charger
- **I2C™ or SPI serial interface available**
- **Wide voltage range**
 - 1.8 to 4.1V for serial communication
 - Down to 1.2V for timekeeping
- **Operating temperature –40 to 85 °C**

Part	Package	Interface	Baseline Timekeeping			Advanced Timekeeping			
			ICC/IBAT With Xtal	Counters & Timers	Interrupt Outputs	ICC/IBAT With RC	Auto VBAT Backup	Unique ID	SRAM (B)
AB0801	QFN-16	I ² C™	55nA	x	2	15nA		x	0
AB0803	QFN-16	I ² C™	55nA	x	1	15nA	x	x	0
AB0804	QFN-16	I ² C™	55nA	x	1	15nA	x	x	64
AB0805	QFN-16	I ² C™	55nA	x	4	15nA	x	x	256
AB0815	QFN-16	SPI	55nA	x	3	15nA	x	x	256

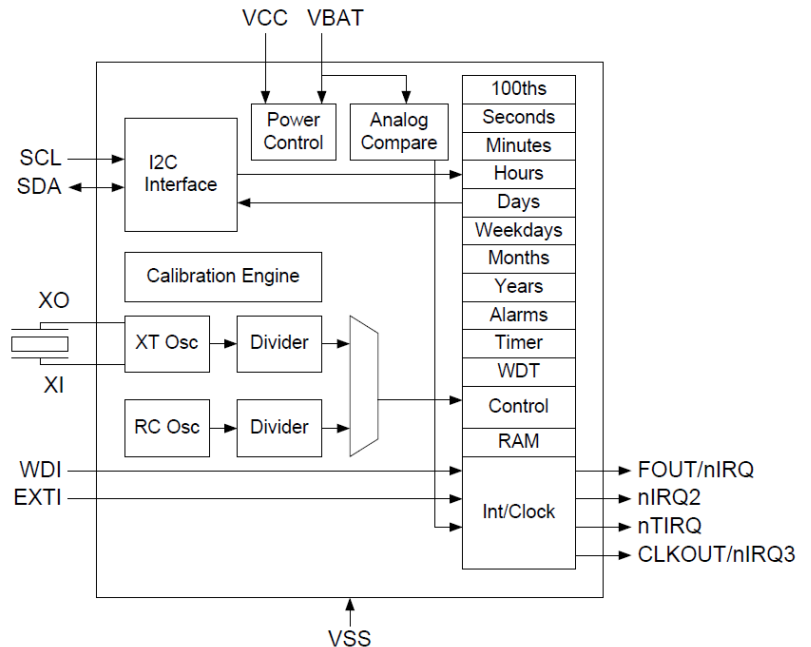
Part	Package	Interface	Power Management					
			Integrated Power Switch	System Sleep Manager	Analog Voltage Comparator	Interrupt Inputs	External Reset Monitor	Trickle Charger
AB0801	QFN-16	I ² C™						
AB0803	QFN-16	I ² C™						x
AB0804	QFN-16	I ² C™						x
AB0805	QFN-16	I ² C™			x	x		x
AB0815	QFN-16	SPI			x	x		x

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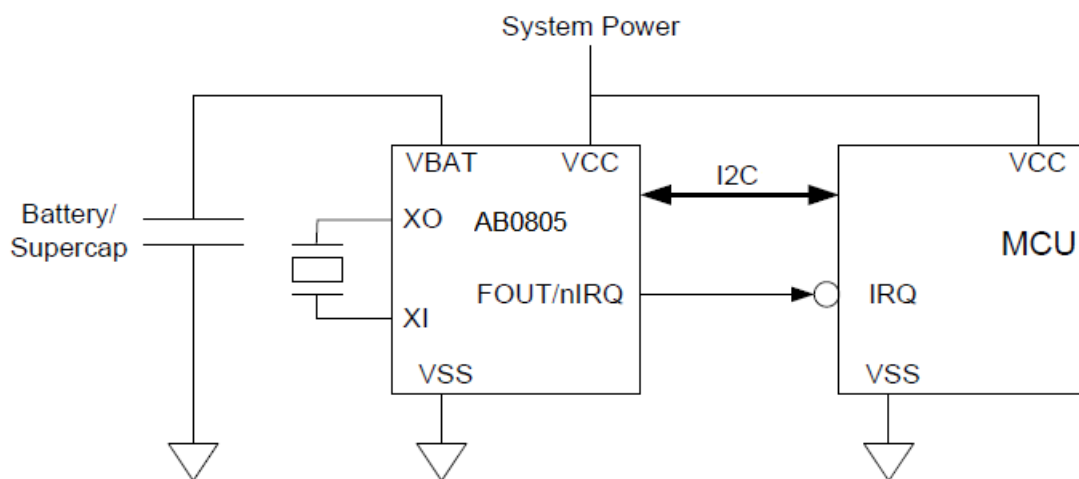
Based on ultra-low power technology developed at Ambiq, the AB08XX real-time clock family provides flexible, advanced RTC timekeeping features at the lowest possible power budget.

The AB08XX family includes automatic battery switching, programmable countdown timers and alarms, a watchdog timer, and integrated RAM options enabling operation as a backup device in both line-powered and battery-powered systems. Additional power management functions are available for monitoring of external interrupts such as push-button signals and host brown-out detection.

The AB08XX is compatible with leading crystal vendors and supports digitally controlled crystal calibration functions. For applications with flexible accuracy requirements, the AB08XX includes a unique, patented integrated RC oscillator function that provides even lower current draw than the crystal oscillator. Using a proprietary algorithm, the RC oscillator can be periodically calibrated against the crystal.



AB0805 Function Block Diagram



AB0805 Typical Application Circuit