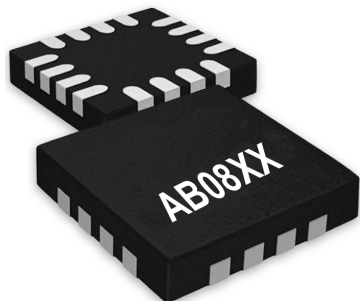


AM18XX Real-Time Clock Family with Power Management



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

The AB18XX is a feature-rich ultra-low power real time clock (RTC) family with advanced power management capabilities. With typical active current of only 15 to 55 nA, the AB18XX is ideal for applications requiring maximum possible battery life and the smallest, least expensive battery.

The AB18XX 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.

In addition, an integrated power switch and system sleep manager allow the AB18XX to be used as a supervisory component in a host microcontroller-based system.

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 SRAM
- **Power management**
 - Integrated power switch for power control of host processor
 - System sleep manager
 - Programmable analog voltage comparator
 - External interrupt monitoring
 - External reset signal 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)
AB1801	QFN-16	I ² C™	55nA	x	2	15nA		x	0
AB1805	QFN-16	I ² C™	55nA	x	4	15nA	x	x	256
AB1815	QFN-16	SPI	55nA	x	3	15nA	x	x	256

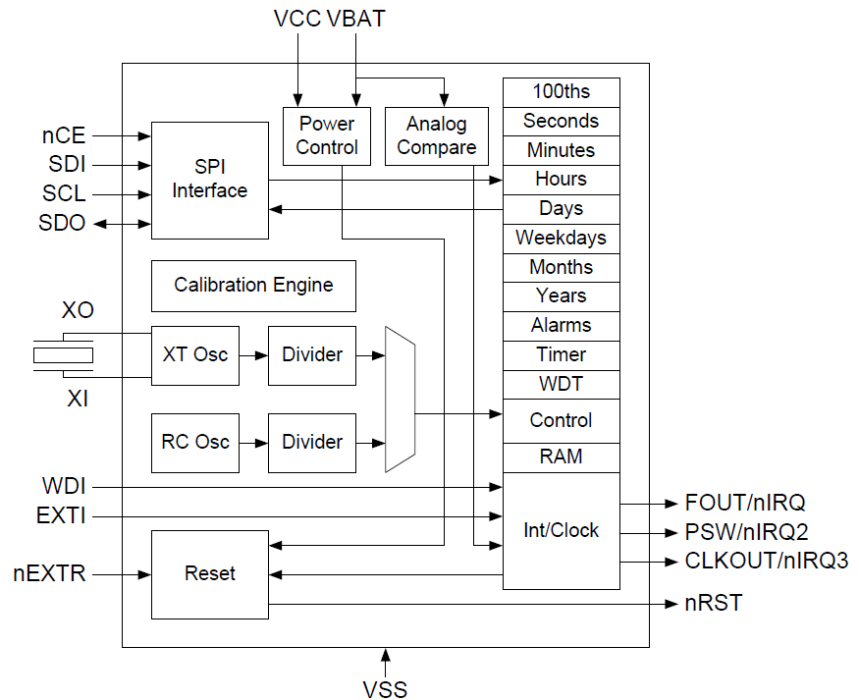
Part	Package	Interface	Power Management					
			Integrated Power Switch	System Sleep Manager	Analog Voltage Comparator	Interrupt Inputs	External Reset Monitor	Trickle Charger
AB1801	QFN-16	I ² C™	x	x				
AB1805	QFN-16	I ² C™	x	x	x	x	x	x
AB1815	QFN-16	SPI	x	x	x	x	x	x

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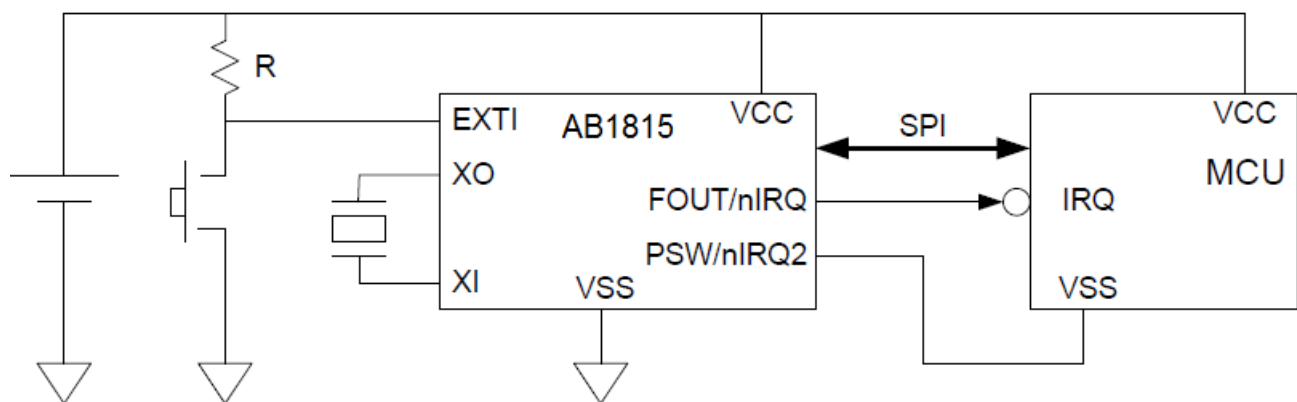
Based on ultra-low power technology developed at Ambiq, the AB18XX real-time clock family provides flexible, advanced RTC timekeeping features as well as innovative power management functions.

The AB18XX 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 sleep management, monitoring of external interrupts such as pushbutton signals, and host brown-out detection. Featuring a unique and patented integrated power switch, the AB18XX can also serve as a host power controller to minimize the total system sleep current.

The AB18XX is compatible with crystals from leading vendors and supports digitally controlled crystal calibration functions. For applications with flexible accuracy requirements, the AB18XX 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.



AB1815 Function Block Diagram



AB1805 Typical Application Circuit