

REAL TIME CLOCKS

Intersil's family of Real Time Clock products offer a wide variety of useful industry-standard functions and features covering basic low-cost clock and calendar RTCs, feature-rich RTCs including supervisory functions and EEPROM memory for system personality data, as well as high-accuracy 3-in-1 RTC modules which integrate RTC, 32kHz crystal, and onboard temperature sensor.



ISL12058: World's Smallest, Low Cost and Low Power RTC

High-Accuracy RTC Modules

RTC Modules with Embedded Crystal and Temp Comp

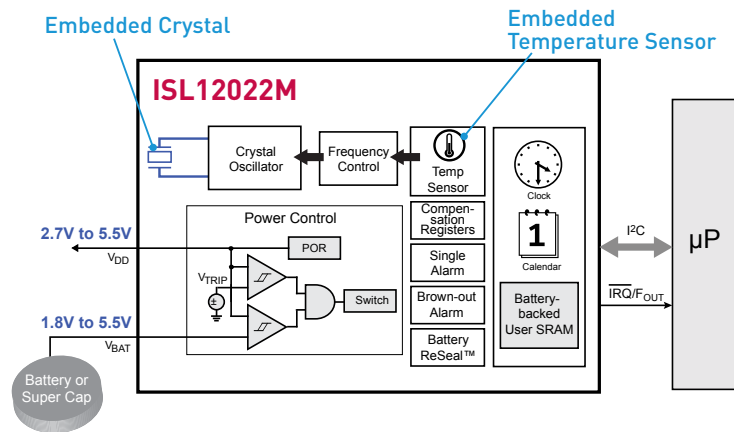
ISL12022M

3 in 1 RTC Module (RTC + Embedded Crystal + Temp Sensor) Achieves Better than +5ppm Accuracy

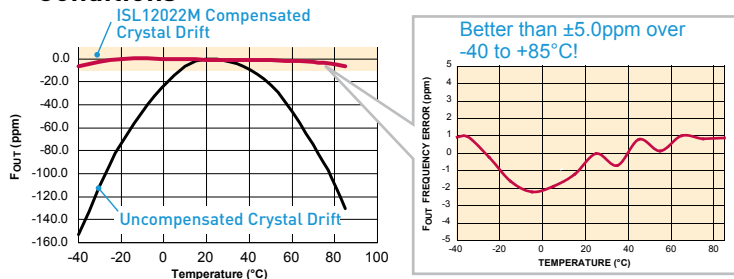
Key Features

- **±5ppm Accuracy (-40°C to +85°C)**
 - Factory programmed RTC for optimal accuracy
 - Onboard temperature sensor
 - Embedded crystal
- **Reliable Timekeeping & Power Management**
 - Backup battery management
 - V_{DD} and battery status monitors and switchover timestamp
 - Battery ReSeal™ function extends battery shelf life
- **User Programmability**
 - I²C Interface
 - 128 bytes battery-backed user SRAM
- **See also**
 - ISL12020M (DFN 3 in 1); ISL12022 and ISL12023 standalone RTCs

Block Diagram



High Accuracy Even in Extreme Temperature Conditions



High-Accuracy RTC Modules

Device	I _{BAT} (nA)	Alarms	Selectable Frequency Output	CPU Supervisory Function		Battery		IRQ	F _{OUT}	SRAM	Other Functions	Package
				POR	Watchdog Timer	ReSeal™	Backup					
ISL12020M	1000	1	15	N	N	Y	Y	Shared Pin	128 Bytes	• Battery Switchover Time Stamp • Battery Status Monitor	20 Ld DFN	
ISL12022M	1000	1	15	N	N	Y	Y	Shared Pin	128 Bytes	• Battery Switchover Time Stamp • Battery Status Monitor	20 Ld SOIC	
ISL12022MA	1000	1	15	N	N	Y	Y	Shared Pin	128 Bytes	• Enhanced Environmental Moisture Tolerance • 100% Pin Compatible with ISL12022M • Firmware Compatible with ISL12020M and ISL12022M	20 Ld SOIC	
ISL12022M-R5421	1000	1	15	N	N	Y	Y	Shared Pin	128 Bytes	• Enhanced ESD Performance • 100% Pin Compatible with ISL12022M • Firmware Compatible with ISL12020M and ISL12022M	20 Ld SOIC	

Feature-Rich RTCs

Feature-Rich RTC with Embedded Unique ID

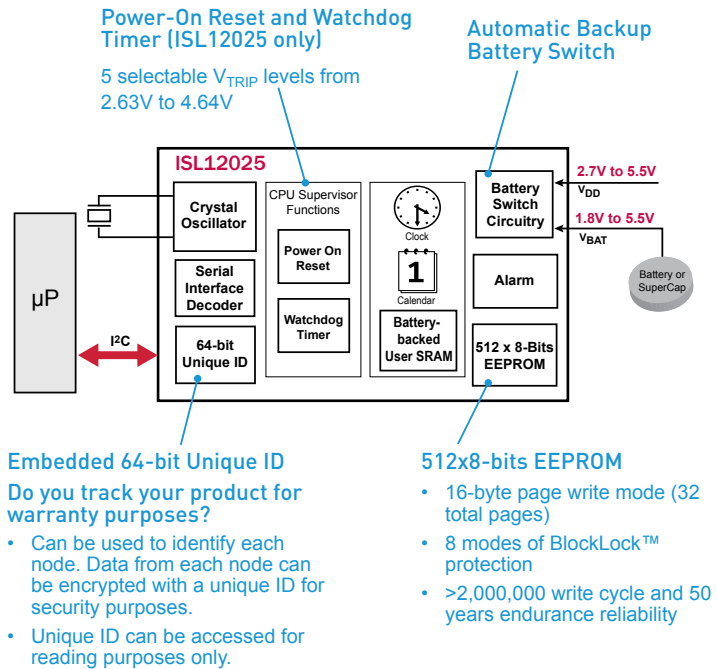
ISL12024, ISL12025

RTC with Factory Programmed 64-bit Unique ID Enhances Security

Key Features

- Real-Time Clock/Calendar-Tracks Time in Hours, Minutes and Seconds
 - Day of the Week, Day, Month and Year
- 64-Bit Read-Only Unique ID
- Two Non-Volatile Alarms
 - Settable by Seconds, to Months
 - Repeat Mode (Periodic Interrupts)
- Automatic Backup Switching to Battery or SuperCap™
- On-Chip Oscillator Compensation
 - Internal Feedback Resistor and Compensation Capacitors
 - Analog and Digital Trim

Block Diagram



Feature-Rich RTCs

Device	I _{BAT} (nA)	Alarms	Selectable Frequency Output	CPU Supervisory Function		Battery		IRQ	F _{OUT}	SRAM	Other Functions	Package
				POR	Watchdog Timer	Re Seal™	Backup					
With 50/60 Cycle AC Input												
ISL12030	N/A	2	N	N	N	N	N	Y	N	128 Bytes	• AC Input	8 Ld SOIC
ISL12032	800	2	7	Y	Y	N	Y	Y	Y	128 Bytes	• AC Input • Crystal Backup • Trickle Charger	14 Ld TSSOP
High Precision RTC with On-Chip Temperature Sensor												
ISL12022	1000	1	15	N	N	Y	Y	Shared Pin		128 Bytes	• Battery Switchover Time Stamp • Battery Status Monitor	8 Ld SOIC
ISL12023	1000	1	15	N	N	Y	Y	Dedicated Pin	Dedicated Pin	128 Bytes	• Battery Switchover Time Stamp • Battery Status Monitor	14 Ld TSSOP
With Integrated EEPROM												
ISL12026	850	2	3	N	N	N	Y	Shared Pin		512x8-Bit EEPROM		8 Ld SOIC, 8 Ld TSSOP
With Integrated EEPROM and Embedded Unique ID												
ISL12024	850	2	3	N	N	N	Y	Shared Pin		512x8-Bit EEPROM	• 64-bit Unique ID	8 Ld SOIC, 8 Ld TSSOP
ISL12024IRTCZ	850	2	3	N	N	N	Y	Shared Pin		512x8-Bit EEPROM	• 64-bit Unique ID	8 Ld TDFN
With Integrated EEPROM and CPU Supervisory Functions												
ISL12027	850	2		Y	Y	N	Y	-	-	512x8-Bit EEPROM		8 Ld SOIC, 8 Ld TSSOP
ISL12028	850	2	3	Y	Y	N	Y	Shared Pin		512x8-Bit EEPROM	• CMOS output on alarms	14 Ld SOIC, 14 Ld TSSOP
ISL12029	850	2	3	Y	Y	N	Y	Shared Pin		512x8-Bit EEPROM	• Open drain output on alarms	14 Ld SOIC, 14 Ld TSSOP
With Integrated EEPROM, Embedded Unique ID, and CPU Supervisory Functions												
ISL12025	850	2		Y	Y	N	Y	-	-	512x8-Bit EEPROM	• 64-bit Unique ID • CPU Supervisor	8 Ld SOIC, 8 Ld TSSOP

Low-Cost, Low-Power RTCs

Low-Cost, Low-Power RTC

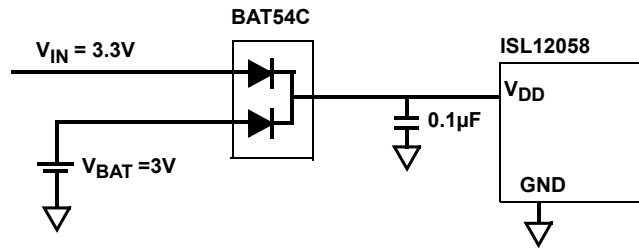
ISL12058

World's Smallest, Low Cost and Low Power RTC

Key Features

- **Low Power**
 - Time keeping current = 650nA max @ 1.8V
- **Ideal for Portable Applications**
 - Operates over 1.4V to 3.6V supplies
- **56% Smaller than Competitive Solutions**
 - 8- μ TDFN (2x2x0.55mm)
- **Easy to Design-in**
 - Pin-to-pin replacement: 8-TDFN (3x3mm), 8-MSOP, 8-SOIC

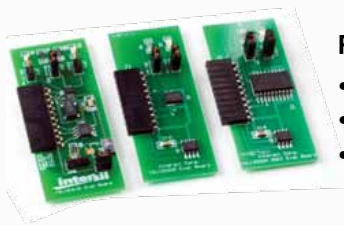
Add Battery Backup to a Low Cost RTC Without a V_{BAT} Input



Low-Cost, Low-Power RTCs

Device	I _{BAT} (nA)	Alarms	Selectable Frequency Output	CPU Supervisory Function		Battery		IRQ	F _{OUT}	SRAM	Other Functions	Package
				POR	Watchdog Timer	Reseal™	Backup					
With IRQs, Alarm and Timer												
ISL12057	400	2	4	N	N	N	N	Shared Pin	N	• 3V		8 Ld SOIC, 8 Ld MSOP, 8 Ld TDFN
ISL12058	400	2	4	N	N	N	N	Shared Pin	N	• 3V		8 Ld SOIC, 8 Ld MSOP, 8 Ld TDFN, 8 Ld μ TDFN
ISL12059	400	0	1	N	N	N	N	Shared Pin	N	• 3V		8 Ld SOIC
ISL12082	800	1	4	N	N	Y	Y	Dedicated Pin	Dedicated Pin	N	• Alarm • Timer	10 Ld MSOP, 8 Ld SOIC
With Battery Backup												
ISL12008	800	1	1	N	N	Y	Y	-	Dedicated Pin			8 Ld SOIC
With Battery Backed SRAM												
ISL1208	400	1	15	N	N	N	Y	Shared Pin		2 Bytes	• InterSeal™	8 Ld MSOP, 8 Ld SOIC, 8 Ld TDFN
ISL1218	400	1	15	N	N	N	Y	Shared Pin		8 Bytes	• InterSeal™	8 Ld MSOP, 8 Ld SOIC
ISL1220	400	1	15	N	N	N	Y	Dedicated Pin	Dedicated Pin	8 Bytes	• InterSeal™	10 Ld MSOP
With Battery Backed SRAM and Event Detection												
ISL1209	400	1	15	N	N	N	Y	Shared Pin		2 Bytes	• Event Detect • InterSeal™	10 Ld MSOP
ISL1219	400	1	15	N	N	N	Y	Shared Pin		2 Bytes	• Event Detect • Time Stamp • InterSeal™	10 Ld MSOP
ISL1221	400	1	15	N	N	N	Y	Dedicated Pin	Dedicated Pin	2 Bytes	• Event Detect • Time Stamp • InterSeal™	10 Ld MSOP

RTC Evaluation Platform Now Compatible with Windows™ 7 & 8!



RTC Daughter Boards

- Contains RTC sample
- 32.768kHz Crystal (if needed)
- Provides Jumper and LED to monitor IRQ/FOUT interrupt



ISLUSB RTC Mother Board

- Provides I²C interface via USB
- Provides Main Supply (3.3V or 5.5V)
- Provides Battery Backup Supply