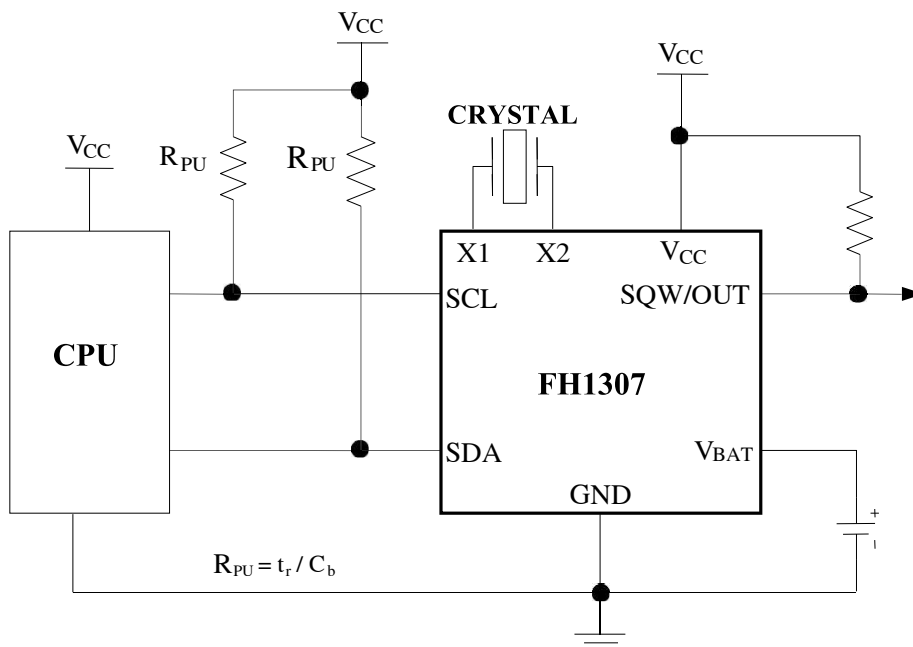# FH1307

64 x 8, Serial, I^{2}C Real-Time Clock

GENERAL DESCRIPTION

The FH1307 serial real-time clock (RTC) is a low- power, full binary-coded decimal (BCD) clock/calendar plus 56 bytes of NV SRAM. Address and data are transferred serially through an I^{2}C, bidirectional bus. The clock/calendar provides seconds, minutes, hours, day, date, month, and year information. The end of the month date is automatically adjusted for months with fewer than 31 days, including corrections for leap year. The clock operates in either the 24-hour or 12- hour format with AM/PM indicator. The FH1307 has a built-in power-sense circuit that detects power failures and automatically switches to the backup supply. Timekeeping operation continues while the part operates from the backup supply.
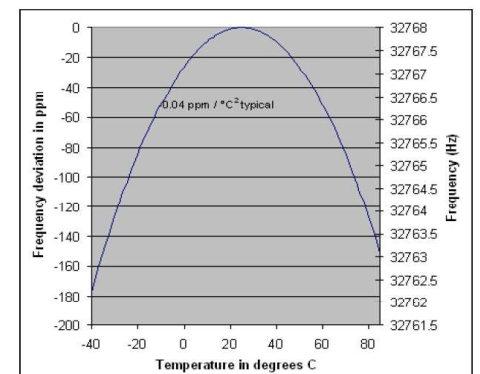
FEATURES

- Real-Time Clock (RTC) Counts Seconds, Minutes, Hours, Date of the Month, Month, Day of the week, and Year with Leap-Year Compensation Valid Up to 2100
- 56-Byte, Battery-Backed, General-Purpose RAM with Unlimited Writes
- I^{2}C Serial Interface
- Programmable Square-Wave Output Signal
- Automatic Power-Fail Detect and Switch Circuitry
- Consumes Less than 500nA in Battery-Backup Mode with Oscillator Running
- Optional Industrial Temperature Range: -40˚C to +85˚C
- Available in 8-Pin Plastic SOP

Ordering Information

Device	Operating Temperature Range	Package	Packing
FH1307	T$_A$ = -40°C ~ +85°C for all packages	SOP-8L	Tape& Reel

TYPICAL OPERATING CIRCUIT

$$R_{PU} = t_r / C_b$$

A. **Application Circuit**

(Physical Diagram)

B. **Crystal frequency vs. temperature.**

PIN CONFIGURATIONS

FH1307 (TOP VIEW)

X1	1	8	VCC
X2	2	7	SQW/OUT
VBAT	3	6	SCL
GND	4	5	SDA

SOP-8L
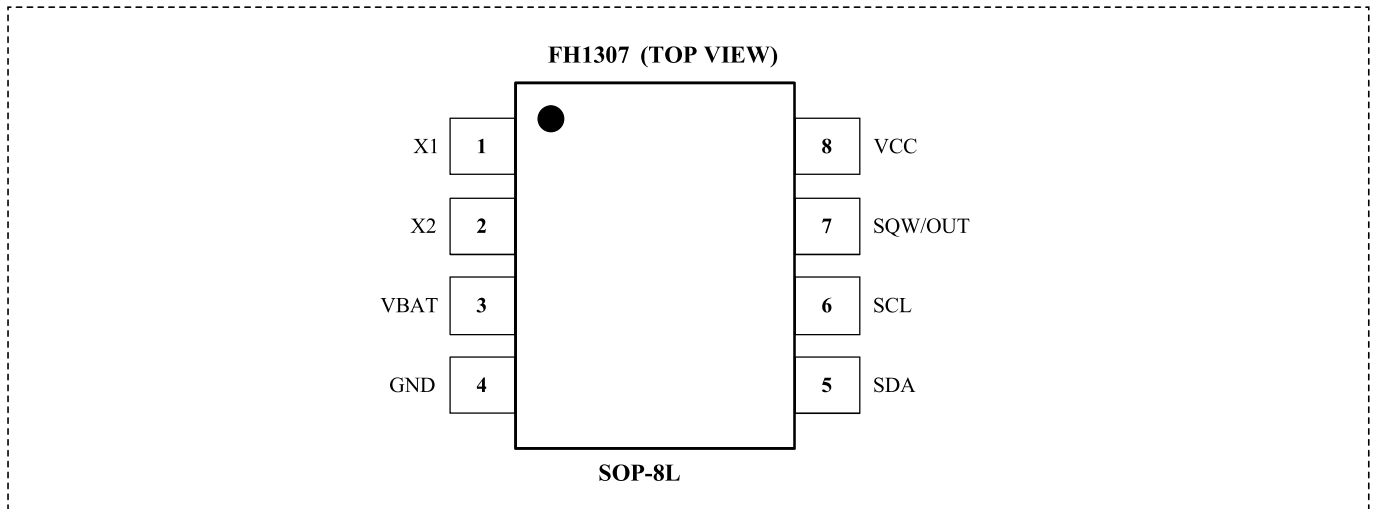
PIN DESCRIPTION

PIN	NAME	FUNCTION
1	X1	Connections for Standard 32.768kHz Quartz Crystal. The internal oscillator circuitry is designed for operation with a crystal having a specified load capacitance (C_L) of 12.5pF. X1 is the input to the oscillator and can optionally be connected to an external 32.768kHz oscillator. The output of the internal oscillator, X2, is floated if an external oscillator is connected to X1. **Note:** For more information on crystal selection and crystal layout considerations, refer to Application Note 58: Crystal Considerations with Dallas Real-Time Clocks.
2	X2	
3	V_{BAT}	Backup Supply Input for Any Standard 3V Lithium Cell or Other Energy Source. Battery voltage must be held between the minimum and maximum limits for proper operation. Diodes in series between the battery and the V_{BAT} pin may prevent proper operation. If a backup supply is not required, V_{BAT} must be grounded. The nominal power-fail trip point (V_{PF}) voltage at which access to the RTC and user RAM is denied is set by the internal circuitry as 1.25 x V_{BAT} nominal. A lithium battery with 48mAh or greater will back up the FH1307 for more than 10 years in the absence of power at +25˚C. UL recognized to ensure against reverse charging current when used with a lithium battery.
4	GND	Ground
5	SDA	Serial Data Input/Output. SDA is the data input/output for the I^2C serial interface. The SDA pin is open drain and requires an external pullup resistor. The pullup voltage can be up to 5.5V regardless of the voltage on V_{CC}.
6	SCL	Serial Clock Input. SCL is the clock input for the I^2C interface and is used to synchronize data movement on the serial interface. The pullup voltage can be up to 5.5V regardless of the voltage on V_{CC}.
7	SQW/OUT	Square Wave/Output Driver. When enabled, the SQWE bit set to 1, the SQW/OUT pin outputs one of four square-wave frequencies (1Hz, 4kHz, 8kHz, 32kHz). The SQW/OUT pin is open drain and requires an external pullup resistor. SQW/OUT operates with either VCC or VBAT applied. The pullup voltage can be up to 5.5V regardless of the voltage on VCC. If not used, this pin can be left floating.
8	V_{CC}	Primary Power Supply. When voltage is applied within normal limits, the device is fully accessible and data can be written and read. When a backup supply is connected to the device and VCC is is below V_{TP}, read and writes are inhibited. However, the timekeeping function continues unaffected by the lower input voltage.

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## ORDERING INFORMATION

Part Number	Voltage Range	Features	Operating Temperature	Package Type	Top Mark	SPQ
FH1307S8	4.5V ~ 5.5V	● 56-Byte,General-Purpose RAM ● I²C Serial Interface ● VBAT Current: 300nA ● SCL Clock Frequency: 100kHz	-40℃ to 85℃	SOP-8L	1307 xx YML	3000PCS/Reel

Note:

➢ FH1307 devices are Pb-free and RoHs compliant.

➢ The surface prints of our semiconductor devices are subject to change during the production process and do not involve changes in electrical parameters, and we will not separately state the notice.

➢ If you have any other custom purchase needs, please contact our sales department.

Device Name: SOP-8L

FH 1307 YML

FH1307: Device Name
YML : Date Code
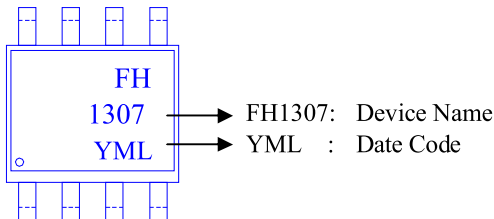
ESD SENSITIVITY CAUTION

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

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Note:

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▲ Update by May.2018