



REAL TIME CLOCK IC

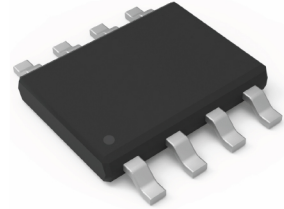
REAL TIME CLOCK IC (Built-in Crystal Oscillator)

High-precision

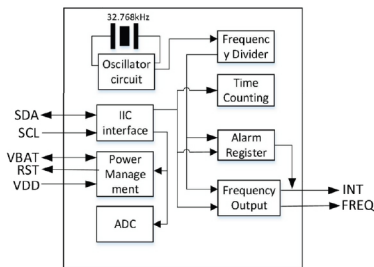


ST8931

- Low power consumption: 0.6μA typical (Ta=25°C).
- Operating voltage: 2.5V ~ 5.5V; Timekeeping: 1.5V ~ 5.5V.
- Operating temperature: -40°C~+105°C
- Standard IIC bus interface, maximum speed 400KHz (4.5V~5.5V).
- Chip pin ESD>4KV
- CMOS Process
- Package Form:SOP8 (150mil) and SOP16 (300mil)



Block diagram



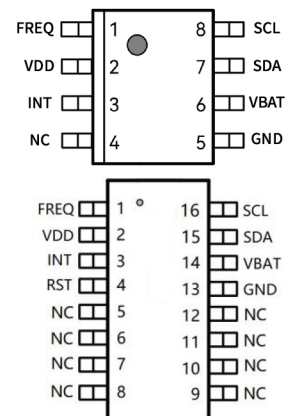
Overview

- Built-in 70-byte general-purpose SRAM
- high precision timing function in a wide temperature range: 0°C ~ +40°C <± 2PPM, -40°C ~ +85°C <± 3.5PPM, +86°C ~ +105°C <± 10PPM.
- Built-in IIC bus 0.5 seconds automatic reset function.
- Built-in 1/1024 second register
- Built-in 8-byte ID code
- Built-in communication verification function
- Built-in clock data write-protection function

Pin Function

Name	function	Features
FREQ	32.768kHz Frequency output pin controlled by register.	Open-drain output
VDD	Positive power supply pin	2.5V~5.5V
INT	Alarm interrupt output pin	Open-drain output
RST	Reset pin with low level active (SD8931 SOP8 does not have this pin)	Open-drain output
GND	Negative power (GND)	
VBAT	Backup battery input pin, built-in voltage regulator and charging current selectable charging circuit.	1.5V to 5.5V, should be connected to GND when not in use
SDA	Serial data input/output pin, this pin is usually pulled up to VDD with a resistor, and connected to other devices with open drain or open collector outputs via wire-AND logic.	N-Channel Open Drain Output/CMOS input
SCL	Serial Clock Input pin. Since the signal is processed on the rising/falling edge of the SCL, special attention should be paid to the rising/falling rise/lowering time of the SCL signal, and the instructions should be strictly adhered to. In order to reduce the SCL rising edge time, the port where the MCU is connected to SCL can be set to CMOS output, do not set it to open-drain output.	CMOS input
NC	There is no internal connection to the chip	

Terminal connection



Characteristics

• DC characteristics

Symbol	Parameters	Condition	Min	Typical	Max	Unit
V _{DD}	Main power supply		2.5		5.5	V
V _{keep}	Timekeeping		1.5		5.5	V
V _{BAT}	Standby battery supply voltage		1.5		5.5	V
I _{DD1}	Main supply current	V _{DD} =5V		0.6		μA
I _{DD2}	The supply current when the IIC communicates	V _{DD} =3V		0.5	1.0	μA
I _{DD3}	Power supply current when charging is enabled	V _{DD} =5V		80		μA
I _{BAT}	Spare battery supply current	V _{BAT} =3V		0.5		μA
I _{I1}	The input leakage current of SCL			100		nA
I _{I0}	The input/output leakage current of the SDA			100		nA
V _{ASWITCH}	Hysteresis voltage for switching between VBAT and VDD			85		mV
V _{sw}	Voltage to switch between VBAT and VDD	Ta=25°C		2.4		V
INT / SDA Vol.	INT / SDA low level output voltage	V _{DD} =5V I _{OL} =0.5mA	0.1	0.2	0.3	V
V _{COMP}	Temperature compensation threshold voltage			2.4		V

• Frequency Error & Temperature Relationship Curve

