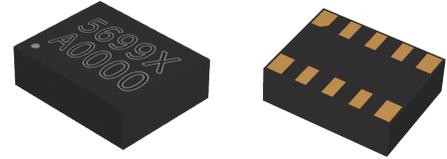


## REAL TIME CLOCK MODULE (I2C-Bus) High Stability, Power Switching

# INS5699



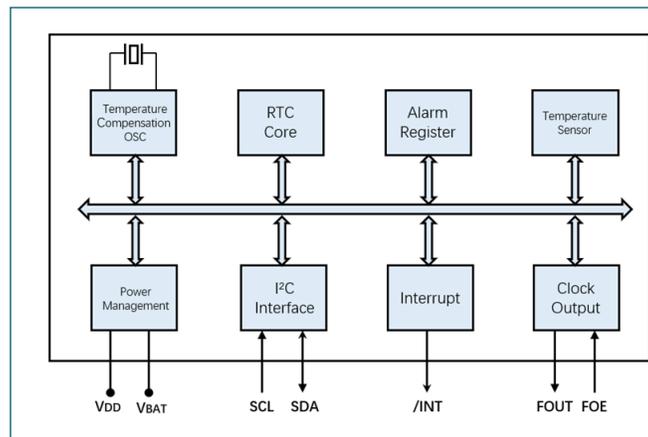
INS5699 is the upgrade version from INS5609 with better temperature stability and lower power consumption.

INS5699 is an I2C bus interface real-time clock with ultra low power consumption which includes a 32.768KHz TCXO. The high precise temperature sensor and temperature compensated circuit ensure the high clock accuracy. It supports calendar (year, month, day, hour, minute, second), clock, alarm and wakeup timer functions etc. By the battery backup switchover function and the interface power supply input pin, INS5699 can support various power supply circuitries. The devices in this module are fabricated via a C-MOS process for low current consumption, which enables long-term battery back-up.

### Features:

- Built in 32.768 kHz TCXO
- Interface type: I2C-Bus interface (400 kHz)
- Operating voltage range: 2.5 V to 5.0 V
- Auto power switching function: automatically switches to backup power
- Interrupt output: wake up every minute or every second
- Alarm interruption: day, date, hour, minute
- Auto repeat wakeup timer interruption
- Support time accuracy to 1/16 second

### Block Diagram



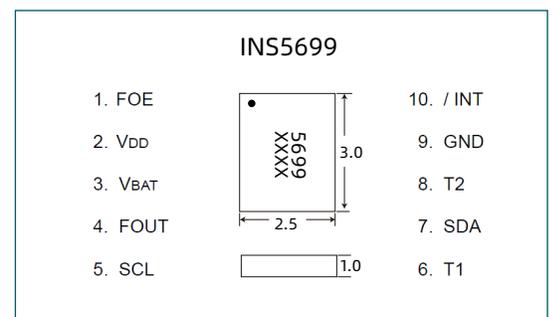
### Overview

- Interface type  
I2C-Bus high-speed bus specifications. (400 kHz)
- Auto power switch function  
The VDD voltage is monitored and it switches to the backup power supply by the automatic operation.
- Frequency output function  
It may select a CMOS or open drain output  
Output frequency is selectable from 32.768KHz, 2014Hz, 1Hz
- Wakeup timer function  
Selectable from 244  $\mu$ s to 2.8 days(12 bit x 1 ch.)  
Timer source clock selectable from 1/60Hz, 1Hz, 64Hz, 4096Hz  
Auto release after interrupt output from /INT pin at timer completes.
- Alarm function  
It is possible program from day to minute
- Leap years autocorrection

### Pin Function

Signal Name	Pin Function	Pin Function
FOE	Input	The FOUT output control pin. "1" - enable FOUT, "0" - FOUT Hi-Z
VDD	-	Power supply pin
VBAT	-	Power supply by backup battery, in the backup voltage range. Connect to VDD when switchover function is not necessary.
FOUT	Output	Frequency output pin, controlled by FOE. Frequency can be set by FSEL bits.
SCL	Input	Serial clock input pin
/INT	Output	Interrupt output, open drain
GND	-	Ground pin
T1,T2	-	Factory test pin, no need connect
SDA	Input/Output	Serial data input and output pin

### Terminal Connection/External Dimensions



### Electrical Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Operating voltage	V <sub>DD</sub>	-	2.5	3.0	5.0	V
Backup battery	V <sub>BAT</sub>	-	1.6	3.0	5.0	V
Power supply voltage in case of single supply (V <sub>DD</sub> =V <sub>BAT</sub> )	V <sub>DD</sub>	-	1.6	3.0	5.0	V
Operating temp.	T <sub>a</sub>	-	-40	+25	+85	°C
Temp. stability	$\Delta f/f$	T <sub>a</sub> = -40°C ~ +85°C	-5	-	+5	x 10 <sup>-6</sup>
Aging/year	f <sub>a</sub>	@25°C	-3	-	+3	ppm
Start time	t <sub>STA</sub>	@25°C	-	-	1	s
Current consumption	I <sub>DD</sub>	(Power supply by backup battery)	-	0.5	-	$\mu$ A