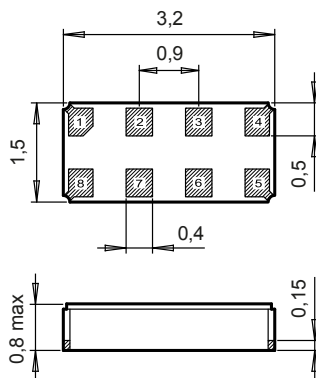




Real Time Clock Module with I²C-Bus



Package:



Technical drawing of a rectangular plate with dimensions and hole positions. The plate has a total width of 3,2 and a total height of 1,6. There are two rows of three rectangular holes. The horizontal distance between the centers of the holes in each row is 0,9. The vertical distance between the centers of the holes in the two rows is 0,5. The distance from the left edge to the center of the first hole in the top row is 0,4. The distance from the bottom edge to the center of the first hole in the bottom row is 0,8. The distance from the right edge to the center of the last hole in the top row is 0,8. The distance from the right edge to the center of the last hole in the bottom row is 0,8. The holes are represented by dashed lines for the top row and solid lines for the bottom row.

All dimensions in mm typical

IoT
Metering
Industrial
Automotive
Health Care
Wearables, Portables

The RV-4162-C7 is a SMT Real-Time Clock Module that incorporates an integrated CMOS circuit together with an XTAL. It operates under vacuum in a hermetically sealed ceramic package with metal lid.

Low power consumption: 350 nA @ 3 V.
Operating voltage range: 1.0 V to 4.4 V.
Time accuracy: ± 20 ppm @ 25°C.
Operating temperature range: -40 to +85°C.
User programmable offset value.
Oscillator stop detection.
Provides year, month, date, weekday, hours, minutes, seconds, 100th.
Automatic leap year calculation and century bits.
Alarm and Watchdog functions.
Clock output frequencies: 32.768 kHz to 1 Hz.
I²C-bus interface: 400 kHz.
100% Pb-free, RoHS-compliant.
Automotive qualification according to AEC-Q200 available.

The block diagram illustrates the internal architecture of the DS1307C Real Time Clock (RTC). The system is powered by V_{DD} (pin 5) and V_{SS} (pin 3). A 32.768 KHz CRYSTAL is connected to the OSC pin (pin 2). The internal components include:

- OSC**: Oscillator block connected to the crystal.
- DIVIDER**: Contains sub-blocks for FREQUENCY-OFFSET COMPENSATION, CLKOUT OUTPUT CONTROL, and OSCILLATOR FAIL DETECTION. It receives input from the OSC and provides output to the CLKOUT pin (pin 1).
- INT CONTROL**: Receives input from the INT pin (pin 6) and provides output to the INT pin.
- I²C-BUS INTERFACE**: Connected to the SCL (pin 8) and SDA (pin 1) pins. It interfaces with the ADDRESS REGISTER.
- WATCHDOG**: Connected to the ADDRESS REGISTER and the Flags register.
- ADDRESS REGISTER**: Receives data from the I²C-BUS INTERFACE and provides output to the WATCHDOG.
- Flags**: A register containing various status bits: 10th/100th Second, Seconds, Minutes, Hours, Weekday, Date, Month / Century, Years, Freq. Compensation, Watchdog, Month Alarm, Date Alarm, Hour Alarm, Minute Alarm, Second Alarm, and Flags. It provides output to the INT pin (pin 6) and the SDA pin (pin 1).
- POWER UP RESET**: Receives input from the V_{DD} and V_{SS} pins and provides output to the ADDRESS REGISTER.

ELECTRICAL CHARACTERISTICS AT 25°C

More detailed information can be found in the Application Manual.

	Symbol	Condition	Min.	Typ.	Max	Unit
Supply voltage	V_{DD}	I ² C-bus active	1.3		4.4	V
Supply voltage	V_{DD}	Time keeping	1.0		4.4	V
Current consumption Time keeping mode	I_{DDO}	I ² C-bus inactive, $V_{DD} = 3\text{ V}$		350	500	nA
CLKOUT frequency	F_{CLKOUT}	Programmable	32768 to 1			Hz
Frequency tolerance	$\Delta F/F$	@ 25°C	$\pm 20^{1)}$			ppm
Aging first year max.	$\Delta F/F$	@ 25°C	± 3			ppm

1) Tighter frequency tolerances on request.

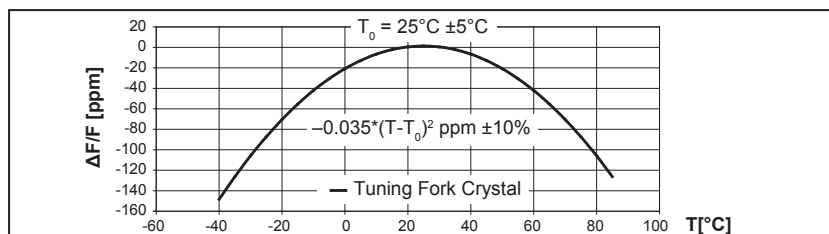
ENVIRONMENTAL CHARACTERISTICS

		Conditions	Max. Dev.
Storage temp. range		-55 to +125°C	
TA Operating temperature range		-40 to +85°C	
Shock resistance	$\Delta F/F$	5000 g, 0.3 ms, 1/2 sine	± 5 ppm
Vibration resistance	$\Delta F/F$	20 g / 10–2000 Hz	± 5 ppm

TERMINATIONS AND PROCESSING

Package	Termination	Processing
SON-8	Au flashed pads	IPC/JEDEC J-STD-020C 260°C / 20 - 40 s

FREQUENCY TEMPERATURE CHARACTERISTICS



PIN CONNECTIONS TOP VIEW

Pin	Connection
1	SDA Serial Data
2	CLKOUT Clock Output
3	V_{SS} Ground
4	NC Not connected
5	V_{DD} Power Supply Voltage
6	INT Interrupt Output
7	NC Not connected
8	SCL Serial Clock Input

ORDERING INFORMATION

RV - 4162 - C7 TA QC	
RTC module	Qualification
Product type	QC = Commercial Grade (Standard)
	QA = Automotive Grade AEC-Q200
Package size	Temperature range
C7 = 3.2 x 1.5 x 0.8 mm	TA = -40 to +85°C (Standard)
A unique part number will be generated for each product specification, i.e:	
20xxxx-MG01	1'000 pcs (in 12 mm tape on 7" reel)
20xxxx-MG03	3'000 pcs (in 12 mm tape on 7" reel)

All specifications subject to change without notice.



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