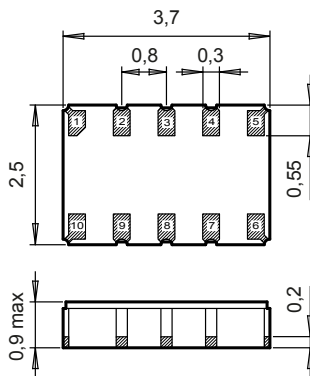




Real-Time Clock Module with SPI-Bus



Package:



Technical drawing of a two-story building facade showing window and door layouts with dimensions. The drawing includes a ground floor and a first floor. The ground floor features a central door (0.8m wide) and four windows (each 0.8m wide). The first floor features four windows (each 0.8m wide). The total width of the facade is 3.7m. The height of the ground floor is 1.4m, and the height of the first floor is 3.0m. The drawing also shows a section of the roof and a section of the wall.

All dimensions in mm typical

IoT
Metering
Industrial
Portables
Automotive
Health Care

The RV-3149-C3 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: 800 nA @ 3 V.
Wide operating voltage range: 1.3 V to 5.5 V.
Time accuracy, temp. compensated: Option A: -40 to +85°C, ±6 ppm.
Option B: -40 to +85°C, ±25 ppm.
Extended operating temperature range: -40 to +125°C.
Automatic Backup Switchover and Trickle Charger function.
Provides year, month, weekday, date, hours, minutes and seconds.
Timer and Alarm functions.
Clock output frequencies: 32.768 kHz, 1024 Hz, 32 Hz, 1 Hz.
2 bytes non-volatile user memory, 8 bytes user RAM.
SPI-bus interface: 4-wire, 1 MHz.
100% Pb-free, RoHS-compliant.
Automotive qualification according to AEC-Q200 available.

Figure 1: Block diagram of the DS1307C real-time clock. The diagram shows the internal components and their connections to a 32.768 kHz Xtal oscillator. The oscillator is connected to the OSC pin (3) and the output control block. The output control block is connected to the CLKOUT pin (3), the CLKOE pin (1), and the INT pin (7). The power control block is connected to VDD (2), VBACKUP (9), and VSS (6). The system control logic is connected to the divider and temperature compensation logic, the output control block, and the temperature sensor. The SPI-BUS 4-wire Serial Interface is connected to CE (8), SCL (4), SDO (5), and SDI (10). The temperature sensor is connected to the system control logic. The DS1307C is shown with its pins and their functions: Control 1, Control INT, Control INT-Flags, Control Status, Control_Reset, Seconds, Minutes, Hours, Date, Weekday, Month, Year, Seconds Alarm, Minutes Alarm, Hours Alarm, Date Alarm, Weekday Alarm, Month Alarm, Year Alarm, Timer Low, Timer High, Temperature °C, 2 Bytes of user EEPROM, EE Ctrl, XTAL Offset, XTAL Coef, XTAL T0, and 8 Bytes of user RAM.

ELECTRICAL CHARACTERISTICS AT 25°C

More detailed information can be found in the Application Manual.

ENVIRONMENTAL CHARACTERISTICS

TERMINATIONS AND PROCESSING

FREQUENCY TEMPERATURE CHARACTERISTICS

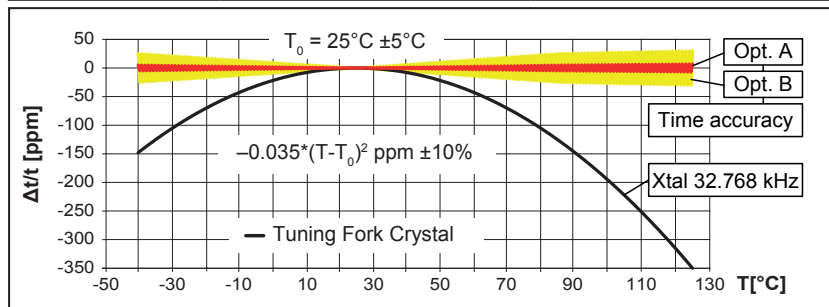
PIN CONNECTIONS TOP VIEW

ORDERING INFORMATION

	Symbol	Condition	Min.	Typ.	Max	Unit
Supply voltage	V_{DD}	Time keeping	1.3		5.5	V
Supply voltage	V_{DD}	Thermom. active	2.1		5.5	V
Current consumption Time keeping mode	I_{DDO}	SPI-bus inactive, $V_{DD} = 3\text{ V}$		800	1000	nA
Time acc. Opt. A / B	$\Delta t/t$	-40 to +85°C	$\pm 6 / \pm 25$			ppm
Aging first year max.	$\Delta F/F$	@ 25°C	± 3			ppm

	Conditions	Max. Dev.
Storage temp. range	-55 to +125°C	
TA Operating temperature range	-40 to +85°C	
TB Extended oper. temp. range	-40 to +125°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

Package	Termination	Processing
SON-10	Au flashed pads	IPC/JEDEC J-STD-020C 260°C / 20 - 40 s



Pin	Connection
1	CLKOE Clock Output Enable
2	V_{DD} Power Supply Voltage
3	CLKOUT Clock Output
4	SCL Serial Clock Input
5	SDO Serial Data Output
6	V_{SS} Ground
7	$\overline{\text{INT}}$ Interrupt Output
8	CE Chip Enable
9	V_{BACKUP} Backup Supply Voltage
10	SDI Serial Data Input

RV - 3149 - C3	Option A	TA	QC
RTC module			Qualification
Product type			QC = Commercial Grade (Standard)
Package size			QA = Automotive Grade AEC-Q200
C3 = 3.7 x 2.5 x 0.9 mm			Temperature range
Time accuracy			TA = -40 to +85°C (Standard)
Option A = ± 6 ppm @ -40°C to +85°C			TB = -40 to +125°C
Option B = ± 25 ppm @ -40°C to +85°C			
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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