

100% leadfree, RoHS - compliant

General Description

The RV-8803-C7 is a high accuracy, ultra-low power Real-Time-Clock Module with embedded 32.768 kHz Crystal. High accuracy, high stability is achieved by factory calibrated, temperature compensated DTCXO and results to time-accuracy of ± 3.0 ppm across the temperature range from -40 °C to +85 °C.

Standard Clock & Calendar function tracks second, minute, hour in 24-hour format, year and leap -year flags. Beside standard RTC function like Timer & Alarm, it includes integrated Temperature Sensor, Time Stamp Event Input and User RAM and offers I2C-bus (2-wire Interface).

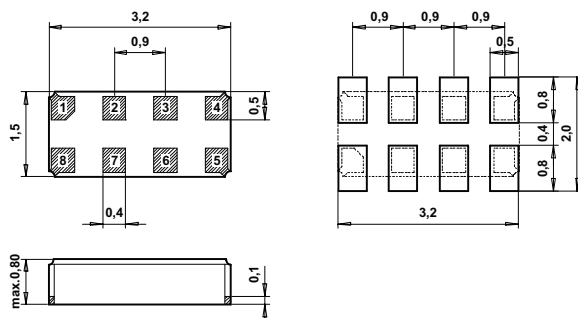
RV-8803-C7 is the smallest and offers the lowest current consumption among all temperature compensated RTC modules.

For pick-and-place equipment, the parts are available in 12 mm tape: 7" (178 mm) reel with 1'000 parts or reel with 3'000 parts.

Applications

- Communication
- IOT Wireless Sensors and Tags / Handsets
Metering
- E-Meter / Heating Counter / Smart Meters / PV Converter
Outdoor
- ATM & POS systems / Surveillance systems / Ticketing
Medical
- Glucose Meter / Health Monitoring Systems
Safety
- Security & Camera Systems / Door Lock & Access Control
Consumer
- Gambling Machines / TV & Set Top Boxes / White Goods
Automation
- DSC / Data Logger / Home & Factory Automation

Dimensions

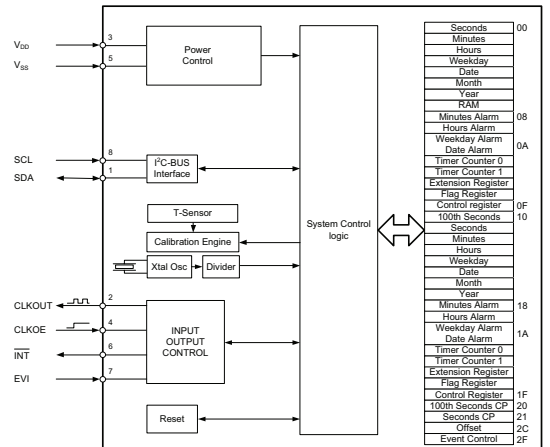


Real Time Clock Module with I2C-Bus

Features

- 32.768 kHz built-in "Tuning Fork" crystal oscillator
Counters for hundredths, seconds, minutes, hours, date, month, year, century and weekday
Factory calibrated temperature compensation
Very high Time Accuracy
- ± 1.5 ppm 0 to +50 °C
- ± 3.0 ppm -40 to +85 °C
- Aging compensation with OFFSET value
I2C (up to 400 kHz) serial interface
Periodic Countdown Timer Interrupt function
Periodic Time Update Interrupt function (seconds, minutes)
Alarm Interrupts for date, weekday, hour and minute settings
External Event Input
Programmable Clock Output for peripheral devices (32.768 kHz, 1.024 kHz, 1 Hz) with enable/disable function (CLKOE)
Automatic leap year calculation (2000 to 2099)
Wide operating voltage range: 1.5 V to 5.5 V
Very low current consumption: 240 nA (VDD = 3.0V)
Operating temperature range: -40 to +85 °C
Ultra-small and compact C7 package size, RoHS-compliant and 100% lead free: 3.2 x 1.5 x 0.8 mm
Register compatible with Epson RX-8803SA/LC

Block Diagram





Electrical Characteristics at 25 °C

	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage	V_{DD}	Time keeping	1.5		5.5	V
Supply voltage	V_{DD}	Temp. comp.	1.5		5.5	V
Current consumption	I_{DDO}	$V_{DD} = 3V$		240	400	nA
CLKOUT frequency	F_{CLKOUT}	programmable	32768/1024/1			Hz
Frequency Tol: 1Hz	$\Delta F/F$	-40 to +85 °C		0	±3	ppm
Frequency Tol: 32768Hz	$\Delta F/F$	@25 °C		±10	±20	ppm
Freq.vs.Temp.	$\Delta F/F_{TOPR}$	-40 to +85 °C	$-0.035 \text{ ppm}/\text{°C} \cdot (T - T_0)^2 \pm 10\%$			ppm
Aging first year	$\Delta F/F$	@ 25 °C			± 3	ppm
Time accuracy Temperature Compensated	$\Delta t/t$	0 to +50 °C			±0.13	s/day
					±0.13	s/day
		-40 to +85 °C			±0.26	s/day
					±3.0	s/day

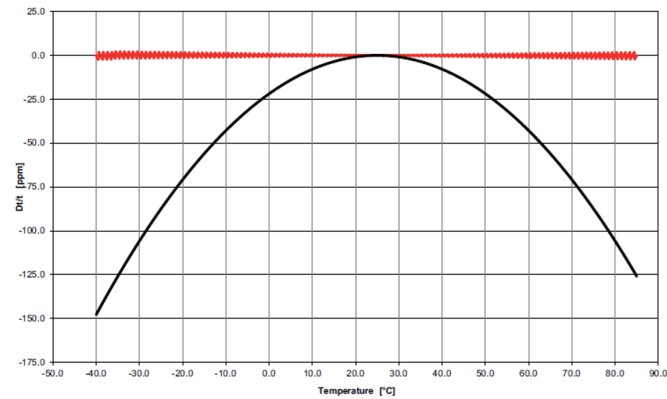
Environmental Characteristics

		Conditions	Max. Dev.
Storage temp. range		-55 to +125 °C	
Operating temperature range		-40 to +85 °C	
Shock resistance	$\Delta F/F$	5000 g, 0.3 ms, ½ sine	± 5 ppm
Vibration resistance	$\Delta F/F$	20 g / 10-2000 Hz	± 5 ppm

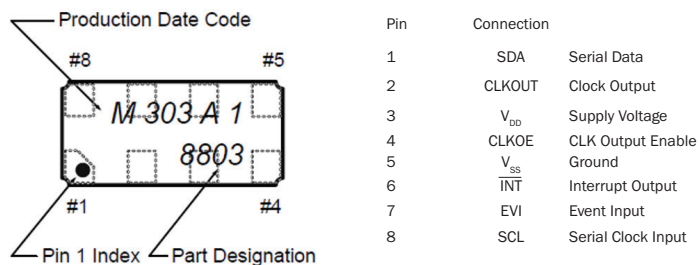
Package, Terminations and Processing

Package-Type	Termination	Processing
SON 8-pin	For SMD mounting Au plated pads	Reflow soldering 260 °C/20 s max.

Frequency Temperature Characteristics



Pin Connections Top View



Ordering Information

The versions below are considered standards and should be readily available. For the other delivery form, please contact EM Microelectronic-Marín S.A. Please make sure to give the complete part number when ordering.

Part Number	Bus	Time Deviation	Temperature	Feature	Package	Delivery form
RV-8803-C7-TA-QC	I2C	+/- 3 ppm	-40 °C to +85 °C		SMD C7	12 mm Tape, 7 Inch Reel