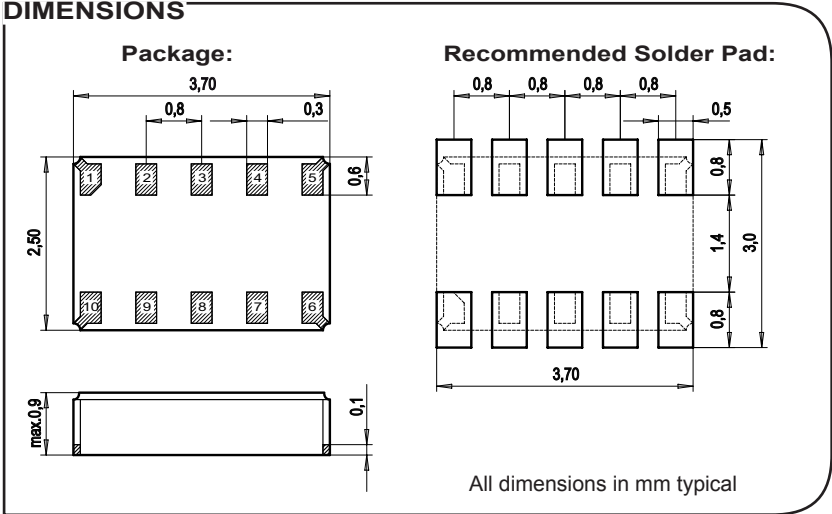
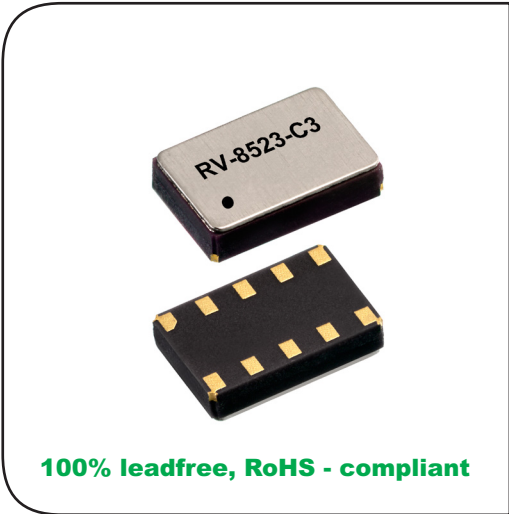


RV-8523-C3

Real Time Clock Module with I²C Bus



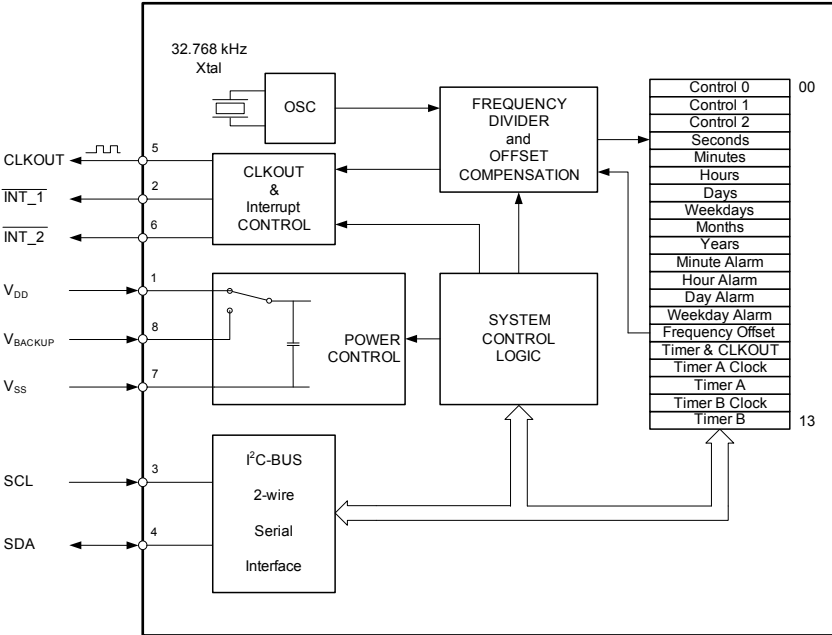
- Ultra low power consumption 130nA Xtal integrated solution.
- Frequency-Offset Trimming Register
- Backup supply switchover circuitry
- Miniature SMT ceramic package
- Very tight frequency tolerance
- I²C Bus Interface (fast mode 1 MHz)
- Programmable Clock-output
- Low aging
- Time keeping mode down to 1.2 V
- Programmable alarm, timer and interrupt functions

DESCRIPTION:

This RTC IC has been specially designed to achieve an ultra-low power consumption of typically 130nA @ V_{DD} 3.0V in time-keeping mode. The very small SMT ceramic-package combines the 32.768 kHz crystal unit with the CMOS-based oscillator and real-time-clock circuitry. The calendar function tracks year, month, date, and day-of-the-week with built-in century and leap-year flags. The clock function tracks minute and second in 24-hour format. Programmable alarm setting, dual timer functions and integrated switch-over circuitry to backup supply voltage increase flexibility.

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

BLOCK DIAGRAM:



ELECTRICAL CHARACTERISTICS AT 25°C:

| | Symbol | Condition | Min. | Typ. | Max | Unit |
|---------------------------------------|----------------|-----------------------------|--|------|-----|---------|
| Supply voltage | V_{DD} | I ² C Bus Active | 1.6 | | 5.5 | V |
| Supply voltage | V_{DD} | Power Managm. | 1.8 | | 5.5 | V |
| Supply voltage | V_{DD} | Time keeping | 1.2 | | 5.5 | V |
| Current consumption during access | I_{DD} | fsc1=1 MHz V_{DD} 3 V | | 100 | 200 | μ A |
| | | fsc1=100 kHz V_{DD} 3 V | | 50 | 100 | μ A |
| Current consumption Time keeping mode | I_{DDO} | fsc1=0 Hz, V_{DD} 3 V | | 130 | 180 | nA |
| | | fsc1=0 Hz, V_{DD} 2 V | | 110 | 160 | nA |
| CLKOUT frequency | | Programmable | 32768...to...1 | | | Hz |
| Frequency tolerance | $\Delta F/F$ | @ 25°C | $\pm 10 / \pm 20$ ¹⁾ | | | ppm |
| Aging first year max. | $\Delta F/F$ | @ 25°C | ± 3 | | | ppm |
| Frequency vs. temp. | $\Delta F/F_0$ | $20 \leq T_0 \leq 30$ | $-0.035 \text{ ppm}/^\circ\text{C} \cdot (T - T_0)^2 \pm 10\%$ | | | ppm |

1) Tighter and wider frequency tolerances on request.

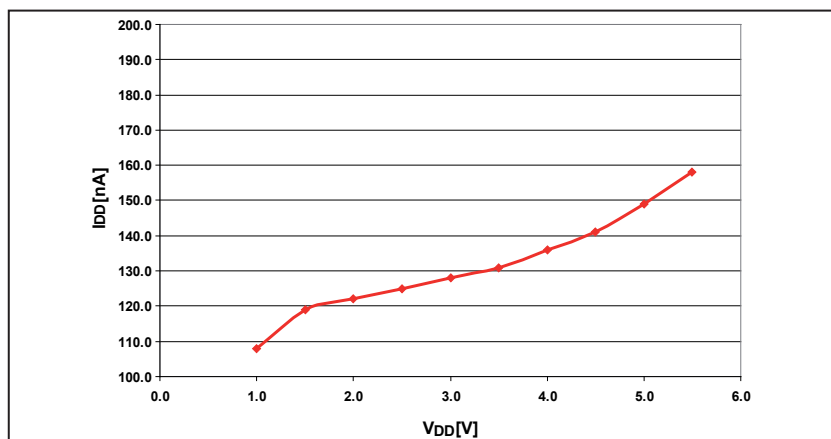
ENVIRONMENTAL CHARACTERISTICS:

| | 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-Type | Termination | Processing |
|--------------|------------------------------------|---------------------------------------|
| SON 10-pin | For SMD mounting Au plated pads | Reflow soldering 260°C / 20 s max. |

CURRENT CONSUMPTION vs. POWER SUPPLY VOLTAGE:



PIN CONNECTIONS TOP VIEW:

| Pin | Connection |
|-----|--|
| 1 | V_{DD} Power Supply Voltage |
| 2 | $\overline{\text{INT}}_1$ Interrupt_1 Output |
| 3 | SCL Serial Clock Input |
| 4 | SDA Serial Data |
| 5 | CLKOUT Clock Frequency Output |
| 6 | $\overline{\text{INT}}_2$ Interrupt_2 Output |
| 7 | V_{SS} Ground |
| 8 | V_{BACKUP} Backup Supply Voltage |
| 9 | NC not connected |
| 10 | NC not connected |

All specifications subject to change without notice.



Micro Crystal AG
Mühlestrasse 14
CH-2540 Grenchen
Switzerland

Tel. +41 32 655 82 82
Fax +41 32 655 82 83
sales@microcrystal.com
www.microcrystal.com