**RV-3028-C7**
Extreme Low Power RTC Module

**DESCRIPTION**
The RV-3028-C7 is a SMD 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.

**APPLICATIONS**
IoT
Metering
Industrial
Automotive
Health Care
Wearables, Portables

**FEATURES**
- Extreme low power consumption: 45 nA @ 3 V.
- Wide operating voltage range: 1.1 V to 5.5 V.
- Time accuracy: Factory calibrated to ±1 ppm @ 25°C
- User progr. password for write protection of time and configuration.
- Non-volatile configuration settings with user programmable offset value.
- Automatic Backup Switchover and Trickle Charger function.
- Provides year, month, date, weekday, hours, minutes, seconds, UNIX.
- 32.768 kHz, 8192 Hz, 1024 Hz, 64 Hz, 32 Hz, 1 Hz. 43 bytes non-volatile user memory, 2 bytes user RAM.
- I²C-bus interface: 400 kHz.
- 100% Pb-free, RoHS-compliant.
- Automotive qualification according to AEC-Q200 available.

**DIMENSIONS**

**Recommended Solder Pad:**

Metal lid is connected to V_{SS} (pin #5)

All dimensions in mm typical

**BLOCK DIAGRAM**

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**DIMENSIONS**

**Package:**

- 3.2
- 0.9
- 0.4
- 0.15

**Recommended Solder Pad:**

- 0.9
- 0.9
- 0.9
- 0.4
- 3.2
- 0.5
- 0.4
- 3.2

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**APPLICATIONS**

IoT
Metering
Industrial
Automotive
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Wearables, Portables
**ELECTRICAL CHARACTERISTICS AT 25°C**

More detailed information can be found in the Application Manual.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Condition</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{DD}$</td>
<td>Time keeping</td>
<td>1.1</td>
<td>5.5</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>$V_{DD}$</td>
<td>I²C-bus active</td>
<td>1.2</td>
<td>5.5</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>$I_{DDO}$</td>
<td>I²C-bus inactive, $V_{DD} = 3, \text{V}$</td>
<td>45</td>
<td>60</td>
<td>nA</td>
<td></td>
</tr>
<tr>
<td>$F_{CLKOUT}$</td>
<td>Programmable</td>
<td>32768...to...1</td>
<td>Hz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Time accuracy | $\Delta t$ | @ 25°C | ±1 | ppm |
| Aging first year max. | $\Delta F/F$ | @ 25°C | ±3 | ppm |

**ENVIRONMENTAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Max. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage temperature range</td>
<td>−55 to +125°C</td>
</tr>
<tr>
<td>TA Operating temperature range</td>
<td>−40 to +85°C</td>
</tr>
<tr>
<td>Shock resistance</td>
<td>$\Delta F/F$</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>$\Delta F/F$</td>
</tr>
</tbody>
</table>

**TERMINATIONS AND PROCESSING**

<table>
<thead>
<tr>
<th>Package</th>
<th>Termination</th>
<th>Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFN-8</td>
<td>Au flashed pads</td>
<td>IPC/JEDEC J-STD-020C</td>
</tr>
</tbody>
</table>

**FREQUENCY TEMPERATURE CHARACTERISTICS**

- $T_r = 25°C ±5°C$
- $-0.035(T-T_0)^2 \text{ppm} ±10\%$
- Tuning Fork Crystal

**PIN CONNECTIONS TOP VIEW**

- Pin 1 Index
- Part Designation
- Product Date Code
- #1 #4
- #2 #5
- #6 #8

**ORDERING INFORMATION**

- RTC module
- Product type
- Package size
- C7 = 3.2 x 1.5 x 0.8 mm
- Temperature range
- $TA = -40$ 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.