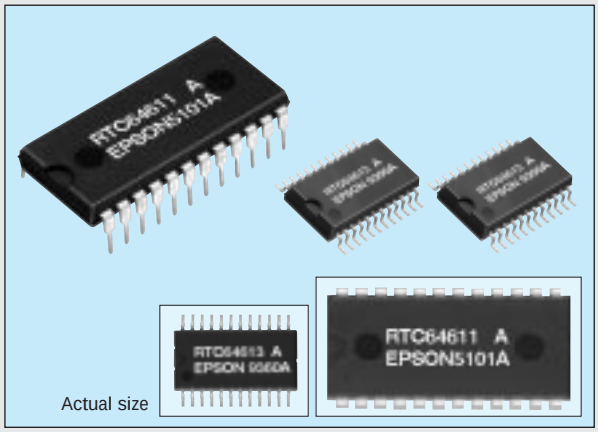
查询RTC-64611供应商


8-bit REAL TIME CLOCK MODULE

# RTC-64611/64613

- Builtin crystal unit allows adjustment-free efficient operation.
- 8-bit data bus and high speed access (85 nsec. max.).
- Provided with the same interface as S-RAM and battery backup function.
- Interruption of alarm of sec. to day and day of week and carry interruption.
- Reference signal selectable in a range of 1 Hz to 64 Hz (binary).
- Leap year automatically adjustable (gregorian calendar).
- With 1 Hz output terminal.
- Provided with START/STOP, 30 second adjust function.
- RTC-64613 uses a similar mounting method to that of a normal SMD IC.




## Specifications (characteristics)

### Absolute Max. rating

| Item | Symbol | Condition | Specifications | Unit |
|---|---|---|---|---|
| Power source voltage | $V_{DD}$ | Ta=25˚C | -0.5 to 7.0 | V |
| Input voltage | $V_{IN}$ | | -0.5 to $V_{DD}$+0.3 | |
| Storage temperature | $T_{STG}$ | RTC-64611 | -55 to +85 | ˚C |
| | | RTC-64613 | -55 to +125 | |
| Soldering condition | $T_{SOL}$ | RTC-64611 | Under 260˚C within 10 sec. (lead part) (package should be less than 150˚C) | |
| | | RTC-64613 | Twice at under 260˚C within 10 sec. or under 230˚C within 3 min. | |

### Operating range

| Item | Symbol | Condition | Specifications | Unit |
|---|---|---|---|---|
| Operating voltage | $V_{DD}$ | — | 4.5 to 5.5 | V |
| Operating temperature | $T_{OPR}$ | | -20 to + 75 | ˚C |
| Data holding voltage | $V_{DH}$ | $\overline{CS}$≥$V_{DD}$ - 0.2V | 2.0 to 4.5 | V |
| CS data holding time | $t_{CDR}$ | | 0 min. | ns |
| Operation restoring time | $t_R$ | | $t_{RC}$ (85 ns.) | |

### Frequency characteristics and current consumption characteristics

| Item | Symbol | Condition | | Specifications | Unit |
|---|---|---|---|---|---|
| Frequency tolerance | Δf/fo | Ta=25˚C $V_{DD}$=5V | 64611 A | +15/-5(5±10) | ppm |
| | | | 64611 B | +55/-45(5±50) | |
| | | | 64613 A | +25/-15(5±20) | |
| | | | 64613 | +55/-45(5±50) | |
| Frequency temperature characteristics | | -10 to +70˚C (25˚C reference temperature) | | +10/-120 | |
| | | -20 to +75˚C (25˚C reference temperature) | | +10/-220 | |
| Aging | fa | $V_{DD}$=5V, Ta=25˚C, first year | | ±5 max. | ppm/Y |
| Shock resistance | S.R. | Three drops on a hard board from 75 cm or 3000G x 0.3ms x 1/2 sine wave x 3 directions | | ±10 max. | ppm |
| Current consumption | $I_{DD1}$ | No load | $V_{DD}$=5V | 2 max. | mA |
| | $I_{DD2}$ | $\overline{CS}$ ≥ 1.8V | $V_{DD}$=2V | | μA |

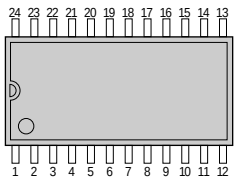
Unless otherwise stated, characteristics (specifications) shown in the above table are based on the rated operating temperature and voltage condition.

### DC characteristics

($V_{DD}$ = 5V±0.5V, Ta = -20 to + 75˚C)

| Item | Symbol | Condition | $V_{DD}$= 5V±10% | | $V_{DD}$= 2V | | Unit |
|---|---|---|---|---|---|---|---|
| | | | Min. | Max. | Min. | Max. | |
| "H" input voltage | $V_{IH}$ | | 2.2 | $V_{DD}$ | $V_{DD}$-0.2 | $V_{DD}$ | V |
| "L" input voltage | $V_{IL}$ | | -0.3 | 0.8 | -0.3 | 0.2 | |
| Input leak current | $I_{IN}$ | | — | ± 2 | — | ± 2 | μA |
| Three-state leak current | $I_{TSL}$ | | | ±10 | | ±10 | |
| Output leak current | $I_{LOH}$ | | | | | | |
| "H" output voltage (except for 1 Hz, $\overline{IRQ}$) | $V_{OH}$ | $I_{OH}$=-1mA | 2.4 | — | — | — | V |
| "L" output voltage | $V_{OL}$ | $I_{OL}$=2.1mA | — | 0.4 | | | |
| Input capacity | $C_{IN}$ | $V_{IN}$=0V Ta=25˚C f =1.0 MHz | | 12.5 | | | pF |
| Output capacity | $C_{OUT}$ | | | | | | |

## Terminal connection



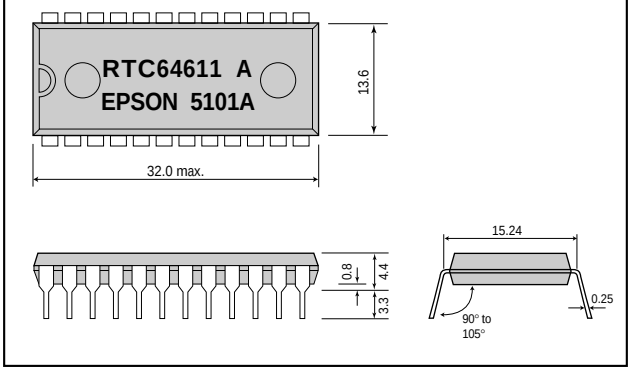

| No. | Pin terminal | No. | Pin terminal |
|---|---|---|---|
| 1 | GND | 13 | $I/O_4$ |
| 2 | H-START/$\overline{STOP}$ | 14 | $I/O_5$ |
| 3 | $\overline{IRQ}$ | 15 | $I/O_6$ |
| 4 | 1Hz | 16 | $I/O_7$ |
| 5 | $A_3$ | 17 | $I/O_8$ |
| 6 | $A_2$ | 18 | $\overline{CS}$ |
| 7 | $A_1$ | 19 | $\overline{OE}$ |
| 8 | $A_0$ | 20 | $\overline{WE}$ |
| 9 | $I/O_1$ | 21 | NC |
| 10 | $I/O_2$ | 22 | ($V_{DD}$) |
| 11 | $I/O_3$ | 23 | ($V_{DD}$) |
| 12 | GND | 24 | $V_{DD}$ |

- ($V_{DD}$) is to be same level as $V_{DD}$. Do not connect it to any external terminals.
- NC is not connected internally.

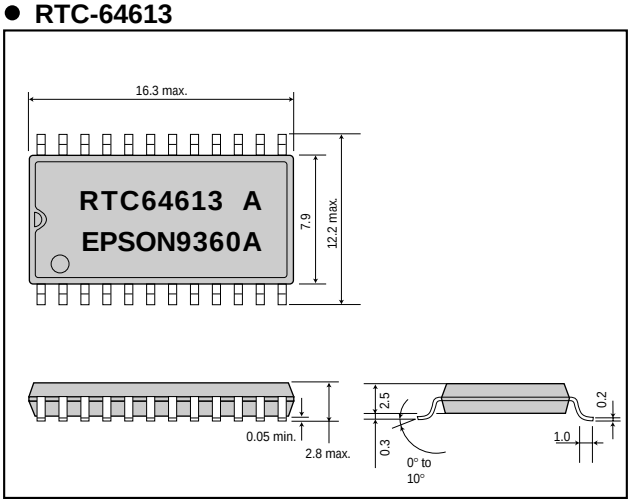
## External dimensions

(Unit: mm)

### RTC-64611




### RTC-64613



## Register table

| Address | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | 1 Hz | 2 Hz | 4 Hz | 8 Hz | 16 Hz | 32 Hz | 64 Hz | Counter |
| 1 | * | 10-sec. digit | | | 1-sec. digit | | | | |
| 2 | | 10-min. digit | | | 1-min. digit | | | | |
| 3 | * | | 10-hour digit | | 1-hour digit | | | | |
| 4 | * | | | | Day-of-week digit | | | | |
| 5 | * | | 10-day digit | | 1-day digit | | | | |
| 6 | * | | | 10-month digit | 1-month digit | | | | |
| 7 | 10-year digit | | | | 1-year digit | | | | |
| 8 | ENB | 1 Hz | 2 Hz | 4 Hz | 8 Hz | 16 Hz | 32 Hz | 64 Hz | Alarm register |
| 9 | | 10-sec. digit | | | 1-sec. digit | | | | |
| A | | 10-min. digit | | | 1-min. digit | | | | |
| B | | * | 10-hour digit | | 1-hour digit | | | | |
| C | | * | | | Day-of-week digit | | | | |
| D | | * | 10-day digit | | 1-day digit | | | | |
| E | Carry flag | * | | Carry interruption enable | Alarm interruption enable | * | | Alarm flag | Control register |
| F | RAM7 | RAM6 | RAM5 | RAM4 | TEST *1 | 30-sec. adjustment | RESET | S.START /STOP | |

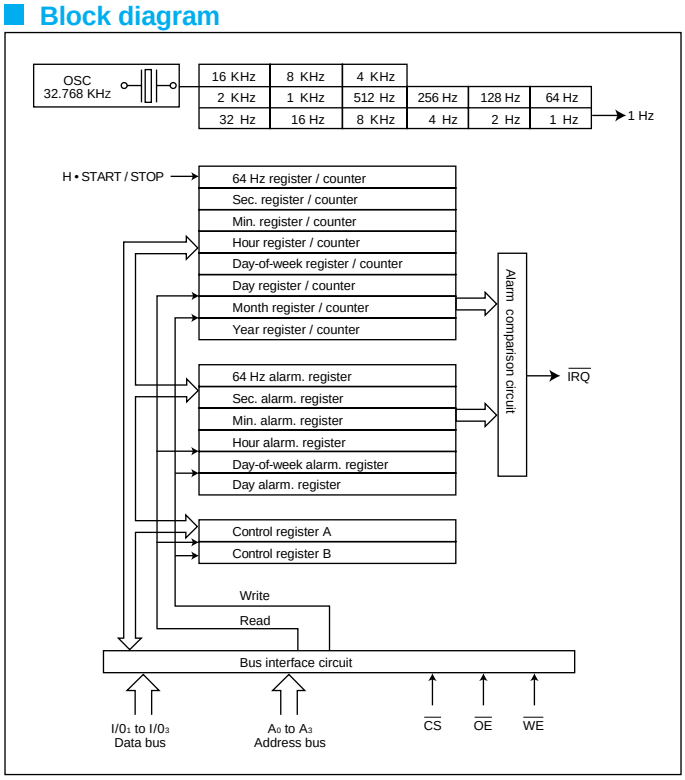
*1 Be sure to enter "O" to TEST bit.

## Supplement

| Bit name | Description |
|---|---|
| * mark | Empty bit and unwriteable<br>Recognized as "0" while reading |
| 10-hour digit (b5) | Only for 24H mode |
| Under-sec. counter | Read only (unwriteable)<br>Used as binary code data |
| Under-sec. alarm register | Used as binary code data |
| Sec.to year | Both counter and alarm register use BCD code |
| Day of week | Coded data is used<br>EX: 0…Sunday 1…Monday 2…Tuesday 3…Wednesday<br>4…Thursday 5…Friday 6…Saturday |

Note: Do not enter erroneous data for clock. This may result in time keeping error.

## Block diagram



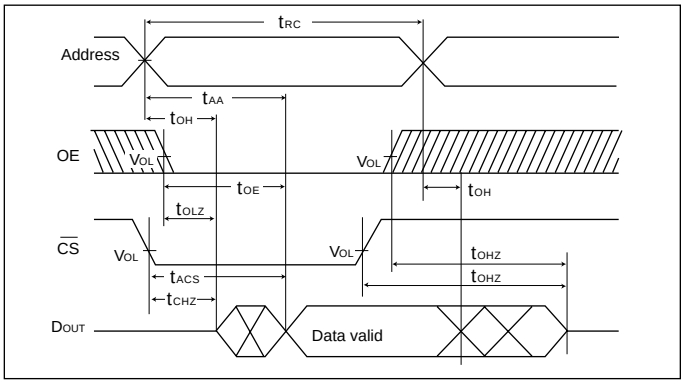

## Switching characteristic

### Measuring condition

- Input pulse level: 0.8 to 2.4V
- Input rise time, fall time: 5 nsec.
- IN/OUT timing pulse level: 1.5V
- Out put load: 1 TTL Gate +100pF

### Read mode

| Item | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|
| Read cycle time | $t_{RC}$ | 85 | — | ns |
| Address access time | $t_{AA}$ | — | 85 | |
| Chip select access time | $t_{ACS}$ | | | |
| Output enable access time | $t_{OE}$ | | 45 | |
| Output hold time | $t_{OH}$ | 10 | — | |
| Chip select / output set time | $t_{CLZ}$ | | | |
| Output enable / output set time | $t_{OLZ}$ | 5 | | |
| Chip deselect / output floating | $t_{CHZ}$ | 0 | 35 | |
| Output disable / output floating | $t_{OHZ}$ | | | |




### Write mode

| Item | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|
| Write cycle time | $t_{WC}$ | 85 | — | ns |
| Chip select time | $t_{CW}$ | 75 | | |
| Address valid time | $t_{AW}$ | | | |
| Address setup time | $t_{AS}$ | 0 | | |
| Write pulse time | $t_{WP}$ | 60 | | |
| Address holding time | $t_{WR}$ | 10 | | |
| $\overline{WE}$ output floating | $t_{WHZ}$ | 0 | 35 | |
| Input data set time | $t_{DW}$ | 40 | — | |
| Input data hold time | $t_{DH}$ | 0 | | |
| Output disable / output floating | $t_{OHZ}$ | | 35 | |
| $\overline{WE}$ output set time | $t_{OW}$ | 5 | — | |

