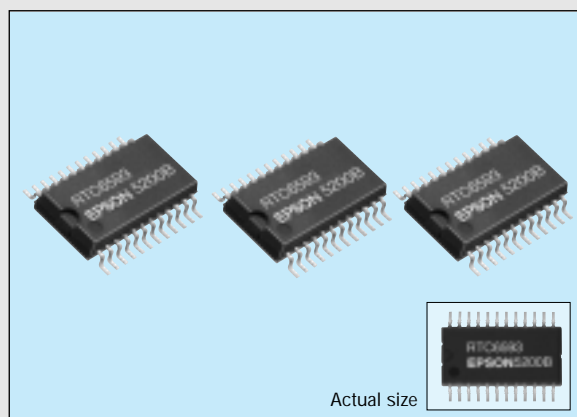


REAL TIME CLOCK MODULE FOR PC/AT \*1

# RTC-6593

- Built-in crystal unit allows adjustment-free efficient operation.
- Provides 114-bytes of backed-up RAM.
- Extended alarm function.
- Low current consumption.
- A built-in power supply switching circuit makes it possible to provide automatic power supply backup to both the RTC and extended RAM.

\*1 PC/AT is a trademark of International Business Machines Corporation.



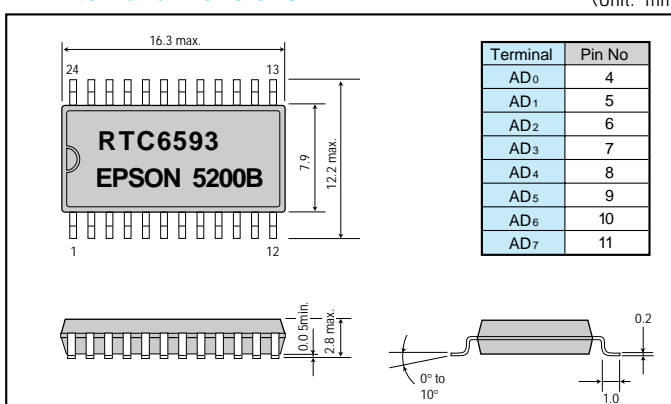
## Specifications (characteristics)

### Absolute Max. rating

| Item                 | Symbol           | Condition   | Rating                         | Unit |
|----------------------|------------------|---|--------------------------------|------|
| Supply voltage       | V <sub>DD</sub>  | V <sub>DD</sub> -GND  | - 0.3 to + 7.0                 | V    |
| Input voltage        | V <sub>IN</sub>  | Input pin   | - 0.3 to V <sub>DD</sub> + 0.3 |      |
| Storage temperature  | T <sub>STG</sub> | —   | - 55 to +125                   | °C   |
| Soldering conditions | T <sub>SOL</sub> | Twice under 260°C within 10 seconds or under 230°C within 3 minutes |                                |      |

### External dimensions

(Unit: mm)



### Operating range, frequency and DC characteristics

| Item                        | Symbol            | Condition   | Min. | Typ. | Max.                 | Unit  |
|-----------------------------|-------------------|---|------|------|----------------------|-------|
| Supply voltage              | V <sub>DD</sub>   | V <sub>DD</sub> -GND                                    | 4.5  | 5.0  | 5.5                  | V     |
| Operating temperature       | T <sub>OPR</sub>  | —   | -10  |      | +70                  | °C    |
| Frequency tolerance         | Δf/f <sub>0</sub> | T <sub>a</sub> =25°C, V <sub>DD</sub> =5V               |      |      | 5±20                 | ppm   |
| Temperature characteristics | T <sub>OP</sub>   | T <sub>a</sub> =-10 to 70°C<br>25°C standard            |      |      | +10<br>-120          |       |
| Voltage characteristics     | f <sub>V</sub>    | T <sub>a</sub> =stable                                  |      |      | ±6                   | ppm/V |
| Aging                       | f <sub>A</sub>    | T <sub>a</sub> =25°C, V <sub>DD</sub> =5V<br>First year |      |      | ±5                   | ppm/Y |
| Input voltage               | High level        | V <sub>IH</sub>   | 2.2  |      | V <sub>DD</sub> +0.3 | V     |
|                             | Low level         | V <sub>IL</sub>   | -0.3 |      | 0.8                  |       |
| Output voltage              | High level        | V <sub>OH</sub>   | 2.4  |      |                      |       |
|                             | Low level         | V <sub>OL</sub>   |      |      | 0.4                  |       |
| Power supply current        | I <sub>DD</sub>   | Output unloaded   |      | 3    | 10                   | mA    |
| Battery supply current      | I <sub>BAT</sub>  | V <sub>BAT</sub> =3V<br>V <sub>DD</sub> =0V             |      | 0.5  | 1.0                  | μA    |

### Terminal functions

| Terminal             | Function                                    | Pin No. |
|----------------------|---|---------|
| MOT                  | Model select (input)                        | 1       |
| AD <sub>0</sub> to 7 | Multiplexed bi-direction address/data buses | 4 to 11 |
| GND                  | Power supply (ground)                       | 12      |
| $\overline{RTC}$     | Real time clock select (input)              | 13      |
| AS                   | Address strobe (input)                      | 14      |
| R/ $\overline{W}$    | Read/Write (input)                          | 15      |
| DS                   | Data strobe (input)                         | 17      |
| $\overline{RESET}$   | Reset (input)                               | 18      |
| $\overline{IRQ}$     | Interrupt request (output)                  | 19      |
| V <sub>BAT</sub>     | Back-up power supply                        | 20      |
| $\overline{XIRQ}$    | Extended alarm interrupt request (output)   | 21      |
| $\overline{XALM}$    | Extended alarm select (input)               | 22      |
| SQW                  | Square wave output                          | 23      |
| V <sub>DD</sub>      | Power supply (+5V)                          | 24      |
| NC                   | Not connected internally                    | 2,3,16  |