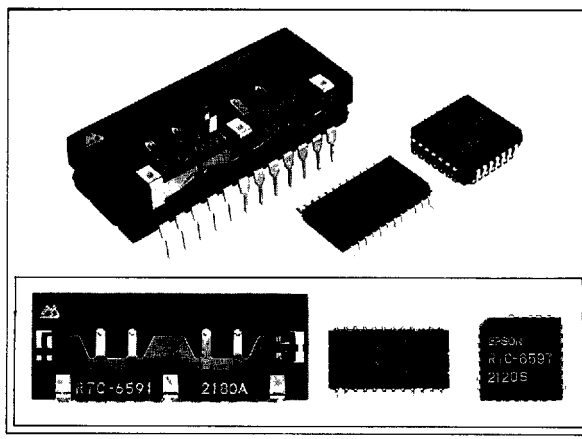


REAL TIME CLOCK MODULE FOR PC/AT**

RTC-658X/659X

- A built-in crystal resonator makes the product efficient and adjustment free.
- Provides 114 bytes of backed-up RAM.
- Extended alarm function (659X series).
- Low current consumption.
- Batteries (BR1225) are option for RTC-6581/6591 only. (Batteries are packed separately from the RTC.)

**PC/AT is a trademark of IBM corporation in USA.



Actual size

Specifications(characteristics)

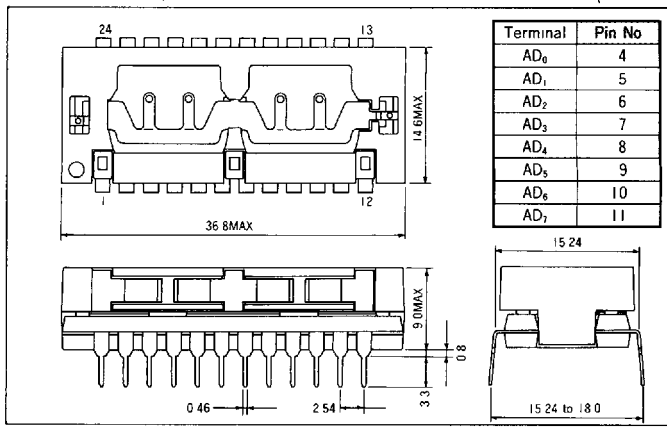
Absolute Maximum Rating

| Item | Symbol | Condition | Rating | Unit | |
|----------------------|-----------|------------------------|---|------------|----|
| Supply voltage | V_{DD} | $V_{DD} - V_{SS}$ | -0.3 to +7.0 | V | |
| Input voltage | V_{IN} | Input pin | $V_{SS} - 0.3$ to $V_{DD} + 0.3$ | V | |
| Storage temperature | T_{STG} | Discreat Component | 6581/6591 | -40 to +85 | °C |
| | | | 6583/6593 | -55 to | |
| | | | 6587/6597 | +125 | |
| Soldering conditions | T_{SOL} | 6581/6591 | 260°C or less for 10 seconds or less. Package Temp. should be 150°C or less | | |
| | | 6583/6593 6587/6597 | Twice under 260°C within 10 seconds or under 230°C within 3 minutes. | | |

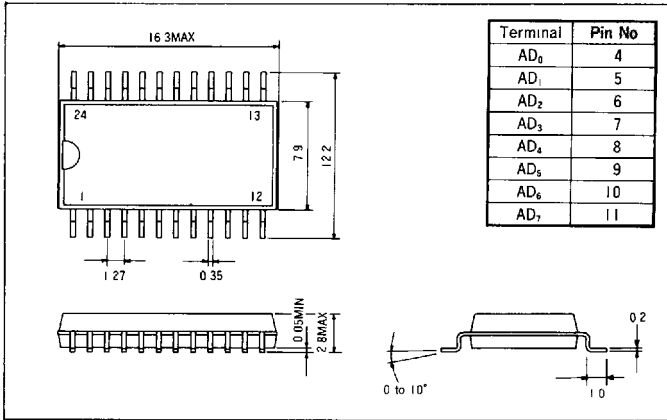
External Dimension

RTC-6581/6591

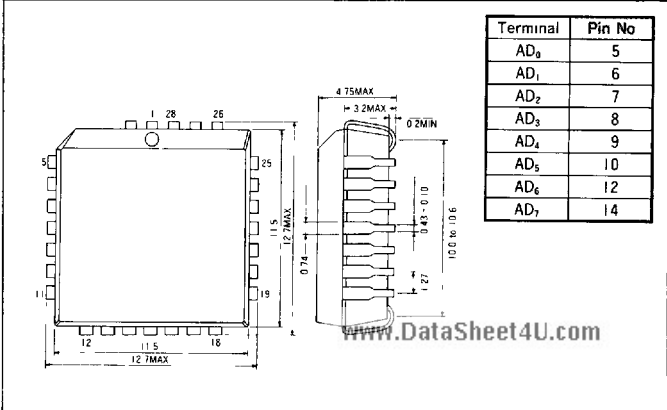
(Unit: mm)



RTC-6583/6593



RTC-6587/6597



Operating Range, Frequency and DC Characteristics

| Item | Symbol | Condition | Min. | Typ. | Max. | Unit |
|-----------------------------|---------------|--|--|------|----------------|---------------|
| Supply voltage | V_{DD} | $V_{DD} - V_{SS}$ | 4.5 | 5.0 | 5.5 | V |
| Operating temperature | T_{OPR} | | -10 | | +70 | °C |
| Frequency tolerance | $\Delta f/fo$ | $T_a = 25^\circ\text{C}, V_{DD} = 5\text{V}$ | | | 5 ± 20 | ppm |
| Temperature characteristics | top | $T_a = -10$ to 70°C 25°C standard | | | +10 -120 | ppm |
| Voltage characteristics | fv | $T_a = \text{stable}$ | | | ± 6 | ppm/V |
| Aging | fa | $T_a = 25^\circ\text{C}, V_{DD} = 5\text{V}$ First year | | | ± 5 | ppm/Y |
| Input Voltage | High level | V_{IH} | 2.2 | | $V_{DD} + 0.3$ | V |
| | Low level | V_{IL} | -0.3 | | 0.8 | V |
| Output Voltage | High level | V_{OH} | $V_{DD} = 5\text{V}$ $I_{LOAD} = -4\text{mA}$ | 2.4 | | V |
| | Low level | V_{OL} | $V_{DD} = 5\text{V}$ $I_{LOAD} = +4\text{mA}$ | | 0.4 | V |
| Power supply current | I_{DD} | Output unloaded | | 3 | 10 | mA |
| Battery supply current | I_{BAT} | $V_{BAT} = 3\text{V}$ $V_{DD} = 0\text{V}$ | | 0.5 | 1.0 | μA |

Address Map

RTC Address Map

| | | | | |
|-----|-----------|------|------------|---------------------|
| 00 | 14 BYTES | 00 H | 0 | Seconds |
| 13 | | 0D H | 1 | Seconds Alarm |
| 14 | 114 BYTES | 0E H | 2 | Minutes |
| | | | 3 | Minutes Alarm |
| | | | 4 | Hours |
| | | | 5 | Hours Alarm |
| | | | 6 | Day of the Week |
| | | | 7 | Day of Month |
| | | | 8 | Month |
| | | | 9 | Year |
| | | | 10 | Register A |
| | | | 11 | Register B |
| | | 12 | Register C | |
| | | 13 | Register D | |
| 127 | | 7F H | 14 | General purpose RAM |
| | | | 127 | |

Extended Alarm Address Map (RTC-659X only)

| | | | | |
|----|---------|-----|---|--------------------------------|
| 00 | 8 BYTES | 00H | 0 | Extended Seconds Alarm |
| | | | 1 | Extended Minutes Alarm |
| | | | 2 | Extended Hours Alarm |
| | | | 3 | Extended Day of the Week Alarm |
| | | | 4 | Extended Day of Month Alarm |
| | | | 5 | Extended Month Alarm |
| 07 | | 07H | 6 | Register 6 |
| | | | 7 | Register 7 |

Terminal Functions

| Terminal | Function | Pin No. | | | | | |
|--------------------|---|---------|---------|---------|---------|-------------------|-------------------|
| | | 6581 | 6591 | 6583 | 6593 | 6587 | 6597 |
| MOT | Mode select (input) | 1 | 1 | 1 | 1 | 2 | 2 |
| AD0 to 7 | Multiplexed bi-direction address/data buses | 4 to 11 | 4 to 11 | 4 to 11 | 4 to 11 | 5 to 10 12, 14 | 5 to 10 12, 14 |
| VSS | Power supply (ground) | 12 | 12 | 12 | 12 | 15 | 15 |
| \overline{CS} | Real time clock select (input) | 13 | — | 13 | — | 16 | — |
| \overline{RTC} | Real time clock select (input) | — | 13 | — | 13 | — | 16 |
| AS | Address strobe (input) | 14 | 14 | 14 | 14 | 17 | 17 |
| R/W | Read/Write (input) | 15 | 15 | 15 | 15 | 19 | 19 |
| DS | Data strobe (input) | 17 | 17 | 17 | 17 | 21 | 21 |
| \overline{RESET} | Reset (input) | 18 | 18 | 18 | 18 | 22 | 22 |
| \overline{IRQ} | Interrupt request (output) | 19 | 19 | 19 | 19 | 23 | 23 |
| V _{BAT} | Back-up power supply | — | — | 20 | 20 | 24 | 24 |
| \overline{XIRQ} | Extended alarm interrupt request (output) | — | 21 | — | 21 | — | 25 |
| \overline{XALM} | Extended alarm select (input) | — | 22 | — | 22 | — | 26 |
| SQW | Square wave output | 23 | 23 | 23 | 23 | 27 | 27 |
| V _{DD} | Power supply (+5V) | 24 | 24 | 24 | 24 | 28 | 28 |
| NC | Not connected internally | Others | Others | Others | Others | Others | Others |
| NP | No physical pin | — | — | — | — | 3,4 | 3,4 |

Block Diagram

