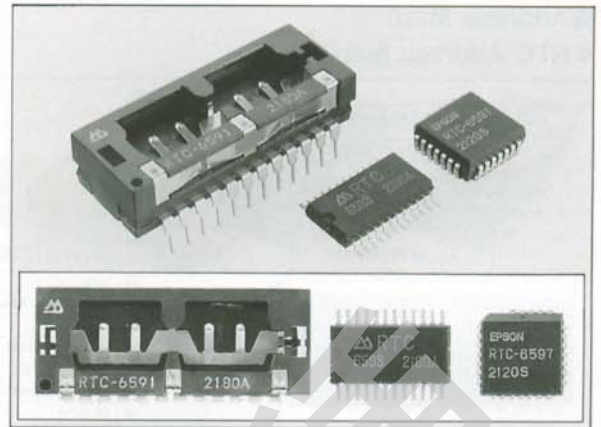


# REAL TIME CLOCK MODULE FOR PC/AT<sup>®</sup>

## 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
			6583/6593 6587/6597	-55 to +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.	

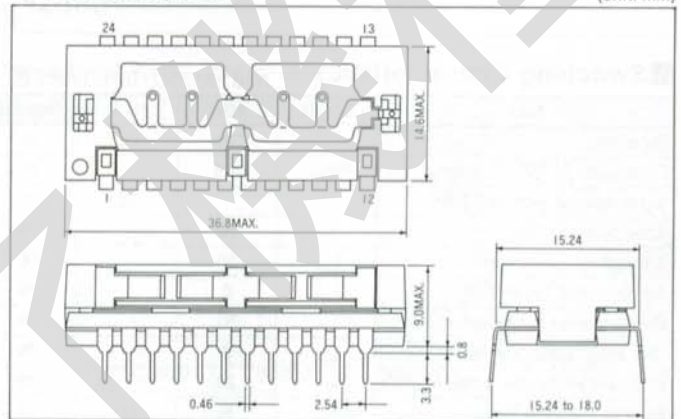
#### Operating Range, Frequency and DC Characteristics

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	$\Delta f/fo$	$T_a = 25^\circ\text{C}, V_{DD} = 5\text{V}$			$5 \pm 20$	ppm
Temperature characteristics	$top$	$T_a = -10$ to $70^\circ\text{C}$ 25°C standard			+10 -120	ppm
Voltage characteristics	$f_v$	$T_a = \text{stable}$			$\pm 6$	ppm/V
Aging	$fa$	$T_a = 25^\circ\text{C}, V_{DD} = 5\text{V}$ First year			$\pm 5$	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	$\mu\text{A}$

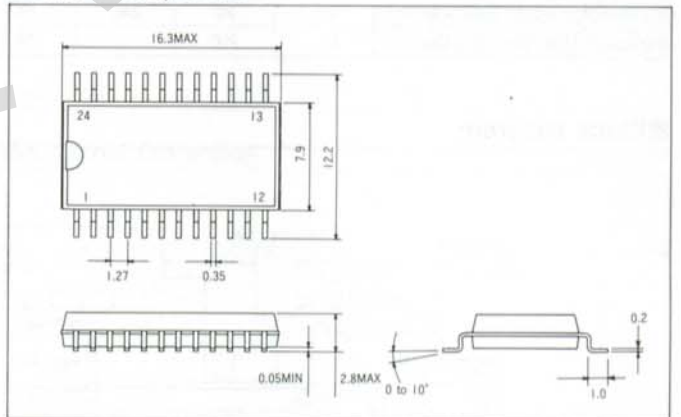
#### External Dimension

##### ● RTC-6581/6591

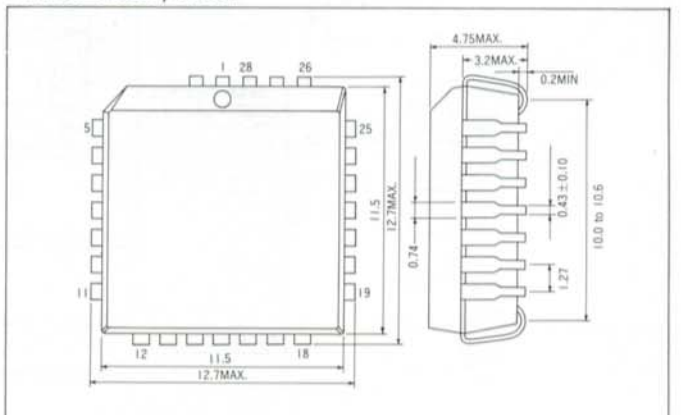
(Unit: mm)



##### ● RTC-6583/6593



##### ● RTC-6587/6597



## Address Map

### RTC Address Map

00	14 BYTES	00 H	0	Seconds
13		0D H	1	Seconds Alarm
14		0E H	2	Minutes
			3	Minutes Alarm
	114 BYTES		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
			6	Register 6
07		07H	7	Register 7

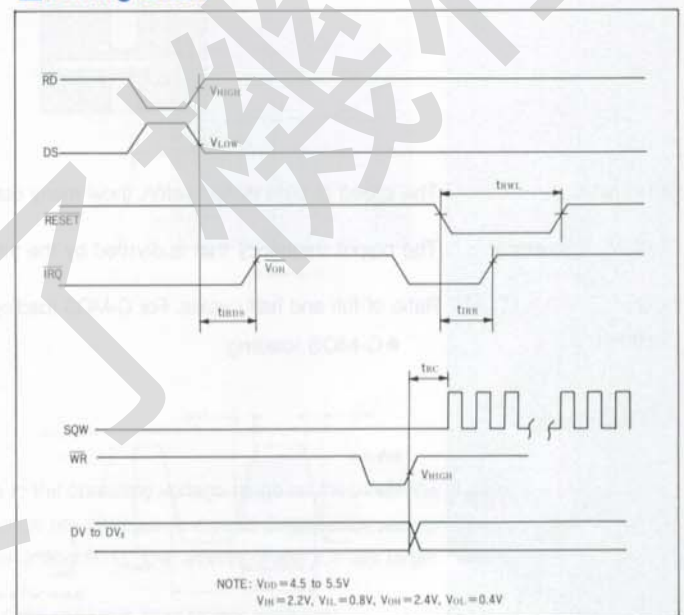
## Switching Characteristic

Item	Symbol	Min.	Max.	Unit
Reset pulse width	$T_{RWL}$	5	—	$\mu$ S
Oscillation start up time	$T_{RL}$	—	1	s
IRQ release from DS low	$t_{IRDS}$	—	2	$\mu$ S
IRQ release from reset low	$t_{IRR}$	—	2	$\mu$ S
VRT bit delay	$t_{VRTD}$	—	1	$\mu$ S

## 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 (grand)	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
RESET	Reset (input)	18	18	18	18	22	22
IRQ	Interrupt request (output)	19	19	19	19	23	23
V <sub>BAT</sub>	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 <sub>DD</sub>	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

## Timing Chart



## Block Diagram

