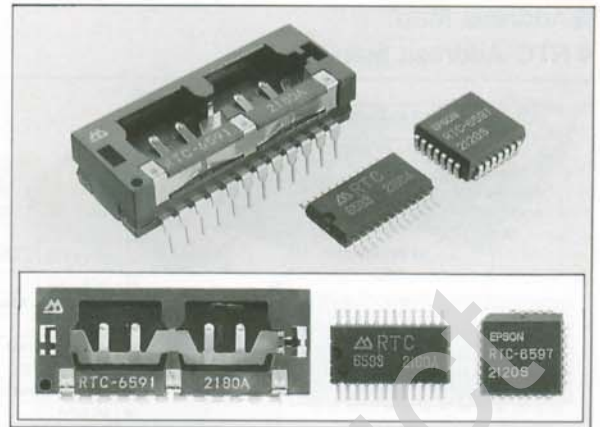


# REAL TIME CLOCK MODULE FOR PC/AT<sup>®</sup>

## 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.	

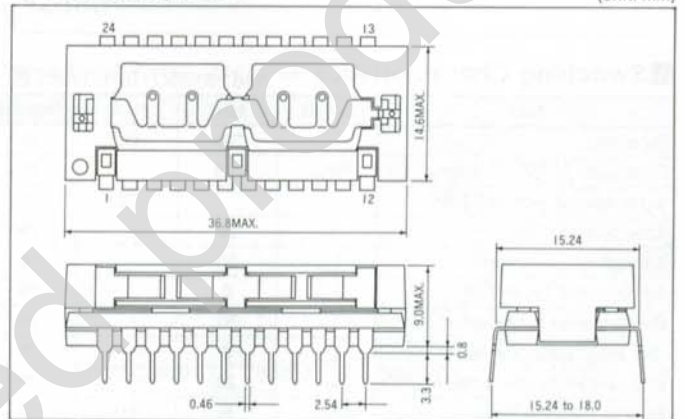
#### Operating Range, Frequency and DC Characteristics

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	$fv$	$T_a = \text{stable}$			$\pm 6$	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	$\mu\text{A}$

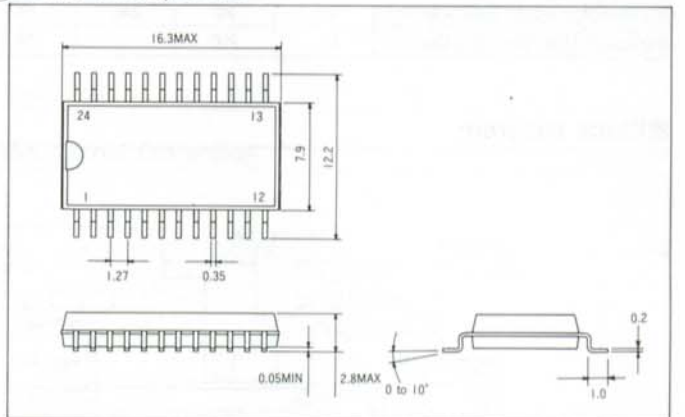
#### External Dimension

##### ● RTC-6581/6591

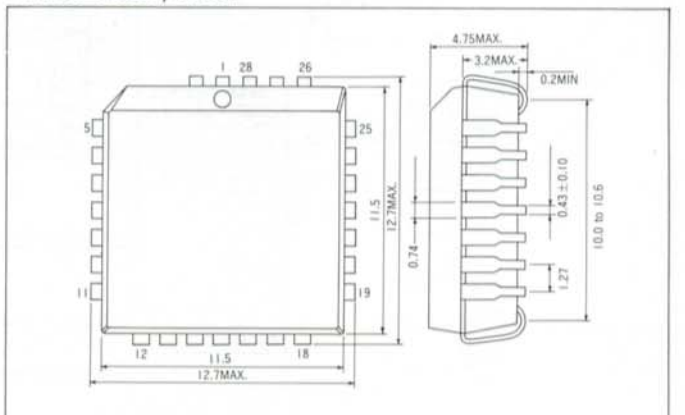
(Unit: mm)



##### ● 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	
			14	General purpose RAM	
127			7F H	127	General purpose RAM

### 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

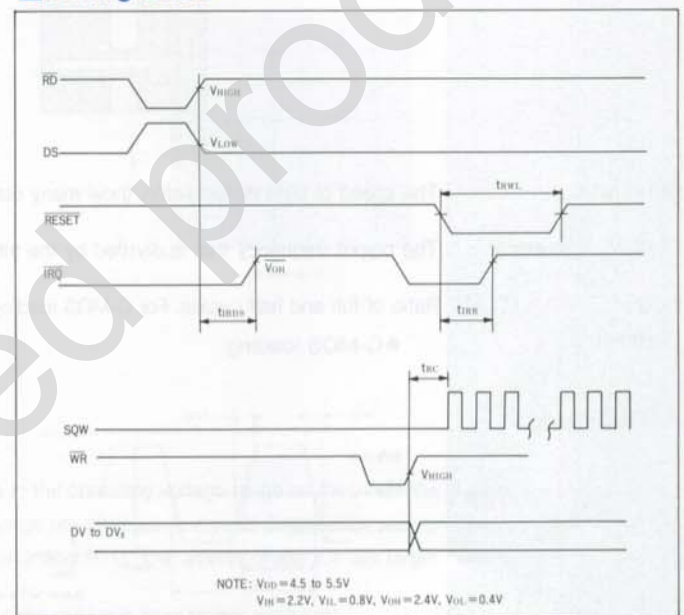
## Switching Characteristic

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 (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
RESET	Reset (input)	18	18	18	18	22	22
$\overline{IRQ}$	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

