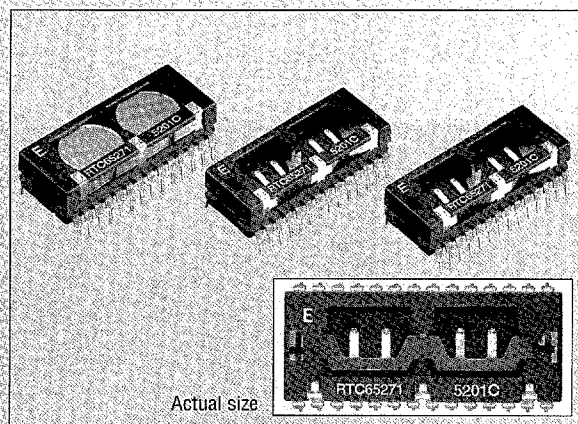


8-bit REAL TIME CLOCK MODULE

RTC-65271

- Built-in crystal unit allows adjustment-free efficient operation.
- A built-in power supply switching circuit makes it possible to provide automatic power supply backup to both the RTC and extended RAM.
- The real-time clock block consists of:
Indirect register: 1-byte Control register: 4-bytes
Clock, alarm, calendar: 10-bytes User RAM: 50-bytes
- Extended RAM: 4K-bytes of built-in S-RAM
Page register: 1-byte Configuration: 32-bytes x 128 pages
- The package is a 28-pin DIP IC with a battery holder that makes battery replacement possible.
- Batteries (BR1225) are available as an option. (Batteries are packed separately from the RTC.)



■ Specifications (characteristics)

Batteries in this photograph are used only to show the inserted condition. This RTC is not supplied with the batteries inserted.

■ Absolute Max. rating

Item	Symbol	Condition	Min.	Max.	Unit
Supply voltage	V_{DD}	$V_{DD} - GND$	-0.3	+7.0	V
Input voltage	V_{IN}	Input Pin		$V_{DD} + 0.3$	
Storage temperature	T_{STG}	*1	-40	+85	°C
Soldering condition	T_{SOL}	260°C or less, for 10 seconds or less; (package should be 150°C or less)			

*1 Storage temperature as a discrete component.

■ Operating conditions

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage	V_{DD}	—	4.75	5.0	5.5	V
Operating temperature	T_{OPR}	—	-10	—	+70	°C

■ Frequency characteristics

Item	Symbol	Condition	Max.	Unit
Frequency tolerance	$\Delta f/f_0$	$T_a = 25^\circ\text{C}$, $V_{DD} = 5\text{V}$	5 ± 20	ppm
Temperature characteristics	T_{OP}	$T_a = -10$ to 70°C , $V_{DD} = 5\text{V}$ *1	+10 -120	
Voltage characteristics	f_v	$T_a = \text{stable}$, $V_{DD} = 3\text{V}$ *1	± 5	ppm/V
Aging	f_a	$T_a = 25^\circ\text{C}$, $V_{DD} = 5\text{V}$, first year	± 5	ppm/year

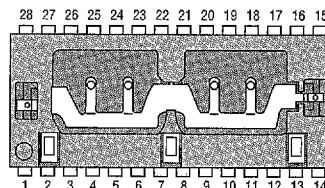
*1: The frequency deviation (Oppm) at $T_a = 25^\circ\text{C}$ for "top" or at $V_{DD} = 5\text{V}$ for "fv" is used as the reference value.

■ DC characteristics

(V_{DD} = 5.0V ± 10%, T_a = -10 to +70°C)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Input voltage	V_{IH}	—	2.2	—	$V_{DD} + 0.3$	V
	V_{IL}		-0.3		0.8	
Input leak current	I_i	RESET, RD, WR, RTC, XRAM, Do to D7, A0 to A5	—	—	± 1	μA
Output voltage	V_{OH}	$V_{DD} = 5\text{V}$, $I_{LOAD} = 4\text{mA}$	2.4	—	—	V
	V_{OL}	$V_{DD} = 5\text{V}$, $I_{LOAD} = 4\text{mA}$	—		0.4	
Power supply current	I_{DD}	Output unloaded	—	—	15	mA
Current when using battery backup	I_{BAT}	$T_a = 25^\circ\text{C}$	—	0.5	1.0	μA
Input current	I_{STBY}	STBY=GND	—	—	2	

■ Terminal connection

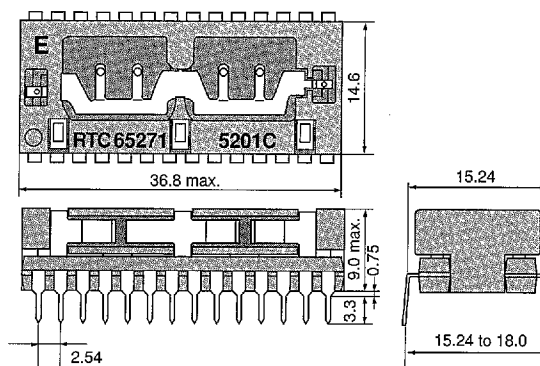


No.	Pin/Terminal	No.	Pin/Terminal
1	A ₀	15	RTC
2	A ₁	16	XRAM
3	TMODE	17	WR
4	TCLOCK	18	NC
5	STBY	19	RD
6	D ₀	20	RESET
7	D ₁	21	IRQ
8	D ₂	22	NC
9	D ₃	23	A ₅
10	D ₄	24	A ₄
11	D ₅	25	SQW
12	D ₆	26	V _{DD}
13	D ₇	27	A ₃
14	GND	28	A ₂

• NC is not connected internally.

■ External dimensions

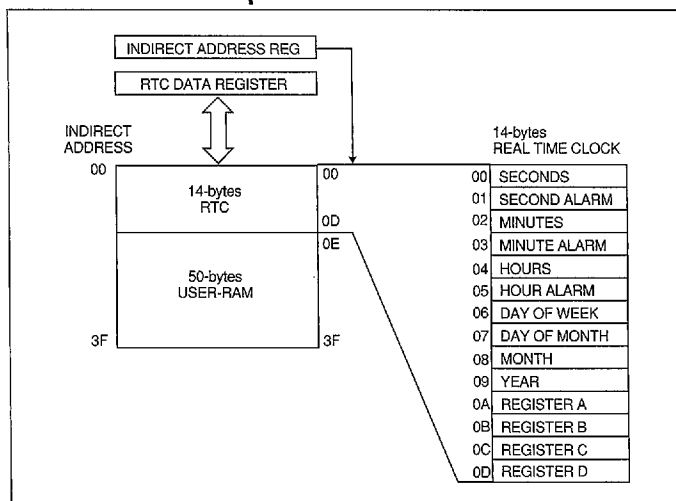
(Unit: mm)



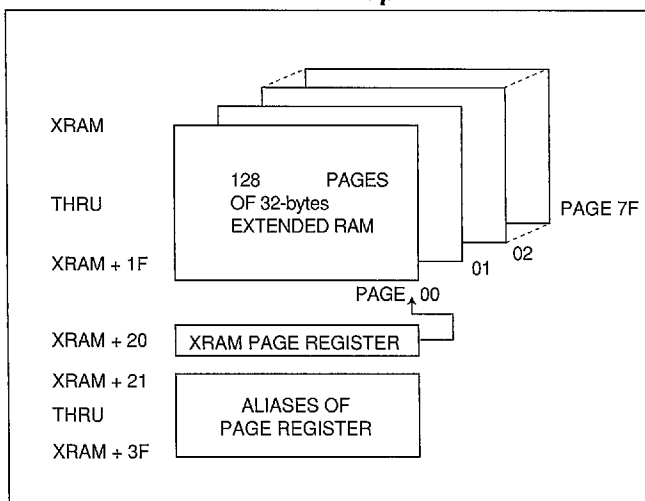
Note: For information on handling batteries, please independently refer to the pertinent regulations, as this product does not come equipped with batteries.

■ Address map

- **RTC address map**



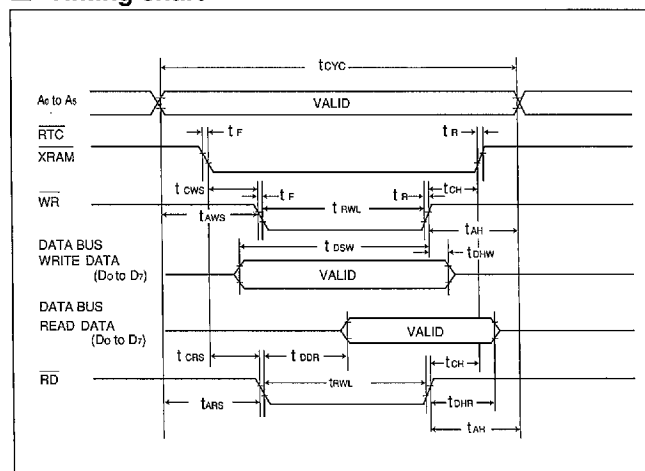
- **Extended RAM address map**



■ **Switching characteristics** ($V_{DD} = 5V \pm 10\%$, $GND = 0V$, $T_a = -10$ to $+70^\circ C$)

Item	Symbol	Min.	Max.	Remarks
Cycle Time	t _{CYC}	395	DC	ns
Pulse width $\overline{RD}/\overline{WR}$ ="L" interval	t _{RWL}	325	—	
Signal rise / fall time CS, $\overline{RD}$, $\overline{WR}$	t _{r, f}	—	30	
Address holding time	t _{AH}	20	—	
Address setup before $\overline{RD}$	t _{ARS}	50		
Address setup before $\overline{WR}$	t _{AWS}	0		
Chip select setup time before $\overline{RD}$	t _{CRS}	50		
Chip select setup time before $\overline{WR}$	t _{CWS}	0		
Chip select hold time a after $\overline{RD}/\overline{WR}$	t _{CH}	20		
Read data holding time	t _{DHR}	10	100	
Write data holding time	t _{DHW}	0	—	
$\overline{RD}$ Peripheral output data delay time	t _{DDR}	20	240	
Peripheral write data setup time	t _{DSW}	200	—	

■ Timing chart



■ Block diagram

