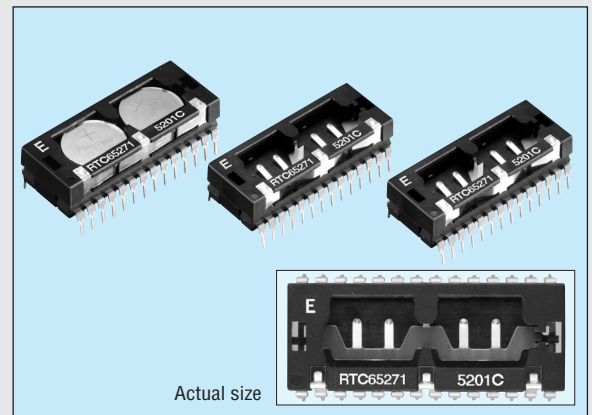


8-bit REAL TIME CLOCK MODULE

RTC-65271

- Built-in crystal unit allows adjustment-free efficient operation.
- A builtin 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 builtin 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.)



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

■ Specifications (characteristics)

■ 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 s 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	$\Delta f/f_0$	$T_a = +25\text{ °C}$, $V_{DD} = 5\text{ V}$	5 ± 20	$\times 10^{-6}$
Temperature characteristics	T_{OP}	$T_a = -10\text{ to }+70\text{ °C}$, $V_{DD} = 5\text{ V}$ *1	+10 -120	
Voltage characteristics	f_v	$T_a = \text{stable}$, $V_{DD} = 3\text{ V}$ *1	± 5	$\times 10^{-6}/V$
Aging	f_a	$T_a = +25\text{ °C}$, $V_{DD} = 5\text{ V}$, first year	± 5	$\times 10^{-6}/\text{year}$

*1: The frequency deviation (0×10^{-6}) at $T_a = +25\text{ °C}$ for "top" or at $V_{DD} = 5\text{ V}$ for "fv" is used as the reference value.

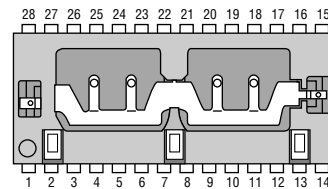
■ DC characteristics

($V_{DD} = 5.0\text{ V} \pm 10\%$, $T_a = -10\text{ to }+70\text{ °C}$)

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, D ₀ to D ₇ , A ₀ to A ₅	—	—	± 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}	$T_a = +25\text{ °C}$	—	0.5	1.0	μA
Input current	I_{STBY}	STBY=GND	—	—	2	

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

■ Terminal connection

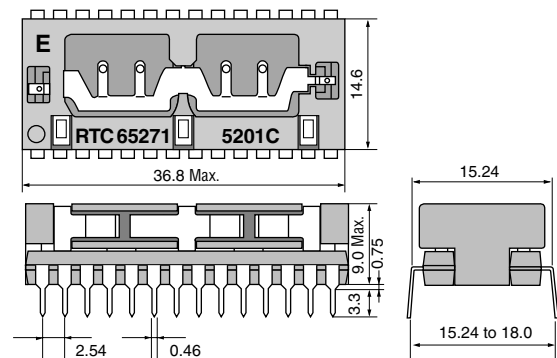


No.	Pin	Terminal	No.	Pin	Terminal
1	A ₀	15	RTC		
2	A ₁	16	XRAM		
3	TMODE	17	WR		
4	TCLOCK	18	NC		
5	STBY	19	RD		
6	D ₀	20	RESET		
7	D ₁	21	IRQ		
8	D ₂	22	NC		
9	D ₃	23	A ₅		
10	D ₄	24	A ₄		
11	D ₅	25	SOW		
12	D ₆	26	V _{DD}		
13	D ₇	27	A ₃		
14	GND	28	A ₂		

• NC is not connected internally.

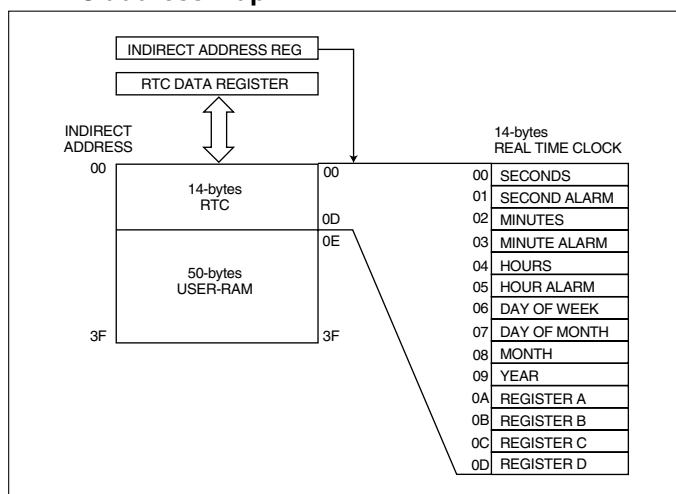
■ External dimensions

(Unit: mm)

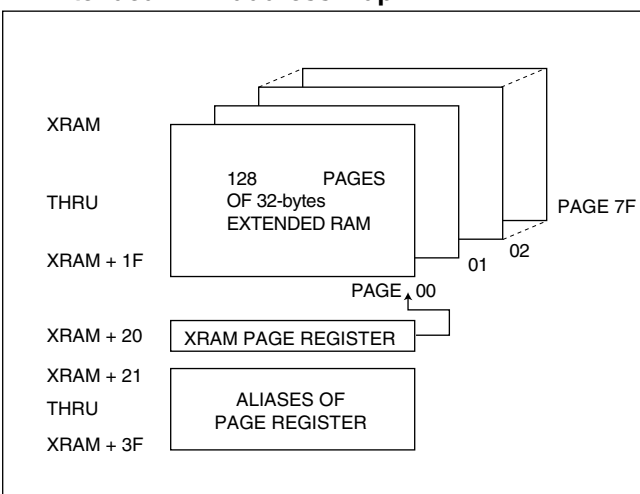


■ Address map

- **RTC address map**



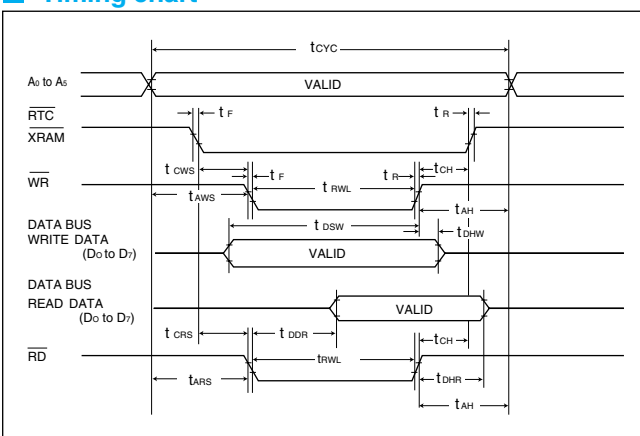
- **Extended RAM address map**



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

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 , t _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

