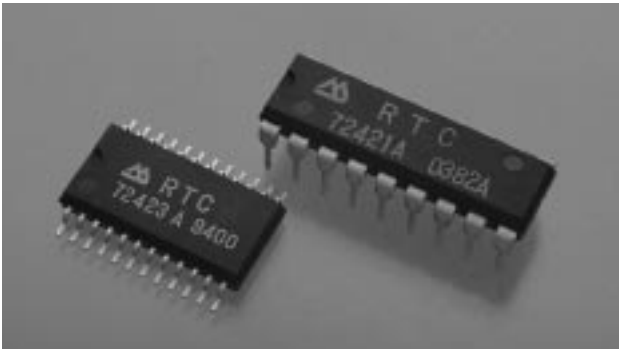


Real Time Clock Modules - Seiko Epson

RTC-72421/72423



Absolute Max. Rating

Item	Symbol	Condition	Specification	Unit
Supply voltage	V_{DD}	$T_a=25^\circ\text{C}$	-0.3 ~ +7.0	V
Input and Output voltage	V_{IO}	$T_a=25^\circ\text{C}$	GND -0.3 ~ $V_{DD} + 0.3$	V
Storage temp.	T_{STG}	RTC-72421	-55 ~ +85	°C
		RTC-72423	-55 ~ +125	
Soldering condition	T_{SOL}	RTC-72421	Under 260°C within 10S (lead part) (package should be less than 150°C)	
		RTC-72423	Under 260°C within 10S x 2 time under 230°C within 3 min	

Operating Voltage

Item	Symbol	Condition	Specification	Unit
Operating voltage	V_{DD}	-	4.5 ~ 5.5	V
Operating temperature	T_{OPR}	-	-40 ~ +85	°C
Data holding voltage	V_{DH}	-	2.0 ~ 5.5	V
CSI data holding time	t_{CDR}	Refer to the data holding timing	2.0 min.	µS
Operating restoring time	t_R			

Frequency and Current Consumption Characteristics

Item	Symbol	Condition	Specification	Unit	
Frequency tolerance	$\Delta f/fo$	$T_a=25^\circ\text{C}$ $V_{DD}=5\text{V}$	72421A	±10	ppm
			72421B	±50	
			72423A	±20	
			7243B	±50	
Frequency temperature characteristics		-10 ~ +70°C, (25°C reference temperature)	±10/-120	ppm	
Aging	f_a	$V_{DD}=5\text{V}$, $T_a=25^\circ\text{C}$, 1st year	±5 max.	ppm	
Shock resistance	S.R.	Drop test of 3 times on a hard board from 75cm height of 300G x 0.3ms x 1/2 sine wave x 3 directions	±5 max.	ppm	
Current consumption	I_{DD1}	CSI ≥ 0V	$V_{DD}=5\text{V}$	10 max.	µA
	I_{DD2}		$V_{DD}=2\text{V}$	5 Max.	

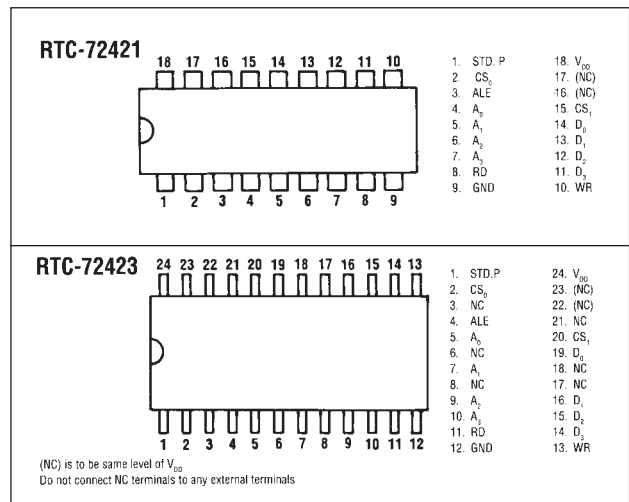
Electrical Characteristics

Item	Symbol	Condition	Min	Typ.	Max.	Unit	Applicable terminal
"H" Input Voltage (1)	V_{IH1}	-	2.2	-	-	V	All inputs
"L" Input Voltage (1)	V_{IL1}	-	-	-	0.8	V	other than CSI
Input leakage current (1)	I_{IK1}	$V_i = V_{DD}/OV$	-	-	1/-1	µA	Input other than $D_2 - D_3$
Input leakage current (2)	I_{IK2}		-	-	10/-10	µA	$D_0 - D_3$
"L" output voltage (1)	V_{OL1}	$I_{OL}=2.5\text{mA}$	-	-	0.4	V	$D_0 - D_3$
"H" output voltage	V_{OH}	$I_{OH}=-400\mu\text{A}$	2.4	-	-	V	
"L" output voltage (2)	V_{OL2}	$I_{OL}=2.5\text{mA}$	-	-	0.4	V	STD.P
OFF leak current	I_{OFFLK}	$V_i = V_{DD}/OV$	-	-	10	µA	
Input capacity	C_1	Input Frequency 1MHz	-	5	-	pF	
"H" Input Voltage (2)	V_{IH2}	$V_{DD}=2-5.5\text{V}$	4/5 V_{DD}	-	-	V	CSI ₁
"L" Input Voltage (2)	V_{IL2}		-	-	1/5 V_{DD}	V	

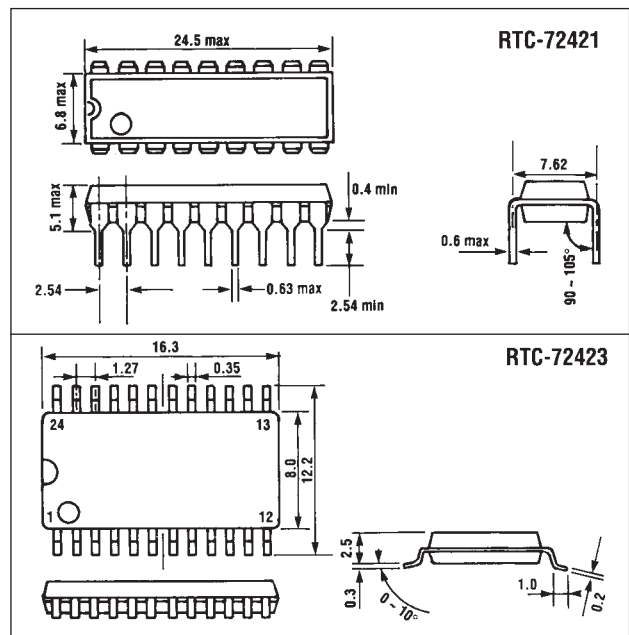
Features

- Built-in quartz crystal makes regulation unnecessary and allows for easy design
- ALE INPUT terminal available for 8048, 8051 and 8085 series
- Incorporates built-in time counters (year, month, week, day)
- 12hr/24hr clock switchcover function and automatic leap year setting
- 30 seconds error adjustment function
- READ, WRITE, HOLD, STOP, RESET and CHIP SELECT inputs
- The CMOS IC boasts low current consumption & features a backup function
- 18 pin dual-in-line package
- Pin and function are compatible with the SMC 5242C

Terminal Connection



Dimensions (mm)



Real Time Clock Modules - Seiko Epson

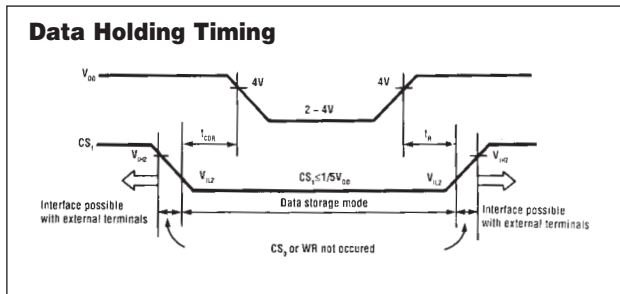
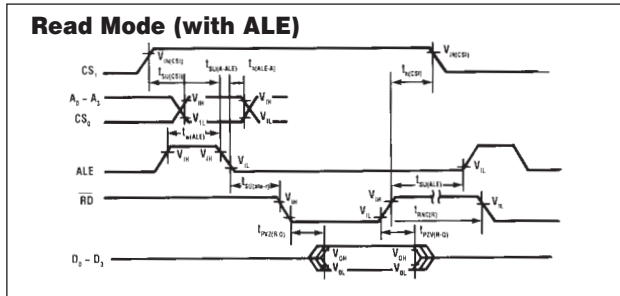
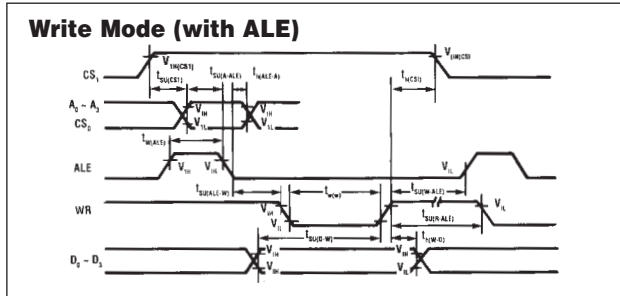
RTC-72421/72423 Continued

Notes

0="L" level, 1="H" level, REST=RESET ITRPT/STND=INTRUPT/STANDARD

1. Bit * does not exist
2. Please mask AM/PM bit with 10's of hours operation
3. Busy is read only. IRQ can only be set low ("0")

Data Bit	PM/AM	ITRPT/STND	24/12
1	PM	ITRPT	24
0	AM	STND	12



Function Table

Address	Register				Data				Count value	Remarks	
	A3	A2	A1	A0	D3	D2	D1	D0			
0	0	0	0	0	S ₇	S ₆	S ₄	S ₂	S ₁	0-9	1 second digit register
1	0	0	0	1	S ₁₀	*	S ₁₀	S ₂₀	S ₁₀	0-5	10 second digit register
2	0	0	1	0	M ₁	m ₁₆	m ₄	m ₂	m ₁	0-9	1 minute digit register
3	0	0	1	1	M ₁₀	*	m ₁₀	m ₂₀	m ₁₀	0-5	10 minute digit register
4	0	1	0	0	H ₁	h ₆	h ₄	h ₂	h ₁	0-9	1 hour digit register
5	0	1	0	1	H ₁	*	PM/AM	h ₂₀	h ₁₀	0-2 or 0-1	PM/AM, 10 hour digit register
6	0	1	1	0	D ₁	d ₆	d ₄	d ₂	d ₁	0-9	1 day digit register
7	0	1	1	1	D ₁₀	*	*	d ₂₀	d ₁₀	0-3	10 day digit register
8	1	0	0	0	MO ₁	mo ₆	mo ₄	mo ₂	mo ₁	0-9	1 month digit register
9	1	0	0	1	MO ₁₀	*	*	*	mo ₁₀	0-1	10 month digit register
A	1	0	1	0	Y ₁	y ₆	y ₄	y ₂	y ₁	0-9	1 year digit register
B	1	0	1	1	Y ₁₀	y ₂₀	y ₄₀	y ₂₀	y ₁₀	0-9	10 year digit register
C	1	1	0	0	W	*	w ₄	w ₂	w ₁	0-6	week register
D	1	1	0	1	Reg D	30 sec	IRQ	BUSY	HOLD	-	Control register D
					ADJ	FLAG					
E	1	1	1	0	Reg E	t ₁	t ₀	ITRPT	MASK	-	Control register E
								/STND			
F	1	1	1	1	Reg F	TEST	24/12	STOP	REST	-	Control register F

Switching Characteristics (with ALE)

Please connect ALE to VDD (If the microprocessor does not have an ALE OUTPUT)

Item	Symbol	Condition	Min	Max	Unit
CS1 set up time	t _{SU(CS1)}	-	1000	-	nS
Address set up time	t _{SU(A-ALE)}	-	50	-	nS
Address hold time	t _{HA(ALE)}	-	50	-	nS
ALE pulse width	t _{WA(ALE)}	-	80	-	nS
ALE before WRITE	t _{SU(ALE-W)}	-	0	-	nS
ALE before READ	t _{SU(ALE-R)}	-	0	-	nS
ALE before WRITE	t _{SU(W-ALE)}	-	50	-	nS
ALE before READ	t _{SU(R-ALE)}	-	50	-	nS
WHITE pulse width	t _{W(W)}	-	120	-	nS
RD to DATA	t _{RZ(VR-Q)}	C _L =150pF	-	120	nS
DATA hold	t _{P(VZIR-Q)}	-	0	-	nS
DATA setup time	t _{SU(D-W)}	-	80	-	nS
DATA hold time	t _{H(WD)}	-	10	-	nS
CS1 hold time	t _{H(CS1)}	-	1000	-	nS
RD/WR recovery time	t _{RECR(W)}	-	200	-	nS

(VDD=5V±, Ta=-10~70°C)

