4-bit REAL TIME CLOCK MODULE

RTC-72421/72423

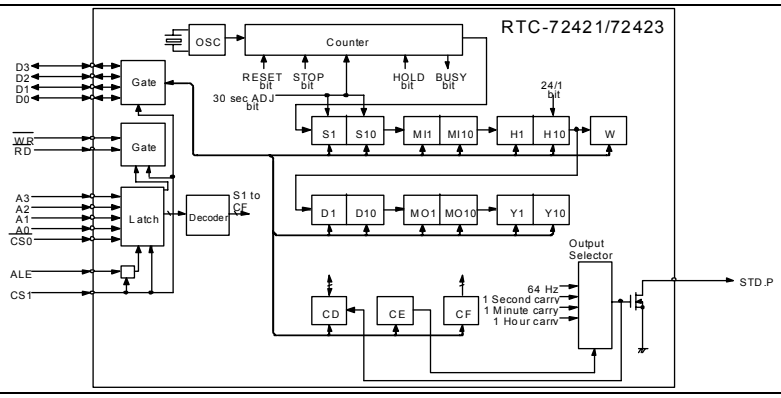
- Built-in crystal unit allows adjustment-free efficient operation.
- 24 h/12 h changeable and leap year automatically adjustable (Gregorian calendar).
- Lead(Pb)-free : Contains high melting temperature type solder (Pb85 %) exempted by RoHS directive.

Actual size

RTC-72421

RTC-72423

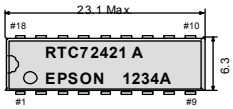
Block diagram



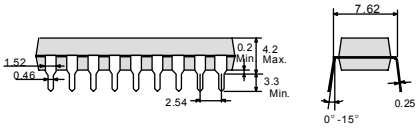
Terminal connection/External dimensions

(Unit:mm)

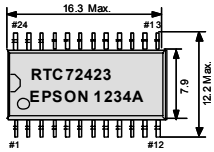
● RTC-72421 (DIP 18-pin)



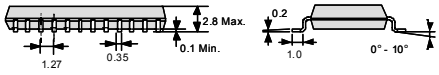
No.	Pin terminal	No.	Pin terminal
1	STD.P	18	VDD
2	/CS0	17	(VDD)
3	ALE	16	(VDD)
4	A0	15	CS1
5	A1	14	C0
6	A2	13	D1
7	A3	12	D2
8	/RD	11	D3
9	GND	10	/WR



● RTC-72423 (SOP 24-pin)



No.	Pin terminal	No.	Pin terminal
1	STD.P	24	VDD
2	/CS0	23	(VDD)
3	N.C.	22	(VDD)
4	ALE	21	N.C.
5	A0	20	CS1
6	N.C.	19	D0
7	A1	18	N.C.
8	N.C.	17	N.C.
9	A2	16	D1
10	A3	15	D2
11	/RD	14	D3
12	GND	13	/WR



Metal may be exposed on the top or bottom of this product. This will not affect any quality, reliability or electrical spec.

Specifications (characteristics)

*Refer to application manual for details.

Absolute Max. rating

Item	Symbol	Condition	Min.	Max.	Unit
Supply voltage	V_{DD}	T_a=+25 °C	-0.3	+7.0	V
Input voltage	$V_{I/O}$	T_a=+25 °C	GND-0.3	V_{DD}+0.3	V
Storage temperature *	T_{STG}	RTC-72421	-55	+85	°C
		RTC-72423	-55	+125	°C

*Stored as bare product after unpacking

Operating range

Item	Symbol	Condition	Min.	Max.	Unit
Power voltage	V_{DD}	—	4.5	5.5	V
Clock voltage	V_{CLK}	—	2.0	5.5	V
Operating temperature	T_{OPR}	RTC-72421	-10	+70	°C
		RTC-72423	-40	+85	°C

Stored as bare produc after unpacking

Frequency characteristics

Item	Symbol	Condition		Range	Unit
Frequency precision	Δf/f	T_a=+25 °C, V_{DD}=5.0 V	72421A	±10	×10^{-6}
			72421B	±50	
			72423A	±20	
			72423	±50	
Frequency temperature characteristics	TOP	-10 °C to +70 °C (+25 °C)		+10 / -120	
		-40 °C to +85 °C(+25 °C)		+10 / -220	
Frequency voltage characteristics	f/V	T_a=+25 °C, V_{DD}=2.0 V to 5.5 V		±5.0 Max.	×10^{-6}/V
Aging	fa	T_a=+25 °C, V_{DD}=5.0 V, First year		±5.0 Max.	×10^{-6}/year

DC characteristics

Item	Symbol	Condition		Min.	Typ.	Max.	Unit	Applicable terminal
Current consumption	I_{DD1}	CS_1= 0 V, Exclude input/output current	V_{DD}=5 V	—	1	10	μA	—
	I_{DD2}		V_{DD}=2 V		0.9	5		—
"H" input voltage (1)	V_{IH1}	—		2.2	—	—	V	All inputs other than CS_1
"L" input voltage (1)	V_{IL1}			—	—	0.8		
"L" output voltage (1)	V_{OL1}	I_{OL}=2.5 mA		—	—	0.4	V	D_0 to D_3
"H" output voltage	V_{OH}	I_{OH}=-400 μA		2.4	—	—		
"L" output voltage (2)	V_{OL2}	I_{OL}=2.5 mA		—	—	0.4	V	STD.P
OFF leak current	I_{OFFLK}	V_I=V_{DD}/0 V		—	—	10/-10	μA	
Input capacity	C_I	Input frequency 1 MHz		—	10	—	pF	Input other than D_0 to D_3
					20			D_0 to D_3, STD.P
"H" input voltage (2)	V_{IH2}	V_{DD}=2.0 V to 5.5 V		4/5 V_{DD}	—	—	V	CS_1
"L" input voltage (2)	V_{IL2}			—	—	1/5 V_{DD}		
Input leak current (1)	I_{LK1}	V_I=V_{DD}/0 V		—	—	1/-1	μA	Input other than D_0 to D_3
Input leak current (2)	I_{LK2}					10/-10		D_0 to D_3

End to End EPSON TOYOCOM

The development of our ubiquitous network society has caused a diversification of applications and has increased the demand for high-level quartz devices in terms of quality, quantity, and function.
The Quartz Device Operations Division of SEIKO EPSON CORPORATION (EPSON)and TOYO COMMUNICATION EQUIPMENT CO.,LTD.(TOYOCOM) were integrated on October 1,2005 to establish a new company, EPSON TOYOCOM CORPORATION, to meet these market and customer demands.
Each company contributes its own strength; EPSON holds a strong presence in consumer products and TOYOCOM is strong in industrial products. The consolidation of these two companies in a new company that provides advanced expertise with a wide range of products for terminals and infrastructure to our customers.
Quartz device have become crucial in the network environment where products are increasingly intended for broadband, ubiquitous applications and where various types of terminals can transfer information almost immediately via LAN and WAN on a global scale. EPSON TOYOCOM CORPORATION addresses every single aspect within a network environment. The new corporation offers “end-to-end” solutions to problems arising with products for consumer use, such as core network systems and automotive systems.

PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING INTERNATIONAL STANDARD

At EPSON TOYOCOM, all environmental initiatives operate under the Plan-Do-Check-Action(PDCA) cycle designed to achieve continuous improvements. The environmental management system (EMS) operates under the ISO 14001 environmental management standard.
In May 2001, all of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification.
In the future, new group companies will be expected to acquire the certification around the third year of operations.

ISO 14000 is an international standard for environmental management that was established by the International Standards Organization in 1996 against the background of growing concern regarding global warming, destruction of the ozone layer, and global deforestation.

WORKING FOR HIGH QUALITY

EPSON TOYOCOM quickly began working to aquire company-wide ISO 9000 series certification, and has acquired ISO 9001 or ISO 9002 certification with all targeted products manufactured in Japanese and overseas plants.
The Quartz Device Operations Division (Ina Japan,EPM and SZE) have acquired QS-9000 certification, which are of higher Level.
Also QS-9000 and TS 16949 certification, which is of higher level, has been acquired.

QS-9000 is an enhanced standard for quality assurance systems formulated by leading U.S.automobile manufacturers based on the international ISO 9000 series.

ISO/TS 16949 is a global standard based on QS-9000, a severe standard corresponding to the requirements from automobile industry.

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  / traffic control equipment / and others requiring equivalent reliability.
- In this new crystal master for EPSON TOYOCOM, product code and marking will still remain as previously identified prior to the merger.
  Due to the on going strategy of gradual unification of part numbers, please review product code and marking as they will change during the course of the coming months.
  We apologize for the inconvenience, but we will eventually have a unified part numbering system for Epson Toyocom which will be user friendly.