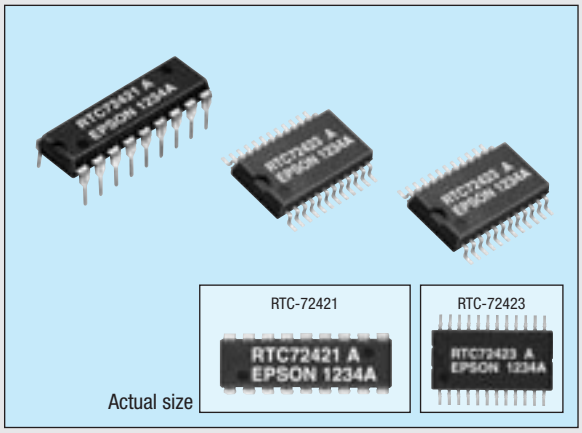
4-bit REAL TIME CLOCK MODULE

RTC-72421 / 72423

Product number (please refer to page 5)

Q4272421xxxxx00 **Q4272423xxxxx00**

- Built-in crystal unit allows adjustment-free efficient operation.
- 12/24 h clock switchover function and automatic leap year setting.
- Interrupt masking.
- Available for lead (Pb) - free soldering.
- Available for lead (Pb) - free terminal.



The details are mentioned in the application manual.

http://www.epsondevice.com

Specifications (characteristics)

Absolute Max. rating

Item	Symbol	Condition	Min.	Max.	Unit
Supply voltage	V_{DD}	Ta = +25 °C	-0.3	7.0	V
Input and output voltage	$V_{I/O}$	Ta = +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
Supply voltage	V_{CLK}	–	2.0	5.5	V
Operating temperature *	T_{OPR}	RTC-72421	-10	70	°C
		RTC-72423	-40	85	°C

* No condensation

Frequency characteristics

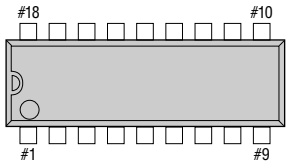
Item	Symbol	Condition		Range	Unit
Frequency tolerance	Δf/f	Ta = +25 °C, V_{DD} = 5 V	72421 A	±10	x 10^{-6}
			72421 B	±50	
			72423 A	±20	
			72423	±50	
Frequency temperature characteristics	T_{op}	-10 °C to +70 °C (Reference at +25 °C)		+10 / -120	
		-40 °C to +85 °C (Reference at +25 °C)		+10 / -220	
Frequency voltage characteristics	f/V	Ta = +25 °C, V_{DD} = 2.0 V to 5.5V		±5 Max.	x 10^{-6} / V
Aging	fa	V_{DD} = 5 V, Ta = +25 °C, first year		±5 Max.	x 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		
Input leak current (1)	I_{LK1}	V_I = V_{DD} / 0 V		–	–	±1	µA	Input other than D_0 to D_3
Input leak current (2)	I_{LK2}				–	±10		D_0 to D_3
"L" output voltage (1)	V_{OL1}	I_{OL} = 2.5 mA		–	–	0.4	V	
"H" output voltage	V_{OH}	I_{OH} = -400 µA		2.4	–	–		
"L" output voltage (2)	V_{OL2}	I_{OL} = 2.5 mA		–	–	0.4		STD.P
Off leak current	I_{OFFLK}	V_I = V_{DD}/0 V			–	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
"H" input voltage (2)	V_{IH2}	V_{DD} = 2 V to 5.5 V		4/5 V_{DD}	–	–	V	CS_1
"L" input voltage (2)	V_{IL2}			–		1/5 V_{DD}		

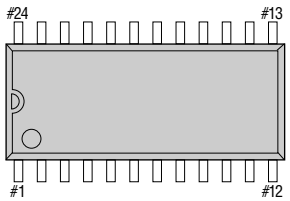
Terminal connection

● **RTC-72421**



No.	Pin terminal	No.	Pin terminal
1	STD. P	18	V_{DD}
2	$\overline{CS_0}$	17	(V_{DD})
3	ALE	16	(V_{DD})
4	A_0	15	CS_1
5	A_1	14	D_0
6	A_2	13	D_1
7	A_3	12	D_2
8	$\overline{RD}$	11	D_3
9	GND	10	$\overline{WR}$

● **RTC-72423**

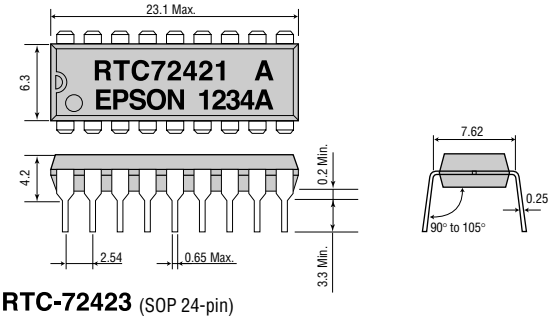


No.	Pin terminal	No.	Pin terminal
1	STD. P	24	V_{DD}
2	$\overline{CS_0}$	23	(V_{DD})
3	NC	22	(V_{DD})
4	ALE	21	NC
5	A_0	20	CS_1
6	NC	19	D_0
7	A_1	18	NC
8	NC	17	NC
9	A_2	16	D_1
10	A_3	15	D_2
11	$\overline{RD}$	14	D_3
12	GND	13	$\overline{WR}$

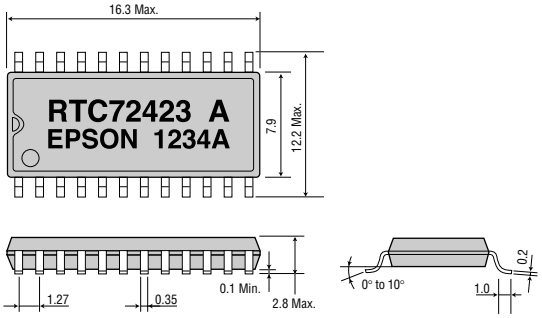
External dimensions

(Unit: mm)

● **RTC-72421** (DIP 18-pin)



● **RTC-72423** (SOP 24-pin)



THE CRYSTALMASTER

ENERGY SAVING EPSON

EPSON offers effective savings to its customers through a wide range of electronic devices, such as semiconductors, liquid crystal display (LCD) modules, and crystal devices. These savings are achieved through a sophisticated melding of three different efficiency technologies.

Power saving technology provides low power consumption at low voltages.

Space saving technology provides further reductions in product size and weight through super-precise processing and high-density assembly technology.

Time saving technology shortens the time required for design and development on the customer side and shortens delivery times.

Our concept of Energy Saving technology conserves resources by blending the essence of these three efficiency technologies. The essence of these technologies is represented in each of the products that we provide to our customers.

In the industrial sector, leading priorities include measures to counter the greenhouse effect by reducing CO2, measures to preserve the global environment, and the development of energy-efficient products. Environmental problems are of global concern, and although the contribution of energy-saving technology developed by EPSON may appear insignificant, we seek to contribute to the development of energy-saving products by our customers through the utilization of our electronic devices. EPSON is committed to the conservation of energy, both for the sake of people and of the planet on which we live.

WORKING WITH ENVIRONMENTAL ISSUES

In 1988, Seiko Epson led in working to abolish CFCs, and perfect abolition of those ozone layer-destroying substances was achieved in 1992. In 1998, the 10th year of start of the CFC-free activity, Seiko Epson set this year as the "Second Environmental Benchmark Year" and established a new corporate General Environmental Policy. Seiko Epson is tackling with environmental issues comprehensively.

At the end of Fiscal 1988, Seiko Epson succeeded in abolishing chloric solvents doubted to be harmful to human body. In fiscal 1999, Seiko Epson started the activity with a goal of abolishing lead solder pointed out possibility of enironmental pollutant.

Promotion of Environment Management System conforming to International Standard

To strengthen management for environmental activities, Seiko Epson Group aims at acquisition of the ISO14001 certification for Japanese and abroad main business bases (including affiliates) for manufacturing, sales, software development and others.

As of May 25 , 2001, planned 68 bases of all manufacturing bases and some non-manufacturing bases have acquired the certification.

Co-existence Mark

The environmental mark symbolizing Epson's basic stance of "Co-existence with Nature".
The design incorporates a fish, flower, and water, representing mutually supportive co-existence.

ISO14000 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

Seiko-Epson quickly began working to acquire company-wide ISO9000 series certification, and has acquired ISO9001 or ISO9002 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.

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