

**Built-in TIME STAMP FUNCTION
SERIAL-INTERFACE REAL TIME CLOCK MODULE**

RX-5412 SF

- Built in frequency adjusted 32.768 kHz crystal unit.
- Interface Type : 4-wire serial interface
- Operating voltage range : 2.5 V to 5.5 V
- Wide Timekeeper voltage range : 1.4 V to 5.5 V
- Low backup current : 0.5 μ A / 3 V (Typ.)
- Built-in SRAM : Built-in 2048 bit (8 bit \times 256)
- The various functions include full calendar, alarm, timer, time stamp, Watch dog timer, automatic power switching function.



Product Number (Please contact us)
X1B000082xxxx00

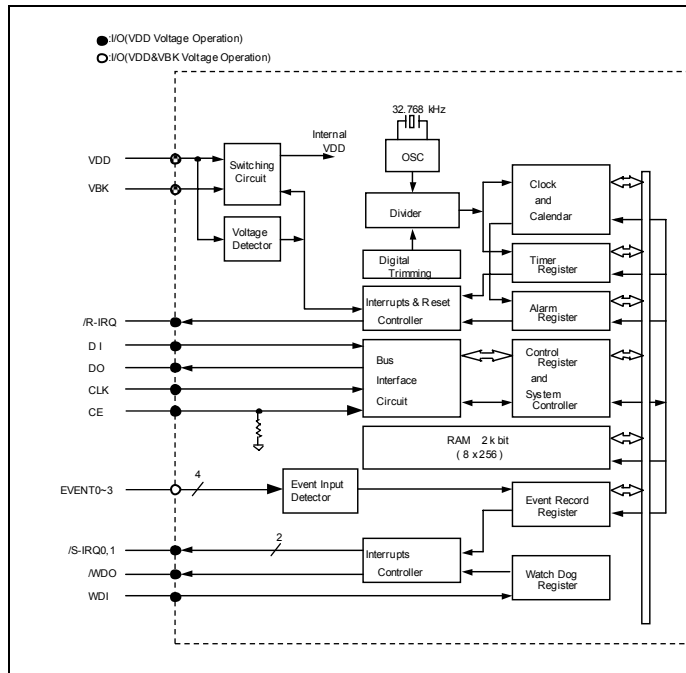


Actual size



NEW

Block diagram



Overview

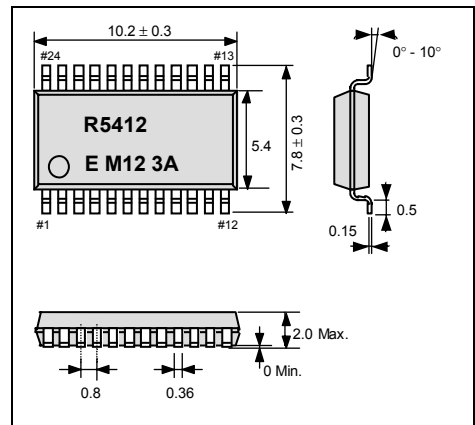
- Timer function
 - Timer function which can be set up between 1/4096 second and 4095 minutes.
- Alarm function
 - Alarm function can be set to free combination of day, day of week, hour, or minute.
- Time-stamp function
 - Event record function can record separate time data in each of event input terminal.
- Watch dog timer function
 - Watch dog timer function which can be set to 1.95 ms from 500 ms
- 2048bit S-RAM.
 - It is used for general-purpose memory and event record.

Pin Function

Signal name	Pin No.	I / O	Function	Signal name	Pin No.	I / O	Function
Vss	1	-	GND	(Vss)	24	-	
EVENT0	2	Input	Event input	(Vss)	23	-	
EVENT1	3	Input	Event input	(Vss)	22	-	
VBK	4	-	Backup powersupply	(Vss)	21	-	
EVENT2	5	Input	Event input	(Vss)	20	-	
(Vss)	6	-		(Vss)	19	-	
EVENT3	7	Input	Event input	/S-IRQ1	18	Output	Event record interrupt output (open drain)
CE	8	Input	Chip enabled input	/S-IRQ0	17	Output	Event record interrupt output (open drain)
CLK	9	Input	Clock input pin for serial data transmission	WDI	16	Input	Watch dog input (open drain)
DO	10	Output	Data output pin for serial data transmission	WDO	15	Output	Watch dog output (open drain)
DI	11	Input	Data input pin for serial data transmission	N.C.	14	-	
/R-IRQ	12	Output	RTC function interrupt output (open drain)	V _{DD}	13	-	Power supply

External dimensions

(Unit:mm)



Specifications (characteristics)

*Refer to application manual for details.

Electrical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	
Power voltage	V _{DD}	-	2.5	3.0	5.5	V	
Clock voltage	V _{CLK}	-	1.4	3.0	5.5	V	
Operating temperature	T _{OPR}	-	-40	+25	+85	°C	
Frequency tolerance	$\Delta f / f$	Ta = +25 °C, V _{DD} = 3.0 V	5 ± 23 *			$\times 10^{-6}$	
Current Consumption	I _{DD1}	Back up operation , CE = GND , /IRQ = OFF	VBK=5 V		0.5	1.0	μ A
	I _{DD2}		VBK=3 V		0.5	1.0	

*Equivalent to 1 minute of monthly deviation.

“QMEMS” EPSON TOYOCOM

In order to meet customer needs in a rapidly advancing digital, broadband and ubiquitous society, we are committed to offering products that are one step ahead of the market and a rank above the rest in quality. To achieve our goals, we follow a “3D (three device) strategy” designed to drive both horizontal and vertical growth. We will to grow our three device categories of “Timing Devices”, “Sensing Devices” and “Optical Devices”, and expand vertical growth through a combination of products from these categories.

A Quartz MEMS is any high added value quartz device that exploits the characteristics of quartz crystal material but that is produced using MEMS (micro-electro-mechanical system) processing technology.

Market needs are advancing faster than previously imagined toward smaller, more stable crystal products, but we will stay ahead of the curve by rolling out products that exceed market speed and quality requirements. We want to further accelerate the 3D strategy by QMEMS.

Quartz devices 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 “Digital Convergence” solutions to problems arising with products for consumer use, such as, core network systems and automotive systems.



PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

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.

All of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification.

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

In order to provide high quality and reliable products and services that meet customer needs, Epson Toyocom made early efforts towards obtaining ISO9000 series certification and has acquired ISO9001 for all business establishments in Japan and abroad. We have also acquired ISO/TS 16949 certification that is requested strongly by major automotive manufacturers as standard.

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 the automobile industry.

► Explanation of the mark that are using it for the catalog

	► Pb free.
	► Complies with EU RoHS directive. *About the products without the Pb-free mark. Contains Pb in products exempted by EU RoHS directive. (Contains Pb in sealing glass, high melting temperature type solder or other.)
	► The products have been designed for high reliability applications such as Automotive.

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/ Medical instruments to sustain life / Submarine transmitters / Power stations and related / Fire work equipment and security equipment
/ traffic control equipment / and others requiring equivalent reliability.
- In this new crystal master for Epson Toyocom, product codes and markings will remain as previously identified prior to the merger.
Due to the on-going strategy of gradual unification of part numbers, please review product codes and markings, 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 that will be user friendly.