

4-wire serial interface high-stability RTC module

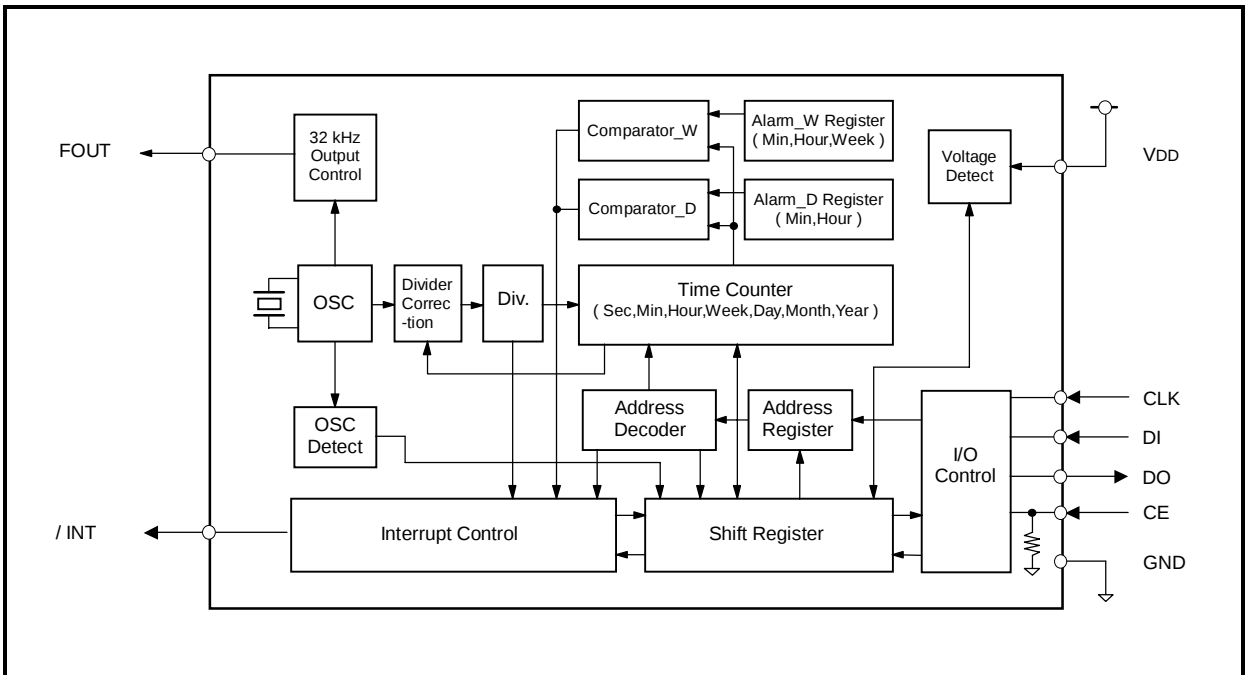
RX-4045 SA

Preliminary

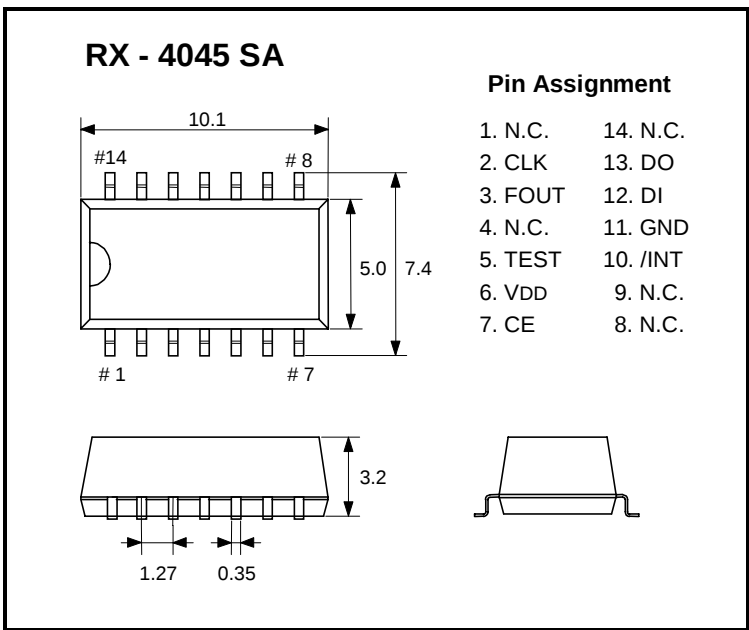
Product number:Q4140455xxxxx00

- Built in frequency adjusted 32.768 kHz crystal unit.
- Serial interface which can be controlled by 4 or 3 signal lines.
- Dual Alarm and Timer IRQ function are Available.
- 32.768 kHz clock frequency output. (FOUT)
- Low backup current : 0.48 μ A / 3 V (Typ.)
- Wide operating voltage range : 1.7 V to 5.5 V Wide timekeeper voltage range : 1.15 V to 5.5 V
- Available as small package.(SOP-14pin)

■ Block Diagram



■ Pin Assignment



■ Pin Descriptions

Terminal	Pin No.	Descriptions
CLK	2	Serial clock input
FOUT	3	32.768 kHz output (Nch open drain)
TEST	5	TEST terminal
VDD	6	VDD
CE	7	Chip enable
/INT	10	Interrupt output (Nch open drain)
GND	11	GND
DI	12	Data input
DO	13	Data output

■ Specifications

1. Operating range

Item	Symbol	Condition	Min.	Max.	Unit
Supply voltage	V _{DD}		1.70	5.5	V
Data holding voltage	V _{CLK}		1.15	5.5	V
Operating temperature range	TOPR		-40	+85	°C

2. Frequency characteristics

Item	Symbol	Condition	Max.	Unit
Frequency tolerance	f / f ₀	Ta=+25 °C , V _{DD} =3.0 V	5 ± 5	X 10 ⁻⁶
Frequency temperature characteristics		Ta=-10 ~ +70 °C , V _{DD} =3.0 V	+10 / -120	X 10 ⁻⁶
Aging	fa	Ta=+25 °C, V _{DD} =3.0 V, First year	± 5	X 10 ⁻⁶

3. DC characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Current consumption Backup mode	I _{DD}	Output=Open, V _{DD} =3 V		0.48	1.2	μA
V _{DD} detect voltage (High)	V _{DETH}	Ta = +25 °C	1.90	2.10	2.30	V
V _{DD} detect voltage (Low)	V _{DETL}	Ta = +25 °C	1.15	1.30	1.45	V

■ Register table

Address	Item	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
00	SEC.	-	S40	S20	S10	S8	S4	S2	S1
01	MIN.	-	M40	M20	M10	M8	M4	M2	M1
02	HOUR	-	-	H20 P/A	H10	H8	H4	H2	H1
03	WEEK	-	-	-	-	-	W4	W2	W1
04	DAY	-	-	D20	D10	D8	D4	D2	D1
05	MONTH	20/19	-	-	MO10	MO8	MO4	MO2	MO1
06	YEAR	Y80	Y40	Y20	Y10	Y8	Y4	Y2	Y1
07	Digital offset	0	F6	F5	F4	F3	F2	F1	F0
08	Alarm_W (MIN.)	-	WM40	WM20	WM10	WM8	WM4	WM2	WM1
09	Alarm_W (HOUR)	-	-	WH20 WP/A	WH10	WH8	WH4	WH2	WH1
0A	Alarm_W (WEEK)	-	WW6	WW5	WW4	WW3	WW2	WW1	WW0
0B	Alarm_D (MIN.)	-	DM40	DM20	DM10	DM8	DM4	DM2	DM1
0C	Alarm_D (HOUR)	-	-	DH20 DP/A	DH10	DH8	DH4	DH2	DH1
0D		-	-	-	-	-	-	-	-
0E	Control register1	WALE	DALE	24/12	/CLEN2	TEST	CT2	CT1	CT0
0F	Control register 2	VDSL	VDET	/XST	PON	/CLEN1	CTFG	WAFG	DAFG

NOTICE

- The material is subject to change without notice.
- Any part of this material may not be reproduced or duplicated in any form or any means without the written permission of Seiko Epson.
- The information, applied circuit, program, using way etc., written in this material is just for reference. Seiko Epson does not assume any liability for the occurrence of infringing any patent or copyright of third party. This material does not authorize the licence for any patent or intellectual property rights.
- Any product described in this material may contain technology or the subject relating to strategic products under the control of the Foreign Exchange and Foreign Trade Law of Japan and may require an export licence from the Ministry of international Trade and industry or other approval from another government agency.
- The products(except for some product for automotive applications) listed up on this material are designed to be used with ordinary electronic equipment(OA equipment, AV equipment,communications equipment, measuring instruments etc). Seiko Epson does not assume any liability for the case using the products with the application required high reliability or safety extremely (such as aerospace equipment etc). When intending to use any our product with automotive application and the other application than ordinary electric equipments as above, please contact our sales representatives in advance.

© SEIKO EPSON CORPORATION 2003

SEIKO EPSON CORPORATION

ELECTRONIC DEVICE MARKETING DEPARTMENT

EPSON ELECTRONICS AMERICA, INC.

150 River Oaks Parkway, San Jose, CA 95134, U.S.A.

Phone: (1)800-228-3964 (Toll free) : (1)408-922-0200 Fax: (1)408-922-0238

EPSON EUROPE ELECTRONICS GmbH

Riesstrasse 15, 80992 Munich, Germany

Phone: (49)-(0)89-14005-0 Fax: (49)-(0)89-14005-110

EPSON (CHINA) CO., LTD.

23F, Beijing Silver Tower 2# North RD DongSangHuan ChaoYang District, Beijing, China

Phone: (86) 10-6410-6655 Fax: (86) 10-6410-7319

EPSON HONG KONG LTD.

20/F., Harbour Centre, 25 Harbour Road, Wanchai, Hong kong

Phone: (852) 2585-4600 Fax: (852) 2827-2152

EPSON TAIWAN TECHNOLOGY & TRADING LTD.

14F, No.7, Song Ren Road, Taipei 110

Phone: (886) 2-8786-6688 Fax: (886) 2-8786-6660

EPSON SINGAPORE PTE. LTD.

No.1, Temasek Avenue #36-00, Millenia Tower, Singapore 039192

Phone: (65) 337-7911 Fax: (65) 334-2716

SEIKO EPSON CORPORATION KOREA Office

50F, KLI 63 Building,60 Yoido-dong, Youngdeungpo-Ku, Seoul, 150-763, Korea

Phone: (82) 2-784-6027 Fax: (82) 2-767-3677

Electronic devices information on WWW server

<http://www.epsondevice.com>

