

**REAL TIME CLOCK MODULE (I²C-Bus)
For Automotive
Built-in 32.768 kHz-DTCXO, High Stability**



Product Number
RA8803SA UA: X1B000262A00100
RA8803SA UB: X1B000262A00200
RA8803SA UC: X1B000262A00300
RA8803SA AA: X1B000262A00600

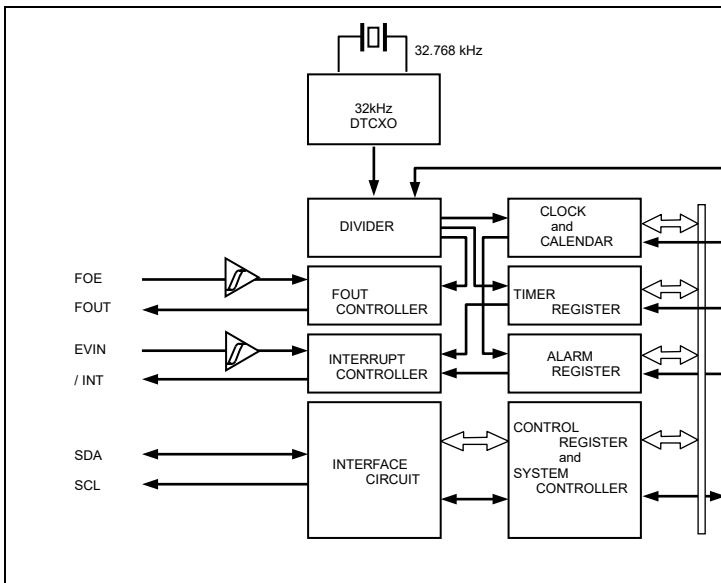
RA8803SA

- Built in frequency adjusted 32.768 kHz crystal unit and DTCXO.
- 1/100s resolution Time register
- Interface Type : I²C-Bus interface (400kHz)
- Interface voltage range : 1.6 V to 5.5 V
- Temp. compensated voltage range : 2.2 V to 5.5 V
- Timekeeping voltage range : 1.6 V to 5.5 V
- Selectable clock output (32.768 kHz, 1024 Hz, 1 Hz)
- The various functions include full calendar, alarm, timer, EVIN input.
- Applications : Car audio, Car navigation system, Clock
- Conforms to AEC-Q200

*The I²C-BUS is a trademark of NXP Semiconductors.



Block diagram



Overview

- **High Stability**
 - UA ± 3.4 x 10⁻⁶ / -40 °C to +85 °C (Equivalent to ±9 seconds of month deviation)
 - UB ± 5.0 x 10⁻⁶ / -40 °C to +85 °C (Equivalent to ±13 seconds of month deviation)
 - UC ± 5.0 x 10⁻⁶ / -30 °C to +70 °C
 - AA (+5 ± 5.0) x 10⁻⁶ / +25 °C
- **High Resolution:** 1/100s Time register with capture buffer
- **32.768 kHz frequency output function**
 - FOUT pin output (C-MOS output), CL=30 pF
 - Output selectable: 32.768 kHz, 1024 Hz, 1 Hz
- **The various interrupt**
 - Timer Function can be set between 1/ 4096 second and 4095 minutes.
 - Alarm Function can be set to day of week, day, hour, or minute.
 - EVIN input.
- **Time synchronize function with 1PPS signal input**
- **Register compatibility:** upper compatible with RX-8801.

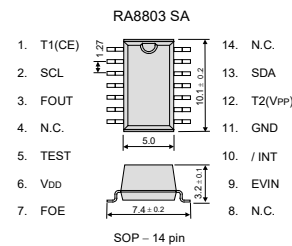
*It is possible to use it by the terminal connection as 32.768 kHz-DTCXO.

Pin Function

Signal Name	I / O	Function
T1(CE)	input	Use by the manufacture for testing. (Do not connect externally.)
SCL	input	Serial clock input pin.
FOUT	Output	The pin outputs the reference clock signal. (CMOS output)
TEST	input	Use by the manufacture for testing.
V _{DD}	-	Connected to a positive power supply
FOE	input	The input pin for the FOUT output control.
EVIN	input	External event input. Open is Prohibited.
/INT	Output	Interrupt output (N-ch. open drain).
GND	-	Connected to a ground
T2(V _{PP})	-	Use by the manufacture for testing. (Do not connect externally.)
SDA	I/O	Data input and output pin.

Terminal connection / External dimensions

(Unit:mm)



The metal case inside of the molding compound may be exposed on the top or bottom of this product. This purely cosmetic and does not have any effect on quality, reliability or electrical specs.

Specifications (characteristics)

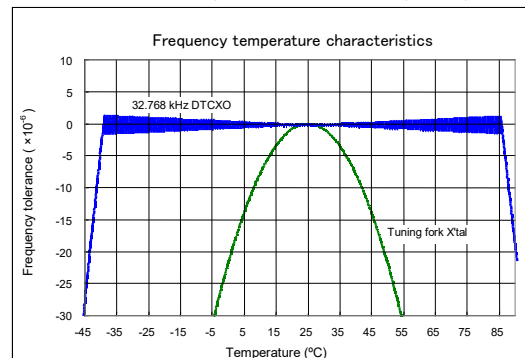
* Refer to application manual for details.

■ Electrical Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Operating voltage	V _{DD}	Interface voltage	1.6	3.0	5.5	V	
Temp. compensated Voltage	V _{TEM}	Temp. compensated voltage	2.2	3.0	5.5	V	
Clock supply voltage	V _{CLK}	-	1.6	3.0	5.5	V	
Operating temperature	T _{OPR}	-	-40	+25	+85	°C	
Stability	Δf / f	UA	Ta = -40 °C to +85 °C	±3.4 *1		× 10 ⁻⁶	
		UB	Ta = -40 °C to +85 °C	±5.0 *2			
		UC	Ta = -30 °C to +70 °C				
		AA	Ta = +25 °C	5 ±5.0 *3			
Current consumption (1)	I _{DD1}	Backup Mode FOE = GND, /INT = V _{DD} FOUT output : OFF	V _{DD} = 5V	-	0.75	3.4	μA
Current consumption (2)	I _{DD2}		V _{DD} = 3V	-	0.75	2.1	μA

*1) Equivalent to ±9 seconds of month deviation. *2) Equivalent to ±13 seconds of month deviation.
 *3) Equivalent to ±13 seconds of month deviation. (excluding offset)

■ 32.768 kHz-DTCXO Frequency temperature characteristics (Example)



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