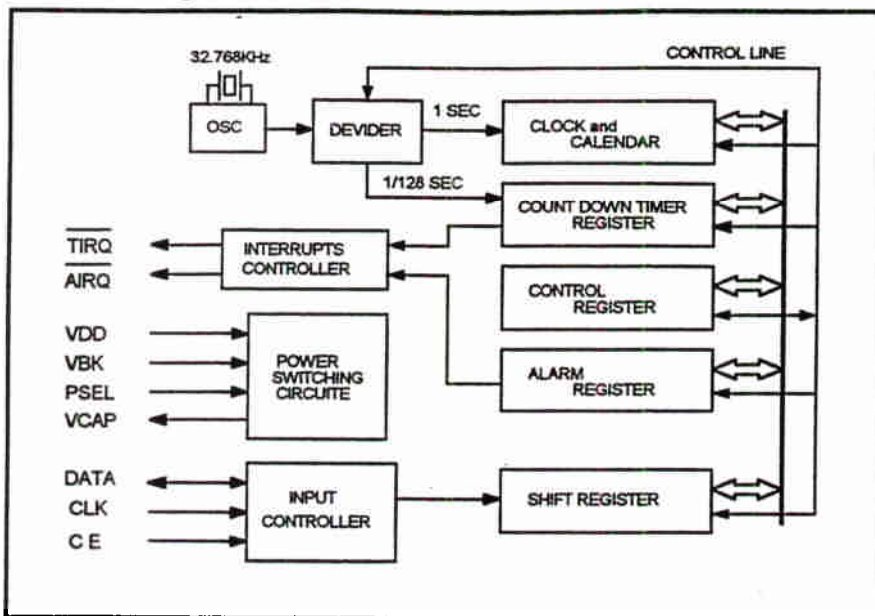


Serial RTC with Alarm and Timer

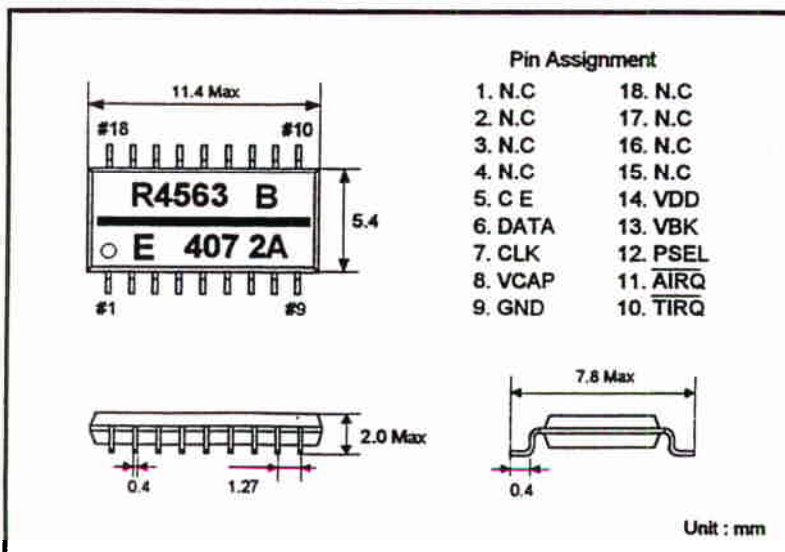
RTC - 4563 SB

- Built in frequency adjusted 32.768KHz quartz crystal.
- Leap Year automatically corrected.
- Alarm function (minute to week).
- Available interval timer interrupt function.(1/128sec to 255hours.)
- Available summer-time support function.
- Low profile , 2.0mm height.
- Low backup current. (0.9 μ A/3V TYP.)
- Wide operating voltage range : 2.5V to 5.5V
- Wide data hold voltage range : 2.0V to 5.5V

■ Block Diagram



■ External Dimensions



■ Pin Description

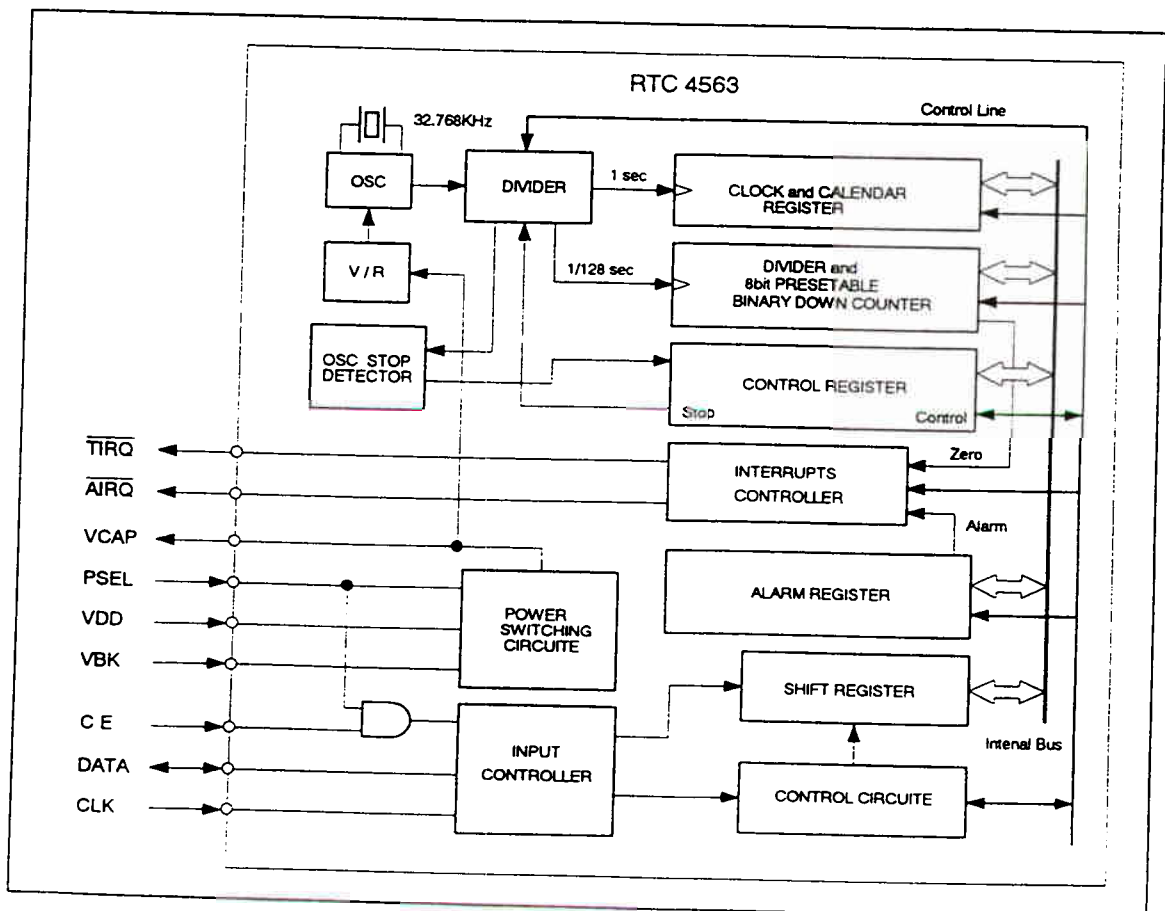
Pin	No.	Description
CE	5	Chip Enable.
DATA	6	Data input/output.
CLK	7	Serial clock input.
VCAP	8	
GND	9	Ground
/TIRQ	10	Timer interrupt output. Open drain.
/AIRQ	11	Alarm interrupt output. Open drain.
PSEL	12	Power supply Select.
VBK	13	Backup battery input.
VDD	14	Main power supply input.

- The Built-in Quartz Crystal Makes The Product Streamlined and Adjustment Free.
- The serial interface that can control it with 3 signals line
- Alarm interrupt function is day of week and time and minutes
- Interval timer interrupt function can set it up until 1/128 seconds to 255 hours
- There is each the exclusive interrupt output terminal alarm, timer, and a software can mask it each.
- The dedication interrupt output of 2 system of alarm, timer which a software can mask
- Available power switching function.
- Serial communication abnormal end, crystal oscillation stop, The update cycle is in progress, each detection functions
- Daylight-saving time change support function
- Automatic leap year correction function (the Christian era, the the Heisei era name of an era)
- The wide interface voltage range of 2.5-5.5 V
- Low consumption electric current 0.9 μ A / 3V (TYP.)
- SOP is most suitable for high density implementation with a small package

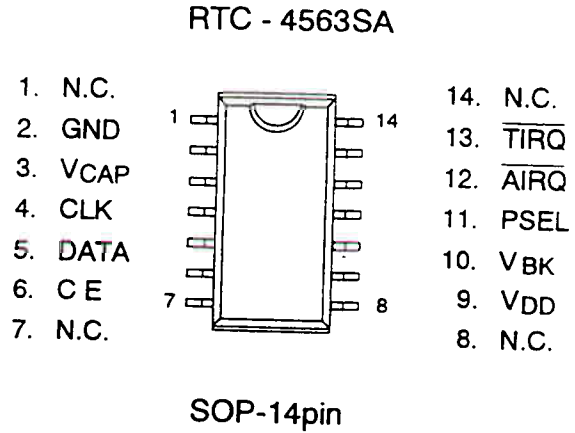
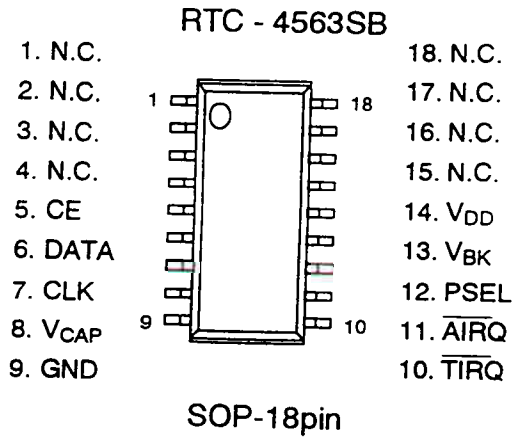
Abstract

This module is real time clock of the serial interface which had crystal resonator built-in. This module has Clock & Calender circuitry and power supply switch circuitry and alarm and a function of timer interrupt changed in auto from seconds to a year to leap year. Detection function possesses, communication abnormal end, oscillation stoped, the time and carendar update cycle is in progress, other function. Serial interface can control it by minimum port number with three signal line. Because a package is small with SOP, various cellular phone, handy term, is most suitable for a use of other small electron equipment.

Block diagram



PIN-FUNCTION



Symbol	Pin-assign SOP18 / (SOP14)	I/O	Function
CE	5 (6)	Input	It is chip enable input terminal, and access to register is possible, and DATA terminal is high impedance during "L" level, and DATA terminal and CLK terminal is prohibited by "H" level, and current decreases, too, fr, TEST, RESET bit is cleared in "0" forcibly, and power-up still gives "L" level CE terminal as "L" level
DATA	6 (5)	Input/ Output	It is the input and output terminal
CLK	7 (4)	Input	Shift clock input terminal and takes in data from DATA terminal in write mode with start edge of CLK signaling, and outputs data from DATA terminal in Read mode.
VCAP	8 (3)	—	It is condenser junction terminal for inside power supply. This pin connect 0.1 μ F between VCAP-GND.
GND	9 (2)	—	Connect to the minus side of power supply.
/TIRQ	10 (13)	Output	It is open drain terminal for the interval timer interrupt output.
/AIRQ	11 (12)	Output	It is open drain terminal for the interval alarm interrupt output.
PSEL	12 (11)	Input	VDD power supply, "L" level use VBK power supply, and, as for "H" level, turn into access disabling state of "L" level
VBK	13 (10)	Input	Power supply for back up.
VDD	14 (9)	Input	Power supply
N.C.	1,2,3,4, 15,16, 17,18 (1,7,8,14)		It isn't connected inside, but use it with "OPEN" by all means to get characteristic of the oscillating circuit which became stable more.

※ Connect bypass capacitor more than 0.1 μ F to VDD - GND interval closest to by all means.

■ Characteristic

1. Maximum Ratings

Ta=25°C

Description	Symbol	Condition	Ratings	Unit
Power supply Voltage (1)	VDD	—	-0.3~+7.0	V
Power supply Voltage(2)	VBAT	—	-0.3~+7.0	
Input Voltage	VIN1	CE,CLK,PSEL	-0.3~+7.0	V
	VIN2	DATA	GND-0.3~VDD+0.3	
Output Voltage	VOUT1	/TIRQ,/AIRQ	-0.3~+7.0	V
	VOUT2	DATA	GND-0.3~VDD+0.3	
Temperature	TSTG	—	-55~+125	°C

2. Operating condition

Description	Symbol	Condition	Ratings	Unit
Power supply Voltage	VDD	—	2.5~5.5	V
Backup Voltage	VCLK	—	2.0~5.5	V
Operating temperature	TOPR	—	-40~+85	°C

3. Oscillator characteristics

Description	Symbol	Condition	Spec.	Unit
Frequency accuracy	$\Delta f / f_0$	Ta=25°C, VDD=3V	5±23 ※	ppm
Oscillator start up time	Sec	After initialize.	3(MAX)	Sec
Temperature characteristics		-10~70°C 25°C(Typ)	+10 / -120	ppm
Voltage characteristics		Ta=25°C, VDD=2.0~5.5V	±2.0	ppm / V

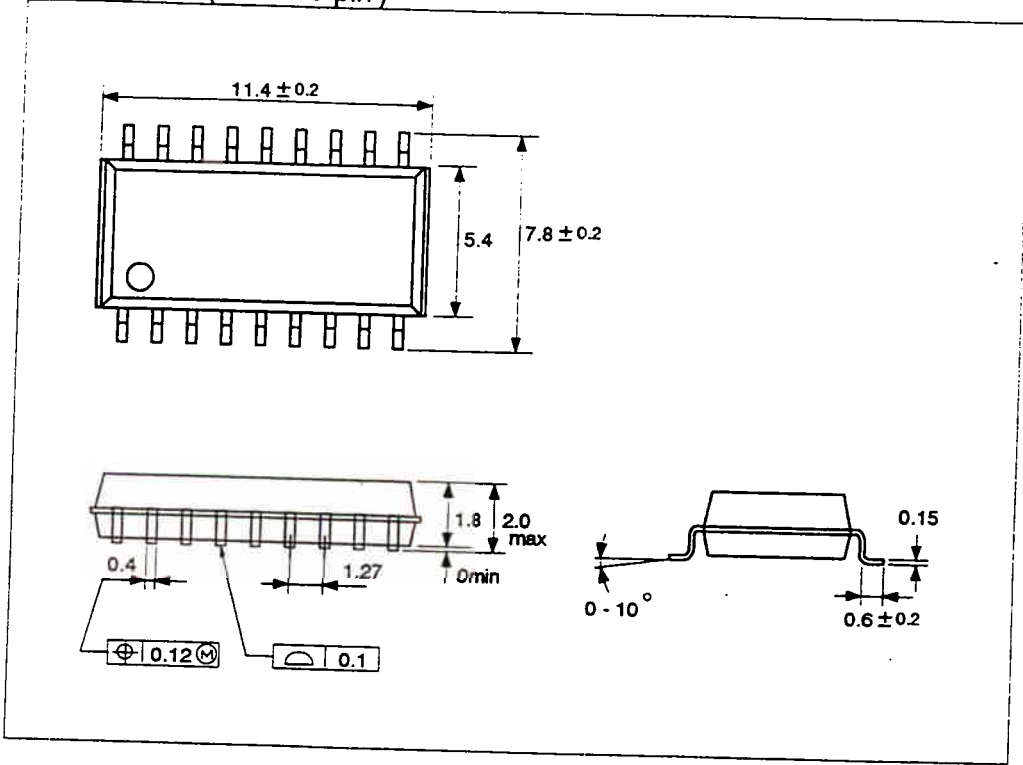
4. DC CHARACTERISTICS

(VDD=2.5~5.5V, Ta=-40 ~ 85°C)

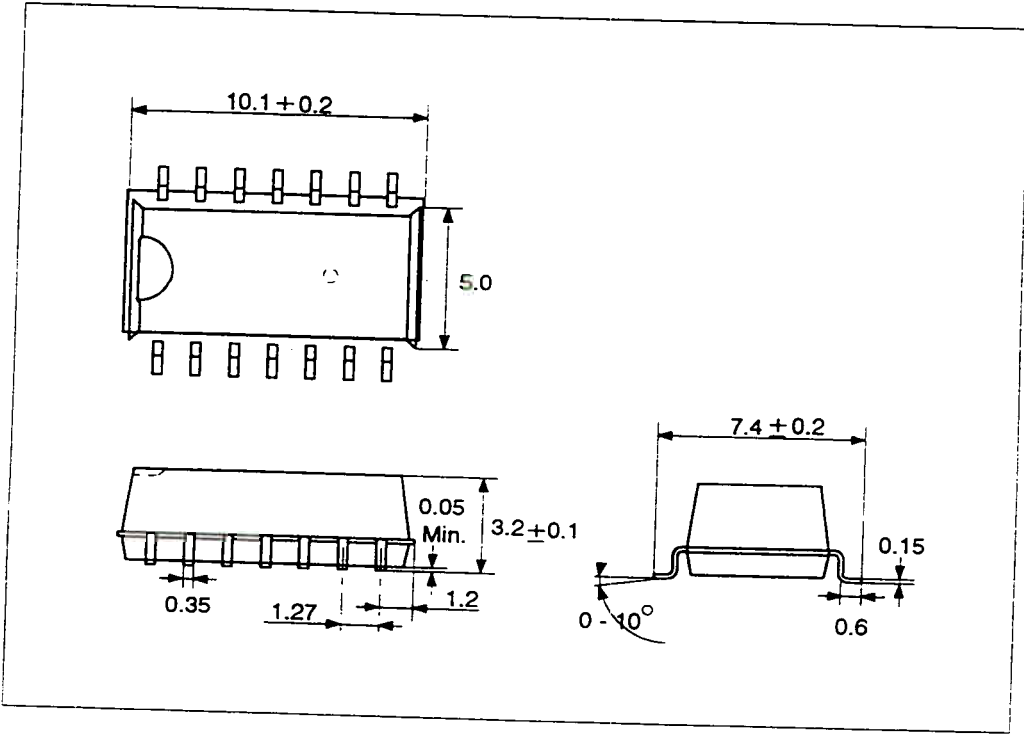
Description	Symbol	Condition	MIN.	TYP.	MAX.	Unit	Notes
Input Voltage 1	VIH1	—	0.7VDD	—	—	V	Input terminal except PSEL
	VIL1	—	—	—	0.3VDD	V	
Input Voltage 2	VIH2	—	0.7VCAP	—	—	V	PSEL
	VIL2	—	—	—	0.3VCAP	V	
Input leakage current 1	ILK1	VI=VDD/GND	—	—	1/-1	μA	CE,CLK
Input leakage current 2	ILK2	VI=VDD/GND	—	—	10/-10	μA	DATA
Output Low voltage 1	VOL1	IO=1mA	—	—	0.2VDD	V	DATA
Output High voltage	VOH	IO=-400μA	0.8VDD	—	—	V	DATA
Output Low voltage 2	VOL2	IO=1mA	—	—	0.2VDD	V	/AIRQ,/TIRQ
OFF leakage current	IOFLK	VO=VDD	—	—	10	μA	/AIRQ,/TIRQ
Standby current 1	IDD1	VDD=5V	—	1.2	1.8	μA	VDD
		VI: CE=GND,PSEL=VDD	—	—	—	—	
Standby current 2	IDD2	VDD=3V	—	0.9	1.5	μA	VDD
		VI: CE=GND,PSEL=VDD	—	—	—	—	
Backup current 3	IDD3	VBK=2V VI: CE=GND,PSEL=GND	—	0.8	1.3	μA	VBK

■ external form drawing

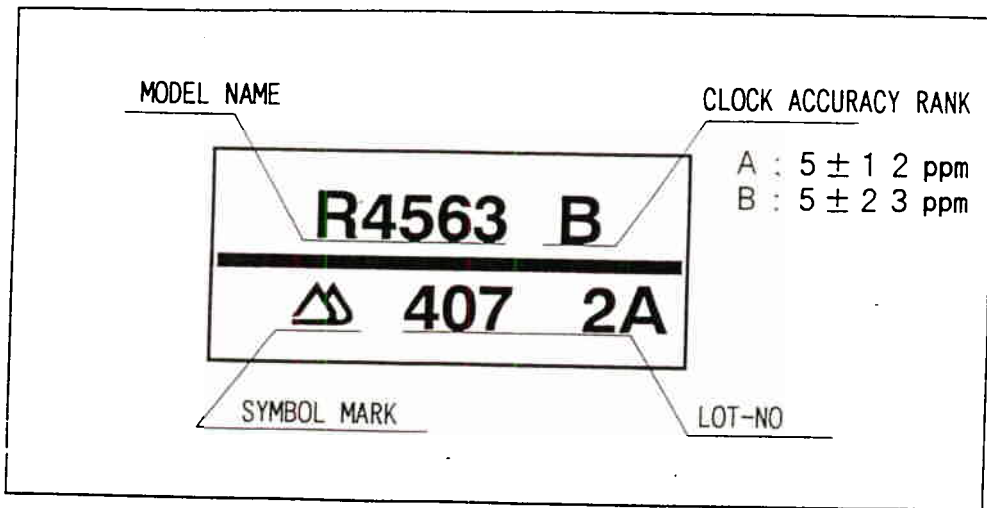
RTC-4563SB (SOP 18-pin)



RTC-4563SA (SOP 14-pin)



Marking layout



An illustration of which was shown aloft isn't a thing prescribing a figure of marking letter, dimension, elaboration of location with the thing which contour of description and marking location of marking is shown in.