

MICROCOMPUTER WITH BUILT-IN PAGING DECODER**S-70L01AQS**

The S-70L01AQS microcomputer incorporates a decoder conforming to CCIR Radio Paging Decode 1(POCSA Code), a melody generator, an LCD driver and a timer. Only attaching externally a radio frequency circuit, an LCD panel, EEPROM for ID purpose and other parts makes it easy to create a numeric pager.

The circuit without DC/DC converter can also be operated by one battery because it is operated at min. 0.9V. The circuit configuration reduces radiation noises and power consumption.

The decoder can support decoding, error correction and data length conversion like SEIKO decoder IC S-70L41BFT and is provided with several customizing functions.

A 76.8 kHz quartz crystal oscillator is used to respond to data rates 512, 1200 and 2400 bps

■ Features

- Low voltage operation: 0.9 V min.
- Low current consumption: 10 μ A typ. at 1. 5 V
- Oscillator: Crystal oscillator (76.8 kHz)
- CPU core: 8bit CPU (65C02)
- ROM/RAM: 8 k byte ROM/512 byte RAM
- Port: 4bit Output,8bit I/O
- Timer/counter: 8bit Programmable Timer / Watch Timer
- LCD driver configuration: 32 segments x 4 commons
- Data rate: 512/1200/2400 bps
- Address/Frame: 6 addresses/ 6 frames
- 2-bit error random correction
- Melody generator

■ Brief Specifications

Table 1 Brief Specifications

Item	Specifications	Conditions
Operating power supply voltage range	$V_{DD} = 0.9$ to 2.2 V	$F_{osc} = 76.8$ KHz
Average current consumption during standby	10 μ A	$V_{DD} = 1.5$ V, $T_a = 25$ °C
Current consumption during HALT mode	6 μ A	$V_{DD} = 1.5$ V, $T_a = 25$ °C
Operating temperature range	– 10 to 55 °C	

NOTICE

- Note that the products incorporating SEIKO paging decoder built-in microcomputers may infringe upon any patent depending upon applications including applied circuits herein, specifications or countries of destination of the products.
- Pay great attention to copyright of melody when you use a melody generator using SEIKO paging decoder built-in microcomputers.
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■ Pin Assignment

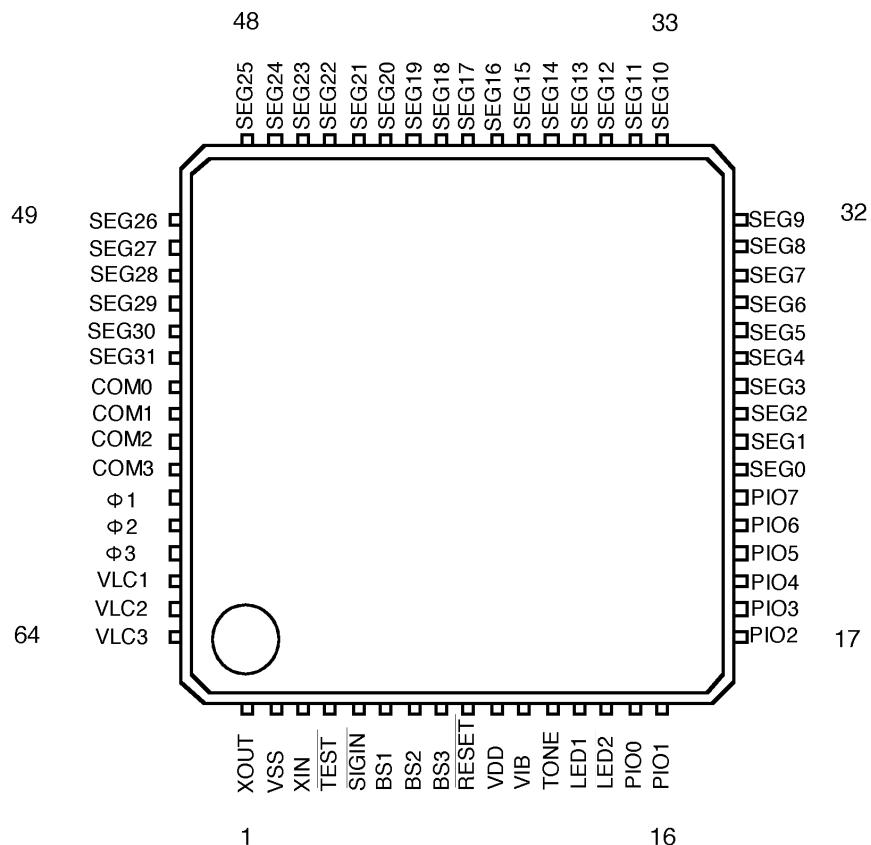


Figure 1

■ Function of Each Pin

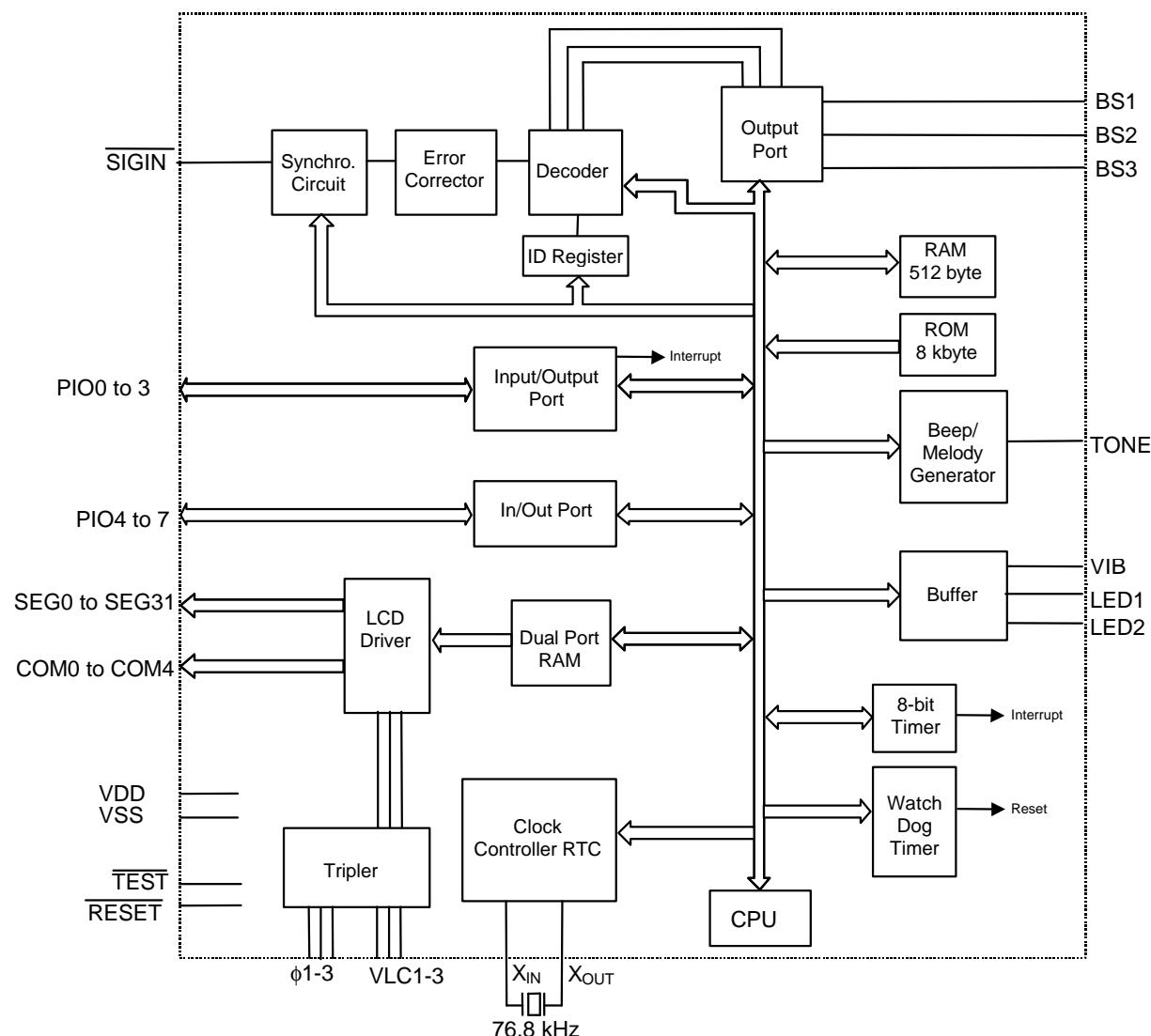
Table 2 Function of Each Pin

Pin No.	Name	I/O	Reset State	Description
1	X _{OUT}	O	-	Oscillating Circuit Output Pin
2	V _{SS}	-	-	Power Supply Pin (GND)
3	V _{IN}	I	-	Oscillating Circuit Input Pin
4	TEST	I	I	Pullup Resistor Bulit-In Test Pin: Data can be written in the Test Register when this pin is "L." Normally operates when "H" or "Open."
5	SIGIN	I	I	Received Data Input Pin
6	BS1	O	L	Battery Save Signal Output Pin for RF Control: Can be used as an output port.
7	BS2	O	L	Battery Save Signal Output Pin for Quick Charge: Can be used as an output port.
8	BS3	O	L	Battery Save Signal Output Pin for PLL Control: Can be used as an output port.
9	RESET	I	I	Pullup Resister Bulit-In Reset Input Pin
10	V _{DD}	-	-	Positive Power Supply Pin
11	V _{IB}	O		Vibrator Drive Pin: Can be used as an output port.
12	TONE	O	L	Sound Output Pin: Can be used as an output port.
13 to 14	LED1 to 2	O	L	2-bit LED Drive Pin: Can be used as an output port.
15 to 18	PIO0 to 3	I/O	I	4-bit Input/Output Port: Interrupt is possible at the falling edge.
19 to 22	PIO4 to 7	I/O	I	4-bit Input/Output Port
23 to 54	SEG0 to 31	O	-	Segment Signal Output Pin for LCD Driver
55 to 58	COM0 to 3	O	-	Common Signal Output Pin for LCD Driver
58 to 61	Ø1 to 3	-	-	Tripler capacitor Connecting Pin for LCD Driver
62 to 64	V _{LC1} to 3	-	-	Power Supply Pin for LCD Driver

MICROCOMPITER WITH BUILT-IN PAGING DECODER

S-70L01AQS

Block Diagram



Absolute Maximum Ratings

Table 3 Absolute Maximum Ratings

Item	Symbol	Conditions	Ratings	Unit
Storage Temp. Range	T _{stg}		-40 to + 125	°C
Operating Temp. Range	T _{opr}		-10 to + 55	°C
Power Voltage	V _{DD}	T _a = 25 °C	-0.3 to + 4.0	V
Input Voltage	V _{IN}	T _a = 25 °C	-0.3 to V _{DD} + 0.3	V
Output Voltage	V _{OUT}	T _a = 25 °C	-0.3 to V _{DD} + 0.3	V
Power Dissipation	P _d	T _a = 25 °C	300	mW

■ Recommended Operating Conditions

Table 4 Recommended Operating Conditions

Unless otherwise specified: $T_a = -10$ to $+55$ °C

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Power Voltage	V_{DD}	at 76.8 kHz	0.9	-	2.2	V
Input Voltage	V_{IN}		0	-	V_{DD}	V
Clock Osc. Frequency	f_x	$V_{DD} = 0.9$ to 2.2 V	-	76.8	-	kHz

■ DC Characteristics

Table 5 DC Characteristics

Unless otherwise specified: $V_{DD}=1.5$ V, $V_{SS}=0$ V, $T_a=25$ °C

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Operating Power Supply Voltage Range	V_{DD}	$T_a = -10$ °C to $+55$ °C at 76.8 kHz	0.9	-	2.2	V
Osc. Start Voltage	V_{DOB}	$T_a = -10$ °C to $+55$ °C at 76.8 kHz	0.9	-	2.2	V
Average Current Consumption during Standby	I_{DD1}	$T_a = -10$ °C to $+55$ °C at 76.8 kHz	-	10	30	μA
Current Consumption in the HALT mode	I_{DD2}	$T_a = -10$ °C to $+55$ °C at 76.8 kHz	-	6	20	μA
Output Current	I_{OH1}	$V_{OUT} = 1.2$ V *1	-	-500	-150	μA
	I_{OL1}	$V_{OUT} = 0.3$ V *1	150	300	-	μA
Input Voltage	V_{IH1}	input pin *2	$0.8 \times V_{DD}$	-	-	V
	V_{IH1}	Schmitt trigger pin *3	$0.9 \times V_{DD}$	-	-	V
	V_{IL2}	input pin *2	-	-	$0.2 \times V_{DD}$	V
	V_{IL2}	Schmitt trigger pin *3	-	-	$0.1 \times V_{DD}$	V
Pullup Current	I_R	$V_{in} = 0$ V *4	-30	-13	-3	μA
LCD Voltage	V_{LC1}	$T_a = -10$ °C to $+50$ °C, $RL = 1M\Omega$, Boosting capacitor = $0.47 \mu F$	0.940	1.000	1.060	V
	V_{LC2}		1.816	1.952	2.078	V
	V_{LC3}		2.707	2.910	3.091	
LCD High Level Output Current	I_{OH2}	$V_{OUT} = V_{LC2} = -0.05$ V *5	-	-10.0	-3.0	μA
	I_{OH3}	$V_{OUT} = V_{LC3} = -0.05$ V *5	-	-10.0	-3.0	μA
LCD Low Level Output Current	I_{OL2}	$V_{OUT} = 0.05$ V*5	3.0	12.0	-	μA
Schmitt Hysteresis Width	V_{WD}	Schmitt trigger pin *3	-	0.6	-	V

*1 Applies to pins BS1, BS2, BS3, VIB, TONE, LED1, LED2, PIO0 through PIO7.

*2 Applies to pins SIGIN,PIO0 through PIO7.*3 Applies to pins TEST and RESET.*4 Applies to pins TEST,RESET, PIO0 through PIO7.

*5 Applies to pins SEG0 through SEG31, COM0 through COM3.

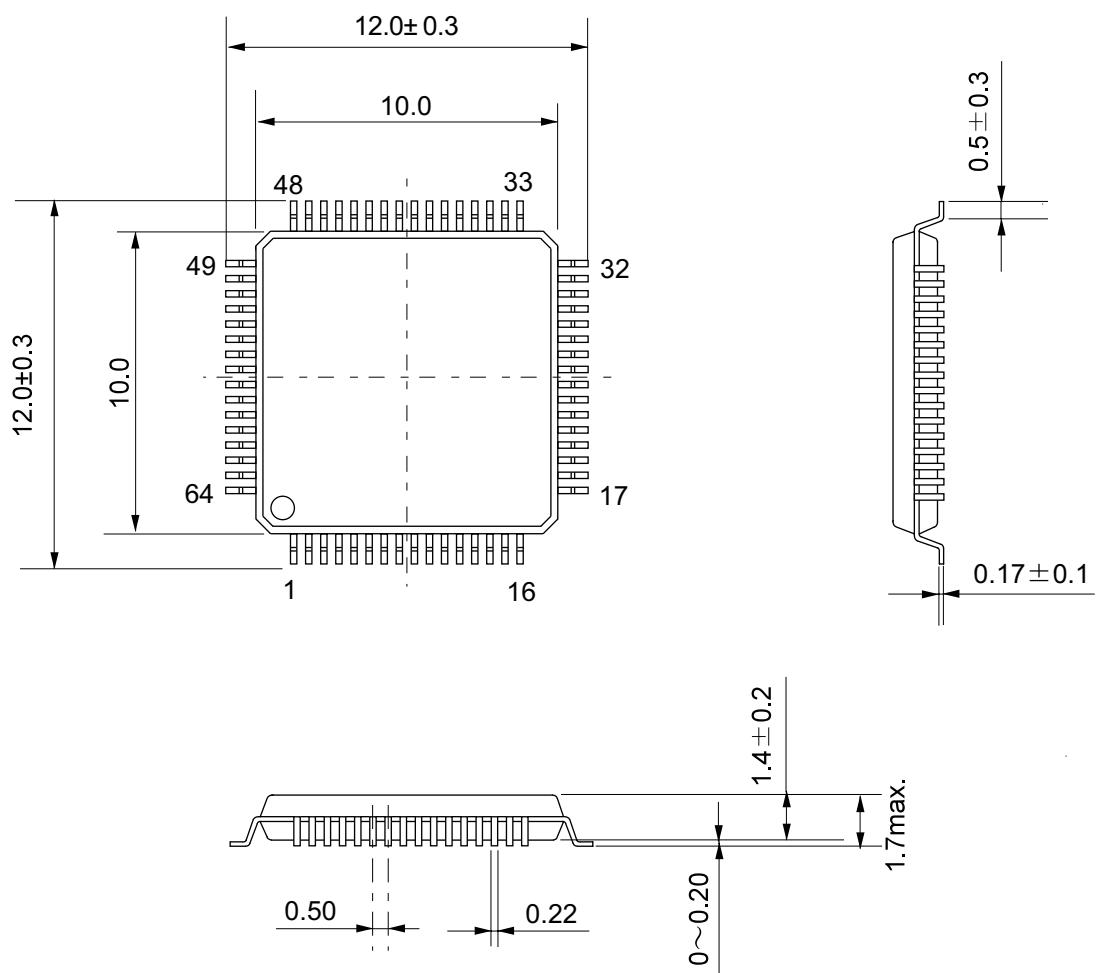
Note: It is recommended to insert a capacitor of $0.1\mu F$ or more between pins V_{DD} and V_{SS} .

■ 64-pin SQFP

QS064-A 990531

● Dimensions

Unit:mm



No. : QS064-A-PSD-1.0

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