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CMOS 16-BIT SINGLE CHIP MICROCONTROLLER

S5U1C17656T Manual

(Software Evaluation Tool for S1C17656)

SEIKO EPSON CORPORATION

Rev.1.0

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Configuration of product number

Devices

S1 C 17xxx F 00E1 00

■ Packing specifications

00:	Besides tape & reel	
0A:	TCP BL	2 directions
0B:	Tape & reel	BACK
0C:	TCP BR	2 directions
0D:	TCP BT	2 directions
0E:	TCP BD	2 directions
0F:	Tape & reel	FRONT
0G:	TCP BT	4 directions
0H:	TCP BD	4 directions
0J:	TCP SL	2 directions
0K:	TCP SR	2 directions
0L:	Tape & reel	LEFT
0M:	TCP ST	2 directions
0N:	TCP SD	2 directions
0P:	TCP ST	4 directions
0Q:	TCP SD	4 directions
0R:	Tape & reel	RIGHT
99:	Specs not fixed	

■ Specification

■ Package

- D: Bare chip
- F: QFP
- B: BGA, WCSP

■ Model number

■ Model name

- C: Microcontroller, digital products

■ Product classification

- S1: Semiconductor

Development tools

S5U1 C 17000 Y2 1 00

■ Packing specifications

- 00: Standard packing

■ Version

- 1: Version 1

■ Tool type

- Hx: ICE
- Tx: Evaluation board
- Cx: Compiler package
- Yx: Programmer software

■ Corresponding model number

- 17xxx: For S1C17xxx

■ Tool classification

- C: Microcontroller use

■ Product classification

- S5U1: Development tool for semiconductor products

Table of Contents

1. Overview

The S5U1C17656T (SVT17656: Software Evaluation Tool for S1C17656) is an evaluation board for the Seiko Epson single-chip microcontroller S1C17656. This board includes an S1C17656, an LCD panel, touch keys, and a piezoelectric buzzer.

1) CPU	S1C17656 (TQFP14-80pin)
2) Power supply voltage	Coin type battery (CR2032, 3.0 V) *1
3) CPU clock	OSC1A: 32.768 kHz crystal resonator OSC3B: S1C17656 internal oscillator
4) Devices mounted	S1C17656 (16-bit MCU) Crystal resonator (32.768 kHz) LCD panel (7 SEG × 6 digits, 30 segments × 2 commons) 12 touch keys Piezoelectric buzzer Coin type battery holder Jumper patterns for current consumption measurement Through-hole patterns for debug interface Through-hole patterns for UART communication
5) Operating temperature range	5 °C to 35 °C
6) Operating voltage range	2.2 V to 3.6 V

*1 Note that no coin type battery is included.

Note! Be sure to avoid using chlorinated solvents on this board. Depending on the on-board component, they may cause corrosion that interferes with using the board safely.

1.1 Directions for Use

An S1C17656 software debugging and evaluation environment can be constructed with the procedure shown below.

<When performing software debugging>

(1) The S5U1C17656T has through hole electrodes for the debug signals but does not provide components required for the debug interface such as connectors to connect with the 4-pin target interface cable and 4-pin flash programming power supply cable supplied with the S5U1C17001H (ICDmini).
To perform software debugging using this board, prepare the components required for connecting with the ICDmini.

(2) Supply power to the S5U1C17656T by putting a coin type battery (CR2032, 3.0V) into the battery holder, or connecting the power supply cable of the S5U1C17001H2 (ICDmini Ver. 2) or a stabilized power supply to the terminals of the battery holder. The power supply voltage must be within the S1C17656 operating voltage range (1.8 V to 3.6 V when programming the flash memory embedded in the S1C17656).

(3) Connect the ICDmini to the PC using the USB cable supplied with the ICDmini.

The DIP switches on the ICDmini (SW4 and SW5 to select the DSIO signal level) should be set to "Voltage input from the target system." If the S5U1C17001H2 (ICDmini Ver. 2) is used as the emulator and the flash erasing/programming voltage is supplied from the ICDmini, set DIP SW8 on the ICDmini to configure the flash programming voltage output to be enabled.

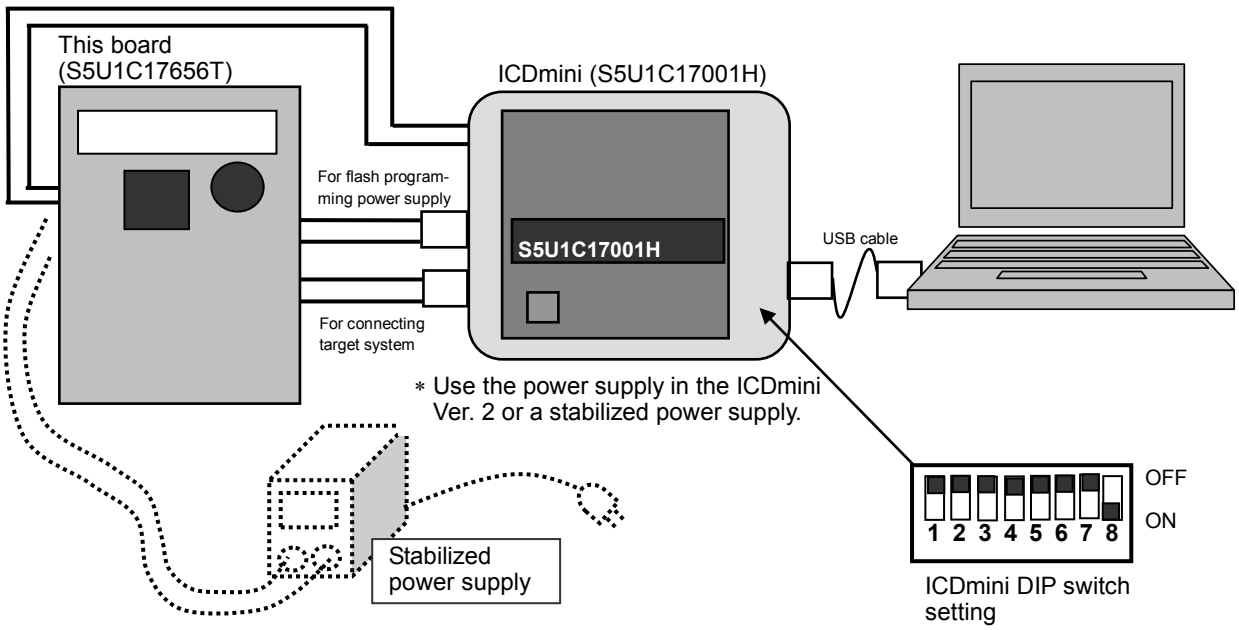


Figure 1.1.1 Connections for Software Debugging

2. Name and Function of Each Part

2.1 Name of Each Part

The figure below shows the name of each part.

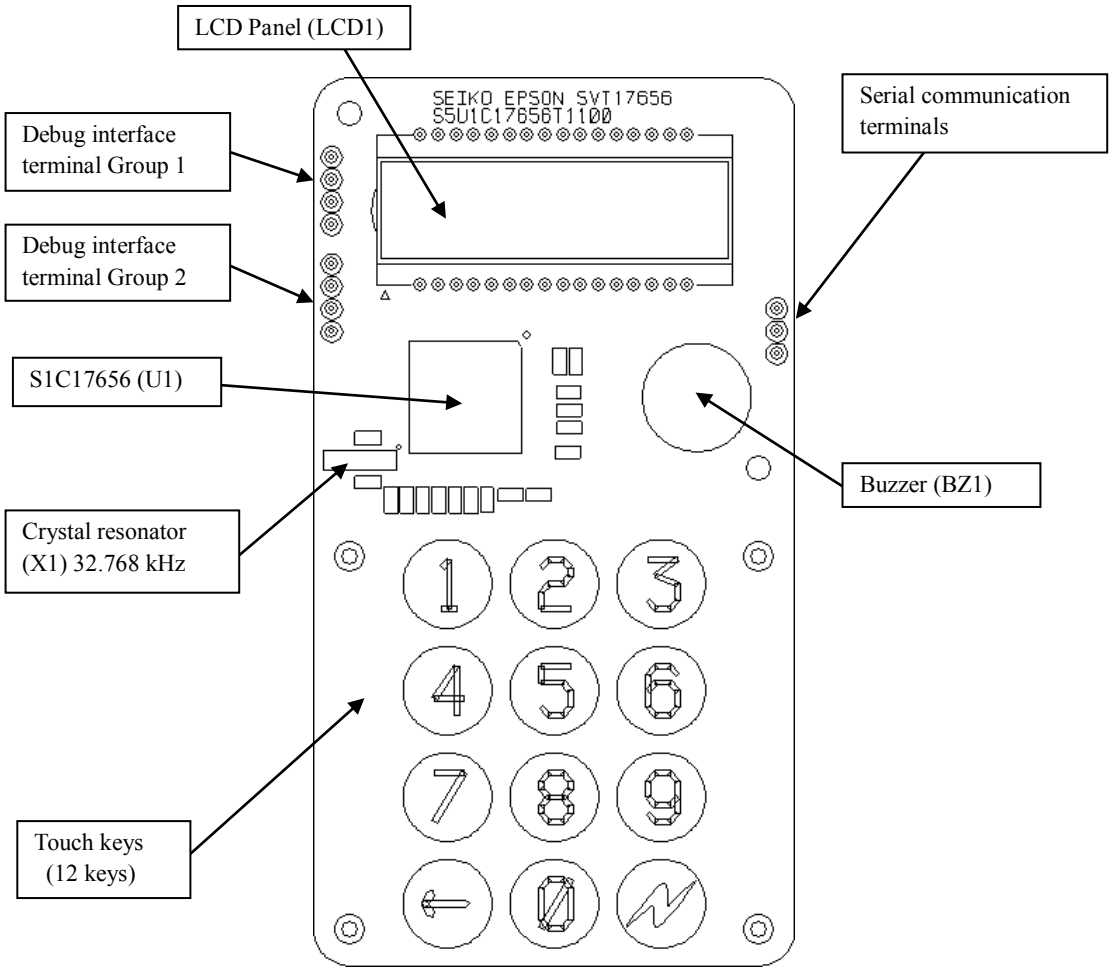


Figure 2.1.1 Part Names on Front Side of S5U1C17656T

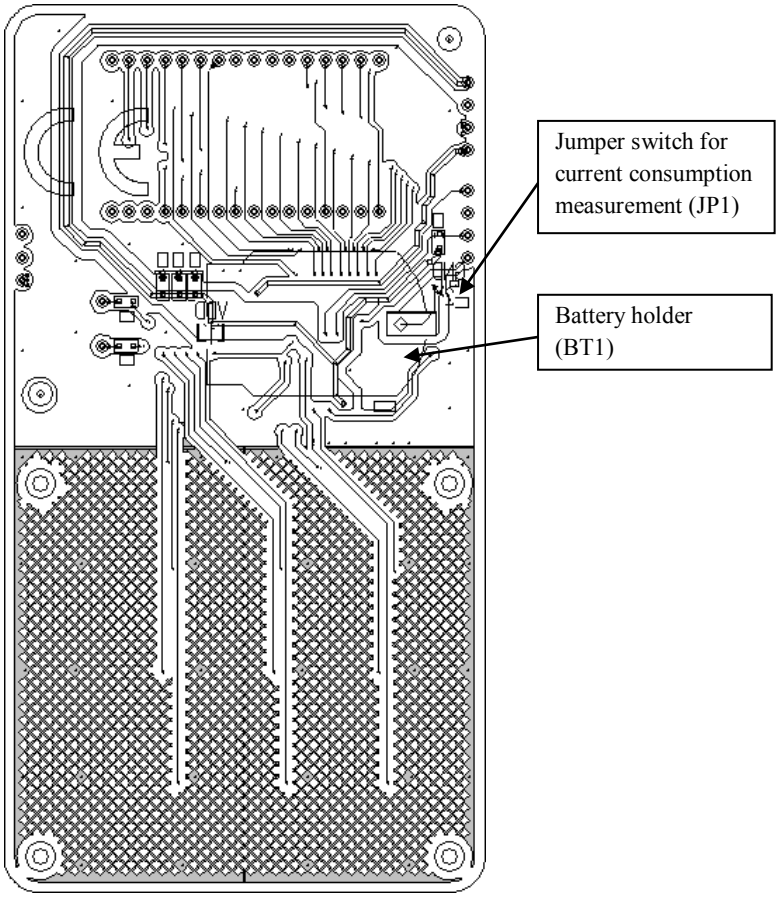


Figure 2.1.2 Part Names on Back Side of S5U1C17656T

2.2 Function of Each Part

2.2.1 Function of Jumper Switch

Table 2.2.1.1 Jumper Switch Function

Name	Type	Function	Factory setting	Optional setting
JP1	Soldered	S1C17656 current consumption measurement (V_{SS}) *1	Short-circuited	Open

*1 To measure current consumption of the S1C17656, insert an ammeter between the jumper terminals.

2.2.2 Functions of Parts

Table 2.2.2.1 List of Major Parts and Their Function

Part name	Location	Function
IC	U1	S1C17656 (16-bit MCU)
LCD	LCD1	TN 30 segments × 2 commons, 1/3 bias, 1/2 duty
Coin type battery holder	BT1	CR2032 coin type battery holder
Crystal resonator	X1	32.768 kHz, MC-146 (7 pF)
Piezoelectric buzzer	BZ1	Ø = 12.2 mm
Resistors	R1–R6	5.6 MΩ, for charging/discharging touch keys
Connection terminal	Vdd	Through hole for degug interface Group 1
Connection terminal	#RESET	Through hole for degug interface Group 1
Connection terminal	GND_2	Through hole for degug interface Group 1
Connection terminal	Vpp	Through hole for degug interface Group 1
Connection terminal	DCLK	Through hole for degug interface Group 2
Connection terminal	GND_3	Through hole for degug interface Group 2
Connection terminal	DSIO	Through hole for degug interface Group 2
Connection terminal	DST2	Through hole for degug interface Group 2
Connection terminal	P00/SIN0	Through hole for connecting a serial communication device
Connection terminal	P01/SOUT0	Through hole for connecting a serial communication device
Connection terminal	GND_1	Through hole for connecting a serial communication device

3. Block Diagram

The figure below shows the block diagram of the S5U1C17656T.

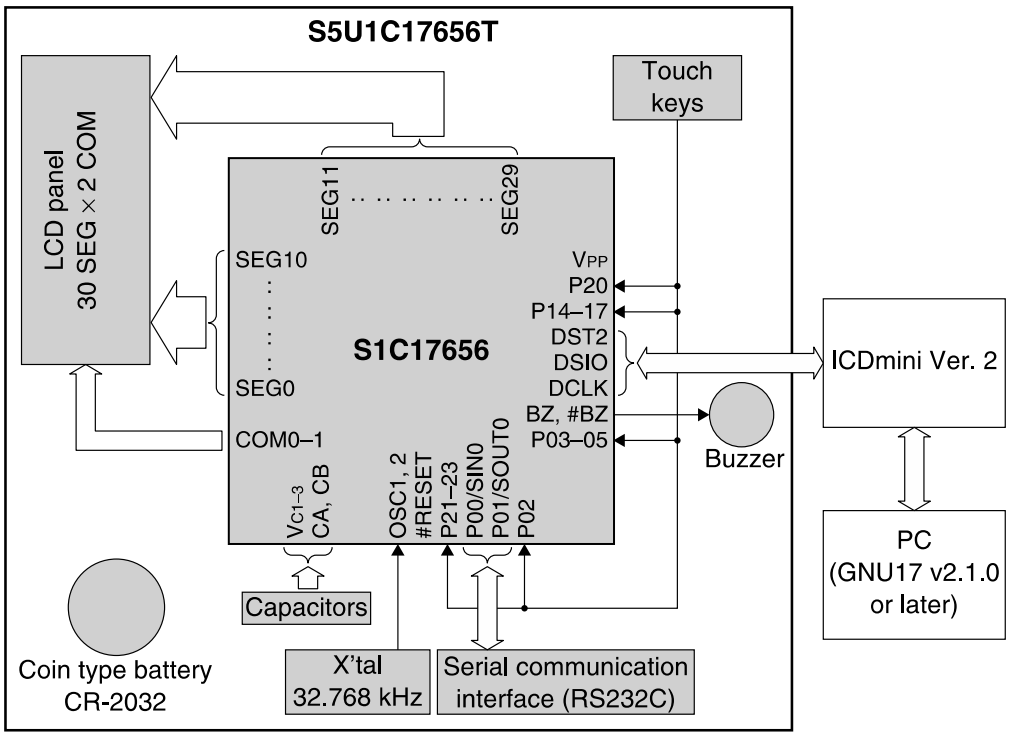


Figure 3.1 S5U1C17656T Block Diagram

4. Connection Terminals (Through Holes)

Table 4.1 List of Debug Interface Group 1 Connection Terminals

No.	Terminal name	I/O	Function
1	Vdd	I/O	Target operating voltage input/output
2	#RESET	I	Target reset signal input
3	GND	–	Power supply (GND)
4	Vpp	I	Flash programming voltage input

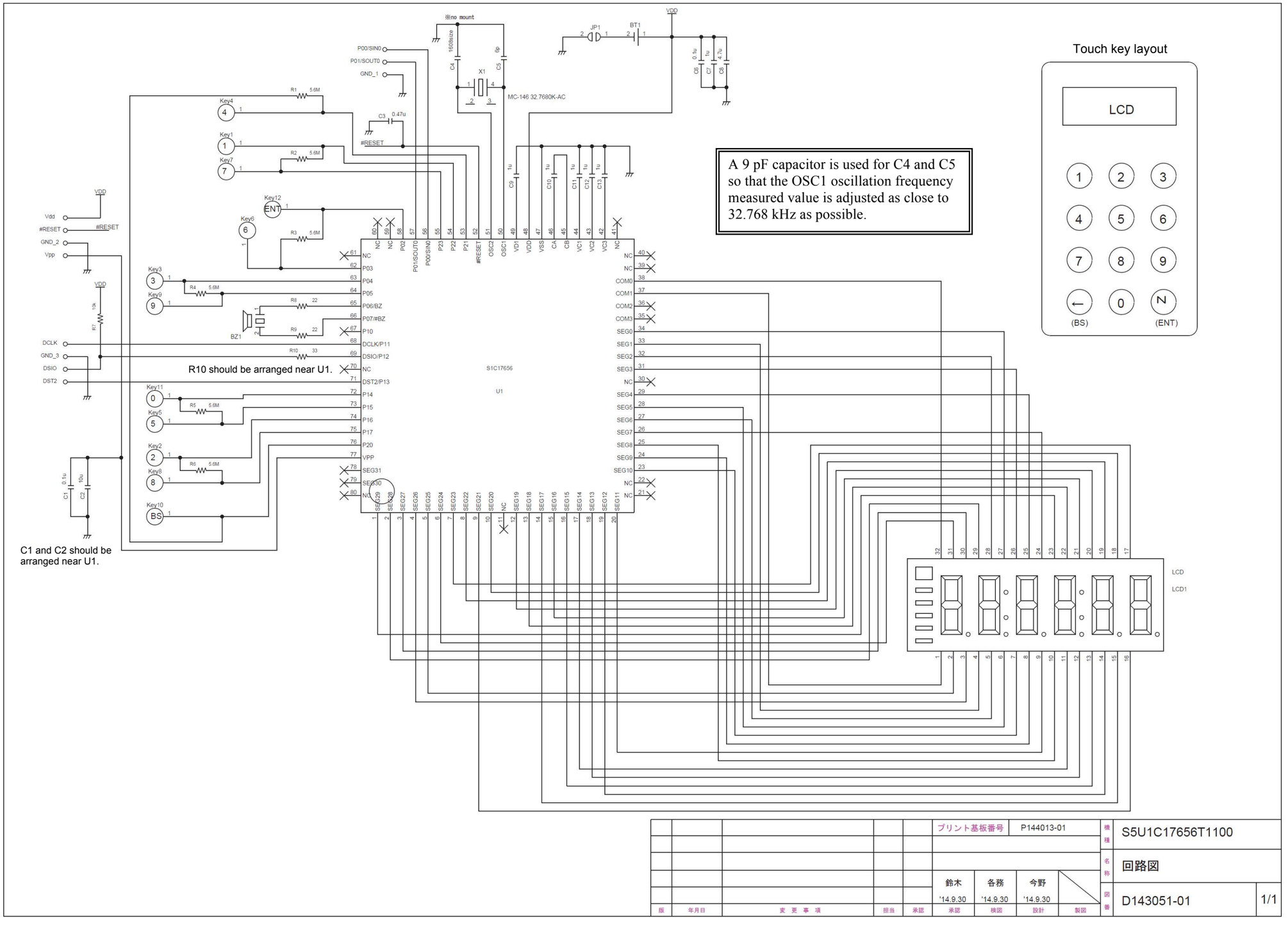
Table 4.2 List of Debug Interface Group 2 Connection Terminals

No.	Terminal name	I/O	Function
1	DCLK	O	Clock signal output for debugging
2	GND	–	Power supply (GND)
3	DSIO	I/O	Serial communication signal input/output for debugging
4	DST2	O	Debug status signal output

Table 4.3 List of Serial Communication Signal Connection Terminals

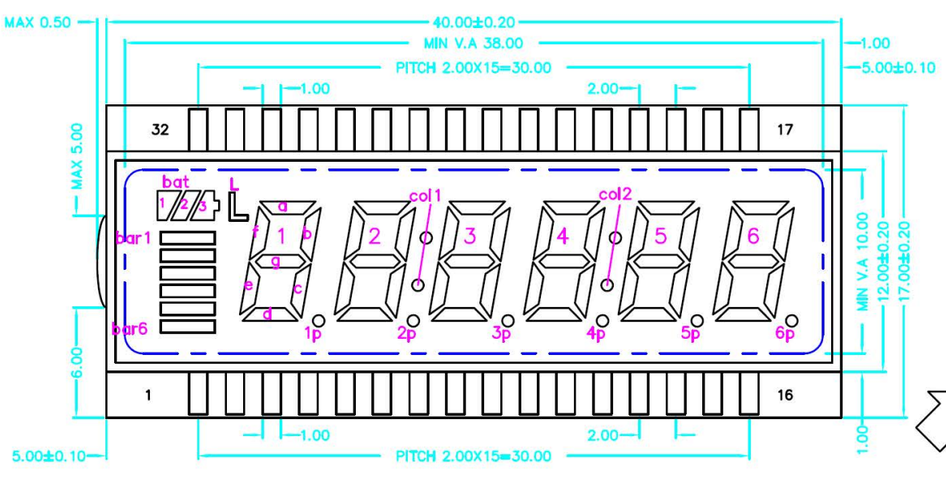
No.	Terminal name	I/O	Function
1	P00/SIN0	I	Serial communication (UART) signal input
2	P01/SOUT0	O	Serial communication (UART) signal output
3	GND	–	Power supply (GND)

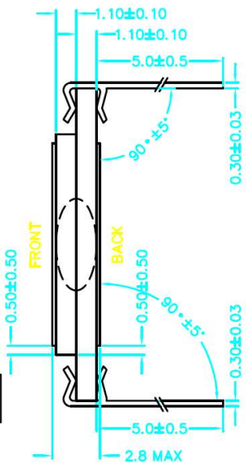
Appendix A Circuit Diagram



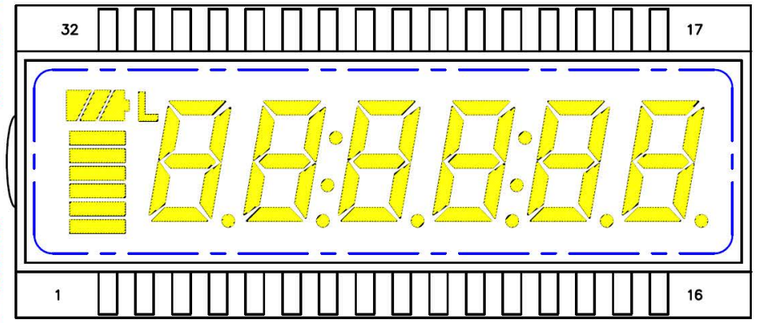
Appendix B LCD Panel Wiring Diagram

确认此型号所有图纸 签字确认：





显示效果图



PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
COM1		bar3	bar5	1c	2e	2c	3e	3c	3g	3a	4e	4c	4g	4a	5c	6c	6g	6a	6e	5g	5a	5e	col1	2g	2a	1g	1a	1e	bat3	bat1	bar1	C1
COM2	C2	bar4	bar6	1d	2f	2d	3f	3d	3p	3b	4f	4d	4p	4b	5d	6d	6p	6b	6f	5p	5b	5f	col2	2p	2b	1p	1b	1f	L	bat2	bar2	

1. 显示类型	TN,POSITIVE	6. 驱动条件	1/2 DUTY 1/3 BIAS	DATE	REVISION RECORD	REV	東莞市信潤電子有限公司	
2. 视向	6 O'CLOCK	7. 工作温度	-20℃ ~+70℃					
3. 工作电压	3 V	8. 储存温度	-30℃ ~+80℃				DRAWING NO. XT501609A UNIT mm PRO (3) ±0.20mm	
4. 偏光片类型	REFLECTIVE	9. 客户资料	SVT17656				DRAWING BY	CHECKED BY / APPROVED BY / PAGE
5. 连接方式	PIN	10. 玻璃结构	小片在上，大片在下					WHL 2014/10/11 / 1/2

Appendix C S5U1C17656T1100 Parts List

Table C.1 S5U1C17656T1100 Parts List *1

No.	Location	Name	Product No.	Specification	Q'ty	Manufacture
1	U1	MCU	S1C17656	TQFP14-80pin	1	SEIKO EPSON CORPORATION
2	LCD1	LCD panel	Custom product	TN, driven with 3 V	1	MAP ELECTRONICS CO.,LTD.
3	BT1	Coin battery holder	CH7410-2032LF	for CR2032	1	TAKACHI ELECTRONICS ENCLOSURE CO., LTD.
4	X1	Crystal resonator	MC-146 (CL = 7 pF)	32.768 kHz	1	SEIKO EPSON CORPORATION
5	BZ1	Piezoelectric buzzer	PS1240P02BT	Ø = 12.2 mm	1	TDK Corporation
6	R1, R2, R3, R4, R5, R6	Resistor	MCR03ERTJ565	5.6 MΩ 1608	6	ROHM Co., Ltd.
7	R7	Resistor	MCR03ERTJ103	10 kΩ 1608	1	ROHM Co., Ltd.
8	R8, R9	Resistor	MCR03ERTJ220	22 Ω 1608	2	ROHM Co., Ltd.
9	R10	Resistor	MCR03ERTJ330	33 Ω 1608	1	ROHM Co., Ltd.
10	C1, C6	Capacitor	GRM188R71C104KA01D	0.1 µF 16 V B 1608	2	Murata Manufacturing Co., Ltd.
11	C2	Capacitor	C1608X5R0J106M080AB	10 µF 6.3 V B 1608	1	TDK Corporation
12	C3	Capacitor	GRM188R71C474KA88D	0.47 µF 16 V 1608	1	Murata Manufacturing Co., Ltd.
13	C4, C5	Capacitor	GRM1885C1H9R0DZ01D	9 pF 50 V 1608	2	Murata Manufacturing Co., Ltd.
14	C7, C9, C10, C11, C12, C13	Capacitor	GRM188R61C105KA12D	1 µF 16 V B 1608	6	Murata Manufacturing Co., Ltd.
15	C8	Capacitor	GRM188R60J475KE19D	4.7 µF 6.3 V B 1608	1	Murata Manufacturing Co., Ltd.

*1 Parts are subject to change without notice.

Table C.2 S5U1C17656T1100 Parts List (Installed Part, Attachments) *1

No.	Name	Product No.	Specification	Q'ty	Manufacture
1	Polycarbonate plate	N144005-01 (custom product)	Transparent, t = 0.5 mm, 55 × 65 mm	2	Nissho Sangyo Co.,Ltd
2	Plastic screw	PC-0204	M2 4 mm, Material: PC	4	Hirosugi-Keiki Co.,Ltd.
3	Plastic nut	PCNT-02	M2, Material: PC	4	Hirosugi-Keiki Co.,Ltd.

*1 Parts are subject to change without notice.

Revision History

Attachment-1

Rev. No.	Date	Page	Category	Contents
Rev 1.0	2015/03/13	All	New	New establishment

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