

C-MOS 32-BIT SINGLE CHIP MICROCONTROLLER **S5U1C31D41 Manual** (S1C31D41 Evaluation Board)

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Table of Contents

1.	Overview	1
2.	Name and Function of Each Part	2
3.	Settings	
	1 Power Supply	
	2 Audio device	
4.	Debugging Software	8
4.	1 Debugging by debug probe	8
4.	2 Debugging by Micro-USB	
Ap	pendix A Circuit Diagrams	
Ap	pendix B Parts List	
Rev	vision History	

1. Overview

S5U1C31D41T (S1C31D41 Evaluation Board) is an evaluation board for the Seiko Epson single-chip microcontroller S1C31D41. This board is equipped with Electromagnetic buzzer for developing the sound and with debugger function (DAPLink) which connects to PC directly via Micro-USB.

Figure 1.1 shows the S5U1C31D41T evaluation board.



Figure 1.1 S5U1C31D41T Evaluation Board

2. Name and Function of Each Part

Table 2.1 lists the main parts on S5U1C31D41T, and Figure 2.1 shows the parts layout.

Table 2.1	Main Parts Description
-----------	------------------------

Name	Part Number	Description	Remarks
S1C31D41	U3	MCU(Cortex-M0+)	
Electromagnetic buzzer	B1	Sound output device	
USB to Serial Converer	U1	For communication with PC (For writing sound data)	
64Mbit/8Mbyte QSPI flash memory	U4	For storing a sound ROM data	
Debug IC	U7	For debugging by DAPLink	
Micro-USB connector (TypeB)	CN1	For power supply from USB- VBUS and for connecting PC when write sound data	
Micro-USB connector (TypeB)	CN4	For power supply from USB- VBUS and for connecting PC when debug software	
Debug probe I/F connector	CN2	For connecting debug probe	
External power connector	J5	For connecting with an external power such as stabilized power supply.	+input - GND
Jumper for switching power	J7		
Jumper for switching operating voltage	JP1	Switching 5V⇔3.3V	
Audio jack	J8	For connecting speaker	
Piezoelectric buzzer connector	9C	For connecting Piezoelectric buzzer	
External power connector for Piezoelectric buzzer	J11	For power supply to Piezoelectric buzzer	+input - GND
Reset switch	SW7/SW9	SW7:For reset hardware SW9:For reset debug IC	
Dip switch	SW8	For setting software	
Push switch	SW1/SW2/SW3/SW4/SW5	For operating software	
External connector	J1/J2/J3/J4/J6	For connecting sensor module	



Figure 2.1 Parts Layout

 1^{-5} : External connector

3. Settings

3. Settings

3.1 Power Supply

The power supply can be selected from following four sources by J7 jumper setting.

- VBUS(CN4) : Supplied from USB-VBUS to CN4
- VDSEG : Supplied from debug probe to CN2
- VBUS(CN1) : Supplied from USB-VBUS to CN1
- EXVDD : Supplied from an external power to J5

Table 3.1.1 shows the jumper setting of power supply.

Power Supply	pply J7 Settings Remarks	
VBUS(CN4) 1-2 Short		Connect Micro-USB to CN4
VDSEG	1-2 Short、3-4 Short	Connect debug probe to CN2
VBUS(CN1)	1-2 Short、5-6 Short	Connect Micro-USB to CN1
EXVDD	1-2 Short、7-8 Short	Connect DC +5V to J5 (+ input, - GND)

Table 3.1.2 shows the jumper setting of operating voltage for S1C31D41.

Table 3.1.2 Operating Voltage Switching

Operating Voltage	JP1 Settings
5V	2-3 Short
3.3V	1-2 Short

*For the connection and jumper settings during debugging, refer to "4 Debugging Software ".

3. Settings



Figure 3.1.1 Layout of parts for Power Supply

3.2 Audio device

S5U1C31D41T can output sound by three types of audio devices.

- Played by speaker
- Played by Electromagnetic buzzer
- Played by Piezoelectric buzzer whose power is supplied from an internal power
- Played by Piezoelectric buzzer whose power is supplied from an external power

Table 3.2.1 shows the jumper settings of each device.

Device	JP2	JP3	JP4	J10	J11	Connector
Speaker	Don't care	Don't care	Don't care	Don't care	_	J8
Electromagnetic buzzer	2-3 Short	2-3 Short	1-2-3 Open	Short	_	Mounted on the board
Piezoelectric buzzer (internal power)	1-2 Short	1-2 Short	1-2 Short	Open	_	J9
Piezoelectric buzzer (external power)	1-2 Short	1-2 Short	2-3 Short	Open	+input -GND	J9

Table 3.2.1 Audio Device Switching

Note 1: Jumper settings should not be done during power is supplied. The parts mounted on the board such as amplifier may be damaged. Please switch the jumper with the power off.

Note 2: Please decide the voltage of external power supply which is input to Piezoelectric buzzer by referring the rated value of the buzzer, and follow the silk on the board to connect input to [+] and GND to [-].



Figure 3.2.1 Layout of parts for setting audio devices

4. Debugging Software

S5U1C31D41T has three types of connection for software debug.

- Connect PC to the S5U1C31D41T board via IAR Systems debug probe I-jet
- Connect PC to the S5U1C31D41T board via SEGGER debug probe J-Link
- Connect PC to the S5U1C31D41T board via Micro-USB

The following 4.1 and 4.2 show the method of debug by each connection.

4.1 Debugging by debug probe



Figure 4.2.1 Connection Diagram of S5U1C31D41T and PC by I-jet



Figure 4.2.2 Connection Diagram of S5U1C31D41T and PC by J-Link

No	Name	ю	機能		Name	Ю	機能
1	VTref	0	MCU reference voltage	11	+5V	Ι	DC +5V Power Input
2	SWDIO	ю	Serial wire data input/output	12	TRACECLK	-	NC
3	GND	Р	GND	13	+5V	Ι	DC +5V Power Input
4	SWCLK	Ι	Serial wire clock input	14	TDATA0	-	NC
5	GND	Р	GND	15	GND	Ρ	GND
6	SWO	-	NC	16	TDATA1	-	NC
7	-	-	NC	17	GND	Ρ	GND
8	TDI	-	NC	18	TDATA2	-	NC
9	NC	-	NC	19	GND	Ρ	GND
10	nRESET	I	MCU Reset	20	TDATA3	-	NC

Table 4.2.1 Terminal Layout Table for Debug I/F(CN2)

4.2 Debugging by Micro-USB

S5U1C31D41T enables software debug by on-board debugger function which allows to connect to PC directly via Micro-USB.



Figure 4.2.3 Connection Diagram of S5U1C31D41T and PC by Micro-USB

Note : If you debug without pushing SW9 after connecting the cable, it may not work properly.

Appendix A Circuit Diagrams







Appendix A Circuit Diagrams





Appendix A Circuit Diagrams

Appendix B Parts List

Image: Constraint of the second sec	Item	Quantity	Reference	Part	Manufacture
2 2 CN1, CN4 1050170001 Moles 4 17 CL3C3(4,CSC7.C9CII,C12CL3C,C Change En Co., Ltd. 5 3 C2,CSC10,C12,C2CA,CG,OC3,C40 Samsung Electro-Mechanics 5 3 C2,CSC10 CL10A/75K058NNC Samsung Electro-Mechanics 6 CSL23,CSC22,C2CA CL10A/75K058NNC Samsung Electro-Mechanics 7 6 CSL24,CSC2,CSC3,C3C,CA CL10A/75K058NNC Samsung Electro-Mechanics 9 6 C36,C73,CSC3,CSC3,CC3,CC4 CL10A/165K005NNC Samsung Electro-Mechanics 10 3 C31,C3A,C41 GRN158D1E100K MURATA AVX Corporation 11 10 C32,CSC3,CSC3,CC2A,CC4 GD30/759KA72A AVX Corporation 12 2 C43,CSA C1.10B164KB8NNL Samsung Electro-Mechanics 13 1 D1 ESD9/750KA72A AVX Corporation 14 1 D2 RSN051VAM0407R ROIM 15 4 JP1_JP2_JP3_JP4 6J30021121 Worth Elektronik 16 2					
1 CV2 PHIL2-1988AG Chang Enr Ca. Ld. 4 17 CL23C21C22C2CCDC GRM55801C104K MIRATA 5 3 CL26C5(7.5C)/CLC12CCC GRM55801C104K MIRATA 6 5 CC3C5(27)/CL22C2CCC GRM55801C104K Samssag Eletro-Mechanics 6 5 CC3C12C2/CL22C4C3 GRM55801C103K Samssag Eletro-Mechanics 7 6 C15C1GC1/CL2C2C4C4 GRM55801L103K MIRATA 8 1 C18 C18/CL2C1/CL2C2C4C4 GRM55801L103K MIRATA 9 6 C28/C25C2AC3C3C3C4C4 C1101405K00NNG Samssag Eletro-Mechanics 10 3 C216/CA C1101405K80NL Association MIRATA 12 C3 C42G C1101405K80NL Association MIRATA 13 1 D1 C30031121 Warth Electro-Mechanics Miration 14 1 D2 RS305VMA907R Sulfaconcector Solutions Miration 15 4 J122J PPPCoid11FRN-RC Sulfac					
4 17 C1.C3.C4.C5.C7.CV.ILC12.C1.C0 GRN158.B1C104K MIRATA 5 3 C2.C3.C3.C2 CL104.075K08NNC Samsung Eletro-Mechanics 6 5 C.S.C3.C3.C2.C2.C2 C10.64.075K08NNC Samsung Eletro-Mechanics 7 6 C.S.C3.C3.C2.C2.C2 C10.64.055K05NNC Samsung Eletro-Mechanics 9 6 C.S.C3.C3.C3.C3.C3.C3.C3.C3.C3.C3.C3.C3.C3.					
International system International system 1 1 C2L5C10 CL10A475KOBNNC Samsung Electro-Mechanics 6 5 C2L5C10 CL10A475KOBNNC Samsung Electro-Mechanics 7 6 C15CL6C17C19.C2L2.04 GRM15SSUL1100A MURATA 8 1 C18 CL60XSUL100A MURATA 9 6 C2SC25C3KC39.24 CL21A106KOQNNG Samsung Electro-Mechanics 10 3 C14.C3L2.04 CL21A106KOQNNG Samsung Electro-Mechanics 12 2 C4A.C3A CL10B104KB8NNL Samsung Electro-Mechanics 13 1 D L ESDM5K0516G ONSemi 14 1 D2 RSX051VAM07R ROIIM ROIM 15 4 JP1.212.01 PPC041LPB-KRC Salins Connectorian 16 2 JJ.2 PPC041LPB-KRC Salins Connectorian 16 2 JJ.2 PPC041LPB-KRC Salins Connectorian 17 1 D3 Salins Connectorian <t< td=""><td></td><td></td><td></td><td></td><td></td></t<>					
5 3 C2:65:10 C110475K08NNC Samsung Eleten-Mechanics 6 5 C8:23:25:27:72:8 C10540185K05NNNC Samsung Eleten-Mechanics 7 6 C15C14C17:C19:24:24:3 C108K505NNNC Samsung Eleten-Mechanics 9 6 C26:C23:C35:C38:C39:C44 C121A106K0QNNG Samsung Eleten-Mechanics 10 3 C31:C33:C41 GRM15S5111103K Mt RATA 11 1 C32 0492VC393KAT2A MX Corporation 12 C34:C36 C110104KRBNNN, Samsung Eleten-Mechanics Samsung Eleten-Mechanics 13 1 D1 ESD9XE0515G ONSemi 14 10 PLP213.1P4 R8104KRBNN, Samsung Eleten-Mechanics 15 4 D1.1P2.1P3.1P4 R81046G Multin Connector Solutions 16 2 J.1.1J PPTC9011121 Worth Elektronik 16 3 J.5.9.310.11 G1300821121 Worth Elektronik 20 1 J.7 G1300821121 Worth Elektronik 21 1 J.	4	17		GRW155B51C104K	MURAIA
6 S CR32,025,C27,C28 CL85A105,C28,C32,C43 GRNNNC Samsung Electro-Mechanics 8 1 C18 C1608XSRU233K080AC TDK Corporation 9 6 C26,C29,C35,C28,C39,C4 C121106K0QNNNC Samsung Electro-Mechanics 10 3 C31,C33,C41 GRM155B11103K MURATA 11 1 C32 0402/C393KA17A AVX Corporation 12 2 C34,C36 C1.000194MS0156 ONSemi 13 1 D1 ESDM50517A AVX Corporation 14 1 D2 RSA851VAMURTR ROHM Number Solutions 14 1 D2 RSA851VAMURTR ROHM ROHM 16 2 JJ2 PPP04HLEPN-RC Aum Tech Aum Tech 16 3 J46 BY001111 Worth Electronik Contractor Solutions 19 4 J5.9310.J11 6130021111 Worth Electronik Contractor Solutions 21 1 J7 6130021111C7R STA14.FY<	5	3		CL10A475KO8NNNC	Samsung Electro-Mechanics
8 1 C16 TDK Carperation 9 6 C26.C29.C38.C39.C4 C12.1046K0QNNNC Samsung Electro-Mechanics 10 3 C31.C33.C41 GRM15SB1E103K MURATA 11 1 C32 0402V2393KAT2A AVX Corporation 12 2 C34.C36 C1.10B104KBNNL Samsung Electro-Mechanics 13 1 D1 ESD65VAM97R ROIM 14 1 D2 RSN651VAM97R ROIM 15 4 JPL/PZ/P3.P4 6130031121 Warth Elektronik 16 2 J.J.2 PPPC041LFBN-RC Sullins Connector Solutions 17 1 J3 RS148-G Adam Tech 18 2 J.4.J6 PPTC062LFBN-RC Sullins Connector Solutions 20 1 J7 6130621121 Warth Elektronik 21 1 J8 ST406-G Survisoic Industrial Corp. 22 1.E01.LED2 BG1111C-TR STALEY STALEY 24					
9 6 C3C32(33(23(2)) C1214106K0QNNG Samsup Electrowellcanis 11 1 C3(2) 0402VC393KAT2A AVX Corporation 12 2 C34(2) 0402VC393KAT2A AVX Corporation 13 1 D1 ESD9M5.0875G ONSemi 14 1 D2 RSVSIVAM00T ROHM 15 4 JP1.PZ.JPJ 6130031111 Warth Elektronik 16 2 JJ.J2 PPCOHLEPN-ACC Sullins Connector Solutions 17 1 J3 RS148-G Adam Tech 20 1 J7 G130021121 Warth Elektronik 21 1 J7 G130021121 Warth Elektronik 22 1 LED1.4.ED2 BC1111C-TR STAVLA 23 2 1.4.J.3 BLM1BFC660NN MIRATA 24 1.2.J.4.S.L.S.L.8.B BLM1DFC660NN MIRATA 25 1 0.0 RC907NS.115 mepria 26 1 0.1	7				MURATA
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62 1 Y2 MC-146(32.768kHz) EPSON					
	62	1	Y2	MC-146(32.768kHz)	EPSON

Note ! The parts are subject to be changed without notice.

Revision History

Attachment-1

Rev. No.	Date	Page	Category	Contents
Rev 1.0	2022/03/04	All	new	New establishment
Rev 1.1	2022/04/13	4,8,9.10,	Change	Added debugging instructions
		11,15		Corrected the schematic

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