CMOS 32-BIT SINGLE CHIP MICROCONTROLLER

S5U1C31001L1200
(Bridge Board Ver. 2)
Manual

SEIKO EPSON CORPORATION

Rev.1.0

Evaluation board/kit and Development tool important notice

1. This evaluation board/kit or development tool is designed for use for engineering evaluation, demonstration, or development purposes only. Do not use it for other purposes. It is not intended to meet the requirements of design for finished products.
2. This evaluation board/kit or development tool is intended for use by an electronics engineer and is not a consumer product. The user should use it properly and in a safe manner. Seiko Epson dose not assume any responsibility or liability of any kind of damage and/or fire coursed by the use of it. The user should cease to use it when any abnormal issue occurs even during proper and safe use.
3. The part used for this evaluation board/kit or development tool may be changed without any notice.

NOTICE

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1. Overview

The S5U1C31001L1200 (Bridge Board Ver. 2) is an adapter board which is inserted between general-purpose debug probe (e.g. IAR I-jet or SEGGER J-Link) and a target board when debugging an S1C13 Family MCU.

1.1 Function

- Outputs and controls V_{PP} voltage (+7.5 V).

- Supplies +3 V and +5 V power voltages.

- Passes control and data signals between the debug probe and the target board.

The flash memory embedded in the S1C31 Family MCUs requires a +7.5 V flash programming power supply (V_{PP}) for high-speed programming with user program/data. This board generates the V_{PP} by boosting the 5 V power voltage supplied by the debug probe [*1] and supplies it to the target board. The V_{PP} output is controlled using the ENVPP signal output from the S1C31 Family MCU [*2].

When using the power voltage booster [*3] included in the S1C31 Family MCU, set JP2 on this board to open (OFF) so that V_{PP} will not be supplied to the target board from this board.

This board uses the +5 V from the debug probe for the +5 V power output to the target board. The +3 V power for the target board is generated using the step-down regulator on this board from the +5 V. These power voltages should only be used within the maximum allowable current of the debug probe.

(*1) Supply +5 V to the external power supply connector J3 (see Figure 3.1) when using a debug probe that has no +5 V supply (e.g. uLink).

(*2) This function is required only in debug mode. The ENVPP pin can be used for the original functions, however, make sure that this does not affect the external circuits.
It is not necessary to use this board when using the MCU's power voltage booster.

(*3) For more information, refer to the technical manual for the S1C31 Family MCU model to be used.

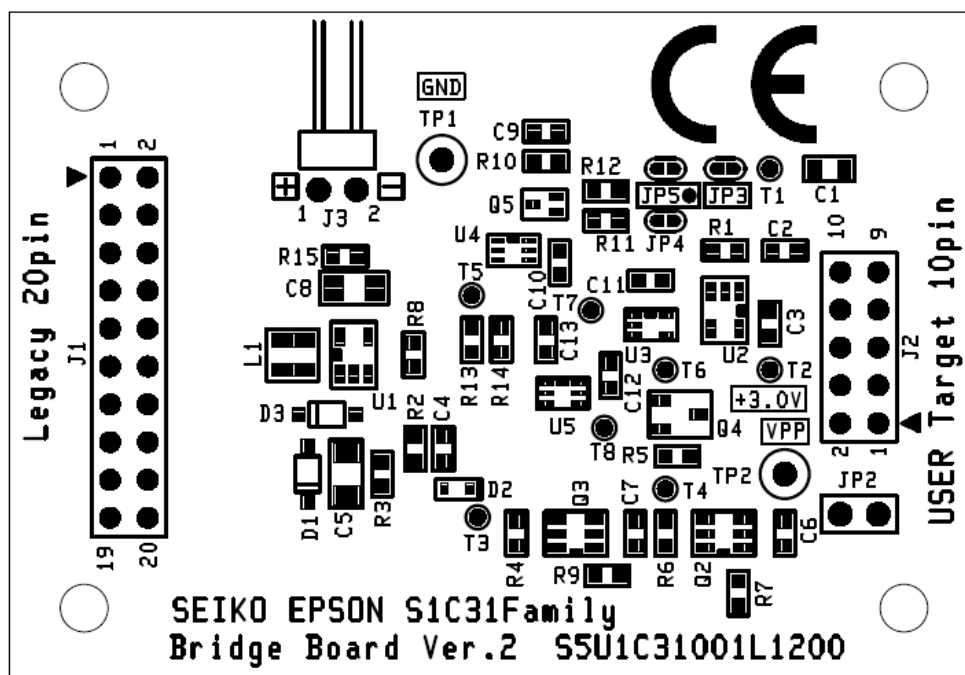Figure 1.1 S5U1C31001L1200 (Bridge Board Ver. 2) External View

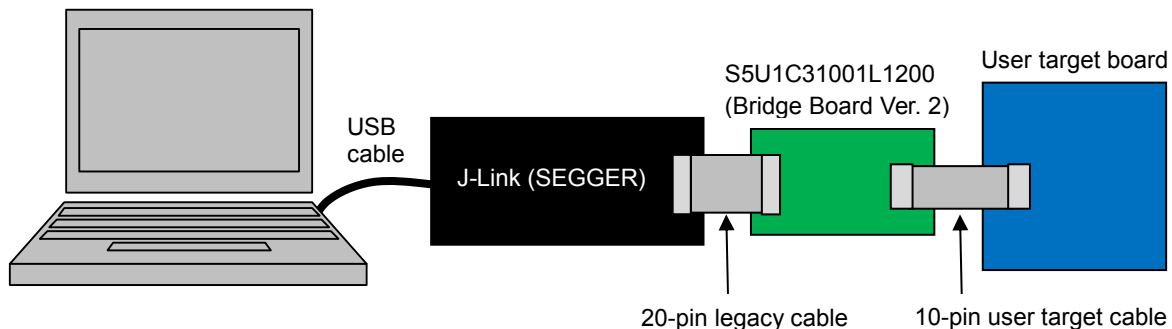# 2. Connection Examples

When J-Link is used

Figure 2.1 Connection Diagram when J-Link is Used

When I-jet is used

Connect the I-jet to the 20-pin legacy connector on the S5U1C31001L1200 (Bridge Board Ver. 2) using the pitch conversion adapter (ARM-20) that comes with the I-jet.
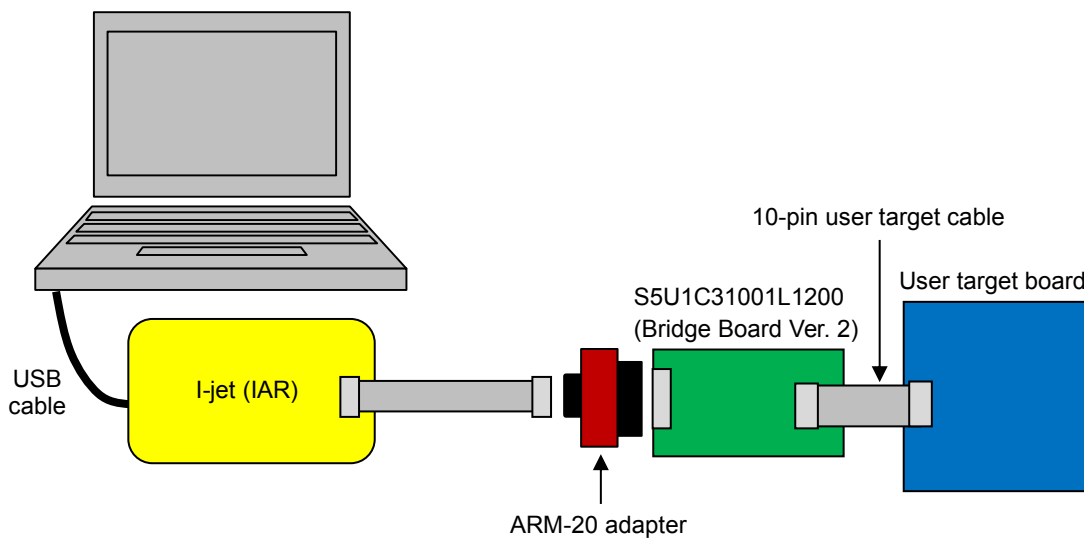
Figure 2.2 Connection Diagram when I-jet is Used

3.   Name and Function of Each Part
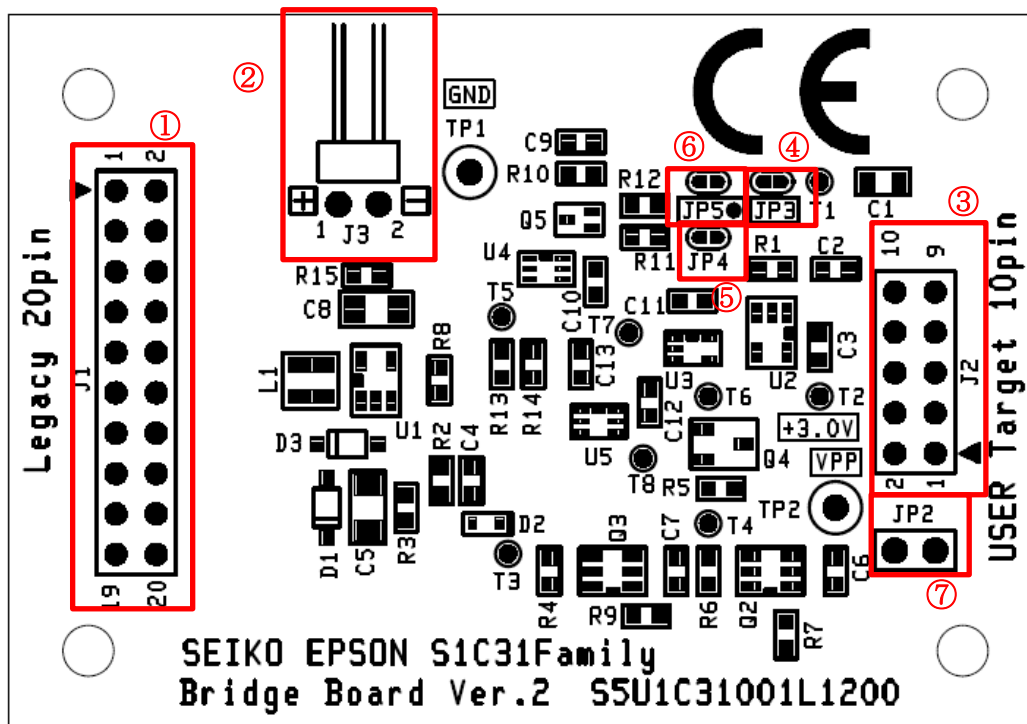
Figure 3.1 Parts Layout Diagram

Table 3.1 Name and Setting of Each Part

No	Symbol	Function name	Setting for debugging
1	J1 (Legacy 20pin)	Debug probe connector	Connect with a debug probe.
2	J3	External power supply connector (DC +5.0 V ±10%)	Unused. However, supply +5 V to this connector if a debug probe that has no power supply is used.
3	J2 (USER Target 10pin)	User target board connector	Connect with a target board.
4	JP3	V_{PP} control selection jumper for multi-programming	Short (default)
5	JP4	V_{PP} control (ENVPP) selection jumper for debugging	Short (default)
6	JP5	V_{PP} control selection jumper for multi-programming	Open (default)
7	JP2	V_{PP} output ON/OFF jumper	Set to ON (Short) to supply V_{PP} to the target board. Set to OFF (Open) when the MCU's power voltage booster is used.

 * The jumpers are set as shown in the "Setting for debugging" column at factory shipment.

4. Connectors

4.1 20-pin Legacy Connector (J1)

Table 4.1 20-pin Legacy Connector (J1) Pin Assignment Table

No	Name	I/O	Description
1	VTref	O	Reference voltage of the target MCU
2	–	–	N.C.
3	–	–	N.C
4	GND	P	GND
5	–	–	N.C.
6	GND	P	GND
7	SWDIO	I/O	Serial wire data input/output
8	GND	P	GND
9	SWDCLK	I	Serial wire clock input
10	GND	P	GND
11	–	–	N.C.
12	GND	P	GND
13	–	–	N.C.
14	GND	P	GND
15	nRESET	I	Target MCU reset
16	GND	P	GND
17	–	–	N.C.
18	GND	P	GND
19	+5V	P (I)	DC +5 V input
20	GND	P	GND
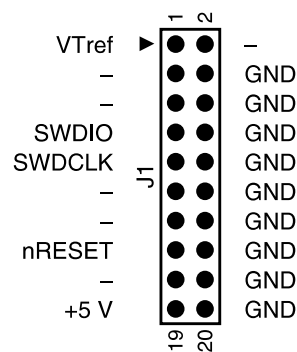
Figure 4.1 20-pin Legacy Connector (J1) Pin Assignment

4.2 10-pin User Target Connector (J2)

Table 4.2 10-pin User Target Connector (J2) Pin Assignment Table

No	Name	I/O	Description
1	SWDCLK	O	Serial wire clock output
2	GND	P	GND
3	SWDIO	I/O	Serial wire data input/output
4	+3V	P (O)	DC +3 V power voltage output
5	V_{PP}	P (O)	Flash programming power voltage output
6	GND	P	GND
7	nRESET	O	Target MCU reset
8	VTref	I	Reference voltage of the target MCU
9	V_{CC}	P (O)	DC +5 V power voltage output
10	ENVPP	I	V_{PP} control signal input

Figure 4.2 10-pin User Target Connector (J2) Pin Assignment

Appendix 1. Circuit Configuration Example to Eliminate External Power Supply for Target Board

The S5U1C31001L1200 (Bridge Board Ver. 2) can supply +5 V and +3 V fixed power only to the target board. If the target board requires another voltage to operate, it must be externally supplied to the target board.
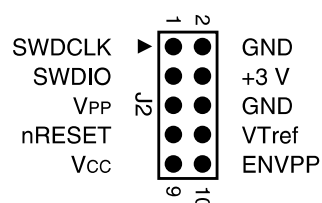
You can make a debugging environment without an external power supply by mounting a voltage regulator, which is driven with +5 V from the S5U1C31001L1200 (Bridge Board Ver. 2), on the target board (See Figure A1.1).

When connecting a reset circuit that uses a push switch on the target board to the #RESET pin of the S1C31 Family MCU, it should be designed so that no conflict will occur between the reset signal on the target board and the nRESET signal of the debug probe.
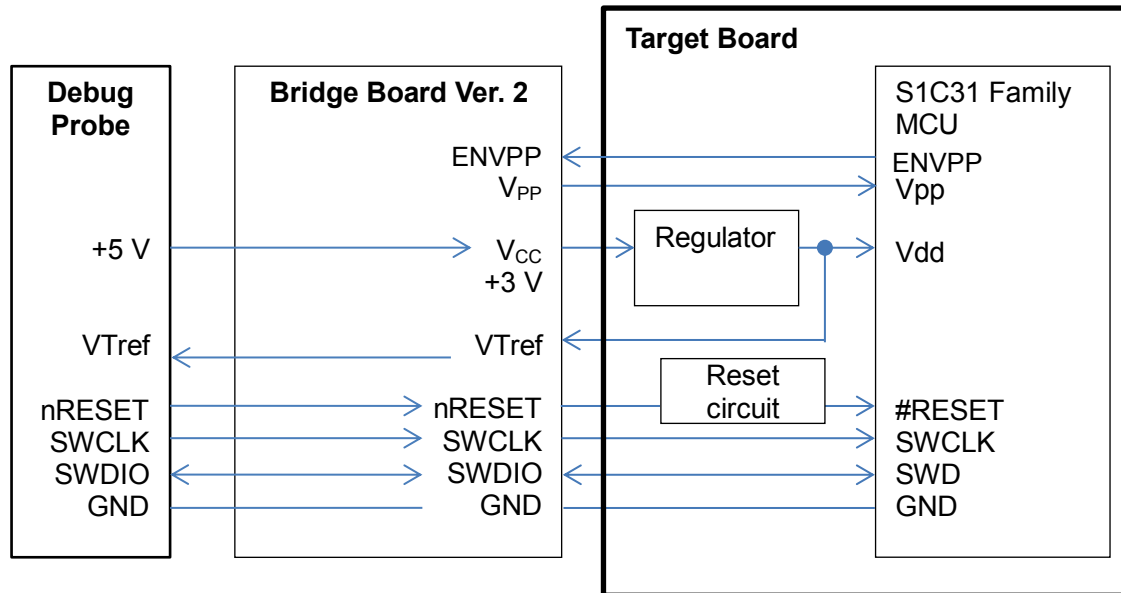

Figure A1.1 Circuit Configuration Example to Eliminate External Power Supply for Target Board

Appendix 2. Application to Multi-Programmer

The S5U1C31001L1200 (Bridge Board Ver. 2) allows multi-programming [*1] using a J-Link. Multi-programming uses the +5 V power output of the J-Link as the V_{PP} ON/OFF control signal. This does not allow use of the +5 V as the power source of this board. Therefore, multi-programming requires an external power supply (DC +5 V) to drive this board and to change the jumper settings on this board.

When performing multi-programming using the MCU's power voltage booster, this board is not required.

(*1)   The flash memories of more than one S1C31 Family MCU can be programmed simultaneously using a J-Link and the J-Flash flash programming software that comes with the J-Link. For more information, refer to "Multi-Programming Application Notes."

Table A2.1 Settings for Multi-Programming

No.	Symbol	Function name	Setting for multi-programming
1	J1 (Legacy 20pin)	Debug probe connector	Connect with J-Link.
2	J3	External power supply connector (DC +5.0 V ±10%)	Supply +5 V to this connector from an external power supply.
3	J2 (USER Target 10pin)	User target connector	Connect with a target board.
4	JP3	V_{PP} control selection jumper for multi-programming	Open (pattern cut)
5	JP4	V_{PP} control (ENVPP) selection jumper for debugging	Open (pattern cut)
6	JP5	V_{PP} control selection jumper for multi-programming	Short (with soldering)
7	JP2	V_{PP} output ON/OFF jumper	Set to ON (Short) to supply V_{PP} to the target board.

A2.1 How to Change Jumper Setting

[When the JP3, JP4, and JP5 are used for the first time]

To set JP3 and JP4 to Open, cut the center of their shorted pad patterns. To short JP5, solder the separated short pads.

Pattern cut (JP3, JP4)   Solder to short (JP5)
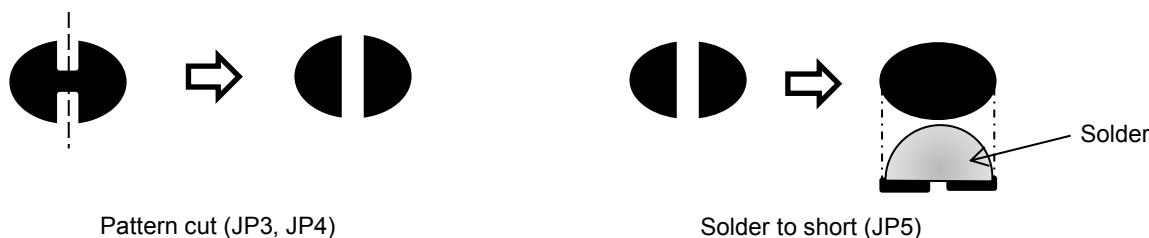
A2.2 ENVPP Signal

Multi-programming does not require the ENVPP signal. Therefore, it is not necessary to connect the ENVPP signal of the target board to this board. This board is not affected even if the ENVPP signal is connected.

Revision History

Attachment-1

Rev. No.	Date	Page	Category	Contents
Rev 1.0	2017/07/25	All	New	New establishment

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