Serial Flash Programmer

S550-SFWv3

Examples of Circuit for

Serial Programming

Sunny Giken Inc.

Serial Flash Programmer
S550-SFWv3

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Table of Contents

1. Outline

1.1. Precautions

This manual illustrates the examples of circuit for serial programming. In use of this manual, please read "S550-SFWv3 operation manual".

2. Circuitry Examples

The following diagrams show examples of a circuit for serial programming when you design peripheral circuit of MCU.

2.1. M16C/60 (except [2 Power supplies]), M16C/80, M32C/80 (except [2 Power supplies]), R32C/100 (except [2 Power supplies]) Series, and M16C/24 Group and selecting "Standard serial I/O mode 1 (Clock synchronous)"

[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD, RXD, SCLK, and BUSY terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. When pulling-up these signals, the resistance should be more than 4.7kΩ.

Note 3. Execute the same procedure as "Note 2" for CE terminal. You may also choose to pull-up the terminal and isolate without connecting to CE terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix it at H level on the board directly.

Note 4. Execute the same procedure as "Note 2" for EPM terminal. You may also choose to pull-down the terminal and isolate without connecting to EPM on S550-SFWv3. When it is not used in the peripheral circuit, you may fix it at L level on the board directly.

Note 5. Connect CNVss terminal to the CNVss on S550-SFWv3 by pulling-up or pulling-down with more than 4.7kΩ resistance.

Note 6. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 7. Vss terminal is signal ground. Be sure to connect it.

* Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.

[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable (E8a compatibility)	14-10 Standard Cable
1	CLK	Vcc
2	GND	BUSY
3	CNVss	CLK
4	EPM	TXD
5	RXD	CE
6	GND	EPM
7	CE	GND
8	Vcc	RESET
9	BUSY	CNVss
10	GND	RXD
11	TXD	
12	GND	
13	RESET	
14	GND	

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.

[Circuitry Examples]

Note 1. Be sure to set it so that Vcc1 is greater than or equal to Vcc2.

Note 2. When Vcc1 is greater than Vcc2, do not connect the CE pin to the CE terminal on S550-SFWv3. Pull it up on the target board by Vcc2. In case that Vcc1 equals to Vcc2, refer to the "Note 5".

Note 3. Power supply of S550-SFWv3 is provided by a user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 4. Isolate TXD, RXD, SCLK and BUSY terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. When pulling-up these signals, the resistance should be more than 4.7kΩ.

Note 5. Execute the same procedure as "Note 4" for CE terminal. You may also choose to pull-up the terminal and isolate without connecting to CE terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix it at H level on the board directly.

Note 6. Execute the same procedure as "Note 4" for EPM terminal. You may also choose to pull-down the terminal and isolate without connecting to EPM on S550-SFWv3. When it is not used in the peripheral circuit, you may fix it at L level on the board directly.

Note 7. Connect CNVss terminal to the CNVss on S550-SFWv3 by pulling-up or pulling-down with more than 4.7kΩ resistance.

Note 8. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 4" for CMOS output.

Note 9. Vss terminal is signal ground. Be sure to connect it.

* **Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.**
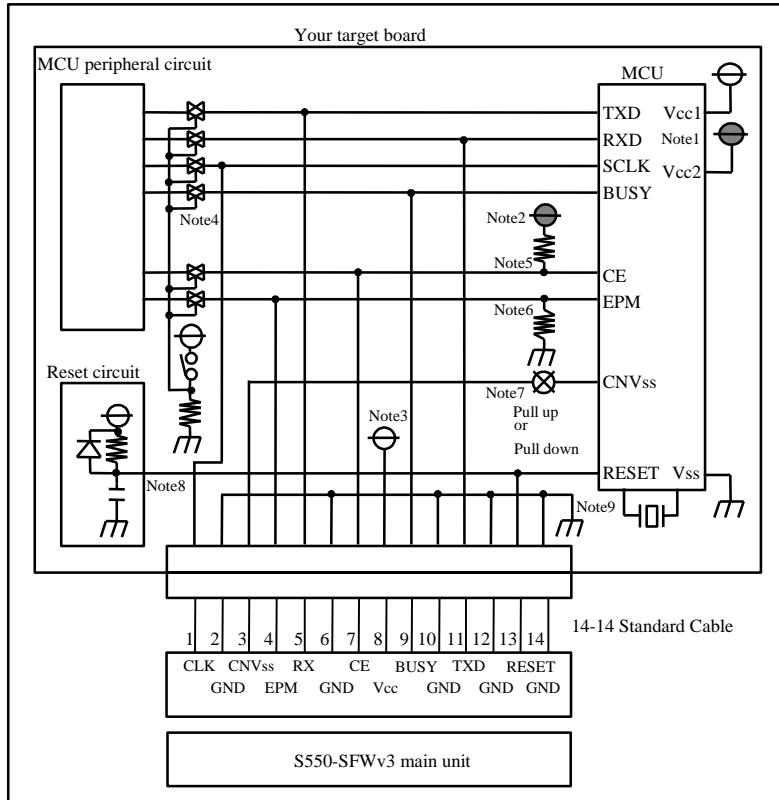
[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable (E8a compatibility)	14-10 Standard Cable
1	CLK	Vcc
2	GND	BUSY
3	CNVss	CLK
4	EPM	TXD
5	RXD	CE
6	GND	EPM
7	CE	GND
8	Vcc	RESET
9	BUSY	CNVss
10	GND	RXD
11	TXD	
12	GND	
13	RESET	
14	GND	

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.

2.3. M16C/60[2 Power supplies] Group and selecting "Standard serial I/O mode 3 (Single-wire)"

[Circuitry Examples]
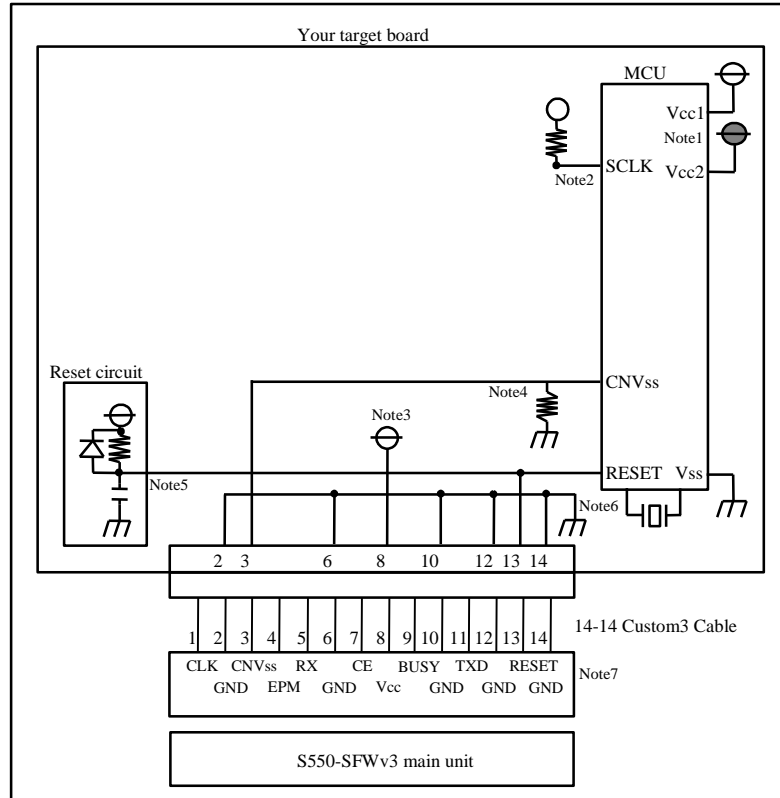
Note 1. Be sure to set it so that Vcc1 is greater than or equal to Vcc2.
Note 2. Pull SCLK terminal up on the target board by Vcc1.
Note 3. Power supply of S550-SFWv3 is provided by a user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.
Note 4. Connect CNVss terminal to the CNVss terminal on S550-SFWv3 by pulling-down with 150kΩ resistance.
Note 5. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Connect to the RESET terminal on S550-SFWv3 by pulling-up with 4.7kΩ or more resistance for CMOS output.
Note 6. Vss terminal is signal ground. Be sure to connect it.
Note 7. Can not be used except 14-14 Custom3 Cable.

* Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.

[Connector Pin Assignment]

Pin Number#	14-14 Custom3 Cable (E8a compatibility)
1	NC
2	GND
3	CNVss
4	NC
5	-
6	GND
7	-
8	Vcc
9	-
10	GND
11	-
12	GND
13	RESET
14	GND

'NC': no connection
'-': not connect

* Note that "14-14 Custom3 Cable (model: S550-SFW-CB3)" serves as an option.

2.4. M16C/50 Series and selecting "Standard serial I/O mode 1 (Clock synchronous)"

[Circuitry Examples]

Note 1. Power supply of S550-SFWv3 is provided by a user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD, RXD, SCLK and BUSY terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. When pulling-up these signals, the resistance should be more than 4.7kΩ.

Note 3. Connect CNVss terminal to the CNVss on S550-SFWv3 by pulling-down with more than 4.7kΩ or more resistance. Do not connect a capacitor to this terminal. For other circuits, please consult with us.

Note 4. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 5. Vss terminal is signal ground. Be sure to connect it.

* Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.

[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable (E8a compatibility)	14-10 Standard Cable
1	CLK	Vcc
2	GND	BUSY
3	CNVss	CLK
4	-	TXD
5	RXD	-
6	GND	-
7	-	GND
8	Vcc	RESET
9	BUSY	CNVss
10	GND	RXD
11	TXD	
12	GND	
13	RESET	
14	GND	

'-': not connect

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.

2.5. M16C/1N Group and selecting "Standard serial I/O mode 1 (Clock synchronous)"

[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD, RXD, SCLK and BUSY terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. When pulling-up these signals, the resistance should be more than 4.7kΩ.

Note 3. Execute the same procedure as "Note 2" for CE terminal. You may also choose to pull-up the terminal and isolate without connecting to CE terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix it at H level on the board directly.

Note 4. Execute the same procedure as "Note 2" for SEL terminal. You may also choose to pull-down the terminal and isolate without connecting to EPM on S550-SFWv3. When it is not used in the peripheral circuit, you may fix it at L level on the board directly.

Note 5. Connect CNVss terminal to the CNVss on S550-SFWv3 by pulling-down with more than 4.7kΩ or more resistance. Do not connect a capacitor to this terminal. For other circuits, please consult with us.

Note 6. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 7. Vss terminal is signal ground. Be sure to connect it.

* Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.
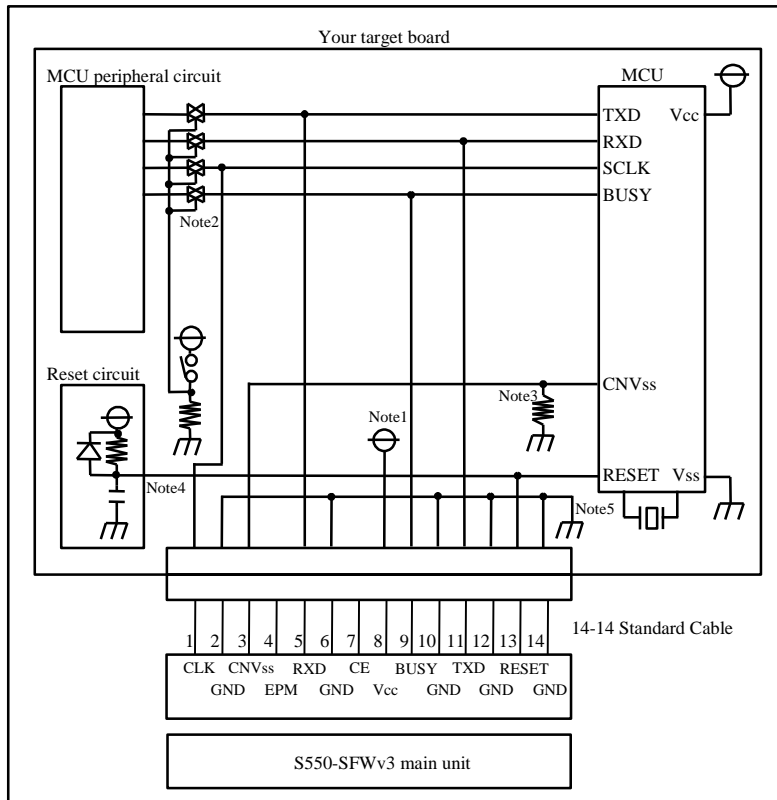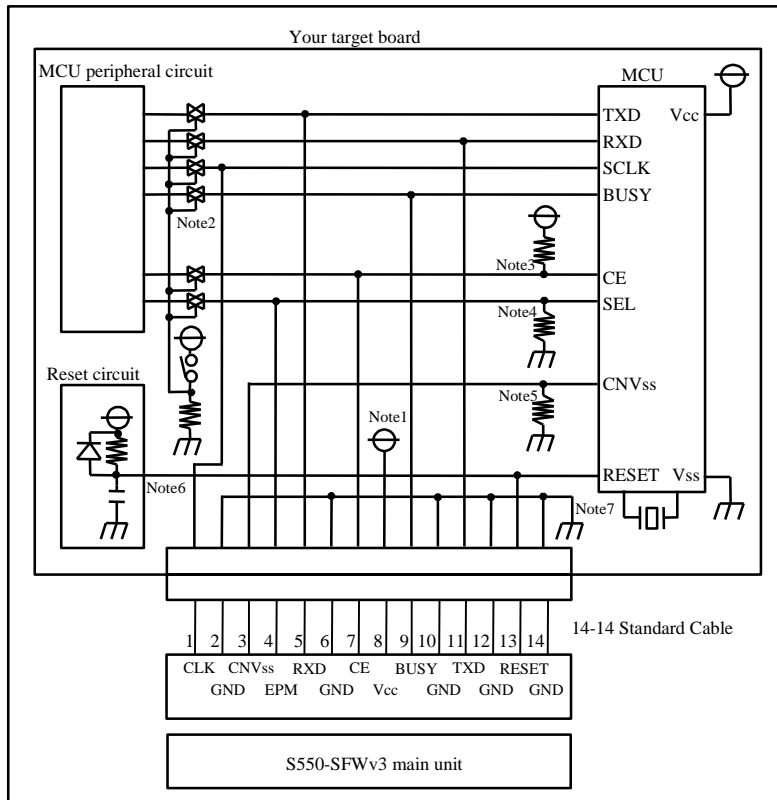
[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable (E8a compatibility)	14-10 Standard Cable
1	CLK	Vcc
2	GND	BUSY
3	CNVss	CLK
4	EPM	TXD
5	RXD	CE
6	GND	EPM
7	CE	GND
8	Vcc	RESET
9	BUSY	CNVss
10	GND	RXD
11	TXD	
12	GND	
13	RESET	
14	GND	

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.

2.6. M16C/22 Group and selecting "Standard serial I/O mode 1 (Clock synchronous)"

[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD, RXD, SCLK and BUSY terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. When pulling-up these signals, the resistance should be more than 4.7kΩ.

Note 3. Execute the same procedure as "Note 2" for CE terminal. You may also choose to pull-up the terminal and isolate without connecting to CE terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix it at H level on the board directly.

Note 4. Connect CNVss terminal to the CNVss on S550-SFWv3 by pulling-down with more than 4.7kΩ or more resistance. Do not connect a capacitor to this terminal. For other circuits, please consult with us.

Note 5. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 6. Vss terminal is signal ground. Be sure to connect it.

*　**Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.**
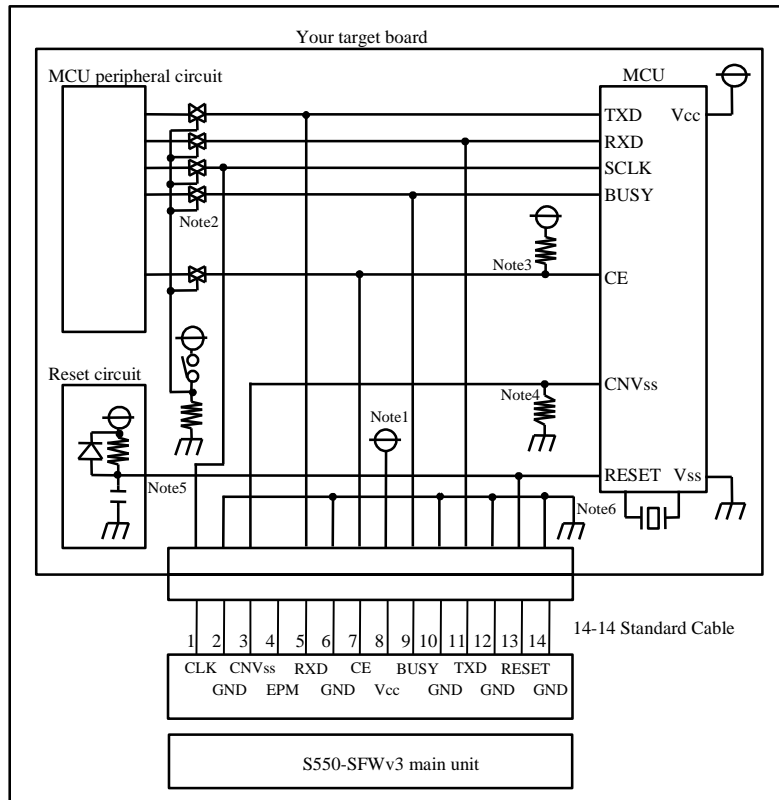
[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable (E8a compatibility)	14-10 Standard Cable
1	CLK	Vcc
2	GND	BUSY
3	CNVss	CLK
4	-	TXD
5	RXD	CE
6	GND	-
7	CE	GND
8	Vcc	RESET
9	BUSY	CNVss
10	GND	RXD
11	TXD	
12	GND	
13	RESET	
14	GND	

'-': not connect

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.

2.7. M16C/26 Group and selecting "Standard serial I/O mode 1 (Clock synchronous)"
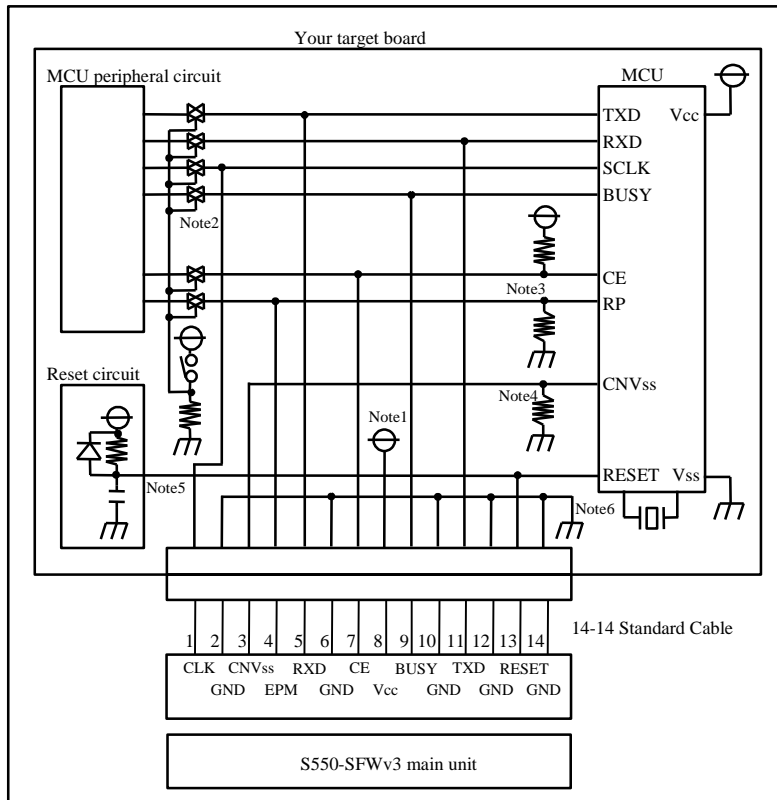
[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD, RXD, SCLK and BUSY terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. When pulling-up these signals, the resistance should be more than 4.7kΩ.

Note 3. Execute the same procedure as "Note 2" for CE and RP terminals. Connect either CE or RP terminal to CE or EPM on S550-SFWv3. You may also choose to pull-up the CE terminal or pull-down the RP terminal and isolate without connecting to CE or EPM terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix the CE terminal at H level or the EPM terminal at L level on the board directly.

Note 4. Connect CNVss terminal to the CNVss on S550-SFWv3 by pulling-down with more than 4.7kΩ or more resistance. Do not connect a capacitor to this terminal. For other circuits, please consult with us.

Note 5. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 6. Vss terminal is signal ground. Be sure to connect it.

* Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.

[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable (E8a compatibility)	14-10 Standard Cable
1	CLK	Vcc
2	GND	BUSY
3	CNVss	CLK
4	RP	TXD
5	RXD	CE
6	GND	RP
7	CE	GND
8	Vcc	RESET
9	BUSY	CNVss
10	GND	RXD
11	TXD	
12	GND	
13	RESET	
14	GND	

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.

2.8. M16C/28, M16C/29 Group and selecting "Standard serial I/O mode 1 (Clock synchronous)"
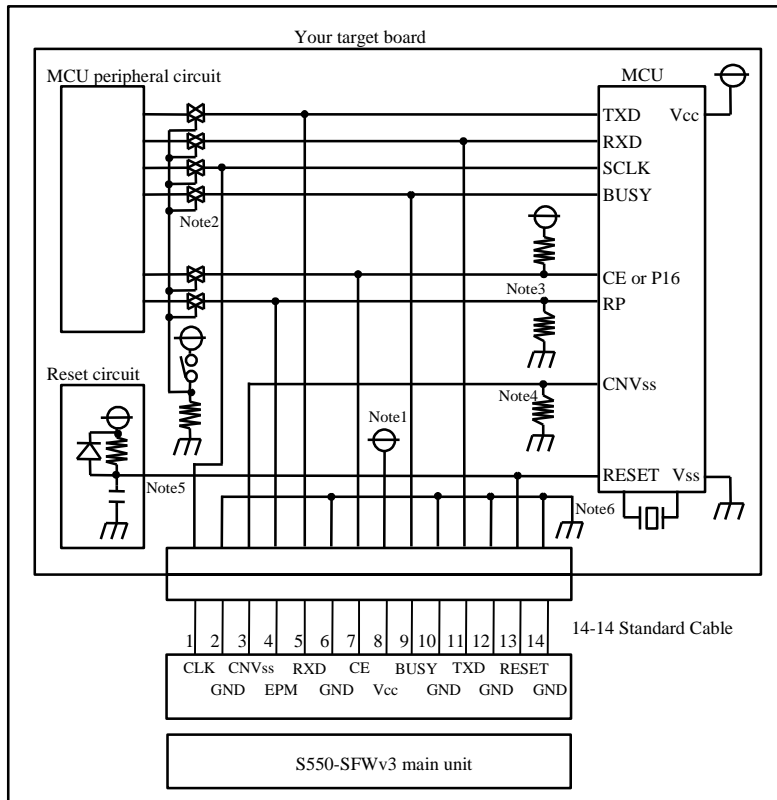
[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD, RXD, SCLK and BUSY terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. When pulling-up these signals, the resistance should be more than 4.7kΩ.

Note 3. Execute the same procedure as "Note 2" for CE, P16 and RP terminals. Connect the CE terminal to CE terminal on S550-SFWv3, or connect either P16 or RP terminal to CE or EPM on S550-SFWv3. You may also choose to pull-up the CE terminal, or pull-up the P16 terminal and pull-down the RP terminal, then isolate from MCU peripheral circuit without connecting to CE or EPM terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix the CE terminal at H level, or the P16 terminal at H level and EPM terminal at L level on the board directly.

Note 4. Connect CNVss terminal to the CNVss on S550-SFWv3 by pulling-down with more than 4.7kΩ or more resistance. Do not connect a capacitor to this terminal. For other circuits, please consult with us.

Note 5. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 6. Vss terminal is signal ground. Be sure to connect it.

* **Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.**

[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable (E8a compatibility)	14-10 Standard Cable
1	CLK	Vcc
2	GND	BUSY
3	CNVss	CLK
4	RP	TXD
5	RXD	CE(P16)
6	GND	RP
7	CE(P16)	GND
8	Vcc	RESET
9	BUSY	CNVss
10	GND	RXD
11	TXD	
12	GND	
13	RESET	
14	GND	

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.

2.9. M16C/2N Group and selecting "Standard serial I/O mode 1 (Clock synchronous)"

[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD, RXD, SCLK and BUSY terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. When pulling-up these signals, the resistance should be more than 4.7kΩ.

Note 3. Connect CNVss terminal to the CNVss on S550-SFWv3 by pulling-down with more than 4.7kΩ or more resistance. Do not connect a capacitor to this terminal. For other circuits, please consult with us.

Note 4. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 5. Vss terminal is signal ground. Be sure to connect it.

Note 6. Connect CNVss1 and CNVss2 terminals to VSS on your target board.

* **Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.**
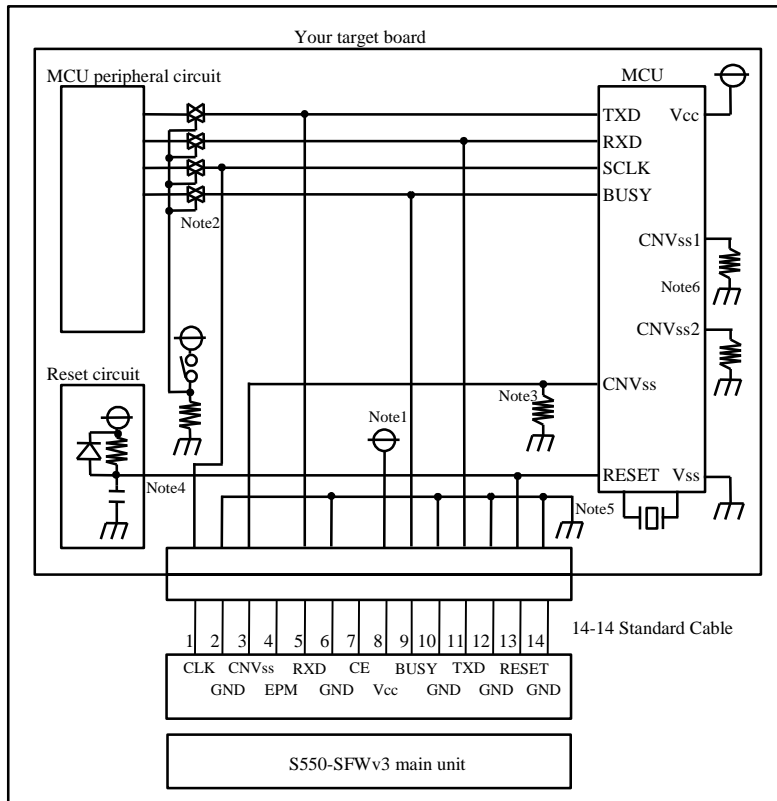
[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable (E8a compatibility)	14-10 Standard Cable
1	CLK	Vcc
2	GND	BUSY
3	CNVss	CLK
4	-	TXD
5	RXD	-
6	GND	-
7	-	GND
8	Vcc	RESET
9	BUSY	CNVss
10	GND	RXD
11	TXD	
12	GND	
13	RESET	
14	GND	

'-': not connect

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.

2.10. R8C/10, R8C/11, R8C/12, R8C/13 Group and selecting "Standard serial I/O mode 1 (Clock synchronous)"

[Circuitry Examples]
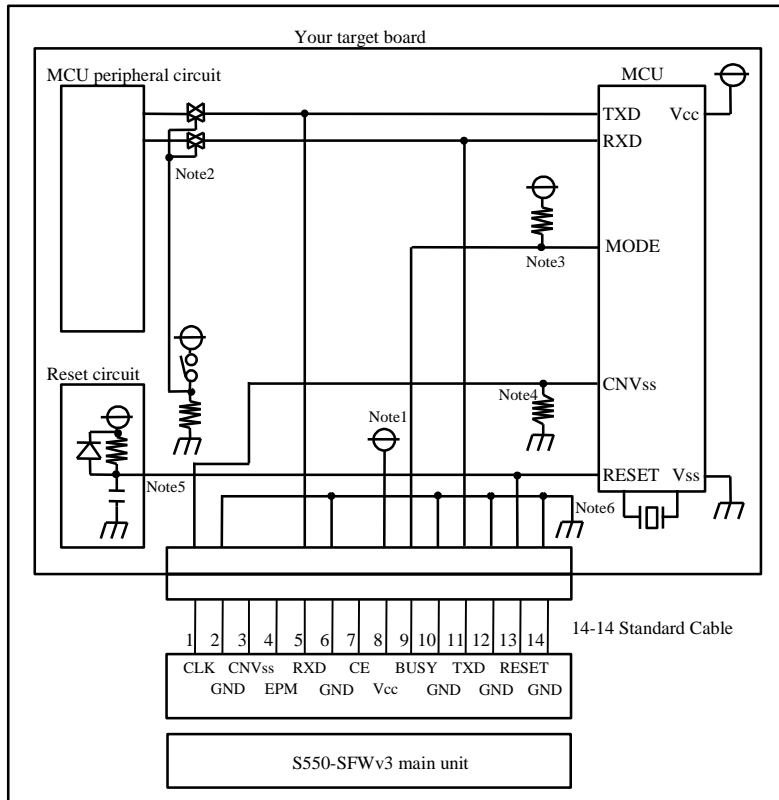
Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD, RXD and MODE terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. When pulling-up these signals, the resistance should be more than 4.7kΩ.

Note 3. Connect MODE terminal to the BUSY terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ or more resistance. Do not connect a capacitor to this terminal.

Note 4. Connect CNVss terminal to the CLK on S550-SFWv3 by pulling-down with more than 4.7kΩ or more resistance. Do not connect a capacitor to this terminal.

Note 5. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 6. Vss terminal is signal ground. Be sure to connect it.

Note 7. It can program without an oscillation circuit.

*   Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.

[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable (E8a compatibility)	14-10 Standard Cable
1	CNvss	Vcc
2	GND	MODE
3	-	CNvss
4	-	TXD
5	RXD	-
6	GND	-
7	-	GND
8	Vcc	RESET
9	MODE	-
10	GND	RXD
11	TXD	
12	GND	
13	RESET	
14	GND	

'-': not connect

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.

2.11. R8C/LX Series and selecting "Standard serial I/O mode 3 (Single-wire)"

[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Connect MODE terminal to the CE terminal on S550-SFWv3 by pulling-up with 4.7kΩ or more resistance. Do not connect a capacitor to this terminal.

Note 3. When the reset circuit on your target board is open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the isolation from the reset circuit by the jumper, analog switching, three-state, etc for CMOS output and CR delay circuit.

Note 4. Vss terminal is signal ground. Be sure to connect it.

Note 5. Connect VREF terminal to the VCC terminal.

* Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.

[Connector Pin Assignment]

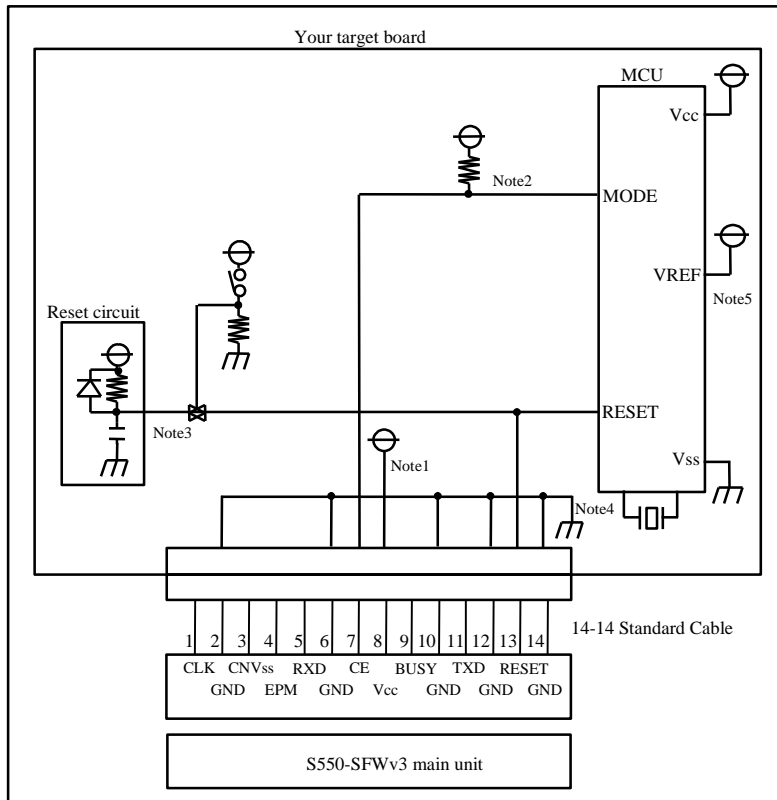| Pin Number#	14-14 Standard Cable (E8a compatibility)
1	-
2	GND
3	-
4	-
5	-
6	GND
7	MODE
8	Vcc
9	-
10	GND
11	-
12	GND
13	RESET
14	GND

'-': not connect

2.12. R8C Family other than R8C/LX Series, R8C/10, R8C/11, R8C/12, or R8C/13 Group and selecting "Standard serial I/O mode 3 (Single-wire)"

[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Connect MODE terminal to the CE terminal on S550-SFWv3 by pulling-up with 4.7kΩ or more resistance. Do not connect a capacitor to this terminal.

Note 3. When the reset circuit on your target board is open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the isolation from the reset circuit by the jumper, analog switching, three-state, etc for CMOS output and CR delay circuit.

Note 4. Vss terminal is signal ground. Be sure to connect it.

* Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.

[Connector Pin Assignment]

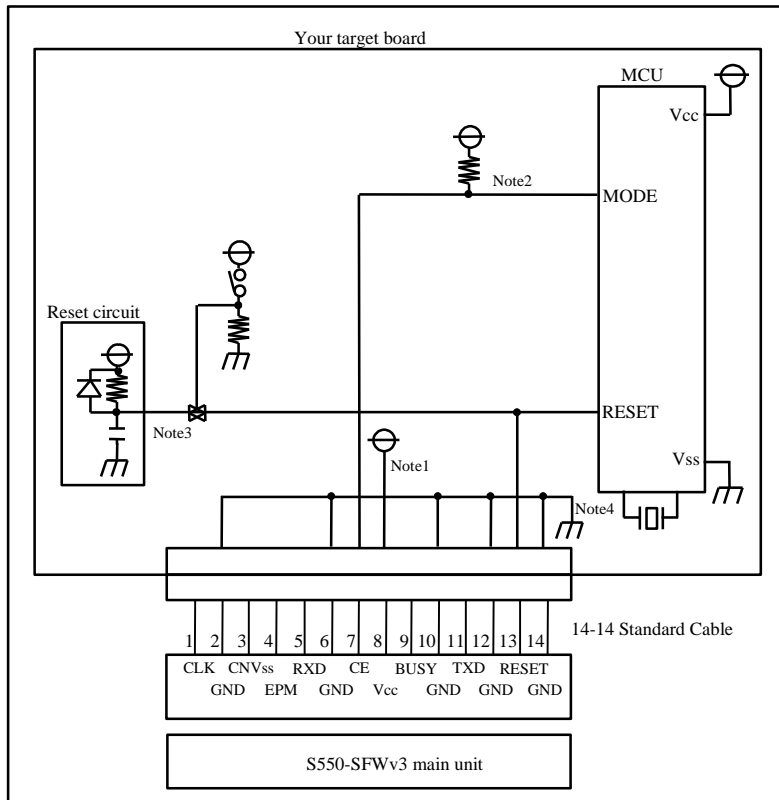| Pin Number#	14-14 Standard Cable (E8a compatibility)
1	-
2	GND
3	-
4	-
5	-
6	GND
7	MODE
8	Vcc
9	-
10	GND
11	-
12	GND
13	RESET
14	GND

'-': not connect

2.13.   SH/Tiny Series and selecting "Generic BOOT (UART)"
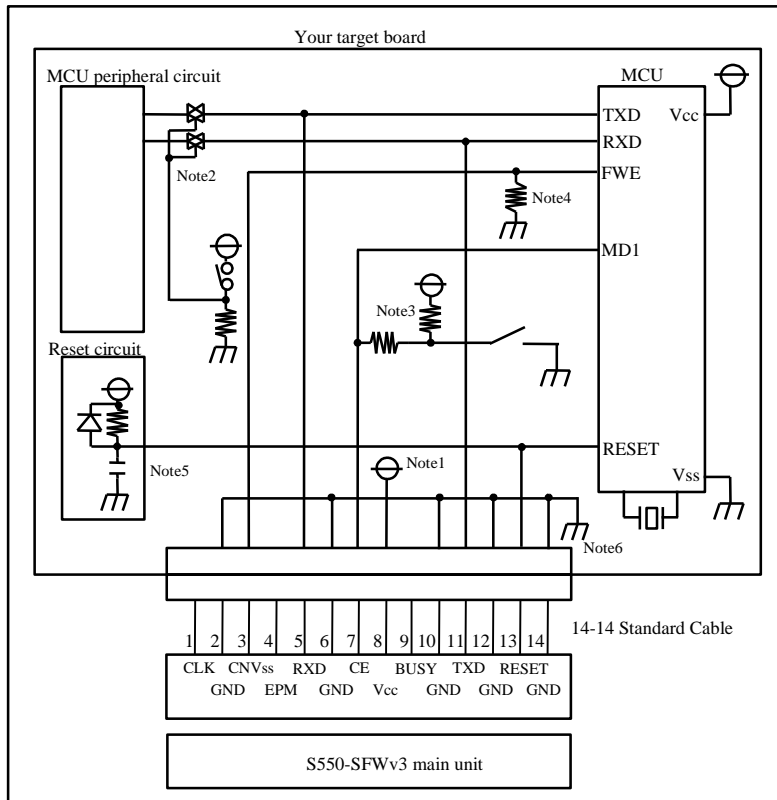
[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD and RXD terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU.Pull these signals up by more than 4.7kΩ resistance.

Note 3. Connect MD1 terminal to the CE terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down MD1 terminal and isolate without connecting to CE terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 4. Connect FWE terminal to the CNVss on S550-SFWv3 by pulling-down with more than 4.7kΩ resistance. You may also choose to pull-up FWE terminal and isolate without connecting to CNVss terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at H level on the board directly.

Note 5. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 6. Vss terminal is signal ground. Be sure to connect it.

*   Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.

[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable	14-20 Custom1 Cable
1	-	RESET
2	GND	GND
3	FWE	FWE
4	-	GND
5	RXD	-
6	GND	GND
7	MD1	MD1
8	Vcc	GND
9	-	-
10	GND	NC
11	TXD	NC
12	GND	NC
13	RESET	NC
14	GND	NC
15		RXD
16		GND
17		TXD
18		NC
19		-
20		Vcc

'NC': no connection
'-': not connect

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.
* Note that "14-20 Custom1 Cable (model: S550-SFW-CB1)" serves as an option.

2.14. SH7147, SH7216, SH7280 Series and selecting "Generic BOOT (UART)"

[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD and RXD terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. Pull these signals up by more than 4.7kΩ resistance.

Note 3. Connect MD0 terminal to the EPM terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down MD0 terminal and isolate without connecting to EPM terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 4. Connect MD1 terminal to the CE terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down MD1 terminal and isolate without connecting to CE terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 5. Connect FWE terminal to the CNVss terminal on S550-SFWv3 by pulling-down with more than 4.7kΩ resistance. You may also choose to pull-up FWE terminal and isolate without connecting to CNVss terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at H level on the board directly.

Note 6. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 7. Vss terminal is signal ground. Be sure to connect it.

*   Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.
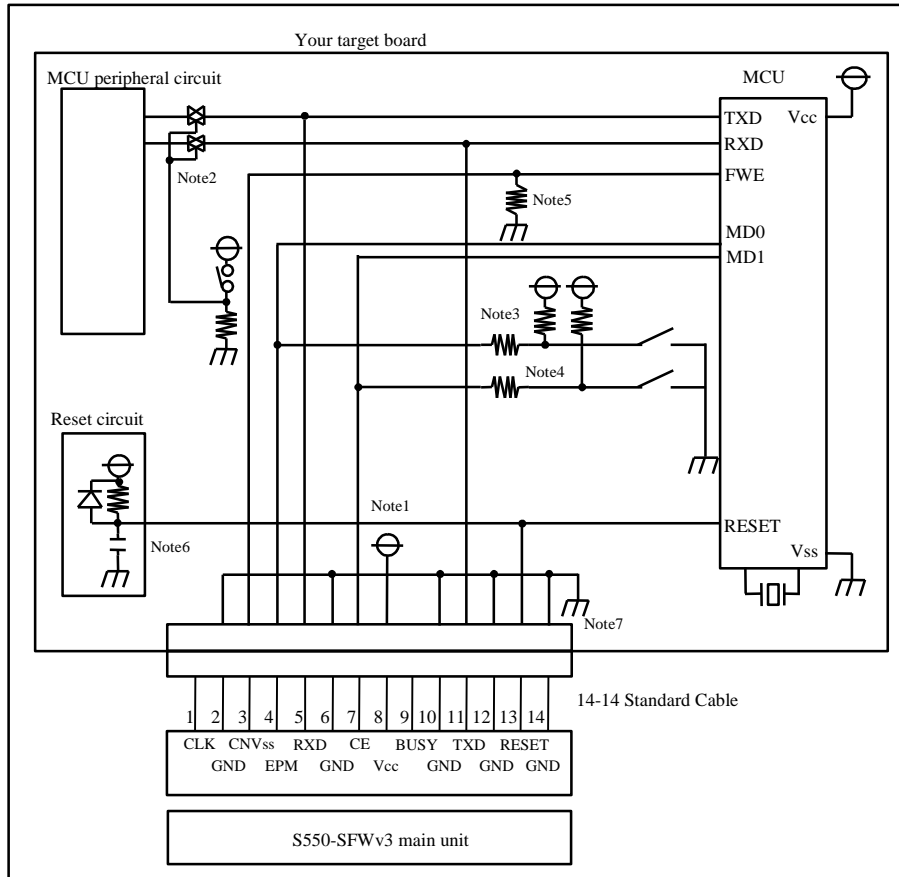
[Connector Pin Assignment]

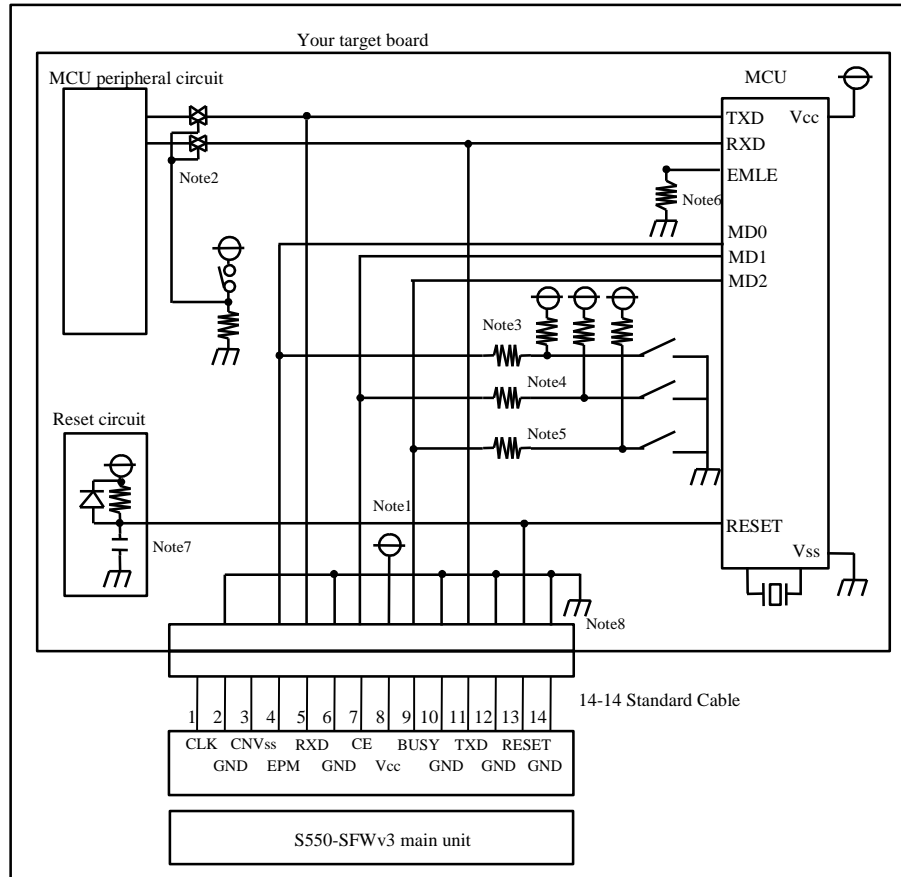| Pin Number#	14-14 Standard Cable	14-20 Custom1 Cable
1	-	RESET
2	GND	GND
3	FWE	FWE
4	MD0	GND
5	RXD	MD0
6	GND	GND
7	MD1	MD1
8	Vcc	GND
9	-	-
10	GND	NC
11	TXD	NC
12	GND	NC
13	RESET	NC
14	GND	NC
15		RXD
16		GND
17		TXD
18		NC
19		-
20		Vcc

'NC': no connection
'-': not connect

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.
* Note that "14-20 Custom1 Cable (model: S550-SFW-CB1)" serves as an option.

2.15. H8SX/1600 Series and selecting "Generic BOOT (UART)"

[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD and RXD terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. Pull these signals up by more than 4.7kΩ resistance.

Note 3. Connect MD0 terminal to the EPM terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down MD0 terminal and isolate without connecting to EPM terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 4. Connect MD1 terminal to the CE terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-up MD1 terminal and isolate without connecting to CE terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at H level on the board directly.

Note 5. Connect MD2 terminal to the BUSY terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down MD2 terminal and isolate without connecting to BUSY terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 6. Pull down EMLE terminal with more than 4.7kΩ resistance.

Note 7. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 8. Vss terminal is signal ground. Be sure to connect it.

* Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.

[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable	14-20 Custom1 Cable
1	-	RESET
2	GND	GND
3	-	-
4	MD0	GND
5	RXD	MD0
6	GND	GND
7	MD1	MD1
8	Vcc	GND
9	MD2	MD2
10	GND	NC
11	TXD	NC
12	GND	NC
13	RESET	NC
14	GND	NC
15		RXD
16		GND
17		TXD
18		NC
19		-
20		Vcc

'NC': no connection
'-': not connect

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.
* Note that "14-20 Custom1 Cable (model: S550-SFW-CB1)" serves as an option.

2.16. H8S/Tiny Series and selecting "Generic BOOT (UART)"
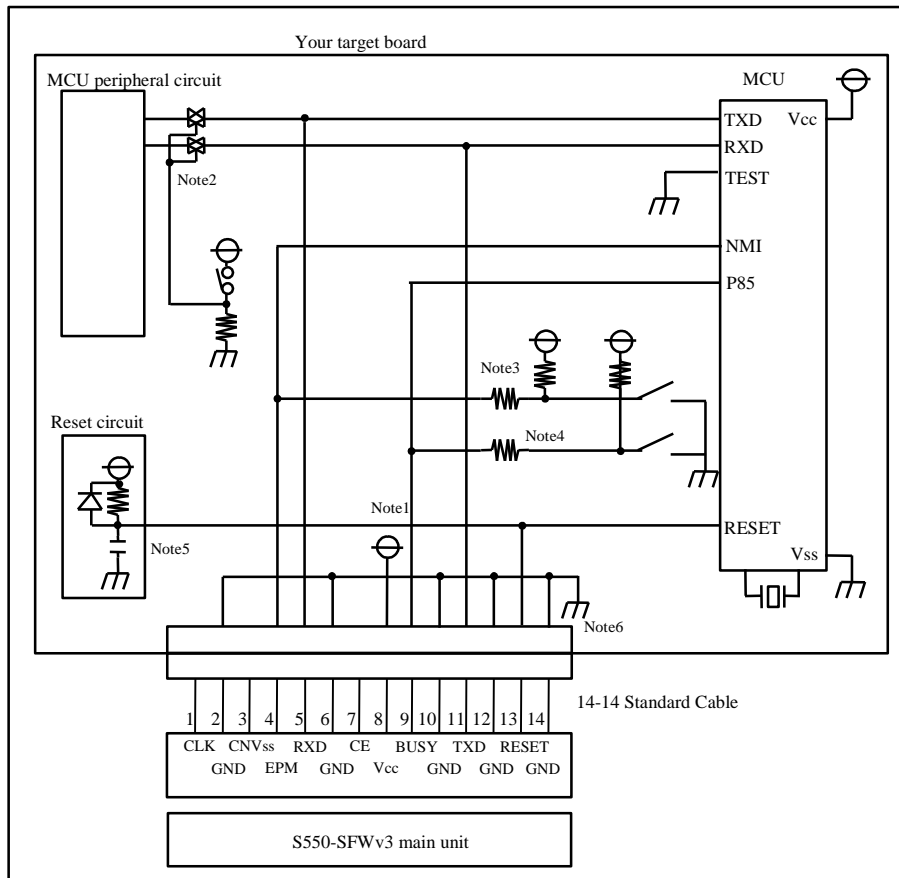
[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD and RXD terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. Pull these signals up by more than 4.7kΩ resistance.

Note 3. Connect NMI terminal to the CE terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down NMI terminal and isolate without connecting to CE terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 4. Connect P85 terminal to the BUSY terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-up P85 terminal and isolate without connecting to BUSY terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at H level on the board directly.

Note 5. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 6. Vss terminal is signal ground. Be sure to connect it.

* Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.

[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable	14-20 Custom1 Cable
1	-	RESET
2	GND	GND
3	-	-
4	NMI	GND
5	RXD	NMI
6	GND	GND
7	-	-
8	Vcc	GND
9	P85	P85
10	GND	NC
11	TXD	NC
12	GND	NC
13	RESET	NC
14	GND	NC
15		RXD
16		GND
17		TXD
18		NC
19		-
20		Vcc

'NC': no connection
'-': not connect

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.
* Note that "14-20 Custom1 Cable (model: S550-SFW-CB1)" serves as an option.

2.17. RX610, RX621, RX62N, RX62G, RX62T Group and selecting "Generic BOOT (UART)"

[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD and RXD terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. Pull these signals up by more than 4.7kΩ resistance.

Note 3. Connect MD0 terminal to the EPM terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-up MD0 terminal and isolate without connecting to EPM terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at H level on the board directly.

Note 4. Connect MD1 terminal to the CE terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down MD1 terminal and isolate without connecting to CE terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 5. Pull down EMLE terminal with more than 4.7kΩ resistance.

Note 6. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 7. Vss terminal is signal ground. Be sure to connect it.

Note 8. If there is BSCANP terminal, pull down it with more than 4.7kΩ resistance.

* **Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.**
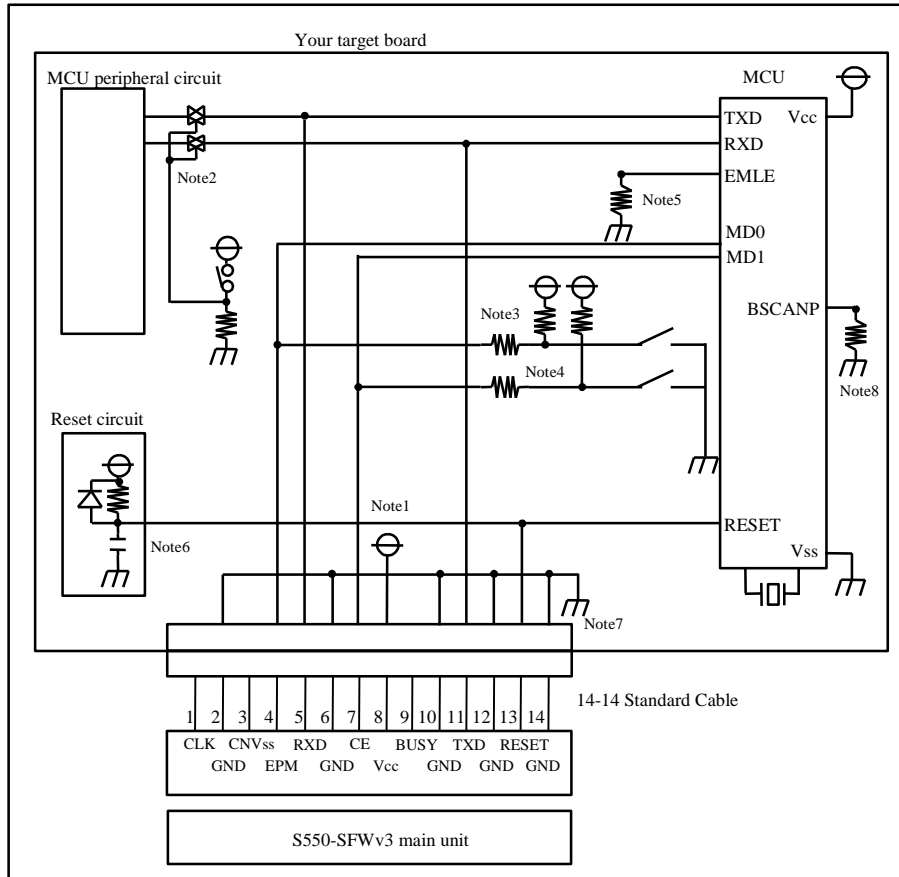
[Connector Pin Assignment]

| Pin Number#	14-14 Standard Cable	14-20 Custom1 Cable	14-14 Custom2 Cable (E1 compatibility) [except RX610 group])
1	-	RESET	NC
2	GND	GND	GND
3	-	-	NC
4	MD0	GND	NC
5	RXD	MD0	RXD
6	GND	GND	NC
7	MD1	MD1	MD1
8	Vcc	GND	Vcc
9	-	-	NC
10	GND	NC	MD0
11	TXD	NC	TXD
12	GND	NC	GND
13	RESET	NC	RESET
14	GND	NC	GND
15		RXD	
16		GND	
17		TXD	
18		NC	
19		-	
20		Vcc	

'NC': no connection
'-': not connect

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.
* Note that "14-20 Custom1 Cable (model: S550-SFW-CB1)" and "14-14 Custom2 Cable (model: S550-SFW-CB2)" serve as an option.

2.18. RX210, RX21A, RX220, RX630, RX631, RX63N Group and selecting "Generic BOOT (UART)"
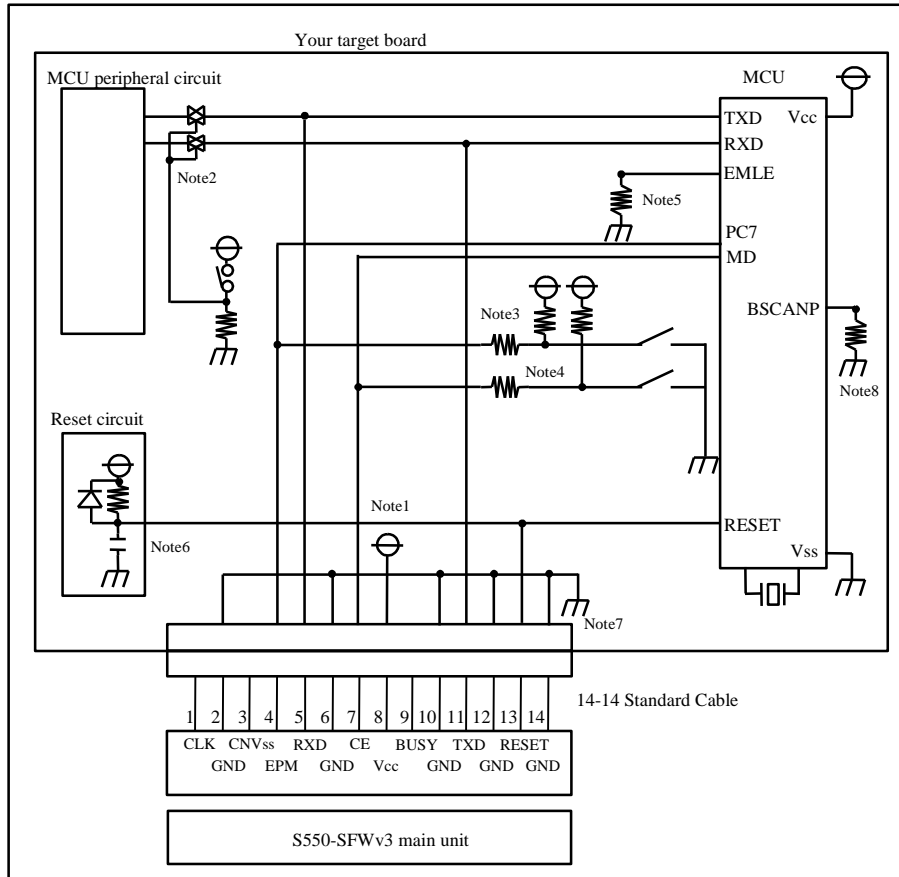
[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.
Note 2. Isolate TXD and RXD terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. Pull these signals up by more than 4.7kΩ resistance.
Note 3. Connect PC7 terminal to the EPM terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down PC7 terminal and isolate without connecting to EPM terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.
Note 4. Connect MD terminal to the CE terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down MD terminal and isolate without connecting to CE terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.
Note 5. If there is EMLE terminal, pull down it with more than 4.7kΩ resistance.
Note 6. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.
Note 7. Vss terminal is signal ground. Be sure to connect it.
Note 8. If there is BSCANP terminal, pull down it with more than 4.7kΩ resistance.

* **Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.**

[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable	14-20 Custom1 Cable	14-14 Custom2 Cable (E1 compatibility)
1	-	RESET	NC
2	GND	GND	GND
3	-	-	NC
4	PC7	GND	NC
5	RXD	PC7	RXD
6	GND	GND	NC
7	MD	MD	MD
8	Vcc	GND	Vcc
9	-	-	NC
10	GND	NC	PC7
11	TXD	NC	TXD
12	GND	NC	GND
13	RESET	NC	RESET
14	GND	NC	GND
15		RXD	
16		GND	
17		TXD	
18		NC	
19		-	
20		Vcc	

'NC': no connection
'-': not connect

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.
* Note that "14-20 Custom1 Cable (model: S550-SFW-CB1)" and "14-14 Custom2 Cable (model: S550-SFW-CB2)" serves as an option.

2.19. RX110, RX130, RX23E-A, RX23T, RX24T, RX24U, RX63T(64/48pin) Group and selecting "Generic BOOT (UART)"
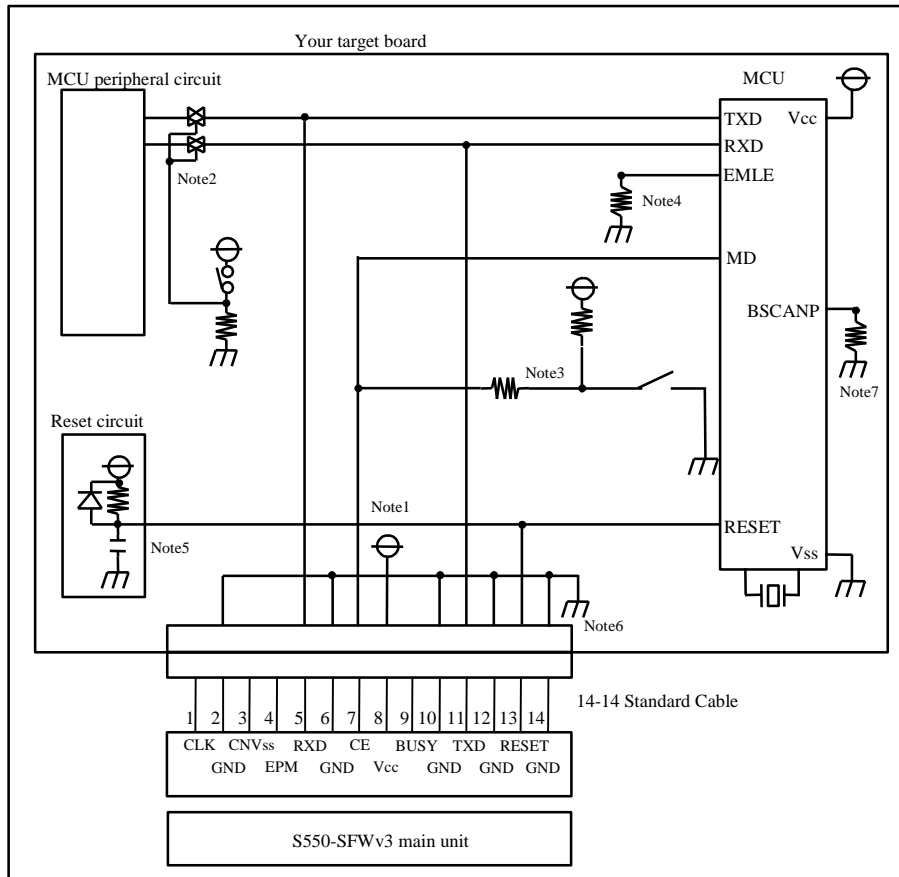
[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD and RXD terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. Pull these signals up by more than 4.7kΩ resistance.

Note 3. Connect MD terminal to the CE terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down MD terminal and isolate without connecting to CE terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 4. If there is EMLE terminal, pull down it with more than 4.7kΩ resistance.

Note 5. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 6. Vss terminal is signal ground. Be sure to connect it.

Note 7. If there is BSCANP terminal, pull down it with more than 4.7kΩ resistance.

* Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.

[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable	14-20 Custom1 Cable	14-14 Custom2 Cable (E1 compatibility)
1	-	RESET	NC
2	GND	GND	GND
3	-	-	NC
4	-	GND	NC
5	RXD	-	RXD
6	GND	GND	NC
7	MD	MD	MD
8	Vcc	GND	Vcc
9	-	-	NC
10	GND	NC	-
11	TXD	NC	TXD
12	GND	NC	GND
13	RESET	NC	RESET
14	GND	NC	GND
15		RXD	
16		GND	
17		TXD	
18		NC	
19		-	
20		Vcc	

'NC': no connection
'-': not connect

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.
* Note that "14-20 Custom1 Cable (model: S550-SFW-CB1)" and "14-14 Custom2 Cable (model: S550-SFW-CB2)" serves as an option.

2.20. RX63T(144/120/112/100pin) Group and selecting "Generic BOOT (UART)"
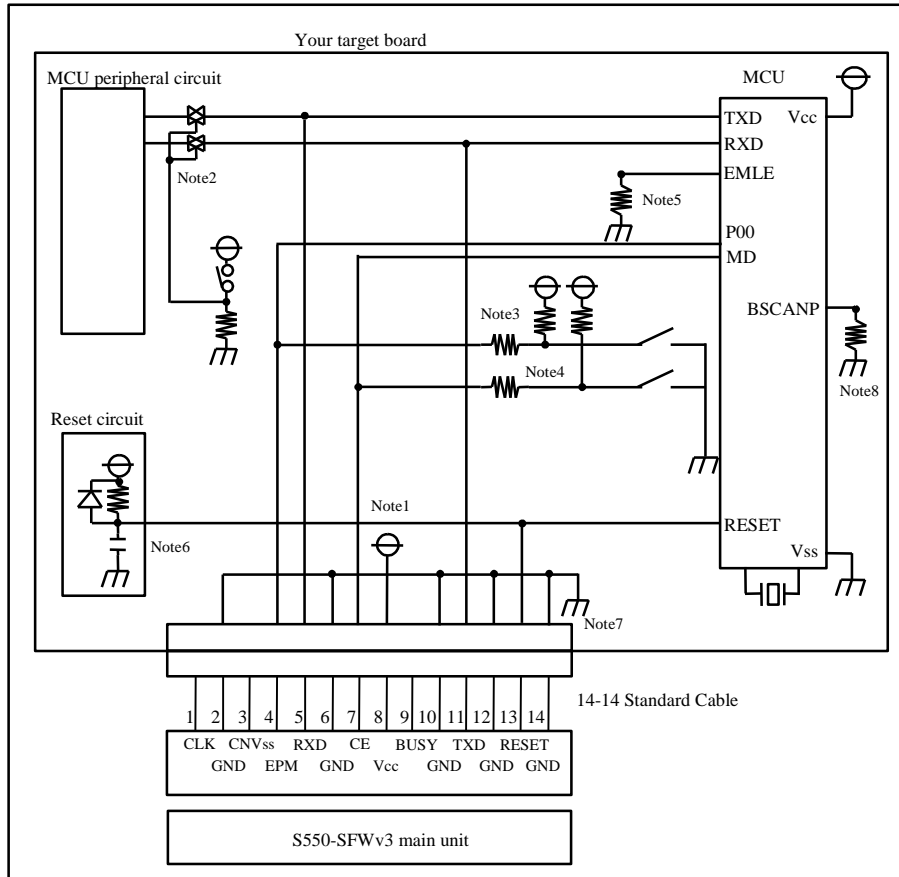
[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD and RXD terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. Pull these signals up by more than 4.7kΩ resistance.

Note 3. Connect P00 terminal to the EPM terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down P00 terminal and isolate without connecting to EPM terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 4. Connect MD terminal to the CE terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down MD terminal and isolate without connecting to CE terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 5. If there is EMLE terminal, pull down it with more than 4.7kΩ resistance.

Note 6. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 7. Vss terminal is signal ground. Be sure to connect it.

Note 8. If there is BSCANP terminal, pull down it with more than 4.7kΩ resistance.

* **Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.**
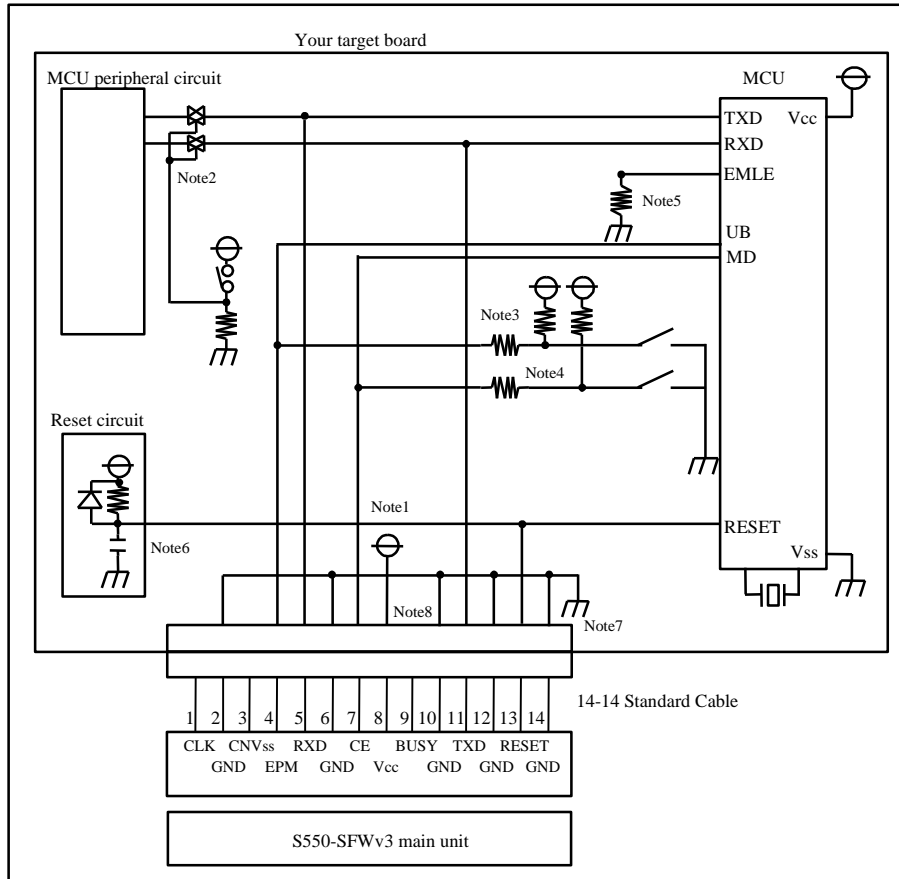
[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable	14-20 Custom1 Cable	14-14 Custom2 Cable (E1 compatibility)
1	-	RESET	NC
2	GND	GND	GND
3	-	-	NC
4	P00	GND	NC
5	RXD	P00	RXD
6	GND	GND	NC
7	MD	MD	MD
8	Vcc	GND	Vcc
9	-	-	NC
10	GND	NC	P00
11	TXD	NC	TXD
12	GND	NC	GND
13	RESET	NC	RESET
14	GND	NC	GND
15		RXD	
16		GND	
17		TXD	
18		NC	
19		-	
20		Vcc	

'NC': no connection
'-': not connect

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.
* Note that "14-20 Custom1 Cable (model: S550-SFW-CB1)" and "14-14 Custom2 Cable (model: S550-SFW-CB2)" serves as an option.

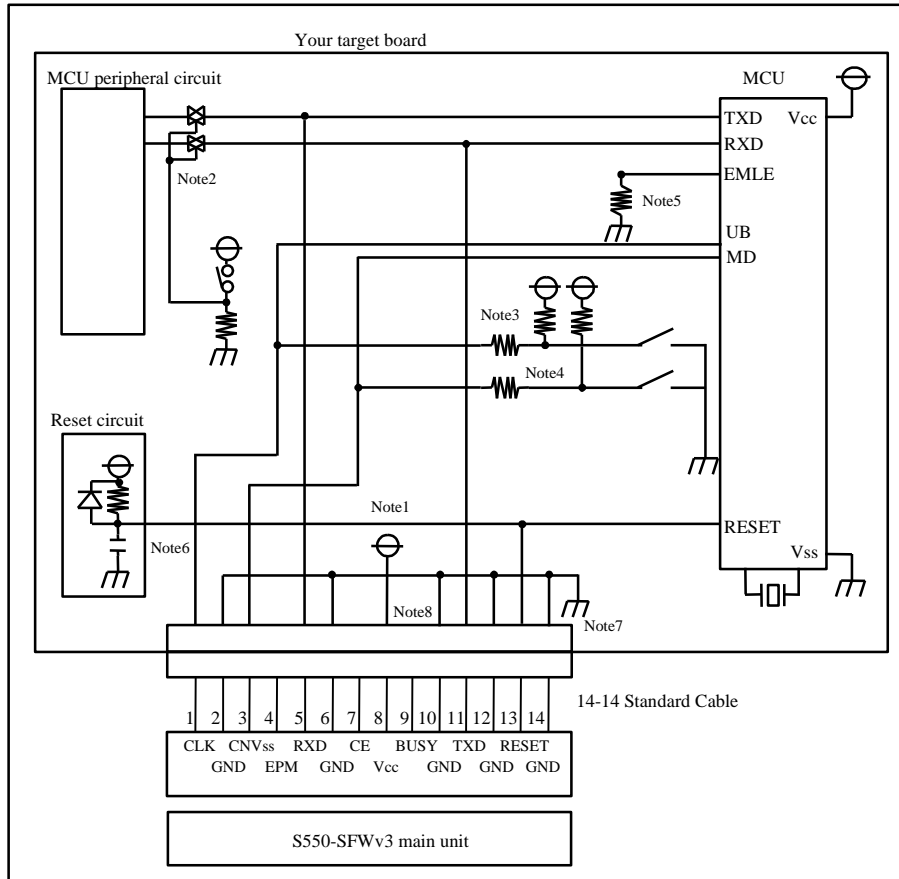## 2.21. RX651, RX65N, RX66T Group and selecting "Generic BOOT (UART)"

[Circuitry Examples #1]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD and RXD terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. Pull these signals up by more than 4.7kΩ resistance.

Note 3. Connect UB terminal to the EPM terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down UB terminal and isolate without connecting to EPM terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 4. Connect MD terminal to the CE terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down MD terminal and isolate without connecting to CE terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 5. If there is EMLE terminal, pull down it with more than 4.7kΩ resistance.

Note 6. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 7. Vss terminal is signal ground. Be sure to connect it.

Note 8. BUSY terminal on S550-SFWv3 is reserved. Do not connect anything.

* Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.

[Circuitry Examples #2]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD and RXD terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. Pull these signals up by more than 4.7kΩ resistance.

Note 3. Connect UB terminal to the CLK terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down UB terminal and isolate without connecting to CLK terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 4. Connect MD terminal to the CNVss terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down MD terminal and isolate without connecting to CNVss terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 5. If there is EMLE terminal, pull down it with more than 4.7kΩ resistance.

Note 6. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 7. Vss terminal is signal ground. Be sure to connect it.

Note 8. BUSY terminal on S550-SFWv3 is reserved. Do not connect anything.

*   Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.

[Connector Pin Assignment]

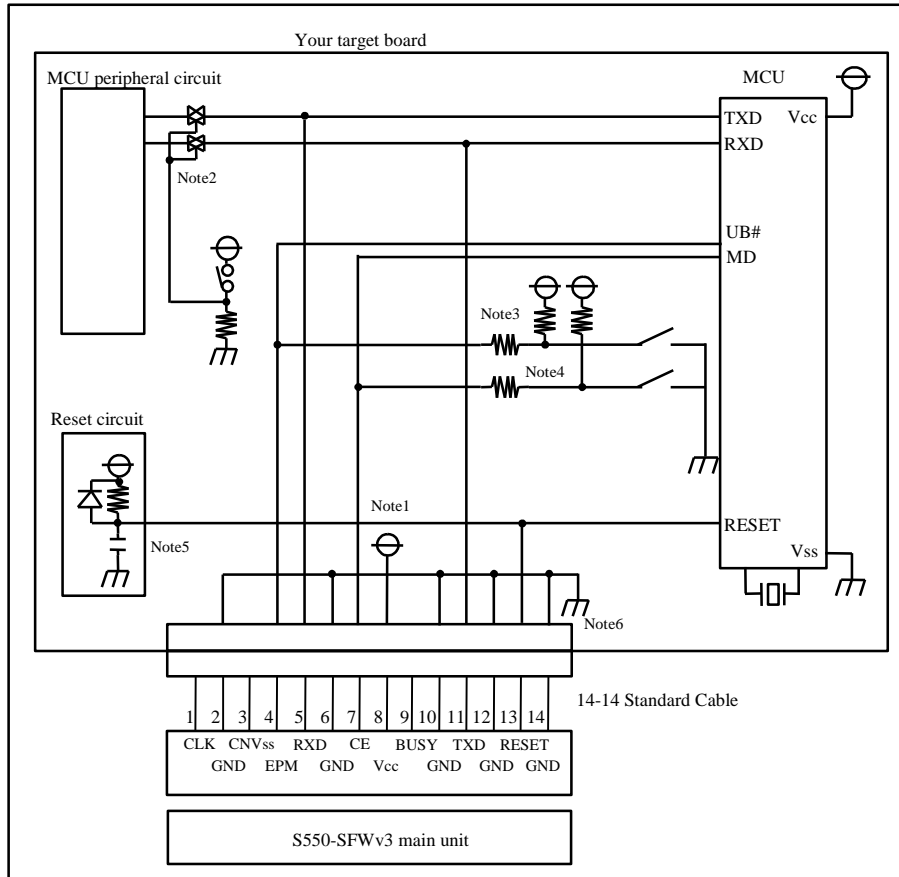| Pin Number#	14-14 Standard Cable [Circuitry Examples #1]	14-14 Standard Cable [Circuitry Examples #2]	14-20 Custom1 Cable	14-14 Custom2 Cable (E1 compatibility)
1	-	UB	RESET	NC
2	GND	GND	GND	GND
3	-	MD	-	NC
4	UB	-	GND	NC
5	RXD	RXD	UB	RXD
6	GND	GND	GND	NC
7	MD	-	MD	MD
8	Vcc	Vcc	GND	Vcc
9	-	-	-	NC
10	GND	GND	NC	UB
11	TXD	TXD	NC	TXD
12	GND	GND	NC	GND
13	RESET	RESET	NC	RESET
14	GND	GND	NC	GND
15			RXD	
16			GND	
17			TXD	
18			NC	
19			-	
20			Vcc	

'NC': no connection
'-': not connect

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.
* Note that "14-20 Custom1 Cable (model: S550-SFW-CB1)" and "14-14 Custom2 Cable (model: S550-SFW-CB2)" serves as an option.

2.22. RX111, RX113 Group and selecting "Generic BOOT (UART)"

[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD and RXD terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. Pull these signals up by more than 4.7kΩ resistance.

Note 3. Connect UB# terminal to the EPM terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-up UB# terminal and isolate without connecting to EPM terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at H level on the board directly.

Note 4. Connect MD terminal to the CE terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down MD terminal and isolate without connecting to CE terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 5. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 6. Vss terminal is signal ground. Be sure to connect it.

* Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.
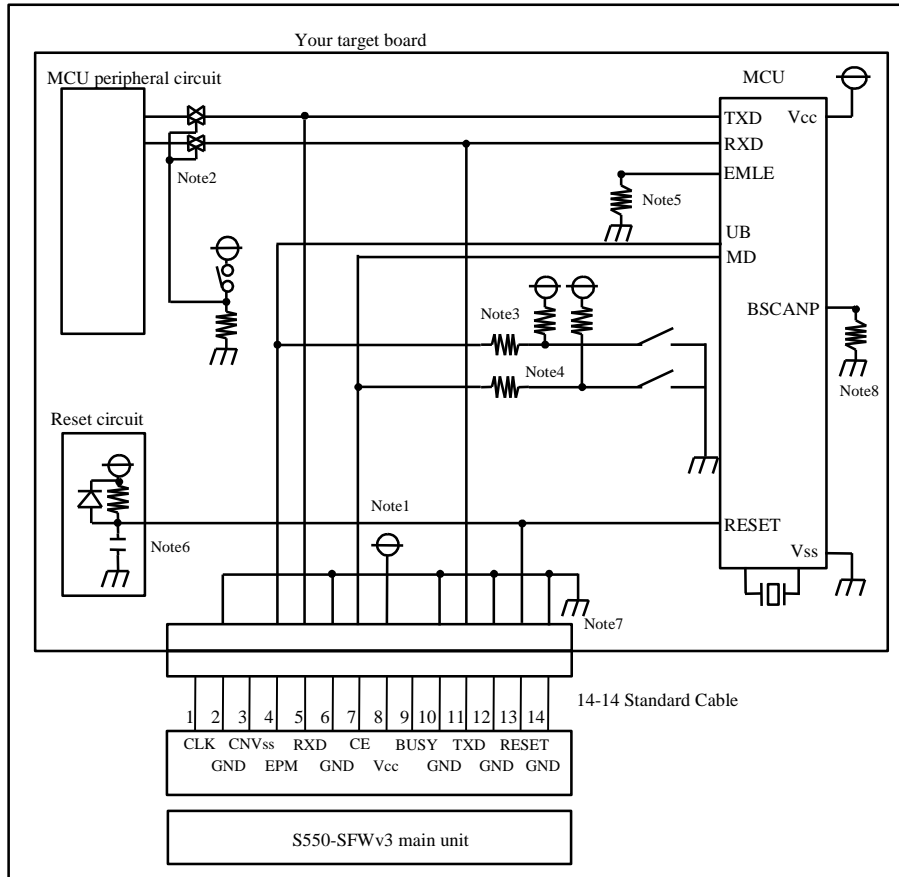
[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable	14-20 Custom1 Cable	14-14 Custom2 Cable (E1 compatibility)
1	-	RESET	NC
2	GND	GND	GND
3	-	-	NC
4	UB#	GND	NC
5	RXD	UB#	RXD
6	GND	GND	NC
7	MD	MD	MD
8	Vcc	GND	Vcc
9	-	-	NC
10	GND	NC	UB#
11	TXD	NC	TXD
12	GND	NC	GND
13	RESET	NC	RESET
14	GND	NC	GND
15		RXD	
16		GND	
17		TXD	
18		NC	
19		-	
20		Vcc	

'NC': no connection
'-': not connect

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.
* Note that "14-20 Custom1 Cable (model: S550-SFW-CB1)" and "14-14 Custom2 Cable (model: S550-SFW-CB2)" serves as an option.

2.23. RX230, RX231 Group and selecting "Generic BOOT (UART)"

[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD and RXD terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. Pull these signals up by more than 4.7kΩ resistance.

Note 3. Connect UB terminal to the EPM terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down UB terminal and isolate without connecting to EPM terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 4. Connect MD terminal to the CE terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down MD terminal and isolate without connecting to CE terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 5. If there is EMLE terminal, pull down it with more than 4.7kΩ resistance.

Note 6. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 7. Vss terminal is signal ground. Be sure to connect it.

Note 8. If there is BSCANP terminal, pull down it with more than 4.7kΩ resistance.

* **Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.**

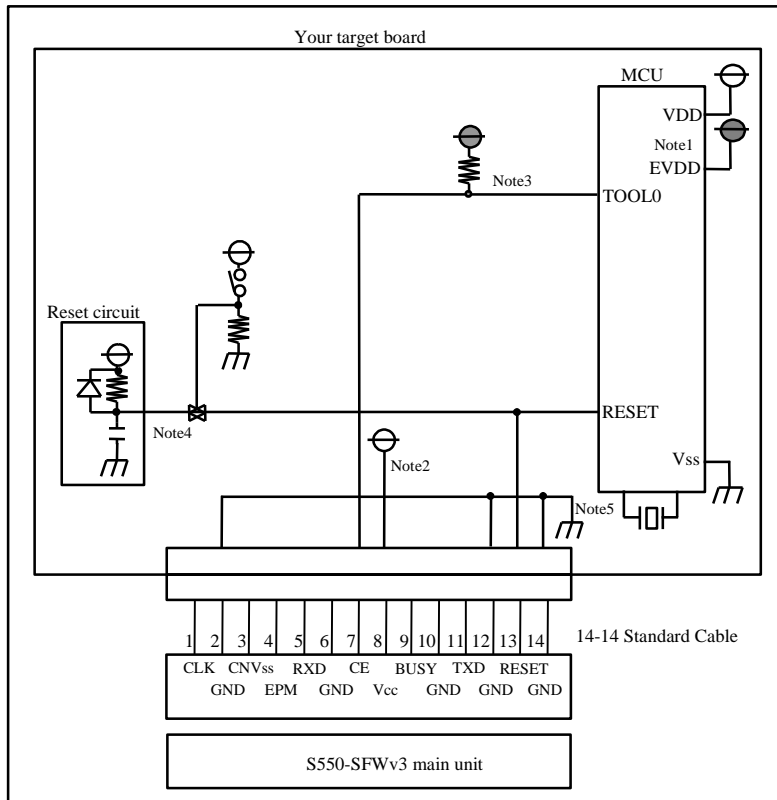| Pin Number#	14-14 Standard Cable	14-20 Custom1 Cable	14-14 Custom2 Cable (E1 compatibility)
1	-	RESET	NC
2	GND	GND	GND
3	-	-	NC
4	PC7	GND	NC
5	RXD	PC7	RXD
6	GND	GND	NC
7	MD	MD	MD
8	Vcc	GND	Vcc
9	-	-	NC
10	GND	NC	PC7
11	TXD	NC	TXD
12	GND	NC	GND
13	RESET	NC	RESET
14	GND	NC	GND
15		RXD	
16		GND	
17		TXD	
18		NC	
19		-	
20		Vcc	

'NC': no connection
'-': not connect

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.
* Note that "14-20 Custom1 Cable (model: S550-SFW-CB1)" and "14-14 Custom2 Cable (model: S550-SFW-CB2)" serves as an option.

2.24. RL78 Family and selecting "Single wire Clock-asynchronous serial I/O (Single-wire)"

[Circuitry Examples]

Note 1. Be sure to set it so that VDD is equal to EVDD.

Note 2. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 3. Connect TOOL0 terminal to the CE terminal on S550-SFWv3 by pulling-up with 1kΩ or more resistance. Do not connect a capacitor to this terminal.

Note 4. When the reset circuit on your target board is open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the isolation from the reset circuit by the jumper, analog switching, three-state, etc for CMOS output and CR delay circuit.

Note 5. Vss terminal is signal ground. Be sure to connect it.

* Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.

[Connector Pin Assignment]

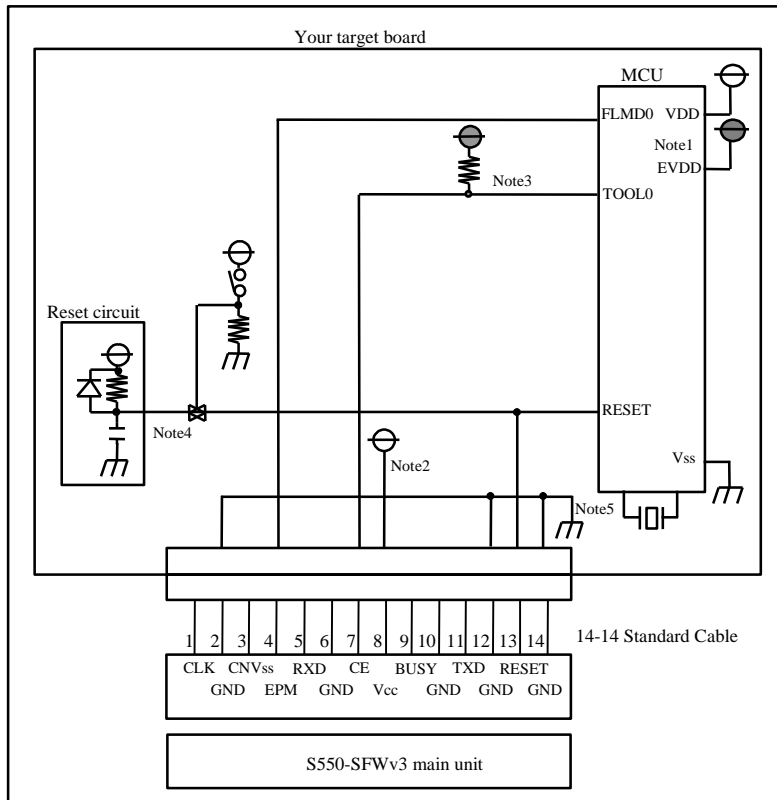| Pin Number#	14-14 Standard Cable	14-14 Custom4 Cable (E1 compatibility)
1	-	NC
2	GND	GND
3	-	NC
4	-	NC
5	-	TOOL0
6	GND	NC
7	TOOL0	NC
8	Vcc	Vcc
9	-	NC
10	GND	NC
11	-	NC
12	GND	GND
13	RESET	RESET
14	GND	GND

'NC': no connection
'-': not connect

* Note that "14-14 Custom4 Cable (model: S550-SFW-CB4)" serves as an option.

2.25. 78K Family and selecting "Single wire Clock-asynchronous serial I/O (Single-wire)"

[Circuitry Examples]

Note 1. Be sure to set it so that VDD is equal to EVDD.

Note 2. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 3. Connect TOOL0 terminal to the CE terminal on S550-SFWv3 by pulling-up with 1kΩ or more resistance. Do not connect a capacitor to this terminal.

Note 4. When the reset circuit on your target board is open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the isolation from the reset circuit by the jumper, analog switching, three-state, etc for CMOS output and CR delay circuit.

Note 5. Vss terminal is signal ground. Be sure to connect it.

*　Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.
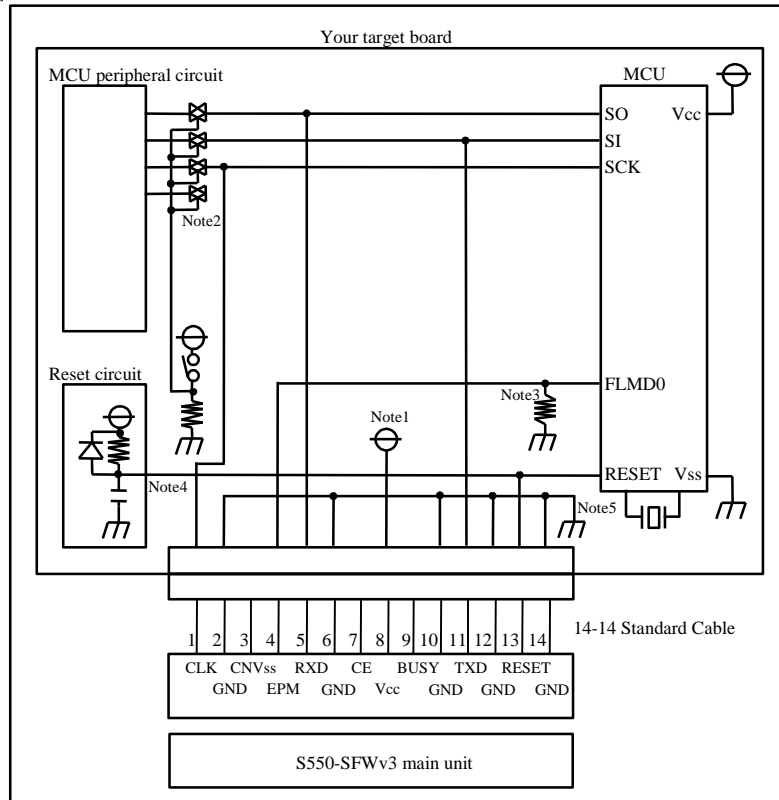
[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable
1	-
2	GND
3	-
4	FLMD0
5	-
6	-
7	TOOL0
8	Vcc
9	-
10	-
11	-
12	GND
13	RESET
14	GND

'-': not connect

2.26. 78K Family and selecting "3-Wire Serial I/O (Clock synchronous [NO HS])"

[Circuitry Examples]

Note 1. Power supply of S550-SFWv3 is provided by a user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate SO, SI and SCK terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. When pulling-up these signals, the resistance should be more than 4.7kΩ.

Note 3. Connect FLMD0 terminal to the CNVss on S550-SFWv3 by pulling-down with more than 4.7kΩ or more resistance. Do not connect a capacitor to this terminal. For other circuits, please consult with us.

Note 4. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 5. Vss terminal is signal ground. Be sure to connect it.

* Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.
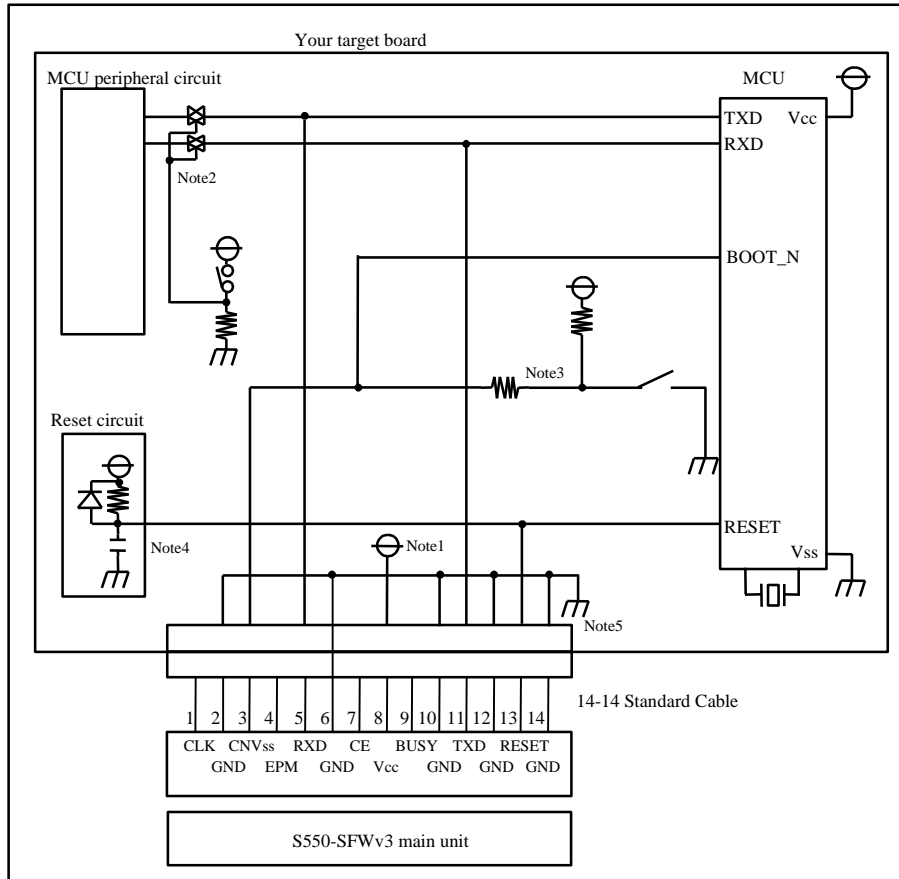
[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable
1	SCK
2	GND
3	-
4	FLMD0
5	RXD
6	GND
7	-
8	Vcc
9	-
10	GND
11	TXD
12	GND
13	RESET
14	GND

'-': not connect

2.27. M3H (2) Group in TXZ3 Series and selecting "Single-boot Mode (UART)"

[Circuitry Examples]

Note 1. When stand-alone programming, the power supply of S550-SFWv3 is provided by the user target board via Vcc pins. Connect the power source of the board to the Vcc terminal directly.

Note 2. Isolate TXD and RXD terminals from the MCU peripheral circuit, in case the jumper, analog switching, three-state, etc. are built in when serial programming. Isolation can be omitted when the signals to the peripheral circuit are in output status when seen from the target CPU. Pull these signals up by more than 4.7kΩ resistance.

Note 3. Connect BOOT_N terminal to the CNVss terminal on S550-SFWv3 by pulling-up with more than 4.7kΩ resistance. If there is a switch for mode setting on the target board, put protective resistance between S550-SFWv3 and the switch. You may also choose to pull-down BOOT_N terminal and isolate without connecting to CNVss terminal on S550-SFWv3. When it is not used in the peripheral circuit, you may fix at L level on the board directly.

Note 5. When the reset circuit on your target board is CR delay circuit or open collector output, or it is a circuit with constant current load of less than tens of micron amperes, connect to the RESET terminal on S550-SFWv3 directly. Execute the same procedure as "Note 2" for CMOS output.

Note 6. Vss terminal is signal ground. Be sure to connect it.

*   Please check the hardware manual or the Data sheet of each microcomputer along with this connection circuitry example.

[Connector Pin Assignment]

Pin Number#	14-14 Standard Cable
1	-
2	GND
3	BOOT_N
4	-
5	RXD
6	GND
7	-
8	Vcc
9	-
10	GND
11	TXD
12	GND
13	RESET
14	GND

'-': not connect

*Note that signal names and directions are the ones seen from the programmer side.
Especially the signals for 5:RXD and 11:TXD would be other way around when seen from the target side.

Version	Revised contents	Revised date
Rev.A	First edition	2012/03/07
Rev.B	"2.18" has been added. "2.19" has been added.	2012/10/18
Rev.C	2. Circuitry Examples - Custom cable model have been added.	2013/04/05
Rev.D	"2.20" has been added. "2.21" has been added. "2.24" has been added.	2015/06/12
Rev.E	"2.19" has been changed. (Add RX23T)	2015/10/28
Rev.F	"2.18" has been changed. (Add RX231) "2.19" has been changed. (Add RX130, RX24T) "2.21" has been changed. (Add RX113)	2016/04/25
Rev.G	"2.13" through "2.21" - Add note for the case of isolating without connecting to S550-SFWv3 about terminals on MCU connecting CNVss terminal, EPM terminal, CE terminal or BUSY terminal on S550-SFWv3. "2.13" through "2.21" and "2.23" - Change using cable on Circuitry Examples from Custom Cable to Standard Cable. "2.18" has been changed. (Move RX231 to "2.22") "2.19" has been changed. (Add RX24U) "2.22" has been added.	2018/01/25
Rev.H	"2.17" through "2.20", "2.22" and "2.23" - Change Connector Pin Assignment for Pin #1 on 14-14 Custom 2 Cable to "NC". "2.19" has been added. (Add RX23E-A) "2.21" has been added. (Add RX651 and RX66T) "2.27" has been added. (Add M3H (2))	2020/02/04
Rev.I	"2.21" has been added. (Add RX65N)	2020/11/16