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MB2198-761-01-E/02-E

F^2MC-16FX Family MB96610 Evaluation Board Operation Guide

Doc. No. 002-05593 Rev. *A

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Preface

This document indicates directions for use about the "MB96610 evaluation board" which is the evaluation environment of MB96610 series of a F^{2}MC-16FX-16bit microcontroller*.

*: Referred to MCU below.

■ Using the product safely

This manual contains important information for using this product safely.

Be sure to read this manual before using the product, and to follow the directions given in this manual in order to use the product correctly.

In particular, thoroughly read "Caution of the product described in this manual" at the start of this document, and perform a thorough safety check before using the product.

Store this manual in a safe location where it can easily be accessed at any time while you are using the product.

■ Related Manual

You should refer for following Manual as well:

☐ MCU Evaluation Board MB2198-760-E Operation Manual

Contents - MB96610 Evaluation Board

Quantity	Description	Part No.
1	MB96610 Evaluation Board with socket	MB2198-761-01-E
1	MB96610 Evaluation Board without socket (direct mounted)	MB2198-761-01-E

■ European RoHS compliance

Products with an -E suffix on the part number are European RoHS compliant products.

■ Notice on this document

All information included in this document is current as of the date it is issued. Such information is subject to change without any prior notice.

Please confirm the latest relevant information with the sales representatives.

■ Target products

The available products with this evaluation board are shown below.

Series	Product Number (not included Package suffix)
MB96610	MB96F612R, MB96F612A MB96F613R, MB96F613A MB96F615R, MB96F615A

■ Caution of the product described in this manual

The following precautions apply to the product described in this manual.

⚠ **WARNING**	Indicates a potentially hazardous situation which could result in death or serious injury and/or a fault in the user's system if the product is not used correctly.

Electric shock, Damage	Before performing any operation described in this manual, turn off all the power supplies to the system. Performing such an operation with the power on may cause an electric shock or device fault.
Electric shock, Damage	Once the product has been turned on, do not touch any metal part of it. Doing so may cause an electric shock or device fault.

⚠ **CAUTION**	Indicates the presence of a hazard that may cause a minor or moderate injury, damages to this product or devices connected to it, or may cause to loose software resources and other properties such as data, if the device is not used appropriately.

Cuts, Damage	Before moving the product, be sure to turn off all the power supplies and unplug the cables. Watch your step when carrying the product. Do not use the product in an unstable location such as a place exposed to strong vibration or a sloping surface. Doing so may cause the product to fall, resulting in an injury or fault.
Damage	Do not place anything on the product or expose the product to physical shocks. Do not carry the product after the power has been turned on. Doing so may cause a malfunction due to overloading or shock.
Damage	Since the product contains many electronic components, keep it away from direct sunlight, high temperature, and high humidity to prevent condensation. Do not use or store the product where it is exposed to much dust or a strong magnetic or electric field for an extended period of time. Inappropriate operating or storage environments may cause a fault.
Damage	Use the product within the ranges given in the specifications. Operation over the specified ranges may cause a fault.
Damage	To prevent electrostatic breakdown, do not let your finger or other object come into contact with the metal parts of any of the connectors. Before handling the product, touch a metal object (such as a door knob) to discharge any static electricity from your body.
Damage	When installing the sub board, align the key positions of main board connector and sub board connector, and fix with the screw set before use. When removing, remove all screws of screw set, then remove the sub board vertically from the main board. Otherwise, the product may be damaged, such as corruption of the connector section.
Damage	Because the product has no casing, it is recommended that it be stored in the original packaging. Transporting the product may cause a damage or fault. Therefore, keep the packaging materials and use them when re-shipping the product.

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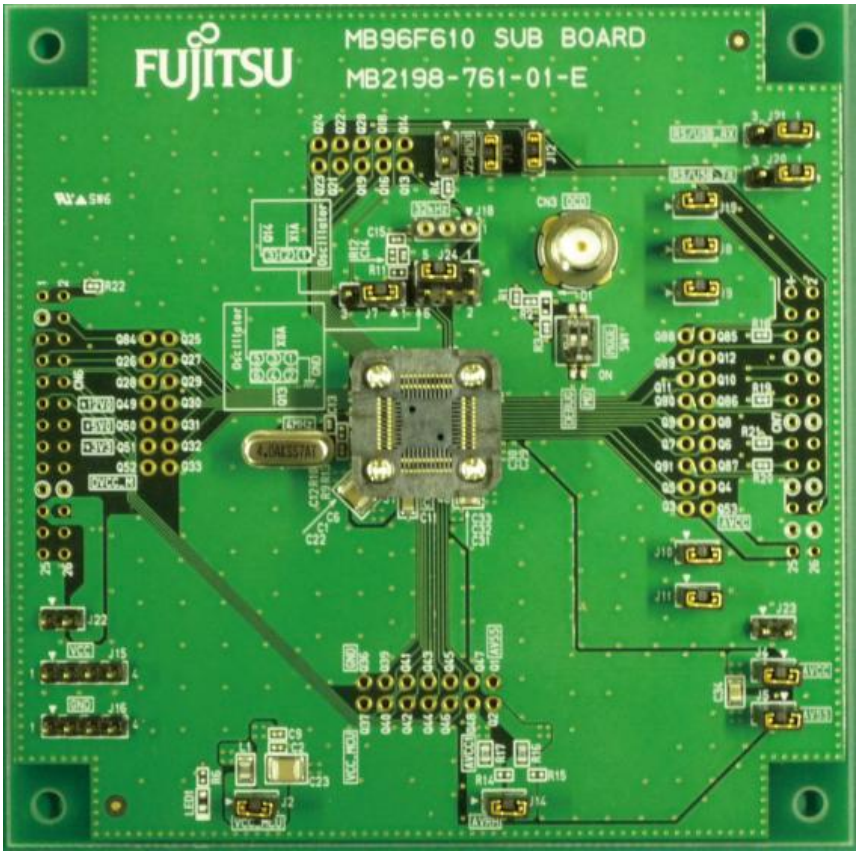
1. Overview

The MB96610 Evaluation Board provides the evaluative environment of the MB96610 series MCU

Figure 1-1. MB96610 Evaluation Board



1.1 Functional overview

This board can mount MCU (with or without socket).

The location of the main function is shown as follows.

Figure 1-2. MB96610 Evaluation Board functional overview

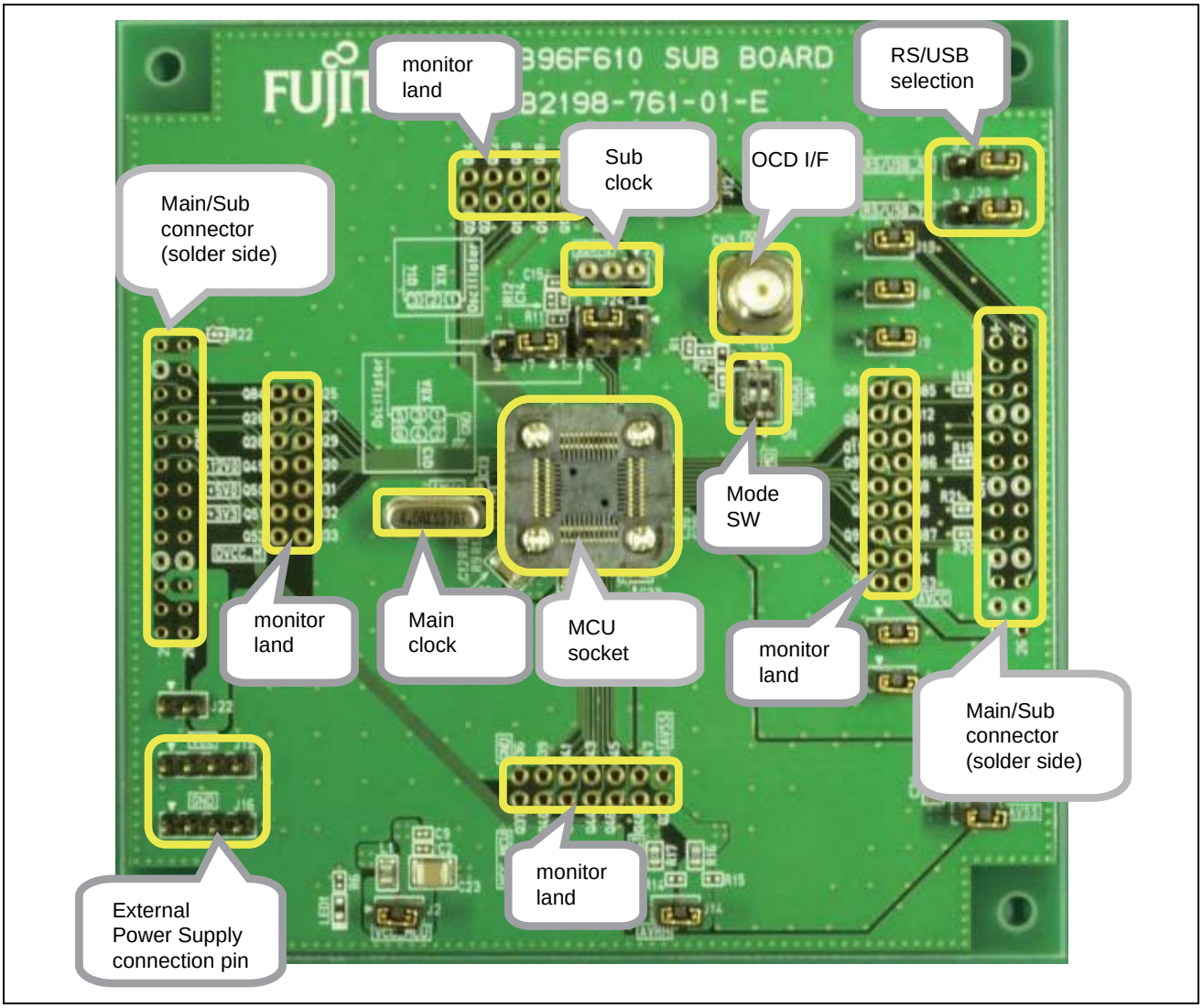


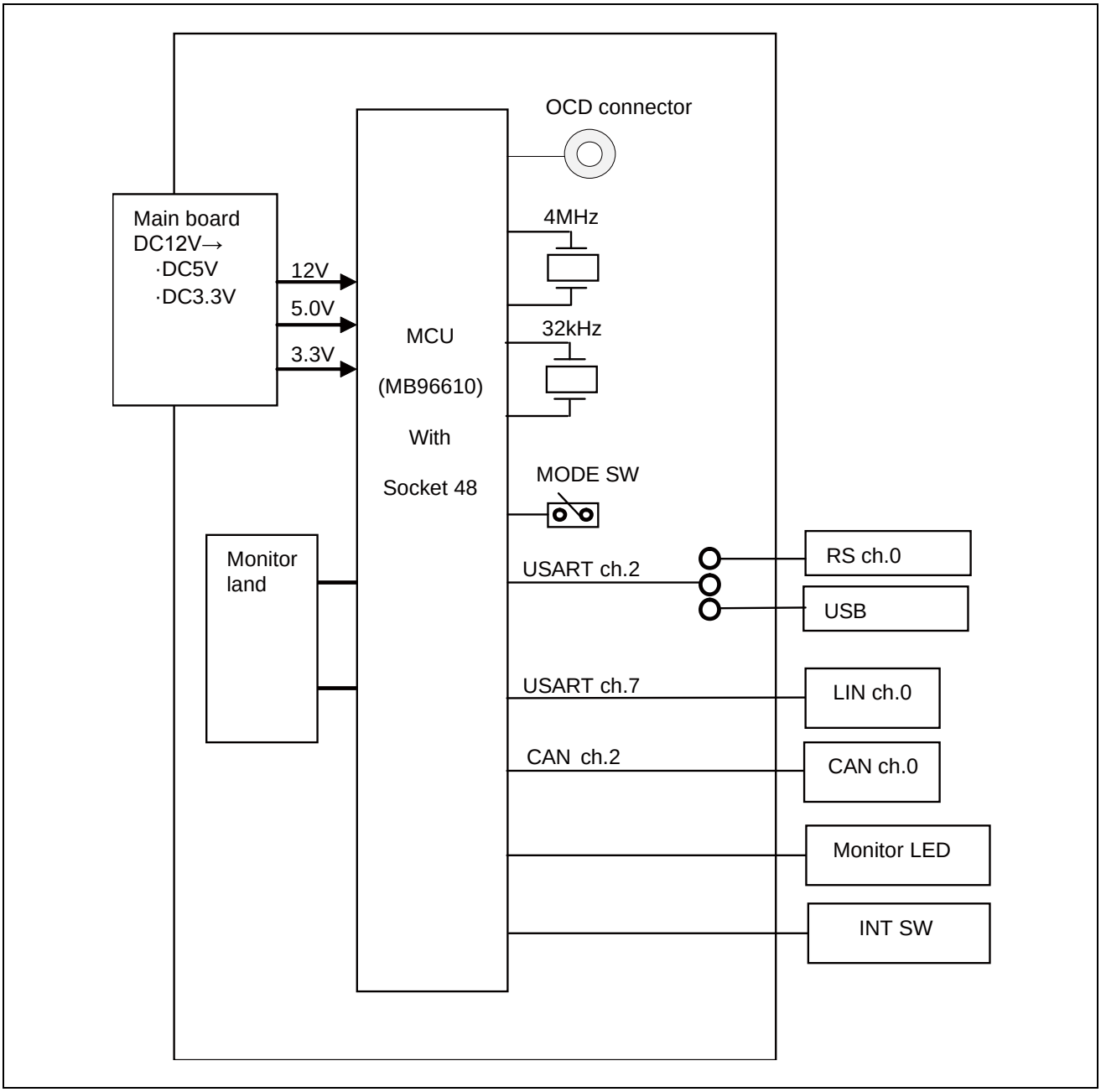
Table 1-1. MB96610 Evaluation Board function list

Function	Specification	Remarks
MCU	MB96F610 with socket or direct mounted	with socket NQPACK048SD-ND HQPACK048SD
Oscillator	Main clock 4MHz Sub clock 32.768kHz	with socket
External power supply connection	External power supply connection (DC3.3V to 5.0V)	
OCD connector	OCD debugger(MB2100-01-E) Connection	
MODE SW	MB96610 mode switch	
NMIX SW	MB96610 pin monitor land	
RS/USB select	UART ch.0 connect to RS/USB by 3pin Jumper for transmission and reception.	
Main/sub connector	26pins (2 rows × 13 pins) connector × 2 Connect to a connector on the Main board (mounted solder side)	2.54mm pitch

1.2 Block diagram

The block diagram of this board is shown below.

Figure 1-3. MB96610 Evaluation Board Block Diagram



2. Functional Details

The functional details of this board are shown as following.

2.1 Power supply settings

Please confirm the following jumpers are closed.
(J2, J4, J5, J14)

Figure 2-1. Power supply jumpers location

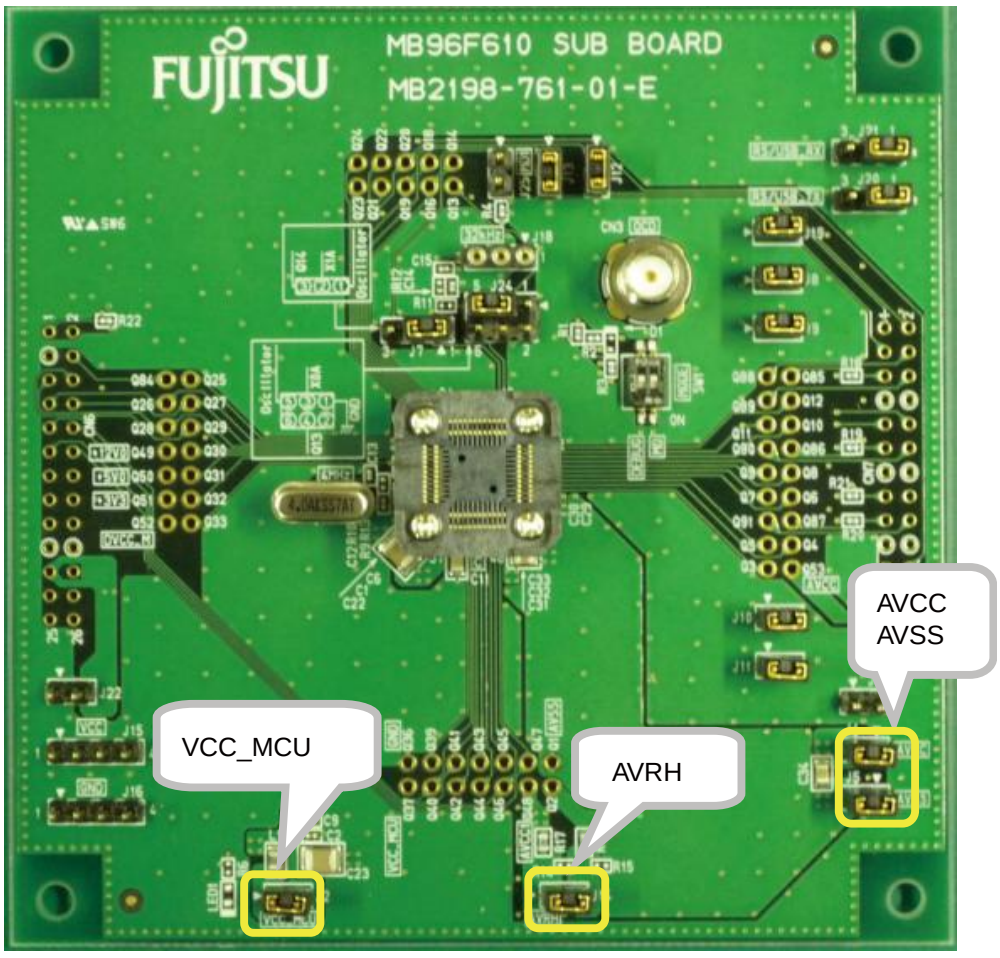


Table 2-1. Power supply jumpers function

Jumper	Function	Setting
J2	[VCC_MCU] Power supply for VCC pin	Close (default) : ON Open : OFF
J14	[AVRH] Power supply for AVRH pin	Close (default) : ON Open : OFF
J4	[AVCC] Power supply for AVCC pin	Close (default) : ON Open : OFF
J5	[AVSS] Power supply for AVSS pin	Close (default) : ON Open : OFF

2.2 Sub clock settings

The sub clock connection can be set as follows by J7 and J24.
The settings of these jumpers is shown below.
Note: A sub clock oscillator is not mounted in default. (Xtal 32.768kHz)

Figure 2-2. Sub clock jumpers location

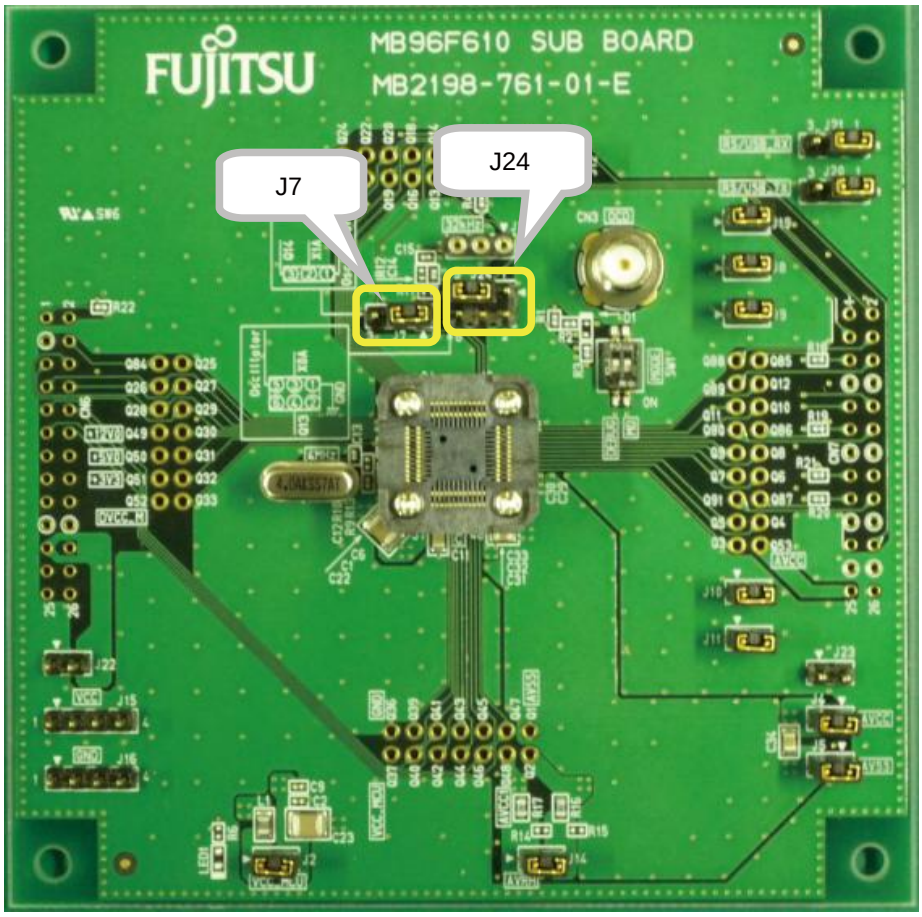


Table 2-2. J7 setting

Setting	X1A connection select
1-2	X1A connect to sub clock (default)
2-3	X1A connect to Q14

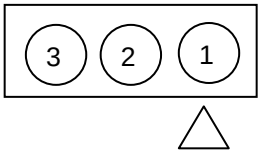
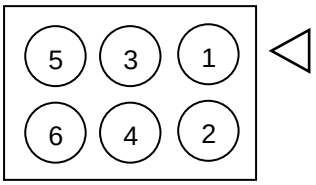


Table 2-3. J24 setting

Setting	X0A connection select
1-3	X0A connect to GND
3-5	X0A connect to sub clock (default)
3-4	X0A connect to Q13



2.3 UART ch.0 select jumper

The connection destination of the UART ch.0 signal can be selected by J20/J21.
These jumpers location and settings are shown below.

Figure 2-3. UART ch.0 select jumper location

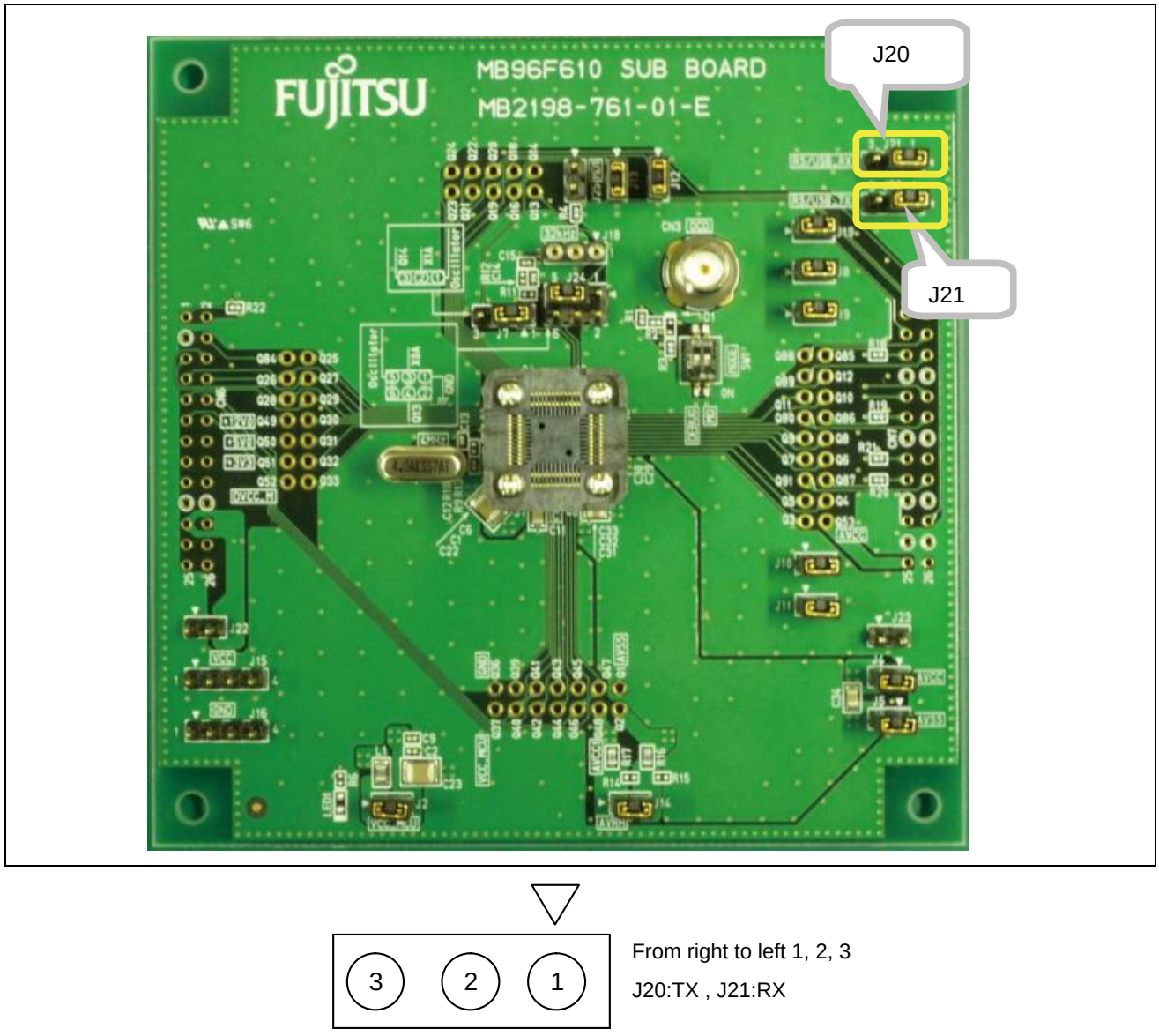


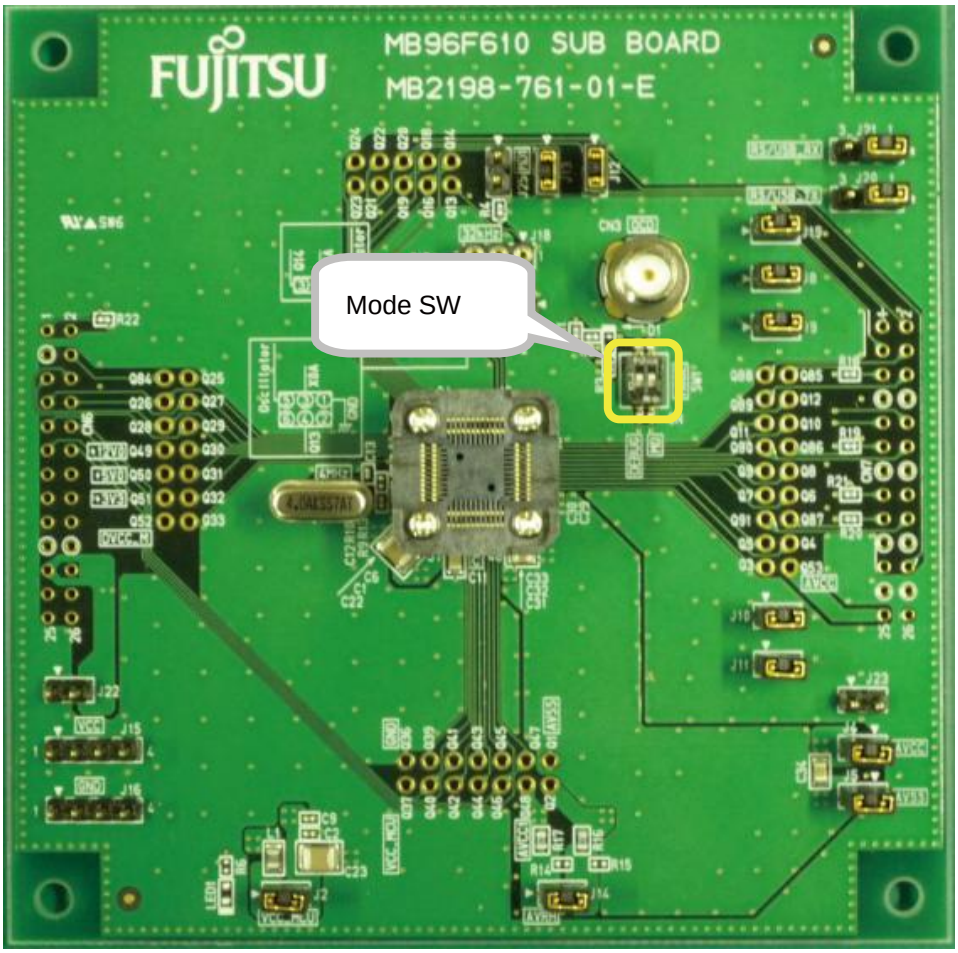
Table 2-4. J20, J21 setting

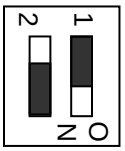
Setting	Function select
1-2	RS232C (default)
2-3	USB

2.4 Mode SW settings

The selection of the operational mode of MCU can be set by SW1 as follows.
The mode switch location and settings are shown below.

Figure 2-4. Mode SW location





bit1:MD , bit2:DEBUG

Table 2-5. Mode SW setting (SW1)

ON	OFF	Mode SW setting
1,2	-	MB96610 : serial writer mode
1	2	MB96610 : user mode (default)

2.5 OCD (On chip debugger) interface

The MB96610 evaluation board can operate software "Softune" for debugging by connecting Cypress OCD-E (on chip debugger). The OCD connector location and settings are shown below.

Figure 2-5. OCD cable connect location

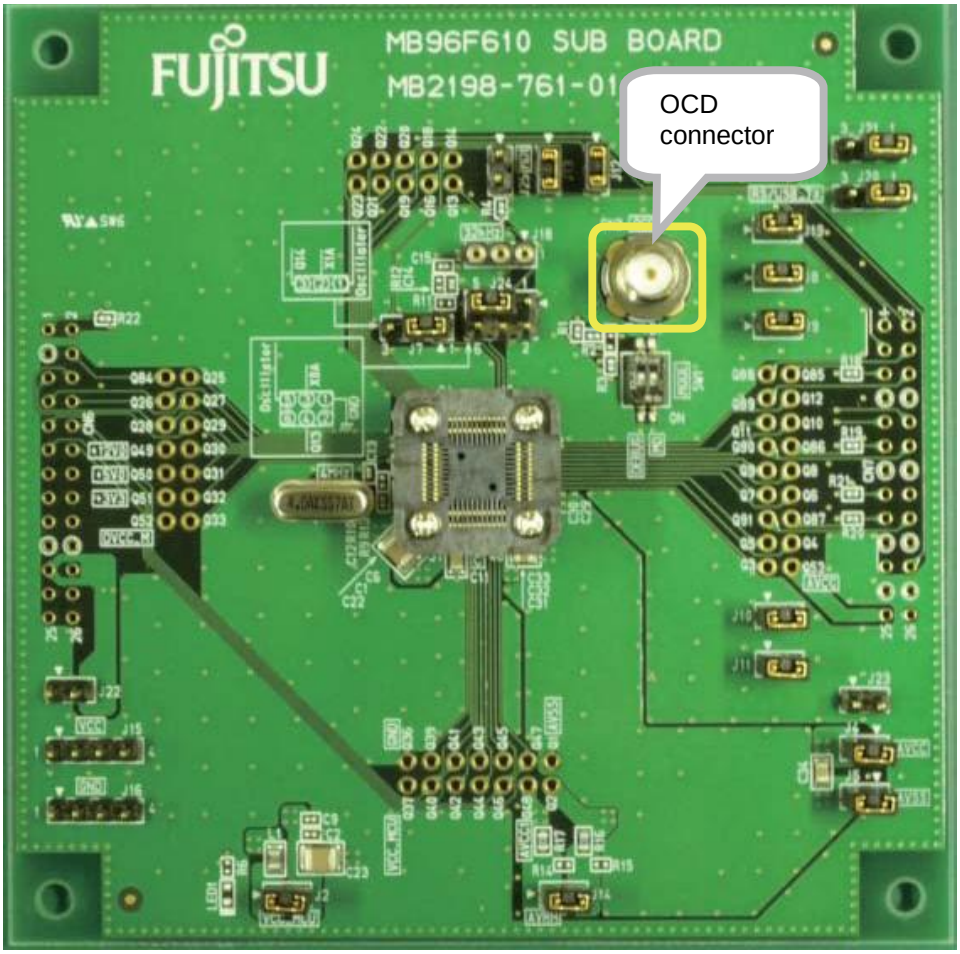
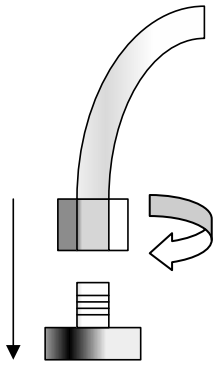


Figure 2-6. How to connect OCD-E



Please turn the coaxial cable appended to Cypress OCD-E(MB21000-01-E) as shown in a left chart.

2.6 Other jumper settings

These jumpers are in order to free the MCU pin from on board peripherals.

Table 2-6. Isolate jumpers location

Jumper	Signal
J12	LIN I/F ch.0 : RX
J13	LIN I/F ch.0 : TX
J8	RS I/F ch.0 (USB): RX
J9	RS I/F ch.0 (USB): TX
J10	CAN I/F ch.0 : RX
J11	CAN I/F ch.0 : TX
J19	LIN_NSLP0
J2	VCC_MCU : MCU power supply
J4	AVCC : analog power supply
J5	AVSS : analog ground
J14	AVRH : analog reference power supply

2.7 Signal monitor

The correspondence of the monitor land and the MCU pin number is shown as follows. (Q numbers are equal to MCU pin numbers.)

Table 2-7. Monitor land list

Q	Pin No.	Q	Pin No.	Q	Pin No.
2	2	21	21	43	43
3	3	22	22	44	44
4	4	23	23	45	45
5	5	24	24	46	46
6	6	25	25	47	47
7	7	26	26		
8	8	27	27		
9	9	28	28		
10	10	29	29		
11	11	30	30		
12	12	31	31		
13	13	32	32		
14	14	33	33		
16	16	39	39		
18	18	40	40		
19	19	41	41		
20	20	42	42		

2.8 Main board connection

The connection of MCU and I/O on the main board is shown below.

- **General-purpose LED**

The correspondence table for the general-purpose LED mounted on the main board and the MCU pin number is shown below.

Table 2-8. General-purpose LED

MONITOR LED	Parts number	MB96610	
		Pin number	Pin name
LED0	LED28	46	P6_0
LED1	LED29	47	P6_1
LED2	LED32	40	P3_0
LED3	LED33	41	P3_1
LED4	LED36	26	P1_4
LED5	LED37	27	P1_5
LED6	LED40	28	P1_6
LED7	LED41	29	P1_7

- **Interrupt SW**

The correspondence of interruption SW mounted on the main board and the MCU pin number is shown below.

Table 2-9. Interrupt switch

INT SW	Parts number	MB96610	
		Pin number	Pin name
INT0	SW4	11	P05_6 (INT4_R)
INT1	SW7	23	P00_3 (INT11)
INT2	SW9	21	P00_4 (INT12)
INT3	SW11	22	P00_5 (INT13)

- **NMI SW**

The correspondence of NMI SW mounted on the main board and the MCU pin number is shown below.

Table 2-10. NMI switch

NMI SW	Parts number	MB96610	
		Pin number	Pin name
NMI	SW3	12	NMI

- **Reset SW**

The correspondence of RESET SW mounted on the main board and the MCU pin number is shown below.

Table 2-11. RESET switch

Reset SW	Parts number	MB96610	
		Pin number	Pin name
RESET	SW2	33	RSTX

- **Volume SW**

The correspondence of Volume SW mounted on the main board and the MCU pin number is shown below.

Table 2-12. Volume switch

Volume SW	Parts number	MB96610	
		Pin number	Pin name
Volume	VR1	3	P06_3 (AN3)

3. Power-ON

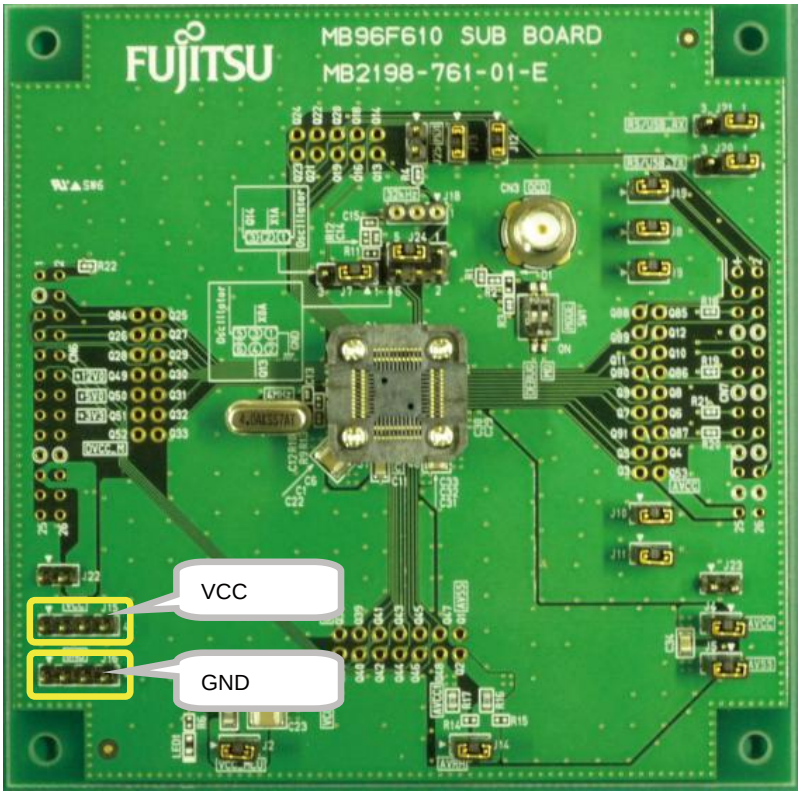
Basically, this board cannot turn on the power supply alone.

Please mount on the main board(MB2198-760-E) and use it.

3.1 FOR TEST USE ONLY, External power supply connection pin

The external power supply connection position is shown as follows.
(VCC = 3.3V to 5.0V)
When you connect an external power supply to this pin, and you use alone this board, please short-circuit J22 (DVCC) and J23 (AVCC).

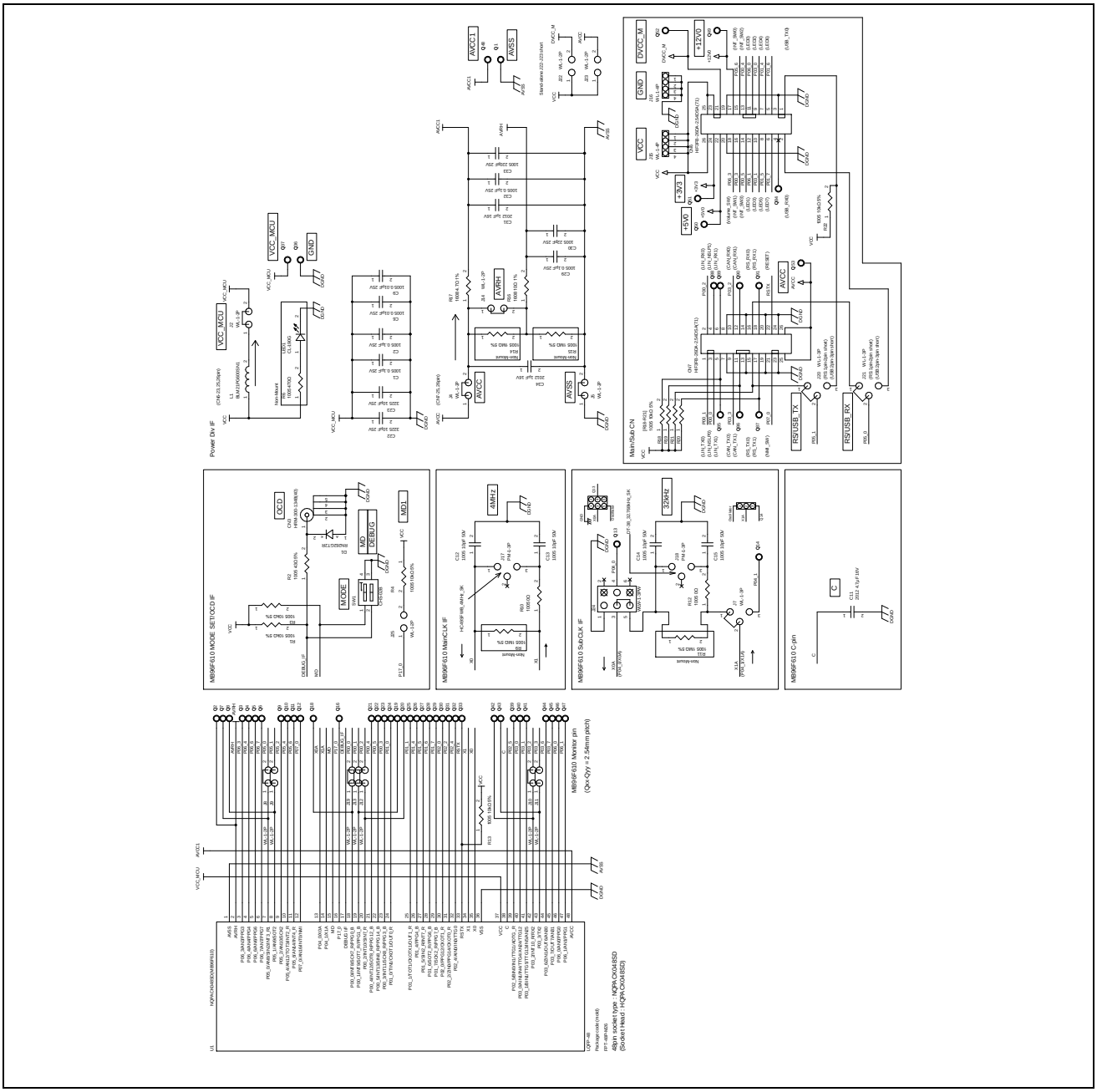
Figure 3-1. External power supply connection pin location



3.2 Power-ON

Please follow the user's manual for the Main board(MB2198-760-E).

4. Circuit Diagram



5. Recycling

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According to the European WEEE-Directive and its implementation into national laws we take this device back.

For disposal please send the device to the following address:

Cypress Semiconductor

198 Champion Court

San Jose, CA 95134-1709

Gültig für EU-Länder:

Gemäß der Europäischen WEEE-Richtlinie und deren Umsetzung in landesspezifische Gesetze nehmen wir dieses Gerät wieder zurück.

Zur Entsorgung schicken Sie das Gerät bitte an die folgende Adresse:

Cypress Semiconductor

198 Champion Court

San Jose, CA 95134-1709



6. China-RoHS Regulation

Compliance with Administration on the Control of Pollution Caused by Electronic Information Products of the People's Republic of China



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产品中有毒有害物质或元素的名称及含量

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷线路板	×	○	○	○	○	○
电源	○	○	○	○	○	○

○：表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T 11363-2006规定的限量要求以下。
×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T 11363-2006 规定的限量要求。

Revision History

Document Revision History

Document Title: MB2198-761-01-E/02-E F^{2}MC-16FX Family MB96610 Evaluation Board Operation Guide Document Number: 002-05593			
Revision	**Issue Date**	**Origin of Change**	**Description of Change**
**	07/19/2012	MITK	Initial release
*A	04/29/2016	MITK	Migrated Spansion Guide from SS704-00001-1v0-E to Cypress format