To our customers,

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April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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User's Manual

M66592FP Utility Board M3A-0038G01

Instruction Manual

Renesas Electronics
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Rev.1.02 2006.12

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CONTENTS

The product composition is shown below. Please check that all the following products are complete before use.

Model Name	Contents	Quantity
M3A-0038G01	M66592FP Utility Board	1
RJJ11F0001	M3A-0038G01 Instruction Manual (Japanese)	1
REJ11F0001	M3A-0038G01 Instruction Manual (English)	1

This product is thus complied with European RoHS Directive.

The restriction of the use of certain Hazardous Substances in electrical and electronic equipment.

M66592FP user is provided gratuitously with "USB Sample Firmware" for M66592FP evaluation.
For the details, please contact Renesas Technology or your distributor or check information on the following homepages.

Renesas Technology Homepage:

http://www.renesas.com

For Renesas production support, contact to Customer Support Center:

csc@renesas.com

Inquiry about This Product

Please contact your distributor for technical support or Renesas production support for your technical inquiry via email.

Note: Please enter product number, your facsimile number, your phone number, your name, department, and organization in your inquiry email.

1. Summary

M3A-0038G01 is an evaluation board for Renesas original Hi-Speed USB ASSP M66592FP.

The model name, package and package description of the chip that is mounted on the board is following.

Board	Chip Model Name	Package Model	Package Description
M3A-0038G01	M66592FP	64P6Q-A	Plastic 64pin 10×10mm body LQFP

The board has the following features:

(1) By connecting this board to a control board using the interface connector, it is possible to do evaluation on the user system.

(2) A solder pattern (symbol name L2) is prepared on the USB signal line for chip common mode choke coil (Murata Manufacturing Co., Ltd. made), it is possible to do EMI suppression evaluation. *1

(3) A solder pattern (symbol name U2) is prepared on the USB signal line for ESD protection device (Renesas Technology Corporation made), it is possible to do ESD protection evaluation. *2

(4) It is possible to supply 1.5V to core power of M66592FP, and 3.3V or 1.8V to interface power VIF of M66592FP.

(5) It is possible to select separate bus mode or multiplex bus mode for M66592FP.

(6) It is possible to test M66592FP's functions (excluding split bus) by connecting with M3A-0033 board*3.

Note: *1, *2 : Though the influence on the eye diagram of these parts has been confirmed, please fully evaluate other influences in user system.

*3 : M3A-0033 board is the Renesas USB ASSP evaluation motherboard.

2. Outline

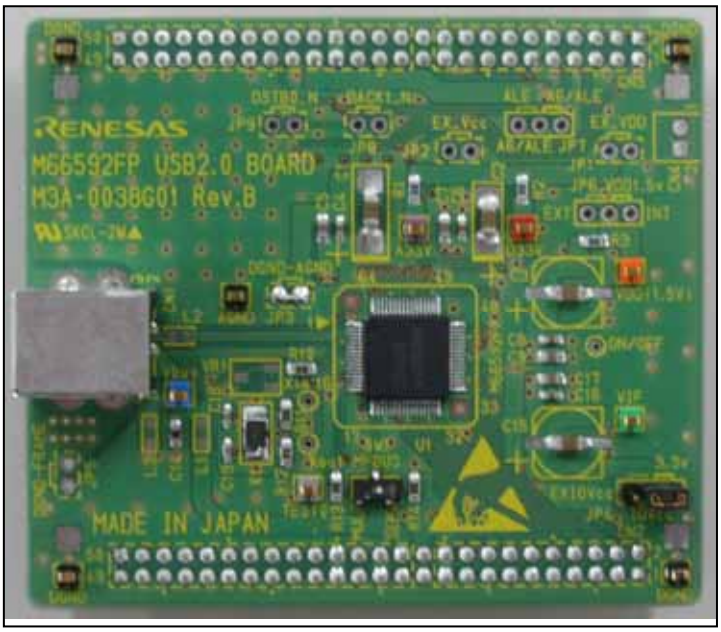


Figure 1. M3A-0038G01 Board Top View

3. Specification

Board Size	70 mm × 80 mm
Supply power	VDD: 1.5V
	AFEA33V, AFED33V 3.3V
	VIF: 3.3V or 1.8V
Interface:	50-pin Connector × 2 (2.54 mm pitch, dual straight header, male type)
	USB Connector (B Type)

3.1 Connector Description

Connectors CN2 and CN3 provide all bus interface pins of the chip such as processor bus interface and DMA interface. Therefore, these pins provide the same pin characteristics of M66592FP such as electric characteristic, IO direction, and functions except for the signal with *. The following tables show the pin number and function correspondences.

Pin Description of M66592FP	Connector	Pin Number of Connector	Function of M66592FP
D15-8	CN2	2-9(D15-8)	Data bus (I/O)
D6/AD6-D1/AD1	CN2	12-17(D6/AD6-D1/AD1)	Data bus or shared address bus for multiplex bus mode (I/O)
D7, D0	CN2	11, 18	Data bus (I/O)
SD7-0	CN2	41-48(SD7-0)	Split bus (DMA Interface) (I/O)
A5-1	CN3	16-12	Address bus (I)
A6/ALE	CN3	17(to connect ALE to CN3-21, please refer chapter 4 JP7)	Address bus or ALE for multiplex bus mode (I/O)
WR0_N*	CN3	1	Write strobe (I)
WR1_N*	CN2	23	Write strobe (I)
RD_N*	CN3	3	Read strobe (I)
CS_N*	CN3	5	Chip select (I)
RST_N***	CN3	6	Reset (I)
Vbus	CN2	24	Vbus (O)
EXIOVcc (VIF)	CN2	25, 26	Interface power supply (I)
DREQ0_N, DREQ1_N	CN3	7, 26	DMA request (O)
DACK0_N **	CN3	8	DMA Acknowledge (I)
DACK1_N/DSTB0_N **	CN3	25, 35	DMA Acknowledge (I) / Data strobe for DREQ0_N (I)
INT_N	CN3	9	Interrupt request (O)
VDD (EX_VCC)	CN3	19, 20	Power supply (3.3V) (I)
GND	CN2	1, 10, 19, 20, 29, 30, 49, 50	GND
GND	CN3	2, 4, 10, 11, 18, 29, 30, 49, 50	GND
SOF_N	CN3	24	SOF pals (O)
DEND0_N, DEND1_N	CN3	36, 40	End of DMA transfer (I/O)
NC	CN2	21, 22	No pin
NC	CN2	27, 28, 31-40	No connect
NC	CN3	22,23,27,28,32-34,37-39,41-48	No connect

*: Pulled up with 10kΩ

**: Pulled up 1MΩ

***: Connected to GND with 0.1 μF

4. Jumper and Switch Setting

JP Number	Function	Factory Settings
JP1	It is necessary to short JP1 when supplying 3.3V from CN4.	Open
JP2	It is necessary to cut JP2's pattern when supplying 3.3 V from CN4.	Shorted
JP3	JP3 connects AGND and DGND outside M66592FP.	Shorted
JP5	It is necessary to cut JP5's pattern when dividing frame ground and signal ground.	Shorted

JP Number	Position	Function
JP4 (VIF)	"EXIOVcc"	Power is Supplied to VIF through CN2-25 and 26.
	"3.3V"	AFEA33V, AFED33V of M66592 and VIF are supplied from same source.

JP Number	Position	Function	Factory Settings
JP6 (VDD 1.5V)	"EXT"	CN3-31 are connected VDD of M66592.	"INT" (Shorted by pattern)
	"INT"	1.5V output of a regulator on the board is supplied to VDD of M66592.	

JP Number	Position	Function	Factory Settings
JP7	"ALE"	CN3-21 is connected ALE of M66592.	"A6/ALE" (Shorted by pattern)
	"A6/ALE"	CN3-17 are connected ALE of M66592.	

JP Number	Function		Factory Settings
	JP8 Short	JP9 Short	
JP8,JP9	CN3-25 is connected #61pin of M66592.	CN3-35 is connected #61pin of M66592.	Both JP8 and J9 are Shorted on the back surface of the board.

SW Number	Function	
SW1 (MPBUS)	Switch to "SEPA"	Separate bus mode is selected.
	Switch to "MULT"	Multiplex bus mode is selected.

5. Setup

This section illustrates how to use this board with a target board (MCU board) to connect to a PC or a hub.

5.1 Using with M3A-0033

M3A-0033 is the Renesas USB ASSP evaluation motherboard. It is possible to test M66592FP easily by combining with this board and M3A-0033. But, it isn't possible to test M66592FP's split bus.

(1) How to evaluate on M3A-0033

It is possible to functional evaluation of a firmware for M66592 using the remote debugger KD308 that is attached to M3A-0033. Please refer to M3A-0033 Instruction Manual "Chapter 5. Software Setup".

(2) Setting of switch and jumper

(a) Switching SW1 to "SEPA".

(b) Short JP4 to "3.3 V".

(3) Connecting M3A-0038G01 to M3A-0033

Insert CN2's #1-pin and #2-pin of M3A-0038G01 board to CN8's #1-pin and #2-pin of M3A-0033 to connect two boards together.

(4) Connect to HUB or PC

Supply power (DC5V) by CN1 of M3A-0033.

Connect USB cable's B connector to CN1 of M3A-0038G01 and then connect USB cable's A connector to HUB or PC.

5.2 Using with other boards

The board combined with this board (M3A-0038G01) is called a target board in description below.

M66592FP corresponds to a separate bus mode and multiplex bus mode. Switching SW1 of M3A-0038G01 according to the MCU to use. Below are notes for target board design.

5.2.1 Notes for target board design

(1) The receptacle of a target board should suit the size of this board (Refer to Figure 3 and Figure 4). Please make pin arrangement same as this board (Refer to Table 1 and Table 2). Please refer to the M3A-0038G01 part list and circuit diagram when selecting connector and pin arrangement.

(2) As incorrect insertion preventive measures, please carry out stuffing the pins of target board that correspond to 21-pin and 22-pin of CN2 of this board. When HKP-50FD2 of Honda Communication Industry is used as receptacle, GM-25K of this company suit as stuffing.

(3) The core power supply of M66592FP is 1.5V. A regulator makes 1.5V from 3.3V through 19-pin and 20-pin of CN3.

(4) The interface power supply VIF is 1.8V (1.7-2.0V) or 3.3V (3.0-3.6V). Short JP4 to "EXIOVcc" and supply interface power by 25-pin and 26-pin of CN2. Please short JP4 to "3.3V", when VIF is 3.3V same as core power supply. In this case, power supply to "EXIOVcc" is unnecessary.

(5) Please use SD0-SD7 of CN2 when using split bus for DMA. SD0-SD7 can be used also as a general-purpose port.

(6) Processing for no connect signal: Please refer to M66592 datasheet for detail.

SD0-SD7: Keep open.
DREQn_N: Keep open.
DACKn_N: It is pulled up with 1MΩ to VIF in M3A-0038G01 board.
DENDn_N: Keep open.
SOF_N: Keep open.

5.2.2 Separate bus mode

Please switch SW1 of M3A-0038G01 board to "SEPA" when using as separate bus mode. Use A1-A6 of CN3 as address bus.

5.2.3 Multiplex bus mode

Please switch SW1 of M3A-0038G01 board to "MULT" when using as multiplex bus mode. Use AD1-AD6 of CN3 as address line share with data line. Keep open A1-A5 of CN3. Use 17-pin (A6/ALE) of CN3 as ALE.

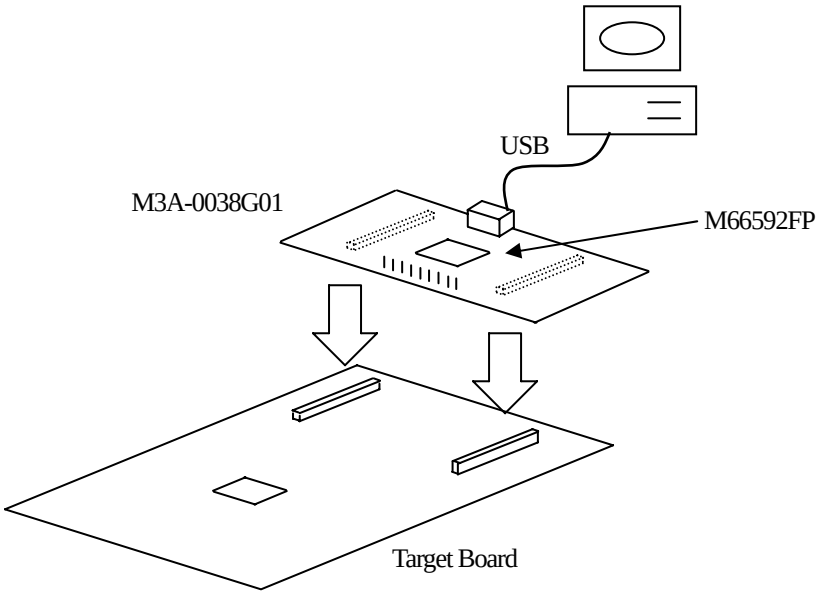


Figure 2. Target Board Connection Illustrator

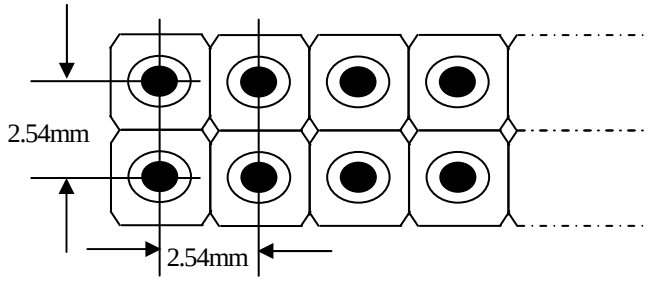


Figure 3. Pin Pitch of Connectors CN2 and CN3

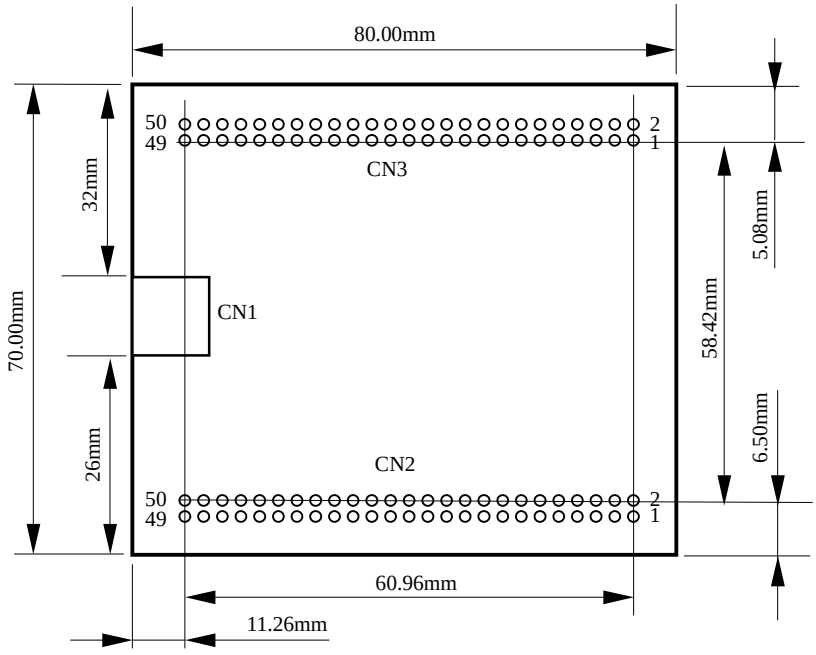


Figure 4. Pin Direction of Connector CN2 and CN3 (Top View)

Table 1. M3A-0038G01 CN2 Pin Assignment

PIN	16bit-sepa *1	16bit-multi *2	PIN	16bit-sepa *1	16bit-multi *2
1	GND	GND	2	D15	D15
3	D14	D14	4	D13	D13
5	D12	D12	6	D11	D11
7	D10	D10	8	D9	D9
9	D8	D8	10	GND	GND
11	D7	D7	12	D6	D6/AD6
13	D5	D5/AD5	14	D4	D4/AD4
15	D3	D3/AD3	16	D2	D2/AD2
17	D1	D1/AD1	18	D0	D0
19	GND	GND	20	GND	GND
21	No Available	No Available	22	No Available	No Available
23	WR1_N	WR1_N	24	VBUS	VBUS
25	EXIOVcc	EXIOVcc	26	EXIOVcc	EXIOVcc
27			28		
29	GND	GND	30	GND	GND
31			32		
33			34		
35			36		
37			38		
39			40		
41	SD7	SD7	42	SD6	SD6
43	SD5	SD5	44	SD4	SD4
45	SD3	SD3	46	SD2	SD2
47	SD1	SD1	48	SD0	SD0
49	GND	GND	50	GND	GND

Table 2. M3A-0038G01 CN3 Pin Assignment

PIN	16bit-sepa *1	16bit-multi *2	PIN	16bit-sepa *1	16bit-multi *2
1	WR0_N	WR0_N	2	GND	GND
3	RD_N	RD_N	4	GND	GND
5	CS_N	CS_N	6	RST_N	RST_N
7	DREQ0_N	DREQ0_N	8	DACK0_N	DACK0_N
9	INT_N	INT_N	10	GND	GND
11	GND	GND	12	A1	Unused
13	A2	Unused	14	A3	Unused
15	A4	Unused	16	A5	Unused
17	A6	ALE	18	GND	GND
19	EXVcc	EXVcc	20	EXVcc	EXVcc
21	Unused	(JP7-ALE)	22		
23			24	SOF_N	SOF_N
25	DACK1_N/DSTB0_N	DACK1_N/DSTB0_N	26	DREQ1_N	DREQ1_N
27			28		
29	GND	GND	30	GND	GND
31	JP6-EXT(External 1.5V Input)	JP6-EXT(External 1.5V Input)	32		
33			34		
35	DACK1_N/DSTB0_N	DACK1_N/DSTB0_N	36	DEND0_N	DEND0_N
37			38		
39			40	DEND1_N	DEND1_N
41			42		
43			44		
45			46		
47			48		
49	GND	GND	50	GND	GND

*1: When select 16bit-Separate Bus mode

*2: When select 16bit-Multiplex Bus mode

Appendix1: Part List

Renesas Solutions Corporation

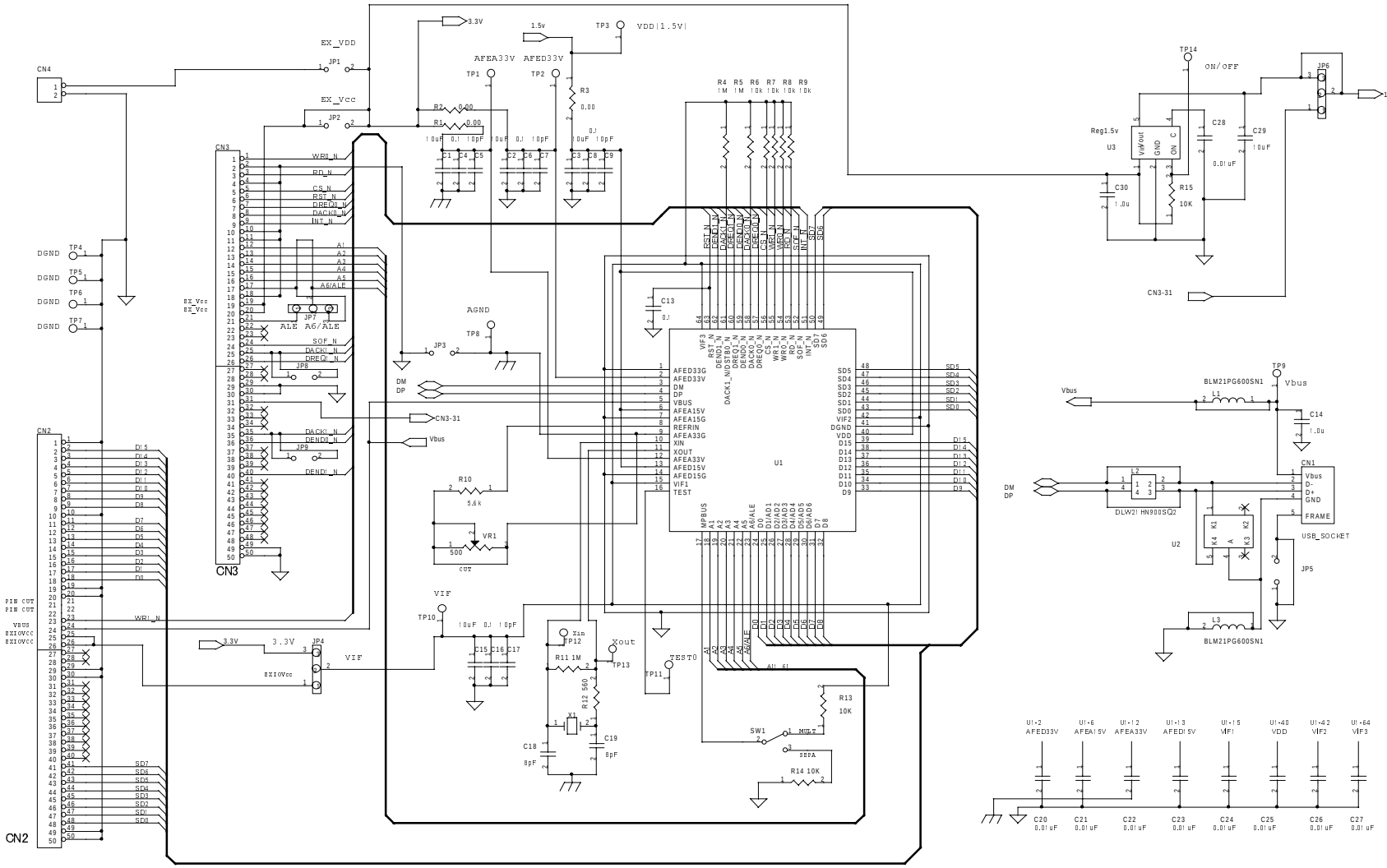
No.	Component Name		Component Specification		Notes
	Type	Symbol on Board	Product Number	Manufacture	
1	USB SOCKET	CN1	UBB-4R-D14T-1(LF)(SN)	JST	
2	HEADER 25X2	CN2, CN3	FFC-50BSM1B	Honda	
3	HEADER 2	CN4	BS2P-SHF-1AA(LF)(SN)	JST	No mounted.
4	Chip Capacitor	C1, C2, C3, C15, C29	GRM31CB11A106KA01	Murata	10uF
5	Chip Capacitor	C4, C6, C8, C13, C16	GRM188F11E104ZA01D	Murata	0.1uF
6	Chip Capacitor	C5, C7, C9, C17	GRM2162C1H100JD01D	Murata	10pF
7	Chip Capacitor	C14, C30	GRM219F11E105ZA01D	Murata	1.0uF
8	Chip Capacitor	C18, C19	GRM1882C1H8R0DZ01D	Murata	8pF
9	Chip Capacitor	C20-28	GRM188F11H103ZA01D	Murata	0.01uF
10	Jumper SW (2pin)	JP1, JP2, JP3, JP5	WL-1	MAC8	No mounted.
11	Jumper SW (3pin)	JP4	WL-1	MAC8	3pin
12	Chip Ferrite Bead	L1, L3	BLM21PG600SN1	Murata	No mounted.
13	Common Mode Choke Coil	L2	DLW21HN900SQ2	Murata	No mounted.
14	Chip Resistor	R1, R2, R3	MCR10EZPJ000	Rohm	0Ω.
15	Chip Resistor	R4, R5, R11	MCR10EZPJ105	Rohm	1M, 5%
16	Chip Resistor	R6-9, R13-15	MCR10EZPJ103	Rohm	10kΩ, 5%
17	Chip Resistor	R10	MCR10EZPF5601	Rohm	5.6kΩ, 1%
18	Chip Resistor	R12	MCR10EZPF5600	Rohm	560Ω, 1%
19	Slide SW	SW1	CAS-120A1	Copal	
20	ASSP	U1	M66592FP	Renesas	

		Title	M3A-0038G01
		Drawing No.	PPL-M3A-0038G01

No.	Component Name		Component Specification		Notes
	Type	Symbol on Board	Product Number	Manufacture	
21	TVS Diode	U2	HZM6.2Z4MFA-E or HZM6.8Z4MFA-E	RENESAS	No Mounted.
22	1.5V VDD	U3	LP2992AIM5-1.5/NOPB	NS	1.5V 250mA
23	Crystal Oscillator	X1	DSX321G 24.0000MHz	Daishinku	
24	Test Pin 1P (SMD)	TP1 (AFEA33V)	HK-5-G (Purple)	Mac8	
25	Test Pin 1P (SMD)	TP2 (AFED33V)	HK-5-G (Red)	Mac8	
26	Test Pin 1P (SMD)	TP3 (VDD)	HK-5-G (Orange)	Mac8	
27	Test Pin 1P (SMD)	TP4, TP5, TP6, TP7, TP8 (GND)	HK-5-G (Black)	Mac8	
28	Test Pin 1P (SMD)	TP9 (Vbus)	HK-5-G (Blue)	Mac8	
29	Test Pin 1P (SMD)	TP10 (VIF)	HK-5-G (Green)	Mac8	
30	Test Pin 1P (SMD)	TP11 (TEST0)	HK-5-G (Gray)	Mac8	
31	Test Pin 1P (SMD)	TP12, TP13, TP14	ST-1-1	Mac8	No Mounted.
32	Jumper Socket	For JP4	JS-1	Mac8	
33	PWB		M3A-0038G01 REV.B		

		Title	M3A-0038G01
		Drawing No.	PPL-M3A-0038G01
			(2/2)

Appendix2 : Circuit Diagram



M3A－0038G01

Rev.B (1/1)

Revision History	M3A-0038G01 Instruction Manual

Rev.	Date	Description	
		Page	Summary
1.00	Mar.01.04	—	First edition issued
1.01	Feb.15.05	Appendix 1	Parts List Deleted : #21 SRV05-4 SEMTECH
		Appendix 2	Circuit Diagram Modified : Connection of pin #1 of U3 (Regurator) ; JP2-1 → JP2-2 Deleted : Parts No. of U2 (SRV05-4) Modified : Pin No. of U2
1.02	Dec.05.06	Contens	Addition: This product is thus complied with European RoHS Directive.
		Appendix 1	Parts List Modified : # 1,3,4,5,6,7,8,9,14,15,16,17,18,21,22 (Part type name is thus complied with European RoHS Directive)