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32192 Group

Evaluation Board Product Standards

M3A-2154G02

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Chapter 1. Overview

1-1. Outline of the Product

Mounted microcomputer type name	M32192F8TFP
Evaluation board type name (socket mounted type)	M3A-2154G02

Operation mode	Single-chip mode, Processor mode and External extension mode
Board extension	Can be extended using the board's extension connector
CAN I/F	Comes standard with a 2-channel CAN connector, CAN cable included
RS-232C I/F	Comes standard with a connector
Serial port	One of four channels can be selected using a rotary switch
Analog port	Inputs on two channels can be controlled using variable resistor (VR) controls
Display I/O	Comes with a single-port LED
Input I/O	Comes with a single-port toggle switch

Note: The M3A-2154G02 consists of the Evaluation Board M3A-2154G01 on which the M32192F8TFP (hereafter abbreviated as the M32R/ECU) is socket-mounted.

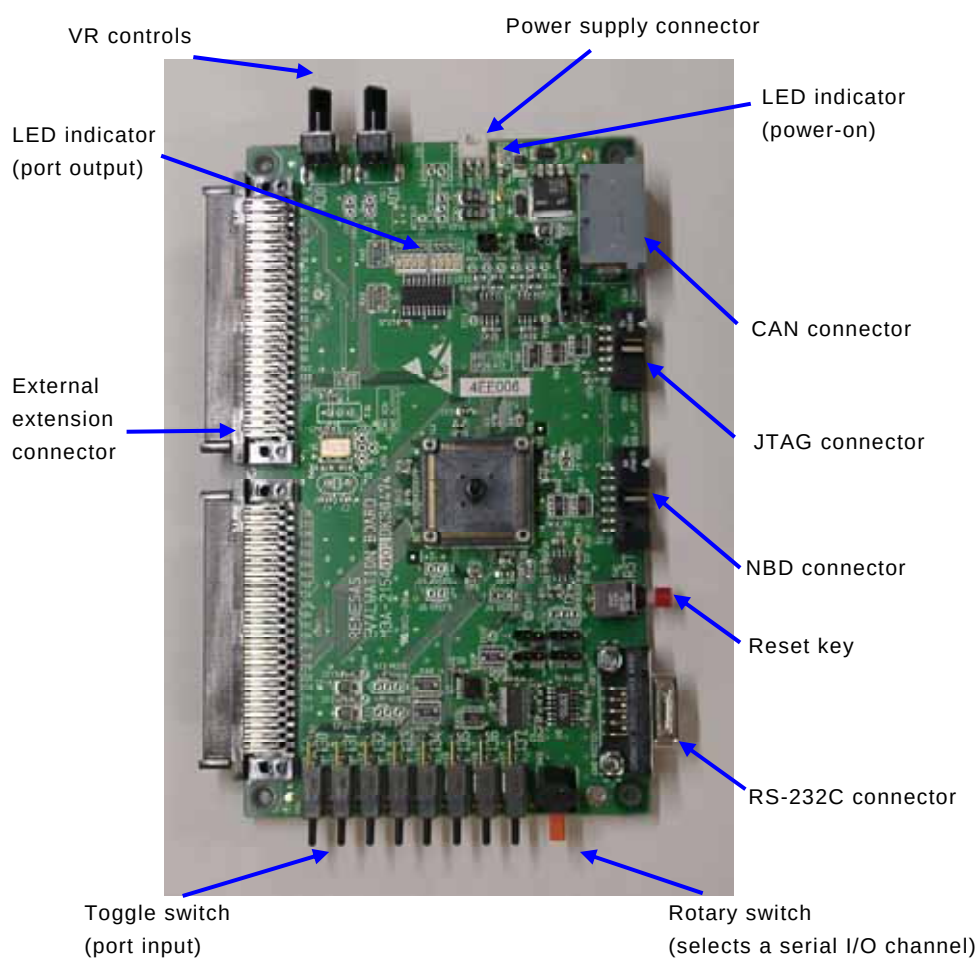


Figure 1-1-1. Photograph of the M3A-2154G02

1-2. External View

An external view of the M3A-2154G02 is shown below.

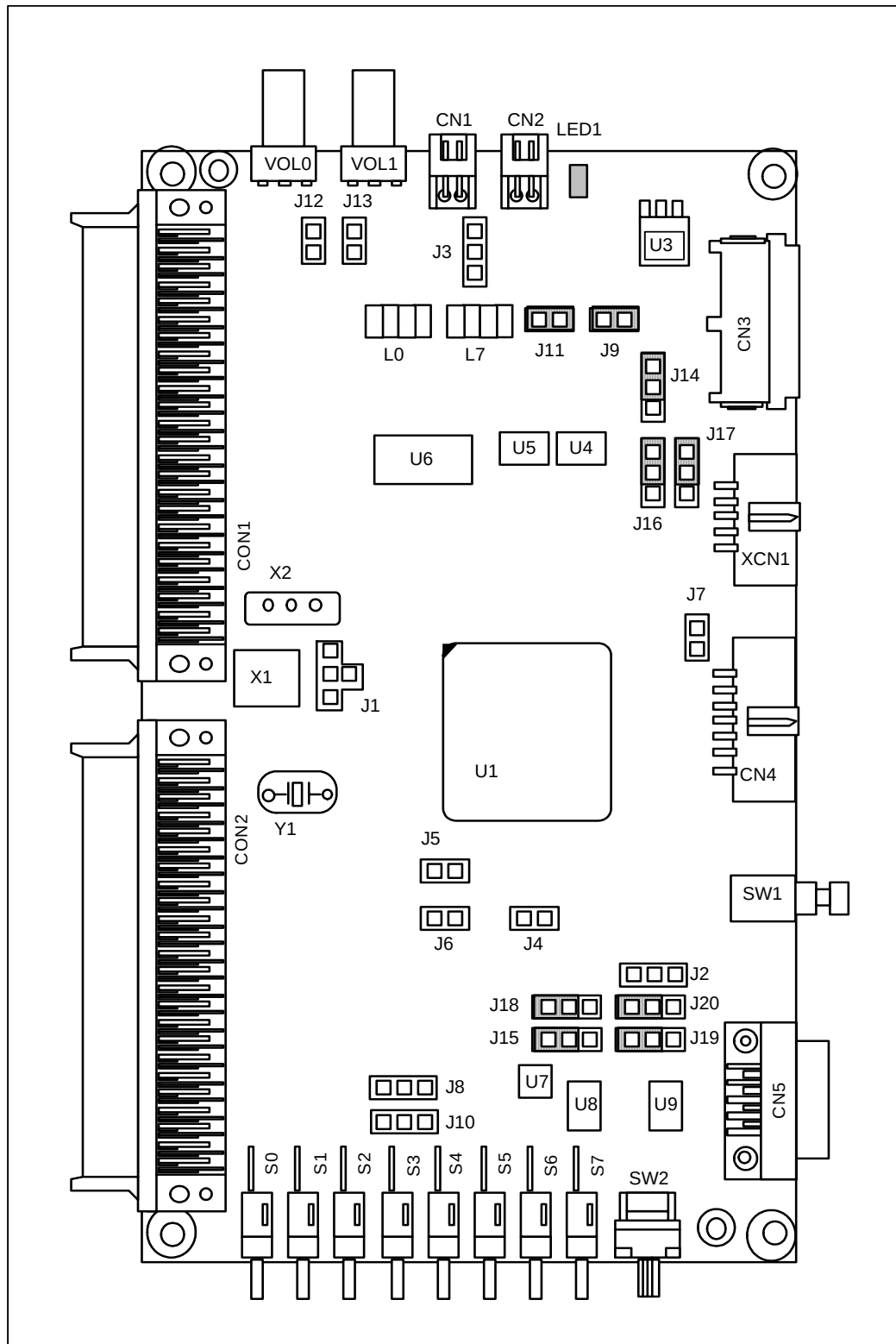


Figure 1-2-1. External view of the M3A-2154G02

1-3. Block Diagram

A block diagram of the M3A-2154G02 is shown below.

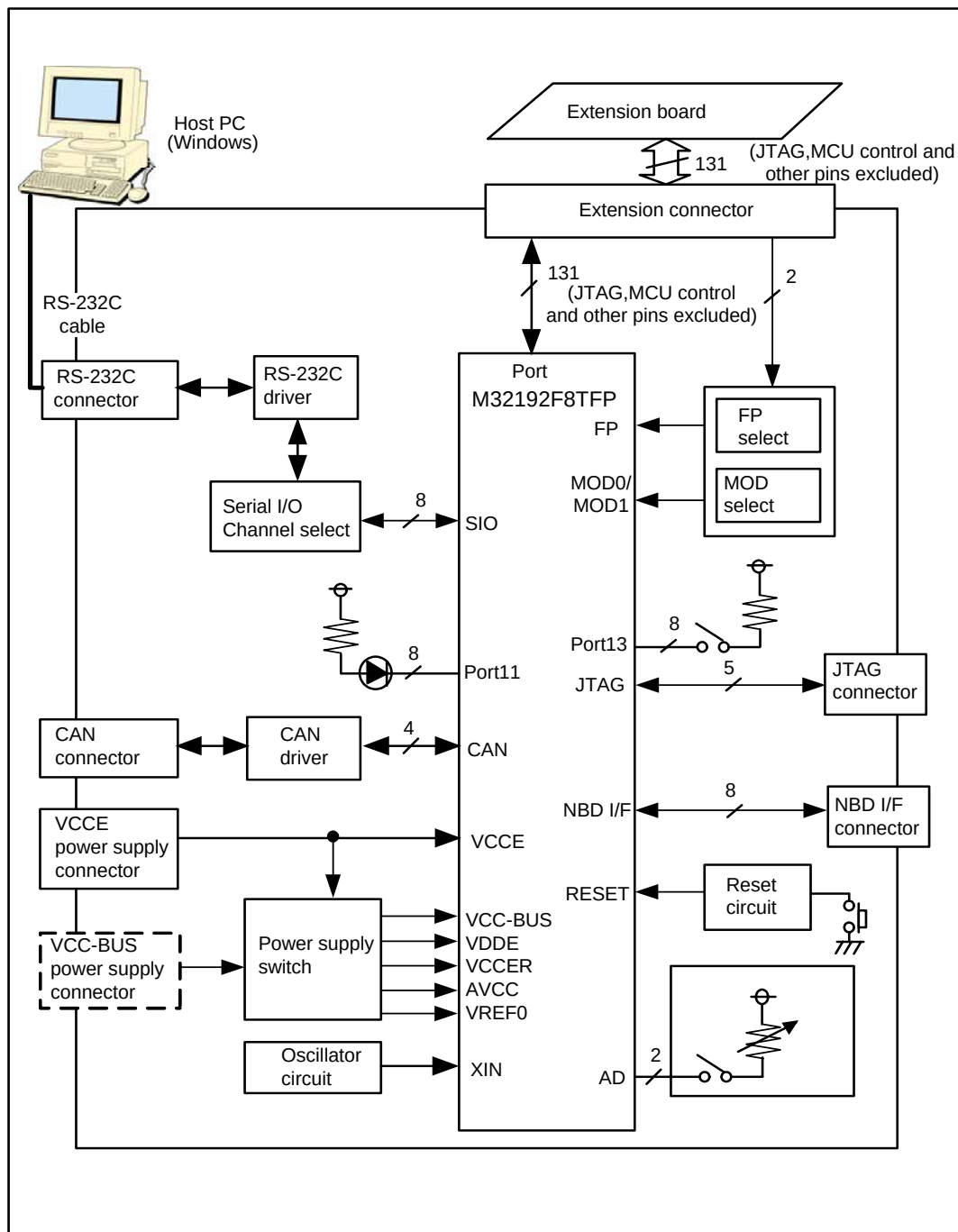


Figure 1-3-1. Block diagram of the M3A-2154G02

1-4. Specifications of the Evaluation Board

1-4-1. Electrical Characteristics

Table 1-4-1. Electrical Characteristics

Symbol	Parameter	Rated Value
VCCE,VCC-BUS	Power supply voltage	4.5 V to 5.5 V or 3.0 V to 3.6 V
VCCER	Power supply voltage	3.0 V to 3.6 V
Tstg	Storage ambient temperature	0°C to +70°C
Topr	Operating ambient temperature	0°C to +70°C

*1: Operating conditions require that no dewdrops and corrosive gas be present.

1-4-2. Functional Characteristics

Table 1-4-2. Functional Characteristics

Item		M3A-2154G02
CPU		M32192F8TFP(U1)
		Clock input: 20 MHz; CPU clock: 160 MHz
Memory	Flash memory	1MB
	SRAM	176KB
RS-232C interface		Comes standard with a 9-pin Dsub connector (CN5) for serial communication with the host PC (Windows)
JTAG interface		Comes standard with a 10-pin JTAG connector for Renesas SDI (XCN1)
NBD interface		Comes standard with a 14-pin NBD connector (CN4)
CAN interface * Supported only when VCCE is a 5 V-system power supply.		Comes standard with a 2-channel connector for CAN communication (CN3), a CAN-to-Dsub connector (9-pin) conversion cord included
Power supply	VCCE	Power supply, Connector (CN2) 4.5 V–5.5 V or 3.0 V–3.6 V
	VCC-BUS	Power supply for bus control pin, Connector (CN1)
	LED	Illuminates in red when powered on (LED1)
General-purpose output		LED indicators (L0–L7), CPU ports (P110–P117)
General-purpose input		Toggle switches (S0–S7), CPU ports (P130–P137)
Reset		Reset switch (SW1), reset input (red pushbutton) * Because the circuit for VCCE is configured to have operating margins for both 5 V and 3.3 V-system power supplies, please be careful when you configure a reset circuit.
Serial I/O		Rotary switch (SW2), which selects one of four serial I/O channels
Analog input		VR controls (VOL0, VOL1) Connects these VR controls with AD0IN0 and AD0IN1 to use them to control inputs on ports
Extension		Extension connectors (CON1, CON2)

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Chapter 2. Functional Specifications

2-1. Configuration of the Power Supply

The power to the M32R/ECU can be supplied from two sources, VCC-BUS and VCCE, independently of each other. With default settings, the power to the M32R/ECU is fed through the VCCE power supply connector to all of its internal circuits.

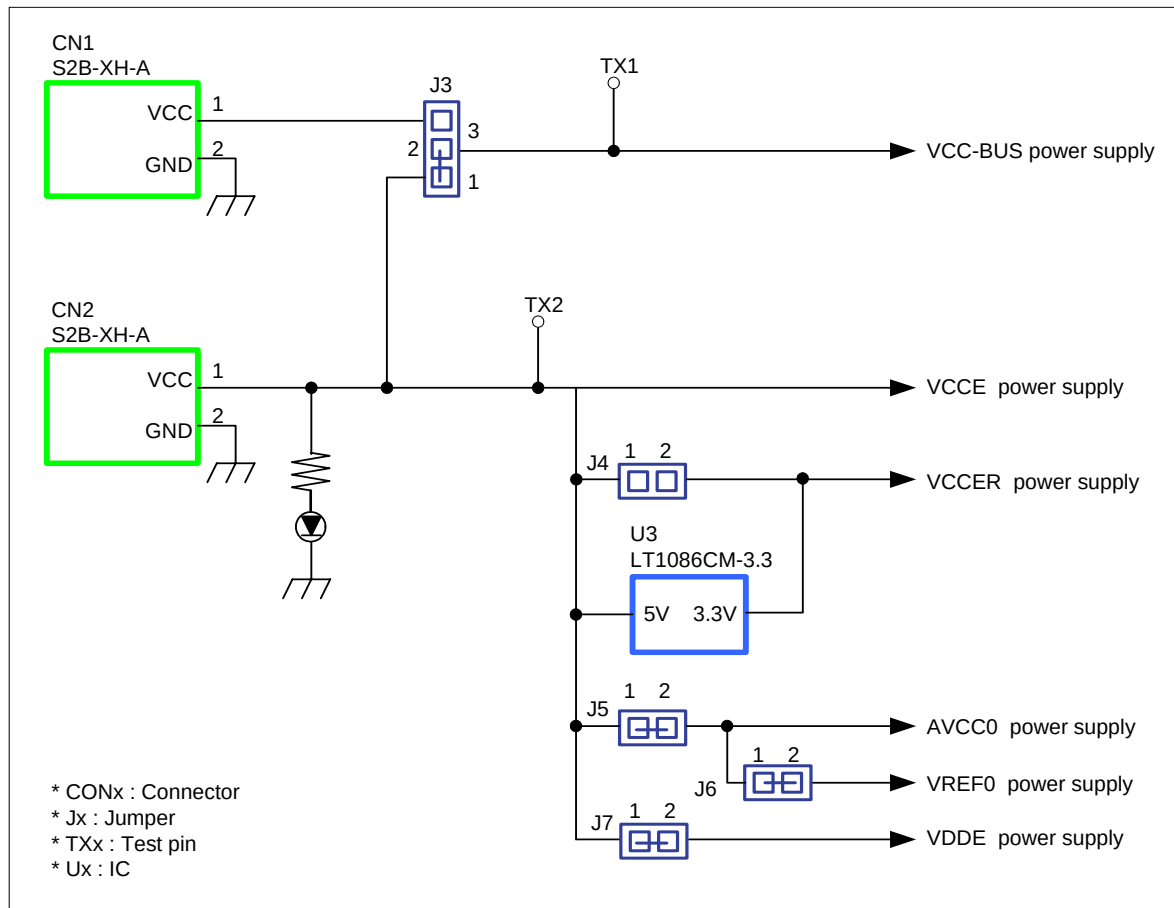


Figure 2-1-1. Power supply circuit

Table 2-1-1. Configuration of the Power Supply

Connector	Power Supply	Jumper			Description
		Name	Condition		
CN1	VCC-BUS	J3	Shorted between 1–2	Default	Power supply from VCCE (CN2)
			Shorted between 2–3		Power supply from VCC-BUS (CN1)
CN2	VCCE	–	–	–	VCCE power supply
	VCCER	J4	Open	Default	Disconnects VCCE power supply Uses the on-board 3.3 V power generator circuit
			Shorted between 1–2		Power supply from VCCE
–	AVCC0	J5	Shorted between 1–2	Default	Power supply from VCCE
–	VREF0	J6	Shorted between 1–2	Default	Power supply from AVCC0
–	VDDE	J7	Shorted between 1–2	Default	Power supply from VCCE

Note: The J3, J5, J6 and J7 jumpers are shorted by pattern wiring on the reverse side of printed circuit board.

Case of setting the condition except for default, setting the jumper is required after cutting the pattern for default condition. Refer to the chapter 3-6 'Pattern diagram'.

Usage Precautions

In order to control the power supplied to the VCCER pin of the M32R/ECU U1, jumper J4 must be set according to the operating voltage of VCCE, which is the main power supply to the board.

Table 2-1-2. Condition for Using the VCCE (Main Power Supply for the Board)

Usage condition of VCCE (main power supply for the board)	Necessary process		VCCER pin state of M32R/ECU U1
When VCCE = 5V system	J4 Open	Default	3.3 V power supply
	J4 shorted between 1–2		5V power supply
When VCCE = 3.3V system	J4 Open		Operation can not be guaranteed
	J4 shorted between 1–2		3.3 V power supply

2-2. FP Select Circuit

The FP select circuit is used for reprogramming the internal flash memory of the M32R/ECU. This circuit is configured in such a way that FP is switched from the EXTFP signal of extension connector (CON2) by using a jumper (J10).

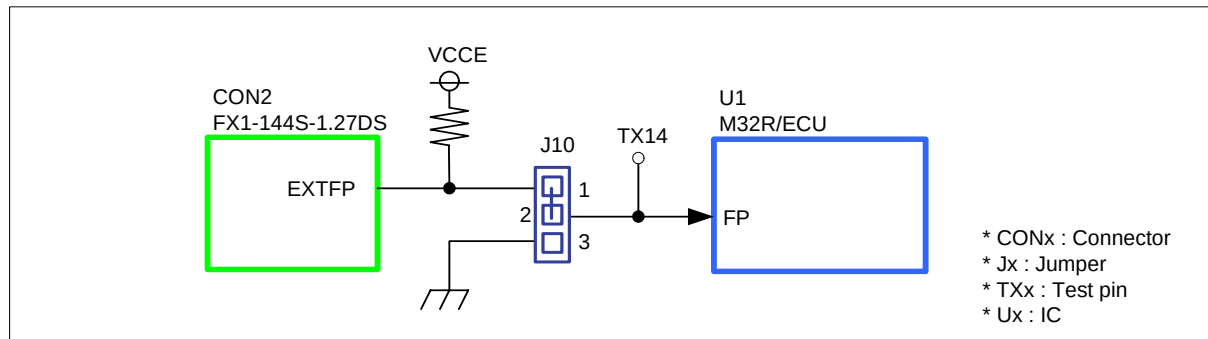


Figure 2-2-1. FP select circuit

Table 2-2-1. FP Select Circuit (Jumper)

Name	Condition		Description
J10	Shorted between 1–2	Default	Enables reprogramming the mounted M32R/ECU's internal flash
	Shorted between 2–3		Disables reprogramming the mounted M32R/ECU's internal flash
	Open		Unusable

Note: The J10 jumper is shorted by pattern wiring on the reverse side of printed circuit board.

Case of setting the condition except for default, setting the jumper is required after cutting the pattern for default condition. Refer to the chapter 3-6 'Pattern diagram'.

2-3. MOD Select Circuit

This circuit is used to set operation modes of the M32R/ECU. The MOD0 power supply is configured in such a way that MOD0 is switched from the EXTMOD0 signal of extension connector (CON2) by using a jumper (J8). The MOD1 power supply defaults to 0 V. The MOD2 power supply is fixed to 0 V.

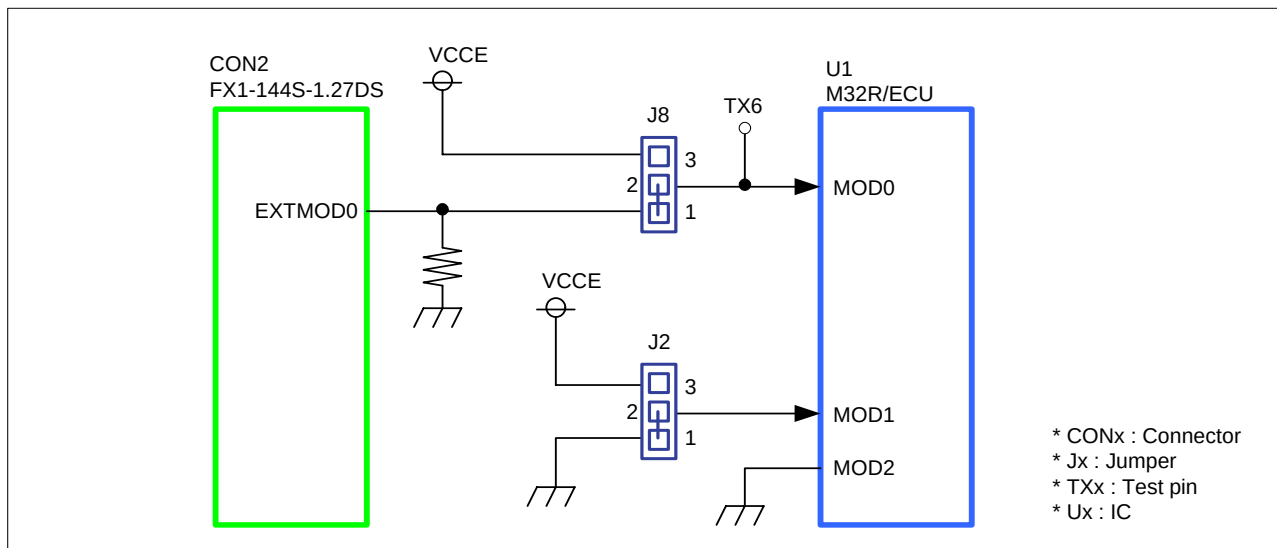


Figure 2-3-1. MOD select circuit

Table 2-3-1. Operation Mode Settings

MOD0	MOD1	Description
0	0	- When flash reprogramming is disabled: Single-chip mode - When flash reprogramming is enabled: Flash rewrite + single-chip mode
1	0	- When flash reprogramming is disabled: Processor mode - When flash reprogramming is enabled: Flash rewrite from boot ROM + single-chip mode
0	1	External extension mode
1	1	Settings inhibited

Table 2-3-2. MOD Select Circuit (Jumper)

Name	Condition		Description
J8	Shorted between 1–2	Default	Pulls MOD0 low or controls MOD0 by EXTMOD0
	Shorted between 2–3		Fixes MOD0 to VCCE
J2	Shorted between 1–2	Default	Fixes MOD1 to 0 V
	Shorted between 2–3		Fixes MOD1 to VCCE

Note: The J2 and J8 jumpers are shorted by pattern wiring on the reverse side of printed circuit board.

Case of setting the condition except for default, setting the jumper is required after cutting the pattern for default condition. Refer to the chapter 3-6 'Pattern diagram'.

2-4. Serial I/O Interface

The evaluation board is interfaced to the host PC (Windows) through its RS-232C by using SIO of the M32R/ECU. Of the RS-232C control signals, only TXD and RXD are used for connection to the host PC (Windows). The unused CTS and RTS are directly-coupled to configure a loop-back. The unused DSR and DTR also are configured in a similar manner.

The serial I/O interface is configured in such a way that only one serial I/O channel can be used at a time. Any of the four channels 0–3 can be selected using a rotary switch.

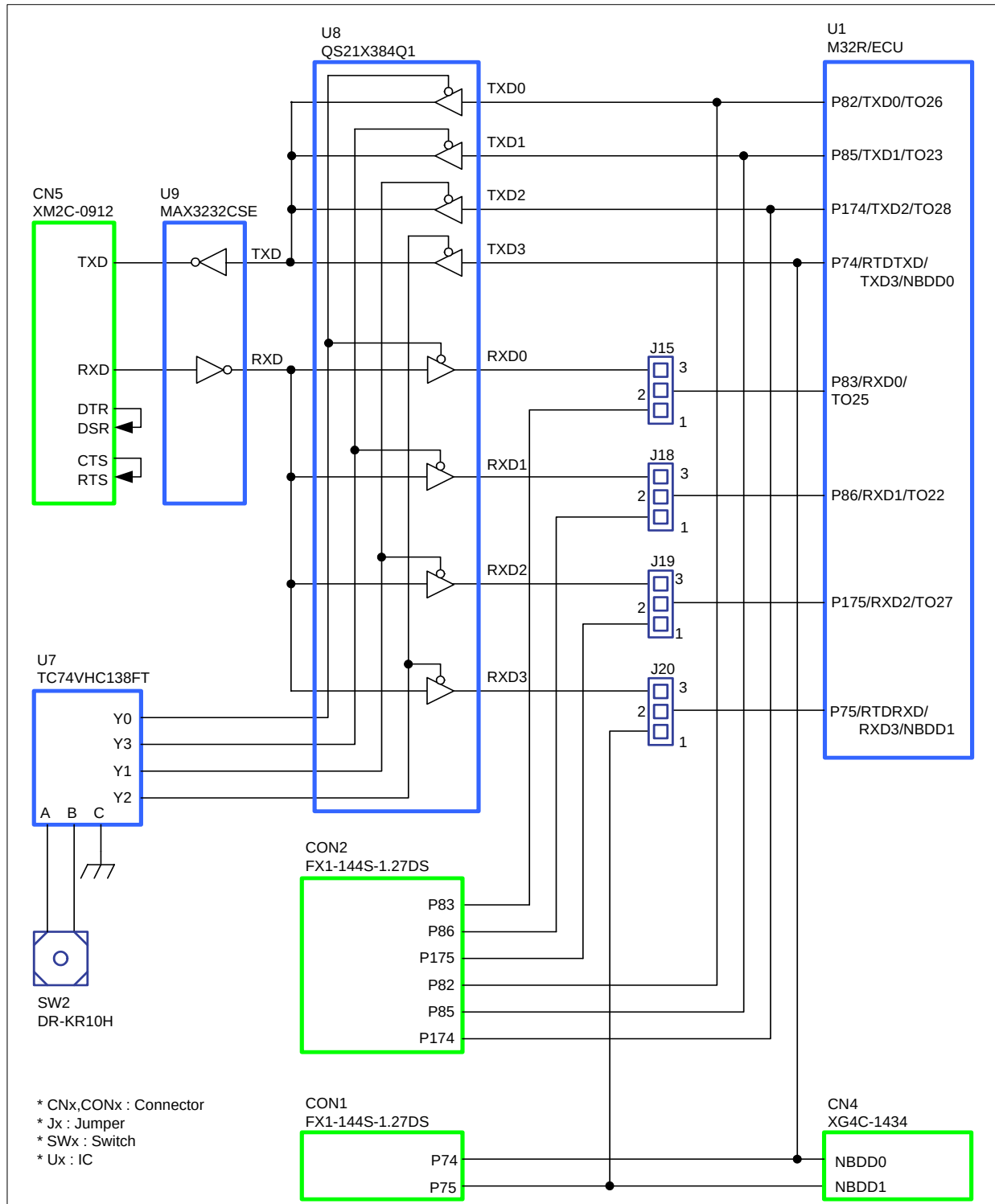


Figure 2-4-1. Serial I/O interface

Table 2-4-1. Channel Selection by a Rotary Switch

Rotary switch position	Selected channel
0	SIO0
1	SIO1
2	SIO2
3	SIO3
4	SIO0
5	SIO1
6	SIO2
7	SIO3
8	SIO0
9	SIO1

Table 2-4-2. Serial I/O Interface (Jumper)

Name	Condition		Description
J15	Shorted between 1–2	Default	Connects P83/RXD0/TO25 to the extension connector (CON2)
	Shorted between 2–3		Uses the RXD0 function in RS-232C
J18	Shorted between 1–2	Default	Connects P86/RXD1/TO22 to the extension connector (CON2)
	Shorted between 2–3		Uses the RXD1 function in RS-232C
J19	Shorted between 1–2	Default	Connects P175/RXD2/TO27 to the extension connector (CON2)
	Shorted between 2–3		Uses the RXD2 function in RS-232C
J20	Shorted between 1–2	Default	Connects P75/RTDRXD/RXD3/NBDD1 to the extension connector (CON1)
	Shorted between 2–3		Uses the RXD3 function in RS-232C

Note: The jumpers J15, J18, J19 and J20 are shorted by jumper parts.

Table 2-4-3. RS-232C Connector Pin Assignments

Connector Name	Pin No.	Signal Name	Description
CN5	1	DCD	Unused
	2	RXD	Received data
	3	TXD	Transmitted data
	4	DTR	Connects to the DSR pin
	5	SG	Ground
	6	DSR	Connects to the DTR pin
	7	RTS	Connects to the CTS pin
	8	CTS	Connects to the RTS pin
	9	RI	Unused

2-5. Oscillator Circuit

The oscillator circuit can be selected from three options by using the jumper J1: a surface mount-type 20 MHz crystal oscillator module, a DIP-type crystal oscillator module or a crystal resonator.

By default, the surface mount-type 20 MHz crystal oscillator module is selected.

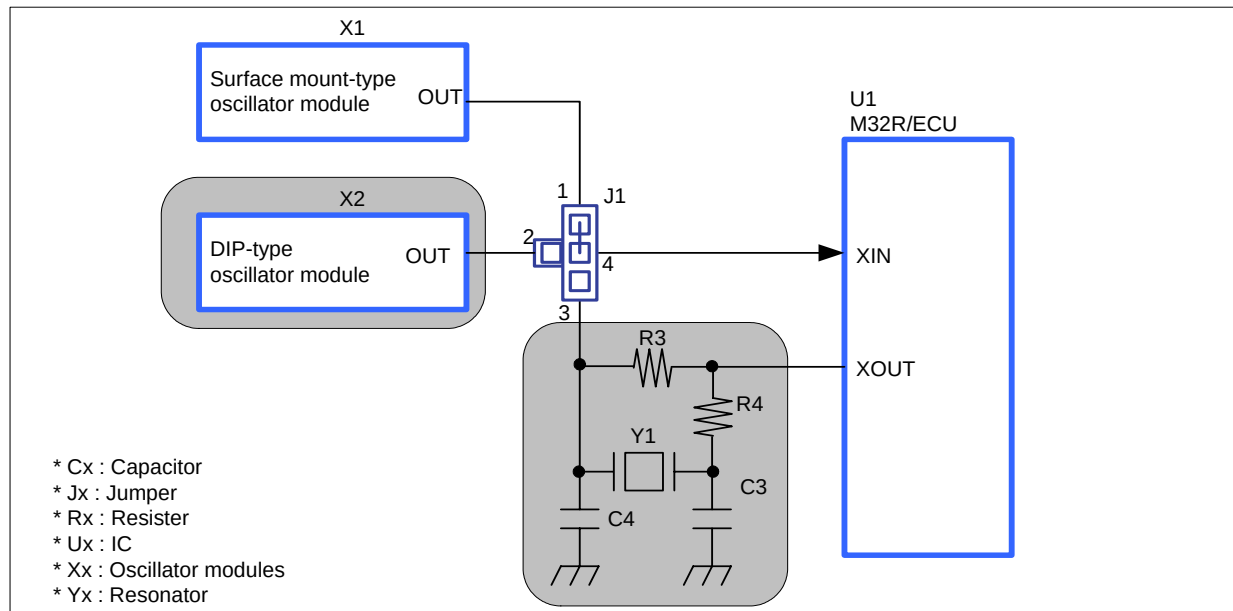


Figure 2-5-1. Oscillator circuit

Note: The shaded sections in the above diagram have only patterns available. When using the resonator Y1, please be sure to add capacitors (C3, C4) and a resistor (R3, R4).

Table 2-5-1. Oscillator Circuit Connections (Jumper)

Name	Condition		Description
J1	Shorted between 1–4	Default	Outputs a clock from X1 (surface mount-type oscillator module)
	Shorted between 2–4		Outputs a clock from X2 (DIP-type oscillator module)
	Shorted between 3–4		Outputs a clock from Y1 (resonator)

Note: The J1 jumper is shorted by pattern wiring on the reverse side of printed circuit board.

Case of setting the condition except for default, setting the jumper is required after cutting the pattern for default condition. Refer to the chapter 3-6 'Pattern diagram'.

2-6. General-purpose Output Port LED Indicators

The LED indicators (L0–L7) are used to indicate the status of the M32R/ECU ports P110–P117.

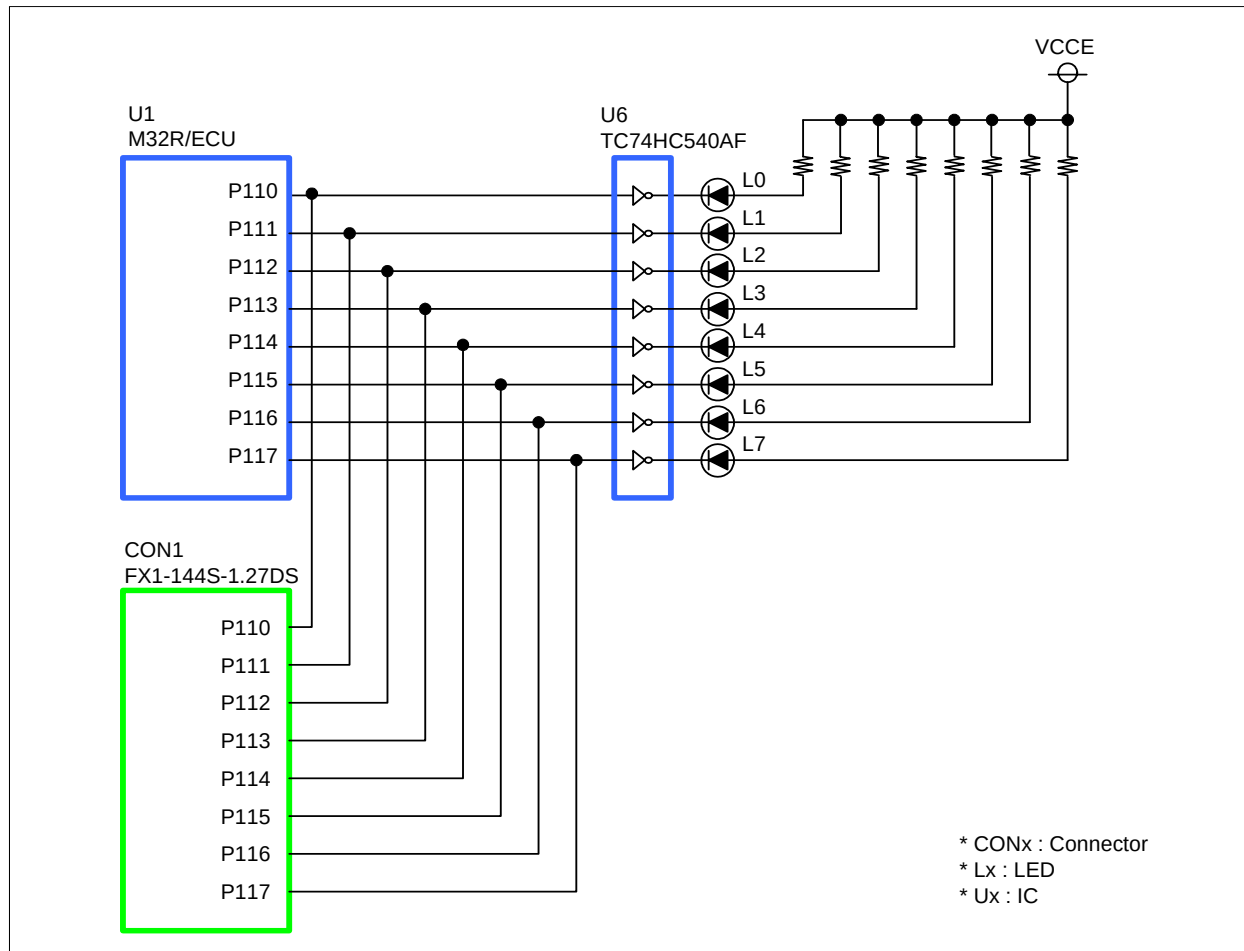


Figure 2-6-1. LED indicator block for the general-purpose output ports

Table 2-6-1. LED Indicators of General-purpose Output Ports

LED Name	Corresponding M32R/ECU Port	ON Condition	Color
L0	P110	High	Red
L1	P111	High	Red
L2	P112	High	Red
L3	P113	High	Red
L4	P114	High	Red
L5	P115	High	Red
L6	P116	High	Red
L7	P117	High	Red

2-7. General-purpose Input Port Control Circuit

The general-purpose input port control circuit is used to control the status of the M32R/ECU ports P130–P137 by using toggle switches (S0–S7). For the settings of jumpers J16 and J17, see the Section 2-9, “CAN Interface”.

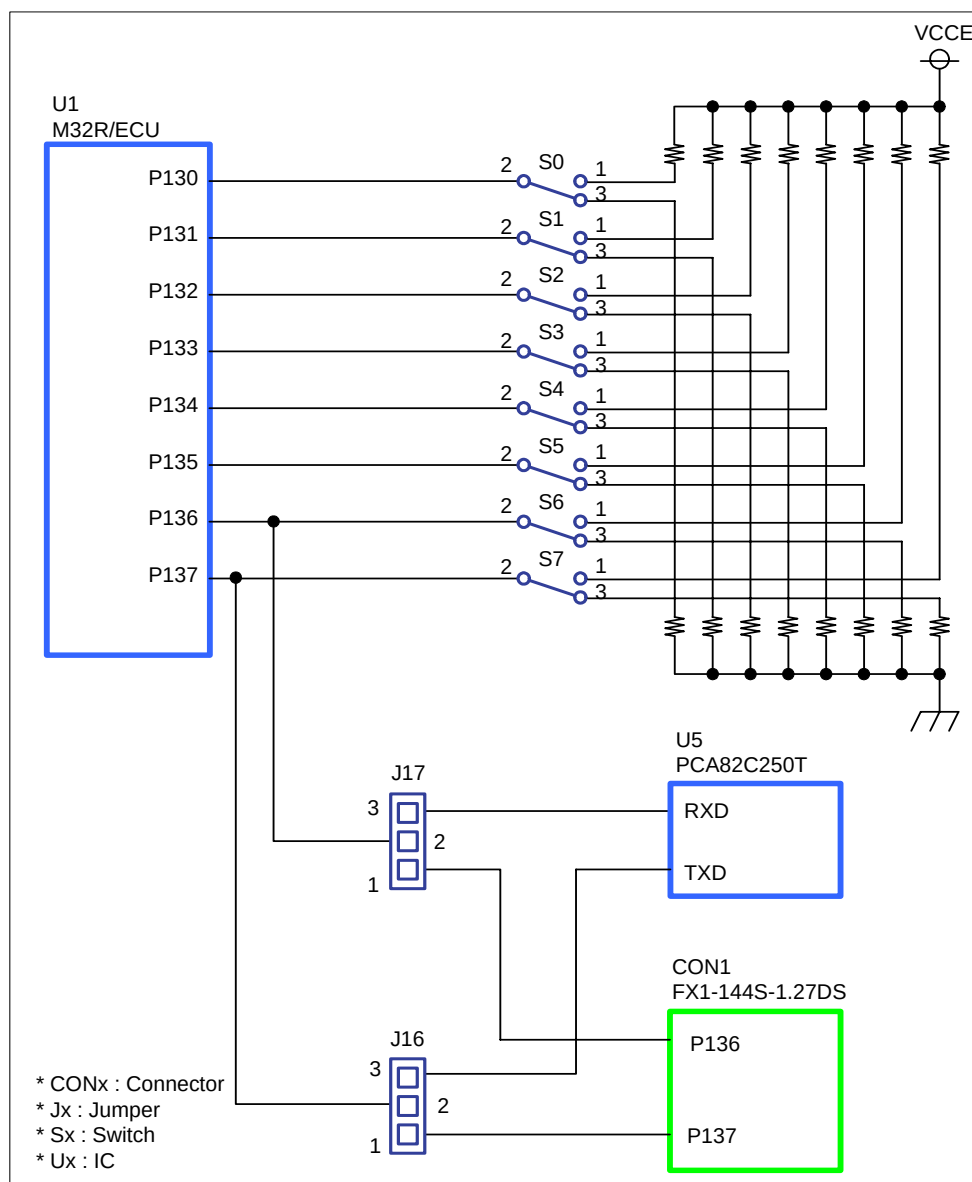


Figure 2-7-1. General-purpose input port control circuit

Table 2-7-1. Relationship between
Toggle Switches and Ports

Toggle Switch Name	Corresponding M32R/ECU Port
S0	P130
S1	P131
S2	P132
S3	P133
S4	P134
S5	P135
S6	P136
S7	P137

Table 2-7-2. Toggle Switch Positions

Lever Direction	Port Input Level
Up	High
Middle	Open
Down	Low

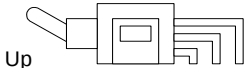
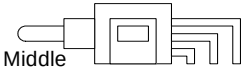
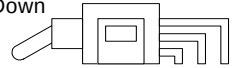
Lever direction			
Port input level	H	Open	L

Figure 2-7-2. Toggle switch positions

2-8. Analog Port Input Control Circuit

The analog port input control circuit is used to control the status of the M32R/ECU analog ports AD0IN0 and AD0IN1 by using VR controls VOL0 and VOL1.

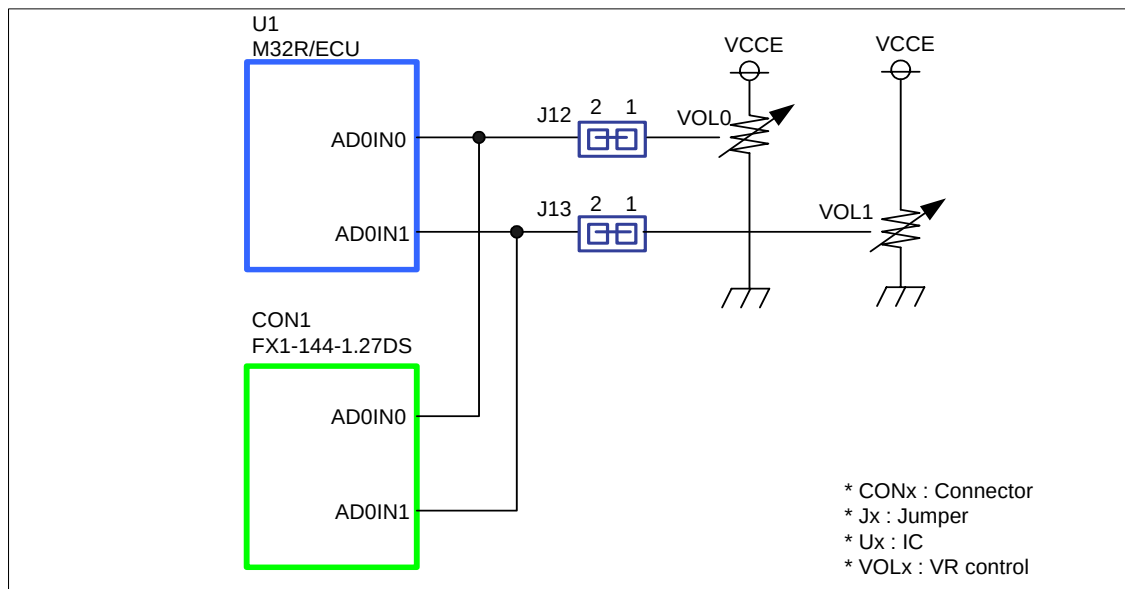


Figure 2-8-1. Analog port input control circuit

Table 2-8-1. Analog Port Input Control (Jumper)

Name	Condition		Description
J12	Shorted between 1–2	Default	Uses VR control (VOL0)
	Open between 1–2		Does not use VR control (VOL0)
J13	Shorted between 1–2	Default	Uses VR control (VOL1)
	Open between 1–2		Does not use VR control (VOL1)

Note: The J12 and J13 jumpers are shorted by pattern wiring on the reverse side of printed circuit board.

Case of setting the condition except for default, setting the jumper is required after cutting the pattern for default condition. Refer to the chapter 3-6 'Pattern diagram'

2-9. CAN Interface

The evaluation board is interfaced to a CAN-mounted system by using the internal CAN functions of the M32R/ECU.

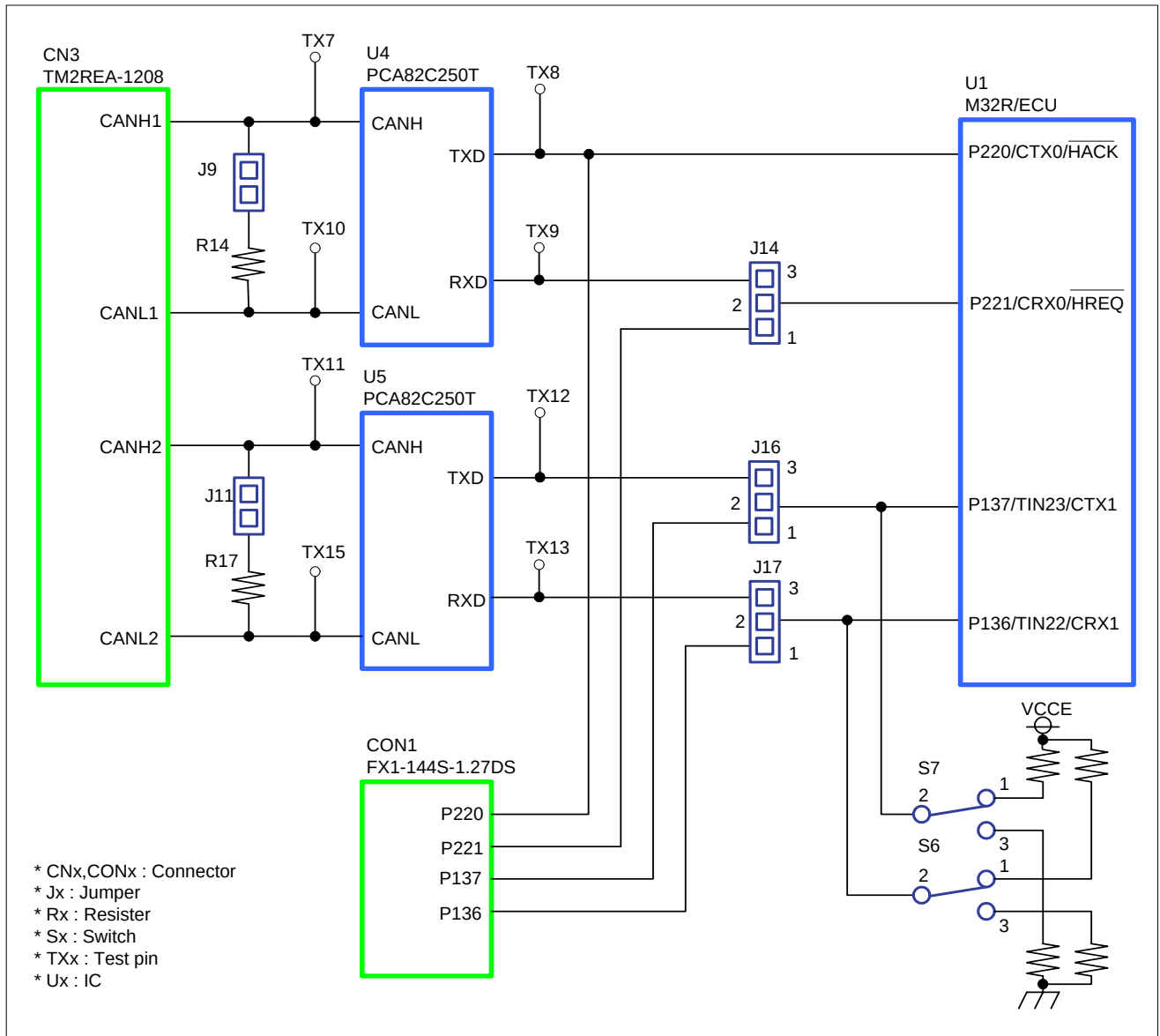


Figure 2-9-1. Interface with a CAN-mounted system

Table 2-9-1. CAN Connector Pin Assignments

Connector Name	Pin No.	Signal Name	Description
CN3	1	CANH1	High-level CAN0 input/output port
	2	CANL1	Low-level CAN0 input/output port
	3	CANH2	High-level CAN1 input/output port
	4	CANL2	Low-level CAN1 input/output port
	5	GND	Ground
	6	N.C.	Unused
	7	GND	Ground
	8	N.C.	Unused

(1) How to connect the CAN connector

The jumpers J14, J16 and J17 allow selecting the destinations to which the CAN communication pins (CTX, CRX) are connected.

Table 2-9-2. Jumper Usage Conditions (J14, J16 and J17)

Name	Condition		Description
J14	Shorted between 1–2	Default	Connects P221/CRX0/HREQ to the extension connector (CON1)
	Shorted between 2–3		Uses the CRX0 function in CAN connector CN3
J16	Shorted between 1–2	Default	Connects P137/TIN23/CTX1 to the extension connector (CON1)
	Shorted between 2–3		Uses the CTX1 function in CAN connector CN3
J17	Shorted between 1–2	Default	Connects P136/TIN22/CRX1 to the extension connector (CON1)
	Shorted between 2–3		Uses the CRX1 function in CAN connector CN3

Note: The jumpers J14, J16 and J17 are shorted by jumper parts.

(2) How to select the terminating resistor connection

The jumpers J9 and J11 allow the terminating resistors to be used in the CAN transmission path.

Table 2-9-3. Selecting the Terminating Resistor Connection (J9, J11)

Name	Condition		Description
J9	Shorted between 1–2	Default	Uses the CAN0 terminating resistor mounted on-board
	Open between 1–2		Does not use the CAN0 terminating resistor mounted on-board
J11	Shorted between 1–2	Default	Uses the CAN1 terminating resistor mounted on-board
	Open between 1–2		Does not use the CAN1 terminating resistor mounted on-board

Note: The jumpers J9 and J11 are shorted by jumper parts.

2-10. JTAG/NBD Interface

The JTAG connector for Renesas SDI, XCN1 consists of the 2.54-mm contact pitch XG4C-1034 made by Omron Corporation. The NBD connector, CN4 consists of the 2.54-mm contact pitch XG4C-1434 made by Omron Corporation.

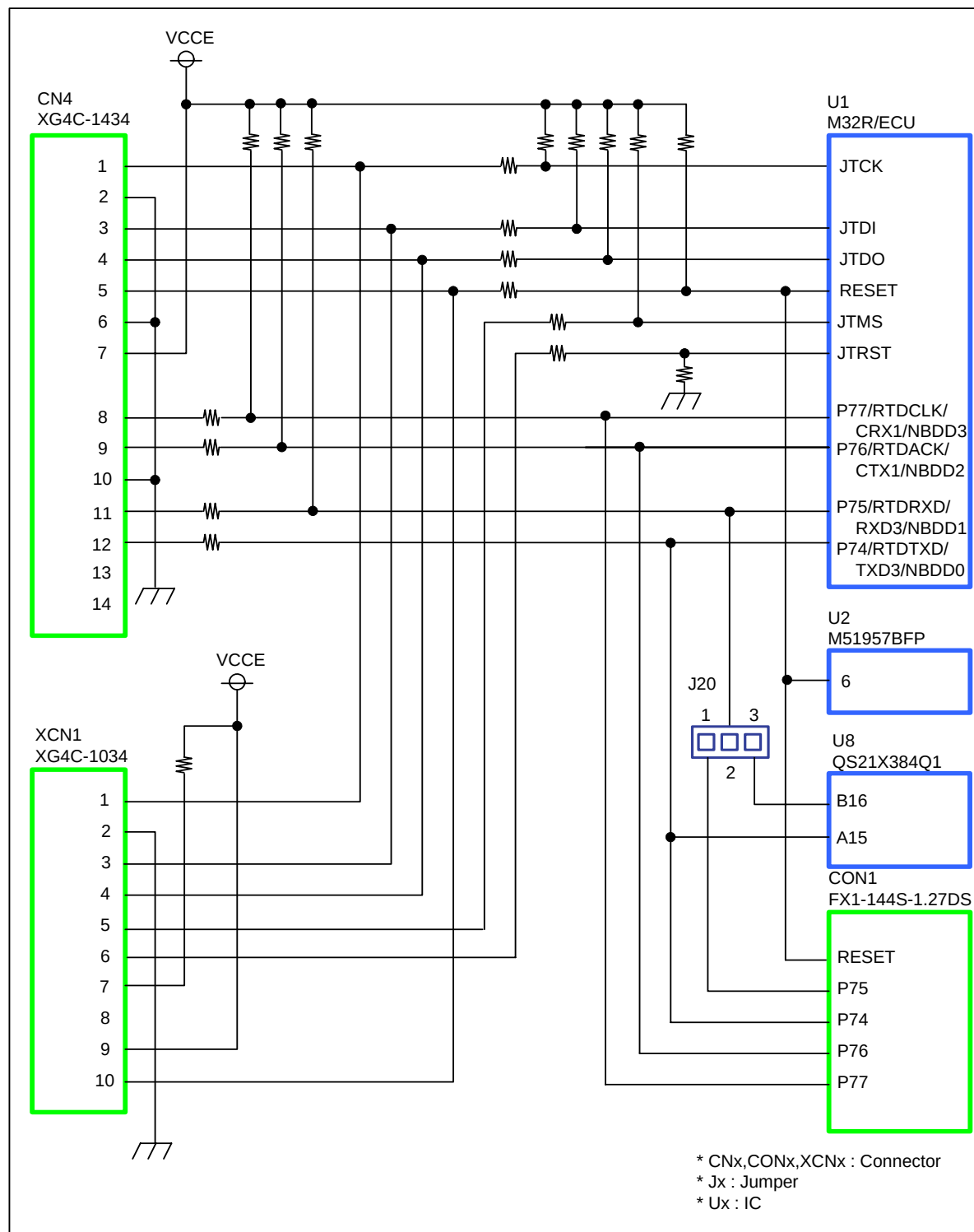


Figure 2-10-1. JTAG/NBD Interface

Table 2-10-1. JTAG Interface Connector Pin Assignments

Connector Name	Pin No.	Signal Name	Description
XCN1	1	JTCK	Test clock
	2	GND	Ground
	3	JTDI	Test data input
	4	JTDO	Test data output
	5	JTMS	Test mode select
	6	JTRST	Test reset
	7	JDBI	Break request
	8	VCCE	Power supply
	9	JVCC	User system power supply monitor
	10	RESET	Reset

Table 2-10-2. NBD Interface Connector Pin Assignments

Connector Name	Pin No.	Signal Name	Description
CN4	1	NBDCLK	Synchronizing clock input
	2	GND	Ground
	3	NBDSYNC#	Top of data input
	4	NBDEVNT#	Event output
	5	RESET	Reset
	6	GND	Ground
	7	JVCC	Power supply
	8	NBDD3	Command/Address/Data
	9	NBDD2	Command/Address/Data
	10	GND	Reset
	11	NBDD1	Command/Address/Data
	12	NBDD0	Command/Address/Data
	13	N.C.	Unused
	14	N.C.	Unused

Chapter 3. Reference Data

3-1. Jumper and Test Pin Lists

3-1-1. Jumpers

Table 3-1-1. Jumper List

Jumper No.	Default	Description
J1	Shorted between 1–4	Outputs a clock from X1 (surface mount-type oscillator module)
J2	Shorted between 1–2	Fixes MOD1 to 0 V
J3	Shorted between 1–2	Power supply from VCCE
J4	Open	Power supply from VCCE
J5	Shorted between 1–2	Power supply from VCCE
J6	Shorted between 1–2	Power supply from AVCC0
J7	Shorted between 1–2	Power supply from VCCE
J8	Shorted between 1–2	Pulls MOD0 low or controls MOD0 by EXTMOD0
J9	Shorted between 1–2	Uses the CAN0 terminating resistor mounted on-board
J10	Shorted between 1–2	Enables reprogramming the mounted M32R/ECU's internal flash
J11	Shorted between 1–2	Uses the CAN1 terminating resistor mounted on-board
J12	Shorted between 1–2	Uses the VR control (VOL0)
J13	Shorted between 1–2	Uses the VR control (VOL1)
J14	Shorted between 1–2	Connects P221/CRX0/HREQ to the extension connector (CON1)
J15	Shorted between 1–2	Connects P83/RXD0/TO25 to the extension connector (CON2)
J16	Shorted between 1–2	Connects P137/TIN23/CTX1 to the extension connector (CON1)
J17	Shorted between 1–2	Connects P136/TIN22/CRX1 to the extension connector (CON2)
J18	Shorted between 1–2	Connects P86/RXD1/TO22 to the extension connector (CON2)
J19	Shorted between 1–2	Connects P175/RXD2/TO27 to the extension connector (CON2)
J20	Shorted between 1–2	Connects P75/RTDRXD/RXD3/NBDD1 to the extension connector (CON1)

3-1-2. Test Pins

Table 3-1-2. List of Test Pins

Test Pin No.	Signal Name	Test Pin No.	Signal Name
TX1	VCC-BUS	TX10	CANL1
TX2	VCCE	TX11	CANH2
TX3	GND	TX12	CTX1
TX4	GND	TX13	CRX1
TX5	RESET	TX14	FP
TX6	MOD0	TX15	CANL2
TX7	CANH1	TX16	TXD1
TX8	CTX0	TX17	P87
TX9	CRX0	TX18	VREF0

3-2. Extension Connectors CON1 and CON2

3-2-1. Pin Assignments of the Extension Connector CON1

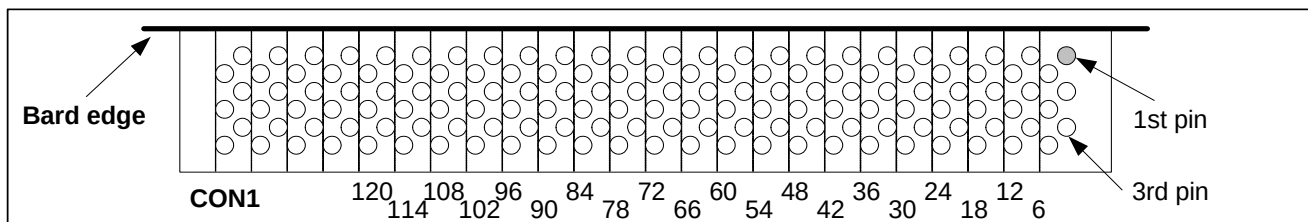


Table 3-2-1. CON1 Connector Pin Assignments

Pin No.	Signal Name	Pin No.	Signal Name	Pin No.	Signal Name	Pin No.	Signal Name
1	AVCC	31	NC	61	VCCE	91	NC
2	GND	32	NC	62	GND	92	P124
3	VCCE	33	GND	63	AVCC0	93	P125
4	P150	34	NC	64	VREF0	94	P126
5	NC	35	RESET	65	AD0IN0	95	P127
6	NC	36	NC	66	AD0IN1	96	NC
7	P153	37	NC	67	AD0IN2	97	NC
8	NC	38	NC	68	AD0IN3	98	NC
9	NC	39	NC	69	AD0IN4	99	NC
10	NC	40	NC	70	AD0IN5	100	NC
11	NC	41	NC	71	AD0IN6	101	NC
12	NC	42	NC	72	AD0IN7	102	NC
13	NC	43	NC	73	GND	103	NC
14	NC	44	P74	74	AD0IN8	104	NC
15	NC	45	P75	75	AD0IN9	105	NC
16	P130	46	P76	76	AD0IN10	106	NC
17	P131	47	P77	77	AD0IN11	107	NC
18	P132	48	NC	78	AD0IN12	108	NC
19	P133	49	NC	79	AD0IN13	109	NC
20	P134	50	NC	80	AD0IN14	110	NC
21	P135	51	NC	81	AD0IN15	111	NC
22	P136	52	NC	82	P61	112	P110
23	P137	53	P100	83	P62	113	P111
24	P220	54	P101	84	P63	114	P112
25	P221	55	P102	85	SBI	115	P113
26	NC	56	P103	86	GND	116	P114
27	NC	57	P104	87	GND	117	P115
28	VCCE	58	P105	88	GND	118	P116
29	GND	59	P106	89	VCCE	119	P117
30	NC	60	P107	90	GND	120	P97

Note 1: N.C. denotes "Not Connected."

Note 2: Pin Nos. 121 to 141 are not connected.

3-2-2. Pin Assignments of the Extension Connector CON2

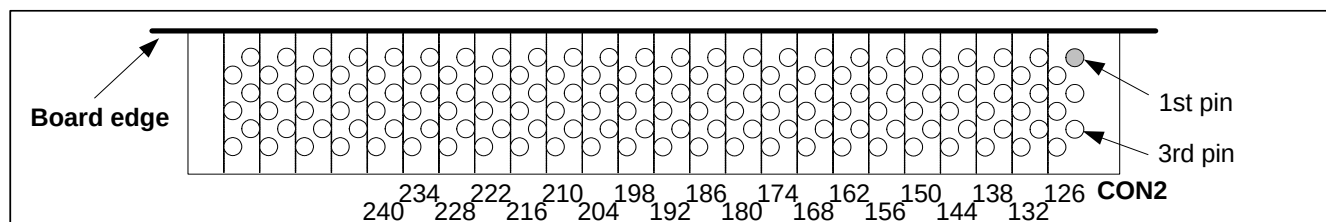


Table 3-2-2. CON2 Connector Pin Assignments

Pin No.	Signal Name	Pin No.	Signal Name	Pin No.	Signal Name	Pin No.	Signal Name
1 (121)	P96	31 (151)	NC	61 (181)	P174	91 (211)	P1
2 (122)	P95	32 (152)	NC	62 (182)	P175	92 (212)	P0
3 (123)	P94	33 (153)	VCC-BUS	63 (183)	NC	93 (213)	GND
4 (124)	P93	34 (154)	VCCE	64 (184)	NC	94 (214)	P73
5 (125)	VCCE	35 (155)	GND	65 (185)	NC	95 (215)	P72
6 (126)	GND	36 (156)	NC	66 (186)	NC	96 (216)	P71
7 (127)	VCC-BUS	37 (157)	NC	67 (187)	FP	97 (217)	P70
8 (128)	P27	38 (158)	NC	68 (188)	MOD0	98 (218)	P43
9 (129)	P26	39 (159)	NC	69 (189)	NC	99 (219)	P42
10 (130)	P25	40 (160)	NC	70 (190)	NC	100 (220)	P41
11 (131)	P24	41 (161)	NC	71 (191)	GND	101 (221)	VCC-BUS
12 (132)	P23	42 (162)	NC	72 (192)	NC	102 (222)	GND
13 (133)	P22	43 (163)	NC	73 (193)	NC	103 (223)	NC
14 (134)	P21	44 (164)	NC	74 (194)	GND	104 (224)	NC
15 (135)	P20	45 (165)	NC	75 (195)	VCCE	105 (225)	NC
16 (136)	GND	46 (166)	NC	76 (196)	VCC-BUS	106 (226)	NC
17 (137)	P37	47 (167)	NC	77 (197)	P17	107 (227)	NC
18 (138)	P36	48 (168)	NC	78 (198)	P16	108 (228)	NC
19 (139)	P35	49 (169)	NC	79 (199)	P15	109 (229)	NC
20 (140)	P34	50 (170)	NC	80 (200)	P14	110 (230)	NC
21 (141)	P33	51 (171)	NC	81 (201)	P13	111 (231)	GND
22 (142)	P32	52 (172)	NC	82 (202)	P12	112 (232)	NC
23 (143)	P31	53 (173)	NC	83 (203)	P11	113 (233)	NC
24 (144)	P30	54 (174)	NC	84 (204)	P10	114 (234)	NC
25 (145)	P47	55 (175)	P87	85 (205)	P7	115 (235)	NC
26 (146)	P46	56 (176)	P86	86 (206)	P6	116 (236)	NC
27 (147)	P225	57 (177)	P85	87 (207)	P5	117 (237)	NC
28 (148)	P224	58 (178)	P84	88 (208)	P4	118 (238)	NC
29 (149)	P45	59 (179)	P83	89 (209)	P3	119 (239)	NC
30 (150)	P44	60 (180)	P82	90 (210)	P2	120 (240)	NC

Note 1: N.C. denotes "Not Connected."

Note 2: Pin Nos. 121 to 144 are not connected.

Note 3: Numbers in parentheses () in the table correspond to the Pin No. on the board.

3-3. CAN Cable

(1) External view

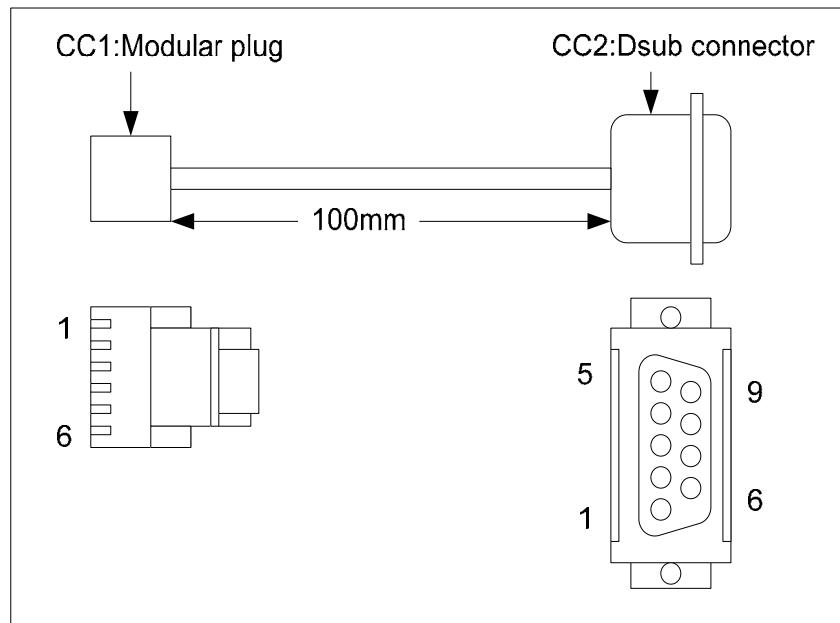


Figure 3-3-1. External view

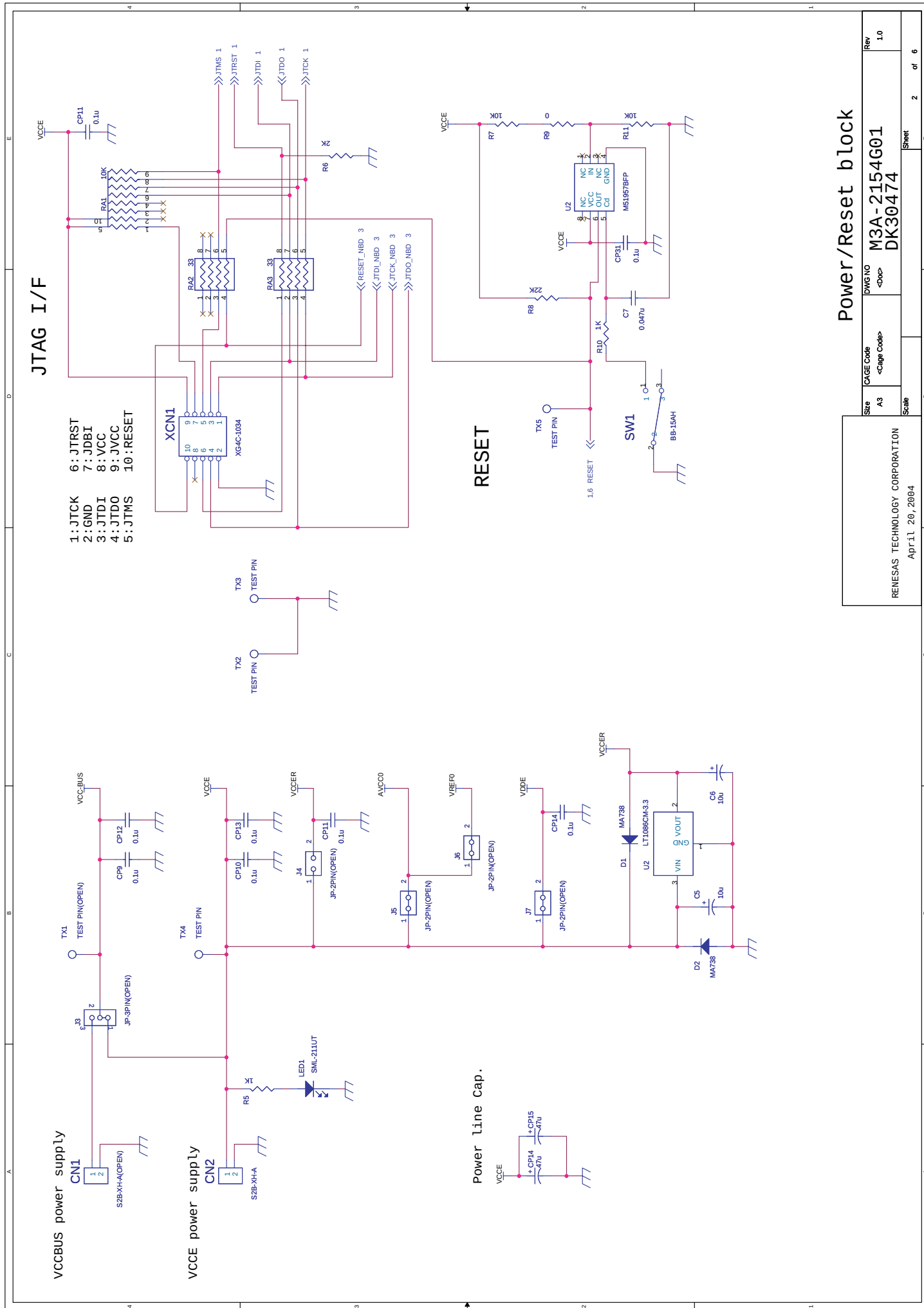
(2) CC1 and CC2 connections

Table 3-3-1. Connection Table

CC1			CC2	
Pin No.	Pin Name		Pin No.	Pin Name
1	N.C.		N.C.	1
2	CANL (blue)		CANL	2
3	N.C.		GND	3
4	CANH (white)		N.C.	4
5	GND (black)		N.C.	5
6	N.C.		N.C.	6
			CANH	7
			N.C.	8
			N.C.	9

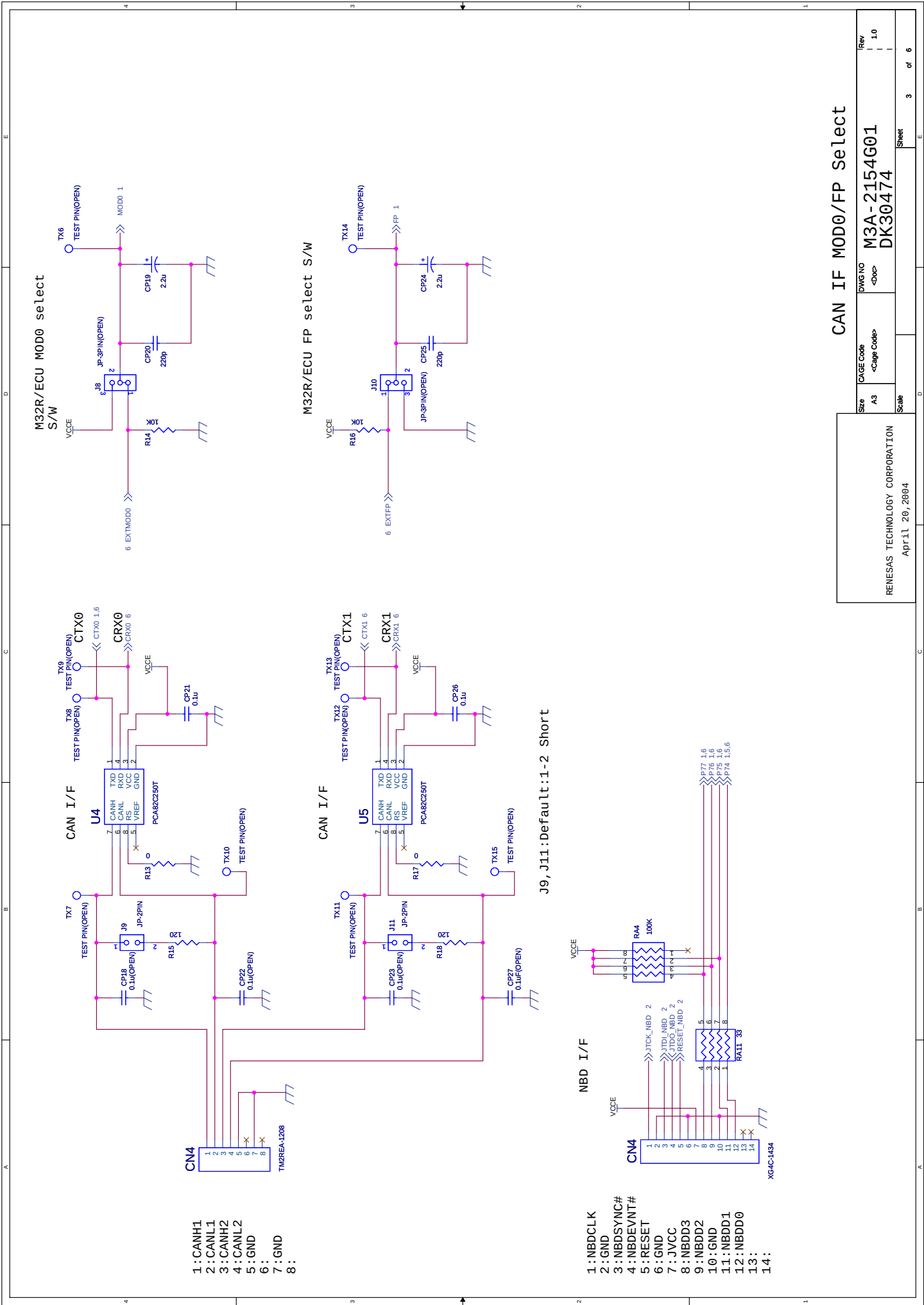
3-4. Connection Diagram

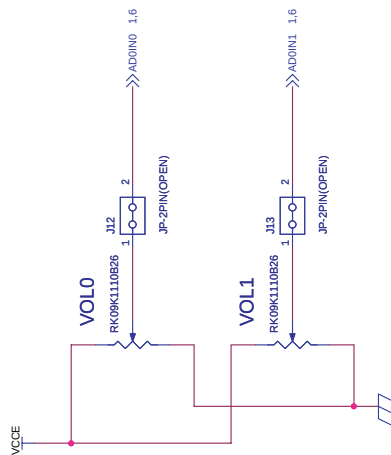
A connection diagram is provided in following pages for your reference.



Power/Reset block

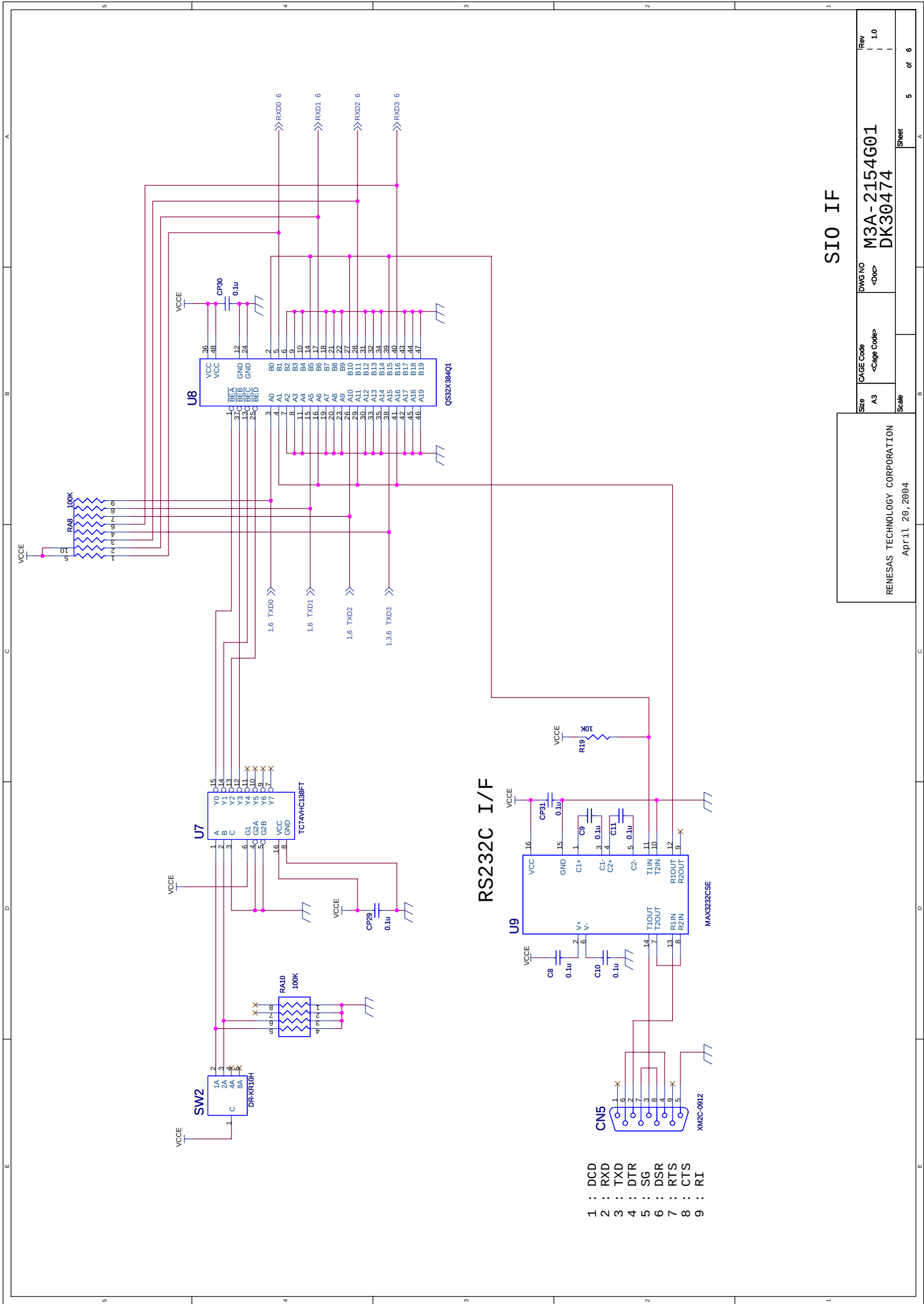
RENESAS TECHNOLOGY CORPORATION		DWG NO	Rev
Size	A3	M3A-2154G01	1.0
CAGE Code	<Cage Code>	DK30474	
Scale	1	Sheet	2 of 6





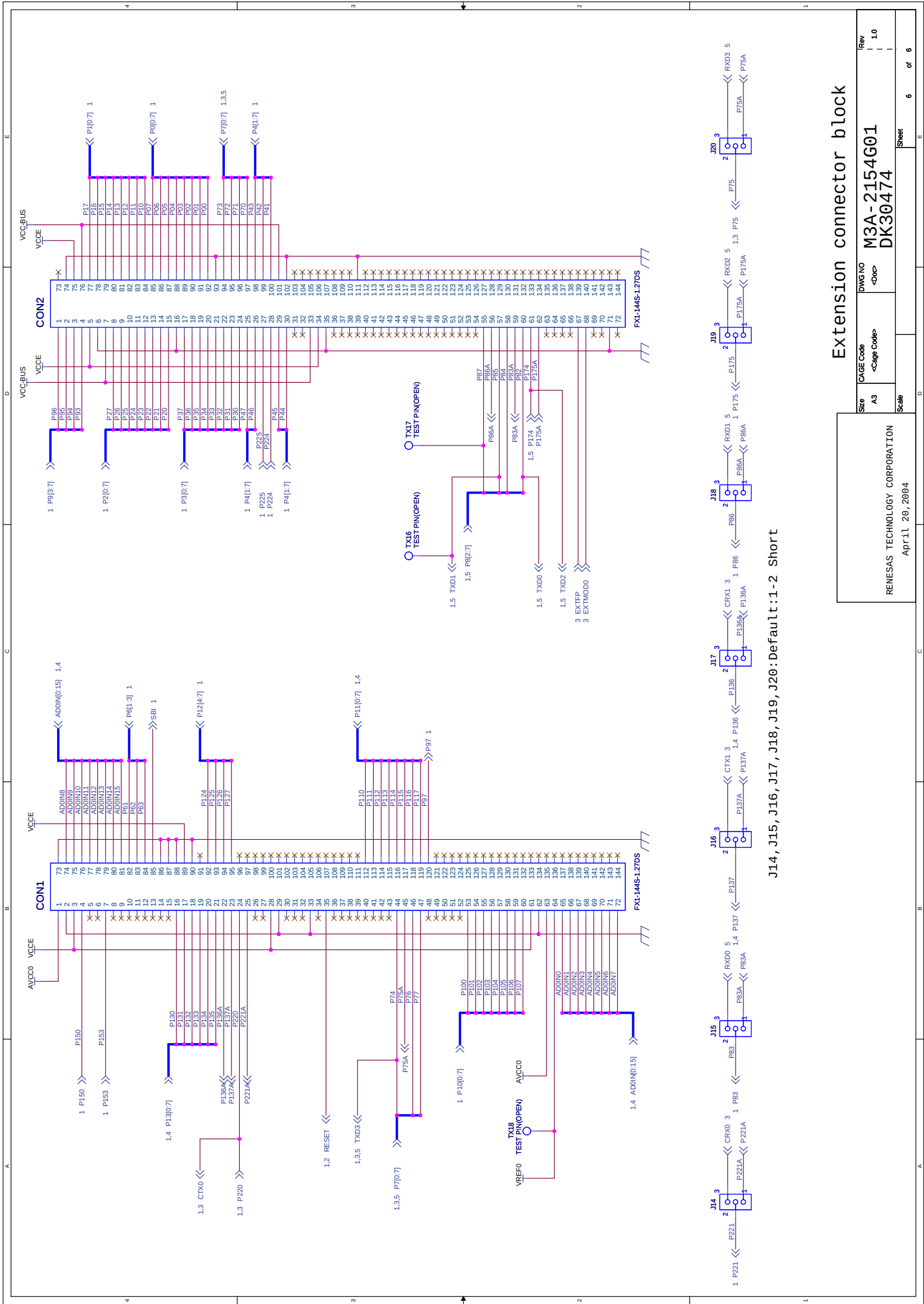
RENESAS TECHNOLOGY CORPORATION
April 20, 2004

Size A3	CAGE Code <Cage Code>	DWG NO <Dwg>	Rev 1.0
M3A-2154G01		DK30474	
Scale		Sheet	4 of 6
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RENESAS TECHNOLOGY CORPORATION		DWG NO	M3A-2154G01	Rev	1.0
Apr'11 20, 2004		<Doc>	DK30474		
Size	A3	CAGE Code	<Cage Code>	Sheet	5 of 6
Scale					



J14, J15, J16, J17, J18, J19, J20: Default: 1-2 Short

Extension connector block

Size		CAGE Code	DWG NO	Rev
A3		<Cage Code>	M3A-2154G01	1.0
Scale			DK30474	
RENESAS TECHNOLOGY CORPORATION				
Apr'11 20, 2004				
Sheet		6	of	6

3-5. Part List

A part list is provided in following pages for your reference.

Renesas Technology Corporation

Handling		Classification		No.		Title					Division in charge	
		Part List		PPL-M3A-2154G02		M3A-2154G02					Power Train Group	
Created				Revision								
Checked												

M3A-2154G02		Power Train Group	

Item No.	Part Name		Part No.	Part Type Name (Drawing No.,Product Specification)	Part Specification		Required Q'ty per Unit	Supply Classification	Remarks
	Description				Manufacturer Name	Mounting Direction			
1.	M32R/ECU#6HL	U1		M32192F8TFP	Renesas	Socket-mounted	1		
2.	Microcomputer socket	U1		NQPACK144SD	Sankyokasei	Mounted directly	1		
3.	Microcomputer socket	U1		HQPACK144SD	Sankyokasei	Mounted directly	1		
4.	Reset IC	U2		M51957BFP	Renesas	Mounted directly	1		
5.	Regulator	U3		LT1086CM-3.3	Linear	Mounted directly	1		
6.	CAN driver IC	U4, 5		PCA82C250T	Philips	Mounted directly	2		
7.	LED driver IC	U6		TC74HC540AF	Toshiba	Mounted directly	1		
8.	Decoder IC	U7		TC74VHC138FT	Toshiba	Mounted directly	1		
9.	Bus switch IC	U8		QS32X384Q1	IDT	Mounted directly	1		
10.	RS232C driver IC	U9		MAX3232CSE	MAXIM	Mounted directly	1		
11.	Oscillator	X1		DS0751SL-20MHz	Daishinku	Mounted directly	1		
12.	Oscillator	X2		DOC-49S1(20MHz)	Daishinku	Not mounted	0		
13.	Resonator	Y1		CSA-20MTz(20MHz)	Murata	Not mounted	0		
14.	Switch (push type)	SW1		BB-15AH (right-angle type)	Nihon Kaiheiki	Mounted directly	1		
15.	Operating unit for SW1	For SW1		AT-475 (red color)	Nihon Kaiheiki	Mounted directly	1		
16.	Rotary switch	SW2		DR-KR10H (right-angle type)	Nihon Kaiheiki		1		
Special note: (1) Blank columns denote the same content as the upper row. (2) If two or more part type names are written for one part, the upper row has priority. (3) The asterisk (*) in the item No. column denotes that the rest is blank.									
Special note:									

Renesas Technology Corporation

Item No.	Part Name		Part Specification			Mounting Direction	Required Qty per Unit	Supply Classification	Remarks
	Description	Part No.	Part Type Name (Drawing No.,Product Specification)	Manufacturer Name					
17	Switch	S0-7	A-13J2V (right-angle type)	Nihon Kaiheiki		Mounted directly	8		
18	Connector	CN1	S2B-XH-A	J.S.T. Mfg.		Not mounted	0		
19	Connector	CN2	S2B-XH-A	J.S.T. Mfg.		Mounted directly	1		
20	Connector	CN3	TM2REA-1208	Hirose		Mounted directly	1		
21	Connector	CN4	XG4C-1434	Omron		Mounted directly	1		
22	Connector	CN5	XM2C-0912	Omron		Mounted directly	1		
23	Connector	CON1,2	FX1-144S-1.27DS	Hirose		Mounted directly	2		
24	Connector	XCN1	XG4C-1034	Omron		Mounted directly	1		
25	Jumper pin (4 pins)	J1	FFC-4ASM1B	Honda Tsushin Kogyo		Not mounted	0		
26	Jumper pin (3 pins)	J2,3,8,10	FFC-3ASM1B	Honda Tsushin Kogyo		Not mounted	0		
27		J14-20	FFC-3ASM1B	Honda Tsushin Kogyo		Mounted directly	7		
28	Jumper pin (2 pins)	J9,11	FFC-2ASM1B	Honda Tsushin Kogyo		Mounted directly	2		
29		J4,5,6,7,12,13	FFC-2ASM1B	Honda Tsushin Kogyo		Not mounted	0		
30	LED	LED1, L0-7	SML-211UT	Rohm		Mounted directly	9		
31	Test pin	TX1,6-18	ST-1-1	Mac-Eight		Not mounted	0		
32	Test pin	TX2-5	ST-1-1	Mac-Eight		Mounted directly	4		
33	Laminated ceramic capacitor	CP1-3	GRM40F105Z25(1.0uF)	Murata		Mounted directly	3		
34	Laminated ceramic capacitor	CP4,5,8-14,20,25,	GRM40F104Z50(0.1uF)	Murata		Mounted directly	20		
35		CP27-31,C6-9							
Special note: (1) Blank columns denote the same content as the upper row. (2) If two or more part type names are written for one part, the upper row has priority. (3) The asterisk (*) in the item No. column denotes that the rest is blank.									
Special note:									

Renesas Technology Corporation

Item No.	Part Name		Part Specification			Mounting Direction	Required Qty per Unit	Supply Classification	Remarks
	Description	Part No.	Part Type Name (Drawing No.,Product Specification)	Manufacturer Name					
36	Laminated ceramic capacitor	CP6,7	GRM40F103Z50(0.01uF)	Murata		Mounted directly	2		
37	Laminated ceramic capacitor	CP17,21,22,26	GRM40F104Z50(0.1uF)	Murata		Not mounted	0		
38	Laminated ceramic capacitor	CP19,24	GRM40CH221J50(220pF)	Murata		Mounted directly	2		
39	Laminated ceramic capacitor	C1,2	GRM40CH300J50(30pF)	Murata		Not mounted	0		
40	Laminated ceramic capacitor	C3	GRM40B473K50(0.047uF)	Murata		Mounted directly	1		
41	Tantalum electrolytic capacitor	C4,5	F931D106MBA(10uF)	Nichicon		Mounted directly	2		
42	Tantalum electrolytic capacitor	CP15,16	F931C476MCA(47uF)	Nichicon		Mounted directly	2		
43	Tantalum electrolytic capacitor	CP18,23	F931V225MBA(2.2uF)	Nichicon		Mounted directly	2		
44	Diode	D1,2	MA738	Matsushita		Mounted directly	2		
45	5% resistor array (10 KΩ)	RA1	CND2B10 10KΩJ(10KΩ)	KOA		Mounted directly	1		
46	5% resistor array (33 Ω)	RA2,3,11	CN2B4 33ΩJ(33Ω)	KOA		Mounted directly	3		
47	5% resistor array (100 KΩ)	RA4,10	CN2B4 100KΩJ(100KΩ)	KOA		Mounted directly	2		
48	5% resistor array (100 KΩ)	RA6-9	CND2B10 100KΩJ(100KΩ)	KOA		Mounted directly	4		
49	5% resistor array (1 KΩ)	RA5	CND2B10 1KΩJ(1KΩ)	KOA		Mounted directly	1		
50	5% resistor (1 KΩ)	R1,5,10	MCR10EZHJ102(1KΩ)	Rohm		Mounted directly	3		
51	5% resistor (1 MΩ)	R2	MCR10EZHJ105(1MΩ)	Rohm		Not mounted	0		
52	5% resistor (0 Ω)	R3,9,12,16	MCR10EZHJ000(0Ω)	Rohm		Mounted directly	4		
Special note: (1) Blank columns denote the same content as the upper row. (2) If two or more part type names are written for one part, the upper row has priority. (3) The asterisk (*) in the item No. column denotes that the rest is blank.									
Special note:									

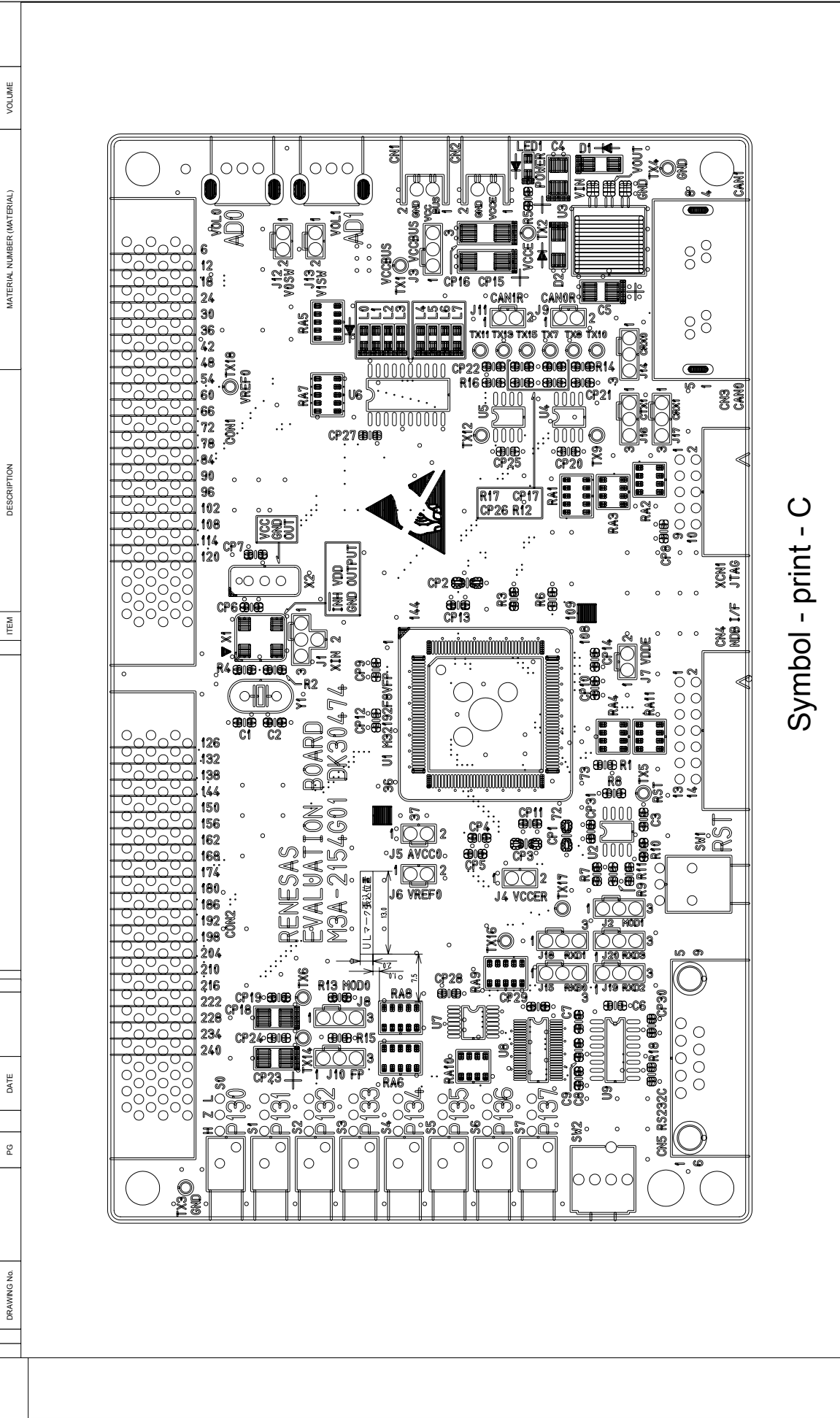
Renesas Technology Corporation

Item No.	Part Name		Part Specification				Required Qty per Unit	Supply Classification	Remarks
	Description	Part No.	Part Type Name (Drawing No.,Product Specification)	Manufacturer Name	Mounting Direction				
53	5% resistor (0 Ω)	R4	MCR10EZHU000(0Ω)	Rohm	Not mounted		0		
54	5% resistor (2 KΩ)	R6	MCR10EZHU202(2KΩ)	Rohm	Mounted directly		1		
55	1% resistor (10 KΩ)	R7,11,13,15,18	MCR10EZHF1002(10KΩ)	Rohm	Mounted directly		5		
56	5% resistor (22 KΩ)	R8	MCR10EZHU223(22KΩ)	Rohm	Mounted directly		1		
57	5% resistor (120 Ω)	R14,17	MCR10EZHU121(120Ω)	Rohm	Mounted directly		2		
58	Variable resistor	VOL0,1	RK09K1110B26 (right-angle type)	ALPS	Mounted directly		2		
59	Jx compatible jumper socket	J9,11,14-20	DIC208	Honda Tsushin Kogyo	Mounted directly		9		
60	Rubber feet		TM-166-3 (black color)	3M	-		5		
61	Board		M3A-2154G01 (DK30474)	(SHT)	-		1		
62	Power cable		EM4-99012		-		1		Included as part
63	CAN cable		EM4-A2001		-		2		Included as part
*									
Special note: (1) Blank columns denote the same content as the upper row. (2) If two or more part type names are written for one part, the upper row has priority. (3) The asterisk (*) in the item No. column denotes that the rest is blank.									

Special note:

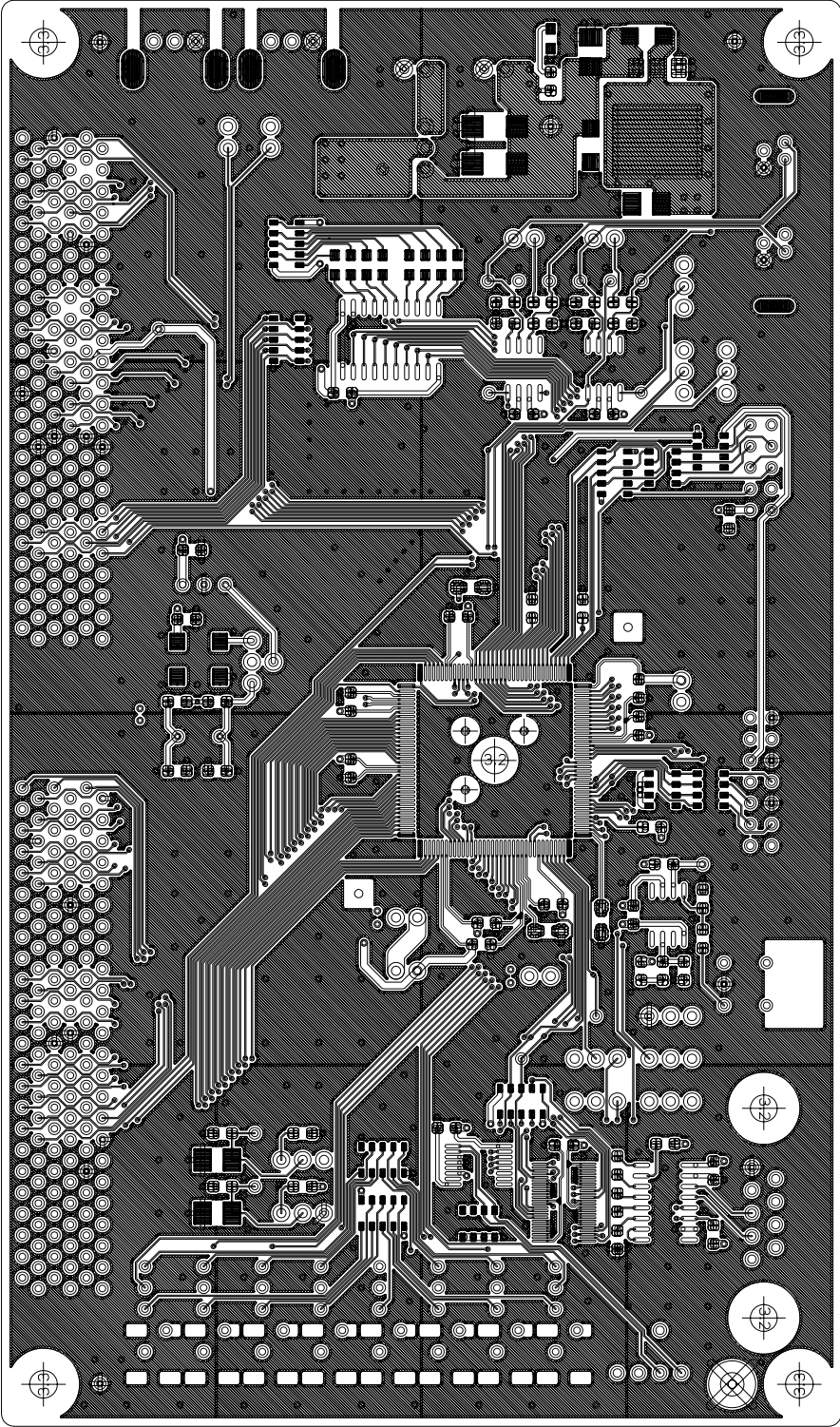
3-6. Pattern diagram

A pattern diagram for the board is provided in following pages for your reference.



Symbol - print - C

M3A-2154G01		DATE	04-6-15
Pattern diagram(1/6)		SCALE	/ (NTS)
RENEAS TECHNOLOGY CORPORATION		DIM IN mm	
RENEAS SOLUTIONS CORPORATION		3RD ANGLE PROJECTION	
DRAWN		CHECKED	DESIGN
APPROVED			
DK30483			

DRAWING No.		PG	DATE		ITEM		DESCRIPTION		MATERIAL NUMBER (MATERIAL)		VOLUME
											

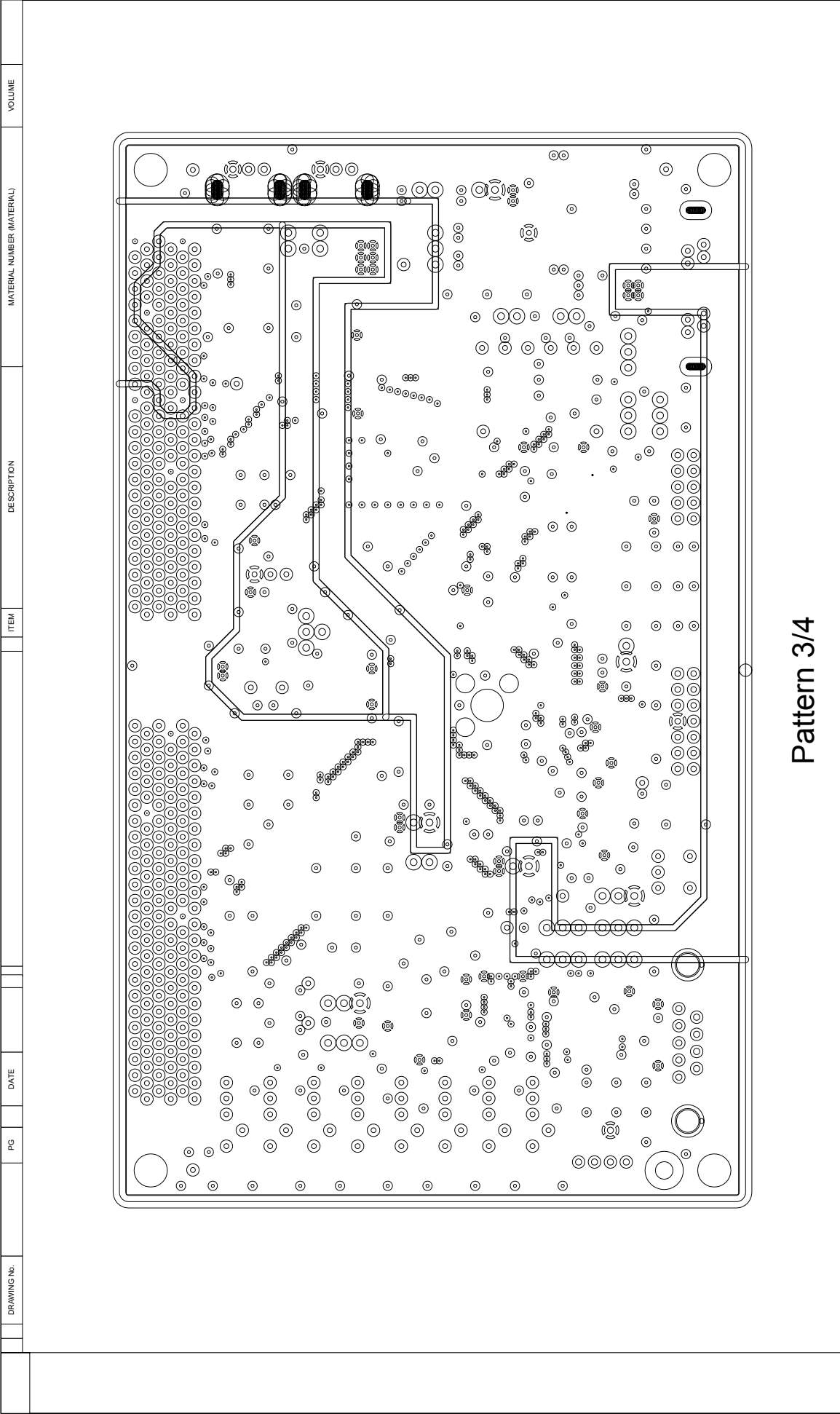
Pattern 1/4

M3A-2154G01				DATE	04-6-15		
Pattern diagram (2/6)				SCALE	/ (NTS)		
RENESAS TECHNOLOGY CORPORATION				DIM IN mm			
RENESAS SOLUTIONS CORPORATION				3RD ANGLE PROJECTION			
				DRAWN	CHECKED	DESIGN	APPROVED
DK30483							

DRAWING NO.		PG	DATE	ITEM		DESCRIPTION	MATERIAL NUMBER (MATERIAL)	VOLUME

Pattern 2/4

		3RD ANGLE PROJECTION		DIM IN mm	SCALE	DATE	M3A-2154G01	
					/ (NTS)	04-6-15	Pattern diagram (3/6)	
		RENESAS TECHNOLOGY CORPORATION		RENESAS SOLUTIONS CORPORATION				
		DRAWN	CHECKED	DESIGN	APPROVED			
						DK30483		

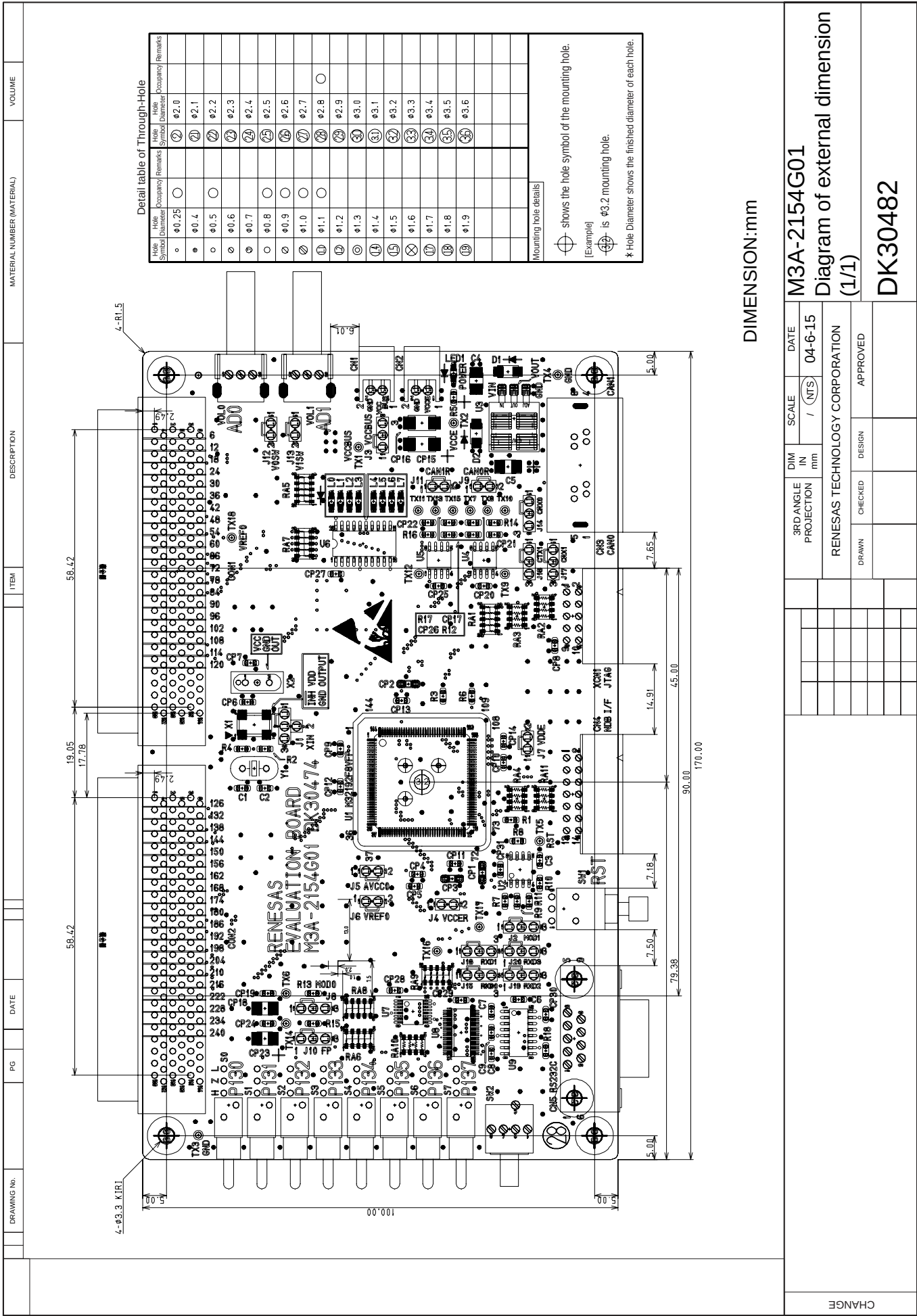


Pattern 3/4

										M3A-2154G01										Pattern diagram (4/6)									
										04-6-15																			
										RENESAS TECHNOLOGY CORPORATION										DK30483									
										RENESAS SOLUTIONS CORPORATION																			
										DESIGN										APPROVED									
										DRAWN										CHECKED									
										</																			

3-7. Diagram of external dimension

A diagram of external dimension for the board is provided in following pages for your reference.



REVISION HISTORY	32192 Group Evaluation Board Product Standards M3A-2154G02
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Rev.	Date	Description	
		Page	Summary
0.20	Jun 07, 2002	—	First edition
1.00	Aug 02, 2004	11	Table 1-4-1 corrected (VCCER specification added)
		18	Figure 2-4-1 corrected
		22	Figure 2-7-1 corrected
		25	Figure 2-9-1 corrected
		27	Figure 2-10-1 corrected
		31	Table 3-1-2 corrected
		33, 34	Figure 3-2-2 and Figure 3-2-3 corrected
1.10	Oct 31, 2006	48	Pattern diagram added
		55	Diagram of external dimension added
		16	- Corrected a clerical error of a specification of Oscillator Circuit (Chapter 2-5)
		23	- Corrected a clerical error of a specification of JTAG/NBD interface (Chapter 2-10)
		30	- Corrected a clerical error of a specification of CAN cable (Chapter 3-3)
		50	- Updated a diagram of the external dimension (Appendix 3-7)

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M3A-2154G02

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