Applications Engineering

SKPCOMMS

User's Manual

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1.0 Introduction

The SKPCOMMS board is an add-on component for standard Renesas StarterKit Plus (SKP) products. It was design to bring out various communication interfaces from SKP MCUs as well as provide more functionality, such as an external power supply, than what is on a standard SKP board.

The SKPCOMMS board can be ordered fully populated, or with a sub-set of components.

2.0 Contents of Product Package

This section describes the contents of the SKPCOMMS product package. When unpacking your SKPCOMMS, please check to see that all products listed below are included.

2.1 SKPCOMMS StarterKit Plus Add-on Product List
Table 2-1 lists the products included in the SKPCOMMS.

Table 2-1 SKPCOMMS Product List

Product Name	Quantity	Remark
SKPCOMMS Board	1	SKP COMMS Add-on SKP Board
Dual Row 50-pin Headers	2	To be populated on you board.
Power Supply	1	Needed when using the SKPCOMMS board
SKP CD-ROM	1	Installs necessary documents and sample programs.

2.1.1 SKP CD-ROM

The CD-ROM contains the electronic manuals and software necessary for developing programs. Your computer must have Netscape Navigator® or Microsoft®'s Internet Explorer to view the help files and Acrobat Reader to view the manuals.

Insert the enclosed CD into your computer and SKP installer will auto-start. The SKP installer program will create a C:\MTOOL and **C:\MTOOL\SKPCOMMS** folder on your machine. Documentation, sample code, and other SKP related files would be under C:\MTOOL\ COMMS folder.

If the SKP installer program does not start up, browse the CD's root folder and double-click on '***skp_installer.exe***' to start installation. If you continue having problems on the install, please read the '***Install FAQ.txt***' file on the root folder of the CD.

3.0 Limited Guarantee and Support

Renesas Technology America, Inc., warrants the SKPCOMMS to be free from component or assembly defect for a period of 180 days from the date of purchase. Settlement is limited to repair or replacement of the product only. Renesas Technology America, Inc., does not assume any liability arising out of the application or use of any product, circuit or procedure described herein. No other liability or warranty apply, expressed or implied. Software warranty is limited to replacement of the CD only. While every attempt has been made to ensure accurate documentation, Renesas Technology America, Inc., cannot be held responsible for error or omissions and reserves the right to make changes without further notice.

"Flash-Over-USB" is a trademark of Renesas Technology America, Inc. All trademarks are the property of their respective owners.

4.0 System Connectivity

The following lists the hardware and software products required for using the SKPCOMMS StarterKit Plus Add-on.

- Host Computer (supplied by user)
- Standard Renesas SKP board (sold separately)
- SKPCOMMS Board
- (2) Dual row 50-pin headers (to be populated on the board by user)
- Power Supply
- RTA-FoUSB-MON (ICD) (sold separately)
- Mini USB Cable (sold separately)
- Target Cable (sold separately)
- Software Tools (HEW IDE, NC30 Compiler/Linker, KD30 Debugger, FoUSB Programmer)

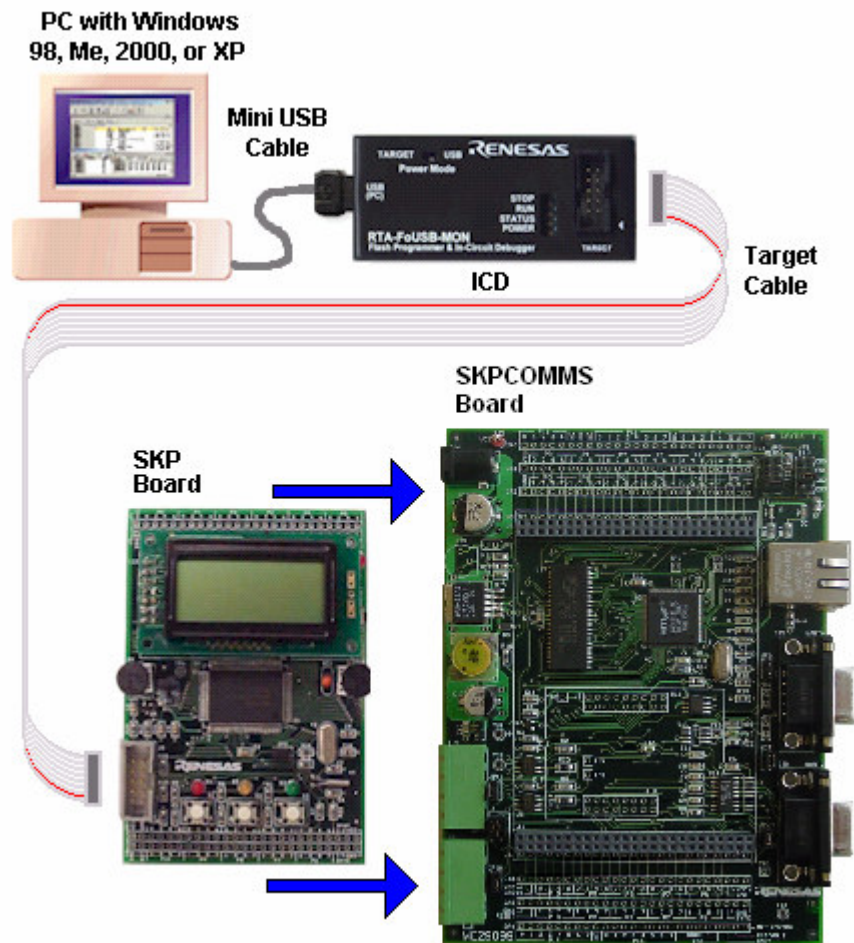Figure 4-1 shows the system connectivity for the SKPCOMMS.

Figure 4-1 SKPCOMMS System Connectivity

4.1 Host Computer Requirements

The minimum requirement to be able to use the software that comes with the SKPCOMMS is a PC with a USB port and Microsoft Windows 98, ME, 2000, or XP.

Note: For Windows 95 and NT, that do not support USB, please contact Renesas representative or email techsupport.rta@renesas.com for options.

4.2 SKPCOMMS Board

The SKPCOMMS board is an Add-on board for standard Renesas SKP boards. It is designed to be plugged in to a standard SKP evaluation product. When plugging in a standard SKP board into the SKPCOMMS board, orientate the silk screen text on both boards so that they are readable from the same direction.

4.3 ICD (RTA-FoUSB-MON)

IMPORTANT!
The ICD provides a plug-and-play debugging and programming interface to the SKP boards by using the host computer's Universal Serial Bus (USB). When using a SKP board with a SKPCOMMS board attached, switch the power source switch on the RTA-FoUSB-MON to "**TARGET**" Powered Mode since the power supply on the SKPCOMMS board will provide power to the SKP board as well as the RTA-FoUSB-MON. If the switch is left at "USB" Powered Mode, some MCU pins may be driven to undesirable levels.

5.0 Hardware

5.1 SKPCOMMS Board

Figure 5-1 shows the SKPCOMMS Board with major components identified.

Figure 5-1. SKPCOMMS Board
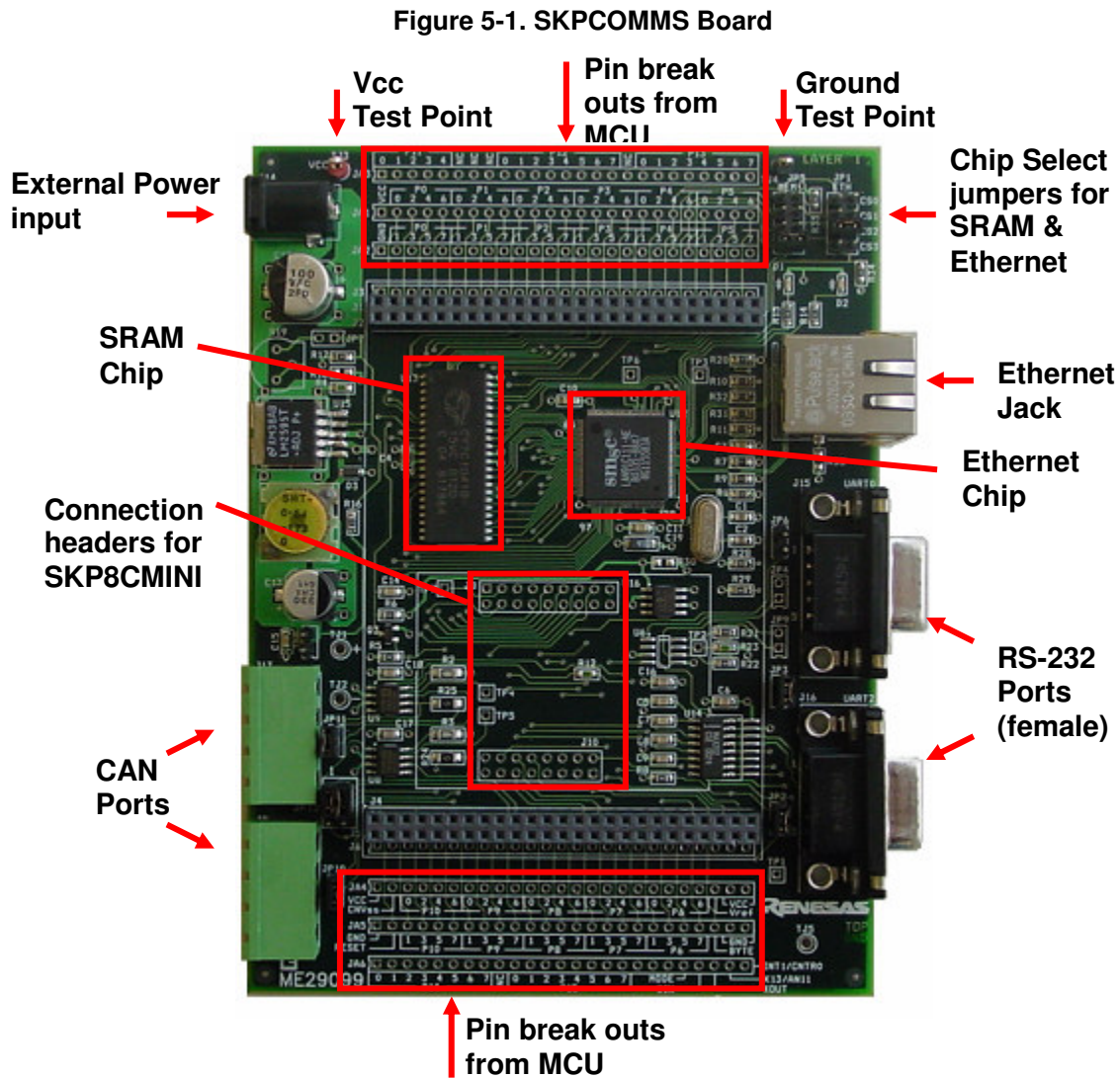
5.2 SKPCOMMS Board Block Diagram

The SKPCOMMS board contains multiple component interfaces. Note that not all components may be populated depending on which version you purchased.
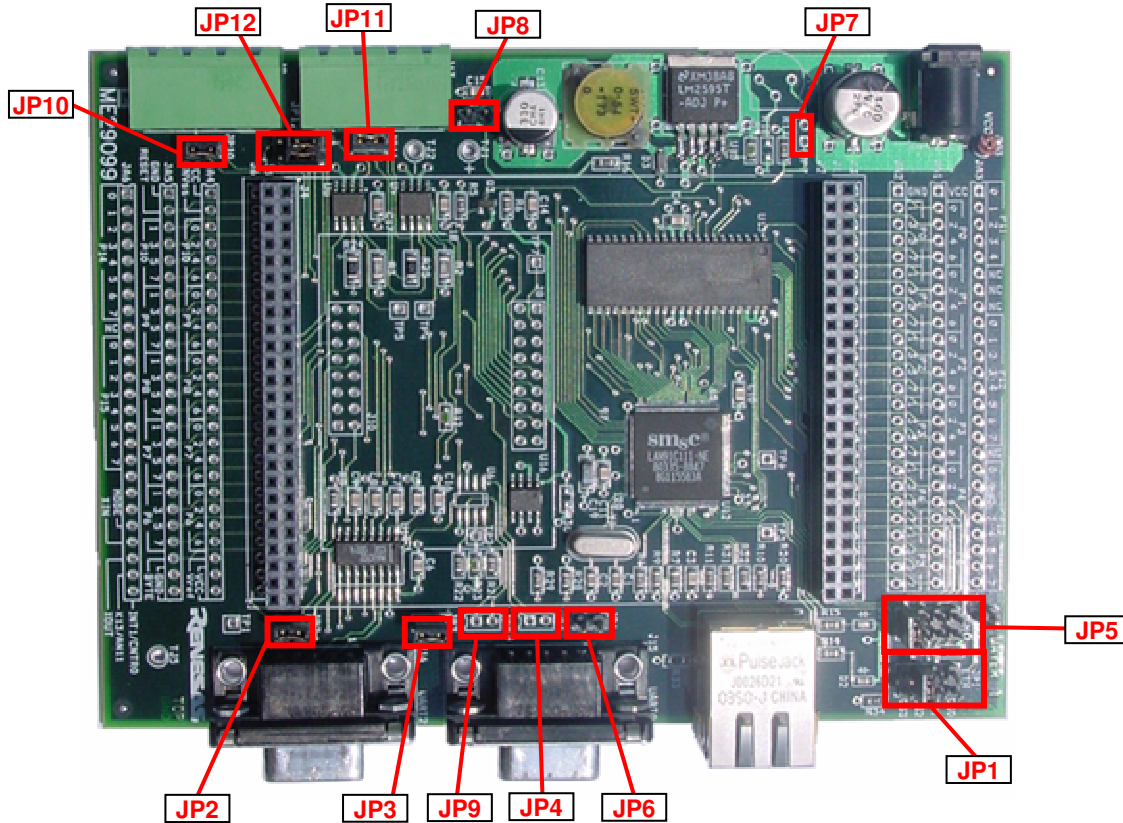
Figure 5-2. SKPCOMMS Block Diagram
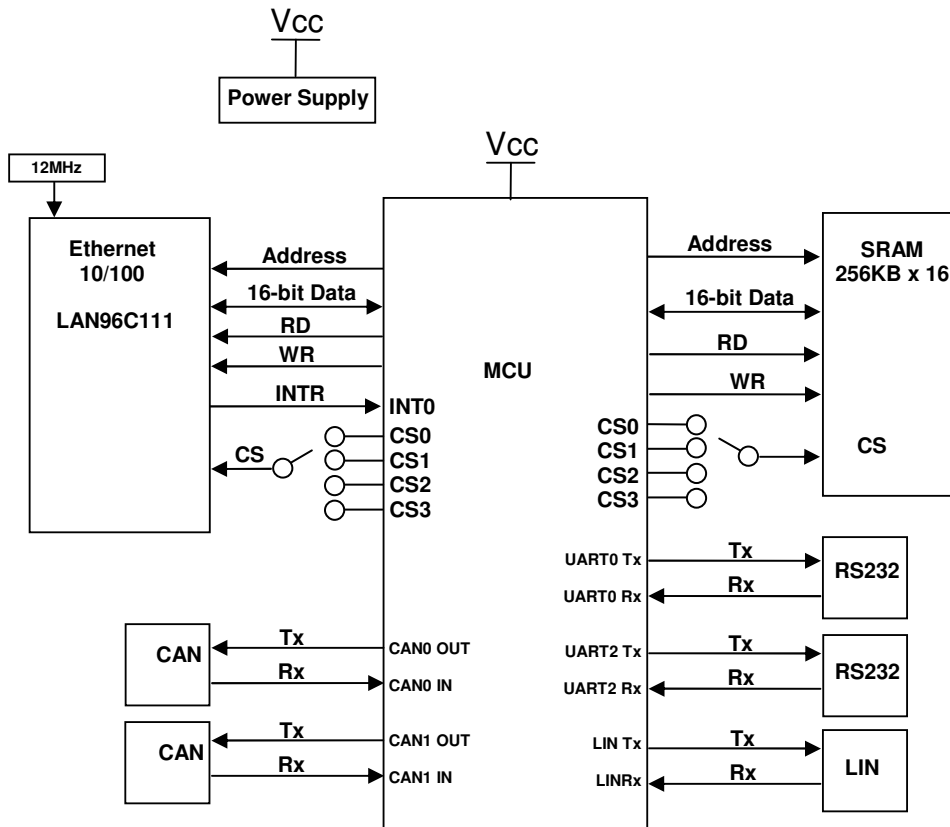
5.4 SKPCOMMS Board Jumper Configuration

5.4.1 Table of Jumper Connections
The following table shows all the jumper settings for the SKPCOMMS board. Note that the default jumper settings are different for a full SKPCOMMS board (all components populated) as opposed to a COMMS-LITE (Ethernet and SRAM not populated).

Jumper	SKPCOMMS Default	SKPCOMMS LITE Default	Purpose
JP1	5-6 (CS2)	OFF	This jumper is used to select which Chip Select pin will be driven to the Ethernet chip. Only horizontally short one of the four possible selections. (**NOTE1**)
JP2	ON	ON	When shorted, the Rx line from the RS232 transceiver will be connected to the UART2 Rx pin on the target MCU.
JP3	ON	ON	When shorted, the Tx line from the RS232 transceiver will be connected to the UART2 Tx pin on the target MCU.
JP4	Not Populated	Not Populated	When shorted, the Rx line from the LIN transceiver will be connected to port 7_1 pin on the target MCU.
JP5	1-2 (CS0)	OFF	This jumper is used to select which Chip Select pin will be driven to the SRAM chip. Only horizontally short one of the four possible selections. (**NOTE1**)
JP6	OFF	OFF	When shorted, the INTR0 line from the Ethernet chip will be connected to the INT0 pin on the target

			MCU.
JP7	Not Populated	Not Populated	When shorted, provides a feedback circuit for adjusting the output voltage of the supply. (NOTE 2)
JP8	ON	ON	When shorted, the power will be distributed from the supply to the COMMS and target MCU boards.
JP9	Not Populated	Not Populated	Output pins for the LIN circuit
JP10	OFF	OFF	When shorted, installs a 120Ohm CAN termination resistor.
JP11	OFF	OFF	When shorted, installs a 120Ohm CAN termination resistor.
JP12	1-3 2-4	1-3 2-4	For selecting the CAN pins to be routed to the CAN transceiver. M16C/29: Short 3-5 and 4-6 All other MCUs: Short 1-3 and 2-4

NOTE 1 - The chip select order is reversed between the M16C and M32C family of devices. The silk screen on the SKPCOMMS board is for M16C. So for M32C, you would short the position for CS3 if you desired CS0.

NOTE 2 – Setting up the variable power supply is beyond the scope of this manual. Contact your local Renesas representative for assistance.

6.0 System Operation & Limitations

6.1 Power Supply

When using the SKPCOMMS add-on board, you must use the external power supply provided with the kit. Also, please change the switch on the RTA-FoUSB-MON to "TARGET" Powered Mode.

6.2 Pin and Peripheral Limitations

SIO/UART1 pins are used for communication between the SKP board kernel and KD30 Debugger through the ICD. Do not connect these pins to any other circuit, as UART1 cannot be used in the user program. For details, please see ICD (RTA-FoUSB-MON) User Manual on Target M16C ROM Monitor Resources or related ICD application notes.

6.3 Memory Map

Because the SKPCOMMS board was designed to work will all the standard SKP kits, the memory map for address mapped components (SRAM and Ethernet) will be different for each device depending on the chip select jumpers used. Refer to the MCU's hardware manual for more details.

7.0 SKPCOMMS Board Specifications

7.1 Hardware Specifications

Table 7-1 lists the specifications of the SKPCOMMS Board. See documents "SKPCOMMS Schematic.pdf " and "SKPCOMMS Board BOM.xls" for more information.

Table 7-1. SKPCOMMS Board Specifications

Item	Specification
SRAM	128KB x 16 (device Manufacture may be Renesas or Cypress)
Ethernet	SMsC LAN96C111 10/100 BaseT Ethernet controller
RS232 Driver	Maxim MAX202CSE

7.2 Power Supply Requirements

The SKPCOIMMS Board (and attached MCU SKP board) will draw more power than can be supplied by the RTA-FoUSB-MON debugger. Therefore, only use the provided external power supply to power your system.

7.3 Operating Environment

Table 7-3 lists the environmental conditions for using and storing the SKPCOMMS board. When storing the board, place it in a conductive bag and then in the packing box your product was shipped in from the factory.

Table 7-2. Operating Environment

Environmental Condition	Ambient Temperature	Ambient Humidity
Operating	0 - 55°C (No corrosive gas allowed)	30 to 80% (non-condensing)
Storage	-30 to 75°C (No corrosive gas allowed)	30 to 80% (non-condensing)

Appendix A. Troubleshooting Guide

This section discusses possible problems you may encounter while installing the software. This section also discusses the countermeasures and solutions to resolve these problems.

If, for any reason, you cannot resolve the problem, please contact your Renesas representative for assistance.

A.1 Installing Required Files Manually

This section discusses how to install the SKPCOMMS software and development tools manually (i.e. when not using the SKPCOMMS installer).

(1) Create an *SKPCOMMS* folder under C:\MTOOL on your PC and then copy the directories from the *\SKPCOMMS\files* folder on the SKP CD to this folder.

Appendix B. Reference Manuals

| Item	Title	Description
1.	**SKPCOMMS User's Manual**	Installation and operation guide for the SKPCOMMS.
2.	**SKPCOMMS Board Schematic**	Schematic diagram for the SKPCOMMS board.
3.	**SKPCOMMS Board BOM**	Bill of materials for the SKPCOMMS board.

Appendix C. Expansion Headers

J1 Pin	Function
1	Vcc
2	P0_0, AN00, D0
3	P0_2, AN02, D2
4	P0_4, AN04, D4
5	P0_6, AN06, D6
6	P1_0, D8
7	P1_2, D10
8	P1_4, D12
9	P1_6, INT4, D14
10	P2_0, AN20, A0
11	P2_2, AN22, A2
12	P2_4, AN24, A4
13	P2_6, AN26, A6
14	P3_0, A8
15	P3_2, A10
16	P3_4, A12
17	P3_6, A14
18	P4_0, A16
19	P4_2, A18
20	P4_4, CS0
21	P4_6, CS2
22	P5_0, WRL, WR
23	P5_2, RD
24	P5_4, HLDA
25	P5_6, ALE

J2 Pin	Function
1	GND
2	P0_1, AN01, D1
3	P0_3, AN03, D3
4	P0_5, AN05, D5
5	P0_7, AN07, D7
6	P1_1, D9
7	P1_3, D11
8	P1_5, INT3, D13
9	P1_7, INT5, D15
10	P2_1, AN21, A1
11	P2_3, AN23, A3
12	P2_5, AN25, A5
13	P2_7, AN27, A7
14	P3_1, A9
15	P3_3, A11
16	P3_5, A13
17	P3_7, A15
18	P4_1, A17
19	P4_3, A19
20	P4_5, CS1
21	P4_7, CS3
22	P5_1, WRH, BHE
23	P5_3, BCLK
24	P5_5, HOLD
25	P5_7, RDY, CLKOUT

J3 Pin	Function
1	Vcc
2	CNVss
3	P10_0, AN0
4	P10_2, AN2
5	P10_4, AN4, KI0
6	P10_6, AN6, KI2
7	P9_0, TB0in, CLK3
8	P9_2, TB2in, Sout3
9	P9_4, TB4in, DA1
10	P9_6, Sout4, ANEX1
11	P8_0, TA4out, U
12	P8_2, INT0
13	P8_4, INT2
14	P8_6, XCout
15	P7_0, TxD2, SDA2, TA0out
16	P7_2, CLK2, TA1out, V
17	P7_4, TA2out, W
18	P7_6, TA3out
19	P6_0, CTS0
20	P6_2, RxD0, SCL0
21	P6_4, CTS1, CLKS1
22	P6_6, RxD1, SCL1
23	Vref
24	Vcc
25	Vcc

J4 Pin	Function
1	GND
2	RESET
3	P10_1, AN1
4	P10_3, AN3
5	P10_5, AN5, KI1
6	P10_7, AN7, KI3
7	P9_1, TB1in, Sin3
8	P9_3, TB3in, DA0
9	P9_5, CLK4, ANEX0
10	P9_7, ADTRIG, Sin4
11	P8_1, TA4in, /U
12	P8_3, INT1
13	P8_5, NMI
14	P8_7, XCin
15	P7_1, RxD2, SCL2, TB5in
16	P7_3, CTS2, TA1in, /V
17	P7_5, TA2in, /W
18	P7_7, TA3in
19	P6_1, CLK0
20	P6_3, TxD0, SDA0
21	P6_5, CLK1
22	P6_7, TxD1, SDA1
23	BYTE
24	GND
25	GND

Appendix D. SKPCOMMS Board Dimensions
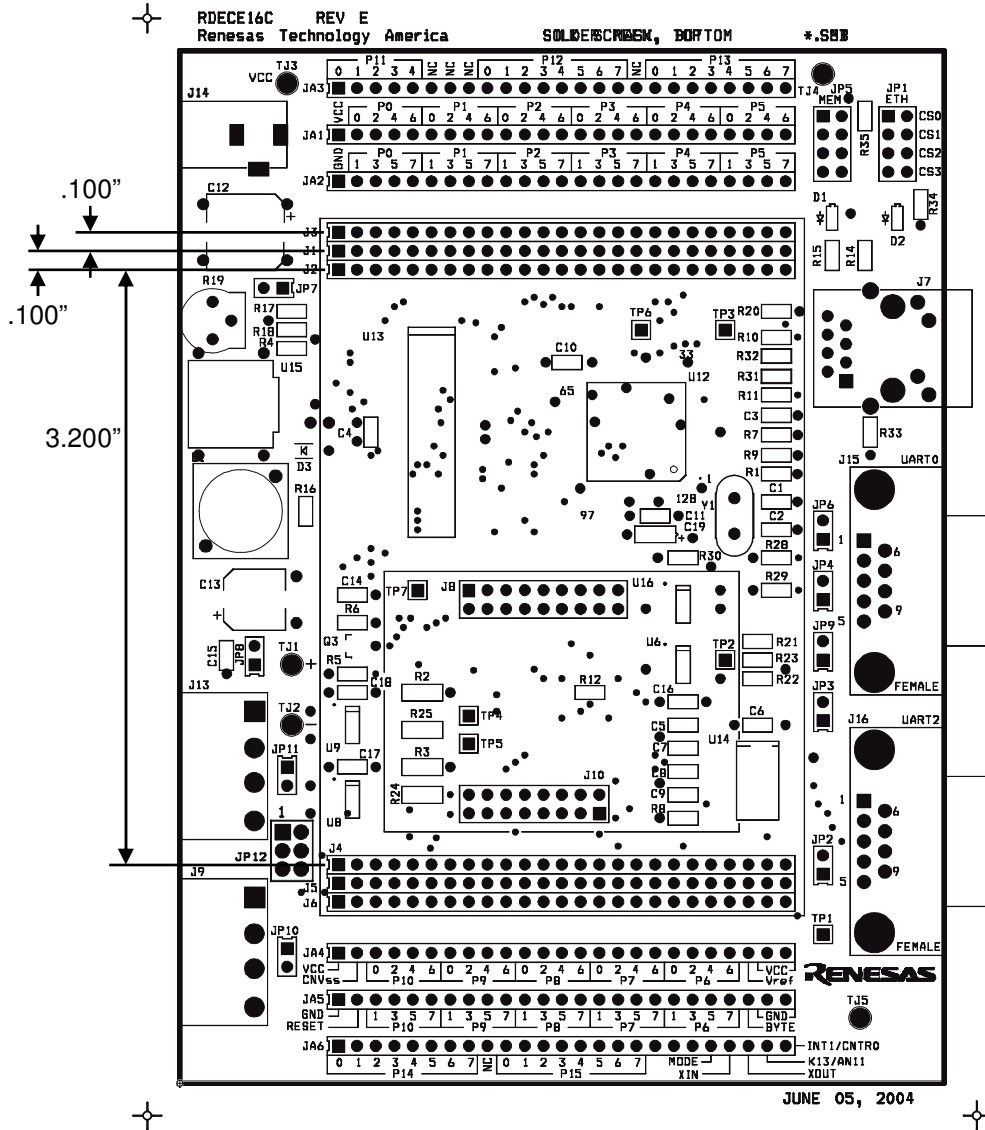
NOTES:
- All headers are standard 0.1 inch spacing
- Distance between headers are the same for top and bottom side of the board

Appendix E. RTA-FoUSB-MON (ICD)

For details on how to use the ICD, please see RTA-FoUSB-MON user's manual.