

Dear customer

ROHM Co., Ltd. ("ROHM"), on the 1st day of April, 2024, has absorbed into merger with 100%-owned subsidiary of LAPIS Technology Co., Ltd.

Therefore, all references to "LAPIS Technology Co., Ltd.", "LAPIS Technology" and/or "LAPIS" in this document shall be replaced with "ROHM Co., Ltd." Furthermore, there are no changes to the documents relating to our products other than the company name, the company trademark, logo, etc.

Thank you for your understanding.

ROHM Co., Ltd. April 1, 2024

Dear customer

LAPIS Semiconductor Co., Ltd. ("LAPIS Semiconductor"), on the 1st day of October, 2020, implemented the incorporation-type company split (shinsetsu-bunkatsu) in which LAPIS established a new company, LAPIS Technology Co., Ltd. ("LAPIS Technology") and LAPIS Technology succeeded LAPIS Semiconductor's LSI business.

Therefore, all references to "LAPIS Semiconductor Co., Ltd.", "LAPIS Semiconductor" and/or "LAPIS" in this document shall be replaced with "LAPIS Technology Co., Ltd."

Furthermore, there are no changes to the documents relating to our products other than the company name, the company trademark, logo, etc.

Thank you for your understanding.

LAPIS Technology Co., Ltd. October 1, 2020

FEXL7416_EVA_startguide-01



ML7416LSI Evaluation Kit Start Guide

* Read this guide first

Issue Date: May 7, 2015



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2-4-8 Shinyokohama, Kouhoku-ku, Yokohama 222-8575, Japan http://www.lapis-semi.com/en/ Introduction

Thank you for your purchasing our product. Read this "Start Guide" first before using the product to ensure proper use of the product. After reading, keep this guide handy for future reference. This start guide describes the attached articles and connection methods.

The following related manuals are available and should be referenced as needed:

- ML7416 Data Sheet
- ML7416LSI Design Manual
- Wireless PAN Test Tool User's Manual

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1. Cautions in Handling This Product

- This product is an evaluation kit. It shall be used only for evaluations.
- Use the application software of this product on a personal computer with Windows XP or Windows 7 installed.
- Duplicating all or any part of the software of this product or distributing a copy without the permission of the copyright owner violates the copyright.
- LAPIS assumes no responsibility for retrofitting and illegal using of this product.
- Should this product cause a harmful radio wave interference, immediately change the frequency used or stop the radio wave output and make crosstalk avoidance treatments.
- The evaluation board is set with constants of 200 kbps or lower data rate and 920 MHz band at shipment. If you want to use other conditions for evaluation, refer to the Design Manual to modify the constants.

2. Setup Flow

This flow is from the check on package contents to the assembly.

STEP 1
Checking on Package Contents
STEP 2
Setting Evaluation Board
STEP 3
Setting up Serial Communication Software

STEP1 Checking on Package Contents

Open the box. First, confirm all of the following articles are available. Should there is any missing or broken part, contact the source from which you purchased it.

- * CD-ROM is packaged only when purchased first time.
- * The mounted parts may look different from the photo depending on the shipment time.
- * Prepare the stabilized power supply and the serial communication software (TeraTerm) by yourself.



STEP2 Setting Evaluation Board

This chapter describes the evaluation board setting.

* Always turn off the power when configuring the board setting.

Insert the USB cable into the USB connector on the evaluation board enclosed by a heavy line in the photo below.

* An attempt to diagonally insert the USB cable may break the connector.

	<image/>
ML7416 Evaluation	Board

Figure 1 Connection between the Evaluation Board and USB Cable

This section describes the control board setting. The following table lists the jumper functions and recommended settings of the evaluation board.

JP No. Feature ended settings mode primary mode sectional mode tertiary mode tertiary mode tertiary JP1 VDDIO_CPU VDD_REG_CPU power supply setting Short: Power supply setting Short: Power supply setting Short Short Short Short For tuning at shipment. Always needs to be use setting. JP2 Loop Filetr voltage monitoring Short: Monitor output, Open: Normal setting Open Short Short Always needs to be used in 1-2 Short setting. JP3 VDDIO_CPURF power supply setting 1-2: Use VDDIO_CPURF, 2-3: Use external powers 1-2 Short Short Short New seeds to be used in 1-2 Short setting. JP4 A_MON pin settings Short: VDDIO_RF, Open: A_MON monitor output Short Short Short Short: Short setting. JP5 Regulator power supply setting for TCXO 1-2: Fixed to GND, 2-3: Fixed to power supply 1-2: Short Short Always needs to be used in 1-2 Short setting. JP6 Setting for control TCXO 1-2: Fixed to GND, 2-3: Fixed to power supply 1-2: Short Always needs to be used seti nshort. JP7 RESETN setting Short: Use, Open: Nct use Open Always needs to be used seti nshort. JP8 Use V		ind Settings							
ph control Con		Remarks					Feature		JP No.
IP2 Cop File voltage motion Sint: Monitor output, Quen, Konnal selling Open Image of the selling of th			COT CICLE	00001100	printiger				JP1
drag image Field Set Model Construction Construction drag A_NEWS mestings Stort Field Can MD, Open A, MDN monitor output Stort Stort Mathematic MD, MDN monitor output Mathematic MD, MDN monitor output Mathematic MD, MDN monitor output Stort Mathematic MD, MDN monitor output	be used in Open	For tuning at shipment. Always needs to be use setting.				Open			JP2
JP4 A. MON pin settings Shot: Flued to CMD. Open: A, MON montor output Shot Image: Shot in Shot: Shot: Shot in Shot: Shot	etting.	Always needs to be used in 1-2 Short setting.				1-2 Short	1-2: Use VDDIO_CPURF, 2-3: Use external powers		JP3
JP6 Skinn for control TCX 1-2 Field to KN2_2-3 Field to power supply 1-2 Short Marya needs to be used in 1-2 Short steined Vort JP7 REISE IN stetting Short I kee, Open Not use Open Awaya needs to be used in 1-2 Short steined Vort JP7 REISE IN stetting Short I kee, Open Not use Open Awaya needs to be used in 1-2 Short steined Vort USB (power supply for VDD, USB (power supply for VDD, USB (power supply for VDD, USB (power supply sted.) JP11 Use VDD_USB 2 power supply Short I kee, Open Not use Open Amage and the USB power supply for VDD, USB (power supply sted.) JP14 Wome warms manage power Short I kee, Open Not use Open Amage and the USB power supply for VDD, USB (power supply to USL USL, Open Not use Open Amage and the USB power supply for VDD, USB (power supply to USL USL, Open Not use Open Amage and the USB power supply for VDD, USB (power supply to USL USL, Open Not use Open Amage and the USB power supply for VDD, USB (power supply for VDB, USB, Dower supply for VDD, USB (power supply for VDB, USB, Dower supply for VDB, USB, Dower supply for VDD, USB (power supply for VDB, USB, Dower supply for VDB, USB, Dower supply for VDB, USB, Dower supply for VDD, USB (power supply for	et in Open.	When use as a analog monitor circuit set in Op				Short		A_MON pin settings	JP4
JP6 Skinn for control TCX 1-2 Field to KN2_2-3 Field to power supply 1-2 Short Marya needs to be used in 1-2 Short steined Vort JP7 REISE IN stetting Short I kee, Open Not use Open Awaya needs to be used in 1-2 Short steined Vort JP7 REISE IN stetting Short I kee, Open Not use Open Awaya needs to be used in 1-2 Short steined Vort USB (power supply for VDD, USB (power supply for VDD, USB (power supply for VDD, USB (power supply sted.) JP11 Use VDD_USB 2 power supply Short I kee, Open Not use Open Amage and the USB power supply for VDD, USB (power supply sted.) JP14 Wome warms manage power Short I kee, Open Not use Open Amage and the USB power supply for VDD, USB (power supply to USL USL, Open Not use Open Amage and the USB power supply for VDD, USB (power supply to USL USL, Open Not use Open Amage and the USB power supply for VDD, USB (power supply to USL USL, Open Not use Open Amage and the USB power supply for VDD, USB (power supply for VDB, USB, Dower supply for VDD, USB (power supply for VDB, USB, Dower supply for VDB, USB, Dower supply for VDD, USB (power supply for VDB, USB, Dower supply for VDB, USB, Dower supply for VDB, USB, Dower supply for VDD, USB (power supply for						Open	Short: VDDIO_RF, Open: external input	Regulator power supply setting for	JP5
JP7 RESET N setting Short I word (No. Open Not use Open Mays needs to be used set in Short. JP13 Be VOD_USB3 power supply Short Use, Open Not use Open Short Mays needs to be used set in Short. JP13 Use VOD_USB3 power supply Short Use, Open Not use Open Short Mays needs to be used set in Short. JP14 Use VOD_USB3 power supply Short Use, Open Not use Open Short Short Use, Open Not use JP14 VD033V setting, On Short Use, Open Not use Open Short Water R42 is implemented. JP16 VD0_PER setting Short Use, Open Not use Open Short Water R42 is implemented. JP11 SP MS0 pin selection Short CPIOA2 setted, Open GPIOA2 not selected Open Short Short JP12 SP SN fin selection Short GPIOA3 selected, Open GPIOA3 not selected Open Short Short JP12 SP SN Kin selection Short GPIOA3 seled	etting.	Always needs to be used in 1-2 Short setting.				1-2 Short			JP6
gH13 Use VDD_USB2 power supply Short Short Open Short Sh		Always needs to be used set in Short.				Short			JP7
arr.13 Give Void Obs2 (power supply) Short Use, Open: Not use Open Short Short Use, Open: Not use Open Short Use, Open: Not use Open Short Use, Open: Not use Short Use, Open: Not use Open Short Use, Open: Not use Short Use, Open: Not use Open Short Short Use, Open: Not use Open Short Short Use, Open: Short Use, Open: CPIOA3 not selected Open Short <	D (IC2 regulator)	When using neuron supply for VDD, USD (IC2 r				Open	Short: Use, Open: Not use	Use VDD_USB1 power supply	JP8
JP17 Use VDD_USB3 power supply Short: Use, Open: Not use Open Set this setting only with USB3 connector power. JP19 VDD33V setting Short: Connection, Open: OI resistor connection Short Short when R45 is implemented. JP14 VMD2/WVX_NEDOUS POWER Short: Use, Open: Not use Open Monton USB 2000000000000000000000000000000000000	5 (IC2 regulator), s					Short	Short: Use, Open: Not use	Use VDD_USB2 power supply	JP13
JPD Even-server - record prove Start Use, Open Not use Open Monomial When using 3.3V power supply for US8-UART JP14 Verd_Server - record prove Start Use, Open Not use Open Start Verd_Server - record prove Start Use, Open Not use Open Start Verd_Server - record prove Start Verd_Server - record prove - reco	tor power supply i	Set this setting only when USB3 connector pow				Open	Short: Use, Open: Not use	Use VDD_USB3 power supply	JP17
jipit Vest-Server		Short when R45 is implemented.				Short	Short: Connection, Open: 0Ω resistor connection	VDD33V setting	JP19
Julia Julia <td< td=""><td></td><td>When using 3.3V power supply for LISP LIAPT</td><td></td><td></td><td></td><td>Open</td><td>Short: Use, Open: Not use</td><td></td><td>JP9</td></td<>		When using 3.3V power supply for LISP LIAPT				Open	Short: Use, Open: Not use		JP9
JP16 DD Short Use, Open: Not Use Open Short When R42 is implemented. JP16 VDD_LO1 setting Short: Connection, Open: OD resistor connection Open Short when R42 is implemented. JP10 SPI MISD pin selection Short: GPIOA2 selected, Open: GPIOA3 not selected Open Short Short when R42 is implemented. JP11 SPI MISD pin selection Short: GPIOA3 selected, Open: GPIOA3 not selected Open Short When nusing CN8 connector. JP12 SPI SKN pin selection Short: GPIOA1 selected, Open: GPIOA1 not selected Open Short When using CN8 connector. JP23 SPI MISD pin selection Short: GPIOA1 selected, Open: GPIOA1 not selected Open Short When using CN10 connector. JP24 SPI SKN pin selection Short: GPIOA1 selected, Open: GPIOA1 not selected Open Short When using CN10 connector. JP24 SPI SKN pin selection Short: GPIOA8 selected, Open: GPIOA8 not selected Open Short When using CN10 connector. JP24 SPI SKN pin selection Short: GPIOA8 selected, Open: GPIOA8 not selected Open Short Short JP24 SPI SKN pin selection Short: GPIOA8 selected, Open: GPIOA8 select						Open	Short: Use, Open: Not use		JP14
JP20 VDD_IO1 setting Shott: Connection. Open: OP resistor connection Open Image: Construction open: CPIOA2 selected. Open: GPIOA2 not selected open Shott when R46 is implemented. JP10 SPI MISD pin selection Shott GPIOA3 selected. Open: GPIOA3 not selected open Open Shott Shott JP11 SPI MOSI pin selection Shott GPIOA3 selected. Open: GPIOA3 not selected open Open Shott Shott JP12 SPI SCK pin selection Shott: GPIOA1 selected. Open: GPIOA1 not selected Open Shott Shott JP23 SPI MSD pin selection Shott: GPIOA1 selected. Open: GPIOA1 not selected Open Shott Shott JP23 SPI MOSI pin selection Shott: GPIOA1 selected. Open: GPIOA1 not selected Open Shott Shott JP24 SPI SCK pin selection Shott: GPIOA3 selected. Open: GPIOA3 not selected Open Shott Shott JP24 SPI SCK pin selection Shott: GPIOA3 selected. Open: GPIOA3 not selected Open Shott Shott JP24 SPI SCK pin selection Shott: GPIOA3 selected. Open: GPIOA3 not selected Open Shott Shott JP25 SPI SCK pin selection Shott: GPIOA3 selected. Open: GPIOA3 not selected Open Shott Shott JP26 CN0 connector SPI/SSIS power Sho									
JP10 SPIMSD pin selection Short: GPIOA2 selected, Open: CPIOA3 not selected Open Short Short JP11 SPI MSD pin selection Short: GPIOA3 selected, Open: CPIOA3 not selected Open Short Short JP12 SPI SCK pin selection Short: GPIOA1 selected, Open: CPIOA1 not selected Open Short Short JP12 SPI SCK pin selection Short: GPIOA1 selected, Open: GPIOA1 not selected Open Short Short JP22 SPI MSD pin selection Short: GPIOA1 selected, Open: GPIOA11 not selected Open Short Short JP23 SPI MSD pin selection Short: GPIOA1 selected, Open: GPIOA11 not selected Open Short Short JP24 SPI SCK pin selection Short: GPIOA9 selected, Open: GPIOA9 not selected Open Short Short JP24 SPI SSN pin selection Short: GPIOA9 selected, Open: Not supply Open Short Short JP24 SPI SSN pin selection for UT SUU; Short: Supply, Open: Not supply Open Short Pinetisse JP24 CNR connector SPI/SSIS power short: Supply, Open: Not supply Open Always needs to be used set in OPEN. JP34		Short when R42 is implemented.				Open	Short: Use, Open: 0Ω resistor connection	VDD_PER setting	JP16
JP11 SPI MOSI pin selection Short. GPIOA3 selected. Open: GPIOA3 not selected Open Short Short JP12 SPI SCK pin selection Short. GPIOA1 selected. Open: GPIOA1 not selected Open Short Short JP12 SPI SKN pin selection Short. GPIOA1 selected. Open: GPIOA1 not selected Open Short Short JP22 SPI MIS0 pin selection Short. GPIOA11 selected. Open: GPIOA11 not selected Open Short Short JP23 SPI MOSI pin selection Short. GPIOA11 selected. Open: GPIOA8 not selected Open Short Short JP24 SPI SKN pin selection Short. GPIOA9 selected. Open: GPIOA9 not selected Open Short Short JP24 SPI SKN pin selection for UT SCLL Short. GPIOA9 selected. Open: GPIOA9 not selected Open Max Anways needs to be used set in OPEN. JP31 Connector SPISSIS power spip/ Short. Supply. Open: Not supply Open Max Anways needs to be used set in OPEN. JP32 Connector selection for UT SCLL 12: GPIOA9 selected. Open: Open Aways needs to be used set in OPEN. JP34 Connector selection for UT SCLL 12: GPIOA9 selected. Open: Open <		Short when R46 is implemented.				Open	Short: Connection, Open: 0Ω resistor connection	VDD_IO1 setting	JP20
JP12 SPI SCK pin selection Short: GPIOAD selected, Open: GPIOAD not selected Open Short Short JP15 SPI SSN pin selection Short: GPIOA1 selected, Open: GPIOA1 not selected Open Short Short JP23 SPI MIS0 pin selection Short: GPIOA10 selected, Open: GPIOA11 not selected Open Short Short JP23 SPI MOS1 pin selection Short: GPIOA11 selected, Open: GPIOA3 not selected Open Short Short JP24 SPI SCK pin selection Short: GPIOA19 selected, Open: GPIOA3 not selected Open Short Short JP24 SPI SCK pin selection Short: GPIOA9 selected, Open: GPIOA3 not selected Open Short Short JP21 CN10 connector SPISSIS power supply Short: Supply, Open: Not supply Open Mays needs to be used set in OPEN. JP31 Connection for U7 SCLK. 12: GPIOA3 selected, Open: Open Open Aways needs to be used set in OPEN. JP32 Connection selection for DUT 12: GPIOA1 selected, Open: Open Aways needs to be used set in OPEN. JP33 Connection selection for DUT 12: GPIOA1 selected, Open: Open Aways needs to be used set in OPEN.			Short			Open	Short: GPIOA2 selected, Open: GPIOA2 not selected	SPI MIS0 pin selection	JP10
JP12 SPI SCK pin selection Short GPIOA0 selected, Open: GPIOA0 not selected Open Sol Short JP15 SPI SSN pin selection Short GPIOA1 selected, Open: GPIOA1 not selected Open Short Short JP22 SPI MIS0 pin selection Short: GPIOA1 selected, Open: GPIOA1 not selected Open Short Short JP23 SPI MOSI pin selection Short: GPIOA1 selected, Open: GPIOA9 not selected Open Short Short JP24 SPI SSN pin selection Short: GPIOA1 selected, Open: GPIOA9 not selected Open Short Short JP24 SPI SSN pin selection Short: GPIOA9 selected, Open: GPIOA9 not selected Open Short Short JP24 SPI Son pin selection for DIT Short: Supply, Open: Not supply Open Short Short JP24 CN0 connector SPI/SSIS power supply Short: Supply, Open: Not supply Open Short Short Supply JP33 Connection selection for DIT 1-2: CPIOA9 selected, 2-3: GPIOA9 selected, Open: Open Open Always needs to be used set in OPEN. JP34 Connection selection for DIT 1-2: CPIOA1 selected, 2-3: GPIOA9 selected, Open: Open Short Always needs to be u		When using CNR connector	Short			Open	Short: GPIOA3 selected, Open: GPIOA3 not selected	SPI MOSI pin selection	JP11
JP22 SPI MIS0 pin selection Short: GPIOA10 selected Open Selected Short JP23 SPI MOSI pin selection Short: GPIOA11 selected, Open: GPIOA11 not selected Open Short Short JP24 SPI SCK pin selection Short: GPIOA18 selected, Open: GPIOA8 not selected Open Short Short JP25 SPI SSN pin selection Short: GPIOA9 selected, Open: GPIOA9 not selected Open Short Short JP21 Chapply Short: Supply, Open: Not supply Open Short Short JP22 Connection selection for U7 SCLK 1/2 GPIOA9 selected, 2-3: GPIOA9 selected, Open: Open Open Always needs to be used set in OPEN. JP32 Connection selection for DUT 1/2 GPIOA9 selected, 2-3: GPIOA9 selected, Open: Open Open Always needs to be used set in OPEN. JP34 Connection selection for DIN for 1/2 GPIOA9 selected, 2-3: GPIOA9 selected, Open: Open Always needs to be used set in OPEN. JP34 Connection selection for DIN for 1/2 GPIOA9 selected, 2-3: GPIOA9 selected, Open: Open Always needs to be used set in OPEN. JP34 Connection selection for U7 1/2 GPIOA9 selected, 2-3: GPIOA1 selected, Open: Open Always needs to be used set in OPEN. JP35 Conn			Short			Open	Short: GPIOA0 selected, Open: GPIOA0 not selected	SPI SCK pin selection	JP12
JP22 SPI MISU pn selection selected Open Short JP23 SPI MOSI pn selection Short GPIOA11 selected. Open: GPIOA8 not selected Open Short JP24 SPI SN pin selection Short GPIOA9 selected, Open: GPIOA9 not selected Open Short JP25 SPI SN pin selection Short: GPIOA9 selected, Open: GPIOA9 not selected Open Short JP21 CN8 connector SPI/SSIS power supply Short: Supply, Open: Not supply Open Short Short JP23 SN10 connector SPI/SSIS power supply Short: Supply, Open: Not supply Open Short Maways needs to be used set in OPEN. JP31 Connection selection for U7 SCUL 1-2: GPIOA11 selected, 2-3: GPIOA1 selected, Open: Open Always needs to be used set in OPEN. JP32 Connection selection for DOUT Not selected Open Always needs to be used set in OPEN. JP34 Connection selection for U7 SCUL 1-2: GPIOA1 selected, Open: Open Always needs to be used set in OPEN. JP34 Connection selection for U7 SCUL 1-2: GPIOA1 selected, Open: Open Always needs to be used set in OPEN. JP34 Connection selection for U7 Not selected Open Always needs to be used set in OPEN.			Short			Open	Short: GPIOA1 selected, Open: GPIOA1 not selected	SPI SSN pin selection	JP15
JP23 SM MOSI pin selection selected Open Short Short JP24 SPI SCK pin selection Short: CPIOA8 selected, Open: CPIOA8 not selected Open Short Short JP25 SPI SSN pin selection Short: CPIOA9 selected, Open: CPIOA9 not selected Open Short Short JP21 CM8 connector SPI/SSIS power supply Short: Supply, Open: Not supply Open Open Always needs to be used set in OPEN. JP31 Connection selection for UT SCLK for UT 12: CPIOA1 selected, 2-3: CPIOA9 selected, Open: for UT Open Always needs to be used set in OPEN. JP32 Connection selection for DOUT for UT 12: CPIOA1 selected, 2-3: CPIOA3 selected, Open: for UT Open Always needs to be used set in OPEN. JP34 Connection selection for DIDUT for UT 12: CPIOA1 selected, 2-3: CPIOA3 selected, Open: for UT Open Always needs to be used set in OPEN. JP34 Connection selection for UT 12: CPIOA10 selected, 2-3: CPIOA3 selected, Open: for UT Open Always needs to be used set in OPEN. JP34 Connection selection for UT 12: CPIOA10 selected, 2-3: CPIOA1 selected, Open: for UT Open Always needs to be used set in OPEN. JP33 Power supply for UT Short: Supply. Open: Not supply Open Always needs to be used set in OPEN. JP44 MODE_SW pow						Open		SPI MIS0 pin selection	JP22
JP24SP1 SCK pin selectionShort: GP10A8 selected, Open: GP10A8 not selectedOpenShortShortJP25SP1 SSN pin selectionShort: GP10A9 selected, Open: GP10A9 not selectedOpenShortShortJP21CN8 connector SP1/SS1S power supplyShort: Supply, Open: Not supplyOpenOpenShortSupplyJP31Connection selection for U7 SCLK for selected for U7 SCLKShort: Supply, Open: Not supplyOpenOpenAways needs to be used set in OPEN.JP32Connection selection for U7 SCLK for U71-2: GP10A9 selected, 2-3: GP10A0 selected, Open: Not selectedOpenOpenAways needs to be used set in OPEN.JP34Connection selection for D0UT for U71-2: GP10A9 selected, 2-3: GP10A1 selected, Open: Not selectedOpenOpenAways needs to be used set in OPEN.JP34Connection selection for D0UT for U71-2: GP10A1 selected, Open: Not selectedOpenOpenAways needs to be used set in OPEN.JP34Connection selection for U71-2: GP10A1 selected, Open: Not selectedOpenOpenAways needs to be used set in OPEN.JP34Connection selection for U71-2: GP10A1 selected, Open: Not selectedOpenOpenAways needs to be used set in OPEN.JP34Connection selection for U71-2: GP10A3 selected, Open: Not selectedOpenOpenAways needs to be used set in OPEN.JP44Connection between MODE_SW Add CMOA12Short: Supply, Open: Not supplyOpenOpenOpenJP44Connection between MODE_S		When using CN10 connector	Short			Open		SPI MOSI pin selection	JP23
JP21 CN8 connector SPI/SSIS power supply Short: Supply, Open: Not supply Open Image: Connector SPI/SSIS power supply Short: Supply, Open: Not supply Open Image: Connector SPI/SSIS power supply Short: Supply, Open: Not supply Open Image: Connector SPI/SSIS power supply Short: Supply, Open: Not supply Open Image: Connector SPI/SSIS power supply Always needs to be used set in OPEN. JP31 Connection selection for DOUT 1-2: GPIOA1 selected, 2-3: GPIOA3 selected, Open: for U7 Open Always needs to be used set in OPEN. JP34 Connection selection for DIN for 7 1-2: GPIOA1 selected, 2-3: GPIOA3 selected, Open: Not selected Open Always needs to be used set in OPEN. JP35 Connection selection for U7 Not selected -3: GPIOA3 selected, Open: Not selected Open Always needs to be used set in OPEN. JP34 Connection selection for U7 Not selected -3: GPIOA3 selected, Open: Not selected Open Always needs to be used set in OPEN. JP33 Power supply for U7 Short: Supply, Open: Not supply Open Always needs to be used set in OPEN. JP41 MODE_SW power supply Short: Supply, Open: Not supply Open Settine GPIO pin used as SCL pin. JP47 IZ power supply Short: Supply		When using CNTO connector	Short			Open	Short: GPIOA8 selected, Open: GPIOA8 not selected	SPI SCK pin selection	JP24
JP21 supply Open Open Open JP29 CN10 connector SPI/SSIS power supply Short: Supply, Open: Not supply Open Open Always needs to be used set in OPEN. JP31 Connection selection for U7 SCLK 1-2: GPIOA3 selected, 2-3: GPIOA0 selected, Open: Not selected Open Always needs to be used set in OPEN. JP32 Connection selection for DDUT for U7 1-2: GPIOA1 selected, 2-3: GPIOA3 selected, Open: U7 Open Always needs to be used set in OPEN. JP34 Connection selection for U7 1-2: GPIOA1 selected, 2-3: GPIOA3 selected, Open: U7 Open Always needs to be used set in OPEN. JP35 Connection selection for U7 1-2: GPIOA8 selected, 2-3: GPIOA1 selected, Open: U7 Open Always needs to be used set in OPEN. JP34 Connection selection for U7 1-2: GPIOA8 selected, 2-3: GPIOA1 selected, Open: U7 Open Always needs to be used set in OPEN. JP34 Connection between MODE_SW and GPIOA12 Short: Supply, Open: Not supply Open Always needs to be used set in OPEN. JP47 I2C power supply Short: Supply, Open: Not supply Open Set the GPIO pin used as SCL pin. JP47 I2C power supply Short: Supply, Open: Not supply Open Set the GPIO			Short			Open	Short: GPIOA9 selected, Open: GPIOA9 not selected	SPI SSN pin selection	JP25
JP29 supply Short: Supply, Open: Not Supply Open Always needs to be used set in OPEN. JP31 Connection selection for U7 SCtk 1-2: GPIOA9 selected, 2-3: GPIOA0 selected, Open: Not selected Open Always needs to be used set in OPEN. JP32 Connection selection for DIN for U7 1-2: GPIOA11 selected, 2-3: GPIOA2 selected, Open: Not selected Open Always needs to be used set in OPEN. JP34 Connection selection for DIN for U7 1-2: GPIOA10 selected, 2-3: GPIOA1 selected, Open: Not selected Open Always needs to be used set in OPEN. JP35 Connection selection for U7 1-2: GPIOA8 selected, 2-3: GPIOA1 selected, Open: Not selected Open Always needs to be used set in OPEN. JP34 Connection selection for U7 1-2: GPIOA8 selected, 2-3: GPIOA1 selected, Open: Not selected Open Always needs to be used set in OPEN. JP33 Power supply for U7 Short: Supply, Open: R63 resistor connection Open Always needs to be used set in OPEN. JP44 MODE_SW power supply Short: Supply, Open: Not supply Open Open Always needs to be used set in OPEN. JP44 MODE_SW power supply Short: Supply, Open: Not supply Open Set the GPIO pin used as SCL pin. JP44 ZC power supply						Open	Short: Supply, Open: Not supply		JP21
JP31 Connection selection for U/SCLR Not selected Open Always needs to be used set in OPEN. JP32 Connection selection for DUT 1-2: GPIOA1 selected, 2-3: GPIOA2 selected, Open: U/T Open Always needs to be used set in OPEN. JP34 Connection selection for U/T 1-2: GPIOA1 selected, 2-3: GPIOA3 selected, Open: U/T Open Always needs to be used set in OPEN. JP35 Connection selection for U/T 1-2: GPIOA1 selected, 2-3: GPIOA1 selected, Open: U/T Open Always needs to be used set in OPEN. JP33 Power supply for U/T Short: Supply, Open: R63 resistor connection Open Always needs to be used set in OPEN. JP41 MODE_SW power supply Short: Supply, Open: Not supply Open Always needs to be used set in OPEN. JP40 Connection between MODE_SW and GPIOA12 Short: Supply, Open: Not supply Open Open Encoded to the GPIO pin used as SCL pin. JP52 I2C, SCL pin selection 1-2: GPIOA8, 2-3: GPIOA0 Open Set the GPIO pin used as SCL pin. JP54 I2C, SDA pin selection 1-2: GPIOA8, 2-3: GPIOA1 Open Set the GPIO pin used as SDA pin. JP54 I2C, SDA pin selection 1-2: GPIOA8, 2-3: GPIOA1GPIOA5 Open Set the GPIO pin used as						Open	Short: Supply, Open: Not supply		JP29
JP32 for U7 Not selected Open Always needs to be used set in OPEN. JP34 Connection selection for DIN for J7 1-2: GPIOA10 selected, 2-3: GPIOA3 selected, Open: Not selected Open Always needs to be used set in OPEN. JP35 Connection selection for U7 1-2: GPIOA8 selected, 2-3: GPIOA1 selected, Open: Not selected Open Always needs to be used set in OPEN. JP33 Power supply for U7 Short: Supply, Open: R63 resistor connection Open Always needs to be used set in OPEN. JP41 MODE_SW power supply Short: Supply, Open: Not supply Open Open Always needs to be used set in OPEN. JP42 Connection between MODE_SW and GPIOA12 Short: Connection, Open: R76 resistor connection Open Open Image: Connection selection JP40 Connection between MODE_SW and GPIOA12 Short: Supply, Open: Not supply Open Image: Connection selection Image: Connection JP50 I2C_SCL pin selection 1-2: GPIOA8, 2-3: GPIOA1 Open Image: Connection set the GPIO pin used as SCL pin. JP51 I2C_SDA pin selection 1-2: GPIOA8, 2-3: GPIOA1(GPIOA5 Open Set the GPIO pin used as SDA pin. JP54 I2C_SDA pin selection 1-2: GPIOA8, 2-3: GPIOA1(GPIOA5 </td <td></td> <td>Always needs to be used set in OPEN.</td> <td></td> <td></td> <td></td> <td>Open</td> <td>Not selected</td> <td></td> <td>JP31</td>		Always needs to be used set in OPEN.				Open	Not selected		JP31
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JP33 Connection selection for U7 Not selected Open Always needs to be used set in OPEN. JP33 Power supply for U7 Short: Supply, Open: R63 resistor connection Open Always needs to be used set in OPEN. JP41 MODE_SW power supply Short: Supply, Open: Not supply Open Always needs to be used set in OPEN. JP40 Connection between MODE_SW and GPIOA12 Short: Connection, Open: R76 resistor connection Open Empty 1000000000000000000000000000000000000		Always needs to be used set in OPEN.				Open	1-2: GPIOA10 selected, 2-3: GPIOA3 selected, Open:		JP34
JP41 MODE_SW power supply Short: Supply, Open: Not supply Open Image: Connection between MODE_SW and GPIOA12 JP40 and GPIOA12 Short: Connection, Open: R76 resistor connection Open Image: Connection between MODE_SW and GPIOA12 JP47 I2C power supply Short: Supply, Open: Not supply Open Image: Connection between MODE_SW and GPIOA12 JP47 I2C power supply Short: Supply, Open: Not supply Open Image: Connection Between MODE_SW and Connection Connection JP50 I2C_SCL pin selection 1-2: GPIOA8, 2-3: GPIOA0(GPIOA4 Open Set the GPIO pin used as SCL pin. JP52 I2C_SDA pin selection 1-2: GPIOA9, 2-3: GPIOA1 Open Set the GPIO pin used as SDA pin. JP55 I2C_SDA pin selection 1-2: GPIOA9, 2-3: GPIOA1(SPIOA5 Open Set the GPIO pin used as SDA pin. JP44 Power supply for Tester IF Short: VDD PER, Open: Not supply Open Always needs to be used set in OPEN. JP46 ICE power supply Short: Supply, Open: Not supply Open Always needs to be used set in OPEN. JP46 ICE power supply Short: Supply, Open: Not connected Short Short When R80 is implemented. JP49 ICE SWD connection se		Always needs to be used set in OPEN.				Open		Connection selection for U7	JP35
JP40 Connection between MODE_SW and GPIOA12 Short: Connection, Open: R76 resistor connection Open JP47 I2C power supply Short: Supply, Open: Not supply Open Status JP50 I2C, SCL pin selection 1-2: GPIOA4, 2-3: GPIOA0 Open Set the GPIO pin used as SCL pin. JP52 I2C_SCL pin selection 1-2: GPIOA8, 2-3: GPIOA0/GPIOA4 Open Set the GPIO pin used as SCL pin. JP54 I2C_SDA pin selection 1-2: GPIOA8, 2-3: GPIOA1 Open Set the GPIO pin used as SDA pin. JP55 I2C_SDA pin selection 1-2: GPIOA9, 2-3: GPIOA1/GPIOA5 Open Set the GPIO pin used as SDA pin. JP46 ICE power supply Short: VDD_PER, Open: Not supply Open Always needs to be used set in OPEN. JP48 ICE power supply Short: Supply, Open: Not supply Open Always needs to be used set in OPEN. JP49 ICE SWD connection setting Short: SWD connected, Open: Not connected Image: Short Short when R90 is implemented.		Always needs to be used set in OPEN.				Open	Short: Supply, Open: R63 resistor connection	Power supply for U7	JP33
JP40 and GPIOA12 Short: Connection, Open: KNo resistor connection Open JP47 I2C power supply Short: Supply, Open: Not supply Open Set the GPIO pin used as SCL pin. JP50 I2C_SCL pin selection 1-2: GPIOA4, 2-3: GPIOA0 Open Set the GPIO pin used as SCL pin. JP52 I2C_SCL pin selection 1-2: GPIOA8, 2-3: GPIOA0/GPIOA4 Open Set the GPIO pin used as SCL pin. JP52 I2C_SDA pin selection 1-2: GPIOA8, 2-3: GPIOA1 Open Set the GPIO pin used as SDA pin. JP54 I2C_SDA pin selection 1-2: GPIOA9, 2-3: GPIOA1/GPIOA5 Open Set the GPIO pin used as SDA pin. JP54 I2C_SDA pin selection 1-2: GPIOA9, 2-3: GPIOA1/GPIOA5 Open Set the GPIO pin used as SDA pin. JP44 Power supply for Tester IF Short: VDD_PER, Open: Not supply Open Always needs to be used set in OPEN. JP46 ICE power supply Short: Supply, Open: Not supply Short J-LINK: Short/ULINK2: Open. JP49 ICE SWD connection setting Short: SWD connected, Open: Not connected Image: Connection setting Short: SWD connected, Open: Not connected						Open	Short: Supply, Open: Not supply	=,	JP41
JP50 I2C_SCL pin selection 1-2: GPIOA4, 2-3: GPIOA0 Open Set the GPIO pin used as SCL pin. JP52 I2C_SCL pin selection 1-2: GPIOA8, 2-3: GPIOA0(GPIOA4 Open Set the GPIO pin used as SCL pin. JP54 I2C_SDA pin selection 1-2: GPIOA8, 2-3: GPIOA1/GPIOA5 Open Set the GPIO pin used as SDA pin. JP55 I2C_SDA pin selection 1-2: GPIOA8, 2-3: GPIOA1/GPIOA5 Open Set the GPIO pin used as SDA pin. JP54 I2C_SDA pin selection 1-2: GPIOA8, 2-3: GPIOA1/GPIOA5 Open Set the GPIO pin used as SDA pin. JP44 Power supply for Tester IF Short: VDD_PER, Open: Not supply Open Always needs to be used set in OPEN. JP46 ICE power supply Short: Supply, Open: Not supply Open Short JLINK: Short/ULINK2: Open. JP49 ICE SWD connection setting Short: SWD connected, Open: Not connected Image: Short Supple set S								and GPIOA12	
JP52 12C_SCL pin selection 1-2: GPIOAB, 2-3: GPIOA0/GPIOA4 Open Set the GPIO pin used as SCL pin. JP54 12C_SDA pin selection 1-2: GPIOAB, 2-3: GPIOA1 Open Set the GPIO pin used as SDA pin. JP55 12C_SDA pin selection 1-2: GPIOAB, 2-3: GPIOA1 Open Set the GPIO pin used as SDA pin. JP55 12C_SDA pin selection 1-2: GPIOAB, 2-3: GPIOA1/GPIOA5 Open Set the GPIO pin used as SDA pin. JP46 Power supply for Tester IF Short: VDD_PER, Open: Not supply Open Always needs to be used set in OPEN. JP46 ICE power supply Short: Supply, Open: Not supply Short J-LINK: Short/ULINK2: Open. JP49 ICE SWD connection setting Short: SWD connected, Open: Not connected Image: Connection setting Short: SWD connected, Open: Not connected									
JP54 I2C_SDA pin selection 1-2: GPIOA5, 2-3: GPIOA1 Open Set the GPIO pin used as SDA pin. JP55 I2C_SDA pin selection 1-2: GPIOA9, 2-3: GPIOA1/GPIOA5 Open Set the GPIO pin used as SDA pin. JP4 Power supply for Tester IF Short: VDD_PER, Open: Not supply Open Always needs to be used set in OPEN. JP46 ICE power supply Short: Supply, Open: Not supply Short J-LINK': Short/ULINK2: Open. JP49 ICE SWD connection setting Short: SWD connected, Open: Not connected Image: Connection setting Short: SWD connected, Open: Not connected Image: Connection setting									
JP55 I2C_SDA pin selection 1-2: GPIOA9, 2-3: GPIOA1/GPIOA5 Open Set the GPIO pin used as SDA pin. JP4 Power supply for Tester IF Short: VDD_PER, Open: Not supply Open Always needs to be used set in OPEN. JP46 ICE power supply Short: Supply, Open: Not supply Short Short J-LINK: Short/ULINK2: Open. JP49 ICE SWD connection setting Short: SWD connected, Open: Not connected Image: Connected set in OPEN. Short: SWD connected, Open: Not connected Image: Connected set in OPEN.									
JP4 Power supply for Tester IF Short: VDD_PER, Open: Not supply Open Always needs to be used set in OPEN. JP46 ICE power supply Short: Supply, Open: Not supply Short Short J-LINK: Short/ULINK2: Open. JP49 ICE SWD connection setting Short: SWD connected, Open: Not connected Image: Connection setting Short: SWD connected, Open: Not connected Image: Connection setting									
JP46 ICE power supply Short: Supply, Open: Not supply Short Short J-LINK: Short/ULINK2: Open. Short when R90 is implemented. JP49 ICE SWD connection setting Short: SWD connected, Open: Not connected Image: Connection setting Short: SWD connected, Open: Not connected Image: Connection setting Short: SWD connected, Open: Not connected									
JP49 ICE SWD connection setting Short: SWD connected, Open: Not connected Image: Connected in the setting in the se		J-LINK: Short/ULINK2: Open.							
		Short when R90 is implemented.				GHUIL			
JEST ICE SWOR connection setting Onori, SWOR connected, Open, Not connected									
JP53 ICE RESETN connection setting Short: RESETN connected, Open: VDD_ICE								-	

Table 1 Table of ML7416BGA Evaluation Board Settings

SW No.		Feature	Recomm ended settings	Remarks
SW3_1	I2C device WP	ON: Enable, OFF: Disable	OFF	
SW3_2	I2C device A2	ON: "1", OFF: "0"	OFF	
SW3_3	I2C device A1	ON: "1", OFF: "0"	OFF	Set the address of I2C device.
SW3_4	I2C device A0	ON: "1", OFF: "0"	OFF	
SW2_3	MODE1	ON: "1", OFF: "0"	OFF	Normally, use set in OFF.
SW2_2	MODE0	ON: "1", OFF: "0"	OFF	Normally, use set in OFF.
SW2_5	TEST_CPU	ON: "1", OFF: "0"	OFF	Normally, use set in OFF.
SW2_4	TEST	ON: "1", OFF: "0"	OFF	Normally, use set in OFF.
SW2_6	REGPDIN	ON: "1", OFF: "0"	OFF	Normally, use set in OFF.
SW2_1	GPIOA12	ON: "1", OFF: "0"	OFF	Normally, use set in OFF.

STEP3 Setting up Serial Communication Software

This step describes how to set up serial communication software used for operating the evaluation kit.

- LAPIS recommends Tera Term (free software) as the serial communication software. Macros included in the packaged CD_ROM are written in the macro language for Tera Term. Download it before starting this operation.
- (1) Install Tera Term on the personal computer used for the evaluation.
- (2) Install the Virtual COM Port driver for USB-UART conversion FTDI device on the personal computer used for the evaluation. Download the driver from the following Web page.

http://www.ftdichip.com/FT Drivers.htm

- (3) Connect the evaluation board and the microcomputer board.
- (4) Use the USB cable to connect the ML7416 evaluation board with the personal computer on which Tera Term is installed.
- (5) Start Tera Term. When it has started, the screen in Figure 3 is displayed.

🛄 Te	era Term - [di	isconnected] VT				. 🗆 🗵
<u>F</u> ile	<u>E</u> dit <u>S</u> etup	o C <u>o</u> ntrol <u>W</u> ir	ndow <u>H</u> elp			
						-
	Tera Term: N	lew connection				× –
	• ICP/	IP H <u>o</u> st:	myhost.mydol	main	•	
			⊠ T <u>e</u> lnet	TCP <u>p</u> ort#:	23	
	© <u>S</u> eria	Port:	COM1 💌			
		OK	Cancel	<u>H</u> elp		
		Figure	e 3 Tera Term In	itial Screen		

- (6) Select "Serial", then in the "Port:" combo box, select a COM port to use.
- (7) When it has started, from the "**Setup**" menu, select "**Serial port?...**", change the settings by referring to Figure 4, then click the "**OK**" button.

Setting value	Baud Rate:	57600
	Data:	8 bit
	Parity:	none
	Stop:	1 bit
	Flow Control:	hardware

(8) From the "**Setup**" menu, select "**Terminal...**", change the settings by referring to Figure 4, then click the "**OK**" button. Setting value New-line

Receive:	CR+LF
Transmit:	CR
Local echo:	Uncheck



- (9) Press the SW1 reset button on the evaluation board.
- (10) From the serial communication software, enter "**RREG 6C**".
 - It is successful when "OK 88" is displayed as shown in Figure 5.

💹 COM7:115200baud - Tera Term VT							
ファイル(E)	編集(E)	設定(S)	ב>רם−µ©	ウィンドウ(W)	Resi <u>z</u> e	ヘルプ(円)	
RREG 6C OK 88 ■							
							> :

Figure 5 Screen after RREG 6C Command

This concludes the preparation for using this product.

From now on, refer to the attached "Wireless PAN Test Tool User's Manual" and perform communication tests to check the device connection state and proper operations.

Revision History

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Document No.	Issue Date	Previous Edition	New Edition	Description
FEXL7416EVA_startguide-01	May 7, 2015	-	_	First edition issued