

# ML7344, ML7406EVA Start Guide

---

Issue Date: Dec 19, 2014



**NOTES**

No copying or reproduction of this document, in part or in whole, is permitted without the consent of LAPIS Semiconductor Co., Ltd.

The content specified herein is subject to change for improvement without notice.

Examples of application circuits, circuit constants and any other information contained herein illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

Great care was taken in ensuring the accuracy of the information specified in this document. However, should you incur any damage arising from any inaccuracy or misprint of such information, LAPIS Semiconductor shall bear no responsibility for such damage.

The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. LAPIS Semiconductor does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by LAPIS Semiconductor and other parties. LAPIS Semiconductor shall bear no responsibility whatsoever for any dispute arising from the use of such technical information.

The Products specified in this document are intended to be used with general-use electronic equipment or devices (such as audio visual equipment, office-automation equipment, communication devices, electronic appliances and amusement devices).

The Products specified in this document are not designed to be radiation tolerant.

While LAPIS Semiconductor always makes efforts to enhance the quality and reliability of its Products, a Product may fail or malfunction for a variety of reasons.

Please be sure to implement in your equipment using the Products safety measures to guard against the possibility of physical injury, fire or any other damage caused in the event of the failure of any Product, such as derating, redundancy, fire control and fail-safe designs. LAPIS Semiconductor shall bear no responsibility whatsoever for your use of any Product outside of the prescribed scope or not in accordance with the instruction manual.

The Products are not designed or manufactured to be used with any equipment, device or system which requires an extremely high level of reliability the failure or malfunction of which may result in a direct threat to human life or create a risk of human injury (such as a medical instrument, transportation equipment, aerospace machinery, nuclear-reactor controller, fuel-controller or other safety device). LAPIS Semiconductor shall bear no responsibility in any way for use of any of the Products for the above special purposes. If a Product is intended to be used for any such special purpose, please contact a ROHM sales representative before purchasing.

If you intend to export or ship overseas any Product or technology specified herein that may be controlled under the Foreign Exchange and the Foreign Trade Law, you will be required to obtain a license or permit under the Law.

Copyright 2013 - 2014 LAPIS Semiconductor Co., Ltd.

---

**LAPIS Semiconductor Co.,Ltd.**

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

## Introduction

Thank you very much for purchasing products of our company. Before using this product, please use correctly after reading this “start guide”. Moreover, please keep it carefully even after reading this. This start guide indicates enclosure attachment and the connection method.

The manual shown in the following other than this document is prepared. Please check if needed.

- Datasheet
- Design Guide
- Simple MAC User's Manual

### 1. Attention on the handling of this product

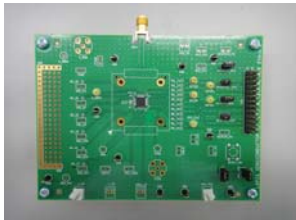
- This product is evaluation kit. It is available for evaluation only.
- Any responsibility cannot be taken about building this product into other products.
- Please use the application software of this product with the PC with which Japanese version Windows 7 is installed.
- It will become infringement of copyright, if all or a part of software of this product is reproduced without permission of copyright or duplicate things are distributed.
- Any responsibility cannot be taken about reconstruction and illegal use of this product.
- If the example of a harmful electric wave interference should occur from this product, please change operating frequency promptly, or suspend the output of an electric wave, and perform disposal for interference evasion etc.

### 2. Setup Flow

Please check when open the box and all the following articles are assembled first. If it should run short or should have damaged, please inform a purchasing agency.

- CD-ROM is packed only when first time purchase.
- By shipment time, mounting parts etc may differ from a photograph in part.
- Please prepare a stabilized power supply and serial communication software (TeraTerm).
- A USB UART IC (FT232R), which is made by FTDI, is placed on the control board. Please download a USB device driver from <http://www.ftdichip.com>.

- ML7344/ML7406 Evaluation Board... 1



- USB(A-MicroB) Cable... 1
- CD-ROM... 1 (First time purchase only)

- ML7344, ML7406 Control Board... 1



- Antenna... 1  
\*Attached antenna is for 800-900MHz band. If using other band (e.g. 400MHz), antenna gain will be worse. In case of testing communication, please use proper antenna.



2.1. ML7344, ML7406 Control Board Setting

This section describes the control board setting.

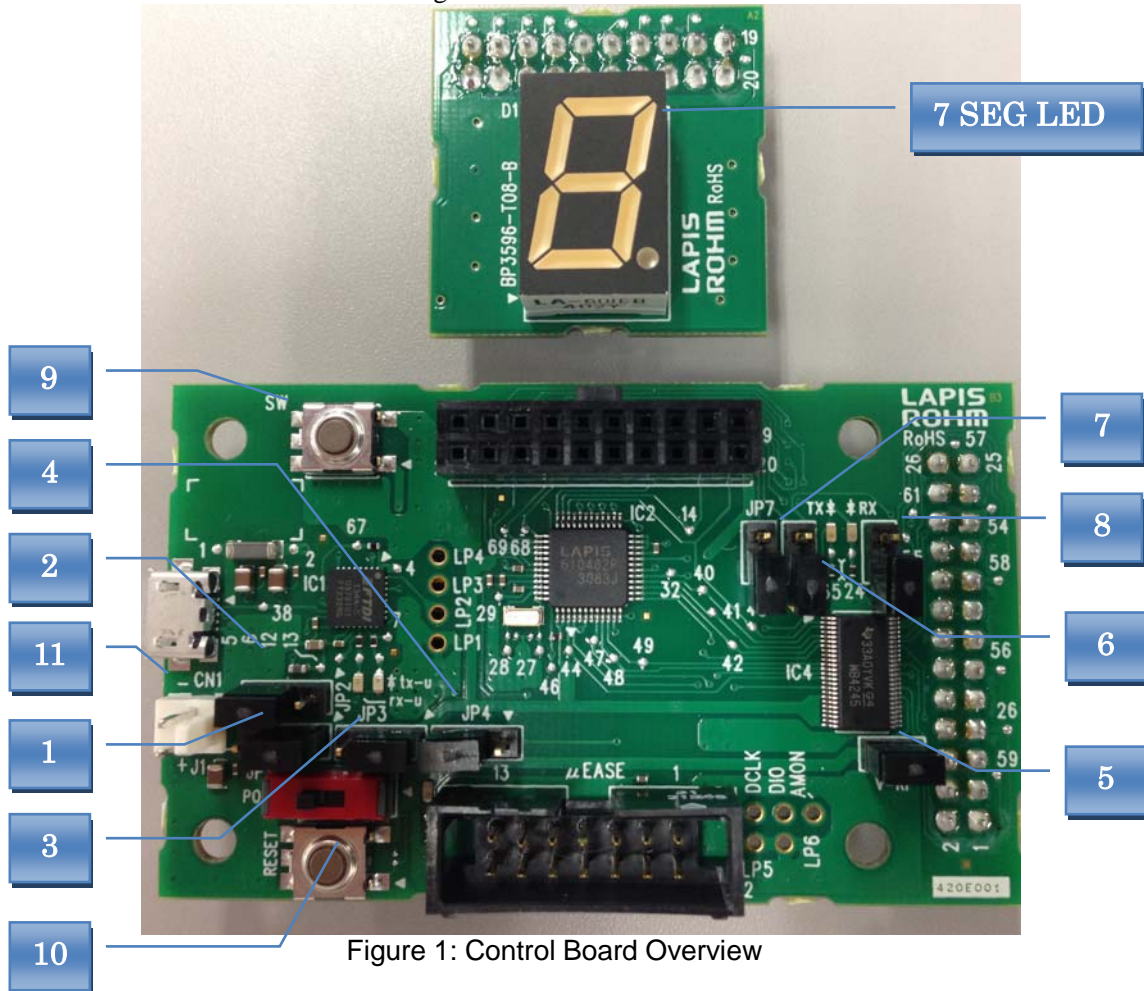


Figure 1: Control Board Overview

Table 1: Detailed Description of Control Board

No.	Symbol	Name	Function	Initial configuration
1	JP1	Main power supply setup	USB electric supply (1-2) and external electric supply (2-3)	1-2
2	JP2	External electric supply setup to JP1	Power supply terminal J1 (1-2) and for uEASE (2-3)	1-2
3	JP3	Evaluation board power supply setup	A main power supply (1-2) and the power supply terminal J1 (2-3) *1	1-2
4	JP4	RESET setup	uEASE (1-2) and RESET SW (2-3)	2-3
5	JP5 (V-RF)	Evaluation board power supply	The consumption current of an evaluation board is measured.	short
6	JP6	DIO signal connection	Connects DIO and MCU(short) *2	open
7	JP7	DCLK signal connection	Connects DCLK and MCU (short) *2	open
8	JP8	Signal connection for ML7396B	Other products: Open *3	no jumper
9	SW	SW	General SW (future extension)	
10	RESET	RESET	Hard reset button	
11	J1	Power supply terminal	Power supply connector	

\*1. \*(2-3) is used when a test the voltage characteristic of an evaluation board.

\*2. uses in DIO mode (future extension)

\*3. It may break, when it is made to Short with products other than ML7396B.

There are four modes of operation in this evaluation kit, and setup of a jumper differs for each mode. Please set up a jumper correctly after referring to the following table.

Table 2: Mode of operation and a jumper setup

Mode	Function	Function			
		JP1	JP2	JP3	JP4
Usually mode (Initial condition)	all operate USB bus power	1-2	-	1-2	2-3
Debug mode	Uses uEASE	2-3	2-3	1-2	1-2
Demo mode	uses Battery BOX for the power supply terminal J1	2-3	1-2	1-2	2-3
Evaluation mode	Electric power is supplied to a control board from USB, and an evaluation board is supplied from the power supply terminal J1. (The power supply voltage of an evaluation board is changeable)	1-2	1-2	2-3	2-3

2.2. ML7344, ML7406 Evaluation Board Setting Procedure

The ML7344 evaluation board is connected with the control board as shown below.

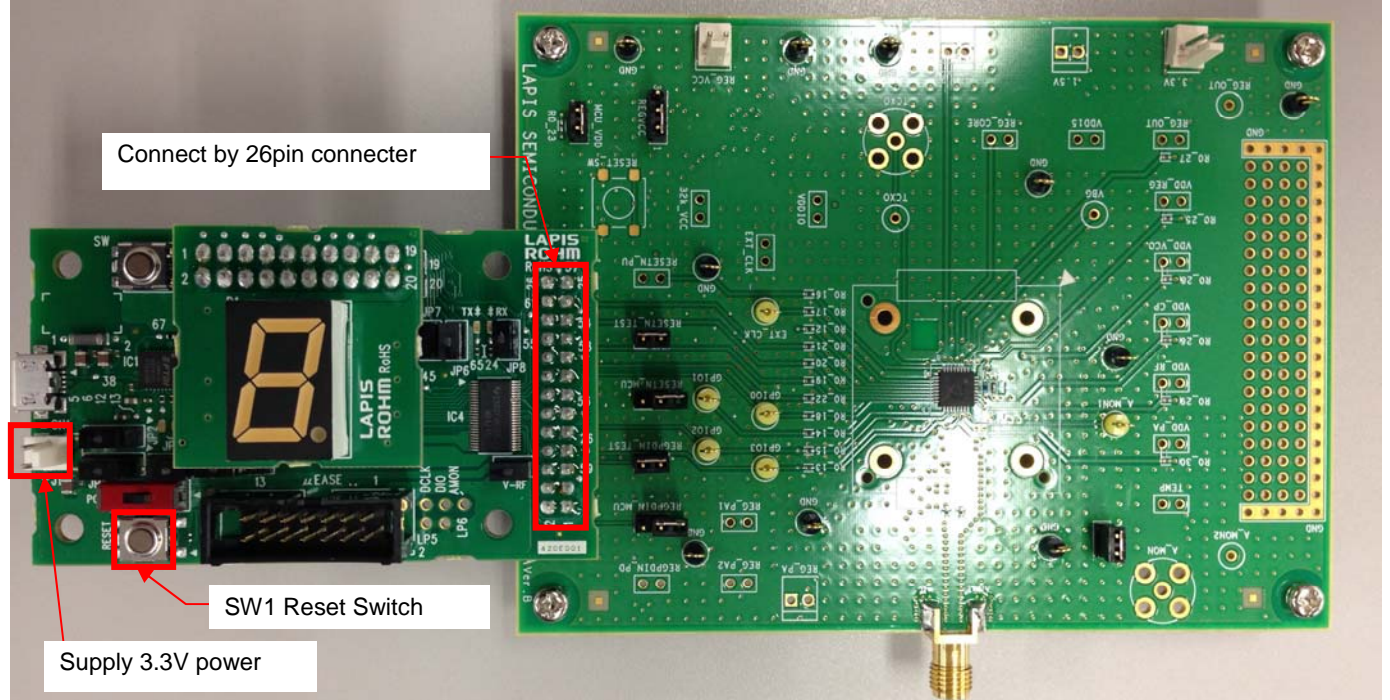


Figure 2: ML7344 Evaluation Board Connection Overview

The ML7406 evaluation board is connected with the control board as shown below.

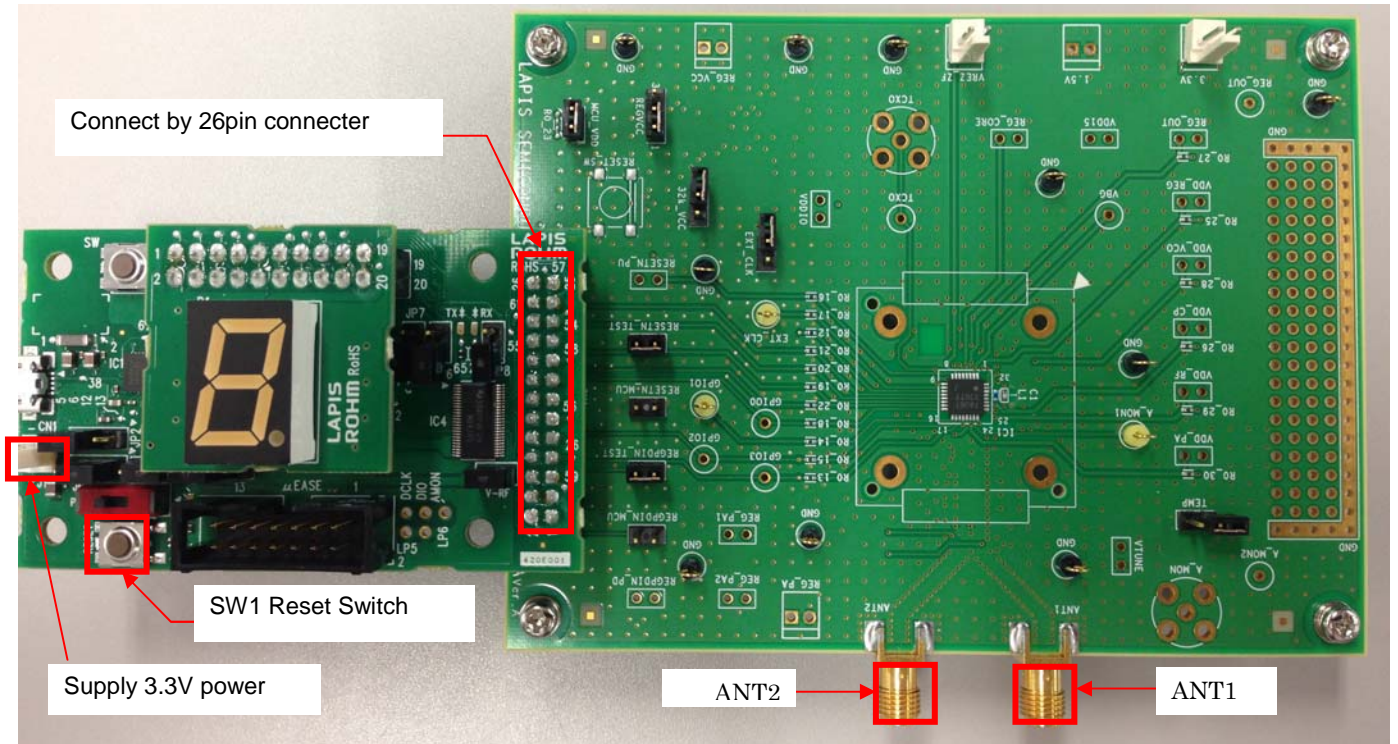


Figure 3: ML7406 Evaluation Board Connection Overview

\* When you do not use DIVERSITY, please use ANT1.



## [Connection verification procedure]

1. Supply 3.3V power supply.
2. Reset the control board.
3. Start the terminal software (Tera Term).
4. Set the terminal software. (For terminal settings, refer to "2.4 Terminal Setting".)  
\* No prompt will be displayed by power-on, terminal software setting, or reset.
5. Verify the connection by a register read command. The connection is correct if confirm of "88" is displayed in response to the read command "RREG 0B".

\* When a power supply is re-switched on, please reboot terminal software (TeraTerm).

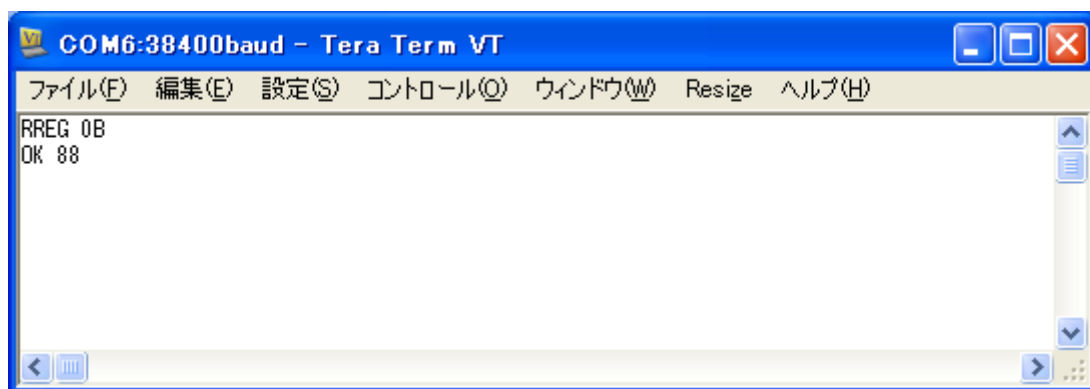


Figure 4: Connection Confirmation Image

### 2.3. ML7344, ML7406 Evaluation Board Jumper Setting

ML7344 and ML7406 evaluation board jumper function and recommended setting are as following.

Table 3: Evaluation board jumper setting table

JP No.	Silk	Recommended Jumper Setting	Remarks
JP1	RESETN_MCU	short	For old micro controller
JP2	REGPDIN_MCU	short	For old micro controller
JP3	REGVCC	1-2short	TCXO internal power supply (3.3V) If TCXO is external power supplied from REG_VCC, 2-3 short.
JP4	32k_VCC	open	
JP5	EXT_CLK	open	
JP101	RESETN_TEST	open	For micro controller
JP102	REGPDIN_TEST	open	For micro controller
JP105	MCU_VDD	short	Micro controller and evaluation board power supply simultaneously (3.3V) If these are individual power supplied, open
JP117	TEMP	open	
JP118	VTUNE	short(ML7344)	
		open(ML7406)	

2.4. Terminal Setting

2.4.1. Tera Term Setting

The Tera Term serial port settings are shown below.

The red frame indicates required settings. Use Tera Term version 4.63 or higher.

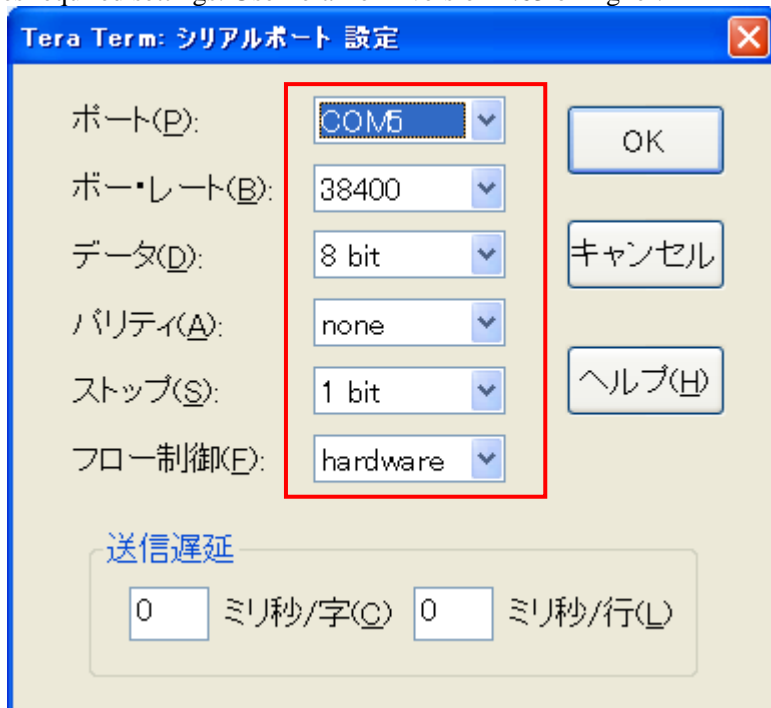


Figure 5: Tera Term Serial Port Setting Screen

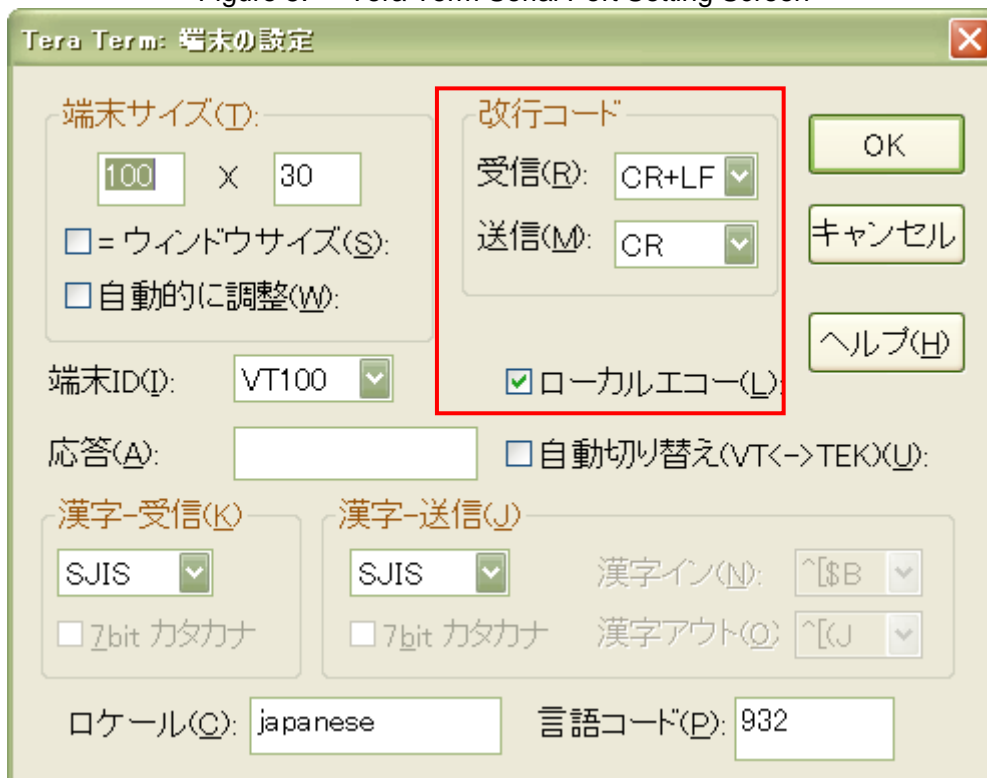


Figure 6: Tera Term Terminal Setting Screen

**2.4.2. Wireless Control Tool Setting**

Wireless Control Tool (WCT) is able to control ML7344 Simple MAC (Note: WCT is not used for ML7406.). WCT serial port setting is below. You must set category in red box.

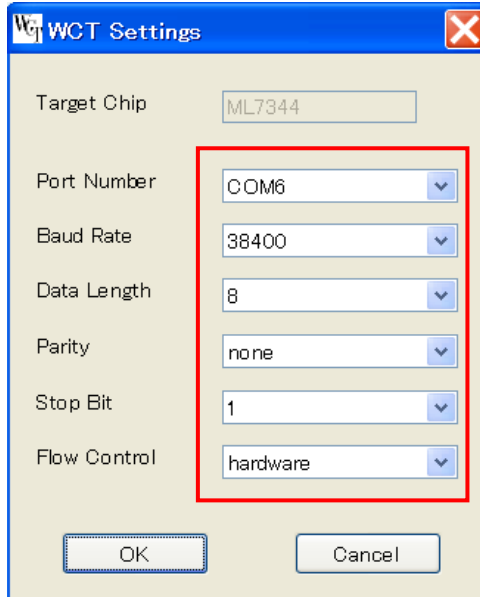


Figure 7: WCT serial port setting

If you push OK button on WCT serial port setting window, WCT main window is popped up. You can set verification command in Initial tab, Control tab, RFTest tab, RegBANK0 tab, RegBANK1 tab, RegBANK2 tab or RegBANK3 tab. Please refer to “ML7344, ML7406 Wireless Control Tool User’s manual”.

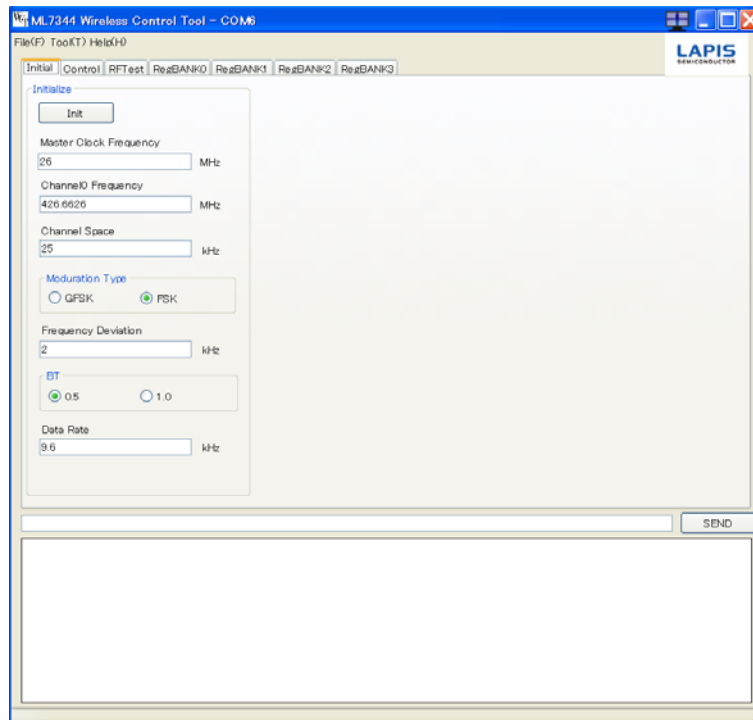


Figure 8: WCT main window

## Revision History

Document No.	Issue Date	Page		Description
		Previous Edition	New Edition	
FEXL7344_7406EVA_startguide-01	2013.7.25	–	–	First edition issued
FEXL7344_7406EVA_startguide-02	2014.5.8	5	2	Added Control board setting
			4	Added Table of jumper setting
			5	Added WCT setting
FEXL7344_7406EVA_startguide-03	2014.12.19	1	1	Modified assembled items
		2	2	Changed Control board
			3	Added Control board jumper setting
		3	4	Modified Evaluation board pictures
		7	5	Moved connection verification procedure
		4	6	Modified Evaluation board jumper setting