

MGEQ1C064 Evaluation Board

Explanation Manual

Contents

1.	Introduction.....	3
1.1	Whole Picture.....	4
1.2	Ev Board Hardware Instruction.....	5
1.3	Ev Board Circuit	6
1.3.1	MLink Circuit.....	6
1.3.2	MGEQ1C064 Circuit	7
1.4	Ev Board PCB	8
	Top	8
	Bottom	9
2.	Driver Install.....	11
3.	Revision History.....	14
4.	Disclaimers	15

1. Introduction

The **MGEQ1C064** is AEC-Q100 Grade 2 qualified, which can be operating within -40°C to 105°C operating temperature, 2.4V ~ 5.5V operating voltage and LIN interface for robust communication. It is a single-chip microcontroller based on a high performance 1-T architecture 80C51 CPU that executes instructions in 1~7 clock cycles (about 6~7 times the rate of a standard 8051 device), and has an 8051 compatible instruction set. Therefore at the same performance as the standard 8051, the **MGEQ1C064** can operate at a much lower speed and thereby greatly reduce the power consumption.

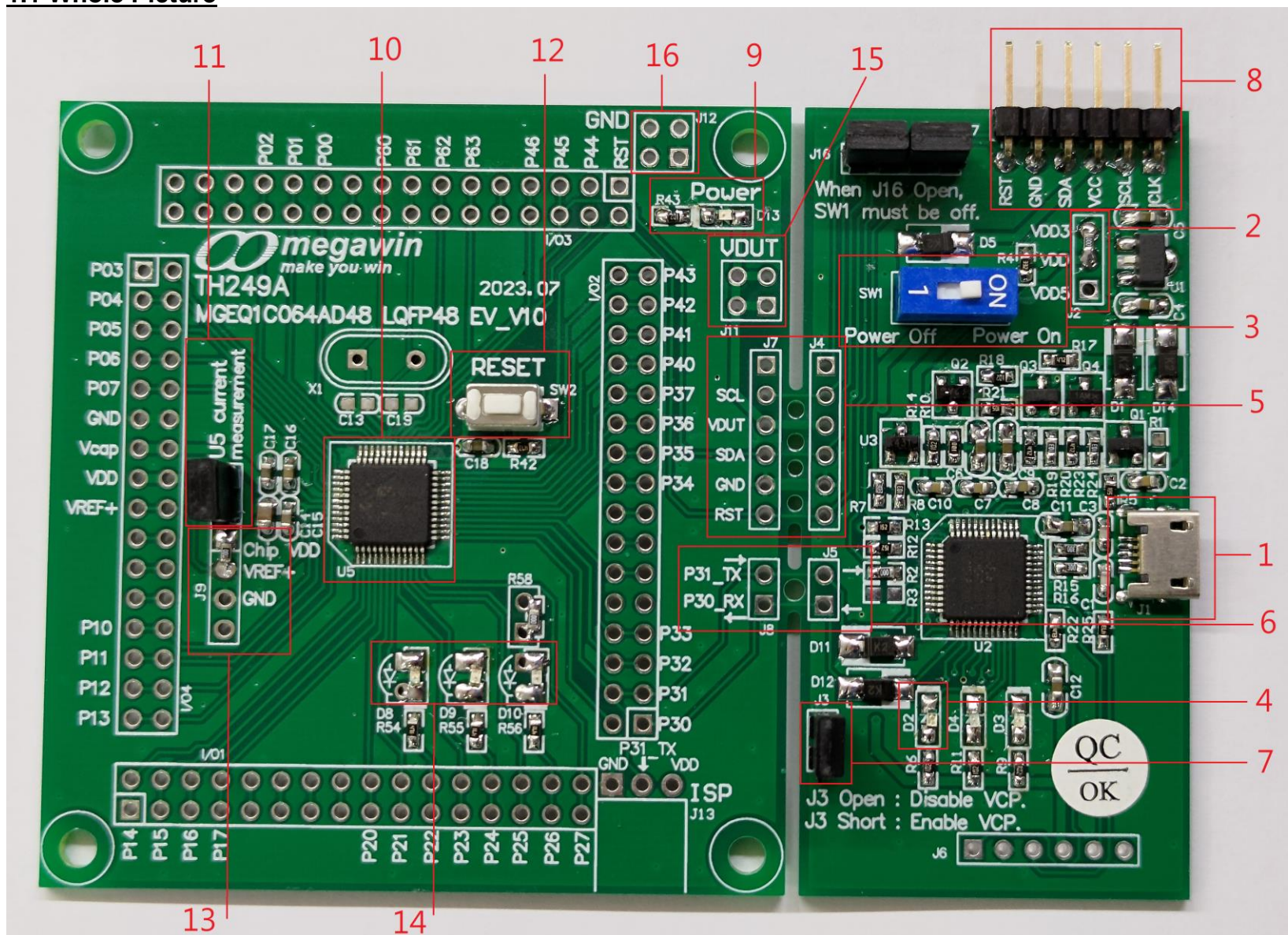
The **MGEQ1C064** has **64K** bytes of embedded Flash memory for code and data. The Flash memory can be programmed either in serial writer mode (via ICP, In-Circuit Programming) or in In-System Programming mode. And, it also provides the In-Application Programming (IAP) capability. ICP and ISP allow the user to download new code without removing the microcontroller from the actual end product; IAP means that the device can write non-volatile data in the Flash memory while the application program is running. There needs no external high voltage for programming due to its built-in charge-pumping circuitry.

The **MGEQ1C064** retains all features of the standard 80C52 with 256 bytes of scratch-pad RAM, 4 external interrupts with High/Low trigger option, a multi-source 4-level interrupt controller, and five timer/counters. In addition, the **MGEQ1C064** has **48** I/O port pins, one XRAM of **3840** bytes, **1.0M sps** 12-bit ADC, five 16-bit timer, one 8-channel PCA with dead-time controlled PWM, one 8-bit SPI, three TWI/I2C (TWI0/I2C0, TWI1/I2C1 and STWI/ SI2C), keypad interrupt, three Analog Comparators, Watchdog Timer, Real-Time-Clock module, two Brown-out Detectors, an ECKI external clock input (P6.0), an on-chip crystal oscillator(shared with P6.0 and P6.1), an internal high precision oscillator (IHRCO), an on-chip clock multiplier (CKM) to generate high speed clock source, an internal low speed RC oscillator (ILRCO) and four serial ports (UART0 ~ 3) which UART0 has enhanced serial function that facilitates multiprocessor communication, LIN bus mode and a speed improvement mechanism (X2/X4 mode). Support 3 different DMA transfer types, M2P (XRAM to Peripheral), P2M (Peripheral to XRAM) and P2P (Peripheral to Peripheral) to enhance transfer performance and reduce CPU loading.

The **MGEQ1C064** has multiple operating modes to reduce the power consumption: idle mode, power down mode, slow mode, sub-clock mode, RTC mode, watch mode and monitor mode. In the Idle mode the CPU is frozen while the peripherals and the interrupt system are still operating. In the Power-Down mode the RAM and SFRs' value are saved and all other functions are inoperative; most importantly, in the Power-down mode the device can be waked up by many interrupt or reset sources. In slow mode, the user can further reduce the power consumption by using the 8-bit system clock pre-scaler to slow down the operating speed. Or select sub-clock mode which clock source is derived from internal low speed oscillator (ILRCO) for CPU to perform an ultra-low speed operation. The RTC module supports Real-Time-Clock function in all operating modes. In watch mode, it keeps WDT running in power-down or idle mode and resumes CPU as an auto-wakeup timer when WDT overflows. Monitor mode provides the Brown-Out detection in power down mode and resumes CPU when chip VDD reaches the specific detection level.

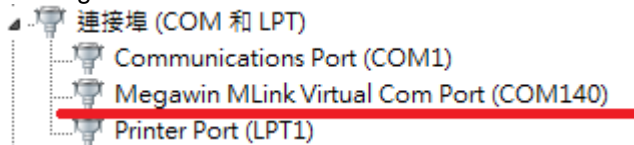
Additionally, the **MGEQ1C064** is equipped with the Megawin proprietary On-Chip Debug (OCD) interface for In-Circuit Emulator (ICE). The OCD interface provides on-chip and in-system non-intrusive debugging without any target resource occupied. Several operations necessary for an ICE are supported such as Reset, Run, Stop, Step, Run to Cursor and Breakpoint Setting. The user has no need to prepare any development board during firmware developing or the socket adapter used in the traditional ICE probe head. All the thing the user needs to do is to prepare a connector for the dedicated OCD interface. This powerful feature makes the developing very easy for any user.

1.1 Whole Picture



1.2 Ev Board Hardware Instruction

1. J1: Micro USB Connector.
2. J2: Power select.
 - a. VDD5 – USB 5V Output.
 - b. VDD – Select 5V or 3.3V to MGEQ1C064.
 - c. VDD3 -- On Board LDO 3.3V Output(U1).
3. SW1: Control U5 power on/off.
4. D2: PC identify MLink successful when D2 turn ON.
5. J4: Connector in ICE adaptor(MLink) for connecting with EV board to program MGEQ1C064.
J7: Connector in EV board for connecting with ICE adaptor(MLink).
6. J5: Connector in ICE adaptor(MLink) for connecting with EV board to transfer UART data.
J15: Connector in EV board for connecting with ICE adaptor(MLink).
7. J3: Virtual Com Port function selection, when J3 open and plug out → plug in PC, VCP function is disable. when J3 short and plug out → plug in PC, VCP function is enabled. After installing driver(how to install driver, refer the [2. Driver Install](#)), Device Manager will appear “Megawin MLink Virtual Com Port” as below figure.



“Megawin MLink Virtual Com Port” support as below as baud rate only:

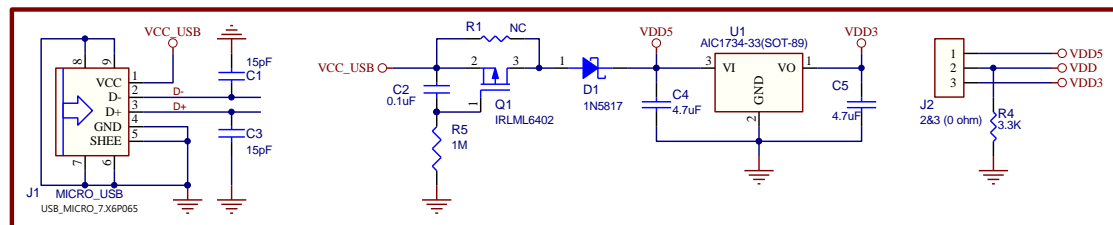
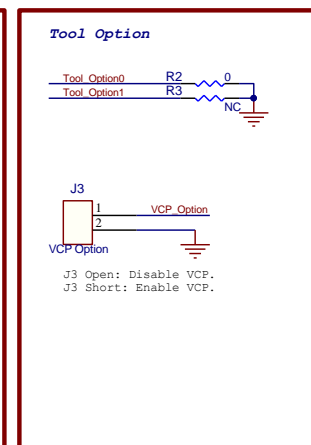
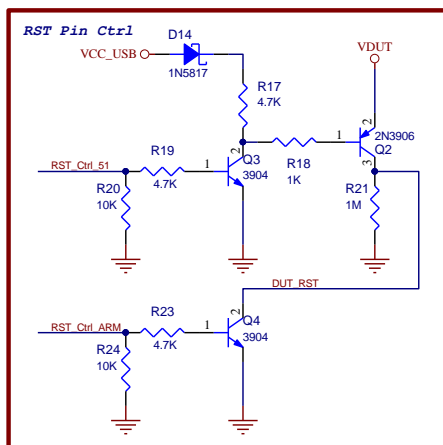
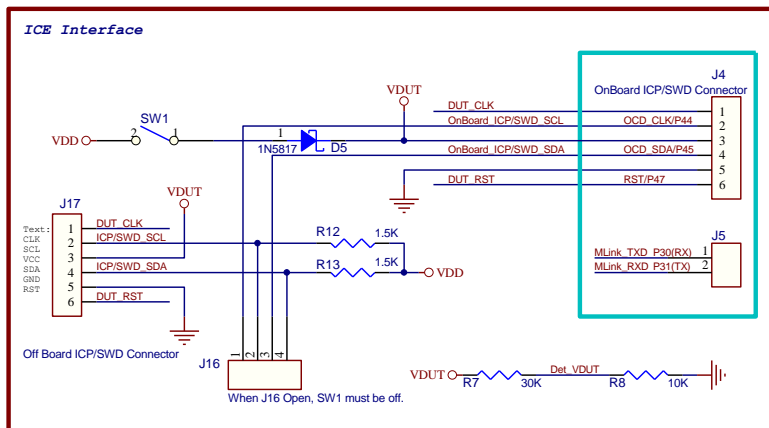
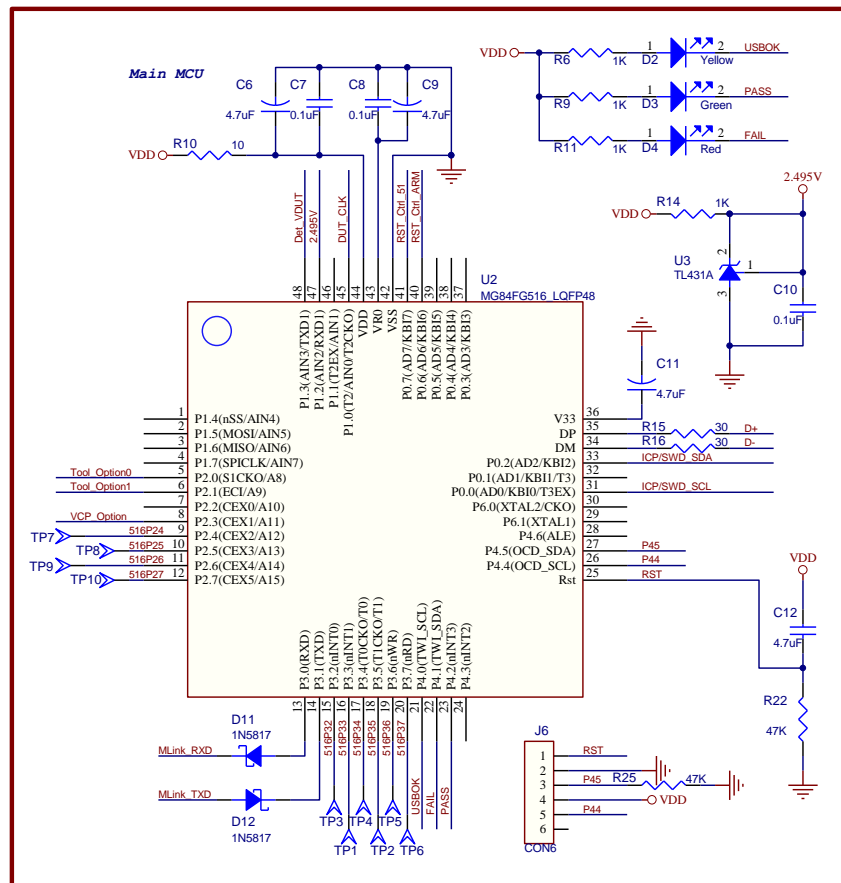
600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 128000, 7200, 14400, 28800...etc bps.

“Megawin MLink Virtual Com Port” also support **Stop Bit 1** only.

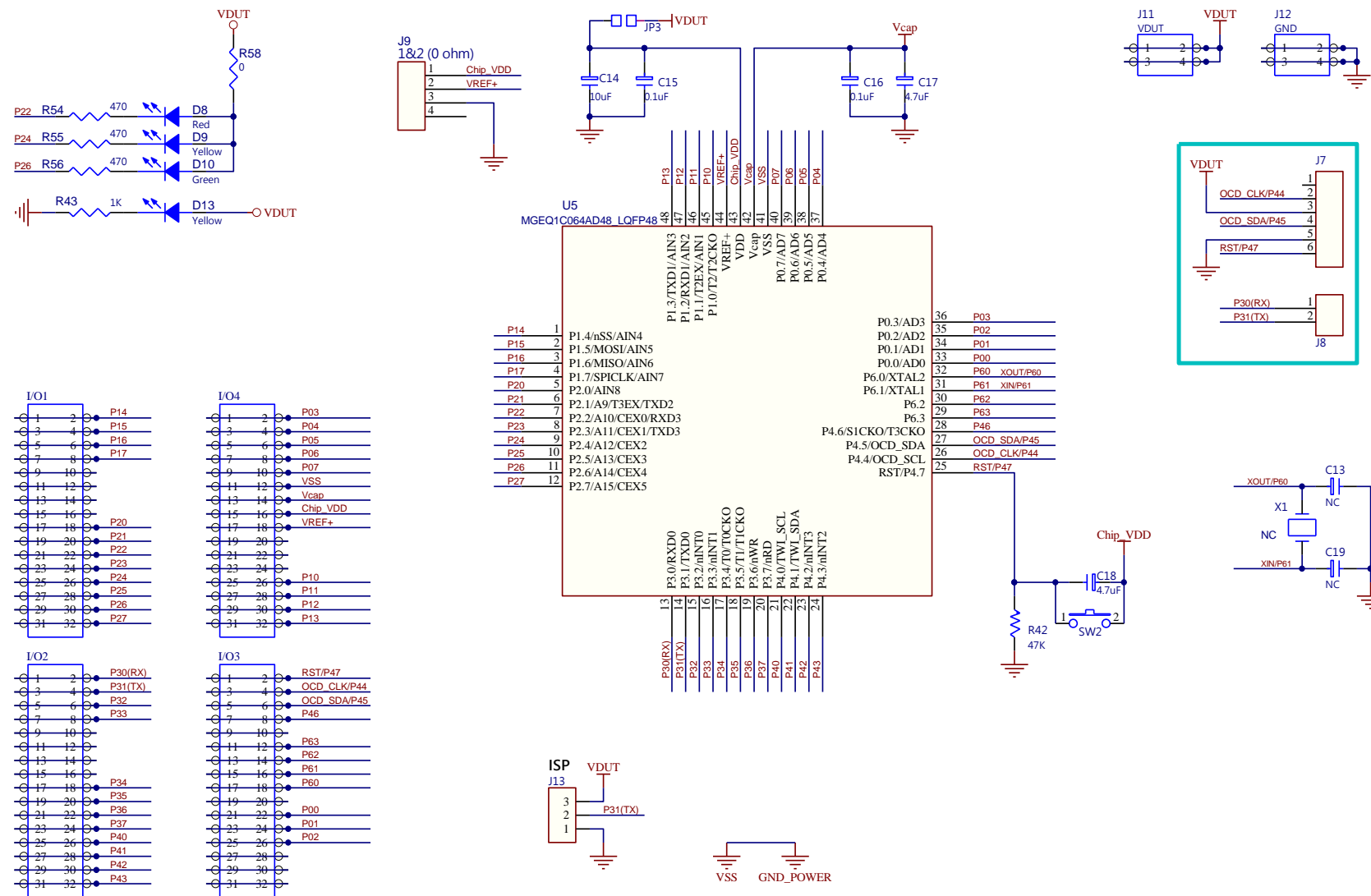
8. J17: When J16 open and SW1 off, MLink can program other DUT board through J17 connector.
9. D13: EV board power indicator LED.
10. U5: MGEQ1C064 LQFP-48 package.
11. JP3: User can measure MGEQ1C064 operating current by connecting an ammeter.
12. SW2: Pressing the button will trigger external reset signal to U5(MGEQ1C064).
13. J9: MGEQ1C064 VREF input pin, it is tied to VDD default.
14. D8, D9, D10: IO LED.
15. J11: EV board VDUT connector.
16. J12: EV board GND connector.

1.3 Ev Board Circuit

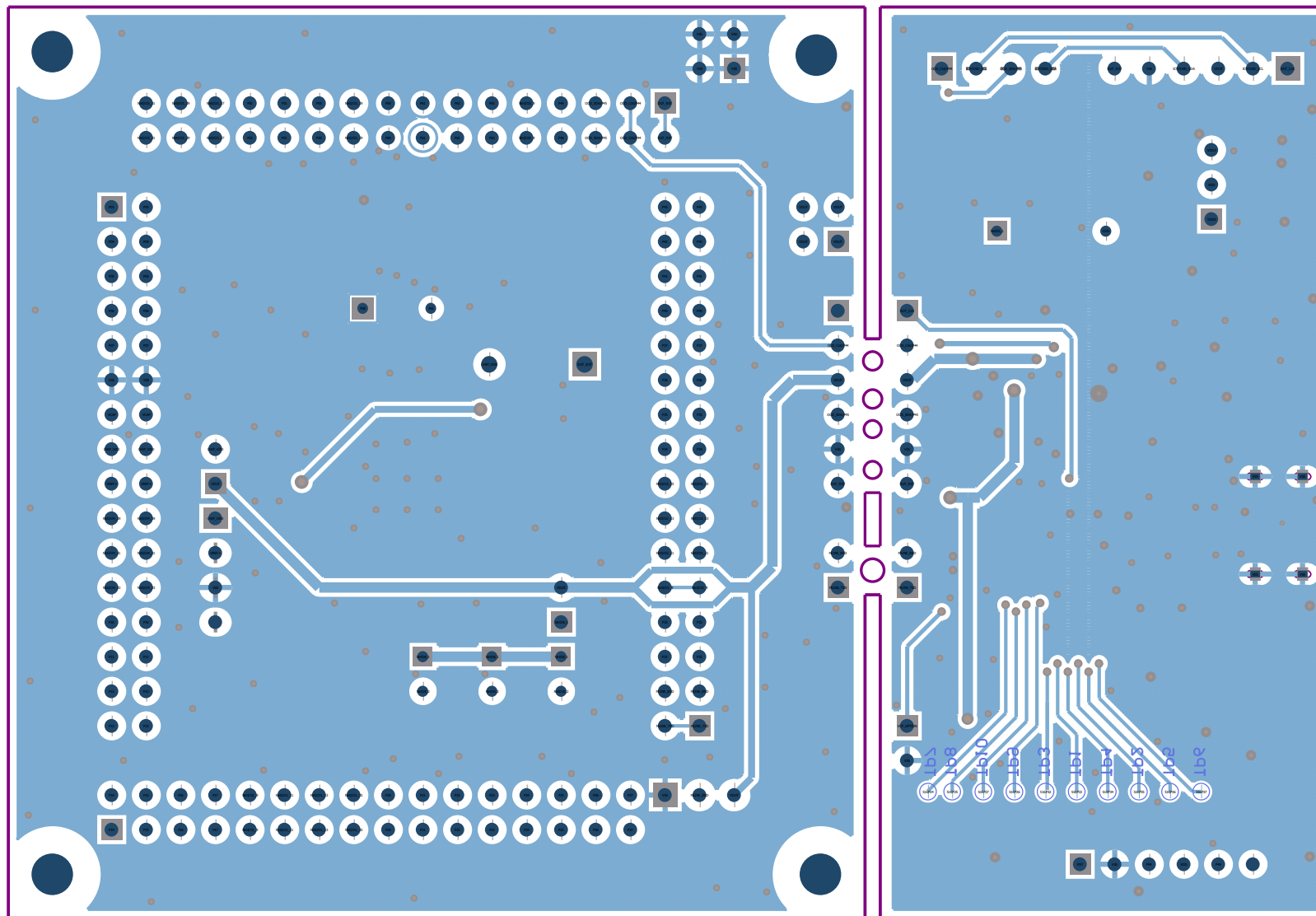
1.3.1 MLink Circuit

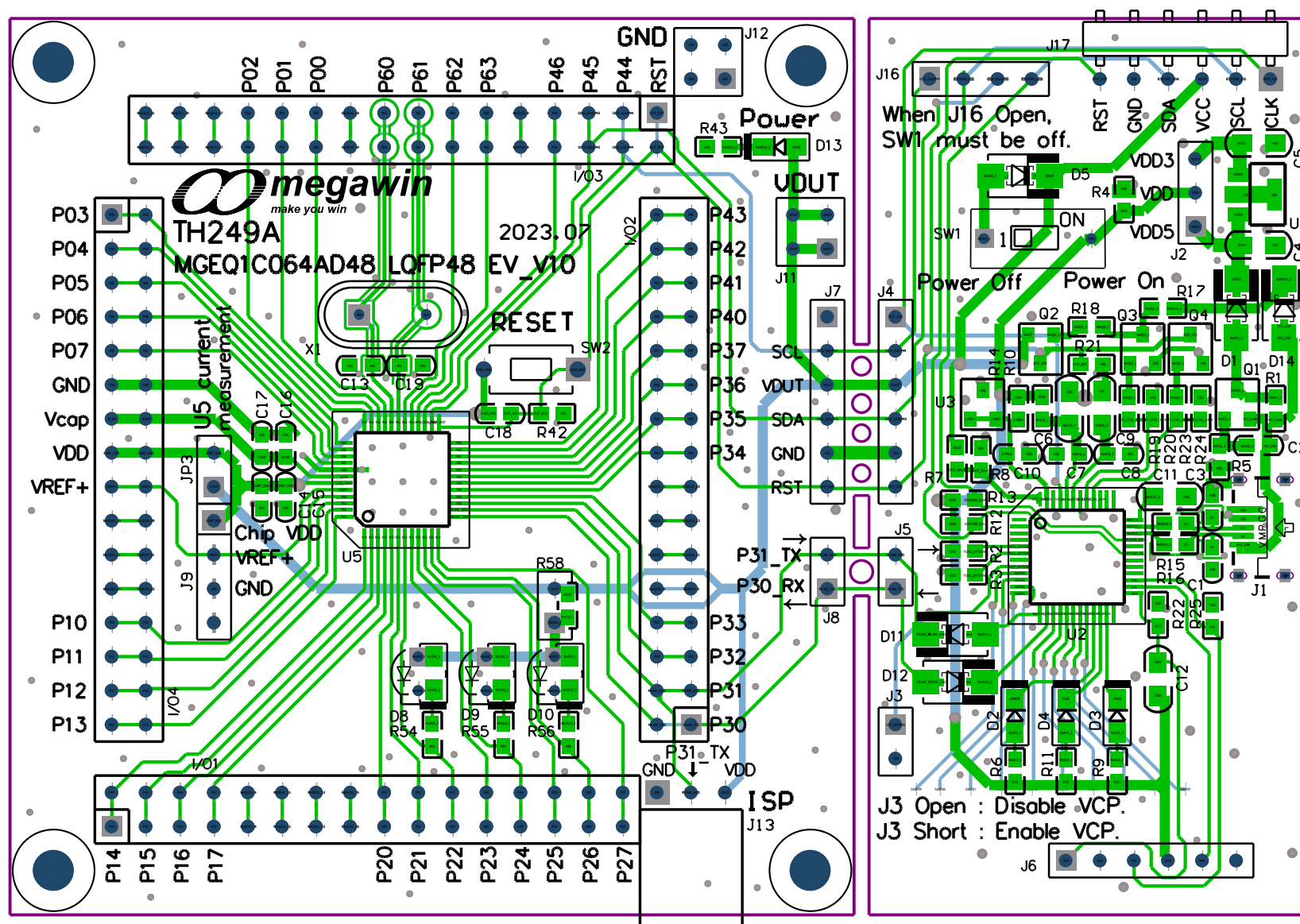


1.3.2 MGEQ1C064 Circuit



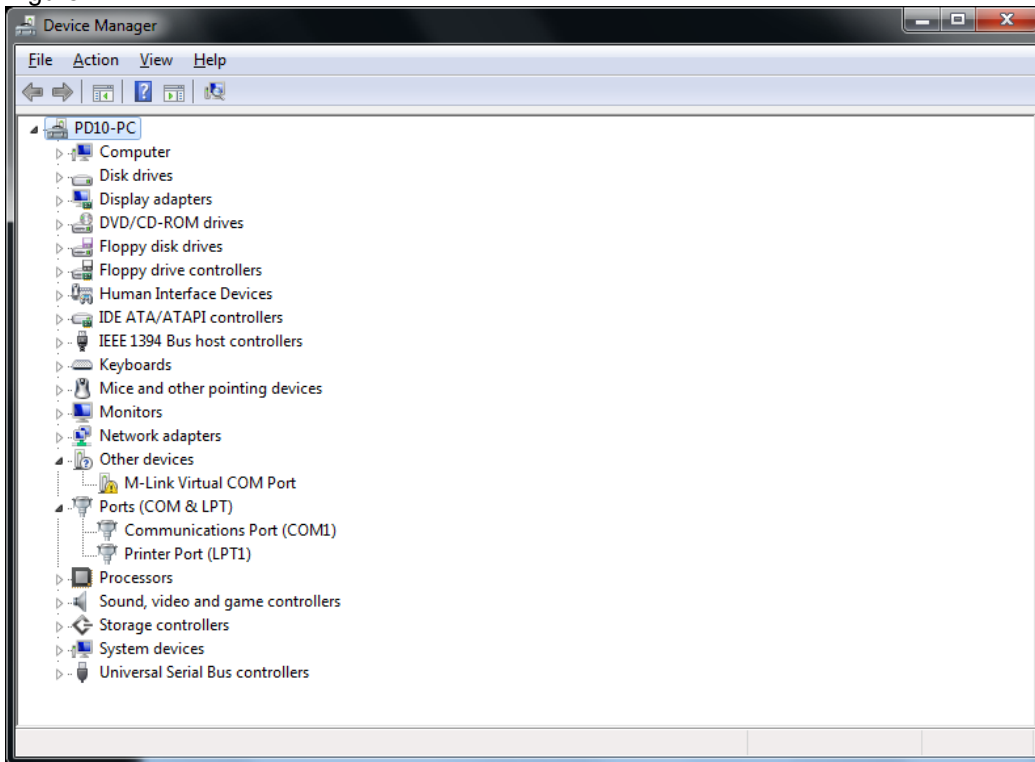
Bottom



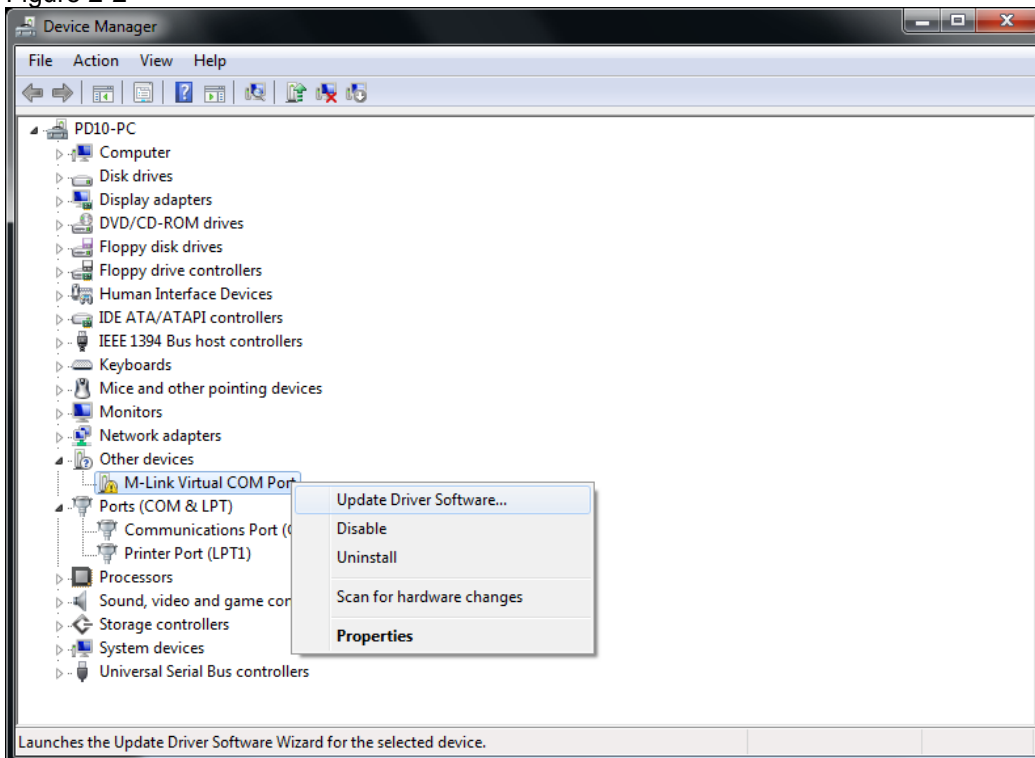


2. Driver Install

Step 1: The user short J3 plug MGEQ1C064 EV board into any USB port in a PC, then open Device Manager.
Figure 2-1

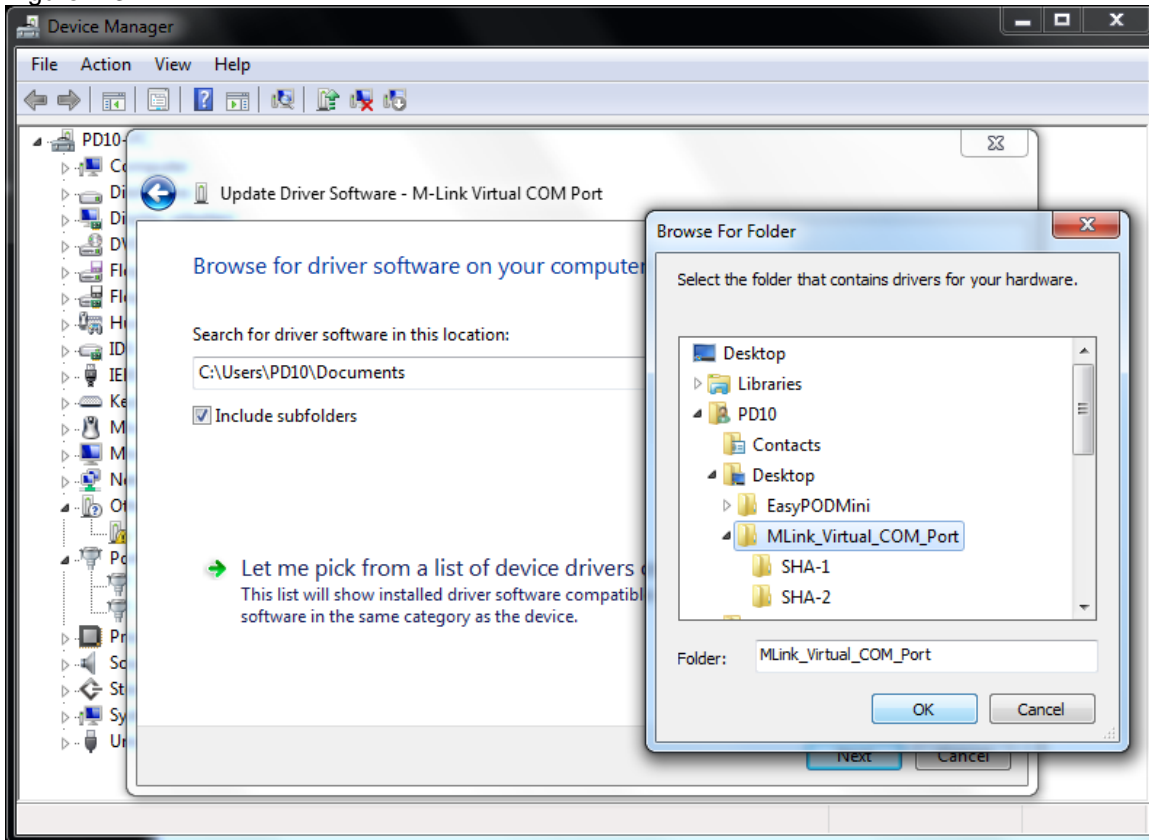


Step 2: Click “Right” key on Megawin MLink Virtual Com Port and “Update Driver Software”...
Figure 2-2



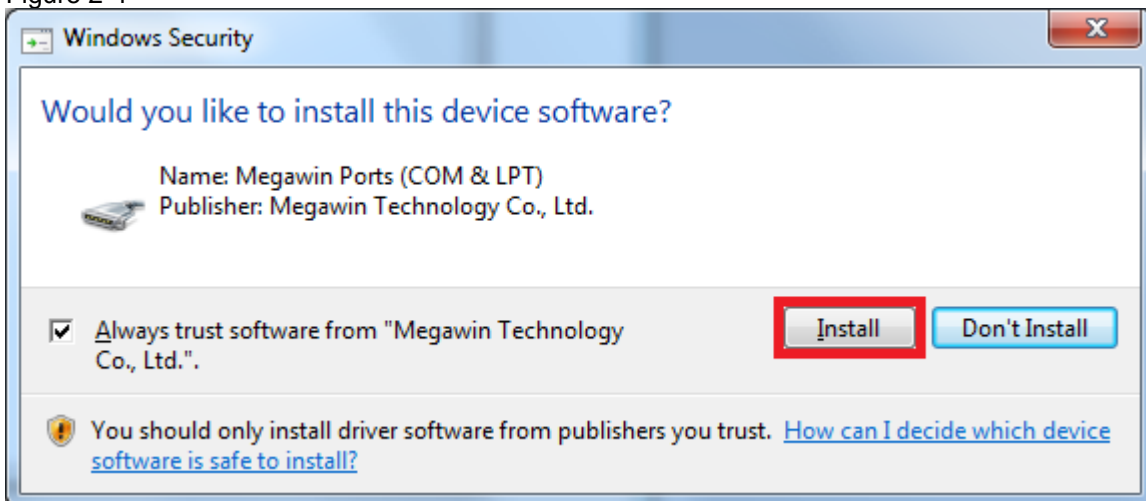
Step 3: Indicate Megawin MLink Virtual Com Port Driver path in the user's PC, OS will select SHA-1 or SHA-2 automatic.

Figure 2-3



Step 4: Click **"Install"** and wait a while.

Figure 2-4



Step 5: The user install driver successfully...

Figure 2-5

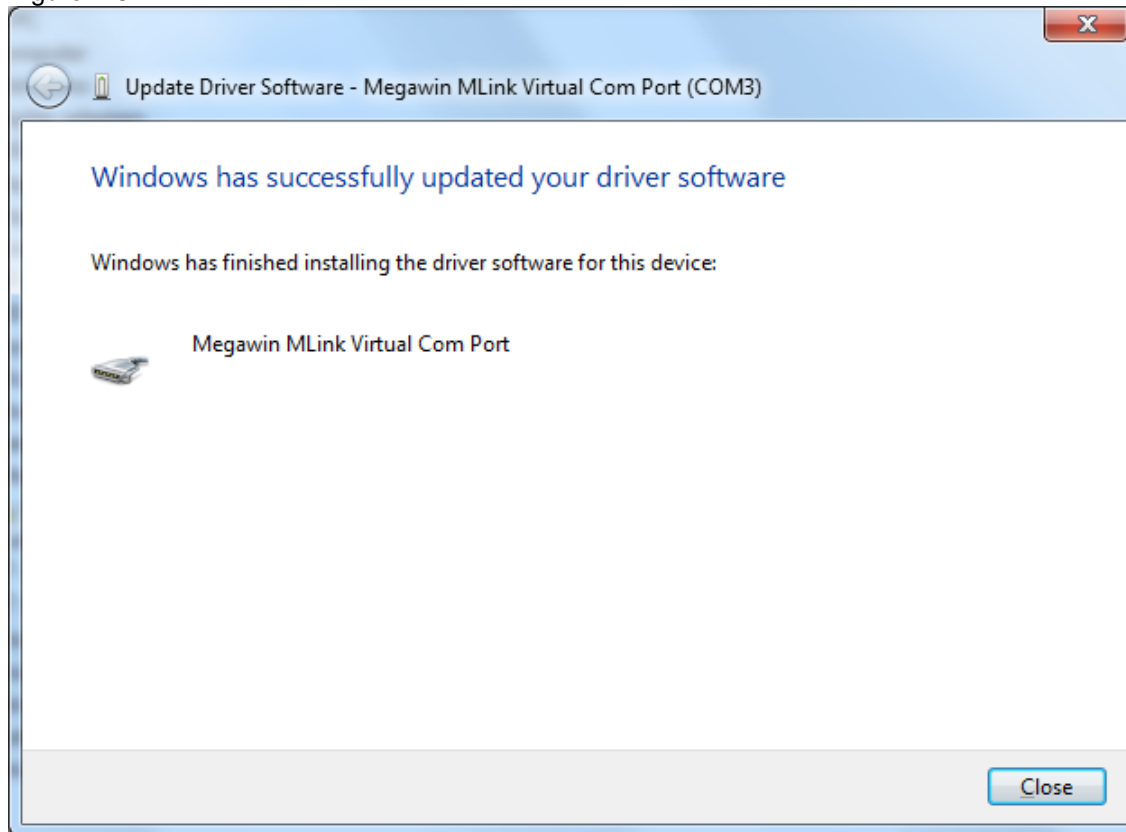
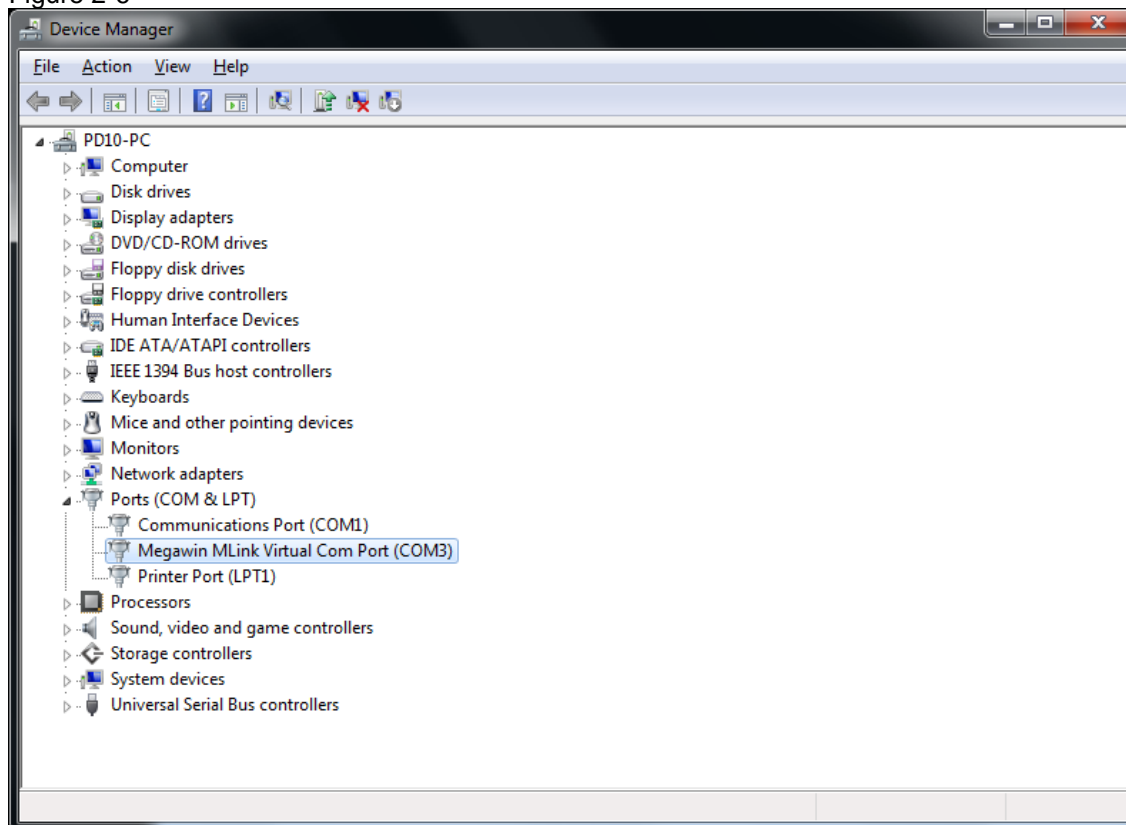


Figure 2-6



3. Revision History

Revision	Description	Date
V1.00	(1) New Create.	2023/08/21

4. Disclaimers

Herein, megawin stands for “***megawin Technology Co., Ltd.***”

Life Support — This product is not designed for use in medical, life-saving or life-sustaining applications, or systems where malfunction of this product can reasonably be expected to result in personal injury. Customers using or selling this product for use in such applications do so at their own risk and agree to fully indemnify Megawin for any damages resulting from such improper use or sale.

Right to Make Changes — Megawin reserves the right to make changes in the products - including circuits, standard cells, and/or software - described or contained herein in order to improve design and/or performance. When the product is in mass production, relevant changes will be communicated via an Engineering Change Notification (ECN).