

MG32F02V032 Evaluation Board

Explanation Manual

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1. Introduction

The **MG32F02V** is a single-chip 32-bit microcontroller based on a high performance Core ARM 32-bit Cortex™-M0 CPU with embedded Nested Vectored Interrupt Controller (NVIC).

The **MG32F02V** has up to **32K** bytes of embedded main flash memory for code and data, programmable memory size of embedded system flash memory for boot load code and 64 bytes of embedded option-byte flash memory for chip configuration. The all flash memory can be programmed either in serial writer mode (ICP, In-Circuit-Programming). Also, the main flash memory can be programmed in ISP (In-System Programming) mode or SRAM (Boot on SRAM) mode. 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 **MG32F02V** retains all features of the ARM 32-bit Cortex™-M0 with **4K** bytes of SRAM, **4** I/O ports, **32** external interrupts source with 4-level interrupt controller and seven 8/16-bits timer/counters. In addition, the **MG32F02V** has a System Tick Timer, two Watchdog Timers, three Advance timer modules with IC/OC, four Basic timer modules for universal using, on-chip crystal oscillator for 32.768 KHz to 25MHz, two high precision internal oscillators IHRCO for 11.059/12MHz and ILRCO for 32 KHz, one 12-bit ADC with one temperature sensor.

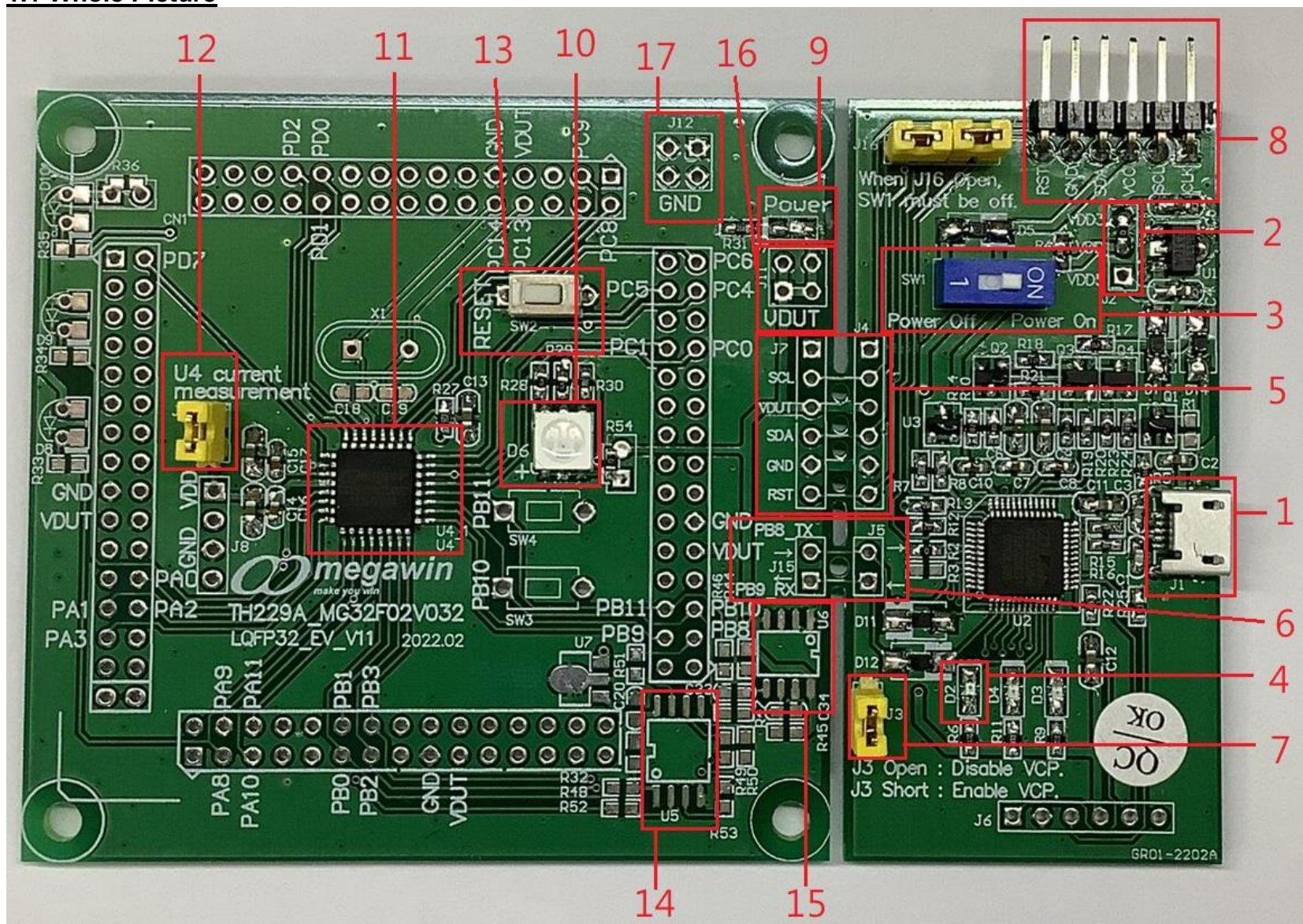
Also, the **MG32F02V** support multiple and flexible communicate interface for production application. It provides alternate function pins those are including of GPIO, I2C, SPI, UART, Timer with IC/PWM, ADC, NCO, CCL, SDT and SWD(on chip debug). It has maximum 29 GPIO pins and provides programmable IO type - quasi-bidirectional , push-pull output , open-drain output , input only(Hi-z) with optional pull-high. In addition, it is built-in internal de-bounce circuit to deglitch noise for worse signals.

One direct memory access (DMA) controller is used to improve data transfer between peripherals and memory and memory to memory. The data can be transfer by DMA controller and does not cost any CPU time.

For power management and reset control, the **MG32F02V** is built-in a power supervisor including of a Low Voltage Detector(LVD), three Brown-out Detectors(BOD0/BOD1/BOD2), a Power-On Reset(POR) , a Low-voltage Reset(LVR). The **MG32F02V** has multiple power-down modes to reduce the current consumption: Sleep mode and Stop mode.

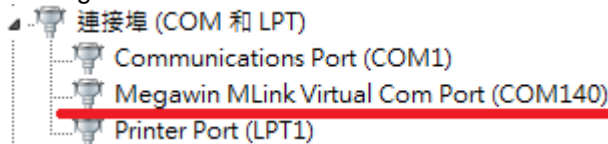
In the Sleep mode the CPU is frozen while the peripherals and the interrupt system are still operating. In the Stop mode the RAM and SFRs' value are saved and all other functions are inoperative; most importantly, in the Sleep mode the chip can be waked up by many interrupt or reset sources(POR/LVR/BOD0/BOD1/BOD2).

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 MG32F02V serial.
 - c. VDD3 -- On Board LDO 3.3V Output(U1).
3. SW1: Control U8 power on/off.
4. D2: PC identify MLink successful when D2 turn ON, but only programming turn ON at Win10.
5. J4: Connector in ICE adaptor(MLink) for connecting with EV board to program MG32F02V serial.
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:

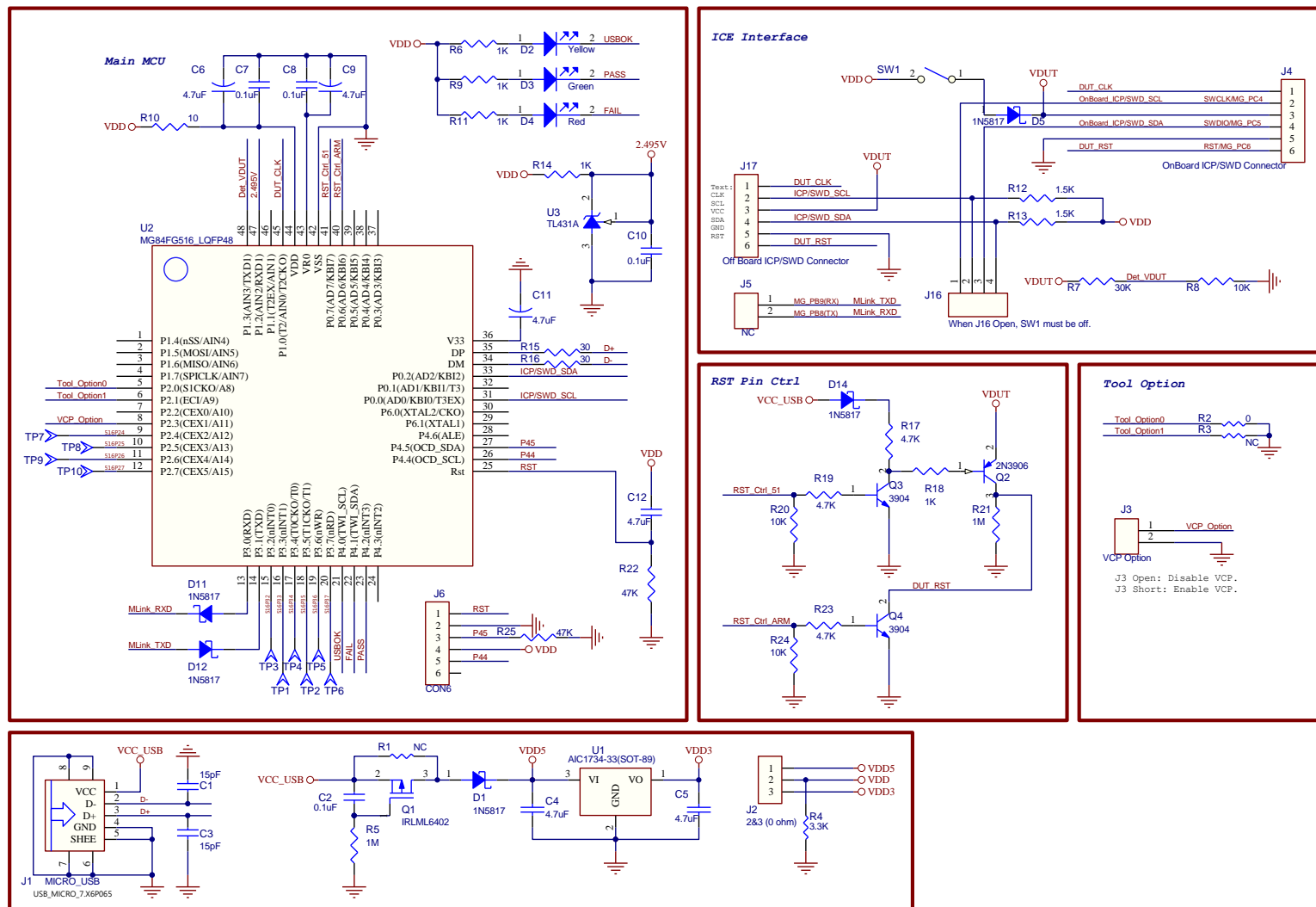
600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 128000, 7200, 14400, 28800...etc bps.

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

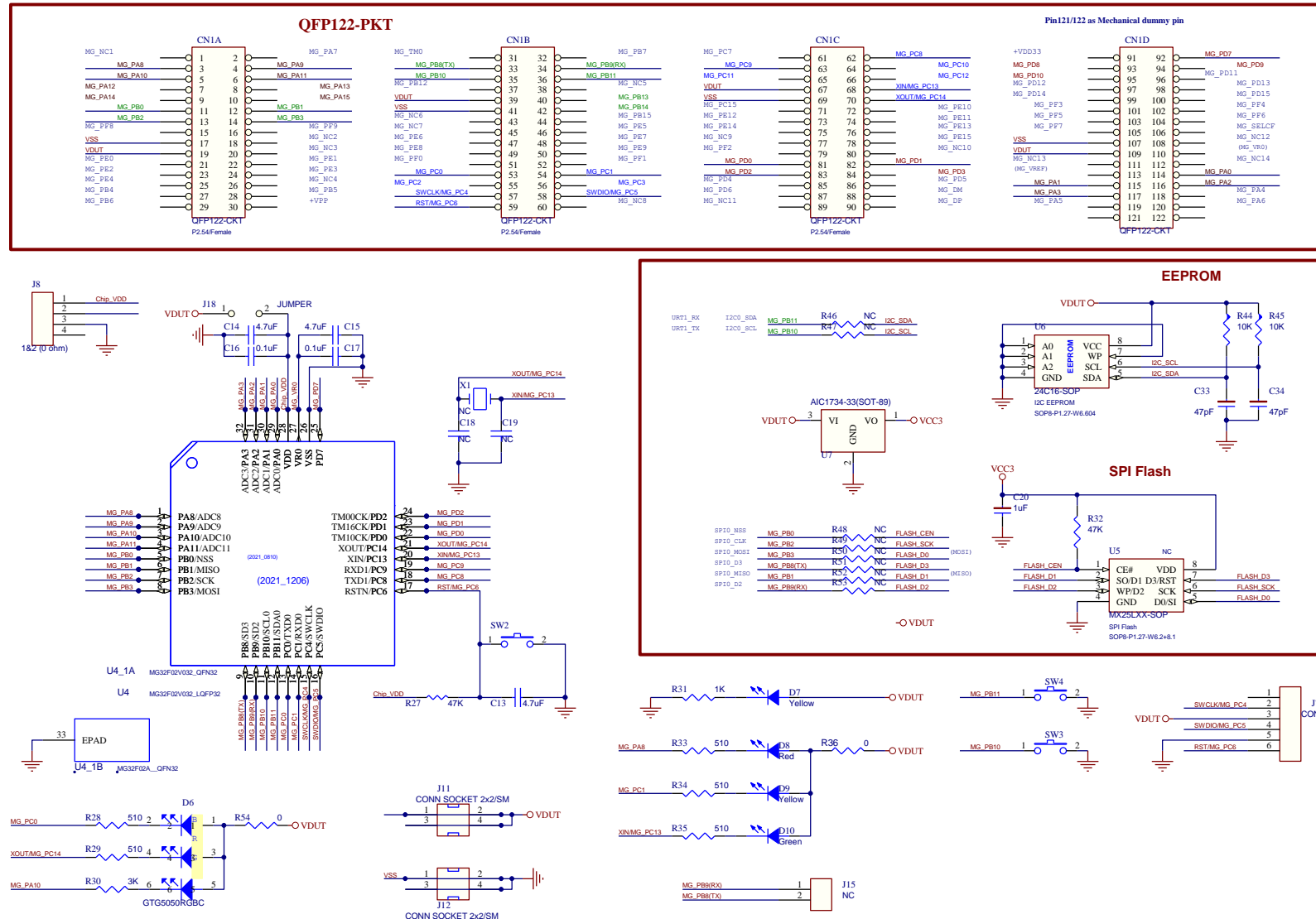
8. J17: When J16 open and SW1 off, MLink can program other DUT board through J17 connector.
9. D7: EV board power indicator LED.
10. D6: RGB LED.
11. U4: MG32F02V032 LQFP-32 package.
12. J18: User can measure MG32F02V032 operating current by connecting an ammeter.
13. SW2: Pressing the button will trigger external reset signal to U4(MG32F02V032).
14. U5: SPI flash, user can choose a SPI flash then place on the position. It is NC default.
15. U6: I²C EEPROM, user can choose a I²C EEPROM then place on position. It is NC default.
16. J11: EV board VDUT connector.
17. J12: EV board GND connector.

1.3 Ev Board Circuit

1.3.1 MLink Circuit

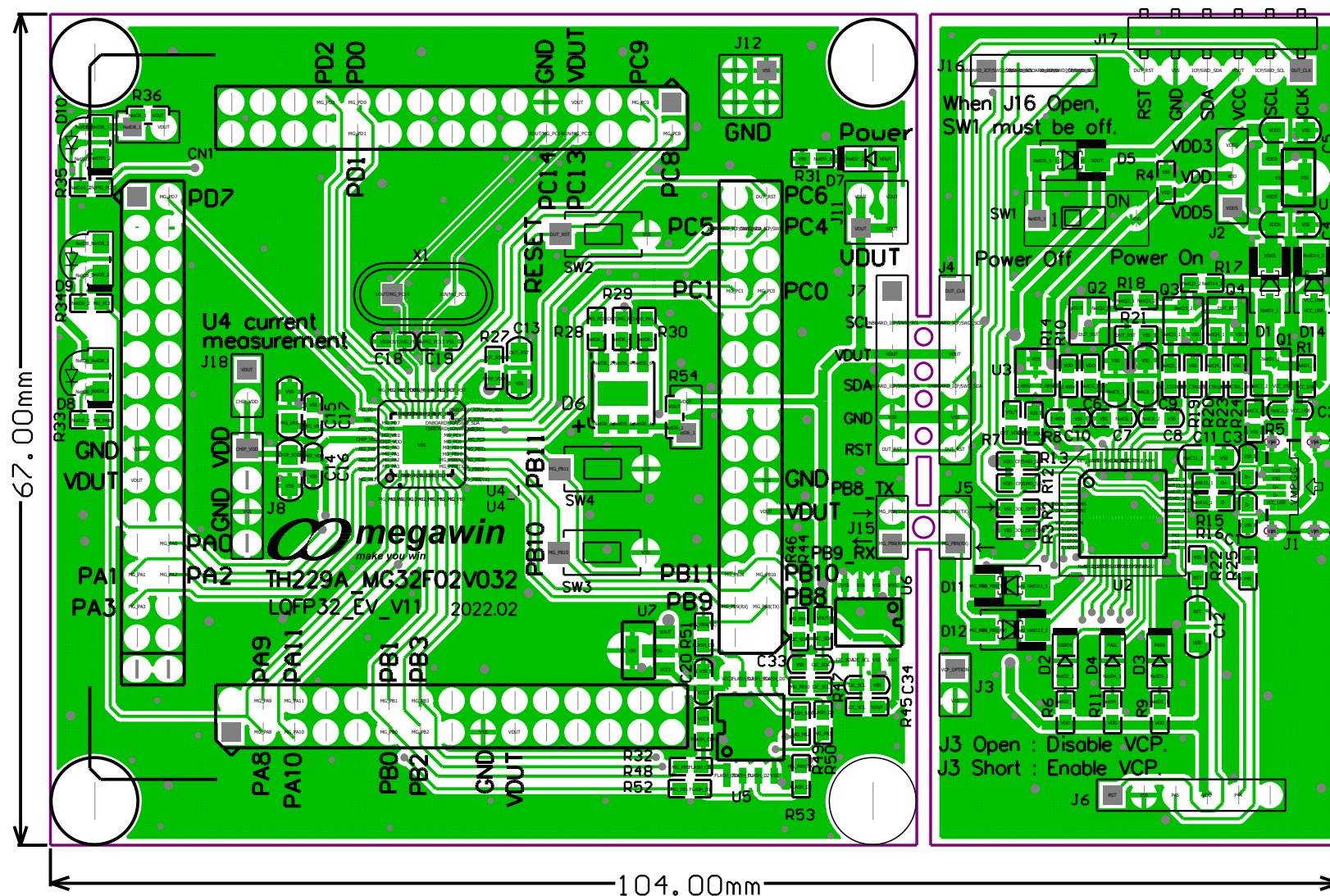


1.3.2 MG32F02V032 Circuit



1.4 Ev Board PCB

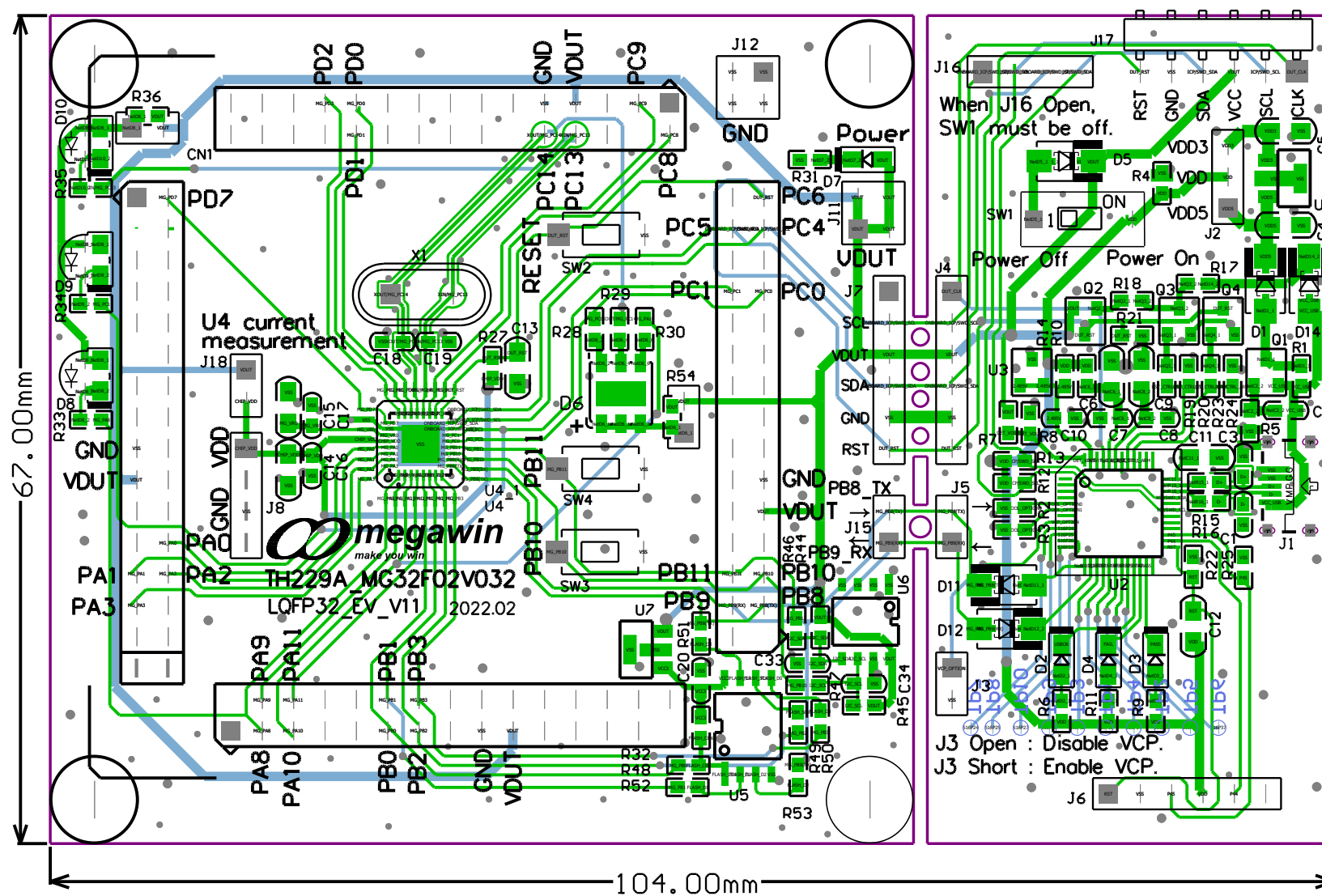
Top



The image displays a top-down view of a printed circuit board (PCB) layout for a 16-bit parallel adder. The board is populated with various components, including integrated circuits (ICs), resistors, capacitors, and connectors. The layout is organized into several functional blocks, with components labeled with their respective part numbers and values. The board is divided into two main sections by a vertical line, with the left section containing the main logic and the right section containing the input/output logic. The layout includes a legend at the bottom right, which defines the symbols used for components and their values.

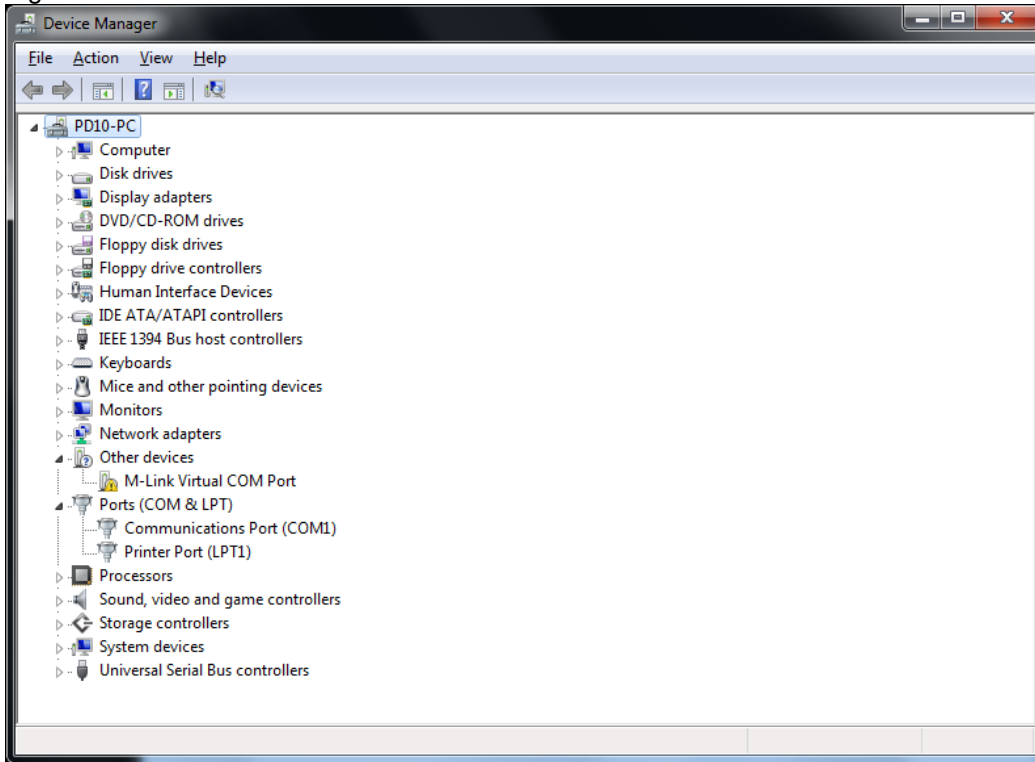
Legend:

- IC: Integrated Circuit
- RES: Resistor
- CAP: Capacitor
- VR: Variable Resistor
- VR1: Variable Resistor 1
- VR2: Variable Resistor 2
- VR3: Variable Resistor 3
- VR4: Variable Resistor 4
- VR5: Variable Resistor 5
- VR6: Variable Resistor 6
- VR7: Variable Resistor 7
- VR8: Variable Resistor 8
- VR9: Variable Resistor 9
- VR10: Variable Resistor 10
- VR11: Variable Resistor 11
- VR12: Variable Resistor 12
- VR13: Variable Resistor 13
- VR14: Variable Resistor 14
- VR15: Variable Resistor 15
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- VR225: Variable Resistor 225
- VR226: Variable Resistor 226
- VR227: Variable Resistor 227
- VR228: Variable

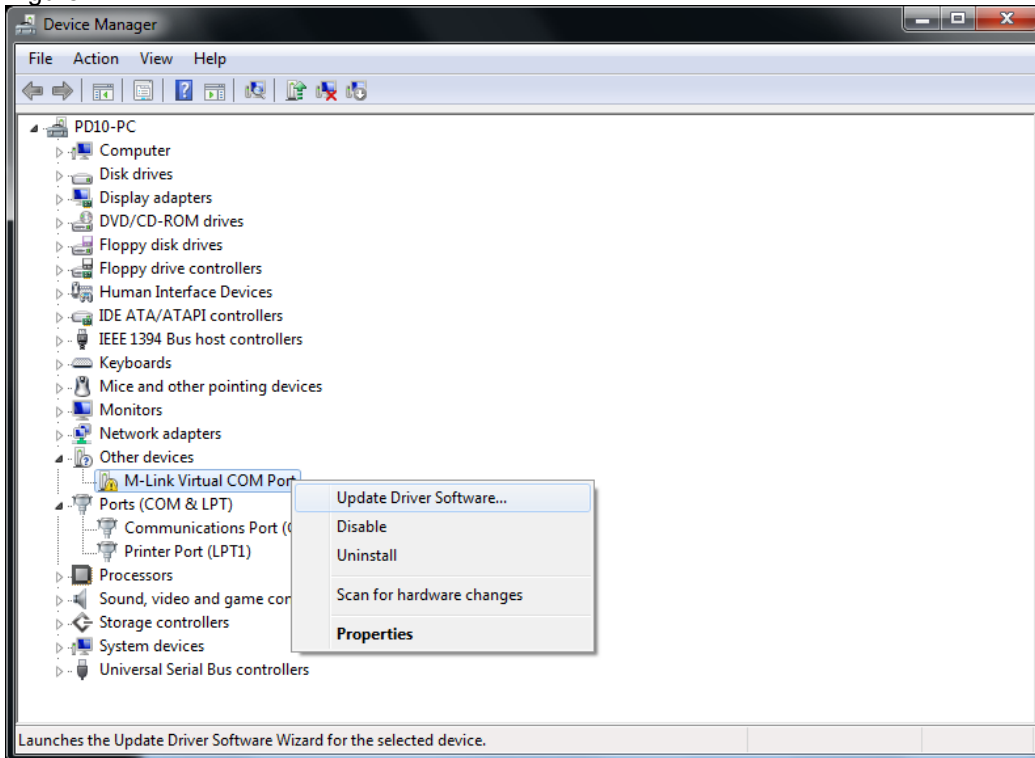


2. Driver Install

Step 1: The user short J3 plug MG32F02V032 EV board into any USB port in a PC, then open Device Manager.
Figure 2-1

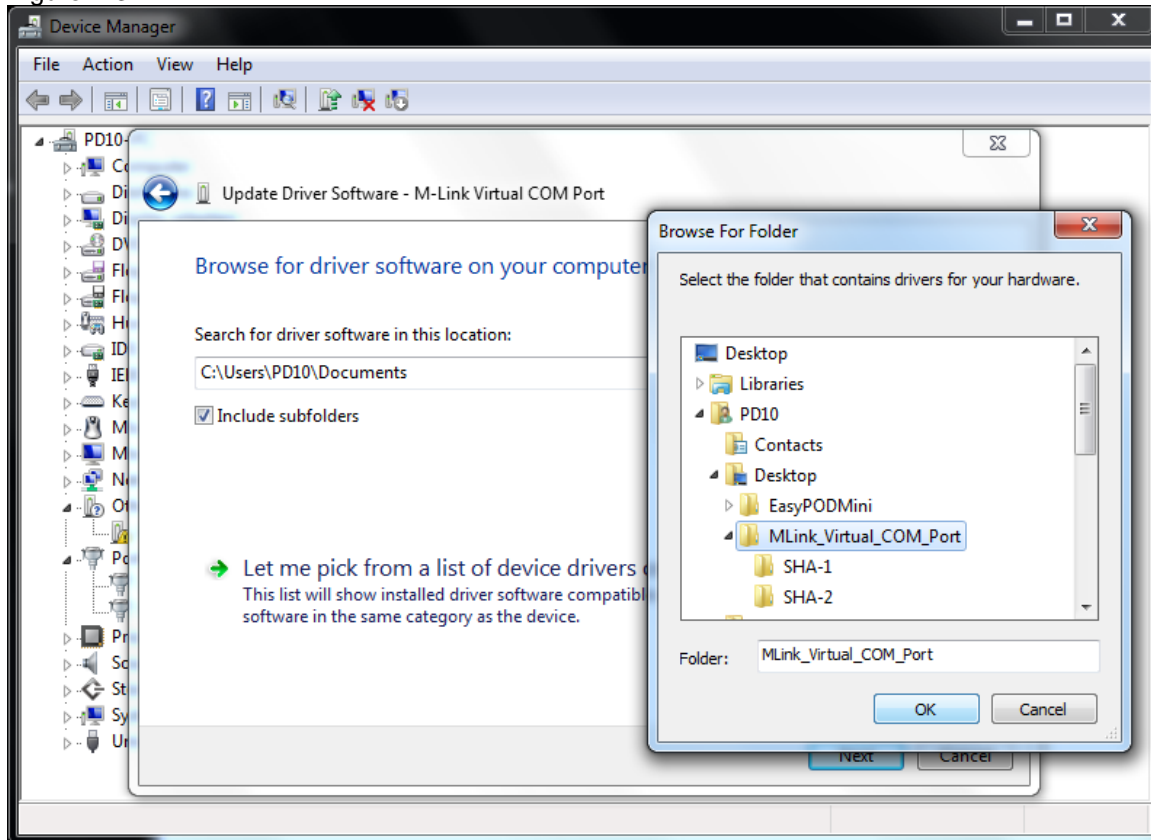


Step 2: Click "Right" key on Megawin MLink Virtual Com Port and "Update Driver Software"...
Figure 2-2



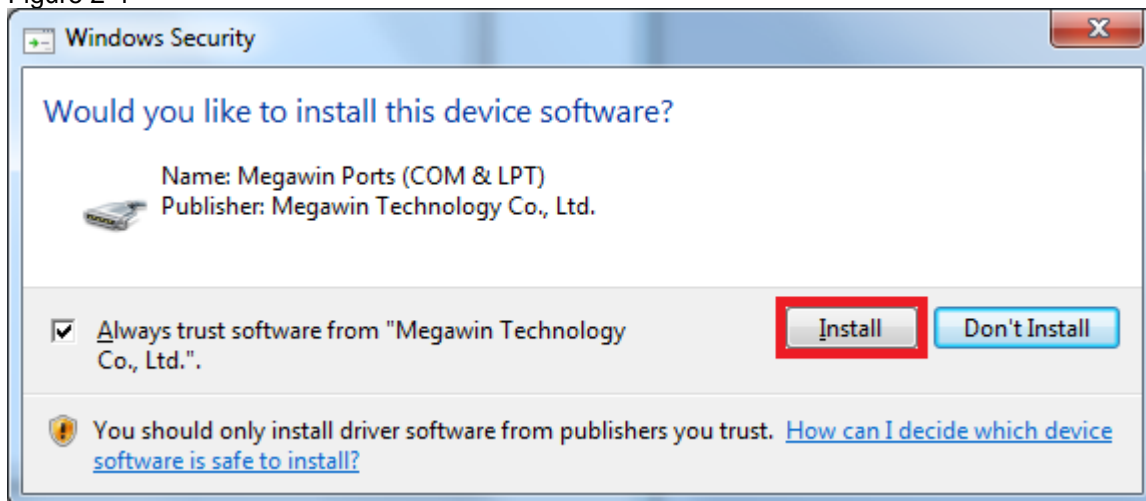
Step 3: Indicate Megawin MLink Virtual Com Port Driver path in the user's PC, OS will select SHA-1 or SHA-2 automatic.

Figure 2-3



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

Figure 2-4



Step 5: The user install driver successfully...

Figure 2-5

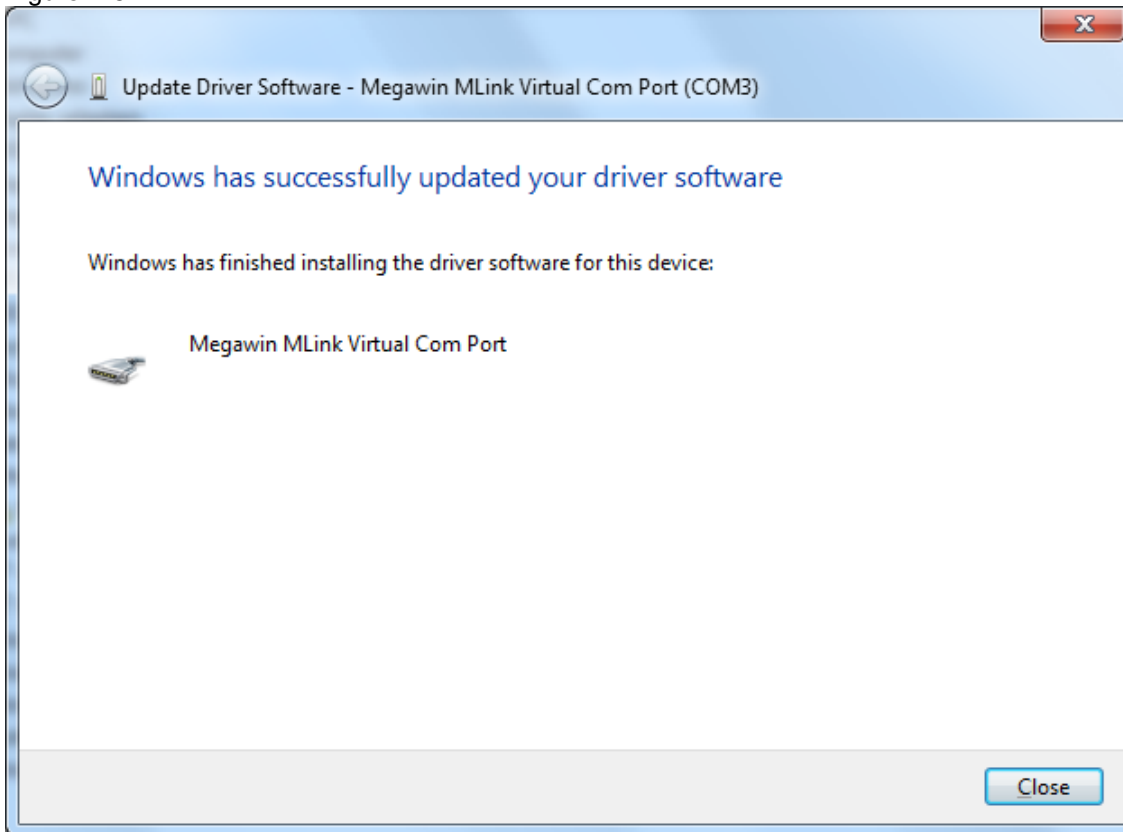
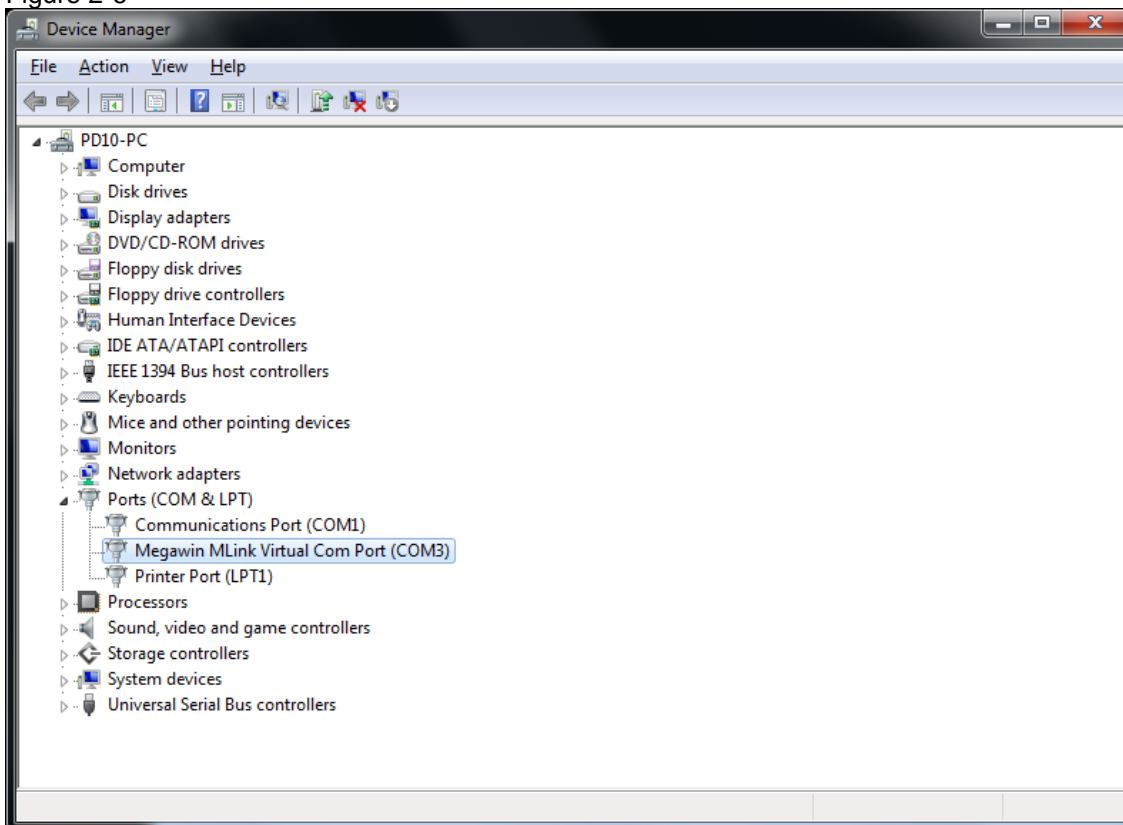


Figure 2-6



3. Revision History

Revision	Description	Date
V1.00	(1) New Create.	2022/05/12

4. Disclaimers

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