

# MPLAB<sup>®</sup> ICD User's Guide

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## A.3 MPLAB ICD Demo Board

The MPLAB ICD Demo Board is a simple demonstration board that supports PIC16F87X microcontrollers. The board can be used stand-alone with a pre-programmed part or with the MPLAB ICD Module and MPLAB ICD Header. A sample program is provided to demonstrate the unique features of the devices. Although a 40-pin and a 28-pin socket are provided to accommodate the different packages, only one processor can be run at a time.

### A.3.1 Processor Sockets

Available sockets are:

- 40-pin socket for PIC16F871/874/877
- 28-pin socket for PIC16F870/872/873/876

Additional 20- and 14-pin male to male headers have been provided as stand-offs. Simply insert the desired headers onto the MPLAB ICD Demo Board and then plug the MPLAB ICD Header into the stand-offs. Without the stand-offs, the MPLAB ICD Header would not plug into the sockets. Or, simply insert the device directly onto the MPLAB ICD Demo Board.

### A.3.2 Display

Eight red LEDs are connected to PORTC of each processor type. The PORTC pins are set high to light the LEDs.

### A.3.3 DIP Switches

Eight DIP Switches are provided in a package as SW3. When all switches are in the ON position, each of eight red LEDs is connected to a pin of PORTC.

### A.3.4 Power Supply

The MPLAB ICD Demo Board uses a 9.0V power supply to create a 5.0V V<sub>DD</sub> voltage to power the MPLAB ICD Module. This 9V power supply is **NOT** provided with the MPLAB ICD system. If you own a PICSTART Plus Programmer, you can use its power supply to power the MPLAB ICD Demo Board. The part number is AC162039. The minimum power supply specifications for the MPLAB ICD Demo Board as shipped are:

- DC power supply: 9VDC @ 0.3A
- With barrel connector: ID = 2.5 mm, OD = 5.5 mm, Barrel length: 10.0 mm, Inside positive

### A.3.5 ICD Connection

A modular cable connection next to the power supply can be used to connect the MPLAB ICD Demo Board directly to the MPLAB ICD Module.

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## A.3.6 RS-232 Serial Port

A RS-232 level shifting circuit has been provided to support connection to a RS-232 host through the DB9 connector. The port is configured as DCE, and can be connected to a PC using a straight through cable, as opposed to a null modem cable. The circuitry must be populated by the user:

- U4 – Analog Devices MAX233A or equivalent
- R14-R19 – 330Ω, 1/8W resistor
- C7-C11 – 0.1 μF capacitors
- J4 – DB9 female right angle connector

## A.3.7 Push-Button Switches

Two push buttons provide the following functions:

- $\overline{\text{MCLR}}$  to reset the processor
- Active low switch connected to RB0

## A.3.8 Oscillator Options

You can use the on-board RC oscillator circuit or plug an oscillator in the 4-pin socket. Make sure to set the jumper (JP1) to the proper selection.

- Socket provided for clock oscillator – use an oscillator from 32 kHz to 20 Mhz
- RC circuit – the frequency generated by the R3 resistor and C4 capacitor ranges from about 3.5 Mhz to 6 Mhz, depending on the operating voltage and ambient temperature.

## A.3.9 Analog Input

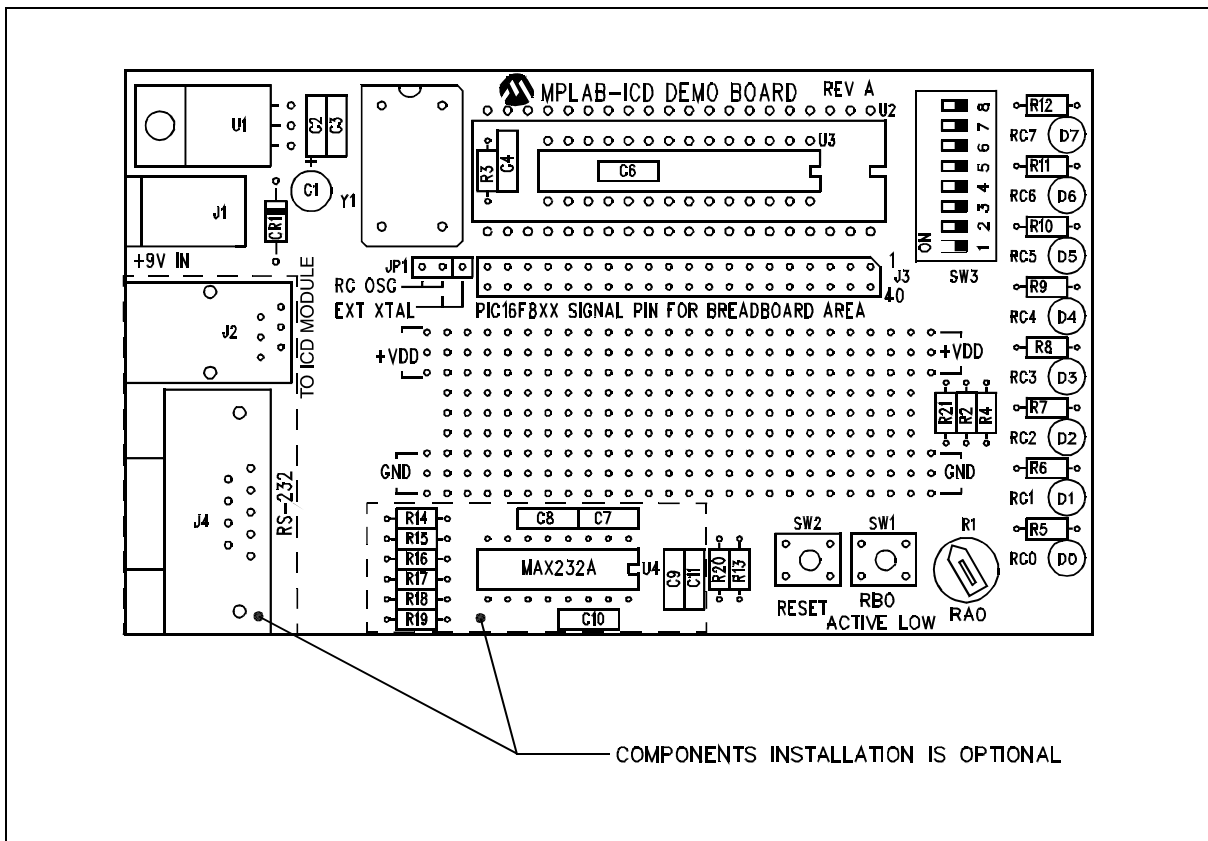
A 1Kohm potentiometer is connected through a series 470 ohm resistor (to protect the part should the pin be configured as an output) to RA0/AN0. The port can be adjusted from VDD to GND to provide an analog input to the PIC16F87X parts.

## A.3.10 Silkscreens and Schematics

This section contains the silkscreen and schematic diagrams for the MPLAB ICD Demo Board.

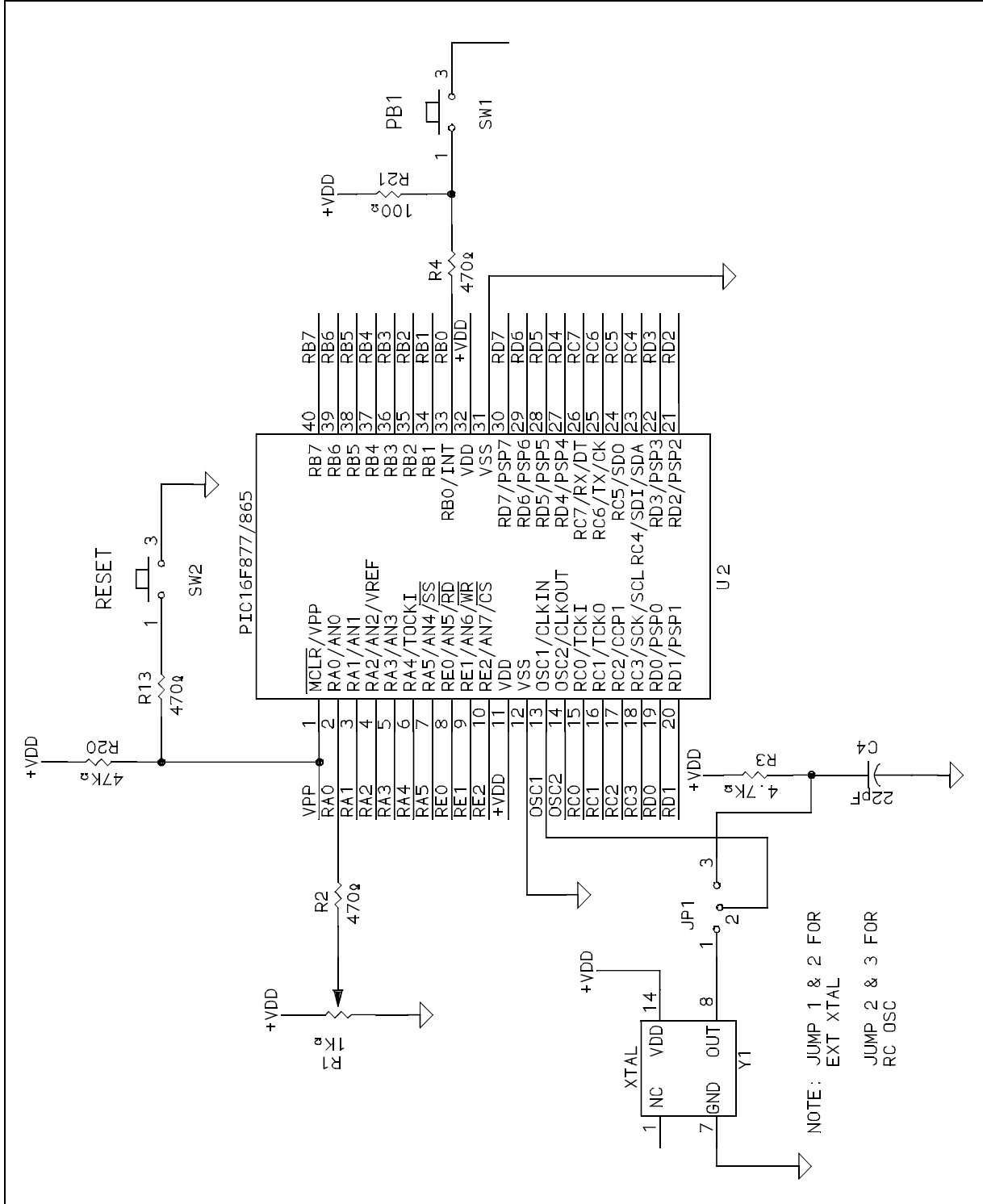
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Figure A.7: MPLAB ICD Demo Board Silkscreen



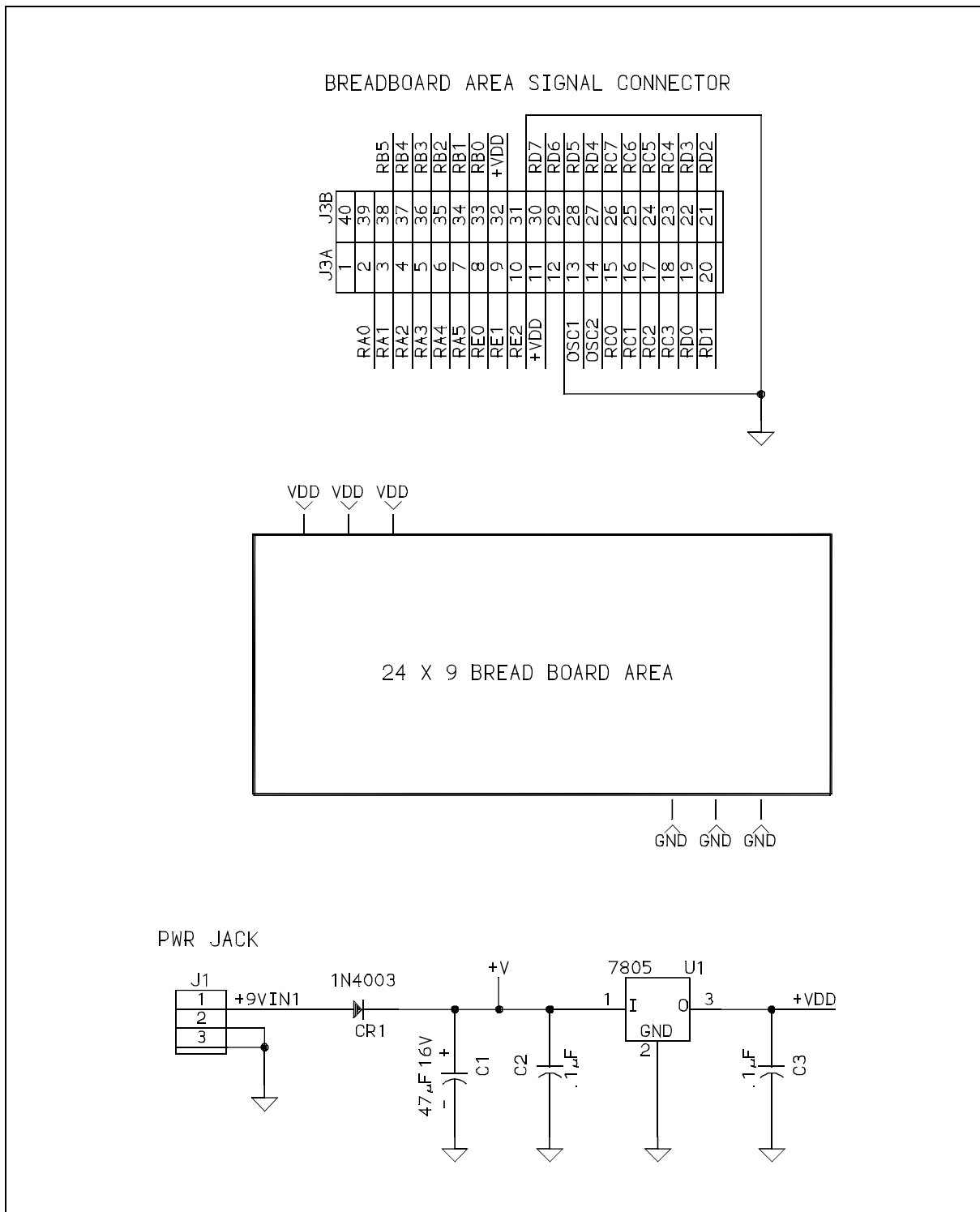
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Figure A.8: MPLAB ICD Demo Board Schematic, Part 1



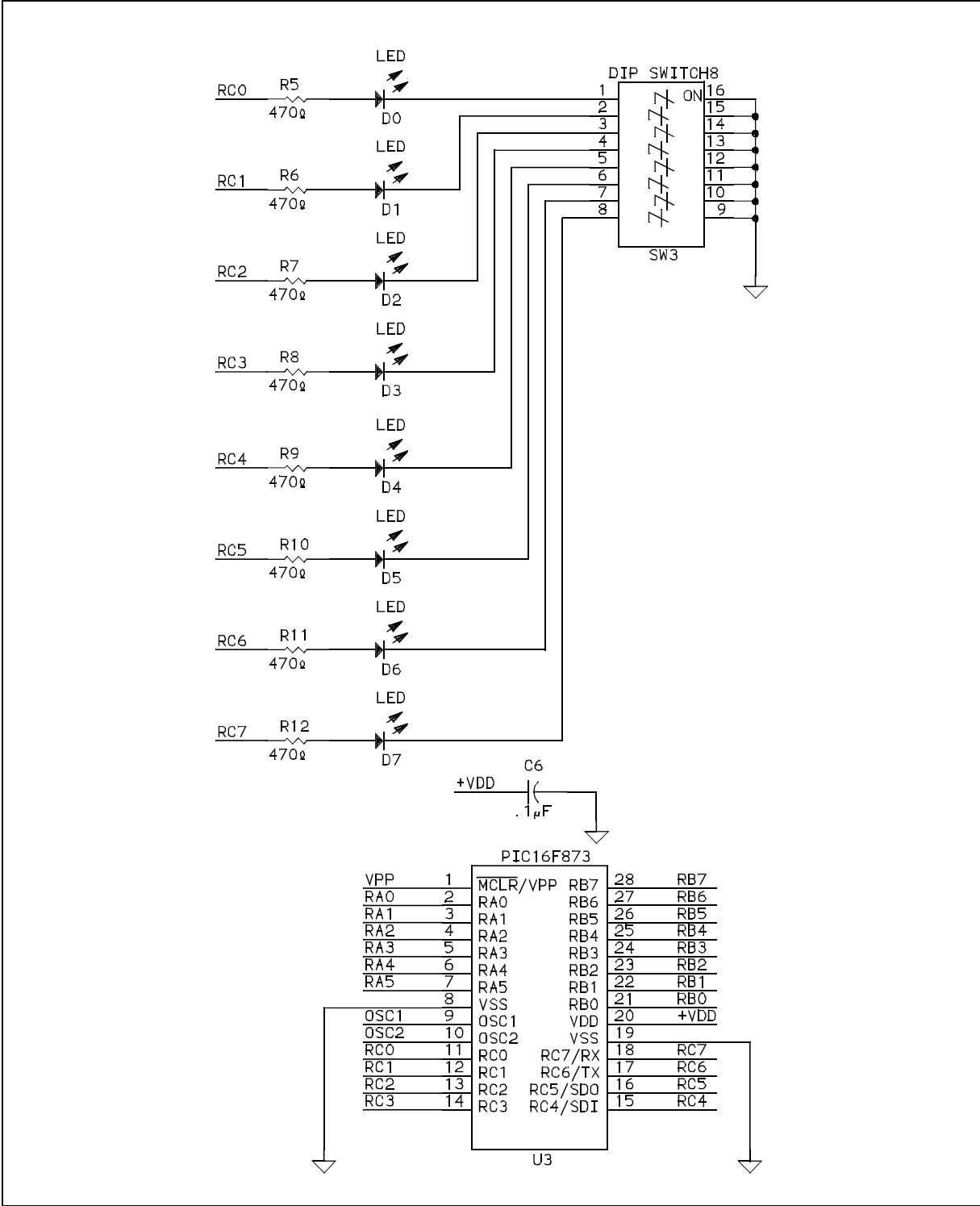
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Figure A.9: MPLAB ICD Demo Board Schematic, Part 2



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Figure A.10: MPLAB ICD Demo Board Schematic, Part 3



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Figure A.11: MPLAB ICD Demo Board Schematic, Part 4

