MICROCHIP

PIC16C5x 28P DIP/28P SOIC PM3 socket modules AC164301/AC164302 modification for current limit Vpp/MCLR during programming

Problem: There are some cases in which PIC16C5x devices failed to program due to excessive current sink at Vpp/MCLR pin. To stay within spec and limit the current to 100mA max at Vpp/MCLR pin during programming, the user can modify the AC164301(28P DIP)/AC164302(28P SOIC) PM3 socket module.

Symptoms: During the programming operation, the PM3 screen will turn off and power-cycle will be required to bring the PM3 to power up again.

Cause: PIC16C5x devices require 100mA limit current during programming at Vpp/MCLR pin.

Solution: This ETN will provide instructions to modify the 28P DIP socket module AC164301 and 28 SOIC AC164302 to support PIC16C5x devices that exhibit the symptoms.

IMPORTANT NOTE: Once AC164301/AC164302 are modified, **the socket modules must not be used** to program any other devices outside the PIC16C5x family indicated in the programming spec.
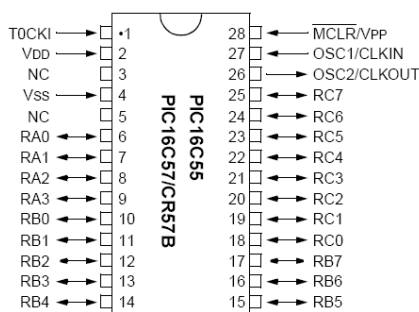
Materials:
1. 150ohm 0805 SMT resistor
2. 390pF thru-hole capacitor
3. 40-DIP socket module **AC164301** or the **AC164302**, PM3 socket module 28P SOIC.
4. Soldering tools.
5. SuperGlue
6. Wire and wire-wrap tool.

**Steps for modifying the AC164301 40P DIP module:**

To start, here is a pinout for both 28P DIP and 28P SOIC as a reference:


PDIP, SOIC, Windowed CERDIP

The goal is to isolate the bypass the connection to the socket pin using a 150 ohm resistor and to add a cap to the Vss pin of the DUT (DIP socket pin 4).

1. Remove the top cover from the socket module.
2. To isolate the device pin, cut the socket module at the bottom as indicated

Top view   Two cuts at the
                        Bottom
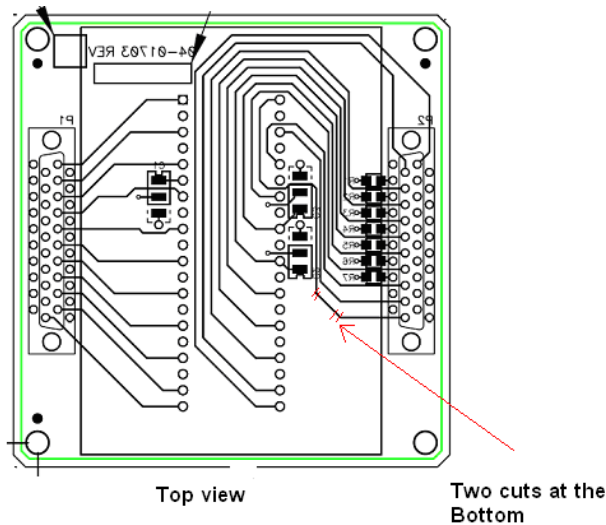
3. Glue a **150ohm 0805** resistor as indicated in the picture below.
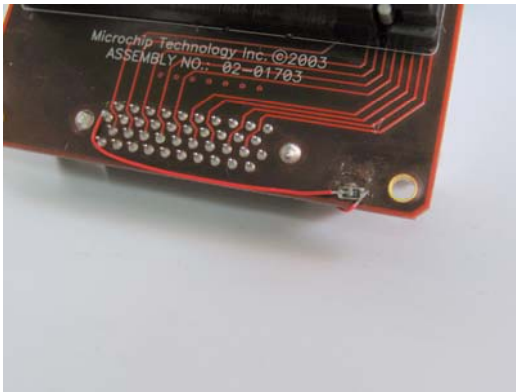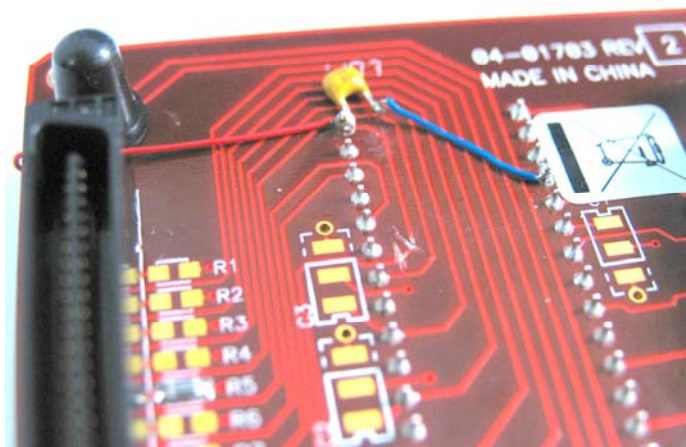

4. Solder one end of the wire to PIN40 at the P2 connector as indicated in the picture, and solder the other end to the glued resistor.
5. Solder the wire to the other end of the resistor and pass the wire to Socket Pin 40 as indicated in the pictures below (note the cuts as well).
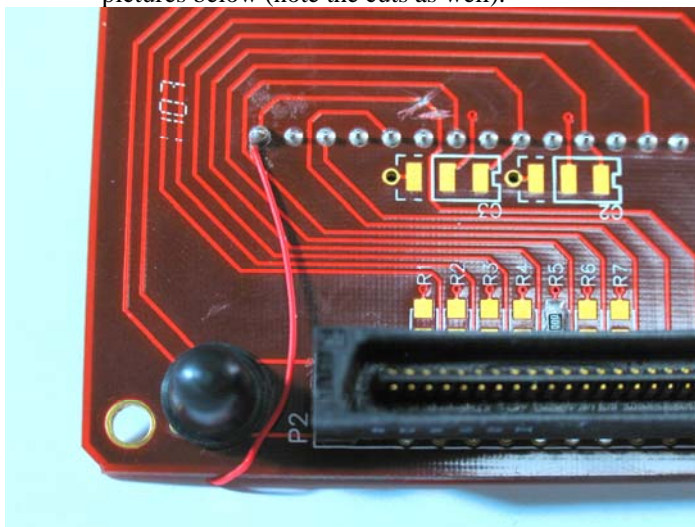
6. Place the plastic back carefully and with the tip of a soldering iron, heat up the corners to secure the socket module plastic cover against the board.

![Microchip logo]

7. Solder the 390pF capacitor to the Vpp pin (socket pin 40) and the other end to the Vss pin (socket pin 4) as shown in the picture below.


**Steps for modifying the AC164302 28P SOIC module:**

The goal is to isolate the connection to the MCLR (socket pin 28) and bypass this connection with a 150 ohm resistor, then, add a 390pf cap between the MCLR pin and the Vss pin (socket pin 4).

1. Remove the top cover from the socket module.

2. To isolate socket pin 28, cut the trace as indicated in the drawing below.
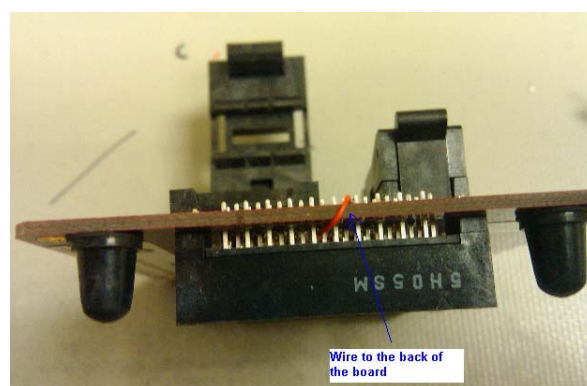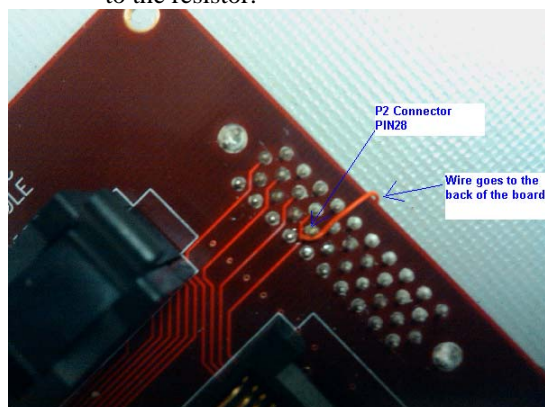

AC164332 Bottom view
Modifications
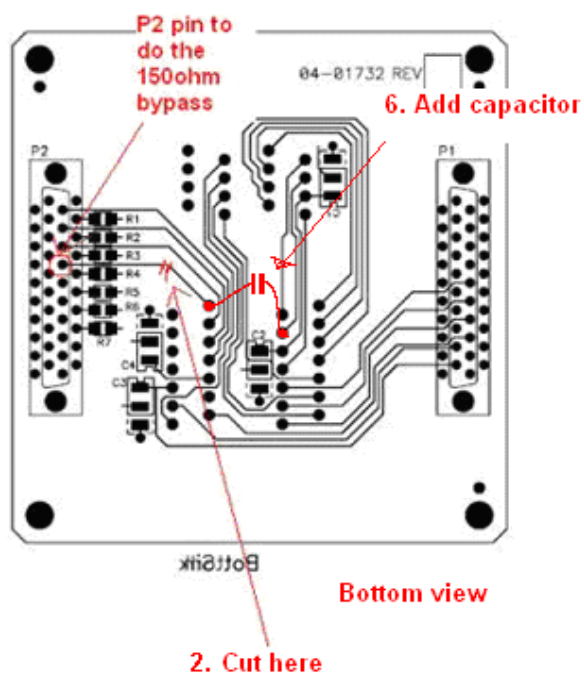
3. Now, solder one end of the **150ohm 0805** resistor at socket pin 28.
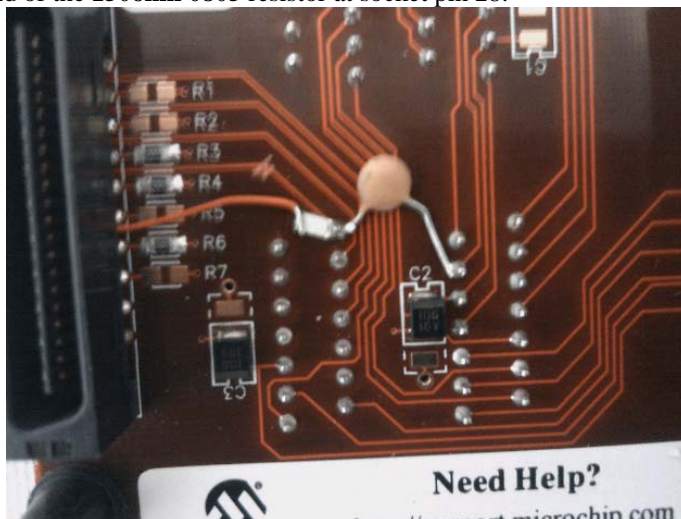
4. Solder the other end of the wire to the P2 connector pin, as indicated in the picture, and solder the other end to the resistor.

5. Place the plastic back carefully and with the tip of a soldering iron, heat up the corners to secure the socket module plastic cover against the board.
6. Solder the 390pF capacitor to the Vpp pin (socket pin 28) and the other end to the Vss pin (socket pin 4) as shown in the picture below the No. 3 step.