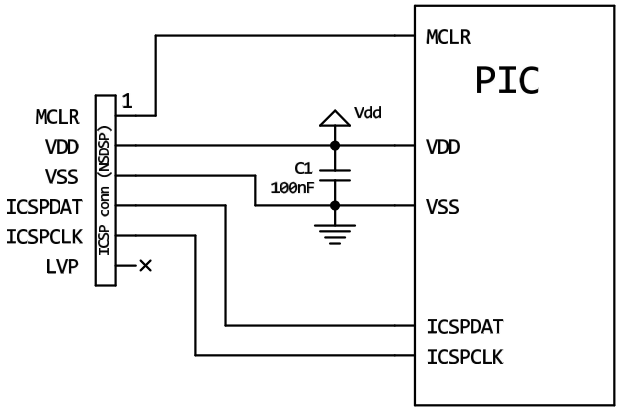
Support summary

- Programming - Yes
- Debugging provisions - Yes



LVP Programming

Low-Voltage Programming (LVP) can only be used for these PIC devices if the LVP configuration bit is enabled. Fresh (unprogrammed) devices have LVP bit set and therefore they can be programmed. It is impossible to disable LVP bit during LVP programming, but if the device has been previously programmed with HVP programmer, the LVP bit may have been disabled.

When brown-out is enabled with BOREN configuration bit, LVP is only possible when the VDD voltage is above the brown-out threshold.

These limitations may be avoided with High-Voltage Programming (HVP). NSDSP-2 can generate high voltage for HVP internally. NSDSP-1 cannot, therefore NSDSP-1 requires NSHVX or an external circuit for HVP.

HVP Programming

NSDSP-2 can program PIC16F1459 with HVP.

With NSDSP-1, HVP programming is possible, but only with NSHVX High Voltage Extension or an external HVP circuit.

Target Voltage Below 2.7V

If voltage is less than 2.7V programming is severely limited - it is impossible to bulk erase the device, it is also impossible to erase configuration bits.

NSDSP-1 cannot detect target voltage and it assumes that the voltage is above 2.7V. If the actual target voltage is less, programming will fail. However, if you tell NSDSP that the target voltage is below 2.7V through programming software, NSDSP will use special low-voltage algorithm. NSDSP will verifies if the desired programming can be performed at voltages below 2.7V, and if it is possible (device is not code protected, configuration bits do not change or only change from 1 to 0), it performs the programming. If such programming is impossible, NSDSP software will stop and show an error message.

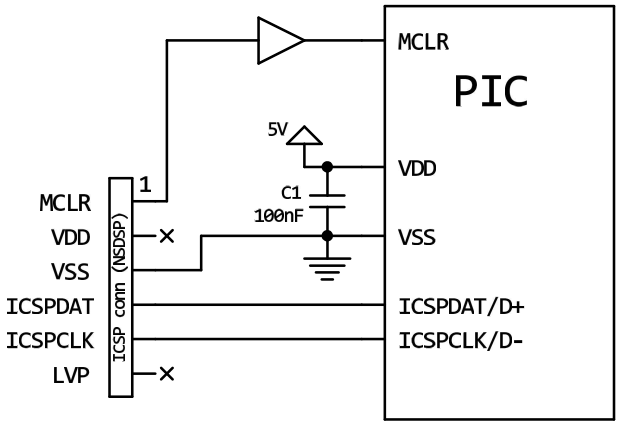
NSDSP-2 can detect actual voltage, therefore it may choose the algorithm based on the detected voltage. However, you can override this decision by specifying your own voltage value. This will disable the voltage detection. For example, you can try to force normal algorithm even if voltage is slightly less than the threashold.

Programming using low-voltage algorithm may be considerably slower. In addition, you may need to decrease programming speed to 3MHz or below.

debugging.

Since they are used for USB, these pins cannot be used at voltages above 3.3V. Therefore, if your PIC runs at 5V, programming requires special considerations.

First, you need to make sure that NSDSP runs at 3.3V. If you use NSDSP-1-3V3 then this is automatic. If you use NSDSP-1-U, set the jumper to supply 3.3V. The 3.3V power will not be used to power the target PIC. It only sets the voltage level which is suitable for the alternative ICSP pin pair.



Then you need to disconnect the NSDSP VDD line from the PIC. This is necessary because it uses 3.3V while your PIC is running at 5V. Make sure VSS line is still connected.

Finally, you need to make sure that the NSDSP's MCLR 3.3V output can drive PIC's MCLR pin at 5V. Theoretically this would require a level translator (as shown on the schematics), but in our tests straight connection worked sufficiently well.

Debugging

NSDSP firmware contains all the necessary provisions for debugging PIC16F1459 and may be debugged when debugging software becomes available.

PIC16F1459 uses ordered haliting, has 3 hardware breakpoints.

Debugging does not consume resources in the user space.

Links

Microchip PIC16F1459 page