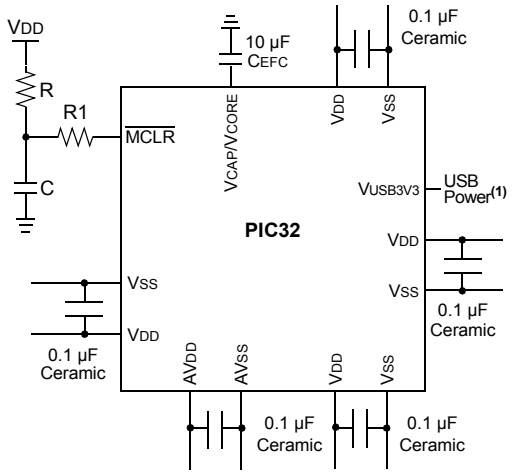
FIGURE 2-1: RECOMMENDED MINIMUM CONNECTION



Note 1: Refer to **Section 18.4 "Powering the USB Transceiver"** for requirements of this pin.

2.2.1 BULK CAPACITORS

The use of a bulk capacitor is recommended to improve power supply stability. Typical values range from 4.7 µF to 47 µF. This capacitor should be located as close to the device as possible.

2.3 Master Clear ($\overline{MCLR}$) Pin

The $\overline{MCLR}$ pin provides for two specific device functions:

- Device Reset
- Device Programming and Debugging

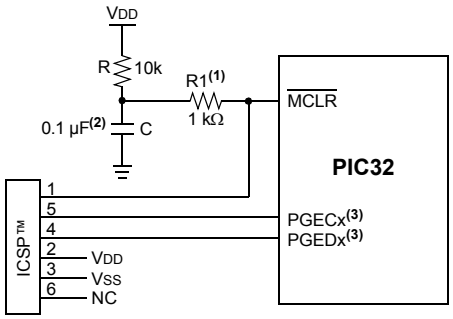
Pulling The $\overline{MCLR}$ pin low generates a device Reset. Figure 2-2 illustrates a typical $\overline{MCLR}$ circuit. During device programming and debugging, the resistance and capacitance that can be added to the pin must be considered. Device programmers and debuggers drive the $\overline{MCLR}$ pin. Consequently, specific voltage levels (V_{IH} and V_{IL}) and fast signal transitions must not be adversely affected. Therefore, specific values of R and C will need to be adjusted based on the application and PCB requirements.

Note: When $\overline{MCLR}$ is used to wake the device from Retention Sleep, a POR Reset will occur.

For example, as illustrated in Figure 2-2, it is recommended that the capacitor, C, be isolated from the $\overline{MCLR}$ pin during programming and debugging operations.

Place the components illustrated in Figure 2-2 within one-quarter inch (6 mm) from the $\overline{MCLR}$ pin.

FIGURE 2-2: EXAMPLE OF $\overline{MCLR}$ PIN CONNECTIONS(1,2,3)



Note 1: $470\Omega \le R1 \le 1\ k\Omega$ will limit any current flowing into $\overline{MCLR}$ from the external capacitor, C, in the event of $\overline{MCLR}$ pin breakdown, due to Electrostatic Discharge (ESD) or Electrical Overstress (EOS). Ensure that the $\overline{MCLR}$ pin V_{IH} and V_{IL} specifications are met without interfering with the debugger/programmer tools.

2: The capacitor can be sized to prevent unintentional Resets from brief glitches or to extend the device Reset period during POR.

3: No pull-ups or bypass capacitors are allowed on active debug/program PGECx/PGEDx pins.

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