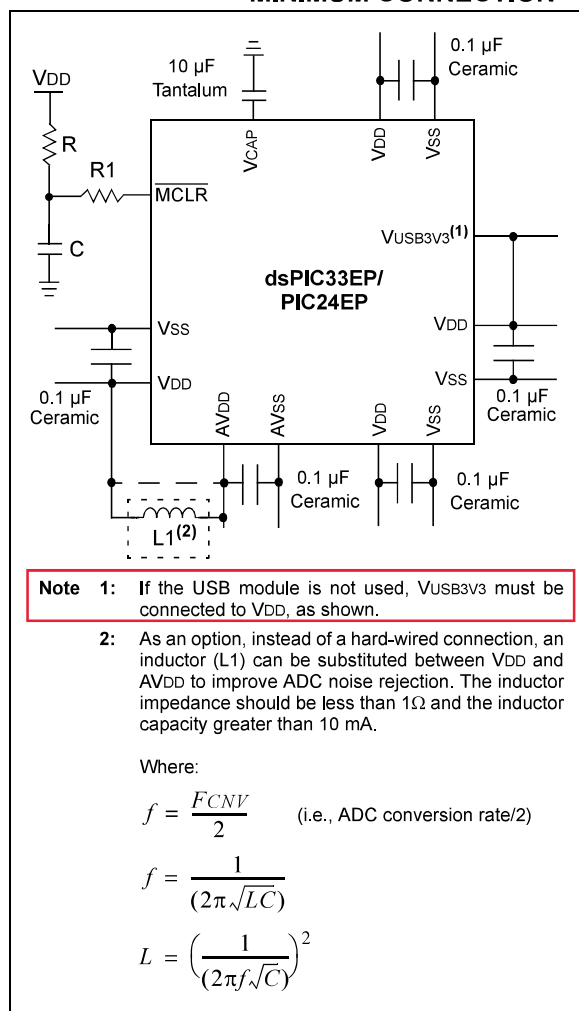


FIGURE 2-1: RECOMMENDED MINIMUM CONNECTION



2.2.1 TANK CAPACITORS

On boards with power traces running longer than six inches in length, it is suggested to use a tank capacitor for integrated circuits including DSCs to supply a local power source. The value of the tank capacitor should be determined based on the trace resistance that connects the power supply source to the device and the maximum current drawn by the device in the application. In other words, select the tank capacitor so that it meets the acceptable voltage sag at the device. Typical values range from 4.7 µF to 47 µF.

2.3 CPU Logic Filter Capacitor Connection (VCAP)

A low-ESR (< 1 Ohms) capacitor is required on the VCAP pin, which is used to stabilize the voltage regulator output voltage. The VCAP pin must not be connected to VDD and must have a capacitor greater than 4.7 µF (10 µF is recommended), 16V connected

to ground. The type can be ceramic or tantalum. See [Section 32.0 “Electrical Characteristics”](#) for additional information.

The placement of this capacitor should be close to the VCAP. It is recommended that the trace length not exceeds one-quarter inch (6 mm). See [Section 29.2 “On-Chip Voltage Regulator”](#) for details.

2.4 Master Clear (MCLR) Pin

The MCLR pin provides two specific device functions:

- [Device Reset](#)
- [Device Programming and Debugging](#)

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 MCLR pin. Consequently, specific voltage levels (VIH and VIL) 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.

For example, as shown in [Figure 2-2](#), it is recommended that the capacitor C, be isolated from the MCLR pin during programming and debugging operations.

Place the components as shown in [Figure 2-2](#) within one-quarter inch (6 mm) from the MCLR pin.

FIGURE 2-2: EXAMPLE OF MCLR PIN CONNECTIONS

