

## PVCC and AVCC Decoupling and Layout Considerations

Providing a constant, low noise input voltage at the PVCC (Power Circuitry VCC) and AVCC (Control Circuitry VCC) pins to the Silanna power stage products is critical to maximizing their performance.

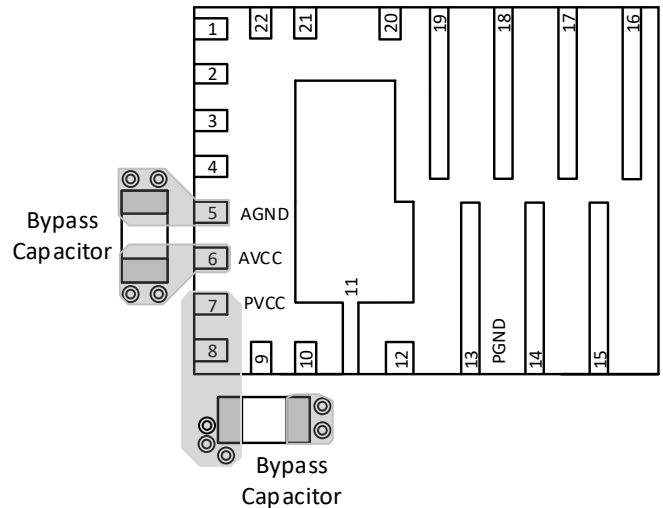
The PVCC decoupling capacitor provides transient charge for the bootstrap capacitor and the switching of the low side ZqFET™ MOSFET gate in the Silanna power stage. The PGND pins are the return path for PVCC current.

The AVCC decoupling capacitor provides charge for the low-current, noise sensitive interface circuitry. The AGND is the return path for the AVCC. If PVCC supplies AVCC, it is recommended that a low pass resistor capacitor filter network be used to reduce noise on the AVCC pin. Typical values are 10 ohms and 0.1 uF for this filter.

The low gate to drain capacitance of the Silanna ZqFET™ allows for faster switching speeds, and the high di/dt and dv/dt associated with fast switching makes board layout critical to optimizing performance.

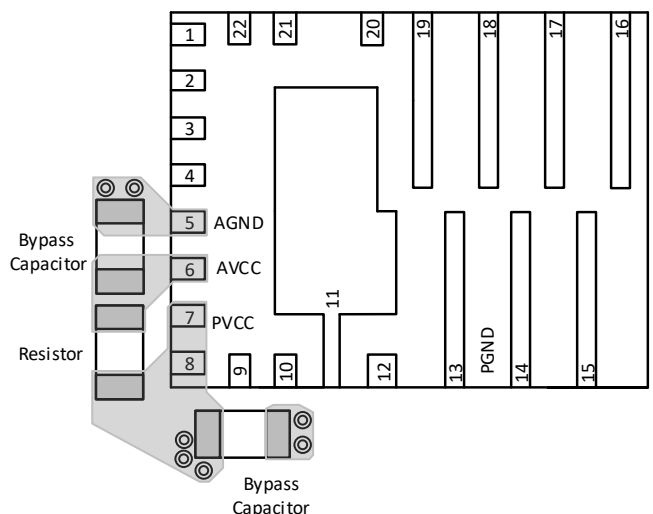
Both PVCC and AVCC decoupling capacitors should be high quality surface mount ceramic capacitors. The chosen capacitors should have both low esr and low esl to provide the lowest impedance to ground.

The recommended layouts for PVCC and AVCC decoupling capacitors are shown in Figure 1 and Figure 2. The decoupling capacitors are depicted in 0402 package sizes. The PVCC capacitor is shown with vias connecting to power planes internal to the PCB. Figure 1 shows the layout used when PVCC and AVCC are derived from different sources. Figure 2 shows the layout when AVCC is derived from PVCC.



**Figure 1: Separate AVCC and PVCC decoupling layout**

With AVCC provided by PVCC, the recommended procedure is to add an RC low pass filter between PVCC and AVCC. This filter will attenuate any noise present on the PVCC supply and provide a quiet source for the sensitive control circuits powered by AVCC.



**Figure 2: AVCC powered from PVCC decoupling layout**

## Revision History

Date	Revision	Notes	Author
March 11, 2018	1.0	Initial Release	MS
July 2, 2018	2.0	Reformatting and text edits.	AR
July 15, 2019	3.0	Text edits. Update headers/footers and update to new logo.	CR