Power-Up/Down Sequence Requirements for Axcelerator ES Devices

Introduction

The Axcelerator family devices support a large variety of features and therefore contain different voltage supply inputs to the device. To define the optimal power-up/down sequence, Actel performed an experiment on engineering samples (devices marked as ES) of Axcelerator devices. The results are described in this technical brief. Table 1 summarizes the required power supply inputs to the Axcelerator devices.

Table 1 • *Available Voltage Supply Inputs to the Axcelerator Devices*

Power Supply Input	Description
V_{CCA}	Core supply voltage
$V_{CCI}Bx$	I/O supply voltage (per bank)
V_{CCDA}	Differential amplifier supply voltage
V_{REF}	Supply for Voltage referenced I/O standards
V_{CCC_PLx}	PLL core supply voltage

Power-Up Sequence

Different power-up sequences have been tested on multiple of Axcelerator ES devices. The preliminary data collected from the test results indicate that if V_{CCA} is powered up before V_{CCDA}, a high amount of static current will be experienced on V_{CCA}. After power up of V_{CCDA}, the current level on V_{CCA} drops to its normal value (less than 10mA). The excessive current on V_{CCA} results in greater power consumption and possible degradation effects. Therefore, it is recommended that V_{CCDA} be powered up first.

The order of V_{CCI} power up does not have any effect on the power-up static current of V_{CCA}. Actel recommends that users power up V_{CCI} after V_{CCDA} and V_{CCA}.

V_{REF} is the voltage source for voltage referenced I/O standards. Therefore it is recommended that V_{REF} be powered up after V_{CCI} (I/O bank power supply).

V_{CCC_PLL} supplies the voltage for the operation of PLLs. There is no power-up sequence requirement for V_{CCC_PLL}, but it is recommended that V_{CCC_PLL} be powered up after V_{CCA} is powered up.

Power-Down Sequence

The test results indicate that during power down, if V_{CCDA} is powered down before V_{CCA}, a large static current will again be experienced on V_{CCA}. Therefore the same precaution that is taken during power up should be taken during power-down of the device: users need to make sure that V_{CCDA} is powered-down after V_{CCA}.

Conclusion

Based on the preliminary data obtained from the experiments performed on the ES devices, Actel recommends that users implement the following sequence when powering up Axcelerator Family devices:

1. Bring V_{CCDA} to 2.5V or 3.3V. It must be equal to the highest V_{CCI} value

2. Bring V_{CCA} to 1.5V

3. Bring all V_{CCI}s to their specified values

4. Bring V_{REF} and V_{CCC_PLL} values to their nominal voltage

To correctly power down, the device, users should reverse the order of the steps used for power up. Full characterization will be performed to identify all the aspects of different power-up sequences. Please visit the Actel website at http://www.actel.com for the latest information.

Actel and the Actel logo are registered trademarks of Actel Corporation.

All other trademarks are the property of their owners.

http://www.actel.com