



1. Introduction

The XtremeDSP Kit is supplied with an external power supply for stand-alone use using the USB interface. This power supply comes with a 2 meter cable connecting the power supply to the mini-din connector on the XtremeDSP Kit motherboard. The wire gauge of the 2m cable, combined with its length, can create a significant voltage drop on the +5V supply on the motherboard, with highly utilized or high-speed FPGA designs. The +5V supply is used to generate the +3.3V and +1.5V supplies for the FPGA on the board.

The supply voltage (Avcc) of the AD6644 (14-bit ADCs) is specified to be +4.85V, minimum. Therefore, if there is a significant drop in the +5V across the power supply cable, the voltage may indeed drop below +4.85V at the ADCs. When this occurs, the digital outputs of the ADC devices are likely to be unpredictable.

2. Diagnosis and Detection

2.1 How the problem manifests itself

- (1) The XtremeDSP Kit functions and configures normally with most designs. Problems are only encountered when running larger designs or high speed designs that will draw a higher current. The problematic areas will be limited to the ADCs.
- (2) When the ADCs fall below their minimum voltage, of +4.85V on the +5V supply, the digital outputs of the ADCs begin to fail, characterized by the reduction in 5 bits of effective resolution.
- (3) The external power supply fitted with a 2 meter cable from the power brick to the XtremeDSP Kit can cause this problem.

2.2 How to verify the problem

- (1) Measure the voltage at the +5V terminals on the XtremeDSP Kit motherboard once the FPGA design is up and running. Figure 1 shows a capacitor (C37) across which the +5V can be measured. This capacitor is located on the bottom of the BenONE motherboard.

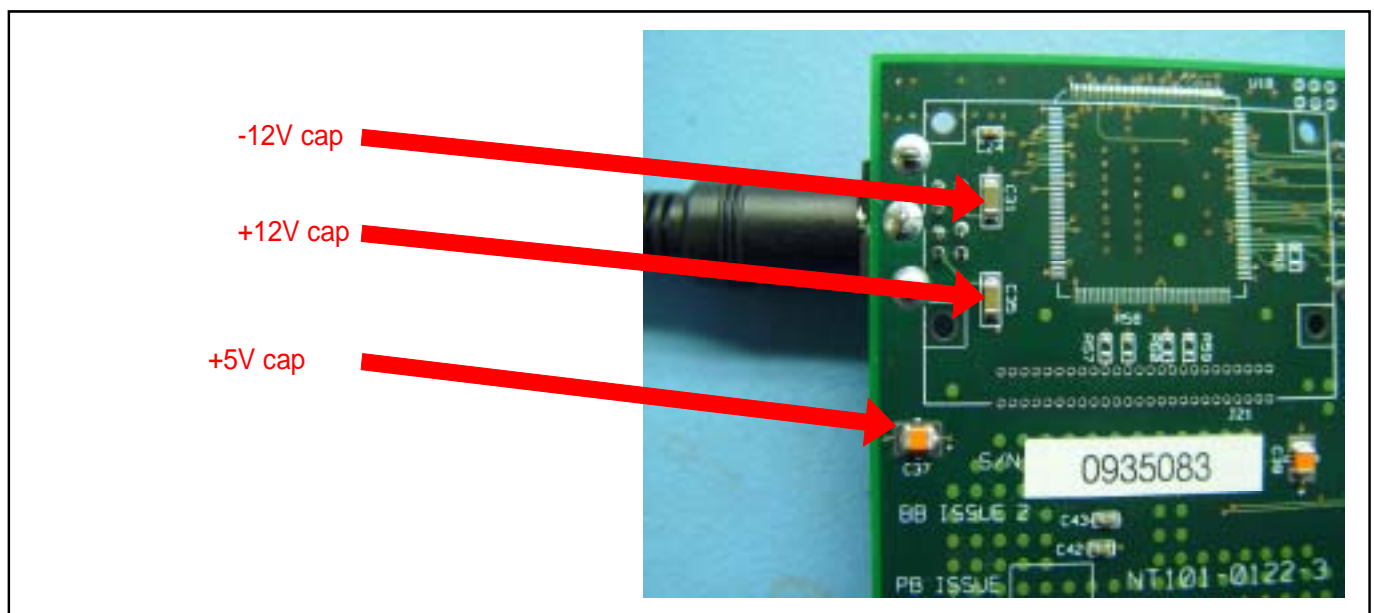


Figure 1: Voltage Measurement points on BenONE

This is the first point where the +5V voltage from the cable can be measured easily. Please note that there is a fixed 0.1V drop on the 5V rail due to inductors between this point and the ADC units on the BenADDA. **Therefore, if the voltage measured across C37 is less than 4.95V then this voltage is on the threshold of the recommended minimum voltage specified for the ADC devices.**

- (2) Plugging the XtremeDSP Kit into a PCI slot removes the need to use the external power supply (**Please note: DO NOT use the external power supply when the XtremeDSP Kit is plugged into the PCI slot!**). If the problem is not present when the board is plugged into a PCI slot then this confirms that the external power supply is the problem.

3. Affected XtremeDSP Kits

This issue affects all XtremeDSP kits that have 2 meter cables. XtremeDSP Kits shipped from Xilinx after June 10, 2003 have the new power supply with either a 1 meter or 0.3 meter cable. The new supplies as have a ferrite collar attached to the new, shorter cable.

4. Available Solutions

4.1 Use the PCI slot, not the external power supply

One solution to this problem is to use the XtremeDSP Kit in a PCI slot, eliminating the need to use the external power supply. **Please note: DO NOT use the external power supply when the XtremeDSP Kit is plugged into the PCI slot.**

4.2 New, Improved Power Supply

A new, improved power supply that fixes this problem will be available shortly and shipped to you at no cost. There is no need to return your original power supply.

If you are outside the North America:

Please contact Clair McBride, below, and provide her with your contact information (name, company, phone, email) and shipping address for the new power supply.

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If you are in North America:

Please contact Dolores LaPlante, below, at Nallatech Inc. in Florida, with the same information.

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For technical questions on this issue, please Charlie Cump at Nallatech at +1-650-948-9433, c.cump@nallatech.com).

4.3 Bench Power Supply

Another solution is to use bench supplies to generate the +5V, +12V and -12V required on the XtremeDSP Kit motherboard. Each supply used to generate these voltages will be required to be within the maximum ratings outlined in Table 1.

Supply Voltage	Maximum Ripple & Noise	Maximum Load Regulation	Maximum Current	Cable Gauge
+5 Volts	1% Peak to Peak	5%	5A	18AWG
+12 Volts	1% Peak to Peak	5%	2A	20AWG
-12 Volts	1% Peak to Peak	5%	800mA	20AWG
RETURN	-	-	-	18AWG

Table 1: Bench Power Supply Specification

A suitable 8-pin mini DIN plug connector is required to connect the power supplies to the XtremeDSP Kit motherboard, a list of suppliers for this connector is given in Table 2.

Company	Website	Part No.	Telephone Number
Digikey	www.digikey.com	275-1003-ND	1-800-DIGI-KEY or +44 (0)800 587 0991
Digikey	www.digikey.com	CP-2080-ND	1-800-DIGI-KEY or +44 (0)800 587 0991
Farnell Components	www.farnell.com	152-210	+44 (0)870 1200 200

Table 2: Connector suppliers

An alternative to using the connector above is a cable assembly with the 8 pin mini DIN on one end and flying leads on the other, suitable cable assemblies are available from the companies outlined in Table 3.

Manufacturer	Website	Distributor	Distributor location	Telephone Number	Part No.
LIH TZU	www.lihtzu.com		USA		

Table 3: Cable assembly manufacturers

The correct pin-out for the 8 pin mini DIN can be found in the XtremeDSP User Guide or in Table 4 below.

Supply Voltage	Pin#	Looking at connector on BenONE-PCI
+5V	1	
+5V	2	
+5V	3	
+12V	4	
-12V	5	
RETURN	6	
RETURN	7	
RETURN	8	

Table 4: Mini DIN Pin-out

5. Modification Record

Date	Issue #	Comments
28 May, 2003	1	Document Introduction
23 June, 2003	2	Updated connector pinout + Documentation typing errors (ECN364)



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