



120041
CERN project EDA-02267

Investigation Reports
Investigation Report no. 1

FmcDel1ns4cha

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1 REMARKS SCHEMATICS EDA-02267-V3-0_SCH.PDF

1.1 Sheet 1

MCP23s17

During reset GPIO's are defined as input no pull-up. This means high impedance.

Consequences for signal

- CAL_EN : **Not connected ?**
- TRIG_SEL : OK
- OUT_ENA : ?
- TERM_ENABLE : Connected to FET-gate; termination resistors can switch very fast on/off, resulting in EMC problems during reset or thermal problems. (see sheet 6)
- TDC_ADRx : Probably no problem

1.2 Sheet 2

If the differential REFIN is driven by a single-ended signal, the unused side (REFIN) should be decoupled via a suitable capacitor to a quiet ground.

1.3 Sheet 5

Capacitor C3 and diode D5B are used to generate a boost voltage that is higher than the input voltage. In most cases a 0.1 μ F capacitor and fast switching diode (such as the 1N4148 or 1N914 with a switching speed 4ns) will work well. The BOOST pin must be at least 2.3V above the SW pin for best efficiency. If this spec is not met probably the LT3503 will produce more heat. I can not find specifications about the switching speed of the BAR66.

A second reason to choose an other diode is that one pin is not connected, may be this will work as antenna

Outputs Greater Than 6V

For outputs greater than 6V, add a resistor of 1k to 2.5k across the inductor to damp the discontinuous ringing of the SW node, preventing unintended SW current.

1.4 Sheet 6

IC17 (TS3USB221DR) D-, 1D- & 2D-pins are not connected thus floating. This are the drain & source pins of a FET. May be it is better to pull-up or down these pins.

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1.5 Sheet 10

IC25x is directly connected to a Lemo connector without signal conditioning. Via this connector or connected cable or during fitting of the cable it is possible to initiate electrostatic discharge. In the datasheet the following is printed:

Caution: ESD (electrostatic discharge) sensitive device. Electrostatic charges as high as 4000 V readily accumulate on the human body and test equipment and can discharge without detection. Although the AD8009 features proprietary ESD protection circuitry, permanent damage may occur on devices subjected to high energy electrostatic discharges. Therefore, proper ESD precautions are recommended to avoid performance degradation or loss of functionality.

2 REMARKS PCB EDA-02267-V3_MFG.ZIP

2.1 Top IC19

SMD paste is smaller than power-pad; may be a problem.

2.2 Bottom R2B R3B

Copper seams floating beneath the silkscreen text R2B & R3B.

2.3 Bottom 5 locations

Au plane is not separated from the pins of components with mask. The solderpaste is flowing from the pins to the Au plane => Functional can be OK (one plane) but IPC risk to non conformity of soldering of the pins. Check silkscreen locations R24A, C8A, R11B, C36A & C39.

Check also location IC16 (powerpad).

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3 REMARKS EDA-02267-V3-0_PCB-MAT.PDF

3.1 IC30

In description is written that component is 1.2 MHz device. The manufacturer P/N is an 2.2MHz device.

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