

IROD Modifications

The modifications below are not reflected in the IROD symbolic netlist.

1. ✓ The following resistor value was changed to better match trace impedance and to decrease signal rise time. FPGA configuration did not complete under some conditions due to slow CCLK rise time.

All EXB2HV560JV resistor packs (56 ohms) were changed to EXB2HV270JV (27 ohms).

2. ✓ The following resistor values were changed to allow the Measurement ADC to run at its maximum clock rate of 16 MHz.

resistor(s)	old value	new value	comment
PWR74-PWR76	4.7 k	360	These are current-limiting resistors to protect the ADC when no VME 12V is present. Further protection is provided by the FPGA (HPU EMIF and HPU_XB) designs, which never drive ADC signals high.
PWR73 (PWR72)	1k 1k	360 1k (no change)	These are pullup resistors for ADCCLK and ADCSCLK. They are needed because (1) the ADC uses 5V CMOS levels and (2) the FPGA's never drive ADC signals high. The new 360 ohm value provides a reasonable rise time, allowing a 16 MHz ADCCLK. The value for the ADCSCLK pullup resistor was not changed, because ADCSCLK frequency is ~ 4MHz.

3. ✓ The following modify the motherboard to accept GPU's loaded with 1.5V TMS320C6203B's. Once modified, the motherboard is not compatible with 1.8V TMS320C6202's.

component(s)	old value	new value	comment
✓ PWR50	18.2k	29.4k	Changes VA overvoltage protection threshold from 1.9V to 1.65V.
✓ PWR16	6.19k	8.45k	Changes VAOK comparator threshold from 1.6 V to 1.35 V.
✓ (CGX4)	(50 MHz)	(25MHz)	(Reverts the oscillator frequency to the original value as specified in the symbolic netlist. The 50 MHz oscillator was needed for the TMX320C6202 only, because it did not have the 10x PLL option.)

✓ Change the DSP VA VID straps as necessary to set VA to 1.5V:

VID0, VID1, VID3: remove/do not install
VID2, VID4: install

4. ✓ The following values were changed to support the final DPU Control design.

component(s)	old value	new value	comment
✓ DCU1	XC2S150...	XC2S200...	Upgrades to largest pin-compatible FPGA.
✓ DCR2-DCR5	360	do not install	These pullups are no longer required. If they are not installed, all DCC pins will have identical load and their output drivers may be configured to any desired LVTTTL drive strength.

5. ✓ Do not install pullup resistors DXR6-DXR15.

6. ✓ Do not install one power switch per voltage (except VB_SURGE).

7. ✓ Do not install 2.2nF capacitors in OVP circuits.

8. ✓ Do not install DX pullups except PullupDXF_HG0 (DXR4) and PullupDXF_HG1 (DXR5).

9. ✓ Vref was changed to ~1.25V by changing the following component values:

All PullupVREF resistors were changed to 357 ohm, 1%.

All PulldownVREF resistors were changed to 221 ohm, 1%.

Also, from mods_and_do_not_install.txt:

do not install:

T__TPS2034D Power.SW_DSP_VCC.Switch3 (PWU36)
T__TPS2034D Power.SW_MB_VCC.Switch3 (PWU40)
T__TPS2034D Power.SW_MB_VCC5.Switch1 (PWU42)
T__TPS2034D Power.SW_DSP_VA.Switch4 (PWU47)
T__TPS2034D Power.SW_VB.Switch3 (PWU51)

T__R360 DataExchange.PullupDXF_HG2 (DXR6)
T__R360 DataExchange.PullupDXF_HG3 (DXR7)
T__R360 DataExchange.PullupDXC_A9 (DXR8)
T__R360 DataExchange.PullupDXC_A8 (DXR9)
T__R360 DataExchange.PullupDXC_A7 (DXR10)
T__R360 DataExchange.PullupDXC_A6 (DXR11)
T__R360 DataExchange.PullupDXC_B9 (DXR12)
T__R360 DataExchange.PullupDXC_B8 (DXR13)
T__R360 DataExchange.PullupDXC_B7 (DXR14)
T__R360 DataExchange.PullupDXC_B6 (DXR15)

T__R360 DPU_Control.PullupDCC_A10 (DCR2)
T__R360 DPU_Control.PullupDCC_A9 (DCR3)
T__R360 DPU_Control.PullupDCC_B10 (DCR4)
T__R360 DPU_Control.PullupDCC_B9 (DCR5)

T__R0 Power.DCDC_DSP_VA.R_VID0 (PWR22)
T__R0 Power.DCDC_DSP_VA.R_VID1 (PWR23)
T__R0 Power.DCDC_DSP_VA.R_VID3 (PWR25)

T__R0 Power.DCDC_VB.R_VID1 (PWR30)
T__R0 Power.DCDC_VB.R_VID3 (PWR32)
T__R0 Power.DCDC_VB.R_VID4 (PWR33)

T__R0 VME_Interface.buffers.OE_Res_AddrBuf (VMR4)
T__R0 VME_Interface.buffers.OE_Res_DataBuf (VMR5)
T__R0 VME_Interface.buffers.OE_Res_InptBuf (VMR6)
T__R0 VME_Interface.buffers.Pullup_DIR_InptBuf (VMR7)

T__C2_2NF Power.OVP_MB_VCC5.Co (PWC15)
T__C2_2NF Power.OVP_MB_VCC.Co (PWC16)
T__C2_2NF Power.OVP_DSP_VCC.Co (PWC17)
T__C2_2NF Power.OVP_DSP_VA.Co (PWC18)
T__C2_2NF Power.OVP_VB.Co (PWC19)
T__C2_2NF Power.OVP_SW5_VB.Co (PWC20)
T__C2_2NF Power.OVP_SW5_DVA.Co (PWC21)

change to 357 ohm 1%:

T__R360 Half_A.DPU0.PullupVREF (A0R4)
T__R360 Half_A.DPU1.PullupVREF (A1R4)
T__R360 Half_A.DPU2.PullupVREF (A2R4)
T__R360 Half_A.DPU3.PullupVREF (A3R4)
T__R360 Half_A.DPU4.PullupVREF (A4R4)
T__R360 Half_A.DPU5.PullupVREF (A5R4)
T__R360 Half_B.DPU0.PullupVREF (B0R4)
T__R360 Half_B.DPU1.PullupVREF (B1R4)
T__R360 Half_B.DPU2.PullupVREF (B2R4)
T__R360 Half_B.DPU3.PullupVREF (B3R4)

T__R360 Half_B.DPU4.PullupVREF (B4R4)
T__R360 Half_B.DPU5.PullupVREF (B5R4)
T__R360 Host.HPU.PullupVREF (HOR4)
T__R360 Interconnect.BPI_FPGA0.Fpga.PullupVREF (ICR2)
T__R360 Interconnect.BPI_FPGA1.Fpga.PullupVREF (ICR5)
T__R360 Interconnect.BPI_FPGA2.Fpga.PullupVREF (ICR8)
T__R360 Interconnect.BPI_FPGA3.Fpga.PullupVREF (ICR11)
T__R360 Interconnect.BPI_FPGA4.Fpga.PullupVREF (ICR14)
T__R360 Interconnect.BPI_FPGA5.Fpga.PullupVREF (ICR17)
T__R360 Interconnect.TTC_FPGA.Fpga.PullupVREF (ICR20)

change to 221 ohm 1%:

T__R360 Half_A.DPU0.PulldownVREF (A0R5)
T__R360 Half_A.DPU1.PulldownVREF (A1R5)
T__R360 Half_A.DPU2.PulldownVREF (A2R5)
T__R360 Half_A.DPU3.PulldownVREF (A3R5)
T__R360 Half_A.DPU4.PulldownVREF (A4R5)
T__R360 Half_A.DPU5.PulldownVREF (A5R5)
T__R360 Half_B.DPU0.PulldownVREF (B0R5)
T__R360 Half_B.DPU1.PulldownVREF (B1R5)
T__R360 Half_B.DPU2.PulldownVREF (B2R5)
T__R360 Half_B.DPU3.PulldownVREF (B3R5)
T__R360 Half_B.DPU4.PulldownVREF (B4R5)
T__R360 Half_B.DPU5.PulldownVREF (B5R5)
T__R360 Host.HPU.PulldownVREF (HOR5)
T__R360 Interconnect.BPI_FPGA0.Fpga.PulldownVREF (ICR3)
T__R360 Interconnect.BPI_FPGA1.Fpga.PulldownVREF (ICR6)
T__R360 Interconnect.BPI_FPGA2.Fpga.PulldownVREF (ICR9)
T__R360 Interconnect.BPI_FPGA3.Fpga.PulldownVREF (ICR12)
T__R360 Interconnect.BPI_FPGA4.Fpga.PulldownVREF (ICR15)
T__R360 Interconnect.BPI_FPGA5.Fpga.PulldownVREF (ICR18)
T__R360 Interconnect.TTC_FPGA.Fpga.PulldownVREF (ICR21)

Change to 360 ohm:

T__R1K Power.Measure.Rclkp (PWR73)
T__R4_7K Power.Measure.Rsclks (PWR74)
T__R4_7K Power.Measure.Rclks (PWR75)
T__R4_7K Power.Measure.Rdouts (PWR76)

Change all EXB2HV560JV resistor packs (56 ohms) to EXB2HV270JV (27 ohms).