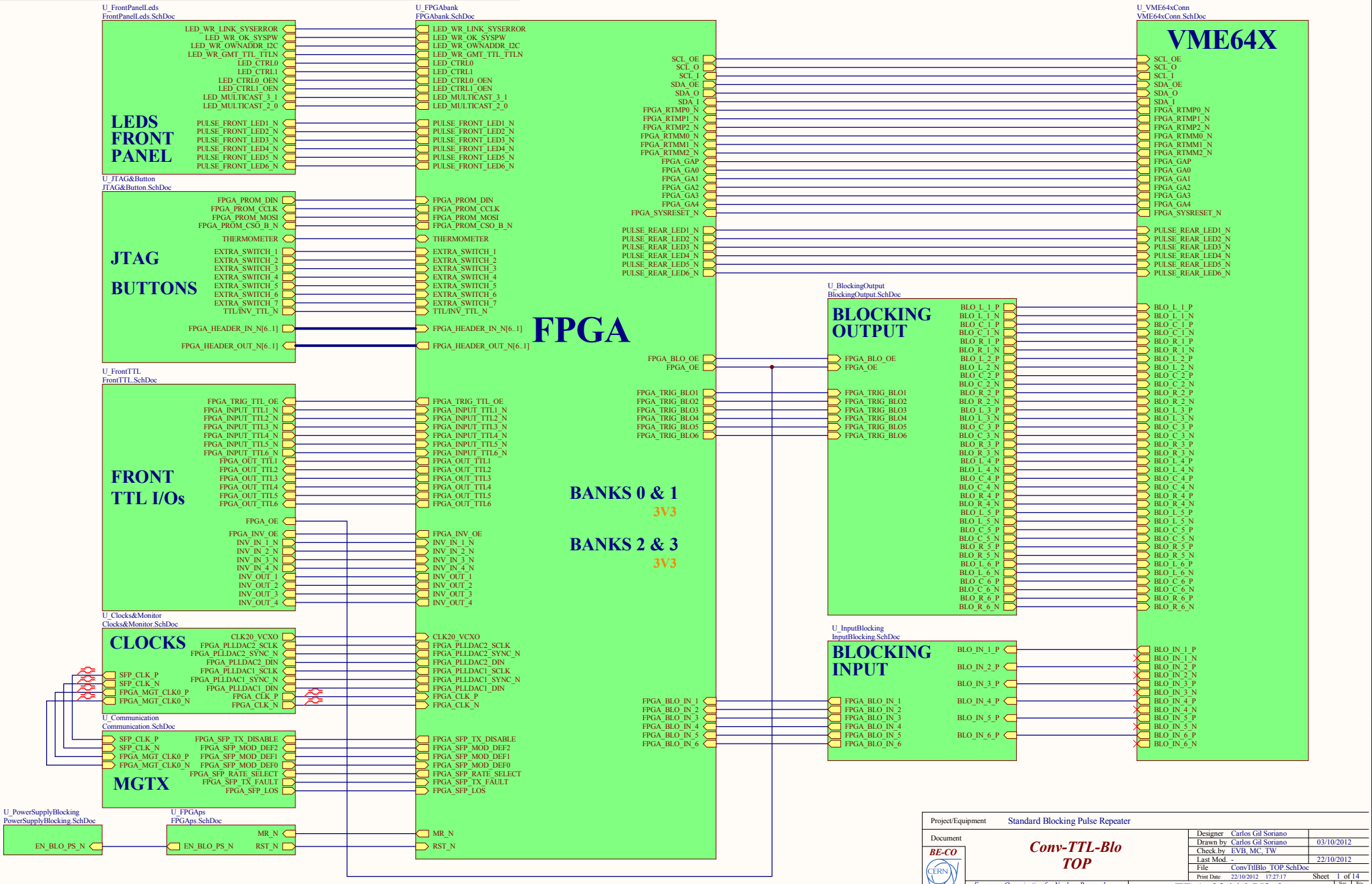


Project/Equipment	Standard Blocking Pulse Repeater		
Document	Conv-TTL-Blo TOP	Designer Carlos Gil Soriano	
BE-CO		Drawn by Carlos Gil Soriano	03/10/2012
		Check by EVB, MC, TW	
		Last Mod. -	22/10/2012
		File ConvTtlBlo_TOP.SchDoc	
		Print Date 22/10/2012 17:27:17	Sheet 1 of 14
European Organization for Nuclear Research CH-1211 Genève 23 - Switzerland	EDA-02446-V2-0	Size A3	Rev 1

Efficiency of 85% and better

IC29 TPS54312PWP

Capacitor CT not mounted: delay of 570ms

IC30 TPS3808G01DBVT

IC11E IC11F SN74LVC14AD

EN_BLO_PS_N

MR_N

RST_N

Not Mounted

IC14G IC14H XC6SLX45T-3FGG484C

Test points

P3V3_VME P1V2 P3V3 P12V_VME P5V_VME P5V

Voltages are:

*** FPGA

VCCO_0	3V3
VCCO_1	3V3
VCCO_2	3V3
VCCO_3	3V3
VCCaux	3V3
VCCint	1V2

*** PROM

VCCaux	3V3

PI filters for decoupling noise in the band of 50 MHz to 150 MHz in 3V3 and 5V rails.

BLM41PG181SN1L is a ferrite with low DCR (max 10mOhm) targeted for high current (power rails).

VCCO_int decoupling capacitors

VCCO_0 decoupling capacitors

VCCO_1 decoupling capacitors

VCCO_2 decoupling capacitors

VCCO_3 decoupling capacitors

VCCAUX decoupling capacitors

Project/Equipment	Standard Blocking Pulse Repeater
Document	Conv-TTL-Blo FPGA PS
Designer	Carlos Gil Soriano
Drawn by	Carlos Gil Soriano 03/10/2012
Check by	EVB, MC, TW
Last Mod.	- 22/10/2012
File	FPGAps.SchDoc
Print Date	22/10/2012 17:27:17
Sheet	2 of 14
Size	A3
Rev	1

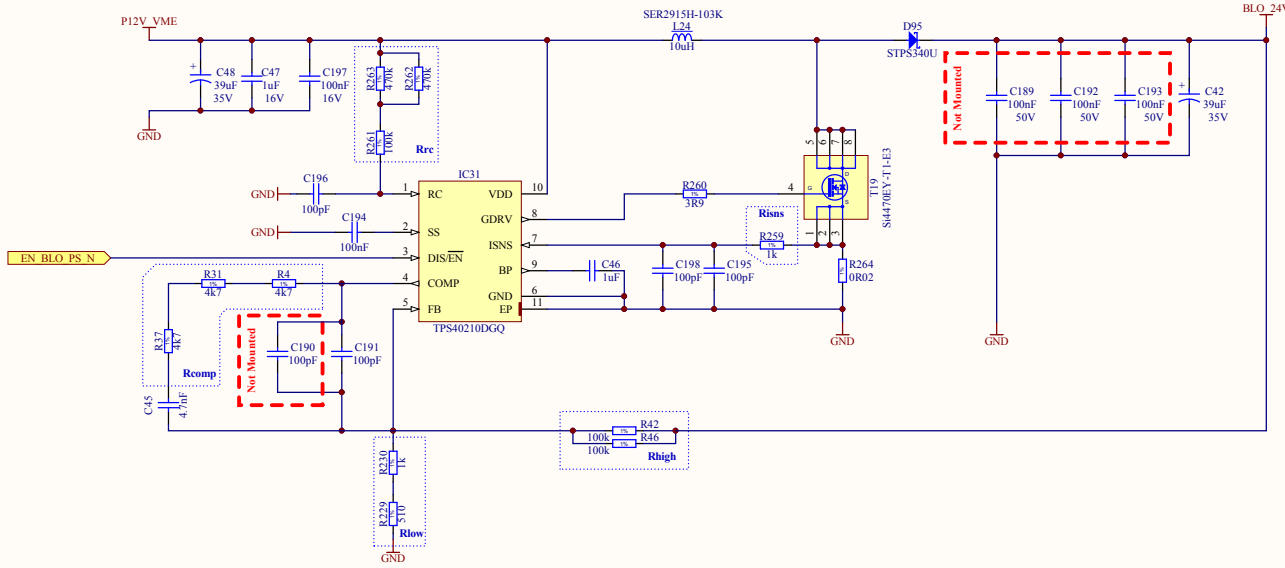
BE-CO

European Organization for Nuclear Research
CH-1211 Genève 23 - Switzerland

EDA-02446-V2-0

Standard Blocking Voltage

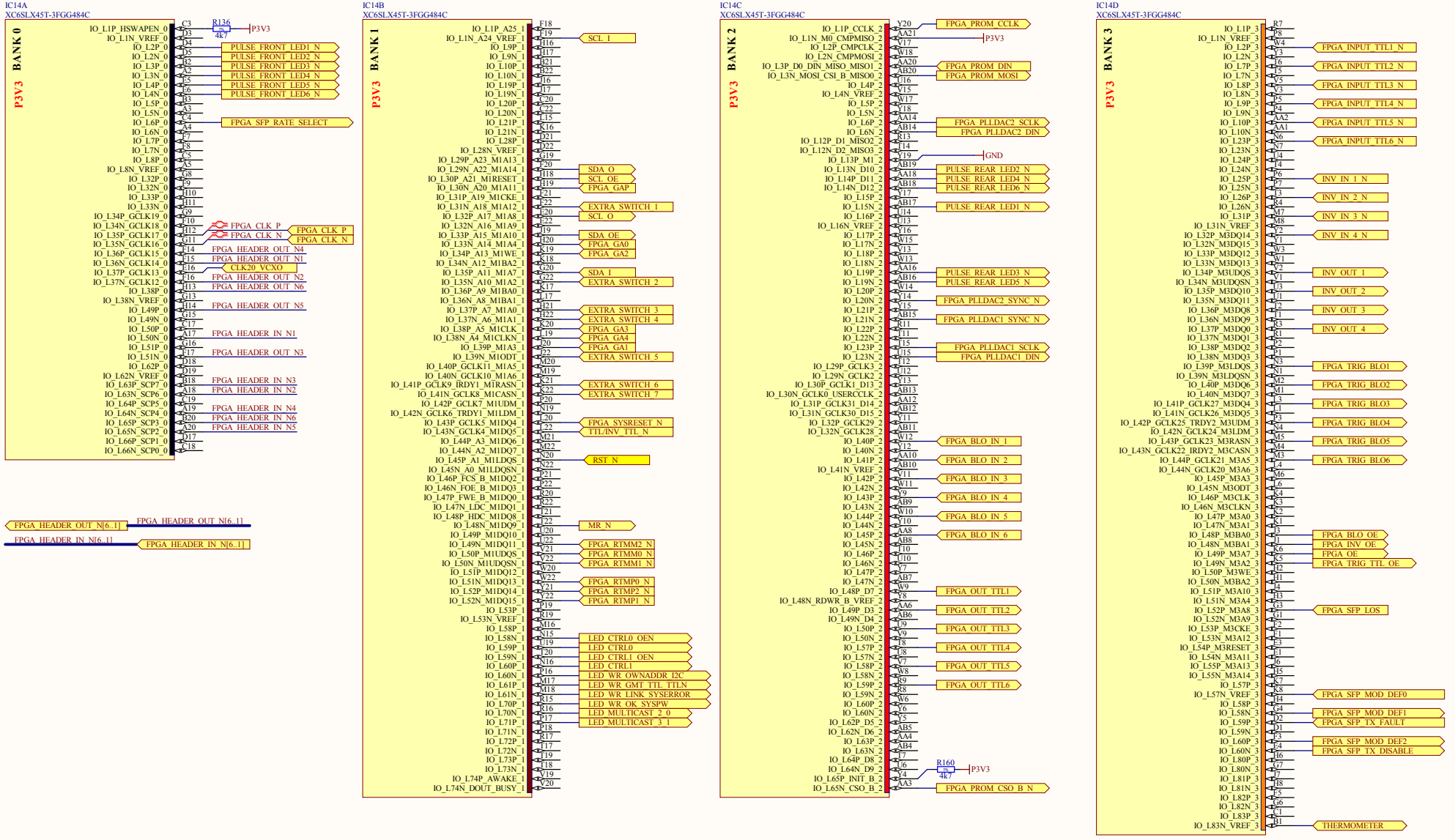
INPUT: 12V
OUTPUT: 24V@2,5A



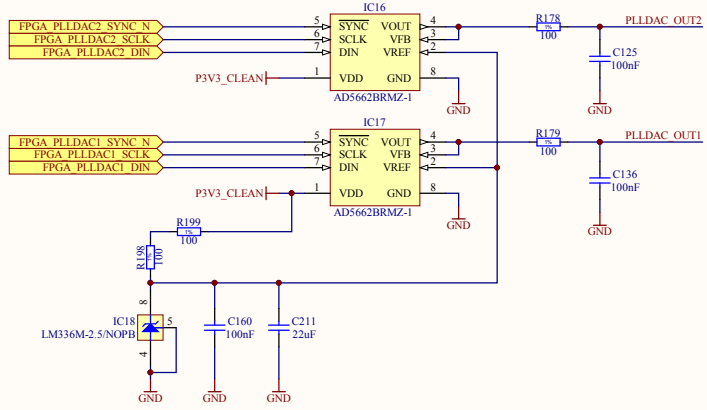
Project/Equipment	Standard Blocking Pulse Repeater		
Document	Conv-TTL-Blo BLOCKING PS	Designer Carlos Gil Soriano	
BE-CO		Drawn by Carlos Gil Soriano	03/10/2012
		Check by EVB, MC, TW	
		Last Mod. -	22/10/2012
		File PowerSupplyBlocking.SchDoc	
		Print Date 22/10/2012 17:27:18	Sheet 3 of 14
European Organization for Nuclear Research CH-1211 Genève 23 - Switzerland	EDA-02446-V2-0	Size A3	Rev 1

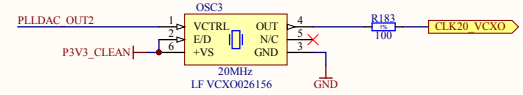
To allow high SerDes ratios, leave all the trigger inputs and outputs in _P pins.

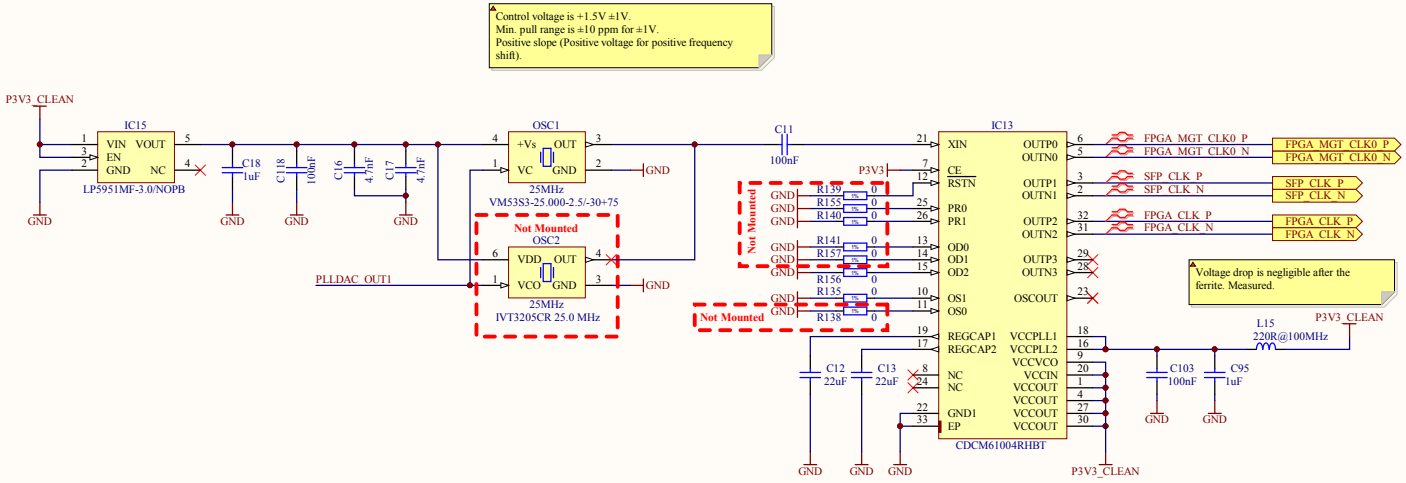
See Xilinx's document UG381, chapter 3 for further information.



Project/Equipment	Standard Blocking Pulse Repeater
Document	Conv-TTL-Blo FPGA BANK
BE-CO	European Organization for Nuclear Research, CH-1211 Genève 23 - Switzerland
Designer	Carlos Gil Soriano
Drawn by	Carlos Gil Soriano 03/10/2012
Check by	EVB, MC, TW
Last Mod.	- 22/10/2012
File	FPGAbank.SchDoc
Print Date	22/10/2012 17:27:18
Sheet	4 of 14
EDA-02446-V2-0	Size A3, Rev 1



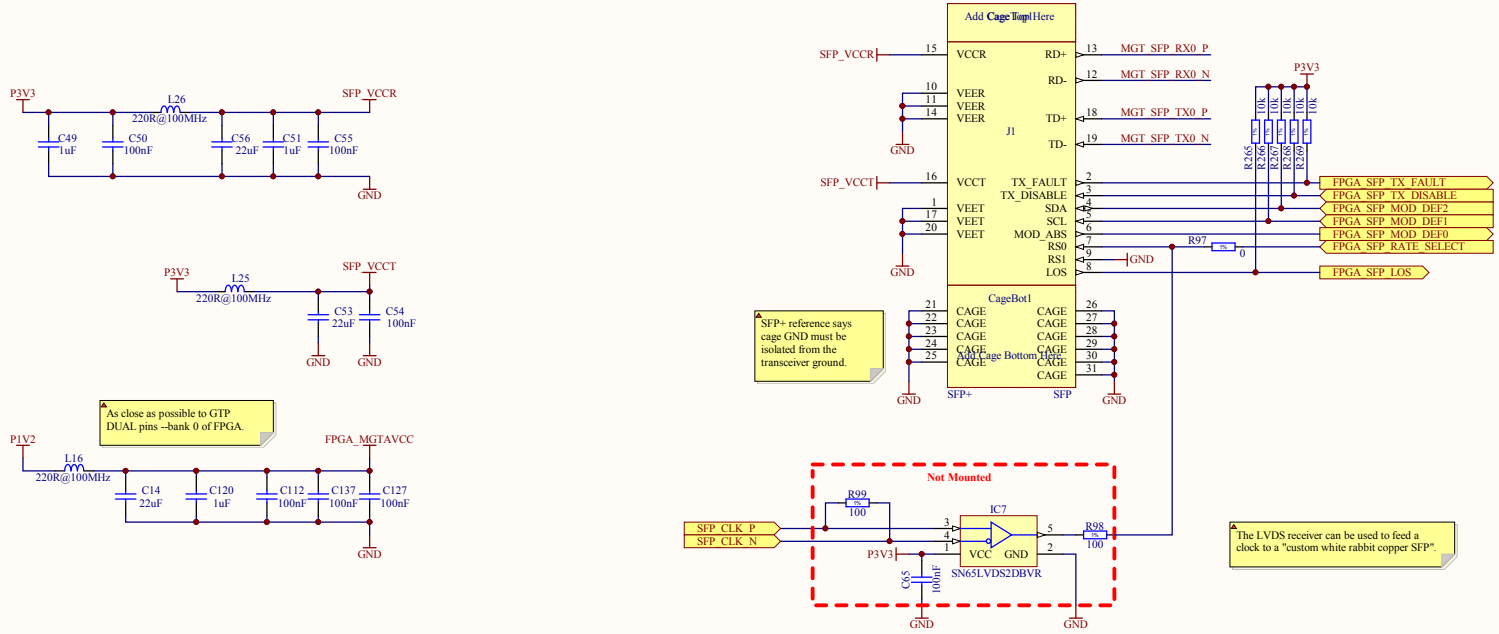




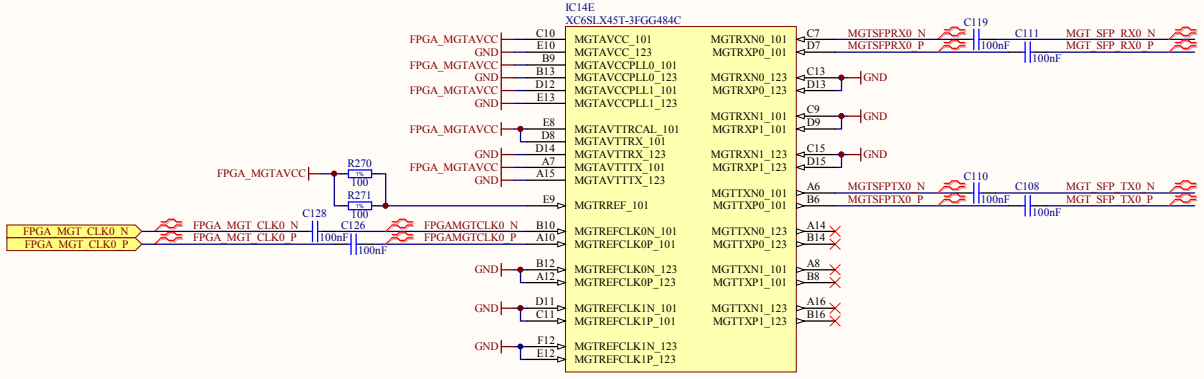
Project/Equipment	Standard Blocking Pulse Repeater		
Document	**Conv-TTL-Blo CLOCKS**	Designer Carlos Gil Soriano	
		Drawn by Carlos Gil Soriano	03/10/2012
		Check by EVB, MC, TW	
		Last Mod. -	22/10/2012
		File Clocks&Monitor.SchDoc	
		Print Date 22/10/2012 17:27:18	Sheet 5 of 14
BE-CO	European Organization for Nuclear Research CH-1211 Genève 23 - Switzerland	EDA-02446-V2-0	Size A3 / Rev 1

SFP+ module.

Please refer to "SFF-8431 Specifications for Enhanced Small Form Factor Pluggable Module SFP+" to full understanding of the capabilities.

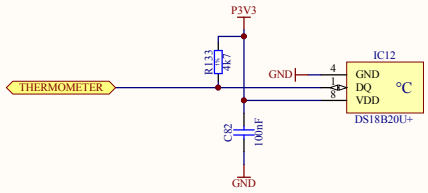


The trace length from the resistor pins to the FPGA pins MGTRREF and MGTVTTRCAL must be equal in length and geometry

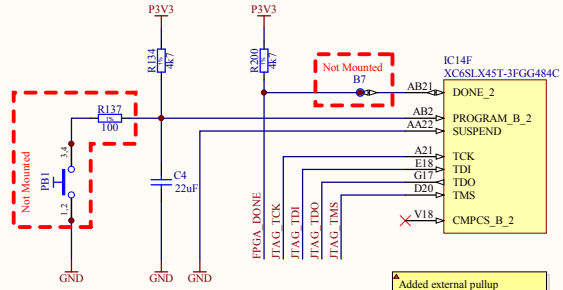


Project/Equipment	Standard Blocking Pulse Repeater		
Document	Conv-TTL-Blo MGTX	Designer Carlos Gil Soriano	
BE-CO		Drawn by Carlos Gil Soriano	03/10/2012
		Check by EVB, MC, TW	
		Last Mod. -	22/10/2012
		File Communication.SchDoc	
		Print Date 22/10/2012 17:27:18	Sheet 6 of 14
European Organization for Nuclear Research CH-1211 Genève 23 - Switzerland	EDA-02446-V2-0	Size A3	Rev 1

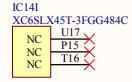
Thermometer will be used to have a FPGA unique ID

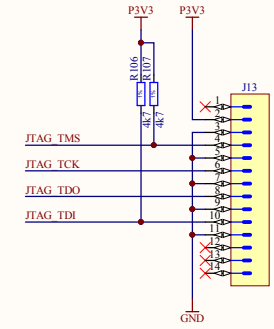


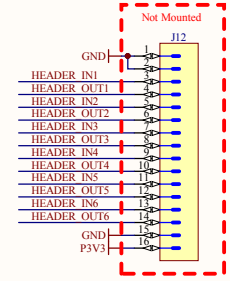
PROGRAM_B must be asserted low for more than 500ns



Added external pullup resistors to pins TDI and TMS as recommended in Xilinx's answer response 11433

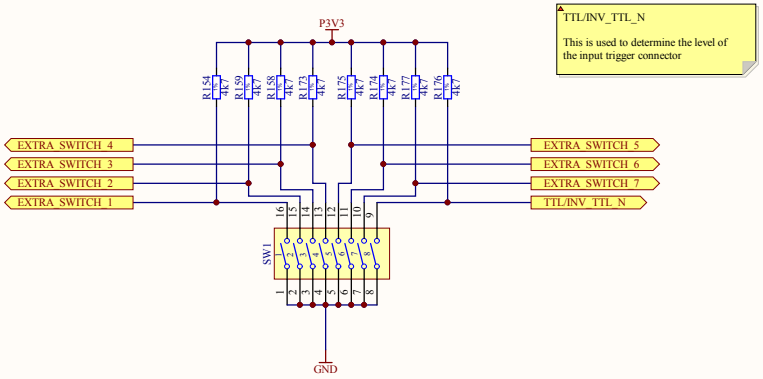


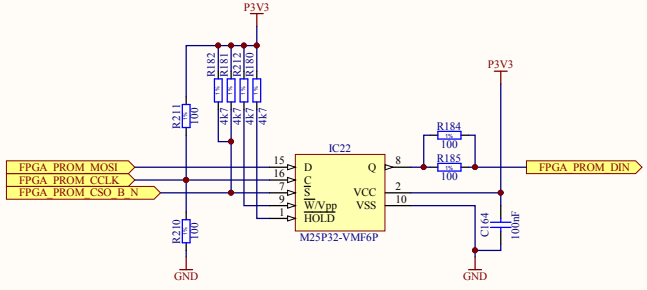


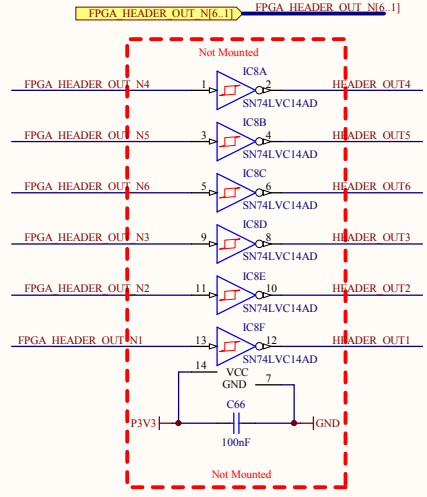


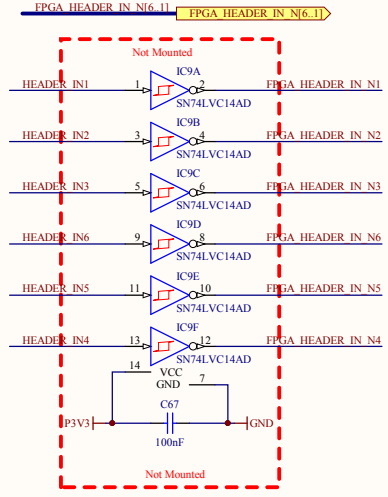
TTL/INV_TTL_N

This is used to determine the level of the input trigger connector





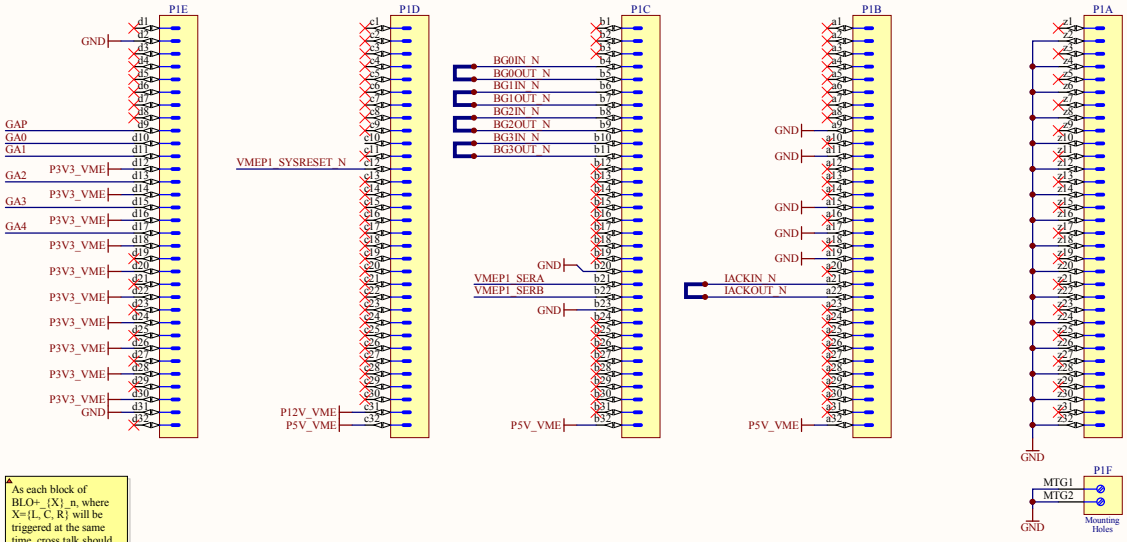




Project/Equipment	Standard Blocking Pulse Repeater		
Document	Conv-TTL-Blo JTAG	Designer Carlos Gil Soriano	
		Drawn by Carlos Gil Soriano	03/10/2012
		Check by EVB, MC, TW	
		Last Mod. -	22/10/2012
		File JTAG&Button.SchDoc	
		Print Date 22/10/2012 17:27:18	Sheet 7 of 14
BE-CO	European Organization for Nuclear Research CH-1211 Genève 23 - Switzerland	EDA-02446-V2-0	Size A3 / Rev 1

Utility Bus Signal: see page 199
ANSI/VITA 1-1994

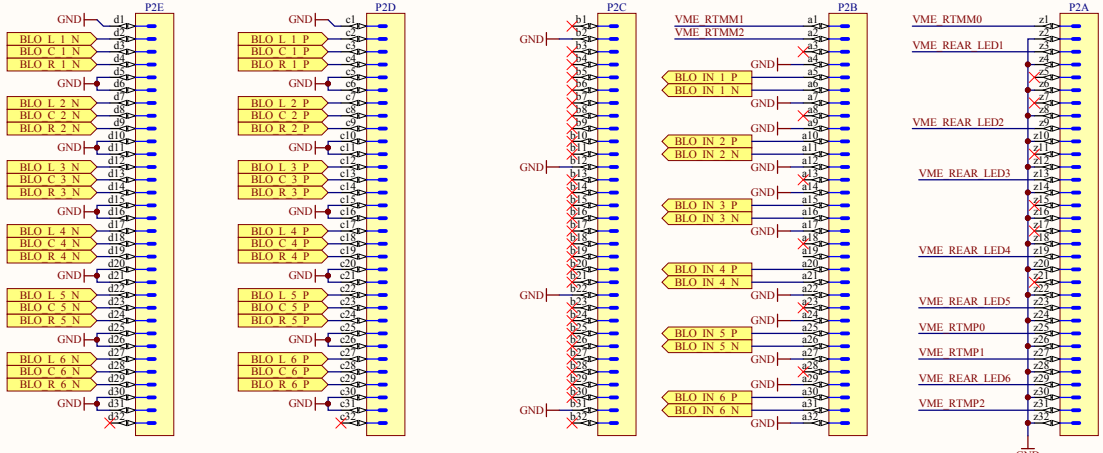
Output configurations in page 230
SYSRESET_N Open collector

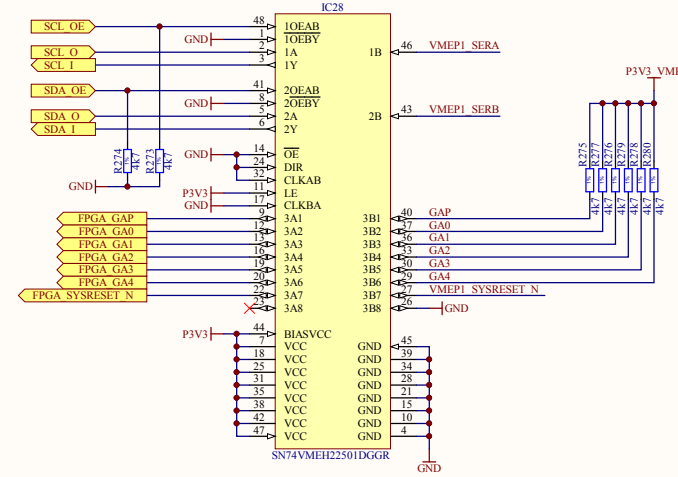


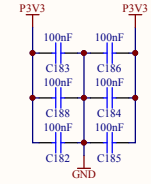
As each block of BLO+_{X}_n, where X={L, C, R} will be triggered at the same time, cross talk should not be so critical.
However, it would be better group the signals as it is shown and leave ground between sets of signals triggered by different sources.

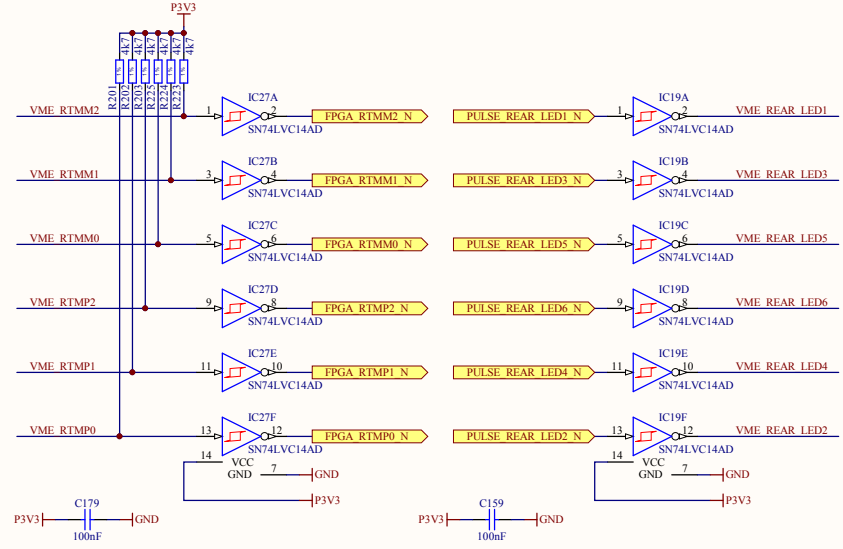
As input signals come from far away, the spectrum of this signal will have less high frequency components that the spectrum of the generated Standard Blocking in conv-ttl-blo
Signals with more spectral power in higher frequencies should be routed more carefully,so it is better to leave the easiest paths to them.
In this case, outer pins should be available for output signals and inner pins to input ones.

As can be seen in ANSI/VITA 1-1994 page 247, the row b is used in VME64. Hence, none of its pins can be used.
Rows z,a,c,d have available pins as documented in the VME64 and VME64x specifications.

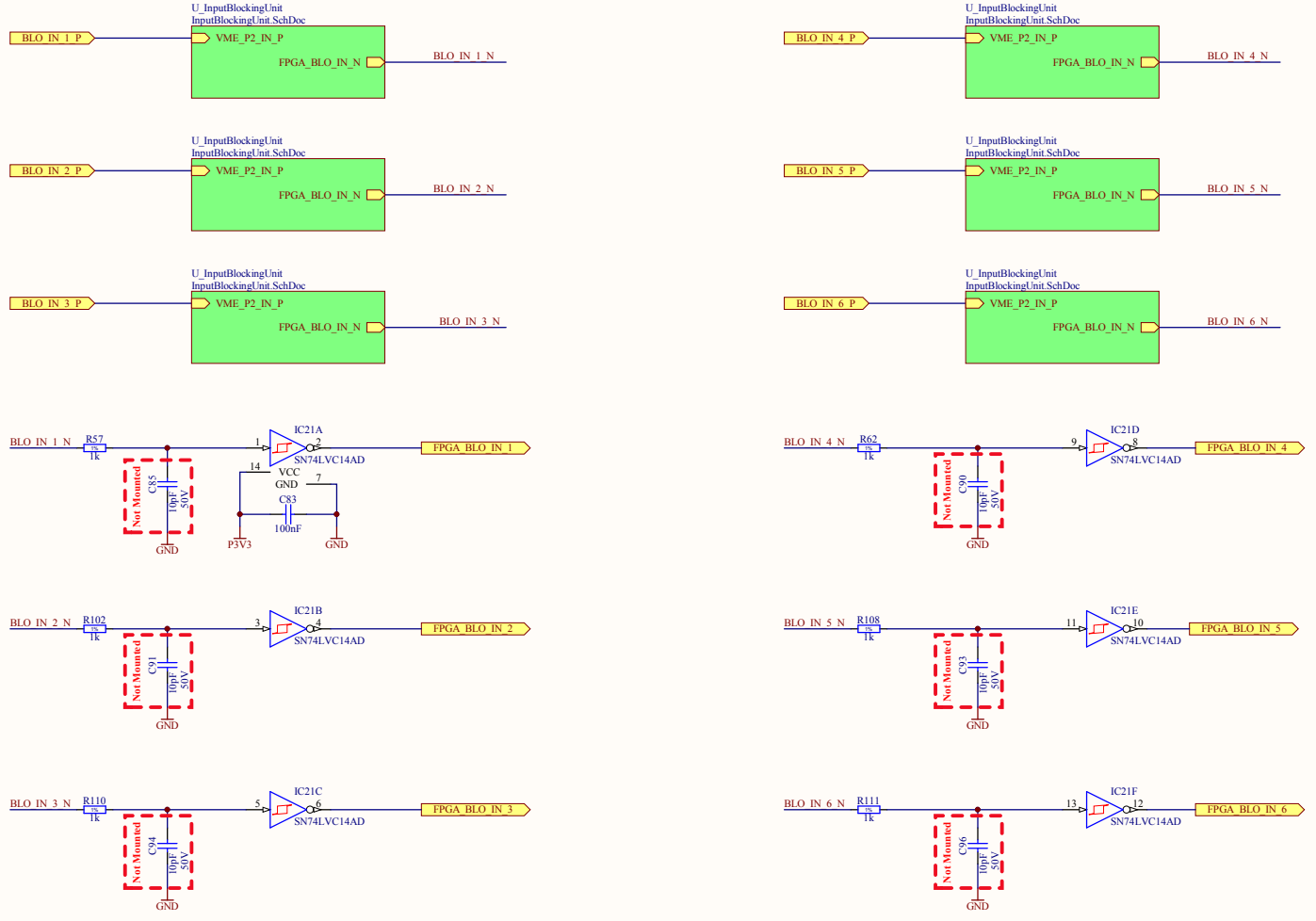






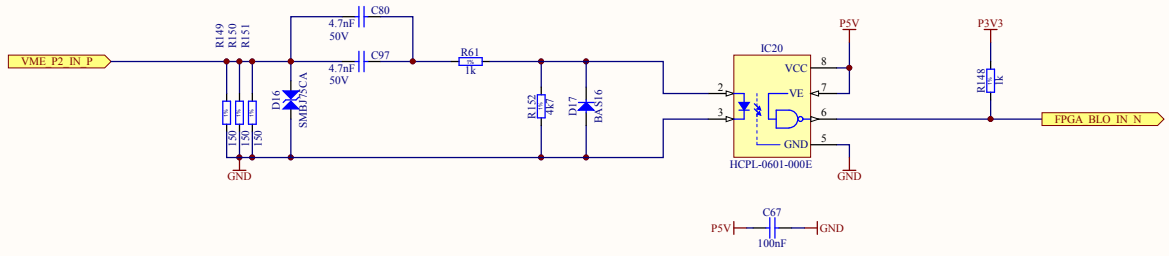


Project/Equipment	Standard Blocking Pulse Repeater		
Document	Conv-TTL-Blo VME64X	Designer Carlos Gil Soriano	
BE-CO		Drawn by Carlos Gil Soriano	03/10/2012
		Check by EVB, MC, TW	
		Last Mod. -	22/10/2012
		File VME64xConn.SchDoc	
		Print Date 22/10/2012 17:27:19	Sheet 8 of 14
European Organization for Nuclear Research CH-1211 Genève 23 - Switzerland	EDA-02446-V2-0	Size A3	Rev 1

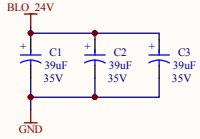


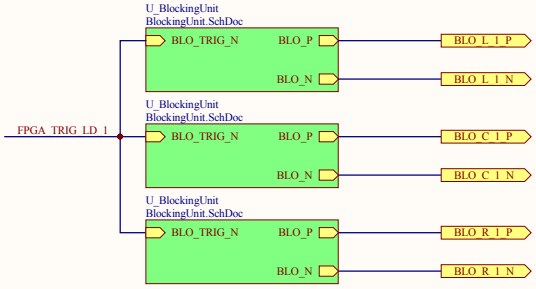
Project/Equipment	Standard Blocking Pulse Repeater		
Document	**Conv-TTL-Blo INPUT BLO**	Designer Carlos Gil Soriano	
BE-CO		Drawn by Carlos Gil Soriano	03/10/2012
		Check by EVB, MC, TW	
		Last Mod. -	22/10/2012
		File InputBlocking.SchDoc	
		Print Date 22/10/2012 17:27:19	Sheet 9 of 14
European Organization for Nuclear Research CH-1211 Genève 23 - Switzerland	EDA-02446-V2-0	Size A3	Rev 1

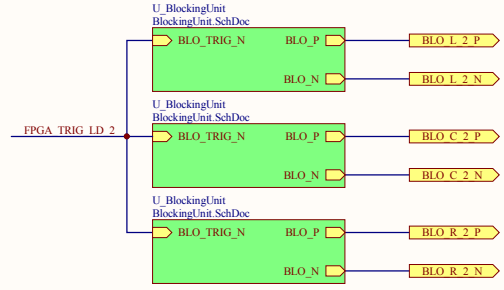
Input waveforms:
nominal 24V Std.Blocking
minimum 5V Std.Blocking

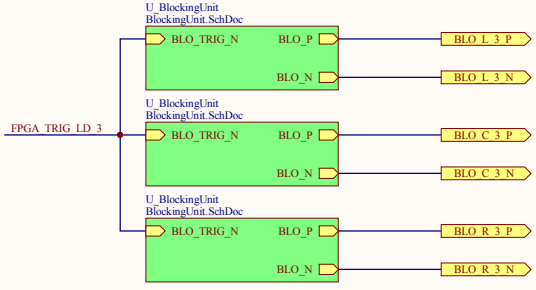


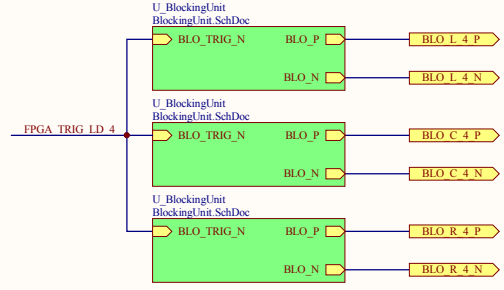
Project/Equipment	Standard Blocking Pulse Repeater		
Document	**Conv-TTL-Blo INPUT UNIT**	Designer Carlos Gil Soriano	
BE-CO		Drawn by Carlos Gil Soriano	03/10/2012
		Check by EVB, MC, TW	
		Last Mod. -	22/10/2012
		File InputBlockingUnit.SchDoc	
		Print Date 22/10/2012 17:27:19	Sheet 10 of 14
European Organization for Nuclear Research CH-1211 Genève 23 - Switzerland	EDA-02446-V2-0	Size A3	Rev 1

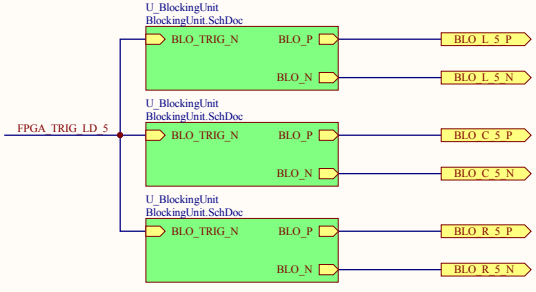


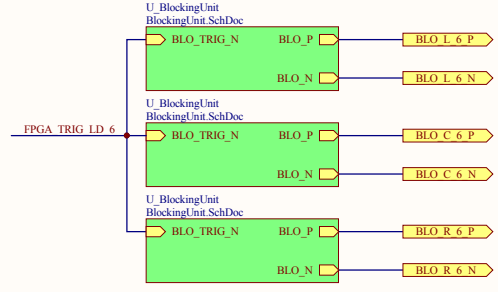


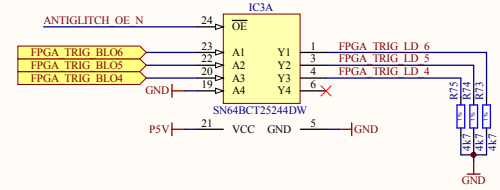


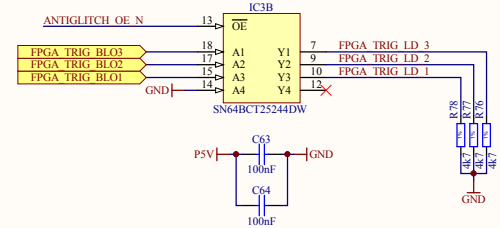


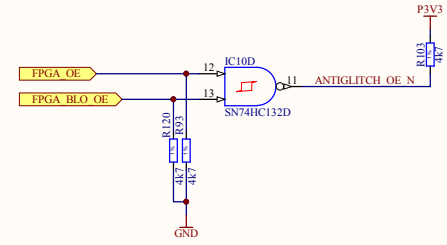


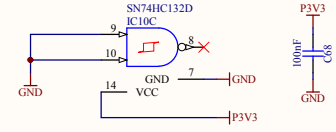




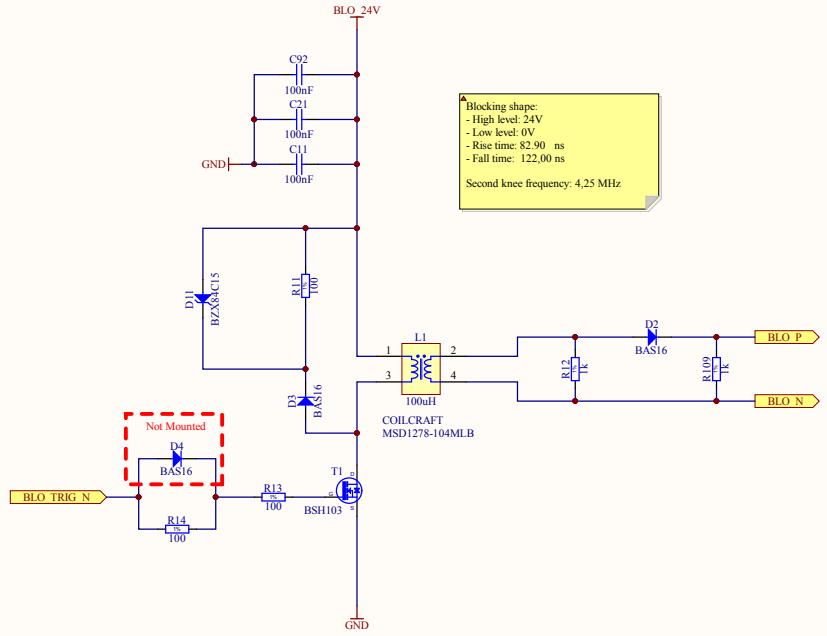








Project/Equipment	Standard Blocking Pulse Repeater		
Document	**Conv-TTL-Blo OUTPUT BLO**	Designer Carlos Gil Soriano	
BE-CO		Drawn by Carlos Gil Soriano	03/10/2012
		Check by EVB, MC, TW	
		Last Mod. -	22/10/2012
		File BlockingOutput.SchDoc	
		Print Date 22/10/2012 17:27:19	Sheet 11 of 14
European Organization for Nuclear Research CH-1211 Genève 23 - Switzerland	EDA-02446-V2-0	Size A3	Rev 1

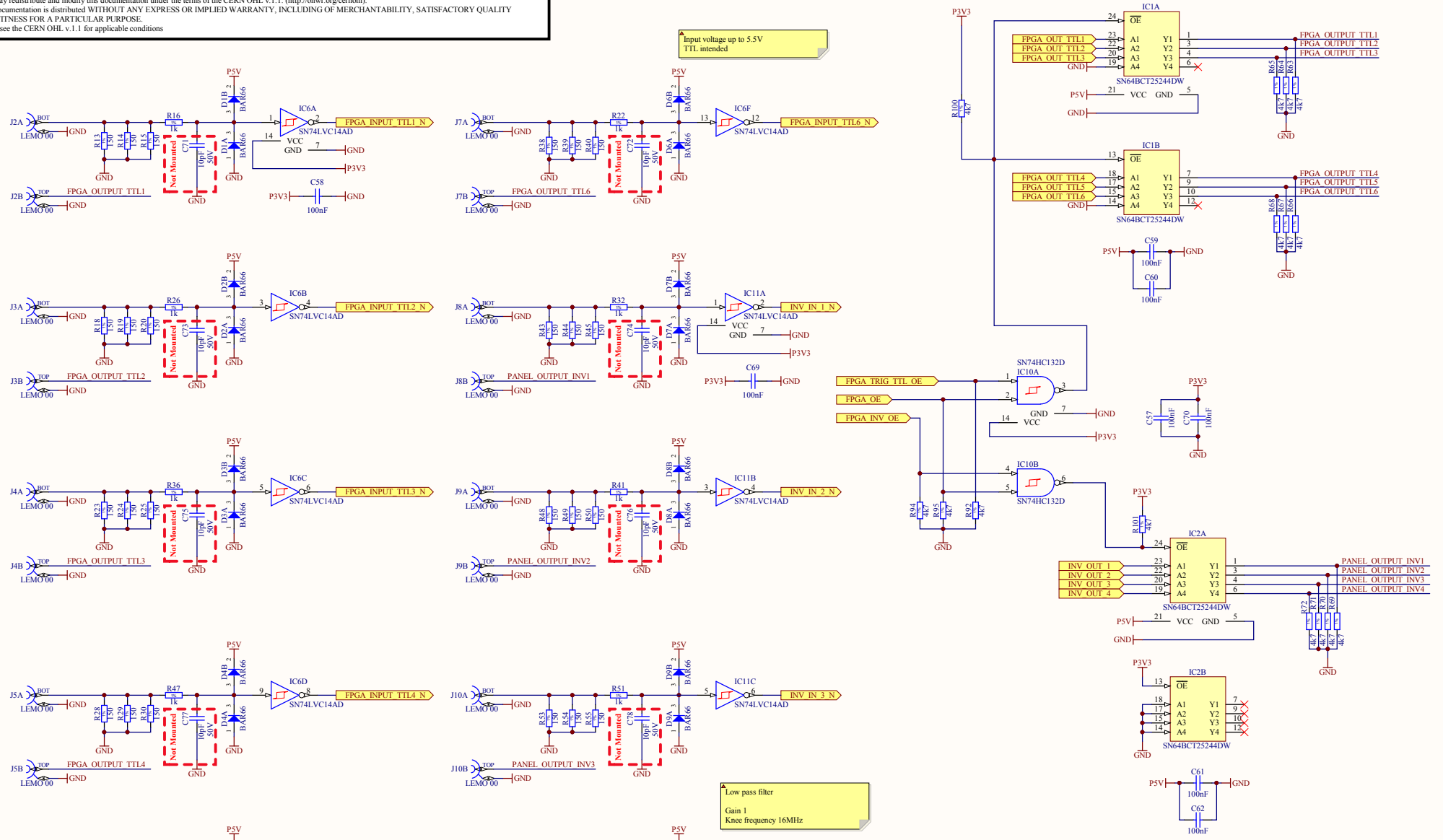


Project/Equipment	Standard Blocking Pulse Repeater		
Document	**Conv-TTL-Blo OUTPUT UNIT**	Designer Carlos Gil Soriano	
BE-CO		Drawn by Carlos Gil Soriano	03/10/2012
		Check by EVB, MC, TW	
		Last Mod. -	22/10/2012
		File BlockingUnit.SchDoc	
		Print Date 22/10/2012 17:27:20	Sheet 12 of 14
European Organization for Nuclear Research CH-1211 Genève 23 - Switzerland	EDA-02446-V2-0	Size A3	Rev 1

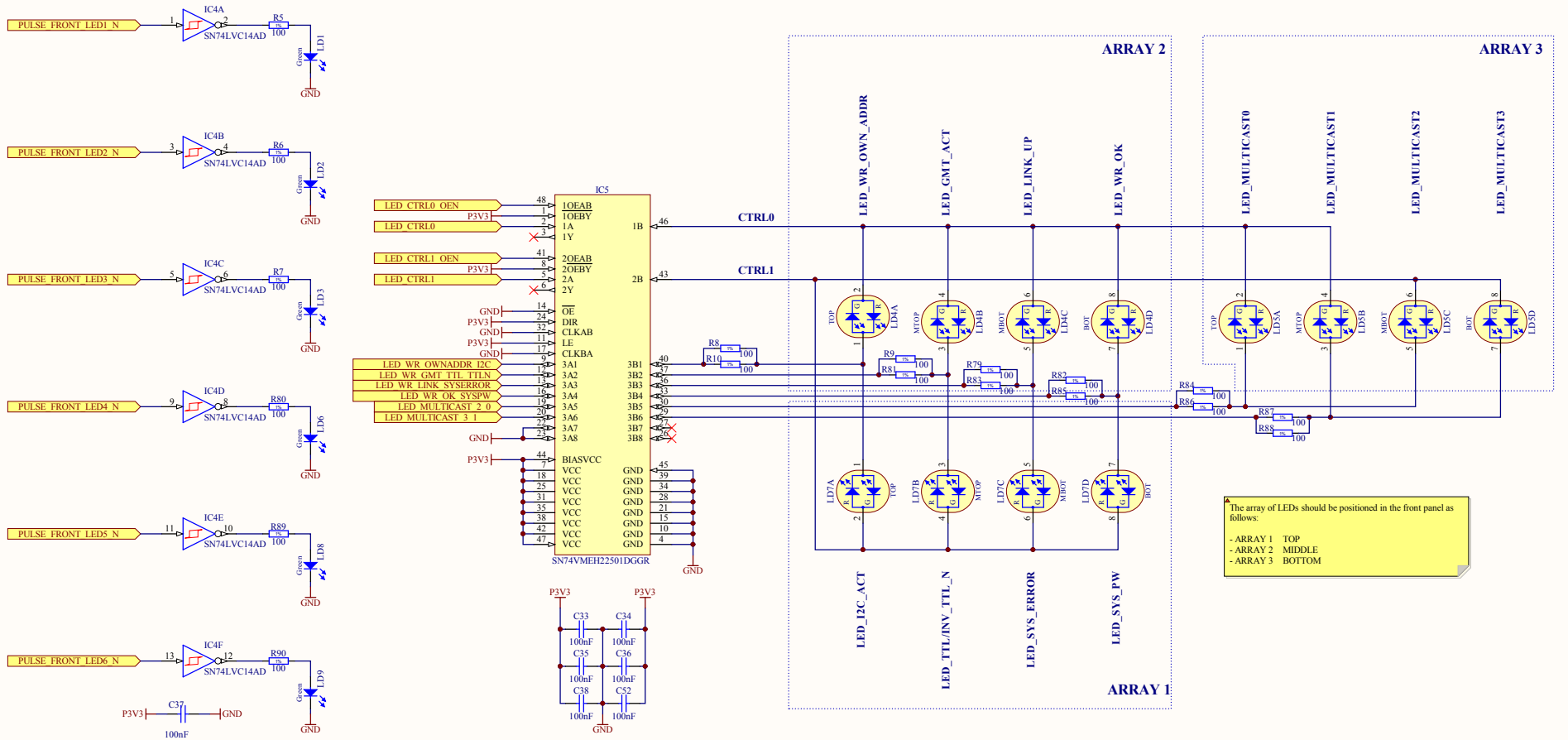
Input voltage up to 5.5V
TTL intended

Low pass filter

Gain 1
Knee frequency 16MHz



Project/Equipment	Standard Blocking Pulse Repeater		
Document	**Conv-TTL-Blo FRONT TTL**	Designer Carlos Gil Soriano	
BE-CO		Drawn by Carlos Gil Soriano	03/10/2012
		Check by EVB, MC, TW	
		Last Mod. -	22/10/2012
		File FrontTTL.SchDoc	
		Print Date 22/10/2012 17:27:20	Sheet 13 of 14
European Organization for Nuclear Research CH-1211 Genève 23 - Switzerland	EDA-02446-V2-0	Size A3	Rev 1



ESD discharge strips (top and bottom of the card)

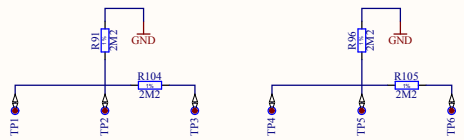


FIG1 FIG2
FIG3 FIG4
FIG5 FIG6

Project/Equipment	Standard Blocking Pulse Repeater		
Document	**Conv-TTL-Blo FRONT PANEL**	Designer Carlos Gil Soriano	
		Drawn by Carlos Gil Soriano	03/10/2012
		Check by EVB, MC, TW	
		Last Mod. -	22/10/2012
		File FrontPanelLeds.SchDoc	
		Print Date 22/10/2012 17:27:20	Sheet 14 of 14
BE-CO	*European Organization for Nuclear Research CH-1211 Genève 23 - Switzerland*	EDA-02446-V2-0	Size A3 / Rev 1