

### U1I CYCLONE V SoC BANK 3

**Bank 3A**  
VCCIO = 3.3V

GPIO 0 D32 Y11 IO\_3A/PR\_ERROR/DIFFIO\_RX\_B7P  
 GPIO 0 D35 AA11 IO\_3A/PR\_DONE/DIFFIO\_RX\_B7N  
 GPIO 0 D10 AD5 IO\_3A/DIFFIO\_TX\_B8P/DQ1B  
 GPIO 0 D13 AE6 IO\_3A/PR\_READY/DIFFIO\_TX\_B8N/DQ1B

**Bank 3B**  
VCCIO = 3.3V

HDMI\_TX\_D16 AE4 IO\_3B/DIFFIO\_TX\_B9P/B\_WEN/DQ2B  
 GPIO 0 D8 AF4 IO\_3B/DIFFIO\_TX\_B9N/GND  
 HDMI\_TX\_D5 AD10 IO\_3B/DIFFIO\_RX\_B10P/B\_A\_14/DQ2B  
 HDMI\_TX\_D10 AE9 IO\_3B/DIFFIO\_RX\_B10N/B\_A\_15/DQ2B  
 HDMI\_LRCLK T11 IO\_3B/DIFFIO\_RX\_B11P/B\_CSN\_0/DQS2B  
 HDMI\_MCLK U11 IO\_3B/DIFFIO\_RX\_B11N/B\_CSN\_1/DQSN2B  
 HDMI\_TX\_D12 AE7 IO\_3B/DIFFIO\_TX\_B12P/B\_A\_12  
 HDMI\_TX\_D14 AF8 IO\_3B/DIFFIO\_TX\_B12N/B\_A\_13/DQ2B  
 HDMI\_TX\_D23 AF8 IO\_3B/DIFFIO\_TX\_B13P/B\_A\_10/DQ2B  
 HDMI\_TX\_D22 AF9 IO\_3B/DIFFIO\_TX\_B13N/B\_A\_11/DQ2B  
 HDMI\_TX\_D4 AD11 IO\_3B/DIFFIO\_RX\_B14P/B\_A\_8/DQ2B  
 HDMI\_TX\_D6 AE11 IO\_3B/DIFFIO\_RX\_B14N/B\_A\_9/DQ2B

HDMI\_TX\_D15 AF5 IO\_3B/DIFFIO\_TX\_B16P/B\_CASN/DQ2B  
 HDMI\_TX\_D13 AF6 IO\_3B/DIFFIO\_TX\_B16N/B\_RASN/DQ2B

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### U1K CYCLONE V SoC BANK 5

**Bank 5A**  
VCCIO = 3.3V

LED4 AF26 IO\_5A/RZQ\_1/DIFFIO\_TX\_R1P/DQ1R

**Bank 5B**  
VCCIO = 3.3V

LED5 AE26 IO\_5A/PR\_REQUEST/DIFFIO\_TX\_R1N/DQ1R

GPIO 1 D3 AD26 IO\_5A/CVP\_CONFDONE/DIFFIO\_TX\_R3N/DQ1R  
 GPIO 0 D29 Y17 IO\_5A/DIFFIO\_RX\_R4P/DQ1R  
 GPIO 0 D28 Y18 IO\_5A/DIFFIO\_RX\_R4N/DQ1R

Y16 LED6  
 W15 LED0  
 AA24 LED1  
 AA23 LED7  
 V16 LED2  
 V15 LED3

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### U1J CYCLONE V SoC BANK 4

**Bank 4A**  
VCCIO = 3.3V

Arduino\_Reset\_n AH7 IO\_4A/RZQ\_0/DIFFIO\_TX\_B25N

Arduino\_I06 AG8 IO\_4A/DIFFIO\_TX\_B25P/B\_DQ\_2/DQ4B IO\_4A/DIFFIO\_TX\_B41P/B\_DQ\_18/DQ6B

Arduino\_I00 AG13 IO\_4A/DIFFIO\_RX\_B26P/B\_DQ\_1/DQ4B IO\_4A/DIFFIO\_RX\_B42P/B\_DQ\_17/DQ6B  
 Arduino\_I01 AF13 IO\_4A/DIFFIO\_RX\_B26N/B\_DQ\_0/DQ4B IO\_4A/DIFFIO\_RX\_B42N/B\_DQ\_16/DQ6B  
 Arduino\_I04 U14 IO\_4A/DIFFIO\_RX\_B27P/B\_DQS\_0/DQS4B IO\_4A/DIFFIO\_RX\_B43P/B\_DQS\_2/DQS6B  
 Arduino\_I05 U13 IO\_4A/DIFFIO\_RX\_B27N/B\_DQSN\_0/DQSN4B IO\_4A/DIFFIO\_RX\_B43N/B\_DQSN\_2/DQSN6B  
 Arduino\_I03 AG9 IO\_4A/DIFFIO\_TX\_B28P/B\_ODT\_0 IO\_4A/DIFFIO\_TX\_B44P/B\_RESETN  
 Arduino\_I07 AH8 IO\_4A/DIFFIO\_TX\_B28N/B\_DQ\_3/DQ4B IO\_4A/DIFFIO\_TX\_B44N/B\_DQ\_19/DQ6B  
 Arduino\_I02 AG10 IO\_4A/DIFFIO\_TX\_B29P/B\_DQ\_6/DQ4B IO\_4A/DIFFIO\_TX\_B45P/B\_DQ\_22/DQ6B  
 Arduino\_I014 AH9 IO\_4A/DIFFIO\_TX\_B29N/B\_ODT\_1/DQ4B IO\_4A/DIFFIO\_TX\_B45N/GND/DQ6B  
 Arduino\_I010 AF15 IO\_4A/DIFFIO\_RX\_B30P/B\_DQ\_5/DQ4B IO\_4A/DIFFIO\_RX\_B46P/B\_DQ\_21/DQ6B  
 Arduino\_I09 AE15 IO\_4A/DIFFIO\_RX\_B30N/B\_DQ\_4/DQ4B IO\_4A/DIFFIO\_RX\_B46N/B\_DQ\_20/DQ6B

Arduino\_I015 AG11 IO\_4A/DIFFIO\_TX\_B32P/B\_DM\_0/DQ4B IO\_4A/DIFFIO\_TX\_B48P/B\_DM\_2/DQ6B  
 Arduino\_I012 AH11 IO\_4A/DIFFIO\_TX\_B32N/B\_DQ\_7/DQ4B IO\_4A/DIFFIO\_TX\_B48N/B\_DM\_23/DQ6B

Arduino\_I013 AH12 IO\_4A/DIFFIO\_TX\_B33P/B\_DQ\_10/DQ5B IO\_4A/DIFFIO\_TX\_B49P/B\_DQ\_26/DQ7B

Arduino\_I08 AF17 IO\_4A/DIFFIO\_RX\_B34P/B\_DQ\_9/DQ5B IO\_4A/DIFFIO\_RX\_B50P/B\_DQ\_25/DQ7B  
 Arduino\_I011 AG16 IO\_4A/DIFFIO\_RX\_B34N/B\_DQ\_8/DQ5B IO\_4A/DIFFIO\_RX\_B50N/B\_DQ\_24/DQ7B  
 GPIO 0 D27 W14 IO\_4A/DIFFIO\_RX\_B35P/B\_DQS\_1/DQ35B IO\_4A/DIFFIO\_RX\_B51P/B\_DQS\_3/DQ37B  
 HDMI\_TX\_VS V13 IO\_4A/DIFFIO\_RX\_B35N/B\_DQSN\_1/DQSN5B IO\_4A/DIFFIO\_RX\_B51N/B\_DQSN\_3/DQSN7B  
 GPIO 0 D11 AG14 IO\_4A/DIFFIO\_TX\_B36P/B\_CKE\_1 IO\_4A/DIFFIO\_TX\_B52N/B\_DQ\_27/DQ7B  
 GPIO 0 D5 AH13 IO\_4A/DIFFIO\_TX\_B36N/B\_DQ\_11/DQ5B IO\_4A/DIFFIO\_TX\_B53P/B\_DQ\_30/DQ7B  
 GPIO 1 D32 AG15 IO\_4A/DIFFIO\_TX\_B37P/B\_DQ\_14/DQ5B IO\_4A/DIFFIO\_TX\_B53N/GND/DQ7B  
 GPIO 0 D7 AH14 IO\_4A/DIFFIO\_TX\_B37N/B\_CKE\_0/DQ5B IO\_4A/DIFFIO\_TX\_B53N/GND/DQ7B  
 GPIO 0 D19 AD17 IO\_4A/DIFFIO\_RX\_B38P/B\_DQ\_13/DQ5B IO\_4A/DIFFIO\_RX\_B54P/B\_DQ\_29/DQ7B  
 GPIO 1 D35 AE17 IO\_4A/DIFFIO\_RX\_B38N/B\_DQ\_12/DQ5B IO\_4A/DIFFIO\_RX\_B54N/B\_DQ\_28/DQ7B

KEY0 AH17 IO\_4A/DIFFIO\_TX\_B40P/B\_DM\_1/DQ5B IO\_4A/DIFFIO\_TX\_B56P/B\_DM\_3/DQ7B  
 KEY1 AH16 IO\_4A/DIFFIO\_TX\_B40N/B\_DQ\_15/DQ5B IO\_4A/DIFFIO\_TX\_B56N/B\_DM\_31/DQ7B

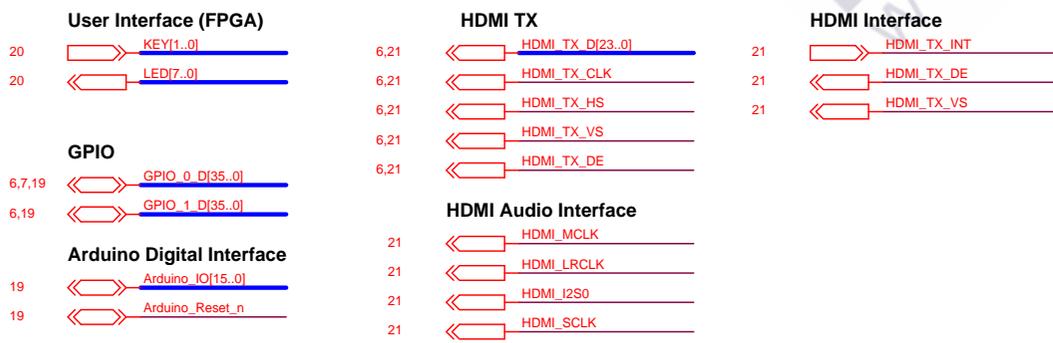
IO\_4A/DIFFIO\_TX\_B57P/B\_DQ\_34/DQ8B

IO\_4A/DIFFIO\_RX\_B58P/B\_DQ\_33/DQ8B IO\_4A/DIFFIO\_RX\_B58N/B\_DQ\_32/DQ8B  
 IO\_4A/DIFFIO\_RX\_B59P/B\_DQS\_4/DQ38B AC23 GPIO 0 D20  
 IO\_4A/DIFFIO\_RX\_B59N/B\_DQSN\_4/DQSN8B

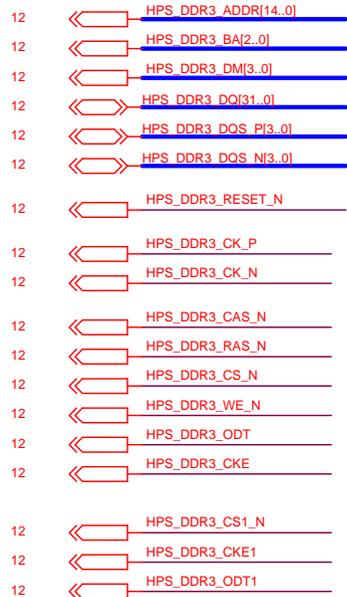
IO\_4A/DIFFIO\_TX\_B60N/B\_DQ\_35/DQ8B AH26 GPIO 1 D11  
 IO\_4A/DIFFIO\_TX\_B61P/B\_DQ\_38/DQ8B AG28 GPIO 1 D4  
 IO\_4A/DIFFIO\_TX\_B61N/GND/DQ8B AH27 GPIO 1 D9  
 IO\_4A/DIFFIO\_RX\_B62P/B\_DQ\_37/DQ8B AF25 GPIO 1 D13  
 IO\_4A/DIFFIO\_RX\_B62N/B\_DQ\_36/DQ8B AG25 GPIO 1 D10

IO\_4A/DIFFIO\_TX\_B64P/B\_DM\_4/DQ8B AF27 GPIO 1 D7  
 IO\_4A/DIFFIO\_TX\_B64N/B\_DQ\_39/DQ8B AF28 GPIO 1 D5

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**DDR3 Interface (HPS)**



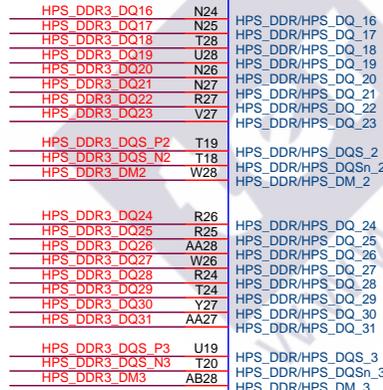
U1L

**CYCLONE V SoC BANK 6 (HPS)**

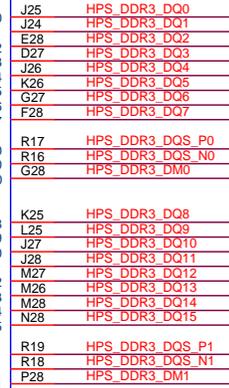
**Bank 6A**  
VCCIO = 1.5V



**Bank 6B**  
VCCIO = 1.5V



5CSEBA6U23I7



U15  
U16  
AC27  
V24

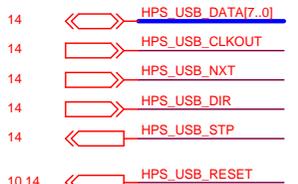
T26  
U25  
AC28  
V25  
V19  
V20  
AE27  
AD28

V18  
V17  
AE28

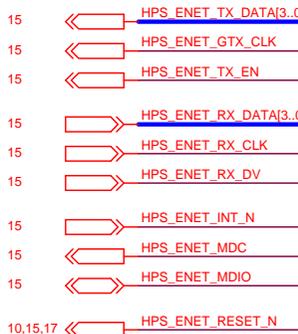
M25  
K27  
R20  
R21  
R28  
P26  
HPS\_GPI0  
HPS\_GPI1  
HPS\_GPI2  
HPS\_GPI3  
HPS\_GPI4  
HPS\_GPI5  
HPS\_GPI6  
HPS\_GPI7  
HPS\_GPI8  
HPS\_GPI9

V28 HPS\_DDR3\_RESET\_N

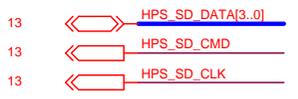
**UBS PHY Interface (ULPI)**



**Ethernet PHY Interface (RGMII)**



**SD Card Interface**



**UART Interface**



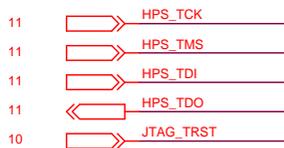
**HPS Reset**



**HPS Clock**



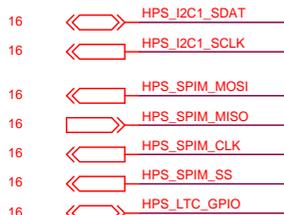
**HPS JTAG INTERFACE**



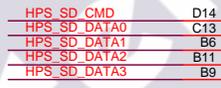
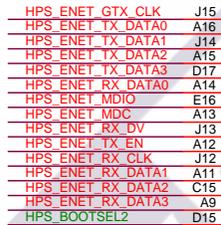
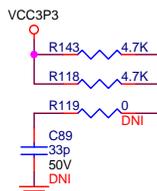
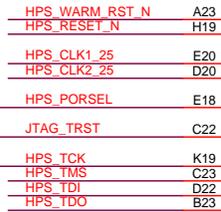
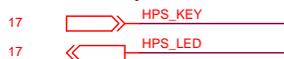
**Accelerometer Interface**



**LTC Interface**



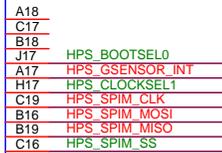
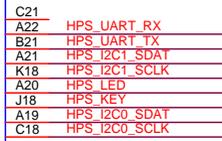
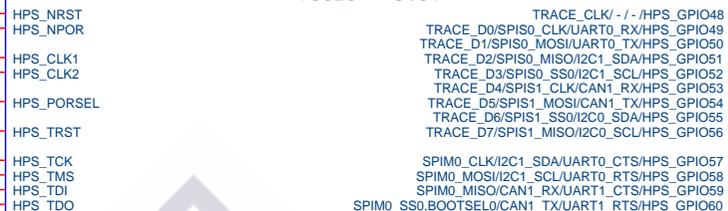
**HPS Key and LED**



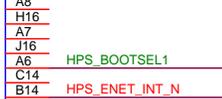
U1M

**CYCLONE V SoC BANK 7 (HPS)**

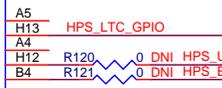
Bank 7A  
 VCCIO = 3.3V



Bank 7B  
 VCCIO = 3.3V



Bank 7C  
 VCCIO = 3.3V

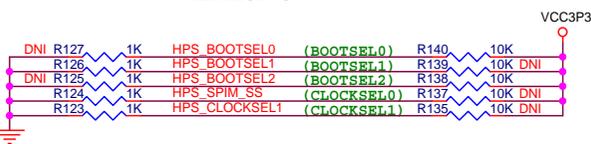


Bank 7D  
 VCCIO = 3.3V



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Default Setting: BOOTSEL[2:0]=101 (Boot from SD CARD)  
 CLKSEL[1:0] =00



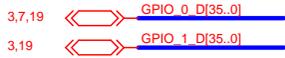
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Title: **DE10-Nano Board**

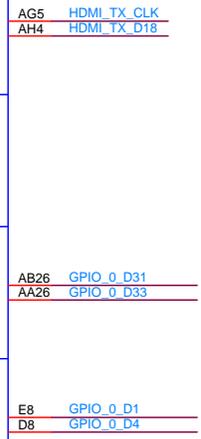
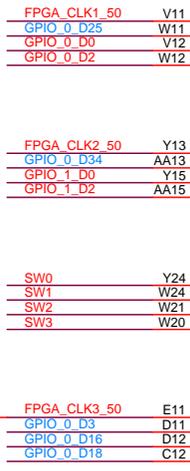
Size: B Document Number: FPGA Bank 7 Rev: B2

Date: Monday, August 21, 2017 Sheet: 5 of 24

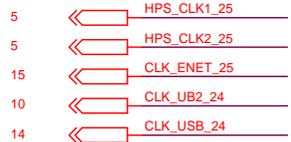
**GPIO**



**User Interface (FPGA)**



**Clock Generator**

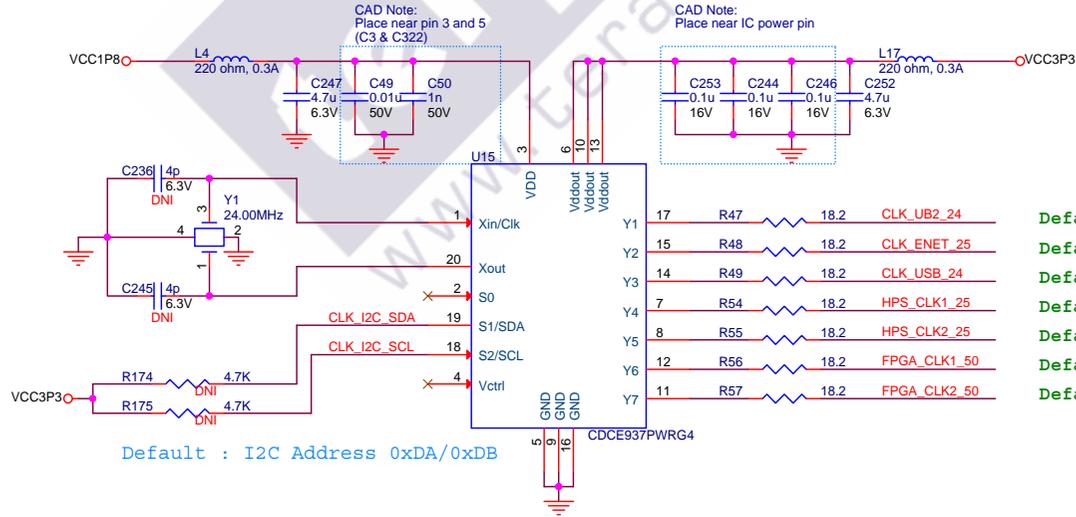


**Factory Default Configuration:**

- 50MHz x2
- 25MHz x3
- 24MHz x2

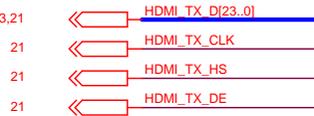
CAD Note: Place near pin 3 and 5 (C3 & C322)

CAD Note: Place near IC power pin



- 17 R47 18.2 CLK\_UB2\_24 **Default: 24MHz**
- 15 R48 18.2 CLK\_ENET\_25 **Default: 25MHz**
- 14 R49 18.2 CLK\_USB\_24 **Default: 24MHz**
- 7 R54 18.2 HPS\_CLK1\_25 **Default: 25MHz**
- 8 R55 18.2 HPS\_CLK2\_25 **Default: 25MHz**
- 12 R56 18.2 FPGA\_CLK1\_50 **Default: 50MHz**
- 11 R57 18.2 FPGA\_CLK2\_50 **Default: 50MHz**

**HDMI TX**



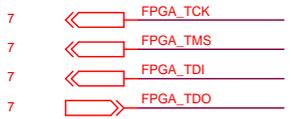
Default : I2C Address 0xDA/0xDB

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Title		
<b>DE10-Nano Board</b>		
Size	Document Number	Rev
B	FPGA Clock and Clock Generator	B2
Date:	Monday, August 21, 2017	Sheet 6 of 24

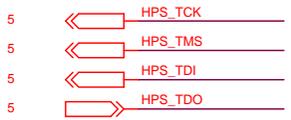
**USB Blaster**



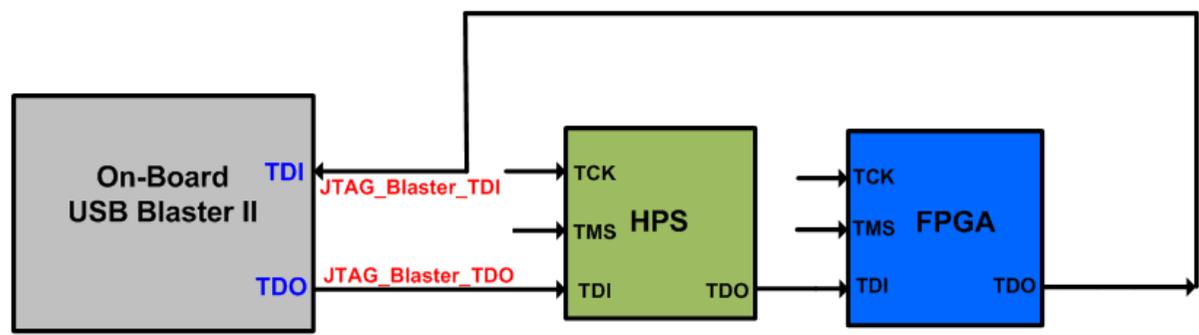
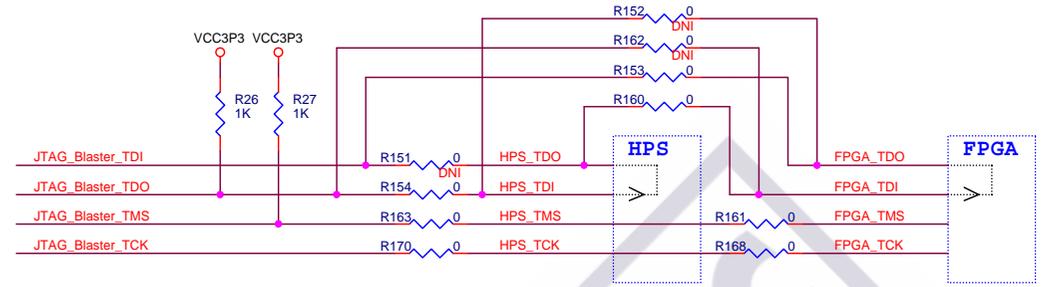
**FPGA JTAG INTERFACE**



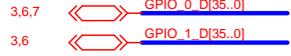
**HPS JTAG INTERFACE**



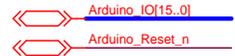
**JTAG Chain**



**GPIO**



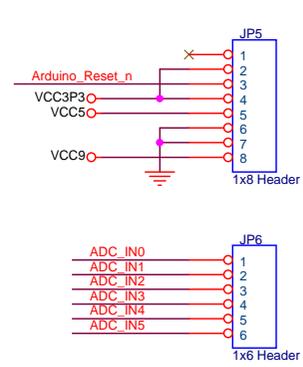
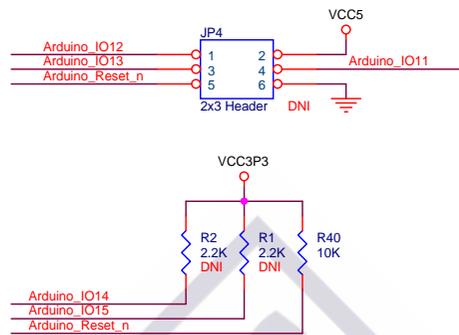
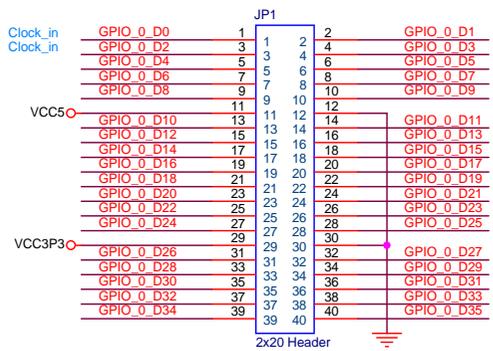
**Arduino Digital Interface**



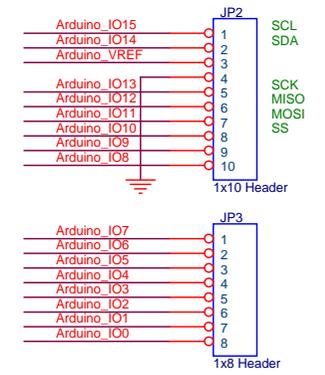
**Analog input interface**



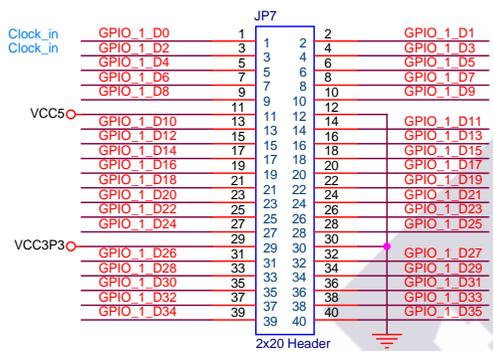
**GPIO 0 Header**



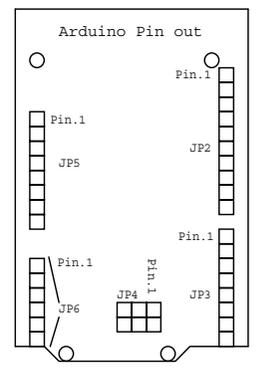
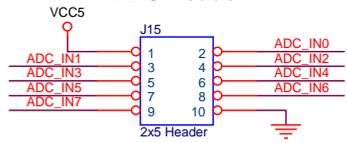
**Arduino UNO Rev3**



**GPIO 1 Header**



**ADC Header**



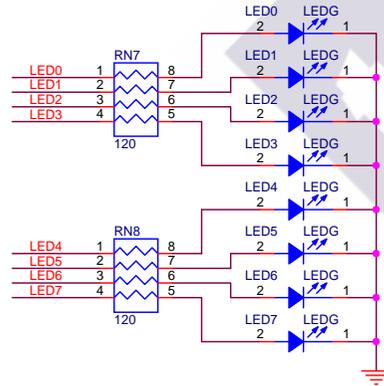
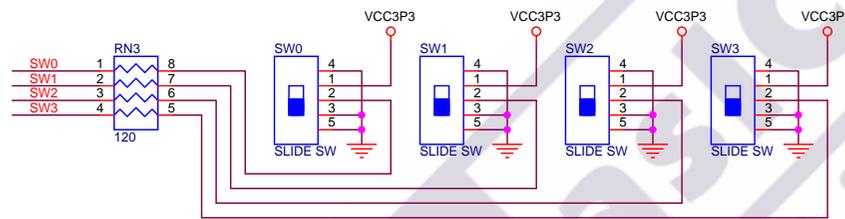
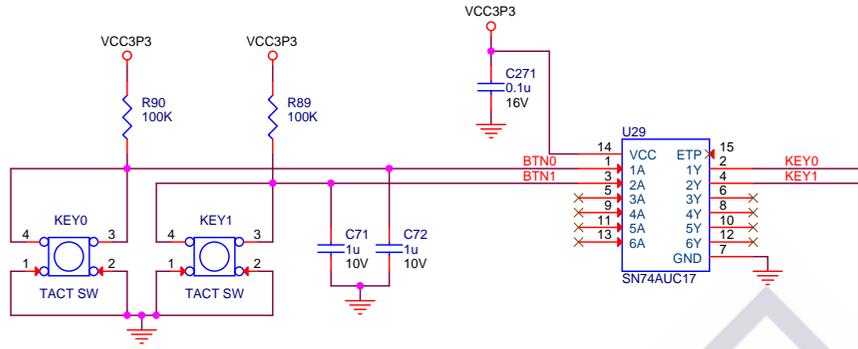
**KEY**



**SWITCH**



**LED**



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Title			
<b>DE10-Nano Board</b>			
Size	Document Number	Rev	
B	FPGA : LED, KEY, SW	B2	
Date:	Monday, August 21, 2017	Sheet	20 of 24