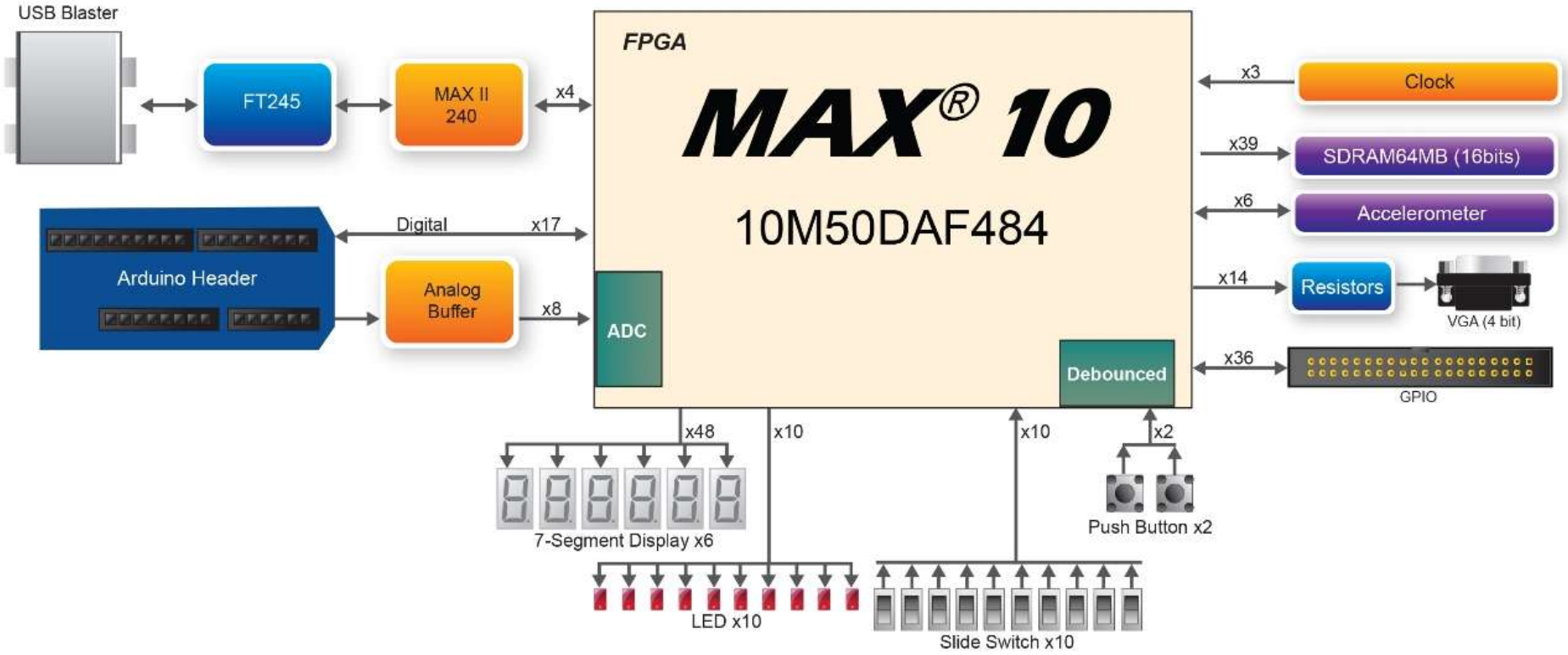

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Title: DE10-Lite		
Size: B	Document Number: Block Diagram	Rev: E0
Date: Thursday, April 13, 2017	Sheet 2 of 18	

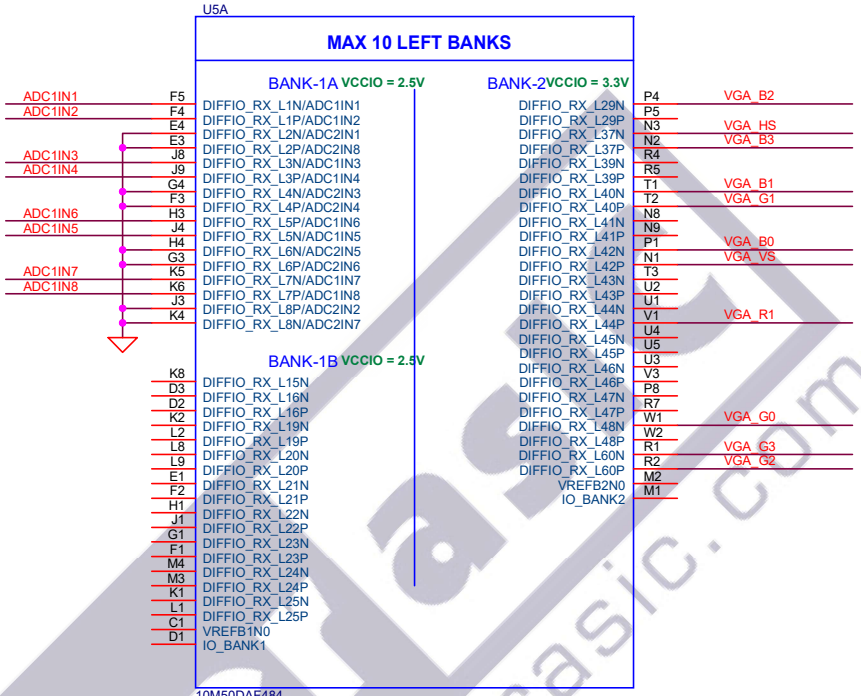
MAX10 Bank 1 & 2

Analog input interface

13 — ADC1IN[8..1]

VGA

4,15 — VGA_R[3..0]
15 — VGA_G[3..0]
15 — VGA_B[3..0]
15 — VGA_HS
15 — VGA_VS



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Title: DE10-Lite

Size: B | Document Number: MAX 10 Bank 1 & 2 | Rev: E0

Date: Friday, August 11, 2017 | Sheet 3 of 18

MAX10 Bank 3 & 4

GPIO 0

7,13 — GPIO_[35..0]

Arduino Digital Interface

13 — Arduino_IO[15..0]

Digital Accelerometer

15 — GSENSOR_SDI
15 — GSENSOR_SCLK
15 — GSENSOR_INT1
15 — GSENSOR_INT2
15 — GSENSOR_CS_n
15 — GSENSOR_SDO

VGA

3,15 — VGA_R[3..0]

U5B

MAX 10 BOTTOM BANKS

		BANK-3 VCCIO = 3.3V	BANK-4 VCCIO = 3.3V		
GPIO_25	Y7	DIFFIO_RX_B10N	DIFFIO_RX_B25N	W11	GPIO_19
GPIO_23	Y8	DIFFIO_RX_B10P	DIFFIO_RX_B25P	Y11	GPIO_17
GPIO_34	AB2	DIFFIO_RX_B12N	DIFFIO_RX_B27N	AB10	GPIO_20
GPIO_32	AB3	DIFFIO_RX_B12P	DIFFIO_RX_B27P	AB11	GPIO_18
GPIO_33	Y3	DIFFIO_RX_B14N	DIFFIO_RX_B29N	AB12	GPIO_16
GPIO_31	Y4	DIFFIO_RX_B14P	DIFFIO_RX_B29P	AB13	GPIO_15
GPIO_30	AA5	DIFFIO_RX_B17N	DIFFIO_RX_B35N	W12	GPIO_14
Arduino_IO0	AB5	DIFFIO_RX_B17P	DIFFIO_RX_B35P	W13	GPIO_13
Arduino_IO1	AB6	DIFFIO_RX_B19N	DIFFIO_RX_B38N	AA14	GPIO_12
Arduino_IO2	AB7	DIFFIO_RX_B19P	DIFFIO_RX_B38P	AB15	GSENSOR_SCLK
GPIO_24	AA8	DIFFIO_RX_B21N	DIFFIO_RX_B40N	AA15	GPIO_11
Arduino_IO3	AB8	DIFFIO_RX_B21P	DIFFIO_RX_B40P	Y16	
GPIO_22	AA9	DIFFIO_RX_B23N	DIFFIO_RX_B42N	AB16	GSENSOR_CS_n
Arduino_IO4	AB9	DIFFIO_RX_B23P	DIFFIO_RX_B42P	AA16	
	V4	DIFFIO_RX_B2N	DIFFIO_RX_B44N	AB19	Arduino_IO10
GPIO_9	V5	DIFFIO_RX_B2P	DIFFIO_RX_B44P	AB20	Arduino_IO13
VGA_R3	Y1	DIFFIO_RX_B4N	DIFFIO_RX_B46N	AA19	Arduino_IO11
VGA_R2	Y2	DIFFIO_RX_B4P	DIFFIO_RX_B46P	Y18	
VGA_R0	AA1	DIFFIO_RX_B6N	DIFFIO_RX_B50N	AB21	Arduino_IO14
GPIO_35	AA2	DIFFIO_RX_B6P	DIFFIO_RX_B50P	AA20	Arduino_IO15
GPIO_29	Y5	DIFFIO_RX_B8N	DIFFIO_RX_B58N	AB17	Arduino_IO8
GPIO_27	Y6	DIFFIO_RX_B8P	DIFFIO_RX_B58P	AB18	
GPIO_3	W9	DIFFIO_TX_RX_B11N	DIFFIO_TX_RX_B24N	V11	GSENSOR_SDI
GPIO_1	W10	DIFFIO_TX_RX_B11P	DIFFIO_TX_RX_B24P	V12	GSENSOR_SDO
GPIO_7	W7	DIFFIO_TX_RX_B13N	DIFFIO_TX_RX_B26N	R12	
GPIO_5	W8	DIFFIO_TX_RX_B13P	DIFFIO_TX_RX_B26P	P12	
	R10	DIFFIO_TX_RX_B15N	DIFFIO_TX_RX_B28N	AA11	Arduino_IO6
	P10	DIFFIO_TX_RX_B15P	DIFFIO_TX_RX_B28P	AA12	Arduino_IO7
GPIO_28	AA6	DIFFIO_TX_RX_B16N	DIFFIO_TX_RX_B34N	V13	
GPIO_26	AA7	DIFFIO_TX_RX_B16P	DIFFIO_TX_RX_B34P	W14	
GPIO_10	W5	DIFFIO_TX_RX_B1N	DIFFIO_TX_RX_B36N	R13	
GPIO_8	W6	DIFFIO_TX_RX_B1P	DIFFIO_TX_RX_B36P	P13	
Arduino_IO5	Y10	DIFFIO_TX_RX_B22N	DIFFIO_TX_RX_B37N	Y13	GSENSOR_INT2
GPIO_21	AA10	DIFFIO_TX_RX_B22P	DIFFIO_TX_RX_B37P	Y14	GSENSOR_INT1
	U6	DIFFIO_TX_RX_B3N	DIFFIO_TX_RX_B39N	V14	
	U7	DIFFIO_TX_RX_B3P	DIFFIO_TX_RX_B39P	W15	
	W4	DIFFIO_TX_RX_B5N	DIFFIO_TX_RX_B41N	U15	
	W3	DIFFIO_TX_RX_B5P	DIFFIO_TX_RX_B41P	V16	
GPIO_6	V7	DIFFIO_TX_RX_B7N	DIFFIO_TX_RX_B43N	AA17	Arduino_IO9
GPIO_4	V8	DIFFIO_TX_RX_B7P	DIFFIO_TX_RX_B43P	Y17	
	R9	DIFFIO_TX_RX_B9N	DIFFIO_TX_RX_B45N	V15	
	P9	DIFFIO_TX_RX_B9P	DIFFIO_TX_RX_B45P	W16	
	AA3	VREFB3N0	DIFFIO_TX_RX_B49N	Y19	Arduino_IO12
	AB4	IO_BANK3	DIFFIO_TX_RX_B49P	W18	
			VREFB4N0	AA13	
			IO_BANK4	AB14	

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Title: **DE10-Lite**

Size	Document Number	Rev
B	MAX 10 Bank 3 & 4	E0

Date: Friday, August 11, 2017 Sheet 4 of 18

MAX10 Bank 5 & 6

SDRAM

12 DRAM_ADDR[12..0]
12 DRAM_DQ[15..0]

12 DRAM_CKE
12 DRAM_LDQM
12 DRAM_UDQM
12 DRAM_WE_N
12 DRAM_CAS_N
12 DRAM_RAS_N
12 DRAM_CS_N
12 DRAM_BA0
12 DRAM_BA1

SWITCH

6,14 SW[9..0]

KEY

6,14 KEY[1..0]

LED

6,14 LEDR[9..0]

7-segment Display

6,14 HEX0[7..0]
6,14 HEX1[7..0]
6,14 HEX2[7..0]
6,14 HEX3[7..0]
14 HEX4[7..0]
14 HEX5[7..0]

U5C

MAX 10 RIGHT BANKS

		BANK-5 VCCIO = 3.3V	BANK-6 VCCIO = 3.3V		
DRAM_ADDR4	U19	DIFFIO_RX_R19N	DIFFIO_RX_R39N	H21	DRAM_DQ10
DRAM_ADDR2	V18	DIFFIO_RX_R19P	DIFFIO_RX_R39P	H22	DRAM_DQ11
DRAM_ADDR3	U18	DIFFIO_RX_R1P/RUP	DIFFIO_RX_R41N	J21	DRAM_UDQM
DRAM_ADDR0	U17	DIFFIO_RX_R1N/RDN	DIFFIO_RX_R41P	J22	DRAM_DQ9
DRAM_DQ5	W22	DIFFIO_RX_R20N	DIFFIO_RX_R42N	G19	DRAM_DQ14
DRAM_DQ4	Y22	DIFFIO_RX_R20P	DIFFIO_RX_R42P	G20	DRAM_DQ13
DRAM_DQ6	W20	DIFFIO_RX_R21N	DIFFIO_RX_R43N	F22	DRAM_DQ15
DRAM_ADDR1	W19	DIFFIO_RX_R21P	DIFFIO_RX_R43P	G22	DRAM_DQ12
DRAM_DQ0	Y21	DIFFIO_RX_R22N	DIFFIO_RX_R44N/DQ2R	M14	
DRAM_DQ1	Y20	DIFFIO_RX_R22P	DIFFIO_RX_R44P/DQ2R	M15	
DRAM_CS_N	U20	DIFFIO_RX_R23N	DIFFIO_RX_R45N	E21	HEX32
DRAM_WE_N	V20	DIFFIO_RX_R23P	DIFFIO_RX_R45P	E22	HEX31
DRAM_LDQM	V22	DIFFIO_RX_R24N	DIFFIO_RX_R46N/DM2R	N19	HEX55
DRAM_DQ7	V21	DIFFIO_RX_R24P	DIFFIO_RX_R46P/DQ2R	N18	HEX53
	R14	DIFFIO_RX_R25N/DQ1R	DIFFIO_RX_R47P/DQ2R	M20	HEX54
	R15	DIFFIO_RX_R25P/DQ1R	DIFFIO_RX_R47N/DQ2R	N20	HEX56
DRAM_BA1	T22	DIFFIO_RX_R26N	DIFFIO_RX_R48N	F20	HEX46
DRAM_BA0	T21	DIFFIO_RX_R26P	DIFFIO_RX_R48P	F21	HEX30
DRAM_ADDR5	T18	DIFFIO_RX_R27N/DM1R	DIFFIO_RX_R49N	C22	HEX25
DRAM_ADDR6	T19	DIFFIO_RX_R27P/DQ1R	DIFFIO_RX_R49P	D22	HEX37
DRAM_ADDR12	R20	DIFFIO_RX_R28N/DQ1R	DIFFIO_RX_R51N/DQ2R	L18	HEX52
DRAM_ADDR10	T20	DIFFIO_RX_R28P/DQ1R	DIFFIO_RX_R51P/DQ2R	M18	
DRAM_RAS_N	U22	DIFFIO_RX_R29N	DIFFIO_RX_R52N/DQ2R	L20	
DRAM_CAS_N	U21	DIFFIO_RX_R29P	DIFFIO_RX_R52P/DQ2R	L19	HEX57
DRAM_DQ2	AA22	DIFFIO_RX_R2N	DIFFIO_RX_R53N	F18	HEX40
DRAM_DQ3	AA21	DIFFIO_RX_R2P	DIFFIO_RX_R53P	E19	HEX42
	P14	DIFFIO_RX_R30N/DQ1R	DIFFIO_RX_R54N	E20	HEX41
	P15	DIFFIO_RX_R30P/DQ1R	DIFFIO_RX_R54P	F19	HEX45
DRAM_CKE	N22	DIFFIO_RX_R31N	DIFFIO_RX_R55N/DQSN3R	K15	
DRAM_DQ8	P21	DIFFIO_RX_R31P	DIFFIO_RX_R55P/DQS3R	K14	
DRAM_ADDR8	P18	DIFFIO_RX_R32N/DQSN1R	DIFFIO_RX_R56N	D19	HEX35
DRAM_ADDR7	R18	DIFFIO_RX_R32P/DQS1R	DIFFIO_RX_R56P	C20	HEX34
DRAM_ADDR11	P20	DIFFIO_RX_R33N/DQ1R	DIFFIO_RX_R57N/DQ3R	J18	HEX43
DRAM_ADDR9	P19	DIFFIO_RX_R33P/DQ1R	DIFFIO_RX_R57P/DQ3R	K18	
	L22	DIFFIO_RX_R34N	DIFFIO_RX_R58N/DQ3R	K20	HEX51
	M21	DIFFIO_RX_R34P	DIFFIO_RX_R58P/DQ3R	K19	
	M22	DIFFIO_RX_R35N	DIFFIO_RX_R59N	E17	HEX36
	N21	DIFFIO_RX_R35P	DIFFIO_RX_R59P	F17	HEX47
	P22	VREFB5N0	DIFFIO_RX_R60N	B21	HEX24
	R22	IO_BANK5	DIFFIO_RX_R60P	B22	HEX26
			DIFFIO_RX_R61N/DM3R	J15	
			DIFFIO_RX_R61P/DQ3R	J14	
			DIFFIO_RX_R62N	A21	HEX23
			DIFFIO_RX_R62P	B20	HEX20
			DIFFIO_RX_R63N/DQ3R	H18	
			DIFFIO_RX_R63P/DQ3R	H19	HEX44
			DIFFIO_RX_R64N/DQ3R	H20	
			DIFFIO_RX_R64P/DQ3R	J20	HEX50
			DIFFIO_RX_R70N/CK#_6	E18	HEX12
			DIFFIO_RX_R70P/CK_6	D18	HEX11
			VREFB6N0	D21	
			IO_BANK6	C21	

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Title: **DE10-Lite**

Size	Document Number	Rev
B	MAX 10 Bank 5 & 6	E0

Date: Friday, August 11, 2017 Sheet 5 of 18

MAX10 Bank 7 & 8

7-segment Display

14 HEX0[7..0]
5,14 HEX1[7..0]
5,14 HEX2[7..0]
5,14 HEX3[7..0]
5,14 HEX4[7..0]
5,14 HEX5[7..0]

SWITCH

14 SW[9..0]

KEY

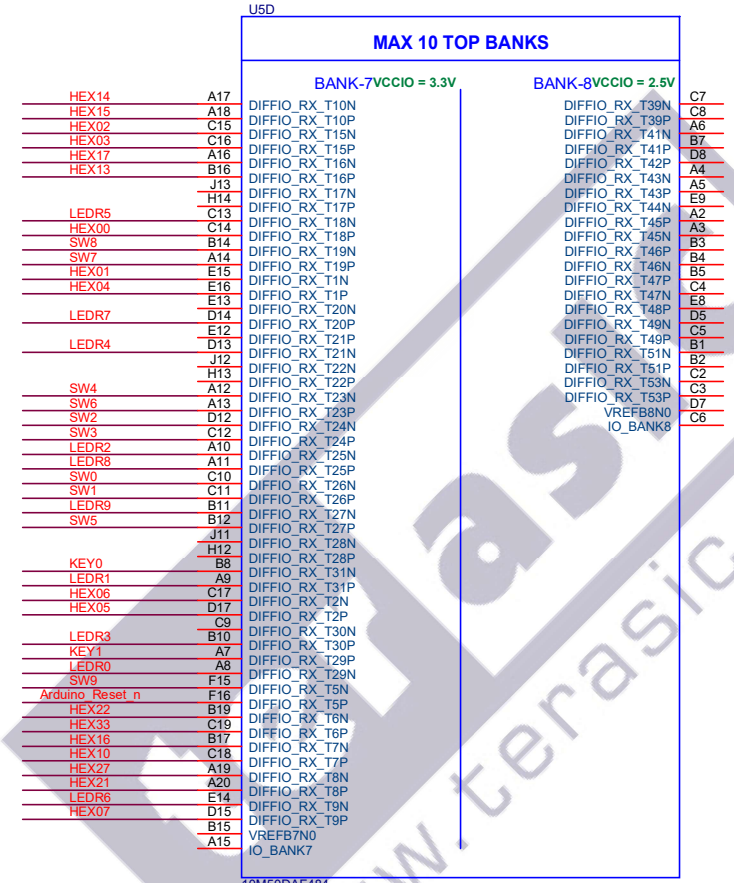
14 KEY[1..0]

LED

14 LEDR[9..0]

Arduino Digital Interface

13 Arduino_Reset_n



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Title: **DE10-Lite**

Size	Document Number	Rev
B	MAX 10 Bank 7 & 8	E0

Date: Friday, August 11, 2017 Sheet 6 of 18

MAX10 Clock

GPIO 0

4,13 — GPIO_[35..0]

SDRAM

12 — DRAM_CLK

U5E

MAX 10 CLOCK

BANK-2 VCCIO = 3.3V

ADC_CLK_10	N4	DIFFIO_RX_L28N/CLK0N	DIFFIO_RX_L38N/DPCLK0	P3	
	N5	DIFFIO_RX_L28P/CLK0P	DIFFIO_RX_L38P/DPCLK1	R3	
	M8	DIFFIO_RX_L36N/CLK1N	DIFFIO_RX_L59N/PLL_L_CLKOUTN	T5	
	M9	DIFFIO_RX_L36P/CLK1P	DIFFIO_RX_L59P/PLL_L_CLKOUTP	T6	

BANK-3 VCCIO = 3.3V

GPIO_2	V9	DIFFIO_TX_RX_B18N/CLK6N
GPIO_0	V10	DIFFIO_TX_RX_B18P/CLK6P
	R11	DIFFIO_TX_RX_B20N/CLK7N
MAX10_CLK1_50	P11	DIFFIO_TX_RX_B20P/CLK7P

BANK-4 VCCIO = 3.3V

DIFFIO_TX_RX_B57N/PLL_B_CLKOUTN		W17	
DIFFIO_TX_RX_B57P/PLL_B_CLKOUTP		V17	

BANK-6 VCCIO = 3.3V

MAX10_CLK2_50	N15	DIFFIO_RX_R38N/CLK2N	DIFFIO_RX_R50N/DPCLK2/DQSn2R	L15	
	N14	DIFFIO_RX_R38P/CLK2P	DIFFIO_RX_R50P/DPCLK3/DQS2R	L14	DRAM_CLK
	K21	DIFFIO_RX_R40N/CLK3N	DIFFIO_RX_R69N/PLL_R_CLKOUTN	G17	
	K22	DIFFIO_RX_R40P/CLK3P	DIFFIO_RX_R69P/PLL_R_CLKOUTP	H17	

BANK-8 VCCIO = 2.5V

	E10	DIFFIO_RX_T38N/CLK4N			
	E11	DIFFIO_RX_T38P/CLK4P			
	J10	DIFFIO_RX_T40P/CLK5P	DIFFIO_RX_T52N/PLL_T_CLKOUTN	E6	
	H11	DIFFIO_RX_T40N/CLK5N	DIFFIO_RX_T52P/PLL_T_CLKOUTP	D6	

10M50DAF484

CAD Note:
Place near IC power pin

VCC3P3

C159 10u 6.3V

C56 0.1u 10V

C52 0.1u 10V

VCC3P3

U16

C9 12p 50V

C11 12p 50V

Y2 24.00MHz

1	VDD	VDDO	8	VCC3P3		
2	XOUT	SSCLK1	4	R17	18.2	ADC_CLK_10
3	XIN/CLKIN	SSCLK3	7	R10	18.2	MAX10_CLK1_50
5	VSS	SSCLK2	6	R9	18.2	MAX10_CLK2_50

Si51211

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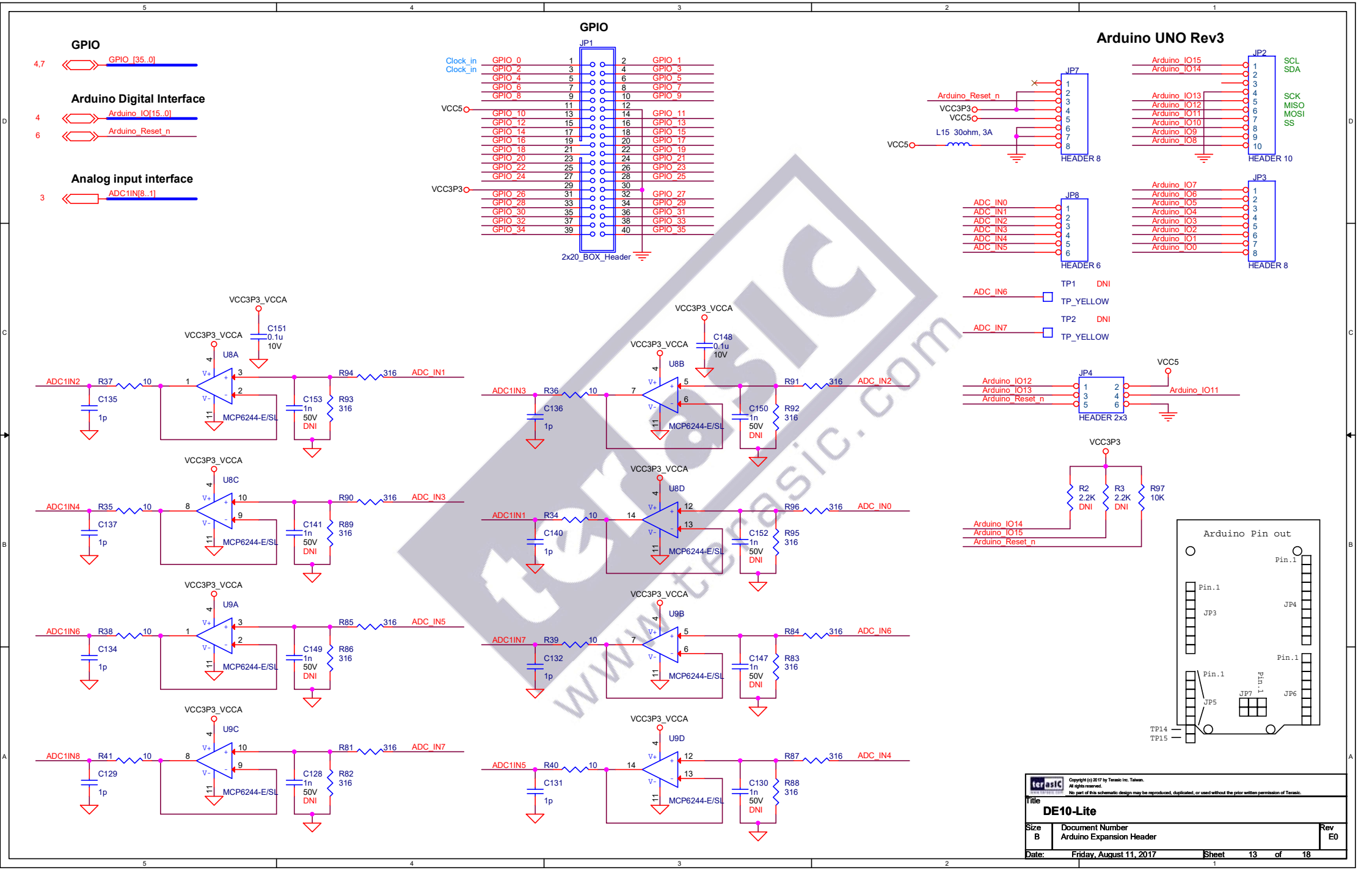
Title: **DE10-Lite**

Size	Document Number	Rev
B	MAX 10 Clocks	E0

Date: Friday, August 11, 2017 Sheet 7 of 18


GPIO
GPIO [35..0]
Arduino Digital Interface
Arduino_IO[15..0]
Arduino_Reset_n
Analog input interface
ADC1IN[8..1]
GPIO
JP1
2x20_BOX_Header
Arduino UNO Rev3
JP7
HEADER 8
JP2
HEADER 10
JP8
HEADER 6
JP3
HEADER 8
TP1
TP_YELLOW
TP2
TP_YELLOW
JP4
HEADER 2x3
VCC3P3_VCCA
MCP6244-E/SL
Arduino Pin out
Title
DE10-Lite
Size B
Document Number
Arduino Expansion Header
Rev E0
Date: Friday, August 11, 2017
Sheet 13 of 18

User IO, 7-Seg, LED

SWITCH

6 SW[9..0]

KEY

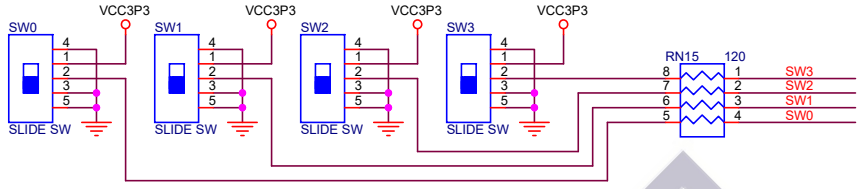
6 KEY[1..0]

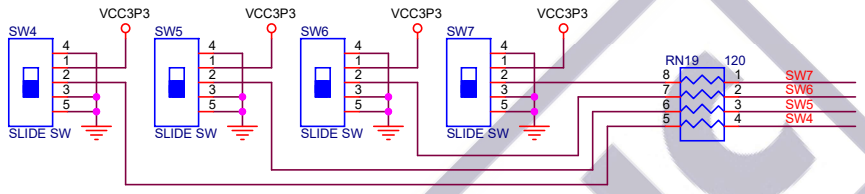
LED

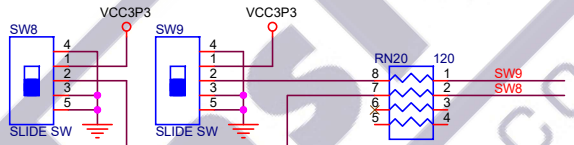
6 LEDR[9..0]

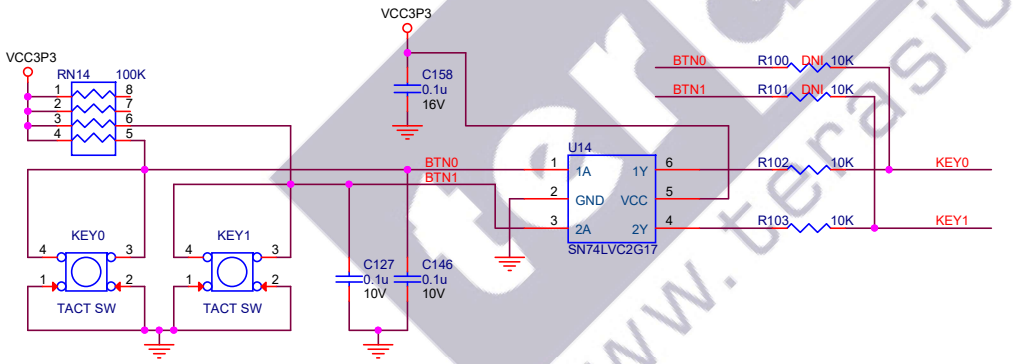
7-segment Display

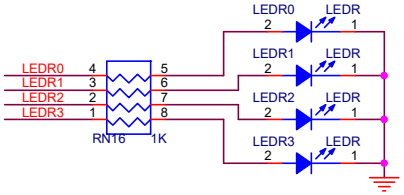
6 HEX0[7..0]
5,6 HEX1[7..0]
5,6 HEX2[7..0]
5,6 HEX3[7..0]
5 HEX4[7..0]
5 HEX5[7..0]

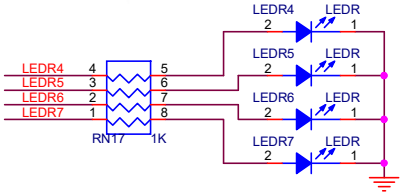


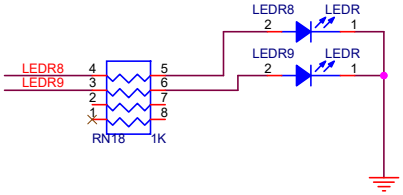


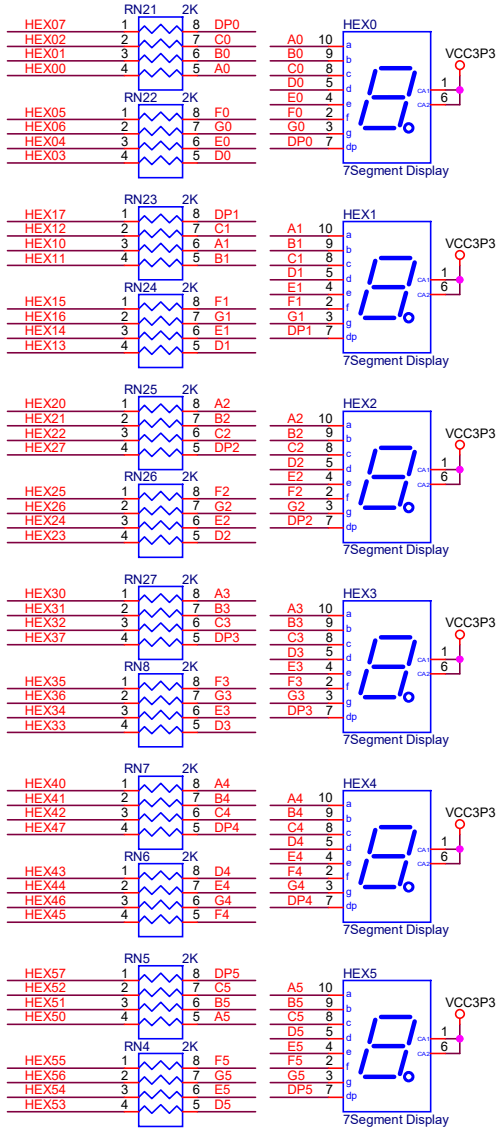












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Title: **DE10-Lite**

Size	Document Number	Rev
B	LED, 7'Segment, User I/O	E0

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