main.SchDoc

Connectors

FPGA

Power

XH1A

Net	Pin	Function	Function	Pin	Net
A1	A1	PA10/USART1_RX	GND	A2	GND
A3	A3	PA9/USART1_TX	USART1_CK/PA8	A4	A4
A5	A5	PC7/UART6_RX	UART6_TX/PC6	A6	A6
A7	A7	PB15/SPI2_MOSI	SPI2_MISO/PB14	A8	A8
+5.0V	A9	+5.0V		A10	GND
A11	A11	PB13/SPI2_SCK	SPI2_NSS/PB12	A12	A12
A13	A13	PB10/PWM	INT2/PB2	A14	A14
+4.2Vbat	A15	+4.2Vbat	GND	A16	GND
A17	A17	PB1/PWM	PWM/PB0	A18	A18
A19	A19	PC5/ADC1-5	ADC1-4/PC4	A20	A20
A21	A21	PA7/SPI1_MOSI	SPI1_MISO/PA6	A22	A22
+3.3V	A23	+3.3V	GND	A24	GND

XH1B

Net	Pin	Function	Function	Pin	Net
B1	B1	PA5/SPI1_SCK	GND	B2	GND
B3	B3	PA3/UART2_RX	SPI1_NSS/PA4	B4	B4
B5	B5	PA2/UART2_TX	PWM/PA1	B6	B6
B7	B7	PA0/PWM	ADC1-13/PC3	B8	B8
+5.0V	B9	+5.0V	GND	B10	GND
B11	B11	PC1/ADC1-11	ADC1-12/PC2	B12	B12
B13	B13	PC0/ADC1-10	INT13/PC13	B14	B14
+4.2Vbat	B15	+4.2Vbat	GND	B16	GND
B17_nEN	B17	PB8/PWM	PWM/PB9	B18	B18
B19	B19	PB6/I2C1_SCL	I2C1_SDA/PB7	B20	B20
B21	B21	PB5/PWM	PWM/PB4	B22	B22
+3.3V	B23	+3.3V	+3.3V	B24	GND

+3.3V C42 10uF GND

+3.3V C1 10uF GND

+3.3V R30 3.3k LED2 530nm GND

B17_nEN 100 R31 nEN

FPGA / Connectors

A20 — GPIO10
A18 — GPIO11
— GPIO24
B14 — GPIO25
— GPIO28
— GPIO30
B11 — GPIO31
FD0 — GPIO32
FD1 R1 33 GPIO33
FD2 — GPIO34

FB21 — GPIO38
FB22 R2 33 GPIO39
FB19 — GPIO42
FB20 — GPIO43
B21 — GPIO44
B22 — GPIO46
B19 R3 33 GPIO49
B20 — GPIO50

FB17 — GPIO51
FB18 R4 33 GPIO52
FB14 — GPIO53
FB13 — GPIO54
B18 — GPIO55
B12 — GPIO58
B4 R5 33 GPIO59
B1 — GPIO60

FB11 — GPIO64
FB12 R6 33 GPIO65
FB8 — GPIO66
FB7 — GPIO67
— GPIO68
FB6 — GPIO69
FB5 — GPIO70
FB4 R7 33 GPIO71
FB3 — GPIO72

FC21 — GPIO73
FC22 R8 33 GPIO74
FC19 — GPIO75
FC20 — GPIO76
— GPIO77
— GPIO80
— GPIO83
— GPIO84
FC17 R9 33 GPIO85
FC18 — GPIO86
FC15 — GPIO87
FC14 — GPIO88
FC13 R10 33 GPIO89
FC12 — GPIO90
FC11 — GPIO98
FC9 — GPIO99
FC8 R11 33 GPIO100
FC7 — GPIO101
FC6 — GPIO103
FC5 — GPIO104
FC4 R12 33 GPIO105
FC3 — GPIO106

FA21 — GPIO110
FA22 R13 33 GPIO111
FA19 — GPIO112
FA20 — GPIO113
A19 — GPIO114
A21 — GPIO115
A22 — GPIO119
A13 R14 33 GPIO120
A12 — GPIO121
FA17 — GPIO124
FA18 R15 33 GPIO125
FA14 — GPIO126
FA13 — GPIO127
A11 — GPIO128
A8 — GPIO129
A7 R16 33 GPIO132
A6 — GPIO133
FA12 — GPIO135
FA11 — GPIO136
FA8 R17 33 GPIO137
FA7 — GPIO138
FA6 — GPIO141
FA5 — GPIO142
FA4 R21 33 GPIO143
FA3 — GPIO144

A5 — GPIO1
A3 — GPIO2
A4 R22 33 GPIO3
A1 — GPIO7

+3.3V

R23 10k

FPGA__nEN

nEN

VT1 AO3401A

R27 3.3k

LED1 590nm

FLT6

FLT3

C4 10uF

C5 10uF

+3.3V_FPGA

GND

+3.3V_FPGA

IC1

1 VIN   ADJ/BYP 4
2 GND   VOUT 5
3 EN

SPX3819M5-L-1-2

C6 10uF   C7 0.1uF

GND

C11 0.1uF

+1.2V

C8 0.1uF   C9 10uF

GND

FLT4

+1.2V_VCCD

C10 10uF

GND

+3.3V_FPGA

IC2

1 VIN   ADJ/BYP 4
2 GND   VOUT 5
3 EN

SPX3819M5-L-2-5

C12 10uF   C13 0.1uF

GND

C17 0.1uF

+2.5V

C14 0.1uF   C15 10uF

GND

FLT5

+2.5V_VCCA

C16 10uF

GND

+1.2V

C18 0.1uF   C19 0.1uF   C20 0.1uF   C21 0.1uF   C22 0.1uF   C23 0.1uF   C24 0.1uF   C25 0.1uF

GND

+1.2V

U1A

5	VCCINT	VCCIO1	17
29	VCCINT	VCCIO2	26
45	VCCINT	VCCIO3	40
61	VCCINT	VCCIO3	47
78	VCCINT	VCCIO4	56
102	VCCINT	VCCIO4	62
116	VCCINT	VCCIO5	81
134	VCCINT	VCCIO6	93
		VCCIO7	117
		VCCIO7	122
		VCCIO8	130
		VCCIO8	139

+3.3V_FPGA

+2.5V_VCCA   +2.5V_VCCA

35 VCCA1   VCCD_PLL1 37   +1.2V_VCCD
107 VCCA2   VCCD_PLL2 109   +1.2V_VCCD

EP4CE6E22

C38 0.1uF   C39 0.1uF

GND

C40 0.1uF   C41 0.1uF

GND

+3.3V_FPGA

C26 0.1uF   C27 0.1uF   C28 0.1uF   C29 0.1uF   C30 0.1uF   C31 0.1uF   C32 0.1uF   C33 0.1uF   C34 0.1uF   C35 0.1uF   C36 0.1uF   C37 0.1uF

GND

U1D

4	GND	GND	95
19	GND	GND	118
22	GND	GND	123
27	GND	GND	131
41	GND	GND	140
48	GND	
57	GND	
63	GND	
79	GND	GNDA1	36
82	GND	GNDA2	108

GND   EP4CE6E22   GND

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A

B

C

D

XA1

+3.3V — FA3 — FA3 | 1 2 | FA4 — FA4 — GND
FA3 — FA5 | 3 4 | FA6 — FA6
FA5 — FA7 | 5 6 | FA8 — FA8
FA7 | 7 8 |
+5.0V | 9 10 | — GND
FA11 — FA11 | 11 12 | FA12 — FA12
FA13 — FA13 | 13 14 | FA14 — FA14
+4.2Vbat | 15 16 | — GND
FA17 — FA17 | 17 18 | FA18 — FA18
FA19 — FA19 | 19 20 | FA20 — FA20
FA21 — FA21 | 21 22 | FA22 — FA22
+3.3V | 23 24 | — GND

Left Con

XC1

+3.3V — FC3 — FC3 | 1 2 | FC4 — FC4 — GND
FC3 — FC5 | 3 4 | FC6 — FC6
FC5 — FC7 | 5 6 | FC8 — FC8
FC7 | 7 8 |
FC9 — FC9 | 9 10 | — GND
FC11 — FC11 | 11 12 | FC12 — FC12
FC13 — FC13 | 13 14 | FC14 — FC14
FC15 — FC15 | 15 16 | — GND
FC17 — FC17 | 17 18 | FC18 — FC18
FC19 — FC19 | 19 20 | FC20 — FC20
FC21 — FC21 | 21 22 | FC22 — FC22
+3.3V | 23 24 | — GND

Top Con

XB1

+3.3V — FB3 — FB3 | 1 2 | FB4 — FB4 — GND
FB3 — FB5 | 3 4 | FB6 — FB6
FB5 — FB7 | 5 6 | FB8 — FB8
FB7 | 7 8 |
+5.0V | 9 10 | — GND
FB11 — FB11 | 11 12 | FB12 — FB12
FB13 — FB13 | 13 14 | FB14 — FB14
+4.2Vbat. | 15 16 | — GND
FB17 — FB17 | 17 18 | FB18 — FB18
FB19 — FB19 | 19 20 | FB20 — FB20
FB21 — FB21 | 21 22 | FB22 — FB22
+3.3V | 23 24 | — GND

Right Con

XD1
FD0 — FD0 | 3
+5.0V | 2
GND | 1
Header 3

XD2
FD1 — FD1 | 3
+5.0V | 2
GND | 1
Header 3

XD3
FD2 — FD2 | 3
+5.0V | 2
GND | 1
Header 3

C43
+5.0V — GND
47uF

Connectors.SchDoc

U1B

EP4CE6E22

GPIO1	B1_0	1	B1_IO	B8_IO__DIFFIO_T1p__DM1T	144	B8_11	GPIO144
GPIO2	B1_1		B1_IO	B8_IO__DIFFIO_T1n__DQ1T	143	B8_10	GPIO143
GPIO3	B1_2		B1_IO	B8_IO__DIFFIO_T2p__DQS1T/CQ1T#,DPCLK7	142	B8_9	GPIO142
GPIO7	B1_3		B1_IO__VREFB1N0	B8_IO__DIFFIO_T5p	141	B8_8	GPIO141
GPIO10	B1_4	10	B1_IO__DIFFIO_L4p__DQS0L/CQ1L,DPCLK0	B8_IO	138	B8_7	GPIO138
GPIO11	B1_5		B1_IO__DIFFIO_L4n	B8_IO	137	B8_6	GPIO137
	FPGA_CLK_40M	23	B1_CLK1__DIFFCLK_0n	B8_IO__VREFB8N0	136	B8_5	GPIO136
GPIO24	B2_0	24	B2_CLK2__DIFFCLK_1p	B8_IO__DIFFIO_T8n__DQ1T	135	B8_4	GPIO135
GPIO25	B2_1	25	B2_CLK3__DIFFCLK_1n	B8_IO__DIFFIO_T10p__DQ1T	133	B8_3	GPIO133
GPIO28	B2_2	28	B2_IO__DIFFIO_L6n	B8_IO__DIFFIO_T10n__DQ1T	132	B8_2	GPIO132
GPIO30	B2_3	30	B2_IO__DIFFIO_L8p__DQS1L/CQ1L#,DPCLK1	B8_IO__DIFFIO_T11p	129	B8_1	GPIO129
GPIO31	B2_4	31	B2_IO__VREFB2N0	B8_IO__DIFFIO_T11n	128	B8_0	GPIO128
GPIO32	B2_5	32	B2_IO__RUP1	B7_IO__DIFFIO_T12p	127	B7_12	GPIO127
GPIO33	B2_6	33	B2_IO__RDN1	B7_IO__DIFFIO_T12n	126	B7_11	GPIO126
GPIO34	B2_7	34	B2_IO	B7_IO	125	B7_10	GPIO125
GPIO38	B3_0	35	B3_IO__DIFFIO_B1p	B7_9	124	B7_9	GPIO124
GPIO39	B3_1	39	B3_IO__DIFFIO_B1n	B7_IO__DIFFIO_T13p	121	B7_8	GPIO121
GPIO42	B3_2	42	B3_IO__DQS1B/CQ1B#,DPCLK2	B7_IO__DIFFIO_T16p	120	B7_7	GPIO120
GPIO43	B3_3	43	B3_IO__PLL1_CLKOUTp	B7_IO__DIFFIO_T16n__DQ1T	119	B7_6	GPIO119
GPIO44	B3_4	44	B3_IO__PLL1_CLKOUTn	B7_IO__VREFB7N0	115	B7_5	GPIO115
GPIO46	B3_5	46	B3_IO__VREFB3N0	B7_IO__RDN4__DQ1T	114	B7_4	GPIO114
GPIO49	B3_6	49	B3_IO__DIFFIO_B9p__DQ1B	B7_IO__RUP4__DQ1T	113	B7_3	GPIO113
GPIO50	B3_7	50	B3_IO__DIFFIO_B9n__DQ1B	B7_IO__PLL2_CLKOUTp	112	B7_2	GPIO112
GPIO51	B3_8	51	B3_IO__DIFFIO_B10p__DQ1B	B7_IO__PLL2_CLKOUTn	111	B7_1	GPIO111
GPIO52	B3_9	52	B3_IO__DIFFIO_B11p	B7_IO__DIFFIO_T19p	110	B7_0	GPIO110
GPIO53	B3_10	53	B3_IO__DIFFIO_B11n	B7_IO__DIFFIO_T20p__DQS0T/CQ1T,DPCLK6	106	B6_8	GPIO106
GPIO54	B4_0	54	B4_IO__DIFFIO_B12p	B6_IO__DIFFIO_R1n	105	B6_7	GPIO105
GPIO55	B4_1	55	B4_IO__DIFFIO_B12n	B6_IO__VREFB6N0	104	B6_6	GPIO104
GPIO58	B4_2	58	B4_IO__DIFFIO_B15p__DQ1B	B6_IO__DQS0R/CQ1R,DPCLK5	103	B6_5	GPIO103
GPIO59	B4_3	59	B4_IO__DIFFIO_B16p__DQ1B	B6_IO__DIFFIO_R3p	101	B6_4	GPIO101
GPIO60	B4_4	60	B4_IO__DIFFIO_B16n__DQ1B	B6_IO__DIFFIO_R3n	100	B6_3	GPIO100
GPIO64	B4_5	64	B4_IO	B6_IO	99	B6_2	GPIO99
GPIO65	B4_6	65	B4_IO__VREFB4N0	B6_IO__DIFFIO_R4p	98	B6_1	GPIO98
GPIO66	B4_7	66	B4_IO__RUP2__DQ1B	B6_IO__DIFFIO_R4n	91	FPGA_CLK_50M	
GPIO67	B4_8	67	B4_IO__RDN2__DQ1B	B6_CLK4__DIFFCLK_2p	90	B6_0	GPIO90
GPIO68	B4_9	68	B4_IO__DIFFIO_B20n__DQS0B/CQ1B,DPCLK3	B6_CLK5__DIFFCLK_2n	89	B5_12	GPIO89
GPIO69	B4_10	69	B4_IO	B5_CLK6__DIFFCLK_3p	88	B5_11	GPIO88
GPIO70	B4_11	70	B4_IO__DIFFIO_B21p	B5_CLK7__DIFFCLK_3n	87	B5_10	GPIO87
GPIO71	B4_12	71	B4_IO__DIFFIO_B21n	B5_IO__DIFFIO_R7p	86	B5_9	GPIO86
GPIO72	B4_13	72	B4_IO__DIFFIO_B22p	B5_IO__DIFFIO_R7n	85	B5_8	GPIO85
GPIO73	B5_0	73	B5_IO	B5_IO__DIFFIO_R8p__DQS1R/CQ1R#,DPCLK4	84	B5_7	GPIO84
GPIO74	B5_1	74	B5_IO	B5_IO__DIFFIO_R8n	83	B5_6	GPIO83
GPIO75	B5_2	75	B5_IO	B5_IO	80	B5_5	GPIO80
GPIO76	B5_3	76	B5_IO__RUP3	B5_IO__VREFB5N0	77	B5_4	GPIO77
				B5_IO__RDN3			

EP4CE6E22

U1C

+3.3V_FPGA

R18 10k   R19 10k   R20 10k

9	B1_nSTATUS	B1_IO__FLASH_nCE,nCSO	8	AS_nCS
14	B1_nCONFIG	B1_DCLK	12	AS_DCLK
21	B1_nCE	B1_IO__DATA0	13	AS_DATA0
92	B6_CONF_DONE	B1_IO__DATA1,ASDO	6	AS_ASDI

+2.5V_VCCA

94	B6_MSEL0	B1_TCK	16	B1_16
96	B6_MSEL1	B1_TDO	20	B1_20
97	B6_MSEL2	B1_TMS	18	B1_18
		B1_TDI	15	B1_15

R32 1k
GND
EP4CE6E22

U2
EPCS4

1	CS	VCC	3
6	DCLK	VCC	7
2	DATA	VCC	8
5	ASDI	GND	4

+3.3V_FPGA
R28 22
GND

+3.3V_FPGA
C65 0.1uF
GND

B1_20	FPGA_JTAG_TDO
B1_18	FPGA_JTAG_TMS
B1_16	R29 33 FPGA_JTAG_TCK
B1_15	FPGA_JTAG_TDI

+3.3V_FPGA
FLT1
C2 10uF   C3 0.1uF
FPGA_CLK_40M
GND

4	VDD
3	CLK
2	GND
1	EN

G2

+3.3V_FPGA
FLT2
C63 10uF   C64 0.1uF
FPGA_CLK_50M
GND

4	VDD
3	CLK
2	GND
1	EN

G1

+3.3V_FPGA
R24 10k   R25 10k   R26 10k

P1

FPGA_JTAG_TCK	1	2	GND
FPGA_JTAG_TDO	3	4	+3.3V
FPGA_JTAG_TMS	5	6	
	7	8	
FPGA_JTAG_TDI	9	10	GND

JTAG

R36 1k
GND

FPGA.SchDoc

JTAG

f32 f33 f34
+5V +5V +5V
GND GND GND

FPGA REV0.2
CycloneIV

LED
EN
3.3VEN

1

XC1

XA1

U1

XB1

JTAG

f32 f33 f34
+5V +5V +5V
GND GND GND

P1

LED1

LED2

XD1 XD2 XD3

FPGA REV0.2
CycloneIV

R18 C11 IC1 C7 C6
C9 C8
C63 FLT6 C4
C64 C17 FLT3
FLT2 C15 C14 IC2 C13 C12 VT1
G1 C5 R23 C42

R8 R9 R10 R11 R12

R31 R13
R7 C30 R14
C31 C21 C38 FLT5
R6 C20 C16
C32 C40 C22 C36 R15
R5 C19 FLT4 C37
C35 C29
C10 R16
R4 C18 C41 C23
C34 C25 C28 R17
C33 C24 C27 C65 R21
R3 C26 R22
R2 C39

R1 C1
G2 R29 R28 U2 R19 R20
FLT1
C3 R32 R27
C2 LED
R26 3.3VEN
C43 R24 R30
R25 R36