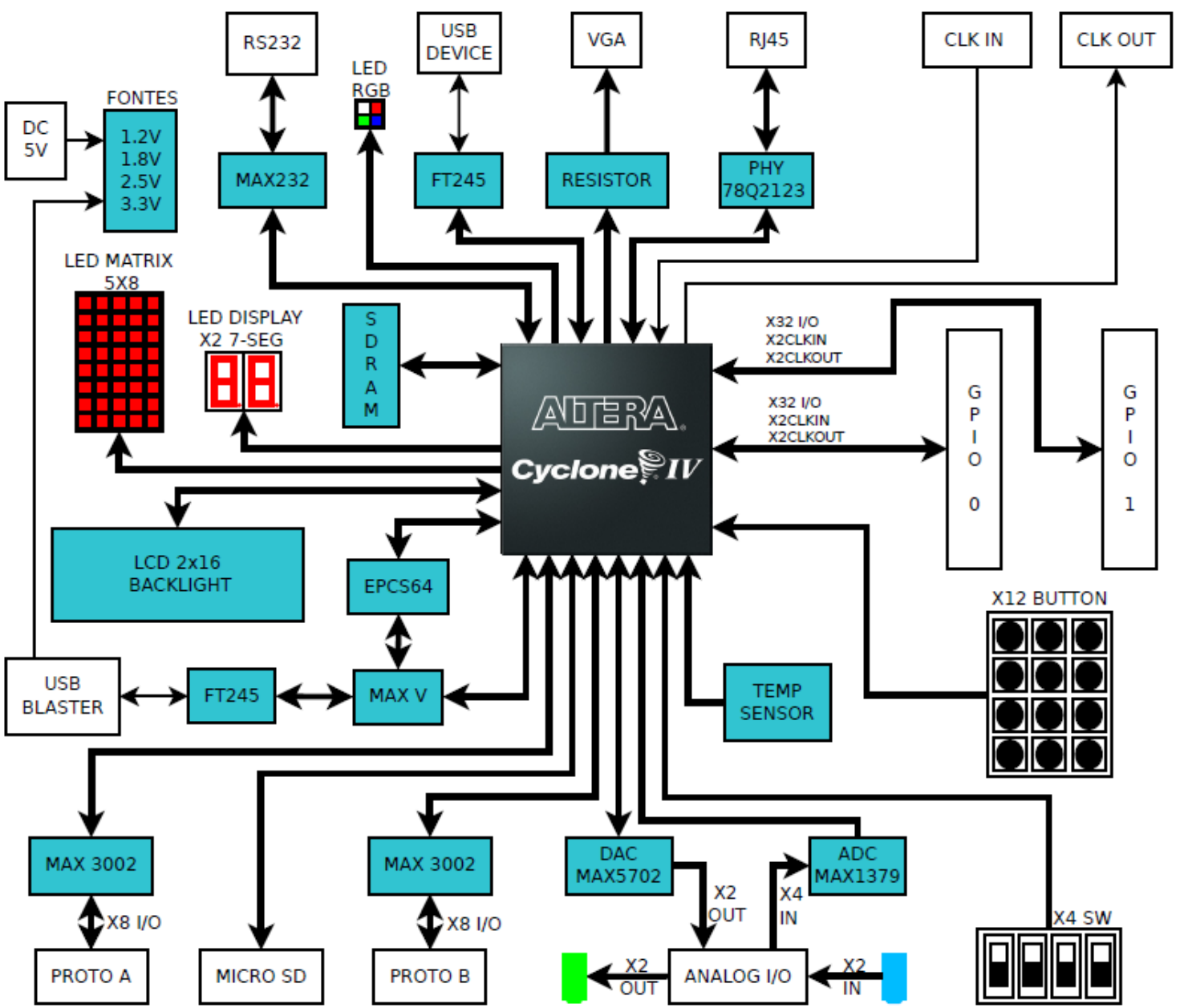
Kit de Desenvolvimento - MercurioIV

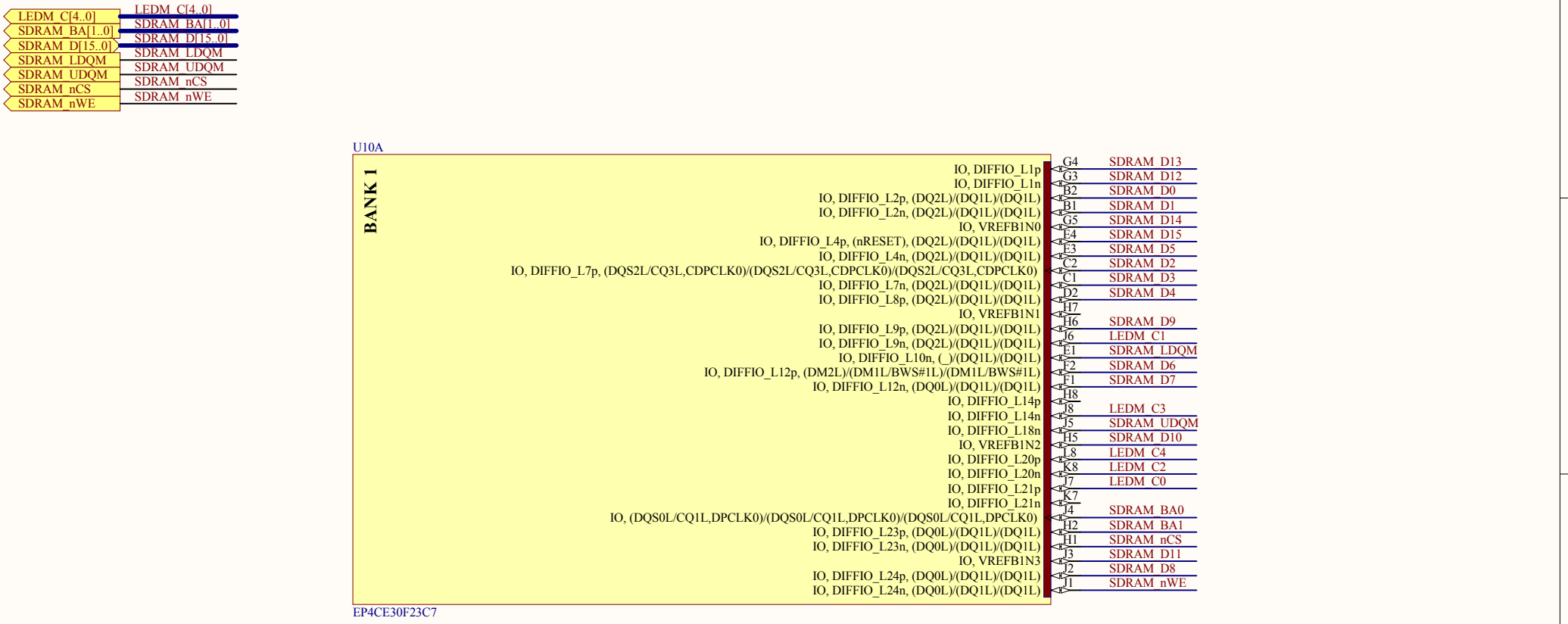


DESCRIÇÃO	FOLHA
Diagrama de Blocos e Sumário	1
FPGA I/O Bancos 1, 2, 3, 4, 5, 6, 7 e 8	2 ~ 9
FPGA Configuração e Clock	10
FPGA Alimentação e Desacoplamento	11
GPIO, PROTO IO, Clock Externo	12
Display LCD e LED, Matriz LED, RGB LED	13
Chaves e Botões	14
SDRAM	15
Porta Ethernet	16
Porta Serial e VGA	17
Porta USB Device e SDcard	18
Conversor ADC, DAC e Sensor de Temperatura	19
Reguladores de Tensão 1.2V, 1.8V, 2.5V e 3.3V	20
ALTERA USB Blaster	21

Title: Mercurio IV

Size	Document Number	Rev
A4	Block Diagram and Cover	2.1

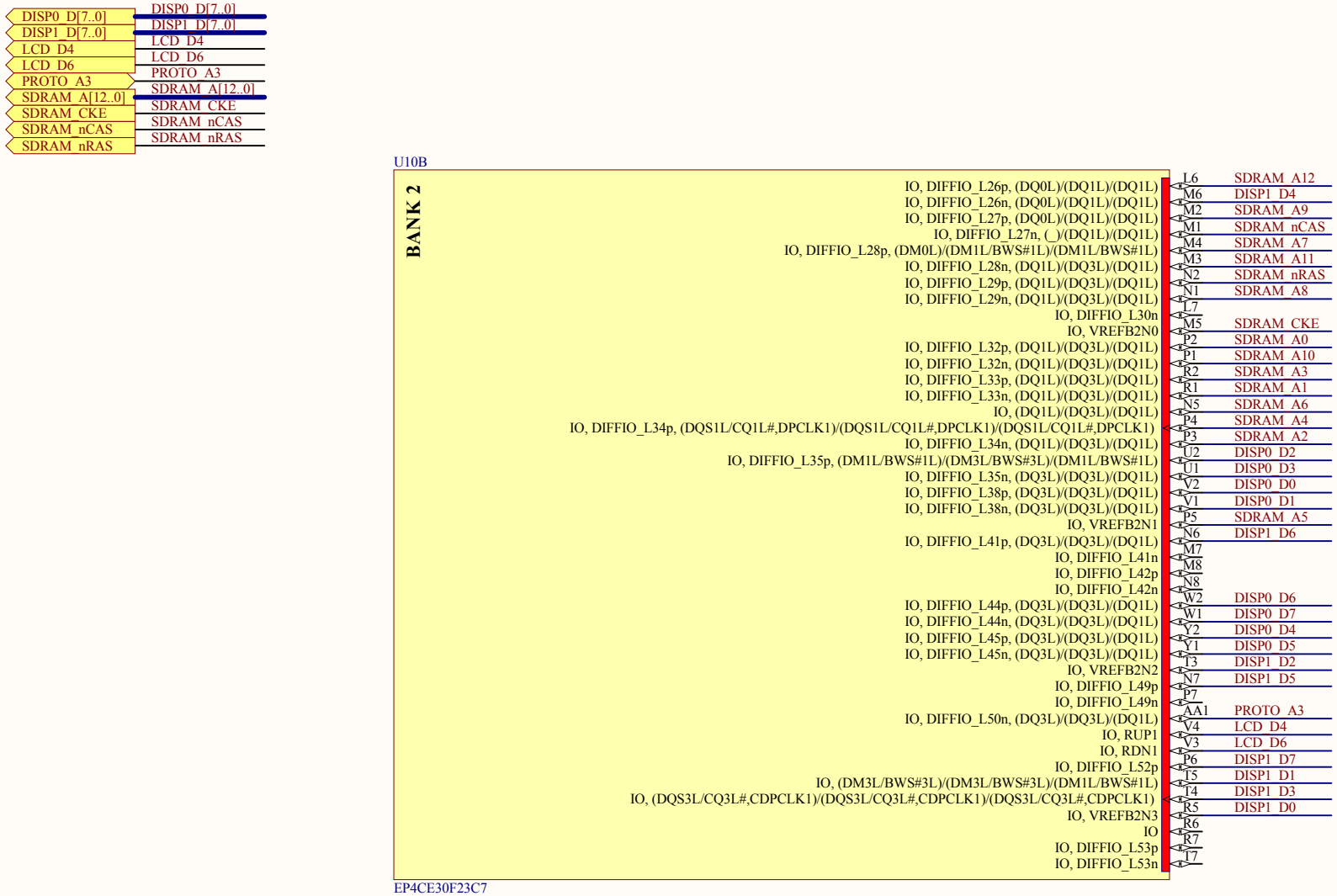
Date: 20/09/2013 Sheet 1 of 21



Title: Mercurio IV

Size	Document Number	Rev
A4	FPGA - BANK 1	2.1

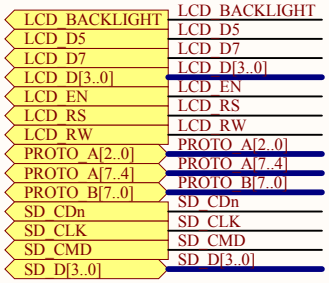
Date: 20/09/2013 Sheet 2 of 21



Title: Mercurio IV

Size	Document Number	Rev
A4	FPGA - BANK 2	2.1

Date: 20/09/2013 Sheet 3 of 21



U10C

BANK 3

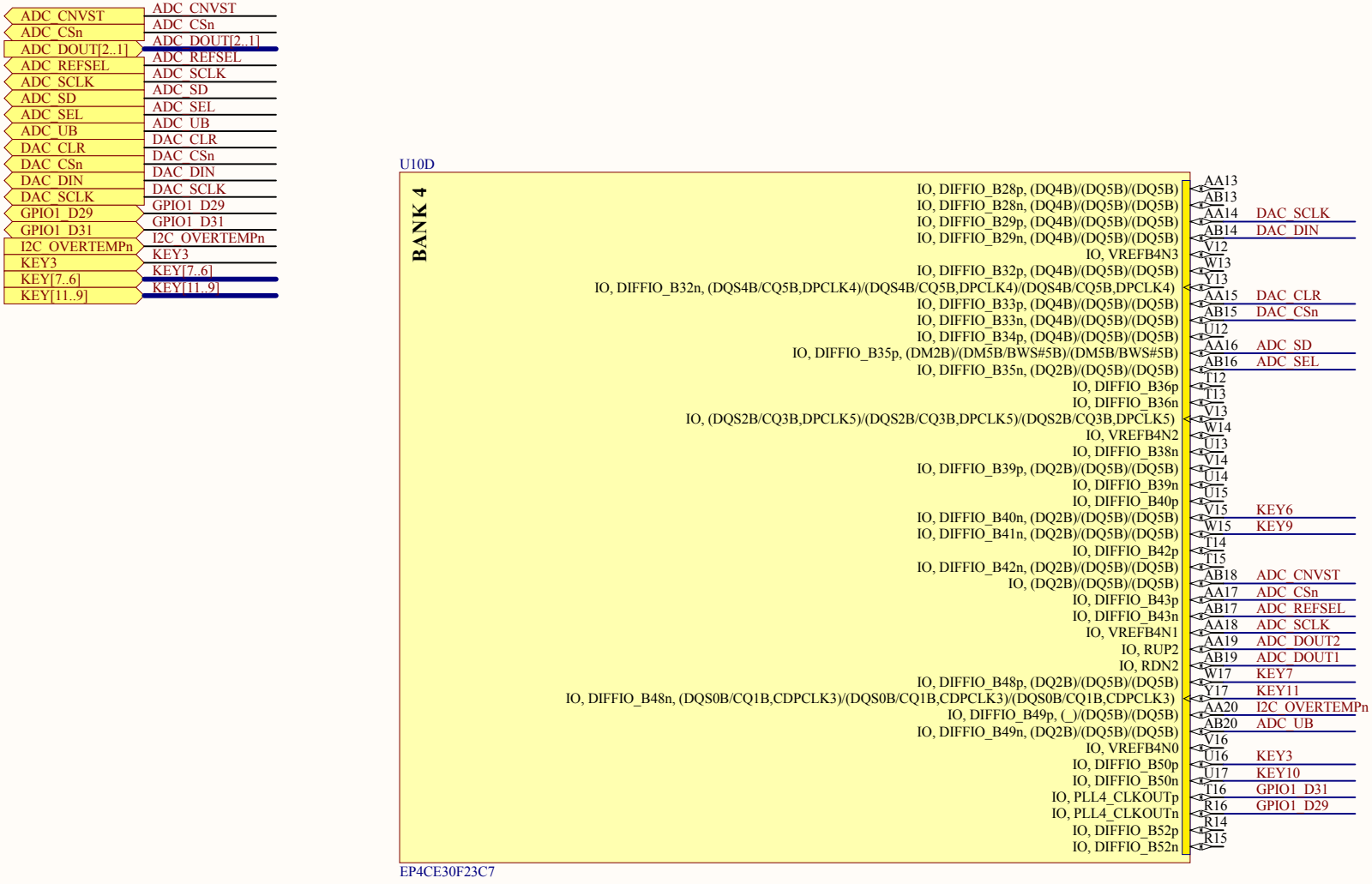
IO, DIFFIO_B1p	V6	LCD_D2
IO, DIFFIO_B1n, (DM3B/BWS#3B)/(DM3B/BWS#3B)/(DM5B/BWS#5B)	V5	LCD_D3
IO, DIFFIO_B3p	U7	SD_CDn
IO, DIFFIO_B3n	U8	LCD_RW
IO, VREFB3N3	Y4	LCD_D5
IO, DIFFIO_B4p, (DQ3B)/(DQ3B)/(DQ5B)	Y3	LCD_D7
IO, DIFFIO_B6p, (DQS1B/CQ1B#,CDPCLK2)/(DQS1B/CQ1B#,CDPCLK2)/(DQS1B/CQ1B#,CDPCLK2)	Y6	SD_D1
IO, PLL1_CLKOUTp	AA3	PROTO_A7
IO, PLL1_CLKOUTn	AB3	PROTO_A2
IO, DIFFIO_B7p, (DQ3B)/(DQ3B)/(DQ5B)	W6	SD_D0
IO, DIFFIO_B7n	V7	LCD_D1
IO, (DQ3B)/(DQ3B)/(DQ5B)	AA4	PROTO_A6
IO, VREFB3N2	AB4	PROTO_A1
IO, DIFFIO_B8p, (DQ3B)/(DQ3B)/(DQ5B)	AA5	PROTO_A5
IO, DIFFIO_B8n	AB5	PROTO_A0
IO, DIFFIO_B11p	T8	
IO, DIFFIO_B11n	T9	
IO, DIFFIO_B12p, (DQ3B)/(DQ3B)/(DQ5B)	W7	SD_CMD
IO, DIFFIO_B12n, (DQ3B)/(DQ3B)/(DQ5B)	Y7	SD_CLK
IO, DIFFIO_B13p, (DQ3B)/(DQ3B)/(DQ5B)	U9	LCD_RS
IO, DIFFIO_B13n, (DQ3B)/(DQ3B)/(DQ5B)	V8	LCD_D0
IO, (DQ3B)/(DQ3B)/(DQ5B)	W8	SD_D2
IO, DIFFIO_B14p, (DM5B/BWS#5B)/(DM3B/BWS#3B)/(DM5B/BWS#5B)	AA7	PROTO_A4
IO, DIFFIO_B14n, (DQ5B)/(DQ3B)/(DQ5B)	AB7	PROTO_B3
IO, (DQ5B)/(DQ3B)/(DQ5B)	Y8	SD_D3
IO, DIFFIO_B15p	T10	
IO, DIFFIO_B15n	T11	
IO, VREFB3N1	V9	LCD_EN
IO, DIFFIO_B16p, (DQS3B/CQ3B#,DPCLK2)/(DQS3B/CQ3B#,DPCLK2)/(DQS3B/CQ3B#,DPCLK2)	V10	LCD_BACKLIGHT
IO, DIFFIO_B17n, (DQ5B)/(DQ3B)/(DQ5B)	U10	
IO, DIFFIO_B18p, (DQ5B)/(DQ3B)/(DQ5B)	AA8	PROTO_B7
IO, DIFFIO_B18n, (DQ5B)/(DQ3B)/(DQ5B)	AB8	PROTO_B2
IO, DIFFIO_B21p, (DQ5B)/(DQ3B)/(DQ5B)	AA9	PROTO_B6
IO, DIFFIO_B21n, (DQS5B/CQ5B#,DPCLK3)/(DQS5B/CQ5B#,DPCLK3)/(DQS5B/CQ5B#,DPCLK3)	AB9	PROTO_B1
IO, VREFB3N0	U11	
IO, DIFFIO_B25n, (DQ5B)/(DQ3B)/(DQ5B)	V11	
IO, DIFFIO_B26p, (DQ5B)/(DQ3B)/(DQ5B)	W10	
IO, DIFFIO_B26n, (DQ5B)/(DQ3B)/(DQ5B)	Y10	PROTO_B4
IO, DIFFIO_B27p, (DM4B)/(DM5B/BWS#5B)/(DM5B/BWS#5B)	AA10	PROTO_B5
IO, DIFFIO_B27n, (_)/(DQ5B)/(DQ5B)	AB10	PROTO_B0

EP4CE30F23C7

Title: **Mercurio IV**

Size	Document Number	Rev
A4	FPGA - BANK 3	2.1

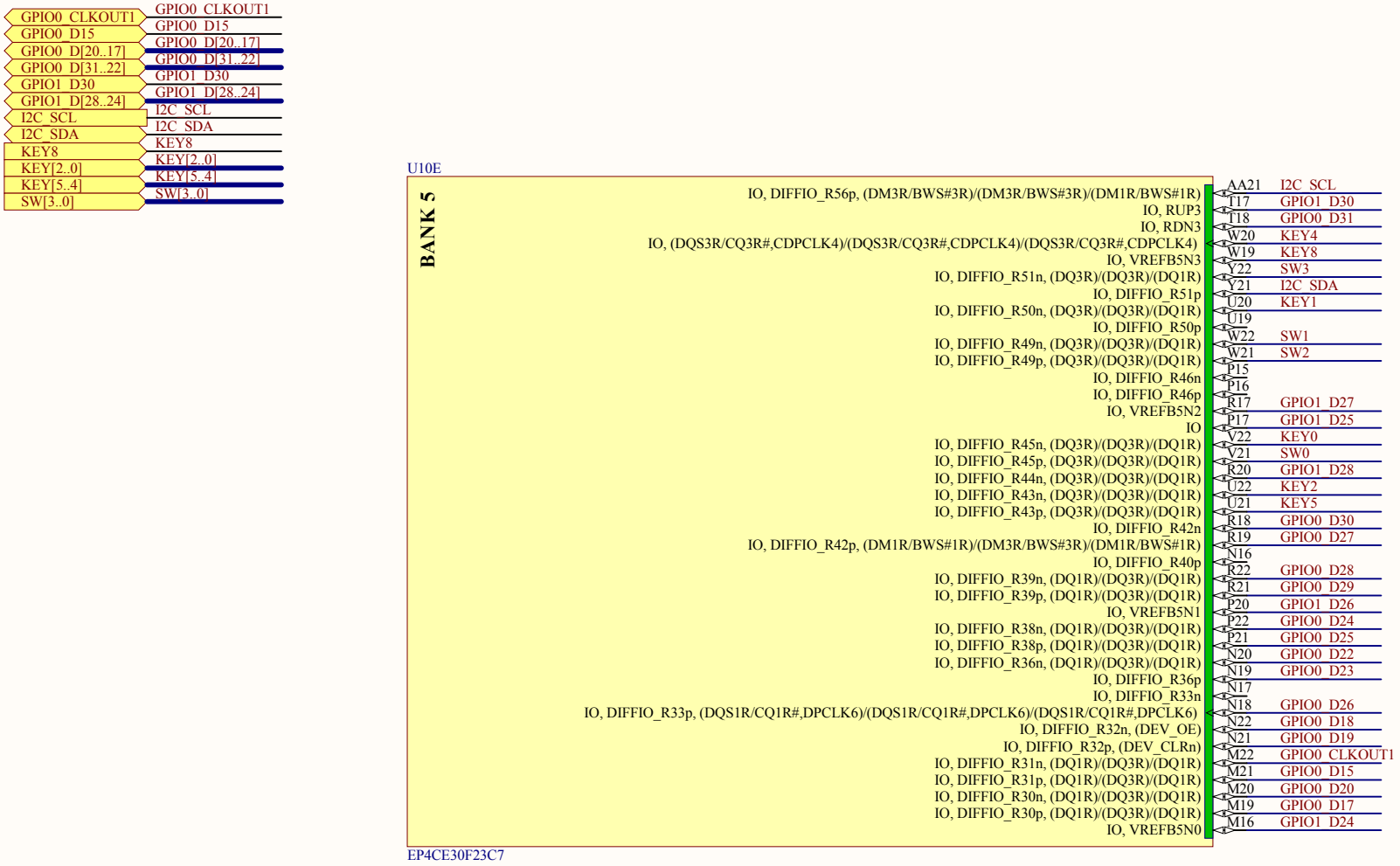
Date: 20/09/2013 Sheet 4 of 21



Title: Mercurio IV

Size	Document Number	Rev
A4	FPGA - BANK 4	2.1

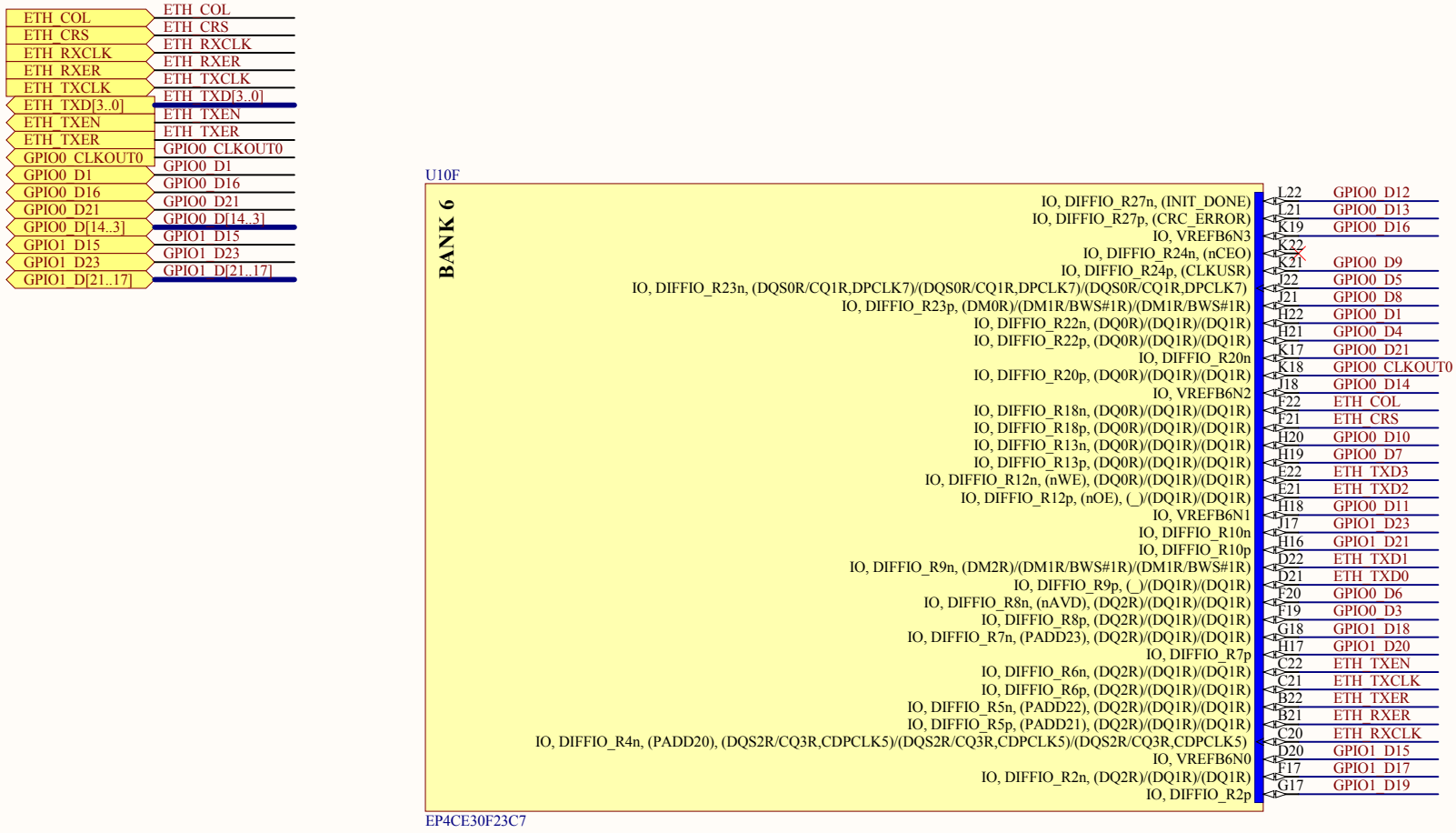
Date: 20/09/2013 Sheet 5 of 21



Title: Mercurio IV

Size	Document Number	Rev
A4	FPGA - BANK 5	2.1

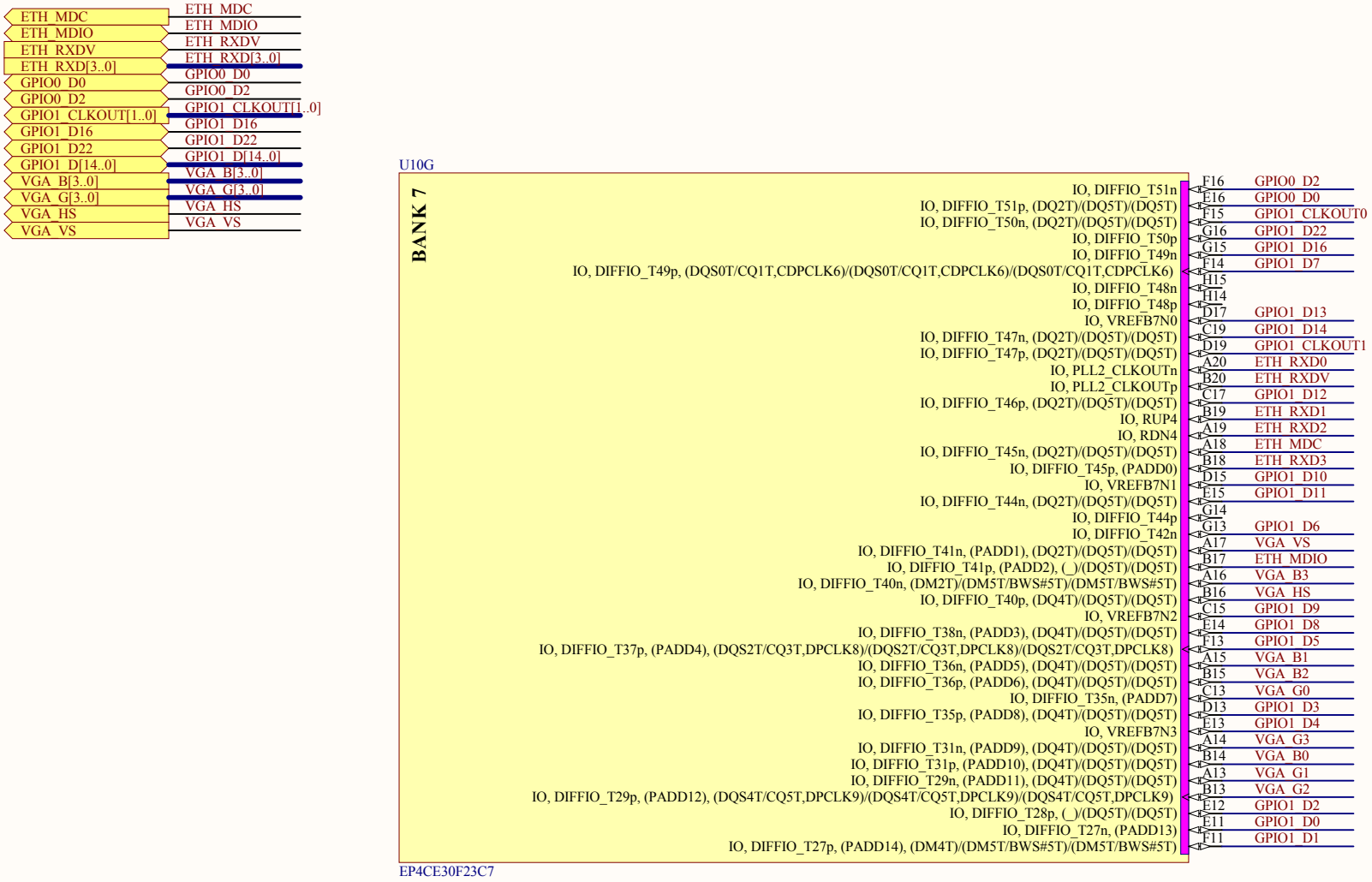
Date: 20/09/2013 Sheet 6 of 21



Title: Mercurio IV

Size	Document Number	Rev
A4	FPGA - BANK 6	2.1

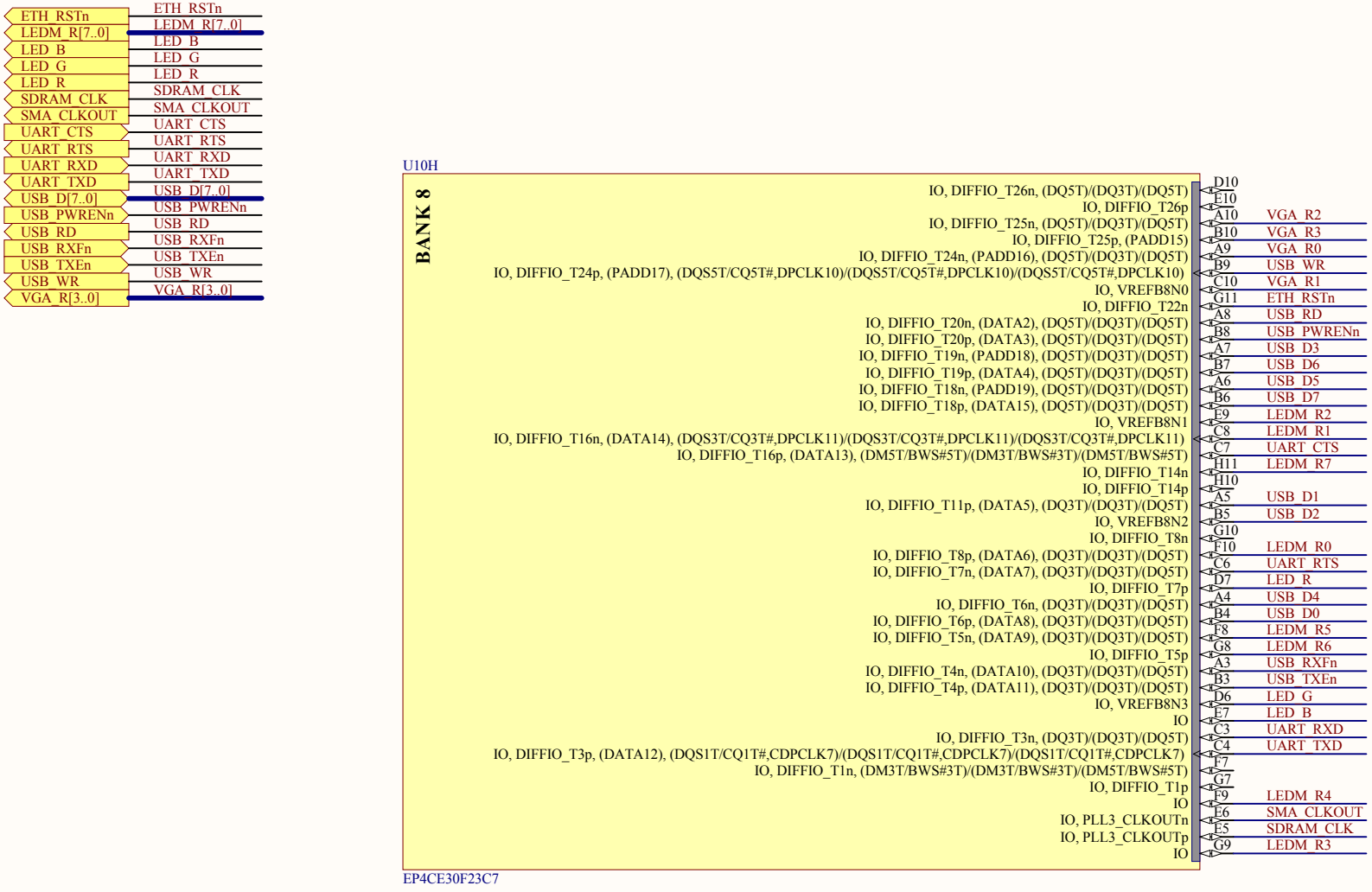
Date: 20/09/2013 Sheet 7 of 21



Title: Mercurio IV

Size	Document Number	Rev
A4	FPGA - BANK 7	2.1

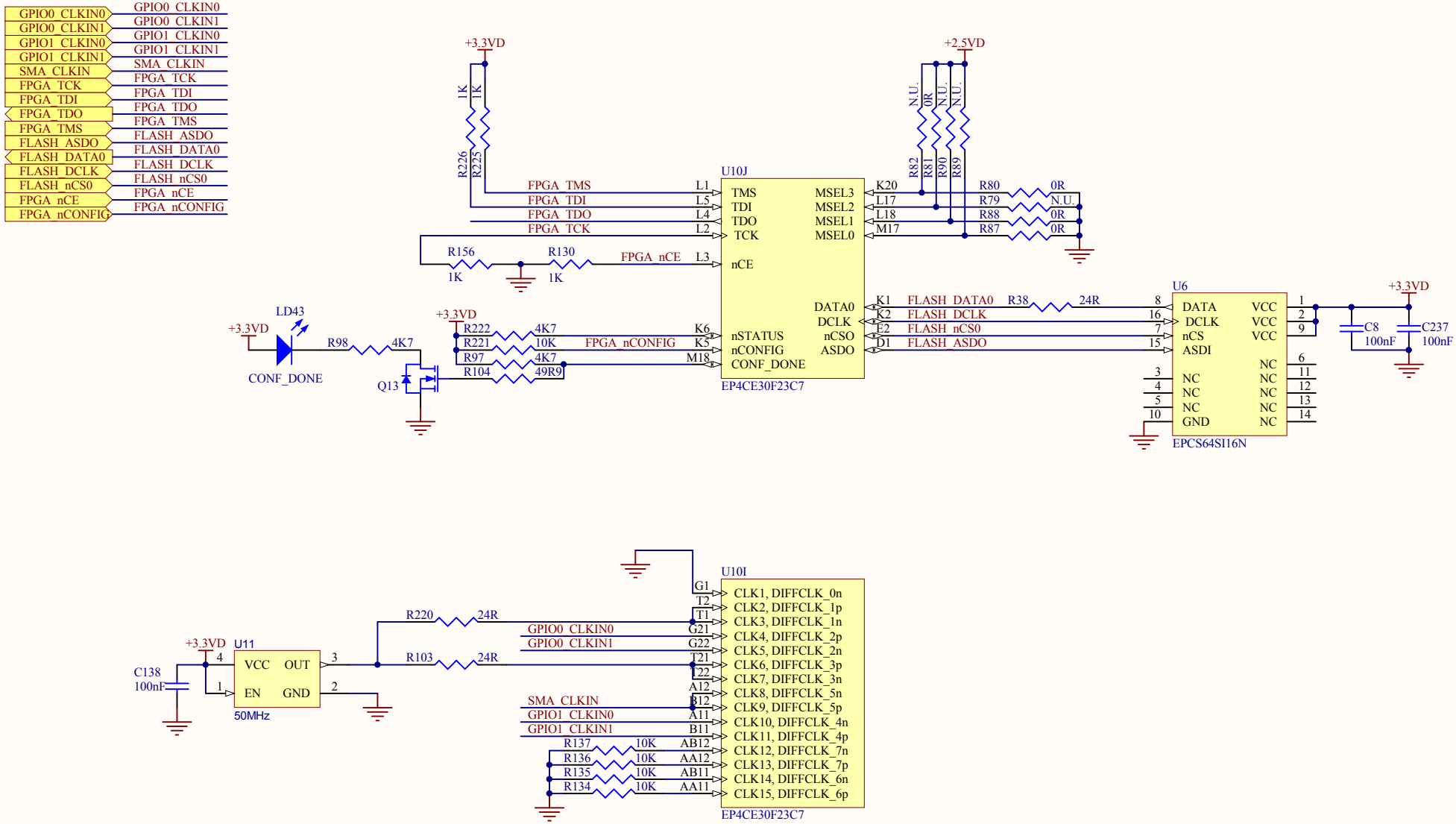
Date: 20/09/2013 Sheet 8 of 21



Title: Mercurio IV

Size	Document Number	Rev
A4	FPGA - BANK 8	2.1

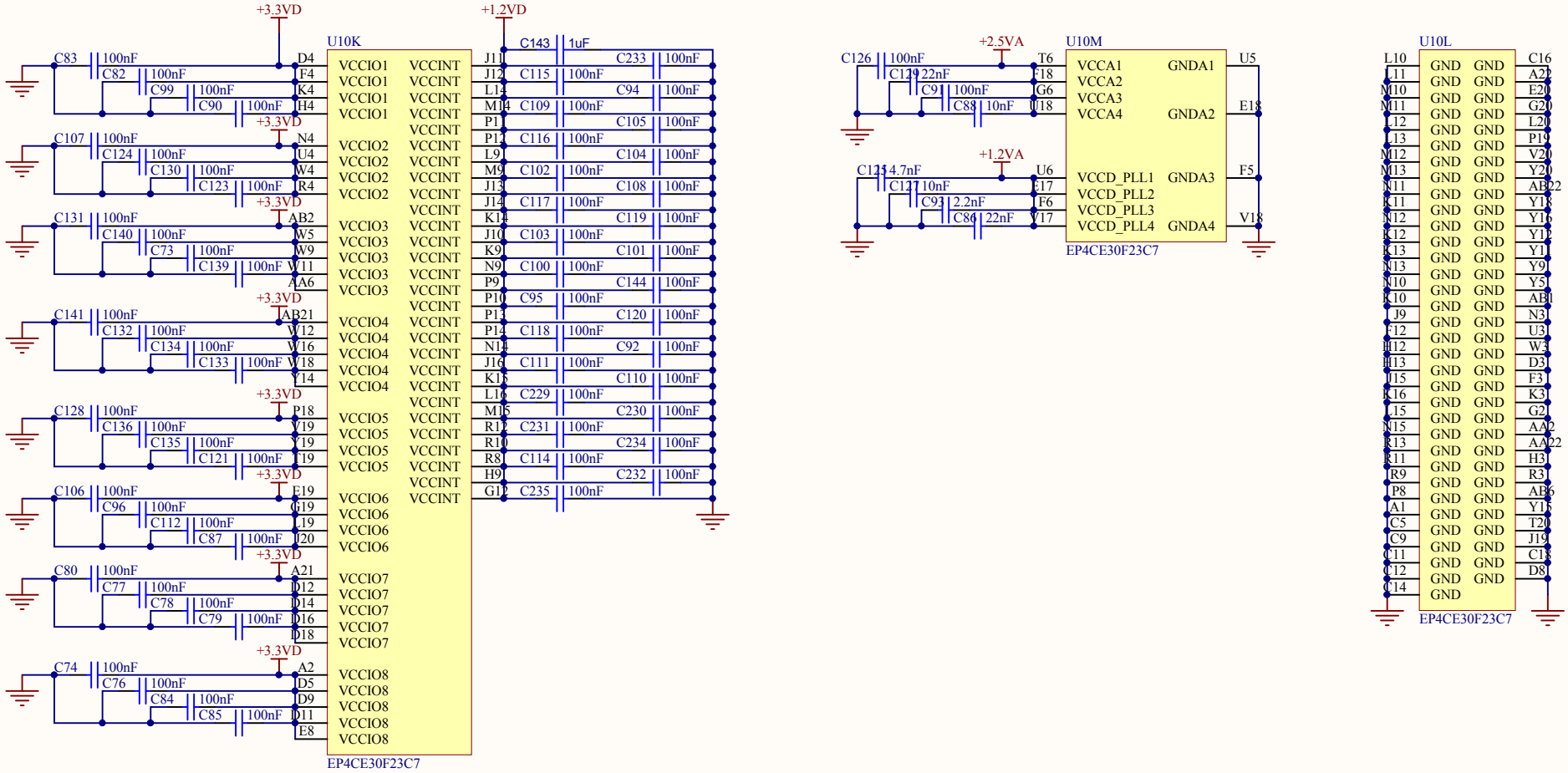
Date: 20/09/2013 Sheet 9 of 21



Title: Mercurio IV

Size	Document Number	Rev
A4	FPGA CONFIG - CLOCK - FLASH	2.1

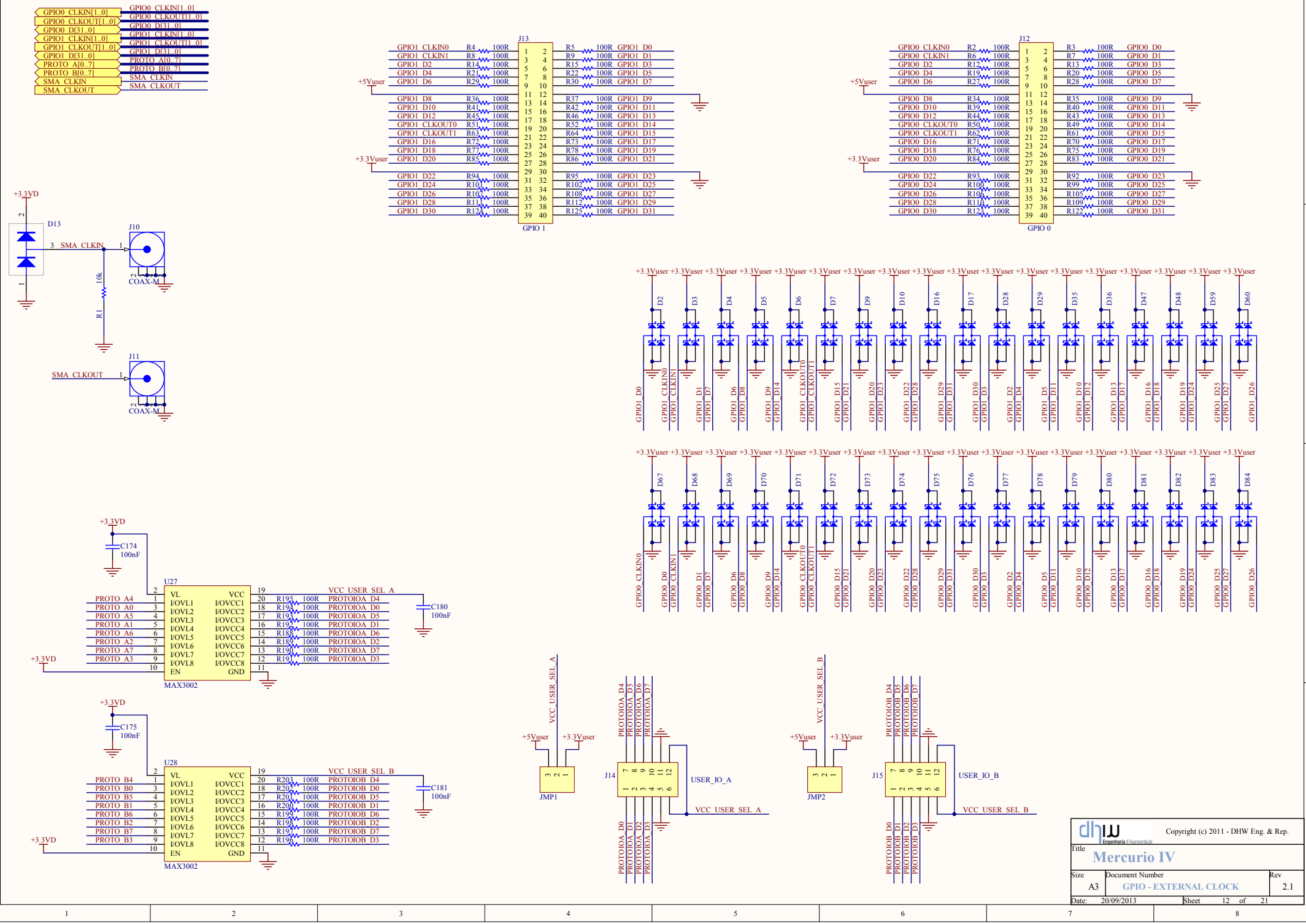
Date: 20/09/2013 Sheet 10 of 21

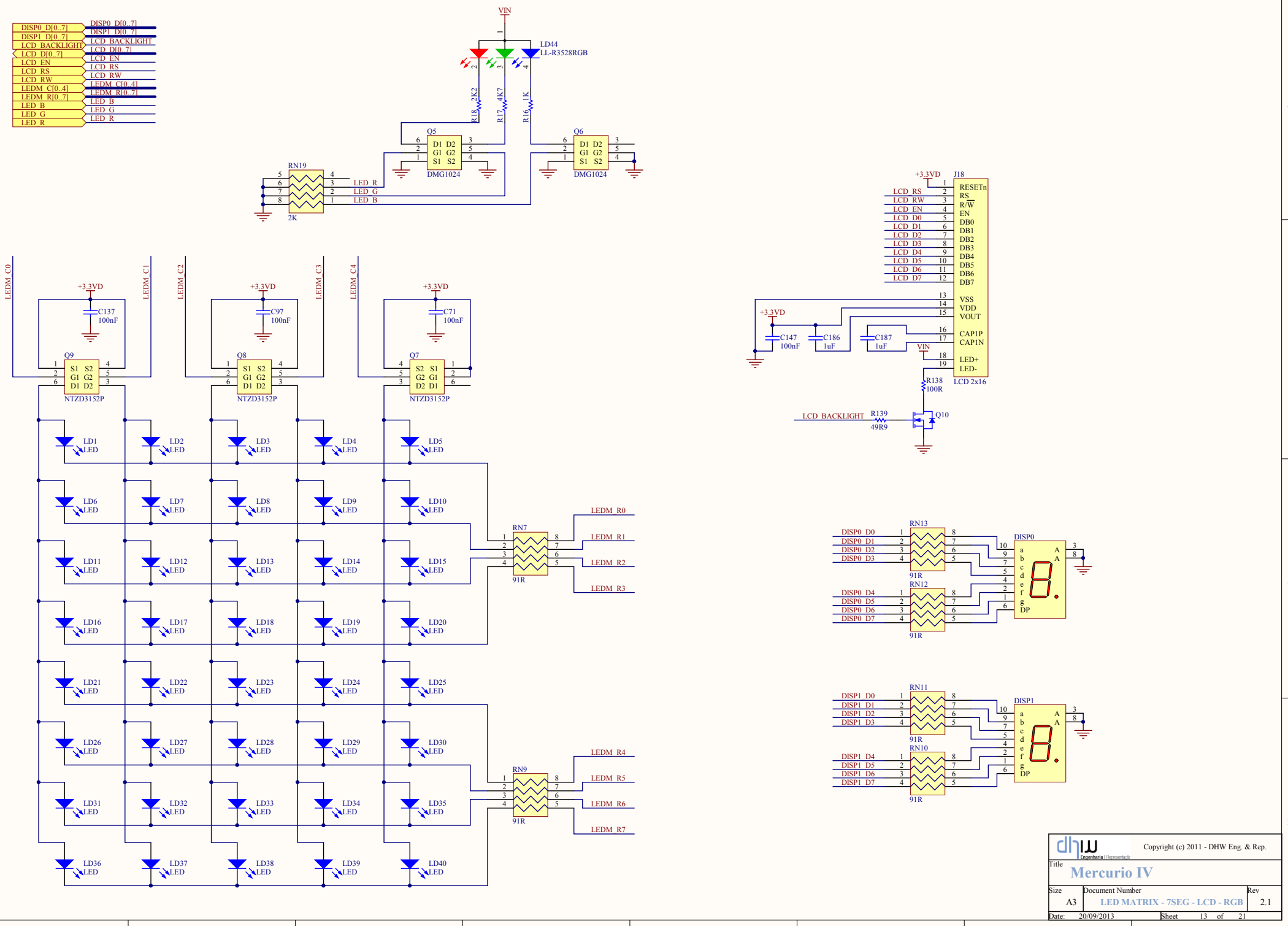


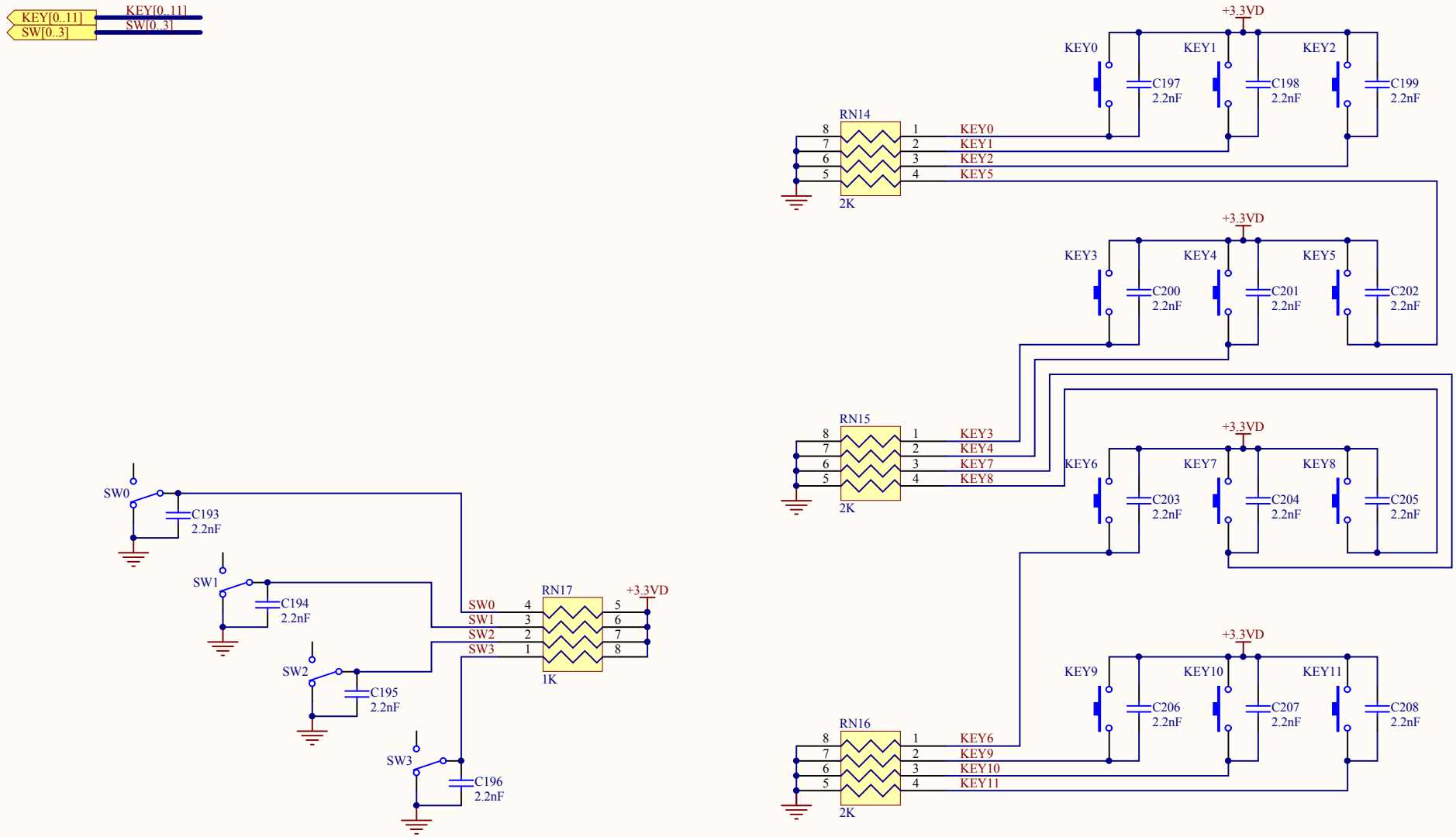
Title: **Mercurio IV**

Size	Document Number	Rev
A4	FPGA POWER	2.1

Date: 20/09/2013 Sheet 11 of 21


GPIO0_CLKIN[1..0]
GPIO0_CLKOUT[1..0]
GPIO0_D[31..0]
GPIO1_CLKIN[1..0]
GPIO1_CLKOUT[1..0]
GPIO1_D[31..0]
PROTO_A[0..7]
PROTO_B[0..7]
SMA_CLKIN
SMA_CLKOUT
J13
GPIO 1
J12
GPIO 0
+5Vuser
+3.3Vuser
+3.3VD
D13
J10
J11
SMA_CLKIN
SMA_CLKOUT
COAX-M
10k
R1
C174
100nF
C175
100nF
C180
100nF
C181
100nF
U27
U28
MAX3002
VCC_USER_SEL_A
VCC_USER_SEL_B
JMP1
JMP2
J14
J15
USER_IO_A
USER_IO_B
Copyright (c) 2011 - DHW Eng. & Rep.
Mercurio IV
GPIO - EXTERNAL CLOCK
A3
2.1
20/09/2013
12 of 21

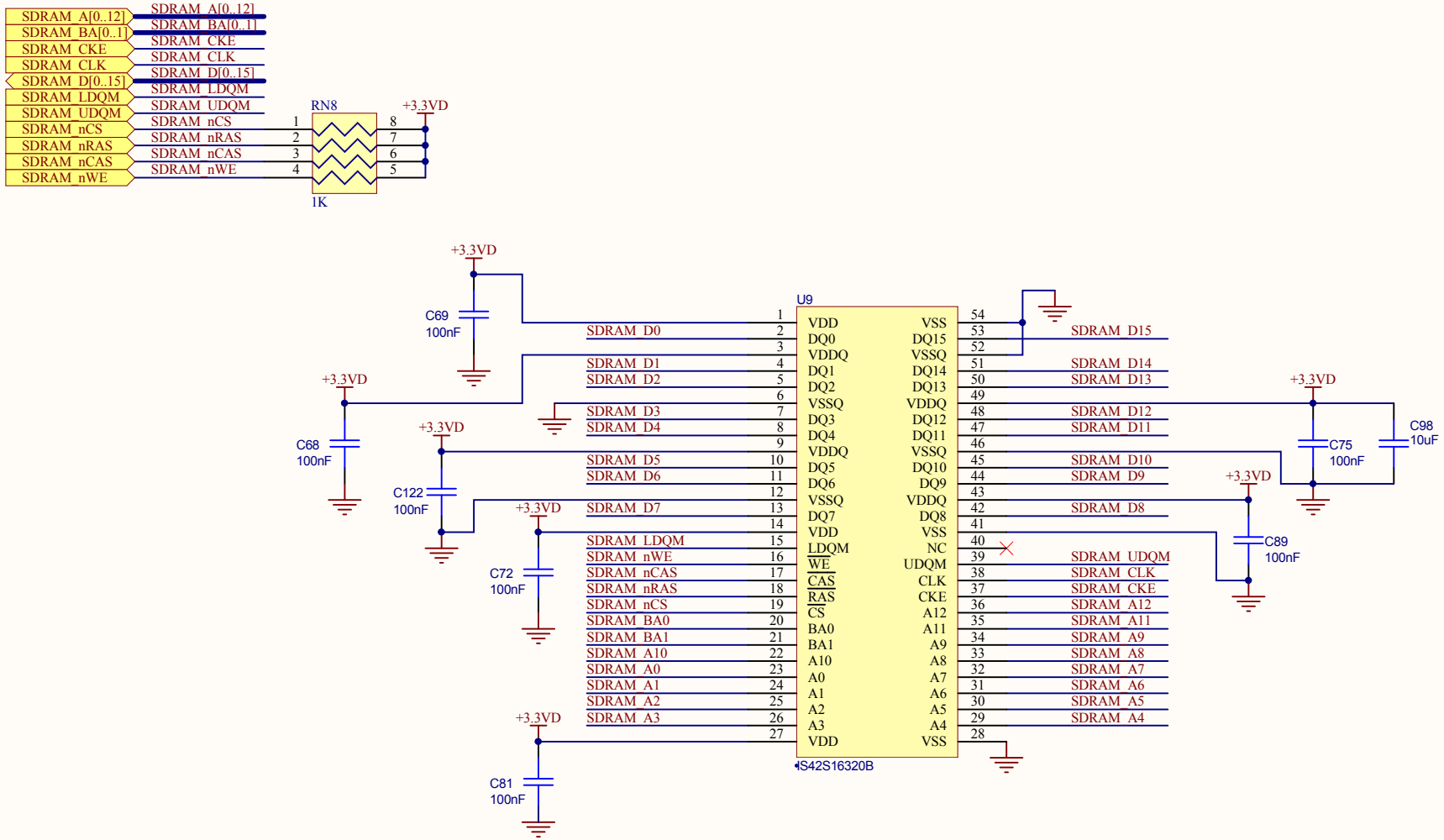

DISP0_D[0..7]
DISP1_D[0..7]
LCD_BACKLIGHT
LCD_D[0..7]
LCD_EN
LCD_RS
LCD_RW
LEDM_C[0..4]
LEDM_R[0..7]
LED_B
LED_G
LED_R
VIN
LD44
LL-R3528RGB
R18 2K2
R17 4K7
R16 1K
Q5
Q6
DMG1024
RN19
2K
LED_R
LED_G
LED_B
+3.3VD
J18
RESETn
RS
R/W
EN
DB0
DB1
DB2
DB3
DB4
DB5
DB6
DB7
VSS
VDD
VOUT
CAP1P
CAP1N
LED+
LED-
LCD 2x16
C147 100nF
C186 1uF
C187 1uF
R138 100R
R139 49R9
Q10
LEDM_C0
LEDM_C1
LEDM_C2
LEDM_C3
LEDM_C4
C137 100nF
C97 100nF
C71 100nF
Q9
Q8
Q7
NTZD3152P
LD1 LED
LD2 LED
LD3 LED
LD4 LED
LD5 LED
LD6 LED
LD7 LED
LD8 LED
LD9 LED
LD10 LED
LD11 LED
LD12 LED
LD13 LED
LD14 LED
LD15 LED
LD16 LED
LD17 LED
LD18 LED
LD19 LED
LD20 LED
LD21 LED
LD22 LED
LD23 LED
LD24 LED
LD25 LED
LD26 LED
LD27 LED
LD28 LED
LD29 LED
LD30 LED
LD31 LED
LD32 LED
LD33 LED
LD34 LED
LD35 LED
LD36 LED
LD37 LED
LD38 LED
LD39 LED
LD40 LED
RN7
RN9
91R
LEDM_R0
LEDM_R1
LEDM_R2
LEDM_R3
LEDM_R4
LEDM_R5
LEDM_R6
LEDM_R7
RN13
RN12
RN11
RN10
DISP0_D0
DISP0_D1
DISP0_D2
DISP0_D3
DISP0_D4
DISP0_D5
DISP0_D6
DISP0_D7
DISP1_D0
DISP1_D1
DISP1_D2
DISP1_D3
DISP1_D4
DISP1_D5
DISP1_D6
DISP1_D7
DISP0
DISP1
a
b
c
d
e
f
g
DP
Copyright (c) 2011 - DHW Eng. & Rep.
Title
Mercurio IV
Size
A3
Document Number
LED MATRIX - 7SEG - LCD - RGB
Rev
2.1
Date: 20/09/2013
Sheet 13 of 21



Title: MercurioIV

Size	Document Number	Rev
A4	KEY - SWITCH	2.1

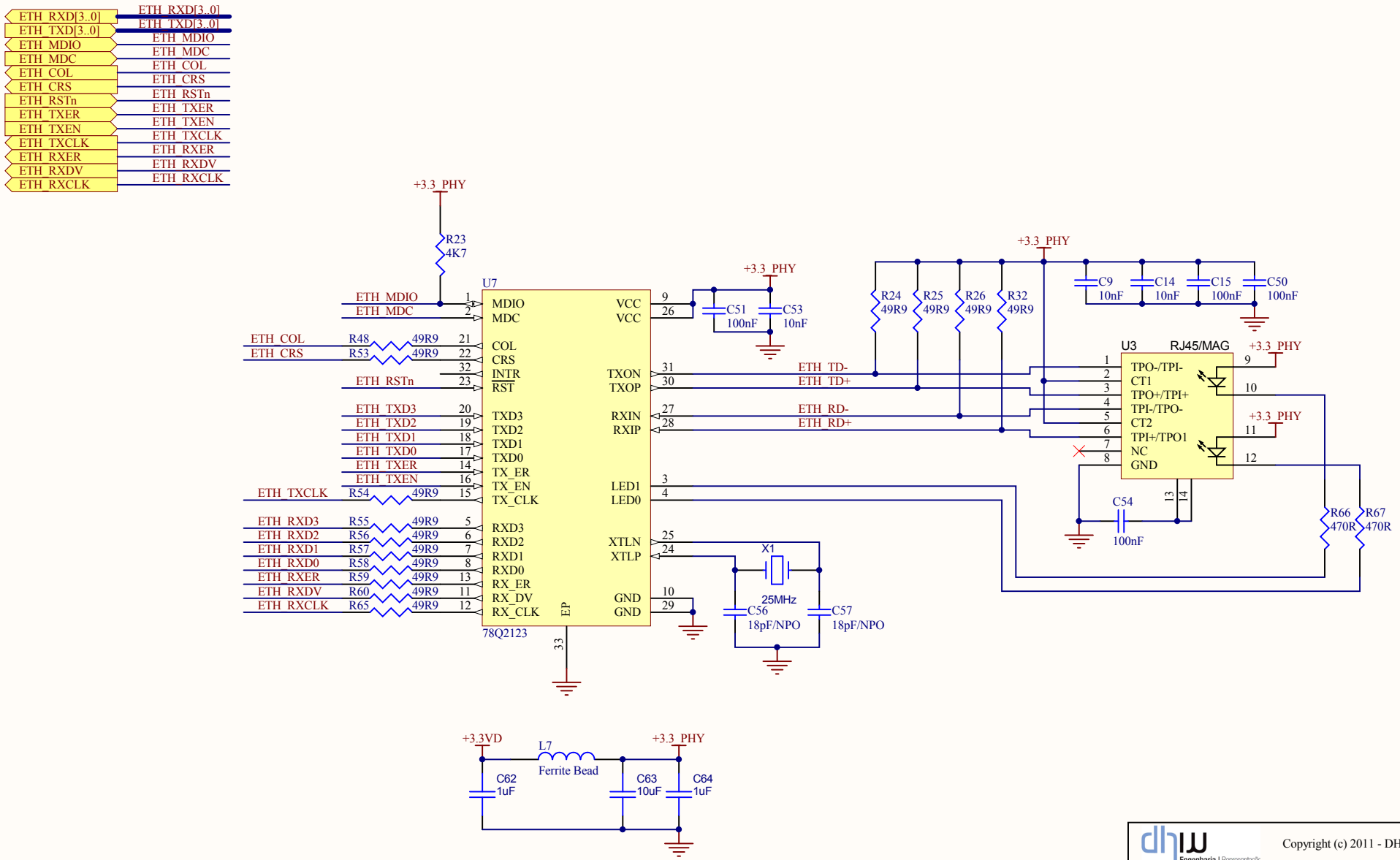
Date: 20/09/2013 Sheet 14 of 21



Title: Mercurio IV

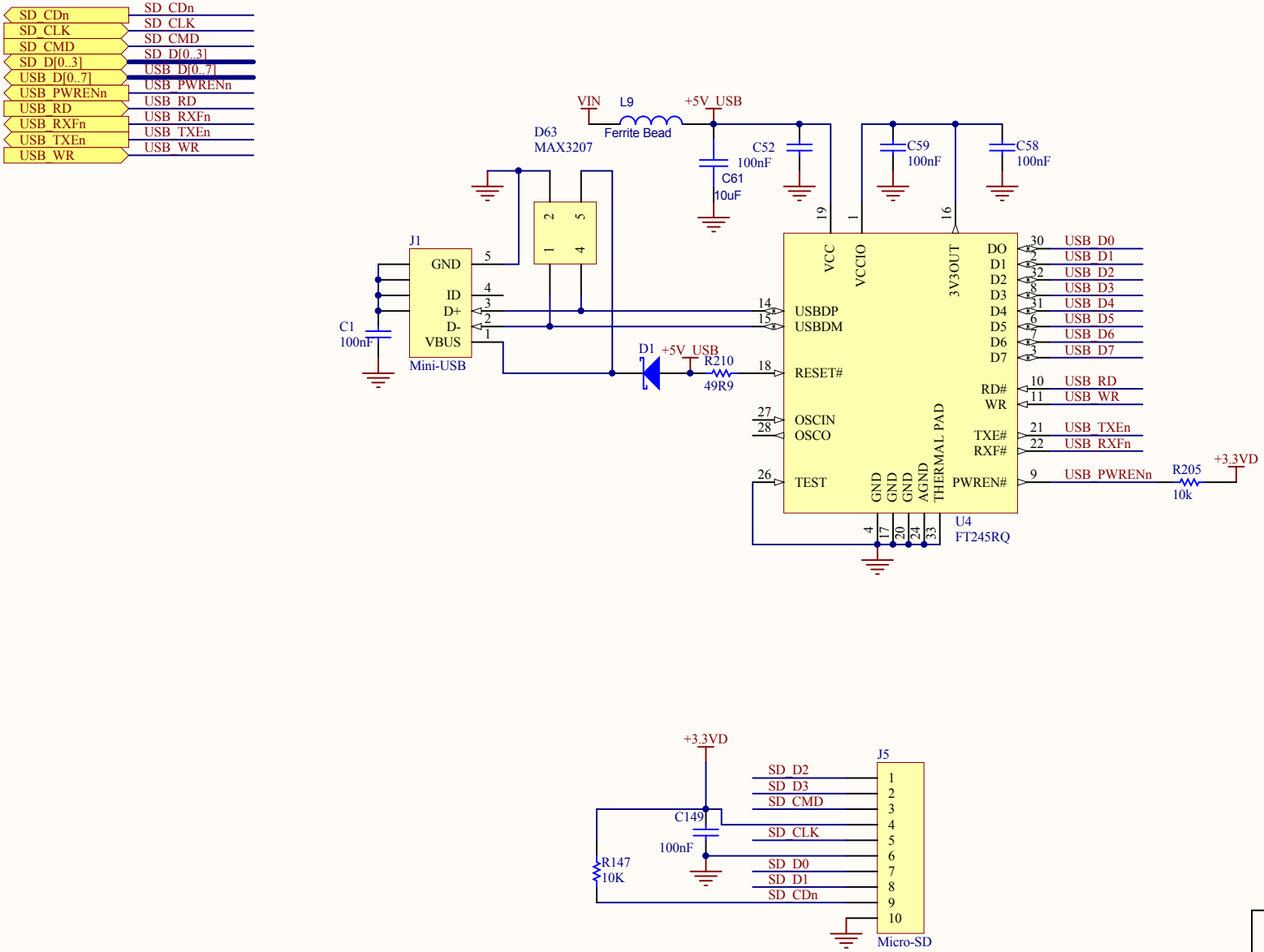
Size	Document Number	Rev
A4	SDRAM	2.1

Date: 20/09/2013 Sheet 15 of 21



Copyright (c) 2011 - DHW Eng. & Rep.

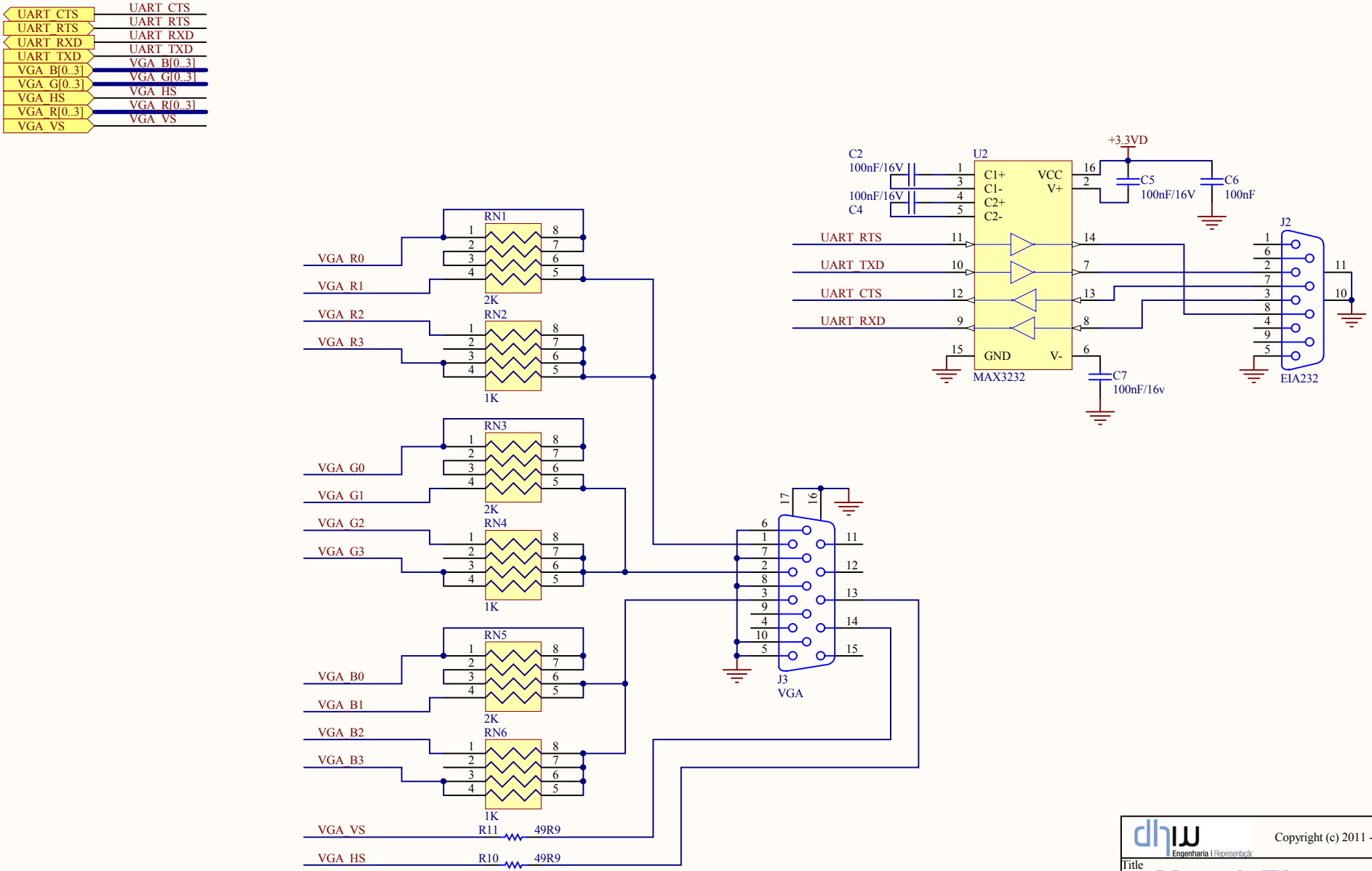
Title: Mercurio IV		
Size: A4	Document Number: ETHERNET	Rev: 2.1
Date: 20/09/2013	Sheet 16 of 21	



Title: Mercurio IV

Size	Document Number	Rev
A4	USB - SDcard	2.1

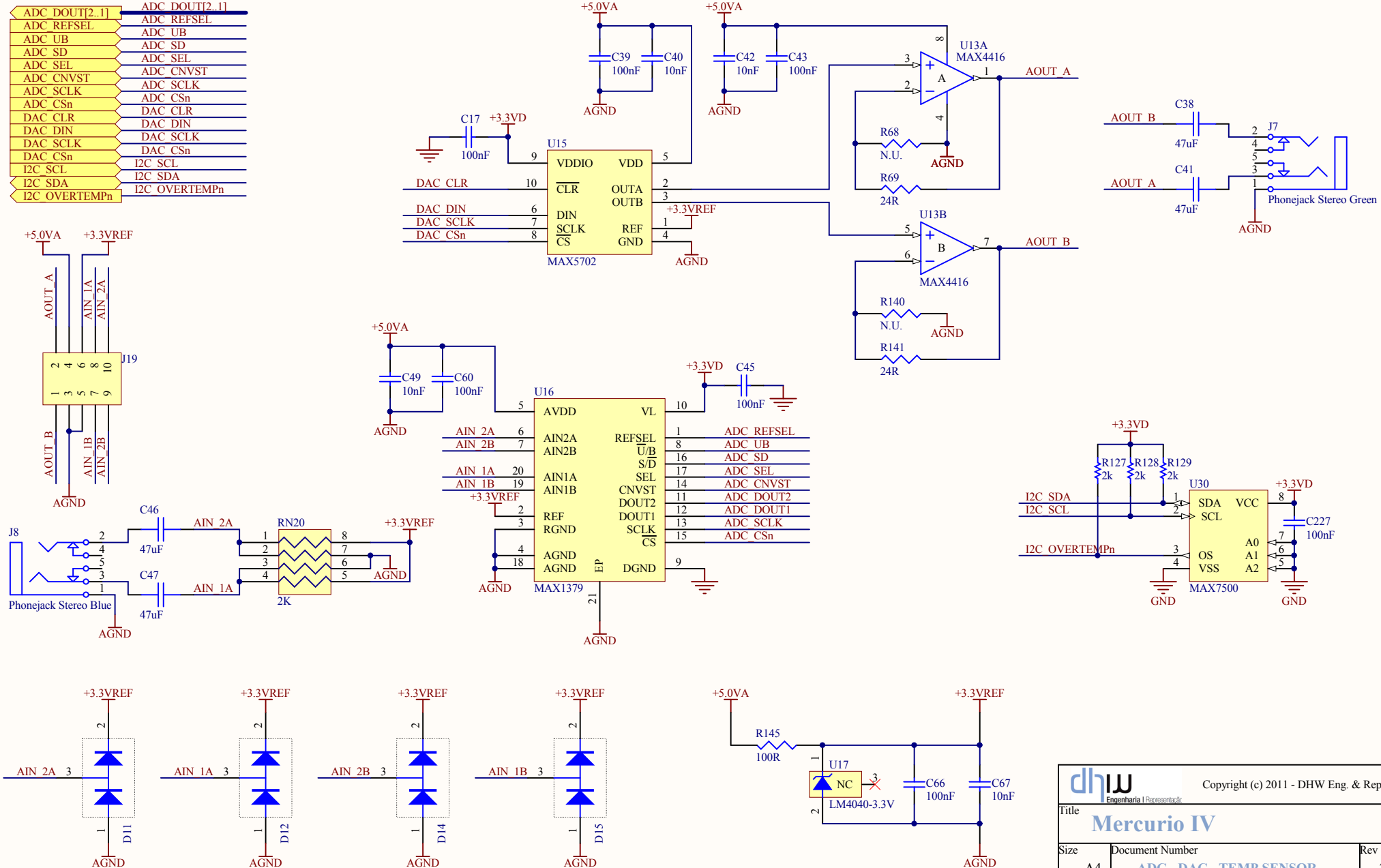
Date: 20/09/2013 Sheet 17 of 21



Title: Mercurio IV

Size	Document Number	Rev
A4	VGA - SERIAL	2.1

Date: 20/09/2013 Sheet 18 of 21

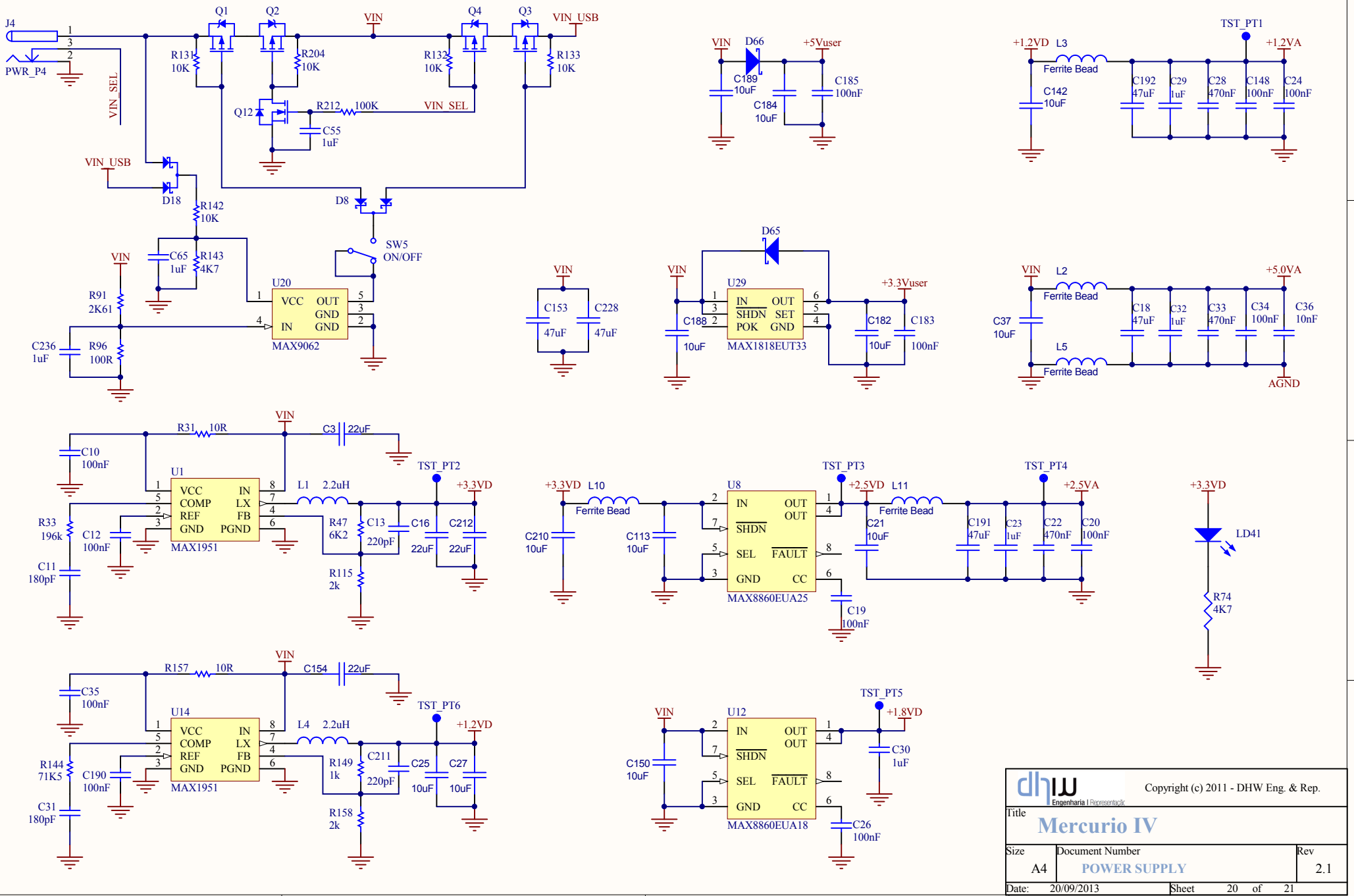


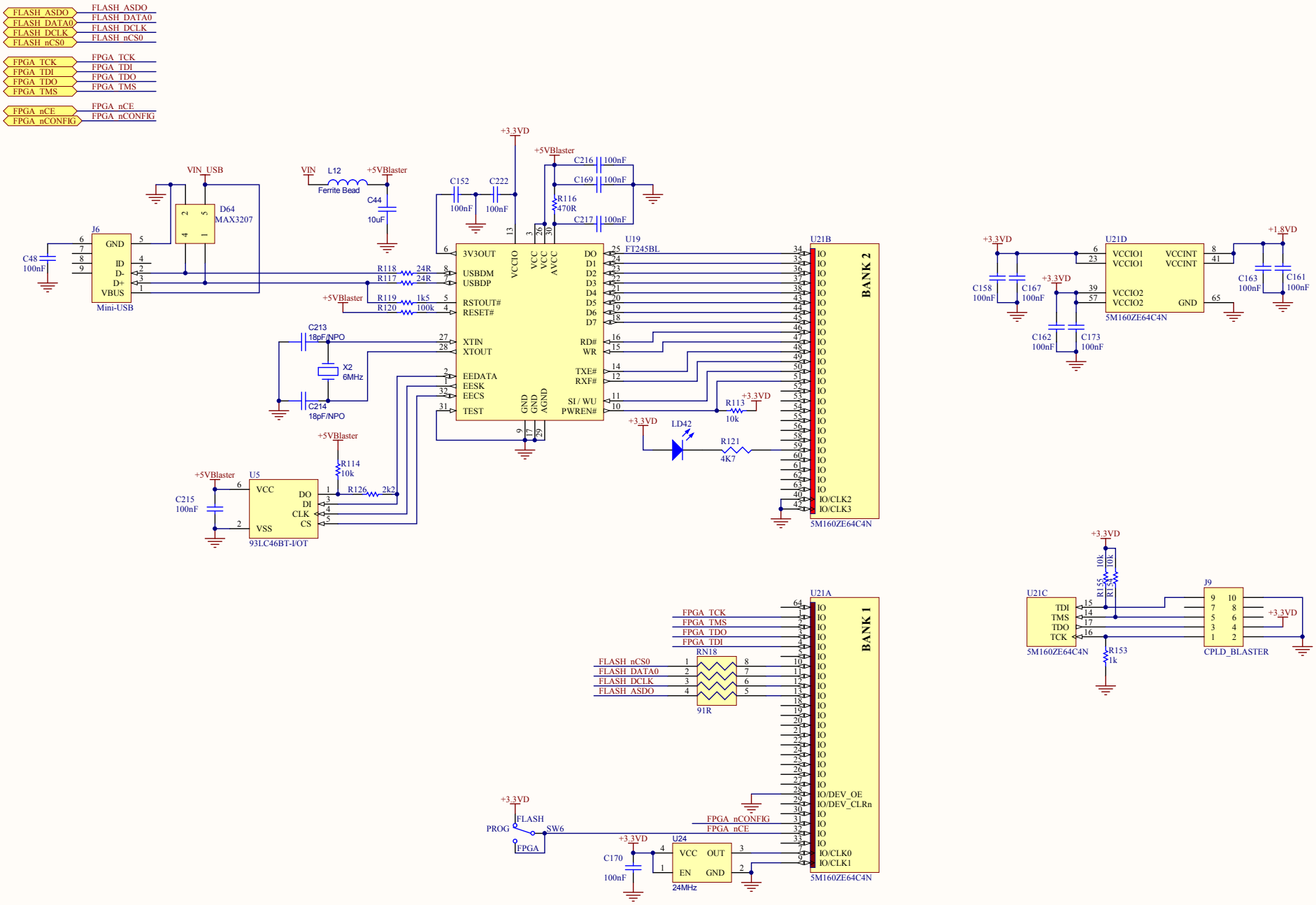
Copyright (c) 2011 - DHW Eng. & Rep.

Title: Mercurio IV

Size	Document Number	Rev
A4	ADC - DAC - TEMP SENSOR	2.1

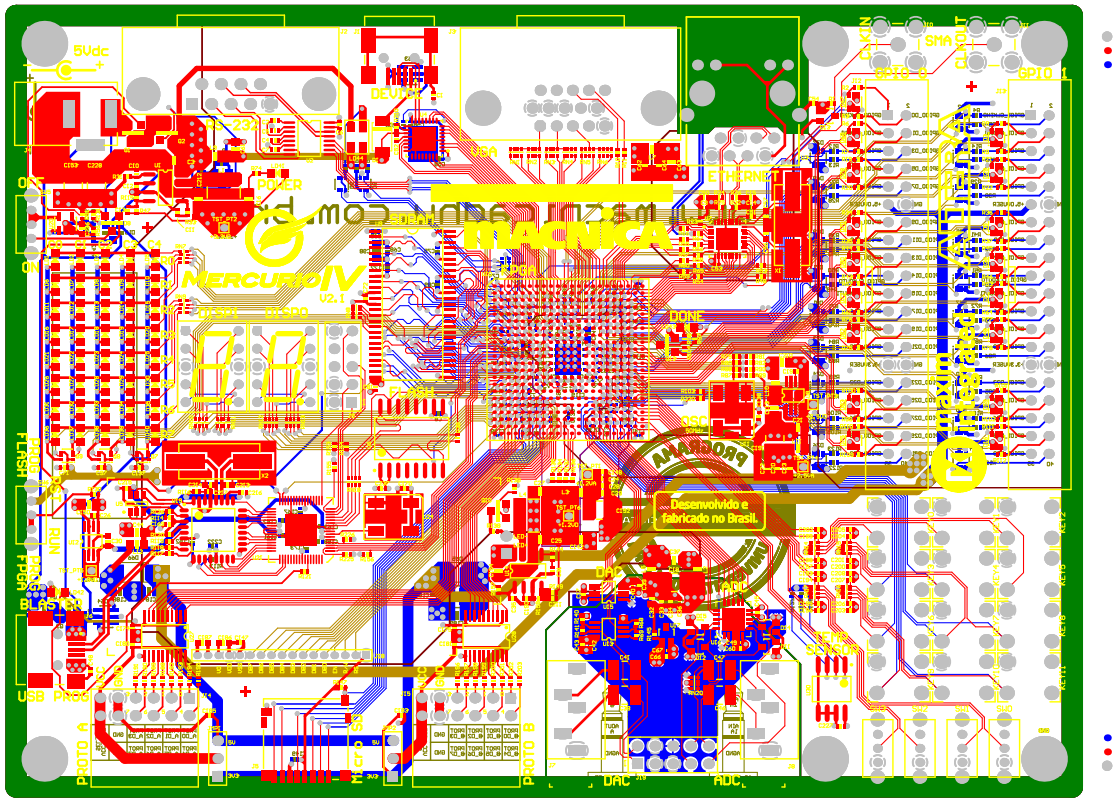
Date: 20/09/2013 Sheet 19 of 21


J4
PWR_P4
VIN_SEL
Q1
Q2
Q3
Q4
VIN
VIN_USB
R131 10K
R204 10K
R132 10K
R133 10K
Q12
R212 100K
C55 1uF
D18
D8
R142 10K
C65 1uF
R143 4K7
SW5 ON/OFF
R91 2K61
C236 1uF
R96 100R
U20
VCC
OUT
GND
IN
MAX9062
VIN
D66
+5Vuser
C189 10uF
C184 10uF
C185 100nF
TST_PT1
+1.2VD
L3
Ferrite Bead
C142 10uF
C192 47uF
C29 1uF
C28 470nF
C148 100nF
C24 100nF
+1.2VA
C153 47uF
C228 47uF
D65
U29
IN
OUT
SHDN
SET
POK
GND
MAX1818EUT33
C188 10uF
C182 10uF
C183 100nF
+3.3Vuser
L2
+5.0VA
C37 10uF
C18 47uF
C32 1uF
C33 470nF
C34 100nF
C36 10nF
L5
AGND
R31 10R
C3 22uF
C10 100nF
U1
COMP
REF
PGND
MAX1951
L1 2.2uH
TST_PT2
+3.3VD
R33 196k
C12 100nF
C11 180pF
R47 6K2
C13 220pF
C16 22uF
C212 22uF
R115 2k
TST_PT3
TST_PT4
+2.5VD
L10
L11
+2.5VA
U8
SHDN
SEL
FAULT
CC
MAX8860EUA25
C210 10uF
C113 10uF
C21 10uF
C191 47uF
C23 1uF
C22 470nF
C20 100nF
C19 100nF
LD41
R74 4K7
R157 10R
C154 22uF
C35 100nF
U14
MAX1951
L4 2.2uH
TST_PT6
R144 71K5
C190 100nF
C31 180pF
R149 1k
C211 220pF
C25 10uF
C27 10uF
R158 2k
TST_PT5
U12
MAX8860EUA18
C150 10uF
C30 1uF
C26 100nF
Copyright (c) 2011 - DHW Eng. & Rep.
Title
Mercurio IV
Size
A4
Document Number
POWER SUPPLY
Rev
2.1
Date: 20/09/2013
Sheet 20 of 21



Copyright (c) 2011 - DHW Eng. & Rep.

Title: Mercurio IV		
Size: A3	Document Number: USB Blaster	Rev: 2.1
Date: 20/09/2013	Sheet 21 of 21	



PLACA: 6 LAYERS
MASCARA DE SOLDA: BRANCA
SIMBOLOGIA: PRETO
MATERIAL: FR4 - 1.6mm
ACABAMENTO: ENIG
VIAS: COBERTAS COM MASCARA DE SOLDA

PCB STACKUP

0.7mil	L1	.GTL - SIGNAL 1
4.5 mil		
1.4mil	L2	.GP1 - GND
22 mil		
1.4mil	L3	.GP2 - PWR1
4.5 mil		
0.7mil	L4	.G1 - SIGNAL 2
22 mil		
1.4mil	L5	.GP3 - PWR2
4.5 mil		
0.7 mil	L6	.GBL - SIGNAL 3

- Dielectric constant 4.3

Top Silkscreen
Bottom Silkscreen
Top Layer - .GTL - SIGNAL 1
Internal 1 - .GP1 - GND
Internal 2 - .GP2 - PWR1
Internal 3 - .G1 - SIGNAL 2
Internal 4 - .GP3 - PWR2
Bottom Layer - .GBL - SIGNAL 3