

1 2 3 4 5 6 7 8

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Hublot-Discrete

PV_Build (A01)

<http://hobi-elektronika.net/>

2009.04.21

DATE	CHANGE NO.	REV

DRAWER	EE	DATE	POWER	DATE	INVENTEC TITLE <i>Hublot-Discrete</i>
DESIGN					
CHECK					
RESPONSIBLE					
SIZE =	3	VER :			SIZE CODE DOC. NUMBER REV
FILE NAME :	XXXX-XXXXXX-XX				A3 CS 1310A22593-0-MTR A01
P/N	XXXXXXXXXXXX				SHEET 1 OF 60

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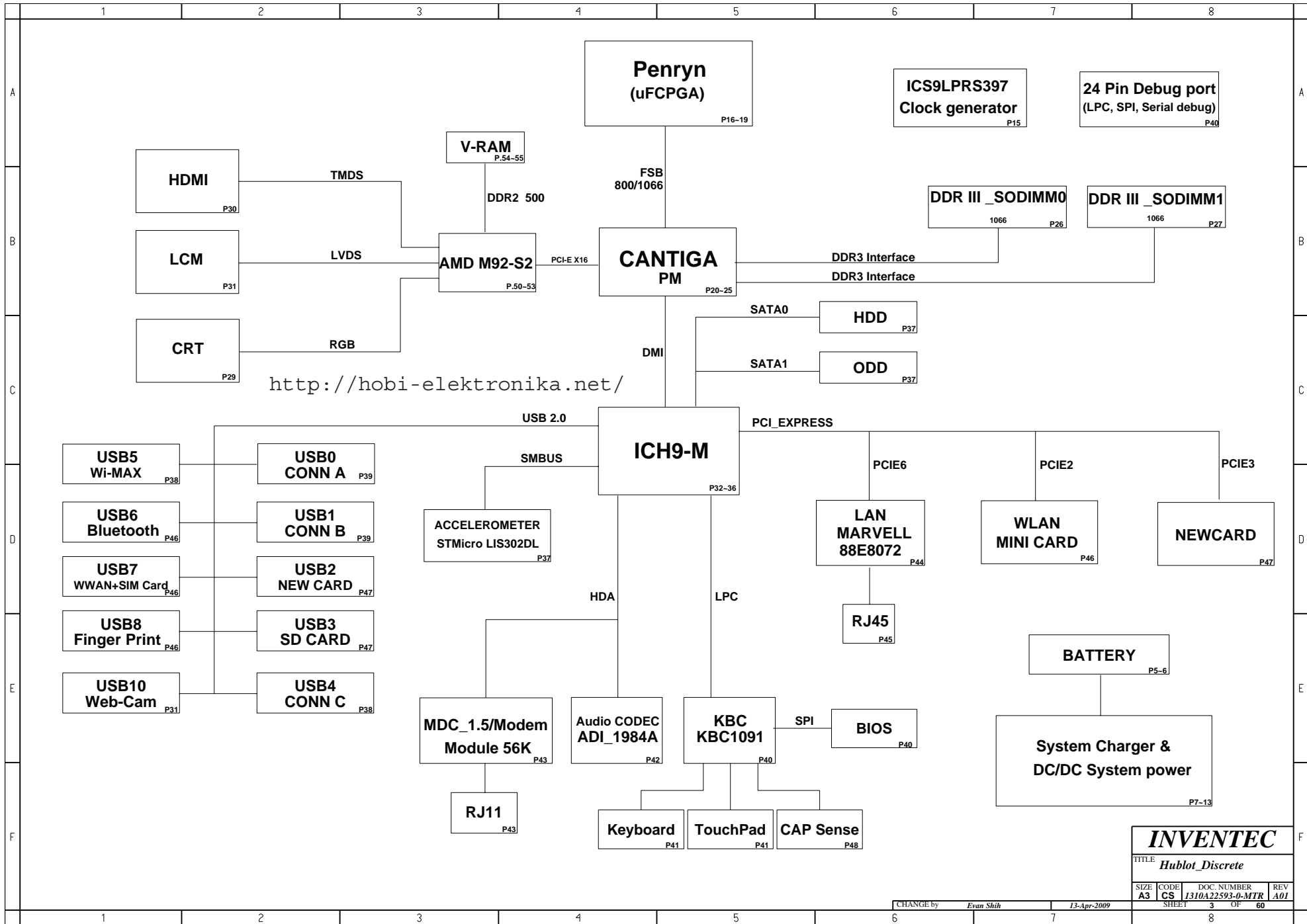
Page	Page	Page
5- DC & Battery Charger.	15- Clock Generator.	37- HDD & ODD CONN & Accelerometer.
6- Select & Battery connector.	16- CPU Penryn-1.	38- USB & Finger print CONN.
7- System Power (+V3A/+V5A).	17- CPU Penryn-2.	39- USB_Daughter Board.
8- System Power (+V1.5/+VCCP).	18- CPU Penryn-3.	40- KBC & BIOS ROM.
9- Graphic Power (+VDD_CORE & +VPCIE).	19- Thermal & Fan.	41- Internal Keyboard & TouchPad CONN.
10- VRAM Power (+V1.8S).	20- N/B Cantiga-1.	42- Audio CODEC & Earphone & Speaker.
11- CPU Power (+VCC_CORE).	21- N/B Cantiga-2.	43- Audio MIC & MDC CONN.
12- DDR Termination Voltage(+V0.75S).	22- N/B Cantiga-3.	44- Giga LAN controller.
13- Power (Sleep: +V5S/+V3S/+V1.5S).	23- N/B Cantiga-4.	45- Magnetic & RJ45 CONN.
14- Power (Sequence).	24- N/B Cantiga-5.	46- Mini Card & BT CONN.
	25- N/B Cantiga-6.	47- New Card & 2 in 1 Card (SD/MMC).
	26- DDR3-DIMM0.	48- LEDs & Buttons & SW/B CONN.
	27- DDR3-DIMM1.	49- Screws & FixMask.
	28- DDR3-DAMPING.	50- AMD M92_S2-1.
	29- CRT CONN.	51- AMD M92_S2-2.
	30- HDMI CONN.	52- AMD M92_S2-3.
	31- LCM CONN.	53- AMD M92_S2-4.
	32- S/B ICH9-1.	54- Video RAM-1 (DDR2).
	33- S/B ICH9-2.	55- Video RAM-2 (DDR2).
	34- S/B ICH9-3.	56- CAP Sense board.
	35- S/B ICH9-4.	57- HDD Extend board.
	36- S/B ICH9-5.	58- Finger Print board.
		59- USB Extend board.
		60- Power Switch & SIM Card board.

INVENTEC

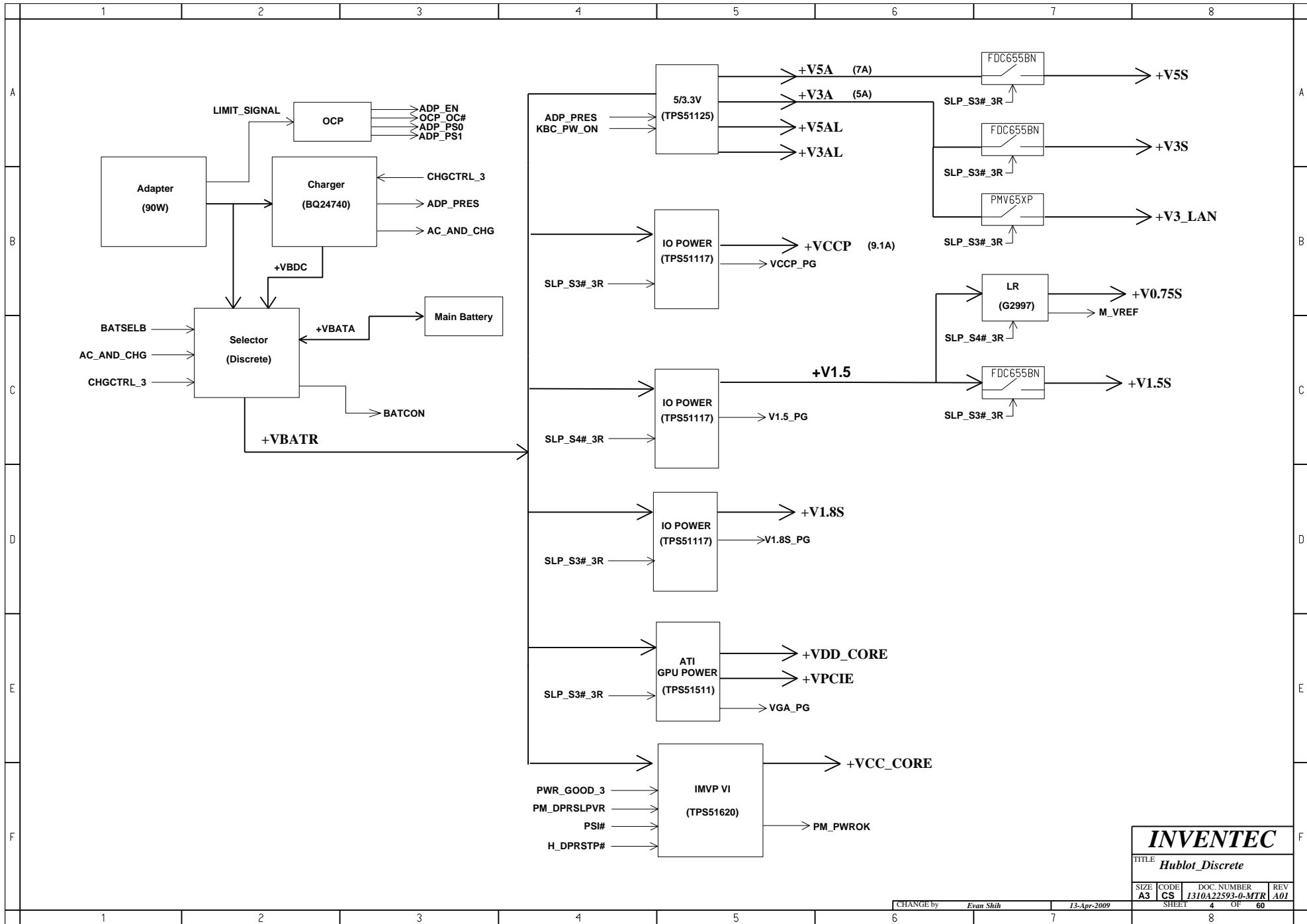
TITLE
Hublot_Discrete

SIZE	CODE	DOC NUMBER	REV
A3	CS	1310A22593-0-MTR	A01
SHEET		2	OF 60

CHANGE by *Evan Shih* 15-Apr-2009

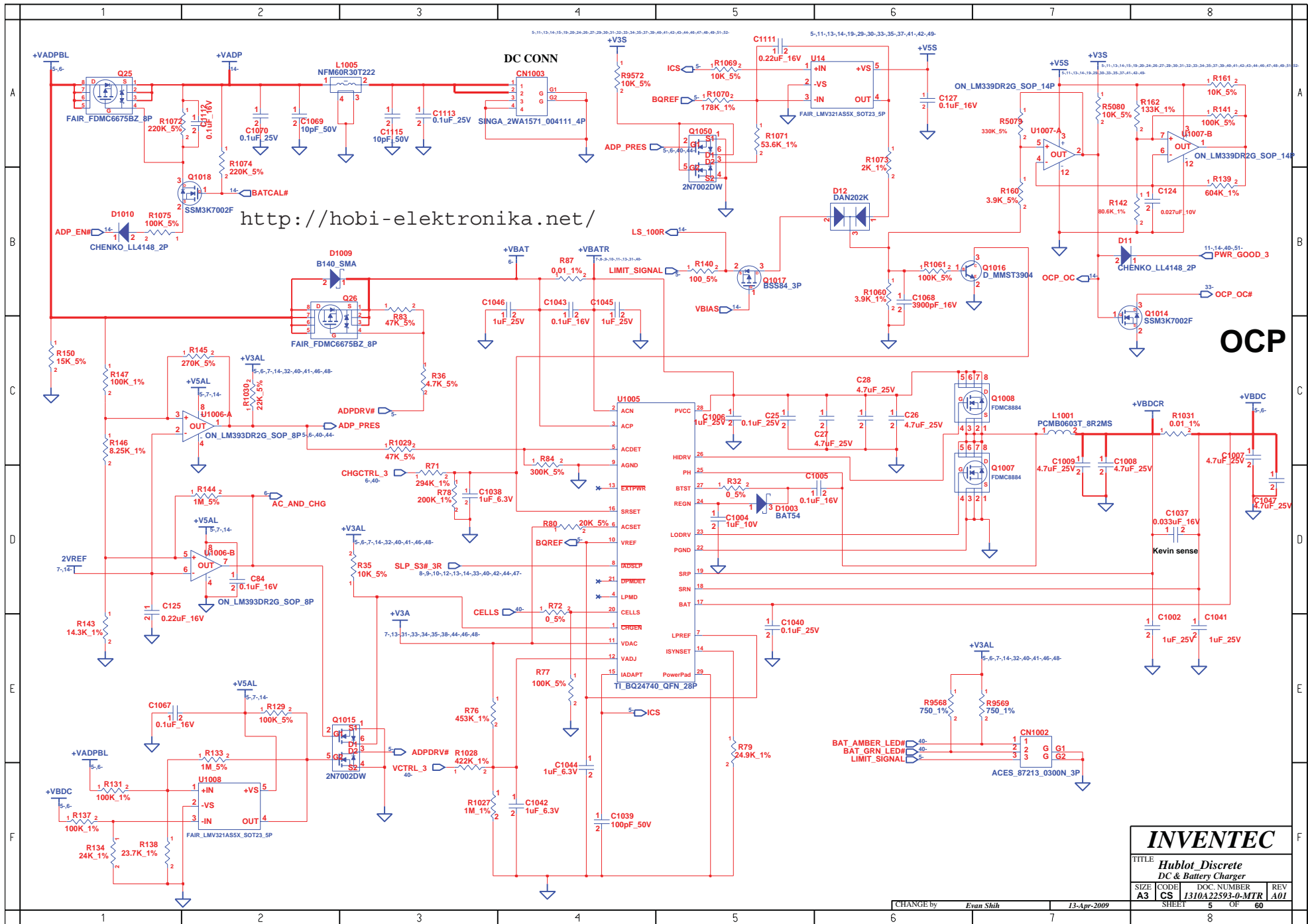


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TITLE Hublot_Discrete			
SIZE A3	CODE CS	DOC NUMBER 1310A22593-0-MTR	REV A01
CHANGE by Evan Shih		13-Apr-2009	
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INVENTEC			
TITLE <i>Hublot_Discrete</i>			
SIZE A3	CODE CS	DOC NUMBER <i>1310A22593-0-MTR</i>	REV A01
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CHANGE by *Evan Shih* 13-Apr-2009



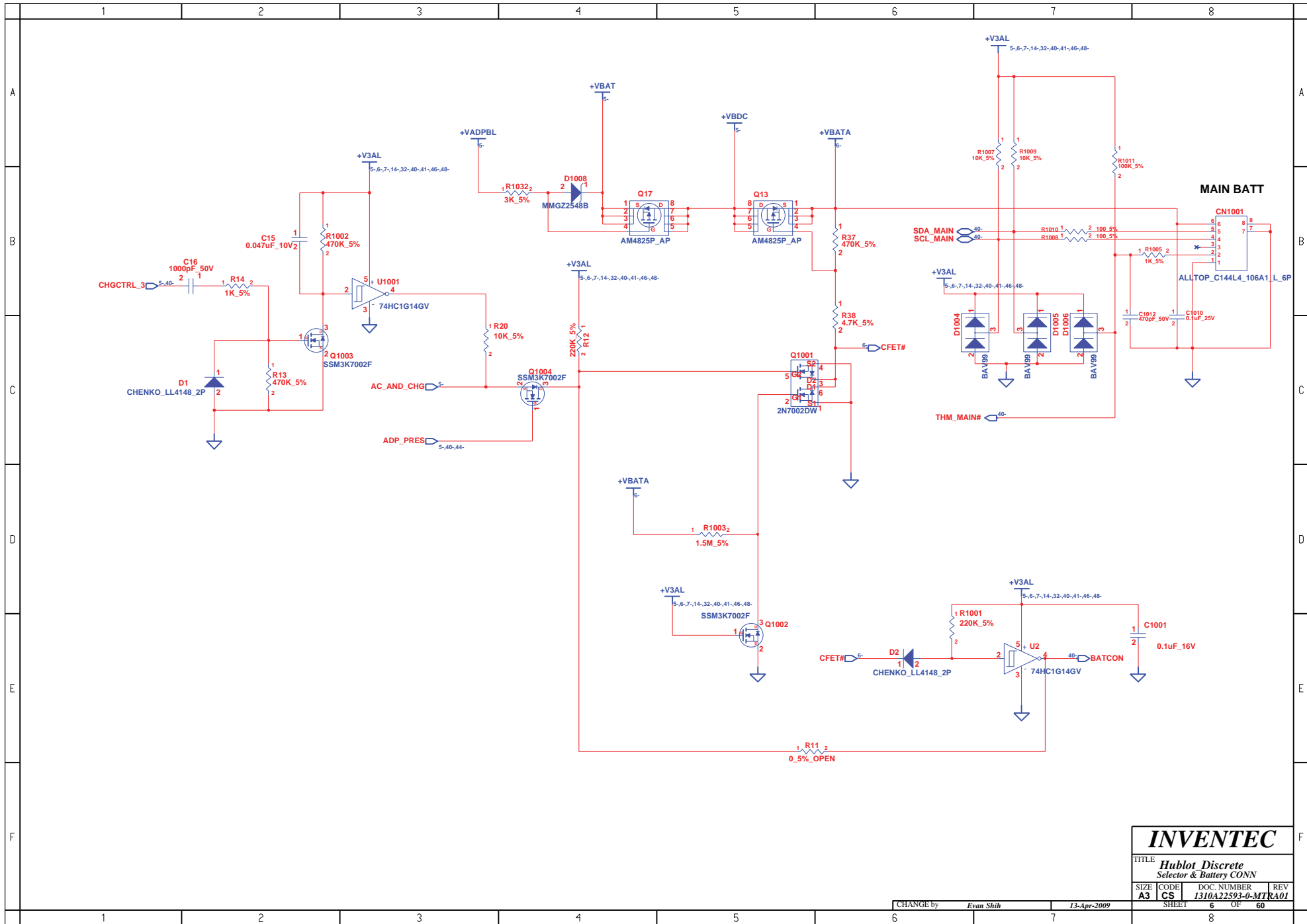
<http://hobi-elektronika.net/>

OCP

INVENTEC

TITLE
*Hublot Discrete
 DC & Battery Charger*

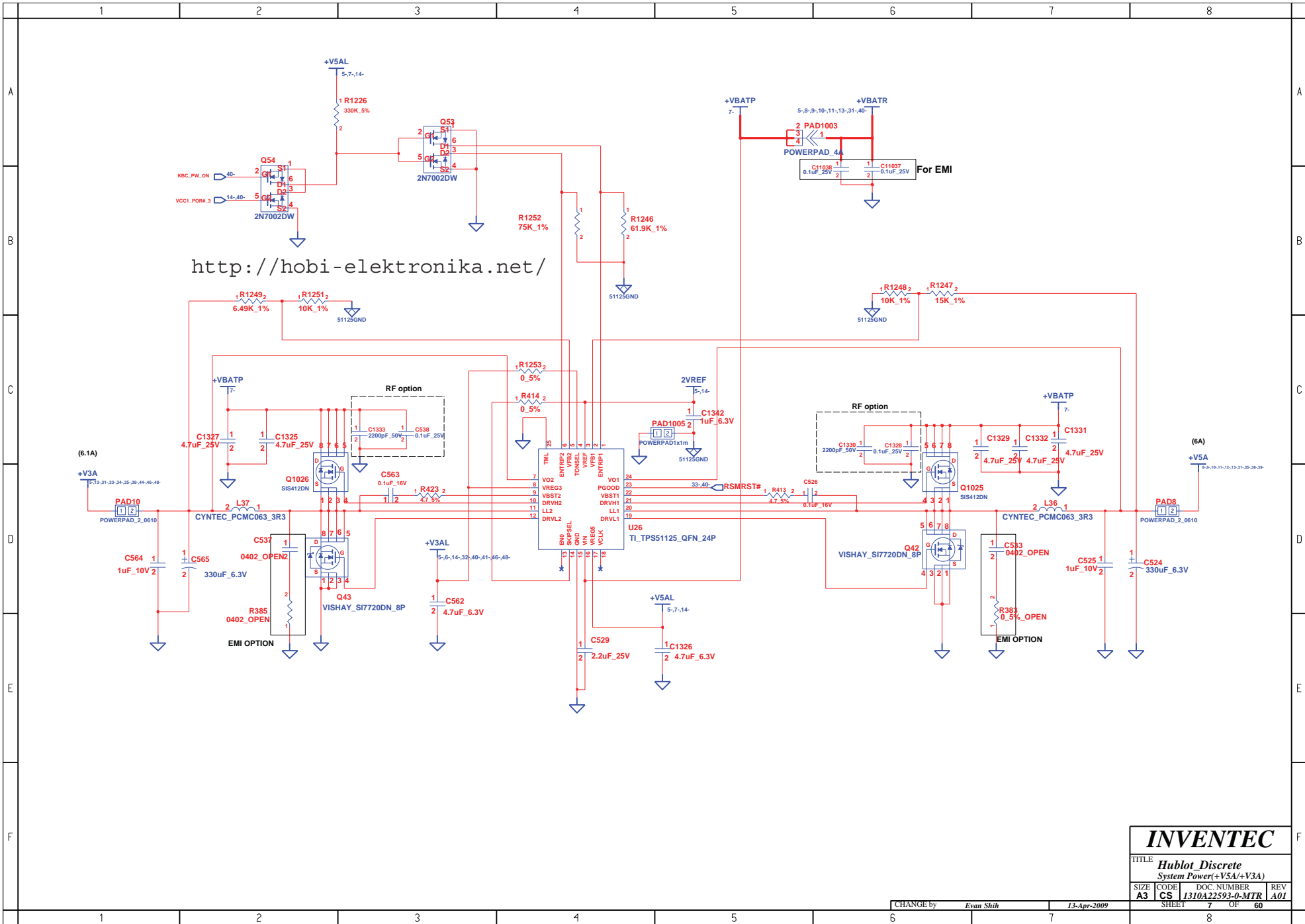
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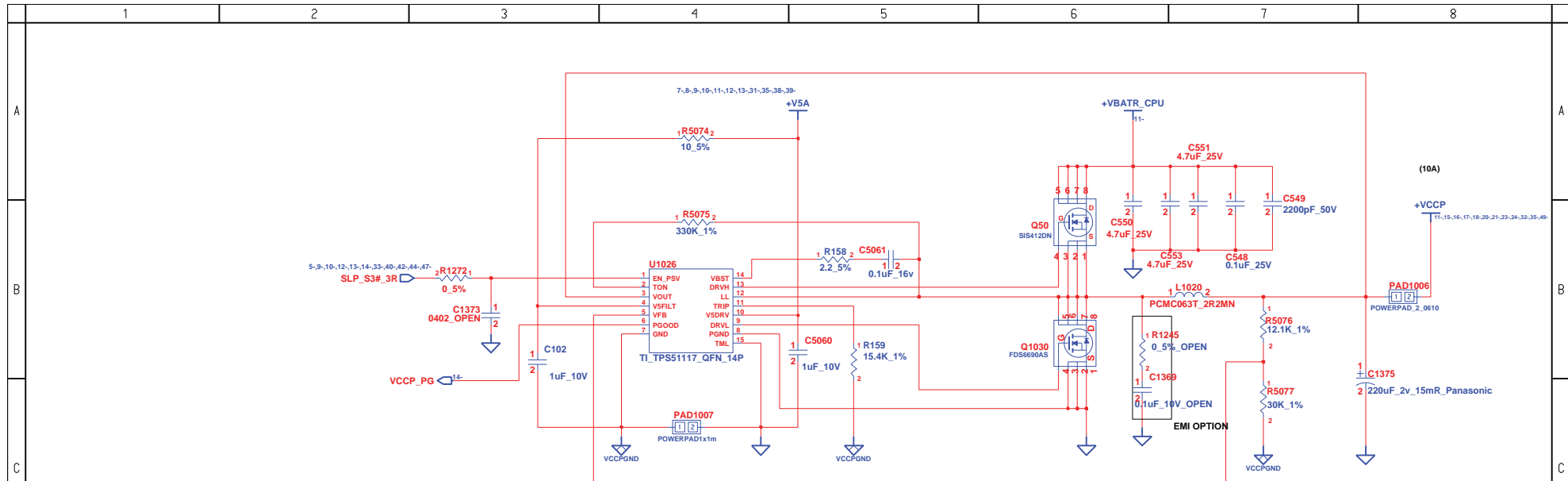
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Evan Shih		OF 60	

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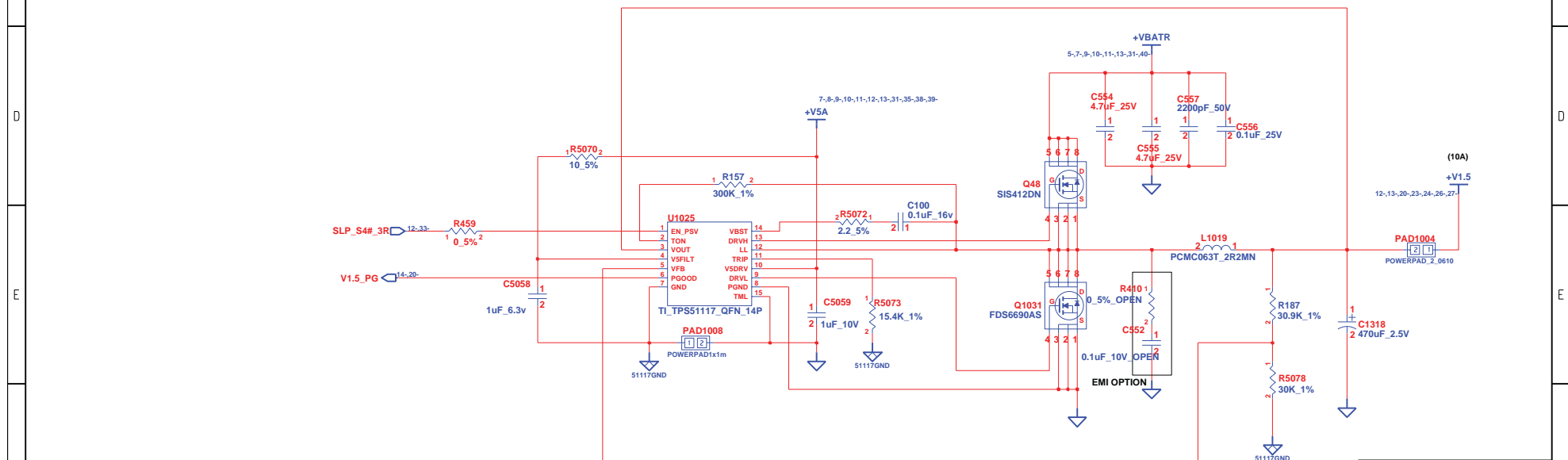


<http://hobi-elektronika.net/>

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CHANGE by: Evan Shih		13-Apr-2009	
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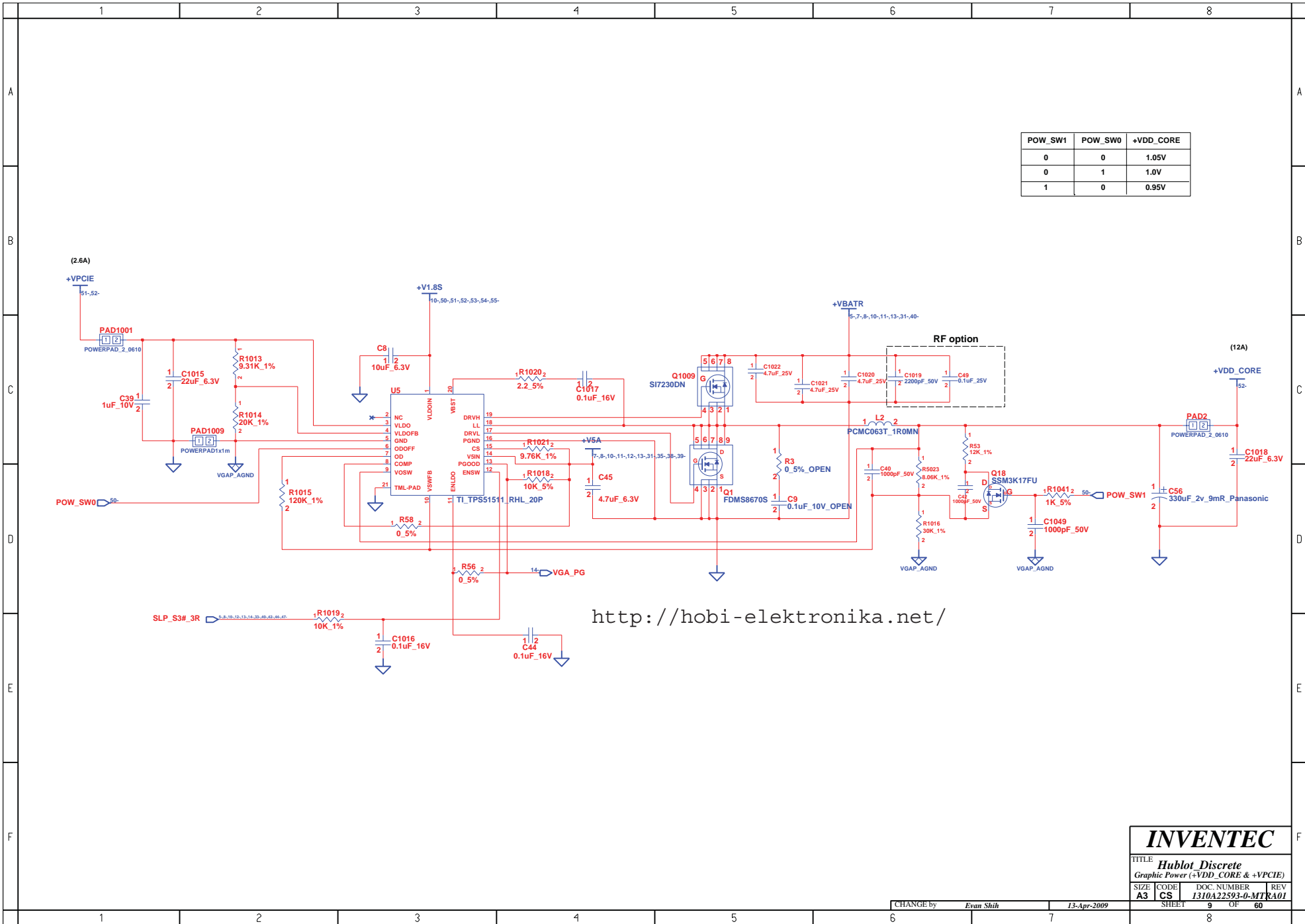
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INVENTEC

TITLE			
Hublot_Discrete			
System Power(+V1.5/+VCCP)			
SIZE	CODE	DOC NUMBER	REV
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POW_SW1	POW_SW0	+VDD_CORE
0	0	1.05V
0	1	1.0V
1	0	0.95V

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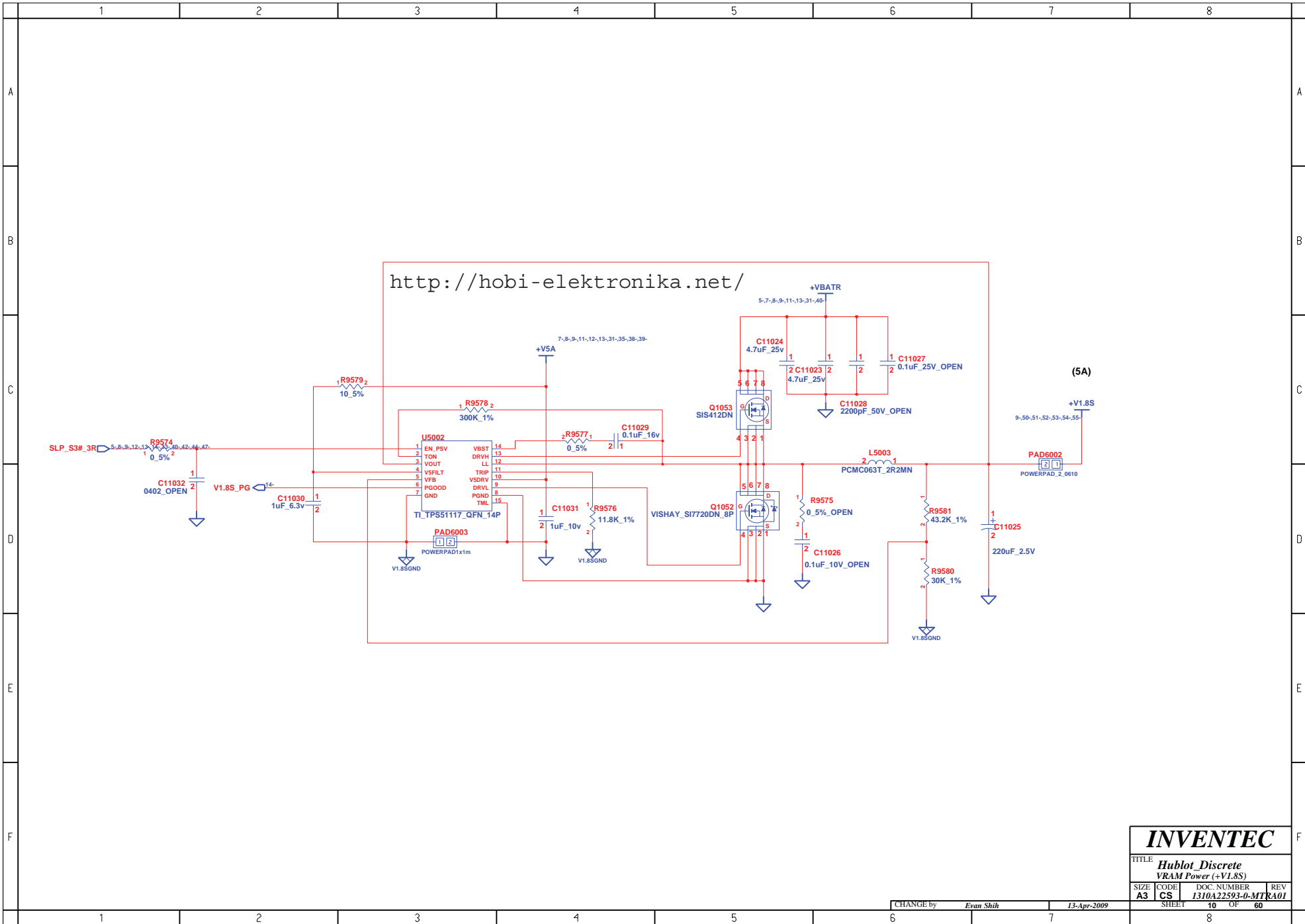
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TITLE **Hublot_Discrete**
Graphic Power (+VDD_CORE & +VPCIE)

SIZE A3	CODE CS	DOC NUMBER 1310A22593-0-MT	REV KA01
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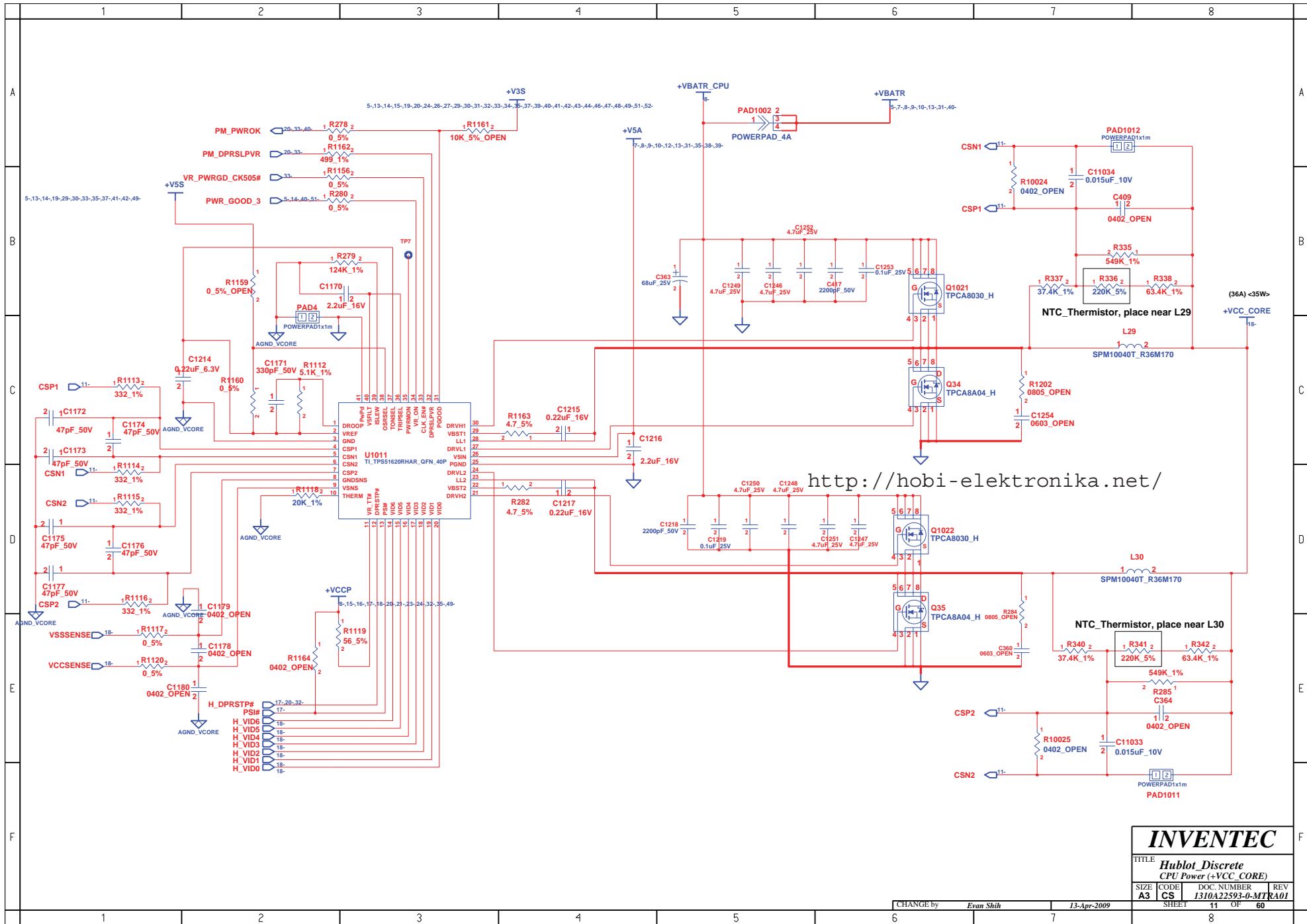
SHEET 9 OF 60



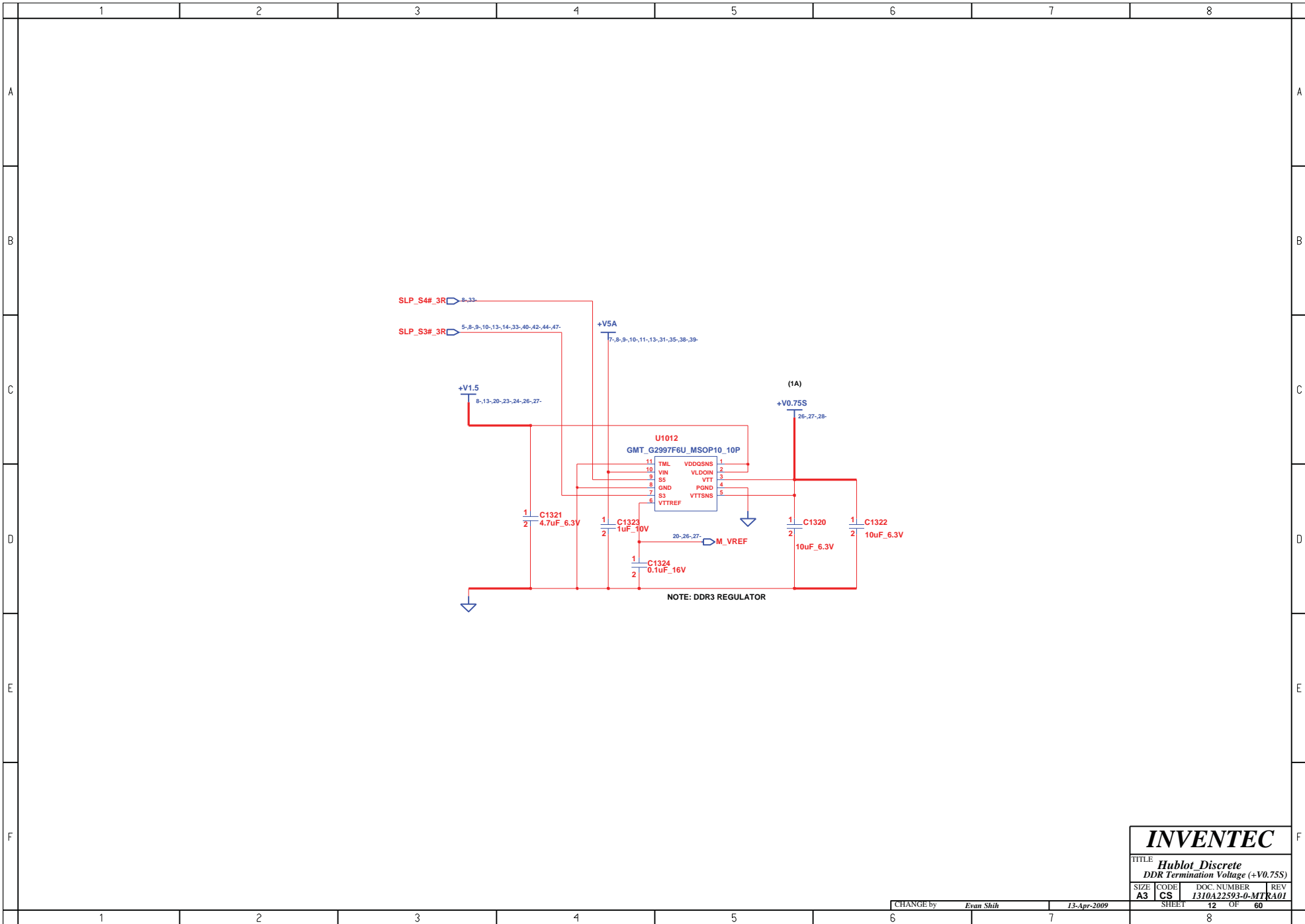
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TITLE			
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VRAM Power (+V1.8S)			
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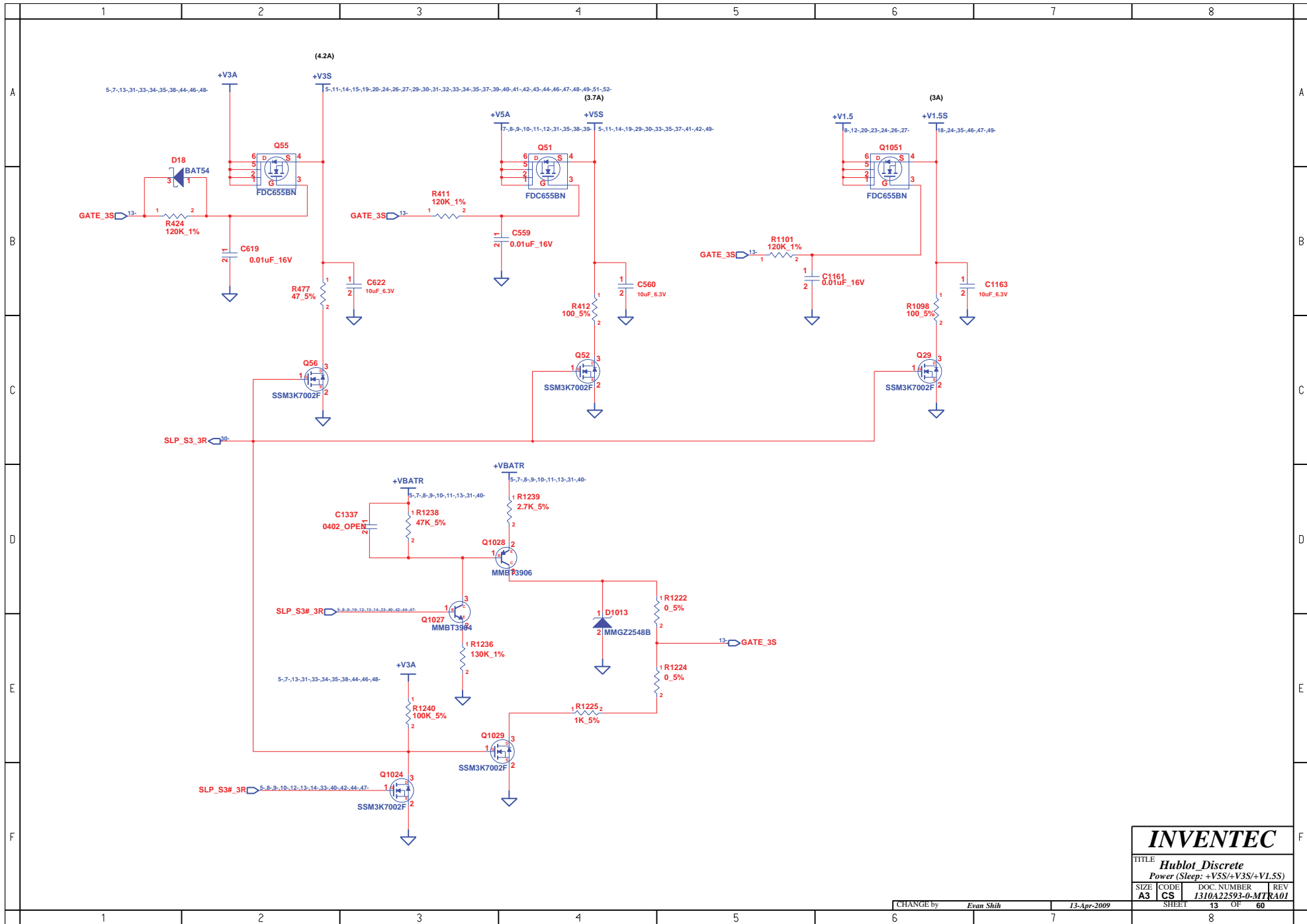
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INVENTEC			
TITLE <i>Hublot Discrete</i>			
DDR Termination Voltage (+V0.75S)			
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1	2	3	4	5	6	7	8
A							A
B							B
C							C
D							D
E							E
F							F
1	2	3	4	5	6	7	8



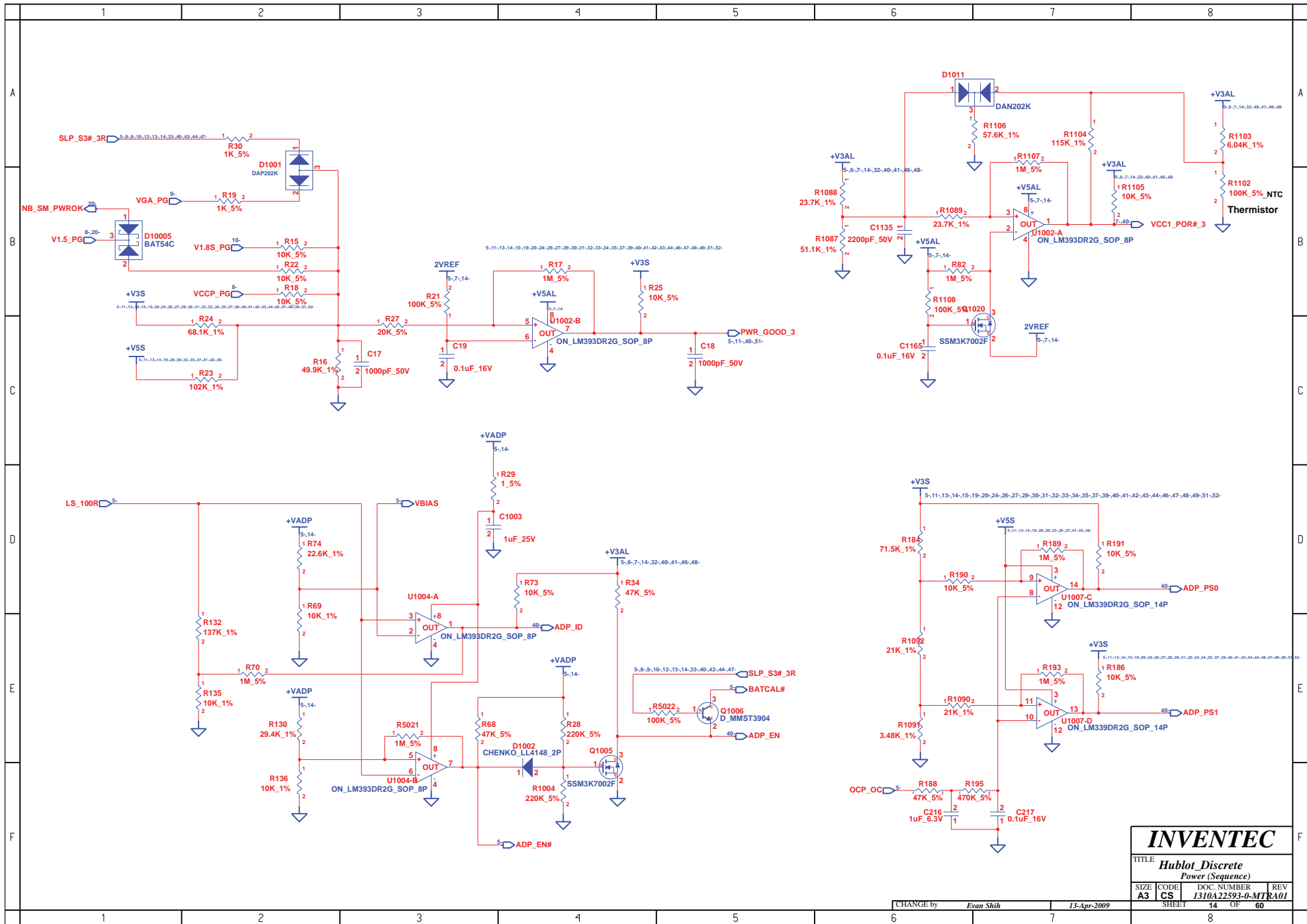
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**Hublot_Discrete
 Power (Sleep: +VSS/+V3S/+V1.5S)**

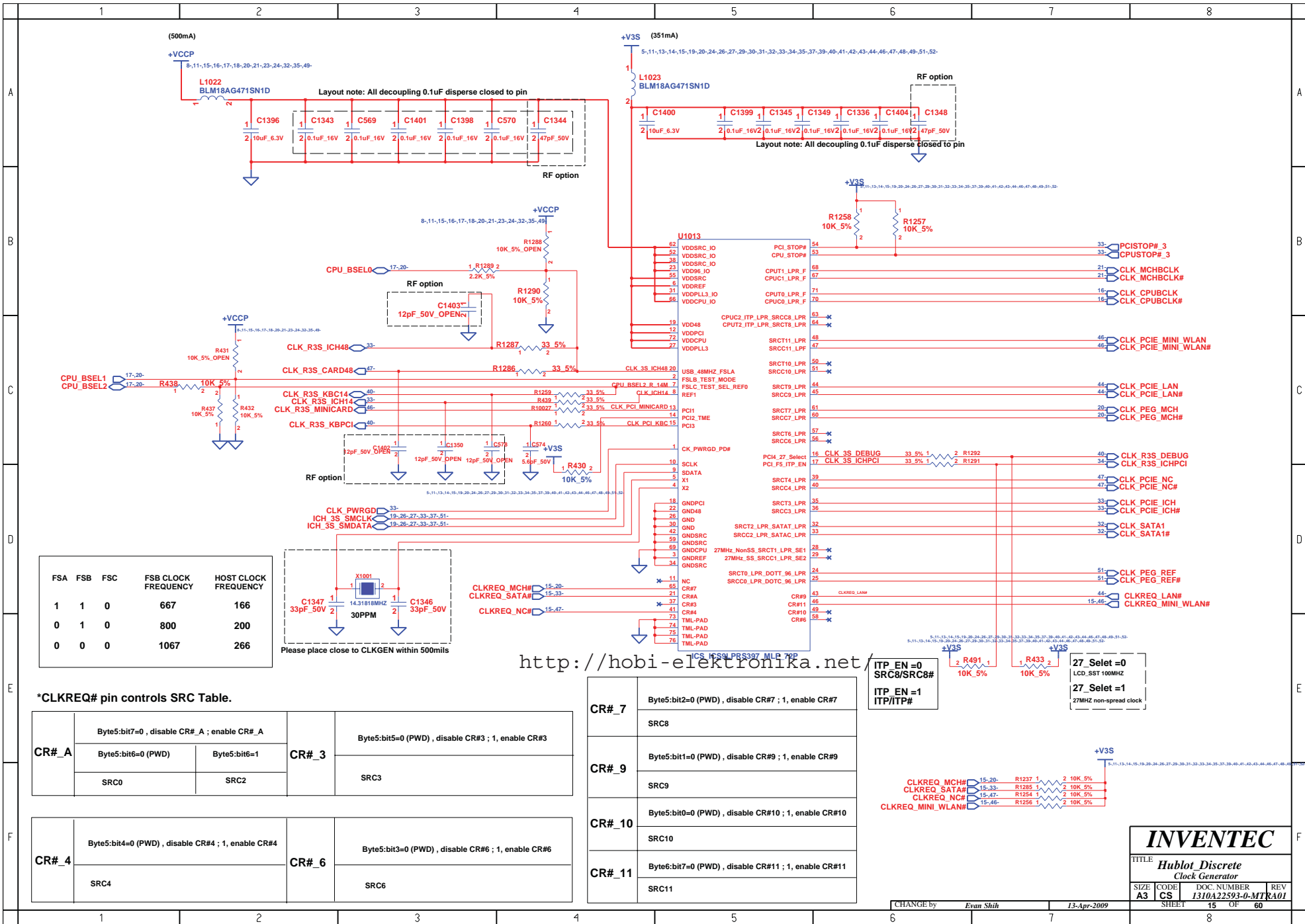
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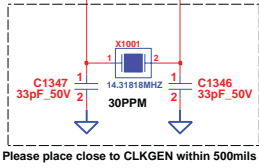
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INVENTEC			
TITLE <i>Hublot Discrete Power (Sequence)</i>			
SIZE A3	CODE CS	DOC NUMBER 1310A22593-0-MTR	REV 01
CHANGE by <i>Evan Shih</i>		13-Apr-2009	
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FSA	FSB	FSC	FSB CLOCK FREQUENCY	HOST CLOCK FREQUENCY
1	1	0	667	166
0	1	0	800	200
0	0	0	1067	266



CLKREQ_MCH# 15-20
 CLKREQ_SATA# 15-33
 CLKREQ_NC# 15-47

*CLKREQ# pin controls SRC Table.

CR#_A	Byte5:bit7=0, disable CR#_A; enable CR#_A	CR#_3	Byte5:bit5=0 (PWD), disable CR#3; 1, enable CR#3
	Byte5:bit6=0 (PWD)		Byte5:bit6=1
	SRC0		SRC2

CR#_4	Byte5:bit4=0 (PWD), disable CR#4; 1, enable CR#4	CR#_6	Byte5:bit3=0 (PWD), disable CR#6; 1, enable CR#6
			SRC4

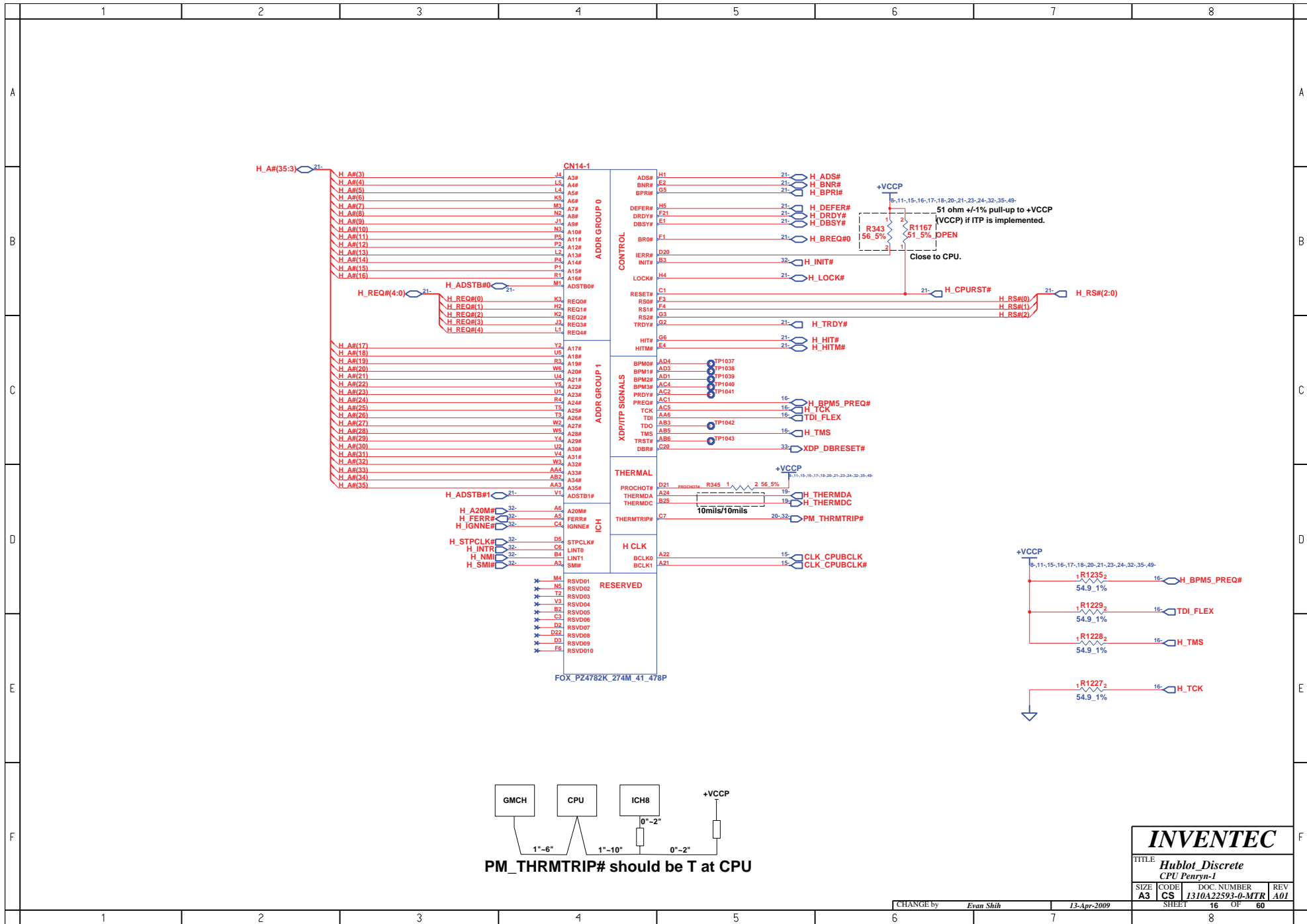
CR#_7	Byte5:bit2=0 (PWD), disable CR#7; 1, enable CR#7	SRC8
CR#_9	Byte5:bit1=0 (PWD), disable CR#9; 1, enable CR#9	SRC9
CR#_10	Byte5:bit0=0 (PWD), disable CR#10; 1, enable CR#10	SRC10
CR#_11	Byte6:bit7=0 (PWD), disable CR#11; 1, enable CR#11	SRC11

ITP_EN=0
 SRC8/SRC8#
 ITP_EN=1
 ITP/ITP#

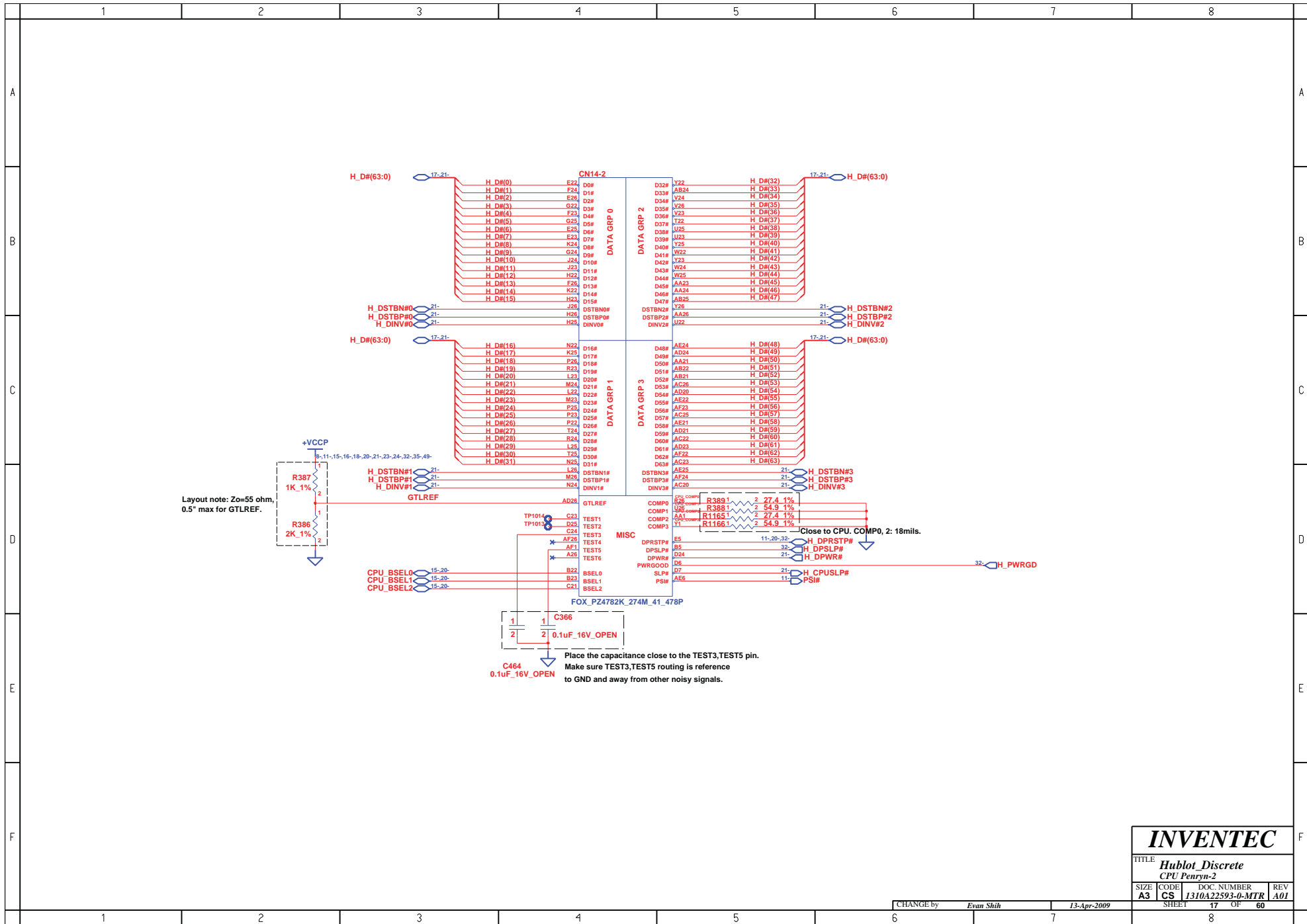
27_Select=0
 LCD_SST 100MHz
 27_Select=1
 27MHz non-spread clock

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INVENTEC
 TITLE: Hublot_Discrete Clock Generator
 SIZE: A3 CODE: CS DOC NUMBER: 1310A22593-0-MTR A01
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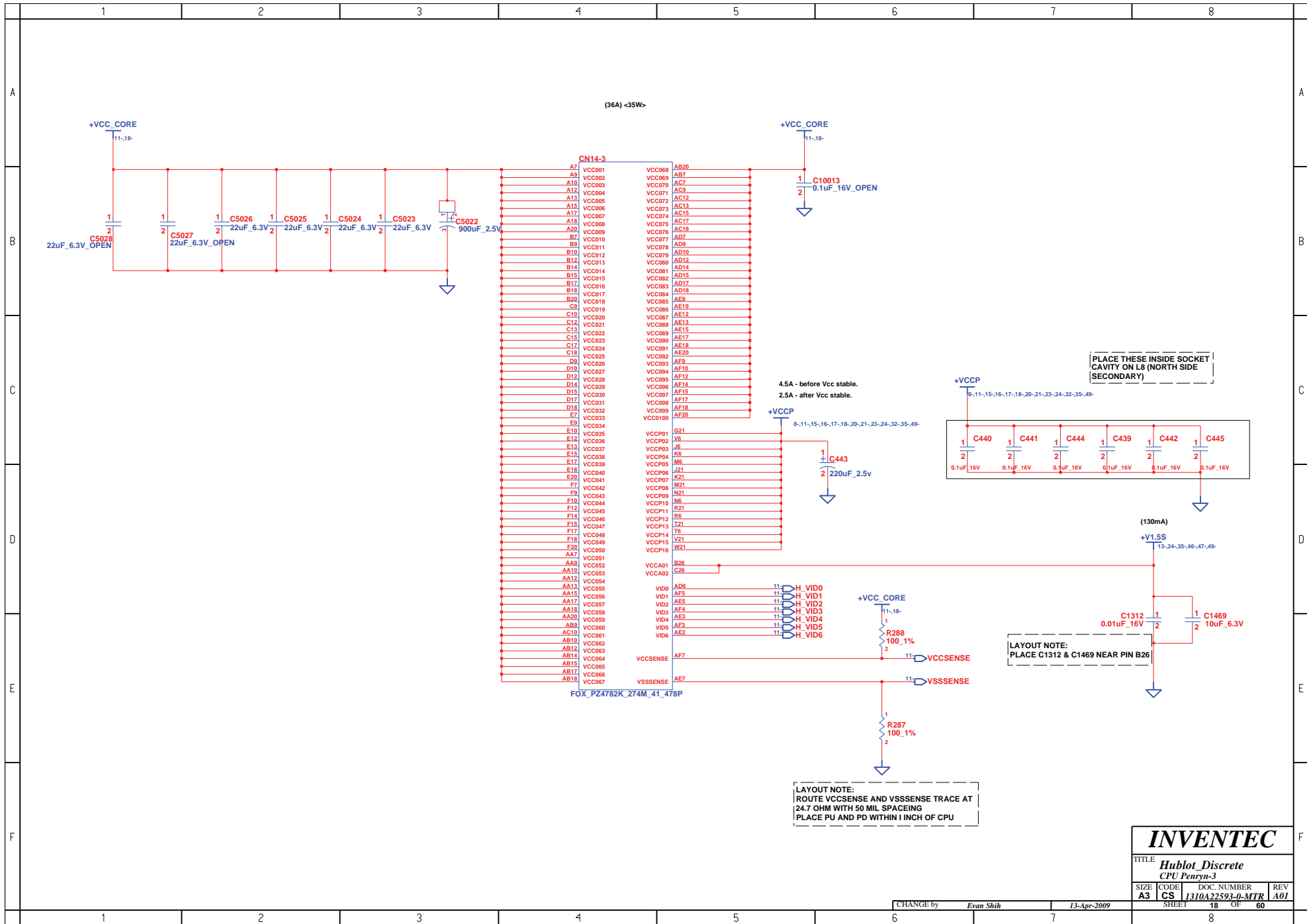
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SIZE A3	CODE CS	DOC NUMBER J310A22593-0-MTR	REV A01
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INVENTEC

TITLE			
Hublot_Discrete			
CPU Penryn-2			
SIZE	CODE	DOC NUMBER	REV
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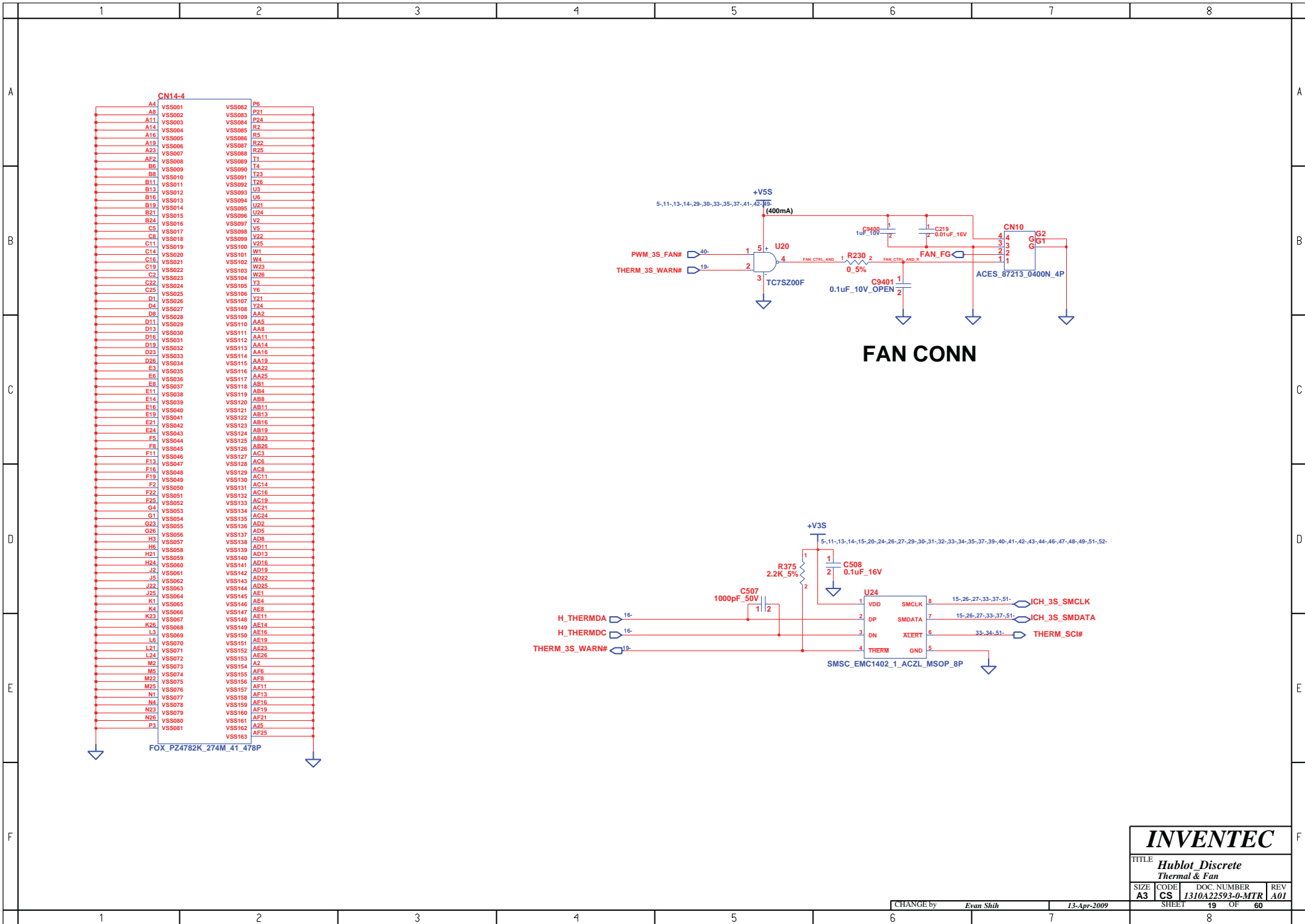
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INVENTEC

TITLE			
Hublot_Discrete			
CPU Penryn-3			
SIZE	CODE	DOC. NUMBER	REV
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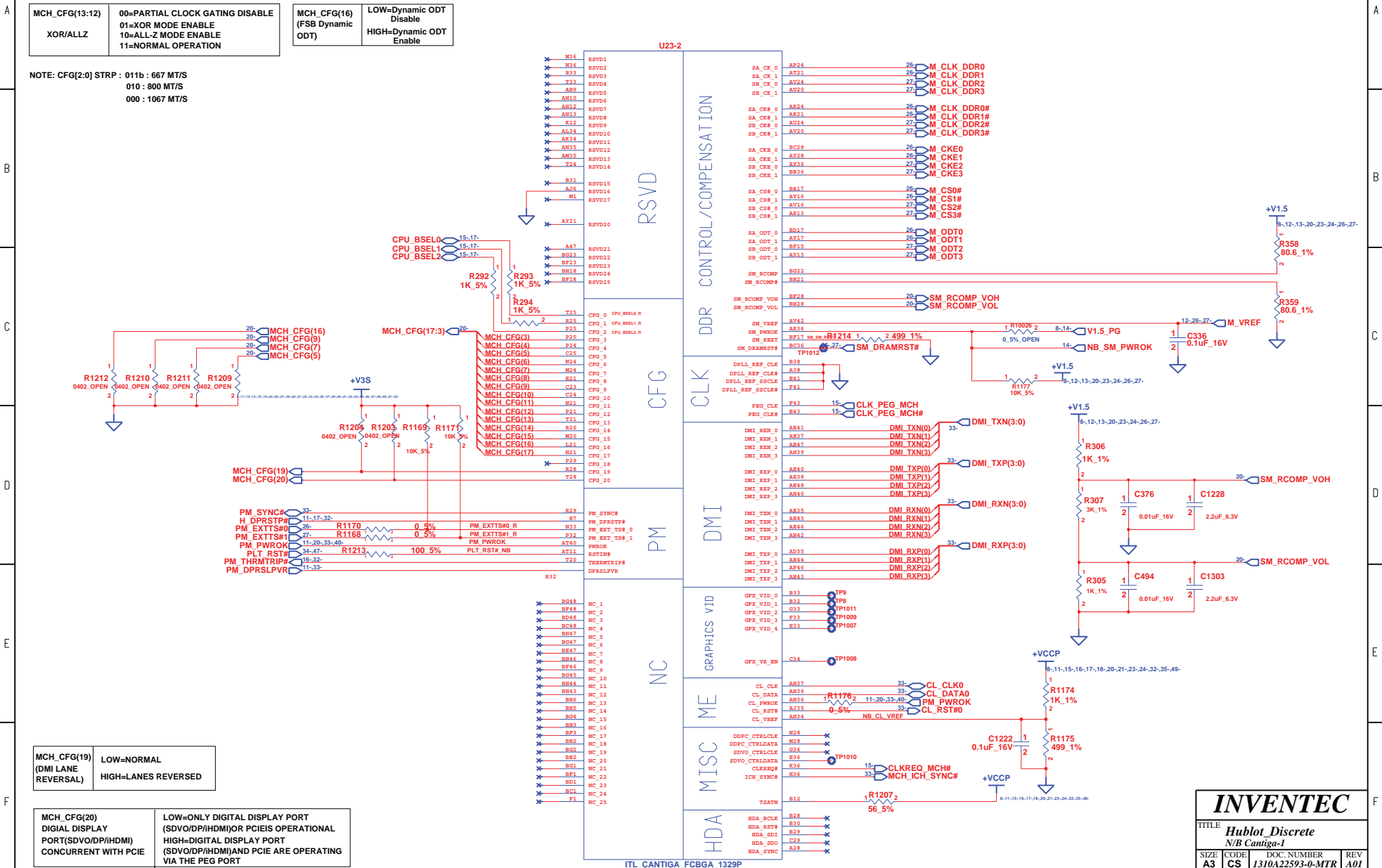


INVENTEC			
TITLE Hublot_Discrete Thermal & Fan			
SIZE A3	CODE CS	DOC NUMBER J310A22593-0-MTR	REV A01
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SHEET 19		OF 60	

MCH_CFG(5)	LOW=DMiX2 HIGH=DMiX4	MCH_CFG(7) (CPU Strap)	LOW=RSVD HIGH=Mobile CPU	MCH_CFG(9) PCIe Graphics Lane	LOW=Reverse Lane HIGH=Normal operation
MCH_CFG(13:12) XOR/ALLZ	00=PARTIAL CLOCK GATING DISABLE 01=XOR MODE ENABLE 10=ALL-Z MODE ENABLE 11=NORMAL OPERATION	MCH_CFG(16) (FSB Dynamic ODT)	LOW=Dynamic ODT HIGH=Dynamic ODT Enable	LOW=Dynamic ODT Disable HIGH=Dynamic ODT Enable	

NOTE : USE 4K-OHM RESISTOR WHEN INSTALLING PULL-UP/PULL-DOWN RESISTOR ON ANY MCH-CFG CONNECTION/PINS.

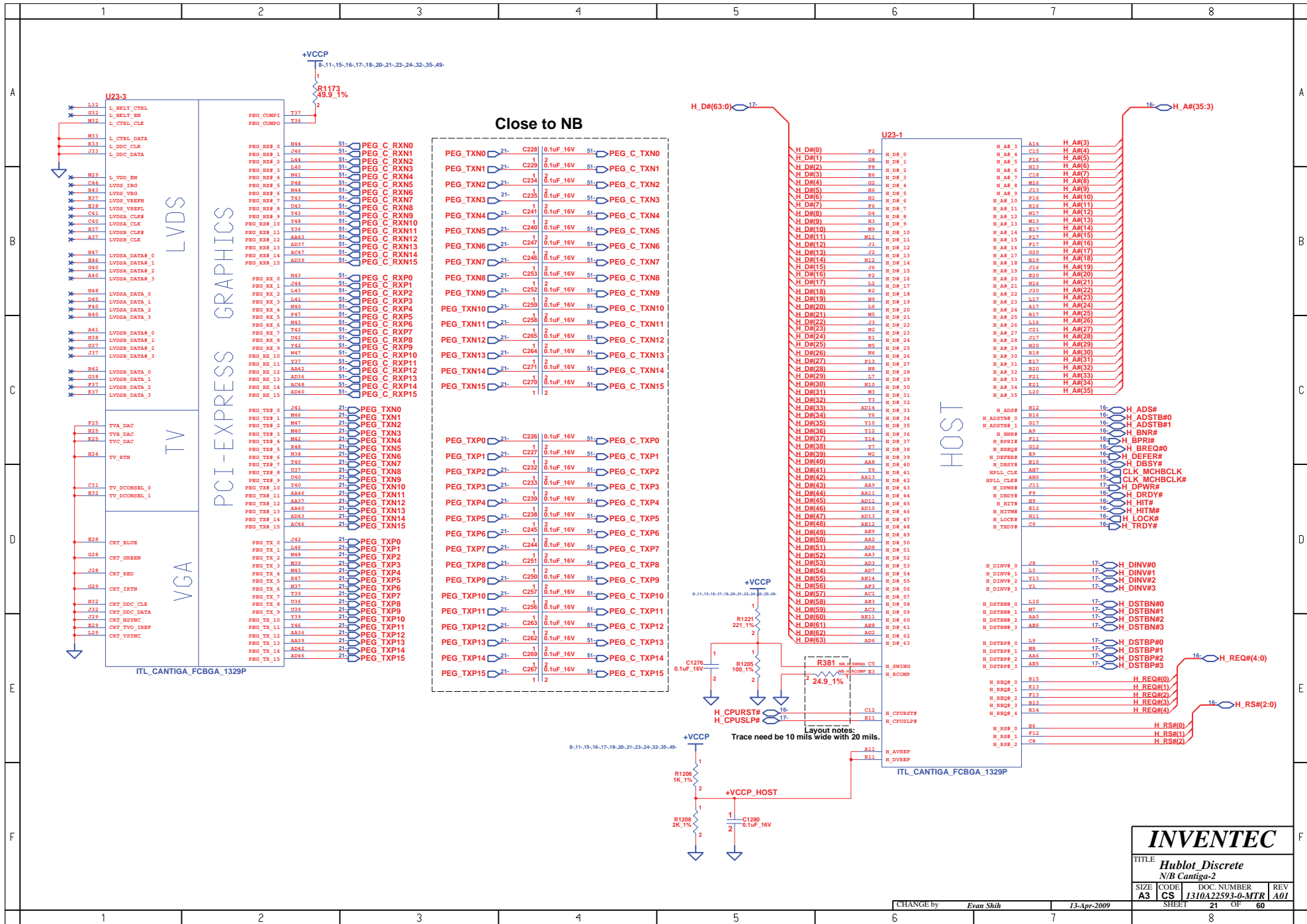
NOTE: CFG[2:0] STRP : 011b : 667 MT/S
010 : 800 MT/S
000 : 1067 MT/S



MCH_CFG(19) (DMI LANE REVERSAL)	LOW=NORMAL HIGH=LANES REVERSED
---------------------------------------	-----------------------------------

MCH_CFG(20) DIGITAL DISPLAY PORT(SDV/D/DP/HDMI) CONCURRENT WITH PCIE	LOW=ONLY DIGITAL DISPLAY PORT (SDV/D/DP/HDMI)OR PCIE OPERATIONAL HIGH=DIGITAL DISPLAY PORT (SDV/D/DP/HDMI)AND PCIE ARE OPERATING VIA THE PEG PORT
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INVENTEC
 TITLE: Hublot_Discrete
 N/B Cantiga-1
 SIZE CODE: A3 CS
 DOC NUMBER: J310A22593-0-MTR
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 REV: A01



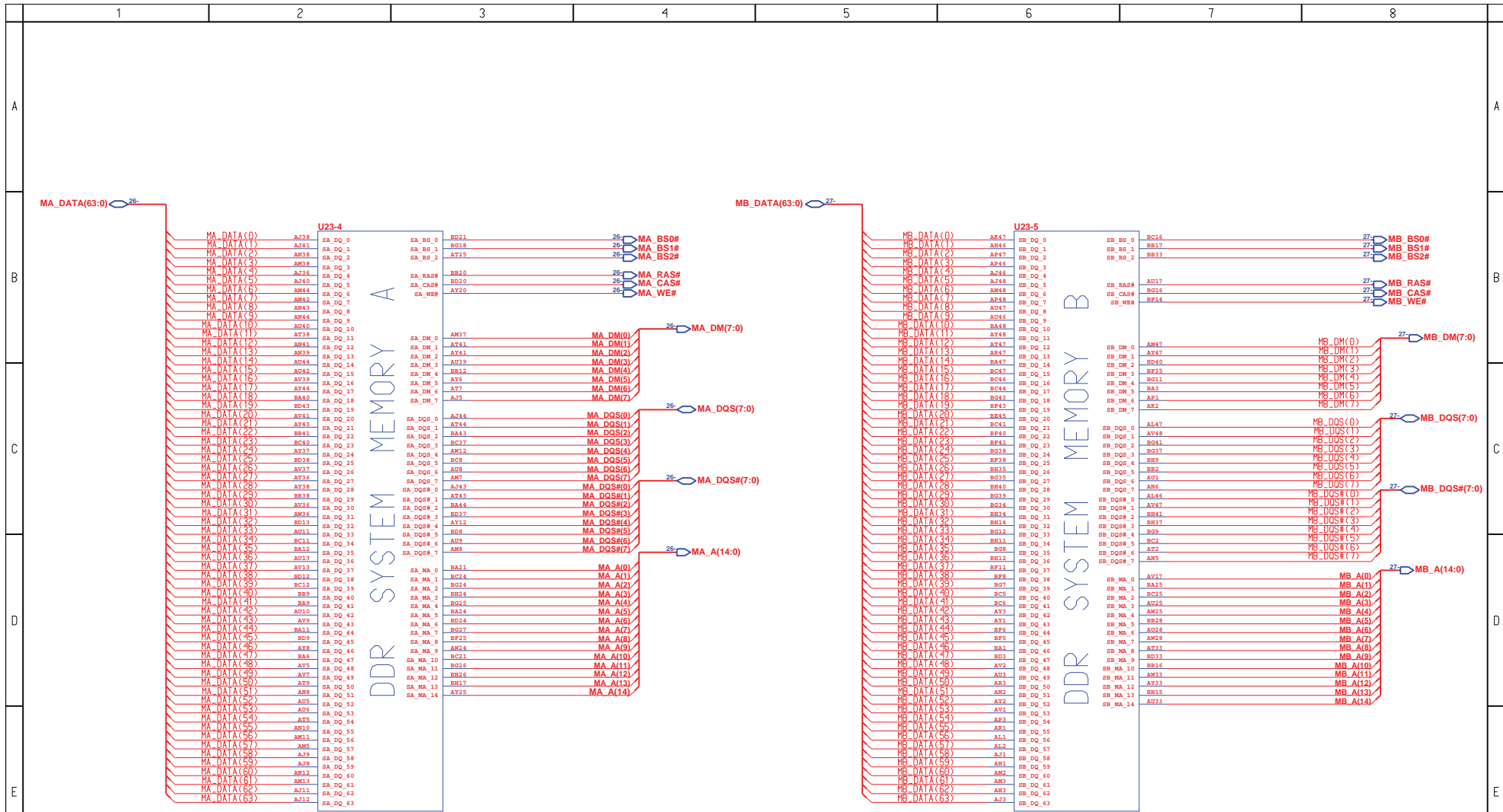
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N/B Cantiga-2

SIZE	CODE	DOC NUMBER	REV
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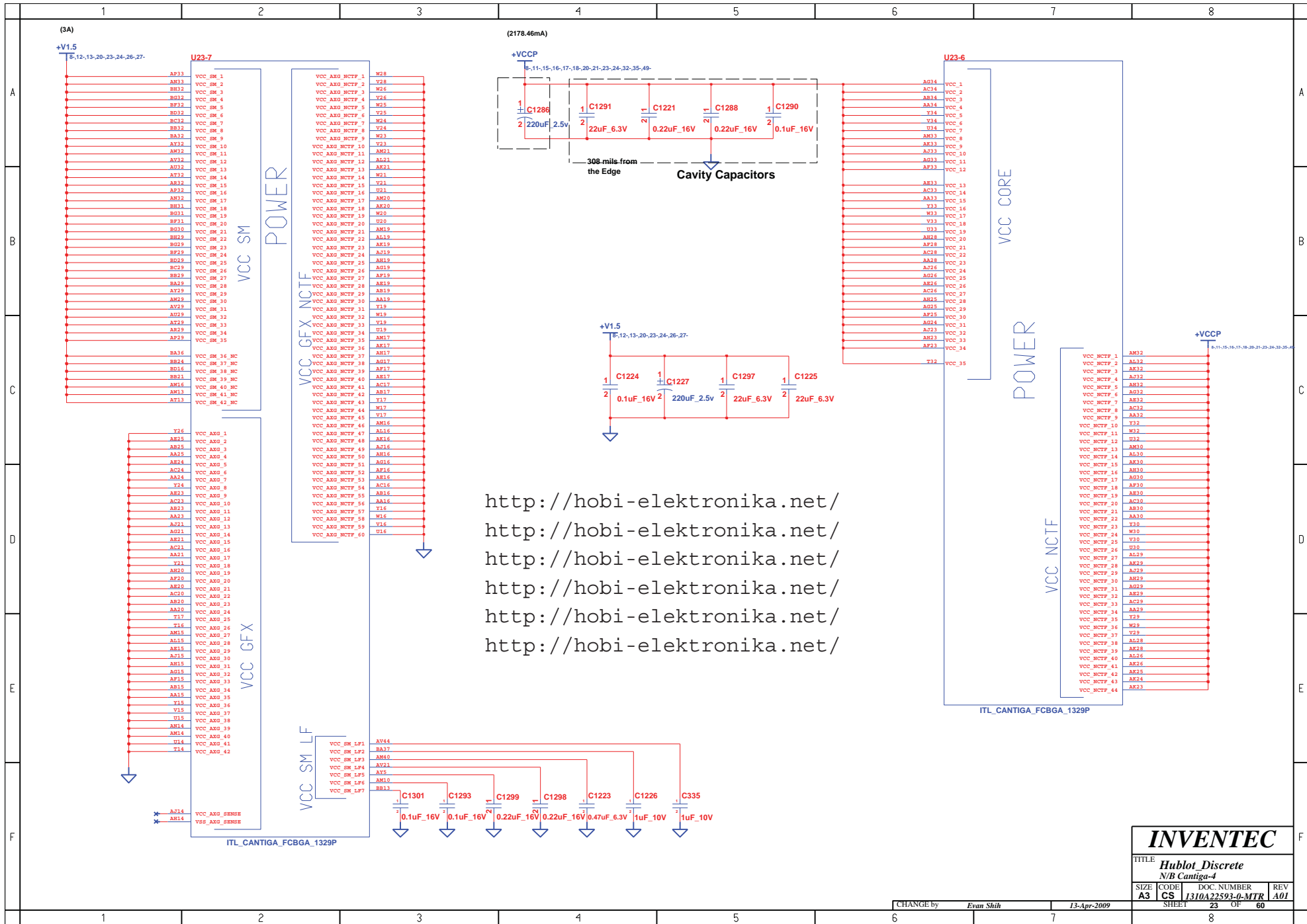
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CHANGE by **Evan Shih** 13-Apr-2009



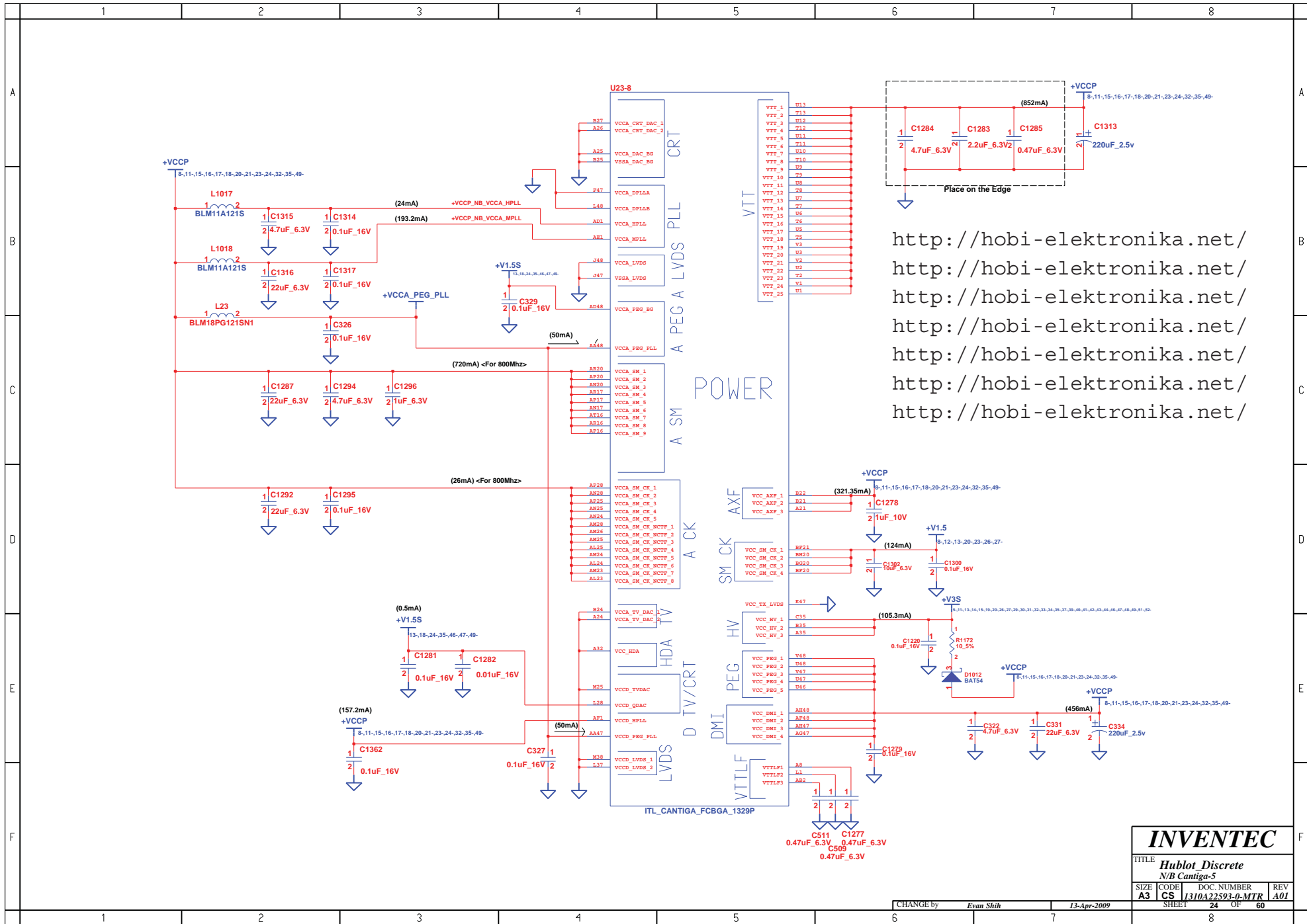
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N/B Cantiga-3			
SIZE: A3	CODE: CS	DOC. NUMBER: J310A22593-0-MTR	REV: A01
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CHANGE by: *Evan Shih* 13-Apr-2009



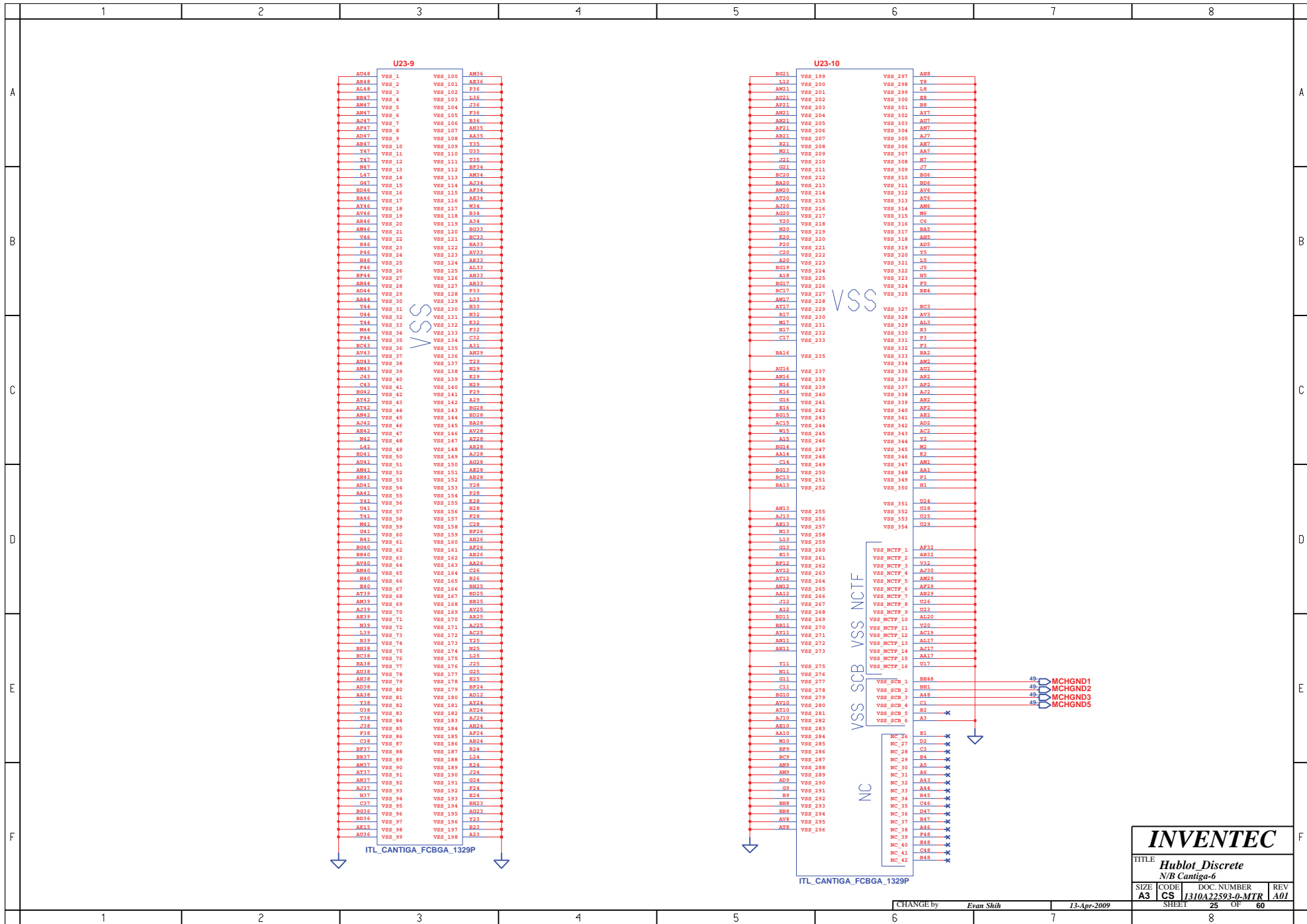
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INVENTEC			
TITLE <i>Hublot_Discrete</i> N/B Cantiga-4			
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CHANGE by <i>Evan Shih</i>		13-Apr-2009	
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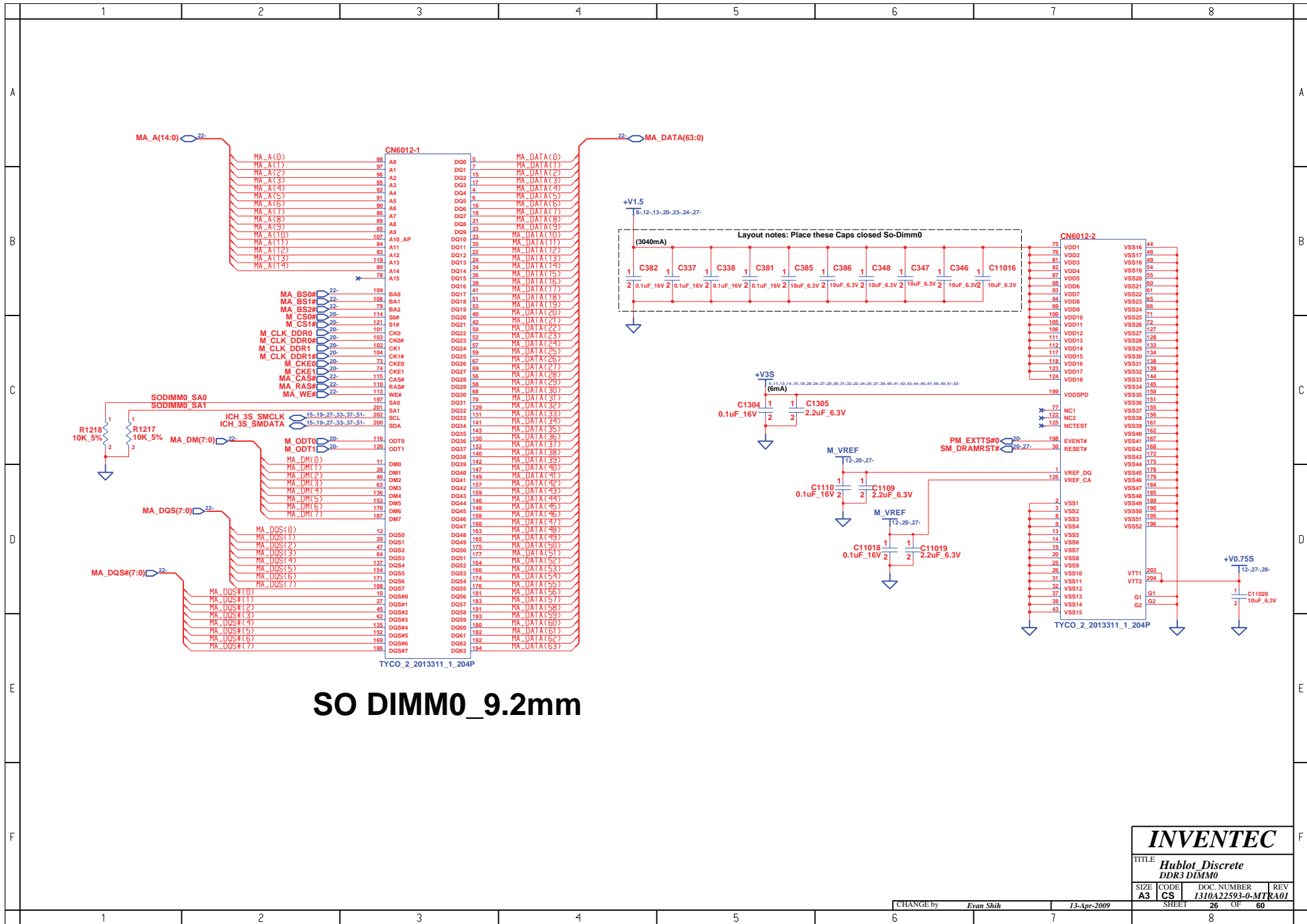
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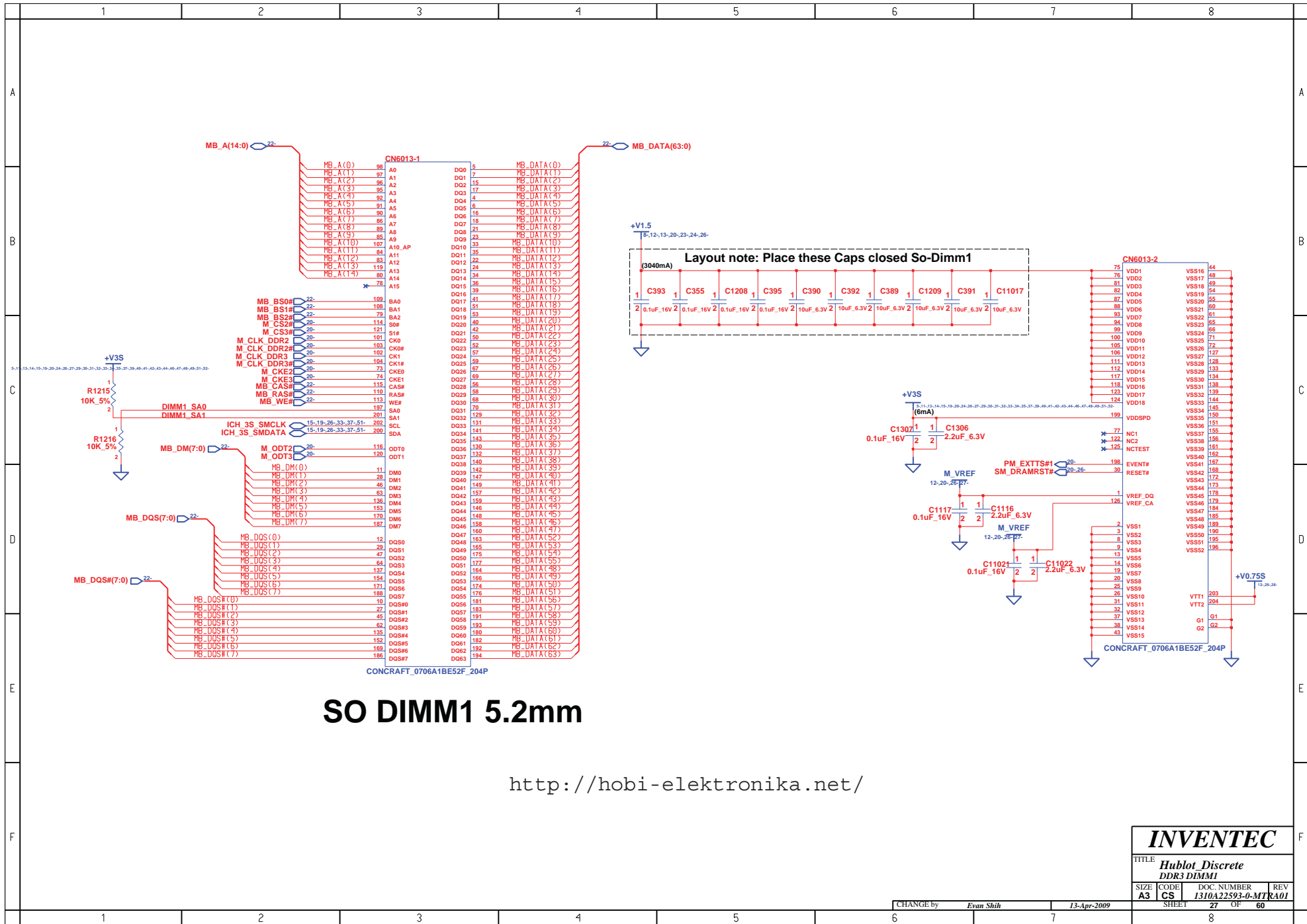


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INVENTEC			
TITLE: Hublot_Discrete DDR3 DIMM0			
SIZE: A3	CODE: CS	DOC. NUMBER: 1310A22593-0-MTR	REV: RA01
CHANGE by: <i>Evan Shih</i>		13-Apr-2009	
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SO DIMM1 5.2mm

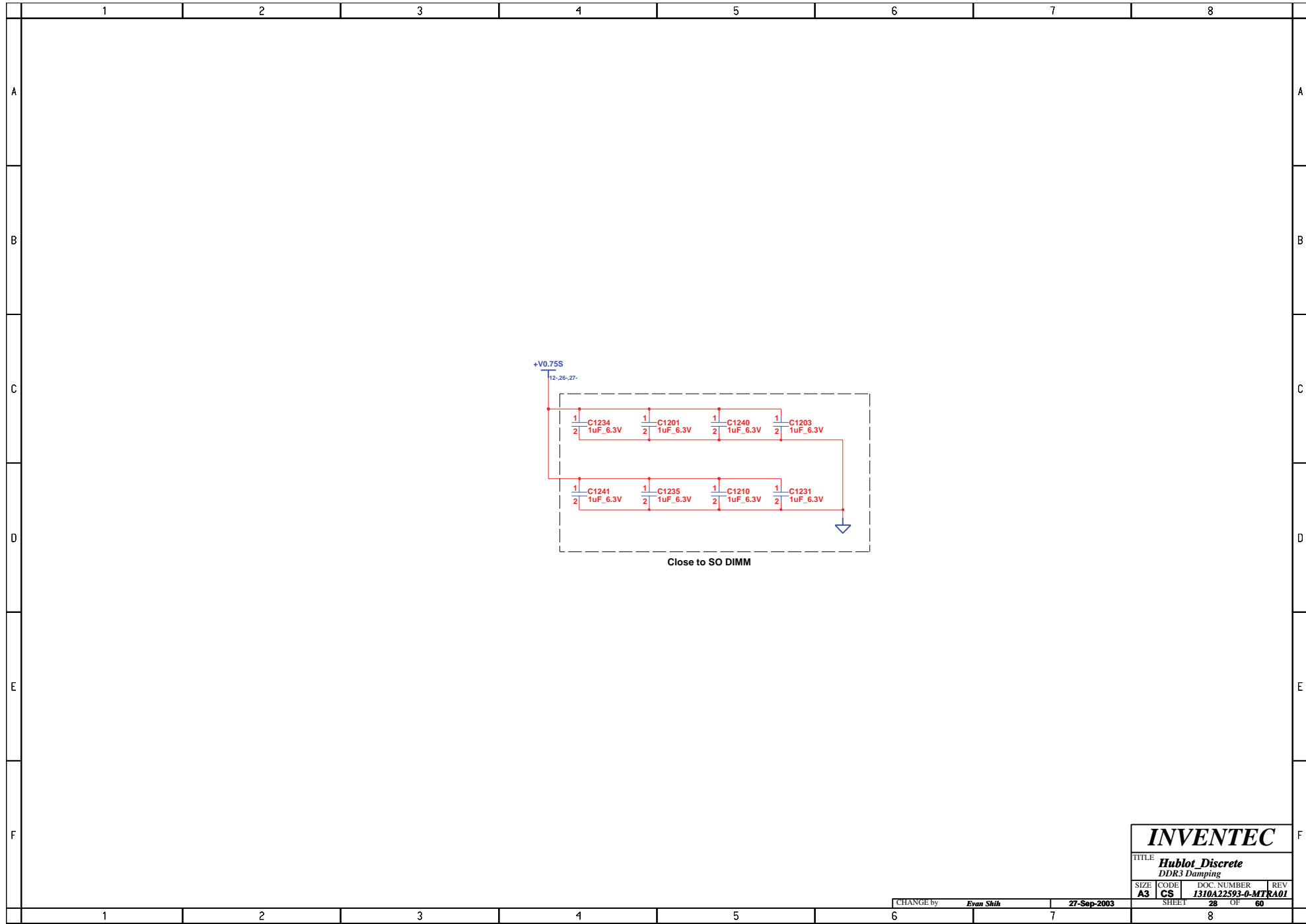
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INVENTEC

TITLE Hublot_Discrete DDR3 DIMM1		
SIZE A3	CODE CS	DOC NUMBER 1310A22593-0-MTR
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INVENTEC			
TITLE <i>Hublot_Discrete</i>			
DDR3 Damping			
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CHANGE by		27-Sep-2003	
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1 2 3 4 5 6 7 8

A

B

C

D

E

F

A

B

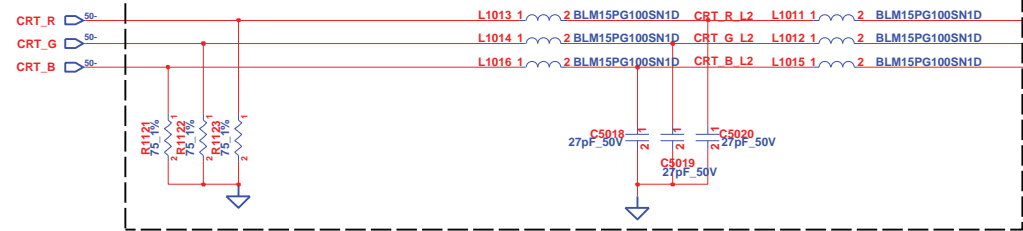
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D

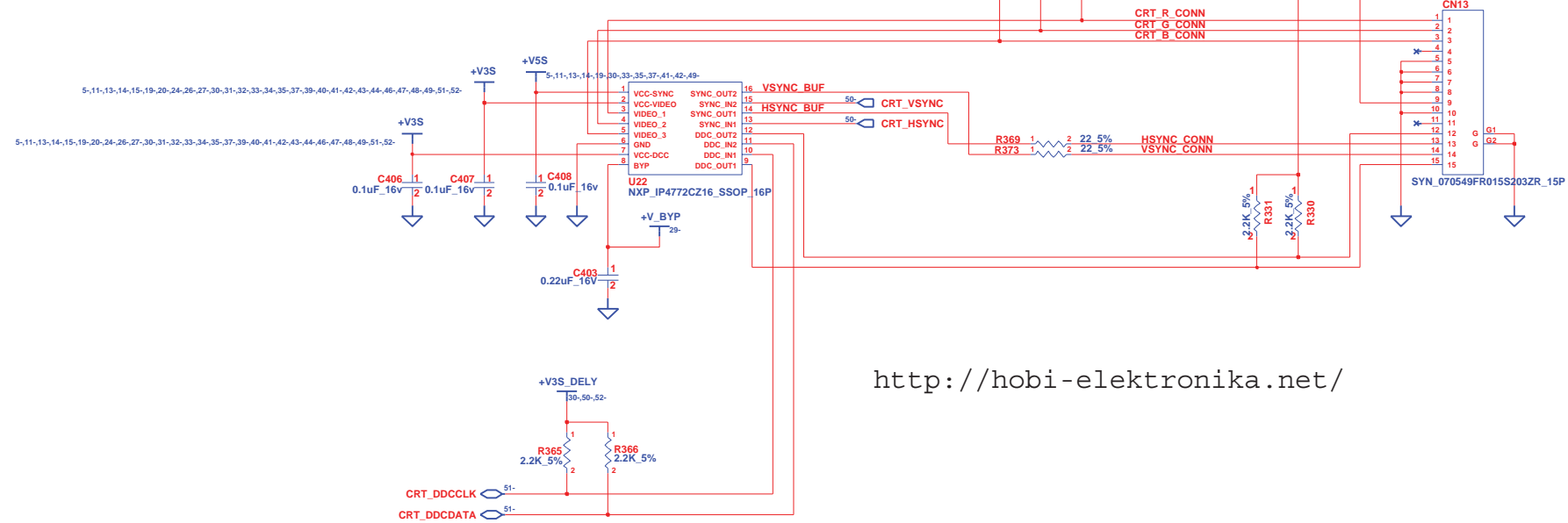
E

F

Close to Connector



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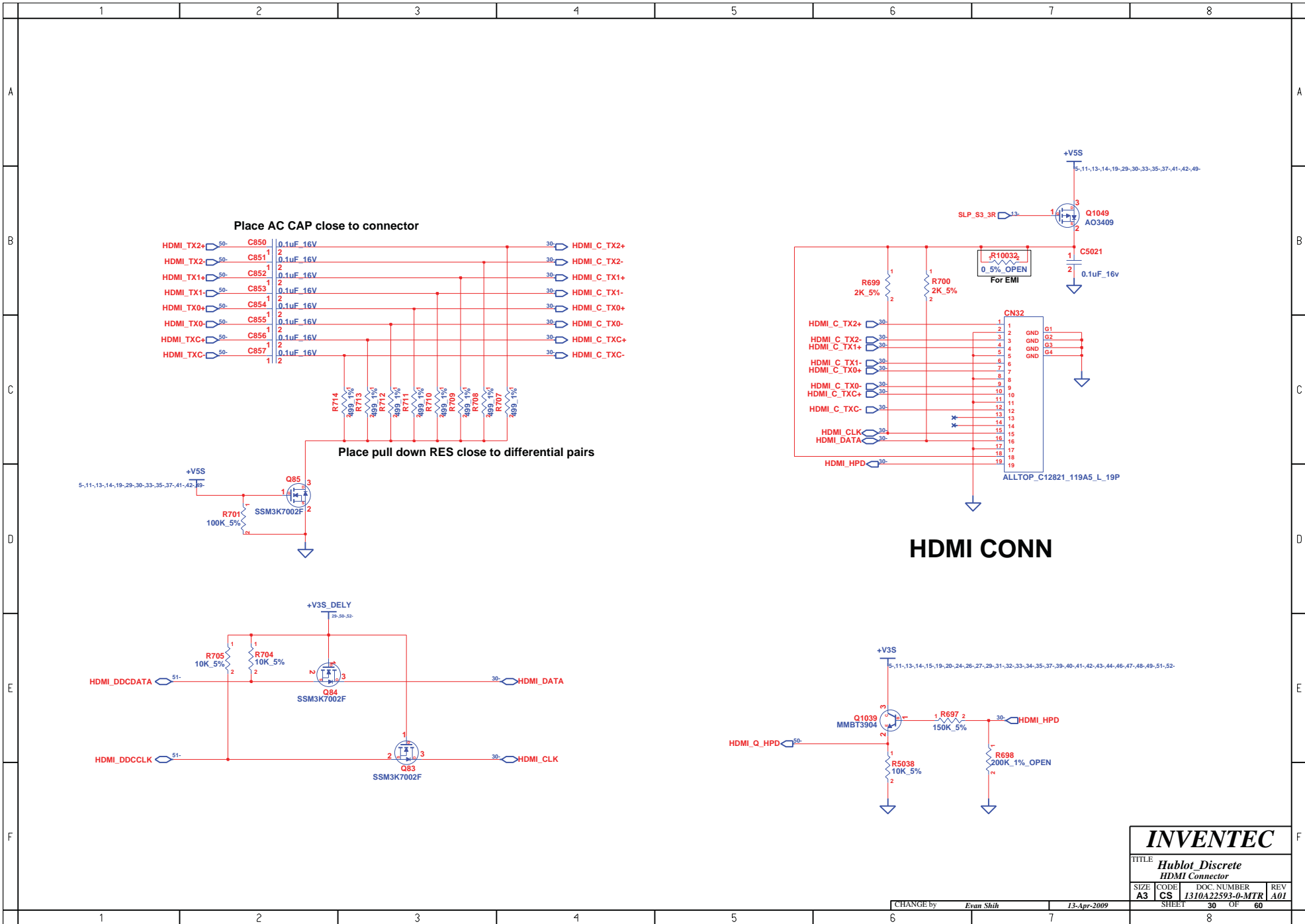
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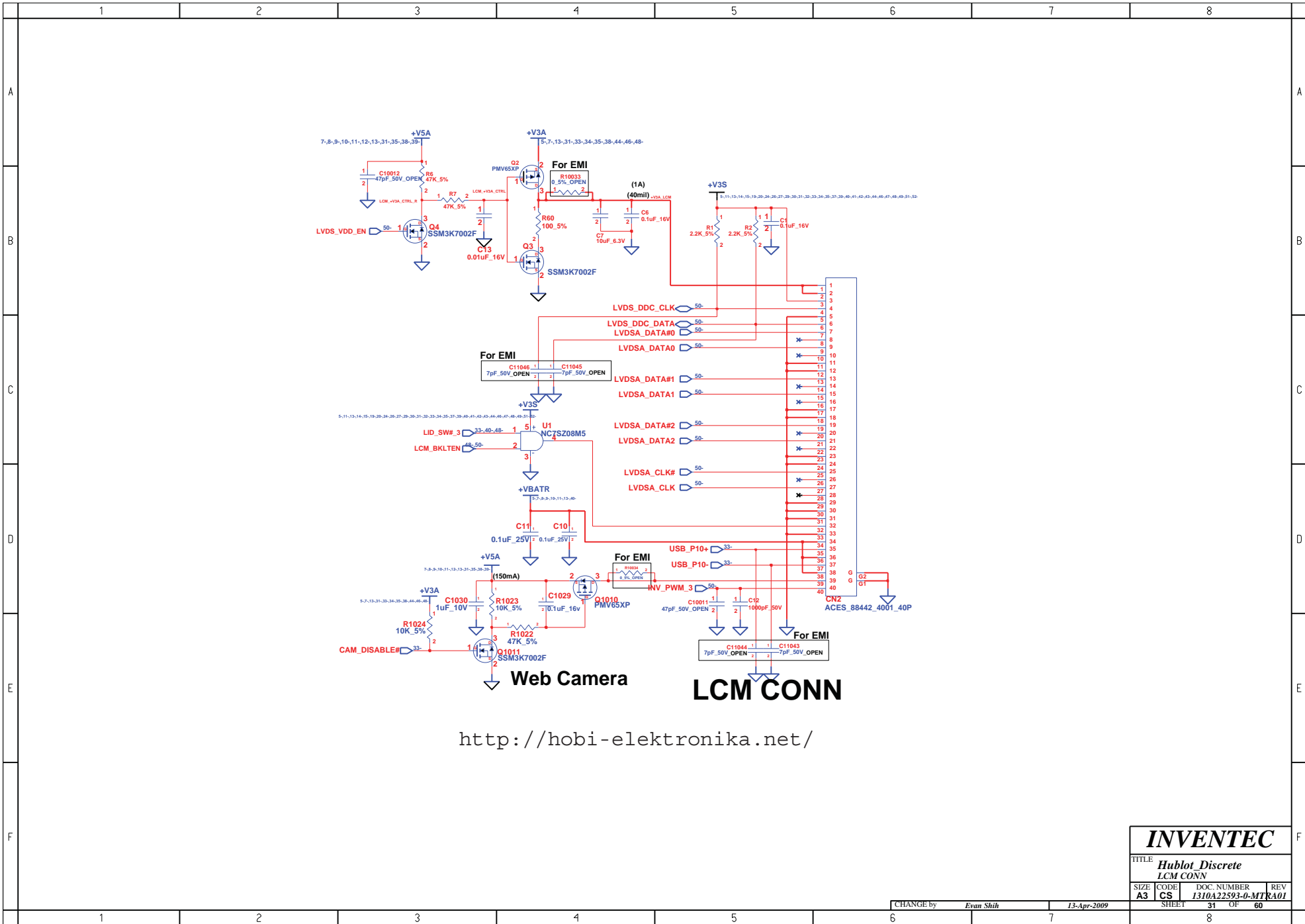
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CRT Connector			
SIZE	CODE	DOC NUMBER	REV
A3	CS	1310A22593-0-MT	KA01
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INVENTEC			
TITLE: Hublot_Discrete HDMI Connector			
SIZE: A3	CODE: CS	DOC NUMBER: J310A22593-0-MTR	REV: A01
CHANGE by: Evan Shih		13-Apr-2009	
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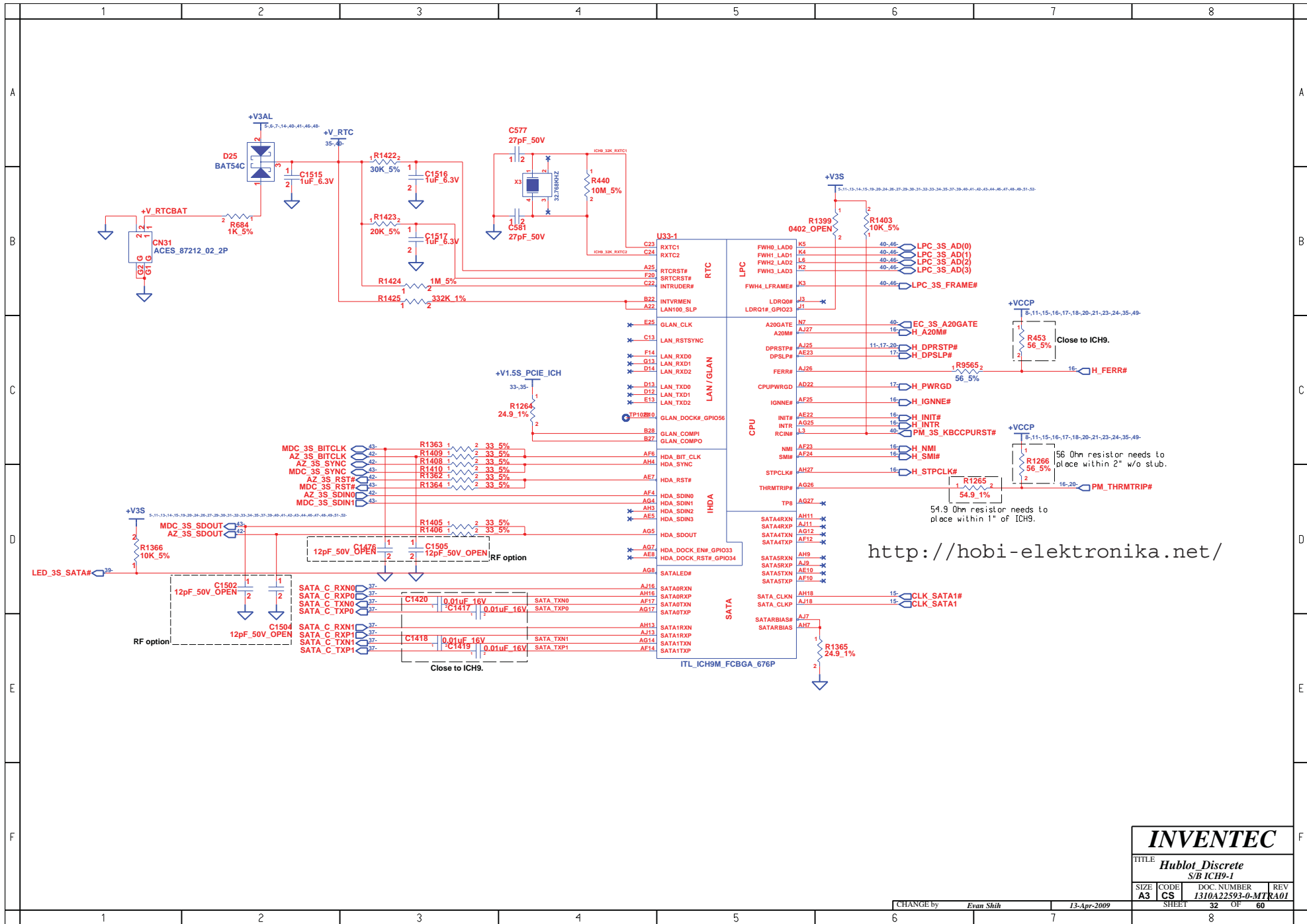
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INVENTEC

TITLE
Hublot_Discrete
LCM CONN

SIZE A3	CODE CS	DOC. NUMBER 1310A22593-0-MTR	REV A01
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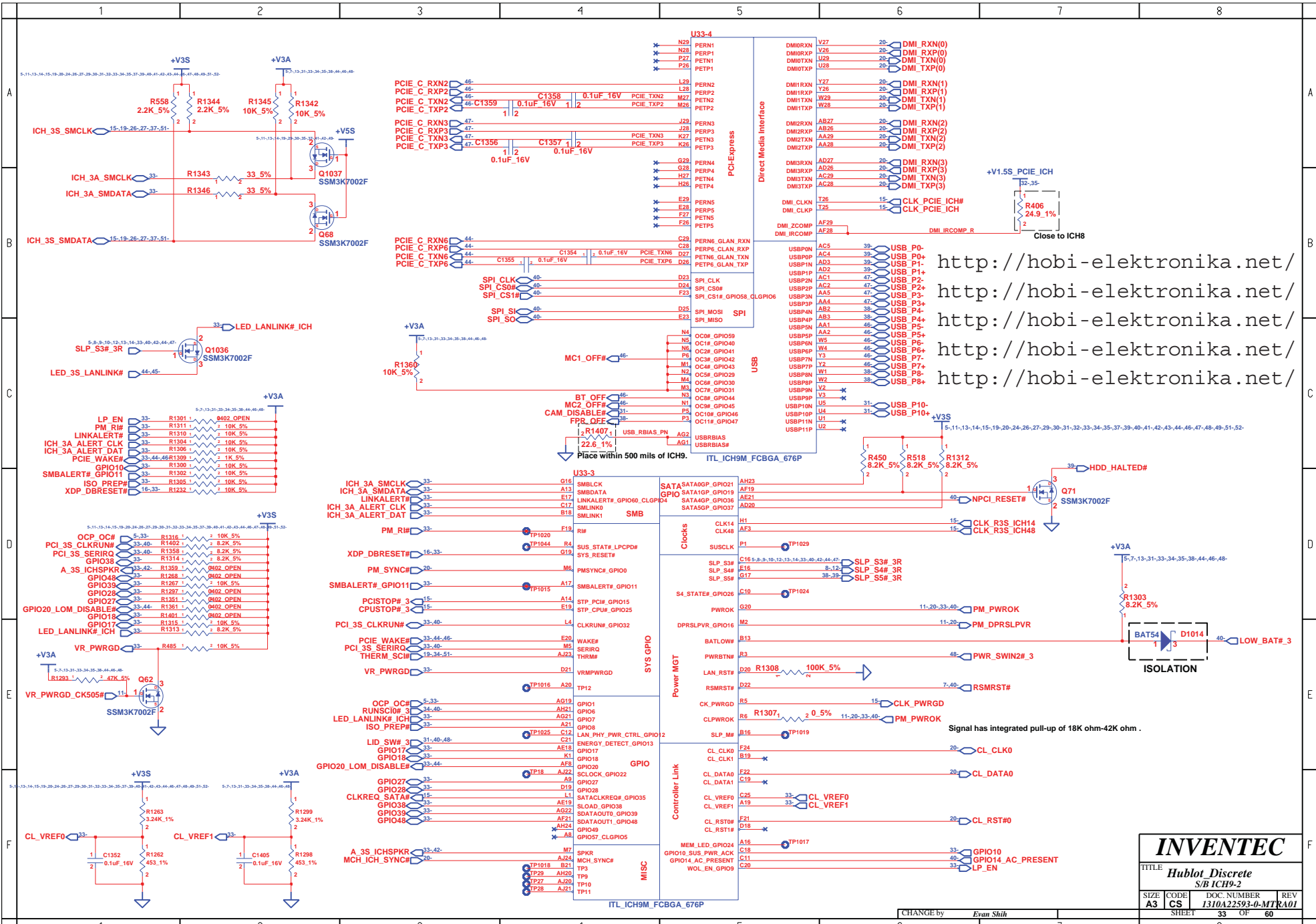
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TITLE
Hublot_Discrete
 S/B ICH9-1

SIZE A3	CODE CS	DOC. NUMBER 1310A22593-0-MTR	REV RA01
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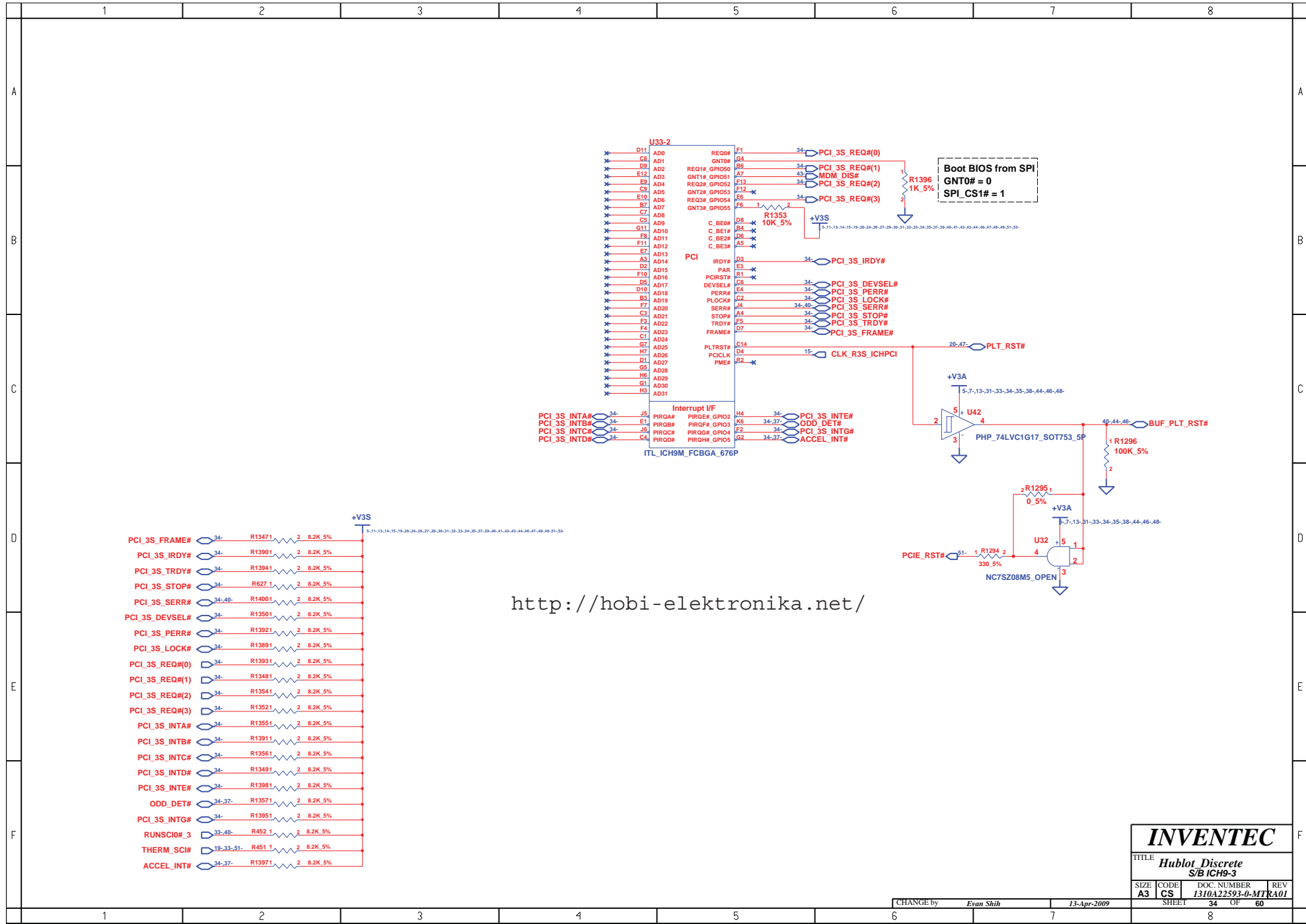
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INVENTEC

Hublot_Discrete
S/B ICH9-2

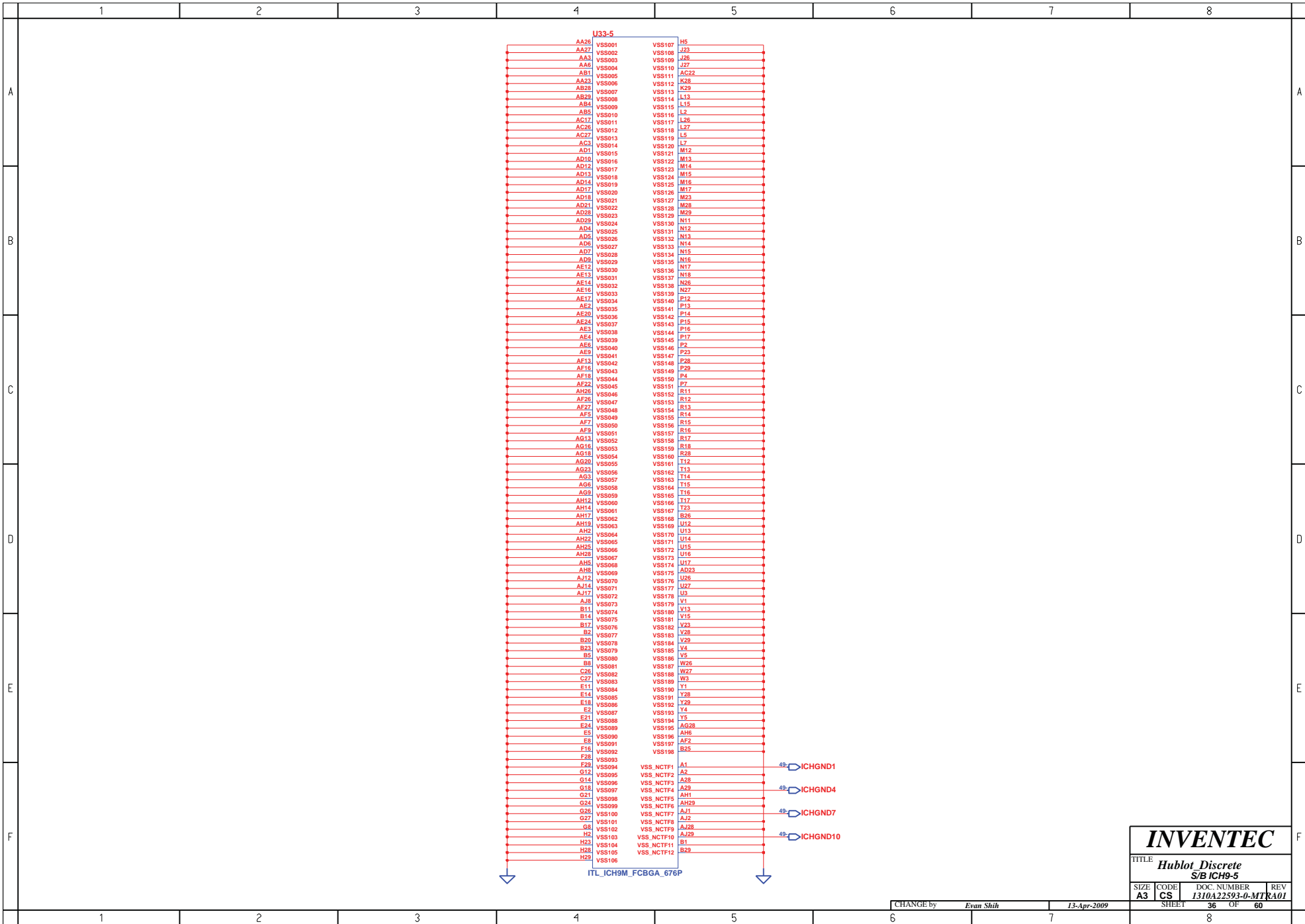
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CHANGE by *Evan Shih*



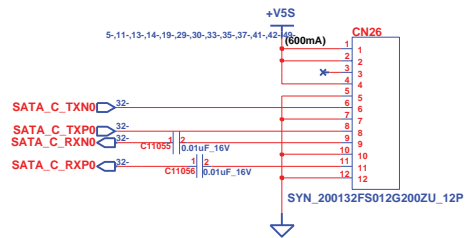
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INVENTEC			
TITLE <i>Hublot Discrete</i> S/B ICH9-3			
SIZE A3	CODE CS	DOC. NUMBER 1310A22593-0-MT	REV KA01
CHANGE by <i>Evan Shih</i>		13-Apr-2009	
SHEET 34		OF 60	

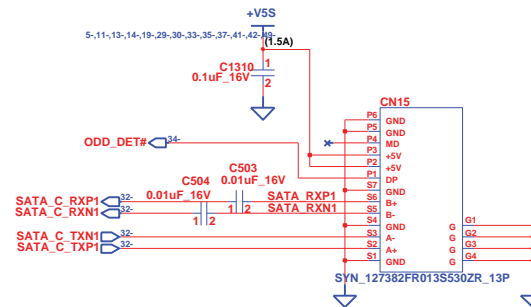


INVENTEC			
TITLE <i>Hublot_Discrete</i> S/B ICH9-5			
SIZE A3	CODE CS	DOC. NUMBER 1310A22593-0-MTR	REV A01
SHEET		OF	
36		60	

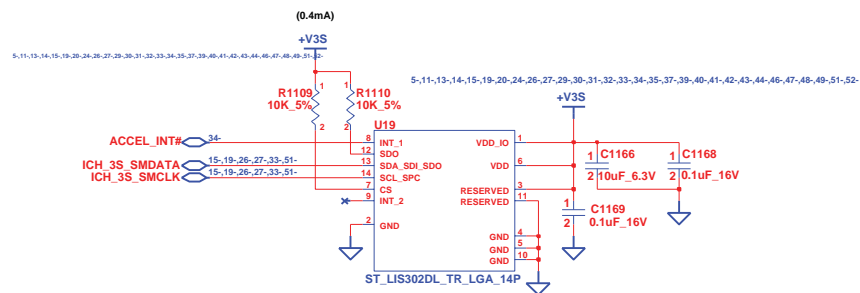
CHANGE by *Evan Shih* 13-Apr-2009



SATA HDD B to B CONN

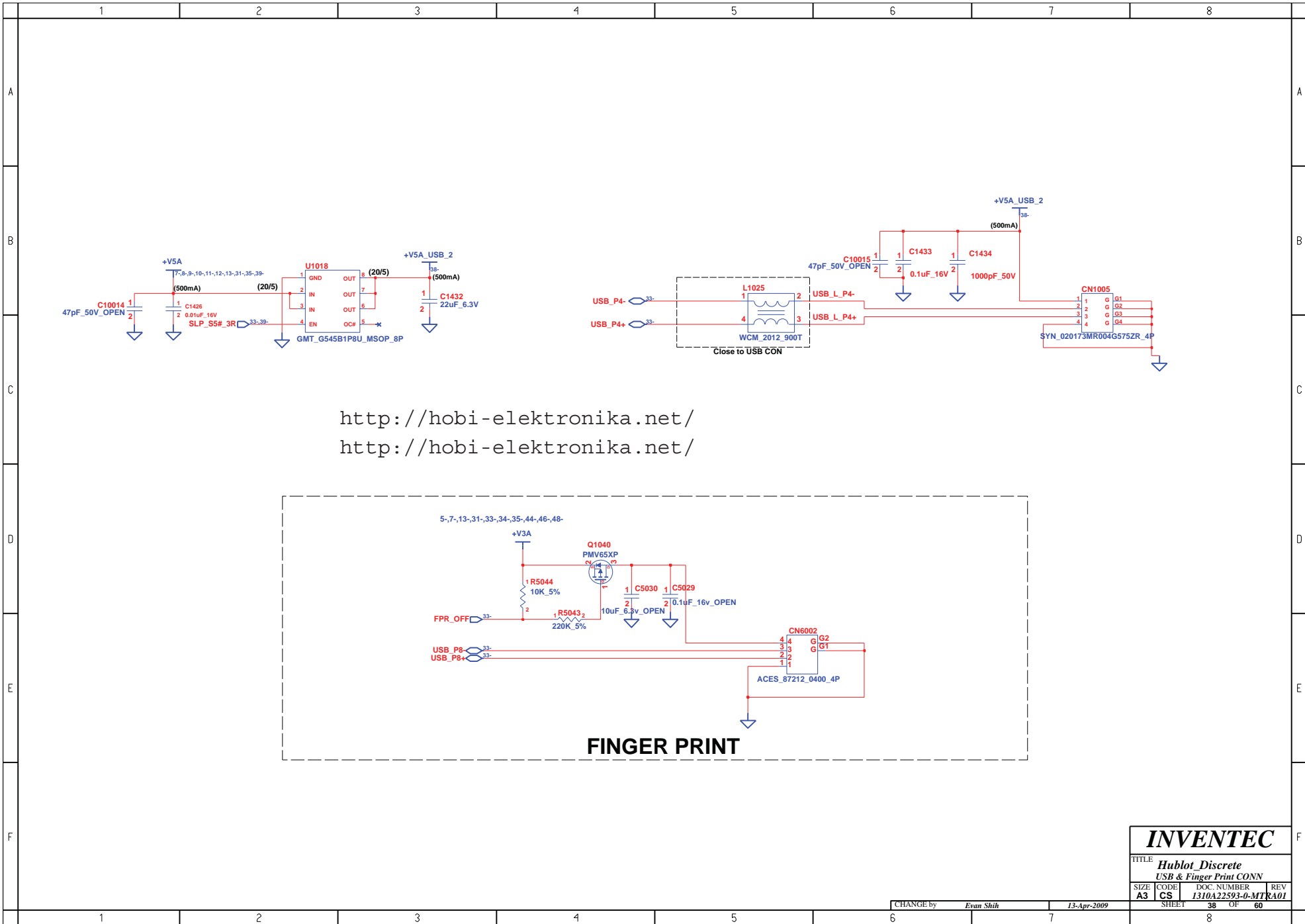


SATA ODD

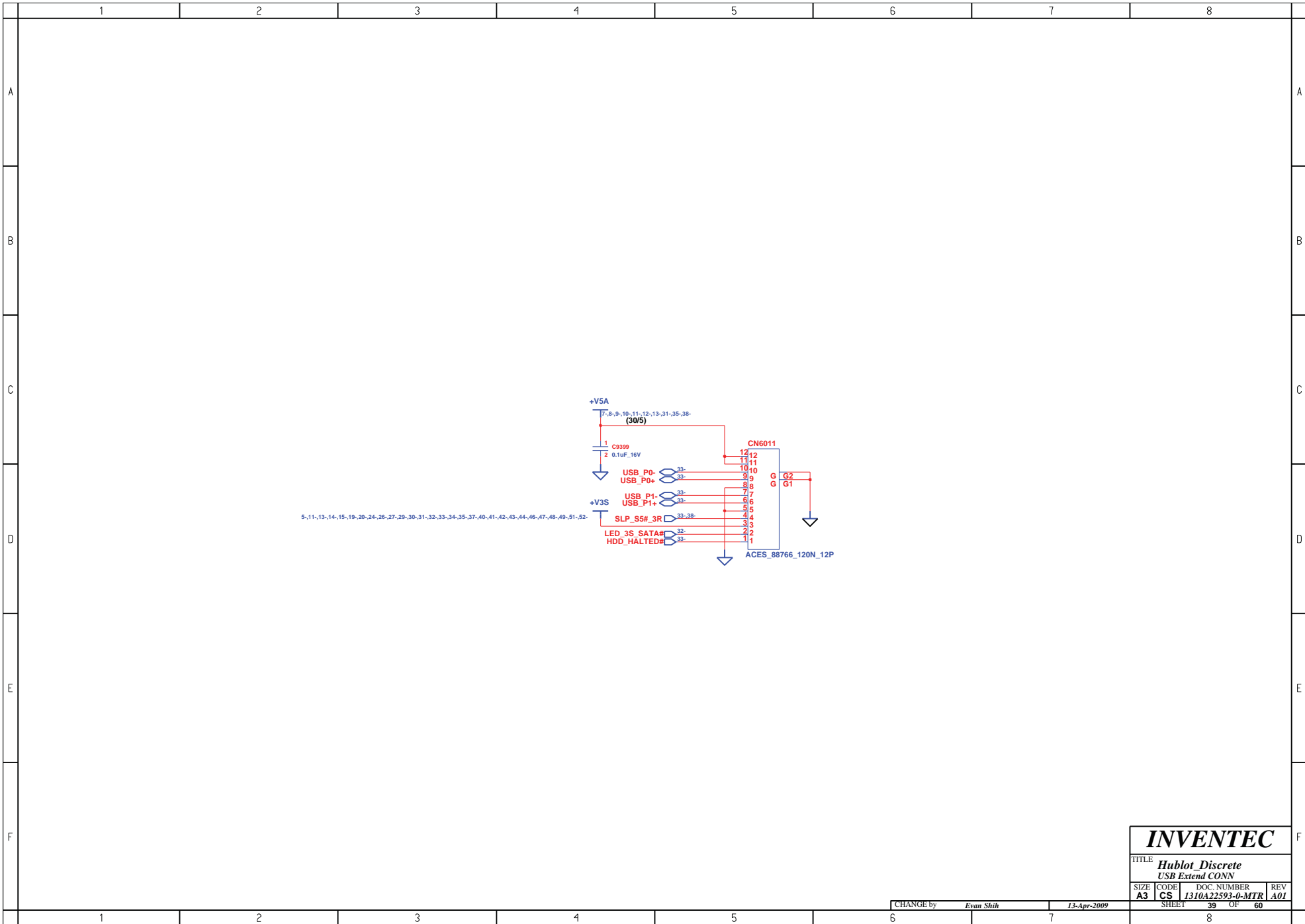


Accelerometer

INVENTEC			
TITLE Hublot_Discrete			
HDD & ODD CONN & Accelerometer			
SIZE A3	CODE CS	DOC NUMBER 1310A22593-0-MTR	REV RA01
CHANGE by <i>Evan Shih</i>		13-Apr-2009	
SHEET 37		OF 60	



INVENTEC			
TITLE <i>Hublot_Discrete</i>			
USB & Finger Print CONN			
SIZE A3	CODE CS	DOC. NUMBER 1310A22593-0-MT	REV RA01
CHANGE by <i>Evan Shih</i>		13-Apr-2009	
SHEET 38		OF 60	



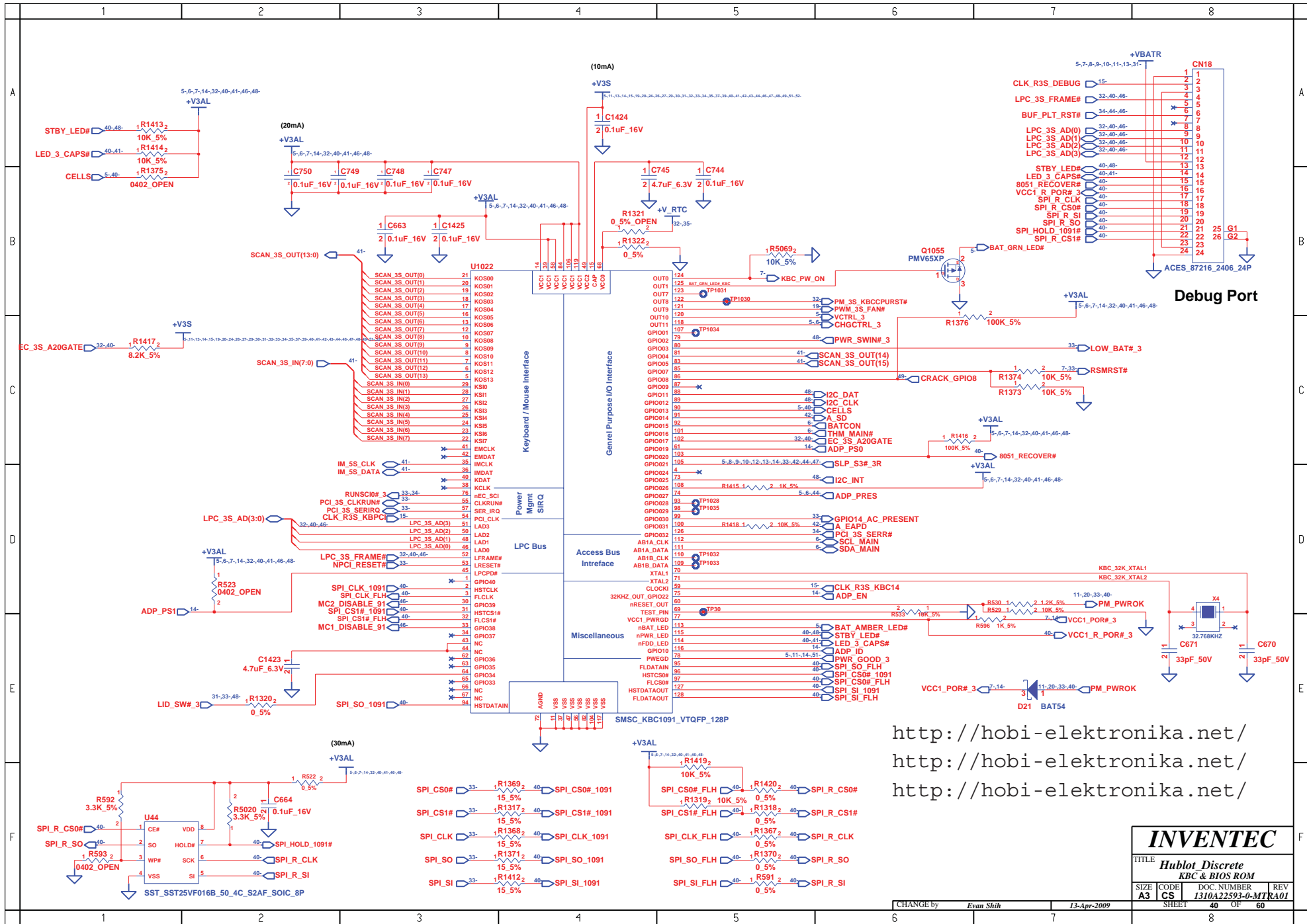
INVENTEC

TITLE *Hublot_Discrete*
USB Extend CONN

SIZE	CODE	DOC NUMBER	REV
A3	CS	1310A22593-0-MTR	A01

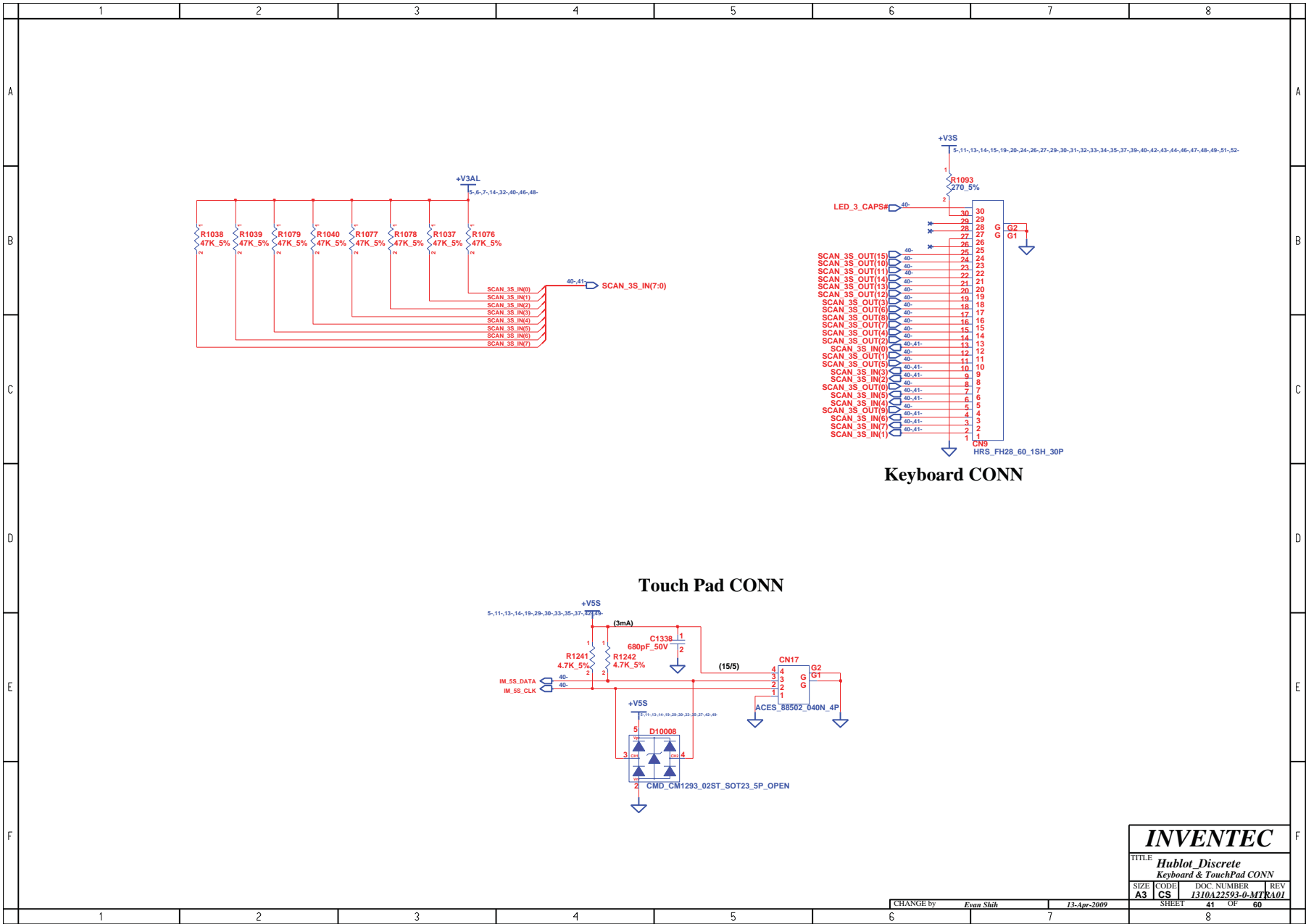
CHANGE by *Evan Shih* 13-Apr-2009

SHEET 39 OF 60



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<http://hobi-elektronika.net/>
<http://hobi-elektronika.net/>

INVENTEC			
TITLE Hublot Discrete KBC & BIOS ROM			
SIZE A3	CODE CS	DOC. NUMBER 1310A22593-0-MTR	REV A01
CHANGE by <i>Evan Shih</i>		13-Apr-2009	
SHEET 40		OF 60	

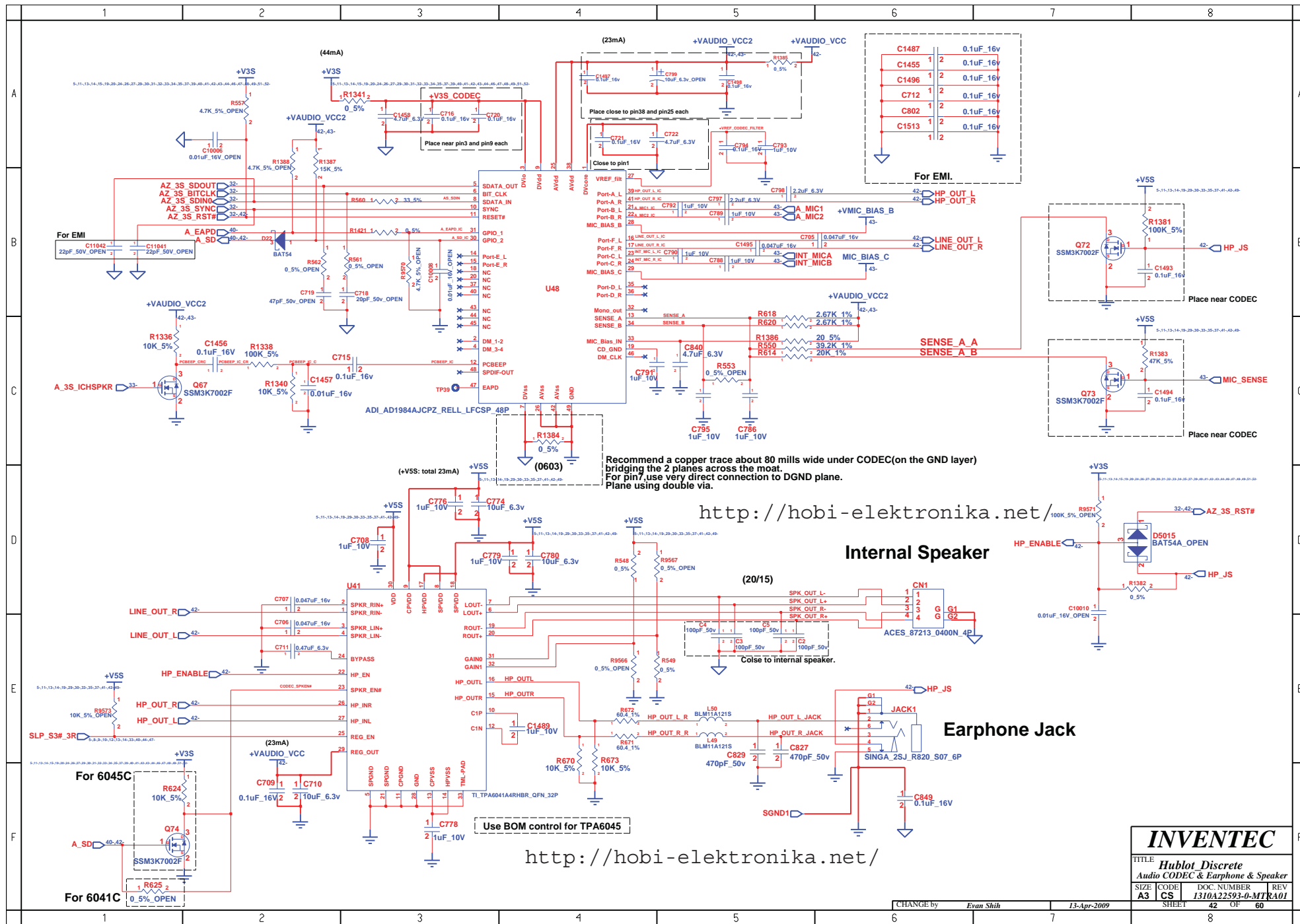


INVENTEC

TITLE *Hublot Discrete*
Keyboard & TouchPad CONN

SIZE	CODE	DCC NUMBER	REV
A3	CS	I310A22593-0-MTKA01	

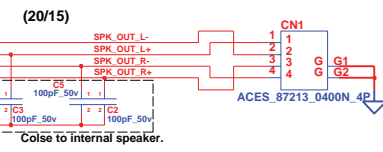
CHANGE by *Evan Shih* 13-Apr-2009 SHEET 41 OF 60



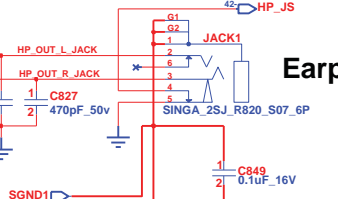
Recommend a copper trace about 80 mills wide under CODEC (on the GND layer) bridging the 2 planes across the moat. For pin7, use very direct connection to DGND plane. Plane using double via.

<http://hobi-elektronika.net/>

Internal Speaker

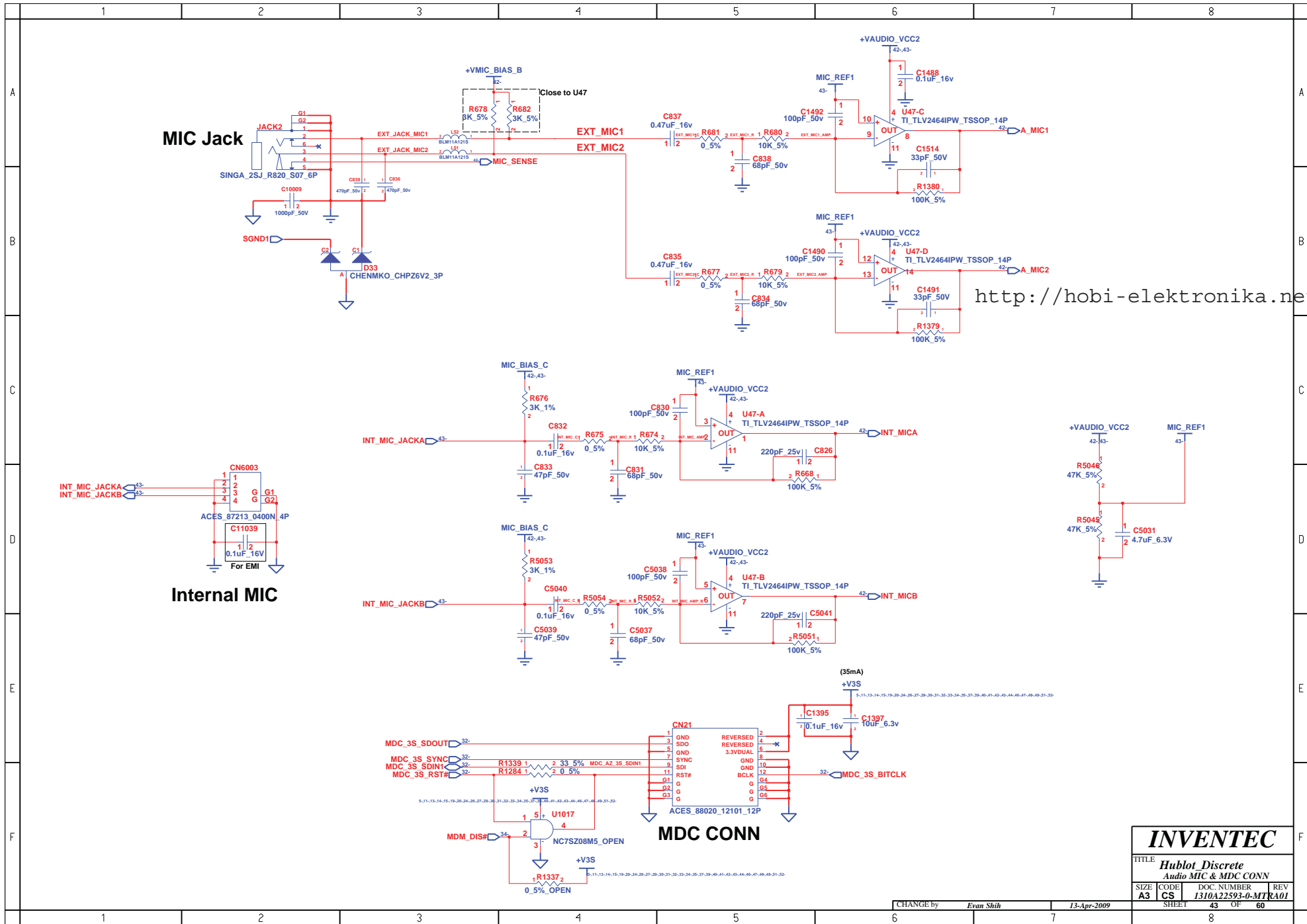


Earphone Jack



<http://hobi-elektronika.net/>

INVENTEC			
TITLE <i>Hublot Discrete Audio CODEC & Earphone & Speaker</i>			
SIZE A3	CODE CS	DOC. NUMBER <i>1310A22593-D-MTR-1A01</i>	REV 42
CHANGE by <i>Evan Shih</i>		13-Apr-2009	
SHEET 42		OF 60	



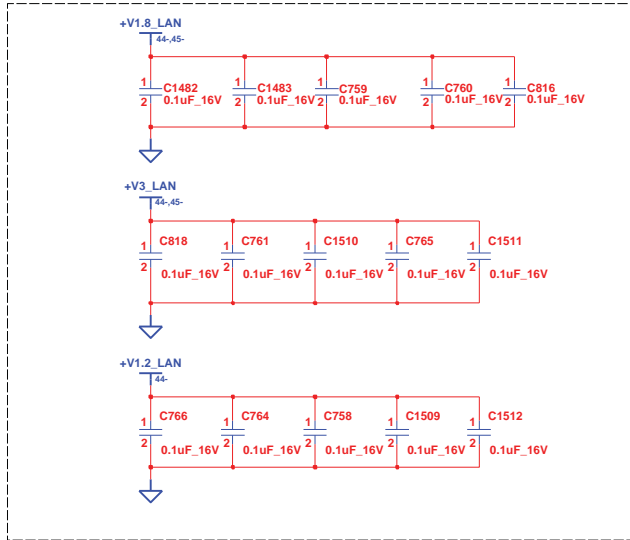
INVENTEC

TITLE: Hublot_Discrete
Audio MIC & MDC CONN

SIZE	CODE	DOC NUMBER	REV
A3	CS	1310A22593-0-MTR	A01

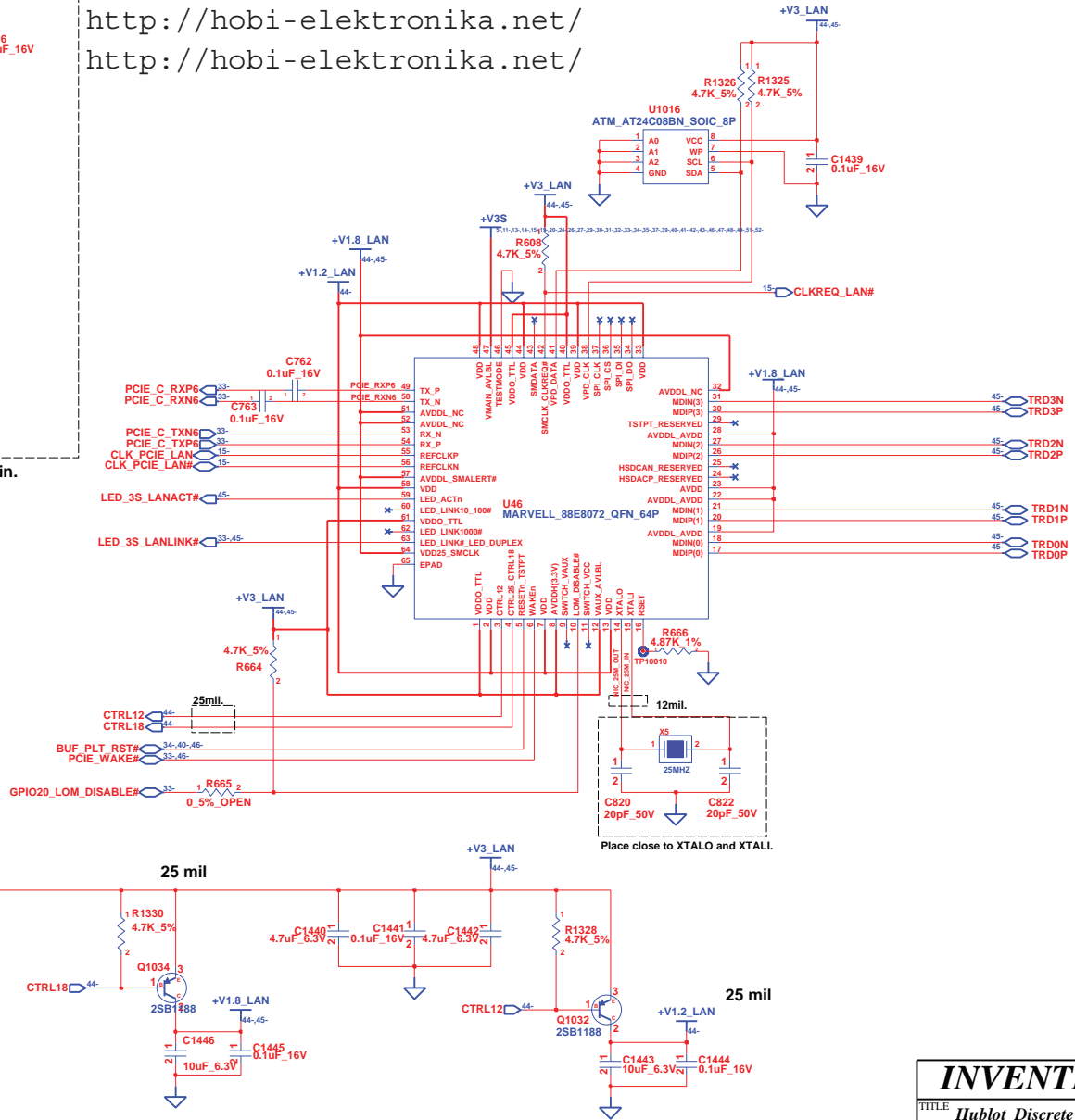
CHANGE by: Evan Shih 13-Apr-2009

SHEET 43 OF 60



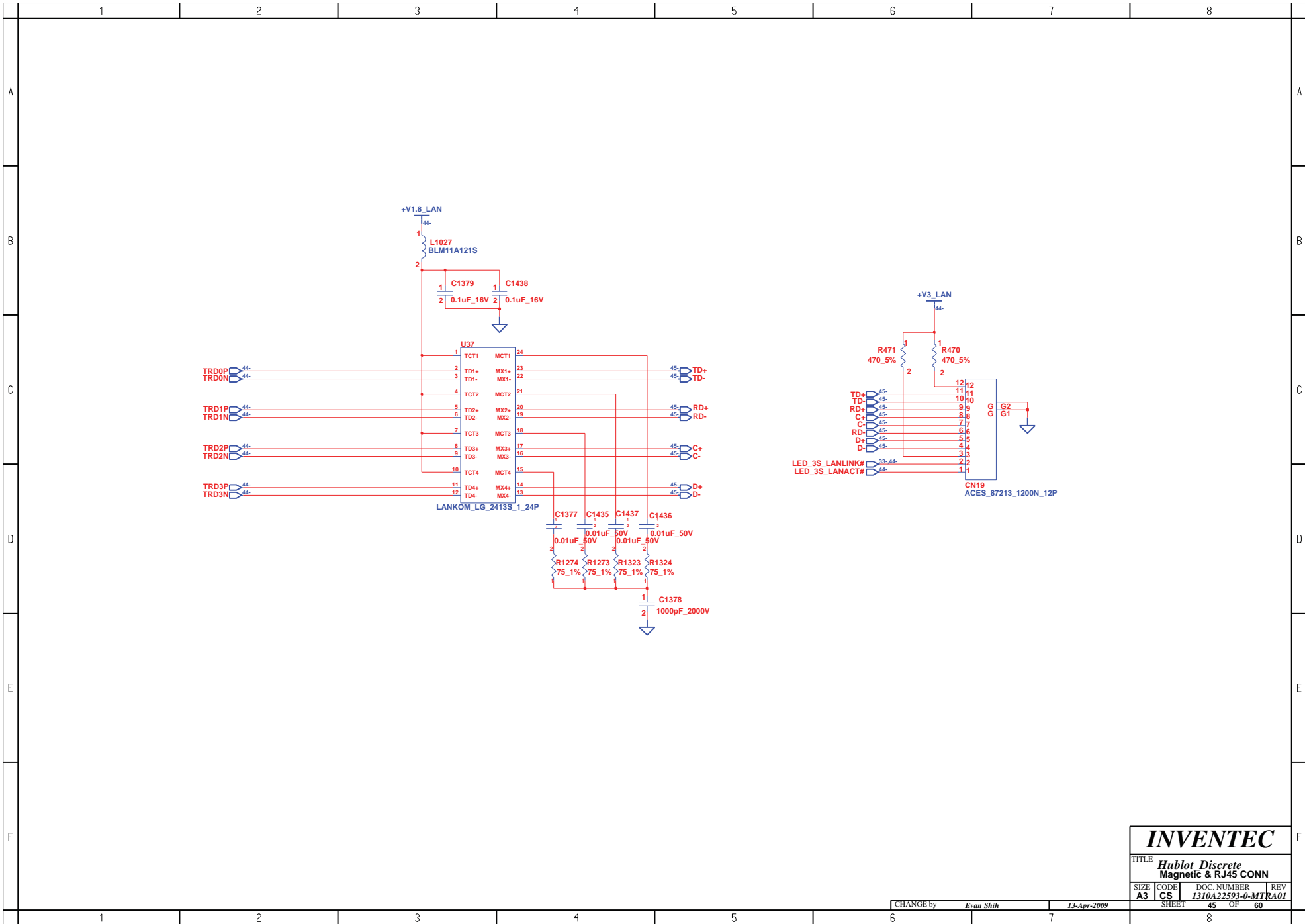
Place bypass cap as close as possible with every power pin.

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<http://hobi-elektronika.net/>



Place close to XTALO and XTALI.

INVENTEC			
TITLE Hublot_Discrete Giga LAN Controller			
SIZE A3	CODE CS	DOC. NUMBER 1310A22593-0-MTR	REV A01
CHANGE by Evan Shih		13-Apr-2009	
SHEET 44		OF 60	



INVENTEC

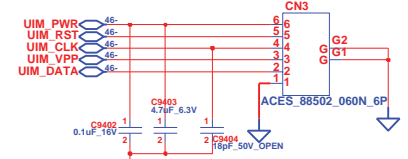
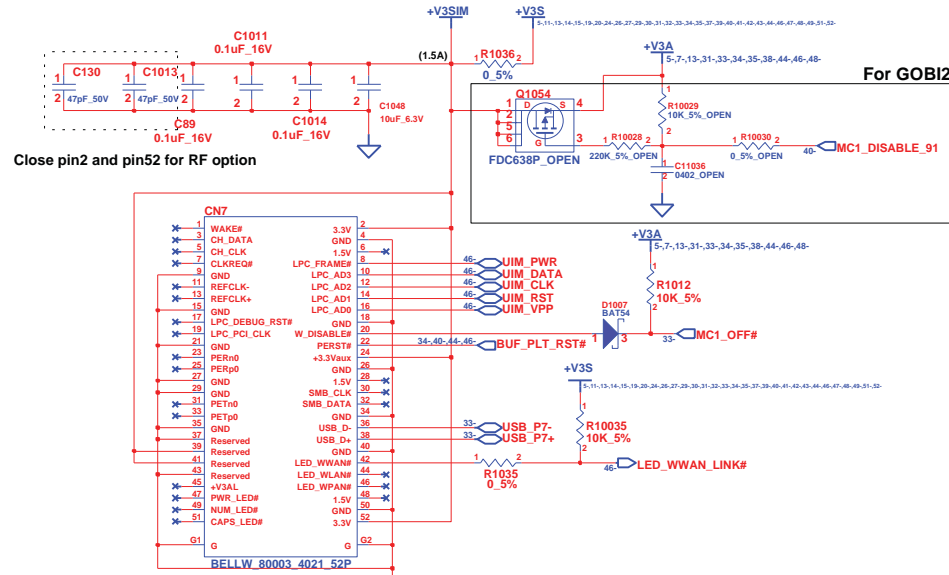
TITLE *Hublot Discrete*
Magnetic & RJ45 CONN

SIZE	CODE	DOC NUMBER	REV
A3	CS	1310A22593-0-MT	RA01

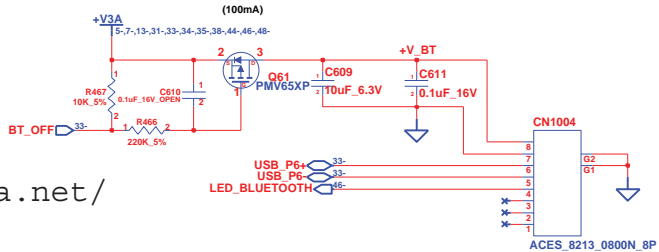
CHANGE by *Evan Shih* 13-Apr-2009

SHEET 45 OF 60

MINI Card-WWAN

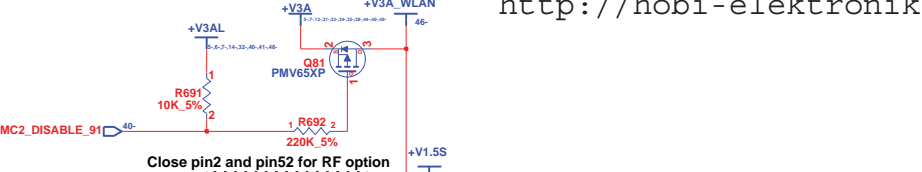


SIM Card Connector

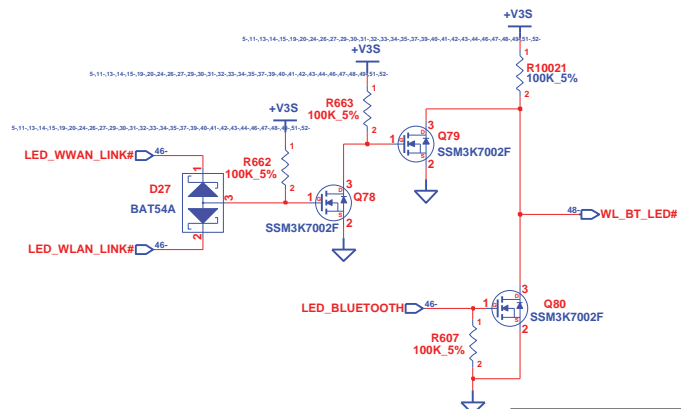


Bluetooth CONN

<http://hobi-elektronika.net/>



Mini Card-WLAN

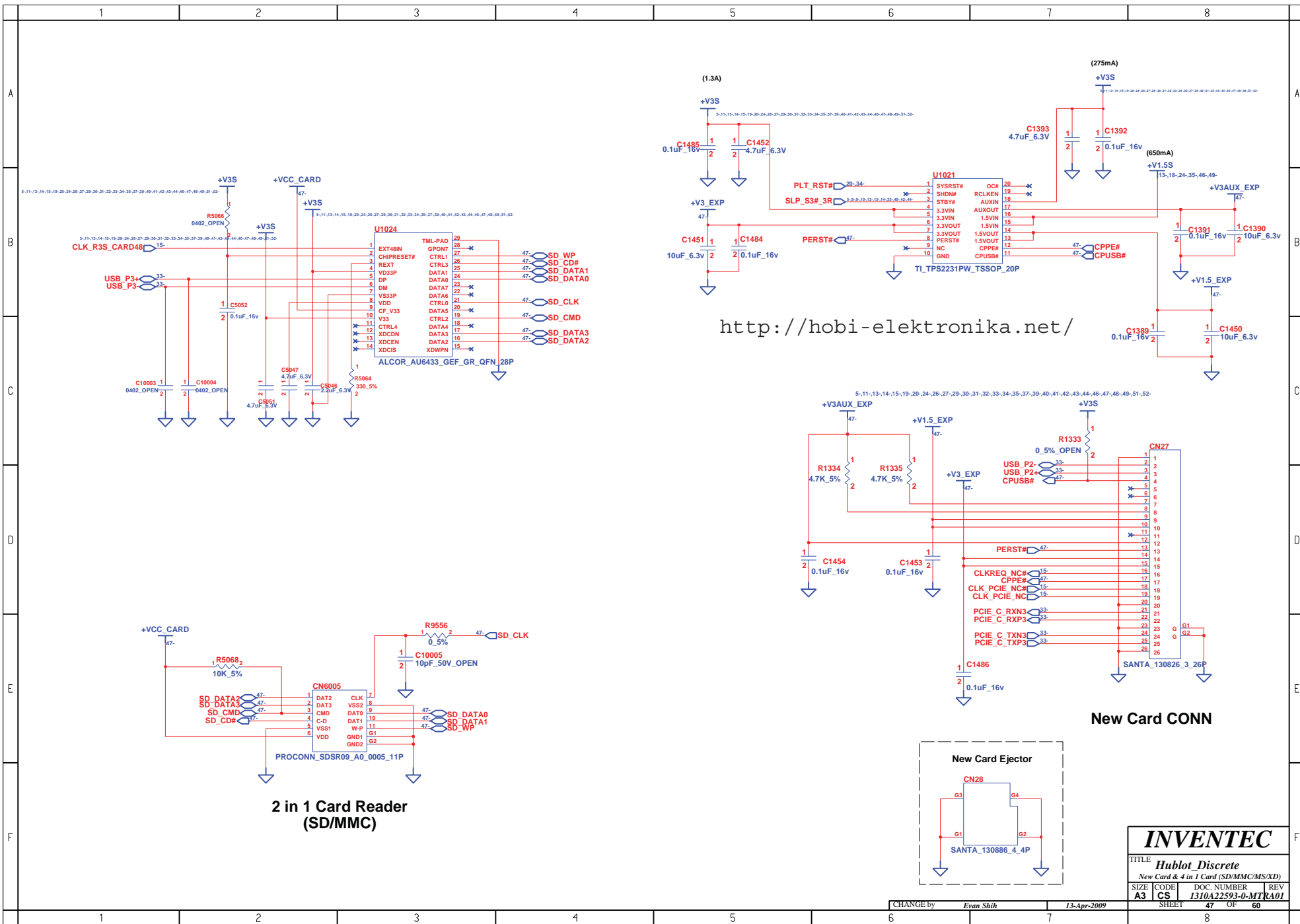


Mini Card-WLAN

INVENTEC

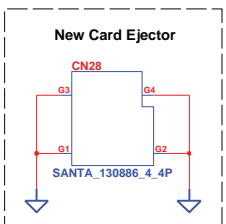
TITLE			
Hublot_Discrete			
Mini Card/BT/SIM Card			
SIZE	CODE	DOC NUMBER	REV
A3	CS	I310A22593-0-MTR	A01
SHEET		OF	
46		60	

CHANGE by *Evan Shih* 13-Apr-2009



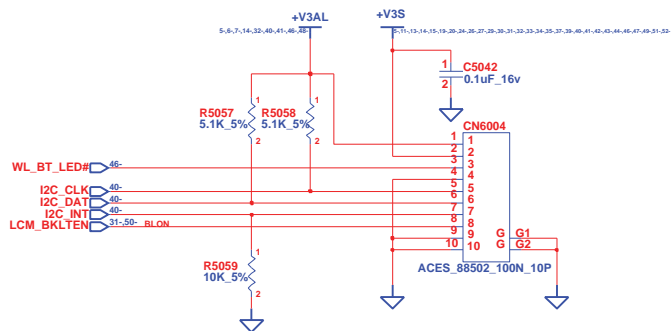
<http://hobi-elektronika.net/>

New Card CONN

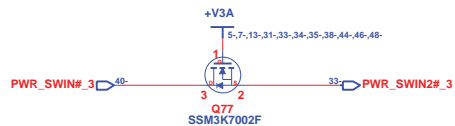
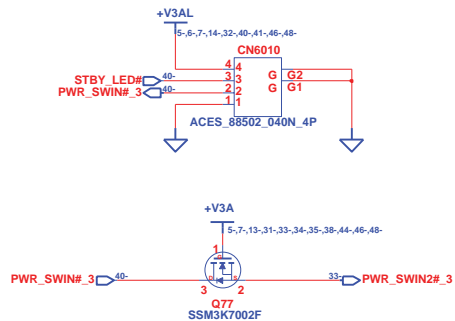


INVENTEC			
TITLE Hublot_Discrete			
New Card & 4 in 1 Card (SD/MMC/MS/XD)			
SIZE A3	CODE CS	DOC. NUMBER 1310A22593-0-MT	REV R01
CHANGE by Evan Shih		13-Apr-2009	
SHEET 47		OF 60	

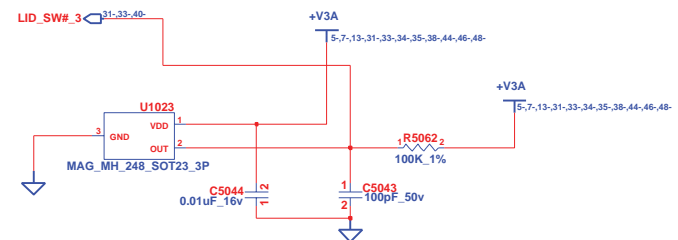
SWITCH BOARD CONN



Power SW CONN



LID SWITCH



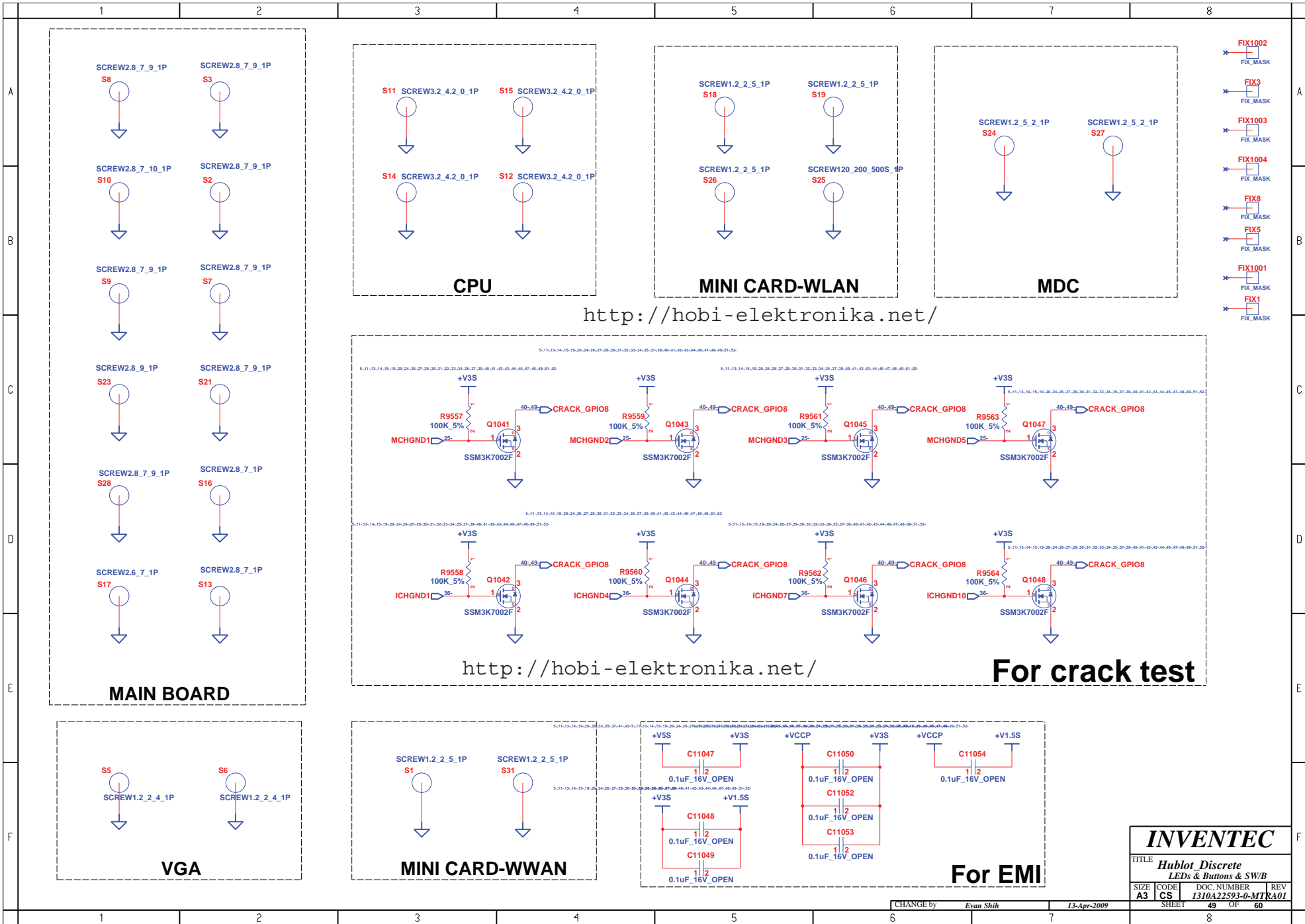
INVENTEC

TITLE
Hublot_Discrete
LEDs & Buttons & SW/B CONN

SIZE A3	CODE CS	DOC NUMBER 1310A22593-0-MT	REV A01
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CHANGE by *Evan Shih* 13-Apr-2009

SHEET 48 OF 60



INVENTEC			
TITLE: Hublot_Discrete LEDs & Buttons & SW/B			
SIZE: A3	CODE: CS	DOC NUMBER: 1310A22593-0-MT	REV: RA01
SHEET: 49		OF: 60	

CHANGE by: *Evan Shih* 13-Apr-2009

STRAPS	PIN	Description of default settings	
TX_PWRS_ENB	GPIO0	PCIe full TX output swing.	1
TX_DEEMPH_EN	GPIO1	PCIe transmitter de-emphasis enabled.	1
BIF_DEBUG_ACCESS	GPIO4	Debug signals muxed out.	0
ROMIDCFG(0:3)	GPIO[11:13,9]	Memory aperture type	X X X X

X = DESIGN DEPENDANT
 0 = DO NOT INSTALL RESISTOR
 1 = INSTALL 10K RESISTOR

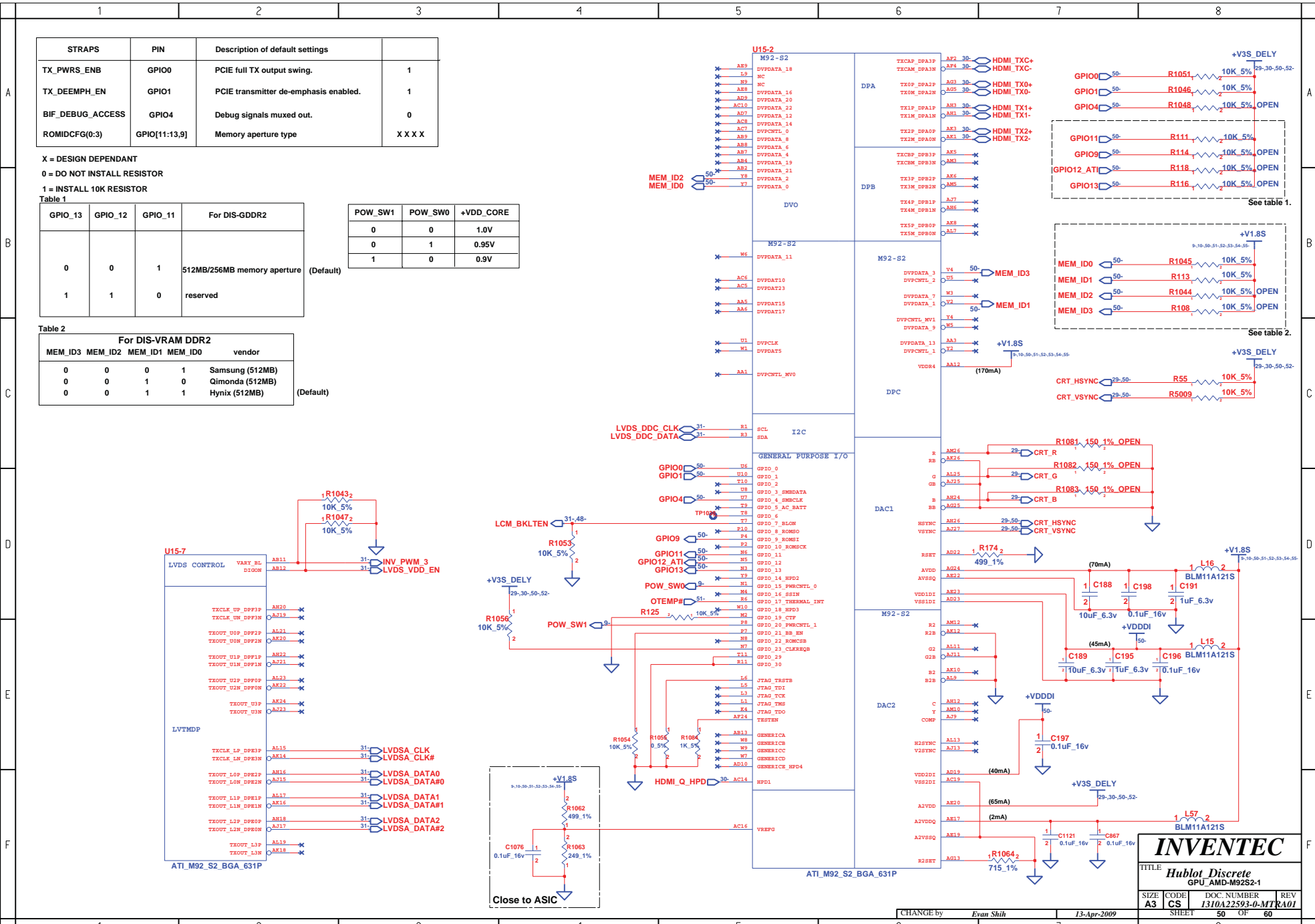
Table 1

GPIO_13	GPIO_12	GPIO_11	For DIS-GDDR2
0	0	1	512MB/256MB memory aperture (Default)
1	1	0	reserved

POW_SW1	POW_SW0	+VDD_CORE
0	0	1.0V
0	1	0.95V
1	0	0.9V

Table 2

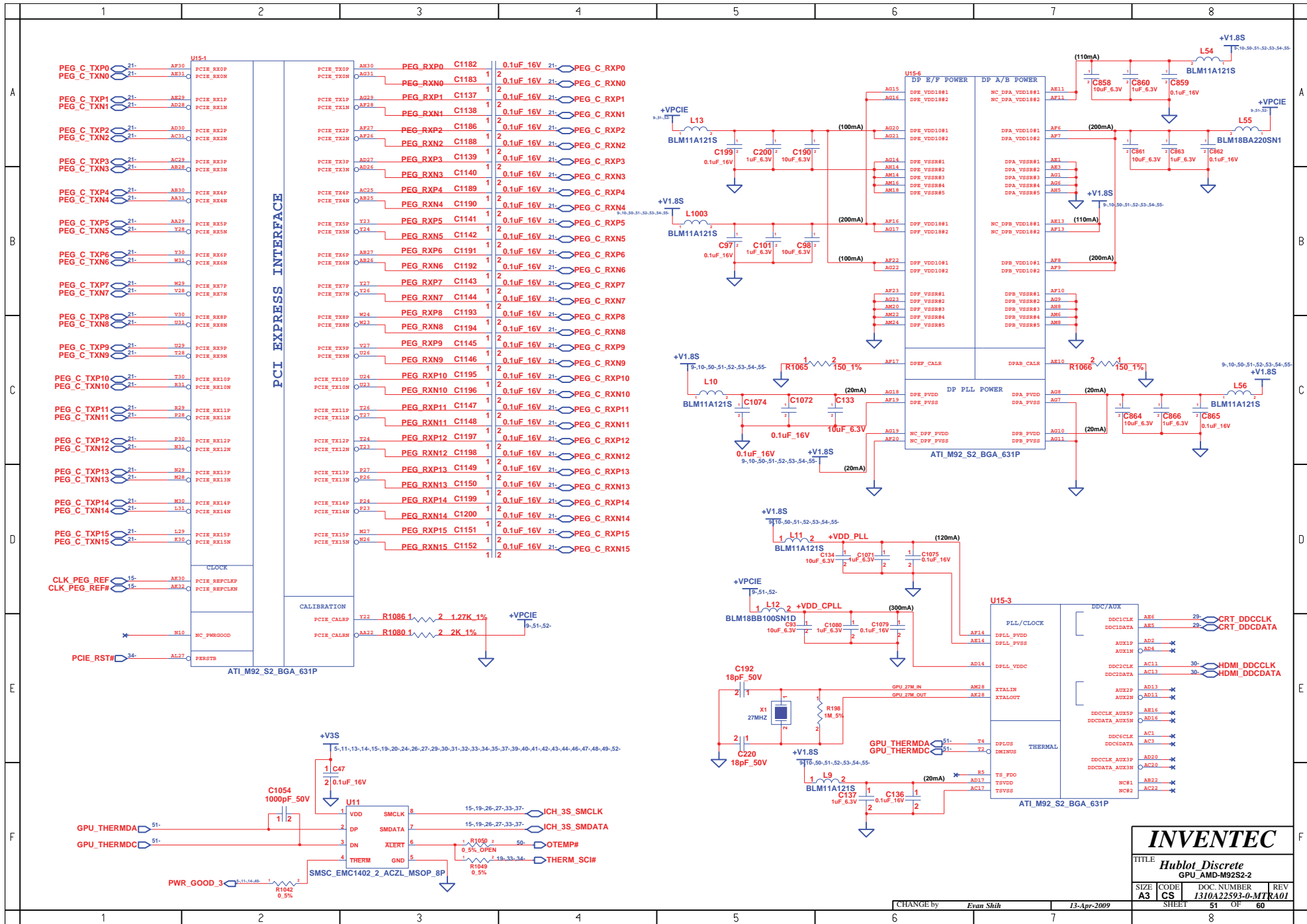
MEM_ID3	MEM_ID2	MEM_ID1	MEM_ID0	vendor
0	0	0	1	Samsung (512MB)
0	0	1	0	Qimonda (512MB)
0	0	1	1	Hynix (512MB) (Default)



INVENTEC

TITLE
 Hublot Discrete
 GPU_AMD-M92S2-1

SIZE A3	CODE CS	DOC NUMBER 1310A22593-0-MTR	REV A01
SHEET 50		OF 60	



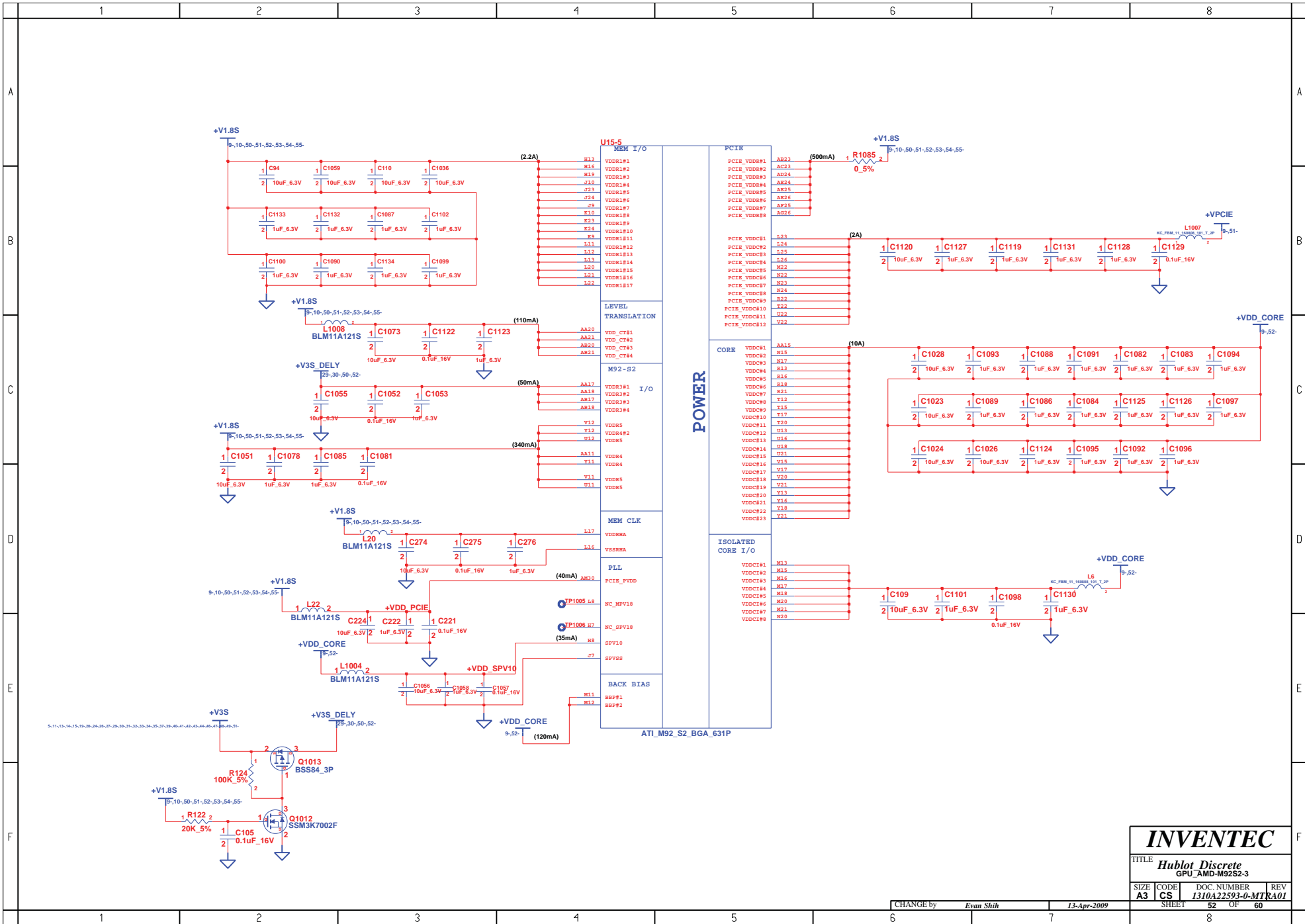
INVENTEC

TITLE: Hublot Discrete GPU_AMD-M92S2-2

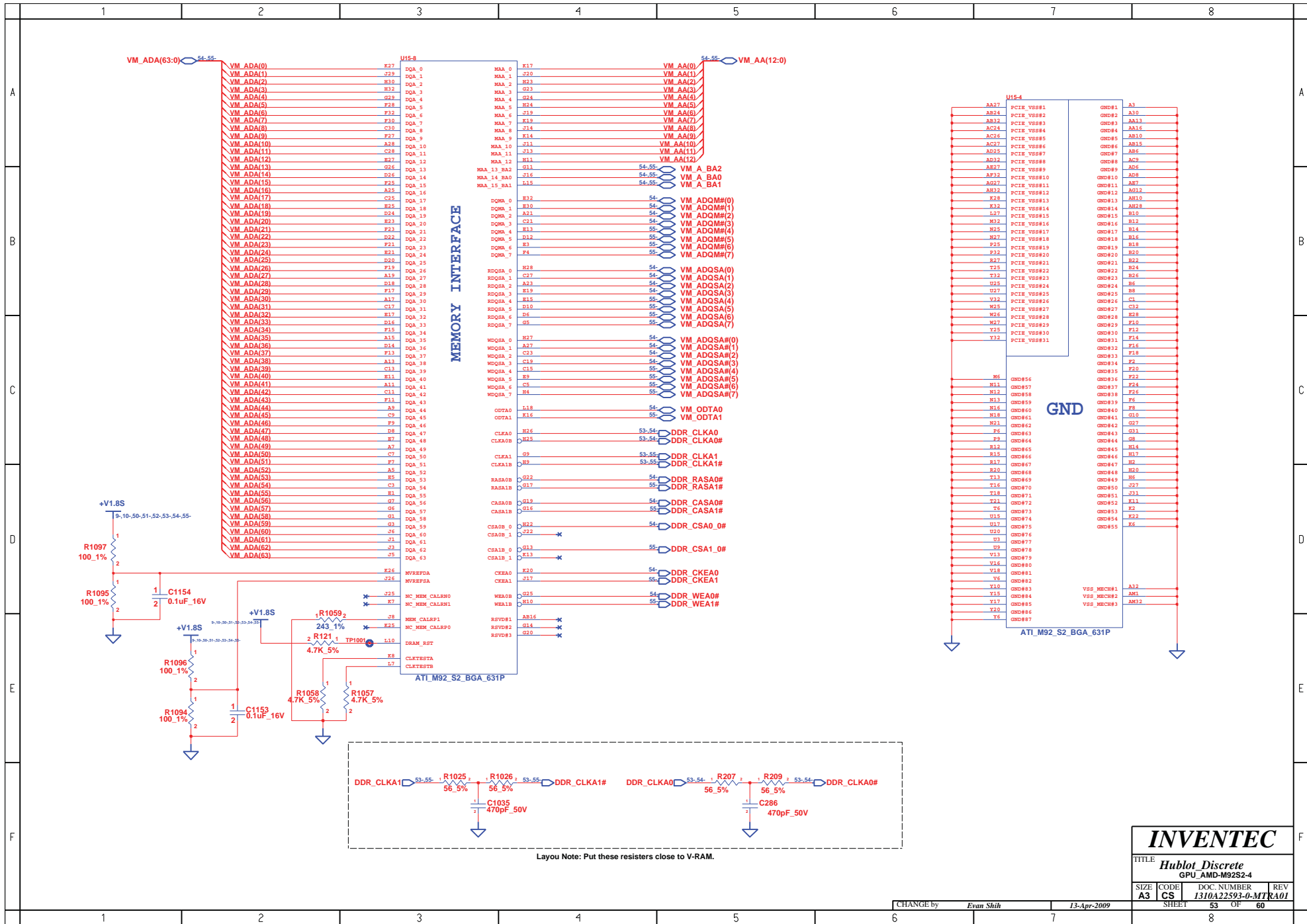
SIZE	CODE	DOC NUMBER	REV
A3	CS	1310A22593-0-MTR401	

SHEET 51 OF 60

CHANGE by *Evan Shih* 13-Apr-2009



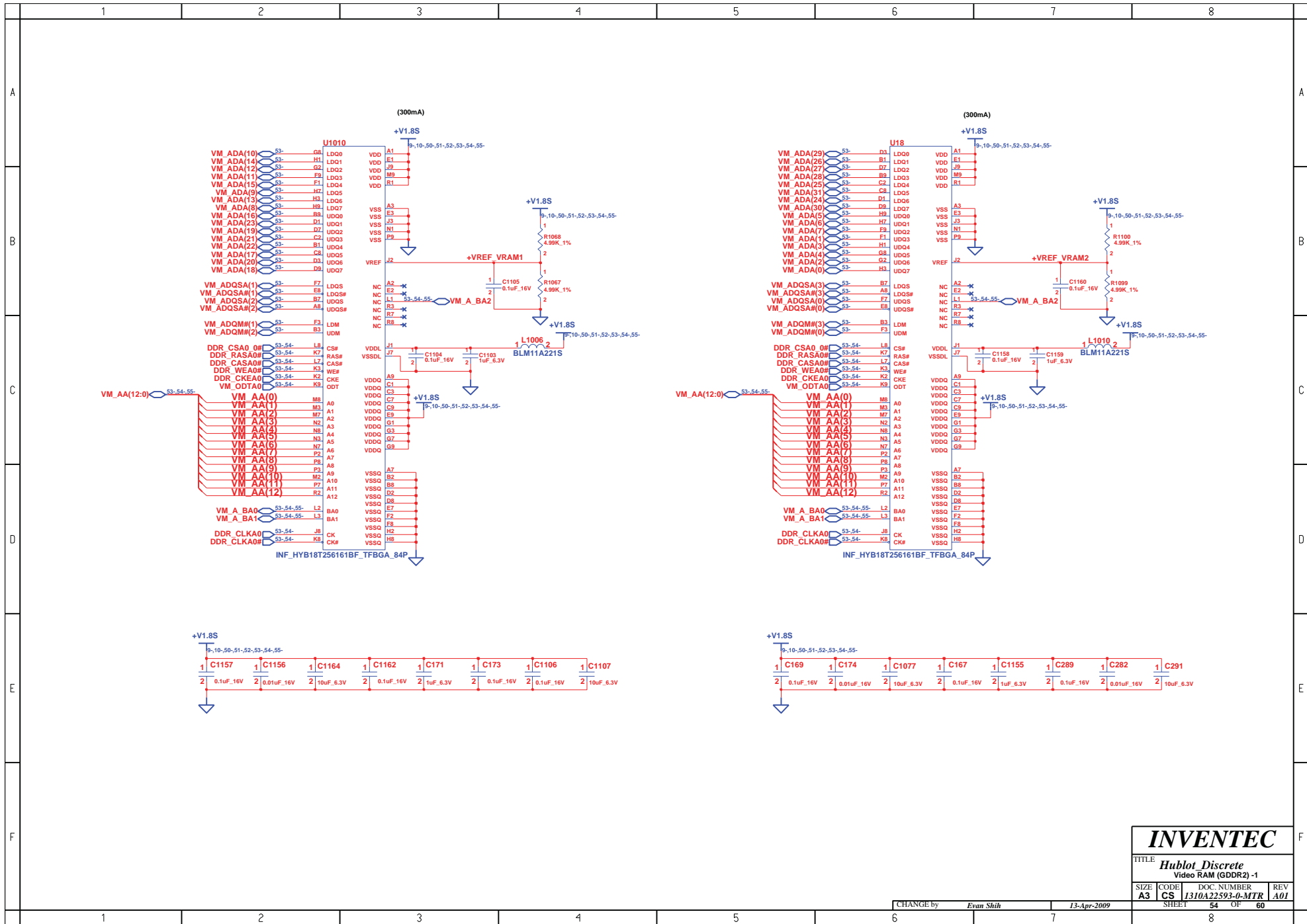
INVENTEC			
TITLE Hublot_Discrete GPU_AMD-M92S2-3			
SIZE A3	CODE CS	DOC NUMBER 1310A22593-0-MTR	REV A01
CHANGE by Evan Shih		13-Apr-2009	
SHEET 52		OF 60	



INVENTEC			
TITLE Hublot_Discrete GPU_AMD-M92S2-4			
SIZE A3	CODE CS	DOC. NUMBER 1310A22593-0-MTR01	REV KA01
SHEET 53		OF 60	

CHANGE by *Evan Shih* 13-Apr-2009

Layout Note: Put these resistors close to V-RAM.

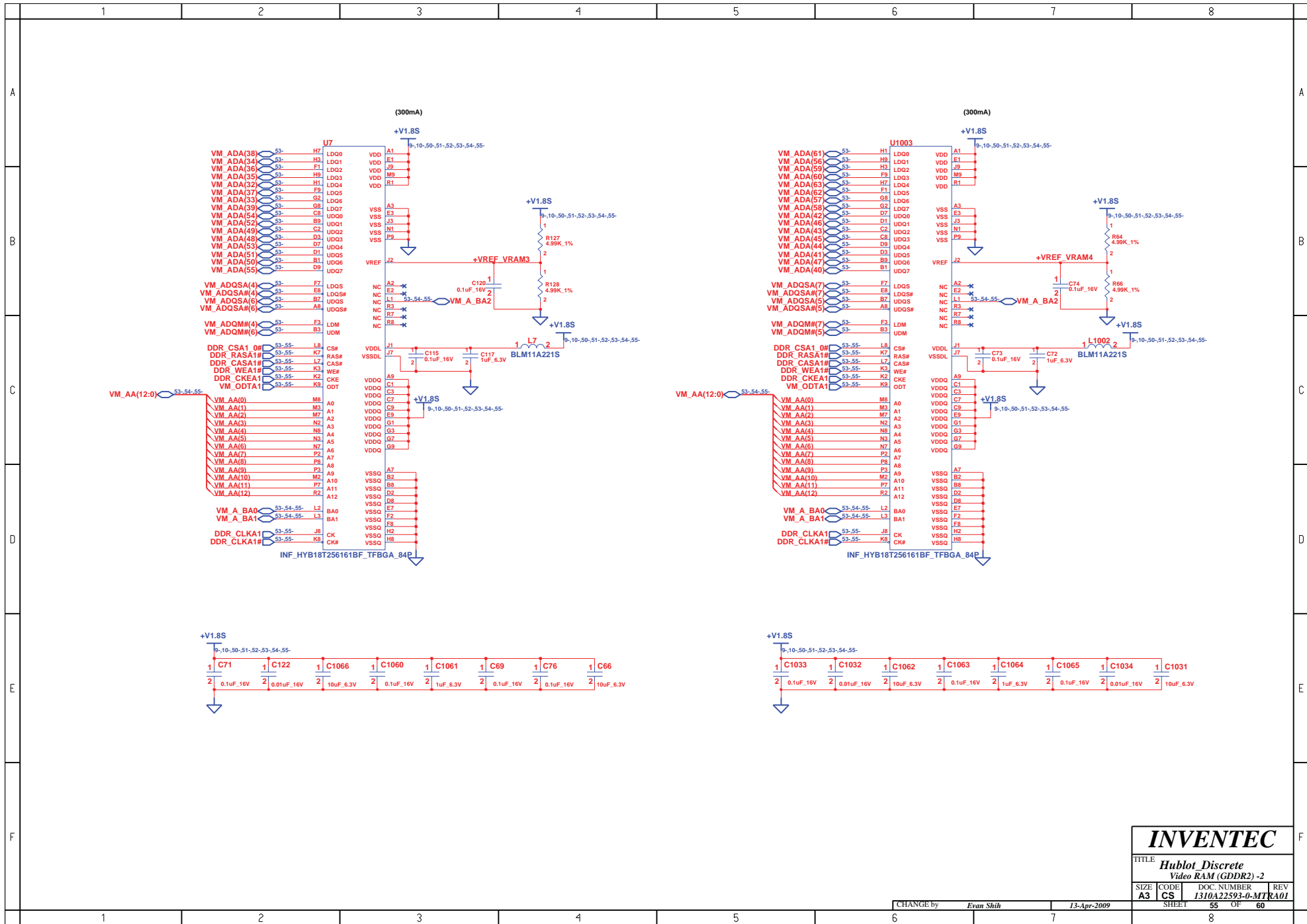


INVENTEC

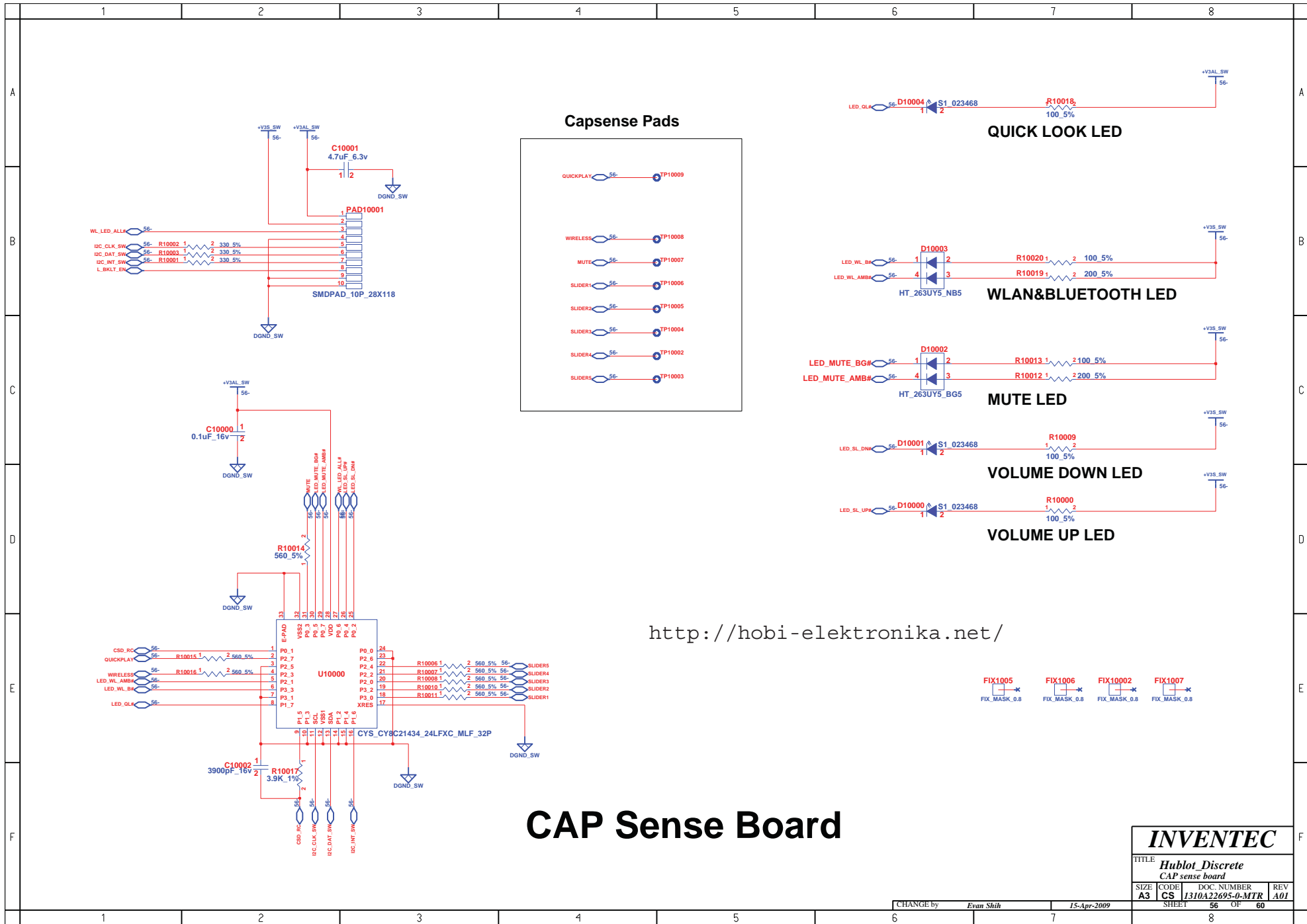
TITLE
Hublot Discrete
Video RAM (GDDR2) -1

SIZE A3	CODE CS	DOC. NUMBER I310A22593-0-MTR	REV A01
SHEET 54		OF 60	

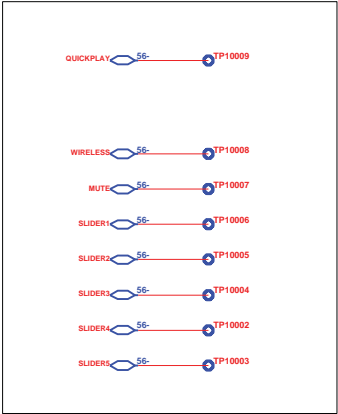
CHANGE by *Evan Shih* 13-Apr-2009



INVENTEC			
TITLE Hublot_Discrete Video RAM (GDDR2) -2			
SIZE A3	CODE CS	DOC. NUMBER 1310A22593-0-MT	REV RA01
CHANGE by Evan Shih		13-Apr-2009	
SHEET 55		OF 60	



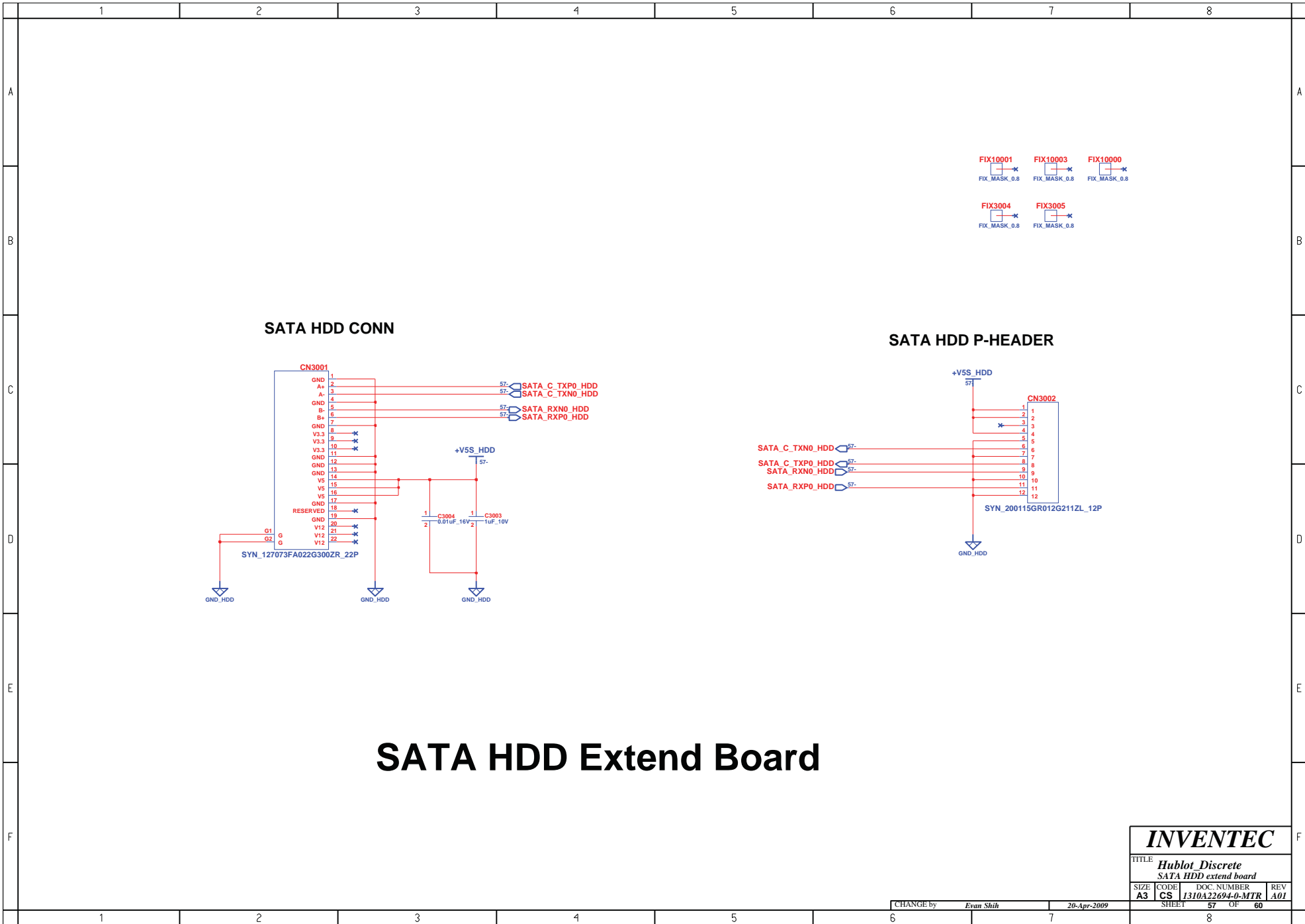
Capsense Pads



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CAP Sense Board

INVENTEC			
TITLE <i>Hublot_Discrete</i> CAP sense board			
SIZE A3	CODE CS	DOC. NUMBER I310A22695-0-MTR	REV A01
CHANGE by <i>Evan Shih</i>		15-Apr-2009	
SHEET 56		OF 60	



SATA HDD CONN

SATA HDD P-HEADER

SATA HDD Extend Board

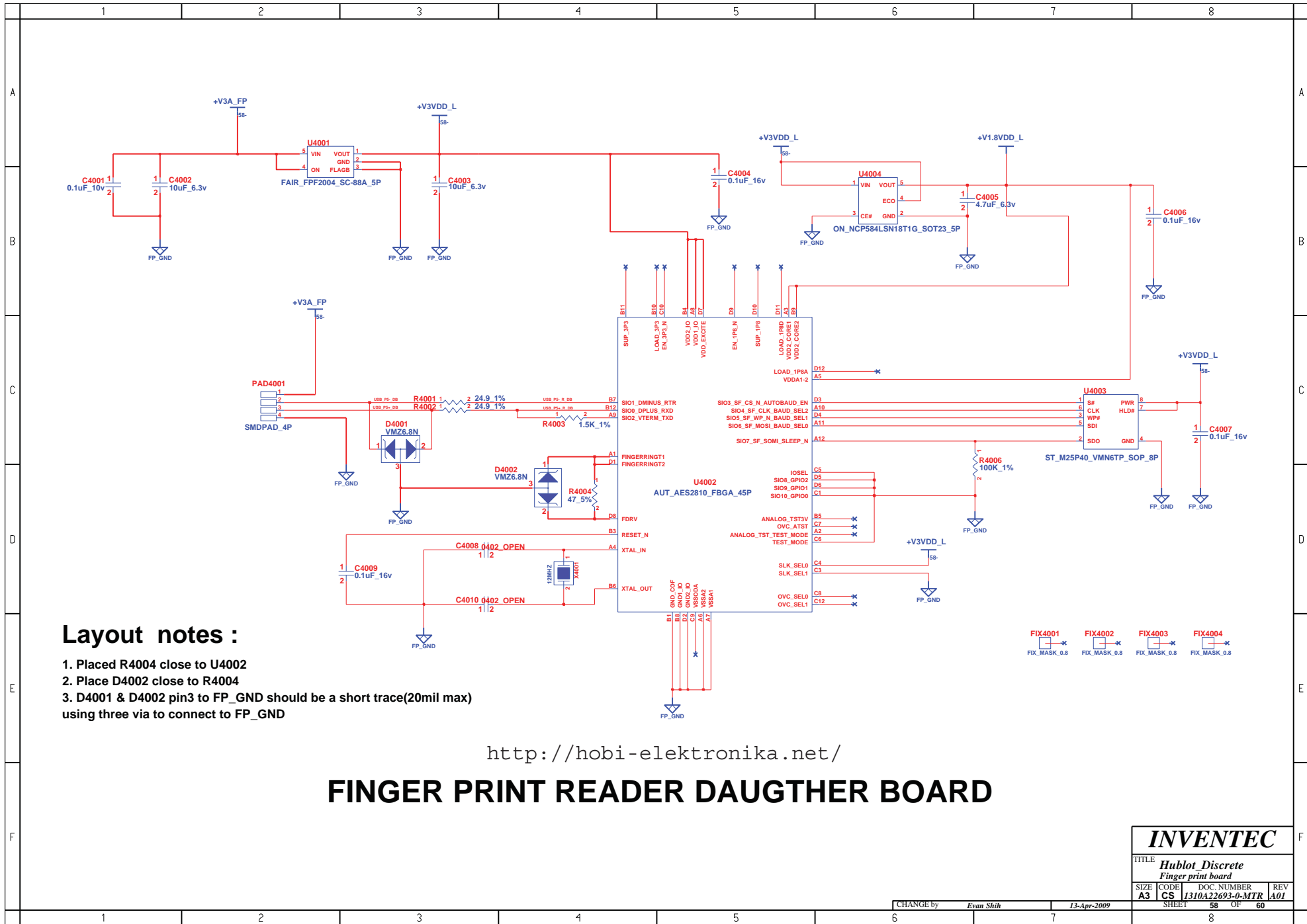
INVENTEC

TITLE
Hublot_Discrete
 SATA HDD extend board

SIZE A3	CODE CS	DOC NUMBER 1310A22694-0-MTR	REV A01
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CHANGE by *Evan Shih* 20-Apr-2009

SHEET 57 OF 60



Layout notes :

1. Placed R4004 close to U4002
2. Place D4002 close to R4004
3. D4001 & D4002 pin3 to FP_GND should be a short trace(20mil max) using three via to connect to FP_GND

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FINGER PRINT READER DAUGHTER BOARD



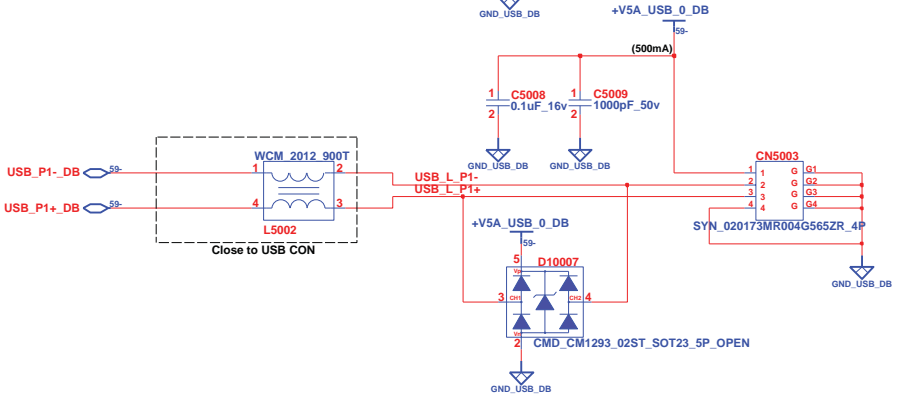
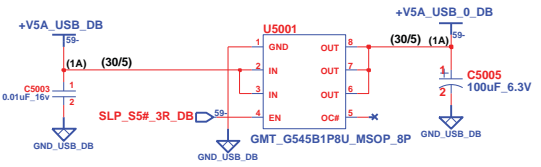
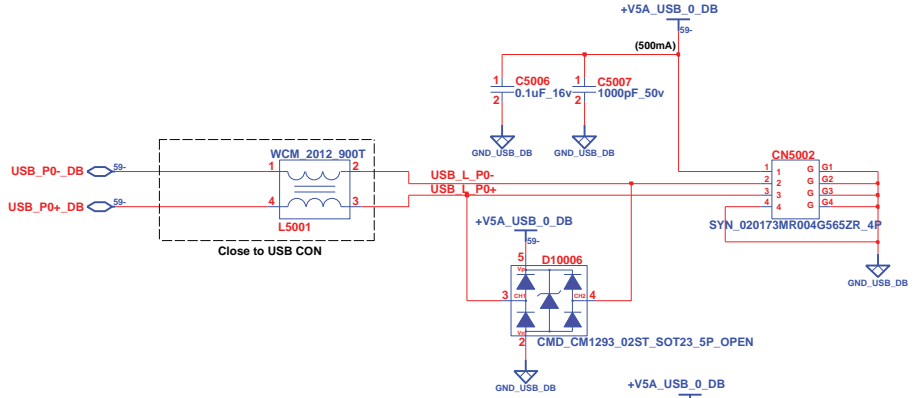
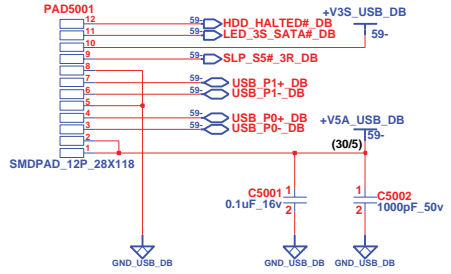
INVENTEC

TITLE
Hublot_Discrete
Finger print board

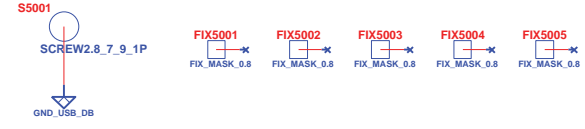
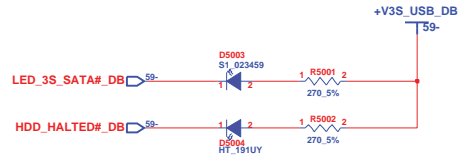
SIZE A3	CODE CS	DOC NUMBER I310A22693-0-MTR	REV A01
SHEET		OF	60

CHANGE by *Evan Shih* 13-Apr-2009

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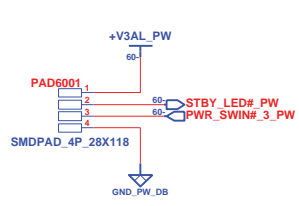


SATA & HDD-Halted LED

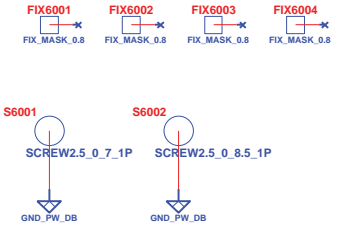
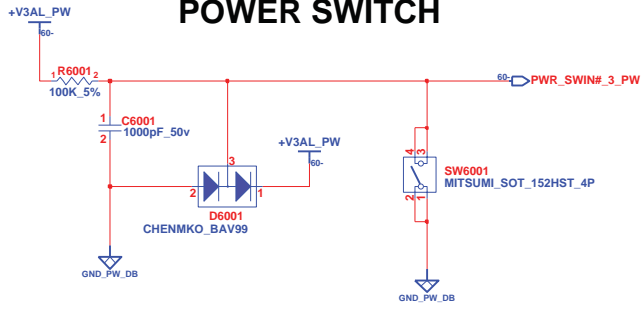


USB Extend Board

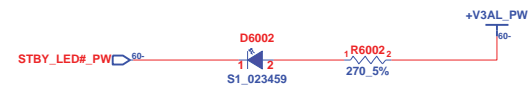
INVENTEC			
TITLE <i>Hublot_Discrete</i> <i>USB extend board</i>			
SIZE A3	CODE CS	DOC. NUMBER I310A22692-0-MTR	REV A01
CHANGE by <i>Evan Shih</i>		15-Apr-2009	
SHEET		OF 60	



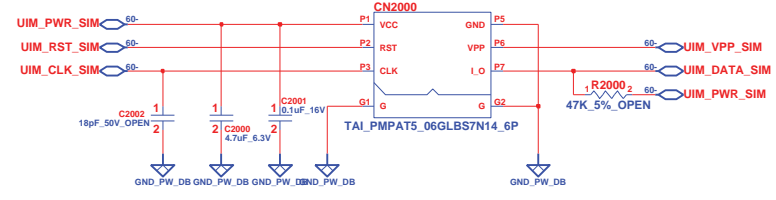
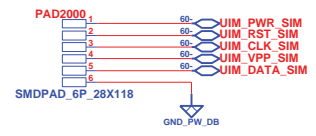
POWER SWITCH



Power / Standby LED



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<http://hobi-elektronika.net/>
<http://hobi-elektronika.net/>



Power Button & SIM Card Board

INVENTEC			
TITLE: <i>Hublot_Discrete</i>			
Power button & SIM Card board			
SIZE: A3	CODE: CS	DOC NUMBER: 1310A22699-0-MTR	REV: A01
CHANGE by: <i>Evan Shih</i>		13-Apr-2009	
SHEET: 60		OF: 60	