LCFC Confidential

Chelsea -SKY M/B Schematics Document

INTEL SKYLAKE Mobile ULT Platform
INTEL SKY Y-series CPU + LPDDR3 Memory

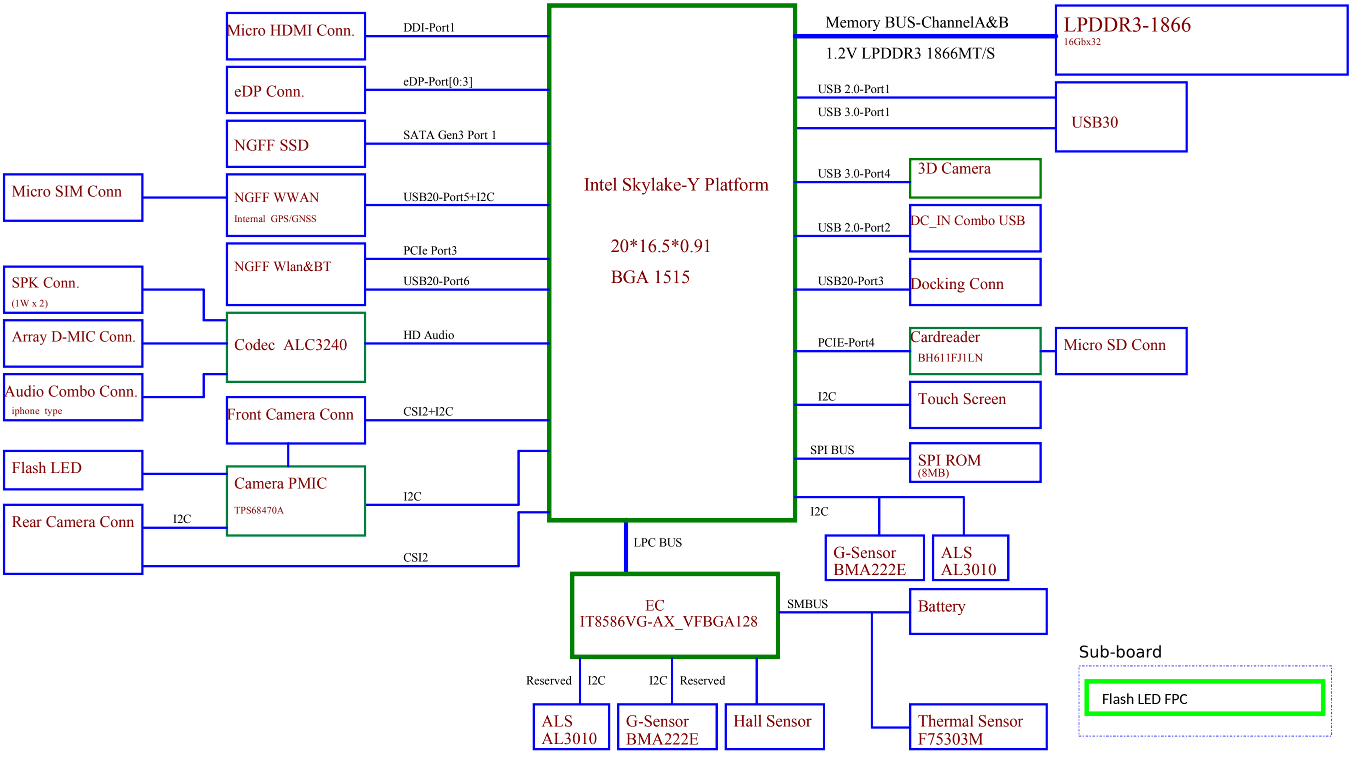
2015-08-13

REV:1.0

Security Classification	LC Future Center Secret Data		
Issued Date	2014/11/15	Deciphered Date	2013/11/08

Title: Cover Page		
Size: C	Document Number: Miix4	Rev: 1.0
Date: Monday, August 17, 2015	Sheet 1 of 37	

LCFC-Chelsea Refresh Block diagram



Security Classification	LC Future Center Secret Data		
Issued Date	2014/11/15	Deciphered Date	2013/11/08

Title: Block Diagram

Size	DocumentNumber	Rev
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Date: Monday, August 17, 2015

Voltage Rails (O --> Means ON , X --> Means OFF)

Power Plane / State	B+ +3VL +5VLP	+3VALW +5VALW +1.0VALW +1.8VALW +CPU_VCCPRIM	+3VALW_PCH	+DDR_1.2V +DDR_1.8V	+5VS +3VS +1.8VS +DDR_0.6VS +CPU_CORE +CPU_VCCIO +CPU_VCCGT +CPU_VCCSA
S0	O	O	O	O	O
S3	O	O	O	O	X
DS3	O	O	X	O	X
S5 S4/AC Only	O	O	O	X	X
S5 S4 Battery only	O	X	X	X	X
S5 S4 AC & Battery don't exist	X	X	X	X	X

STATE / SIGNAL	SLP_S1#	SLP_S3#	SLP_S4#	+VALW	+VALW_PCH	+V	+VS	Clock
Full ON	HIGH	HIGH	HIGH	ON	ON	ON	ON	ON
S1(Power On Suspend)	LOW	HIGH	HIGH	ON	ON	ON	ON	LOW
S3 (Suspend to RAM)	LOW	LOW	HIGH	ON	ON	ON	OFF	OFF
DS3 (Suspend to RAM)	LOW	LOW	HIGH	ON	LOW	ON	OFF	OFF
S4 (Suspend to Disk)	LOW	LOW	LOW	ON	ON	OFF	OFF	OFF
S5 (Soft OFF)	LOW	LOW	LOW	ON	ON	OFF	OFF	OFF

SMBUS Control Table

	SOURCE	Sensor	ALS	BATT	Thermal Sensor	charger
EC_SMB_CLK1 EC_SMB_DAT1	IT8586 +3VALW_EC	X	X	V	X	V
EC_SMB_CLK3 EC_SMB_DAT3	IT8586 +3VS	V +3VS	V +3VS	X	X	X
EC_SMB_CLK0 EC_SMB_DAT0	IT8586 +3VS	X	X	X	V +3VS	X

SM Bus address

	Device	address
EC1	Battery	0001 011X b
	Charger	
EC3	Sensor	
	ALS	
EC0	Thermal Sensor	1001_100xb
	PCH THM	
PCH	TP	

PCIE PORT LIST

Port	Device
1	
2	
3	WLAN
4	CR
5	

USB Port Table

	USB20		USB30	
EXHCI/XHCI	1	USB	1	USB
	2	BT	2	WWAN
	3	EC	3	X
	5	DC in combine	4	3D camera
	7	POGO USB		
	9	WWAN		

BOM Structure Table

BOM Structure		BOM Structure	
TI@	TI MIPI camera mount	MIRROR@	EC Mirror-code enable
TPM@	TPM module	UNMIRROR@	EC Mirror-code disable
DEBUG@	DEBUG CARD Part	DA8@	PCB
ME@	ME part(connector, hole)	UPI@	UPI MIPI camera mount
RF@	RF request		
EMC@	EMC request		
CD@	COST DOWN Part		
REV@	RESERVER Part		

Board ID Table

Board ID	Description	PCB Revision

BOM Configuration Table

SKU	Description	BOM Config	
SKU1			
SKU2			

X76&VGA Configuration Table

SKU	Description	BOM Config	

PCB And LOGO Config

		LOGO
PCB	ZZZ3 PCB 10K NM-A641 REV0 M/B; ZZZ15 NUVOTON@ S IC NPCT650LAAWX TSSOP 28P TPM	ZZZ4 HDMI@ HDMI LOGO
CPU	ZZZ9 M3@ SR2EN; ZZZ16 M5@ SR2EM; ZZZ17 M7@ SR2EM	
VRAM	ZZZ6 HY8G@ HYNIX 8G; ZZZ7 MIC8G@ MICRON8G; ZZZ8 SAM8G@ SAMSUNG 8G; ZZZ12 HY4G@ HYNIX 4G; ZZZ13 MIC4G@ MICRON 4G; ZZZ14 SAM4G@ SAMSUNG 4G	

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Title: Notes List

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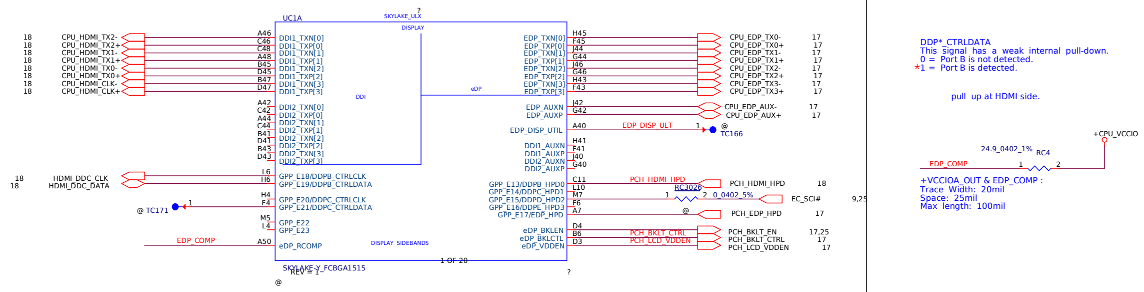

Security Classification	LC Future Center Secret Data		
Issued Date	2014/11/15	Deciphered Date	2013/08/05

Title: MCP (DDI,EDP)

Size	Document Number	Rev
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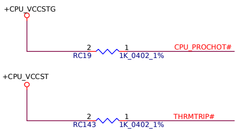
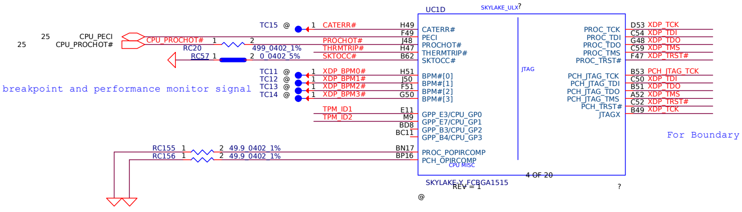


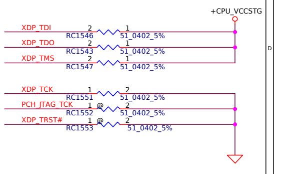
130 degree

output ,for breakpoint and performance monitor signal



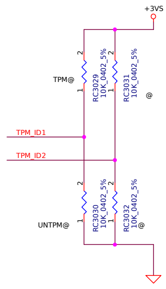
For Boundary Scan

Debug Port DG
Merged MCP XDP-SFF-26Pin Connector Pinout



TPM_ID1	Description
0	NO physical TPM
1	physical TPM

TPM_ID2	Description
0	NATIONZ TPM
1	NUVOTON TPM



Security Classification	LC Future Center Secret Data		
Issued Date	2014/11/15	Deciphered Date	2013/08/05

Title: MCP (XDP,JATG)

LCFC

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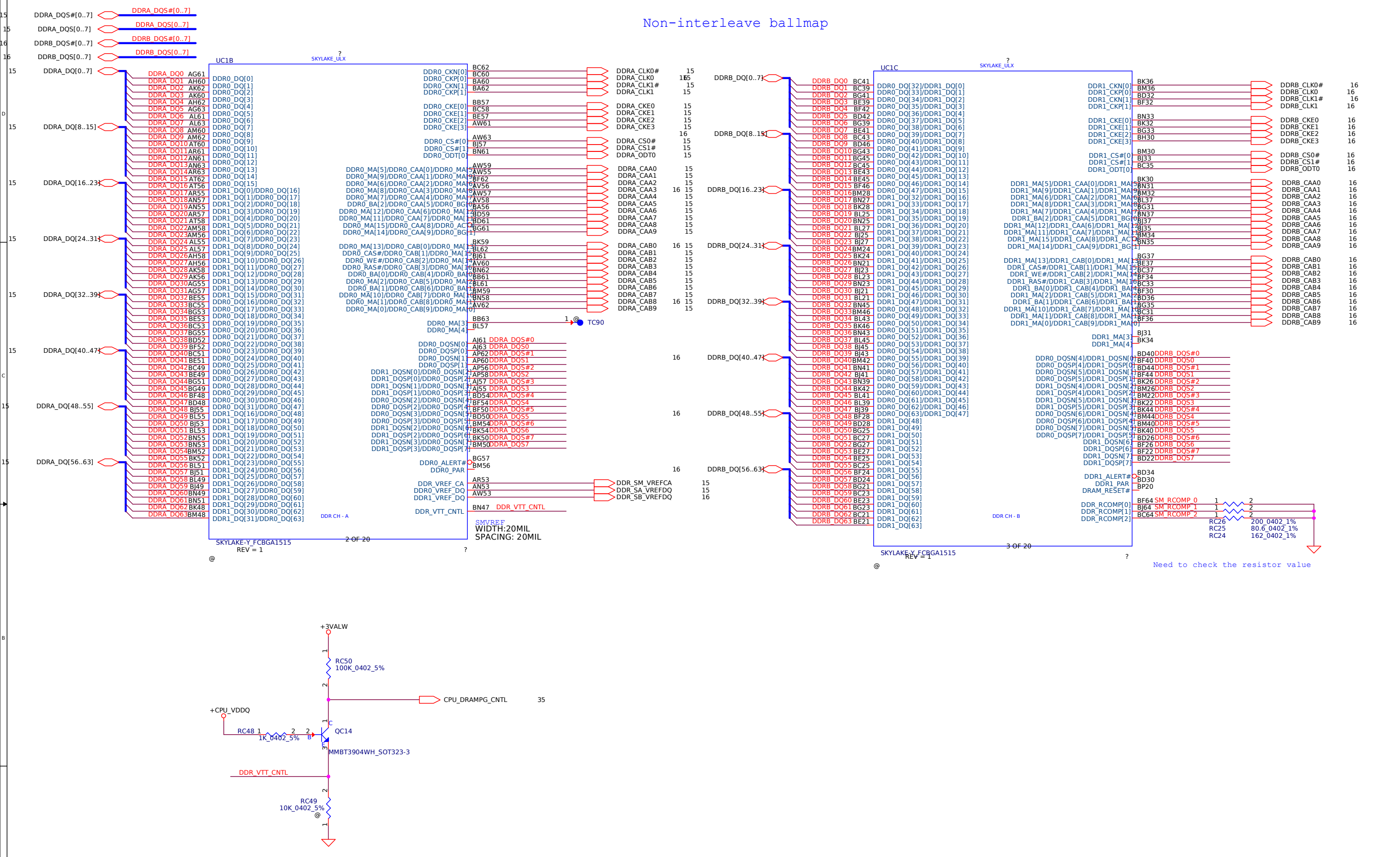
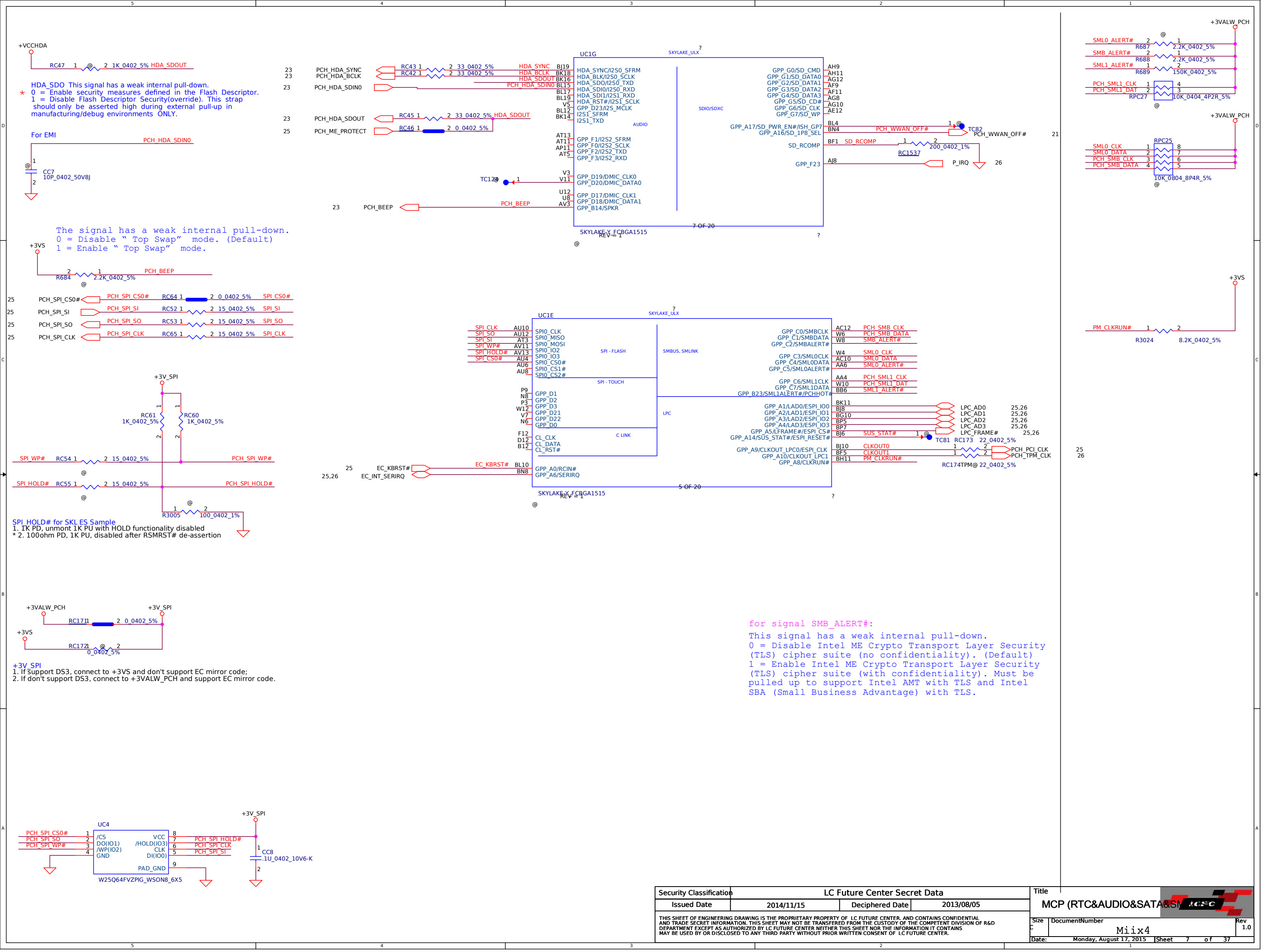
Non-interleave ballmap



Security Classification	LC Future Center Secret Data		
Issued Date	2014/11/15	Deciphered Date	2013/08/05

Title: MCP (DDR)

Size: C | Document Number: Miix4 | Rev: 1.0


HDA_SDO This signal has a weak internal pull-down.
0 = Enable security measures defined in the Flash Descriptor.
1 = Disable Flash Descriptor Security(override). This strap should only be asserted high during external pull-up in manufacturing/debug environments ONLY.
For EMI
The signal has a weak internal pull-down.
0 = Disable " Top Swap" mode. (Default)
1 = Enable " Top Swap" mode.
SPI_HOLD# for SKL ES Sample
1. 1K PD, unmont 1K PU with HOLD functionality disabled
* 2. 100ohm PD, 1K PU, disabled after RSMRST# de-assertion
+3V_SPI
1. If support DS3, connect to +3VS and don't support EC mirror code;
2. If don't support DS3, connect to +3VALW_PCH and support EC mirror code.
for signal SMB_ALERT#:
This signal has a weak internal pull-down.
0 = Disable Intel ME Crypto Transport Layer Security (TLS) cipher suite (no confidentiality). (Default)
1 = Enable Intel ME Crypto Transport Layer Security (TLS) cipher suite (with confidentiality). Must be pulled up to support Intel AMT with TLS and Intel SBA (Small Business Advantage) with TLS.
UC1G
SKYLAKE_Y_FCBGA1515
7 OF 20
UC1E
5 OF 20
UC4
W25Q64FVZPIG_WSON8_6X5
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Title
MCP (RTC&AUDIO&SATA&SMB)
Size C
Document Number
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Rev 1.0
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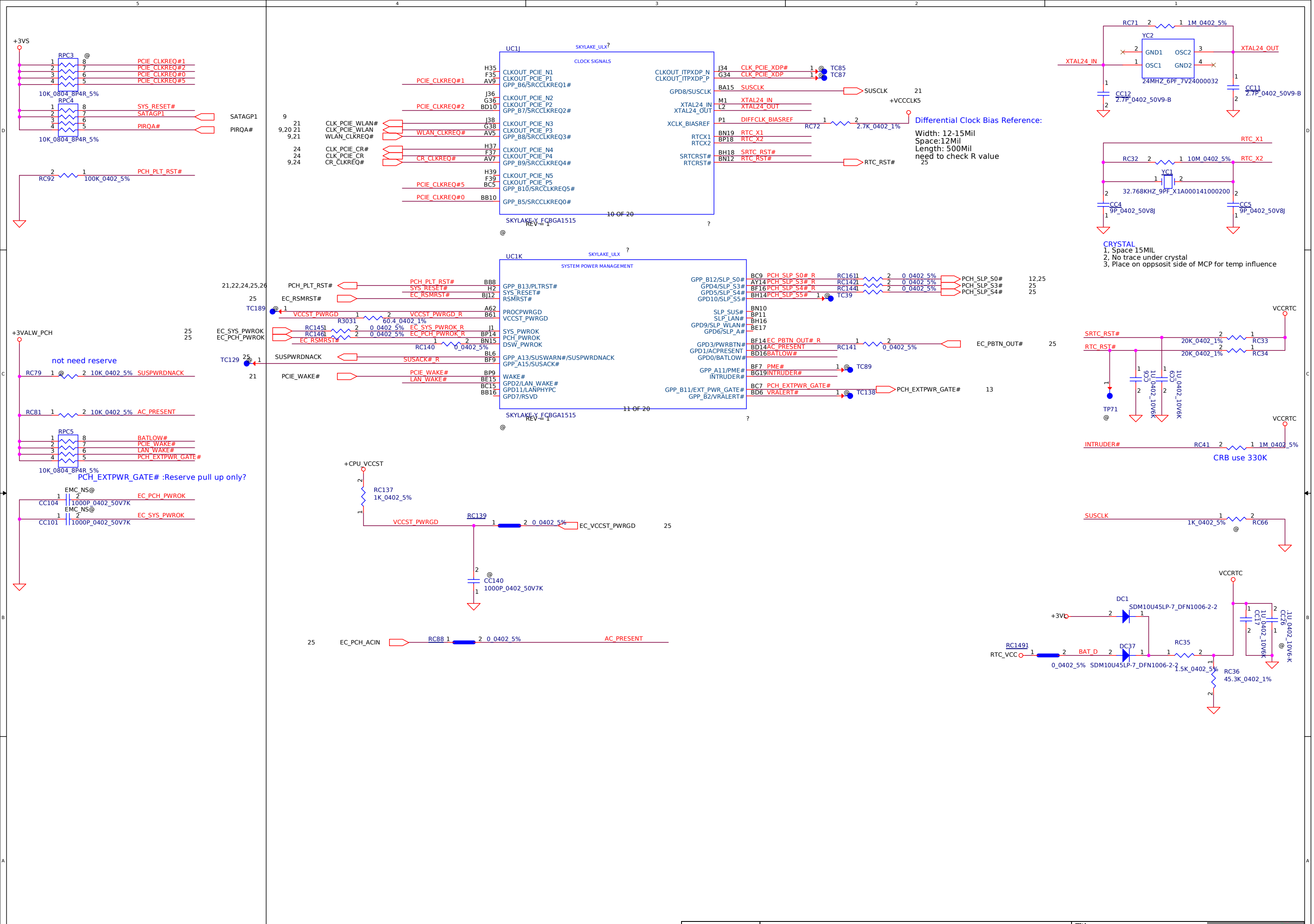

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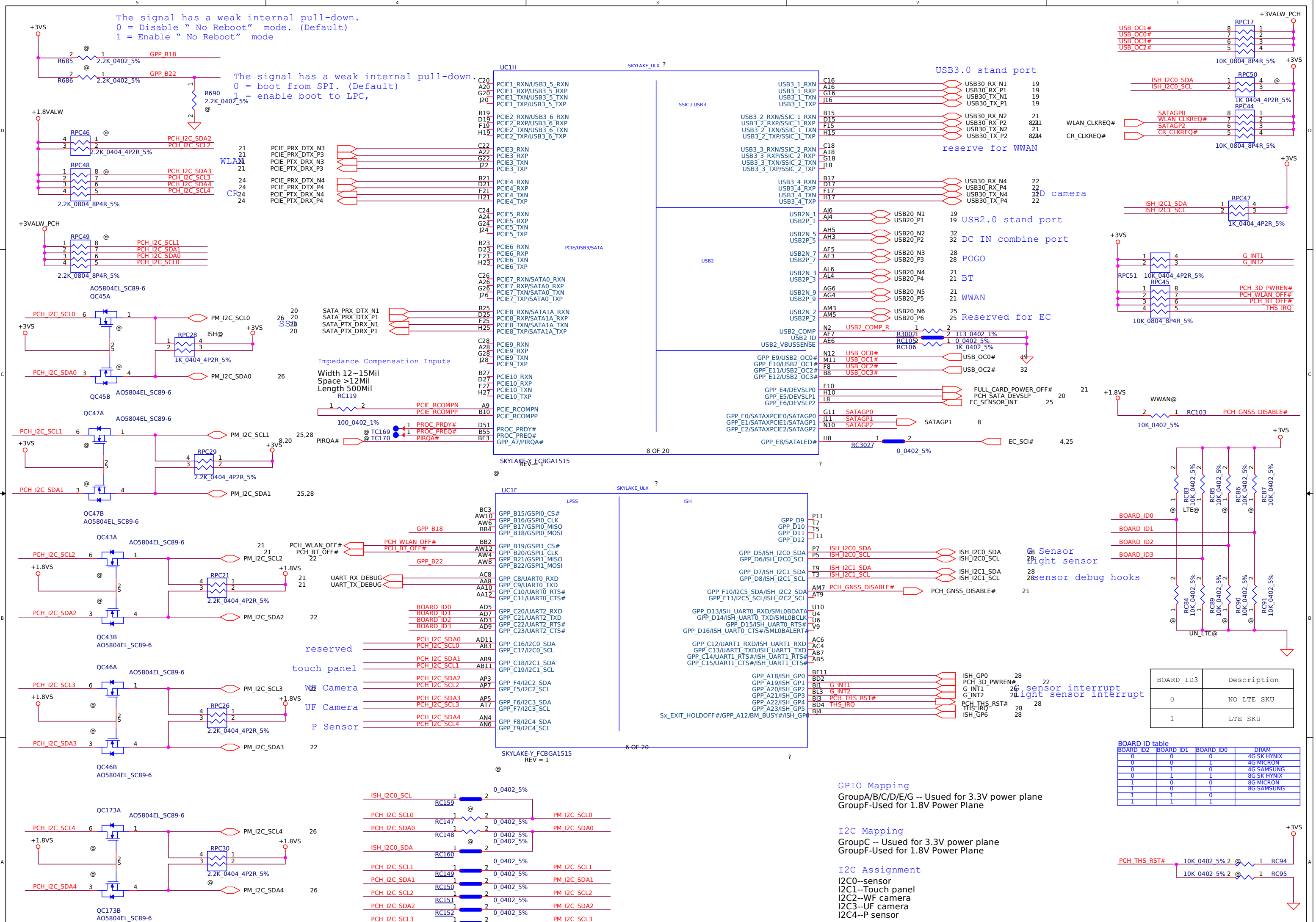
Title: MCP (Clock,PM)

Size: C | Document Number: Miix4 | Rev: 1.0

Date: Monday, August 17, 2015 | Sheet 8 of 37



BOARD_ID3	Description
0	NO LTE SKU
1	LTE SKU

BOARD ID table

BOARD_ID2	BOARD_ID1	BOARD_ID0	DRAM
0	0	0	4G SK HYNIX
0	0	1	4G MICRON
0	1	0	4G SAMSUNG
0	1	1	8G SK HYNIX
1	0	0	8G MICRON
1	0	1	8G SAMSUNG
1	1	0	
1	1	1	

GPIO Mapping

GroupA/B/C/D/E/G -- Uused for 3.3V power plane
GroupF-Used for 1.8V Power Plane

I2C Mapping

GroupC -- Uused for 3.3V power plane
GroupF-Used for 1.8V Power Plane

I2C Assignment

I2C0--sensor
I2C1--Touch panel
I2C2--WF camera
I2C3--UF camera
I2C4--P sensor

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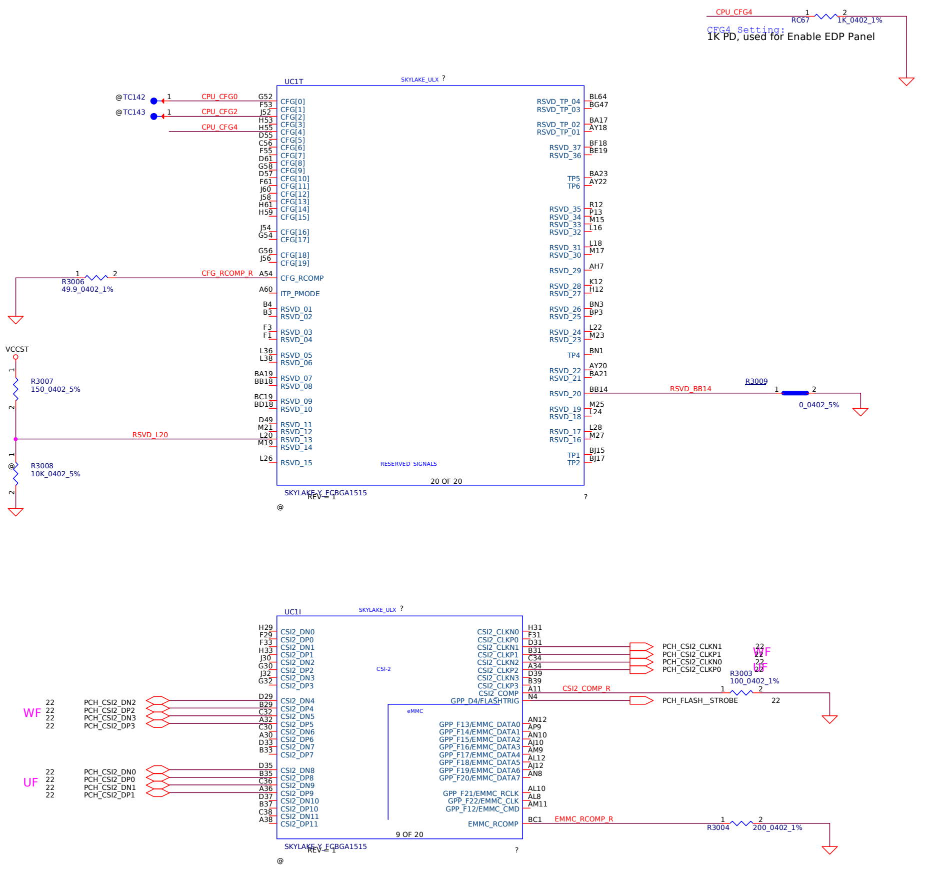
Issued Date	2014/11/15	Deciphered Date	2013/08/05

Title: MCP (GPIO,USB,PCIE)

Size: C | Document Number: Miix4 | Rev: 1.0



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Title: MCP (OTHER)

Size: C | Document Number: Miix4 | Rev: 1.0

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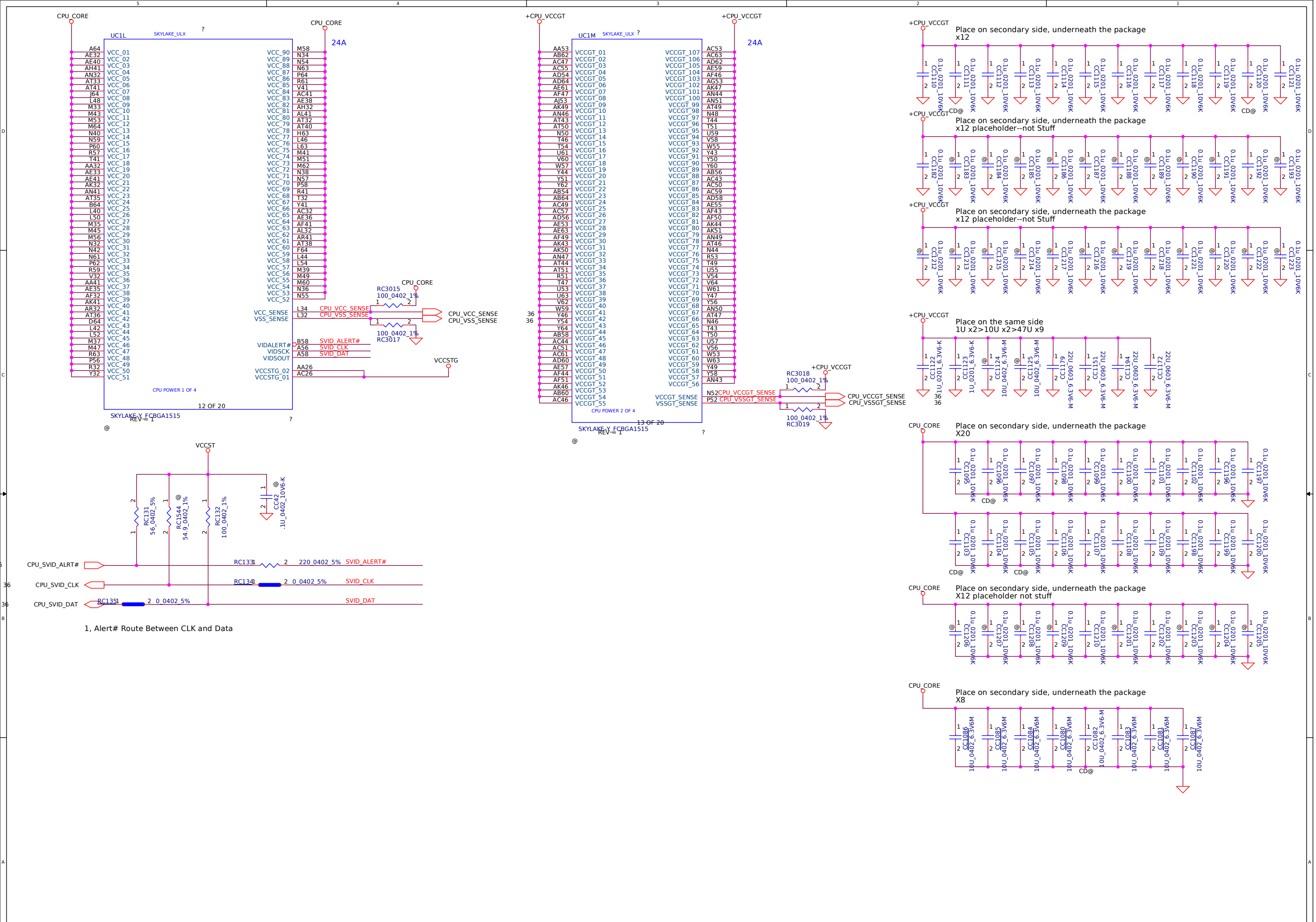
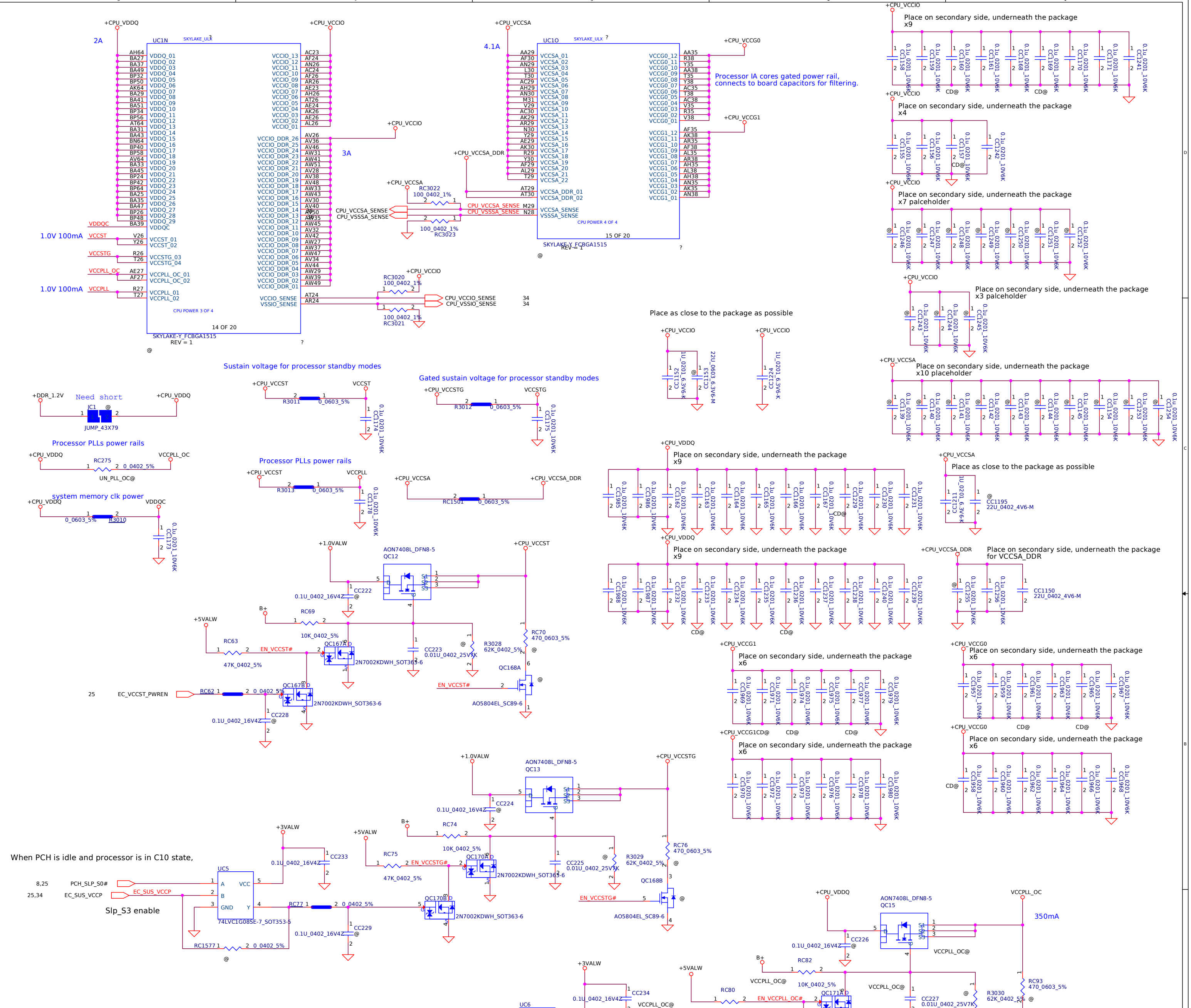


Security Classification	LC Future Center Secret Data		
Issued Date	2014/11/15	Deciphered Date	2013/08/05

Title: MCP (Power)

Size: C | Document Number: Miix4 | Rev: 1.0

Date: Monday, August 17, 2015 |



VCCST : Sustain voltage for processor in Standby modes

VCCPLL : CPU PLL power rails

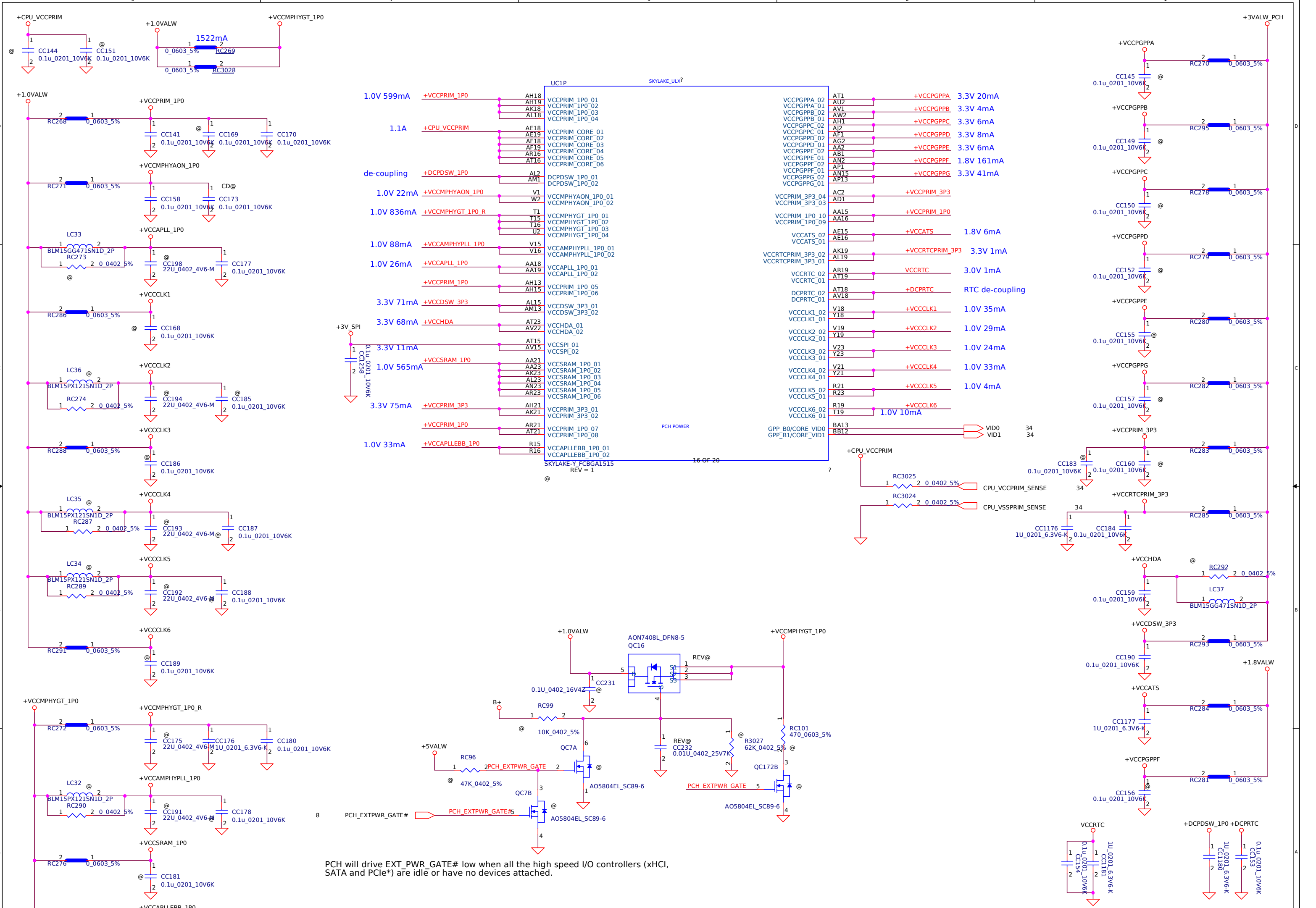
VCCPLL_OC: CPU digital PLL power rails

VCCSTG : Gated version of VCCST

Security Classification	LC Future Center Secret Data			Title
Issued Date	2014/11/15	Deciphered Date	2013/08/05	MCP(Power1)

Size: Custom | Document Number: Miix4 | Rev: 1.0

Date: Monday, August 17, 2015 |

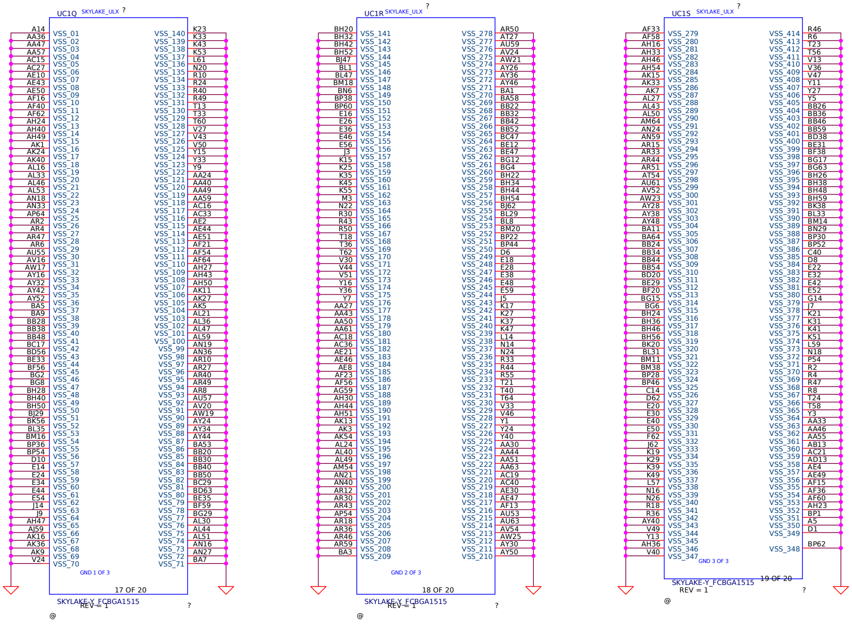


PCH will drive EXT_PWR_GATE# low when all the high speed I/O controllers (xHCI, SATA and PCIe*) are idle or have no devices attached.

Security Classification	LC Future Center Secret Data		
Issued Date	2014/11/15	Deciphered Date	2013/08/05

Title: MCP (Power2)

Size: C | Document Number: Miix4 | Rev: 1.0



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Title
MCP (VSS)

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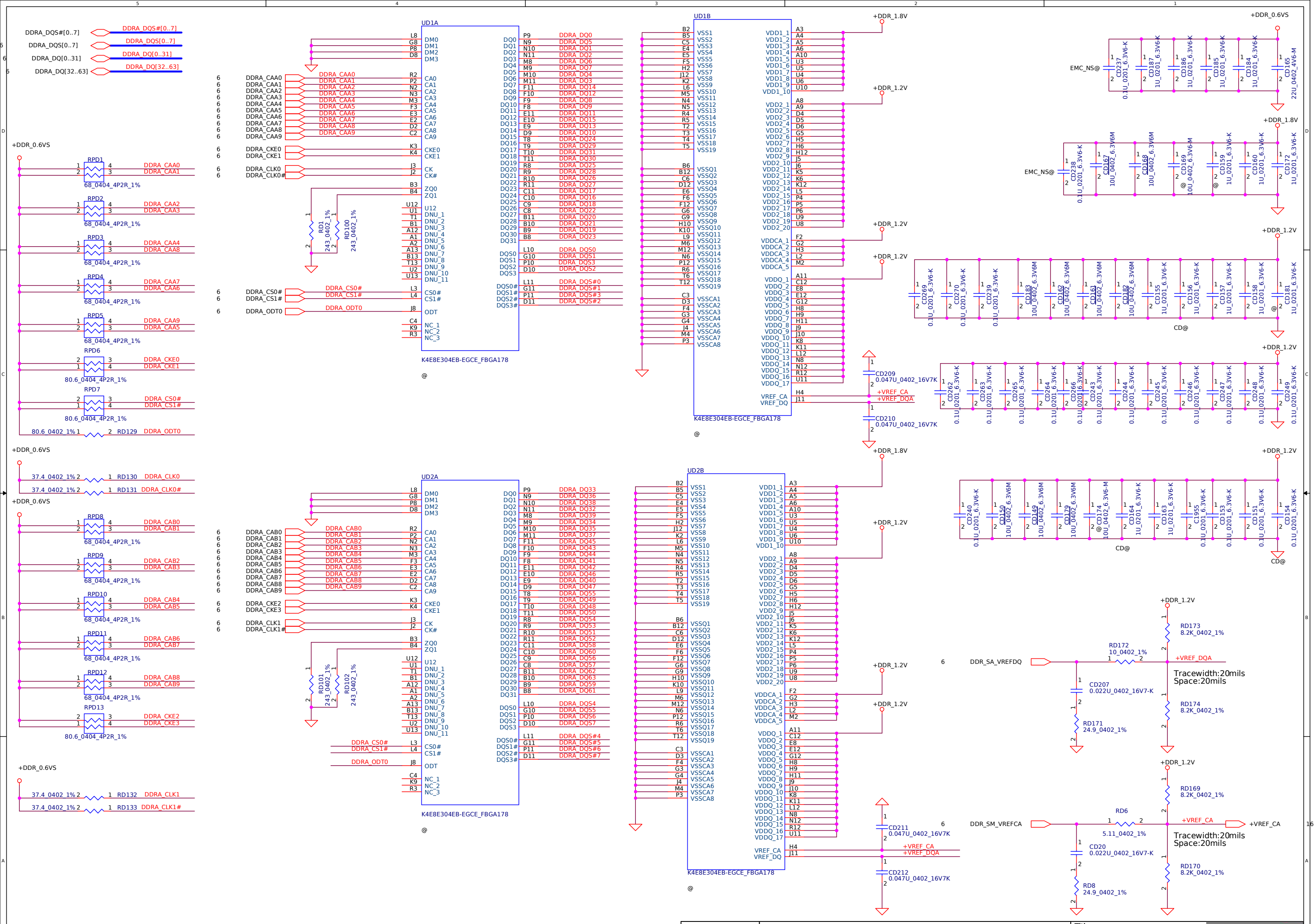
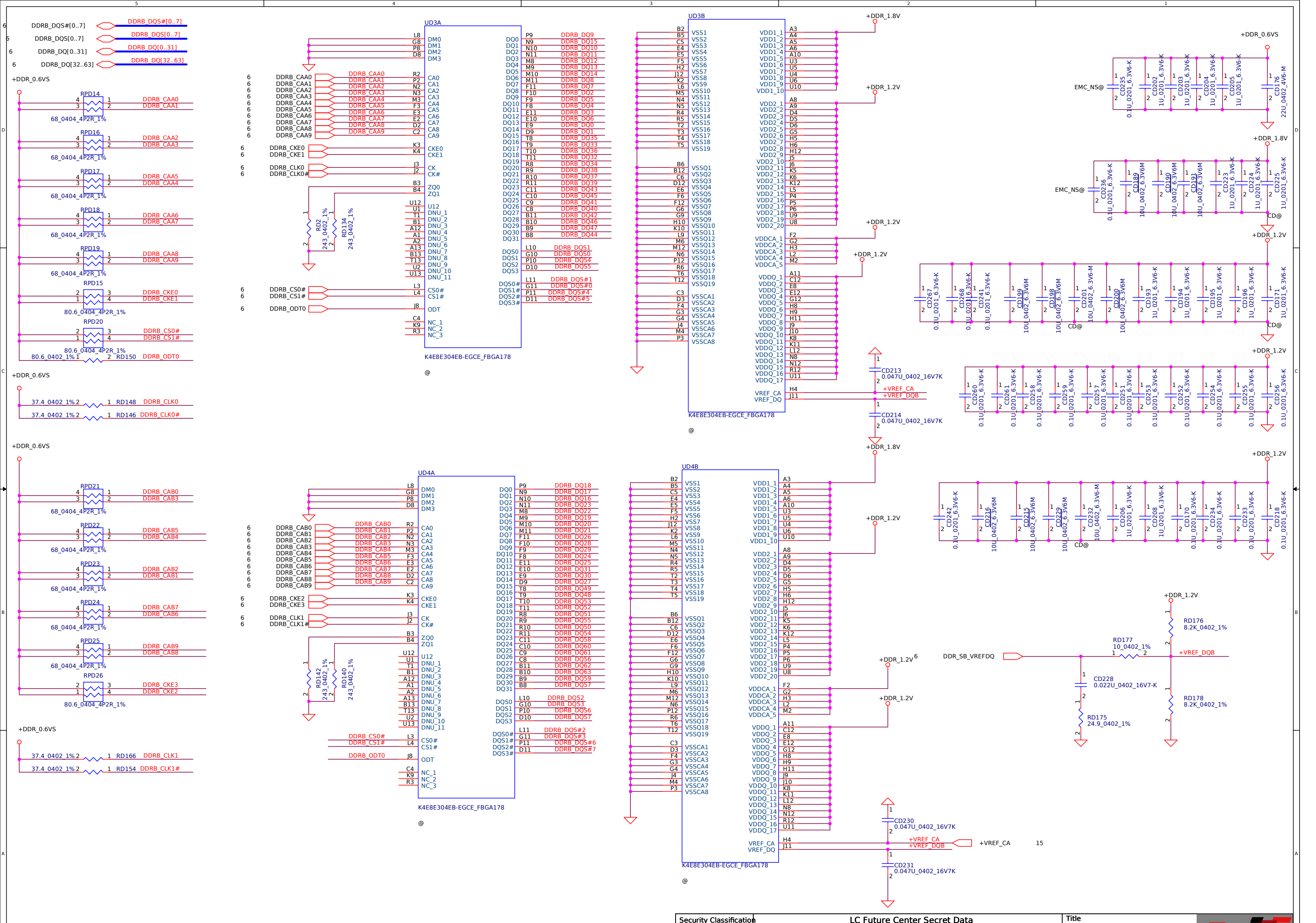


Security Classification	LC Future Center Secret Data		
Issued Date	2014/11/15	Deciphered Date	2013/08/05

Title: LPDDR3-CHA

Size: C | DocumentNumber: Miix4 | Rev: 1.0



Security Classification	LC Future Center Secret Data			Title
Issued Date	2014/11/15	Deciphered Date	2013/08/05	LPDDR3-CHB

Size	Document Number	Rev
C	Miix4	1.0

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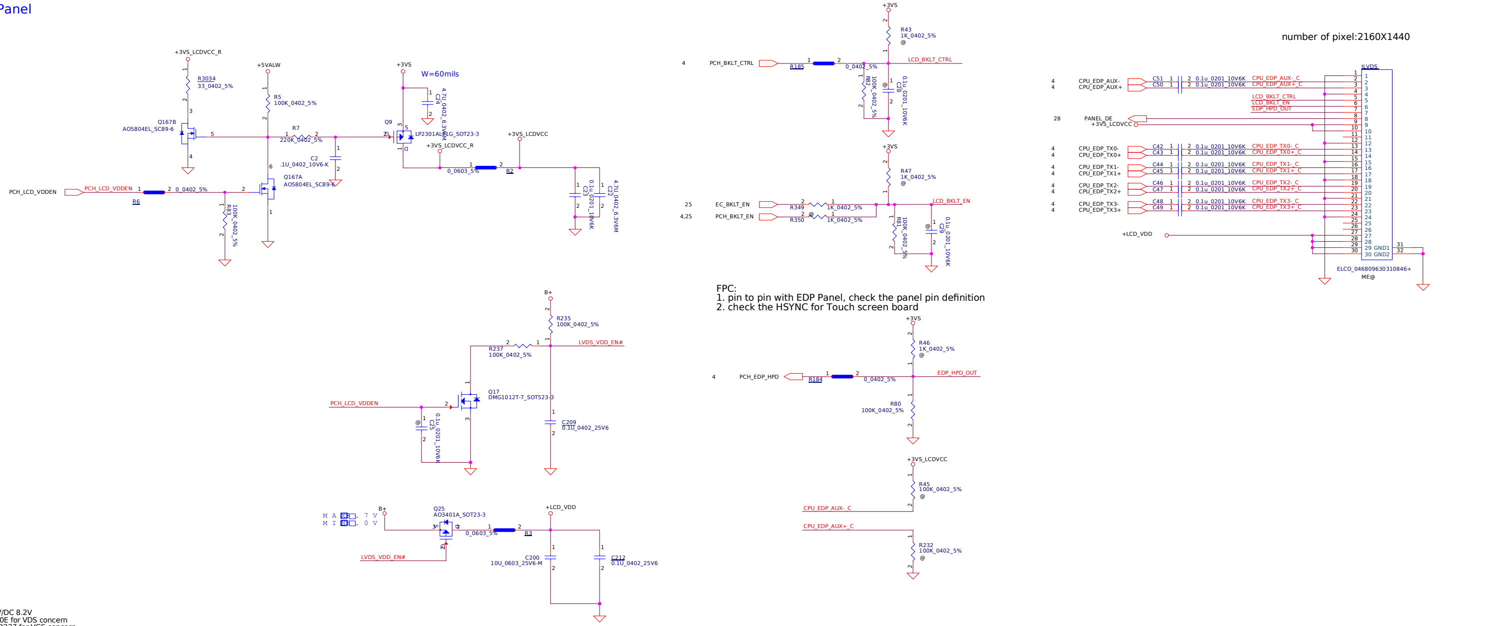
EDP Panel



NOTE

1. AC 19V/DC 8.2V
2. AO5800E for VDS concern
3. R235, R237 for VGS concern
4. C200 for voltage concern

Reserve for other function

Security Classification	LC Future Center Secret Data		
Issued Date	2014/11/15	Deciphered Date	2013/11/08

Title: LCD

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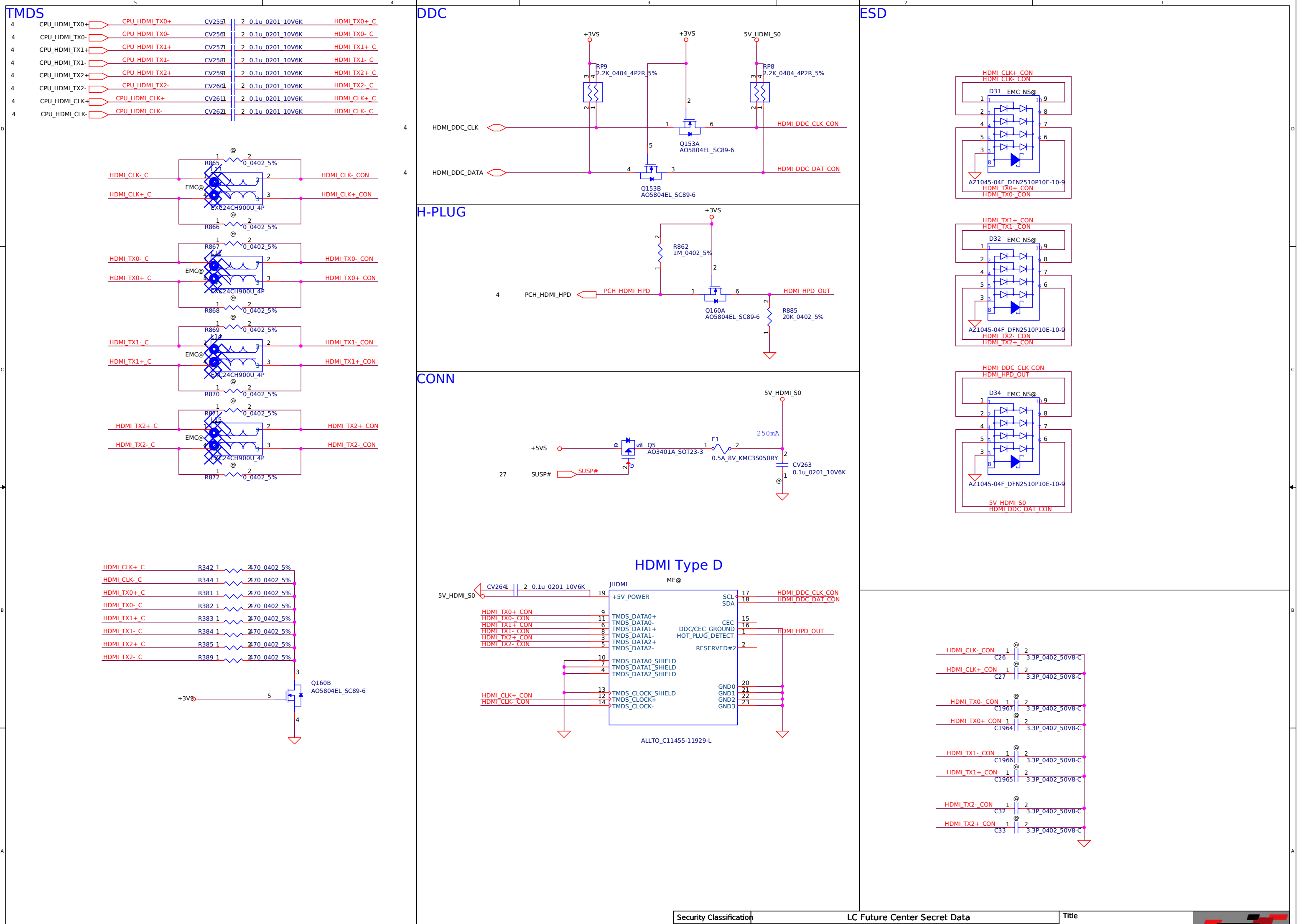

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Title: HDMI

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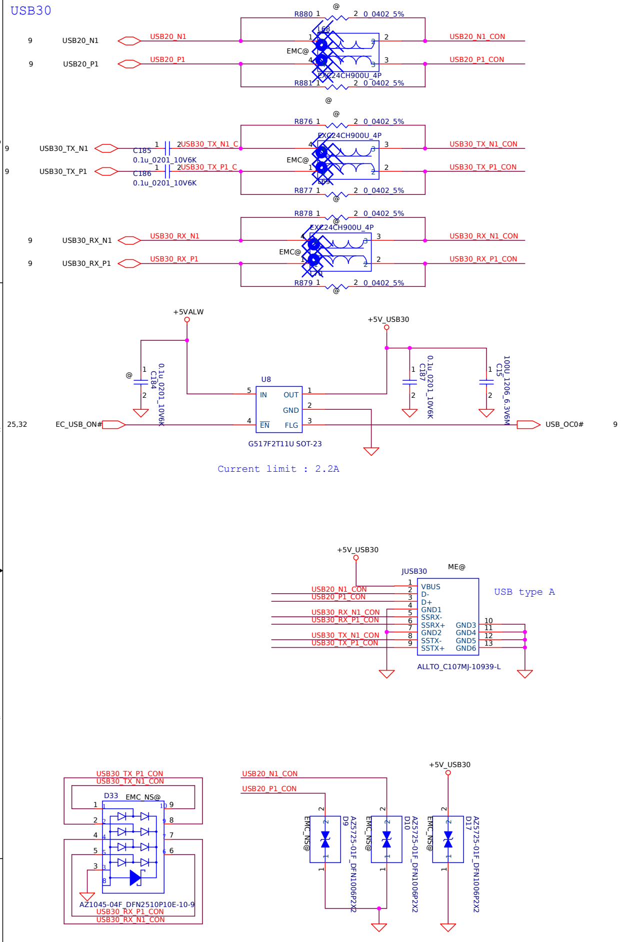
USB30



Security Classification	LC Future Center Secret Data		
Issued Date	2014/11/15	Deciphered Date	2013/11/08

Title: SSD&USB30 Type C

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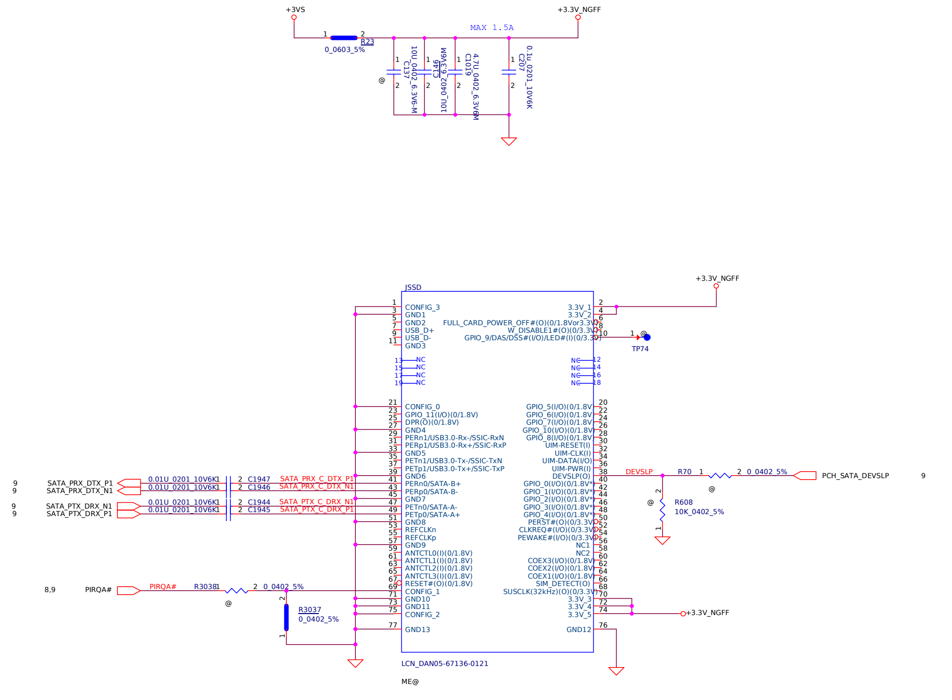
SSD

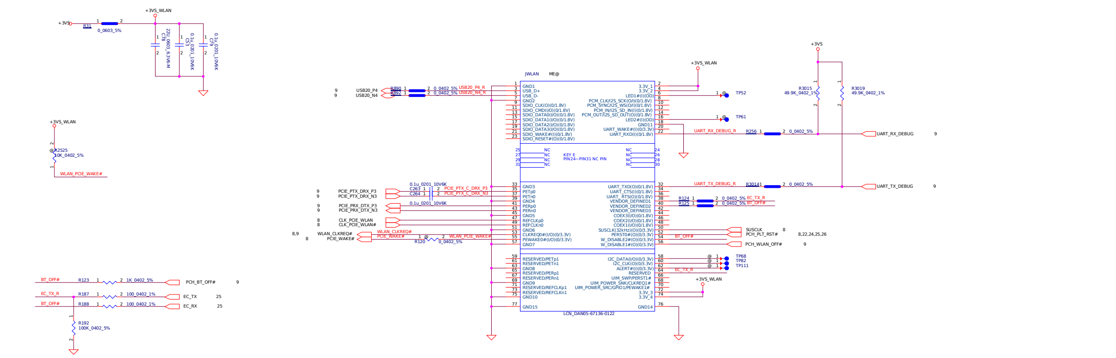


Security Classification	LC Future Center Secret Data		
Issued Date	2014/11/15	Deciphered Date	2013/11/08

Title: SSD&USB30 Type C

Size: C | Document Number: Miix4 | Rev: 1.0

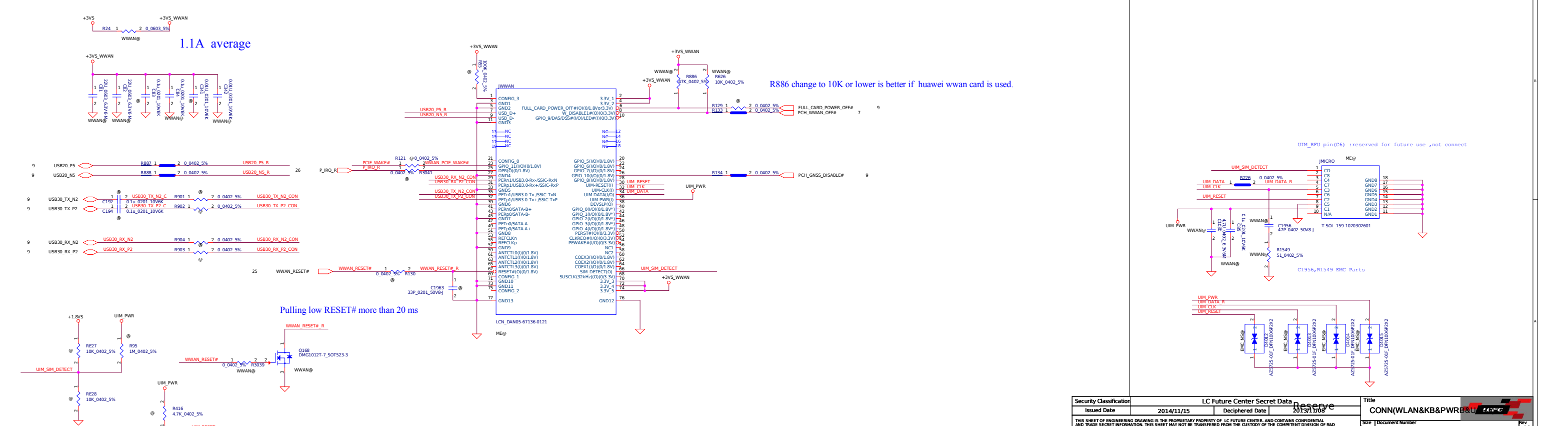
Mini Card(WLAN/WiMAX)



WLAN&BT Combo module circuits

	BT on module Enable	BT on module Disable
* BT_CRTL	H	L
PCH_BT_ON#	L	H

Mini Card(WWAN)



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Issued Date	2014/11/15	Deciphered Date	2013/11/08

Reserve

Title: CONN(WLAN&KB&PWRB&U

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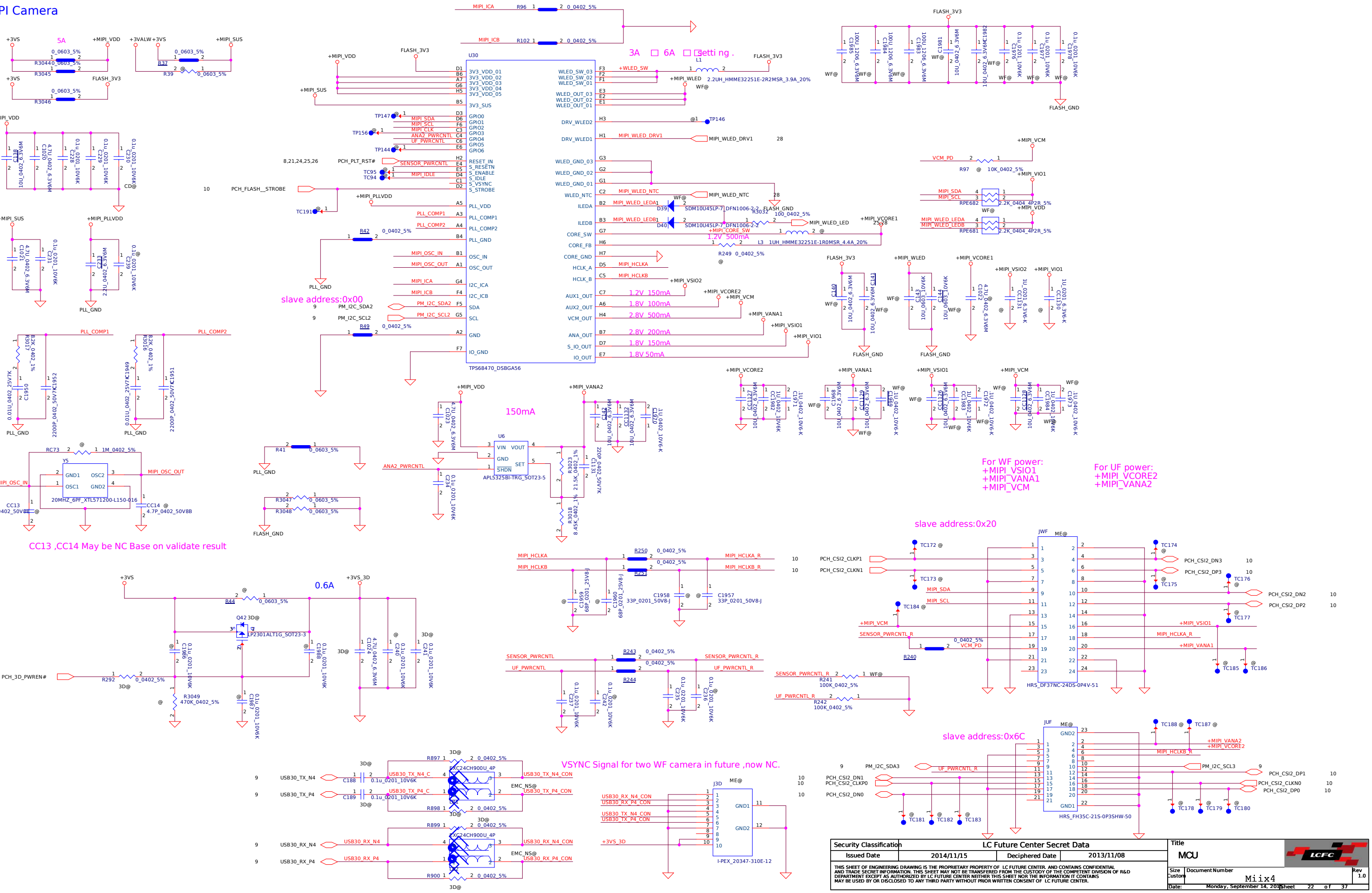
MIPI Camera



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Title: MCU

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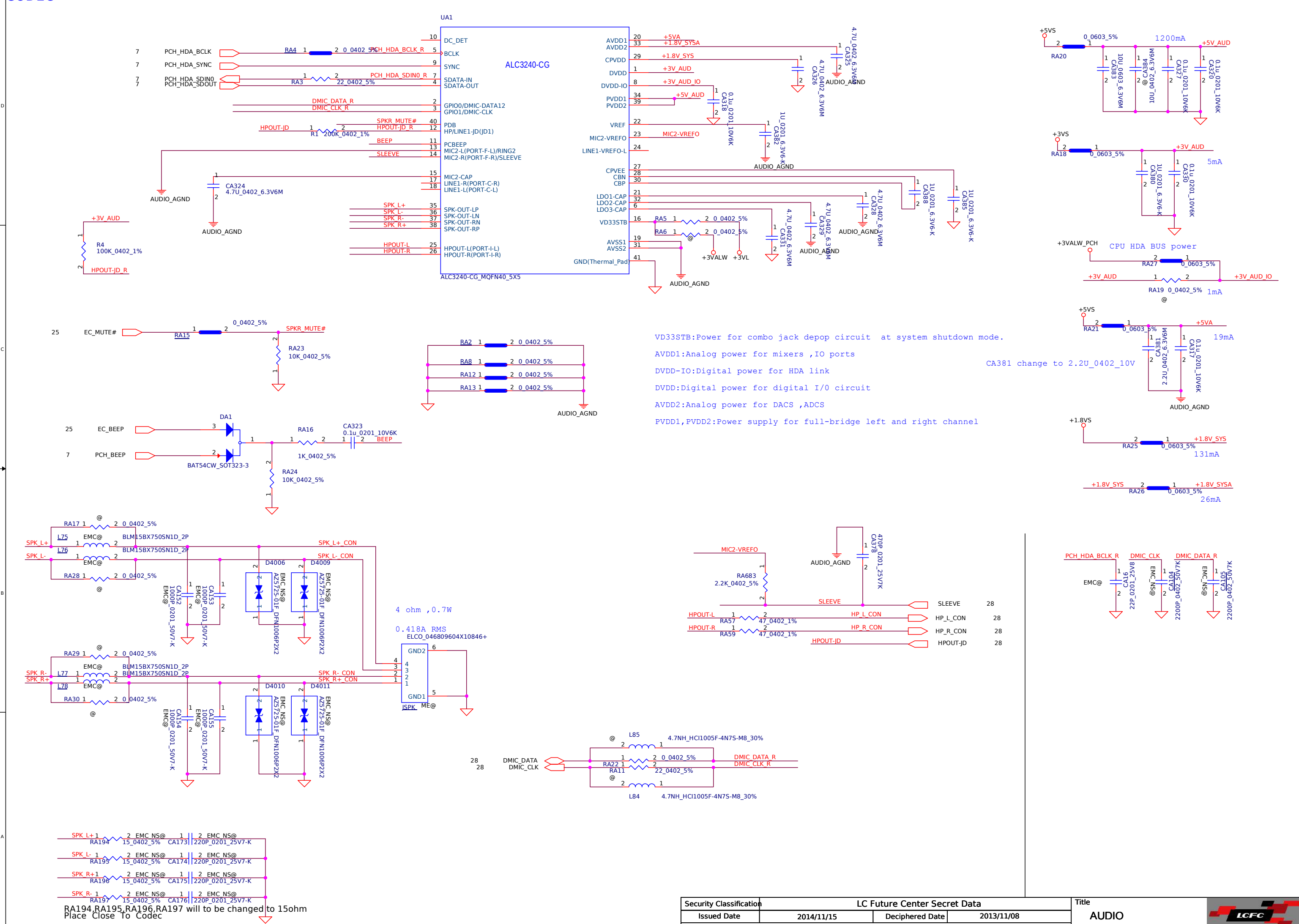
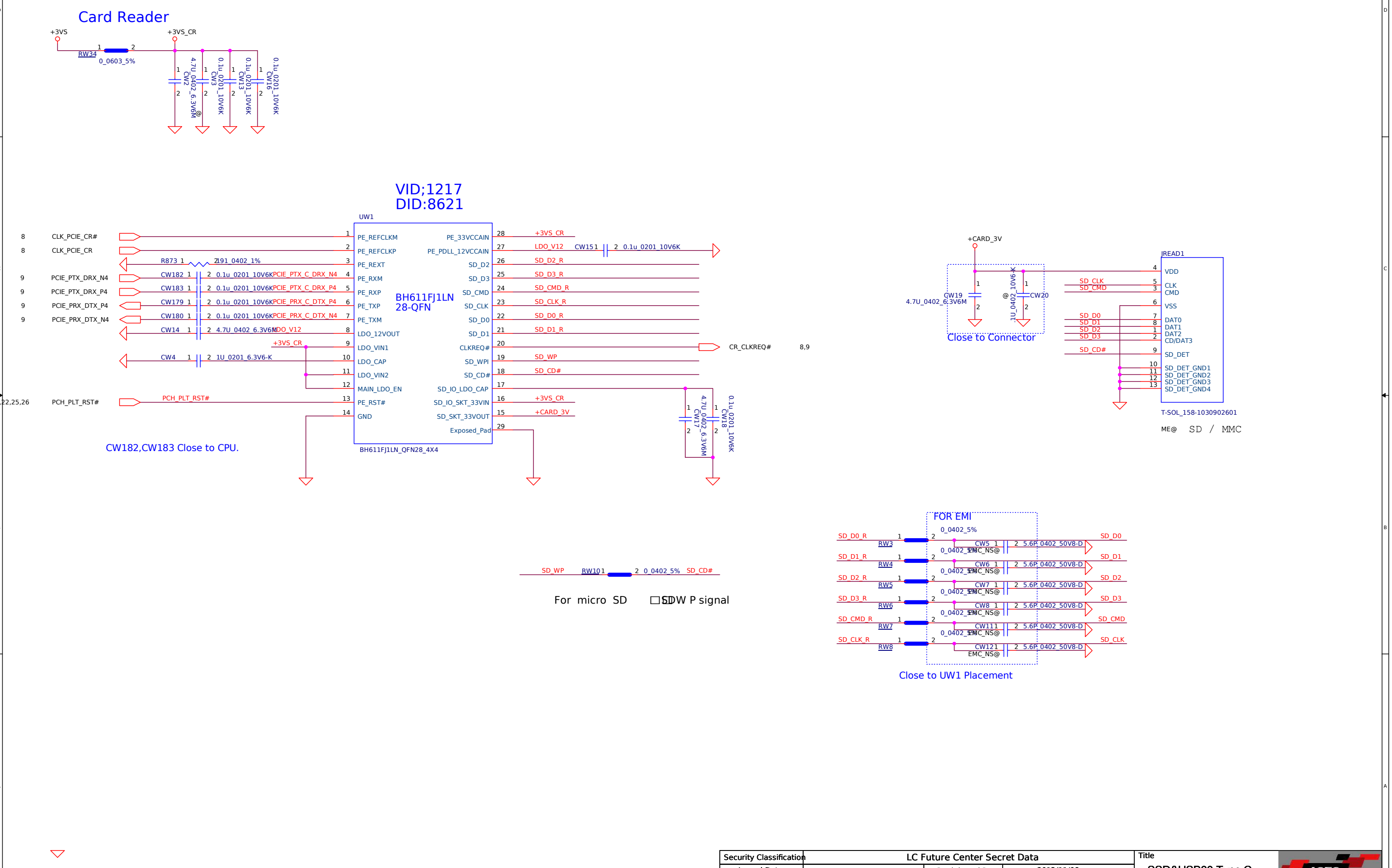
CODEC



Security Classification	LC Future Center Secret Data		
Issued Date	2014/11/15	Deciphered Date	2013/11/08

Title: AUDIO

Size: C | Document Number: Miix4 | Rev: 1.0



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Title: SSD&USB30 Type C

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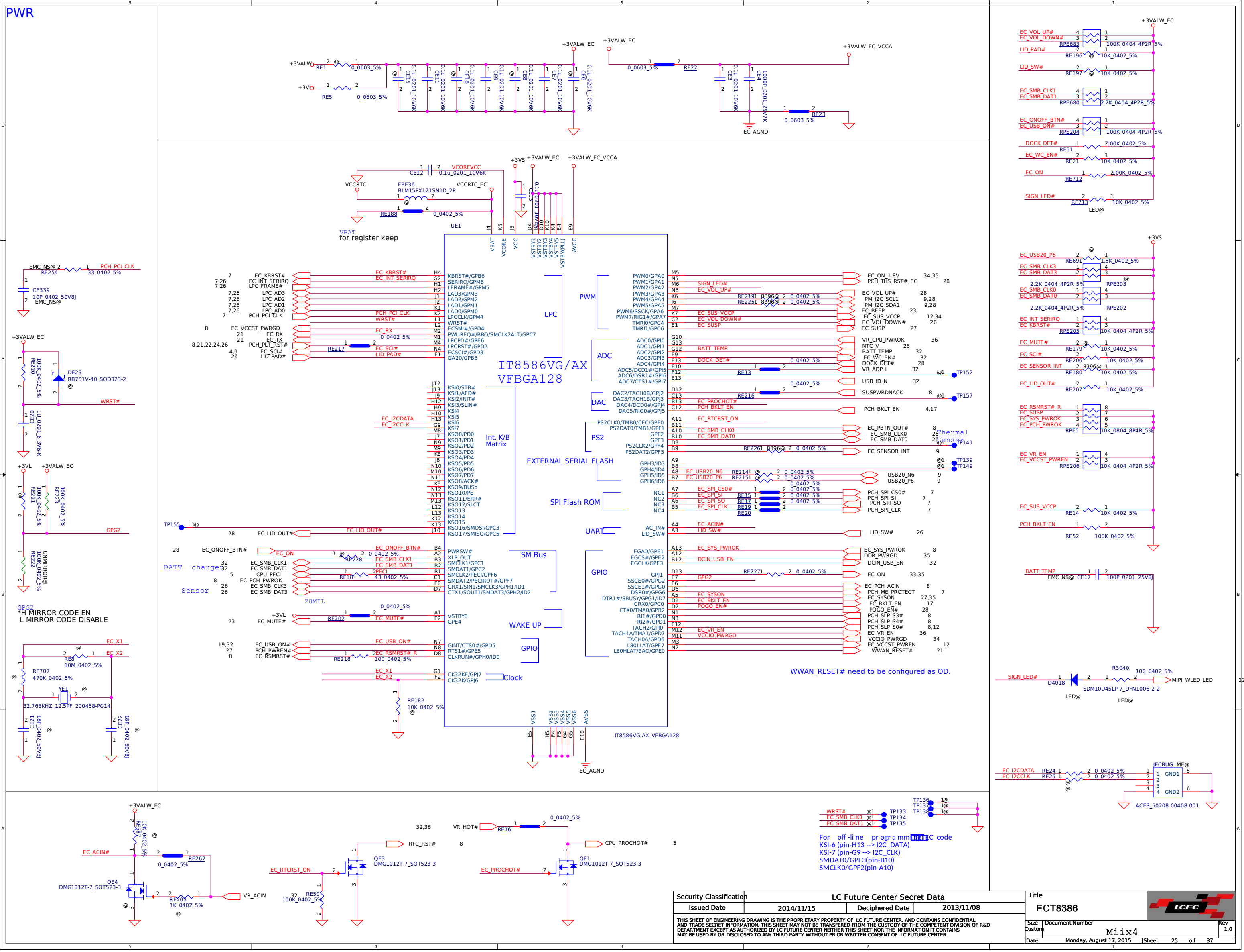
PWR
IT8586VG/AX
VFBGA128
UE1
IT8586VG-AX_VFBGA128
LPC
PWM
ADC
DAC
PS2
Int. K/B Matrix
EXTERNAL SERIAL FLASH
SPI Flash ROM
UART
SM Bus
GPIO
WAKE UP
Clock
VBAT for register keep
BATT charger
Sensor
20MIL
Thermal Sensor
*H MIRROR CODE EN
L MIRROR CODE DISABLE
GPG2
WWAN_RESET# need to be configured as OD.
For off-line programming EC code
KSI-6 (pin-H13 --> I2C_DATA)
KSI-7 (pin-G9 --> I2C_CLK)
SMDAT0/GPF3(pin-B10)
SMCLK0/GPF2(pin-A10)
+3VALW_EC
+3VALW_EC_VCCA
+3VS
+3VL
EC_AGND
32.768KHZ_12.5PF_200458-PG14
DMG1012T-7_SOT523-3
RB751V-40_SOD323-2
SDM10U45LP-7_DFN1006-2-2
JECBUG_ME@
ACES_50208-00408-001
MIPI_WLED_LED
VR_ACIN
RTC_RST#
CPU_PROCHOT#
VR_HOT#
Security Classification
LC Future Center Secret Data
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Deciphered Date 2013/11/08
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Title
ECT8386
Size Custom
Document Number
Miix4
Rev 1.0
Date: Monday, August 17, 2015
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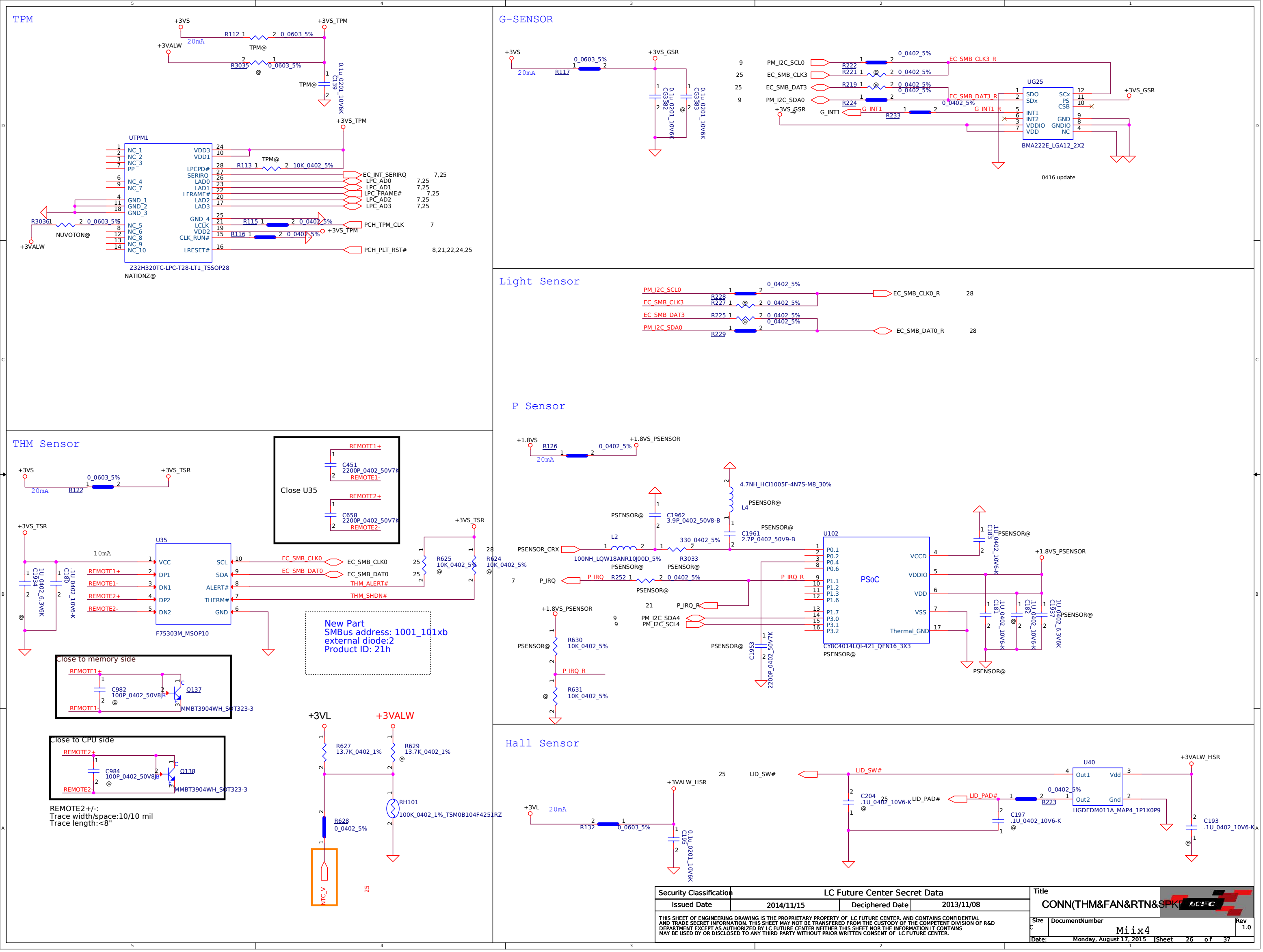

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Title: CONN(THM&FAN&RTN&SPK)

Size	Document Number	Rev
C	Miix4	1.0

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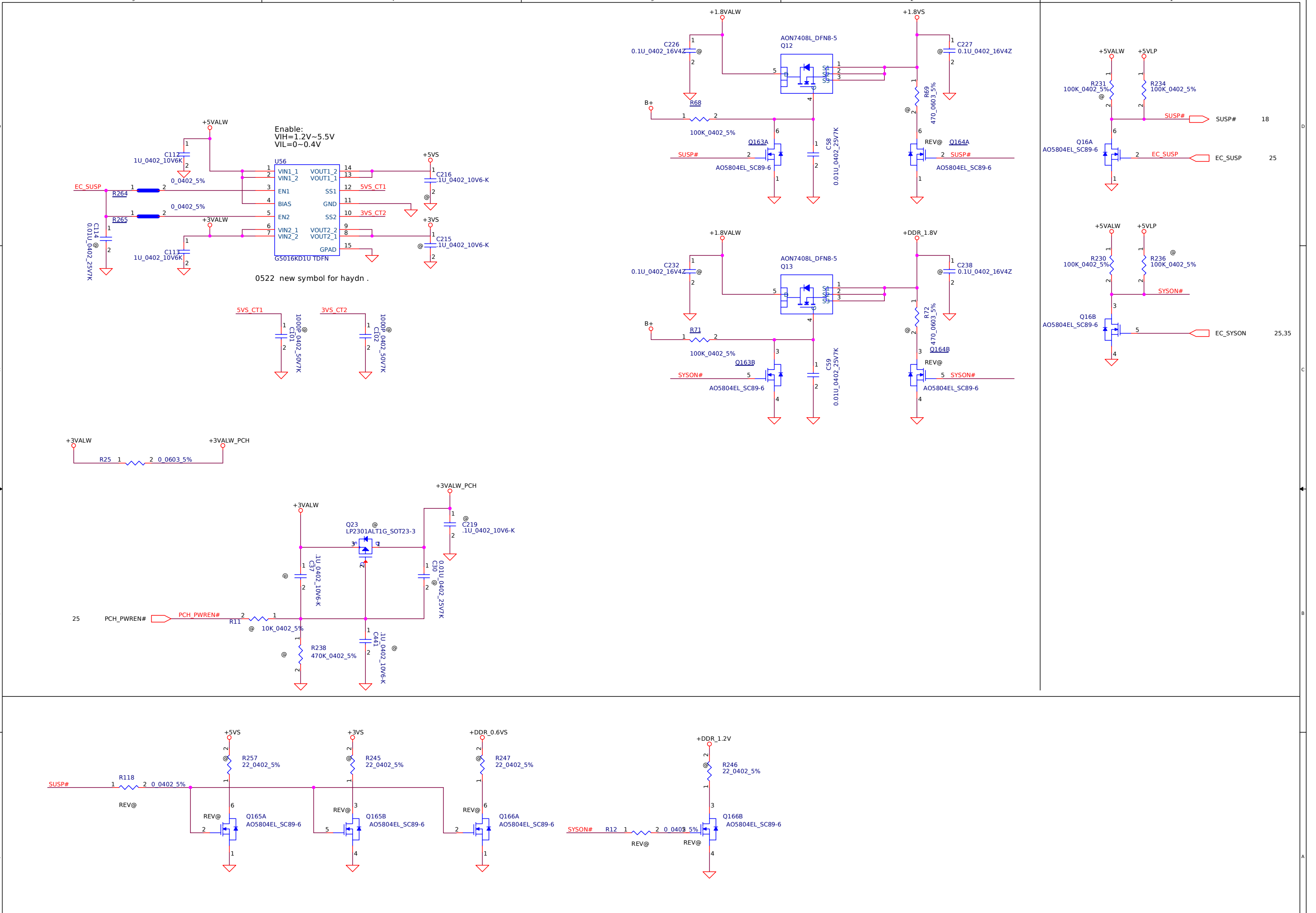
REMOTE2+/-:
Trace width/space:10/10 mil
Trace length:<8"



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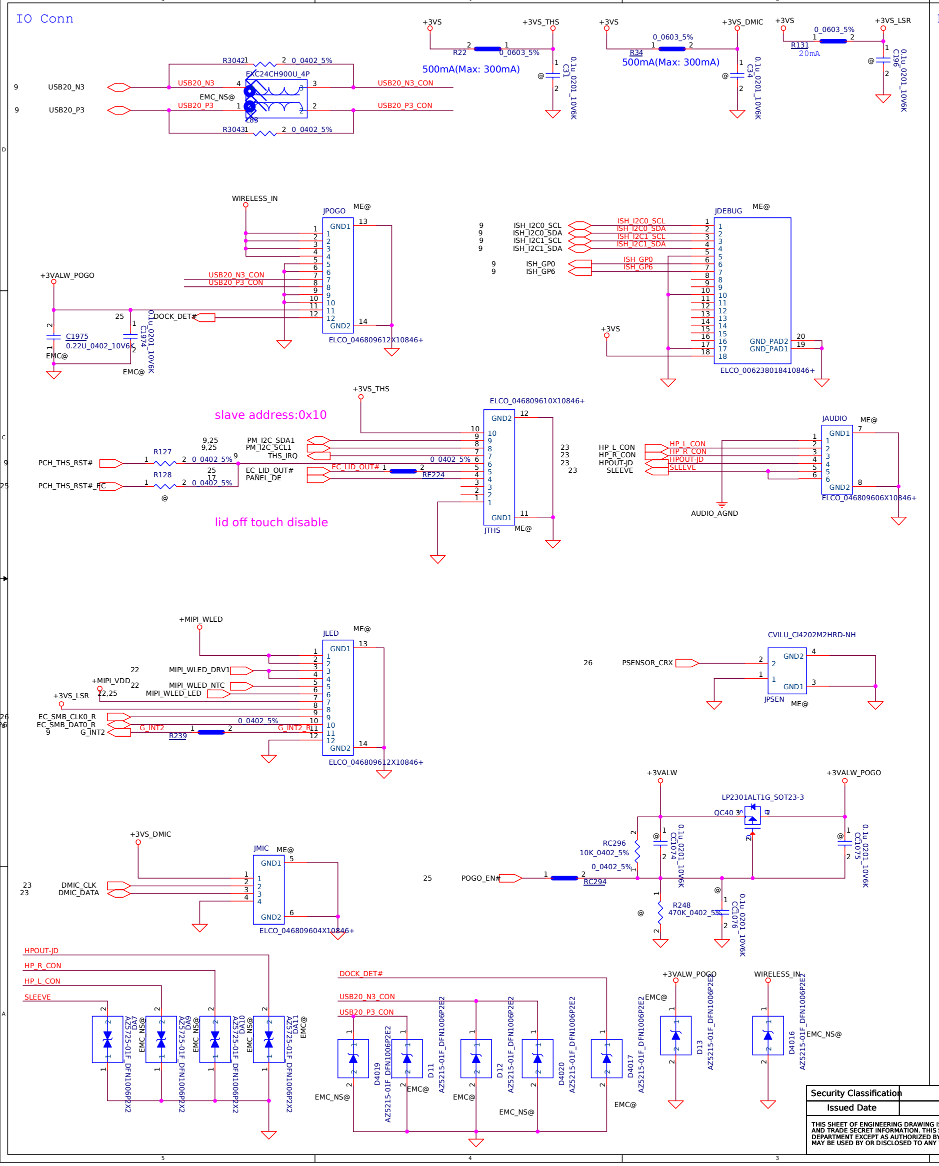
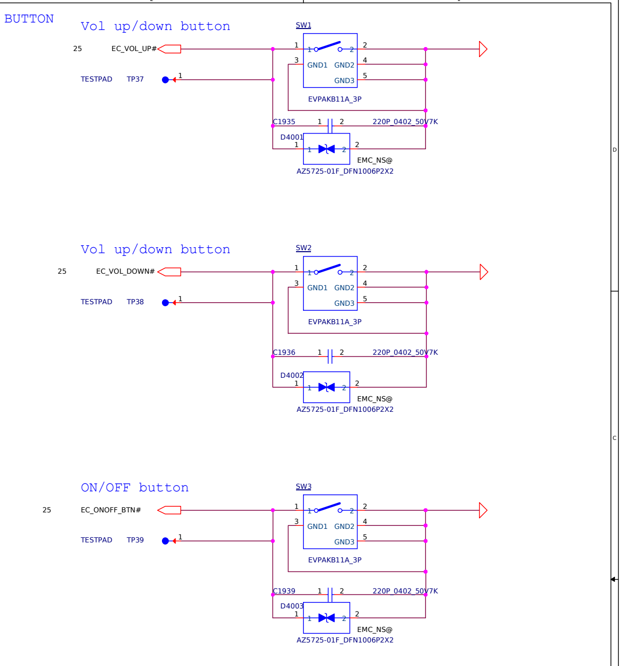
Title		
POWER SWITCH		
Size: C	Document Number: Miix4	Rev: 1.0
Date: Monday, August 17, 2015	Sheet 27 of 37	





Configure	PU	PD	Voltage	POGO_EN#	+3VALW_POGO
No docking	100K	NC	3.3V	3.3V	0V
KB and TP enable	100K	300K	2.475V	0V	3.3V
KB and TP disable(0-15 degree)	100K	300K	2.475V	3.3V	0V
KB and TP disable(345-360 degree)	100K	300K	2.475V	3.3V	0V
KB and TP disable after calculate angle	100K	150K	1.98V	0V	3.3V

Configure	PU	PD	Voltage		
No docking	100K	NC	3.3V		
10W CHG Docking	100K	50K	1.1V		
20W CHG Docking	100K	83K	1.496V		

Security Classification	LC Future Center Secret Data		
Issued Date	2014/11/15	Deciphered Date	2013/11/08

Title: Screw and Hole

LCFC

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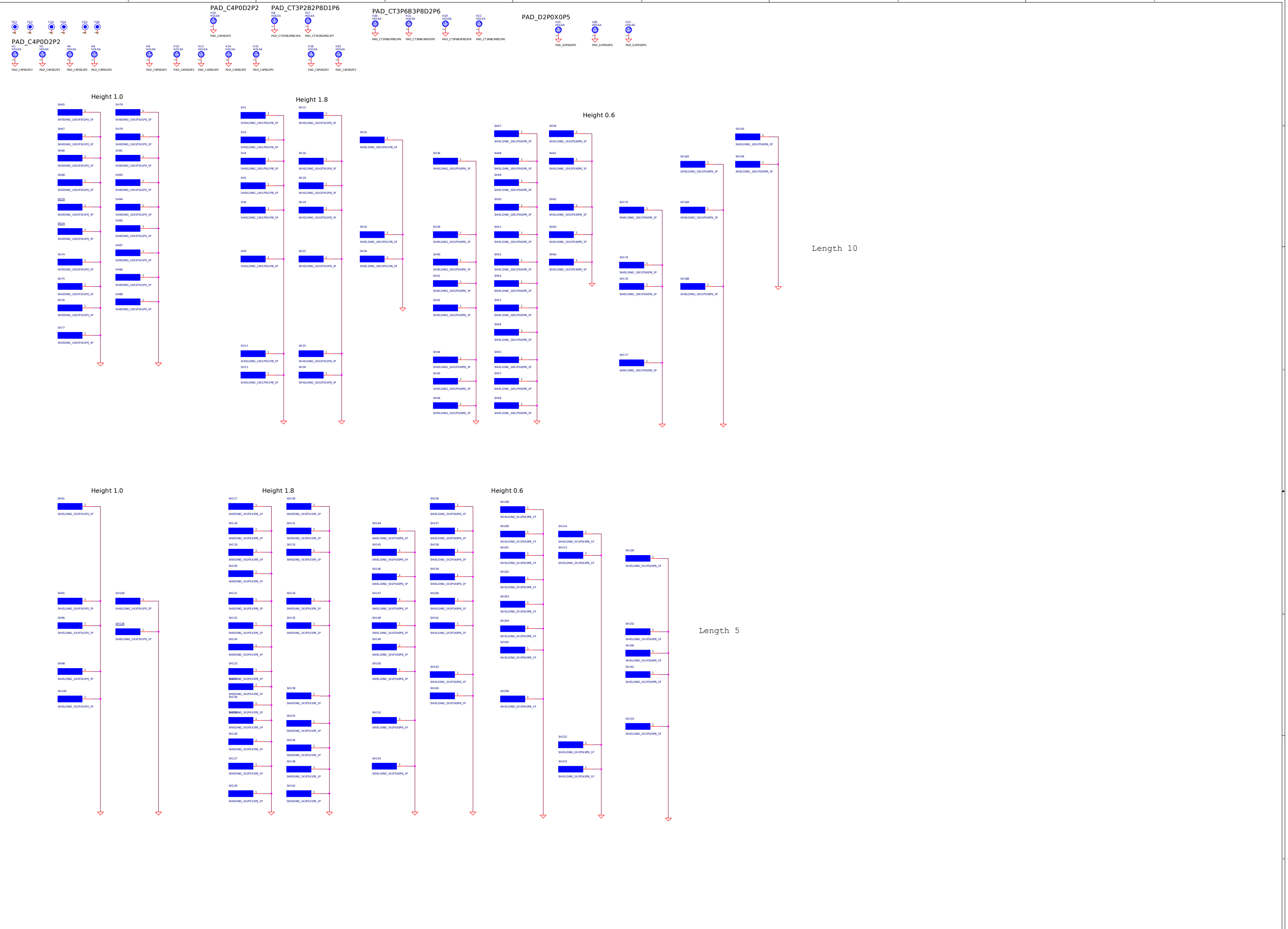

Security Classification	LC Future Center Secret Data		
Issued Date	2014/11/15	Deciphered Date	2013/11/08

Title: Screw and Hole

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01/06:
1.Change EC to 8386
2.modify JPOGO pin define .
3.Change U40 to APX8132HAI-TRG_SOT23-3

01/12:
1.Change EC to 8586
2.Change U40 to HGDEDM011A_MAP4_1P1X0P9

01/13:
1.Change U35 to F75303M_MSOP10

01/21:
1.Add P senosr part schematic
2.Move light sensor to DB.

01/26:
1.Change Codec to ALC3240-CG_MQFN40_5X5

01/30:
1.Change JWWAN to ARGOS_NARB0-M6701-TS15 follow ME request.

2/3:
1.Add o ohm resistor for Power manager signal.

2/9:
1.update UF Camera connector follow ME connector list ,

2/11:
1.Modify J3D pin define.
2.Reserved ESD component for SIM Card interface.
3.Swap USB2.0 port2,port3 signal for layout concern

2/12:
1.Delete Audio jack signal RING2
2.Swap JLVDS pin define .

2/13:
1.Change some resistor to R short for layout concern.
2.modify +CPU_VCCSTG and VCCPLL_OC enable control method
3.Swap JTHS,JAUDIO pin define.
4.Add hole symbol

2/14:
1.Modify touch panel signal HSYNC .
3.Swap JPOGO pin define.

2/25:
1.Modify Camera part schematic.

2/26:
1.Delete UPI Colay component.
2.Add JDEBUG connector
3.combine power part schematic

2/28:
1.Swap JPOGO, JTHS pin define
2. Modify Hole size .

3/2:
1.update RPC28 to 1K_0404_4P2R_5%
2.Add 1.0 height clip.
3.Modify Camera part schematic.
4.combine power part schematic
5.Change CC1150 to 22U_0402_4V6-M

3/3:
1.Change JDEBUG to ELCO_006238018410846+
2.Change P sensor to cypress solution (CY8C4014LQI-421_QFN16_3X3)

3/4:
1.Add R3015,R3019 for debug function
2.Change L75,L76,L77,L78 to BLM18PG221SN1D_2P

3/5:
1.Change U30 to SA00007AT10
2.reserve I2C interface for 8396 EC.

3/6:
1.Reserve CD235 □CD236,CD237,CD238 Follow EMC suggestion.
2.reserve EC debug connector JECBUG
3.combine power part schematic .

3/7:
1.Change QC7 to 2N7002KDWH_SOT363-6

3/9:
1.Change CA384 to 10U_0402_6.3V6M for ME height concern.
2.Change CC192,CC193,CC194,CC191,CC198,CC175,CD165,CD176 to 22U_0402_4V6-M for ME height concern.
3.Change QC7 to AO5804EL_SC89-6
4.Change C200 to 10U_0603_25V6-M for ME height concern.

3/9:
1.Change JAUDIO to ELCO_046809606X10846+ follow ME Connector list
2.Change JMIC to ELCO_046809604X10846+ follow ME Connector list
3.Change JTHS to ELCO_046809610X10846+ follow ME Connector list
4.Change JPOGO,JLED to ELCO_046809612X10846+ follow ME Connector list
5.Change signal MIPI_SDA pull up power plane to +MIPI_VIO1
6.Add UC4 ,colay with UC3 For ME height concern.
7.Reserve pull down for signal P_IRQ
8.Add pull down resistor for GPP_B22
9.change L69,L70,L81,L82 to EXC24CH900U_4P
10.Change L32,L33,L34,L35,L36 to BLM15PX121SN1D_2P For ME height concern.

3/10:
1.Change JCMOS1 to TP71
2. Change EDP power switch to MOS for ME Height concern.
3.chang DC2,DC3 to UC5,UC6 (74LVC1G08SE-7_SOT353-5) For leakage issue.
4.Change R22,R132,RA18,RA20,RA21,RA25,RA26 to R short for ME height concern
5.pull up to +3VALW_EC for signal EC_ON ,POGO_EN#
6.add resistor RE262
7.combine power part schematic
8.Modify EDP pin define.

3/11:
1.Change L4 to 18NH_HCI1005F-18NJ-M8_5% follow vendor suggestion.
2.pull up +3VALW_EC for signal EC_WC_EN

3/12:
1.Delete CA386,CA387
2.Mount RE207
3.combine power part schematic

3/13:
1.Modify JPOGO pin define.
2.Modify Jmic pin define.
3.Combine power part schematic

3/16:
1.change SW1,SW2,SW3 to IPTG14K-Q-T-R_5P follow ME suggestion.
2.set signal VID0 pull up to +3VALW.

SIV

4/13:
1.unmount C193□CW3,C215,C216,CV263
CC1197,CC1105,CC1096,CC1103,CC1082,
CC1111,CC1120
CC1157,CC1160,CC1169
CC1236,CC1229,CC1233
CC1958,CC1965,CC1961,CC1971,CC1974,CC1977
CD154,CD156,CD164,CD225,CD232,CD171,CD201
CC173,CC1132,C230 for components quantity down
2.Change EDP Part diff signal name.

4/14:
1.move signal EC_SENSOR_INT to GPF5
2.move signal EC_SCI# to GPP_E8

4/16:
1.Change R3034 to 33 ohm for LCDVCC fall time fail.
2.Change JSPK to ELCO_046809604X10846+ follow ME connector list
3.Change L68,L12,L13,L14,L15 to EXC24CH900U_4P
4.Change SW1,SW2,SW3 to EVPAKB11A_5P follow ME request.

4/20:
1.Change signal EC_VOL_UP# and EC_VOL_DOWN# pull up power plane to +3VALW.

4/23:
1.Reserve GPP_E15 for SCI function
2.Add test point for signal PCH_FLASH__STROBE
3.Change YC1 to X1A000141000200 ,CC4 to 8P_0402_50V8J,CC5 to 9P_0402_50V8J follow vendor suggestion
4.Add 0 ohm resistor for JSSD pin69.
5.Change D11,D12,D13 to AZ5215-01F_DFN1006P2E2 follow EMC suggestion
6.Reserve D4016 follow EMC suggestion
7.Reserve C26,C27,C1967,C1964,C1966,C1965,C32.C33 follow EMC suggestion.
8.Add D4017 follow EMC suggestion
9.Change PL105 to EXC24CH900U_4P follow EMC suggestion

4/25:
1.Change R887,R888,RW10,RC46,RC57,R96,R102,RC105,R184,R185,RE188,RA2,RA8,R124,R125,R890,R892,RE23 to R short for components quantity down.

SIT

6/8:
1.Reserve Q168 For wwan reset#
2.change R3002 to SD00001KH00
3.Change U56 to SA000067600
4.Reserve LED schematic

6/17:
1.Change D11,D12,D13,D4016,D4017 to AZ5423-01F.R7GR_DFN1006P2E2 follow EMC suggestion.
2.Change CC4 to 9P_0402_50V8J follow crystal vendor suggestion.
3.Change RPE683,RPE204 to 100K_0404_4P2R_5%
4.Change RE712 to 100K_0402_5%

6/19:
1.Add CAP CC1981,CD239,CD240,CD241,CD242

SVT

7/17:
1.Mount C237 and C235 for signal UF_PWRCNTL quality.
2..Change C143,C144 to SE00000XO0J
3.Change C138,C142,C146,CD149,CD150,CD161,CD162,CD167,CD168,CD179,CD182,CD183,
CD189,CD190,CD191,CD198,CD199,CD200,CD215,CD216,CD229,CC1080,CC1081,
CC1083,CC1084,CC1085,CC1086,CC1087 to SE00000UD8J

7/30:
1.Add C1968 and C1969 to solve WF camera garbage issue,.

8/2:
1.Change Y5 to 20MHZ_6PF_XTL571200-L150-016 follow vendor suggstion.
2.Reserve 0.1uF cap for power +MIPI_VANA2
3.Change RC292 to 0402 size o ohm resistor .
4.Add 1uF and 0.1uF caps for mipi camera power.

8/3:
1.Change JLVDS to ELCO_046809630310846+ follow ME request .

8/4:
1.Mount LC37 for SKL 5.67GHz signal noise issue
2.Add C1974 and C1975 follow EMC suggestion.
3.Mount Q168 for WWAN reset signal.
4.Add TPM_ID1 and TPM_ID2 Signal to identify TPM Mount or not .
5.Change R115,R116□R133,R134,R226□R240,R243,R250,R2,R3,RE22,R23,R31,RW34,R34,R37,R117,R122,R131,RC269 ,
R3010,RC3028,RC159,RC160,R222,R224,R228,R229,R233,R239,R126,RW3,RW4,RW5,RW6,RW7,RW8,RE13,RE15,RA15,
RE16,RE17,RE19,RE20,RC64,RC88,RC134,RC135,RC139,RC149,RC150,RC151,RC152,RC153,RC154,RE202,RE216,RE217,R223,RE224,
R244,R251,RC294,R628,RC1491,R3009,,RC3027,RA4,R6,R42,R49,RC62,RC77,RC171,R256,R3014,RE262,R264,R265,R3037
to R short .

8/5:
1.Reserve bead L83 follow EMC request .
2.Reserve bead L84,L85 follow RF request .
3.Combine power part schematic.

8/8:
1.Modify mipi camera schematic.

Security Classification	LC Future Center Secret Data		
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Title: HW_Change_List

LCFC

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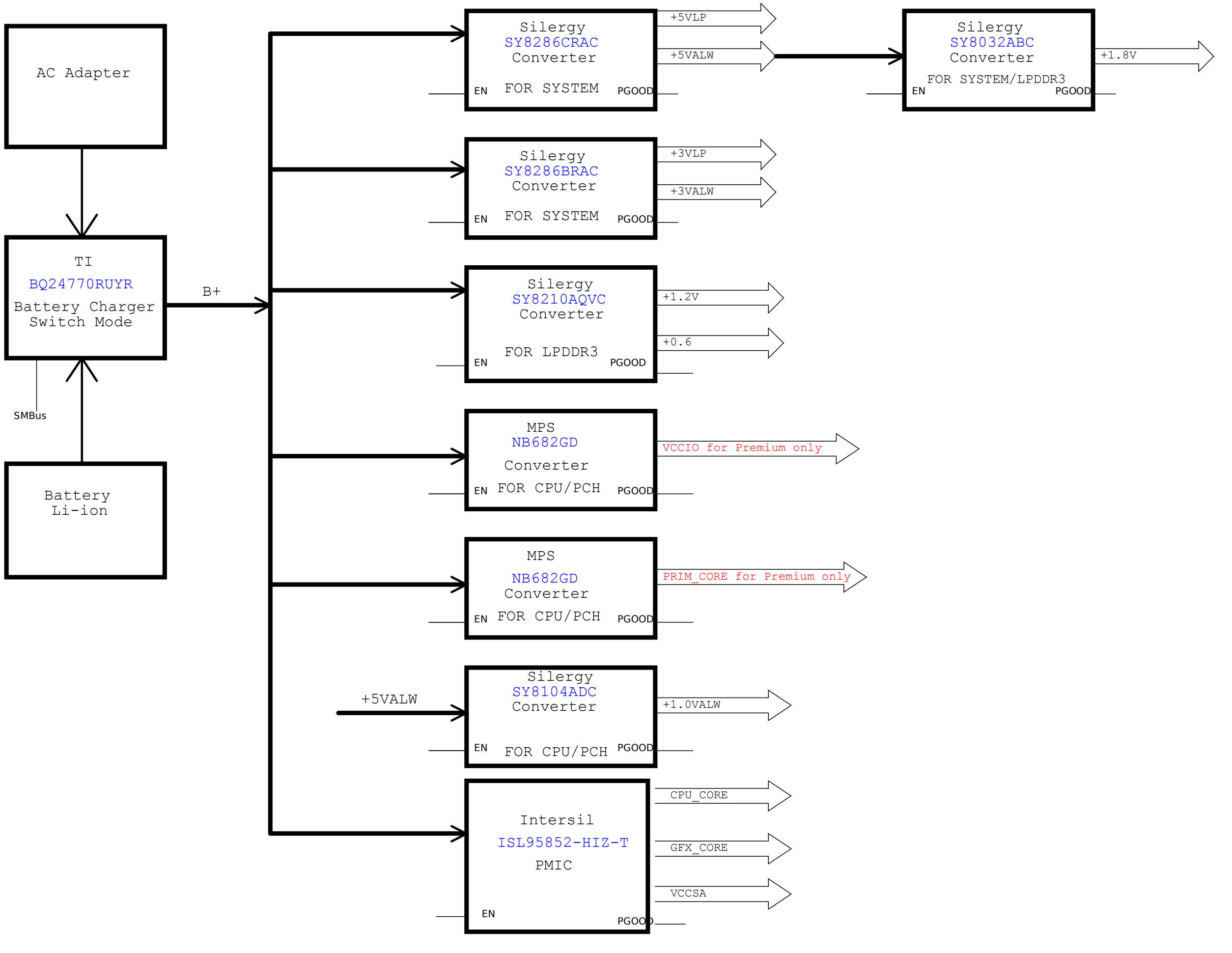

Security Classification	LC Future Center Secret Data			Title: NVDC Charger
Issued Date	2014/02/20	Deciphered Date	2014/02/20	Size: C — Document Number: MIXX4 — Rev: 1.0
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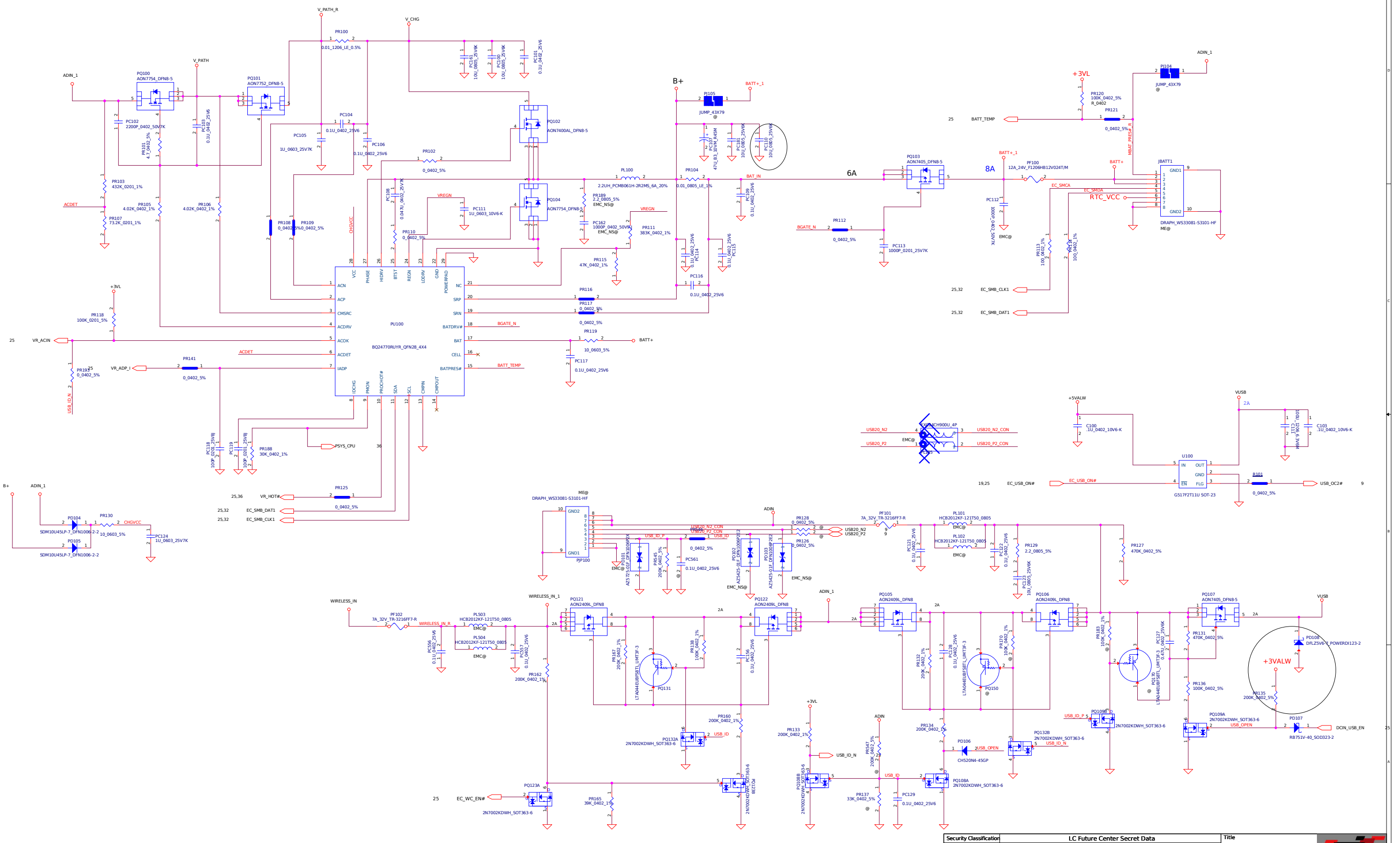
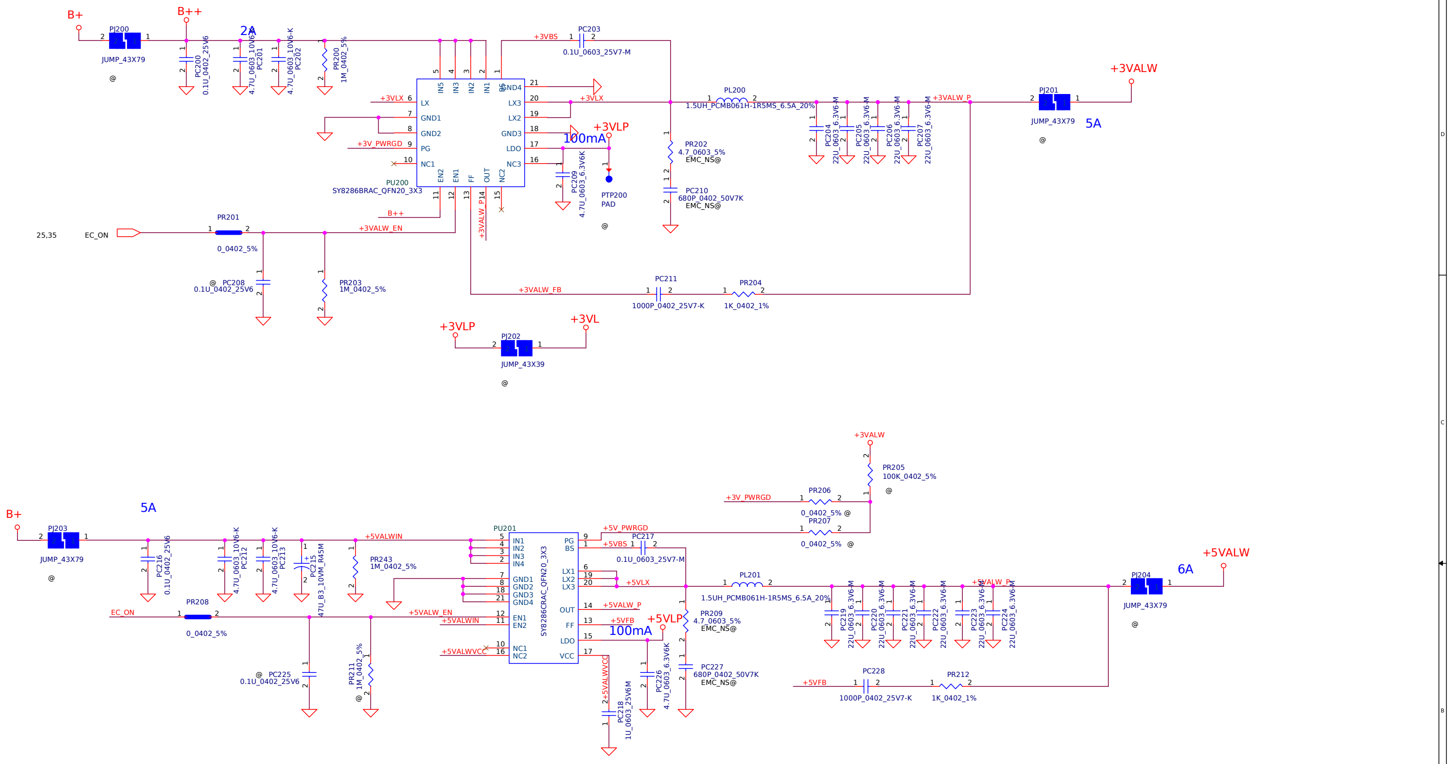


Security Classification	LC Future Center Secret Data		
Issued Date	2014/02/20	Deciphered Date	2014/02/20

Title: NVDC Charger

Size	Document Number	Rev
D	MIXX4	1.0

Date: Monday, August 17, 2015



Security Classification	LC Future Center Secret Data			Title
Issued Date	2014/02/20	Deciphered Date	2014/02/20	3VALWP/5VALWP

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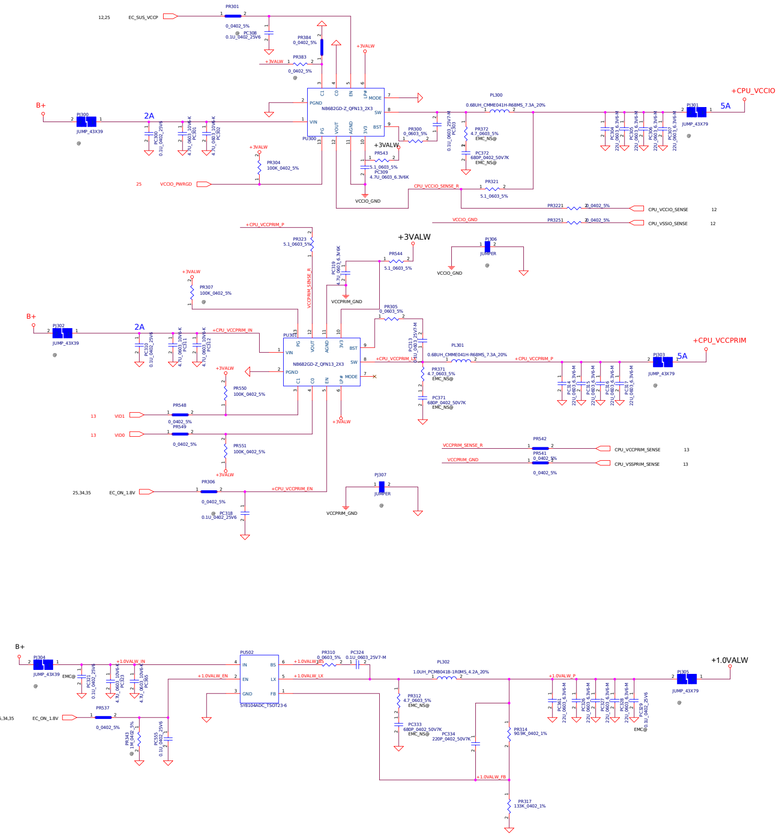

Security Classification	LC Future Center Secret Data		
Issued Date	2013/08/08	Deciphered Date	2013/08/05

Title: 1.35VS/+0.675VS

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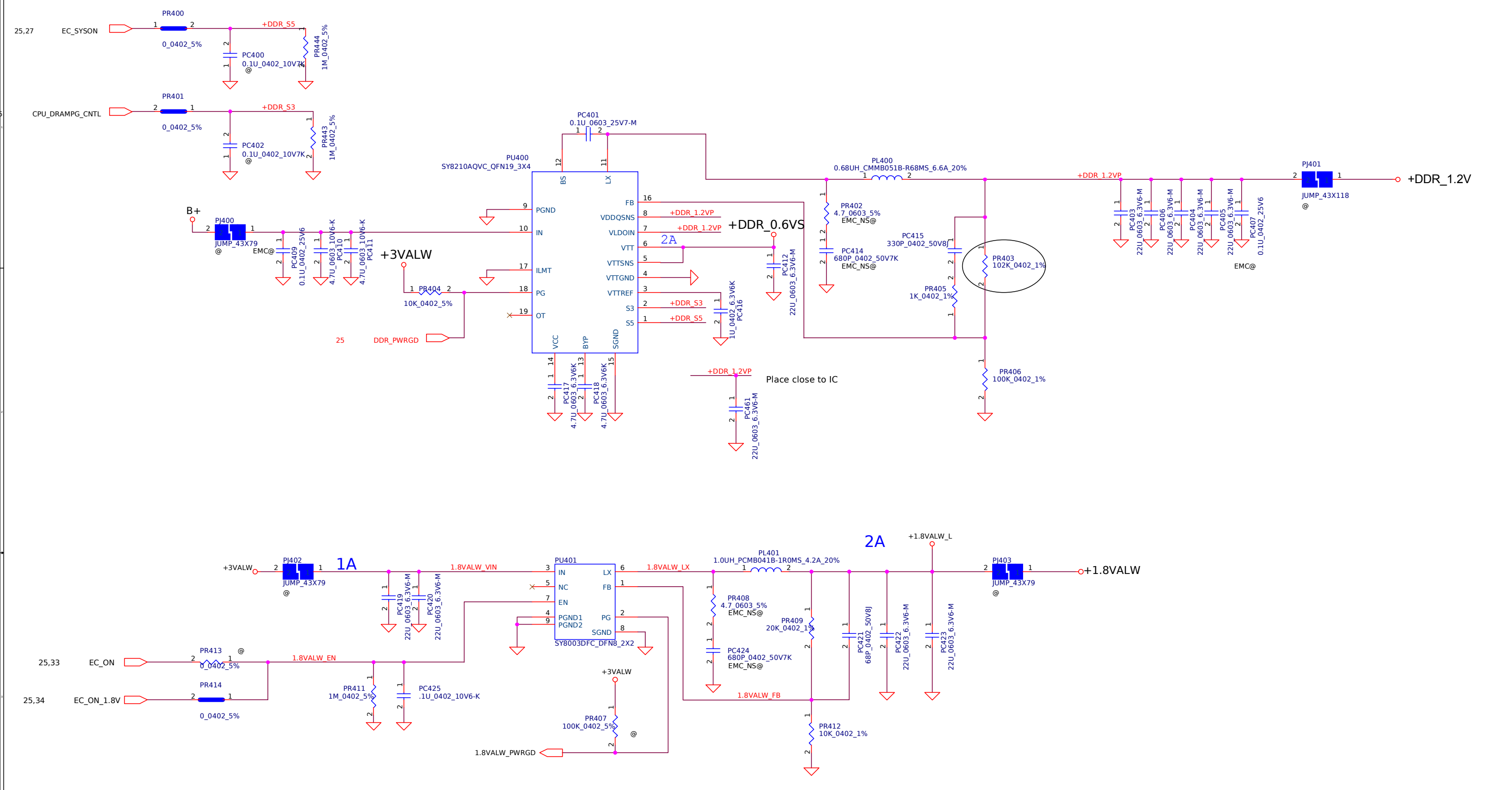

Security Classification	LC Future Center Secret Data			Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05	1.2VS/+0.6VS

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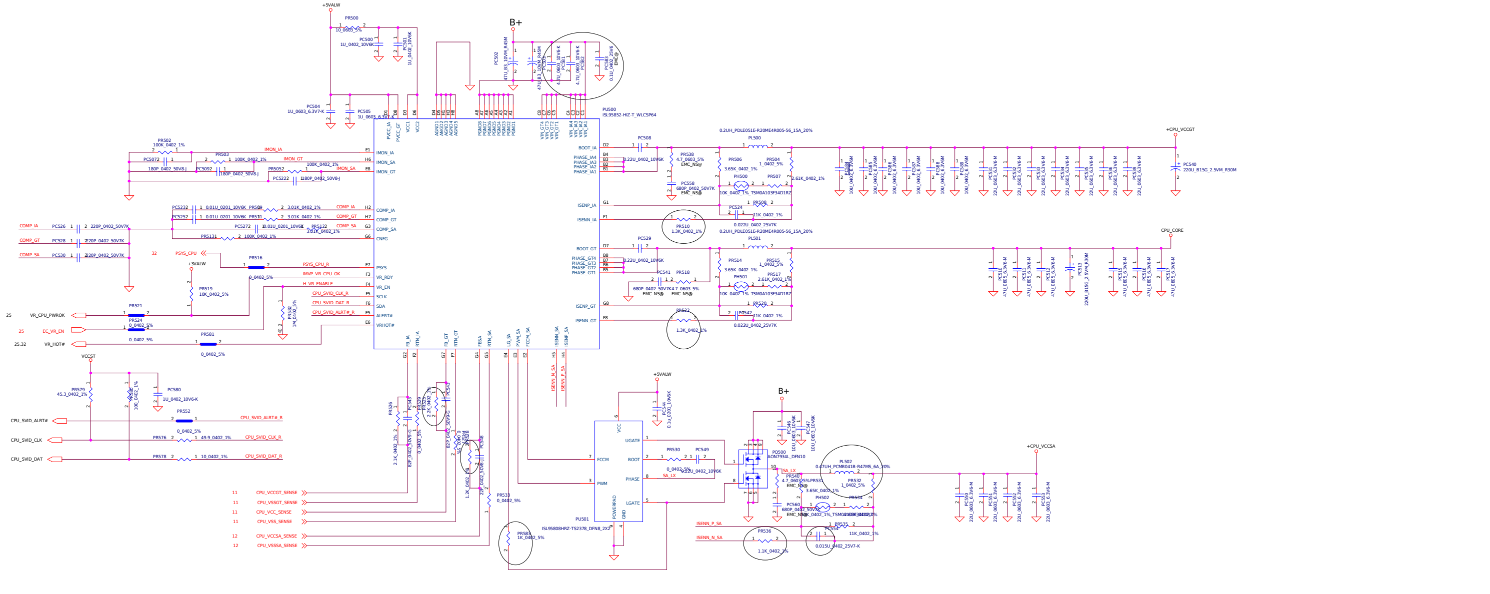

Security Classification	LC Future Center Secret Data		
Issued Date	2014/02/20	Deciphered Date	2014/02/20

Title		
IMVP8		
Size: D	Document Number: MIXX4	Rev 1.0
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Issued Date	2014/02/20	Deciphered Date	2014/02/20

Title		
IMVP8		
Size: C	Document Number: MIXX4	Rev: 1.0
Date: Monday, August 17, 2015	Sheet 37 of 37	