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		
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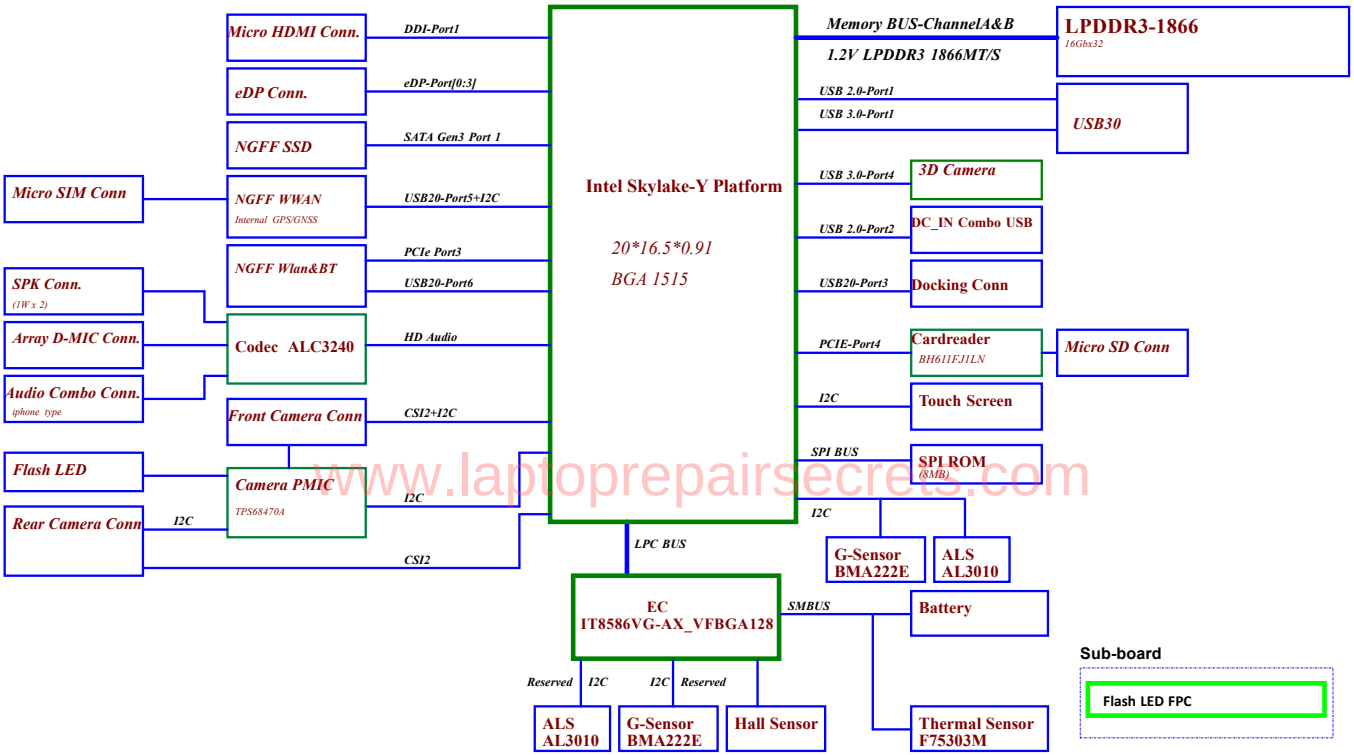
LCFC-Chelsea Refresh Block diagram



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Title	Block Diagram		
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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	O
S3	O			O	O		O	O	X
DS3	O			O	O		X	O	X
S5 S4/AC Only	O			O	O		O	X	X
S5 S4 Battery only	O			X	X		X	X	X
S5 S4 AC & Battery don't exist	X			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	
1	USB	1	USB	
2	BT	2	WWAN	
3	EC	3	X	
4	DC in combine	4	3D camera	
7	POGO USB			
9	WWAN			

X4H01/X4H02

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

PCB	ZZZ3 PCB 10K NM-A641 REV0 M/B ZZZ15 NUVOTON@ SLIC NPCT650LAAWX TSSOP 28P TPM	LOGO
CPU	ZZZ9 M3@ SR2EN ZZZ16 M5@ SR2EM ZZZ17 M7@ SR2EM	ZZZ4 HDMI@ HDMI LOGO
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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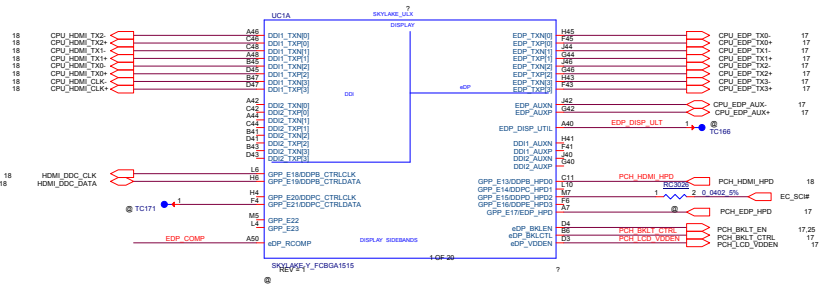

DDP*_CTRLDATA
This signal has a weak internal pull-down.
0 = Port B is not detected.
***1 = Port B is detected.**

pull up at HDMI side.

+VCCIOA_OUT & EDP_COMP :
Trace Width: 20mil
Space: 25mil
Max length: 100mil

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Title: **MCP (DDI,EDP)**

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C	Miix4	1.0
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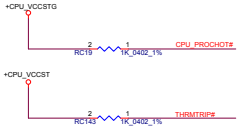
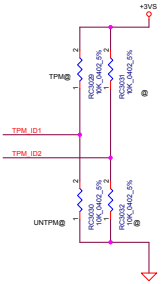
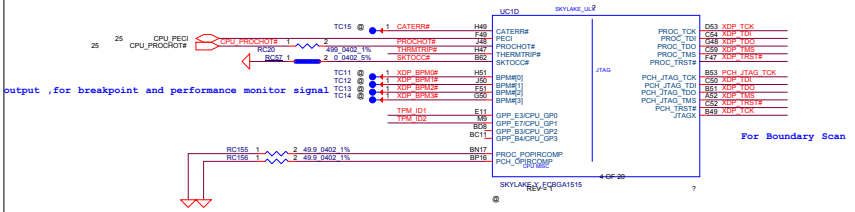


130 degree

TPM_ID1	Description
0	NO physical TPM
1	physical TPM

TPM_ID2	Description
0	NATIONZ TPM
1	NUVOTON TPM

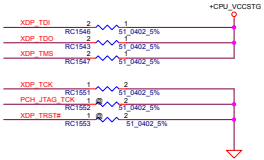




output ,for breakpoint and performance monitor signal

For Boundary Scan

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



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Title			
MCP (XDP,JATG)			
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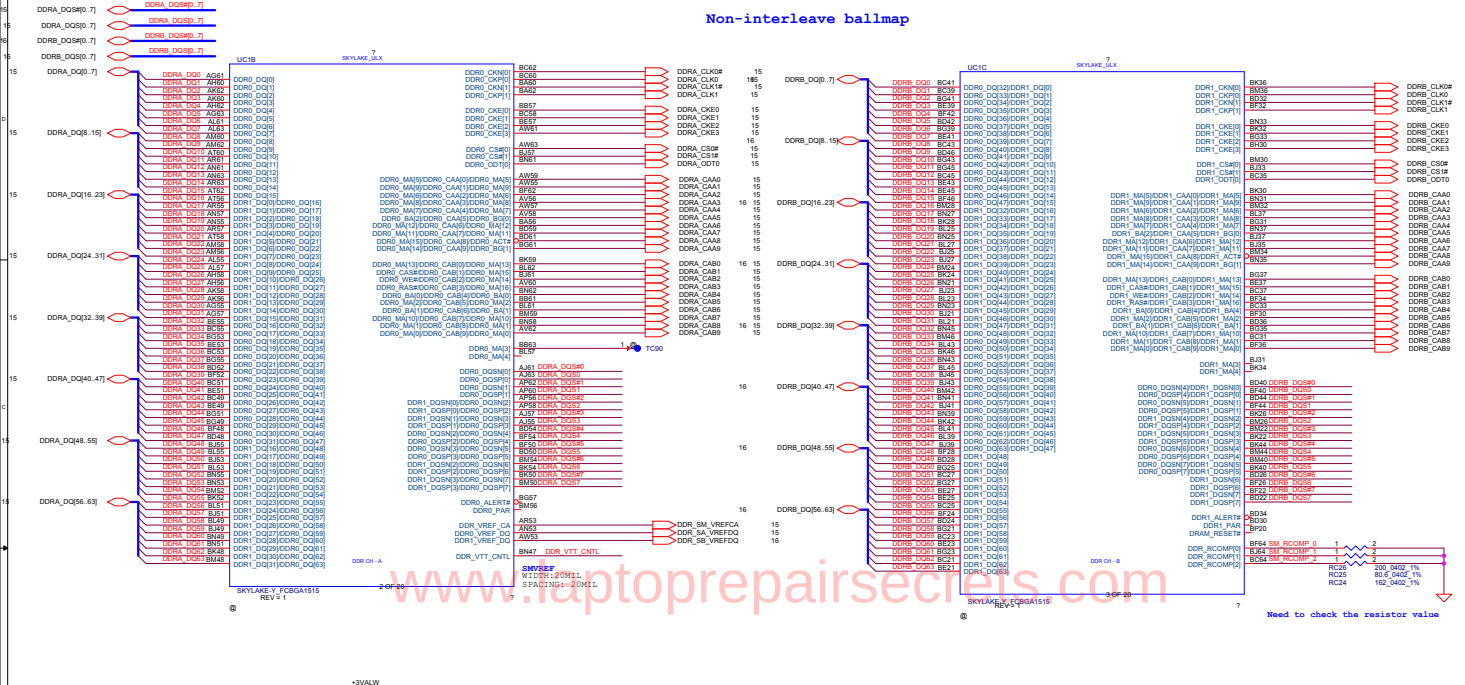
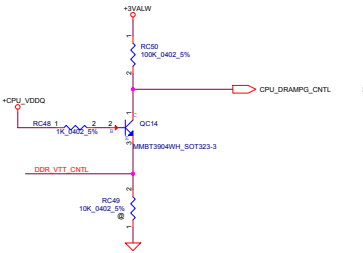
Non-interleave ballmap





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

Title: MCP (DDR)

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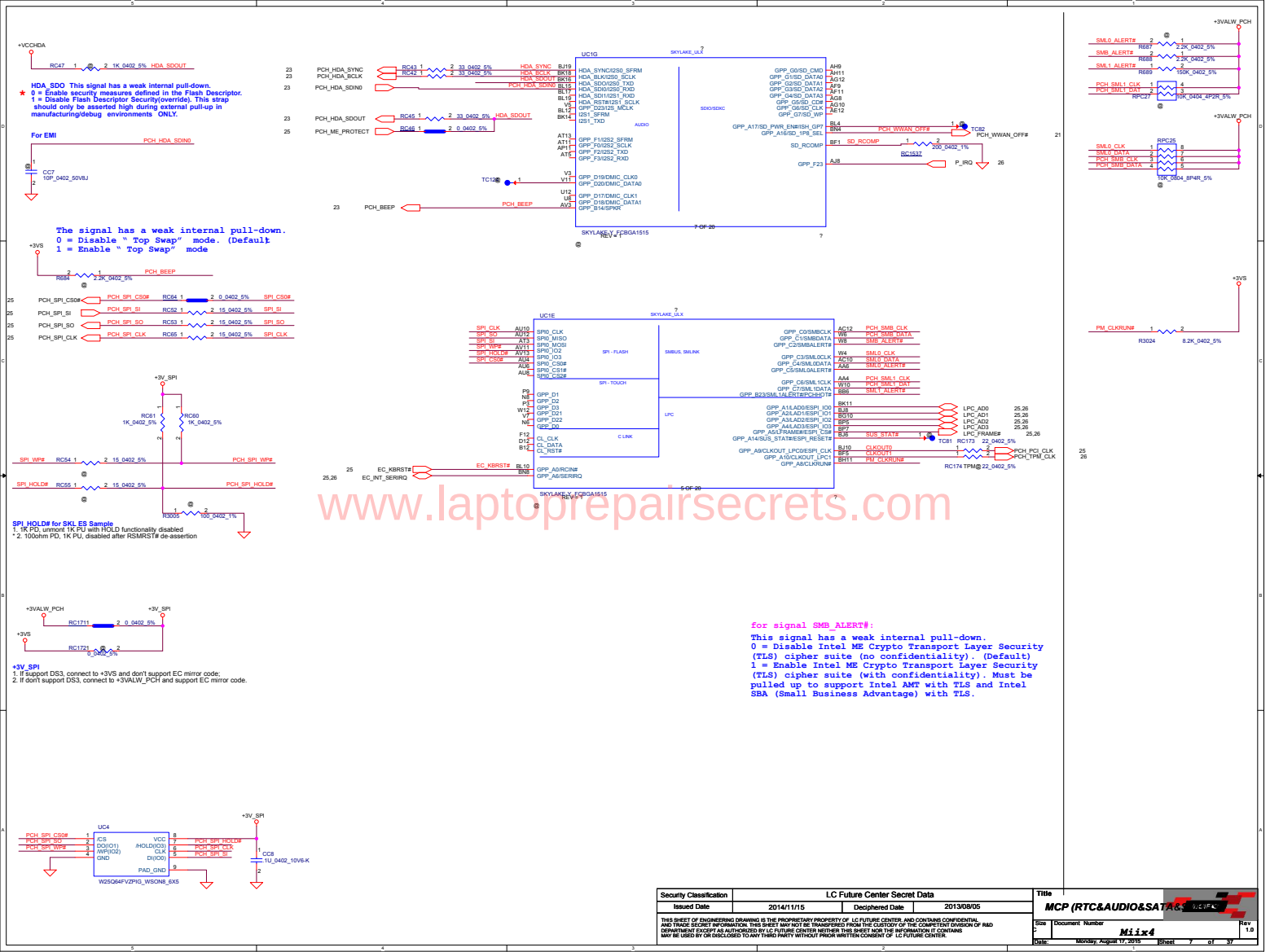

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Issued Date	2014/11/15	Deciphered Date	2013/08/05

Title: MCP (RTC&AUDIO&SATA&USB)

Size	Document Number	Rev
C	Miix4	1.0
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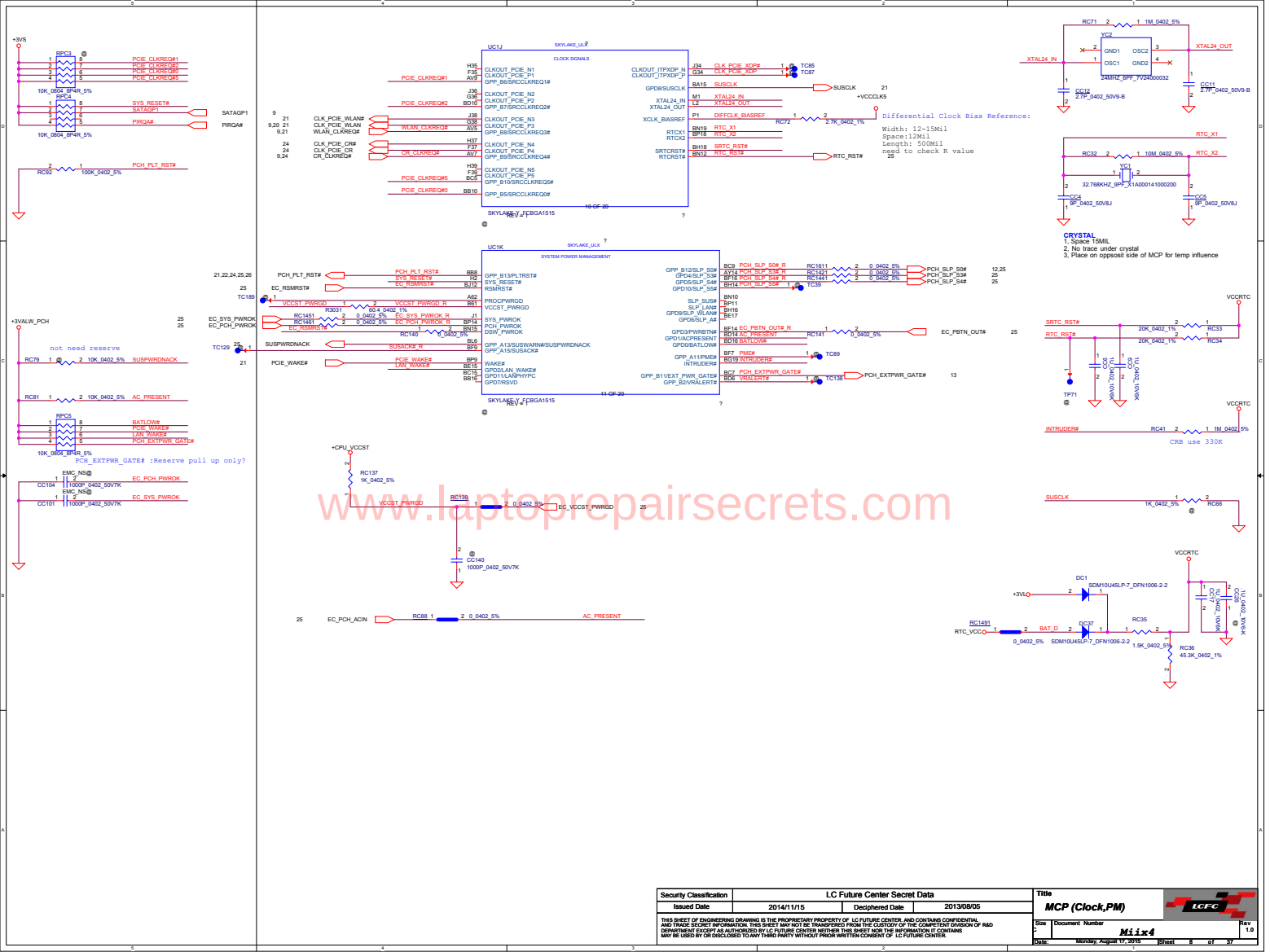

Security Classification	LC Future Center Secret Data		
Issued Date	2014/11/15	Deciphered Date	2013/08/05

Title	MCP (Clock,PM)
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The signal has a weak internal pull-down.
0 = Disable " No Reboot" mode. (Default)
1 = Enable " No Reboot" mode

The signal has a weak internal pull-down.
0 = boot from SPI. (Default)
1 = enable boot to LPC,

WLAN

CR

SSD

Impedance Compensation Inputs
Width 12~15mil
Space >12Mil
Length 500Mil

reserved

touch panel

WF Camera

UF Camera

P Sensor

USB3.0 stand port

reserve for WWAN

2D camera

USB2.0 stand port

DC IN combine port

POGO

BT

WWAN

Reserved for EC

G Sensor
Light sensor

sensor debug hooks

G sensor interrupt
Light sensor interrupt

GPIO Mapping

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

I2C Mapping

GroupC -- Usued 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

BOARD_ID3	Description
0	NO LTE SKU
1	LTE SKU

BOARD ID table

BOARD_ID2	BOARD_ID1	BOARD_ID0	SKUAM
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	

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Title: MCP (GPIO,USB,PCIE)

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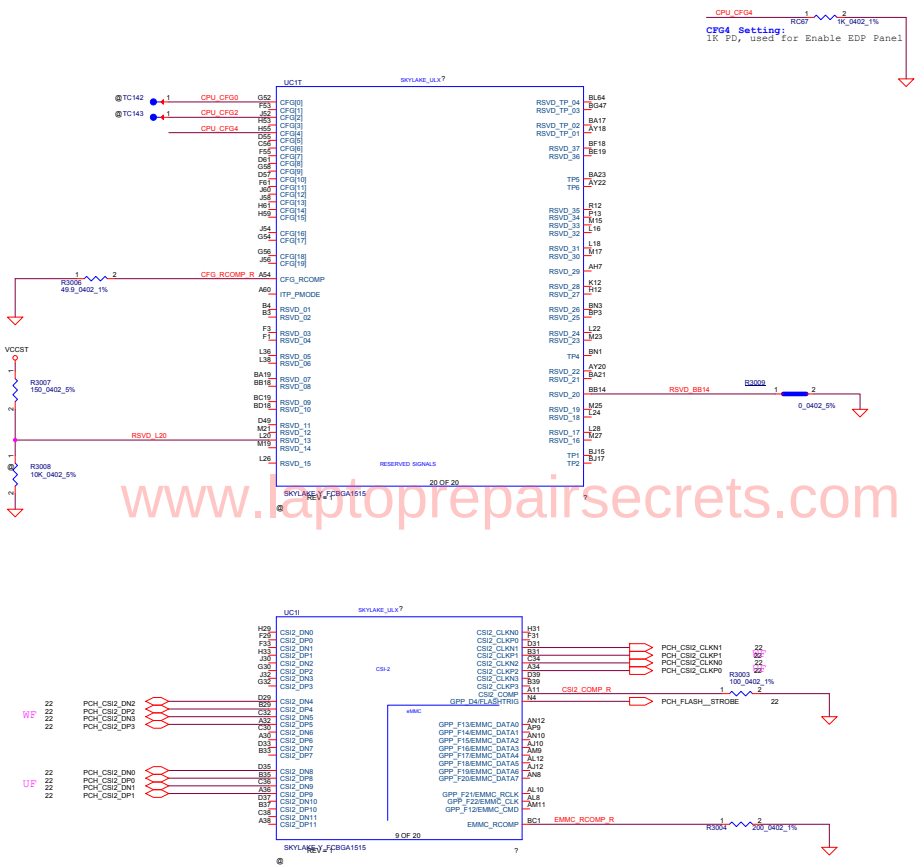

Security Classification	LC Future Center Secret Data		
Issued Date	2014/11/15	Deciphered Date	2013/08/05

Title: MCP (OTHER)

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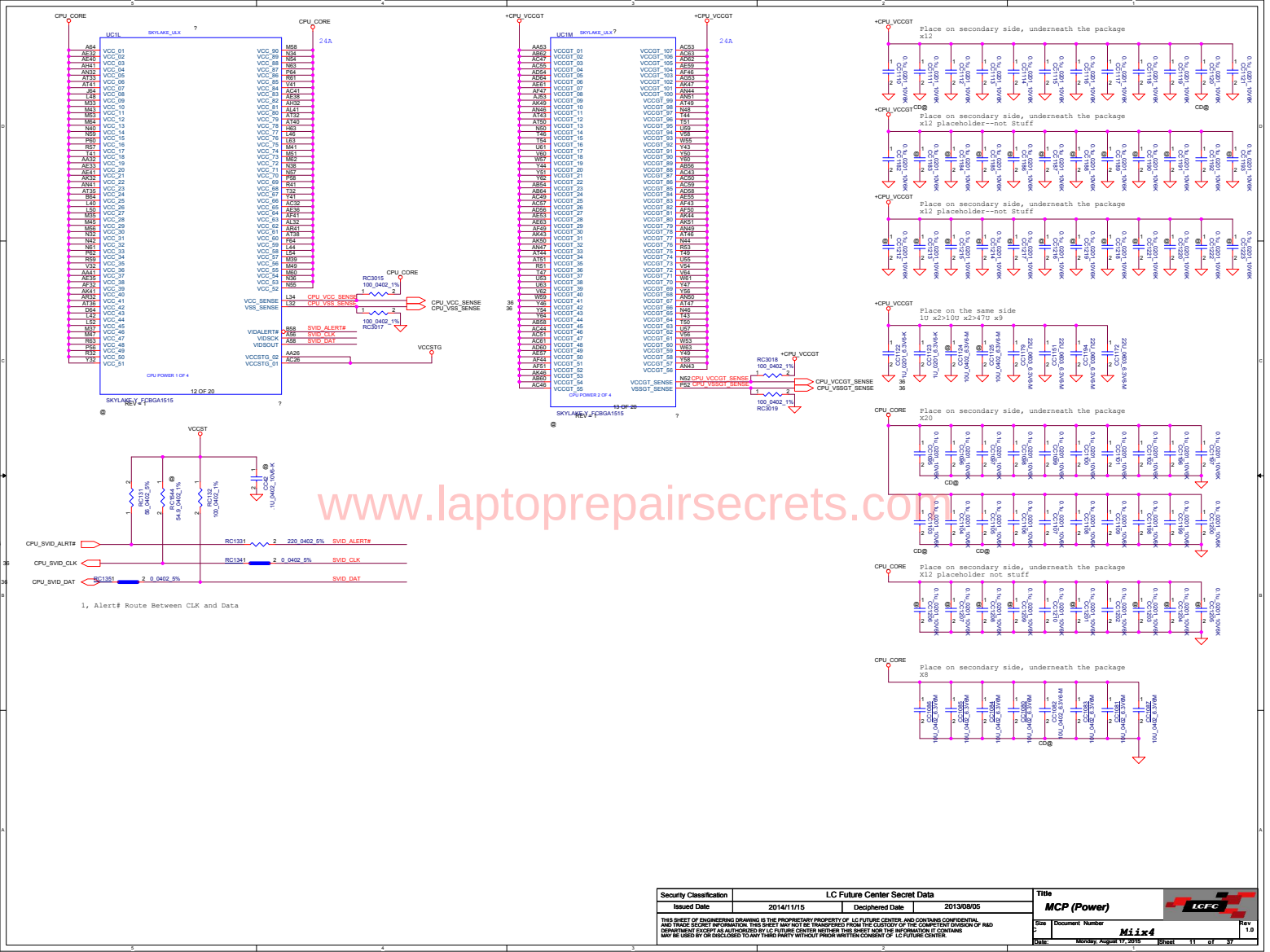

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Title: MCP (Power)

Size: C	Document Number: Miix4	Rev: 1.0
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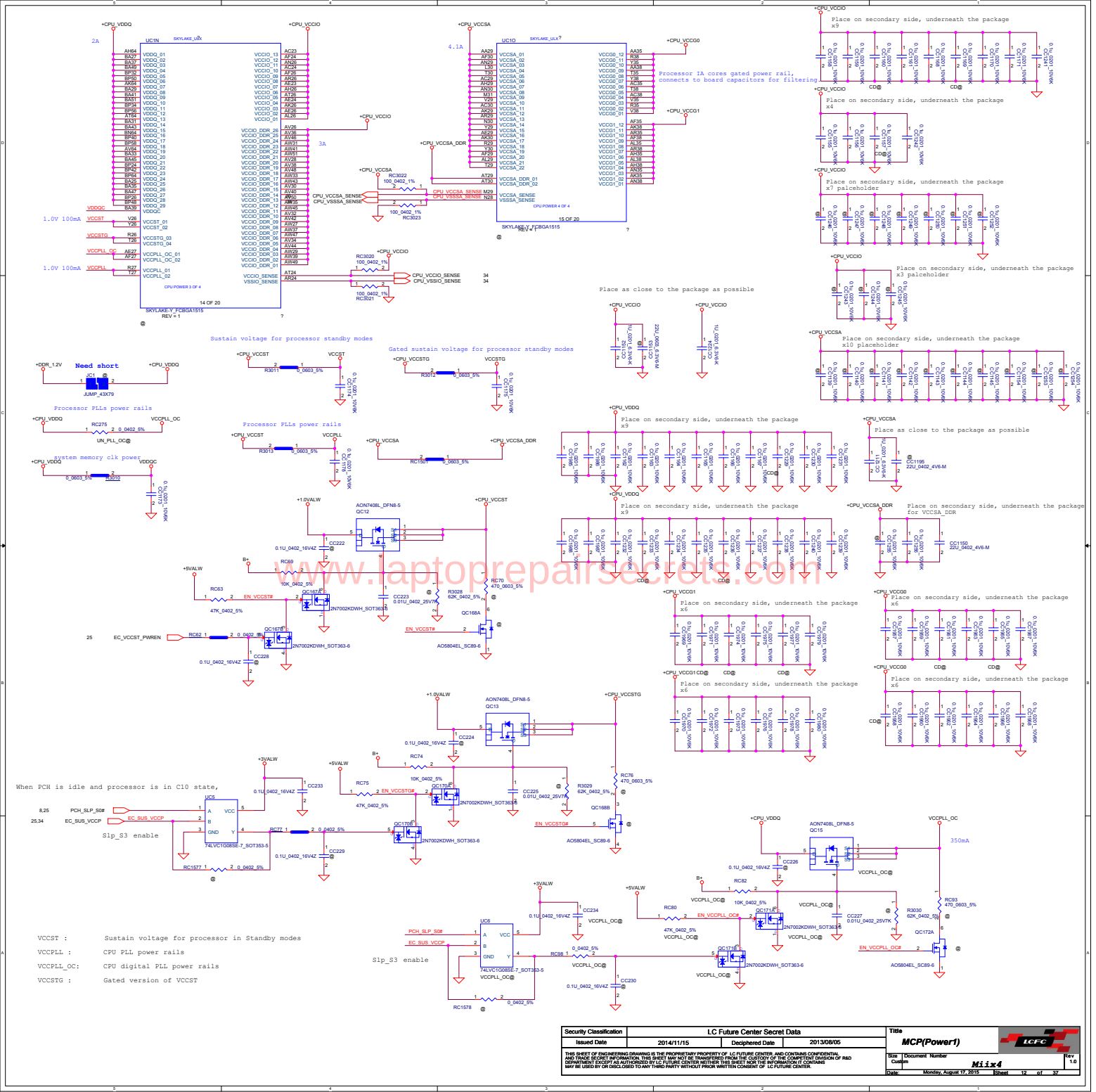

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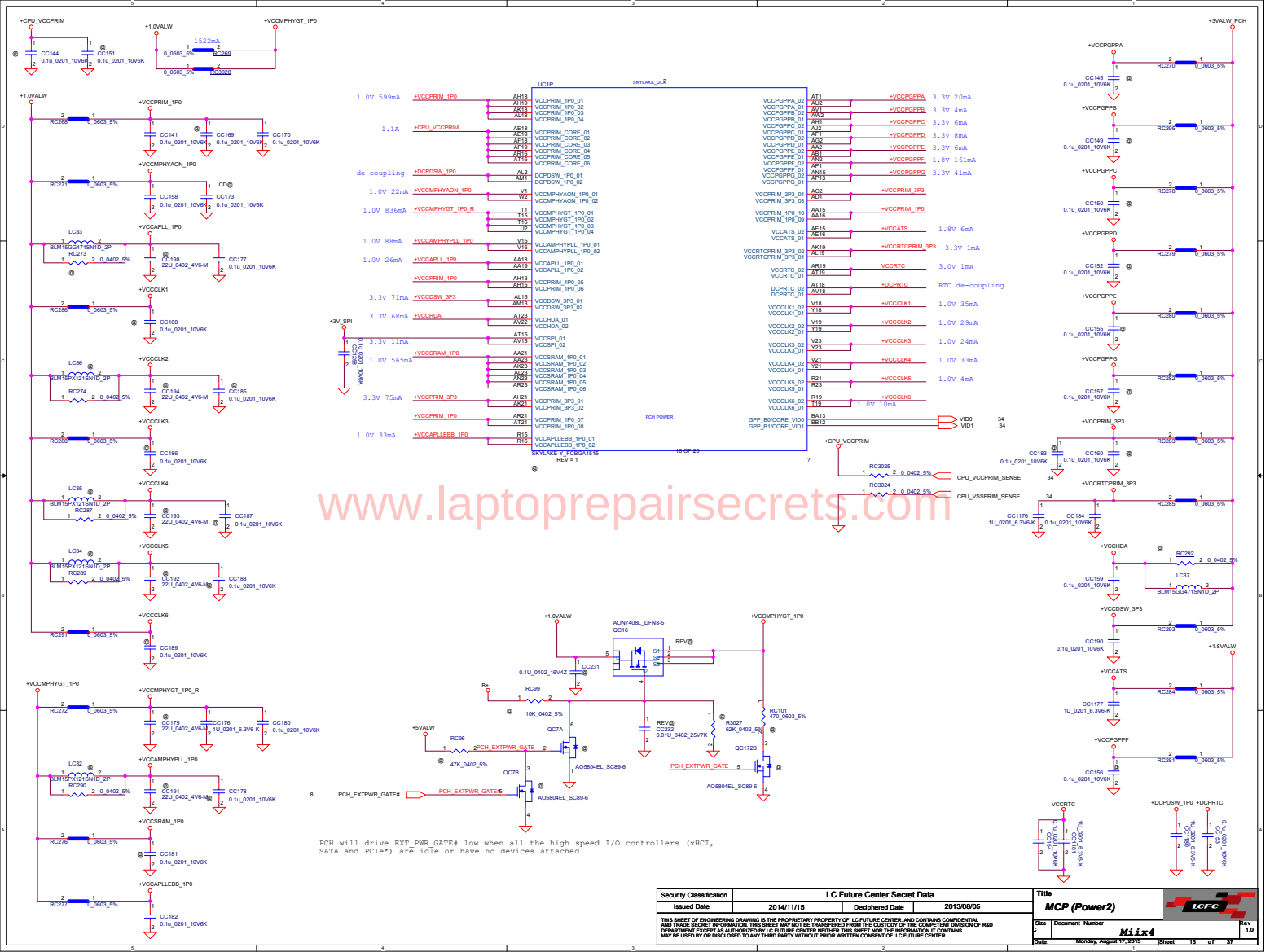

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Title	MCP (Power2)		
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Title: MCP (VSS)

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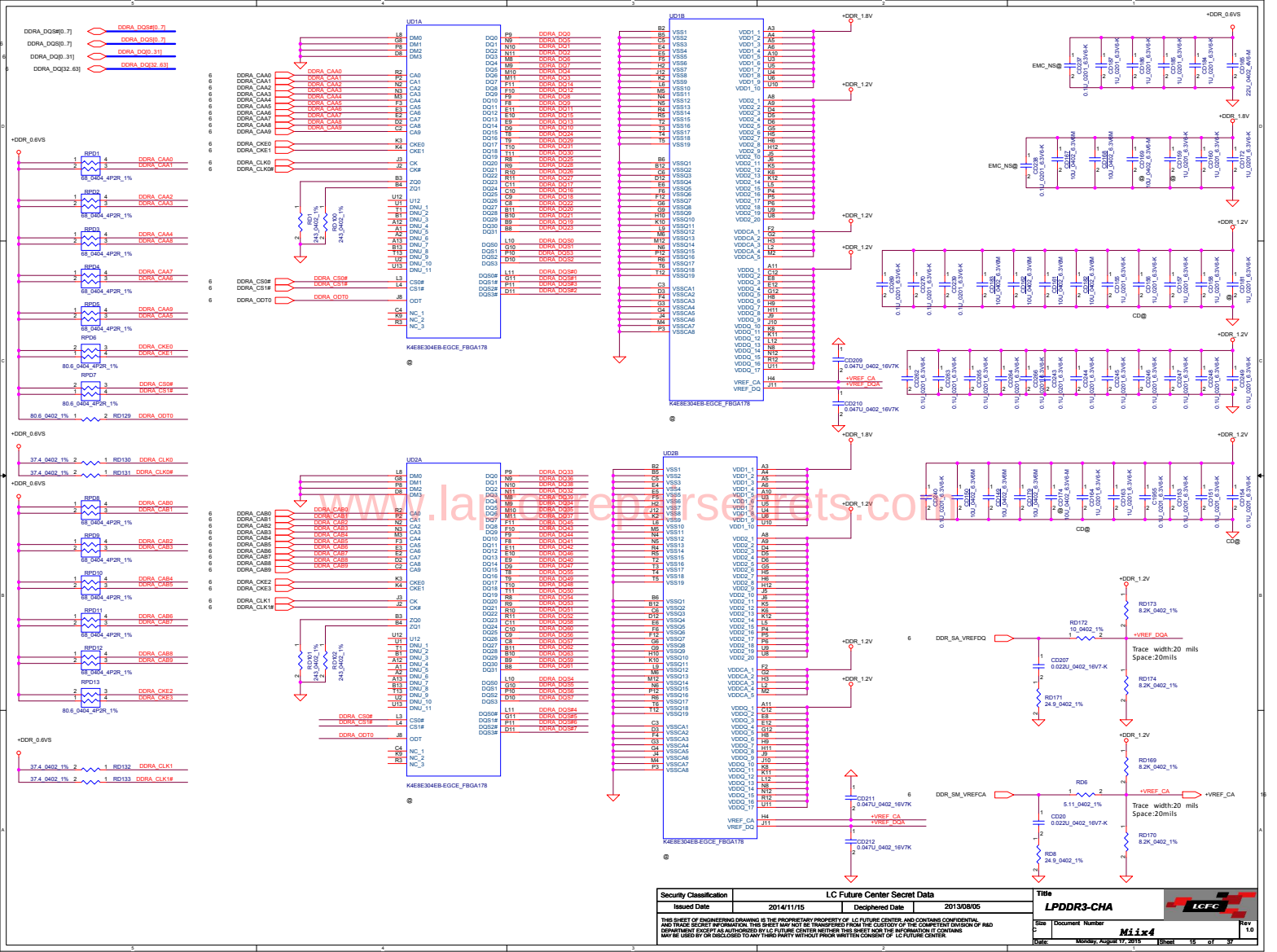

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Title: LPDDR3-CHA

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C	Miix4	1.0

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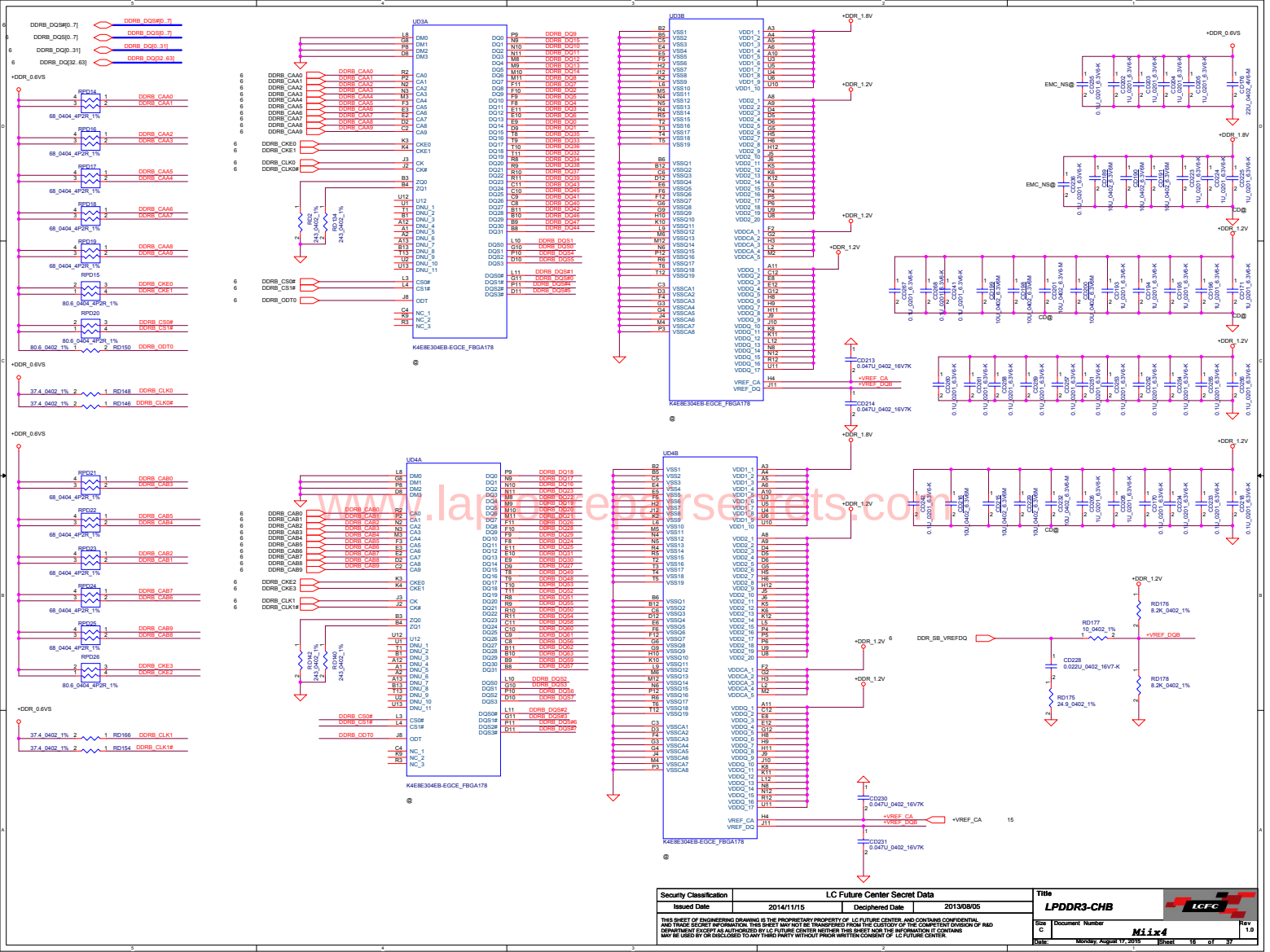

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Issued Date	2014/11/15	Deciphered Date	2013/08/05

Title	LPDDR3-CHB
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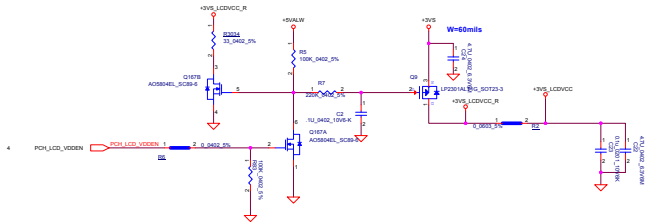
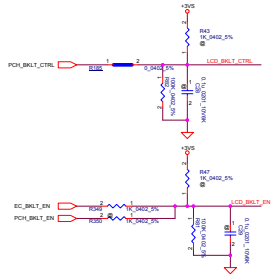
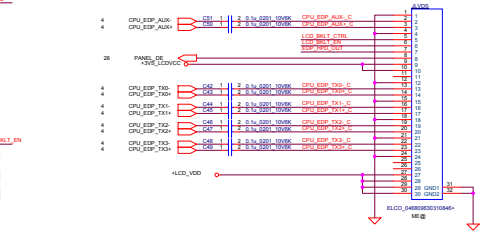
EDP Panel

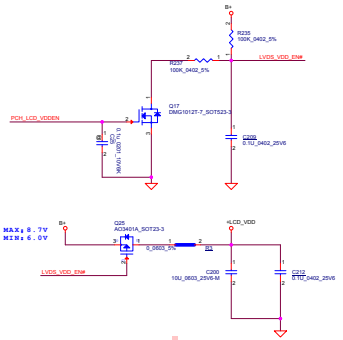


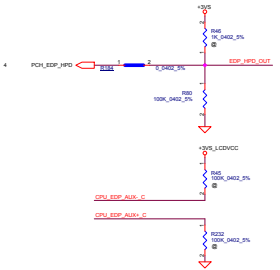


number of pixel:2160X1440



FPC:
1. pin to pin with EDP Panel, check the panel pin definition
2. check the HSYNC for Touch screen board





NOTE

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

Reserve for other function

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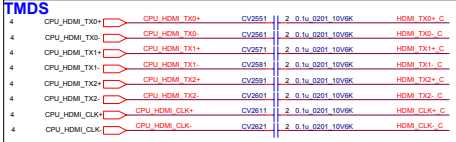
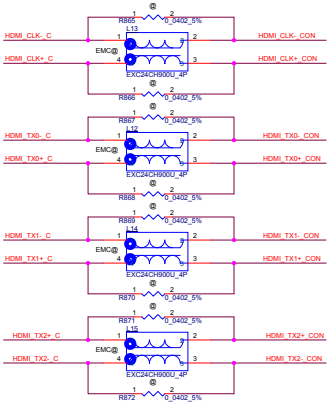
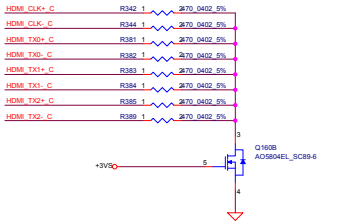
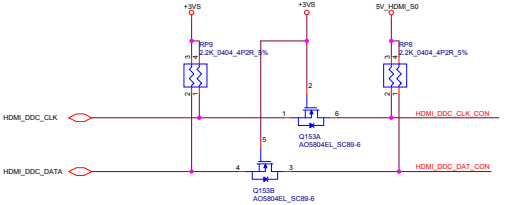
TMDS



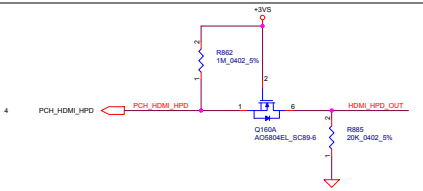




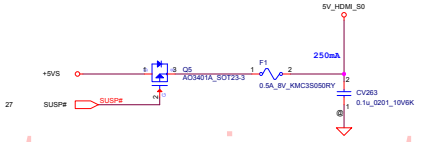
DDC



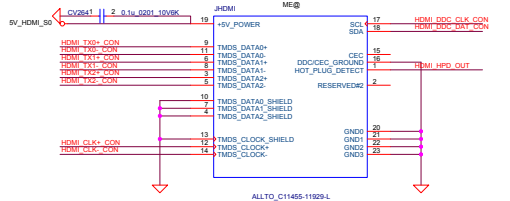
H-PLUG



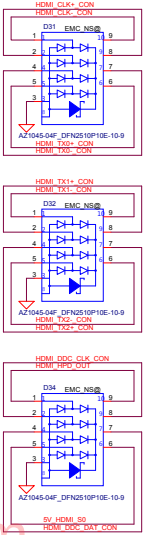
CONN

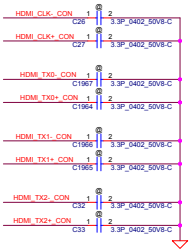


HDMI Type D



ESD





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Title	HDMI		
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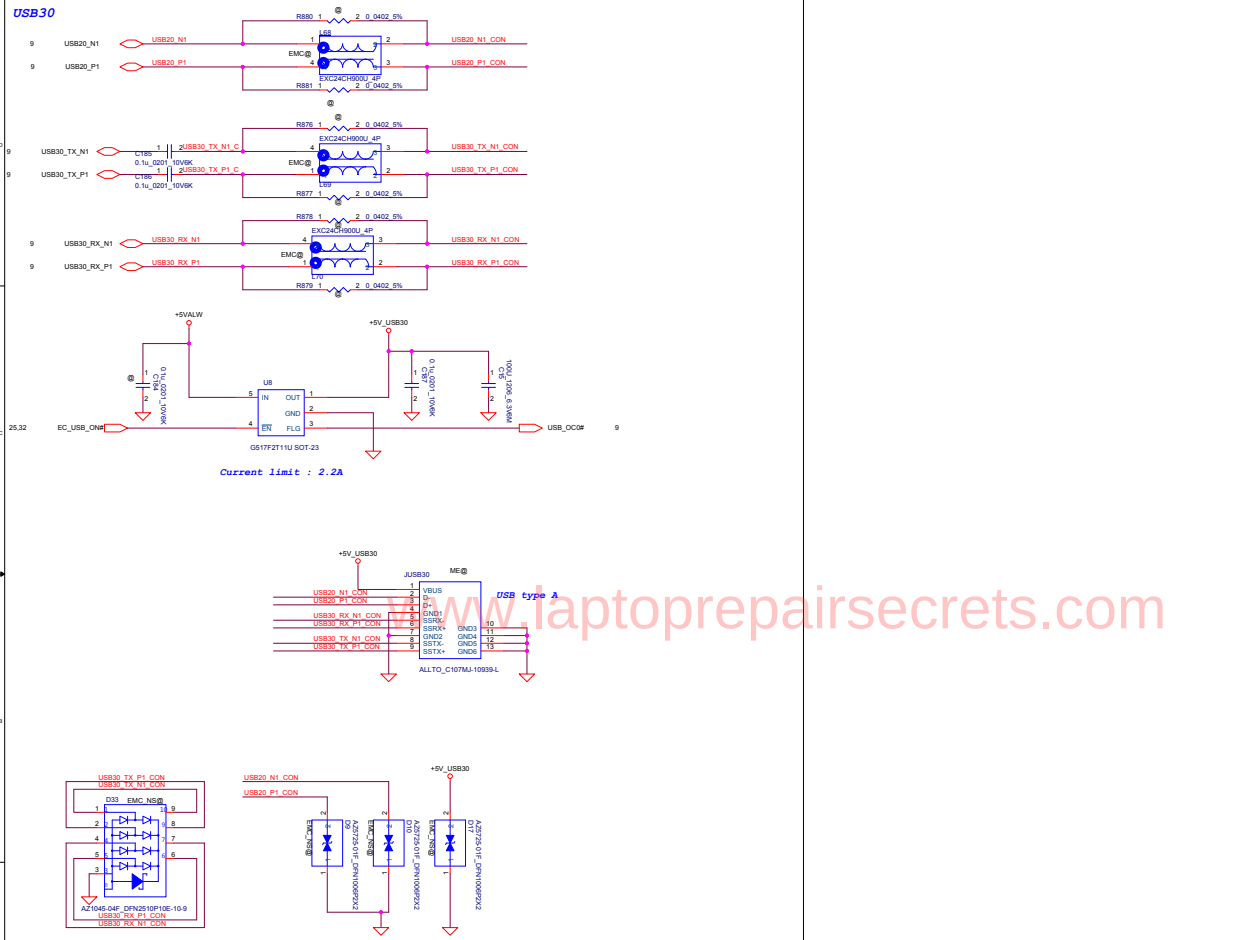

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Title	SSD&USB30 Type C	
Size: C	Document Number: Miix4	Rev: 1.0
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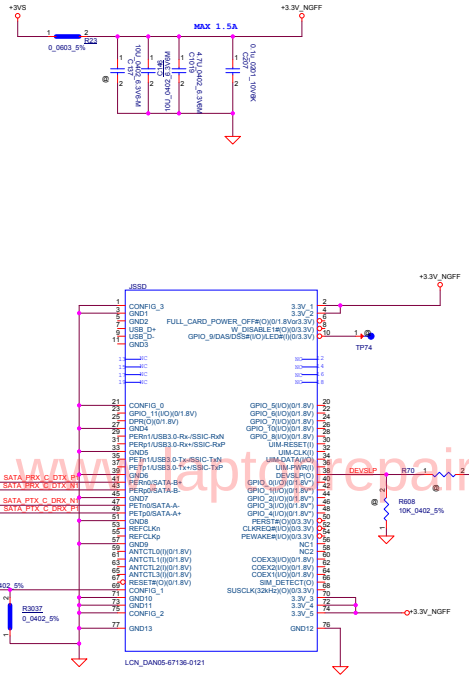
SSD



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Title	SSD&USB30 Type C	
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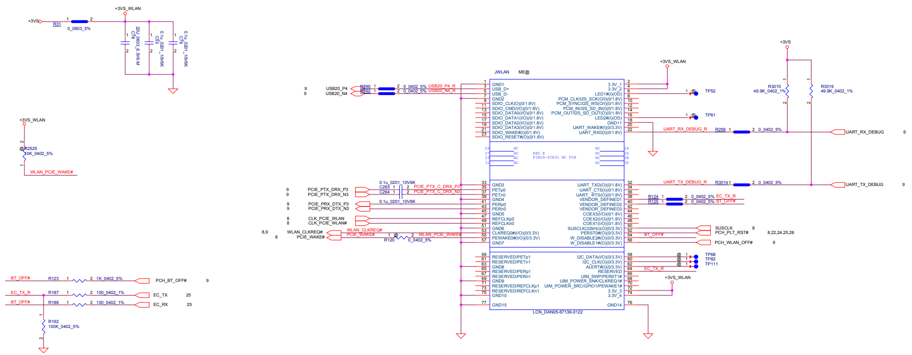
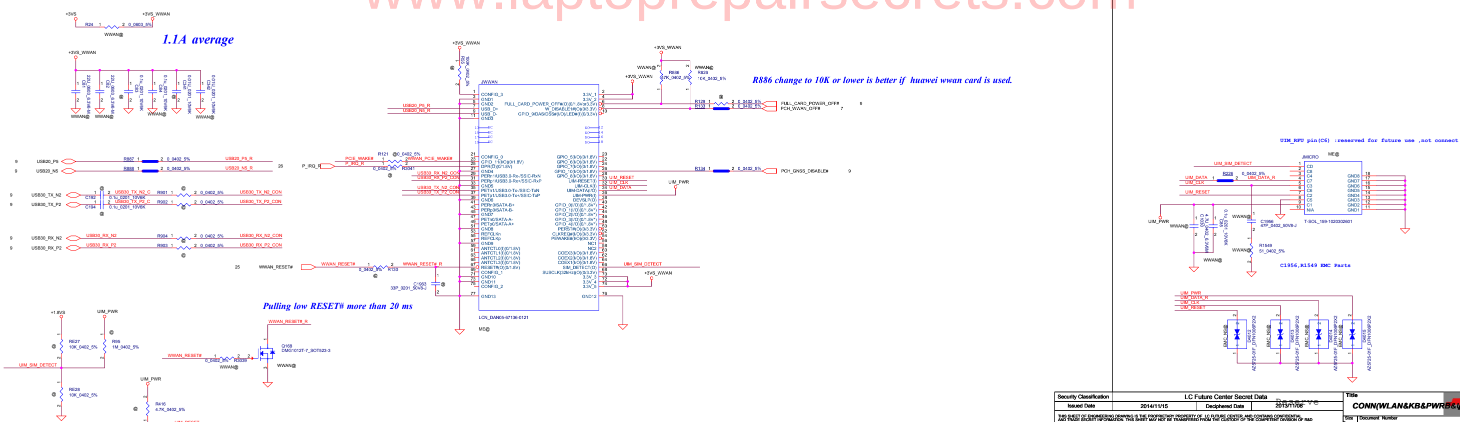
Mini Card(WLAN/WiMAX)



WLAN&BT Combo module circuits

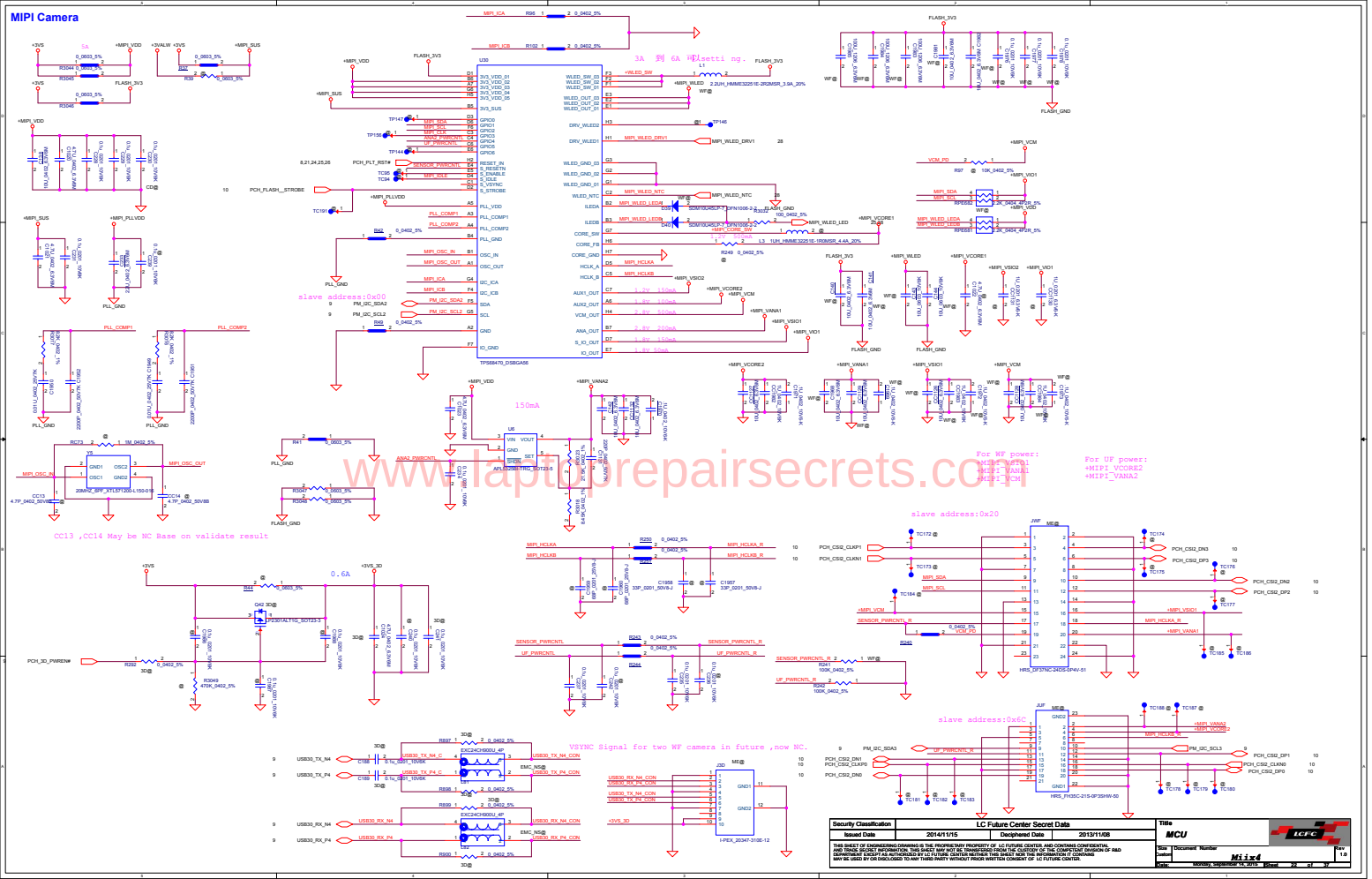
	BT on module Enable	BT on module Disable
★ BT_CRTL	H	L
PCH_BT_ON#	L	H

Mini Card(WWAN)



Security Classification	LC Future Center Secret Data		Title
Issued Date	2014/11/15	Deciphered Date 2013/11/08	CONN(WLAN&KB&PWRB&...

Size D | Document Number Miix4 | Rev 1.0


MIPI Camera
3A 到 6A 可setti ng.
slave address:0x00
150mA
0.6A
slave address:0x20
slave address:0x60
VSYNC Signal for two WF camera in future ,now NC.
CC13 ,CC14 May be NC Base on validate result
For WF power:
+MIPI_VIO1
+MIPI_VCORE2
+MIPI_VANA2
For UF power:
+MIPI_VCORE2
+MIPI_VANA2
www.laptoprepairsecrets.com
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LC Future Center Secret Data
Issued Date
2014/11/15
Deciphered Date
2013/11/08
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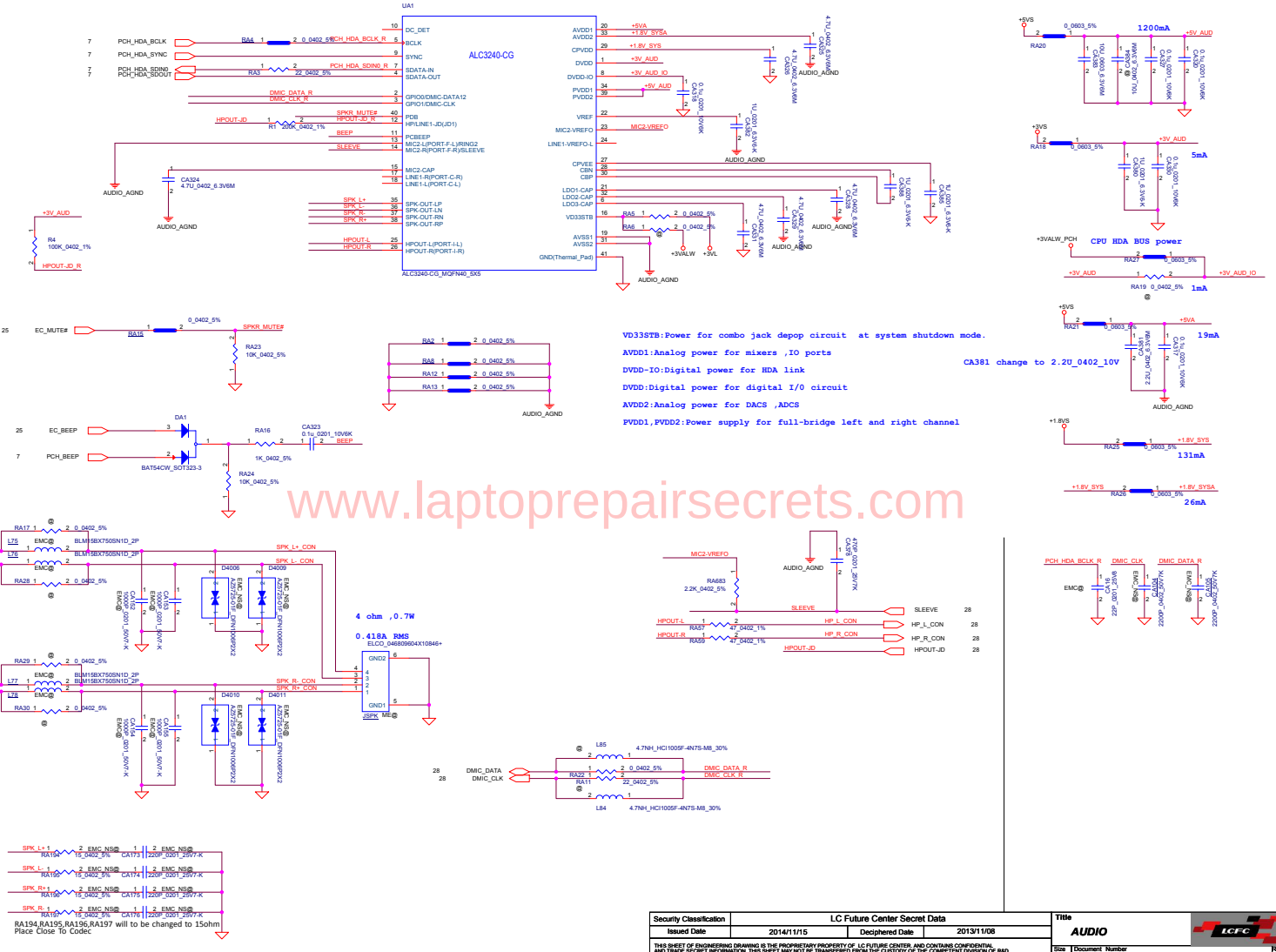
Title
MCU
Size
Custom
Document Number
Mix4
Rev
1.0
Date:
Monday, September 14, 2015
Sheet
22
of
37

CODEC



VD33STB:Power for combo jack depop circuit at system shutdown mode.

AVDD1:Analog power for mixers ,IO ports

DVDD-IO:Digital power for HDA link

DVDD:Digital power for digital I/O circuit

AVDD2:Analog power for DACS ,ADCS

PVDD1,PVDD2:Power supply for full-bridge left and right channel

CA381 change to 2.2U_0402_10V

RA194,RA195,RA196,RA197 will to be changed to 15ohm
Place Close To Codec

Security Classification	LC Future Center Secret Data		
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Title			
AUDIO			
Size	Document Number		Rev
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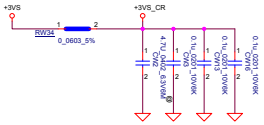
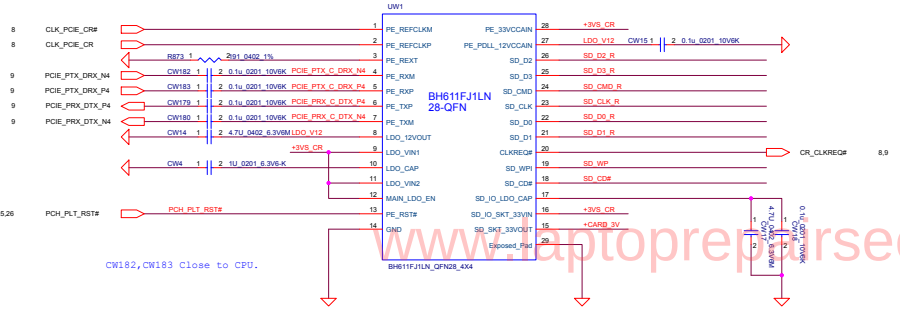
Date: Monday, August 17, 2015		Sheet 23 of 37	

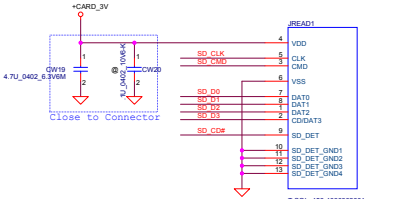
Card Reader



VID;1217
DID:8621

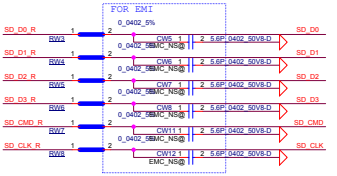


CW182,CW183 Close to CPU.



ME@ **SD / MMC**

For micro SD 插SDW P signal



Close to UW1 Placement

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
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Date:	Monday, August 17, 2015
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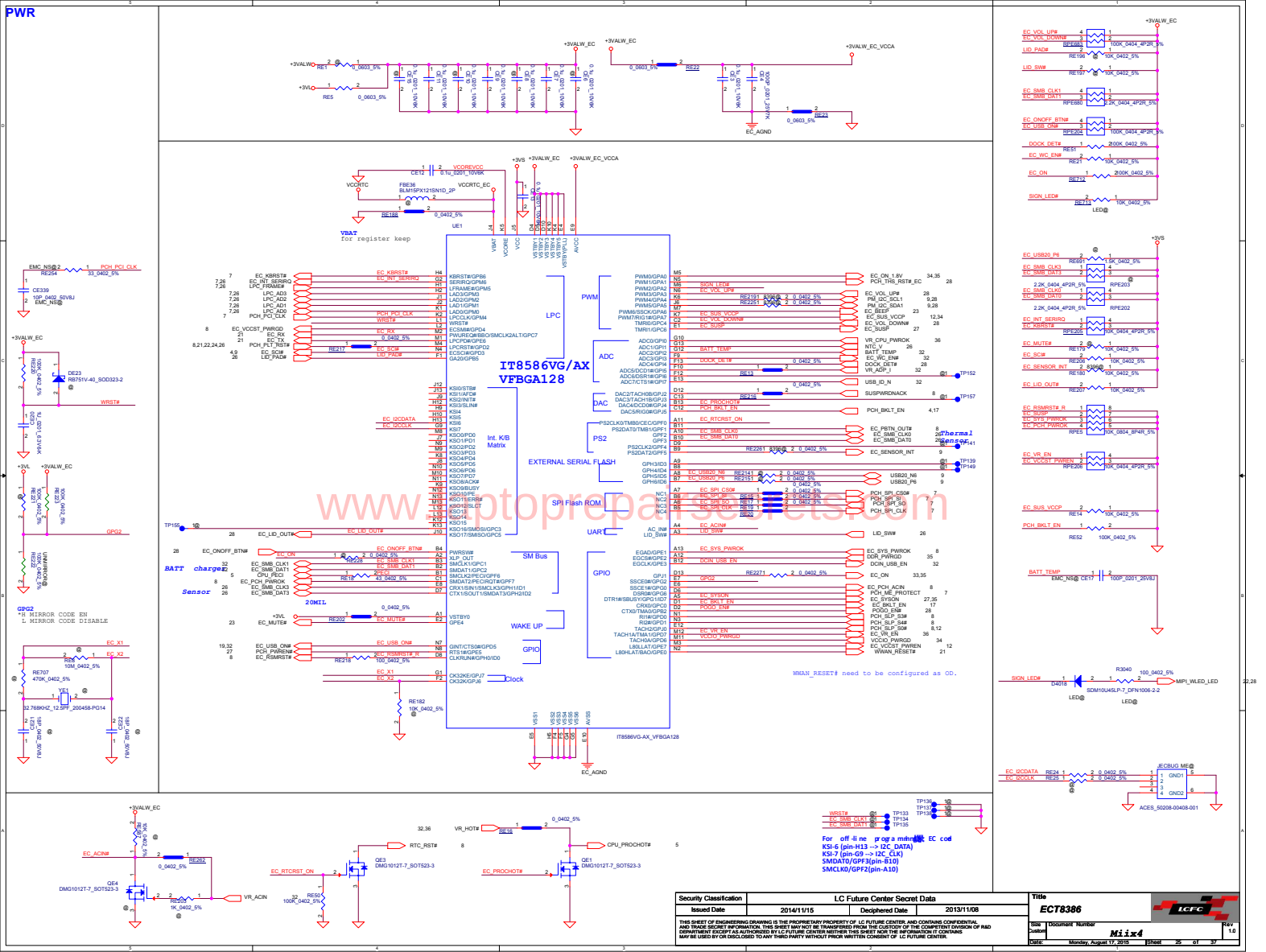

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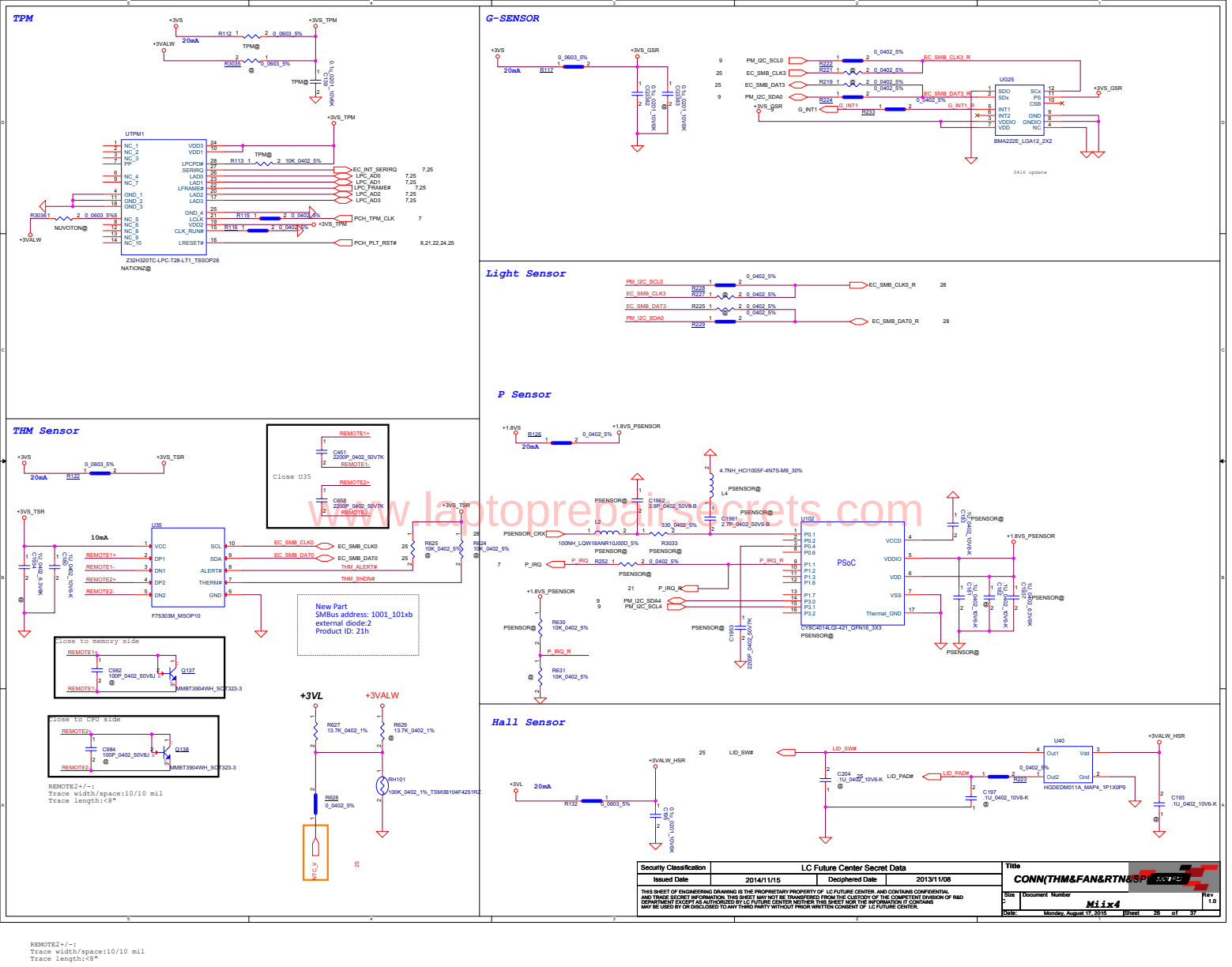
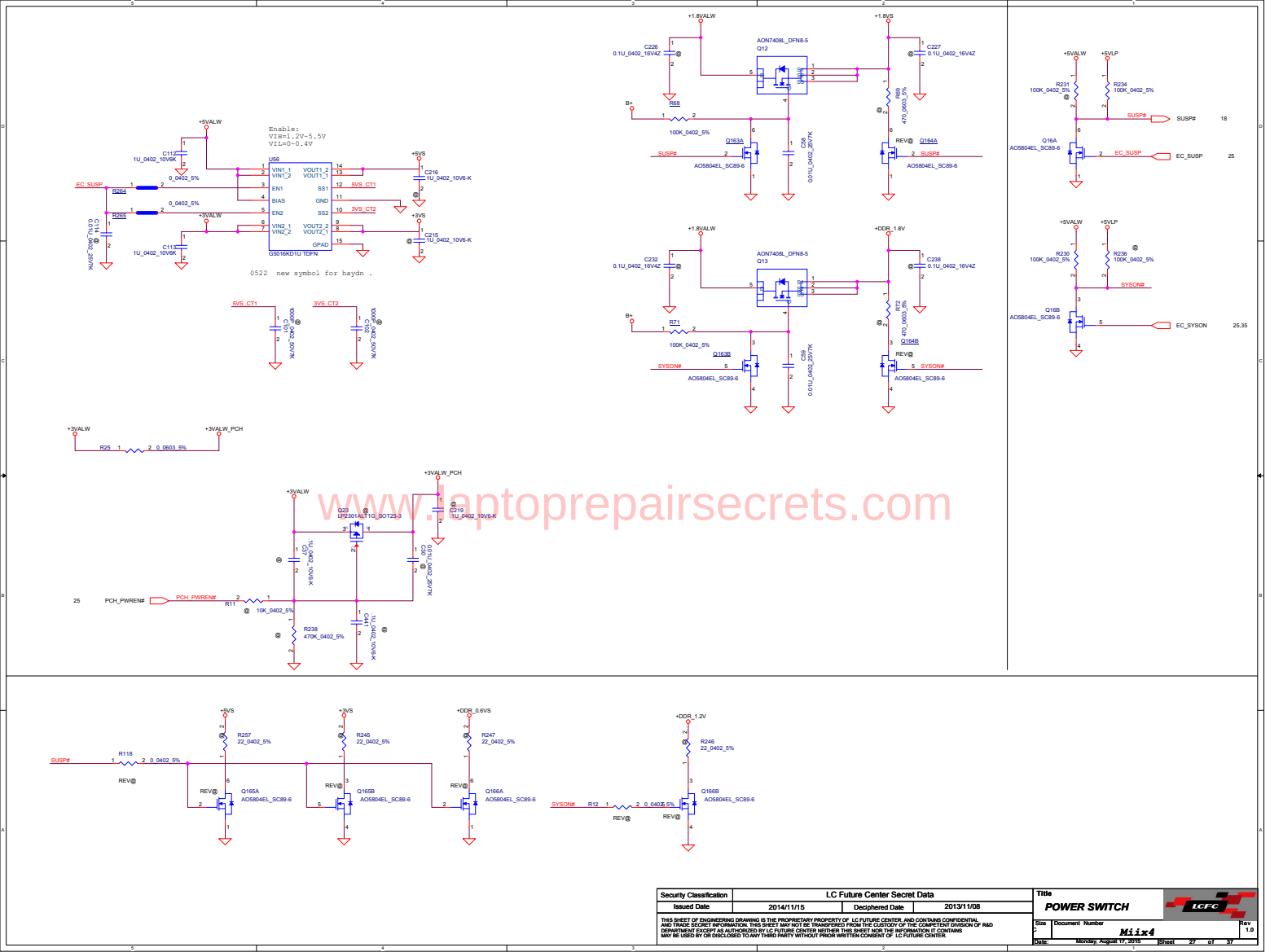
Title	ECT8386		
Size: 1x4sheet	Document Number: Mii x4		Rev: 1.0
Date: Monday, August 17, 2015	Sheet 25 of 37		



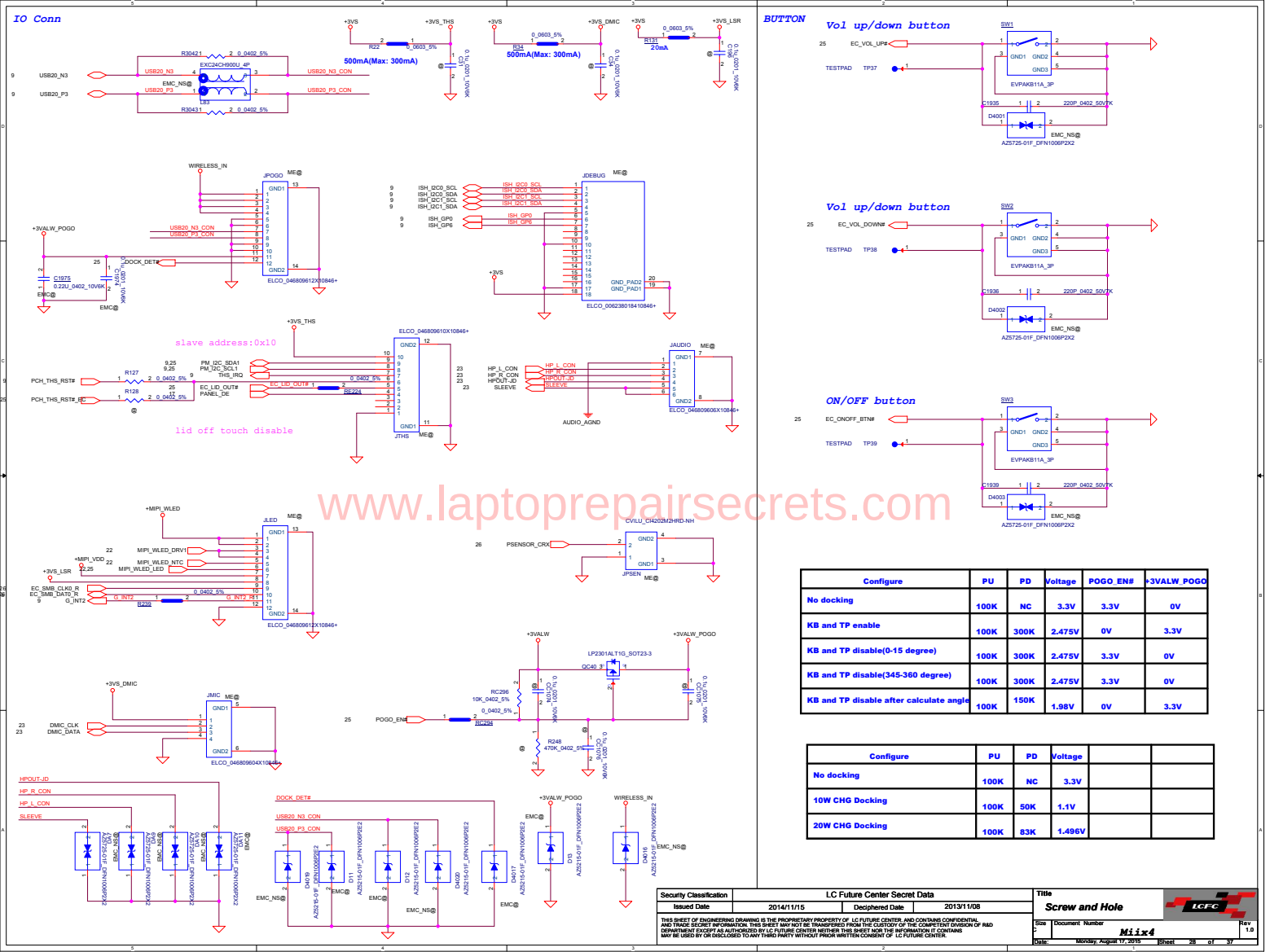
REMOTE2+/-:
Trace width/space:10/10 mil
Trace length:<8"



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

Title: **POWER SWITCH**

Size	Document Number	Rev
C	Miix4	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

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

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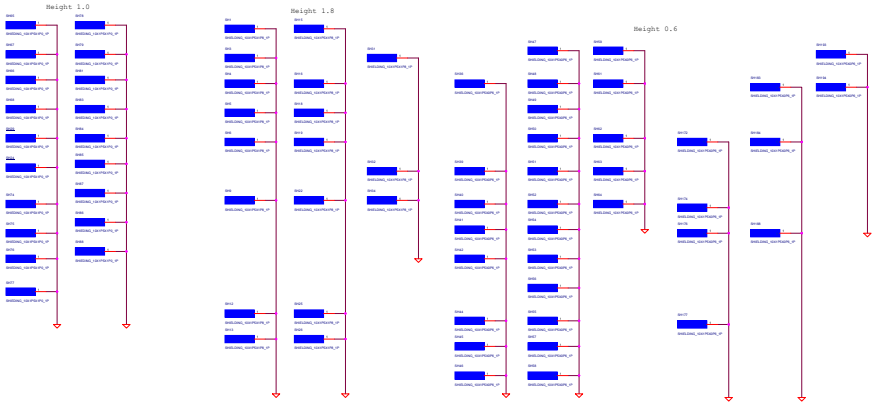

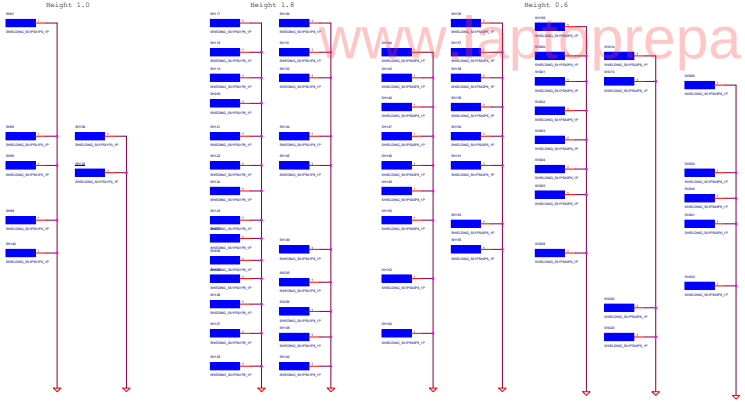

Security Classification	LC Future Center Secret Data		Title: Screw and Hole
Secret Date: 2024/11/06	Declassified Date: 2034/11/06		
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			Sheet 1 of 1

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_NARBO-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 F sensor to cypress solution (CY8C40141QI-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 GPF E22
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,DC6 (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 dif 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 JSFK 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 SE00000X00J
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,RE28,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

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

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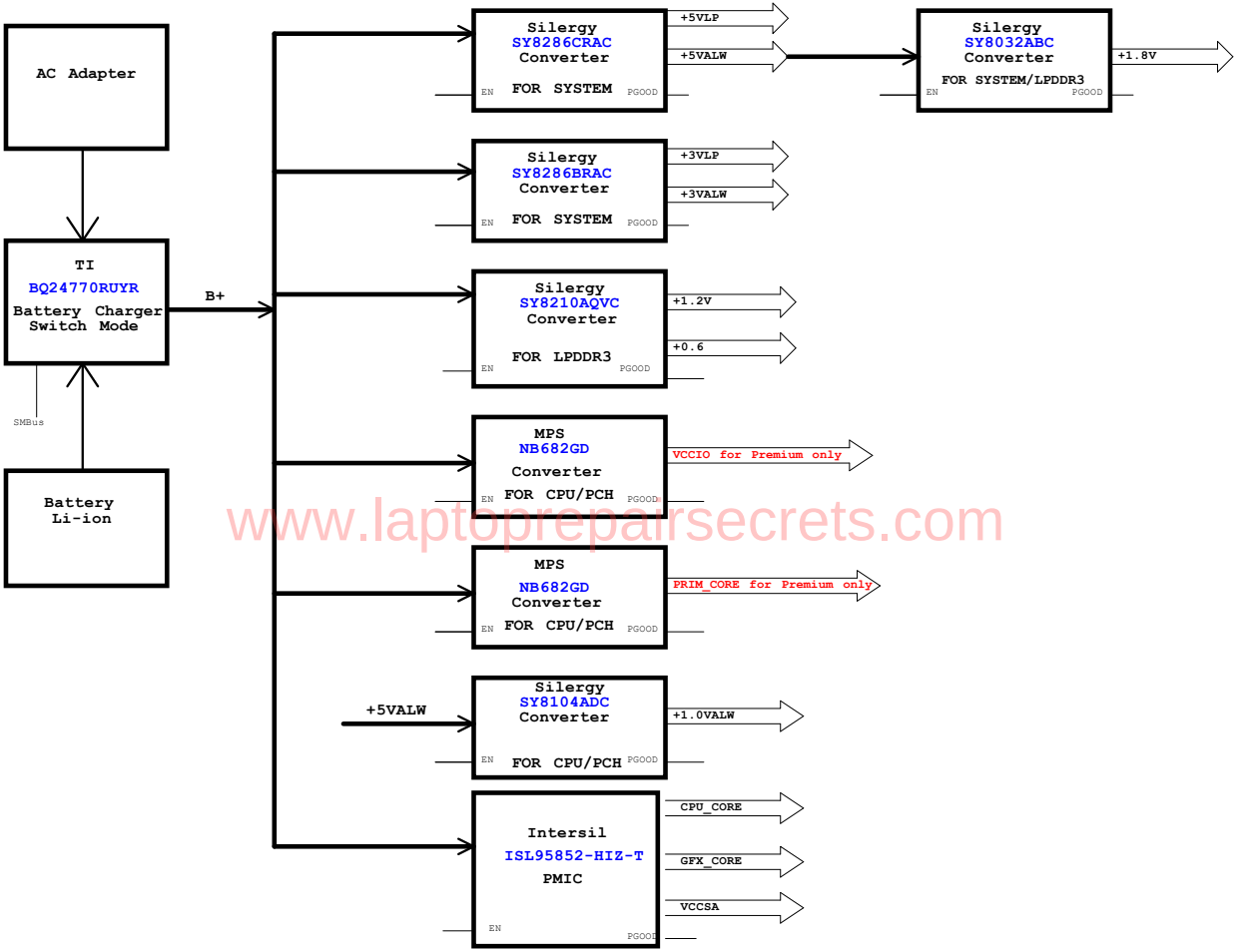
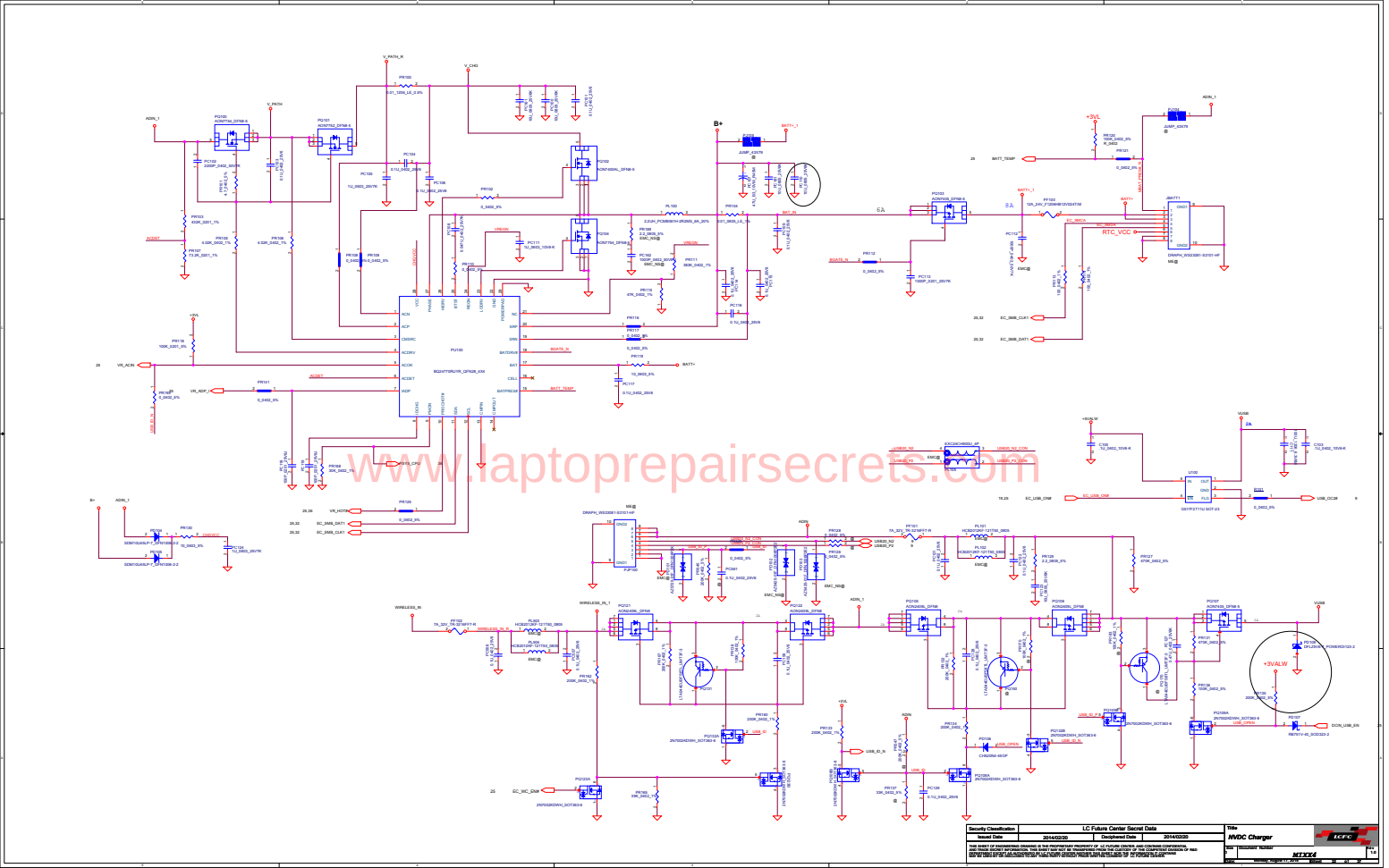


Security Classification	LC Future Center Secret Data		
Issued Date	2014/02/20	Deciphered Date	2014/02/20

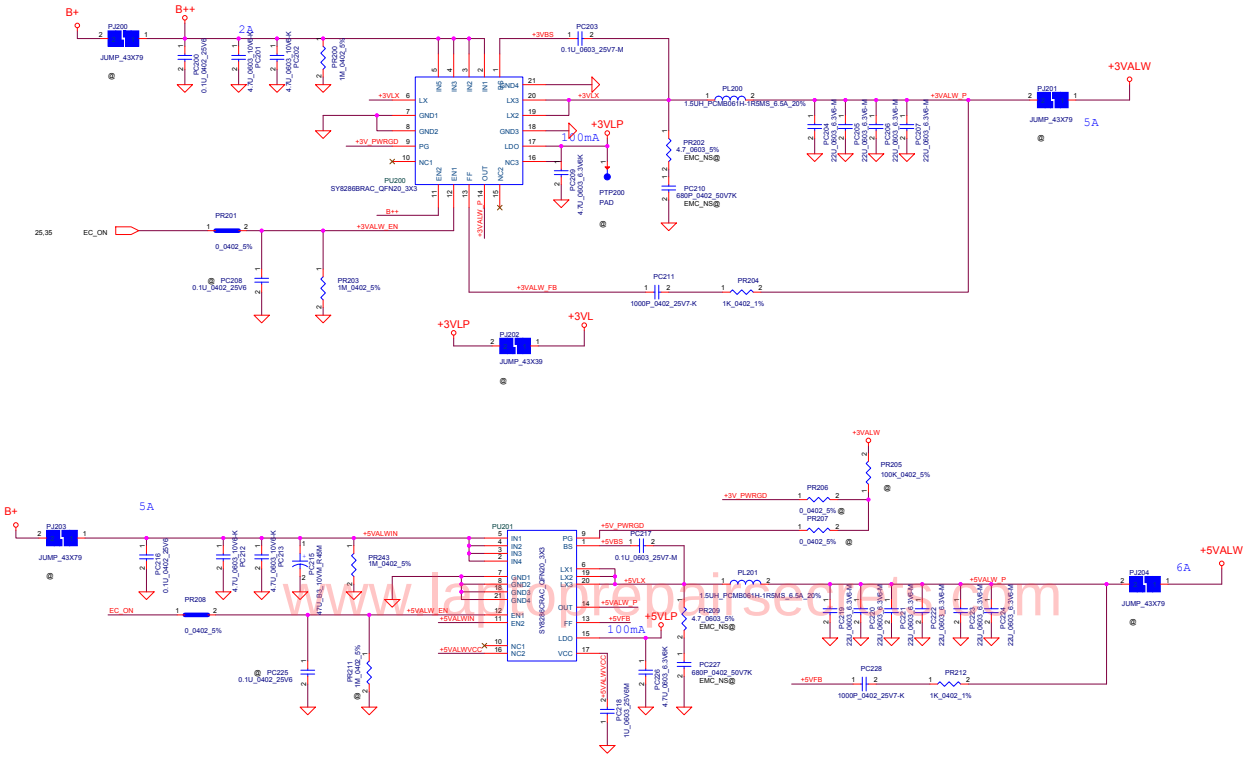
Title: NVDC Charger

Size	Document Number	Rev
C	MIXX4	1.0

Date: Monday, August 17, 2015 Sheet 31 of 37

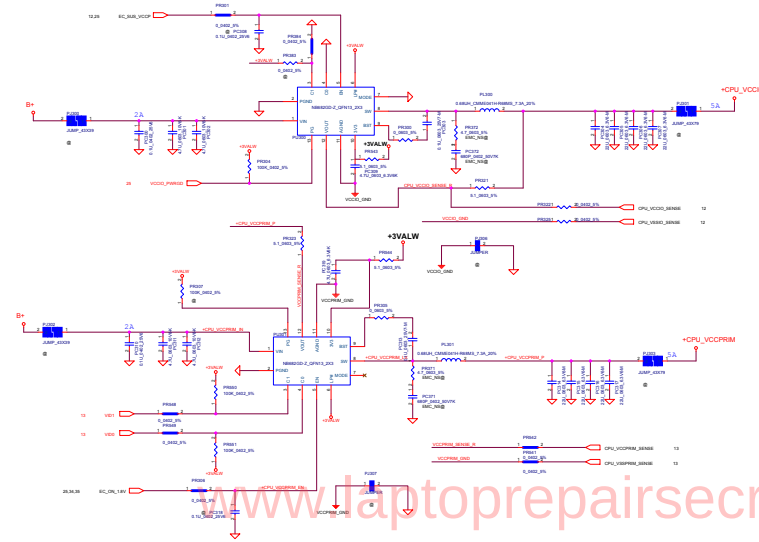


Security Classification	LC Future Center Secret Data	Title	MVDC Charger
Issued Date	2014/02/20	Deciphered Date	2014/02/20
		Size	Document Number
		A	MTX4
		Date: Monday, August 11, 2014	Sheet 28 of 45

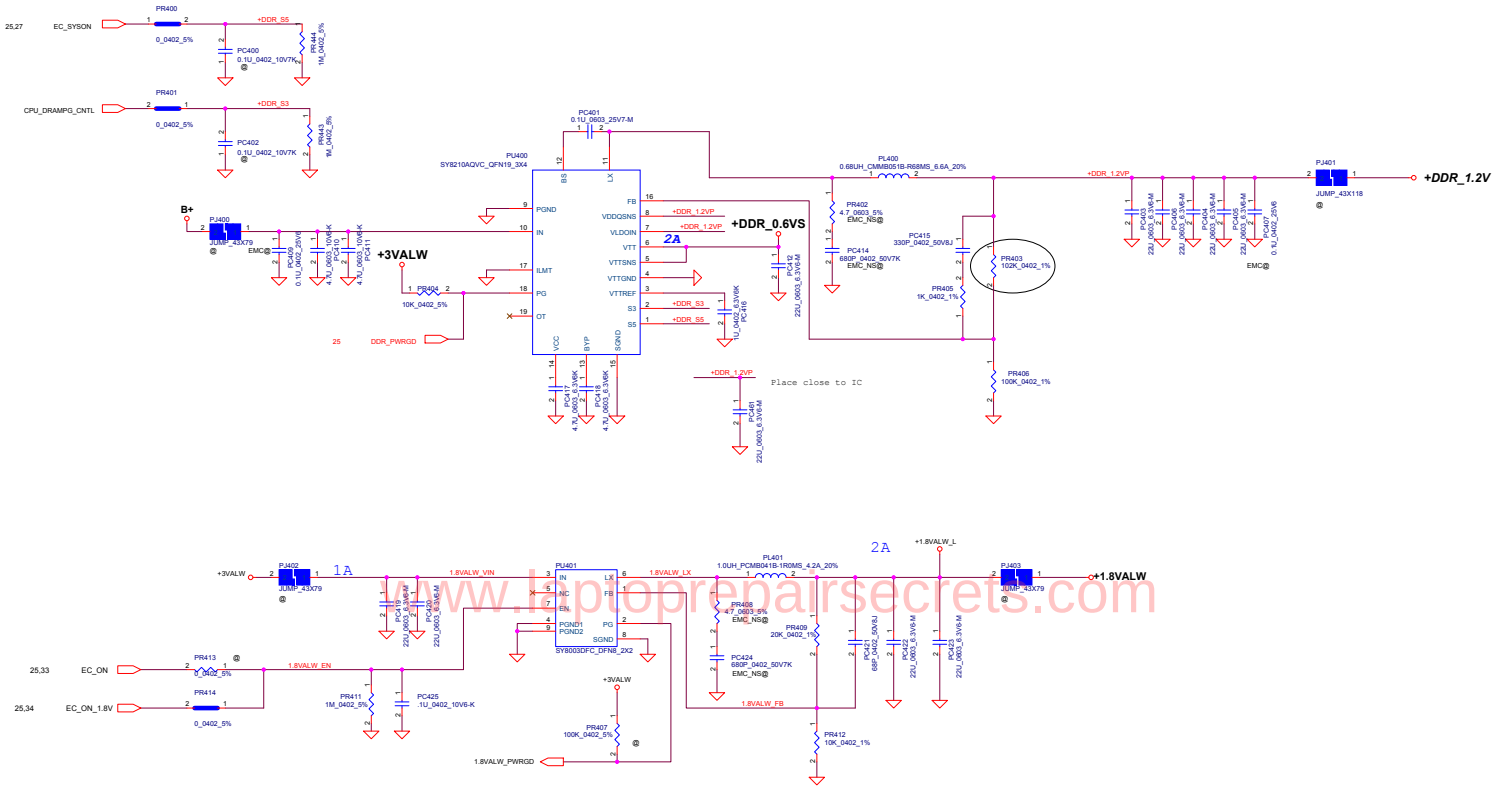


Security Classification	LC Future Center Secret Data		
Issued Date	2014/02/20	Deciphered Date	2014/02/20

Title	3VALWP/5VALWP		
Size	Document Number		Rev
C	MIXX4		1.0
Date:	Monday, August 17, 2015	Sheet	33 of 37



Security Classification	LC Future Center Secret Data		Title: 1.35VS/+0.675VS
Issued Date: 2013/08/08	Deciphered Date: 2013/08/05		
Rev: 0.1	Document Number: MTXX4		Sheet: 14



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

Title: 1.2VS/+0.6VS

Size	Document Number	Rev
C	MIXX4	1.0

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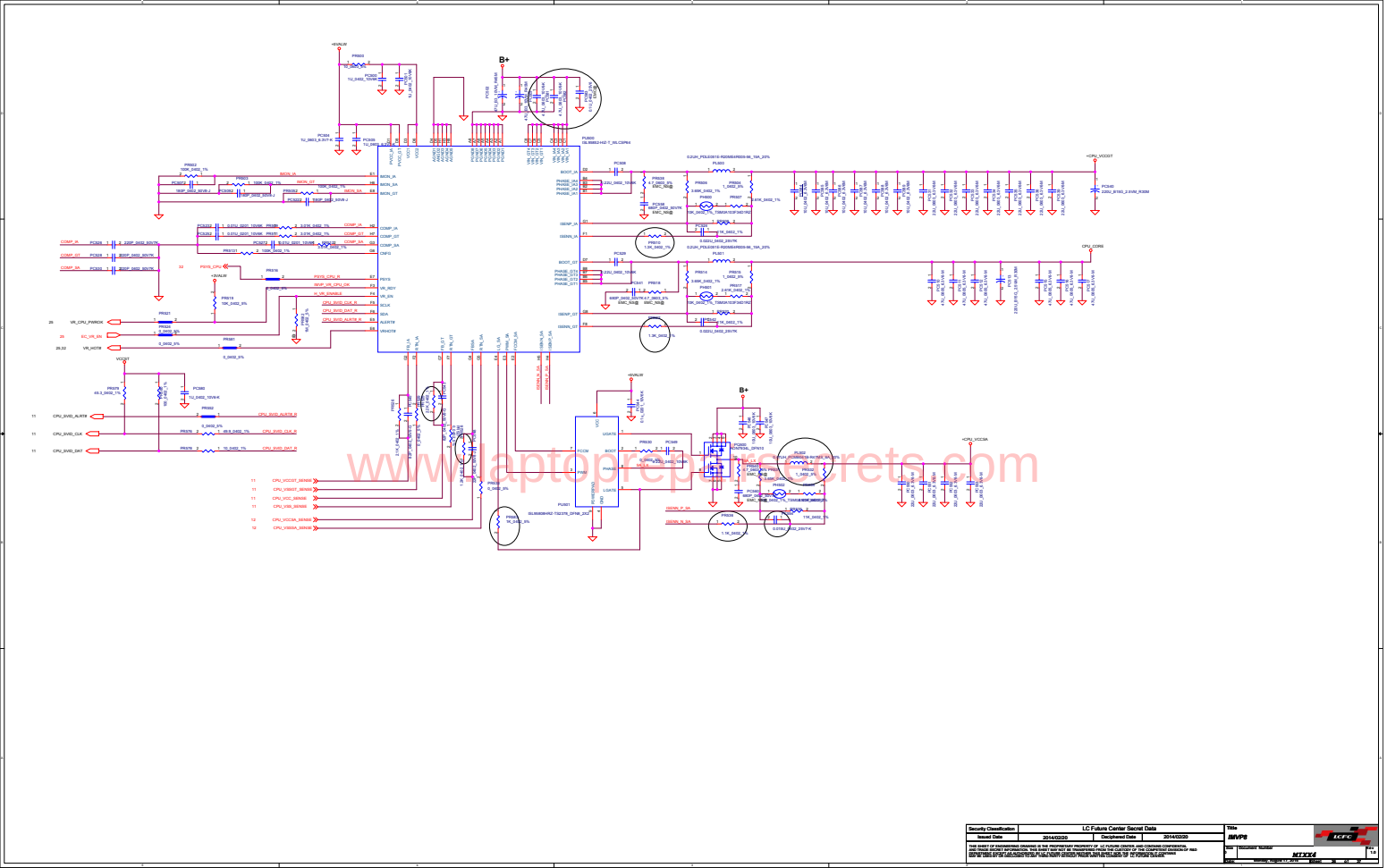

Security Classification	LC Future Center Secret Data	Title	
Issued Date	2014/02/20 Deciphered Date 2014/02/20	MAP8	
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			MTXX4	1.0
		Date: Monday, August 11, 2014	Sheet 26 of 27	

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

Title: *IMVP8*

LCFC

Size	Document Number	Rev
C	*MIXX4*	1.0

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