

LCFC Confidential

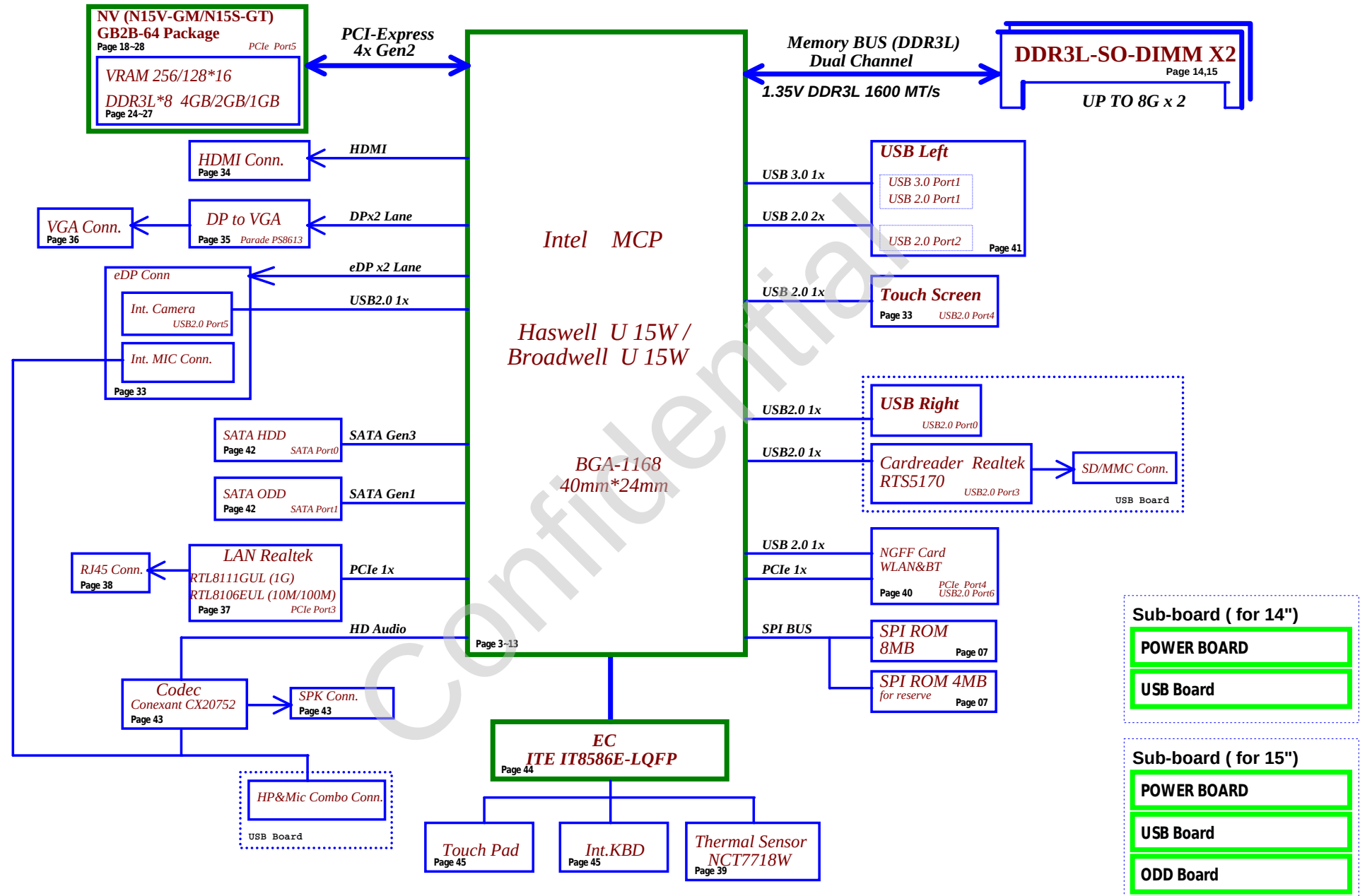
ACLUA M/B Schematics Document

Intel Haswell/Broadwell U-Processor with DDRIII + NV (N15V-GM/N15S-GT) GPU

2013-12-26

REV:0.3

Security Classification	LC Future Center Secret Data			Title		
Issued Date	2013/08/08	Deciphered Date	2013/08/05	Cover Page		
<small>THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.</small>				Size Custom	Document Number ACLUA	Rev 1.0
				Date:	Thursday, December 26, 2013	Sheet 1 of 59



Security Classification		LC Future Center Secret Data		Title	
Issued Date	2013/08/08	Deciphered Date	2013/08/05	Block Diagram	
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.					
Size	Document Number	Rev		Date	
Custom	ACLUA	1.0		Thursday, December 26, 2013 Sheet 2 of 59	

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

Power Plane / State	B+	+3VALW	+3VALW_PCH	+1.35V	
					+5VS +3VS +1.5VS +1.35VS +1.05VS +0.675VS CPU_CORE +VGA_CORE +3VGS +1.8VGS +1.35VGS +0.95VGS
S0	O	O	O	O	O
S3	O	O	O	O	X
S3 Battery only	O	O	O	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#	SLP_S5#	+VALW	+V	+VS	Clock
Full ON		HIGH	HIGH	HIGH	HIGH	ON	ON	ON	ON
S1 (Power On Suspend)		LOW	HIGH	HIGH	HIGH	ON	ON	ON	LOW
S3 (Suspend to RAM)		LOW	LOW	HIGH	HIGH	ON	ON	OFF	OFF
S4 (Suspend to Disk)		LOW	LOW	LOW	HIGH	ON	OFF	OFF	OFF
S5 (Soft OFF)		LOW	LOW	LOW	LOW	ON	OFF	OFF	OFF

USB Port Table

USB 2.0 EHCI1		USB 3.0 XHCI	
0	USB Port (Right Side)		
1	USB Port1 (Left Side)	1	USB Port1 (Left Side)
2	USB Port2 (Left Side)	2	
3	Cardreader	3	
4	TOUCH PANEL	4	
5	Camera		
6	NGFF(WLAN)		
7			

BOM Structure Table

BOM Structure	BTO Item
@	Not stuff
14@	For 14" part
15@	For 15" part
100M@	100M LAN Part
GIGA@	GIGA LAN Part
OPT@	Discrete GPU SKU part
N15SGT@	For N158-GT GPU part
N15VGM@	For N15V-GM part
GC6@	GC62.0 support part
RANKA@	For VRAM RankA part
RANKB@	For VRAM RankB part
UMA@	UMA SKU part
TS@	For support touch panel sku part
AOAC@	AOAC support part
ME@	ME part(connector, hole)

SMBUS Control Table

	SOURCE	VGA	BATT	IT8586E	SODIMM	WLAN WiMAX	Thermal Sensor	PCH	TP Module	charger
EC_SMB_CK1 EC_SMB_DA1	IT8586E +3VALW	X	V	V +3VALW	X	X	X	X	X	V
EC_SMB_CK2 EC_SMB_DA2	IT8586E +3VS	V +3VGS	X	V +3VS	X	X	V +3VS	V +3VALW_PCH	X	X
PCH_SMB_CLK PCH_SMB_DATA	PCH +3VALW_PCH	X	X	X	V +3VS	V +3VS	X	V +3VALW_PCH	X	X

PCIe PORT LIST

Port	Device
1	
2	
3	LAN
4	WLAN
5	Discrete GPU
6	

EC SM Bus1 address

EC SM Bus2 address

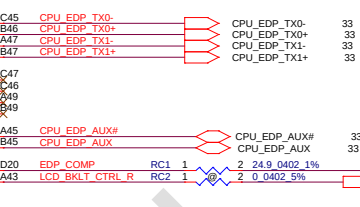
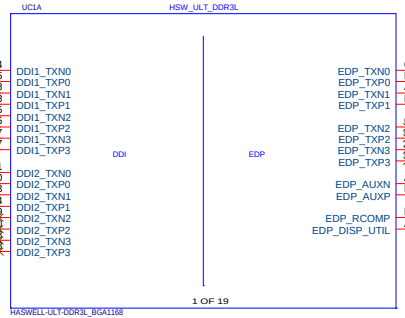
PCH SM Bus address

Device	Address	Device	Address	Device	Address
Smart Battery	0X16	Thermal Sensor NCT7718W	1001_100xb	DDR DIMMA	1010 000xb
Charger	0001 0010 b	VGA	0x41(default)	DDR DIMMB	1010 010xb
		PCH	need to update	Wlan	Rsvd

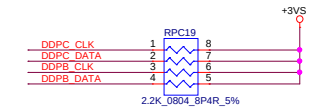
Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
<small>THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.</small>			Notes List Size: Custom Document Number: ACLUA Rev: 1.0 Date: Thursday, December 26, 2013 Sheet: 3 of 59

HDMI D2
HDMI D1
HDMI D0
HDMI CLK

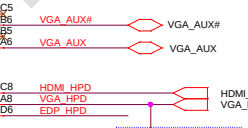
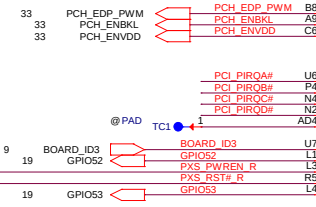
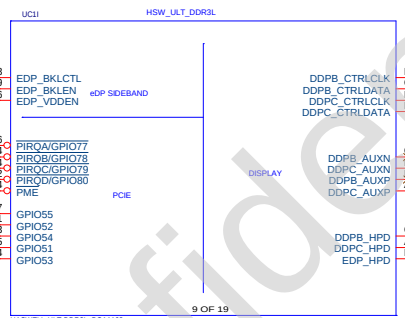
DP TO VGA Converter



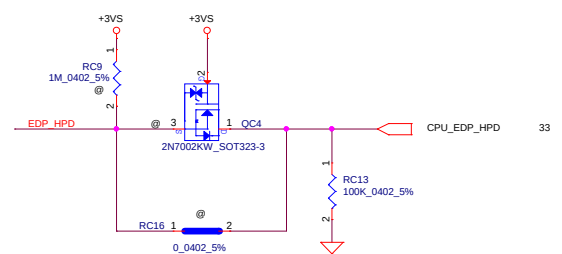
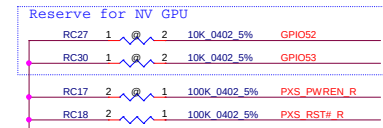
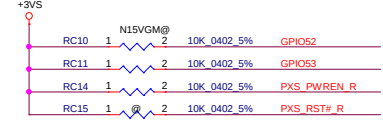
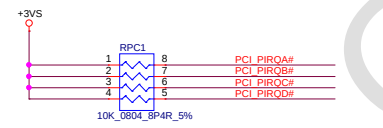
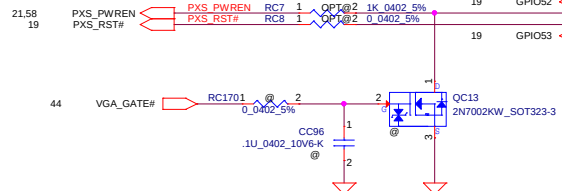
+VCCIOA_OUT & EDP_COMP :
Trace Width: 20mil
Space: 25mil
Max length: 100mil



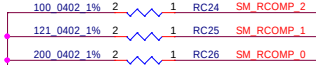
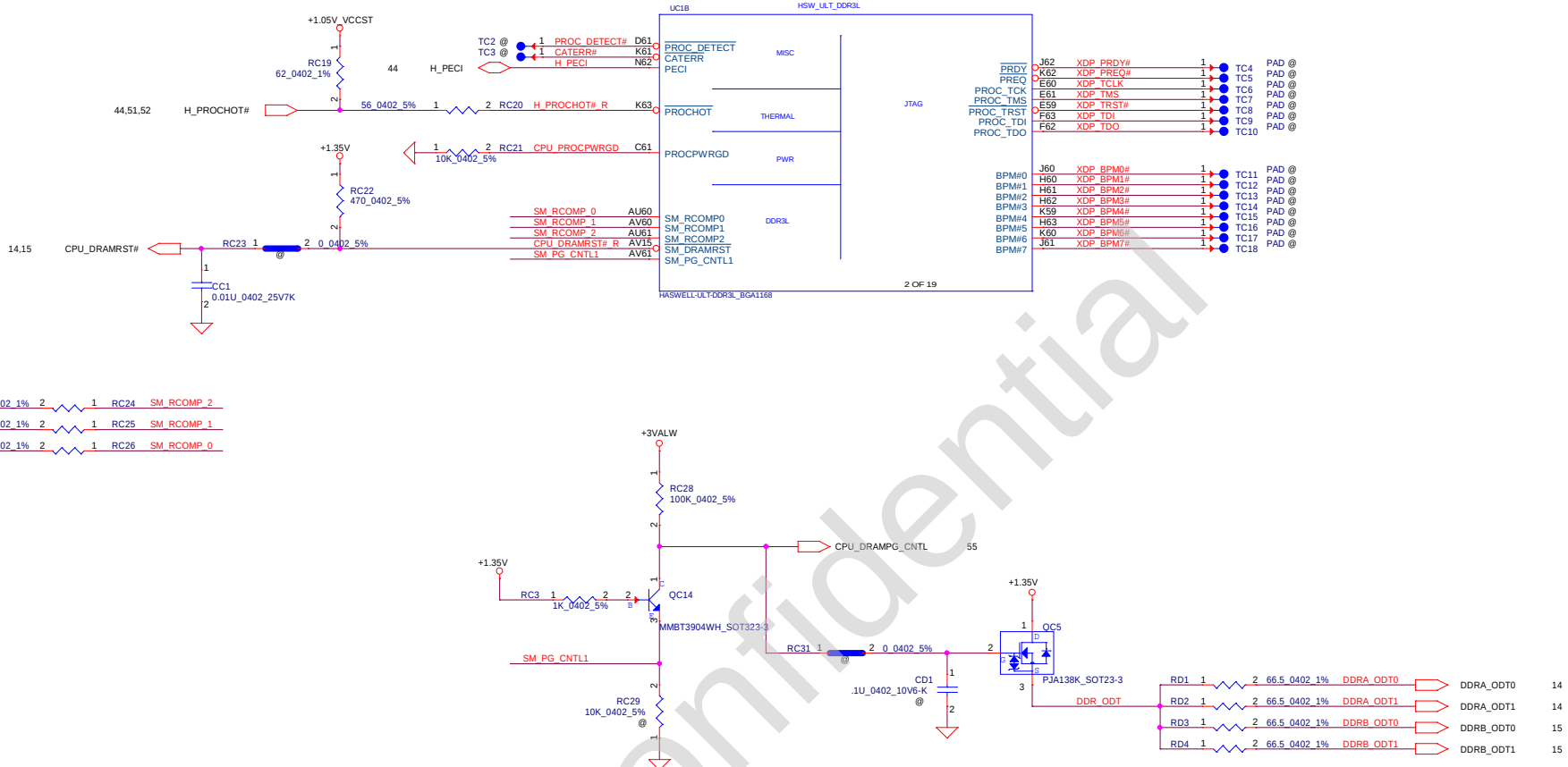
DDPX_CTRLDATA
The signal has a weak internal pull-down.
* H Port is detected.
L Port is not detected.



After confirm with vendor, HPD has internal pull-down ~100k at PS8613, just reserve in case. RC37 can be removed next phase if no issue.

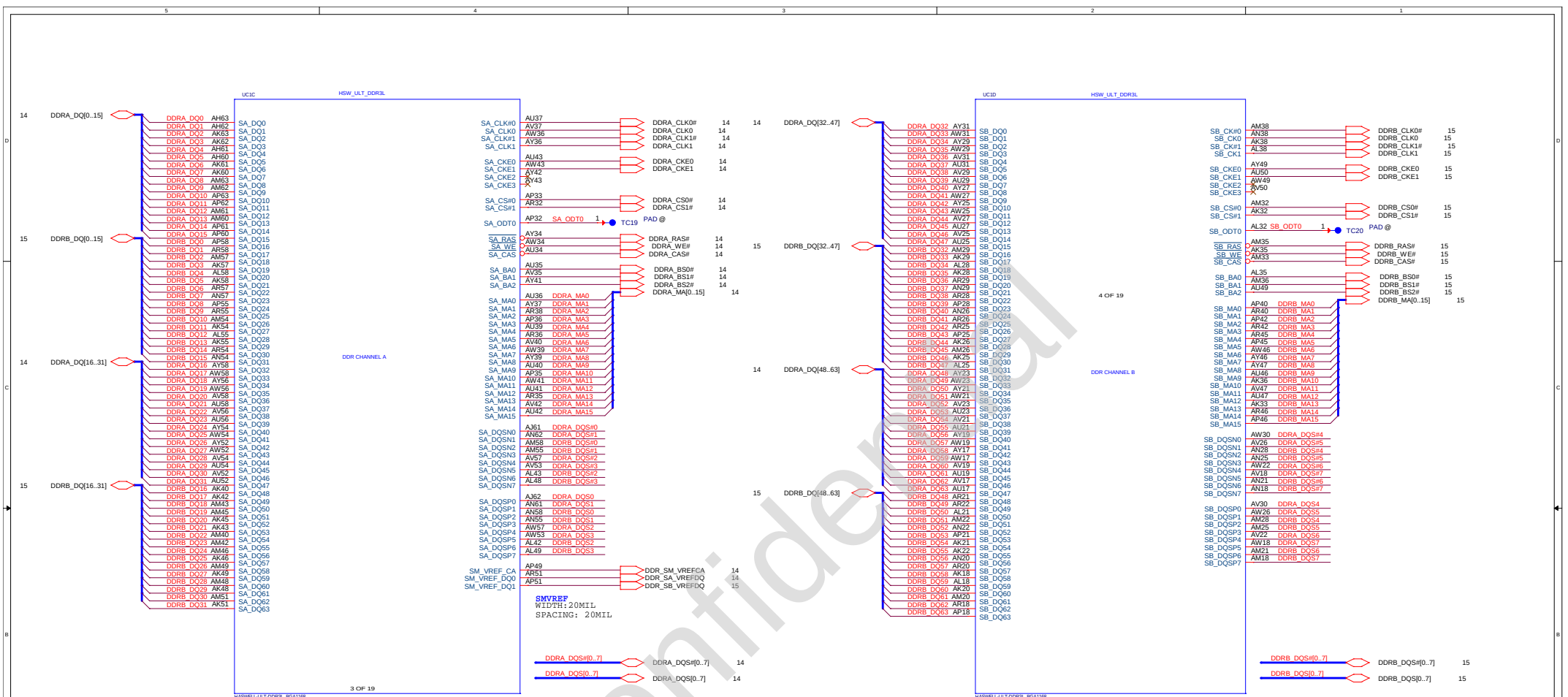


Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			Size Custom
			Document Number ACLUA
			Rev 1.0
			Date: Thursday, December 26, 2013 Sheet 4 of 59

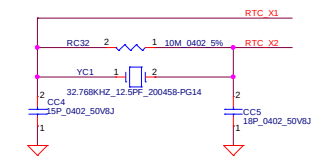


Security Classification	LC Future Center Secret Data	
Issued Date	2013/08/08	Deciphered Date
		2013/08/05
<small>THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.</small>		

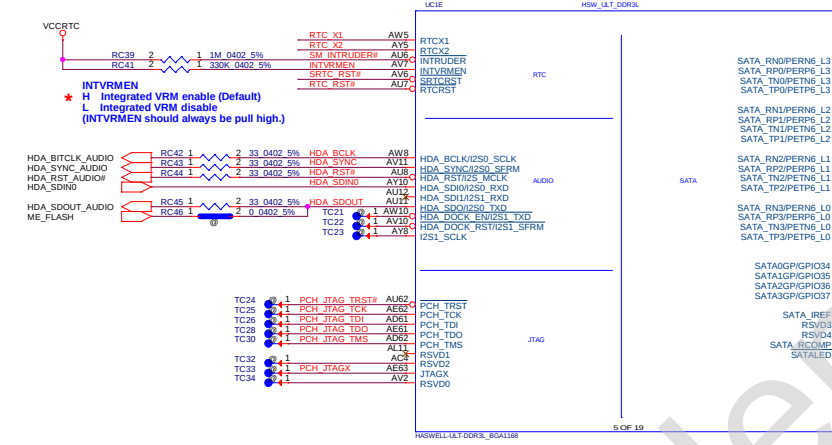
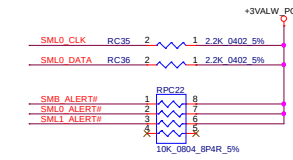
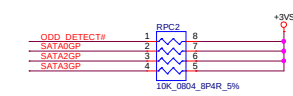
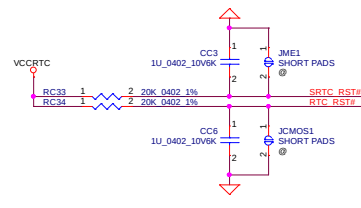
Title		MCP (MISC, THERMAL, JTAG)
Size	Document Number	ACLUA
Custom		
Date:	Thursday, December 26, 2013	Sheet 5 of 59
		Rev 1.0



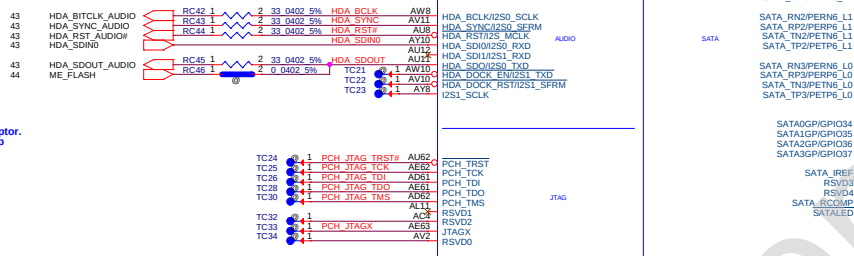
Security Classification		LC Future Center Secret Data		Title	
Issued Date	2013/08/08	Deciphered Date	2013/08/05	MCP (DDR3L)	
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF THE DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.					
Size	Document Number	Rev		1.0	
Custom	ACLUA				
Date:	Thursday, December 26, 2013	Sheet	6	of 59	



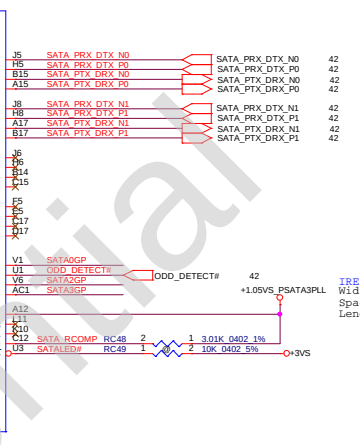
CRYSTAL
 1. Space 15MIL
 2. No trace under crystal
 3. Place on opposite side of MCP for temp influence



INTRMEN
 * H Integrated VRM enable (Default)
 L Integrated VRM disable
 (INTRMEN should always be pull high)

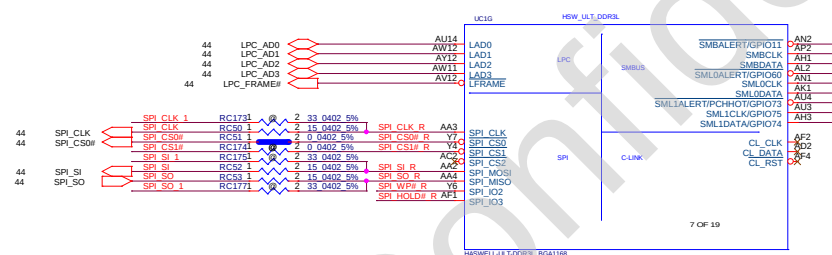


HDA_SDO This signal has a weak internal pull-down.
 0 = Enable security measures defined in the Flash Descriptor.
 1 = Disable Flash Descriptor Security(override). This strap should only be asserted high during external pull-up in manufacturing/debug environments ONLY.

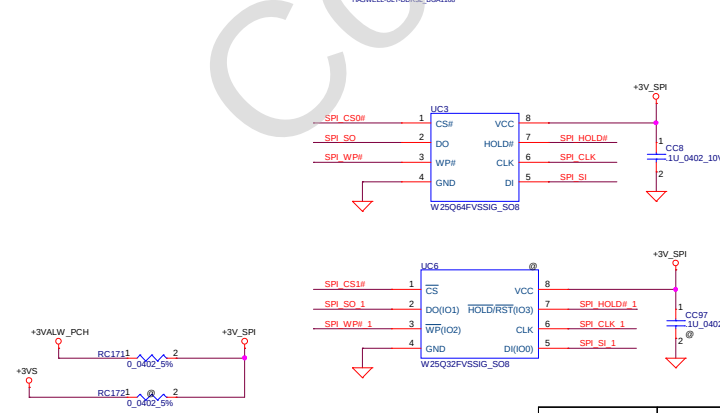
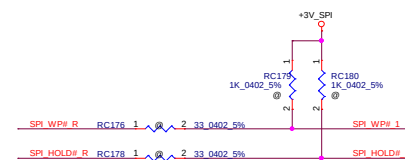
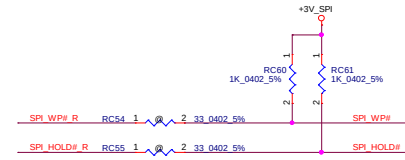


HDD
ODD

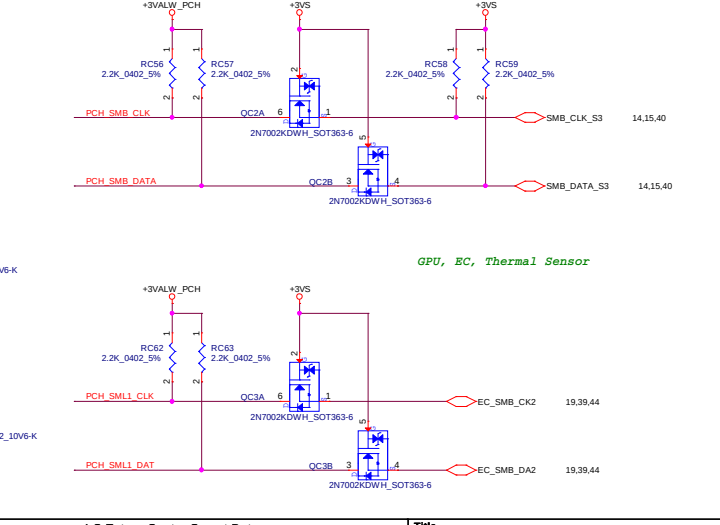
IREF#RCOMP
 Width: 12-15mil
 Space: 12mil
 Length: 500mil



DIMM1, DIMM2, NGFF

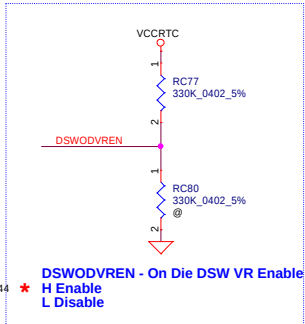
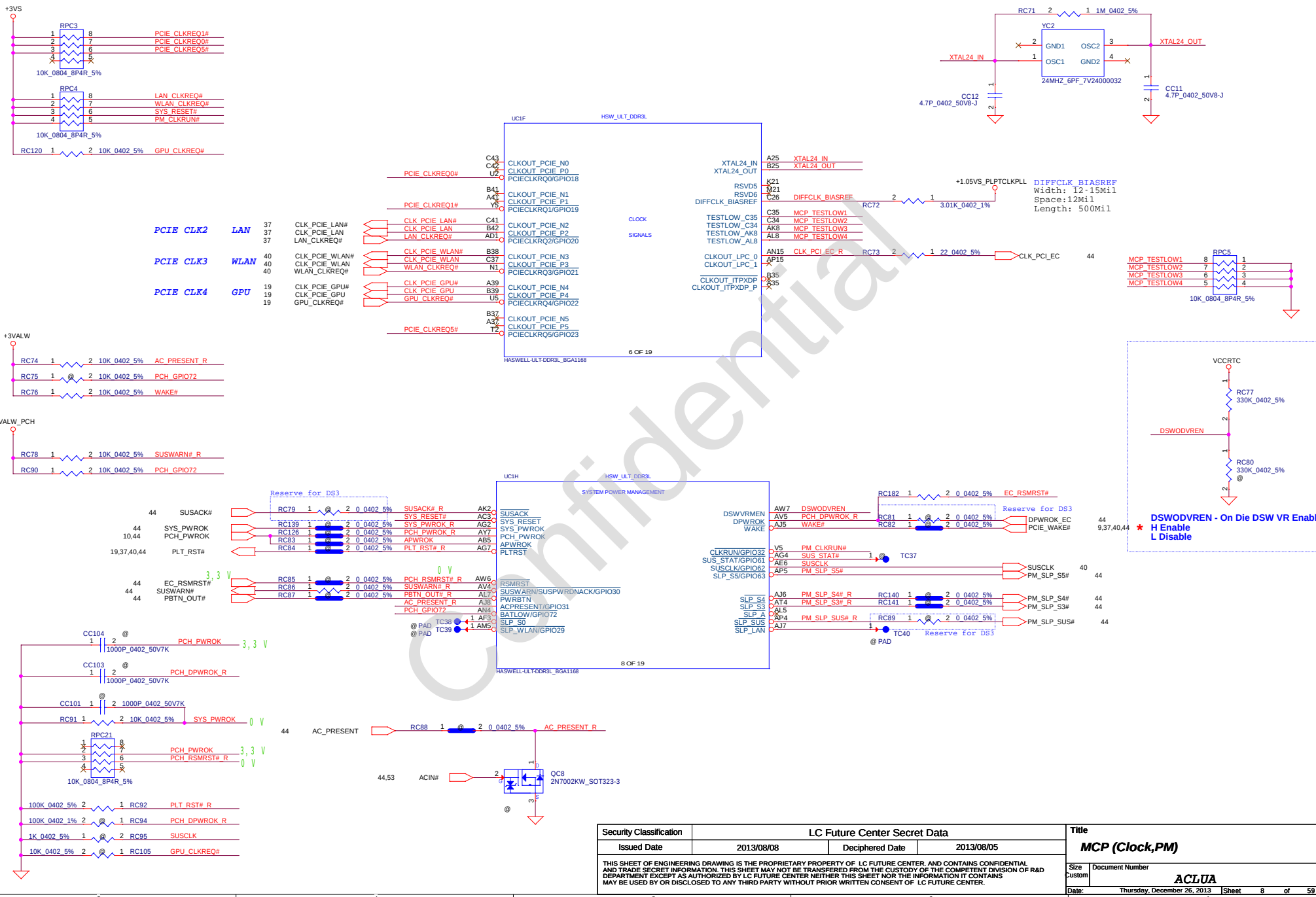


+3V SPI
 1. If support DS3, connect to +3VS and don't support EC mirror code;
 2. If don't support DS3, connect to +3VALW_PCH and support EC mirror code.

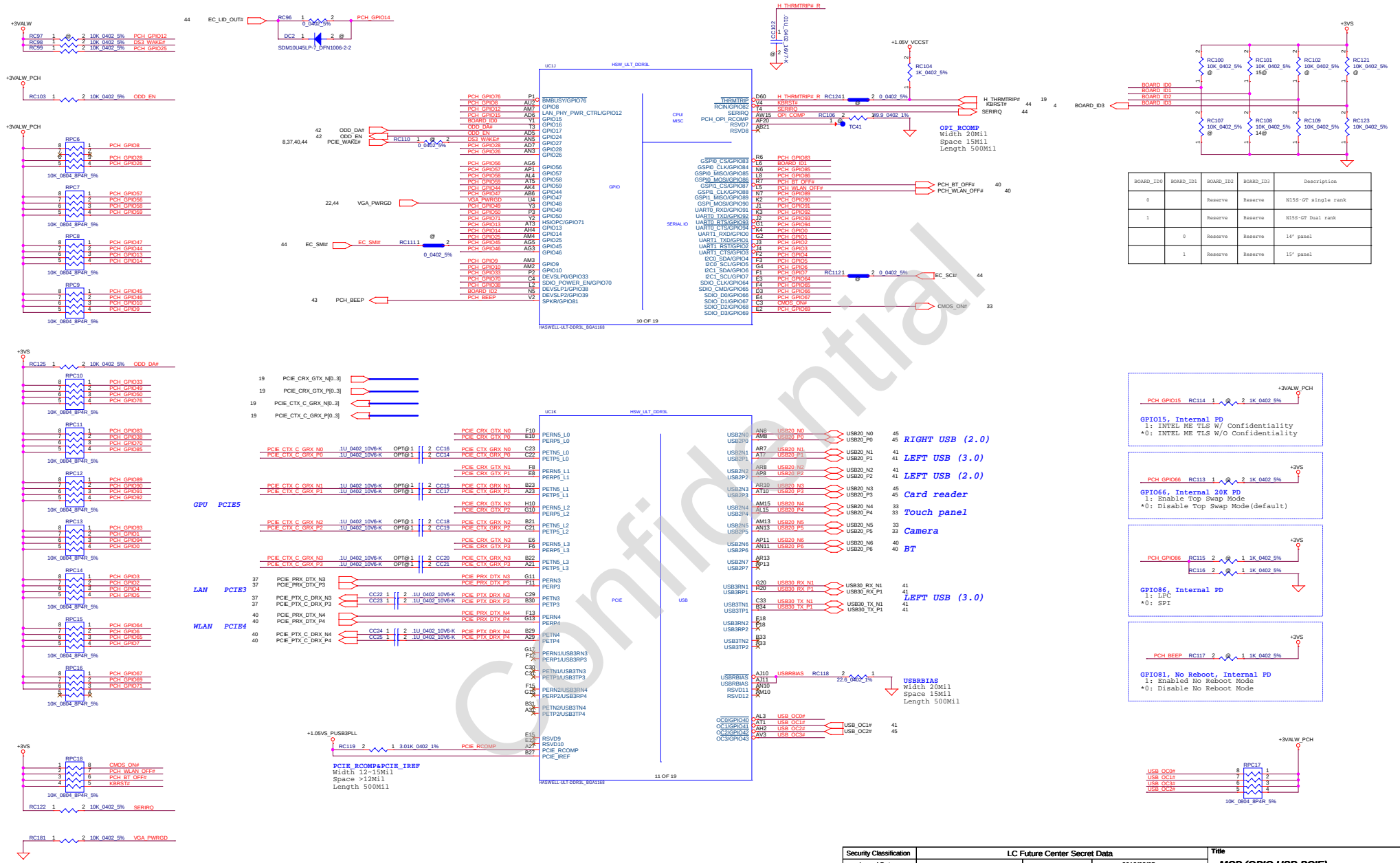


GPU, EC, Thermal Sensor

Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			MCP (RTC&AUDIO&SATA&SMBUS) Rev 1.0 Thursday, December 26, 2013 Sheet 7 of 59



Security Classification		LC Future Center Secret Data		Title	
Issued Date	2013/08/08	Deciphered Date	2013/08/05	MCP (Clock, PM)	
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.				Size Custom	Document Number
				ACLUA	
				Date:	Thursday, December 26, 2013
				Sheet	8 of 59
				Rev	1.0



BOARD_ID0	BOARD_ID1	BOARD_ID2	BOARD_ID3	Description
0	Reserve	Reserve	Reserve	M158-0T single rank
1	Reserve	Reserve	Reserve	M158-0T Dual rank
	0	Reserve	Reserve	14' panel
	1	Reserve	Reserve	15' panel

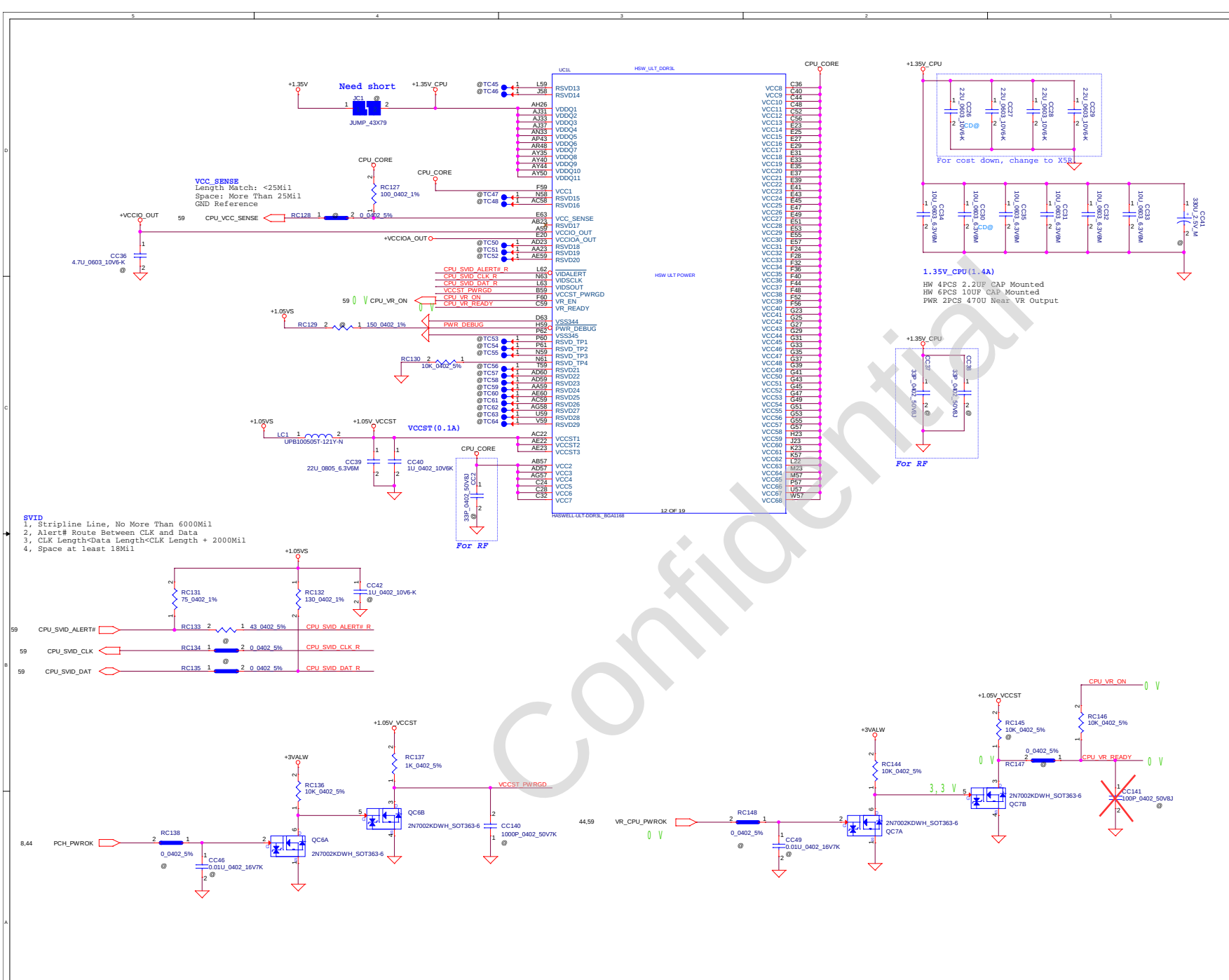
GPIO15, Internal PD
 1: INTEL ME TLS W/ Confidentiality
 *0: INTEL ME TLS W/O Confidentiality

GPIO66, Internal 20K PD
 1: Enable Top Swap Mode
 *0: Disable Top Swap Mode(default)

GPIO86, Internal PD
 1: LFC
 *0: SPI

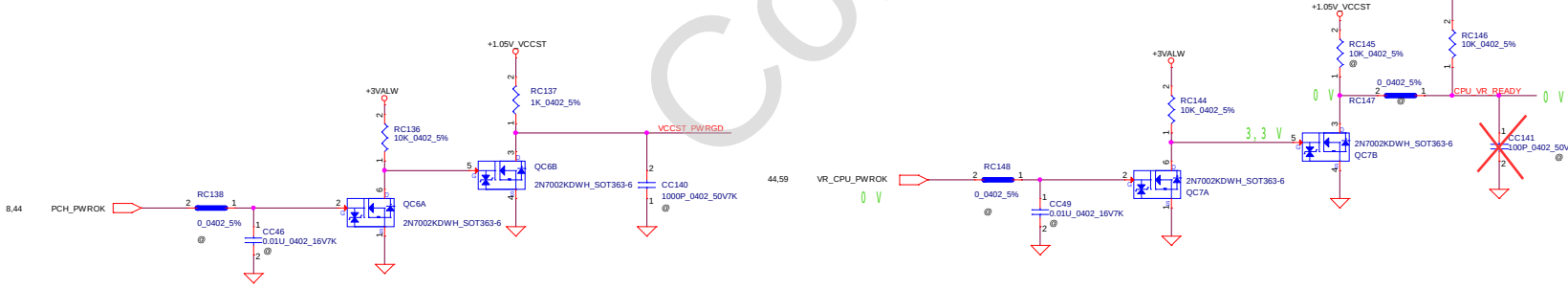
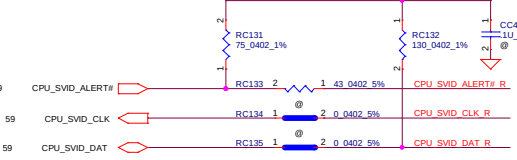
GPIO81, No Reboot, Internal PD
 1: Enabled No Reboot Mode
 *0: Disable No Reboot Mode

Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS THE CONFIDENTIAL INFORMATION AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			Rev 1.0
Document Number	ACLUA		Monday, December 30, 2013 Sheet 9 of 99

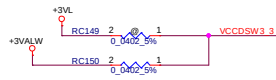
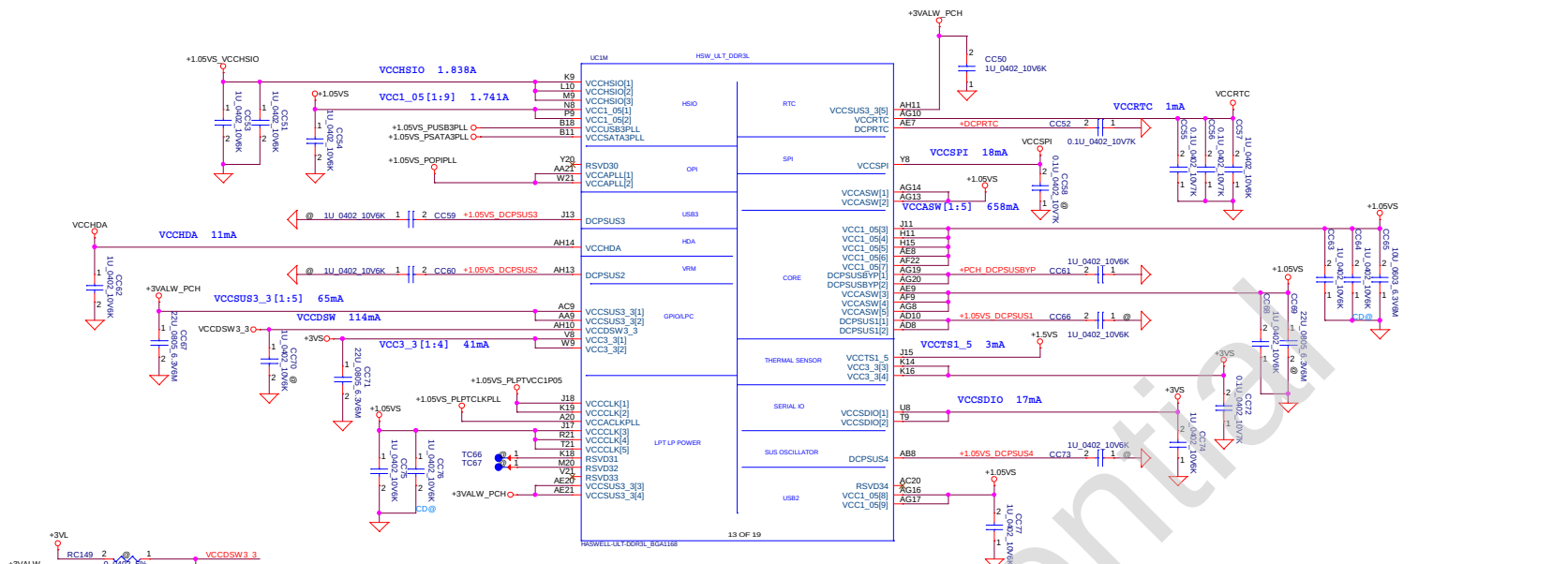


VCC SENSE
 Length Watch: <25Mil
 Space: More Than 25Mil
 GND Reference

SVID
 1, Stripline Line, No More Than 6000Mil
 2, Alert# Route Between CLK and Data
 3, CLK Length<Data Length<CLK Length + 2000Mil
 4, Space at least 18Mil



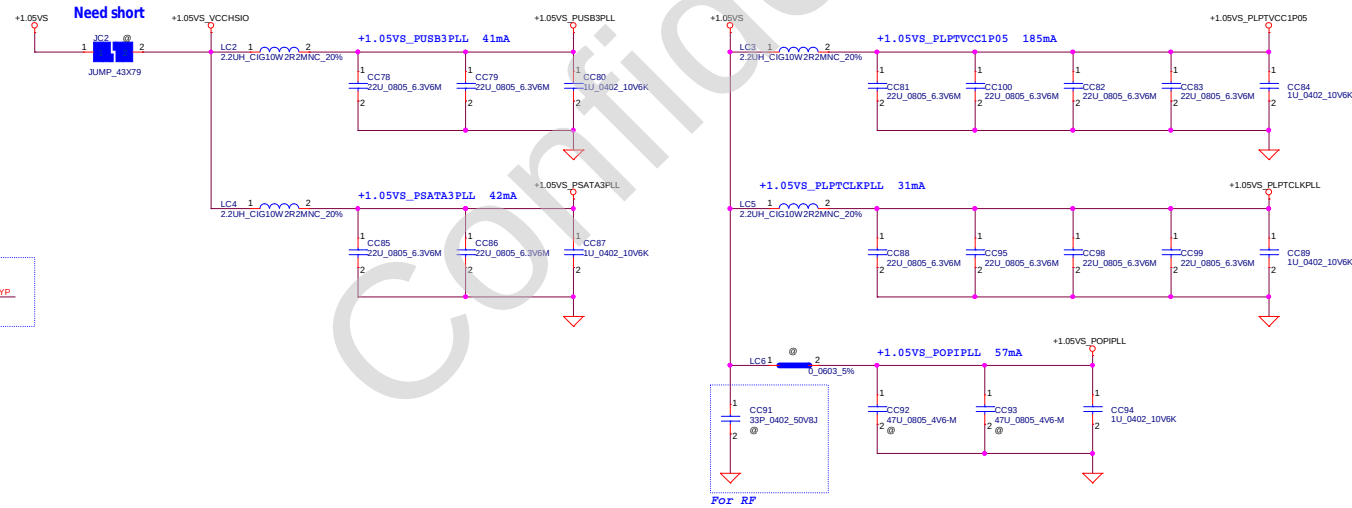
Security Classification		LC Future Center Secret Data		Title	
Issued Date	2013/08/08	Deciphered Date	2013/08/05	MCP (Power)	
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.					
Sheet	1	Document Number	ACLUA	Rev	1.0
Date	Monday, December 30, 2013	Sheet	10	of	59



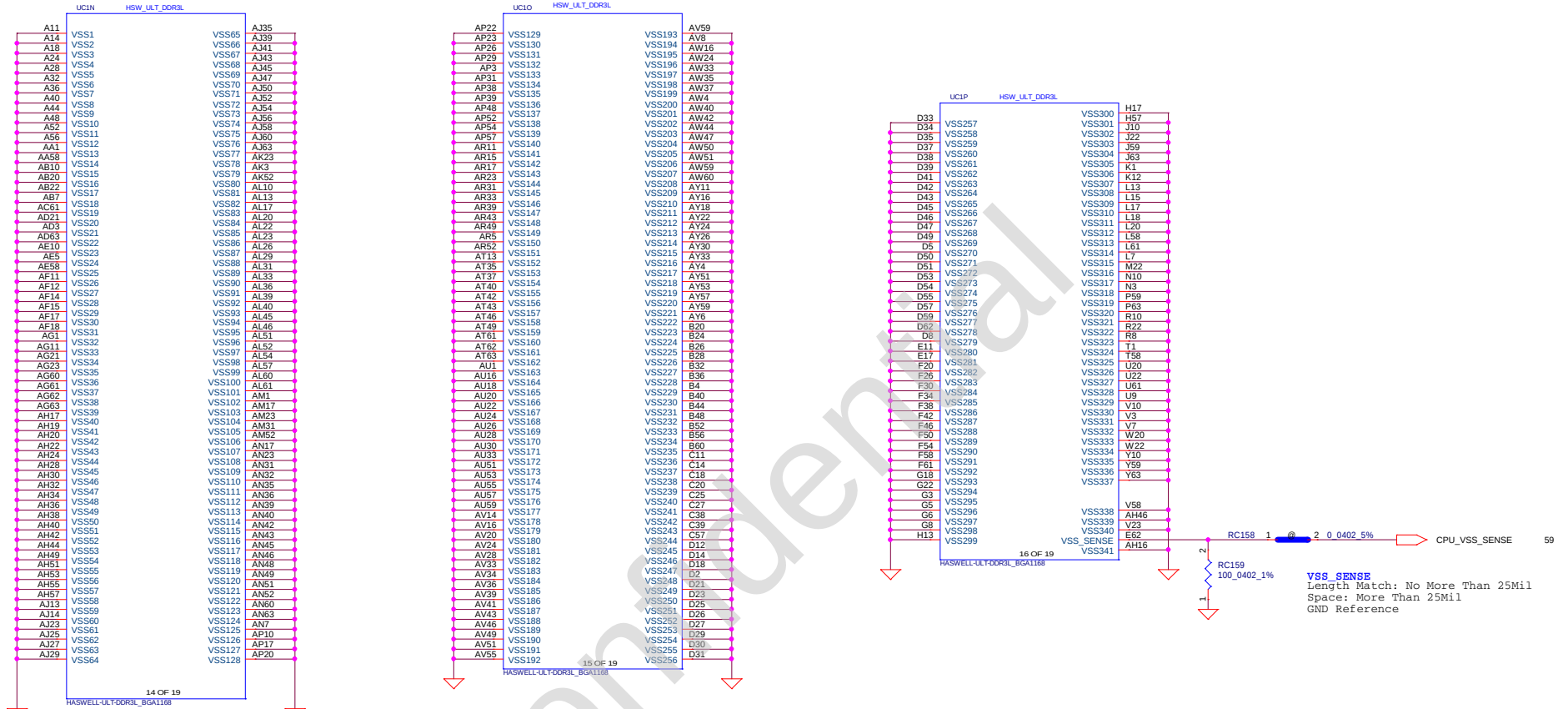
VCCDSW3_3 CC90 1 2 0.47U 0.402 25V6K +PCH_DCPUSBYSP

For Intel recommend, place one 0.47uF capacitor to address temporary inrush current. (DOC. 489999)

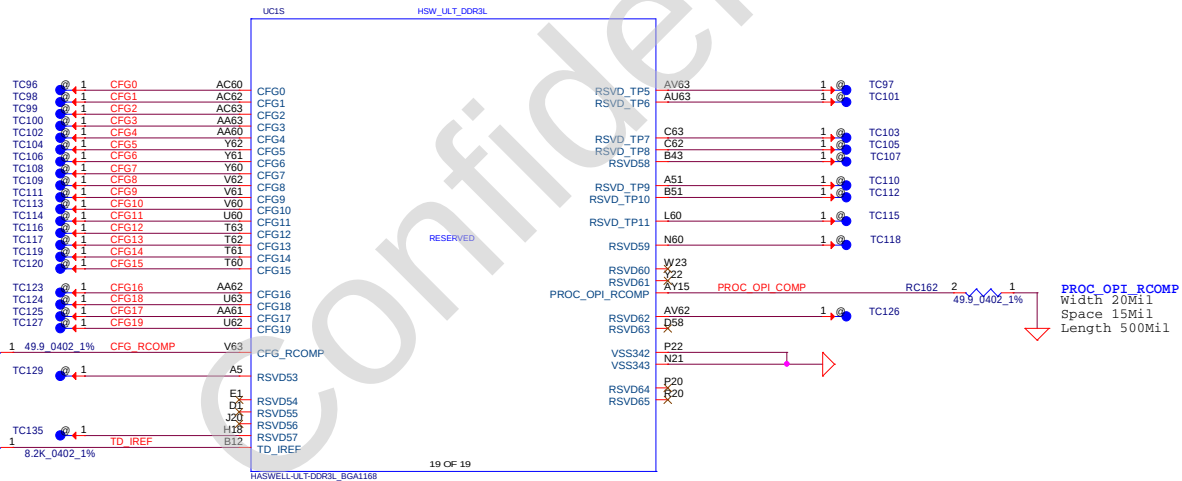
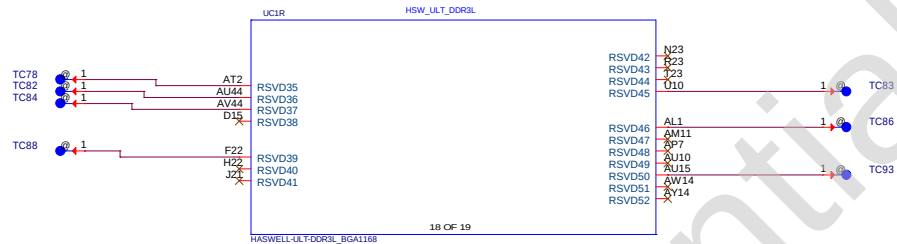
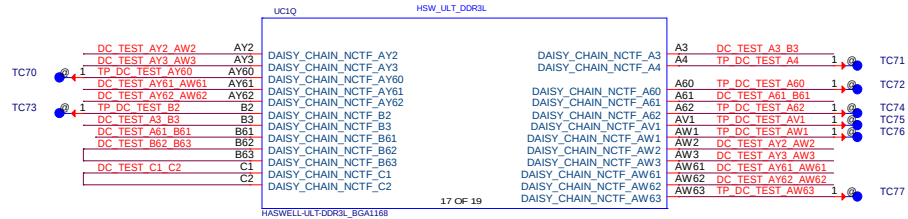
Need short



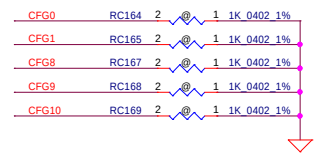
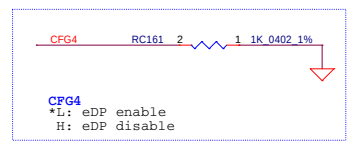
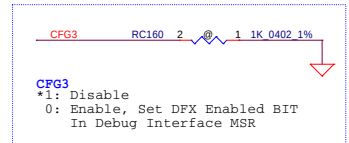
Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			MCP (Power2) Document Number ACLUA Date: Thursday, December 26, 2013 Sheet 11 of 59



Security Classification		LC Future Center Secret Data		Title	
Issued Date	2013/08/08	Deciphered Date	2013/08/05	MCP (VSS)	
<small>THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSMITTED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.</small>					
Size	Document Number	Rev		1.0	
Custom	ACLUA	Date:		Thursday, December 26, 2013 Sheet 12 of 59	



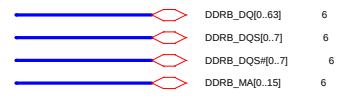
CFG_RCOMP&TD_IREF
Width 20mil
Space 15mil
Length 500mil



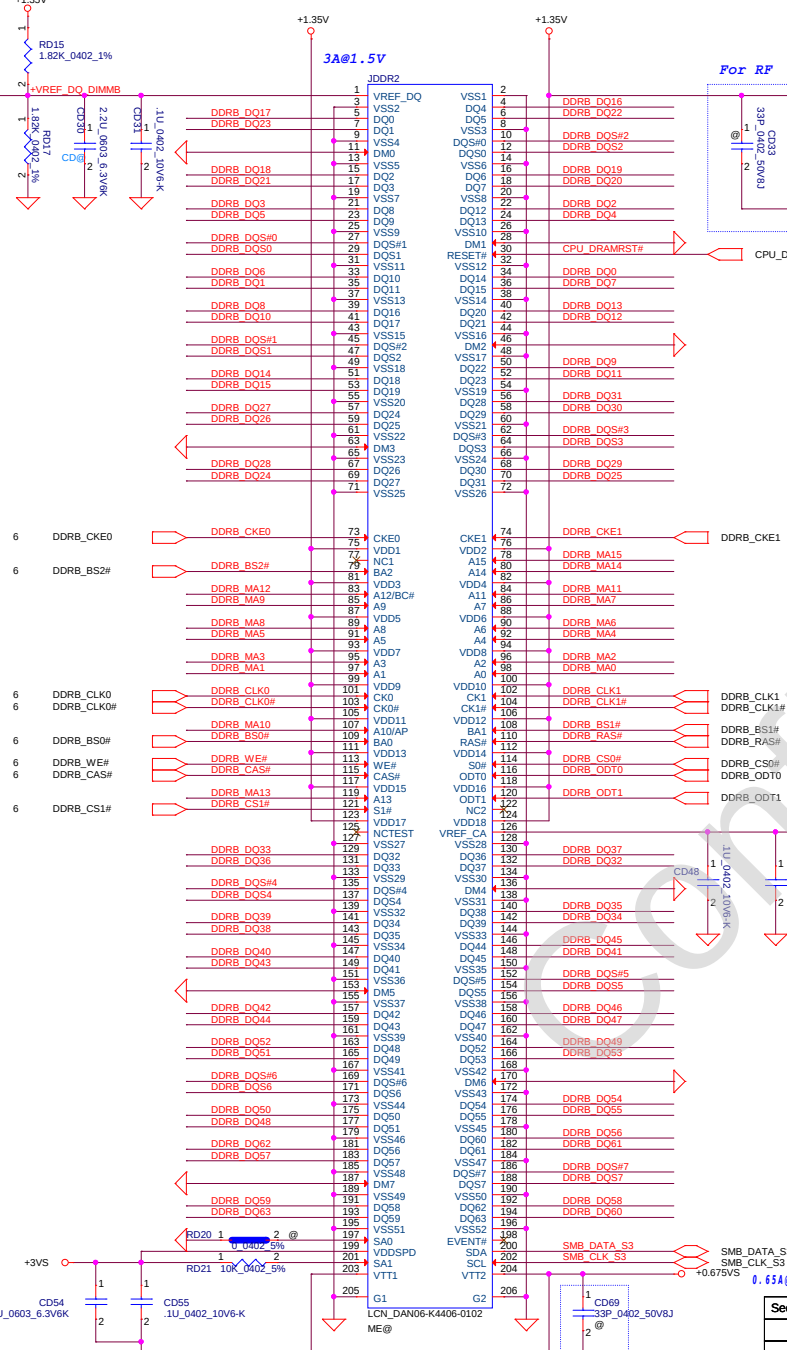
Security Classification		LC Future Center Secret Data		Title	
Issued Date	2013/08/08	Deciphered Date	2013/08/05	MCP (OTHER)	
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.					
Size	Custom	Document Number	ACLUA		Rev 1.0
Date:	Thursday, December 26, 2013	Sheet	13	of	59

DDR3 SO-DIMM B

Swap Table



Pin Number	Pin Name	Net Name
5	DQ0	DDR_B_DQ17
7	DQ1	DDR_B_DQ23
15	DQ2	DDR_B_DQ18
17	DQ3	DDR_B_DQ21
4	DQ4	DDR_B_DQ16
6	DQ5	DDR_B_DQ22
16	DQ6	DDR_B_DQ19
18	DQ7	DDR_B_DQ20
10	DQS#0	DDR_B_DQS#2
12	DQS#0	DDR_B_DQS#1
21	DQ8	DDR_B_DQ3
23	DQ9	DDR_B_DQ5
33	DQ10	DDR_B_DQ6
35	DQ11	DDR_B_DQ1
22	DQ12	DDR_B_DQ2
24	DQ13	DDR_B_DQ4
34	DQ14	DDR_B_DQ0
36	DQ15	DDR_B_DQ7
27	DQS#1	DDR_B_DQS#0
29	DQS#1	DDR_B_DQS#0
39	DQ16	DDR_B_DQ8
41	DQ17	DDR_B_DQ10
51	DQ18	DDR_B_DQ14
53	DQ19	DDR_B_DQ15
40	DQ20	DDR_B_DQ13
42	DQ21	DDR_B_DQ12
50	DQ22	DDR_B_DQ9
52	DQ23	DDR_B_DQ11
45	DQS#2	DDR_B_DQS#1
47	DQS#2	DDR_B_DQS#1
57	DQ24	DDR_B_DQ27
59	DQ25	DDR_B_DQ26
67	DQ26	DDR_B_DQ28
69	DQ27	DDR_B_DQ24
68	DQ28	DDR_B_DQ31
58	DQ29	DDR_B_DQ30
68	DQ30	DDR_B_DQ29
70	DQ31	DDR_B_DQ25
62	DQS#3	DDR_B_DQS#3
64	DQS#3	DDR_B_DQS#3
129	DQ32	DDR_B_DQ33
131	DQ33	DDR_B_DQ36
141	DQ34	DDR_B_DQ39
143	DQ35	DDR_B_DQ38
130	DQ36	DDR_B_DQ37
132	DQ37	DDR_B_DQ32
140	DQ38	DDR_B_DQ35
142	DQ39	DDR_B_DQ34
135	DQS#4	DDR_B_DQS#4
137	DQS#4	DDR_B_DQS#4
147	DQ40	DDR_B_DQ40
149	DQ41	DDR_B_DQ43
157	DQ42	DDR_B_DQ42
159	DQ43	DDR_B_DQ44
146	DQ44	DDR_B_DQ45
148	DQ45	DDR_B_DQ41
158	DQ46	DDR_B_DQ46
160	DQ47	DDR_B_DQ47
152	DQS#5	DDR_B_DQS#5
154	DQS#5	DDR_B_DQS#5
163	DQ48	DDR_B_DQ52
165	DQ49	DDR_B_DQ51
175	DQ50	DDR_B_DQ50
177	DQ51	DDR_B_DQ48
164	DQ52	DDR_B_DQ49
166	DQ53	DDR_B_DQ53
174	DQ54	DDR_B_DQ54
176	DQ55	DDR_B_DQ55
169	DQS#6	DDR_B_DQS#6
171	DQS#6	DDR_B_DQS#6
181	DQ56	DDR_B_DQ62
183	DQ57	DDR_B_DQ57
191	DQ58	DDR_B_DQ59
193	DQ59	DDR_B_DQ63
180	DQ60	DDR_B_DQ56
182	DQ61	DDR_B_DQ61
192	DQ62	DDR_B_DQ58
194	DQ63	DDR_B_DQ60
186	DQS#7	DDR_B_DQS#7
188	DQS#7	DDR_B_DQS#7



Layout Note: Place near DIMM

(10uF_0603_6.3V)*8
(1U_0402_6.3V)*8
(.1U_0402_10V6-K)*4

Layout Note: Place near DIMM

(10U_0603_6.3V)*2
(.1U_0402_10V)*4

Security Classification	LC Future Center Secret Data	
Issued Date	2013/08/08	Deciphered Date 2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSMITTED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.		
Size	Document Number	Rev
Custom	ACLUA	1.0
Date:	Thursday, December 26, 2013	Sheet 15 of 59

Confidential

Security Classification	LC Future Center Secret Data			Title		
Issued Date	2013/08/08	Deciphered Date	2013/08/05	Blank		
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.				Size Custom	Document Number ACLUA	Rev 1.0
				Date:	Thursday, December 26, 2013	Sheet 16 of 59

Confidential

Security Classification	LC Future Center Secret Data			Title		
Issued Date	2013/08/08	Deciphered Date	2013/08/05	Blank		
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.				Size Custom	Document Number ACLUA	Rev 1.0
				Date:	Thursday, December 26, 2013	Sheet 17 of 59

N15x GPIO

GPIO	I/O	ACTIVE	Function Description
GPIO0	OUT	-	FB Enable for GC6 2.0
GPIO1	OUT	N/A	
GPIO2	OUT	N/A	
GPIO3	OUT	N/A	
GPIO4	OUT	N/A	
GPIO5	OUT	N/A	GPU power sequencing---3V3_MAIN_EN
GPIO6	IN	-	GPU wake signal for GC6 2.0
GPIO7	OUT	N/A	
GPIO8	I/O	-	System side PCIe reset Monitor
GPIO9	I/O	N/A	2.2K Pull-up
GPIO10	OUT	N/A	
GPIO11	OUT	-	GPU Core VDD PWM control signal
GPIO12	IN		AC Power Detect Input (10K pull High)
GPIO13	OUT	-	Phase Shedding
GPIO14	IN	N/A	
GPIO15	IN	N/A	
GPIO16		N/A	
GPIO17	IN	N/A	
GPIO18	IN	N/A	
GPIO19	IN	N/A	
GPIO20		N/A	
GPIO21	OUT		GPU PCIe self-reset control
OVERT	OUT		Active Low Thermal Catastrophic Over Temperature

Performance Mode P0 TDP at Tj = 102 C* (DDR3)

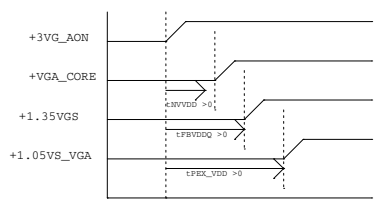
Products	GPU	Mem	NVCLK	NVVDD			FBVDD		FBVDDQ		PCI Express		I/O and PLLVDD		Other	
	(4)	(1.5)	(MHz)	(V)	(A)	(W)	(A)	(W)	(A)	(W)	(mA)	(W)	(mA)	(W)	(mA)	(W)
N14X 128bit 2GB DDR3	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

N15x Multi-level Straps

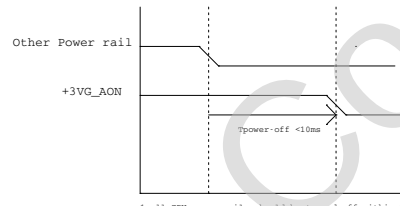
Physical Strapping pin	Power Rail	Logical Strapping Bit3	Logical Strapping Bit2	Logical Strapping Bit1	Logical Strapping Bit0
ROM_SCLK	+3VGS	SOR3_EXPOSED	SOR2_EXPOSED	SOR1_EXPOSED	SOR0_EXPOSED
ROM_SI	+3VGS	RAM_CFG[3]	RAM_CFG[2]	RAM_CFG[1]	RAM_CFG[0]
ROM_SO	+3VGS	DEVID_SEL	PCIE_CFG	SMB_ALT_ADDR	VGA_DEVICE
STRAP0	+3VGS	Reserved(keep pull-up and pull-down footprint and stuff 50Kohm pull-up)			
STRAP1	+3VGS	Reserved(keep pull-up and pull-down footprint and not stuff by default)			
STRAP2	+3VGS				
STRAP3	+3VGS				
STRAP4	+3VGS				

SMBUS_ALT_ADDR	
0	0x9E (Default)
1	0x9C (Multi-GPU usage)

N15V-GM Power Sequence

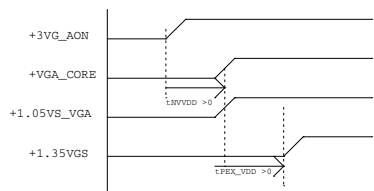


1. all power rail ramp up time should be larger than 40us



1. all GPU power rails should be turned off within 10ms
2. Optimus system VDD3 avoids drop down earlier than NVDD and FBVDDQ

N15S-GT Power Sequence



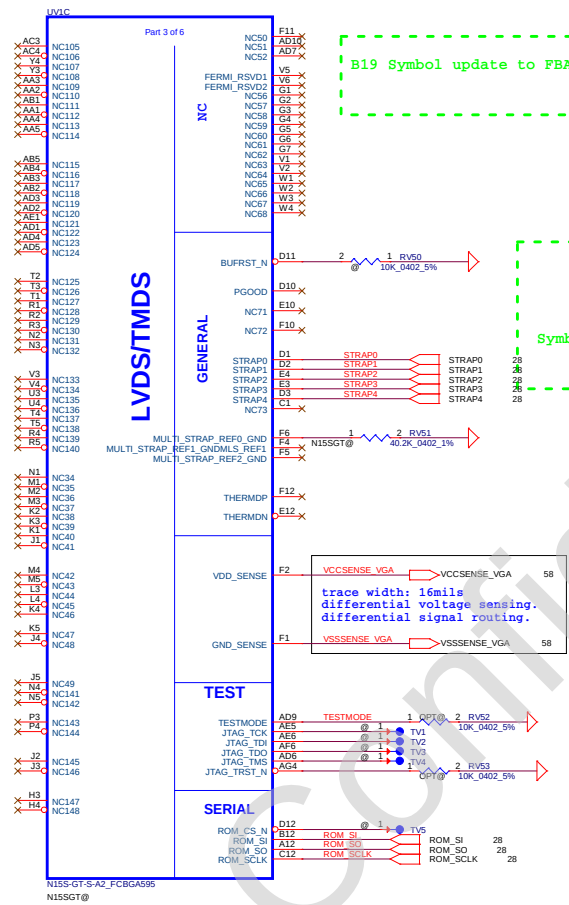
1. all power rail ramp up time should be larger than 40us

N15x Binary Straps

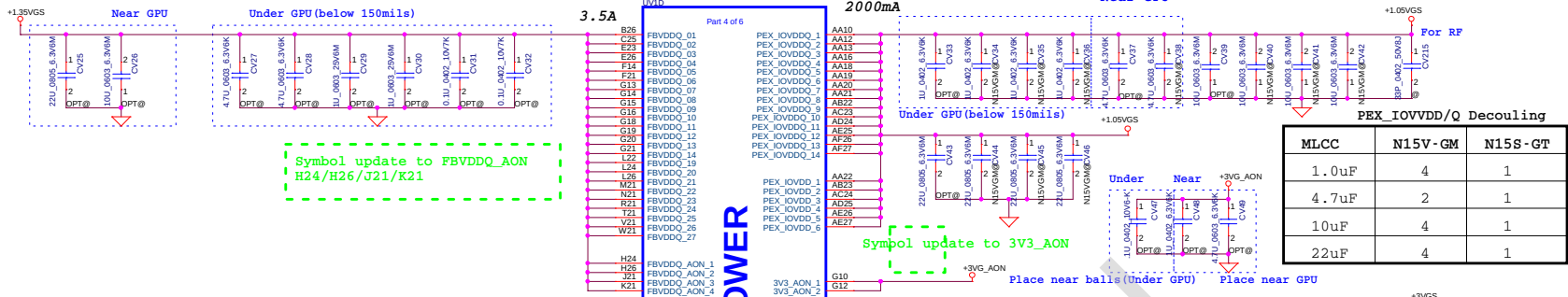
Physical Strapping pin	Power Rail	Strap Mapping
ROM_SCLK	+3VGS	SMB_ALT_ADDR
ROM_SI	+3VGS	SUB_VENDOR
ROM_SO	+3VGS	VGA_DEVICE
STRAP0	+3VGS	RAM_CFG[0]
STRAP1	+3VGS	RAM_CFG[1]
STRAP2	+3VGS	RAM_CFG[2]
STRAP3	+3VGS	RAM_CFG[3]
STRAP4	+3VGS	PCIE_MAX_SPEED

Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			VGA Notes List
Rev	Document Number	Rev	1.0
Date	Thursday, December 26, 2013	Sheet	18 of 59

ACLUA



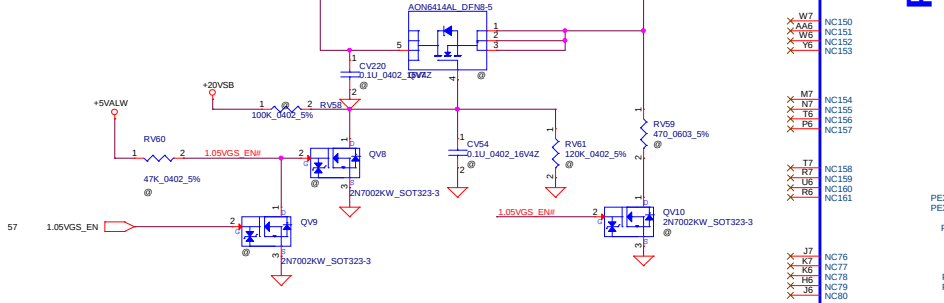
Security Classification		LC Future Center Secret Data		Title	
Issued Date	2013/08/08	Deciphered Date	2013/08/05	N15X_LVDS/HDMI/THERM	
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.					
Sheet	C	Document Number	ACLUA		Rev
Date	Thursday, December 26, 2013	Sheet	20	of	59



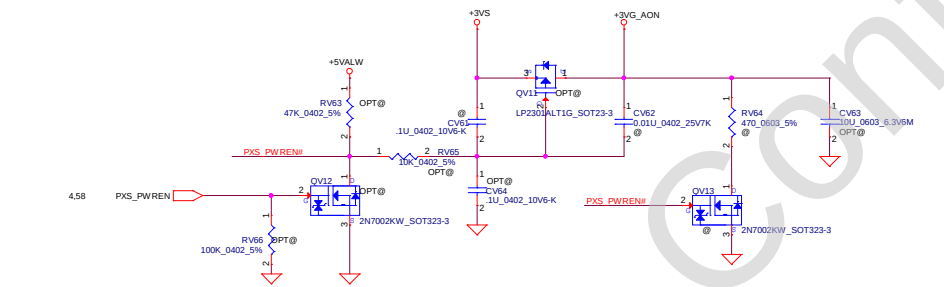
Symbol update to FBVDDQ_AON
H24/H26/J21/K21

Symbol update to 3V3_AON

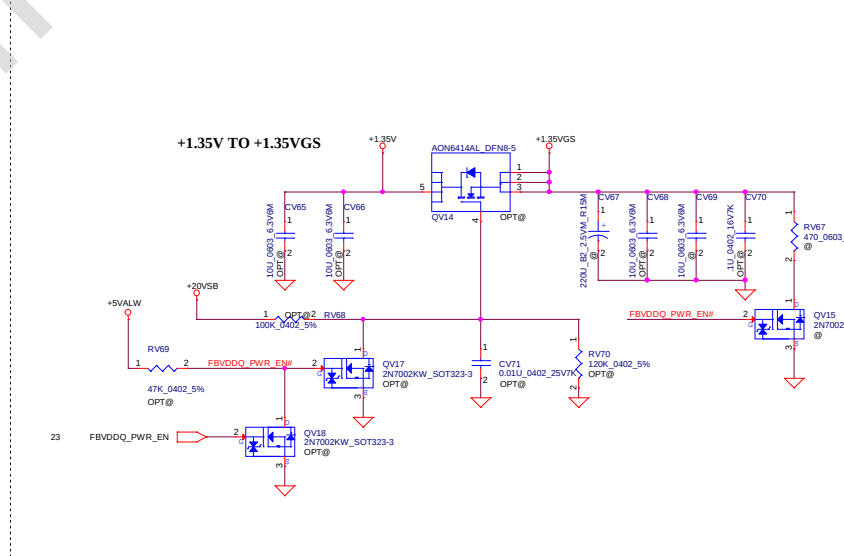
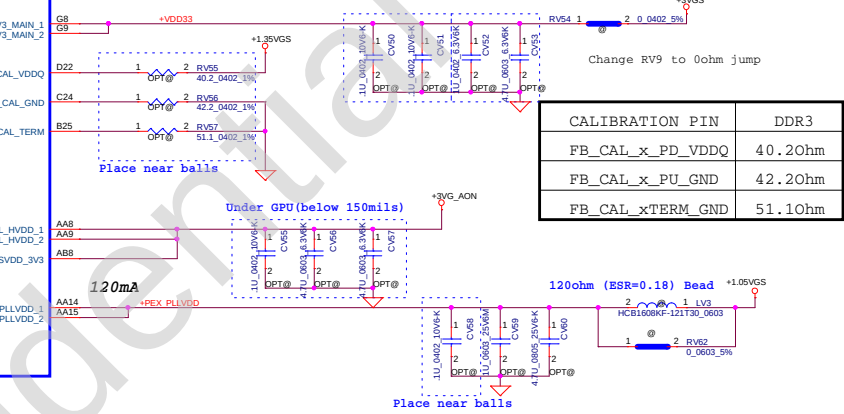
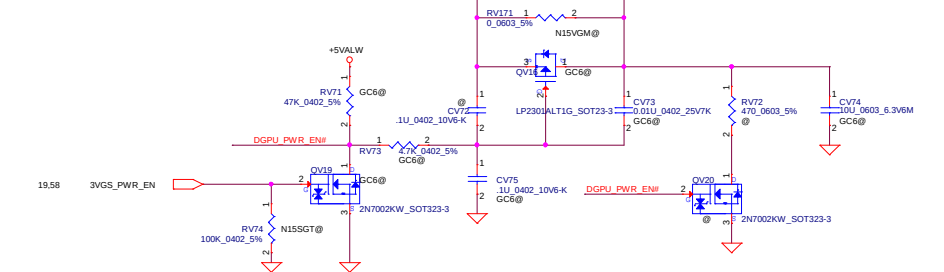
Reserve for GPU +1.05V



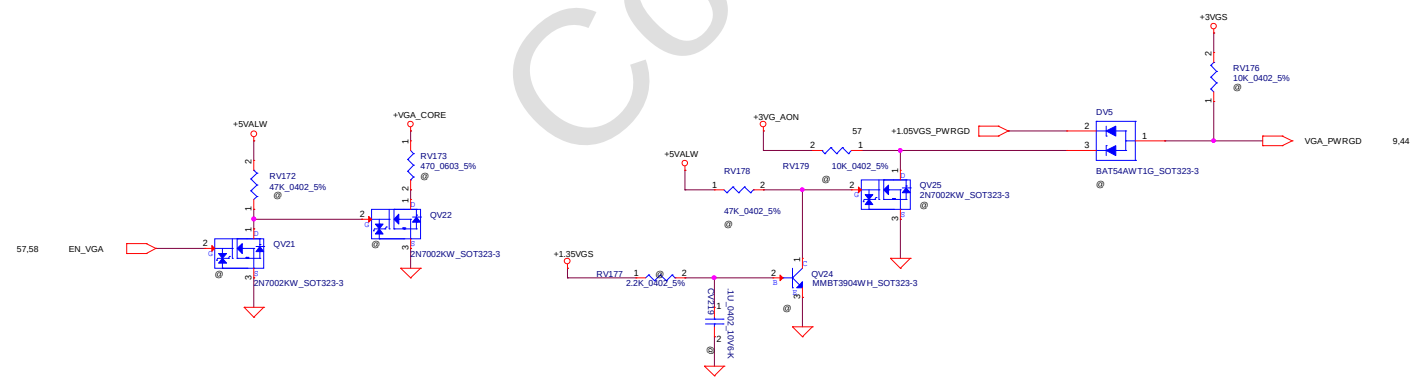
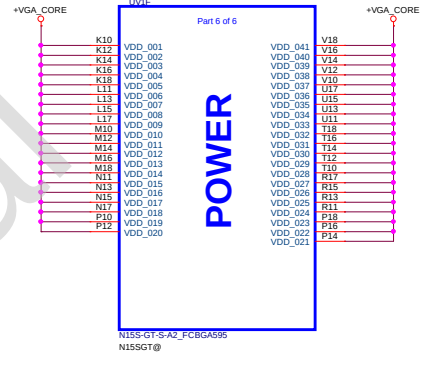
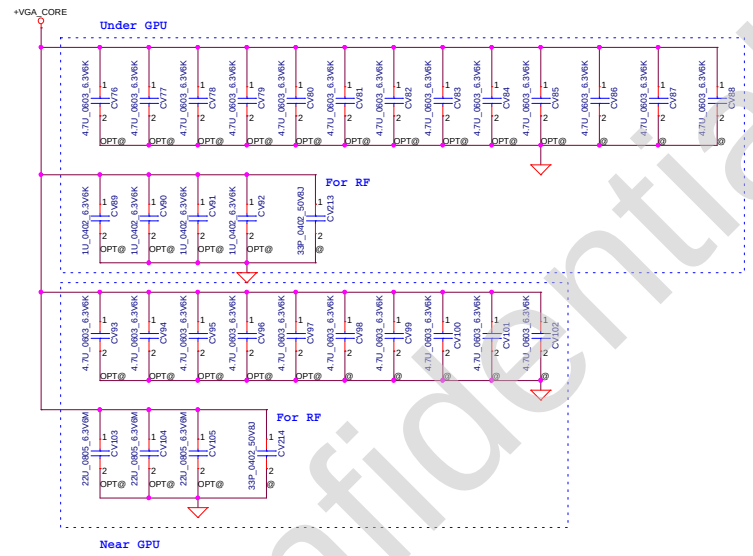
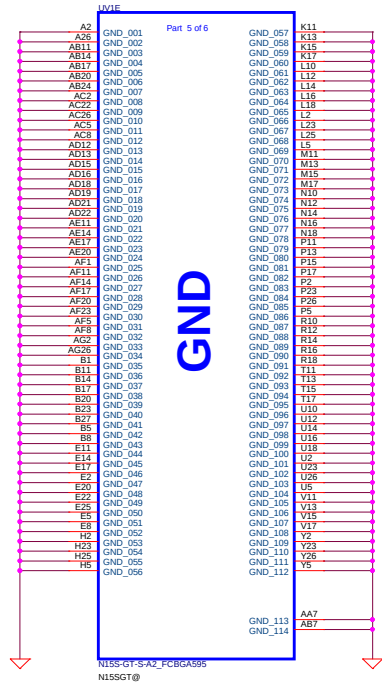
+3.3VS TO +3VG_AON



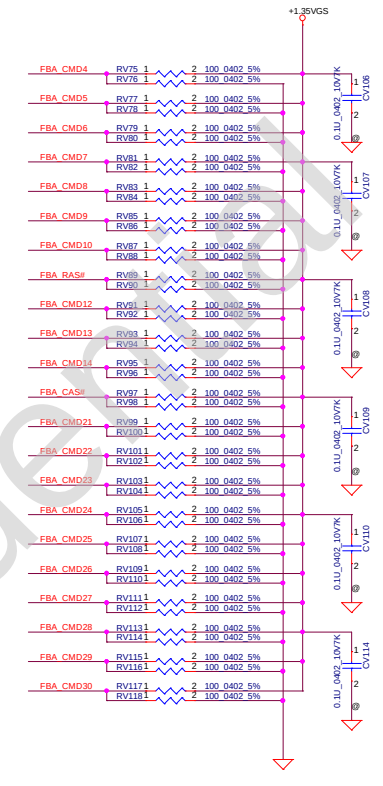
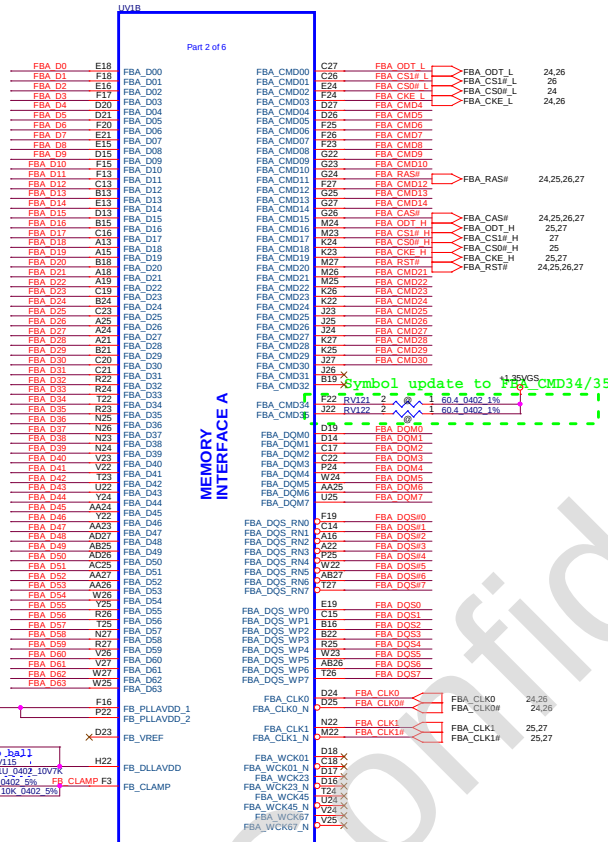
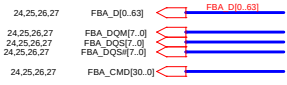
+3.3VS TO +3VGS



Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			N15X_Power
Rev	C	Document Number	1.0
Date:	Thursday, December 26, 2013	Sheet	21 of 59

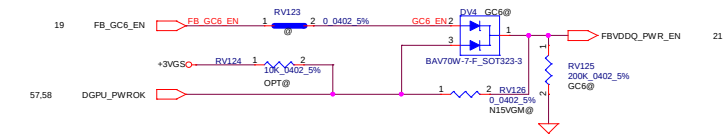
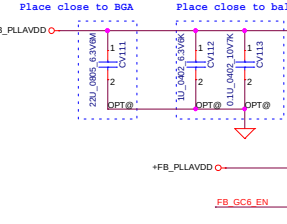
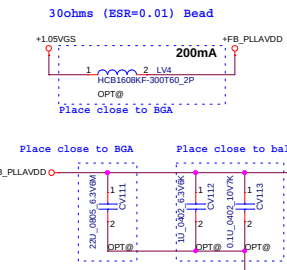


Security Classification		LC Future Center Secret Data		Title	
Issued Date	2013/08/08	Deciphered Date	2013/08/05	N15X_ +VGA CORE, GND	
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR CONSENT OF LC FUTURE CENTER.					
Sheet	C	Document Number	ACLUA		Rev
Date	Thursday, December 26, 2013	Sheet	22	of	59

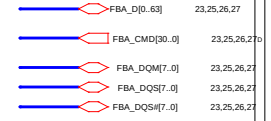
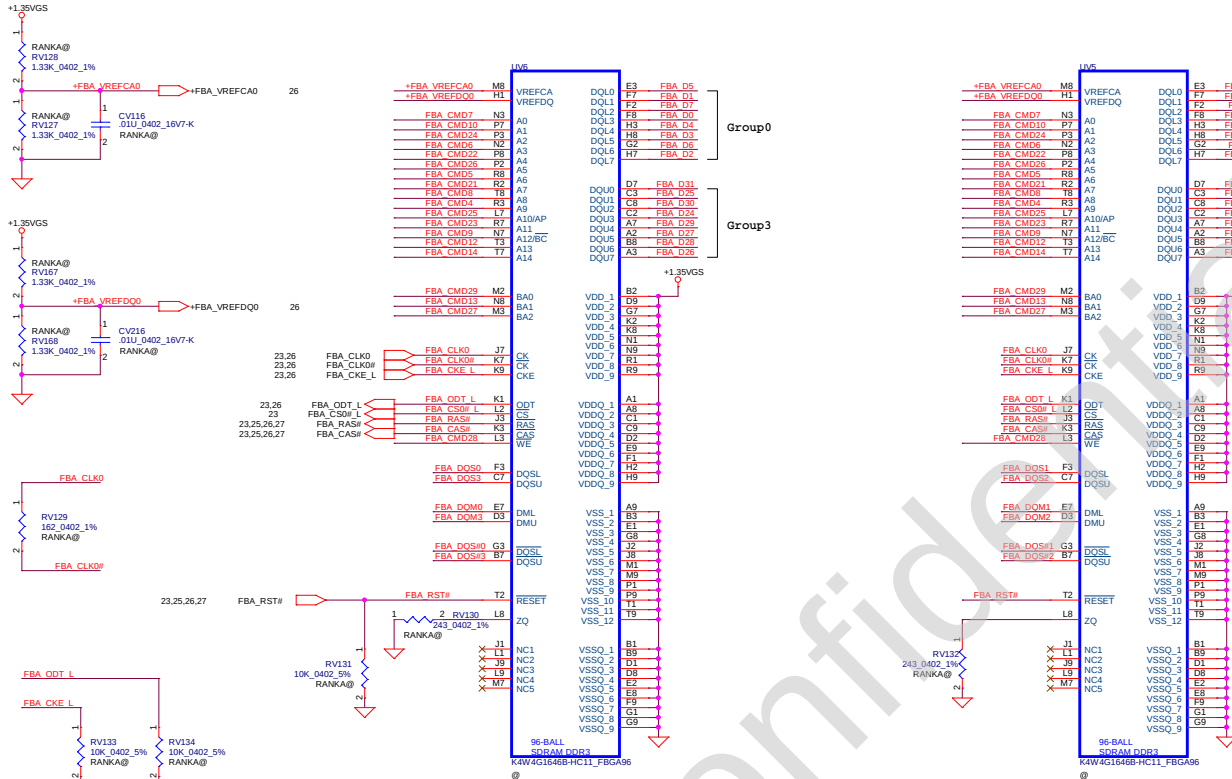


CMD mapping mod Mode E

Address	Rank0		Rank1	
	0..31	32..63	0..31	32..63
Fbx_CMD0	ODT_L		ODT_L	
Fbx_CMD1			CSI#_L	
Fbx_CMD2	CS0#_L			
Fbx_CMD3	CKE_L		CKE_L	
Fbx_CMD4	A9	A9	A11	A11
Fbx_CMD5	A6	A6	A7	A7
Fbx_CMD6	A3	A3	BA1	BA1
Fbx_CMD7	A0	A0	A12	A12
Fbx_CMD8	A8	A8	A8	A8
Fbx_CMD9	A12	A12	A0	A0
Fbx_CMD10	A1	A1	A2	A2
Fbx_CMD11	RAS#	RAS#	RAS#	RAS#
Fbx_CMD12	A13	A13	A14	A14
Fbx_CMD13	BA1	BA1	A3	A3
Fbx_CMD14	A14	A14	A13	A13
Fbx_CMD15	CAS#	CAS#	CAS#	CAS#
Fbx_CMD16			ODT_H	ODT_H
Fbx_CMD17			CSI#_H	CSI#_H
Fbx_CMD18			CS0#_H	
Fbx_CMD19			CKE_H	CKE_H
Fbx_CMD20	RST	RST	RST	RST
Fbx_CMD21	A7	A7	A6	A6
Fbx_CMD22	A4	A4	A5	A5
Fbx_CMD23	A11	A11	A9	A9
Fbx_CMD24	A2	A2	A1	A1
Fbx_CMD25	A10	A10	WE#	WE#
Fbx_CMD26	A5	A5	A4	A4
Fbx_CMD27	BA2	BA2		
Fbx_CMD28	WE#	WE#	A10	A10
Fbx_CMD29	BA0	BA0	BA0	BA0
Fbx_CMD30			BA2	BA2

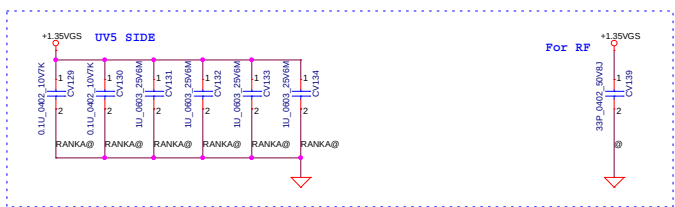
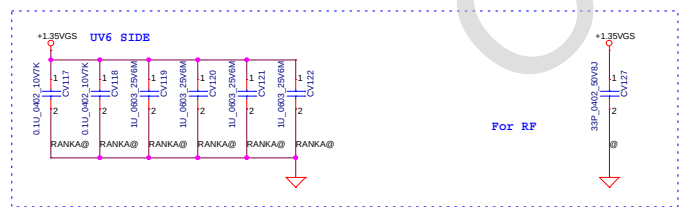


at least 16 mils width(optimal)
20 mils spacing to other signals /planes



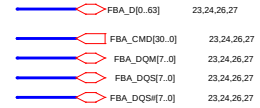
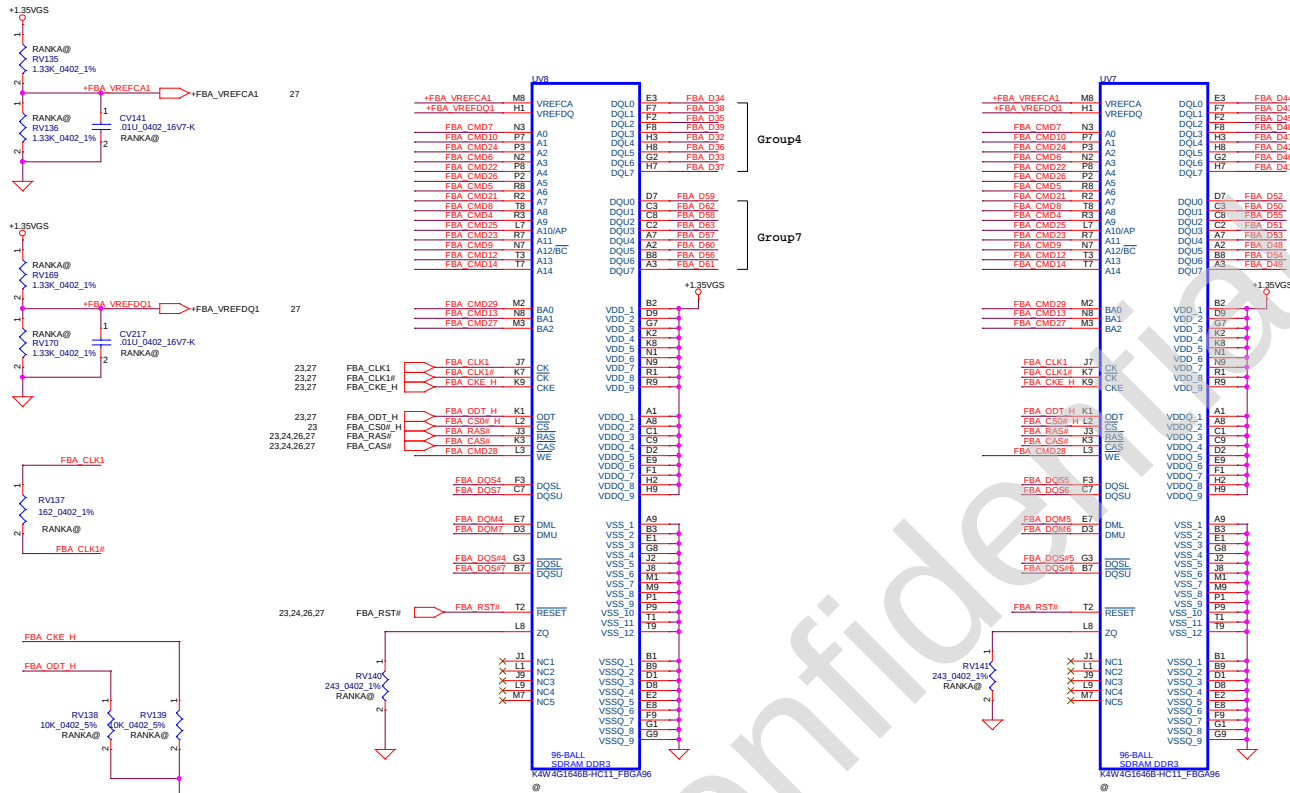
CMD mapping mod Mode E

Address	Rank0		Rank1	
	0..31	32..63	0..31	32..63
FBX_CMD0	ODT_L		ODT_L	
FBX_CMD1			CS1#_L	
FBX_CMD2	CS0#_L			
FBX_CMD3	CKE_L		CKE_L	
FBX_CMD4	A9	A9	A11	A11
FBX_CMD5	A6	A6	A7	A7
FBX_CMD6	A3	A3	BA1	BA1
FBX_CMD7	A0	A0	A12	A12
FBX_CMD8	A8	A8	A8	A8
FBX_CMD9	A12	A12	A0	A0
FBX_CMD10	A1	A1	A2	A2
FBX_CMD11	RAS#	RAS#	RAS#	RAS#
FBX_CMD12	A13	A13	A14	A14
FBX_CMD13	BA1	BA1	A3	A3
FBX_CMD14	A14	A14	A13	A13
FBX_CMD15	CAS#	CAS#	CAS#	CAS#
FBX_CMD16		ODT_H		ODT_H
FBX_CMD17			CS1#_H	
FBX_CMD18		CS0#_H		
FBX_CMD19		CKE_H		CKE_H
FBX_CMD20	RST	RST	RST	RST
FBX_CMD21	A7	A7	A6	A6
FBX_CMD22	A4	A4	A5	A5
FBX_CMD23	A11	A11	A9	A9
FBX_CMD24	A2	A2	A1	A1
FBX_CMD25	A10	A10	WE#	WE#
FBX_CMD26	A5	A5	A4	A4
FBX_CMD27	BA2	BA2		
FBX_CMD28	WE#	WE#	A10	A10
FBX_CMD29	BA0	BA0	BA0	BA0
FBX_CMD30		BA2		BA2



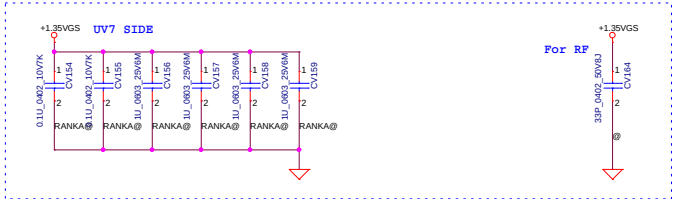
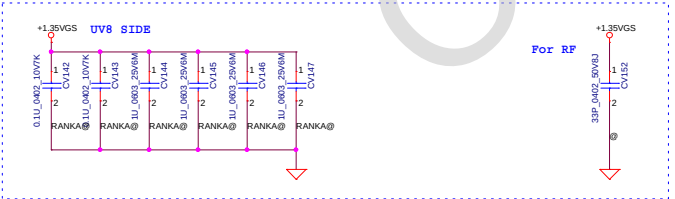
Security Classification		LC Future Center Secret Data		Title	
Issued Date	2013/08/08	Deciphered Date	2013/08/05	DDR3 VRAM Rank0_L	
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.					
Doc No	C	Document Number	ACLUA	Rev	1.0
Date	Thursday, December 26, 2013	Sheet	24	of	59

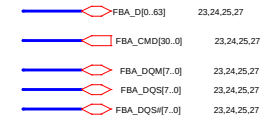
at least 16 mils width(optimal)
20 mils spacing to other signals / planes



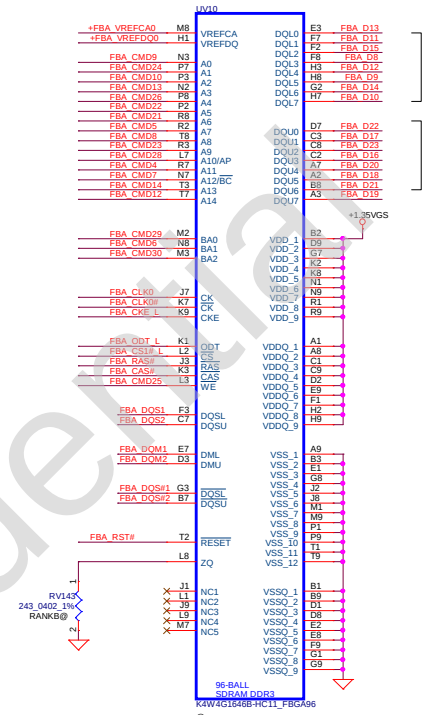
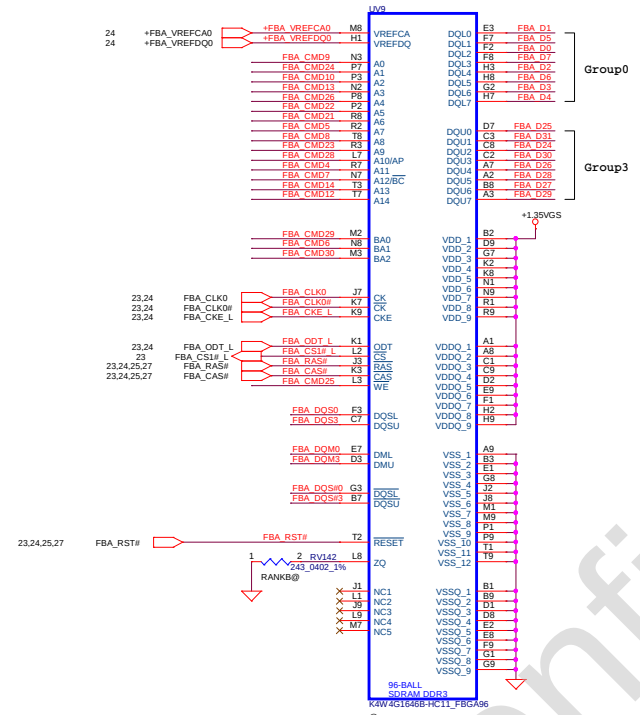
CMD mapping mod Mode E

Address	Rank0	Rank1
Fbx_CMD0	ODT_L	ODT_L
Fbx_CMD1	CS0#_L	CS1#_L
Fbx_CMD2	CS0#_L	CS1#_L
Fbx_CMD3	CKE_L	CKE_L
Fbx_CMD4	A9	A11
Fbx_CMD5	A6	A7
Fbx_CMD6	A3	BA1
Fbx_CMD7	A0	A12
Fbx_CMD8	A8	A8
Fbx_CMD9	A12	A0
Fbx_CMD10	A1	A2
Fbx_CMD11	RAS#	RAS#
Fbx_CMD12	A13	A14
Fbx_CMD13	BA1	A3
Fbx_CMD14	A14	A13
Fbx_CMD15	CAS#	CAS#
Fbx_CMD16	ODT_H	ODT_H
Fbx_CMD17	CS0#_H	CS1#_H
Fbx_CMD18	CS0#_H	CS1#_H
Fbx_CMD19	CKE_H	CKE_H
Fbx_CMD20	RST	RST
Fbx_CMD21	A7	A6
Fbx_CMD22	A4	A5
Fbx_CMD23	A11	A9
Fbx_CMD24	A2	A1
Fbx_CMD25	A10	WE#
Fbx_CMD26	A5	A4
Fbx_CMD27	BA2	BA2
Fbx_CMD28	WE#	A10
Fbx_CMD29	BA0	BA0
Fbx_CMD30	BA2	BA2





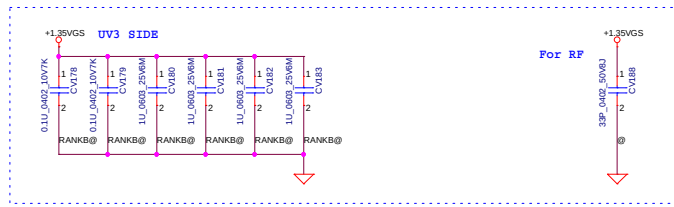
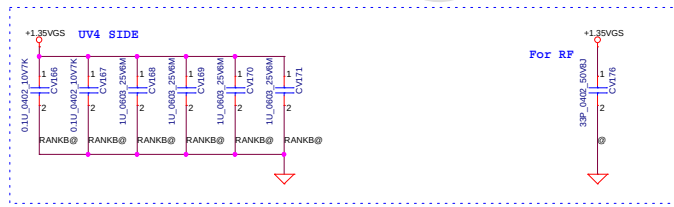
at least 16 mils width(optimal)
20 mils spacing to other signals (planes)



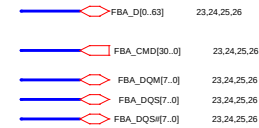
Group1
Group2

CMD mapping mod Mode E

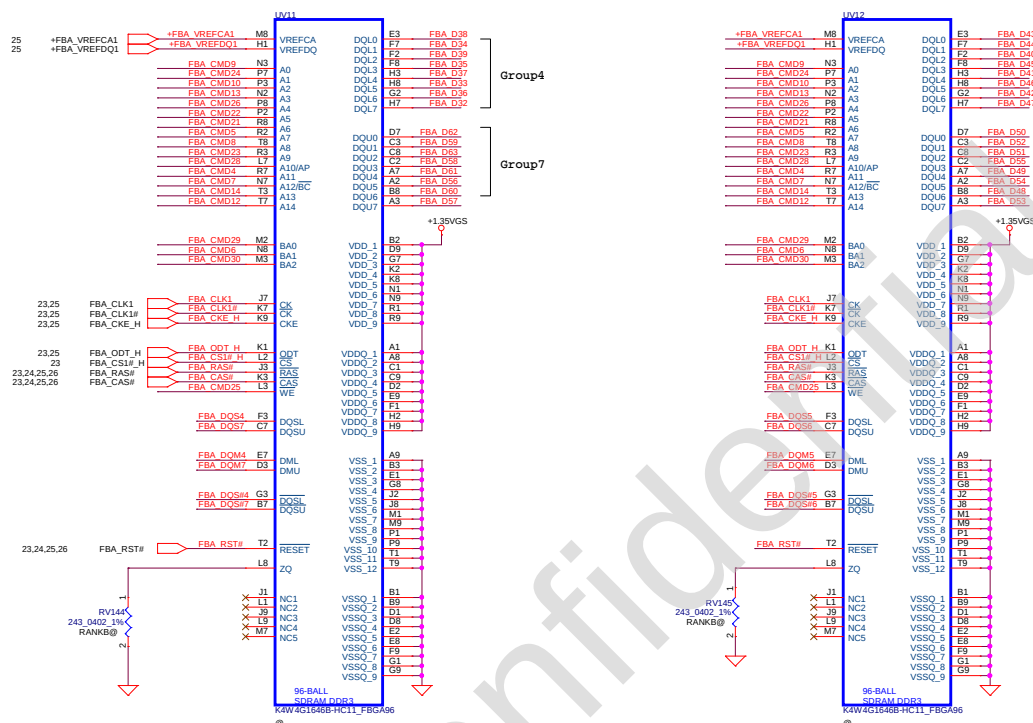
Address	Rank0		Rank1	
	0..31	32..63	0..31	32..63
FBx_CMD0	ODT_L		ODT_L	
FBx_CMD1			CS1#_L	
FBx_CMD2	CS0#_L			
FBx_CMD3			CKE_L	
FBx_CMD4	A9	A9	A11	A11
FBx_CMD5	A6	A6	A7	A7
FBx_CMD6	A3	A3	BA1	BA1
FBx_CMD7	A0	A0	A12	A12
FBx_CMD8	A8	A8	A8	A8
FBx_CMD9	A12	A12	A0	A0
FBx_CMD10	A1	A1	A2	A2
FBx_CMD11	RAS#	RAS#	RAS#	RAS#
FBx_CMD12	A13	A13	A14	A14
FBx_CMD13	BA1	BA1	A3	A3
FBx_CMD14	A14	A14	A13	A13
FBx_CMD15	CAS#	CAS#	CAS#	CAS#
FBx_CMD16		ODT_H		ODT_H
FBx_CMD17				CS1#_H
FBx_CMD18		CS0#_H		
FBx_CMD19		CKE_H		CKE_H
FBx_CMD20	RST	RST	RST	RST
FBx_CMD21	A7	A7	A6	A6
FBx_CMD22	A4	A4	A5	A5
FBx_CMD23	A11	A11	A9	A9
FBx_CMD24	A2	A2	A1	A1
FBx_CMD25	A10	A10	WE#	WE#
FBx_CMD26	A5	A5	A4	A4
FBx_CMD27	BA2	BA2		
FBx_CMD28	WE#	WE#	A10	A10
FBx_CMD29	BA0	BA0	BA0	BA0
FBx_CMD30			BA2	BA2



Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			Document Number ACLUA Date: Thursday, December 26, 2013 Sheet 26 of 59

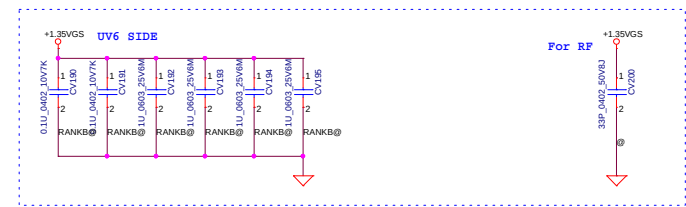


at least 16 mils width(optimal)
20 mils spacing to other signals/planes

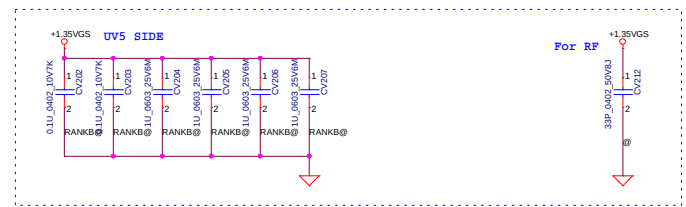


CMD mapping mod Mode E

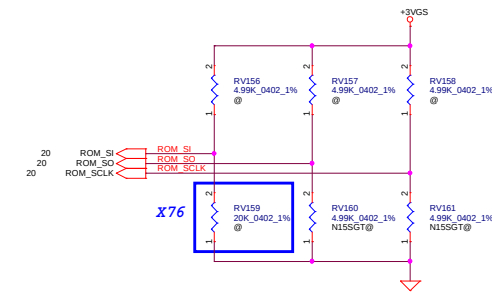
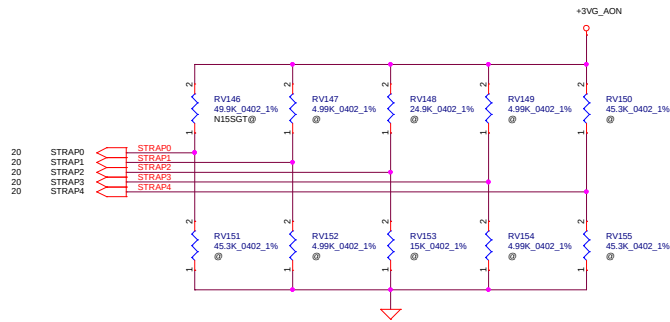
Address	Rank0		Rank1	
	0..31	32..63	0..31	32..63
Fbx_CMD0	ODT_L		ODT_L	
Fbx_CMD1			CS1#_L	
Fbx_CMD2	CS0#_L			
Fbx_CMD3			CKE_L	
Fbx_CMD4	A9	A9	A11	A11
Fbx_CMD5	A6	A6	A7	A7
Fbx_CMD6	A3	A3	BA1	BA1
Fbx_CMD7	A0	A0	A12	A12
Fbx_CMD8	A8	A8	A8	A8
Fbx_CMD9	A12	A12	A0	A0
Fbx_CMD10	A1	A1	A2	A2
Fbx_CMD11	RAS#	RAS#	RAS#	RAS#
Fbx_CMD12	A13	A13	A14	A14
Fbx_CMD13	BA1	BA1	A3	A3
Fbx_CMD14	A14	A14	A13	A13
Fbx_CMD15	CAS#	CAS#	CAS#	CAS#
Fbx_CMD16		ODT_H		ODT_H
Fbx_CMD17			CS1#_H	
Fbx_CMD18		CS0#_H		
Fbx_CMD19		CKE_H		CKE_H
Fbx_CMD20	RST	RST	RST	RST
Fbx_CMD21	A7	A7	A6	A6
Fbx_CMD22	A4	A4	A5	A5
Fbx_CMD23	A11	A11	A9	A9
Fbx_CMD24	A2	A2	A1	A1
Fbx_CMD25	A10	A10	WE#	WE#
Fbx_CMD26	A5	A5	A4	A4
Fbx_CMD27	BA2	BA2		
Fbx_CMD28	WE#	WE#	A10	A10
Fbx_CMD29	BA0	BA0	BA0	BA0
Fbx_CMD30			BA2	BA2



For RP



For RP



Physical Strapping pin	Power Rail	Logical Strapping Bit3	Logical Strapping Bit2	Logical Strapping Bit1	Logical Strapping Bit0
ROM_SCLK	+3VGS	SOR3_EXPOSED	SOR2_EXPOSED	SOR1_EXPOSED	SOR0_EXPOSED
ROM_SI	+3VGS	RAM_CFG[3]	RAM_CFG[2]	RAM_CFG[1]	RAM_CFG[0]
ROM_SO	+3VGS	DEVID_SEL	PCIE_CFG	SMB_ALT_ADDR	VGA_DEVICE
STRAP0	+3VGS	Reserved(keep pull-up and pull-down footprint and stuff 50Kohm pull-up)			
STRAP1	+3VGS	Reserved(keep pull-up and pull-down footprint and not stuff by default)			
STRAP2	+3VGS	Reserved(keep pull-up and pull-down footprint and not stuff by default)			
STRAP3	+3VGS	Reserved(keep pull-up and pull-down footprint and not stuff by default)			
STRAP4	+3VGS	Reserved(keep pull-up and pull-down footprint and not stuff by default)			

Resistor Values	Pull-up to +3VGS	Pull-down to Gnd
4.99K	1000	0000
10K	1001	0001
15K	1010	0010
20K	1011	0011
24.9K	1100	0100
30.1K	1101	0101
34.8K	1110	0110
45.3K	1111	0111

DEVID_SEL	
0	(Default)
1	

PCIE_CFG	
0	(Default)
1	

SMBUS_ALT_ADDR	
0	0x9E (Default)
1	0x9C (Multi-GPU usage)

VGA_DEVICE	
0	3D Device (Class Code 302h)
1	VGA Device (Default)

Physical Strapping pin	Power Rail	Strap Mapping
ROM_SCLK	+3VGS	SMB_ALT_ADDR
ROM_SI	+3VGS	SUB_VENDOR
ROM_SO	+3VGS	VGA_DEVICE
STRAP0	+3VGS	RAM_CFG[0]
STRAP1	+3VGS	RAM_CFG[1]
STRAP2	+3VGS	RAM_CFG[2]
STRAP3	+3VGS	RAM_CFG[3]
STRAP4	+3VGS	PCIE_MAX_SPEED

VRAM	X76	VRAM P/N
Samsung	X76409JVL01	SA000058H10
	X76409JVL51 (1G 32Mx16)	
Micron	X76409JVL02	SA00005M100
	X76409JVL02 (2G 64Mx32)	
Hynix		

X76

GPU	FB Memory (DDR3)	ROM_SI	ROM_SO	ROM_SCLK	STRAP0	STRAP1	STRAP2	STRAP3	STRAP4
N158-GT	Hynix 900MHz H5TCG63AFR-11C 256M x 16	0x3 PD 20K	PD 4.99K	PD 4.99K	PU 49.9K	Un-stuff	Un-stuff	Un-stuff	Un-stuff
	Micron 900MHz MT41J7256M16HA-093G:E 256M x 16	0x4 PD 24.9K							
	Samsung 900MHz K4W4G1646D-BC1A 256M x 16	0x5 PD 30.1K							

GPU	FB Memory (DDR3)	STRAP3	STRAP2	STRAP1	STRAP0	STRAP4	ROM_SI	ROM_SO	ROM_SCLK
N15V-GM	Hynix 900MHz H5TCG63AFR-11C 256M x 16	PD 10K	PU 10K	PD 10K	PD 10K	PD 10K	PD 10K	PD 10K	PD 10K
	Micron 900MHz MT41J7256M16HA-093G:E 256M x 16	PU 10K	PU 10K	PD 10K	PU 10K				

Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			N15X_MISC
Sheet	Document Number	Date	Rev
C	ACLUA	Thursday, December 26, 2013	1.0
			28 of 59

Confidential

Security Classification	LC Future Center Secret Data			Title	Blank		
Issued Date	2013/08/08	Deciphered Date	2013/08/05	Size	Document Number	Rev	
<small>THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.</small>				Custom	ACLUA	1.0	
				Date:	Thursday, December 26, 2013		Sheet

Confidential

Security Classification	LC Future Center Secret Data			Title		
Issued Date	2013/08/08	Deciphered Date	2013/08/05	Blank		
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.				Size Custom	Document Number ACLUA	Rev 1.0
				Date:	Thursday, December 26, 2013	Sheet 30 of 59

Confidential

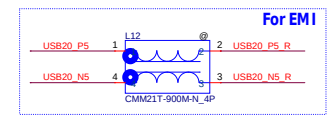
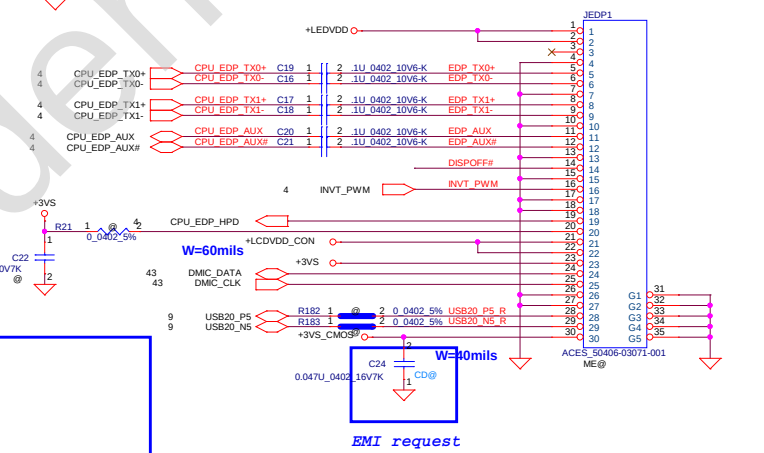
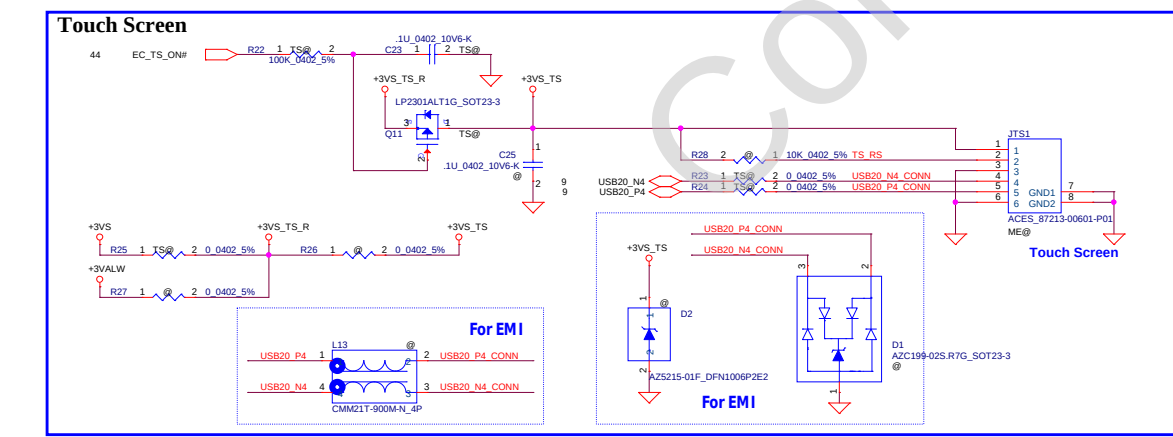
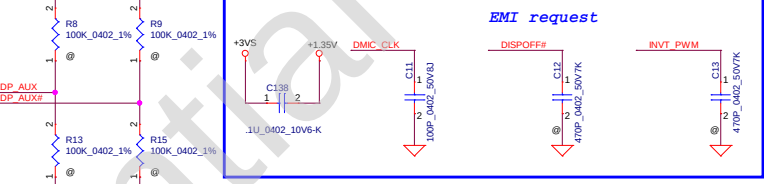
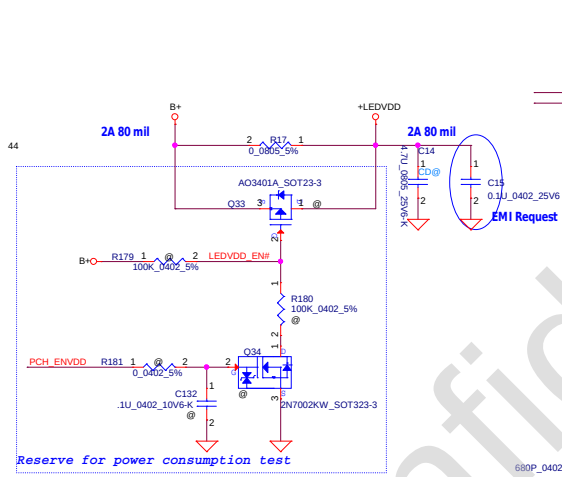
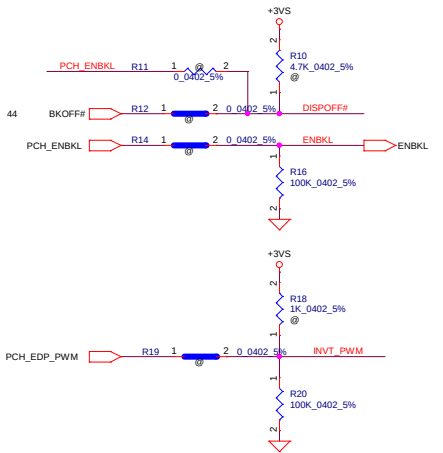
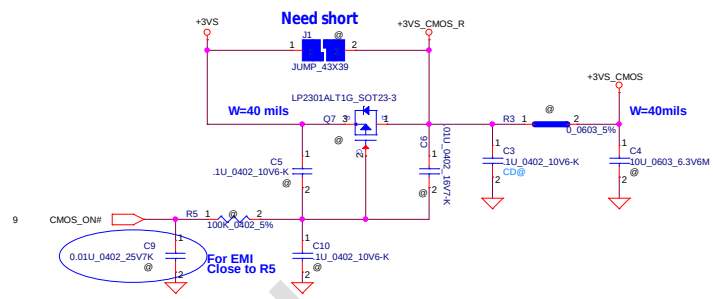
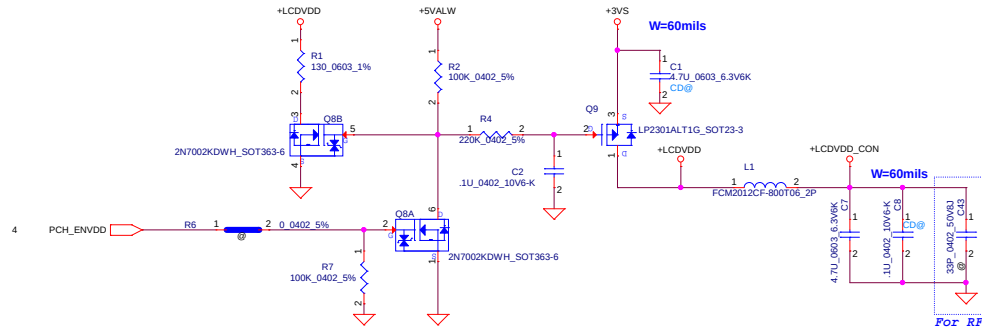
Security Classification	LC Future Center Secret Data			Title		
Issued Date	2013/08/08	Deciphered Date	2013/08/05	Blank		
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.				Size Custom	Document Number ACLUA	Rev 1.0
				Date:	Thursday, December 26, 2013	Sheet 31 of 59

Confidential

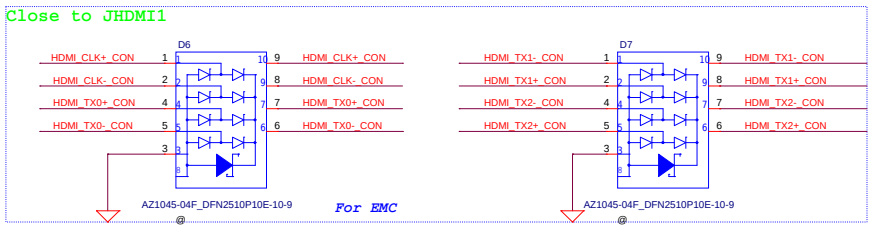
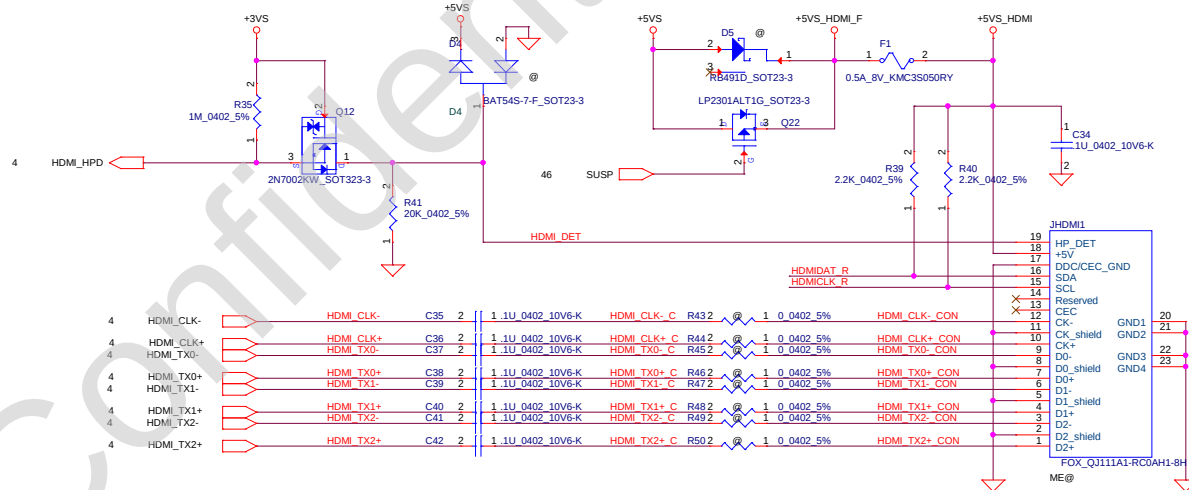
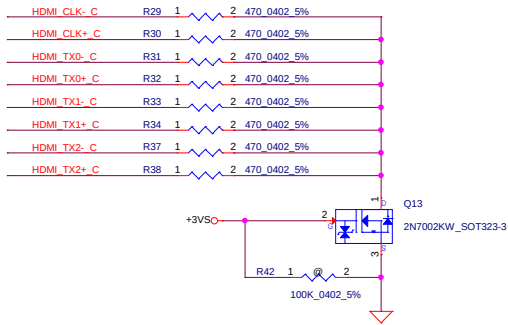
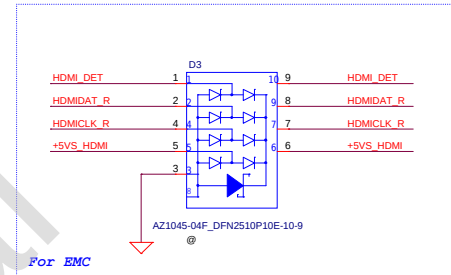
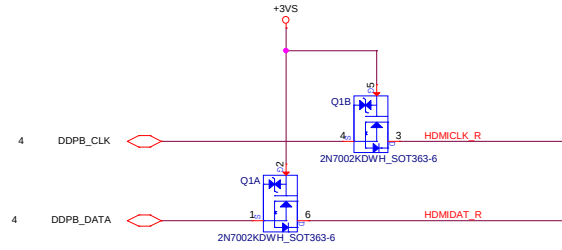
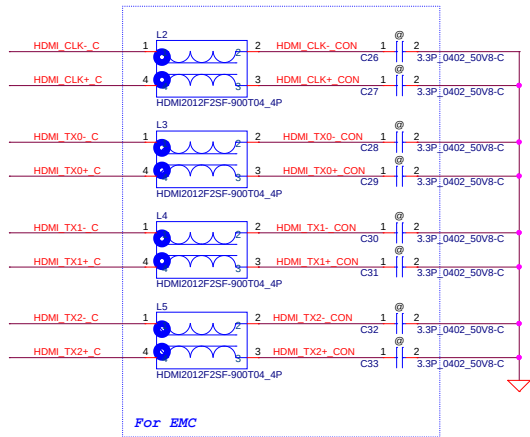
Security Classification	LC Future Center Secret Data			Title		
Issued Date	2013/08/08	Deciphered Date	2013/08/05	Blank		
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.				Size Custom	Document Number ACLUA	Rev 1.0
				Date:	Thursday, December 26, 2013	Sheet 32 of 59

LCD POWER CIRCUIT

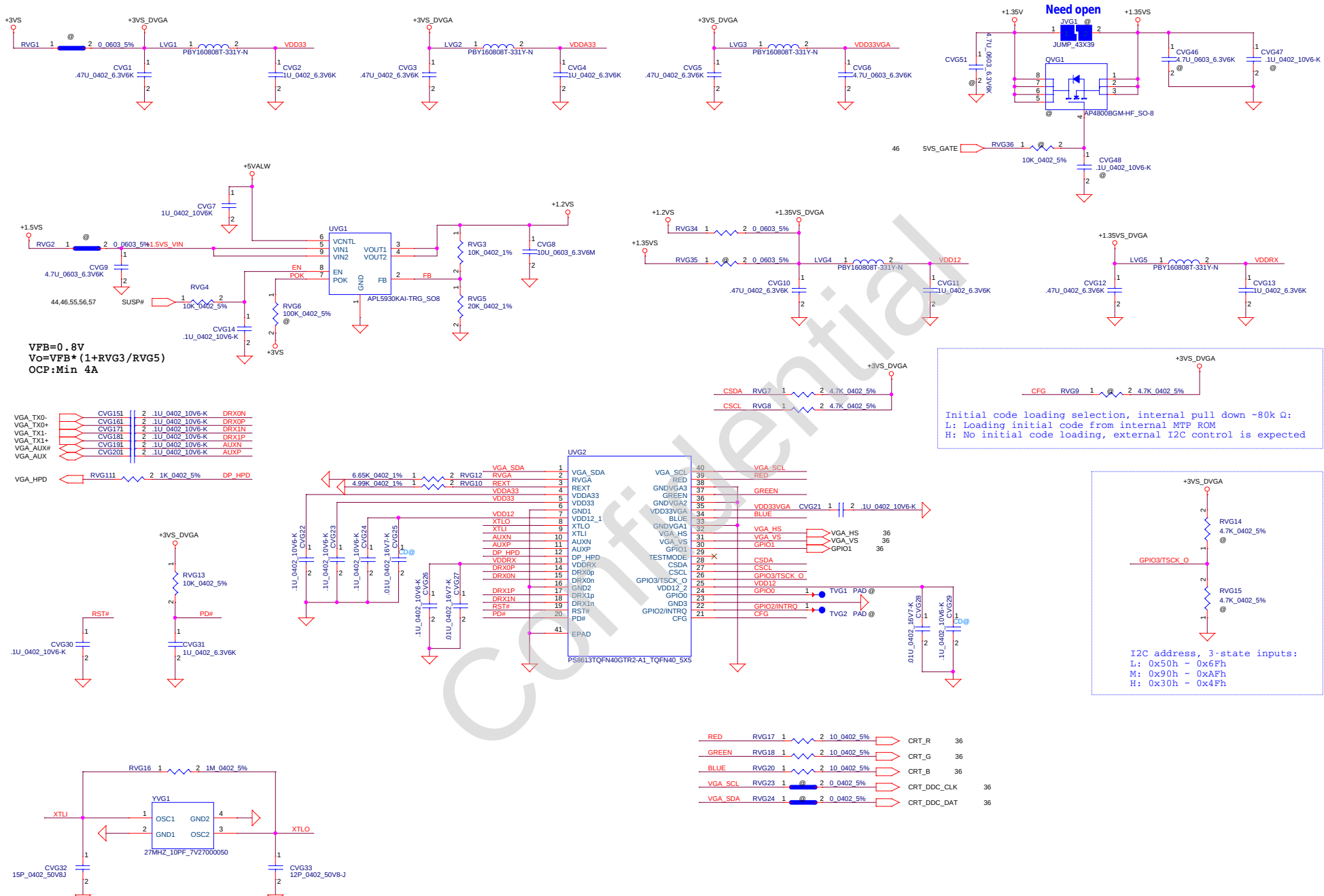
CMOS Camera



Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF RA DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			Document Number Customer ACLUA Date Thursday, December 26, 2013
			Rev 1.0 Sheet 33 of 59

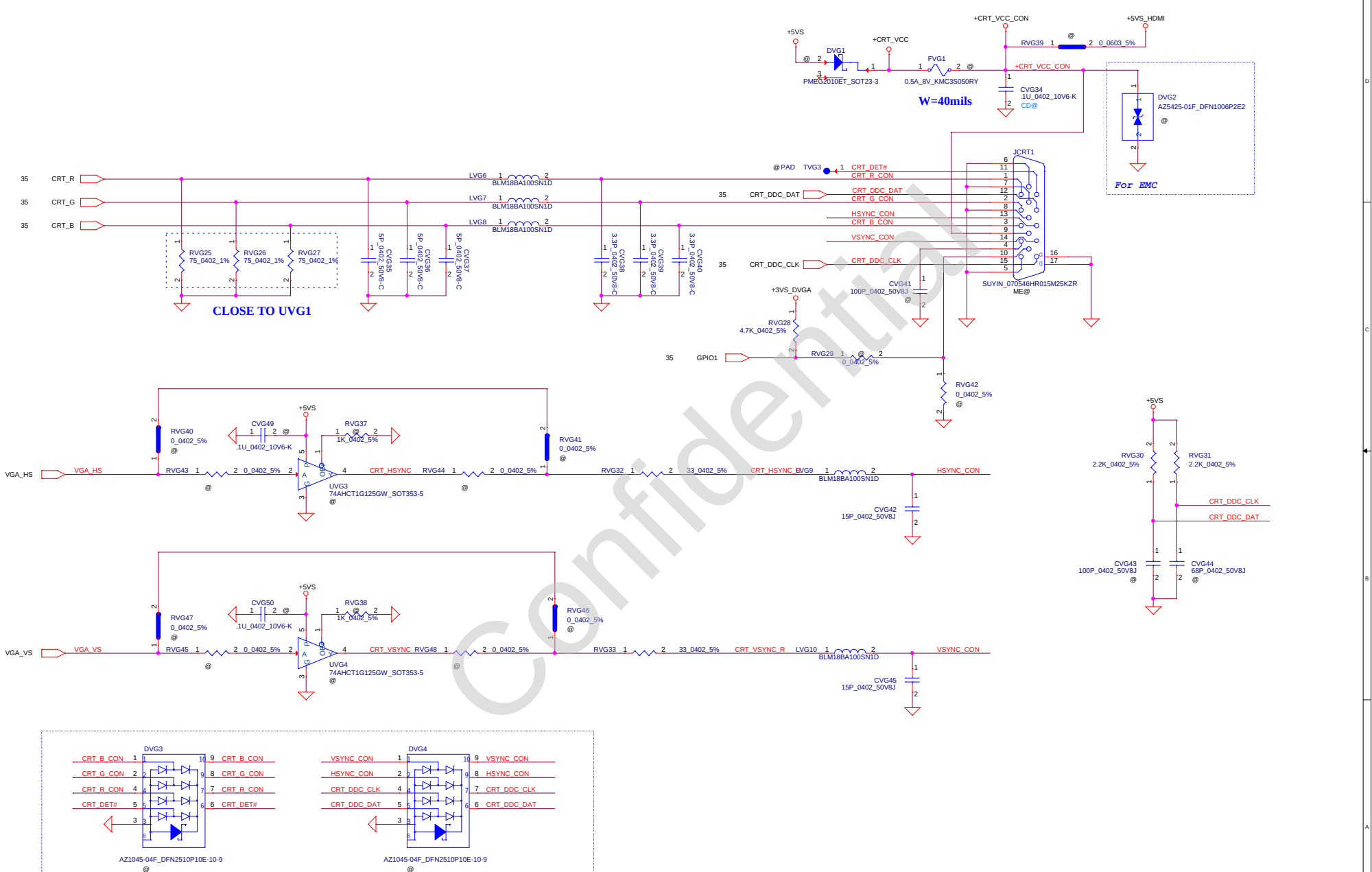


Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			Size Custom
			Document Number ACLUA
			Rev 1.0
			Date: Thursday, December 26, 2013 Sheet 34 of 59



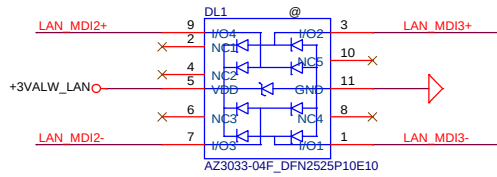
Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSMITTED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			Size Custom
			Document Number ACLUA
			Rev 1.0
			Date: Thursday, December 26, 2013 Sheet 35 of 59

CRT Connector

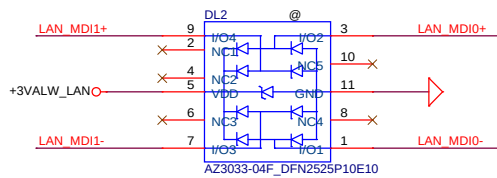


Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
<small>THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.</small>			Size: Custom Document Number: ACLUA Date: Thursday, December 26, 2013 [Sheet 36 of 59]

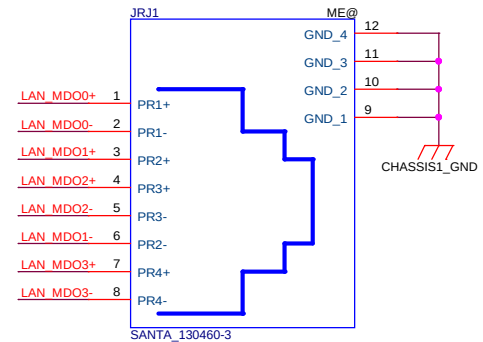
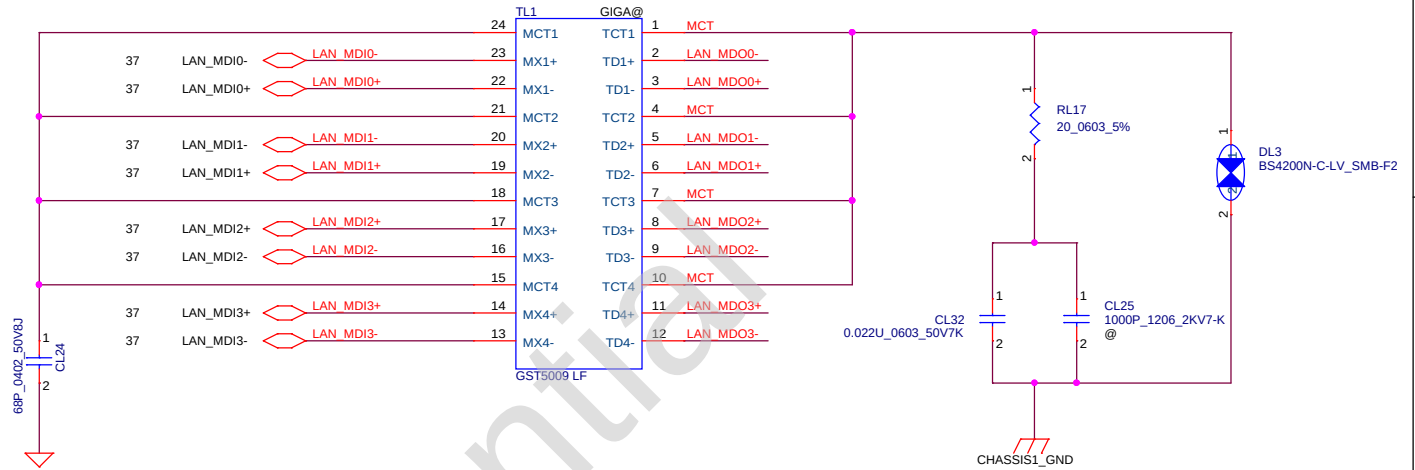
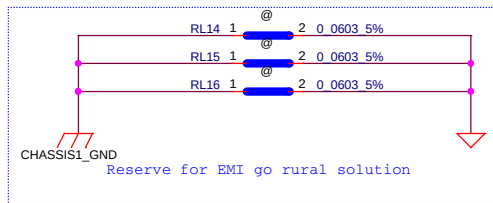
DL1/DL2
1'S PN:SC30003M00



Place Close to TL1



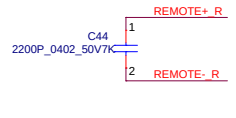
Place Close to TL2



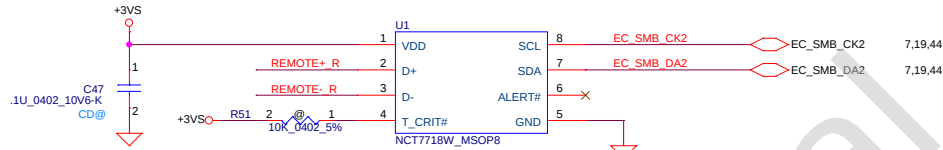
Security Classification	LC Future Center Secret Data		Title	
Issued Date	2013/08/08	Deciphered Date	2013/08/05	
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.				
Size	Document Number			Rev
	ACLJA			1.0
Date:	Friday, December 27, 2013	Sheet	38	of 59

Confidential

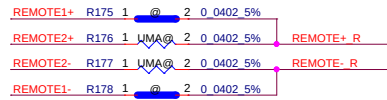
Close to U1



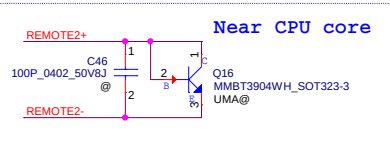
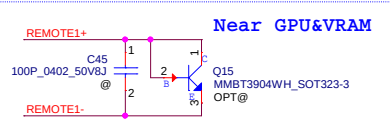
SMSC thermal sensor placed near DIMM



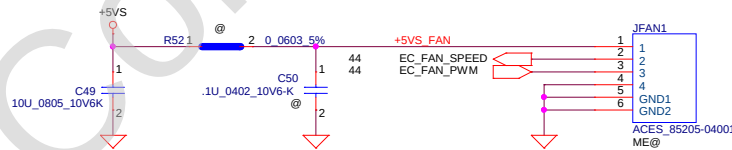
Address 1001_100xb



REMOTE+/-_R, REMOTE1+/-_R, REMOTE2+/-_R:
Trace width/space:10/10 mil
Trace length:<8"

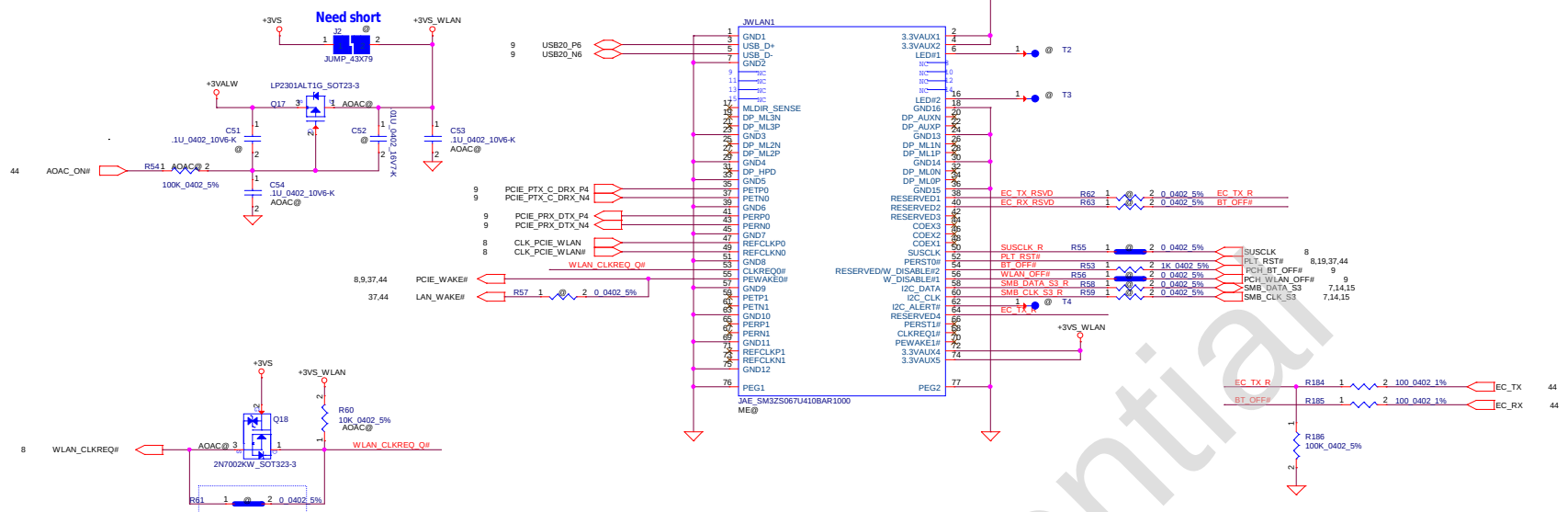


FAN Conn



Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			Thermal sensor/FAN CONN Size: Custom Document Number: ACLUA Date: Thursday, December 26, 2013 Sheet: 39 of 59 Rev: 1.0

Mini-Express Card(WLAN/WiMAX)

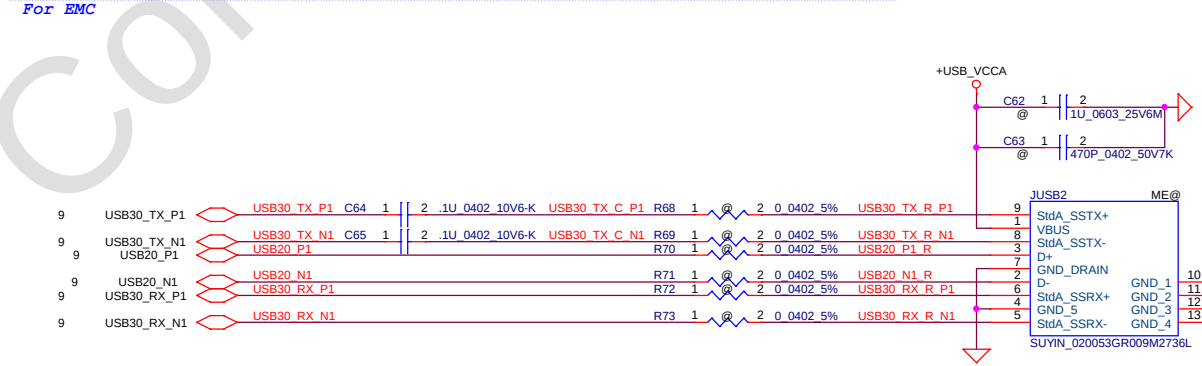
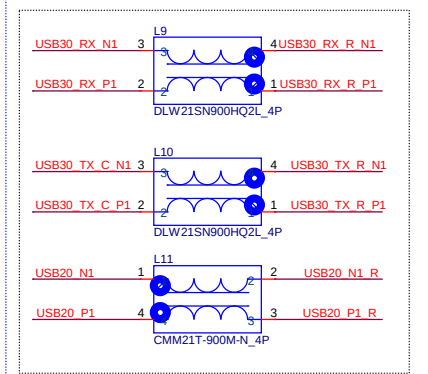
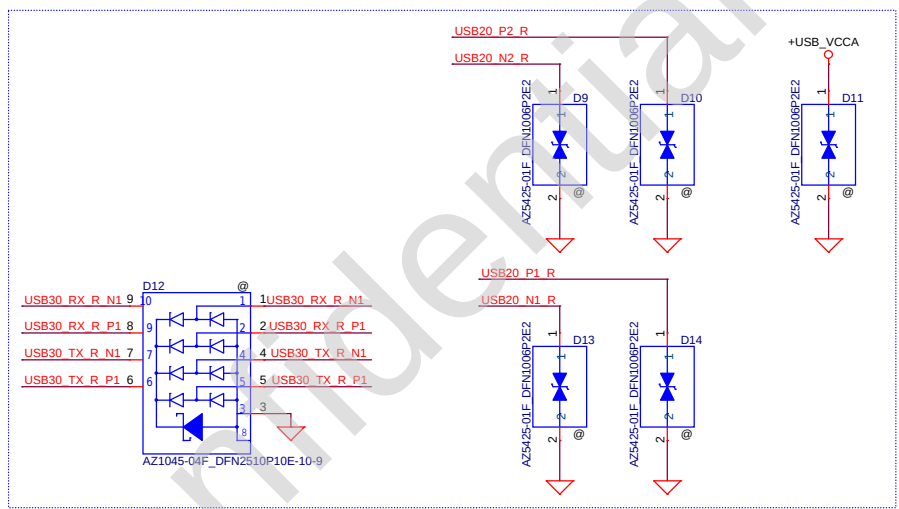
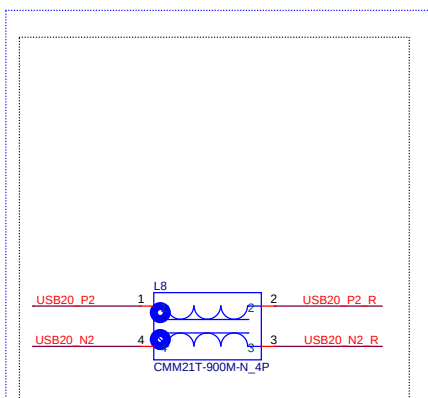
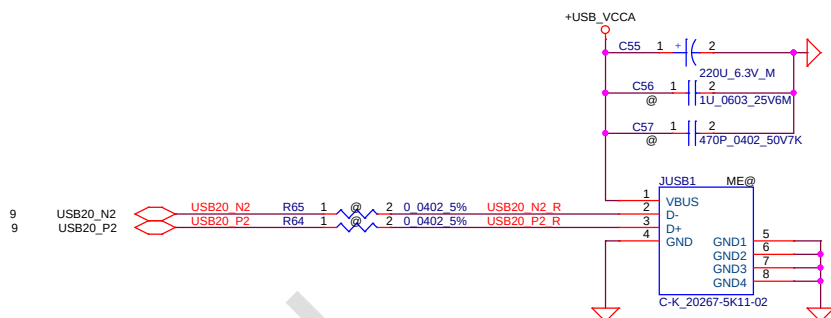
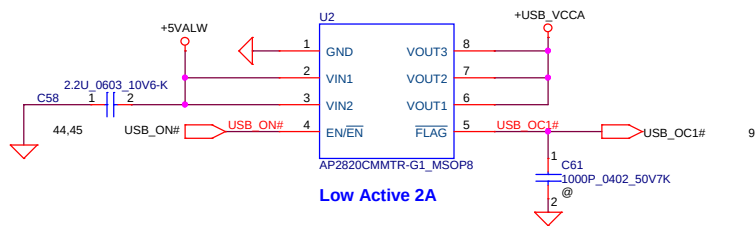


If support AOAC, NC R61;
if not support AOAC, stuff R61.

Confidential

Security Classification		LC Future Center Secret Data		Title	
Issued Date	2013/08/08	Deciphered Date	2013/08/05	NGFF WLAN	
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.				Doc Number	Rev
				ACLUA	1.0
				Date	Thursday, December 26, 2013
				Sheet	40 of 59

LEFT SIDE USB3.0 PORT X2

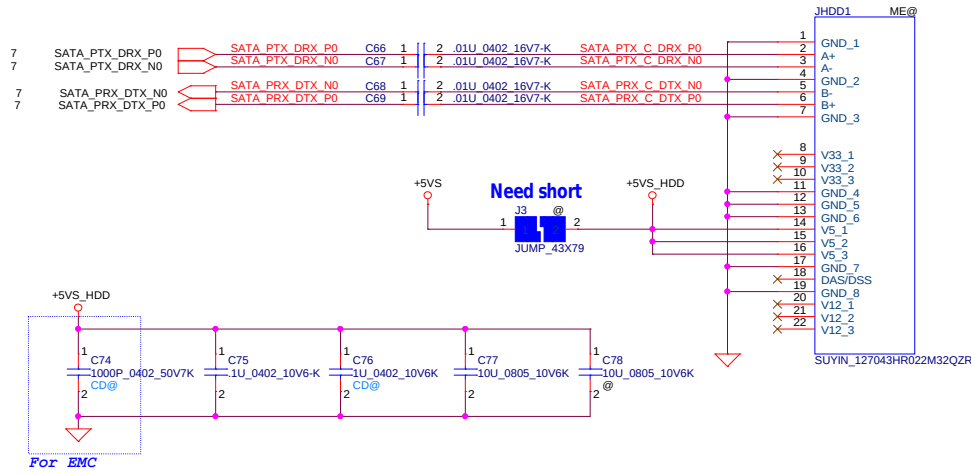


For EMC

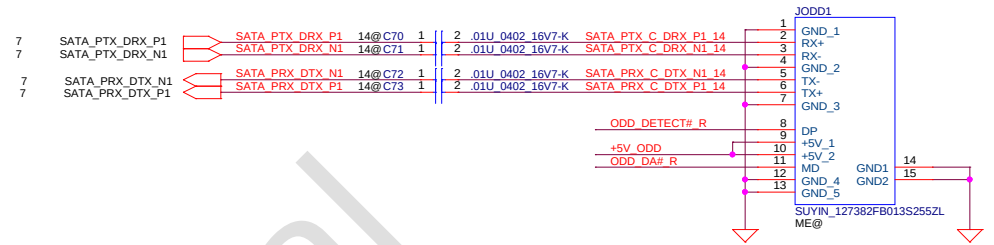
For EMC

Security Classification		LC Future Center Secret Data		Title	
Issued Date	2013/08/08	Deciphered Date	2013/08/05	USB2.0/USB3.0 PORT (LEFT)	
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.					
Size	Document Number	Rev		1.0	
Custom	ACLUA				
Date:	Thursday, December 26, 2013	Sheet	41	of	59

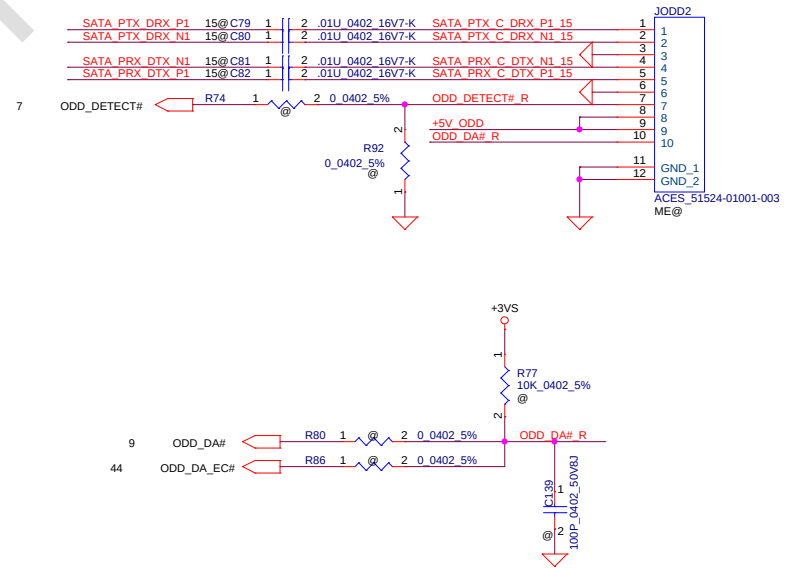
SATA HDD Conn.



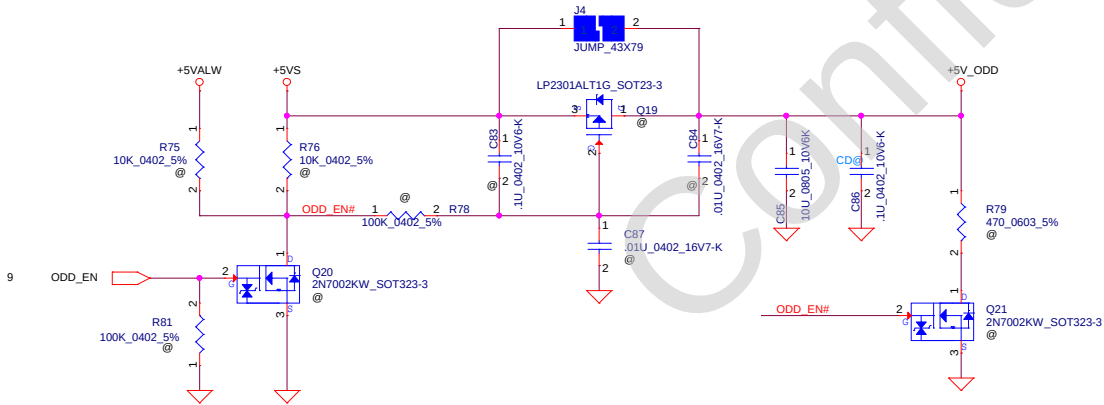
FOR 14" SATA ODD Conn.



FOR 15" SATA ODD FFC Conn

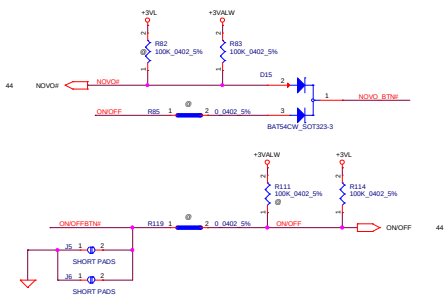


Need open



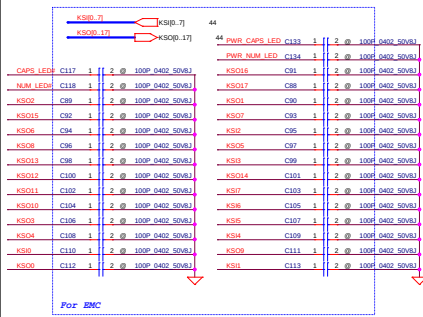
Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			
Size	Document Number	Rev	1.0
Custom	ACLJA		
Date:	Thursday, December 26, 2013	Sheet	42 of 59

ON/OFF switch



TP/B Connector

K/B Connector

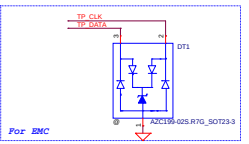
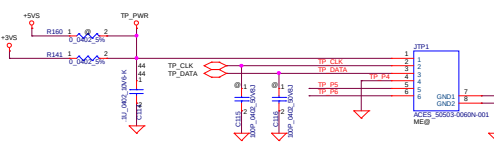


For EMC

14"

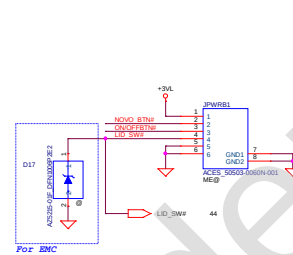
15"

	14"	15"
KB_1	KB14_14	KB01_15
KB_2	KB17_14	KB12_15
KB_3	KB16_14	KB11_15
KB_4	KB09_14	KB05_15
KB_5	KB14_14	KB01_15
KB_6	KB15_14	KB10_15
KB_7	KB06_14	KB04_15
KB_8	KB12_14	KB07_15
KB_9	KB13_14	KB08_15
KB_10	KB05_14	KB02_15
KB_11	KB01_14	KB06_15
KB_12	KB10_14	KB03_15
KB_13	KB02_14	KB012_15
KB_14	KB04_14	KB013_15
KB_15	KB07_14	KB014_15
KB_16	KB08_14	KB011_15
KB_17	KB06_14	KB010_15
KB_18	KB03_14	KB015_15
KB_19	KB012_14	KB016_15
KB_20	KB01_14	KB017_15
KB_21	KB04_14	KB_LED_PWR_15
KB_22	KB011_14	CAPS_LED_15
KB_23	KB010_14	VDD_15
KB_24	KB015_14	NRN_LED_15



For EMC

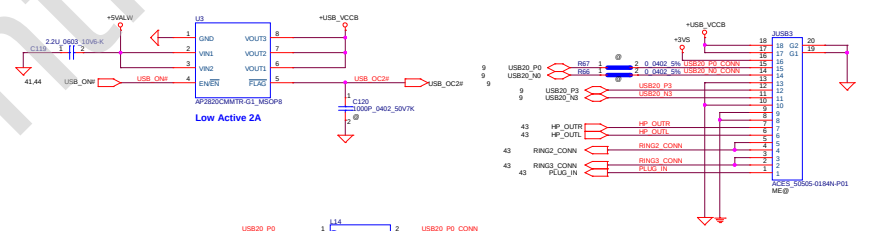
PWR/B Connector



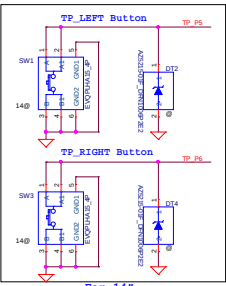
For EMC

USB I/O Connector

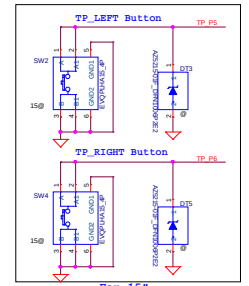
Right Side USB2.0 Port X1 (USB/B)



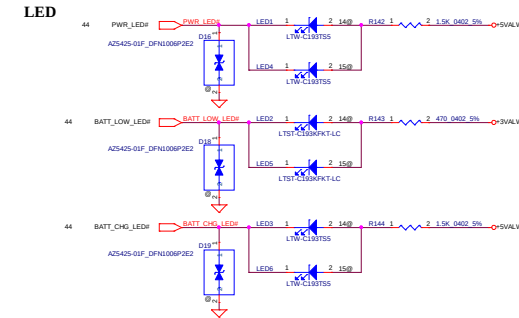
For 14"	For 15"
1	VDD
2	CLK
3	DAT
4	GND
5	TP - L
6	TP - R



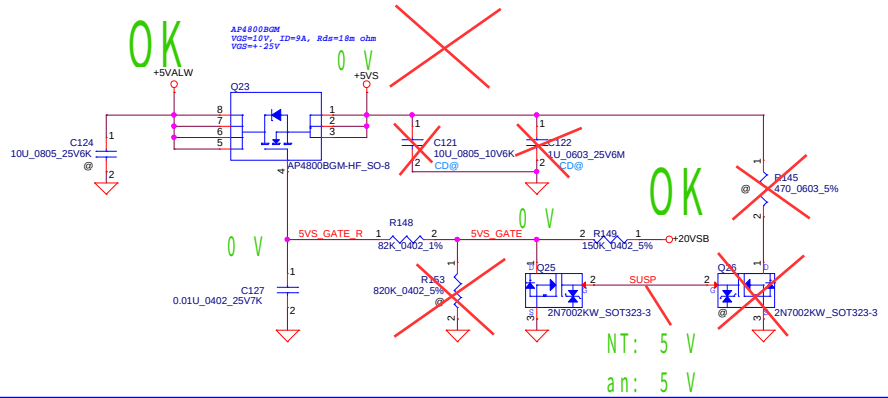
For 14"



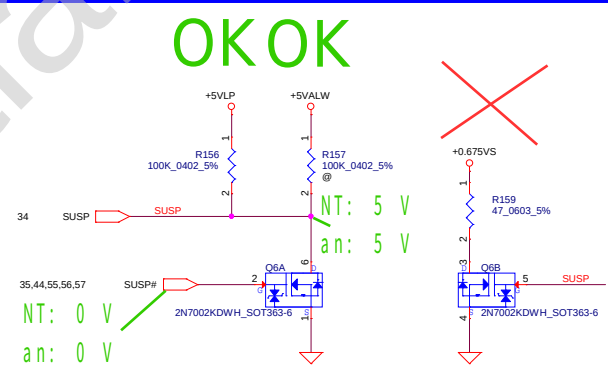
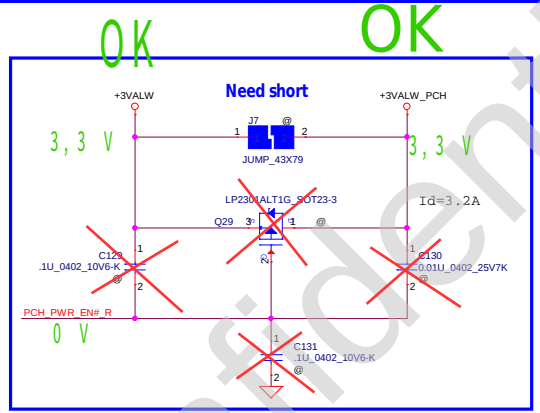
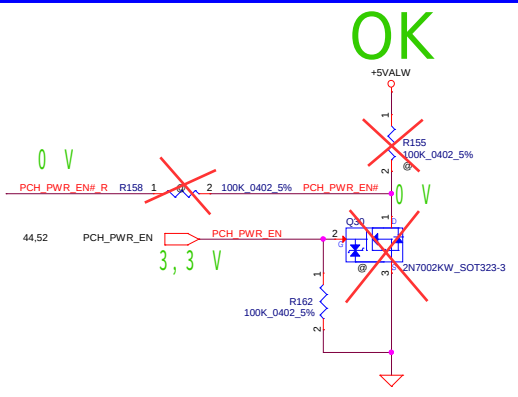
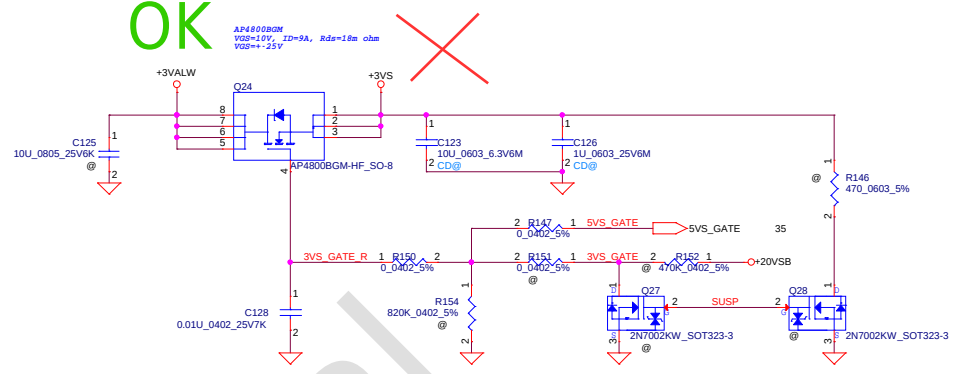
For 15"



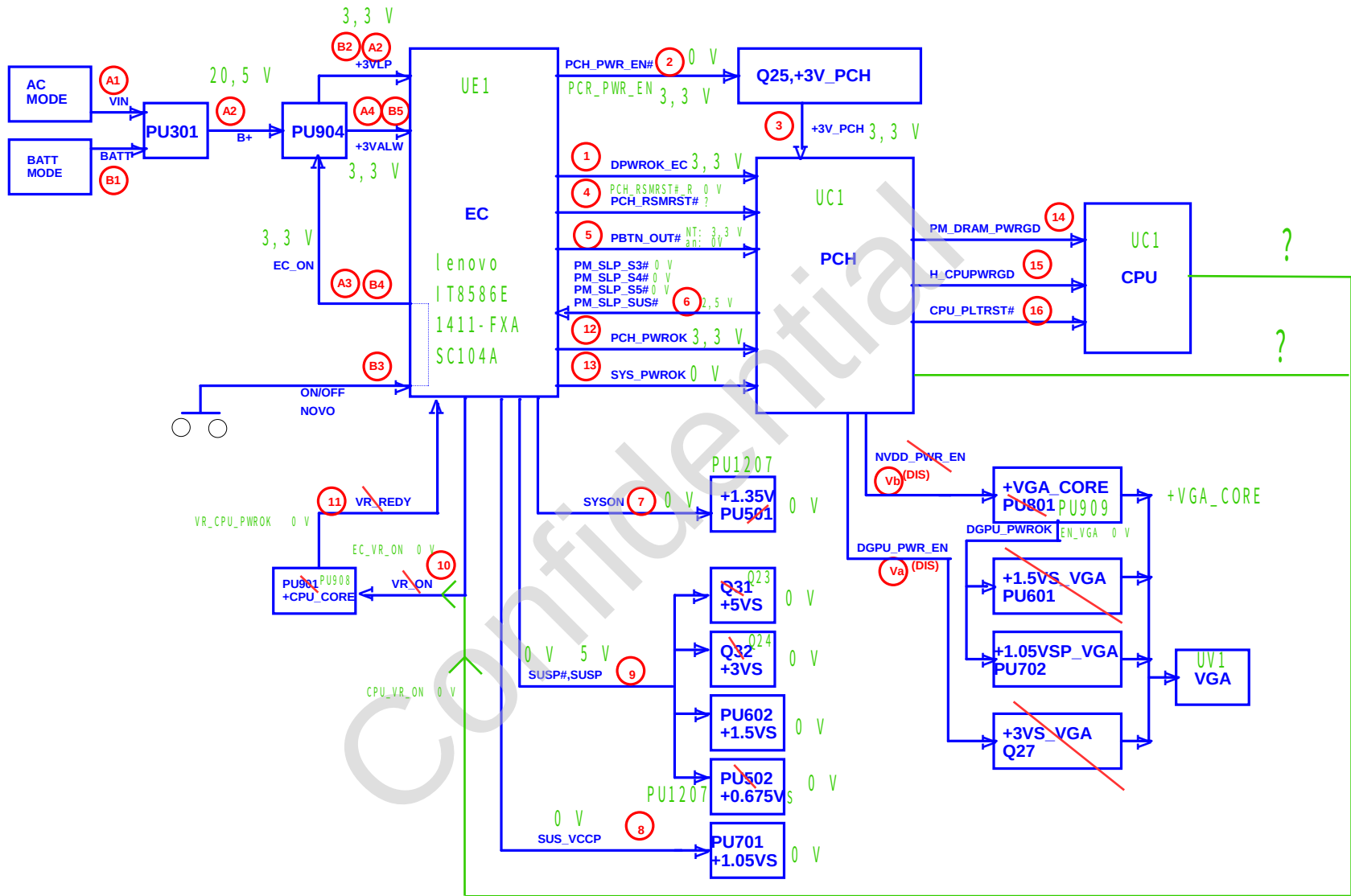
+5VALW to +5VS



+3VALW to +3VS



Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			Document Number Custom
			Rev 1.0
			Date: Thursday, December 26, 2013 Sheet 46 of 59



Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			Size Custom Document Number ACLUA Date: Thursday, December 26, 2013 [Sheet 47 of 59]
			Rev 1.0

LAN chip

UL1 100M@
RTL8106EUL-CG
SA00006C00

Transformer

TL1 100M@
TST1284A LF
SP60008C00

X76 BOM

ZZZ2 H4GX8T@
Hynix
X7603212001

ZZZ3 M4GX8T@
Micron
X7603212002

ZZZ4 H2GX4T@
Hynix
X7603212003

ZZZ5 H2GX4M@
Hynix
X7603212051

ZZZ6 M2GX4M@
Micron
X7603212052

ZZZ7 M2GX4T@
Micron
X7603212004

ZZZ8 S4GX8T@
Samsung
X7603212054

ZZZ9 S2GX4T@
Samsung
X7603212053

ZZZ10 14@
PCB PN
DA20T700100

ZZZ11 15@
PCB PN
DA20T7200100

PCB_MB

Blank component area

UV1 N15VGM@
NV N15V-GM GPU
SA00064R00

RV155 N15VGM@
10K 0402 1%
SD03410028J

RV159 N15VGM@
10K 0402 1%
SD03410028J

RV160 N15VGM@
10K 0402 1%
SD03410028J

RV161 N15VGM@
10K 0402 1%
SD03410028J

Hynix 4G---256X16 *8 pcs X7603212001

UV5 H4T@
HSTC4G63AFR-11C
SA00005YL00

UV6 H4T@
HSTC4G63AFR-11C
SA00005YL00

UV7 H4T@
HSTC4G63AFR-11C
SA00005YL00

UV8 H4T@
HSTC4G63AFR-11C
SA00005YL00

RC100 H4T@
10K 0402 5%
SD02810028J

UV9 H4T@
HSTC4G63AFR-11C
SA00005YL00

UV10 H4T@
HSTC4G63AFR-11C
SA00005YL00

UV11 H4T@
HSTC4G63AFR-11C
SA00005YL00

UV12 H4T@
HSTC4G63AFR-11C
SA00005YL00

RV159 H4T@
20K 0402 1%
SD03420028J

Hynix 2G---256X16 *4 pcs X7603212051

UV5 H2M@
HSTC4G63AFR-11C
SA00005YL00

UV6 H2M@
HSTC4G63AFR-11C
SA00005YL00

UV7 H2M@
HSTC4G63AFR-11C
SA00005YL00

UV8 H2M@
HSTC4G63AFR-11C
SA00005YL00

RC107 H2M@
10K 0402 5%
SD02810028J

RV148 H2M@
10K 0402 1%
SD03410028J

RV151 H2M@
10K 0402 1%
SD03410028J

RV152 H2M@
10K 0402 1%
SD03410028J

RV154 H2M@
10K 0402 1%
SD03410028J

Micron 4G---256X16 *8 pcs X7603212002

UV5 M4T@
MT41J256M16HA-093G.E
SA00006010

UV6 M4T@
MT41J256M16HA-093G.E
SA00006010

UV7 M4T@
MT41J256M16HA-093G.E
SA00006010

UV8 M4T@
MT41J256M16HA-093G.E
SA00006010

RC100 M4T@
10K 0402 5%
SD02810028J

UV9 M4T@
MT41J256M16HA-093G.E
SA00006010

UV10 M4T@
MT41J256M16HA-093G.E
SA00006010

UV11 M4T@
MT41J256M16HA-093G.E
SA00006010

UV12 M4T@
MT41J256M16HA-093G.E
SA00006010

RV159 M4T@
24.9K 0402 1%
SD03420028J

Micron 2G---256X16 *4 pcs X7603212052

UV5 M2M@
MT41J256M16HA-093G.E
SA00006010

UV6 M2M@
MT41J256M16HA-093G.E
SA00006010

UV7 M2M@
MT41J256M16HA-093G.E
SA00006010

UV8 M2M@
MT41J256M16HA-093G.E
SA00006010

RC107 M2M@
10K 0402 5%
SD02810028J

RV148 M2M@
10K 0402 1%
SD03410028J

RV149 M2M@
10K 0402 1%
SD03410028J

RV152 M2M@
10K 0402 1%
SD03410028J

Hynix 2G---256X16 *4 pcs X7603212003

UV5 H2T@
HSTC4G63AFR-11C
SA00005YL00

UV6 H2T@
HSTC4G63AFR-11C
SA00005YL00

UV7 H2T@
HSTC4G63AFR-11C
SA00005YL00

UV8 H2T@
HSTC4G63AFR-11C
SA00005YL00

RC107 H2T@
10K 0402 5%
SD02810028J

RV159 H2T@
20K 0402 1%
SD03420028J

Micron 2G---256X16 *4 pcs X7603212004

UV5 M2T@
MT41J256M16HA-093G.E
SA00006010

UV6 M2T@
MT41J256M16HA-093G.E
SA00006010

UV7 M2T@
MT41J256M16HA-093G.E
SA00006010

UV8 M2T@
MT41J256M16HA-093G.E
SA00006010

RC107 M2T@
10K 0402 5%
SD02810028J

RV159 M2T@
24.9K 0402 1%
SD03420028J

Samsung 4G---256X16 *8 pcs X7603212054

UV5 S4T@
K4W4G1646D-BC1A
SA000063F10

UV6 S4T@
K4W4G1646D-BC1A
SA000063F10

UV7 S4T@
K4W4G1646D-BC1A
SA000063F10

UV8 S4T@
K4W4G1646D-BC1A
SA000063F10

RC100 S4T@
10K 0402 5%
SD02810028J

UV9 S4T@
K4W4G1646D-BC1A
SA000063F10

UV10 S4T@
K4W4G1646D-BC1A
SA000063F10

UV11 S4T@
K4W4G1646D-BC1A
SA000063F10

UV12 S4T@
K4W4G1646D-BC1A
SA000063F10

RV159 S4T@
30.1K 0402 1%
SD03430128J

Samsung 2G---256X16 *4 pcs X7603212053

UV5 S2T@
K4W4G1646D-BC1A
SA000063F10

UV6 S2T@
K4W4G1646D-BC1A
SA000063F10

UV7 S2T@
K4W4G1646D-BC1A
SA000063F10

UV8 S2T@
K4W4G1646D-BC1A
SA000063F10

RC107 S2T@
10K 0402 5%
SD02810028J

RV159 S2T@
30.1K 0402 1%
SD03430128J

PR9440
27K 0402 1%
N15VGM@

PR9434
7.5K 0402 1%
N15VGM@

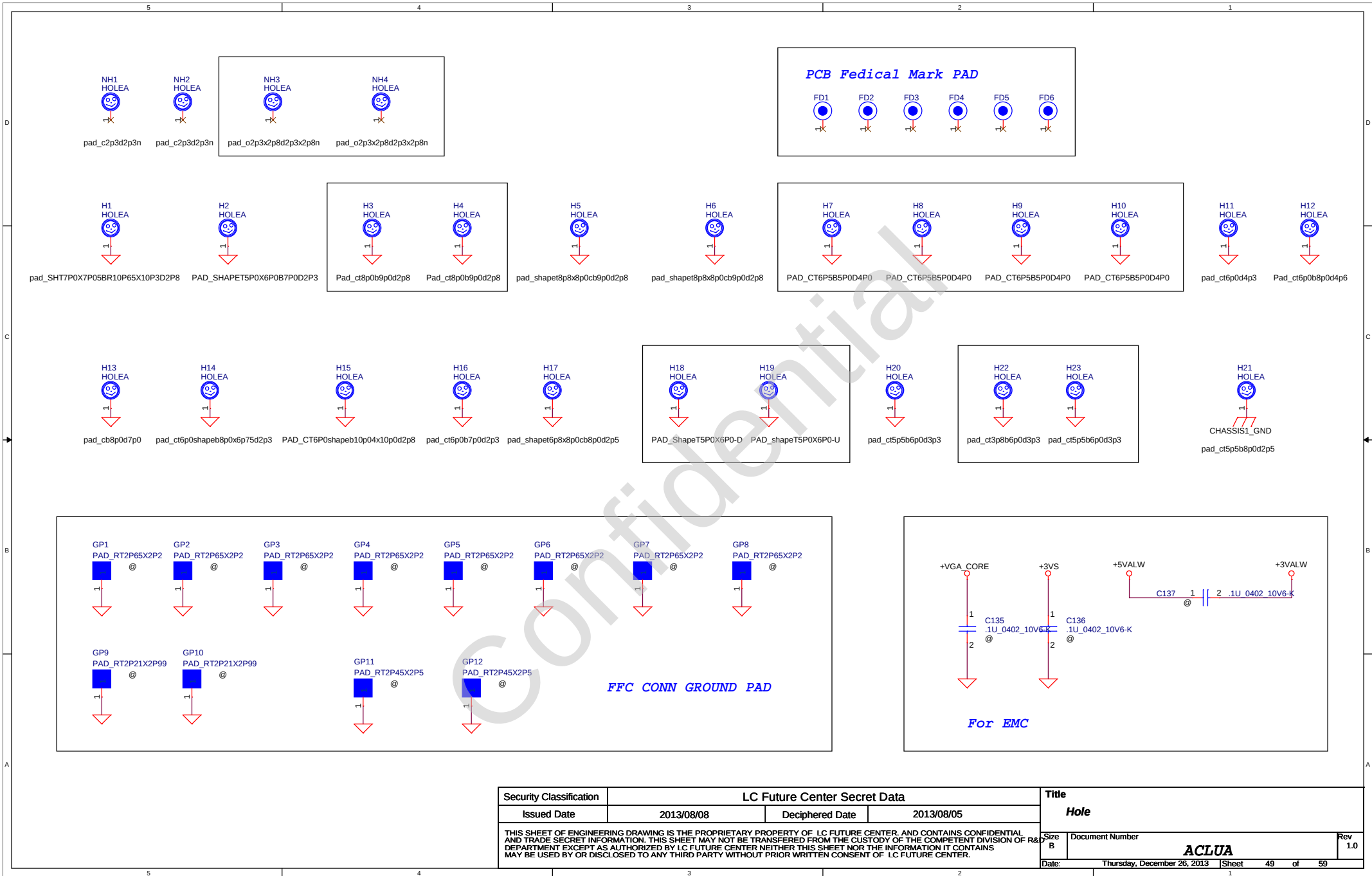
PR9436
0.4002 5%
N15VGM@

PR9437
6.2K 0402 1%
N15VGM@

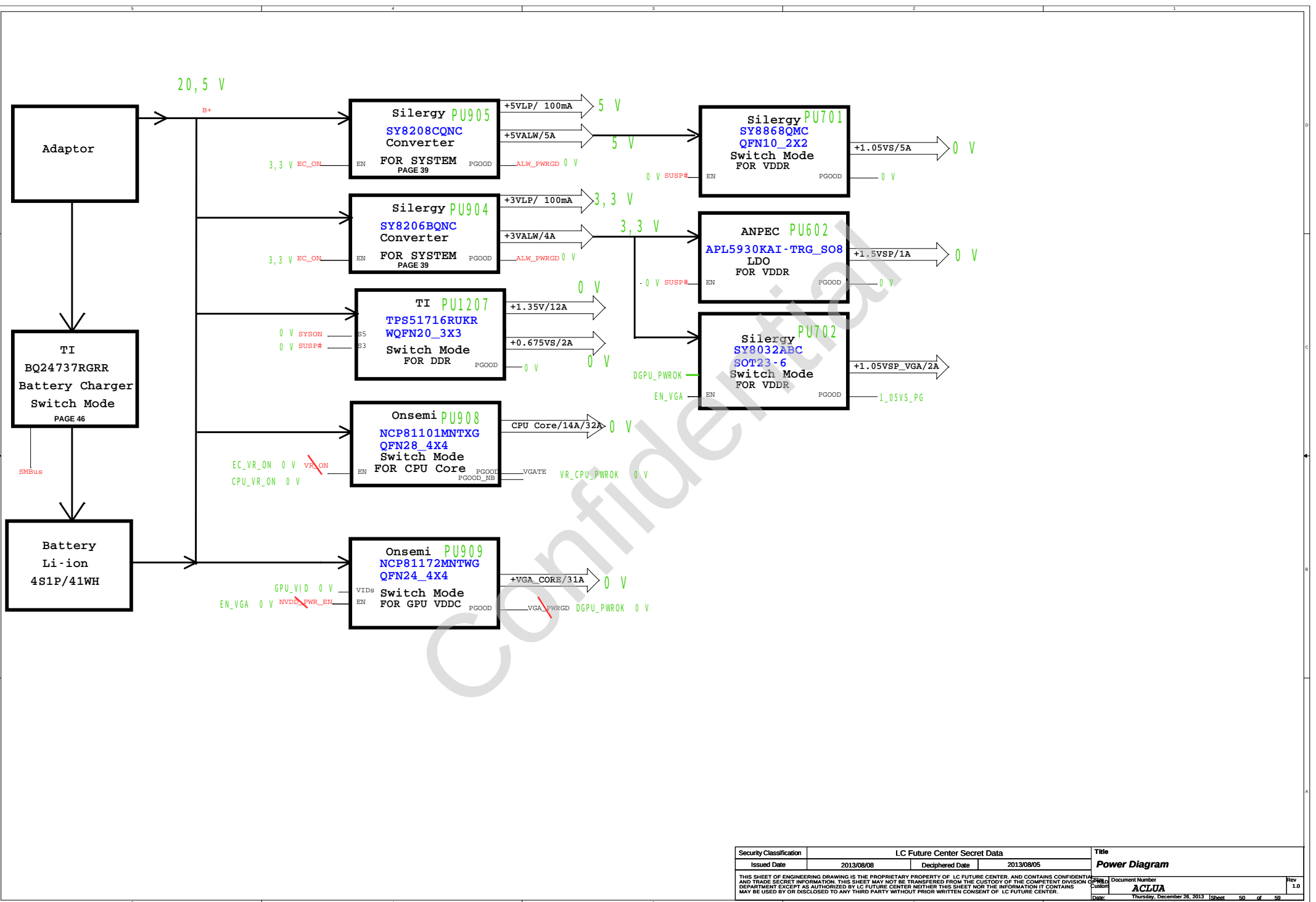
PR9431
1.74K 0402 1%
N15VGM@

PC1277
5600P 0402 25V7-K
N15VGM@

Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			Virtual symbol
Rev	1.0	Document Number	ACLUA
Date	Tuesday, December 31, 2013	Sheet	48 of 59



Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			Size B
			Document Number ACLJA
			Rev 1.0
			Date: Thursday, December 26, 2013
			Sheet 49 of 59

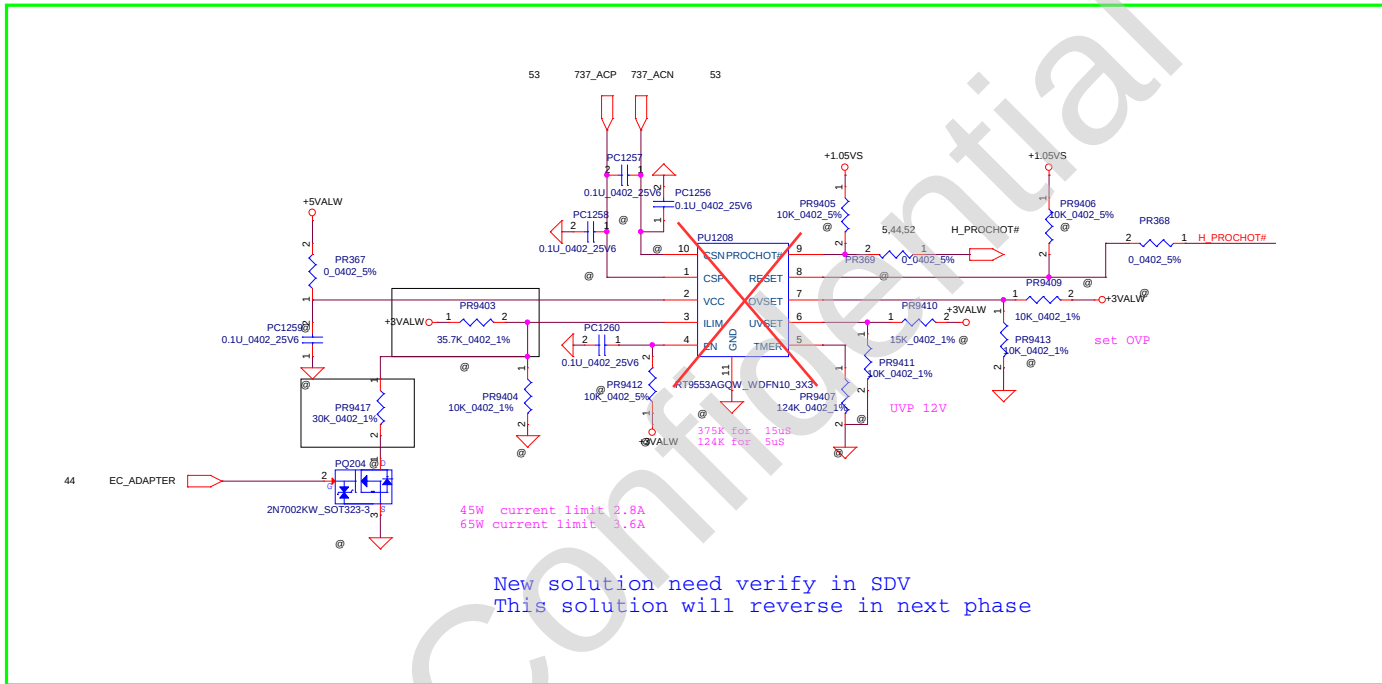
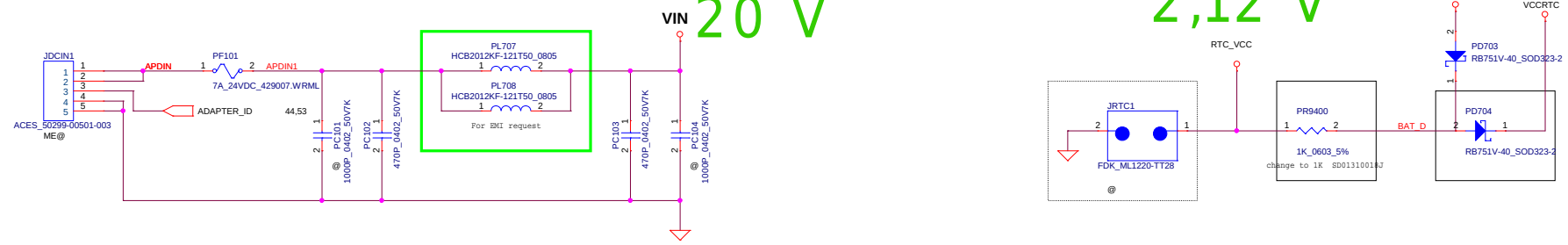


Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			Power Diagram Document Number ACLUA Date: Thursday, December 26, 2013 Sheet 50 of 59
Rev	1.0		

OK 2,87 V

2,12 V

VIN 20 V

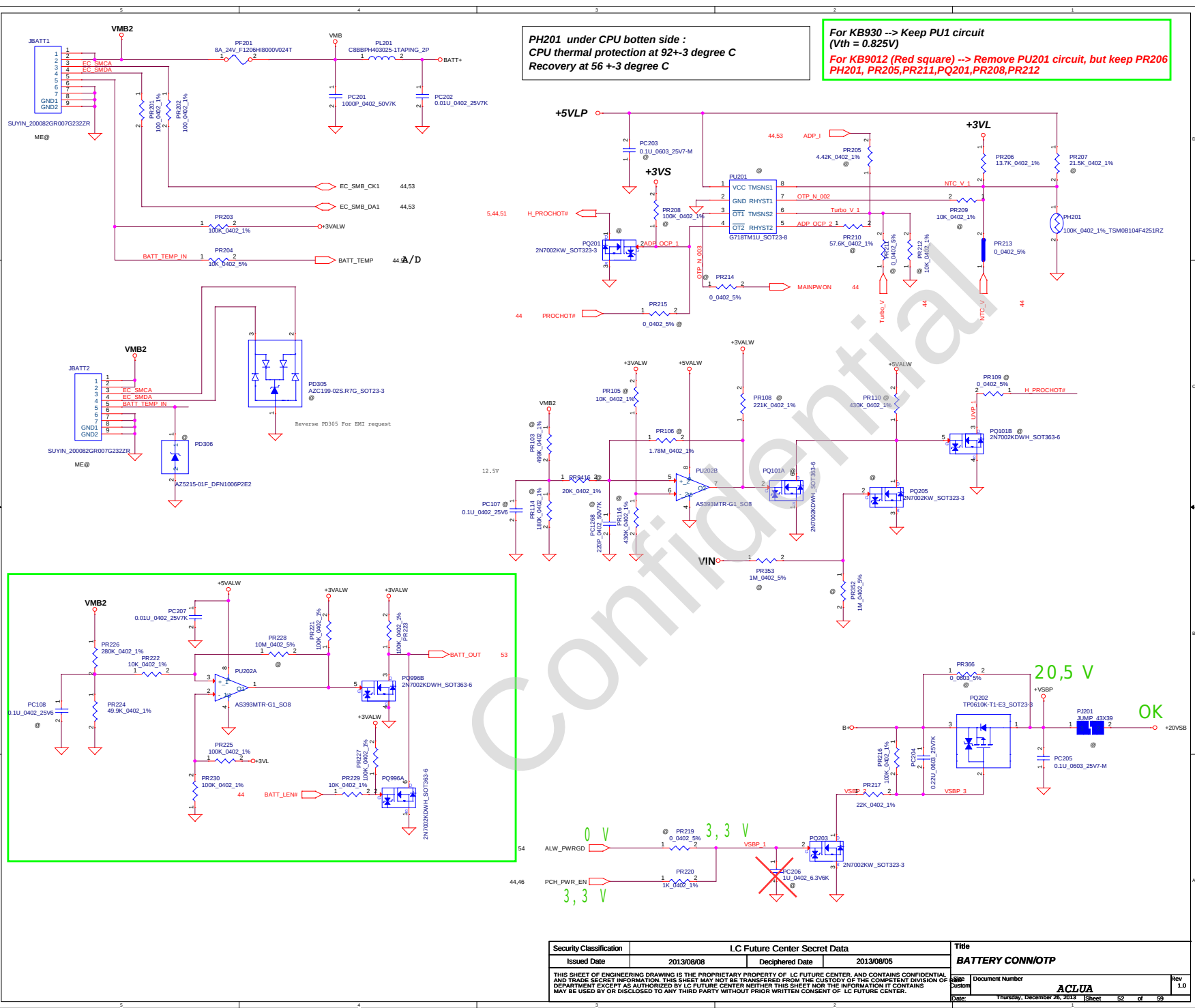


New solution need verify in SDV
This solution will reverse in next phase

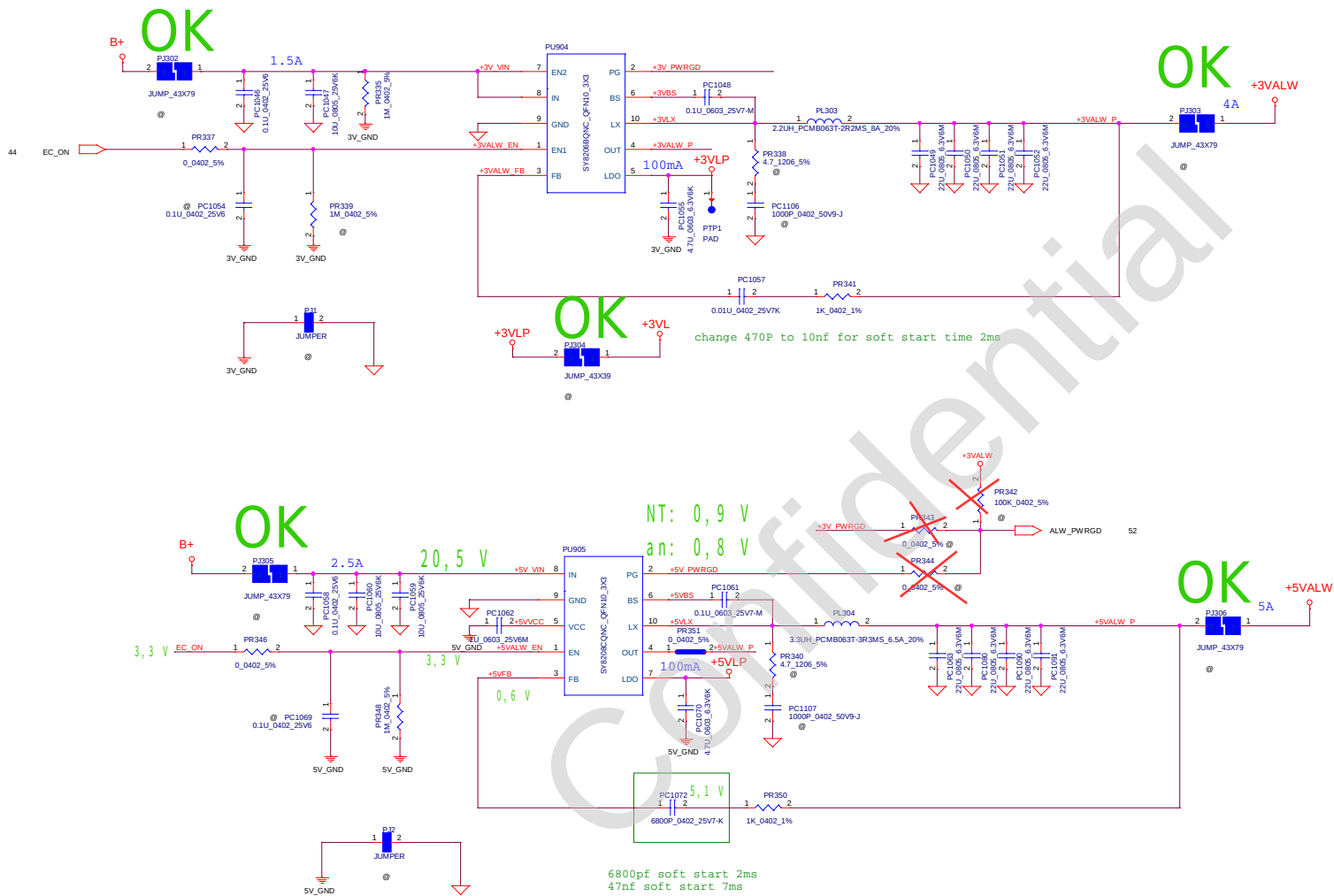
Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			Size Custom
			Document Number ACLUA
			Rev 1.0
			Date: Thursday, December 26, 2013 [Sheet 51 of 59]

PH201 under CPU bottom side :
CPU thermal protection at 92+3 degree C
Recovery at 56 +3 degree C

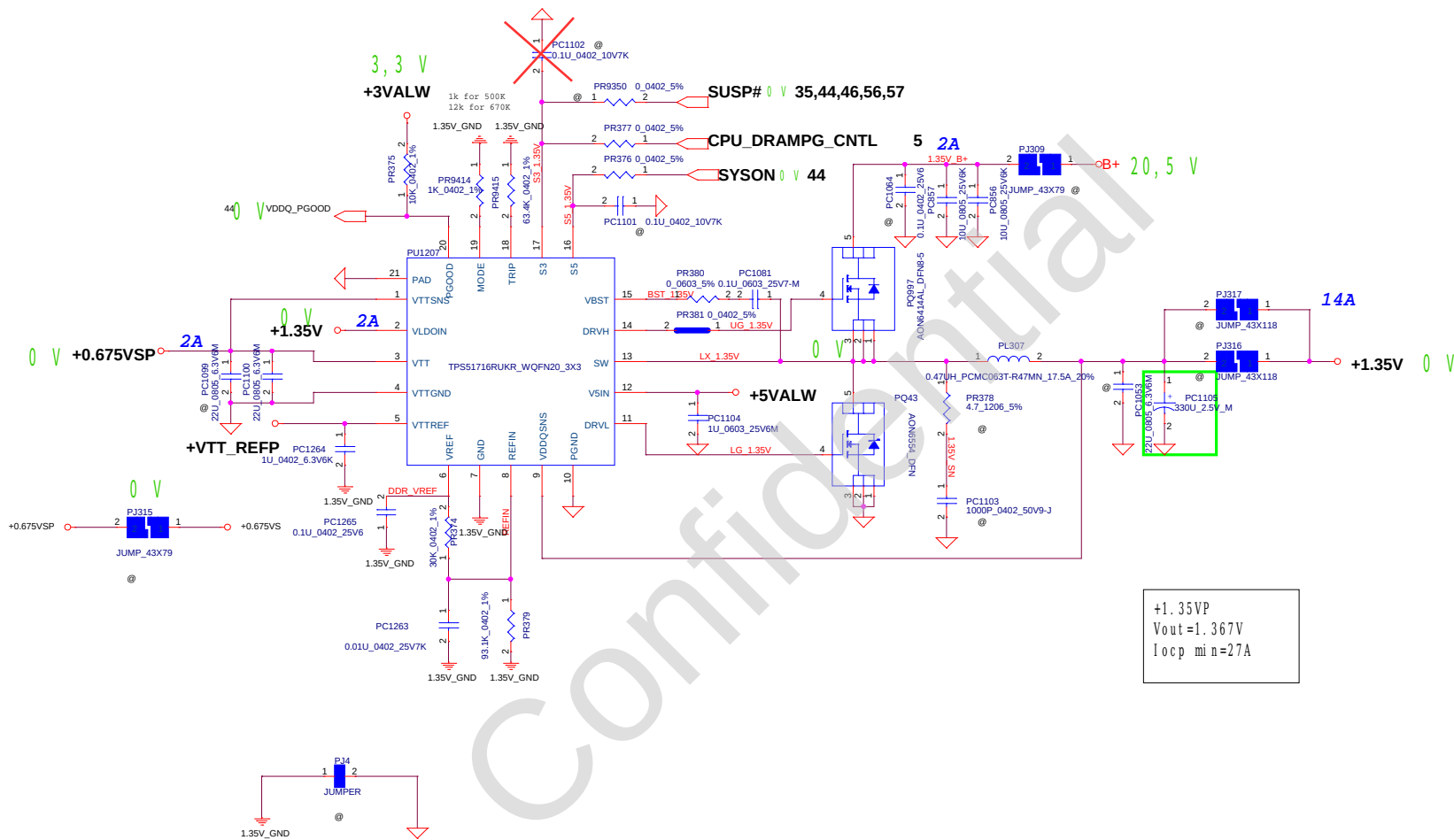
For KB930 --> Keep PU1 circuit
(Vth = 0.825V)
For KB912 (Red square) --> Remove PU201 circuit, but keep PR206
PH201, PR205, PR211, PQ201, PR208, PR212



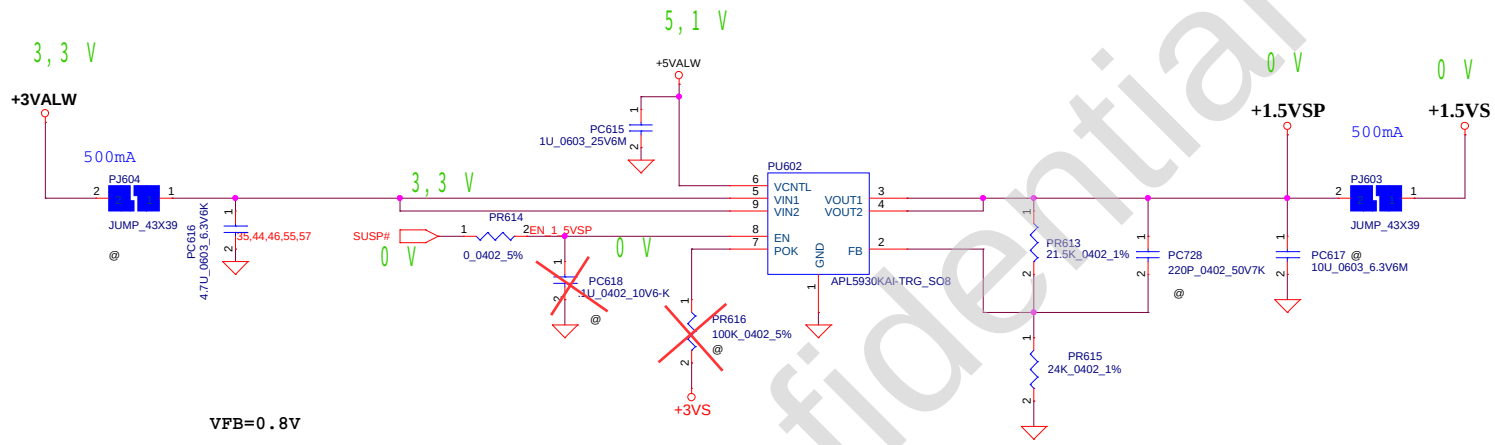
Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
<small>THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSMITTED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.</small>			
Page	Document Number	Rev	1.0
Custom	ACLUA	Date	Thursday, December 26, 2013
		Sheet	52 of 59



Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			PWR_3VALW/5VALW Sheet: _____ Document Number: _____ Date: Thursday, December 26, 2013 Sheet 54 of 59

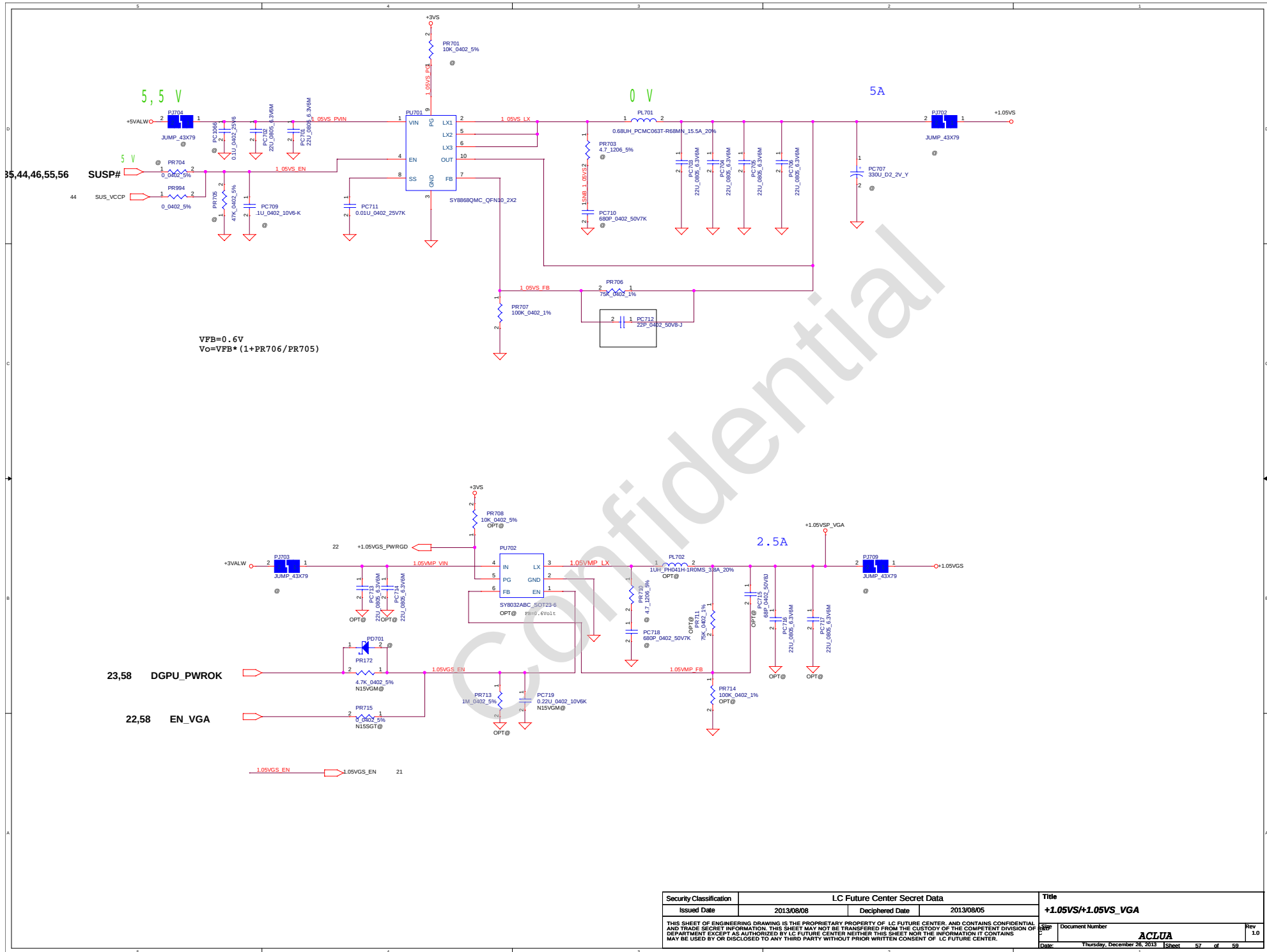


Security Classification	LC Future Center Secret Data		Title
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			Size Document Number Custom ACLUA
			Rev 1.0
			Date: Thursday, December 26, 2013 Sheet 55 of 59



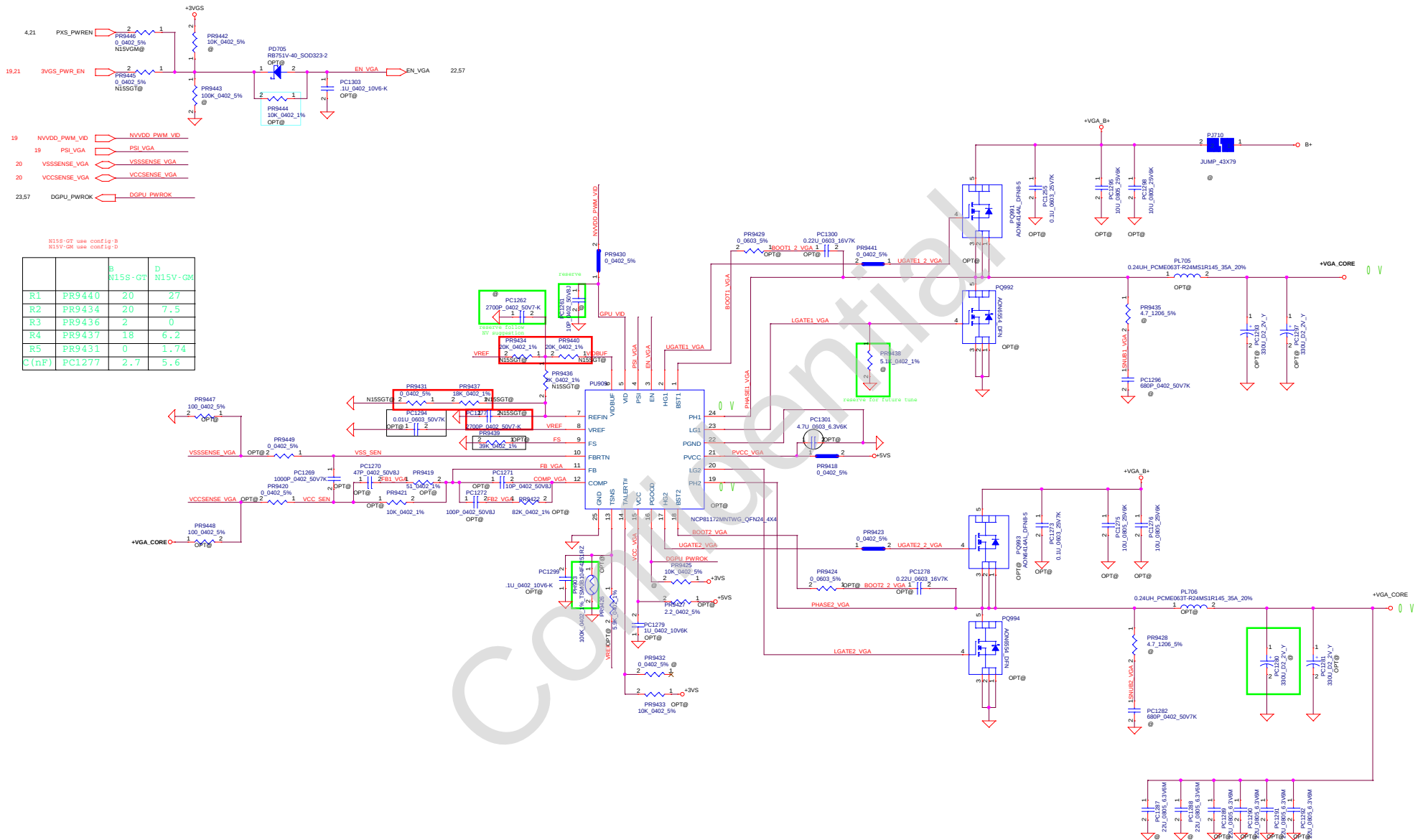
Security Classification	LC Future Center Secret Data		
Issued Date	2013/08/08	Deciphered Date	2013/08/05
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.			

Title		Size	Document Number	Rev
+1.35VS_VGA/+1.5VS				
Date:	Thursday, December 26, 2013	Sheet	56	of 59



$V_{FB} = 0.6V$
 $V_o = V_{FB} * (1 + PR706 / PR705)$

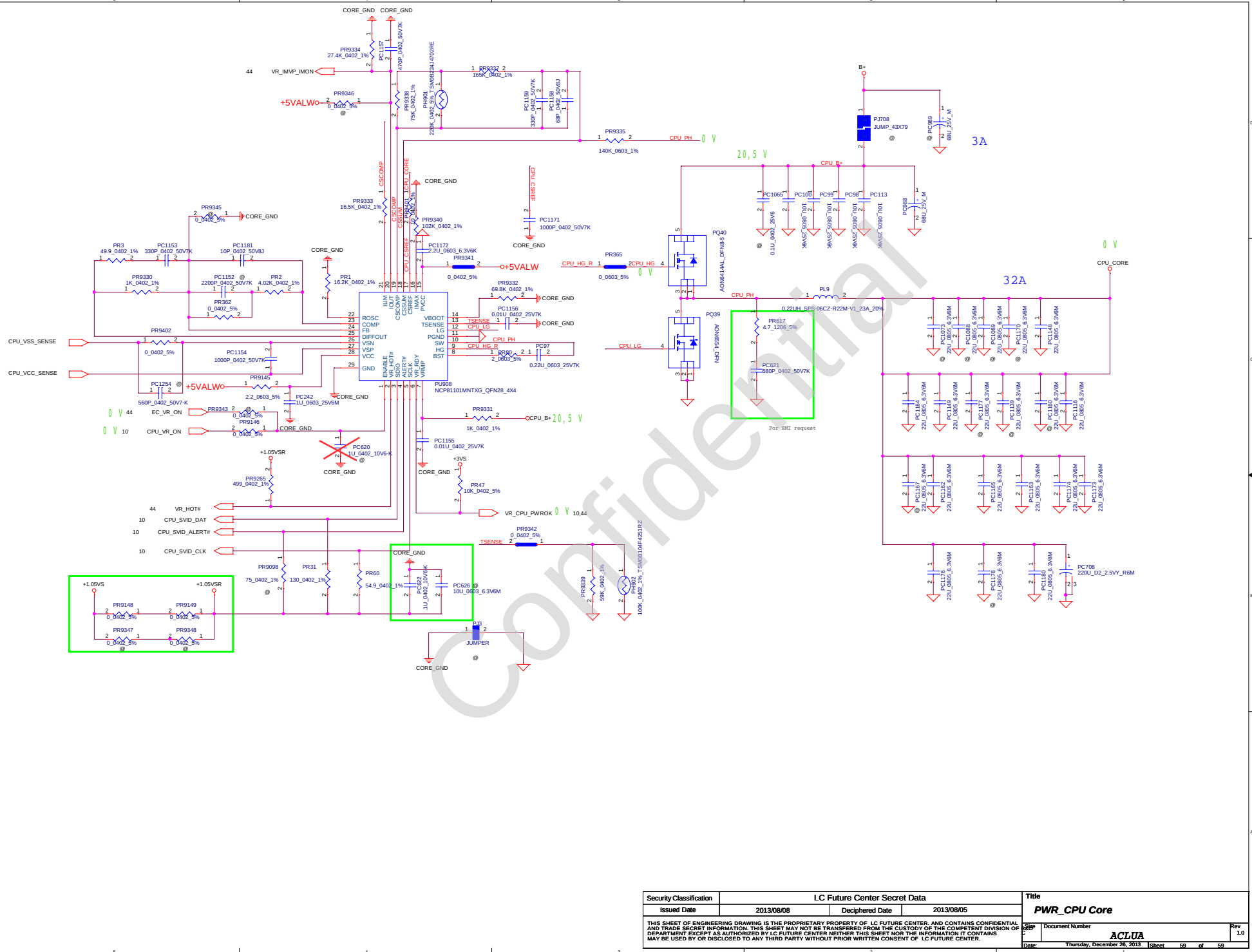
Security Classification		LC Future Center Secret Data		Title	
Issued Date	2013/08/08	Deciphered Date	2013/08/05	+1.05VS/+1.05VS_VGA	
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.					
Sheet	Document Number	Date		Rev	
7	ACLUA	Thursday, December 26, 2013		1.0	
				Sheet	57 of 59



N155-GT use config-B
N15V-QM use config-D

	B	D	
R1	PR9440	20	27
R2	PR9434	20	7.5
R3	PR9436	2	0
R4	PR9437	18	6.2
R5	PR9431	0	1.74
C(nF)	PC1277	2.7	5.6

Security Classification		LC Future Center Secret Data		Title	
Issued Date	2013/08/08	Deciphered Date	2013/08/05	PWR-VGA_CORE	
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSMITTED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.					
Size	Document Number	Rev	1.0		
Custom	ACLUA	Date:	Friday, December 27, 2013	Sheet	88 of 89



Security Classification		LC Future Center Secret Data		Title	
Issued Date	2013/08/08	Deciphered Date	2013/08/05	PWR CPU Core	
THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF LC FUTURE CENTER, AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF DEPARTMENT EXCEPT AS AUTHORIZED BY LC FUTURE CENTER. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF LC FUTURE CENTER.					
Rev	Document Number	Date		Rev	1.0
	ACLUA	Thursday, December 26, 2013		Sheet	59 of 59