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G 320 AST M/B Schematics Document

NM_B321 REV:0.2

AMD FT4 Stoney SOC with DDRIIII

AMD R17M-M1-70

2017-02-04

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Title: Cover Page			
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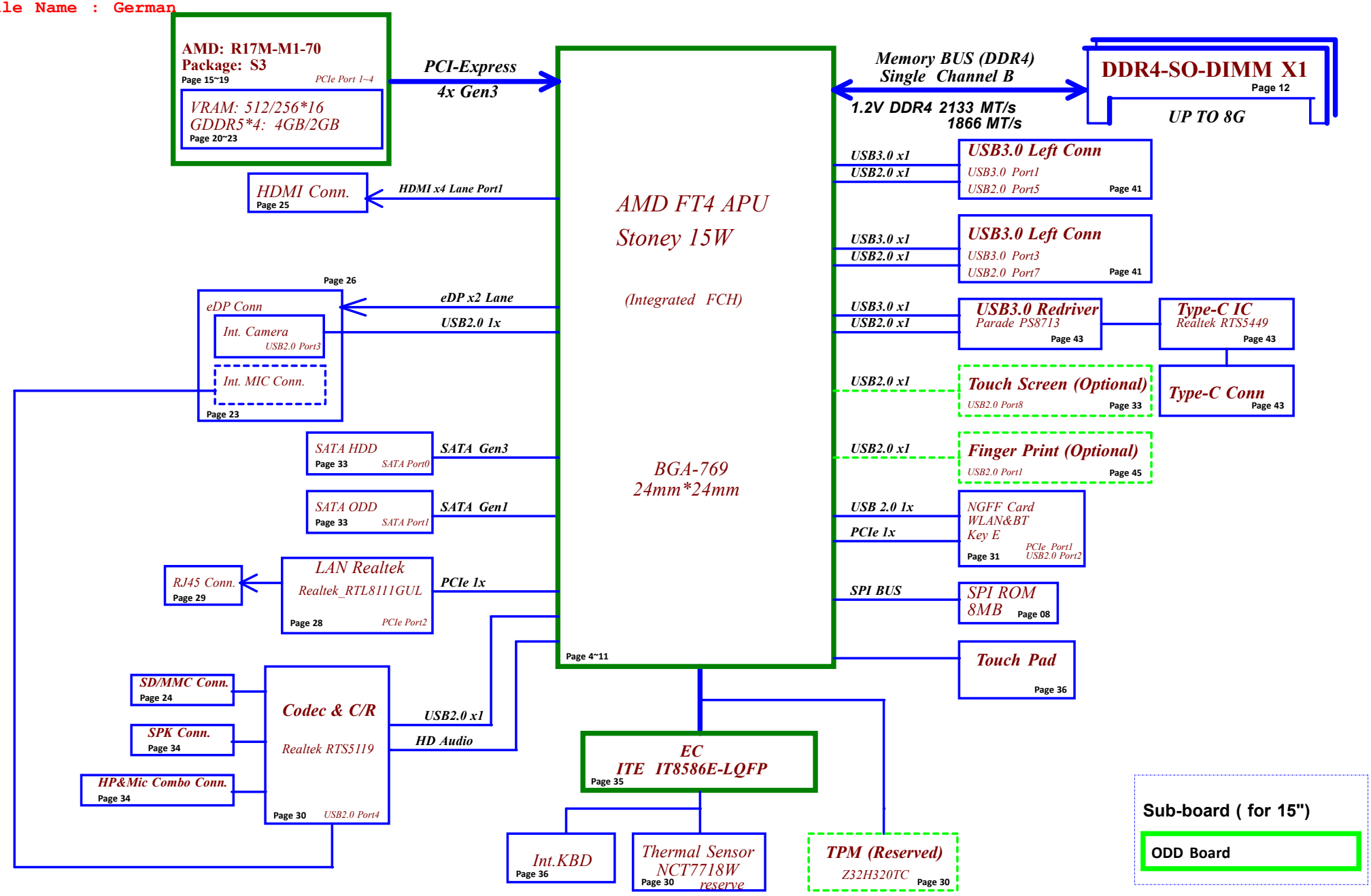
File Name : German



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Title: Block Diagram

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

State \ power plane	B+ (+20VSB) +3VL +5VLP	+5VALW +3VALW (+3VALW_APU) +1.8VALW +0.95VALW +0.775VALW	+2.5V +1.2V (+VSYSMEM_APU)	+5VS +3VS +1.8VS +1.5VS +0.95VS +0.6VS +APU_CORE +APU_CORE_NB +APU_GFX +VGA_CORE +3VGS +1.8VGS +1.35VGS +0.95VGS
S0	O	O	O	O
S3	O	O	O	X
S5 S4/AC	O	O	X	X
S5 S4/ Battery only	O	X	X	X
S5 S4/AC & Battery don't exist	X	X	X	X

STATE \ SIGNAL	SLP_S3#	SLP_S5#	+VALW	+V	+VS	Clock
S0 (Full ON)	HIGH	HIGH	ON	ON	ON	ON
S1 (Power On Suspend)	HIGH	HIGH	ON	ON	ON	LOW
S3 (Suspend to RAM)	LOW	HIGH	ON	ON	OFF	OFF
S4 (Suspend to Disk)	LOW	LOW	ON	OFF	OFF	OFF
S5 (Soft OFF)	LOW	LOW	ON	OFF	OFF	OFF

BOARD Config.	BOARD_ID1	BOARD_ID2 reserve
	0: Dis	0: No KBL
	1: UMA	1: KBL

BOARD Config.	BOARD_ID0	BOARD_ID3
14''	0	0
15''	0	1
17''	1	0

USB Port Table for Stoney FT4

USB 2.0	USB 3.0	Port	Port device
EHCI		0	Finger print
		1	Blue Tooth
		2	Camera
		3	Card Reader
xHCI		4	LEFT USB (3.0)
		5	Type-C
	2	6	RighT USB (3.0) upper
		7	Touch screen

PCIE PORT LIST

	Port	Device
GPP	0	N/A
	1	WLAN
	2	LAN
	3	N/A
GFX	0	DIS GPU
	1	
	2	
	3	

Vinafix

BOM Structure Table

BOM Structure	BTO Item
@	Not stuff
ME@	Connector
14@	For 14" part
15@	For 15" part
EMC@	EMC Part
EMC_NS@	EMC reserve Part
EMC_PX@	EMC GPU part
EMC_CZ@	EMC Carrizo APU part
EMC_15@	EMC 15 part
RF_NS@	RF reserve Part
RF_PXNS@	RF GPU reserve part
UMA@	UMA SKU ID part
PX@	Discrete GPU SKU part
EXO@	EXO GPU Part
TOPAZ@	TOPAZ GPU Part
TPM@	TPM part
AOAC@	AOAC support part
HDT@	HDT Debug part
TS@	Touch screen part
CZ@	Carrizo Part
CZL@	CarrizoL part
CZPX@	Carrizo Discrete Part
CZLPX@	CarrizoL Discrete Part
S4GX4@	X76 SAMSUNG 2G
M4GX4@	X76 MICRON 2G
H4GX4@	X76 HYNIX 2G
S2GX4@	X76 SAMSUNG 1G
M2GX4@	X76 MICRON 1G
H2GX4@	X76 HYNIX 1G
S2G@	SAMSUNG 2G
M2G@	MICRON 2G
H2G@	HYNIX 2G
S1G@	SAMSUNG 1G
M1G@	MICRON 1G
H1G@	HYNIX 1G
CZLUMA@	CarrizoL UMA Part
CZUMA@	Carrizo UMA Part
SIVCD@	SIV COST down material
HDMI@	HDMI Logo
STN@	Stoney part
KBL@	Key board backlight part

VRAM

SMBUS Control Table

	SOURCE	GPU	BATT	IT8586E	SODIMM	WLAN	Thermal Sensor	APU	Charger	PMIC	Touch Pad
EC_SMB_CK1 EC_SMB_DA1	IT8586E +3VL_EC	X	V		X	X	X	X	V	X	X
EC_SMB_CK3 EC_SMB_DA3	IT8586E +3VS	V +3VS_VGA	X		X	X	V	V APU_SIC APU_SID 1.8VS for ASF	X	X	X
APU_SMB_CLK APU_SMB_DATA	APU +3VS	X	X	X	V	V	X		X	X	X
EC_SMB_CK2 EC_SMB_DA2	IT8586E +3VL_EC	X	X		X	X	X	X	X	V	X
TP_I2C0_SCL_R TP_I2C0_SDA_R	APU +1.8VS	X	X	X	X	X	X		X	X	V

EC SM Bus1 address

Device	Address
Battery	0X16
Charger	0001 0010 b

EC SM Bus2 address

Device	Address
PMIC	0X34

EC SM Bus3 address

Device	Address
Thermal Sensor	1001_100xb(reserve)
GPU	0x41(default)
APU SB-TSI	releate to F3x1E4[SbiAddr] or Address Select Pins setting

APU SM Bus1 address

Device	Address
Touch pad	0x15

APU SM Bus2

No use

APU SM Bus3 address

Device	Address
DDR DIMM	0xA0h
WLAN	RSVD

APU SM Bus4

No use

Title: **Notes List**

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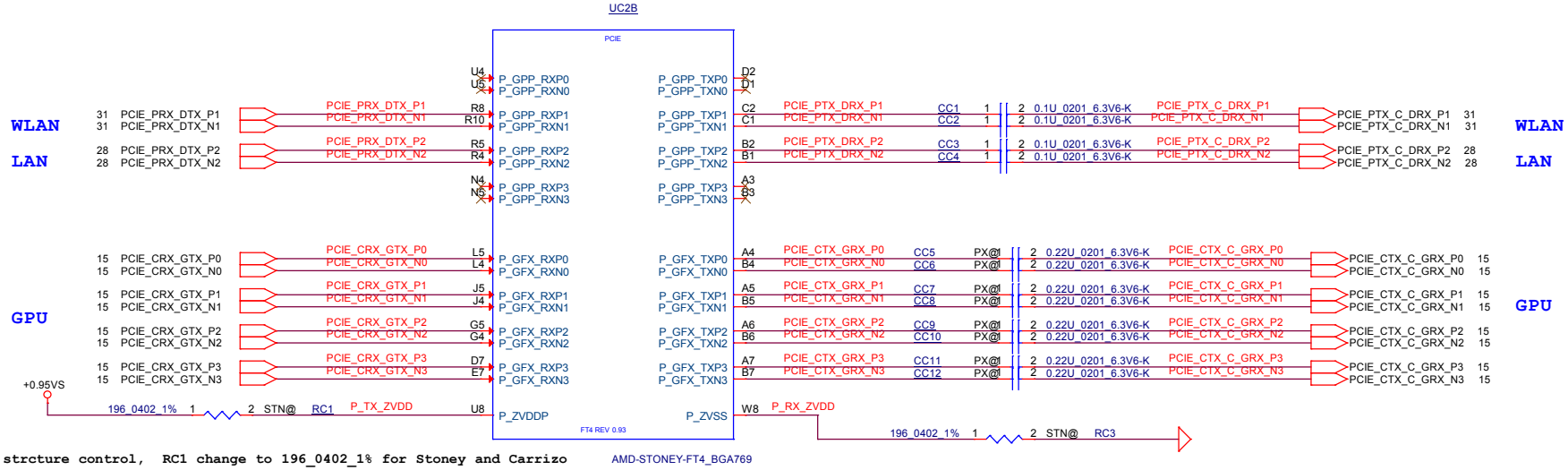

with BOM strcture control, RC1 change to 196_0402_1% for Stoney and Carrizo

@

CarrizoL not support GFX4-GFX7

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Title: FT4 (PCIE I/F)

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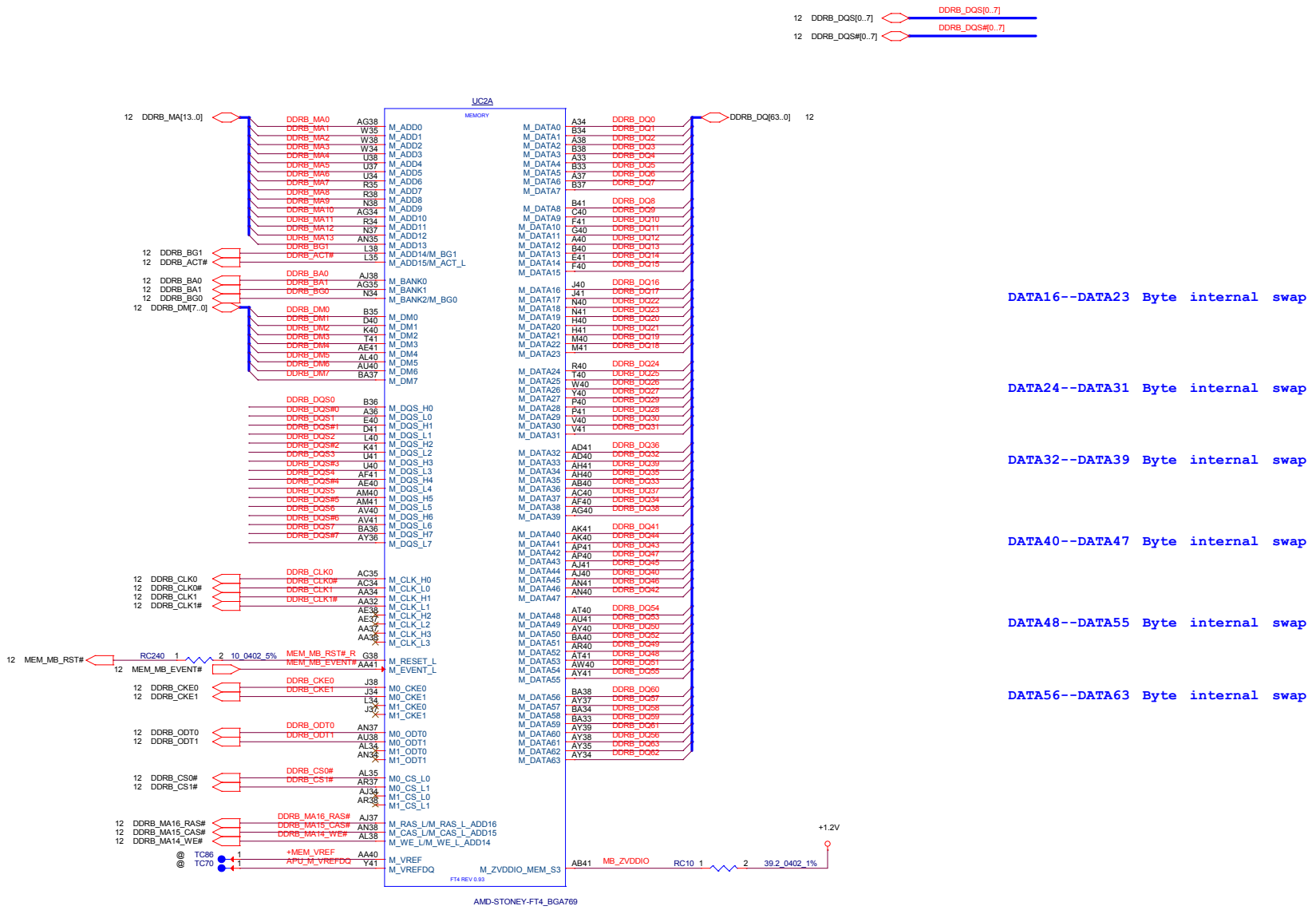

DATA16--DATA23 Byte internal swap

DATA24--DATA31 Byte internal swap

DATA32--DATA39 Byte internal swap

DATA40--DATA47 Byte internal swap

DATA48--DATA55 Byte internal swap

DATA56--DATA63 Byte internal swap

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Title: FT4 (MEM)

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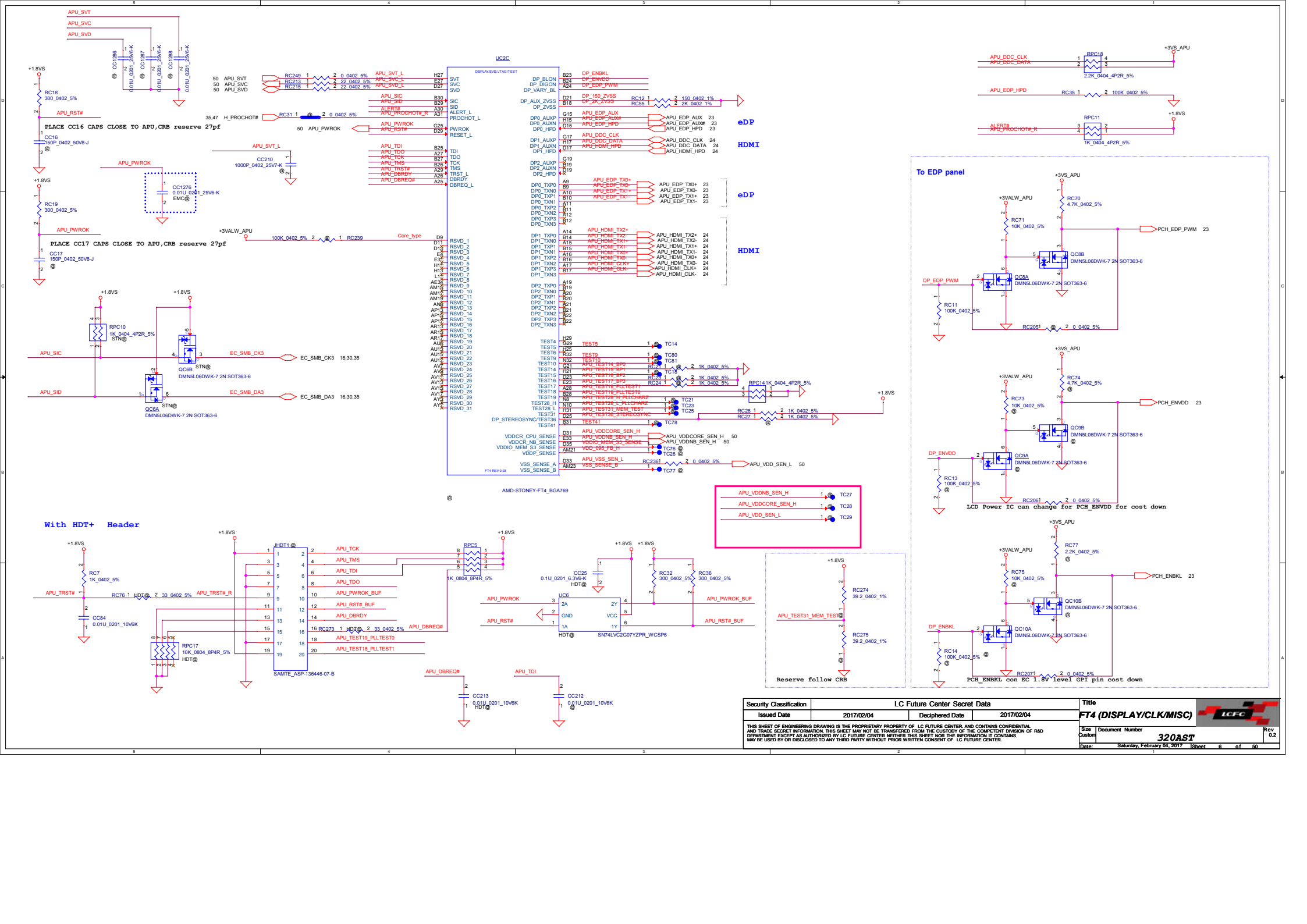

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Title	FT4 (DISPLAY/CLK/MISC)		
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BOARD Config.	BOARD_ID0	BOARD_ID3
14''	0	0
15''	0	1
17''	1	0

Connected to 10-ms RC-delay circuit on VDD_18_S5 power rail.
(CRB PWR Dealy: 22K/0.1uF)

with QC16,QC17, EC must set EC_RSMRST# and EC_SYS_PWRGD reversed compare to DC1 and DC2

Connect TouchPad to I2C port0 following CRB 10/28

Max ESR < 65K ohm !!

delete APU_SHUTDOWN# signal for Stoney FT4

APU_S5_MUX_CTRL 100K pull high follow CRB
BLINK isn't strap pin, don't need pull high

CRB: CARRIZO NEED 10K PD ON UNUSED SDIN
DG: 10K PD

PXS_PWREN_R/PXS_RST#_R/VR_VGA_PWRGD internal pull up 40k

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Title: FT4 (GEVENT/GPIO/SD/AZ)
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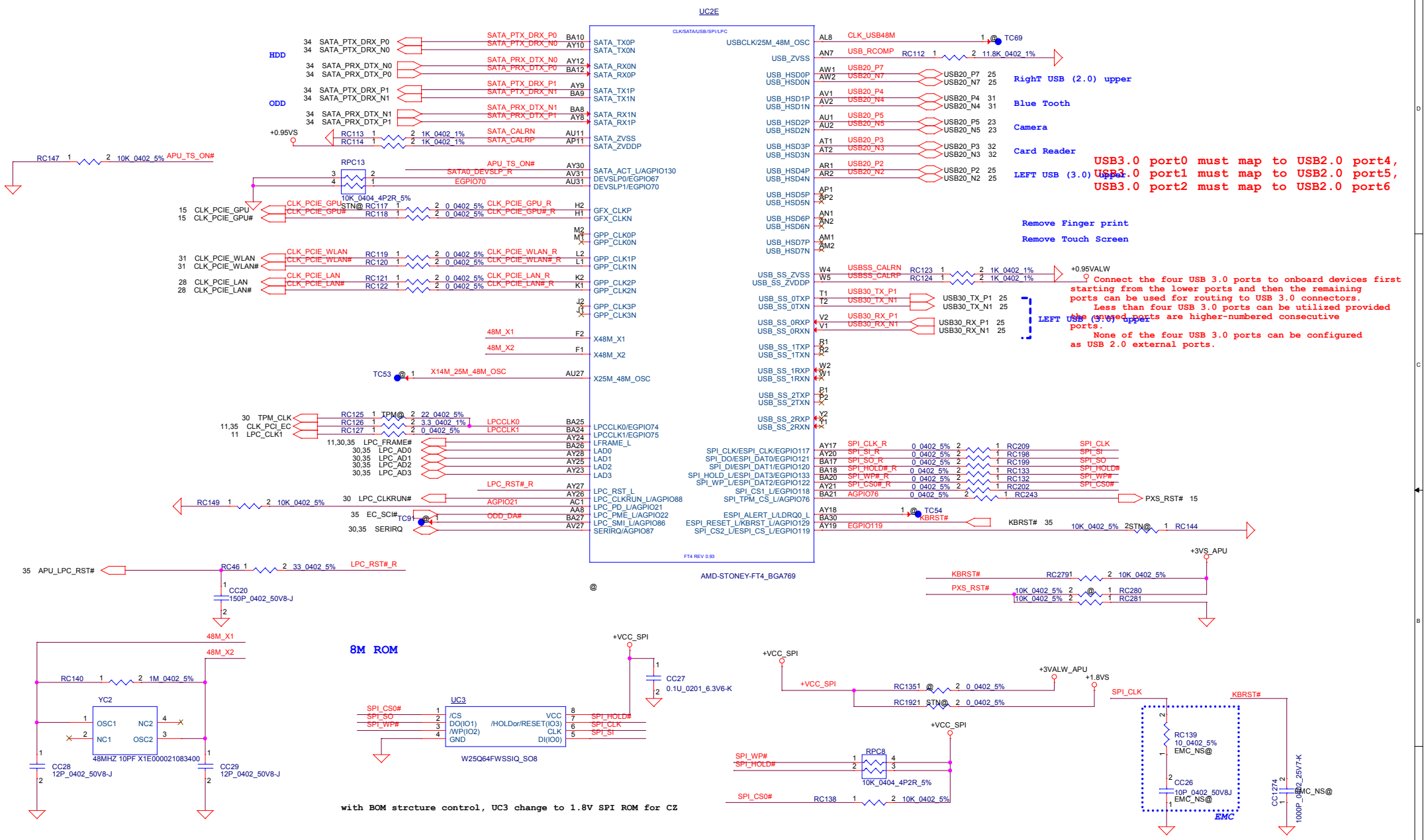

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Title: FT4 (SATA/USB/LPC/SPI)

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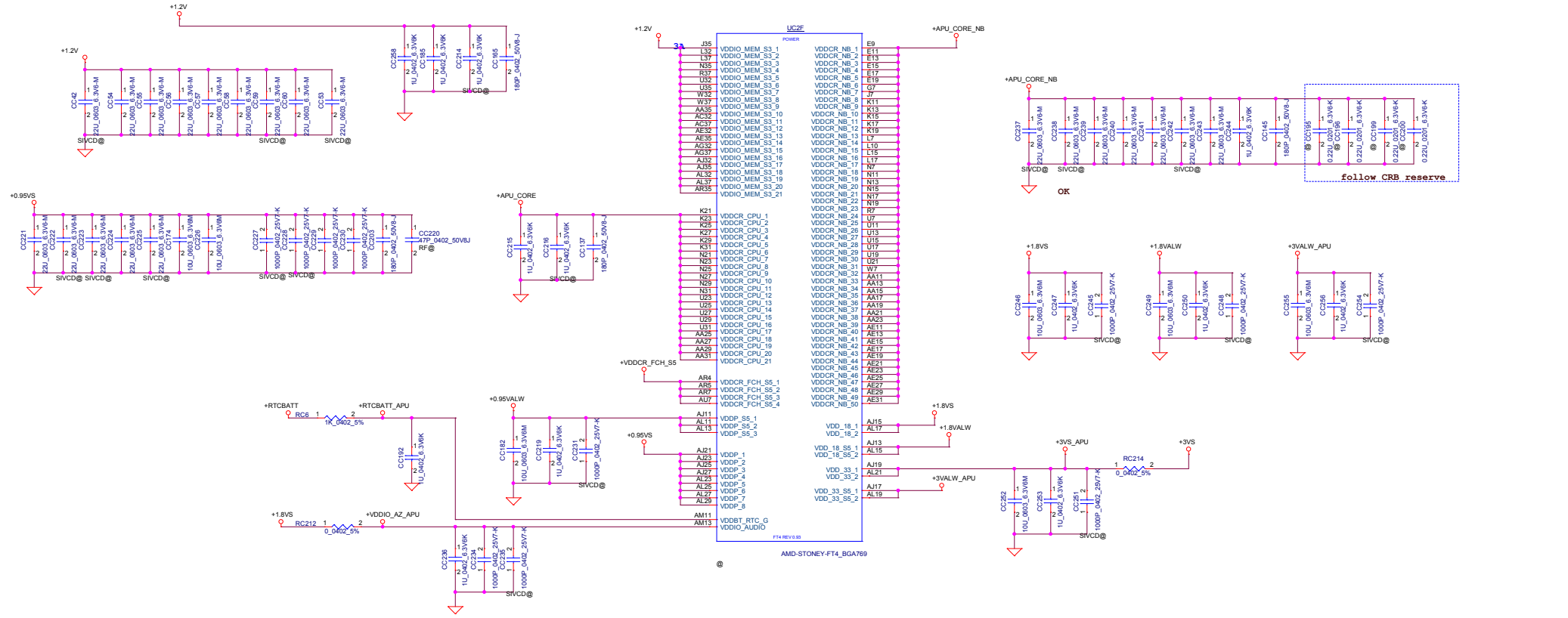

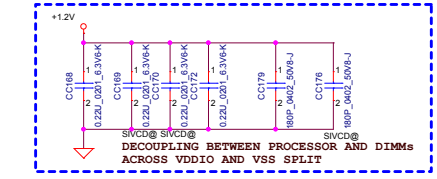

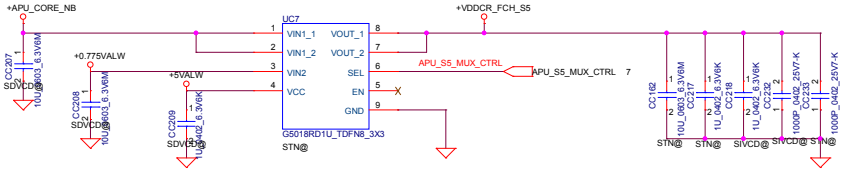

	Design Guide	G FT4	CRB
VDDCR_CPU	7*22uf 0603 2*1uf 0402 1*180pf 0402	11*22uf 0805 2*1uf 0402 1*180pf 0402	11*22uf 0603 1*1uf 0402 1*180pf 0402
VDDCR_NB	11*22uf 0603 1*1uf 0402 1*180pf 0402	11*22uf 0603 1*1uf 0402 1*180pf 0402	15*22uf 0603 8*0.22uf 0402 split *5 1*180pf 0402
VDDCR_GFX			
VDDIO_MEM_S3	9*22uf 0603 3*1uf 0402 3*180pf 0402	9*22uf 0603 2*1uf 0402 split*4 0.22uf 0402 1*180pf 0402 split*2	9*22uf 0603 2*1uf 0402 split*4 0.22uf 0402 1*180pf 0402 split*2
VDDCR_FCH_S5	1*10uf 0402 2*1uf 0402 2*1000pf 0402	1*10uf 0402 2*1uf 0402 2*1000pf 0402	2*10uf 0603 1*0.22uf 0402
VDDP	5*22uf 0603 2*10uf 0603 4*1000pf 0402 1*180pf 0402	5*22uf 0603 2*10uf 0603 4*1000pf 0402 1*180pf 0402	4*10uf 0603 1*0.22uf 0402 1*180pf 0402
VDDP_GFX			
VDDP_S5	1*10uf 0402 1*1uf 0402 1*1000pf 0402	1*10uf 0402 1*1uf 0402 1*1000pf 0402	1*10uf 0603 1*0.22uf 0402
VDD_18	1*10uf 0402 1*1uf 0402 1*1000pf 0402	1*10uf 0402 1*1uf 0402 1*1000pf 0402	1*22uf 0603 1*10uf 0603
VDD_18_S5	1*10uf 0402 1*1uf 0402 1*1000pf 0402	1*10uf 0402 1*1uf 0402 1*1000pf 0402	1*10uf 0603 1*0.22uf 0402
VDD_33	1*10uf 0402 1*1uf 0402 1*1000pf 0402	1*10uf 0402 1*1uf 0402 1*1000pf 0402	1*10uf 0603
VDD_33_S5	1*10uf 0402 1*1uf 0402 1*1000pf 0402	1*10uf 0402 1*1uf 0402 1*1000pf 0402	1*10uf 0603 1*0.22uf 0402
VDDIO_AUDIO	1*10uf 0402 2*1000pf 0402	1*10uf 0402 2*1000pf 0402	3*1uf 0402
VDDBT_RTC_G	1*1000pf 0402	1*1000pf 0402	1*0.22uf 0402

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Title: FT4 (POWER&DECOUPLING)

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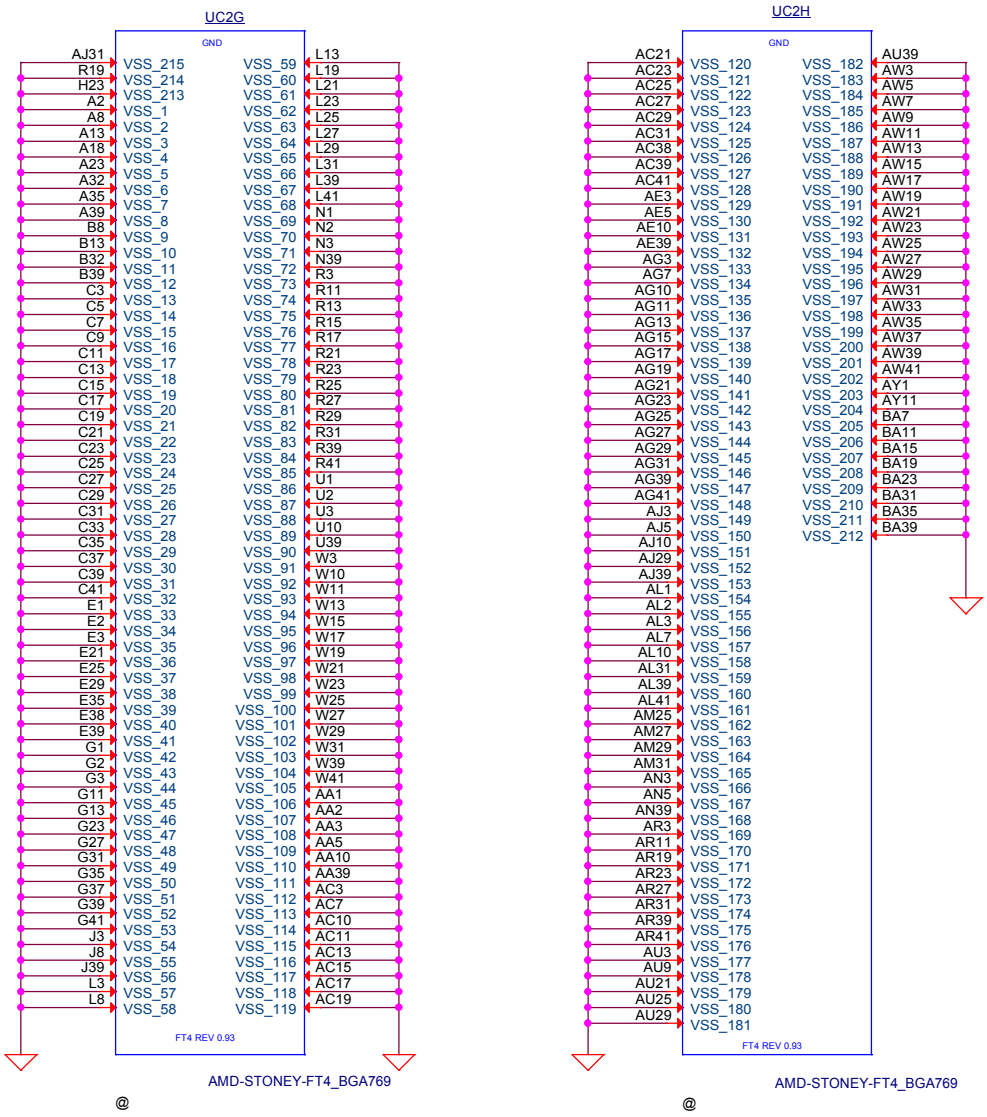

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Title: ***FT4 (VSS)***

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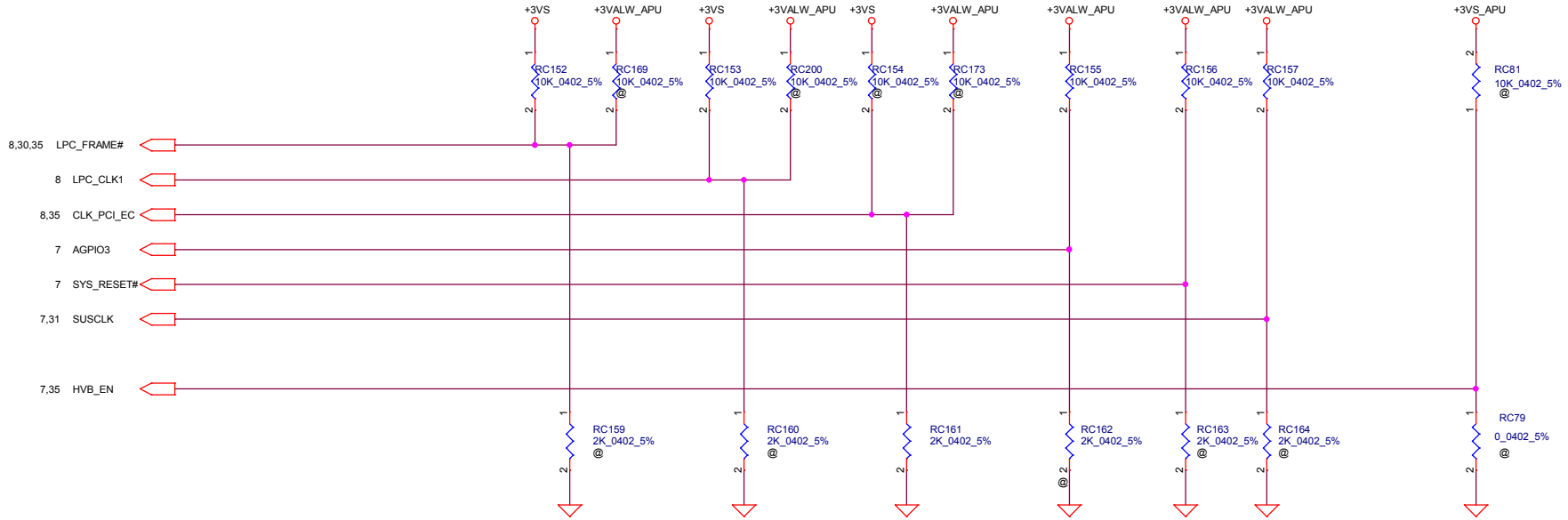

STRAP PINS

Signal	LFRAME_L	LPCCLK1	LPCCLK0	RTCCLK Int pull-up	SYS_RESET_L Int pull-up	AGPIO3 Int pull-up	HVB_EN
Type	II	II	II	I	I	I	
PULL HIGH	SPI ROM Default	Internal CLK Gen Default	Boot Fail Timer Enabled	RTC Coin Battery is implemented Default	Normal Power Up &Reset Timing Default	Enhanced reset logic (for quicker S5 resume) Default	floating Disable HVB on FT4 platforms Default
PULL LOW	LPC ROM	Reserved	Boot Fail Timer Disabled Default	RTC Coin Battery is not implemented	Reserved	traditional reset logic	connected to VSS Enable HVB on FT4 platforms

Type I straps become valid immediately after capture with the rising edge of RSMRST_L,they are captured only once when power is first applied to the processor

Type II straps become valid after PWR_GOOD is asserted,straps are captured every time the systems powers up from the S5 state. A transition from S3 to S0 does not trigger capture.
Type II straps should be pulled up to S0 power rail to prevent leakage when the signal is connected to a device in S0 power domain.

If the LPC bus is connected to devices that are on S0 power rail, then a pull-up resistor to VDD_33 is implemented.

All Strap pins must be configured with either external pull-up or pull-down resistors.

Platforms that are designed for AOAC complaint are recommended to use the Alternate Reset by strapping this pin to ' 1' for Ø
AGPIO3

Title: FT4 (STRAPS)

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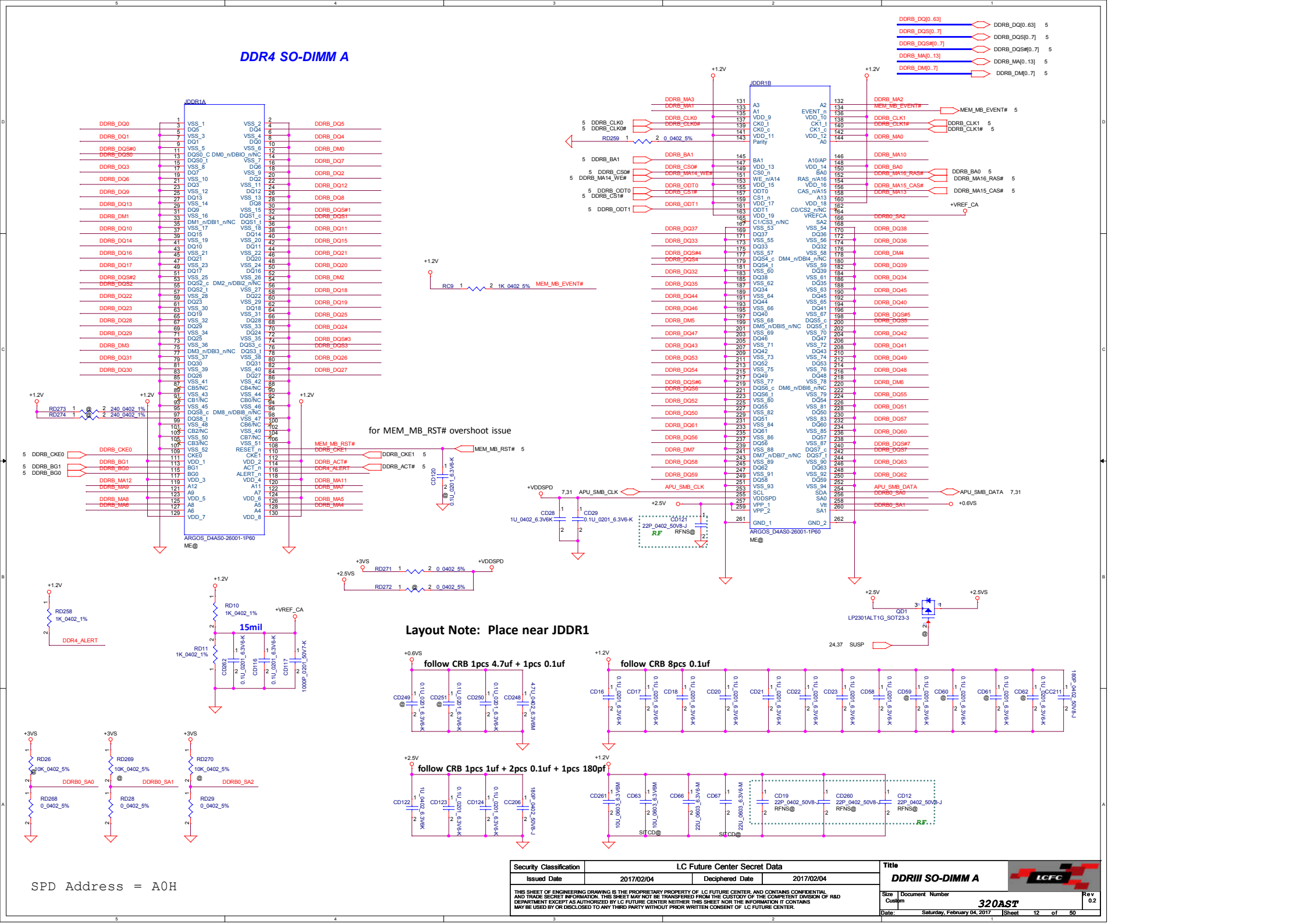
DDR4 SO-DIMM A



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Title: DDRIII SO-DIMM A

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Title

DDRIII SO-DIMM B

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Power-Up/Down Sequence

"Topaz" has the following requirements with regards to power-supply sequencing to avoid damaging the ASIC:

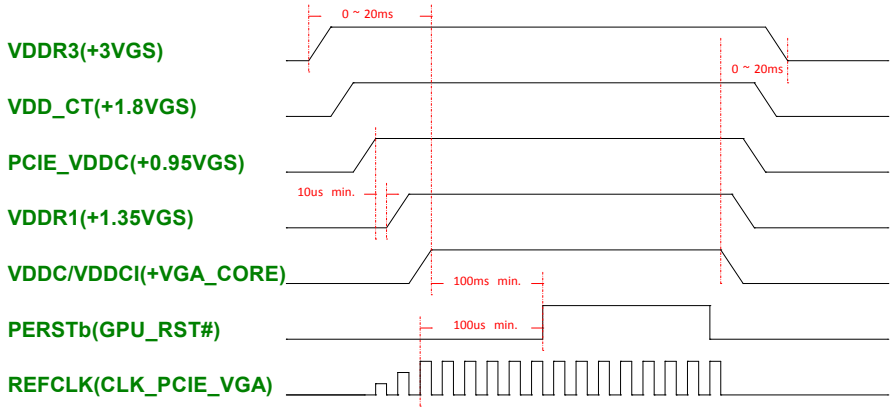
All the ASIC supplies must reach their respective nominal voltages within 20 ms of the start of the ramp-up sequence, though a shorter ramp-up duration is preferred. The maximum slew rate on all rails is 50 mV/µ s.

It is recommended that the 3.3-V rail ramp up first.

The 3.3-V, 1.8-V, and 0.95-V rails must reach their ready state at least 10 µ s before VDDC, VDDCI, and VMEMIO start to ramp up.

The power rails that are shared with other components on the system should be gated for the dGPU so that when the dGPU is powered down (for example AMD PowerXpress idle state), all the power rails are removed from the dGPU. The gate circuits must meet the slew rate requirement (such as ≤ 50 mV/µ s).

For power down, reversing the ramp-up sequence is recommended.



VRAM ID config

Memory Type		VRAM ID PS_3[3:1]	PU resistor RV63	PD resistor RV70
128Mx16	NA	100	4.53K	4.99K
	NA	111	4.75K	NC
	NA	110	3.4K	10K
256Mx16	Hynix H5TC4G63CFR-N0C 4Gb 900(1G)	000	NC	4.75K
	Micron MT41J256M16LY-091G:N 4Gb 900(1G)	010	4.53K	2K
	Samsung K4W4G1646E-BC1A 4Gb 900(1G)	001	8.45K	2K

Title: VGA Notes List

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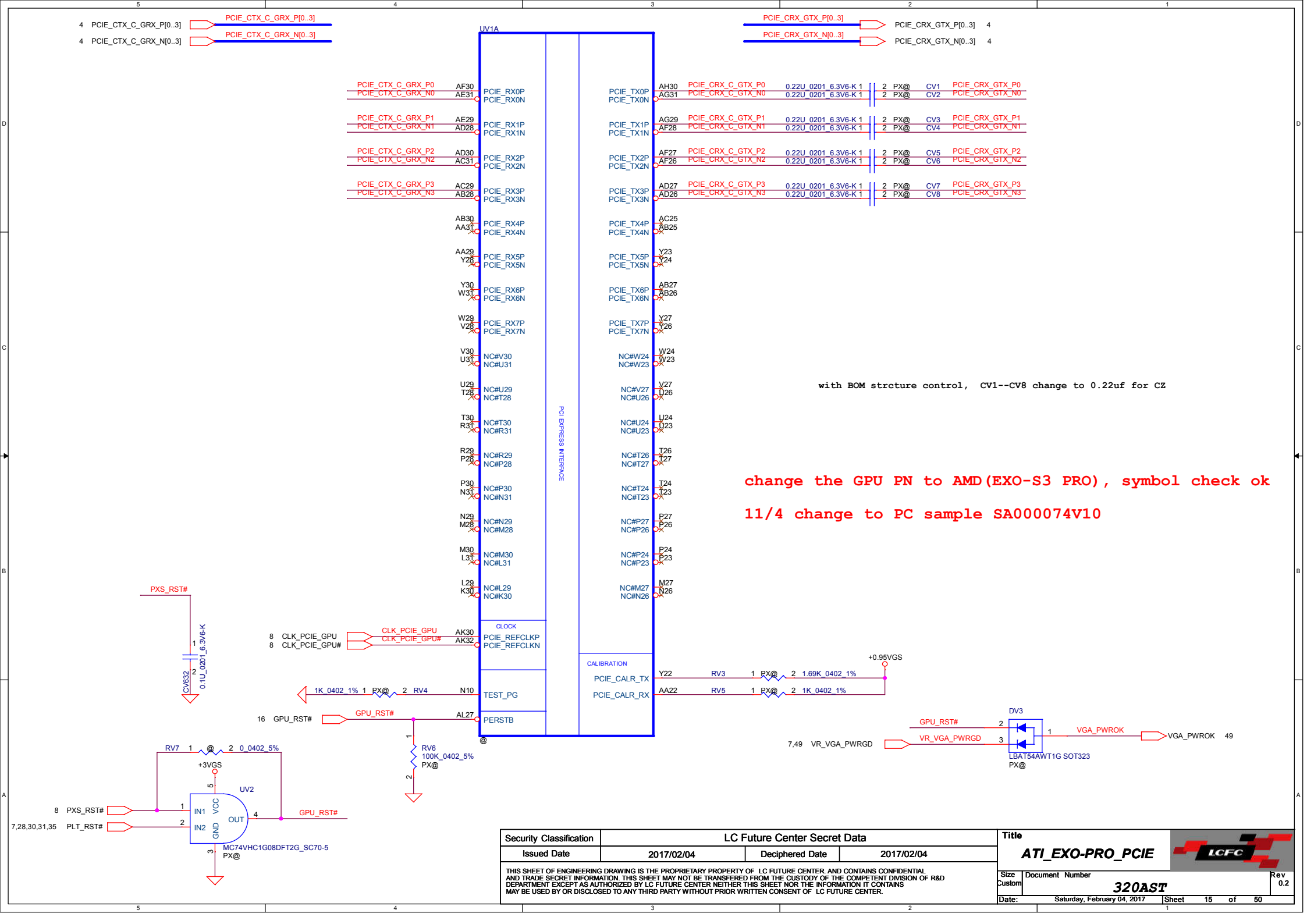

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CONFIGURATION STRAPS

ALLOW FOR PULLUP PADS FOR THESE STRAPS AND IF THESE GPIOS ARE USED, THEY MUST NOT CONFLICT DURING RESET

RECOMMENDED SETTINGS
0= DO NOT INSTALL RESISTOR
1 = INSTALL 10K RESISTOR
X = DESIGN DEPENDANT
NA = NOT APPLICABLE

MLPS Bit	Strap Name	Description	RECOMMENDED SETTINGS
PS_0[1] PS_0[2] PS_0[3]	ROM_CONFIG[0] ROM_CONFIG[1] ROM_CONFIG[2]	Define the ROM type when STRAP_BIOS_ROM_EN = 1. Define the primary memory-aperture size when STRAP_BIOS_ROM_EN = 0. 001 = 256MB	x
PS_0[4]	N/A	Reserved for internal use only. Must be 1 at reset.	1
PS_0[5]	AUD_PORT_CONN_PINSTRAP[0]	The LSB (least significant bit) of the strap option that indicates the number of audio-capable display outputs.	1
PS_1[1]	STRAP_BIF_GEN3_EN_A	1 = PCIe GEN3 is supported. 0 = PCIe GEN3 is not supported. 1= GEN3 is supported	x
PS_1[2]	STRAP_BIF_CLK_PM_EN	0 = The CLKREQB power management capability is disabled 1 = The CLKREQB power management capability is enabled	0
PS_1[3]	N/A	Reserved for internal use only. Must be 0 at reset.	0
PS_1[4]	STRAP_TX_CFG_DRV_FULL_SWING	0 = The transmitter half-swing is enabled 1 = The transmitter full-swing is enabled	1
PS_1[5]	STRAP_TX_DEEMPH_EN	0 = Tx deemphasis disabled. 1 = Tx deemphasis enabled. 1= Enable	x
PS_2[1]	N/A	Reserved.	0
PS_2[2]	N/A	Reserved.	0
PS_2[3]	STRAP_BIOS_ROM_EN	0 = Disable the external BIOS ROM device. 1 = Enable the external BIOS ROM device. 0= Disable	x
PS_2[4]	STRAP_BIF_VGA_DIS	0 = VGA controller capacity enabled. 1 = The device will not be recognized as the system' s VGA controller.	1
PS_2[5]	N/A	Reserved	1
PS_3[1] PS_3[2] PS_3[3]	BOARD_CONFIG[0] BOARD_CONFIG[1] BOARD_CONFIG[2]	Board configuration related strapping, such as for memory ID 100 = Hynix 1G 000 = Hynix 2G 111 = Micron 1G 010 = Micron 2G 110 = Samsung 1G 001 = Samsung 2G	x
PS_3[4] PS_3[5]	AUD_PORT_CONN_PINSTRAP[1] AUD_PORT_CONN_PINSTRAP[2]	Determines the maximum number of digital display audio endpoints that will be presented to the OS and user.(Combine with PS_0[5]) 111 = No usable endpoints. 110 = One usable endpoint. 101 = Two usable endpoints. 111= No usable endpoints. 100 = Three usable endpoints. 011 = Four usable endpoints. 010 = Five usable endpoints. 001 = Six usable endpoints. 000 = All endpoints are usable.	11

MLPS	Bit				BOM		
	5	4	3	2	1	R_pu ( )	R_pd ( )	C(nF)
PS_0[5:1]	1	1	0	0	1	RV71=8.45k	RV77=2K	CV15=NC
PS_1[5:1]	1	1	0	0	1	RV74=8.45K	RV80=2K	CV16=NC
PS_2[5:1]	1	1	0	0	0	RV60=NC	RV69=4.75K	CV18=NC
PS_3[5:1]	1	1	X	X	X	RV63=X76	RV70=X76	CV19=NC

with BOM strcture control,
RV63,RV70 change to different value to adjust VRAM config

with BOM strcture control,
when config PEG3
RV74 change to 8.45K,
RV80 change to 2K

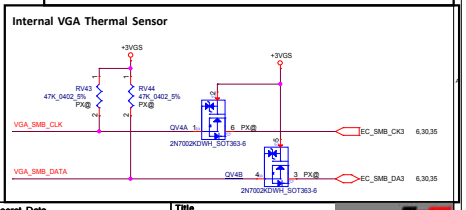
Capacitor Value (nF)	Bits [5:4]
680	00
82	01
10	10
NC	11

R_pu (Ω)	R_pd (Ω)	Bits [3:1]
NC	4750	000
8450	2000	001
4530	2000	010
6980	4990	011
4530	4990	100
3240	5620	101
3400	10000	110
4750	NC	111

Note: 0402 1% resistors are required.

SVC	SVD	Output Voltage (V)
0	0	1.1
0	1	1.0
1	0	0.9
1	1	0.8

Internal VGA Thermal Sensor



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Title: ATI_EXO-PRO_Main_MSIC

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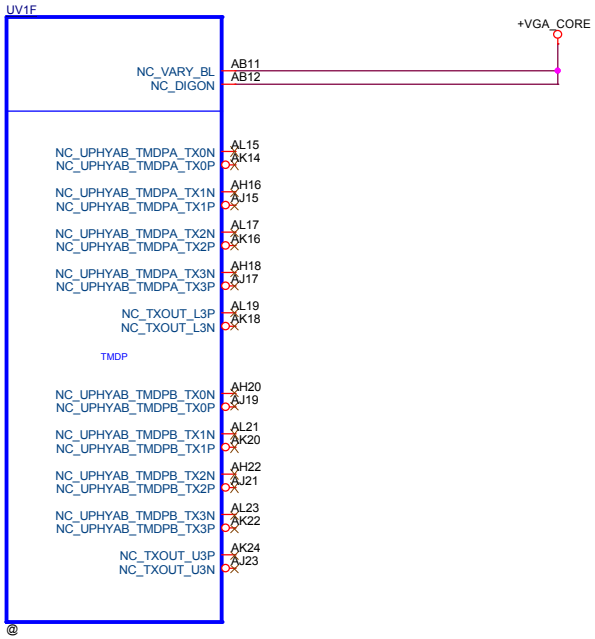

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Title: ATI_EXO-PRO_TMDP

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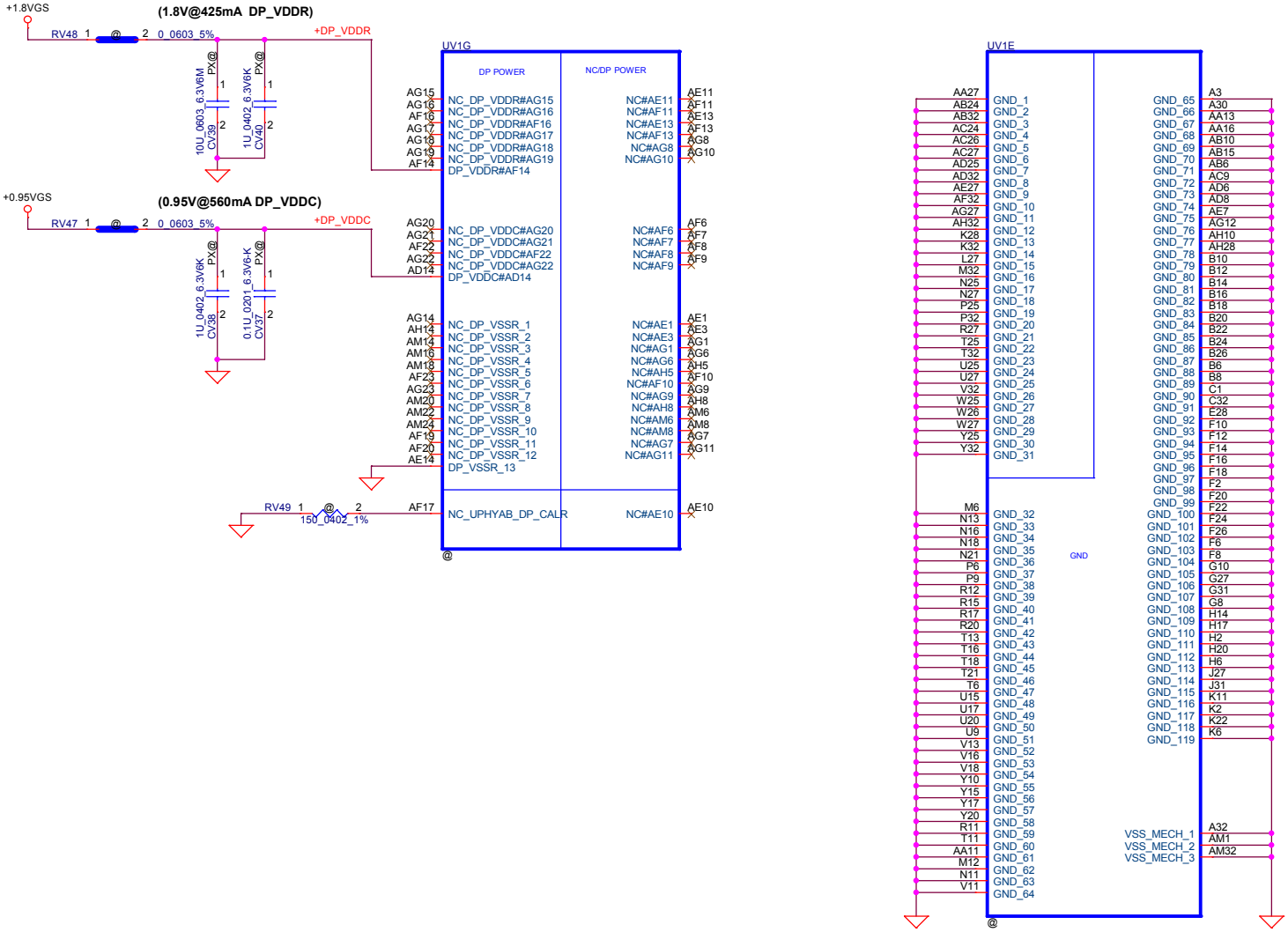
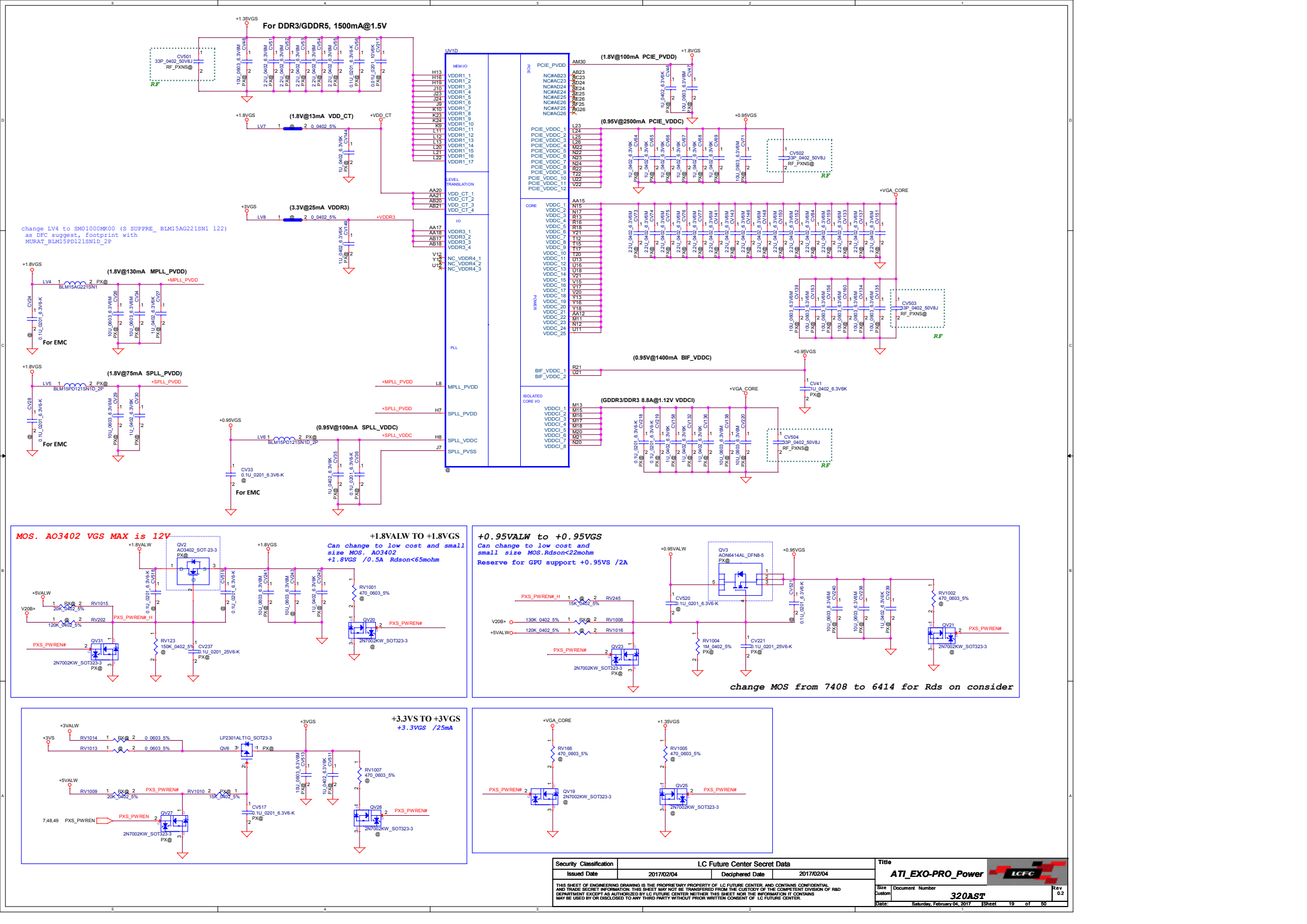


Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

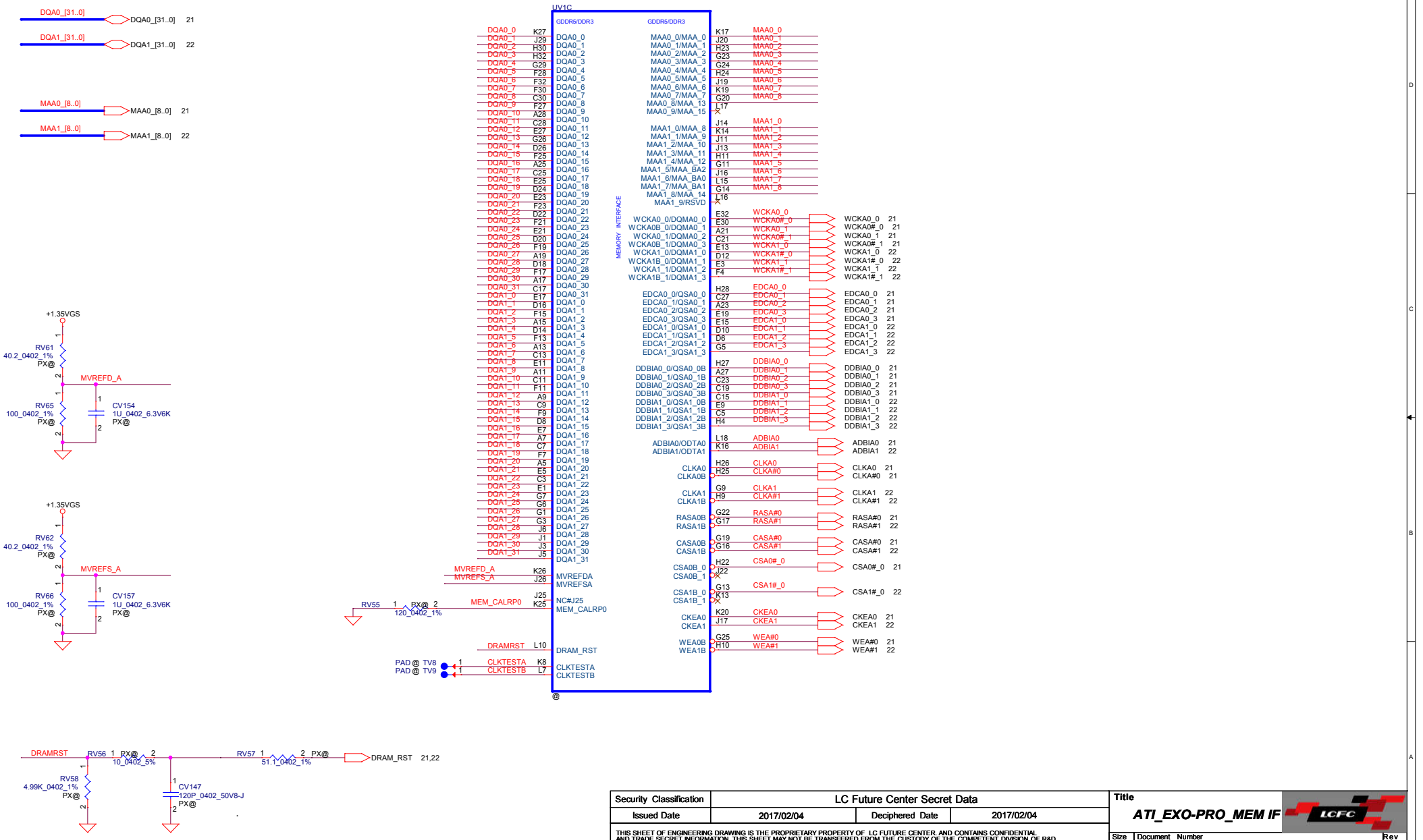
Title: ATI_EXO-PRO_DP Power

Size: Custom	Document Number: 320AST	Rev: 0.2
Date: Saturday, February 04, 2017	Sheet 18 of 50	



Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title	ATI_EXO-PRO_Power		
Size: Custom	Document Number: 320AST		Rev: 0.2
Date: Saturday, February 04, 2017	Sheet 19 of 50		



Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title: ATI_EXO-PRO_MEM IF

Size	Document Number	Rev
Custom	320AST	0.2

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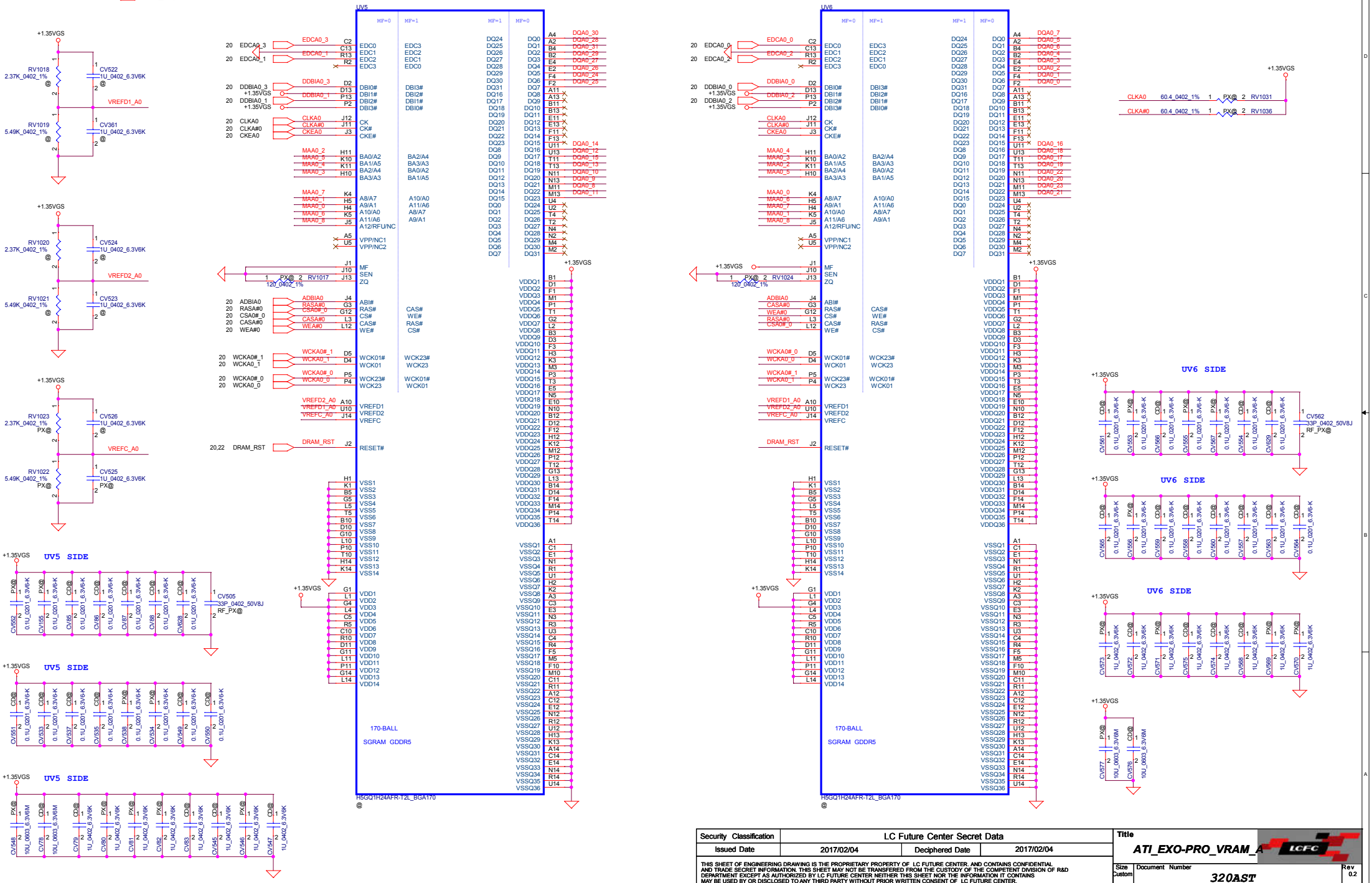
Lower 32 bits

DQA0_[31..0] 20

MAA0_[8..0] 20

MF=0 No Mirror

MF=1 Mirror



Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title: ATI_EXO-PRO_VRAM_A

Size	Document Number	Rev
Custom	320AST	0.2

Date: Saturday, February 04, 2017 | Sheet 21 of 50

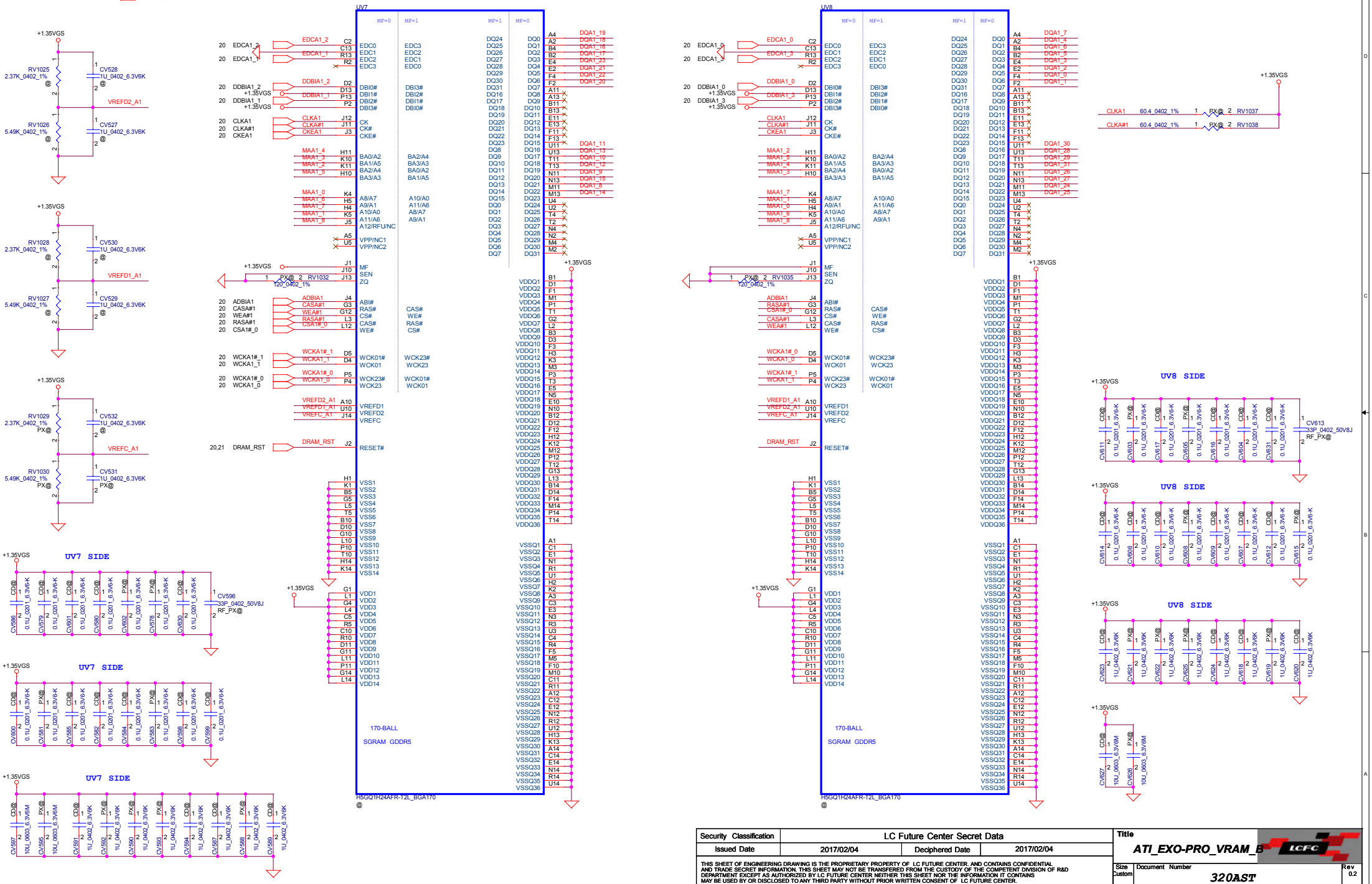
Upper 32 bits

DQA1_[31..0] 20

MAA1_[8..0] 20

MF=1 Mirror

MF=0 No Mirror



Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title: ATI_EXO-PRO_VRAM_B

Size	Document Number	Rev
Custom	320AST	0.2

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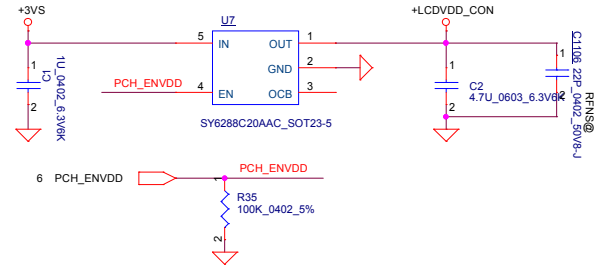
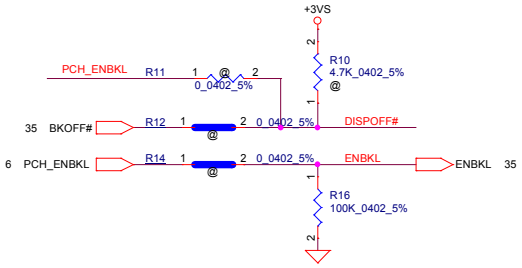
LCD POWER CIRCUIT

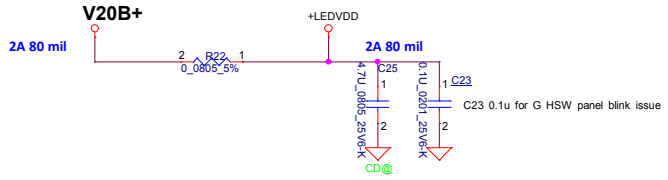


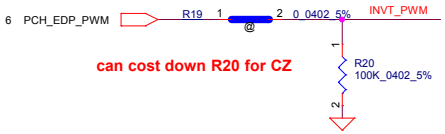
APU output enable Voh min is 1.8V-0.45V=1.35V



Touch Screen

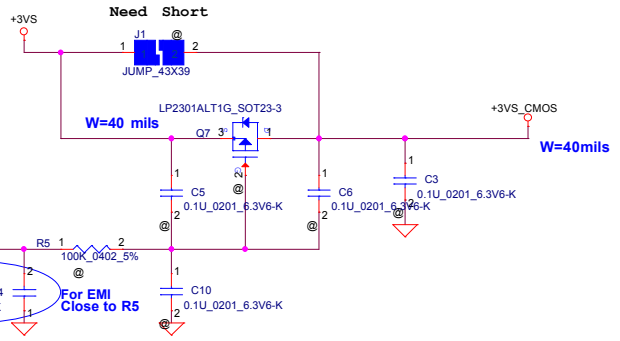
B+ to +LEDVDD POWER

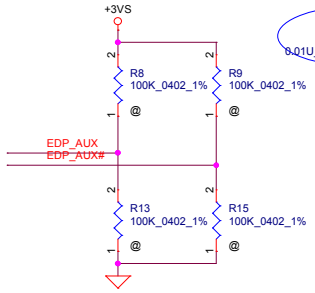


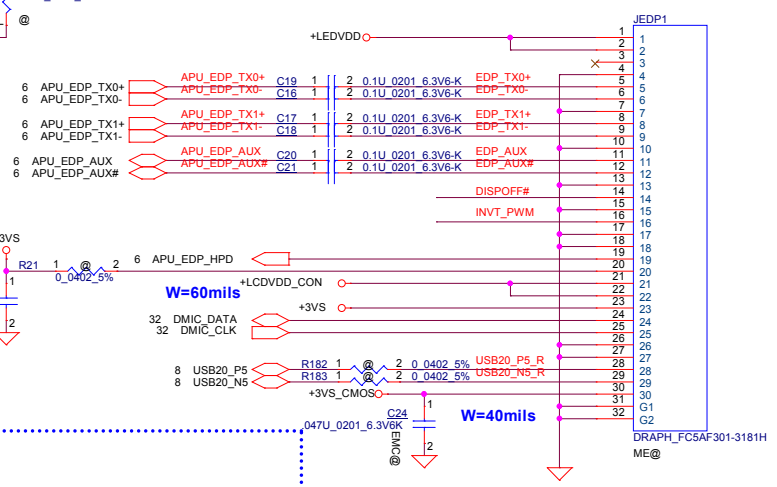


can cost down R20 for CZ

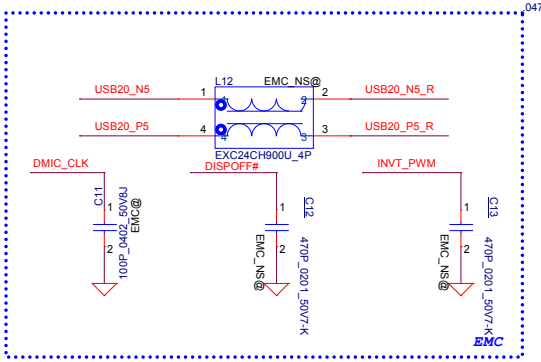
CMOS Camera







Remove Touch screen for 320 AST



Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title	eDP/CMOS/Touch screen		
Size: Custom	Document Number: 320AST		Rev: 0.2
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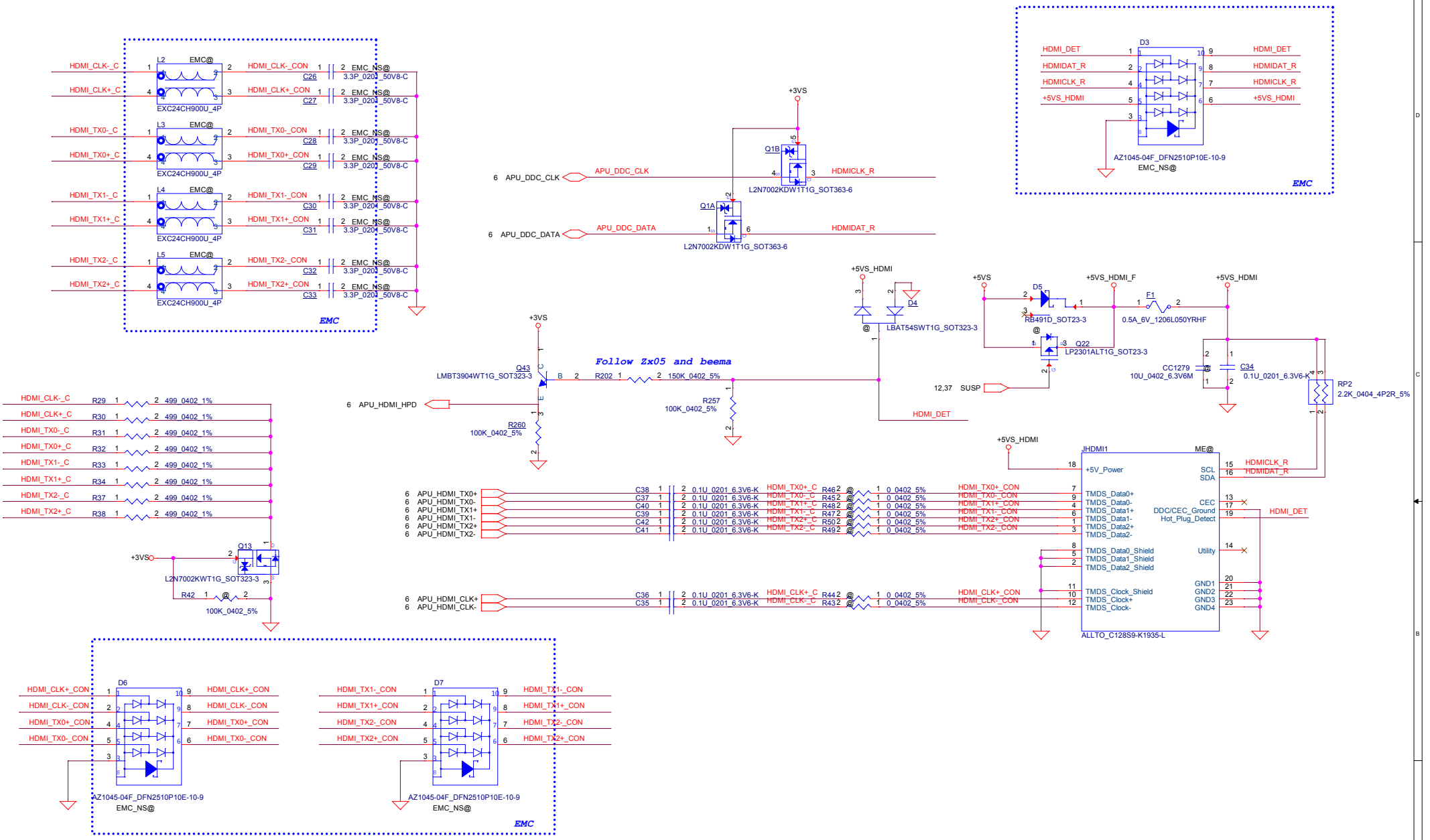

Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title	HDMI_CONN		
Size	Document Number		Rev
Custom	320AST		0.2
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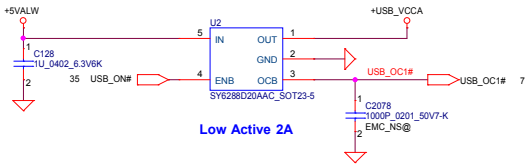
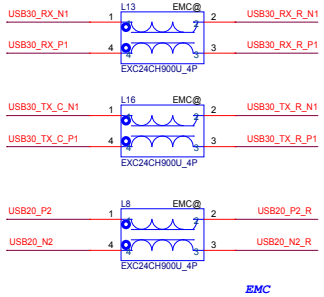
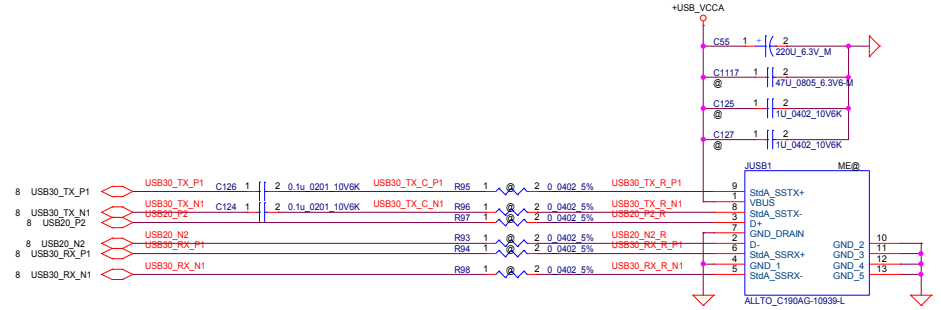
LEFT SIDE USB3.0 PORT x2



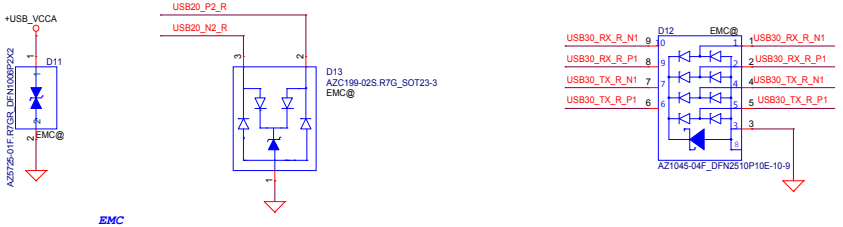
Low Active 2A



EMC

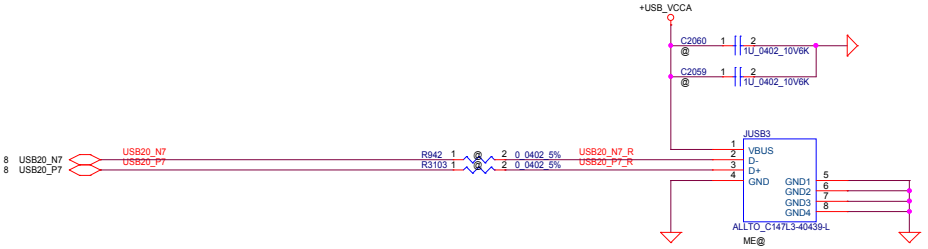


09/05 Update USBConn. P/N DC021609011 wei

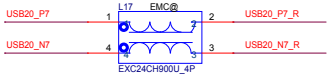


EMC

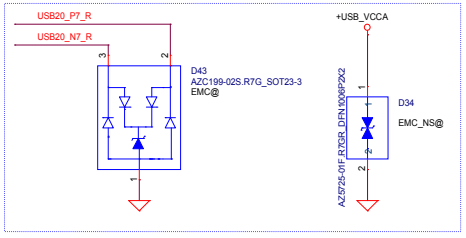
+USB_VCCA



09/05 Update USBConn. P/N DC021609011 wei



FOR ESD Close to Connector



Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title	USB3.0 PORT (LEFT)		
Size C	Document Number 320AST		Rev 0.2
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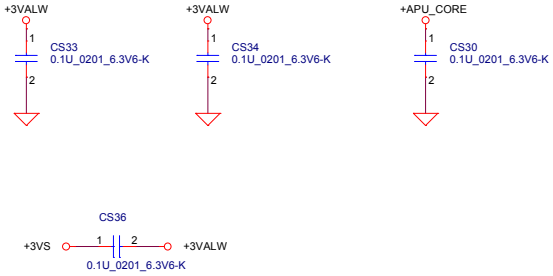
Remove USB Type-C follow OD

Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title: *3D Camera*

Size: Custom	Document Number: 320AST	Rev: 0.2
Date: Saturday, February 04, 2017	Sheet 26 of 50	



Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title: ***DP to CRT Convert(IT6515FN)***

Size	Document Number	Rev
Custom	***320AST***	0.2

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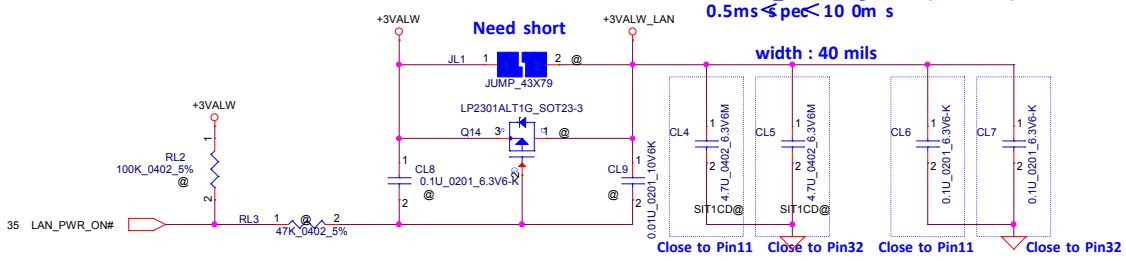
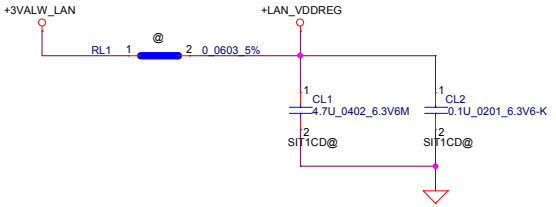
+3VALW TO +3VALW_LAN

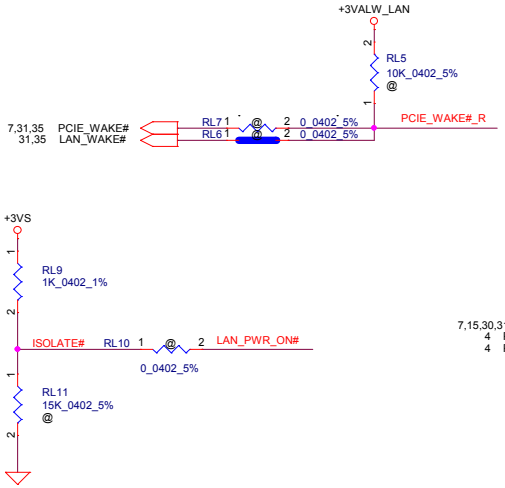
+3VALW_LAN rising t i me (10 %~90 %)
0.5ms ≤ spec ≤ 10 0m s

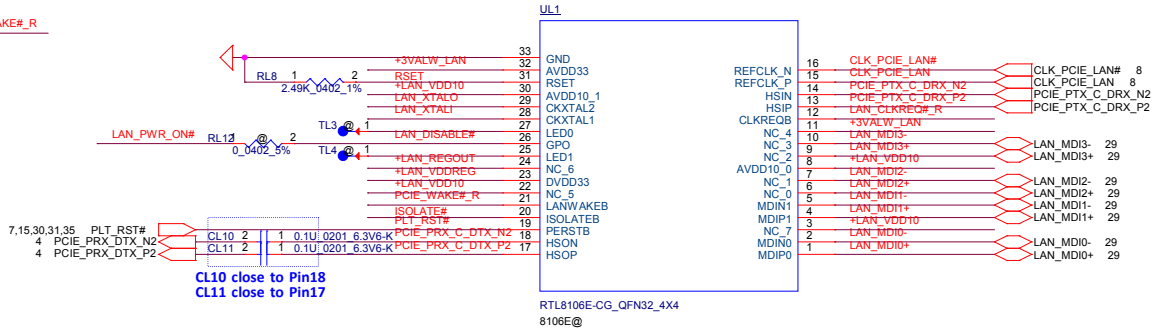
Need short

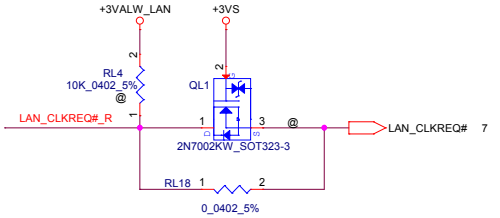
width : 40 mils





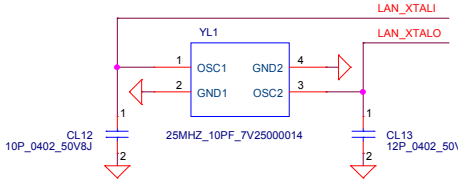






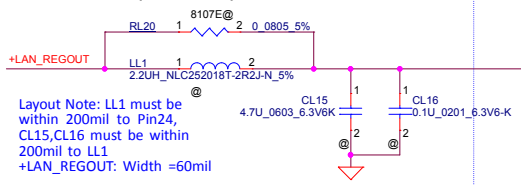
APU CLKREQ all both 3VS power plane

Vinafix

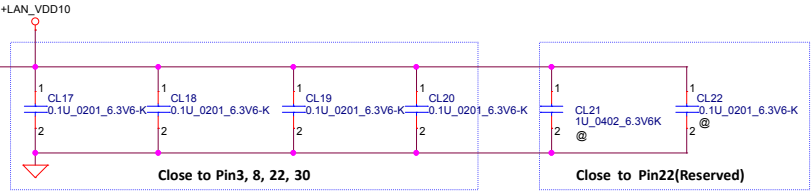


follow G CarrizoL 10pf

For RTL8111GUL/ RTL8106EUL (SWR mode)
For RTL8111H (LDO mode) RL19 stuf f



Layout Note: LL1 must be within 200mil to Pin24, CL15,CL16 must be within 200mil to LL1
+LAN_REGOUT: Width =60mil



Close to Pin3, 8, 22, 30

Close to Pin22(Reserved)

Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title: **LAN_RTL8111GUL**

Size	Document Number	Rev
Custom	320ABR	0.2

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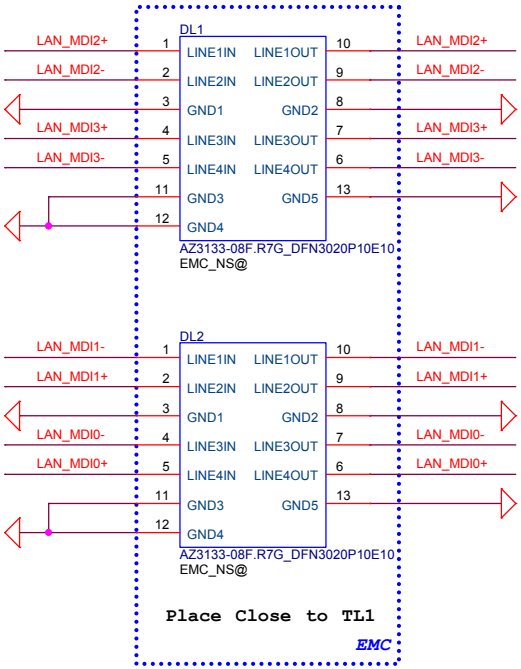
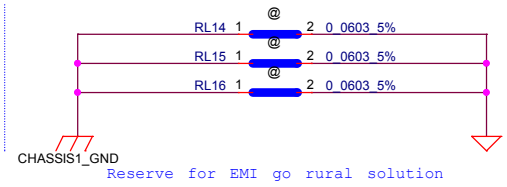
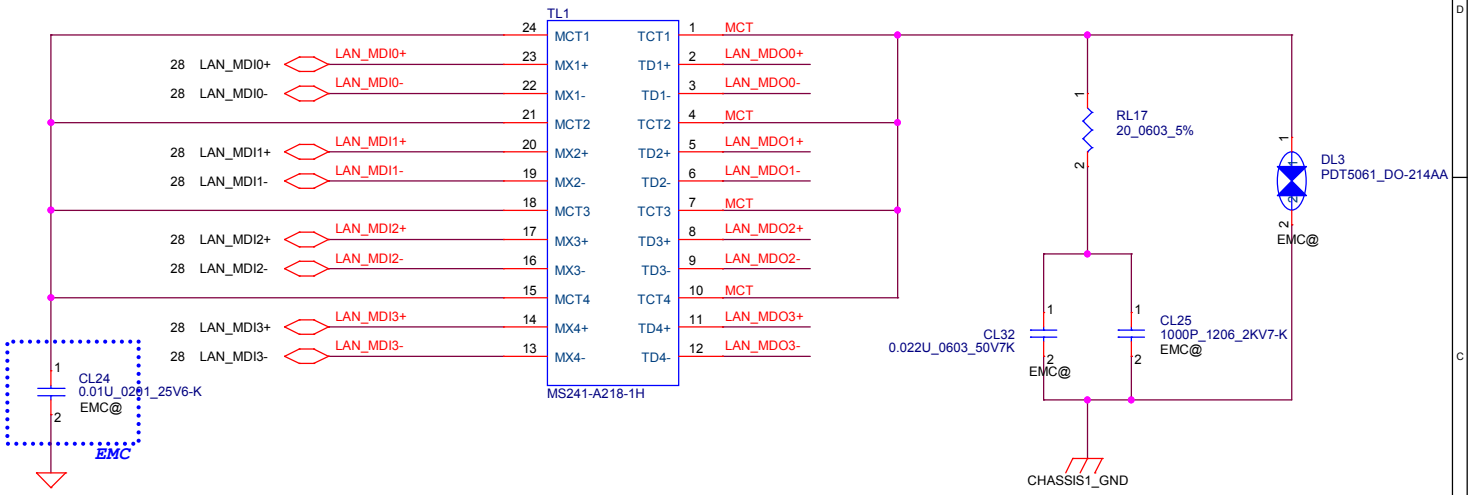
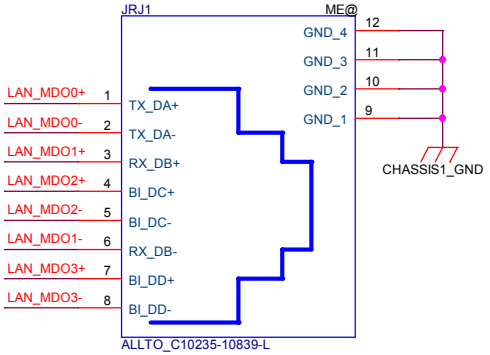
DL1/DL2
1'S PN:SC300003M00









Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title: LAN_Transformer

Size	Document Number	Rev
B	320ABR	0.2

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Close to U1

C44 2200P_0402_50V7K

REMOTE+_R

REMOTE-_R

R175 R176 R177 R178 0_0402_5%

REMOTE1+ REMOTE2+ REMOTE2- REMOTE1-

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

Near GPU&VRAM

C45 100P_0402_50V8J

Q15 LMBT3904WT1G_SOT323-3

Near CPU core

C46 100P_0402_50V8J

Q16 LMBT3904WT1G_SOT323-3

SMSC thermal sensor
placed near DIMM

U1 NCT7718W_MSOP8

VDD D+ D- T_CRIT# SCL SDA ALERT# GND

EC_SMB_CK3 EC_SMB_DA3 6,16,35

C47 0.1U_0201_6.3V6-K

R51 10K_0402_5%

Address 1001_101xb

+3VALW

R17 13.7K_0402_1%

NTC_V1

R1 100K_0402_1%_TSM0B104F4251RZ PX@

R184 R185 0_0402_5% PX@

EC_AGND

Near CPU

R25 13.7K_0402_1%

NTC_V2

R3 100K_0402_1%_TSM0B104F4251RZ

R191 R192 0_0402_5%

HW thermal sensor

C4 0.1U_0201_6.3V6-K

U4 G718TM1U_SOT23-8

VCC TMSNS1 GND RHYST1 OT1 TMSNS2 OT2 RHYST2

R252 R253 21.5K_0402_1%

R196 R197 0_0402_5%

NTC_V1 35 NTC_V2 35

46 EC_ON_R

R6 R7 10K_0402_5%

over temperature threshold:
RSET=3*RTMH
92+/-30C
Hysteresis temperature threshold.
RHYST=(RSET*RTML)/(3*RTML-RSET)
56+/-30C

	Nationz TPM	Nuvoton TPM
RTPM2	Stuff	NC
RTPM12	Stuff	NC
RTPM11	NC	Stuff

TPM

CTPM4 0.1u_0201_10V6K TPM@

CTPM1 10U_0603_6.3V6M TPM@

CTPM3 0.1u_0201_10V6K TPM@

RTPM1 TPM@ 0_0603_5%

1A

UTPM1 TPM@ Z32H320TC-LPC-T28-LT1_TSSOP28

RTPM12 TPM@ 0_0402_5%

Reserve for Nationz TPM

RTPM11 TPM@ 0_0603_5%

Add for Nuvoton TPM

RTPM2 TPM@ 4.7K_0402_5%

RTPM5 RTPM6 RTPM7 RTPM8 RTPM9 RTPM10 TPM@ 0_0402_5%

SERIRQ_TPM LPC_AD0_TPM LPC_AD1_TPM LPC_FRAME#_TPM LPC_AD2_TPM LPC_AD3_TPM

SERIRQ 8,35 LPC_AD0 8,35 LPC_AD1 8,35 LPC_FRAME# 8,11,35 LPC_AD2 8,35 LPC_AD3 8,35

Reserve for Nationz TPM

TPM_CLK 8

TPM_CLKRUN#

RTPM13 TPM@ 0_0402_5%

LPC_CLKRUN#

Reserve for Nuvoton TPM

PLT_RST# 7,15,28,31,35

RTPM4 0_0402_5% TPM@

C49 10U_0805_10V6K

C50 0.1u_0201_10V6K

R52 0_0603_5%

+5VS_FAN

35 EC_FAN_SPEED
35 EC_FAN_PWM

JFAN1 ACES_85205-04001 ME@

GND1 GND2

Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title: Thermal sensor/FAN CONN/TPM

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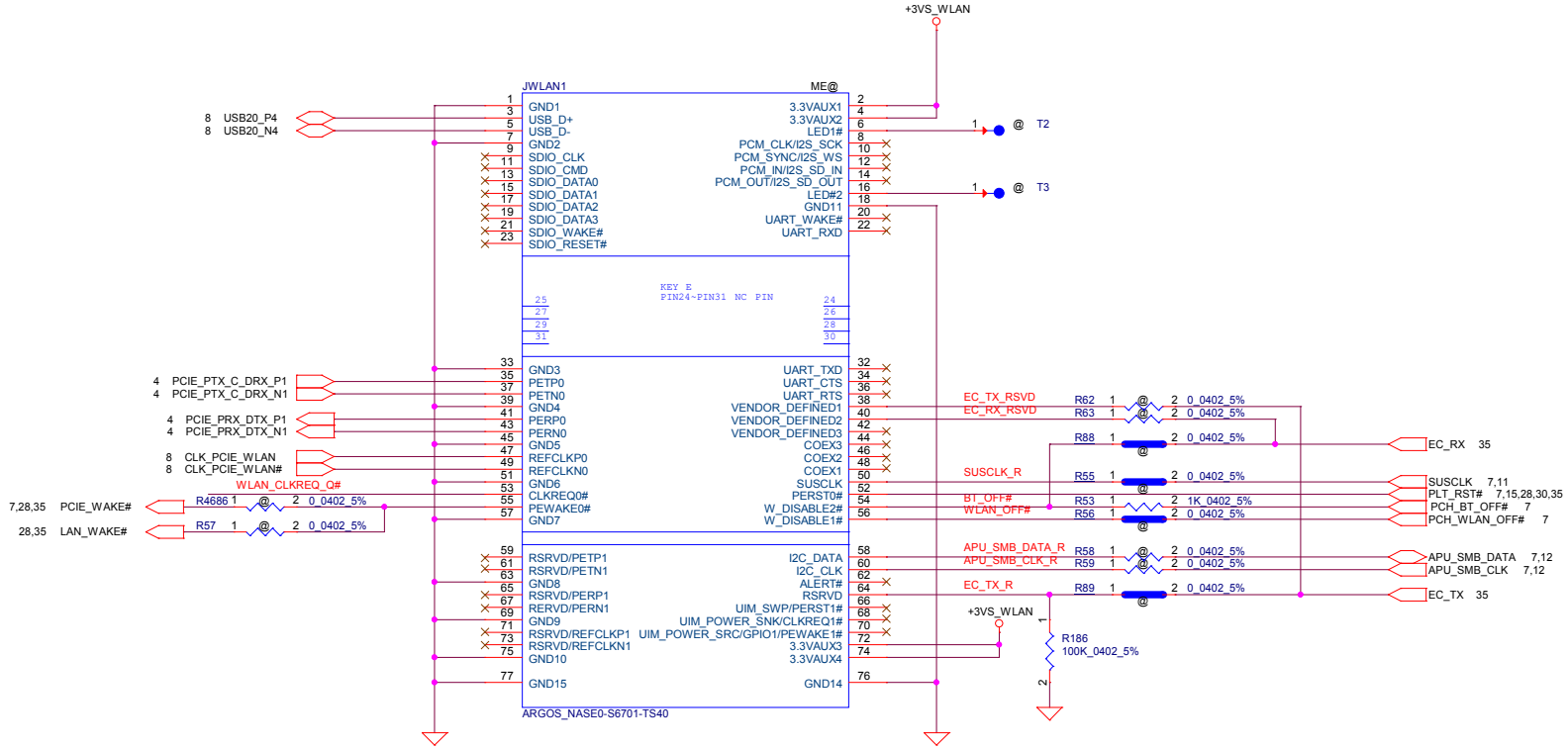
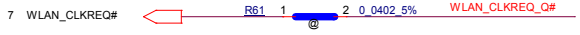
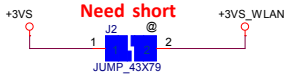
Mini-Express Card(WLAN/WiMAX)







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

Not support AOAC, delete AOAC power circuit 1015

Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title	NGFF WLAN		
Size	Document Number		Rev
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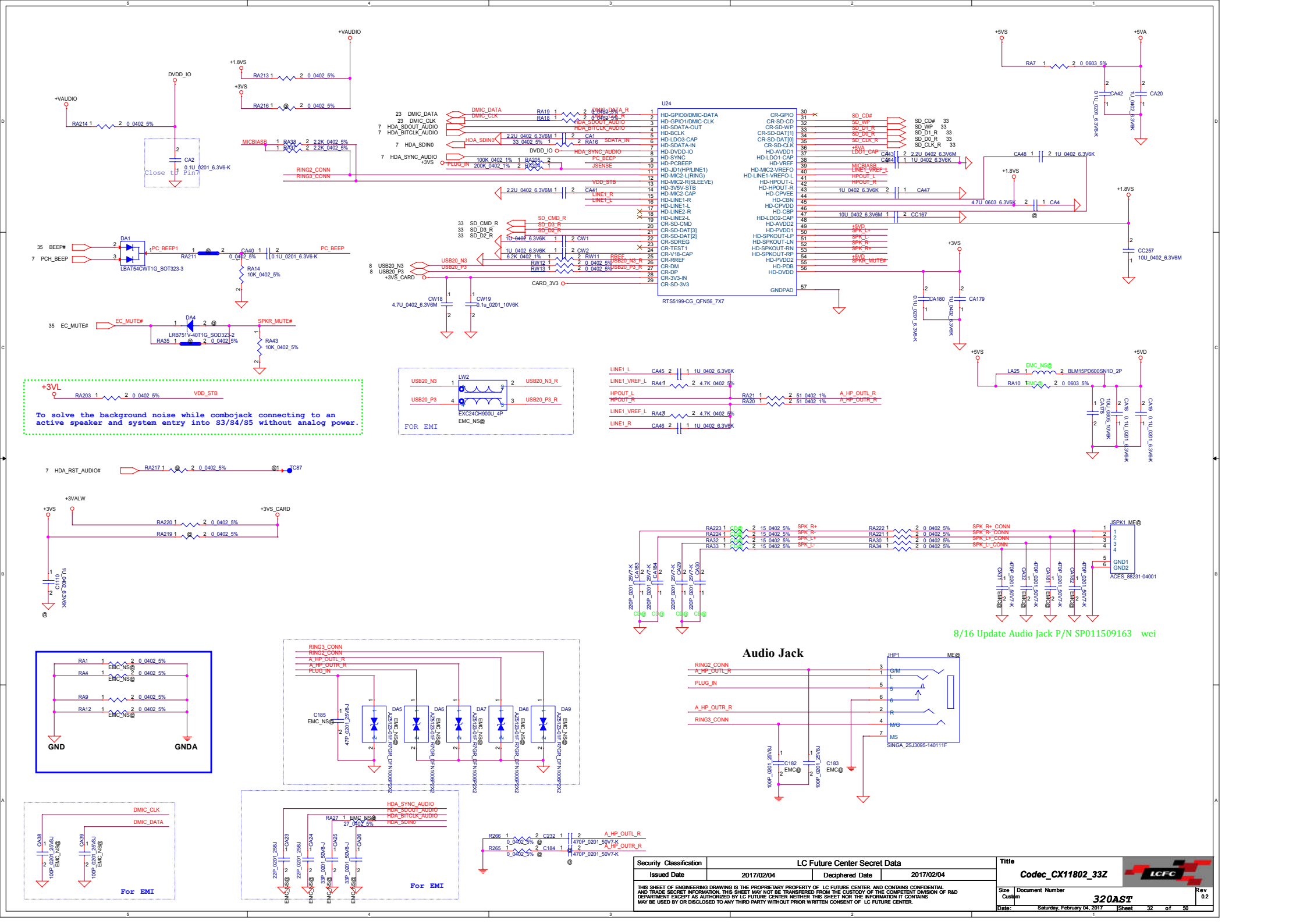

Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

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Title	Codec_CX11802_33Z		
Size	Document Number		Rev
Custom	320AST		0.2
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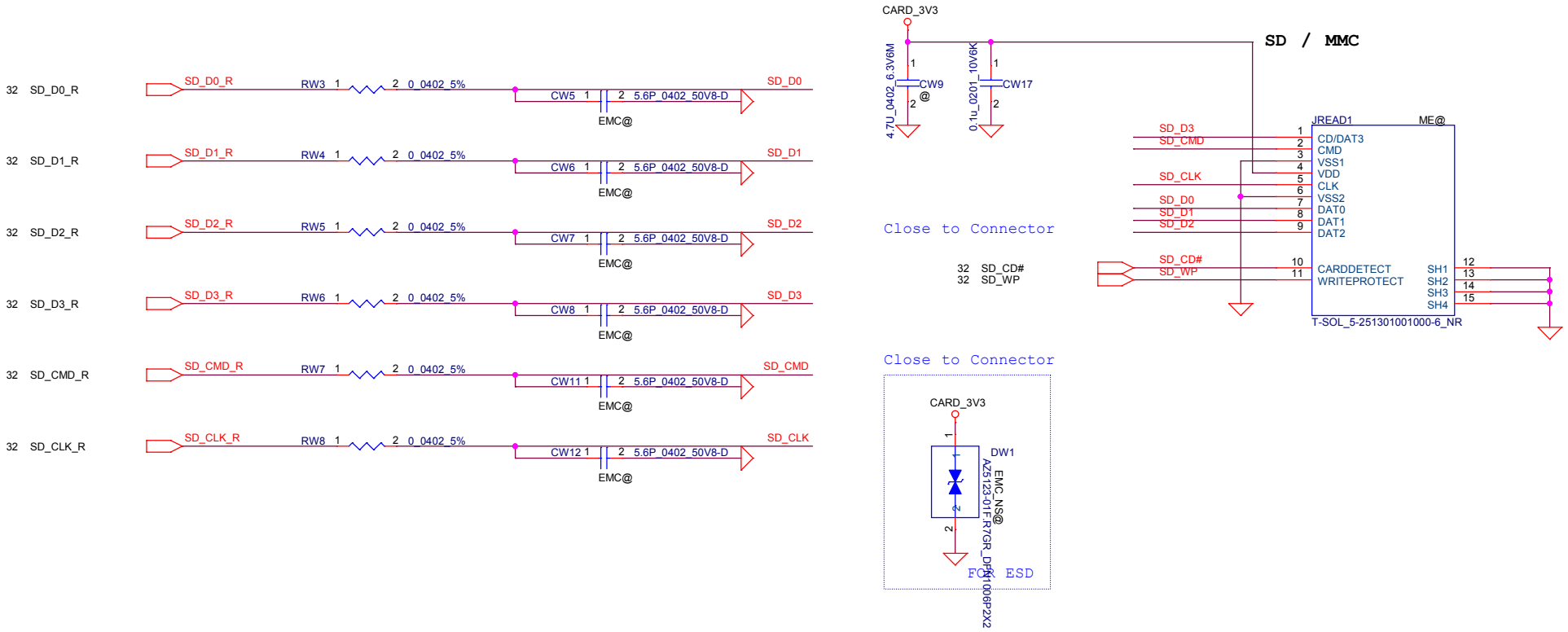

Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title	CardReader		
Size B	Document Number 320AST		Rev 0.2
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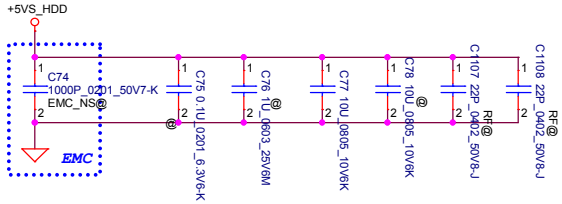
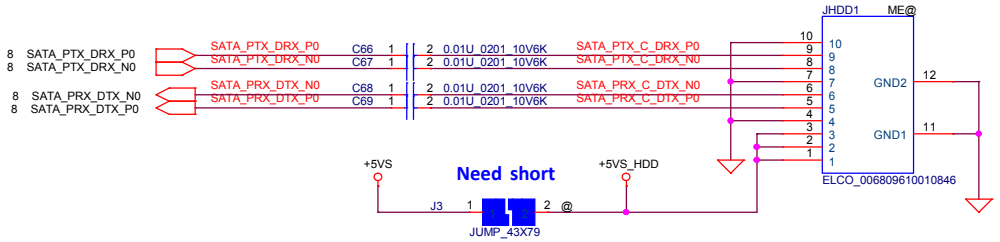
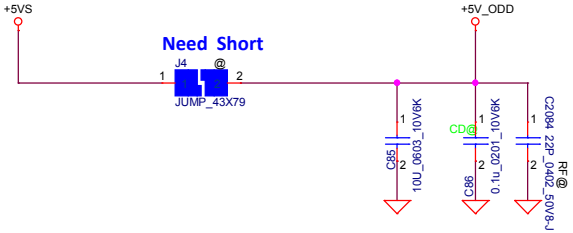
SATA HDD Conn.

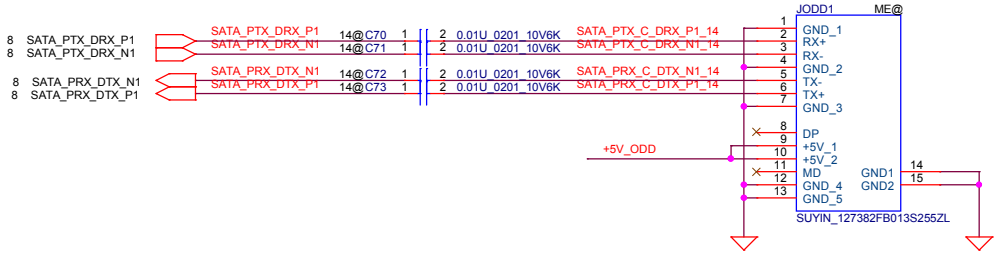


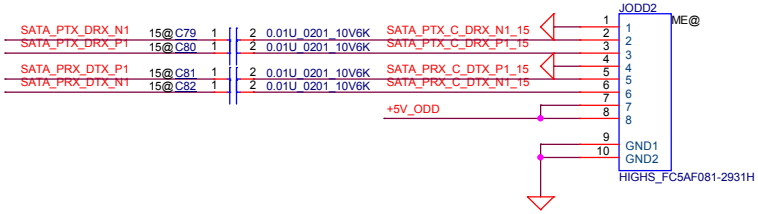




SATA 15 ODD P/N pin assgin is different from G SKL

FOR 14" SATA ODD Conn.

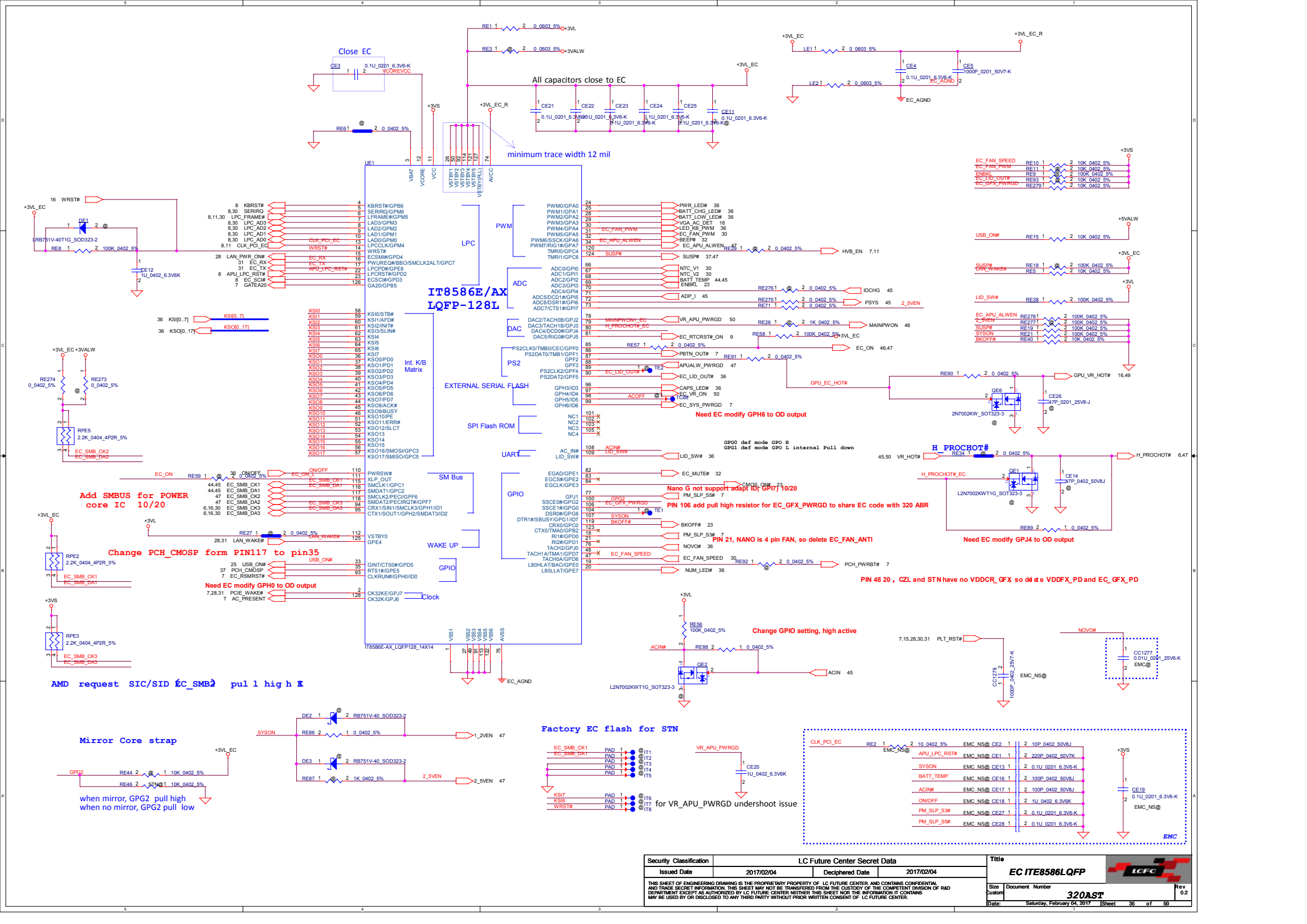




8/16 Update Conn. P/N SP01001YV00 wei

Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title	HDD/ODD CONN		
Size	Document Number		Rev
Custom	320AST		0.2
Date:	Saturday, February 04, 2017	Sheet	34 of 50


Close EC
All capacitors close to EC
minimum trace width 12 mil
IT8586E/AX
LQFP-128L
PWM
LPC
ADC
DAC
PS2
EXTERNAL SERIAL FLASH
SPI Flash ROM
UART
GPIO
SM Bus
WAKE UP
Clock
Int. K/B Matrix
Need EC modify GPH6 to OD output
GPG0 def mode GPO H
GPG1 def mode GPO L internal Pull down
Nano G not support adapt ID(GPI7) 10/20
PIN 106 add pull high resistor for EC_GFX_PWRGD to share EC code with 320 ABR
PIN 21, NANO is 4 pin FAN, so delete EC_FAN_ANTI
PIN 48 20 , CZL and STN have no VDDCR_GFX so delete VDDFX_PD and EC_GFX_PD
Need EC modify GPJ4 to OD output
Add SMBUS for POWER core IC 10/20
Change PCH_CMOSP form PIN117 to pin35
Need EC modify GPH0 to OD output
AMD request SIC/SID EC_SMB2 pull high
Change GPIO setting, high active
Mirror Core strap
when mirror, GPG2 pull high
when no mirror, GPG2 pull low
Factory EC flash for STN
for VR_APU_PWRGD undershoot issue
EMC
Security Classification
LC Future Center Secret Data
Issued Date
2017/02/04
Deciphered Date
2017/02/04
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Title
EC ITE8586LQFP
Size
Custom
Document Number
320AST
Rev
0.2
Date:
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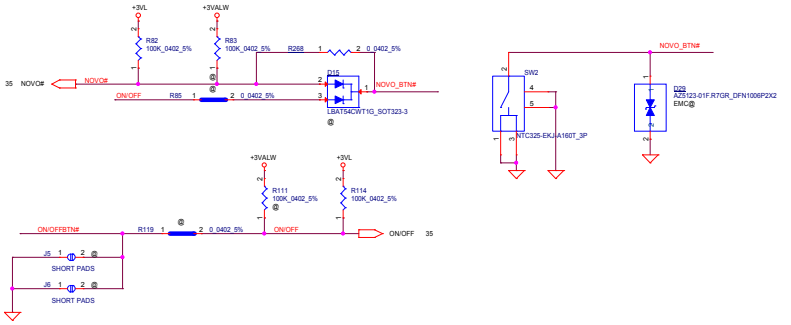
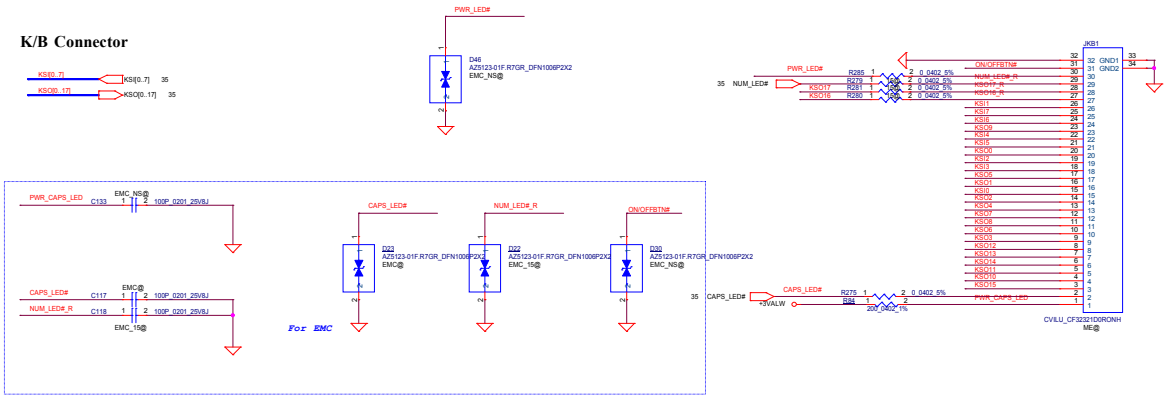
of
50

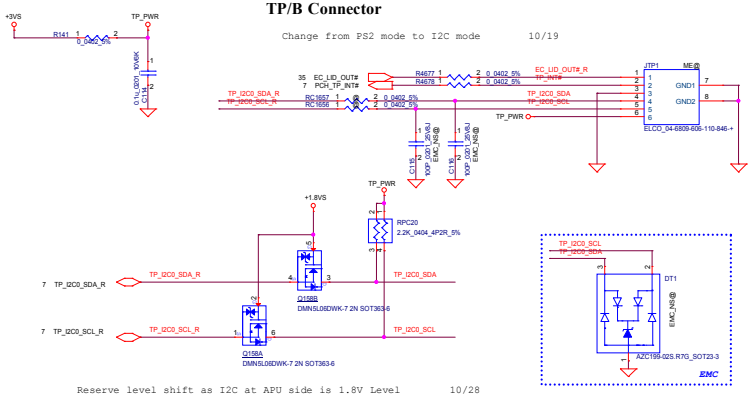
ON/OFF switch



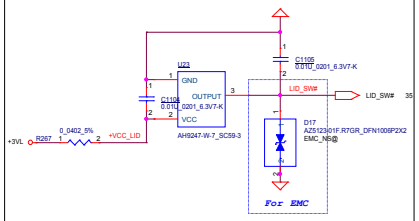
K/B Connector



TP/B Connector

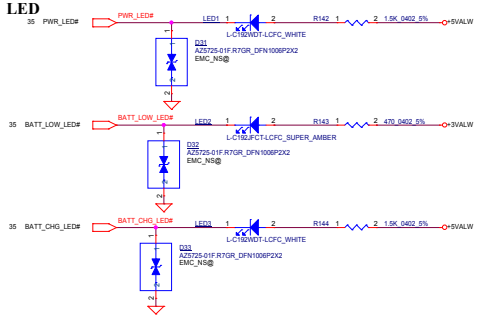


LID Connector

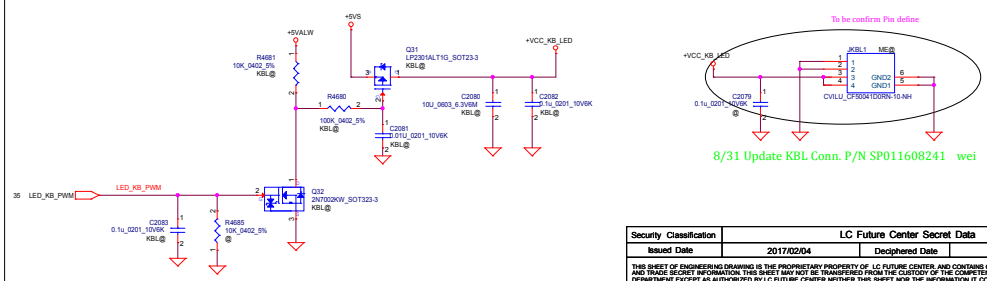


Finger Print Connector

LED



KB Backlight Connector



8/31 Update KBL Conn. P/N SP011608241 wei

Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title	KBD/PWR/IO/LED/TP Conn.		
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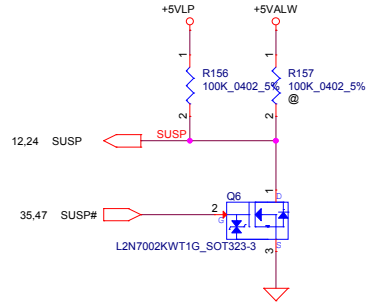


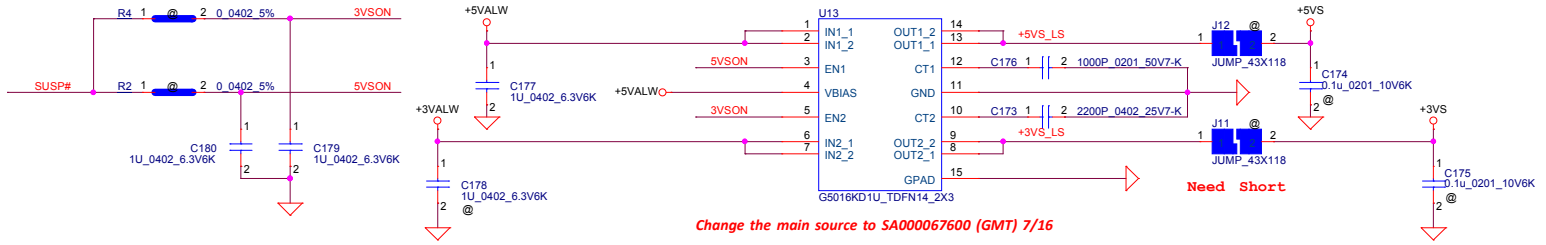
Load Switch

+5VALW To +5VS — **+3VS, C173 --> 2.74ms**

+3VALW To +3VS — **+5VS, C176 --> 2.03ms**

VIN 5V and 3.3V (VBIAS=5V), IMAX(per channel)=6A, Rds=16mohm

Need Short



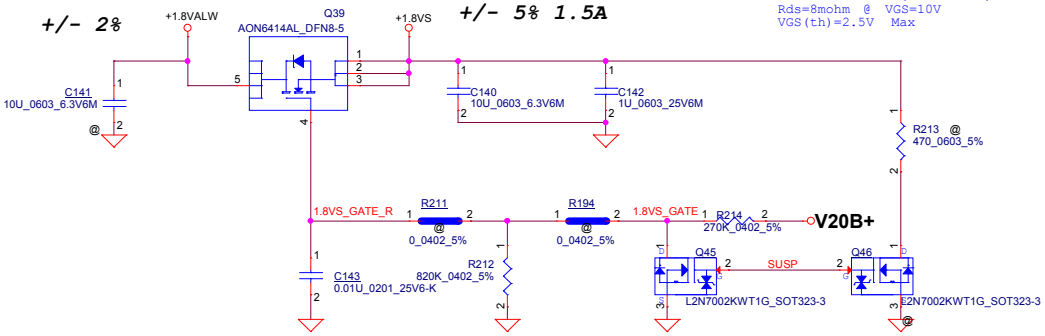
Need Short

Change the main source to SA000067600 (GMT) 7/16

+1.8VALW to +1.8VS

+/- 2% — **+/- 5% 1.5A**

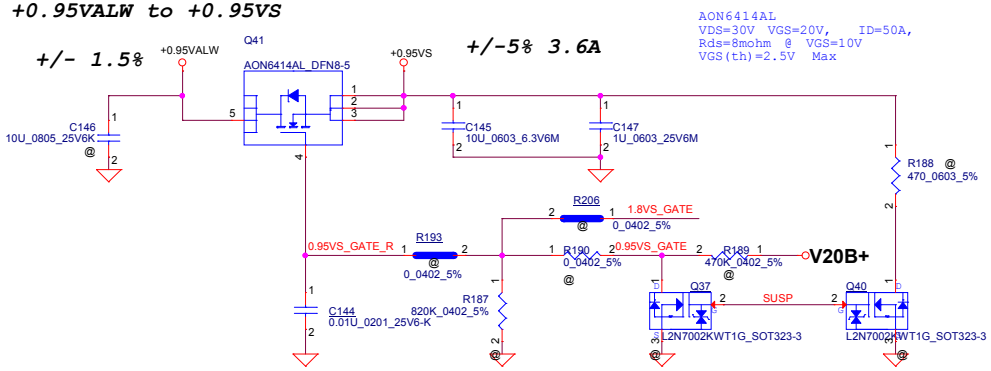
AON6414AL
VDS=30V VGS=20V, ID=50A,
Rds=8mohm @ VGS=10V
VGS(th)=2.5V Max



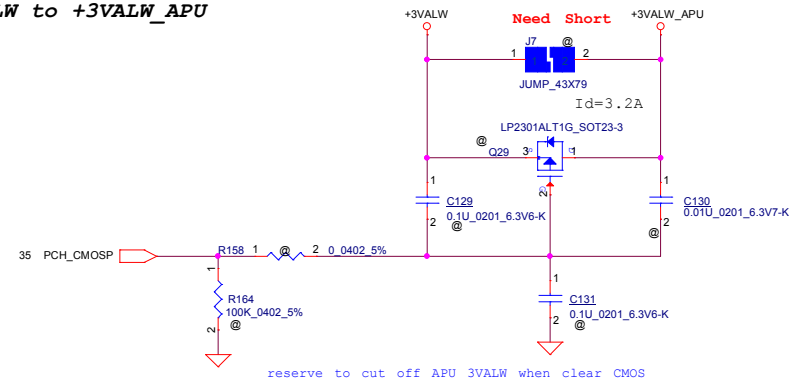
+0.95VALW to +0.95VS

+/- 1.5% — **+/-5% 3.6A**

AON6414AL
VDS=30V VGS=20V, ID=50A,
Rds=8mohm @ VGS=10V
VGS(th)=2.5V Max

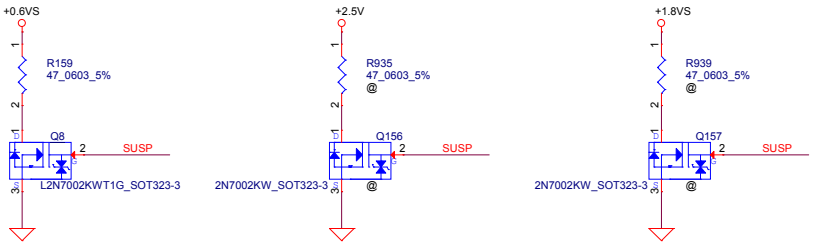


+3VALW to +3VALW_APU



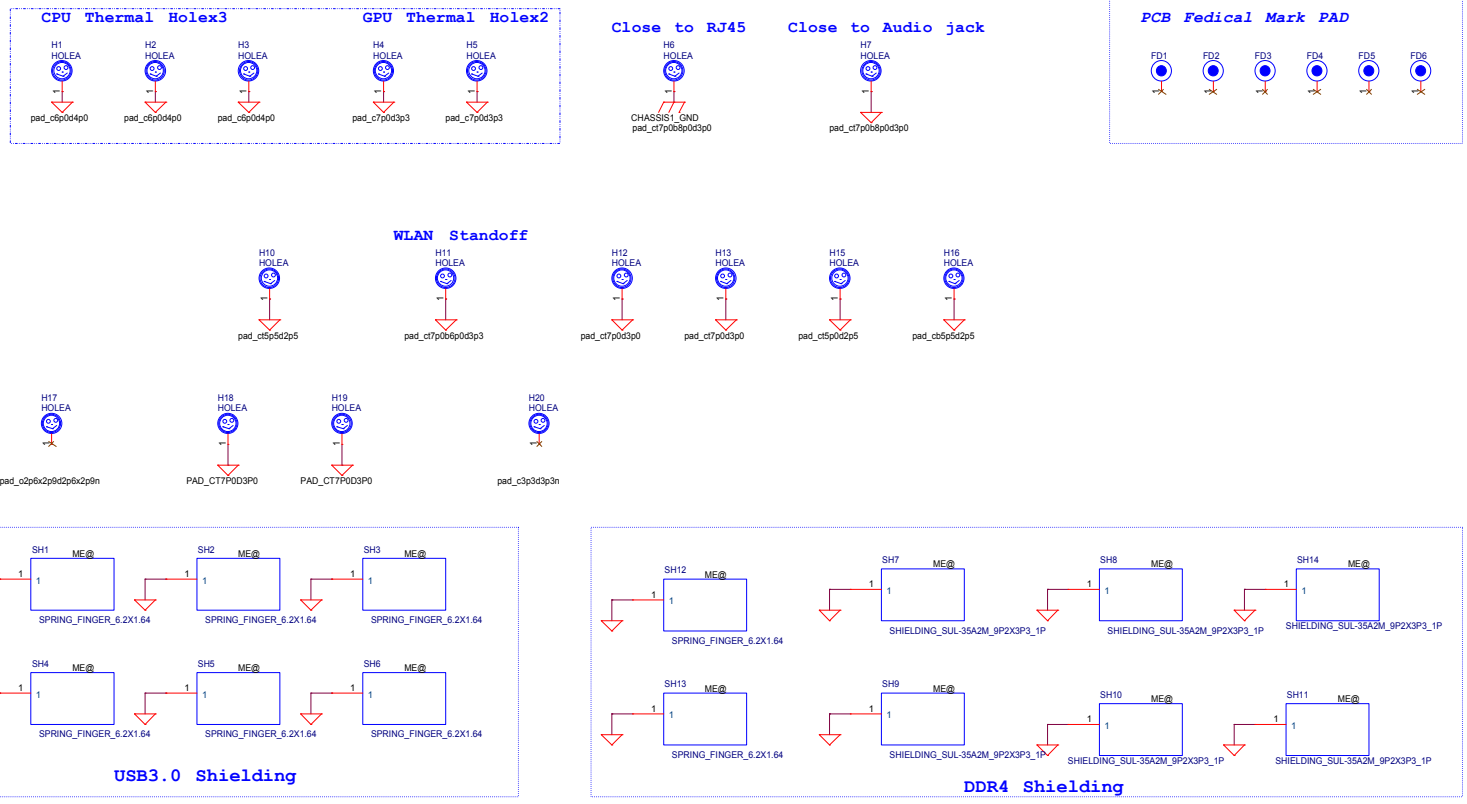
reserve to cut off APU 3VALW when clear CMOS

For DisCharge



Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title	DC V TO VS INTERFACE		
Size: Custom	Document Number: 320AST		Rev: 0.2
Date: Saturday, February 04, 2017	Sheet 37 of 50		



Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title: Hole

Size	Document Number	Rev
C	320AST	0.2

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ZZZ1

PCB PN
DA600013D00

PCB

HDMI@

ZZZ2

HDMI PN
RO00000040J

HDMI

UL1 8107E@

RTL8107E-CG
SA00007FR00

LAN Chip

UV1 PX@

R17M-M1-70 GPU
SA000086K00

GPU

UC2

AMD A6-9220 2.5G/2C/1M/FT4
A6@
SA00008A600

UC2

AMD E2-9000 1.8G/2C/1M/FT4
E2@
SA00007WW10

UC2

AMD A9-9420 3.0G/2C/1M/FT4
A9@
SA00008A500

UC2

AMD A4-9120 2.2G/2C/1M/FT4
A4@
SA00008A700

APU type

Board ID

BD14@

RC47

2K_0402_5%
SD02820018J

RC1659 BD14@

2K_0402_5%
SD02820018J

BD15@

RC47

2K_0402_5%
SD02820018J

RC1660 BD15@

10K_0402_5%
SD02810028J

BD17@

RC39

10K_0402_5%
SD02810028J

RC1659 BD17@

2K_0402_5%
SD02820018J

BOARD Config.	BOARD_ID0	BOARD_ID3
14''	0	0
15''	0	1
17''	1	0

ZZZ3 S4GX4@

Samsung
X7643P12001

ZZZ3 H4GX4@

Hynix
X7643Q12001

ZZZ3 M4GX4@

Micron
X7643T12001

VRAM X76 BOM

UV5 S4G_VR@

K4G41325FE-HC28
SA00007VQ10

UV6 S4G_VR@

K4G41325FE-HC28
SA00007VQ10

UV7 S4G_VR@

K4G41325FE-HC28
SA00007VQ10

UV8 S4G_VR@

K4G41325FE-HC28
SA00007VQ10

RV63 S4G_VR@

3.4K_0402_1%
SD03434018J

RV70 S4G_VR@

10K_0402_1%
SD03410028J

VRAM_Samsung 4GX4

UV5 H4G_VR@

H5GC4H24AJR-R0C
SA000081A00

UV6 H4G_VR@

H5GC4H24AJR-R0C
SA000081A00

UV7 H4G_VR@

H5GC4H24AJR-R0C
SA000081A00

UV8 H4G_VR@

H5GC4H24AJR-R0C
SA000081A00

RV63 H4G_VR@

4.53K_0402_1%
SD03445318J

RV70 H4G_VR@

4.99K_0402_1%
SD03449918J

VRAM_Hynix 4GX4

UV5 M4G_VR@

EDW4032BABG-70-F
SA000081800

UV6 M4G_VR@

EDW4032BABG-70-F
SA000081800

UV7 M4G_VR@

EDW4032BABG-70-F
SA000081800

UV8 M4G_VR@

EDW4032BABG-70-F
SA000081800

RV63 M4G_VR@

4.75K_0402_1%
SD03447518J

Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title: *Virtual symbol*

LCFC

Size	Document Number	Rev
Custom	320AST	0.2

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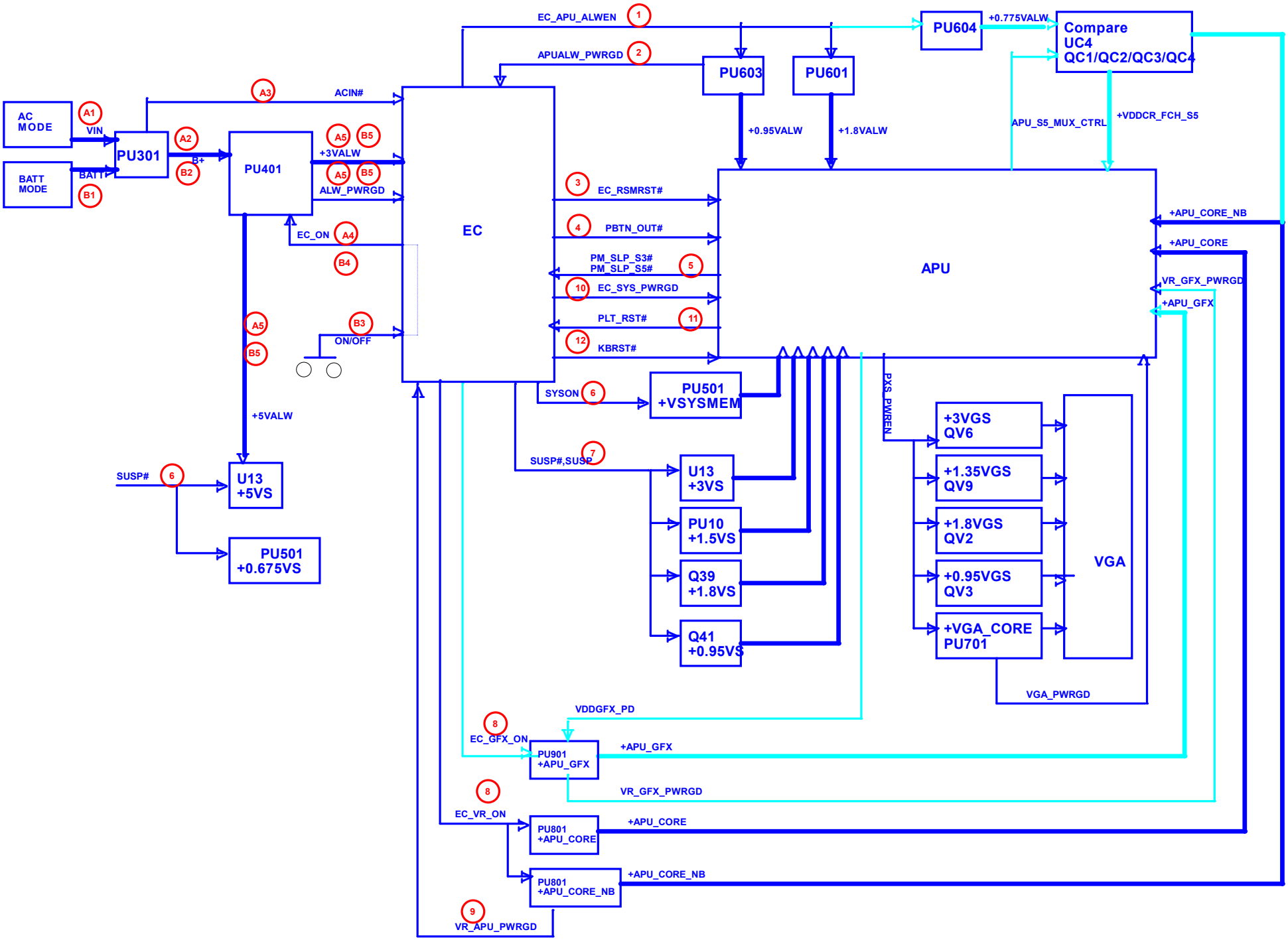

Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title: *Power sequence Block*

Size	Document Number	Rev
Custom	320AST	0.2

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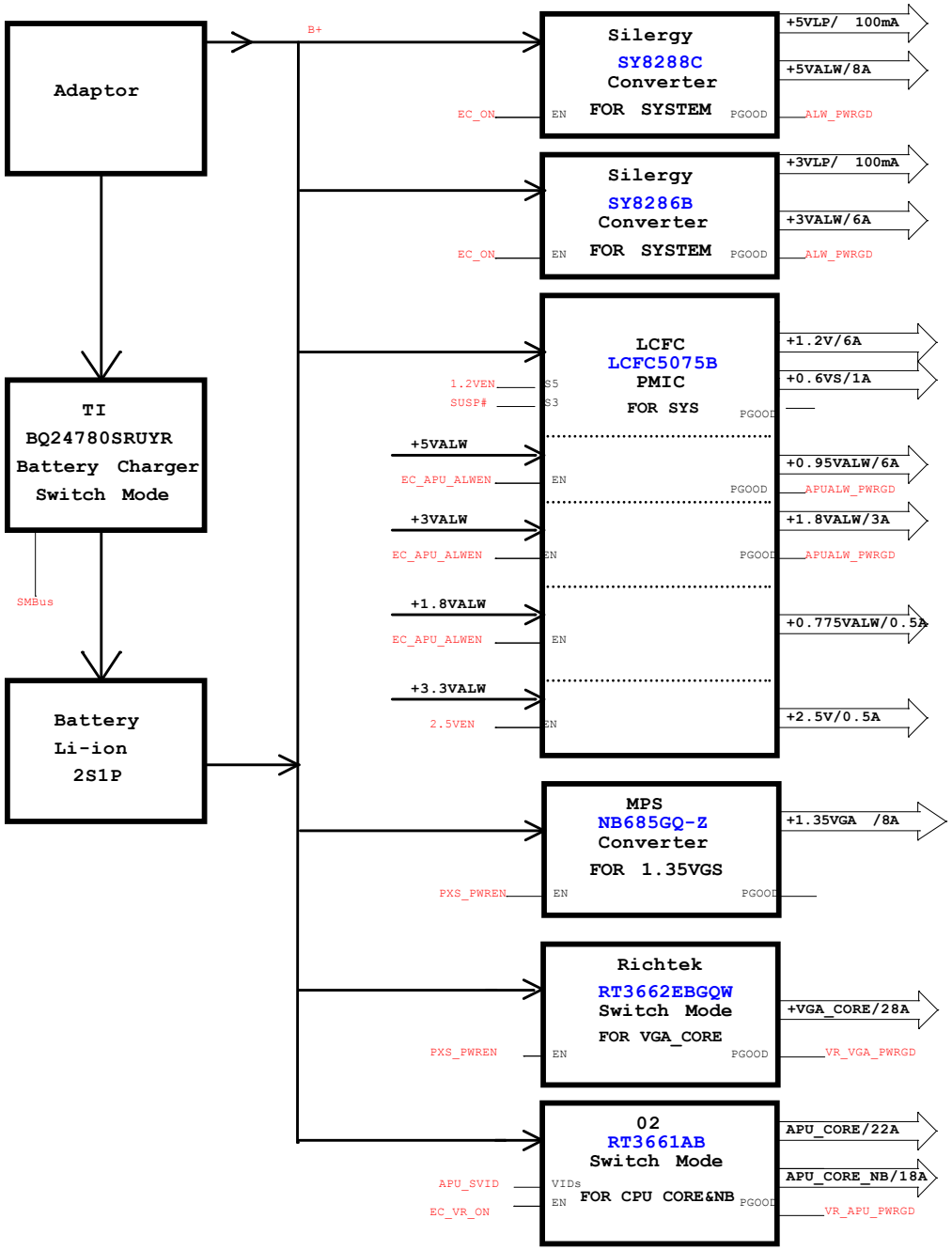
Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title

DP to CRT Convert(IT6515FN)

Size: Custom	Document Number: 320AST	Rev: 0.2
Date: Saturday, February 04, 2017	Sheet 41 of 50	



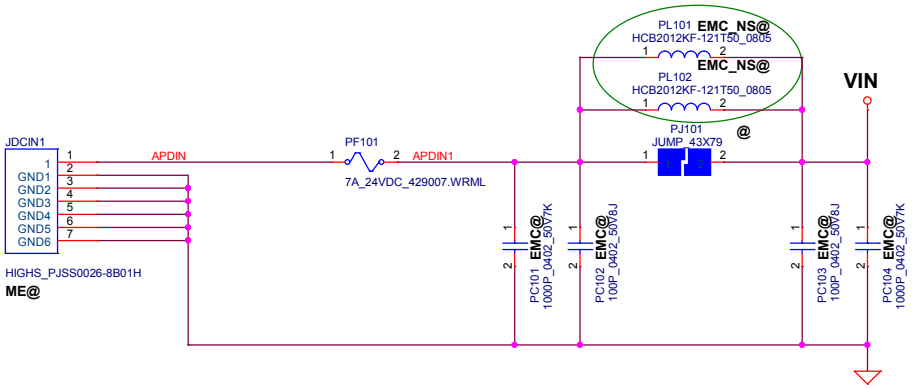
Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

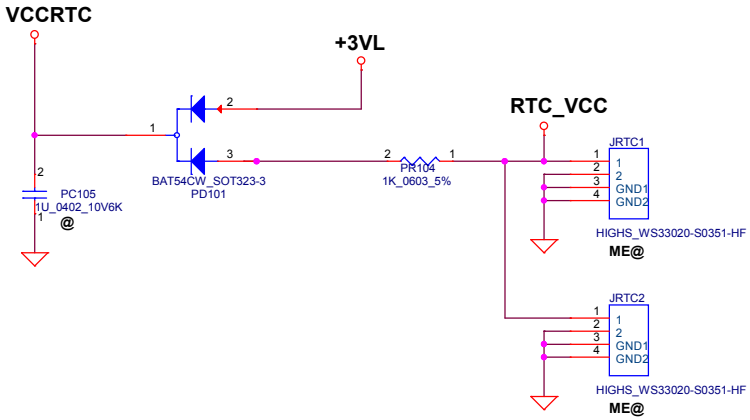
Title: **Power Diagram**

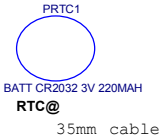
Size	Document Number	Rev
Custom	320AST	0.2

Date: Saturday, February 04, 2017 | Sheet 42 of 50

Cost down PL101,PL102 if EMC test pass







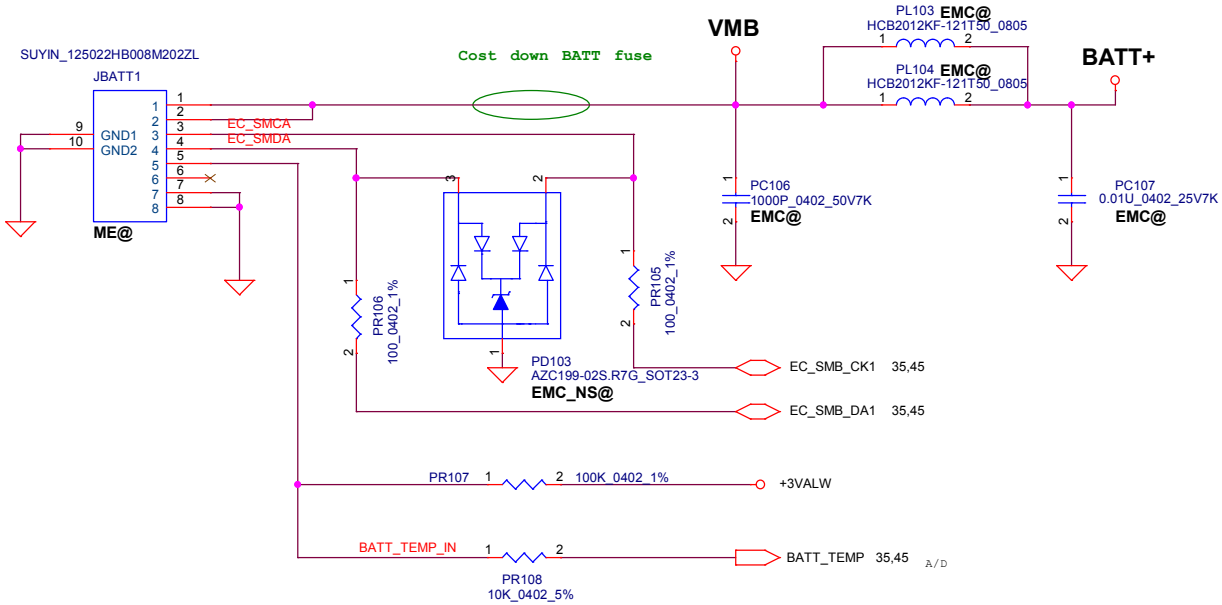
35mm cable

RTC Battery for GCM BOM
(2nd source and quoted price)

Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title: DCIN / RTC

Size: Custom	Document Number: 320ABR	Rev: 0.2
Date: Saturday, February 04, 2017	Sheet 43 of 50	



Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title: **BATTERY CONN/OTP**

Size	Document Number	Rev
B	320ABR	0.2

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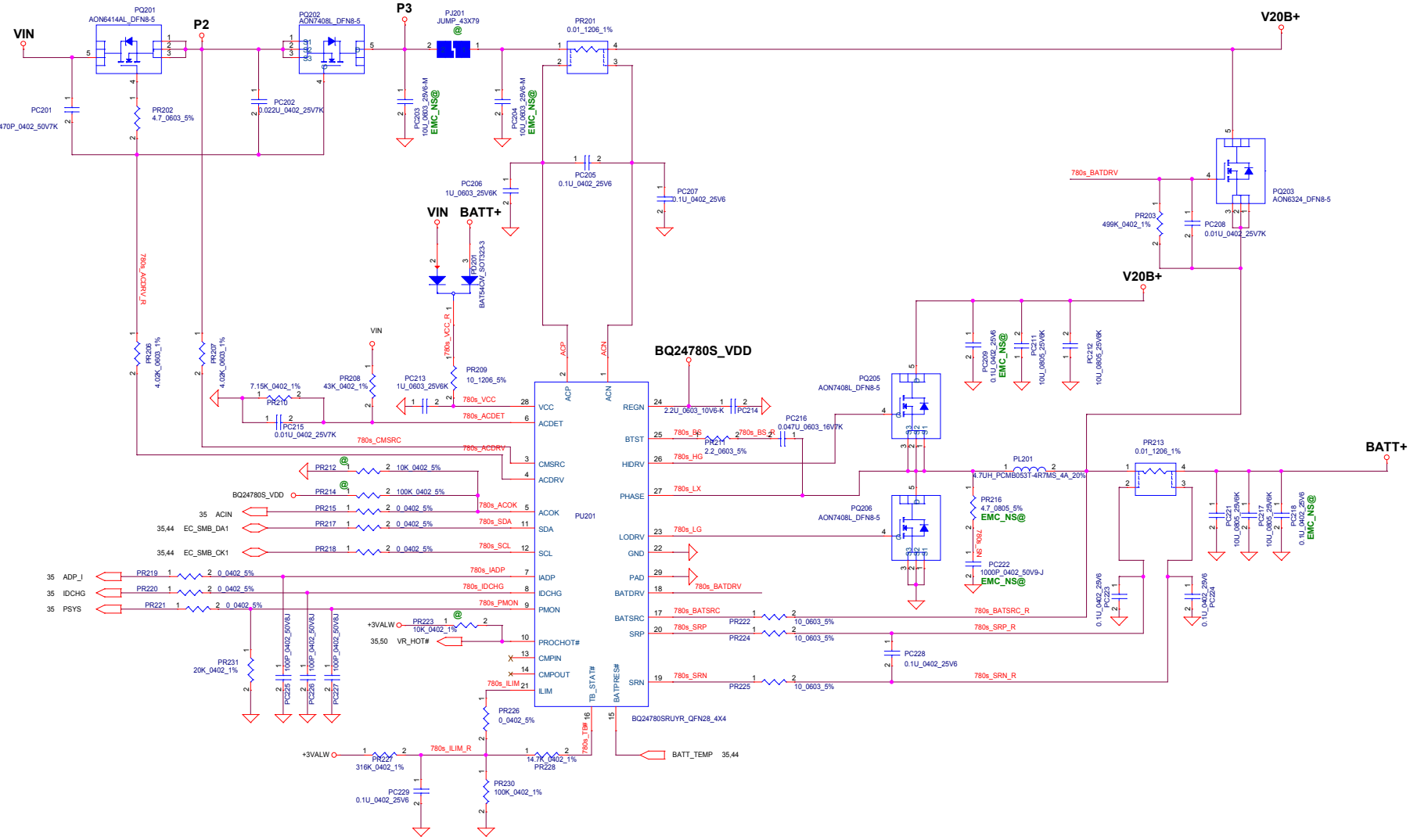

Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

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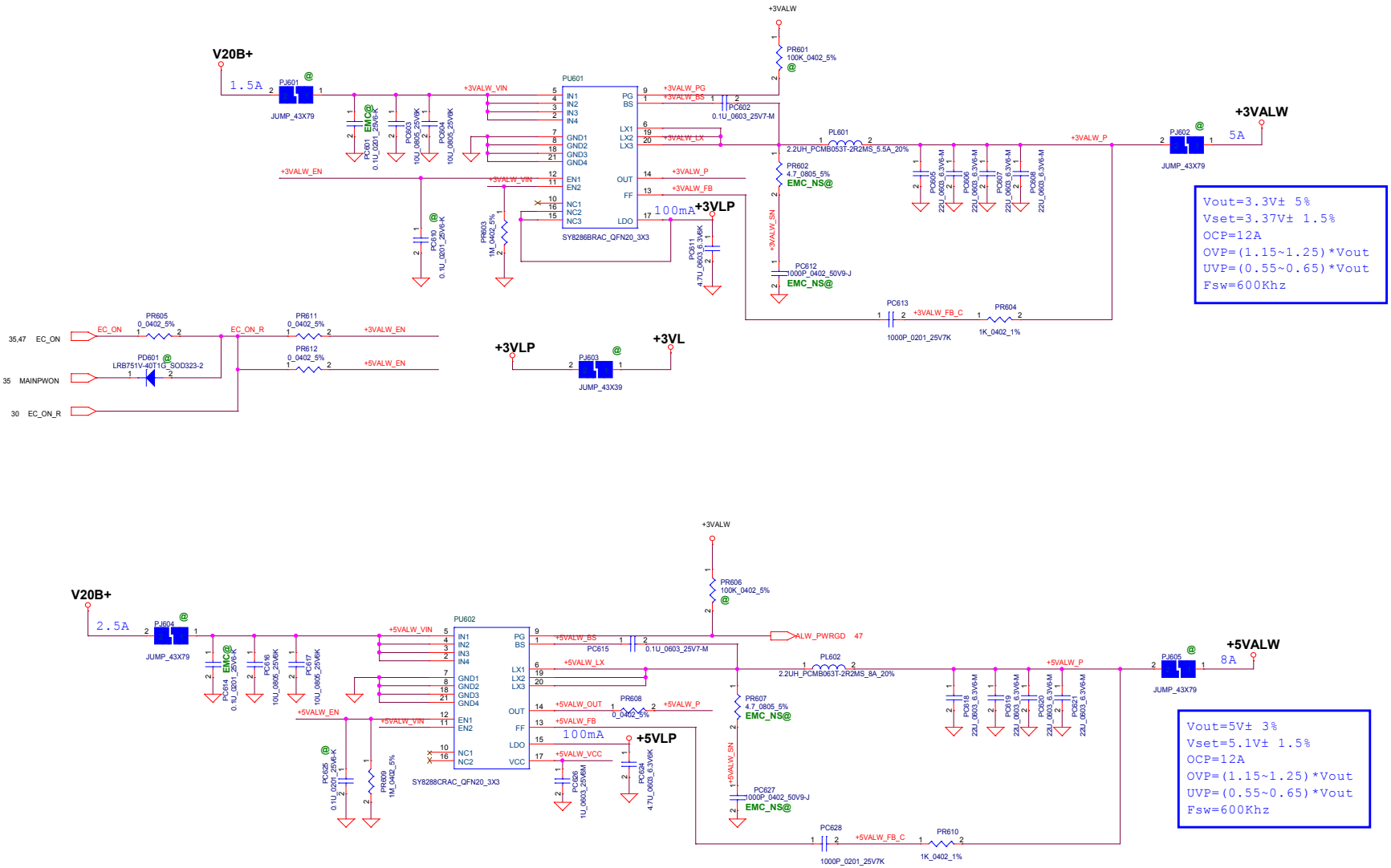
Title: CHARGER

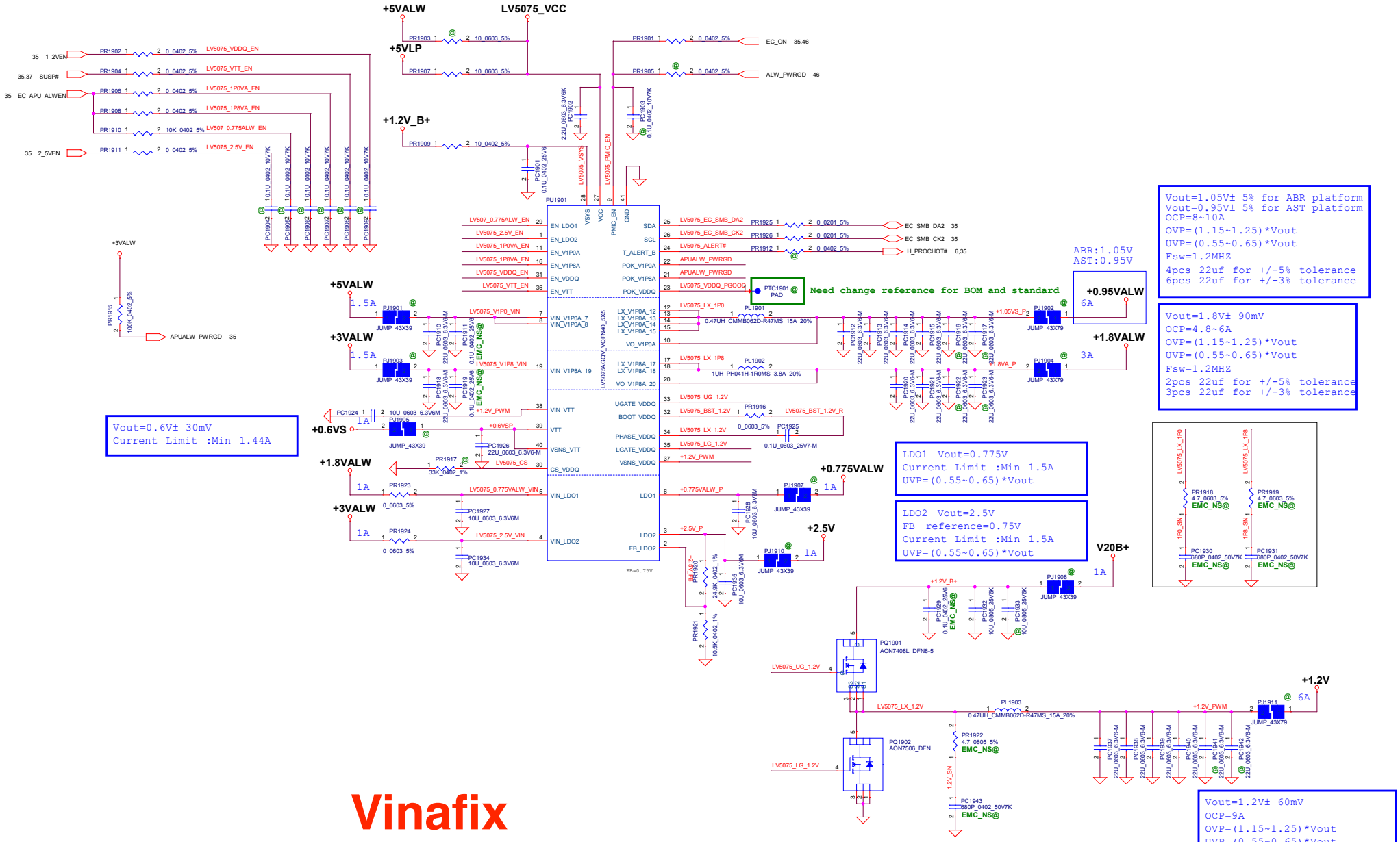
Size	Document Number	Rev
C	320ABR	0.2

Date: Saturday, February 04, 2017 | Sheet 45 of 50



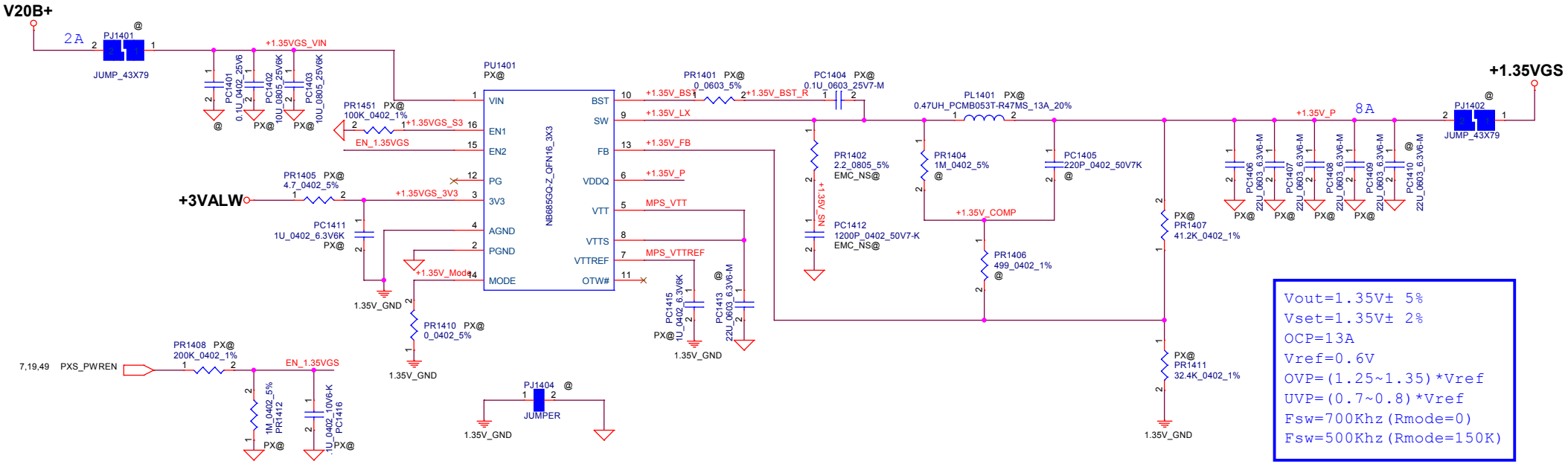
Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title	PWR_3VALW/5VALW		
Size	Document Number		Rev
C	320ABR		0.2
Date:	Saturday, February 04, 2017	Sheet	46 of 50



Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title	System PMIC		
Size	Document Number		Rev
A2	320ABR		0.2
Date:	Saturday, February 04, 2017	Sheet	47 of 50

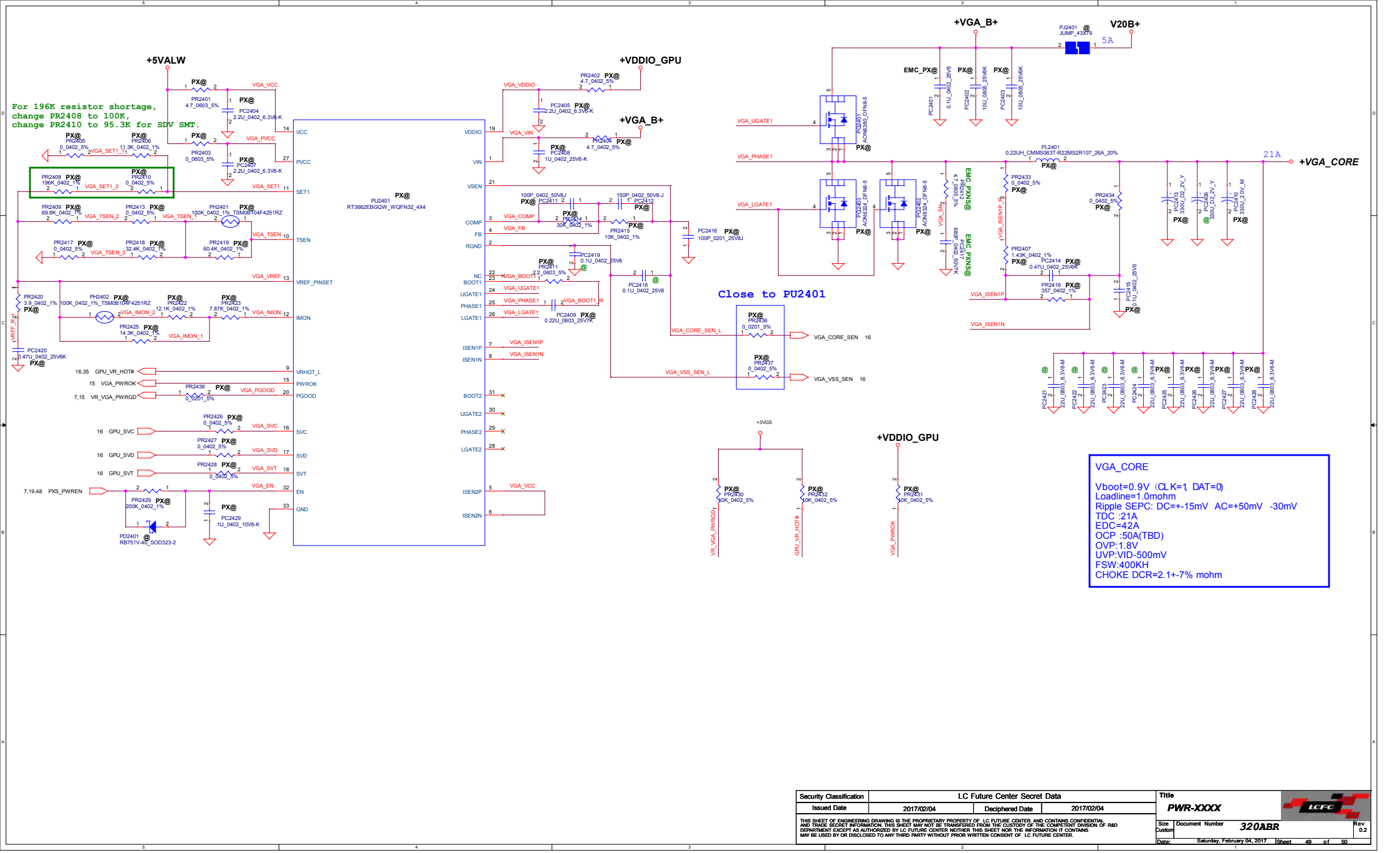


Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

Title: *1.35VGS*

Size	Document Number	Rev
A3	*320ABR*	0.2

Date: Saturday, February 04, 2017 Sheet 48 of 50



Security Classification	LC Future Center Secret Data		
Issued Date	2017/02/04	Deciphered Date	2017/02/04

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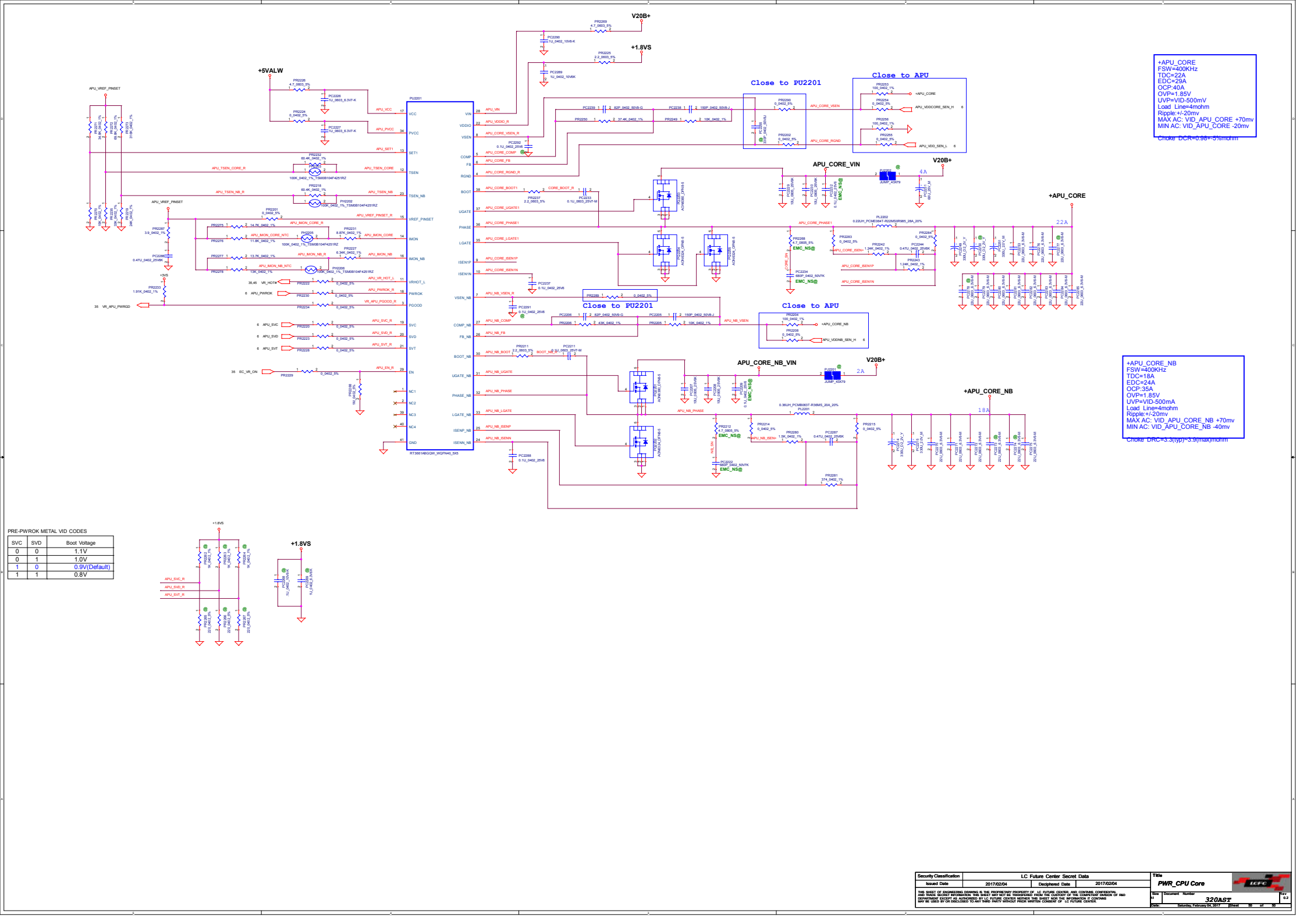
Title: PWR-XXXX

Size: Custom | Document Number: 320ABR | Rev: 0.2

Date: Saturday, February 04, 2017 | Sheet 49 of 50


+APU_CORE
FSW=400KHz
TDC=22A
EDC=29A
OCP:40A
OVP=1.85V
UVP=VID-500mV
Load Line=4mohm
Ripple:+/-20mv
MAX AC: VID_APU_CORE +70mv
MIN AC: VID_APU_CORE -20mv
Choke DCR=0.98+-5%mohm
+APU_CORE_NB
FSW=400KHz
TDC=18A
EDC=24A
OCP:35A
OVP=1.85V
UVP=VID-500mA
Load Line=4mohm
Ripple:+/-20mv
MAX AC: VID_APU_CORE_NB +70mv
MIN AC: VID_APU_CORE_NB -40mv
Choke DRC=3.3(typ)~3.9(max)mohm
PRE-PWROK METAL VID CODES
SVC SVD Boot Voltage
0 0 1.1V
0 1 1.0V
1 0 0.9V(Default)
1 1 0.8V
Close to PU2201
Close to APU
APU_CORE_VIN
APU_CORE_NB_VIN
+APU_CORE
+APU_CORE_NB
+5VALW
+1.8VS
V20B+
PU2201
RT3661ABGQW_WQFN40_5X5
Security Classification
LC Future Center Secret Data
Issued Date
2017/02/04
Deciphered Date
2017/02/04
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Title
PWR_CPU Core
Size
A1
Document Number
320AST
Rev
0.2
Date:
Saturday, February 04, 2017
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of
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