


LCFC Confidential

S350-IGM GS453/GS553 M/B Schematics Document

Intel Geminilake R-Processor with DDR4 + UMA

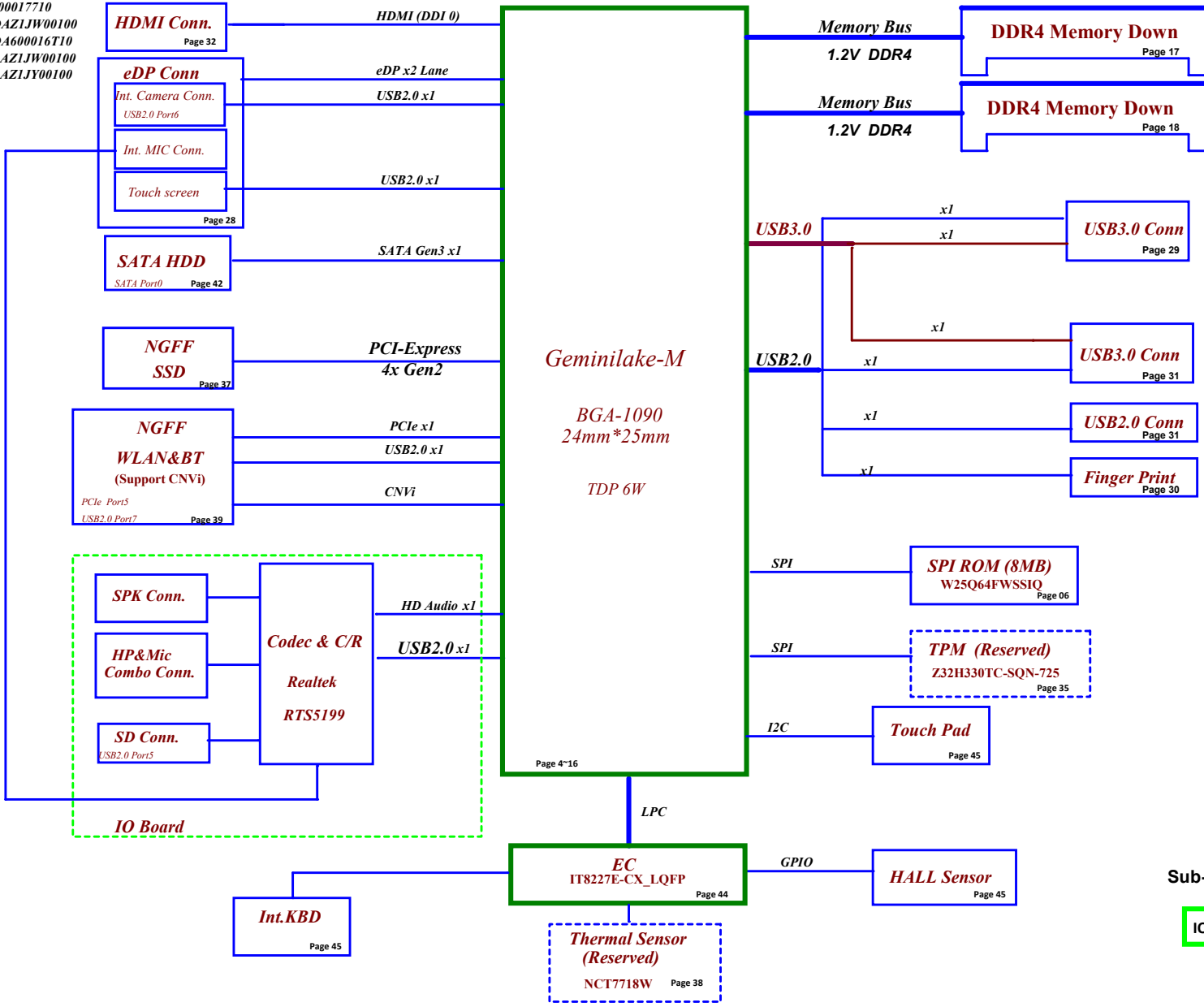
2019-12-26

REV:1.0

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LCFC confidential

Board Number: NM-C961
MB Part Number: DA600017710
14 IO/B Part Number: DAZ1JW00100
15 IO/B Part Number: DA600016T10
14' DAZ Part Number: DAZ1JW00100
15' DAZ Part Number: DAZ1JY00100



Sub-board(for 14" 15")
IO BOARD

Voltage Rails (0 --> Means ON , X --> Means OFF)

<div>Power Plane</div> <div>State</div>	V20B+ +3VL +5VL	+3VALW +5VALW	+3VALW_SOC +1.24VALW +1.8VALW	+1.2V	+5VS +3VS +1.8VS +1.05VS +0.6VS +CPU_CORE +VNN
S0	0	0	0	0	0
S3	0	0	0	0	X
S5 S4/AC Only	0	0	0	X	X
S5 S4 Battery only	0	X	X	X	X
S5 S4 AC & Battery don't exist	X	X	X	X	X

STATE	SIGNAL	SLP_S0#	SLP_S3#	SLP_S4#	SLP_S5#	+VALW	+V	+VS/VTT	Clock
Full ON		HIGH	HIGH	HIGH	HIGH	ON	ON	ON	ON
S0IX(Power On Suspend)		LOW	HIGH	HIGH	HIGH	ON	ON	ON	OFF
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

XHCI	Port	Port device
USB 3.0	0	USB3.0
	1	USB3.0
USB 2.0	0	Fingerprint
	1	USB3.0 (2.0)
	2	BT
	3	USB3.0 (2.0)
	4	USB2.0
	5	CARD READER
	6	CAMERA
	7	Touch Screen(RSVD)

DDI PORT LIST

Port	Device
DDI0	HDMI
DDI1	NC
eDP	eDP

PCIe PORT LIST

Port	Device	BIOS Device ID Map	CLK REQ
0	dGPU	PCIe1(Func0):Root Port#3	CLKREQ0
1			
2			
3	LAN	PCIe0(Func0):Root Port#1	CLKREQ1
4			
5			

BOM Structure Table

BOM Structure	BTO Item
EMC@	For EMC part
EMC_NS@	For EMC un-stuff part
EMC_15@	EMC 15" part
14@	For 14" part
15@	For 15" part
RF@	For RF part
CD@	Cost Down part
DIS@	DIS SKU ID part
UMA@	UMA SKU ID part
IGM@	IGM CPU SKU part
IGMR@	IGMR CPU SKU part
LBG@	LBG project SKU part
NEC@	NEC project SKU part
CNVI@	CNVI SKU part
TMSEN@	Thermal Sensor part
TMSEN_UMA@	UMA Thermal Sensor part
TPM@	TPM part
Debug@	USB debug feature part
USB@	Non USB debug feature part
TS@	Touch Screen part
TS_LBG@	LBG project Touch Screen part
TS_NEC@	NEC project Touch Screen part
UART@	UART debug part
RTCRST@	Clear RTCRST# function part
ME@	ME part
@	un-stuff part
HDMI@	HDMI Logo part
N4100@	GLK N4100 CPU part
N4000@	GLK N4000 CPU part
N5000@	GLK N5000 CPU part
N4100_QS@	GLK N4100 QS CPU part
HDA18@	HDA Bus 1.8V power part
HDA33@	HDA Bus 3.3V power part
NM_C111@	MB PCB part
NS_C121@	ODD PCB part

SMBUS Control Table

	SOURCE	VGA	BATT	IT8986HE	SODIMM	WLAN WIMAX	Thermal Sensor	PCH	TP Module	Charger	PMIC
EC_SMB_CK0 EC_SMB_DA0	EC +3VL	X	X	V	X	X	X	X	X	X	V
EC_SMB_CK1 EC_SMB_DA1	EC +3VL	X	V	V +3VL	X	X	X	X	X	V	X
EC_SMB_CK2 EC_SMB_DA2	EC +3VS	X	X	V +3VS	X	X	V	X	X	X	X
PCH_SMB_CLK PCH_SMB_DATA	PCH +3VALW_SOC	X	X	X	V +3VS	V +3VS	X	V +3VALW_PCH	X	X	X

EC SM Bus0 address		EC SM Bus1 address		EC SM Bus2 address		PCH SM Bus address	
Device	Address	Device	Address	Device	Address	Device	Address
PMIC	0x68	Smart Battery	0x16	Thermal Sensor	0x98(reserve)	DDR SO-DIMM	0xA0
		Charger	0x12			Wlan	Rsvd

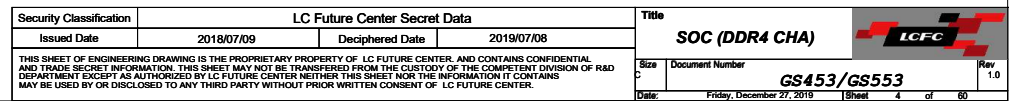
I2C4/I2C7 Bus address (Touch Pad)

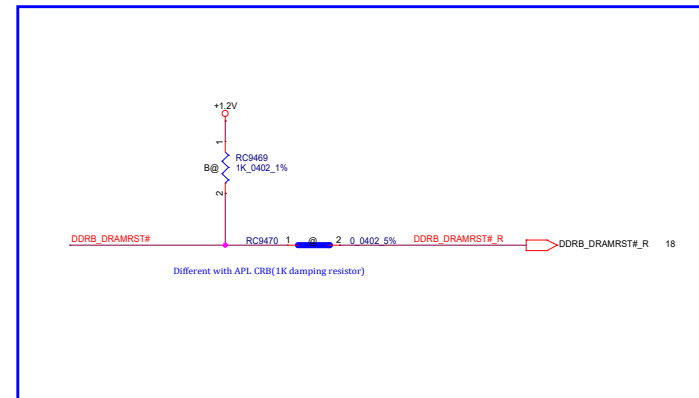
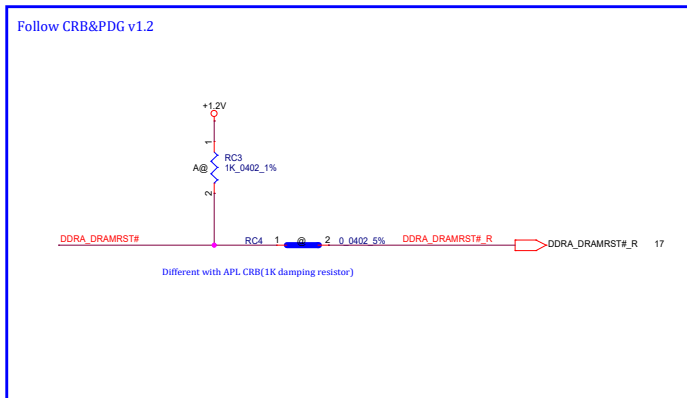
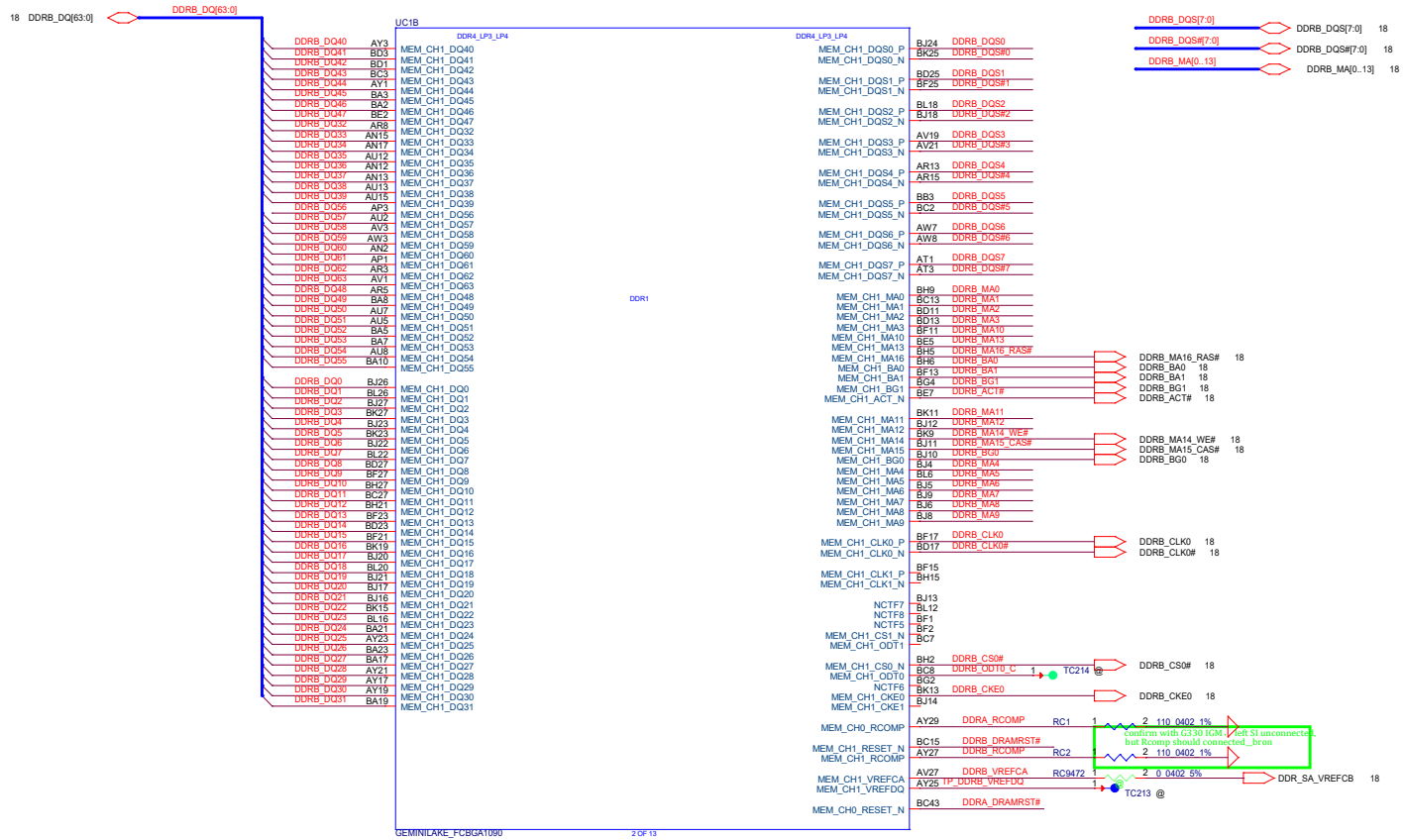
Device	Address
Slave	0x15
Descriptor	0x0001

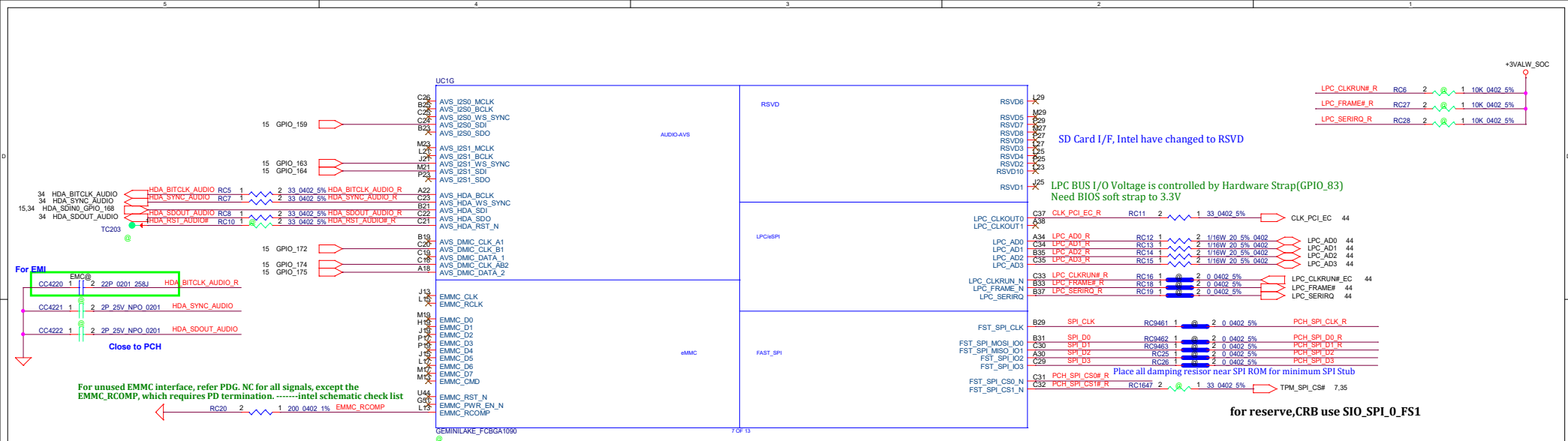
RCOMP RESISTOR REQUIREMENT

INTERFACE	PIN NAME	LOCATION	VALUE(ohm)
Memory	MEM_CH0_RCOMP	RC1	110 +/-1%
	MEM_CH1_RCOMP	RC2	110 +/-1%
USB2	USB2_RCOMP	RC64	113 +/-1%
USB3/PCIe/SATA	PCIe2_USB3_SATA3_RCOMP_P/N	RC63	100 +/-1%
PCIe Refclk	PCIe_REF_CLK_RCOMP	RC62	56 +/-1%
DP/eDP*/HDMI*	EDP_RCOMP_P/N	RC79	100 +/-1%
MDSI	MDSI_RCOMP	RC78	150 +/-1%
CNVi	CNV_WT_RCOMP	RC48	150 +/-1%
SMBUS/GPIO/EMMC for all 1.8V only and 1.8V mode operation of 1.8/3.3V CFIO interfaces	EMMC_RCOMP	RC20	200 +/-1%

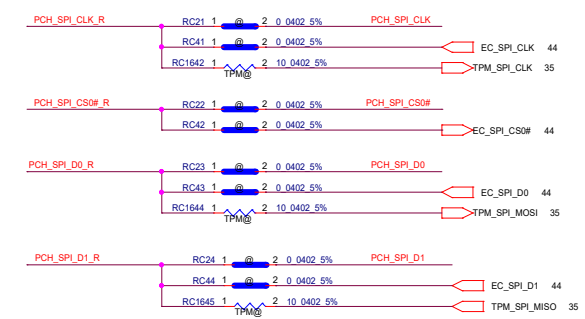
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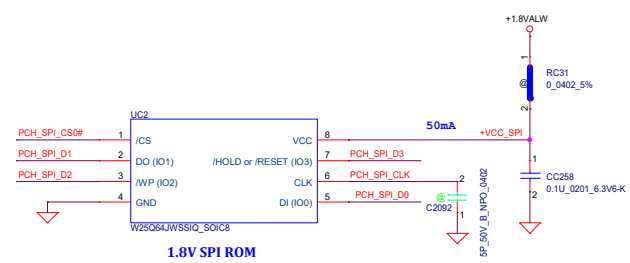


SPI ROM

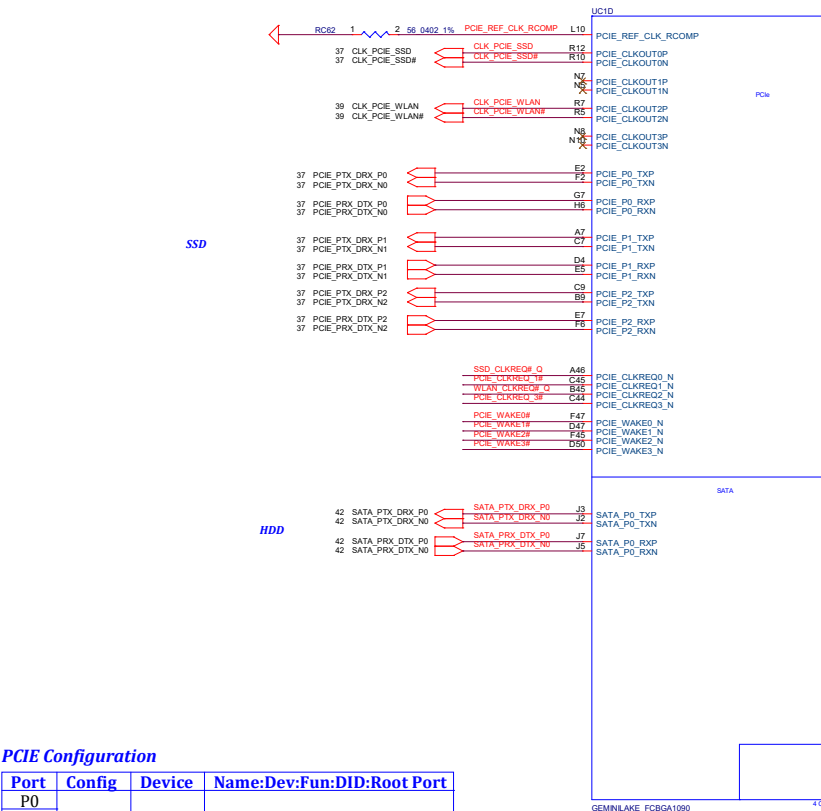


Near place RC21&RC41; RC22&42; RC23&RC43; RC24&RC44

Ball Name	Signal Name	I/O Voltage	Default Term	Buffer Type
FST_SPI_CS0_N	PCH_SPI_CS0#	1.8V	Native	HSMV
FST_SPI_MISO_I00	PCH_SPI_D0	1.8V	Native	HSMV
FST_SPI_MISO_I01	PCH_SPI_D1	1.8V	Native	HSMV
FST_SPI_IO2	PCH_SPI_D2	1.8V	Native	HSMV
FST_SPI_IO3	PCH_SPI_D3	1.8V	Native	HSMV
FST_SPI_CLK	PCH_SPI_CLK	1.8V	Native	HSMV



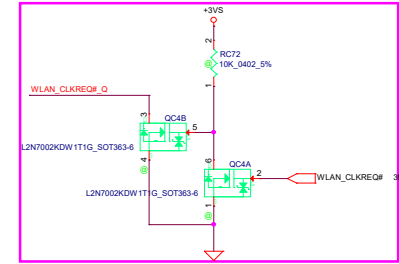
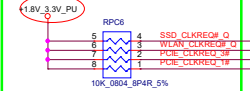
1.8V SPI ROM



PCIE Configuration

Port	Config	Device	Name:Dev:Fun:DID:Root Port
P0			
P1	X4	SSD	PCIe1(Func0):19:0:0x31D8:2
P2			
P3			
P4	X1		PCIe0(Func0):20:0:0x31D6:0
P5	X1	WLAN	PCIe0(Func1):20:1:0x31D7:1

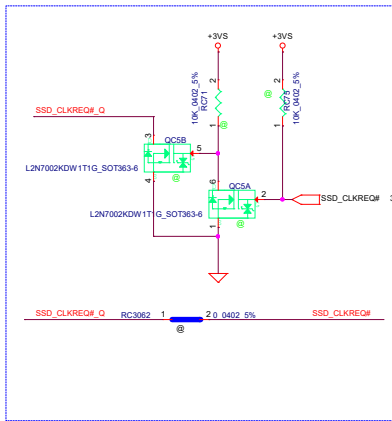
CLOCK REQUEST



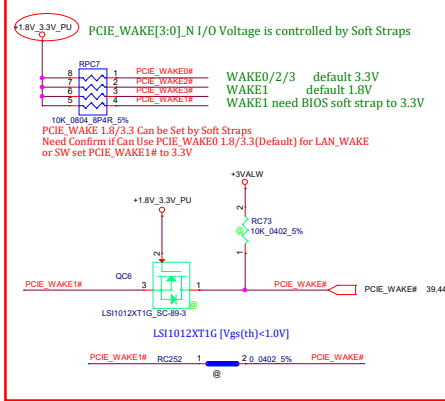
CLKREQ# can be set 1.8V/3.3V by soft strap

Need Check
CLKREQ# can be set 1.8V/3.3V by soft strap
CLKREQ0/2/4 default 3.3V
CLKREQ1 default 1.8V

PCI_CLKREQ[3:0] N/I/O Voltage is controlled by Soft Straps



LAN WAKE

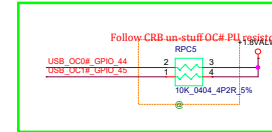


PCIE_WAKE[3:0] N/I/O Voltage is controlled by Soft Straps

WAKE0/2/3 default 3.3V
WAKE1 default 1.8V
WAKE1 need BIOS soft strap to 3.3V

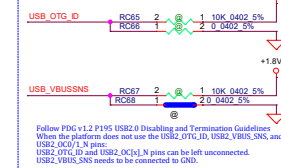
PCIE_WAKE 1.8/3.3 Can be Set by Soft Straps
Need Confirm if Can Use PCIE_WAKE 1.8/3.3(Default) for LAN_WAKE
or SW set PCIE_WAKE1# to 3.3V

USB OCP



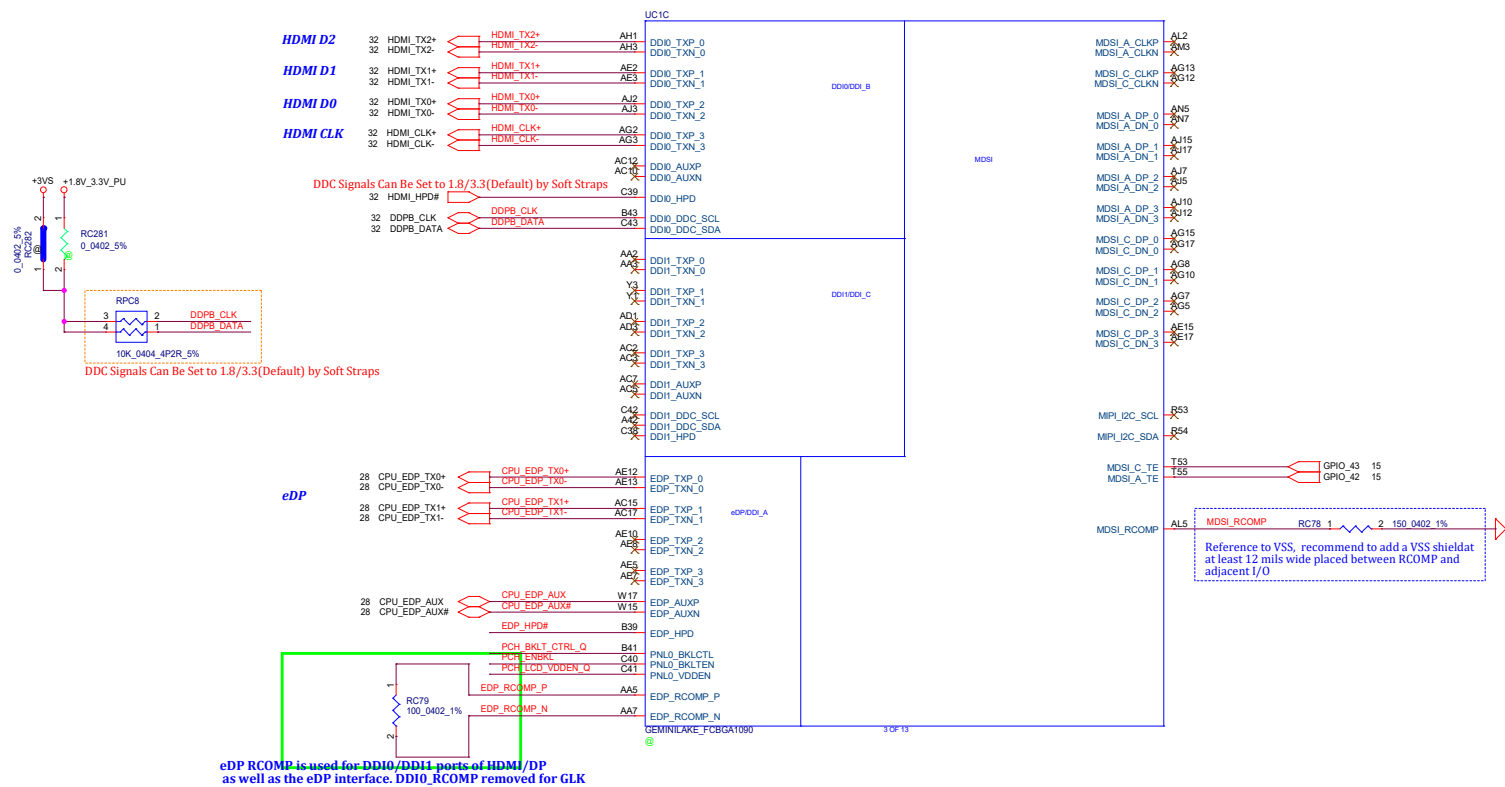
Follow CRB un-stu#E0C# PL1

USB DUAL ROLE



Follow PFG v1.2 P195 USB2.0 Disabling and Termination Guidelines
When the platform does not use the USB_OTG_ID, USB2_VBUS_SNS, and USB2_OC#/I/O pins:
USB2_OTG_ID and USB2_OC#/I/O pins can be left unconnected.
USB2_VBUS_SNS needs to be connected to GND.

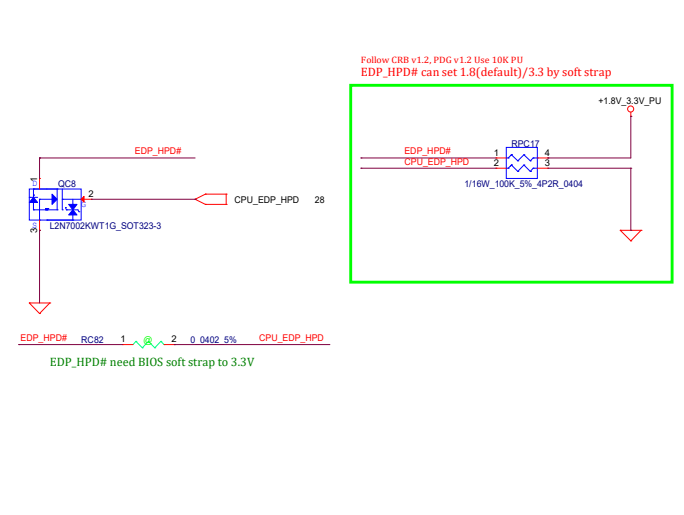
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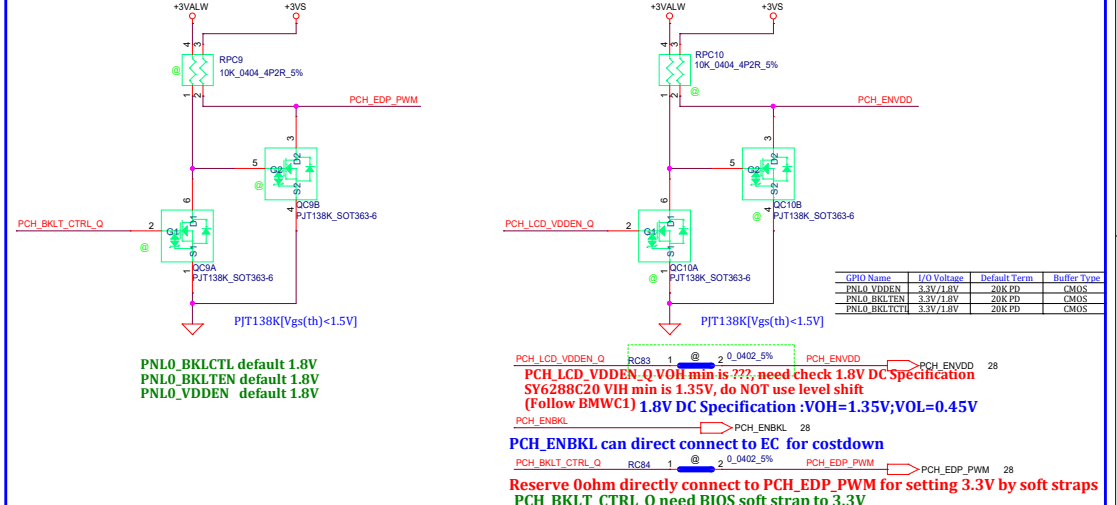
DDI PORT LIST

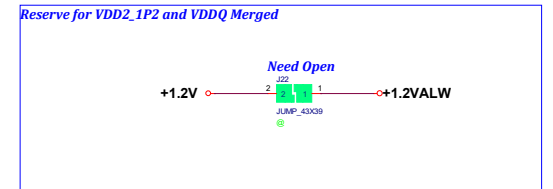
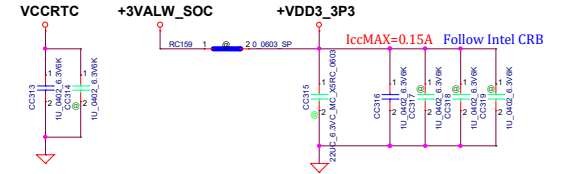
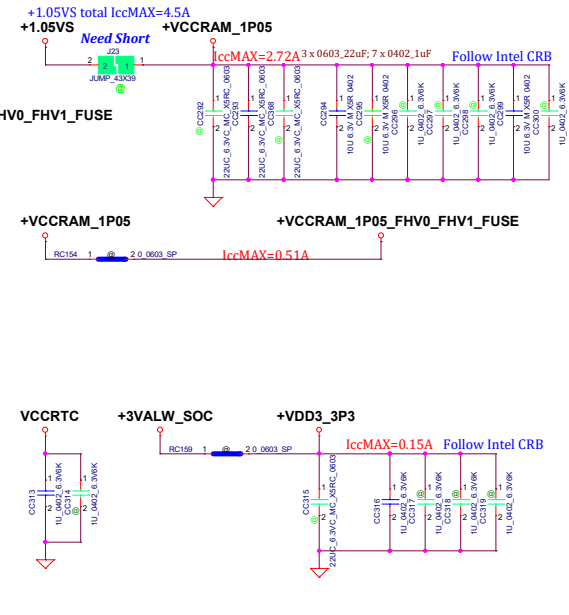
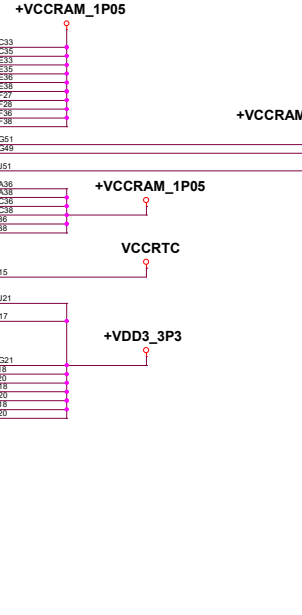
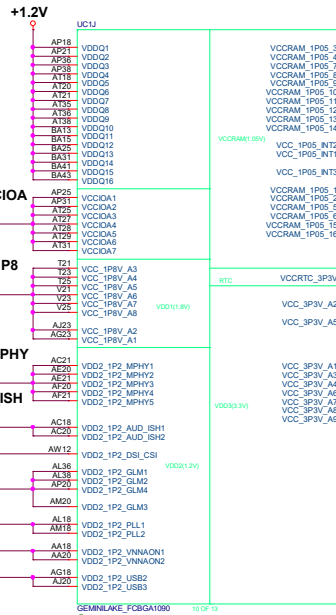
Port	Device	HPD Net	HPD Pin
DDI0	HDMI	HDMI_HPD#	C39
DDI1	N/A	N/A	C38
EDP	eDP	EDP_HPD#	B39


EDP_HPD



PNL0_BKLCTL/PNL0_BKLTEN/PNL0_VDDEN Can be Set 1.8V/3.3V by Soft Strap





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Timing diagram for CC341 and CC359 comparators. The top section shows the CC341 comparator output (CC341) and input (CC341) with a 16x0402_1uF capacitor. The bottom section shows the CC359 comparator output (CC359) and input (CC359) with a 16x0402_1uF capacitor. The diagram is labeled "Follow Intel CRB".

+CPU CORE

EMC57

01U_0201_6 3V6-K

MC_N580

01U_0201_6 3V6-K

Follow CBR, Need EMC Team Confirmation

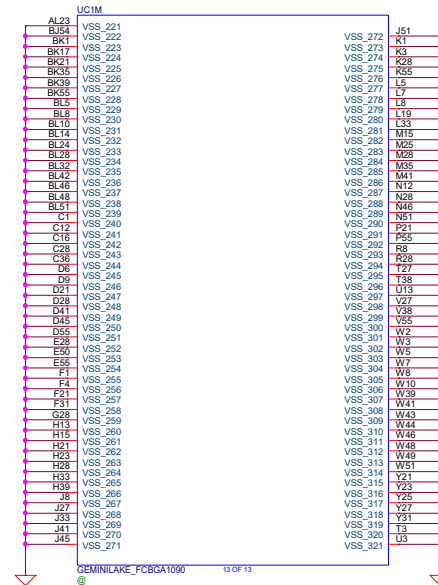
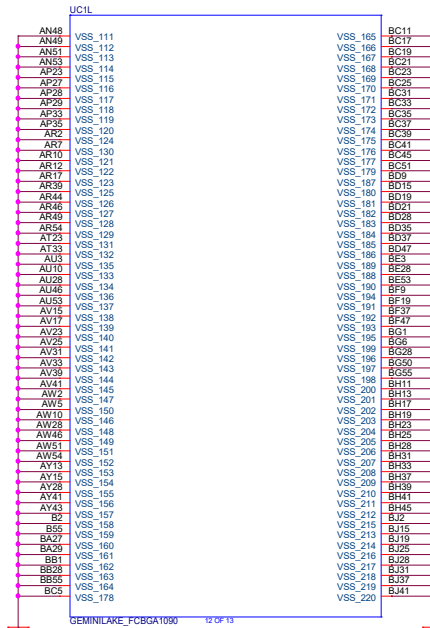
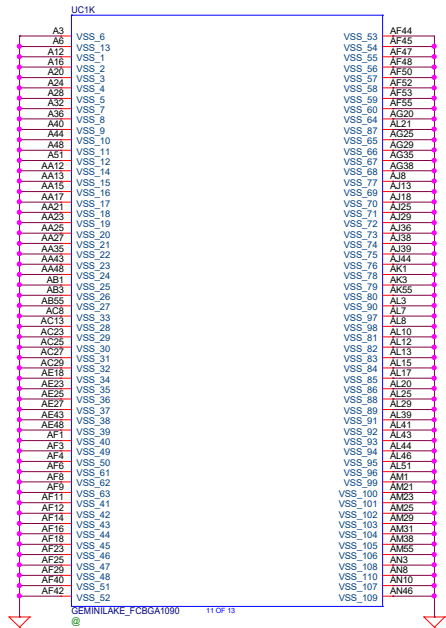
Q	UUT		
	AA28	VCC_VCG1	VNN1
	AA29	VCC_VCG2	VNN2
	AA31	VCC_VCG3	VNN3
	AA33	VCC_VCG4	VNN4
	AC28	VCC_VG5	VNN5
	AC31	VCC_VG6	VNN6
	AE28	VCC_VG7	VNN7
	AE31	VCC_VG8	VNN8
	AF31	VCC_VG9	VNN9
	AF33	VCC_VG10	VNN10
	AG31	VCC_VG11	VNN11
	AG33	VCC_VG12	VNN12
	AJ31	VCC_VG13	VNN13
	AJ33	VCC_VG14	VNN14
	AJ35	VCC_VG15	VNN15
	AL31	VCC_VG16	VNN16
	AL33	VCC_VG17	
	AL35	VCC_VG18	
	AM33	VCC_VG19	
	AM35	VCC_VG20	
	AM36	VCC_VG21	
	CB1	VCC_VG22	
	D33	VCC_VG23	
	D37	VCC_VG24	NC21
	D39	VCC_VG25	
	P39	VCC_VG26	
	P41	VCC_VG27	
	T28	VCC_VG28	
	T29	VCC_VG29	
	T31	VCC_VG30	
	T33	VCC_VG31	
	T35	VCC_VG32	NC22
	T37	VCC_VG33	
	T38	VCC_VG34	NC23
	V29	VCC_VG35	
	V31	VCC_VG36	VCC_VCG_SENSE
	V33	VCC_VG37	VSS_VCG_SENSE
	V35	VCC_VG38	
	V36	VCC_VG39	VNN_SENSE
	Y28	VCC_VG40	VNN_VSS_SENSE
	Y29	VCC_VG41	
	Y33	VCC_VG42	NC24
	Y35	VCC_VG43	
	Y36	VCC_VG44	

GEMINILAKE_FCBG41090

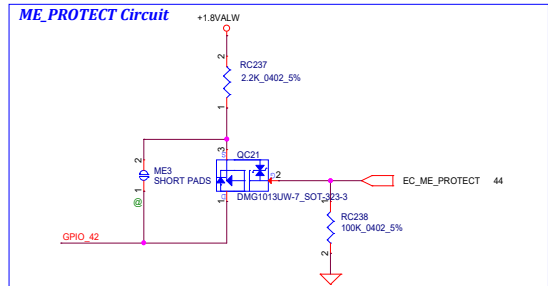
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[illegible]



Diagram illustrating a 4-channel differential signal source configuration. The circuit consists of four parallel branches, each containing a 100 Ohm resistor in series with a 100 Ohm 3V N XPR 0402 resistor. The output voltage is 0.3Vpk. The total current is labeled $I_{ccMAX}=4.0A$.



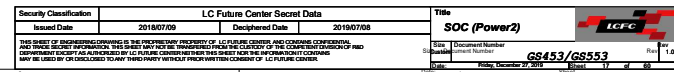
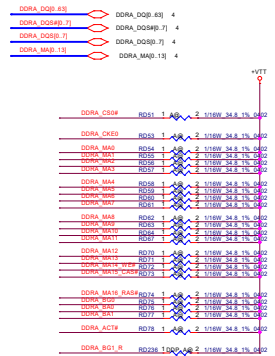
+1.8VALW

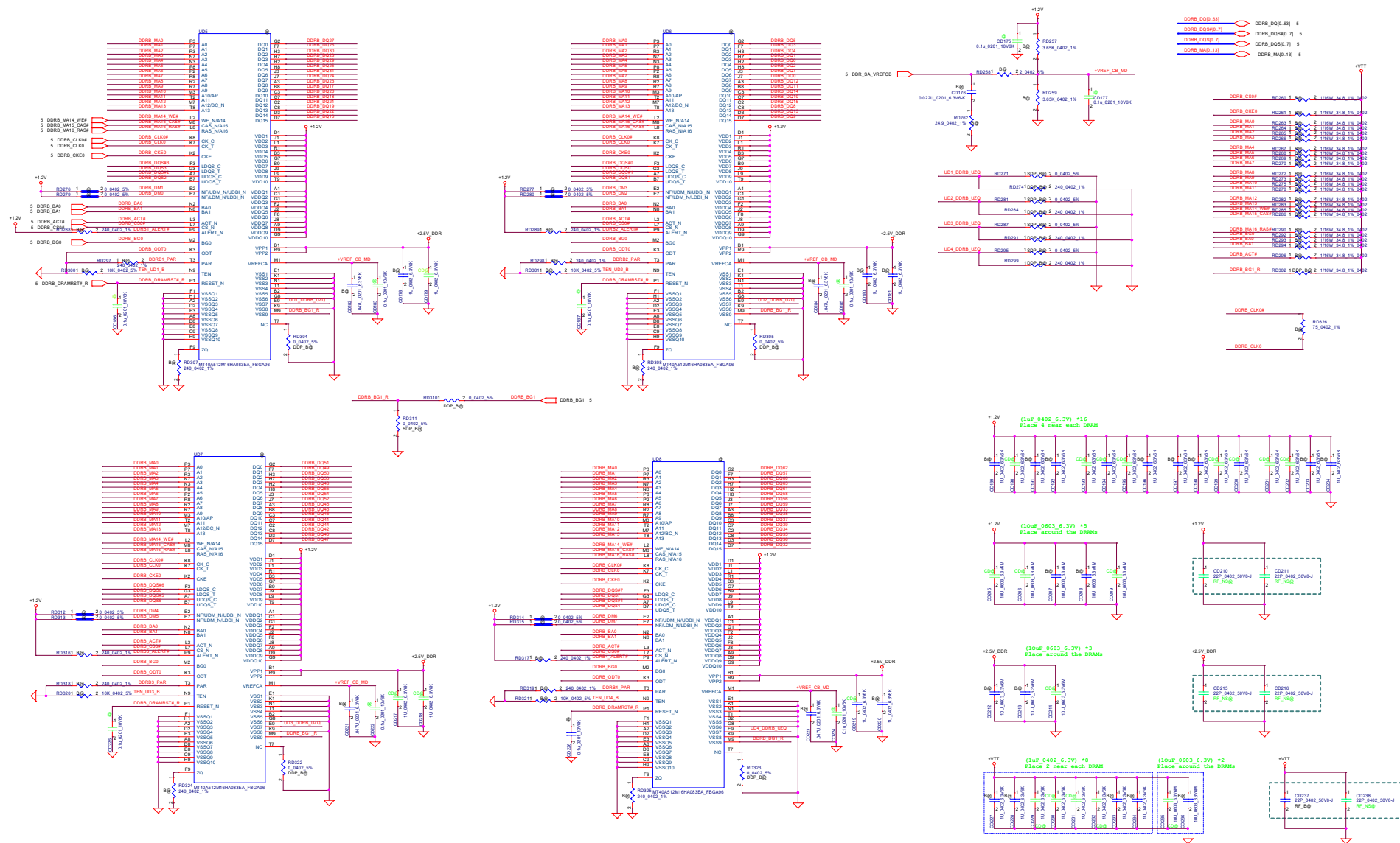


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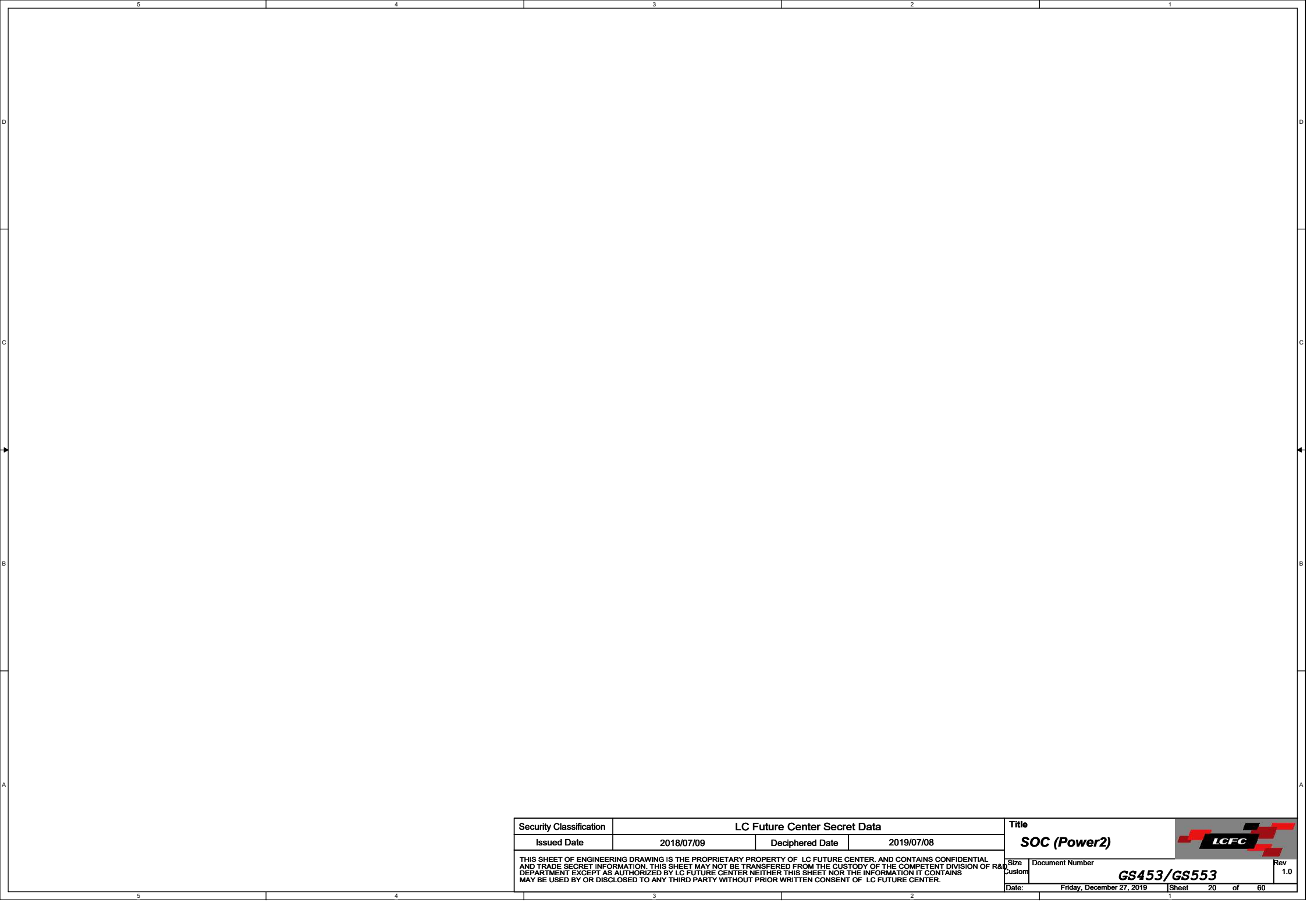
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D																								
C																								
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		2019/07/08		Rev	
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				GS453/GS553	
				Date: Friday, December 27, 2019	
				Sheet 23 of 60	

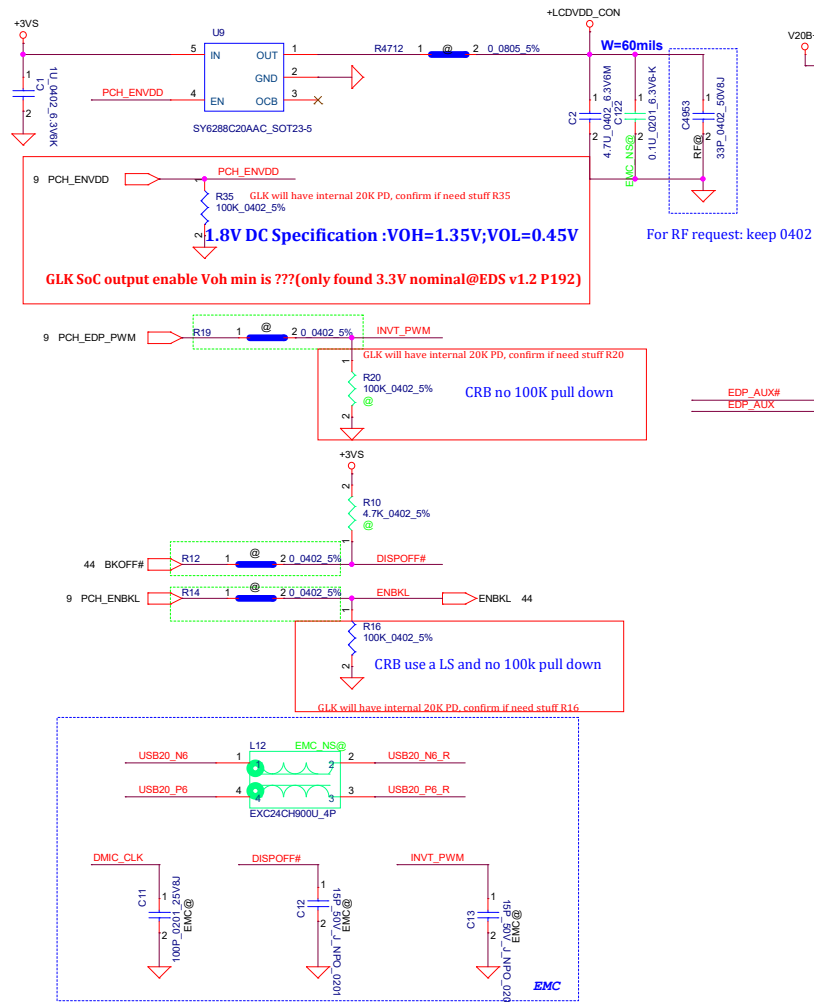
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Issued Date	2018/07/09	Deciphered Date	2019/07/08	ATI_R17M-P1-50_VRAM	
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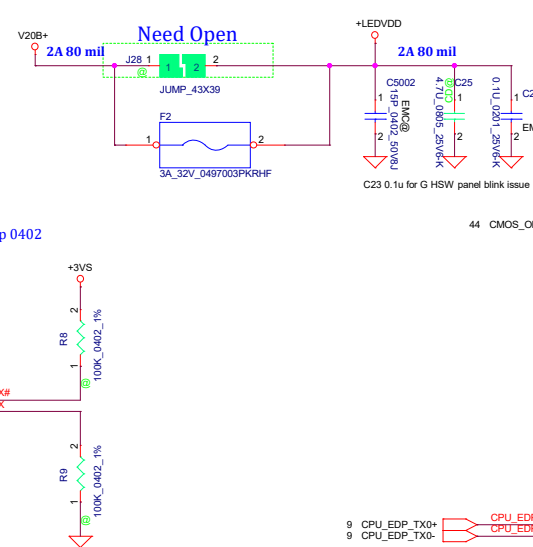


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Date:		Friday, December 27, 2019		Sheet	27	of	60																																
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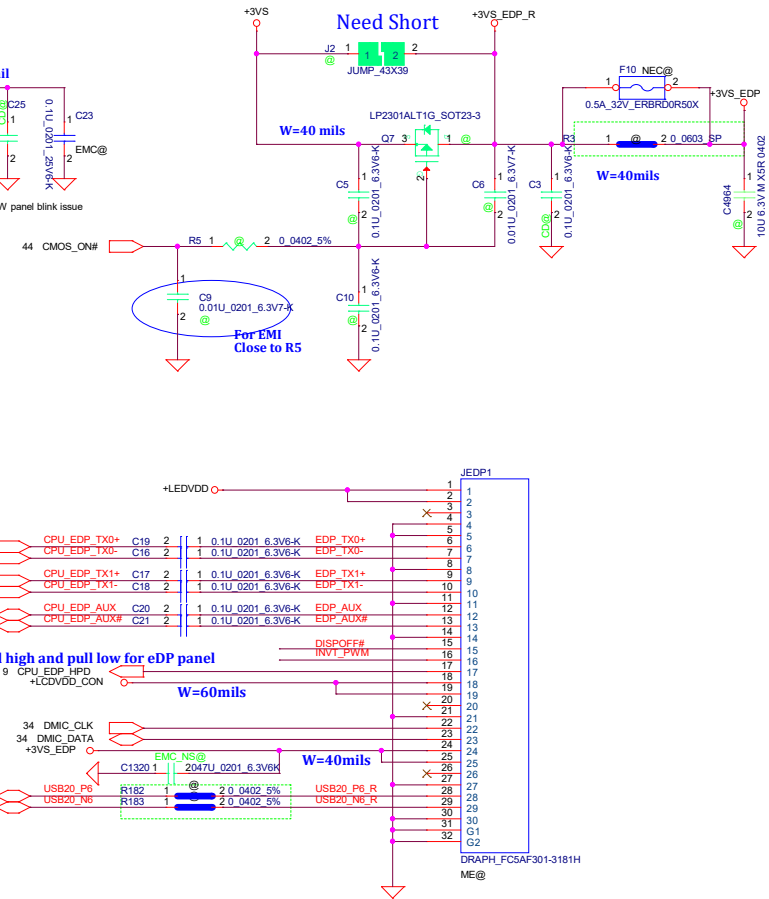
LCD POWER CIRCUIT



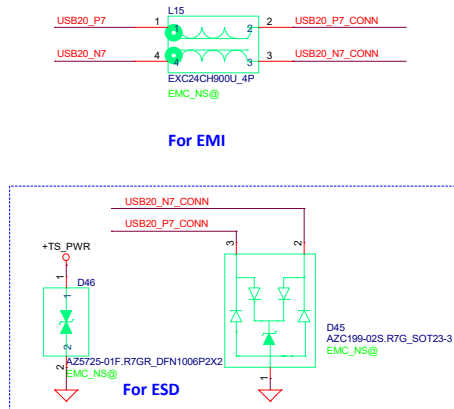
B+ to +LEDVDD POWER



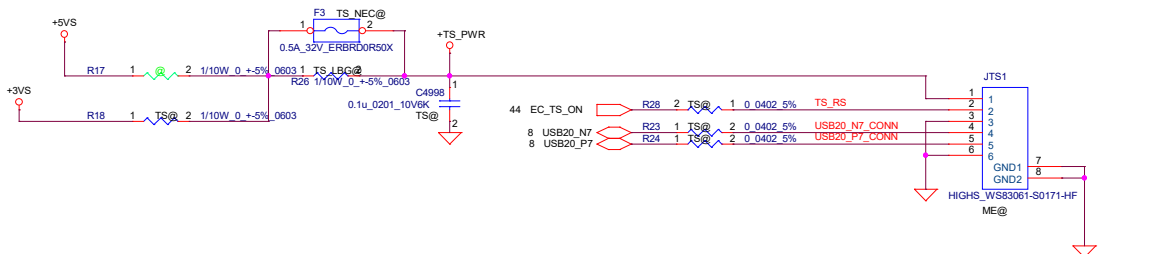
CMOS CAMERA




Touch Screen

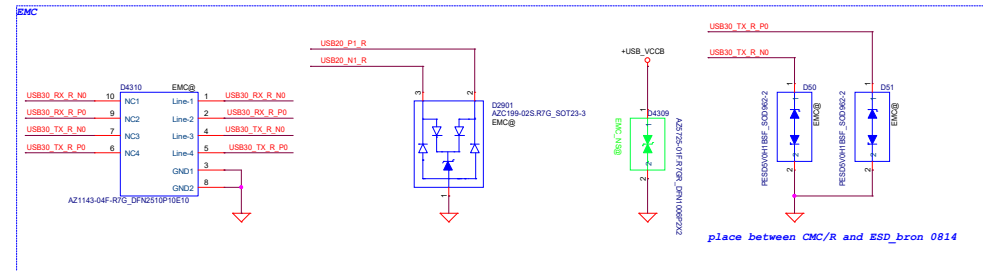
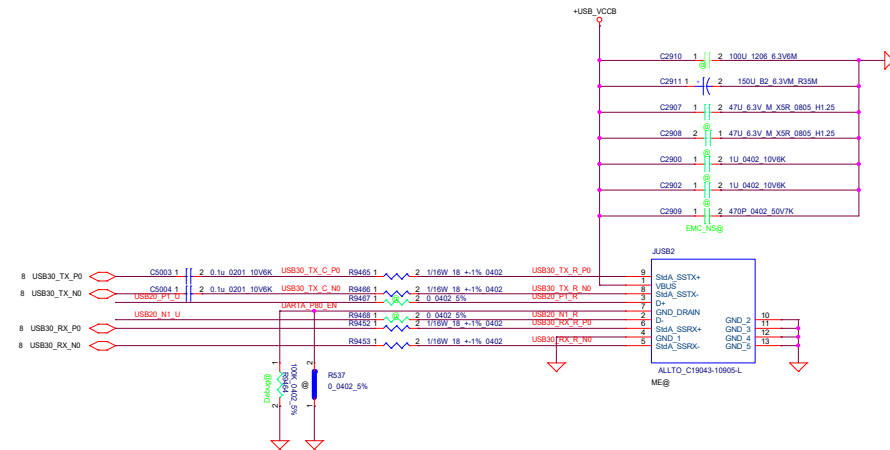
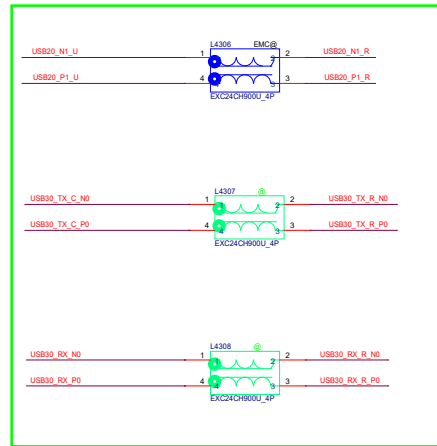
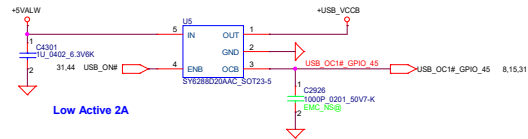


Touch Screen

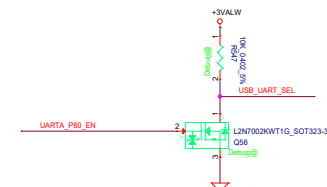
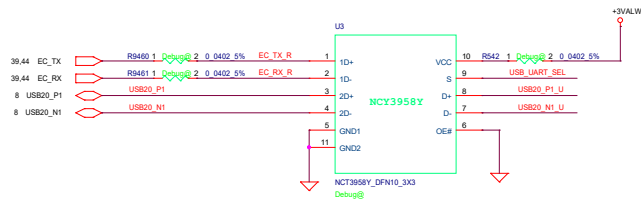


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RIGHT SIDE USB3.0 PORT



For USB Debug Function

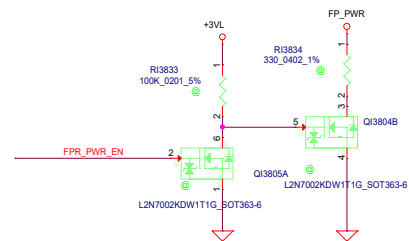
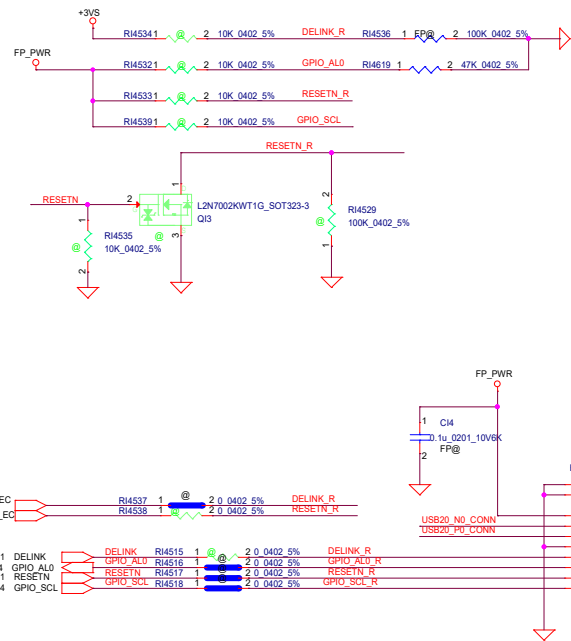
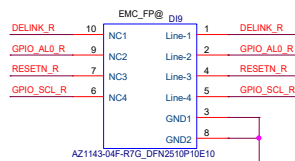
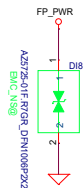
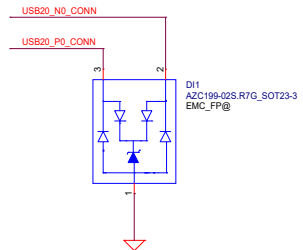
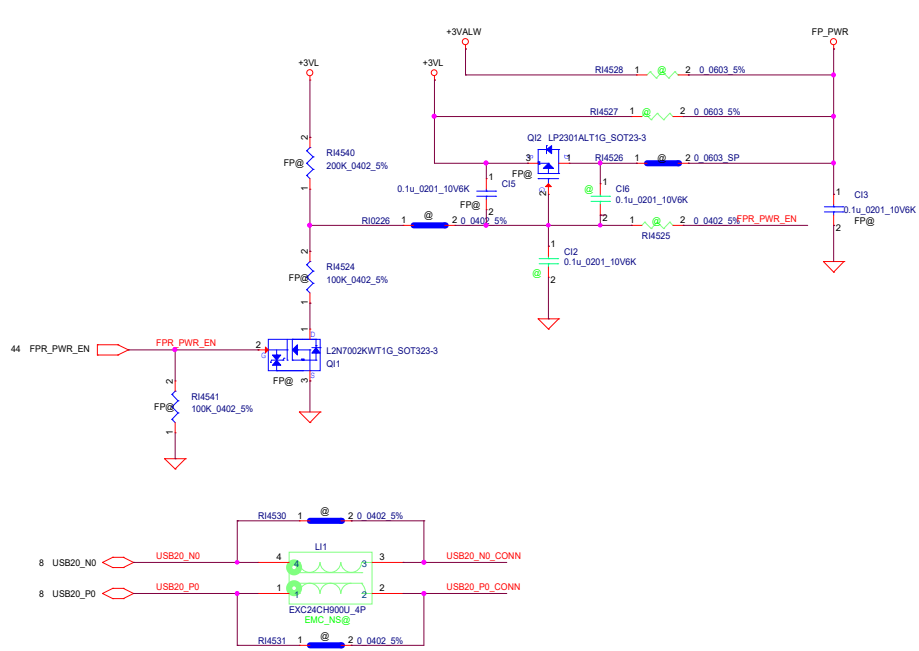



USBDEBUG	Kernel debug
Set input	Set input
Set output Low	ENABLE

UARTA_P80_EN	POST 80
Set input	DISABLE
Set output Low	ENABLE

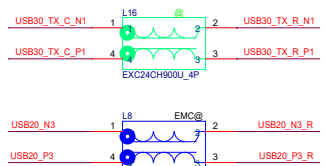
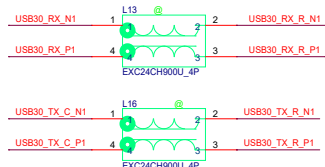
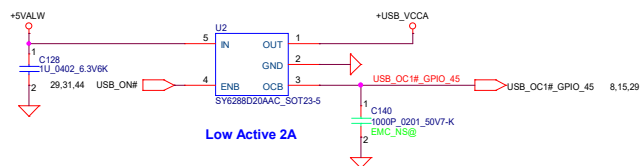
OE#	S	FUNCTION
H	X	DISABLE
L	L	D(+/-) to 1D(+/-)
L	H	D(+/-) to 2D(+/-)

Finger Print

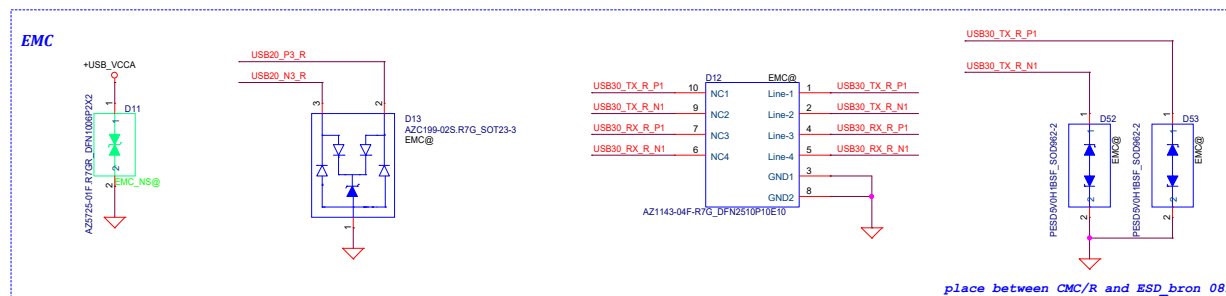
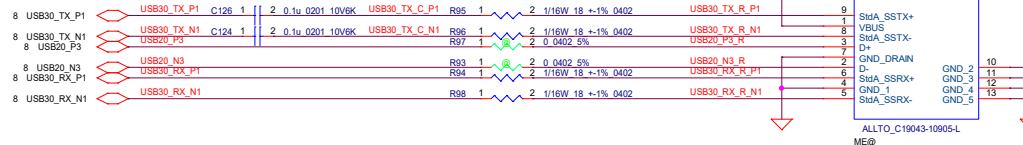


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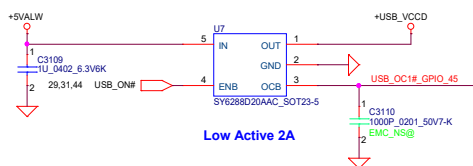
LEFT SIDE USB3.0 PORT x1



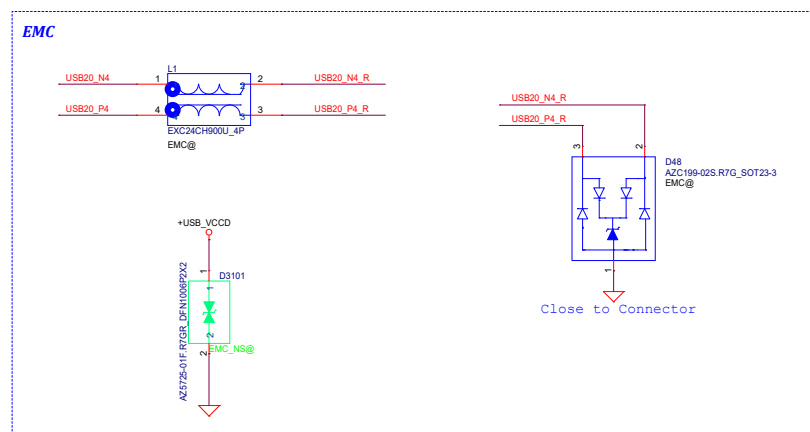
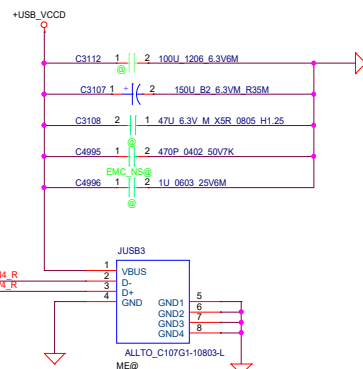
EMC




place between CMC/R and ESD bron 081

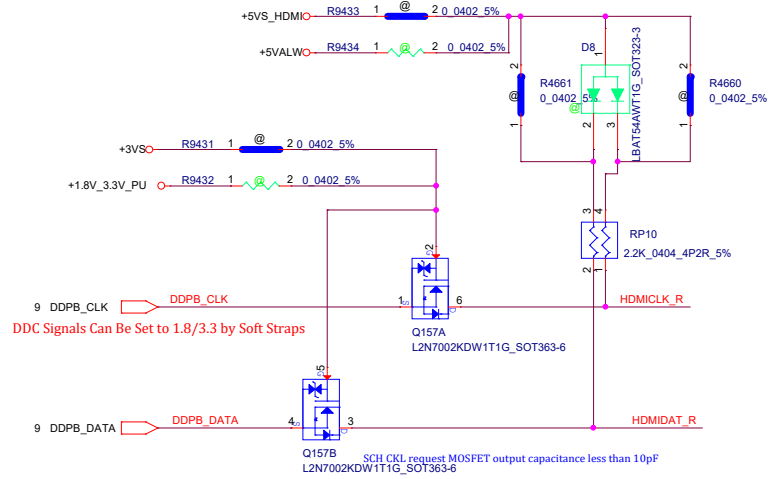
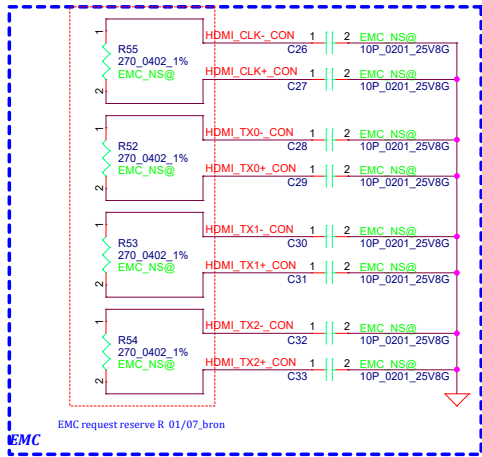


Don't Need Short

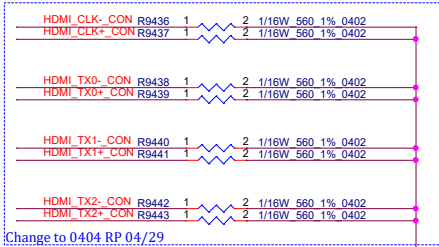



Close to Connector

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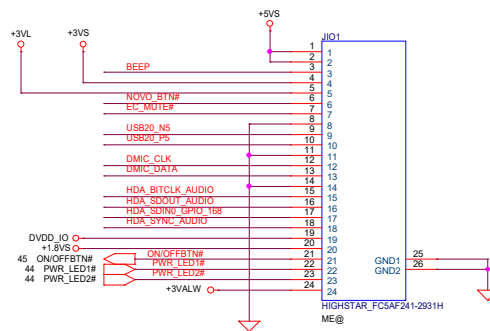
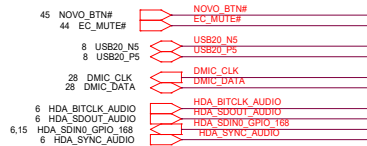
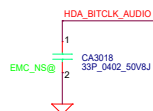
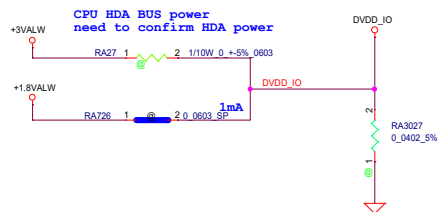
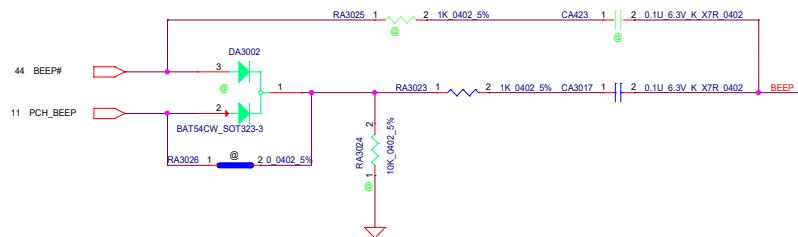


Follow PDG & CRB use 470ohm,SVT change 470 to 560 for HDMI issue



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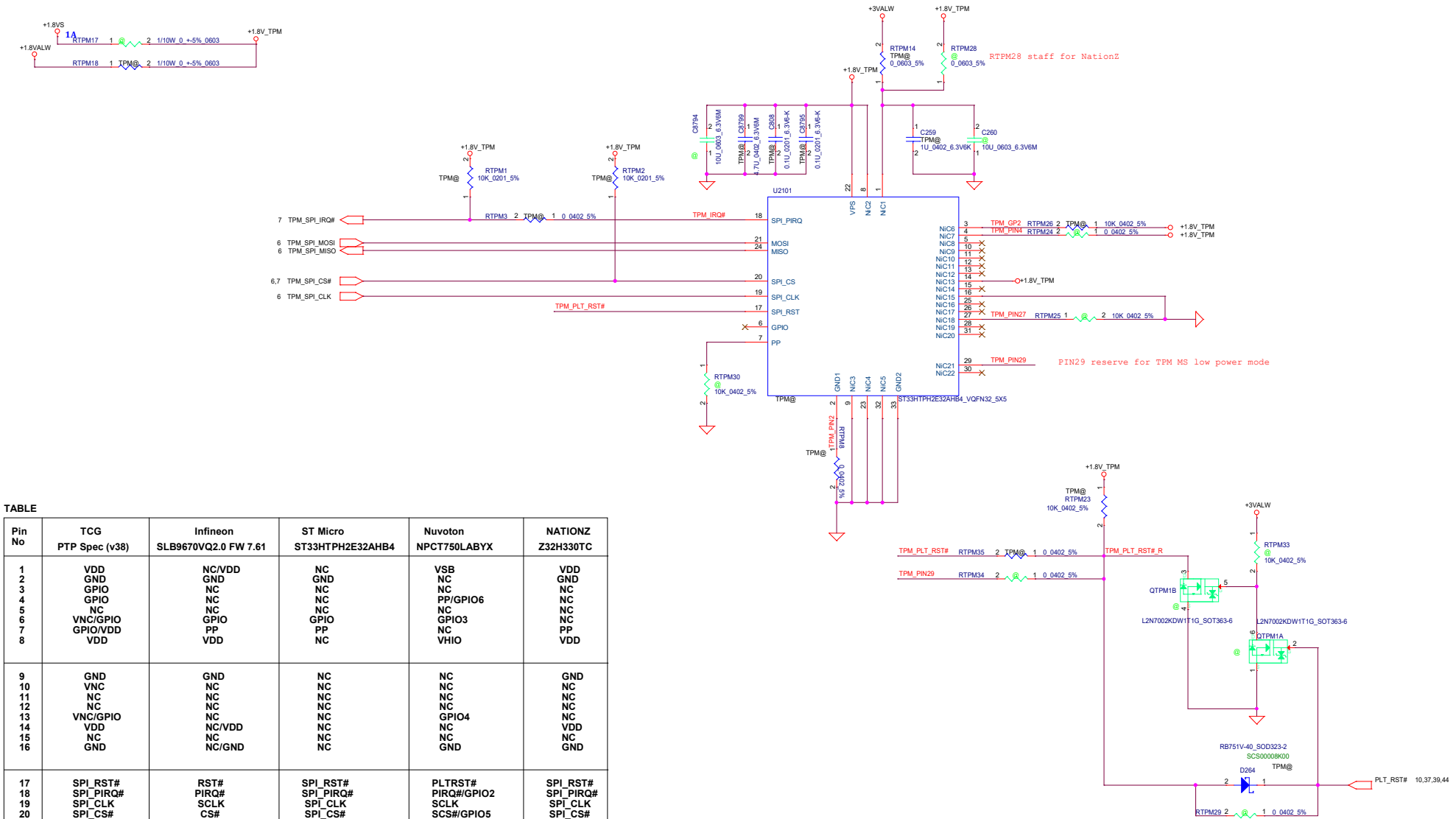





24Pin CONN

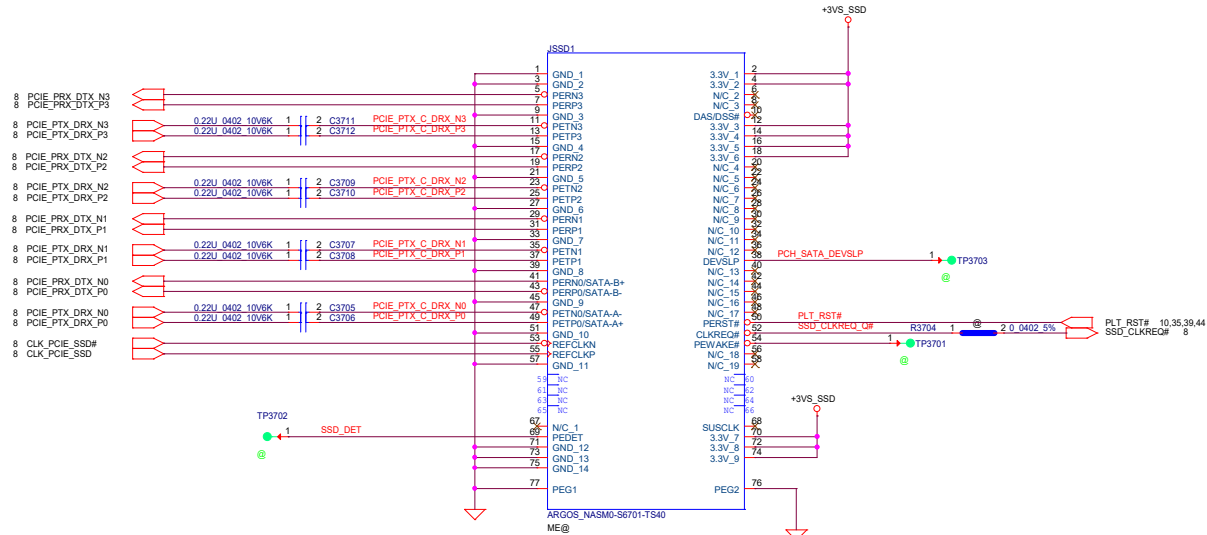
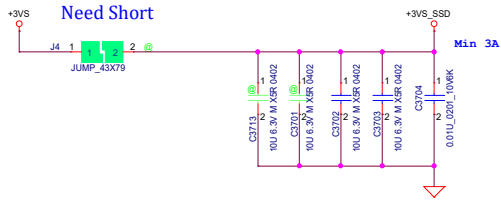
TABLE

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1	VDD	NC/VDD	NC	VSB	VDD
2	GND	GND	NC	NC	GND
3	GPIO	NC	NC	NC	NC
4	GPIO	NC	NC	PP/GPIO6	NC
5	NC	NC	NC	NC	NC
6	VNC/GPIO	GPIO	GPIO	GPIO3	NC
7	GPIO/VDD	PP	PP	NC	PP
8	VDD	VDD	NC	VHIO	VDD
9	GND	GND	NC	NC	GND
10	VNC	NC	NC	NC	NC
11	NC	NC	NC	NC	NC
12	NC	NC	NC	NC	NC
13	VNC/GPIO	NC	NC	GPIO4	NC
14	VDD	NC/VDD	NC	NC	VDD
15	NC	NC	NC	NC	NC
16	GND	NC/GND	NC	GND	GND
17	SPI_RST#	RST#	SPI_RST#	PLTRST#	SPI_RST#
18	SPI_PIRQ#	PIRQ#	SPI_PIRQ#	SPI_PIRQ#	SPI_PIRQ#
19	SPI_CLK	SCLK	SPI_CLK	SCLK	SPI_CLK
20	SPI_CS#	CS#	SPI_CS#	SCS#/GPIO5	SPI_CS#
21	MOSI	MOSI	MOSI	MOSI/GPIO7	MOSI
22	VDD	VDD	VPS	VHIO	VDD
23	GND	GND	NC	GND	GND
24	MISO	MISO	MISO	MISO	MISO
25	NC	NC	NC	NC	NC
26	NC	NC	NC	NC	NC
27	NC	NC	NC	NC	NC
28	NC	NC	NC	NC	NC
29	VNC/GPIO	NC	NC	SDA/GPIO0	NC
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31	VNC	NC	NC	NC	NC
32	GND	GND	NC	NC	GND



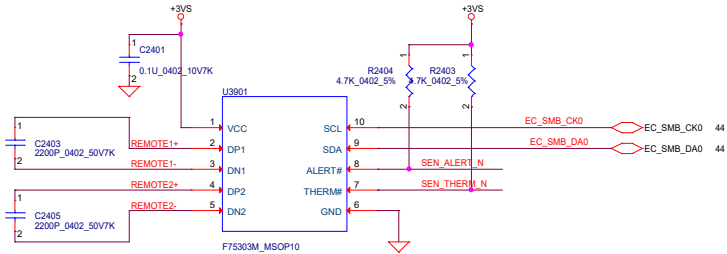
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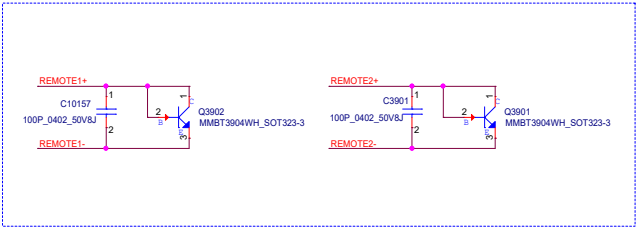


THERMAL SENSOR

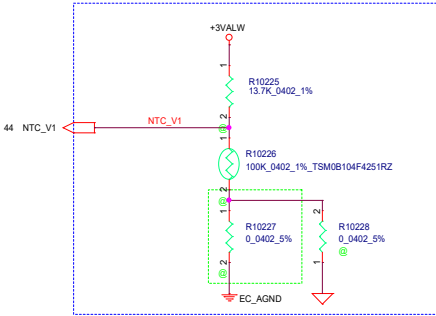
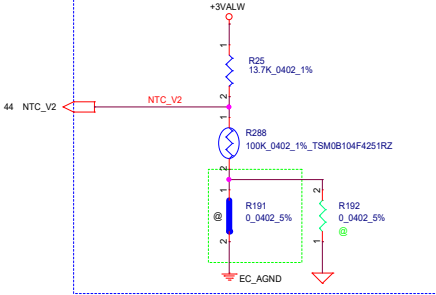
D



REMOTE+/-_R, REMOTE1+/-, REMOTE2+/-:
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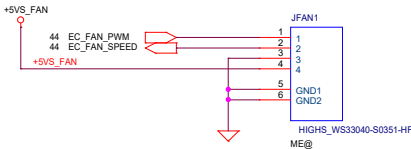
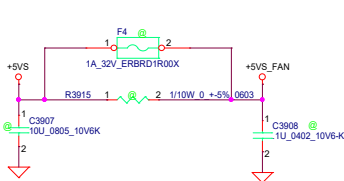
Near CPU



D

C

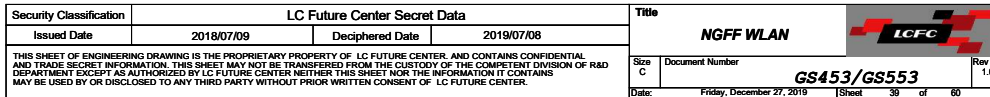
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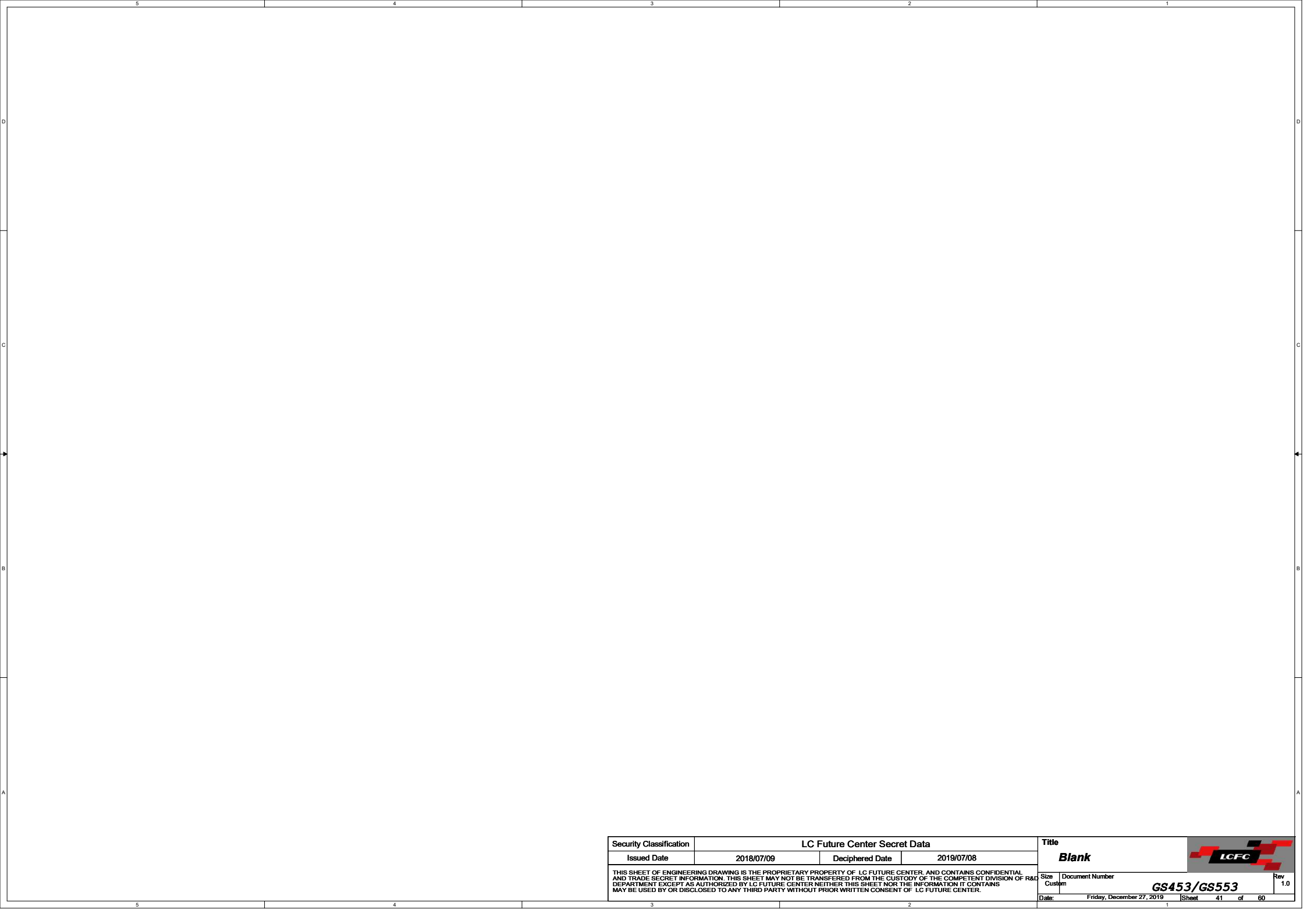
B


A

The schematic diagram illustrates the power management circuitry for the TQ2870 module. It features a central power management IC (U8, SY6288C20AAC_SOT23-5) which is powered by +3VALW and +3V_WLAN. The IC has an output for +3VALW and a control signal for WLAN_PWR_EN. The circuit includes several resistors (R2225, R2226, R2229, R9469, R9470, R9471), capacitors (C2202, C2203, C4003, C4004), and a MOSFET (Q2202). The input signals are CNVL_EN#, PM_SLP_WLAN#, and SUSP#. The output signals are +3VALW and +3V_WLAN.



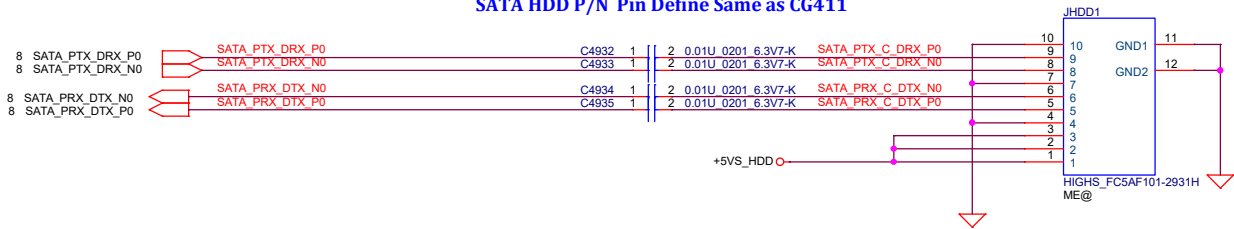
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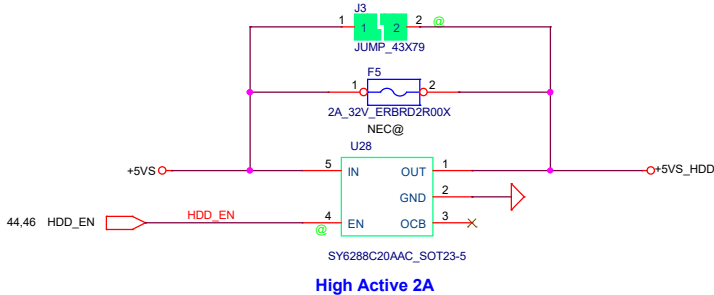
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SATA HDD Conn.

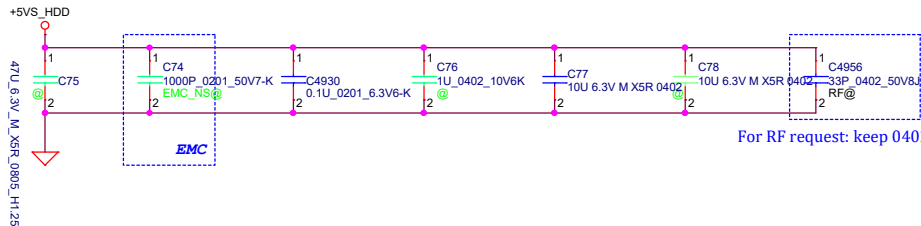
SATA HDD P/N Pin Define Same as CG411




Need Short




High Active 2A

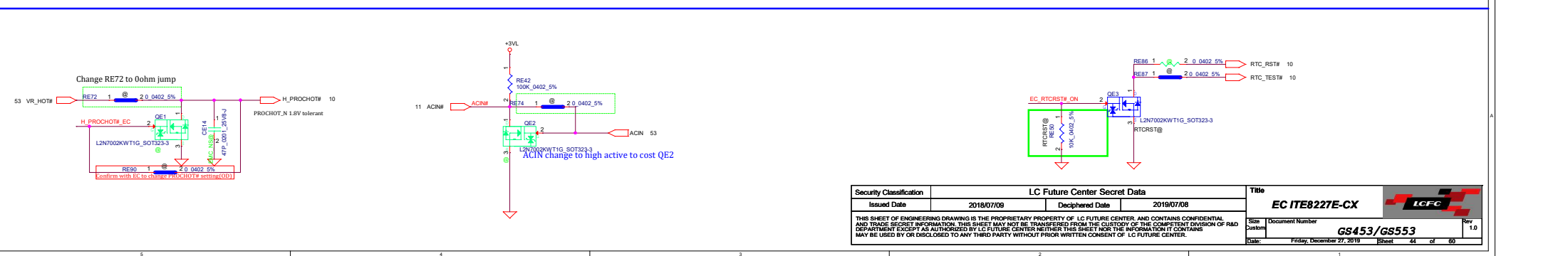
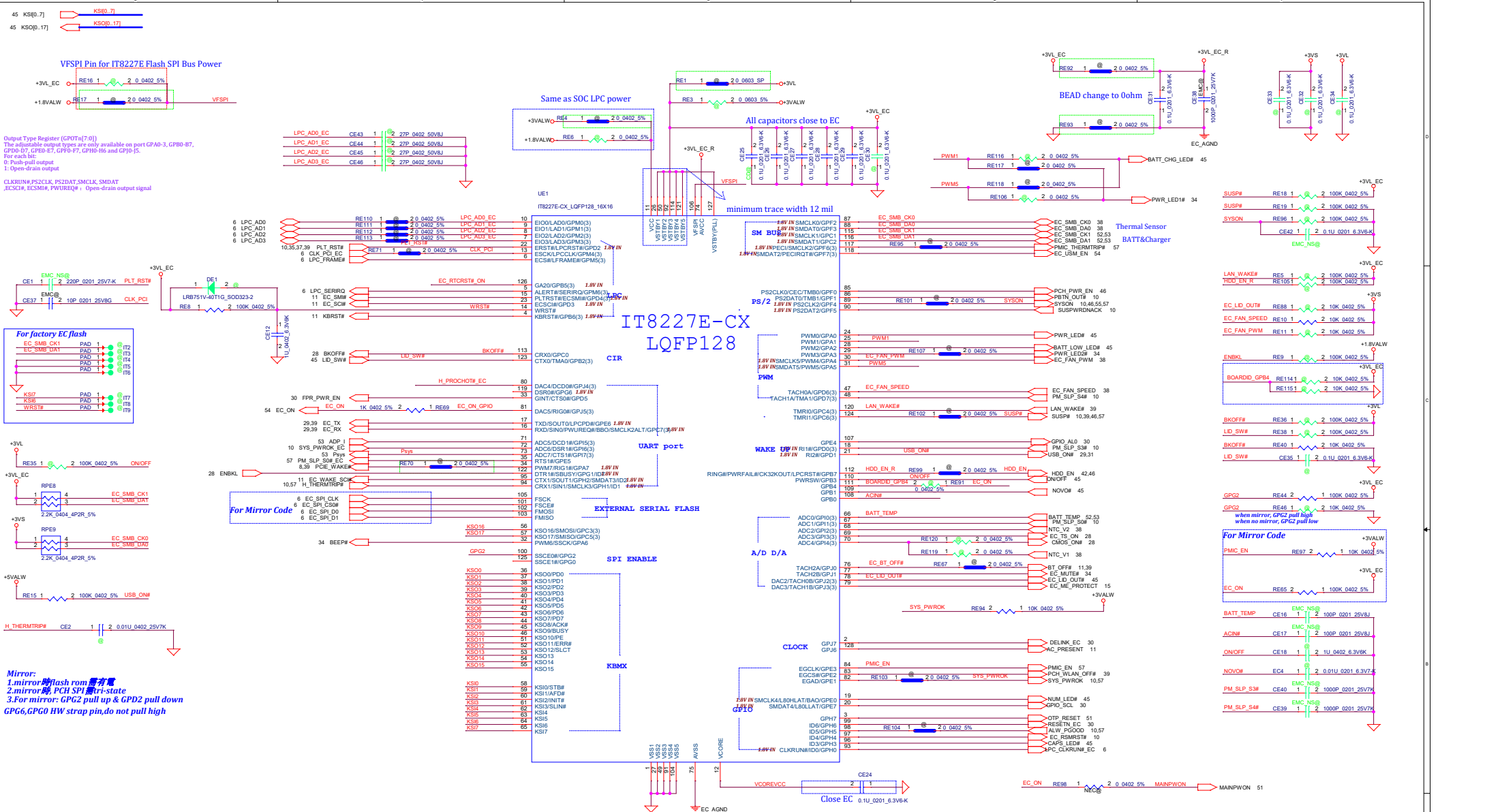


For RF request: keep 0402

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D		A		E		V		F		I		G		Sheet 42		of 60	

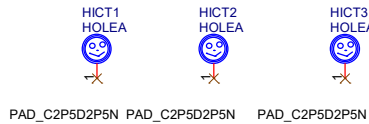
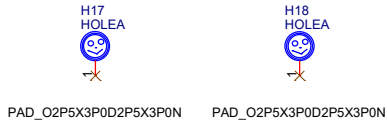
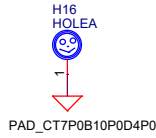
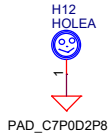
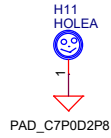
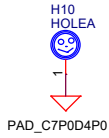
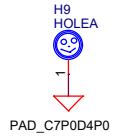
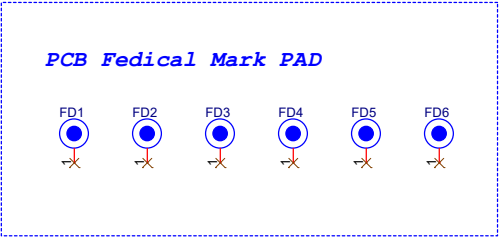
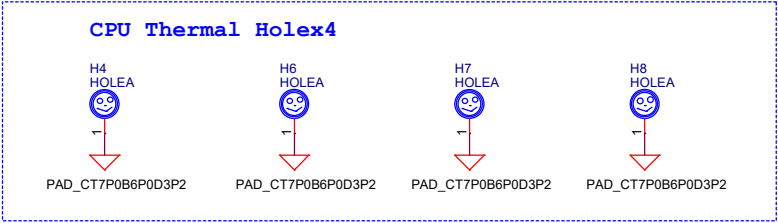
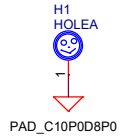


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				Date:	Friday, December 27, 2019	Sheet	43 of 60	

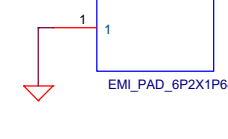
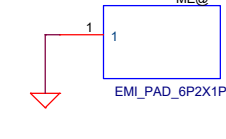
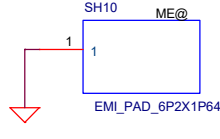
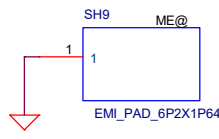
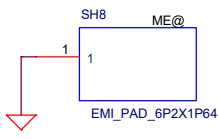
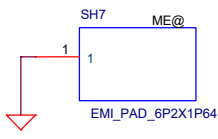
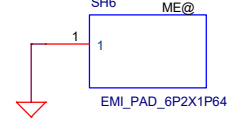
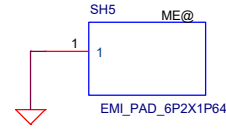
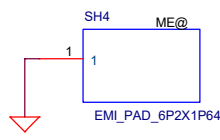
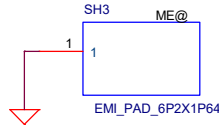
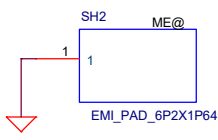
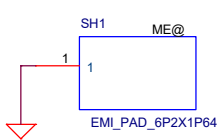



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				Date	Friday, December 27, 2019
				Sheet	44 of 80

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Docu- ment Number	G8543/G8553		Rev 1.0
<p>Docu. Number: G8543/G8553 Page: 1 of: 1</p>			



Shielding



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						Date:	Friday, December 27, 2019	Sheet 47 of 60	Rev 1.0
						GS453/GS553			

DAZ PCB PN

S350 IGL 14&15 PCB MB

PCB IO/B

HDMI Logo

GLK-R CPU
MP Sample

UC1 N5030
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BA000A0C10

UC1 N4120
S IC F1808003007400 SRESZ R0 1.1G 121
BA000A0C10

UC1 N4020
S IC F1808003007426 SPRETO R0 1.1G 121
BA000A0C10

S350 DRAM X76

ZZ24 DRAM_S4G@
ALT_GROUP PARTS D8G SAM GS453
XTW45C1201

ZZ25 DRAM_S4G@
ALT_GROUP PARTS D4G SAM GS553
XTW45C1201

ZZ26 DRAM_M8G@
ALT_GROUP PARTS D8G MIC GS553
XTW45C1204

ZZ27 DRAM_M8G@
ALT_GROUP PARTS D4G MIC GS553
XTW45C1202

ZZ28 DRAM_H8G@
ALT_GROUP PARTS D8G HYN GS453
XTW45C1202

V1415 DRAM X76

ZZ29 VDRAM_M8G@
ALT_GROUP PARTS D8G MIC GV452
XTW45C1201

ZZ210 VDRAM_H8G@
ALT_GROUP PARTS D4G HYN GV452
XTW45C1202

ZZ211 VDRAM_S4G@
ALT_GROUP PARTS D4G SAM GV552
XTW45C1201

RAM Board ID

ID4	ID5	ID6	ID7	Description
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RC9477	RC9478	RC9479	RC9476	MICRON MT40A512M16TB-062E-J
RC9477	RC9478	RC9475	RC9480	HYNIX HGABG8NCJR-XNC
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0	1	0	1	
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0	1	1	1	

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UD2 S4G@
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BA000A0C10

UD3 S4G@
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UD4 S4G@
S IC D4 512MX16/3200 KA8G16SWC-BCWE 121
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UD5 S4G@
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UD6 S4G@
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UD7 S4G@
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UD8 S4G@
S IC D4 512MX16/3200 KA8G16SWC-BCWE 121
BA000A0C10

RC9477 S4G@
S RES 116W 2.2K +5% 0402
SD02822018J

RC9479 S4G@
S RES 116W 2.2K +5% 0402
SD02822018J

RC9480 S4G@
S RES 116W 2.2K +5% 0402
SD02822018J

UD1 S4G@
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UD2 S4G@
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UD4 S4G@
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BA000A0C10

RC9477 S4G@
S RES 116W 2.2K +5% 0402
SD02822018J

RC9478 S4G@
S RES 116W 2.2K +5% 0402
SD02822018J

RC9479 S4G@
S RES 116W 2.2K +5% 0402
SD02822018J

RC9480 S4G@
S RES 116W 2.2K +5% 0402
SD02822018J

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UD2 M8G@
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UD3 M8G@
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UD8 M8G@
S IC D4 512M16 MT40A512M16TB-062E-J 121
BA000A0C10

RC9477 M8G@
S RES 116W 2.2K +5% 0402
SD02822018J

RC9478 M8G@
S RES 116W 2.2K +5% 0402
SD02822018J

RC9479 M8G@
S RES 116W 2.2K +5% 0402
SD02822018J

RC9480 M8G@
S RES 116W 2.2K +5% 0402
SD02822018J

UD1 M4G@
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UD2 M4G@
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UD3 M4G@
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RC9477 M4G@
S RES 116W 2.2K +5% 0402
SD02822018J

RC9478 M4G@
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RC9479 M4G@
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RC9480 M4G@
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UD8 H8G@
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BA000A0C10

RC9477 H8G@
S RES 116W 2.2K +5% 0402
SD02822018J

RC9478 H8G@
S RES 116W 2.2K +5% 0402
SD02822018J

RC9479 H8G@
S RES 116W 2.2K +5% 0402
SD02822018J

RC9480 H8G@
S RES 116W 2.2K +5% 0402
SD02822018J

UD1 H4G@
S IC D4 512MX16/3200 HSANBG8NCJR-XNC 121
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UD2 H4G@
S IC D4 512MX16/3200 HSANBG8NCJR-XNC 121
BA000A0C10

UD3 H4G@
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BA000A0C10

UD4 H4G@
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RC9477 H4G@
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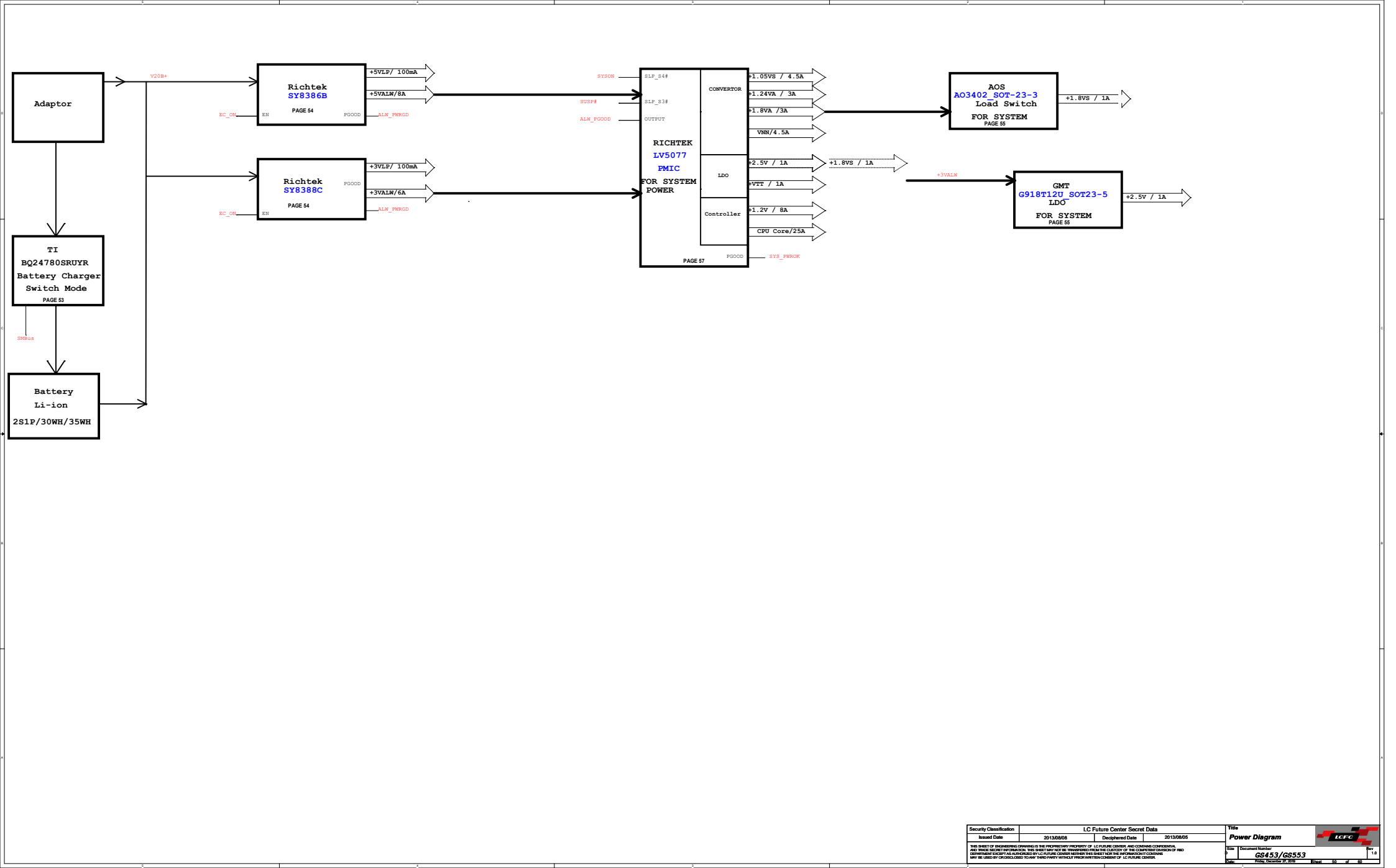
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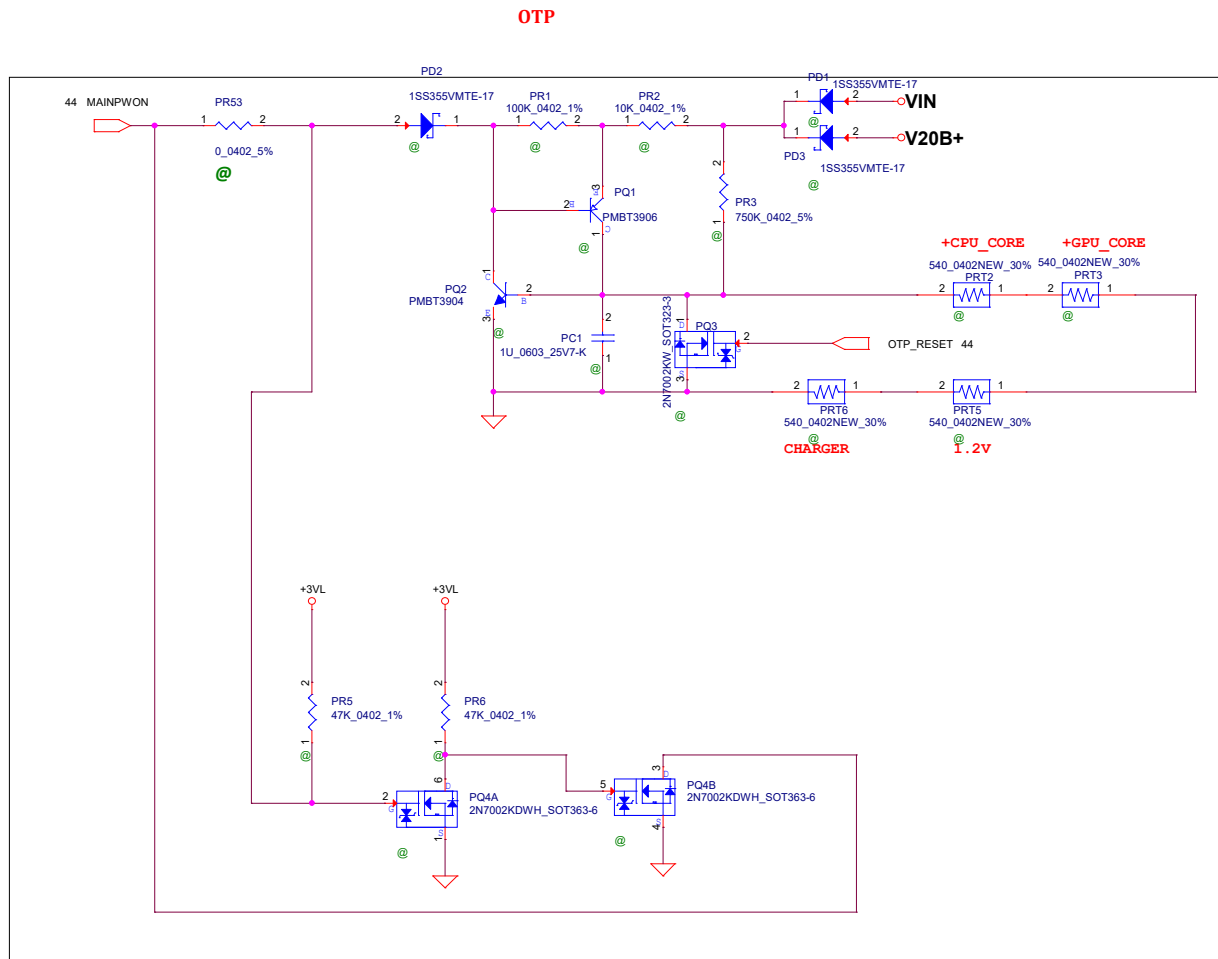
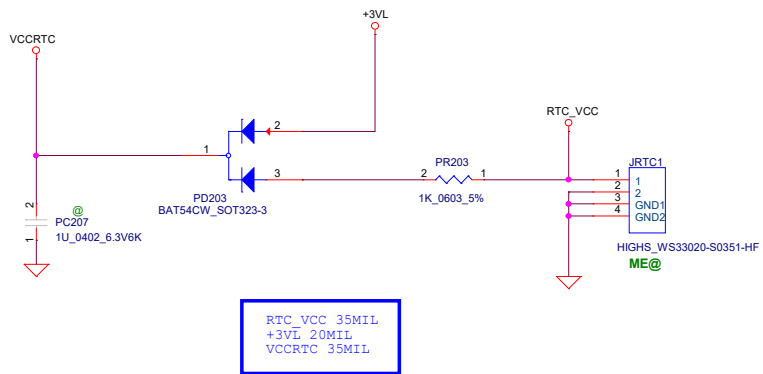
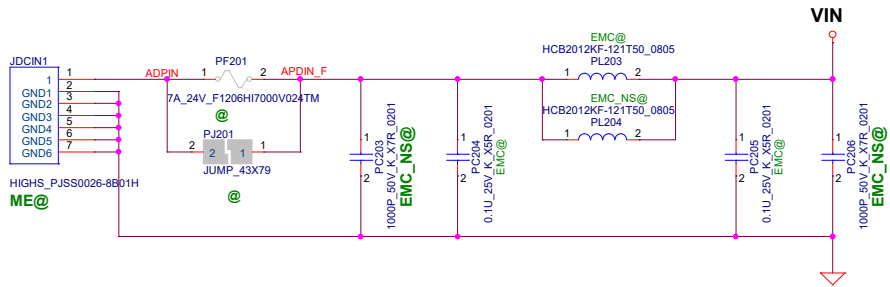
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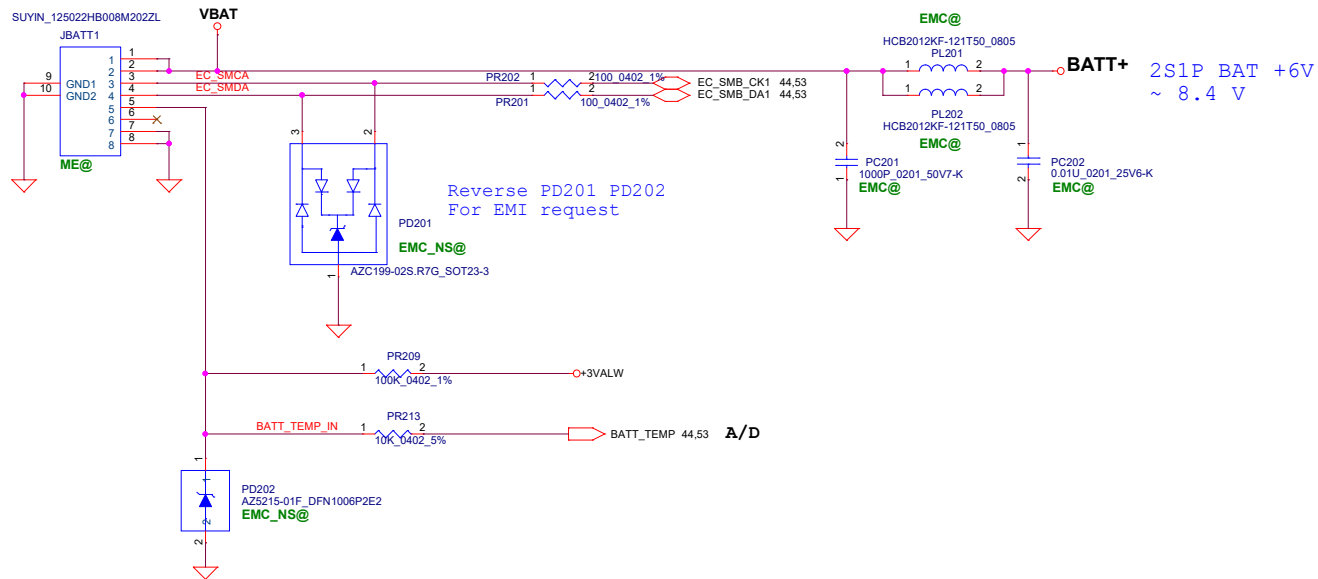
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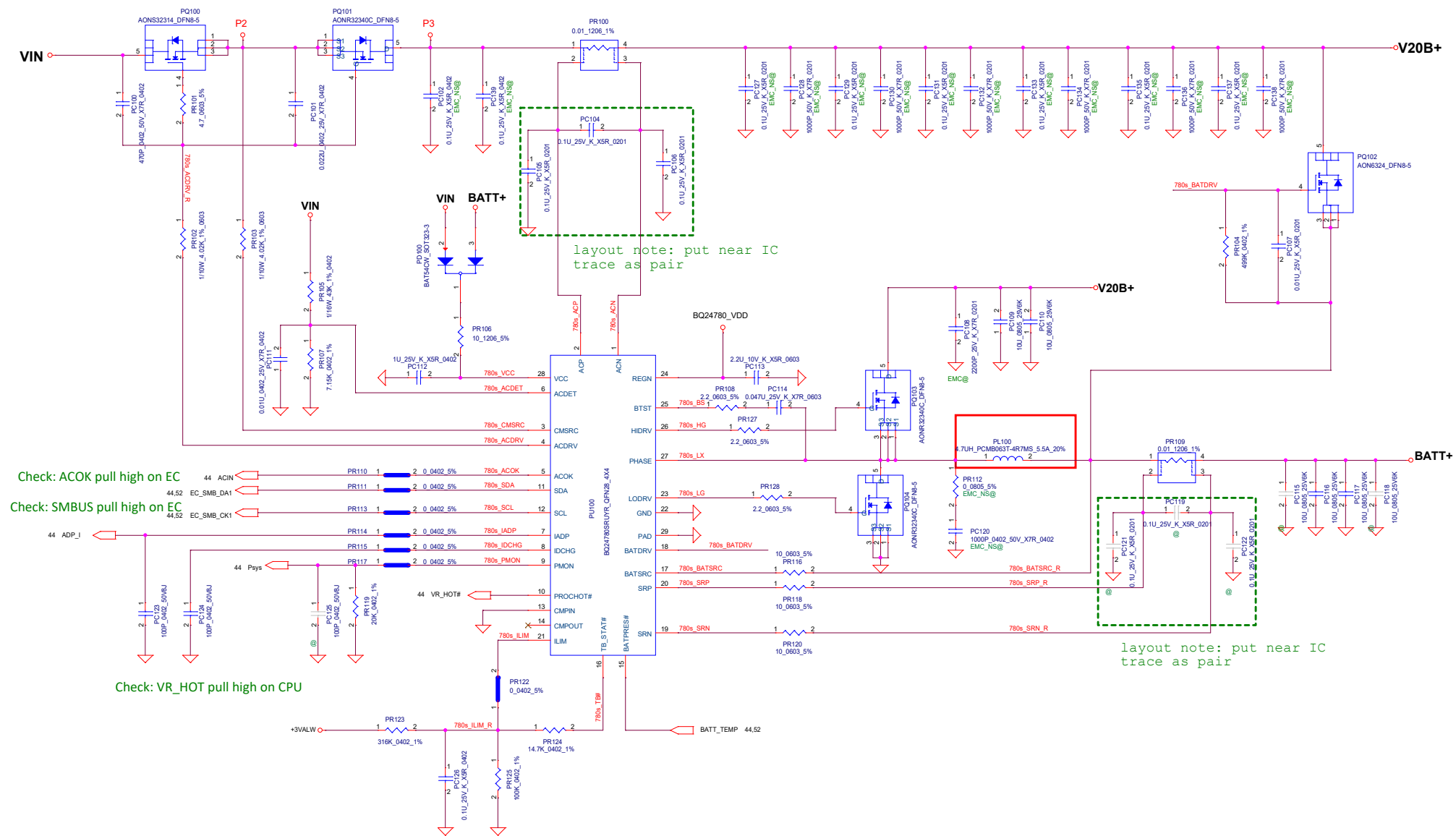


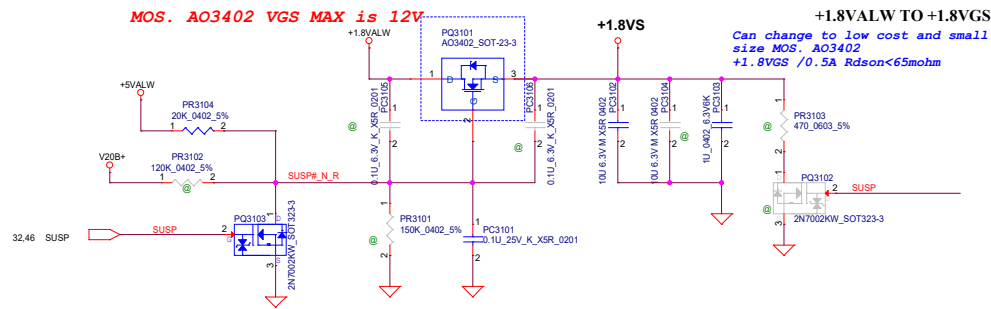
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				Custom	GS453/GS553	1.0
				Date:	Friday, December 27, 2019	Sheet 49 of 60



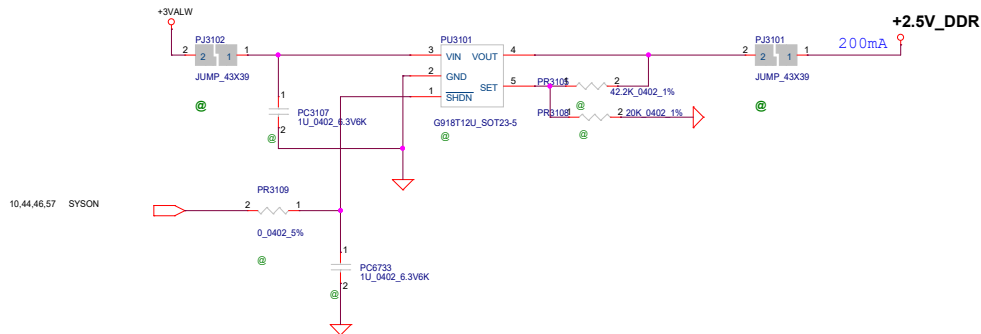


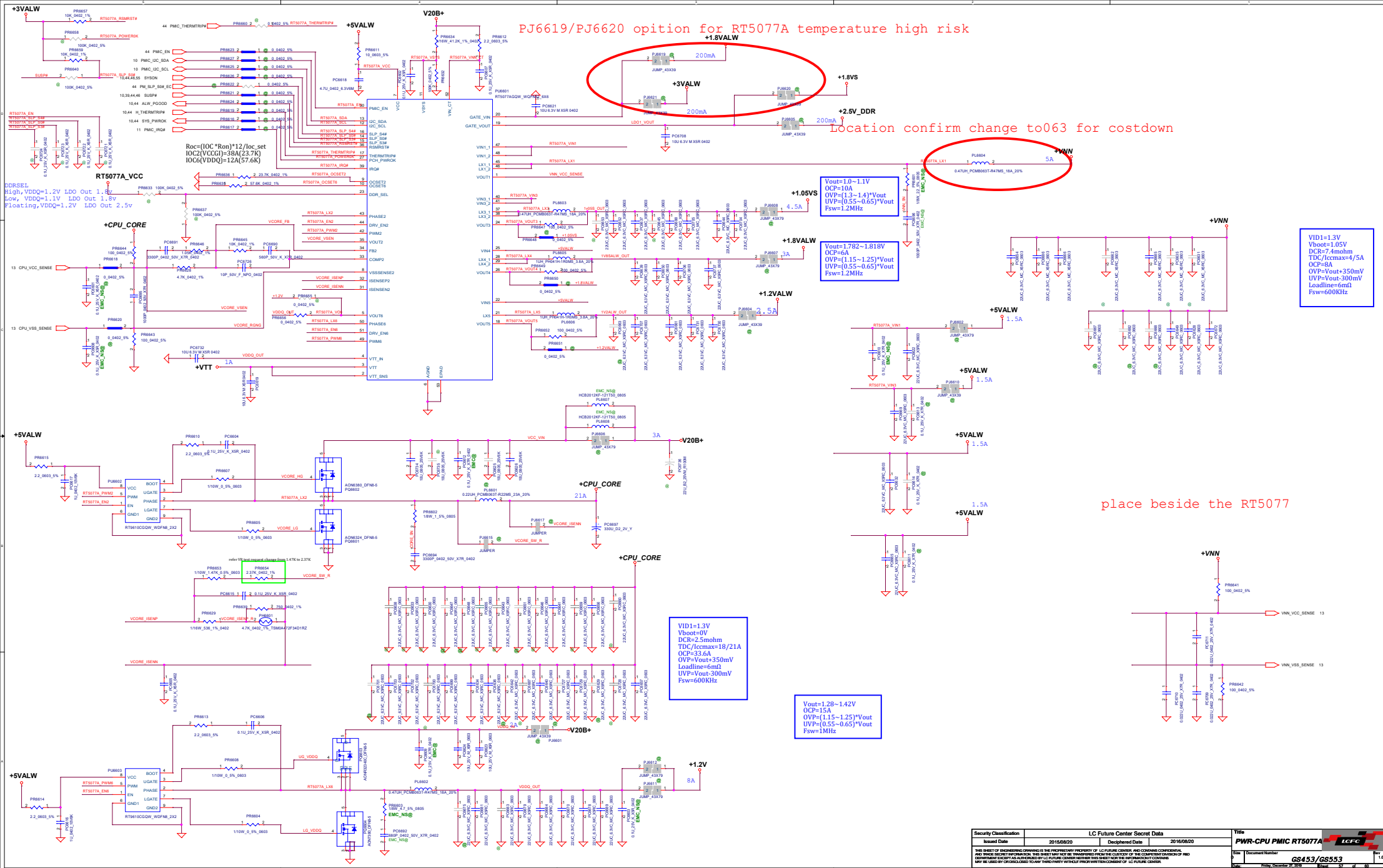







**RT5077A Test high temperature must add this solution
SDV Must Add in bom**



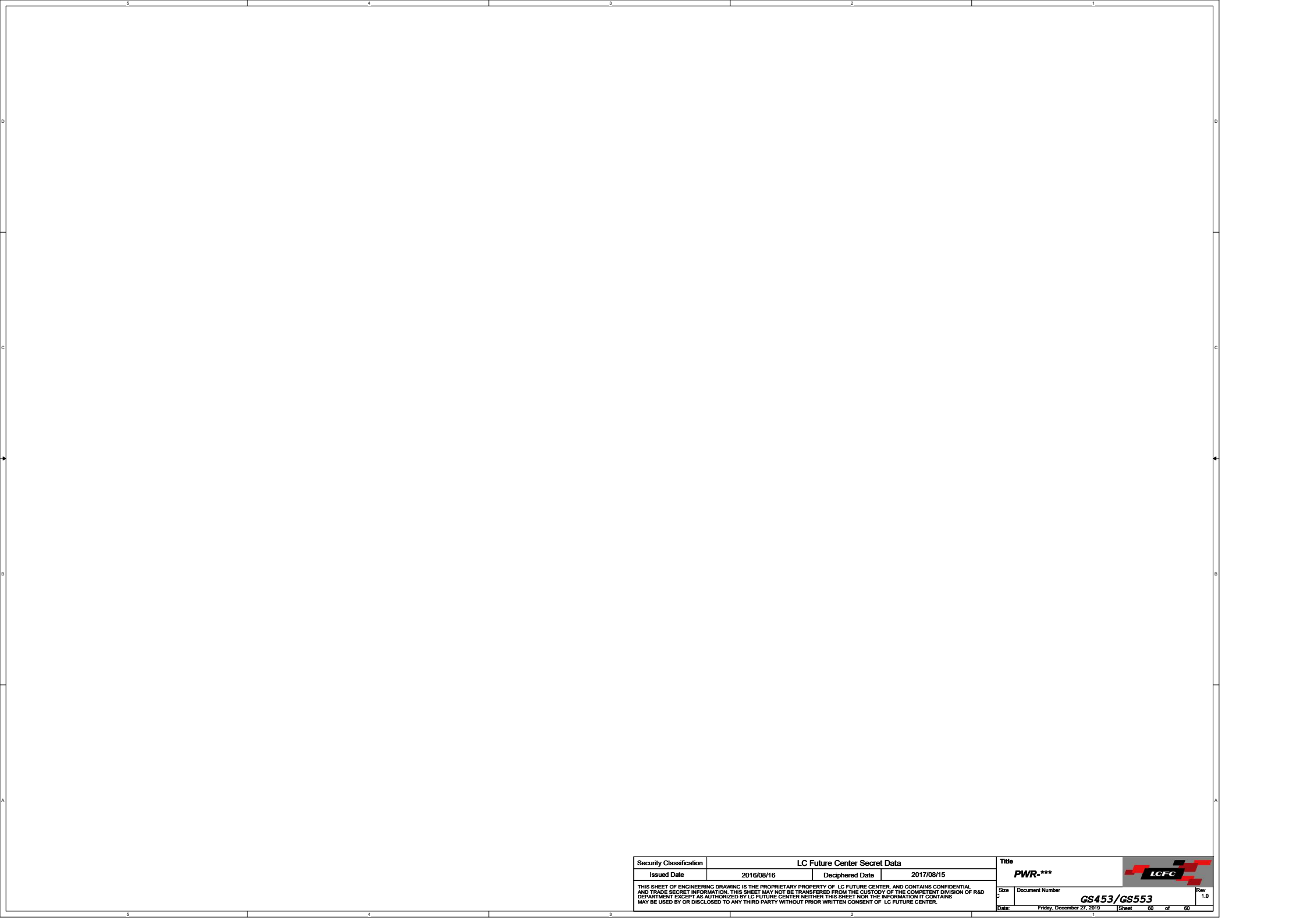



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		2016/08/20		2016/08/20	
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				Rev 1	
				62453/65553	
				Friday, December 2, 2016 3:10 PM	

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C				C																				
B				B																				
A				A																				
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Security Classification	LC Future Center Secret Data			Title																				
Issued Date	2015/08/20	Deciphered Date	2016/08/20	PWR_***																				
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Date: Friday, December 27, 2018				Sheet 58 of 60																				
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C				C																				
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