


# LCFC Confidential

## CG413/CG513 MB Schematics Document

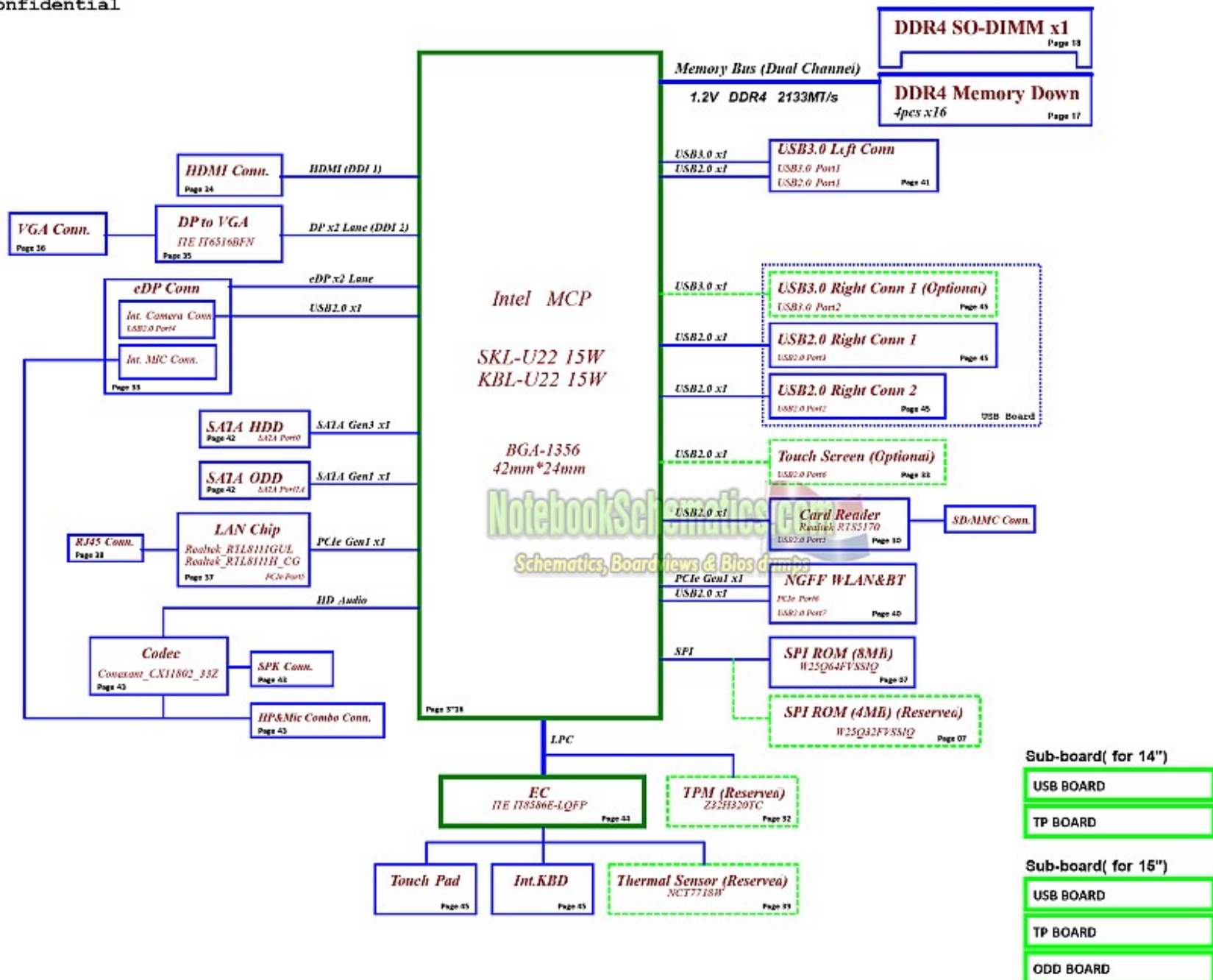
Intel Skylake-U22&U23/Kabylake-U22&U23 with DDR4

2016-06-12

REV:1.0

Security Classification		LC Future Center Secret Data		Title						
Issued Date		2015/08/20		Deciphered Date			2016/08/20		Cover Page	
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Voltage Rails ( O --> Means ON , X --> Means OFF )

Power Plane / State	V20B+	+3VALW +5VALW +3VALW_PCH +1.8VALW +1.0VALW	+1.2V +2.5V_DDR +VCCST	+5VS +3VS +VCCIO +VCCSTG +VCCSA +VCC_GT +CPU_CORE +0.6VS
S0	O	O	O	O
S3	O	O	O	X
S3 Battery only	O	O	O	X
S5 S4 AC Only	O	O	X	X
S5 S4 Battery only	O	X	X	X
S5 S4 AC & Battery don't exist	X	X	X	X

SMBUS Control Table

	SOURCE	BATT	Charger	DGPU	IT8586E	Memory Down	PCH	PMIC	SODIMM	Thermal Sensor	WLAN WiMAX
EC_SMB_CK1 EC_SMB_DA1	IT8586E +3VL_EC	V	V	X	V +3VL_EC	X	X	X	X	X	X
EC_SMB_CK2 EC_SMB_DA2	IT8586E +3VS	X	X	V +3VG_AON	V +3VS	X	V +3VALW_PCH	X	X	V	X
EC_SMB_CK3 EC_SMB_DA3	IT8586E +3VL_EC	X	X	X	V +3VL_EC	X	X	V	X	X	X
PCH_SMB_CLK PCH_SMB_DATA	PCH +3VALW_PCH	X	X	X	X	X	V +3VALW_PCH	X	V +3VS	X	V +3VS

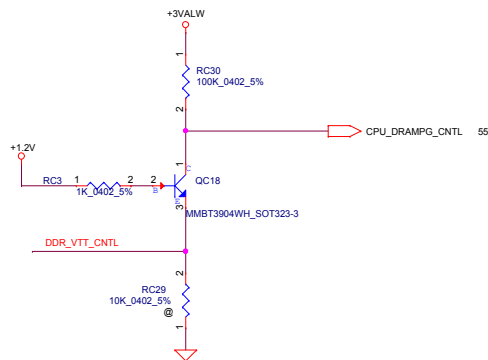
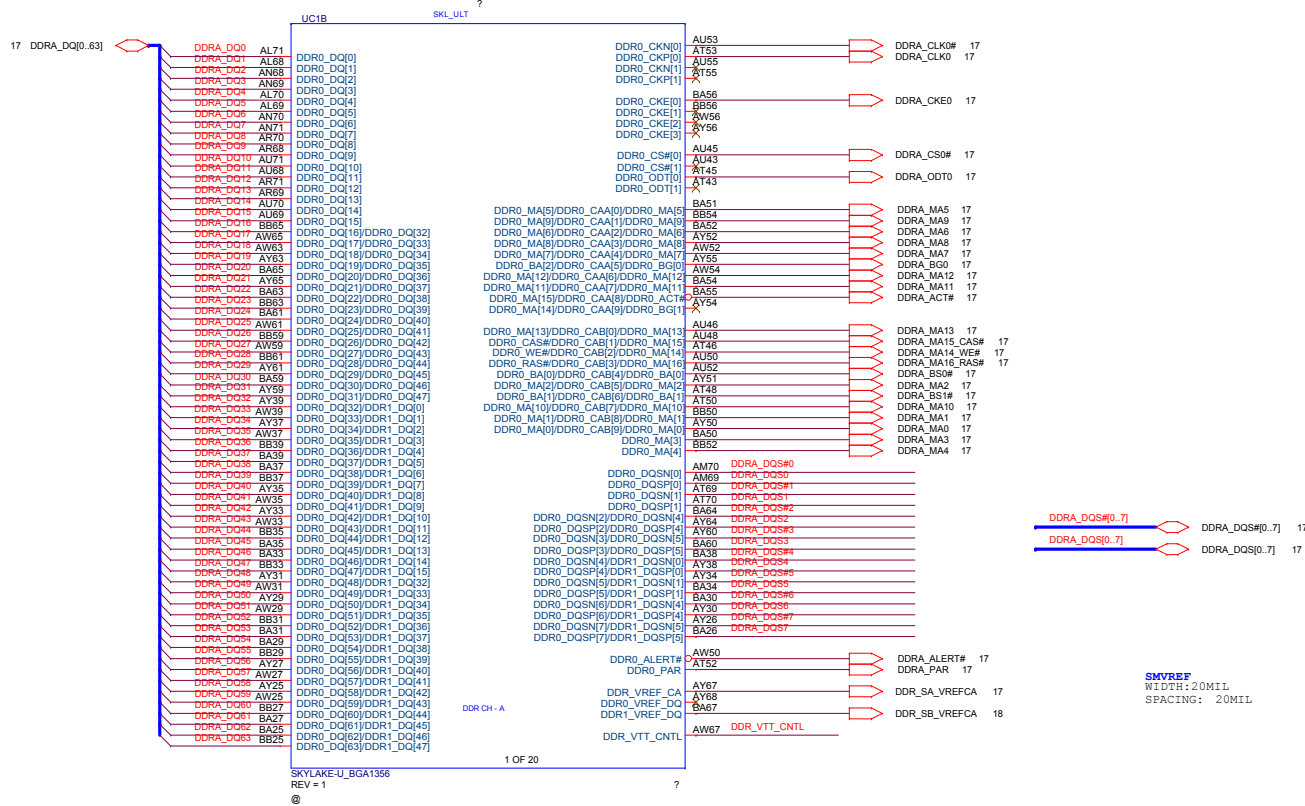
EC SMBus1 address      EC SMBus2 address      EC SMBus3 address      PCH SM Bus address


Device	Address	Device	Address	Device	Address	Device	Address
Smart Battery	need to update	Thermal Sensor(NCT7718W)	1001_100xb	DDR4 SODIMM	need to update	Wlan	Reserved
Charger	0001 0010 b	PCH	need to update				
		DGPU	need to update				

STATE \ SIGNAL	SLP_S3#	SLP_S4#	SLP_S5#	+VALW	+V	+VS	Clock
Full ON	HIGH	HIGH	HIGH	ON	ON	ON	ON
S3 (Suspend to RAM)	LOW	HIGH	HIGH	ON	ON	OFF	OFF
S4 (Suspend to Disk)	LOW	LOW	LOW	ON	OFF	OFF	OFF
S5 (Soft OFF)	LOW	LOW	LOW	ON	OFF	OFF	OFF

HSIO PORT	Function	BOM Structure	BTO Item
USB3.0	1 USB3.0 Conn Left	@	Not stuff
	2 USB3.0 Conn Right(optional)	14@	For 14" part
	3 3D Camera(optional)	15@	For 15" part
	4 NC	14or15@	For 14" or 15" part
	5 NC	14or17@	For 14" or 17" part
	6 NC		
USB2.0	1 USB3.0 Conn Left		
	2 USB2.0 Conn1 Right	Cannonlake@	For Cannonlake part
	3 USB2.0 Conn2 Right	CD@	For C cost down
	4 Camera	DUALMIC@	For Dual MIC part
	5 Cardreader	EMC@	For EMC part
	6 Touch Panel	EMC_15@	For EMC 15" part
	7 Bluetooth	EMC_NS@	For EMC nu-stuff part
	8 NC	EMC_PX@	For EMC PX part
	9 NC	EMC_PXNS@	For EMC PX nu-stuff part
	10 NC	ES@	For ES CPU
PCIE	1 NC	EXO@	For EXO GPU
	2 NC		
	3 NC	ME@	For ME part
	4 NC	NTS@	For nu-touch part
	5 LAN		
	6 WLAN		
	7 used as SATA		
	8 used as SATA		
SATA	9-12 X4 PCIE	PX@	For PX part
	0 HDD	RANKA@	For VRAM rank A part
	1A ODD	RANKB@	For VRAM rank B part
	1B used as PCIE	Realtek SD@	For Realtek SD part
	2 used as PCIE	SINGLEMIC@	For single MIC part
		SINGLERANK@	For single VRAN rank part
		DUALRANK@	For dual VRAN rank part
		TS@	For touch screen part
		TPM@	For TPM part
		UMA@	For UMA part





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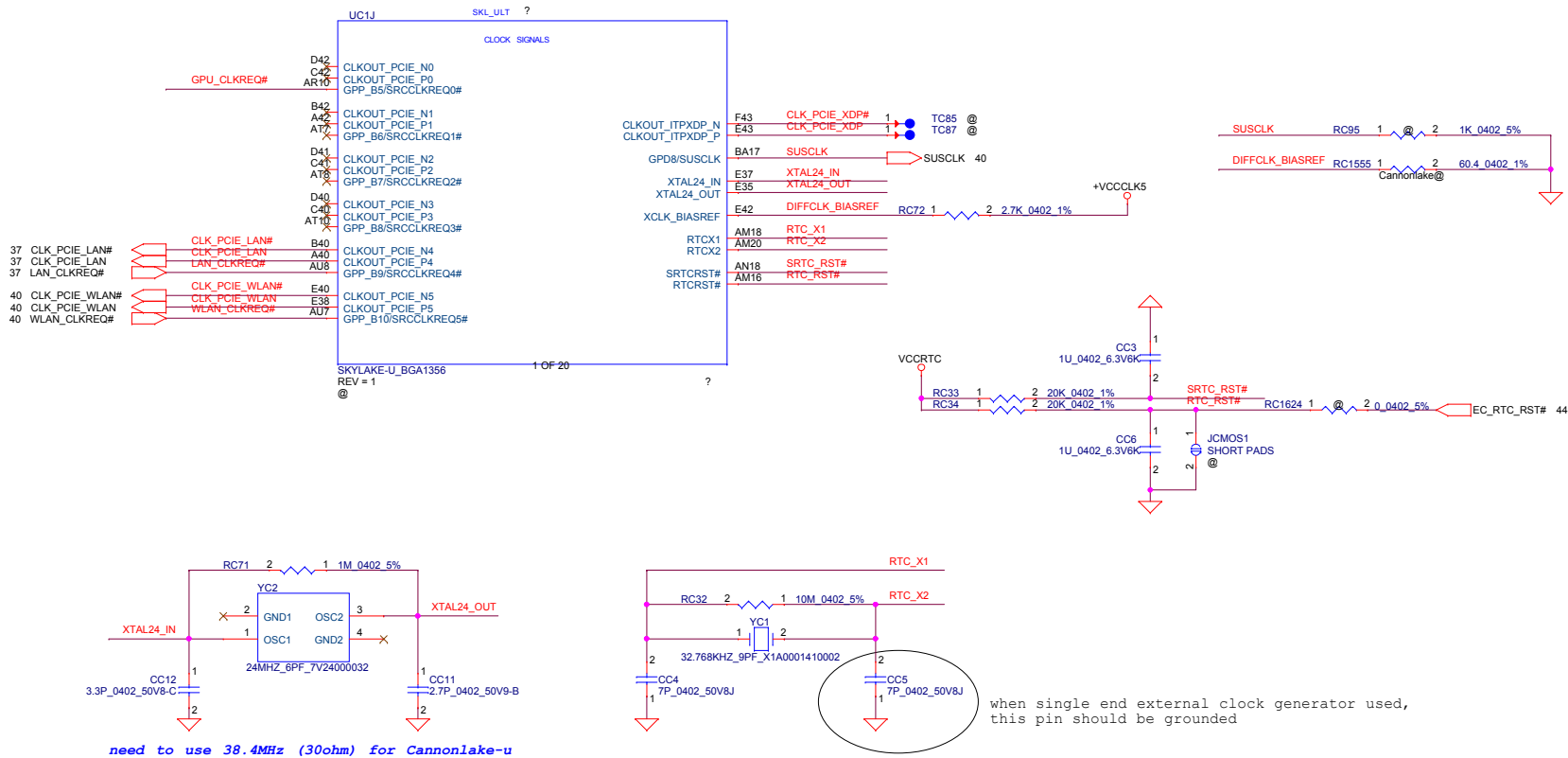
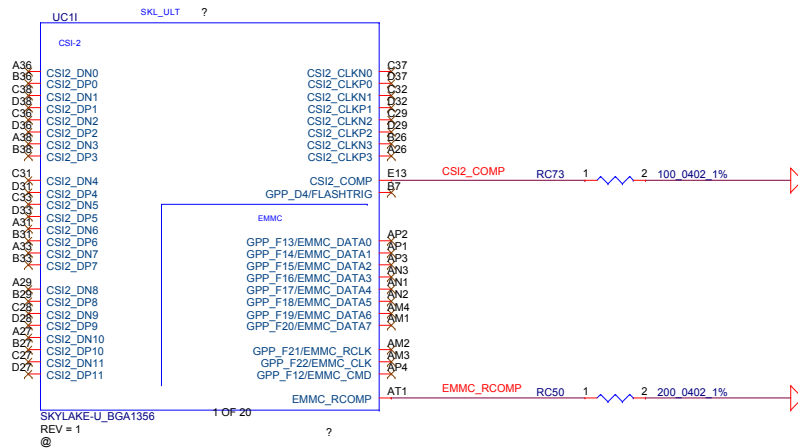
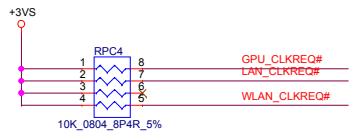






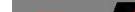


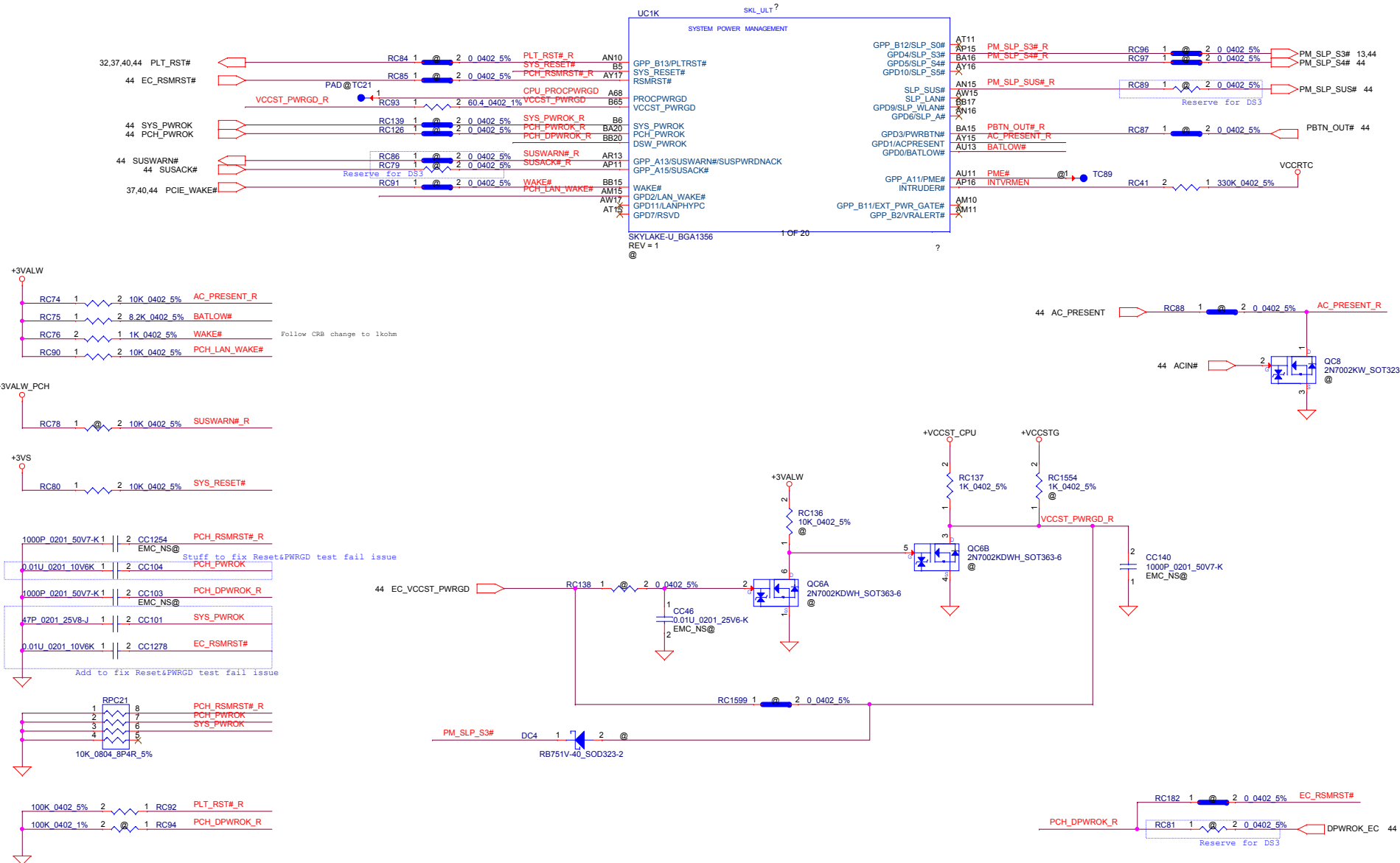




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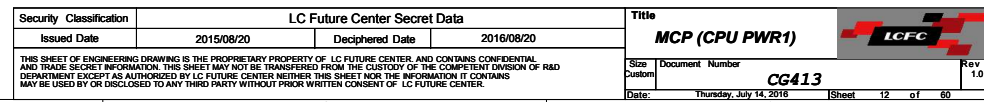
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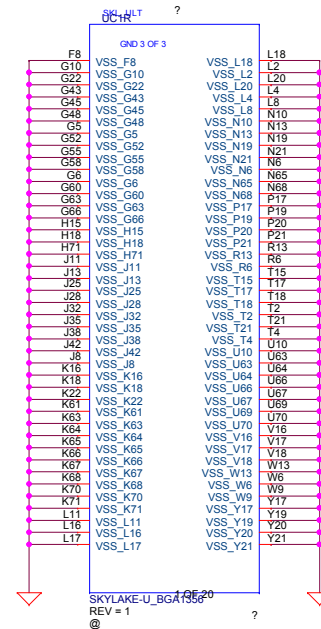
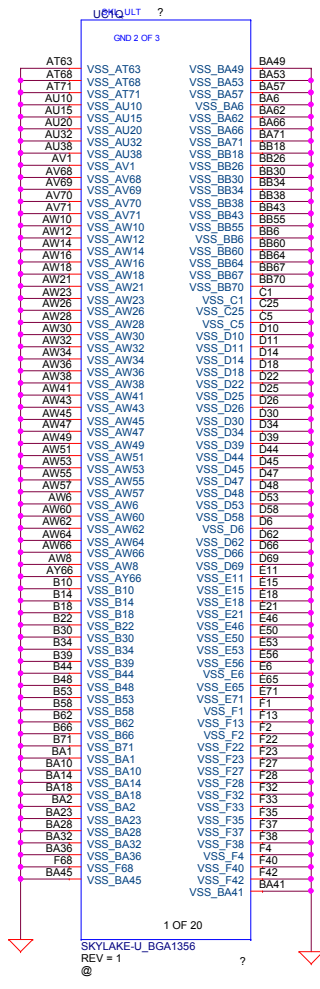
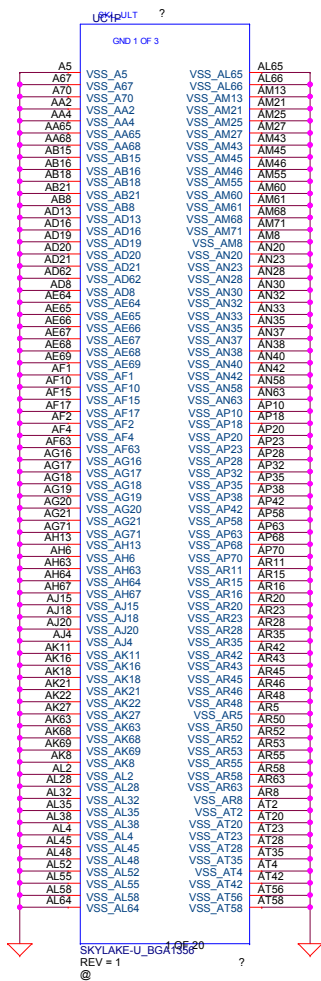
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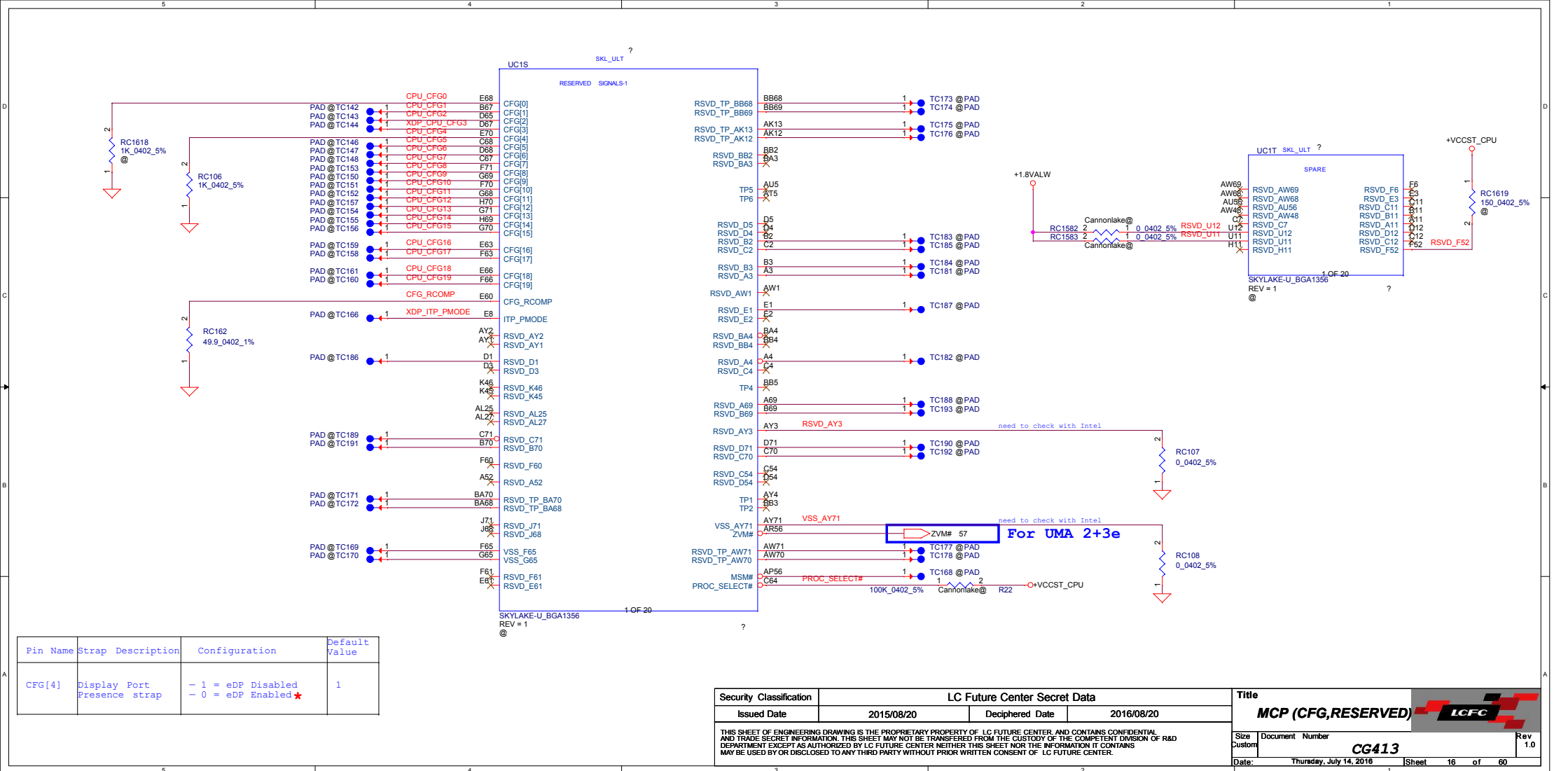


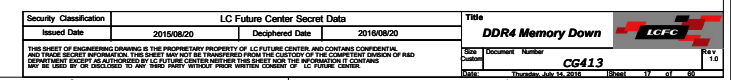




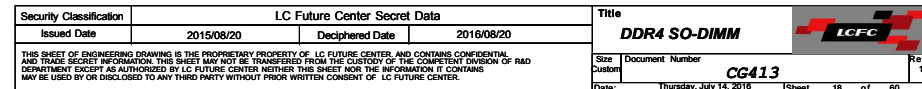









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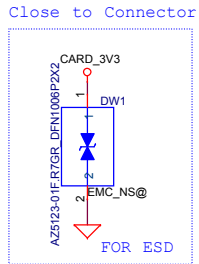
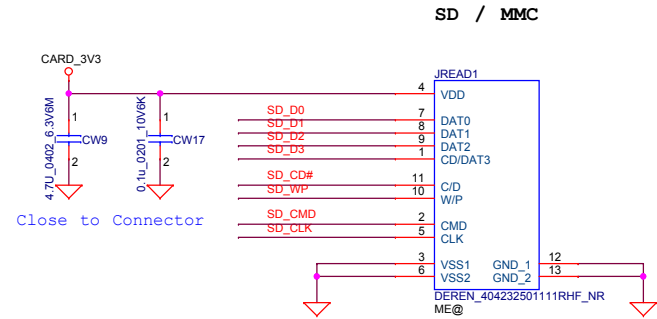
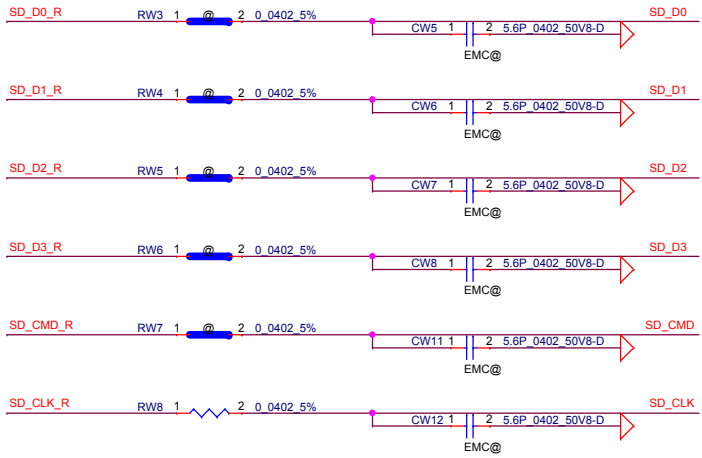
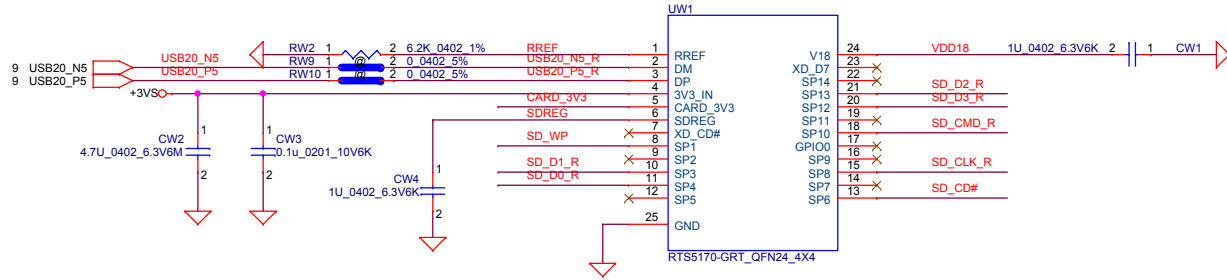
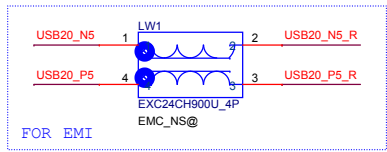


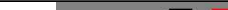
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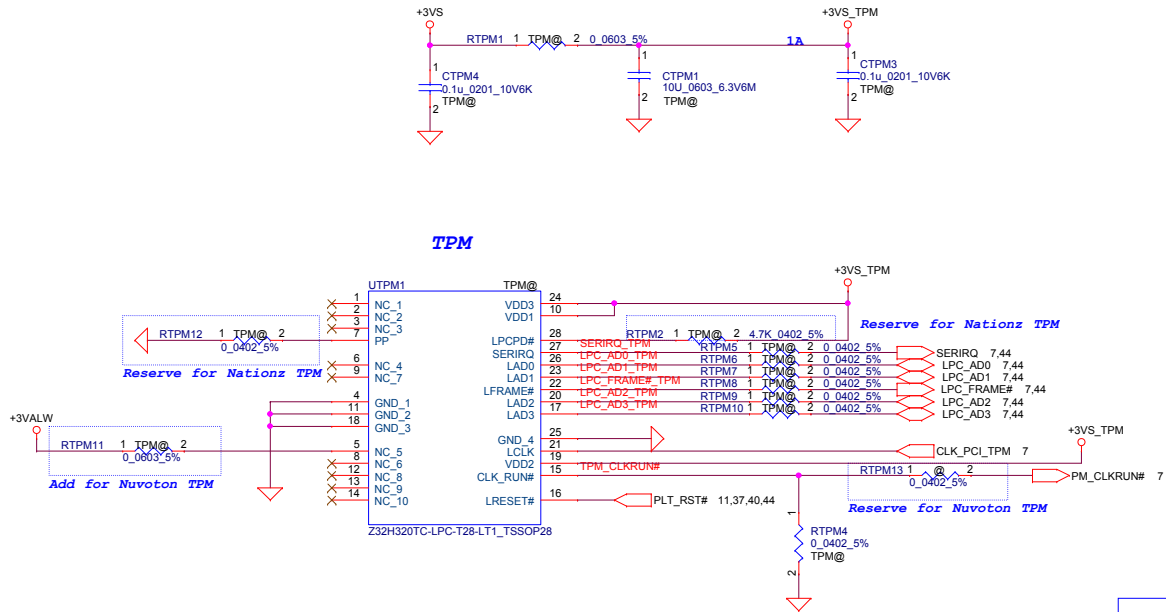
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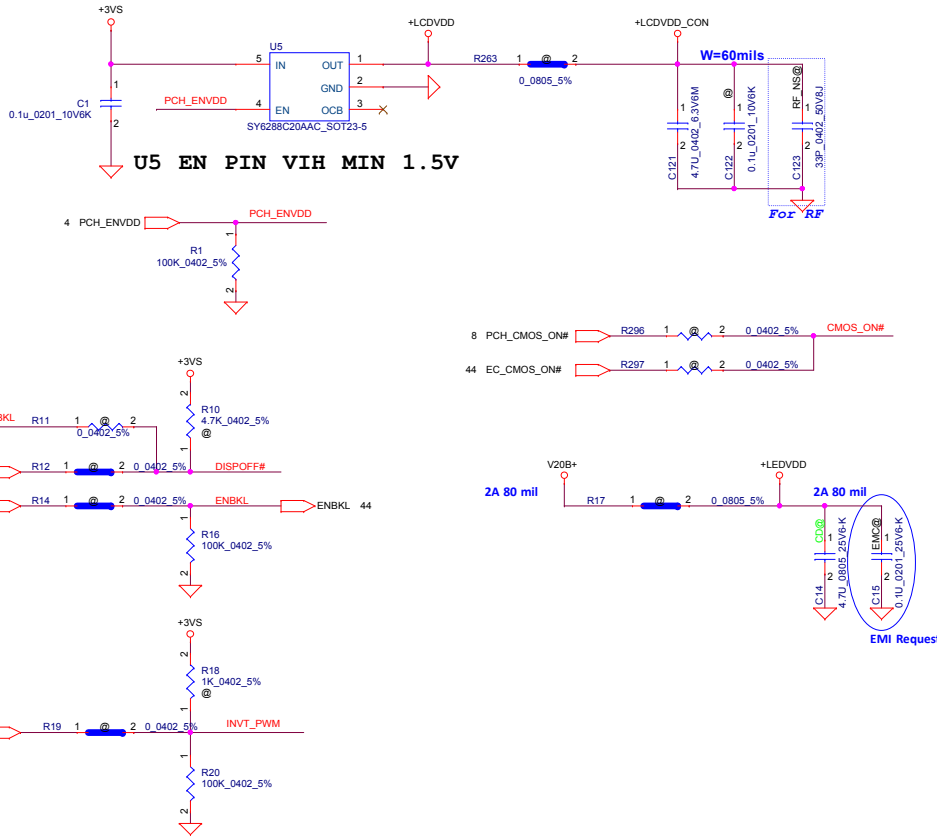


	Nationz TPM	Nuvoton TPM
RTPM2	Stuff	NC
RTPM12	Stuff	NC
RTPM11	NC	Stuff

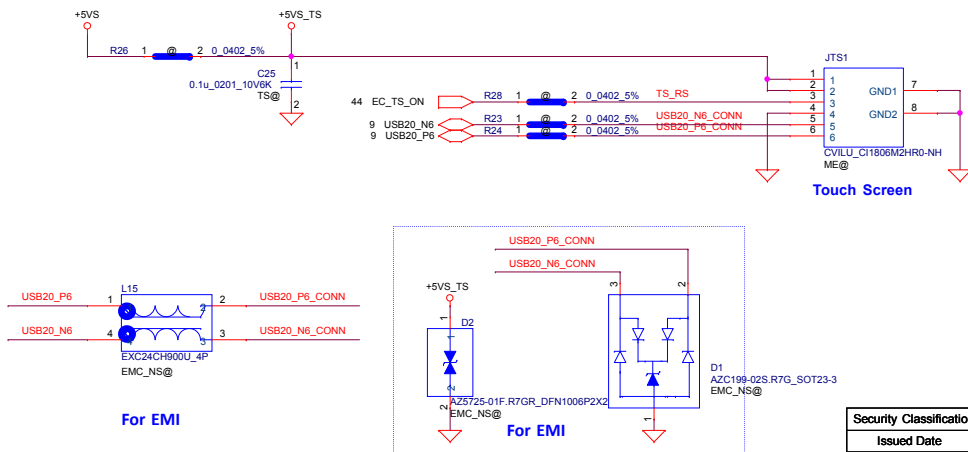
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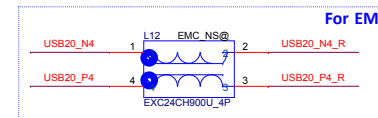
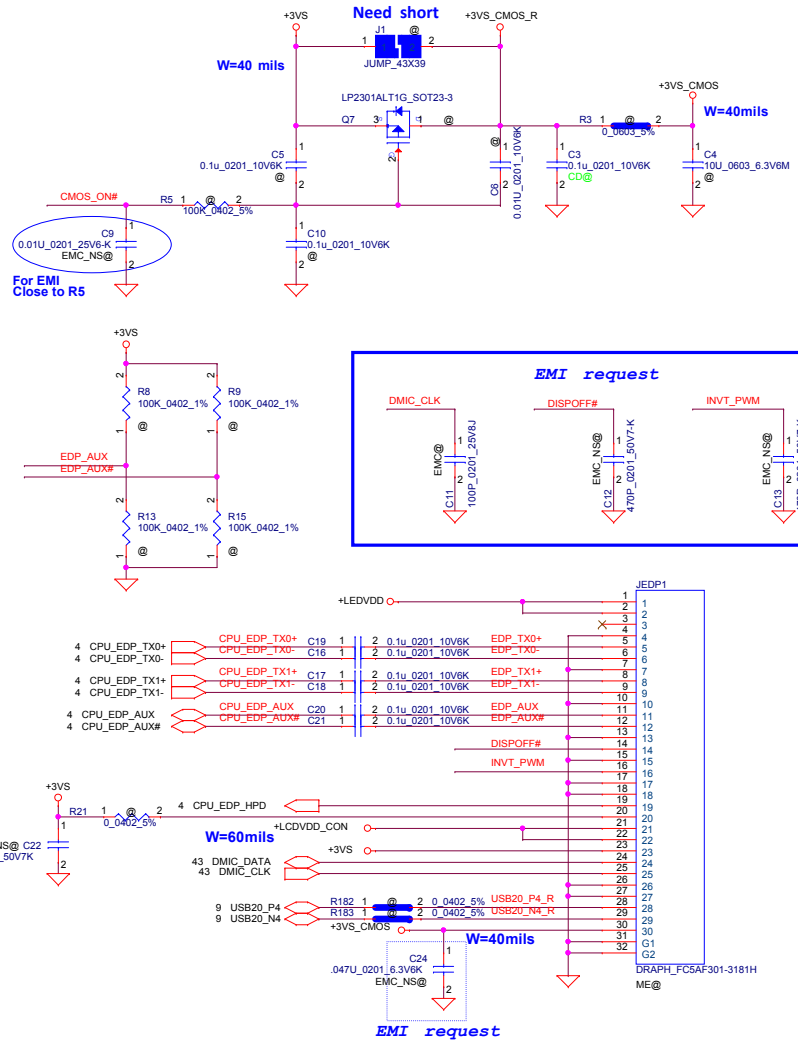
## LCD POWER CIRCUIT



## Touch Screen




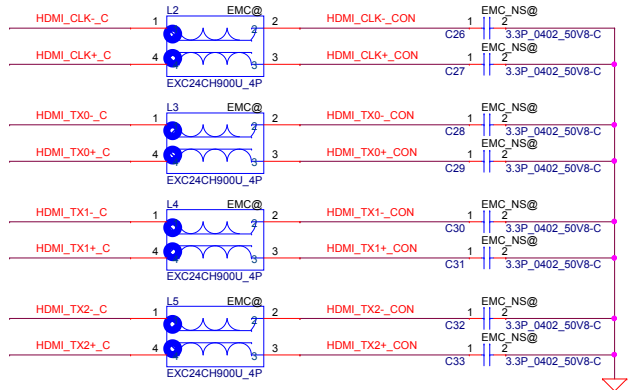
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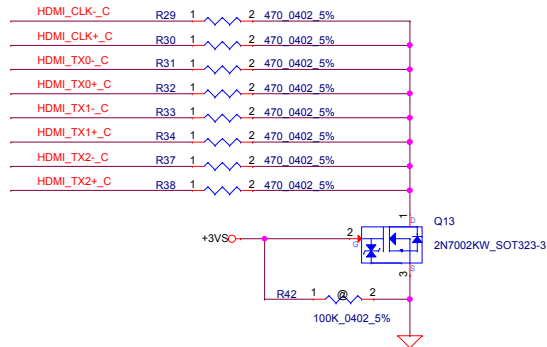
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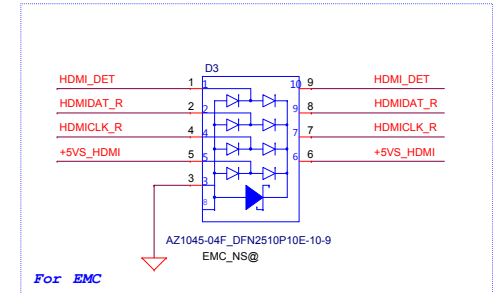
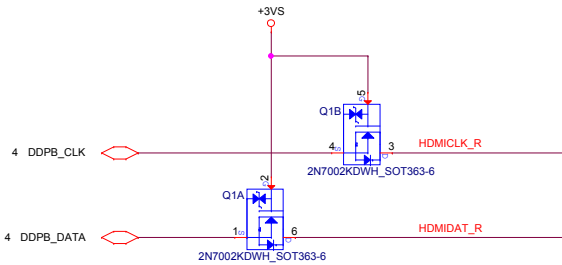
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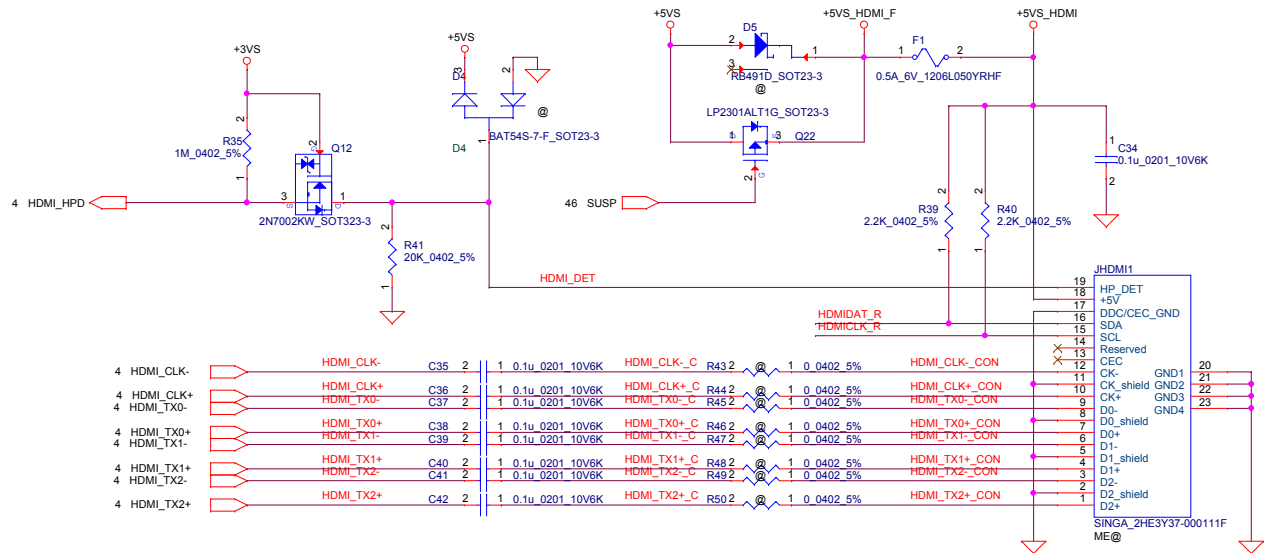
For EMC



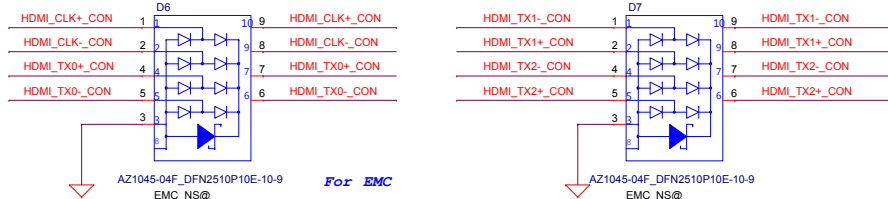
For EMC



For EMC




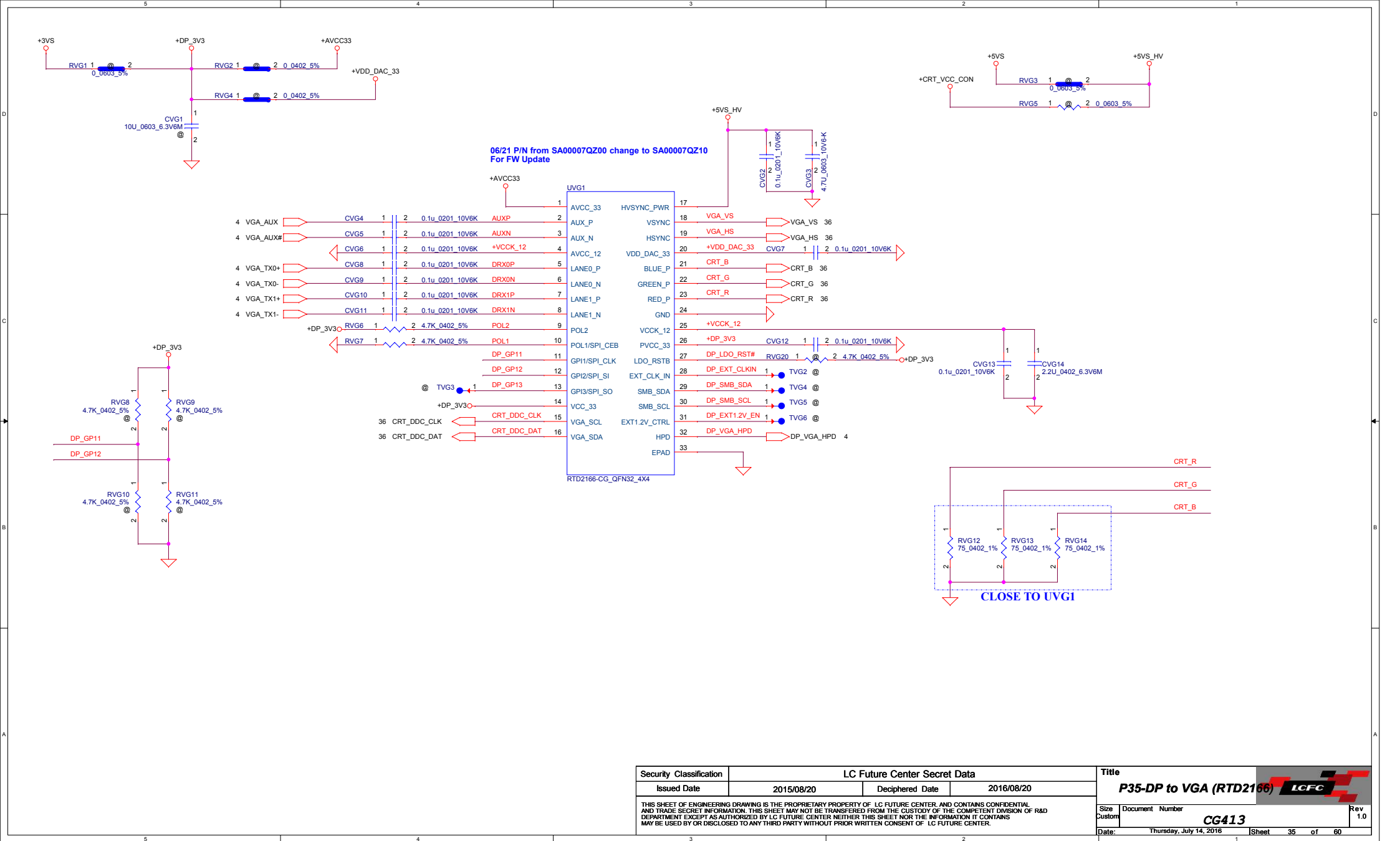
Close to JHDMI1




For EMC

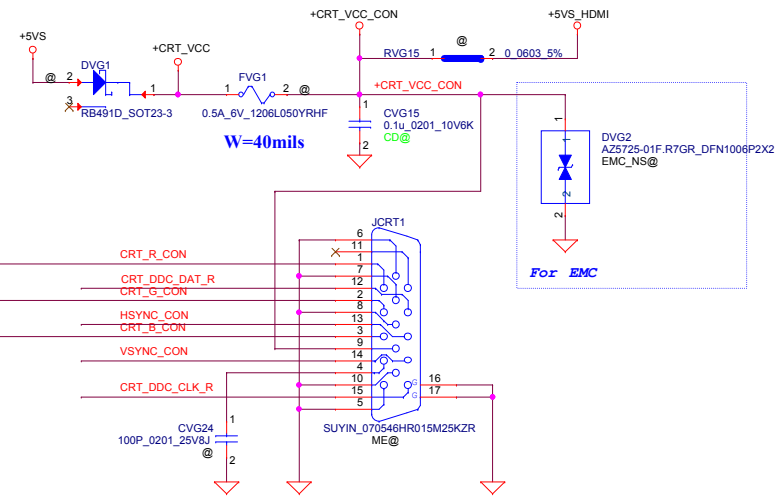
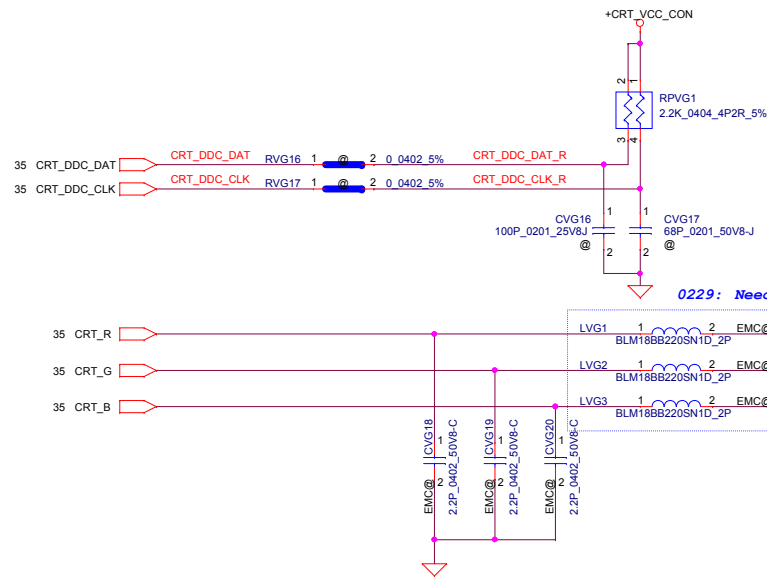
For EMC

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Date:		Thursday, July 14, 2016		Sheet		34		of 60	

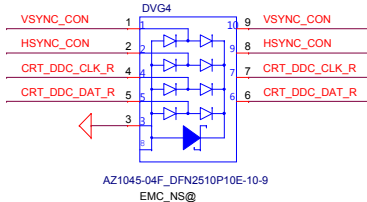
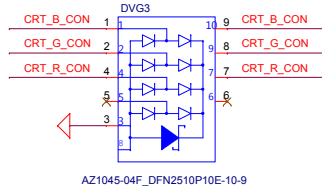
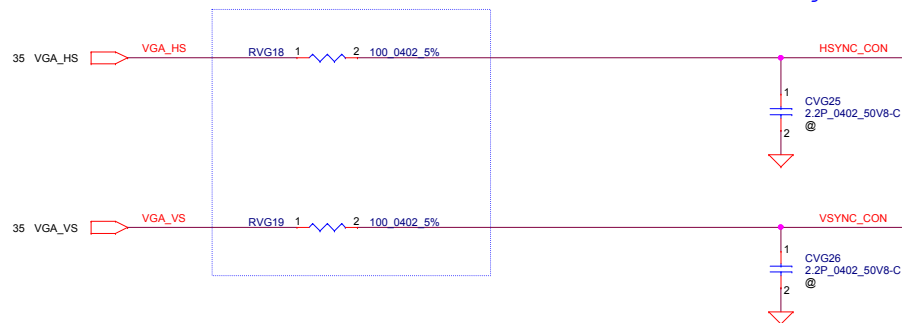



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				Date: Thursday, July 14, 2016	Rev 1.0
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# CRT Connector

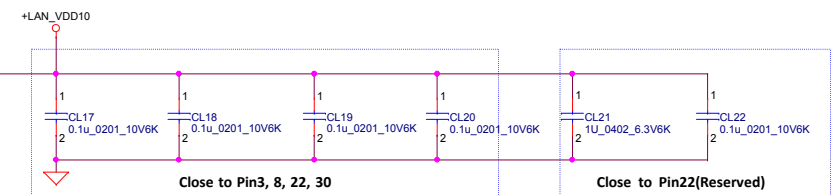
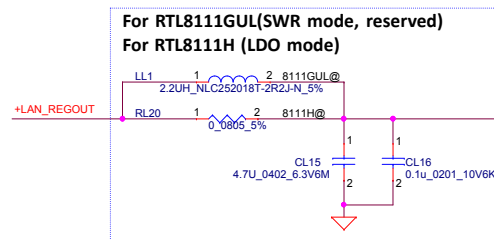
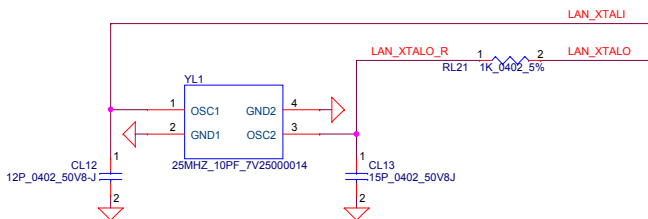
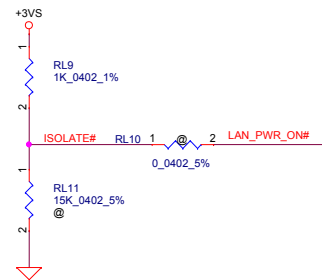
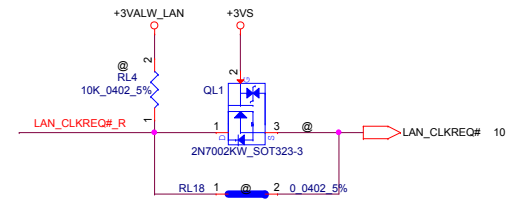
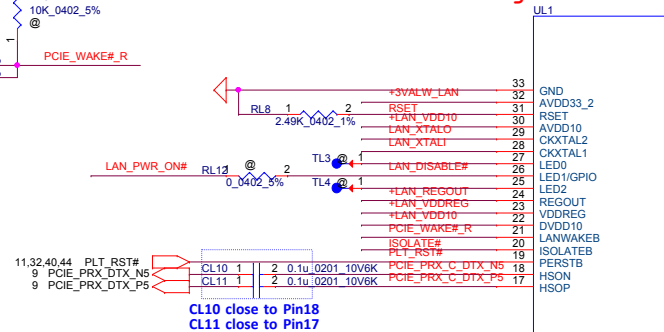
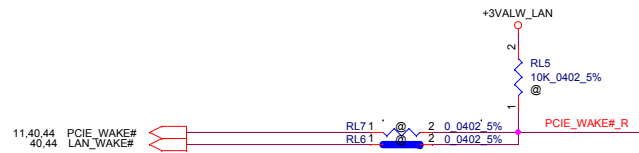
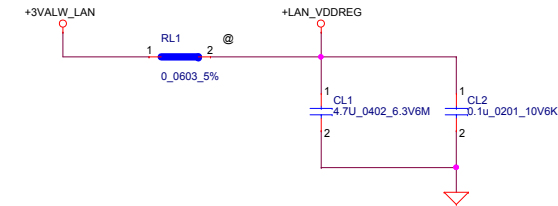
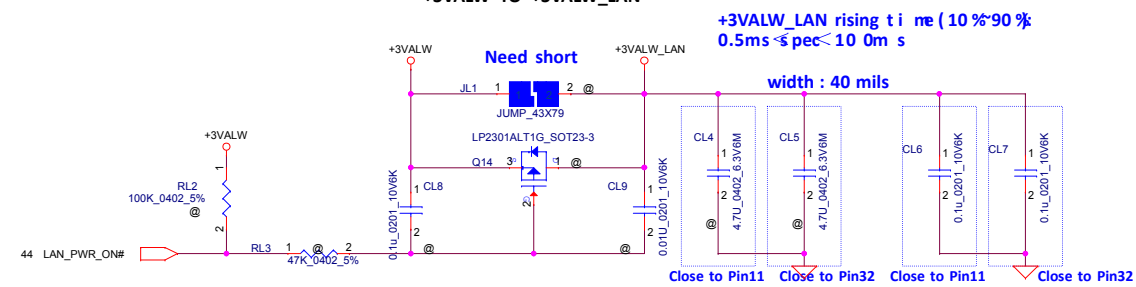


0714: SVT For VGA 20m cable test issue change to 100ohm



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Date:	Thursday, July 14, 2016		Sheet	36	of	60





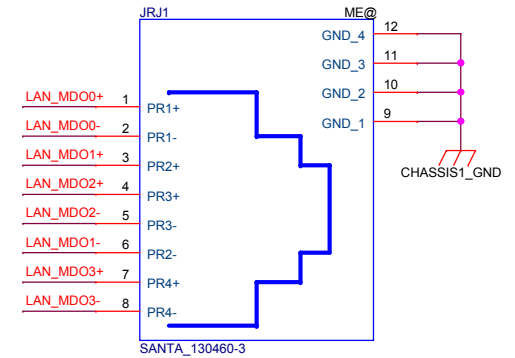
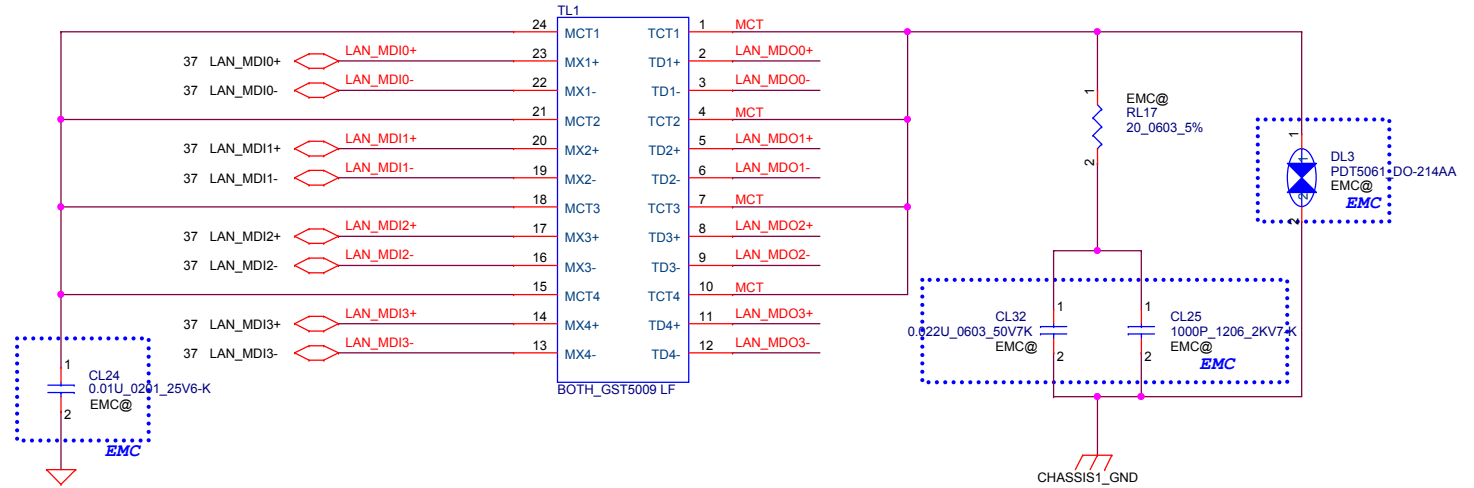
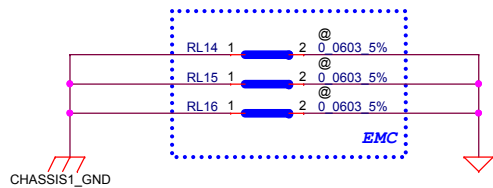
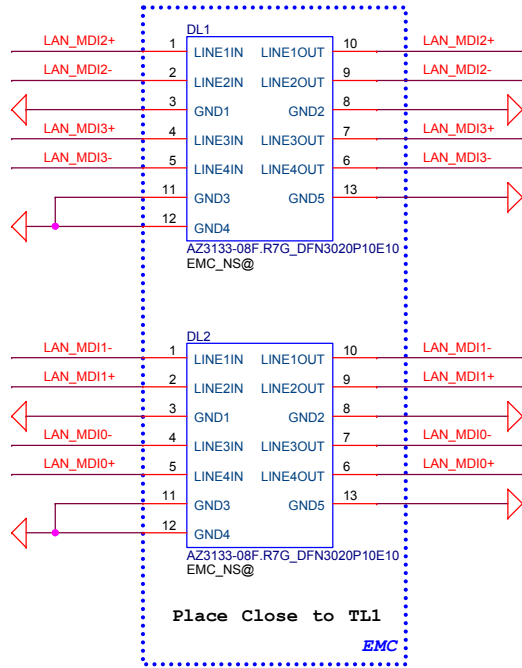
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Issued Date	2015/08/20	Deciphered Date	2016/08/20
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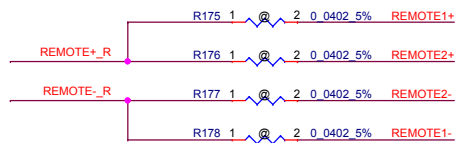
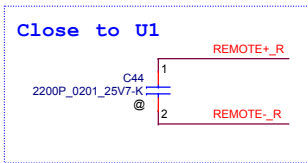
Size Custom	Document Number <b>CG413</b>	Rev 1.0
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Date:	Thursday, July 14, 2016	Sheet 37 of 60

# DL1/DL2 1'S PN:SC300003M00

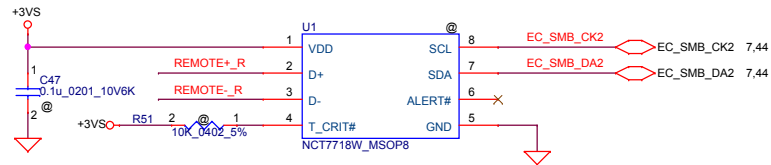


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				Document Number	1.0
				Date:	CG413
				Thursday, July 14, 2016	Sheet 38 of 60

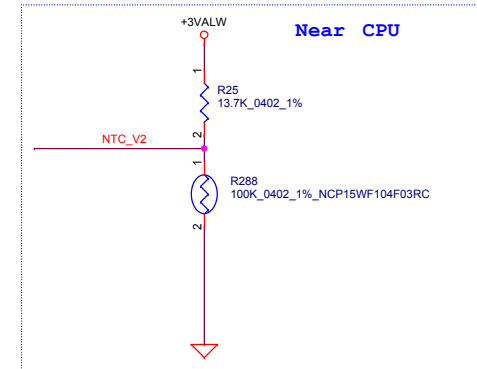
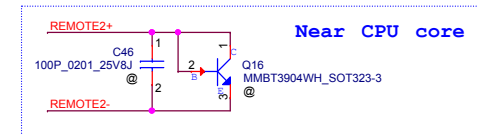
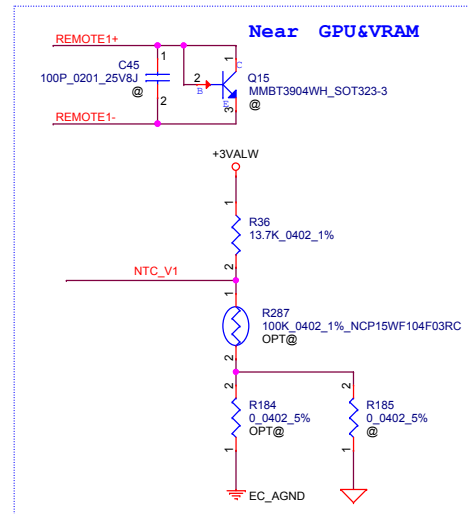


REMOTE+/-\_R, REMOTE1+/-, REMOTE2+/-:  
Trace width/space:10/10 mil  
Trace length:<8"

### SMSC thermal sensor placed near DIMM

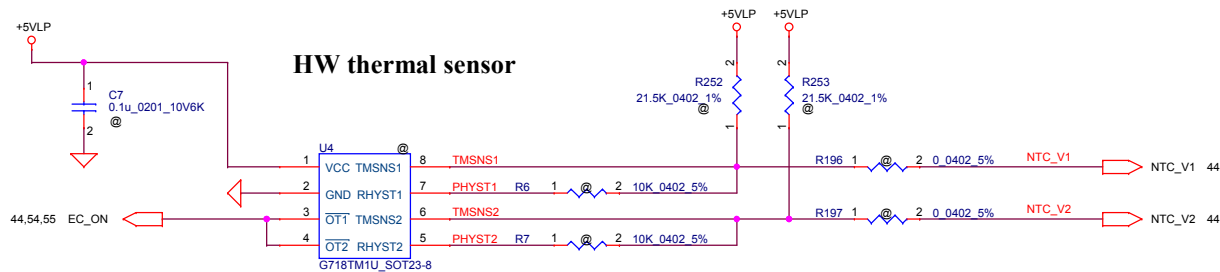


Address 1001\_101xb

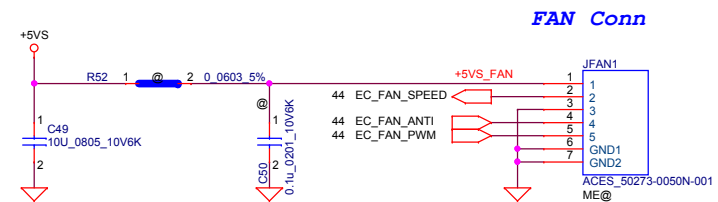


for layout optimized, change the EC\_AGND to GND

### HW thermal sensor

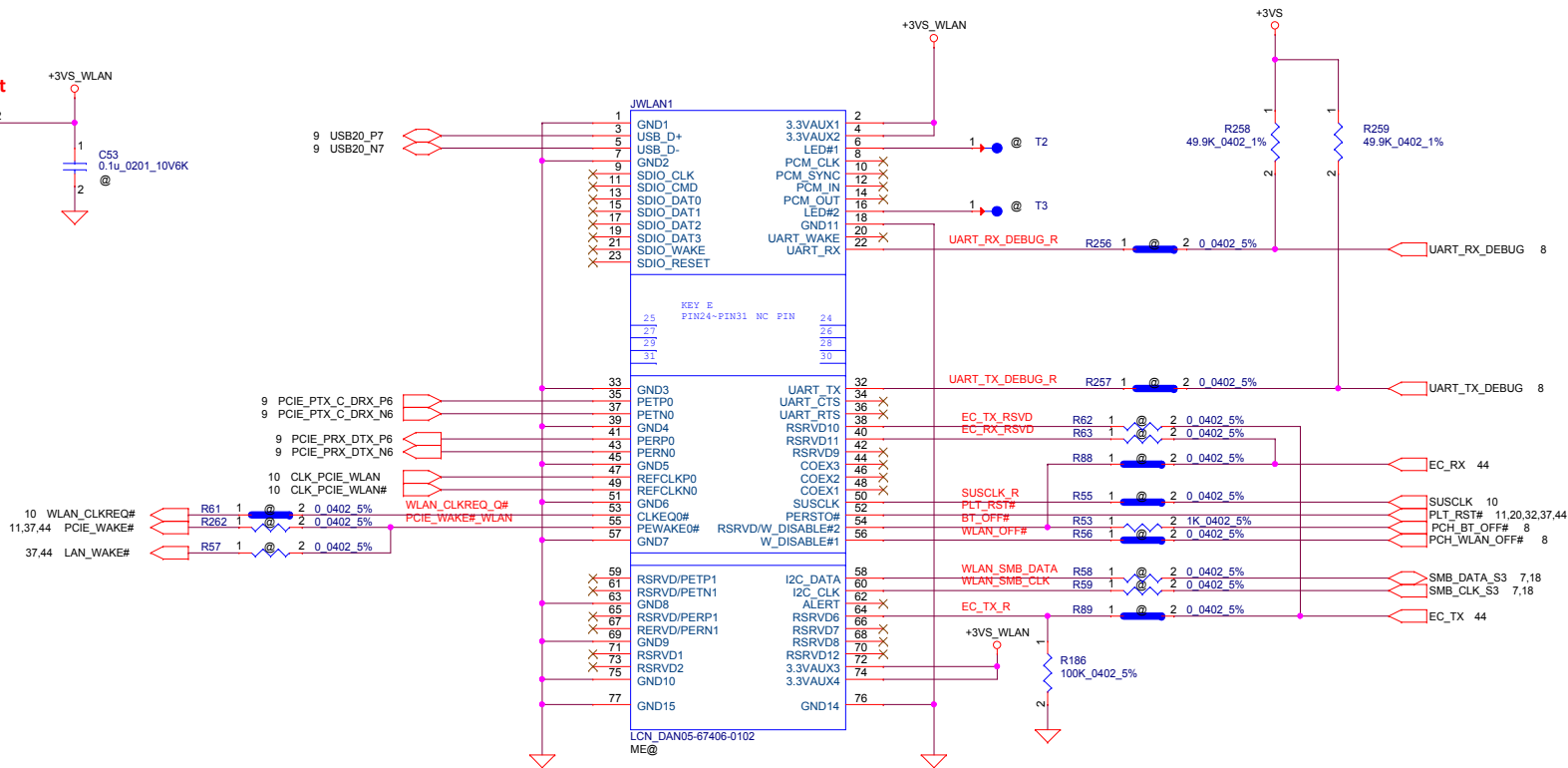


over temperature threshold:  
 $RSET=3*RTMH$   
 $92+/-30C$   
Hysteresis temperature threshold.  
 $RHYST=(RSET*RTML)/(3*RTML-RSET)$   
 $56+/-30C$



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# Mini-Express Card(WLAN/WiMAX)

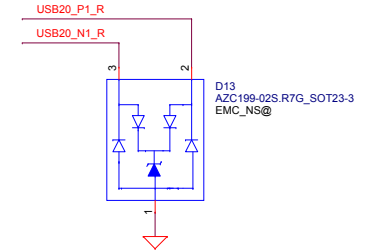
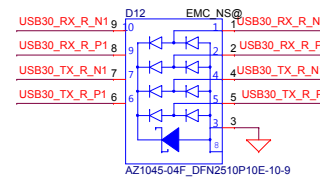
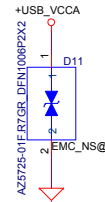
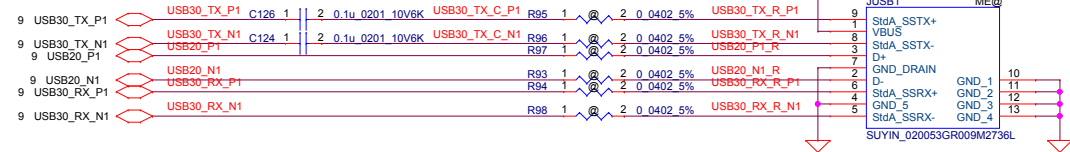
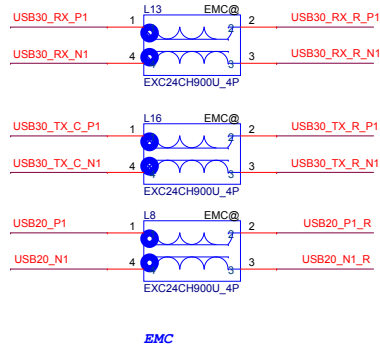
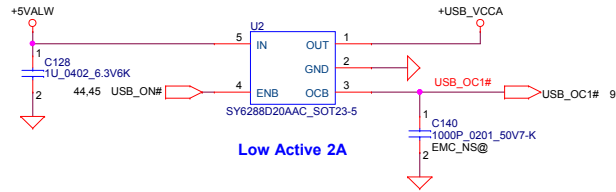



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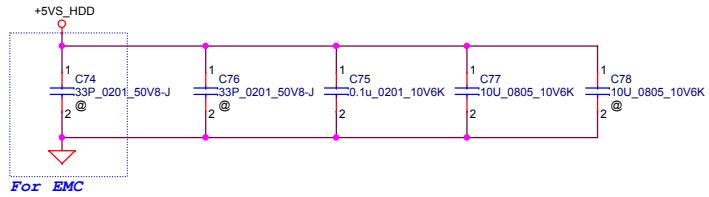
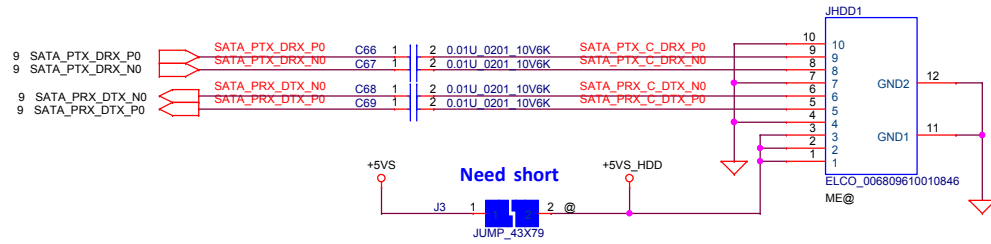
Title		NGFF WLAN	
Size	Custom	Document Number	CG413
Date:	Thursday, July 14, 2016	Sheet	40 of 60



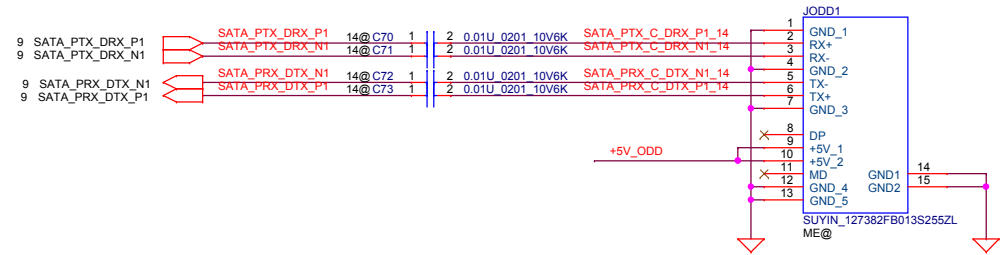
## LEFT SIDE USB3.0 PORT x1



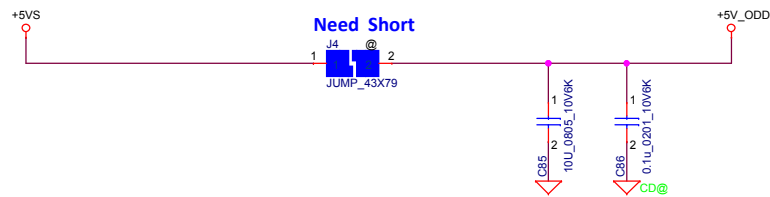
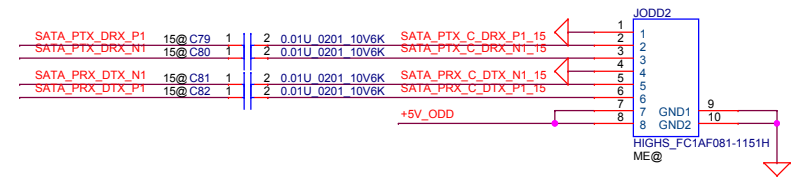
Security Classification		LC Future Center Secret Data		Title			
Issued Date	2015/08/20	Deciphered Date	2016/08/20	USB3.0 PORT (LEFT)			
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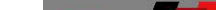
**SATA HDD Conn.**

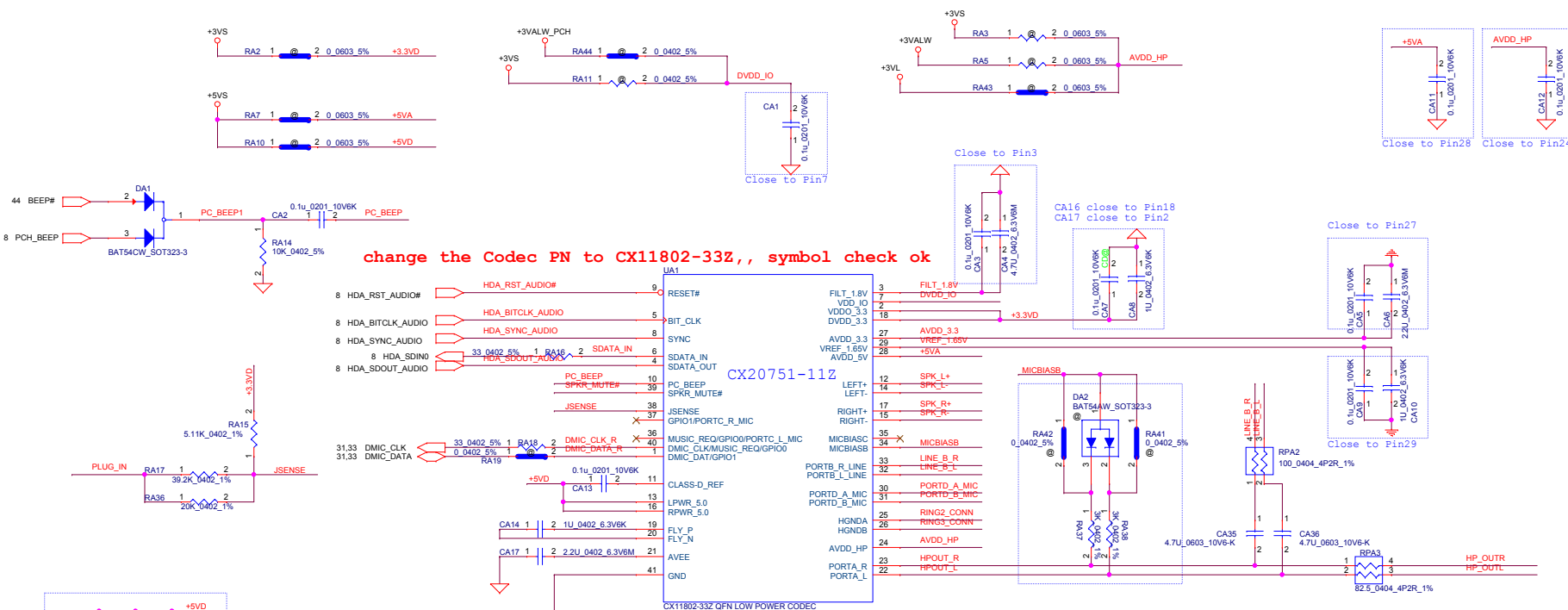
**FOR 14"**  
**SATA ODD Conn.**



**FOR 15"**  
**SATA ODD FFC Conn**



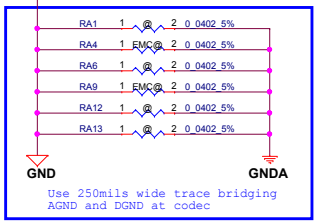
Security Classification		LC Future Center Secret Data				Title									
Issued Date		2015/08/20		Deciphered Date		2016/08/20						HDD/ODD CONN			
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Date:						Thursday, July 14, 2016				Sheet 42 of 60					



change the Codec PN to CX11802-33Z,, symbol check ok

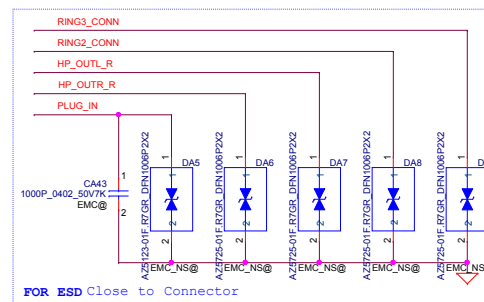
CX20751-11Z

CX11802-33Z QFN LOW POWER CODEC

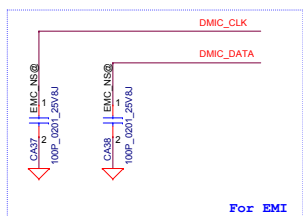
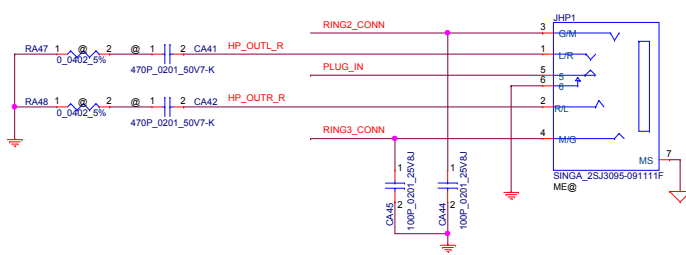
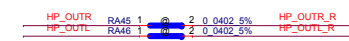


Use 250mils wide trace bridging AGND and DGND at codec

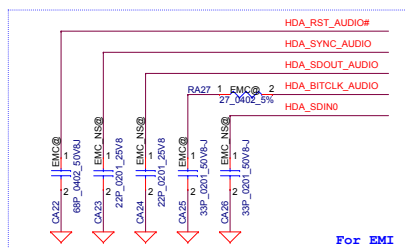
### Audio Jack



FOR ESD Close to Connector

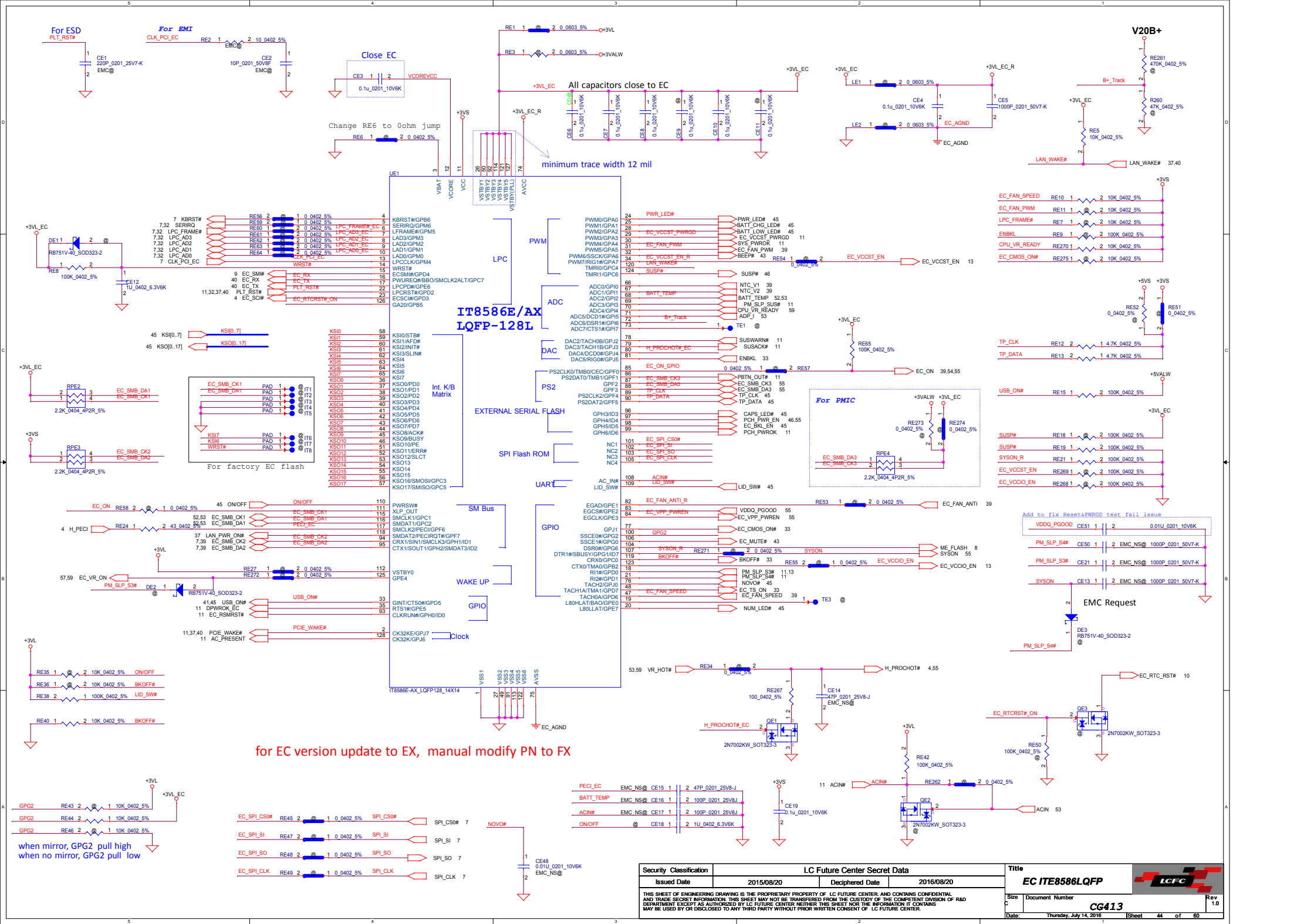


For EMI



For EMI

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Size	Document	Number	Rev		
Custom			CG413		
Date:	Thursday, July 14, 2016	Sheet	43	of	60







# Load Switch

+5VALW To +5VS

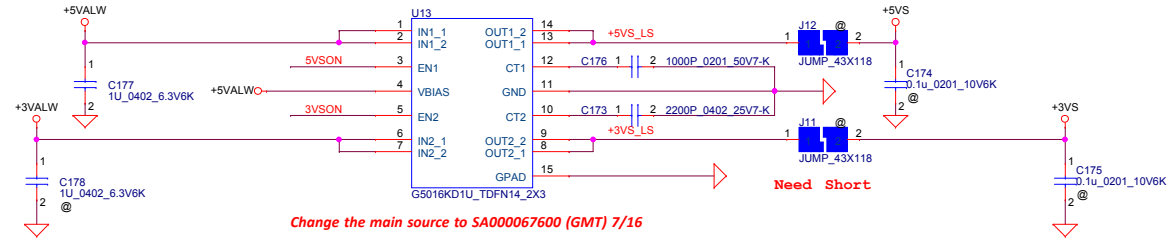
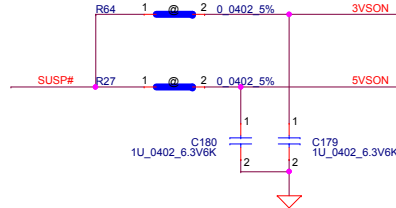
+3VALW To +3VS

+3VS, C173 --> 2.74ms

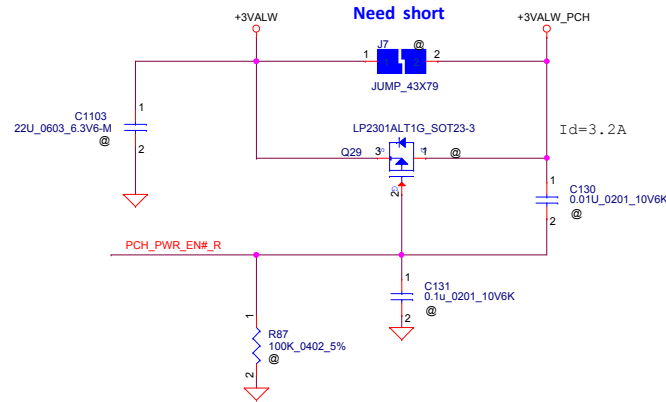
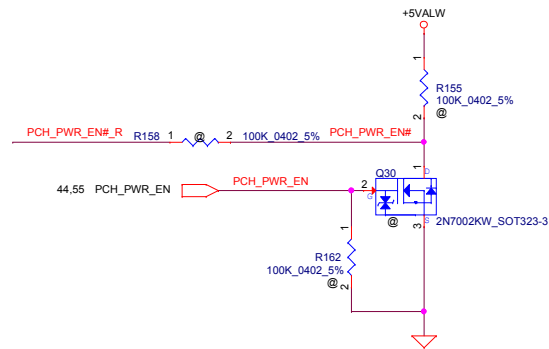
+5VS, C176 --> 2.03ms

VIN 5V and 3.3V (VBIAS=5V), I<sub>MAX(per channel)</sub>=6A, R<sub>ds</sub>=16mohm

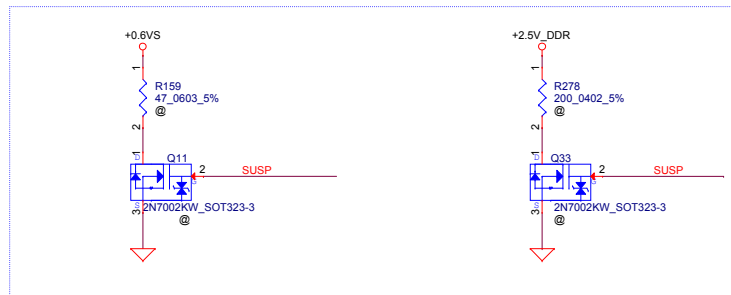
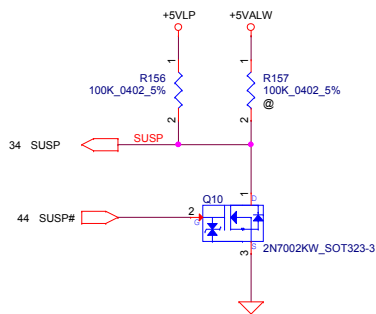
Need Short



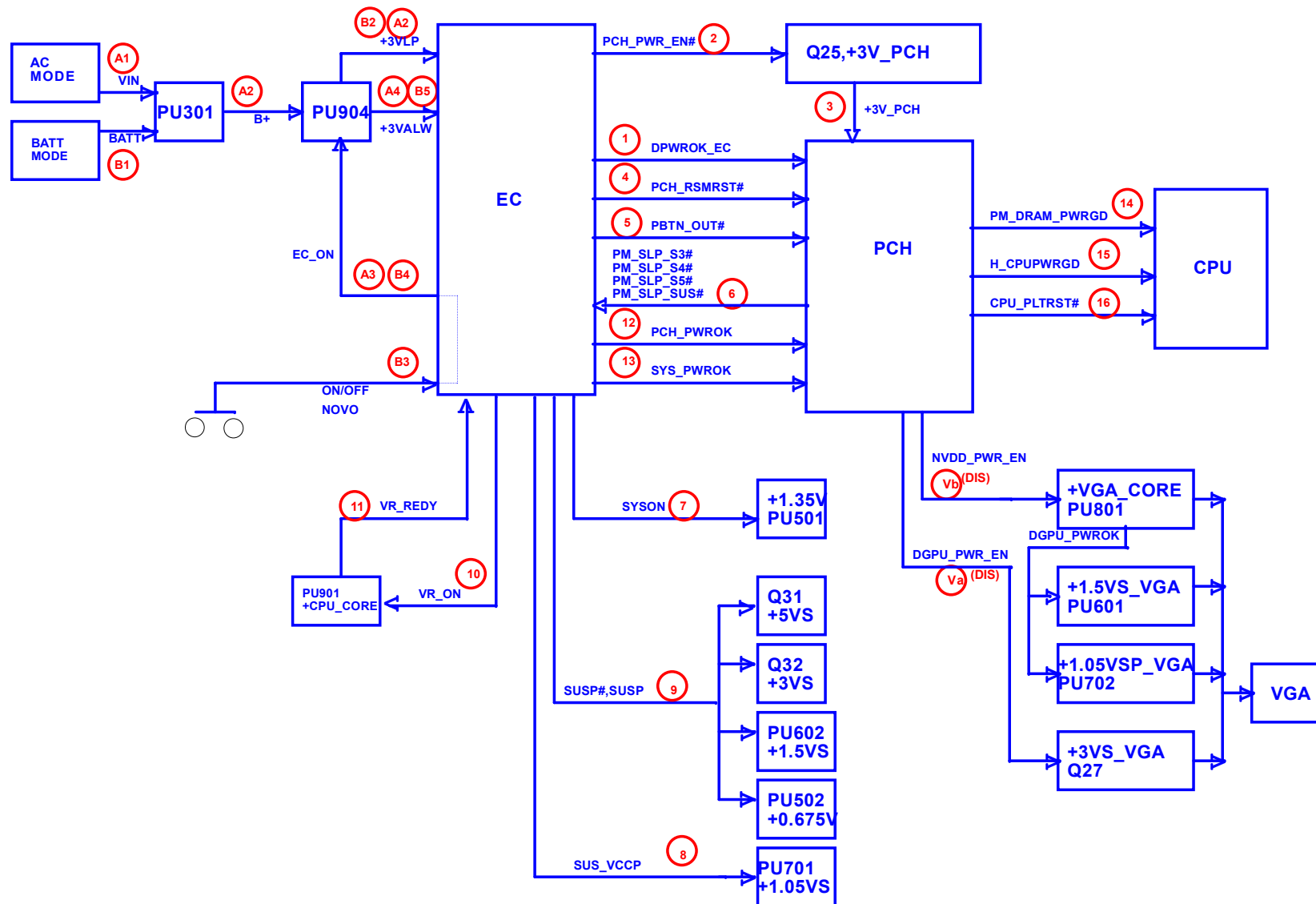
Change the main source to SA000067600 (GMT) 7/16

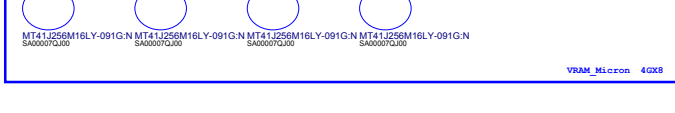
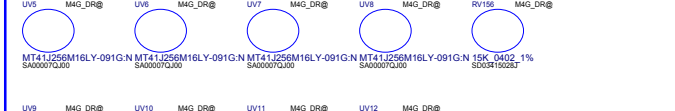
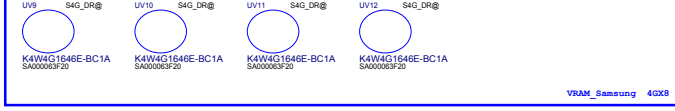
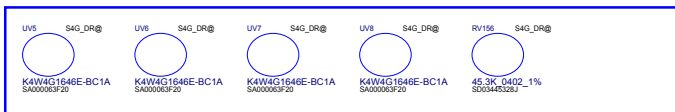
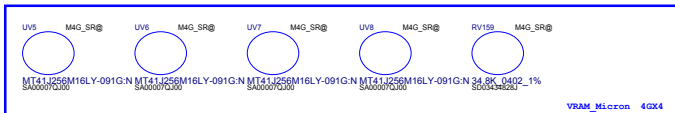
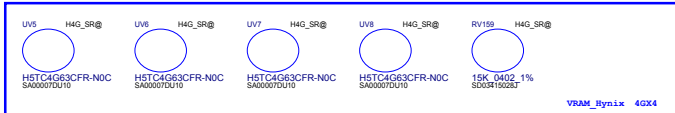
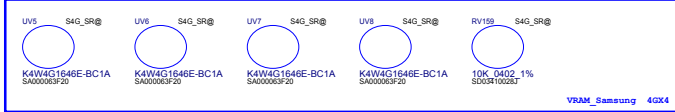
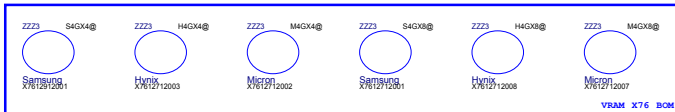
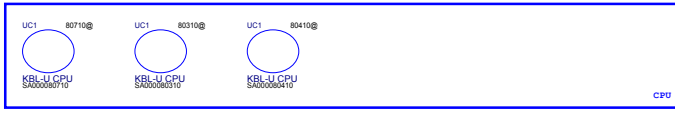
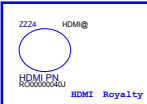
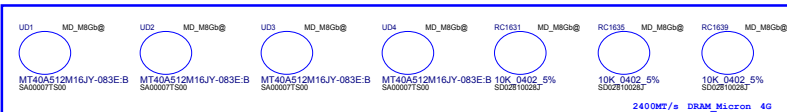
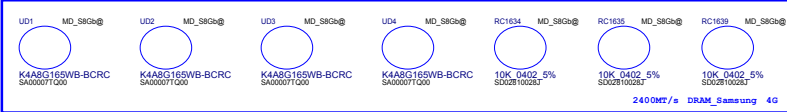
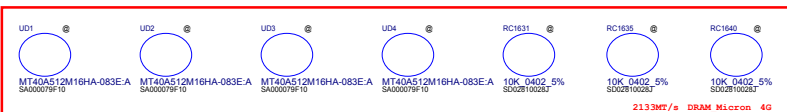
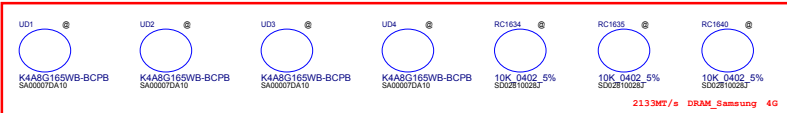
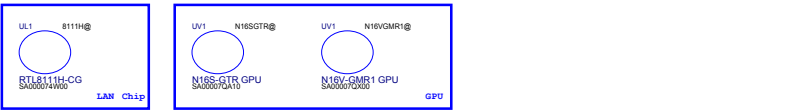
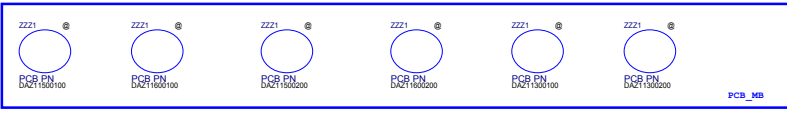


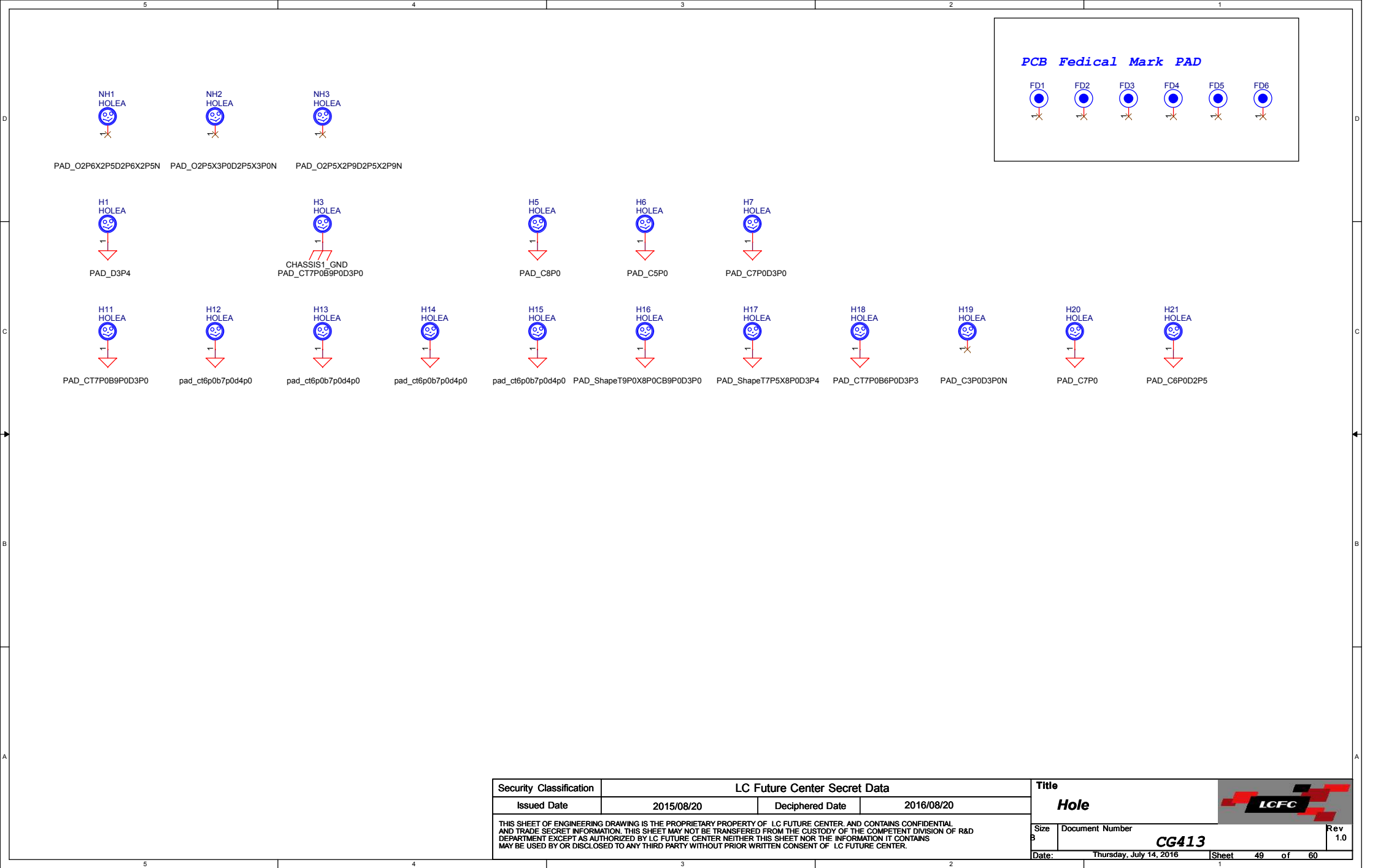
## For DisCharge

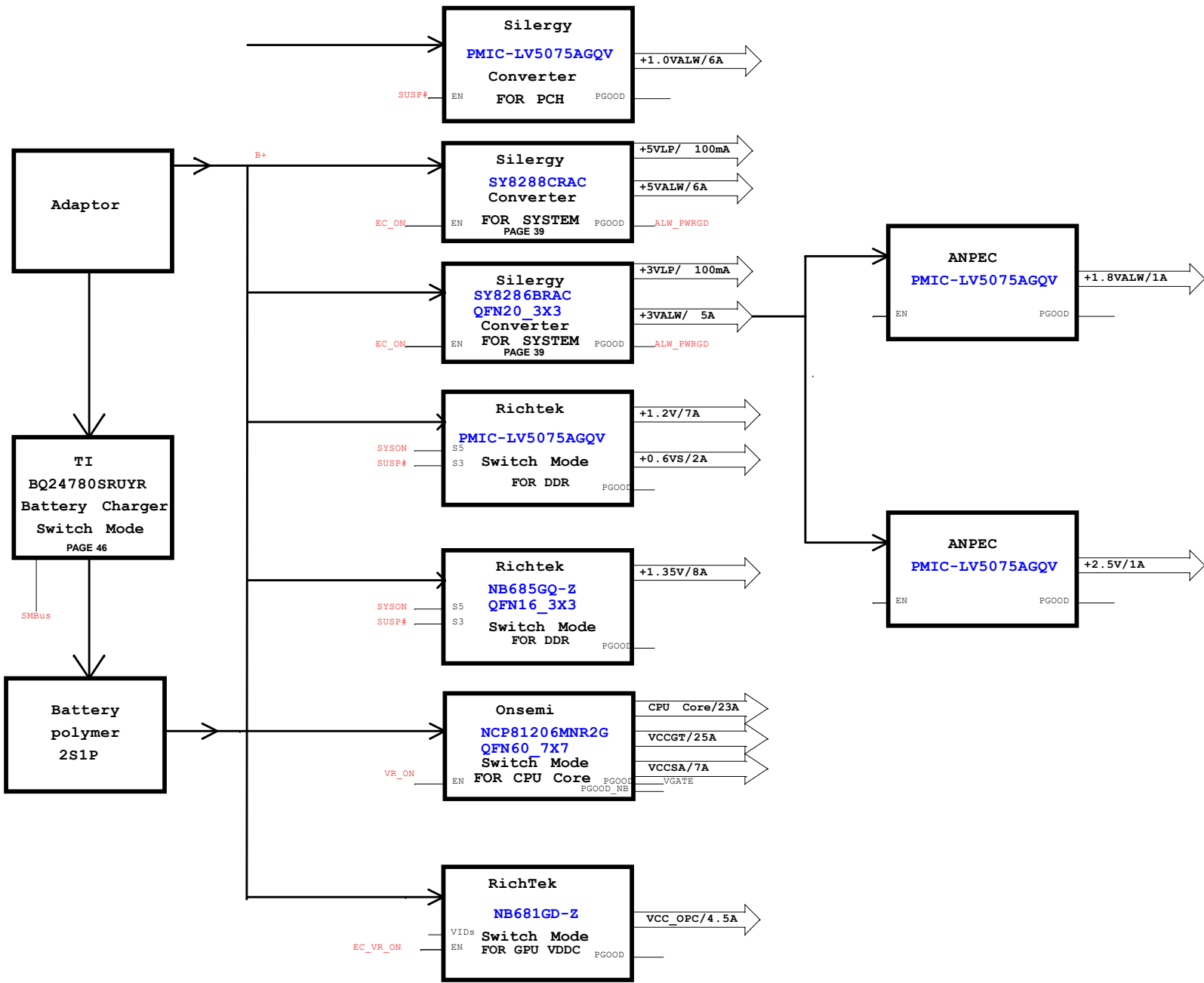


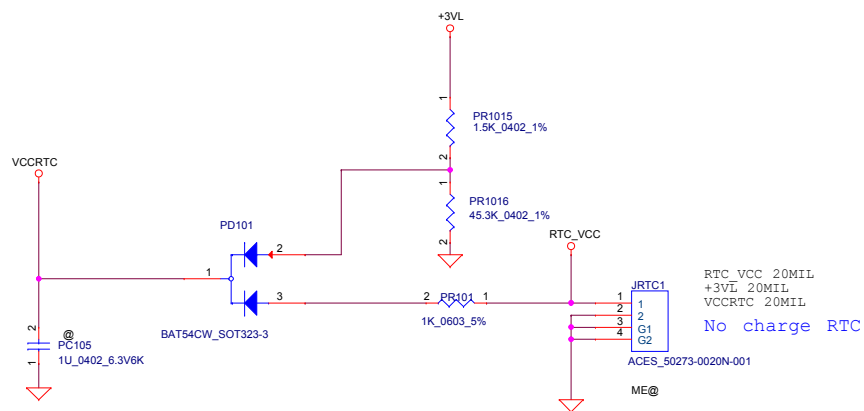
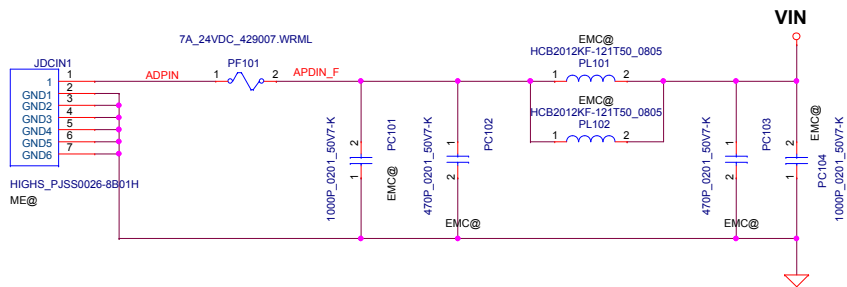
08/29: Need double check enable signal and the resistance





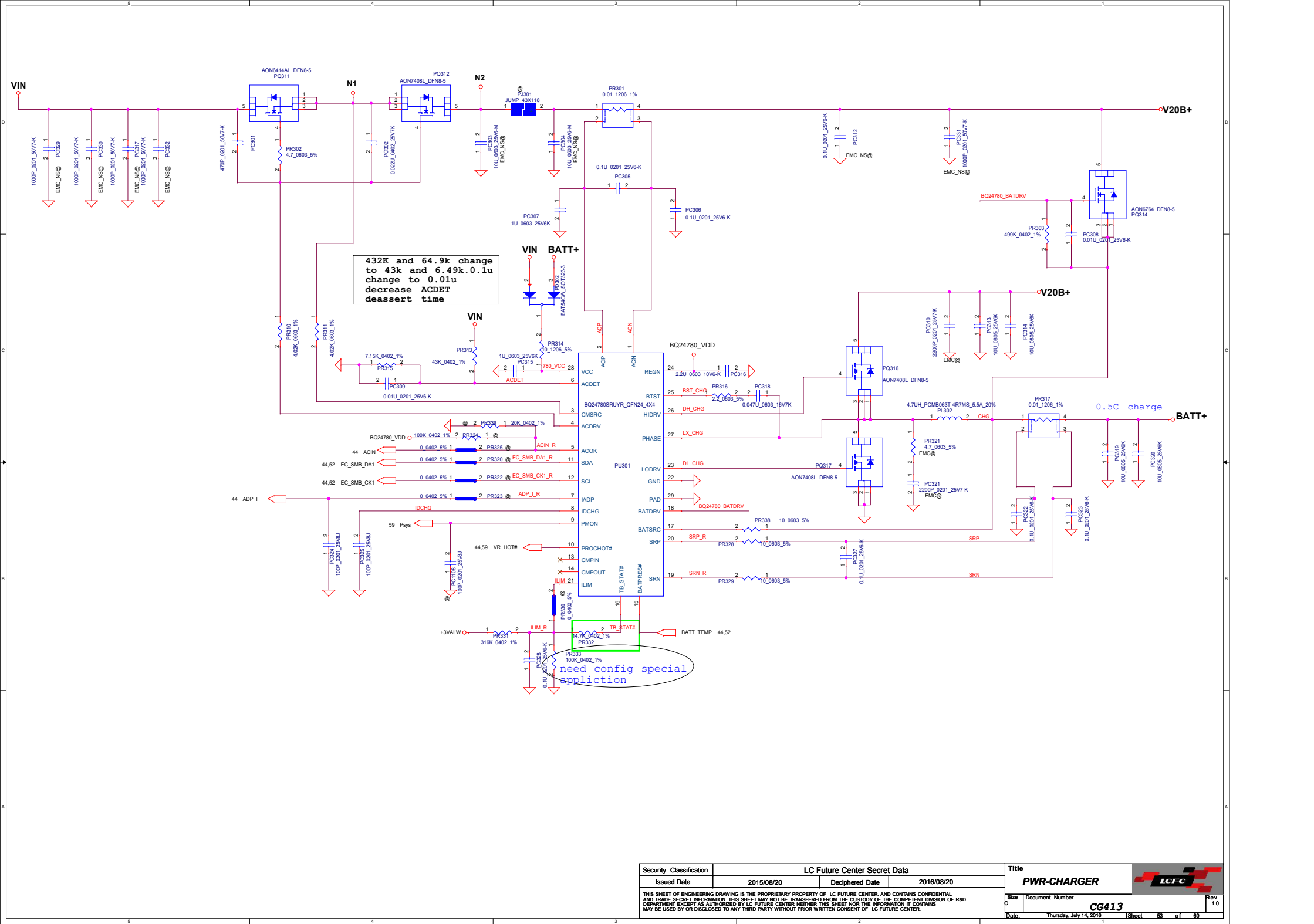


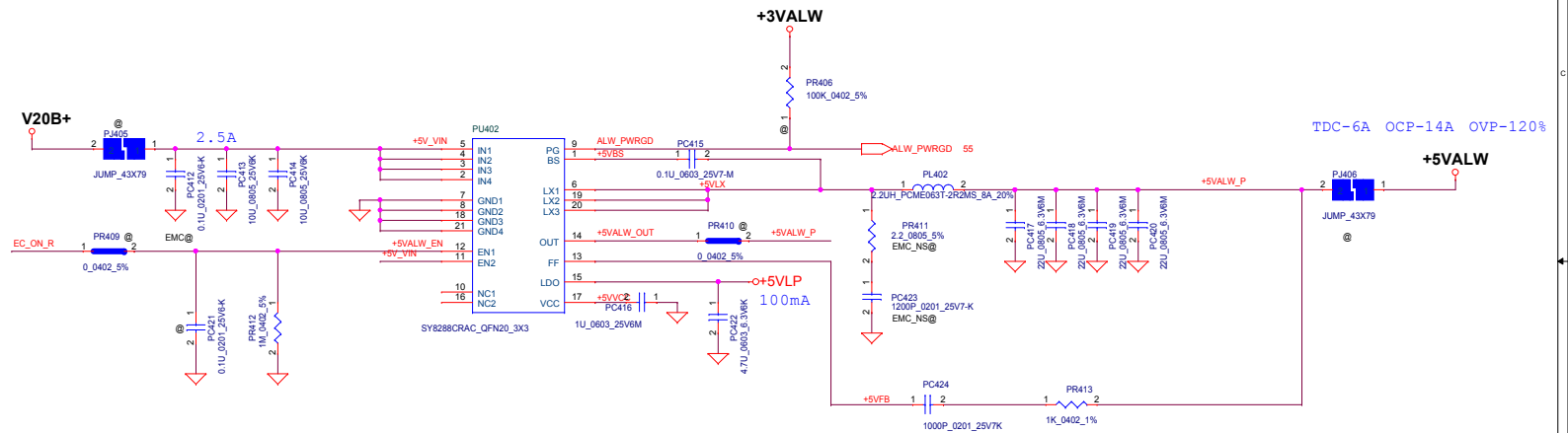
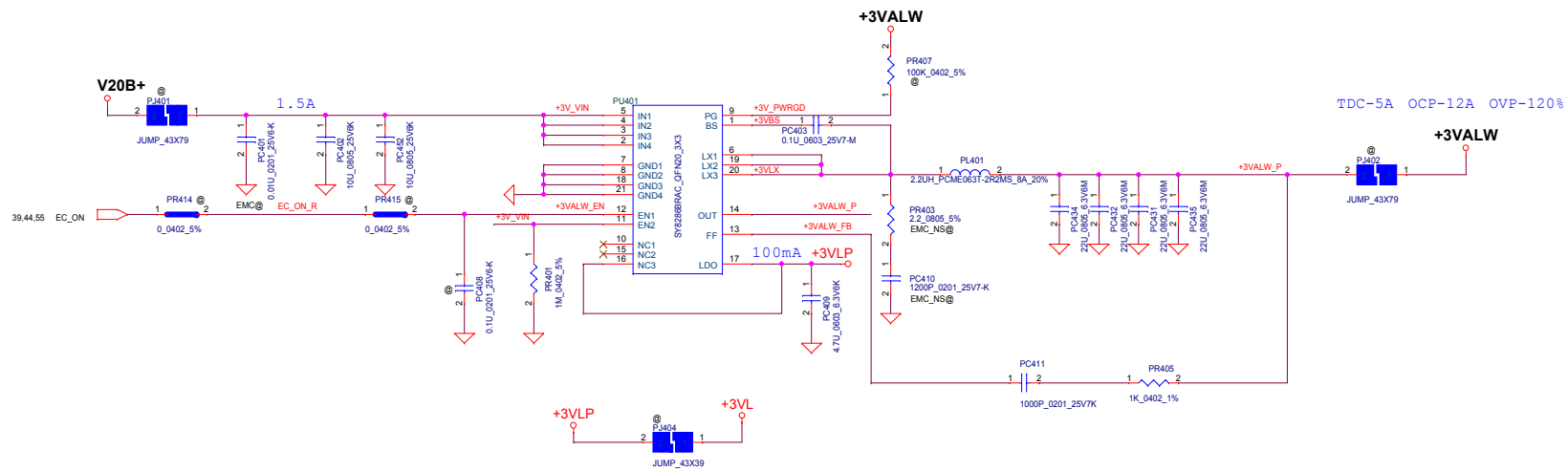







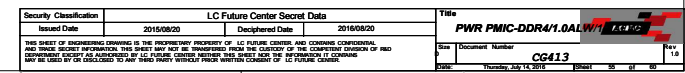







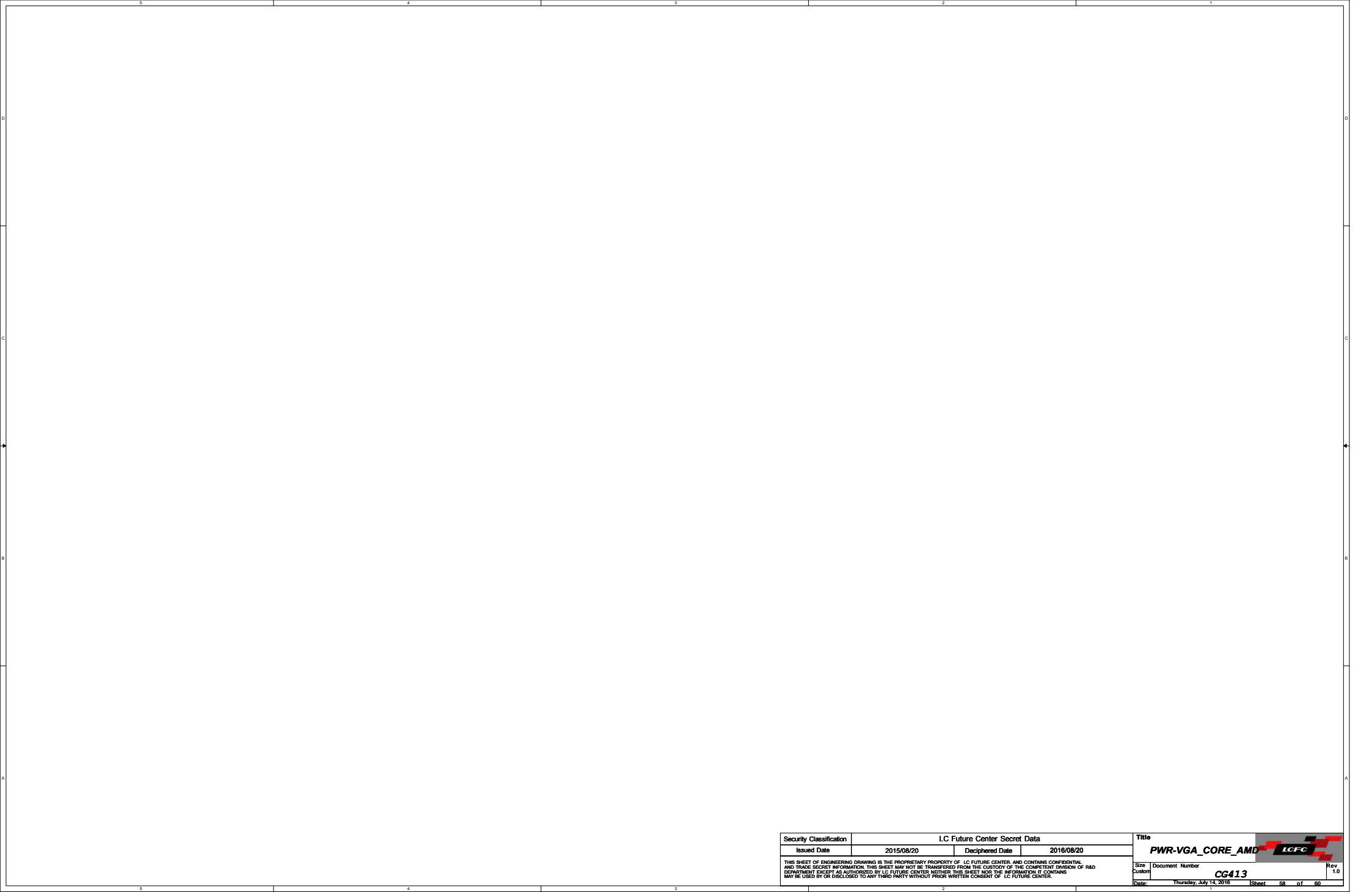
6800pf soft start 2ms  
47nf soft start 7ms


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