

LCFC Confidential

ES322/ES323 NM-B491 MB Schematics Document


Intel Kabylake-U42 with DDR4

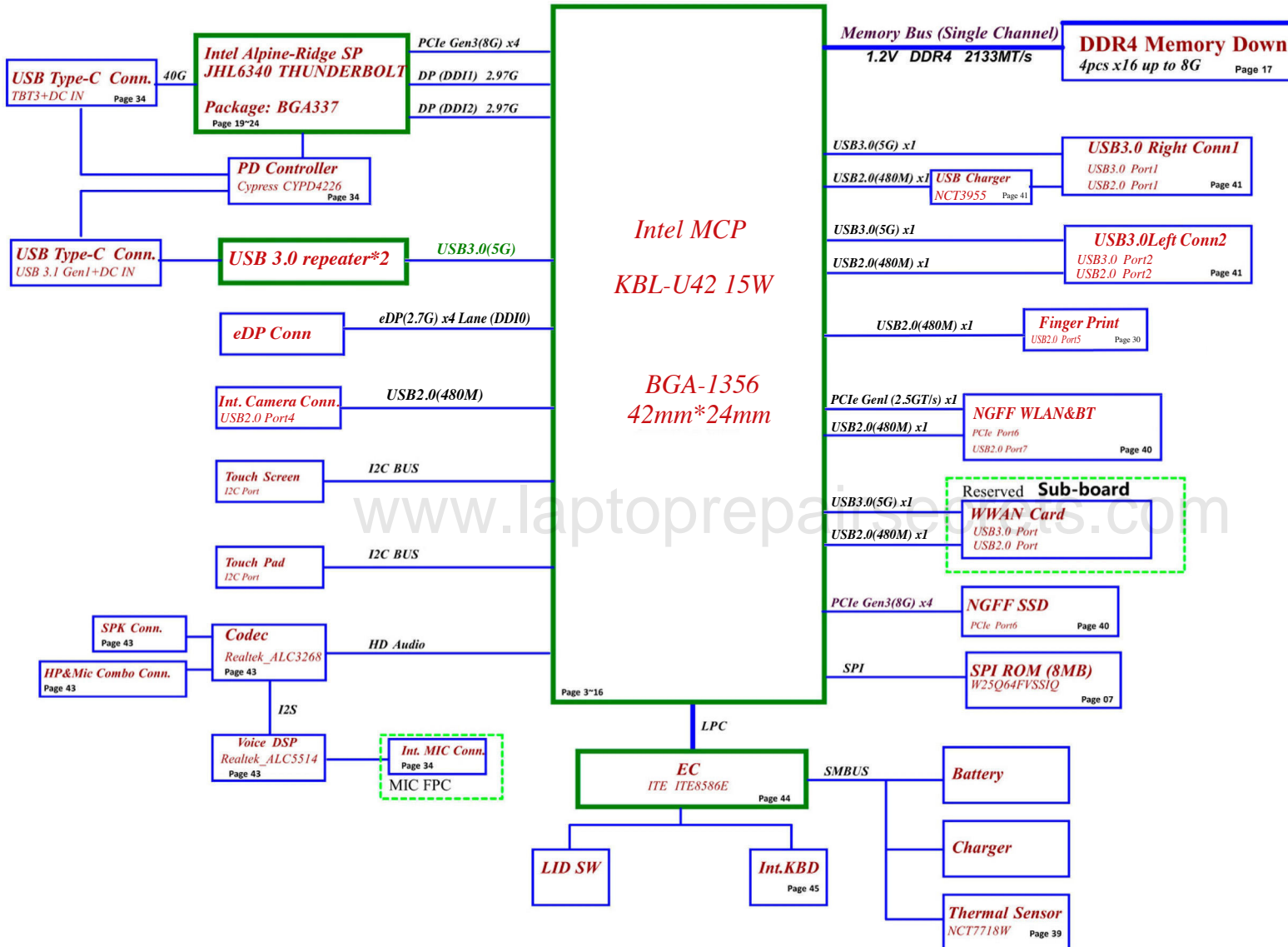
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Voltage Rails (O --> Means ON , X --> Means OFF)

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

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 coast 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 TBT	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 DGPU	PX@	For PX part
	1A ODD	RANKA@	For VRAM rank A part
	1B used as PCIE	RANKB@	For VRAM rank B part
	2 used as PCIE	Realtek_SD@	For Realtek SD part
		SINGLEMIC@	For single MIC part
		SINGLERANK@	For single VRAM rank part
		DUALRANK@	For dual VRAM rank part
		TS@	For touch screen part
		TPM@	For TPM part
		UMA@	For UMA part

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

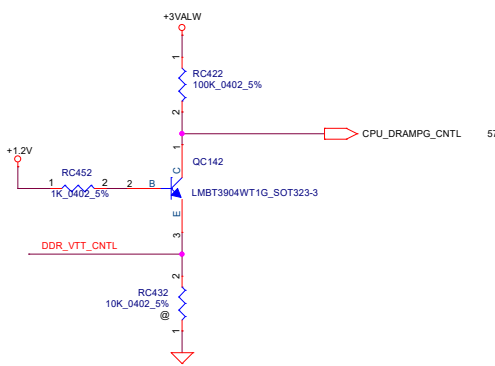
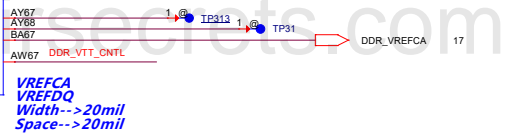
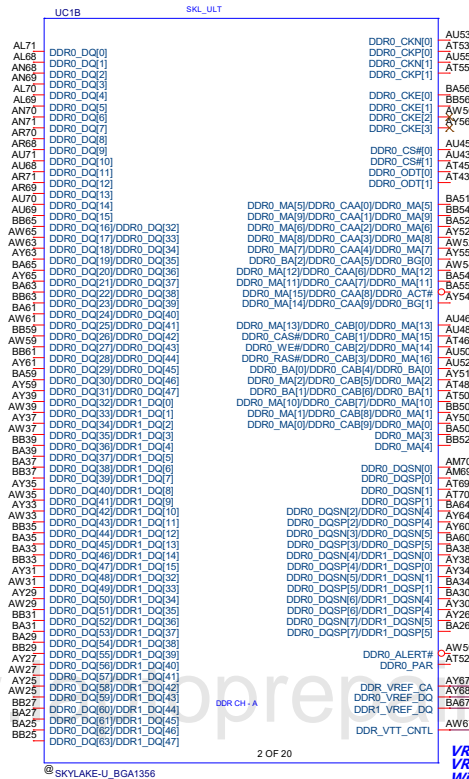
PCH SM Bus address


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

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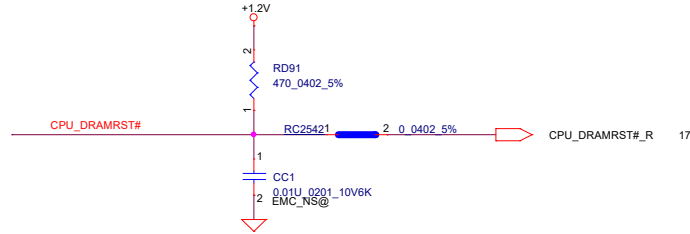
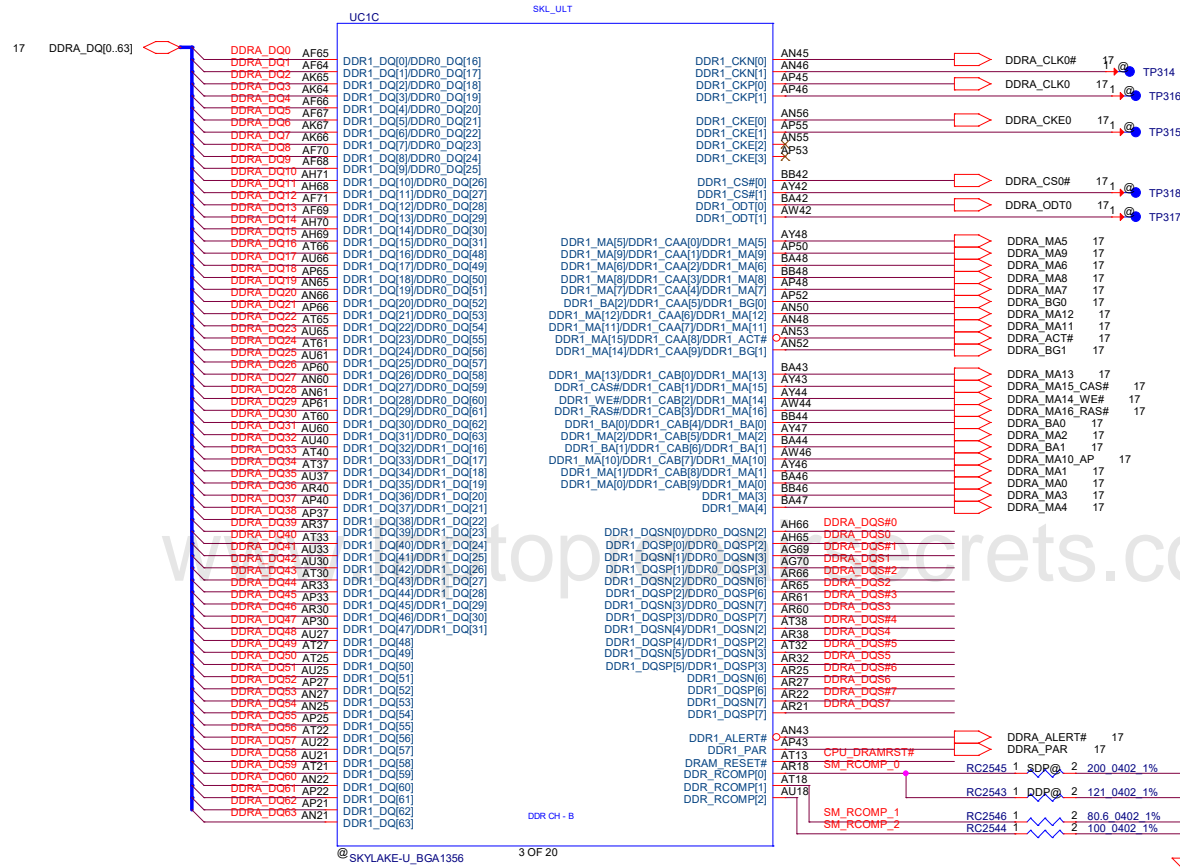


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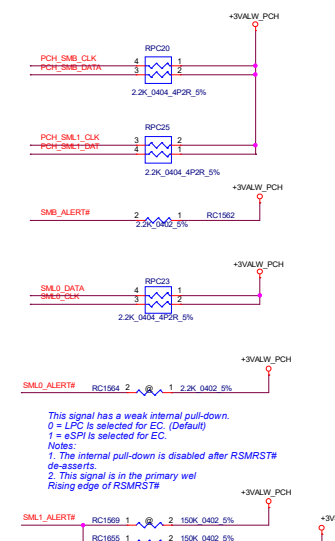
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Chanel A change to Change B, but don't modify the DDR name by JT 0318



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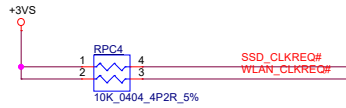
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This signal has a weak internal pull-down.
0 = LPC is selected for EC. (Default)
1 = eSPI is selected for EC.
Notes:
1. The internal pull-down is disabled after RSMRST# de-asserts.
2. This signal is in the primary wrl
Rising edge of RSMRST#

To enable Direct Connect Interface (DCI), a 150K pull up resistor will need to be added to PCHHOT# pin. This pin must be low during the rising edge of RSMRST# (Refer to WW52 MOW)

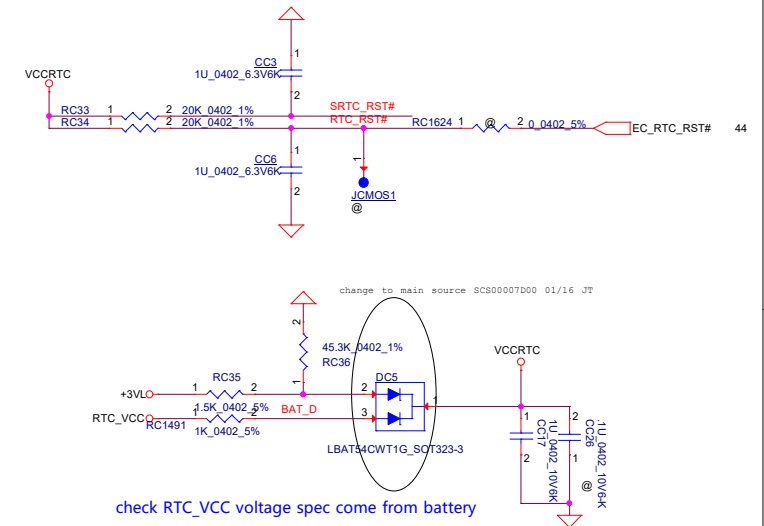
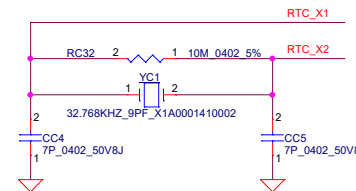
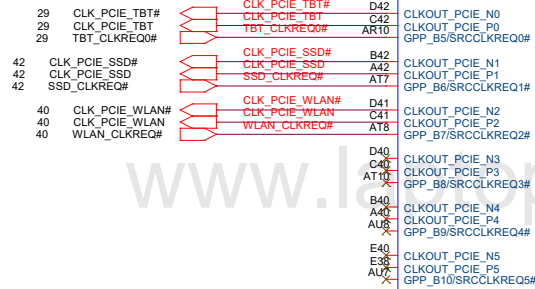
check the Pull up resistor



PCIE CLK0 TBT

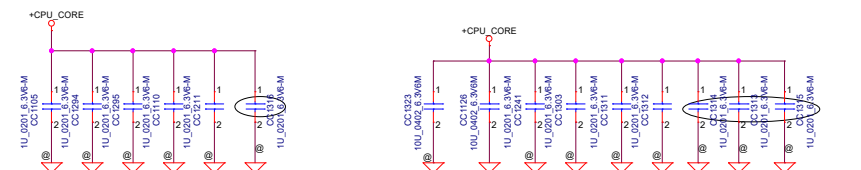
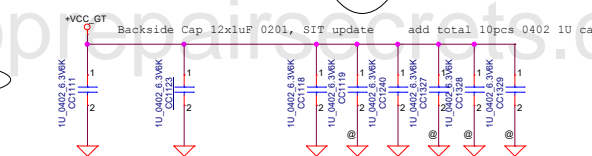
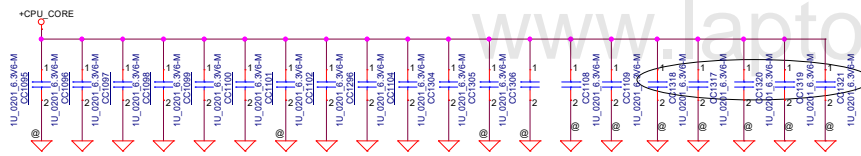
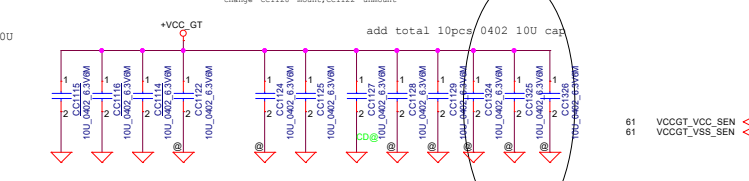
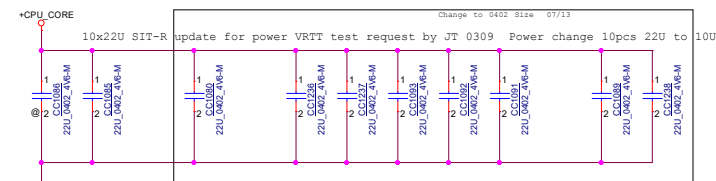
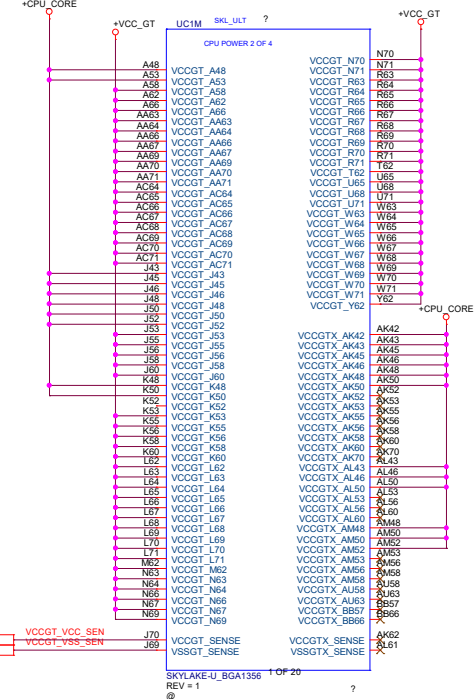
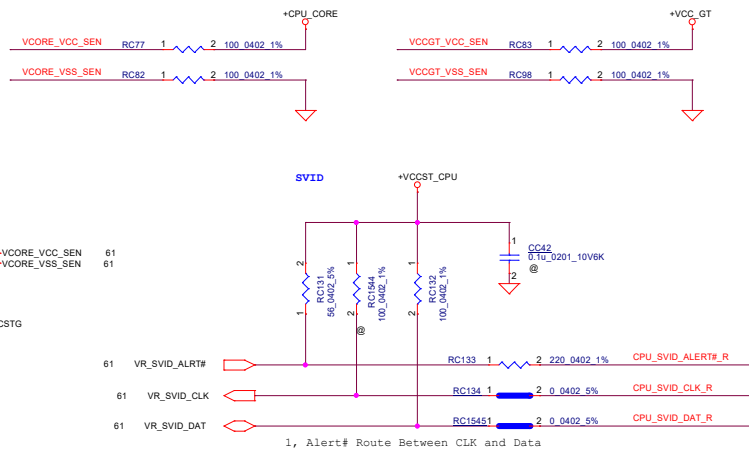
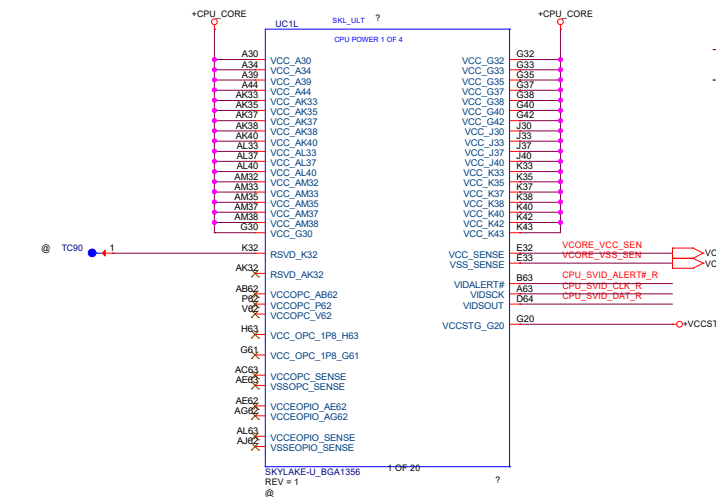
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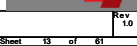
PCIE CLK2 WLAN

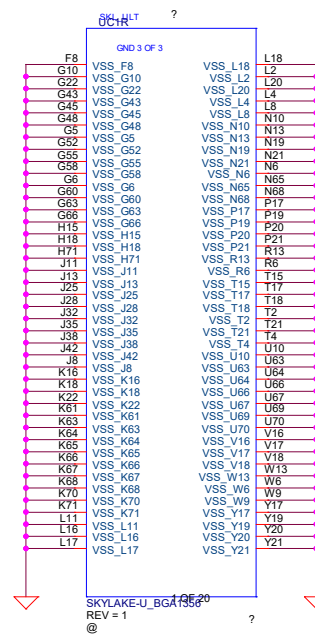
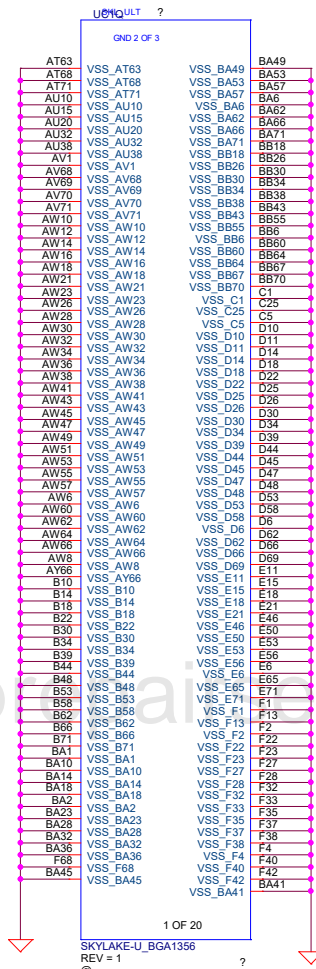
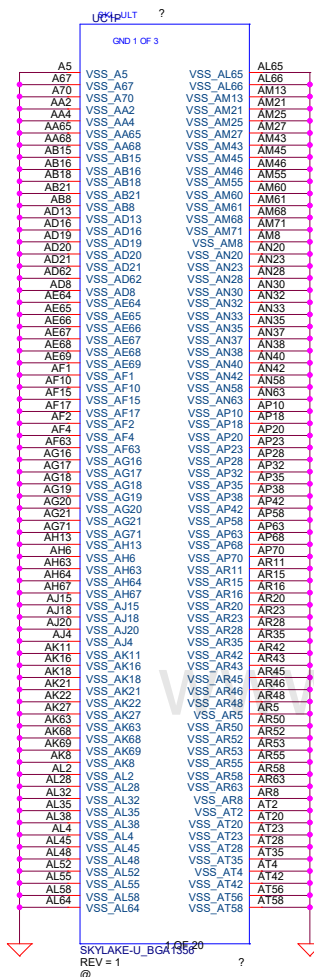


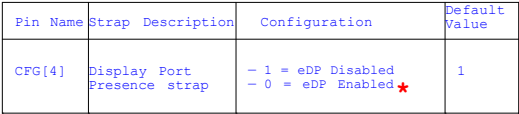
check RTC_VCC voltage spec come from battery


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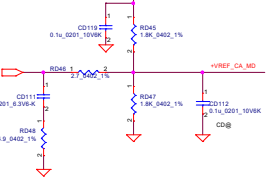
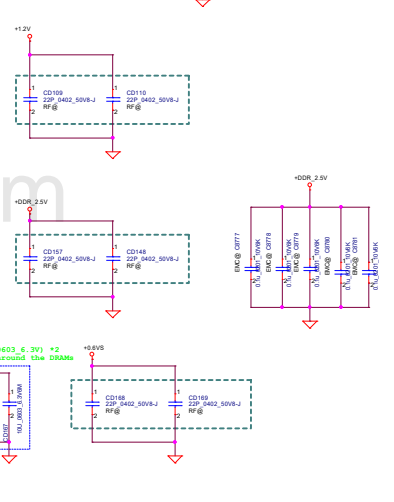
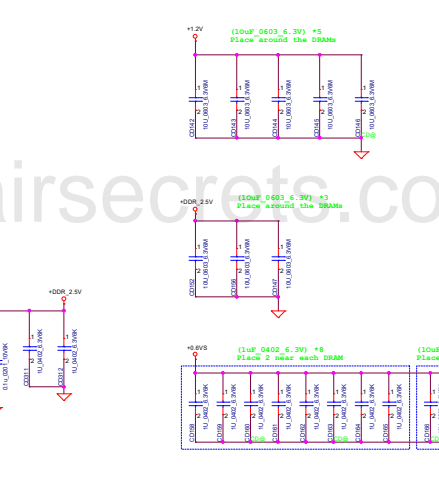
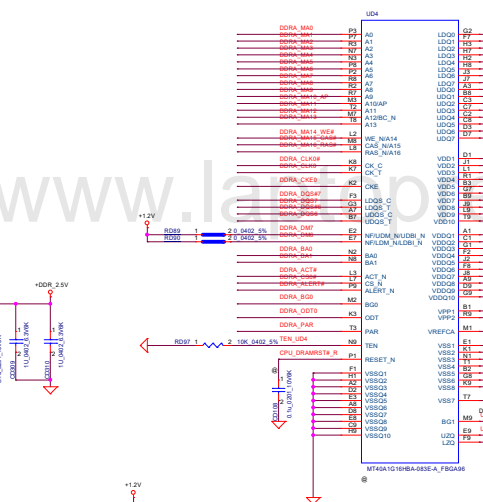
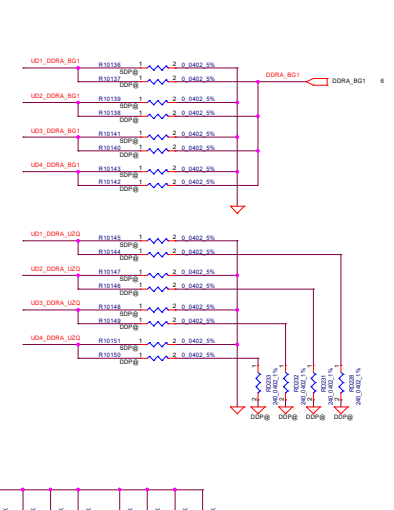
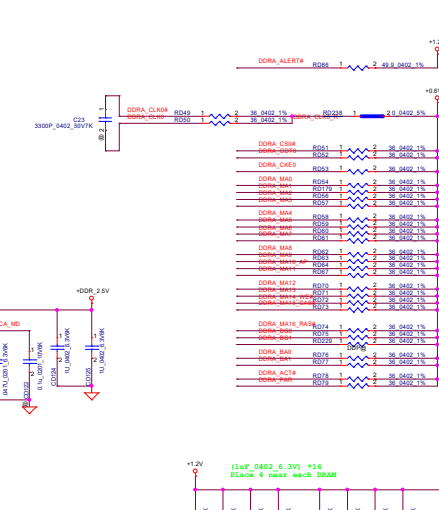
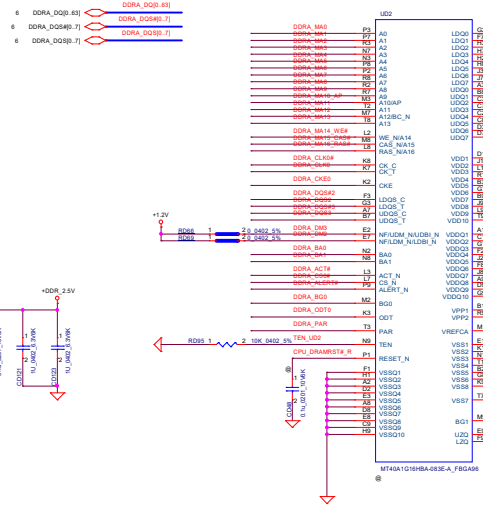








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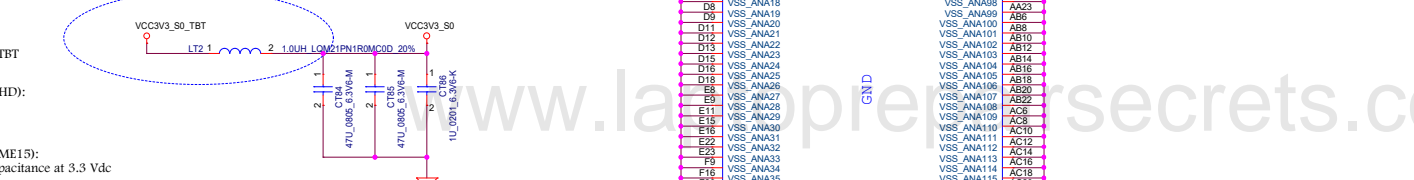
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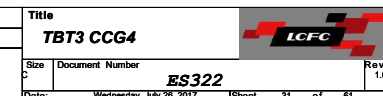
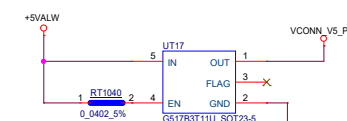
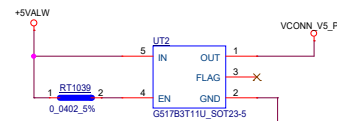
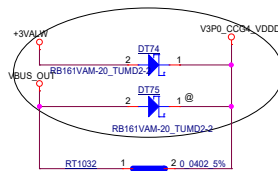
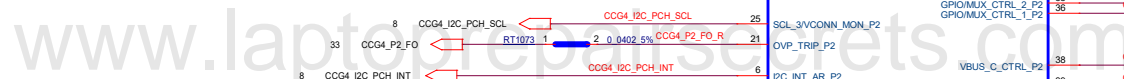
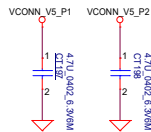
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Date: Wednesday, July 26, 2017				Sheet 28 of 61		

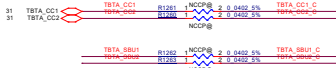
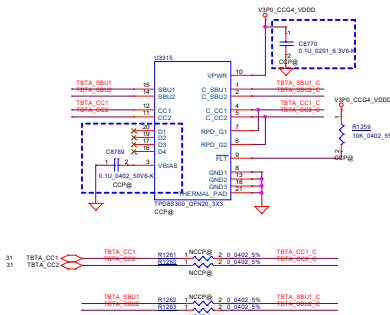
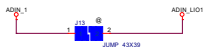
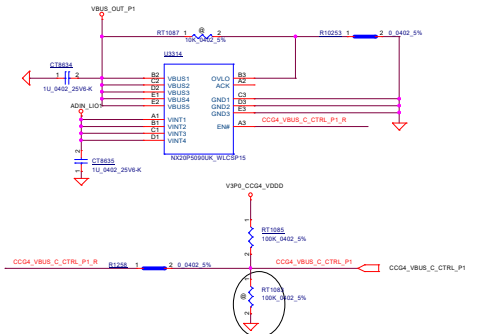


No wake support at all from AR
1. Connect 0Ohm to <R2> and <R3>. Keep <R1> empty.

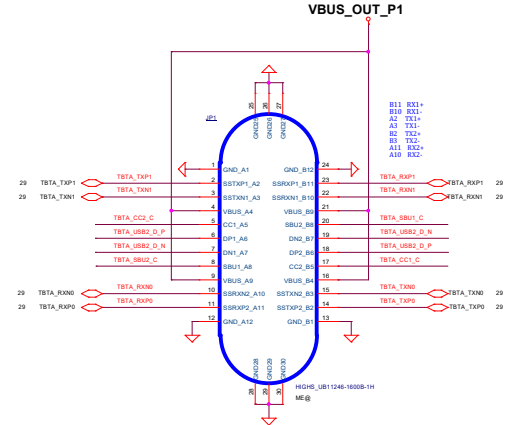
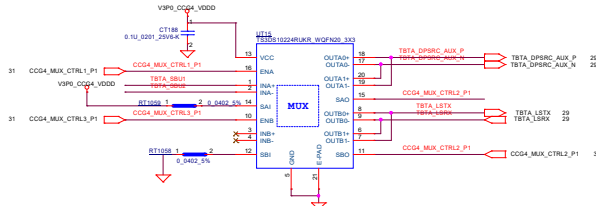
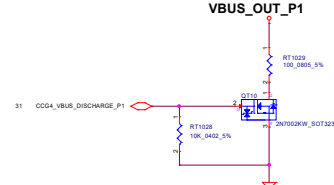
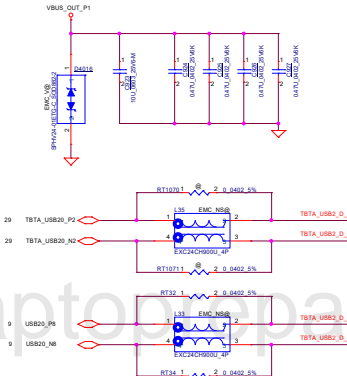
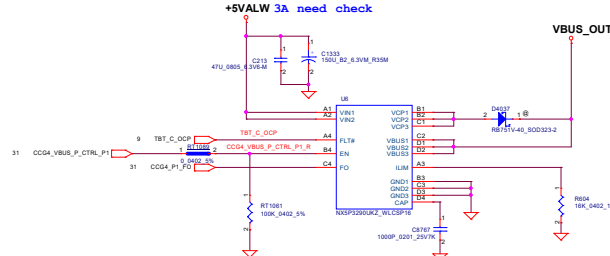
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Issued Date		Deciphered Date		2016/12/08			
2015/12/08		2016/12/08		TBT3-AR Power			
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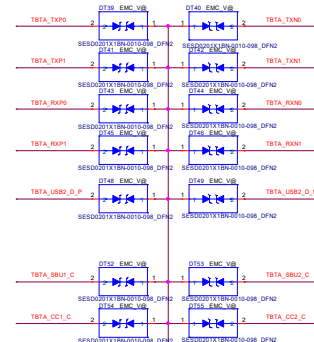
TYPE-C adapter




TBT3 support type-c adpater

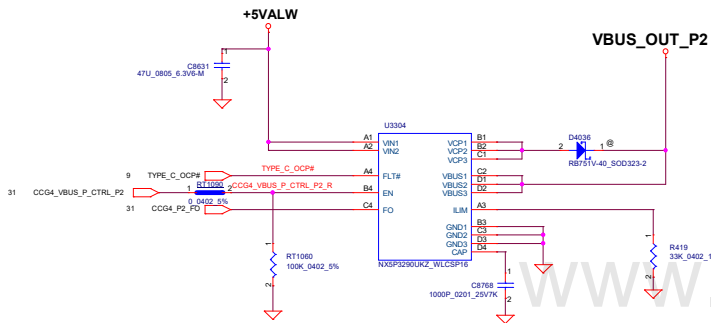
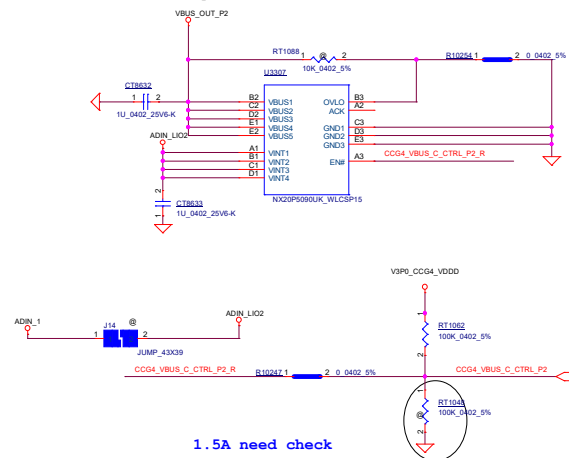


1116 update symbol

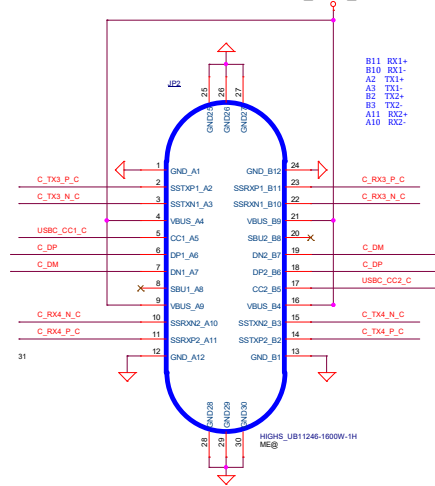


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Issued Date	2015/08/20	Deciphered Date	2016/08/20	TYPEC-A	
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Size	Document Number	REV			
	ES322				

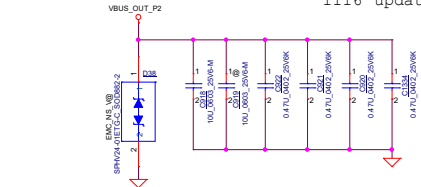
TYPE-C adapter



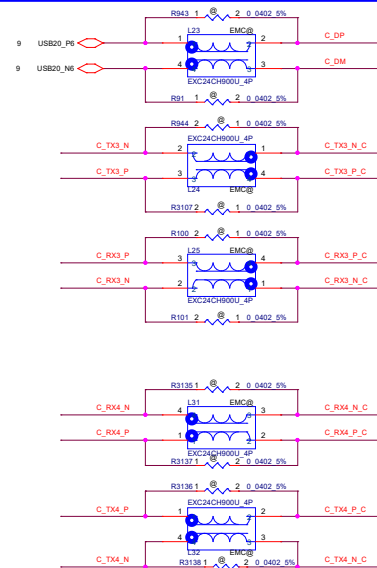
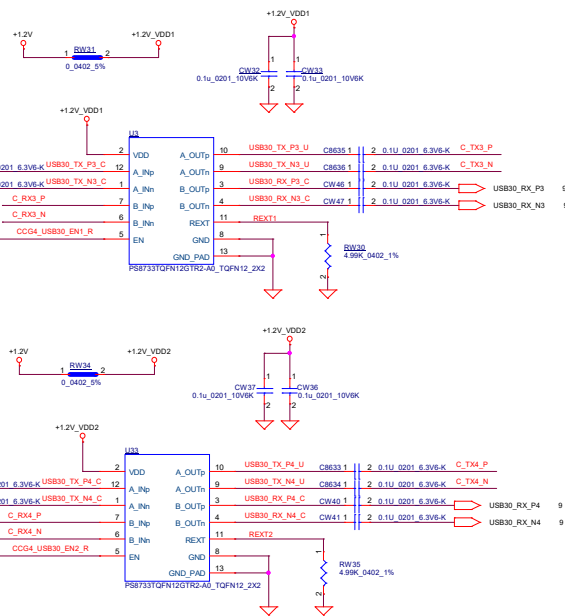
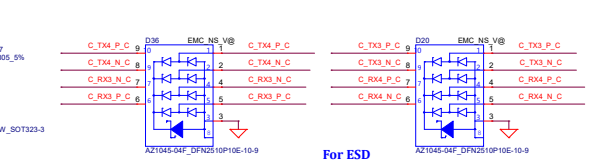
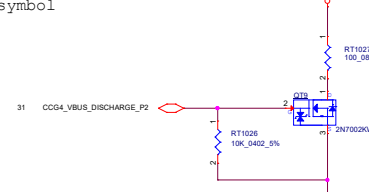
VBUS_OUT_P2



1116 update symbol

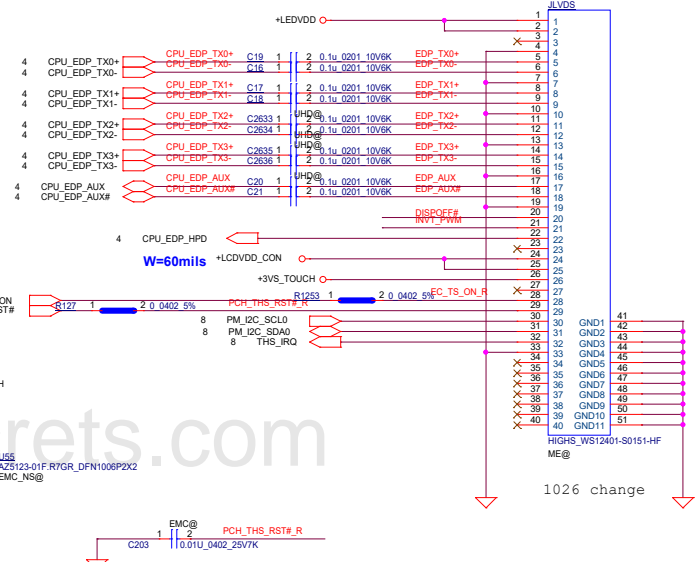
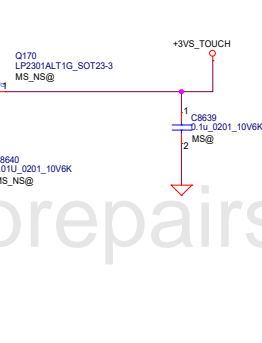
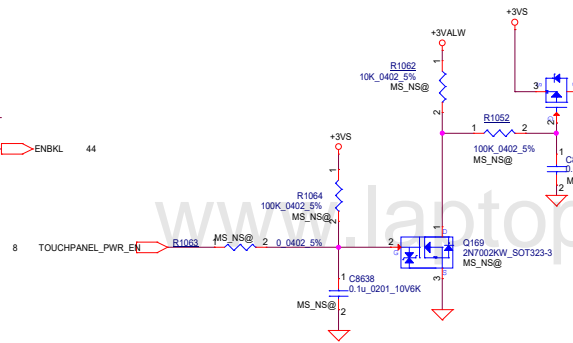
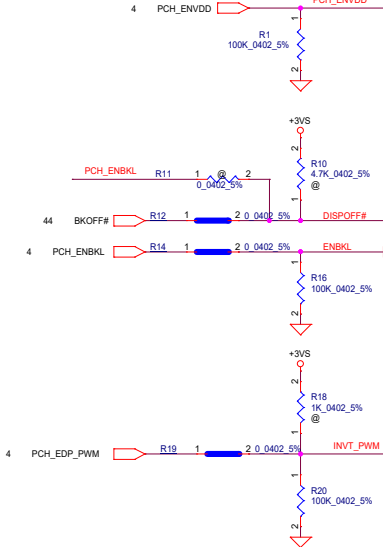
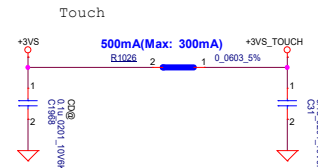
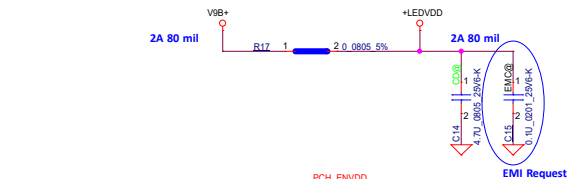
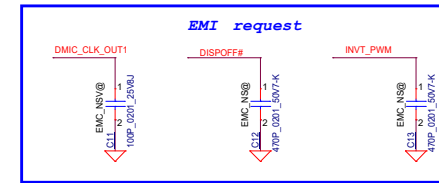
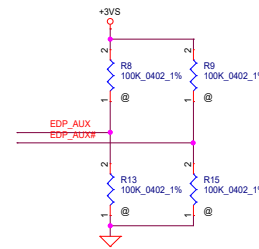
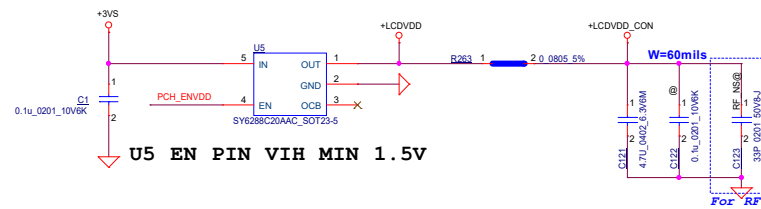


VBUS_OUT_P2

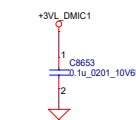
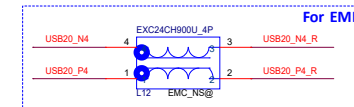
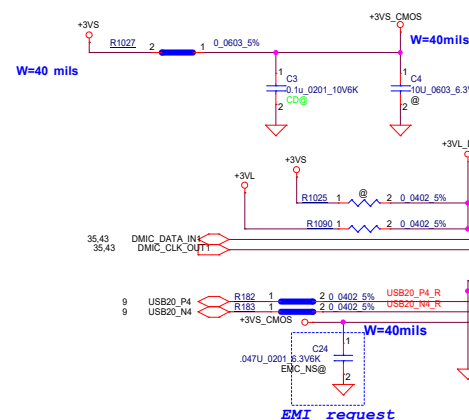


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				Date	Wednesday, 25/26, 2017 18:00:33 of 61

LED POWER CIRCUIT




CMOS Camera




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				Date:	Wednesday, July 26, 2017
				Sheet	34 of 61

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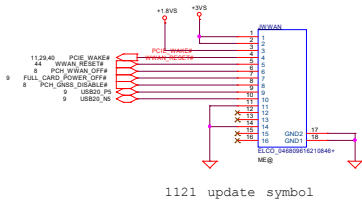
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				Custom	ES322	1.0	
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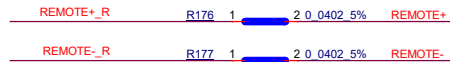
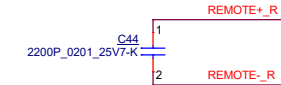
Mini Card(WWAN)

1.1A average



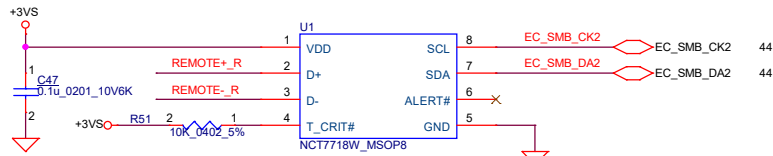
www.laptoprepairsecrets.com

Close to U1

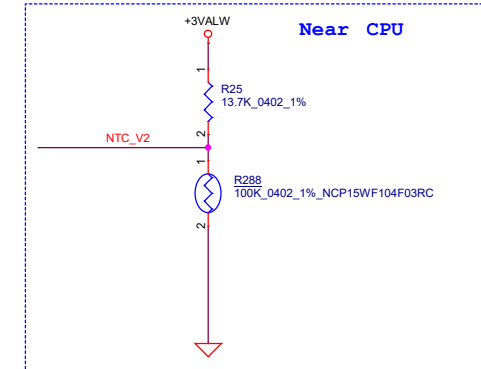
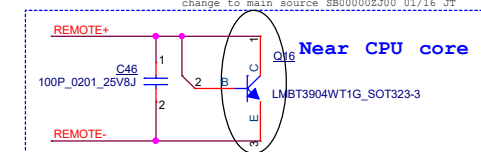


REMOTE+/-_R, REMOTE1+/-, REMOTE2+/-:
Trace width/space:10/10 mil
Trace length:<8"

SMSC thermal sensor placed near DIMM

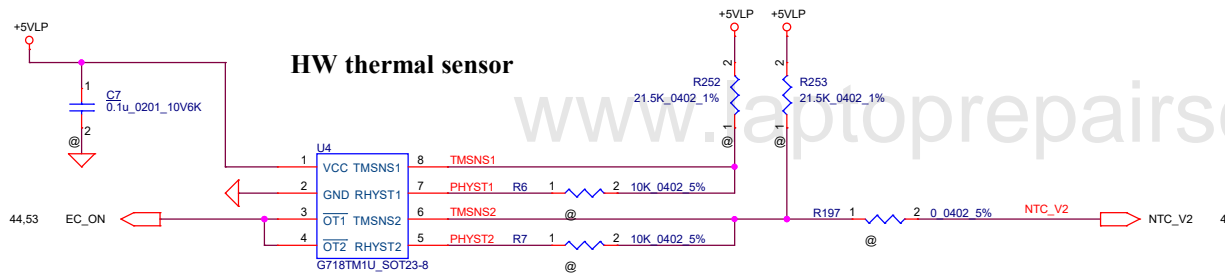


Address 1001_101xb

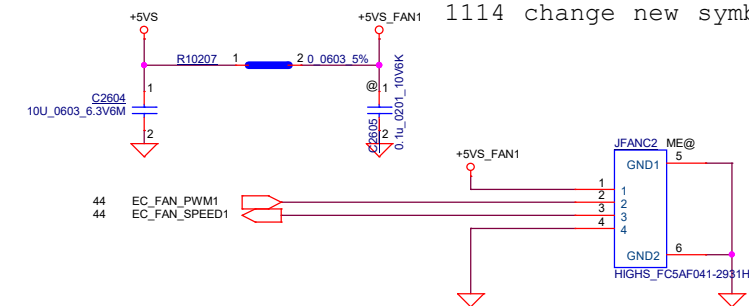
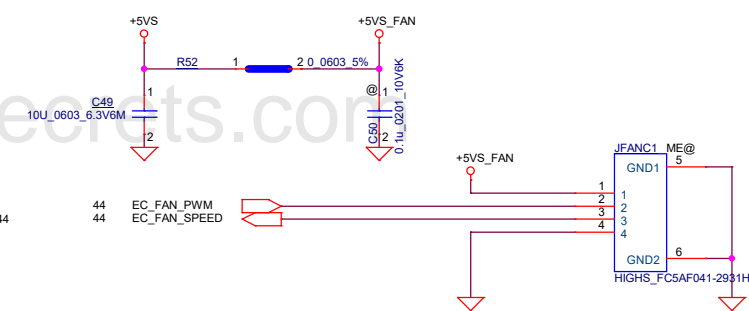


for layout optimized, change the EC_AGND to GND

HW thermal sensor



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

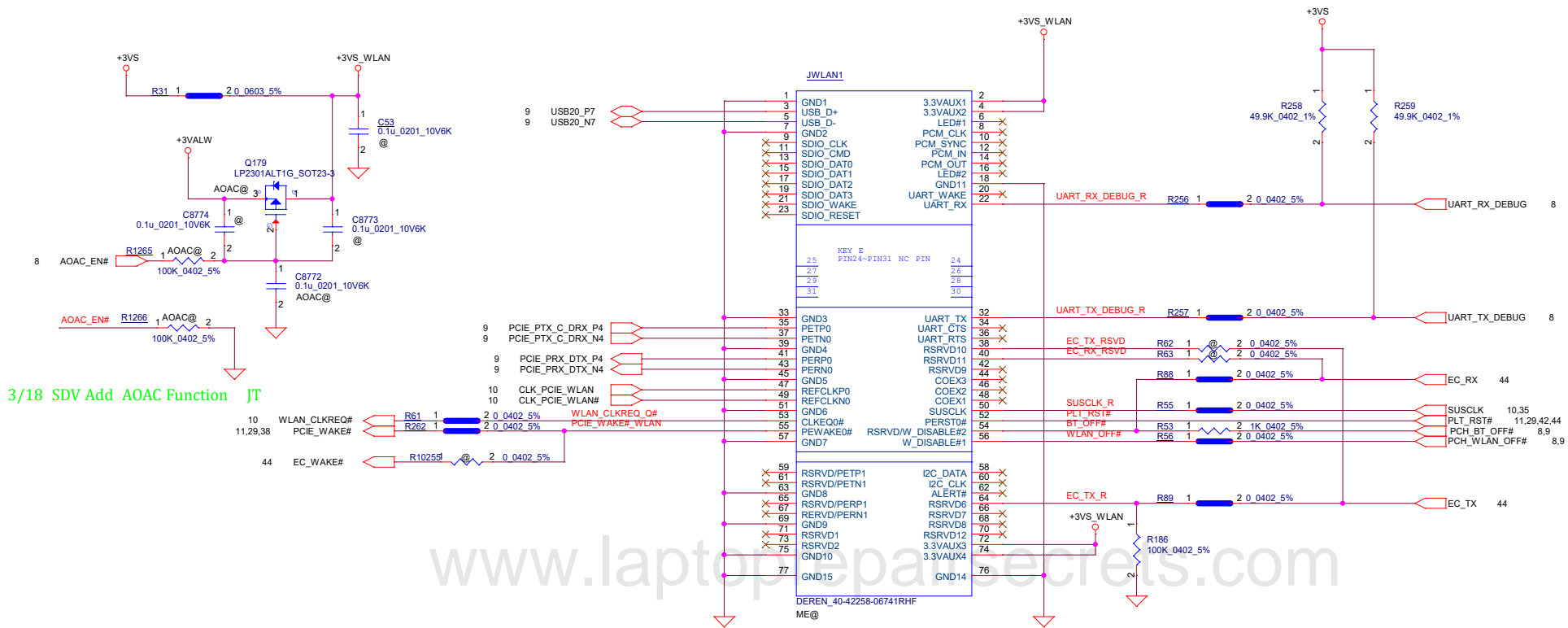


1114 change new symbol

1114 change new symbol

Security Classification	LC Future Center Secret Data			Title	Thermal sensor/FAN CONN	
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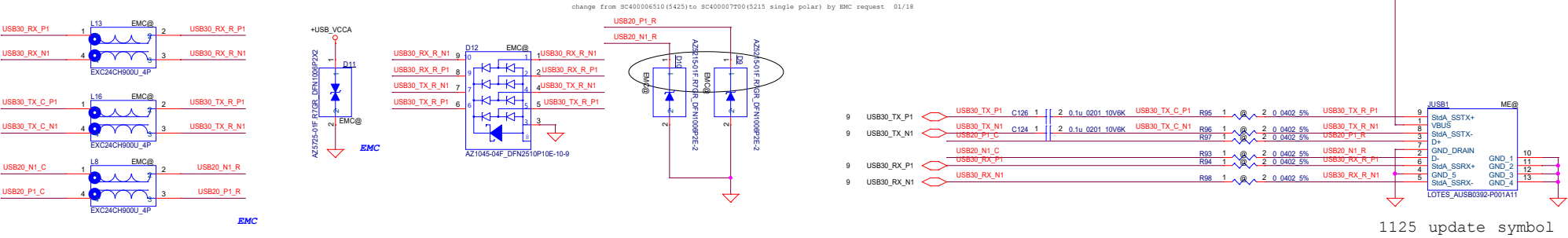
Mini-Express Card(WLAN/WiMAX)



1114 change new symbol

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				ES322	
				Date: Wednesday, July 26, 2017	Sheet 40 of 61

RIGHT SIDE USB3.0 PORT x1

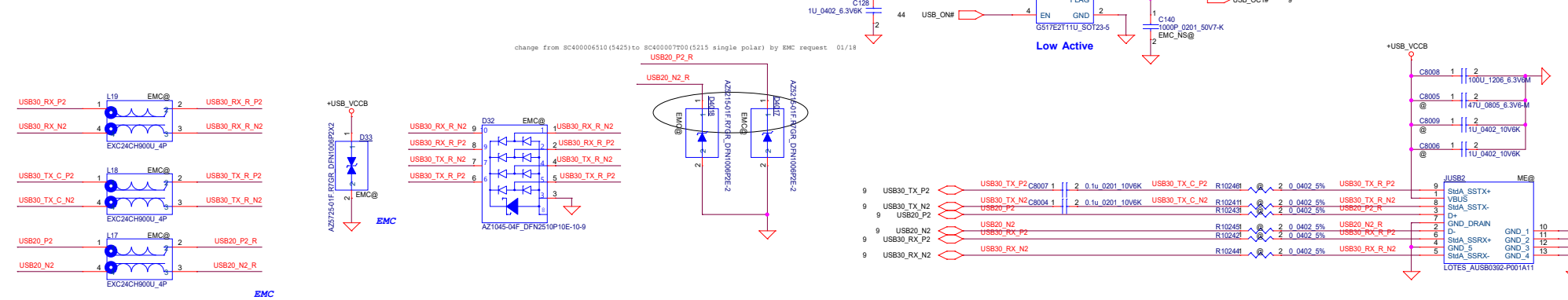


1125 update symbol

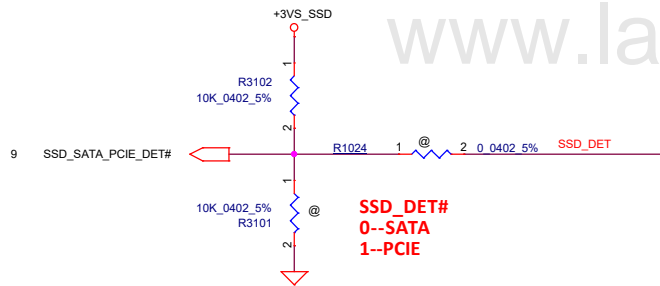
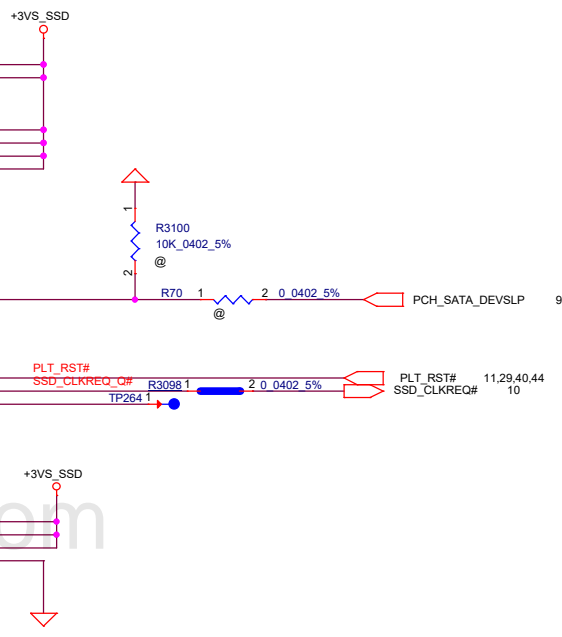
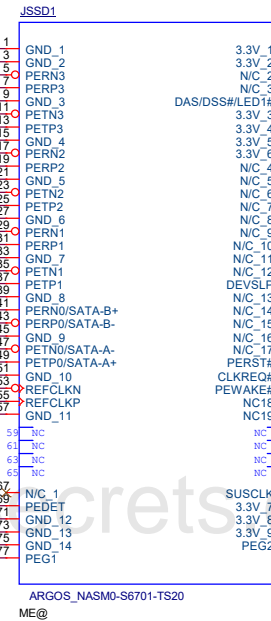
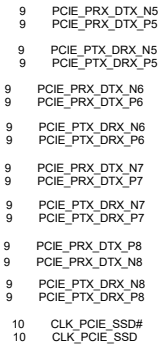
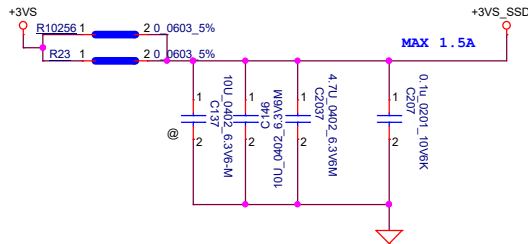
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	pin name	Ctl1	Ctl2	Ctl3	ILM_SEL
Charge port Pin5 Enable H for all	S0 CDP	1	1	1	1
	S3 DCP	0	1	1	0/1
	S4/S5 DCP	0	0	1	0/1
Normal port Pin5 Enable H for S0/S3 L for S4/S5	S0 SDP1	1	1	0	0/1
	S3 SDP1	0	1	0	0/1
	S4/S5 Disable	0	0	0	0/1

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LEFT SIDE USB3.0 PORT x1



1125 update symbol

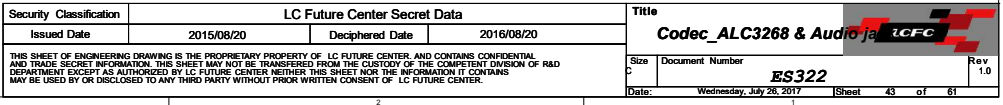


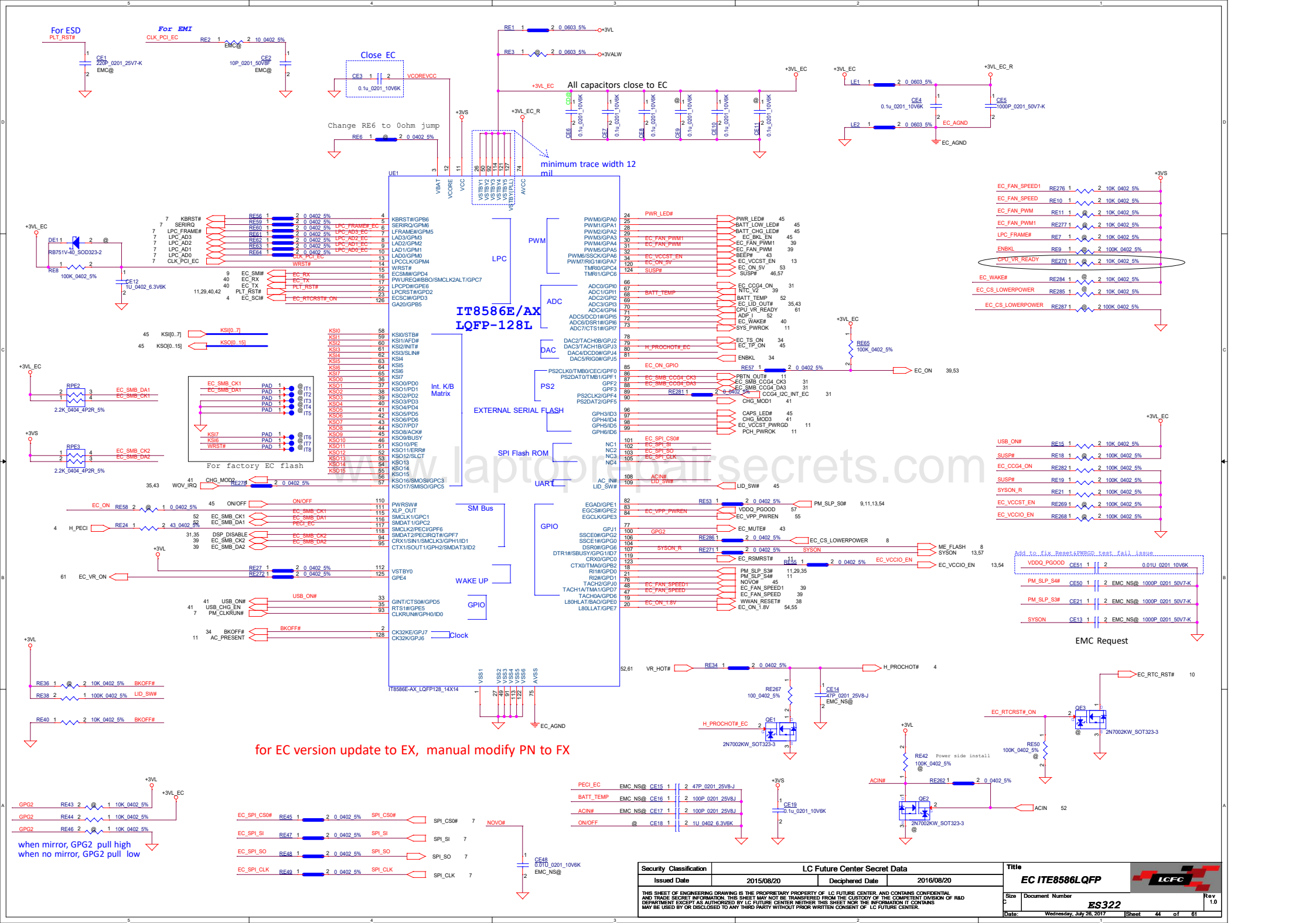
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1110 change

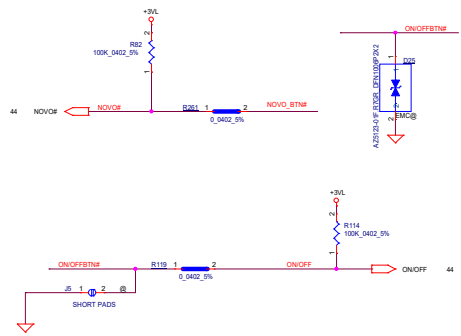
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Issued Date	2015/08/20	Deciphered Date	2016/08/20
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Custom				Rev 1.0	
Date:		Wednesday, July 26, 2017		Sheet 42 of 61	

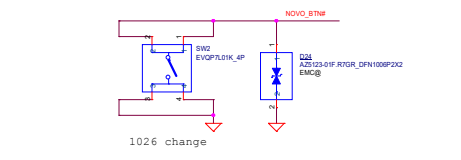




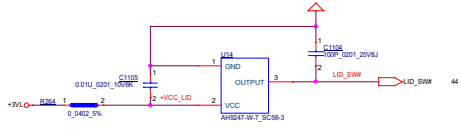
ON/OFF switch



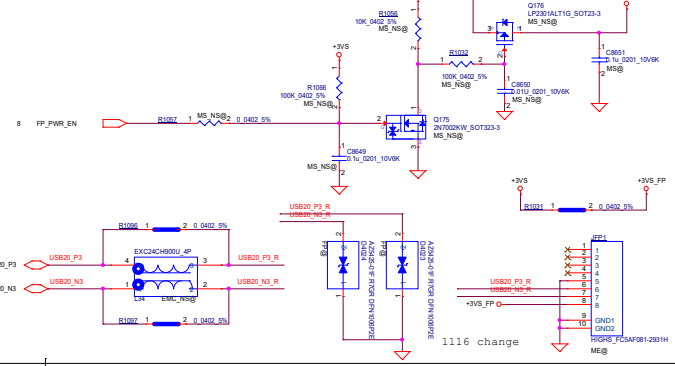
Novo button



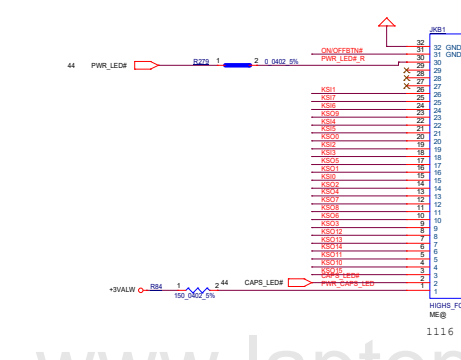
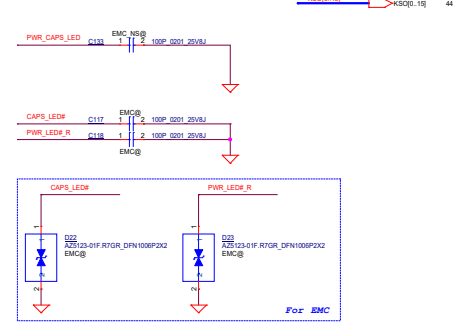
LID switch



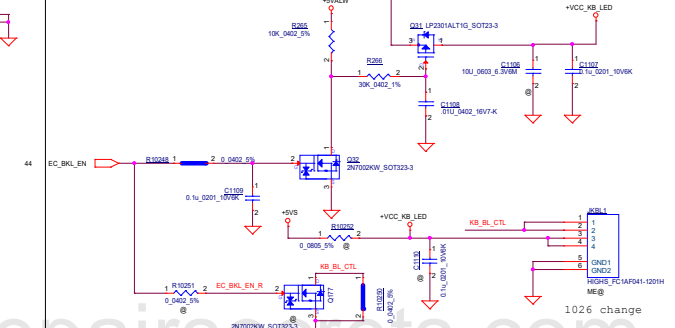
Finger Print Connector



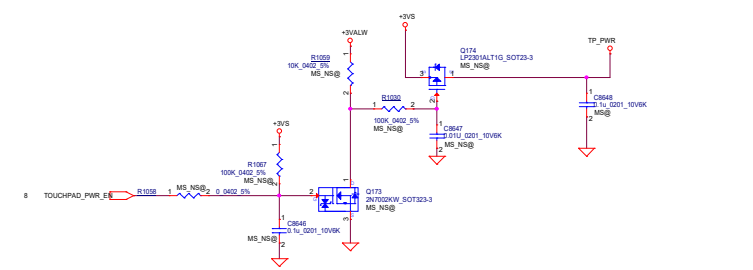
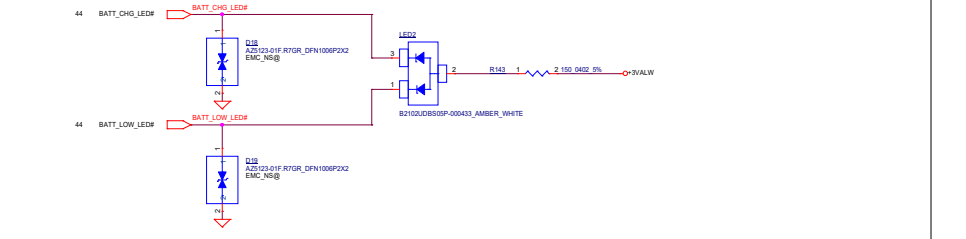
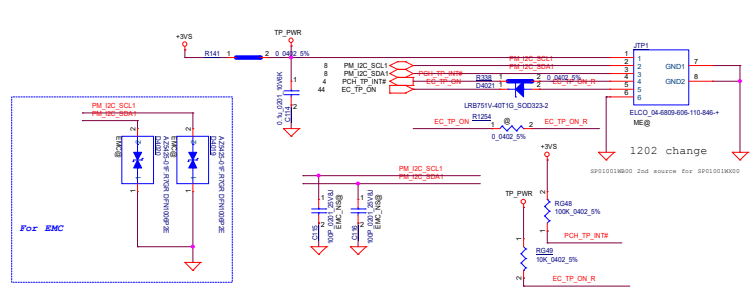
K/B Connector

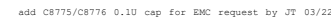



KB Backlight Connector

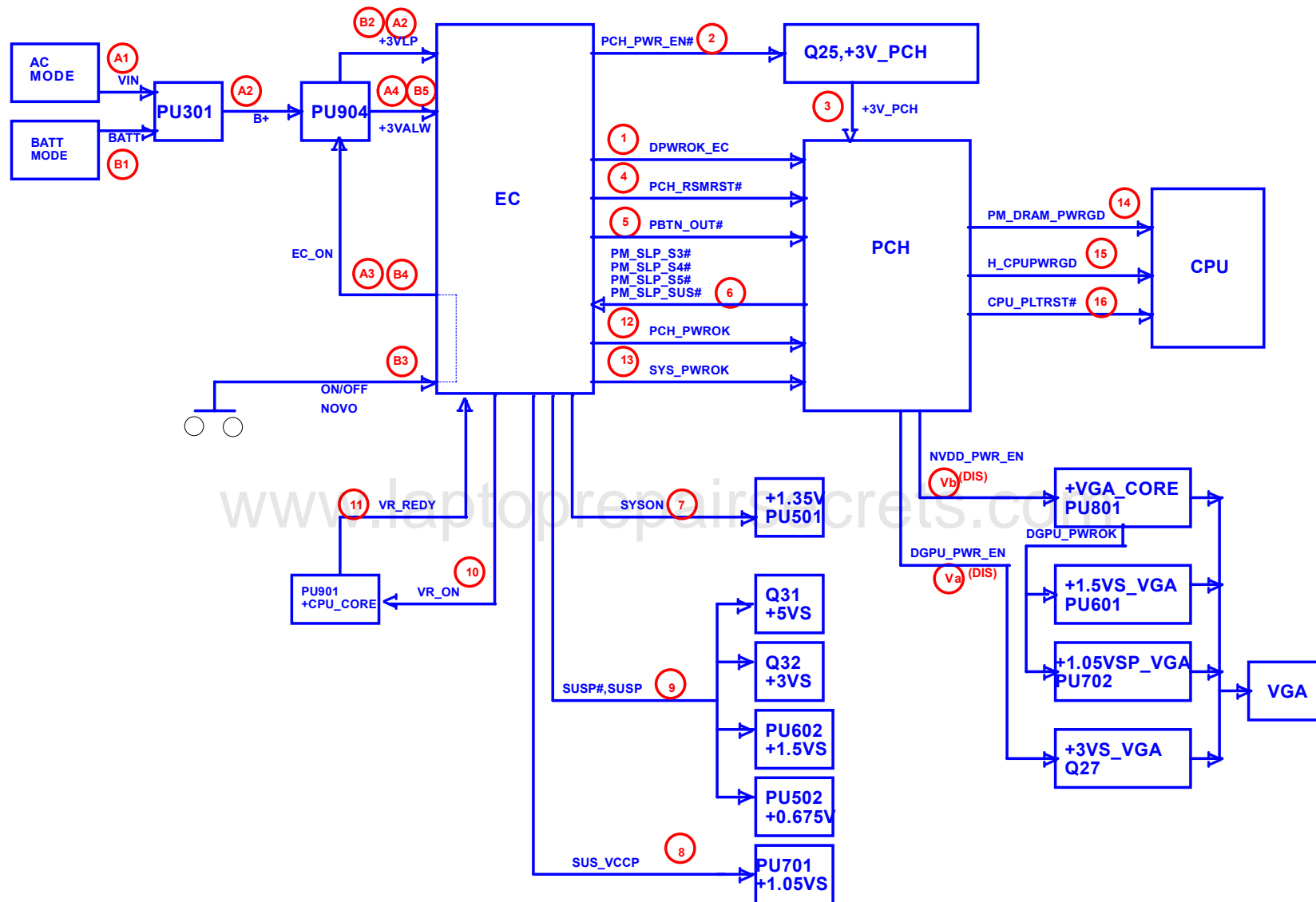


TP/B Connector








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PCB And LOGO Config

PCB		LOGO
CPU		
VRAM		

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PCB Federal Mark PAD

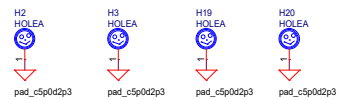


Pad_o2p0x2p2d2p0x2p2n



Pad_o2p0x2p2d2p0x2p2n

pad_c5p0d2p3



pad_c5p0d3p2



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pad_o1p2x2p8d1p2x2p8n



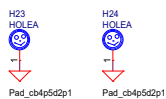
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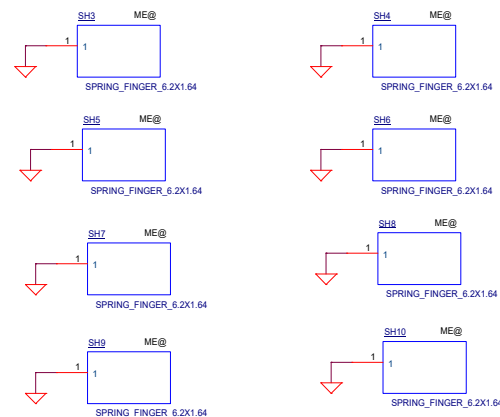
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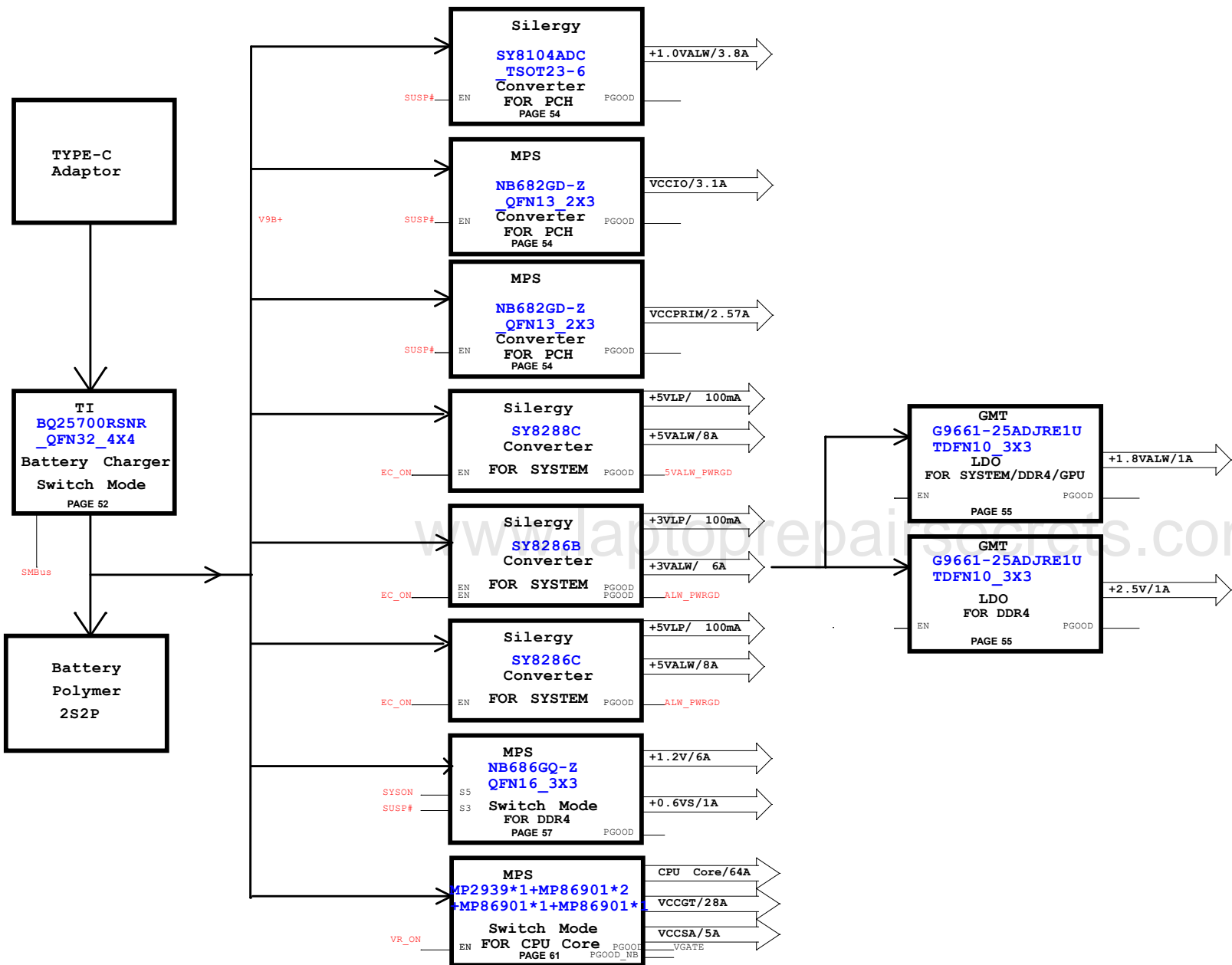
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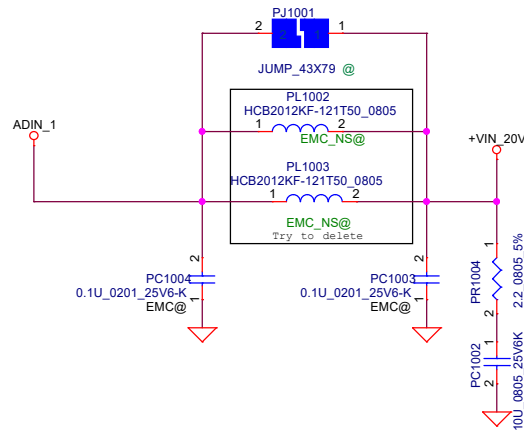


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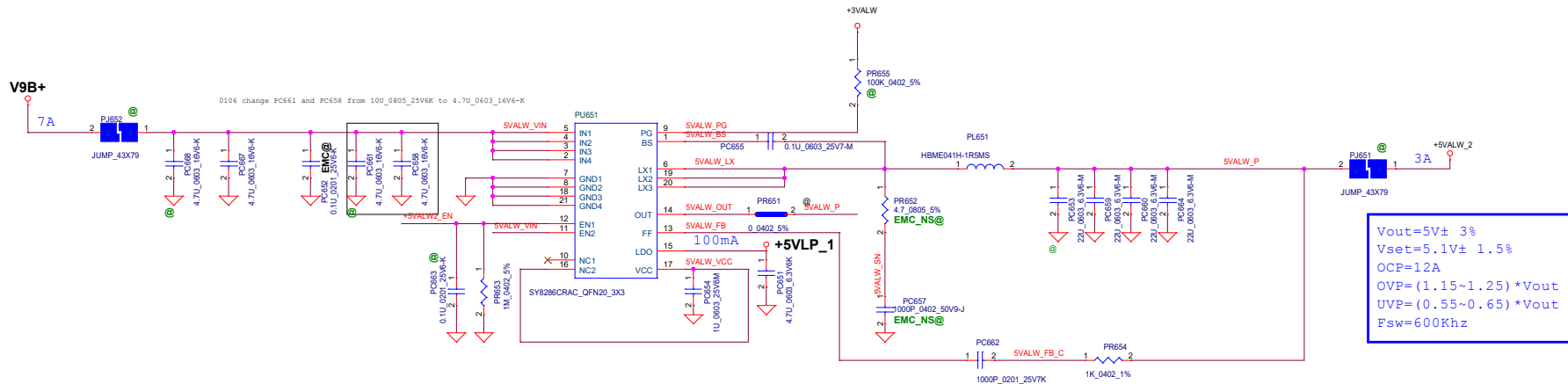
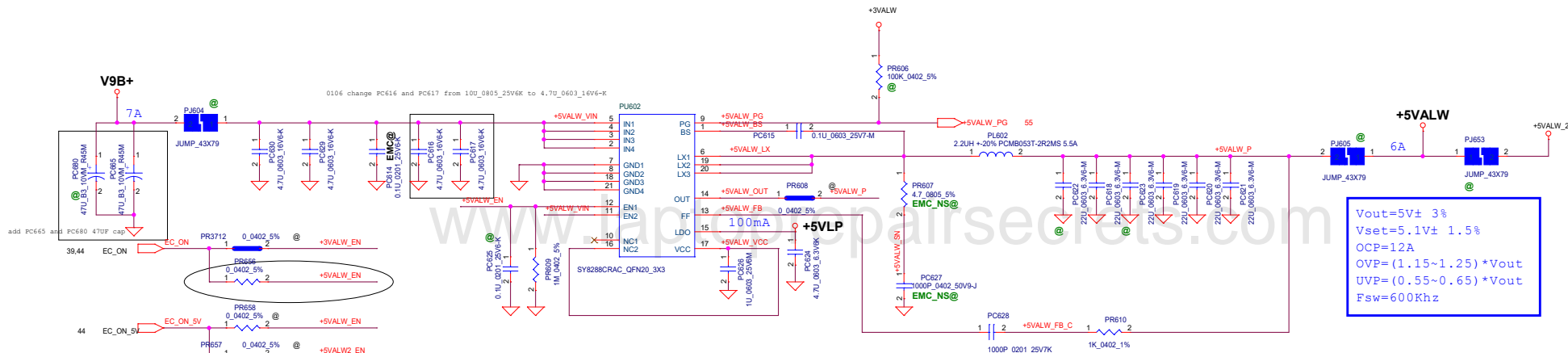
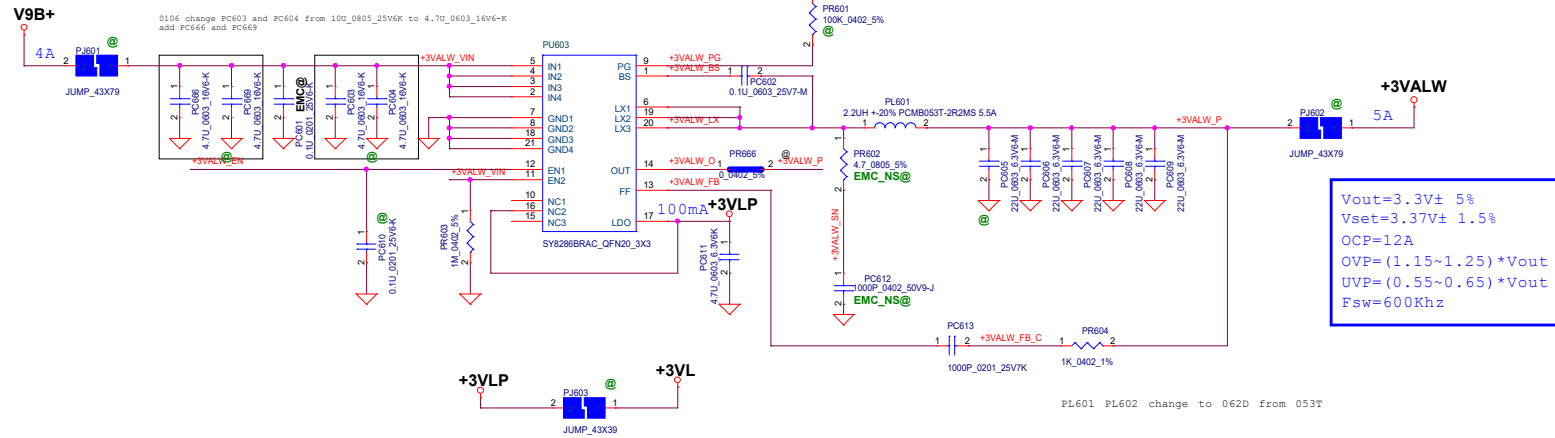


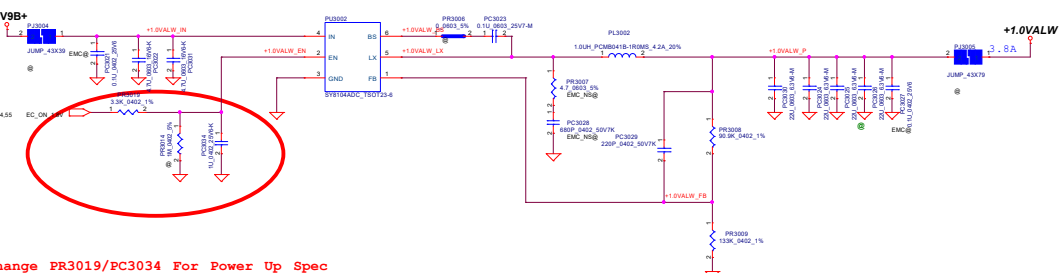




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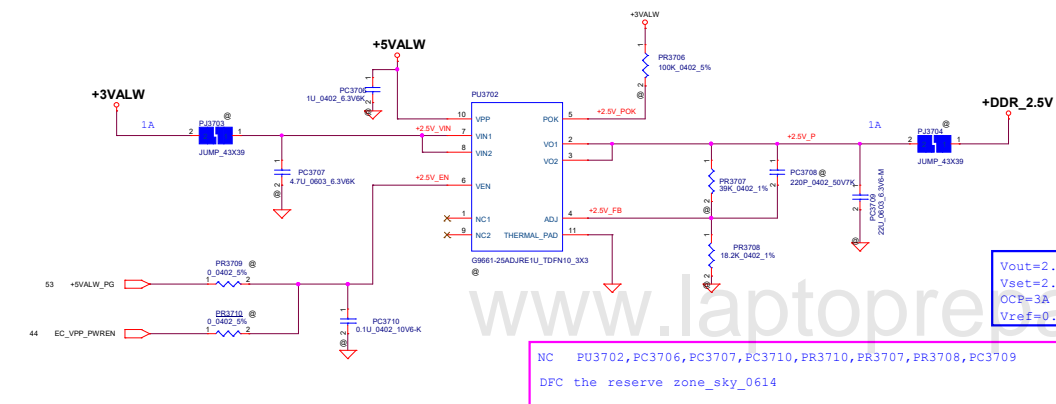
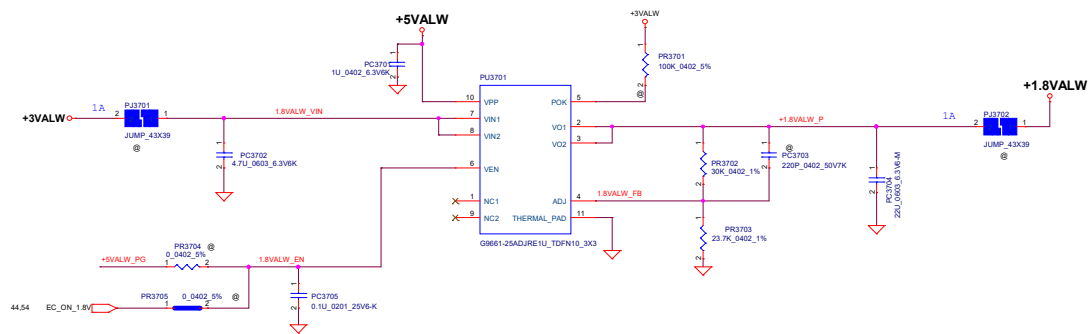
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