P53/P73 Schematic Page Number

Nighthawk - 12L

Project Code: FP530
12L NM-C262 Rev : 1.0
NV N19P-Qx

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010_CPU CFL-H : VCC
011_CPU CFL-H : VCCGT
012_CPU CFL-H : VCCSA/VCCIO/VDD
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044_N19E: POWER
045_N19E: GND
046_N19E: DECOUPLING
047_N19E: DECOUPLING
048_N19E: IFP A/B and XTAL
049_N19E: IFP F/USB-C
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051_N19E: STRAP and ROM
052_HDMI RE-TIMER
053_HDMI LSPCON
054_HDMI CONNECTOR
055_eDP DEMUX
056_LCD CONNECTOR
057_Titan Ridge (1/3)
058_Titan Ridge (2/3)
059_Titan Ridge (3/3)
060_POWER DELIVERY (TPS65988)
061_USB TYPE-C CONNECTOR(1/2)
062_USB TYPE-C CONNECTOR(2/2)
063_PPC
064_TYPE-C XBAR
065_NV TYPE-C MUX
066_NV TYPE-C RETIMER
067_NV TYPE-C CONNECTOR
068_SATA HDD CONN
069_M.2 SATA/PCIE SSD CARD SLOT_1
070_M.2 SATA/PCIE SSD CARD SLOT_2
071_M.2 SATA/PCIE SSD CARD SLOT_3
072_M.2 WLAN CARD SLOT
073_M.2 WWAN CARD SLOT
074_GBE JACKSONVILLE
075_GBE MAGNETICS
076_GBE_RJ45 CONNECTOR
077_MEDIA CARD UHS-II
078_MEDIA CARD INTERFACE UHS-II
079_AUDIO CODEC
080_HP/MIC/SPEAKER/AUDIO JACK
081_AUDIO DEBUG PORT
082_NPCX897KA0BX(1/3)
083_NPCX897KA0BX(2/3)
084_NPCX897KA0BX(3/3)
085_THINK ENGINE 2(1/2)
086_THINK ENGINE 2(2/2)
087_FAN CONNECTOR
088_USB REDRIVER (1/2)
089_USB REDRIVER (2/2)
090_AOU USB POWER/CONN
091_USB POWER/CONNECTOR
092_USB POWER/CONNECTOR
093_APS G-SENSOR
094_DISCRETE TPM 2.0
095_SMBUS SWITCH/LPC DEBUG PORT
096_SMART CARD/NFC
097_CAMERA/TOUCH
098_KEYBOARD/TRACK POINT
099_CLICK PAD
100_FINGER PRINT
101_Color Seneor_FT4222H
102_P73 IO BOARD CONN
103_P73 SCREW HOLE / LED
104_P53 LED BOARD CONN
105_BLANK
106_BLANK
107_BLANK
108_BLANK
109_BLANK
110_BLANK
111_DC-IN
112_BATTERY INPUT
113_BATTERY CHARGER
114_BLANK
115 DC/DC VCC5M/VCC3M
116_DC/DC IMVP8
117_DC/DC VCCPUCORE
118_DC/DC VCCGFXCORE_I
119_DC/DC VCCSA
120_DC/DC VCCCPUIO
121_DC/DC VCC1R05_SUS
122_VCCPUCORE DECOUPLING
123_DC/DC VCC1R8_SUS
124_DC/DC VCC1R2A/VCC0R6B
125_DC/DC VCC2R5A
126_BLANK
127_BLANK
128_BLANK
129_LOAD SW VCCST/VCCSTG
130_LOAD SW PCH SUS/TP
131_LOAD SW LAN
132_LOAD SW B
133_LOAD SW WWAN&WLAN
134_DC/DC USBC
135_DC/DC VCCGFXCORE_D IC
136_DC/DC VCCGFXCORE_D1
137_DC/DC VCC1R35VIDEO
138_DC/DC VCC1R0VIDEO
139_BLANK
140_LOAD SW VIDEO
141_DISCHARGE CIRCUIT VIDEO

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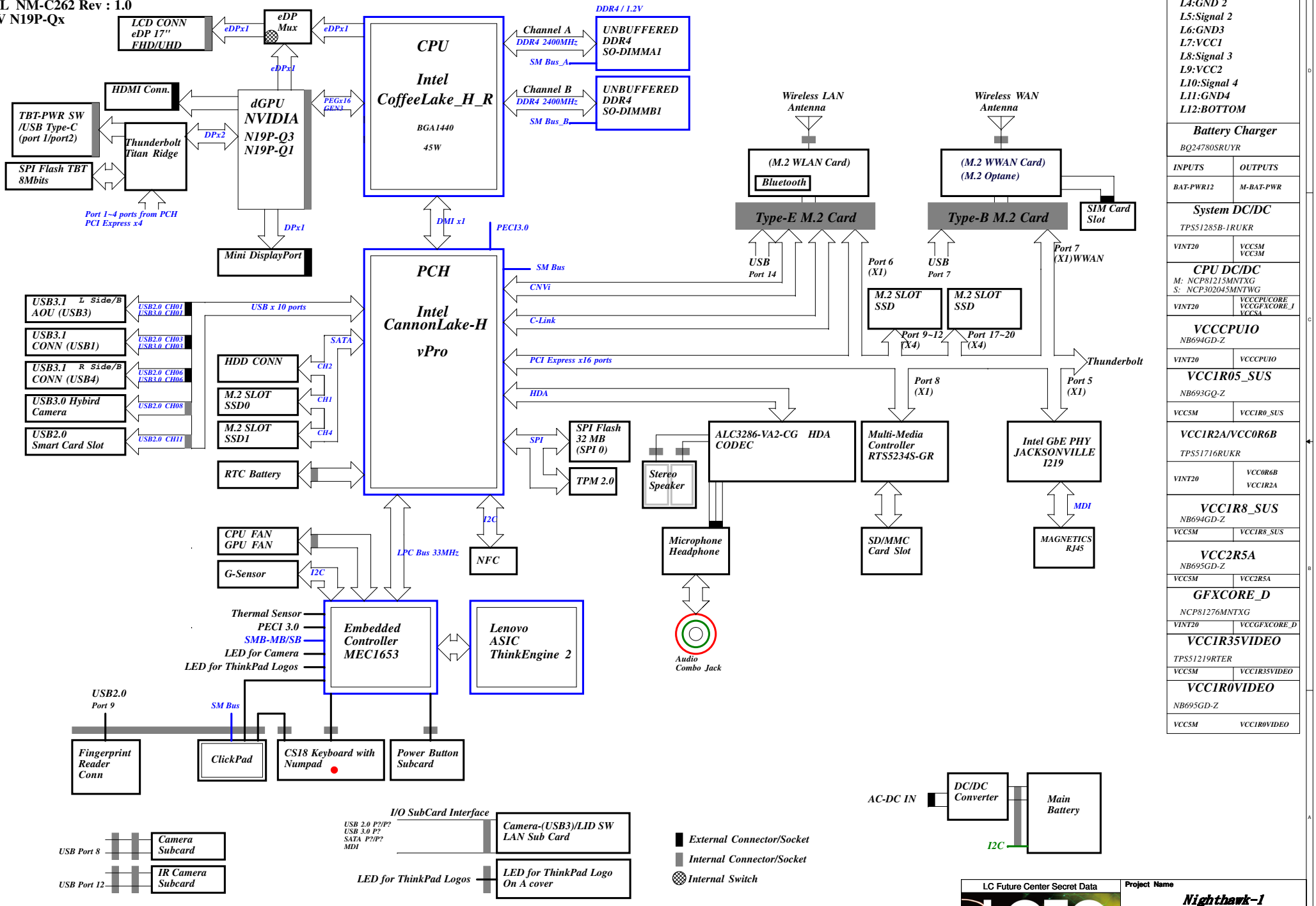
Nighthawk - Block Diagram

Project Code: FP530
12L NM-C262 Rev : 1.0
NV N19P-Qx



PCB Layer Stackup

L1:TOP
L2:GND1
L3:Signal 1
L4:GND 2
L5:Signal 2
L6:GND3
L7:VCC1
L8:Signal 3
L9:VCC2
L10:Signal 4
L11:GND4
L12:BOTTOM

Battery Charger

BQ24780SRUYR

INPUTS	OUTPUTS
BAT-PWR12	M-BAT-PWR

System DC/DC

TPS51285B-1RUKR

VINT20	VCC5M VCC3M

CPU DC/DC

M: NCP81215MNTXG
S: NCP302045MNTWG

VINT20	VCCCPUCORE VCCGFXCORE_1 VCCSA

VCCCPUIO

NB694GD-Z

VINT20	VCCCPUIO

VCC1R05_SUS

NB693GQ-Z

VCC5M	VCC1R0_SUS

VCC1R2A/VCC0R6B

TPS51716RUKR

VINT20	VCC0R6B VCC1R2A

VCC1R8_SUS

NB694GD-Z

VCC5M	VCC1R8_SUS

VCC2R5A

NB695GD-Z

VCC5M	VCC2R5A

GFXCORE_D

NCP81276MNTXG

VINT20	VCCGFXCORE_D

VCC1R35VIDEO

TPS51219RTER

VCC5M	VCC1R35VIDEO

VCC1R0VIDEO

NB695GD-Z

VCC5M	VCC1R0VIDEO

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TABLE: SYSTEM POWER STATE

Gx State (System State)	Sx State (System State)	Mx State (System State)	SW Power	M Power	SUS Power	AMT Power	A Power	B Power	User Observation	Chipset
G0	S0	M0	ON	ON	ON	ON	ON	ON	System Operating	Full On
G1	S3	M3	ON	ON	ON	ON	ON	OFF	Standby	Suspend-to-RAM (STR)
		M-OFF	ON	ON	ON	OFF	ON	OFF	Standby with USB wake enabled	
	Deep S3	M-OFF	ON	ON	ON	OFF	ON	OFF	Standby	
	S4	M3	ON	ON	ON	ON	OFF	OFF	Hibernation with RTC wakeup	Suspend-to-Disk (STD)
	Deep S4	M-OFF	ON	ON	ON	OFF	OFF	OFF		
G2	S5	M3	ON	ON	ON	ON	OFF	OFF	Hibernation or Shutdown	Soft Off
	Deep S5	M-OFF	ON	ON	ON	OFF	OFF	OFF		
	S5 EC OFF	M-OFF	OFF	OFF	OFF	OFF	OFF	OFF		
G3	---	---	OFF	OFF	OFF	OFF	OFF	OFF	No Power	Mechanical Off

EC SMBus1 address

Device	Address
G-Senor (BMA255)	0011 000Xb
G-Senor (KX022-1020)	0011 110Xb

EC SMBus0 address

Device	Address
Smart Battery	0001 0110 b
Charger controller	0001 0010 b

EC SMBus3 address

Device	Address
PCH	0x96h
USB Re-driver	0x20h / 0x21h (Reserved)
USB Re-driver (AOU)	0x52h / 0x53h (Reserved)

EC SMBus4 address

Device	Address
DGPU	0x9Eh

EC SMBus5 address

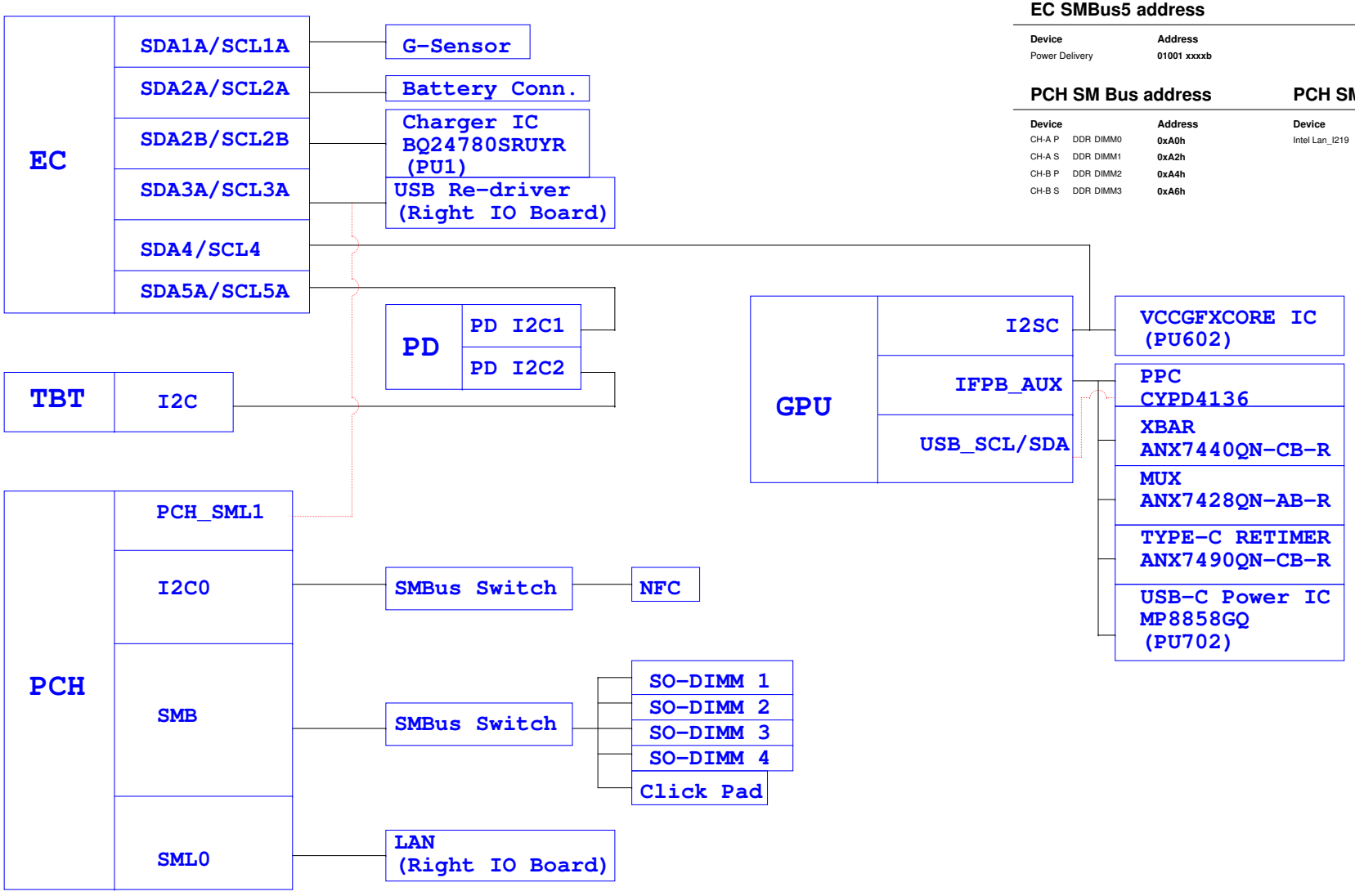
Device	Address
Power Delivery	01001 xxxxb

PCH SM Bus address

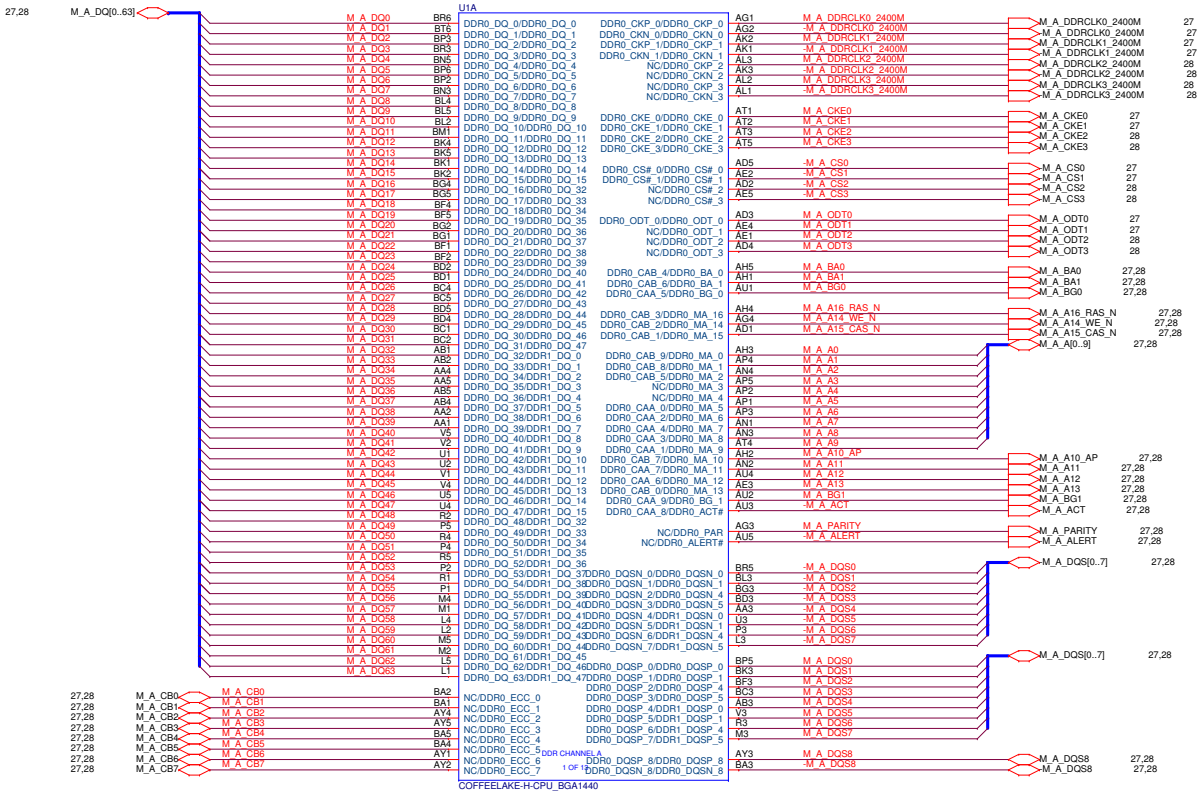
Device		Address
CH-A P	DDR DIMM0	0xA0h
CH-A S	DDR DIMM1	0xA2h
CH-B P	DDR DIMM2	0xA4h
CH-B S	DDR DIMM3	0xA6h

PCH SM Bus0 address

Device	Address
Intel Lan_I219	0XC8h



CPU



DDR4 INTERLEAVE IMPLEMENTATION

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Rev	1.0
Title	CPU
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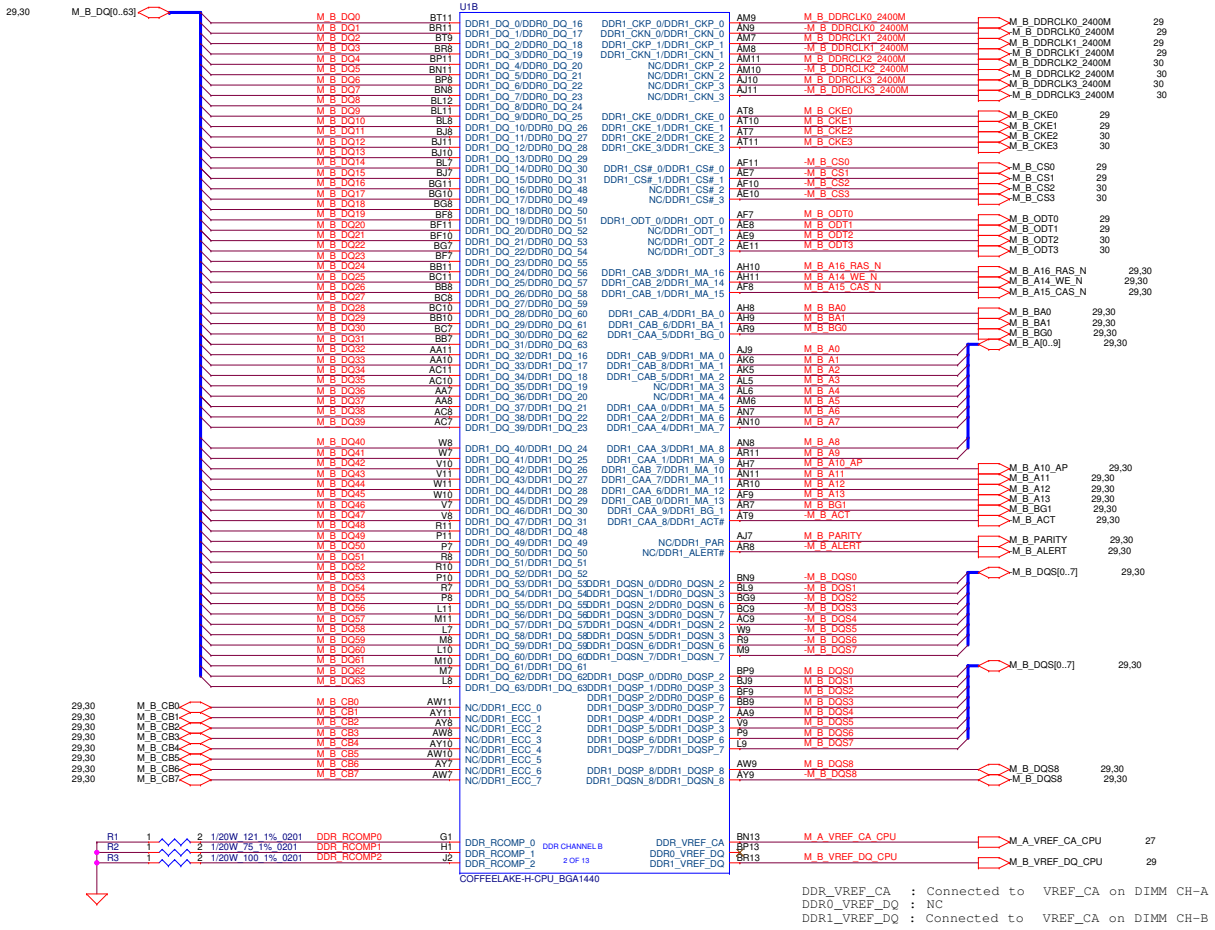
CPU


U1B
M_B_DQ[0..63]
DDR_RCOMP0
DDR_RCOMP1
DDR_RCOMP2
DDR CHANNEL B
2 OF 13
COFFEELAKE-H-CPU_BGA1440
M_A_VREF_CA_CPU
M_B_VREF_DQ_CPU
DDR_VREF_CA : Connected to VREF_CA on DIMM CH-A
DDR0_VREF_DQ : NC
DDR1_VREF_DQ : Connected to VREF_CA on DIMM CH-B

CPU

31 PEG_RXP[15:0]
31 PEG_RXN[15:0]
PEG_TXP[15:0] 31
PEG_TXN[15:0] 31
U1C
PEG_RXP15 E25 PEG_RXP_0 PEG_TXP_0 B25 PEG_TXP15_C C1 1 2 0.22U_6.3V_K_X5R_0201 PEG_TXP15
PEG_RXN15 D25 PEG_RXN_0 PEG_TXN_0 A25 PEG_TXN15_C C2 1 2 0.22U_6.3V_K_X5R_0201 PEG_TXN15
PEG_RXP14 E24 PEG_RXP_1 PEG_TXP_1 B24 PEG_TXP14_C C3 1 2 0.22U_6.3V_K_X5R_0201 PEG_TXP14
PEG_RXN14 F24 PEG_RXN_1 PEG_TXN_1 C24 PEG_TXN14_C C4 1 2 0.22U_6.3V_K_X5R_0201 PEG_TXN14
PEG_RXP13 E23 PEG_RXP_2 PEG_TXP_2 B23 PEG_TXP13_C C5 1 2 0.22U_6.3V_K_X5R_0201 PEG_TXP13
PEG_RXN13 D23 PEG_RXN_2 PEG_TXN_2 A23 PEG_TXN13_C C6 1 2 0.22U_6.3V_K_X5R_0201 PEG_TXN13
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PEG_RXP10 E20 PEG_RXP_5 PEG_TXP_5 B20 PEG_TXP10_C C11 1 2 0.22U_6.3V_K_X5R_0201 PEG_TXP10
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PEG_RXP9 E19 PEG_RXP_6 PEG_TXP_6 B19 PEG_TXP9_C C13 1 2 0.22U_6.3V_K_X5R_0201 PEG_TXP9
PEG_RXN9 D19 PEG_RXN_6 PEG_TXN_6 A19 PEG_TXN9_C C14 1 2 0.22U_6.3V_K_X5R_0201 PEG_TXN9
PEG_RXP8 E18 PEG_RXP_7 PEG_TXP_7 B18 PEG_TXP8_C C15 1 2 0.22U_6.3V_K_X5R_0201 PEG_TXP8
PEG_RXN8 F18 PEG_RXN_7 PEG_TXN_7 C18 PEG_TXN8_C C16 1 2 0.22U_6.3V_K_X5R_0201 PEG_TXN8
PEG_RXP7 D17 PEG_RXP_8 PEG_TXP_8 A17 PEG_TXP7_C C17 1 2 0.22U_6.3V_K_X5R_0201 PEG_TXP7
PEG_RXN7 E17 PEG_RXN_8 PEG_TXN_8 B17 PEG_TXN7_C C18 1 2 0.22U_6.3V_K_X5R_0201 PEG_TXN7
PEG_RXP6 F16 PEG_RXP_9 PEG_TXP_9 C16 PEG_TXP6_C C19 1 2 0.22U_6.3V_K_X5R_0201 PEG_TXP6
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PEG_RXP4 F14 PEG_RXP_11 PEG_TXP_11 C14 PEG_TXP4_C C23 1 2 0.22U_6.3V_K_X5R_0201 PEG_TXP4
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PEG_RXN0 E10 PEG_RXN_15 PEG_TXN_15 B10 PEG_TXN0_C C32 1 2 0.22U_6.3V_K_X5R_0201 PEG_TXN0
VCCCPUIO R4 1 2 1/20W_24.9_1%_0201 PEG_COMP_W12mil G2 PEG_RCOMP
16 DMI_TXP0 DMI_TXP0 D8 DMI_RXP_0 DMI_TXP_0 B8 DMI_RXP0 DMI_RXP0 16
16 DMI_TXN0 DMI_TXN0 E8 DMI_RXN_0 DMI_TXN_0 A8 DMI_RXN0 DMI_RXN0 16
16 DMI_TXP1 DMI_TXP1 E6 DMI_RXP_1 DMI_TXP_1 C6 DMI_RXP1 DMI_RXP1 16
16 DMI_TXN1 DMI_TXN1 F6 DMI_RXN_1 DMI_TXN_1 B6 DMI_RXN1 DMI_RXN1 16
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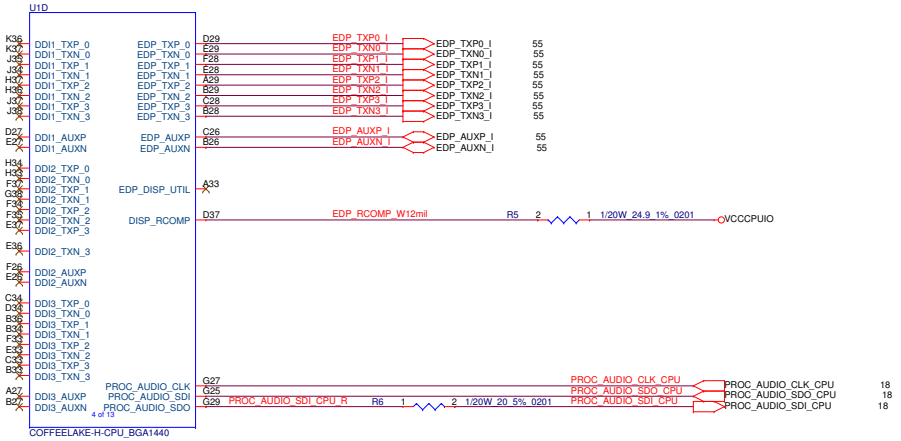
16 DMI_TXN2 DMI_TXN2 E5 DMI_RXN_2 DMI_TXN_2 A5 DMI_RXN2 DMI_RXN2 16
16 DMI_TXP3 DMI_TXP3 J8 DMI_RXP_3 DMI_TXP_3 D4 DMI_RXP3 DMI_RXP3 16
16 DMI_TXN3 DMI_TXN3 J9 DMI_RXN_3 DMI_TXN_3 B4 DMI_RXN3 DMI_RXN3 16
3 OF 13
COFFEELAKE-H-CPU_BGA1440

CPU



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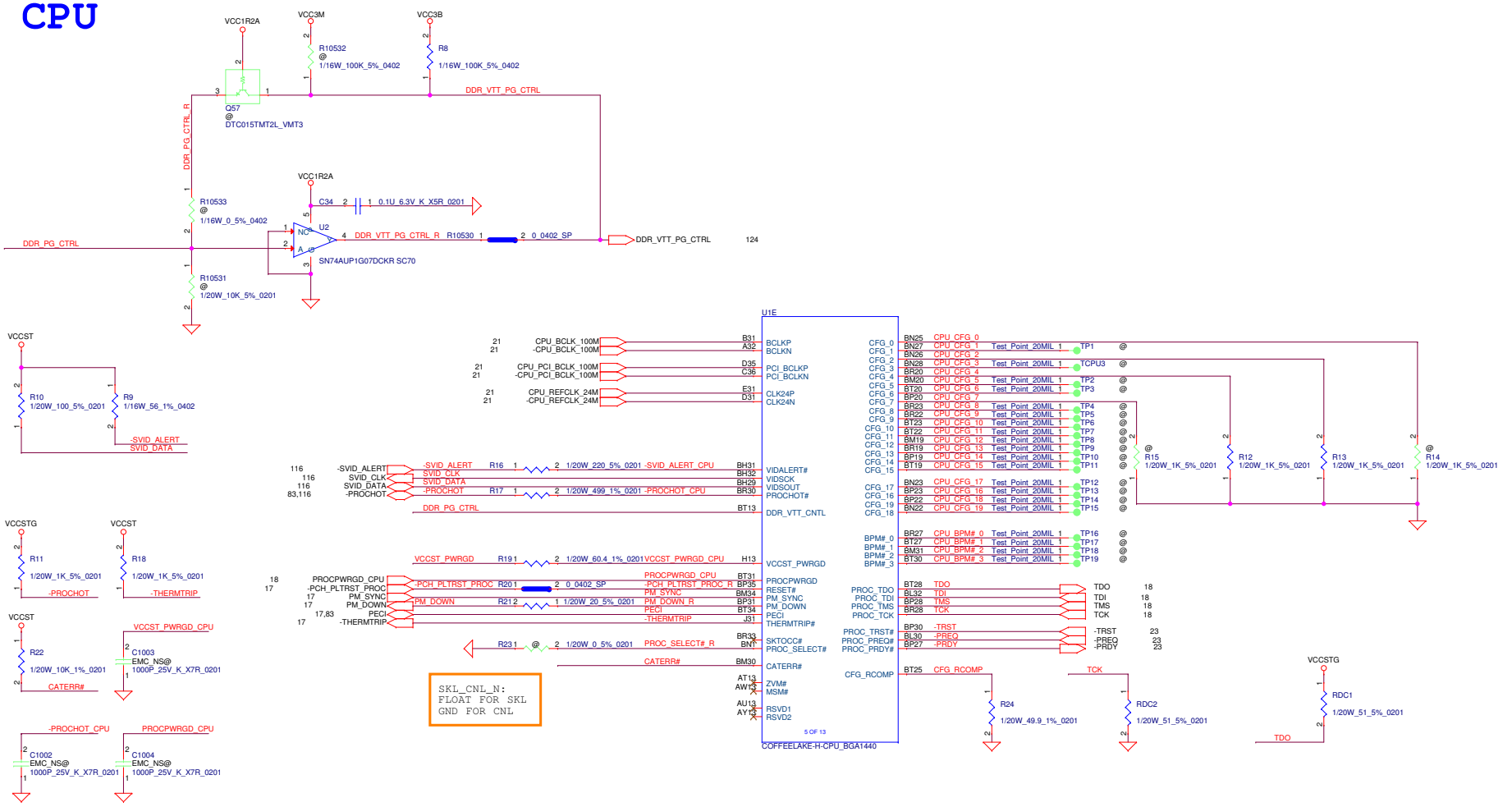
CPU



If VCCSTG is used instead of VCC1R05_SUS,
VCCST_PWRGD will be off in Sleep S0 because
VCCSTG may be turned off when in Sleep S0.
Currently, VCCSTG is still on in Sleep S0
but we may change logic to turn off VCCSTG in sleep S0.
(CT_20141216)

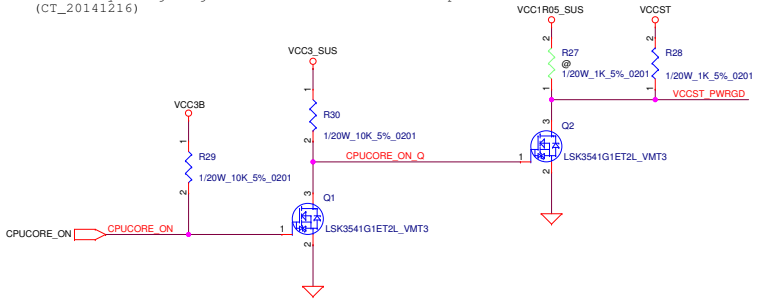


TABLE CFG[19:0] pin has internal Pull up to VCCCPUIO with 5-8 k ohm.

CFG[0] : Stall reset sequence after CPU PLL lock until de-asserted:
1 : No Stall <---------- LOGIC
0 : Stall

CFG[2] : PEG Static Lane Reversal
1 : Normal Operation
0 : Lane Reversal <---------- LOGIC

CFG[4] : eDP enable
1 : Disabled
0 : Enabled <---------- LOGIC

CFG[6:5] : PEG Bifurcation, bus#:dev#:func#=0:1:0
11 : 1x16 <---------- LOGIC

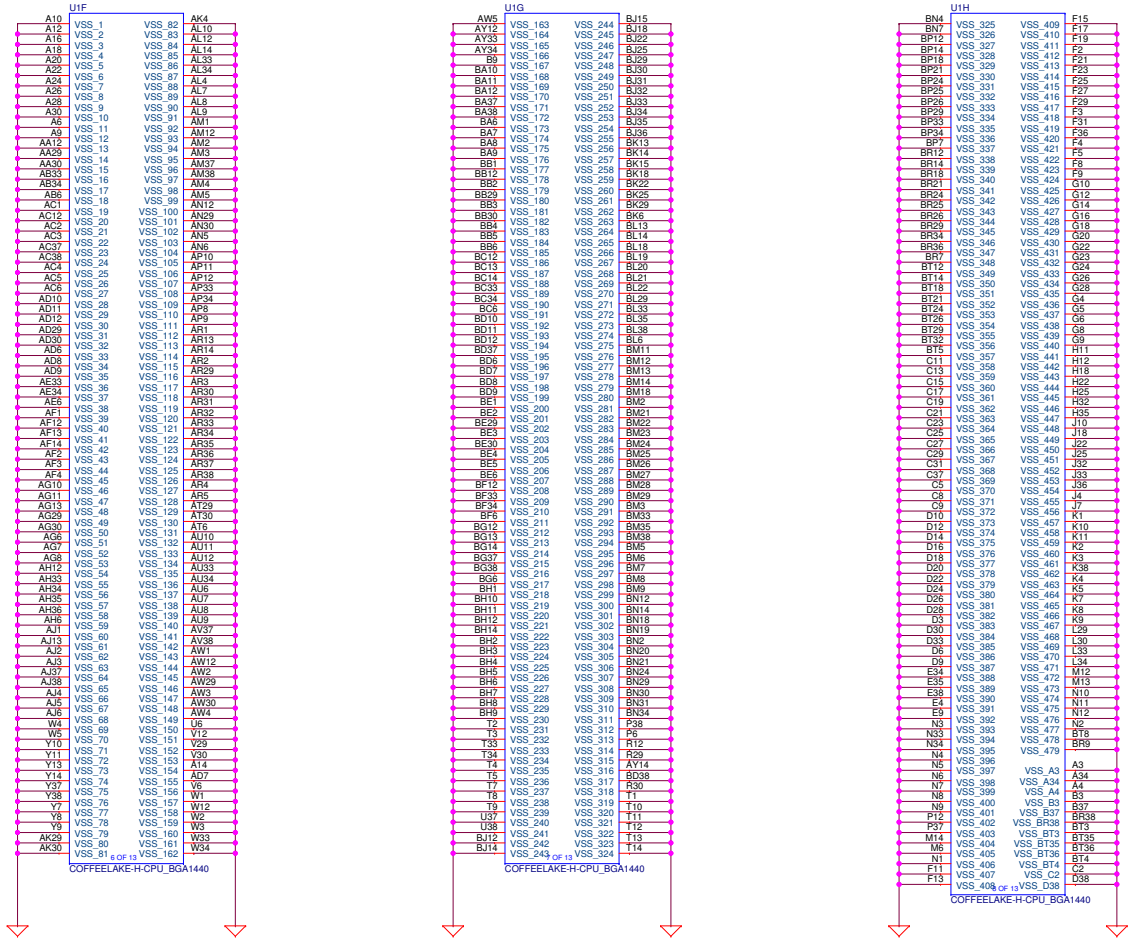
CFG[7] : PEG Training
1 : PEG Train immediately following RESET# deassertion <---------- LOGIC
0 : PEG Wait for BIOS for training

CFG[19:8] : Reserved

For x16 Reversal Lanes - CFG[6/5/2] setting is 110
For x4 Reversal Lanes - CFG[6/5/2] setting is 000

VCCST_PWRGD requirements
1) Indication that the VCCST\VDDQ power supplies are stable and within specification
2) VCCST_PWRGD must go low during Sx pwr states, regardless of the voltage level of VCCST
3) VCCST_PWRGD can assert before or equal to PCH_PWROK, but must never lag it.

CPU



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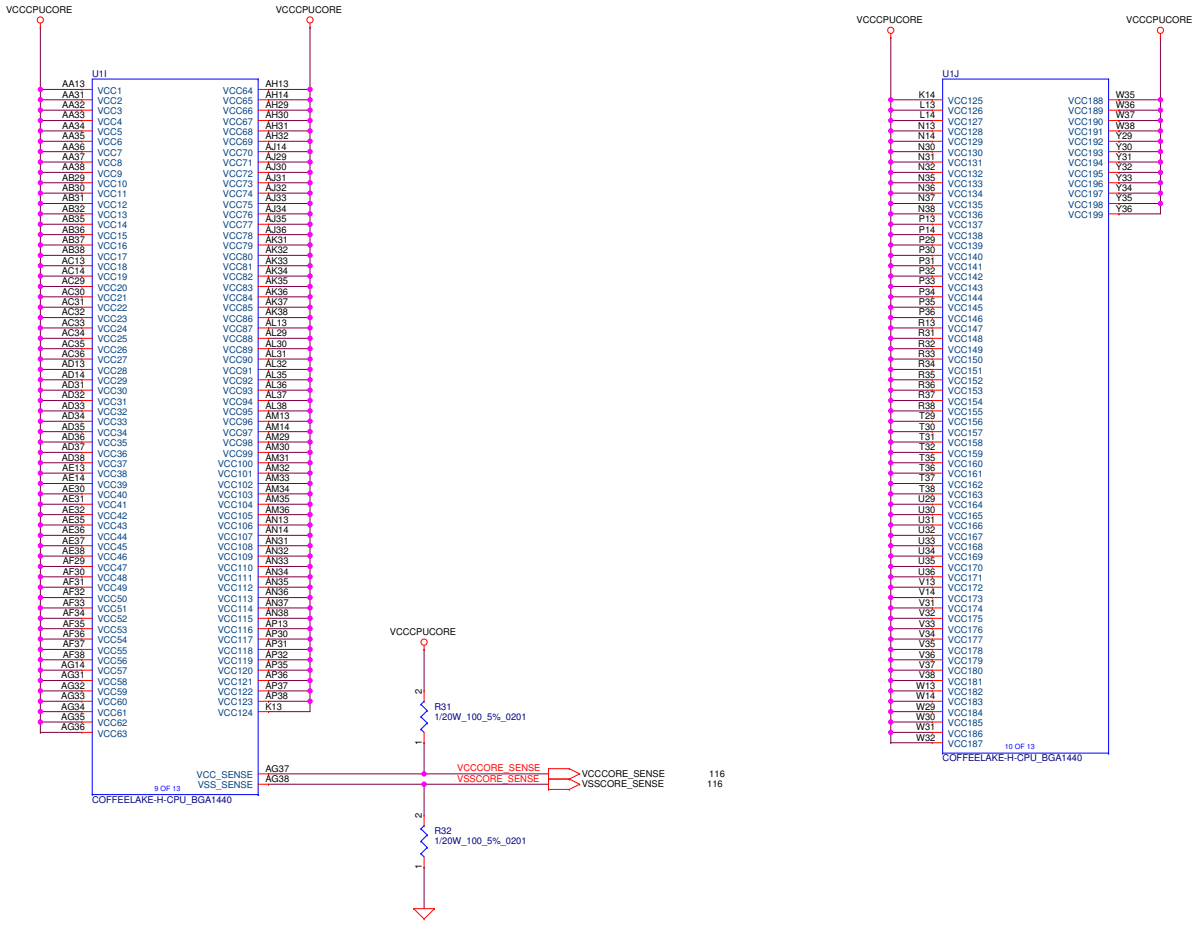
CPU



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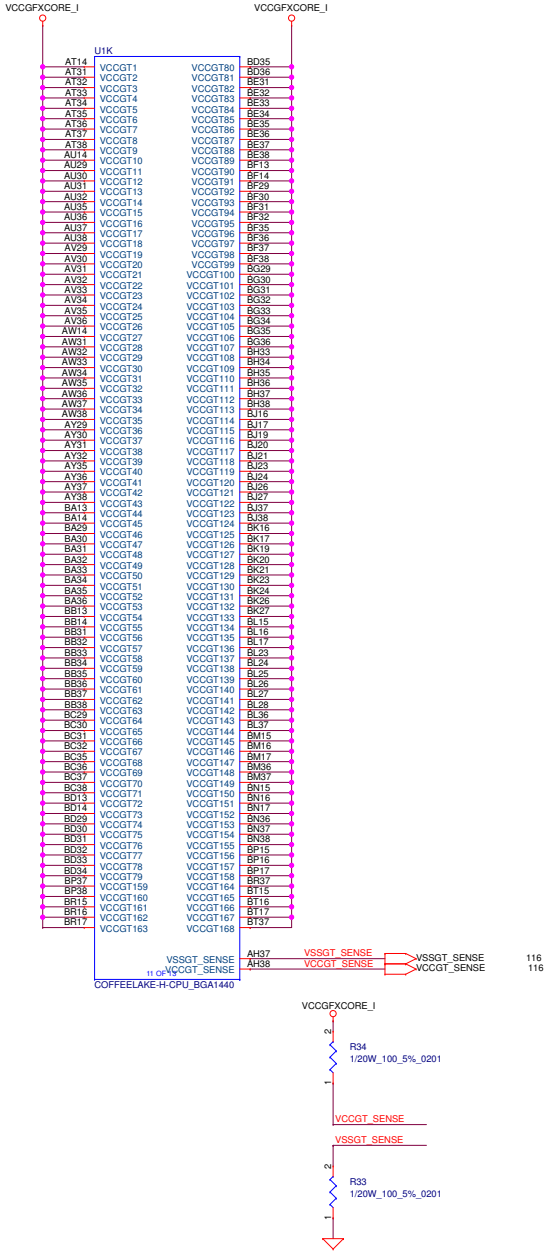
CPU



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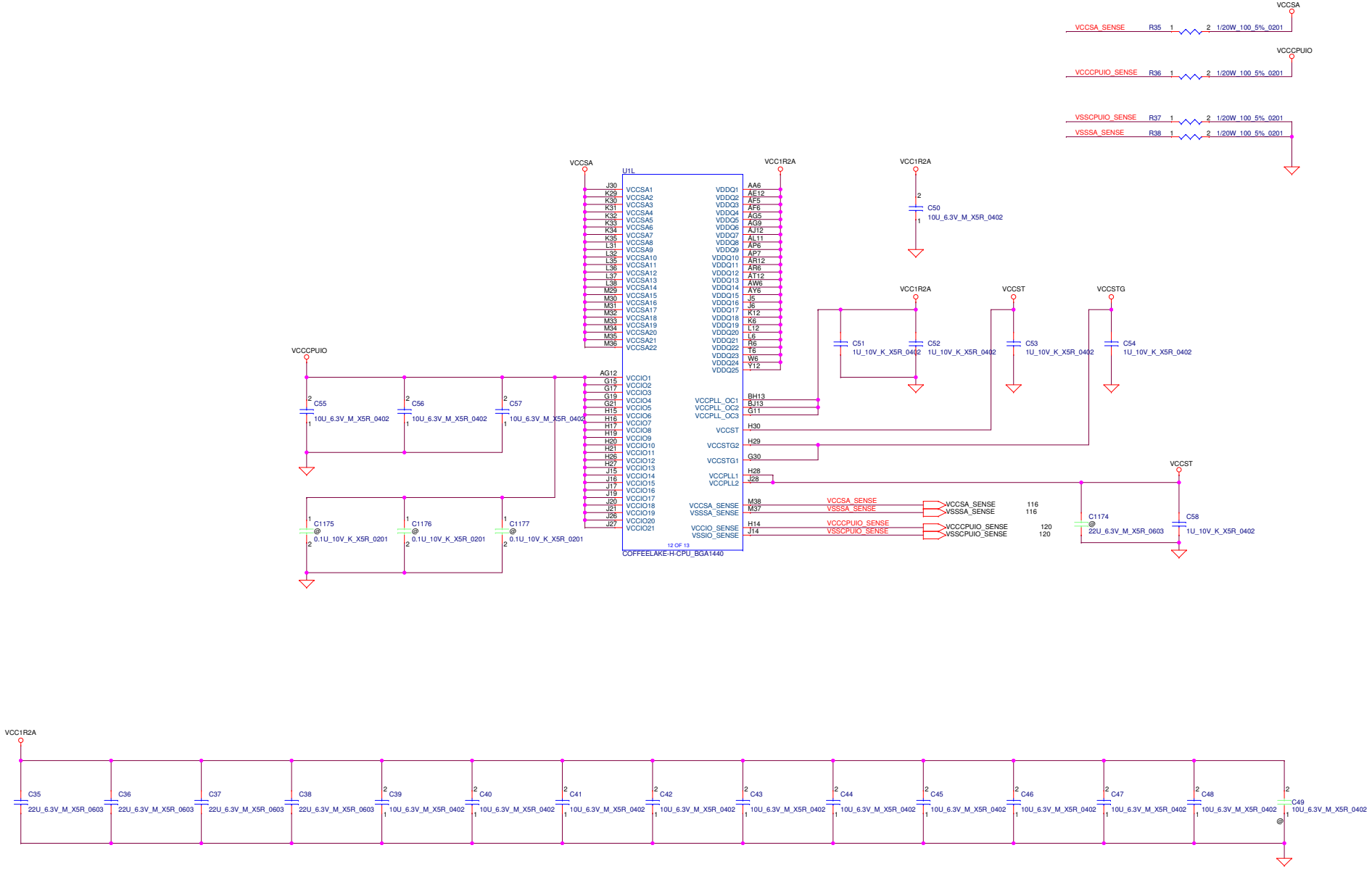
CPU



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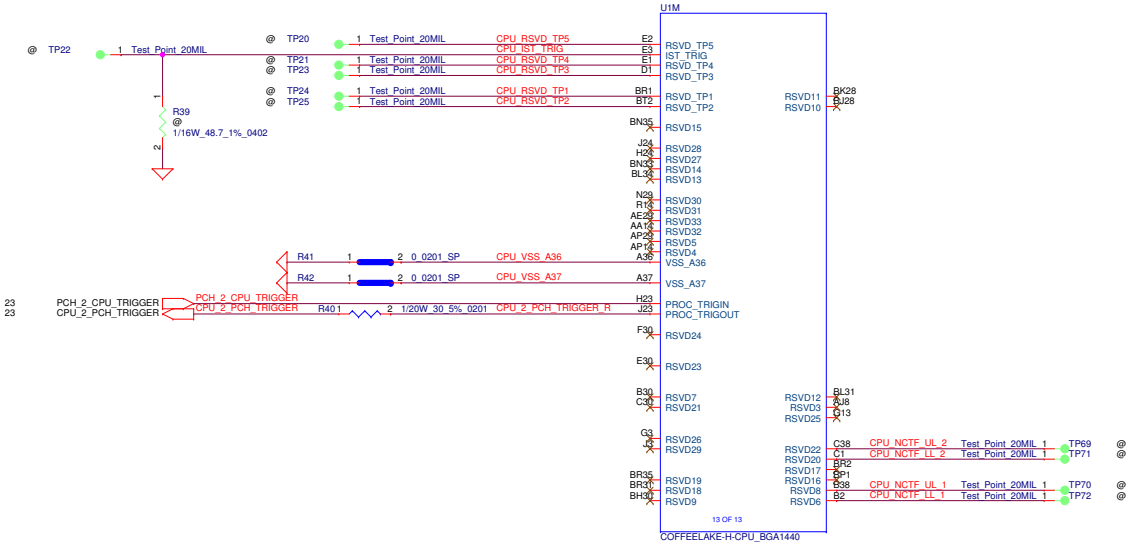
CPU



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LCFC

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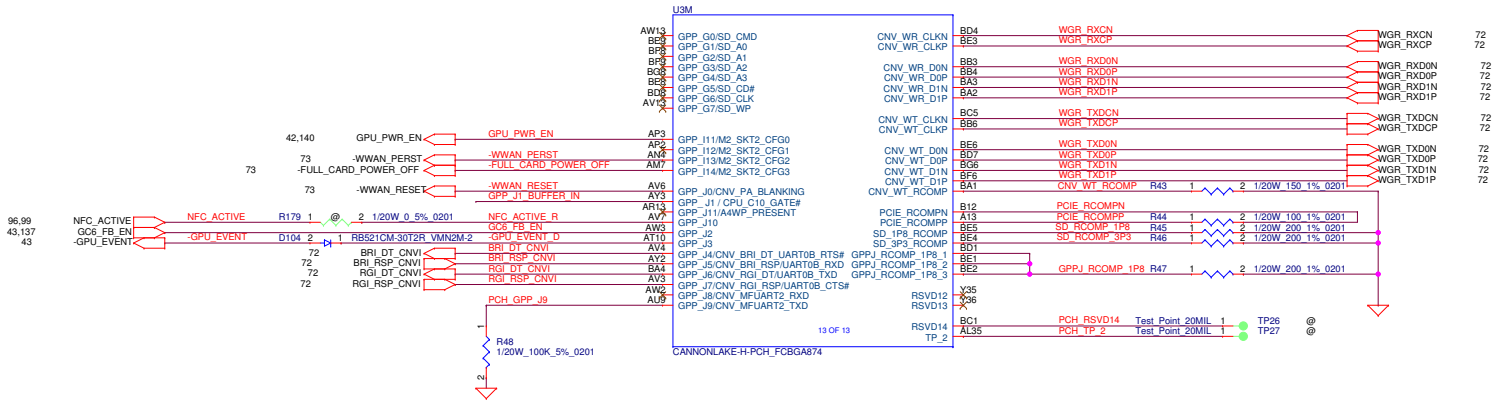
PCH



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PCH

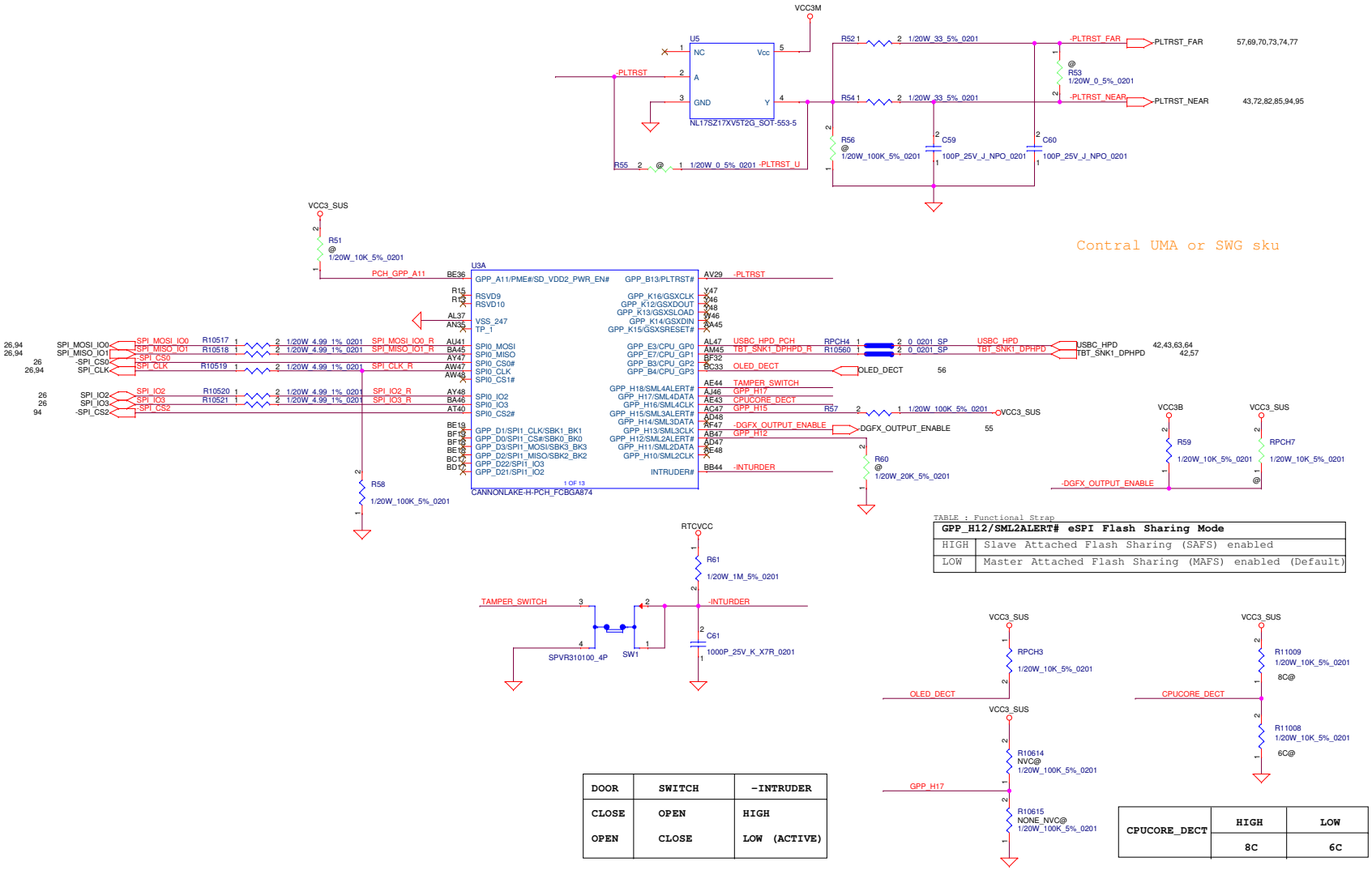


TABLE : Functional Strap

GPP_H12/SML2ALERT# eSPI Flash Sharing Mode	
HIGH	Slave Attached Flash Sharing (SAFS) enabled
LOW	Master Attached Flash Sharing (MAFS) enabled (Default)

DOOR	SWITCH	-INTRUDER
CLOSE	OPEN	HIGH
OPEN	CLOSE	LOW (ACTIVE)

CPUCORE_DECT	HIGH	LOW
	8C	6C

LC Future Center Secret Data

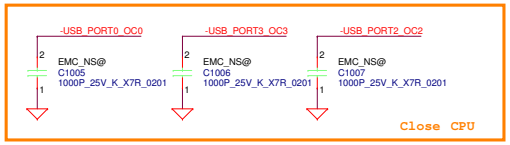
Project Name: Nighthawk-1

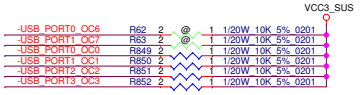
Rev 1.0

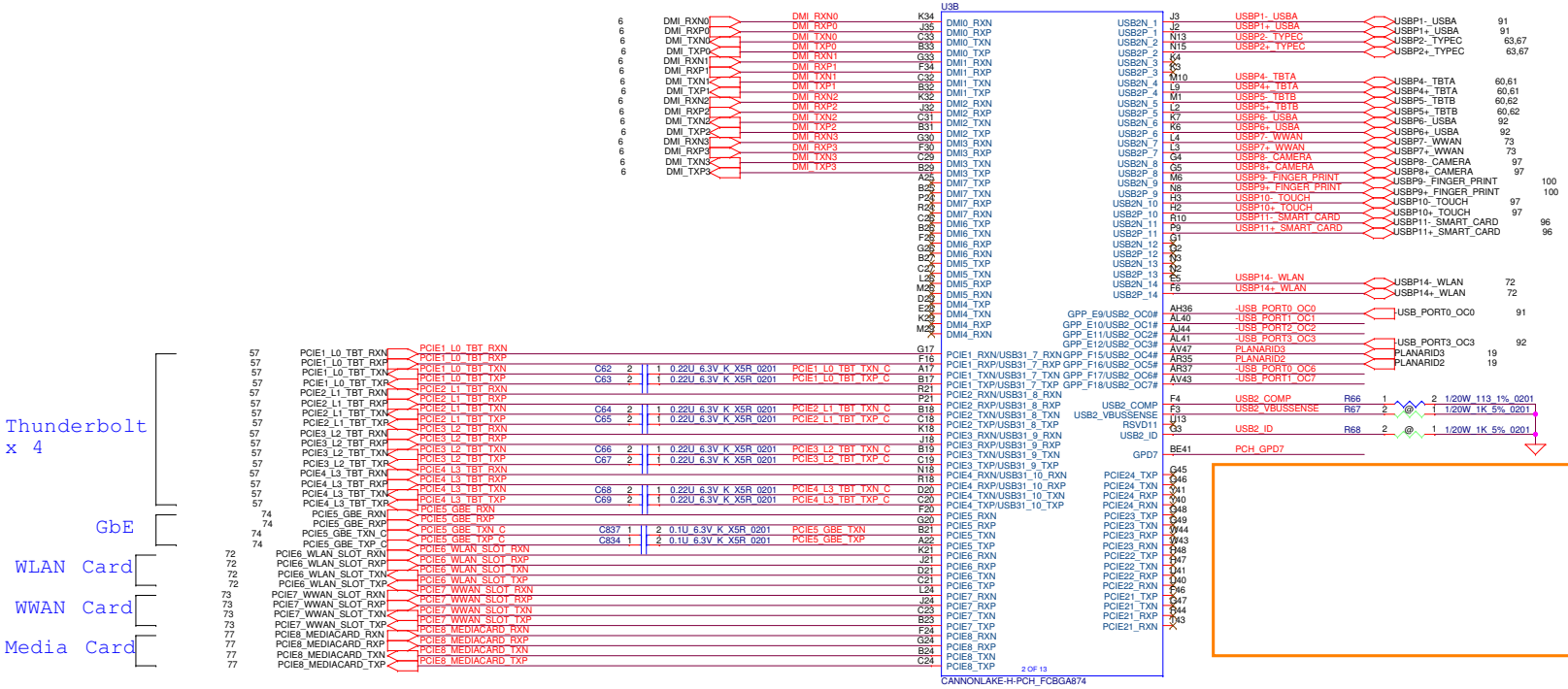
Title: PCH

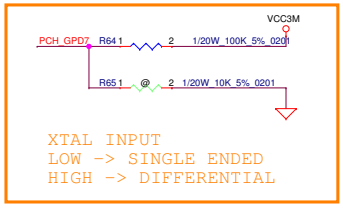
Date: Thursday, April 25, 2019

PCH









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Project Name: Nighthawk-1

Rev 1.0

Title: PCH

Date: Thursday, April 25, 2019

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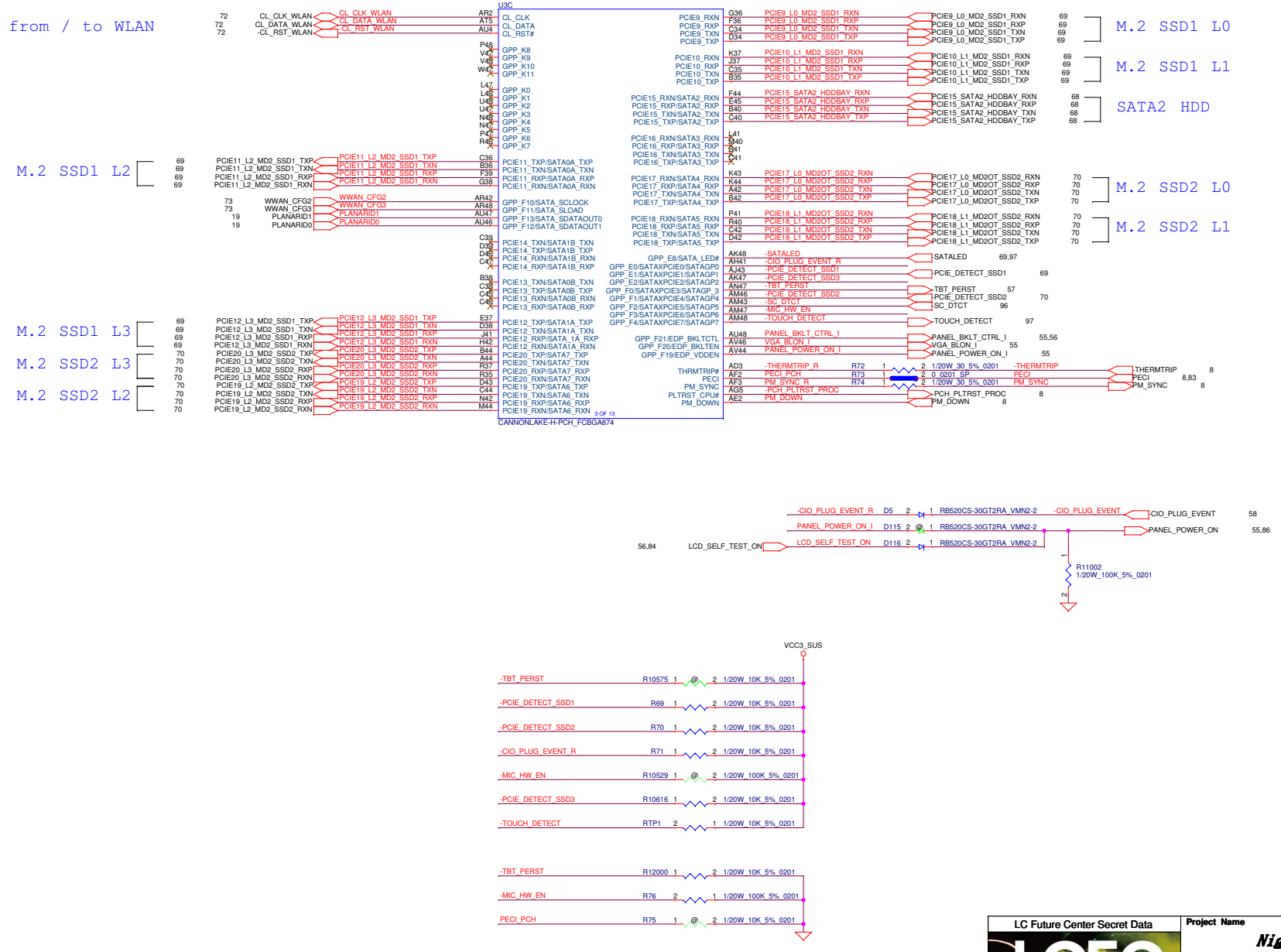
PCH



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Project Name	Nighthawk-1
Rev	1.0
Title	PCH
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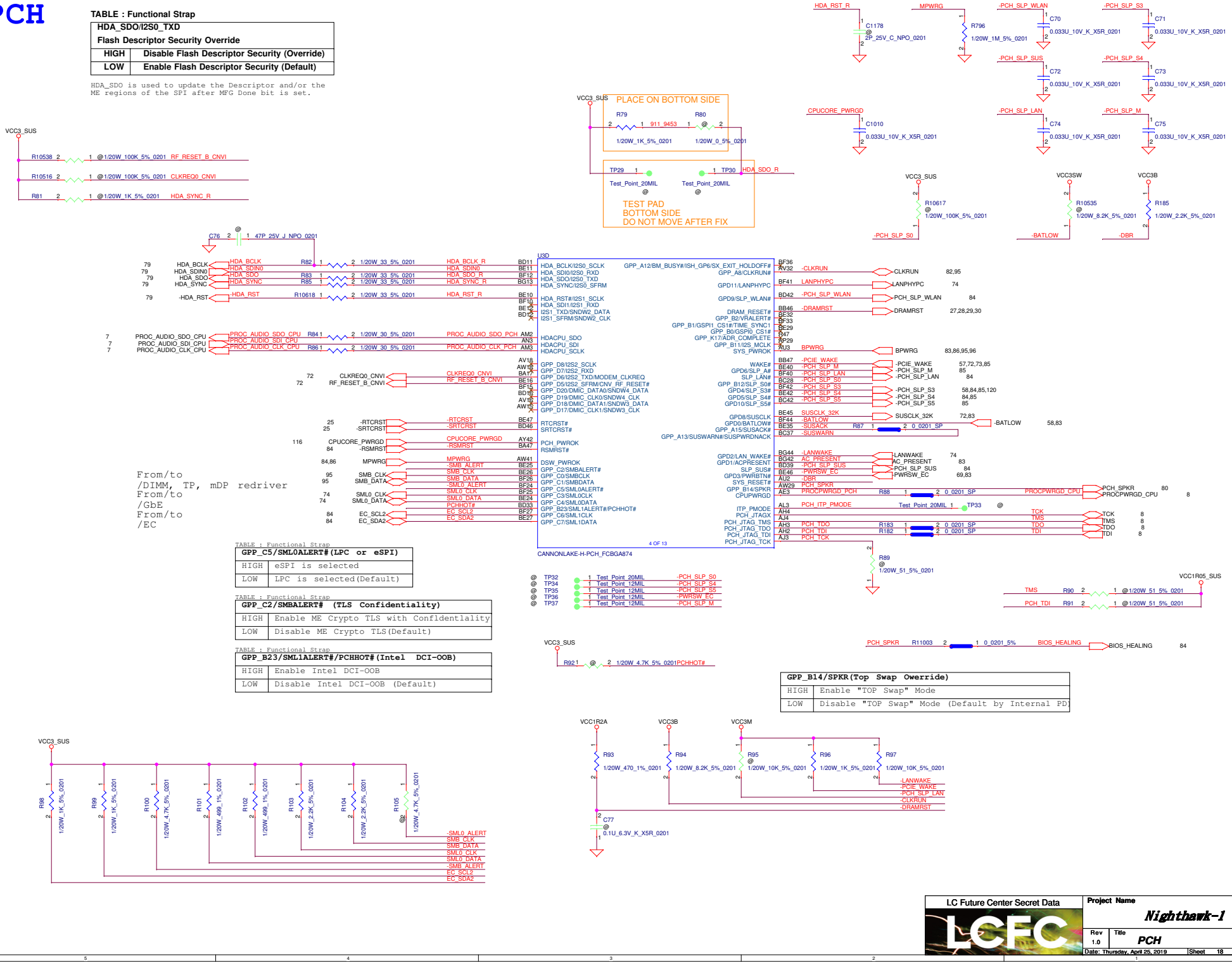
PCH

TABLE : Functional Strap

HDA_SDO/I2S0_TXD	
Flash Descriptor Security Override	
HIGH	Disable Flash Descriptor Security (Override)
LOW	Enable Flash Descriptor Security (Default)

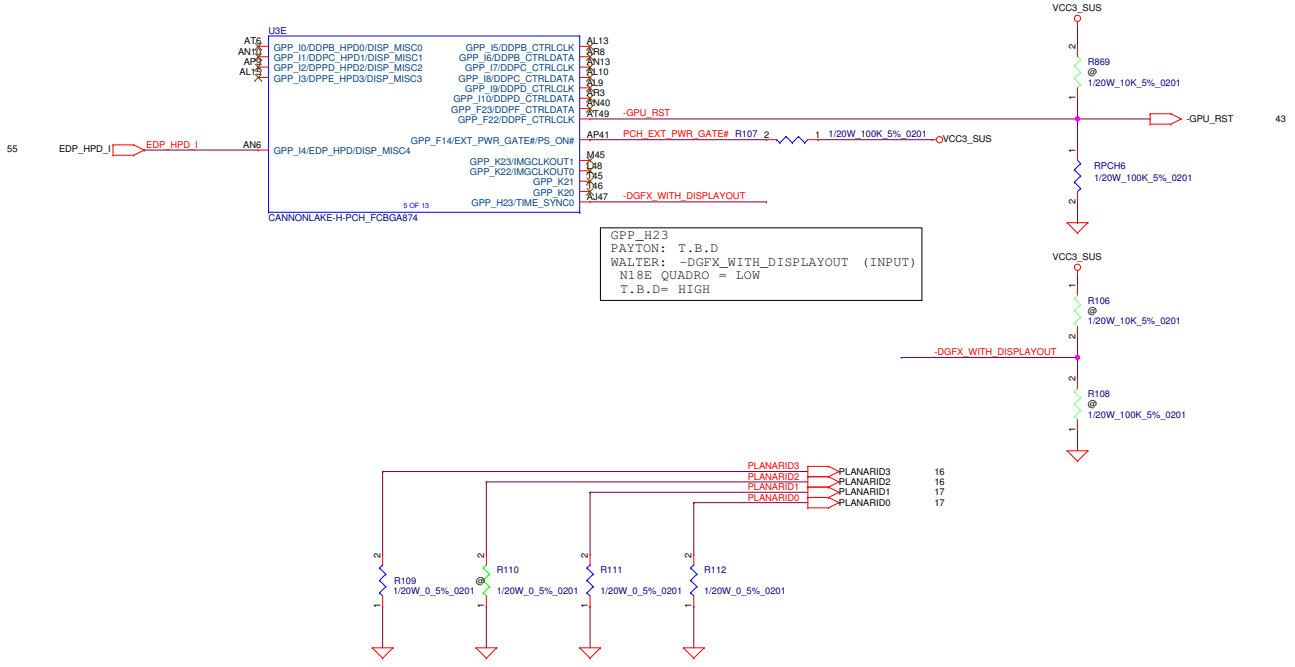
HDA_SDO is used to update the Descriptor and/or the ME regions of the SPI after MFG Done bit is set.



LC Future Center Secret Data

Project Name	
Nighthawk-1	
Rev 1.0	Title: PCH
Date: Thursday, April 25, 2019	Sheet 18 of 142

PCH



GPP_H23
PAYTON: T.B.D
WALTER: -DGFX_WITH_DISPLAYOUT (INPUT)
N18E QUADRO = LOW
T.B.D= HIGH

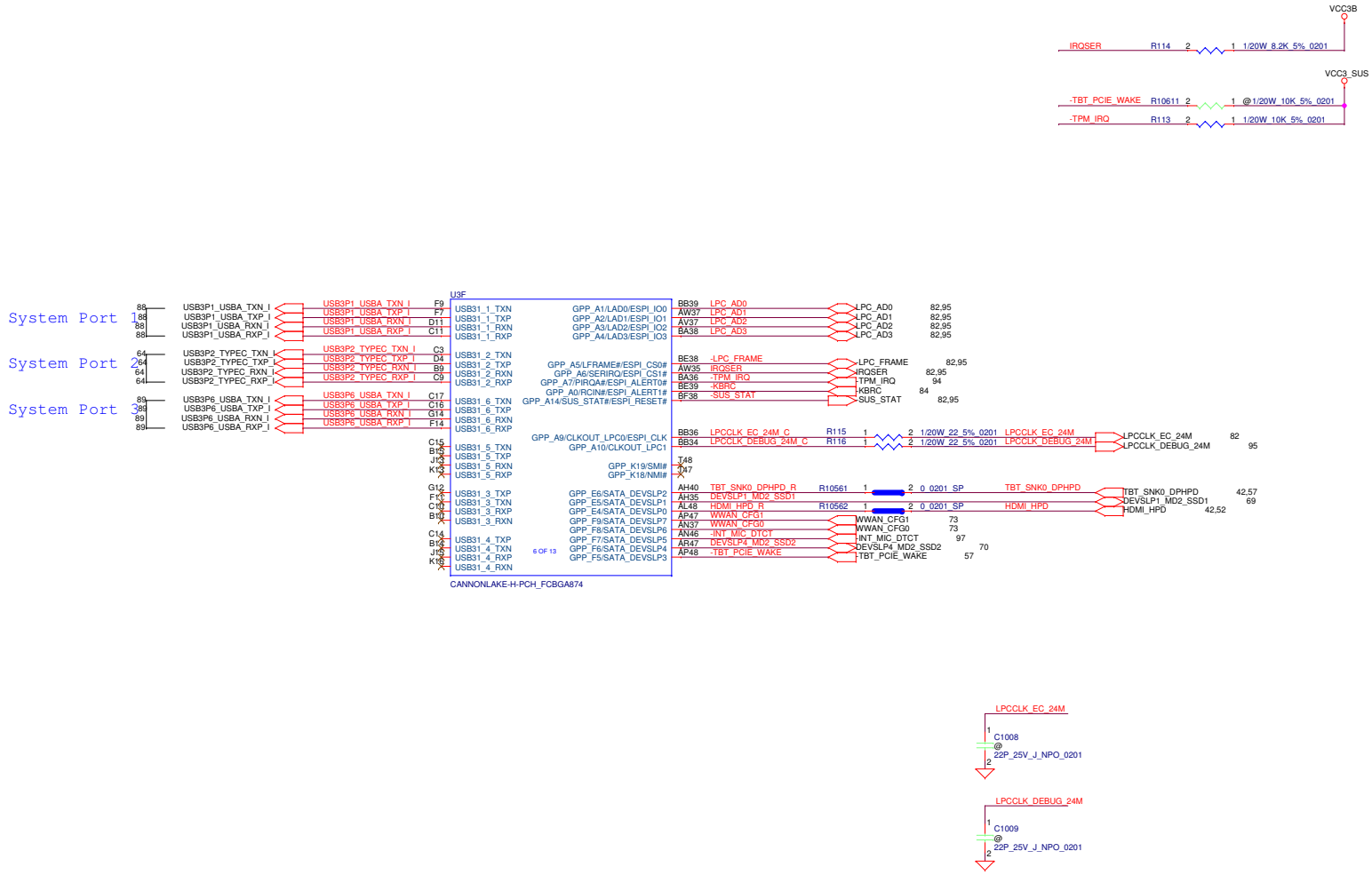
TABLE

	PLANAR ID			
	3	2	1	0
	R109	R110	R111	R112
1	NA	NA	NA	NA
0	ASM	ASM	ASM	ASM

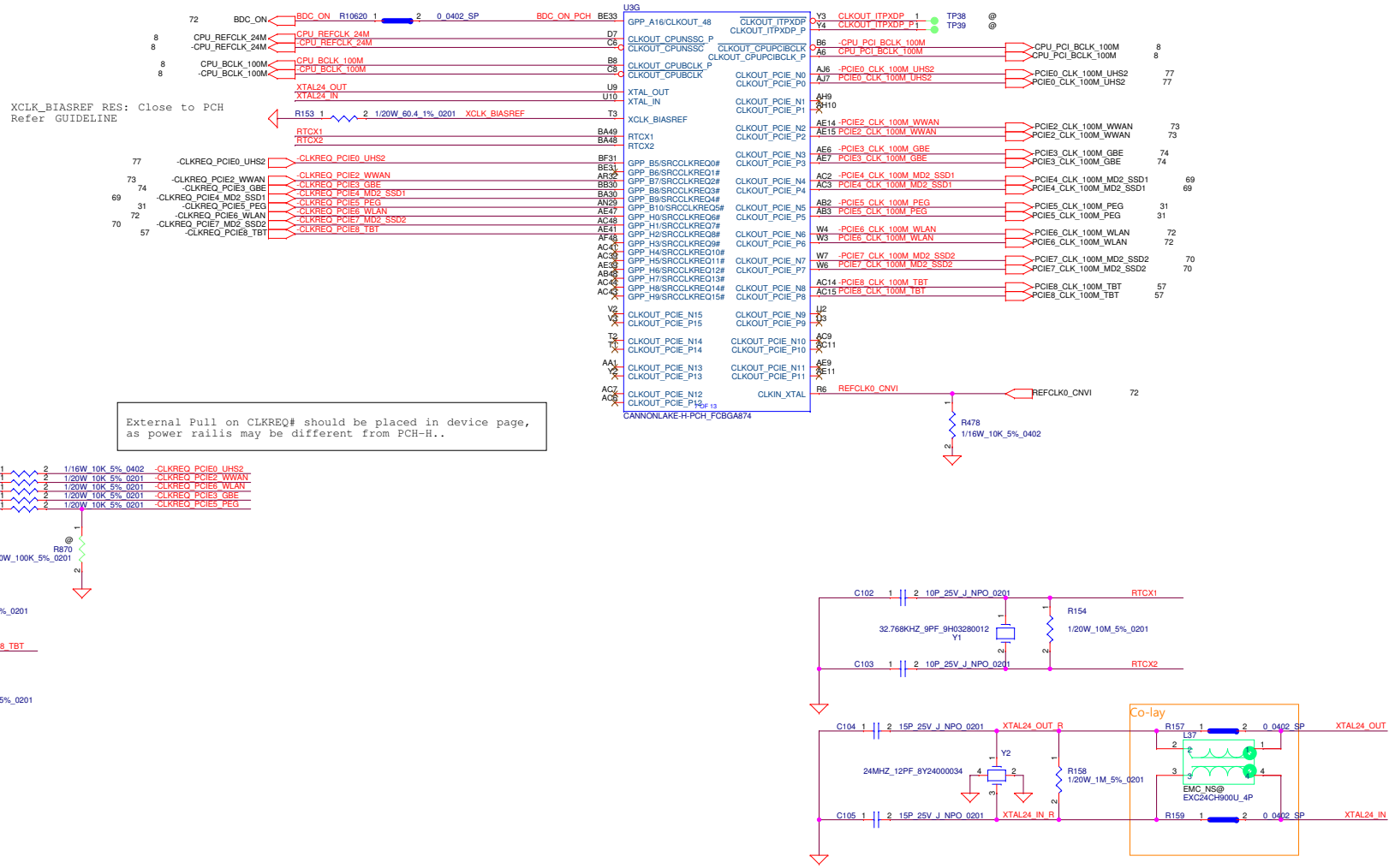
TABLE

LEVEL	PLANARID[3..0]	CPU	PCH
PDV	--------	--------	--------
SDV	0001b	ES	ES
FVT	0010b	ES	ES
SIT	0011b	QS	QS
SVT	0100b	QS	QS

PCH


VCC3B
IRQSER R114 2 1 1/20W 8.2K 5% 0201
VCC3_SUS
-TBT_PCIE_WAKE R10611 2 1 @1/20W 10K 5% 0201
-TPM_IRQ R113 2 1 1/20W 10K 5% 0201
System Port 1
System Port 2
System Port 3
USB3P1_USBA_TXN_I
USB3P1_USBA_TXP_I
USB3P1_USBA_RXN_I
USB3P1_USBA_RXP_I
USB3P2_TYPEC_TXN_I
USB3P2_TYPEC_TXP_I
USB3P2_TYPEC_RXN_I
USB3P2_TYPEC_RXP_I
USB3P6_USBA_TXN_I
USB3P6_USBA_TXP_I
USB3P6_USBA_RXN_I
USB3P6_USBA_RXP_I
U3F
USB31_1_TXN
USB31_1_TXP
USB31_1_RXN
USB31_1_RXP
USB31_2_TXN
USB31_2_TXP
USB31_2_RXN
USB31_2_RXP
USB31_6_TXN
USB31_6_TXP
USB31_6_RXN
USB31_6_RXP
USB31_5_TXN
USB31_5_TXP
USB31_5_RXN
USB31_5_RXP
USB31_3_TXP
USB31_3_TXN
USB31_3_RXP
USB31_3_RXN
USB31_4_TXP
USB31_4_TXN
USB31_4_RXP
USB31_4_RXN
6 OF 13
GPP_A1/LAD0/ESPI_IO0
GPP_A2/LAD1/ESPI_IO1
GPP_A3/LAD2/ESPI_IO2
GPP_A4/LAD3/ESPI_IO3
GPP_A5/LFRAME#/ESPI_CS0#
GPP_A6/SERIRQ/ESPI_CS1#
GPP_A7/PIRQA#/ESPI_ALERT0#
GPP_A0/RCIN#/ESPI_ALERT1#
GPP_A14/SUS_STAT#/ESPI_RESET#
GPP_A9/CLKOUT_LPC0/ESPI_CLK
GPP_A10/CLKOUT_LPC1
GPP_K19/SMI#
GPP_K18/NMI#
GPP_E6/SATA_DEVSLP2
GPP_E5/SATA_DEVSLP1
GPP_E4/SATA_DEVSLP0
GPP_F9/SATA_DEVSLP7
GPP_F8/SATA_DEVSLP6
GPP_F7/SATA_DEVSLP5
GPP_F6/SATA_DEVSLP4
GPP_F5/SATA_DEVSLP3
CANNONLAKE-H-PCH_FCBGA874
LPC_AD0
LPC_AD1
LPC_AD2
LPC_AD3
-LPC_FRAME
IRQSER
-TPM_IRQ
-KBRC
-SUS_STAT
LPCCLK_EC_24M_C
LPCCLK_DEBUG_24M_C
R115
R116
1/20W 22 5% 0201
TBT_SNK0_DPHPD_R
R10561
HDMI_HPD_R
R10562
0 0201 SP
DEVSLP1_MD2_SSD1
WWAN_CFG1
WWAN_CFG0
-INT_MIC_DTCT
DEVSLP4_MD2_SSD2
-TBT_PCIE_WAKE
LPCCLK_EC_24M
LPCCLK_DEBUG_24M
TBT_SNK0_DPHPD
HDMI_HPD
C1008
C1009
@
22P_25V_J_NPO_0201

PCH



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Project Name	Nighthawk-1
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Title	PCH
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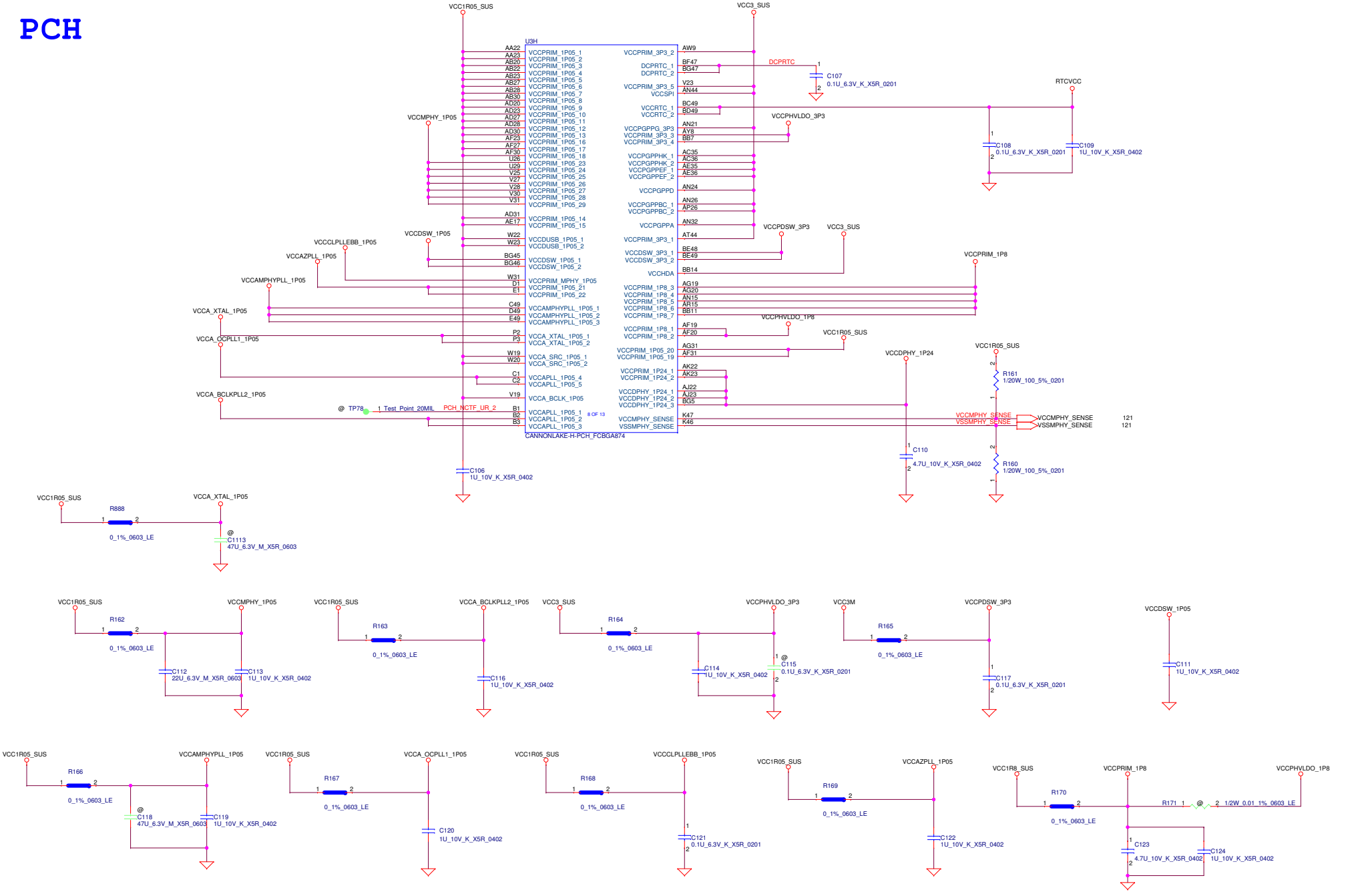
PCH



LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title PCH
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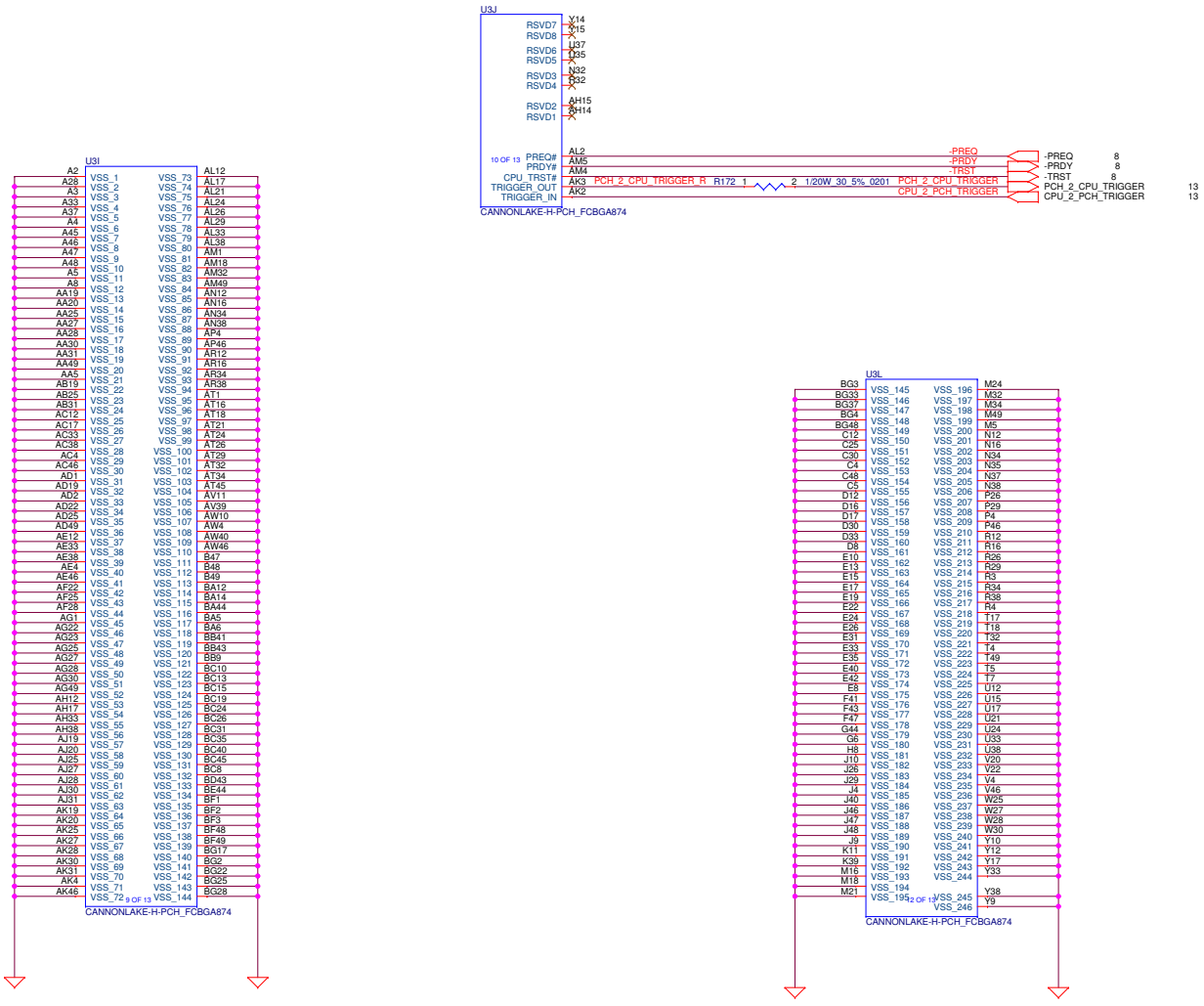
PCH



LC Future Center Secret Data	Project Name: Nighthawk-I	
	Rev: 1.0	Title: PCH
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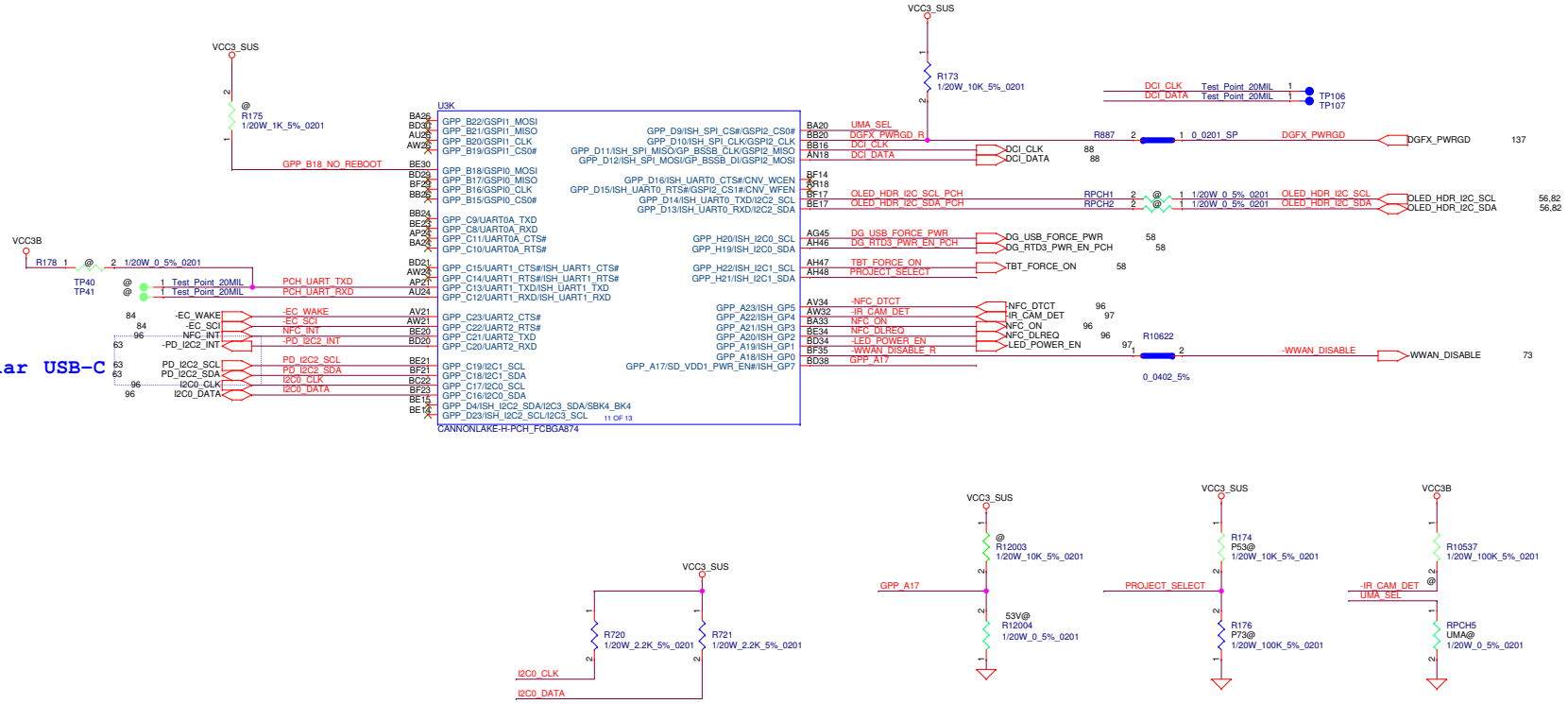
PCH

TABLE : Functional Strap

GPP_B18/GSPI0_MOSI (No Reboot)		PCHR96
HIGH	Enable "No Reboot" Mode	ASM
LOW	Disable "No Reboot" Mode (Default)	NO ASM

LOGIC

For Regular USB-C



LC Future Center Secret Data

Project Name	
Nighthawk-1	
Rev 1.0	Title: PCH
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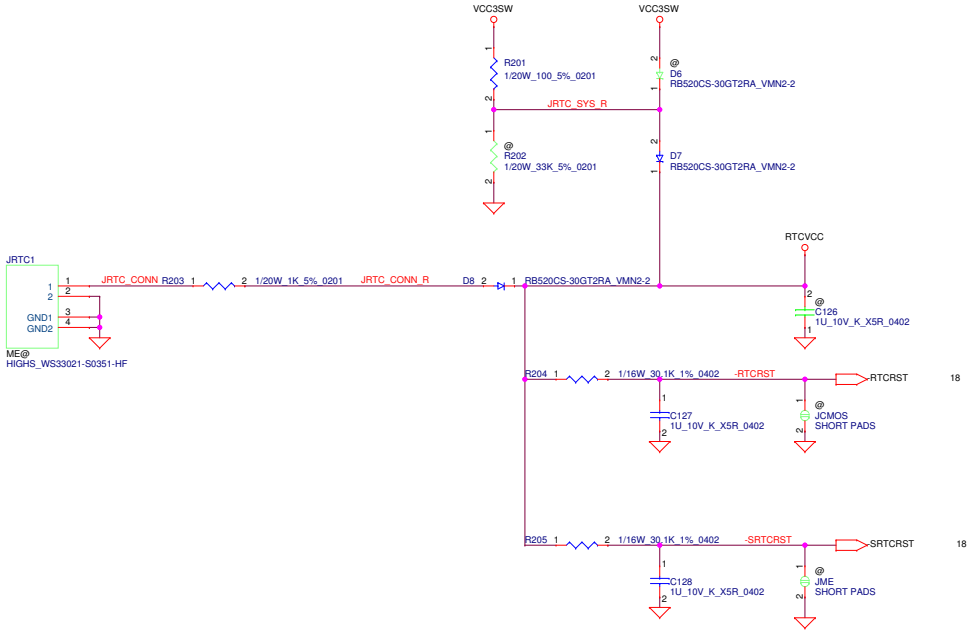
RTC



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Project Name	*Nighthawk-1*
Rev 1.0	Title: *RTC BATTERY*
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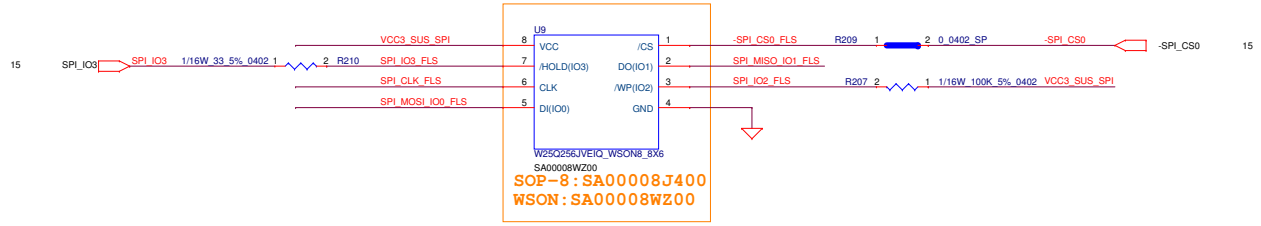
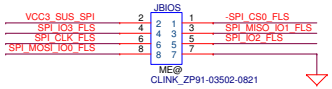
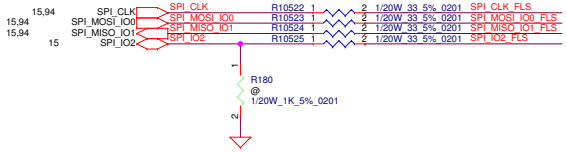
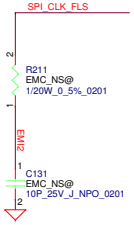
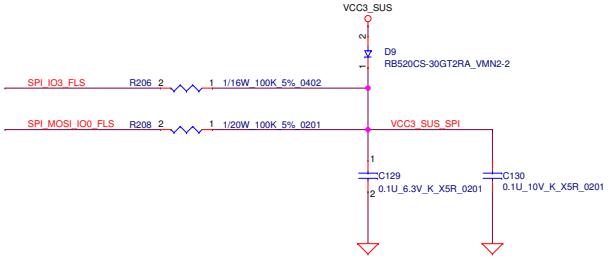
SPI FLASH











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Project Name	Nighthawk-1
Rev 1.0	Title SPI
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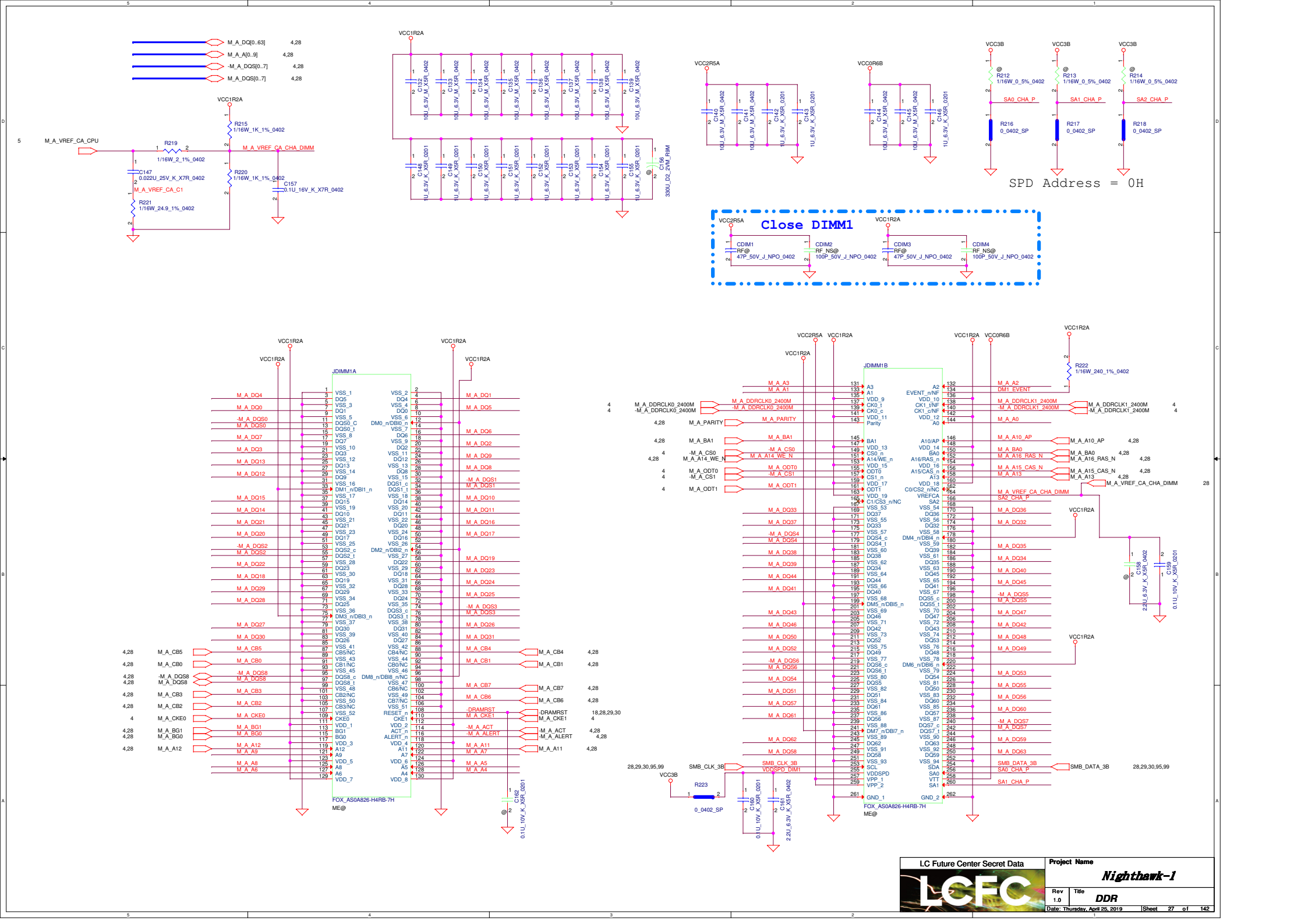

LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title DDR
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M_A_DQ[0..63] 4,27
M_A_A[0..9] 4,27
-M_A_DQS[0..7] 4,27
M_A_DQS[0..7] 4,27

VCC1R2A
C166 10U_6.3V_M_X5R_0402
C167 10U_6.3V_M_X5R_0402
C168 10U_6.3V_M_X5R_0402
C173 10U_6.3V_M_X5R_0402
C174 10U_6.3V_M_X5R_0402
C175 10U_6.3V_M_X5R_0402
C176 10U_6.3V_M_X5R_0402
C177 10U_6.3V_M_X5R_0402
C178 1U_6.3V_K_X5R_0201
C179 1U_6.3V_K_X5R_0201
C180 1U_6.3V_K_X5R_0201
C181 1U_6.3V_K_X5R_0201
C182 1U_6.3V_K_X5R_0201
C183 1U_6.3V_K_X5R_0201
C184 1U_6.3V_K_X5R_0201
C185 1U_6.3V_K_X5R_0201

VCC2R5A
C163 10U_6.3V_M_X5R_0402
C164 10U_6.3V_M_X5R_0402
C169 1U_6.3V_K_X5R_0201
C170 1U_6.3V_K_X5R_0201

VCC0R6B
C171 10U_6.3V_M_X5R_0402
C165 10U_6.3V_M_X5R_0402
C172 1U_6.3V_K_X5R_0201

VCC3B
R224 0_0402_SP — SA0_CHA_S
@R225 1/16W_0_5%_0402 — SA1_CHA_S
@R226 1/16W_0_5%_0402 — SA2_CHA_S
@R227 1/16W_0_5%_0402
R228 0_0402_SP
R229 0_0402_SP

SPD ADDRESS = 1H

Close DIMM2

VCC2R5A
CDIM5 RF@ 47P_50V_J_NPO_0402
CDIM6 RF_NS@ 100P_50V_J_NPO_0402
VCC1R2A
CDIM7 RF@ 47P_50V_J_NPO_0402
CDIM8 RF_NS@ 100P_50V_J_NPO_0402

JDIMM2A
FOX_AS0A826-H4SB-7H
ME@

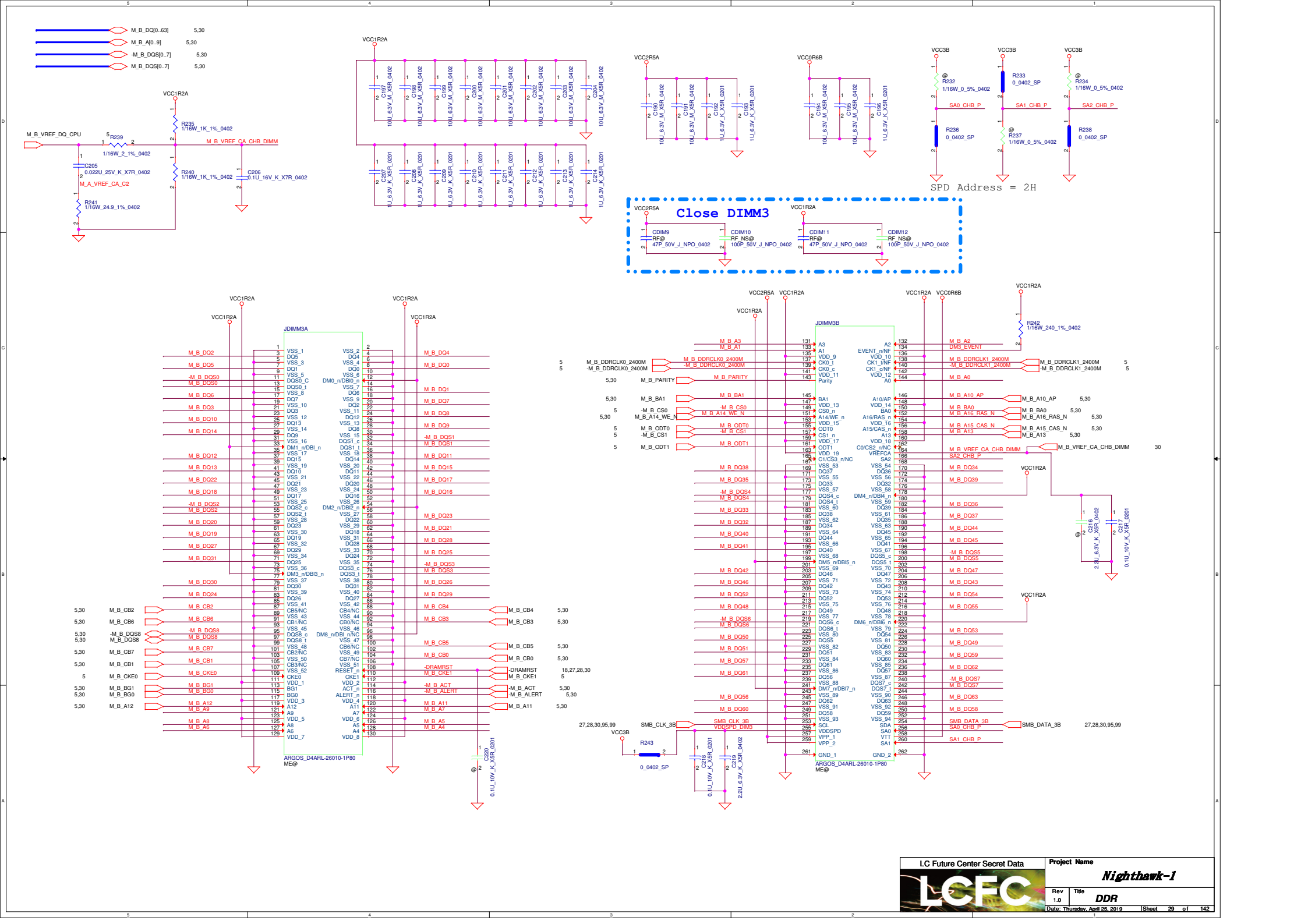
		1	VSS_1	VSS_2	2		
	M_A_DQ4	3	DQ5	DQ4	4	M_A_DQ1	
	M_A_DQ0	5	VSS_3	VSS_4	6	M_A_DQ5	
		7	DQ1	DQ0	8		
	-M_A_DQS0	9	VSS_5	VSS_6	10		
	M_A_DQS0	11	DQS0_C	DM0_n/DBIO_n	12		
		13	DQS0_t	VSS_7	14		
	M_A_DQ7	15	VSS_8	DQ6	16	M_A_DQ6	
	M_A_DQ3	17	DQ7	VSS_9	18	M_A_DQ2	
		19	VSS_10	DQ2	20		
	M_A_DQ13	21	DQ3	VSS_11	22	M_A_DQ9	
	M_A_DQ12	23	VSS_12	DQ12	24	M_A_DQ8	
		25	DQ13	VSS_13	26		
		27	VSS_14	DQ8	28		
		29	DQ9	VSS_15	30		
		31	VSS_16	DQS1_c	32	-M_A_DQS1	
		33	DM1_n/DBI1_n	DQS1_t	34	M_A_DQS1	
	M_A_DQ15	35	VSS_17	VSS_18	36	M_A_DQ10	
	M_A_DQ14	37	DQ15	DQ14	38	M_A_DQ11	
	M_A_DQ21	39	VSS_19	VSS_20	40	M_A_DQ16	
		41	DQ10	DQ11	42		
	M_A_DQ20	43	VSS_21	VSS_22	44	M_A_DQ17	
		45	DQ21	DQ20	46		
	-M_A_DQS2	47	VSS_23	VSS_24	48		
	M_A_DQS2	49	DQ17	DQ16	50		
		51	VSS_25	VSS_26	52		
	M_A_DQ22	53	DQS2_c	DM2_n/DBI2_n	54		
	M_A_DQ18	55	DQS2_t	VSS_27	56	M_A_DQ19	
		57	VSS_28	DQ22	58		
	M_A_DQ29	59	DQ23	VSS_29	60	M_A_DQ23	
	M_A_DQ28	61	VSS_30	DQ18	62	M_A_DQ24	
		63	DQ19	VSS_31	64		
		65	VSS_32	DQ28	66		
		67	DQ29	VSS_33	68	M_A_DQ25	
		69	VSS_34	DQ24	70		
		71	DQ25	VSS_35	72	-M_A_DQS3	
		73	VSS_36	DQS3_c	74	M_A_DQS3	
	M_A_DQ27	75	DM3_n/DBI3_n	DQS3_t	76		
	M_A_DQ30	77	VSS_37	VSS_38	78	M_A_DQ26	
		79	DQ30	DQ31	80		
	M_A_CB5	81	VSS_39	VSS_40	82	M_A_DQ31	
4,27 M_A_CB5		83	DQ26	DQ27	84		
4,27 M_A_CB0	M_A_CB0	85	VSS_41	VSS_42	86	M_A_CB4	M_A_CB4 4,27
		87	CB5/NC	CB4/NC	88		
	-M_A_DQS8	89	VSS_43	VSS_44	90	M_A_CB1	M_A_CB1 4,27
4,27 -M_A_DQS8	M_A_DQS8	91	CB1/NC	CB0/NC	92		
4,27 M_A_DQS8		93	VSS_45	VSS_46	94		
	M_A_CB3	95	DQS8_c	DBI8_n	96		
4,27 M_A_CB3		97	DQS8_t	VSS_47	98	M_A_CB7	M_A_CB7 4,27
	M_A_CB2	99	VSS_48	CB6/NC	100		
4,27 M_A_CB2		101	CB2/NC	VSS_49	102	M_A_CB6	M_A_CB6 4,27
	M_A_CKE2	103	VSS_50	CB7/NC	104		
4 M_A_CKE2		105	CB3/NC	VSS_51	106		
		107	VSS_52	RESET_n	108	-DRAMRST	-DRAMRST 18,27,29,30
	M_A_BG1	109	CKE0	CKE1	110	M_A_CKE3	M_A_CKE3 4
4,27 M_A_BG1	M_A_BG0	111	VDD_1	VDD_2	112		
4,27 M_A_BG0		113	BG1	ACT_n	114	-M_A_ACT	-M_A_ACT 4,27
		115	BG0	ALERT_n	116	-M_A_ALERT	-M_A_ALERT 4,27
	M_A_A12	117	VDD_3	VDD_4	118		
4,27 M_A_A12	M_A_A9	119	A12	A11	120	M_A_A11	M_A_A11 4,27
		121	A9	A7	122	M_A_A7	
	M_A_A8	123	VDD_5	VDD_6	124		
	M_A_A6	125	A8	A5	126	M_A_A5	
		127	A6	A4	128	M_A_A4	
		129	VDD_7	VDD_8	130		

JDIMM2B
FOX_AS0A826-H4SB-7H
ME@

	M_A_A3	131	A3	A2	132	M_A_A2	
	M_A_A1	133	A1	EVENT_n	134	DIM2_EVENT	
		135	VDD_9	VDD_10	136		
4 M_A_DDRCLK2_2400M	M_A_DDRCLK2_2400M	137	CK0_t	CK1_t	138	M_A_DDRCLK3_2400M	M_A_DDRCLK3_2400M 4
4 -M_A_DDRCLK2_2400M	-M_A_DDRCLK2_2400M	139	CK0_c	CK1_c	140	-M_A_DDRCLK3_2400M	-M_A_DDRCLK3_2400M 4
		141	VDD_11	VDD_12	142		
4,27 M_A_PARITY	M_A_PARITY	143	Parity	A0	144	M_A_A0	
		145		A10/AP	146	M_A_A10_AP	M_A_A10_AP 4,27
4,27 M_A_BA1	M_A_BA1	147	BA1	VDD_14	148		
		149	VDD_13	BA0	150	M_A_BA0	
4 -M_A_CS2	-M_A_CS2	151	CS0_n	RAS_n/A16	152	M_A_A16_RAS_N	M_A_BA0 4,27
4,27 M_A_A14_WE_N	M_A_A14_WE_N	153	WE_n/A14	VDD_16	154		M_A_A16_RAS_N 4,27
		155	VDD_15	CAS_n/A15	156	M_A_A15_CAS_N	
4 M_A_ODT2	M_A_ODT2	157	ODT0	A13	158	M_A_A13	M_A_A15_CAS_N 4,27
4 -M_A_CS3	-M_A_CS3	159	CS1_n	VDD_17	160		M_A_A13 4,27
		161	VDD_18	VDD_17	162		
4 M_A_ODT3	M_A_ODT3	163	ODT1	C0/CS2_n/NC	164	M_A_VREF_CA_CHA_DIMM	M_A_VREF_CA_CHA_DIMM 27
		165	VDD_19	VREFCA	166	SA2_CHA_S	
		167	C1/CS3_n/NC	RFU	168		
	M_A_DQ33	169	VSS_53	VSS_54	170	M_A_DQ36	
	M_A_DQ37	171	DQ37	DQ36	172		
		173	VSS_55	VSS_56	174	M_A_DQ32	
	-M_A_DQS4	175	DQ33	DQ32	176		
	M_A_DQS4	177	VSS_57	VSS_58	178		
		179	DQS4_c	DM4_n/DBI4_n	180		
	M_A_DQ38	181	DQS4_t	VSS_59	182	M_A_DQ35	
		183	VSS_60	DQ39	184		
	M_A_DQ39	185	DQ38	VSS_61	186	M_A_DQ34	
		187	VSS_62	DQ35	188		
	M_A_DQ44	189	DQ34	VSS_63	190	M_A_DQ40	
		191	VSS_64	DQ45	192		
	M_A_DQ41	193	DQ44	VSS_65	194	M_A_DQ45	
		195	VSS_66	DQ41	196		
		197	DQ40	VSS_67	198	-M_A_DQS5	
		199	VSS_68	DQS5_c	200	M_A_DQS5	
	M_A_DQ43	201	DM5_n/DBI5_n	DQS5_t	202		
	M_A_DQ46	203	VSS_69	VSS_70	204	M_A_DQ47	
		205	DQ46	DQ47	206		
	M_A_DQ50	207	VSS_71	VSS_72	208	M_A_DQ42	
		209	DQ42	DQ43	210		
	M_A_DQ52	211	VSS_73	VSS_74	212	M_A_DQ48	
		213	DQ52	DQ53	214		
		215	VSS_75	VSS_76	216	M_A_DQ49	
	-M_A_DQS6	217	DQ49	DQ48	218		
	M_A_DQS6	219	VSS_77	VSS_78	220		
		221	DQS6_c	DM6_n/DBI6_n	222		
	M_A_DQ54	223	DQS6_t	VSS_79	224	M_A_DQ53	
		225	VSS_80	DQ54	226		
	M_A_DQ51	227	DQ55	VSS_81	228	M_A_DQ55	
		229	VSS_82	DQ50	230		
	M_A_DQ57	231	DQ51	VSS_83	232	M_A_DQ56	
		233	VSS_84	DQ60	234		
	M_A_DQ61	235	DQ61	VSS_85	236	M_A_DQ60	
		237	VSS_86	DQ57	238		
		239	DQ56	VSS_87	240	-M_A_DQS7	
		241	VSS_88	DQS7_c	242	M_A_DQS7	
	M_A_DQ62	243	DM7_n/DBI7_n	DQS7_t	244		
		245	VSS_89	VSS_90	246	M_A_DQ59	
	M_A_DQ58	247	DQ62	DQ63	248		
		249	VSS_91	VSS_92	250	M_A_DQ63	
		251	DQ58	DQ59	252		
		253	VSS_93	VSS_94	254	SMB_DATA_3B	SMB_DATA_3B 27,29,30,95,99
		255	SCL	SDA	256	SA0_CHA_S	
		257	VDDSPD	SA0	258		
		259	VPP_1	Vtt	260	SA1_CHA_S	
		261	VPP_2	SA1	262		
			GND_1	GND_2			

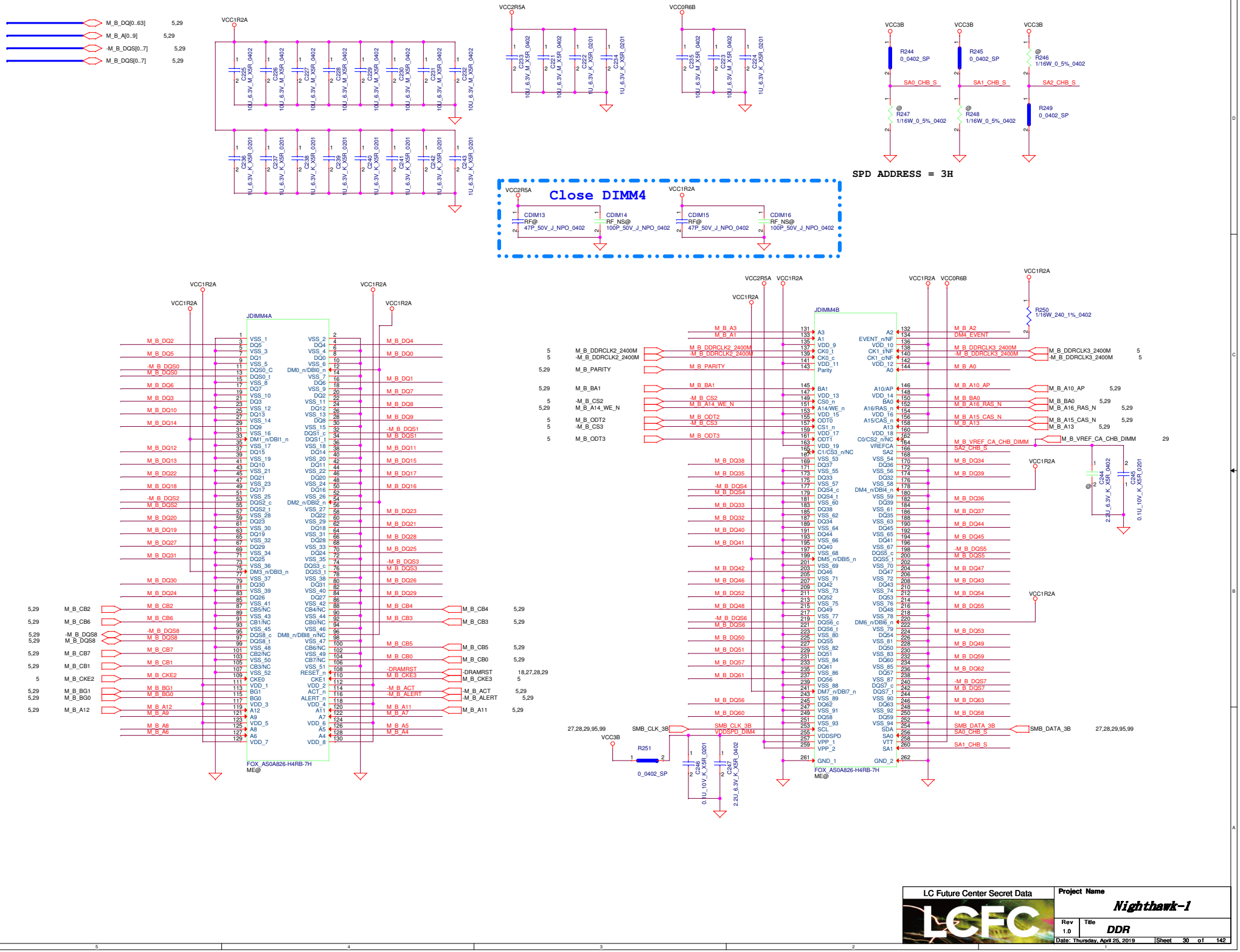
27,29,30,95,99 SMB_CLK_3B — SMB_CLK_3B — VDDSPD_DIM2
VCC3B
R231 0_0402_SP
C188 0.1U_10V_K_X5R_0201
C189 2.2U_6.3V_K_X5R_0402

VCC1R2A
R230 1/16W_240_1%_0402
C186 2.2U_6.3V_K_X5R_0402
C187 0.1U_10V_K_X5R_0201



LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title DDR
Date: Thursday, April 25, 2019	Sheet 29 of 142



LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title DDR
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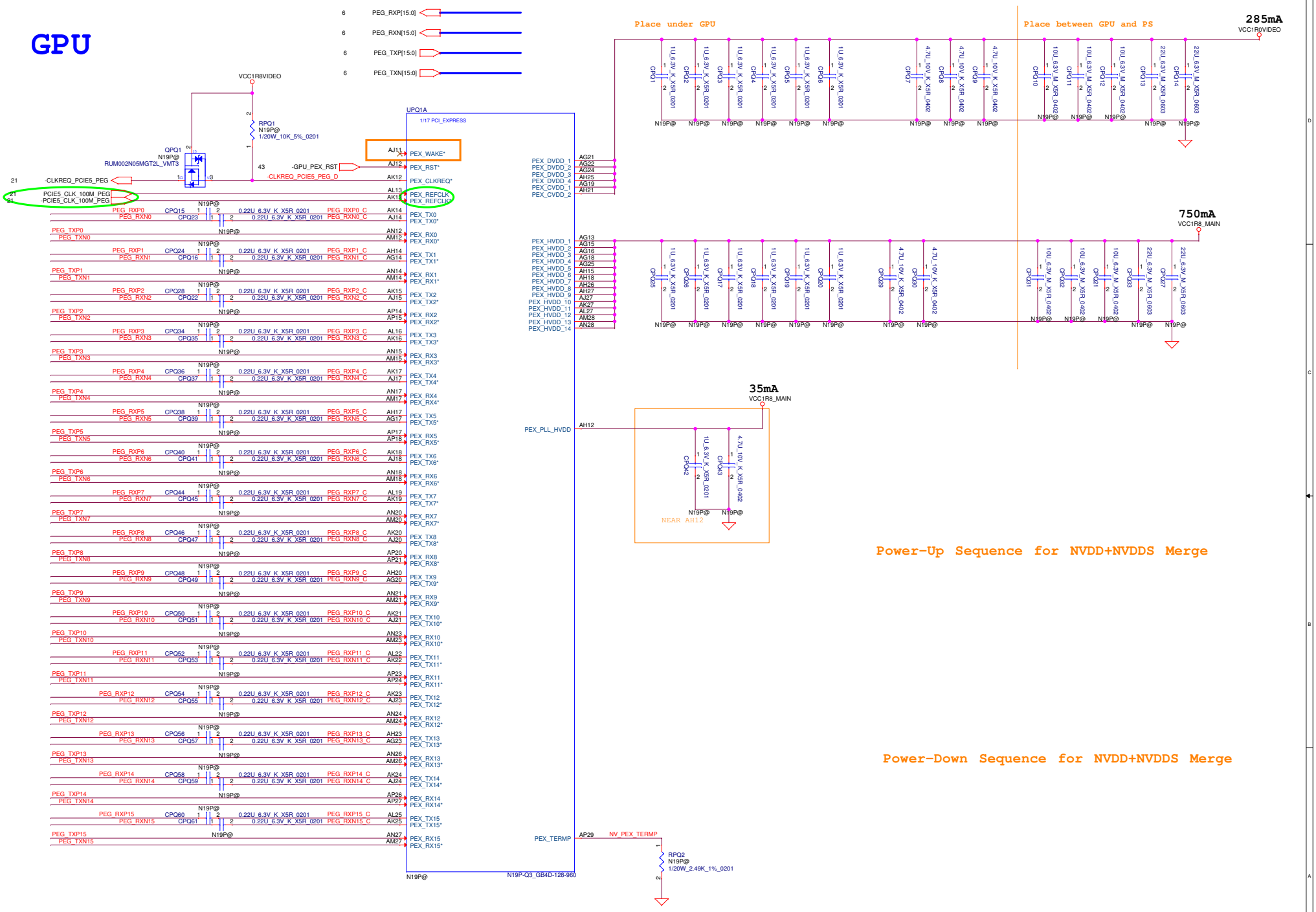
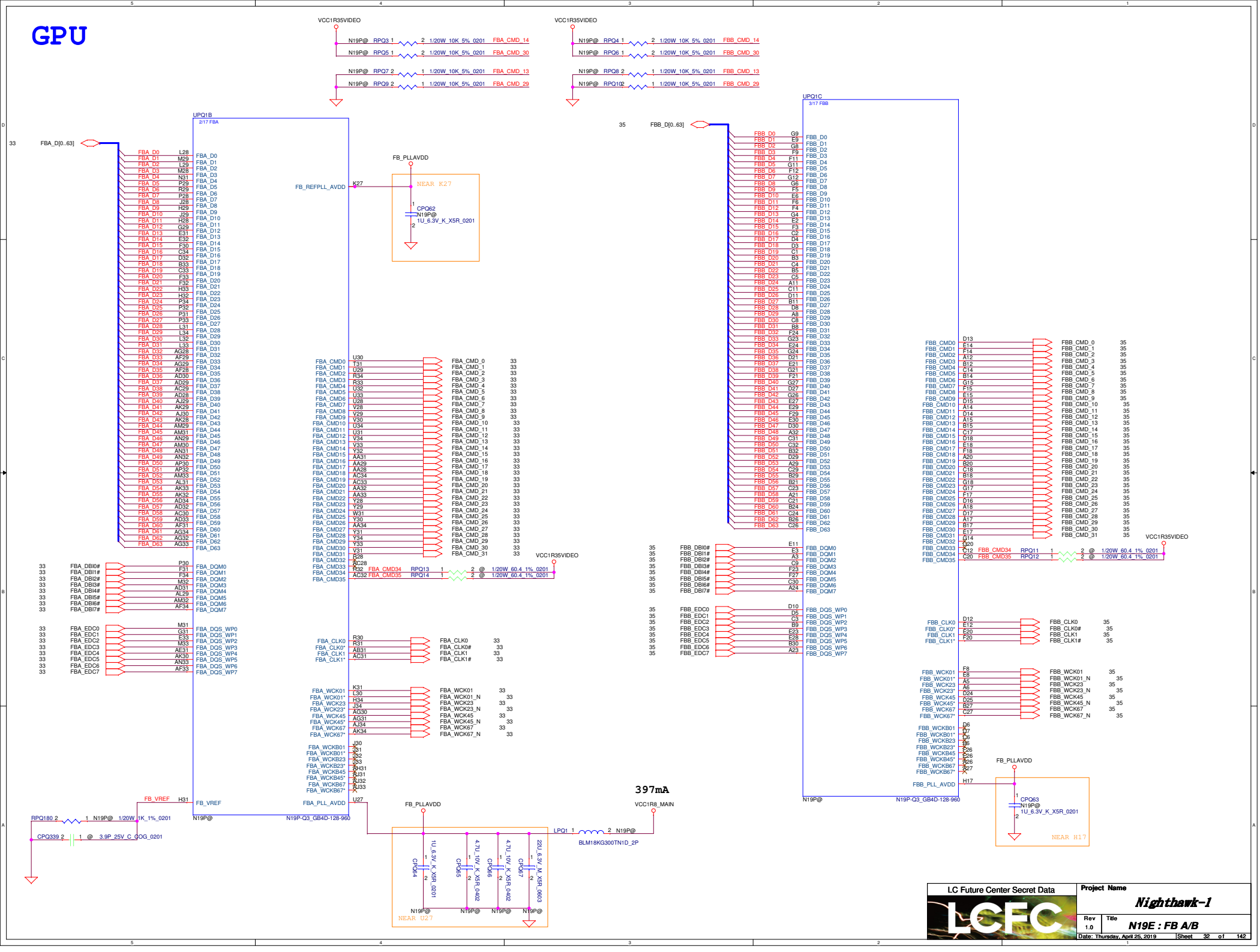
GPU



LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title N19E : PCI EXPREX
Date: Thursday, April 25, 2019	Sheet 31 of 142

GPU


VCC1R35VIDEO
N19P@ RPQ3 1
2 1/20W 10K 5% 0201 FBA_CMD_14
N19P@ RPQ5 1
2 1/20W 10K 5% 0201 FBA_CMD_30
N19P@ RPQ7 2
1 1/20W 10K 5% 0201 FBA_CMD_13
N19P@ RPQ9 2
1 1/20W 10K 5% 0201 FBA_CMD_29
VCC1R35VIDEO
N19P@ RPQ4 1
2 1/20W 10K 5% 0201 FBB_CMD_14
N19P@ RPQ6 1
2 1/20W 10K 5% 0201 FBB_CMD_30
N19P@ RPQ8 2
1 1/20W 10K 5% 0201 FBB_CMD_13
N19P@ RPQ10 2
1 1/20W 10K 5% 0201 FBB_CMD_29
UPQ1B
2/17 FBA
UPQ1C
3/17 FBB
FB_PLLAVDD
NEAR K27
CPQ62
N19P@
1U_6.3V_K_X5R_0201
FB_REFPLL_AVDD
K27
FBA_D[0..63]
FBB_D[0..63]
FBA_CMD0
FBA_CMD1
FBA_CMD2
FBA_CMD3
FBA_CMD4
FBA_CMD5
FBA_CMD6
FBA_CMD7
FBA_CMD8
FBA_CMD9
FBA_CMD10
FBA_CMD11
FBA_CMD12
FBA_CMD13
FBA_CMD14
FBA_CMD15
FBA_CMD16
FBA_CMD17
FBA_CMD18
FBA_CMD19
FBA_CMD20
FBA_CMD21
FBA_CMD22
FBA_CMD23
FBA_CMD24
FBA_CMD25
FBA_CMD26
FBA_CMD27
FBA_CMD28
FBA_CMD29
FBA_CMD30
FBA_CMD31
FBA_CMD32
FBA_CMD33
FBA_CMD34
FBA_CMD35
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FBB_CMD1
FBB_CMD2
FBB_CMD3
FBB_CMD4
FBB_CMD5
FBB_CMD6
FBB_CMD7
FBB_CMD8
FBB_CMD9
FBB_CMD10
FBB_CMD11
FBB_CMD12
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FBB_CMD30
FBB_CMD31
FBB_CMD32
FBB_CMD33
FBB_CMD34
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2 @ 1/20W 60.4 1% 0201
RPQ14 1
2 @ 1/20W 60.4 1% 0201
RPQ11 1
2 @ 1/20W 60.4 1% 0201
RPQ12 1
2 @ 1/20W 60.4 1% 0201
VCC1R35VIDEO
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FBA_DBI1#
FBA_DBI2#
FBA_DBI3#
FBA_DBI4#
FBA_DBI5#
FBA_DBI6#
FBA_DBI7#
FBA_DQM0
FBA_DQM1
FBA_DQM2
FBA_DQM3
FBA_DQM4
FBA_DQM5
FBA_DQM6
FBA_DQM7
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FBA_EDC1
FBA_EDC2
FBA_EDC3
FBA_EDC4
FBA_EDC5
FBA_EDC6
FBA_EDC7
FBA_DQS_WP0
FBA_DQS_WP1
FBA_DQS_WP2
FBA_DQS_WP3
FBA_DQS_WP4
FBA_DQS_WP5
FBA_DQS_WP6
FBA_DQS_WP7
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FBB_EDC2
FBB_EDC3
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FBB_EDC5
FBB_EDC6
FBB_EDC7
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FBB_DQS_WP6
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FBA_CLK0*
FBA_CLK1
FBA_CLK1*
FBA_CLK0
FBA_CLK0#
FBA_CLK1
FBA_CLK1#
FBB_CLK0
FBB_CLK0*
FBB_CLK1
FBB_CLK1*
FBB_CLK0
FBB_CLK0#
FBB_CLK1
FBB_CLK1#
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FBA_WCK01*
FBA_WCK23
FBA_WCK23*
FBA_WCK45
FBA_WCK45*
FBA_WCK67
FBA_WCK67*
FBA_WCK01
FBA_WCK01_N
FBA_WCK23
FBA_WCK23_N
FBA_WCK45
FBA_WCK45_N
FBA_WCK67
FBA_WCK67_N
FBB_WCK01
FBB_WCK01*
FBB_WCK23
FBB_WCK23*
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FBB_WCK45*
FBB_WCK67
FBB_WCK67*
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FBB_WCK01_N
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FBB_WCK67_N
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FBA_WCKB01*
FBA_WCKB23
FBA_WCKB23*
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FBB_WCKB67*
FBA_PLL_AVDD
FBB_PLL_AVDD
FB_PLLAVDD
CPQ63
N19P@
1U_6.3V_K_X5R_0201
NEAR H17
FB_VREF
RPQ180 2
1 N19P@ 1/20W 1K 1% 0201
CPQ339 2
1 @ 3.9P 25V C COG 0201
FB_PLLAVDD
CPQ64
1U_6.3V_K_X5R_0201
CPQ65
4.7U_10V_K_X5R_0402
CPQ66
4.7U_10V_K_X5R_0402
CPQ67
220_6.3V_M_X5R_0603
NEAR U27
397mA
VCC1R8_MAIN
LPQ1 1
2 N19P@
BLM18KG300TN1D_2P
N19P-Q3_GB4D-128-960
N19P-Q3_GB4D-128-960
LC Future Center Secret Data
Project Name
Nighthawk-1
Rev 1.0
Title
N19E : FB A/B
Date: Thursday, April 25, 2019
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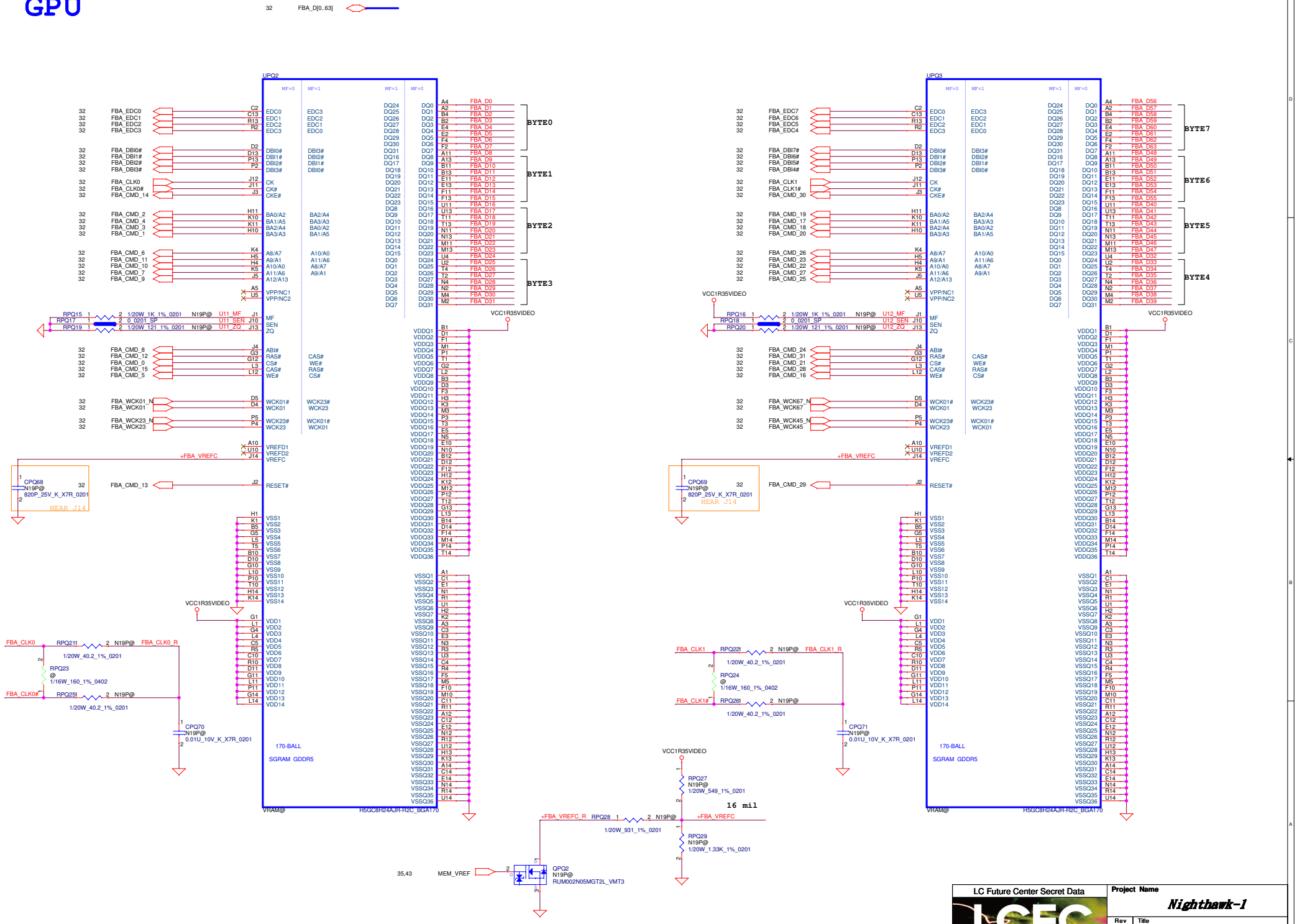
GPU



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Project Name	*Nighthawk-1*
Rev 1.0	Title: *N19E : VRAM CH_A*
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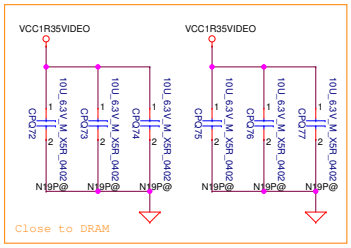
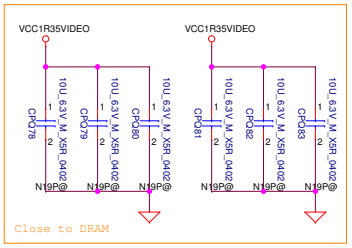
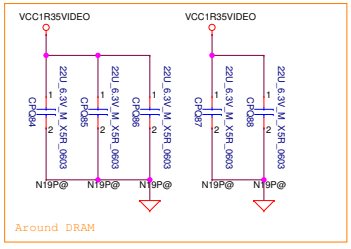
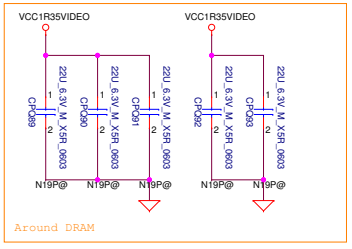
GPU

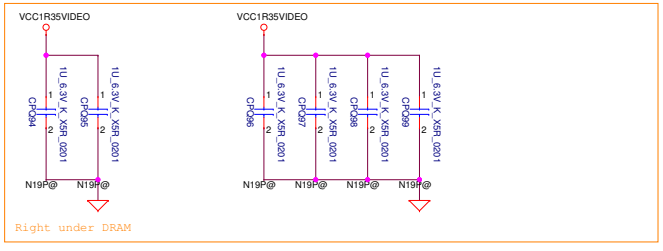


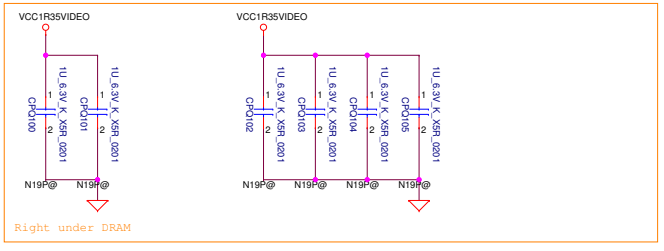


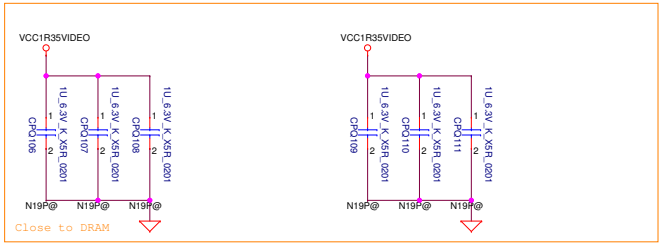
DG-08780-001_v03 P195

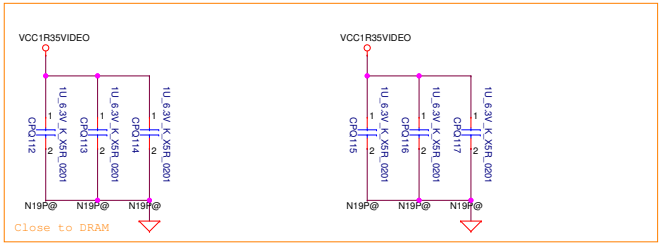


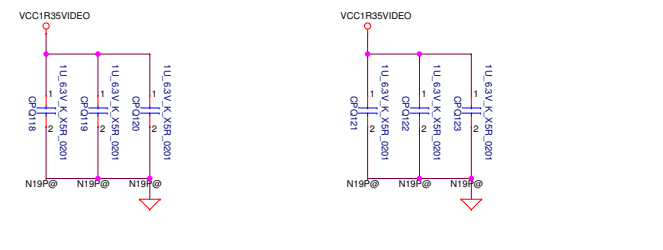


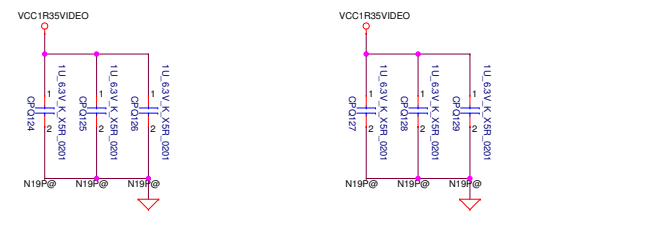












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LCFC

Project Name	*Nighthawk-I*
Rev 1.0	Title *N19E : VRAM CH_A_CAP*
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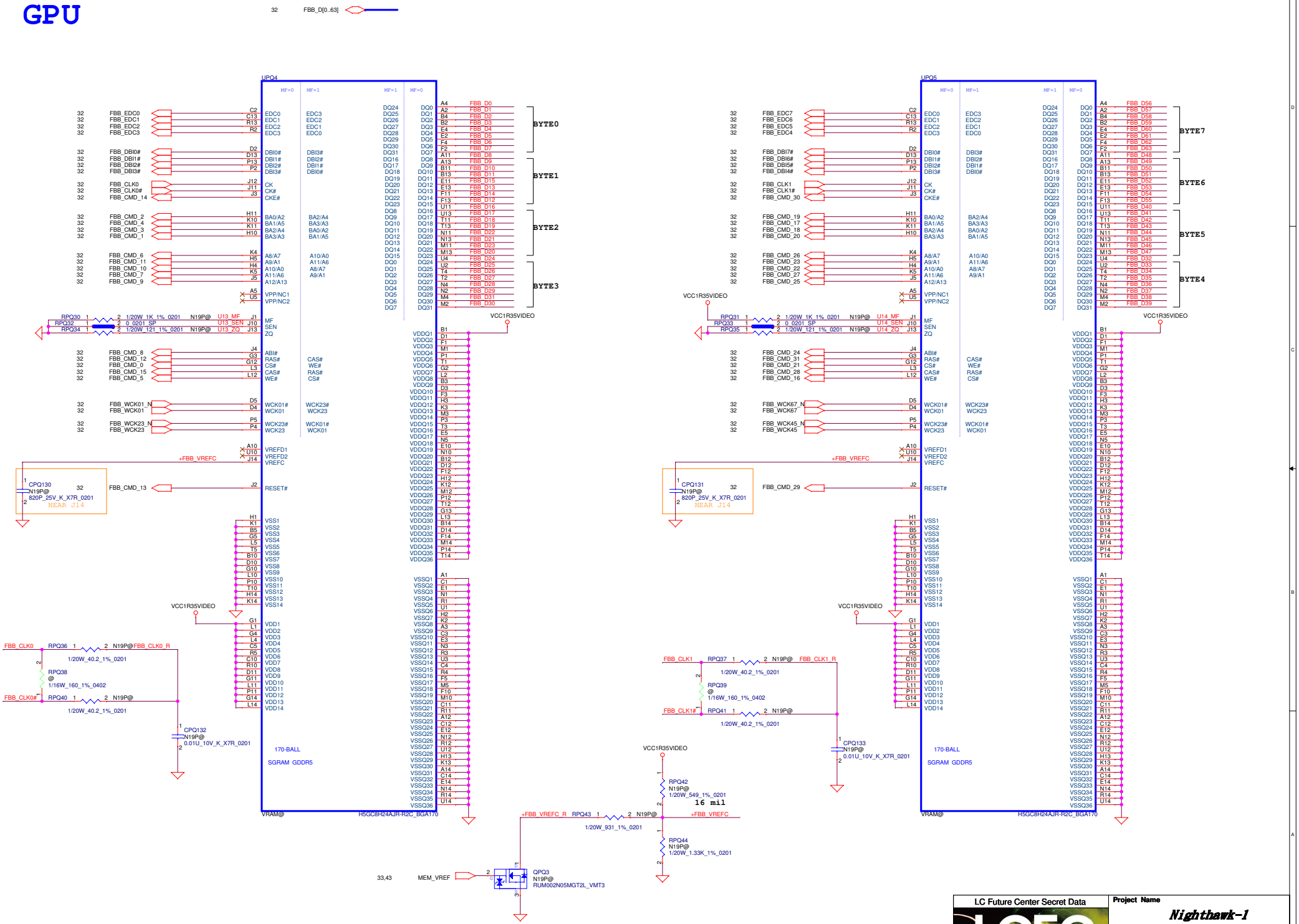
GPU



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Project Name	Nighthawk-1
Rev 1.0	Title N19E : VRAM CH_B
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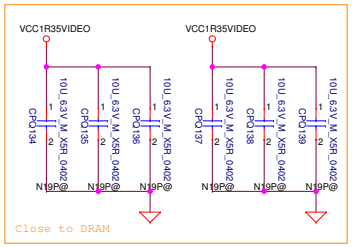
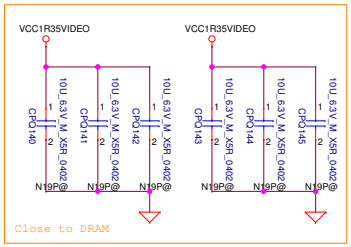
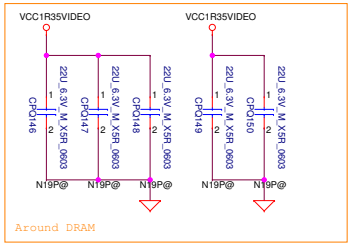
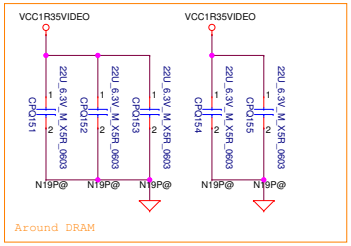
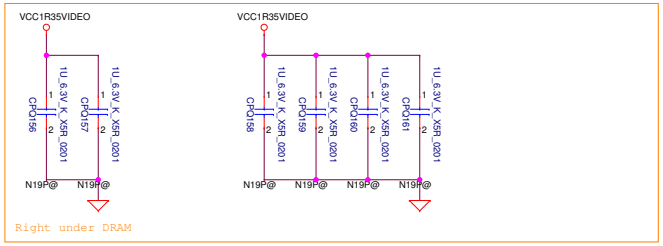
GPU

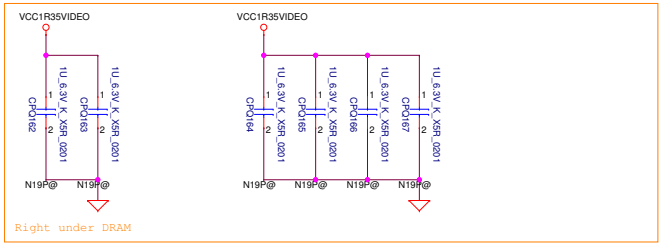


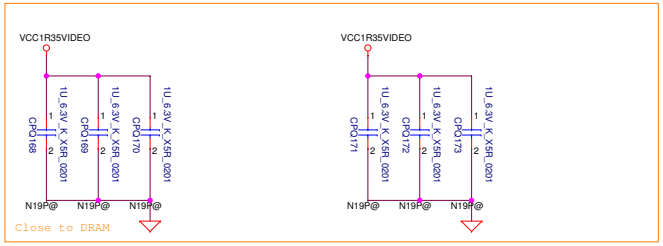


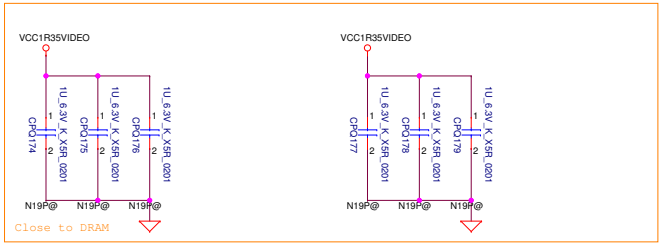


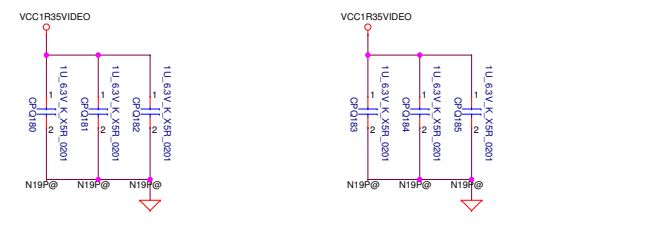


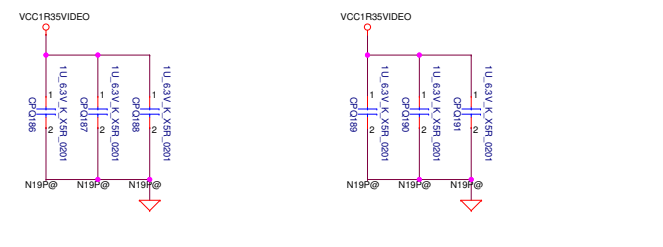












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Project Name	*Nighthawk-1*
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GPU

EMPTY

LC Future Center Secret Data

Project Name: Nighthawk-1

Rev: 1.0

Title: BLANK

Date: Thursday, April 25, 2019

GPU

EMPTY

GPU

EMPTY

GPU

EMPTY

LC Future Center Secret Data

Project Name: *Nighthawk-1*

Rev: 1.0

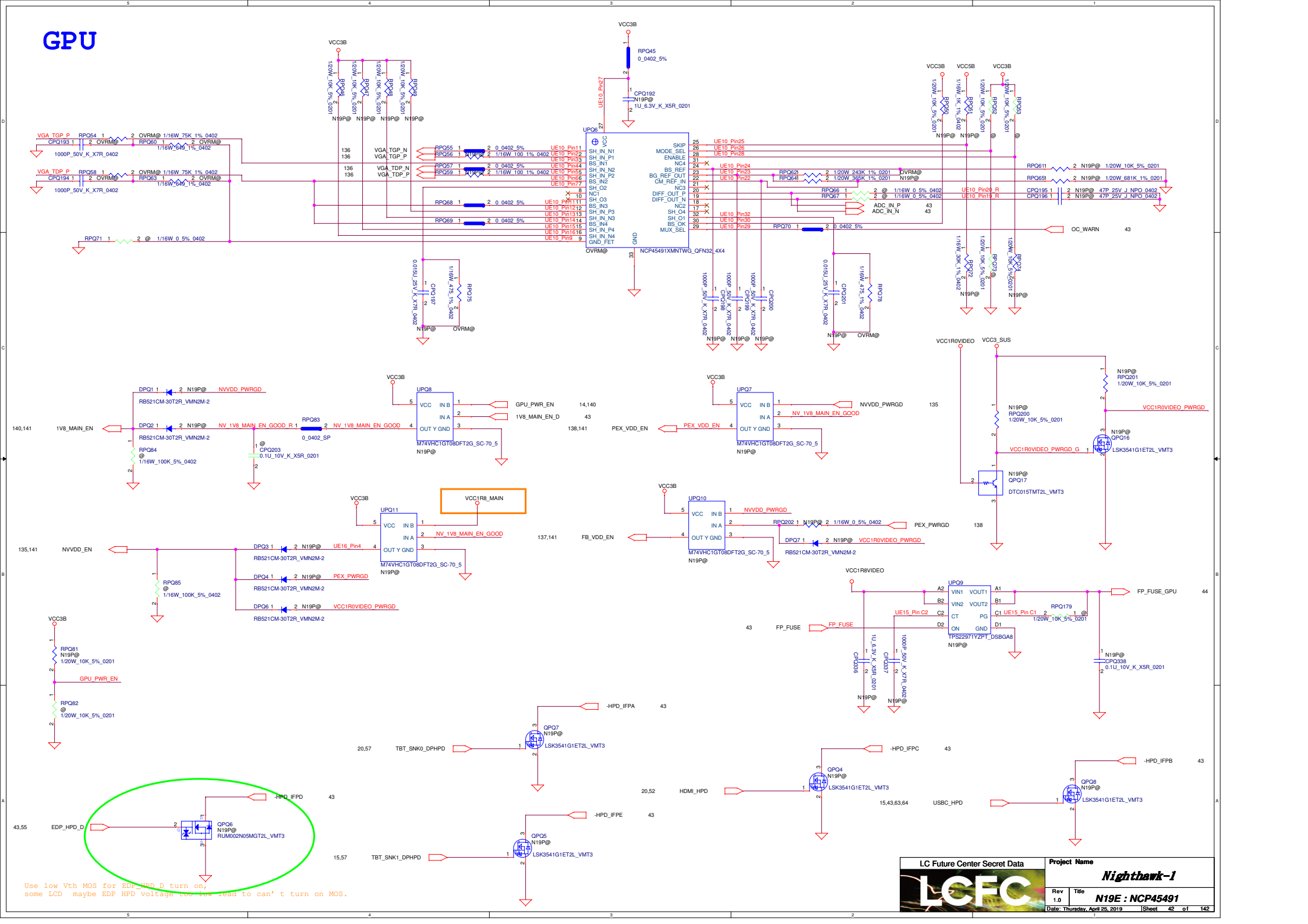
Title: **BLANK**

Date: Thursday, April 25, 2019

GPU

EMPTY

GPU



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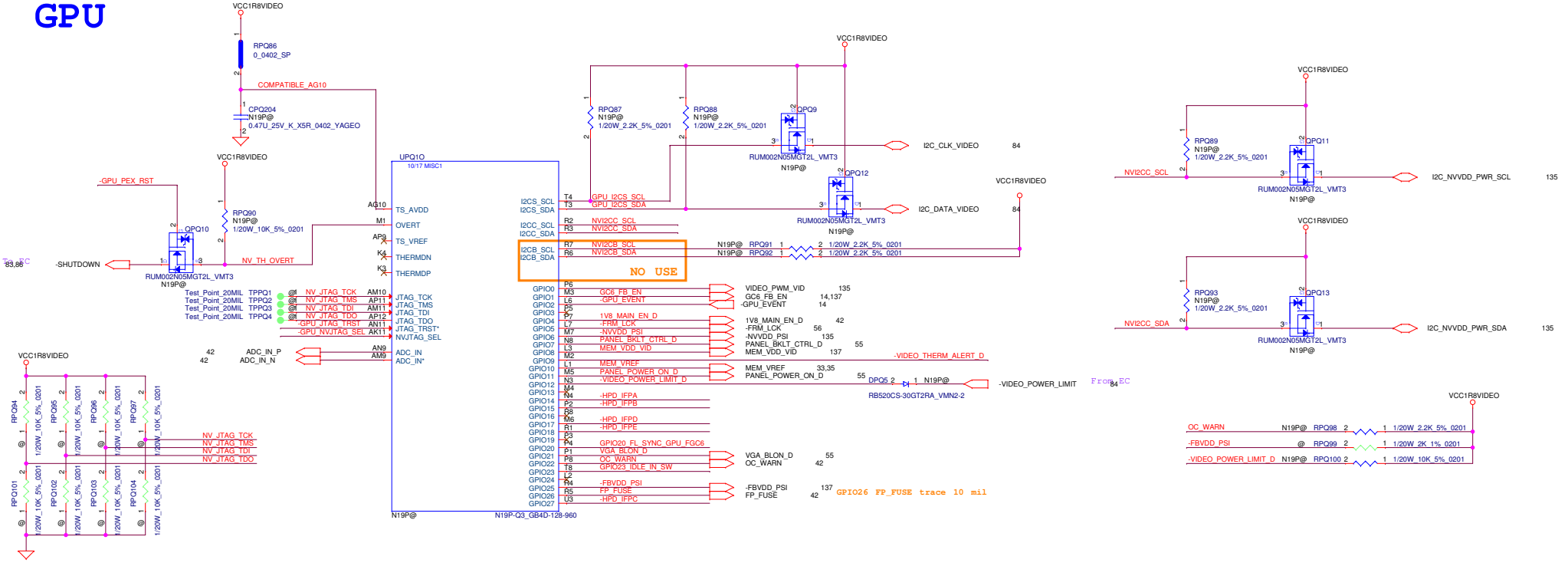
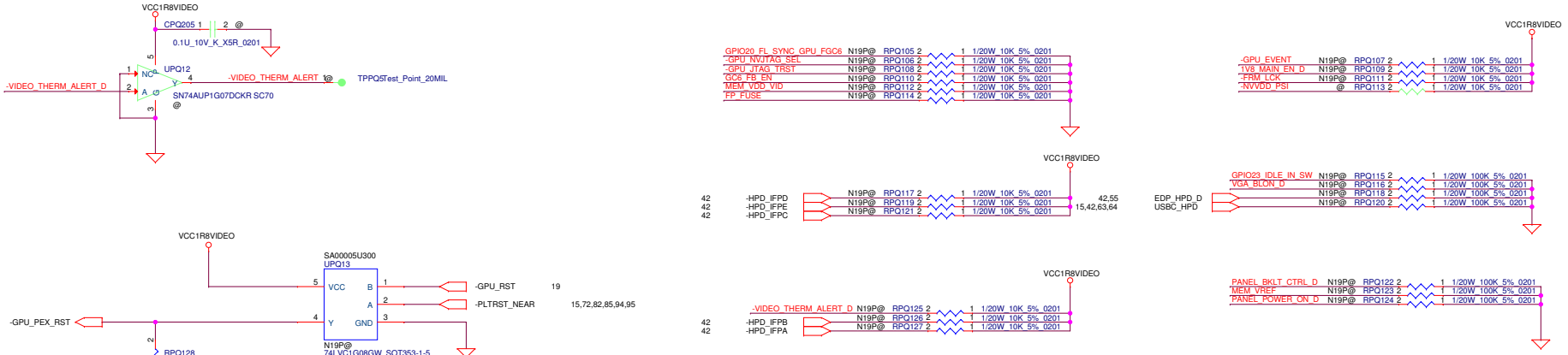
GPU

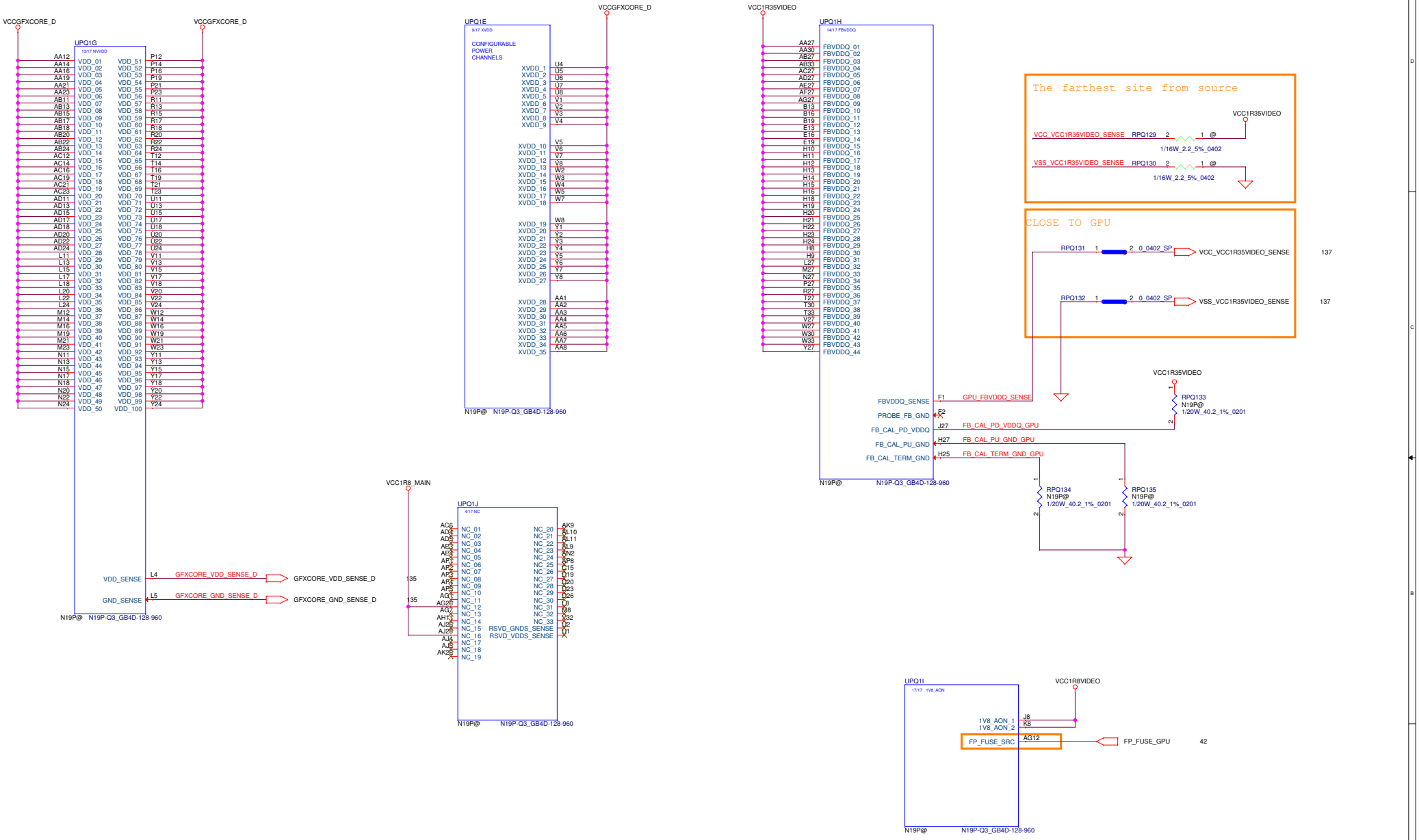




LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title: N19E : GPIO and I2C
Date: Thursday, April 25, 2019	Sheet 43 of 142

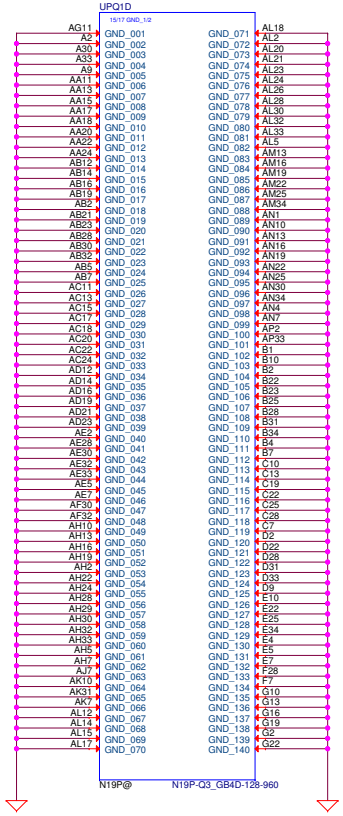
GPU



LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title N19E : POWER
Date: Thursday, April 25, 2019	Sheet 44 of 142

GPU

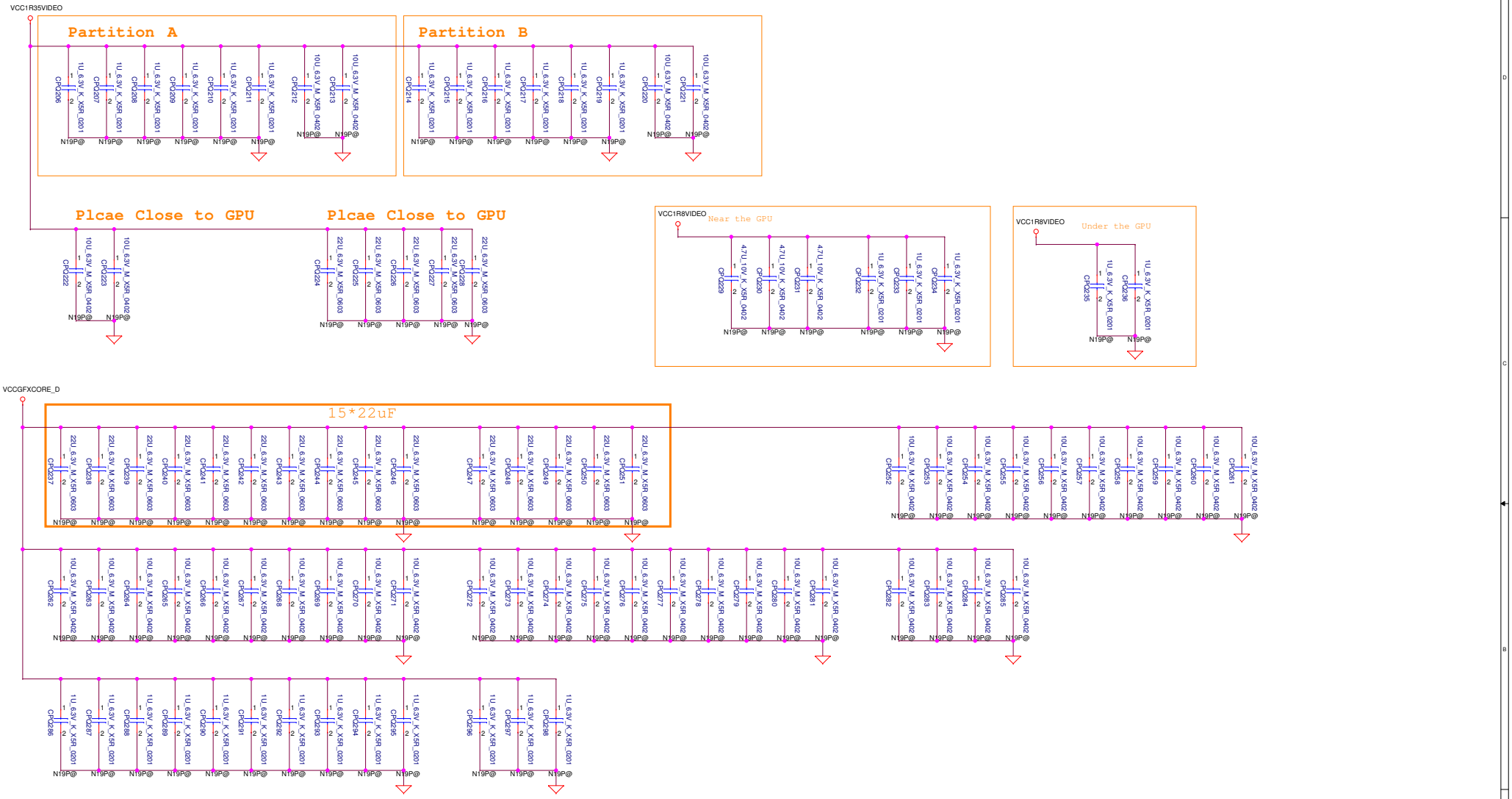


LC Future Center Secret Data

LCFC

Project Name	*Nighthawk-1*
Rev 1.0	Title *N19E : GND*
Date: Thursday, April 25, 2019	Sheet 45 of 142

GPU



LC Future Center Secret Data

LCFC

Project Name: Nighthawk-1

Rev: 1.0

Title: N19E : DECOUPLING (1/2)

Date: Thursday, April 25, 2019

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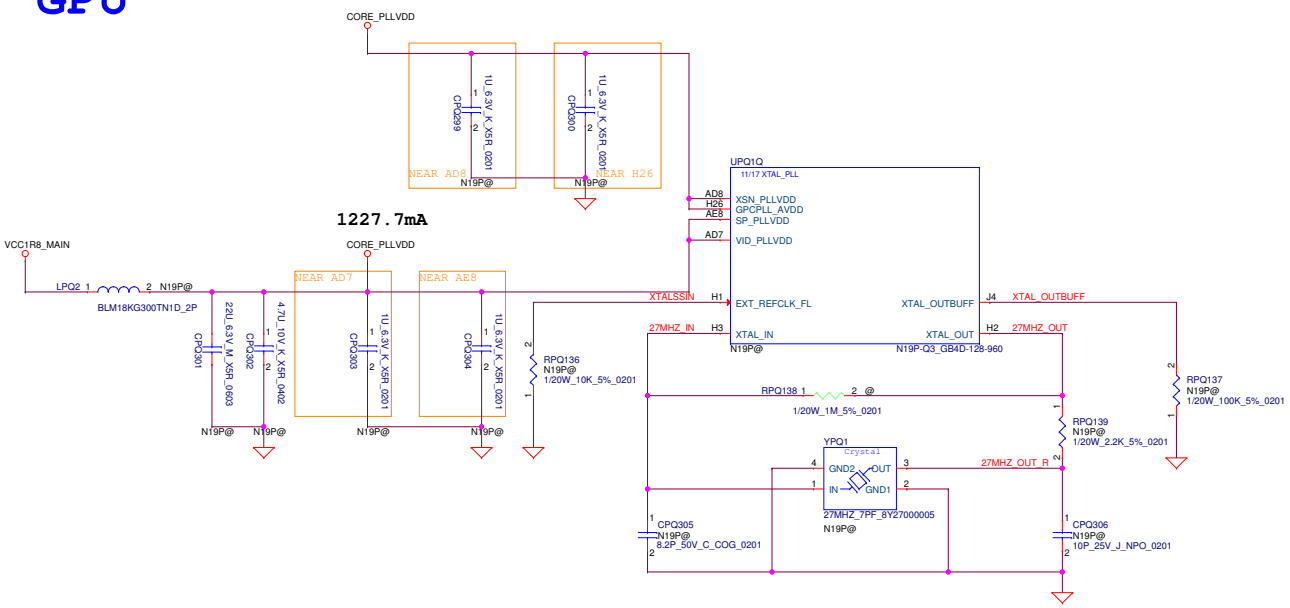
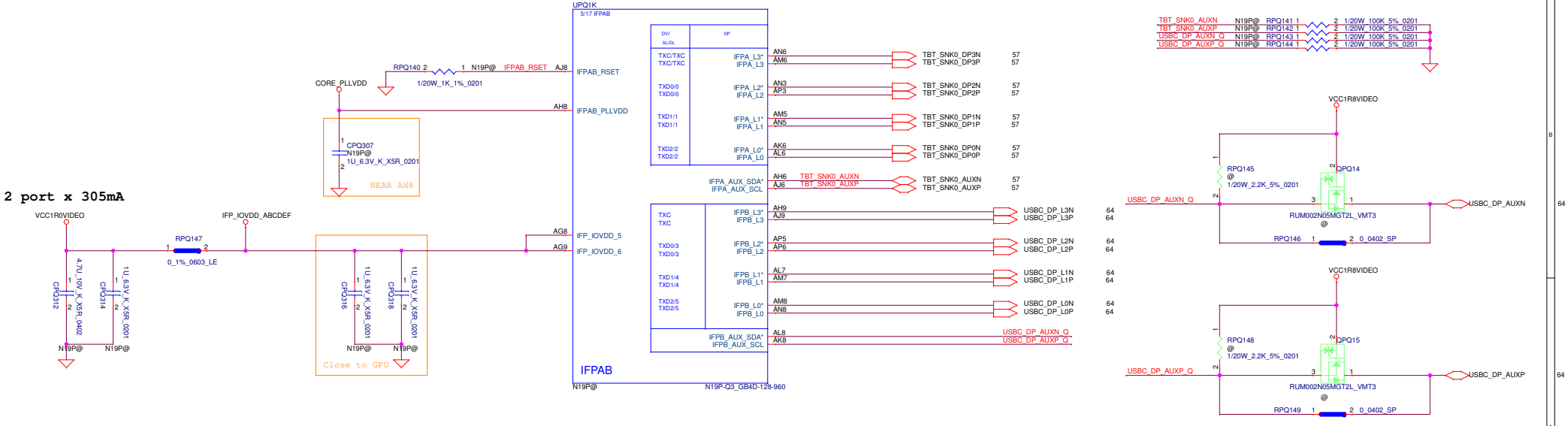
GPU

EMPTY

GPU



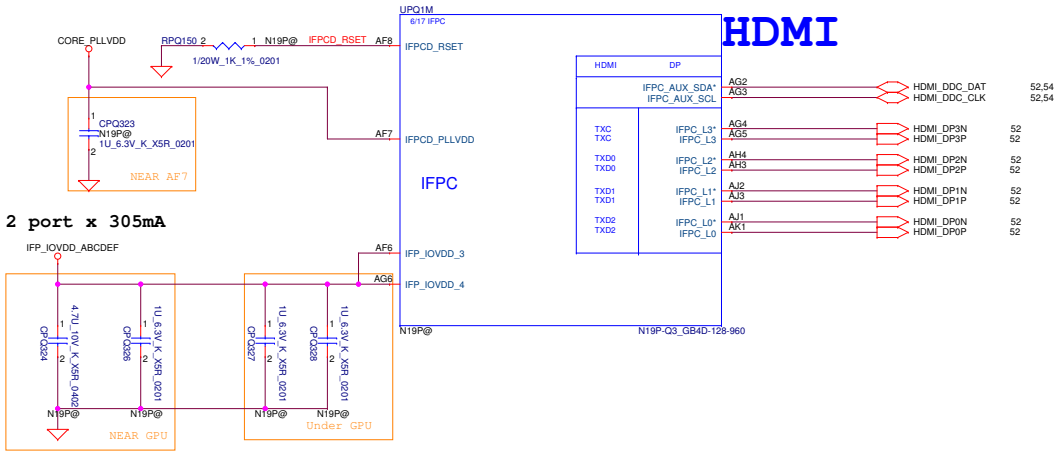
IFPA:THUNDERBOLT
IFPB:Regular Type-c



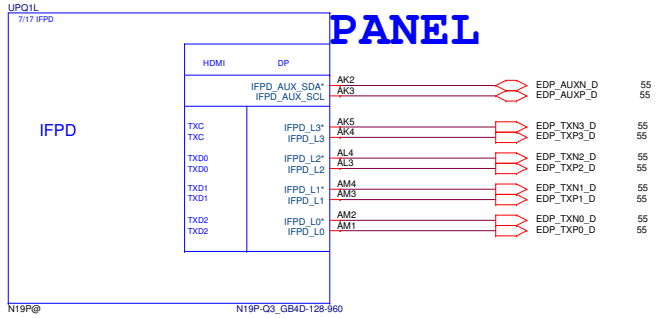
GPU

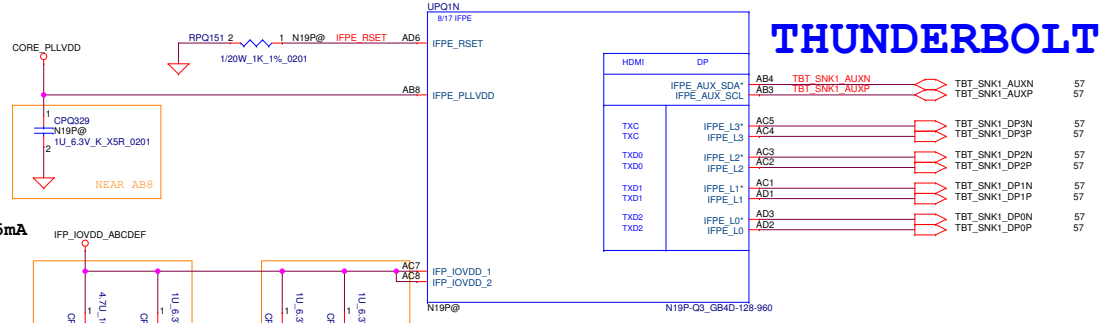
EMPTY

GPU

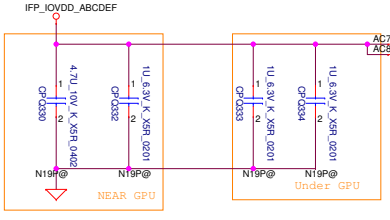


2 port x 305mA





1 port x 305mA



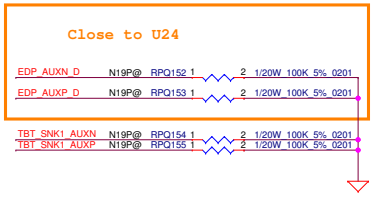


Table 10.1 Digital Display Link Summary

Digital Display Link	Dual-Link DVI	HDMI	DisplayPort
IFPA (Link A)	✓(Dual Link with IFPB)	✓	✓
IFPB (Link B)	✓(Dual Link with IFPA)	✓	✓
IFPC (Link C)	✓(Dual Link with IFPD)	✓	✓
IFPD (Link D)	(not supported)	(not supported)	eDP Only (no ext. display)
IFPE (Link E)	✓(Dual Link with IFPF)	✓	✓
IFPF (Link F)	✓(Dual Link with IFPE)	✓	✓

ntial

GPU

Strap table				STRAP 0		STRAP 1		STRAP 2	
				STRAP0_H@	STRAP0_L@	STRAP1_H@	STRAP1_L@	STRAP2_H@	STRAP2_L@
GPU	Vendor	DIE Rev	Strap	RPQ158	RPQ166	RPQ156	RPQ167	RPQ159	RPQ168
N19P-Q3	Micron	B	0x1	ASM	NO ASM	NO ASM	ASM	NO ASM	ASM
N19P-Q1	Hynix	A	0x2	NO ASM	ASM	ASM	NO ASM	NO ASM	ASM

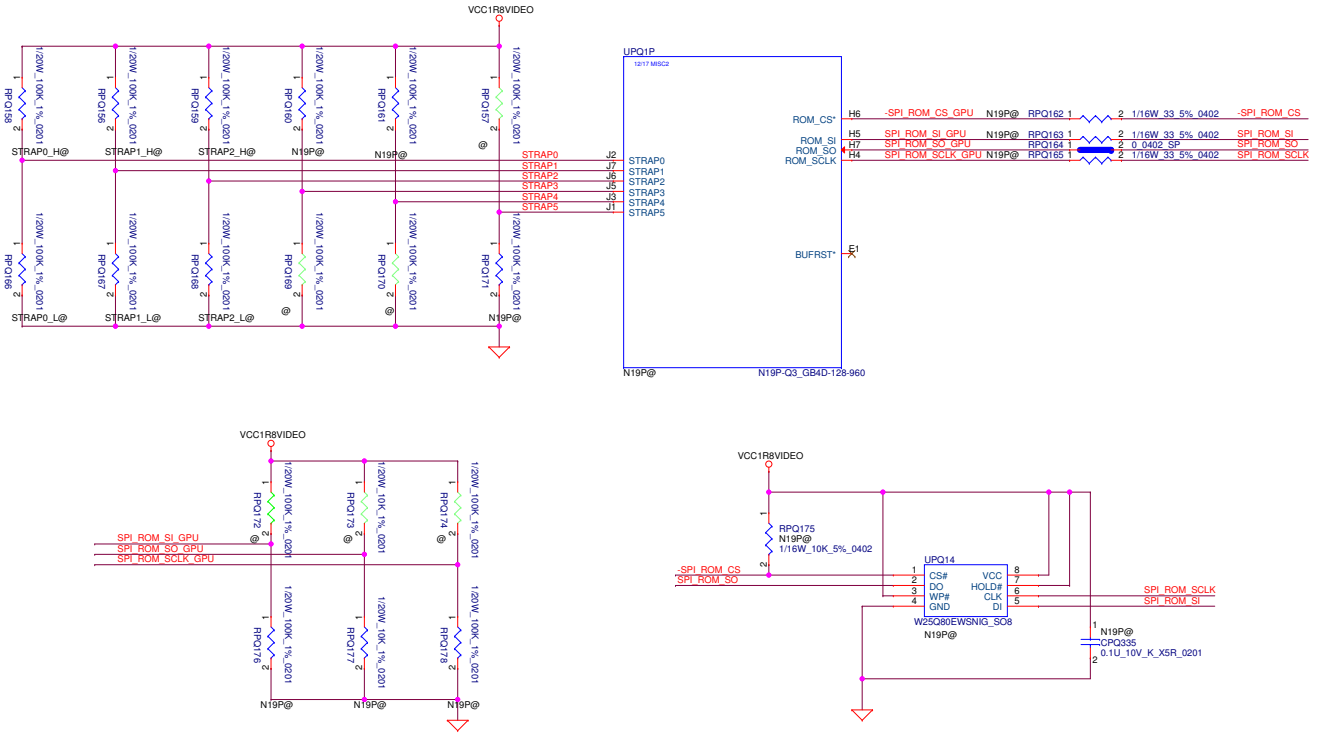


Table 5.3 RAMCFG

Strap Pins see Note			RAMCFG Setting Number
STRAP2	STRAP1	STRAP0	(see Memory RVL for memory configs corresponding to these numbers)
L	L	L	0 (0x0000)
L	L	H	1 (0x0001)
L	H	L	2 (0x0002)
L	H	H	3 (0x0003)
H	L	L	4 (0x0004)
H	L	H	5 (0x0005)
H	H	L	6 (0x0006)
H	H	H	7 (0x0007)
L	L	M	8 (0x0008)
L	M	L	9 (0x0009)
L	M	H	10 (0x000A)
L	H	M	11 (0x000B)
M	L	L	12 (0x000C)
M	L	H	13 (0x000D)
M	H	L	14 (0x000E)
M	H	H	15 (0x000F)
H	L	M	16 (0x0010)
H	M	L	17 (0x0011)
H	M	H	18 (0x0012)
H	H	M	19 (0x0013)
L	M	M	20 (0x0014)
M	L	M	21 (0x0015)
M	M	L	22 (0x0016)
M	M	H	23 (0x0017)
M	H	M	24 (0x0018)
H	M	M	25 (0x0019)
M	M	M	26 (0x001A)

Note: The ternary strap pins listed in the STRAP columns must be pulled to one of three voltage levels. "L" means Low level (GND). "M" means middle level (0.9V). "H" means High level (1.8V).

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Lenovo-LCFC 2016-1
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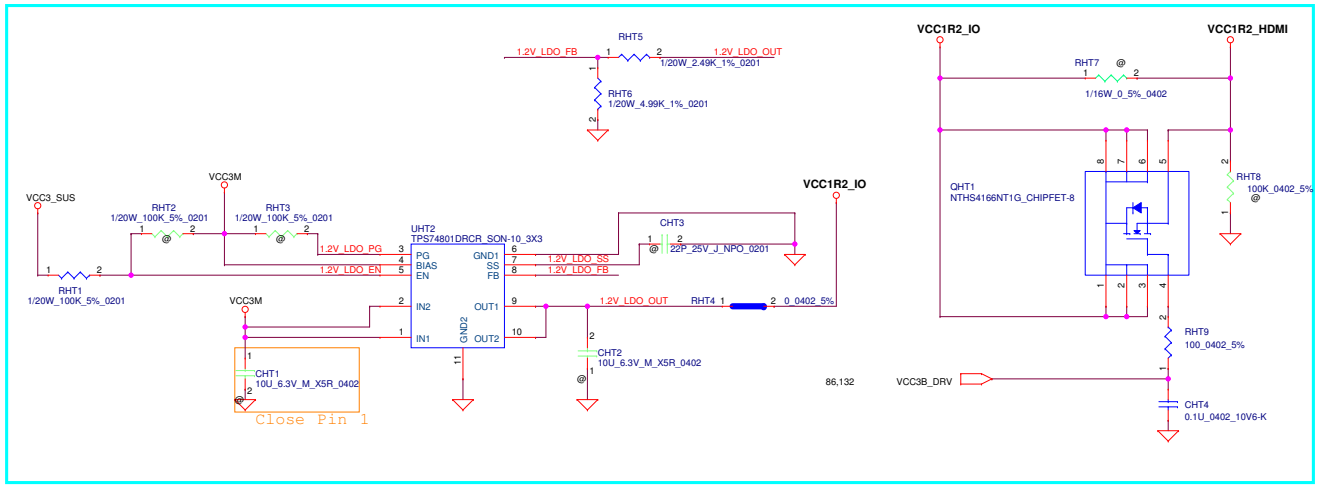
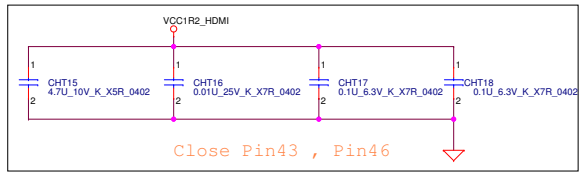
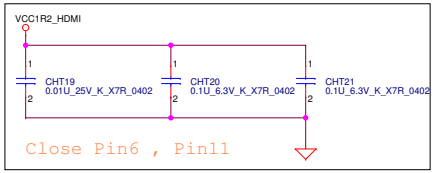
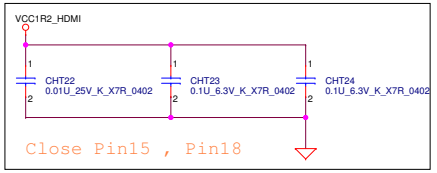
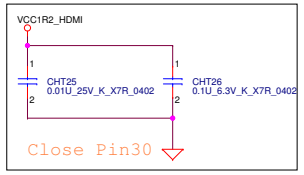
HDMI Re-Timer

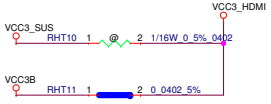


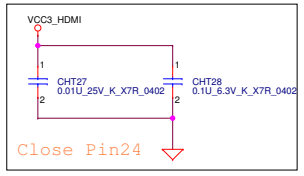












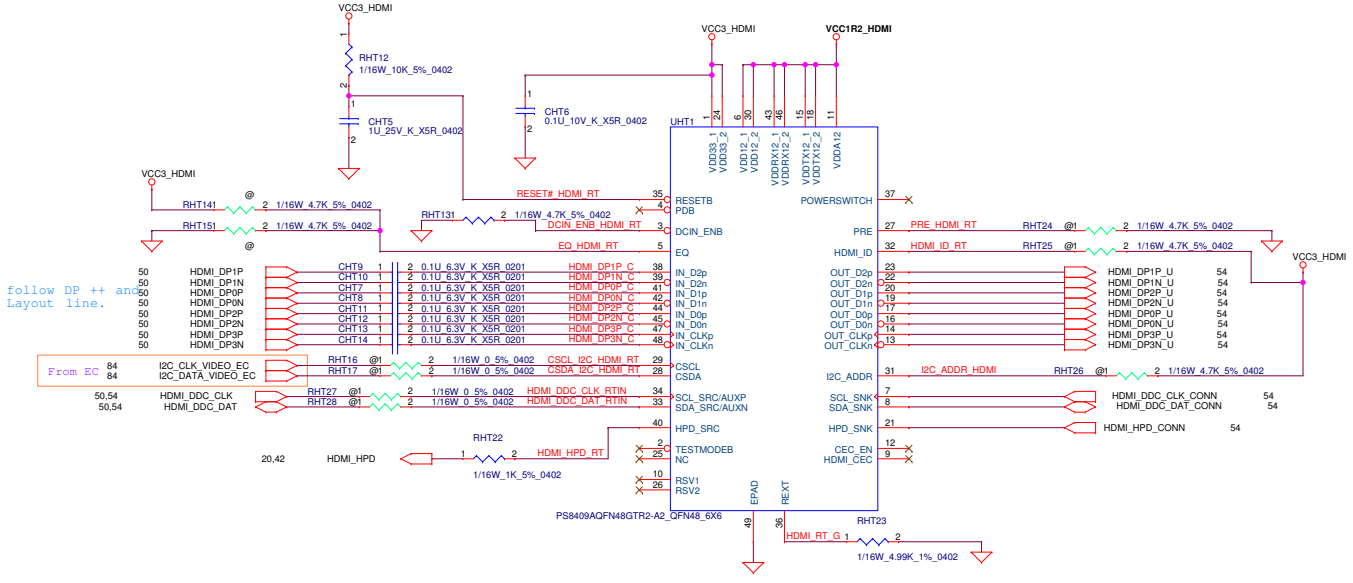


Table 9.12 Display Connector with DVI/HDMI Dongle Support

DP Connector Pin	DisplayPort Signal	DVI/HDMI Signal
1	Main Link Lane 0 +	TX Data 2 +
2	GND	GND
3	Main Link Lane 0 -	TX Data 2 -
4	Main Link Lane 1 +	TX Data 1 +
5	GND	GND
6	Main Link Lane 1 -	TX Data 1 -
7	Main Link Lane 2 +	TX Data 0 +
8	GND	GND
9	Main Link Lane 2 -	TX Data 0 -
10	Main Link Lane 3 +	Clock +
11	GND	GND
12	Main Link Lane 3 -	Clock -
13	CONFIG1 (Connected to GND)	DP_MODE
14	CONFIG1 (Connected to GND)	CEC
15	AUX CH +	SCL (DDC Clock)
16	GND	GND
17	AUX CH -	SDA (DDC Data)
18	Hot Plug Detect	Hot Plug Detect
19	GND Return	GND Return
20	PWR (3.3V)	PWR (3.3V)

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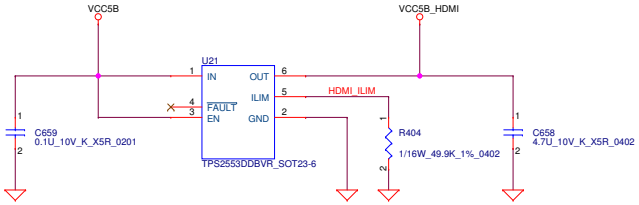
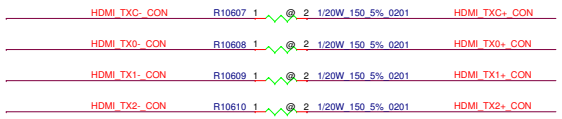
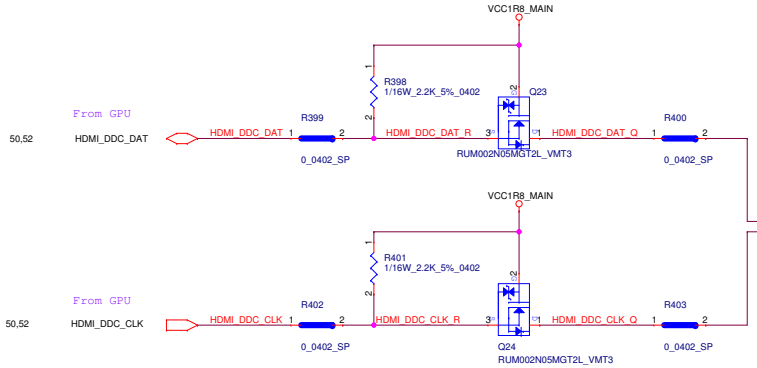
HDMI LSPCON

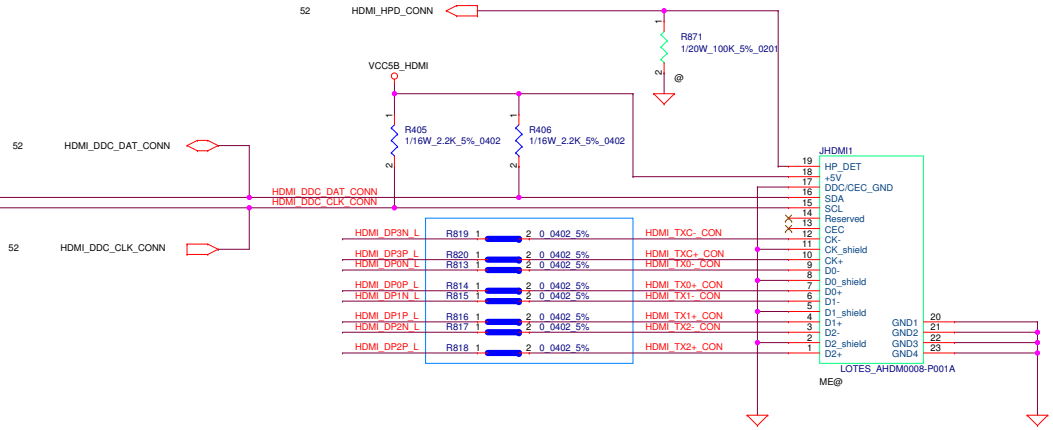
BLANK

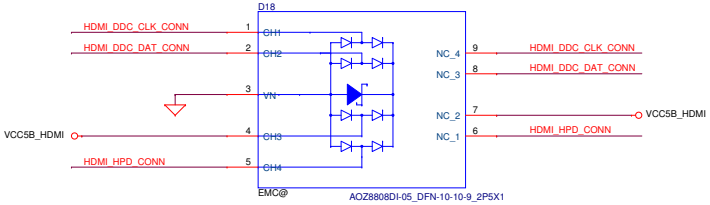
HDMI

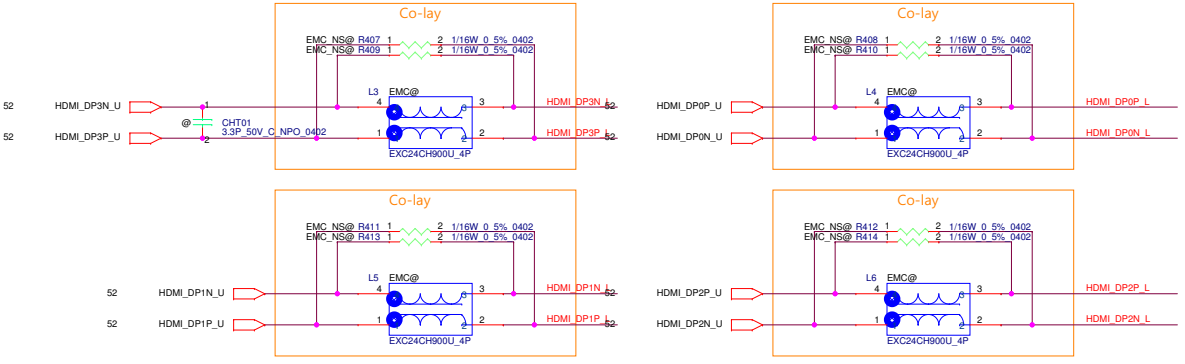


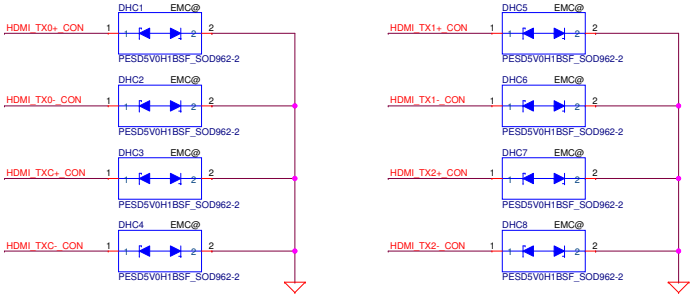








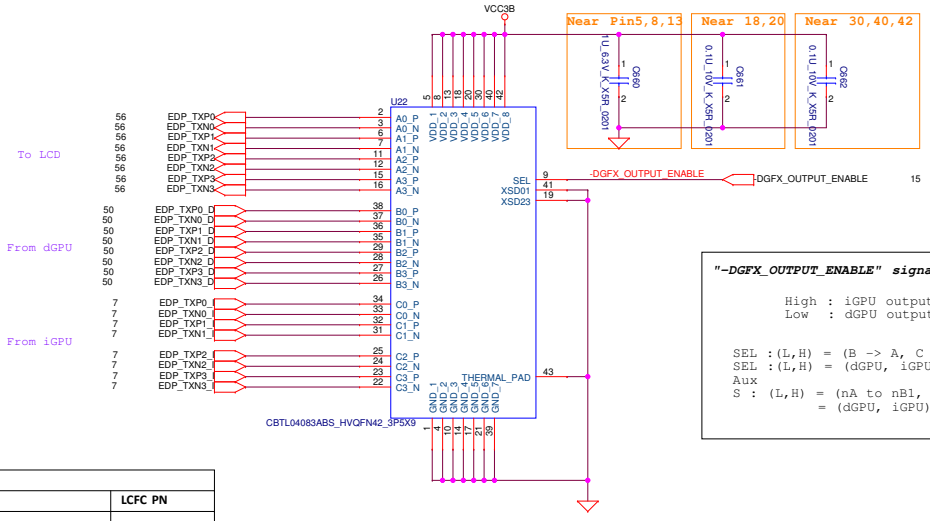




LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title HDMI CONNECTOR
Date: Thursday, April 25, 2019	Sheet 54 of 142

eDP DEMUX

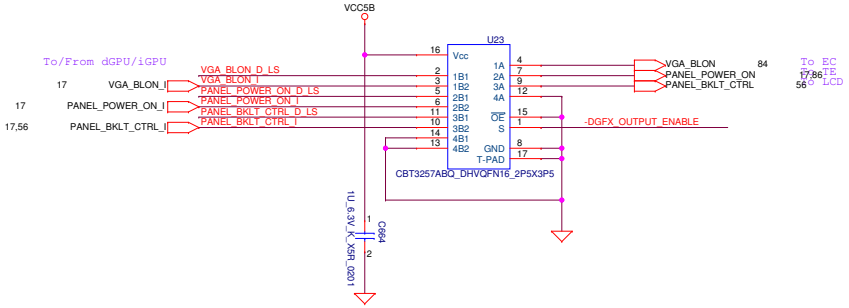


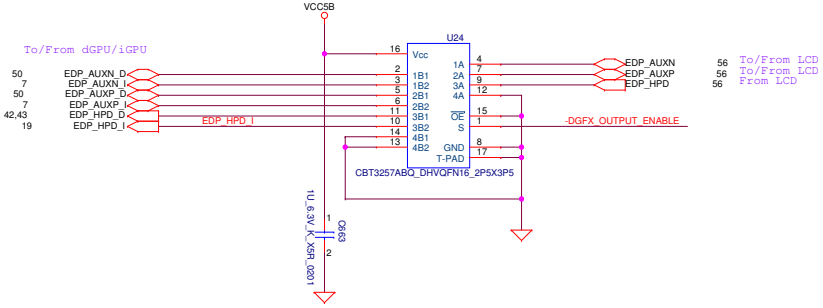
"-DGFX_OUTPUT_ENABLE" signal controls DOCK DP Bus switch

High : iGPU output is selected.
Low : dGPU output is selected.

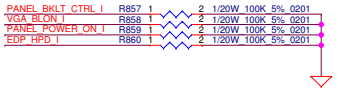
SEL :(L,H) = (B -> A, C ->A)
SEL :(L,H) = (dGPU, iGPU)
Aux
S : (L,H) = (nA to nBl, nA to nB2)
= (dGPU, iGPU)

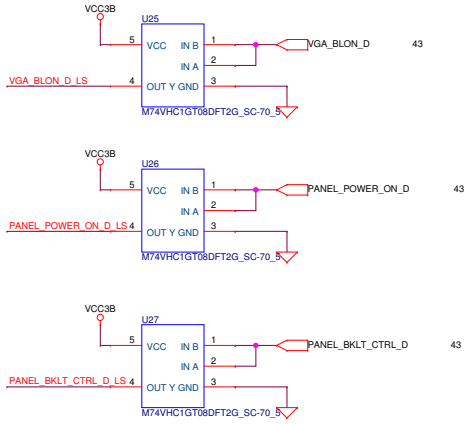
DOCK DP Switch		
Vendor	Vendor PN	LCFC PN
NXP	CBTL04083ABS	
Pericom	PI3PCIE3412ZHE+DAX	





USE SA000080W00
But Footprint :SA00003R00J
MC74VHC1GT08

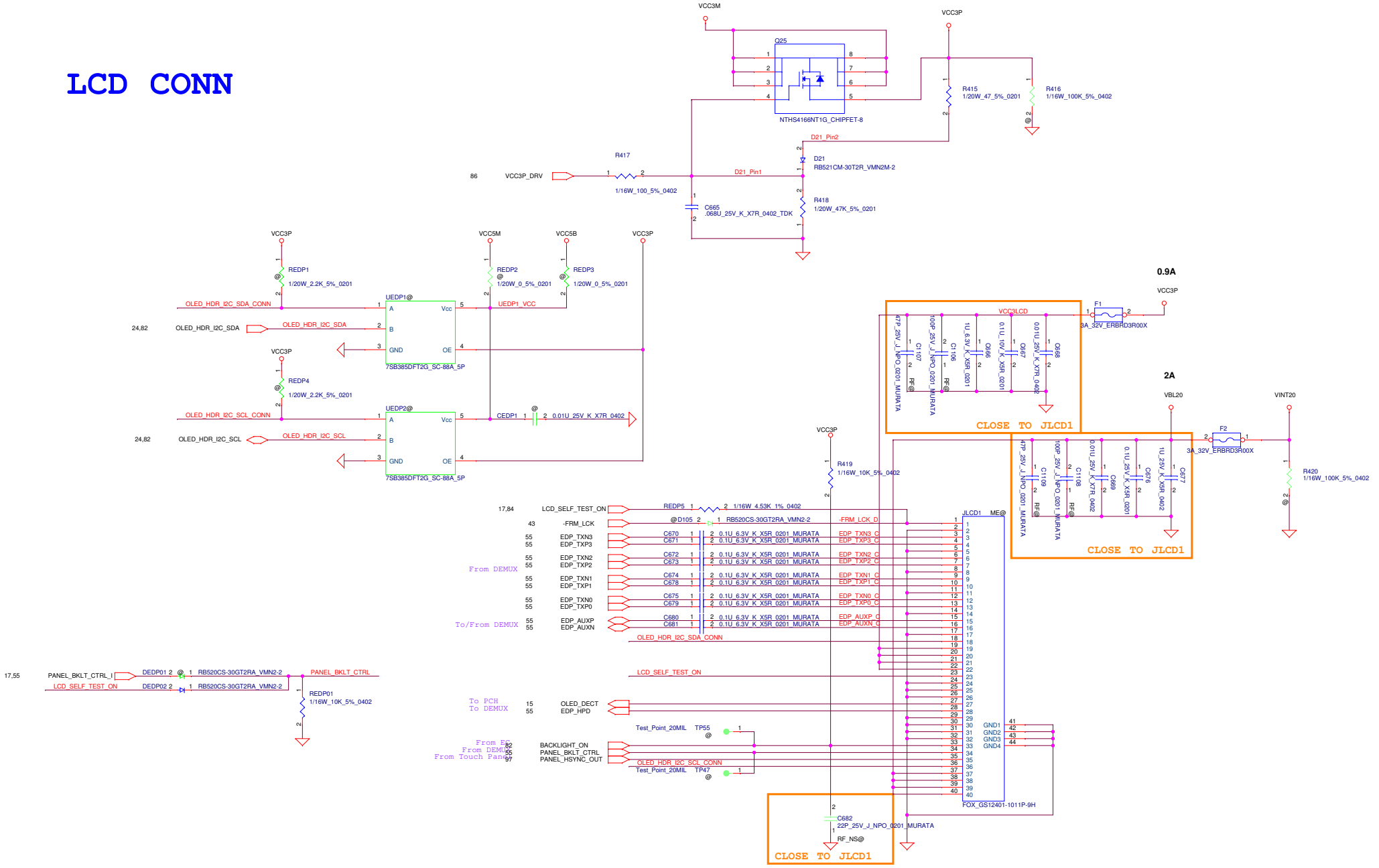




LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title: LCD CONNECTOR
Date: Thursday, April 25, 2019	Sheet 55 of 142

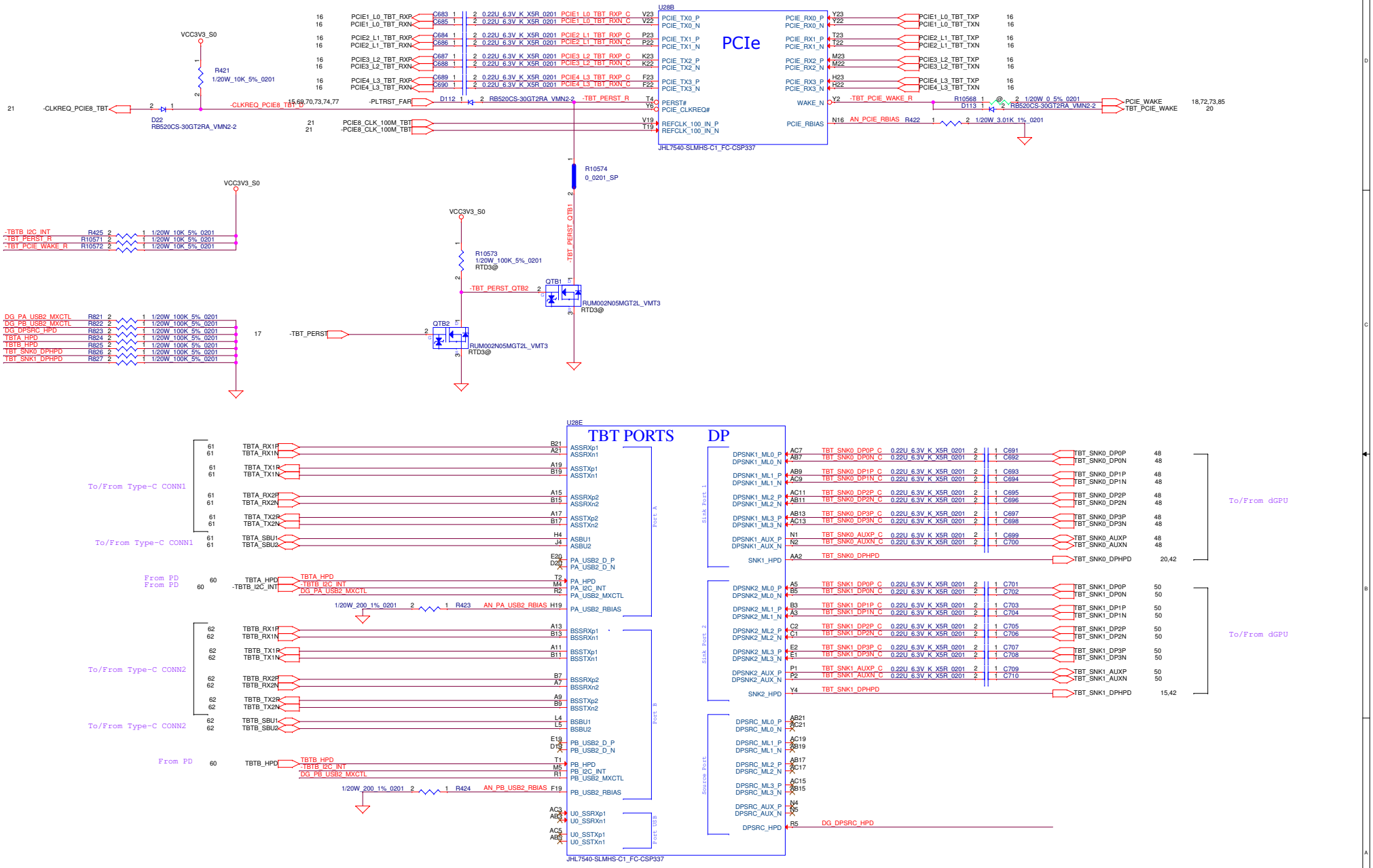
LCD CONN



LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title: LCD CONNECTOR
Date: Thursday, April 25, 2019	Sheet 56 of 142

TUNDERBOLT



LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title: Titan Ridge (1/3)
Date: Thursday, April 25, 2019	Sheet 57 of 142

TUNDERBOLT

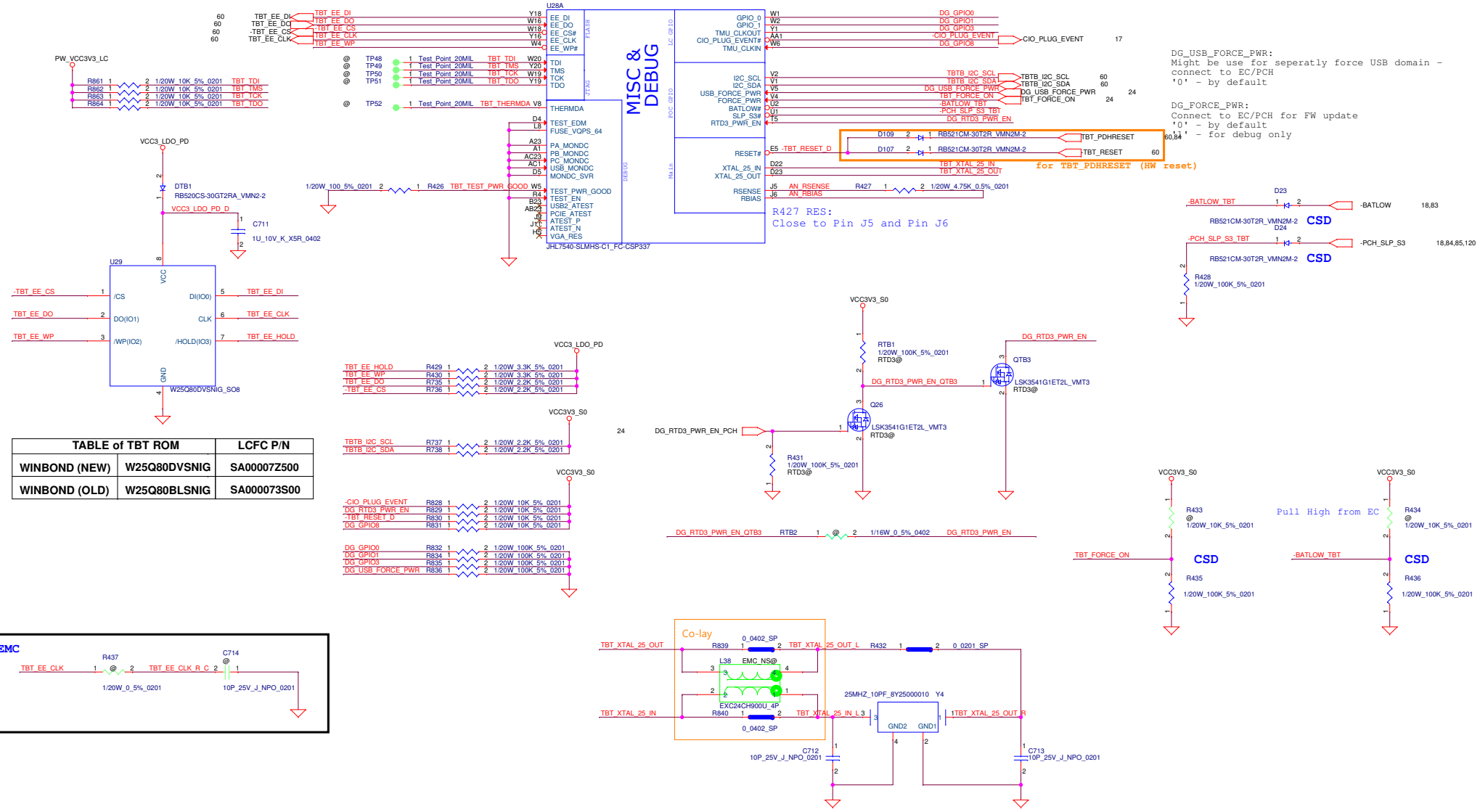


TABLE of TBT ROM		LCFC P/N
WINBOND (NEW)	W25Q80DVSNIG	SA00007Z500
WINBOND (OLD)	W25Q80BLSNIG	SA000073S00

LC Future Center Secret Data

Project Name: Nighthawk-1

Rev 1.0

Title: Titan Ridge (2/3)

Date: Thursday, April 25, 2019

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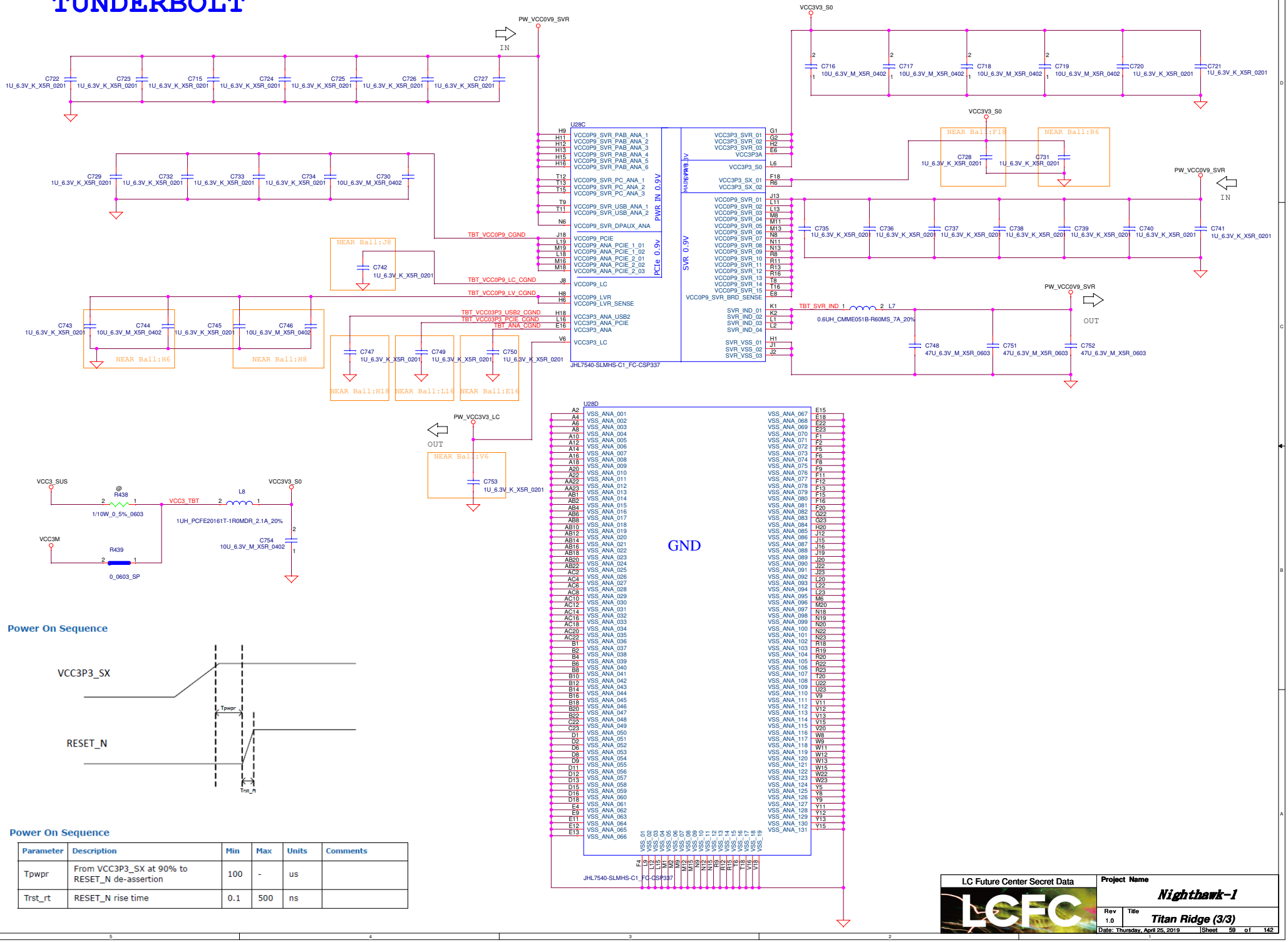
TUNDERBOLT



Power On Sequence

Power On Sequence

Parameter	Description	Min	Max	Units	Comments
Tpwpr	From VCC3P3_SX at 90% to RESET_N de-assertion	100	-	us	
Trst_rt	RESET_N rise time	0.1	500	ns	

LC Future Center Secret Data

LCFC

Project Name: Nighthawk-1

Rev: 1.0

Title: Titan Ridge (3/3)

Date: Thursday, April 25, 2019

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POWER DELIVERY

ADCIN1 BUS POWER CONFIGURATION

DIV = PDR3 / (PDR1 + PDR3)		CONFIGURATION
DIV MIN	DIV MAX	
0.00	0.18	BP_NoResponse
0.20	0.38	BP_WaitFor3V3_Internal
0.40	0.58	BP_WaitFor3V3_External
0.60	1.00	BP_NoWait

← LOGIC

ADCIN2 I2C Address Setting

DIV = PDR4 / (PDR2 + PDR4)		I2C Unique Address [3:1]	
DIV MIN	DIV MAX	ADC_ADDR_DECODE_C1	ADC_ADDR_DECODE_C2
0.00	0.18	000b	100b
0.20	0.38	001b	101b
0.40	0.58	010b	110b
0.60	1.00	011b	111b

← LOGIC

I2C Address

I2C1 (to EC)	TBT PORT	0X23
	USBC PORT	0X27
I2C2 (to TR)	TBT PORT	0X38
	USBC PORT	0X3F

PD CONTROLLER

SN1701012RJTR

SN1701012RJTR_QFN48_6X6

Change footprint to PTPS65988CFRJTR_VQFN48_6X6

2017/08/25

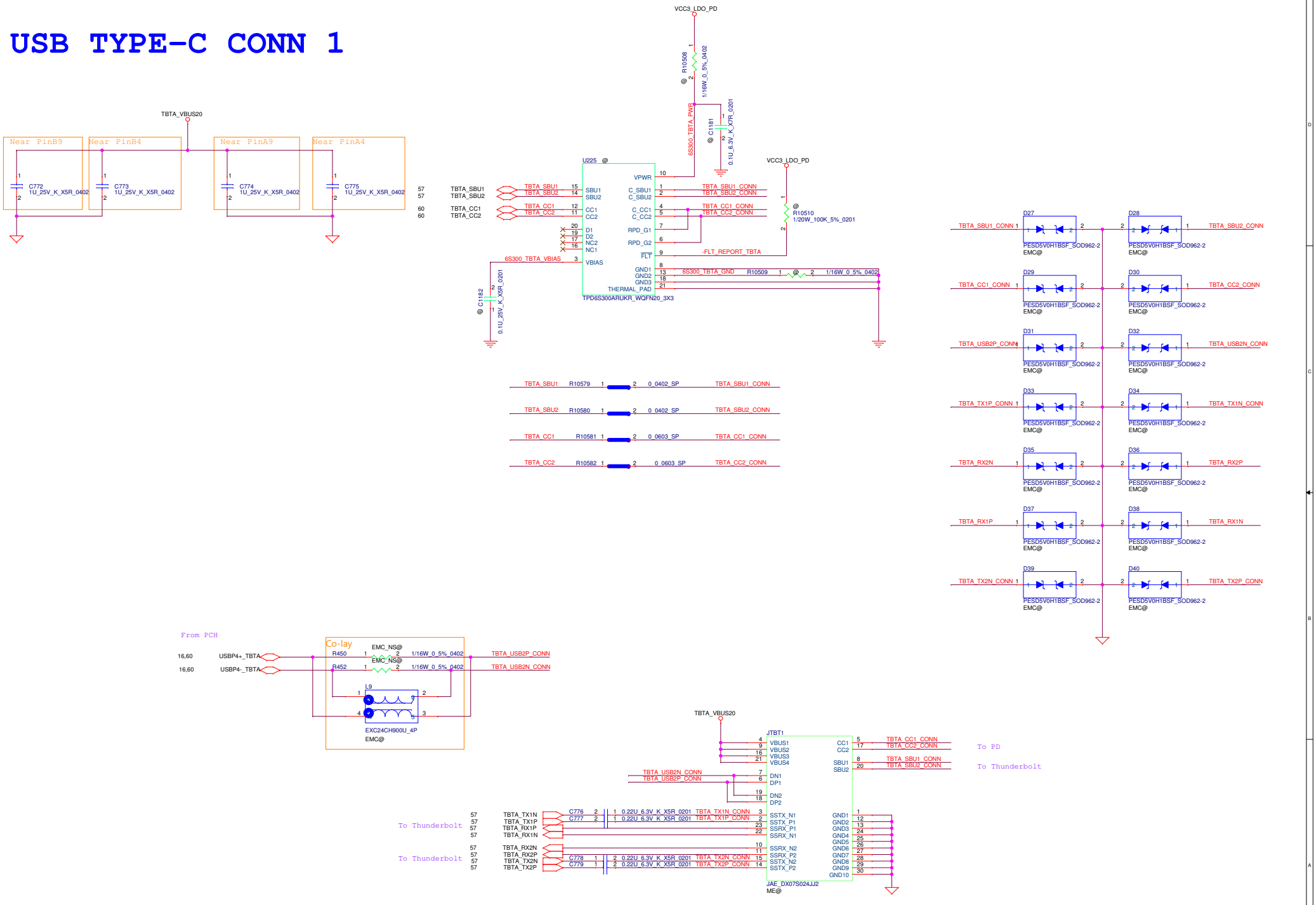
Layout request (Follow Kolar design)

for TBT_PDHRESET (HW reset)

Project Name	Nighthawk-1
Rev	1.0
Title	POWER DELIVERY (TPS65988)
Date: Thursday, April 25, 2019	Sheet 60 of 142

LC Future Center Secret Data

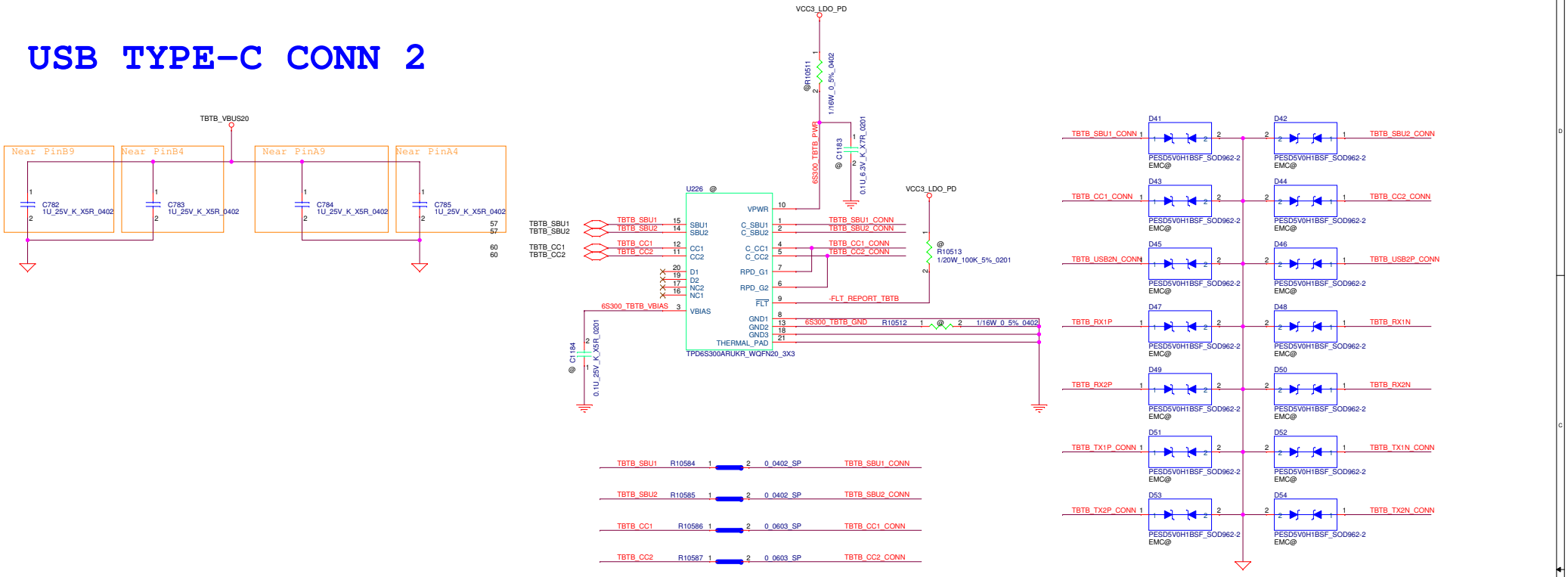
USB TYPE-C CONN 1

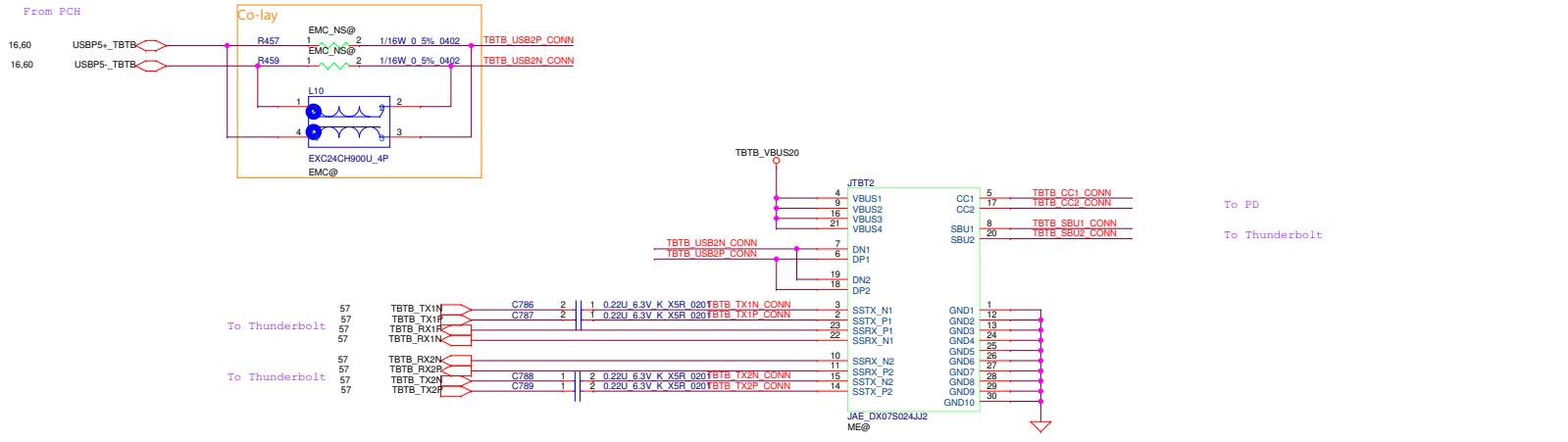


LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title: USB TYPE-C CONNECTOR(1/2)
Date: Thursday, April 25, 2019	Sheet 61 of 142

USB TYPE-C CONN 2

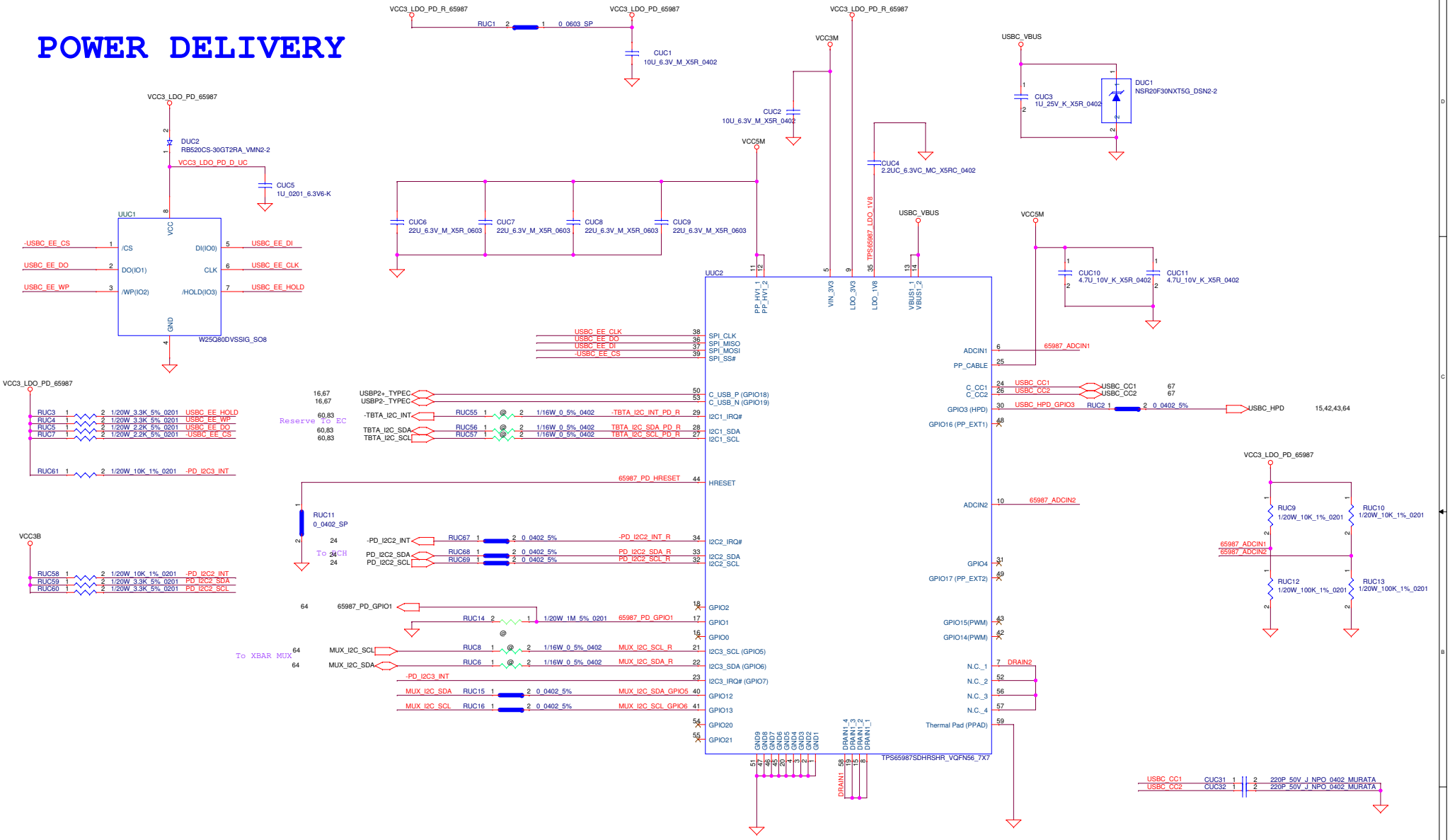




LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title: USB TYPE-C CONNECTOR(2/2)
Date: Thursday, April 25, 2019	Sheet 62 of 142

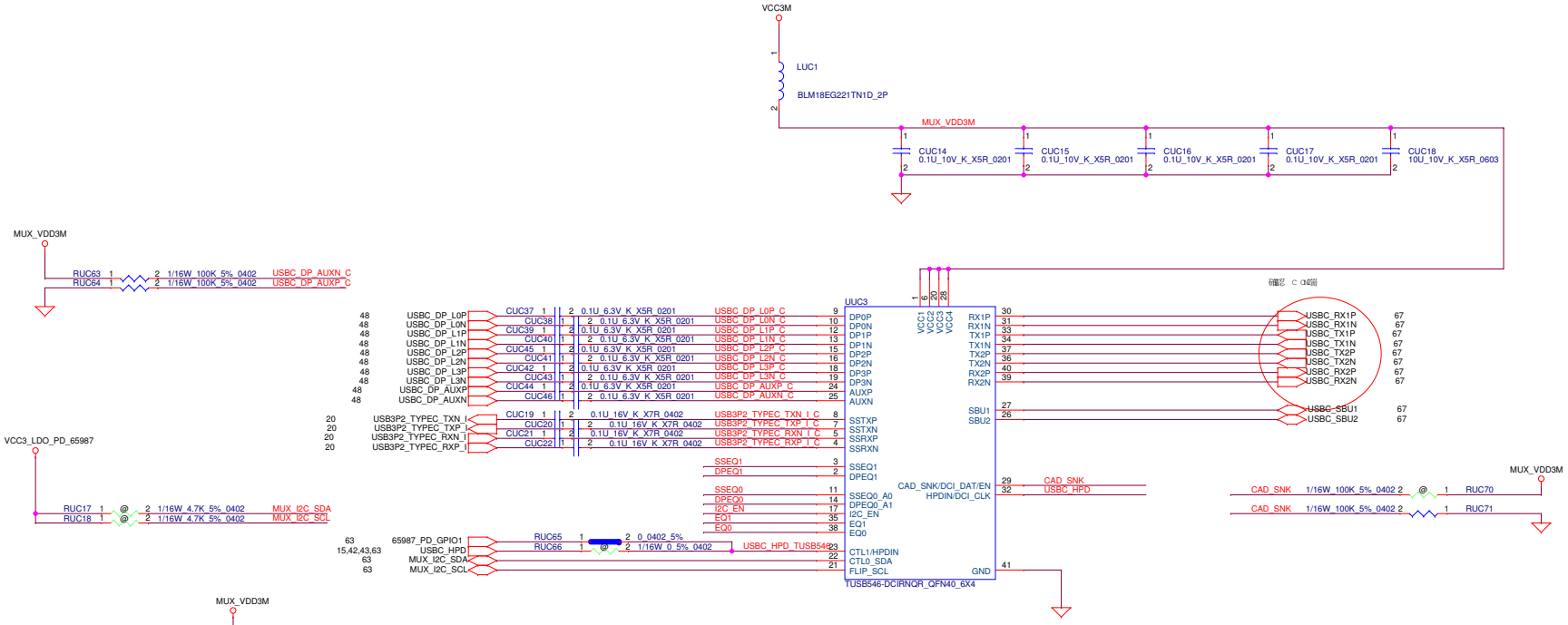
POWER DELIVERY

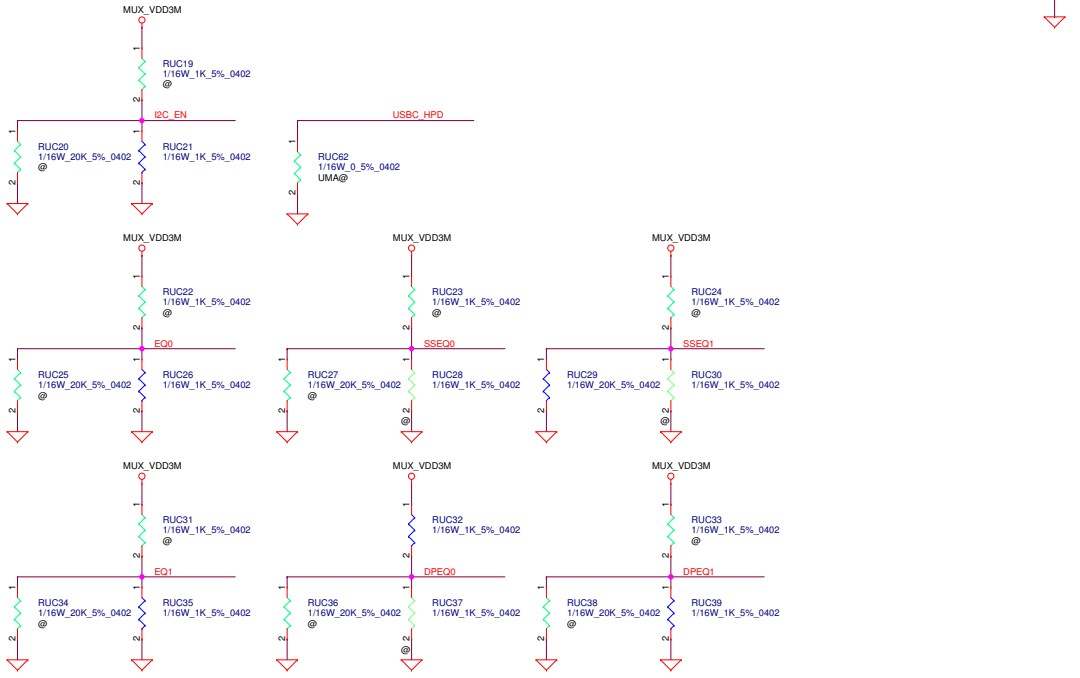


LC Future Center Secret Data

Project Name	Nighthawk-I
Rev 1.0	Title POWER DELIVERY
Date: Thursday, April 25, 2019	Sheet 63 of 142

TYPE-C XBAR TUSB546





LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title: TYPE-C XBAR TUSB546
Date: Thursday, April 25, 2019	Sheet 64 of 142

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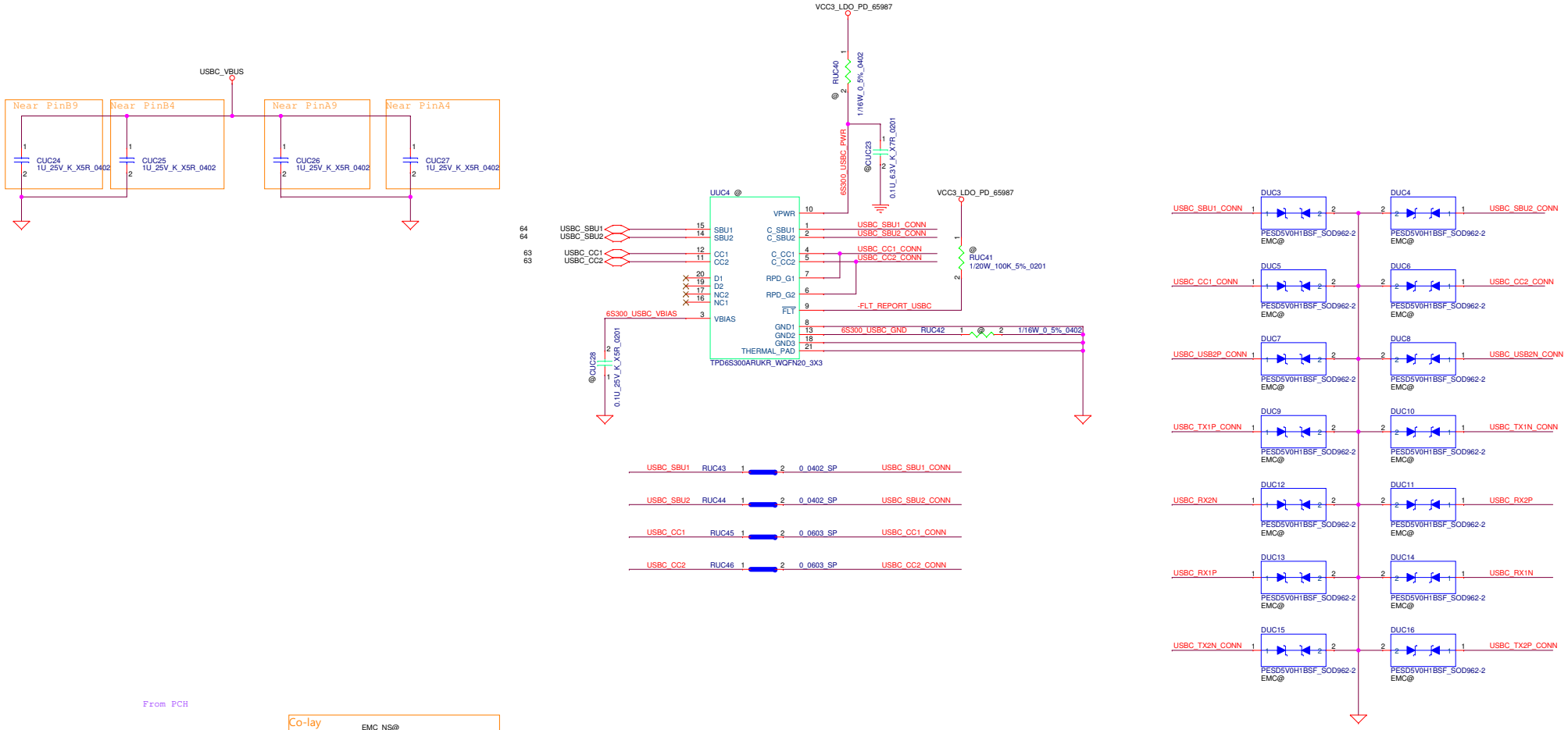
BLANK

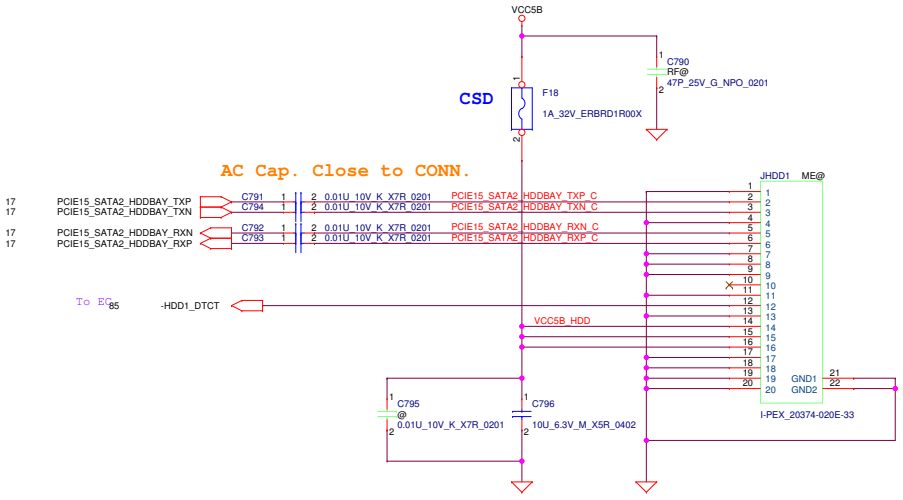
REGULAR TYPE-C CONN



LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title: Regular TYPE-C CONNECTOR
Date: Thursday, April 25, 2019	Sheet 67 of 142

HDD

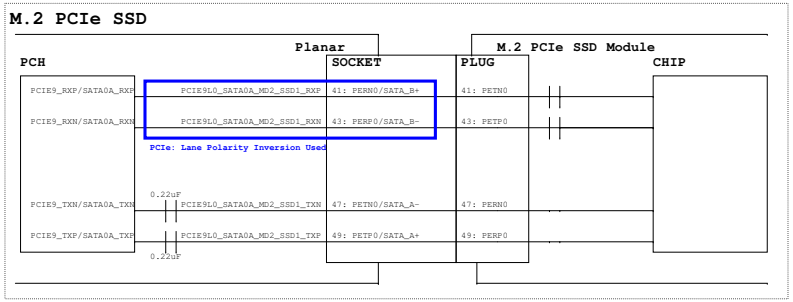


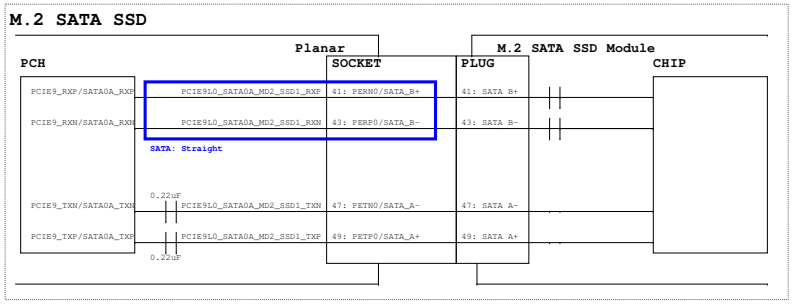
LC Future Center Secret Data

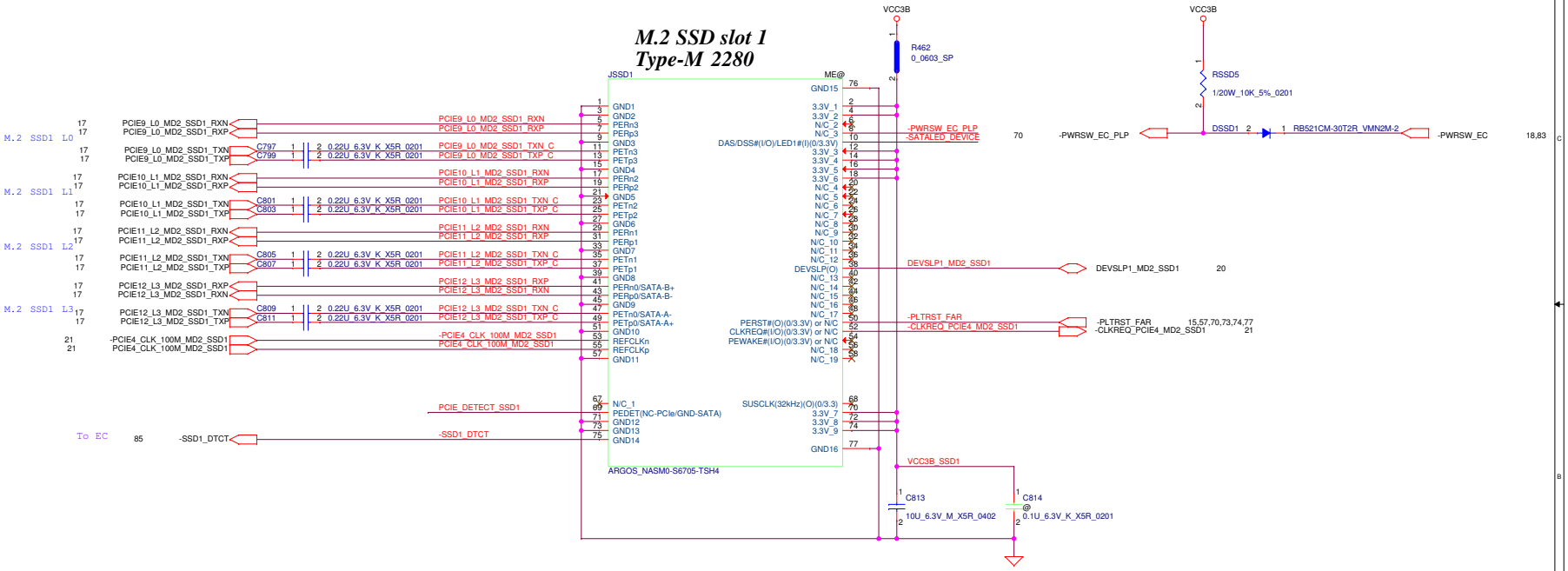
LCFC

Project Name	Nighthawk-1
Rev 1.0	Title: SATA HDD CONN
Date: Thursday, April 25, 2019	Sheet 68 of 142

M.2 SSD





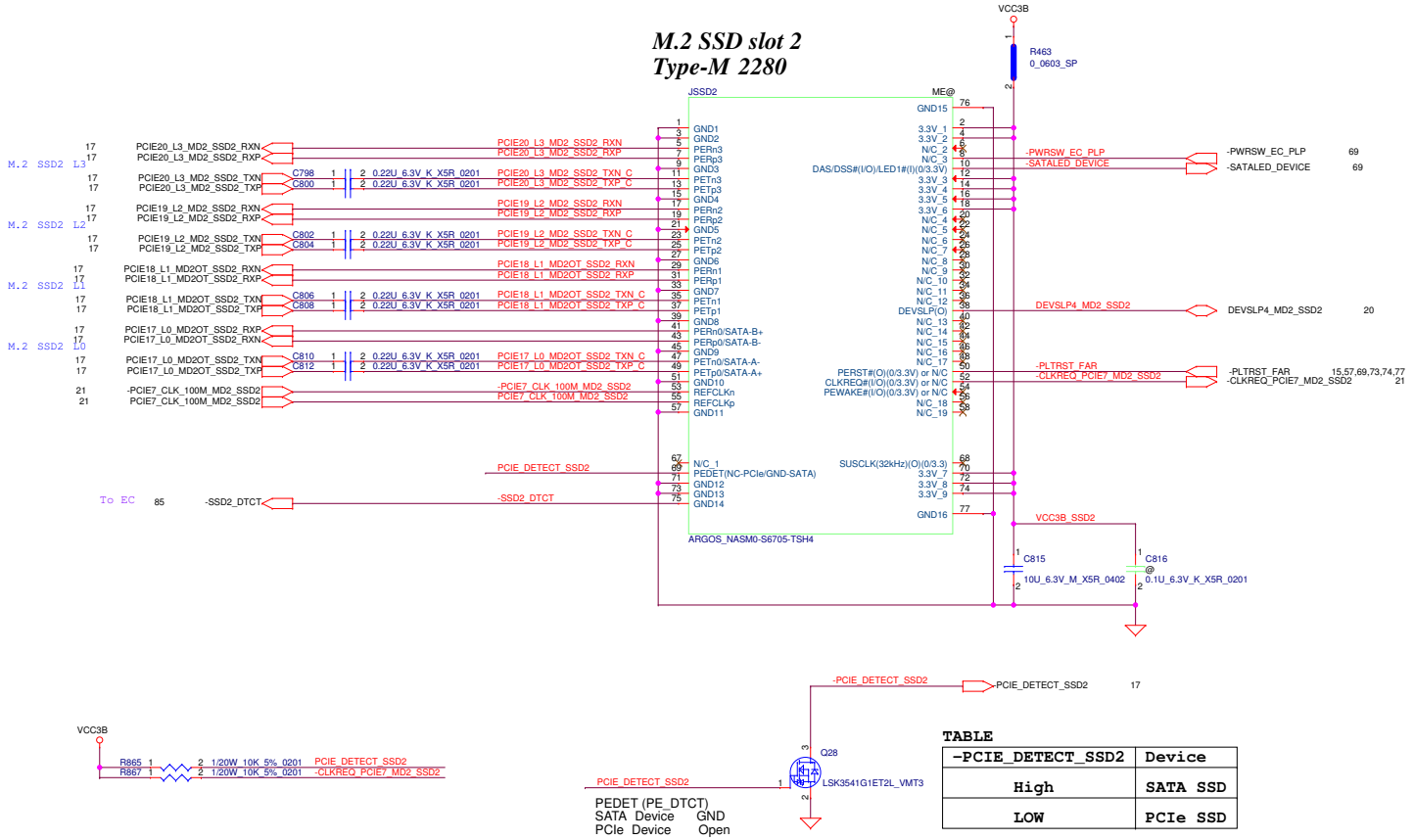


-PCIE_DETECT_SSD1	Device
High	SATA SSD
LOW	PCIe SSD

LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title M.2 SATA/PCIE SSD SLOT_1
Date: Thursday, April 25, 2019	Sheet 69 of 142

M.2 SSD



PEDET (PE_DTCT)
SATA Device GND
PCIe Device Open

TABLE

-PCIE_DETECT_SSD2	Device
High	SATA SSD
LOW	PCIe SSD

LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title M.2 SATA/PCIE SSD SLOT_2
Date: Thursday, April 25, 2019	Sheet 70 of 142

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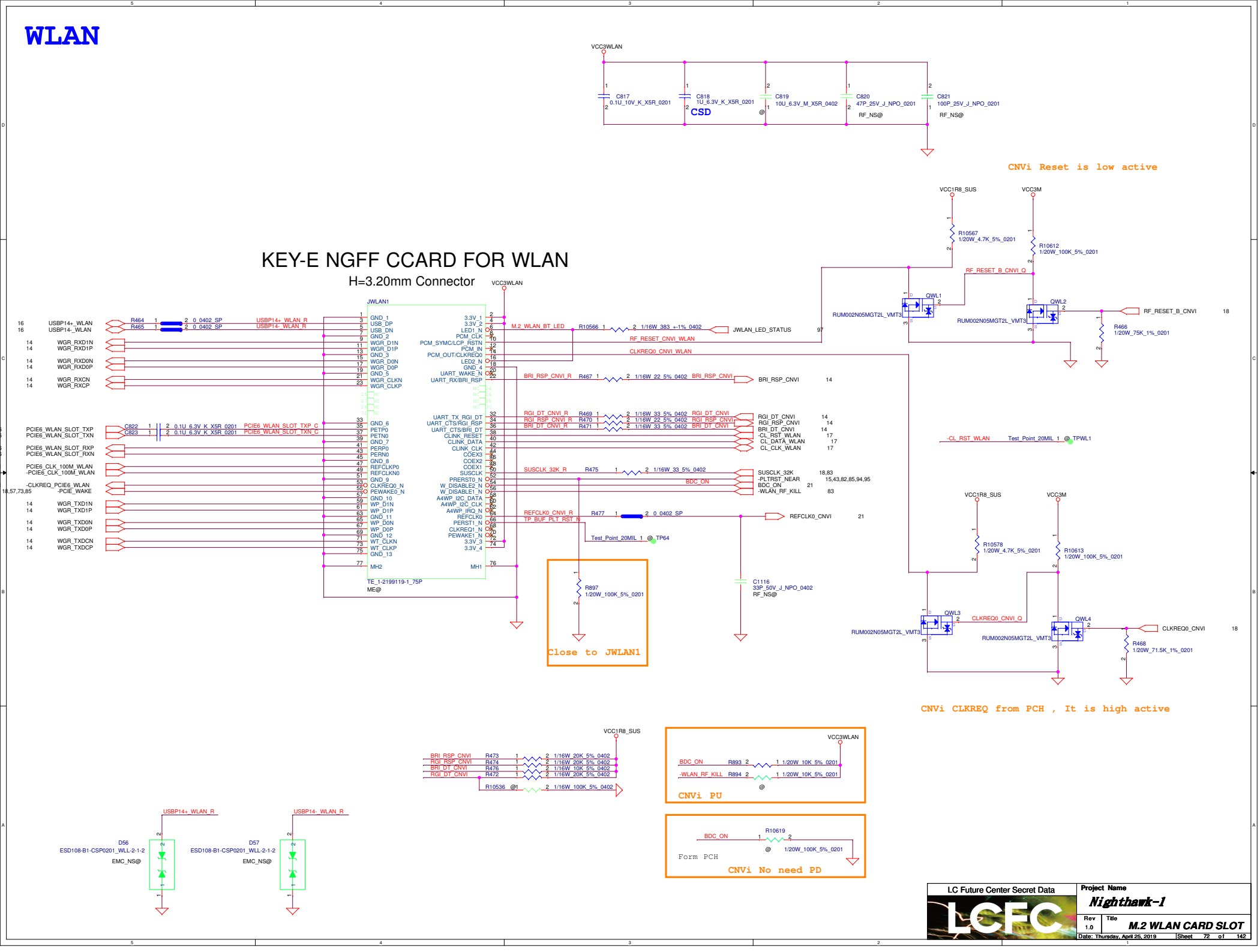
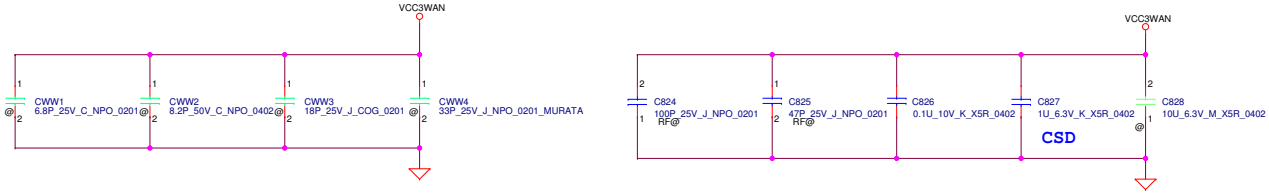
WLAN



LC Future Center Secret Data

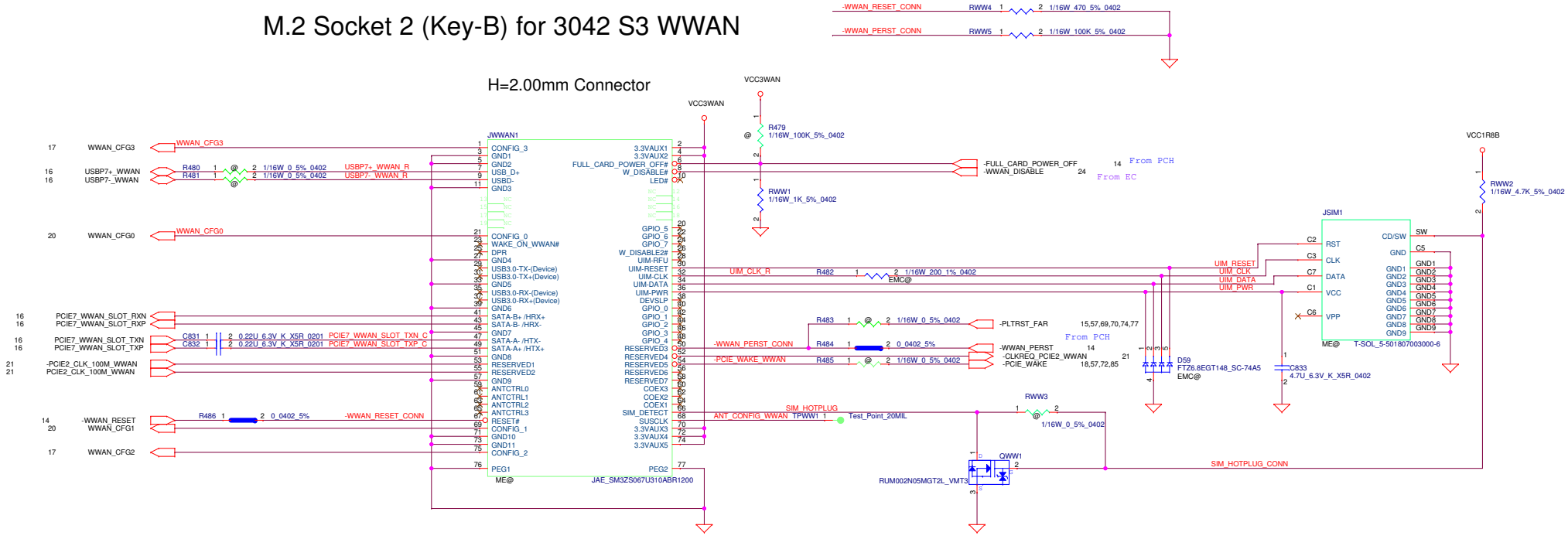
Project Name	Nighthawk-1
Rev 1.0	Title M.2 WLAN CARD SLOT
Date: Thursday, April 25, 2019	Sheet 72 of 142

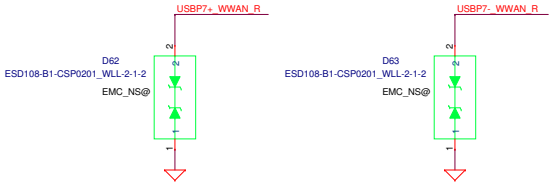
WWAN



M.2 Socket 2 (Key-B) for 3042 S3 WWAN

H=2.00mm Connector





Pin	Pin Name	I/O	Reset Value	Description	Type
36	UIM_PWR	PO	_	USIM power supply	1.8V/3V
30	UIM_RESET	O	L	USIM reset	1.8V/3V
32	UIM_CLK	O	L	USIM clock	1.8V/3V
34	UIM_DATA	I/O	L	USIM data, internal pull up(4.7KΩ)	1.8V/3V
66	SIM_DETECT	I	PD	USIM card detect, internal 390K pull-up. Active high, and high level indicates SIM card is inserted; and low level indicates SIM card is detached.	1.8V

TABLE

	CONFIG 0	CONFIG 3	CONFIG 2	CONFIG 1
Fibocom L850-GL	GND	N.C.	GND	GND

LC Future Center Secret Data

LCFC

Project Name: *Nighthawk-1*

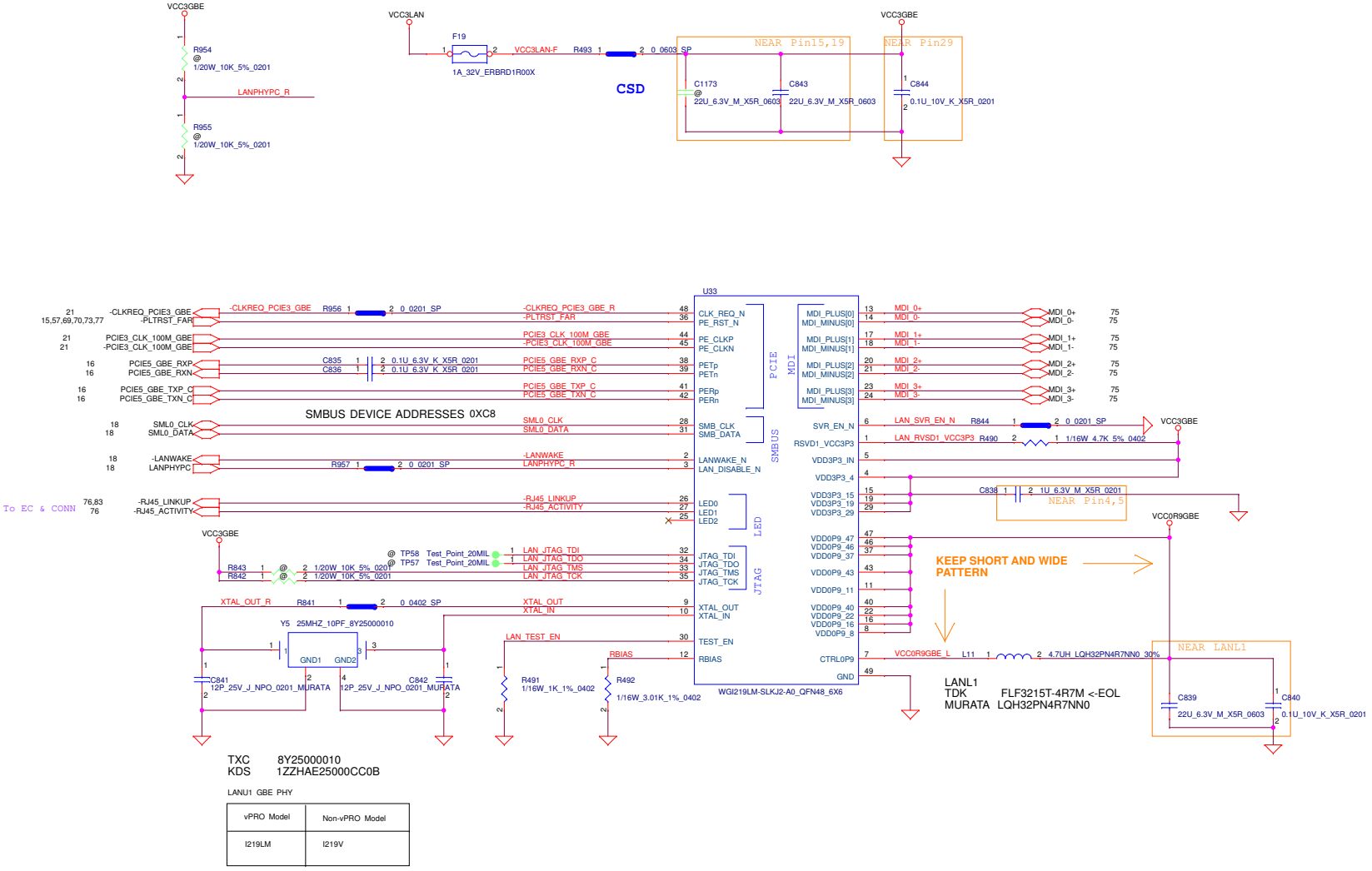
Rev 1.0

Title: *M.2 WWAN CARD SLOT*

Date: Thursday, April 25, 2019

Sheet 73 of 142

LAN

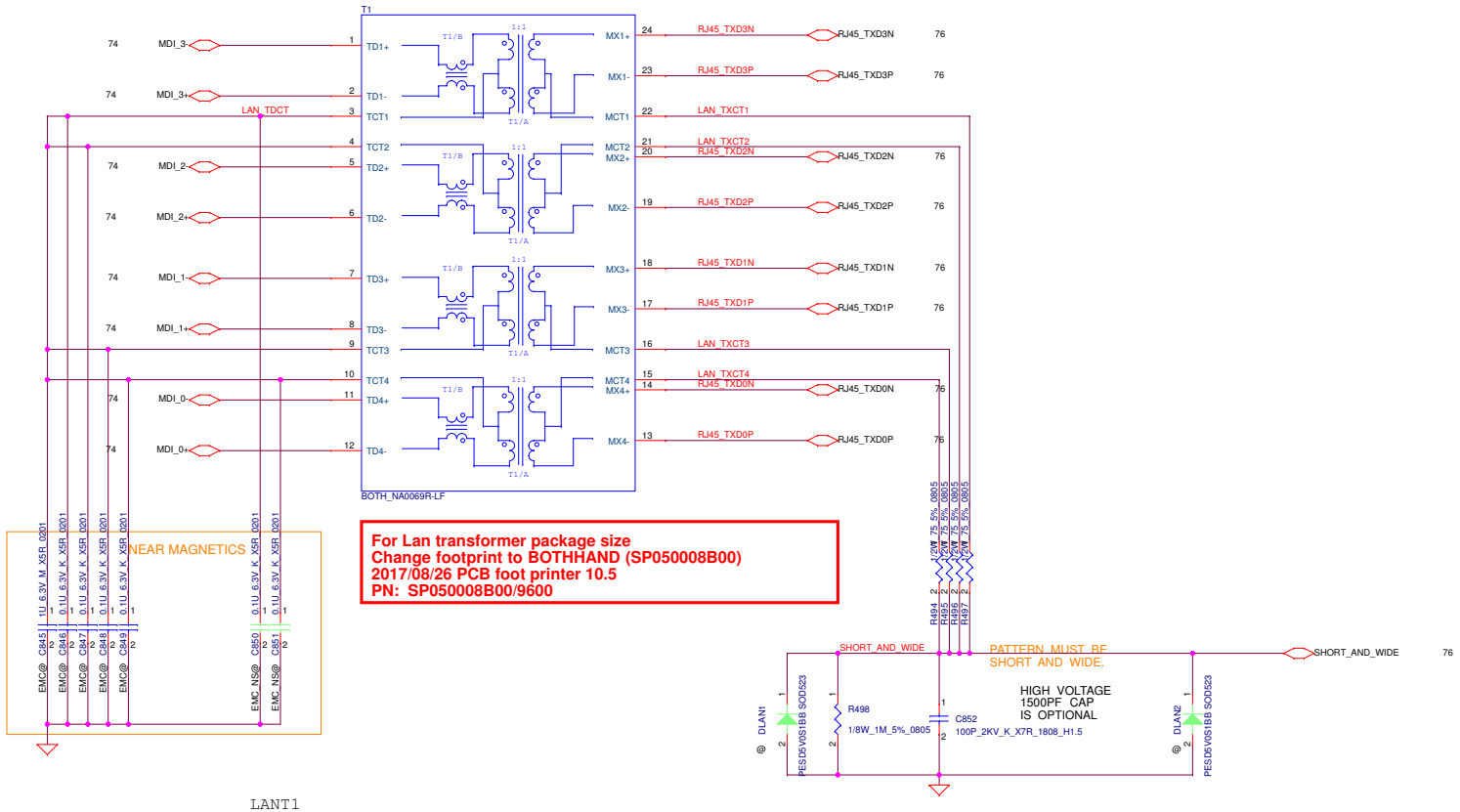


TXC 8Y25000010
KDS 1ZZHAE25000CC0B

LANU1 GBE PHY

vPRO Model	Non-vPRO Model
I219LM	I219V

LAN



LANT1

Vendor	P/N
Bothhand	SP050008B00 NA69LF
TAIMAG	SP050009J00 IH-189-F LAN

LC Future Center Secret Data

Project Name: Nighthawk-1

Rev: 1.0

Title: GBE MAGNETICS

Date: Thursday, April 25, 2019

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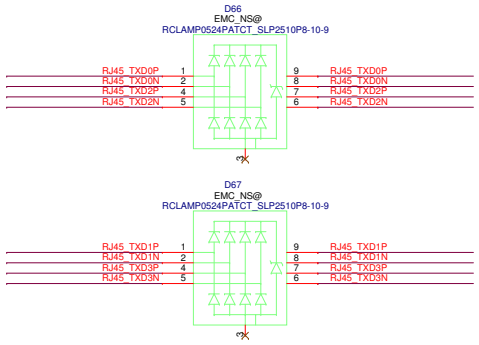
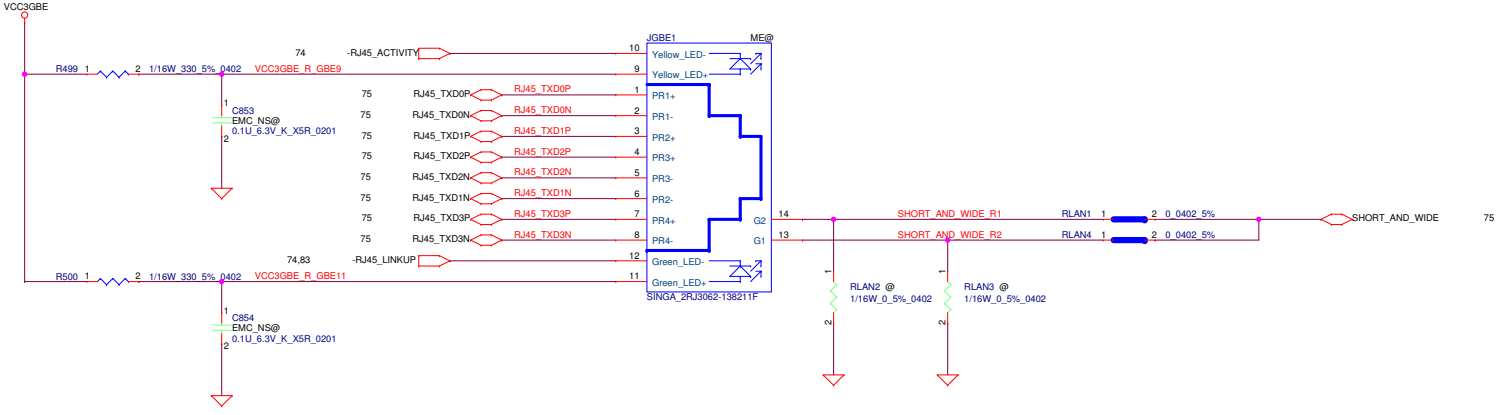
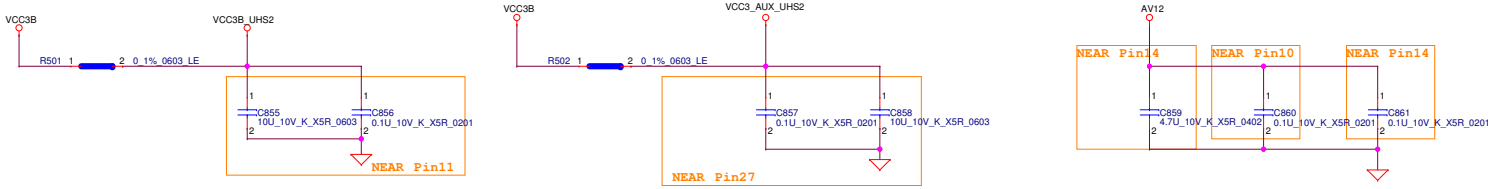
LAN

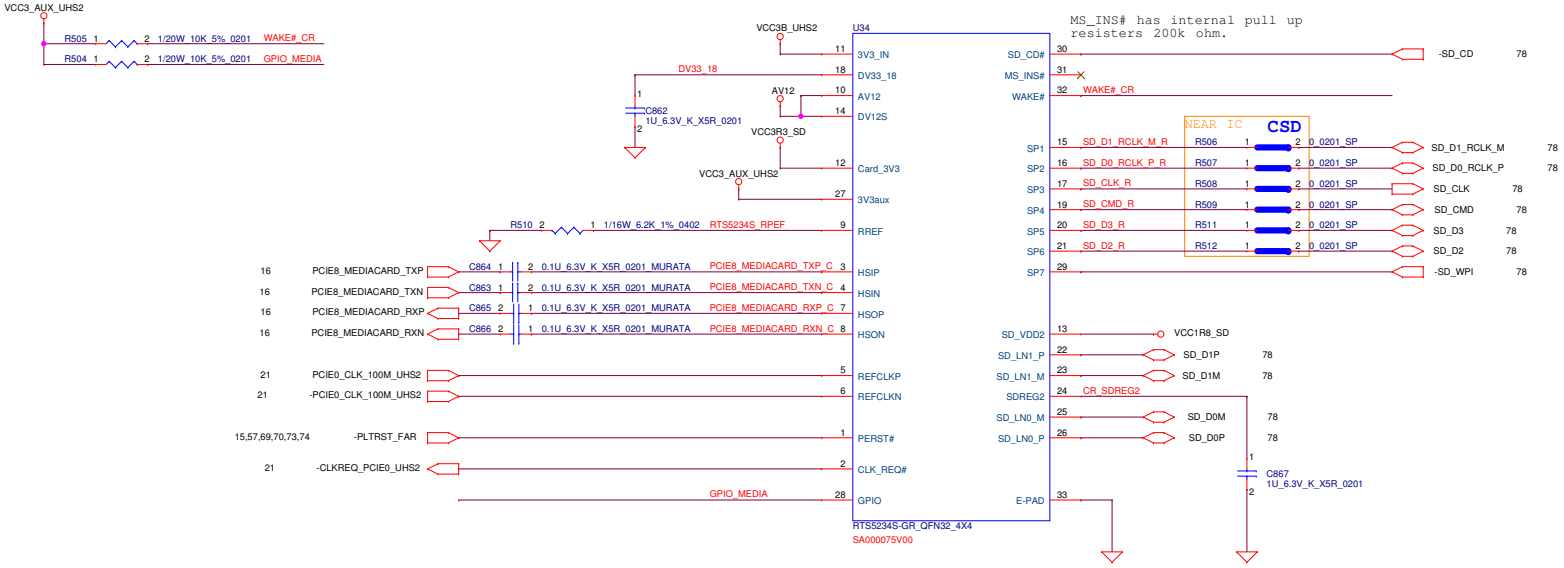


D66,D67	1st:Semtech RCLAMP0524PATCT (SC300000T0J) 2nd:LittelFuse SP3012-04UTG-1 MO-229 (SC300003900) 3th:LittelFuse SP3012-04UTG UDFN (SC300003800)



Card Reader





LC Future Center Secret Data

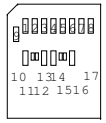
Project Name	Nighthawk-1
Rev 1.0	Title: MEDIACARD UHS-II
Date: Thursday, April 25, 2019	Sheet 77 of 142

Card Reader

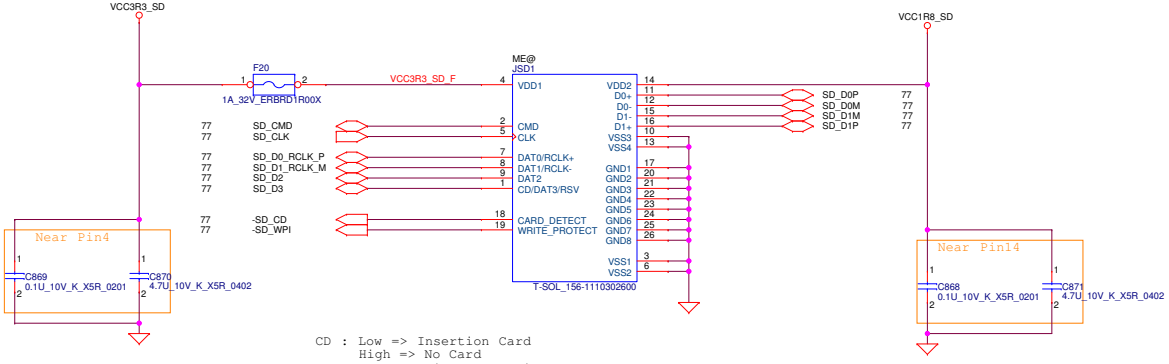
Normal type UHS-II SD Slot

Pin No	SD Mode	UHS II Mode
1	CD/DAT3	
2	CMD	
3	VSS1	
4	VDD	VDD1
5	CLK	
6	VSS2	
7	DAT0	RCLKP
8	DAT1	RCLKM
9	DAT2	
10		VSS3
11		D0P
12		D0M
13		VSS4
14		VDD2
15		D1M
16		D1P
17		VSS5
CD	CARD DETECT	
WP	WRITE PROTECT	

Bottom View

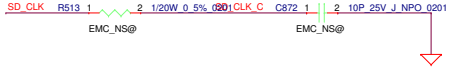


UHS II Interface	UHS I Inteface
4 VDD1 3.3V	1 CD/DAT3
7 RCLKP	2 CMD
8 RCLKM	3 VSS1
10 VSS3	4 VDD 3.3V
11 D0P	5 CLK
12 D0M	6 VSS2
13 VSS4	7 DAT0
14 VDD2 1.8V	8 DAT1
15 D1M	9 DAT2
16 D1P	
17 VSS5	



CD : Low => Insertion Card
High => No Card
WP : Low => Write Protection on
High => Write Protection off or No Card

EMC



LC Future Center Secret Data

Project Name: Nighthawk-1

Rev 1.0

Title: MEDIA CARD INTERFACE UHS-II

Date: Thursday, April 25, 2019

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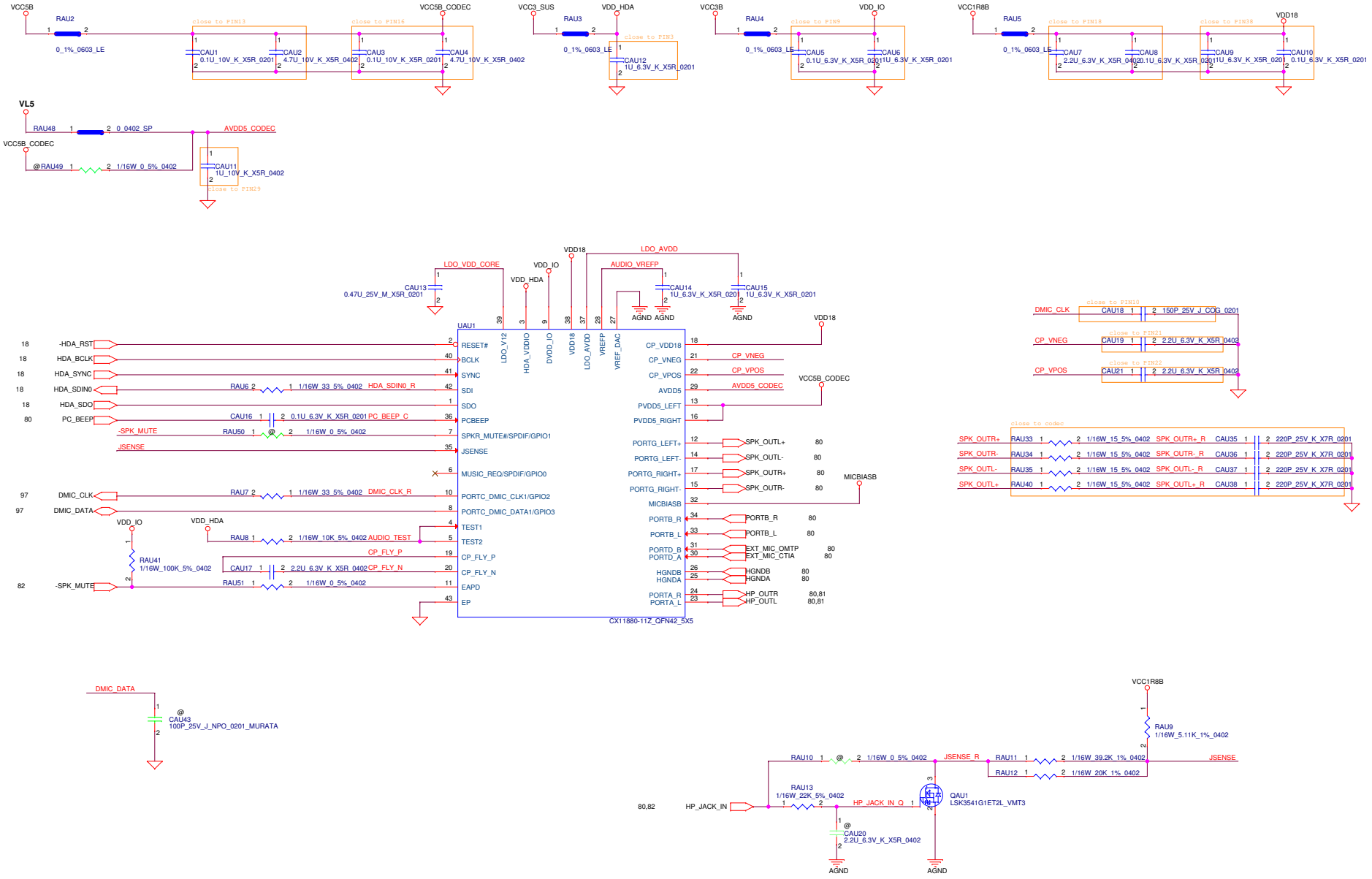
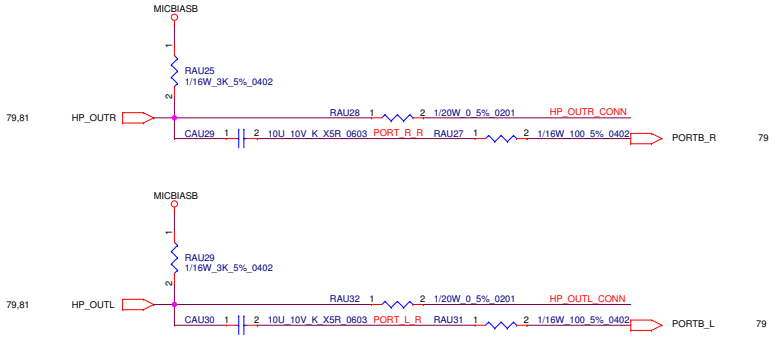
AUDIO CODEC



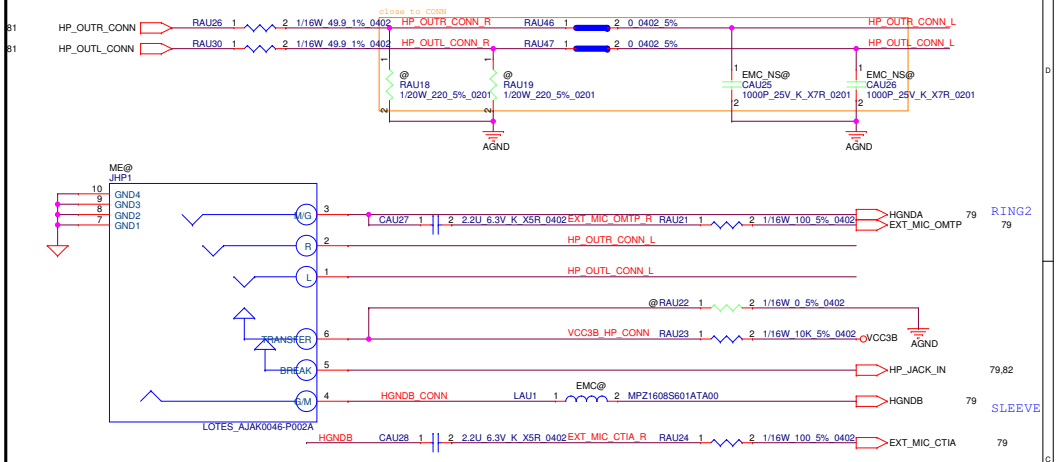
LC Future Center Secret Data

Project Name	Nighthawk-I
Rev 1.0	Title AUDIO CX11880
Date: Thursday, April 25, 2019	Sheet 79 of 142

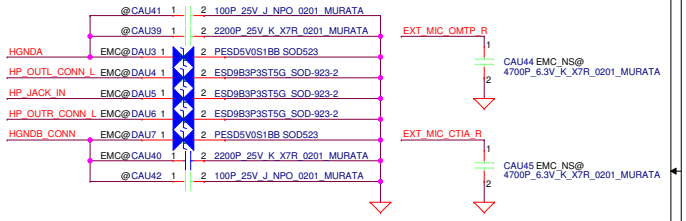
HEAD PHONE/LINE OUT



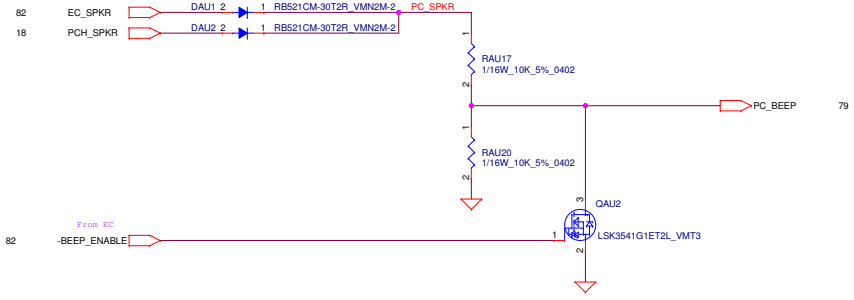
AUDIO JACK/EXT. MIC/LINE IN



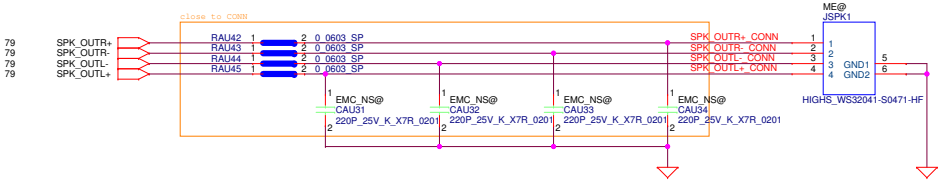
DAU3~DAU7 close to CONN
CAU39, CAU41 close to DAU3
CAU40, CAU42 close to DAU7



PC BEEP



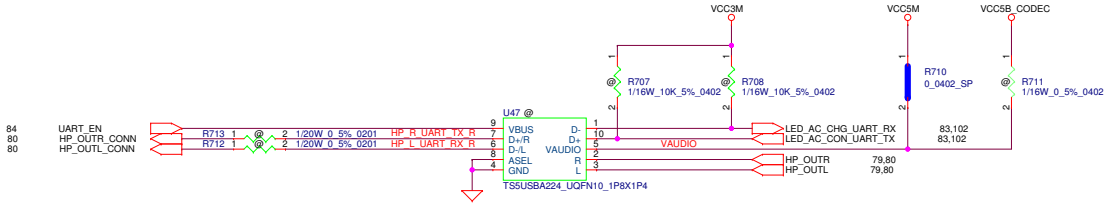
SPEAKER



LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title AUDIO CX11880
Date: Thursday, April 25, 2019	Sheet 80 of 142

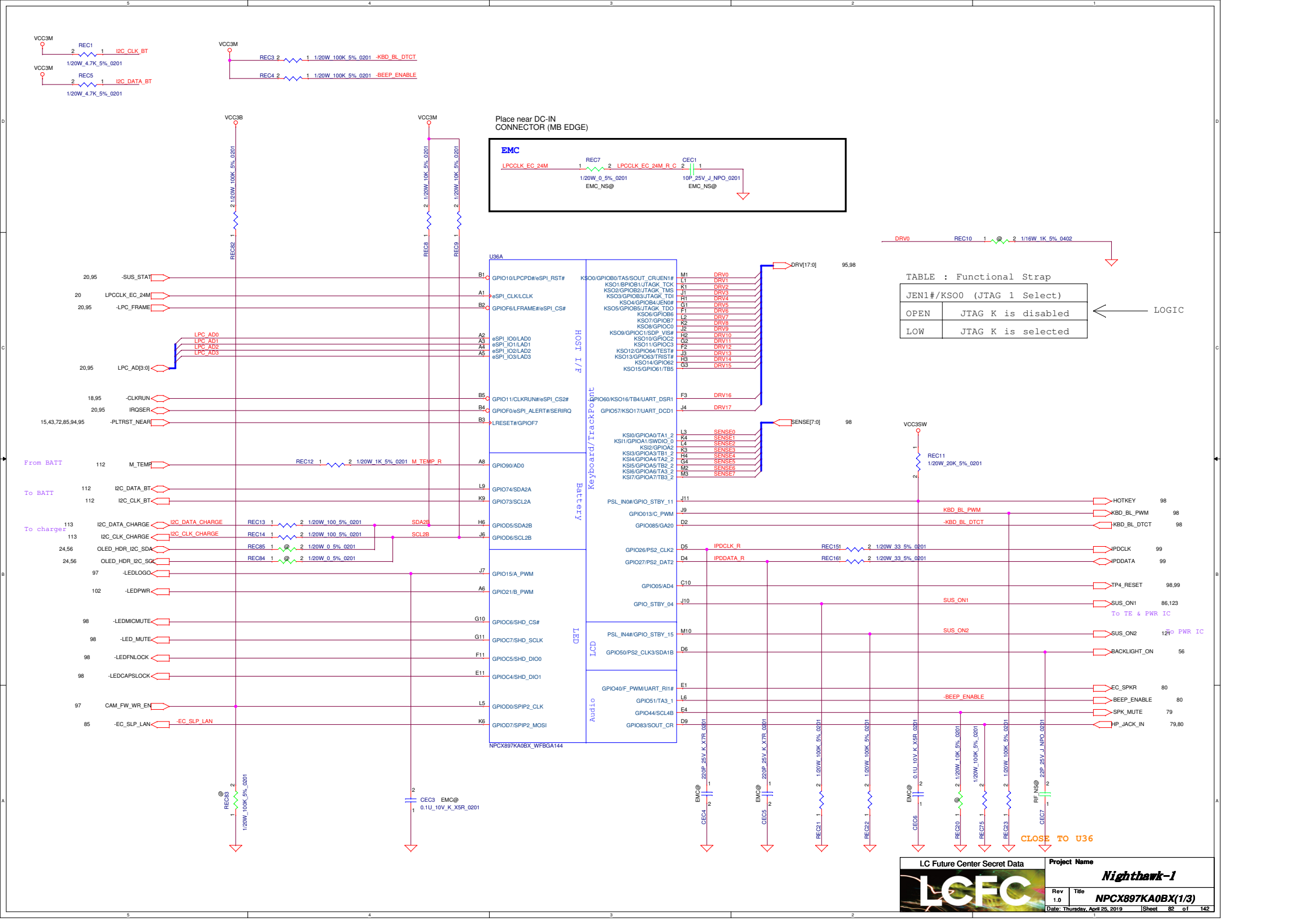
AUDIO DEBUG PORT



LC Future Center Secret Data

LCFC

Project Name	*Nighthawk-I*
Rev 1.0	Title: *AUDIO DEBUG*
Date: Thursday, April 25, 2019	Sheet 81 of 142


VCC3M
REC1
I2C_CLK_BT
1/20W_4.7K_5%_0201
REC5
I2C_DATA_BT
REC3 1/20W_100K_5%_0201 -KBD_BL_DTCT
REC4 1/20W_100K_5%_0201 -BEEP_ENABLE
VCC3B
Place near DC-IN
CONNECTOR (MB EDGE)
EMC
LPCCLK_EC_24M
REC7 1/20W_0_5%_0201 EMC_NS@
LPCCLK_EC_24M_R_C
CEC1 10P_25V_J_NPO_0201 EMC_NS@
REC82
REC8
REC9
U36A
GPIO10/LPCPD#/eSPI_RST#
eSPI_CLK/LCLK
GPIOF6/LFRAME#/eSPI_CS#
eSPI_IO0/LAD0
eSPI_IO1/LAD1
eSPI_IO2/LAD2
eSPI_IO3/LAD3
GPIO11/CLKRUN#/eSPI_CS2#
GPIOF0/eSPI_ALERT#/SERIRQ
LRESET#/GPIOF7
GPIO90/AD0
GPIO74/SDA2A
GPIO73/SCL2A
GPIOD5/SDA2B
GPIOD6/SCL2B
GPIO15/A_PWM
GPIO21/B_PWM
GPIOC6/SHD_CS#
GPIOC7/SHD_SCLK
GPIOC5/SHD_DIO0
GPIOC4/SHD_DIO1
GPIOD0/SPIP2_CLK
GPIOD7/SPIP2_MOSI
KSO0/GPIOB0/TA5/SOUT_CR/JEN1#
KSO1/BPIOB1/JTAGK_TCK
KSO2/GPIOB2/JTAGK_TMS
KSO3/GPIOB3/JTAGK_TDI
KSO4/GPIOB4/JEN0#
KSO5/GPIOB5/JTAGK_TDO
KSO6/GPIOB6
KSO7/GPIOB7
KSO8/GPIOC0
KSO9/GPIOC1/SDP_VIS#
KSO10/GPIOC2
KSO11/GPIOC3
KSO12/GPIO64/TEST#
KSO13/GPIO63/TRIST#
KSO14/GPIO62
KSO15/GPIO61/TB5
GPIO60/KSO16/TB4/UART_DSR1
GPIO57/KSO17/UART_DCD1
KSI0/GPIOA0/TA1_2
KSI1/GPIOA1/SWDIO_0
KSI2/GPIOA2
KSI3/GPIOA3/TB1_2
KSI4/GPIOA4/TA2_2
KSI5/GPIOA5/TB2_2
KSI6/GPIOA6/TA3_2
KSI7/GPIOA7/TB3_2
PSL_IN0#/GPIO_STBY_11
GPIO013/C_PWM
GPIO085/GA20
GPIO26/PS2_CLK2
GPIO27/PS2_DAT2
GPIO05/AD4
GPIO_STBY_04
PSL_IN4#/GPIO_STBY_15
GPIO50/PS2_CLK3/SDA1B
GPIO40/F_PWM/UART_RI1#
GPIO51/TA3_1
GPIO44/SCL4B
GPIO83/SOUT_CR
NPCX897KA0BX_WFBGA144
HOST I/F
Keyboard/TrackPoint
Battery
LED
LCD
Audio
DRV[17:0] 95,98
DRV0 REC10 1 @ 2 1/16W_1K_5%_0402
TABLE : Functional Strap
JEN1#/KSO0 (JTAG 1 Select)
OPEN JTAG K is disabled
LOW JTAG K is selected
LOGIC
SENSE[7:0] 98
VCC3SW
REC11 1/20W_20K_5%_0201
-SUS_STAT 20,95
LPCCLK_EC_24M 20
-LPC_FRAME 20,95
LPC_AD[3:0] 20,95
-CLKRUN 18,95
IRQSER 20,95
-PLTRST_NEAR 15,43,72,85,94,95
From BATT
M_TEMP 112
REC12 1/20W_1K_5%_0201 M_TEMP_R
To BATT
I2C_DATA_BT 112
I2C_CLK_BT 112
To charger
I2C_DATA_CHARGE 113
I2C_CLK_CHARGE 113
REC13 1/20W_100_5%_0201
REC14 1/20W_100_5%_0201
OLED_HDR_I2C_SDA 24,56
OLED_HDR_I2C_SCL 24,56
REC85 1/20W_0_5%_0201
REC84 1/20W_0_5%_0201
-LEDLOGO 97
-LEDPWR 102
-LEDMICMUTE 98
-LED_MUTE 98
-LEDFNLOCK 98
-LEDCAPSLOCK 98
CAM_FW_WR_EN 97
-EC_SLP_LAN 85
REC83 1/20W_100K_5%_0201
CEC3 EMC@ 0.1U_10V_K_X5R_0201
IPDCLK_R
IPDDATA_R
REC151 1/20W_33_5%_0201
REC161 1/20W_33_5%_0201
SUS_ON1
SUS_ON2
HOTKEY 98
KBD_BL_PWM 98
-KBD_BL_DTCT 98
IPDCLK 99
IPDDATA 99
TP4_RESET 98,99
SUS_ON1 86,123
To TE & PWR IC
SUS_ON2 121
BACKLIGHT_ON 56
EC_SPKR 80
-BEEP_ENABLE
BEEP_ENABLE 80
SPK_MUTE 79
HP_JACK_IN 79,80
CEC4 CEC5 CEC6 CEC7
REC21 REC22 REC20 REC75 REC23
CLOSE TO U36
LC Future Center Secret Data
Project Name
Nighthawk-1
Rev 1.0
Title
NPCX897KA0BX(1/3)
Date: Thursday, April 25, 2019
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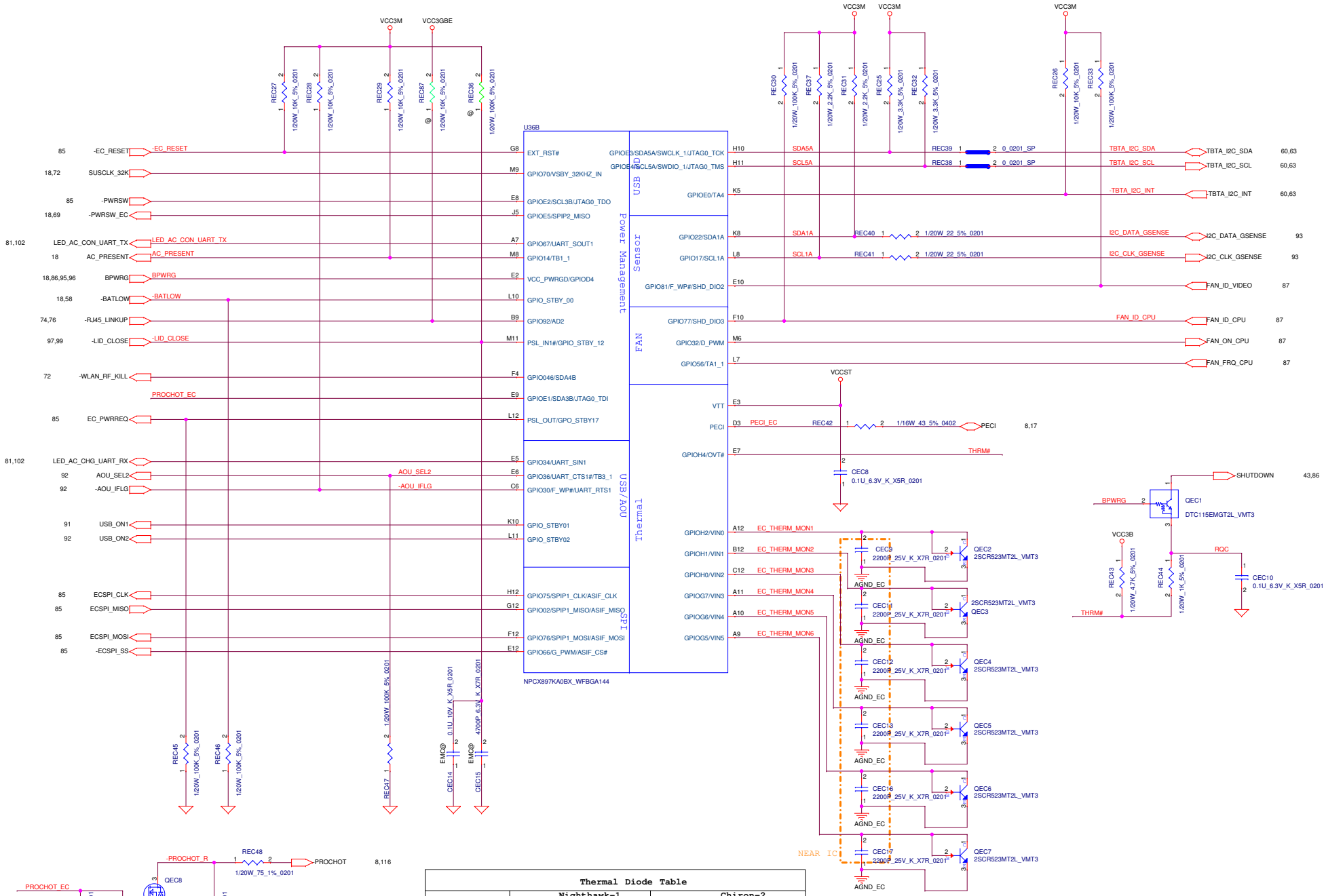


Thermal Diode Table				
ID (Location)	Nighthawk-1		Chiron-2	
	Device	Placed on	Device	Placed on
DIODE 1(QEC2)	CPU DCDC	BOT	CPU DCDC	BOT
DIODE 2(QEC3)	GPU DCDC	TOP	GPU DCDC	TOP
DIODE 3(QEC4)	GPU FAN	TOP	SSD	BOT
DIODE 4(QEC5)	CPU FAN	TOP	GPU FAN	TOP
DIODE 5(QEC6)	DDR DCDC	TOP	CPU FAN	TOP
DIODE 6(QEC7)	SSD	BOT	DIMM	TOP

LC Future Center Secret Data

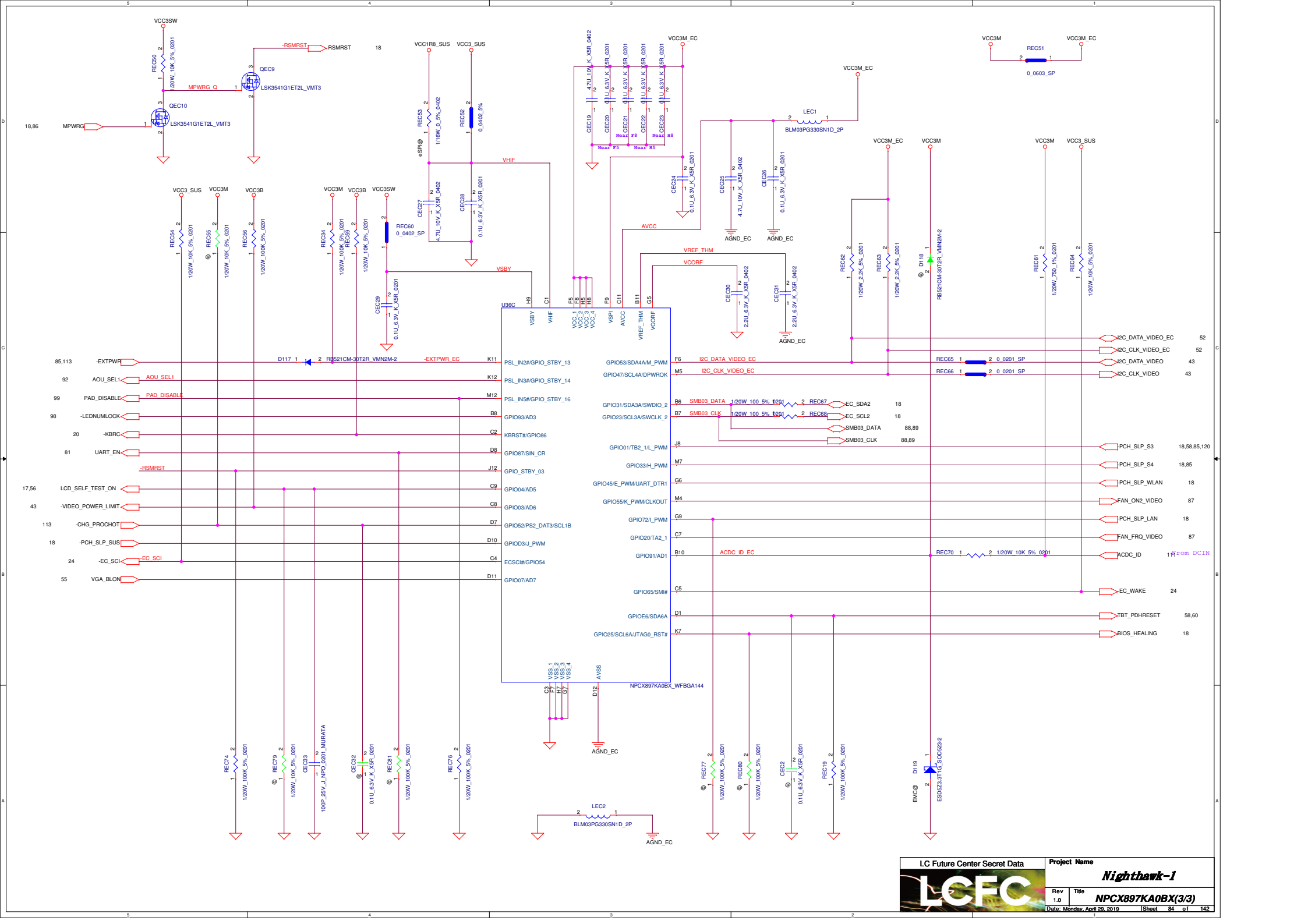
Project Name: Nighthawk-1

Rev: 1.0

Title: NPCX897KA0BX(2/3)

Date: Thursday, April 25, 2019

Sheet 83 of 142



LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	NPCX897KA0BX(3/3)
Date: Monday, April 29, 2019	Sheet 84 of 142

THINK ENGINE

Rohm Think Engine-2 Short term solution

AND LOGIC. Once -PCH_SLP_S3 is de-asserted
VCCST_PWRGD and IMVP_VR_ON should be de-asserted in <= 1 usec.
These are tCPU28 and tPLT17 defined in Intel SKL-H PDG.
(CT_20141216)

VCC3SW
C936 0.01U_10V_K_X7R_0201
C937 0.01U_10V_K_X7R_0201
C938 1U_10V_K_X5R_0402

VL5
R614 1/20W_10K_5%_0201
C939 1000P_25V_K_X7R_0201
TE_VL5

VCC3SW
R615 1/20W_47K_5%_0201
Q43 LSK3541G1ET2L_VMT3

RTE1 @ 1/20W_0_5%_0201
D78 DAP222MGT2L_VMD3
CPUCORE_ON_ASIC
-PCH_SLP_S3
CPUCORE_ON 8,116 To PWR IC & CPU

U37A BD4178AGSW-ZE2 SA000076920

From EC & CHARGER
84,113 -EXTPWR → TE_EXTPWR# → EXTPWR#

From EC/ PWR IC/Tunderbolt
18,58,84,120 -PCH_SLP_S3 → SLP_S3#
18,84 -PCH_SLP_S4 → SLP_S4#
18 -PCH_SLP_S5 → SLP_S5#
82 -EC_SLP_LAN → SLP_LAN#
18 -PCH_SLP_M → SLP_M#
SUS_PWR_ACK → SUSPWRACK

EON → M_ON 115 To PWR IC
LANON → VCCLAN_ON 86
MEON
AON → A_ON 124,125,129 To PWR IC
BON → B_ON 95,120,124,129 To PWR IC & debug CONN
CPUON → CPUCORE_ON_ASIC

15,43,72,82,94,95 -PLTRST_NEAR → PLTRST#
PWRON_DOCK#
-PWRSW_ASIC → PWRSW#
18,57,72,73 -PCIE_WAKE → PME#
ECRST# → EC_RESET 83 To EC

TP112 Test_Point_40MIL
-SSD3_DTCT → PGPIO0
83 EC_PWRREQ → PGPIO1
69 -SSD1_DTCT → PGPIO2
70 -SSD2_DTCT → PGPIO3
86,111 DISCHARGE → PGPIO4
68 -HDD1_DTCT → PGPIO5
TP147 Test_Point_40MIL

MTRCL
STRCL
BATCRG → BAT_CRG → BAT_CRG 113 To Charger

SPISCK → ECSPI_CLK_R R755 1/20W_33_5%_0201 → ECSPI_CLK 83
SPIMOSI → ECSPI_MOSI_R R756 1/20W_33_5%_0201 → ECSPI_MOSI 83
SPISS# → -ECSPI_SS_R R757 1/20W_33_5%_0201 → ECSPI_SS 83 To EC
SPIMISO → ECSPI_MISO_R R617 0_0402_SP → ECSPI_MISO 83

(TEST_IN1)
(TEST_IN2)
(TEST_IN3)
(TEST_IN4)
TEST

R616 1/20W_100K_5%_0201

These are device tamper detection pins. If storage is detached, BIOS will not automatically send password to storage.

VCC3SW
R618 1/20W_4.7K_5%_0201
C940 0.22U_6.3V_K_X5R_0201
-PWRSW_ASIC

VCC3M
R619 1/20W_10K_5%_0201
D79 RB521CM-30T2R_VMN2-2
D80 RB521CM-30T2R_VMN2-2
95,102 -PWRSWITCH → -PWRSW 83 To EC

R762 1/20W_100K_5%_0201 SUS_PWR_ACK
R763 1/20W_100K_5%_0201 BAT_CRG
R764 1/20W_100K_5%_0201 ECSPI_CLK_R
R765 1/20W_100K_5%_0201 -ECSPI_SS_R

VCC3SW
RP23 1/16W_1M_5%_8P4R_0804
-SSD3_DTCT
-HDD1_DTCT
-SSD1_DTCT
-SSD2_DTCT

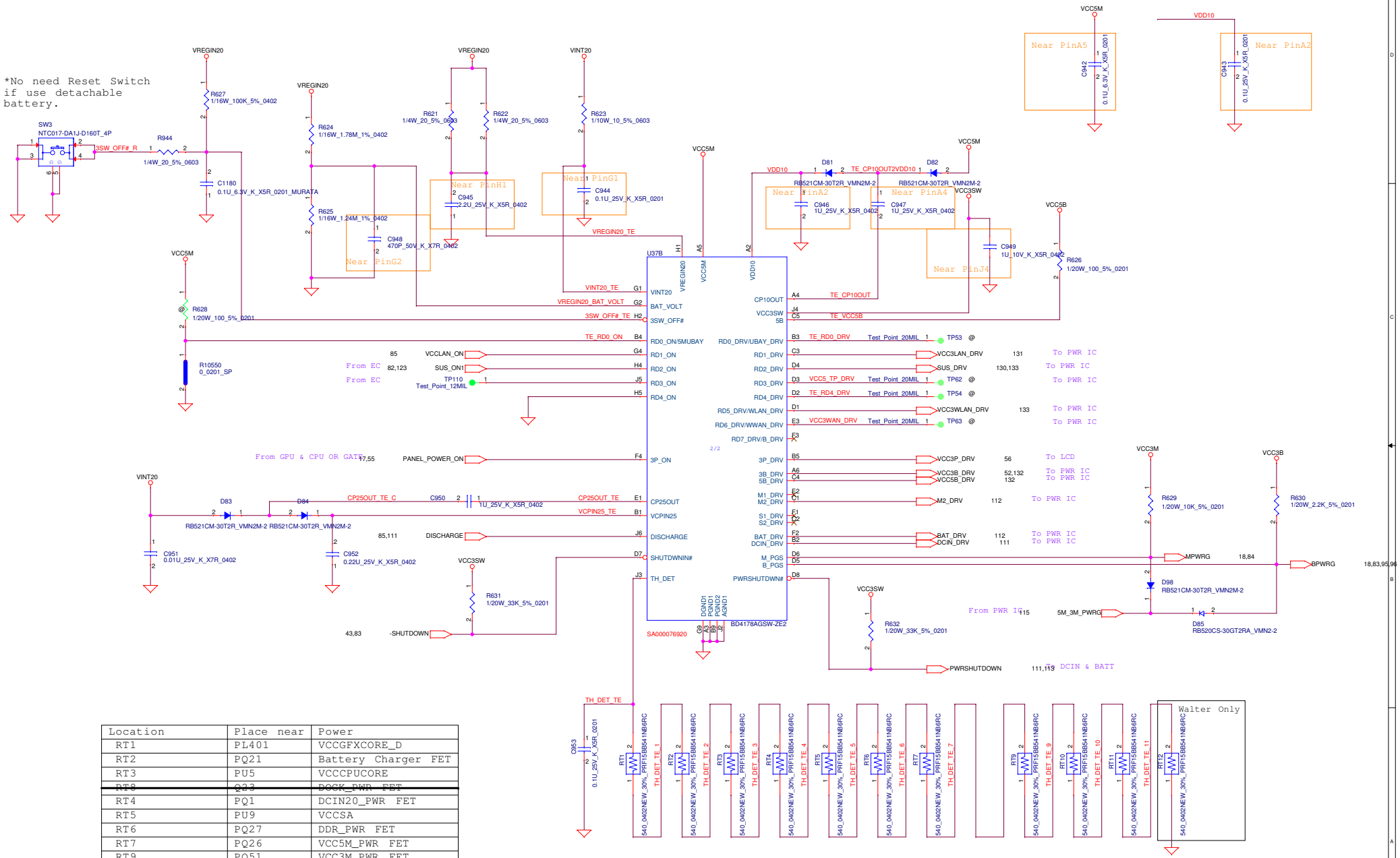
EMC

ECSPI_CLK_R → R620 @ 1/20W_0_5%_0201 → ECSPI_CLK_R_C → C941 @ 10P_25V_J_NPO_0201

LC Future Center Secret Data

Project Name: Nighthawk-1
Rev: 1.0
Title: THINK ENGINE 2(1/2)
Date: Thursday, April 25, 2019
Sheet 85 of 142

THINK ENGINE

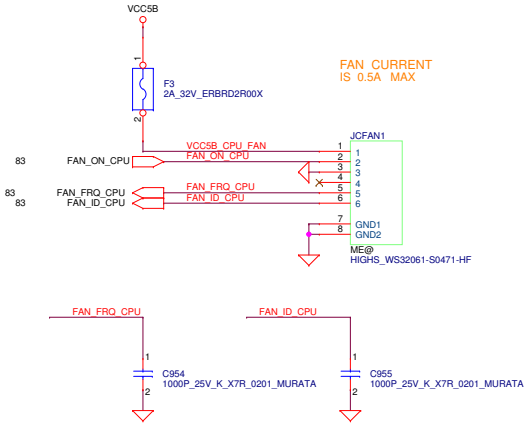


Location	Place near	Power
RT1	PL401	VCCGFXCORE_D
RT2	PQ21	Battery Charger FET
RT3	PU5	VCCCPUCORE
~~RT8~~	~~Q23~~	~~DOCK_PWR FET~~
RT4	PQ1	DCIN20_PWR FET
RT5	PU9	VCCSA
RT6	PQ27	DDR_PWR FET
RT7	PQ26	VCC5M_PWR FET
RT9	PQ51	VCC3M_PWR FET
RT10	PQ10	M_BAT_PWR FET
RT11	PU7	VCCGFXCORE_I
RT12	PQ9	Charge FET
~~PRT1(BAT_FET_HOT)~~	~~PQ11~~	~~BAT_IN~~

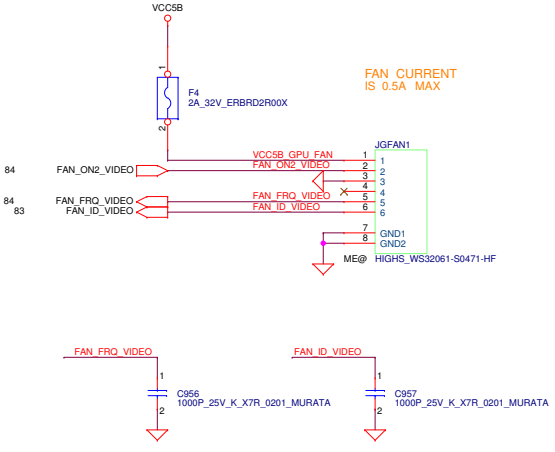
LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title: THINK ENGINE 2(2/2)
Date: Thursday, April 25, 2019	Sheet 86 of 142

CPU FAN



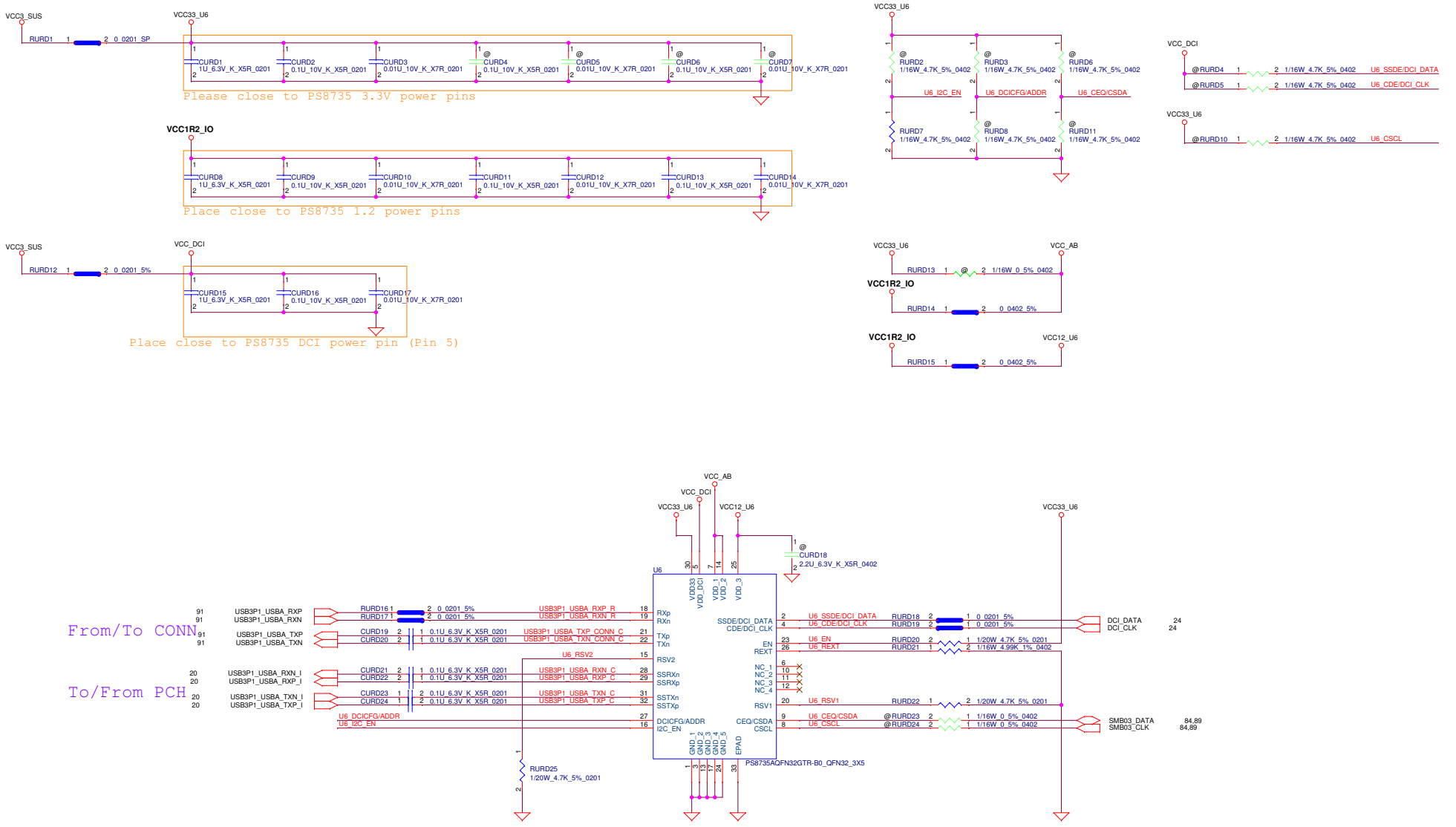
GPU FAN



LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title: FAN CONNECTOR
Date: Thursday, April 25, 2019	Sheet 87 of 142

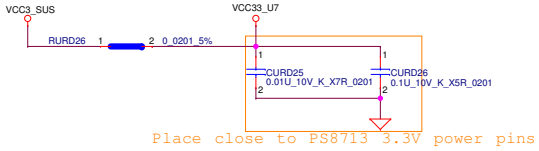
USB3.1 Redriver

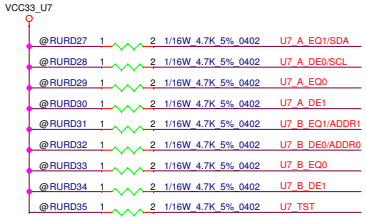


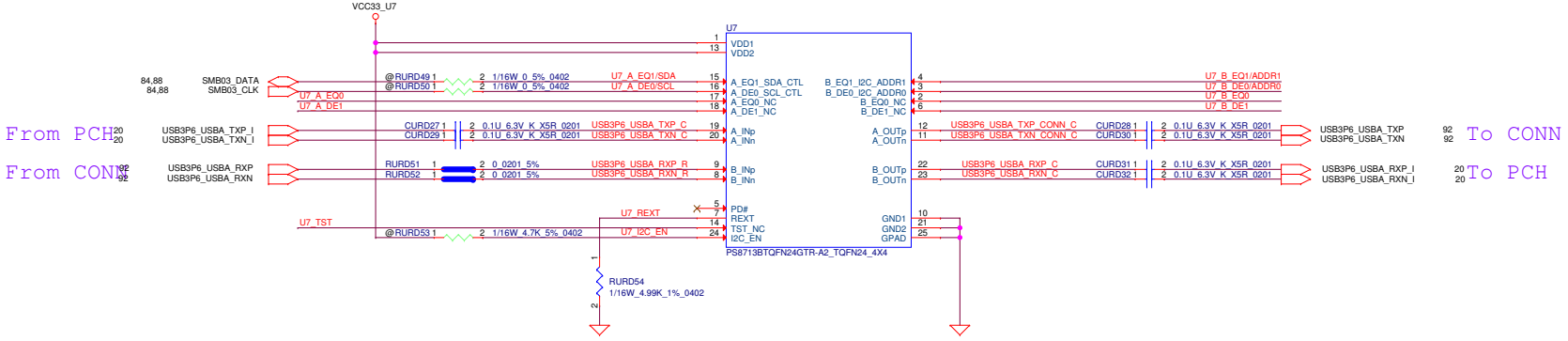
LC Future Center Secret Data

Project Name	Nighthawk-I
Rev 1.0	Title: USB REDRIVER (2/2)
Date: Thursday, April 25, 2019	Sheet 88 of 142

USB3.1 Redriver







LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title: USB REDRIVER (1/2)
Date: Thursday, April 25, 2019	Sheet 89 of 142

BLANK

USB3.1 CONN

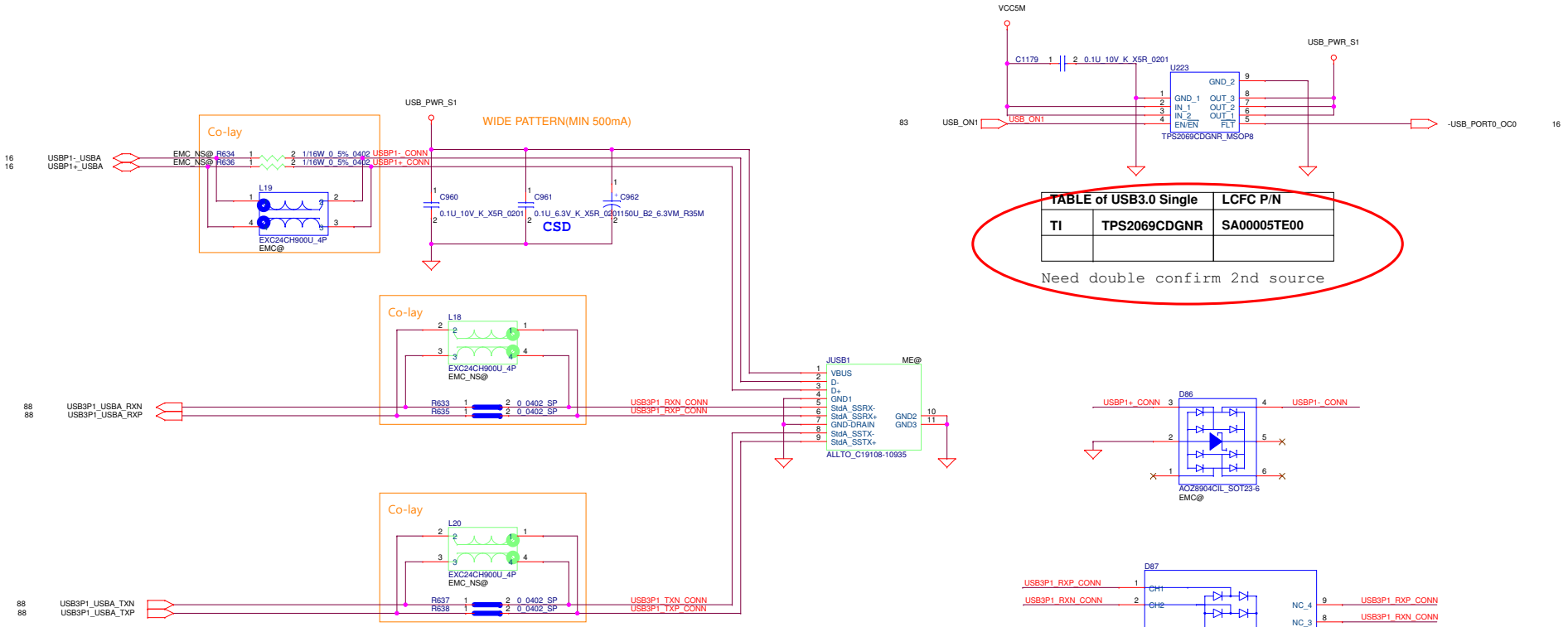


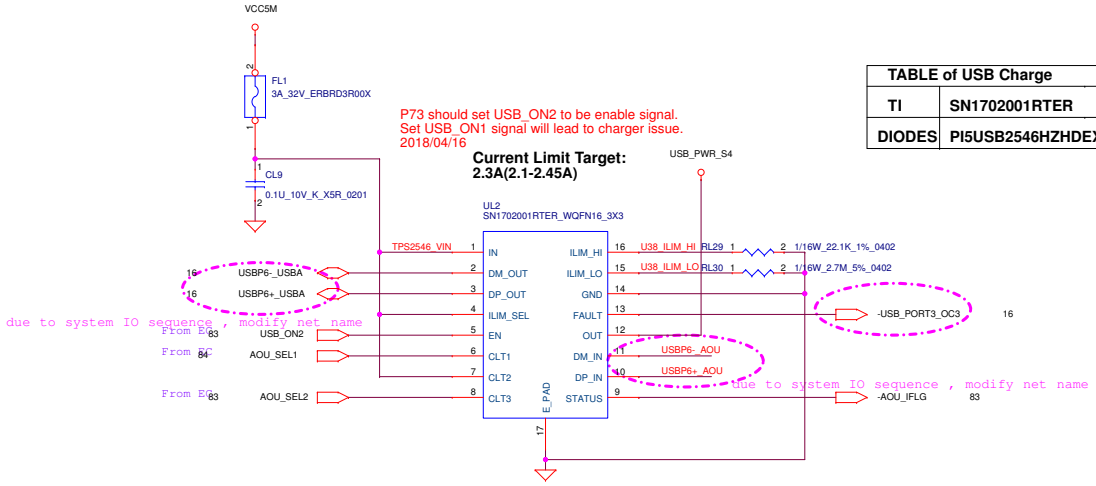
TABLE of USB3.0 Single		LCFC P/N
TI	TPS2069CDGNR	SA00005TE00

Need double confirm 2nd source

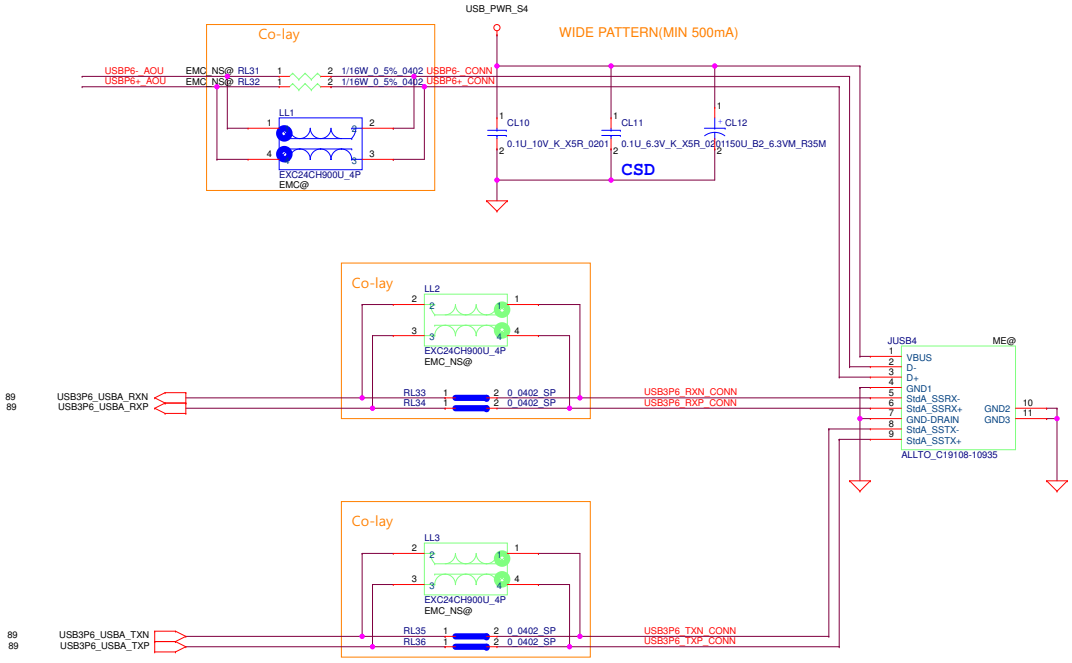
D87	1st:Semtech AOZ8808DI-05 DFN-10 (SC300003H00) 2nd:LittelFuse 3th:LittelFuse

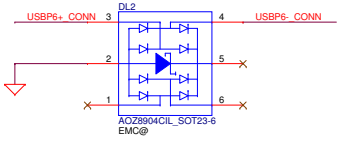
USB Charger IC

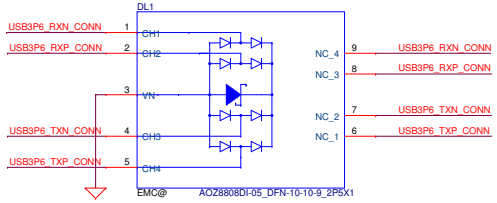
TABLE of USB Charge		LCFC P/N
TI	SN1702001RTER	SA00008HF00
DIODES	PI5USB2546HZHDEX	SA00009D800



USB3.0 CONN







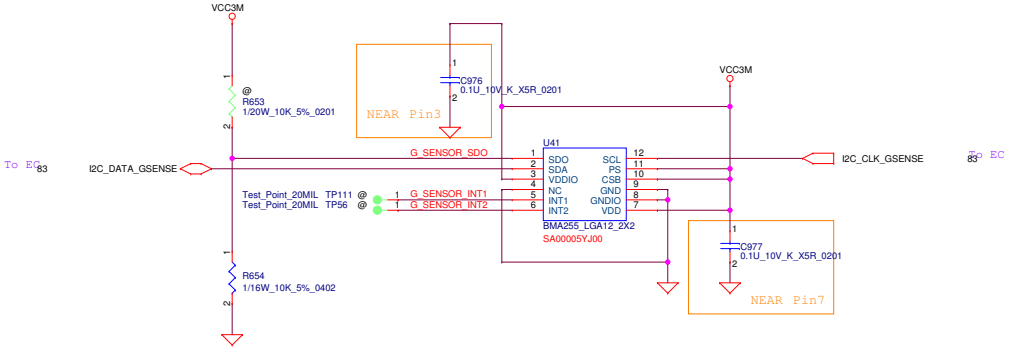
DL1	1st:Semtech AOZ8808DI-05 DFN-10 (SC300003H00) 2nd:LittelFuse 3th:LittelFuse

G-SENSOR

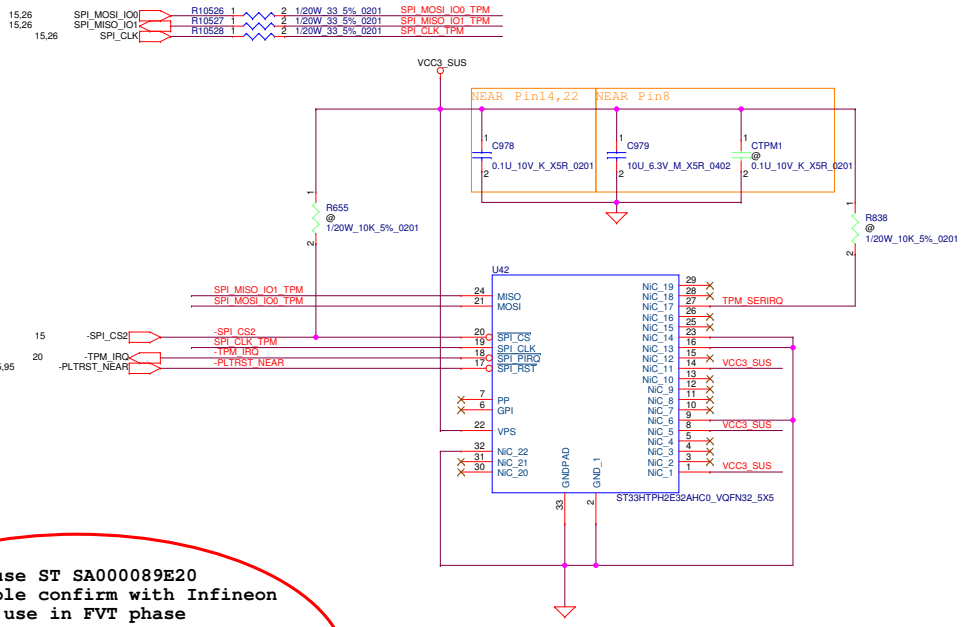
TABLE

P/N	ADDR_SEL	Address
BMA255	H L	30h (W) & 31h (R) 32h (W) & 33h (R)
KX022-1020	H L	3Eh (W) & 3Fh (R) 3Ch (W) & 3Dh (R)

TABLE of G-Sersor (GSU1)		
Vendor	P/N	LCFC P/N
BOSCH	BMA255	SA00005YJ00
Kionix	KX022-1020	SA000081E00



TPM



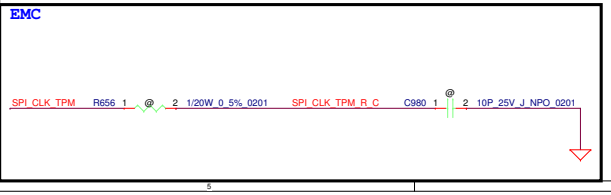
Current use ST SA000089E20
Need double confirm with Infineon
new part use in FVT phase

TABLE of TPM (U42)			
Vendor	P/N	LCFC P/N	Valid through
Infineon	SLB9670VQ2.0FW7.85	SA000075L90	
ST Micro	ST33HTPH2E32AHC0	SA000089E20	2020/Apr/01

TABLE

Pin No	TCG PTP Spec (v38)	Main Source Infineon SLB9670VQ2.0FW7.63 SA000075L50	2nd Source ST Micro ST33HTPH2E32AHB4 SA000089E10
1	VDD	VDD	NC
2	GND	GND	GND
3	GPIO	NC	NC
4	GPIO	NC	PP
5	NC	NC	NC
6	VNC/GPIO	GPIO	NC
7	GPIO/VDD	PP	GPIO
8	VDD	VDD	NC
9	GND	GND	NC
10	VNC	NC	NC
11	NC	NC	NC
12	NC	NC	NC
13	VNC/GPIO	NC	NC
14	VDD	NC	NC
15	NC	NC	NC
16	GND	NC	NC
17	SPI_RST#	RST#	SPI_RST#
18	SPI_PIRQ#	PIRQ#	SPI_PIRQ#
19	SPI_CLK	SCLK	SPI_CLK
20	SPI_CS#	CS#	SPI_CS#
21	MOSI	MOSI	MOSI
22	VDD	VDD	VPS
23	GND	GND	NC
24	MISO	MISO	MISO
25	NC	NC	NC
26	NC	NC	NC
27	NC	NC	NC
28	NC	NC	NC
29	VNC/GPIO	NC	NC
30	VNC/GPIO	NC	NC
31	VNC	NC	NC
32	GND	GND	NC

EMC



LC Future Center Secret Data

Project Name: Nighthawk-1

Rev 1.0

Title: DISCRETE TPM 2.0

Date: Thursday, April 25, 2019

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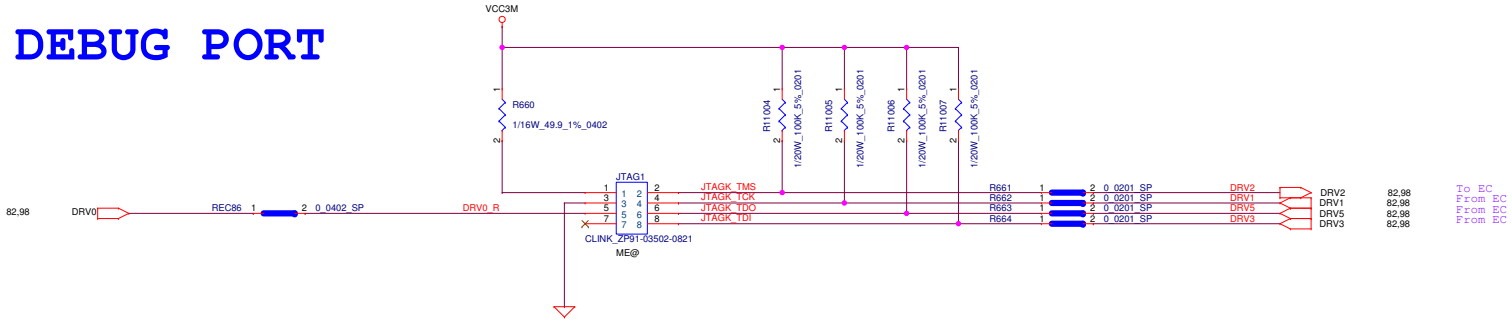
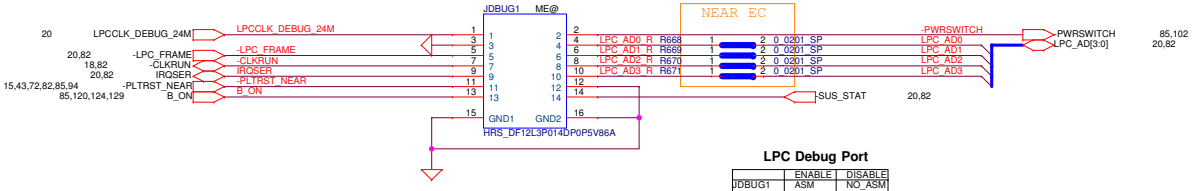
LPC DEBUG PORT



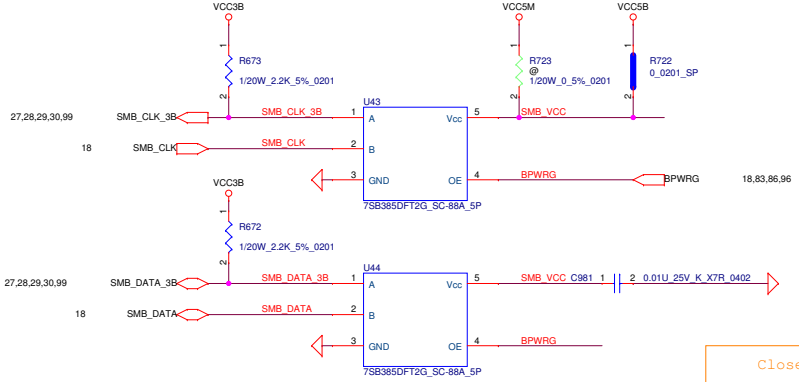


LPC Debug Port

	ENABLE	DISABLE
JDBUG1	ASM	NO_ASM
DBUGR8	ASM	NO_ASM
DBUGR9	ASM	NO_ASM
DBUGR10	ASM	NO_ASM
DBUGR11	ASM	NO_ASM

LOGIC

SMBUS SWITCH



Close to U43.1 and U43.2

SMB_CLK_3B R716 2 1 @1/20W_0_5%_0201 SMB_CLK

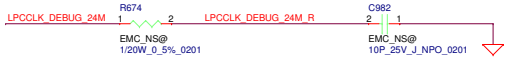
Close to U44.1 and U44.2

SMB_DATA_3B R717 2 1 @1/20W_0_5%_0201 SMB_DATA

TABLE of U43/U44

Vendor	P/N	LCFC P/N
~~TOSHIBA~~	~~TC7SB385FU~~	~~SA00005US0J~~
ON	7SB385DFT2G	SA00007CW00

EMC



LC Future Center Secret Data

Project Name: Nighthawk-1

Rev: 1.0

Title: SMBUS SWITCH/LPC DEBUG PORT

Date: Thursday, April 25, 2019

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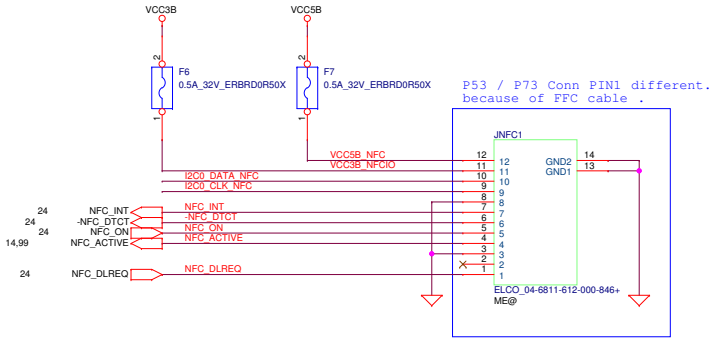
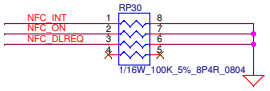
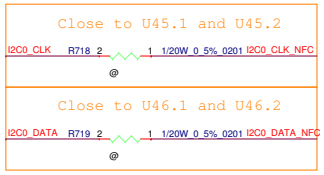
NFC







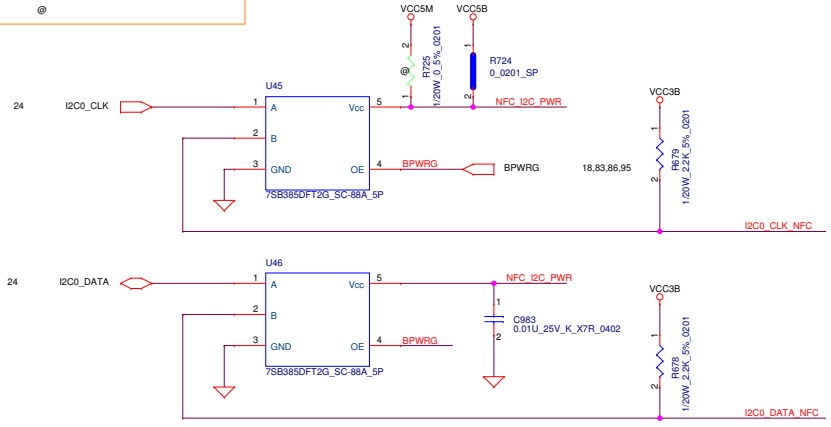
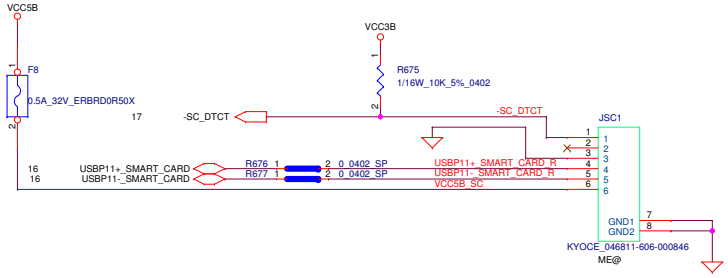


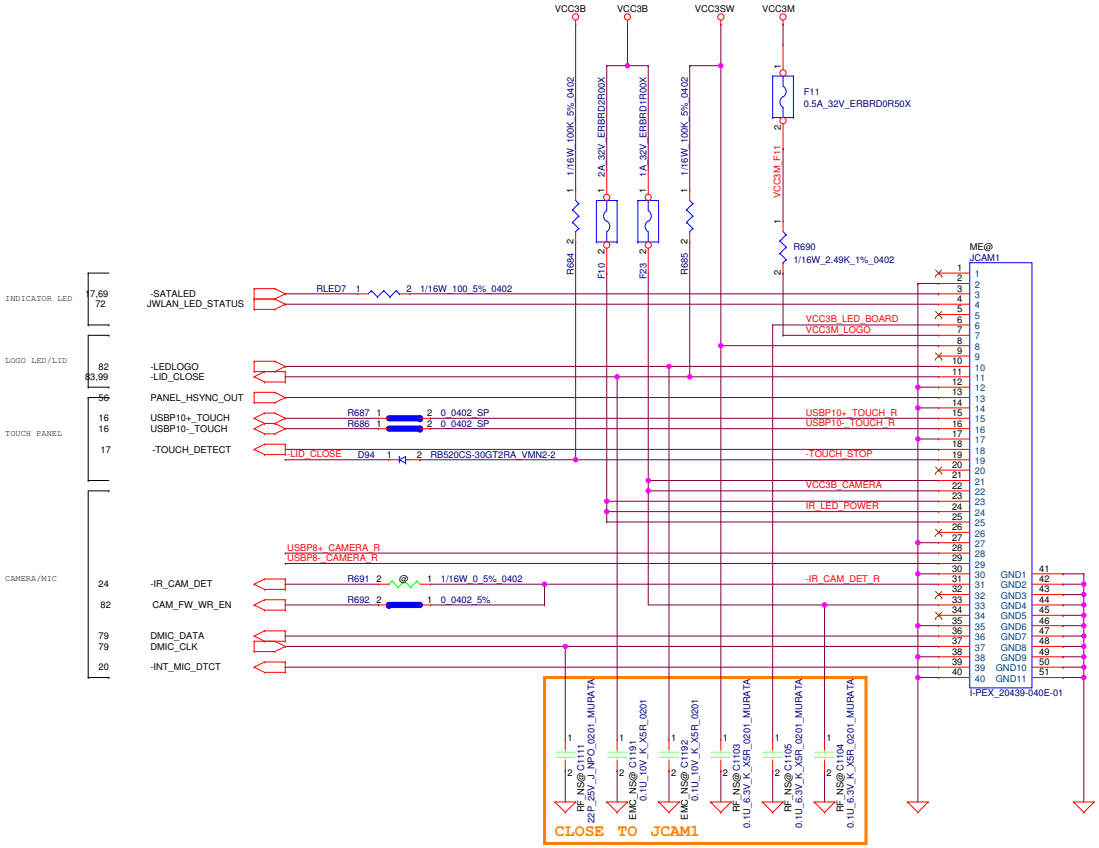
TABLE of U45/U46		
Vendor	P/N	LCFC P/N
~~TOSHIBA~~	~~TC7SP385FU~~	~~SA00005US0J~~
ON	7SB385DFT2G	SA00007CW00

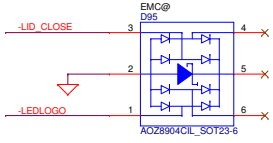
U45, U46 Symbol : SA00005US0J

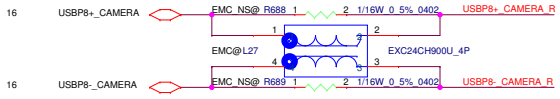
SMART CARD

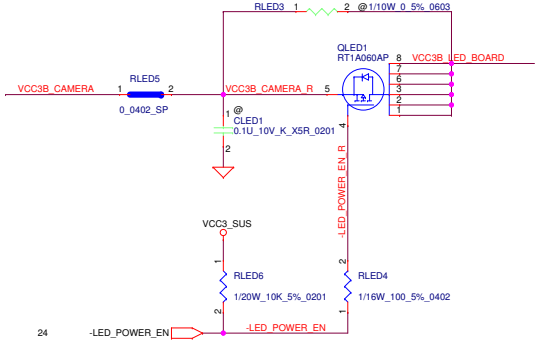


CAMERA/TOUCH









LC Future Center Secret Data

Project Name: *Nighthawk-1*

Rev 1.0

Title: CAMERA/TOUCH

Date: Thursday, April 25, 2019

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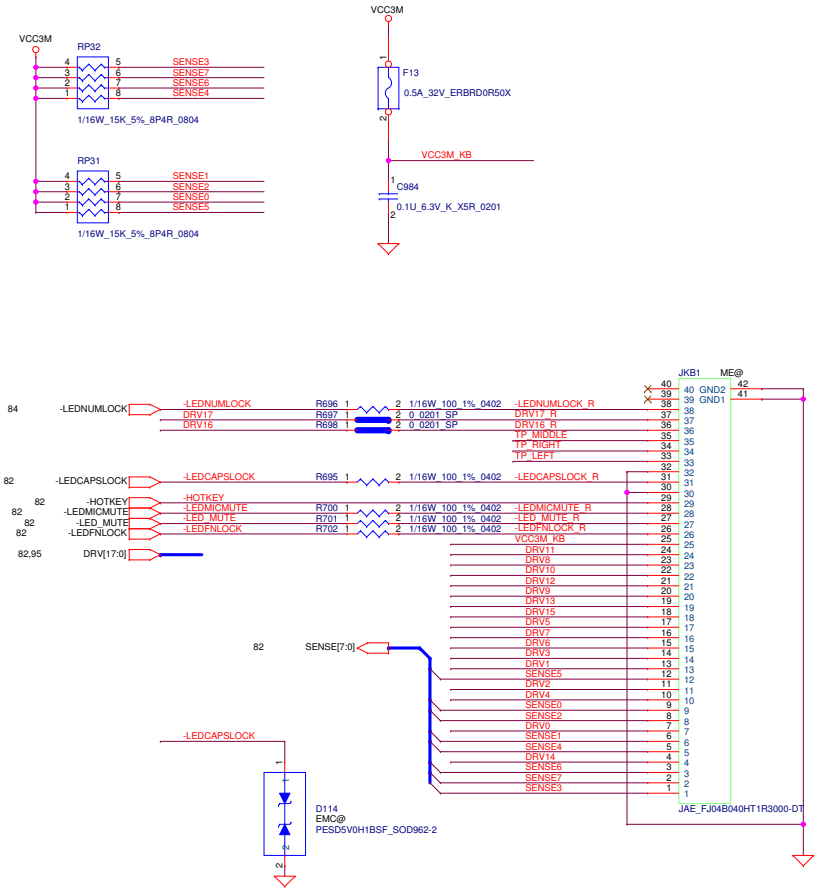
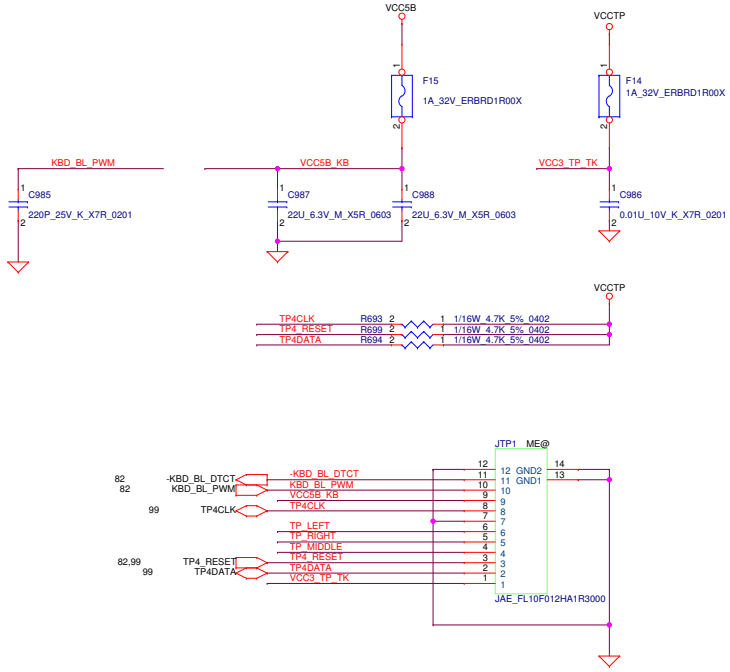
KEYBOARD

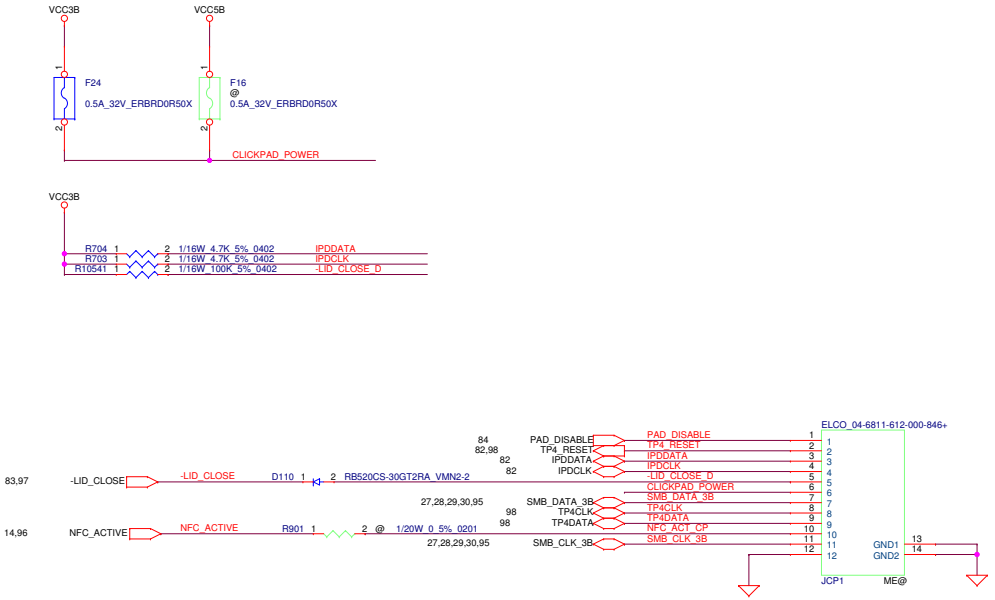


TRACK POINT



LC Future Center Secret Data	Project Name	Nighthawk-1	
	Rev 1.0	Title KEYBOARD/TRACK POINT	
	Date: Thursday, April 25, 2019	Sheet 98 of 142	

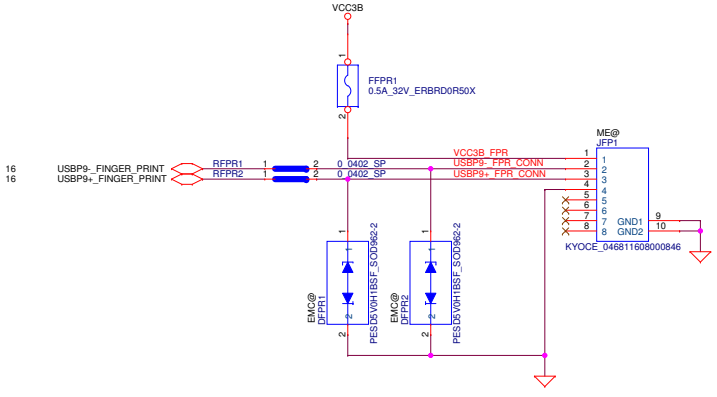
CLICK PAD



LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title CLICK PAD
Date: Thursday, April 25, 2019	Sheet 99 of 142

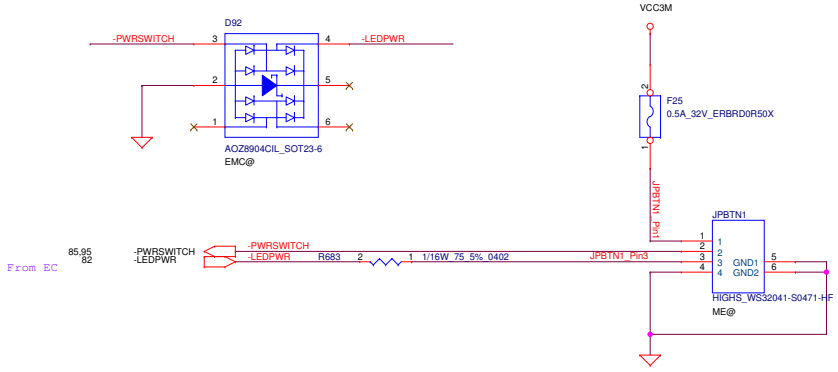
FINGERPRINT

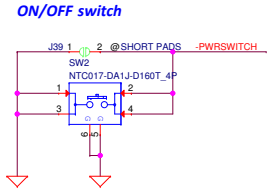


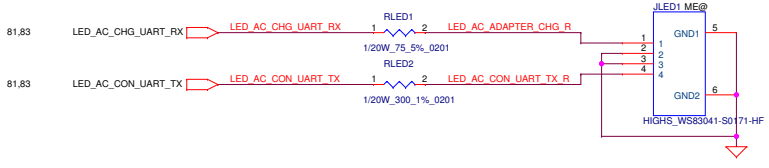
LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title FINGERPRINT
Date: Thursday, April 25, 2019	Sheet 100 of 142

LCD factory calibration sulotion at sub card



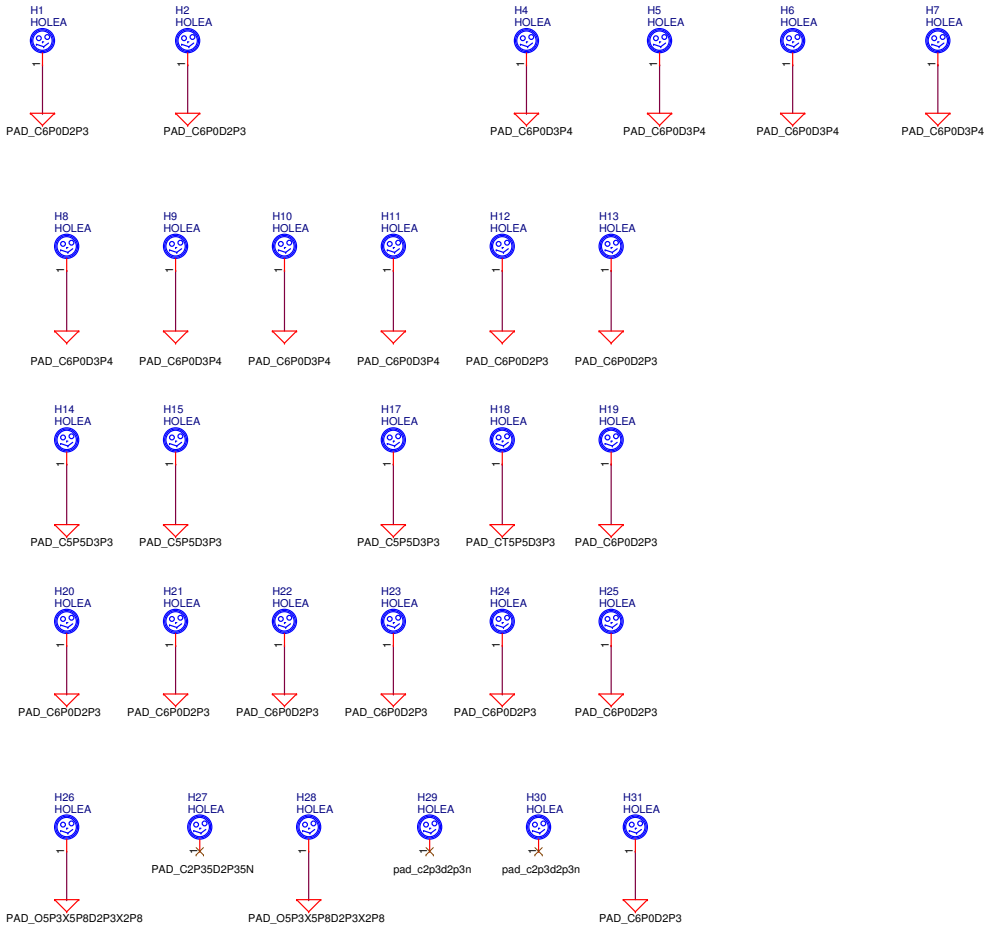




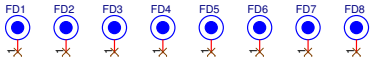
LC Future Center Secret Data

Project Name	*Nighthawk-1*
Rev 1.0	Title: *P53 IO BOARD CONN*
Date: Thursday, April 25, 2019	Sheet 102 of 142

Nighthawk Unique For N19P & UMA

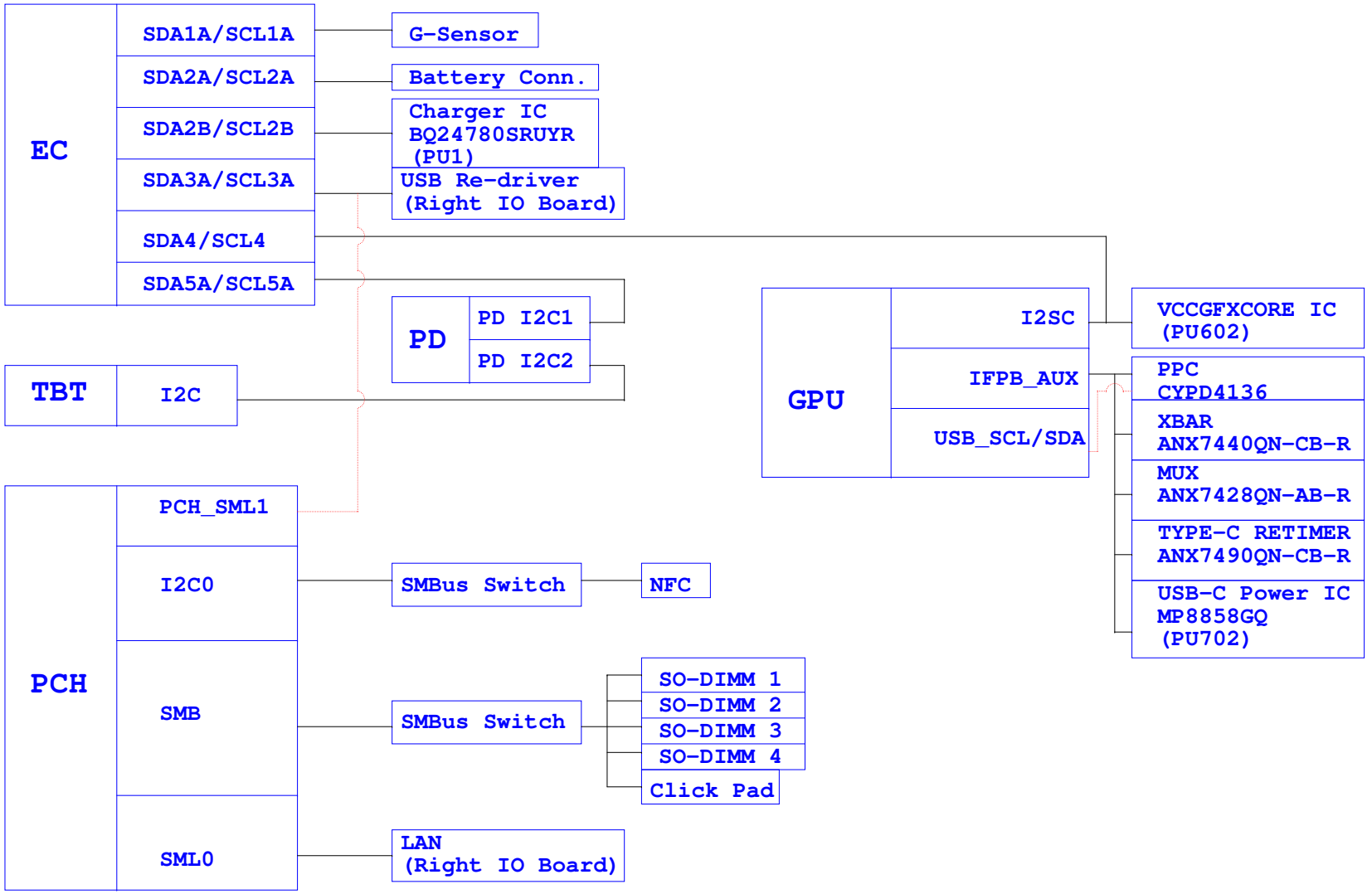


PCB Fedical Mark PAD



LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title HOLE
Date: Thursday, April 25, 2019	Sheet 103 of 142


EC
SDA1A/SCL1A
SDA2A/SCL2A
SDA2B/SCL2B
SDA3A/SCL3A
SDA4/SCL4
SDA5A/SCL5A
G-Sensor
Battery Conn.
Charger IC
BQ24780SRUYR
(PU1)
USB Re-driver
(Right IO Board)
PD
PD I2C1
PD I2C2
TBT
I2C
GPU
I2SC
IFPB_AUX
USB_SCL/SDA
VCCGFXCORE IC
(PU602)
PPC
CYPD4136
XBAR
ANX7440QN-CB-R
MUX
ANX7428QN-AB-R
TYPE-C RETIMER
ANX7490QN-CB-R
USB-C Power IC
MP8858GQ
(PU702)
PCH
PCH_SML1
I2C0
SMB
SML0
SMBus Switch
NFC
SMBus Switch
SO-DIMM 1
SO-DIMM 2
SO-DIMM 3
SO-DIMM 4
Click Pad
LAN
(Right IO Board)

LC Future Center Secret Data

Project Name

Nighthawk-1

Rev	Title
1.0	***BLANK***

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LC Future Center Secret Data

Project Name

Nighthawk-1

Rev	Title
1.0	***BLANK***

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LC Future Center Secret Data

Project Name

Nighthawk-1

Rev	Title
1.0	***BLANK***

Date: Thursday, April 25, 2019 | Sheet 107 of 142

LC Future Center Secret Data

Project Name

Nighthawk-1

Rev	Title
1.0	***BLANK***

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Project Name

Nighthawk-1

Rev 1.0

Title

BLANK

Date: Thursday, April 25, 2019

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LC Future Center Secret Data

Project Name

Nighthawk-1

Rev	Title
1.0	***BLANK***

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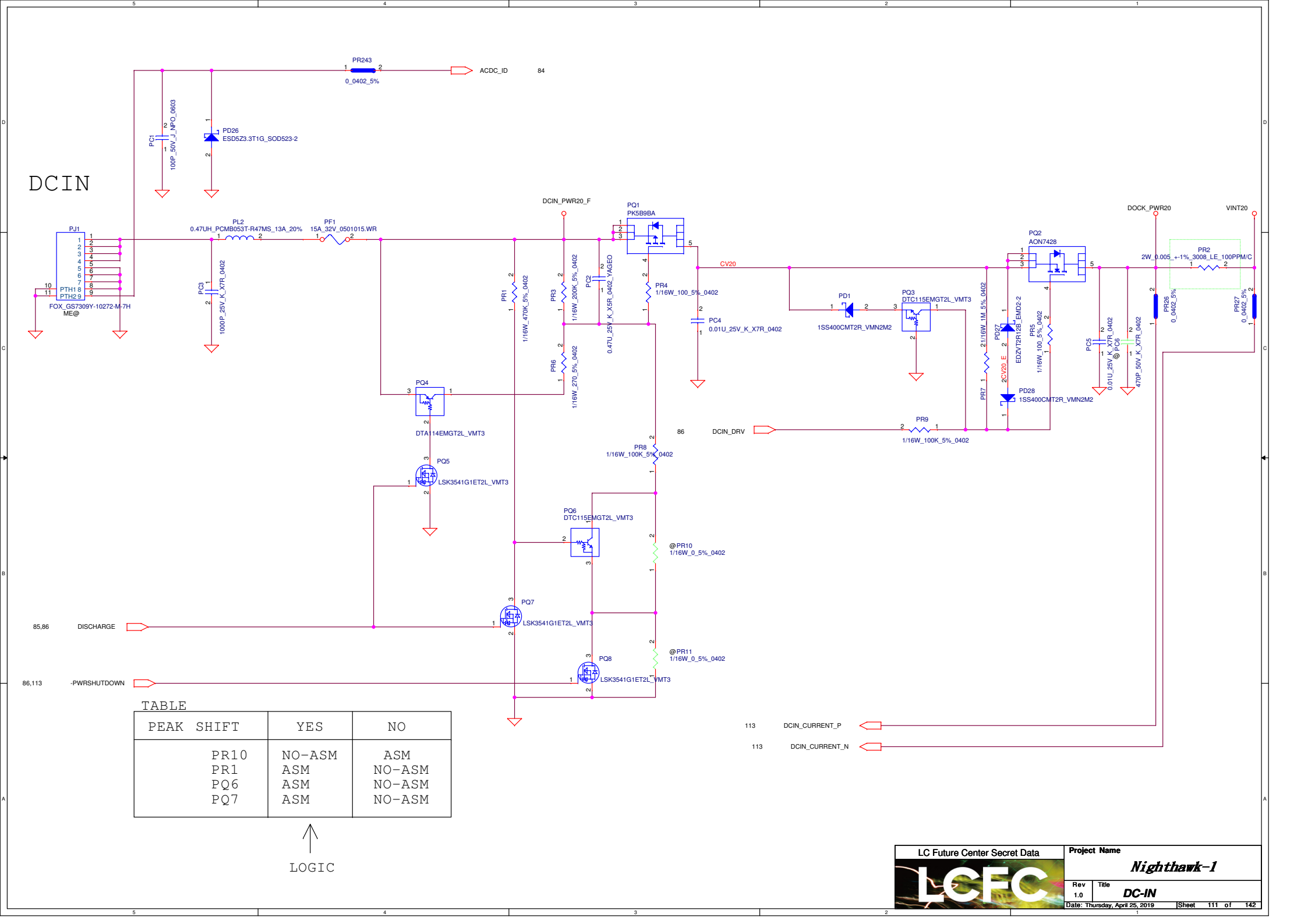

TABLE

PEAK SHIFT	YES	NO
PR10	NO-ASM	ASM
PR1	ASM	NO-ASM
PQ6	ASM	NO-ASM
PQ7	ASM	NO-ASM

LOGIC

LC Future Center Secret Data

Project Name: Nighthawk-1

Rev: 1.0

Title: DC-IN

Date: Thursday, April 25, 2019

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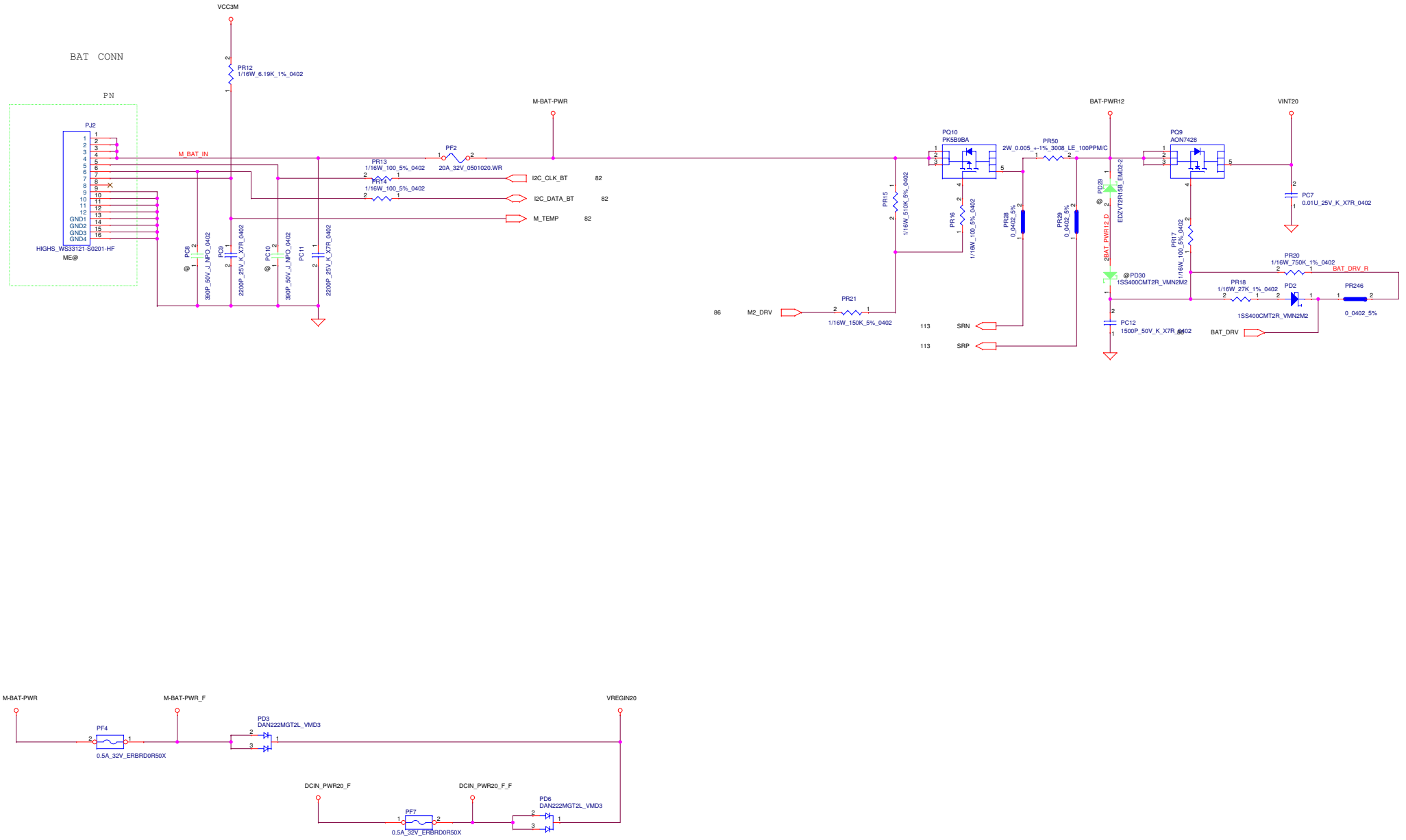
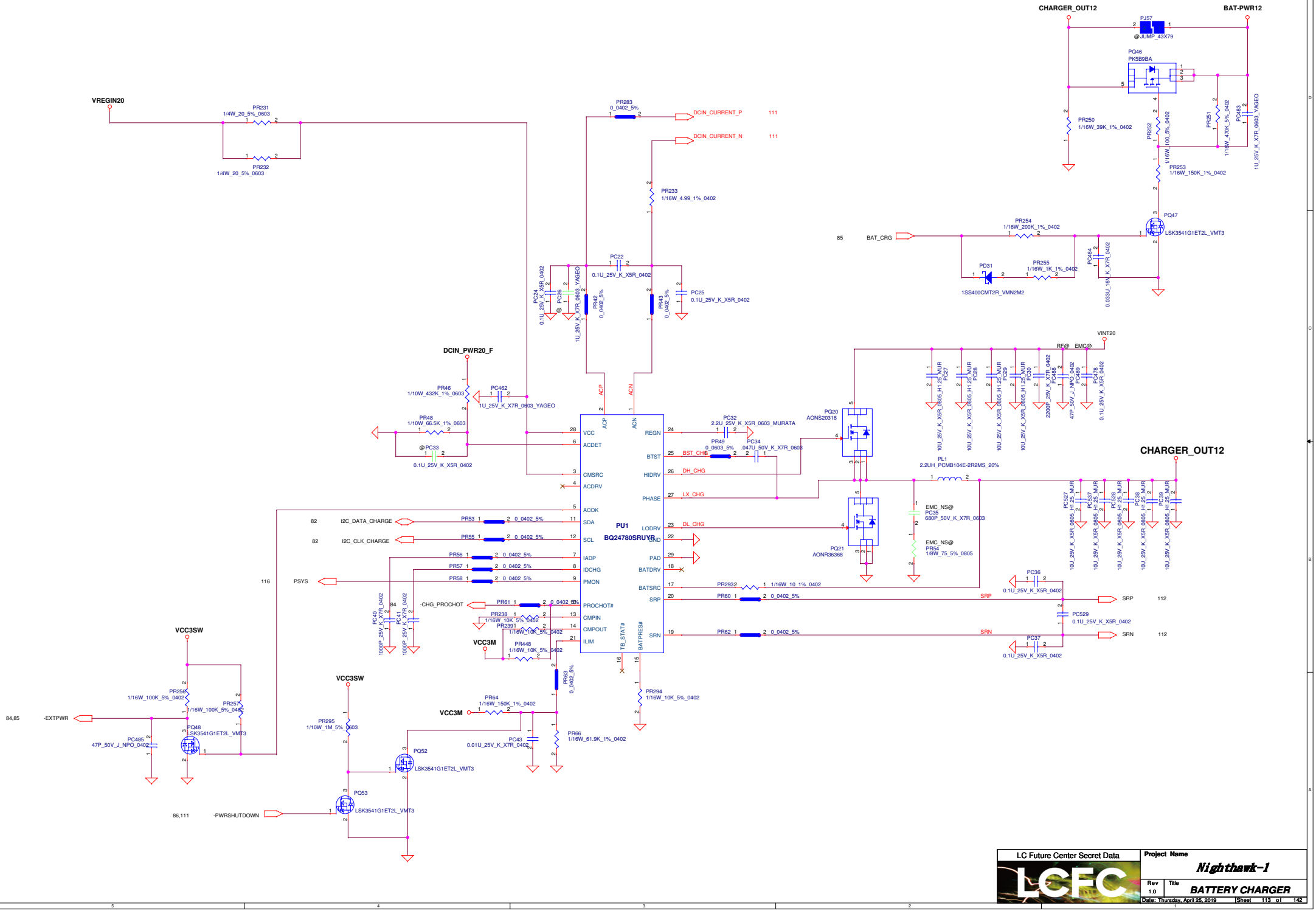


LC Future Center Secret Data

LCFC

Project Name	Nighthawk-1
Rev 1.0	Title: BATTERY INPUT
Date: Thursday, April 25, 2019	Sheet 112 of 142


CHARGER_OUT12
BAT-PWR12
PJ57
@JUMP_43X79
PQ46
PK5B9BA
PR250
1/16W_39K_1%_0402
PR252
1/16W_100_5%_0402
PR251
1/16W_470K_5%_0402
PC483
1U_25V_K_X7R_0603_YAGEO
PR253
1/16W_150K_1%_0402
PQ47
LSK3541G1ET2L_VMT3
PR254
1/16W_200K_1%_0402
PR255
1/16W_1K_1%_0402
PD31
1SS400CMT2R_VMN2M2
PC484
0.033U_16V_K_X7R_0402
85
BAT_CRG
VREGIN20
PR231
1/4W_20_5%_0603
PR232
1/4W_20_5%_0603
PR233
1/16W_4.99_1%_0402
PR283
0_0402_5%
DCIN_CURRENT_P
DCIN_CURRENT_N
111
PC22
0.1U_25V_K_X5R_0402
PC24
0.1U_25V_K_X5R_0402
PC26
1U_25V_K_X7R_0603_YAGEO
PR42
0_0402_5%
PR43
0_0402_5%
PC25
0.1U_25V_K_X5R_0402
DCIN_PWR20_F
PR46
1/10W_432K_1%_0603
PC462
1U_25V_K_X7R_0603_YAGEO
PR48
1/10W_66.5K_1%_0603
@PC33
0.1U_25V_K_X5R_0402
PU1
BQ24780SRUYR
VCC
ACDET
CMSRC
ACDRV
ACOK
SDA
SCL
IADP
IDCHG
PMON
PROCHOT#
CMPIN
CMPOUT
ILIM
REGN
BTST
HIDRV
PHASE
LODRV
GND
PAD
BATDRV
BATSRC
SRP
SRN
TB_STAT#
BATPRES#
ACP
ACN
PC32
2.2U_25V_K_X5R_0603_MURATA
PR49
0_0603_5%
PC34
.047U_50V_K_X7R_0603
BST_CHG
DH_CHG
LX_CHG
DL_CHG
PQ20
AONS20318
PQ21
AONR36368
VINT20
RF@
EMC@
PC27
PC28
PC29
PC30
PC31
PC478
10U_25V_K_X5R_0805_H1.25_MUR
2200P_25V_K_X7R_0402
47P_50V_J_NPO_0402
0.1U_25V_K_X5R_0402
CHARGER_OUT12
PL1
2.2UH_PCMB104E-2R2MS_20%
EMC_NS@
PC35
680P_50V_K_X7R_0603
EMC_NS@
PR54
1/8W_75_5%_0805
PC527
PC531
PC528
PC38
PC39
10U_25V_K_X5R_0805_H1.25_MUR
10U_25V_K_X5R_0805_H1.25_MUR
10U_25V_K_X5R_0805_H1.25_MUR
10U_25V_K_X5R_0805_H1.25_MUR
10U_25V_K_X5R_0805_H1.25_MUR
82
I2C_DATA_CHARGE
I2C_CLK_CHARGE
PR53
PR55
PR56
PR57
PR58
0_0402_5%
116
PSYS
-CHG_PROCHOT
PR61
PR238
1/16W_10K_5%_0402
PR239
1/16W_10K_5%_0402
PR448
1/16W_10K_5%_0402
PC40
1000P_25V_K_X7R_0402
PC41
1000P_25V_K_X7R_0402
84
PR2932
1/16W_10_1%_0402
PR60
SRP
112
PC36
0.1U_25V_K_X5R_0402
PC529
0.1U_25V_K_X5R_0402
PR62
SRN
PC37
0.1U_25V_K_X5R_0402
PR63
0_0402_5%
PR294
1/16W_10K_5%_0402
VCC3M
PR64
1/16W_150K_1%_0402
PC43
0.01U_25V_K_X7R_0402
PR66
1/16W_61.9K_1%_0402
VCC3SW
PR256
1/16W_100K_5%_0402
PR257
1/16W_100K_5%_0402
84,85
-EXTPWR
PQ48
LSK3541G1ET2L_VMT3
PC485
47P_50V_J_NPO_0402
PR295
1/10W_1M_5%_0603
PQ52
LSK3541G1ET2L_VMT3
PQ53
LSK3541G1ET2L_VMT3
86,111
-PWRSHUTDOWN
LC Future Center Secret Data
LCFC
Project Name
Nighthawk-1
Rev
1.0
Title
BATTERY CHARGER
Date: Thursday, April 25, 2019
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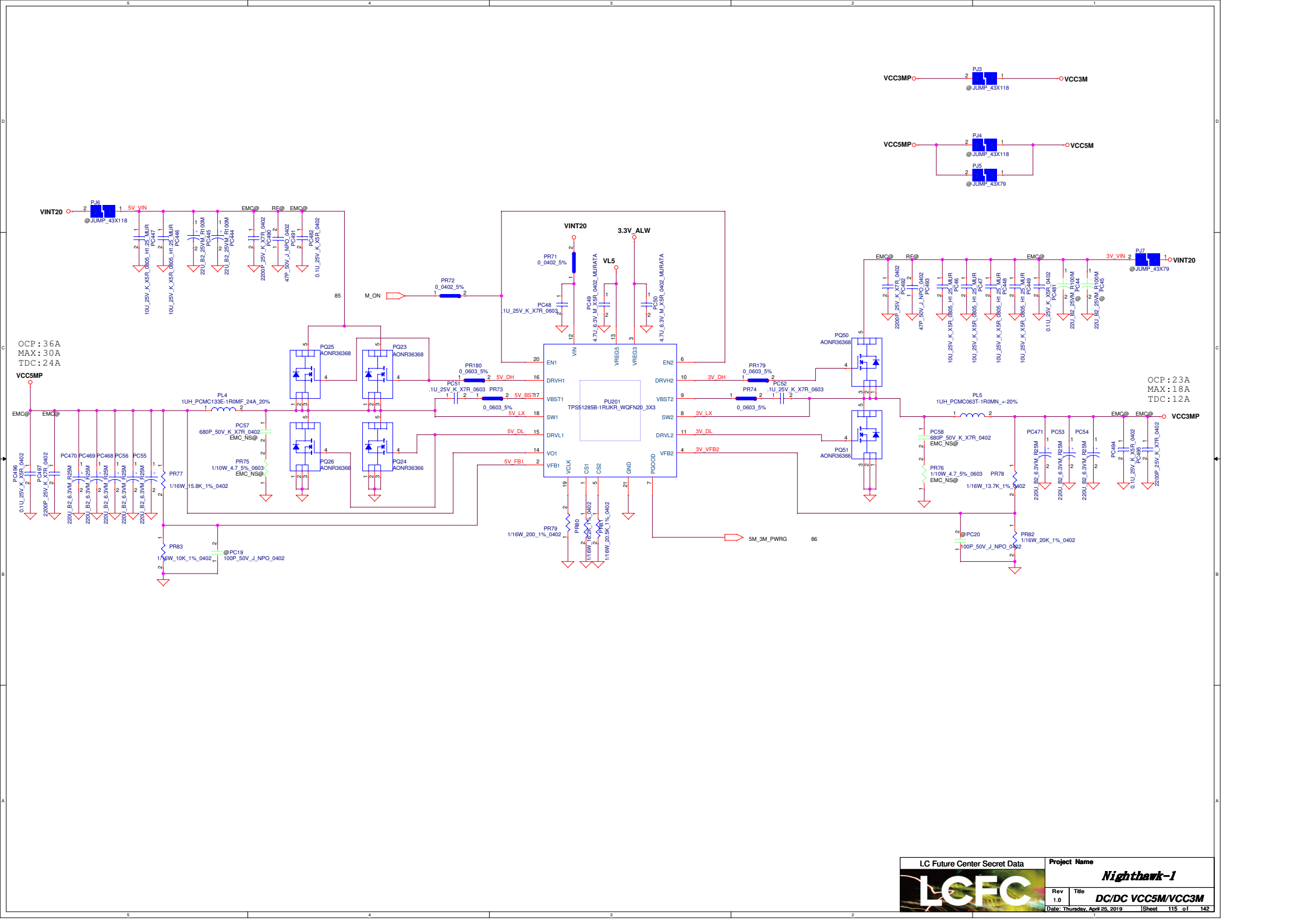
VCC3MP
PJ3
@JUMP_43X118
VCC3M
VCC5MP
PJ4
@JUMP_43X118
VCC5M
PJ5
@JUMP_43X79
VINT20
PJ6
@JUMP_43X118
5V_VIN
3.3V_ALW
VL5
M_ON
PR72
0_0402_5%
PR71
0_0402_5%
PU201
TPS51285B-1RUKR_WQFN20_3X3
EN1
EN2
DRVH1
DRVH2
VBST1
VBST2
SW1
SW2
DRVL1
DRVL2
VO1
VFB1
VFB2
VIN
VREG5
VREG3
VCLK
CS1
CS2
GND
PGOOD
5V_DH
5V_BST
5V_LX
5V_DL
5V_FB1
3V_DH
3V_LX
3V_DL
3V_VFB2
PQ25
AONR36368
PQ23
AONR36368
PQ26
AONR36366
PQ24
AONR36366
PQ50
AONR36368
PQ51
AONR36366
PL4
1UH_PCMC133E-1R0MF_24A_20%
PL5
1UH_PCMC063T-1R0MN_+-20%
PR180
0_0603_5%
PR179
0_0603_5%
PR73
0_0603_5%
PR74
0_0603_5%
PR75
1/10W_4.7_5%_0603
EMC_NS@
PR76
1/10W_4.7_5%_0603
EMC_NS@
PR77
1/16W_15.8K_1%_0402
PR78
1/16W_13.7K_1%_0402
PR79
1/16W_200_1%_0402
PR80
1/16W_16.2K_1%_0402
PR81
1/16W_20.5K_1%_0402
PR82
1/16W_20K_1%_0402
PR83
1/16W_10K_1%_0402
PC48
.1U_25V_K_X7R_0603
PC49
4.7U_6.3V_M_X5R_0402_MURATA
PC50
4.7U_6.3V_M_X5R_0402_MURATA
PC51
.1U_25V_K_X7R_0603
PC52
.1U_25V_K_X7R_0603
PC57
680P_50V_K_X7R_0402
EMC_NS@
PC58
680P_50V_K_X7R_0402
EMC_NS@
@PC19
100P_50V_J_NPO_0402
@PC20
100P_50V_J_NPO_0402
OCP:36A
MAX:30A
TDC:24A
OCP:23A
MAX:18A
TDC:12A
85
86
5M_3M_PWRG
LC Future Center Secret Data
Project Name
Nighthawk-1
Rev
1.0
Title
DC/DC VCC5M/VCC3M
Date: Thursday, April 25, 2019
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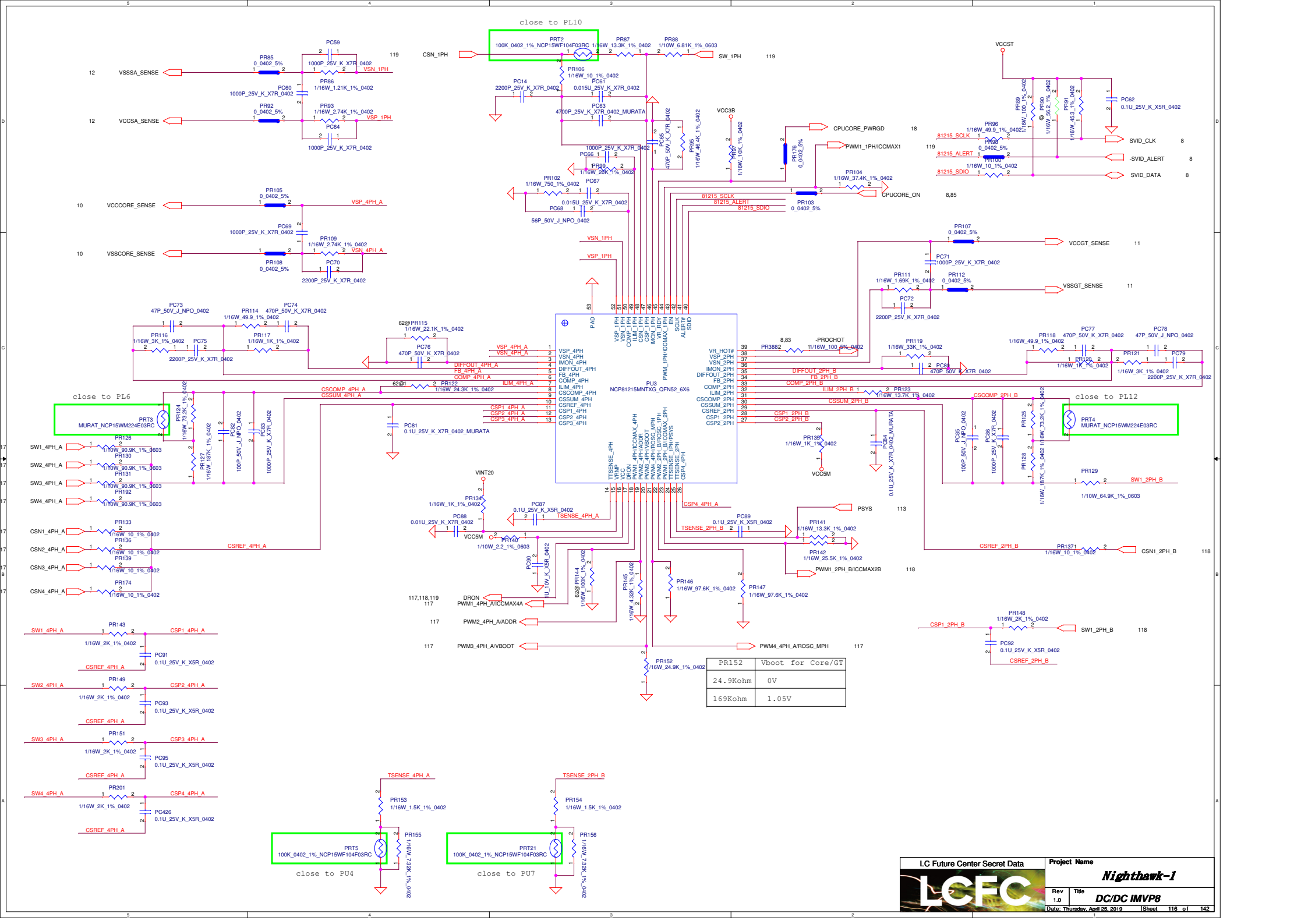
close to PL10
PU3
NCP81215MNTXG_QFN52_6X6
close to PL6
close to PL12
close to PU4
close to PU7
PRT2 100K_0402_1%_NCP15WF104F03RC
PRT3 MURATA_NCP15WM224E03RC
PRT4 MURATA_NCP15WM224E03RC
PRT5 100K_0402_1%_NCP15WF104F03RC
PRT21 100K_0402_1%_NCP15WF104F03RC
CSN_1PH
SW_1PH
VSSSA_SENSE
VCCSA_SENSE
VCCCORE_SENSE
VSSCORE_SENSE
VSN_1PH
VSP_1PH
VSP_4PH_A
VSN_4PH_A
VCCST
VCCGT_SENSE
VSSGT_SENSE
CPUCORE_PWRGD
PWM1_1PH/ICCMAX1
CPUCORE_ON
SVID_CLK
-SVID_ALERT
SVID_DATA
81215_SCLK
81215_ALERT
81215_SDIO
-PROCHOT
DIFFOUT_4PH_A
FB_4PH_A
COMP_4PH_A
ILIM_4PH_A
CSCOMP_4PH_A
CSSUM_4PH_A
CSREF_4PH_A
CSP1_4PH_A
CSP2_4PH_A
CSP3_4PH_A
DIFFOUT_2PH_B
FB_2PH_B
COMP_2PH_B
ILIM_2PH_B
CSCOMP_2PH_B
CSSUM_2PH_B
CSREF_2PH_B
CSP1_2PH_B
CSP2_2PH_B
CSP4_4PH_A
TSENSE_4PH_A
TSENSE_2PH_B
PSYS
VCC5M
VINT20
DRON
PWM1_4PH_A/ICCMAX4A
PWM2_4PH_A/ADDR
PWM3_4PH_A/VBOOT
PWM4_4PH_A/ROSC_MPH
PWM1_2PH_B/ICCMAX2B
CSREF_2PH_B
SW1_2PH_B
CSN1_2PH_B
SW1_4PH_A
SW2_4PH_A
SW3_4PH_A
SW4_4PH_A
CSN1_4PH_A
CSN2_4PH_A
CSN3_4PH_A
CSN4_4PH_A
PR152 | Vboot for Core/GT
24.9Kohm | 0V
169Kohm | 1.05V
LC Future Center Secret Data
Project Name
Nighthawk-1
Rev 1.0
Title
DC/DC IMVP8
Date: Thursday, April 25, 2019
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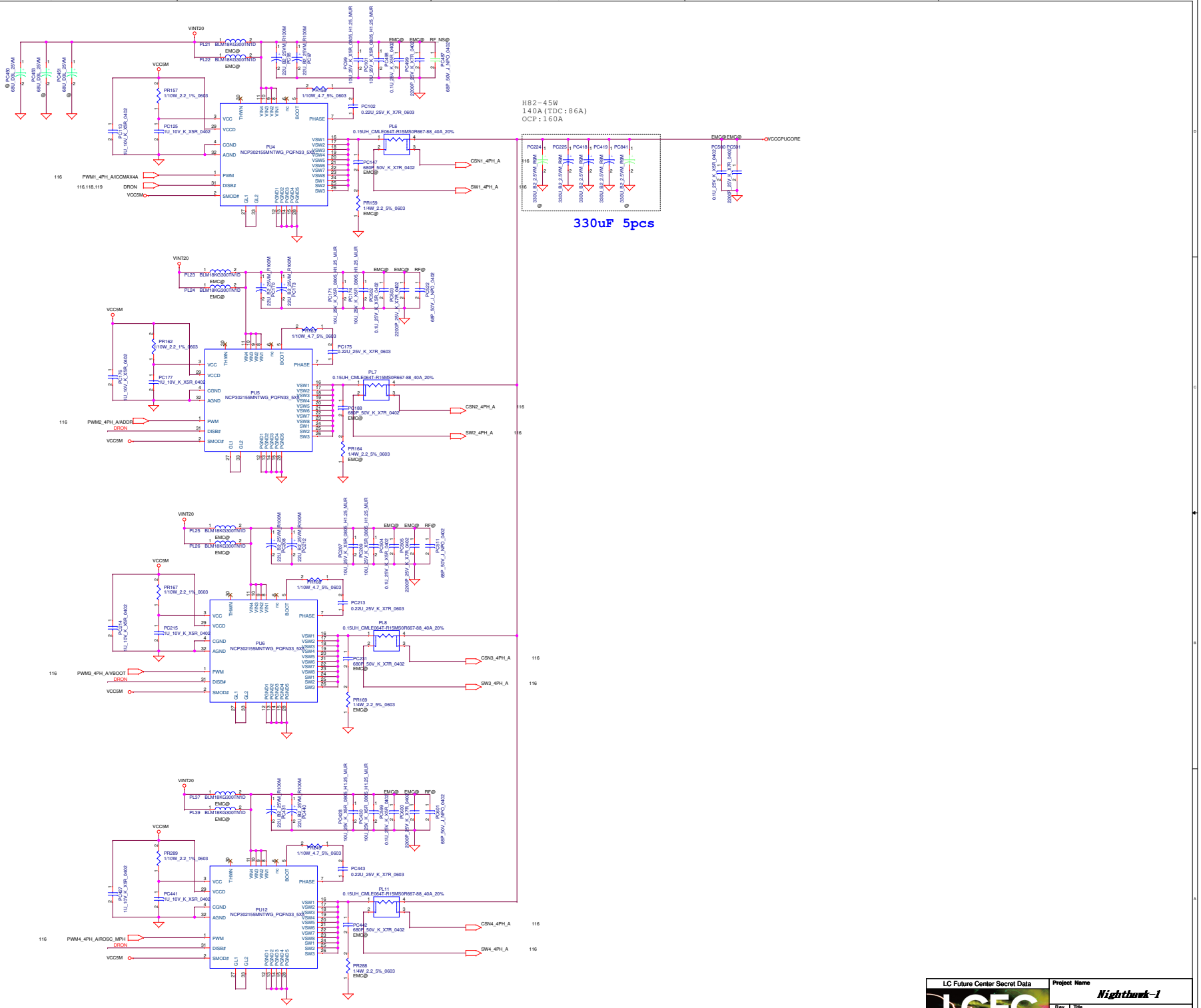
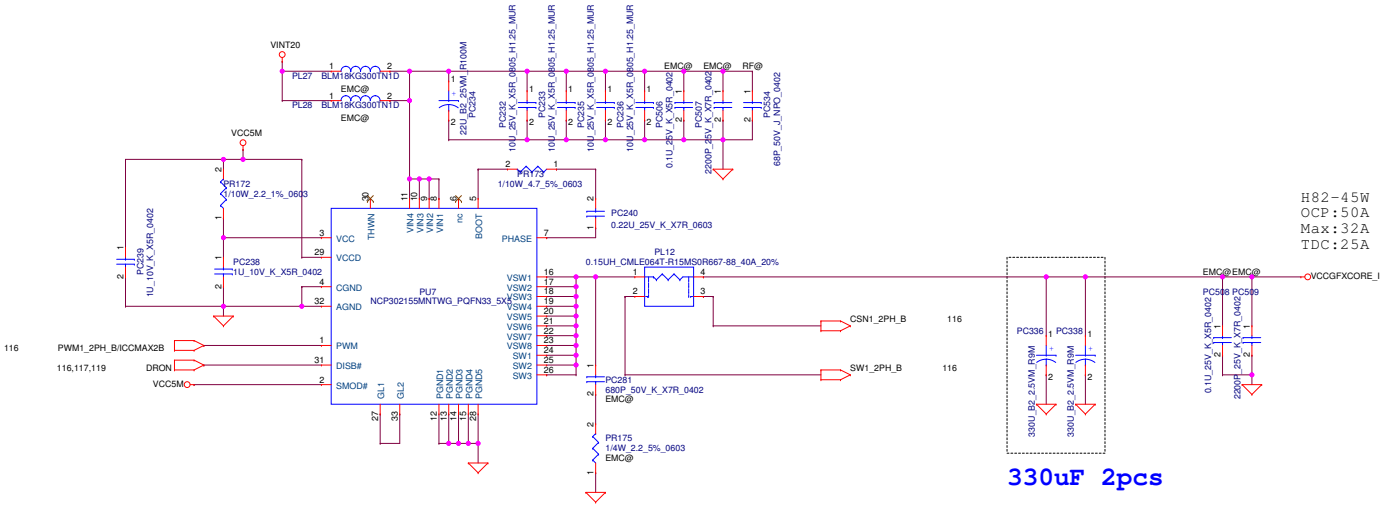
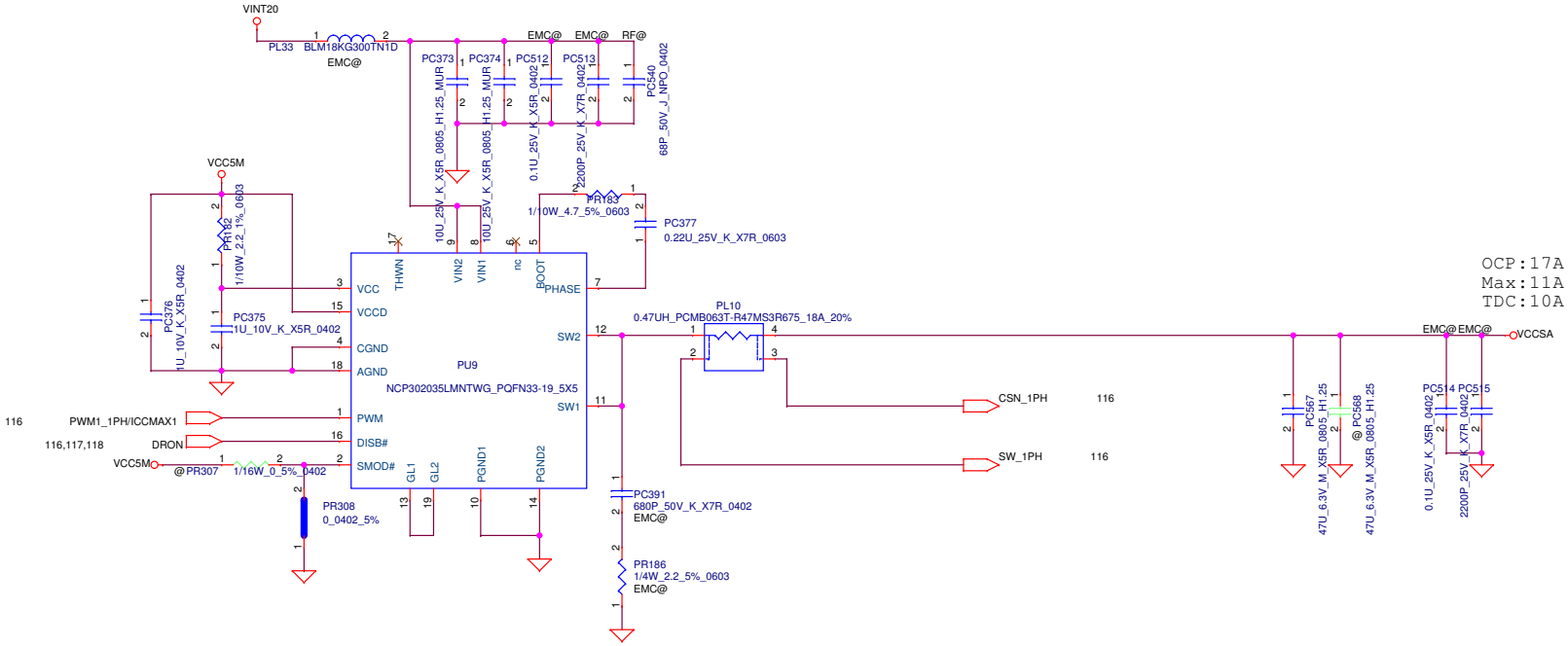


LC Future Center Secret Data

LCFC

Project Name	Nighthawk-1
Rev	1.0
Title	DC/DC VCCPUCORE
Date: Thursday, April 25, 2019	Sheet 117 of 142

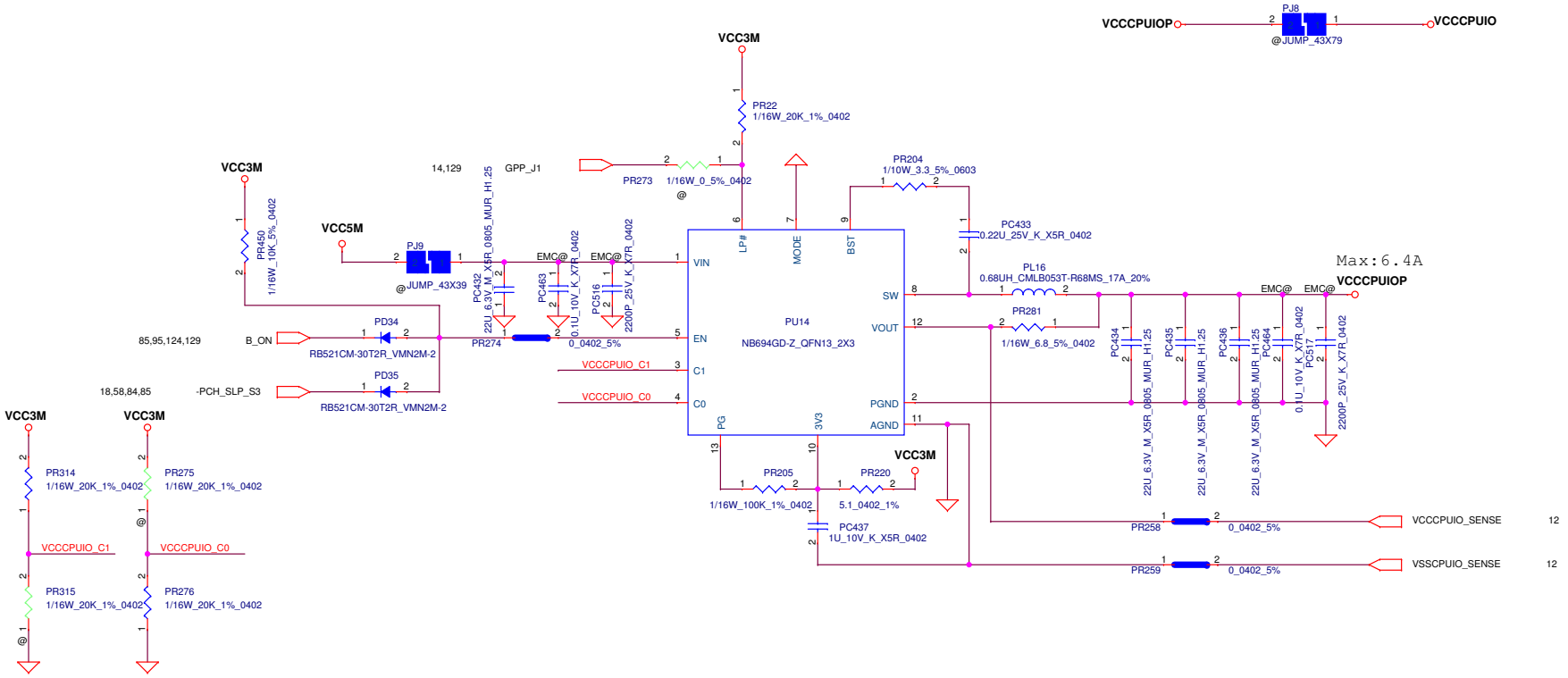

VINT20
PL27 BLM18KG300TNTD
PL28 BLM18KG300TNTD
EMC@
PC232 10U_25V_K_X5R_0805_H1.25_MUR
PC233 10U_25V_K_X5R_0805_H1.25_MUR
PC235 10U_25V_K_X5R_0805_H1.25_MUR
PC236 10U_25V_K_X5R_0805_H1.25_MUR
PC234 22U_25VM_R100M
PC506 0.1U_25V_K_X5R_0402
PC507 2200P_25V_K_X7R_0402
PC534 68P_50V_J_NPO_0402
RF@
VCC5M
PR172 10W_2.2_1%_0603
PR173 1/10W_4.7_5%_0603
PC239 1U_10V_K_X5R_0402
PC238 1U_10V_K_X5R_0402
PC240 0.22U_25V_K_X7R_0603
PU7 NCP302155MNTWG_PQFN33_5X6
VCC
VCCD
CGND
AGND
PWM
DISB#
SMOD#
THWN
VIN4
VIN3
VIN2
VIN1
nc
BOOT
PHASE
VSW1
VSW2
VSW3
VSW4
VSW5
VSW6
VSW7
VSW8
SW1
SW2
SW3
GL1
GL2
PGND1
PGND2
PGND3
PGND4
PGND5
PL12 0.15UH_CMLE064T-R15MS0R667-88_40A_20%
PC281 680P_50V_K_X7R_0402
PR175 1/4W_2.2_5%_0603
116 PWM1_2PH_B/ICCMAX2B
116,117,119 DRON
VCC5M
CSN1_2PH_B 116
SW1_2PH_B 116
PC336 330U_B2_2.5VM_R9M
PC338 330U_B2_2.5VM_R9M
PC508 0.1U_25V_K_X5R_0402
PC509 2200P_25V_K_X7R_0402
EMC@EMC@
VCCGFXCORE_I
H82-45W
OCP:50A
Max:32A
TDC:25A
330uF 2pcs



LC Future Center Secret Data

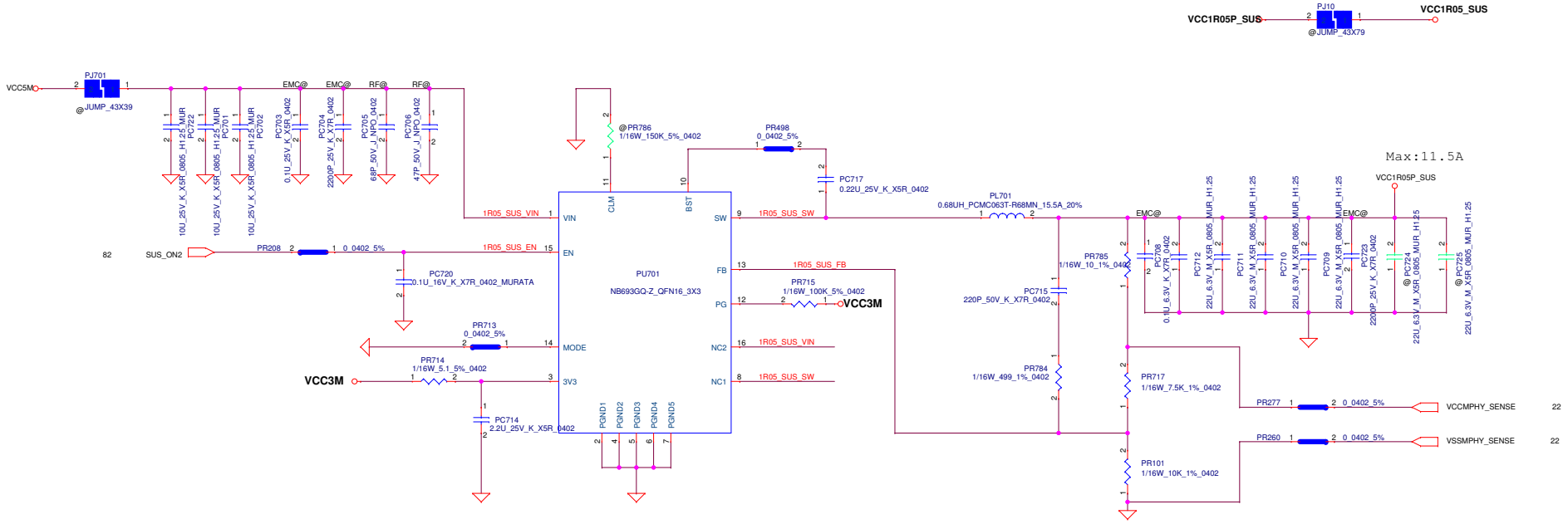
LCFC

Project Name	*Nighthawk-1*
Rev 1.0	Title: **DC/DC VCCSA**
Date: Thursday, April 25, 2019	Sheet 119 of 142



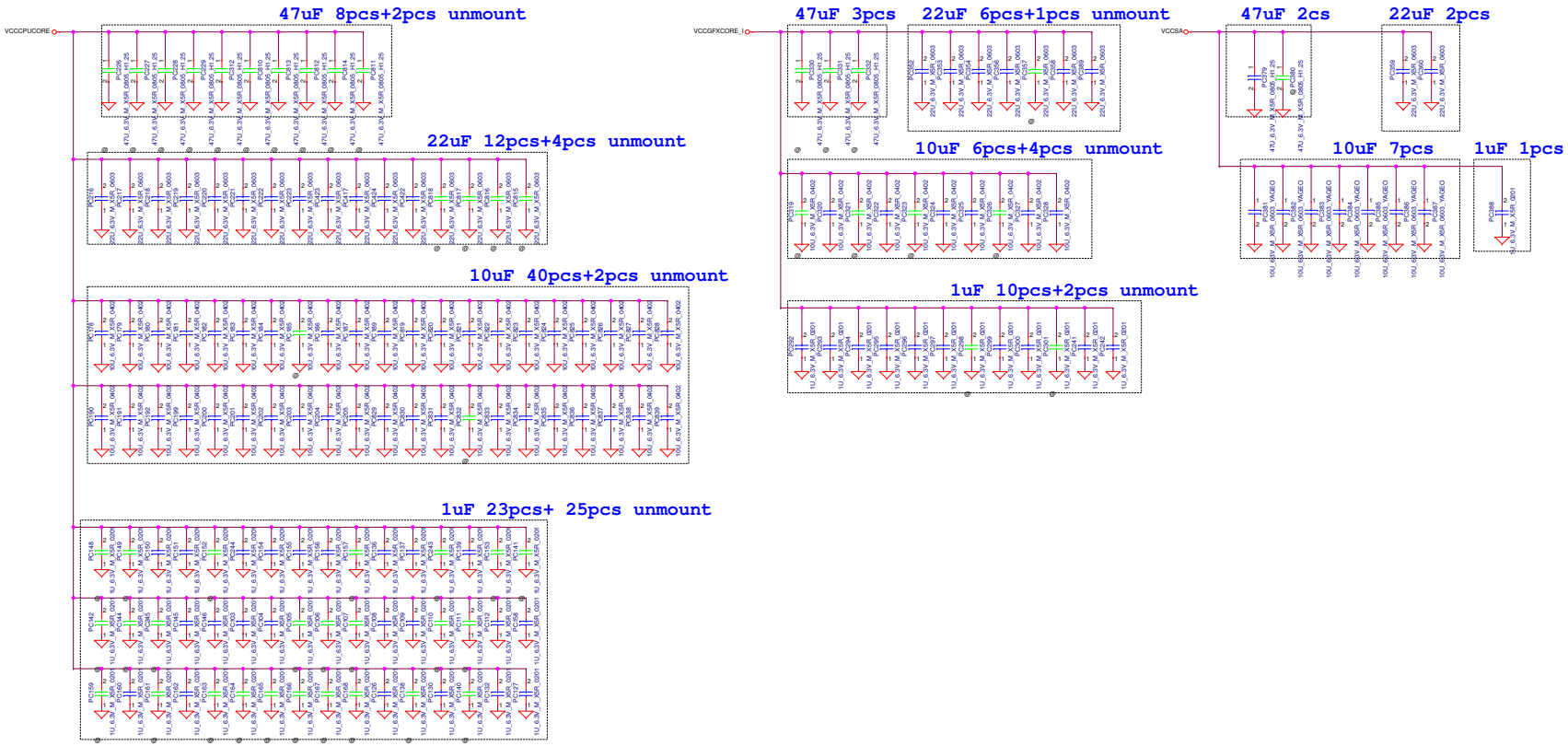
Control Bit Definitions

LP#	C1	C0	VOUT(V)
0	X	X	0
1	0	0	0.85
1	0	1	0.875
1	1	0	0.95
1	1	1	0.975



LC Future Center Secret Data

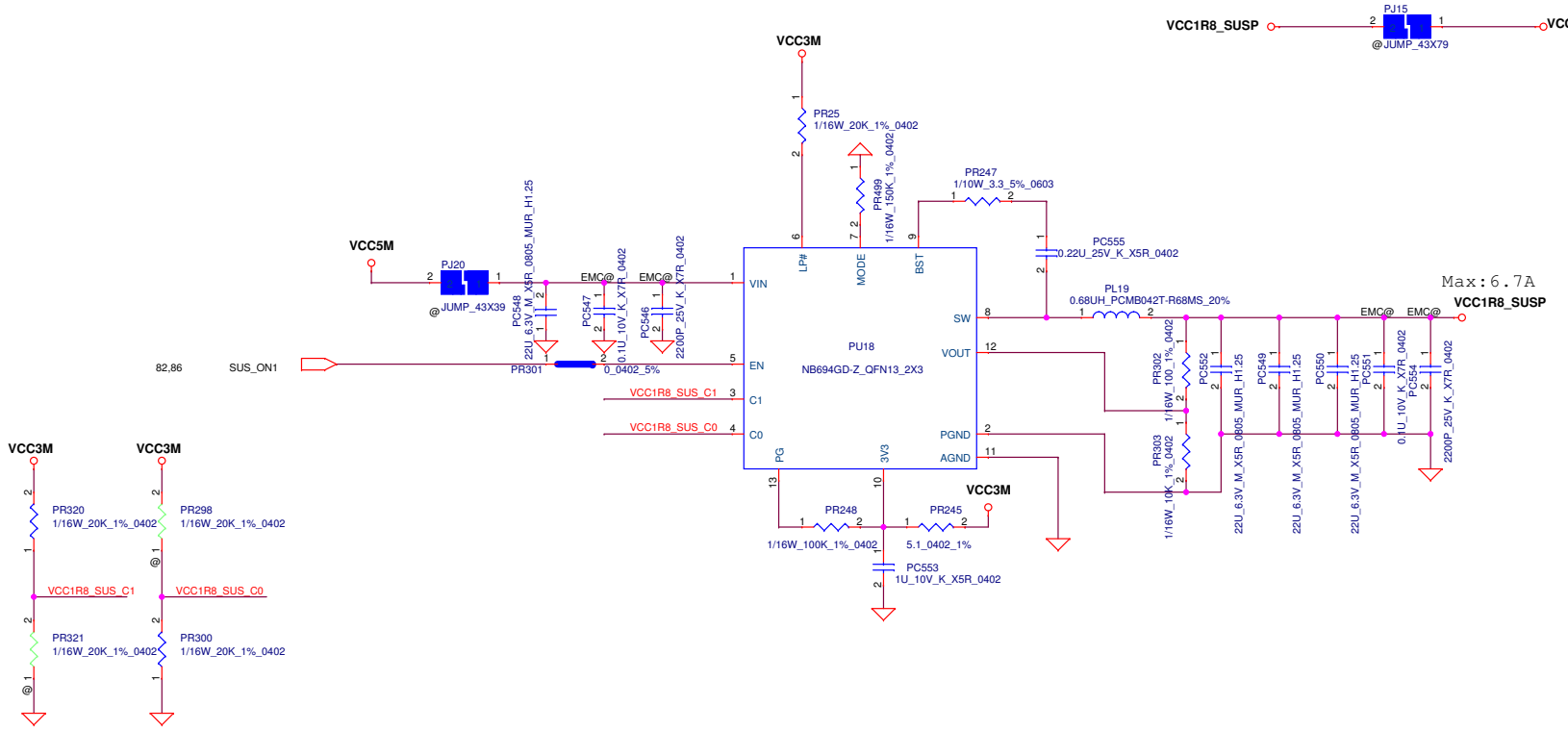
Project Name	*Nighthawk-1*
Rev 1.0	Title: *DC/DC VCC1R05_SUS*
Date: Thursday, April 25, 2019	Sheet 121 of 142



LC Future Center Secret Data

LCFC

Project Name	Nighthawk-1
Rev 1.0	Title VCCCPUCORE DECOUPLING
Date: Thursday, April 25, 2019	Sheet 122 of 142



Control Bit Definitions

LP#	C1	C0	VOUT(V)
1	0	0	1.2
1	0	1	1.5
1	1	0	1.8
1	1	1	2.5

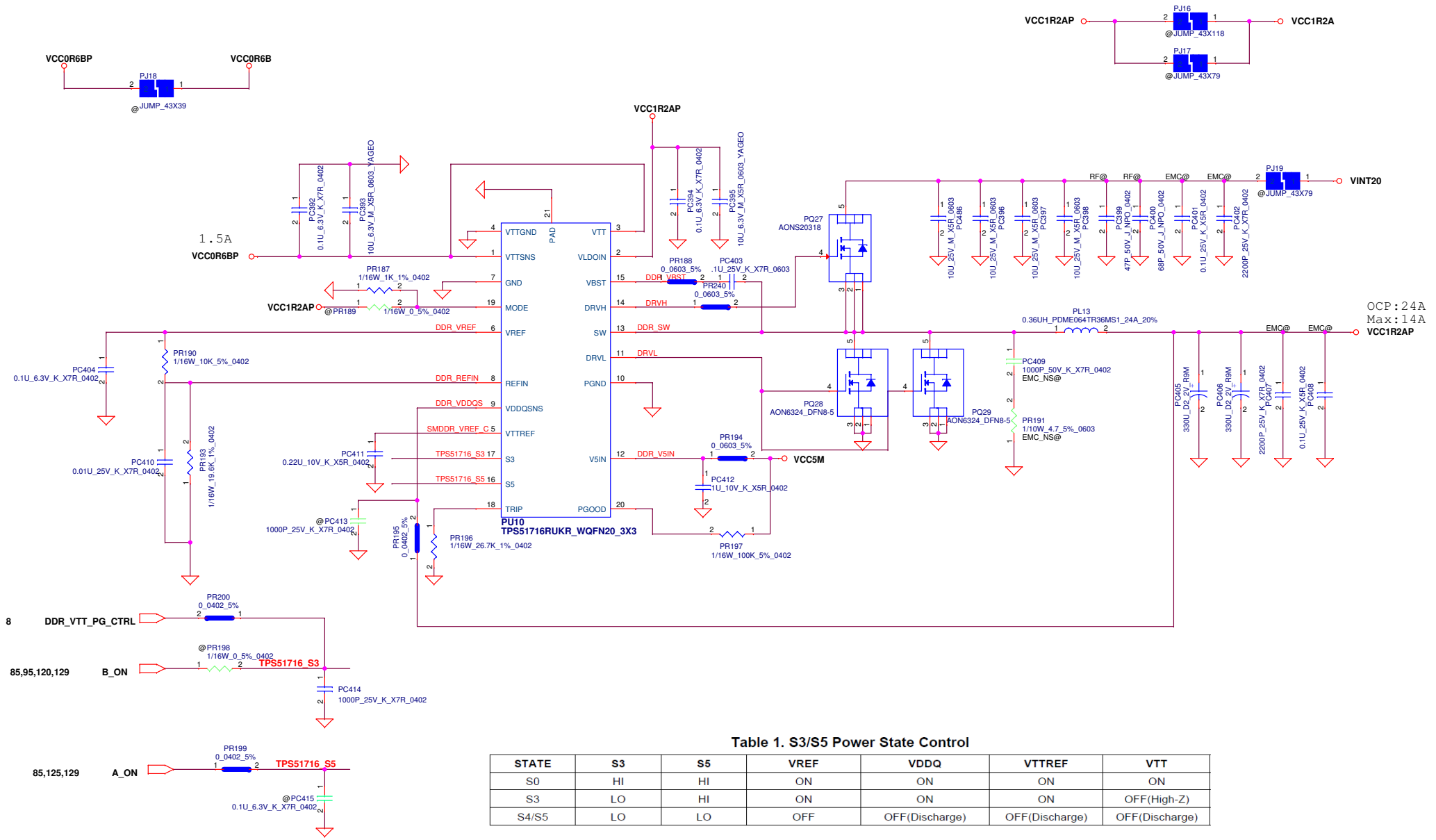
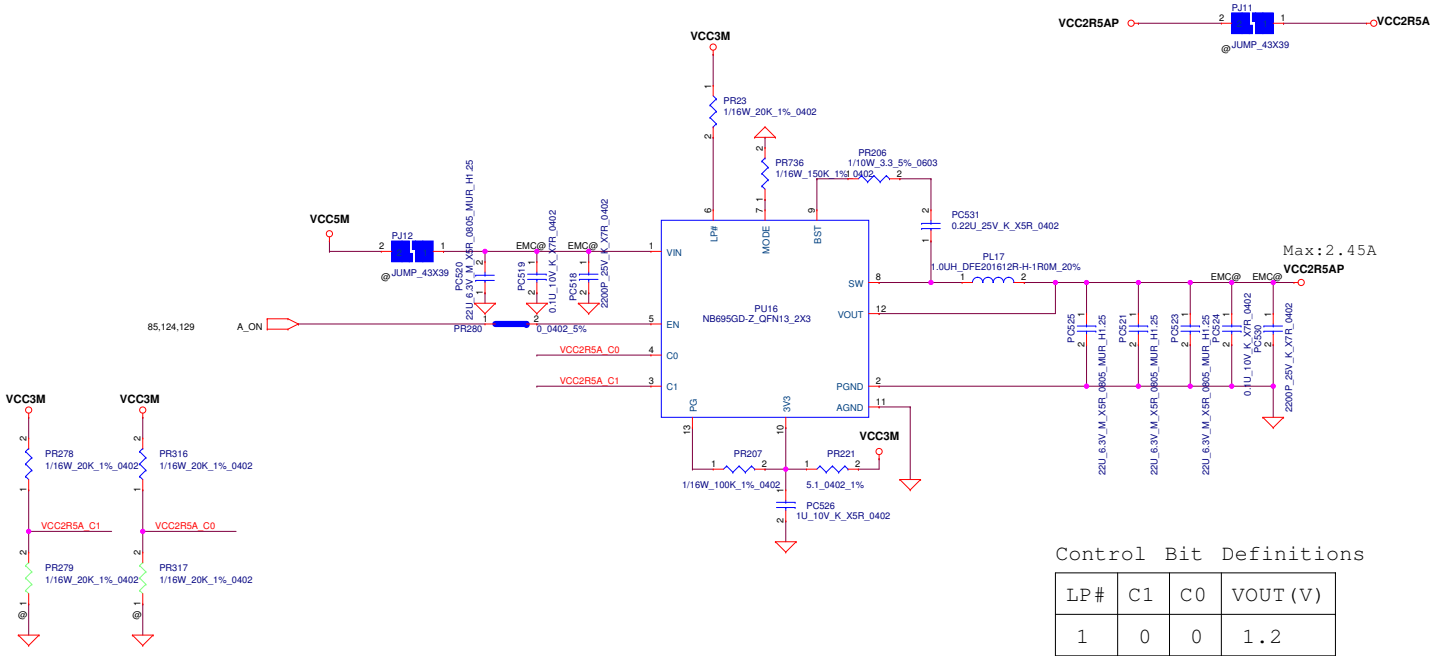


Table 1. S3/S5 Power State Control

STATE	S3	S5	VREF	VDDQ	VTTREF	VTT
S0	HI	HI	ON	ON	ON	ON
S3	LO	HI	ON	ON	ON	OFF(High-Z)
S4/S5	LO	LO	OFF	OFF(Discharge)	OFF(Discharge)	OFF(Discharge)



Control Bit Definitions

LP#	C1	C0	VOUT(V)
1	0	0	1.2
1	0	1	1.5
1	1	0	1.8
1	1	1	2.5

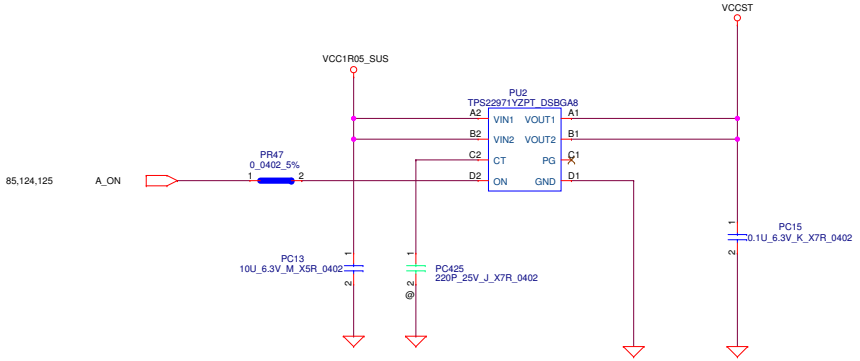
BLANK

BLANK

BLANK

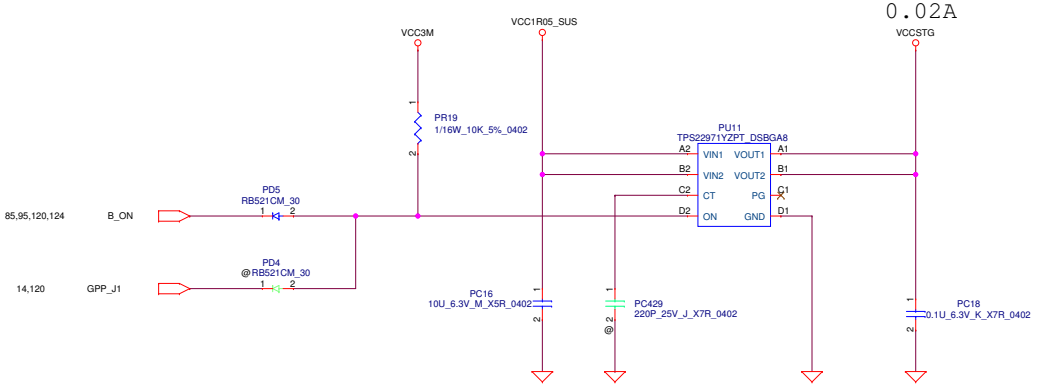
T_on<65us

0.21A



T_on>65us

0.02A



LC Future Center Secret Data

LCFC

Project Name: *Nighthawk-1*

Rev: 1.0

Title: *LOAD SW VCCST/VCCSTG*

Date: Thursday, April 25, 2019

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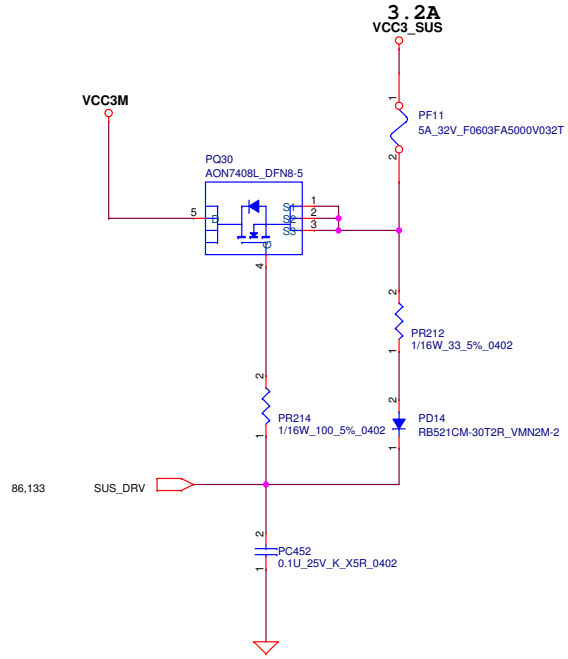
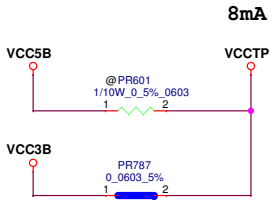
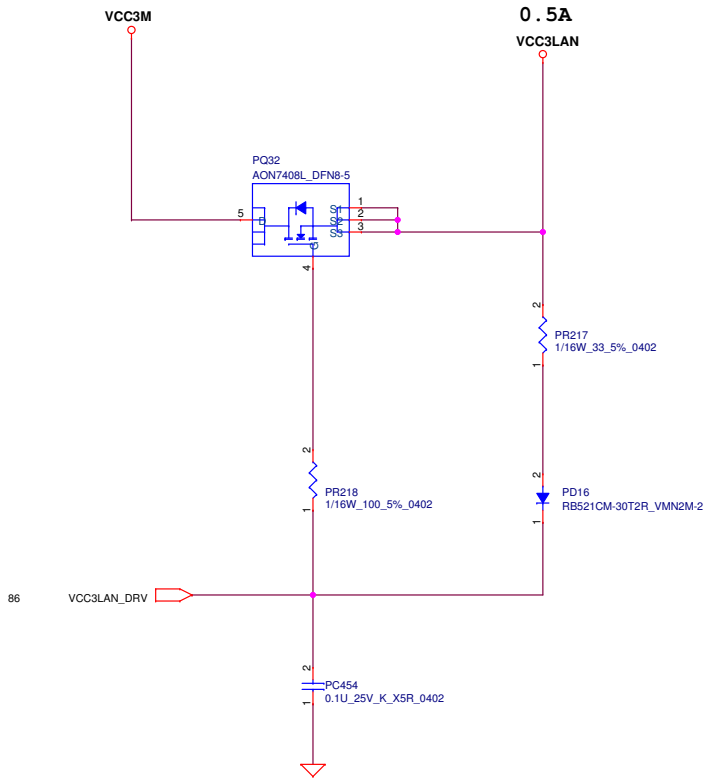




LC Future Center Secret Data

LCFC

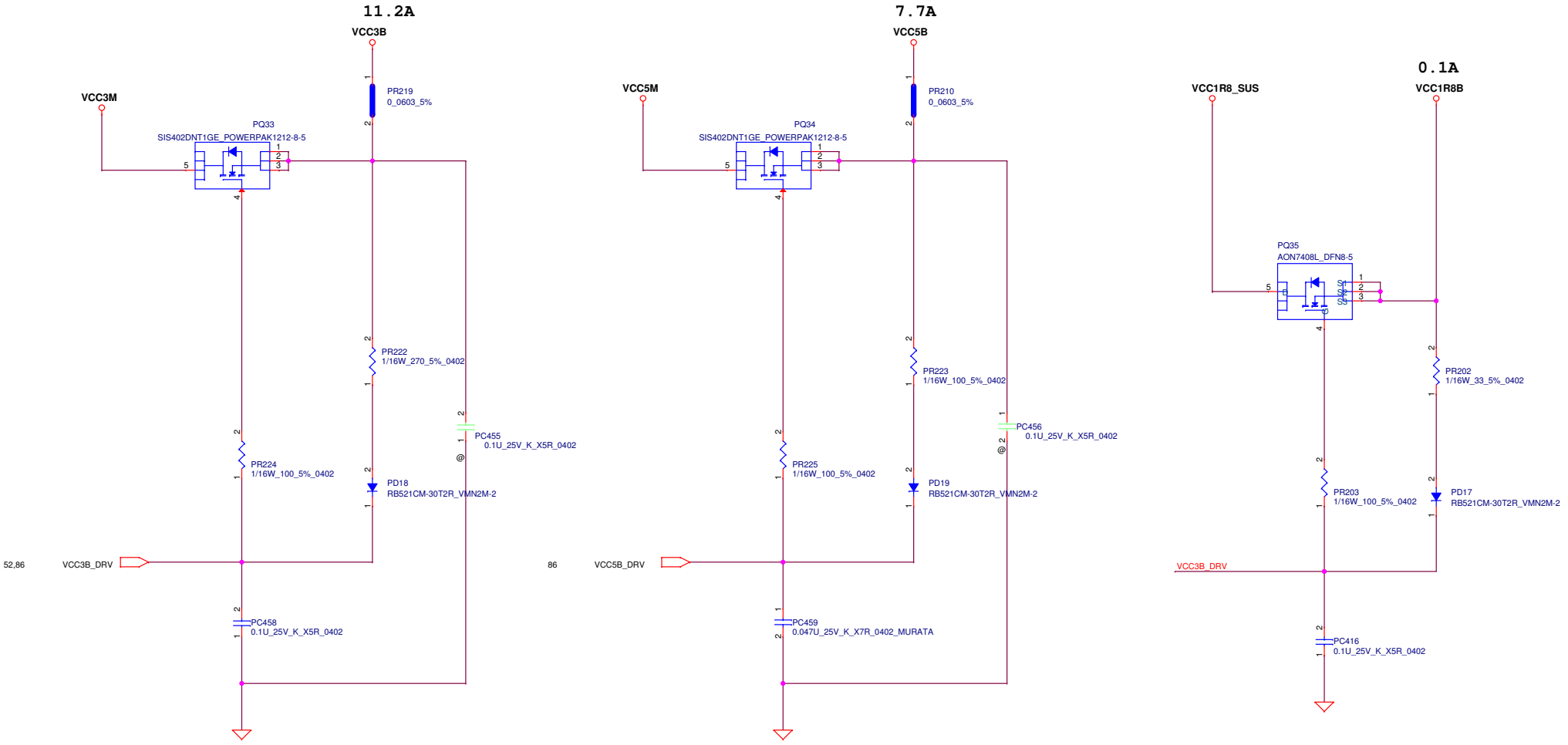
Project Name	*Nighthawk-1*
Rev 1.0	Title *LOAD SW LOAD SW PCH SUS/TP*
Date: Thursday, April 25, 2019	Sheet 130 of 142



LC Future Center Secret Data

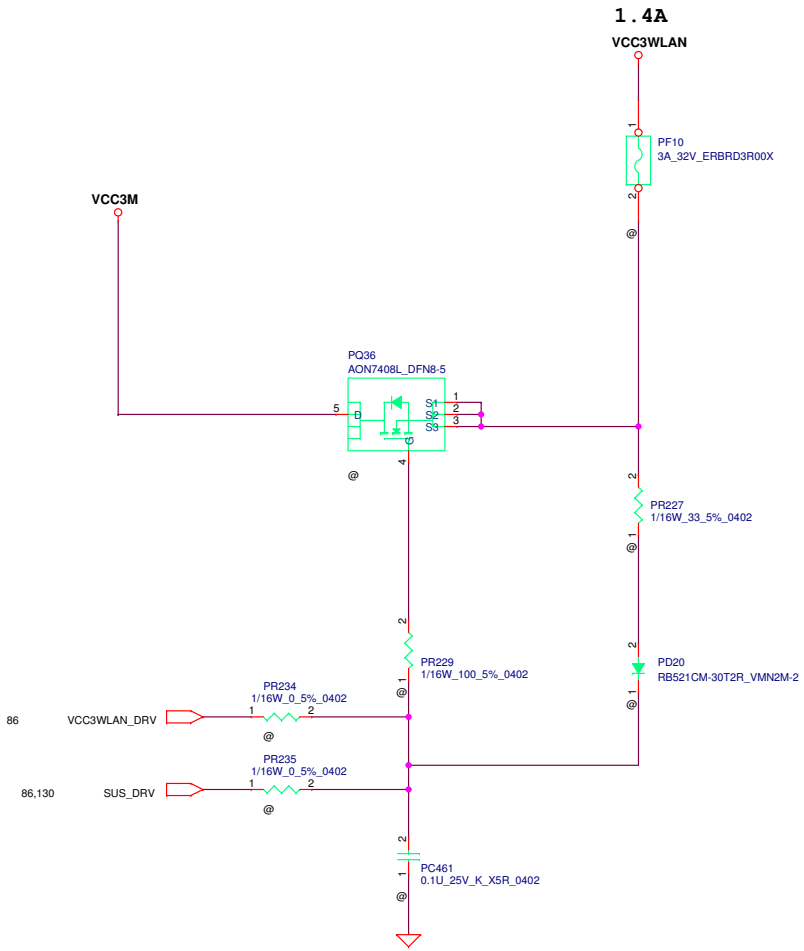
LCFC

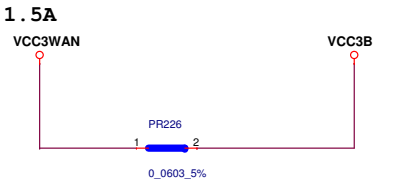
Project Name	*Nighthawk-1*
Rev 1.0	Title **LOAD SW LAN**
Date: Thursday, April 25, 2019	Sheet 131 of 142

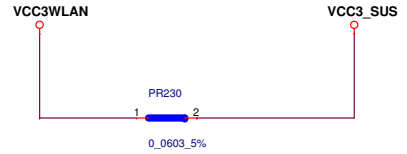


LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title: LOAD SW B
Date: Thursday, April 25, 2019	Sheet 132 of 142







LC Future Center Secret Data

Project Name: *Nighthawk-1*

Rev: 1.0

Title: **LOAD SW WWAN&WLAN**

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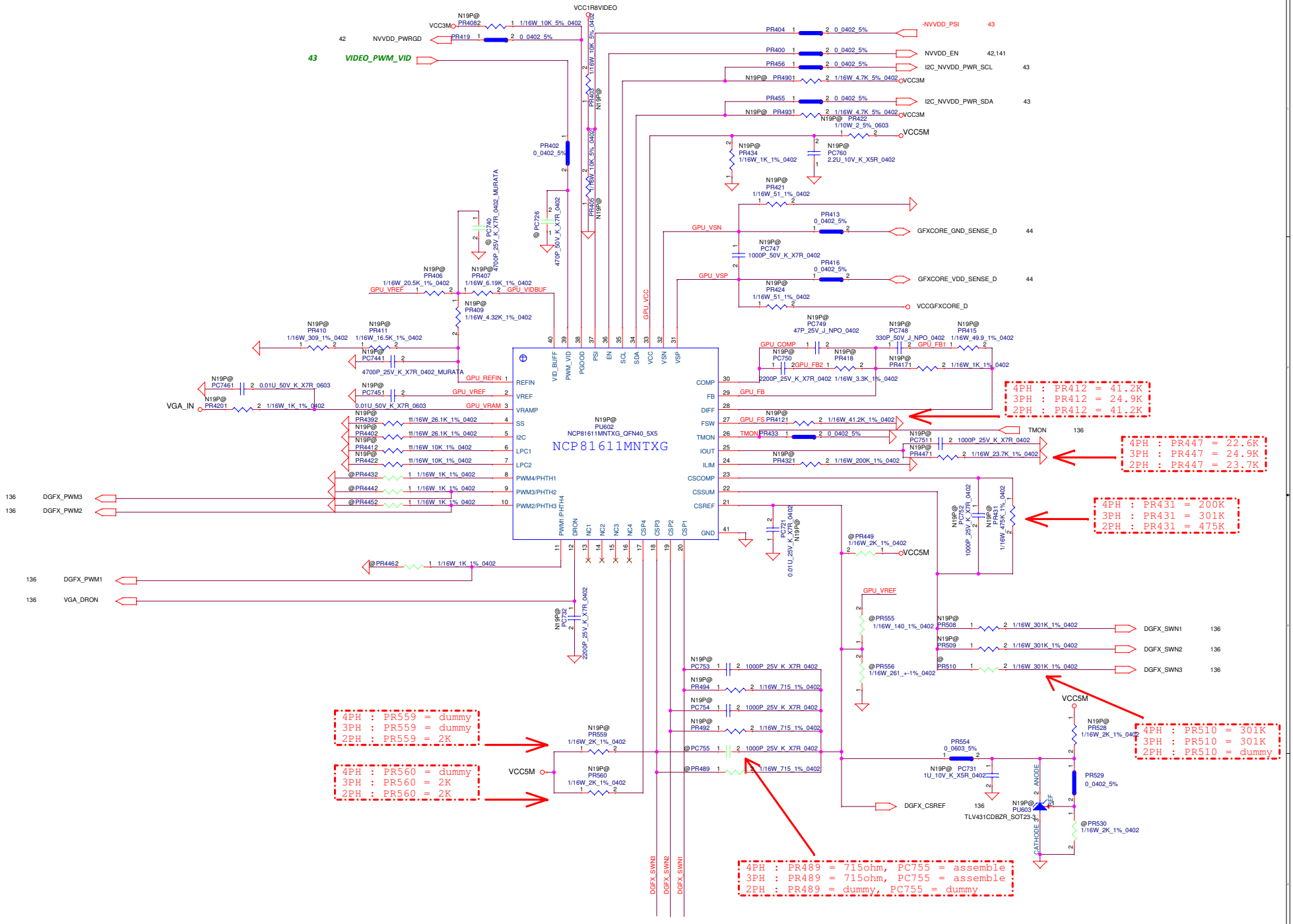
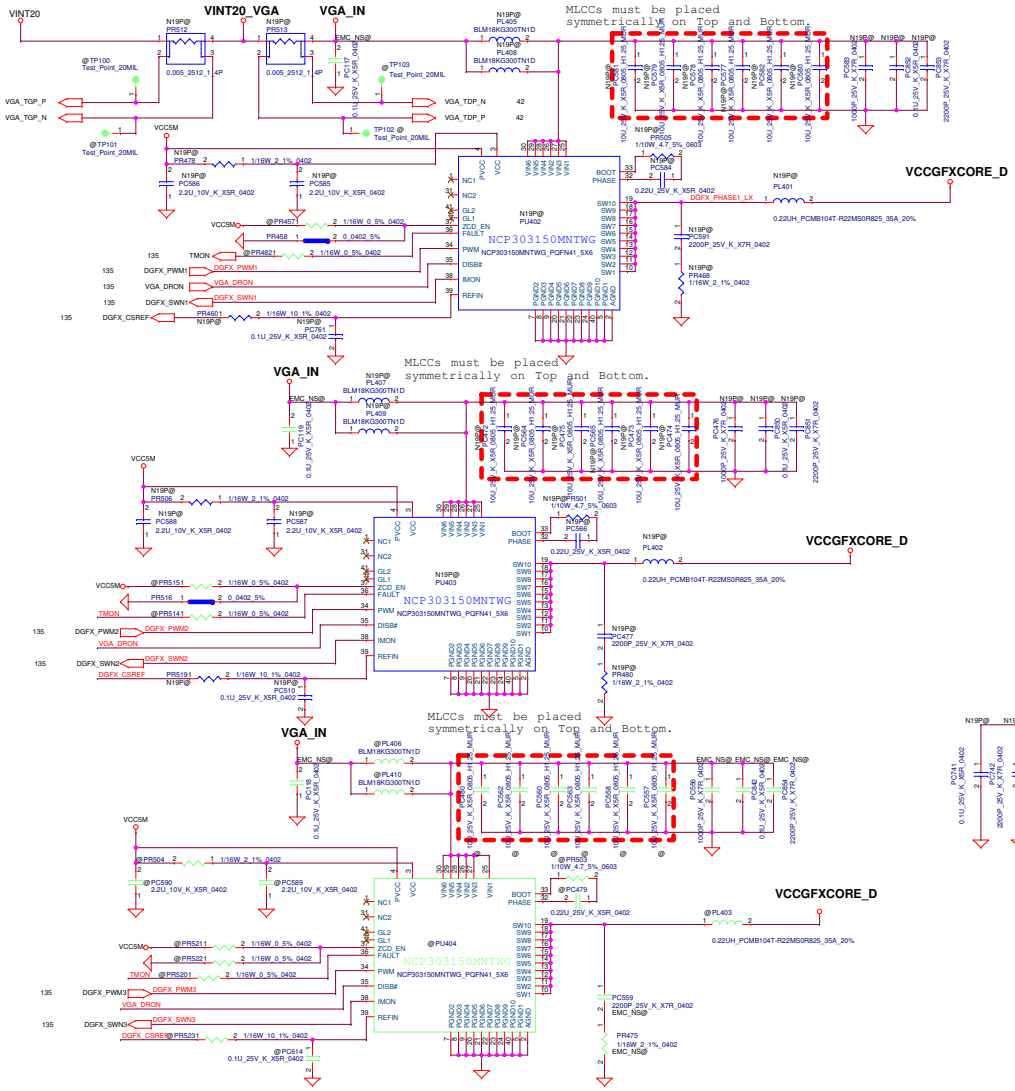
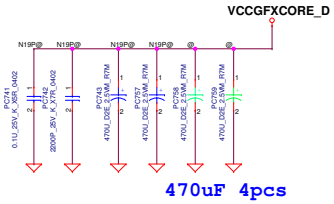


LC Future Center Secret Data

Project Name	Nighthawk-1
Rev 1.0	Title VCCGFXCORE_D IC
Date: Thursday, April 25, 2019	Sheet 135 of 142





	EDP-continue	EDP-Peak	EDPe	OCP
N19E-Q5 (max-Q)	84A	300A	61A	320A
N19E-Q3 (MAX-Q)	84A	300A	60A	320A
N19E-Q1 (MAX-P)	90A	225A	57A	240A
N19P-Q3 (MAX-P)	55A	150A	TBD	160A
N19P-Q1 (MAX-P)	45A	150A	TBD	160A

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Project Name: Nighthawk-1

Rev: 1.0

Title: VCCGFXCORE_D

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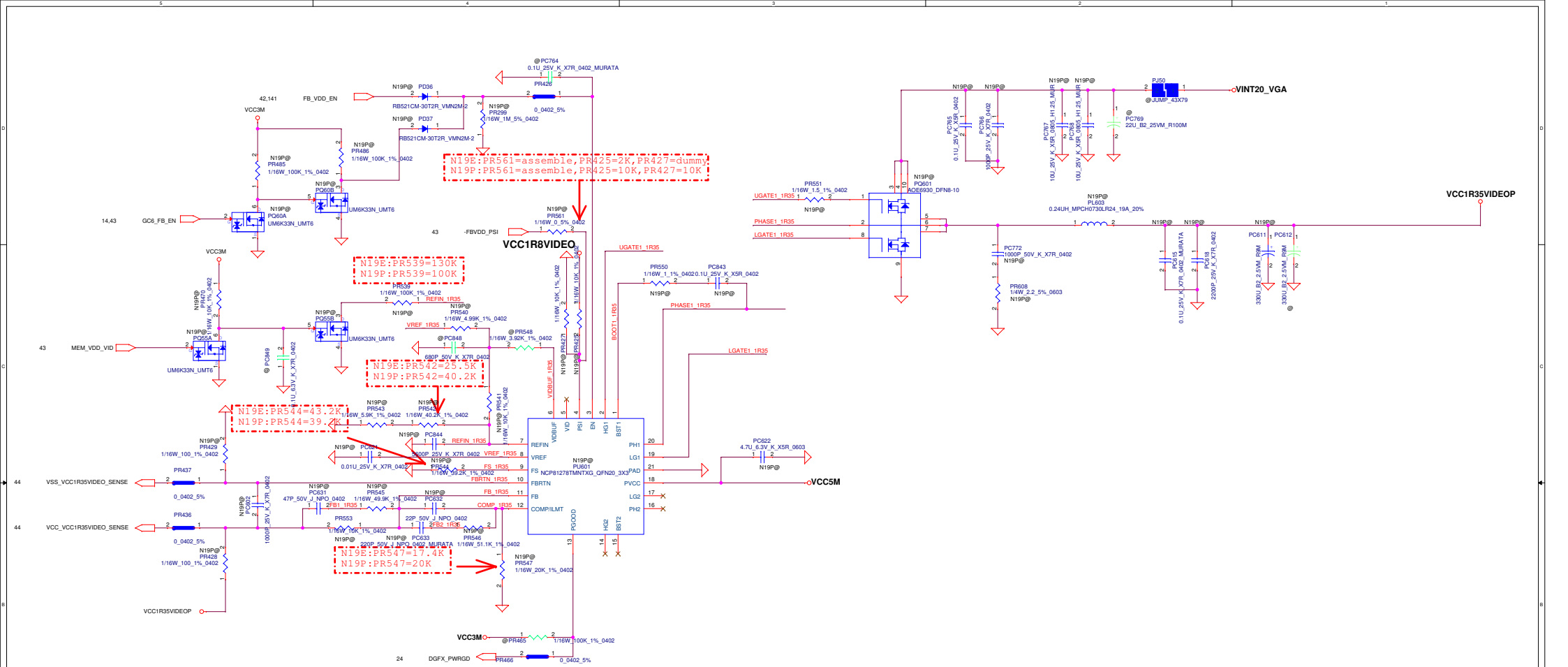
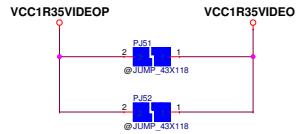


N19E (1.25V/1.35V)				
MEM_VDD_VID	Vref(V)	PR539	PR542	VCC1R35VIDEO
L	2	130K	25.5K	1.25V
H	2	130K	25.5K	1.35V

N19P (1.35V/1.5V)				
MEM_VDD_VID	Vref(V)	PR539	PR542	VCC1R35VIDEO
L	2	100K	40.2K	1.35V
H	2	100K	40.2K	1.5V

	EDP-continue	EDP-Peak	OCP
N19E-Q5/Q3 (max-Q)	40A	54A	70A
N19E-Q1	35A	46A	70A
N19P-Q3/Q1	14A	20A	30A



LC Future Center Secret Data

Project Name: Nighthawk-1

Rev: 1.0

Title: VCC1R35VIDEO

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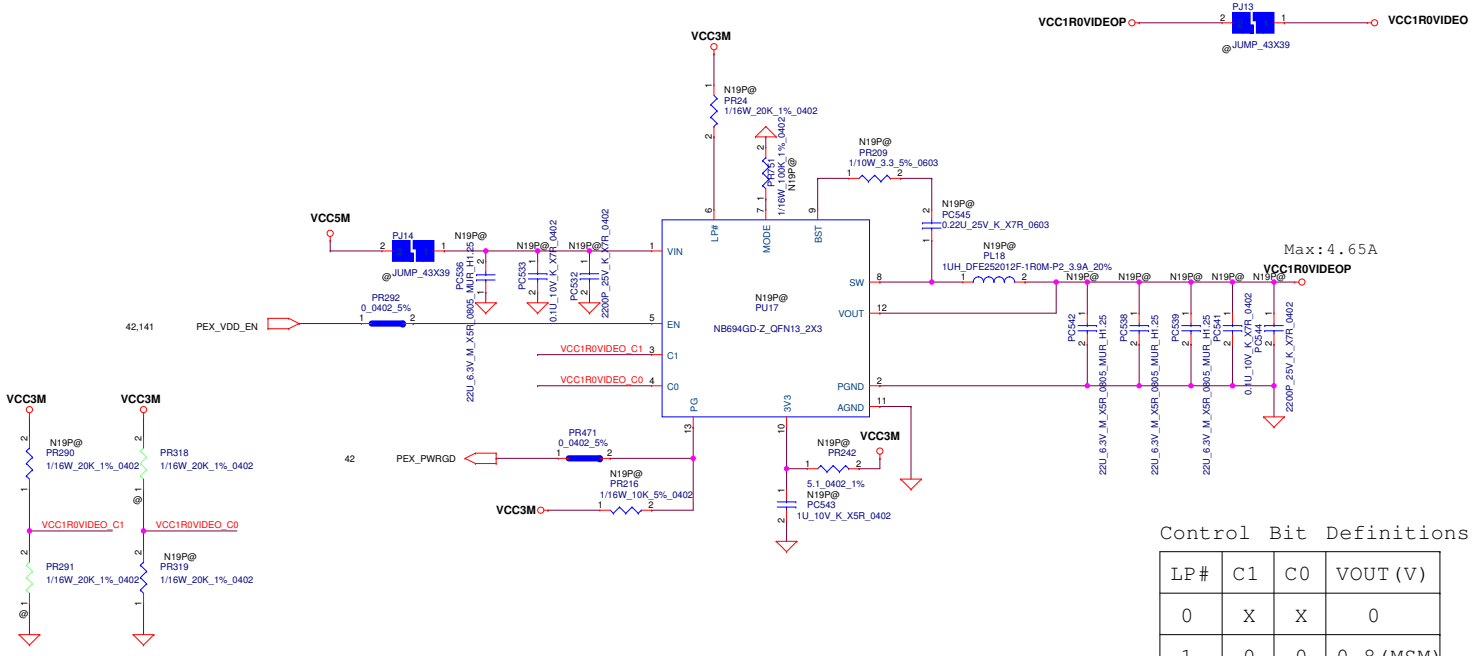

Control Bit Definitions

LP#	C1	C0	VOUT(V)
0	X	X	0
1	0	0	0.8(MSM)
1	0	1	0.95
1	1	0	1
1	1	1	1.05

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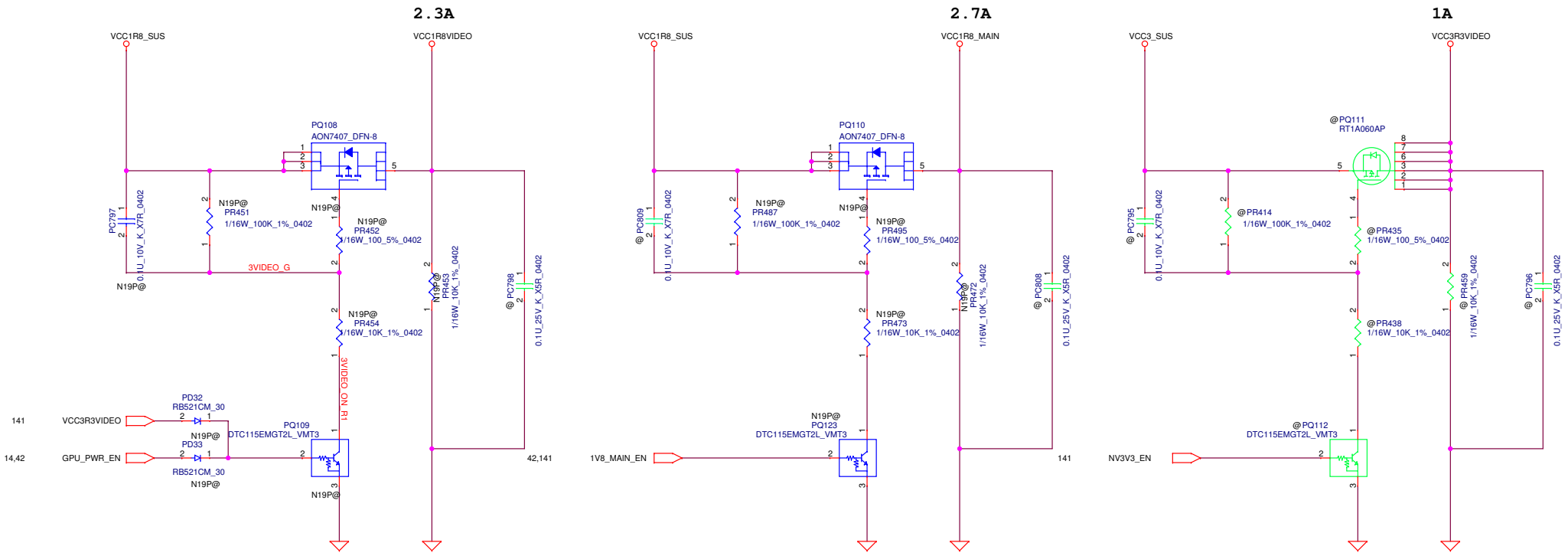
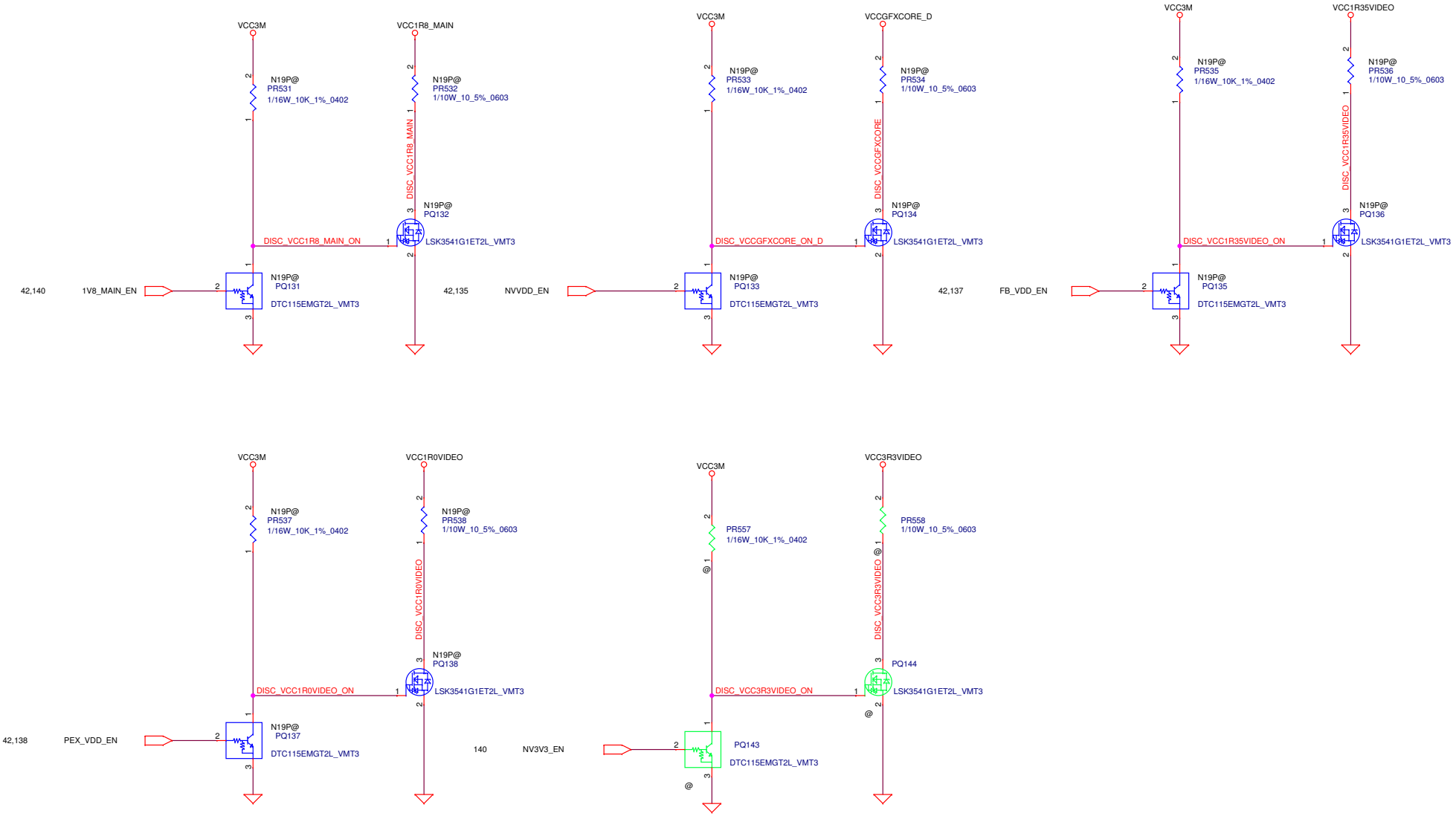


LC Future Center Secret Data

LCFC

Project Name	Nighthawk-1
Rev 1.0	Title: LOAD SW VIDEO
Date: Thursday, April 25, 2019	Sheet 140 of 142



LC Future Center Secret Data

LCFC

Project Name	Nighthawk-1
Rev 1.0	Title DISCHARGE CIRCUIT VIDEO
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3PH@ comment

4PH@ comment

N19P@ comment

82@ comment

LC Future Center Secret Data

LCFC

Project Name: *Nighthawk-1*

Rev: 1.0

Title: **LOAD BOM**

Date: Thursday, April 25, 2019

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