

# T490/T590 Logic Schematics

**DRIFT**  
**VER 1.0**  
**Dec.4 2018**

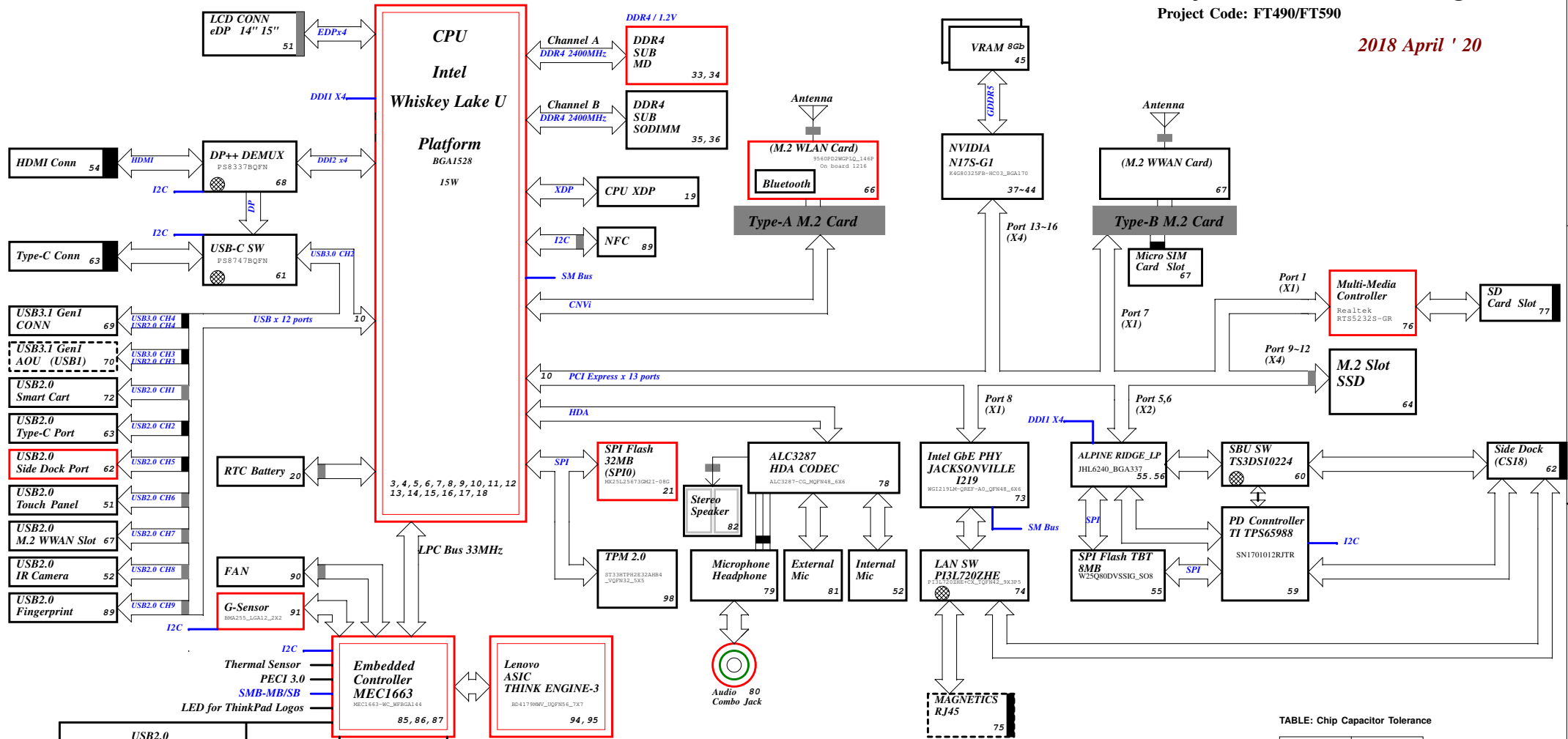
BASE LOGIC 1 : Lightsaber-3 Pass-1 VER 0.25 Jul/10/2017  
BASE LOGIC 2 : Finn-1 SIT VER 2.01 Jun/28/2017

1.TITLE PAGE	36.DDR4 SUB CHANNEL-B SODIMM_2	71.BLANK	99.SCREW HOLES
2.BLOCK DIAGRAM	37.N17S-G1(1/7) PEG I/F	72.Smart Card Reader	100.DC-IN
3.CPU (1/16): DDI/TYPE-C	38.N17S-G1(2/7) VRAM I/F	73.GBE JACKSONVILLE	101.BATTERY INPUT
4.CPU (2/16): DDR (1/2)	39.BLANK	74.GBE LAN SWITCH	102.BATTERY CHARGER(BQ25700A)
5.CPU (3/16): DDR (2/2)	40.N17S-G1(3/7) DIGITA / XTAL	75.LAN_B CONNECTOR	103.DC/DC VCC5M (NB690)
6.CPU (4/16): MISC/JTAG	41.N17S-G1(4/7) STRAP / GPIO	76.MEDIA CARD CONTROLLER	104.DC/DC VCC5M_PD (NB693)
7.CPU (5/16): ESPI/SPI/SMBUS/C-LINK	42.N17S-G1(5/7) POWER	77.MEDIA CONNECTOR	105.DC/DC VCC3M (TPS51393)
8.CPU (6/16): LPSS/ISH	43.N17S-G1(6/7) POWER 2	78.AUDIO ALC3287	106.BLANK
9.CPU (7/16): AUDIO/SDXC	44.N17S-G1(7/7) GND	79.AUDIO CONNECTOR	107.DC/DC VCC1R8_SUS (MP1603L)
10.CPU (8/16): PCIE/USB/SATA	45.VRAM CHANNEL-A	80.AUDIO JACK SENSE	108.DC/DC IMVP8 (MP2949AGQKT)
11.CPU (9/16): CSI-2/EMMC/CNVI	46.BLANK	81.AUDIO EXT MIC I/F	109.DC/DC VCCPUCORE (MP86901C)
12.CPU (10/16): CLOCK SIGNALS	47.BLANK	82.AUDIO SPEAKER	110.DC/DC VCCGFXCORE_I (MP86901)
13.CPU (11/16): SYSTEM PM	48.BLANK	83.AUDIO BEEP	111.DC/DC VCCSA (MP86901A)
14.CPU (12/16): CPU POWER (1/2)	49.BLANK	84.AUDIO DEBUG	112.DC/DC VCC1R2A(NB687)
15.CPU (13/16): CPU POWER (2/2)	50.BLANK	85.MEC1663(1/3)	113.DC/DC VCC1R05_SUS(NB693)
16.CPU (14/16): PCH POWER	51.LCD INTERFACE	86.MEC1663(2/3)	114.DC/DC VCC1R0VIDEO(BD9B304)
17.CPU (15/16): GND	52.LID/CAMERA/MIC/TOUCH INTERFACE	87.MEC1663(3/3)	115.DC/DC VCCGFXCORE_D (NCP8127)
18.CPU (16/16): CFG/RESERVED	53.BLANK	88.KEYBOARD/TRACK POINT	116.DC/DC VCC1R35VIDEO(NB693)
19.XDP CONNECTOR	54.HDMI CONNECTOR	89.TOUCH PAD/NFC/FPR	117.DC/DC VCC1R8VIDEO(BD9B304)
20.RTC BATTERY	55.ALPIKE RIDGE (1/2)	90.FAN CONNECTOR	118.LOAD SW VIDEO
21.SPI FLASH	56.ALPIKE RIDGE (2/2)	91.APS G-SENSOR	119.BLANK
22.BLANK	57.BLANK	92.BLANK	120.LOAD SW VCCST & VCCSTG
23.BLANK	58.BLANK	93.SMBUS SWITCH	121.LOAD SW PCH SUS
24.BLANK	59.TUNDERBOLT PD	94.THINK ENGINE-3 (1/2)	122.BLANK
25.BLANK	60.THUNDERBOLT DEMUX	95.THINK ENGINE-3 (2/2)	123.LOAD SW LAN
26.BLANK	61.USB TYPE-C SWITCH	96.BLANK	124.LOAD SW B
27.BLANK	62.DOCKING CONNECTOR	97.BLANK	125.LOAD SW WLAN
28.BLANK	63.TYPE-C CONNECTOR	98.DISCRETE TPM 2.0	
29.BLANK	64.M.2 SOCKET 3 MODULE I/F		
30.BLANK	65.BLANK		
31.BLANK	66.M.2 TYPE 1216 MODULE		
32.BLANK	67.M.2 SOCKET 2 MODULE I/F		
33.DDR4 SUB CHANNEL-A MD_1	68.DDI DEMULTIPLEXER		
34.DDR4 SUB CHANNEL-A MD_2	69.USB TYPE-A CONNECTOR		
35.DDR4 SUB CHANNEL-B SODIMM_1	70.USB TYPE-A CONN		

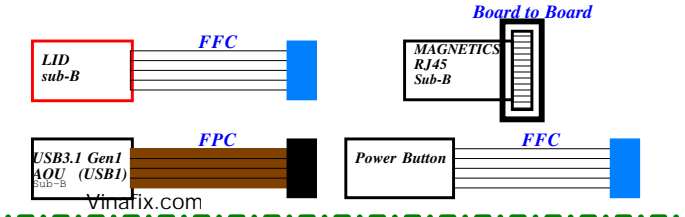
# Drift/Ironhide Block Diagram

Project Code: FT490/FT590

2018 April ' 20



## Sub-Board



- Sub Board
- Different with Windu-2
- External Connector/Socket
- Internal Connector/Socket
- Internal Switch

TABLE: Chip Part Dimension

Size [mm]	mm Size Code	Inch Size Code
0.40 x 0.20	0402	01005
0.60 x 0.30	0603	0201
1.00 x 0.50	1005	0402
1.60 x 0.80	1608	0603
2.00 x 1.25	2125	0805
2.50 x 1.60	2016	0806
2.50 x 2.00	2520	1008
3.20 x 1.60	3216	1206
3.20 x 2.50	3225	1210
4.50 x 1.60	4516	1806
4.50 x 2.50	4525	1810
4.50 x 3.20	4532	1812
5.00 x 2.50	5025	2010
6.40 x 3.20	6432	2512

TABLE: Chip Capacitor Tolerance

Tolerance	Code
+/-0.25pF	C
+/-0.5pF	D
+/-5%	J
+/-10%	K
+/-20%	M
+80/-20%	Z

TABLE: Chip Capacitor Thermal Characteristics

Temperature Range	Capacitance Change	Code
-55 to 150degC	+/-30ppm/degC	NPO
-55 to 125degC	+/-30ppm/degC	C0G
-55 to 125degC	+/-15%	X7R
-55 to 105degC	+/-22%	X6S
-55 to 85degC	+/-15%	X5R

Security Classification	LC Future Center Secret Data
Issued Date	2018/01/12
Deciphered Date	2018/01/12

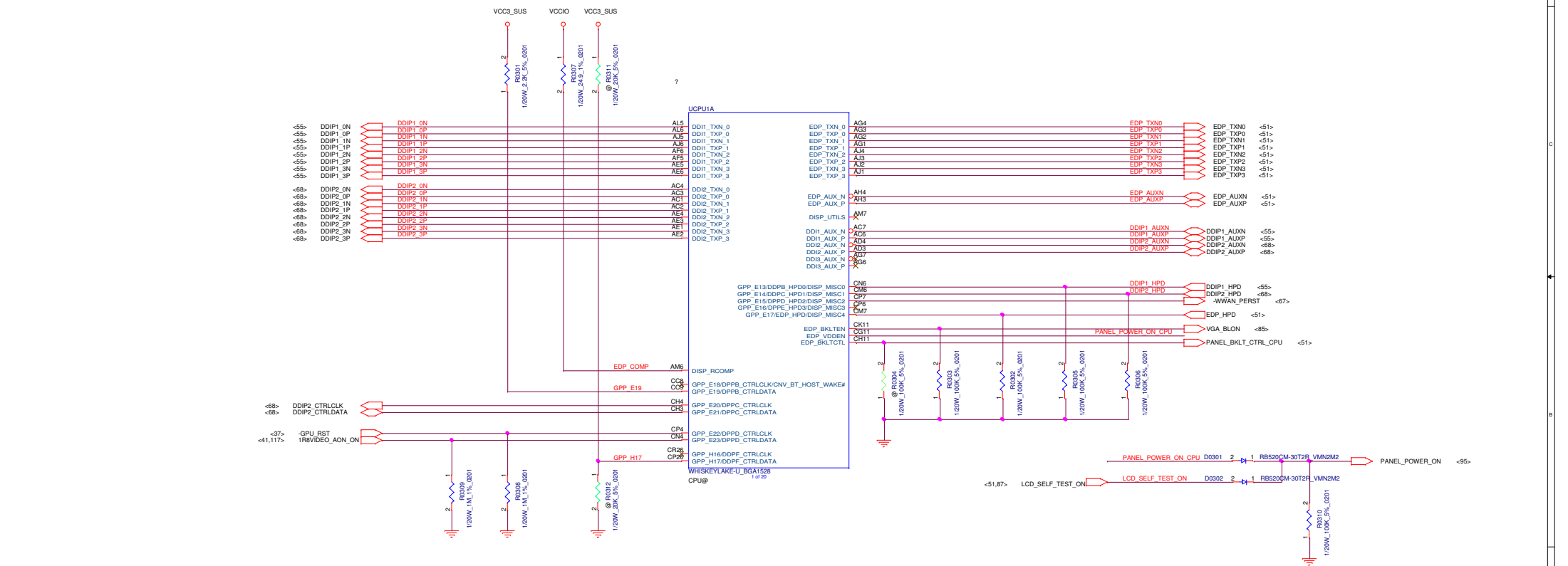
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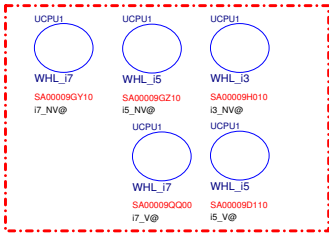
TABLE : Functional Strap		
GPP_E19/DDPB_CTRLDATA (Display Port B Detected)		
HIGH	Port B is detected	← LOGIC
LOW	Port B is not detected (Default)	

TABLE : Functional Strap		
GPP_E21/DDPC_CTRLDATA (Display Port C Detected)		
HIGH	Port C is detected	← LOGIC
LOW	Port C is not detected (Default)	


TABLE : Functional Strap		
GPP_E23/DDPD_CTRLDATA (Display Port D Detected)		
HIGH	Port D is detected	← LOGIC
LOW	Port D is not detected (Default)	



CPU Config



Vinafix.com

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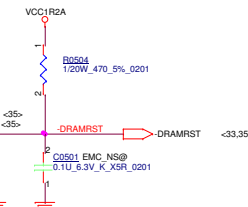






TABLE : Functional Strap

GPP_B14/SPKR (Top Swap Override)	
HIGH	Enable "Top Swap" Mode
LOW	Disable "Top Swap" Mode (Default)

← LOGIC

TABLE : Functional Strap

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

← LOGIC

TABLE : Functional Strap

GPP_B22/GSPI1_MOSI (Boot BIOS Strap Bit BBS)	
HIGH	LPC
LOW	SPI (Default)

← LOGIC

TABLE : Functional Strap

GPP_B23/SML1ALERT#/PCHHOT# (Intel DCI-OOB)	
HIGH	Enable Intel DCI-OOB
LOW	Disable Intel DCI-OOB (Default)

← LOGIC

TABLE : Functional Strap

GPP_D12/ISH_SPI_MOSI/GSPI2_MOSI (Reserved)	
External pull-up is required. Recommend 100 kohm if pulled up to 3.3V or 75 kohm if pulled up to 1.8V	

TABLE : Functional Strap

GPP_F6/CNV_RGI_DT (M.2 CNV Mode Select)	
A weak external Pull-Up is required.	
HIGH	Integrated CNVI disable.
LOW	Integrated CNVI Enable.

← LOGIC

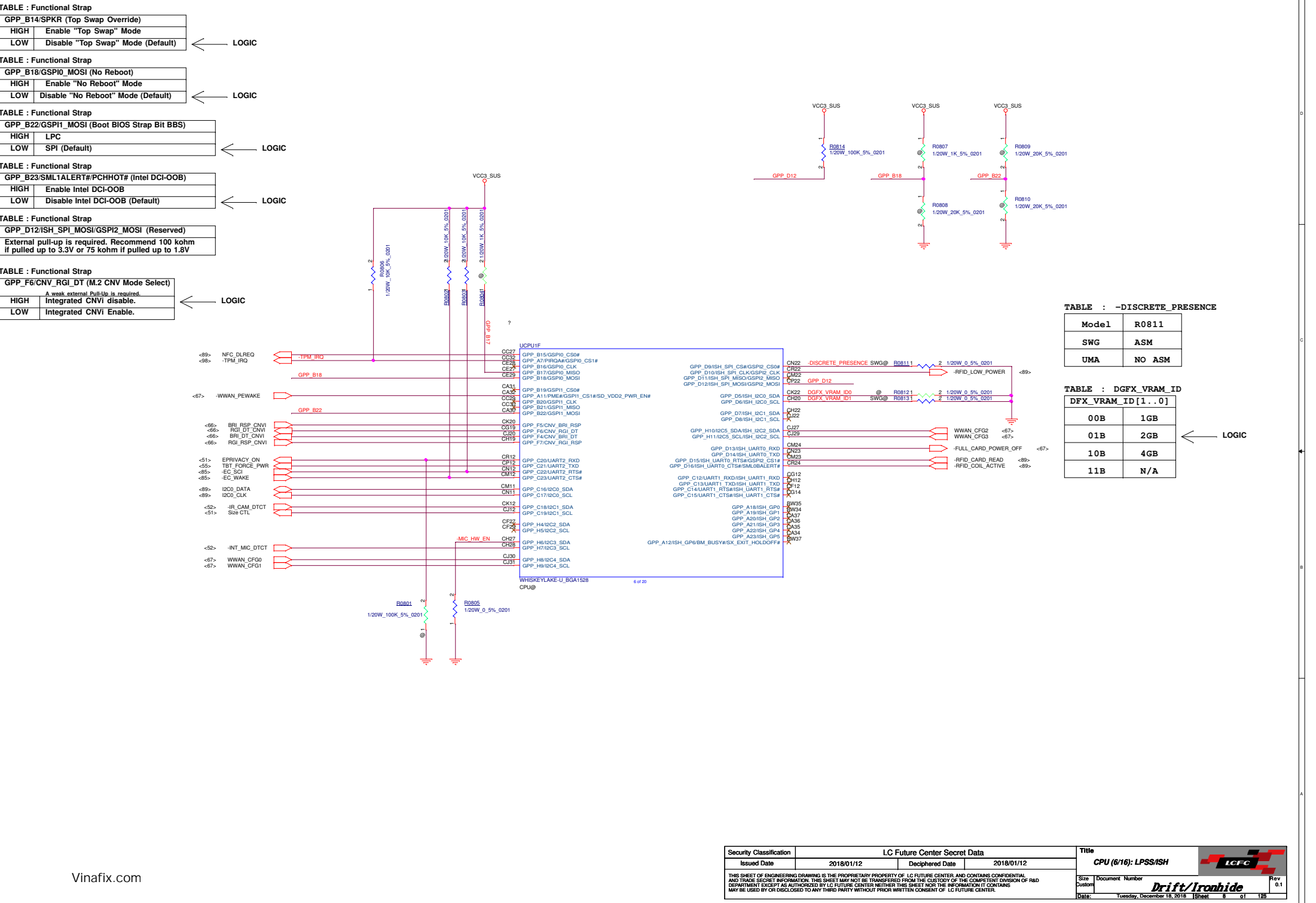


TABLE : --DISCRETE\_PRESENCE

Model	R0811
SWG	ASM
UMA	NO ASM

TABLE : DGFV\_VRAM\_ID

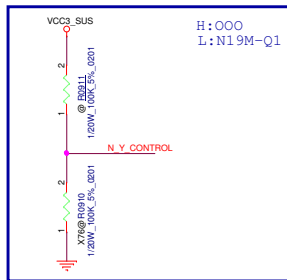
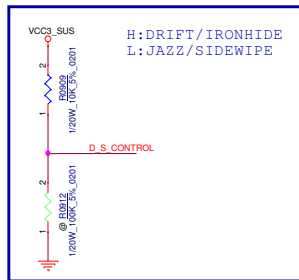
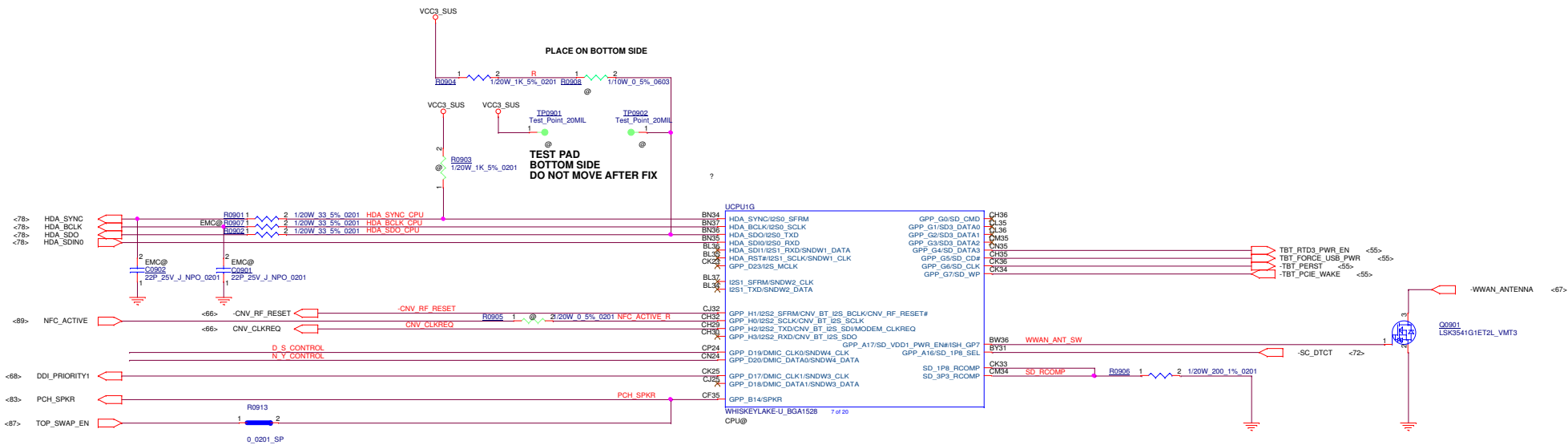
DGFV_VRAM_ID[1..0]	
00B	1GB
01B	2GB
10B	4GB
11B	N/A

← LOGIC



HDA_SDO/12S0_TXD	
Flash Descriptor Security Override	
HIGH	Disable Flash Descriptor Security (Override)
LOW	Enable Flash Descriptor Security (Default)

← LOGIC



PCIe Port Assignment		USB 2.0 Port Assignment		USB 3.0 Port Assignment		SATA Port Assignment	
PCIE 1	Media Card Controller	USB2_1	Smart Card	USB3_1	Type-C Port C	SATA 0	
PCIE 2		USB2_2	Type-C Port C	USB3_2	Type-C Port C	SATA 1A	
PCIE 3		USB2_3	Type-A Port (AOU)	USB3_3	Type-A Port (AOU)	SATA 1B	
PCIE 4		USB2_4	Type-A Port (DCI)	USB3_4	Type-A Port (Std.A)	SATA 2	SATA SSD
PCIE 5 (x2)	Alpine Ridge-DP	USB2_5	TBT Type-C Port	USB3_5			
PCIE 7	WWAN	USB2_6	Touch Panel	USB3_6			
PCIE 8	GbE WGI219	USB2_7	WWAN Card				
PCIE 9 (x4)	Nvidia GPU	USB2_8	RGB / IR Hybrid Camera				
PCIE 13 (x4)	NVMe SSD	USB2_9	Fingerprint Reader				
		USB2_10	(Reserved for Bluetooth)				

Flexible I/O Configuration									
WHL Lake PCH-LP Premium - U					CS19 T14/T15/P53s				
HSIO Port	High Speed Signals		PCI		HSIO Configuration	Device	Descriptor for PCIe	PCI	
			Device	Function				Device	Function
Port 1	USB3 1 / PCIE 1	X2	X4	1Ch	PCIE 1	Media Card Controller	4x1 LaneReversal Disabled		
Port 2	USB3 2 / PCIE 2	X2			PCIE 2	Type-C Port (Gen1)			
Port 3	USB3 3 / PCIE 3	X2			PCIE 3	Type-A Port (AOU)			
Port 4	USB3 4 / PCIE 4	X2			PCIE 4	Type-A Port (Gen1)			
Port 5	USB3 5 / PCIE 5	X2	X4	1Ch	PCIE 5*4 L0	Alpine Ridge - DP	4x1 LaneReversal Disabled		
Port 6	USB3 6 / PCIE 6	X2			PCIE 5*4 L1	Alpine Ridge - DP			
Port 7	PCIE 7 (GbE)	X2			WWAN	Fibocom L850			
Port 8	PCIE 8 (GbE)	X2			GbE	WGI 219			
Port 9	PCIE 9 (GbE)	X2	X4	1Dh	PCIE 9 x4 L0	NV N17S-G1 / G3	4x1 LaneReversal Disabled		
Port 10	PCIE 10	X2			PCIE 9 x4 L1	NV N17S-G1 / G3			
Port 11	PCIE 11 / SATA 0	X2			PCIE 9 x4 L2	NV N17S-G1 / G3			
Port 12	PCIE 12 / SATA 1A	X2			PCIE 9 x4 L3	NV N17S-G1 / G3			
Port 13	PCIE 13 (GbE)	X2	X4	1Dh	PCIE 13 x4 L3	Storage Lane 3	4x1 LaneReversal Enabled		
Port 14	PCIE 14 (GbE)	X2			PCIE 13 x4 L2	Storage Lane 2			
Port 15	PCIE 15 / SATA 1B	X2			PCIE 13 x4 L1	Storage Lane 1			
Port 16	PCIE 16 / SATA 2	X2			PCIE 13 x4 L0 / SATA2	Storage Lane 0 / SATA			

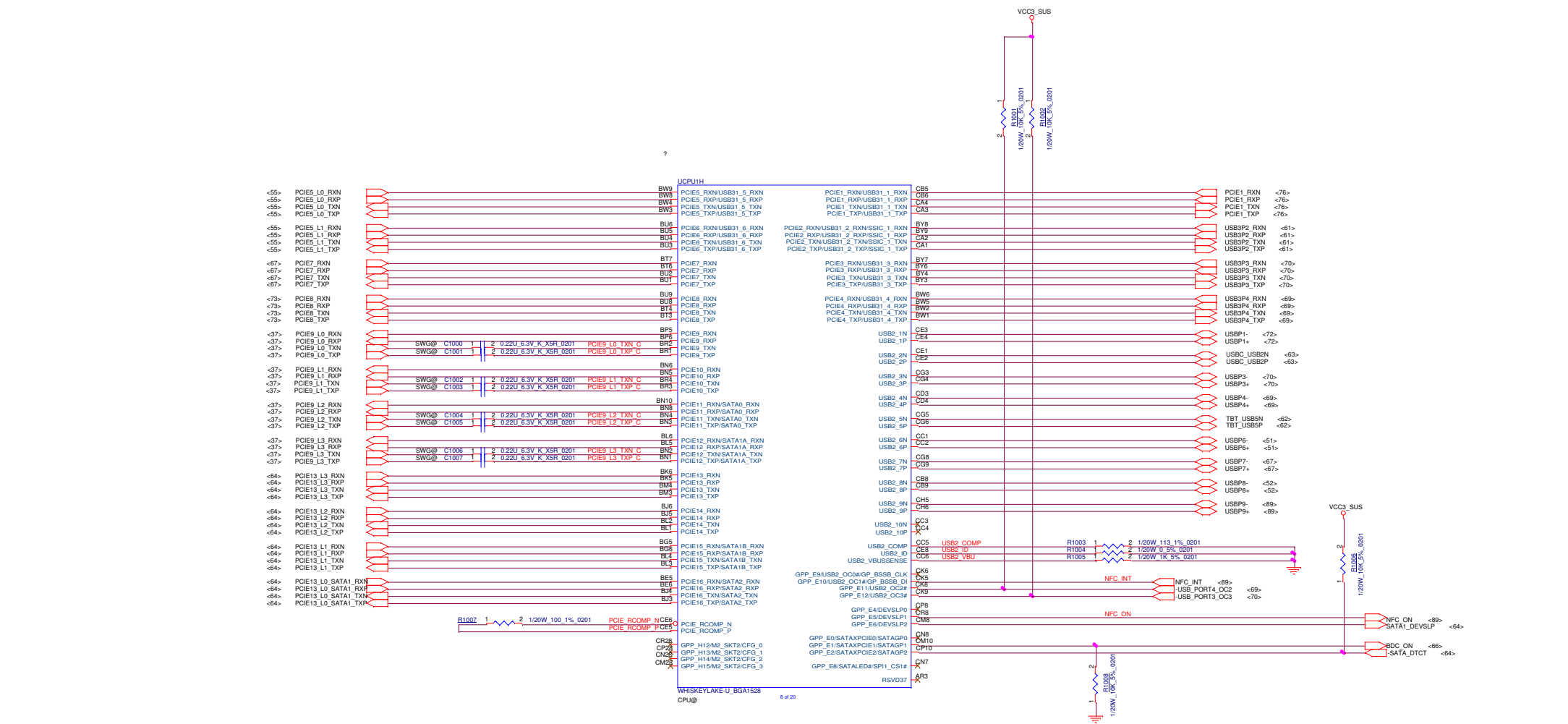


TABLE : Functional Strap

GPP_H21 (XTAL Frequency Select)	
HIGH	24.0MHz
LOW	38.4MHz (Default)

TABLE : Functional Strap

GPP_H23 (eSPI Flash Sharing Mode)	
HIGH	Master Attached Flash Sharing (MAFS) enabled
LOW	Master Attached Flash Sharing (MAFS) disabled (Default)

TABLE : Functional Strap

GPD7 (Reserved)	
External pull-up is required. Recommend 100 kohm.	

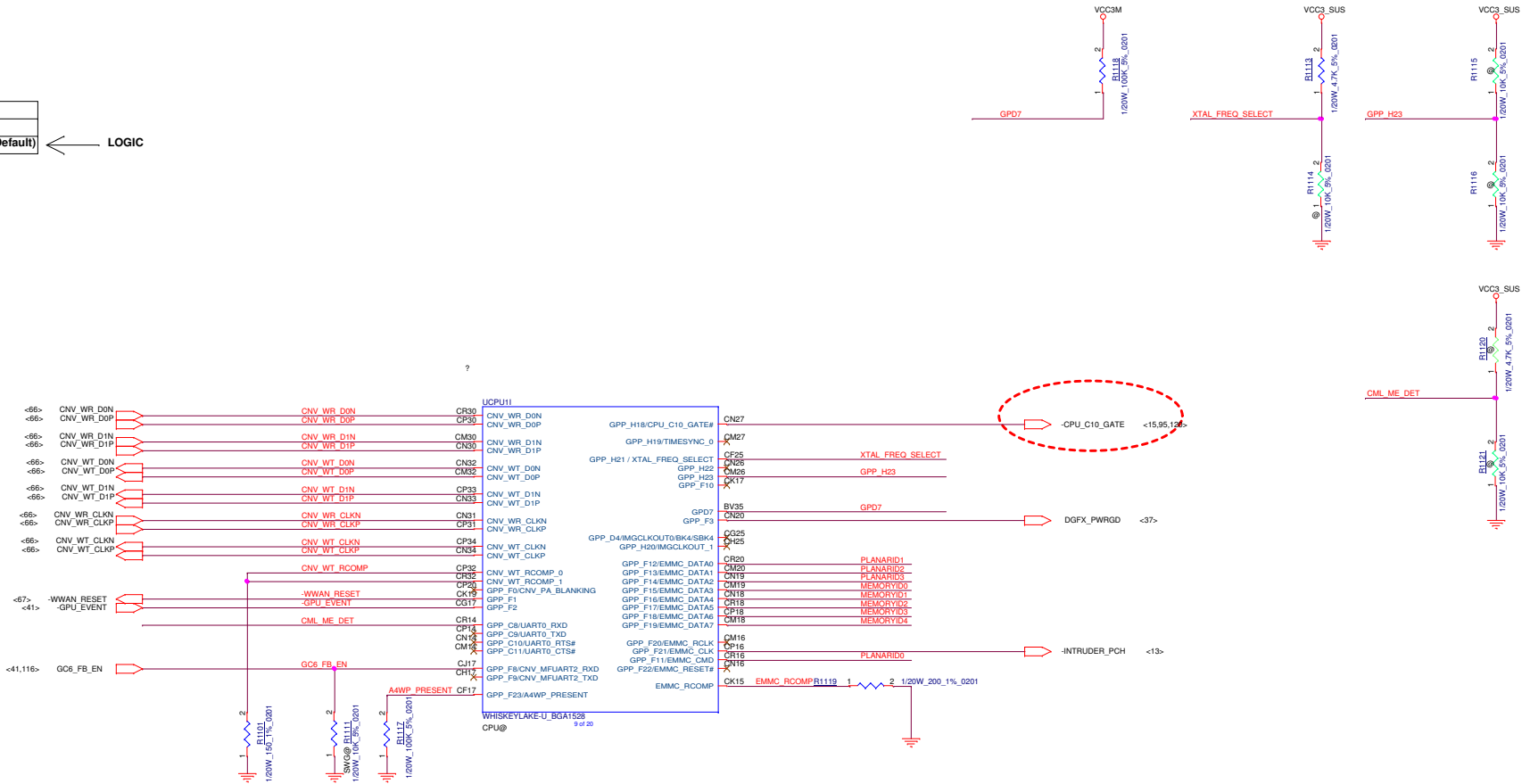
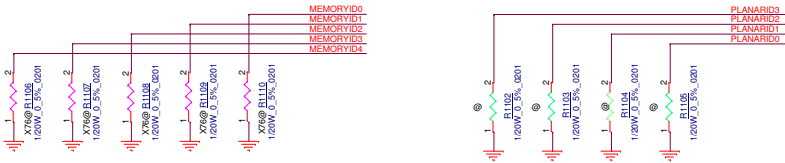


TABLE: MEMORYID

MEMORYID[4:0]	Vendor	U3301, U3302, U3303, U3304			Capacity		
		Part Number	Component	Qty	Channel-0	Channel-1	At least
04h (00100b)	Micron	MT40A512M16LY-075:E	8Gbit SDP	4pcs	4GB	SO-DIMM	4GB
05h (00101b)		MT40A1G16KNR-075:E	16Gbit DDP	4pcs	8GB	SO-DIMM	8GB
08h (01000b)	Samsung	K4A8G16SWC-BCTD	8Gbit SDP	4pcs	4GB	SO-DIMM	4GB
09h (01001b)		K4AAG16SWB-MCTD	16Gbit DDP	4pcs	8GB	SO-DIMM	8GB
0Ah (01010b)	SK hynix	K4ABG16SWA-MCTD	32Gbit DDP	4pcs	16GB	SO-DIMM	16GB
0Ch (01100b)		H5AN8G6NCJR-VKC	8Gbit SDP	4pcs	4GB	SO-DIMM	4GB
0Dh (01101b)		H5ANAG6NAMR-UHC	16Gbit DDP	4pcs	8GB	SO-DIMM	8GB

TABLE: PLANARID

PLANARID[3:0]	PHASE
0h (0000b)	PRE-EVT
0h (0000b)	EVT
1h (0001b)	FVT
2h (0010b)	SIT
Fh (1111b)	SVT



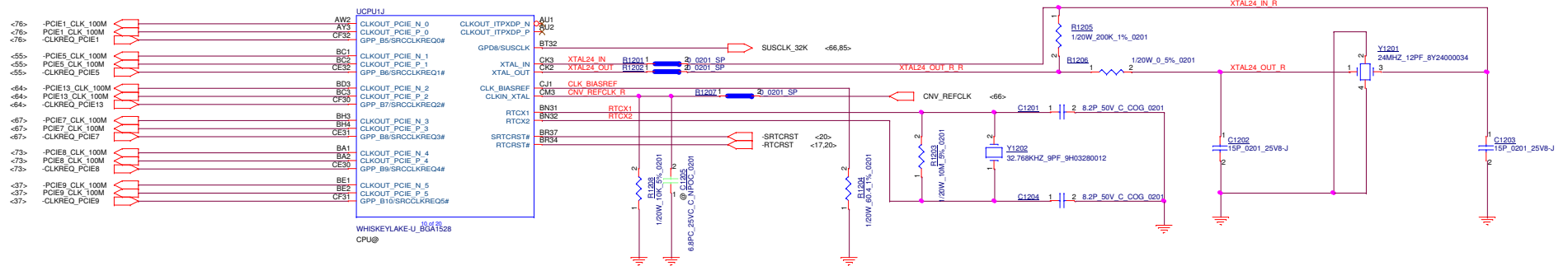
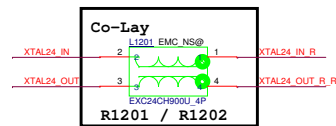
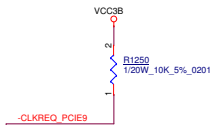
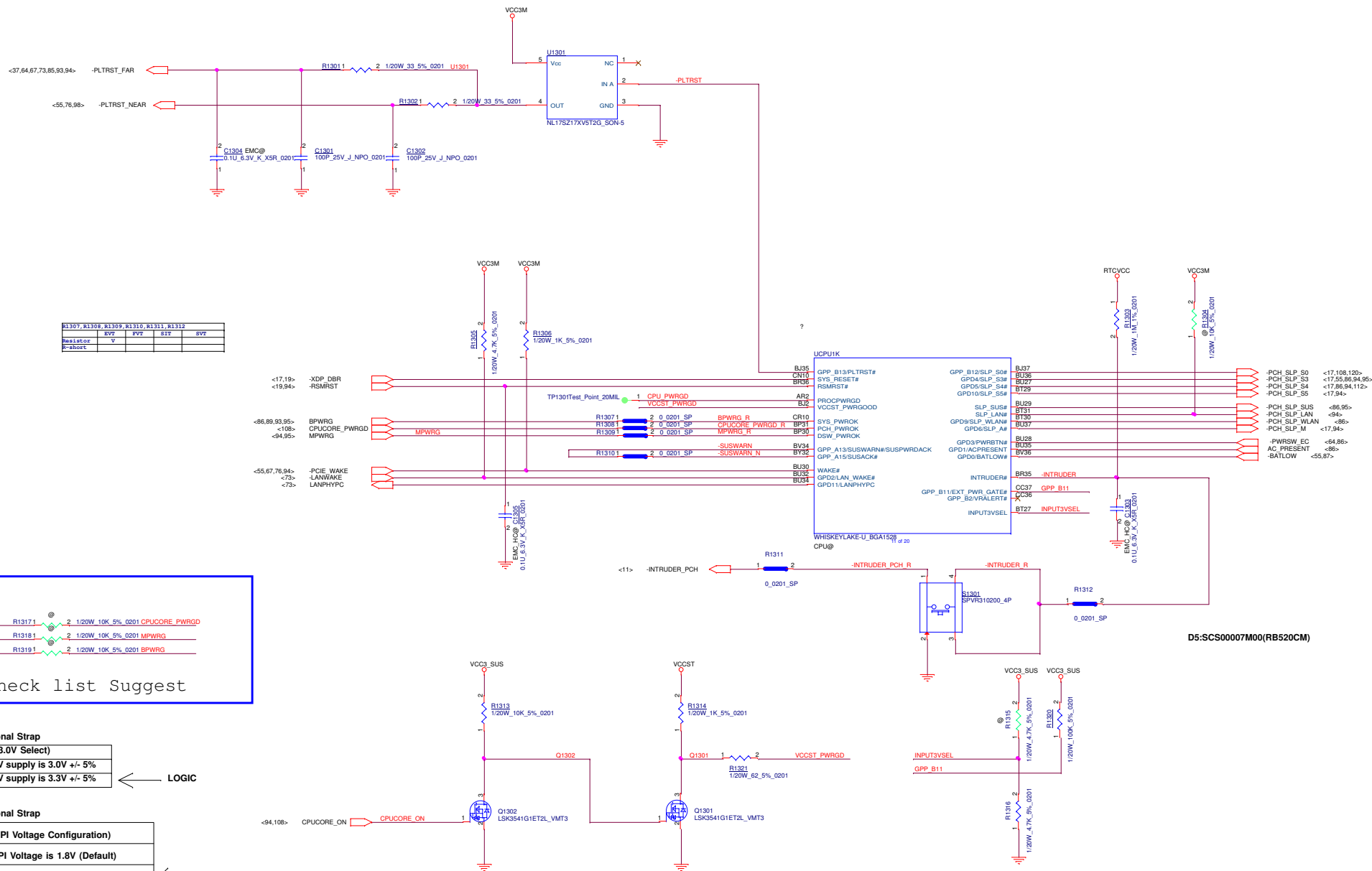
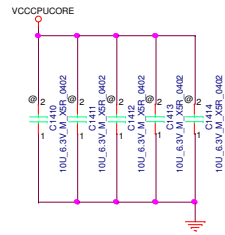
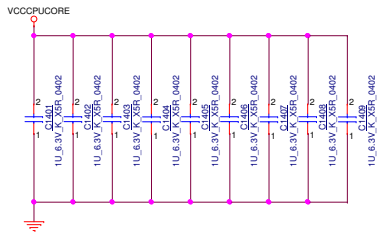


TABLE of U1301		
Vendor	P/N	LCFC P/N
ON	NL17SZ17XV5T2G	SA00005OU00
TOSHIBA	TC7SG17FE	SA00005T00J
TI	SN74LVC1G17DRLR	SA00005MG00

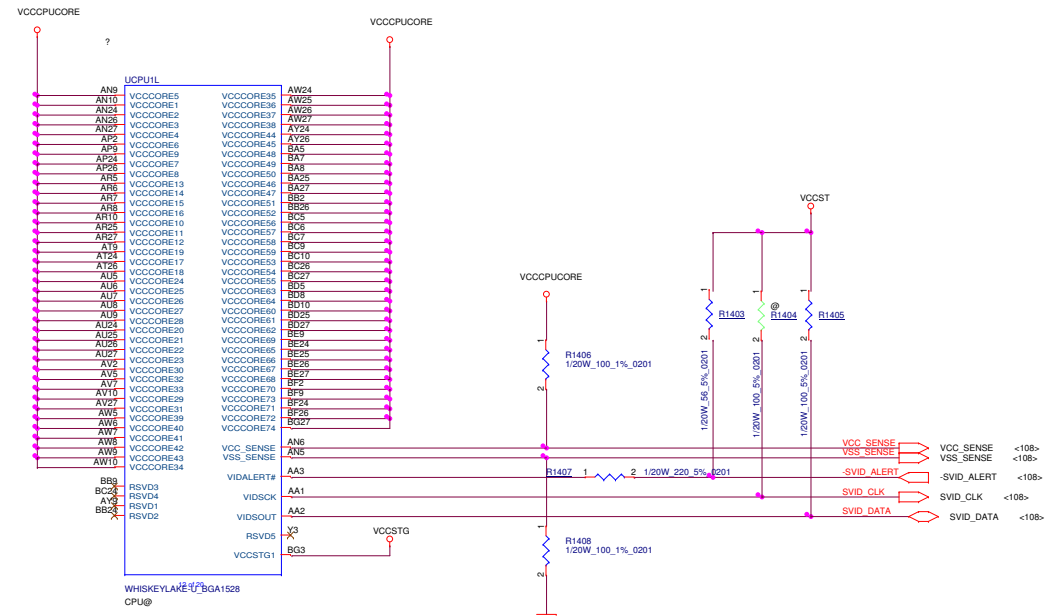
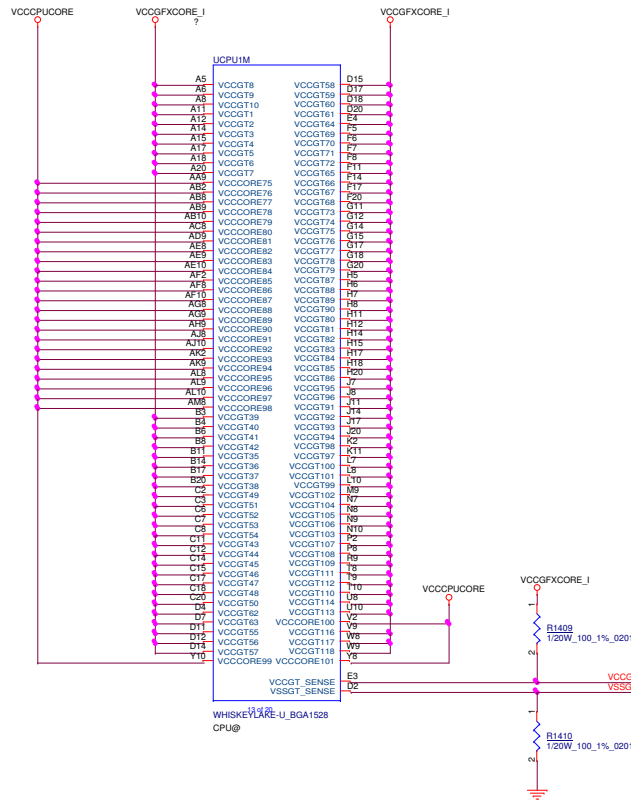


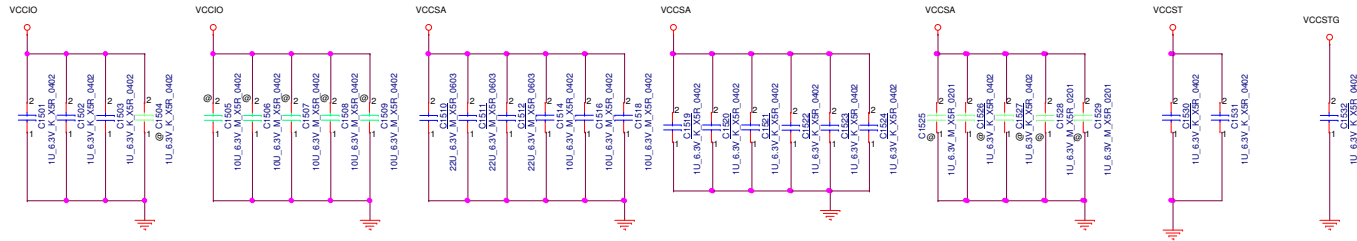


VccGT	PDG	LCFC
47uF_0805	4	HW:0/PWR:0
22uF_0603	15	HW:0/PWR:24
10uF_0402	15	HW:5/PWR:10
1uF_0402/0201	11	HW:0/PWR:10

VccCORE	PDG	PDG
47uF_0805	18	HW:0/PWR:0
22uF_0603	9	HW:0/PWR:24
10uF_0402	22	HW:5/PWR:10
1uF_0402/0201	42	HW:9/PWR:10





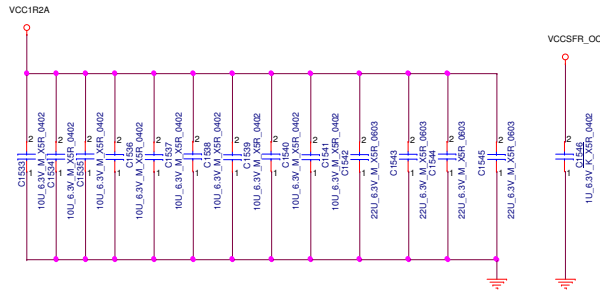
VccSA	PDG	LCFC
47uF_0805	2	HW:0/PWR:0
22uF_0805	0	HW:0/PWR:8
10uF_0402	13	HW:6/PWR:7
1uF_0402	0	HW:6/PWR:7

VDDQ	PDG	LCFC
47uF_0805	0	HW:0/PWR:0
22uF_0805	1	HW:4/PWR:6
10uF_0402	9	HW:9/PWR:0
1uF_0402	4	HW:0/PWR:0

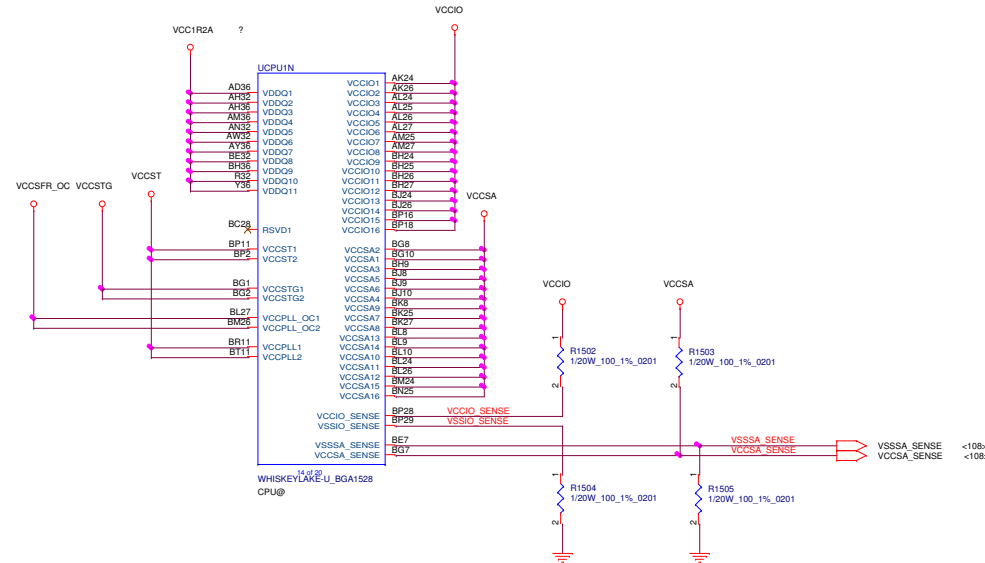
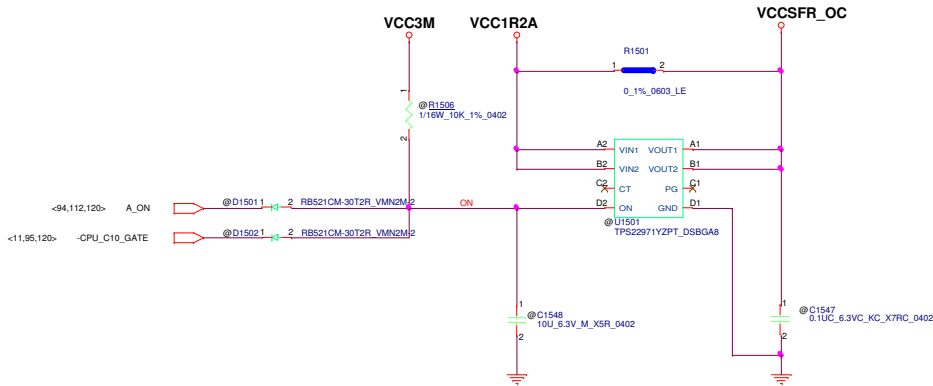
VccIO	PDG	LCFC
47uF_0805	0	HW:0/PWR:0
22uF_0805	0	HW:0/PWR:4
10uF_0402	6	HW:0/PWR:0
1uF_0402	4	HW:3/PWR:0

VccPLL	PDG	LCFC
1uF_0402	1	HW:2/PWR:0
0.1uF_0201	1	HW:0/PWR:0

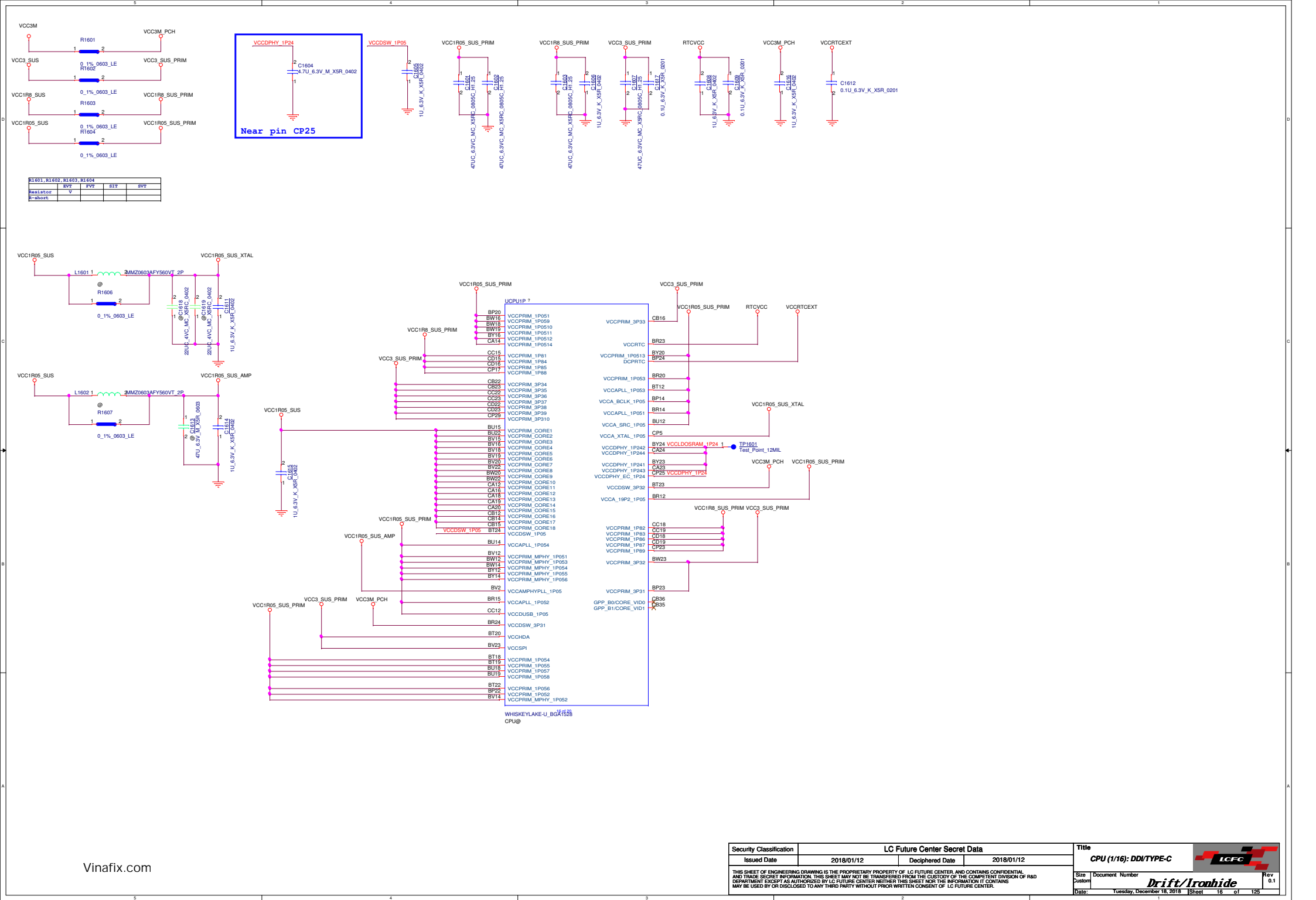
VccPLL_OC	PDG	LCFC
1uF_0402	1	HW:1/PWR:0



B1501	SVF	SVF	SVF	SVF
Regulation	V			
Short				

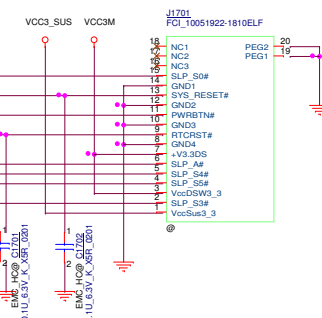



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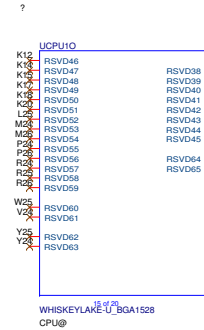
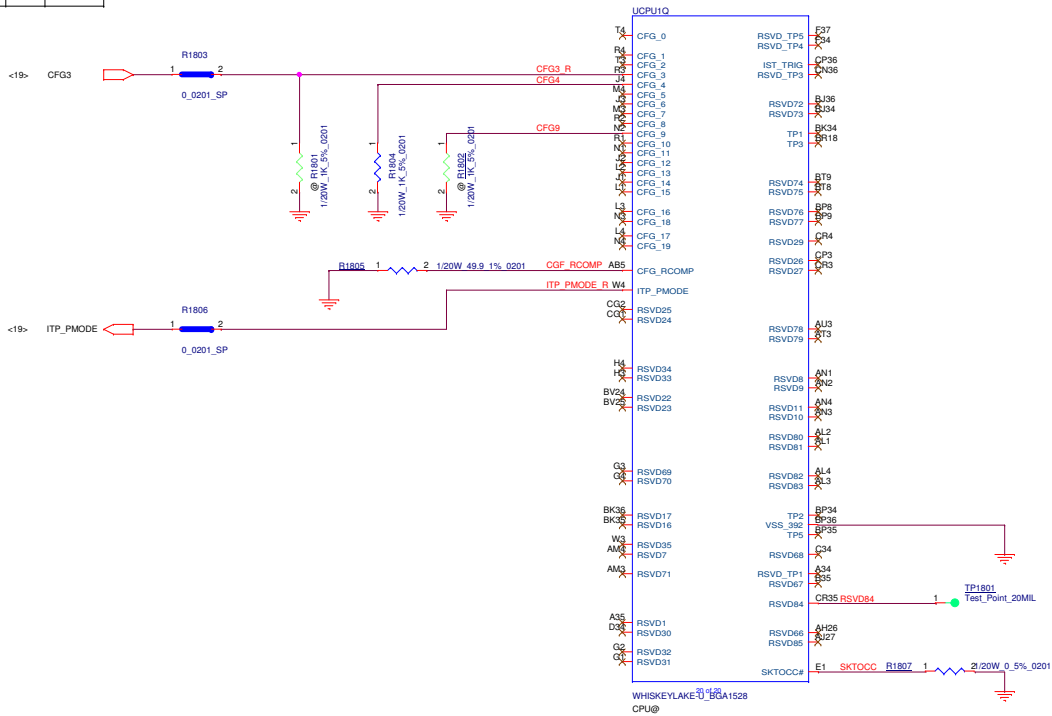


# APS/PETS Interface

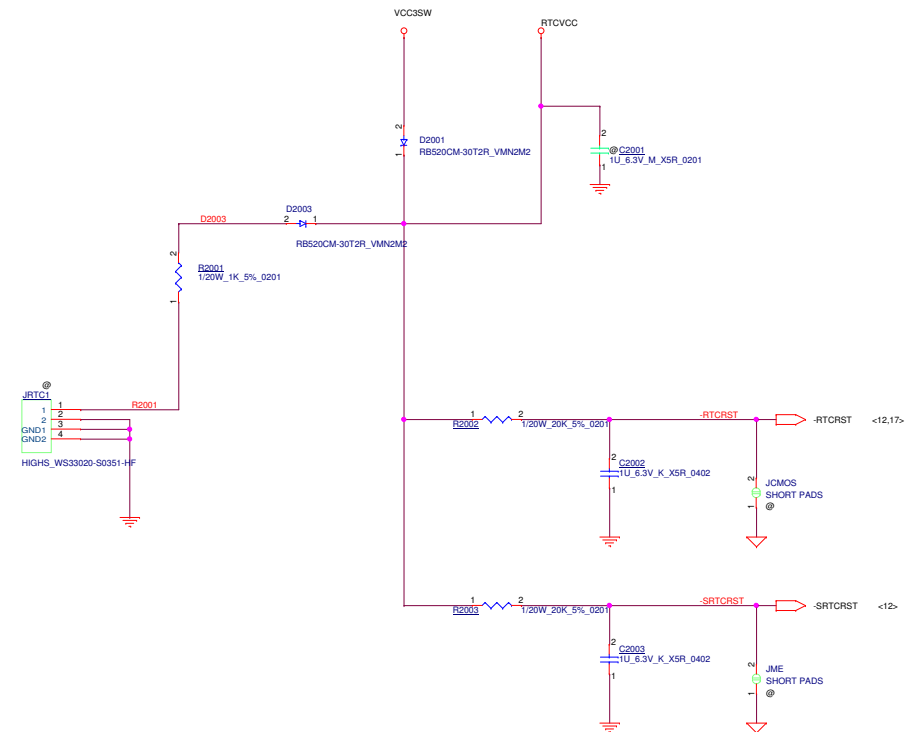


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R1803, R1806	SVT	FVT	SIT	SVT
Resistor	V			
Short				







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Size		Document Number		Date		Rev	
Custom		Drift/Ironhide		Tuesday, December 18, 2018		0.1	
				Sheet		31 of 125	

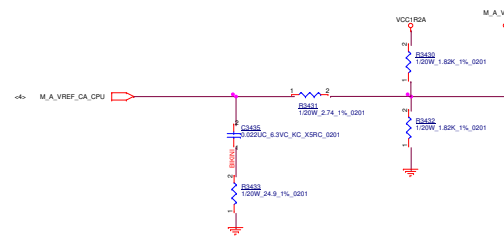
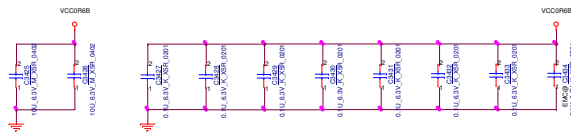
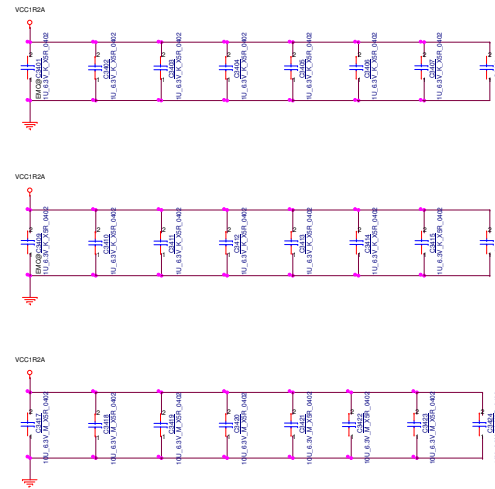
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				1 Sheet	32 of 125

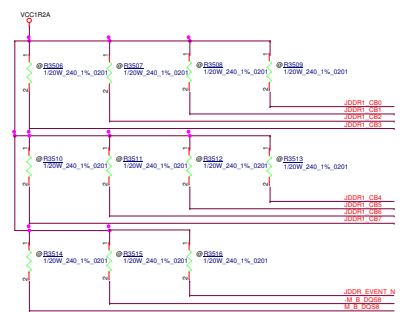
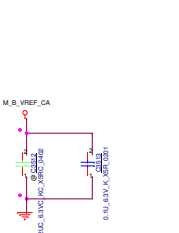
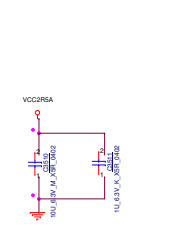
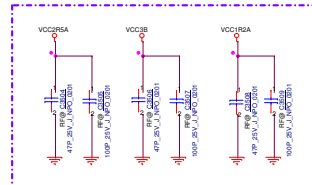
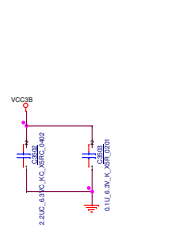
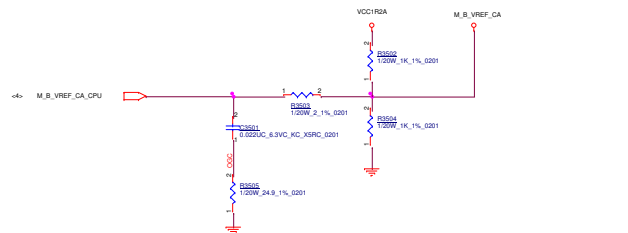
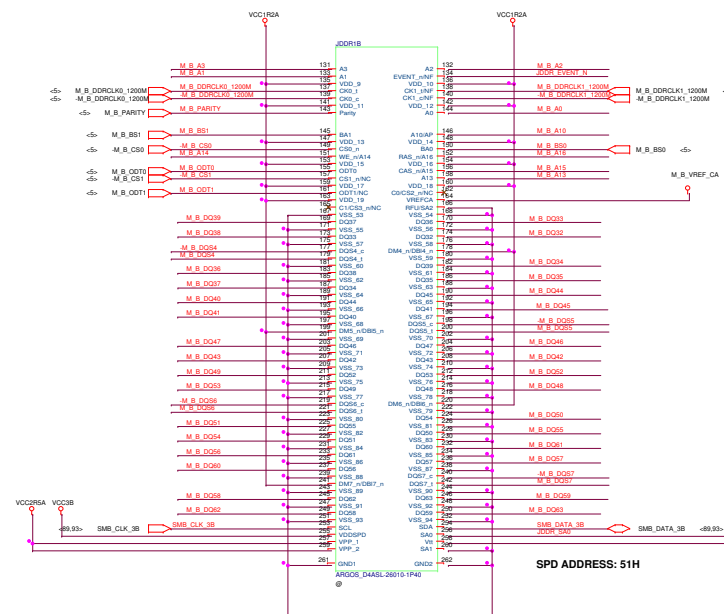
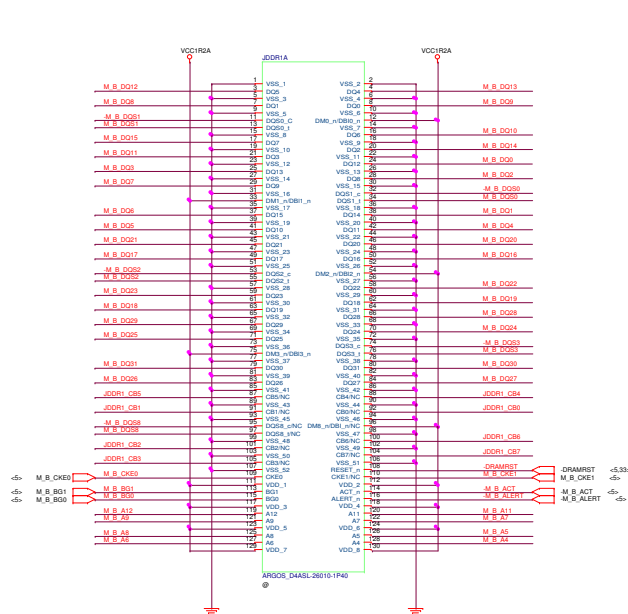






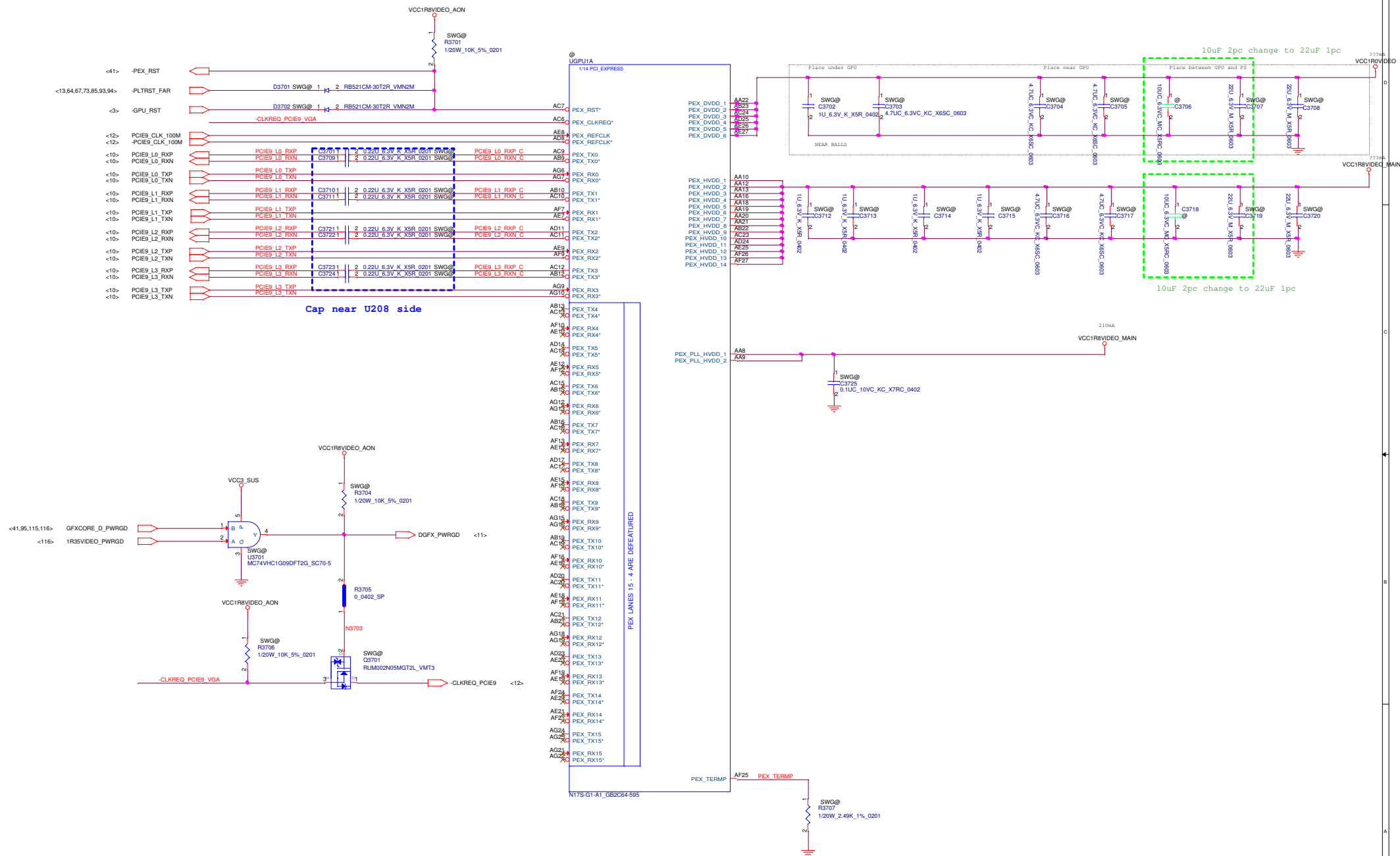


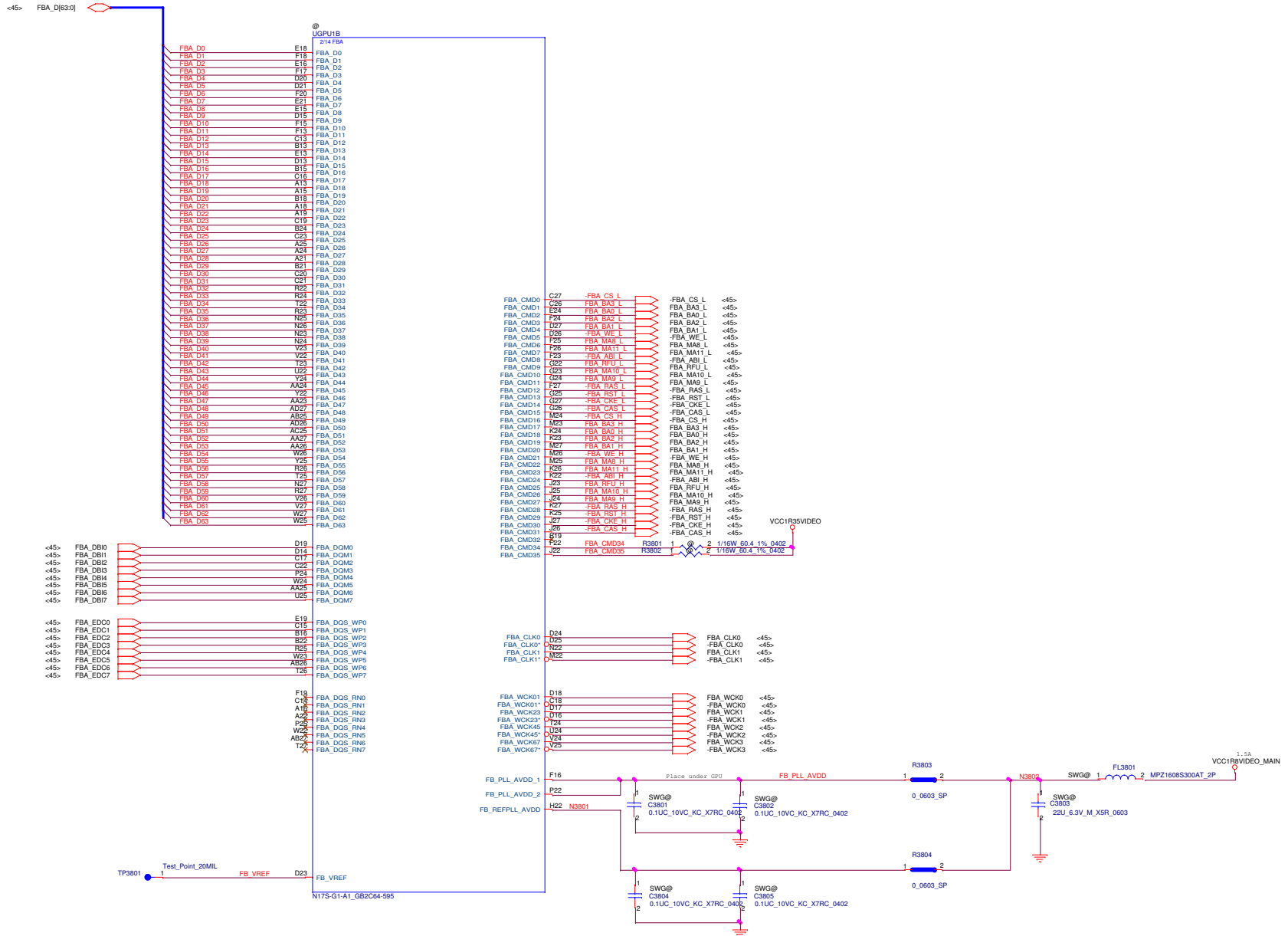
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Date		Tuesday, December 18, 2018		35 of 125	

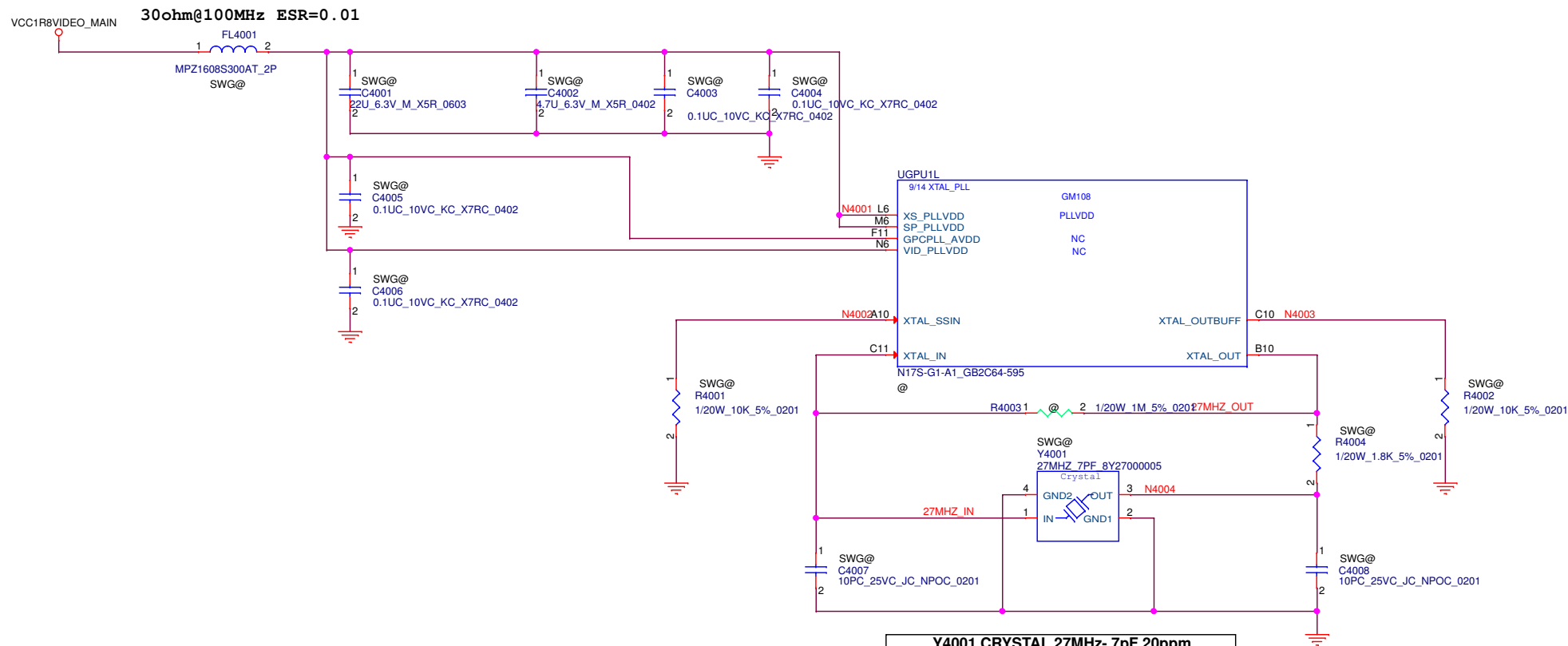







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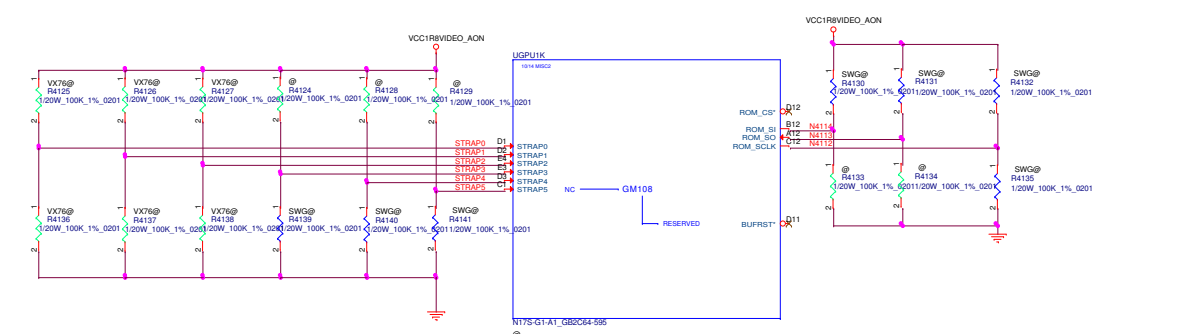
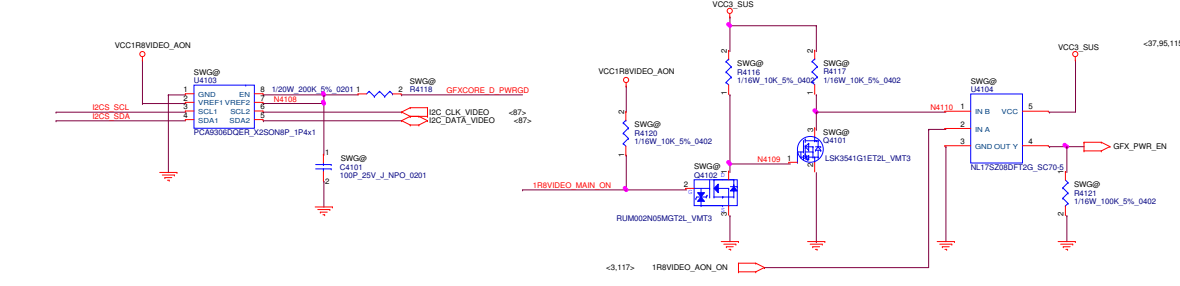
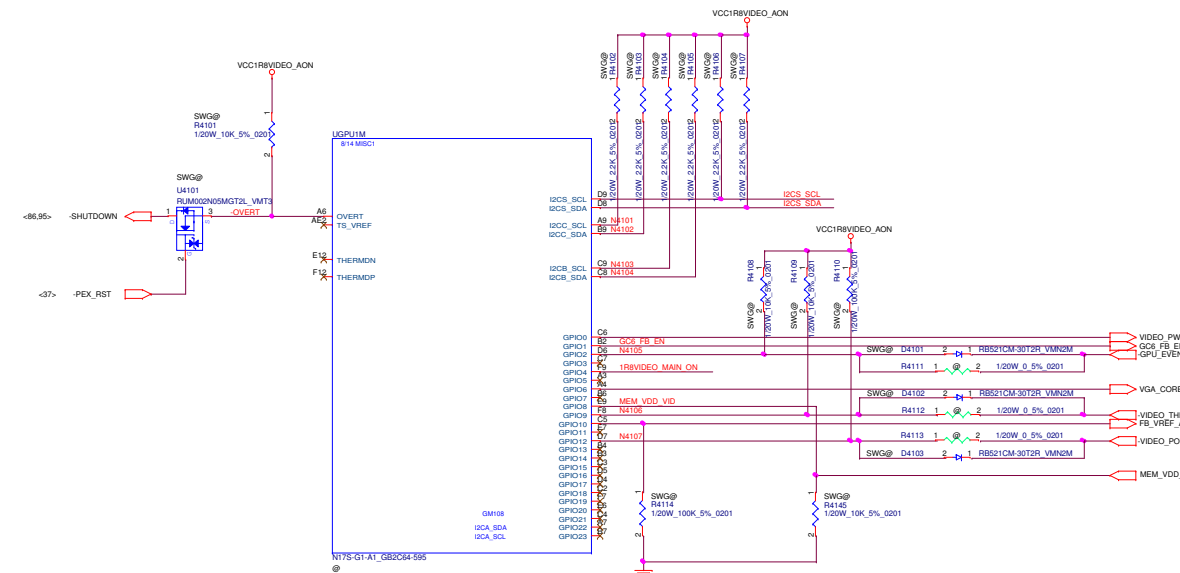




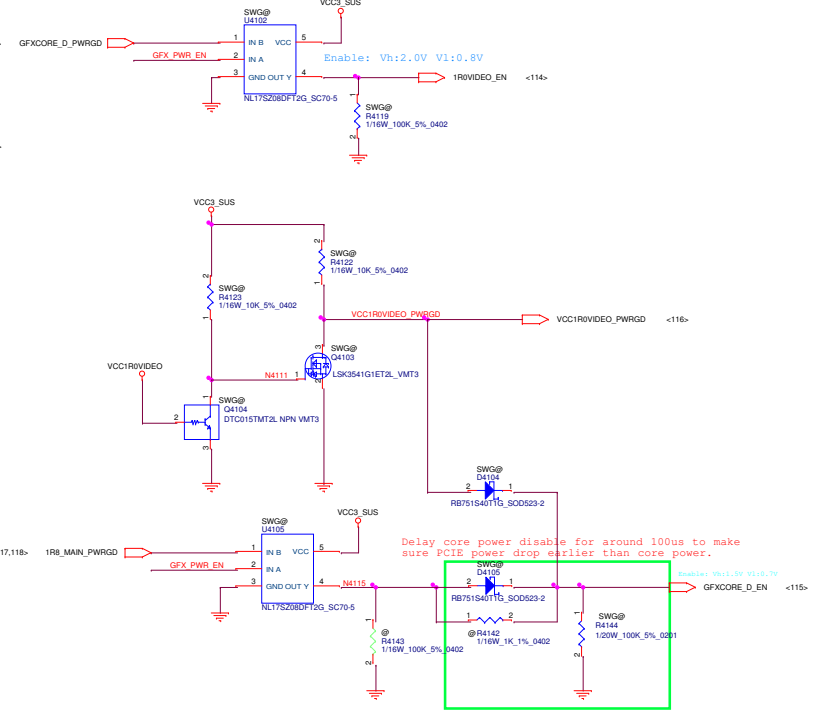
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Vendor	P/N	LCFC P/N
TXC	8Y27000005	SJ10000IB00
KDS	1ZZHAE27000CC0A	SJ10000I800

Security Classification		LC Future Center Secret Data		Title  N17S-G1 (6/6) : GPIO / XTAL							
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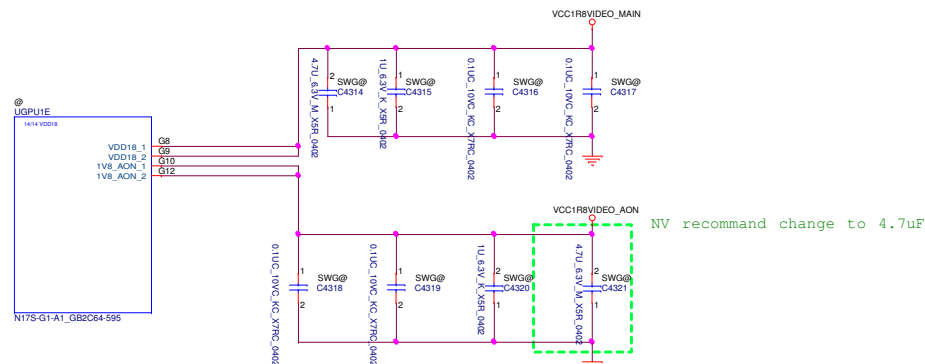
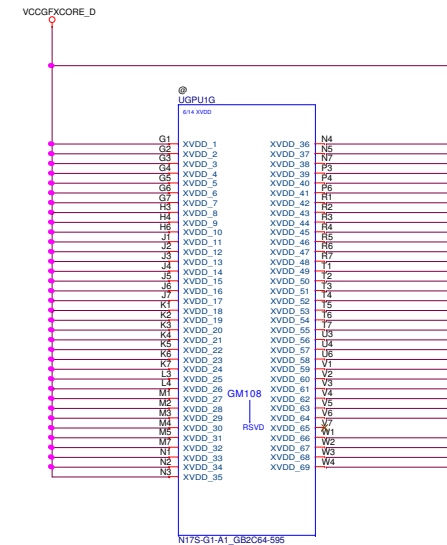
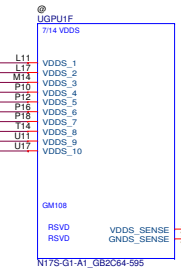
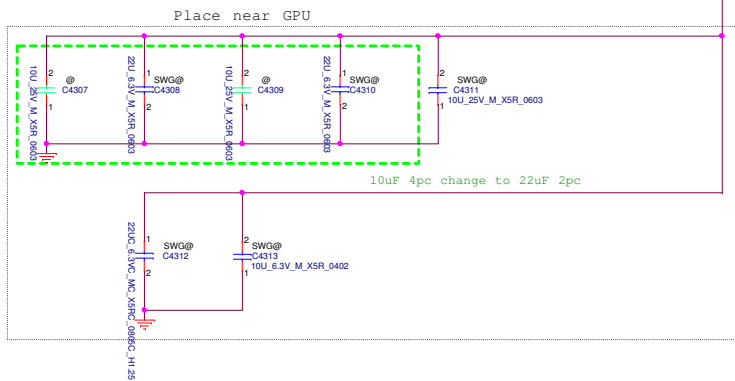


N179-G2 VX76 Config (VRAM + Resistance)						
Memory Density	Vendor	Manufacturer P/N	RAMCFG Setting Number	STRAP 0	STRAP 1	STRAP 2
8Gb (256M x 32)	Micron B-die	MT51J256M32HF-80:B	9 (0x0009)	R4125 R4136	R4126 R4137	R4127 R4138
	Hynix A-die	H5GC8H24AJR-R2C	A (0x000A)	ASM No ASM	ASM No ASM	ASM No ASM
N19M-Q1 VX76 Config (VRAM + Resistance)						
Memory Density	Vendor	Manufacturer P/N	RAMCFG Setting Number	STRAP 0	STRAP 1	STRAP 2
8Gb (256M x 32)	Micron B-die	MT51J256M32HF-70:B	4 (0x0004)	R4125 R4136	R4126 R4137	R4127 R4138
	Hynix A-die	H5GC8H24AJR-R0C	5 (0x0005)	ASM No ASM	ASM No ASM	ASM No ASM



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				Sheet	49 of 125
				Rev	0.1

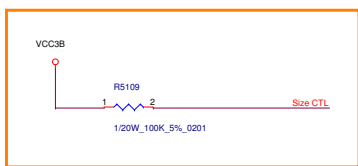
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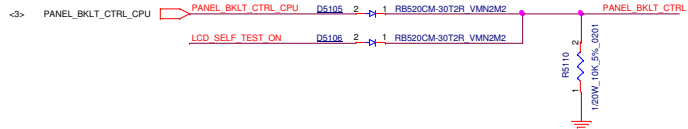


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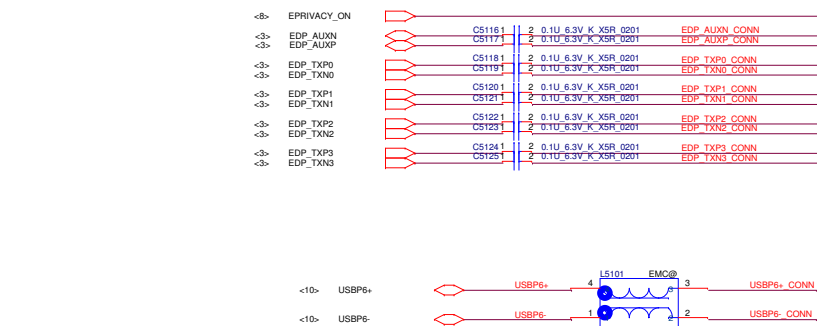
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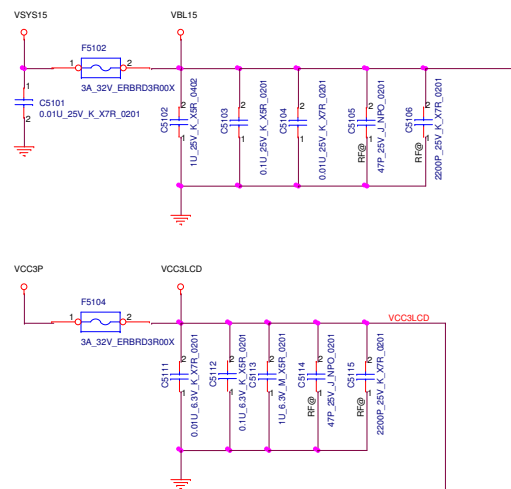
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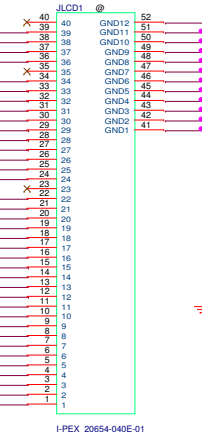
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Resistor	Y			
R-short				



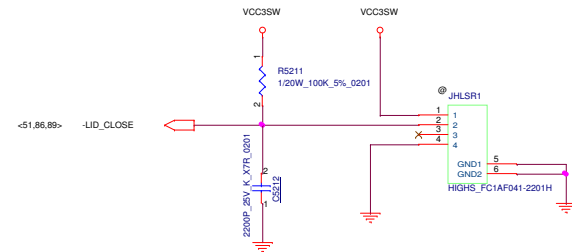
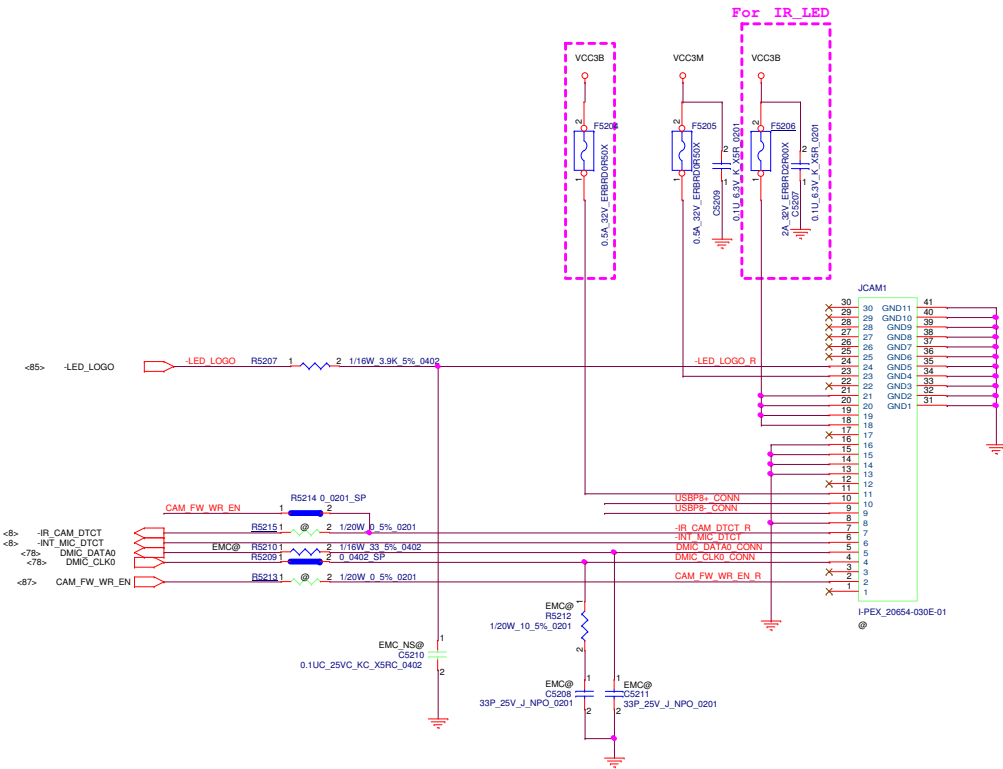
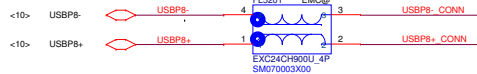
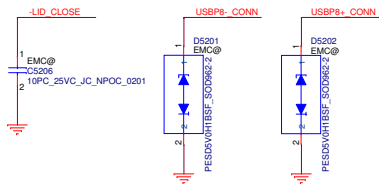
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## LCD CONNECTOR



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				Date: Tuesday, December 18, 2018 15:55:01
				Rev 0.1

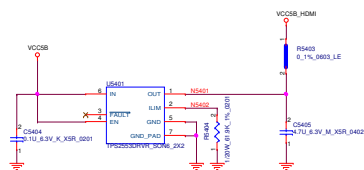
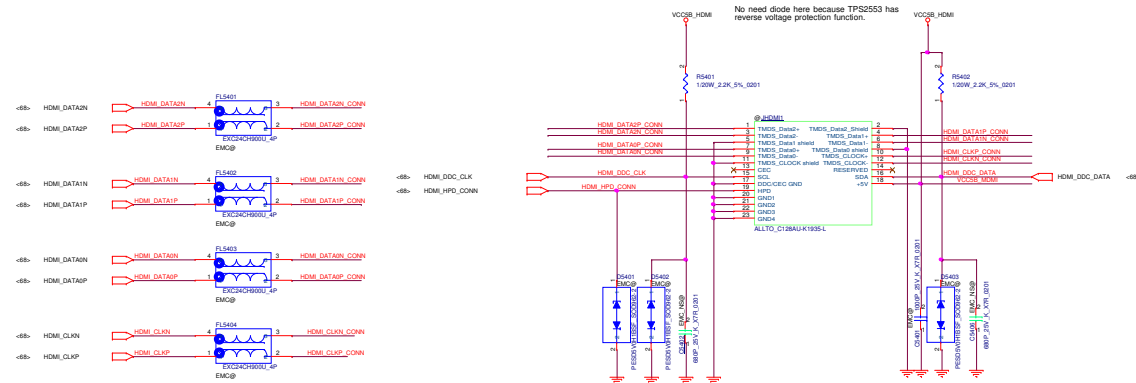


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Date:				Tuesday, December 18, 2018		
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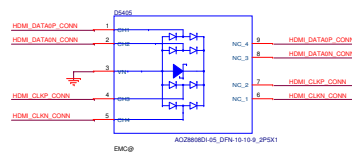
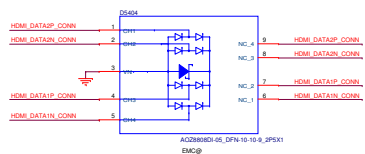
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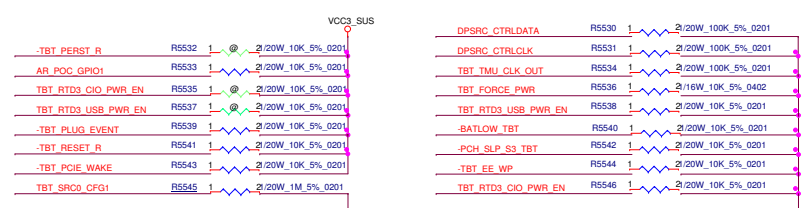
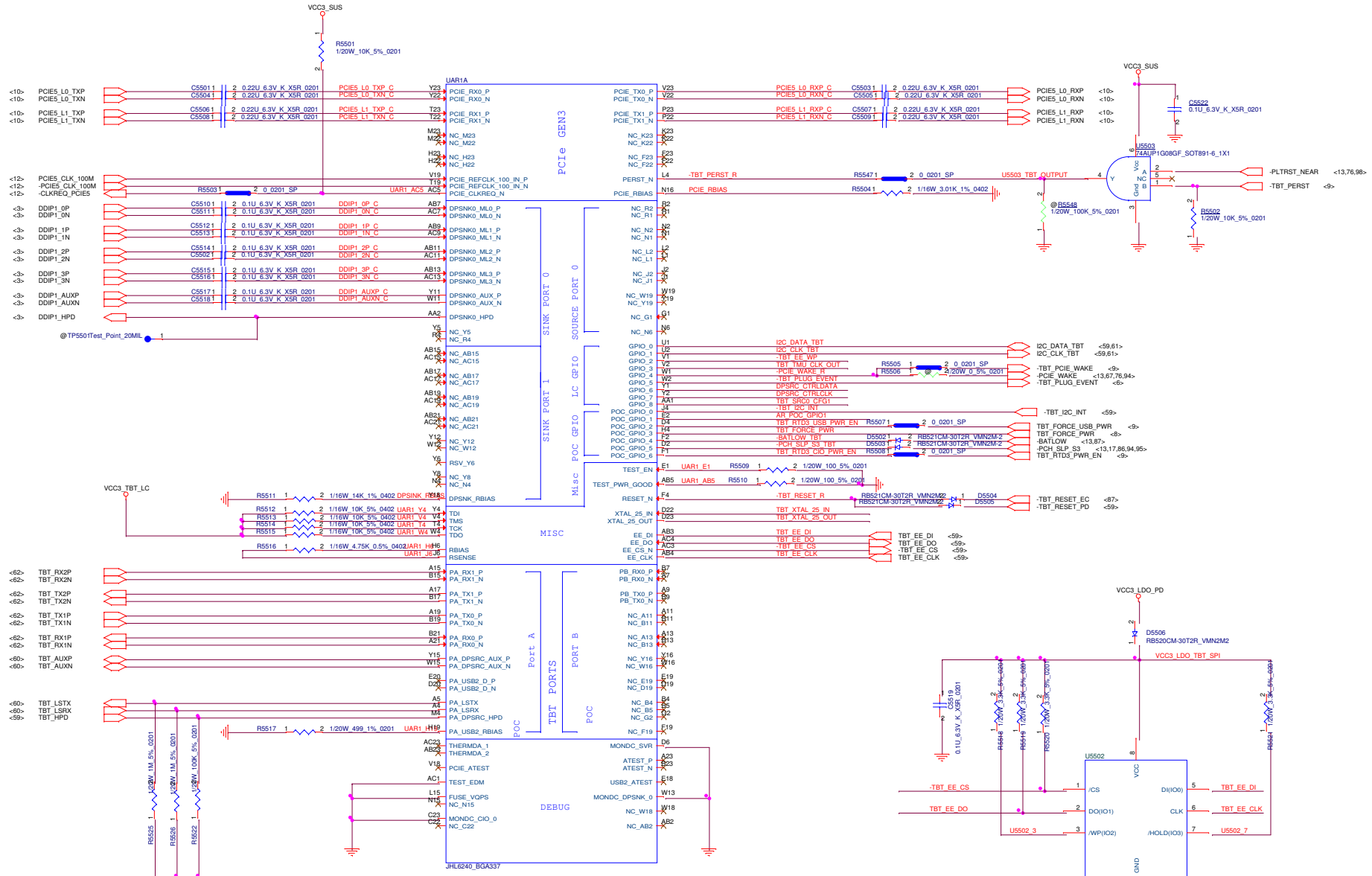
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Custom	C	Drift/Ironhide		0.1	
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1.0	1.0	1.0	1.0	1.0
1.0	1.0	1.0	1.0	1.0





Y3 CRYSTAL 25MHZ 18PF 30PPM		
Vendor	P/N	LCFC P/N
TXC	8Y25000004	SJ10000H00J
KDS	1ZZHAE25000CCOF	SJ10000P300

Security Classification		LC Future Center Secret Data	
Issued Date	2019/01/12	Deciphered Date	2018/01/12
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Title		ALPINE RIDGE (1/2)	
Size	Document Number	Rev	1
Custom	C	0.1	
Date: Tuesday, December 18, 2018		Sheet	55 of 125

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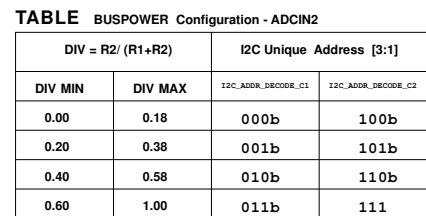
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Security Classification		LC Future Center Secret Data		Title	
Issued Date		2018/01/12	Deciphered Date	2018/01/12	
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Size	Document Number				Rev
Custom			Drift/Ironhide		0.1
Date:		Tuesday, December 18, 2018		Sheet	97 of 125

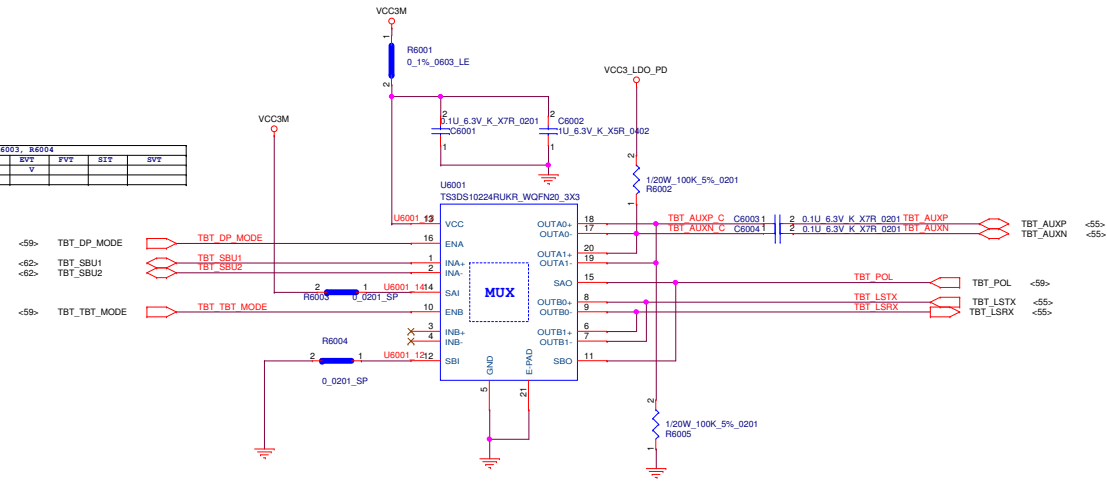


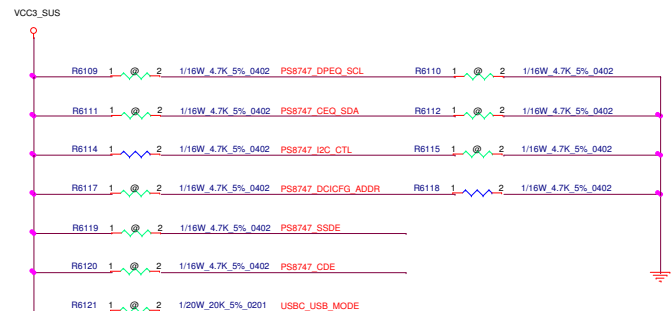
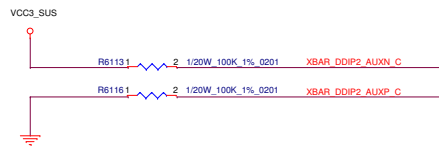
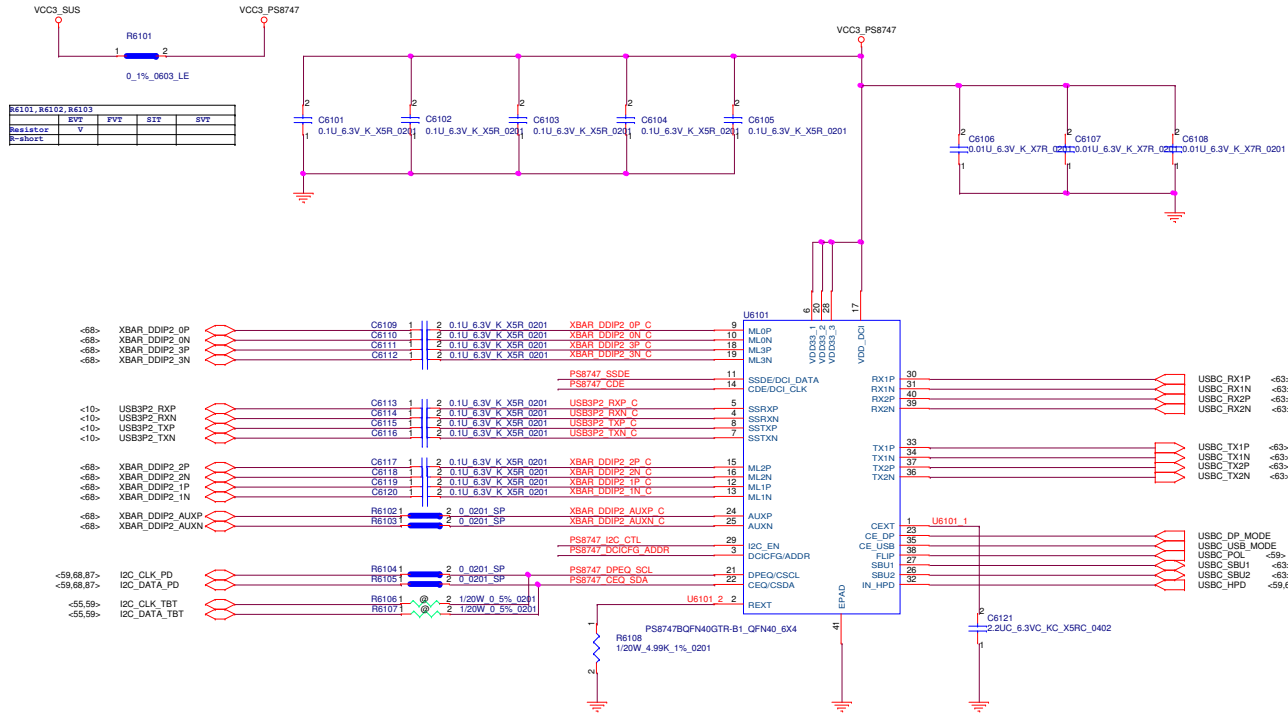
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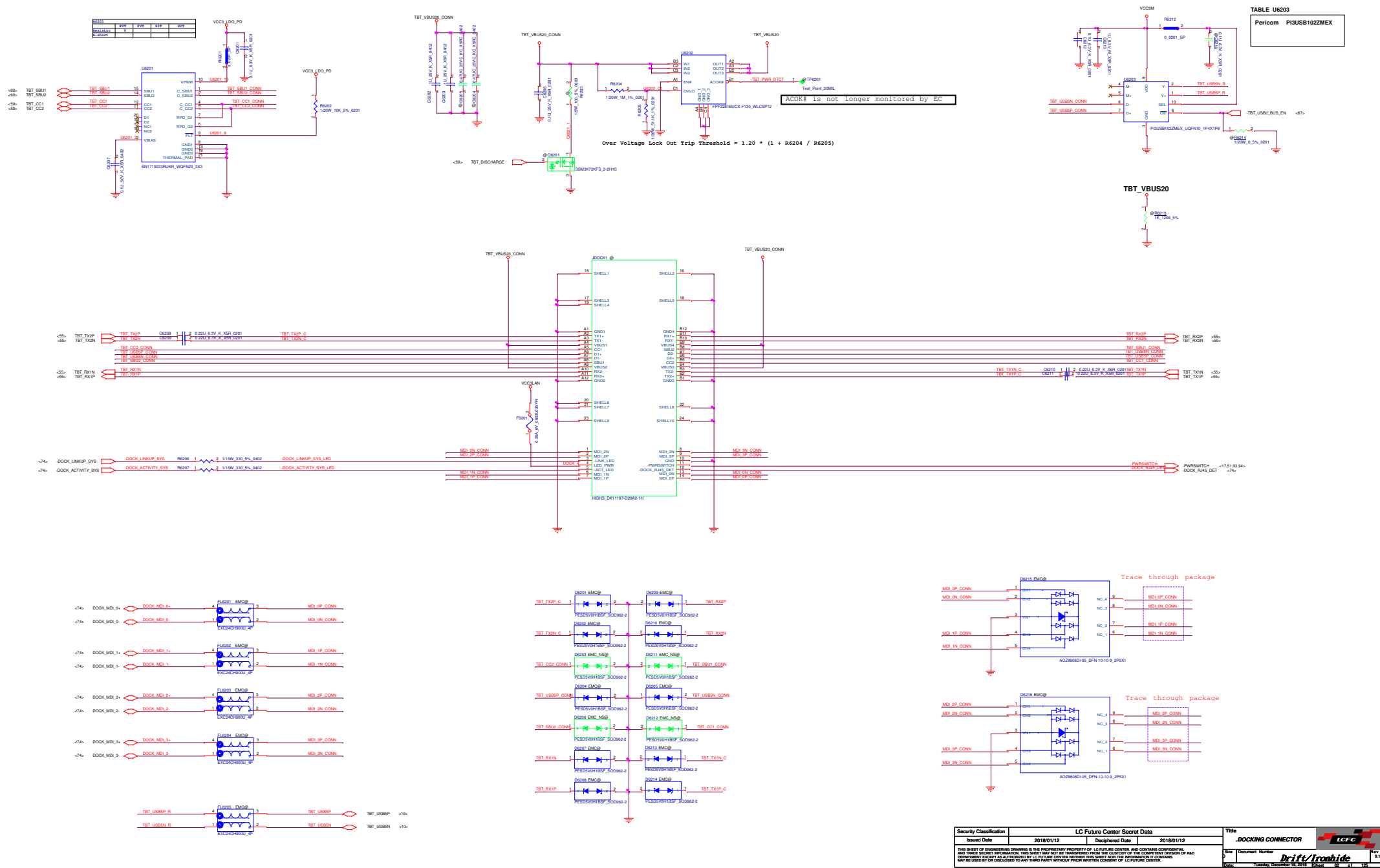
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				Document Number <b>Drift/Ironhide</b>	Rev 0.1
				Date: Tuesday, December 18, 2018	Sheet 59 of 125



R6001, R6003, R6004				
Resistor	SV2	SV2	SV2	SV2
R-short	V			





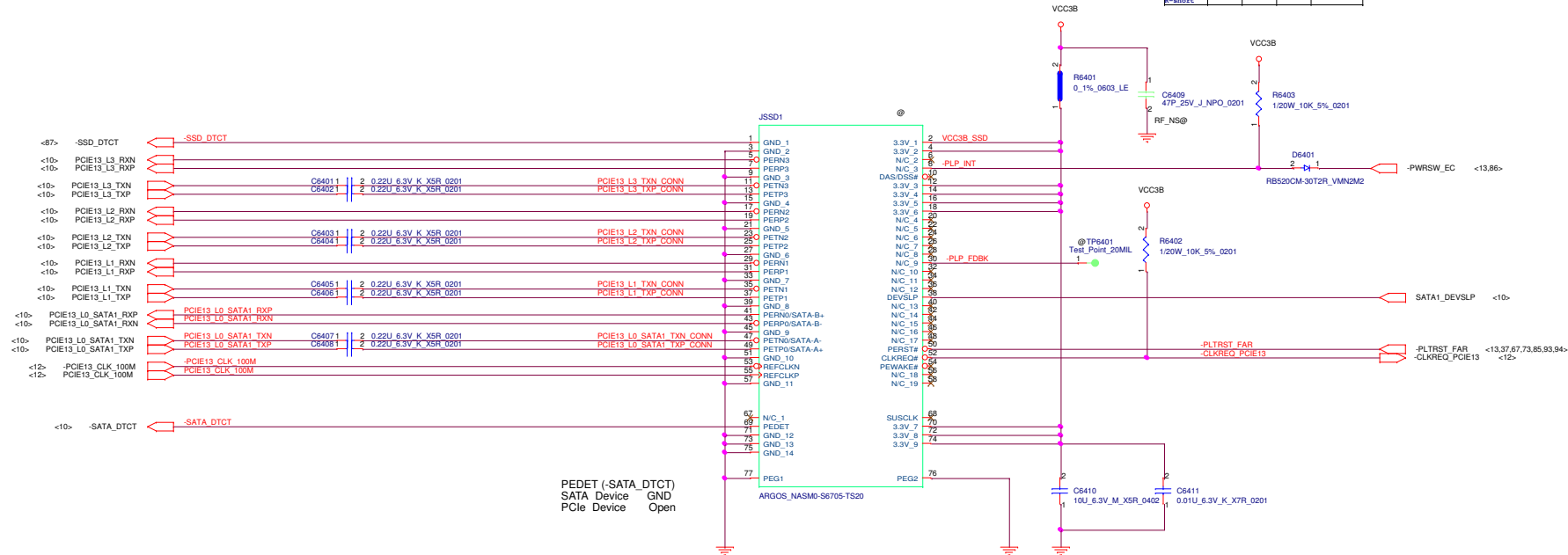




# M.2 Socket 3 (Key-M) for 2280 S3 SSD


## H=3.00mm Connector

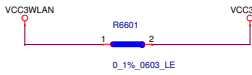
R6401	SVT	FVF	SIT	SVT
Resistor	V			
R-shoot				





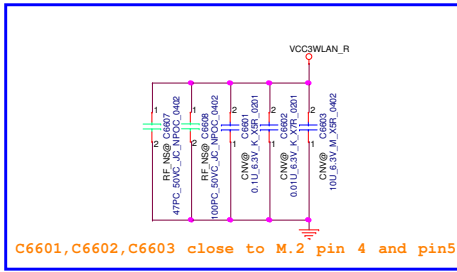
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						Custom		Date		Tuesday, December 18, 2018		Sheet		62		of		125		0.1	

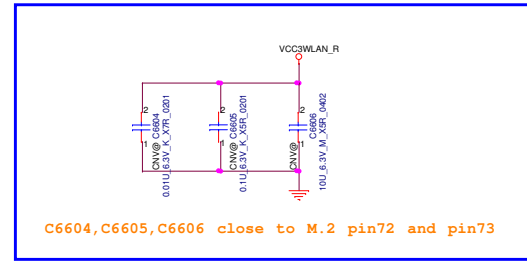


R6601	SVF	FWF	512	SVF
Resistor	V			
R-shoot				

## M.2 Type 1216 Module for WLAN / Bluetooth



C6601,C6602,C6603 close to M.2 pin 4 and pin5



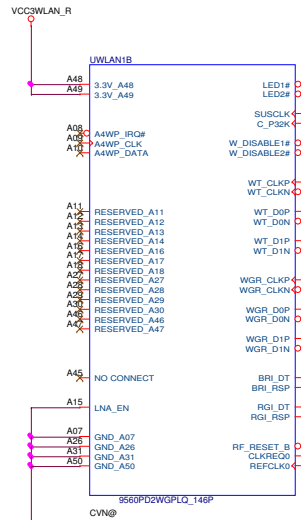
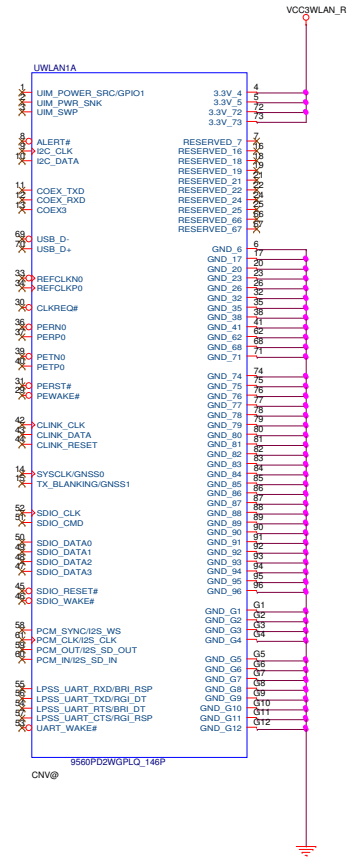
C6604,C6605,C6606 close to M.2 pin72 and pin73

TABLE

Companion RF (CRF)	CNVio	REFCLK	CLKREQ
Jefferson Peak (JfP)	Gen1	Supported	Supported
Harrison Peak (HrP)	Gen2	Not Supported	Not Supported

TABLE

Platform	CNVio	PCH IP	REFCLK
Whiskey Lake	Gen1	Pulsar	38.4MHz Clock form JfP Module
Ice Lake	Gen2	Quasar	Generated inside SoC



R6609,R6611 close to M.2

R6610,R6608 close to PCH



R6602,R6603 close to M.2



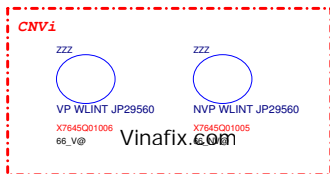
R6607,R6606 close to M.2

R6613 close to PCH

TABLE of CNVi (UWLAN1A & UWLAN1B)

Vendor	Model	LCFC P/N
Intel	Intel Jefferson Peak 2 9560 2*2ac+BT5.0 vPro M.2 1216 LGA	PK29S001400
	Intel Jefferson Peak 2 9560 2*2ac+BT5.0 non-vPro M.2 1216 LGA	PK29S001500

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Issued Date	2018/01/12	Deciphered Date	2018/01/12
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Size	Document	Number	Rev
Custom	C		0.1
Date:	Tuesday, December 18, 2018	15:55	61 125







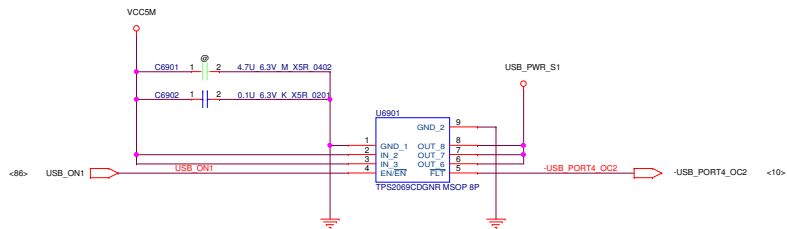


TABLE of USB3.0 Single (U6901)		
Vendor	P/N	LCFC P/N
TI	TPS2069CDGMR	SA00005TE00
Rohm	BD82032FVJ-GE2	SA000084S00

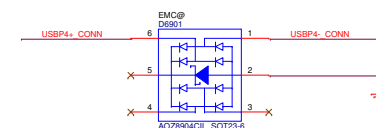
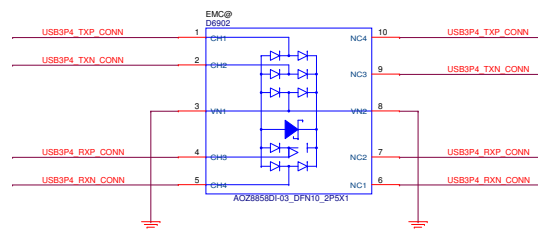
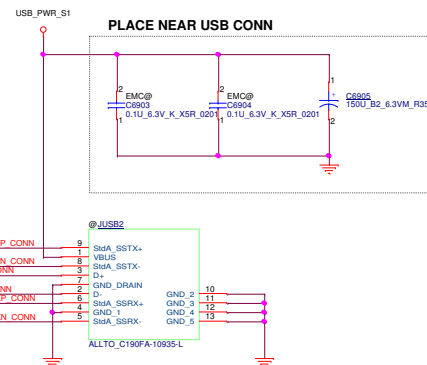
	R6911, R6917, R6918, R6922, R6923, R6924
SVT/ESB	SVT
Relative	V

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<10> USB3P4\_TXN C8907 1 2 0.1U 6.3V K X5R 0201 USB3P4\_TXN\_C R69171 2 0 0201 SP USB3P4\_TXN\_CONN

<10> USB3P4\_RXP R69181 2 0 0201 SP USB3P4\_RXP\_CONN

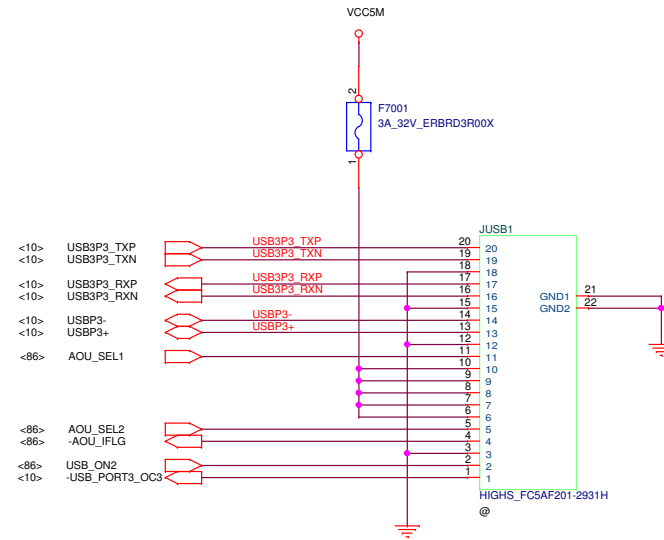
<10> USB3P4\_RXN R69221 2 0 0201 SP USB3P4\_RXN\_CONN




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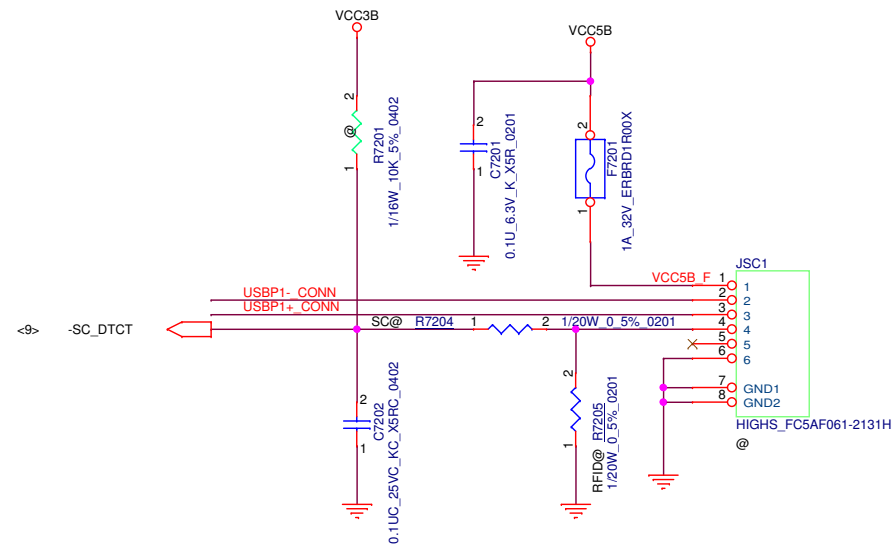
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Issued Date	2019/01/12	Deciphered Date	2019/04/12	USB TYPE-A CONNECTOR	
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Size	Document	Number	Rev		0.1
Date:	Tuesday, December 18, 2018	15:55:01	88	01	125

Security Classification		LC Future Center Secret Data		Title	
Issued Date	2019/01/12	Deciphered Date	2019/04/12	USB TYPE-A CONNECTOR	
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				Date: Tuesday, December 18, 2018	Rev 0.1
				Sheet 70 of 125	



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				<i>Drift/Ironhide</i>		<small>Rev</small> 0.1	
				<small>Date:</small> Tuesday, December 18, 2018		<small>Sheet</small> 71 <small>of</small> 125	



For Smart card



PLACE NEAR JSC1

R7202, R7203				
	EVT	FVT	SIT	SVT
Resistor	V			
R-short				

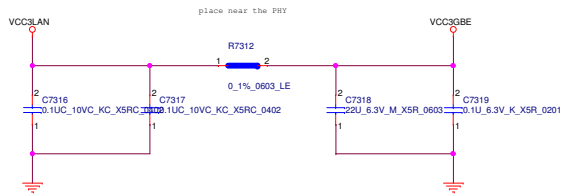
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LC Future Center Secret Data			
Issued Date	2018/01/12	Deciphered Date	2018/01/12
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Title		
Smart Card Reader		
Size	Document Number	Rev 0.1
Drift/Ironhide		
Date:	Tuesday, December 18, 2018	Sheet 72 of 125



Drift/Ironhide





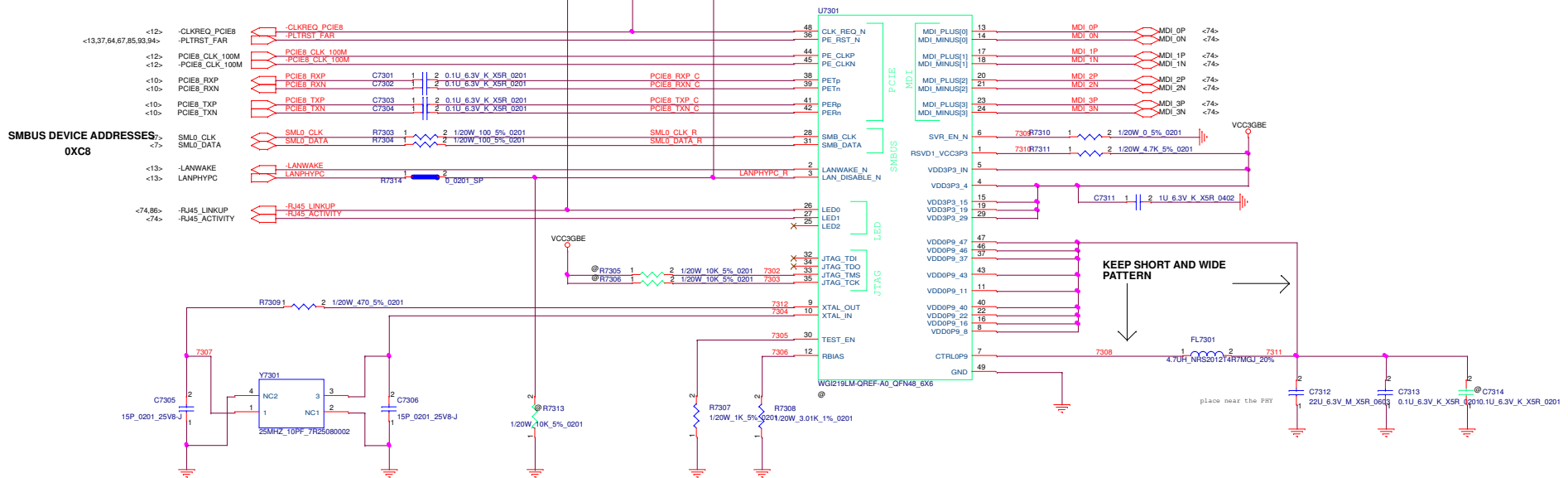
R7312	SWP	FWP	SIZ	SWP
Resistor	V			
short	V			



TABLE		
vPro Capability		
GbE PHY	Yes	No
U13	Jacksonville-LM	Jacksonville-V

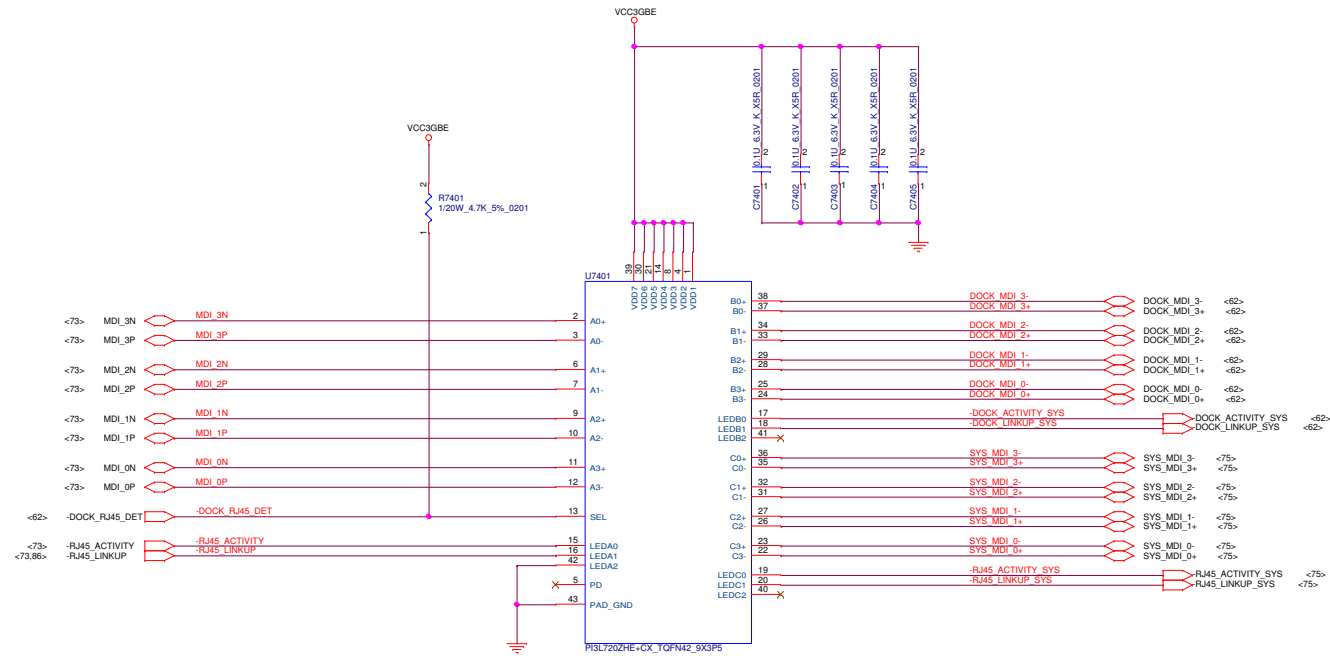
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LOGIC

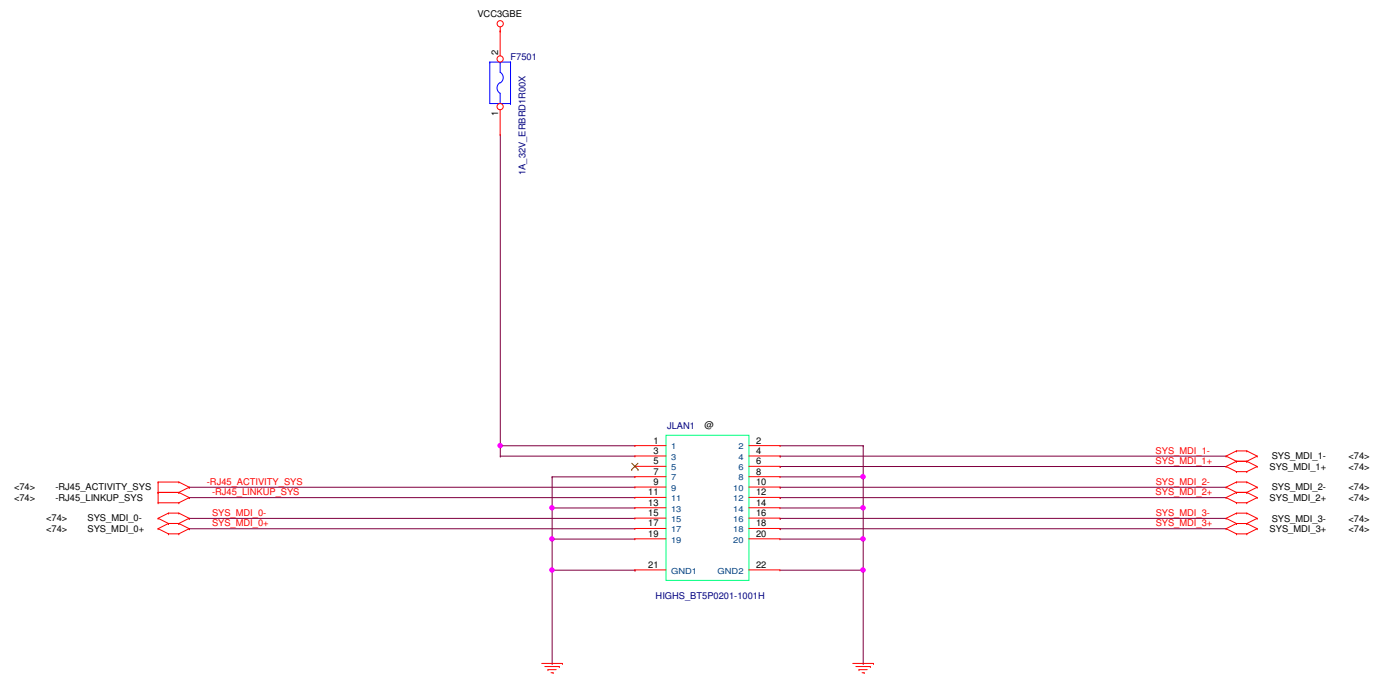
SKU	Description	LCFC P/N
vPRO	WGI219LM SLKJ2	SA000073020
non-vPRO	WGI219V SLKJ4	SA000072210

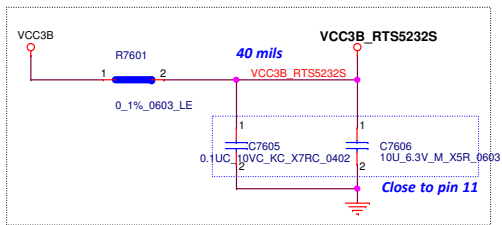


Y7301 CRYSTAL - 25MHz 10pF 30ppm 2016		
Vendor	P/N	LCFC P/N
TXC	7R25080002	SJ10000PP00
KDS	1ZZNAE25000CC0B	TBD
Epson	Q22FA1280055900	SJ10000PU00

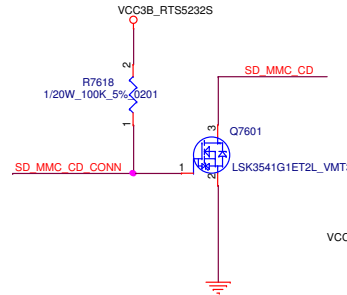
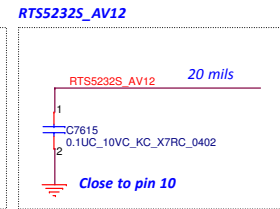
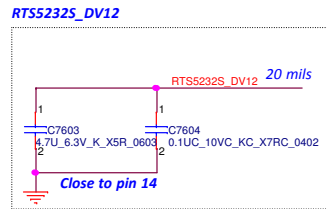
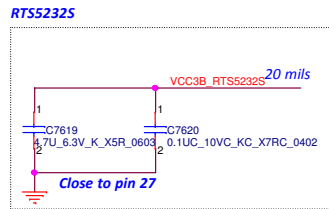
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Issued Date	2018/01/12	Deciphered Date	2018/01/12	GBE JACKSONVILLE	
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Date: Tuesday, December 18, 2018 15:52		73		61 120	



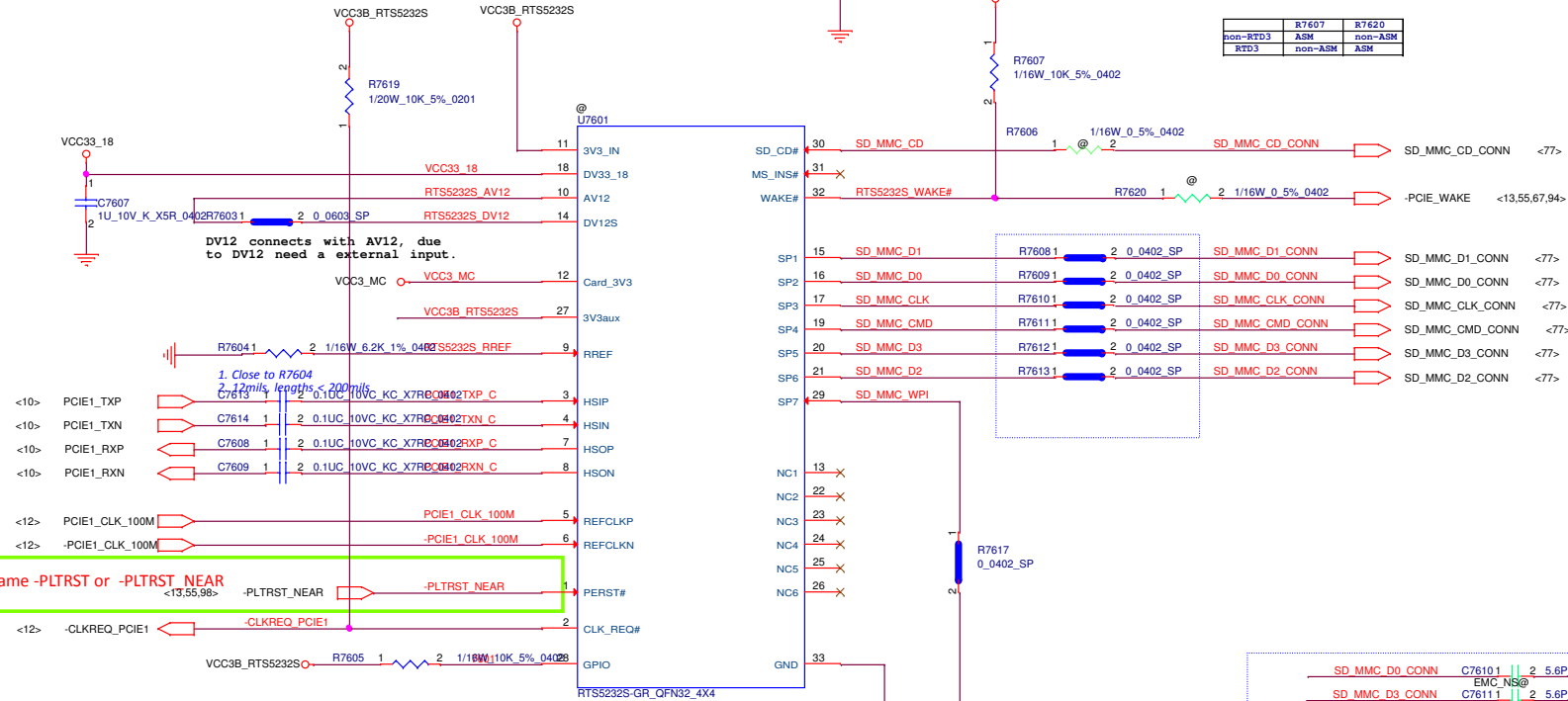




R7601	EVT	FVT	SIT	SVT
Resistor	V			
R-short				

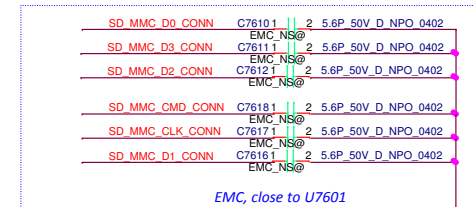


	R7607	R7620
non-RTD3	ASM	non-ASM
RTD3	non-ASM	ASM



Check inet name -PLTRST or -PLTRST\_NEAR  
<13,55,98>

Part Number	Vendor
SA000077K00	RTS5232S-GR REALTEK
SA00009JG00	GL9750-OIYL3 GENESYS

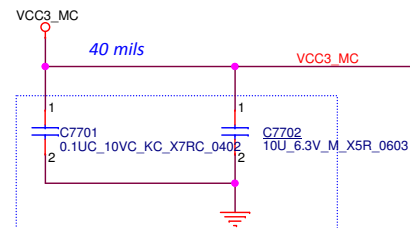


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Security Classification	LC Future Center Secret Data	
Issued Date	2019/01/12	Deciphered Date
		2019/04/12

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Title	MEDIA CARD CONTROLLER	
Size	Document Number	Rev
Custom	T490&T590	0.1
Date:	Tuesday, December 18, 2018	Sheet 76 of 125



Close to JREAD1

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<76> SD\_MMC\_CMD\_CONN  
  
<76> SD\_MMC\_CLK\_CONN  
  
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<76> SD\_MMC\_CD\_CONN

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SD MMC D3 CONN  
SD MMC CMD CONN  
  
SD MMC CLK CONN  
  
SD MMC D0 CONN  
SD MMC D1 CONN  
  
SD MMC CD CONN

@JREAD1

1 DAT2  
2 CD/DAT3  
3 CMD  
4 VDD  
5 CLK  
6 VSS  
7 DAT0  
8 DAT1  
9 DSW2  
10 DSW1

GND1  
GND2  
GND3  
GND4  
GND5  
GND6  
GND7  
GND8

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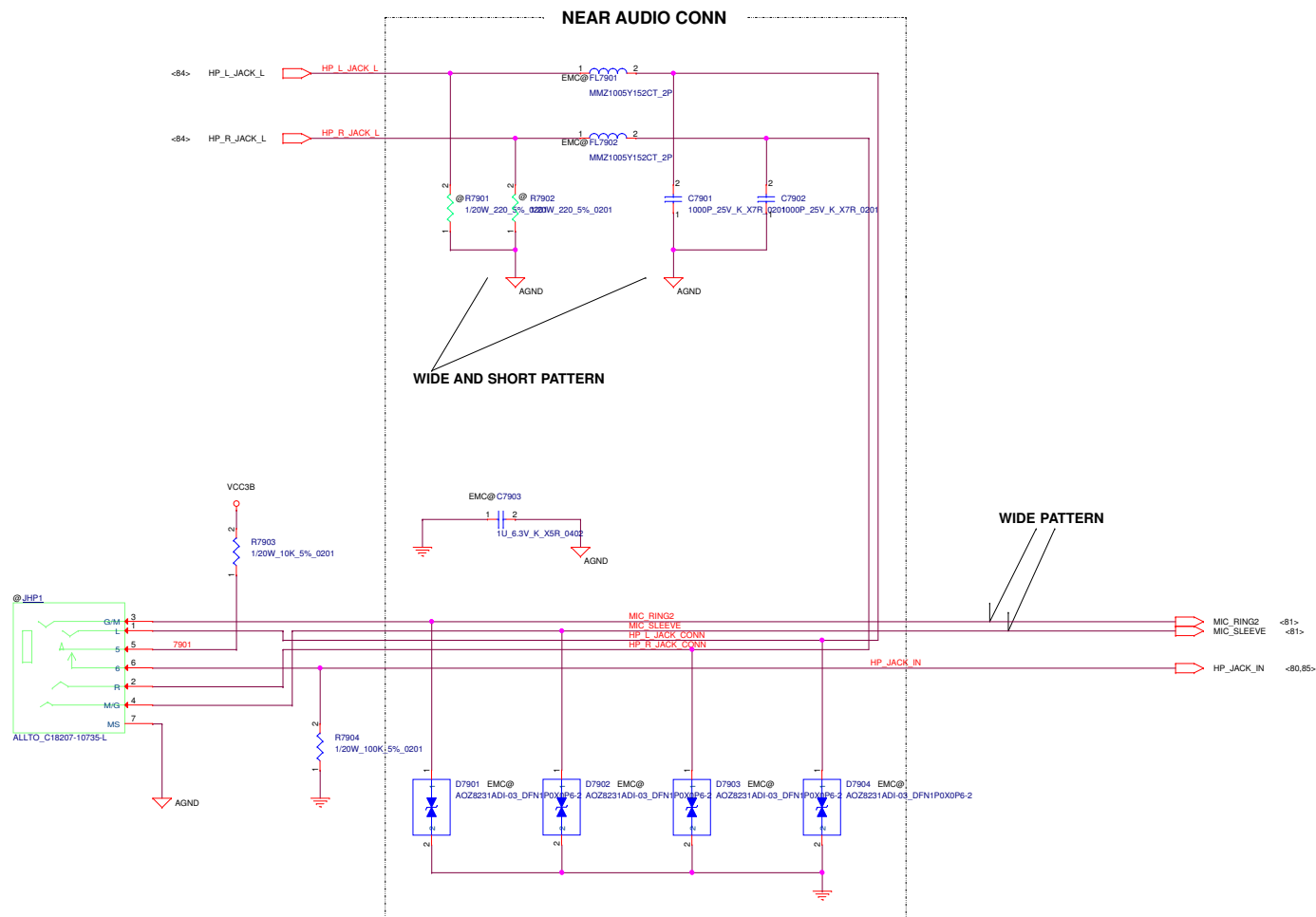
Mode	Detect
Normal	short
Card Insert	open

Security Classification		LC Future Center Secret Data		Title	
Issued Date	2019/01/12	Deciphered Date	2019/04/12	MEDIA CARD CONTROLLER	
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				Date:	Tuesday, December 18, 2018
				Sheet	77 of 125
				Rev	0.1

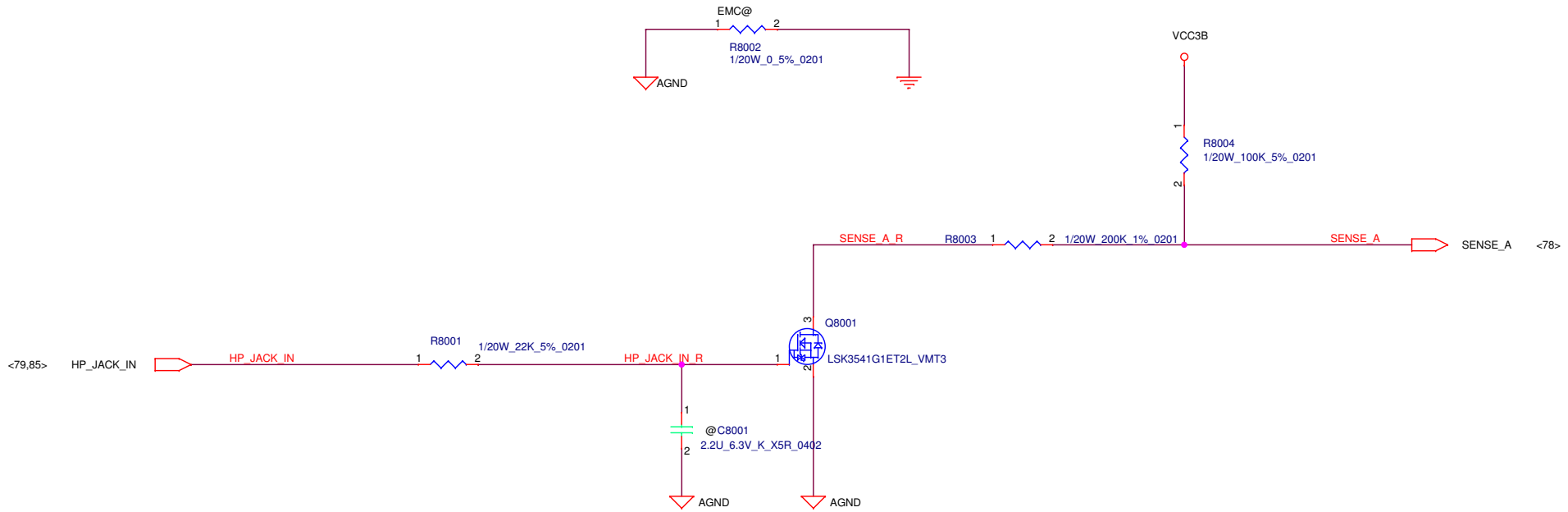


T490&T590





Pin 4 and 5 : Normal Open

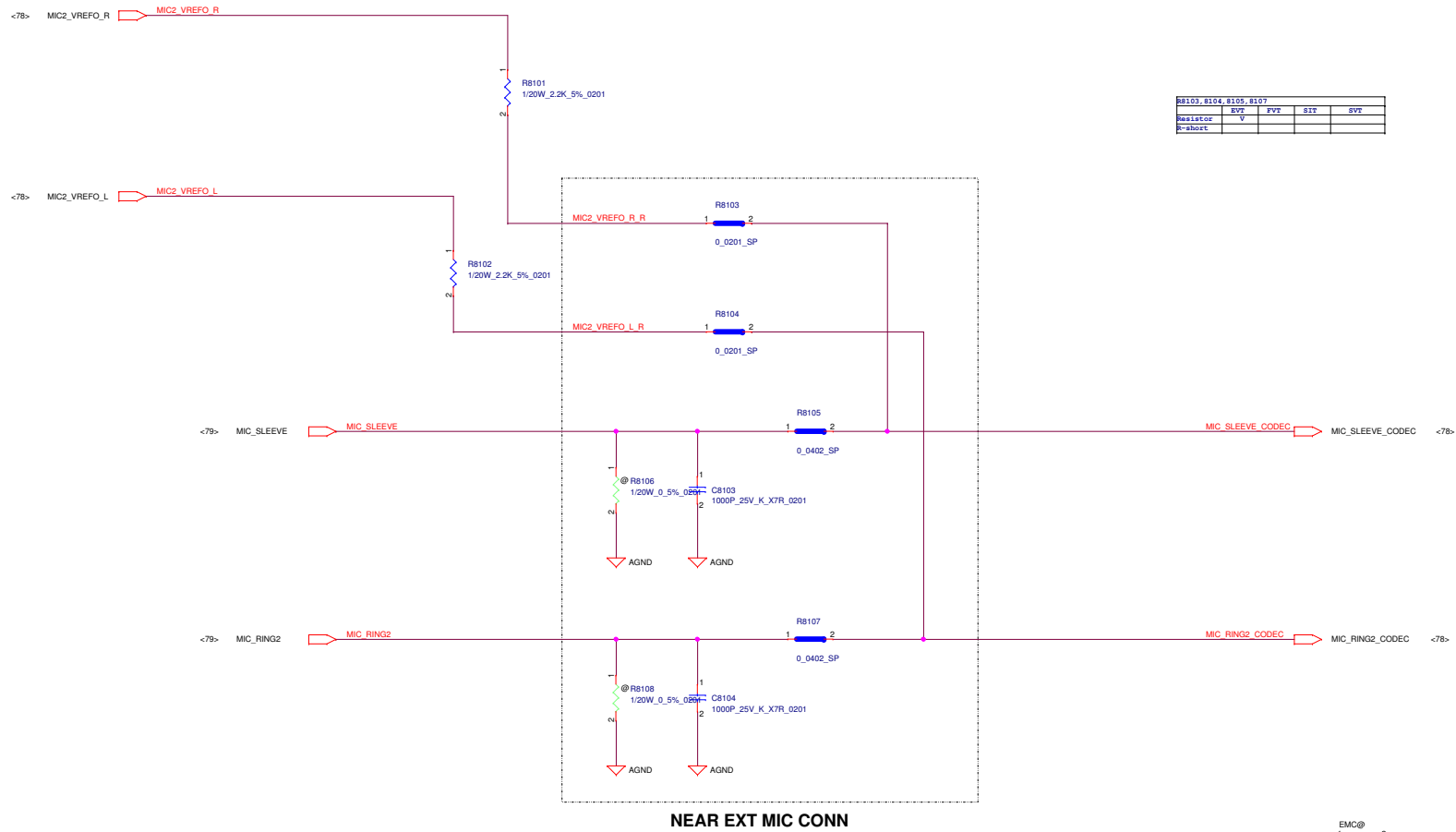


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Issued Date	2019/01/12	Deciphered Date	2019/04/12	AUDIO JACK SENSE	
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				Document Number	0.1
				Date:	Tuesday, December 18, 2018
				Sheet	80 of 125

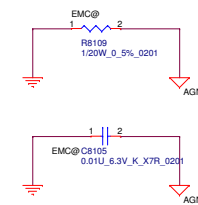


T490&T590

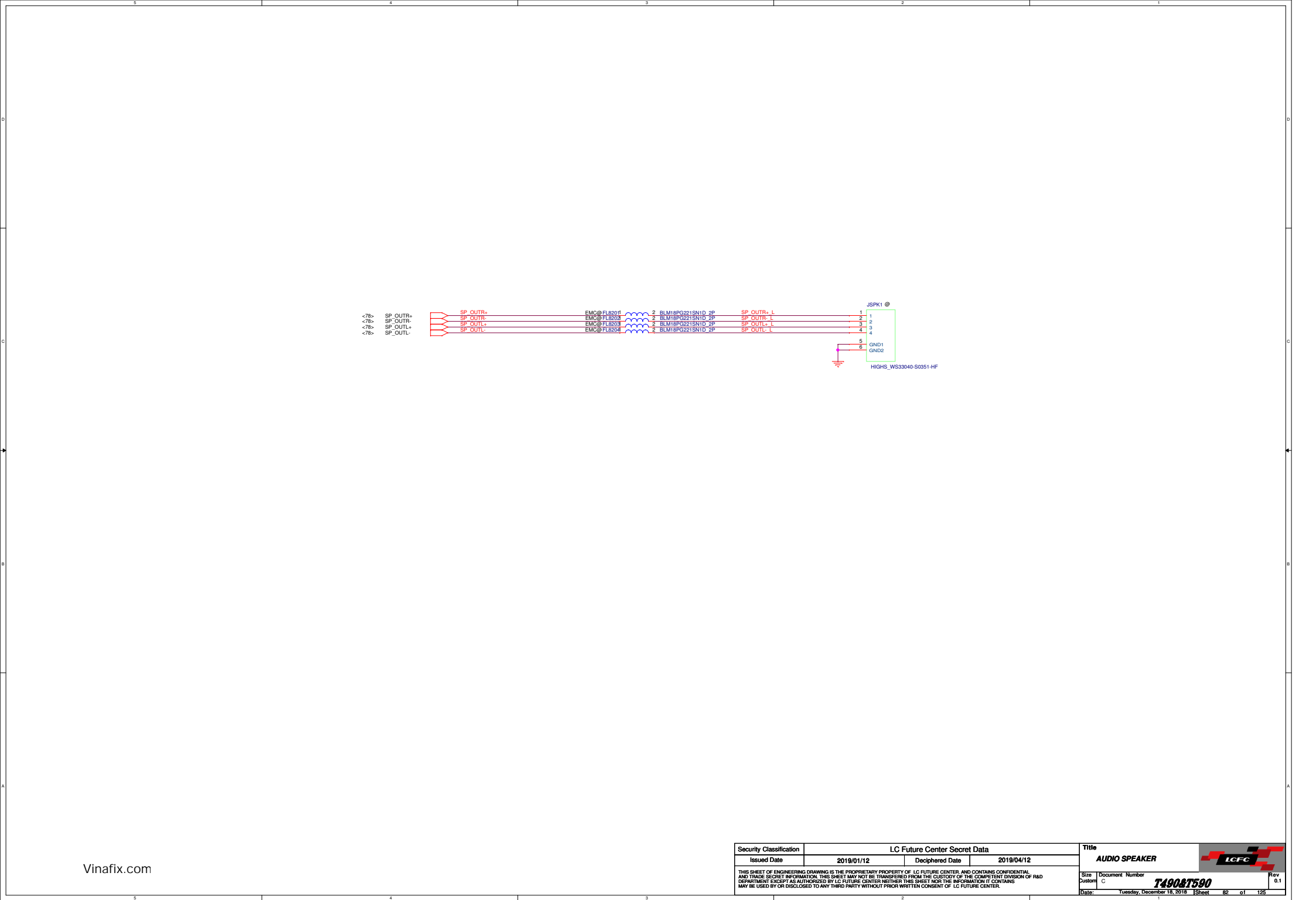




	R8103, R8104, R8105, R8107
Resistor	V
R-shoot	



**T4908T590**



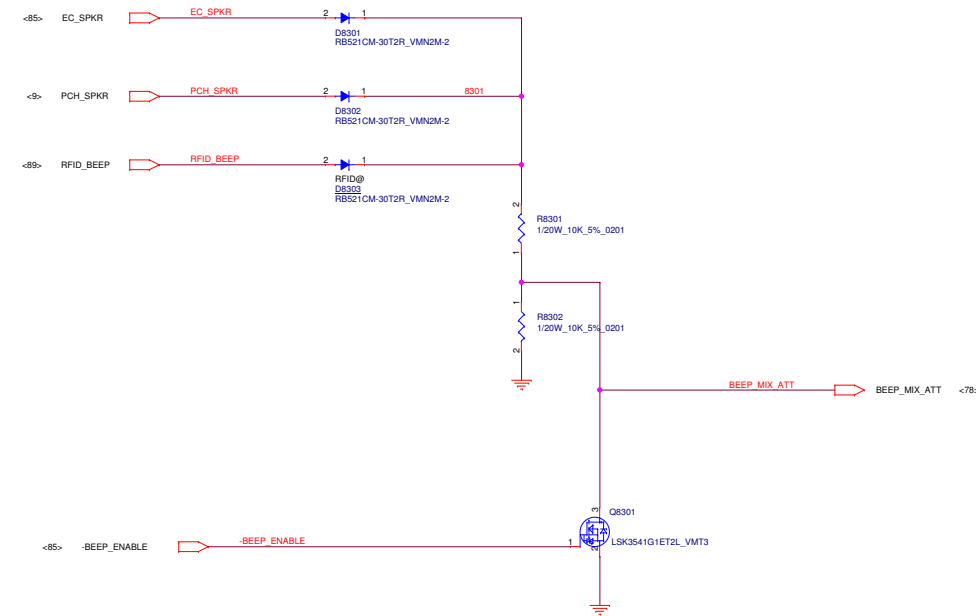
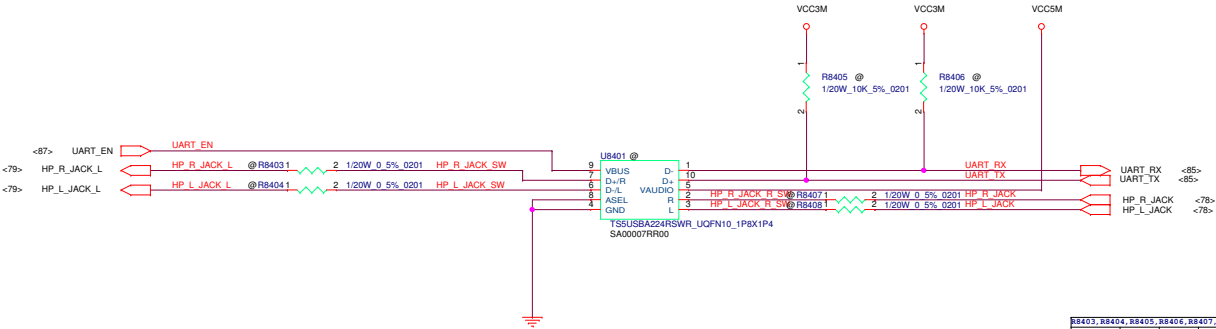


TABLE:

Mode	Audio	UART
UART_EN	L	H



R8403,R8404,R8405,R8406,R8407,R8408				
	EVT	FVT	SIT	SVT
Resistor	V	V	V	
unmount				V

HP_R_JACK_L	RB409	1	0	0201	SP	HP_R_JACK_L_RR	RB401	2	1	0	0201	SP	HP_R_JACK
HP_L_JACK_L	RB410	1	0	0201	SP	HP_L_JACK_L_RR	RB402	2	1	0	0201	SP	HP_L_JACK

R8401,R8402,R8409,R8410				
	EVT	FVT	SIT	SVT
Resistor	V	V	V	
R-short				V



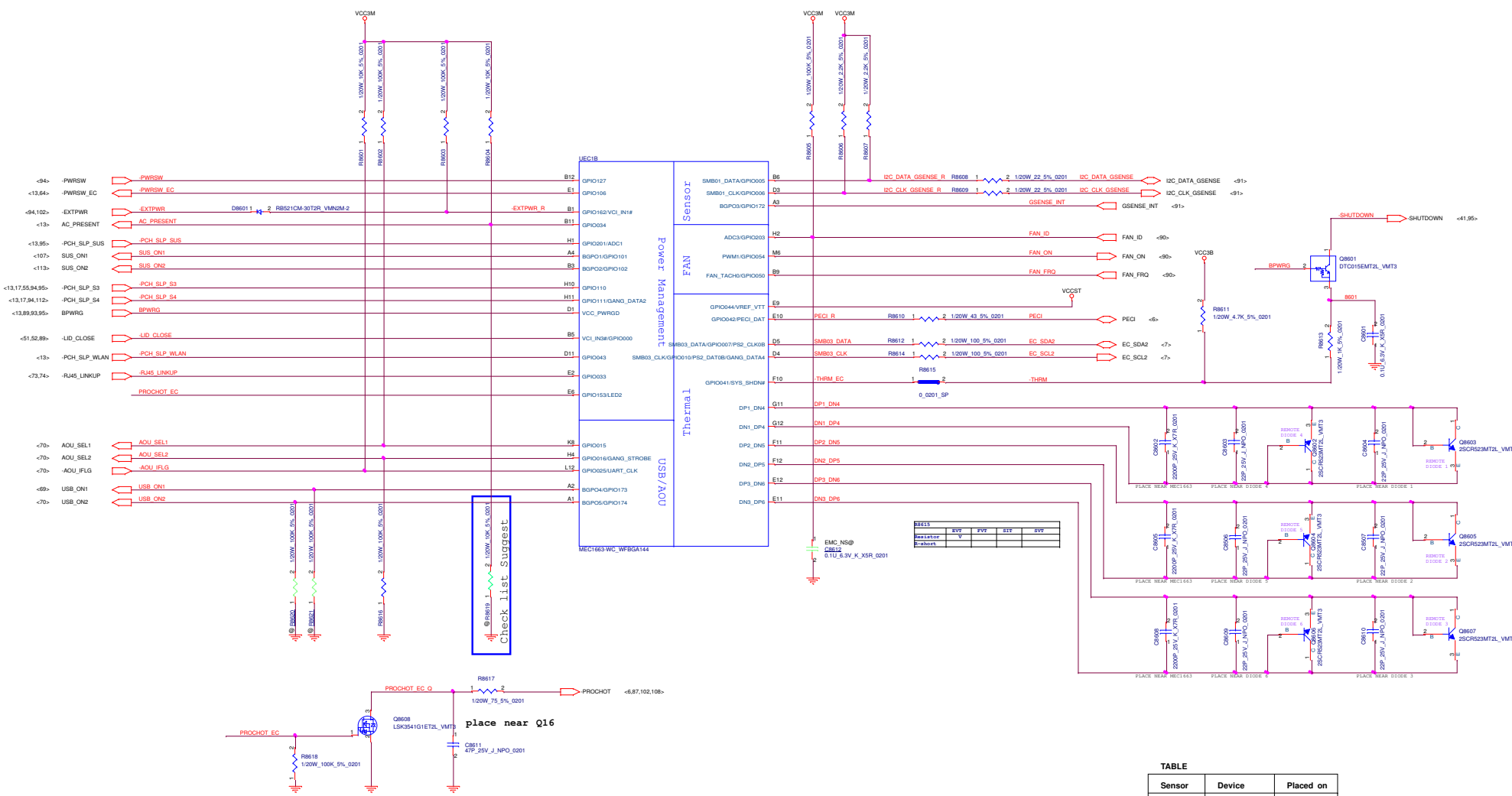
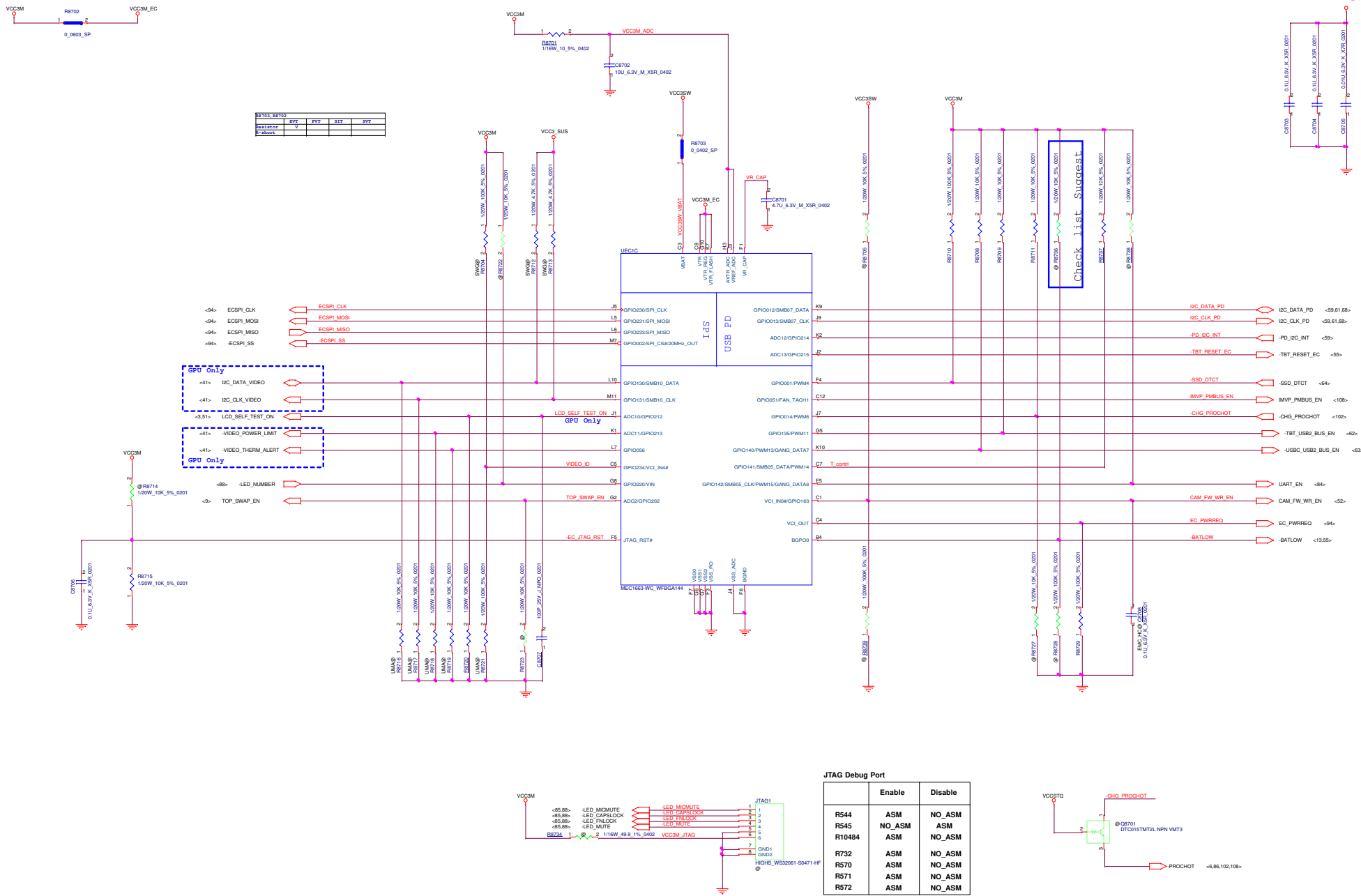
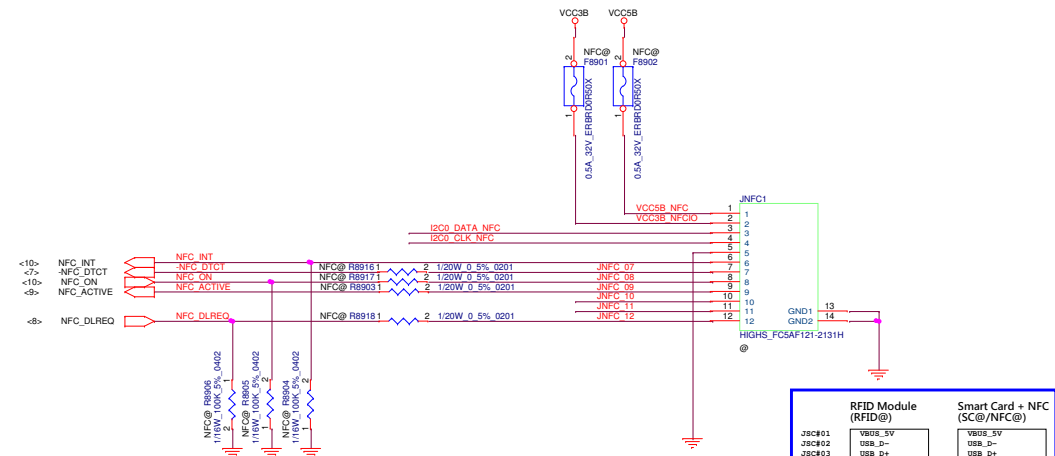
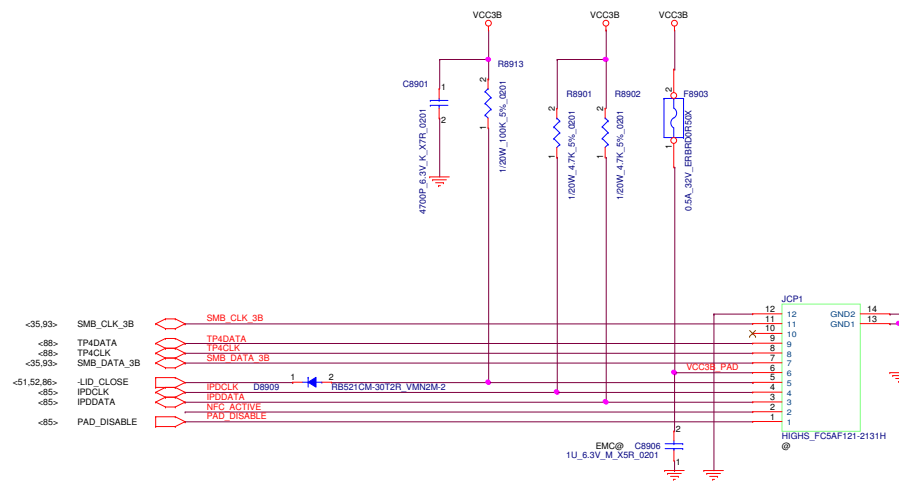


TABLE		
Sensor	Device	Placed on
DIODE1	Battery Charger	BOTTOM
DIODE2	WLAN/WWAN	BOTTOM
DIODE3	SSD	BOTTOM
DIODE4	CPU FIN	BOTTOM
DIODE5	GPU DC/DC	BOTTOM
DIODE6	DDR4	BOTTOM










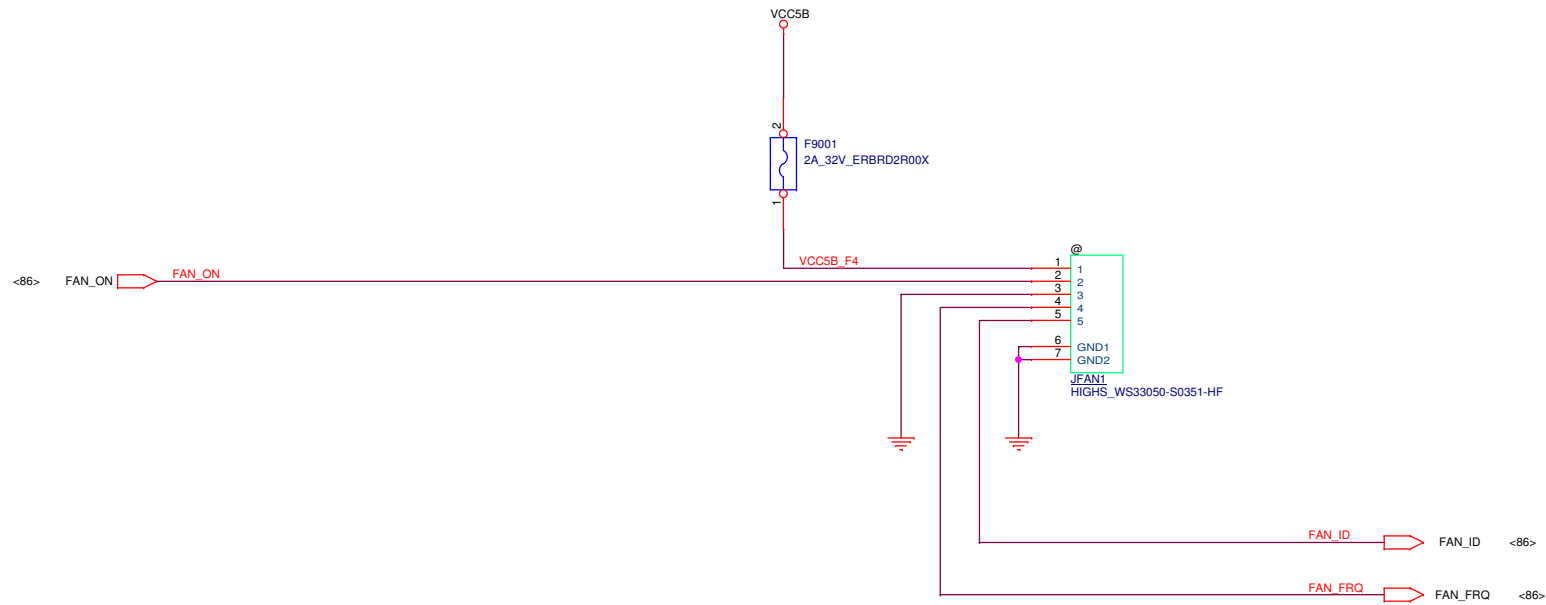
Health care-FPR



PLACE NEAR JFPR1

Part	Value	Unit	Notes
R8901, R8902, R8903	120W	5% 0201	
C8901, C8902, C8903	1U	6.3V M_XSR_0201	

TABLE of U183/U184		
Vendor	P/N	LCFC P/N
TI	SN74LVC1G66DCK	SA00005BE0J
NXP	74LVC1G66GW	SA00007KS00
ONsemi	MC74VHC1G66DFT2G	SA00008JQ00

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Issued Date	2019/01/12	Deciphered Date	2019/04/12	TOUCH PAD/NFC/FPR	
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				Rev 0.1	
Size Custom	Document Number		C		T490AT590
Date	Tuesday, December 18, 2018		15:52:22		89 61 125



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Issued Date	2018/01/12	Deciphered Date	2018/01/12	FAN CONNECTOR			
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				Date:	Tuesday, December 18, 2018	Sheet 90 of 125	

TABLE

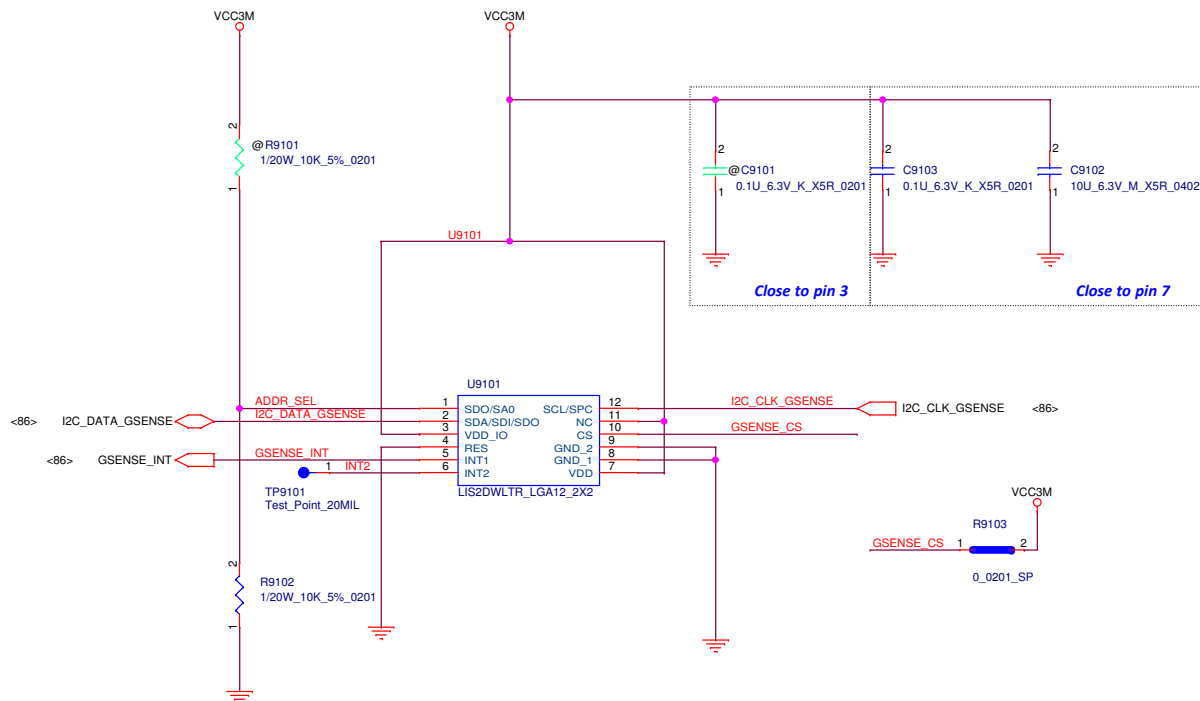
P/N	ADDR_SEL	Address
LIS2DWLTR	H L	32h (W) & 33h (R) 30h (W) & 31h (R)
KX022-1020	H L	3Eh (W) & 3Fh (R) 3Ch (W) & 3Dh (R)

TABLE of G-Sensor (U9101)

Vendor	P/N	LCFC P/N
ST	LIS2DWLTR	SA00009AQ00
Kionix	KX022-1020	SA000081E00

TABLE : G-Sensor Power

HDD Support	VCC3M
SSD Only	VCC3B

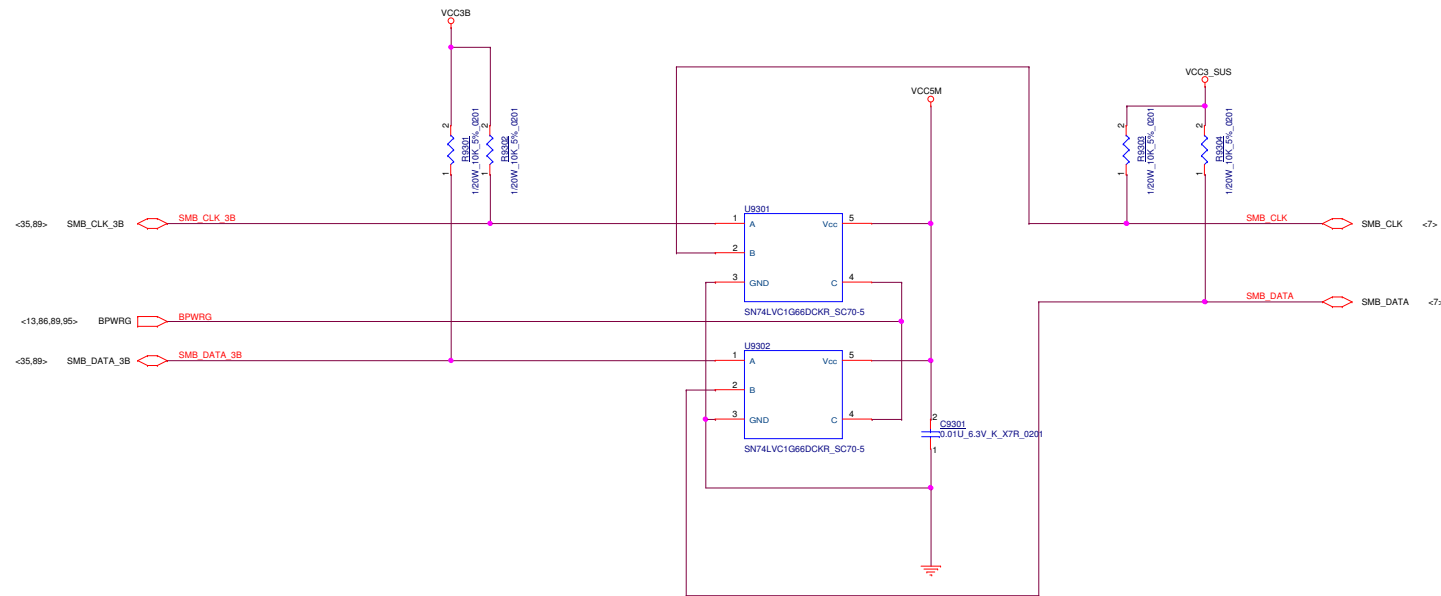


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Issued Date	2018/01/12	Deciphered Date	2018/01/12
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			Document Number <b>Drift/Ironhide</b>
			Date: Tuesday, December 18, 2018
			Sheet 91 of 125
			Rev 0.1

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Size	Document Number		Rev		
Custom	Drift/Ironhide		0.1		
Date:	Tuesday, December 18, 2018		Sheet	92	of 125

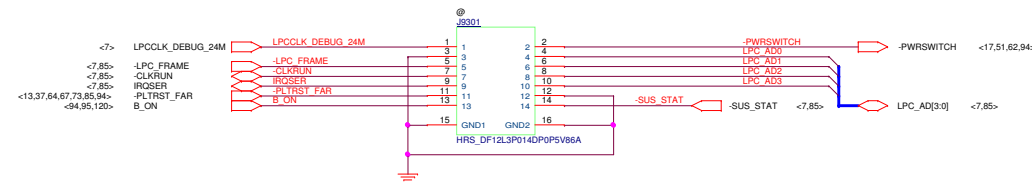


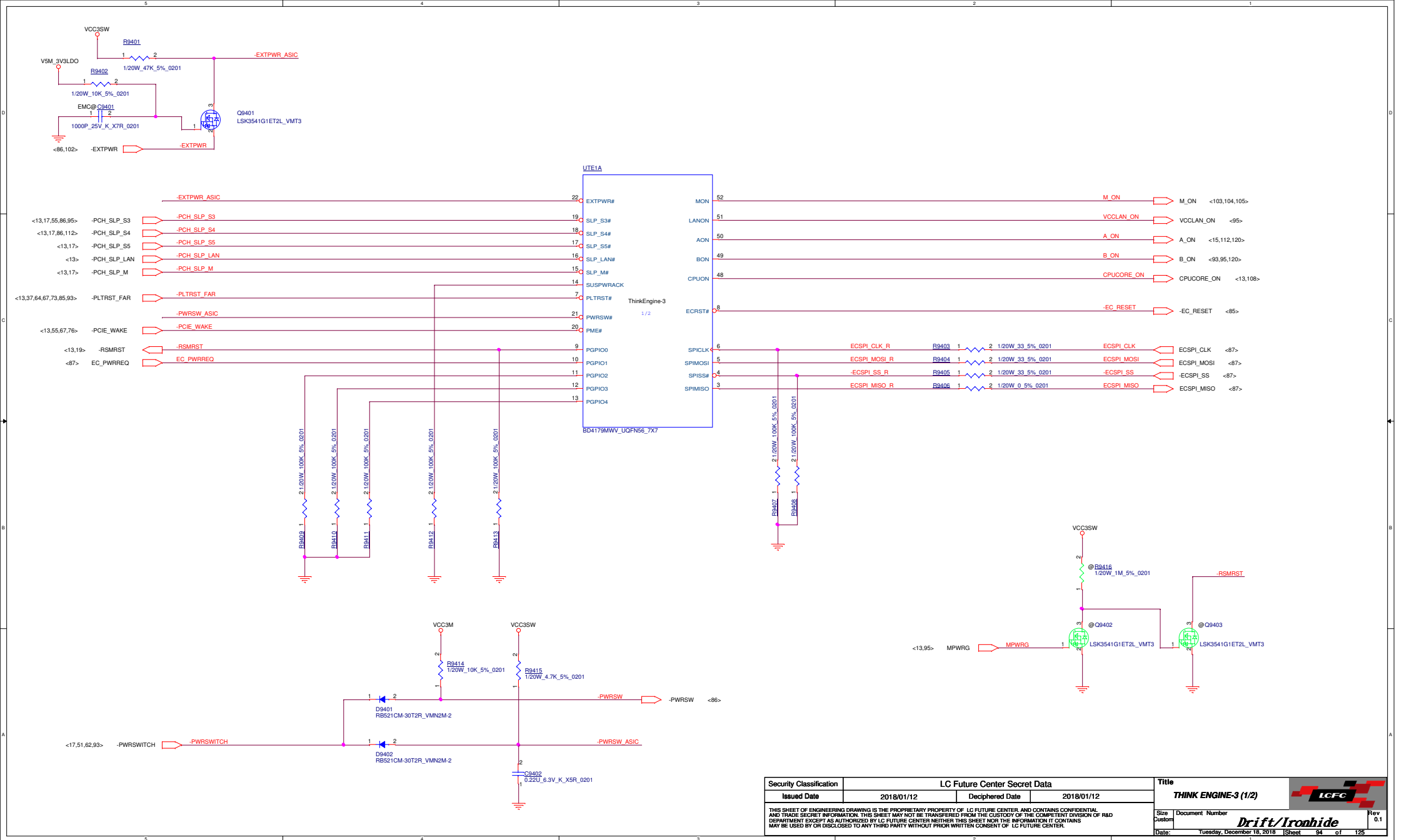


TABLE

REF DES	ENABLE	DISABLE
J5	ASM	NO_ASM
R220	ASM	NO_ASM

↑  
LOGIC







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Drift/Ironhide



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				Sheet		of	
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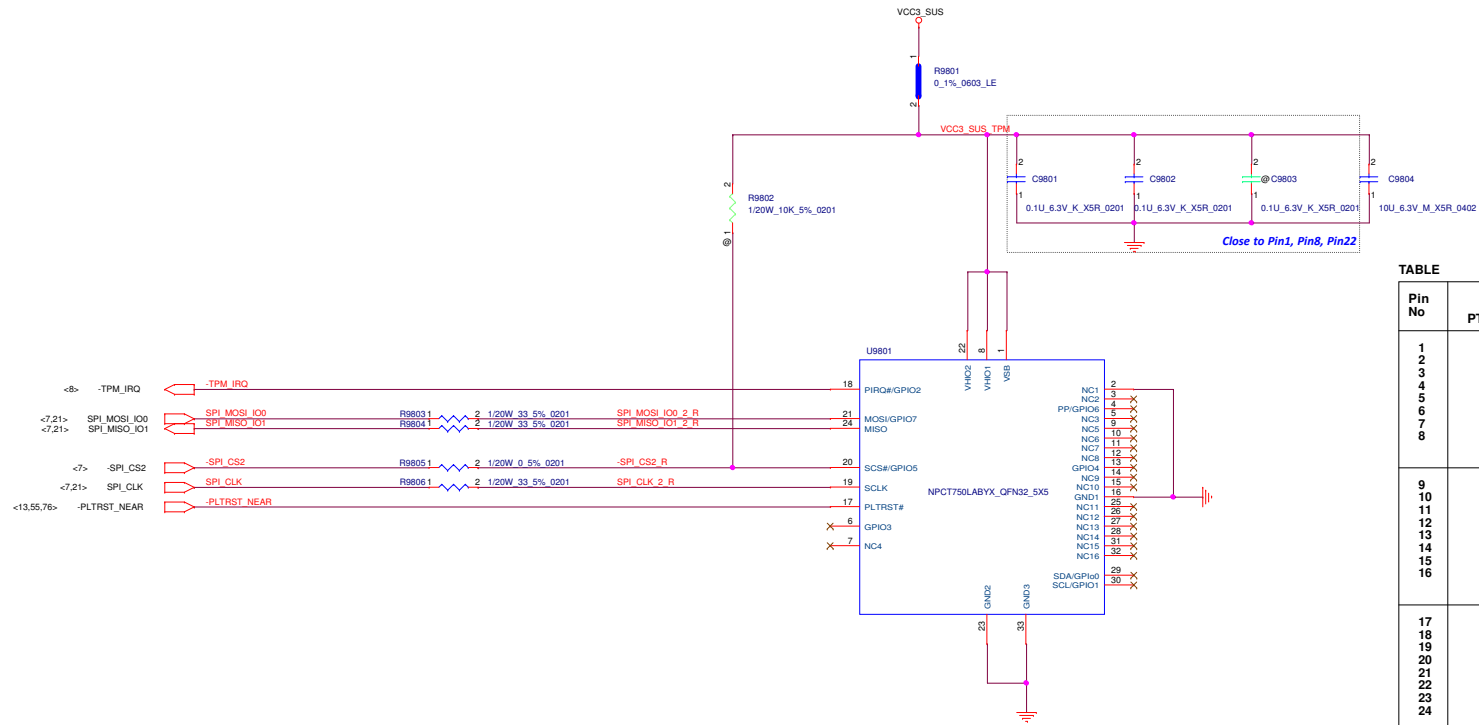



TABLE of TPM (U9801)		
Vendor	P/N	LCFC P/N
Nuvoton	NPCT750LABYX	SA00008KS10
ST Micro	ST33HTPH2E32AHC0	SA000089E20

Import Nuvoton on EVT

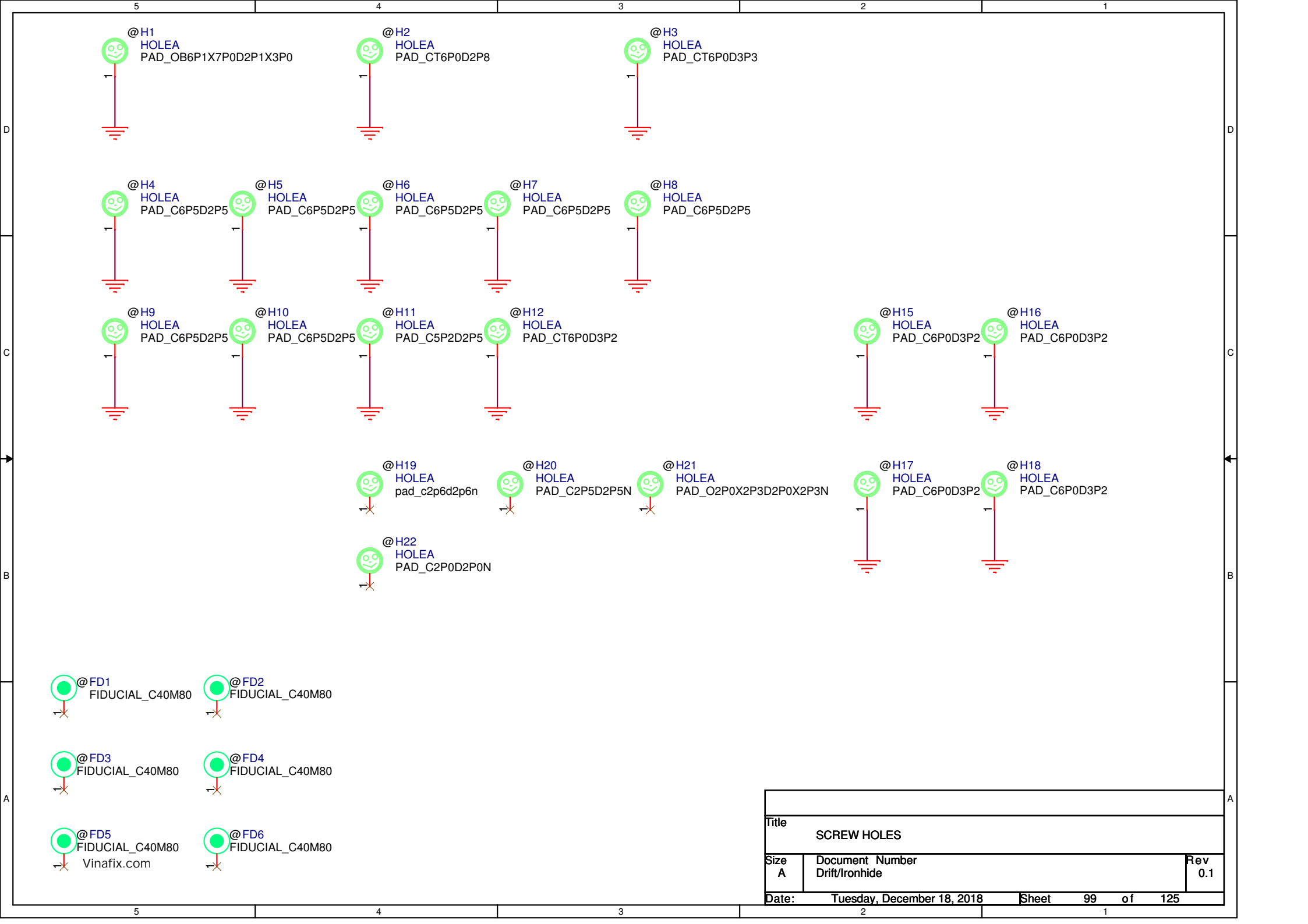
TABLE

Pin No	TCG PTP Spec (v38)	Nuvoton NPCT750LABYX	ST Micro ST33HTPH2E32AHC0
1	VDD	VS	NC
2	GND	NC	NC
3	NC	NC	NC
4	GPIO	GPIO/PP	PP
5	NC	NC	NC
6	GPIO	GPIO3	NC
7	GPIO	NC	GPIO
8	VDD	VHIO	NC
9	NC	NC	NC
10	NC	NC	NC
11	NC	NC	NC
12	NC	NC	NC
13	GPIO	GPIO4	NC
14	NC	NC	NC
15	NC	NC	NC
16	NC	GND	NC
17	SPI_RST#	RST#	SPI_RST#
18	SPI_PIRQ#	PIRQ#/GPIO2	SPI_PIRQ#
19	SPI_CLK	SCLK	SPI_CLK
20	SPI_CS#	SCS#/GPIO5	SPI_CS#
21	MOSI	MOSI/GPIO7	MOSI
22	VDD	VHIO	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	SDA/GPIO1	SDA/GPIO1	NC
30	SDA/GPIO0	SDA/GPIO0	NC
31	NC	NC	NC
32	NC	NC	NC

REV	BY	DATE	REV	BY	DATE
1	V				

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2018/01/12		2018/01/12		DISCRETE TPM 2.0			
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					C	0.1	
				Date		Tuesday, December 18, 2018 10:58:11 AM	
				Drift/Brnhide			





@H1  
HOLEA  
PAD\_OB6P1X7P0D2P1X3P0

@H2  
HOLEA  
PAD\_CT6P0D2P8

@H3  
HOLEA  
PAD\_CT6P0D3P3

@H4  
HOLEA  
PAD\_C6P5D2P5

@H5  
HOLEA  
PAD\_C6P5D2P5

@H6  
HOLEA  
PAD\_C6P5D2P5

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PAD\_C6P5D2P5

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PAD\_C6P5D2P5

@H9  
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PAD\_C6P5D2P5

@H10  
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PAD\_C6P5D2P5

@H11  
HOLEA  
PAD\_C5P2D2P5

@H12  
HOLEA  
PAD\_CT6P0D3P2

@H15  
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PAD\_C6P0D3P2

@H16  
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PAD\_C6P0D3P2

@H19  
HOLEA  
pad\_c2p6d2p6n

@H20  
HOLEA  
PAD\_C2P5D2P5N

@H21  
HOLEA  
PAD\_O2P0X2P3D2P0X2P3N

@H17  
HOLEA  
PAD\_C6P0D3P2

@H18  
HOLEA  
PAD\_C6P0D3P2

@H22  
HOLEA  
PAD\_C2P0D2P0N

@FD1  
FIDUCIAL\_C40M80

@FD2  
FIDUCIAL\_C40M80

@FD3  
FIDUCIAL\_C40M80

@FD4  
FIDUCIAL\_C40M80

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Vinafix.com

@FD6  
FIDUCIAL\_C40M80

Title		
SCREW HOLES		
Size A	Document Number Drift/Ironhide	Rev 0.1
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TABLE PQ0001,PQ0002

VISHAY : SI7153DN  
AOS : AON7409

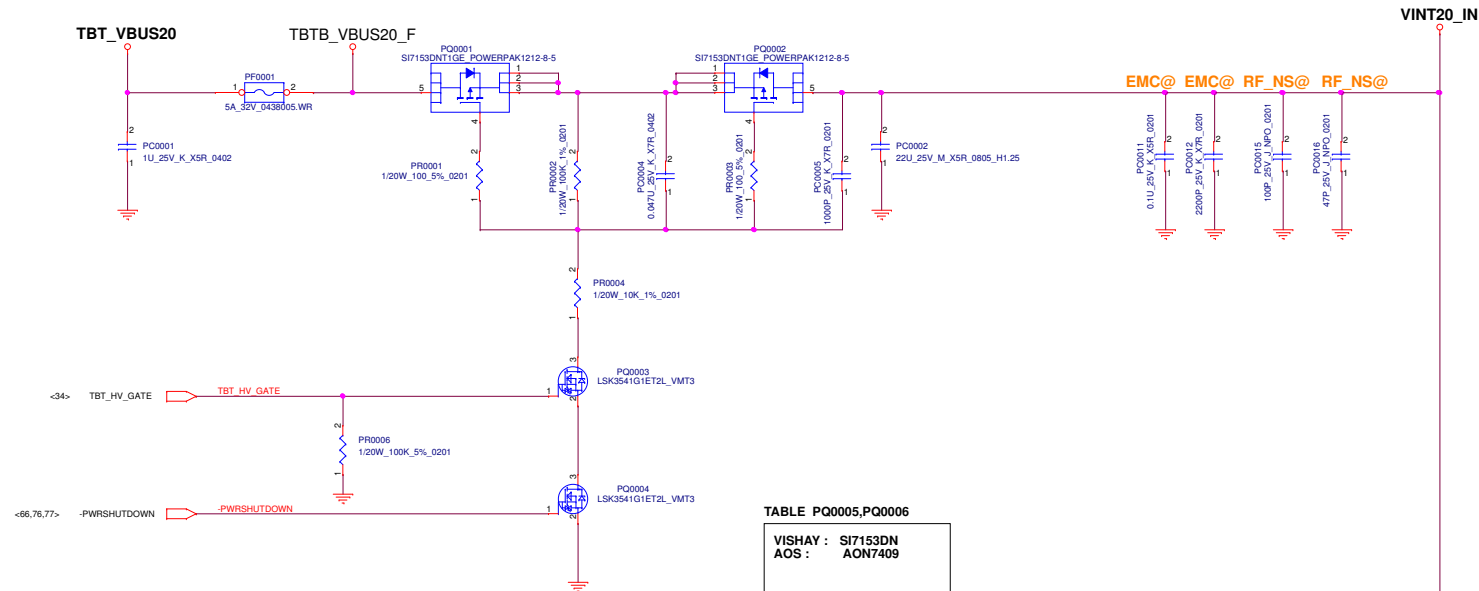
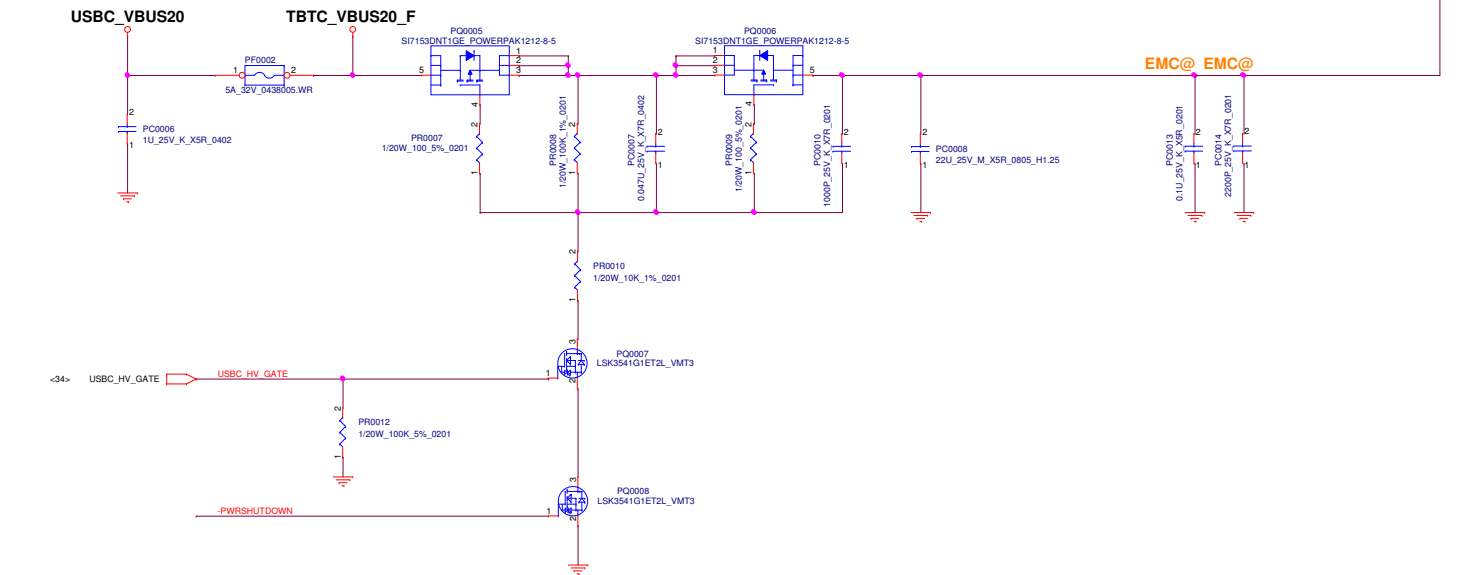


TABLE PQ0005,PQ0006

VISHAY : SI7153DN  
AOS : AON7409



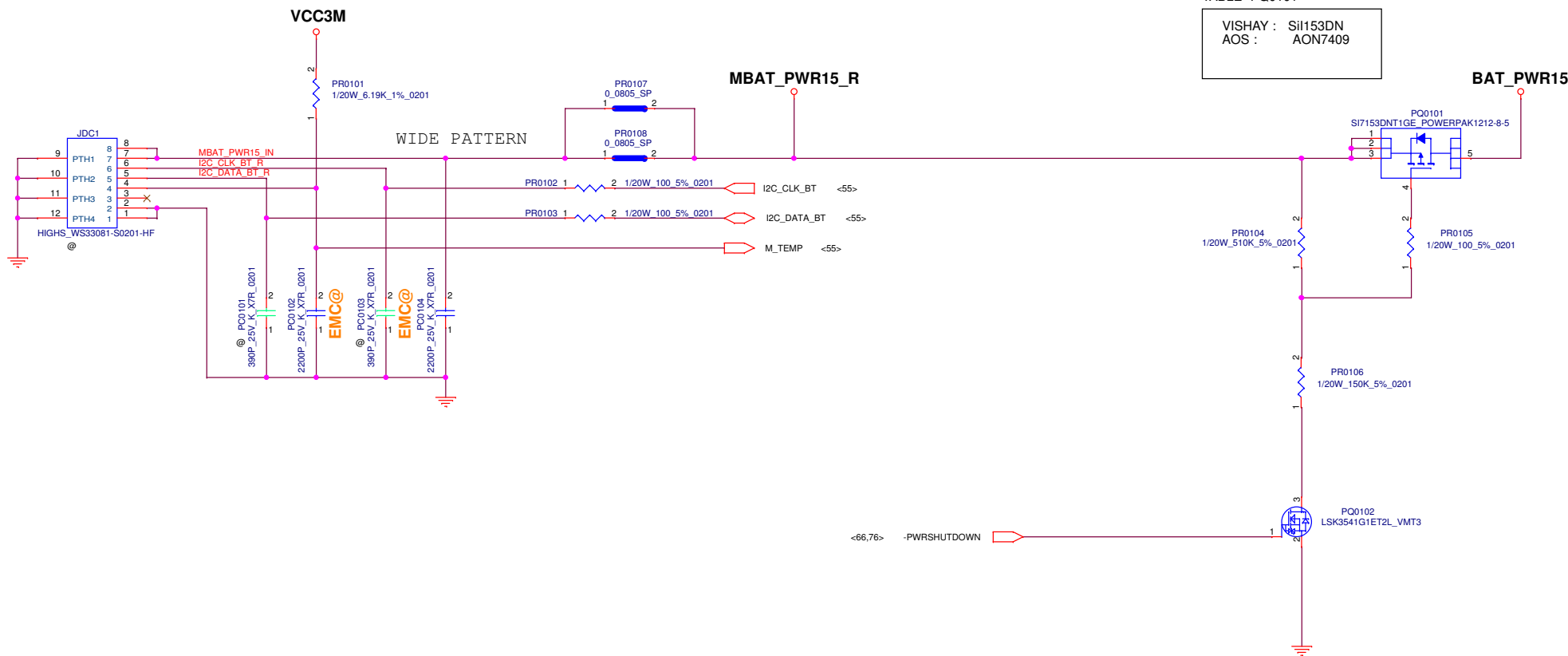



TABLE PQ0101

VISHAY : Si1153DN  
AOS : AON7409

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					Rev 0.1

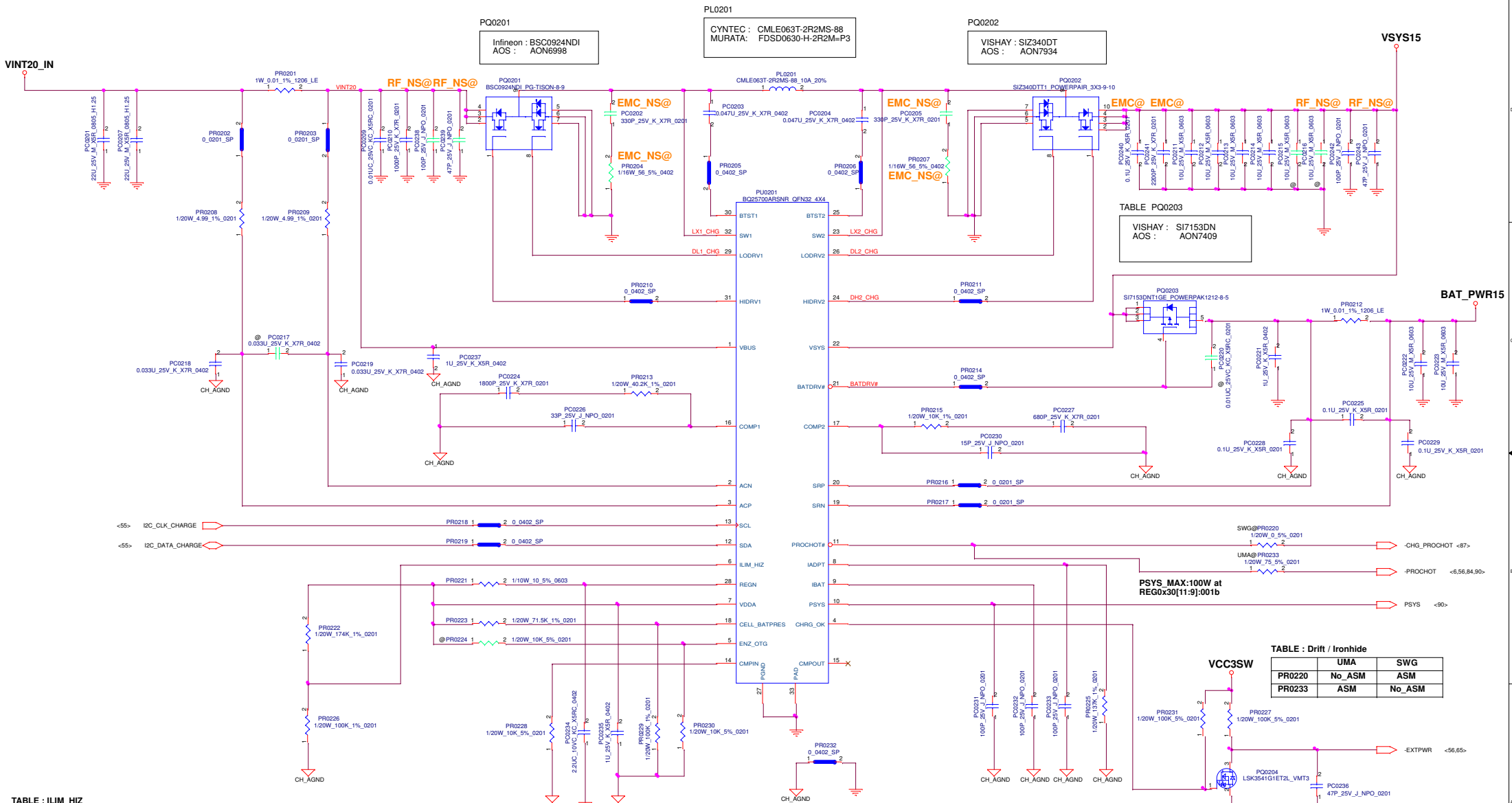


TABLE : ILIM\_HIZ

IDPM	V (ILIM)	PR0222
500mA	1.2V	
1.0A	1.4V	
1.5A	1.6V	
2.0A	1.8V	237K
3.0A	2.2V	174K
3.25A	2.3V	162K

TABLE : CELL\_BATPRES

# of CELL	V (CELL_PRES)	PR0223
1-CELL	1.5V	301K
2-CELL	2.5V	140K
3-CELL	3.5V	71.5K
4-CELL	4.5V	33.2K

TABLE

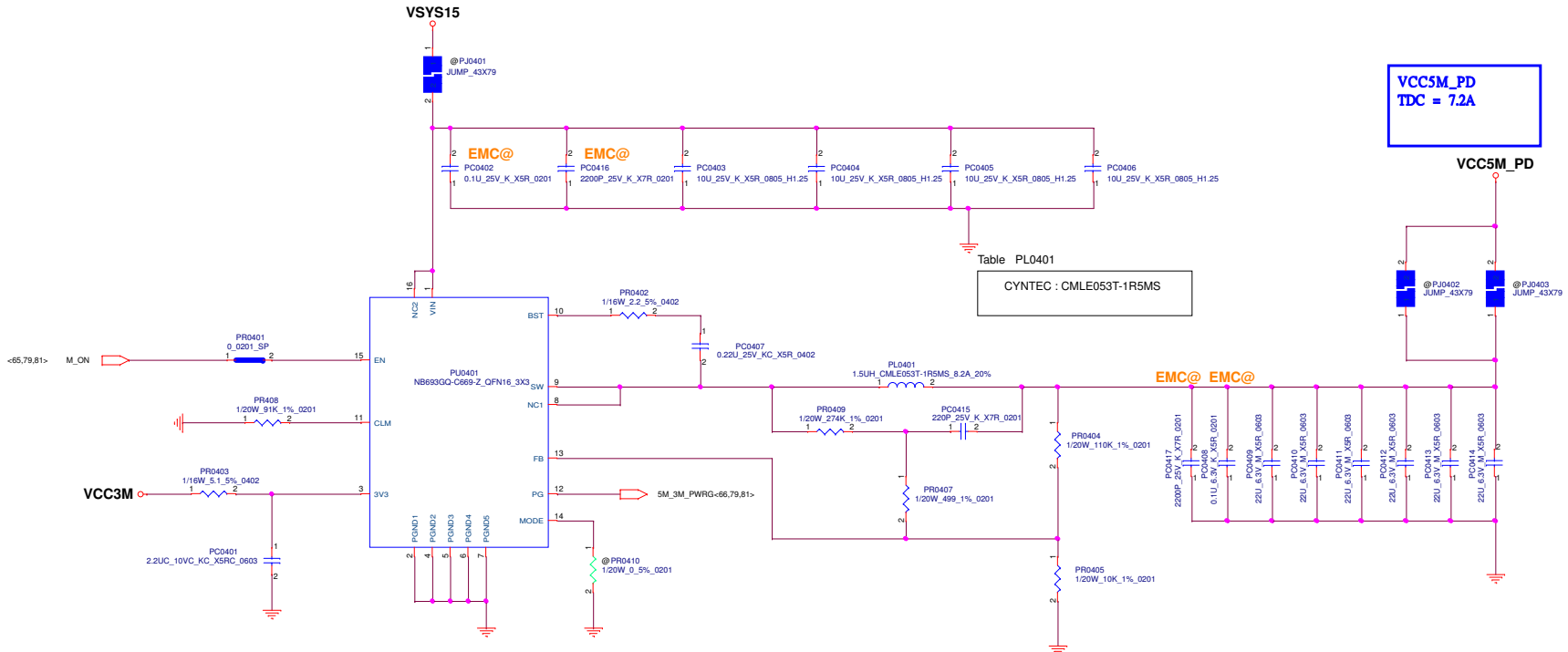
Inductor	R(IADP)	Fsw@POR
1.0uH	93kohm	800KHz
2.2uH	137kohm	800KHz
3.3uH	169kohm	800KHz

TABLE : Drift / Ironhide

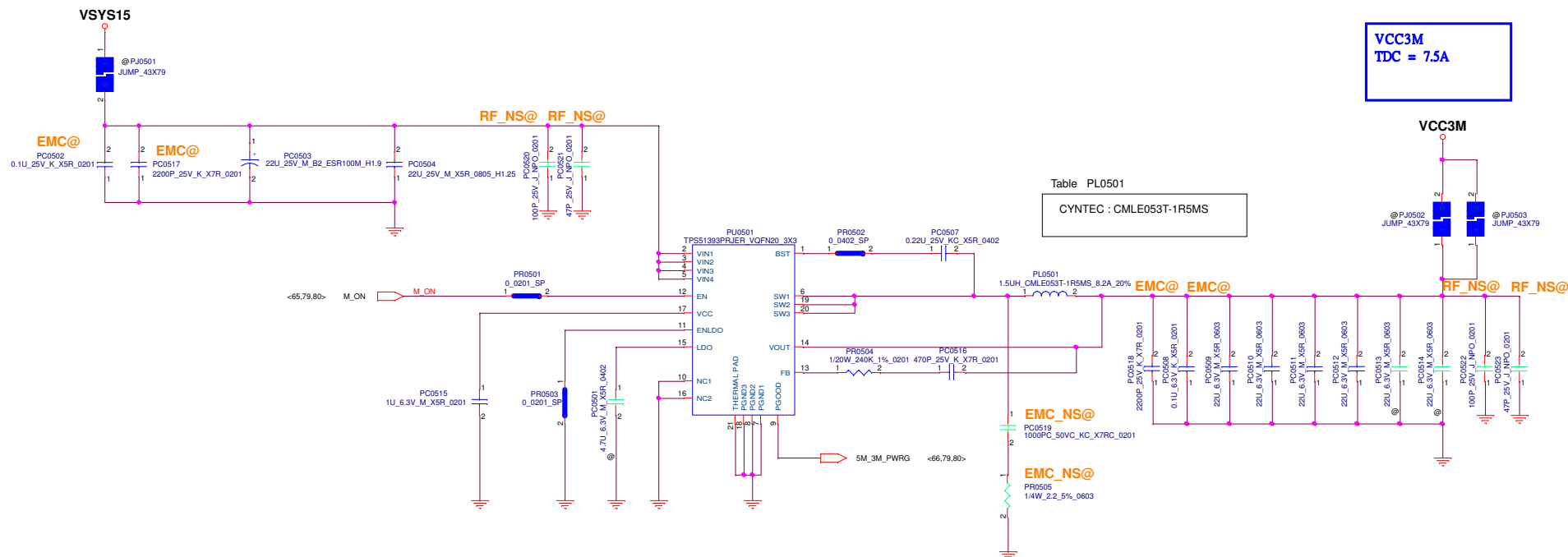
	UMA	SWG
PR0220	No_ASM	ASM
PR0233	ASM	No_ASM

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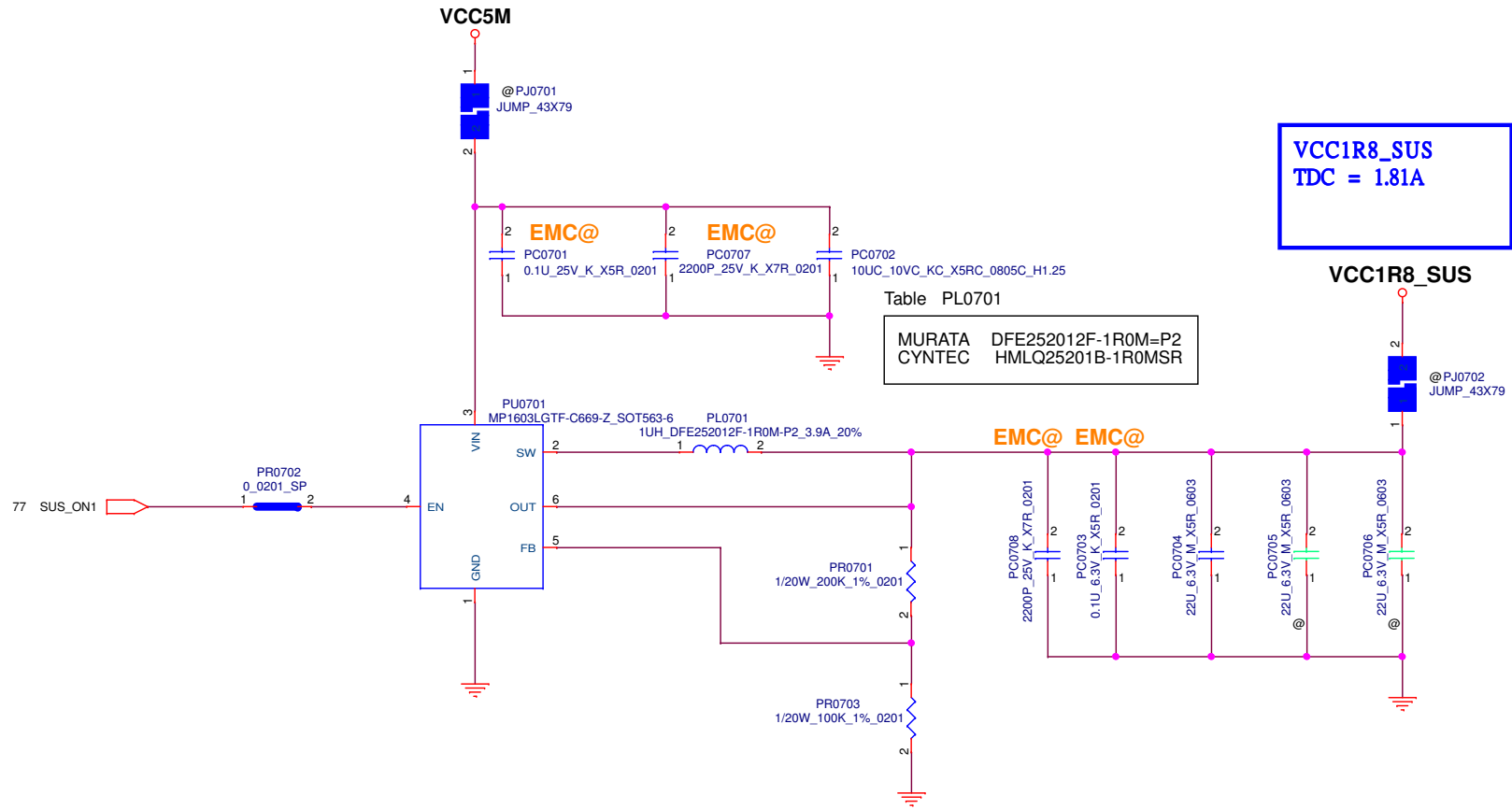





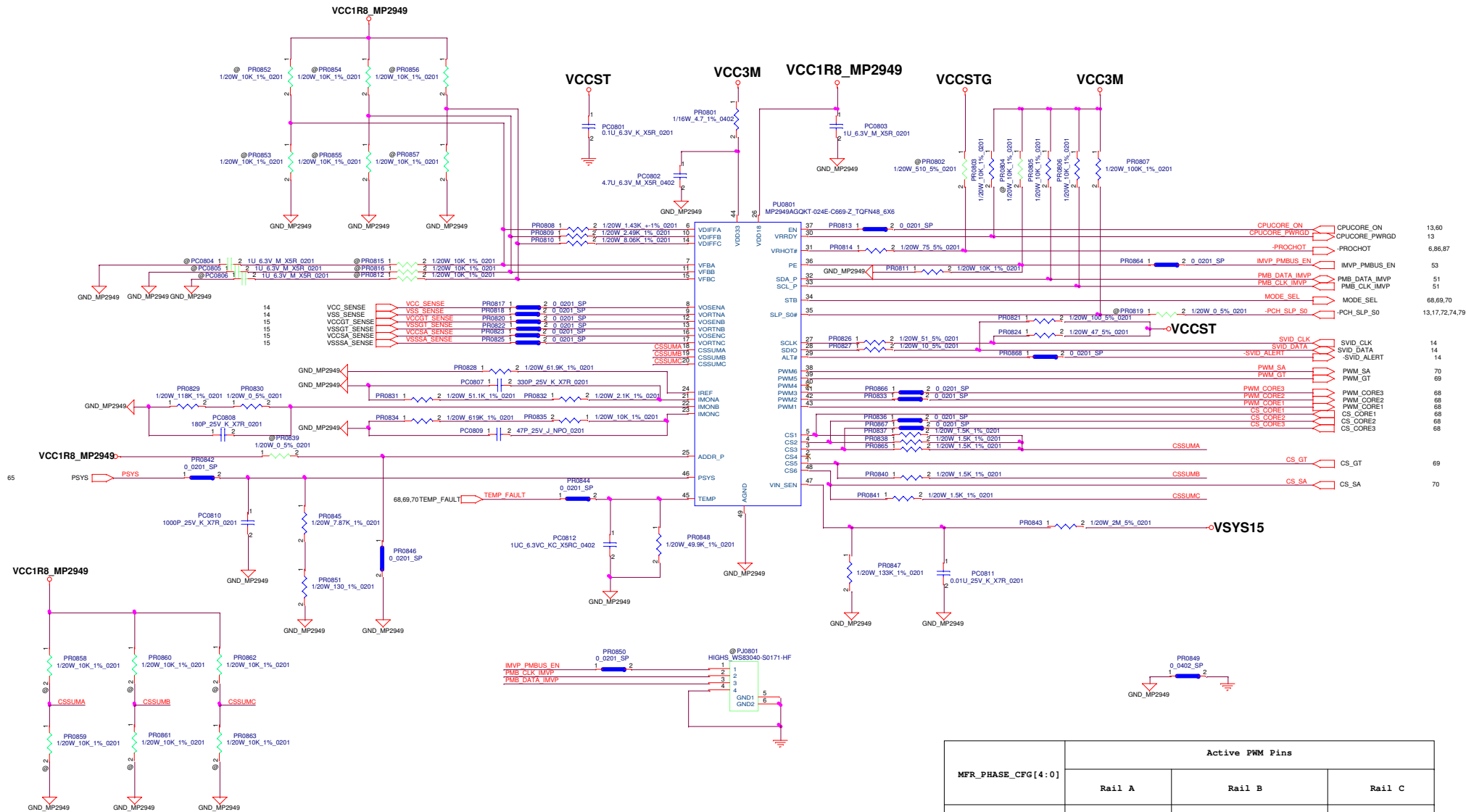


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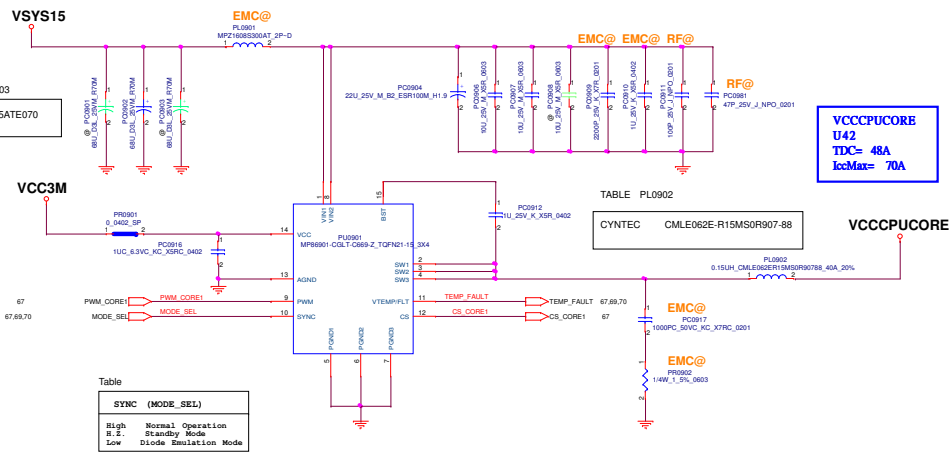
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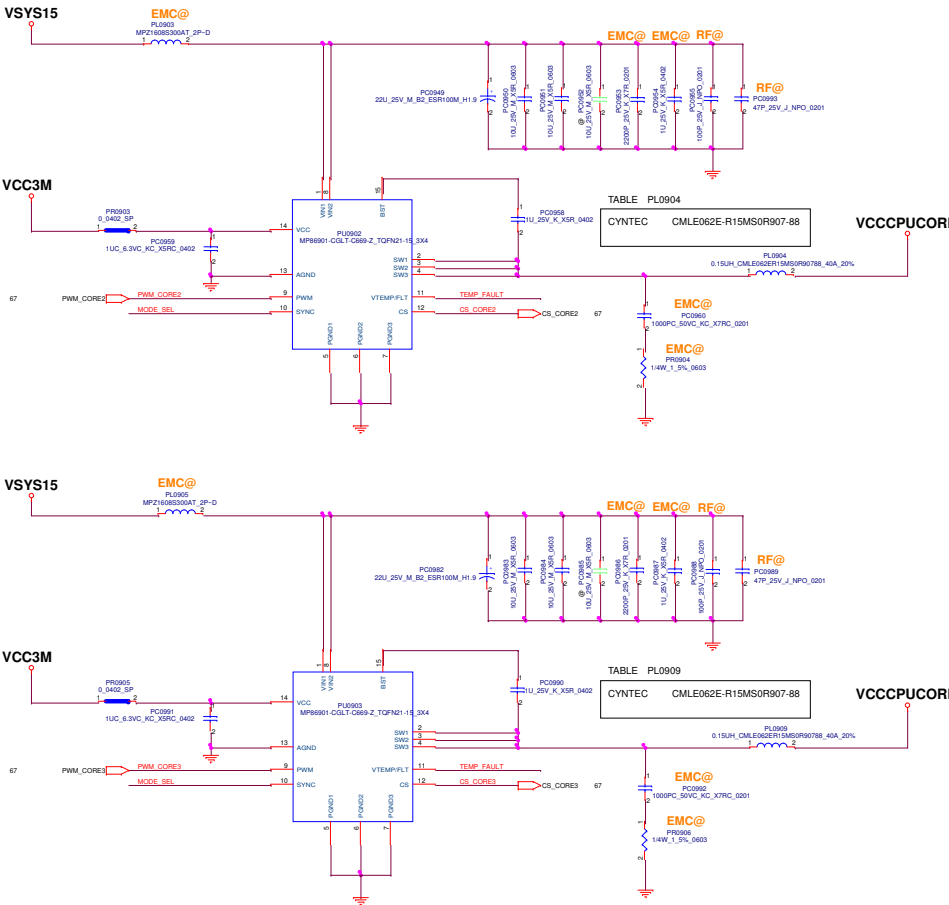
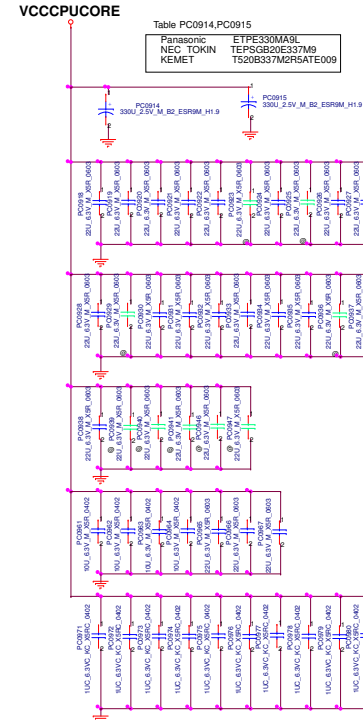
WHL- U42	
PU401	MP2949AGQKT-024E-C669-Z
PR0833	0_0201_5%
PR0836	0_0201_5%
PR0838	1.5K_0201_1%
PR0832	2.1K_0201_1%
PR0831	51.1K_0201_1%
PC0807	330P_0201_25V7-K
PR0839	NA
VR0801	0_0201_5%

MFR_PHASE_CFG[4:0]	Active PWM Pins		
	Rail A	Rail B	Rail C
00100b	1, 2, 3, 4	5	6
00111b	1, 2, 3	4, 5	6
01001b	1, 2, 3	5	6
01100b	1, 2	4, 5	6
01110b	1, 2	5	6
10001b	1	5	6

Table PC0901,PC0902,PC0903  
Panasonic: 25TQC68MYF  
KEMET: TS21D686M02SATE070



For WHL VCCCPUCORE  
2pcs 330uF +18pcs 22uF+4pcs 10uF+10pcs 1uF

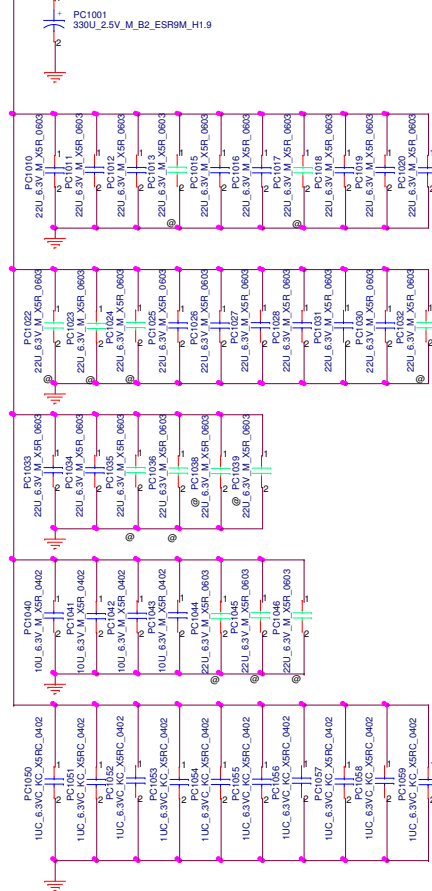


For WHL VCCGFXCORE\_I  
1pcs 330uF +14pcs 22uF+4pcs 10uF+10pcs 1uF

### VCCGFXCORE\_I

Table PC1001

Panasonic	ETPE330MA9L
NEC TOKIN	TEPSGB20E337M9
KEMET	T520B337M2R5ATE009



VSYS15

EMC@

PL1001  
MPZ16085300AT\_2P-D

VCC3M

PR1001  
0.0402\_SP

PC1021  
1uF\_6.3V\_KC\_X5RC\_0402

PWM\_GT

MODE\_SEL

Table

SYNC (MODE_SEL)	
High	Normal Operation
H.Z.	Standby Mode
Low	Diode Emulation Mode

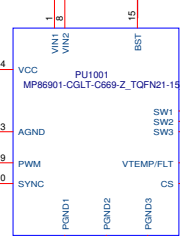


TABLE PL1002

CYNTEC	CMLE062E-R15MS0R907-88
--------	------------------------

PL1002  
0.15uH\_CMLE062ER15MS0R90788\_40A\_20%

EMC@  
PC1023  
1000PC\_50VC\_KC\_X7RC\_0201

EMC@  
PR1002  
1/4W\_1\_5%\_0603

EMC@  
PC1060  
220pF\_25V\_K\_X7R\_0201

EMC@  
PC1061  
0.1uF\_6.3V\_K\_X5R\_0201

EMC@  
PC1062  
0.1uF\_6.3V\_K\_X5R\_0201

EMC@  
PC1063  
0.1uF\_6.3V\_K\_X5R\_0201

EMC@  
PC1064  
0.1uF\_6.3V\_K\_X5R\_0201

EMC@  
PC1065  
0.1uF\_6.3V\_K\_X5R\_0201

EMC@  
PC1066  
0.1uF\_6.3V\_K\_X5R\_0201

EMC@  
PC1067  
0.1uF\_6.3V\_K\_X5R\_0201

VCCGFXCORE\_I  
TDC= 18A  
IccMax= 31A

VCCGFXCORE\_I

VSYS15

EMC@  
PL1101  
MPZ1608S300AT\_2P-D

EMC@ EMC@ RF@

For WHL VCCSA  
7pcs 22uF+3pcs 10uF+7pcs 1uF

VCCSA

VCCSA  
TDC= 4A

VCCSA

VCC3M

PR1101  
0\_0402\_SP  
1 2  
PC1115  
1UC\_6.3VC\_KC\_X5RC\_0402  
1 2

PWM\_SA PWM\_SA  
MODE\_SEL MODE\_SEL

Table

SYNC (MODE_SEL)	
High	Normal Operation
H.Z.	Standby Mode
Low	Diode Emulation Mode

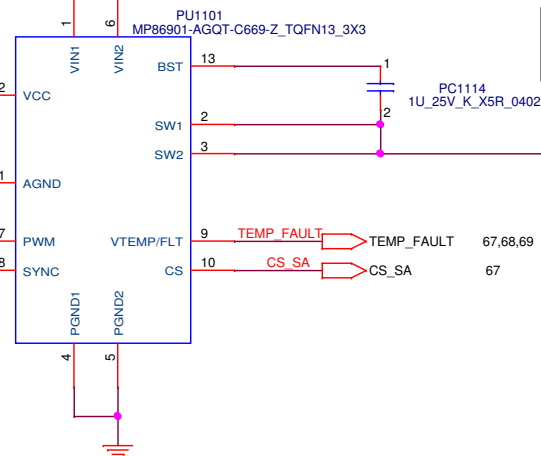


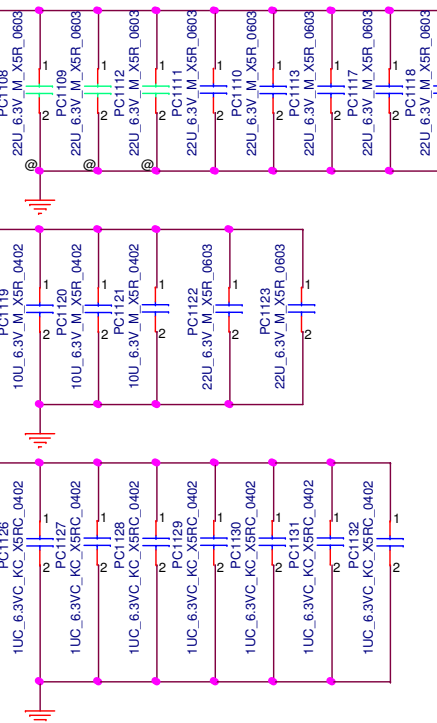
TABLE PL1102  
CYNTEC: CMLB042T-R47MS  
TDK: SPM4020T-R47M-LR

EMC@

EMC@

EMC\_NS@

EMC\_NS@  
PR1102  
1/4W\_2.2\_5%\_0603



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						Size		Document Number		Rev
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						Date:		Tuesday, December 18, 2018		Sheet 111 of 120

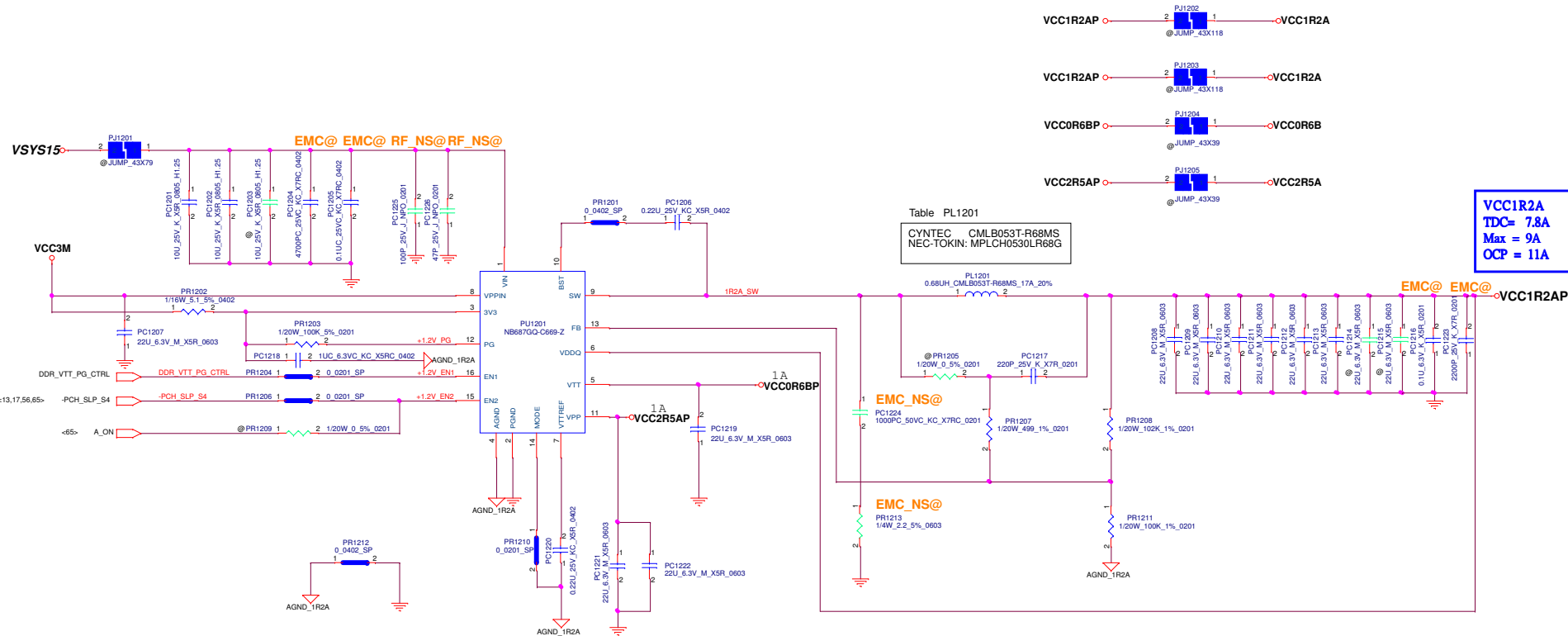


TABLE NB687GQ:EN1/EN2

State	EN1	EN2	VDDQ	VTTRF	VTT	VPP
S0	High	High	ON	ON	ON	ON
S3	Low	High	ON	ON	OFF (High-Z)	ON
S4/S5	Low	Low	OFF	OFF	OFF	OFF
Others	High	Low	OFF	OFF	OFF	OFF

TABLE NB687GQ:MODE

State	USM	Fs	Resistor to GND
M1	NO	700KHz	0
M2	YES	700KHz	90K
M3	NO	500KHz	150K
M4	YES	500KHz	>230K or Float

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		Custom	T490&T590	0.00
		Date:	Tuesday, December 18, 2018	Sheet 112 of 125



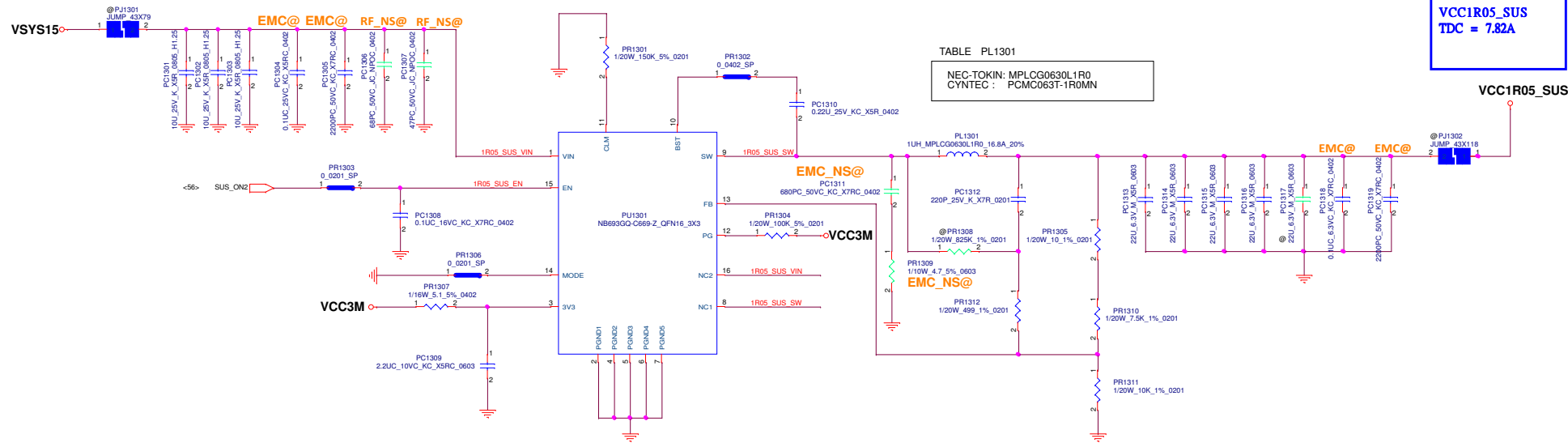
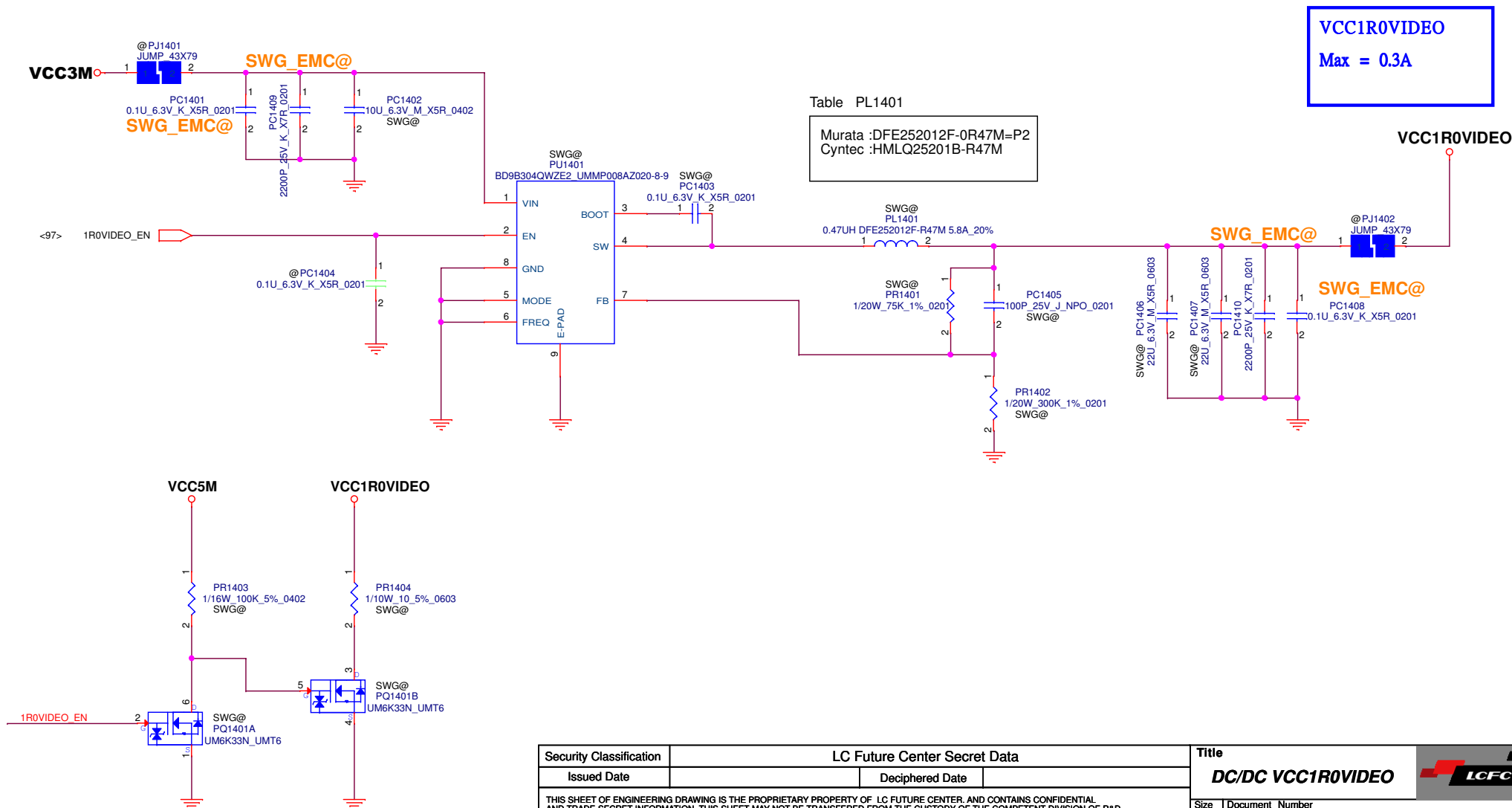


TABLE PL1301

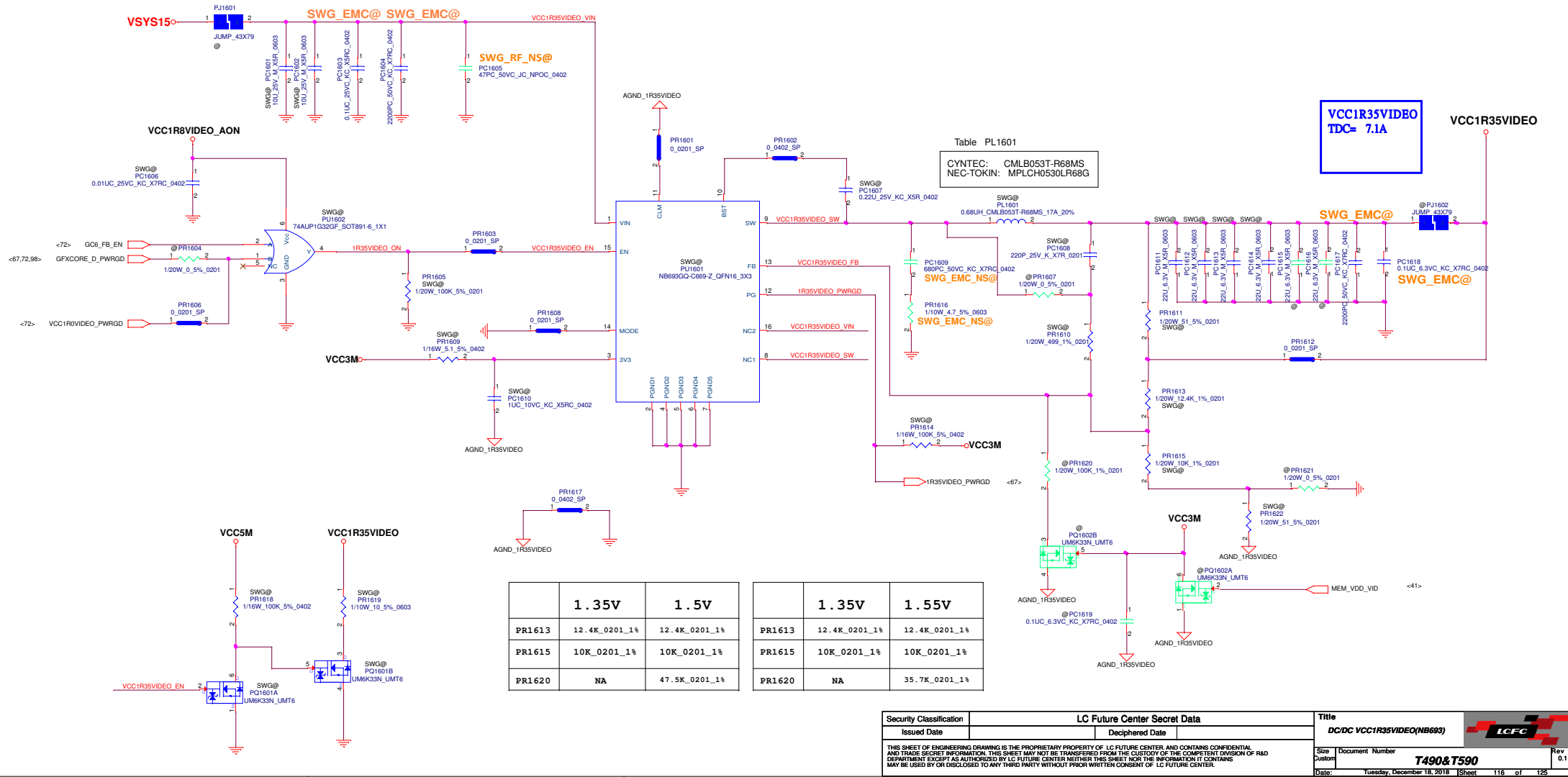
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CYNTEC : PCMC063T-1R0MN

VCC1R05\_SUS  
TDC = 7.82A



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Date:	Tuesday, December 18, 2018		Sheet	114	of 125



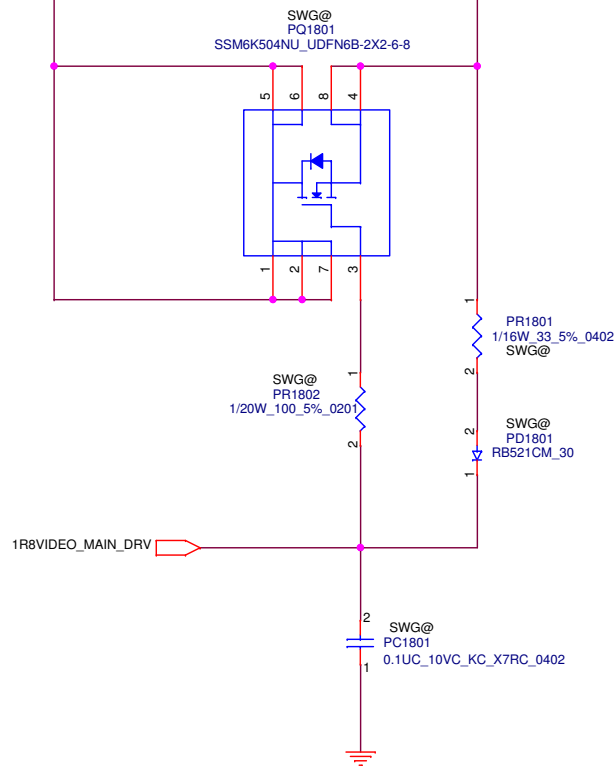


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Date	Tuesday, December 18, 2018	Sheet	116	of	125



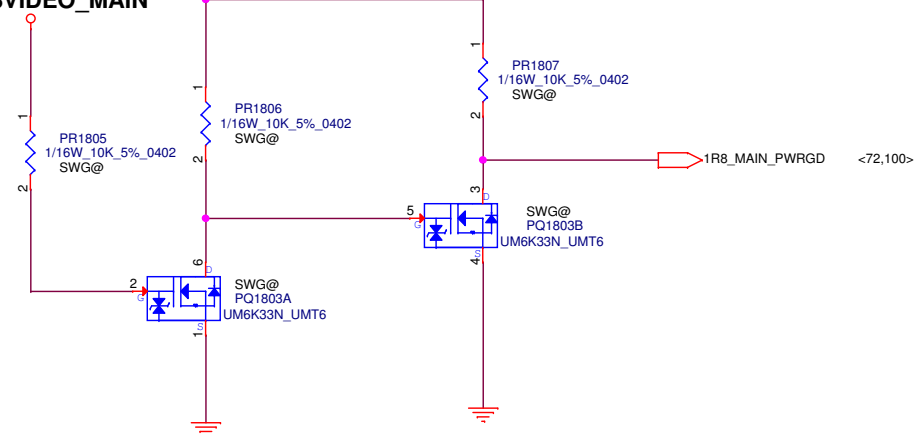
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VCC1R8VIDEO\_MAIN



VCC3\_SUS


VCC1R8VIDEO\_MAIN

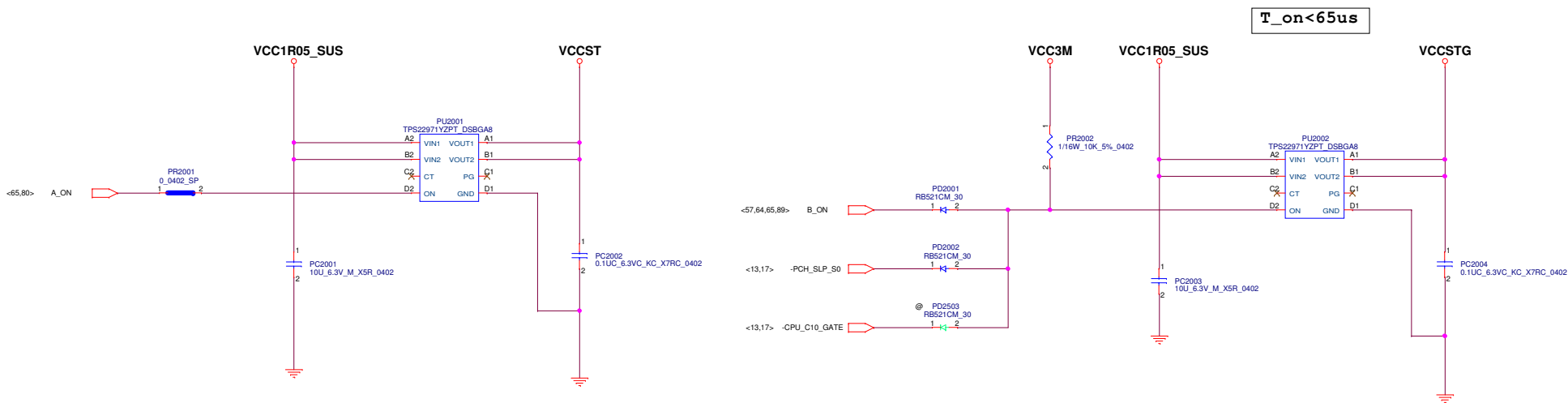


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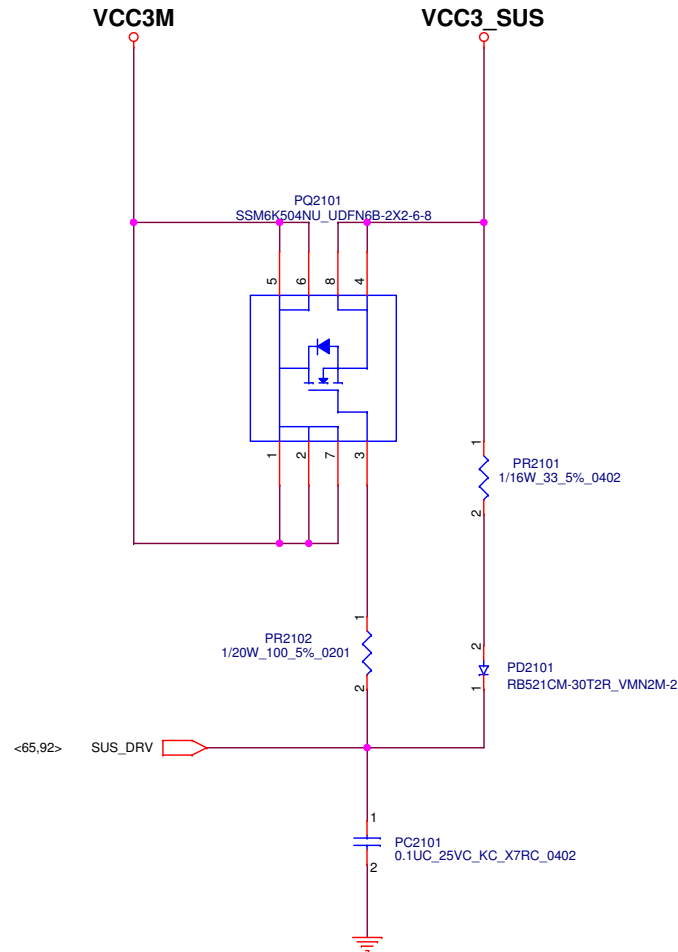
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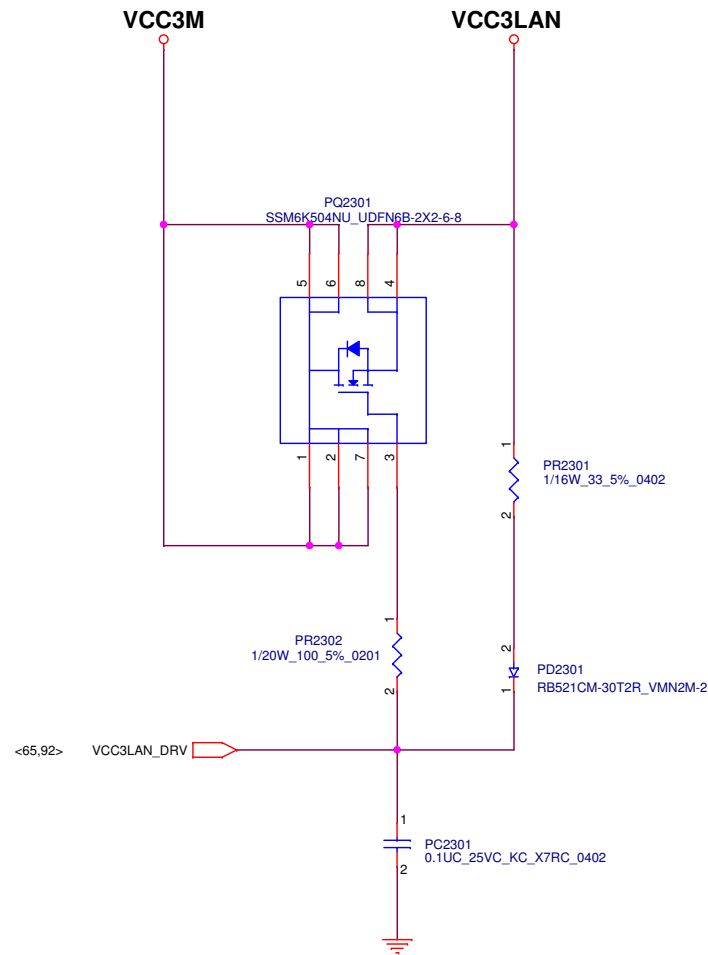



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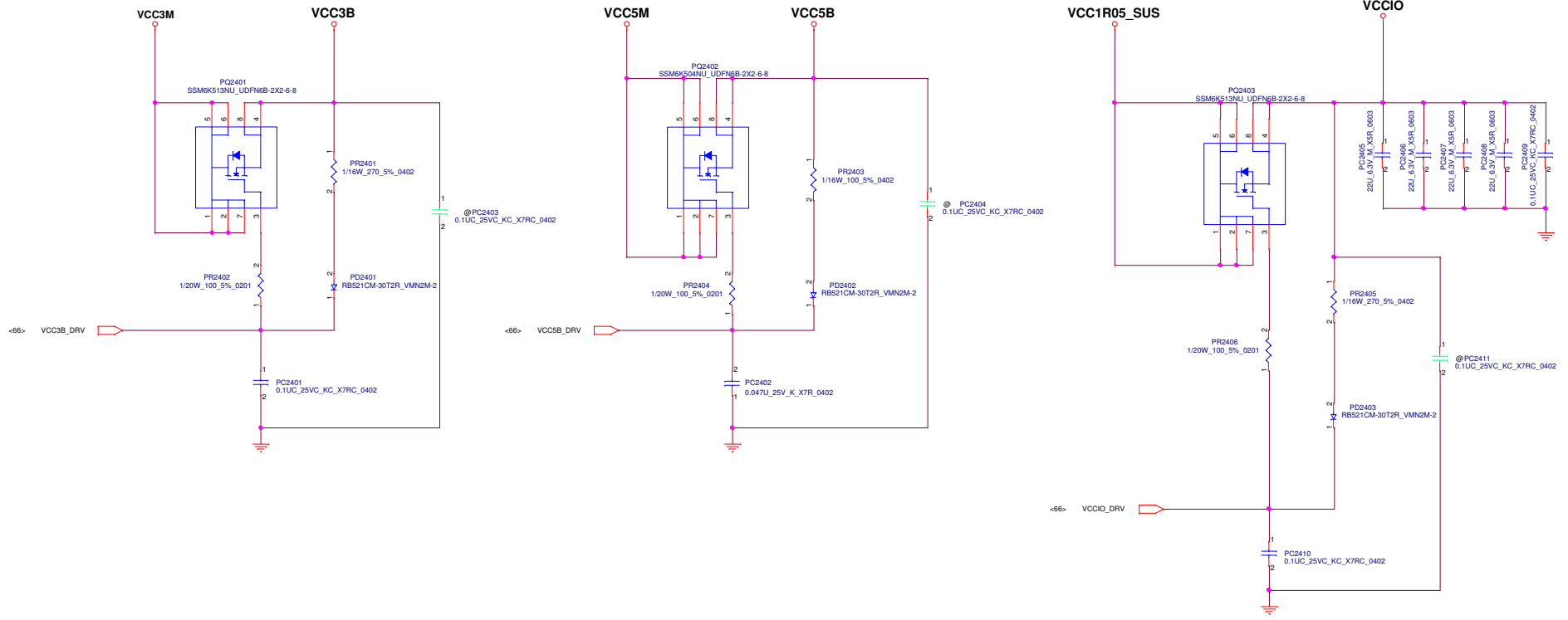
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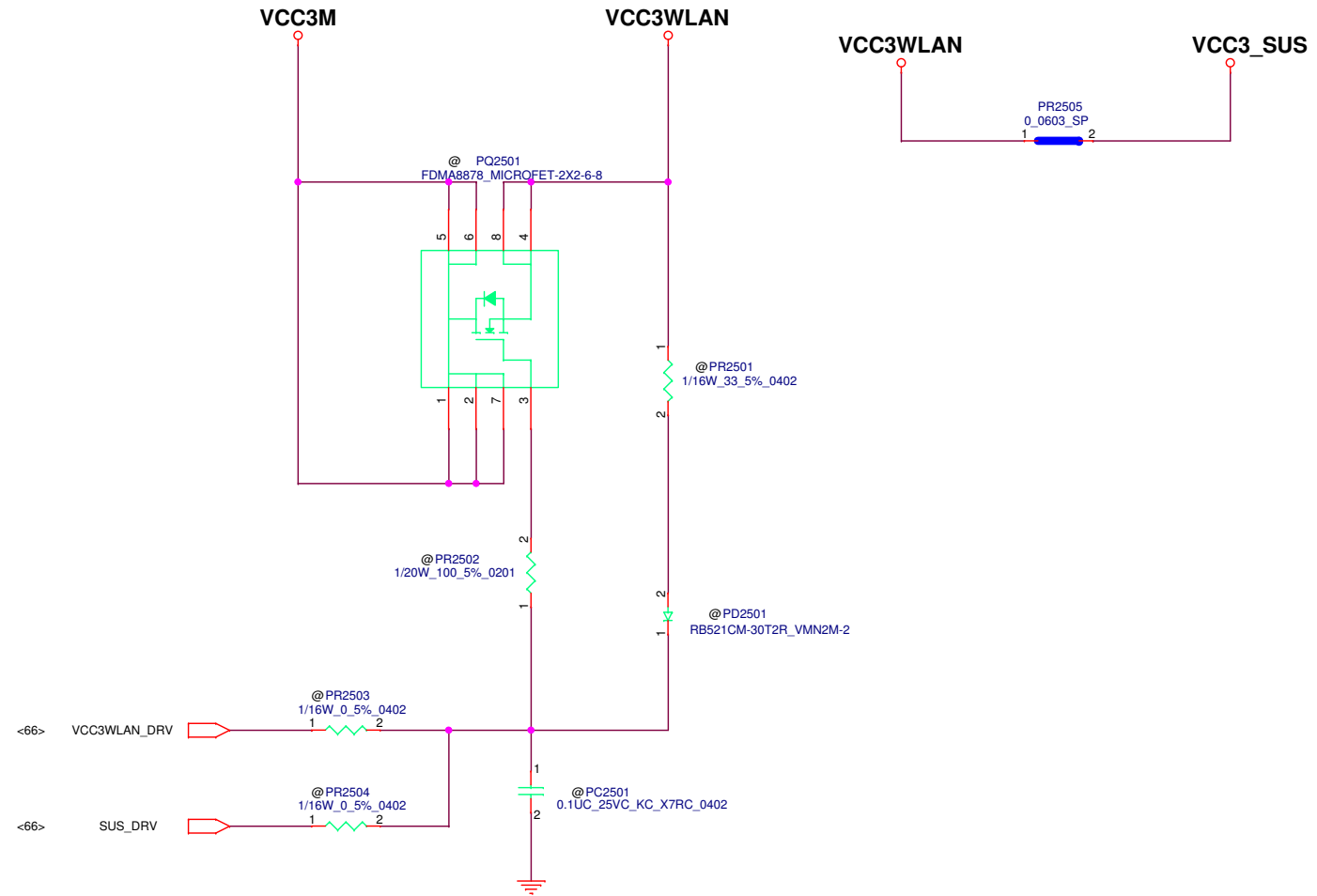
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