Ratchet-1 WHL SVT Logic Schematics

RT1WL-3
VER 3.12
April/1/2019

BASE LOGIC :
Ratchet-1 WHL SIT Logic Schematic Ver 2.18

Lenovo

Project Name : Ratchet-1	Title : TITLE PAGE
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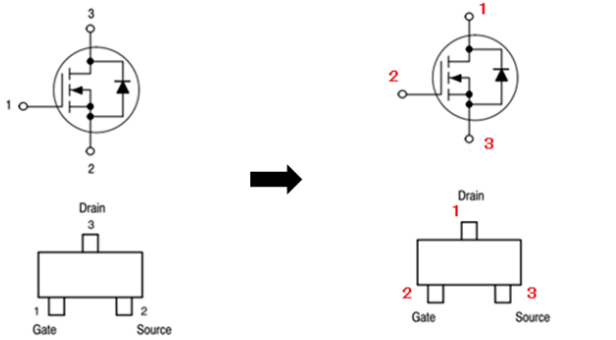
EC HISTORY

RT1IL-3
(Base Logic : Ratchet-1 WHL SIT Logic Schematic Ver. 2.18)

VER.3.00 2019/02/18 APPLIED Ratchet-1 SVT EC001,EC002
VER.3.01 2019/02/19 APPLIED Ratchet-1 SVT EC003
VER.3.02 2019/02/20 APPLIED Ratchet-1 SVT EC004,EC005
VER.3.03 2019/02/21 APPLIED Ratchet-1 SVT EC006,EC007,EC008,EC009,EC010
VER.3.04 2019/02/22 APPLIED Ratchet-1 SVT EC011
VER.3.05 2019/02/25 APPLIED Ratchet-1 SVT EC012,EC013
VER.3.06 2019/02/27 APPLIED Ratchet-1 SVT EC014,EC015
VER.3.07 2019/03/04 APPLIED Ratchet-1 SVT EC016,EC017,EC018
VER.3.08 2019/03/13 APPLIED Ratchet-1 SVT EC019,EC020
VER.3.09 2019/03/14 APPLIED Ratchet-1 SVT EC021
VER.3.10 2019/03/15 APPLIED Ratchet-1 SVT EC022,EC023
VER.3.11 2019/03/20 APPLIED Ratchet-1 SVT EC024
VER.3.12 2019/04/01 APPLIED Ratchet-1 SVT EC025,EC026,EC027

LCFC 3Pin Symbol rule
Orcad Symbol & PCB Footprint pin assignment

Use common rule, Top side is Pin1, not follow original datasheet definition to avoid confusion with different vender definition. Below is an example.



part supplier pin assignment

LCFC common pin assignment

TABLE: Chip Capacitor Thermal Characteristics

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

TABLE: Chip Capacitor Tolerance

Tolerance	Code
+/-0.1pF +/-0.25pF +/-0.5pF	B C D
+/-5% +/-10% +/-20% +80/-20%	J K M Z

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
2.00 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

LOGIC

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Project Name : Ratchet-1	Title : EC HISTORY
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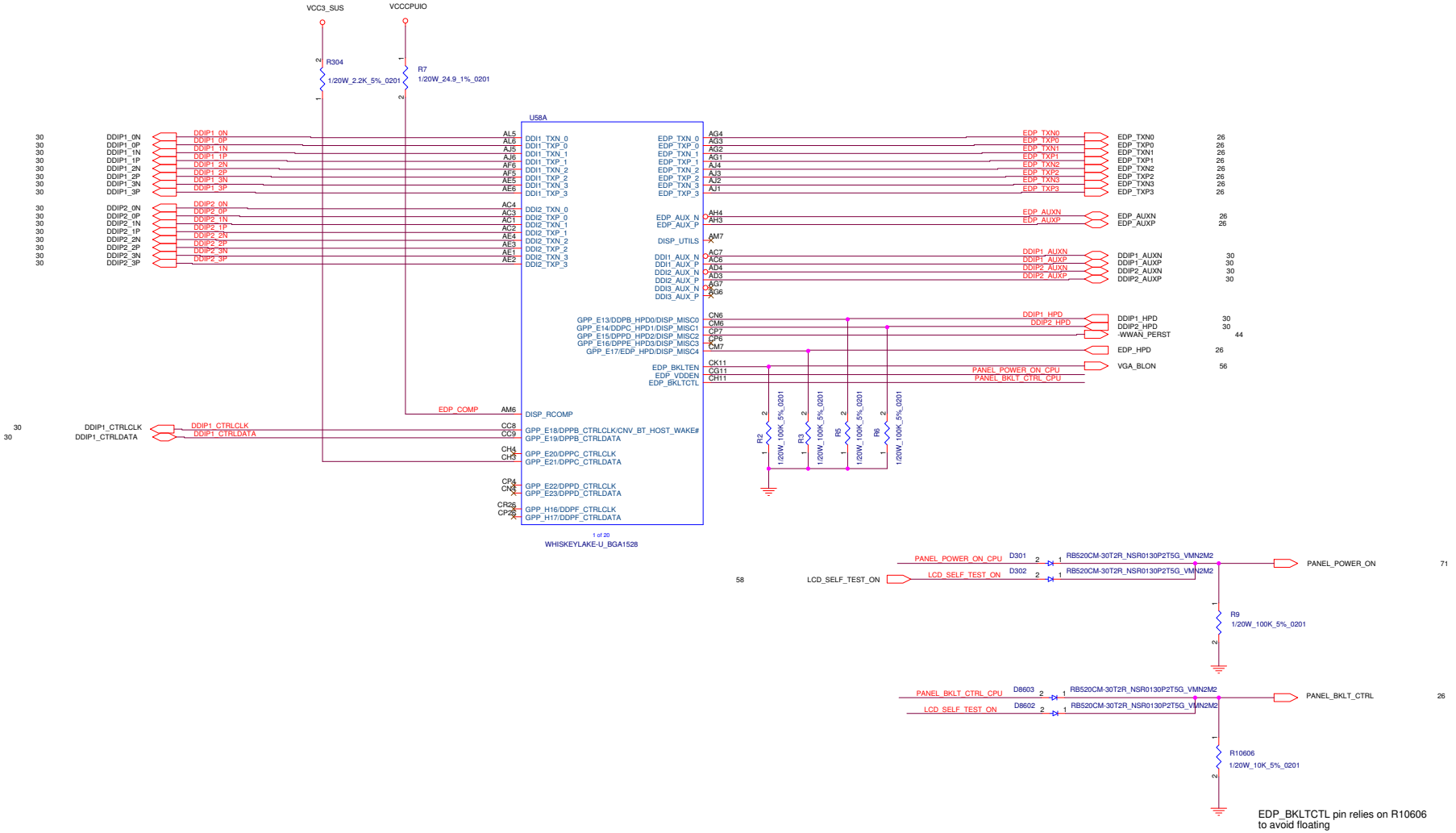
TABLE : Functional Strap

GPP_E19/DDPB_CTRLDATA(DISPLAY PORT B DETECTED)	
GPP_E21/DDPC_CTRLDATA(DISPLAY PORT C DETECTED)	
GPP_E23/DDPD_CTRLDATA(DISPLAY PORT D DETECTED)	
HIGH	**ENABLE**
LOW	**DISABLE**



EDP_BKLTCTL pin relies on R10606 to avoid floating

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Project Name : Ratchet-1		Title : CPU(1/16) : DDI/EDP	
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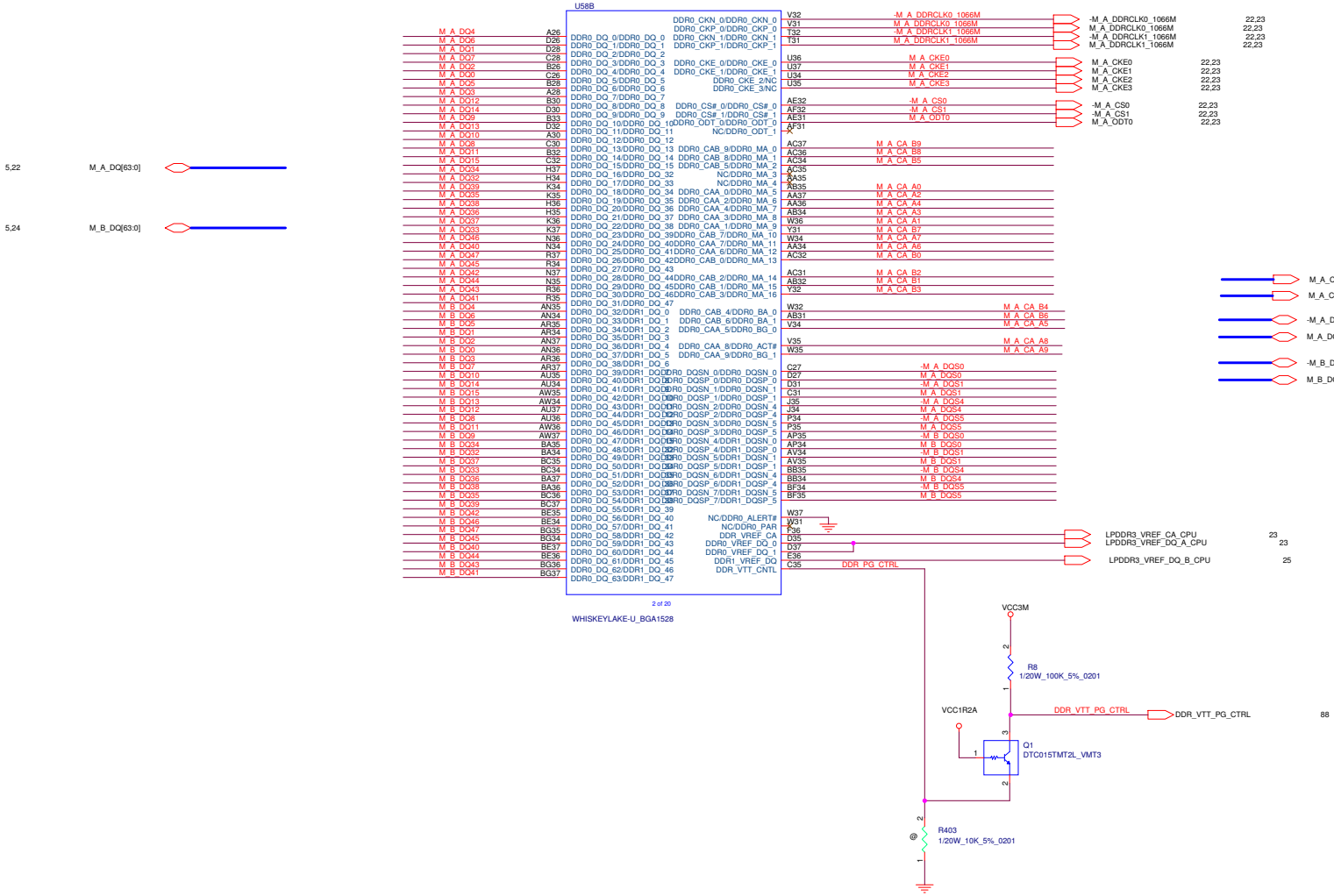

Project Name : Ratchet-1	Title : CPU(2/16) : DDR (1/2)
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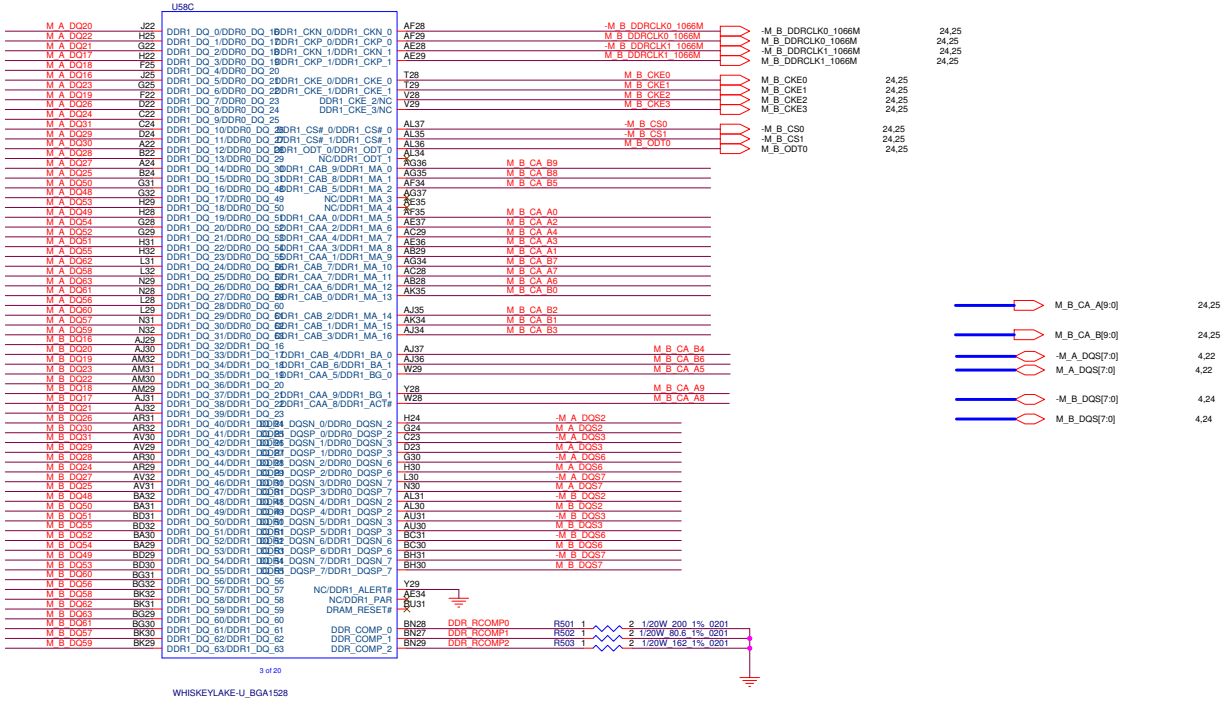

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Project Name : Ratchet-1	Title : CPU(3/16) : DDR (2/2)
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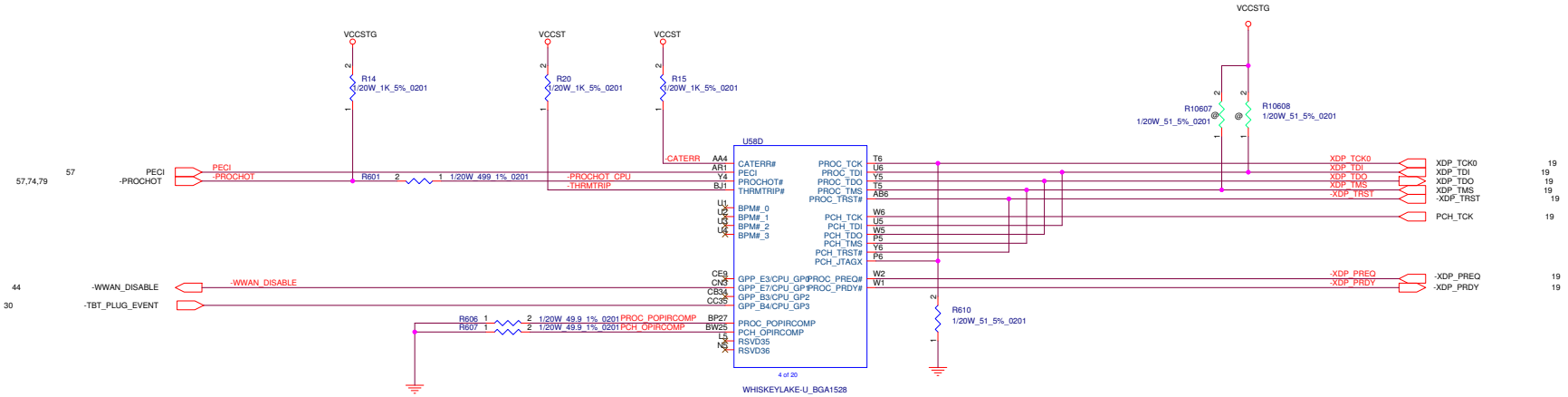

Project Name : Ratchet-1	Title : CPU(4/16) : MISC/JTAG
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TABLE : Functional Strap

SPI0_IO2 (Consent Strap)	
HIGH	Disable (Default)
LOW	Enable

← LOGIC

TABLE : Functional Strap

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

← LOGIC

TABLE : Functional Strap

GPP_C2/SMLALERT#(TLS Confidentiality)	
HIGH	Enable ME Crypto TLS with Confidentiality
LOW	Disable ME Crypto TLS (Default)

← LOGIC

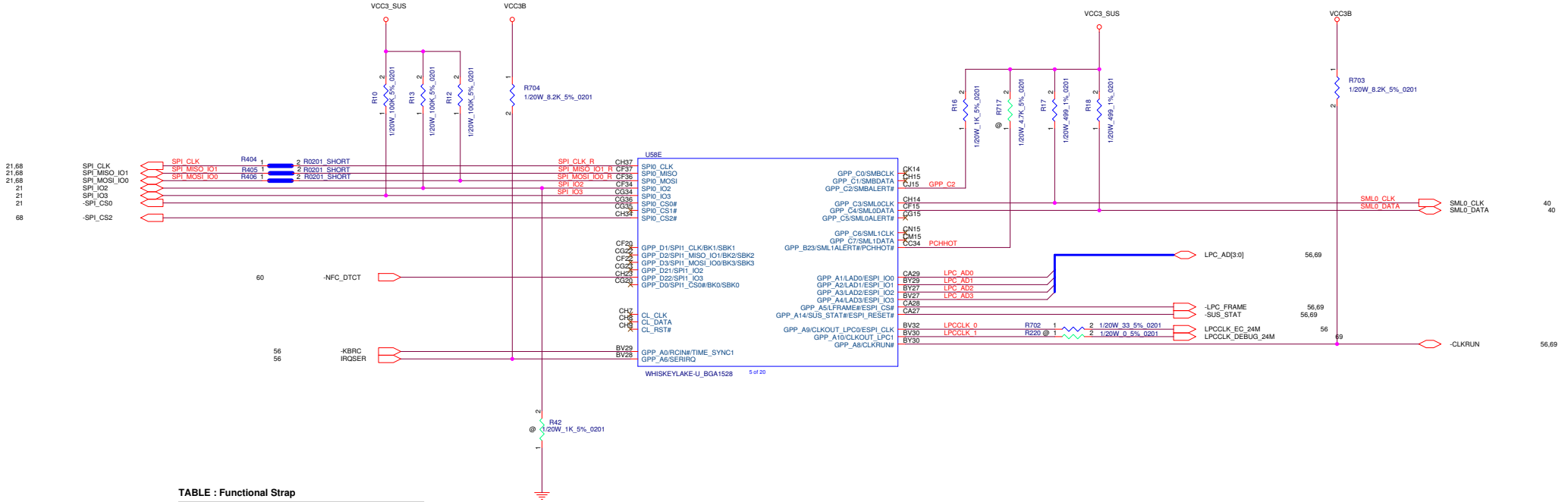

TABLE : Functional Strap

GPP_C5/SML0ALERT# (LPC or eSPI)	
HIGH	eSPI is selected
LOW	LPC is selected (Default)

← LOGIC

Project Name : Ratchet-1	Title : CPU(5/16) : LPC/SPI/SMBUS/C-LINK
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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 Destination)	
HIGH	Boot BIOS from LPC
LOW	Boot BIOS from SPI(Default)

← LOGIC

TABLE : Functional Strap

GPP_F6/CNV_RGI_DT(M.2 CNVi Mode Select)	
HIGH	Integrated CNVi Disabled
LOW	Integrated CNVi Enabled

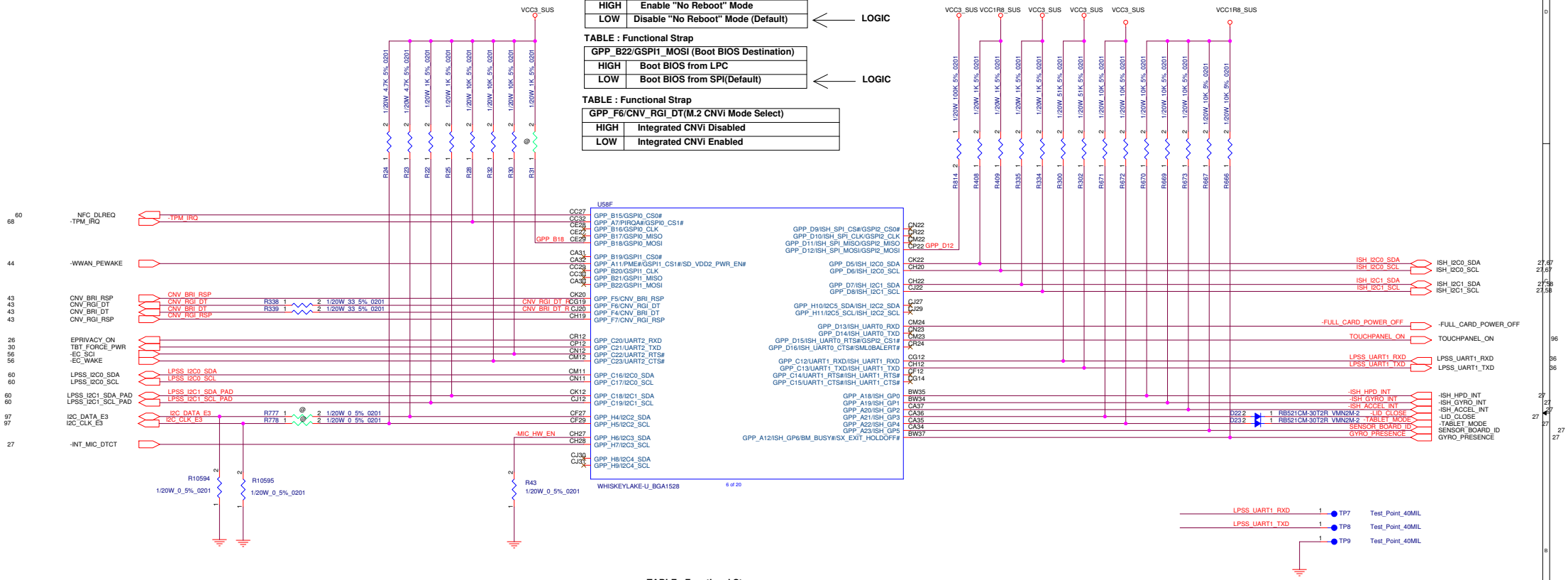

TABLE : Functional Strap

GPP_D12(JTAG ODT Disable)	
HIGH	JTAG ODT Enable (Default)
LOW	JTAG ODT Disable

← LOGIC

Project Name : Ratchet-1	Title : CPU(6/16) : LPSS/ISH	
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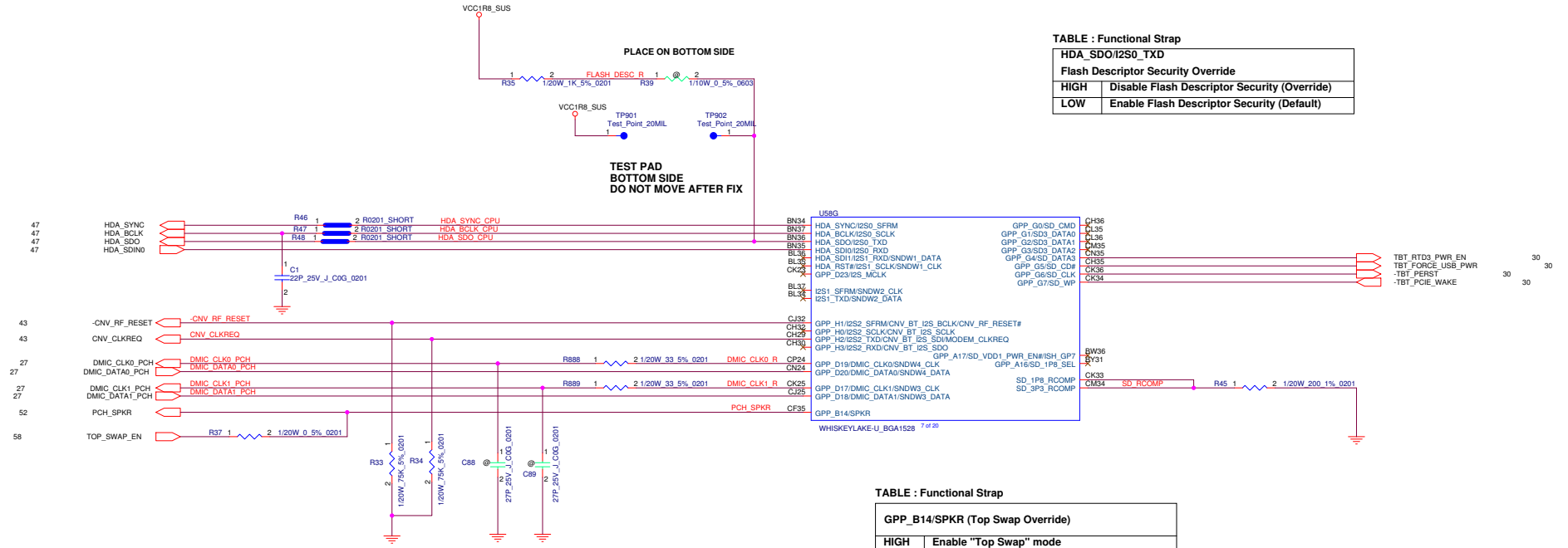

TABLE : Functional Strap

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

TABLE : Functional Strap

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

← LOGIC

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Project Name : Ratchet-1		Title : CPU(7/16) : AUDIO/SDXC	
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Flexible I/O Configuration

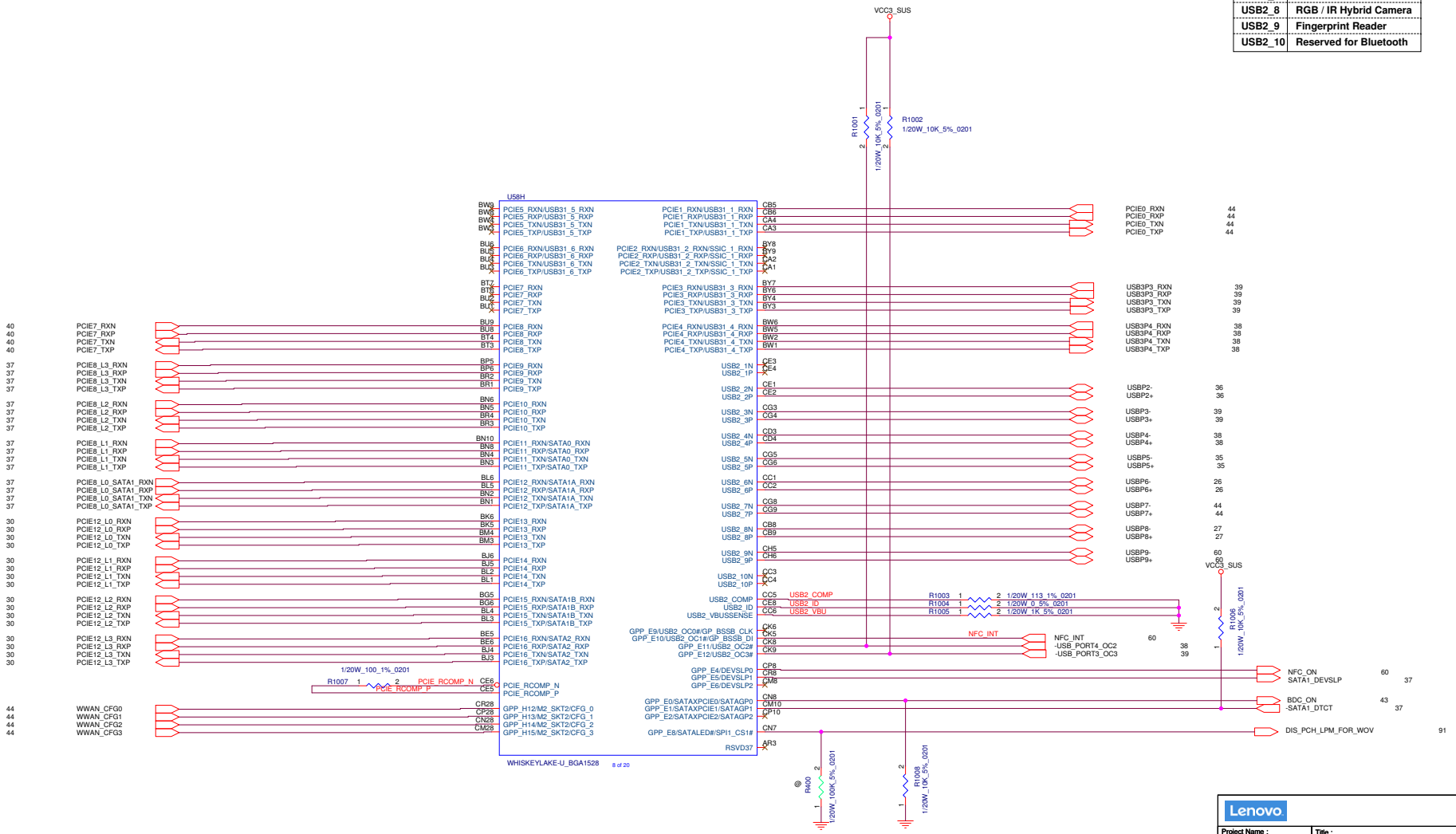
HSIO Port	High Speed Signals	PCI Device	PCI Function	HSIO Configuration	Descriptor for PCIe	Net Name	PCI Device	PCI Function
Port 1	USB3 1 / PCIE 1	1Ch	0h	PCIE 1	4x1 LaneReversal Disabled	PCIE0	1Ch	0h
Port 2	USB3 2 / PCIE 2		1h	PCIE 2		PCIE1		1h
Port 3	USB3 3 / PCIE 3		2h	USB3 3		USB3P3		
Port 4	USB3 4 / PCIE 4		3h	USB3 4		USB3P4		
Port 5	USB3 5 / PCIE 5	1Ch	4h	PCIE 5	4x1 LaneReversal Disabled	N/A		
Port 6	USB3 6 / PCIE 6		5h	PCIE 6		N/A		
Port 7	PCIE 7 (GbE)		6h	PCIE 7		N/A		
Port 8	PCIE 8 (GbE)		7h	PCIE 8 (GbE)		PCIE7	1Fh	6h
Port 9	PCIE 9 (GbE)	1Dh	0h	PCIE 9 (x4)	1x4 LaneReversal Enabled	PCIE8_L3	1Dh	0h
Port 10	PCIE 10		1h	PCIE 10(x4)		PCIE8_L2		
Port 11	PCIE 11 / SATA 0		2h	PCIE 11(x4)		PCIE8_L1		
Port 12	PCIE 12 / SATA 1A		3h	GPIO STRAP		PCIE8_L0_SATA1		
Port 13	PCIE 13 (GbE)	1Dh	4h	PCIE 13(x4)	1x4 LaneReversal Disabled	PCIE12_L0	1Dh	4h
Port 14	PCIE 14 (GbE)		5h	PCIE 14(x4)		PCIE12_L1		
Port 15	PCIE 15 / SATA 1B		6h	PCIE 15(x4)		PCIE12_L2		
Port 16	PCIE 16 / SATA 2		7h	PCIE 16(x4)		PCIE12_L3		

PCIe Port Assignment	
PCIE 1	WWAN
PCIE 2	N/A
PCIE 3	(USB3_3)
PCIE 4	(USB3_4)
PCIE 5	N/A
PCIE 6	N/A
PCIE 7	N/A
PCIE 8	GBE
PCIE 9 (x4)	NVMe SSD
PCIE 13 (x4)	Alpine Ridge-DP

SATA Port Assignment	
SATA 0	(PCIE11)
SATA 1A	SATA SSD
SATA 1B	(PCIE15)
SATA 2	(PCIE16)

USB 3.1 Port Assignment	
USB3_1	(PCIE1)
USB3_2	(PCIE2)
USB3_3	Type-A Port (AOU)
USB3_4	Type-A Port (DCI)
USB3_5	(PCIE5)
USB3_6	(PCIE6)

USB 2.0 Port Assignment	
USB2_1	(Reserved)
USB2_2	Type-C Port A
USB2_3	Type-A Port (AOU)
USB2_4	Type-A Port (DCI)
USB2_5	Type-C Port B (DOCK)
USB2_6	Touch Panel
USB2_7	WWAN Card
USB2_8	RGB / IR Hybrid Camera
USB2_9	Fingerprint Reader
USB2_10	Reserved for Bluetooth



Project Name : Ratchet-1	Title : CPU(8/16) : PCIE/USB/SATA
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TABLE : Functional Strap

GPP_H23(eSPI Flash Sharing Mode)	
HIGH	Enable SAFS
LOW	Enable MAFS(Default)

← LOGIC

TABLE : Functional Strap

GPP_H21 (XTAL Frequency Select)	
HIGH	24MHz XTAL selected
LOW	38.4MHz XTAL frequency selected (Default)

← LOGIC

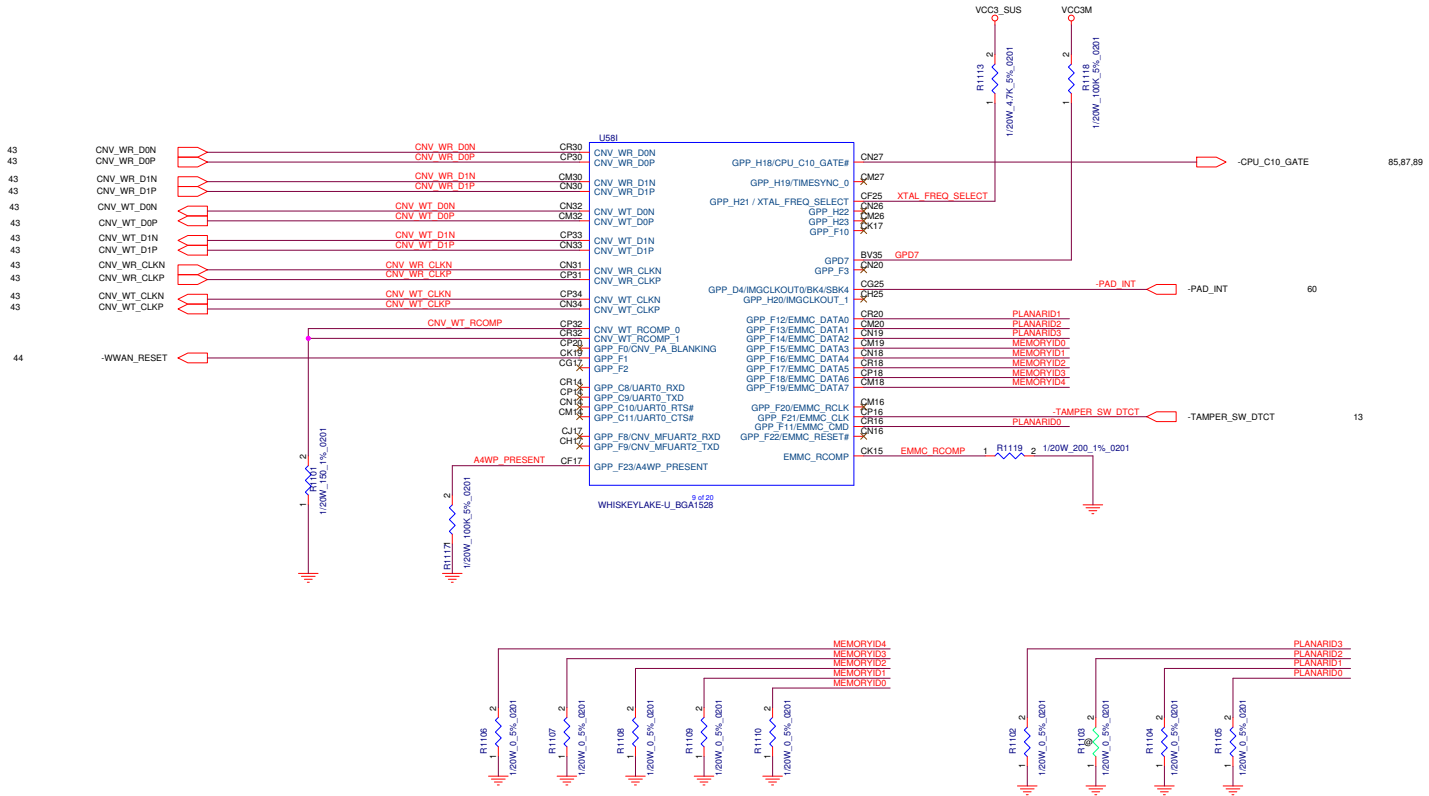

TABLE:

MEMORYID[4:0]	U170,U171,U172,U173			Capacity
00h (00000b)	Samsung	K4E6E304EC-EGCG	16Gbit DDP	8GB
01h (00001b)		K4EBE304EC-EGCG	32Gbit QDP	16GB
02h (00010b)	SK hynix	H9CCNNNBJTALAR-NVD	16Gbit DDP	8GB
03h (00011b)		H9CCNNNCLGALAR-NVD	32Gbit QDP	16GB
04h (00100b)	Samsung	K4E6E304EB-EGCG	16Gbit DDP	8GB
05h (00101b)		K4EBE304EB-EGCG	32Gbit QDP	16GB
06h (00110b)		K4E6E304ED-EGCG	16Gbit DDP	8GB
07h (00111b)		K4EBE304ED-EGCG	32Gbit QDP	16GB
08h (01000b)	Nanya	NT6CL512T32AM-H0	16Gbit DDP	8GB

TABLE

LEVEL	PLANAR ID			
	3	2	1	0
	R1102	R1103	R1104	R1105
1	NA	NA	NA	NA
0	ASM	ASM	ASM	ASM

TABLE

LEVEL	PLANARID[3:0]
EVT	0000B
FVT	0001B
ME SIT	0010B
SIT	0011B
SVT	0100B

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Project Name : Ratchet-1	Title : CPU(9/16) : CSI-2/EMMC/CNVI
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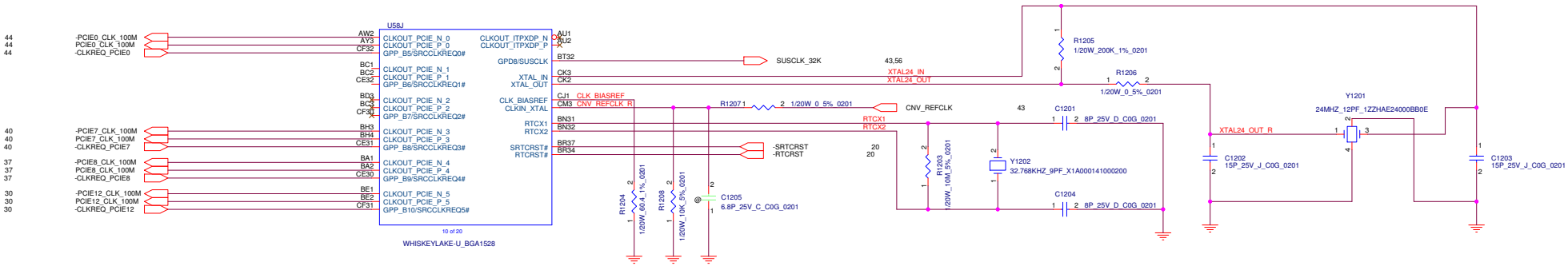

TABLE of Y1202		
Vendor	P/N	LCFC P/N
EPSON	X1A000141000200	SJ10000IX00
TXC	9H03280012	SJ10000J900
KDS	1TJF090DJ1A000B	SJ100069400

TABLE of Y1201		
Vendor	P/N	LCFC P/N
KDS	1ZZHAE24000BB0E	SJ10000TG00
TXC	8Y24080004	SJ10000TN00

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Project Name : Ratchet-1	Title : CPU(10/16) : CLOCK SIGNALS
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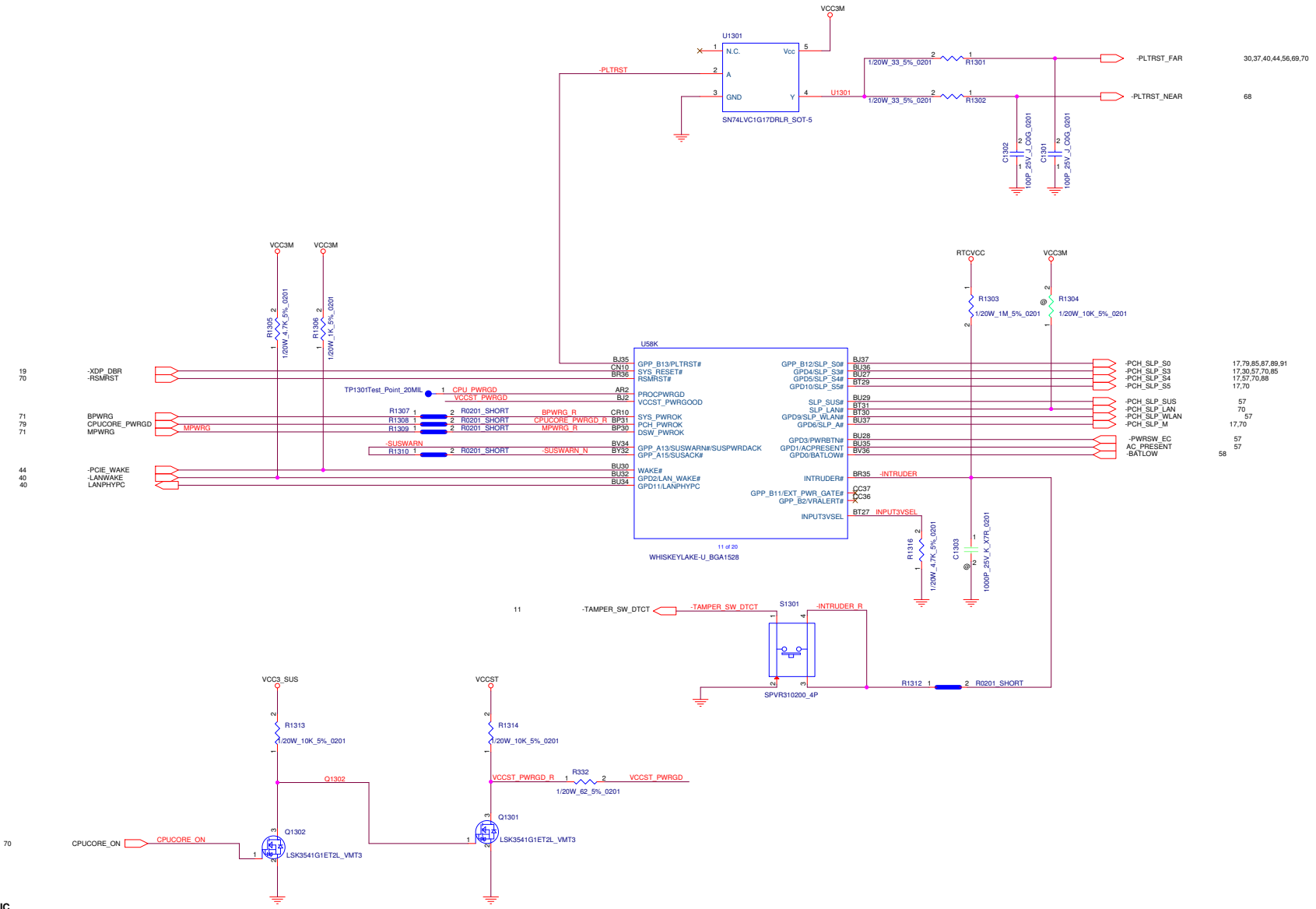

TABLE : Functional Strap

INPUT3VSEL (3.0V Select)	
HIGH	3.3V supply is 3.0V +/- 5%
LOW	3.3V supply is 3.3V +/- 5%

← LOGIC

Project Name : Ratchet-1	Title : CPU(11/16) : SYSTEM PM
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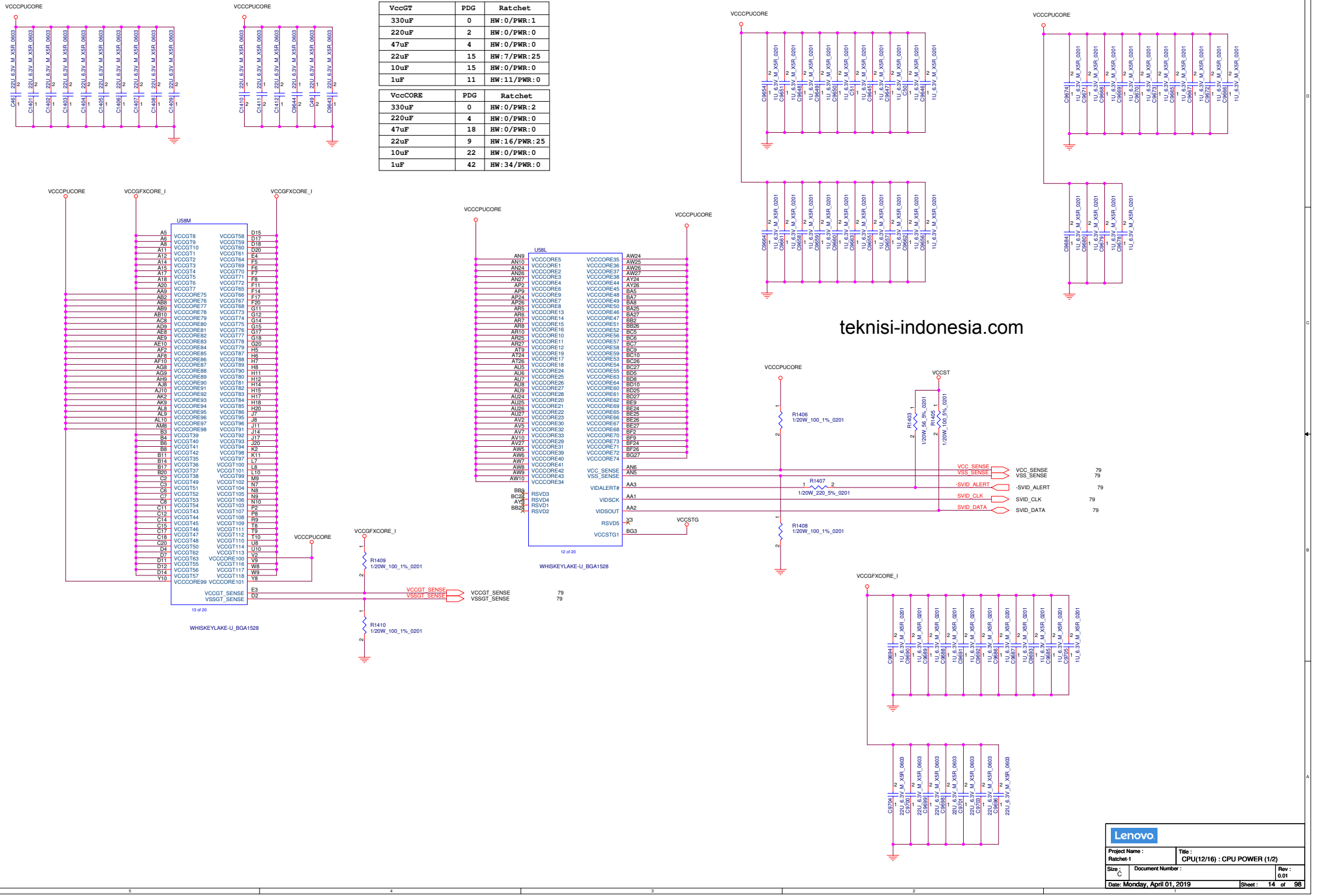
VccGT	PDG	Ratchet
330uF	0	HW:0/PWR:1
220uF	2	HW:0/PWR:0
47uF	4	HW:0/PWR:0
22uF	15	HW:7/PWR:25
10uF	15	HW:0/PWR:0
1uF	11	HW:11/PWR:0

VccCORE	PDG	Ratchet
330uF	0	HW:0/PWR:2
220uF	4	HW:0/PWR:0
47uF	18	HW:0/PWR:0
22uF	9	HW:16/PWR:25
10uF	22	HW:0/PWR:0
1uF	42	HW:34/PWR:0



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Project Name : Ratchet-1	Title : CPU(12/16) : CPU POWER (1/2)
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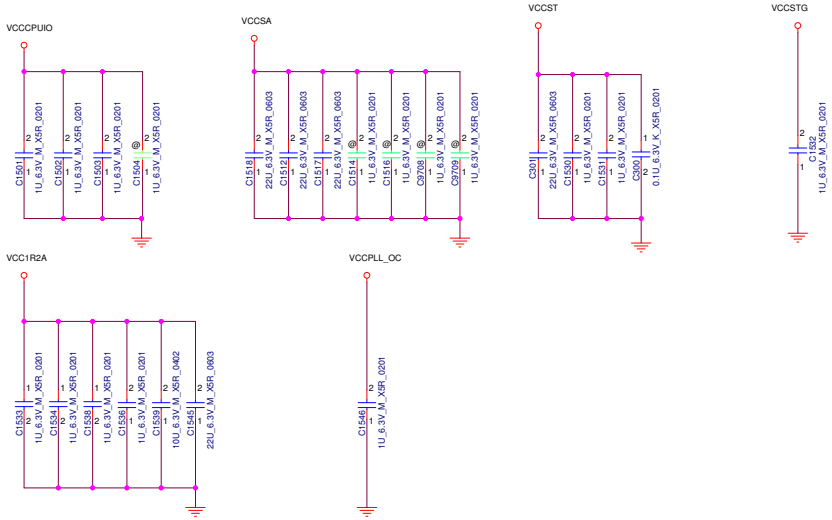


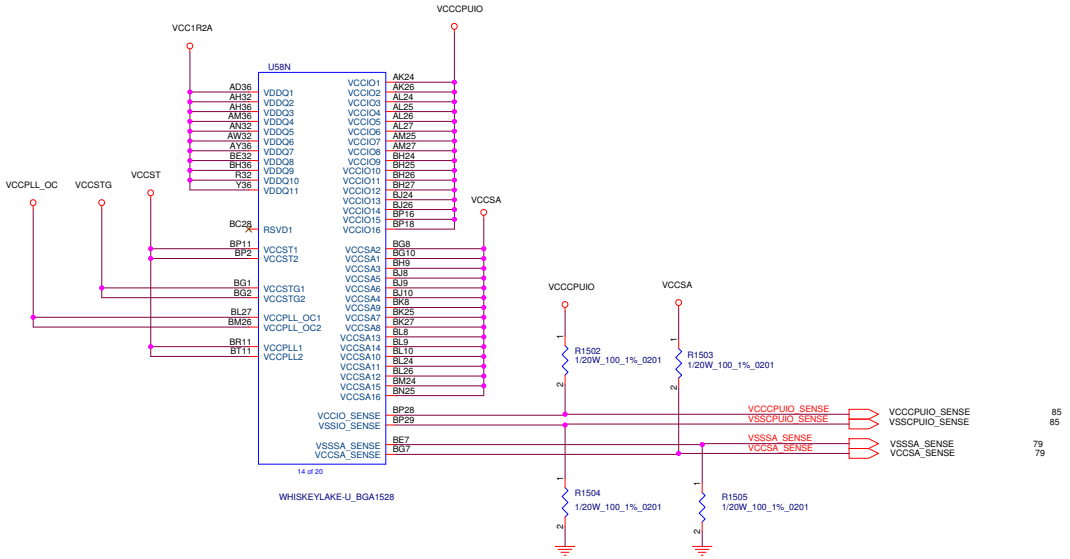
VccSA	PDG	Ratchet
47uF	2	HW:0/PWR:0
22uF	0	HW:3/PWR:6
10uF	13	HW:0/PWR:0
1uF	0	HW:0/PWR:0

VDDQ	PDG	Ratchet
47uF	0	HW:0/PWR:0
22uF	1	HW:1/PWR:5
10uF	9	HW:1/PWR:0/MEM:12
1uF	4	HW:4/PWR:0/MEM:36
0.1uF	0	HW:0/PWR:1
0.01uF	0	HW:0/PWR:1
2200pF	0	HW:0/PWR:1

VccIO	PDG	Ratchet
47uF	0	HW:0/PWR:0
22uF	0	HW:0/PWR:4
10uF	6	HW:0/PWR:0
1uF	4	HW:3/PWR:0
0.1uF	0	HW:0/PWR:1

VccPLL/VCCST	PDG	Ratchet
22uF	0	HW:1/PWR:0
1uF	1	HW:2/PWR:0
0.1uF	1	HW:1/PWR:1

VccPLL_OC	PDG	Ratchet
1uF	1	HW:1/PWR:0



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Project Name : Ratchet-1	Title : CPU(13/16) : CPU POWER (2/2)
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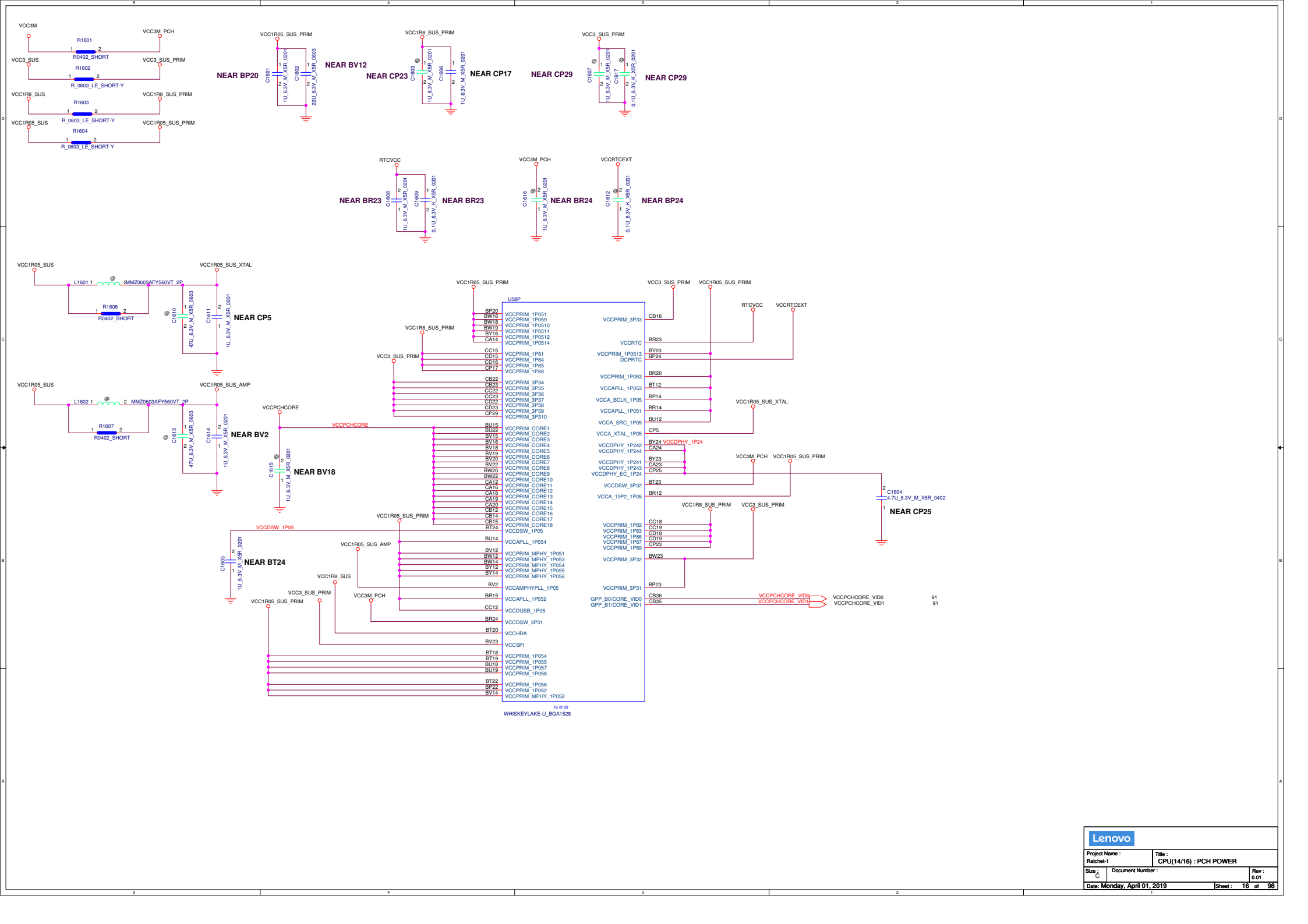

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Project Name : Ratchet-1	Title : CPU(14/16) : PCH POWER	
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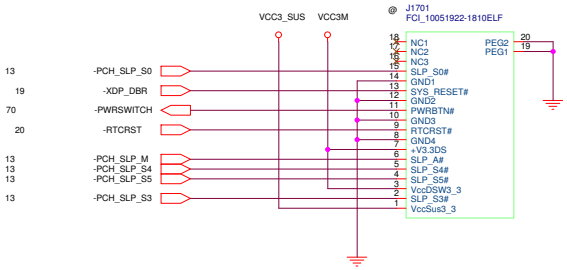
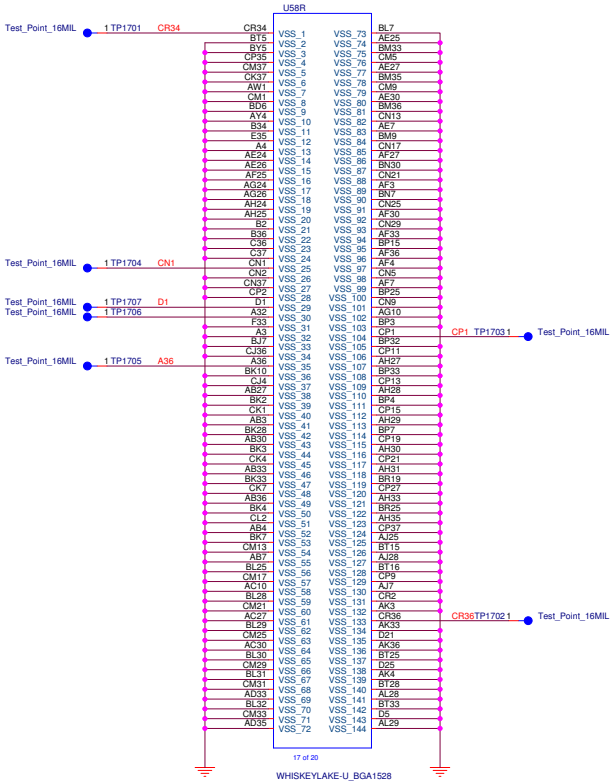
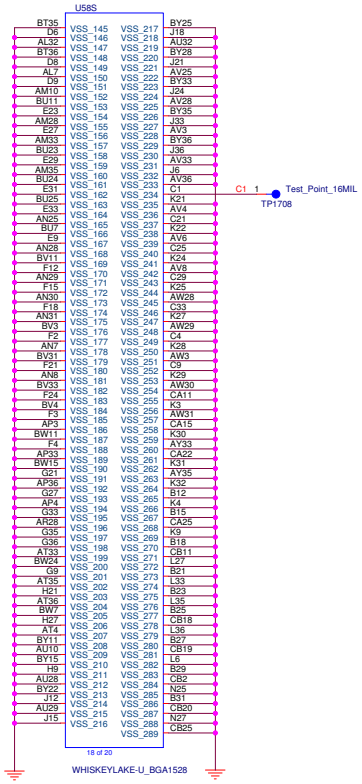
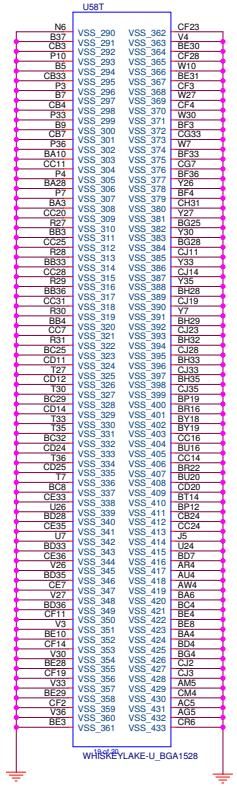
APS/PETS Interface









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Project Name : Ratchet-1	Title : CPU(15/16) : GND
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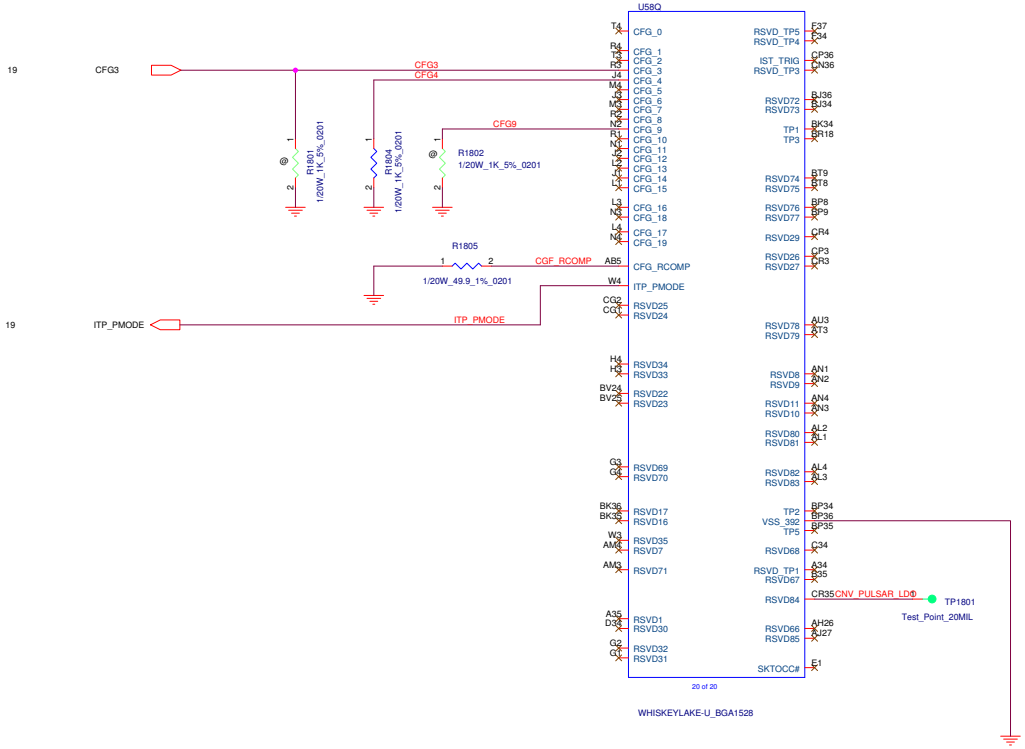
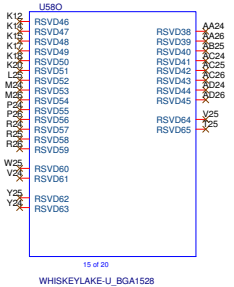
TABLE

CFG0: Stall Reset Sequence after PCU PLL Lock untill de-asserted **1:No Stall** **0: Stall**
CFG3: MSR Privacy Bit Feature **1: MSR (C80h) bit[0] setting** **0: MSR (C80h) bit[0] overridden**
CFG4: eDP Enable **1:Disabled** **0:Enabled**
CFG9: SVID Bus Communication **1:Enabled** **0:Disabled**





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Project Name : Ratchet-1	Title : CPU(16/16) : CFG/RESERVED
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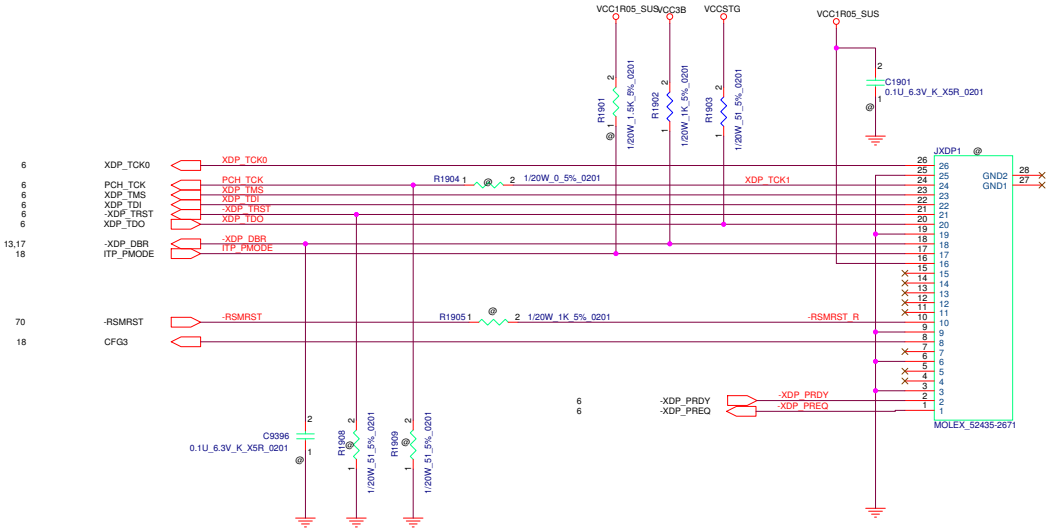

TABLE

Logic	Ref Des	Merged	DCI 2.0
Page 6	R10607	ASM	NO_ASM
	R10608	ASM	NO_ASM
Page 7	R42	ASM	NO_ASM
Page 18	R1801	ASM	NO_ASM
Page 19	JXDP1	ASM	NO_ASM
	C1901	ASM	NO_ASM
	R1903	ASM	ASM
	R1902	ASM	ASM
	R1901	ASM	NO_ASM
	R1905	ASM	NO_ASM
	R1904	ASM	NO_ASM

LOGIC

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Project Name : Ratchet-1	Title : XDP CONNECTOR
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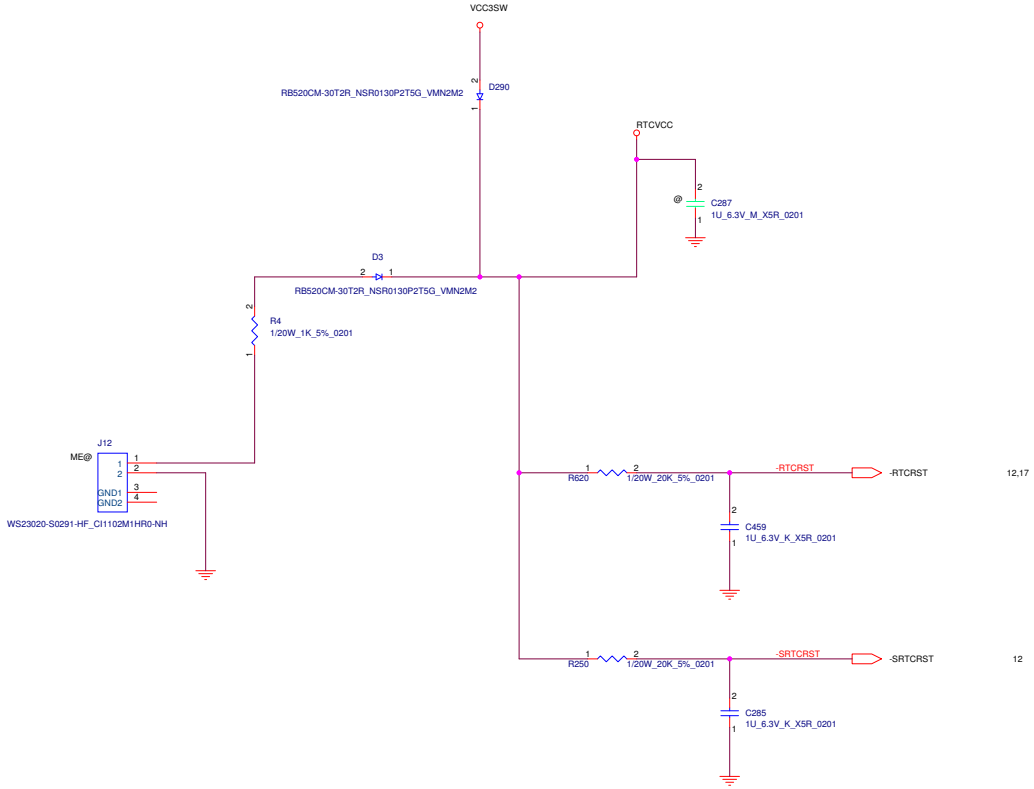
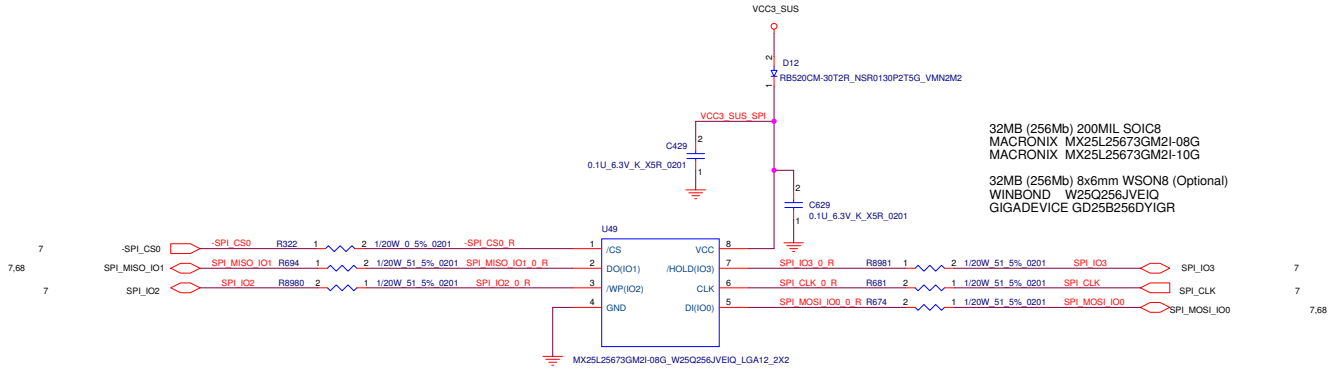


Project Name : Ratchet-1	Title : RTC BATTERY	
Size : C	Document Number :	Rev : 0.01
Date: Monday, April 01, 2019	Sheet : 20 of 98	



32MB (256Mb) 200MIL SOIC8
MACRONIX MX25L25673GM2I-08G
MACRONIX MX25L25673GM2I-10G

32MB (256Mb) 8x6mm WSON8 (Optional)
WINBOND W25Q256JVEIQ
GIGADEVICE GD25B256DYIGR

TABLE

SF100 PIN HEADER INTERFACE (TOP VIEW)					
1	VCC	D12.1	GND	GND	2
3	CS#	R322.2	R681.2	CLK	4
5	MISO	R694.2	R674.2	MOSI	6
7	(KEY)	N/A	N/A	(RESET)	8

Project Name : Ratchet-1		Title : SPI FLASH	
Size : C	Document Number :		Rev : 0.01
Date: Monday, April 01, 2019		Sheet : 21 of 98	

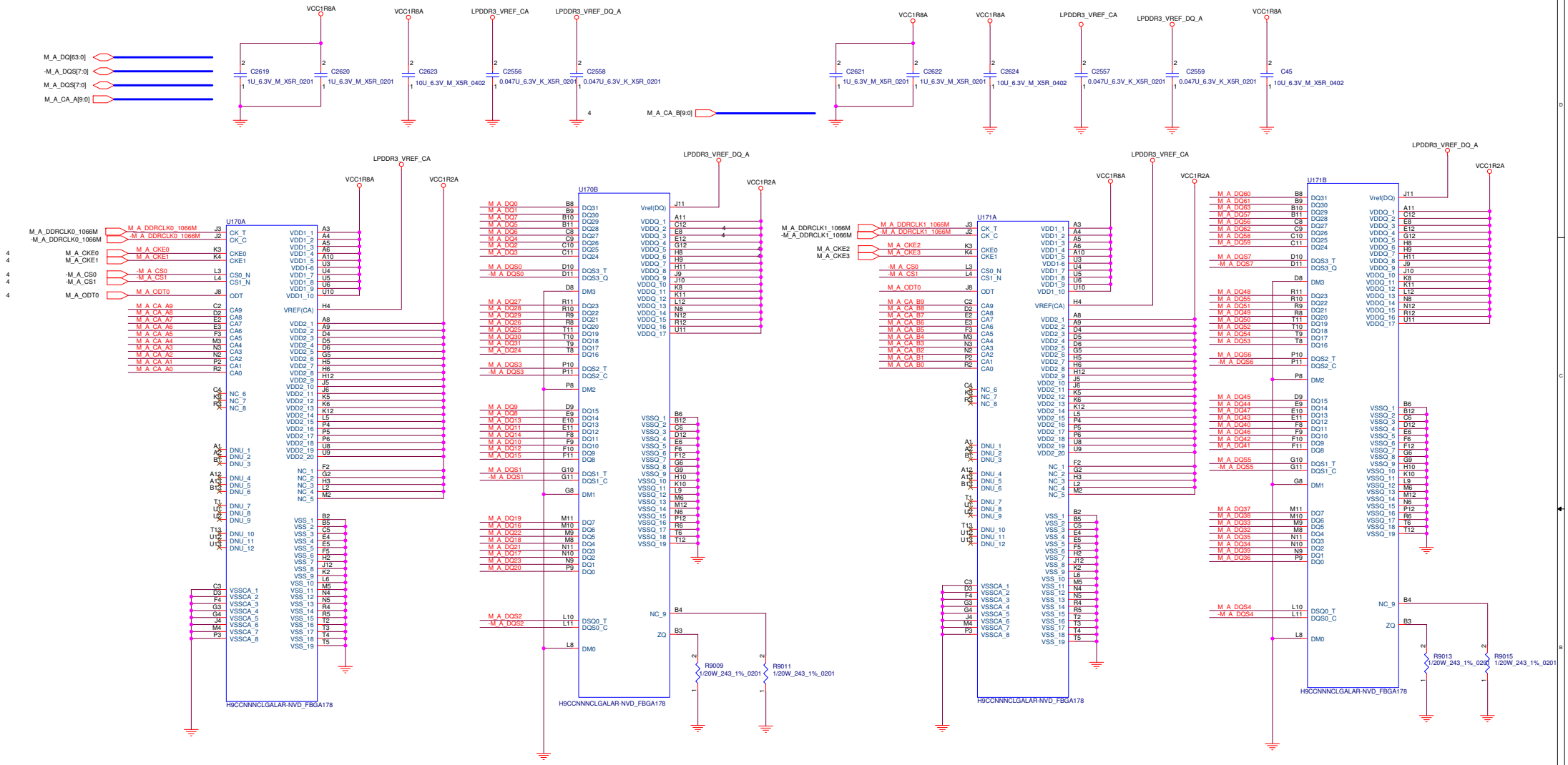


TABLE: LPDDR3 SDRAM Source

Supplier	Capacity	Supplier's P/N	Package Size		Die	Configuration	ZQ0/ZQ	ZQ1/NC	Dual Ch
Samsung	16Gb	K4E6E304EB-EGCG	11.0 x 11.5 mm	DDP	8Gb (256M x32)	2 Rank x (256M x32)	ZQ	NC	8GB
		K4E6E304ED-EGCG	11.0 x 11.5 mm	DDP	8Gb (256M x32)	2 Rank x (256M x32)	ZQ	NC	8GB
	32Gb	K4EBE304EB-EGCG	11.0 x 11.5 mm	QDP	8Gb (512M x16)	2 Rank x (512M x32)	ZQ0	ZQ1	16GB
		K4EBE304ED-EGCG	11.0 x 11.5 mm	QDP	8Gb (512M x16)	2 Rank x (512M x32)	ZQ0	ZQ1	16GB
SK hynix	16Gb	H9CCNNNBJTALAR-NVD	11.0 x 11.5 mm	DDP	8Gb (256M x32)	2 Rank x (256M x32)	ZQ	NC	8GB
	32Gb	H9CCNNNCLGALAR-NVD	11.0 x 11.5 mm	QDP	8Gb (512M x16)	2 Rank x (512M x32)	ZQ0	ZQ1	16GB
Nanya	16Gb	NT6CL512T32AM-H0	10.5 x 11.5 mm	DDP	8Gb (256M x32)	2 Rank x (256M x32)	ZQ	NC	8GB

Lenovo

Project Name : Ratchet-1	Title : LPDDR3 BASE MEMORY CH-A (1/2)
Size : C / Document Number :	Rev : 0.01
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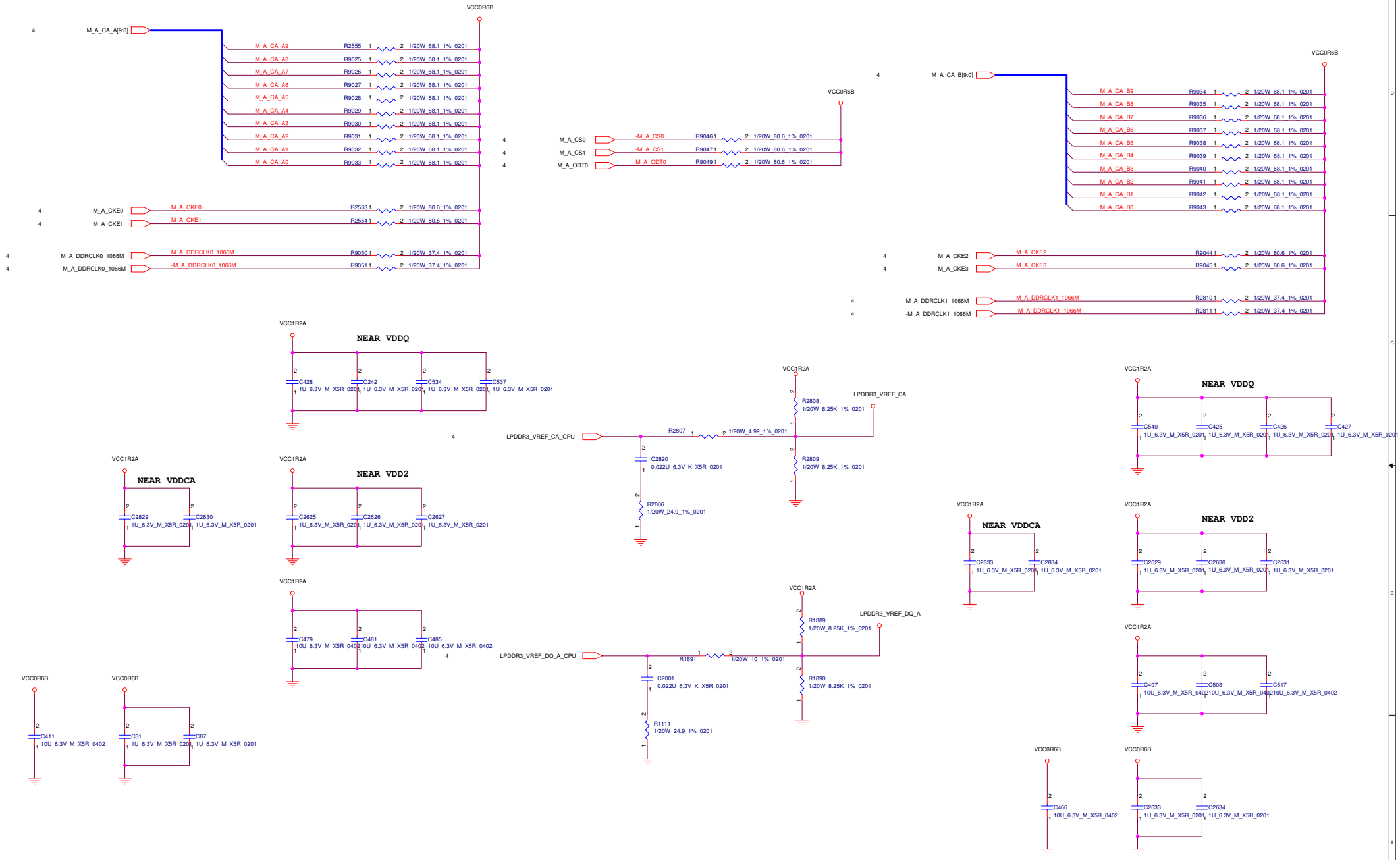

Project Name : Ratchet-1	Title : LPDDR3 BASE MEMORY CH-A (2/2)
Size : C	Document Number :
Date: Monday, April 01, 2019	Rev : 0.01
	Sheet : 23 of 98

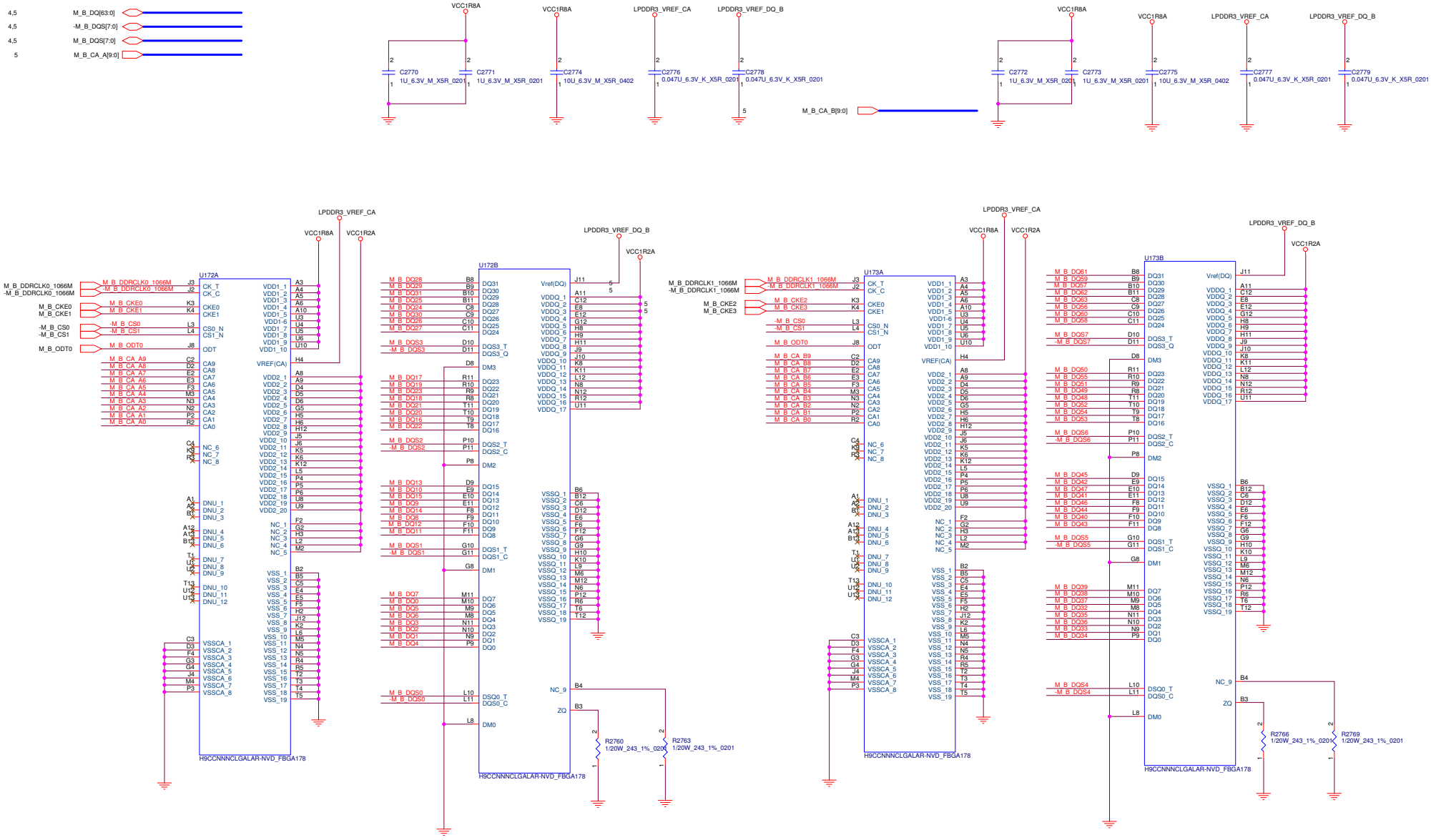

TABLE: LPDDR3 SDRAM Source

Supplier	Capacity	Supplier's P/N	Package Size		Die	Configuration	ZQ0/ZQ	ZQ1/NC	Dual Ch
Samsung	16Gb	K4E6E304EB-EGCG	11.0 x 11.5 mm	DDP	8Gb (256M x32)	2 Rank x (256M x32)	ZQ	NC	8GB
		K4E6E304ED-EGCG	11.0 x 11.5 mm	DDP	8Gb (256M x32)	2 Rank x (256M x32)	ZQ	NC	8GB
	32Gb	K4EBE304EB-EGCG	11.0 x 11.5 mm	QDP	8Gb (512M x16)	2 Rank x (512M x32)	ZQ0	ZQ1	16GB
		K4EBE304ED-EGCG	11.0 x 11.5 mm	QDP	8Gb (512M x16)	2 Rank x (512M x32)	ZQ0	ZQ1	16GB
SK hynix	16Gb	H9CCNNNBJTALAR-NVD	11.0 x 11.5 mm	DDP	8Gb (256M x32)	2 Rank x (256M x32)	ZQ	NC	8GB
	32Gb	H9CCNNNCLGALAR-NVD	11.0 x 11.5 mm	QDP	8Gb (512M x16)	2 Rank x (512M x32)	ZQ0	ZQ1	16GB
Nanya	16Gb	NT6CL512T32AM-H0	10.5 x 11.5 mm	DDP	8Gb (256M x32)	2 Rank x (256M x32)	ZQ	NC	8GB

Lenovo

Project Name : Ratchet-1	Title : LPDDR3 BASE MEMORY CH-B (1/2)
Size : C	Document Number :
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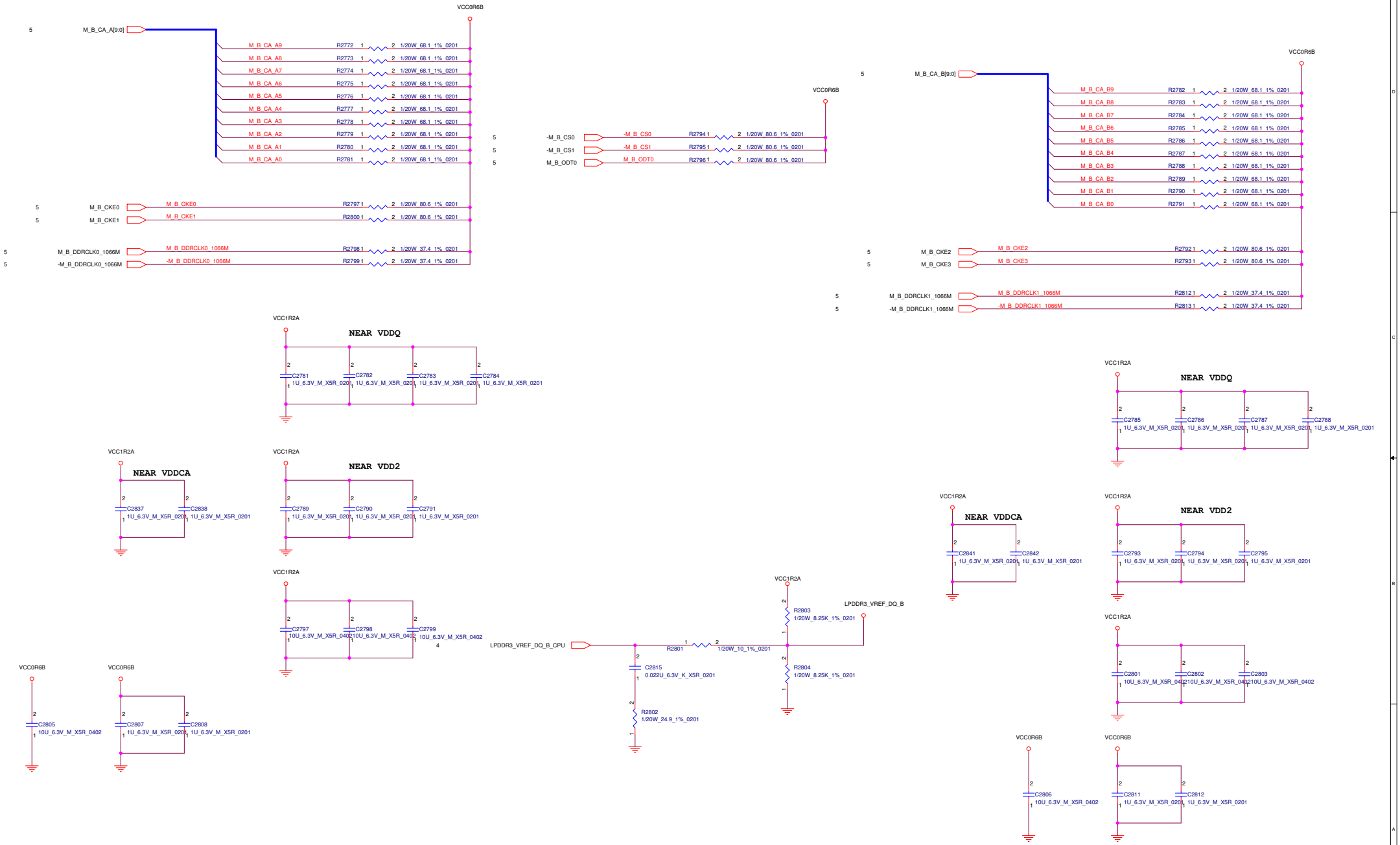
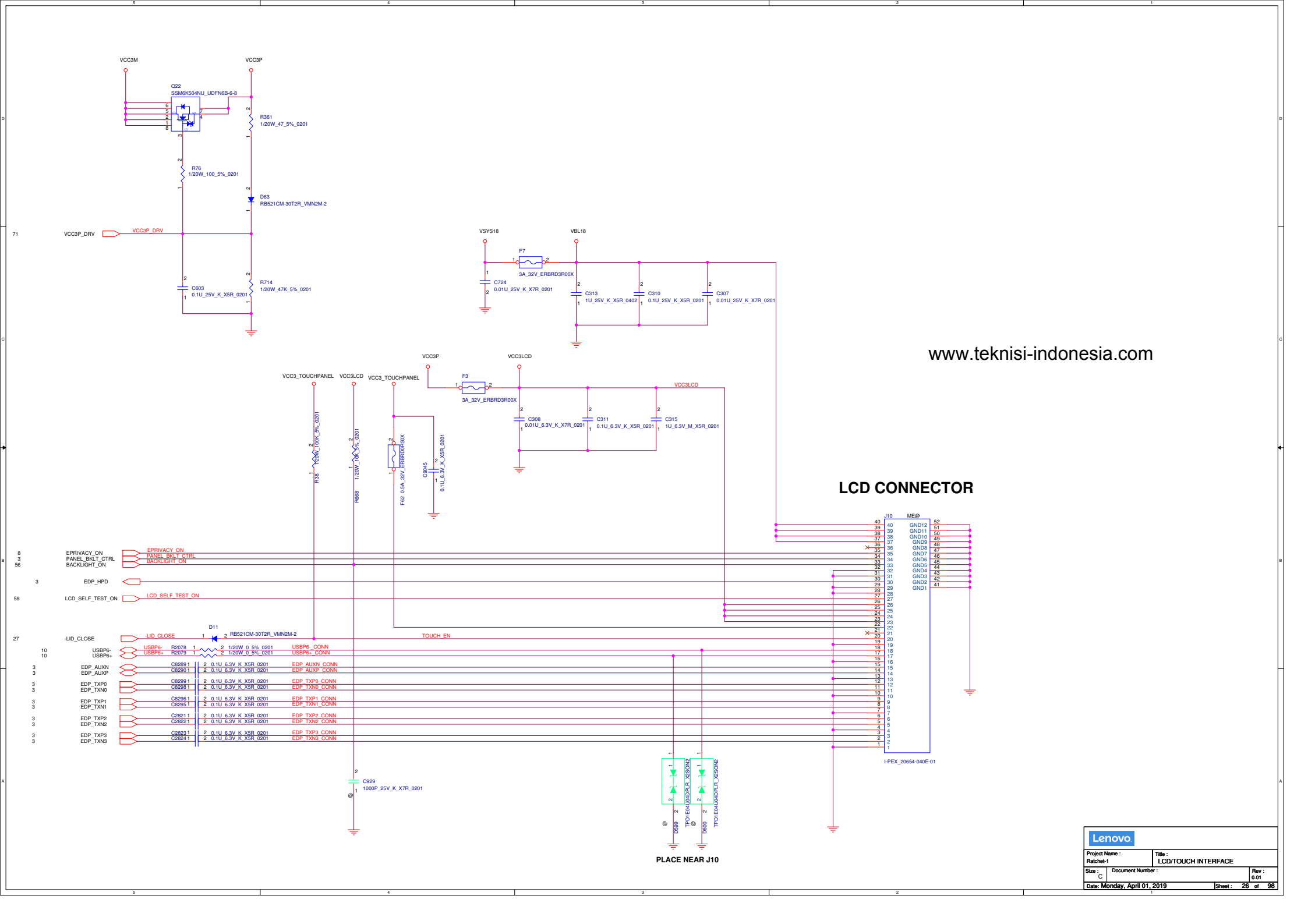
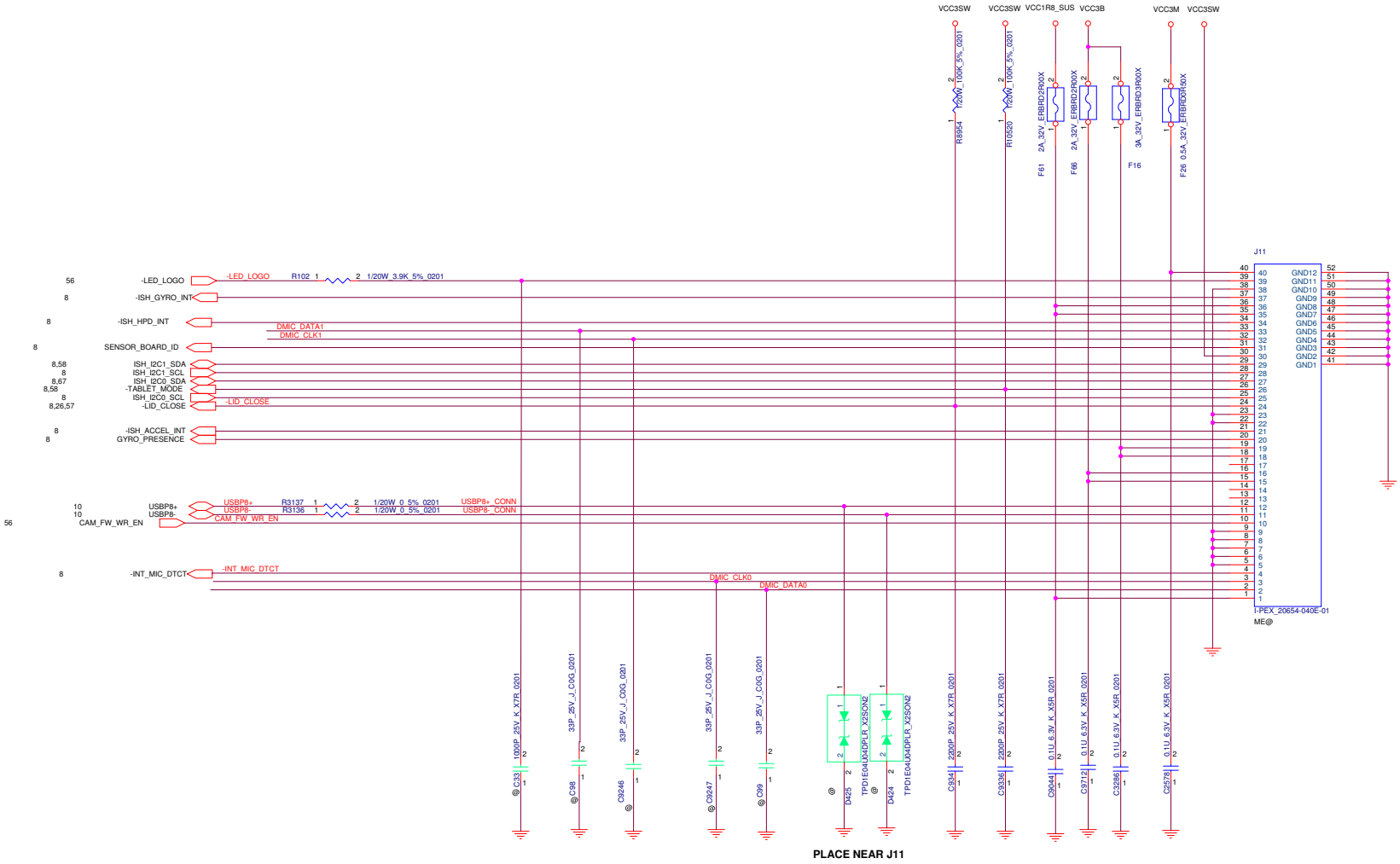
	Sheet : 24 of 98



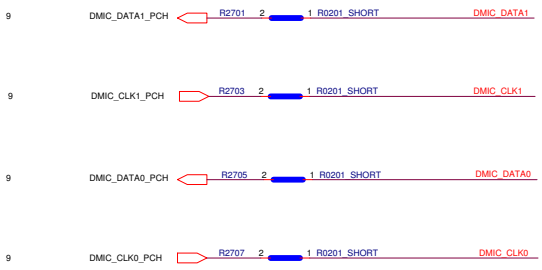
Project Name : Ratchet-1	Title : LPDDR3 BASE MEMORY CH-B (2/2)
Size : C	Document Number :
Date: Monday, April 01, 2019	Rev : 0.01
	Sheet : 25 of 98



Project Name : Ratchet-1	Title : LCD/TOUCH INTERFACE
Size : C	Document Number :
Date: Monday, April 01, 2019	Rev : 0.01
	Sheet : 26 of 98



PLACE NEAR J11



Project Name : Ratchet-1	Title : LID/CAMERA/MIC/SENSOR INTERFACE
Size : C	Document Number :
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Project Name : Ratchet-1	Title : BLANK
Size : C	Document Number :
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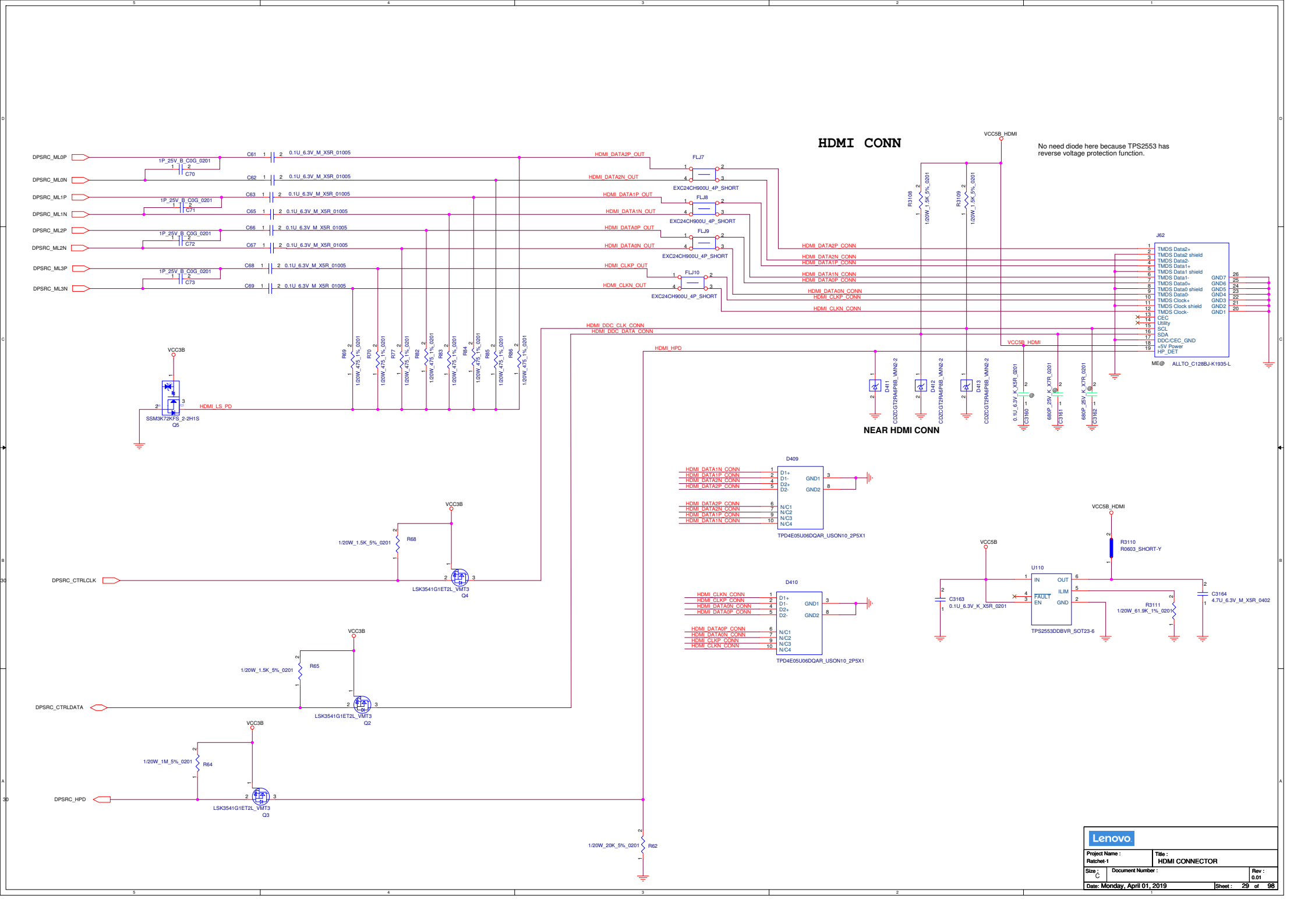
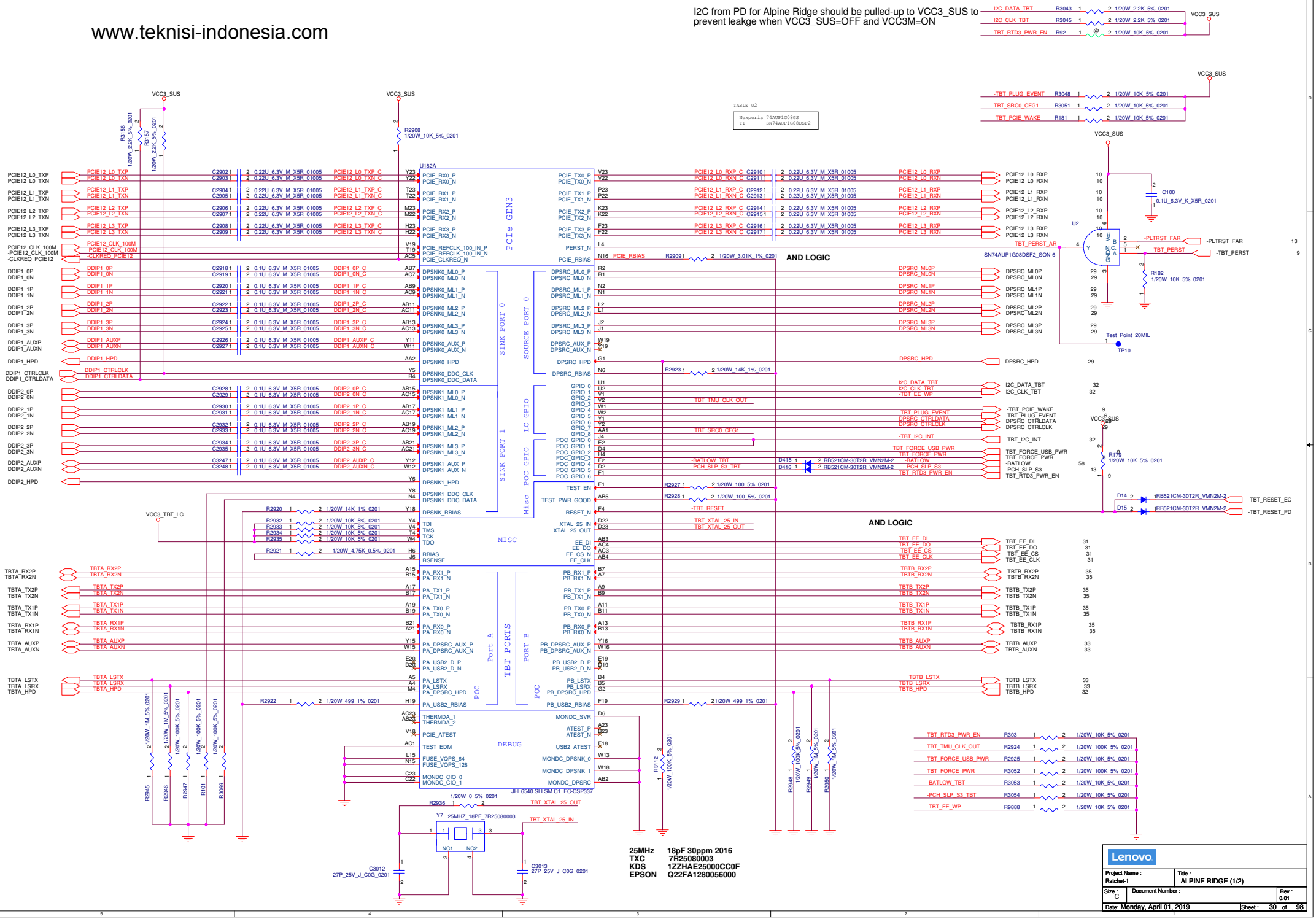
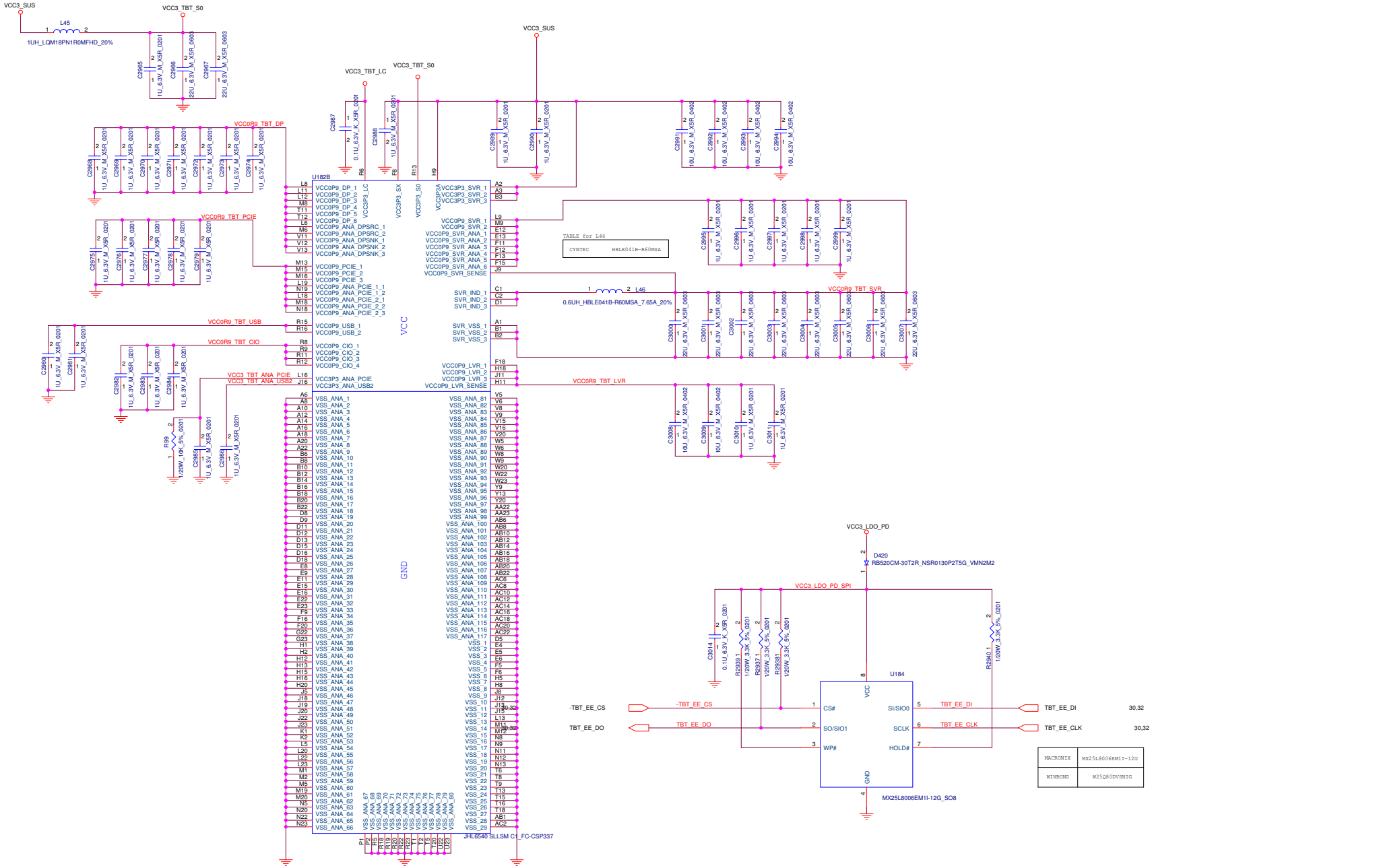
HDMI CONN



Lenovo			
Project Name : Ratchet-1	Title : HDMI CONNECTOR		
Size : C	Document Number :		Rev : 0.01
Date: Monday, April 01, 2019		Sheet : 29 of 98	

I2C from PD for Alpine Ridge should be pulled-up to VCC3_SUS to prevent leakge when VCC3_SUS=OFF and VCC3M=ON





Project Name : Ratchet-1	Title : ALPINE RIDGE (2/2)
Size : C	Document Number :
Date: Monday, April 01, 2019	Sheet : 31 of 98
	Rev : 0.01

TABLE I2C Addressing

I2C1(to EC)	TBTA PORT	0x23
	TBTB PORT	0x27
I2C2(to AR)	TBTA PORT	0x38
	TBTB PORT	0x3F

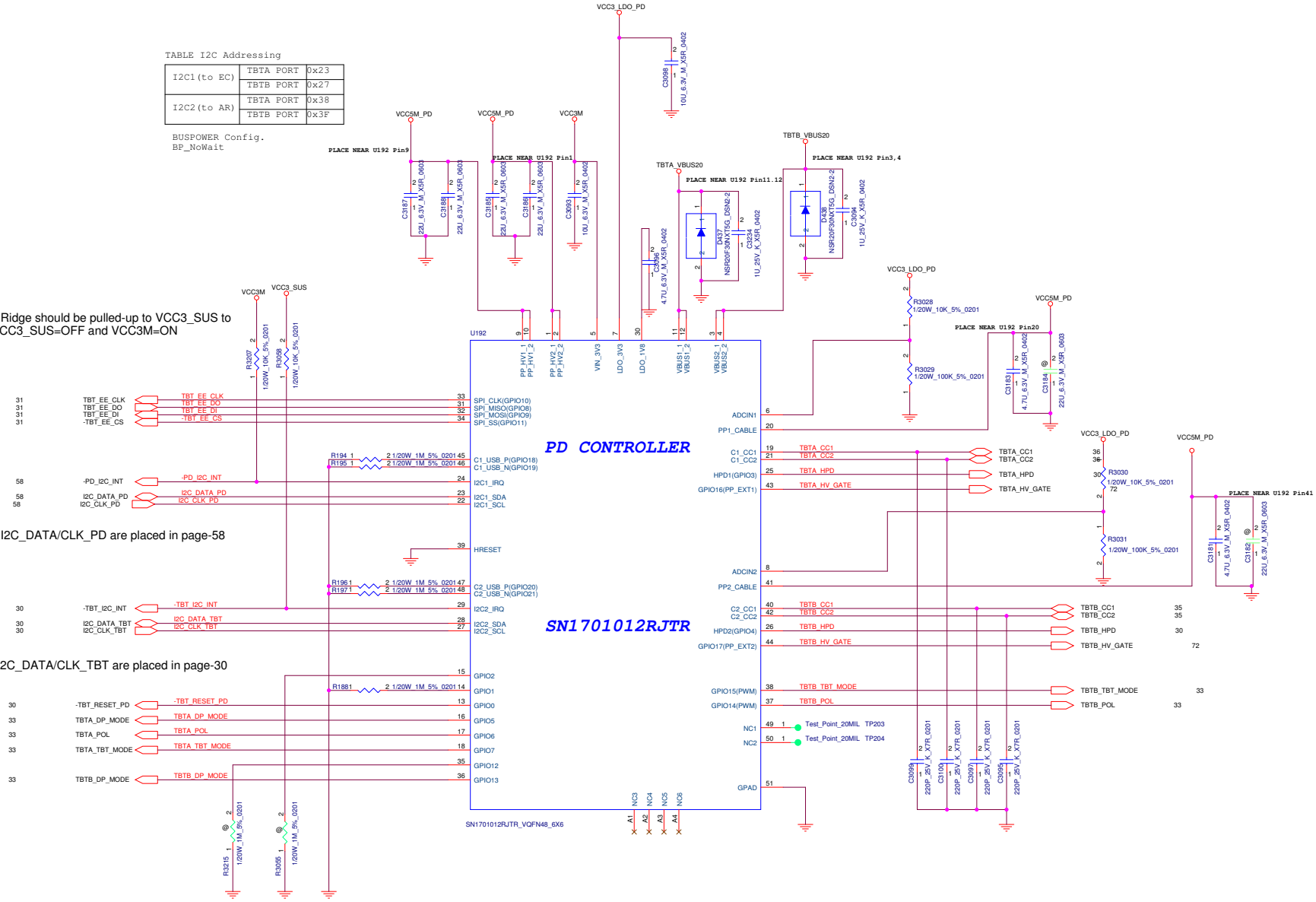
BUSPOWER Config.
BP_NoWait

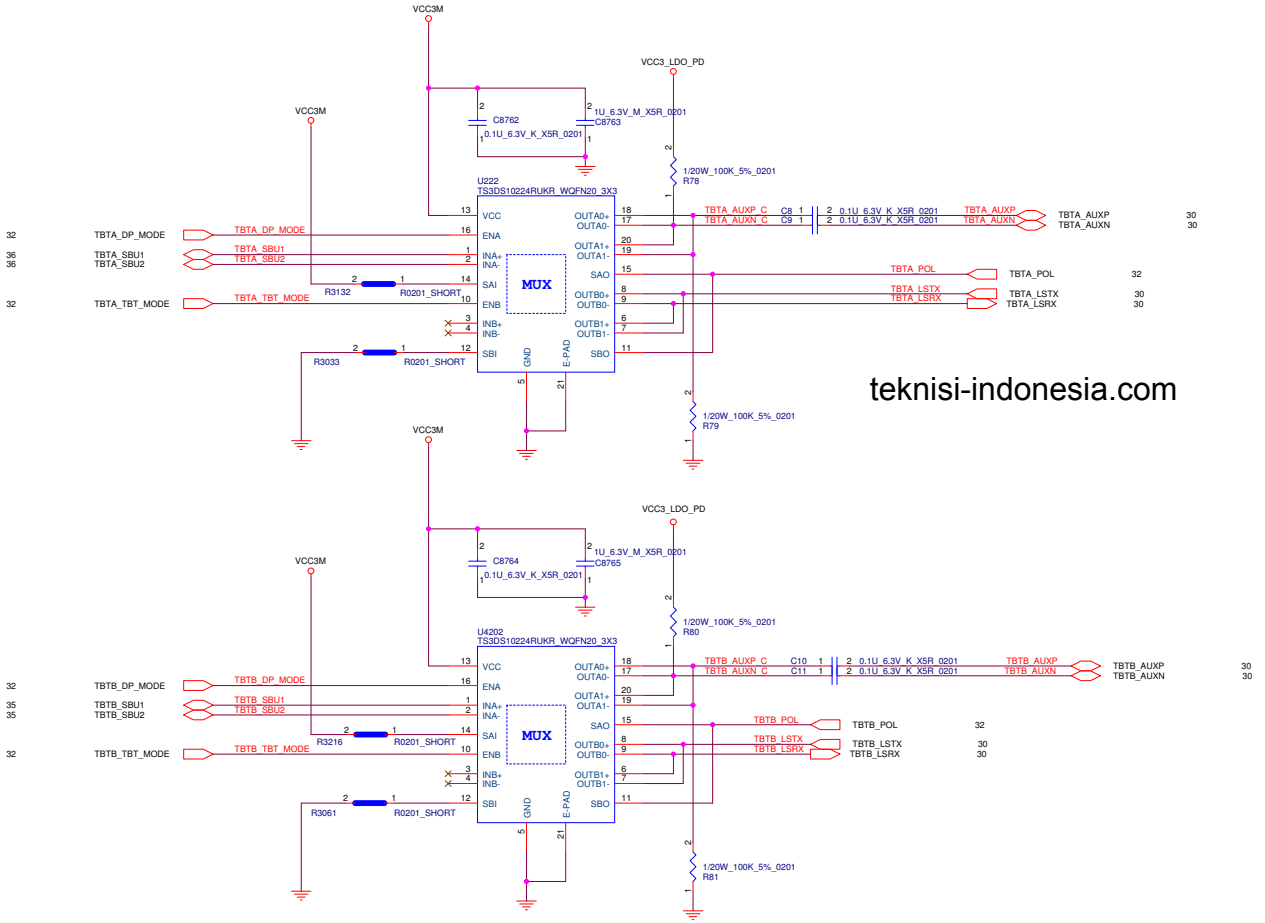
I2C from PD for Alpine Ridge should be pulled-up to VCC3_SUS to prevent leakge when VCC3_SUS=OFF and VCC3M=ON

Pull-up resisters for I2C_DATA/CLK_PD are placed in page-58

Pull-up resisters for I2C_DATA/CLK_TBT are placed in page-30

GPIO2/12 can be floating when unused.





Project Name : Ratchet-1	Title : USB PD DEMUX
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Project Name : Ratchet-1	Title : BLANK
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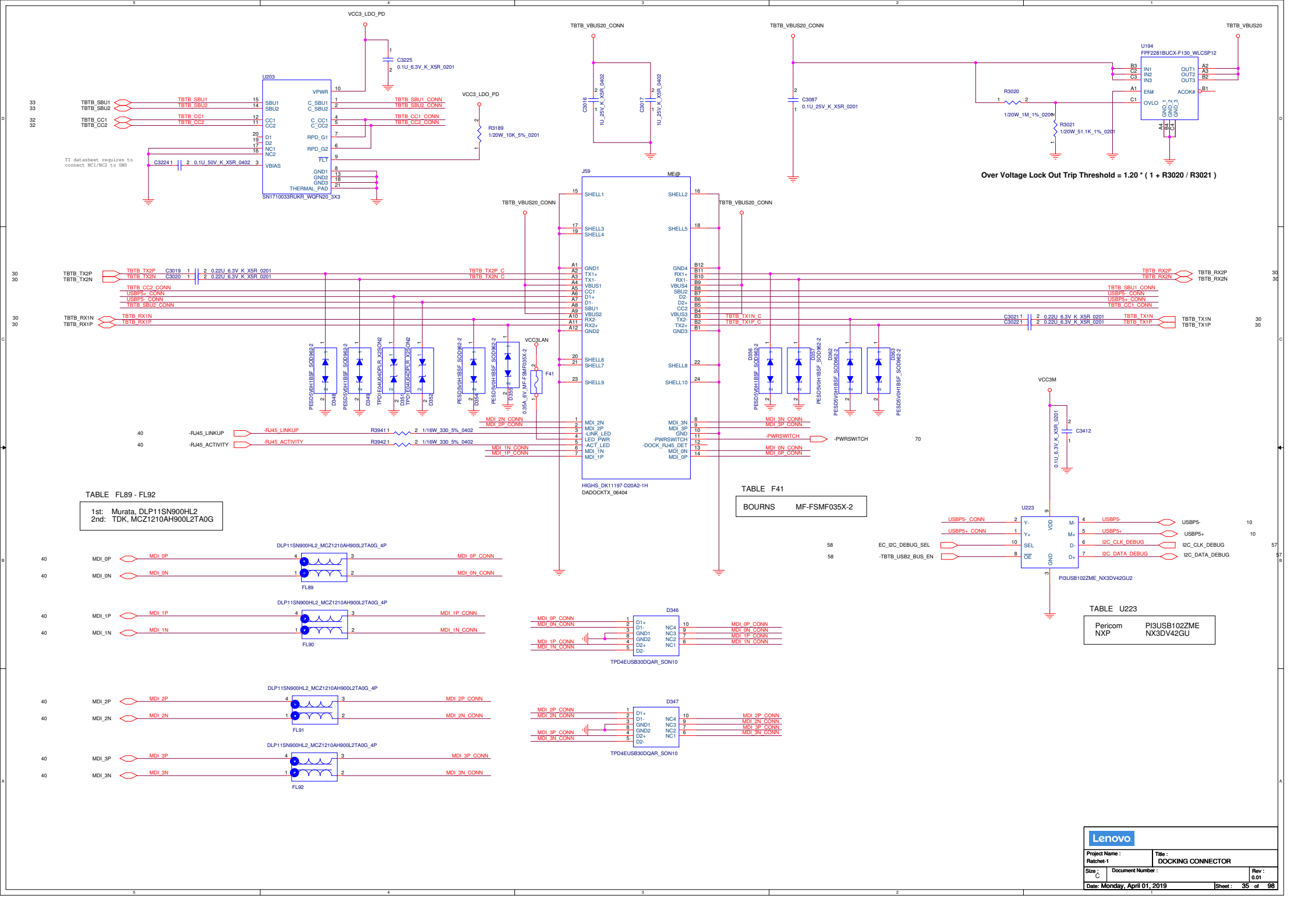
VCC3_LDO_PD
C3225
0.1U_6.3V_K_X5R_0201
U203
VPWR
TBTB_SBU1
TBTB_SBU2
TBTB_CC1
TBTB_CC2
SBU1
SBU2
CC1
CC2
D1
D2
NC1
NC2
VBIAS
C_SBU1
C_SBU2
C_CC1
C_CC2
RPD_G1
RPD_G2
FLT
GND1
GND2
GND3
THERMAL_PAD
SN1710033RUKR_WQFN20_3X3
TI datasheet requires to connect NC1/NC2 to GND
C32241
0.1U_50V_K_X5R_0402
R3189
1/20W_10K_5%_0201
TBTB_VBUS20_CONN
C3016
C3017
1U_25V_K_X5R_0402
C3087
0.1U_25V_K_X5R_0201
TBTB_VBUS20
U194
FPF2281BUCX-F130_WLCSP12
IN1
IN2
IN3
OUT1
OUT2
OUT3
EN#
ACOK#
OVLO
R3020
1/20W_1M_1%_0201
R3021
1/20W_51.1K_1%_0201
Over Voltage Lock Out Trip Threshold = 1.20 * (1 + R3020 / R3021)
J59
ME@
HIGHS_DK11197-D20A2-1H
DADOCKTX_06404
TBTB_TX2P
TBTB_TX2N
TBTB_RX1N
TBTB_RX1P
TBTB_RX2P
TBTB_RX2N
TBTB_TX1N
TBTB_TX1P
TBTB_CC2_CONN
USBP5+_CONN
USBP5-_CONN
TBTB_SBU2_CONN
TBTB_SBU1_CONN
TBTB_CC1_CONN
VCC3LAN
F41
0.35A_6V_MF-FSMF035X-2
PESD5V0H1BSF_SOD962-2
TPD1E04U04DPLR_X2SON2
-RJ45_LINKUP
-RJ45_ACTIVITY
R3941 1
R3942 1
1/16W_330_5%_0402
MDI_2N_CONN
MDI_2P_CONN
MDI_1N_CONN
MDI_1P_CONN
MDI_3N_CONN
MDI_3P_CONN
MDI_0N_CONN
MDI_0P_CONN
-PWRSWITCH
-DOCK_RJ45_DET
TABLE F41
BOURNS MF-FSMF035X-2
VCC3M
C3412
0.1U_6.3V_K_X5R_0201
U223
PI3USB102ZME_NX3DV42GU2
USBP5-_CONN
USBP5+_CONN
EC_I2C_DEBUG_SEL
-TBTB_USB2_BUS_EN
I2C_CLK_DEBUG
I2C_DATA_DEBUG
TABLE U223
Pericom NXP PI3USB102ZME NX3DV42GU
TABLE FL89 - FL92
1st: Murata, DLP11SN900HL2
2nd: TDK, MCZ1210AH900L2TA0G
DLP11SN900HL2_MCZ1210AH900L2TA0G_4P
FL89
FL90
FL91
FL92
D346
D347
TPD4EUSB30DQAR_SON10
Lenovo
Project Name : Ratchet-1
Title : DOCKING CONNECTOR
Size : C
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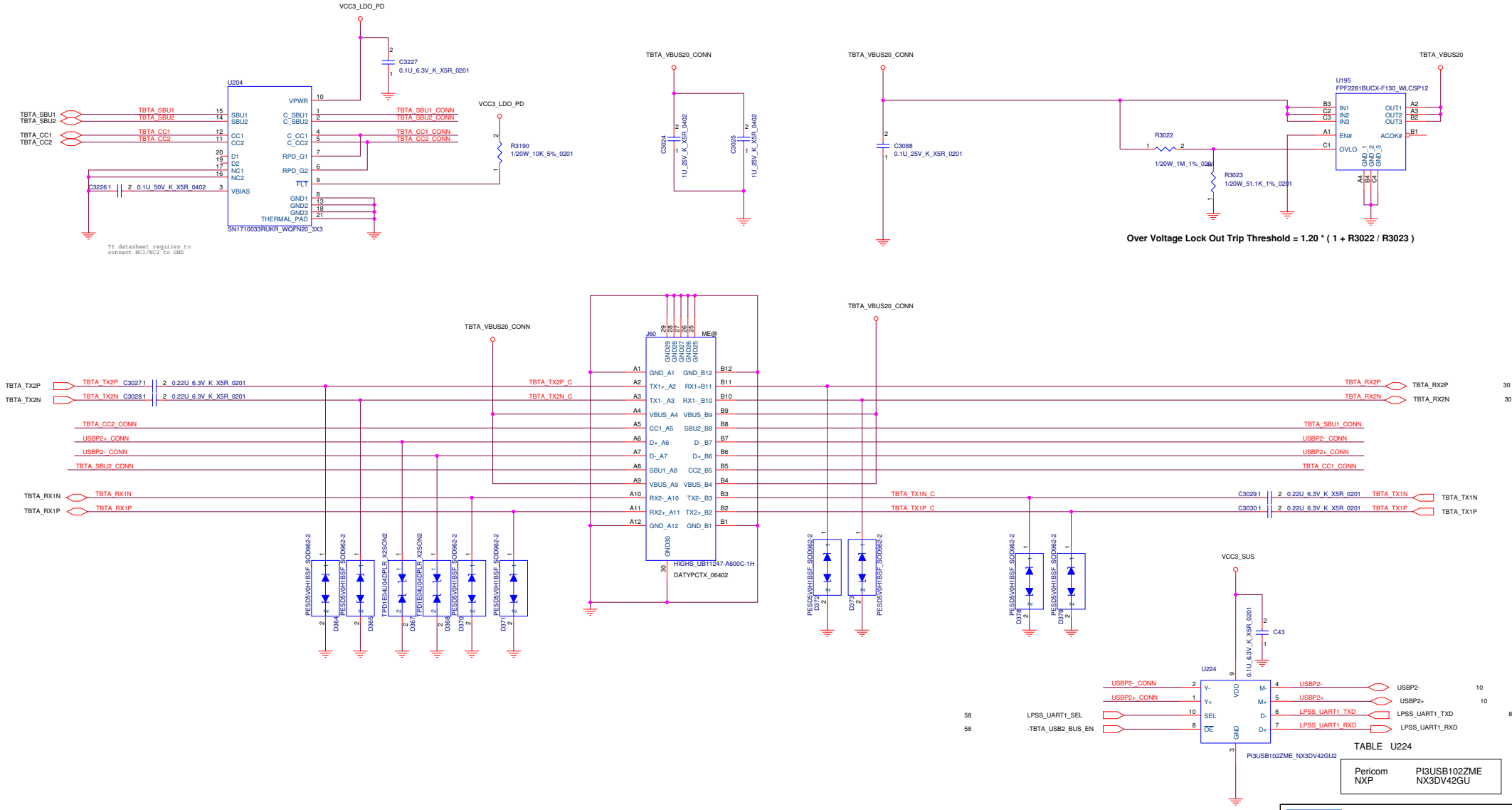
VCC3_LDO_PD
C3227
0.1U_6.3V_K_X5R_0201
U204
VPWR
TBTA_SBU1
TBTA_SBU2
SBU1
SBU2
C_SBU1
C_SBU2
TBTA_SBU1_CONN
TBTA_SBU2_CONN
TBTA_CC1
TBTA_CC2
CC1
CC2
C_CC1
C_CC2
TBTA_CC1_CONN
TBTA_CC2_CONN
D1
D2
NC1
NC2
RPD_G1
RPD_G2
FLT
VBIAS
C32261
0.1U_50V_K_X5R_0402
GND1
GND2
GND3
THERMAL_PAD
SN1710033RUKR_WQFN20_3X3
TI datasheet requires to connect NC1/NC2 to GND
R3190
1/20W_10K_5%_0201
TBTA_VBUS20_CONN
C3024
C3025
1U_25V_K_X5R_0402
C3088
0.1U_25V_K_X5R_0201
U195
FPF2281BUCX-F130_WLCSP12
IN1
IN2
IN3
OUT1
OUT2
OUT3
EN#
ACOK#
OVLO
R3022
1/20W_1M_1%_0201
R3023
1/20W_51.1K_1%_0201
Over Voltage Lock Out Trip Threshold = 1.20 * (1 + R3022 / R3023)
J60
ME@
HIGHS_UB11247-A600C-1H
DATYPCTX_06402
TBTA_TX2P
TBTA_TX2N
TBTA_TX2P_C
TBTA_TX2N_C
TBTA_RX2P
TBTA_RX2N
TBTA_CC2_CONN
USBP2+_CONN
USBP2-_CONN
TBTA_SBU2_CONN
TBTA_SBU1_CONN
TBTA_RX1N
TBTA_RX1P
TBTA_TX1N_C
TBTA_TX1P_C
TBTA_TX1N
TBTA_TX1P
PESD5V0H1BSF_SOD962-2
TPD1E04U04DPLR_X2SON2
VCC3_SUS
C43
U224
PI3USB102ZME_NX3DV42GU2
LPSS_UART1_SEL
-TBTA_USB2_BUS_EN
LPSS_UART1_TXD
LPSS_UART1_RXD
TABLE U224
Pericom PI3USB102ZME
NXP NX3DV42GU
Lenovo
Project Name : Ratchet-1
Title : THUNDERBOLT CONNECTOR
Size : C
Document Number :
Rev : 0.01
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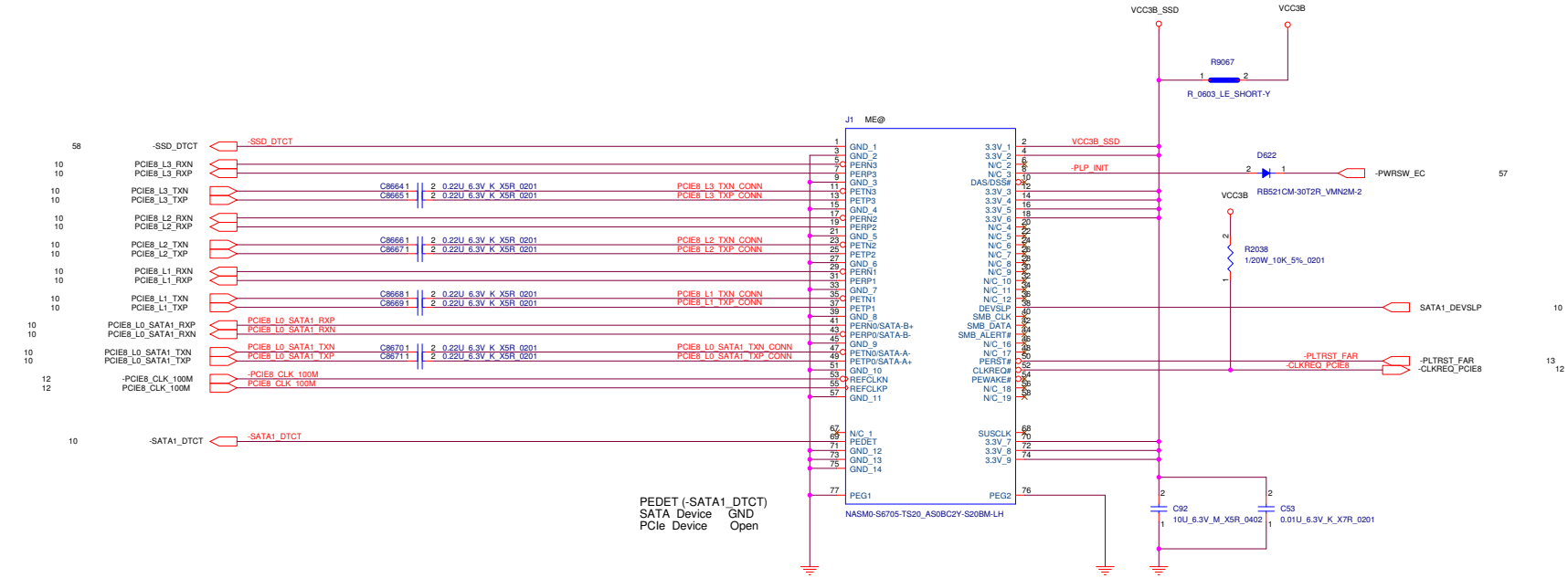
M.2 Socket 3 (Key-M) for 2280 S3 SSD

H=2.00mm Connector



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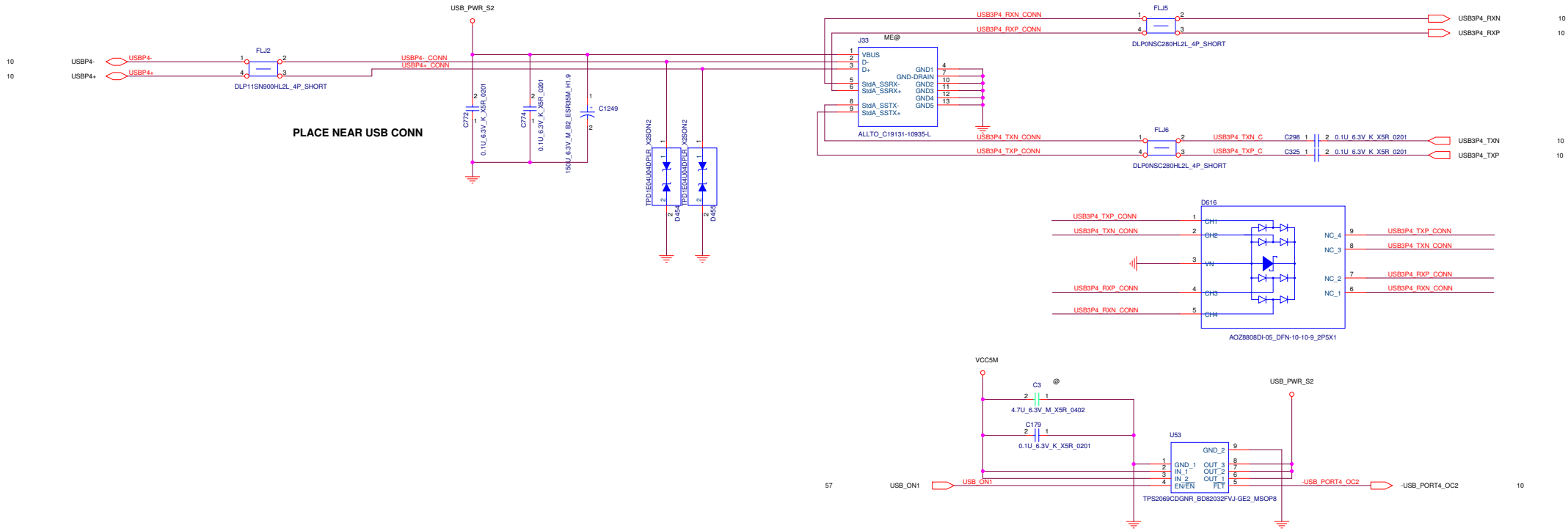
Project Name : Ratchet-1	Title : M.2 SOCKET 3 MODULE I/F
Size : C	Document Number :
Rev : 0.01	
Date: Monday, April 01, 2019	Sheet : 37 of 98



Project Name : Ratchet-1	Title : USB TYPE-A CONNECTOR
Size : C	Document Number :
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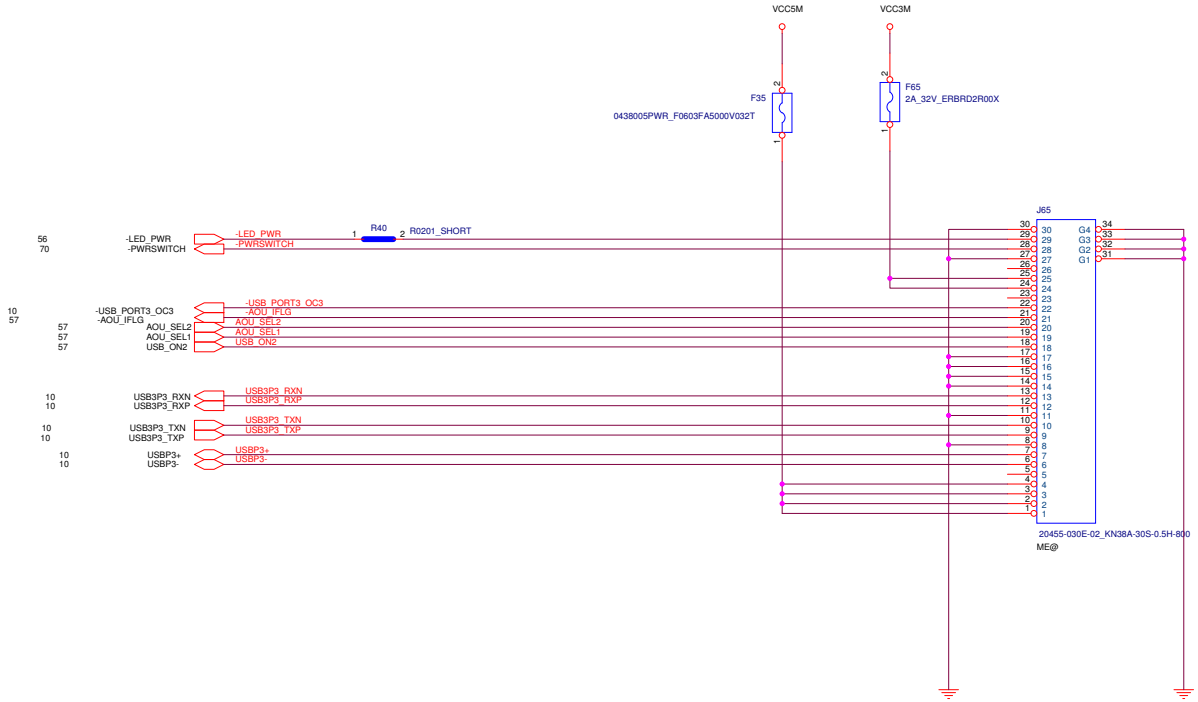
Date: Monday, April 01, 2019	Sheet : 38 of 98



Lenovo			
Project Name : Ratchet-1		Title : USB TYPE-A SUBCARD INTERFAC	
Size : C	Document Number :		Rev : 0.01
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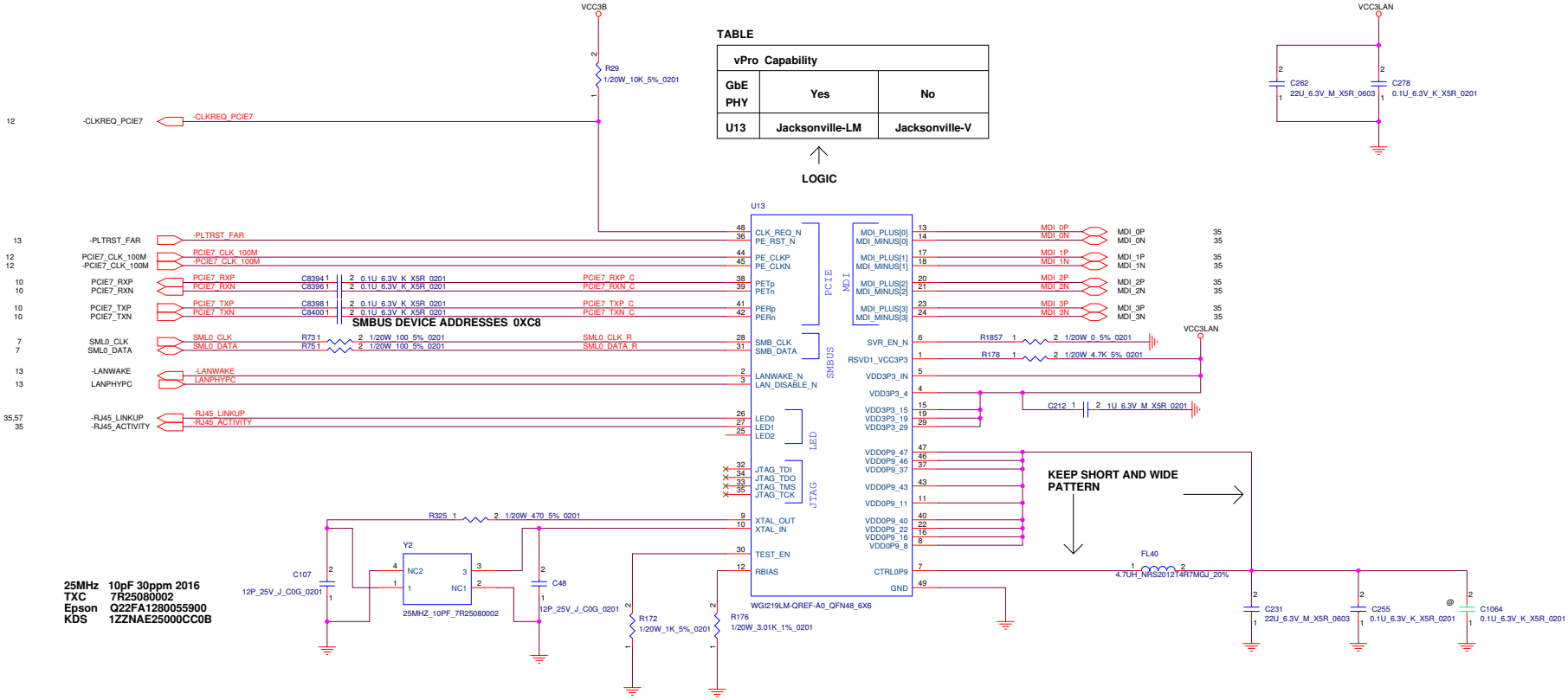

Project Name : Ratchet-1	Title : GBE JACKSONVILLE
Size : C	Document Number :
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Project Name : Ratchet-1	Title : BLANK
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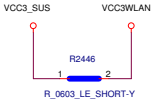
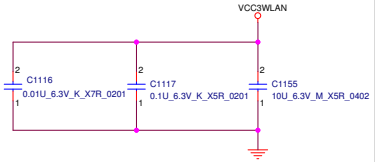
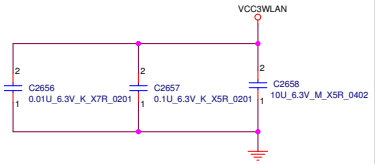
BLANK

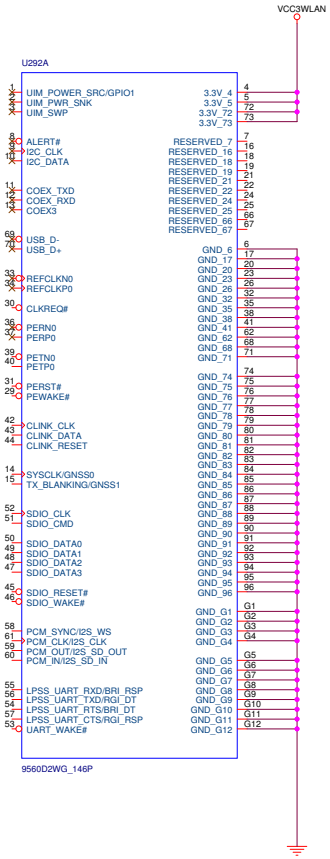
Project Name : Ratchet-1	Title : BLANK
Size : C	Document Number :
Rev : 0.01	
Date: Monday, April 01, 2019	Sheet : 42 of 98

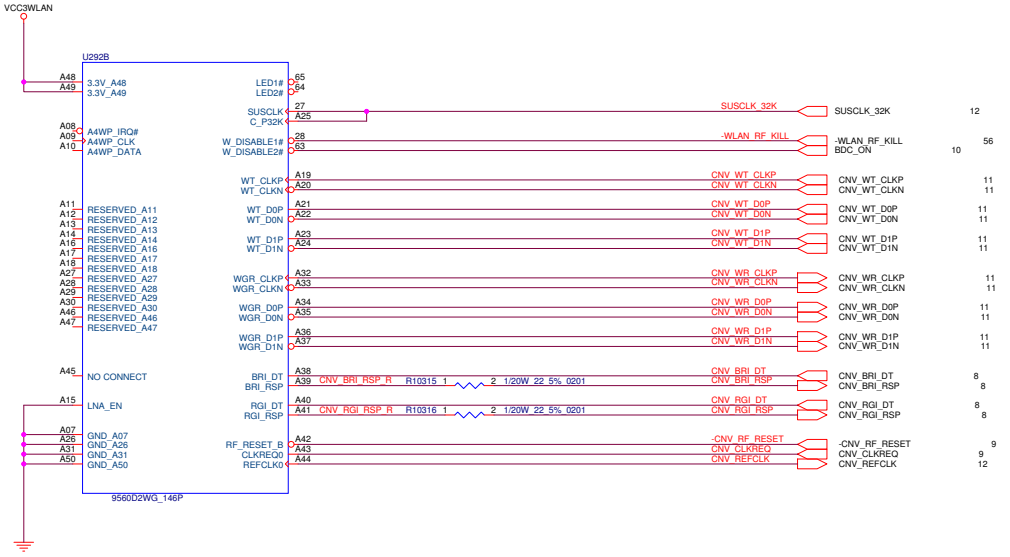
M.2 Type 1216 Module for WLAN / Bluetooth











Lenovo		
Project Name : Ratchet-1	Title : M.2 TYPE 1216 MODULE	
Size :	Document Number :	Rev : 0.01
Date: Monday, April 01, 2019	Sheet : 43 of 98	

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

H=2.00mm Connector

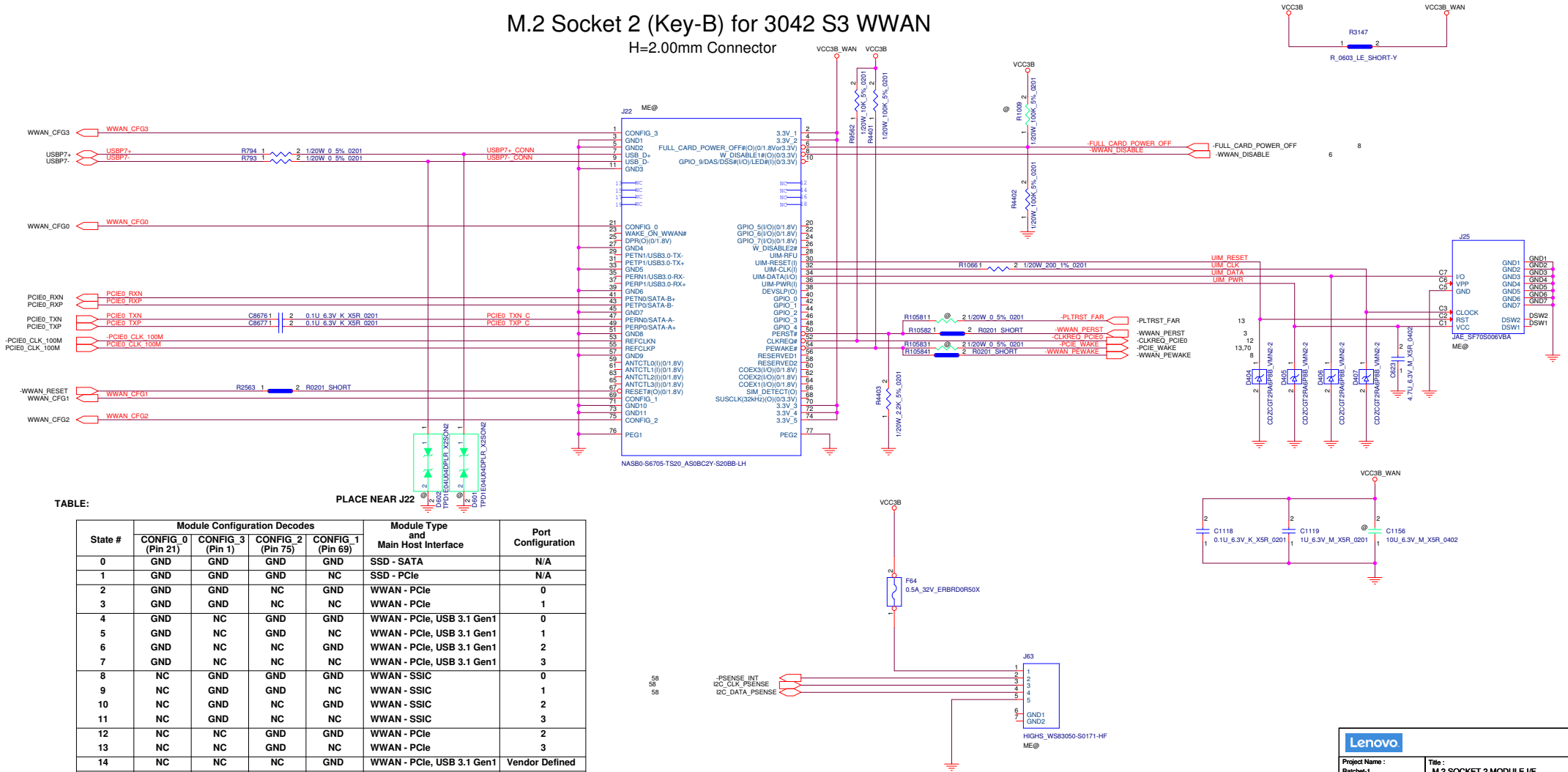


TABLE:

State #	Module Configuration Decodes				Module Type and Main Host Interface	Port Configuration
	CONFIG_0 (Pin 21)	CONFIG_3 (Pin 1)	CONFIG_2 (Pin 75)	CONFIG_1 (Pin 69)		
0	GND	GND	GND	GND	SSD - SATA	N/A
1	GND	GND	GND	NC	SSD - PCIe	N/A
2	GND	GND	NC	GND	WWAN - PCIe	0
3	GND	GND	NC	NC	WWAN - PCIe	1
4	GND	NC	GND	GND	WWAN - PCIe, USB 3.1 Gen1	0
5	GND	NC	GND	NC	WWAN - PCIe, USB 3.1 Gen1	1
6	GND	NC	NC	GND	WWAN - PCIe, USB 3.1 Gen1	2
7	GND	NC	NC	NC	WWAN - PCIe, USB 3.1 Gen1	3
8	NC	GND	GND	GND	WWAN - SSIC	0
9	NC	GND	GND	NC	WWAN - SSIC	1
10	NC	GND	NC	GND	WWAN - SSIC	2
11	NC	GND	NC	NC	WWAN - SSIC	3
12	NC	NC	GND	GND	WWAN - PCIe	2
13	NC	NC	GND	NC	WWAN - PCIe	3
14	NC	NC	NC	GND	WWAN - PCIe, USB 3.1 Gen1	Vendor Defined
15	NC	NC	NC	NC	No Module Present	N/A

Project Name : Ratchet-1	Title : M.2 SOCKET 2 MODULE I/F
Size : C	Document Number :
Rev : 0.01	
Date: Monday, April 01, 2019	Sheet : 44 of 98

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Project Name : Ratchet-1	Title : BLANK	
Size : C	Document Number :	Rev : 0.01
Date: Monday, April 01, 2019	Sheet : 45 of 98	

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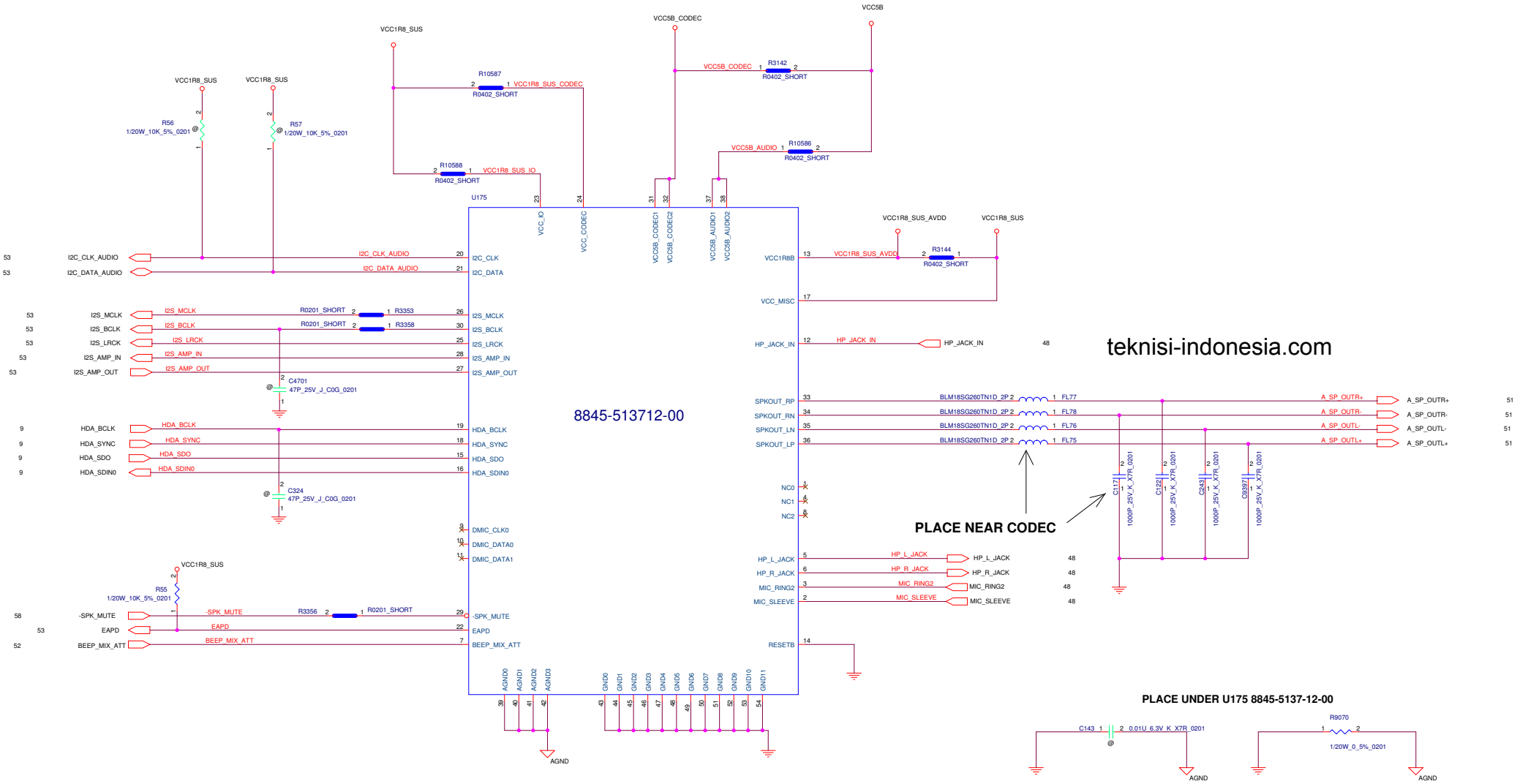
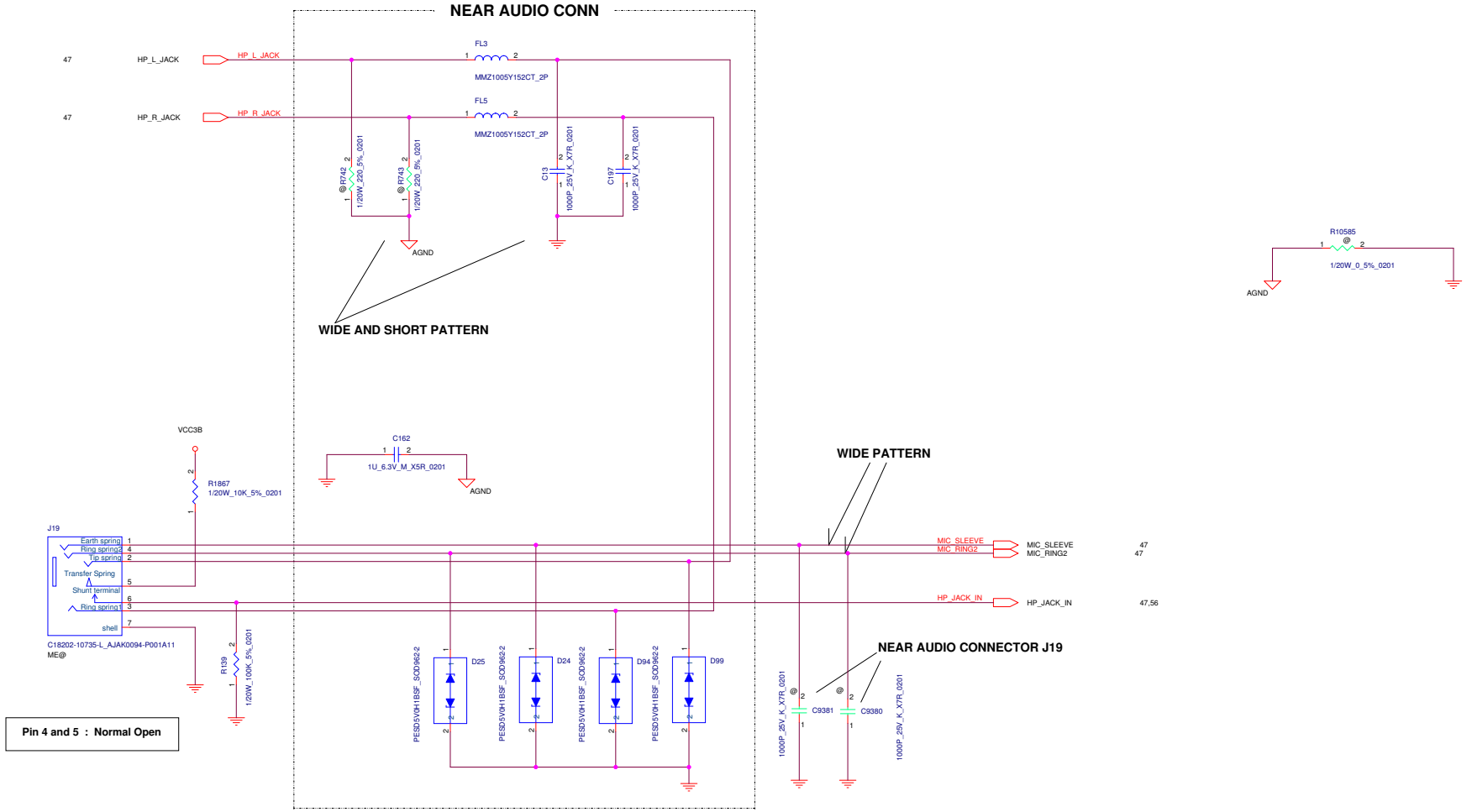
Project Name : Ratchet-1	Title : BLANK	
Size : C	Document Number :	Rev : 0.01
Date: Monday, April 01, 2019	Sheet : 46 of 98	



Project Name : Ratchet-1	Title : AUDIO SIP (ALC3286)
Size :	Document Number : Rev : 0.01
Date: Monday, April 01, 2019	Sheet : 47 of 98



Lenovo			
Project Name : Ratchet-1		Title : AUDIO CONNECTOR	
Size : C	Document Number :		Rev : 0.01
Date: Monday, April 01, 2019		Sheet : 48 of 98	

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Project Name : Ratchet-1	Title : BLANK
Size : C	Document Number :
Rev : 0.01	
Date: Monday, April 01, 2019	Sheet : 49 of 98

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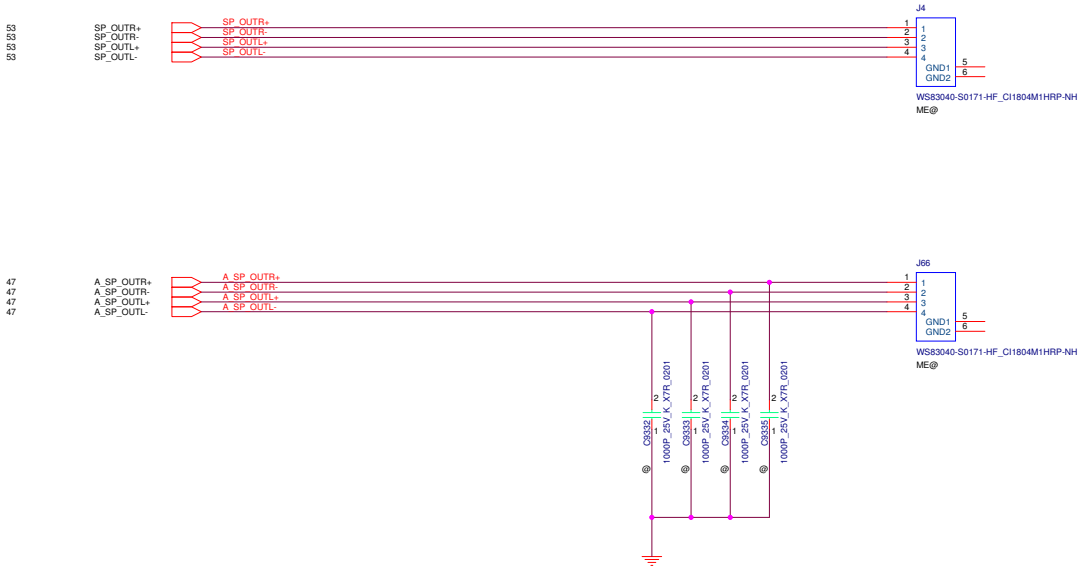
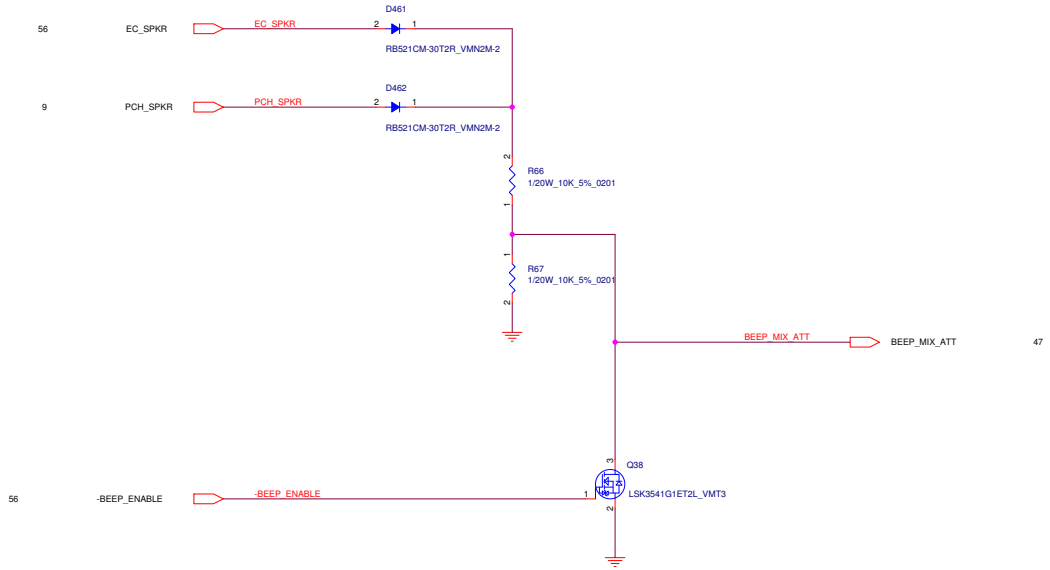
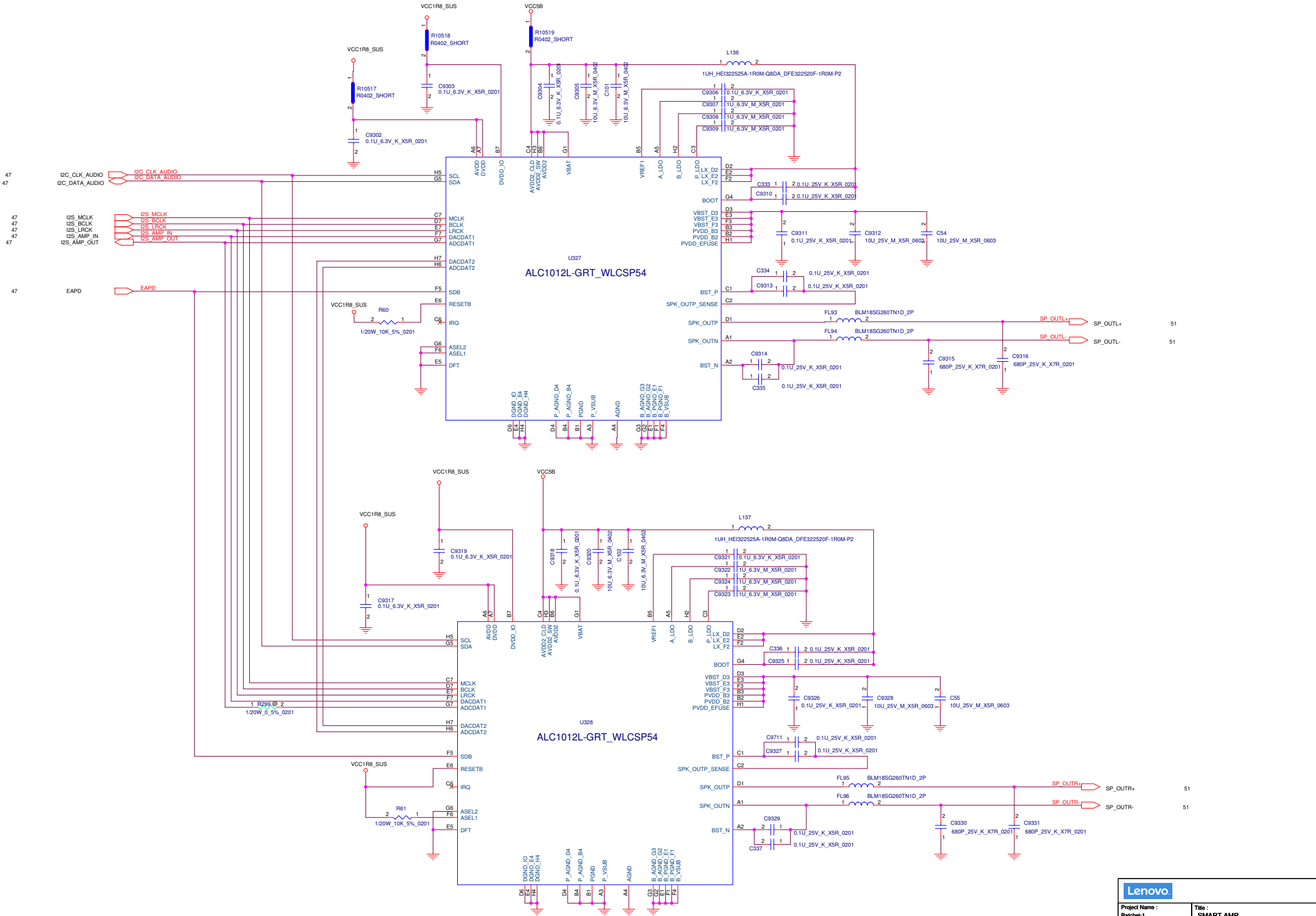
Project Name : Ratchet-1	Title : BLANK	
Size : C	Document Number :	Rev : 0.01
Date: Monday, April 01, 2019	Sheet : 50 of 98	



Lenovo		
Project Name : Ratchet-1	Title : AUDIO SPEAKER	
Size : C	Document Number :	Rev : 0.01
Date: Monday, April 01, 2019	Sheet : 51 of 98	



Lenovo			
Project Name : Ratchet-1		Title : AUDIO BEEP	
Size : C	Document Number :		Rev : 0.01
Date: Monday, April 01, 2019		Sheet : 52 of 98	


VCC1R8_SUS
VCC5B
R10518 R0402_SHORT
R10519 R0402_SHORT
R10517 R0402_SHORT
C9303 0.1U_6.3V_K_X5R_0201
C9302 0.1U_6.3V_K_X5R_0201
L136
1UH_HEI322525A-1R0M-Q8DA_DFE322520F-1R0M-P2
C9304 0.1U_6.3V_K_X5R_0201
C9305 10U_6.3V_M_X5R_0402
C101 10U_6.3V_M_X5R_0402
C9306 0.1U_6.3V_K_X5R_0201
C9307 1U_6.3V_M_X5R_0201
C9308 1U_6.3V_M_X5R_0201
C9309 1U_6.3V_M_X5R_0201
I2C_CLK_AUDIO
I2C_DATA_AUDIO
I2S_MCLK
I2S_BCLK
I2S_LRCK
I2S_AMP_IN
I2S_AMP_OUT
EAPD
SCL
SDA
MCLK
BCLK
LRCK
DACDAT1
ADCDAT1
DACDAT2
ADCDAT2
SDB
RESETB
IRQ
ASEL2
ASEL1
DFT
AVDD
DVDD
DVDD_IO
AVDD2_CLD
AVDD2_SW
AVDD2
VBAT
VREF1
A_LDO
B_LDO
P_LDO
P_LX_D2
P_LX_E2
LX_F2
BOOT
VBST_D3
VBST_E3
VBST_F3
PVDD_B3
PVDD_B2
PVDD_EFUSE
BST_P
SPK_OUTP_SENSE
SPK_OUTP
SPK_OUTN
BST_N
C333 0.1U_25V_K_X5R_0201
C9310 0.1U_25V_K_X5R_0201
C9311 0.1U_25V_K_X5R_0201
C9312 10U_25V_M_X5R_0603
C54 10U_25V_M_X5R_0603
C334 0.1U_25V_K_X5R_0201
C9313 0.1U_25V_K_X5R_0201
FL93 BLM18SG260TN1D_2P
FL94 BLM18SG260TN1D_2P
SP_OUTL+
SP_OUTL-
C9314 0.1U_25V_K_X5R_0201
C335 0.1U_25V_K_X5R_0201
C9315 680P_25V_K_X7R_0201
C9316 680P_25V_K_X7R_0201
U327
ALC1012L-GRT_WLCSP54
DGND_IO
DGND_E4
DGND_H4
P_AGND_D4
P_AGND_B4
PGND
P_VSUB
AGND
B_AGND_G3
B_AGND_G2
B_PGND_E1
B_PGND_F1
B_VSUB
R60 1/20W_10K_5%_0201
C9319 0.1U_6.3V_K_X5R_0201
C9317 0.1U_6.3V_K_X5R_0201
L137
1UH_HEI322525A-1R0M-Q8DA_DFE322520F-1R0M-P2
C9321 0.1U_6.3V_K_X5R_0201
C9322 1U_6.3V_M_X5R_0201
C9324 1U_6.3V_M_X5R_0201
C9323 1U_6.3V_M_X5R_0201
C9318 0.1U_6.3V_K_X5R_0201
C9320 10U_6.3V_M_X5R_0402
C102 10U_6.3V_M_X5R_0402
C336 0.1U_25V_K_X5R_0201
C9325 0.1U_25V_K_X5R_0201
C9326 0.1U_25V_K_X5R_0201
C9328 10U_25V_M_X5R_0603
C55 10U_25V_M_X5R_0603
C9711 0.1U_25V_K_X5R_0201
C9327 0.1U_25V_K_X5R_0201
FL95 BLM18SG260TN1D_2P
FL96 BLM18SG260TN1D_2P
SP_OUTR+
SP_OUTR-
C9329 0.1U_25V_K_X5R_0201
C337 0.1U_25V_K_X5R_0201
C9330 680P_25V_K_X7R_0201
C9331 680P_25V_K_X7R_0201
U328
ALC1012L-GRT_WLCSP54
R299 @ 1/20W_0_5%_0201
R61 1/20W_10K_5%_0201
Lenovo
Project Name : Ratchet-1
Title : SMART AMP
Size : C
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Project Name : Ratchet-1	Title : BLANK	
Size : C	Document Number :	Rev : 0.01
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Project Name : Ratchet-1	Title : BLANK	
Size : C	Document Number :	Rev : 0.01
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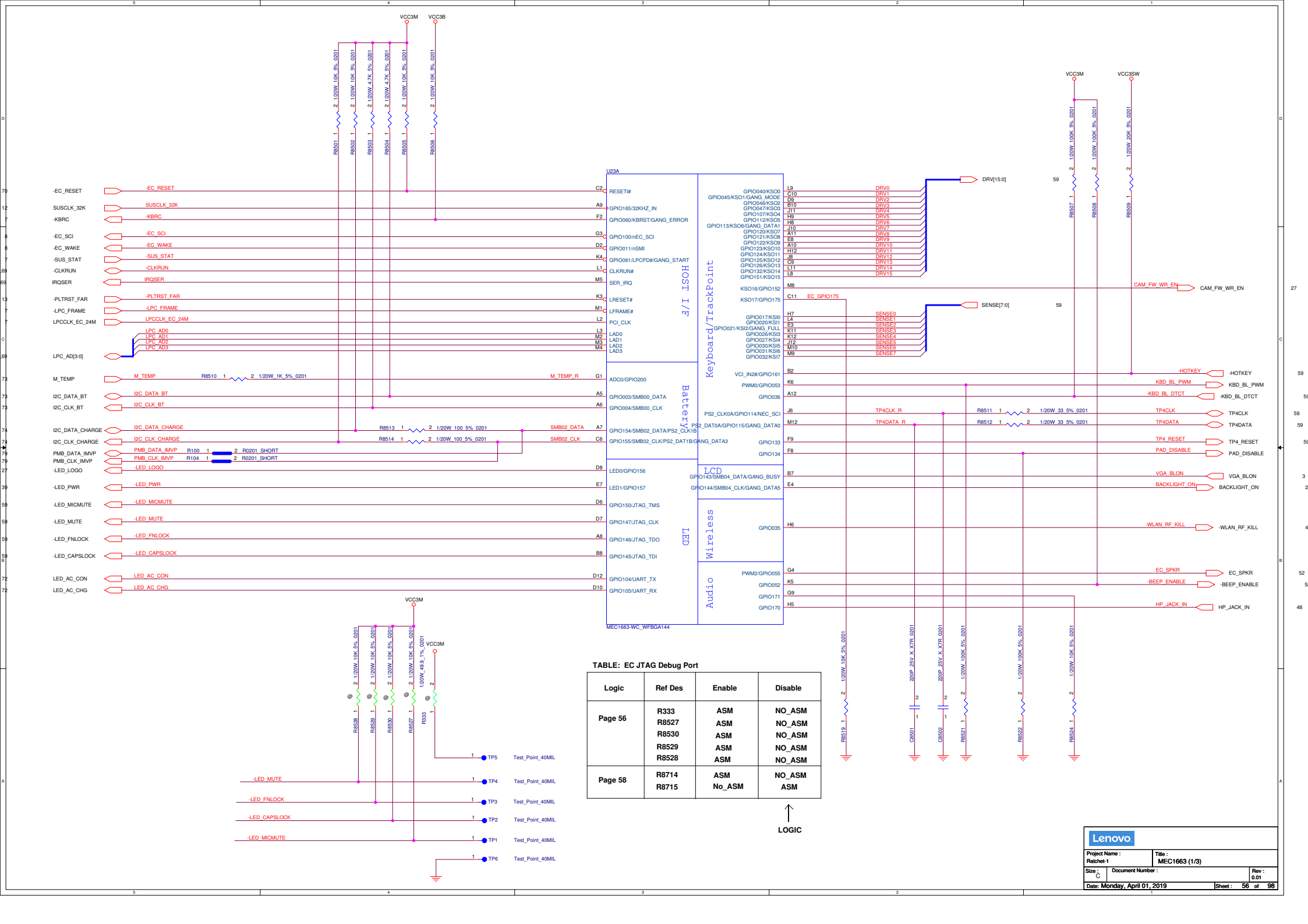
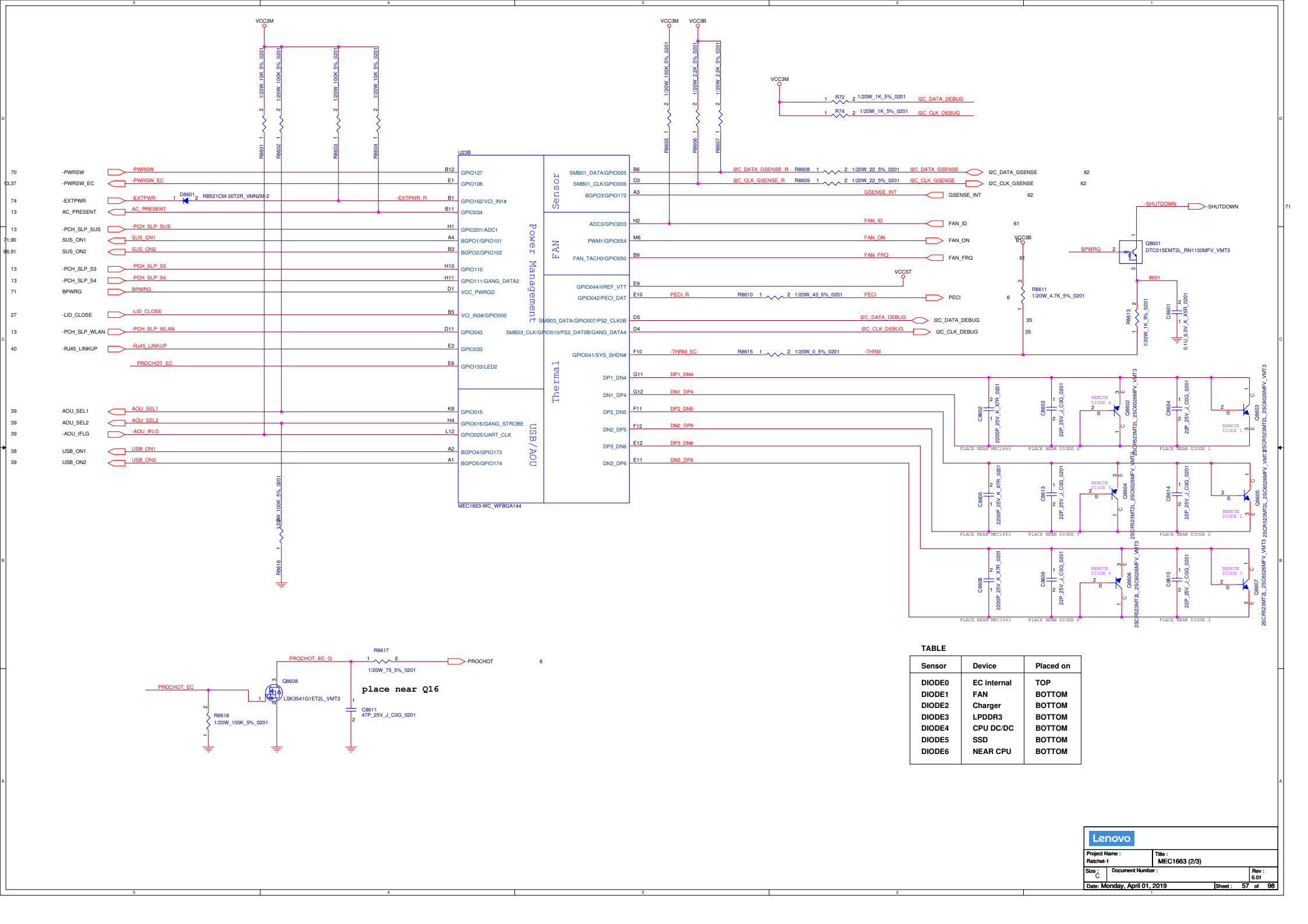


TABLE: EC JTAG Debug Port

Logic	Ref Des	Enable	Disable
Page 56	R333	ASM	NO_ASM
	R8527	ASM	NO_ASM
	R8530	ASM	NO_ASM
	R8529	ASM	NO_ASM
	R8528	ASM	NO_ASM
Page 58	R8714	ASM	NO_ASM
	R8715	No_ASM	ASM

LOGIC

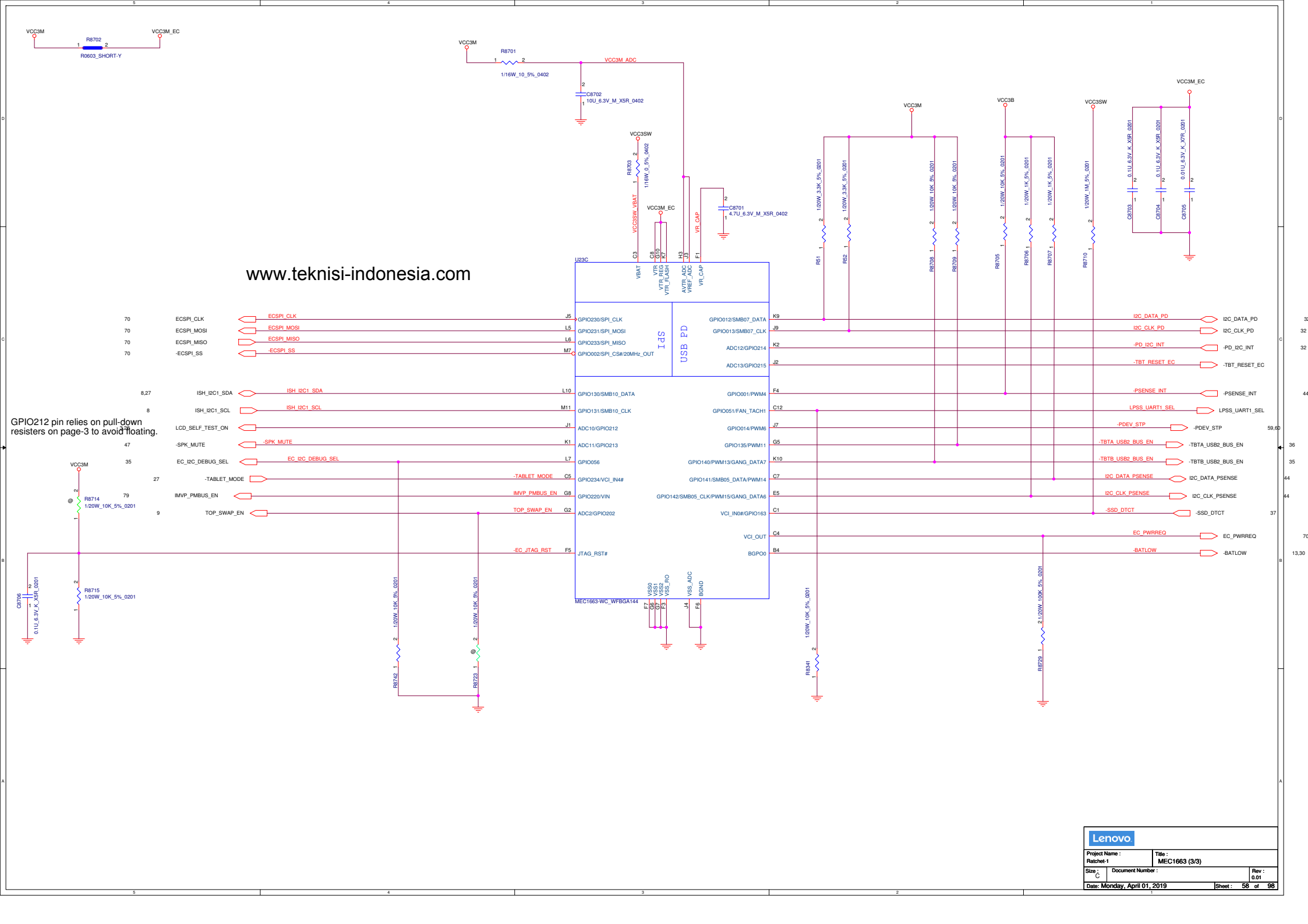
Project Name : Ratchet-1	Title : MEC1663 (1/3)
Size : C	Document Number :
Date: Monday, April 01, 2019	Sheet : 56 of 98



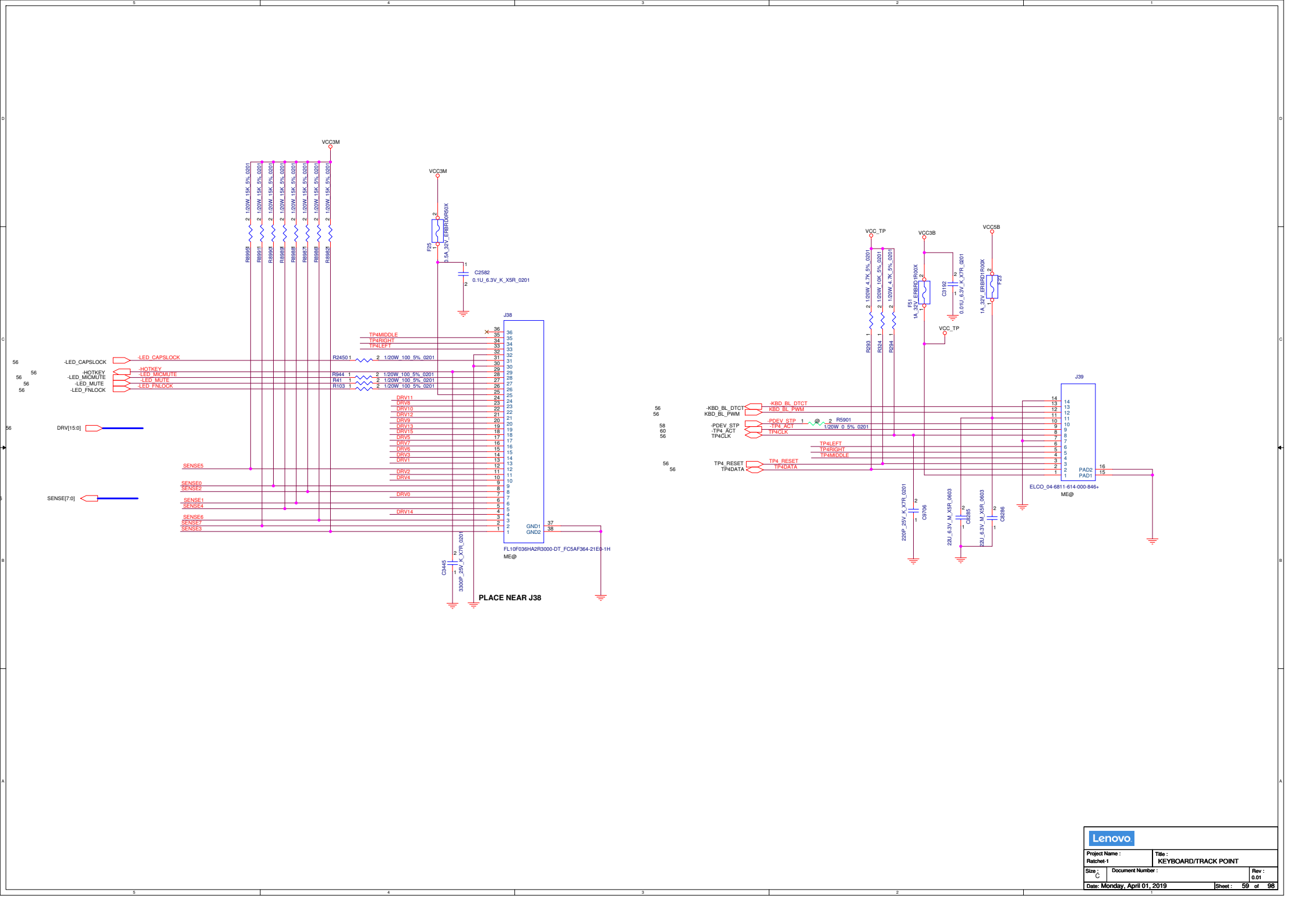
TABLE

Sensor	Device	Placed on
DIODE0	EC internal	TOP
DIODE1	FAN	BOTTOM
DIODE2	Charger	BOTTOM
DIODE3	LPDDR3	BOTTOM
DIODE4	CPU DC/DC	BOTTOM
DIODE5	SSD	BOTTOM
DIODE6	NEAR CPU	BOTTOM

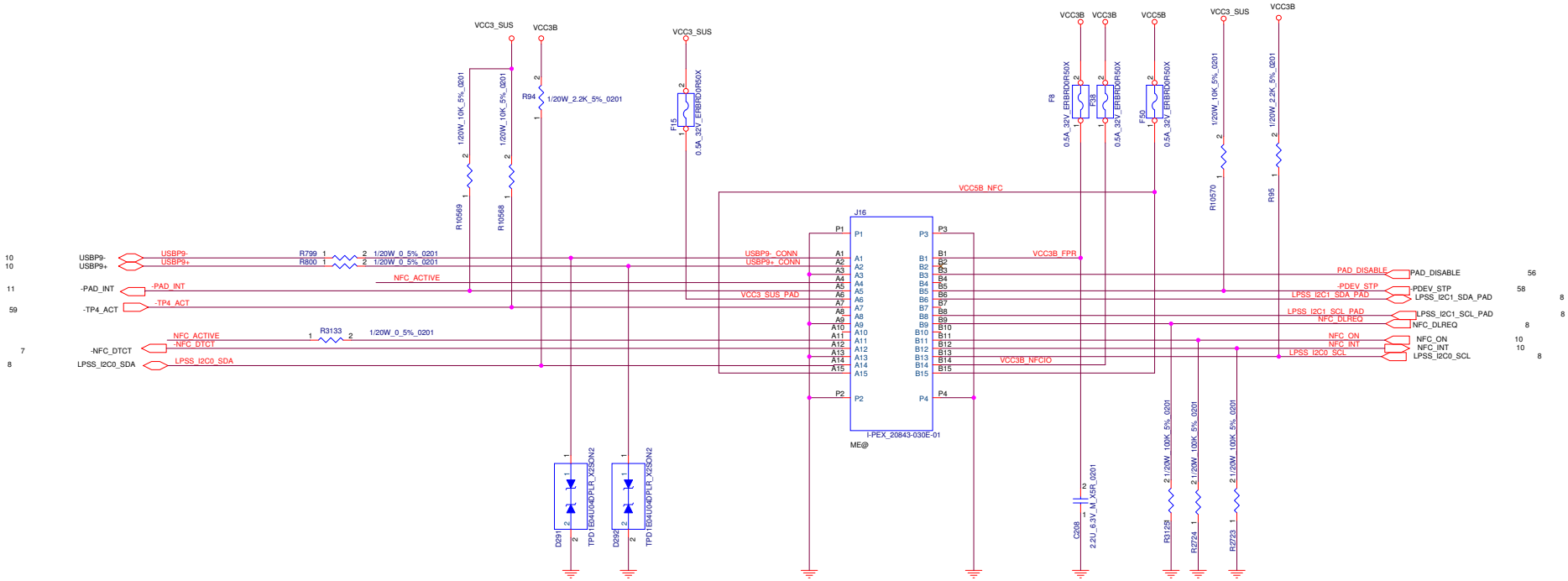
Project Name : Ratchet-1	Title : MEC1663 (2/3)	
Size : C	Document Number :	Rev : 0.01
Date: Monday, April 01, 2019	Sheet : 57 of 98	



Project Name : Ratchet-1	Title : MEC1663 (3/3)
Size : C	Document Number :
Date: Monday, April 01, 2019	Rev : 0.01
	Sheet : 58 of 98

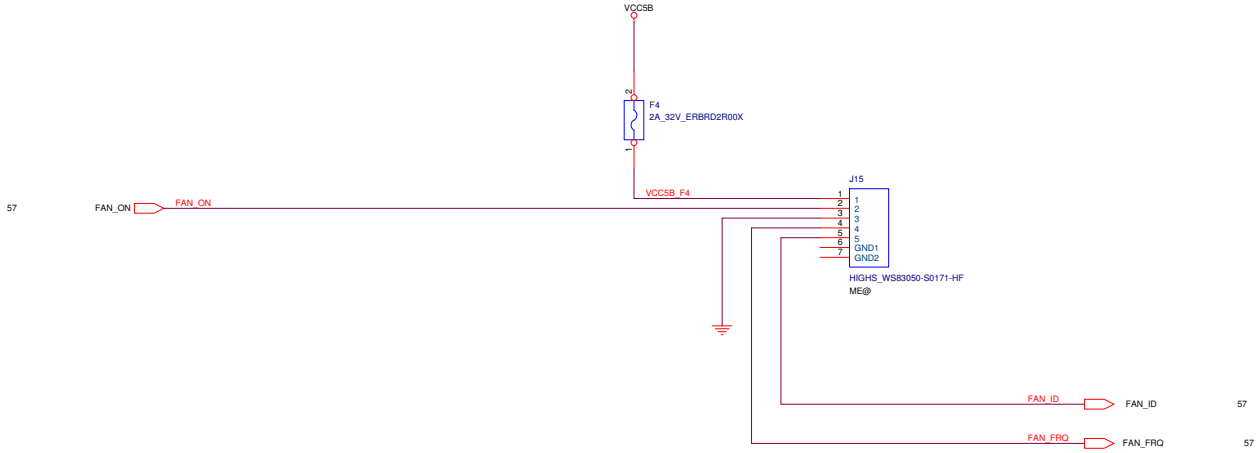


Project Name : Ratchet-1	Title : KEYBOARD/TRACK POINT
Size : C	Document Number :
Date: Monday, April 01, 2019	Rev : 0.01
	Sheet : 59 of 98



PLACE NEAR J16

Lenovo	
Project Name : Ratchet-1	Title : TOUCH PAD/NFC/FPR
Size : C	Document Number :
Rev : 0.01	
Date: Monday, April 01, 2019	Sheet : 60 of 98



Project Name : Ratchet-1	Title : FAN CONNECTOR
Size : C	Document Number :
Rev : 0.01	
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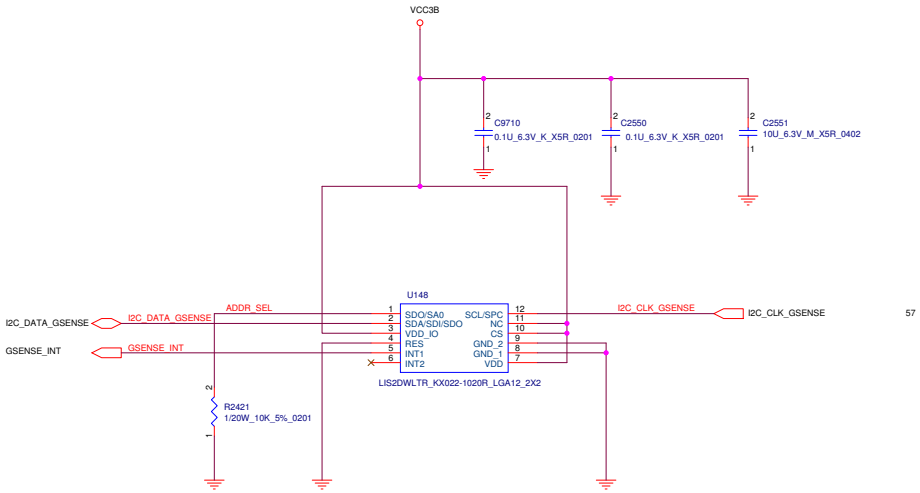
TABLE : G-Sensor Power

HDD Support	**VCC3M**
SSD Only	**VCC3B**

TABLE

P/N	ADDR_SEL	Address
LIS2DWL	**H** **L**	**32h (W) & 33h (R)** **30h (W) & 31h (R)**
KX022-1020	**H** **L**	**3Eh (W) & 3Fh (R)** **3Ch (W) & 3Dh (R)**



Project Name : Ratchet-1	Title : APS G-SENSOR	
Size : C	Document Number :	Rev : 0.01
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Project Name : Ratchet-1	Title : BLANK	
Size : C	Document Number :	Rev : 0.01
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Project Name : Ratchet-1	Title : BLANK	
Size : C	Document Number :	Rev : 0.01
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Lenovo	
Project Name : Ratchet-1	Title : BLANK
Size : C / Document Number :	Rev : 0.01
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Project Name : Ratchet-1	Title : BLANK	
Size : C	Document Number :	Rev : 0.01
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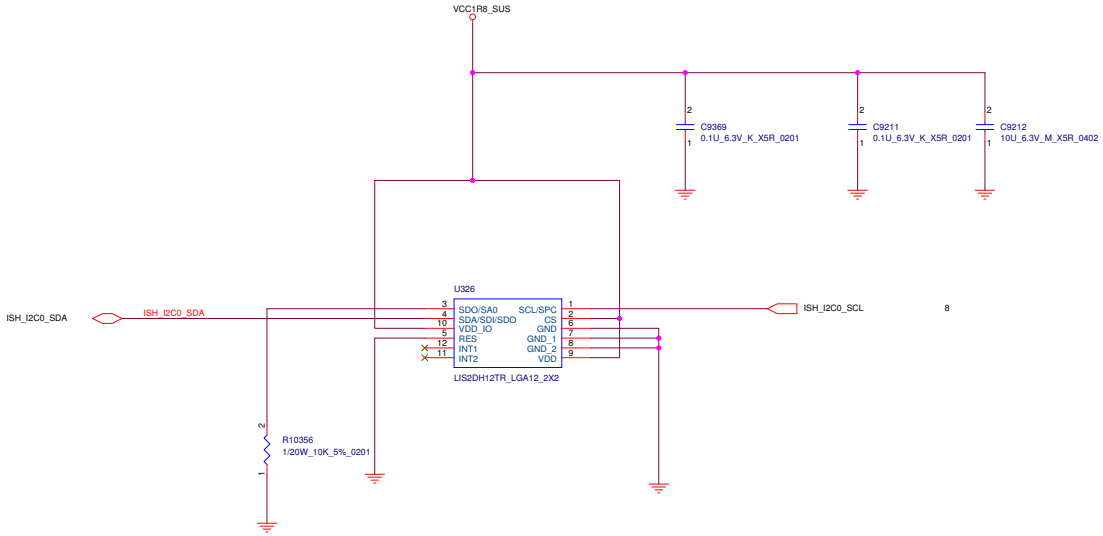
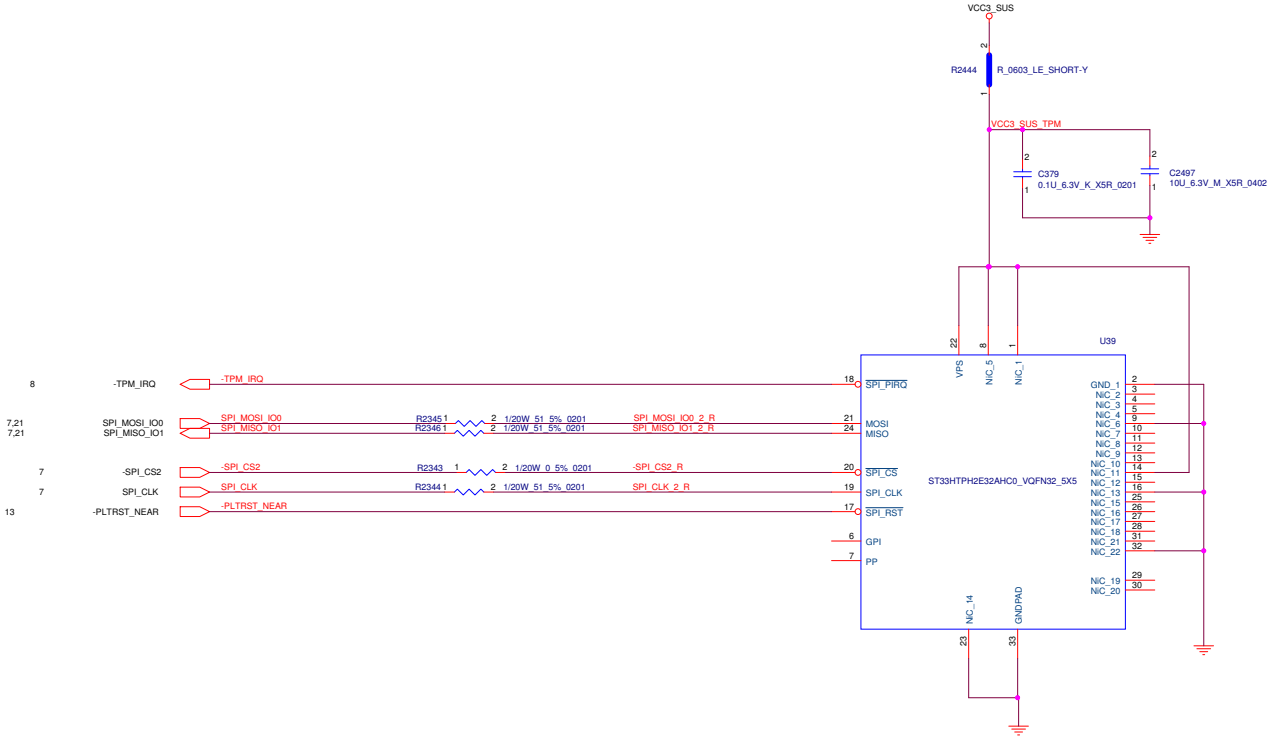
TABLE

P/N	ADDR_SEL	Address
LIS2DH12TR	H	31h (W) & 30h (R)
	L	33h (W) & 32h (R)



Project Name : Ratchet-1	Title : ISH ACCELEROMETER
Size : C	Document Number :
Rev : 0.01	
Date: Monday, April 01, 2019	Sheet : 67 of 98



TABLE

Pin No	TCG PTP Spec Rev.01.03.v22	ST Micro ST33HTPH2E32AHC0	Nuvoton NPCT750LABYX
1	VDD/VSB	NC	VSB
2	GND	GND	NC
3	GPIO	NC	NC
4	GPIO	NC	PP/GPIO6
5	NC	NC	NC
6	VNC/GPIO/I2C_PIRQ#	GPIO	GPIO3
7	GPIO/VDD	PP	NC
8	VDD	NC	VHIO
9	GND	NC	NC
10	VNC	NC	NC
11	NC	NC	NC
12	NC	NC	NC
13	VNC/GPIO/I2C_PIRQ#	NC	GPIO4
14	VDD	NC	NC
15	NC	NC	NC
16	GND	NC	GND
17	SPI_RST#	SPI_RST#	PLTRST#
18	SPI_PIRQ#/I2C_PIRQ#	SPI_PIRQ#	PIRQ#/GPIO2
19	SPI_CLK	SPI_CLK	SCLK
20	SPI_CS#	SPI_CS#	SCS#/GPIO5
21	MOSI	MOSI	MOSI/GPIO7
22	VDD	VPS	VHIO
23	GND	NC	GND
24	MISO	MISO	MISO
25	NC	NC	NC
26	NC	NC	NC
27	VNC/GPIO	NC	NC
28	VNC/GPIO	NC	NC
29	SDA	NC	SDA/GPIO0
30	SCL	NC	SCL/GPIO1
31	VNC	NC	NC
32	GND	NC	NC

Lenovo

Project Name : Ratchet-1	Title : DISCRETE TPM 2.0
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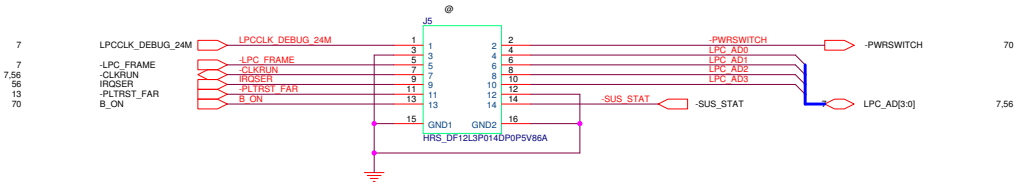
Date: Monday, April 01, 2019	Sheet : 68 of 98

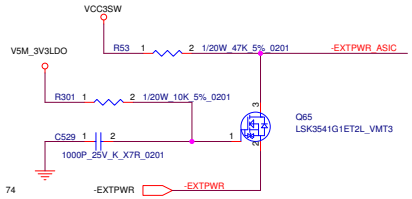
TABLE

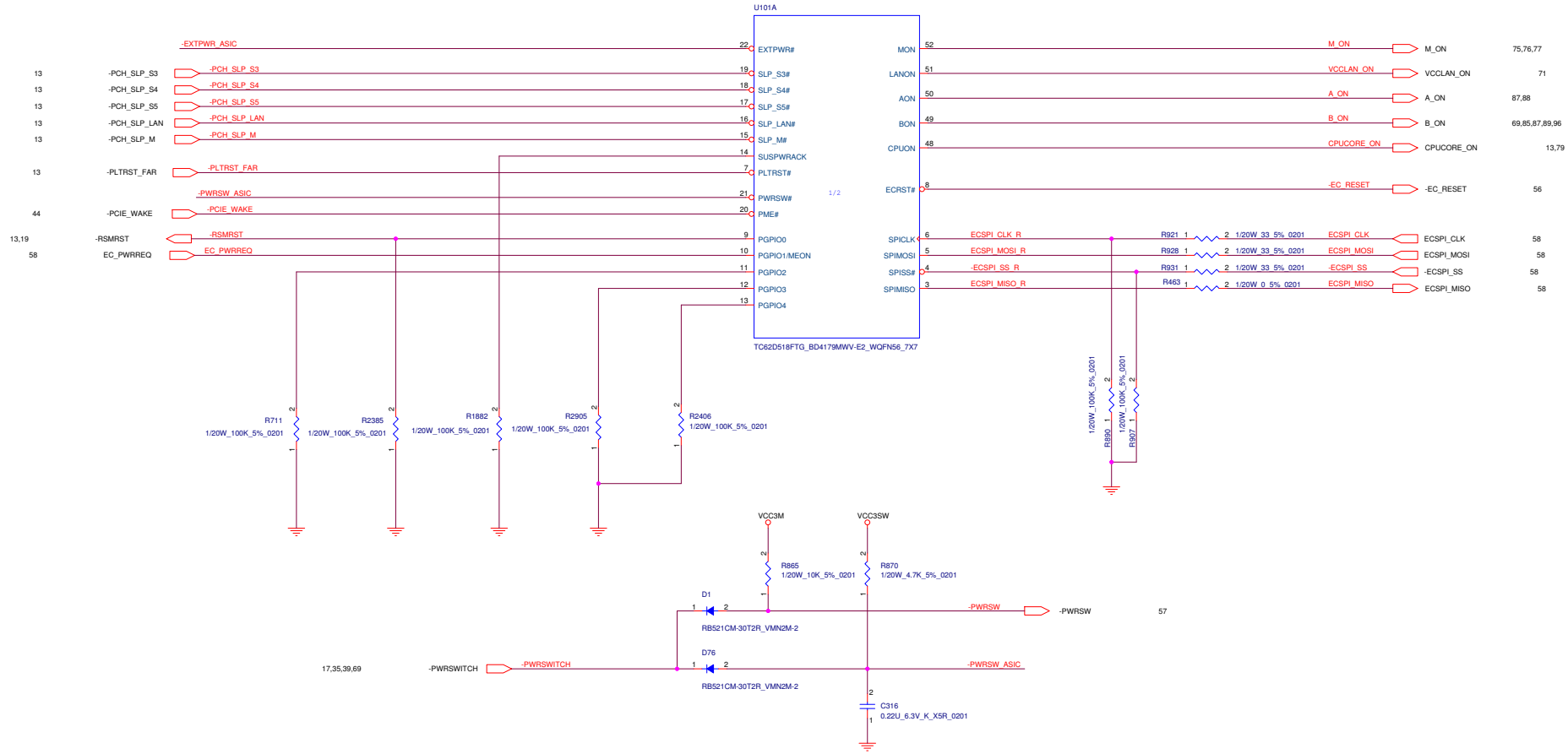
REF DES	ENABLE	DISABLE
J5	ASM	NO_ASM
R220	ASM	NO_ASM

LOGIC

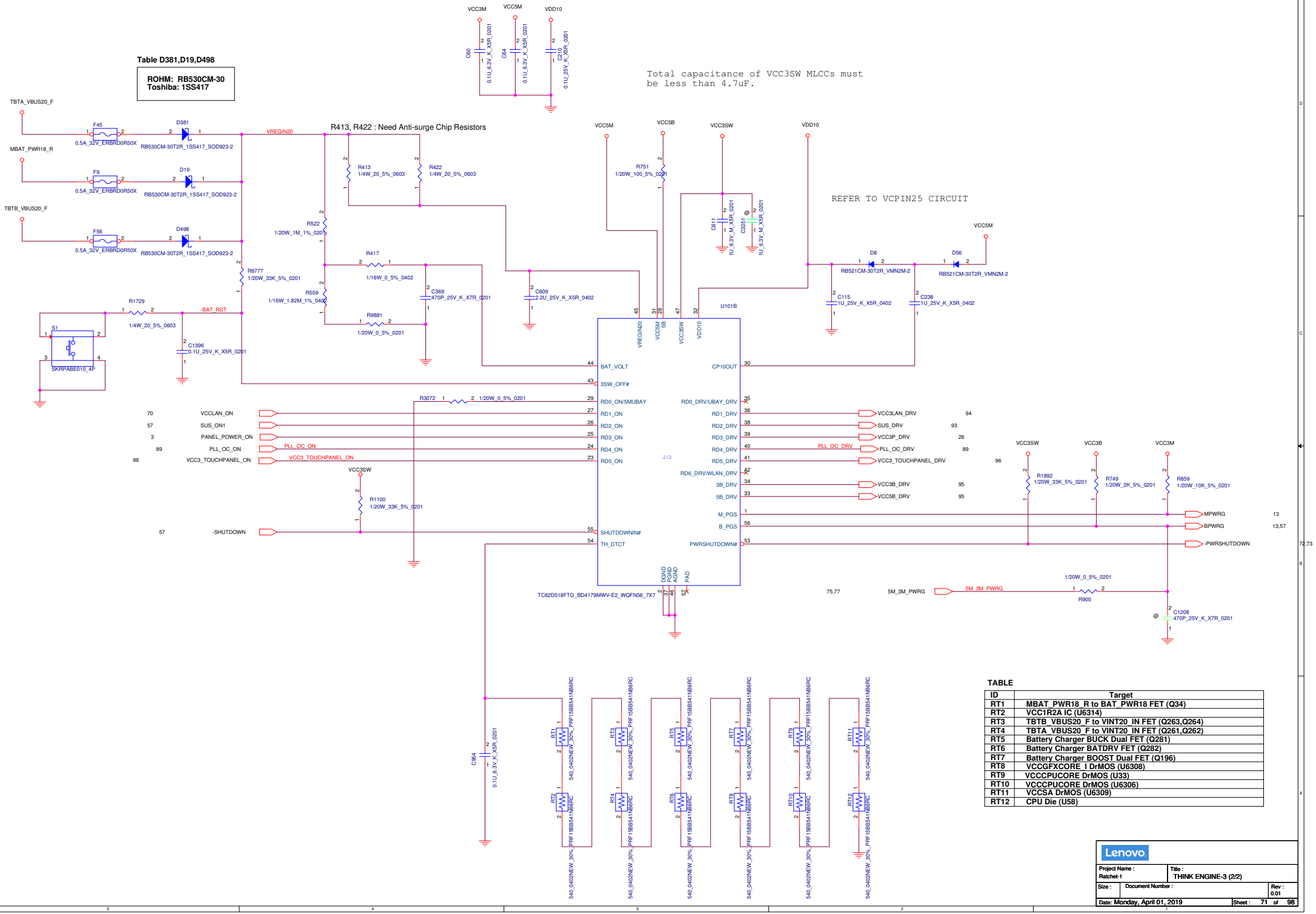


Lenovo		
Project Name : Ratchet-1	Title : LPC DEBUG PORT	
Size : C	Document Number :	Rev : 0.01
Date: Monday, April 01, 2019	Sheet : 69 of 98	





Lenovo		
Project Name : Ratchet-1	Title : THINK ENGINE-3 (1/2)	
Size :	Document Number :	Rev : 0.01
Date: Monday, April 01, 2019	Sheet : 70 of 98	

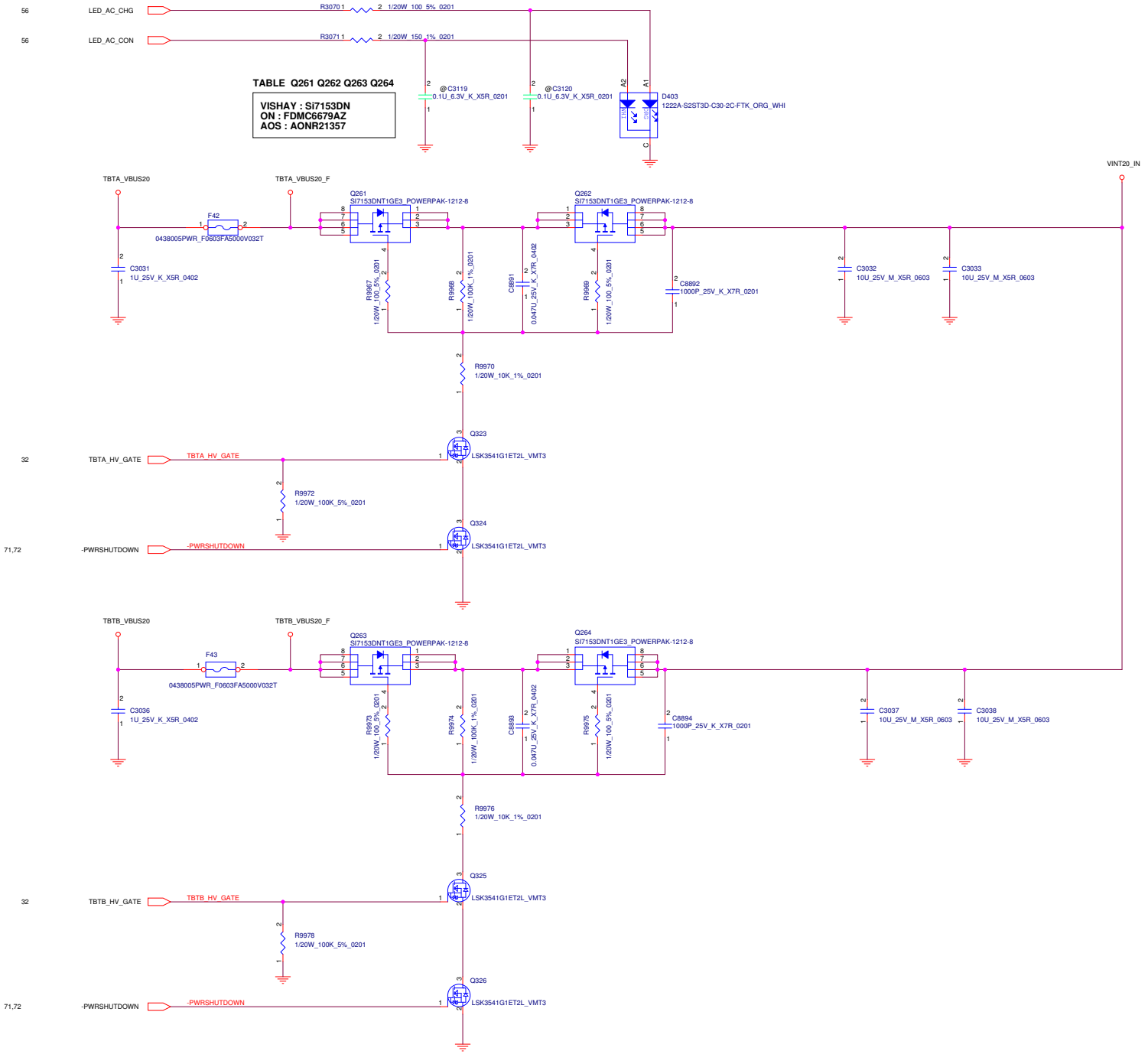


TABLE

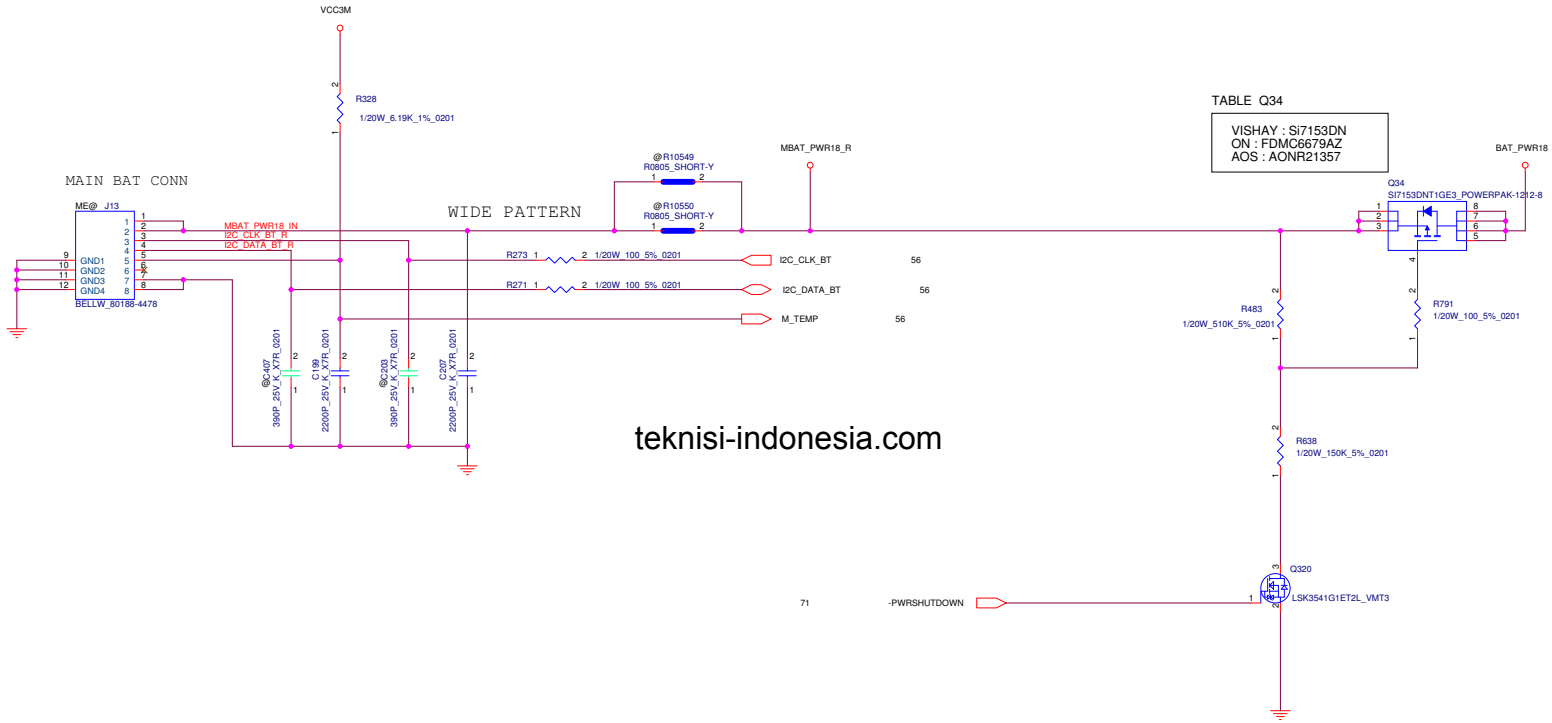
ID	Target
RT1	MBAT_PWR18_R to BAT_PWR18 FET (Q34)
RT2	VCC1R2A IC (U6314)
RT3	TBTB_VBUS20_F to VINT20_IN FET (Q263,Q264)
RT4	TBTA_VBUS20_F to VINT20_IN FET (Q261,Q262)
RT5	Battery Charger BUCK Dual FET (Q281)
RT6	Battery Charger BATDRV FET (Q282)
RT7	Battery Charger BOOST Dual FET (Q196)
RT8	VCCGFXCORE_I DrMOS (U6308)
RT9	VCCCPUCORE DrMOS (U33)
RT10	VCCCPUCORE DrMOS (U6306)
RT11	VCCSA DrMOS (U6309)
RT12	CPU Die (U58)

Lenovo

Project Name : Ratchet-1	Title : THINK ENGINE-3 (2/2)
Size :	Document Number : Rev : 0.01
Date: Monday, April 01, 2019	Sheet : 71 of 98



Lenovo			
Project Name : Ratchet-1		Title : DC-IN	
Size : C	Document Number :		Rev : 0.01
Date: Monday, April 01, 2019		Sheet : 72 of 98	



Project Name : Ratchet-1	Title : BATTERY INPUT
Size : C	Document Number :
Date: Monday, April 01, 2019	Sheet : 73 of 98
	Rev : 0.01

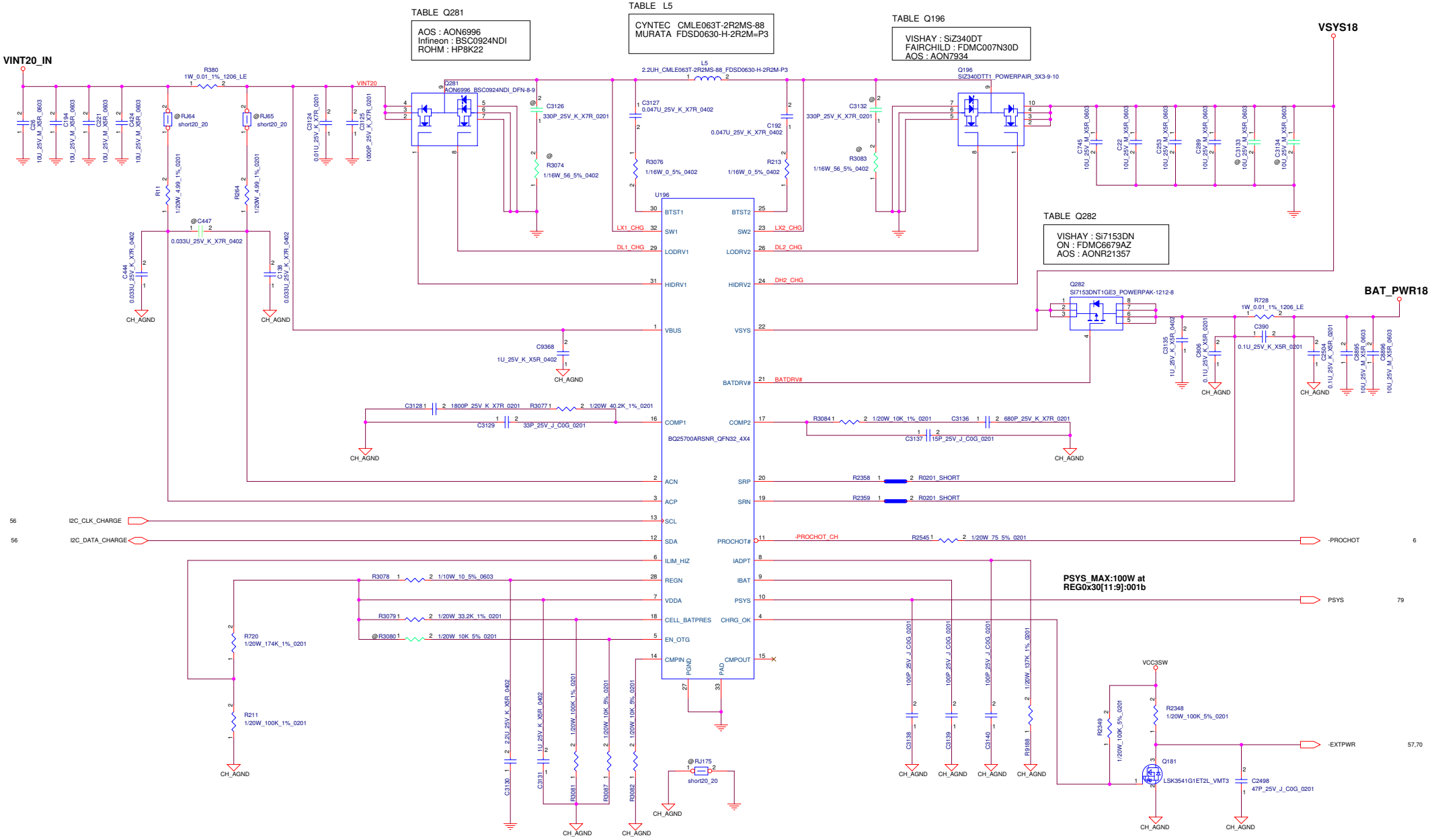


TABLE : ILIM_HIZ

IDPM	V (ILIM)	
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

← LOGIC

TABLE : CELL_BATPRES

# of CELL	V (CELL_PRES)	R3079
1-CELL	1.5V	301K
2-CELL	2.5V	140K
3-CELL	3.5V	71.5K
4-CELL	4.5V	33.2K

← LOGIC

TABLE

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

← LOGIC

Project Name : Ratchet-1	Title : BATTERY CHARGER (BQ25700A)
Size :	Document Number : Rev : 0.01
Date: Monday, April 01, 2019	Sheet : 74 of 98

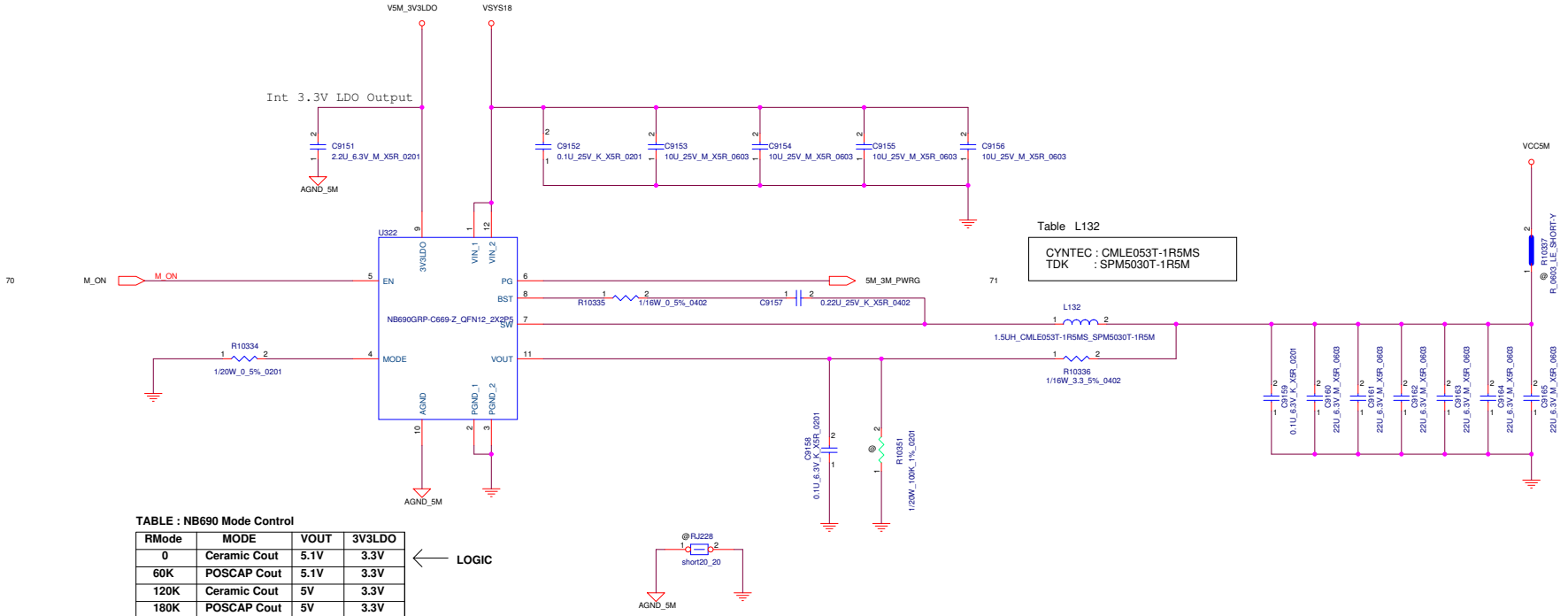


Table L132

CYNTEC :	CMLE053T-1R5MS
TDK :	SPM5030T-1R5M

TABLE : NB690 Mode Control

RMode	MODE	VOUT	3V3LDO
0	Ceramic Cout	5.1V	3.3V
60K	POSCAP Cout	5.1V	3.3V
120K	Ceramic Cout	5V	3.3V
180K	POSCAP Cout	5V	3.3V
Floating	X	3.3V	3.3V

← LOGIC

Project Name : Ratchet-1		Title : DC/DC VCC5M (NB690)	
Size : C	Document Number :		Rev : 0.01
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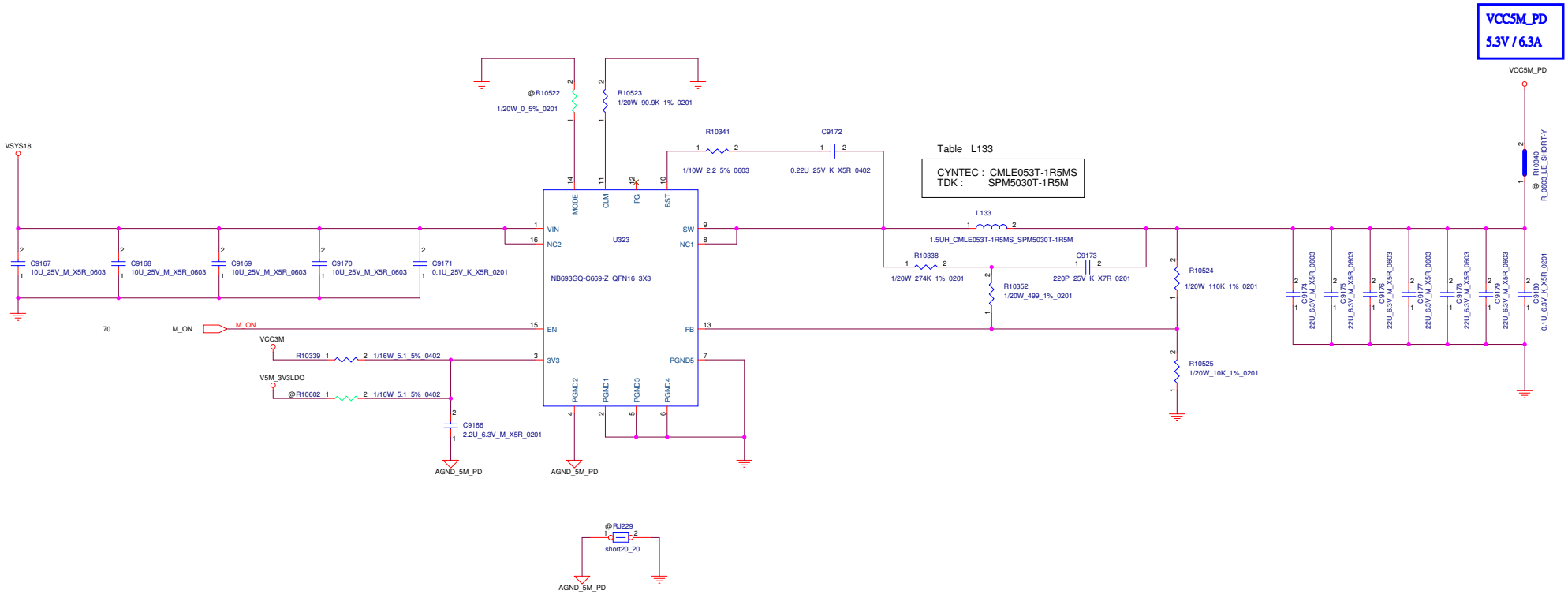
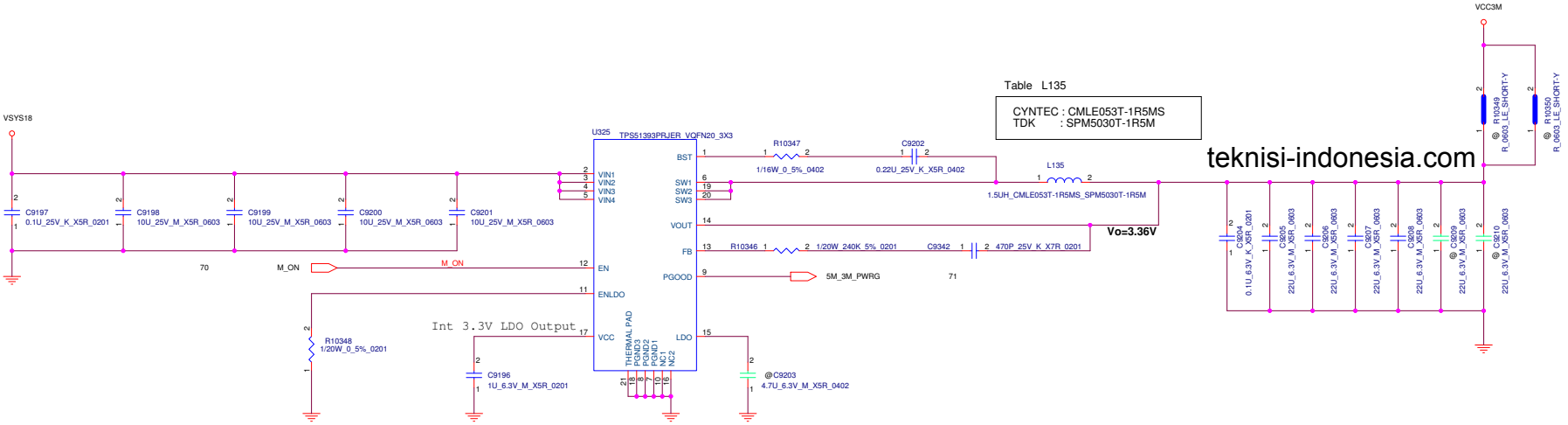


Project Name : Ratchet-1	Title : DC/DC VCC5M_PD (NB690)	
Size : C	Document Number :	Rev : 0.01
Date: Monday, April 01, 2019	Sheet : 76 of 98	



Lenovo		
Project Name : Ratchet-1	Title : DC/DC VCC3M (NB690)	
Size : C	Document Number :	Rev : 0.01
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Project Name : Ratchet-1	Title : BLANK	
Size : C	Document Number :	Rev : 0.01
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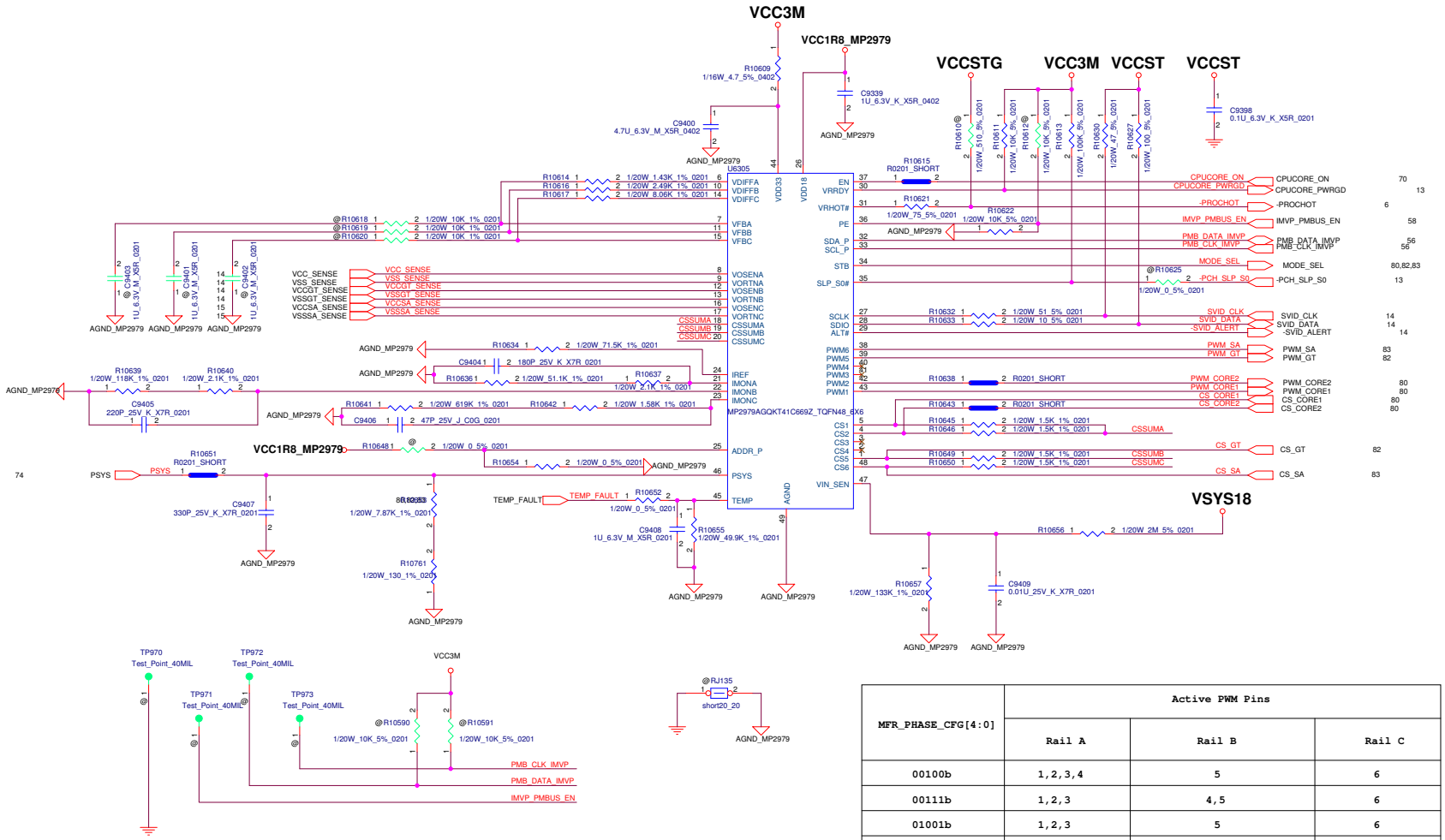

MFR_PHASE_CFG[4:0]	Active PWM Pins		
	Rail A	Rail B	Rail C
00100b	1,2,3,4	5	6
00111b	1,2,3	4,5	6
01001b	1,2,3	5	6
01100b	1,2	4,5	6
01110b	1,2	5	6
10001b	1	5	6

← LOGIC

Lenovo

Project Name : Ratchet-1	Title : DC/DC IMVP8 (MP2979AGQKT)
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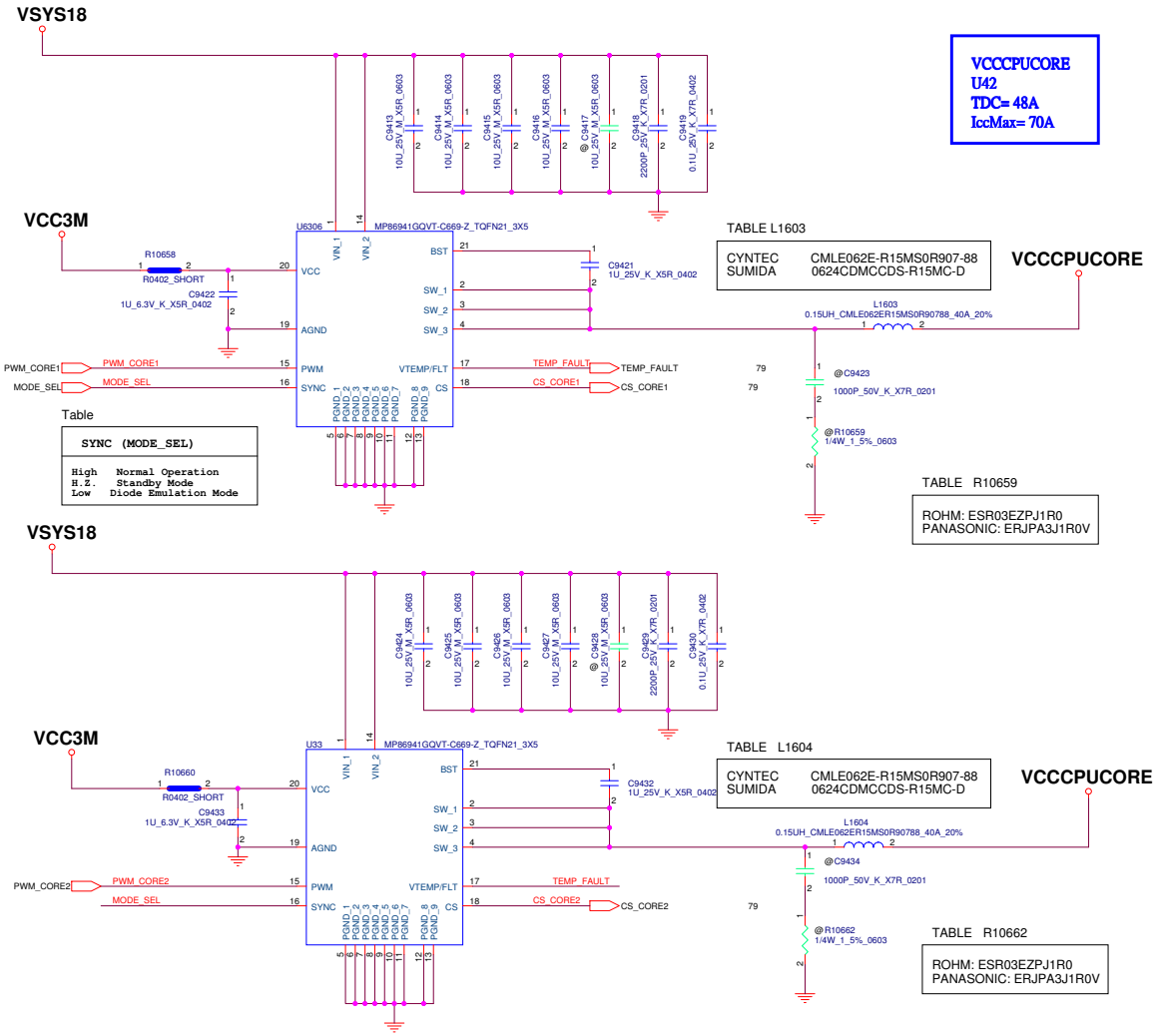
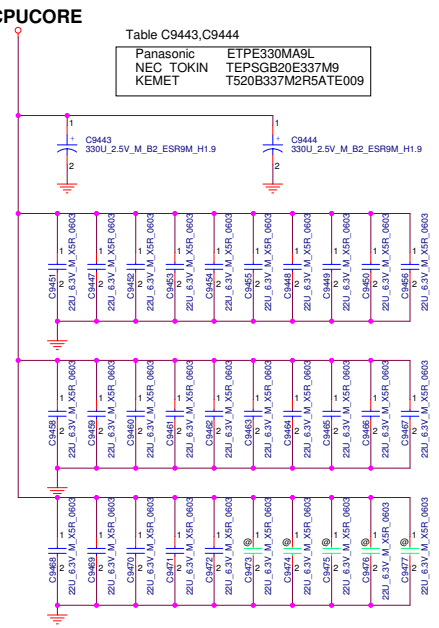


VCCCPUCORE
U42
TDC= 48A
IccMax= 70A

2pcs 330uF + 25pcs for WHL U42 VCCCPUCORE



Lenovo			
Project Name : Ratchet-1		Title : DC/DC VCCCPUCORE (MP86941 X 2)	
Size :	Document Number :		Rev : 0.01
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Lenovo		
Project Name : Ratchet-1	Title : BLANK	
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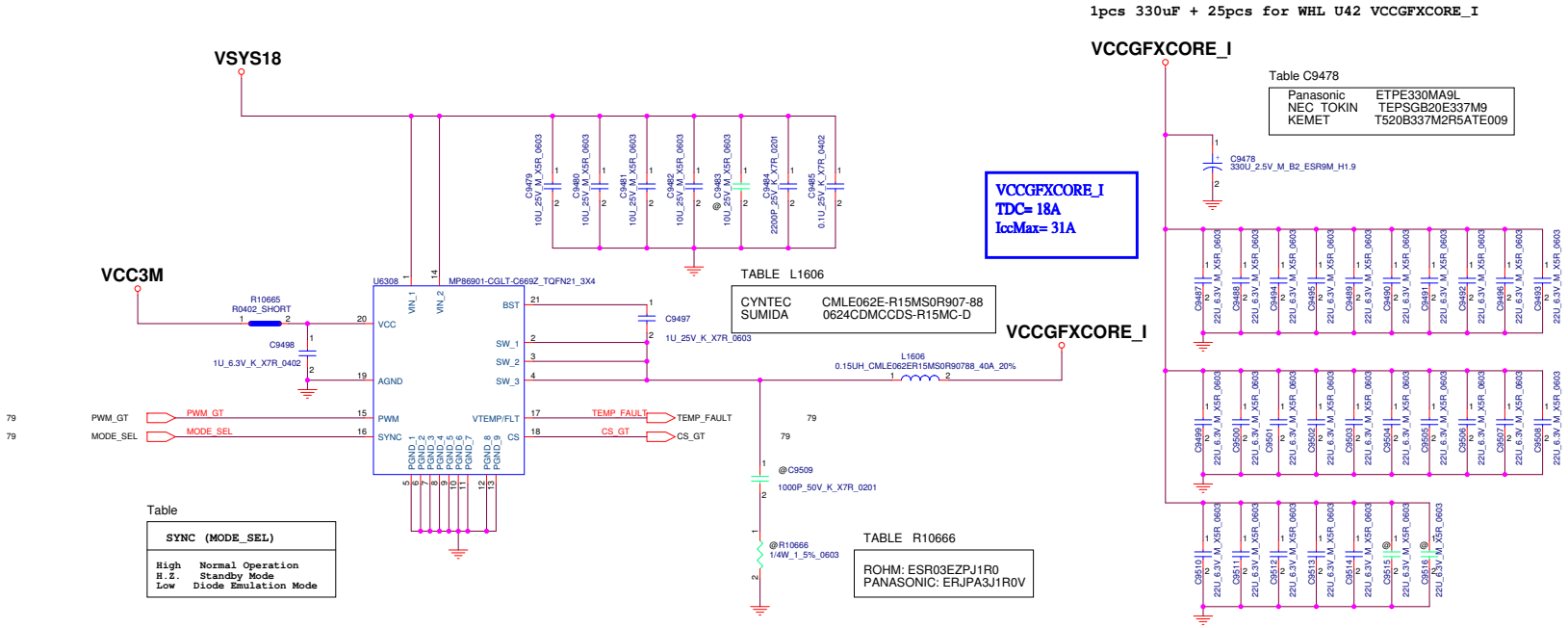
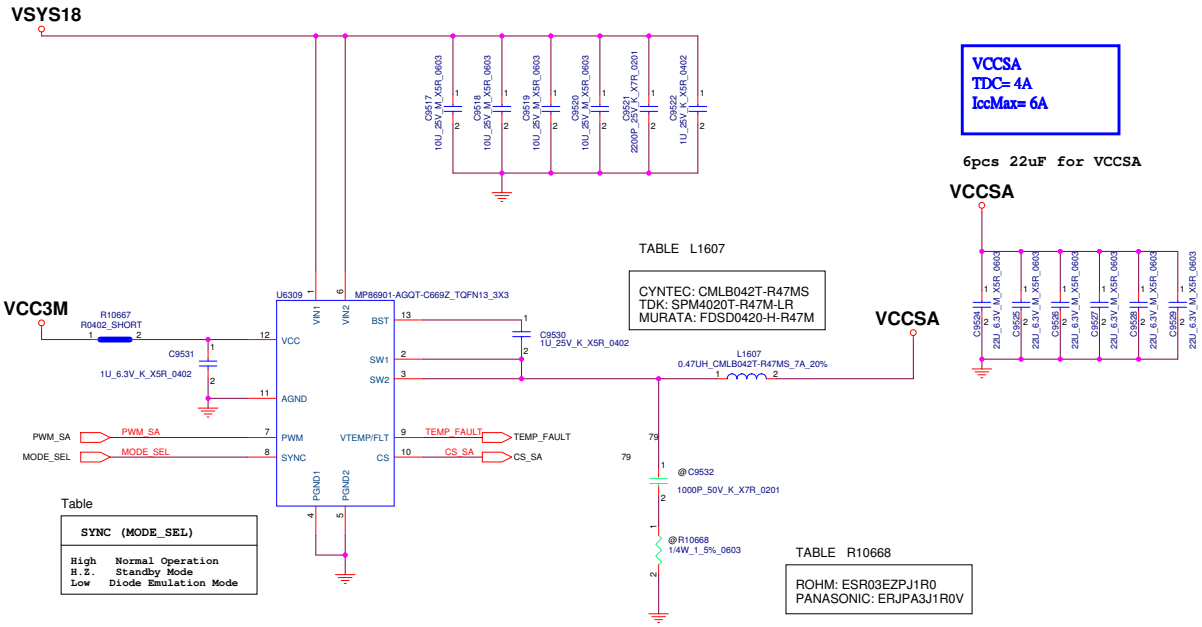


Project Name : Ratchet-1	Title : DC/DC VCCGFXCORE_I (MP86901C)
Size :	Document Number : Rev : 0.01
Date: Monday, April 01, 2019	Sheet : 82 of 98



Project Name : Ratchet-1		Title : DC/DC VCCSA (MP86901A)	
Size :	Document Number :		Rev : 0.01
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Project Name : Ratchet-1	Title : BLANK	
Size :	Document Number :	Rev : 0.01
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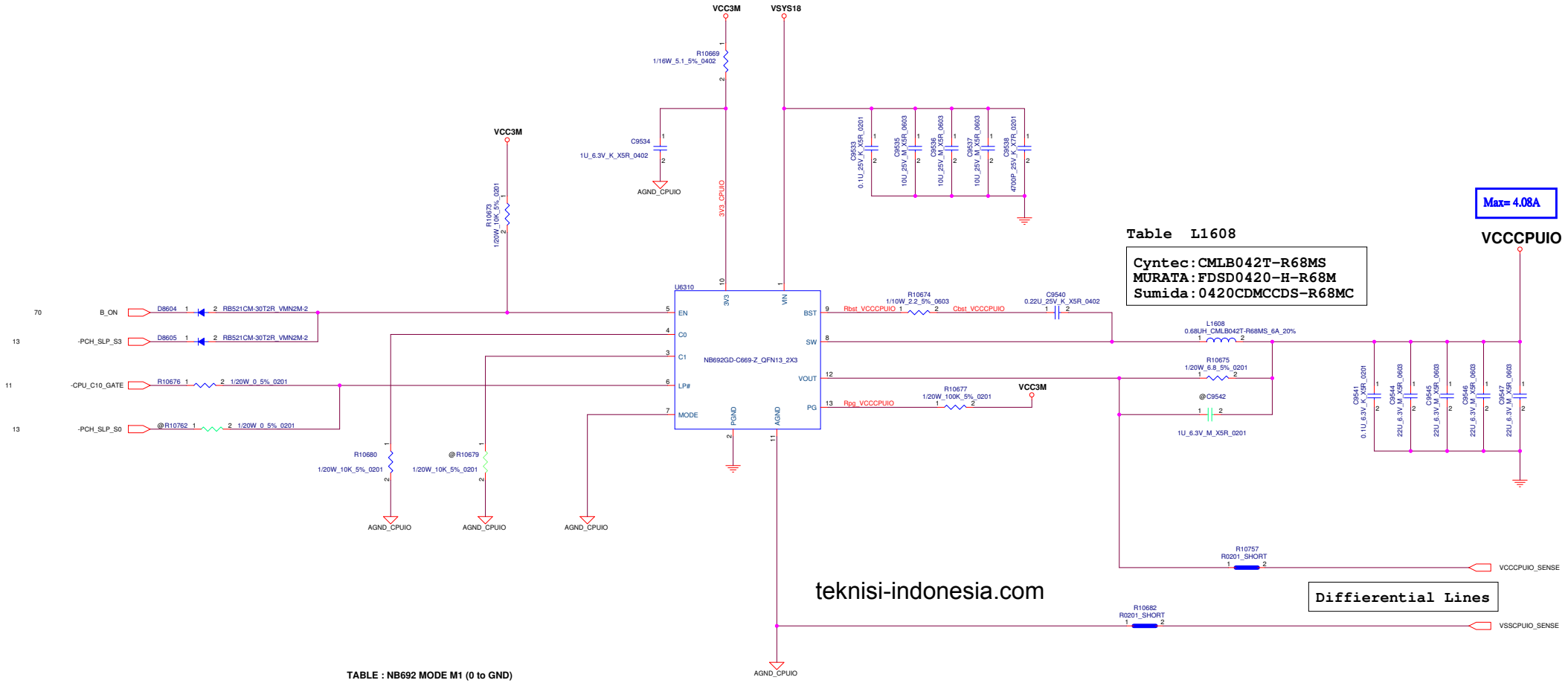

Max= 4.08A

Table L1608

Cyntec:CMLB042T-R68MS
MURATA:FDSD0420-H-R68M
Sumida:0420CDMCCDS-R68MC

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Diffierential Lines

TABLE : NB692 MODE M1 (0 to GND)

LP#	C1	C0	VOUT	
0	X	X	0.000V	← SLP_S0#
1	0	0	0.850V	
1	0	1	0.875V	
1	1	0	0.950V	← LOGIC
1	1	1	0.975V	

Project Name : Ratchet-1	Title : DC/DC VCCCPUIO(NB692)		
Size :	Document Number :		Rev : 0.01
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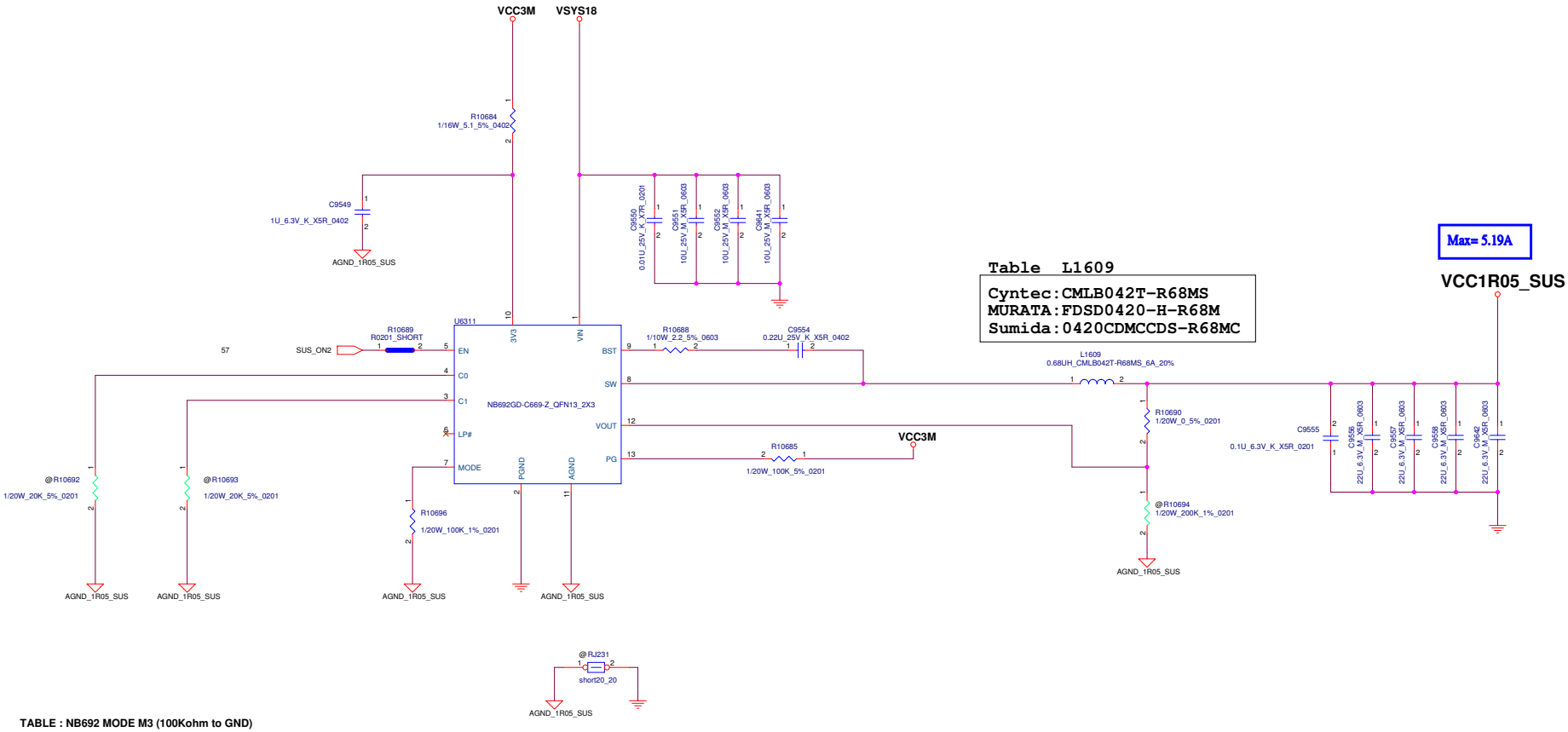

Table L1609

Cyntec:CMLB042T-R68MS
MURATA:FDSD0420-H-R68M
Sumida:0420CDMCCDS-R68MC

TABLE : NB692 MODE M3 (100Kohm to GND)

LP#	C1	C0	VOUT(V)	
0	X	X	0V	
1	0	0	0.8V	
1	0	1	0.95V	
1	1	0	1V	
1	1	1	1.05V	← Default Value

Project Name : Ratchet-1	Title : DC/DC VCC1R05_SUS (NB692)	
Size :	Document Number :	Rev : 0.01
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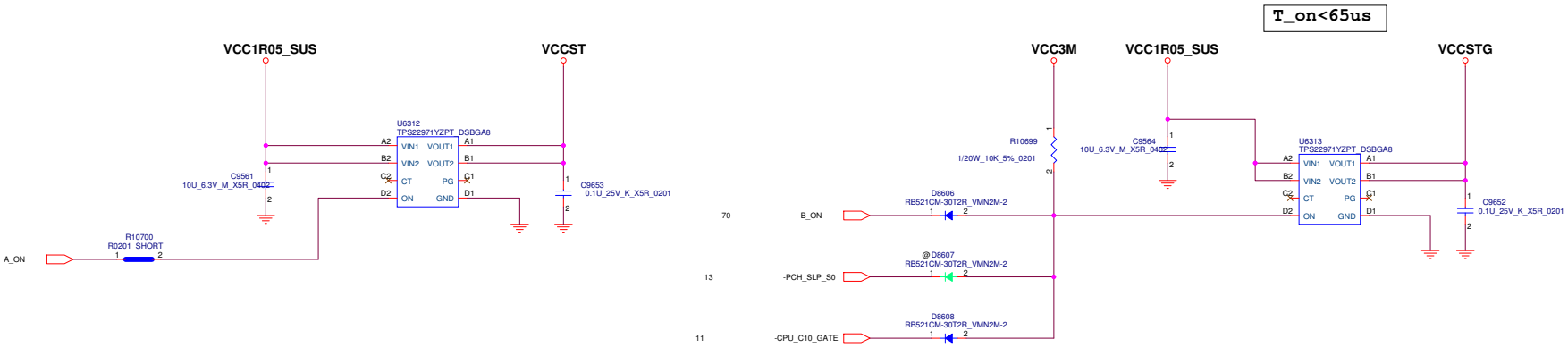

Project Name : Ratchet-1	Title : LOAD SW VCCST & VCCSTG
Size :	Document Number : Rev : 0.01
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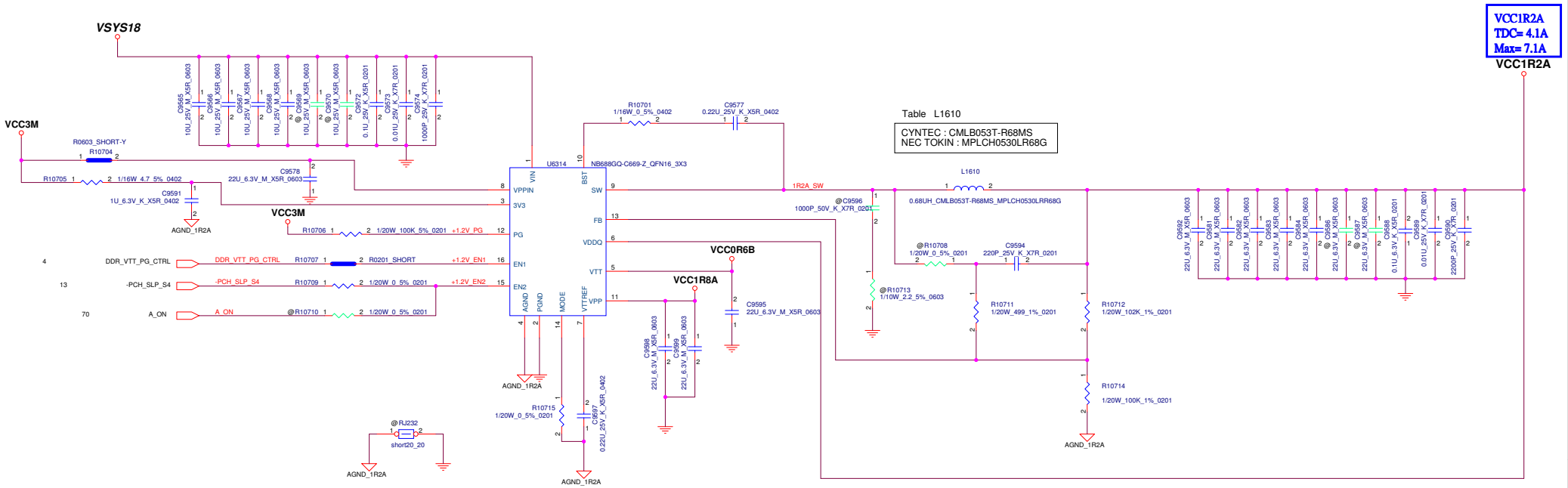

TABLE NB688BGQ:EN1/EN2

State	EN1	EN2	VDDQ	VTTREF	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 NB688BGQ: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

LOGIC

Lenovo

Project Name : Ratchet-1	Title : DC/DC VCC1R2A/0R6B/1R8A(NB688)
Size :	Document Number : Rev : 0.01
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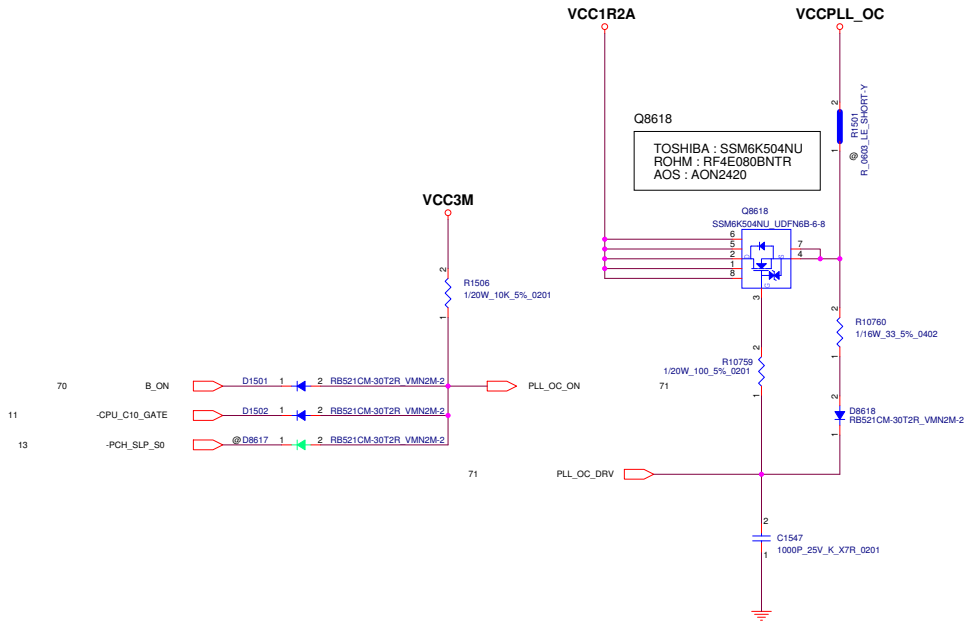

Lenovo			
Project Name : Ratchet-1		Title : LOAD SW VCCPLL_OC	
Size : C	Document Number :		Rev : 0.01
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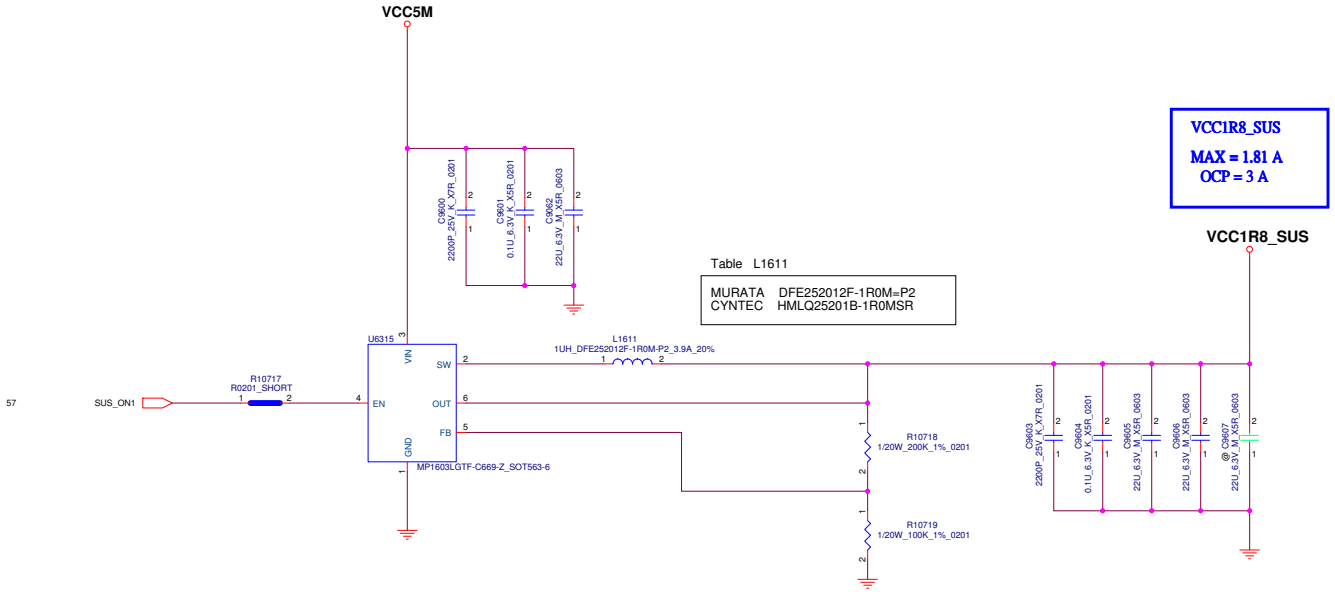

Project Name : Ratchet-1	Title : DC/DC VCC1R8_SUS (MP1603L)
Size : C	Document Number :
Date: Monday, April 01, 2019	Sheet : 90 of 98
	Rev : 0.01

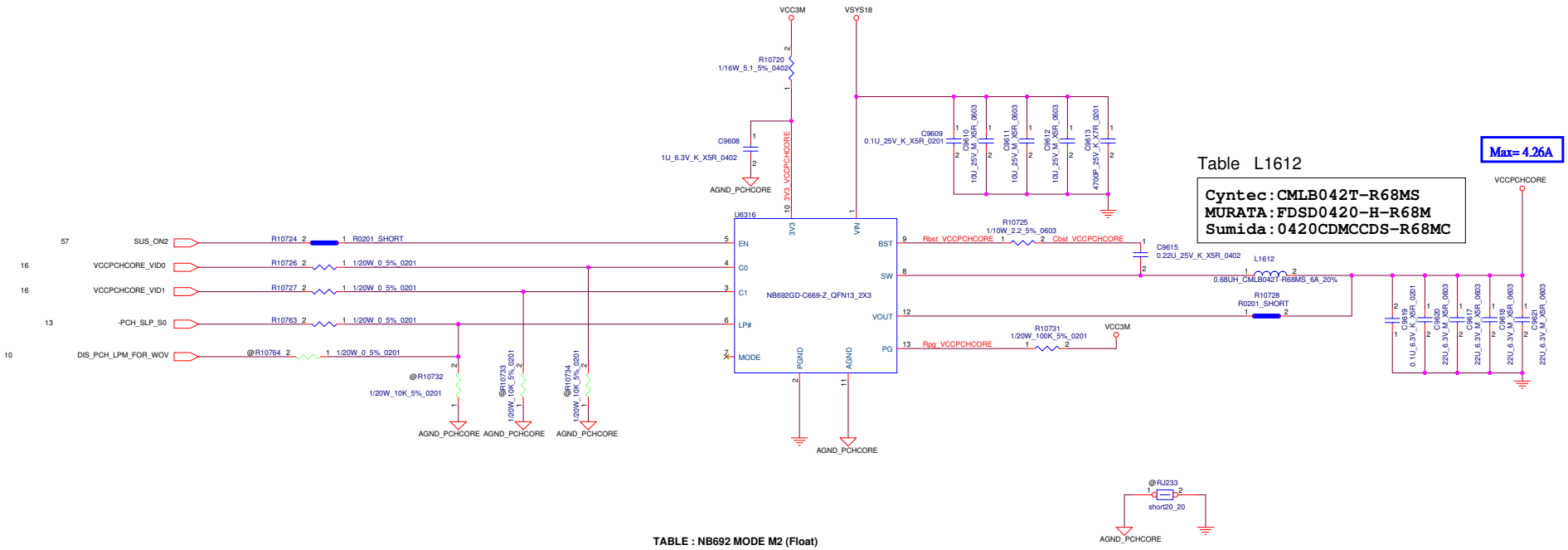

Table L1612

Cyntec:CMLB042T-R68MS
MURATA:FDSD0420-H-R68M
Sumida:0420CDMCCDS-R68MC

TABLE : NB692 MODE M2 (Float)

LP#	C1	C0	VOUT	
0	X	X	0.75V	← SLP_S0#
1	0	0	0.90V	
1	0	1	0.95V	
1	1	0	1.00V	
1	1	1	1.05V	← DEFAULT

Project Name : Ratchet-1	Title : DC/DC VCCPCHCORE(NB692)	
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Project Name : Ratchet-1	Title : BLANK	
Size : C	Document Number :	Rev : 0.01
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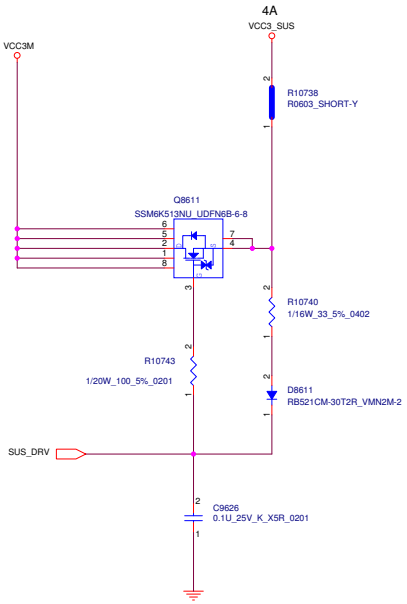
Q8611

TOSHIBA : SSM6K513NU
AOS : AON2420
FAIRCHILD : FDMA8878



Project Name : Ratchet-1	Title : LOAD SW PCH SUS	
Size :	Document Number :	Rev : 0.01
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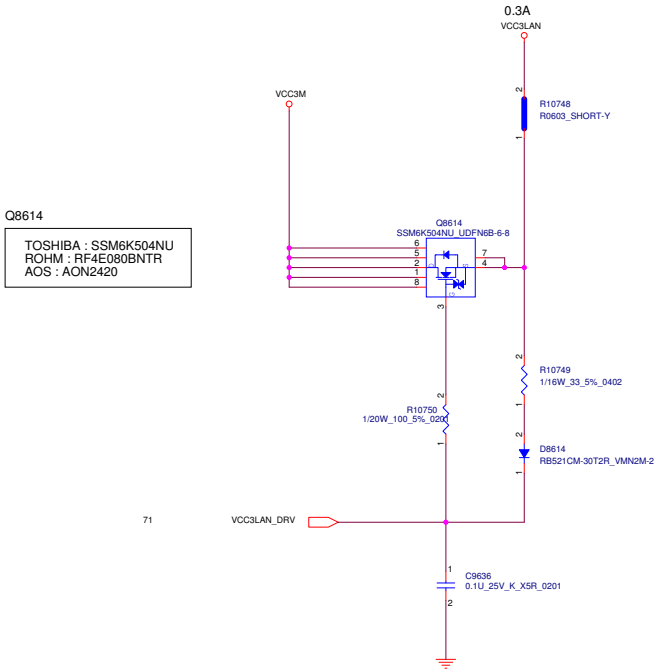

Q8614

TOSHIBA : SSM6K504NU
ROHM : RF4E080BNTR
AOS : AON2420

Project Name : Ratchet-1		Title : LOAD SW LAN	
Size :	Document Number :		Rev : 0.01
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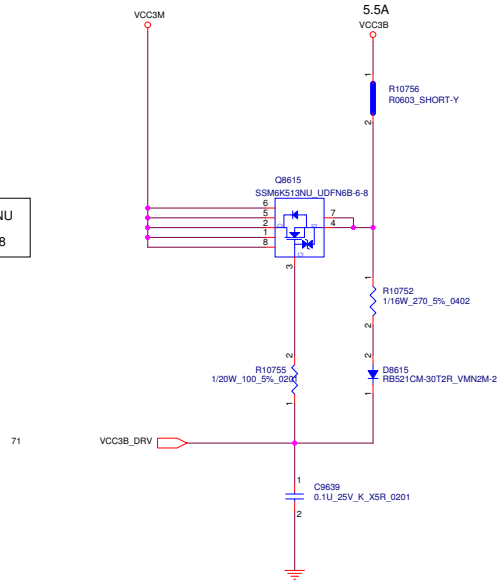
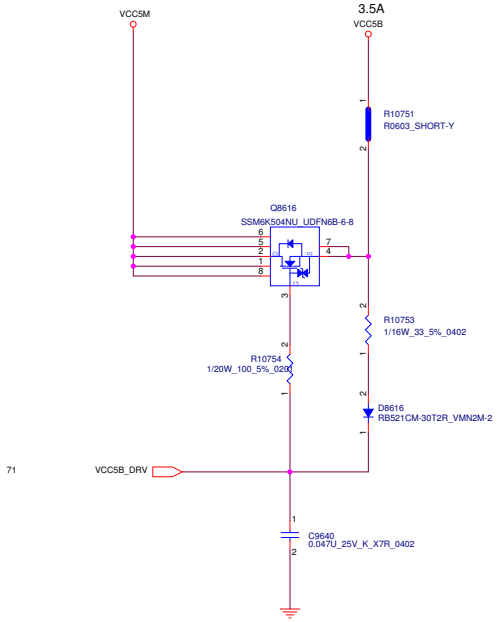
Q8615

TOSHIBA : SSM6K513NU
AOS : AON2420
FAIRCHILD : FDMA8878





Q8616

TOSHIBA : SSM6K504NU
ROHM : RF4E080BNTR
AOS : AON2420

Project Name : Ratchet-1	Title : LOAD SW B	
Size :	Document Number :	Rev : 0.01
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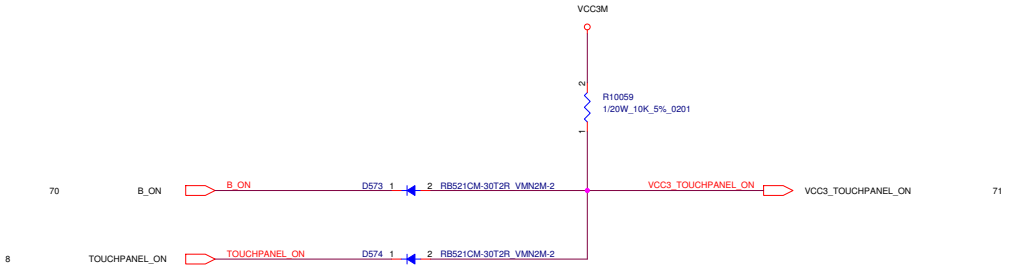
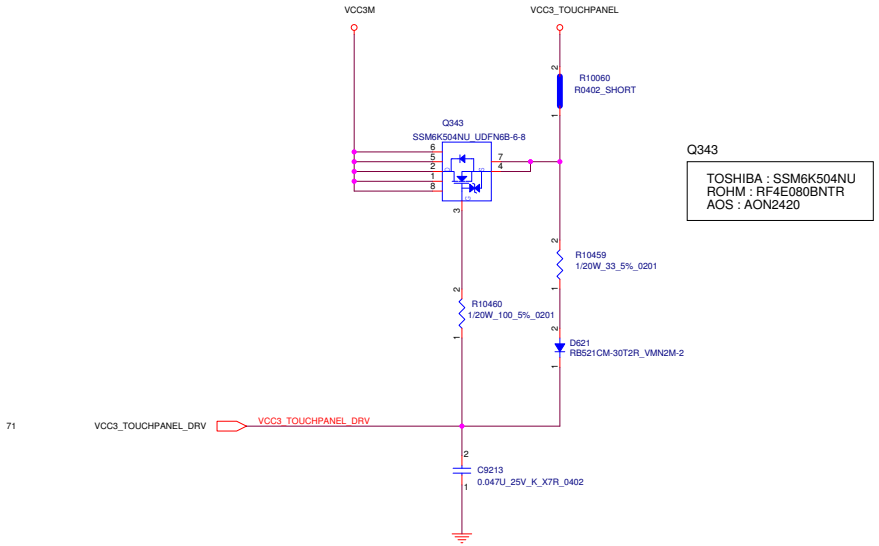
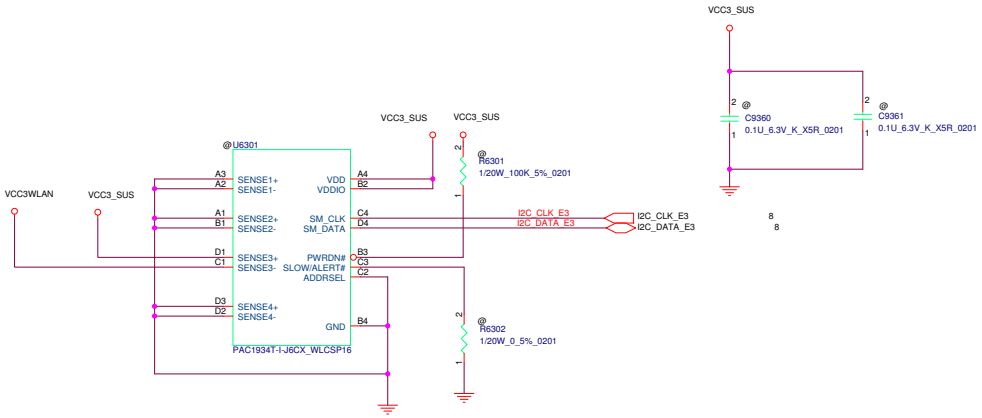




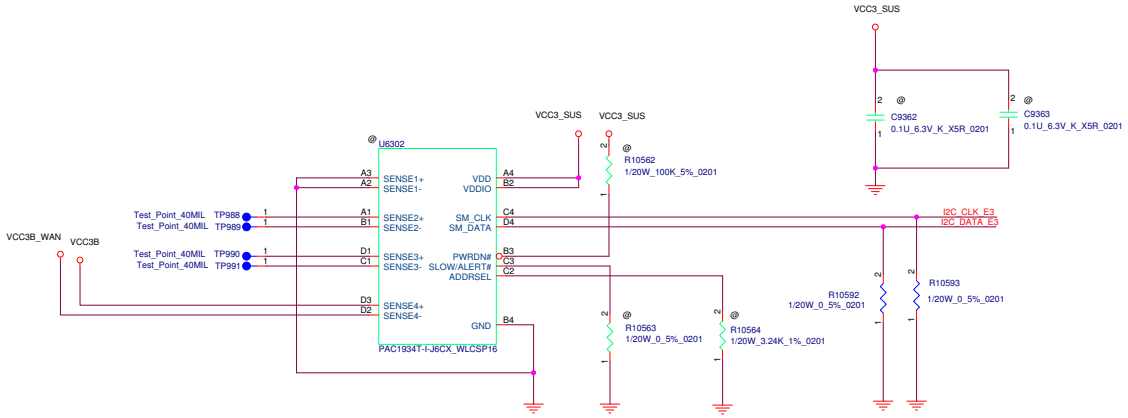
Q343

TOSHIBA : SSM6K504NU
ROHM : RF4E080BNTR
AOS : AON2420

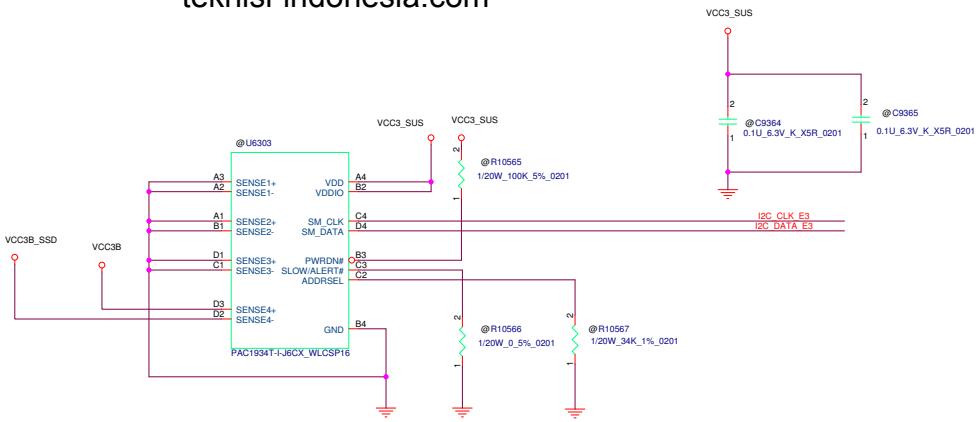
Project Name : Ratchet-1	Title : LOAD SW TOUCH PANEL
Size : C	Document Number :
Rev : 0.49	
Date: Monday, April 01, 2019	Sheet : 96 of 98



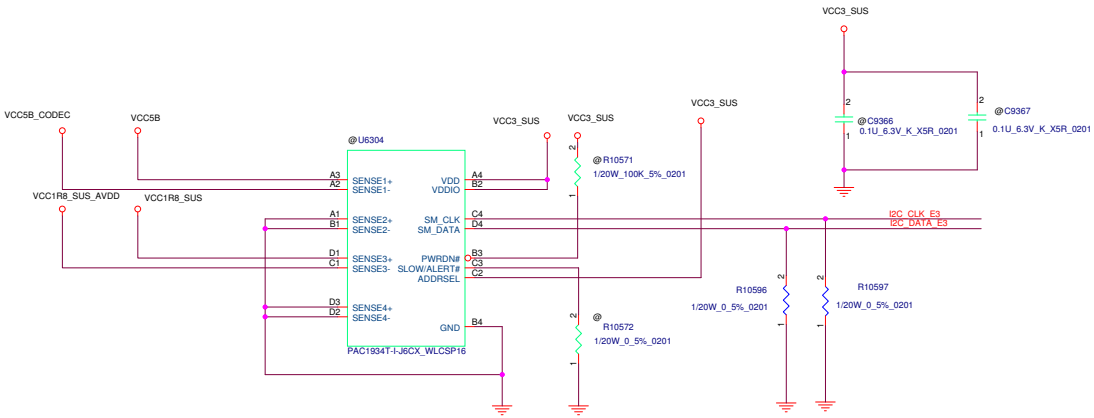
For WLAN I2C Address:0010_000(ADDRSEL=0 (Tie to GND))



For WWAN I2C Address:0010_101(ADDRSEL=3,240)



For Storage I2C Address:0011_010(ADDRSEL=34,000)



For Audio I2C Address:0011_111(ADDRSEL=Tied to VDD)

Lenovo		
Project Name : Ratchet-1	Title : ENERGY ESTIMATION ENGINE	
Size : C	Document Number :	Rev : 0.01
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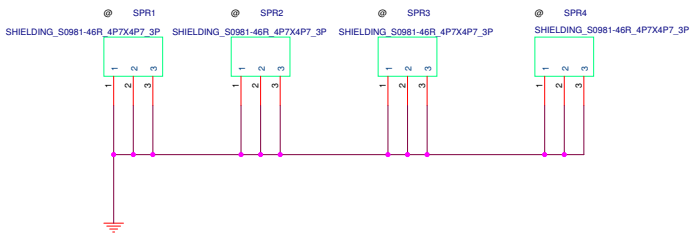
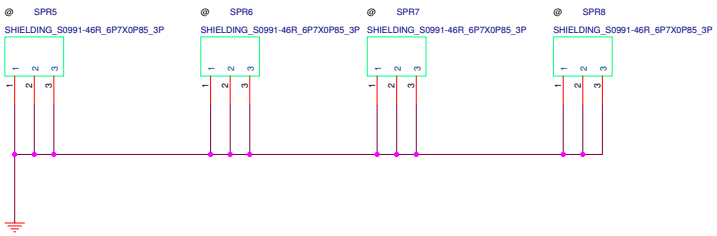
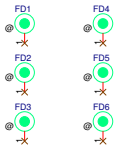




FID
Board Area



Lenovo		
Project Name : Ratchet-1	Title : PTH FOR SCREW HOLES	
Size : C	Document Number :	Rev : 0.01
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