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MS-AC131

Ver: 1.0

Intel Sharkbay plamform H81

CPU:

INTEL-Haswell LGA1150

System Chipset:

INTEL-LYNX

Memory:

DDRIII SO-DIMM (1333/1666MHz) * 2 (Dual Channel)

PWM:

VRD12 - ISL95812

OnBoard Chipset:

HD Audio Codec:RTL887

LAN-realtek8111G

SIO:NUVOTON 5533D

SPI ROM: 64 MB

Other:

HDMI*1

SATA3*2

Side USB3.0 *2

REAL USB2.0 *4

COM Port *1

Expansion Slots:

Mini PCI Express Slot * 2

MICRO-STAR INT'L CO.,LTD

MS-AC131

Size	Document Description	Rev
Custom	Cover Sheet	1.0

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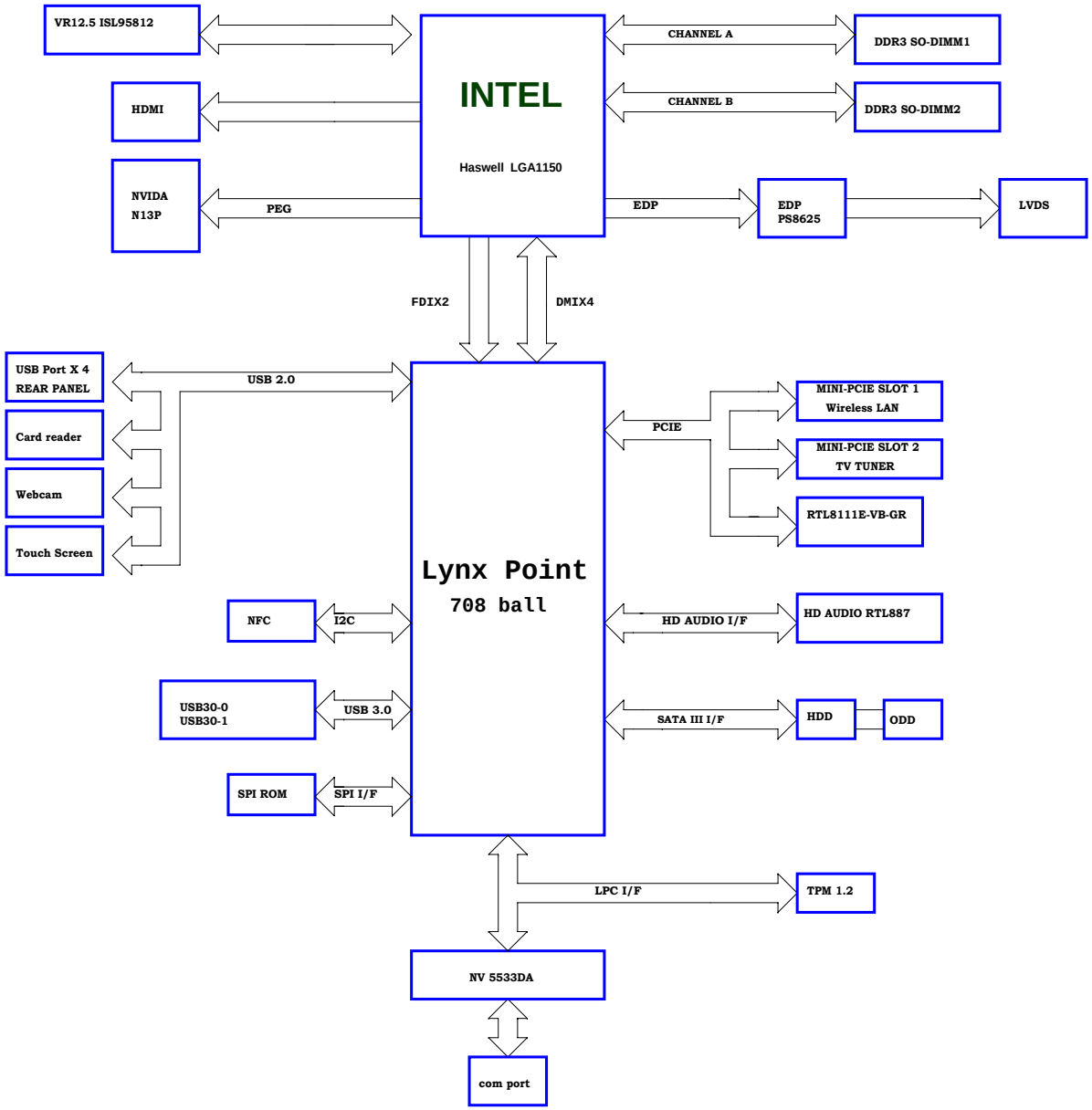
MS-AC131 Block Diagram



MSI	MICRO-STAR INT'L CO.,LTD	
	MS-AC131	
Size: Custom	Document Description: Block Diagram	Rev: 1.0
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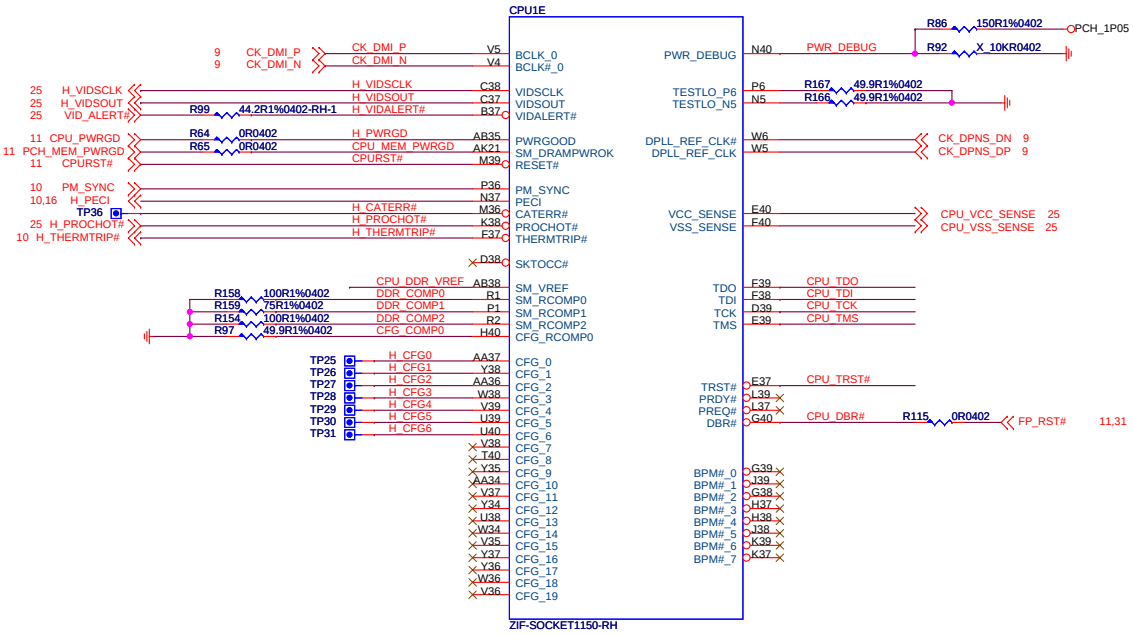

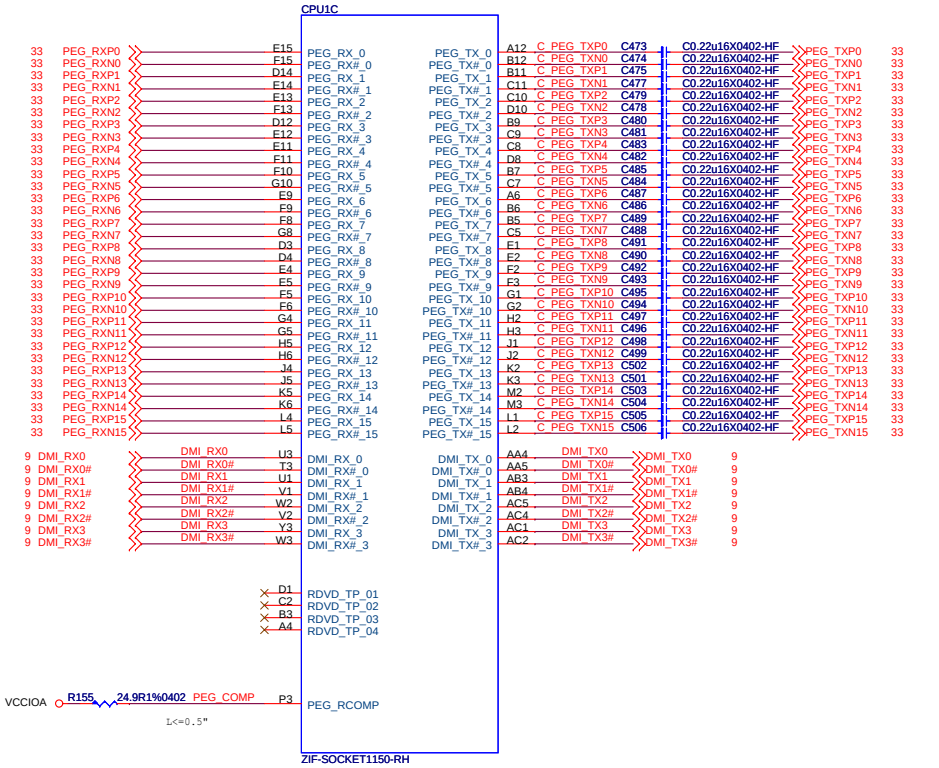

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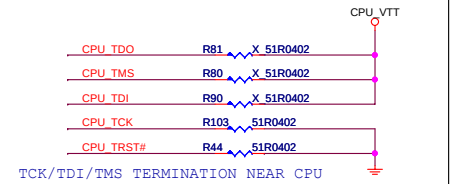

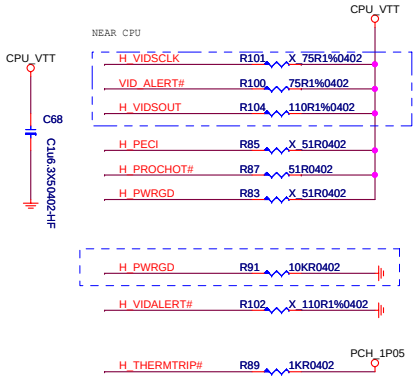

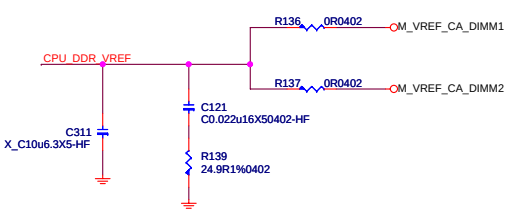

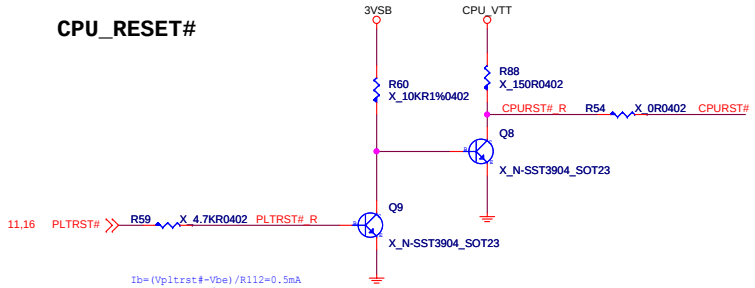

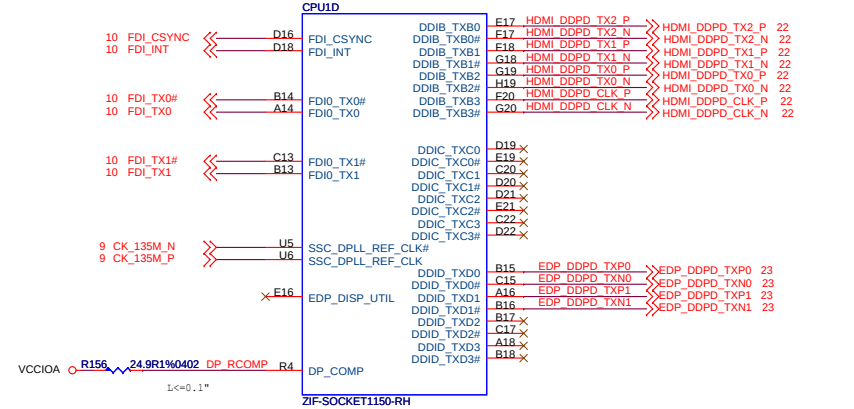

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-AC131	
Size: Custom	Document Description: CPU-CLK/Control/MISC/PEG	Rev: 1.0
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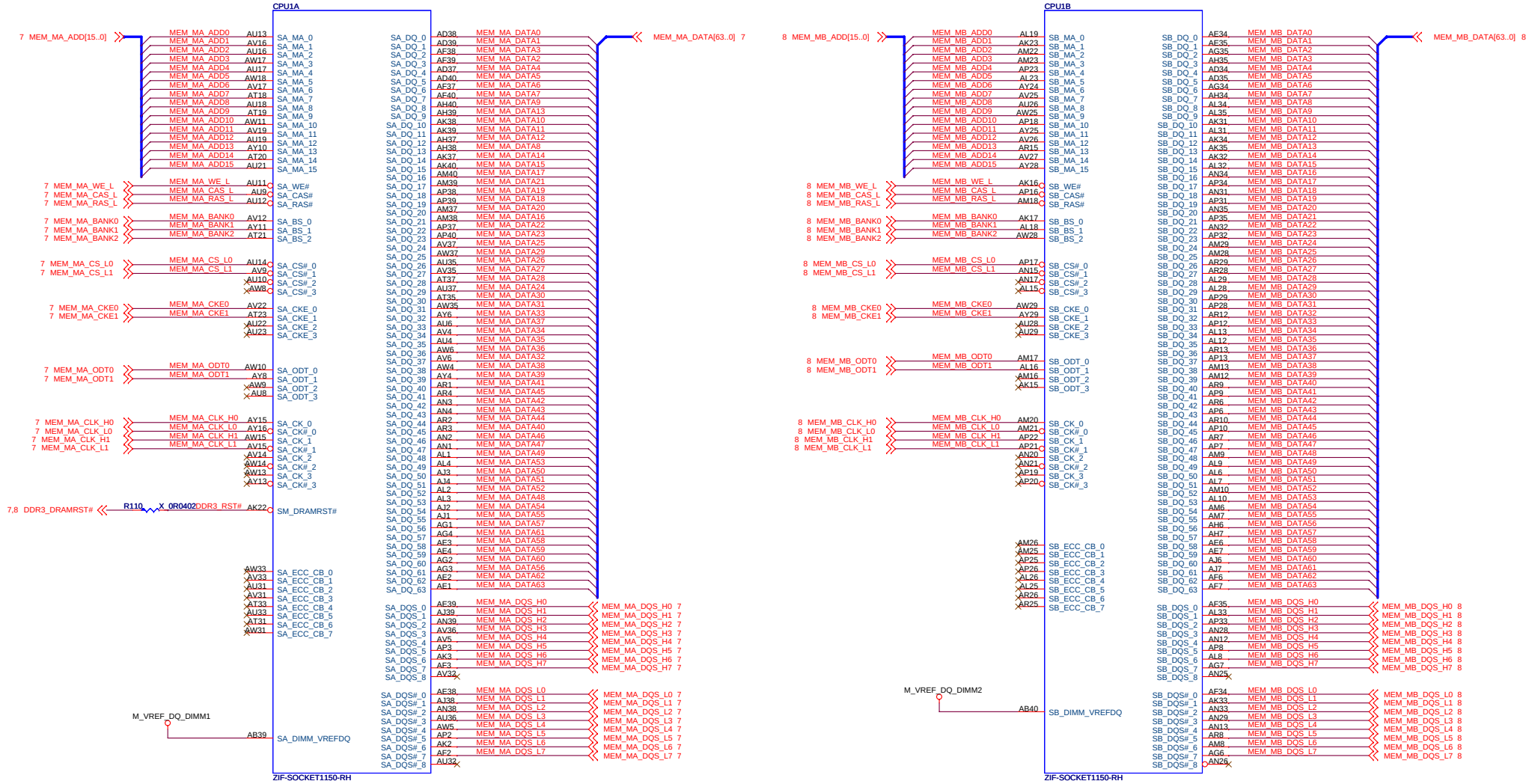

MICRO-STAR INT'L CO.,LTD		
MS-AC131		
Size: Custom	Document Description: CPU-Memory	Rev: 1.0
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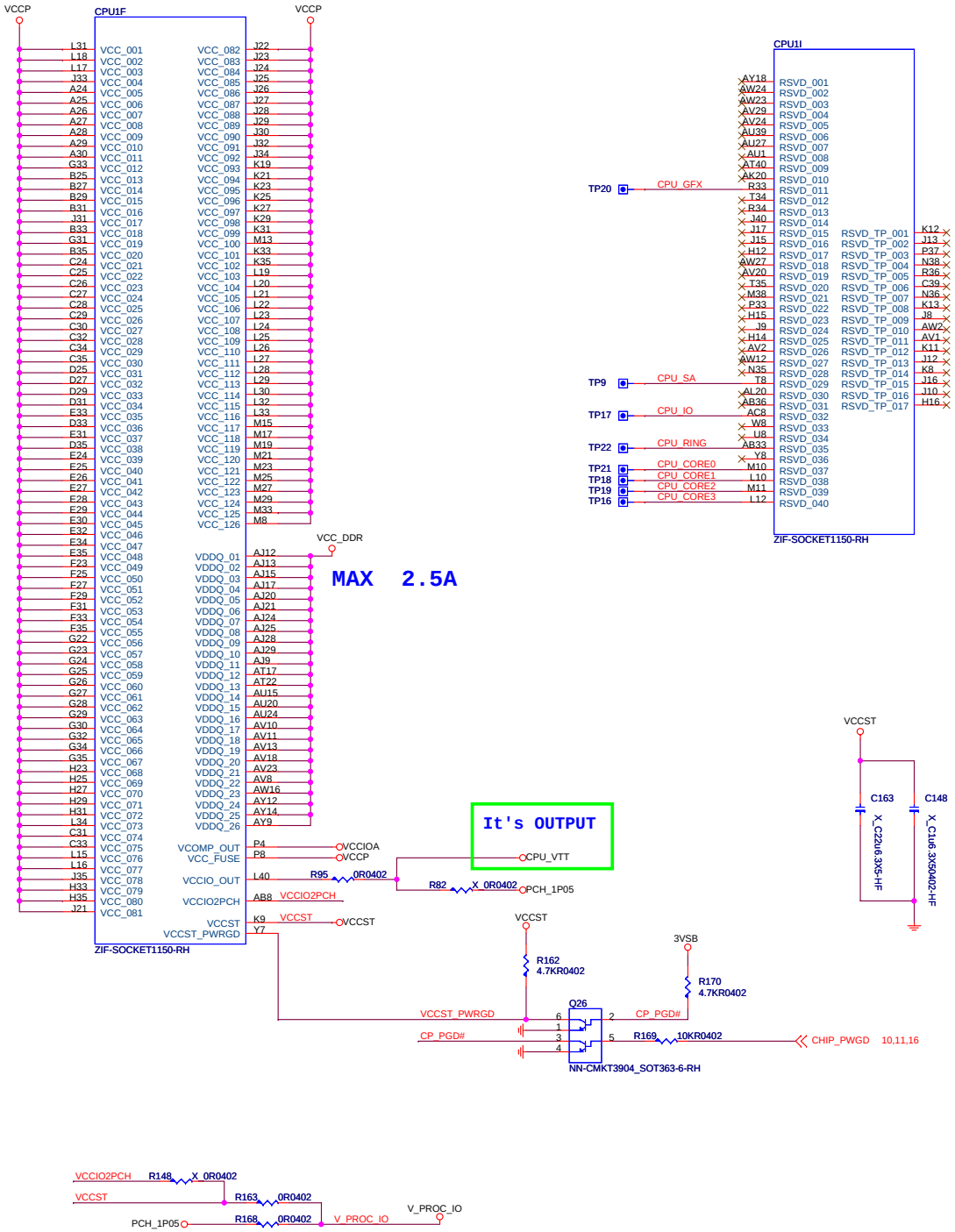
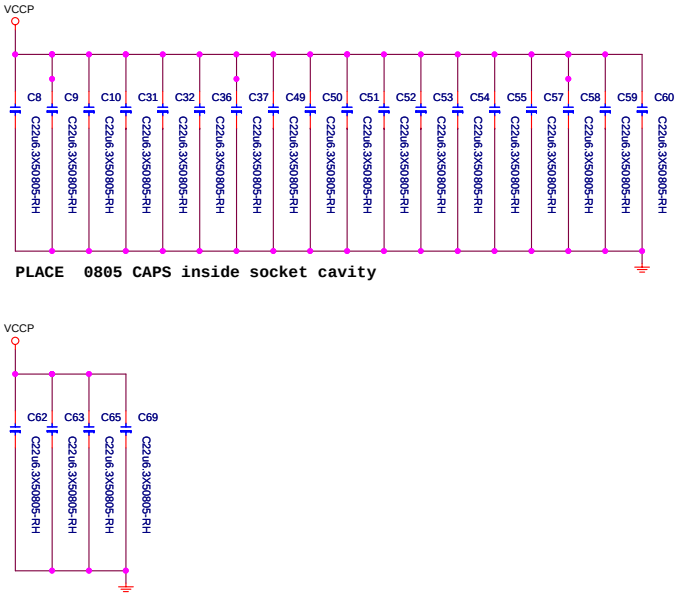
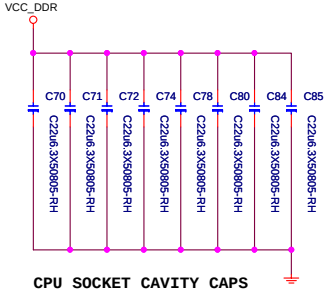


+CPU_VCCP-Decoupling



+1.5V_DDR3-Decoupling



MICRO-STAR INT'L CO.,LTD		
MS-AC131		
Size: Custom	Document Description: CPU-Power	Rev: 1.0
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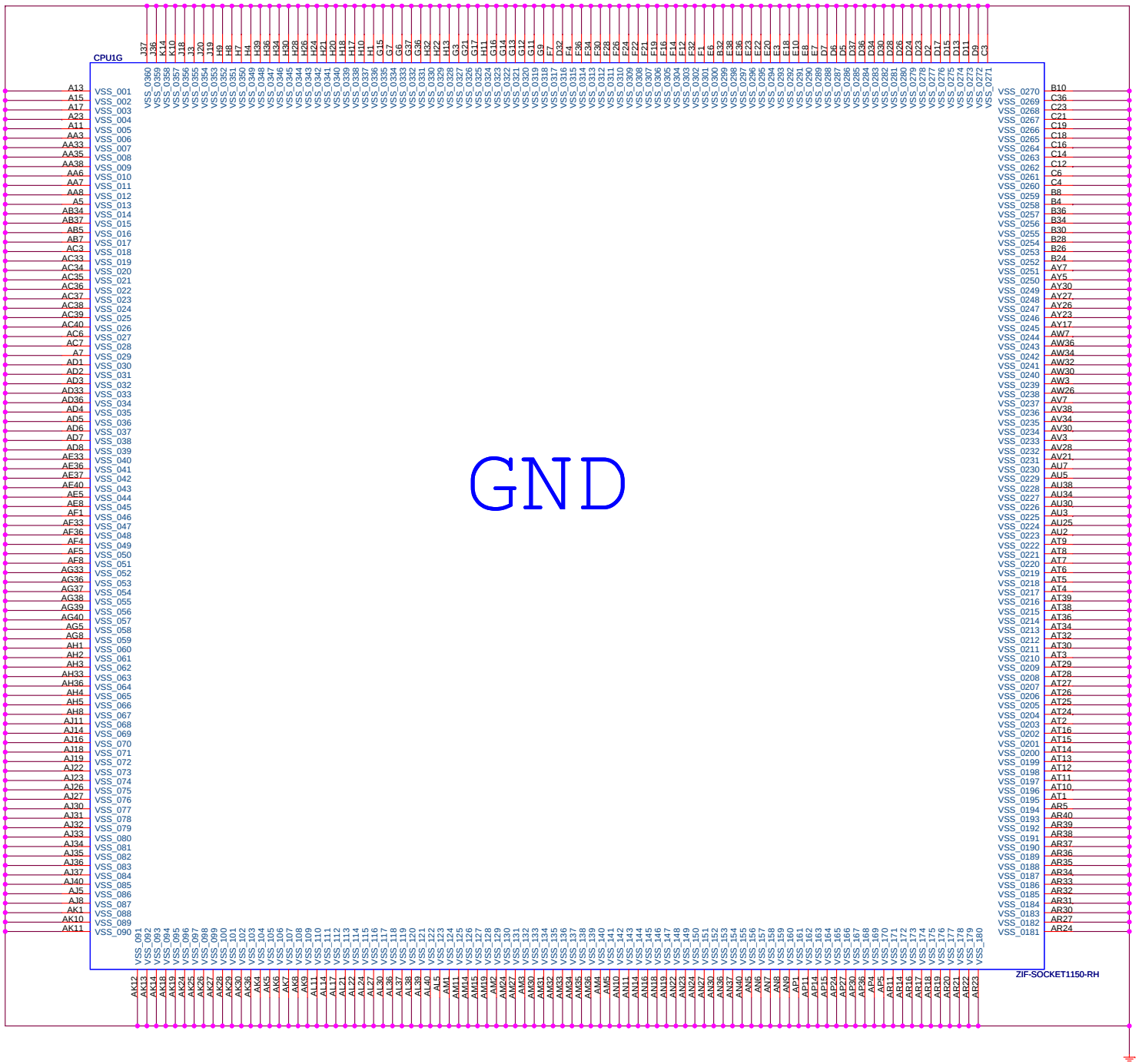

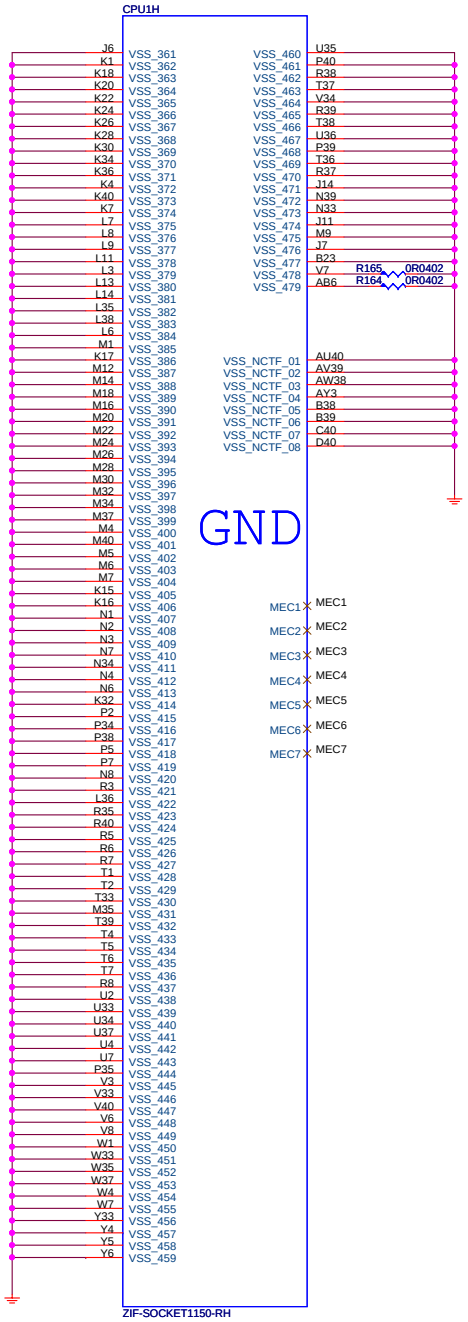

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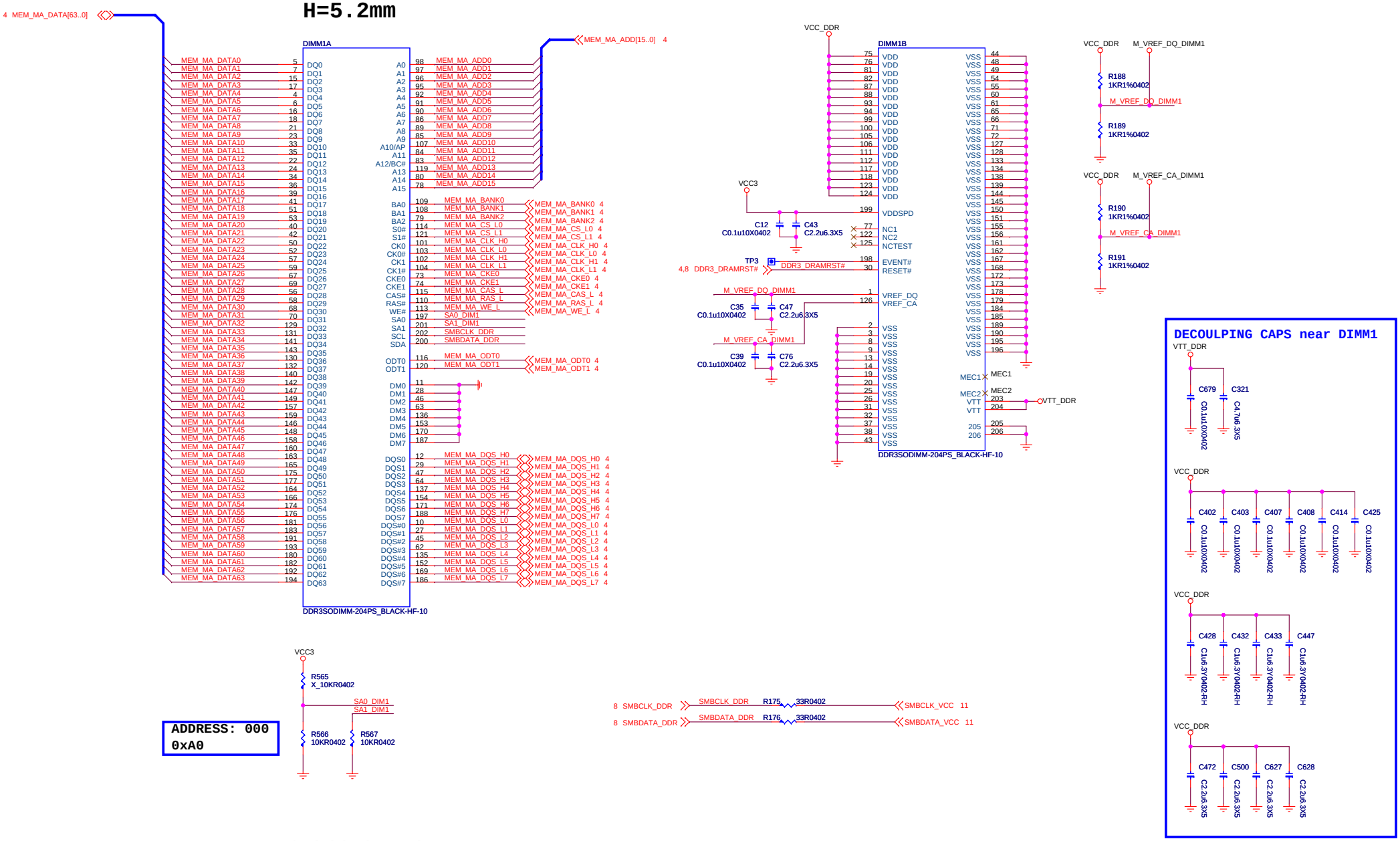
MS-AC131		
Size: Custom	Document Description: CPU-GND	Rev: 1.0
Date: Thursday, May 23, 2013	Sheet 6 of 47	

SO DIMM1 #A

H=5.2mm



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MS-AC131		
Size: Custom	Document Description: DDR III SODIMM 1	Rev: 1.0
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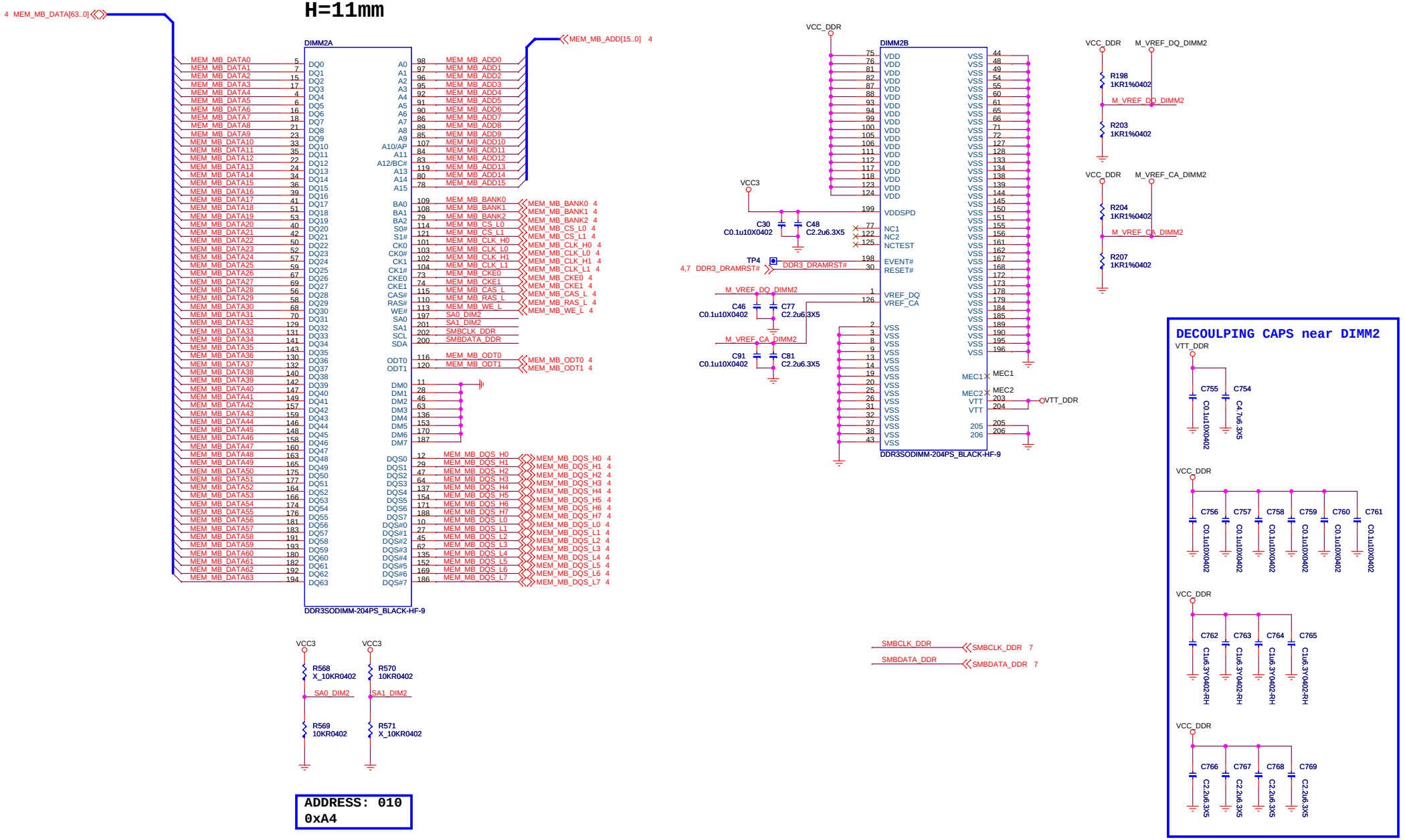
SO DIMM2 #B

H=11mm



ADDRESS: 010
0xA4

MICRO-STAR INT'L CO.,LTD	
MS-AC131	
Size: Custom	Document Description: DDR III SODIMM 2
Rev: 1.0	
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H87 SKU P/N H87

H87

INTEL-DH82H87-RH

USB 2.0 ports 6,7,12 and 13 are disabled on 10 port SKUs.
Only USB 3.0 ports 1 and 2 are enabled.
pcie port7,8 NA

near Connector & Device

PCH1B

PCI-E

USB(2.0)

USB(3.0)

DMI

Only H87

Pair		Device	OC
EHCI#1	0	USB3 Ext. Port B	OC#0
	1	USB3 Ext. Port A	OC#0
	2	USB Ext. Port 2	OC#1
	3	USB Ext. Port 3	OC#1
	4	USB Ext. Port 4	OC#2
	5	USB Ext. Port 5	OC#2
	6	X	
	7	X	
EHCI#2	8	Mini card (TV)	
	9	Card Reader	
	10	Webcam	
	11	Touch Screen	
	12	Mini card (H87)	
	13	X	

2 OF 8

LYNX

PCH1F

CLOCK

CLOCK_IN

Programmable output clock to 33/48MHZ

EMI Reserved

6 OF 8

LYNX

EMC

PCH1A

GPI

PIRQ&GPIO

1 OF8

LYNX

default:OUTPUT

GPO Reserved

no clock gen pull down

CRYSTAL:25MHZ

Company	MICRO-STAR INT'L CO.,LTD
Model	MS-AC131
Size	Custom
Document Description	LYNX PCIE/DMI/USB/CLK
Rev	1.0
Date	Monday, May 27, 2013
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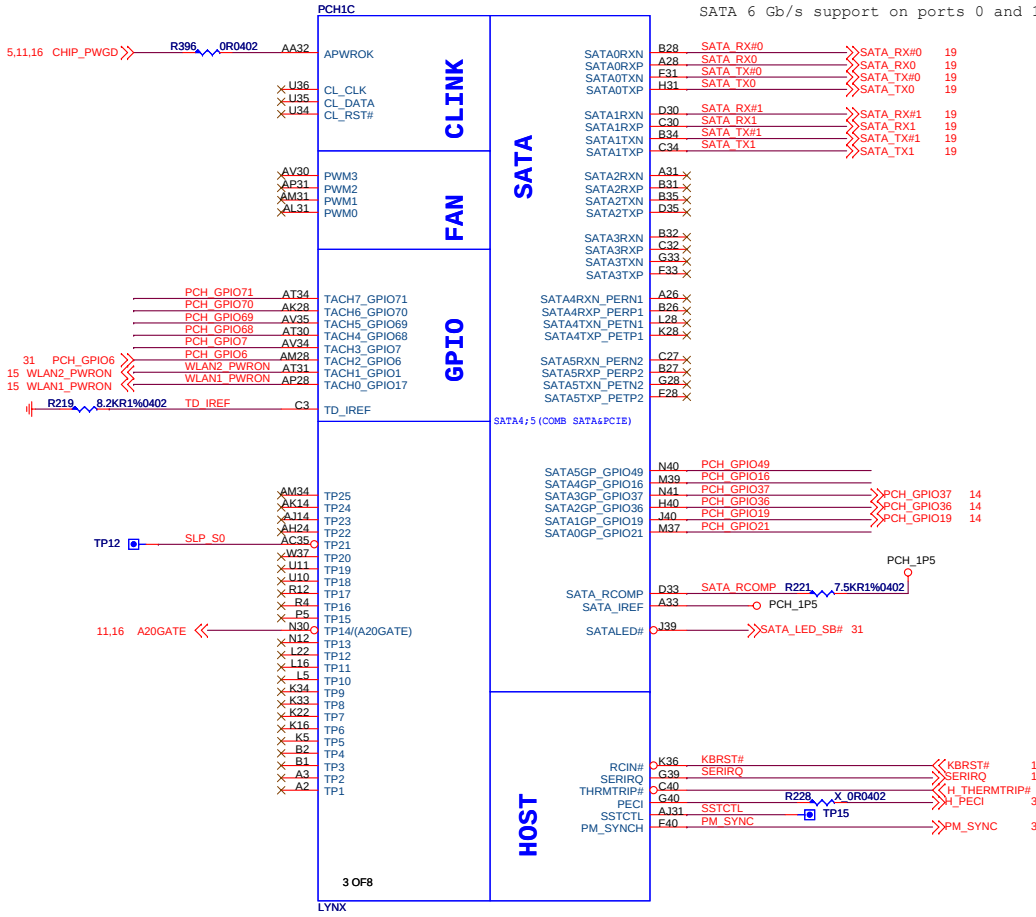
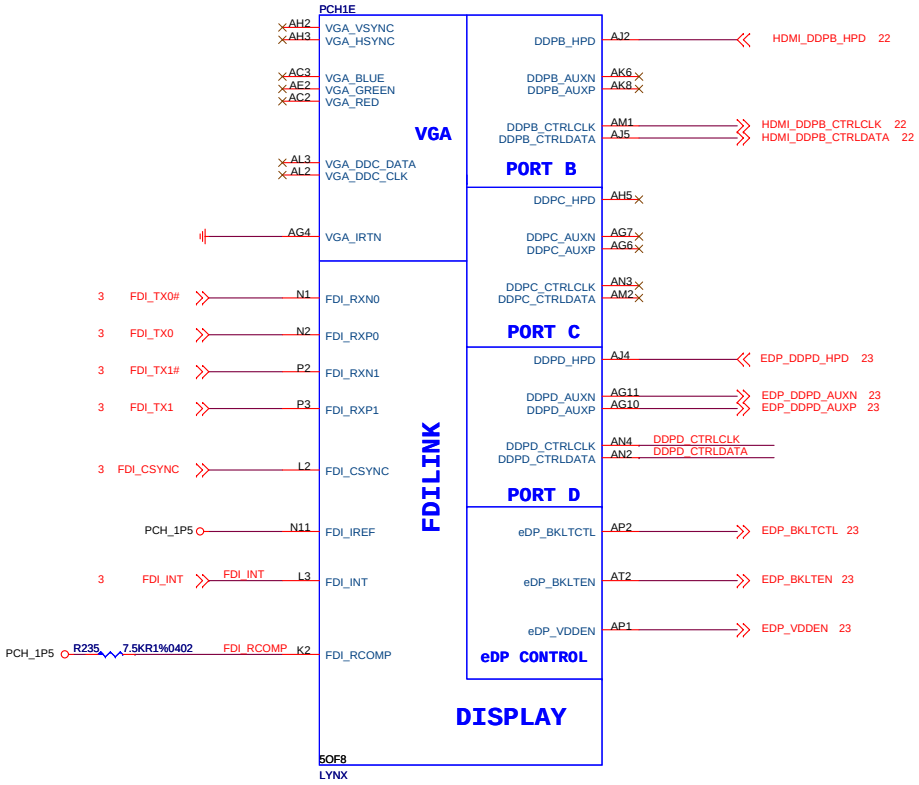
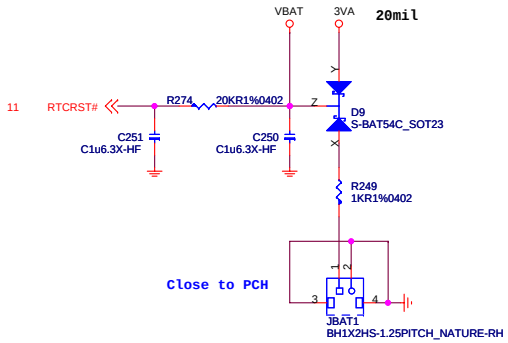
SATA ports 2 and 3 are disabled on 4 port SKUs.
SATA 6 Gb/s support on ports 0 and 1 only.



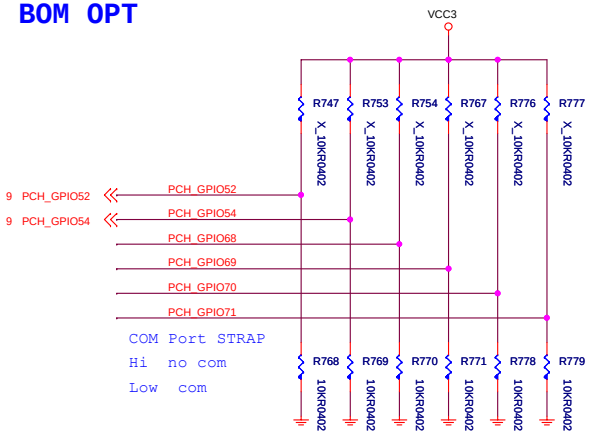


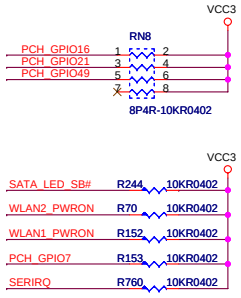
RTC



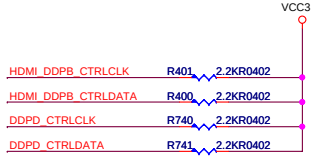
change to N32-1020B40-H06 02/04

BOM OPT





Enable VGA(CTRLCLK/DATA Pull High)

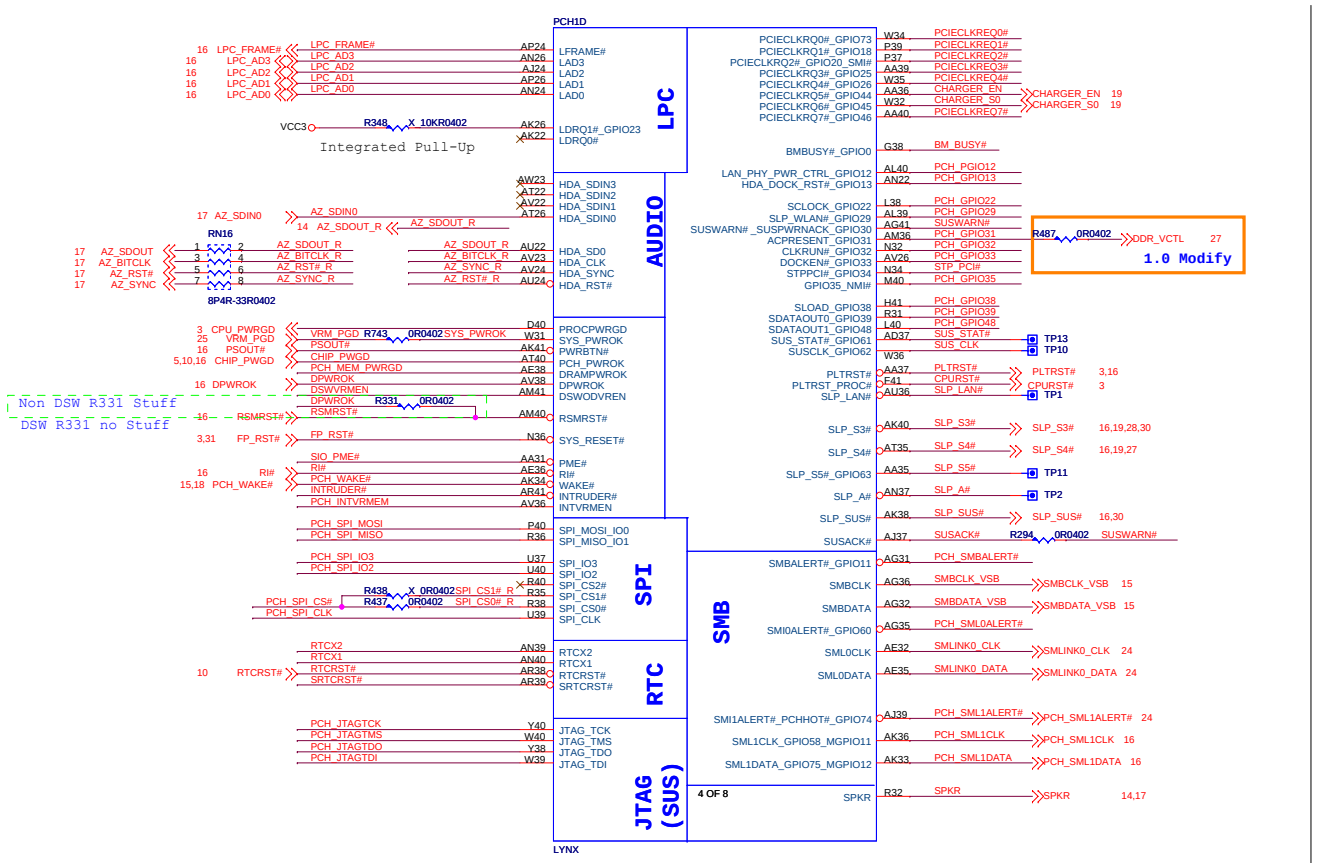


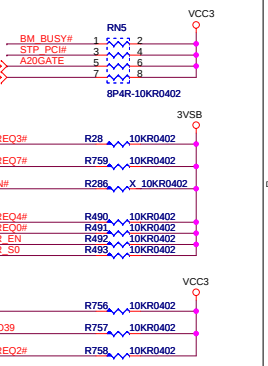
MICRO-STAR INT'L CO.,LTD

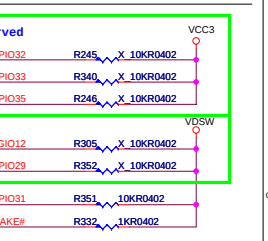
MS-AC131

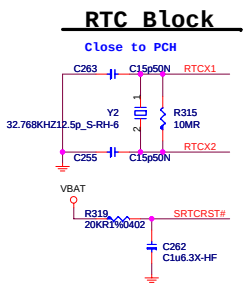
Size	Document Description	Rev
Custom	LYNX-SATA/HOST/FAN/GPIO/VGA	1.0

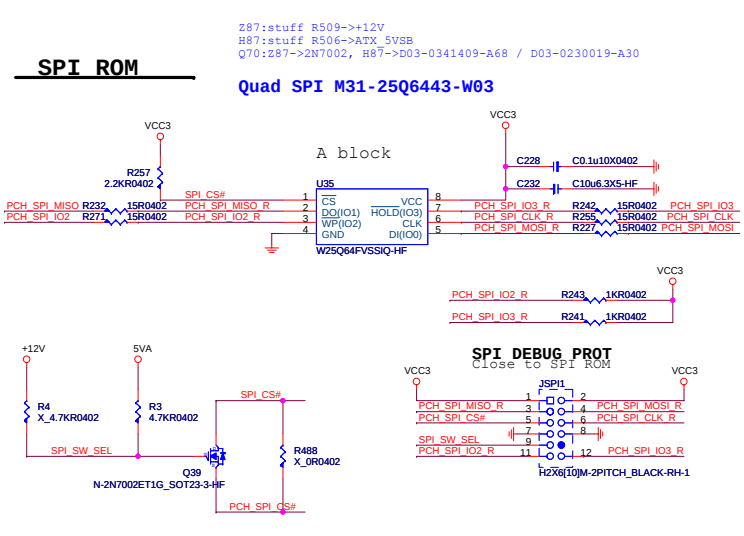
Date: Monday, May 27, 2013 Sheet 10 of 47

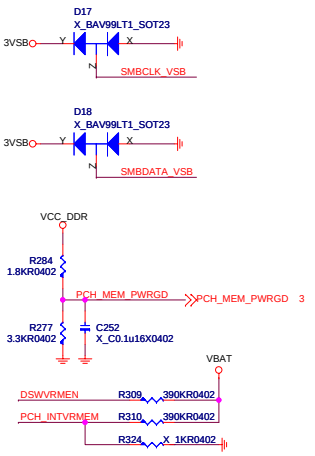


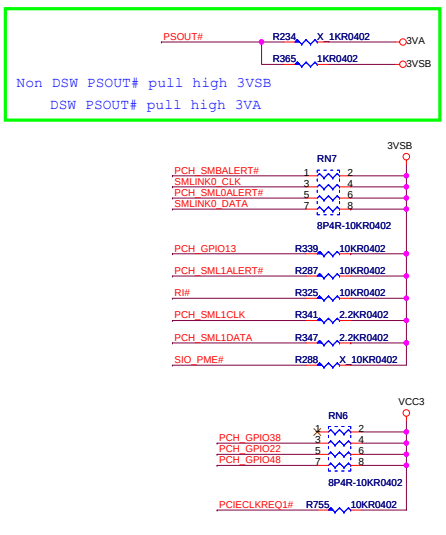












MICRO-STAR INT'L CO.,LTD		
MS-AC131		
Size: Custom	Document Description: LYNX-SMB/LPC/AUDIO/RTC	Rev: 1.0
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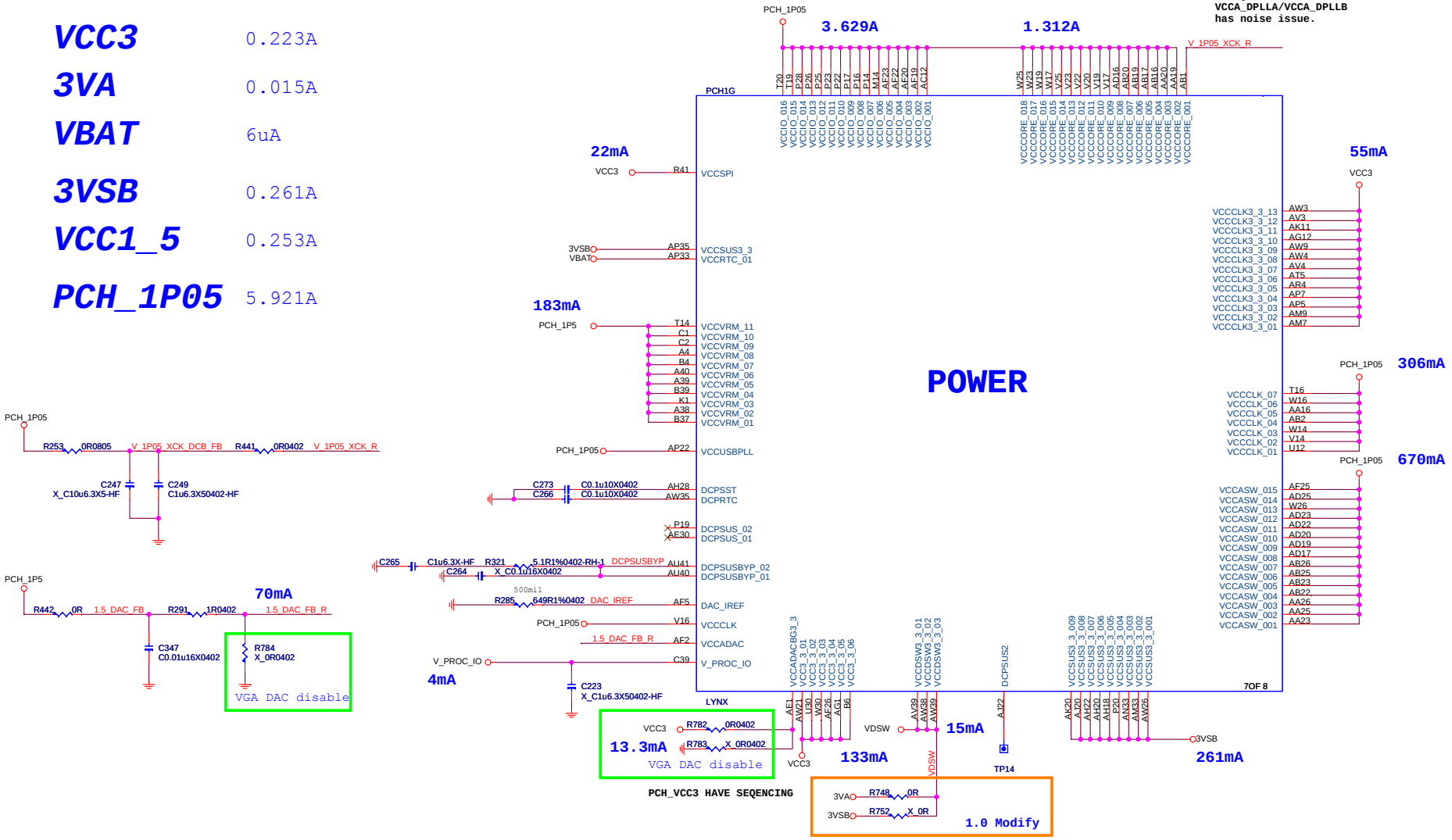
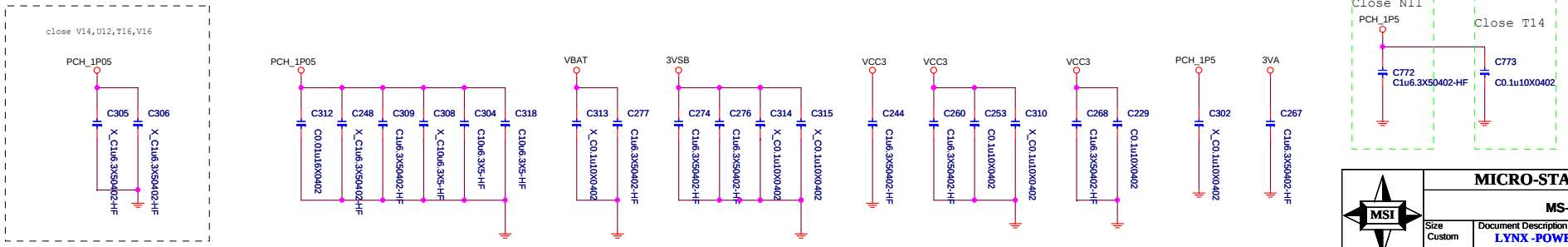
VCC3	0.223A
3VA	0.015A
VBAT	6uA
3VSB	0.261A
VCC1_5	0.253A
PCH_1P05	5.921A

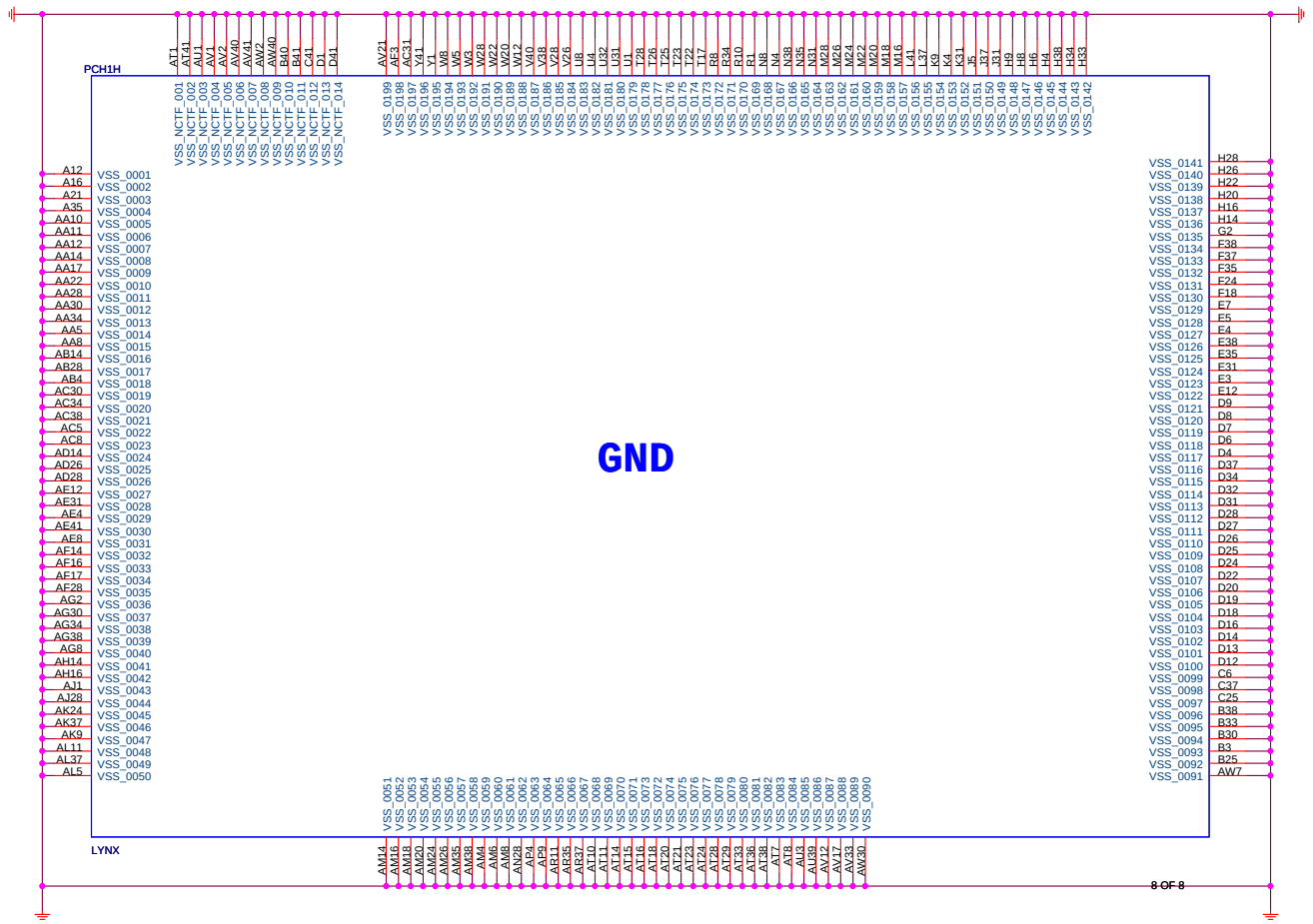
Change to 10UH if VCCA_DPLLA/VCCA_DPLLB has noise issue.



PCH decoupling cap



MICRO-STAR INT'L CO.,LTD		
MS-AC131		
Size: Custom	Document Description: LYNX -POWER	Rev: 1.0
Date: Thursday, May 23, 2013	Sheet 12 of 47	



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MS-AC131		
Size: Custom	Document Description: LYNX-GND	Rev: 1.0
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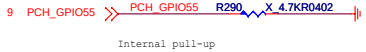
PCH Straps

SPKR

Default Mode:

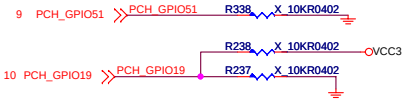
Internal weak Pull-down.

No Reboot Mode with TCO Disabled:
Connect to Vcc3_3 with 8.2k-10k Ohm weak pullup resistor.



GPIO55

Default Mode:
Internal pull-up.
Top Block Swap Mode:
Connect to ground with 4.7k Ohm weak pulldown resistor.



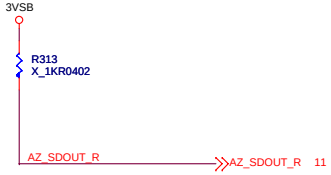
SATA1GP/GPIO19, GPIO51

Default (SPI):
Left both SATA1GP/GPIO19 and GPIO51 floating.
No pull up required.
Boot from PCI:
Connect SATA1GP/GPIO19 to ground with 1k Ohm pull-down resistor.
Leave GPIO51 Floating.
Boot from LPC:
Connect both SATA1GP/GPIO19 and GPIO51 to ground with 1k Ohm pull-down resistor.

Boot device	GPIO51	GPIO19
LPC	0	0
SPI	1	1

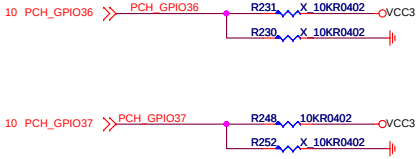
GPIO53

Do not pull low.
Connect to ground with 1k Ohm pull-down resistor.



HDA_SDO

Default:
Do not pull high.
Disable ME in Manufacturing Mode:
Connect to VccSusHDA with 1k Ohm pull-up resistor through a jumper.



GPIO37

Enable TLS:
Pull up with 1k Ohm to VccSus3.3.
Default (Disable TLS):
Leave NC. Internal pull down.

MSI	MICRO-STAR INT'L CO.,LTD		
	MS-AC131		
Size: Custom	Document Description: LYNX STRAPS		Rev: 1.0
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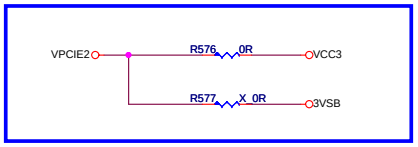
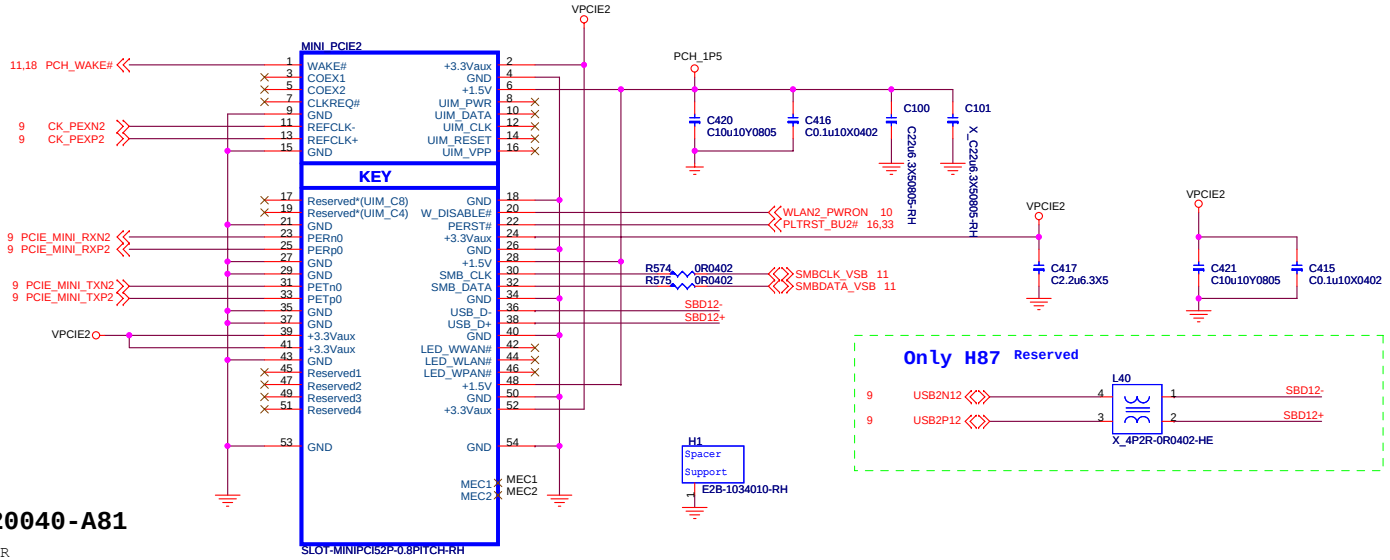
Wireless LAN(Short Card)



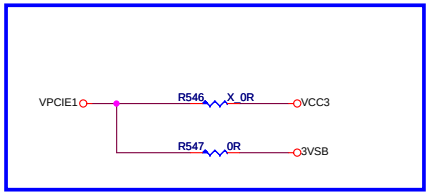


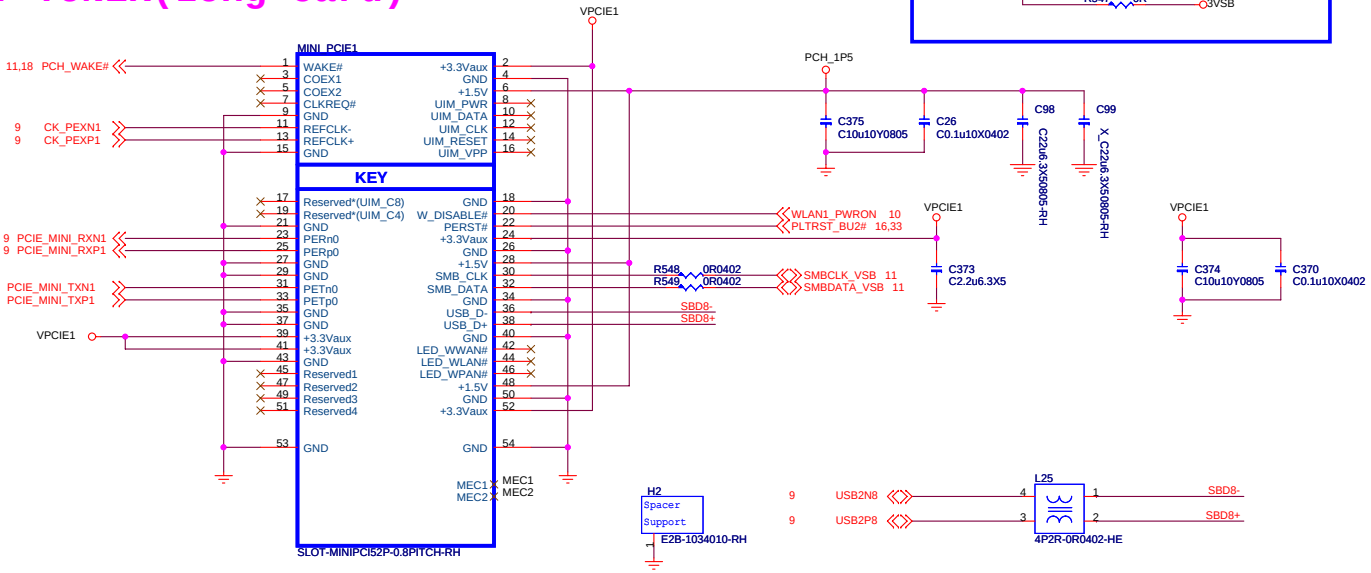
Only H87 Reserved

N11-0520040-A81

PCI ExpressR
Mini Card Electromechanical
Specification
Revision 1.2

TV TUNER(Long Card)





N11-0520040-A81

MICRO-STAR INT'L CO.,LTD		
MS-AC131		
Size: Custom	Document Description: Mini-PCIE Slot	Rev: 1.0
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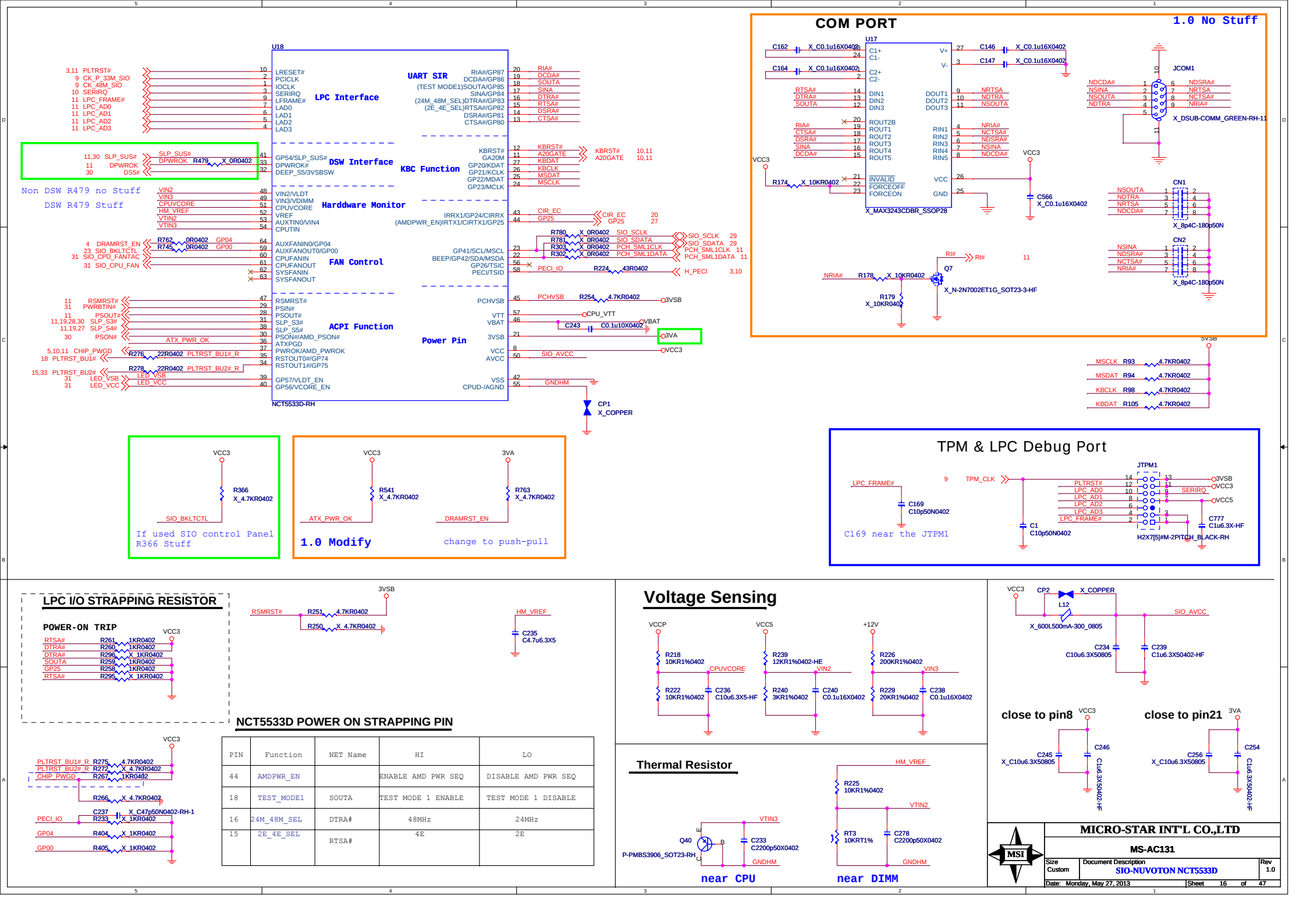
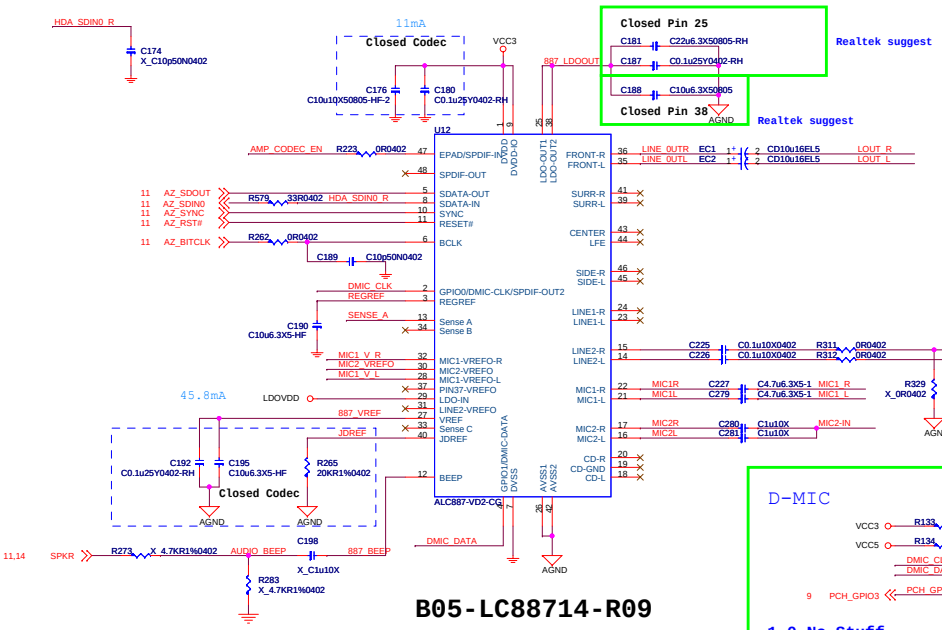
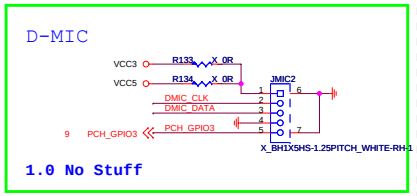
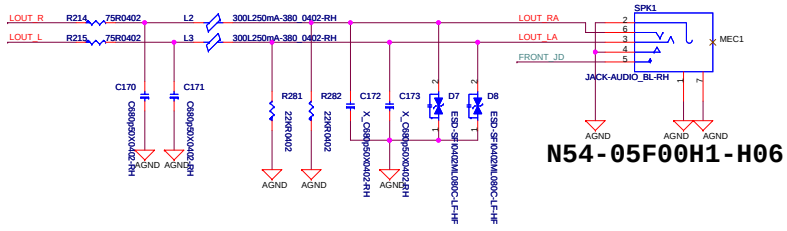
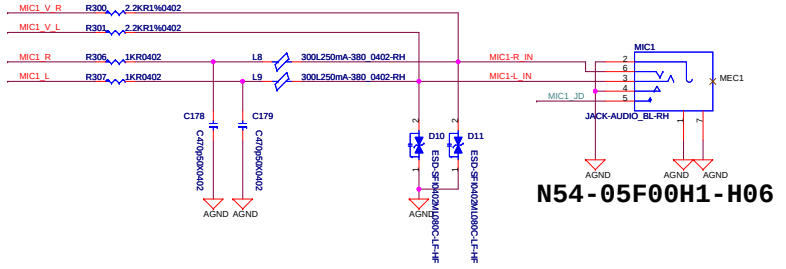


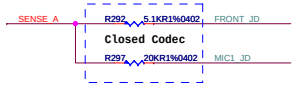
PIN	Function	NET Name	HI	LO
44	AMDPWR_EN		ENABLE AMD PWR SEQ	DISABLE AMD PWR SEQ
18	TEST_MODE1	SOUTA	TEST MODE 1 ENABLE	TEST MODE 1 DISABLE
16	24M_48M_SEL	DTRA#	48MHz	24MHz
15	2E_4E_SEL	RTSA#	4E	2E

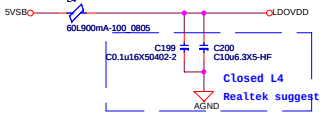


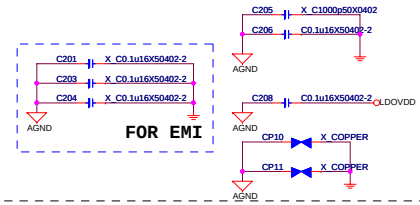


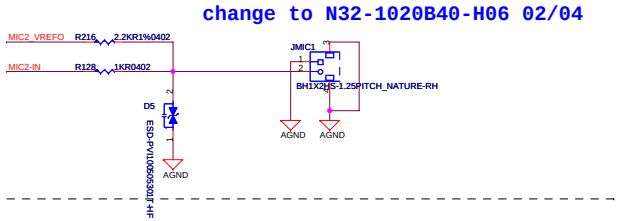


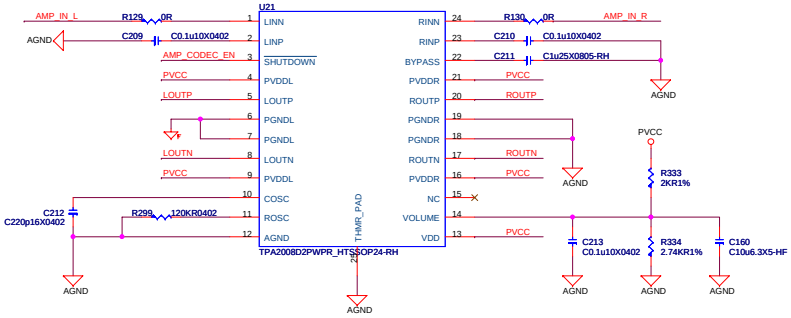


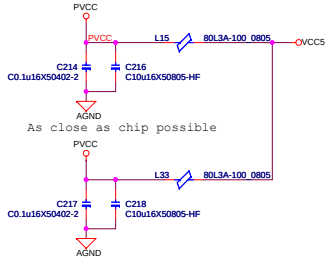


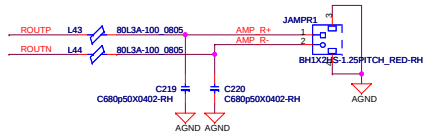


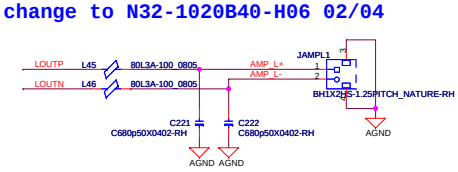












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MS-AC131	
Size: Custom	Document Description: AUDIO ALC 887 & AMP
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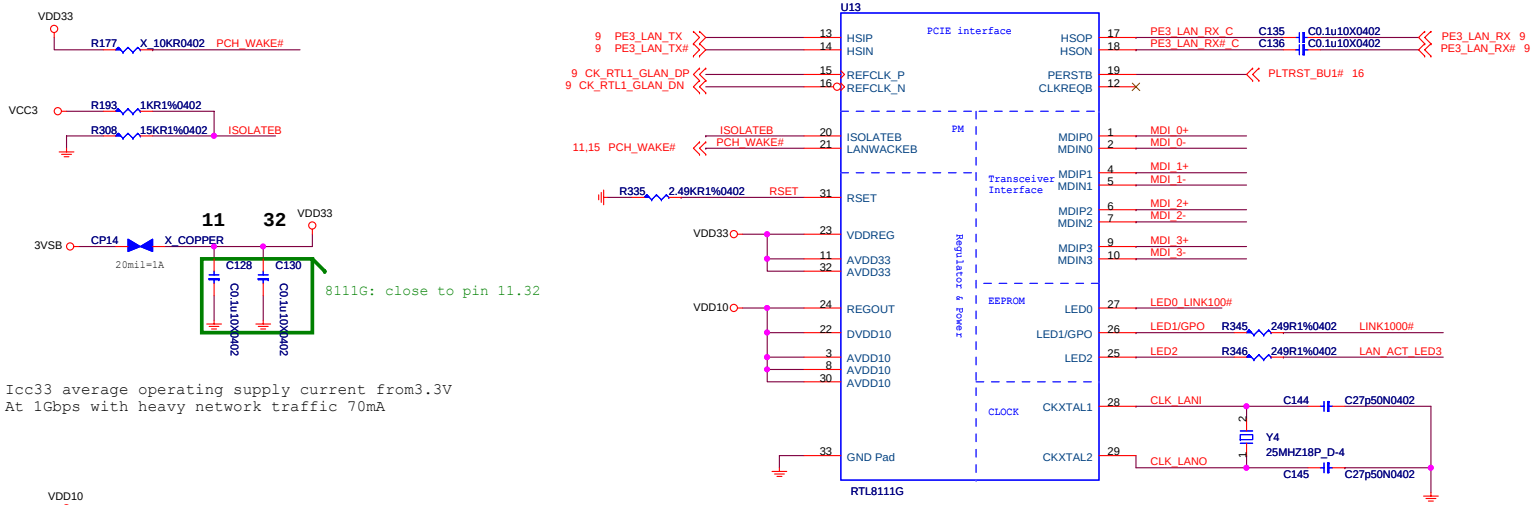
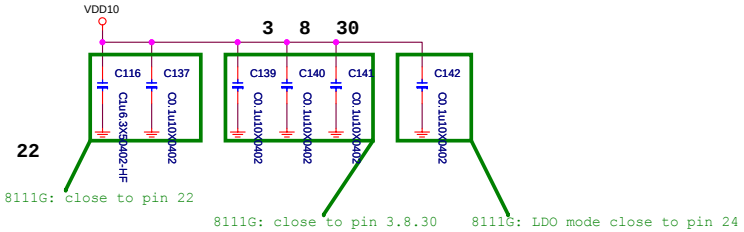
RTL8111G Giga LAN





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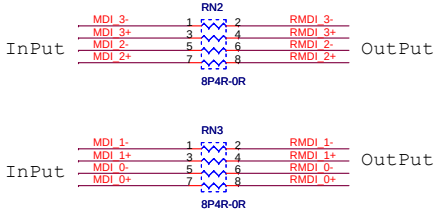
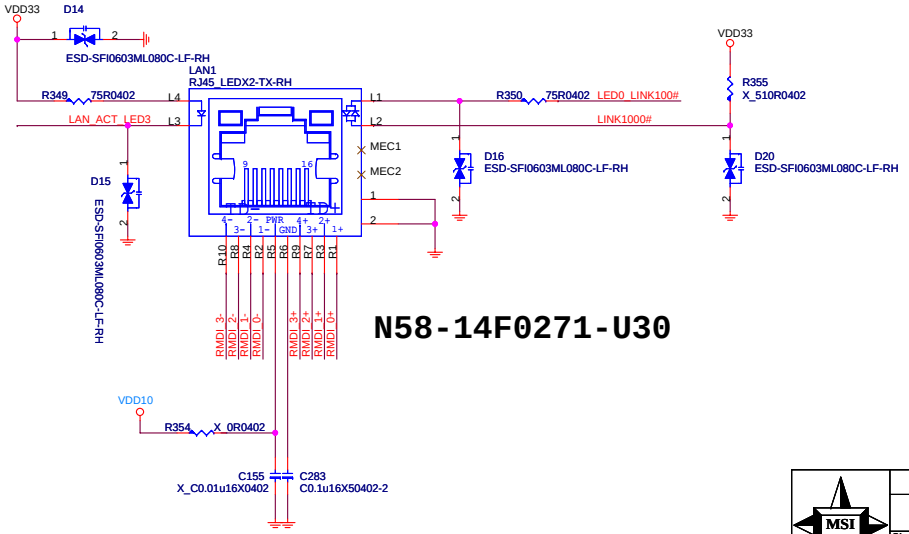
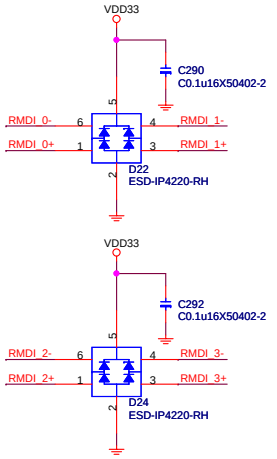




N58-14F0271-U30

Reserve ESD Protect
for connector



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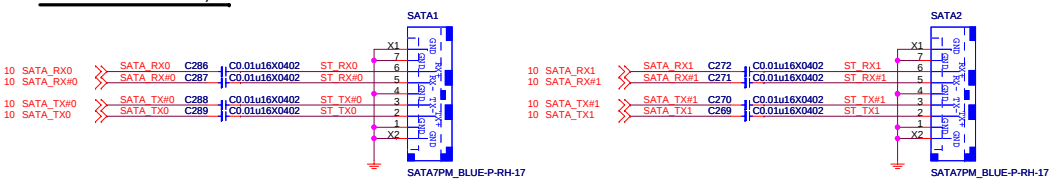
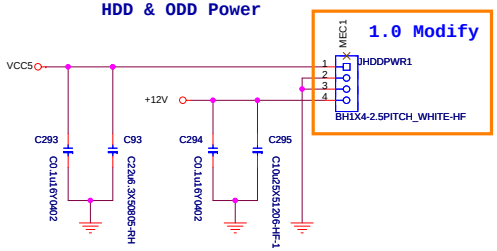
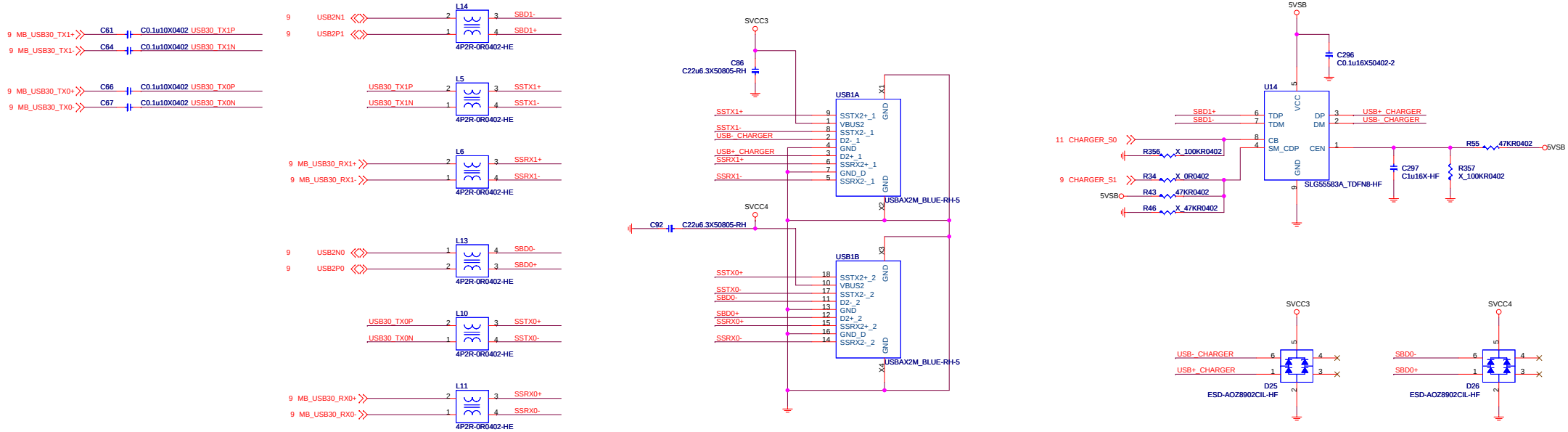
SATA HDD

SATA 6G PORT 0,1

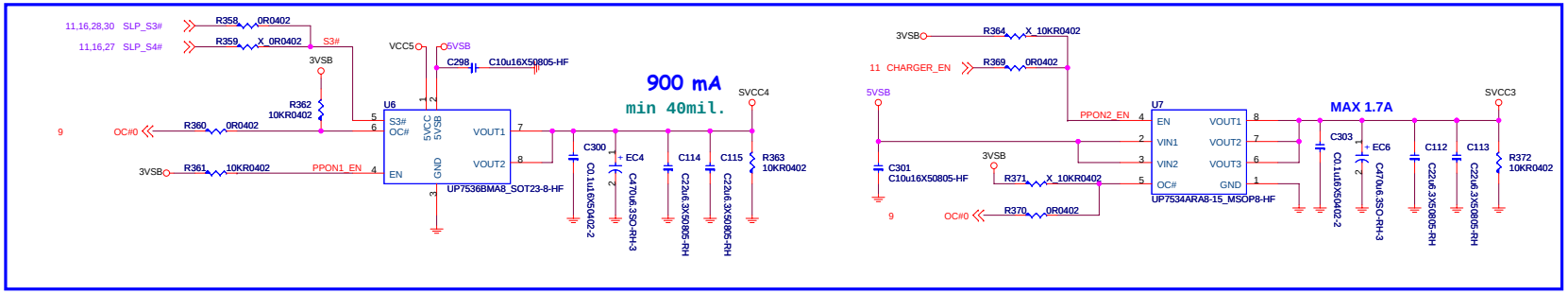


HDD & ODD Power





USB3.0 & USB2.0 SKU POWER KEEP



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MS-AC131	
Size: Custom	Document Description: SATA /USB3.0 Connector
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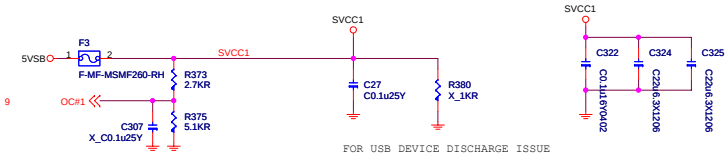
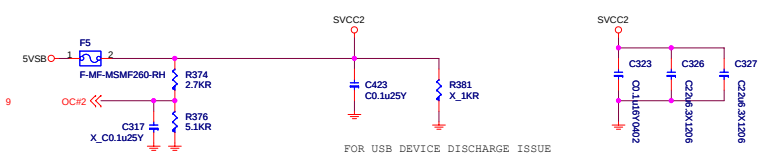
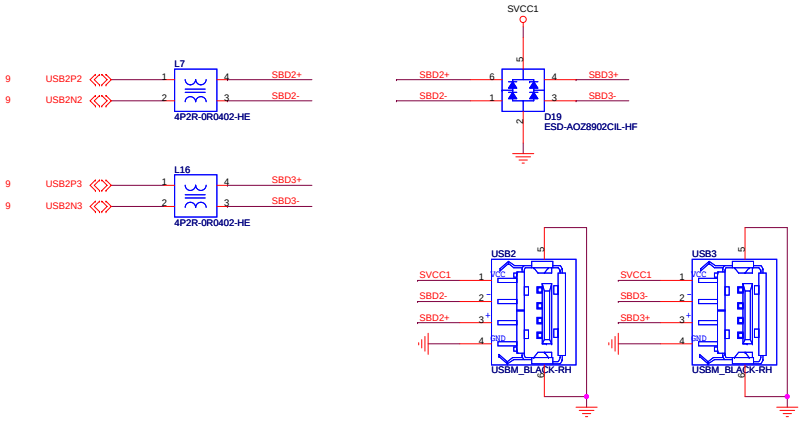
POWER CIRCUIT FOR USB PORT 0,1 (REAR)



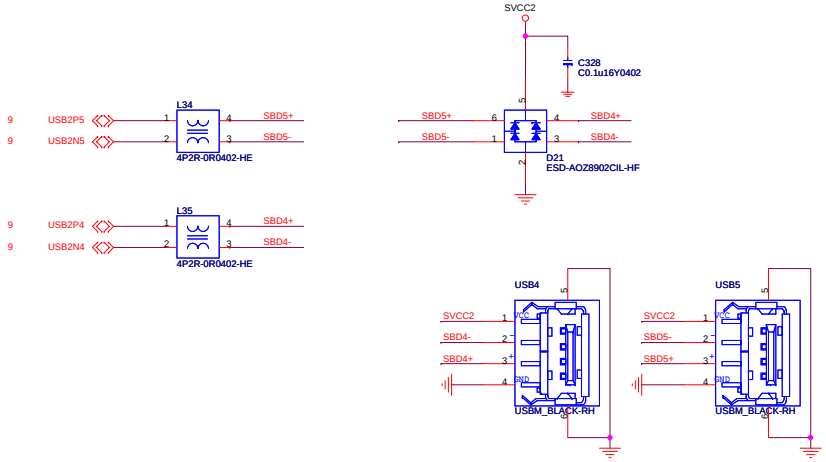
POWER CIRCUIT FOR USB PORT 2,3 (REAR)



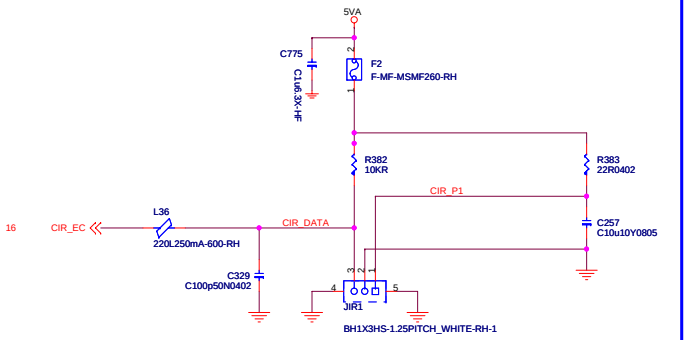
REAR PANEL USB CONNECTOR FOR USB PORT 0,1



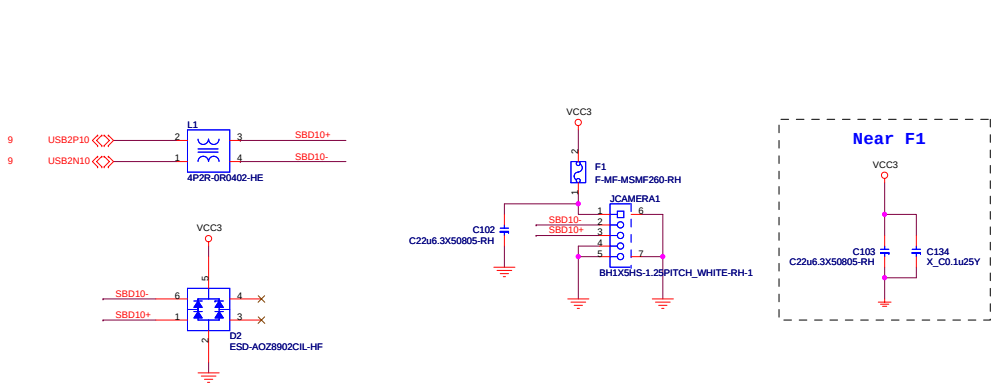
REAR PANEL USB CONNECTOR FOR USB PORT 2,3



IR



Webcam



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Size: Custom	Document Description: USB2.0 / IR / Webcam	Rev: 1.0
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SBD6 + (USB_CARD_P) / SBD6 - (USB_CARD_N) (Zdiff) is 90Ω±10%
Maintain at least 20 mils air gap to the edge of the reference plane

| CLK - DATA | trace length ≦ 100 mils
| DATA - DATA | trace length ≦ 100 mils
no more 2 via ; 2 inch (maximum)

CLK	MODE1 Pin 27 R446	MODE0 Pin 42 R458
48MHz	X	X
24MHz	X	1
12MHz (XTAL)	1	1

MS_SCLK (Pin 37 SP14) & SD_CLK (Pin 22 SD_CLK)
are impedance are 50Ω±15%

Pin 48(RREF trace width 12 mil)
trace must far away 48MHz clock trace

+3V_CR trace width 30 mil

VREG_1.8V trace width 20 mil

1.0 Modify
EMI Reserved
C320 X_C10p50N0402
9 CK_48M_CARD
R447 0R0402
Crystal 8 mil
XTLO R449 X_0R0402
XTLI R448 X_0R0402 CLK_IN
Y3 X_12MHZ16P_S-RH-4
R398 X_270KR
C369 X_C5.6p25N0402
C359 X_C5.6p25N0402

1.0 Modify
R458 X_10KR0402
R459 X_10KR0402
+3V_CR

R ==> close to chip pin
XD6 R460 0R0402 SP14
C126 X_C0.1u10X0402
Reserved

C330 C100p50N0402 5139_RST#
C331 C1u10X50402-HF
C332 C1u10X50402-HF
R397 6.2KR1%0402 RREF
CLK_IN
XTLO
MS_INS#
SD_CD#
SP15

U4
RTS5139-GR-RH
RREF DV18 NC9 RST# XTLO XTLI/CLK_IN CLK_MODE[0] GPIO MS_INS# SD_CD# SP15 SP14
DM DP NC1 NC2 NC3 NC4 NC5 GND NC6 NC7 3V3_IN Card_3V3
SP13 SP12 SP11 SP10 SP9 SP8 SP7 SP6 SP5 CLK_MODE[1] GND SD_D2
XD_CD# DV33_18 GND SP1 SP2 SP3 SP4 SD_D1 SD_D0 SD_CLK SD_CMD SD_D3

L17 4P2R-0R0402-HE
9 USB2N9
9 USB2P9
SBD9-
SBD9+

VCC3 CP7 C349 C10u10X50805-HF-2 +3V_CR C118 C0.1u10X0402
CARD_3V3 C117 C0.1u10X0402

1.0 Modify
R446 X_10KR0402 VREG_1.8V

SD_D2R R450 0R0402 SD_D2

R ==> close to chip pin
SD_D3R R451 0R0402 SD_D3
SD_CMDR R452 0R0402 SD_CMD
SD_CLKR R453 0R0402 SD_CLK
SD_D0R R454 0R0402 SD_D0
SD_D1R R455 0R0402 SD_D1
C127 X_C0.1u10X0402

VREG_1.8V
C348 C1u10X50402-HF
C168 X_C4.7u6.3X5
Reserved

OLD N58-38F0010-TB4
N58-38F0030-TB4

NEW N58-22F1600-T01
N58-22F1610-T01

CARD_3V3
C125 C0.1u10X0402
C167 C4.7u6.3X5
C124 C0.1u10X0402
CARDREAD1
SD_DATA2 MS_VSS SD_CD/DATA3/MMC_RSV MS_VCC MS_SCLK SD_CMD/MMC_CMD MS_DATA3 MS_INS SD_VSS/MMC_VSS1 MS_DATA2 SD_VDD/MMC_VDD MS_DATA0 MS_DATA1 SD_CLK/MMC_CLK MS_BS MS_VSS SD_VSS/MMC_VSS2 SD_DATA0/MMC_DAT SD_DATA1 SD_CD SD_GND SD_WP(SW)
GND X1 MEC1 MEC2 GND X2
3IN1-SD_MS-MMC-HF

VCC3 +3VALW
R456 10KR0402
5139_RST#
Q3 N-2N7002ET1G_SOT23-3-HF
R555 47KR0402
Q43 N-SST3904_SOT23
C119 C0.1u10X0402

SP1=SD_D7 / xD_RDY n/a
SP2=SD_D6 / xD_RE# n/a
SP3=SD_D5 / xD_CE# n/a
SP4=SD_D4 / xD_WE# n/a
SP5=MS_BS / xD_CLE
SP6=MS_D5 / xD_ALE n/a
SP7=MS_D1 / xD_WP#
SP8=MS_D4 / xD_D0 n/a
SP9=MS_D0 / xD_D1
SP10=MS_D2 / xD_D2
SP11=MS_D6 / xD_D3 n/a
SP12=MS_D3 / xD_D4
SP13=MS_D7 / xD_D5 n/a
SP14=MS_CLK / xD_D6
SP15=SD_WP / xD_D7

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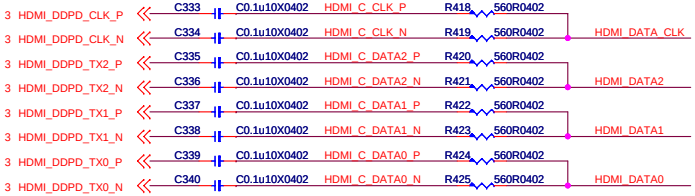
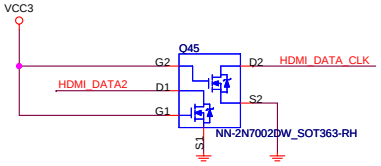
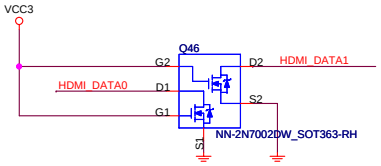
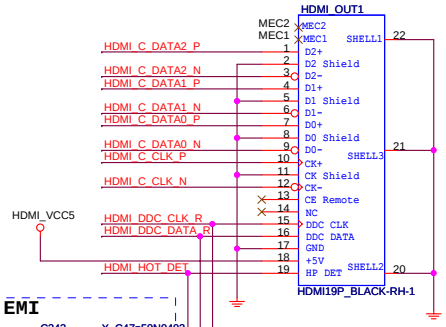
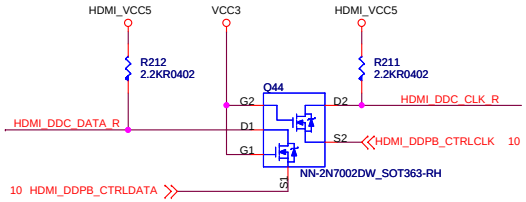
HDMI, DVI : 1920x1200 at 60 Hz (16:10 WUXGA)

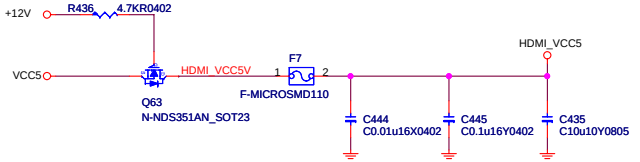


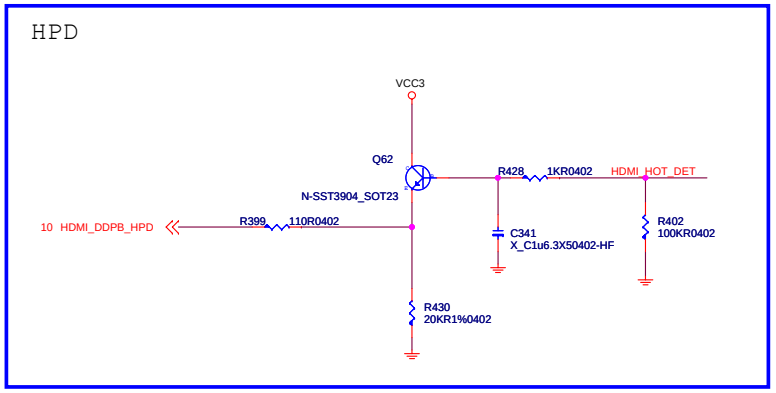


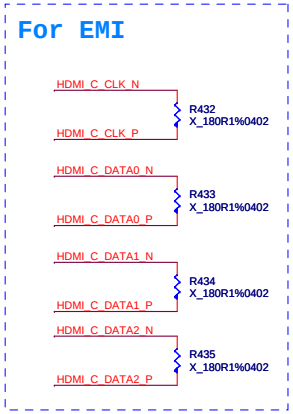


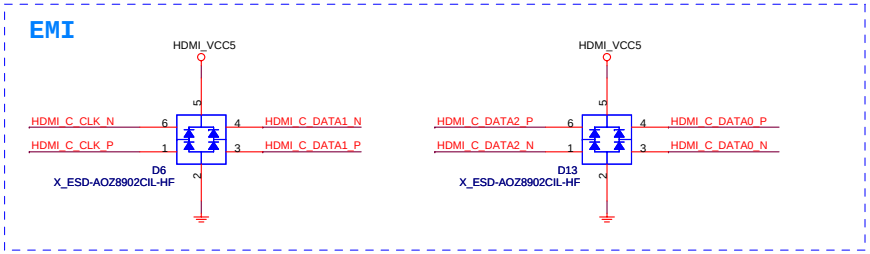












MICRO-STAR INT'L CO.,LTD

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Custom	HDMI	1.0

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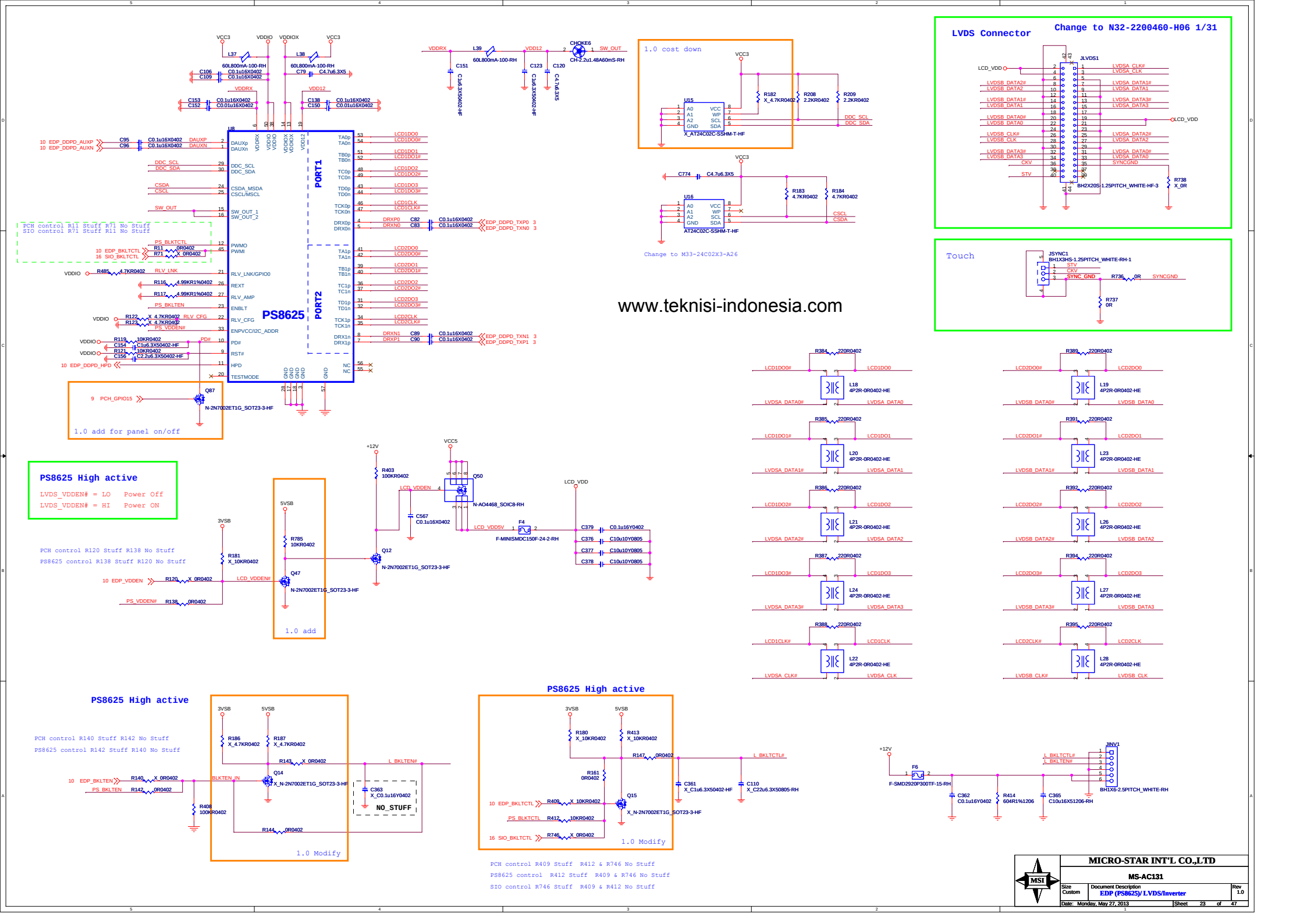
LVDS Connector
Change to N32-2200460-H06 1/31
JLVDS1
BH2X20S-1.25PITCH_WHITE-HF-3
Touch
JSYNC1
BH1X3HS-1.25PITCH_WHITE-RH-1
1.0 cost down
U15
X_AT24C02C-SSHM-T-HF
U16
AT24C02C-SSHM-T-HF
Change to M33-24C02X3-A26
U8
PS8625
PORT1
PORT2
1.0 add for panel on/off
PS8625 High active
LVDS_VDDEN# = LO Power Off
LVDS_VDDEN# = HI Power ON
PCH control R120 Stuff R138 No Stuff
PS8625 control R138 Stuff R120 No Stuff
1.0 add
PS8625 High active
PCH control R140 Stuff R142 No Stuff
PS8625 control R142 Stuff R140 No Stuff
NO_STUFF
1.0 Modify
PS8625 High active
PCH control R409 Stuff R412 & R746 No Stuff
PS8625 control R412 Stuff R409 & R746 No Stuff
SIO control R746 Stuff R409 & R412 No Stuff
1.0 Modify
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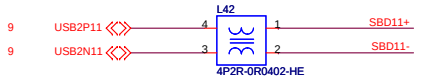
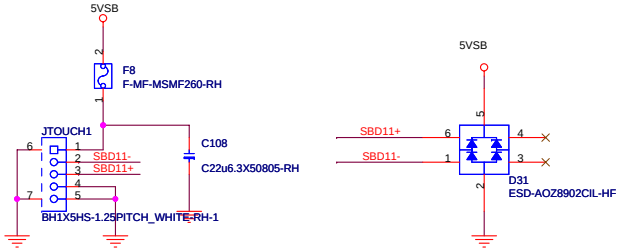
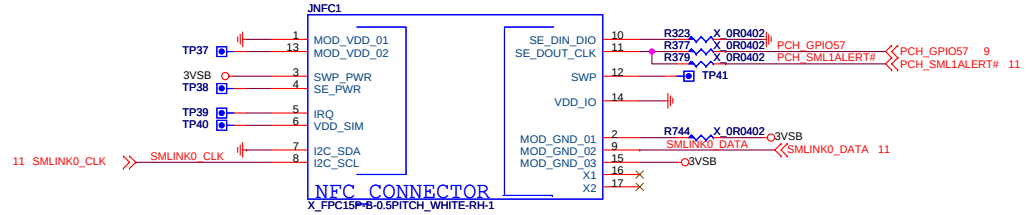
Multi Touch





NFC



1.0 No Stuff

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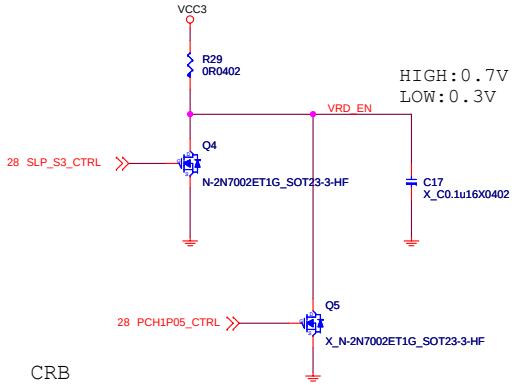
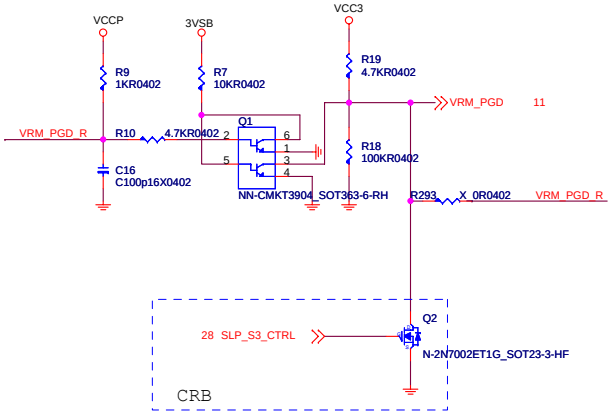
VCORE power on by s3 and VCC3

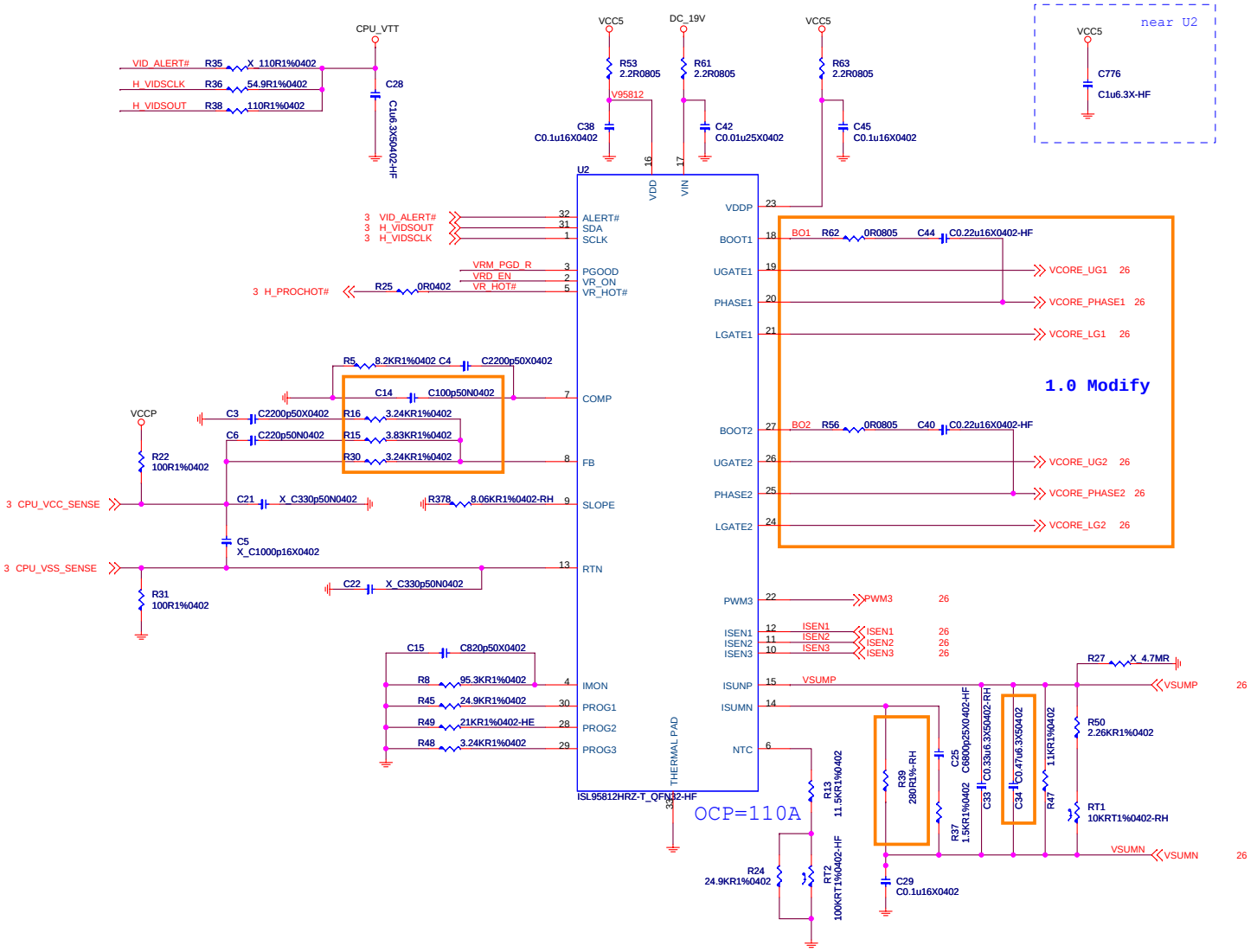


CRB

HIGH:by PCH_1P05V
LOW:by S3

VRMPWRGD LEVEL SHIFT





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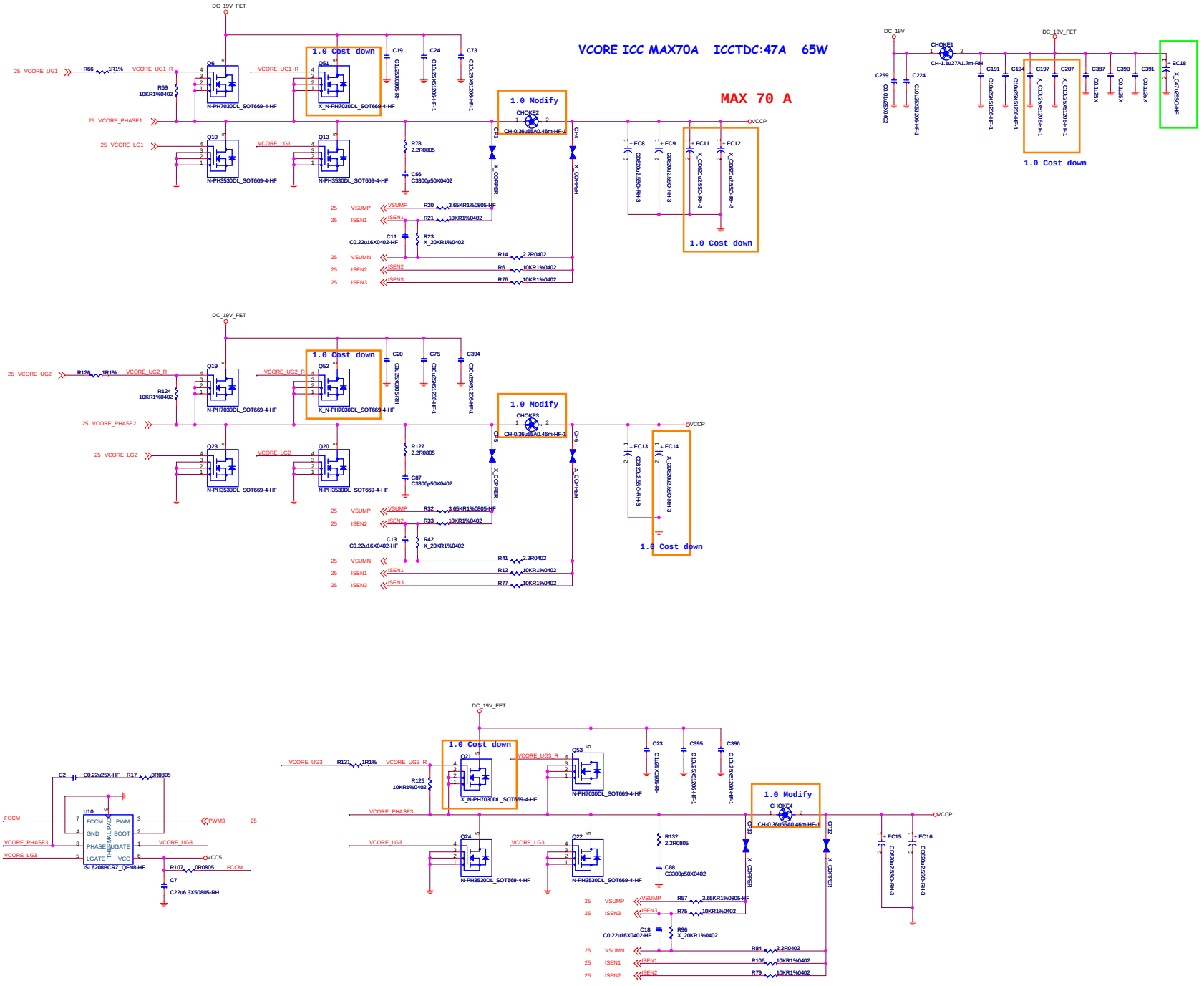
VCCP POWER



MICRO-STAR INT'L CO.,LTD	
MS-AC131	
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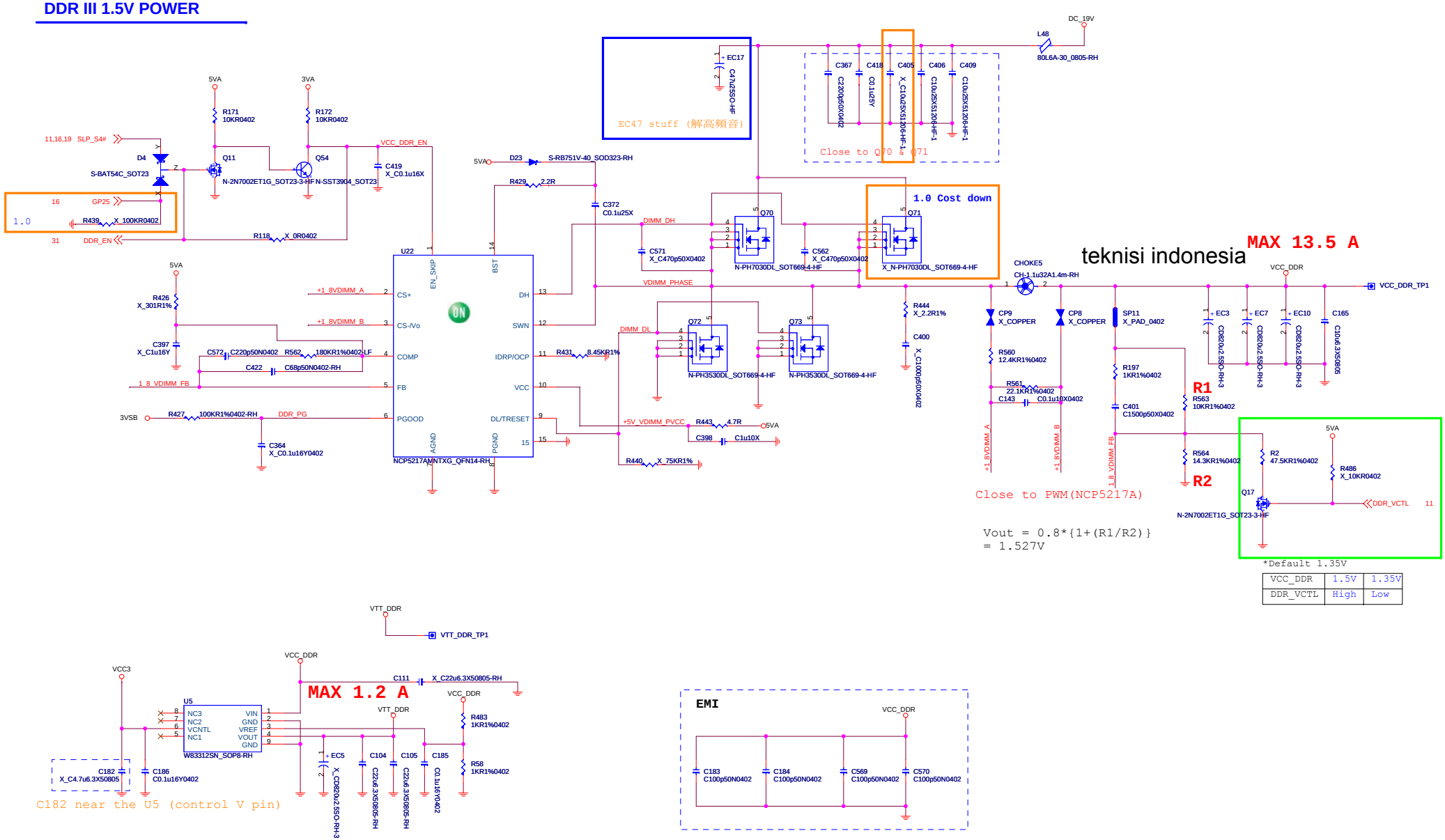
DDR III 1.5V POWER



MICRO-STAR INT'L CO.,LTD		
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Size: Custom	Document Description: DDR POWER (NCP5217)	Rev: 1.0
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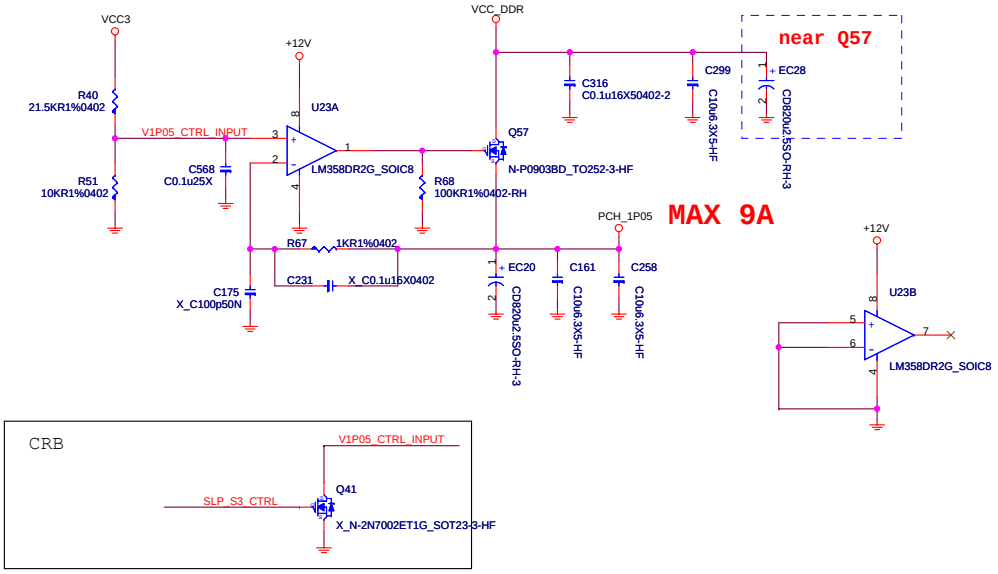
PCH Power:1.05V 5.917 A
GPU Power:1.05V 2.853 A



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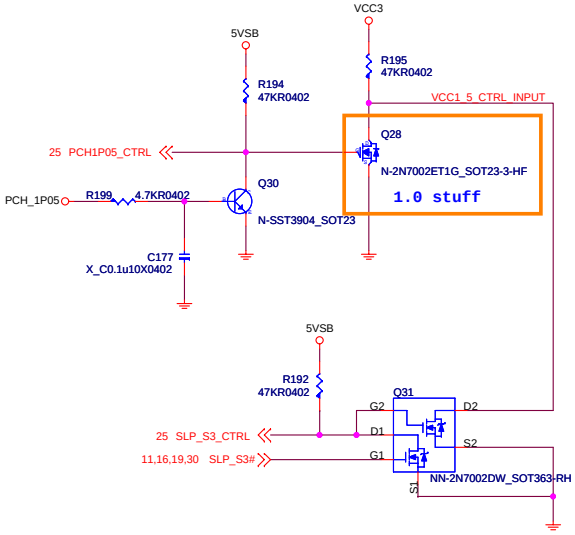
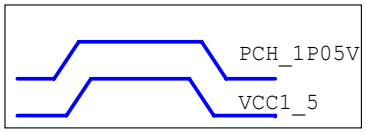
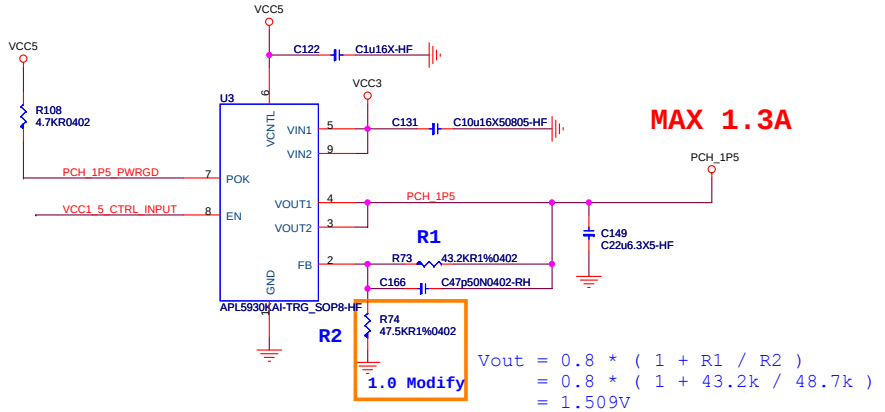
PCH Power:1.5V 0.253 A
Mini PCIE Power:1.5V 1 A



VCC1_5_CTRL_INPUT:
0:1P05V low or S3 low
1:1P05V HIGH and S3 HIGH





Vout = 0.8 * (1 + R1 / R2)
= 0.8 * (1 + 43.2k / 48.7k)
= 1.509V

MICRO-STAR INT'L CO.,LTD

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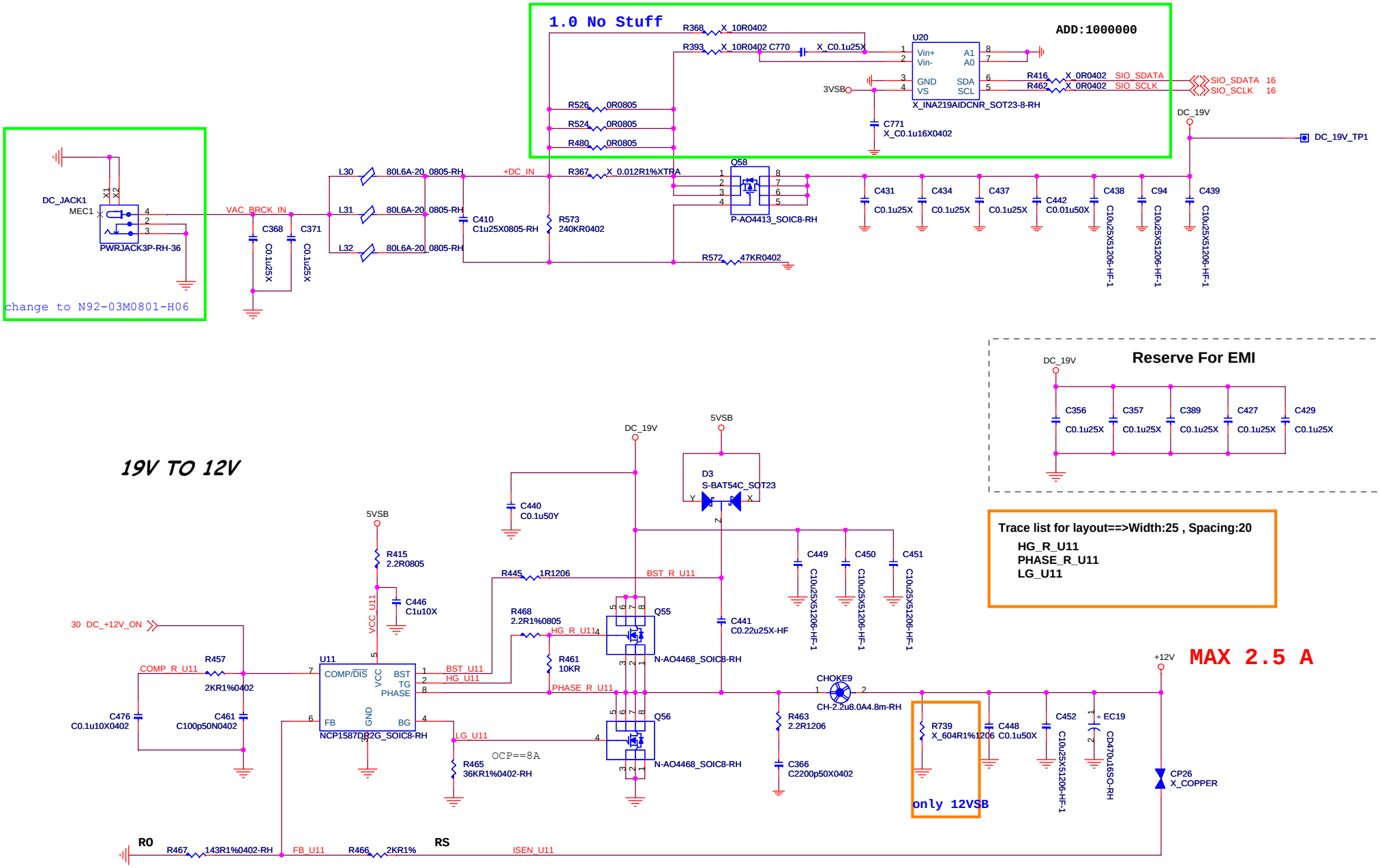

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-AC131	
Size: Custom	Document Description: DC-IN / +12V	Rev: 1.0
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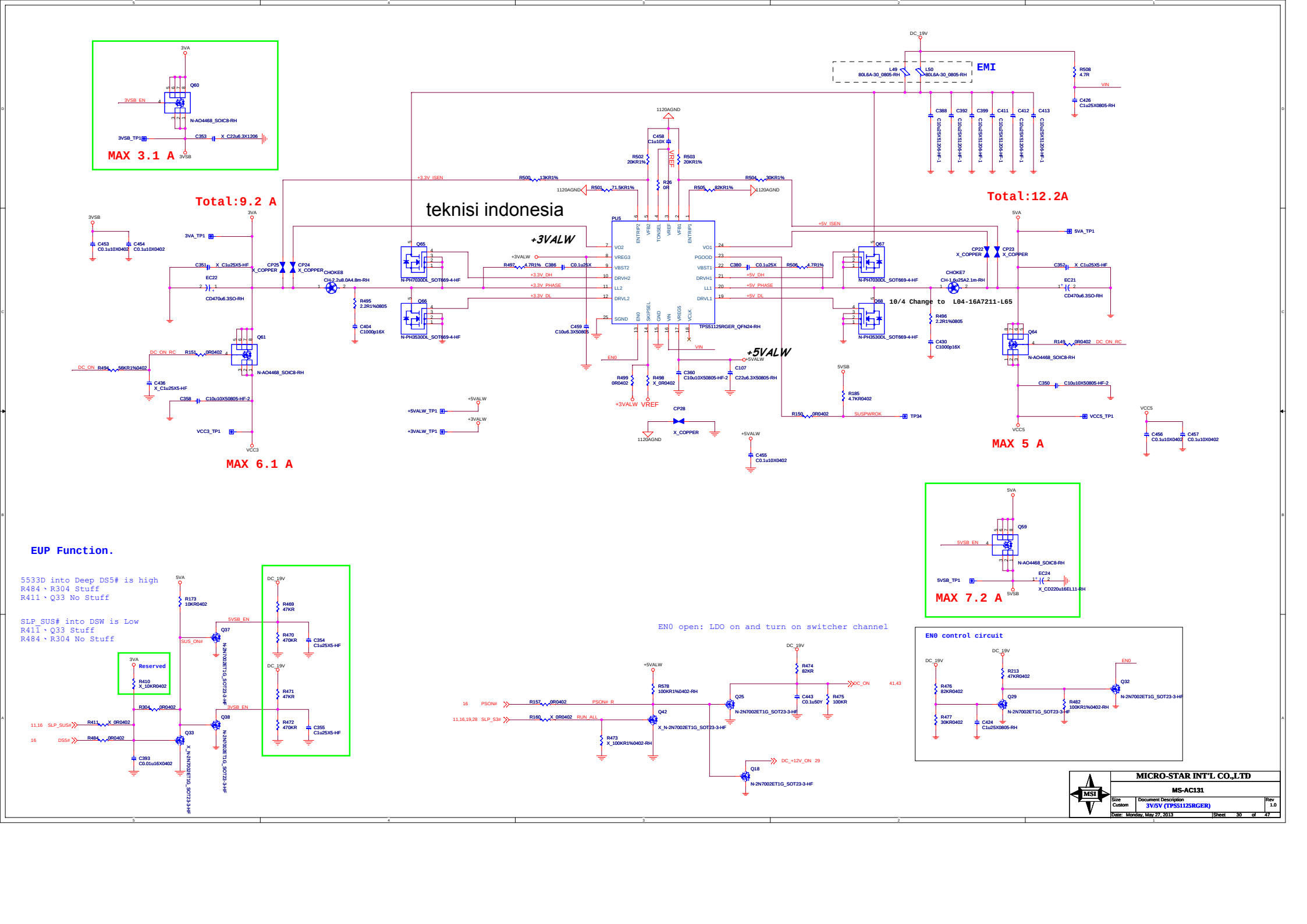
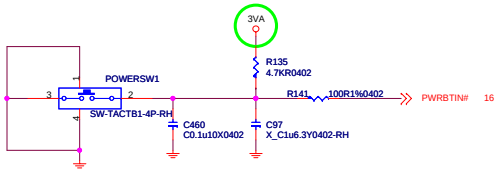
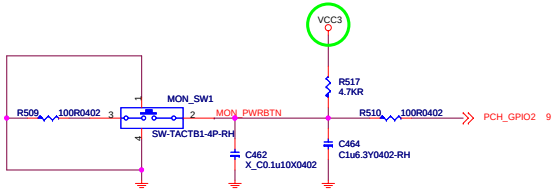

MAX 3.1 A
Total:9.2 A
teknisi indonesia
EMI
Total:12.2A
10/4 Change to L04-16A7211-L65
MAX 6.1 A
MAX 5 A
MAX 7.2 A
+3VALW
+5VALW
EUP Function.
5533D into Deep DS5# is high
R484、R304 Stuff
R411、Q33 No Stuff
SLP_SUS# into DSW is Low
R411、Q33 Stuff
R484、R304 No Stuff
EN0 open: LDO on and turn on switcher channel
EN0 control circuit
MICRO-STAR INT'L CO.,LTD
MS-AC131
3V/5V (TPS51125RGER)

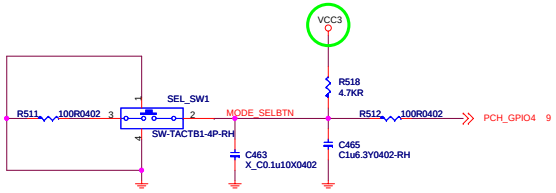
POWER ON/OFF BUTTON



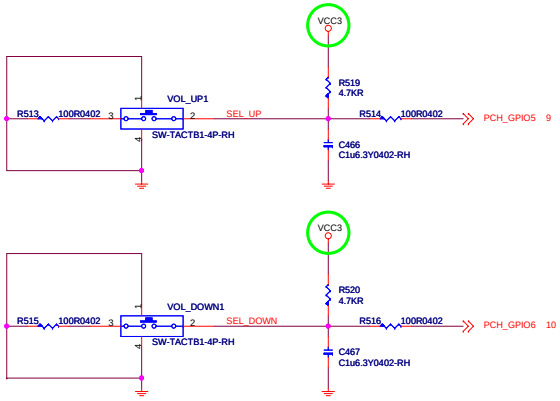
MONITOR ON/OFF BUTTON

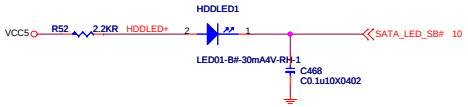


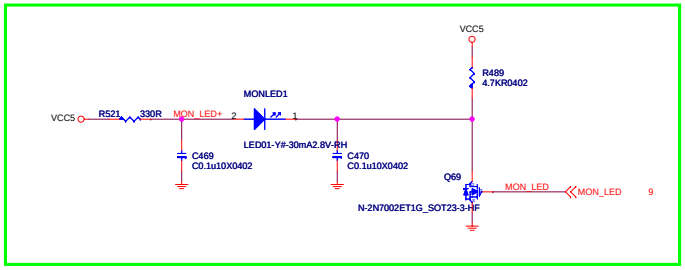
MODE SELECT BUTTON

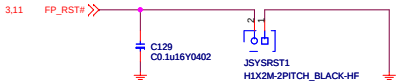


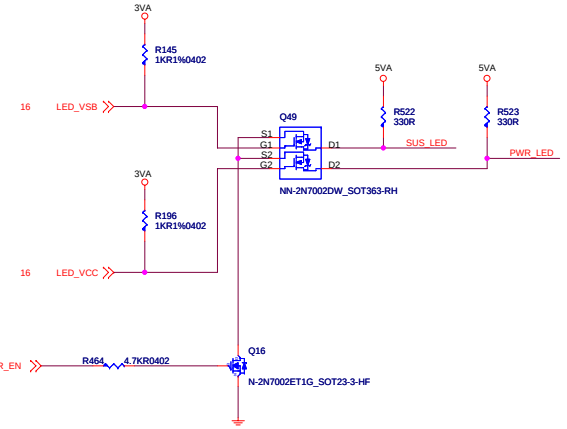
MODE SELECT CONTROL



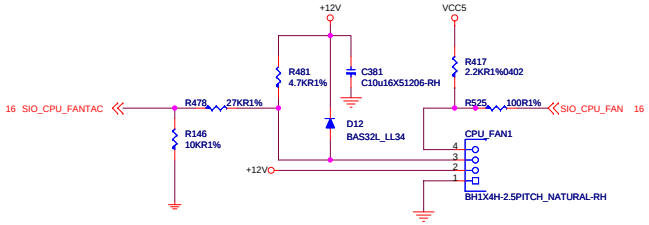








CPU FAN



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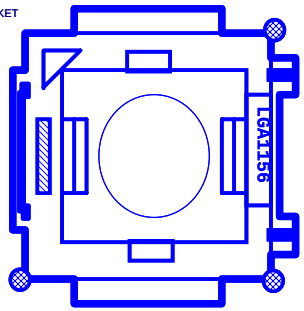
PCB1
MS-AC131 10

LABEL1
RESISTER
BIOS LABEL

BAT1
BAT-BT-CR2032-RH

CPU SOCKET

CPU1_X1
CPU SOCKET



MSI P/N E21-AC71010-L06

CPU_backplate
CPU_backplate

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Optical Fiducial Marks-120

FM4 FM3 FM1 FM2
X_FM X_FM X_FM X_FM
FM6 FM8 FM7 FM5 FM9
X_FM X_FM X_FM X_FM X_FM

Simulation Single End 50ohm

SIM1 — L1_4mil_50_Ohm — X_H1X2M_BLACK-RH
SIM2 — L6_4mil_50_Ohm — X_H1X2M_BLACK-RH
SIM3 — L3_5mil_50_Ohm — X_H1X2M_BLACK-RH
SIM4 — L4_5mil_50_Ohm — X_H1X2M_BLACK-RH

HDMI Royalty

LABEL2
HDMI ROYALTY
Certificated
HDMI_ROYALTY_0.04

SB_SINK
AURAS (0P103760)

GPU Stand off

H3 Spacer Support E2B-7457020-RH
H4 Spacer Support E2B-7457020-RH
H5 Spacer Support E2B-7457020-RH
H6 Spacer Support E2B-7457020-RH

EMI

5VSB — C778 X_C0.1u16Y0402
3VSB — C779 X_C0.1u16Y0402
+12V — C780 X_C0.1u16Y0402
VCC3 — C781 X_C0.1u16Y0402

EMI1 EMI2 EMI3 EMI4
X_E23-5566060-RH

Mounting Holes

MH1 MH2 MH3 MH4
MH5 MH6 MH7 MH8

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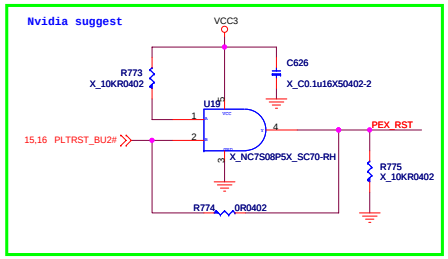

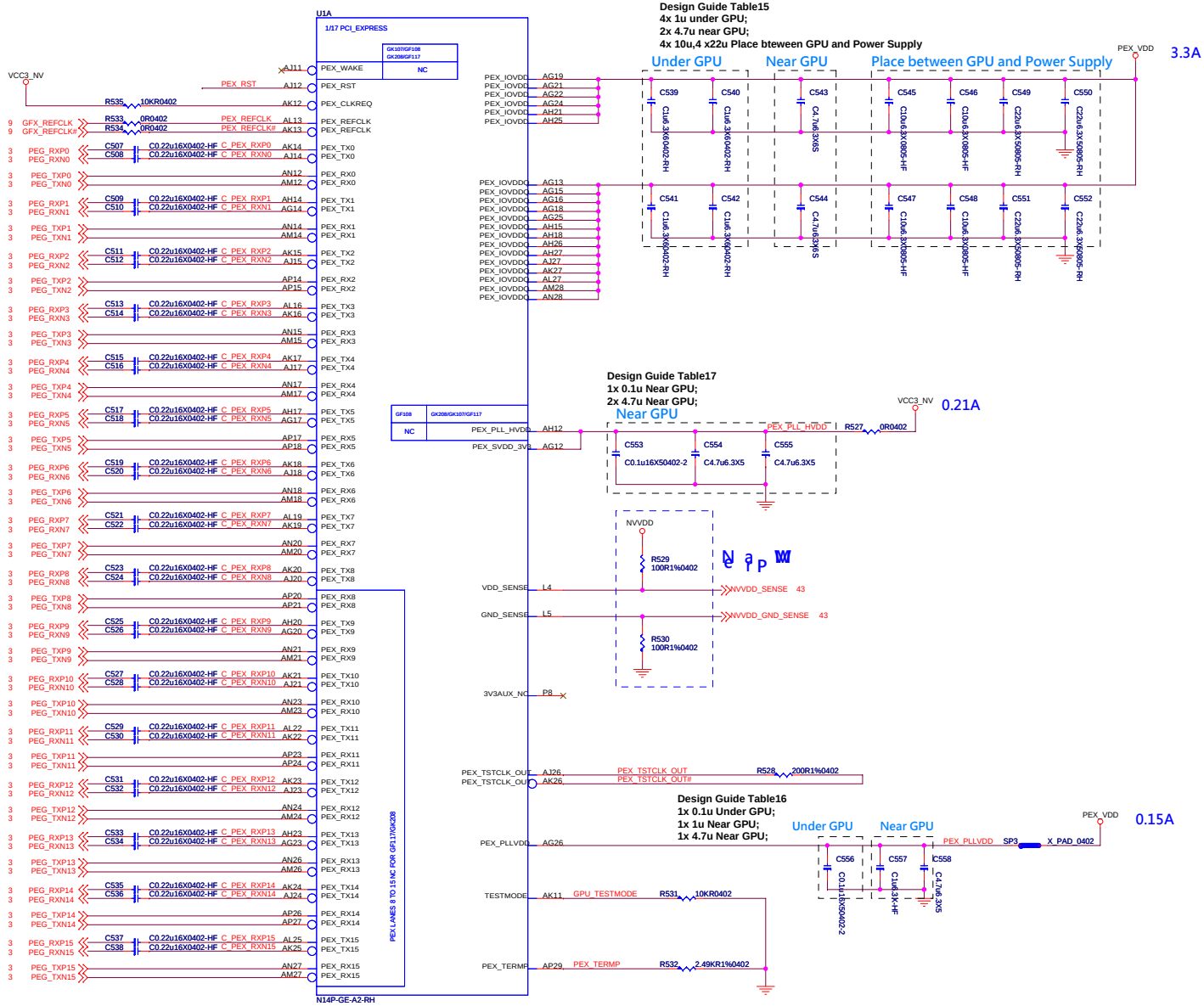

MICRO-STAR INT'L CO.,LTD			
MS-AC131			
Size: C	Document Description: N13P_PCI-E Host		Rev: 1.0
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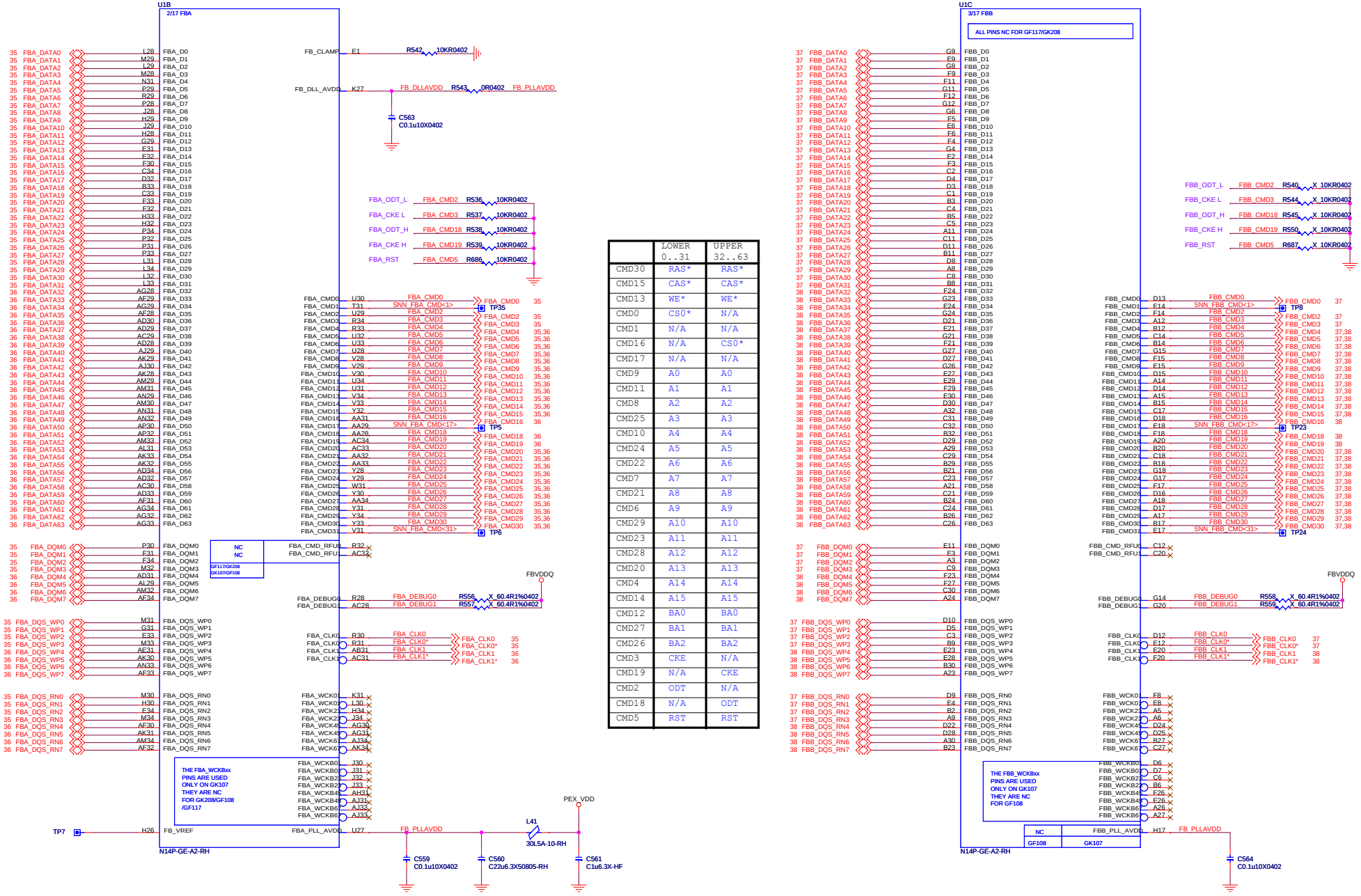
N14M-GE1 SKU No Frame Buffers B



	LOWER 0..31	UPPER 32..63
CMD30	RAS*	RAS*
CMD15	CAS*	CAS*
CMD13	WE*	WE*
CMD0	CS0*	N/A
CMD1	N/A	N/A
CMD16	N/A	CS0*
CMD17	N/A	N/A
CMD9	A0	A0
CMD11	A1	A1
CMD8	A2	A2
CMD25	A3	A3
CMD10	A4	A4
CMD24	A5	A5
CMD22	A6	A6
CMD7	A7	A7
CMD21	A8	A8
CMD6	A9	A9
CMD29	A10	A10
CMD23	A11	A11
CMD28	A12	A12
CMD20	A13	A13
CMD4	A14	A14
CMD14	A15	A15
CMD12	BA0	BA0
CMD27	BA1	BA1
CMD26	BA2	BA2
CMD3	CKE	N/A
CMD19	N/A	CKE
CMD2	ODT	N/A
CMD18	N/A	ODT
CMD5	RST	RST

MSI	MICRO-STAR INT'L CO.,LTD	
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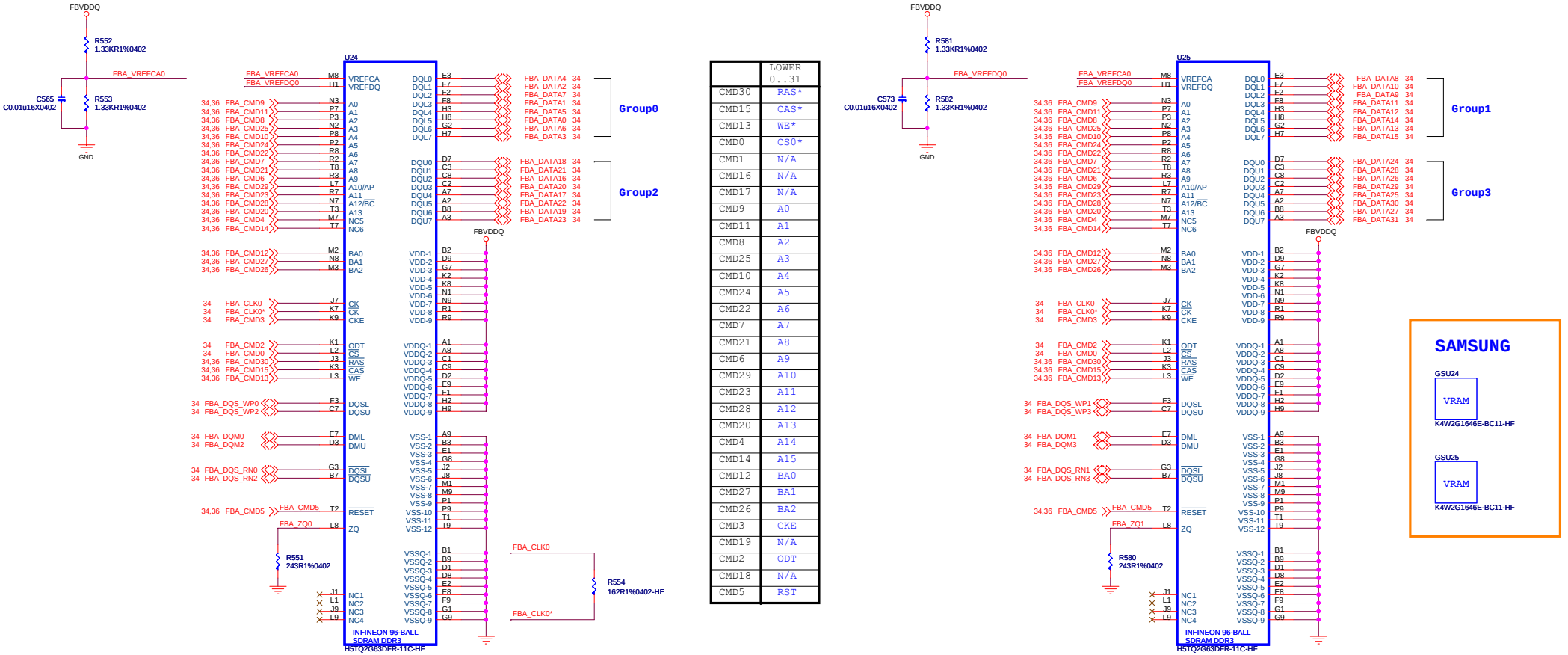
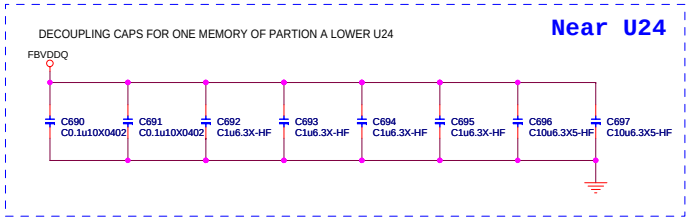


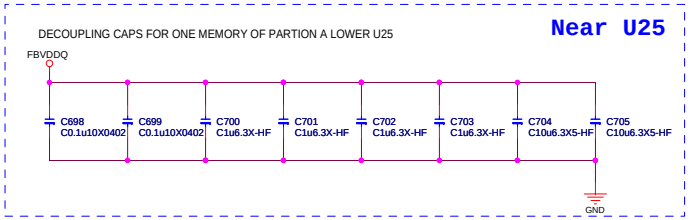
	LOWER 0..31
CMD30	RAS*
CMD15	CAS*
CMD13	WE*
CMD0	CS0*
CMD1	N/A
CMD16	N/A
CMD17	N/A
CMD9	A0
CMD11	A1
CMD8	A2
CMD25	A3
CMD10	A4
CMD24	A5
CMD22	A6
CMD7	A7
CMD21	A8
CMD6	A9
CMD29	A10
CMD23	A11
CMD28	A12
CMD20	A13
CMD4	A14
CMD14	A15
CMD12	BA0
CMD27	BA1
CMD26	BA2
CMD3	CKE
CMD19	N/A
CMD2	ODT
CMD18	N/A
CMD5	RST

SAMSUNG

GSU24 VRAM K4W2G1646E-BC11-HF

GSU25 VRAM K4W2G1646E-BC11-HF





MICRO-STAR INT'L CO.,LTD

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Size	Document Description	Rev
Custom	N13P_MEM A LOWER	1.0

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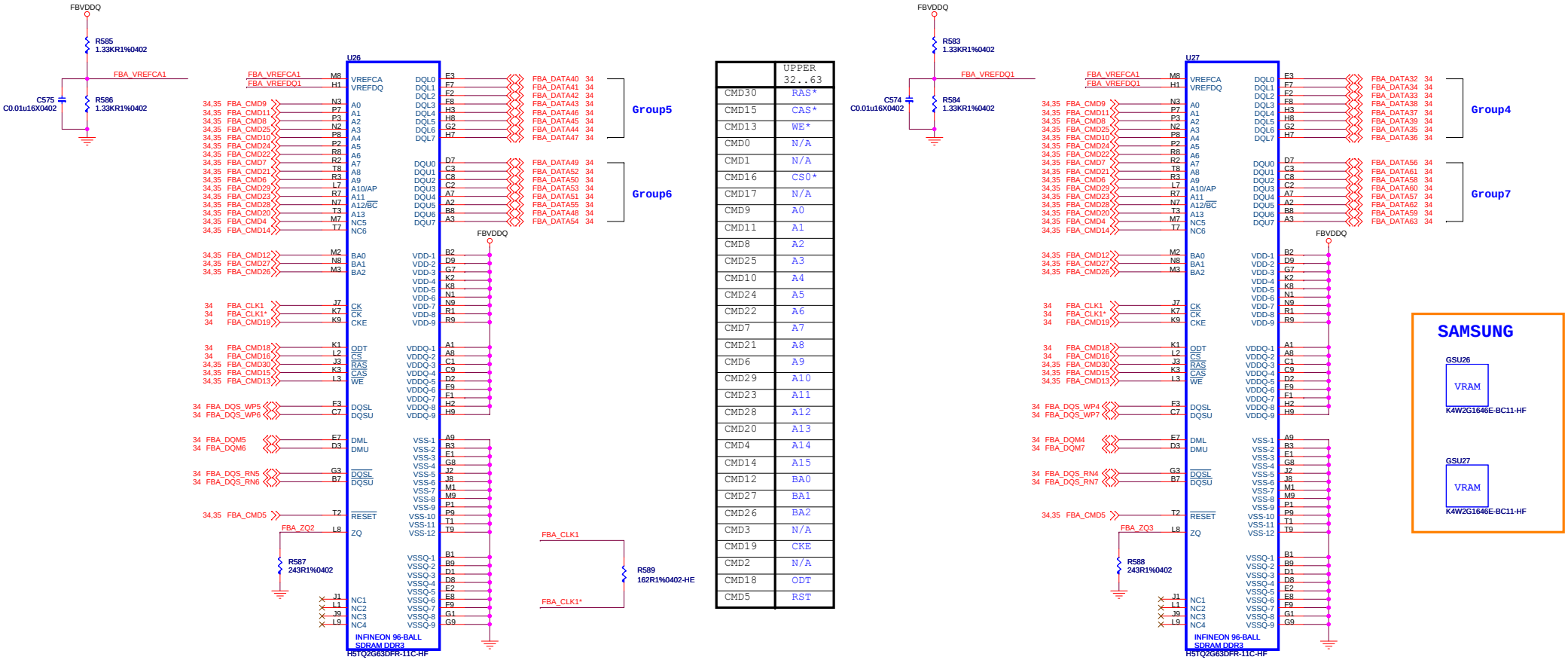

MICRO-STAR INT'L CO.,LTD		
MS-AC131		
Size: Custom	Document Description: N13P_MEM A UPPER	Rev: 1.0
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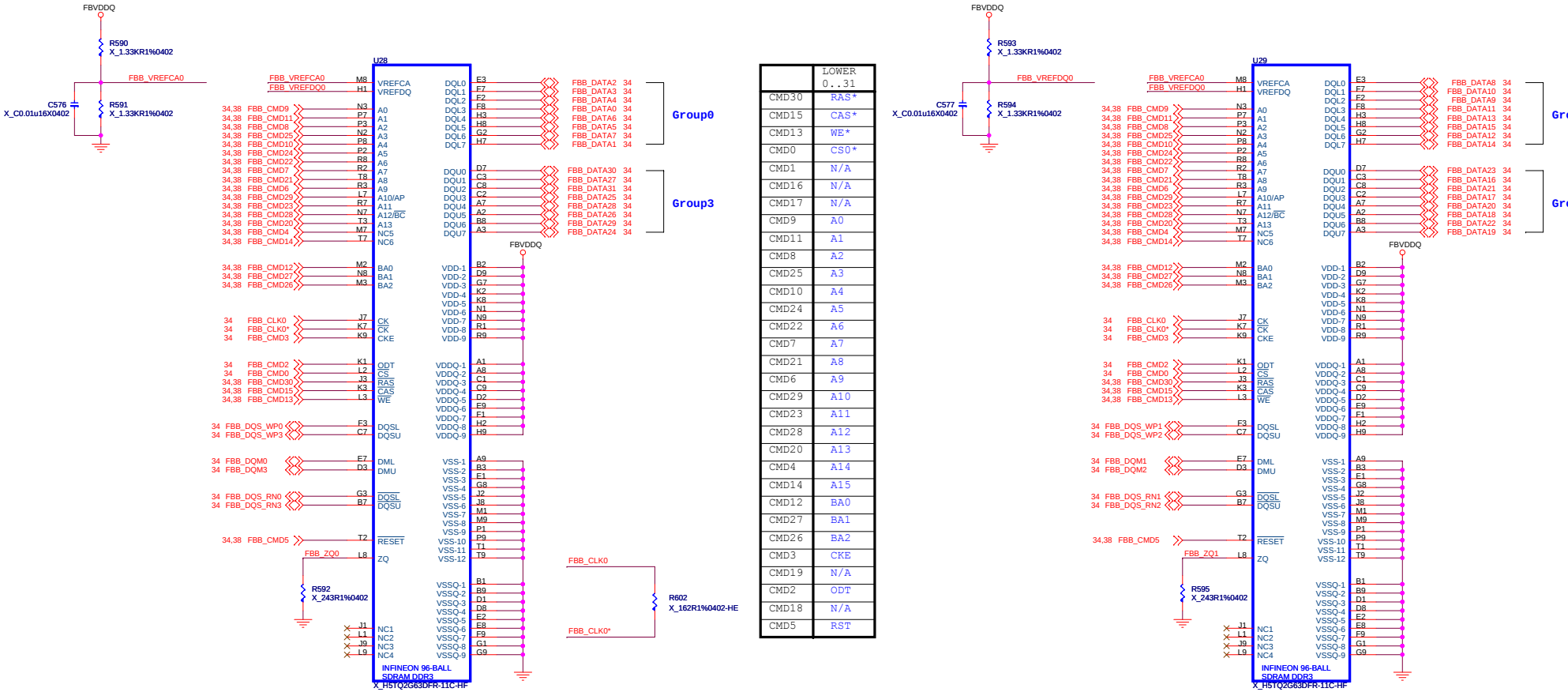
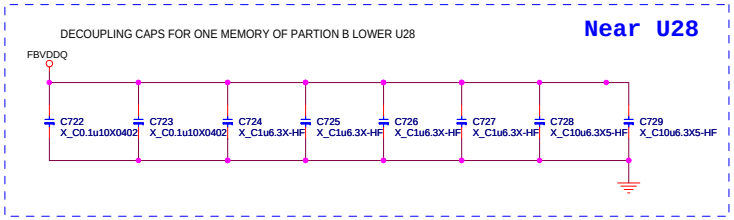
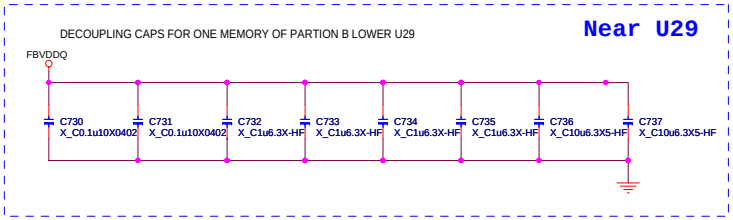
N14M-GE1 SKU No Frame Buffers B



	LOWER 0..31
CMD30	RAS*
CMD15	CAS*
CMD13	WE*
CMD0	CS0*
CMD1	N/A
CMD16	N/A
CMD17	N/A
CMD9	A0
CMD11	A1
CMD8	A2
CMD25	A3
CMD10	A4
CMD24	A5
CMD22	A6
CMD7	A7
CMD21	A8
CMD6	A9
CMD29	A10
CMD23	A11
CMD28	A12
CMD20	A13
CMD4	A14
CMD14	A15
CMD12	BA0
CMD27	BA1
CMD26	BA2
CMD3	CKE
CMD19	N/A
CMD2	ODT
CMD18	N/A
CMD5	RST





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Size	Document Description	Rev
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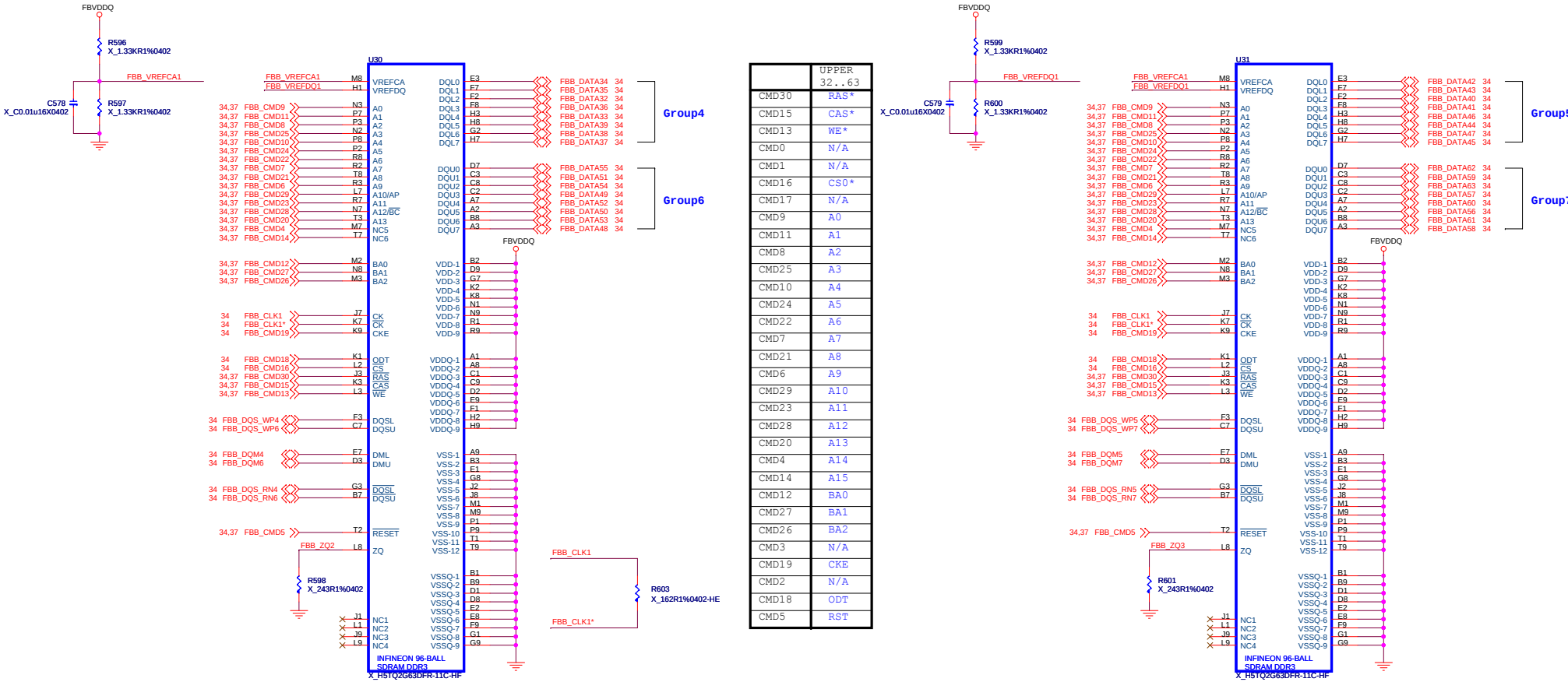
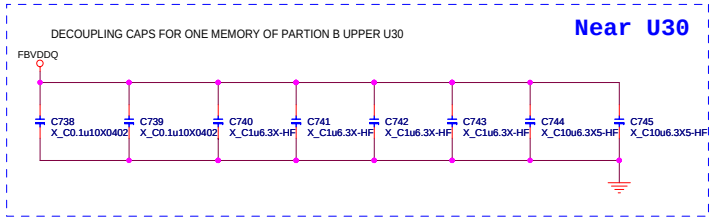
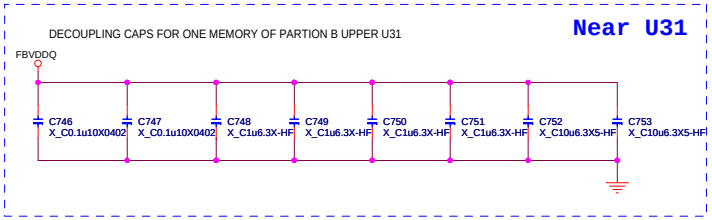
N14M-GE1 SKU No Frame Buffers B







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Size	Document Description	Rev
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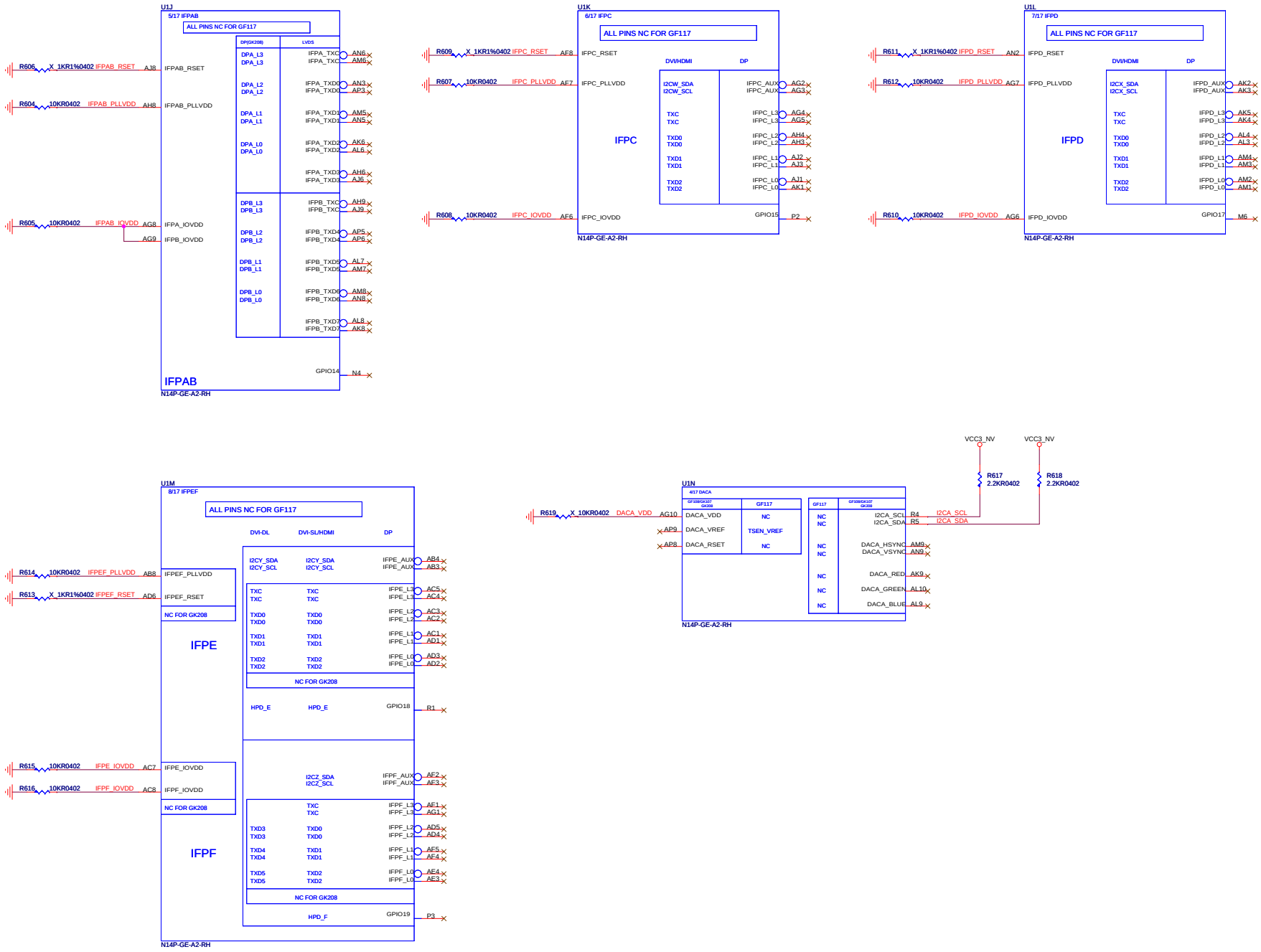

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C	N13P_Display IF	1.0

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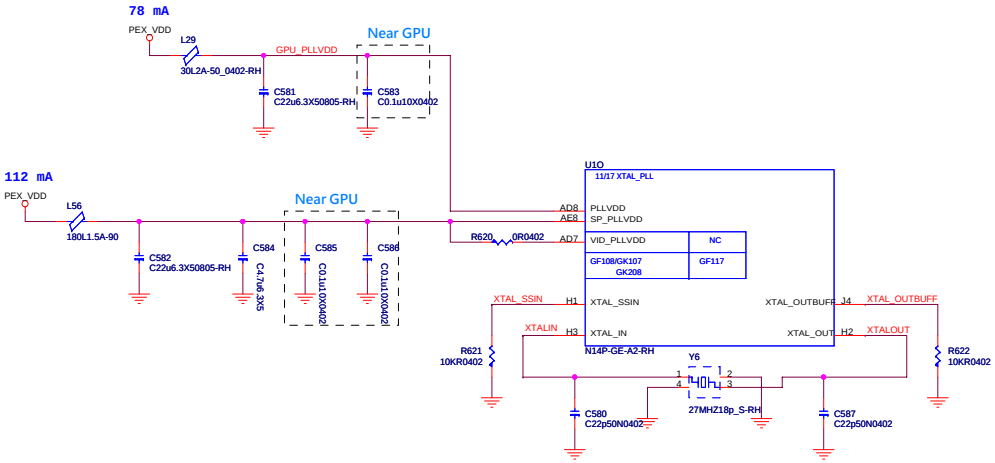
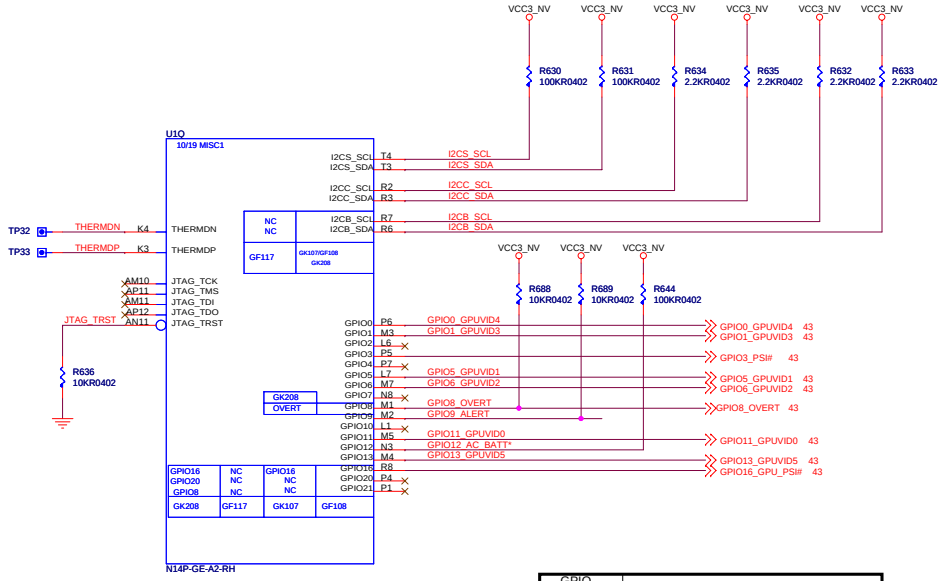
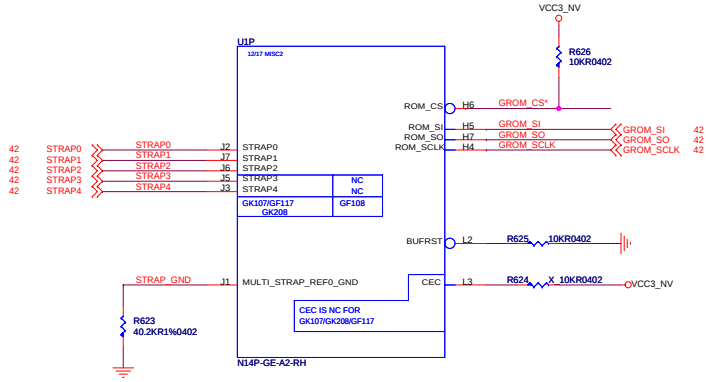
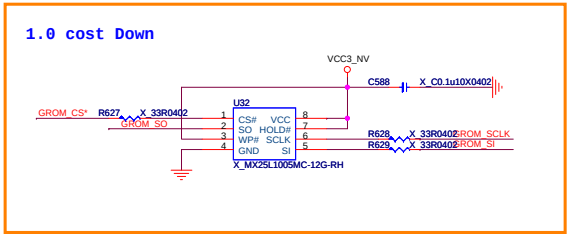




GPIO Function	
GPIO 0	Debug / Service Header / Alt_Fan PWM
GPIO 1	VID2
GPIO 2	LCD Brightness Control (BL PWM)
GPIO 3	LCD Power Enable (PPEN)
GPIO 4	LCD Backlight Enable (BLEN)
GPIO 5	VID0
GPIO 6	VID1
GPIO 7	3D STEREO
GPIO 8	GPU Overtemp
GPIO 9	GPU Thermal Alert
GPIO 10	FB Vref Control (not used sDDR3)
GPIO 11	FBVDD/Q VID (Reserved)
GPIO 12	PWR_Level AC Detect
GPIO 13	NVVDD PSI
GPIO 14	HPD for IFP AB (not used)
GPIO 15	HPD for IFP C (DP)
GPIO 16	Fan PWM/MEM_VDD_CTL/NVVDD PSI/FRAME LOCK
GPIO 17	HPD for IFP D (eDP)
GPIO 18	HPD for IFP E (DP)
GPIO 19	HPD for IFP F (DP)
GPIO 20	<not used>
GPIO 21	<not used>





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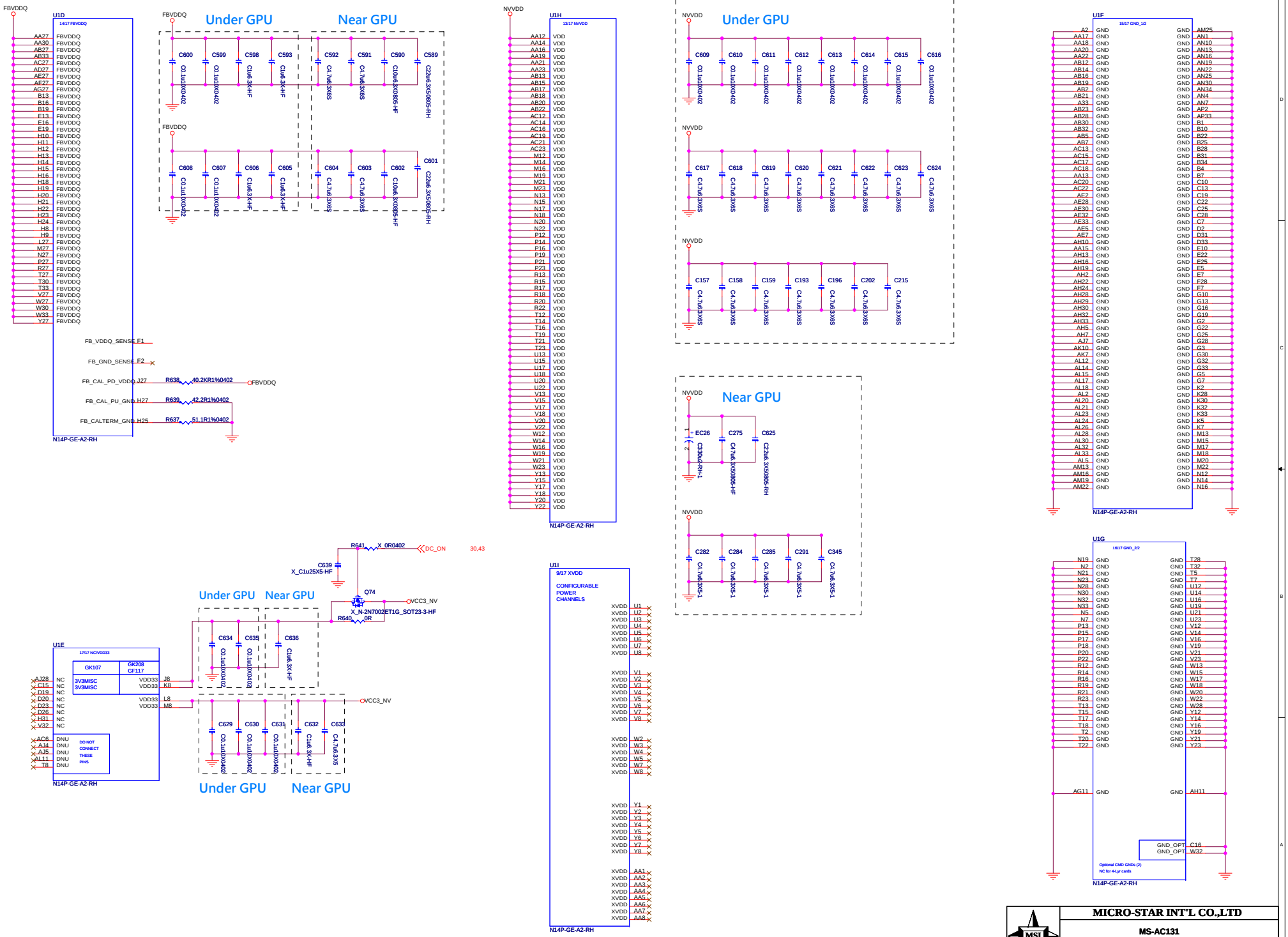
U1D
14/17 FBVDDQ
FBVDDQ
Under GPU
Near GPU
U1H
13/17 NVVDD
NVVDD
U1F
15/17 GND_1/2
N14P-GE-A2-RH
FB_VDDQ_SENSE F1
FB_GND_SENSE F2
FB_CAL_PD_VDDQ J27
R638
40.2KR1%0402
FB_CAL_PU_GND H27
R639
42.2R1%0402
FB_CALTERM_GND H25
R637
51.1R1%0402
U1E
17/17 NC/VDD33
GK107
GK208
GF117
3V3MISC
DO NOT CONNECT THESE PINS
U1I
9/17 XVDD
CONFIGURABLE POWER CHANNELS
U1G
16/17 GND_2/2
R641
X_0R0402
DC_ON
30,43
C639
X_C1u25X5-HF
Q74
X_N-2N7002ET1G_SOT23-3-HF
VCC3_NV
R640
0R
Optional CMD GNDs (2)
NC for 4-Lyr cards
GND_OPT
MICRO-STAR INT'L CO.,LTD
MS-AC131
Document Description
N13P_Power & GND
Rev
1.0
Size
C
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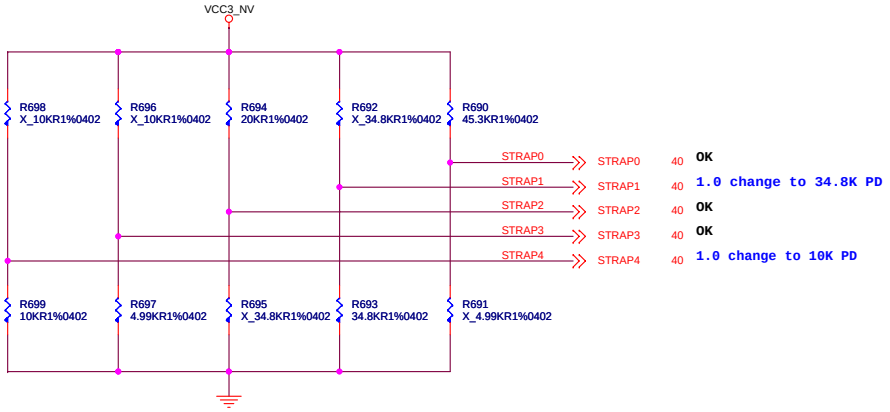

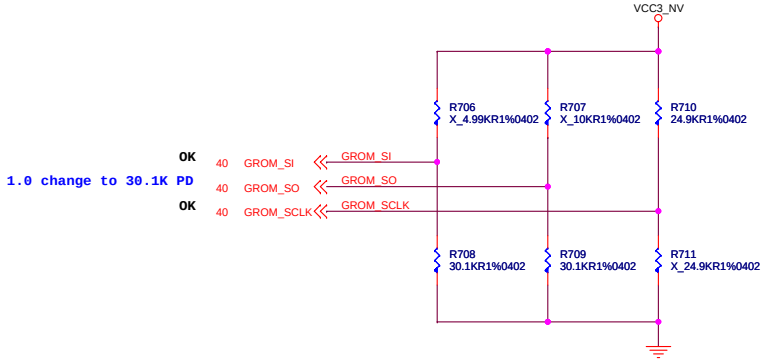

GF108 128Mx16 SAMSUNG K4W2G1646E-BC11 Starp 0x0 4.99K PD

	GK10X/GK208 STRAP PIN MODE TABLE			
PIN NAME	MULTI-LEVEL bit [3:0] Bit 3	Bit 2	Bit 1	Bit 0
STRAP0	USER [3]	USER [2]	USER [1]	USER [0]
STRAP1	3GIO_PADCFG [3]	3GIO_PADCFG [2]	3GIO_PADCFG [1]	3GIO_PADCFG [0]
STRAP2	PCI_DEVID [3]	PCI_DEVID [2]	PCI_DEVID [1]	PCI_DEVID [0]
STRAP3	SOR[3] _EXPOSED	SOR[2] _EXPOSED	SOR[1] _EXPOSED	SOR[0] _EXPOSED
STRAP4	RESERVED	RESERVED	PCIE_MAX_SPEED	DP_PLL_VDD33V
ROM_SCLK	PCI_DEVID [4]	SUB_VENDOR	PCI_DEVID [5]	PEX_PLL_EN_TERM
ROM_SI	RAMCFG [3]	RAMCFG [2]	RAMCFG [1]	RAMCFG [0]
ROM_SO	FB [1]	FB [0]	SMB_ALT_ADDR	VGA_DEVICE

	GND	3V3
4.99K	0000	1000
10K	0001	1001
15K	0010	1010
20K	0011	1011
24.9K	0100	1100
30.1K	0101	1101
34.8K	0110	1110
45.3K	0111	1111

USER_BIT0
USER_BIT1
USER_BIT2
USER_BIT3

Default All SKU(s):
0xF = 45K PU
LVDS Panel EDID Mode

3GIO_PADCFG 0
3GIO_PADCFG 1
3GIO_PADCFG 2
3GIO_PADCFG 3

Table 131 3GIO_PADCFG Strap Settings

0110 Gen 1 / Gen 2 support only

0000 Gen 3 support

PCI_DEVID_0
PCI_DEVID_1
PCI_DEVID_2
PCI_DEVID_3

PCDEVID_3:0] Definitions (Note Actual DEVID set also depends on PCI_DEVID_4)

N13P-GE1 0x0FCE 1100 1110

N14M-GE1 0x105B 0101 1011

VGA_DEVICE
0: 3D DEVICE
1: VGA DEVICE

SMB_ALT_ADDR
0: Thermal Sensor ADR = 0x9E (Default)
1: Thermal Sensor ADR = 0x9C (Multi-GPU usage)

FB [1:0] 10 : 256 MB (Default) Table 125 N14X FB Aperture Size

RAM_CFG[3:0] Definitions

RAM_CFG_0
RAM_CFG_1
RAM_CFG_2
RAM_CFG_3

N13P-GE1 RVL MEMORY STRAP TABLE

0001	128Mx16 SDDR3	Micron MT41J128M16JT-107G
0010	64Mx16 SDDR3	Hynix H5TQ1G63DFR-11C
0011	64Mx16 SDDR3	Samsung K4W1G1646G-BC11
0100	128Mx16 SDDR3	Samsung K4W2G1646E-BC11
0101	128Mx16 SDDR3	Hynix H5TQ2G63DFR-11C
0110	128Mx16 SDDR3	Hynix H5TQ2G63BFR-11C
0111	128Mx16 SDDR3	Samsung K4W2G1646C-HC11
0111	256Mx16 SDDR3	Micron MT41K256M16HA-107G
1111	256Mx16 SDDR3	Samsung K4W4G1646B-HC13

N14M-GE1 RVL MEMORY STRAP TABLE

0000	128Mx16 SDDR3	Samsung K4W2G1646E-BC11
0101	128Mx16 SDDR3	Hynix H5TQ2G63DFR-11C

PEX_PLL_EN_TERM 0: DISABLED (Default) 1: Enable

SUB_VENDOR
0: No Video BIOS ROM
1: BIOS ROM IS PRESENT (Default)

DP_PLL_VDD33V 0: Reserved 1: Default

PCIE_MAX_SPEED
0: Limit booting to PCIE Gen 1
1: Allow booting to PCIE Gen 2 / 3

PCIE_SPEED_CHANGE_GEN3
0: Disable PCIE Gen 3 operation
1: Enable PCIE Gen 3 operation

SOR[X] _EXPOSED 0000 : Not in use

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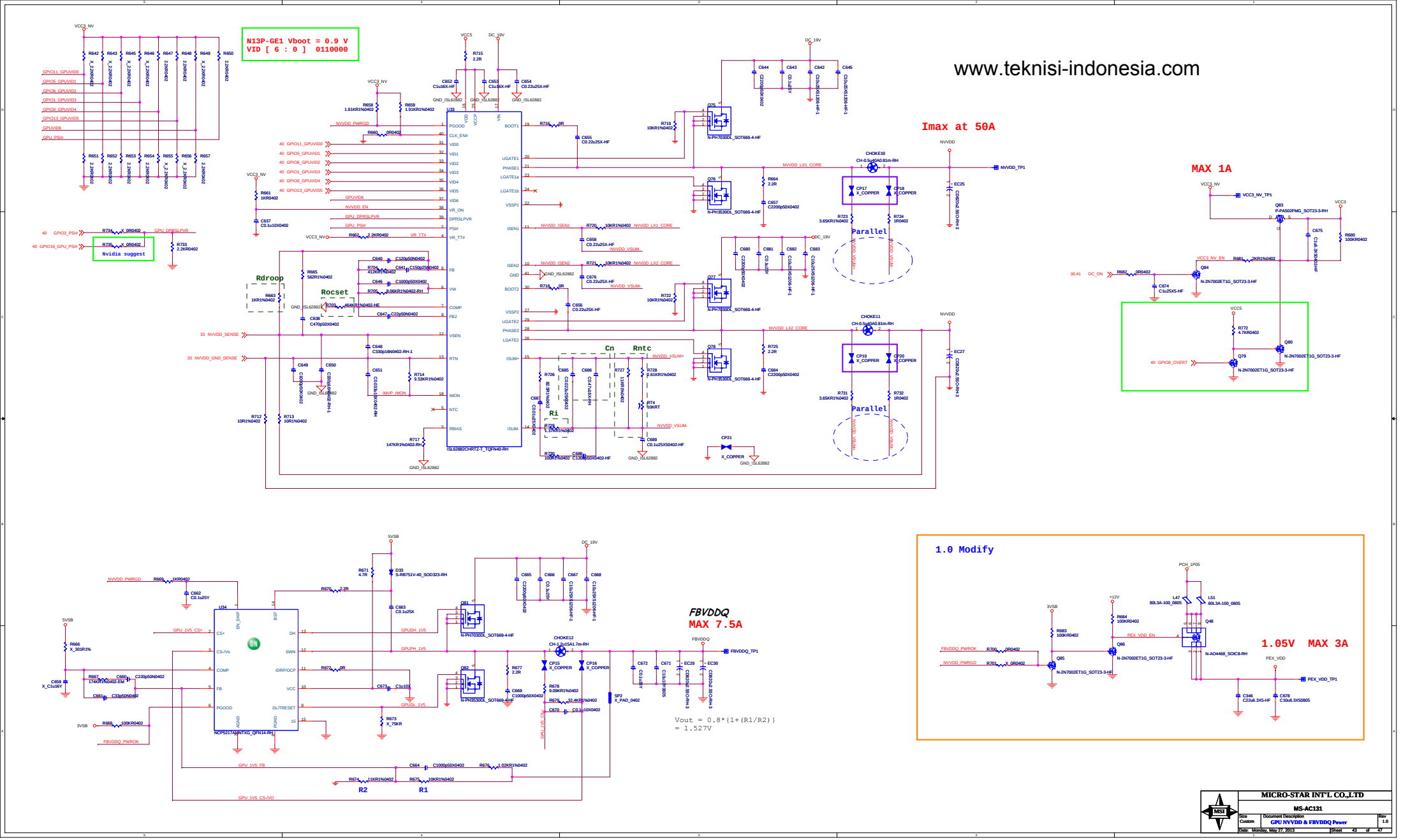
N13P-GE1 Vboot = 0.9 V
VID [6 : 0] 0110000
www.teknisi-indonesia.com
Imax at 50A
MAX 1A
Rdroop
Rocset
Cn
Rntc
Ri
Parallel
Nvidia suggest
1.0 Modify
FBVDDQ
MAX 7.5A
1.05V MAX 3A
Vout = 0.8*(1+(R1/R2))
= 1.527V
R2
R1
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GPU NVVDD & FBVDDQ Power
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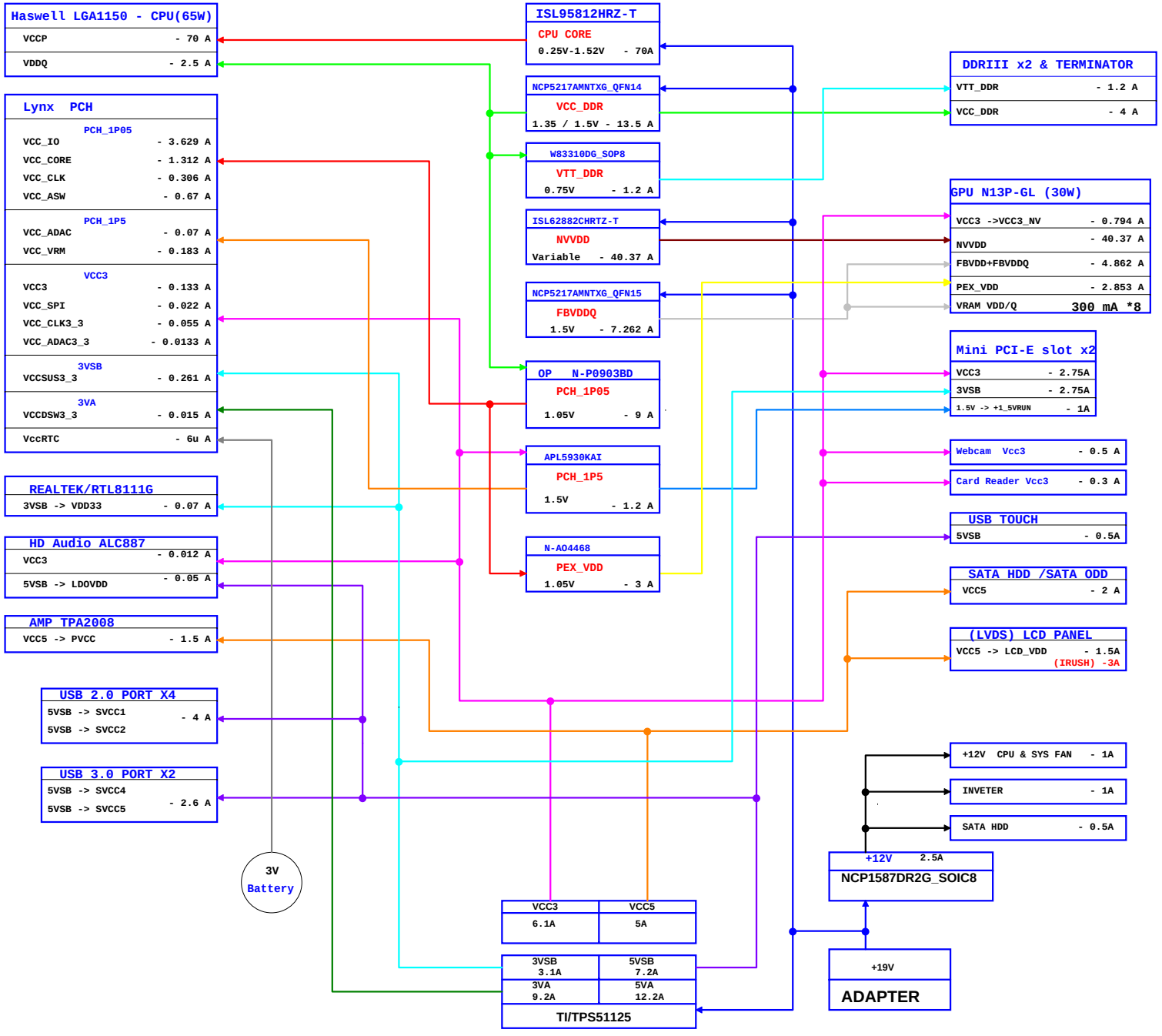

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Lynx Point Platform

GPIO	Alt Func	Type	POWER	SMI	TOL	DEFAULT	SIGNAL NAME	Pull up or Pull down	BIOS
GPIO0	BMBUSY#	I/O	CORE	Y	3.3V	GPI	BM_BUSY#	Pull-up 10K to VCC3	No USE
GPIO1	Unmultiplexed	I/O	CORE	Y	3.3V	GPI	WLAN2_PWRON	Pull-up 10K to VCC3	WLAN2_PWRON
GPIO2	PIRQE#	I/OD	CORE	Y	5V	GPI	PCH_GPIO2	Pull-up 4.7K to VCC3	MON_PWRBTN
GPIO3	PIRQF#	I/OD	CORE	Y	5V	GPI	PCH_GPIO3	Pull-up 10K to VCC3	D-MIC
GPIO4	PIRQG#	I/OD	CORE	Y	5V	GPI	PCH_GPIO4	Pull-up 4.7K to VCC3	MODE_SELBTN
GPIO5	PIRQH#	I/OD	CORE	Y	5V	GPI	PCH_GPIO5	Pull-up 4.7K to VCC3	SEL_UP
GPIO6	Unmultiplexed	I/O	CORE	Y	3.3V	GPI	PCH_GPIO6	Pull-up 4.7K to VCC3	SEL_DOWN
GPIO7	Unmultiplexed	I/O	CORE	Y	3.3V	GPI	PCH_GPIO7	Pull-up 10K to VCC3	No USE
GPIO8	Unmultiplexed	I/O	Suspend	Y	3.3V	GPO	ICC_EN	Pull-down	STRAP
GPIO9	OC5#	I/O	Suspend	Y	3.3V	Native	OC#5	Pull-up 10K to 3VSB	OC5#
GPIO10	OC6#	I/O	Suspend	Y	3.3V	Native	OC#6	Pull-up 10K to 3VSB	OC0#
GPIO11	SMBALERT#	I/O	Suspend	Y	3.3V	Native	PCH_SMBALERT#	Pull-up 10K to 3VSB	No USE
GPIO12	LAN_PHY_PWR_CTRL	I/O	DSW	Y	3.3V	Native	PCH_PGIO12	N/A	No USE
GPIO13	HDA_DOCK_RST#	I/O	Suspend	Y	3.3V	GPI	PCH_GPIO13	Pull-up 10K to 3VSB	No USE
GPIO14	OC7#	I/O	Suspend	Y	3.3V	Native	PCH_GPIO14	Pull-up 10K to 3VSB	MON_LED
GPIO15	Unmultiplexed	I/O	Suspend	Y	3.3V	GPO	PCH_GPIO15	N/A	Panel On/Off
GPIO16	SATA4GP	I/O	CORE	N	3.3V	GPI	PCH_GPIO16	Pull-UP 10K to VCC3	No USE
GPIO17	Unmultiplexed	I/O	CORE	N	3.3V	GPI	WLAN1_PWRON	Pull-up 10K to VCC3	WLAN1_PWRON
GPIO18	PCIECLKRQ1#	I/O	CORE	N	3.3V	Native	PCIECLKREQ1#	Pull-up 10K to VCC3	PCIECLKRQ1#
GPIO19	SATA1GP	I/O	CORE	N	3.3V	GPI	PCH_GPIO19	Pull-up 10K to VCC3	STRAP
GPIO20	PCIECLKRQ2#	I/O	CORE	N	3.3V	Native	PCIECLKREQ2#	Pull-up 10K to VCC3	PCIECLKREQ2#
GPIO21	SATA0GP	I/O	CORE	N	3.3V	GPI	PCH_GPIO21	Pull-up 10K to VCC3	No USE
GPIO22	SCLOCK	I/O	CORE	N	3.3V	GPI	PCH_GPIO22	Pull-up 10K to VCC3	No USE
GPIO23	LDRQ1#	I/O	CORE	N	3.3V	Native	NC	N/A	No USE
GPIO24	Unmultiplexed	I/O	Suspend	N	3.3V	GPO	PCH_GPIO24	N/A	No USE
GPIO25	PCIECLKRQ3#	I/O	Suspend	N	3.3V	Native	PCIECLKREQ3#	Pull-up 10K to 3VSB	PCIECLKREQ3#
GPIO26	PCIECLKRQ4#	I/O	Suspend	N	3.3V	Native	PCIECLKREQ4#	Pull-up 10K to 3VSB	PCIECLKREQ4#
GPIO27	Unmultiplexed	I/O	DSW	N	3.3V	GPI	PCH_GPIO27	Pull-up 10K to VDSW	No USE
GPIO28	Unmultiplexed	I/O	Suspend	N	3.3V	GPO	PCH_GPIO28	N/A	CHARGER_S1
GPIO29	SLP_LAN#	I/O	DSW	N	3.3V	Native	PCH_GPIO29	N/A	No USE
GPIO30	SUSWARN# SUSPWRDNACK	I/O	Suspend	N	3.3V	Native	SUSWARN#	N/A	SUSWARN#
GPIO31	Unmultiplexed	I/O	DSW	N	3.3V	GPI	PCH_GPIO31	Pull-up 10K to VDSW	DDR_VCTL
GPIO32	only CLKRUN#	I/O	CORE	N	3.3V	GPO	PCH_GPIO32	N/A	No USE
GPIO33	HDA_DOCK_EN#	I/O	CORE	N	3.3V	GPO	PCH_GPIO33	N/A	No USE
GPIO34	Unmultiplexed	I/O	CORE	N	3.3V	GPI	STP_PCI#	Pull-up 10K to VCC3	STP_PCI#
GPIO35	NMI#	I/O	CORE	N	3.3V	GPO	PCH_GPIO35	N/A	No USE
GPIO36	SATA2GP	I/O	CORE	N	3.3V	GPI	PCH_GPIO36	N/A	STRAP
GPIO37	SATA3GP	I/O	CORE	N	3.3V	GPI	PCH_GPIO37	Pull-up 10K to VCC3	STRAP
GPIO38	SLOAD	I/O	CORE	N	3.3V	GPI	PCH_GPIO38	Pull-up 10K to VCC3	No USE
GPIO39	SDATAOUT0	I/O	CORE	N	3.3V	GPI	PCH_GPIO39	Pull-up 10K to VCC3	No USE
GPIO40	OC1#	I/O	Suspend	N	3.3V	Native	OC#1	Pull-up 10K to 3VSB	OC1#
GPIO41	OC2#	I/O	Suspend	N	3.3V	Native	OC#2	Pull-up 10K to 3VSB	OC2#
GPIO42	OC3#	I/O	Suspend	N	3.3V	Native	OC#3	Pull-up 10K to 3VSB	OC3#
GPIO43	OC4#	I/O	Suspend	N	3.3V	Native	OC#4	Pull-up about 3VSB	OC4#
GPIO44	PCIECLKRQ5#	I/O	Suspend	N	3.3V	Native	PCIECLKREQ5#	Pull-up 10K to 3VSB	CHARGER_EN
GPIO45	PCIECLKRQ6#	I/O	Suspend	N	3.3V	Native	PCIECLKREQ6#	Pull-up 10K to 3VSB	CHARGER_S0

GPIO	Alt Func	Type	POWER	SMI	TOL	DEFAULT	SIGNAL NAME	Pull up or Pull down	BIOS
GPIO46	PCIECLKRQ7#	I/O	Suspend	N	3.3V	Native	PCIECLKREQ7#	Pull-up 10K to 3VSB	PCIECLKREQ7#
GPIO47	is not available	I/O	Suspend	N	3.3V	Native			
GPIO48	SDATAOUT1	I/O	CORE	N	3.3V	GPI	PCH_GPIO48	Pull-up 10K to VCC3	No USE
GPIO49	SATA5GP	I/O	CORE	N	3.3V	GPI	PCH_GPIO49	Pull-up 10K to VCC3	No USE
GPIO50	Unmultiplexed	I/O	CORE	N	5V	GPI	PCH_GPIO50	Pull-up 10K to VCC3	No USE
GPIO51	Unmultiplexed	I/O	CORE	N	3.3V	GPO	PCH_GPIO51	N/A	STRAP
GPIO52	Unmultiplexed	I/O	CORE	N	5V	GPI	PCH_GPIO52	Pull-Down 10K	BOM SKU
GPIO53	Unmultiplexed	I/O	CORE	N	3.3V	GPO	PCH_GPIO53	N/A	STRAP
GPIO54	Unmultiplexed	I/O	CORE	N	5V	GPI	PCH_GPIO54	Pull-Down 10K	BOM SKU
GPIO55	Unmultiplexed	I/O	CORE	N	3.3V	GPO	PCH_GPIO55	N/A	STRAP
GPIO56	is not available	I/O	Suspend	N	3.3V	Native			
GPIO57	Unmultiplexed	I/O	Suspend	N	3.3V	GPI	PCH_GPIO57	Pull-up 10K to 3VSB	NFC
GPIO58	SML1CLK	I/O	Suspend	N	3.3V	Native	PCH_SML1CLK	Pull-up 2.2K to 3VSB	PCH_SML1CLK
GPIO59	OC0#	I/O	Suspend	N	3.3V	Native	OC#0	Pull-up 10K to 3VSB	OC0#
GPIO60	SML0ALERT#	I/O	Suspend	N	3.3V	Native	PCH_SML0ALERT#	Pull-up 10K to 3VSB	No USE
GPIO61	SUS_SATA#	I/O	Suspend	N	3.3V	Native	SUS_STAT#	N/A	No USE
GPIO62	SUSCLK	I/O	Suspend	N	3.3V	Native	SUS_CLK	N/A	No USE
GPIO63	SLP_S5#	I/O	Suspend	N	3.3V	Native	SLP_S5#	N/A	No USE
GPIO64	CLKOUTFLEX0	I/O	CORE	N	3.3V	Native	NC	N/A	No USE
GPIO65	CLKOUTFLEX1	I/O	CORE	N	3.3V	Native	CK_48M_FLEX1	N/A	CK_48M_SIO
GPIO66	CLKOUTFLEX2	I/O	CORE	N	3.3V	Native	NC	N/A	No USE
GPIO67	CLKOUTFLEX3	I/O	CORE	N	3.3V	Native	CK_48M_FLEX3	N/A	CK_48M_CARD
GPIO68	Unmultiplexed	I/O	CORE	N	3.3V	GPI	PCH_GPIO68	Pull-Down 10K	BOM SKU
GPIO69	Unmultiplexed	I/O	CORE	N	3.3V	GPI	PCH_GPIO69	Pull-Down 10K	BOM SKU
GPIO70	Unmultiplexed	I/O	CORE	N	3.3V	Native	PCH_GPIO70	Pull-Down 10K	BOM SKU
GPIO71	Unmultiplexed	I/O	CORE	N	3.3V	Native	PCH_GPIO71	Pull-Down 10K	BOM SKU
GPIO72	BATLOW#	I/O	DSW	N	3.3V	Native	PCH_GPIO72	Pull-up 1K to VDSW	No USE
GPIO73	PCIECLKRQ0#	I/O	Suspend	N	3.3V	Native	PCIECLKREQ0#	Pull-up 10K to 3VSB	PCIECLKREQ0#
GPIO74	SML1ALERT# PCHHOT#	I/O	Suspend	N	3.3V	Native	PCH_SML1ALERT#	Pull-up 10K to 3VSB	NFC
GPIO75	SML1DATA	I/O	Suspend	N	3.3V	Native	PCH_SML1DATA	Pull-up 2.2K to 3VSB	PCH_SML1DATA

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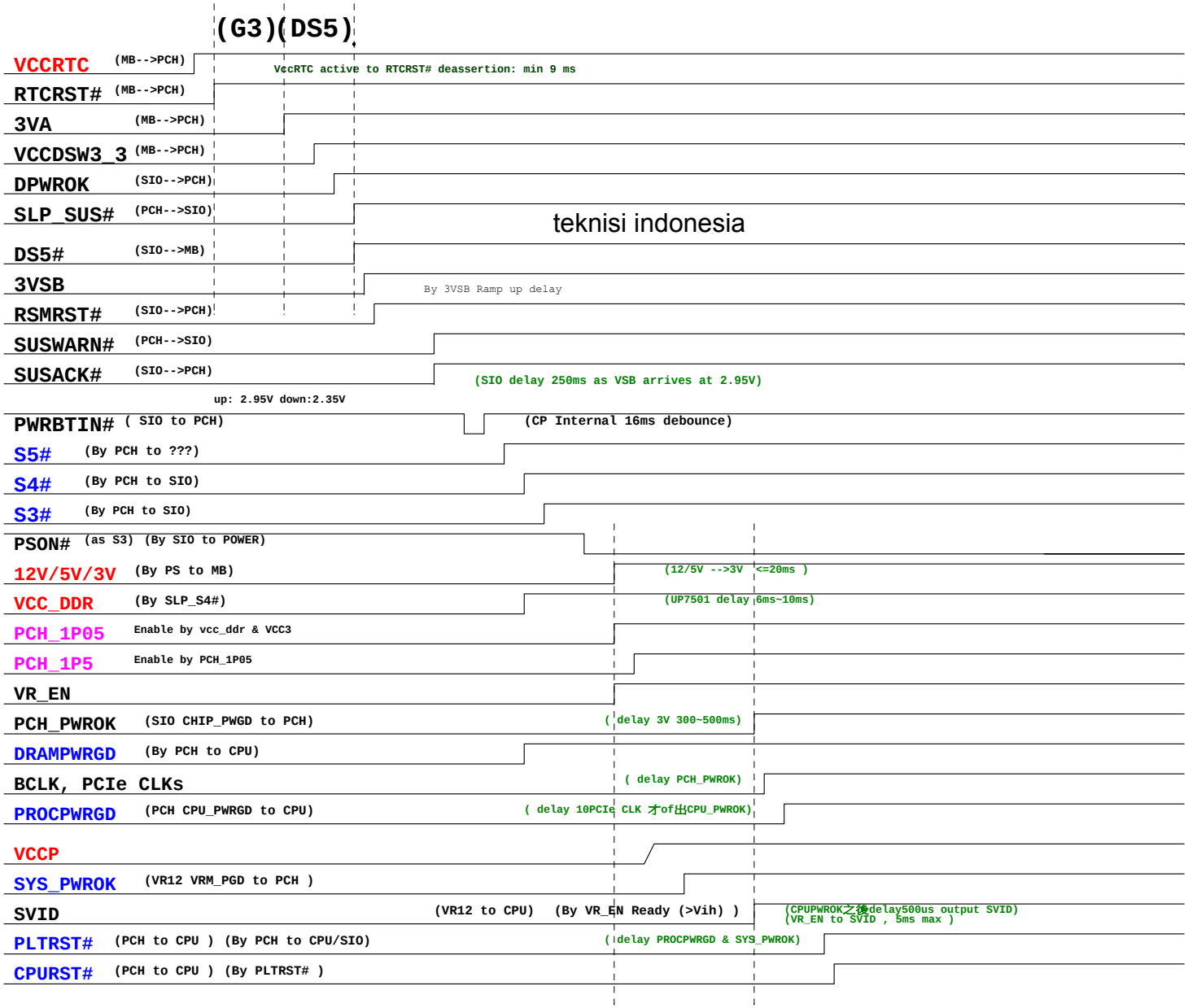

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MS-AC131		
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SPEC

GPU N13P-GE1 (128M*16bit*8 = 2G) co-lay N14M-GE1 (128M*16bit*4 = 1G)
SIO change to 5533D
Use PS8625 eDP to LVDS converter
LAN change to 8111G

0A

Page 11 supports Quad SPI
Page 17 Reserve D-MIC
Page 23 Reserve incell touch 3 Pin
Page 23 LVDS connector change to old N32-2200120-H06
Page 24 Reserve NFC
Page 31 Remove SYS FAN
Page 17 JAMPR1 change to N32-1020B30-H06
Page 17 JAMPL1 & JMIC1 change to N32-1020B40-H06
Page 10 JBAT1 change to N32-1020B40-H06

1.0

Page 23 Modify PS_VDDEN# circuit to High active
Page 23 change BOM for PS8625 signal High active
Page 23 R186 & R180 no stuff
Page 23 U15 no stuff for cost down
Page 25 Modify wrong circuit
Page 25 Change C34 to 0.47uF C11-4747312-M09 for POWER team
Page 25 Change R16 & R30 to 3.24K ohm for POWER team suggest
Page 25 Change C14 to 100pF for POWER team suggest
Page 25 Change R39 to 280 ohm for POWER team suggest
Page 26 Change CHOKE2、3、4 to L04-36B8021-L65 for POWER team suggest
Page 26 EC11、12、14 no stuff for cost down
Page 28 R74 change to 47.5K ohm
Page 21 Card Reader CLOCK change to PCH supply (cost down)
Page 16 R541 no stuff for Vendor suggest
Page 16 R763 no stuff (SIO GP04 change to push-pull)
Page 43 Modify PEX_VDD circuit
Page 11 & 27 DDR_VCTL change to PCH GPIO31 (DSW)
Page 19 JHDDPWR1 change to N32-1040D31-H06 (防呆)
Page 23 add PCH_GPIO15 control panel on/off
Page 32 add HDMI Royalty
Page 16 & 27 Deep S3 control VCC_DDR POWER signal change to SIO GP25
Page 12 VDSW change to 3VA
Page 42 STRAP1 change to 34.8K PD (NV suggest)
Page 42 STRAP4 change to 10K PD (NV suggest)
Page 42 ROM_SO change to 30.1K PD (NV suggest)