MS-AC951 Ver: 1.0

Intel Sharkbay plamform H81

CPU: INTEL-Haswell LGA1150

System Chipset: INTEL-LYNX

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

GPU: NVIDIA N14P-GV2
NVIDIA N14M-GE/GL

CPU PWM: VRD12 - ISL95812

OnBoard Chipset: SIO NUVOTON NCT6681D
HD Audio Codec RTL887
LAN-realtek 8111G
CARD READER_RTS5139
SPI ROM: 64 MB
USB 2.0 Hub

Expansion Slots: Mini PCI Express Slot * 2

Other: HDMI In *1
HDMI Out *1
SATA3 *2 , SATA2 *2
Side USB3.0 *2
REAL USB2.0 *4
COM Port *1

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MS-AC951

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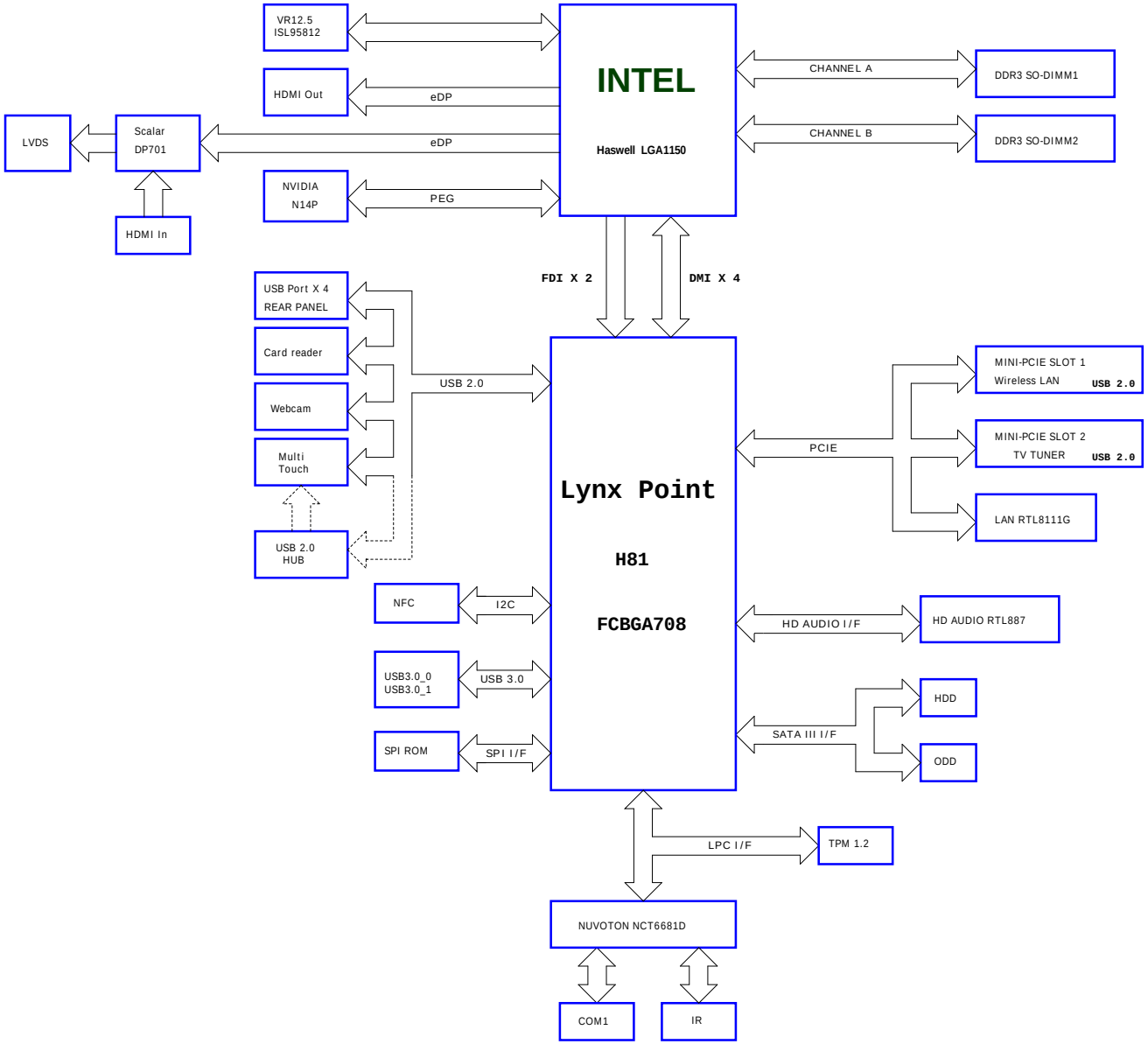
MS-AC951 Block Diagram

Intel Sharkbay plamform H81



MICRO-STAR INT'L CO.,LTD		
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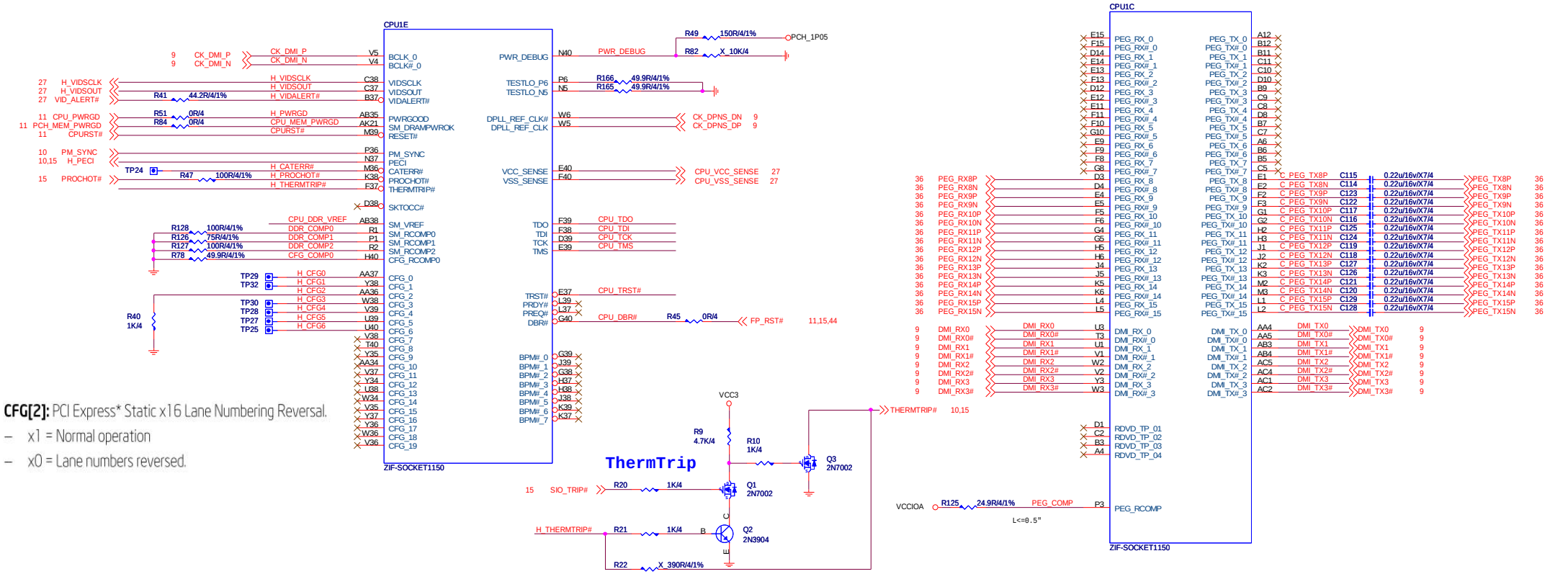

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MS-AC951	
Size: Custom	Document Description: CPU-CLK/Control/MISC/PEG
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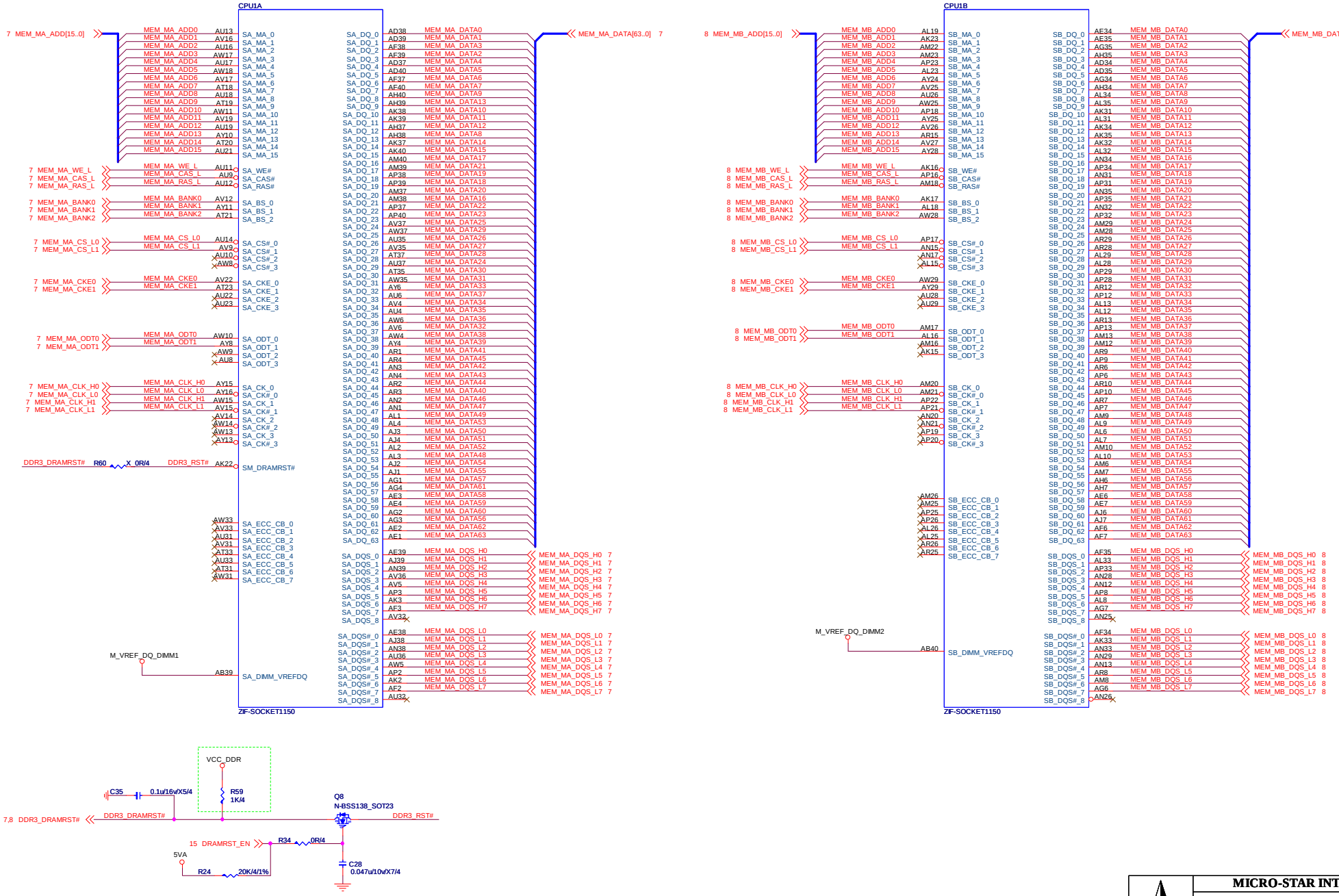

MICRO-STAR INT'L CO.,LTD	
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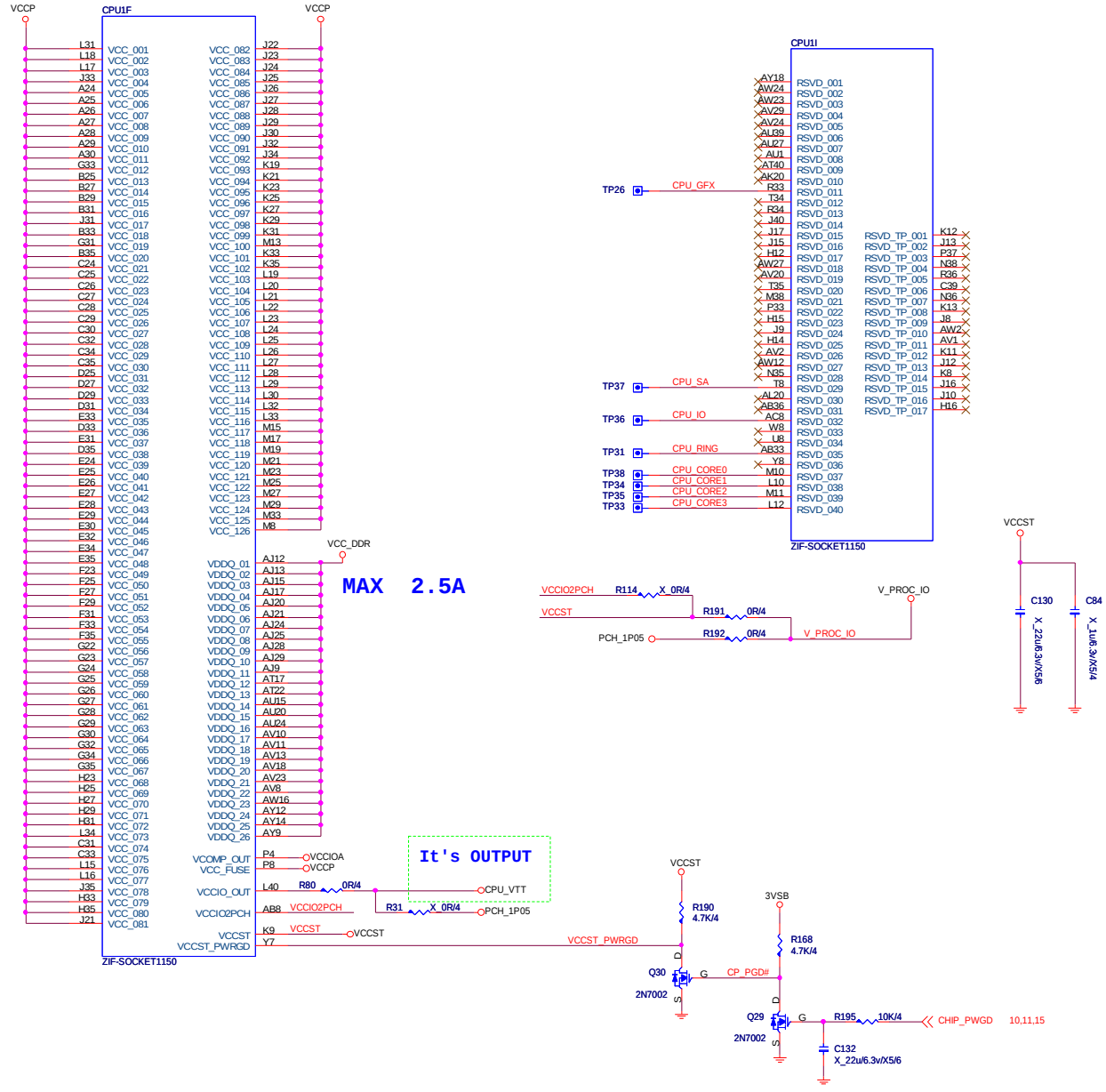
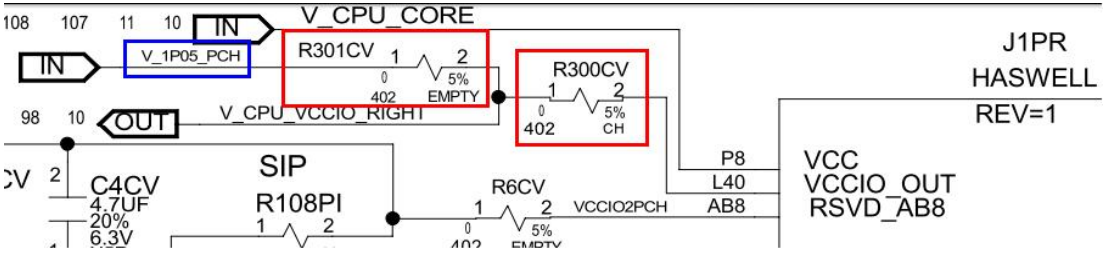
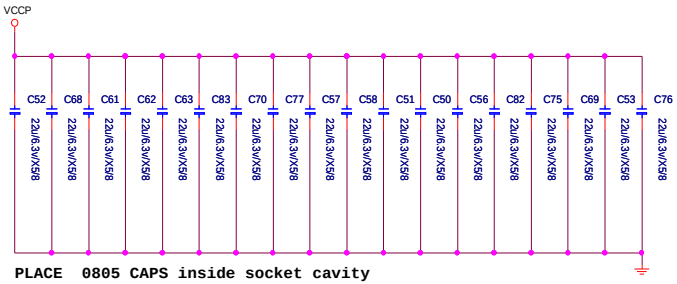
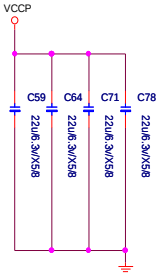




+CPU_VCCP-Decoupling

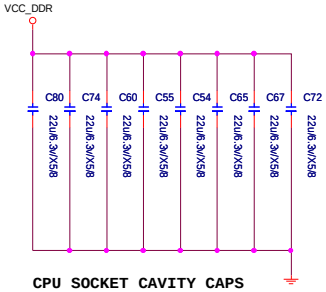


PLACE 0805 CAPS inside socket cavity



PLACE 0805 CAPS Near CPU SOCKET edge

+1.5V_DDR3-Decoupling



CPU SOCKET CAVITY CAPS

MICRO-STAR INT'L CO.,LTD		
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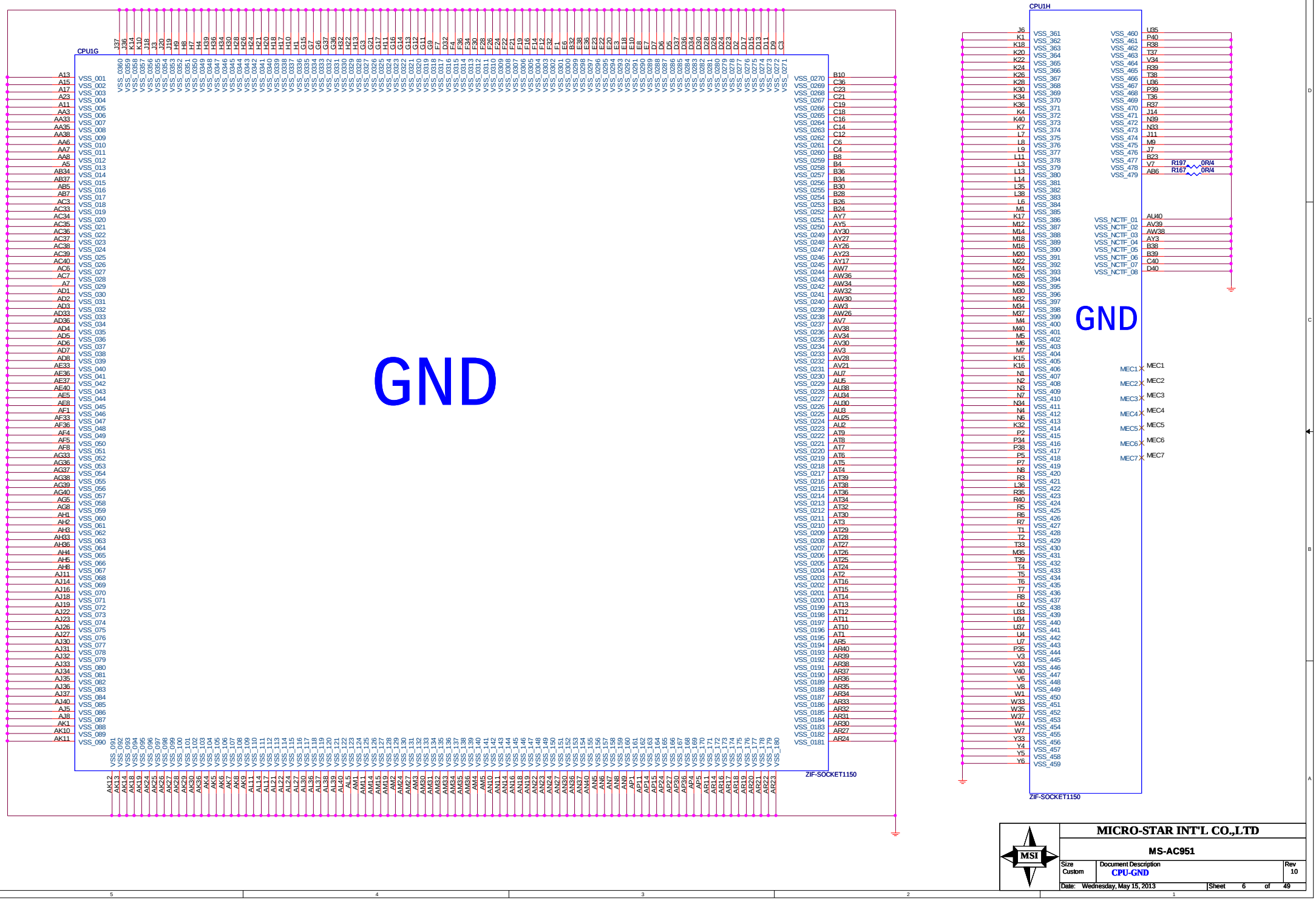

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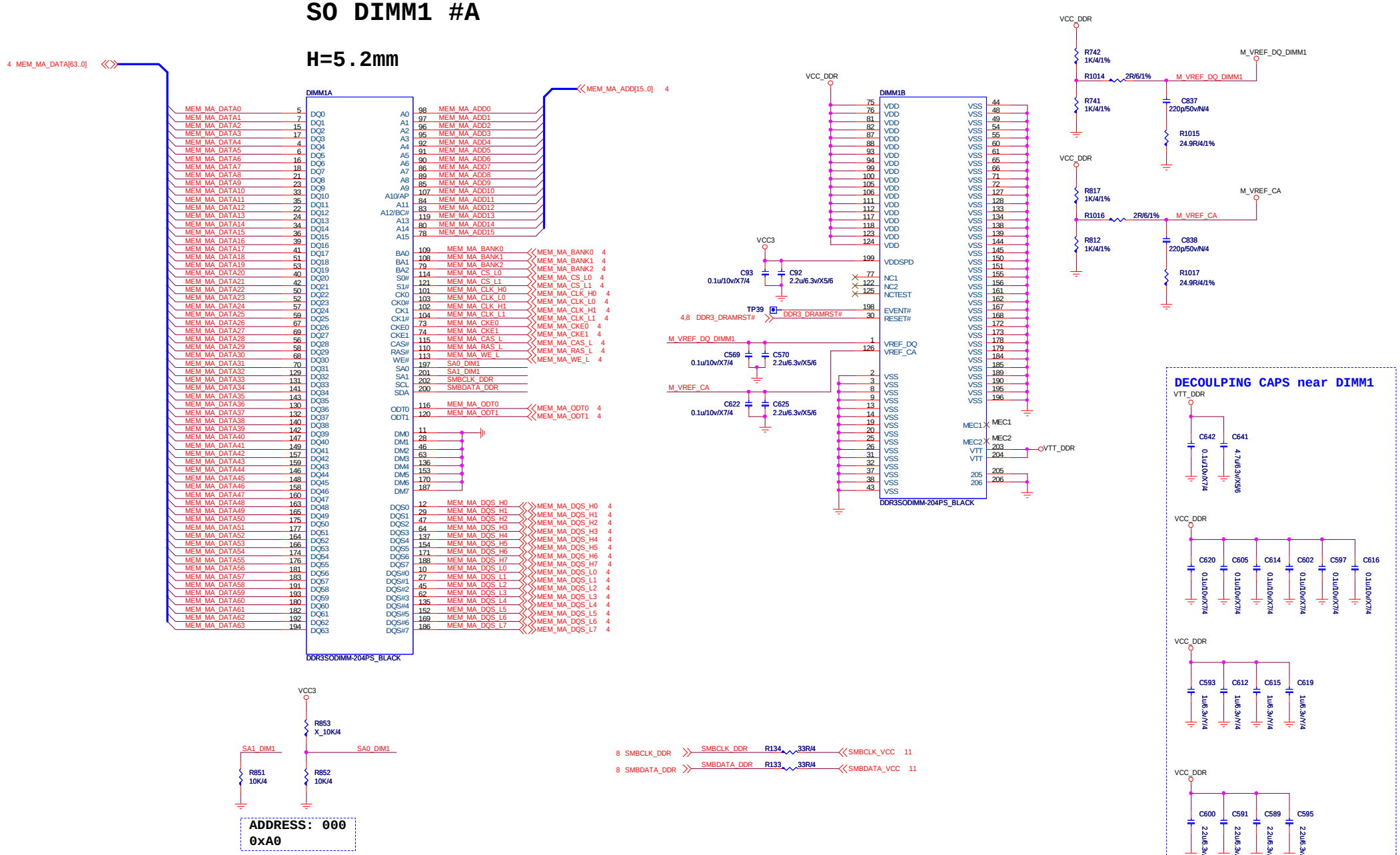
SO DIMM1 #A

H=5.2mm



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Size: Custom	Document Description: DDR III SODIMM 1
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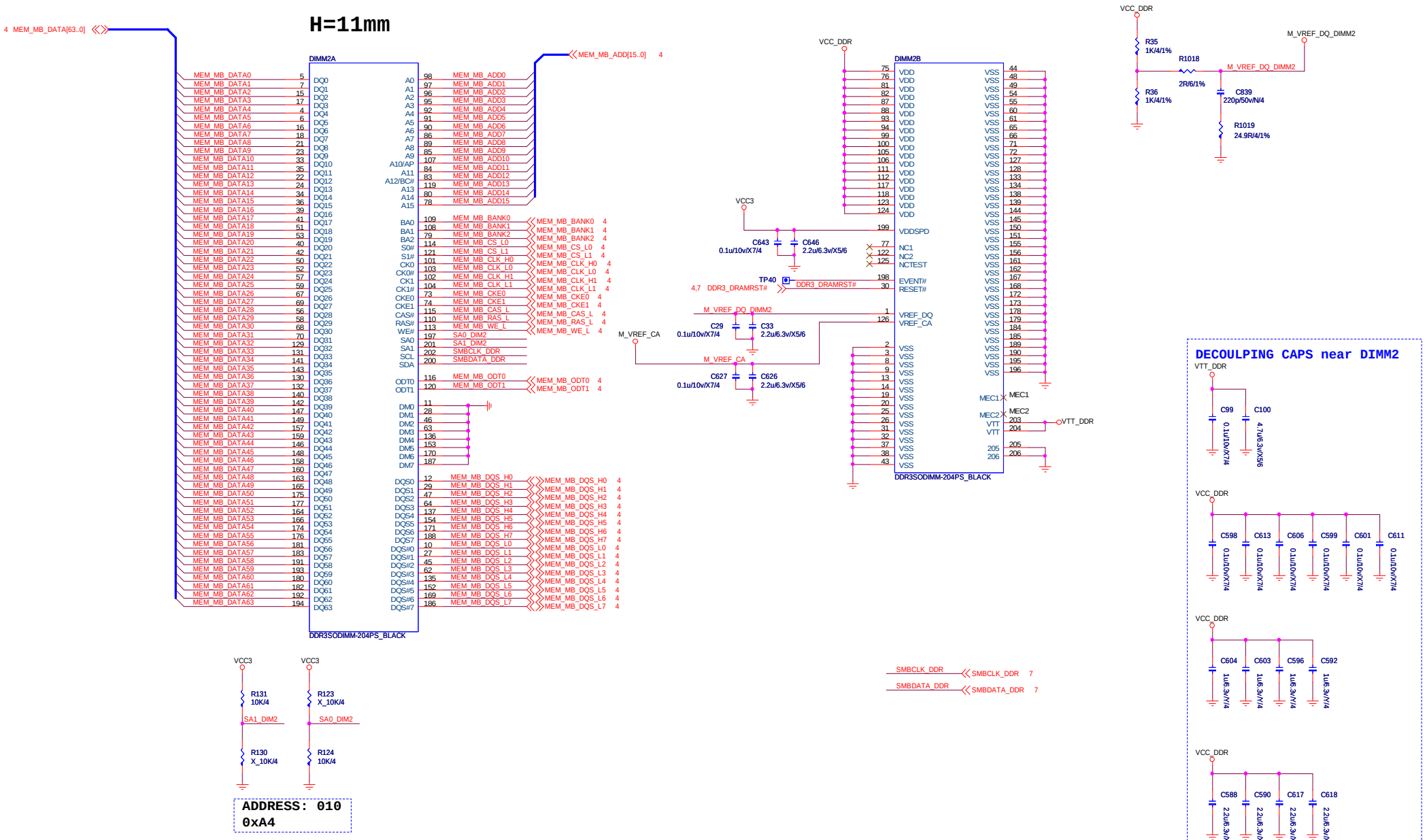
SO DIMM2 #B

H=11mm



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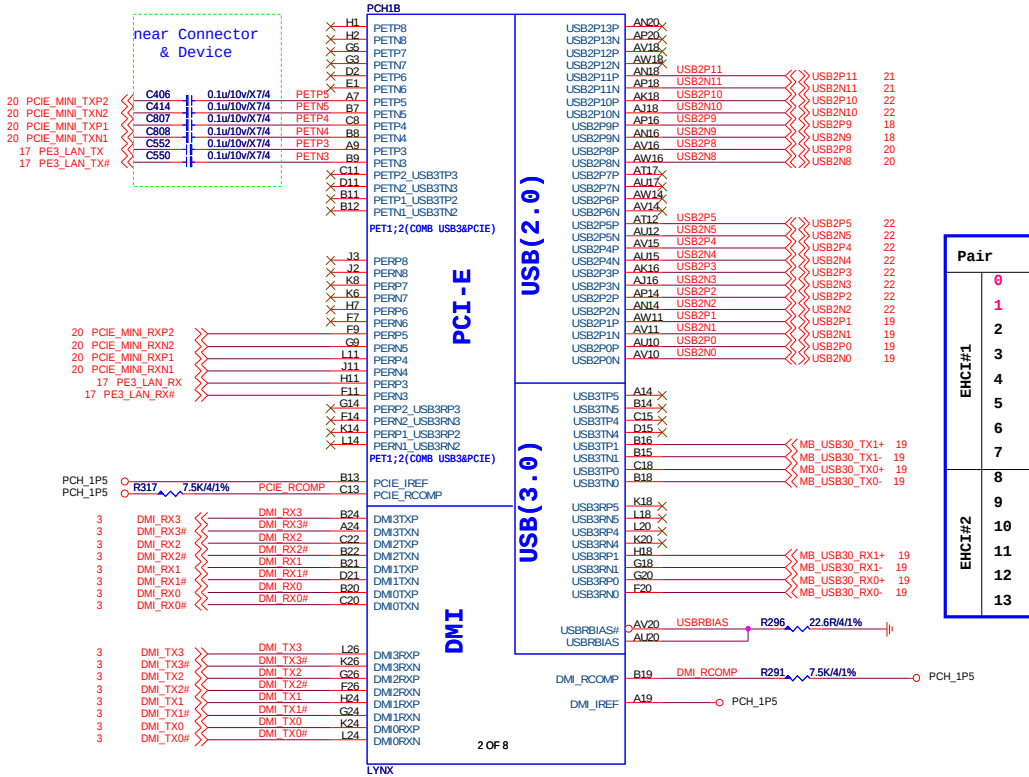
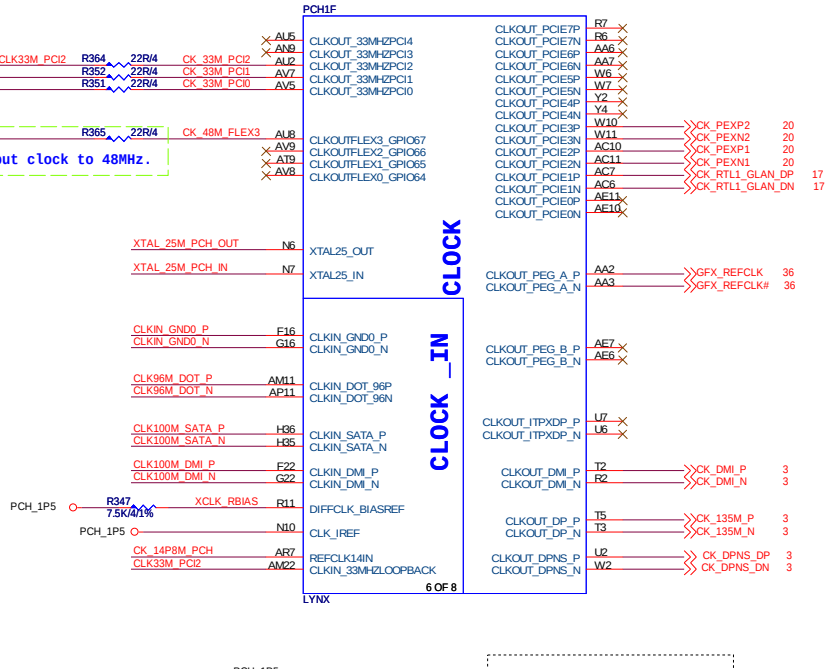
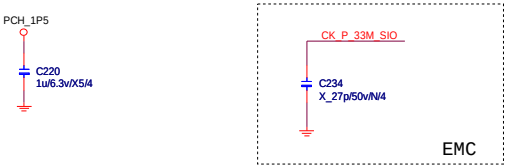
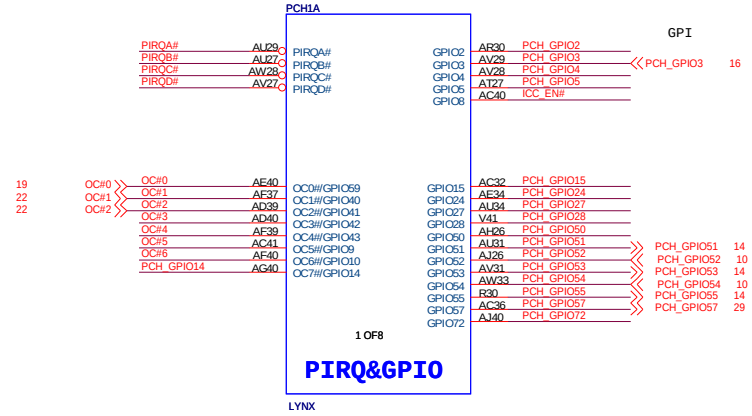
USB 2.0 ports 6,7,12 and 13 are disabled on 10 port SKUs.
Only USB 3.0 ports 1 and 2 are enabled.
pcie port7,8 NA

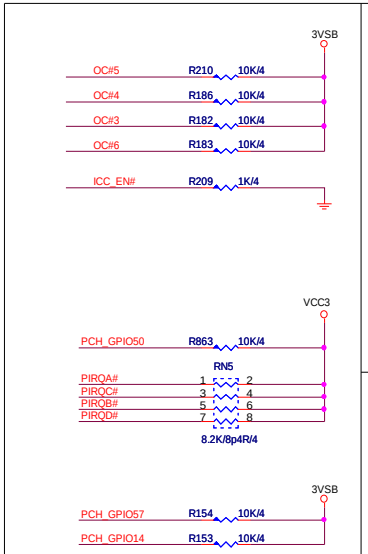


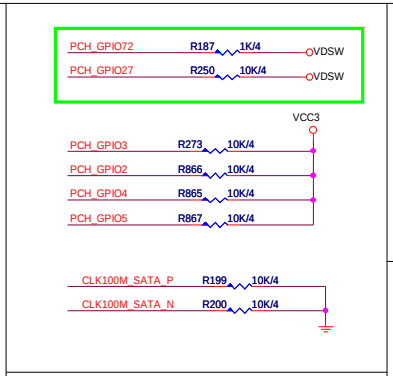
Pair		Device	OC
EHCI#1	0	USB3 Ext. Port B	OC#0
	1	USB3 Ext. Port A	OC#0
	2	USB2 Ext. Port 2	OC#1
	3	USB2 Ext. Port 3	OC#1
	4	USB2 Ext. Port 4	OC#2
	5	USB2 Ext. Port 5	OC#2
	6	X	
	7	X	
EHCI#2	8	Mini card (TV)	
	9	Card Reader	
	10	Webcam	
	11	Touch Screen	
	12	X	
	13	X	

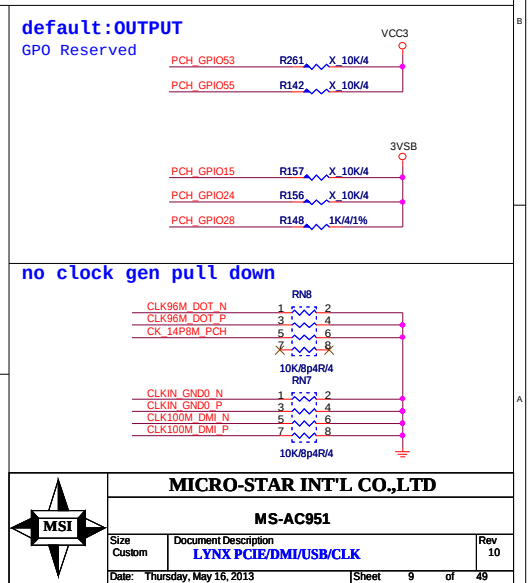












MICRO-STAR INT'L CO.,LTD

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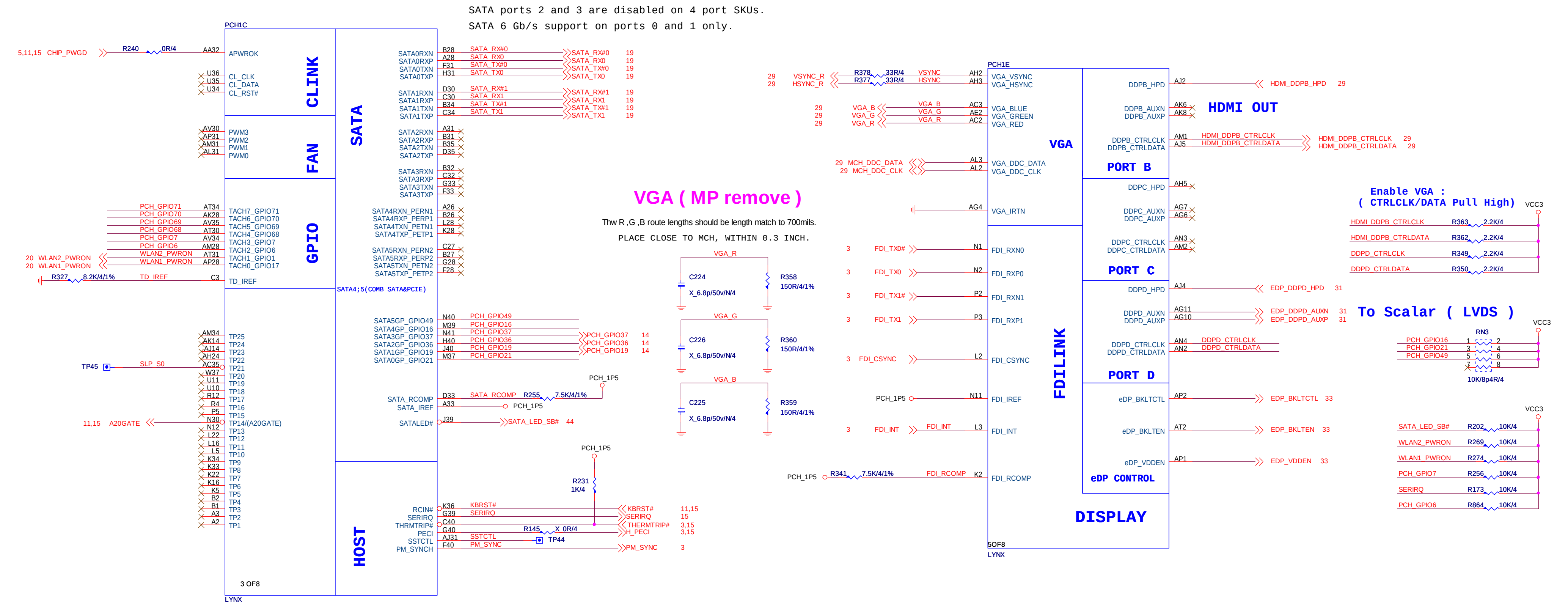
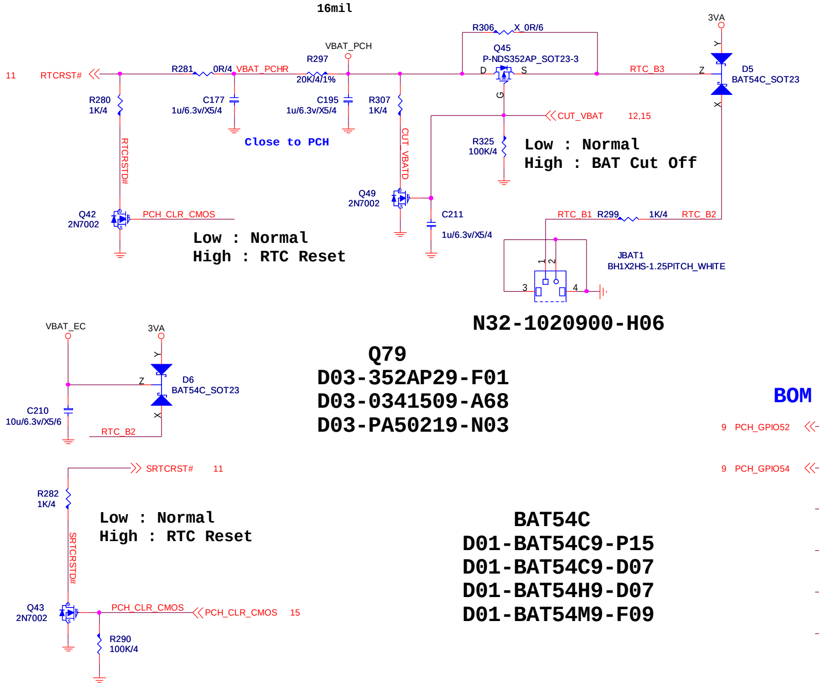
SATA ports 2 and 3 are disabled on 4 port SKUs.
SATA 6 Gb/s support on ports 0 and 1 only.



RTC and CLR_CMOS



BOM SKU GPIO Setting

ReMark : 1 => High ; 0 => Low

Model	機殼	BOM Number	BOM OPT.	GPIO52	GPIO54	GPIO68	GPIO69	GPIO70	GPIO71		
AC95	21.5" 4G	606-AC951-01S	95B	0	0	0	0	0	0		
				0	0	0	0	0	0		
				0	0	0	0	0	0		
				0	0	0	0	0	0		
				0	0	0	0	0	0		
				0	0	0	0	0	0		
				0	0	0	0	0	0		
				0	0	0	0	0	0		
				0	0	0	0	0	0		
				0	0	0	0	0	0		
				0	0	0	0	0	0		
				0	0	0	0	0	0		
				0	0	0	0	0	0		
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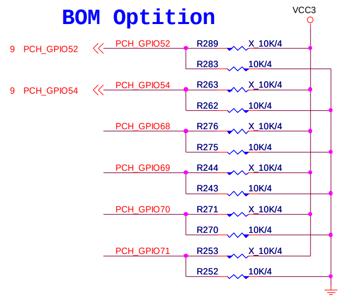
				0	0	0	0	0	0		
				0	0	0	0	0	0		

BOM Optition



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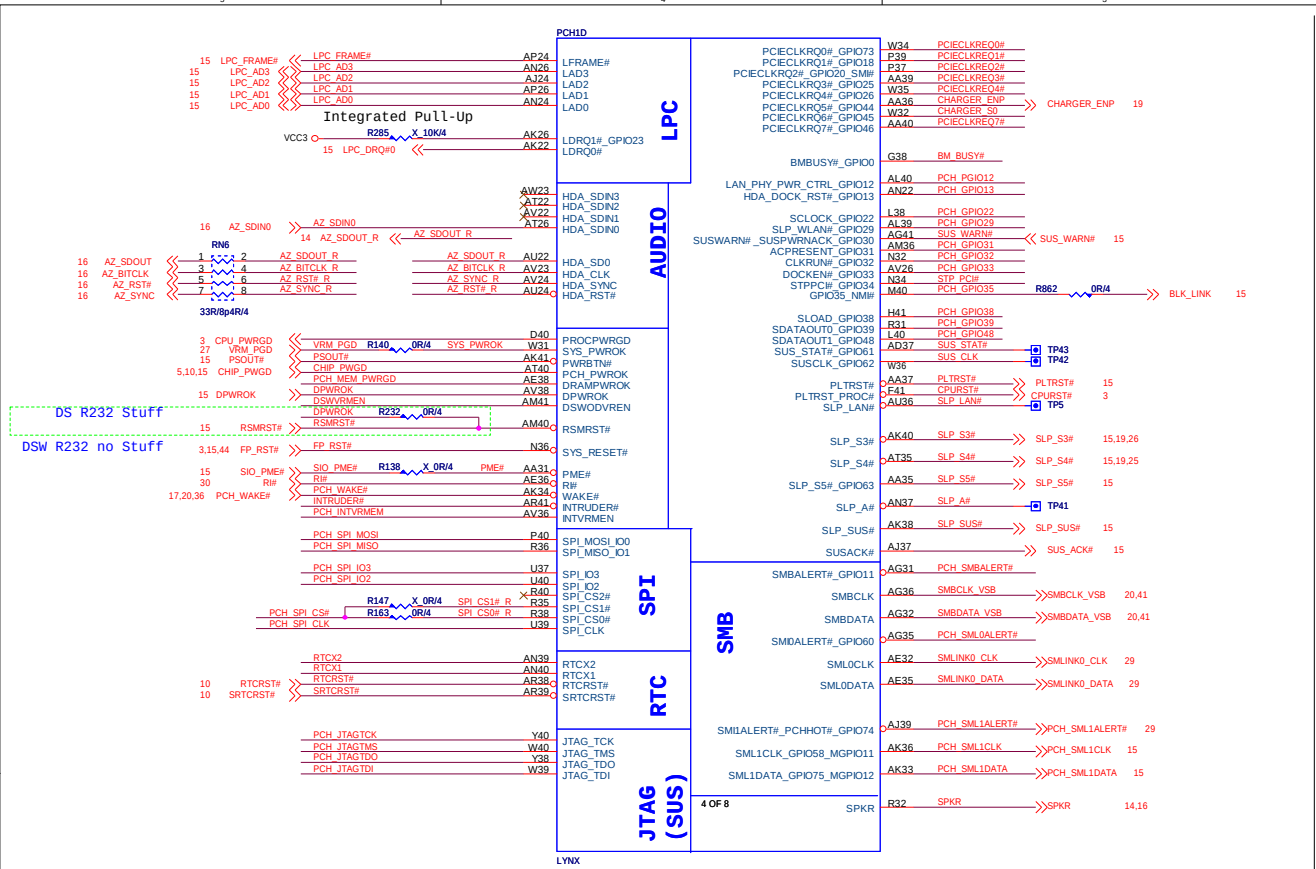

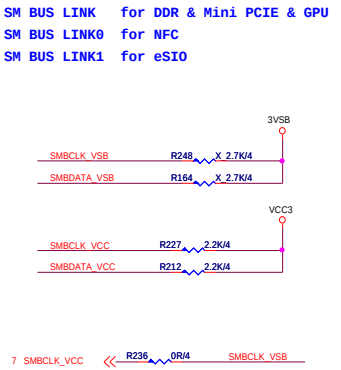

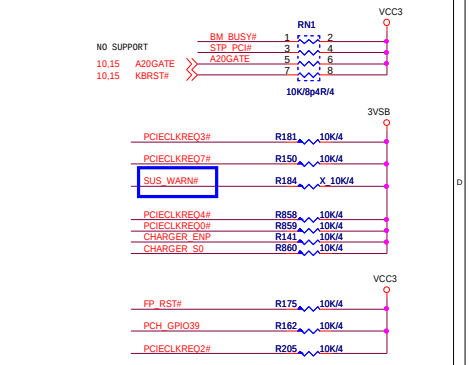

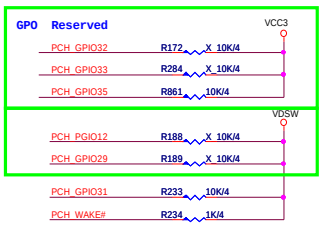

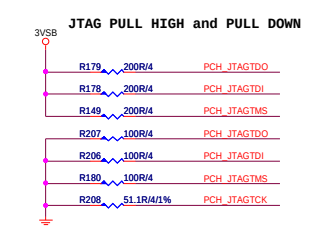

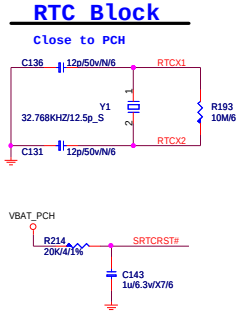

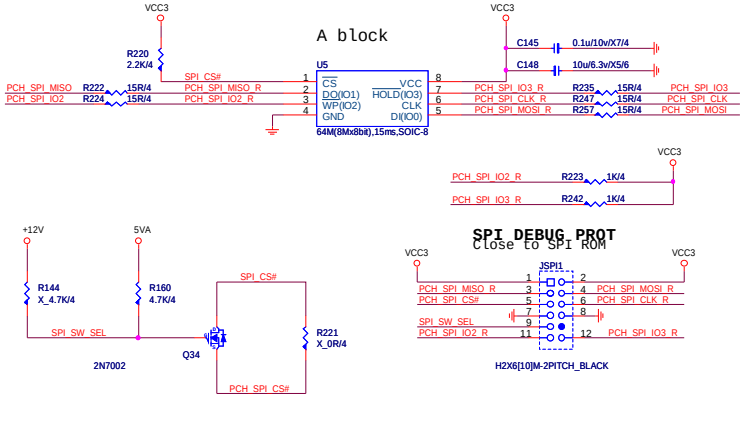

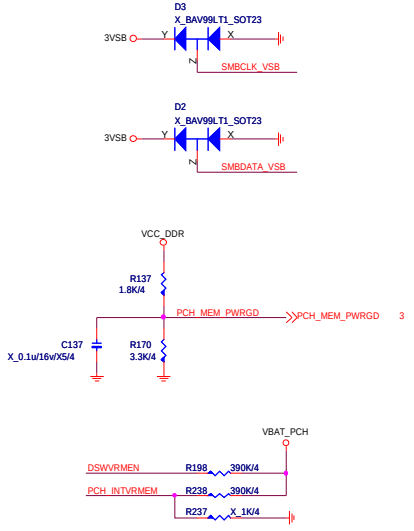

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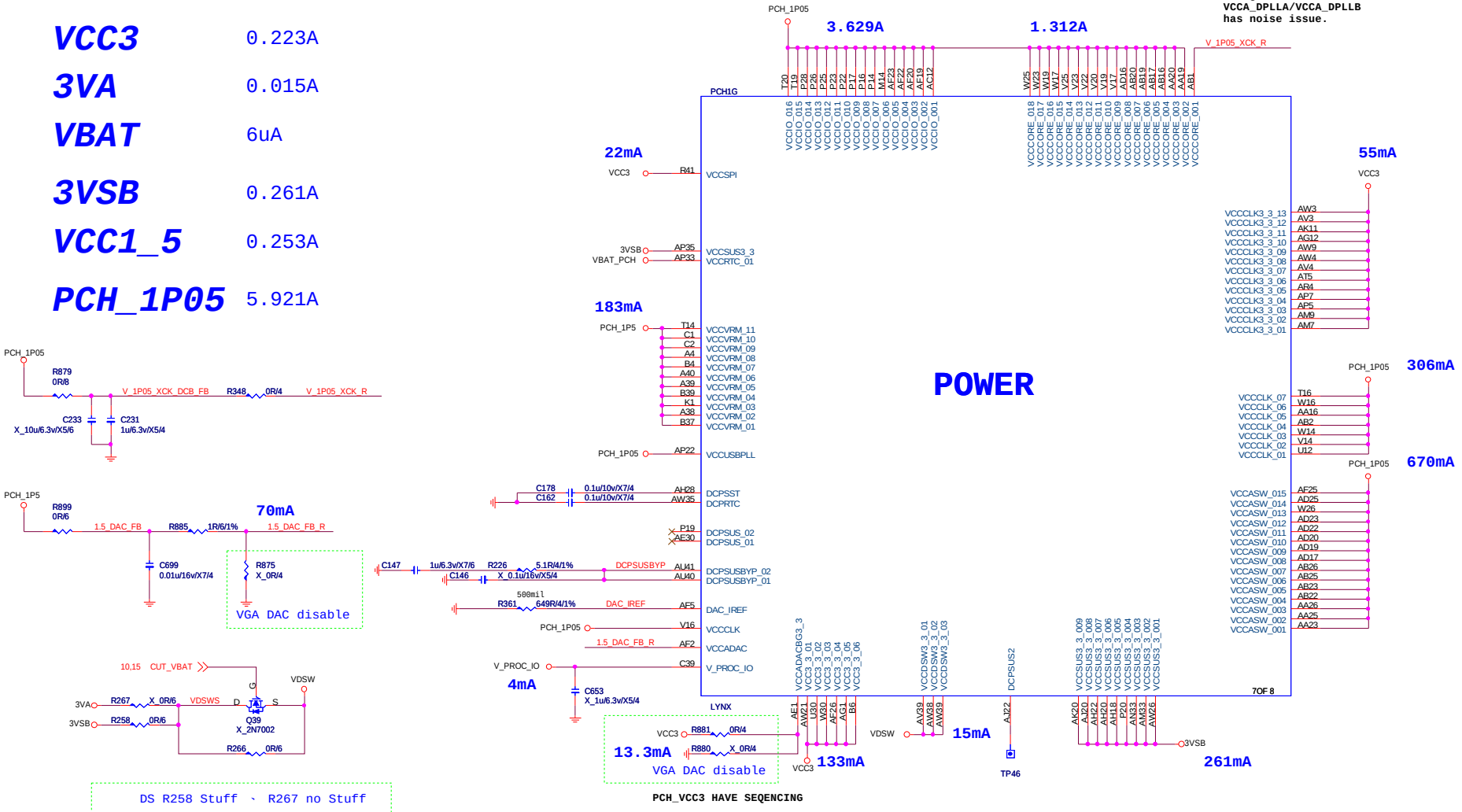
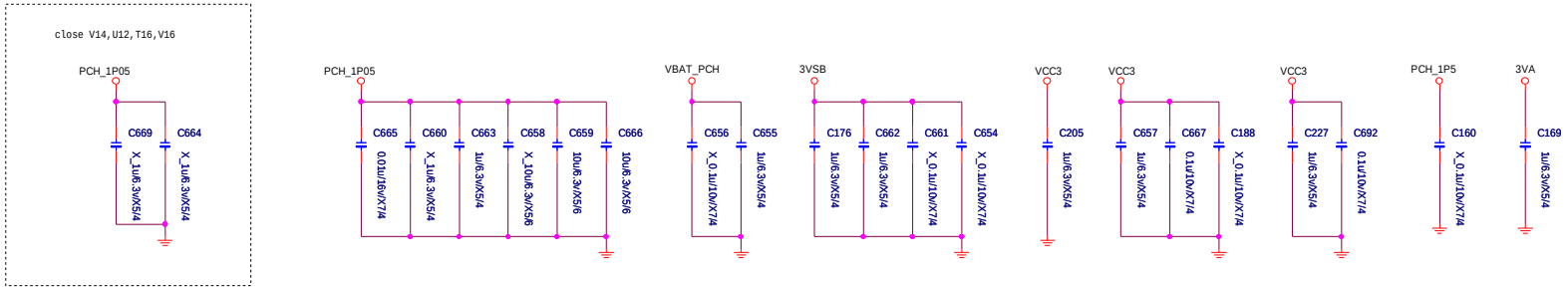
VCC3	0.223A
3VA	0.015A
VBAT	6uA
3VSB	0.261A
VCC1_5	0.253A
PCH_1P05	5.921A

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



PCH decoupling cap



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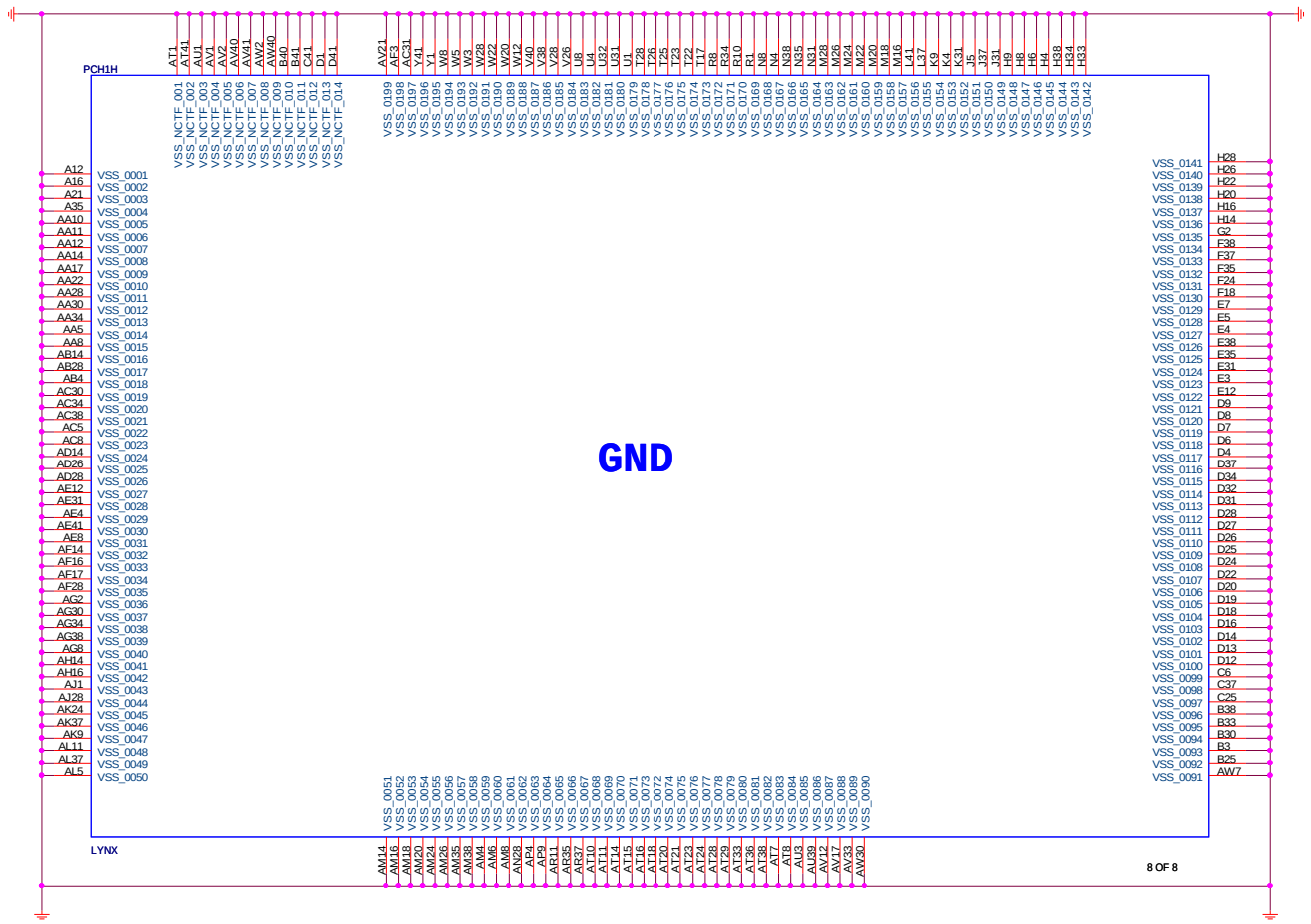

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PCH Straps

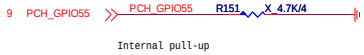
SPKR

Default Mode:

Internal weak Pull-down.

No Reboot Mode with TCO Disabled:

Connect to Vcc3_3 with 8.2k-10k Ohm weak pullup resistor.



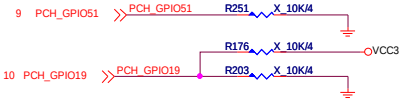
GPIO55

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.

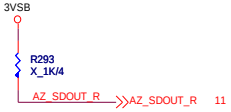
Boot from LPC:

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.



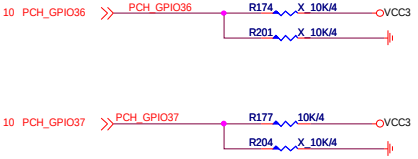
HDA_SDO

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.

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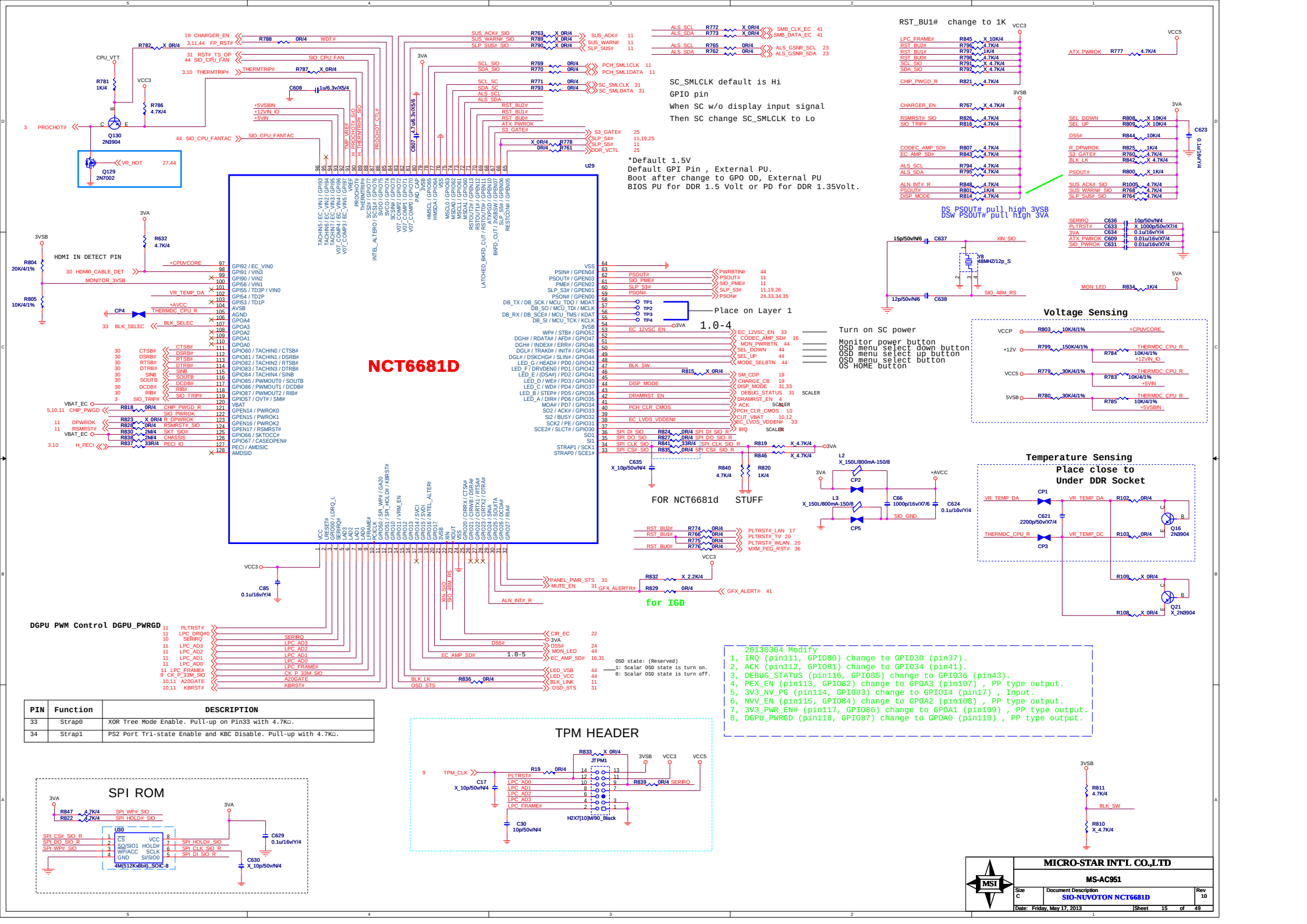

PIN	Function	DESCRIPTION
33	Strap0	XOR Tree Mode Enable. Pull-up on Pin33 with 4.7KΩ.
34	Strap1	PS2 Port Tri-state Enable and KBC Disable. Pull-up with 4.7KΩ.

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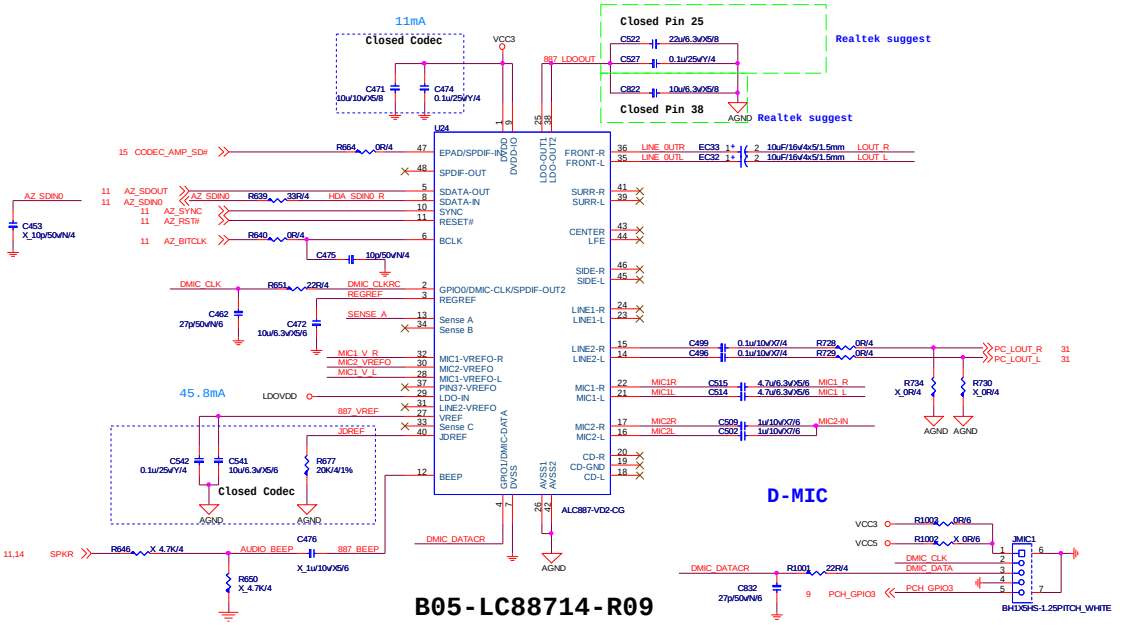
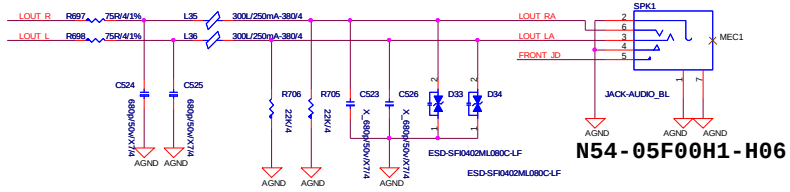
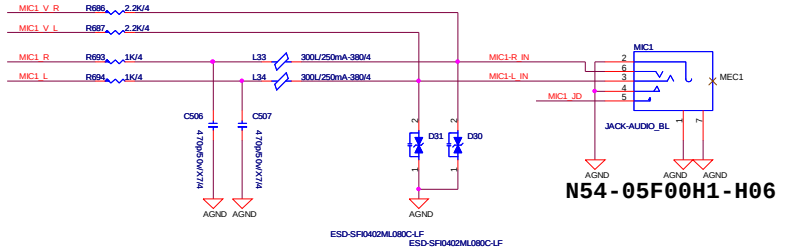
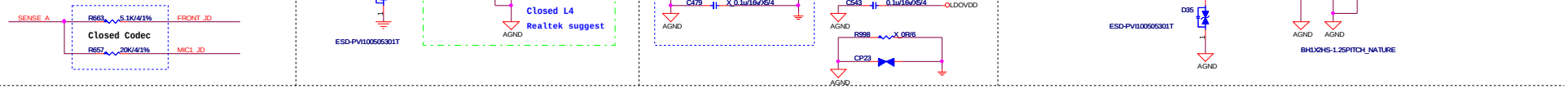
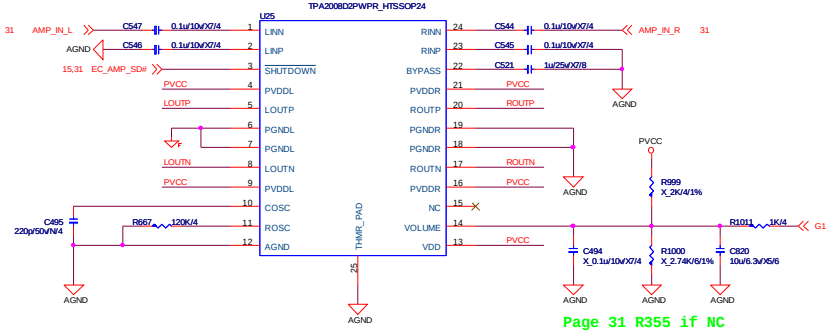


Audio Jack Symbol and Data Sheet 是顛倒的.









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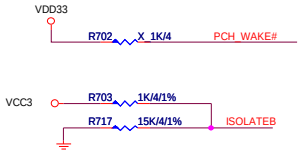
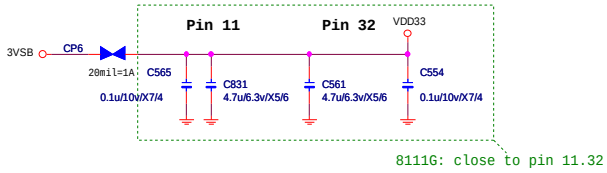
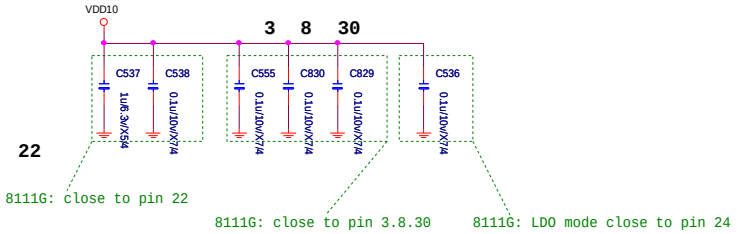
RTL8111G Giga LAN

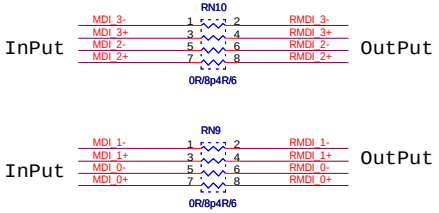


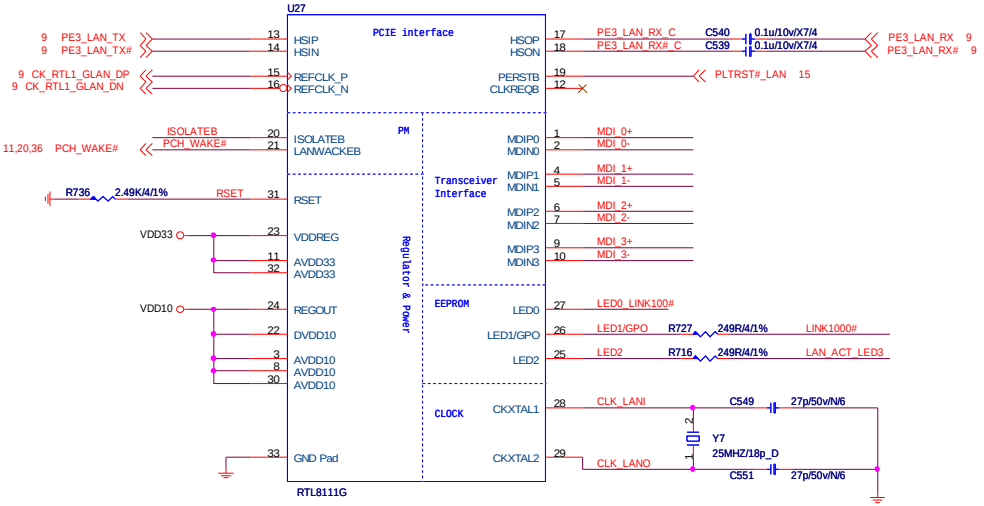


Icc33 average operating supply current from3.3V
At 1Gbps with heavy network traffic 70mA

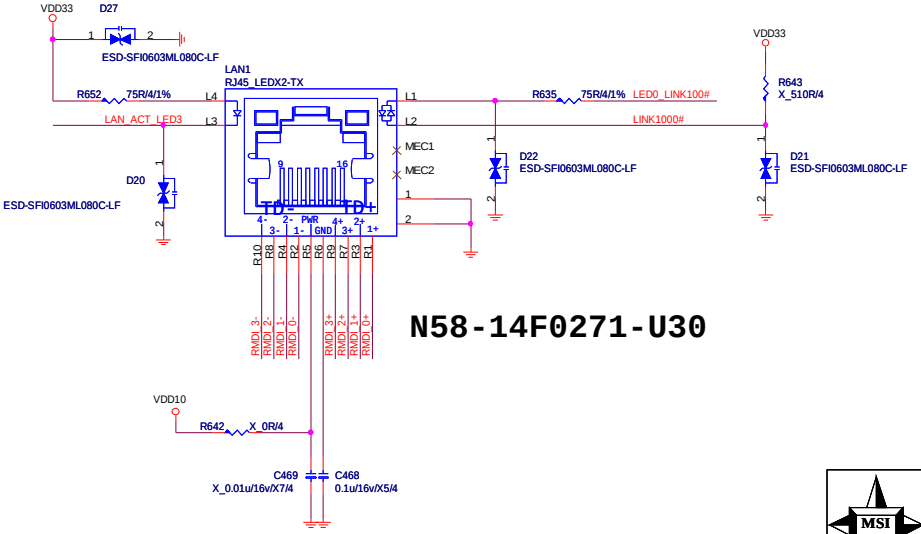


Icc10 average operating supply current from1.0V
At 1Gbps with heavy network traffic 300mA

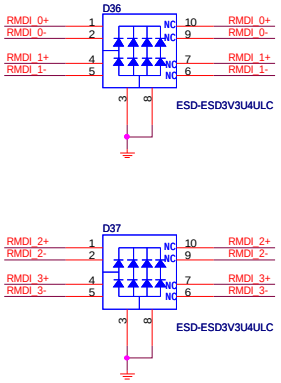




N58-14F0271-U30



Reserve ESD Protect
for connector



MSI	MICRO-STAR INT'L CO.,LTD	
	MS-AC951	
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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)

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

CLK	MODE1 Pin 27 R971	MODE0 Pin 42 R962
48MHz	X	X
24MHz	X	1
12MHz (XTAL)	1	1

EMI Reserved
C781 X_10p/50v/N/4
9 CK_48M_CARD
R960 0R/4

Crystal 8 mil
XTLO R954 X_0R/4 XTLI R955 X_0R/4 CLK_IN
Y3 12MHZ/16P_S
R458 270K/6
C294 5.6p/50v/N/6
C293 5.6p/50v/N/6

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

CARDREAD1
CARD_3V3
C791 0.1u/10v/X7/4
C792 4.7u/6.3v/X5/6
C793 0.1u/10v/X7/4
SD_D2 SD_D3 SP14 SD_CMD SP12 MS_INS# SP10 SP9 SP7 SD_CLK SP5 SD_D0 SD_D1 SD_CD# SP15
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

C783 100p/50v/N/4 5139_RST#
C782 1u/10v/X5/4
C784 1u/10v/X5/4
R968 6.2K/4/1%
RREF
CLK_IN XTLO
R962 X_10K/4 R963 X_10K/4
+3V_CR
MS_INS# SD_CD# SP15

R ==> close to chip pin
XD6 R964 0R/4 SP14 C785 X_0.1u/10v/X7/4
Reserved

U38
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
RTS5139-GR
XD_CD# DV33_18 GND SP1 SP2 SP3 SP4 SD_D1 SD_D0 SD_CLK SD_CMD SD_D3

L48 0R/4p2R/4
9 USB2N9 9 USB2P9 SBD9- SBD9+

+3V_CR R958 NC
R958 X_8.2K/4/1%
3VSB R957 10K/4
VCC3 R970 47K/4
5139_RSTC# R959 X_0R/4 5139_RST#
Q133 2N7002
Q134 2N7002
C790 1u/25v/X5/6

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

VCC3 CP15 +3V_CR
C795 10u/10v/X5/8
C794 0.1u/10v/X7/4
CARD_3V3
C796 0.1u/10v/X7/4

R971 X_10K/4 VREG_1.8V
R972 0R/4 SD_D2

R ==> close to chip pin
SD_D3R R973 0R/4 SD_D3
SD_CMDR R974 0R/4 SD_CMD
SD_CLKR R977 0R/4 SD_CLK
SD_D0R R976 0R/4 SD_D0
SD_D1R R975 0R/4 SD_D1
C799 X_0.1u/10v/X7/4

VREG_1.8V
C798 1u/10v/X5/4
C797 X_4.7u/10v/X5/6
Reserved

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MS-AC951
Size Custom
Document Description CARD READER_RTS5139
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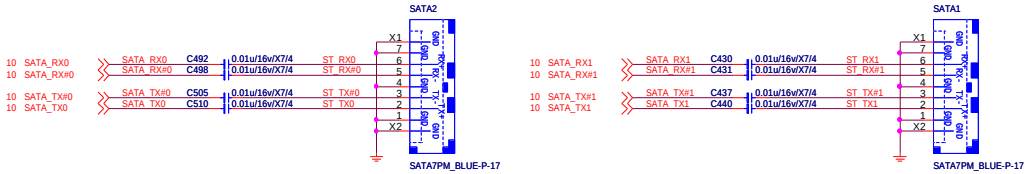
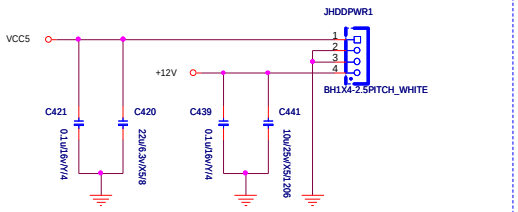
SATA HDD

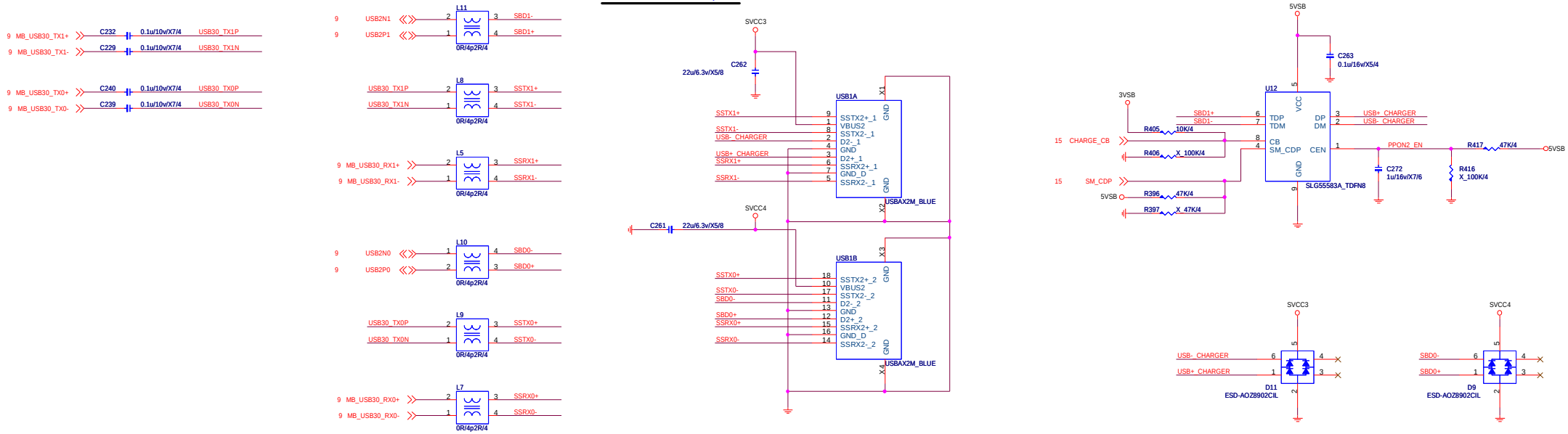
SATA 6G PORT 0,1



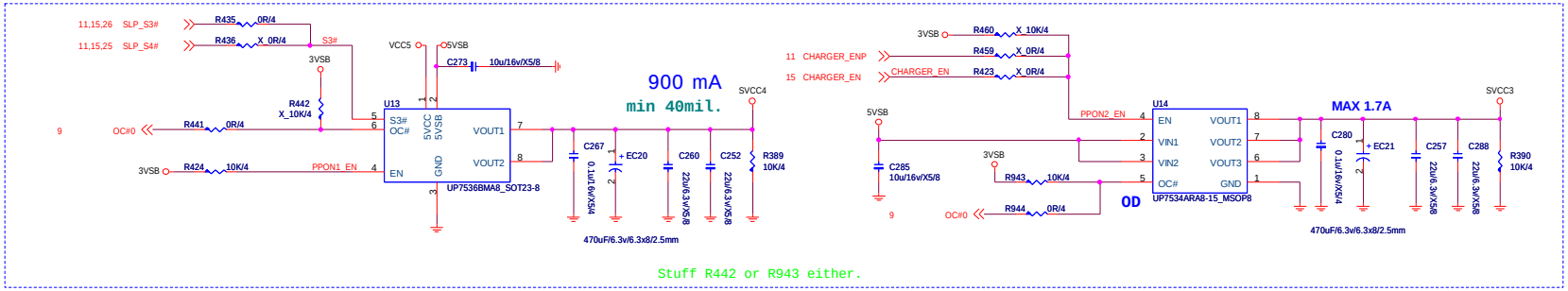
HDD & ODD Power



USB 3.0 PORT 0,1



USB3.0 & USB2.0 SKU POWER KEEP



MICRO-STAR INT'L CO.,LTD			
MS-AC951			
Size: Custom	Document Description: SATA / USB3.0 Connector		Rev: 10
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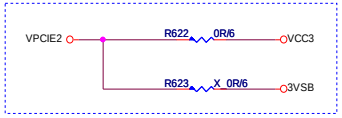
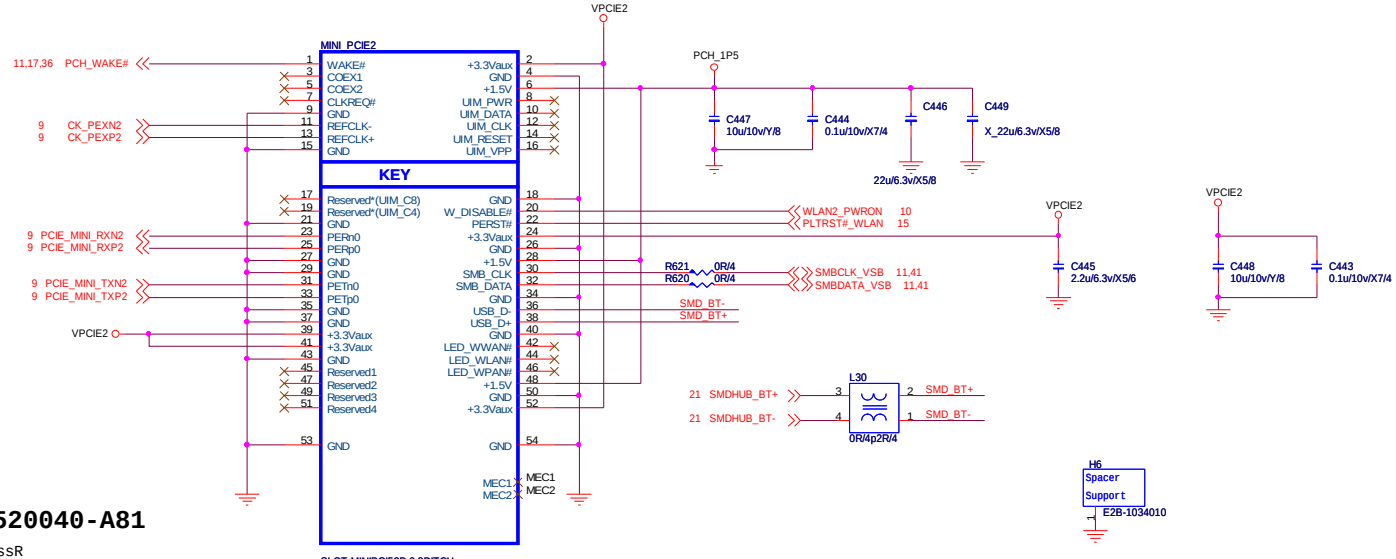
Wireless LAN(Short Card)

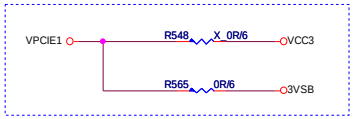


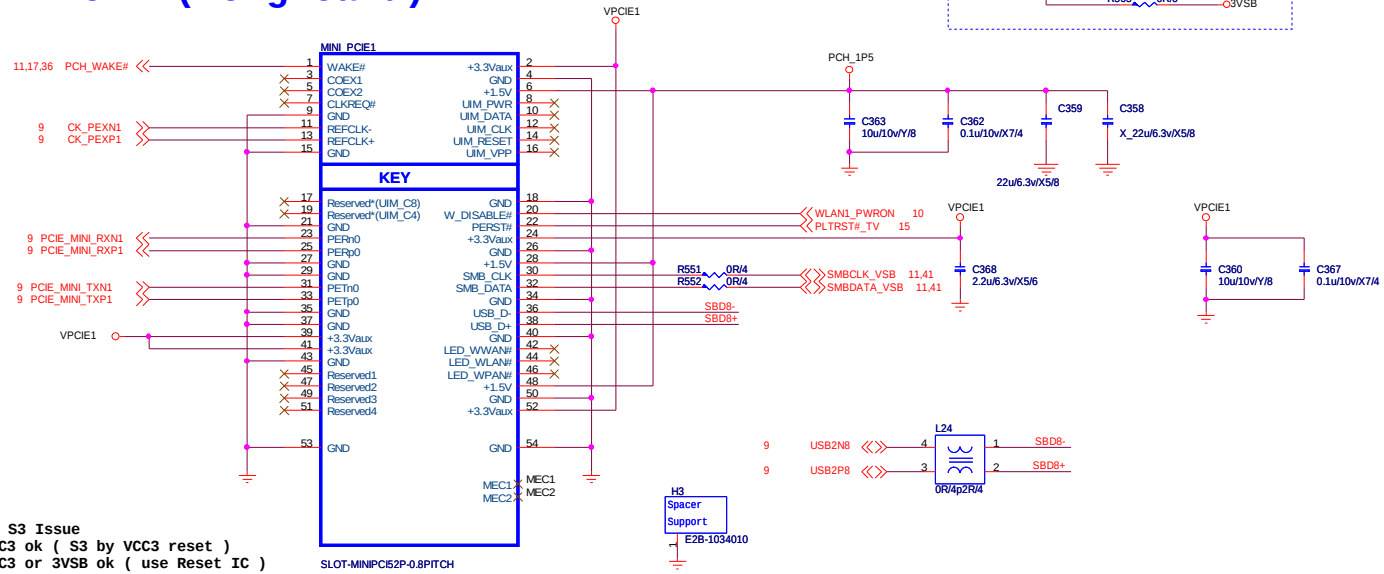


N11-0520040-A81

PCI ExpressR
Mini Card Electromechanical
Specification
Revision 1.2

TV TUNER(Long Card)





N11-0520040-A81

圖剛 TV-Card S3 Issue
H335A ==> VCC3 ok (S3 by VCC3 reset)
H335B ==> VCC3 or 3VSB ok (use Reset IC)

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	MS-AC951	
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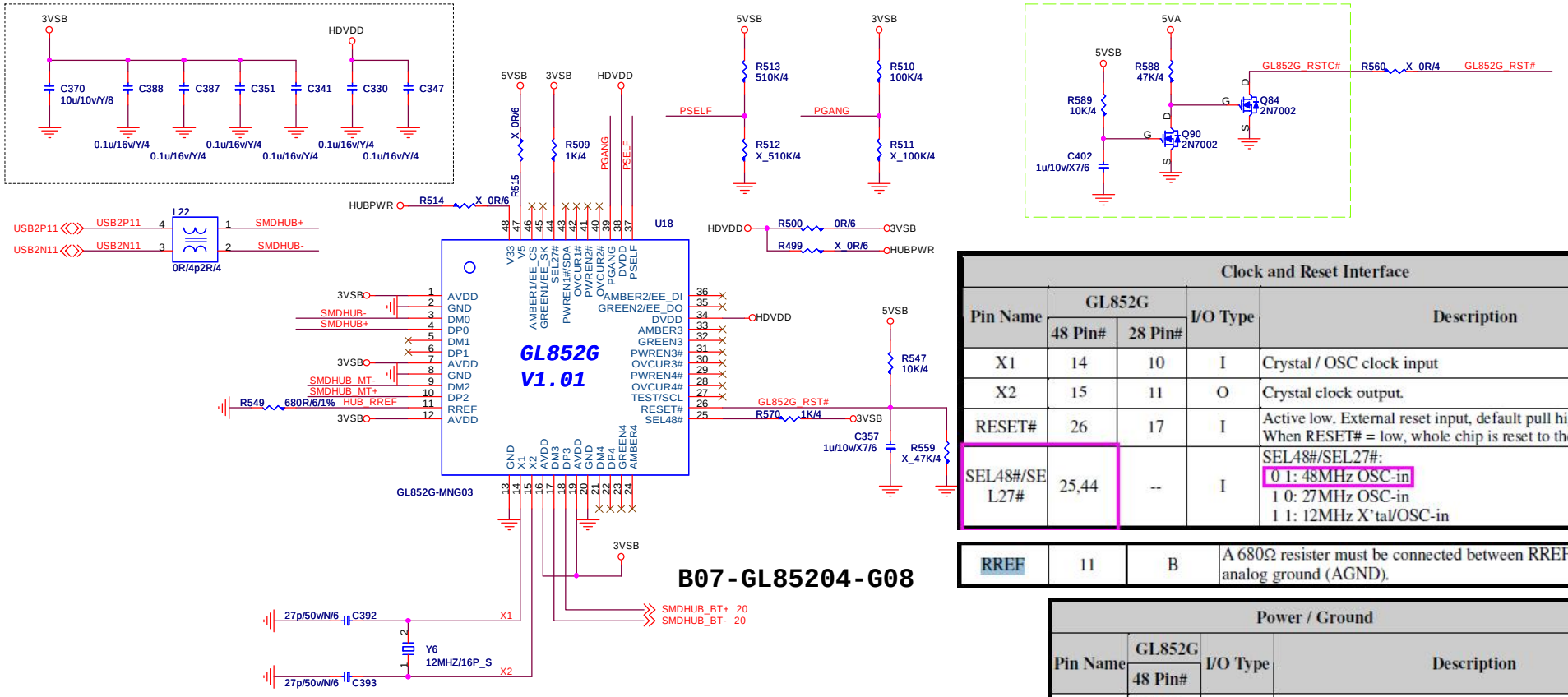


B07-GL85204-G08

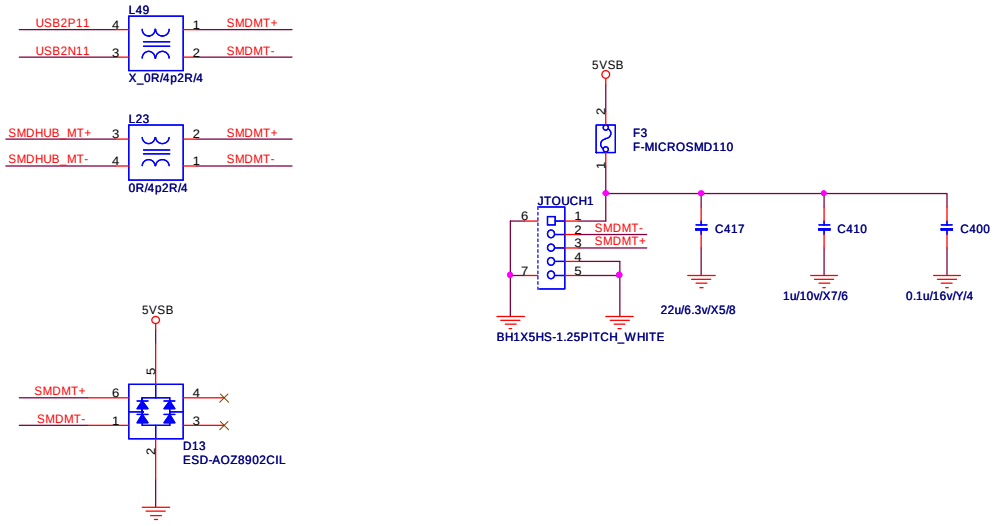
Clock and Reset Interface				
Pin Name	GL852G 48 Pin#	GL852G 28 Pin#	I/O Type	Description
X1	14	10	I	Crystal / OSC clock input
X2	15	11	O	Crystal clock output.
RESET#	26	17	I	Active low. External reset input, default pull high 10KΩ. When RESET# = low, whole chip is reset to the initial state.
SEL48#/SEL27#	25,44	--	I	SEL48#/SEL27#: 0 1: 48MHz OSC-in 1 0: 27MHz OSC-in 1 1: 12MHz X'tal/OSC-in

RREF	11	B	A 680Ω resister must be connected between RREF and analog ground (AGND).

Power / Ground			
Pin Name	GL852G 48 Pin#	I/O Type	Description
AVDD	1,7,12, 16,19	P	3.3V analog power input for analog circuits.
DVDD	34,38	P	3.3V digital power input for digital circuits
GND	2,8, 13,20	P	Ground
V5	47	P / I	5V Power input. It need be NC if using external regulator
V33	48	P / O	5V-to-3.3V regulator Vout (LQFP48) It can be NC or connect to 3.3V power if using external regulator (LQFP48 only)

PSELF	37	I	0: GL852G is bus-powered. 1: GL852G is self-powered.
PGANG	39	B	This pin is default put in input mode after power-on reset. Individual/gang mode is strapped during this period. After the strapping period, this pin will be set to output mode, and then output high for normal mode. When GL852G is suspended, this pin will output low. *For detailed explanation, please see Chapter 5 Gang input:1, output: 0@normal, 1@suspend Individual input:0, output: 1@normal, 0@suspend

Multi Touch



MICRO-STAR INT'L CO.,LTD

MS-AC951

Size	Document Description	Rev
Custom	Multi Touch / USB 2.0 Hub	10

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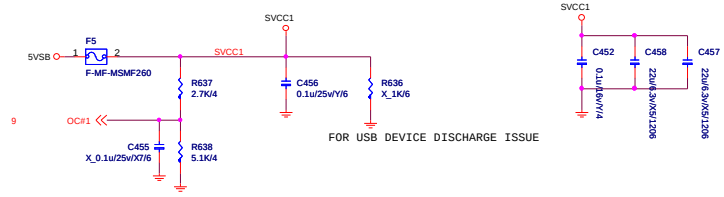
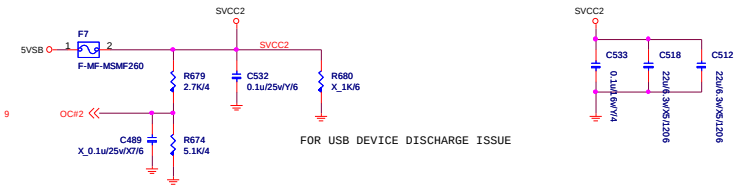
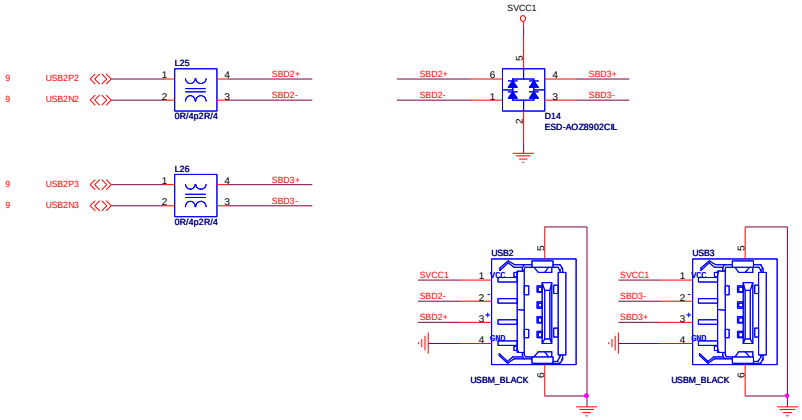
POWER CIRCUIT FOR USB PORT 0,1 (REAR)



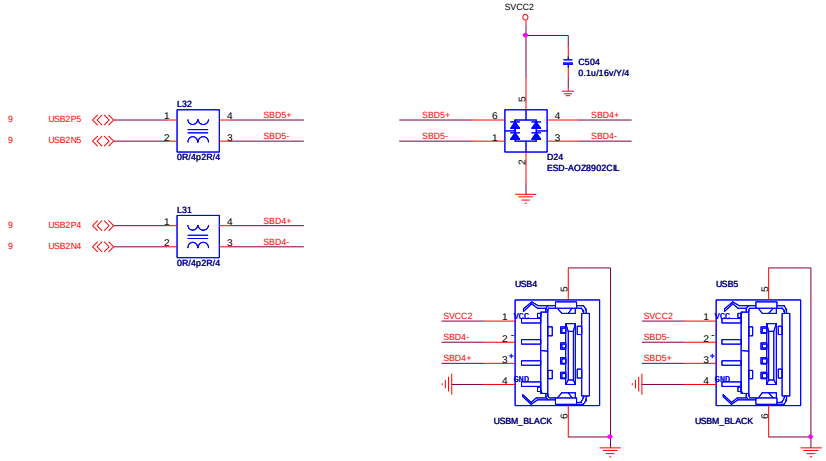
POWER CIRCUIT FOR USB PORT 2,3 (REAR)



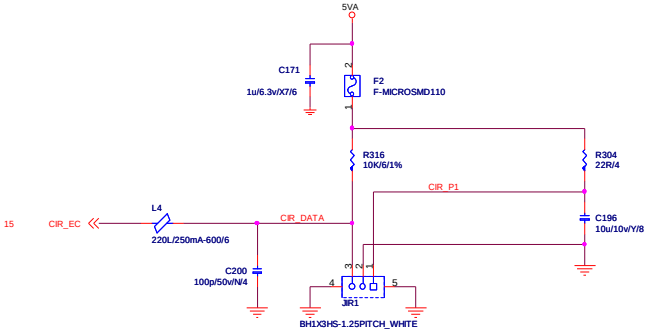
REAR PANEL USB CONNECTOR FOR USB PORT 0,1



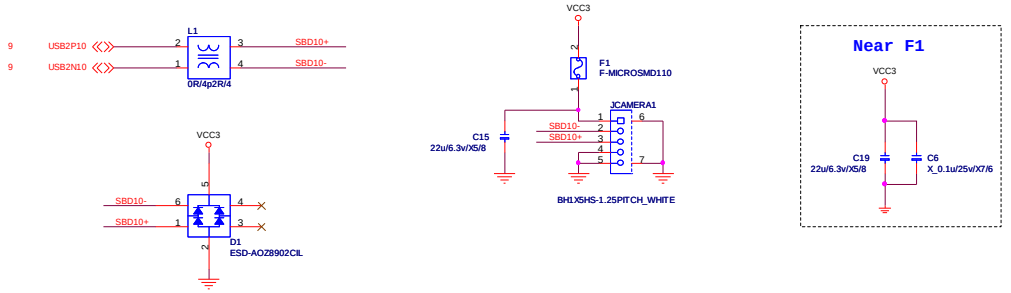
REAR PANEL USB CONNECTOR FOR USB PORT 2,3



IR



Webcam



MICRO-STAR INT'L CO.,LTD		
MS-AC951		
Size: Custom	Document Description: USB2.0 / IR / Webcam	Rev: 10
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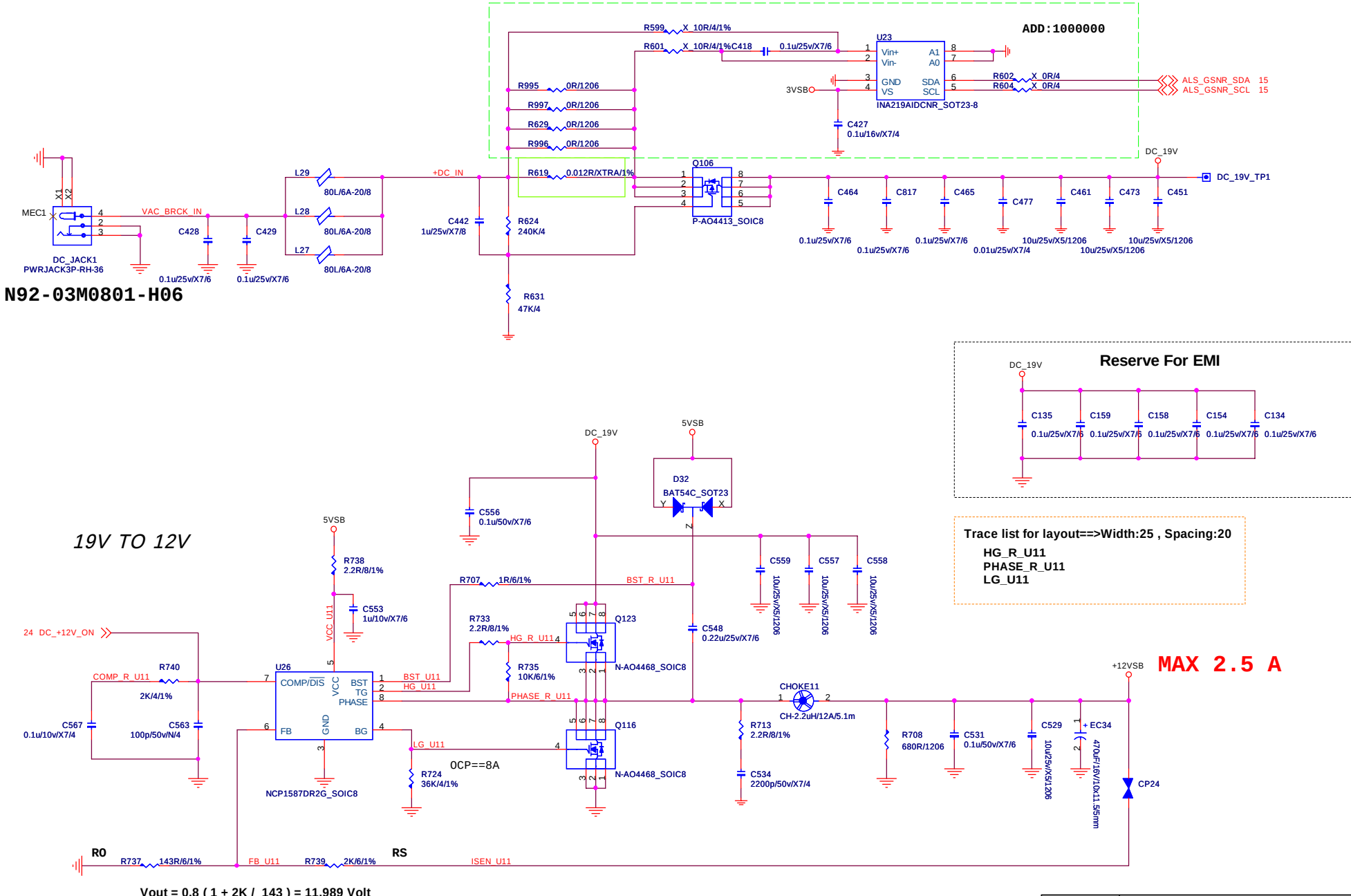

MICRO-STAR INT'L CO.,LTD		
MS-AC951		
Size: Custom	Document Description: DC-IN / +12VSB	Rev: 10
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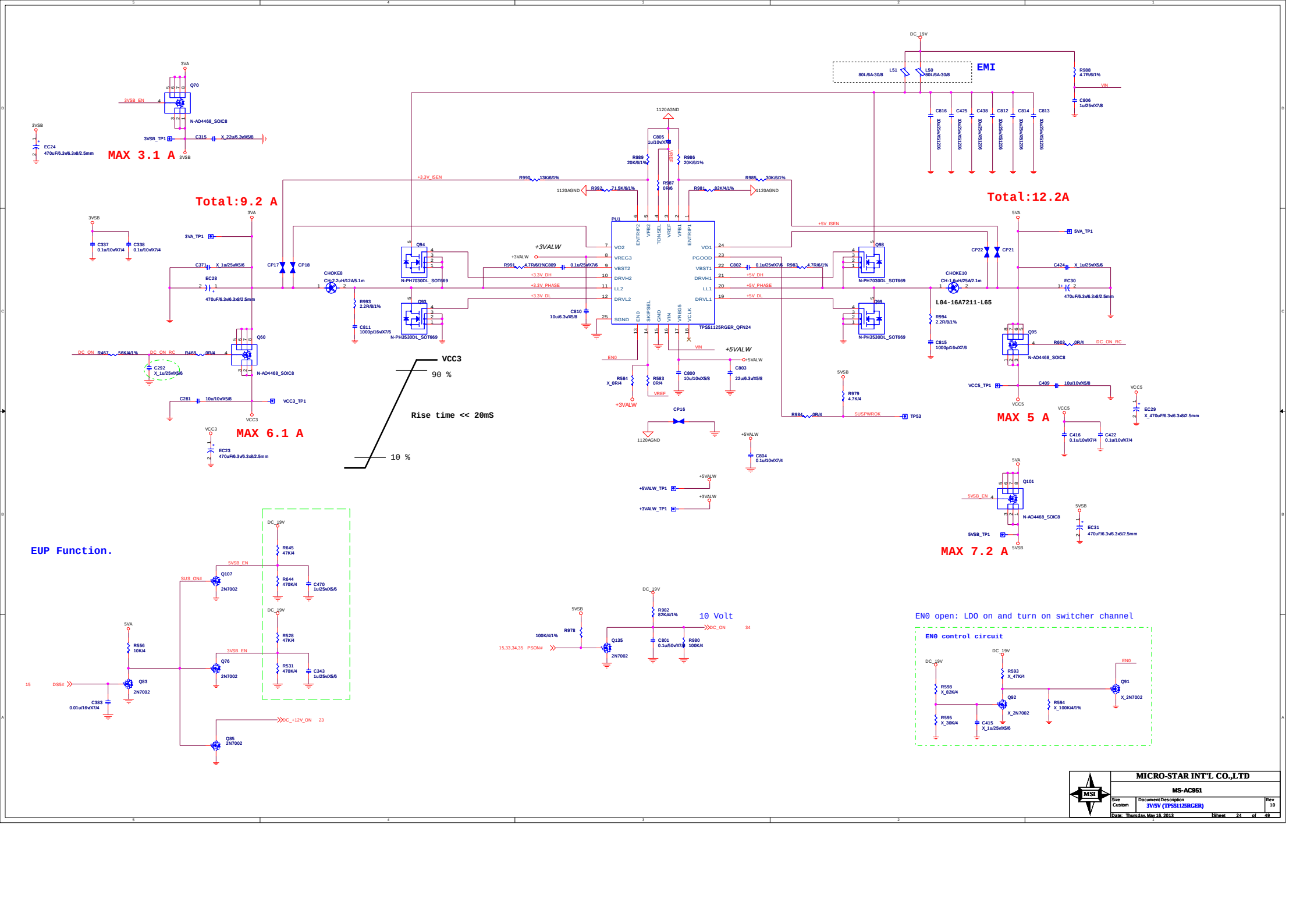
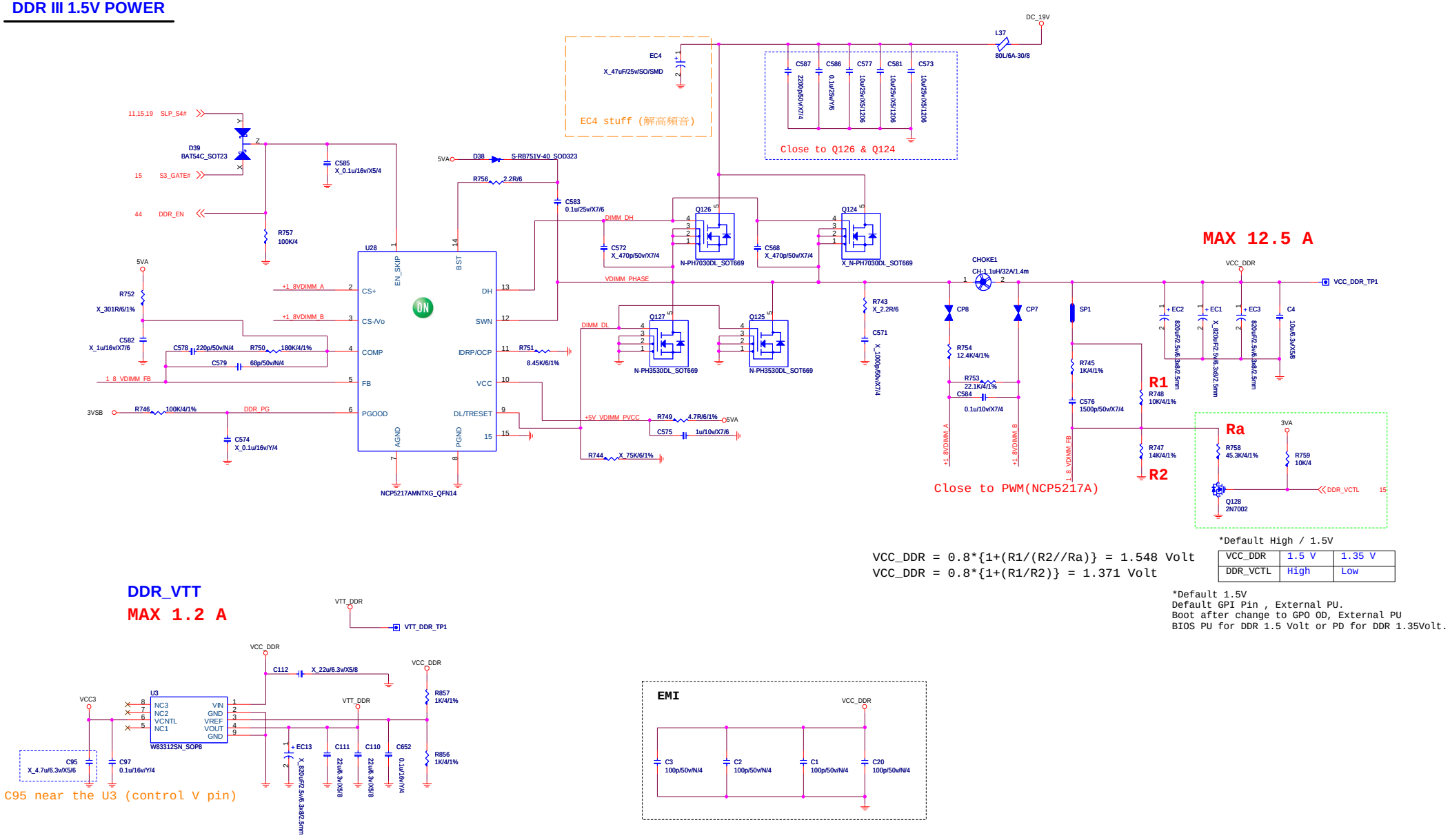

MAX 3.1 A
Total:9.2 A
MAX 6.1 A
Total:12.2A
MAX 5 A
MAX 7.2 A
EMI
VCC3
90 %
10 %
Rise time << 20mS
EUP Function.
10 Volt
EN0 open: LDO on and turn on switcher channel
EN0 control circuit
L04-16A7211-L65
TPS51125RGER_QFN24
MICRO-STAR INT'L CO.,LTD
MS-AC951
3V/5V (TPS5112SRGER)

DDR III 1.5V POWER



*Default High / 1.5V

VCC_DDR	1.5 V	1.35 V
DDR_VCTL	High	Low

VCC_DDR = 0.8*{1+(R1/(R2//Ra)} = 1.548 Volt
VCC_DDR = 0.8*{1+(R1/R2)} = 1.371 Volt

*Default 1.5V
Default GPI Pin , External PU.
Boot after change to GPO OD, External PU
BIOS PU for DDR 1.5 Volt or PD for DR 1.35Volt.

DDR_VTT

MAX 1.2 A

MSI	MICRO-STAR INT'L CO.,LTD	
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Size: Custom	Document Description: DDR POWER (NCP5217)	Rev: 10
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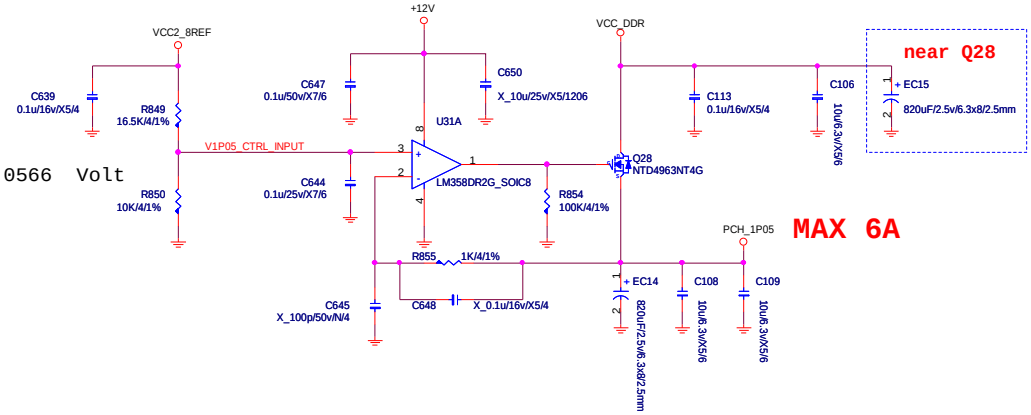
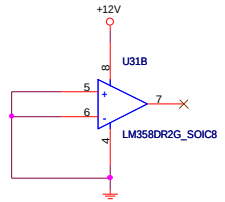
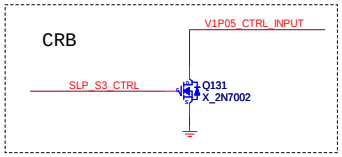
PCH Power:1.05V 5.917 A



V1P05_CTRL_INPUT = 1.0566 Volt

MAX 6A



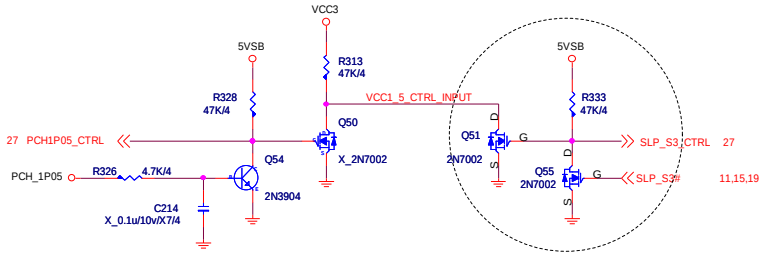


Q28 16mOhm
D03-0496300-O05
D03-042120B-N02

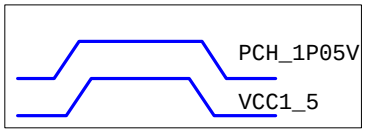
Q28 90mOhm
D03-3055D0B-N03

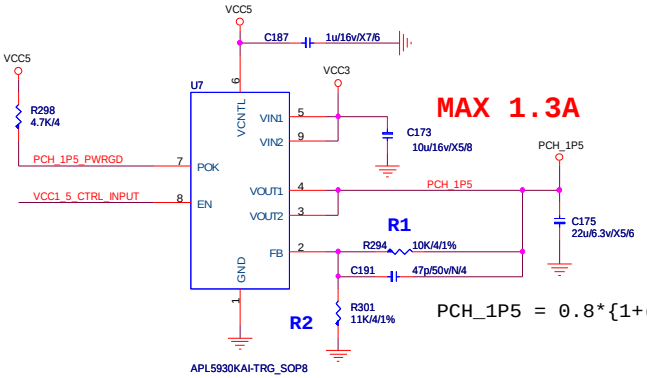
Symbol	Parameter	Rating	Unit
V_{IN}	VIN Supply Voltage (VIN to GND)	-0.3 ~ 4.0	V
V_{CNTL}	VCNTL Supply Voltage (VCNTL to GND)	-0.3 ~ 7	V
V_{OUT}	VOUT to GND Voltage	-0.3 ~ V_{IN} +0.3	V
	POK to GND Voltage	-0.3 ~ 7	V
	EN, FB to GND Voltage	-0.3 ~ V_{CNTL} +0.3	V
P_D	Power Dissipation	3	W
T_J	Maximum Junction Temperature	150	°C
T_{STG}	Storage Temperature	-65 ~ 150	°C
T_{SDR}	Maximum Lead Soldering Temperature, 10 Seconds	260	°C

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

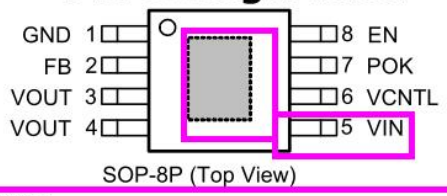




MAX 1.3A

PCH_1P5 = 0.8*{1+(R1/R2)} = 1.532 Volt

Pin Configuration



SOP-8P (Top View)

= Exposed Pad
(connected to VIN plane for better heat dissipation)

MICRO-STAR INT'L CO.,LTD

MS-AC951

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Custom	PCH Power & ACPI	10

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VCORE power on by S3 and VCC3

HIGH:0.7V
LOW:0.3V

CRB

HIGH:by PCH_1P05V
LOW:by S3

VRMPWRGD LEVEL SHIFT

CRB

ISL95812HRZ-T_QFN32

OCP=110A

near U1

MICRO-STAR INT'L CO.,LTD	
MS-AC951	
Size: Custom	Document Description: CPU Power - ISL95812
Rev: 10	
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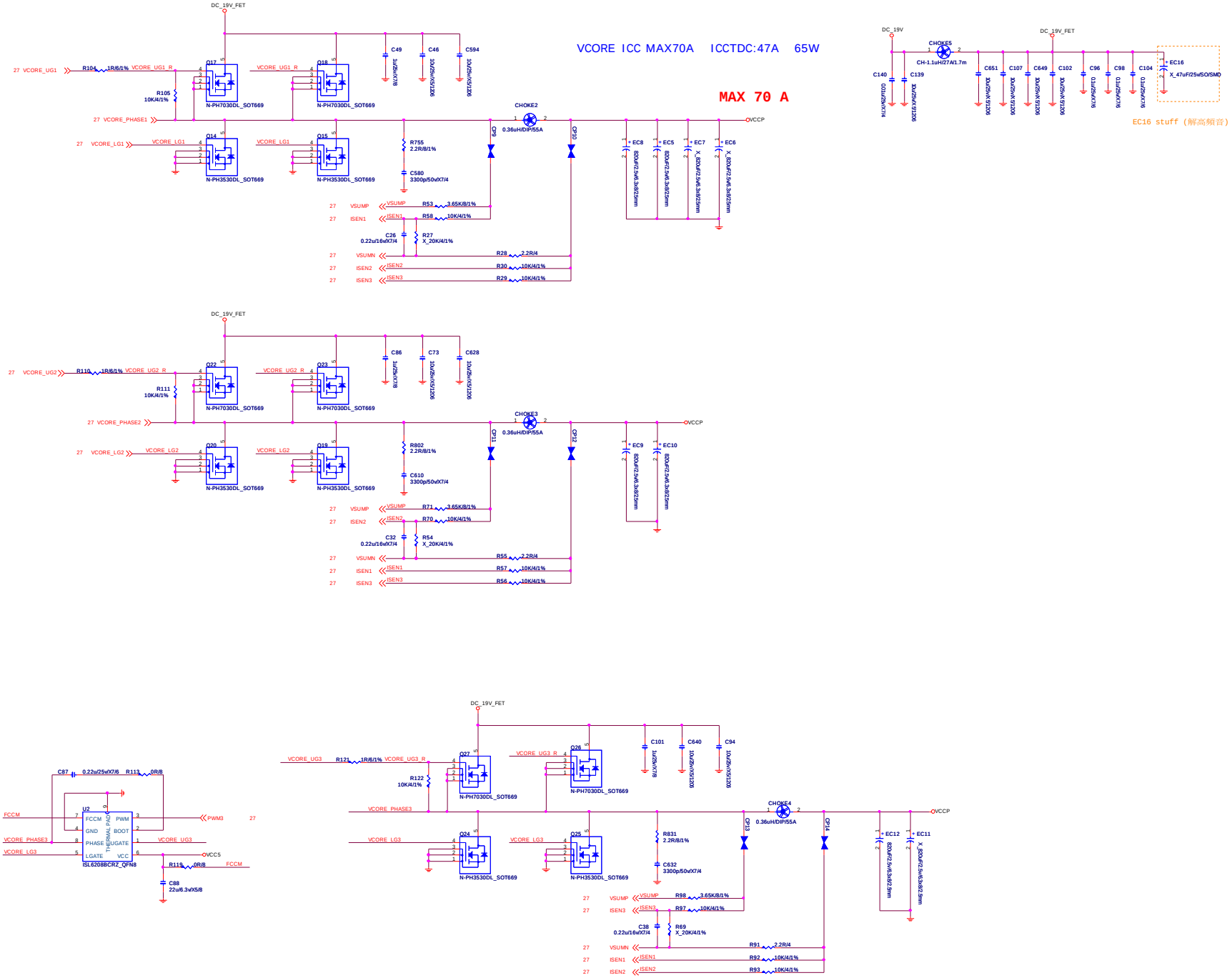
VCCP POWER



MICRO-STAR INT'L CO.,LTD

MS-AC951

Size: Custom | Document Description: CPU Power - MOSFET | Rev: 10

Date: Thursday, May 16, 2013 | Sheet 28 of 49

PLACE CLOSE TO VGA CONNECTOR

as close as possible to VGA connector within 500Mil

Valid Three Display Configurations through the Processor

Display 1	Display 2	Display 3	Maximum Resolution Display 1	Maximum Resolution Display 2	Maximum Resolution Display 3
HDMI	HDMI	DP	4096x2304 @ 24 Hz 2560x1600 @ 60 Hz		3840x2160 @ 60 Hz
DVI	DVI	DP	1920x1200 @ 60 Hz		3840x2160 @ 60 Hz
DP	DP	DP	3840x2160 @ 60 Hz		
VGA	DP	HDMI	1920x1200 @ 60 Hz	3840x2160 @ 60 Hz	4096x2304 @ 24 Hz 2560x1600 @ 60 Hz
eDP	DP	HDMI	3840x2160 @ 60 Hz	3840x2160 @ 60 Hz	4096x2304 @ 24 Hz 2560x1600 @ 60 Hz

VGA Connector (MP remove)

N32-2071101-H06

NFC

NFC_CONNECTOR

FPC15P-B-0.5PITCH_WHIT

HDMI OUT

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

For EMI

EMI

N5Y-19M0221-H06

HPD

MICRO-STAR INT'L CO.,LTD	
MS-AC951	
Size: Custom	Document Description: HDMI Out/ NFC /VGAPinHeader
Rev: 10	
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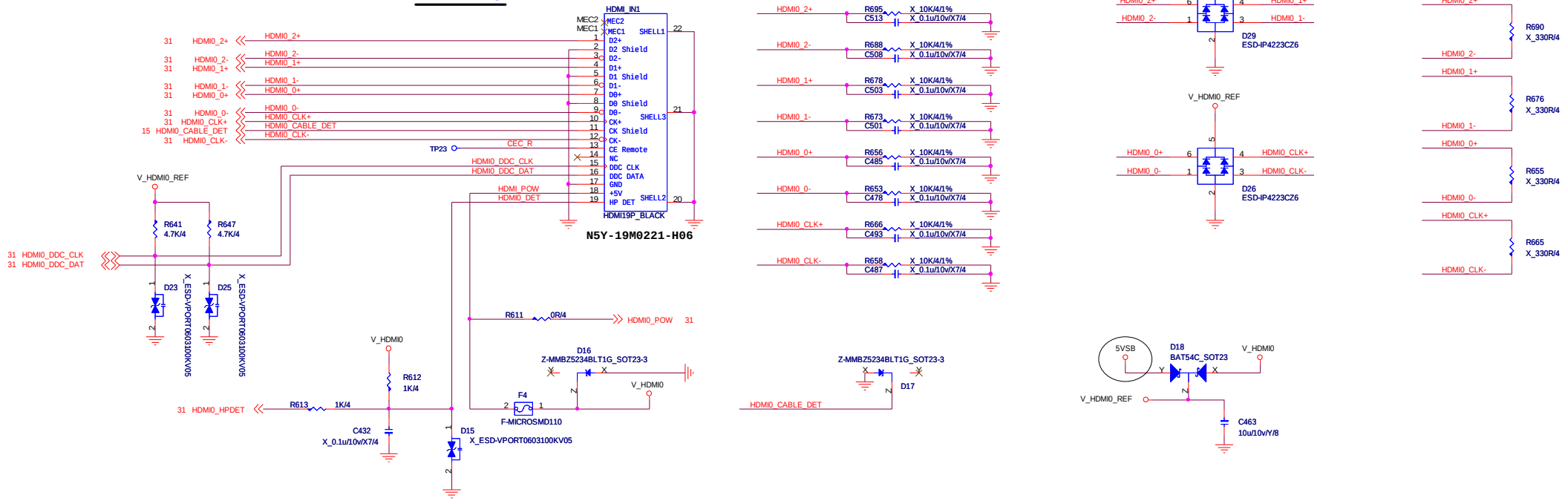
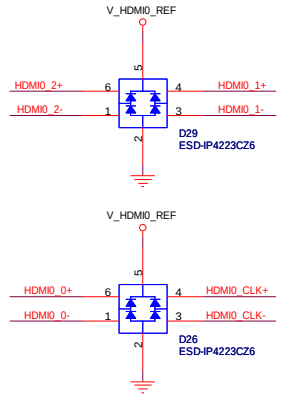
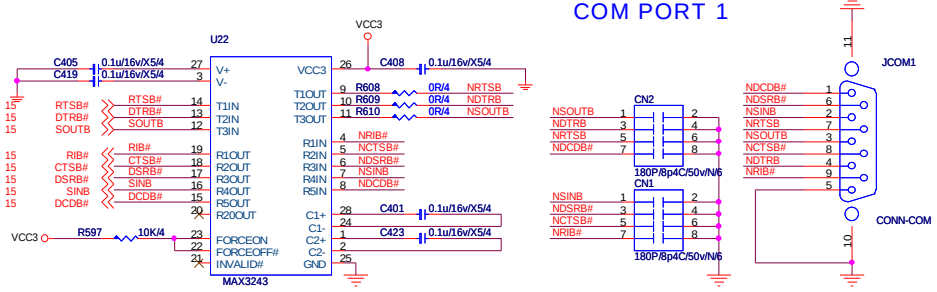
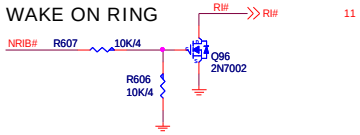
HDMI1 INPUT



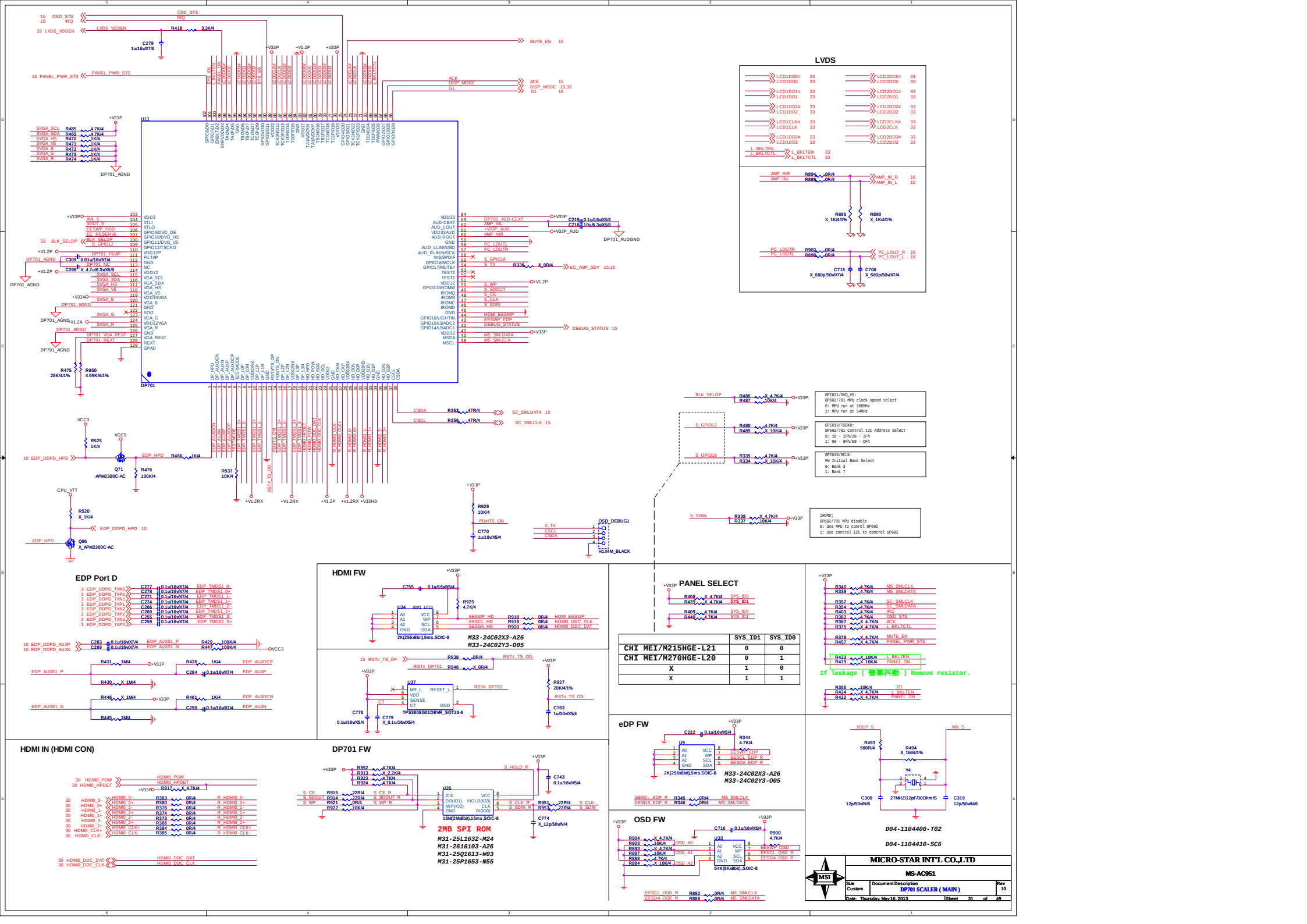


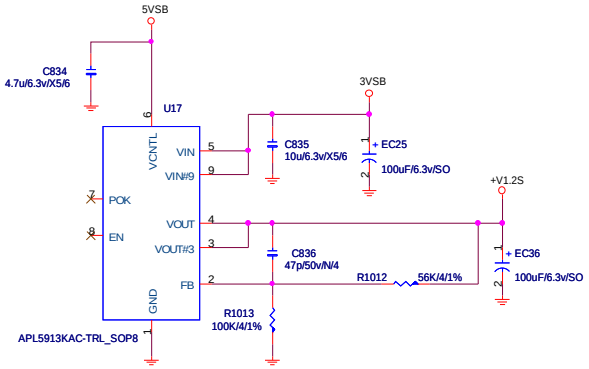
COM PORT 1



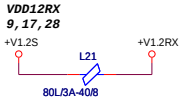


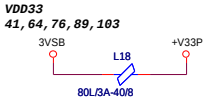
MICRO-STAR INT'L CO.,LTD		
MS-AC951		
Size: Custom	Document Description: HDMI In / COM1	Rev: 10
Date: Thursday, May 16, 2013	Sheet 30 of 49	

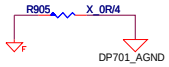

LVDS
DP701
U11
EDP Port D
HDMI FW
PANEL SELECT
eDP FW
OSD FW
DP701 FW
HDMI IN (HDMI CON)
2MB SPI ROM
M31-25L1632-M24
M31-2616103-A26
M31-25Q1613-W03
M31-25P1653-N55
M33-24C02X3-A26
M33-24C02Y3-005
D04-1104400-T02
D04-1104410-SC6
MICRO-STAR INT'L CO.,LTD
MS-AC951
DP701 SCALER (MAIN)
Thursday, May 16, 2013
Sheet 31 of 49
If leakage (螢幕抖動) Remove resistor.

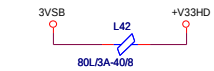


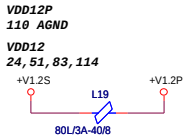
VCC_DDR = 0.8*{1+(R1/R2)} = 1.248 Volt

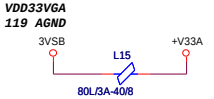


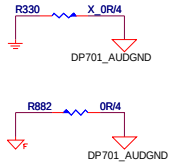


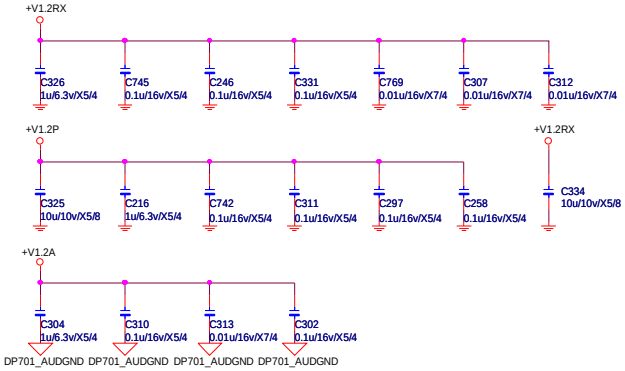


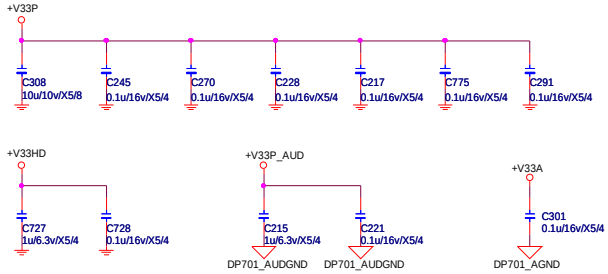












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Size	Document Description	Rev
Custom	DP701 SCALER(POWER)	10

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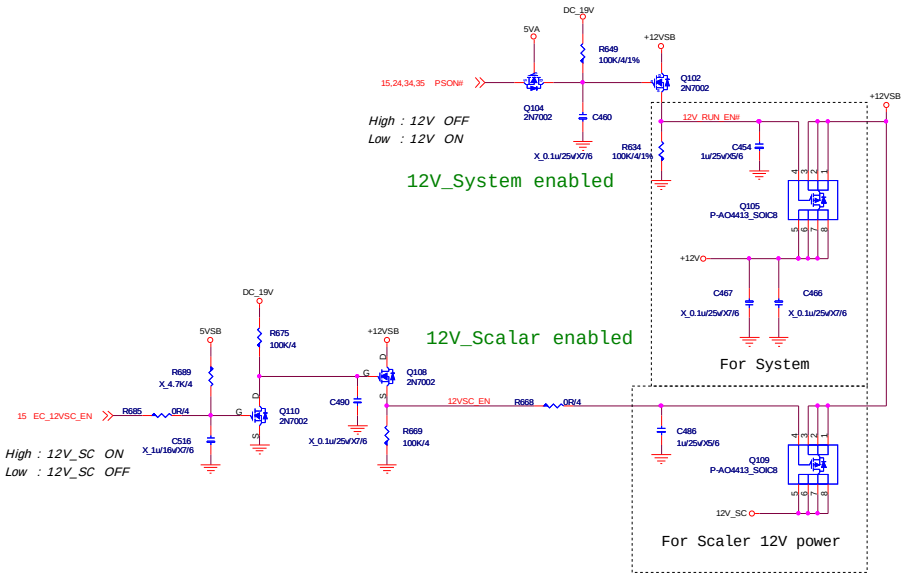

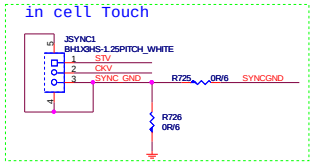

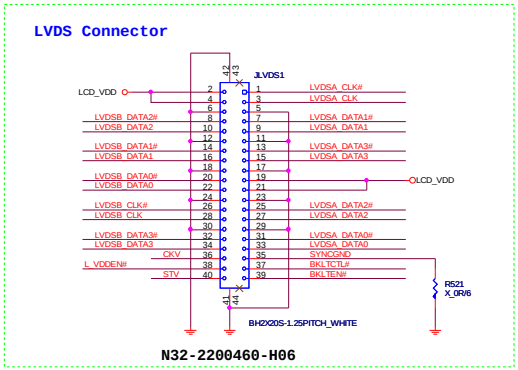

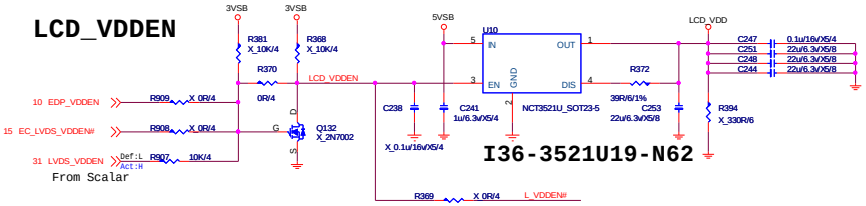

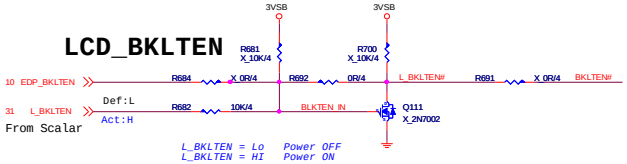

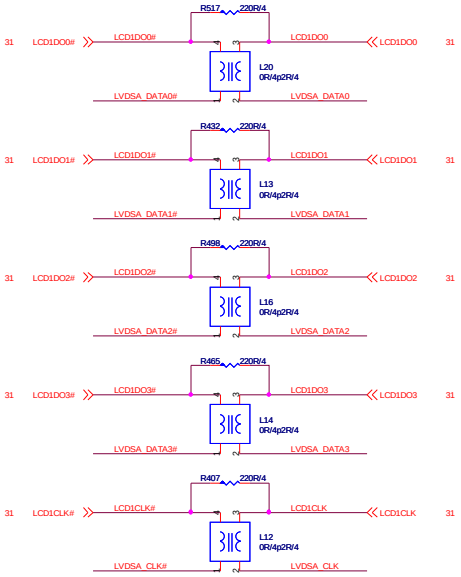

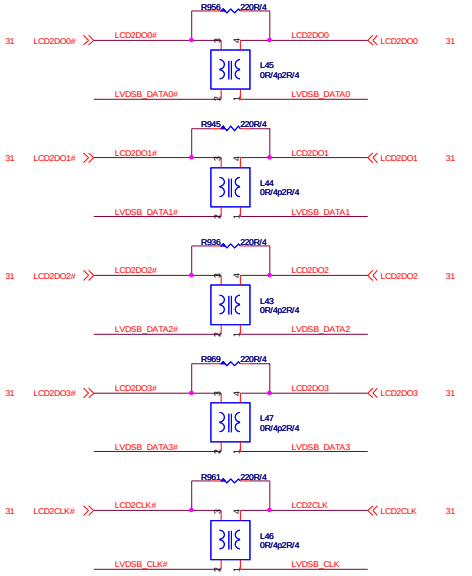

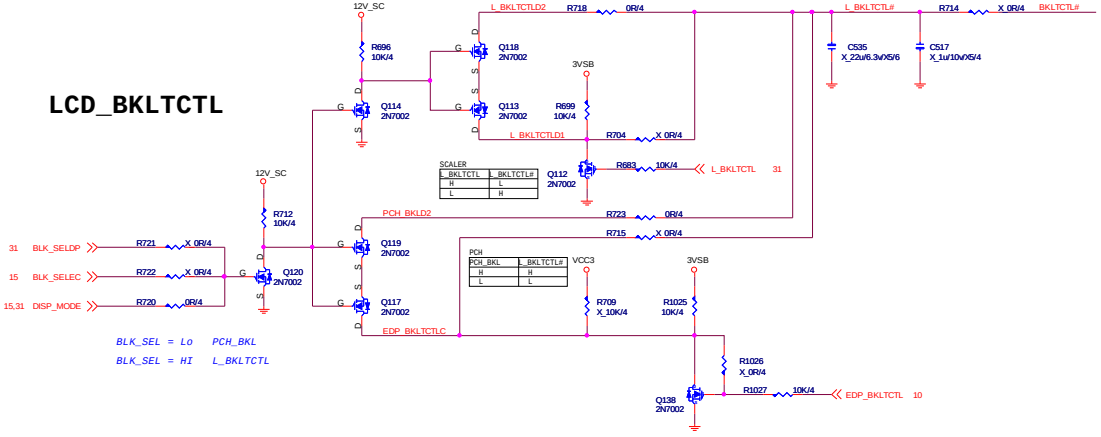

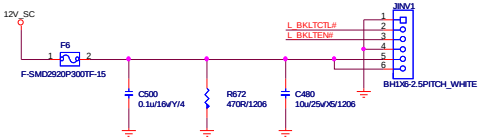

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Size	Document Description	Rev
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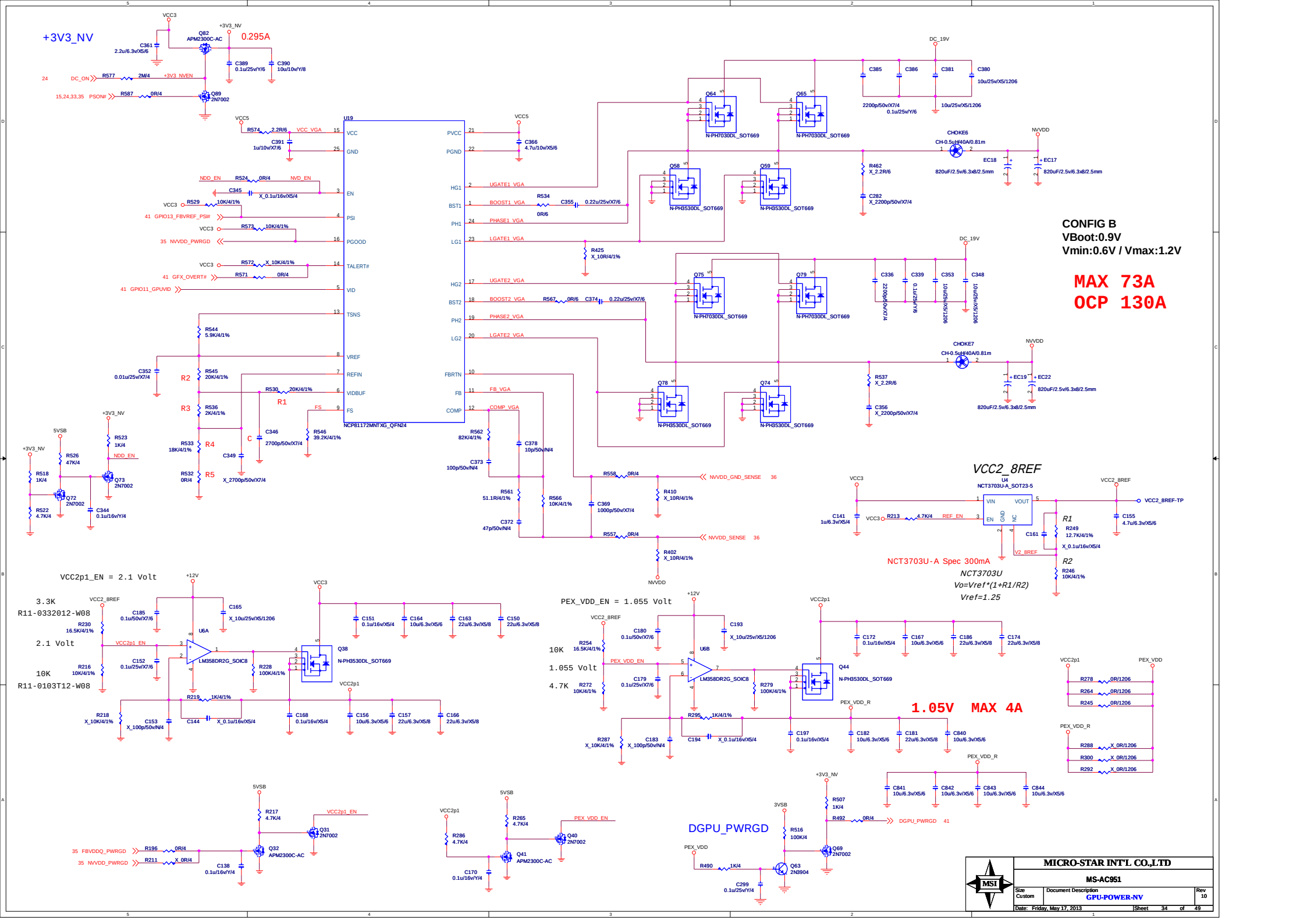
+3V3_NV
0.295A
VCC3
+3V3_NV
Q82
APM2300C-AC
C361
2.2u/6.3v/X5/6
C389
0.1u/25v/Y/6
C390
10u/10v/Y/8
DC_ON
R577
2M/4
+3V3_NVEN
PSON#
R587
0R/4
Q89
2N7002
U19
VCC5
R574
2.2R/6
VCC_VGA
C391
1u/10v/X7/6
VCC
GND
PVCC
PGND
C366
4.7u/10v/X5/6
NDD_EN
R524
0R/4
NVD_EN
C345
X_0.1u/16v/X5/4
EN
R529
10K/4/1%
PSI
GPIO13_FBVREF_PSI#
R573
10K/4/1%
NVVDD_PWRGD
PGOOD
R572
X_10K/4/1%
TALERT#
GFX_OVERT#
R571
0R/4
GPIO11_GPUVID
VID
TSNS
R544
5.9K/4/1%
VREF
C352
0.01u/25v/X7/4
R2
R545
20K/4/1%
REFIN
R530
20K/4/1%
R1
VIDBUF
R3
R536
2K/4/1%
FS
R546
39.2K/4/1%
R533
18K/4/1%
R4
C346
2700p/50v/X7/4
C
C349
X_2700p/50v/X7/4
R532
0R/4
R5
NCP81172MNTXG_QFN24
HG1
UGATE1_VGA
BST1
BOOST1_VGA
R534
0R/6
C355
0.22u/25v/X7/6
PH1
PHASE1_VGA
LG1
LGATE1_VGA
R425
X_10R/4/1%
HG2
UGATE2_VGA
BST2
BOOST2_VGA
R567
0R/6
C374
0.22u/25v/X7/6
PH2
PHASE2_VGA
LG2
LGATE2_VGA
FBRTN
FB
FB_VGA
COMP
COMP_VGA
R562
82K/4/1%
C378
10p/50v/N/4
C373
100p/50v/N/4
R561
51.1R/4/1%
R566
10K/4/1%
C372
47p/50v/N/4
R558
0R/4
NVVDD_GND_SENSE
36
C369
1000p/50v/X7/4
R410
X_10R/4/1%
R557
0R/4
NVVDD_SENSE
36
R402
X_10R/4/1%
NVVDD
Q64
Q65
N-PH7030DL_SOT669
Q58
Q59
N-PH3530DL_SOT669
C385
C386
C381
C380
10u/25v/X5/1206
2200p/50v/X7/4
0.1u/25v/Y/6
10u/25v/X5/1206
CHOKE6
CH-0.5uH40A/0.81m
EC18
820uF/2.5v/6.3x8/2.5mm
EC17
820uF/2.5v/6.3x8/2.5mm
NVVDD
R462
X_2.2R/6
C282
X_2200p/50v/X7/4
DC_19V
Q75
Q79
C336
C339
C353
C348
CHOKE7
CH-0.5uH40A/0.81m
EC19
EC22
820uF/2.5v/6.3x8/2.5mm
R537
X_2.2R/6
C356
X_2200p/50v/X7/4
Q78
Q74
CONFIG B
VBoot:0.9V
Vmin:0.6V / Vmax:1.2V
MAX 73A
OCP 130A
VCC2_8REF
U4
NCT3703U-A_SOT23-5
VIN
VOUT
EN
GND
NC
VCC2_8REF-TP
C141
1u/6.3v/X5/4
R213
4.7K/4
REF_EN
C161
R1
R249
12.7K/4/1%
X_0.1u/16v/X5/4
V2_8REF
C155
4.7u/6.3v/X5/6
R2
R246
10K/4/1%
NCT3703U-A Spec 300mA
NCT3703U
Vo=Vref*(1+R1/R2)
Vref=1.25
VCC2p1_EN = 2.1 Volt
3.3K
R11-0332012-W08
2.1 Volt
10K
R11-0103T12-W08
+12V
VCC2_8REF
R230
16.5K/4/1%
C185
0.1u/50v/X7/6
C165
X_10u/25v/X5/1206
U6A
LM358DR2G_SOIC8
VCC2p1_EN
C152
0.1u/25v/X7/6
R216
10K/4/1%
R228
100K/4/1%
Q38
N-PH3530DL_SOT669
C151
0.1u/16v/X5/4
C164
10u/6.3v/X5/6
C163
22u/6.3v/X5/8
C150
22u/6.3v/X5/8
R219
1K/4/1%
R218
X_10K/4/1%
C153
X_100p/50v/N/4
C144
X_0.1u/16v/X5/4
C168
0.1u/16v/X5/4
C156
10u/6.3v/X5/6
C157
22u/6.3v/X5/8
C166
22u/6.3v/X5/8
PEX_VDD_EN = 1.055 Volt
10K
1.055 Volt
4.7K
R254
16.5K/4/1%
C180
0.1u/50v/X7/6
C193
X_10u/25v/X5/1206
U6B
LM358DR2G_SOIC8
PEX_VDD_EN
C179
0.1u/25v/X7/6
R272
10K/4/1%
R279
100K/4/1%
Q44
N-PH3530DL_SOT669
R295
1K/4/1%
C194
X_0.1u/16v/X5/4
R287
X_10K/4/1%
C183
X_100p/50v/N/4
C172
0.1u/16v/X5/4
C167
10u/6.3v/X5/6
C186
22u/6.3v/X5/8
C174
22u/6.3v/X5/8
C197
0.1u/16v/X5/4
C182
10u/6.3v/X5/6
C181
22u/6.3v/X5/8
C840
10u/6.3v/X5/6
1.05V MAX 4A
PEX_VDD_R
R278
0R/1206
R264
0R/1206
R245
0R/1206
R288
X_0R/1206
R300
X_0R/1206
R292
X_0R/1206
C841
10u/6.3v/X5/6
C842
10u/6.3v/X5/6
C843
10u/6.3v/X5/6
C844
10u/6.3v/X5/6
5VSB
R217
4.7K/4
VCC2p1_EN
Q31
2N7002
Q32
APM2300C-AC
FBVDDQ_PWRGD
NVVDD_PWRGD
R196
0R/4
R211
X_0R/4
C138
0.1u/16v/Y/4
VCC2p1
R286
4.7K/4
R265
4.7K/4
PEX_VDD_EN
Q40
2N7002
Q41
APM2300C-AC
C170
0.1u/16v/Y/4
DGPU_PWRGD
PEX_VDD
3VSB
R516
100K/4
R490
1K/4
Q63
2N3904
R507
1K/4
R492
0R/4
DGPU_PWRGD
41
Q69
2N7002
C299
0.1u/25v/Y/4
MICRO-STAR INT'L CO.,LTD
MS-AC951
Size
Custom
Document Description
GPU-POWER-NV
Rev
10
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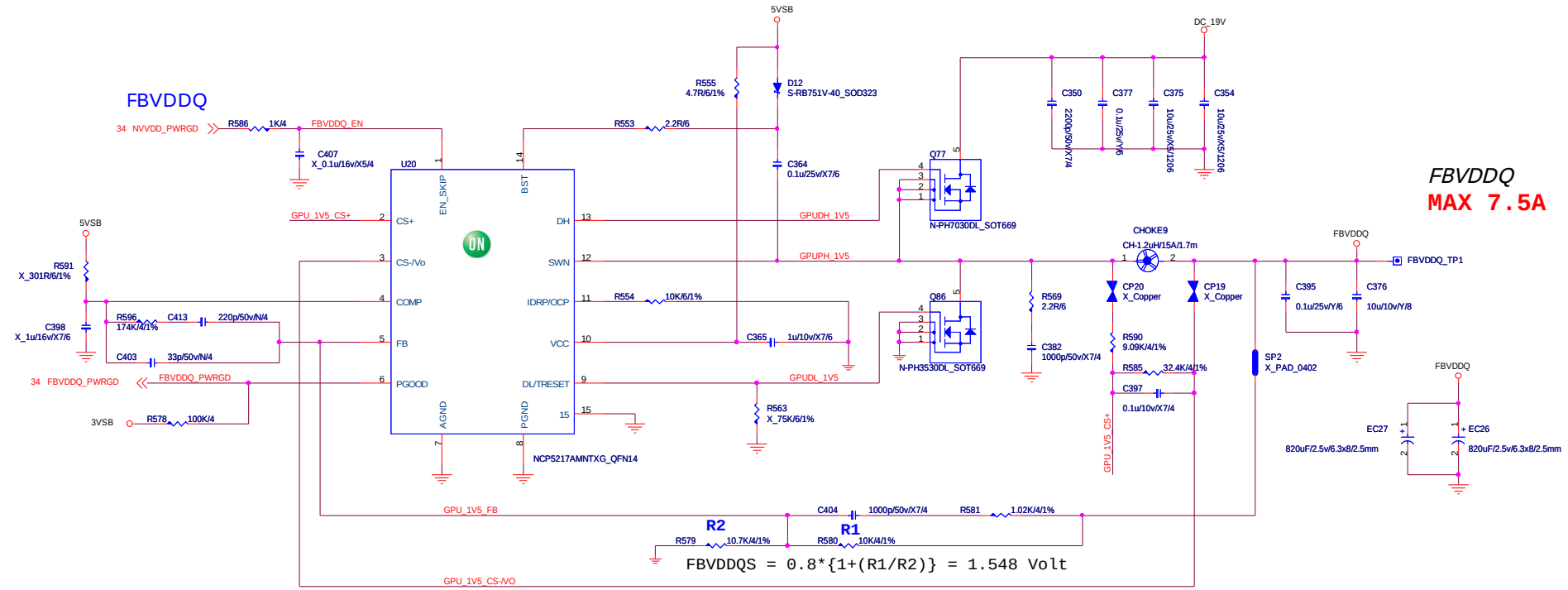

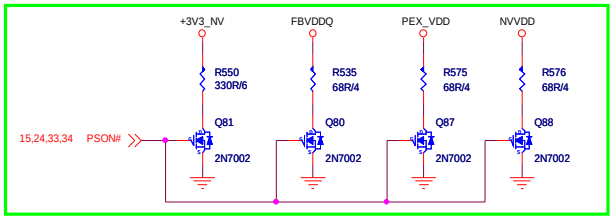

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Size: Custom	Document Description: GPU FBVDDQ	Rev: 10
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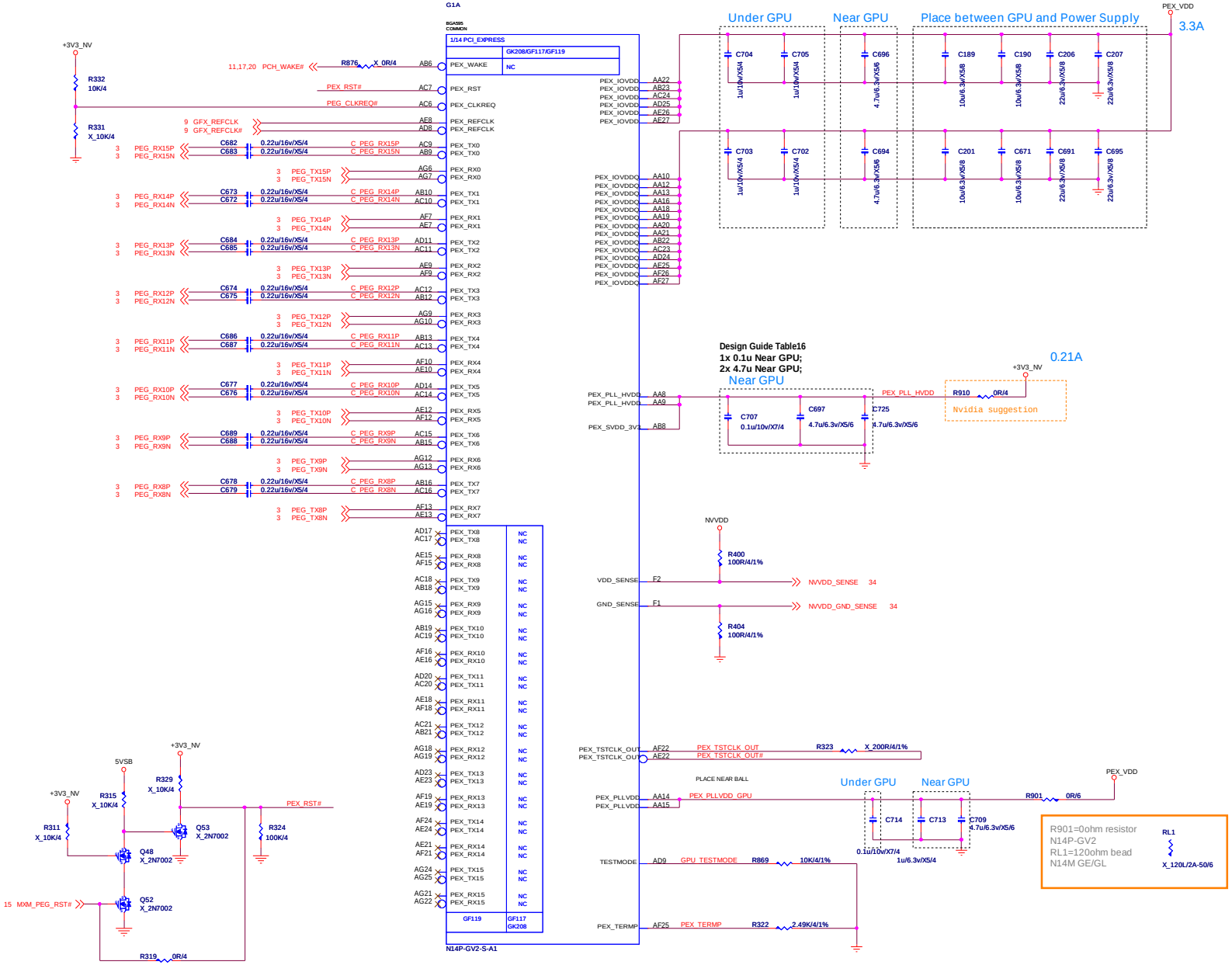
N14P-GV2(PCI-Express Gen3 x8 Interface)

N14M-GE(PCI-Express Gen2 x8 Interface)

N14P-GV2 MSI PN:B03-0N14P65-N08
N14M-GE MSI PN:B03-0N14M15-N08

Design Guide Table14
4x 1u under GPU;
2x 4.7u near GPU;
4x 10u,4 x22u Place bteween GPU and Power Supply

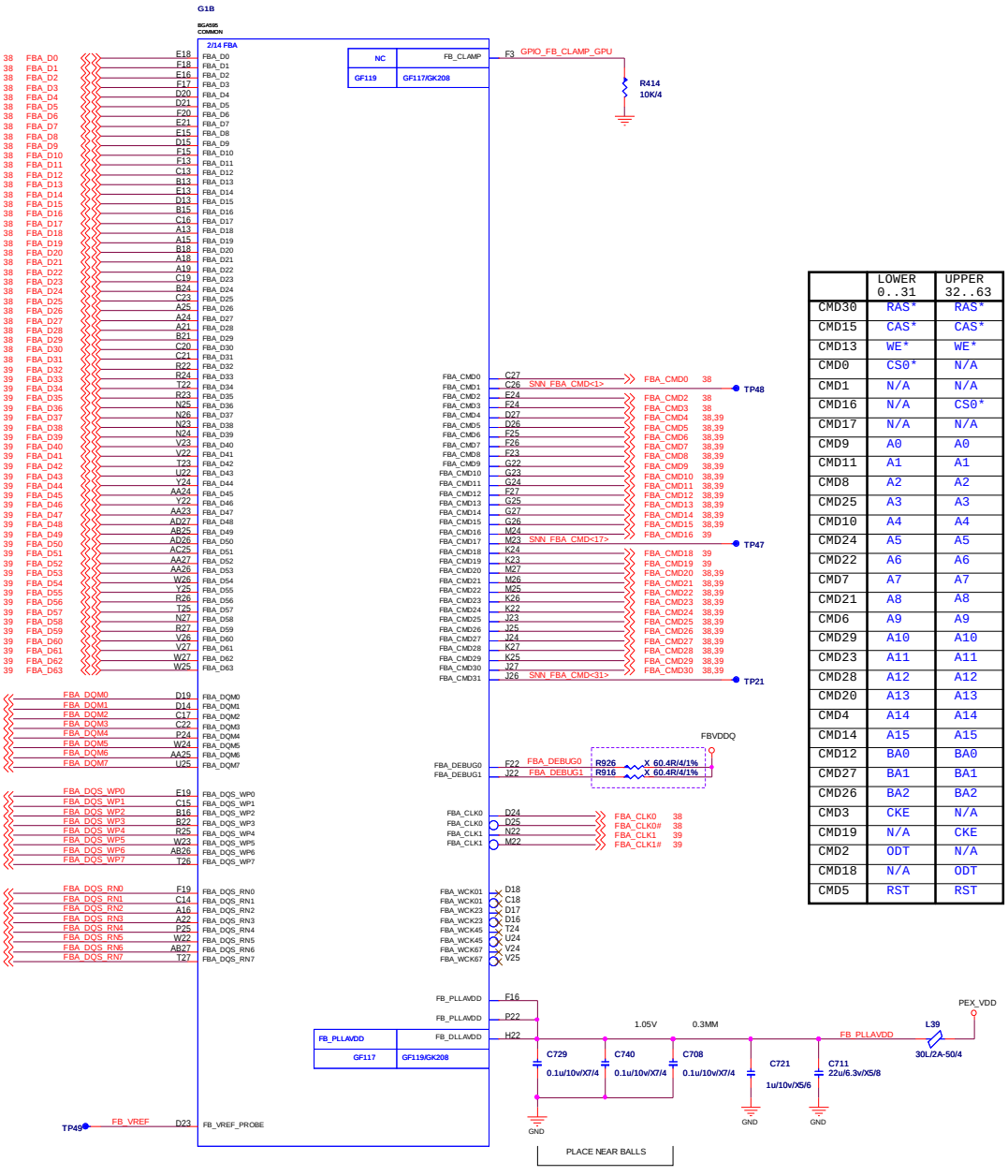


MICRO-STAR INT'L CO.,LTD	
MS-AC951	
Size: Custom	Document Description: N14P-GV2_PCI-E Host
Rev: 10	
Date: Friday, May 17, 2013	Sheet 36 of 49

N14P-GV2 co-lay N14M-GE(Frame Buffer Interface)

N14P-GV2 MSI PN:B03-0N14P65-N08

N14M-GE MSI PN:B03-0N14M15-N08



	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

MICRO-STAR INT'L CO.,LTD

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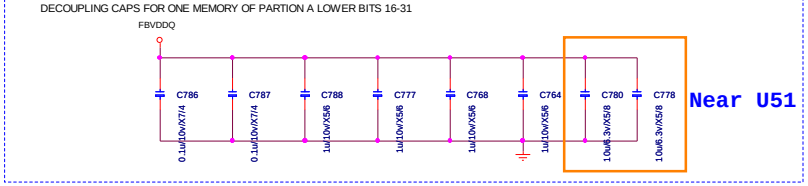
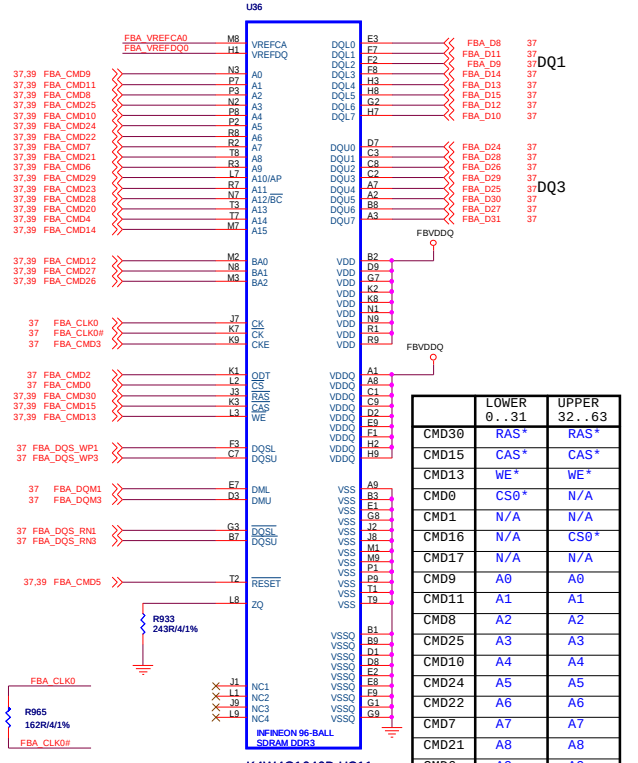
Memory Lower Partition A

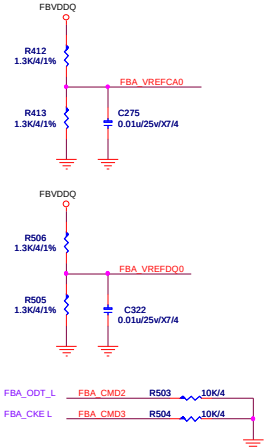
MEMORY DECOUPLING CAPS

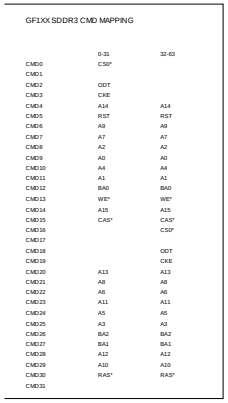
DECOUPLING CAPS FOR ONE MEMORY OF PARTION A LOWER BITS 16-31





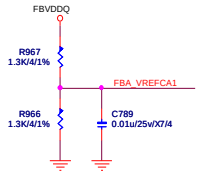
	LOWER 0..31	UPPER 32..63
CMD30	RAS*	RAS*
CMD15	CAS*	CAS*
CMD13	WE*	WE*
CMD0	CS0*	N/A
CMD1	N/A	N/A
CMD16	N/A	CS0*
CMD17	N/A	N/A
CMD9	A0	A0
CMD11	A1	A1
CMD8	A2	A2
CMD25	A3	A3
CMD10	A4	A4
CMD24	A5	A5
CMD22	A6	A6
CMD7	A7	A7
CMD21	A8	A8
CMD6	A9	A9
CMD29	A10	A10
CMD23	A11	A11
CMD28	A12	A12
CMD20	A13	A13
CMD4	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

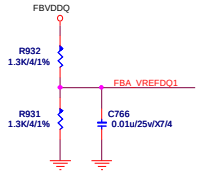




* A15 is not required for any x16 device, even up to 4Gb density

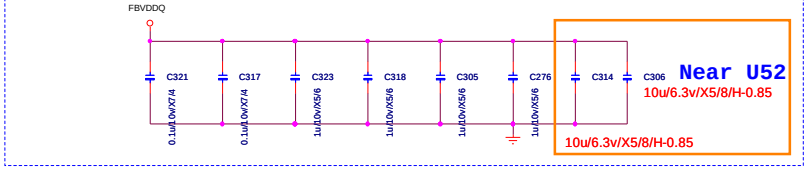
* A15 is only needed if we support x8 configurations, and only at 4Gb

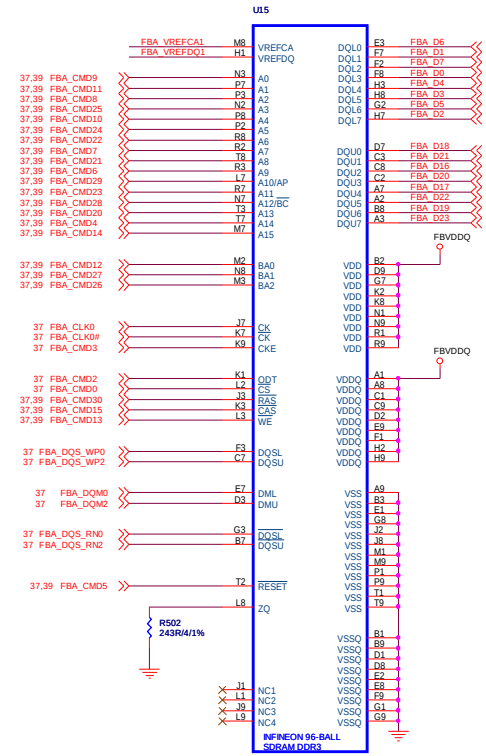




MEMORY DECOUPLING CAPS

DECOUPLING CAPS FOR ONE MEMORY OF PARTION A LOWER BITS 0-15





N14M-GS/LP AND N14P-GV2 DDR3 & DDR3L MEMORY RVL

NVIDIA recommends the following DDR3 memories for use in conjunction with notebook designs using N14M-GS/LP and N14P-GV2.

Table 4. N14M-GS/LP and N14P-GV2 DDR3 Recommended Memories 128Mx16 Configuration

Configuration	Vendor	Strap	FBVDD/ FBVDDQ	Manufacturer Part Number	Max Speed CK (MHz)	Memory Date Code Minimum	Status
128M×16 DDR3	Samsung	0x7	1.5 V/ 1.5 V	K4W2G1646E-BC1A	1000	1204	Production Candidate
				K4W2G1646E-BC11	900	1204	Production Candidate
	Micron	0x5	1.5 V/ 1.5 V	MT41J128M16JT-093G:K	1000	1234	Production Candidate
				MT41J128M16JT-107G:K	900	1150	Production Candidate
	Hynix	0x6	1.5V/ 1.5V	H5TQ2G63DFR-N0C	1000	N/A	Production Candidate
				H5TQ2G63DFR-11C	900	N/A	Production Candidate

Table 5. N14M-GS/LP and N14P-GV2 DDR3 Recommended Memories 256Mx16 Configuration

Configuration	Vendor	Strap	FBVDD/ FBVDDQ	Manufacturer Part Number	Max Speed CK (MHz)	Memory Date Code Minimum	Status
256Mx16 DDR3	Samsung	0x3	1.5 V/ 1.5 V	K4W4G1646B-HC11	900	N/A	Production Candidate
	Micron	0x1	1.5 V/ 1.5 V	MT41K256M16HA-107G:E	900	N/A	Production Candidate

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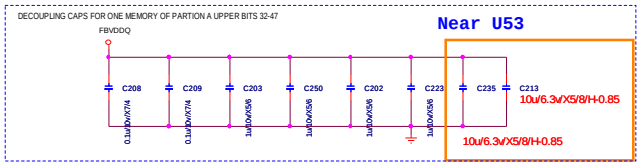
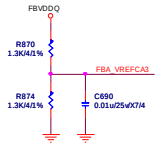
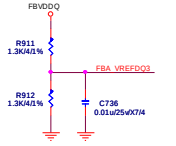
Memory Upper Partition A

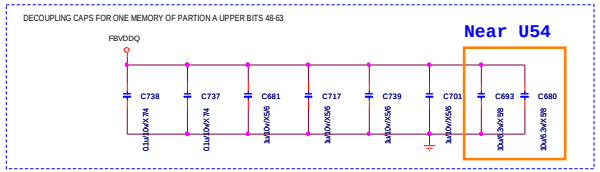
MEMORY DECOUPLING CAPS

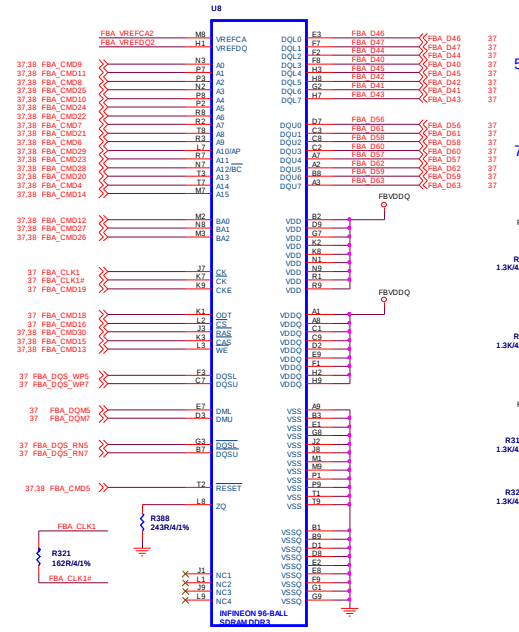


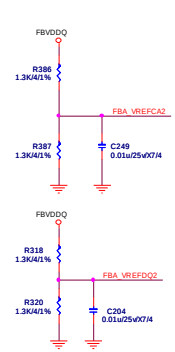


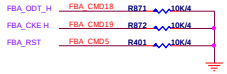


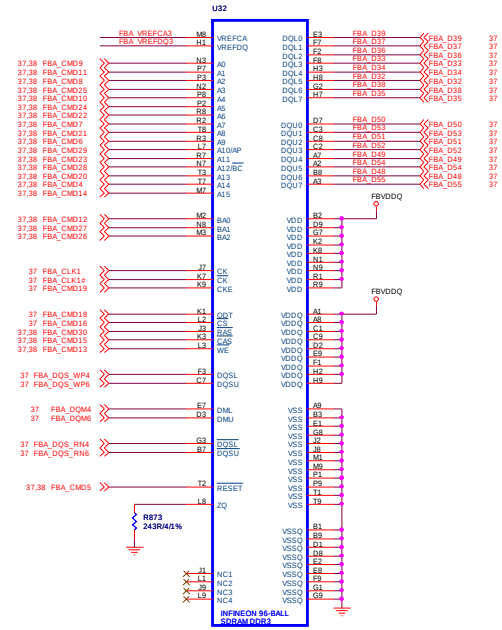
MEMORY DECOUPLING CAPS











N14M-GS/LP AND N14P-GV2 DDR3 & DDR3L MEMORY RVL

NVIDIA recommends the following DDR3 memories for use in conjunction with notebook designs using N14M-GS/LP and N14P-GV2.

Table 4. N14M-GS/LP and N14P-GV2 DDR3 Recommended Memories 128Mx16 Configuration

Configuration	Vendor	Strap	FBVDD/ FBVDDQ	Manufacturer Part Number	Max Speed CK (MHz)	Memory Date Code Minimum	Status
128Mx16 DDR3	Samsung	0x7	1.5 V/ 1.5 V	K4W2G1646E-BC1A	1000	1204	Production Candidate
				K4W2G1646E-BC11	900	1204	Production Candidate
	Micron	0x5	1.5 V/ 1.5 V	MT41J128M16JT-093G:K	1000	1234	Production Candidate
				MT41J128M16JT-107G:K	900	1150	Production Candidate
	Hynix	0x6	1.5V/ 1.5V	H5TQ2G63DFR-H0C	1000	N/A	Production Candidate
				H5TQ2G63DFR-11C	900	N/A	Production Candidate

Table 5. N14M-GS/LP and N14P-GV2 DDR3 Recommended Memories 256Mx16 Configuration

Configuration	Vendor	Strap	FBVDD/ FBVDDQ	Manufacturer Part Number	Max Speed CK (MHz)	Memory Date Code Minimum	Status
256Mx16 DDR3	Samsung	0x3	1.5 V/ 1.5 V	K4W4G1646B-HC11	900	N/A	Production Candidate
	Micron	0x1	1.5 V/ 1.5 V	MT41K256M16HA-107G:E	900	N/A	Production Candidate

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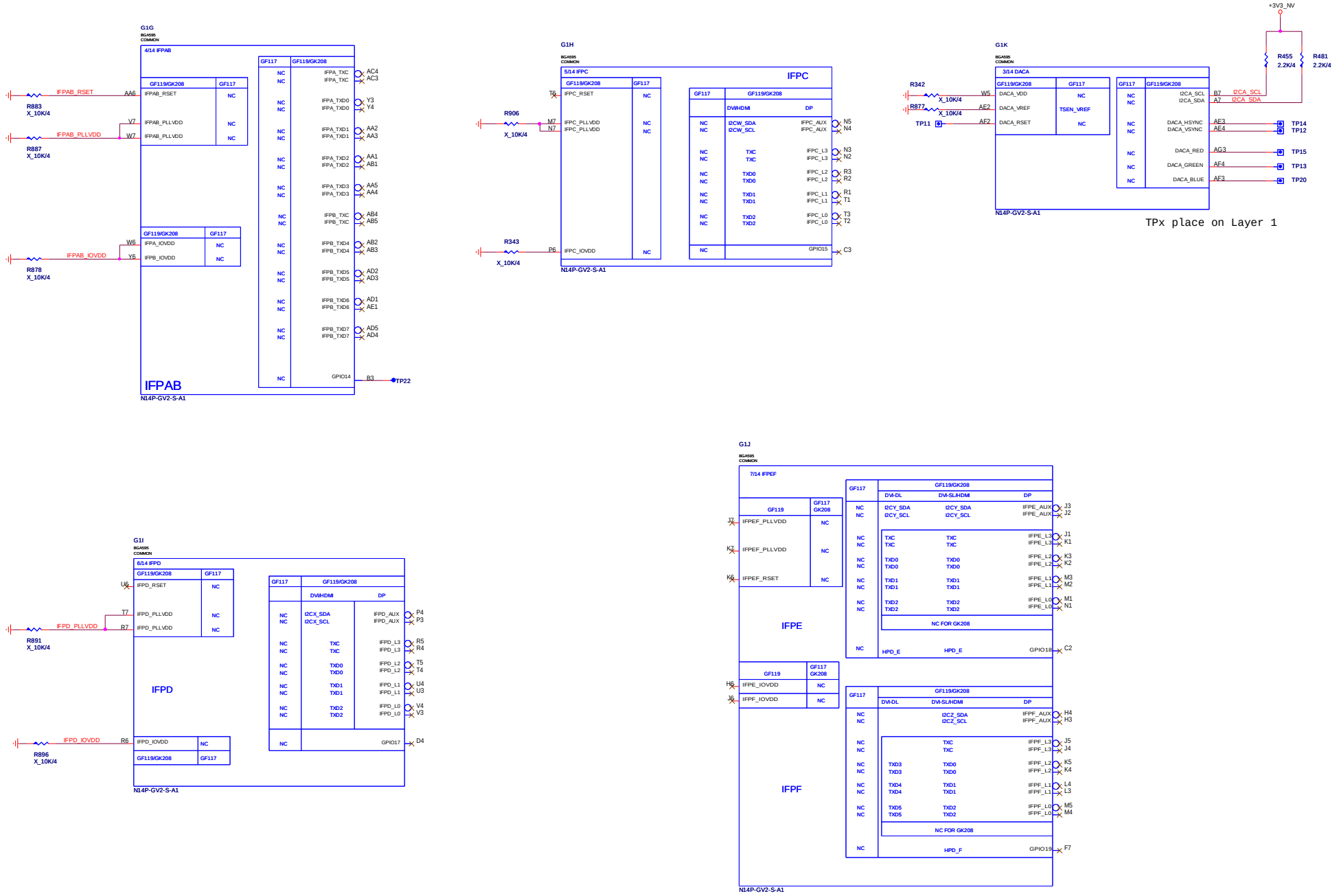

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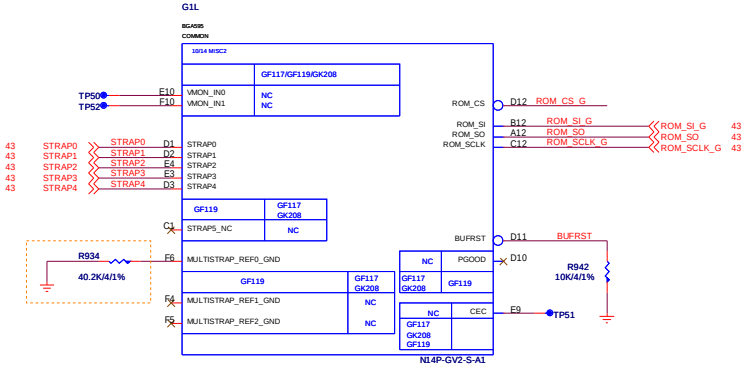
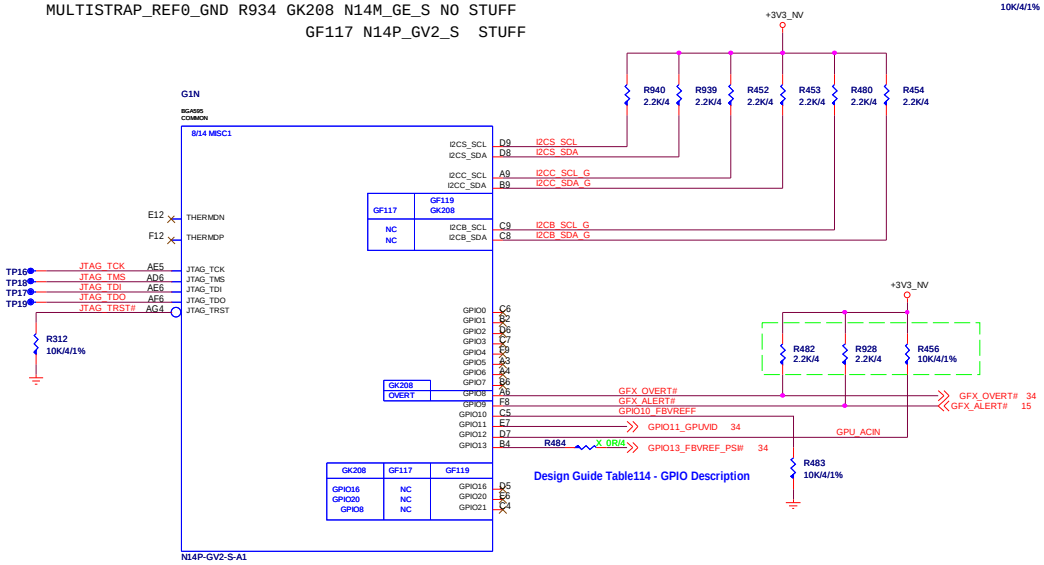
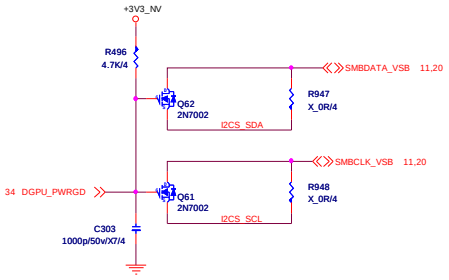
N14P-GV2 co-lay N14M-GE(Thermal & GPIO)

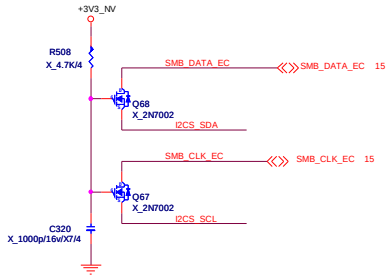


MULTISTRAP_REF0_GND R934 GK208 N14M_GE_S NO STUFF
GF117 N14P_GV2_S STUFF

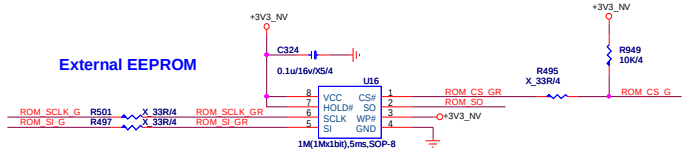


Design Guide Table114 - GPIO Description

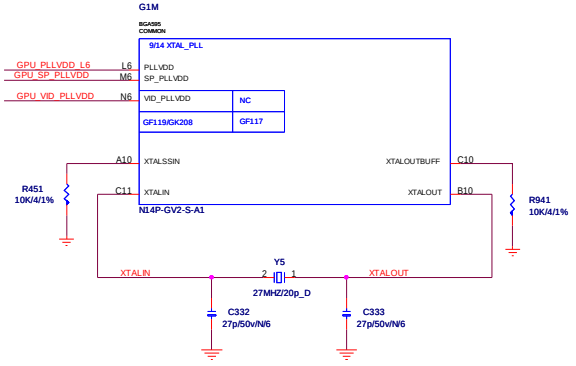


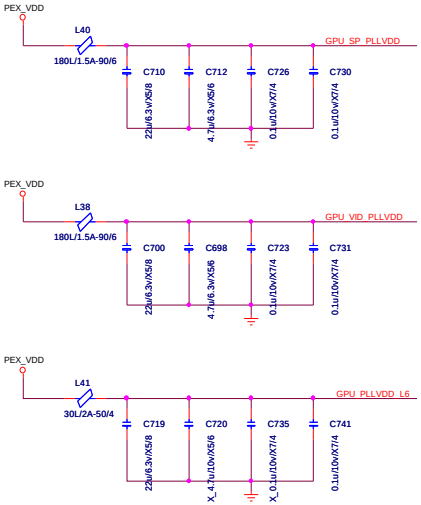


External EEPROM



M31-25L1022-M24





GPIO	GK208	GF117
GPIO 0	DEBUG Service	FAN_PWM/FB_CLAMP/DEBUG Service
GPIO 1	MEM_VDD_CTL/FAN_PWM	NVVDD_VID2
GPIO 2	LCD brightness control (LCD_BLPWM)	UNUSED
GPIO 3	LCD Power enable (LCD_PPEN)	UNUSED
GPIO 4	LCD Backlight enable (LCD_BLEN)	UNUSED
GPIO 5	NVVDD PWM_VID_BOOT_EN	NVVDD VID0
GPIO 6	Remote Sensor Error Correction	NVVDD VID1
GPIO 7	LVDS_Switch/3D VISION/STEREO	UNUSED
GPIO 8	GPU Overtemp	GPU Overtemp
GPIO 9	GPU thermal Alert	GPU Thermal Alert
GPIO 10	FB Vref Control	UNUSED
GPIO 11	NVVDD PWM_VID	MEM_VDD_CTL
GPIO 12	PWR_Level AC Detect	PWR_Level AC Detect
GPIO 13	NVVDD PSI	UNUSED(No Need to Set in VBIOS)
GPIO 14	HPD IFPAB (DPIIM)	N/A on Package
GPIO 15	HPD IFPC (DP)	N/A on Package
GPIO 16	FAN_PWM	N/A on Package
GPIO 17	HPD IFPD (eDP)	N/A on Package
GPIO 18	UNUSED	N/A on Package
GPIO 19	HPD IFPF (DPIIM)	N/A on Package
GPIO 20	UNUSED	N/A on Package
GPIO 21	UNUSED	N/A on Package

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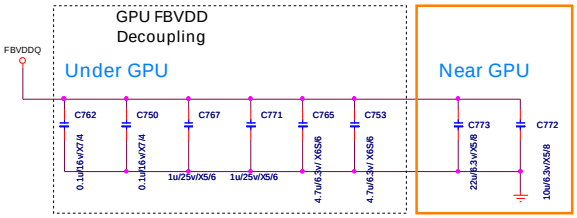
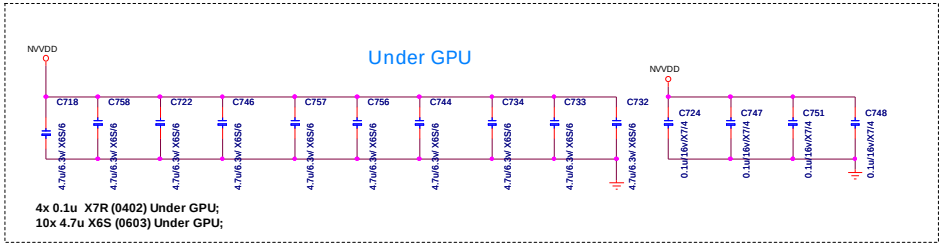
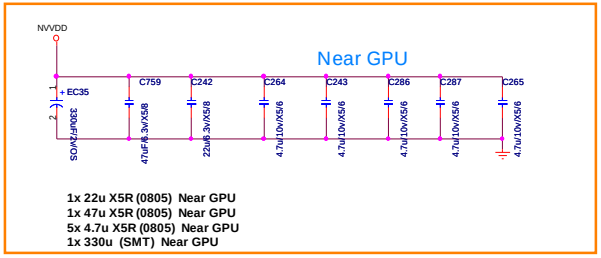
N14P-GV2 co-lay N14M-GE (Power & GND)



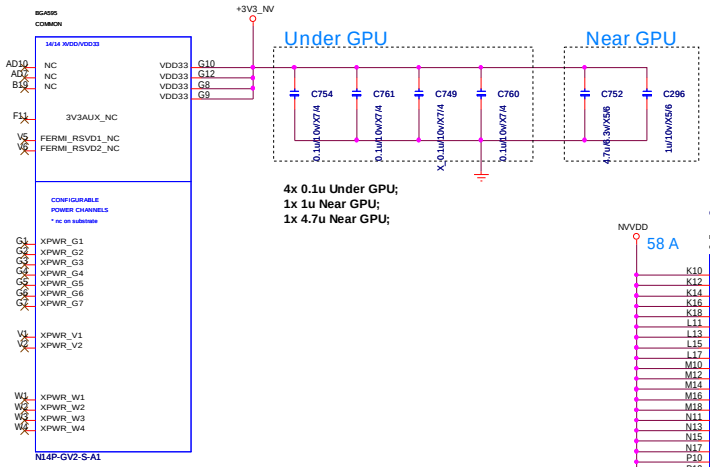
2x 0.1u X7R (0402) Under GPU;
2x 1u X7R (0603) Under GPU;
2x 4.7u X6S (0603) Under GPU;
1x 10u X5R (0805) Near GPU
1x 22u X5R (0805) Near GPU



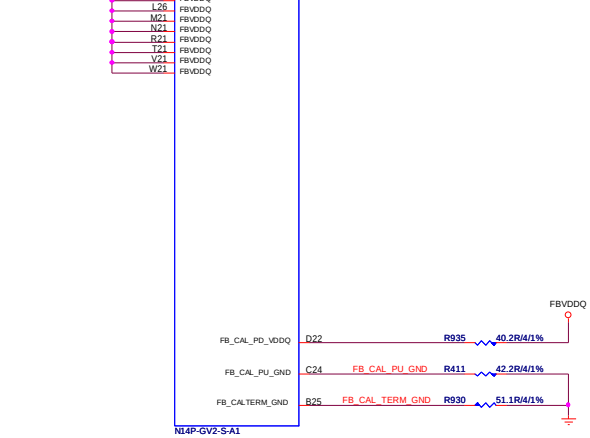
4x 0.1u X7R (0402) Under GPU;
10x 4.7u X6S (0603) Under GPU;

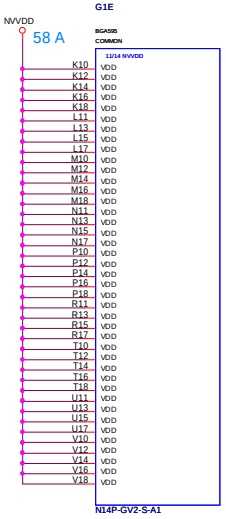


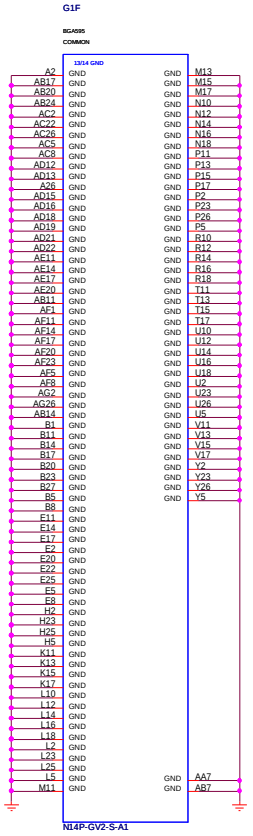
1x 22u X5R (0805) Near GPU
1x 47u X5R (0805) Near GPU
5x 4.7u X5R (0805) Near GPU
1x 330u (SMT) Near GPU



4x 0.1u Under GPU;
1x 1u Near GPU;
1x 4.7u Near GPU;







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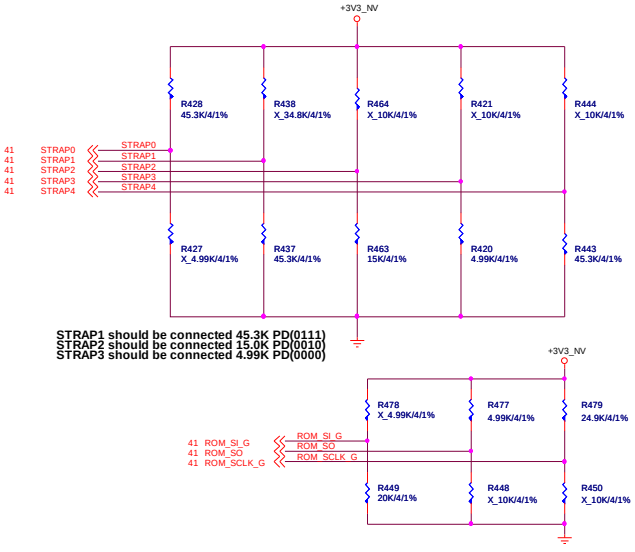
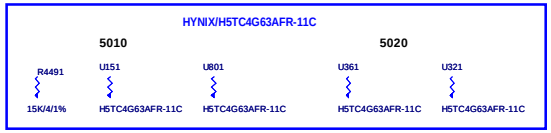


ROM_SCLK should be connected 24.9K PU (1100) for N14P-GV2
10K PD for N14M-GE/GL

ROM_SO should be connected 4.99K PU(1000) for N14P-GV2
10K PD for N14M-GE/GL

ROM_SI should be connected 20K PD(0011) Samsung K4W4G1646B-HC11 for N14P-GV2 256Mx16
20K PD(0011) Samsung K4W4G1646B-HC11 for N14M-GE/GL 256Mx16



Samsung 2G Die

N14M-GE/GL Strap0 10K PD
GMR1
X_10K/4/1%

N14M-GE/GL Strap1 10K PD
GMR4
X_10K/4/1%

N14M-GE/GL Strap2 10K PU
GMR2
X_10K/4/1%

N14M-GE/GL Strap3 10K PD
GMR5
X_10K/4/1%

N14M-GE/GL Strap4 10K PD
GMR3
X_10K/4/1%

N14M-GS/LP AND N14P-GV2 DDR3 & DDR3L MEMORY RVL

NVIDIA recommends the following DDR3 memories for use in conjunction with notebook designs using N14M-GS/LP and N14P-GV2.

Table 4. N14M-GS/LP and N14P-GV2 DDR3 Recommended Memories 128Mx16 Configuration

Configuration	Vendor	Strap	FBVDD/ FBVDDQ	Manufacturer Part Number	Max Speed CK (MHz)	Memory Date Code Minimum	Status
128Mx16 DDR3	Samsung	0x7	1.5 V/ 1.5 V	K4W2G1646E-BC1A	1000	1204	Production Candidate
				K4W2G1646E-BC11	900	1204	Production Candidate
	Micron	0x5	1.5 V/ 1.5 V	MT41J128M16JT-093G:K	1000	1234	Production Candidate
				MT41J128M16JT-107G:K	900	1150	Production Candidate
	Hynix	0x6	1.5V/ 1.5V	H5TQ2G63DFR-N0C	1000	N/A	Production Candidate
				H5TQ2G63DFR-11C	900	N/A	Production Candidate

Table 5. N14M-GS/LP and N14P-GV2 DDR3 Recommended Memories 256Mx16 Configuration

Configuration	Vendor	Strap	FBVDD/ FBVDDQ	Manufacturer Part Number	Max Speed CK (MHz)	Memory Date Code Minimum	Status
256Mx16 DDR3	Samsung	0x3	1.5 V/ 1.5 V	K4W4G1646B-HC11	900	N/A	Production Candidate
	Micron	0x1	1.5 V/ 1.5 V	MT41K256M16HA-107G:E	900	N/A	Production Candidate

Table 6. N14M-GS/LP and N14P-GV2 DDR3 Recommended Memories 256Mx16 Configuration

Configuration	Vendor	Strap	FBVDD/ FBVDDQ	Manufacturer Part Number	Max Speed CK (MHz)	Memory Date Code Minimum	Status
256Mx16 DDR3	Samsung	0x3	1.5 V/ 1.5 V	K4W4G1646B-HC11	900	N/A	Production ready
	Micron	0x1	1.5 V/ 1.5 V	MT41K256M16HA-107G:E	900	N/A	Production ready
	Hynix	0x2	1.5V/ 1.5V	H5TC4G63AFR-11C	900	N/A	Production ready

USER_BIT0	Default All SKU(s):
USER_BIT1	0xF = 45K PU
USER_BIT2	LVDS Panel EDID Mode
USER_BIT3	
	Table 131 3GIO_PADCFG Strap Settings
3GIO_PADCFG 0	
3GIO_PADCFG 1	0110 Gen 1 / Gen 2 support only
3GIO_PADCFG 2	0000 Gen 3 support
3GIO_PADCFG 3	
	PCDEVID_3:0] Definitions (Note Actual DEVID set also depends on PCI_DEVID_4)
PCI_DEVID_0	
PCI_DEVID_1	
PCI_DEVID_2	
PCI_DEVID_3	
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_0	
RAM_CFG_1	
RAM_CFG_2	
RAM_CFG_3	
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

	GF11X/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	PCIE_SPEED_CHANGE_GEN3	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

RAM_CFG[3:0] Definitions

GK208/GK107r MEMORY STRAP TABLE		
0001	256Mx16 SDDR3	Micron
0010	256Mx16 SDDR3	
0011	256Mx16 SDDR3	Samsung
0100	128Mx16 SDDR3	
0101	128Mx16 SDDR3	Micron
0110	128Mx16 SDDR3	Hynix
0111	128Mx16 SDDR3	Samsung

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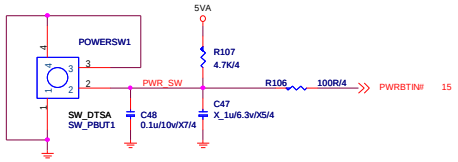
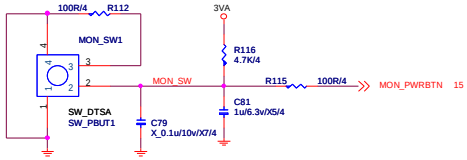
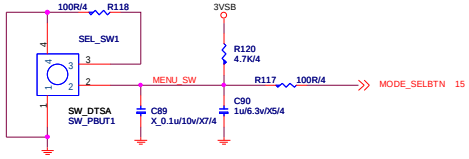
POWER ON/OFF BUTTON



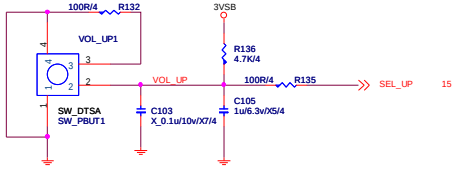
HDMI IN / PC / Monitor OFF BUTTON



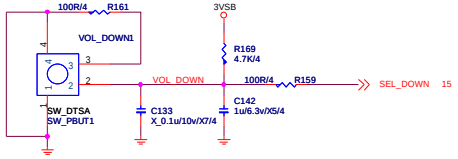
OSD MODE SELECT BUTTON

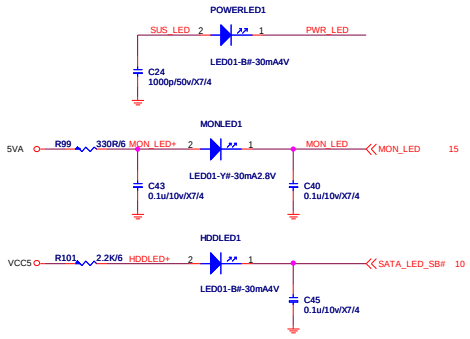


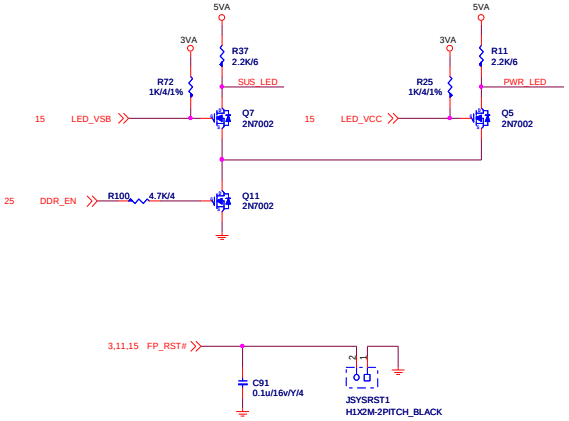
ITEM UP CONTROL



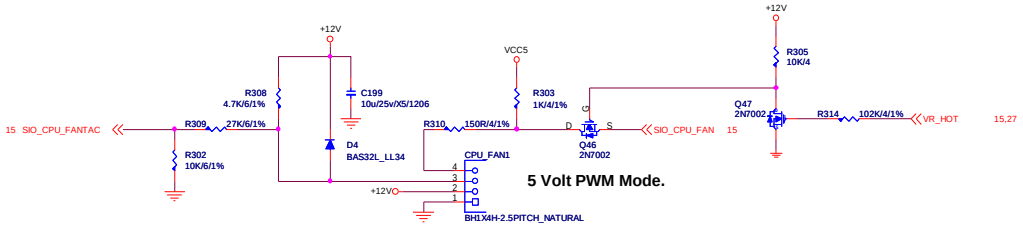
ITEM DOWN CONTROL

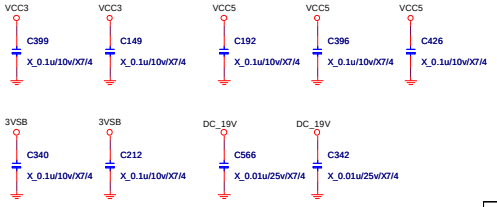






SYSTEM FAN





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PCB1
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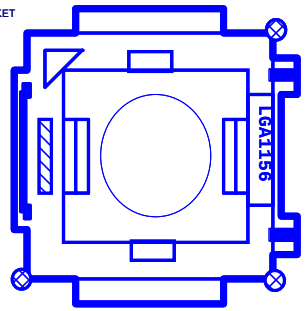
P80-AC95110-E48
P80-AC95110-G37

CPU SOCKET

CPU1_X1
CPU SOCKET



MSI P/N E21-AC71010-L06

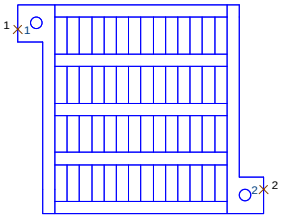
LABEL2
HDMI ROYALTY
HDMI_ROYALTY_0.15

CPU_BK1
CPU_backplate

BAT1
BAT-BT-CR2032

LABEL1
BIOS Label
BIOS LABEL

SB_SINK

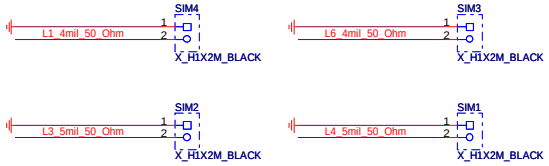


AURAS (0P103760)

Optical Fiducial Marks-120

FM2 FM7 FM4 FM9
FM8 FM1 FM6 FM5 FM3
X_FM

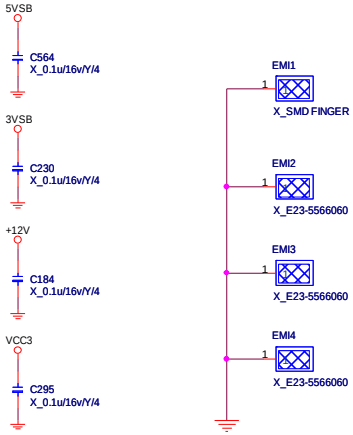
Simulation Single End 50ohm



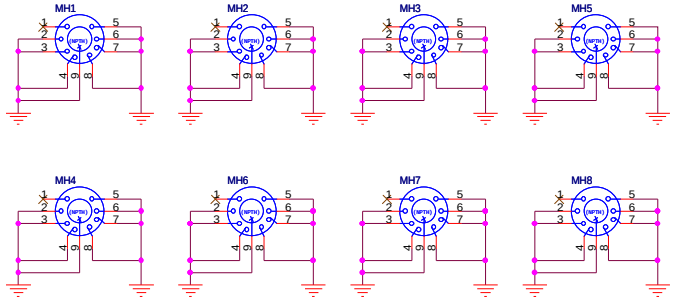
GPU Stand off

H1 H2 H4 H5
Spacer Support
E2B-7457020

EMI



Mounting Holes



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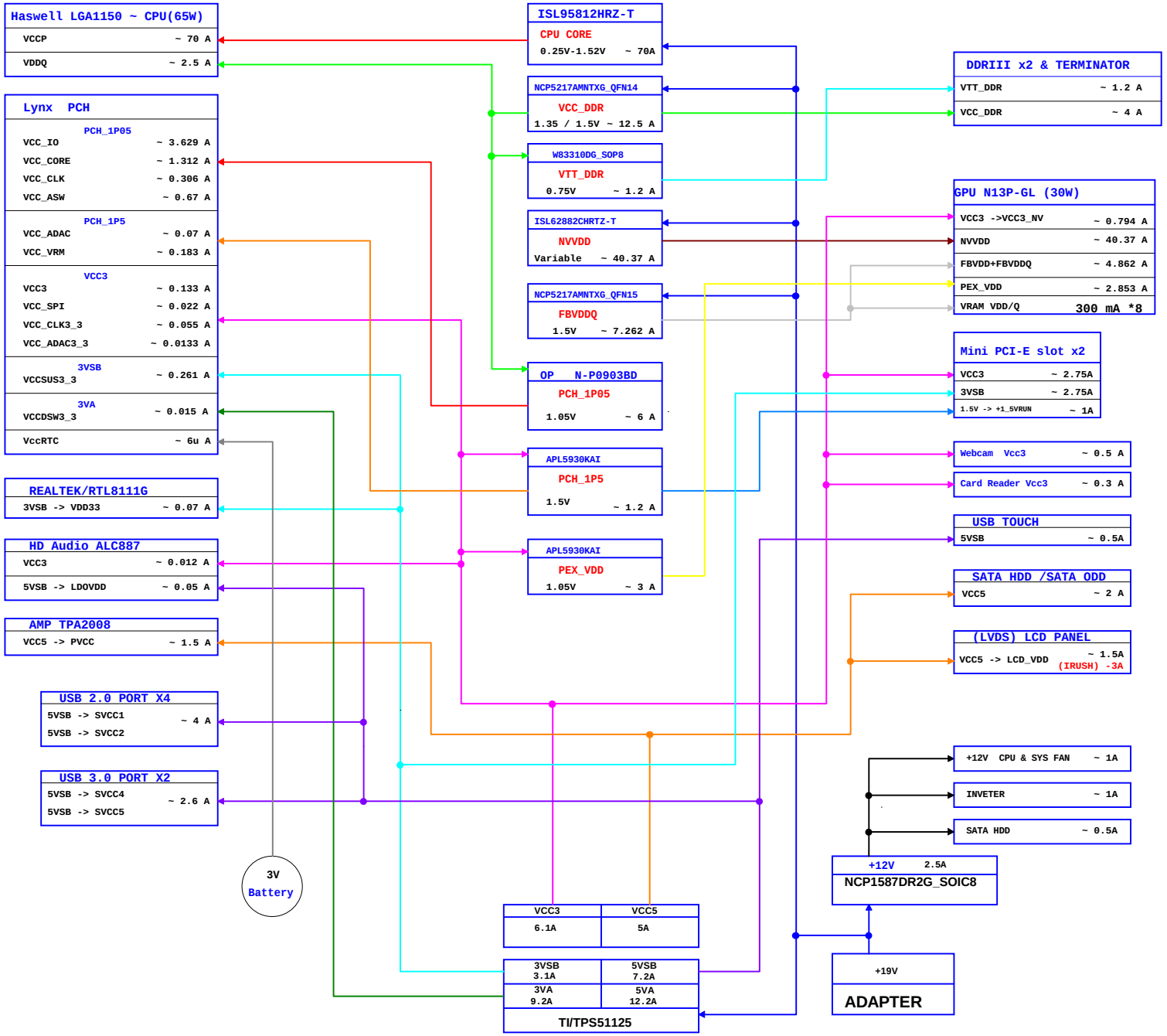

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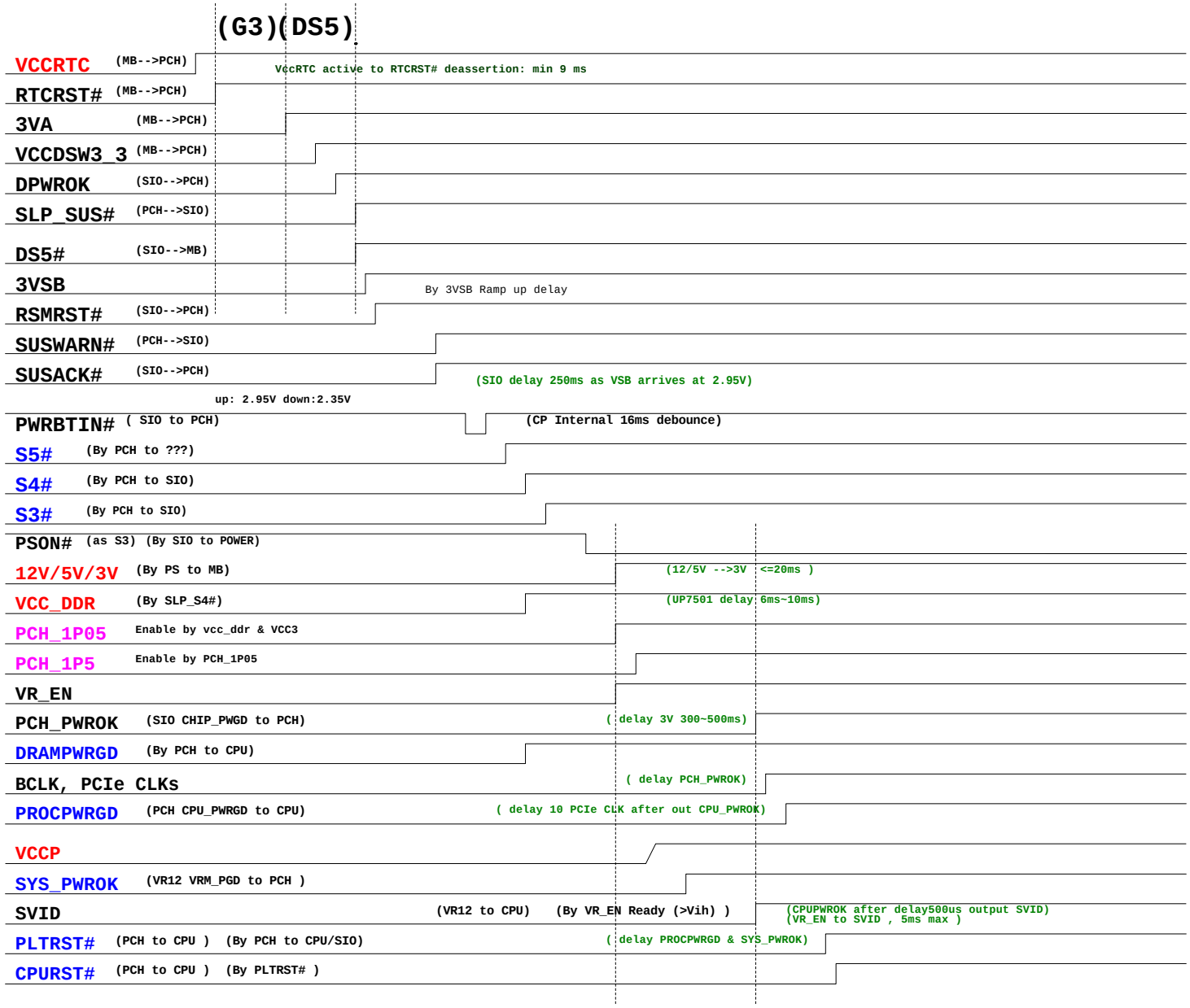
Lynx Point Platform

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	CHARGER_EN
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	CHARGER_S0
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 3VA	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 3VA	No USE
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	DDR_VCTL
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	PCIECLKREQ5#
GPIO45	PCIECLKRQ6#	I/O	Suspend	N	3.3V	Native	PCIECLKREQ6#	Pull-up 10K to 3VSB	PCIECLKREQ6#

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-up 10K to VCC3	No USE
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-up 10K to VCC3	No USE
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-up 10K to VCC3	No USE
GPIO69	Unmultiplexed	I/O	CORE	N	3.3V	GPI	PCH_GPIO69	Pull-up 10K to VCC3	No USE
GPIO70	Unmultiplexed	I/O	CORE	N	3.3V	Native	PCH_GPIO70	Pull-up 10K to VCC3	No USE
GPIO71	Unmultiplexed	I/O	CORE	N	3.3V	Native	PCH_GPIO71	Pull-up 10K to VCC3	No USE
GPIO72	BATLOW#	I/O	DSW	N	3.3V	Native	PCH_GPIO72	Pull-up 1K to 3VA	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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AIO MS-AC951 Version 1.0 *SCHEMATIC HISTORY*

Rev	Date	Page	Description
1.0	20130422	19	JHDDPWR1 change footprint and P/N : N32-1040D31-H06.
1.0	20130422	23	R707 from 1206 change to 0603.
1.0	20130422	27	Modify Gate and Phase circuit error.
1.0	20130422	45	Add HDMI In / Out Label.
1.0	20130422	9	C236 and C237 footprint from 0402 change to 0603.
1.0	20130422	16	C462 and C832 footprint from 0402 change to 0603.
1.0	20130422	17	C549 and C551 footprint from 0402 change to 0603.
1.0	20130422	18	C293 and C294 footprint from 0402 change to 0603.
1.0	20130422	41	C332 and C333 footprint from 0402 change to 0603.
1.0	20130422	21	Q90 from 2N3904 change to 2N7002.
1.0	20130422	19	R442 change to NC.
1.0	20130422	27	Q10 from 2N3904 change to APM2300C.
1.0	20130424	16	R999 , R1000 , C494 NC , Add R1011 1K Ohm for S5 VCC5 leakage.
1.0	20130424	32	U17 change to APL5913 SOP8 for thermal issue.
1.0	20130424	26	R301 from 10.7K change to 11K.
1.0	20130425	25	EC1 , Q124 change to NC for Power team suggest.
1.0	20130425	27	C37 from 33pf change to 100pf for power team suggest.
1.0	20130425	28	EC6 , EC7, EC11 change to NC for Power team suggest.
1.0	20130425	3	R52 from 0402 change to 0603, remove R39.
1.0	20130425	7	Add R1014 , C837, R1015 , R1016 , C838 , R1017 for DDR VREF.
1.0	20130425	8	Delete M_VREF_DQ_DIMM1 ; Add R1018 , C839 , R1019 for DDR VREF..
1.0	20130430	19	R423 NC ; R417 net from CHARGER_EN change to PPON2_EN , Avoid 5VSB leakage 0.3 volt.
1.0	20130506	29	Remove Q100 , R1004 , R614 , R625 , R626 , Q103 , C450 , R633 , R630 , R654 , R648. Add Q136 , Q137 , R1020 , R1021 , R1022 for HDMI OUT HPD.
1.0	20130508	16	PVCC change to 5VSB for HDMI in put audio, L56 change to NC.
1.0	20130510	11	Add R1023 for Quicksetting.
1.0	20130510	31	Y4 From DIP change to SMD for reduese ESR from 50 Ohm to 30 Ohm. C300 , C319 from 22pF change to 30pF.
1.0	20130510	35	Remove U21 circuit , because U21 over spec.
1.0	20130513	34	Delete C198 卡Thermal module, add C840 ~ C844.
1.0	20130513	11	C131 , C136 from 15pF change to 12pF.
1.0	20130513	41	C332 , C333 from 22pF change to 27pF.
1.0	20130513	21	Y6 from DIP change to SMD, C392, C393 from 16pF change to 27pF.
1.0	20130514	15	C638 from 15pF change to 12pF.