MS-16GB Ver : 0A (nVIDIA N13P-GS/GL)

Chief River Platform

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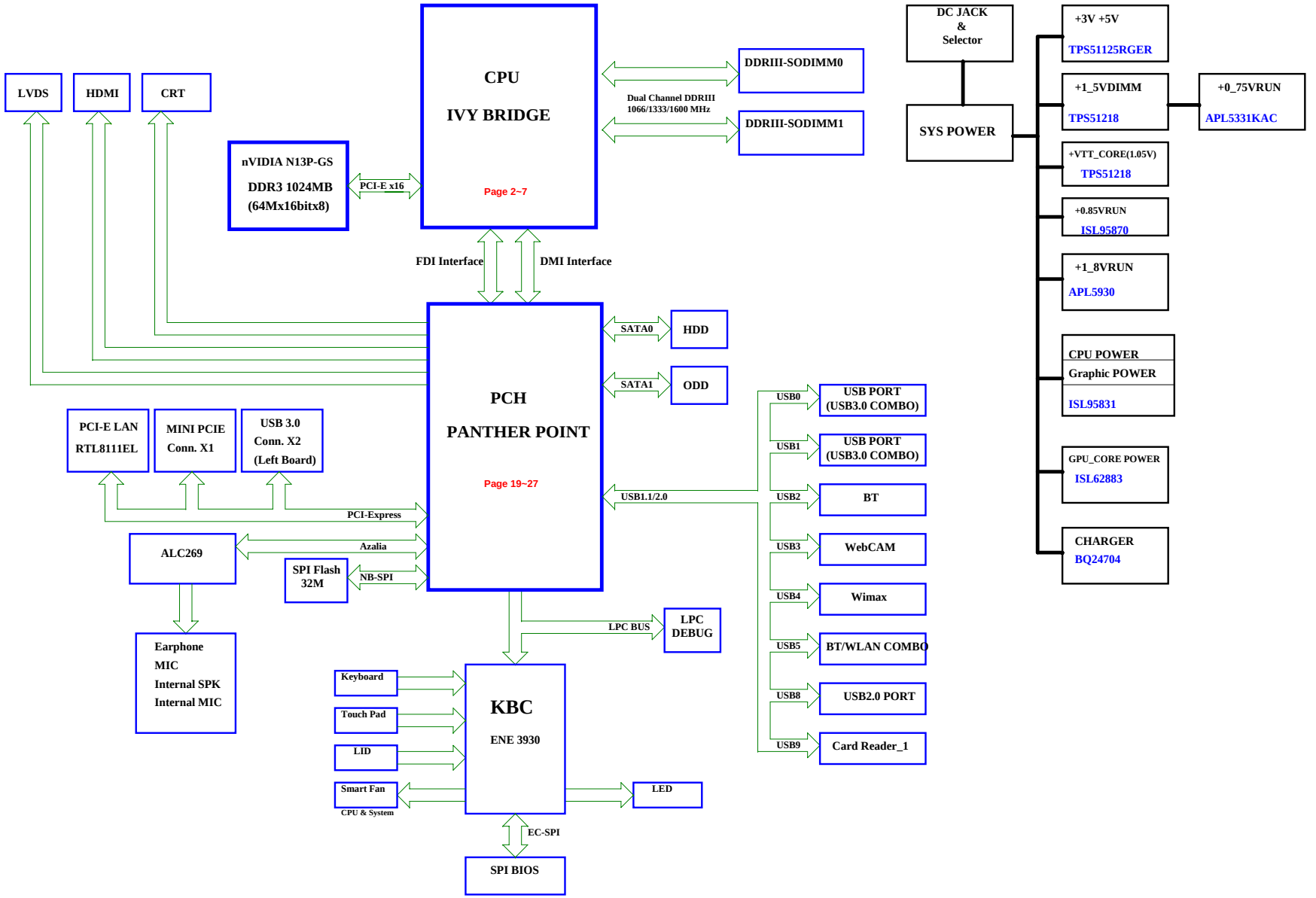

MICRO-STAR INT'L CO.,LTD.

BLOCK DIAGRAM

MS-16GB

Rev 1.0

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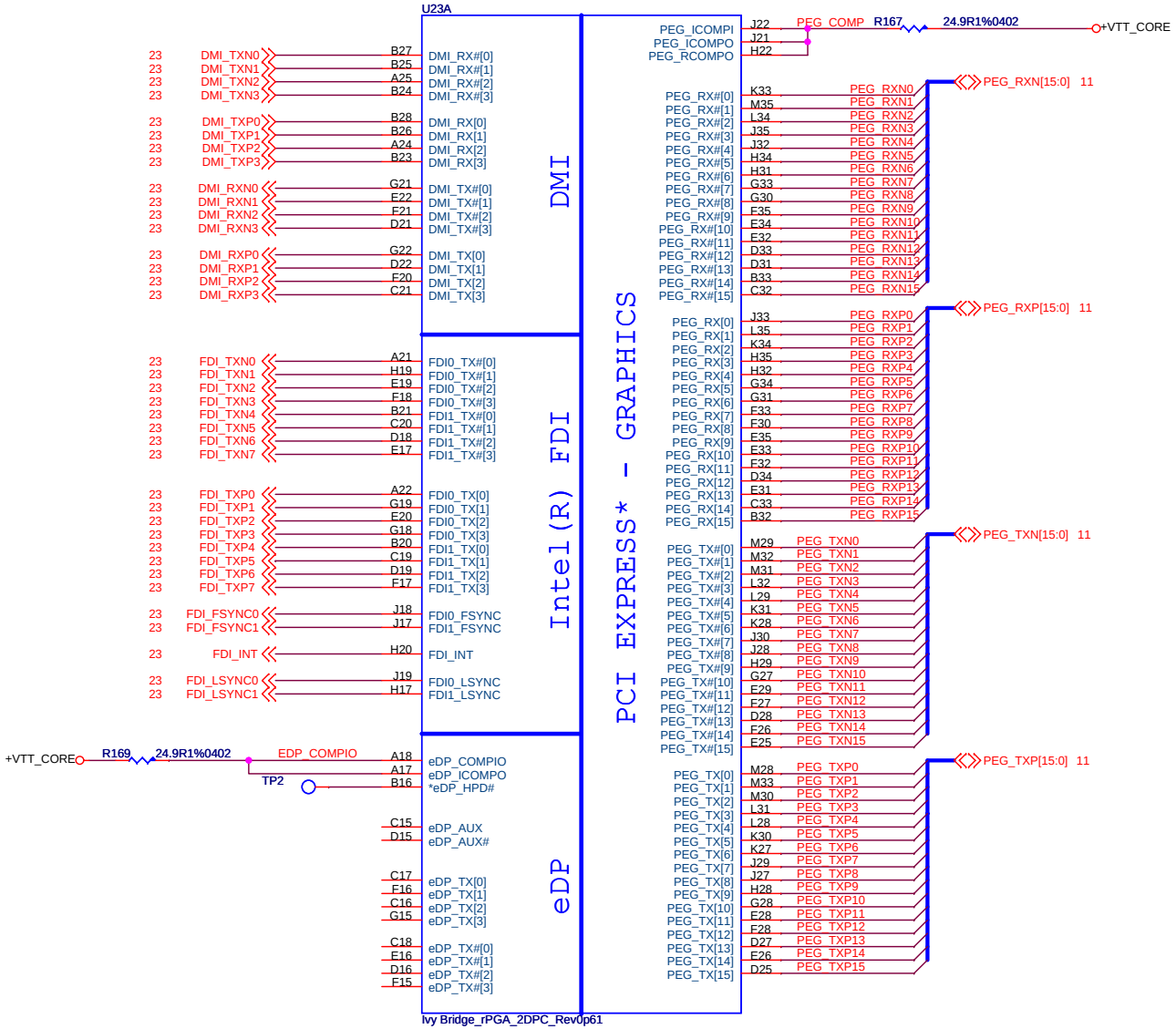
IVY BRIDGE PROCESSOR (HOST)



Title	PROCESSOR-1 (HOST BUS)		
Size B	Document Number MS-16GB		Rev 1.0
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IVY BRIDGE PROCESSOR(CLK,MISC,JTAG)

U23B

MISC
PROC_SELECT#
SKTOCC#
CATERR#
PECI
PROCHOT#
THERMTRIP#

CLOCKS
BCLK
BCLK#
DPLL_REF_CLK
DPLL_REF_CLK#

DDR3 MISC
SM_DRAMRST#
SM_RCOMP[0]
SM_RCOMP[1]
SM_RCOMP[2]

THERMAL

PWR MANAGEMENT
PM_SYNC
UNCOREPWRGOOD
SM_DRAMPWROK
RESET#

JTAG & BPM
PRDY#
PREQ#
TCK
TMS
TRST#
TDI
TDO
DBR#
BPM#[0]
BPM#[1]
BPM#[2]
BPM#[3]
BPM#[4]
BPM#[5]
BPM#[6]
BPM#[7]

Ivy Bridge_rPGA_2DPC_Rev0p61

26 H_SNB_IVB# C26
TPJNC29 SKTOCC# AN34
TPJNC30 H_CATERR# AL33
26,31 H_PECI AN33
31 EC_PROCHOT# R310 X_0R0402 PROCHOT# R R158 0R0402 H_PROCHOT# AL32
26 H_THRMTRIP# AN32
23 H_PM_SYNC AM34
26 H_CPUPWRGD AP33
R150 10KR0402
VDDPWRGOOD_R V8
25 BUF_PTL_RST#
R289 1.47KR1%0402
R288 681R1%0402
PLT_RST# R AR33
1.045V

BCLK A28 CLK_EXP 22
BCLK# A27 CLK_EXP# 22
DPLL_REF_CLK A16 R294 1KR1%0402
DPLL_REF_CLK# A15 R295 1KR1%0402 +VTT_CORE
SM_DRAMRST# R8 CPUDRAMRST#
SM_RCOMP[0] AK1 SM_RCOMP0JNC R172 140R1%0402
SM_RCOMP[1] A5 SM_RCOMP1JNC R296 25.5R1%0402
SM_RCOMP[2] A4 SM_RCOMP2JNC R297 200R1%0402

PRDY# AP29
PREQ# AP27 XDP_PREQ#
TCK AR26 XDP_TCLK
TMS AR27 XDP_TMS
TRST# AP30 XDP_TRST#
TDI AP28 XDP_TDI
TDO AP26 XDP_TDO
DBR# AL35 XDP_DBRESET#
BPM#[0] AT28
BPM#[1] AR29
BPM#[2] AR30
BPM#[3] AT30
BPM#[4] AR32
BPM#[5] AR31
BPM#[6] AT31
BPM#[7] AR32

+VTT_CORE
R148 68R0402
R310 X_0R0402
R158 0R0402

If use EC_PROCHOT# , R310 need staff, R148 need change to 62ohm, R158 need change to 56ohm;

PLT_RST#_R set 1v level: R334 1.5K , R3370 649R:
PLT_RST#_R set 1.05v level: R334 1.47K , R3370 681R:

[Fuqun] Follow MS-16F3

+3VRUN
+VTT_CORE
C447 X_C0.1u10X0402
R292 X_68R0402
R290 X_40.2R1%0402
U22 X_SN74LVC1G07

[Fuqun] Not need pull high follow DPDG

+VTT_CORE
RN5
XDP_TDI 1 2
XDP_TMS 3 4
XDP_PREQ# 5 6
XDP_TCLK 7 8
X_8P4R-51R/4

XDP_TRST# R149 X_51R1%0402
+3VRUN
XDP_DBRESET# R153 1KR1%0402
+VTT_CORE
XDP_TDO R309 X_51R1%0402

+1_5VRUN
+3VSUS
R306 200R1%0402
R180 130R1%0402
R182 X_1.5KR5%0402
C295 X_C0.1u10X0402
U11A X_NC7WZ14P6X_SC70
R176 X_10KR0402
R183 X_10KR0402
R177 X_20KR1%0402
C294 X_C1u6.3Y0402
Z0301
Q12 X_N-SST3904_SOT23
23 PM_DRAM_PWRGD
U10 X_S08P5X_SC70
Z0302
R179 X_1.5KR1%0402
R178 X_1.27KR1%0402
VDDPWRGOOD_R
1.5V
R181 X_0R0402
+1_5VRUN_PWGD 41

+1_5VDIMM
Q10放碘乙R62放1K
R186 X_1KR0402
R185 0R0402
Q13 X_N-BSS138_SOT23
9,10 DDR3_DRAMRST# R190
6,22 DRAMRST_CNTRL_PCH R188
CPUDRAMRST#
R184 X_4.99KR1%0402
C305 X_C0.047u10X0402

Title	PROCESSOR-2 (MISC)		
Size	Document Number		Rev
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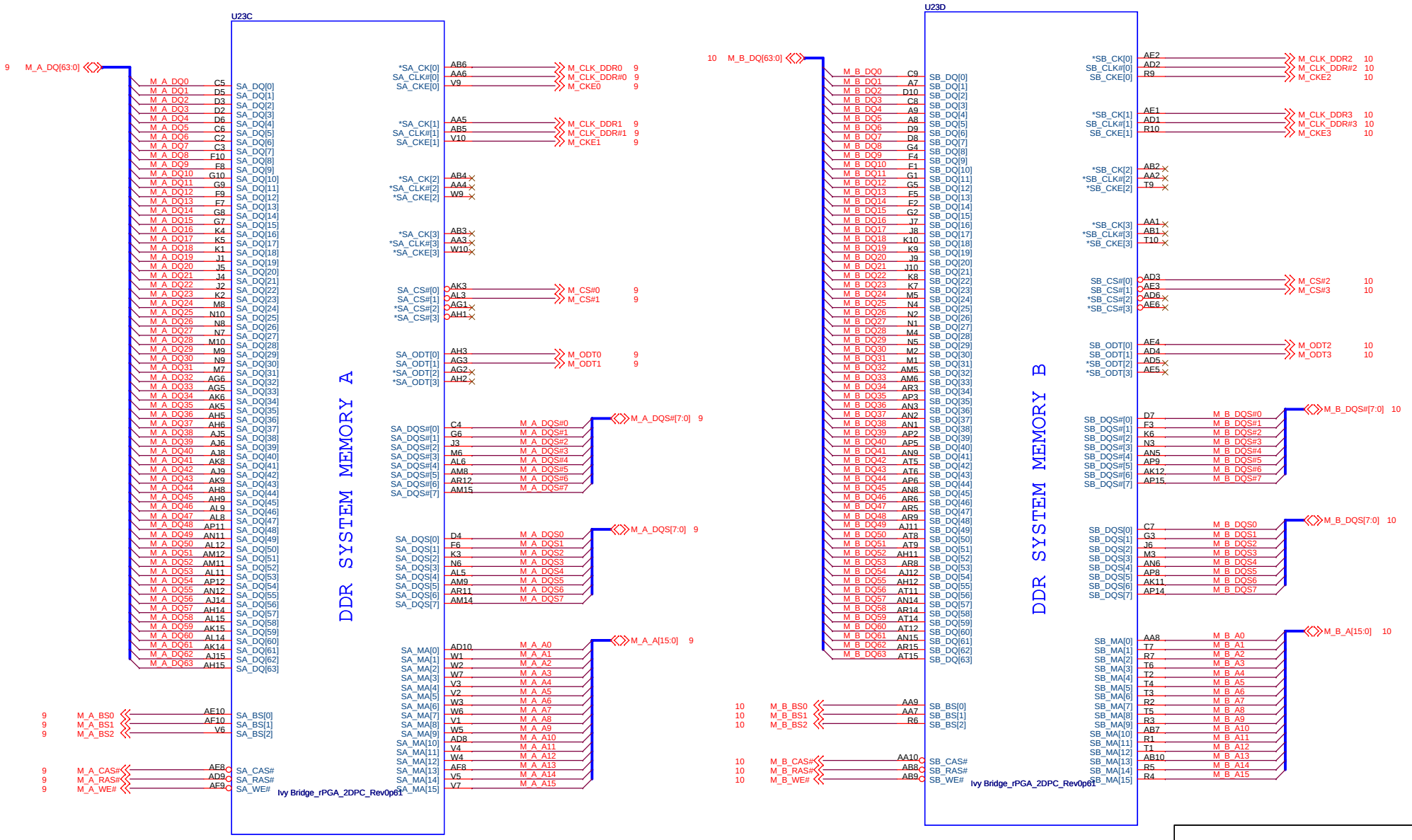
IVY BRIDGE PROCESSOR (DDR3)



Title	PROCESSOR-3 (DDR3)
Size	Custom
Document Number	MS-16GB
Rev	1.0
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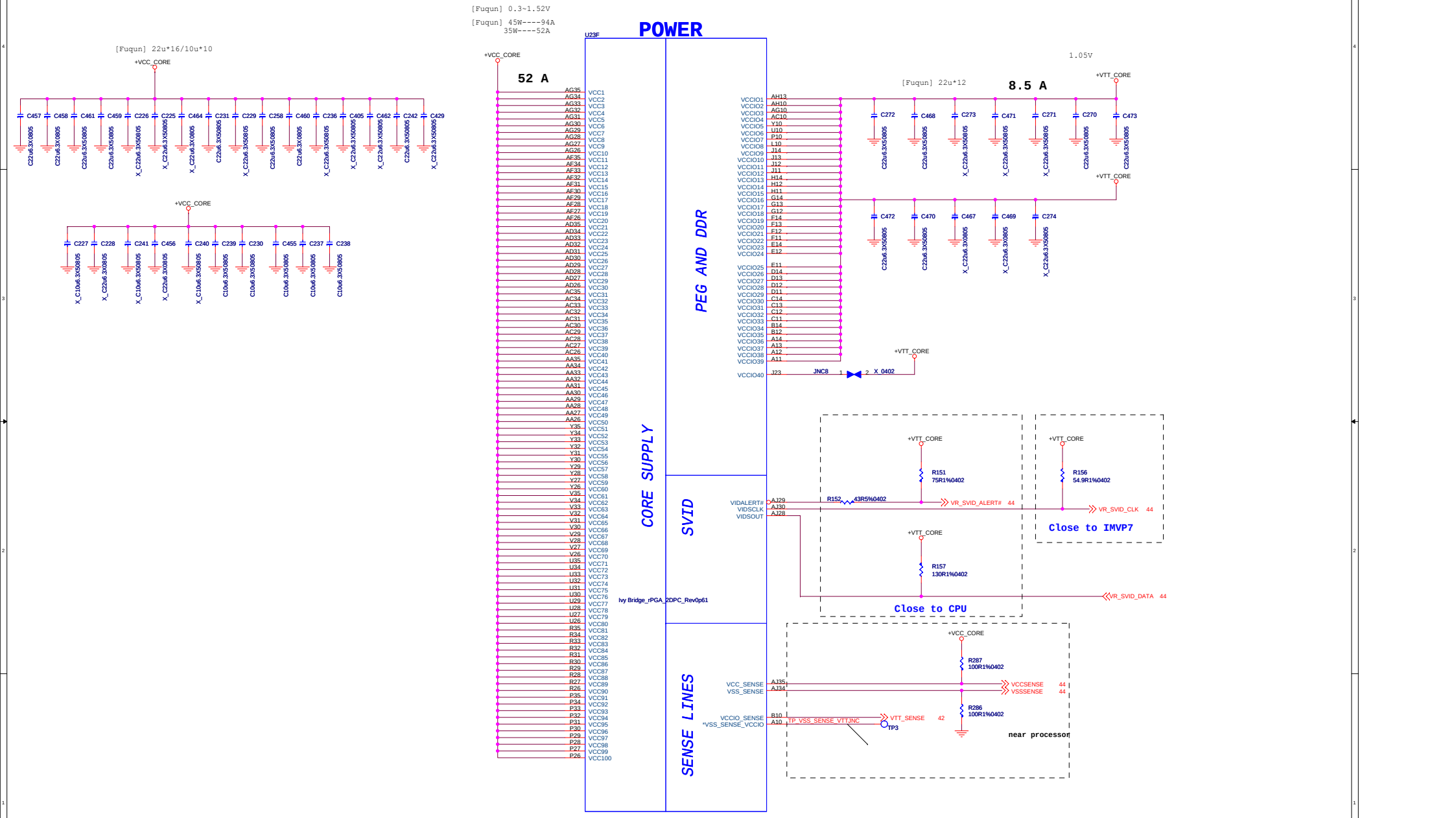
IVY BRIDGE PROCESSOR (POWER)



Title	PROCESSOR-4 (POWER)	
Size: C	Document Number: MS-16GB	Rev: 1.0
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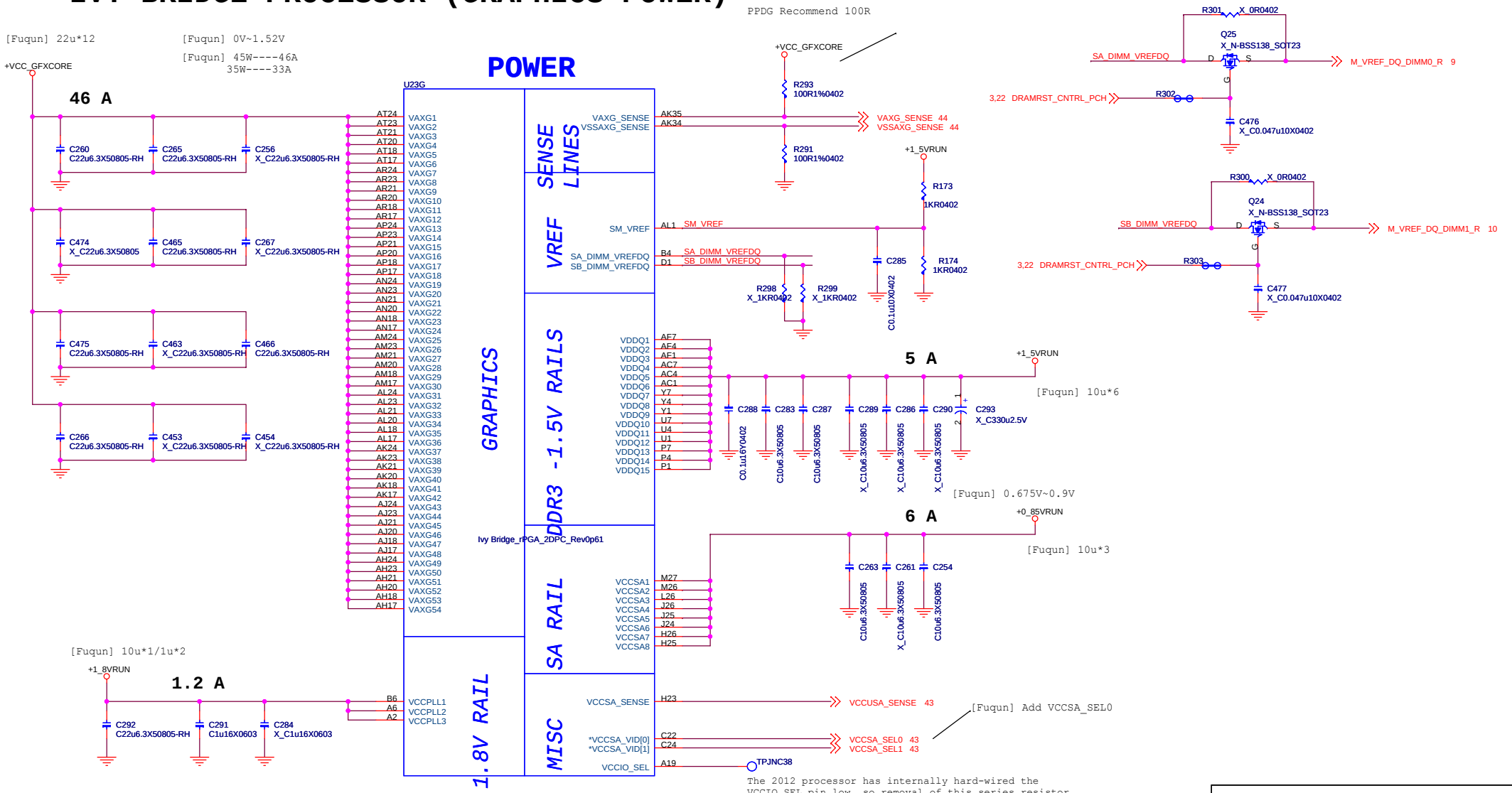
IVY BRIDGE PROCESSOR (GRAPHICS POWER)



Title	PROCESSOR-5 (GRAPHICS POWER)		
Size: Custom	Document Number: MS-16GB		Rev: 1.0
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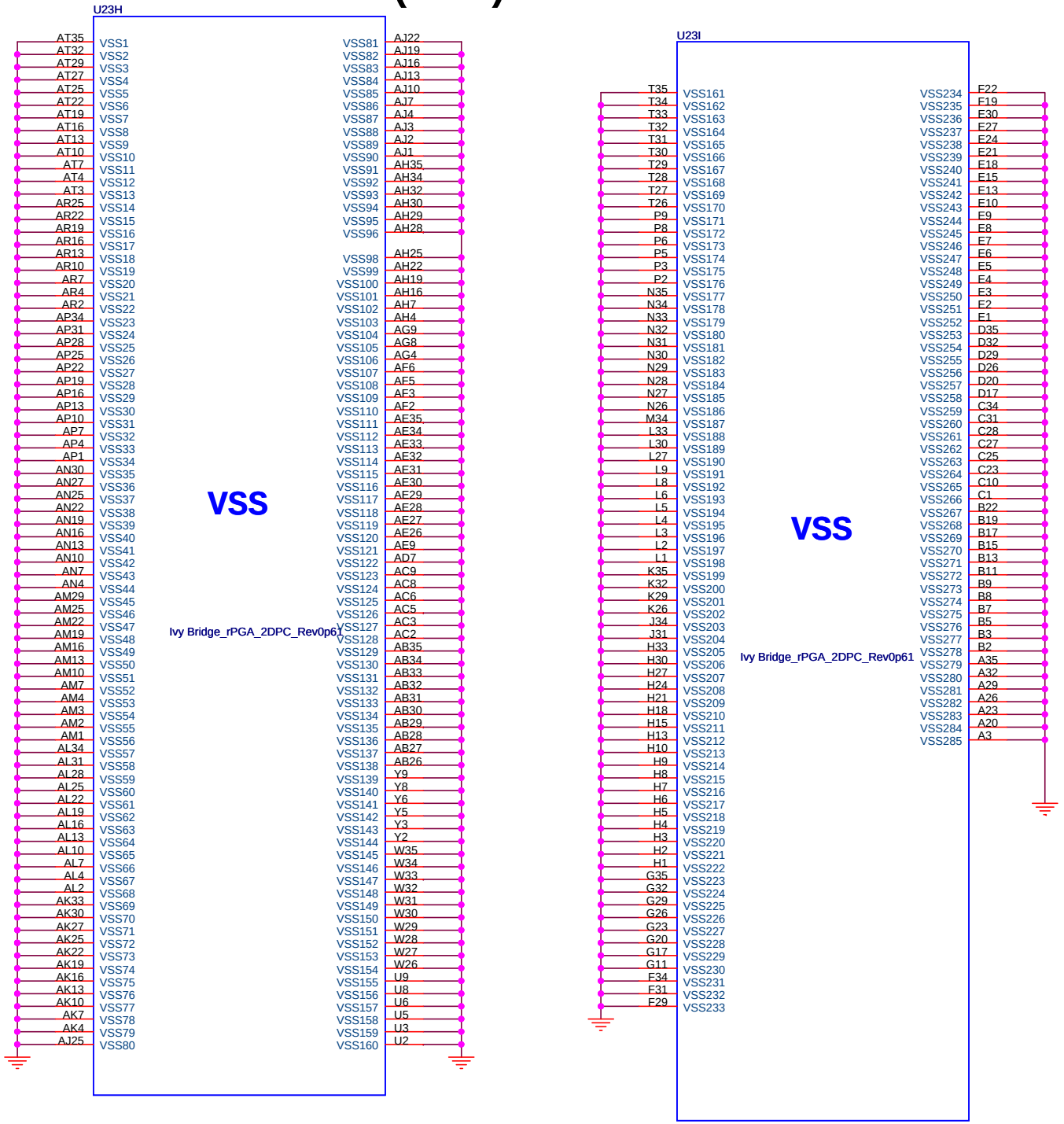
IVY BRIDGE PROCESSOR (GND)



Title	PROCESSOR-6 (GND)	
Size: Custom	Document Number: MS-16GB	Rev: 1.0
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IVY BRIDGE PROCESSOR (RESERVED)

U23E

UMA: NC R155

R155 1KR0402

CFG2 TPJNC35
CFG3 TPJNC36
CFG4 TPJNC33
CFG5 TPJNC31
CFG6

AK28 CFG[0]
AK29 CFG[1]
AL26 CFG[2]
AL27 CFG[3]
AK26 CFG[4]
AL29 CFG[5]
AL30 CFG[6]
AM31 CFG[7]
AM32 CFG[8]
AM30 CFG[9]
AM28 CFG[10]
AM26 CFG[11]
AN28 CFG[12]
AN31 CFG[13]
AN26 CFG[14]
AM27 CFG[15]
AK31 CFG[16]
AN29 CFG[17]

TPJNC64 AJ31 VAXG_VAL_SENSE
TPJNC32 AH31 VSSAXG_VAL_SENSE
TPJNC63 AJ33 VCC_VAL_SENSE
TPJNC28 AH33 VSS_VAL_SENSE

AJ26 RSVD5

F25 RSVD8
F24 RSVD9
F23 RSVD10
D24 RSVD11
G25 RSVD12
G24 RSVD13
E23 RSVD14
D23 RSVD15
C30 RSVD16
A31 RSVD17
B30 RSVD18
B29 RSVD19
D30 RSVD20
B31 RSVD21
A30 RSVD22
C29 RSVD23

J20 RSVD24
B18 RSVD25

J15 RSVD27

RESERVED

Ivy Bridge_rPGA_2DPC_Rev0p61

*VCC_DIE_SENSE AH27 TPJNC34
*VSS_DIE_SENSE AH26 TPJNC37

these PINs for debug purpose

RSVD28 L7 TPJNC39
RSVD29 AG7 TPJNC41
RSVD30 AE7 TPJNC40
RSVD31 AK2 TPJNC43
RSVD32 W8

RSVD33 AT26
RSVD34 AM33
RSVD35 AJ27

RSVD37 T8
RSVD38 J16
RSVD39 H16
RSVD40 G16

*RSVD_NCTF1 AR35
*RSVD_NCTF2 AT34
*RSVD_NCTF3 AT33
*RSVD_NCTF4 AP35
*RSVD_NCTF5 AR34

*RSVD_NCTF6 B34
*RSVD_NCTF7 A33
*RSVD_NCTF8 A34
*RSVD_NCTF9 B35
*RSVD_NCTF10 C35

RSVD51 AJ32
RSVD52 AK32

*BCLK_ITP AN35 TPJNC66
*BCLK_ITP# AM35 TPJNC65

*RSVD_NCTF11 AT2
*RSVD_NCTF12 AT1
*RSVD_NCTF13 AR1

KEY B1 TPJNC42

CFG2 - PCI-Express Static Lane Reversal	
CFG2	1 :Normal Operation 0 :Lane Numbers Reversed 15 -> 0, 14 -> 1, ...

CFG4 - Display Port Presence	
CFG4	1:Disabled; No Physical Display Port attached to Embedded Display Port 0:Enabled; An external Display Port device is connected to the Embedded Display Port

PCI-Express Configuration Select	
CFG[5:6]	11:Default X16-device 1 functions 1 and 2 disabled 10: X8 X8-device 1 functions 1 enable, function2 disabled 01:Reserved--(device 1 functions 1disabled function2 enable 00: X8 X4 X4-device 1 functions 1 and 2 enable

Title: PROCESSOR-7 (RESERVE)			
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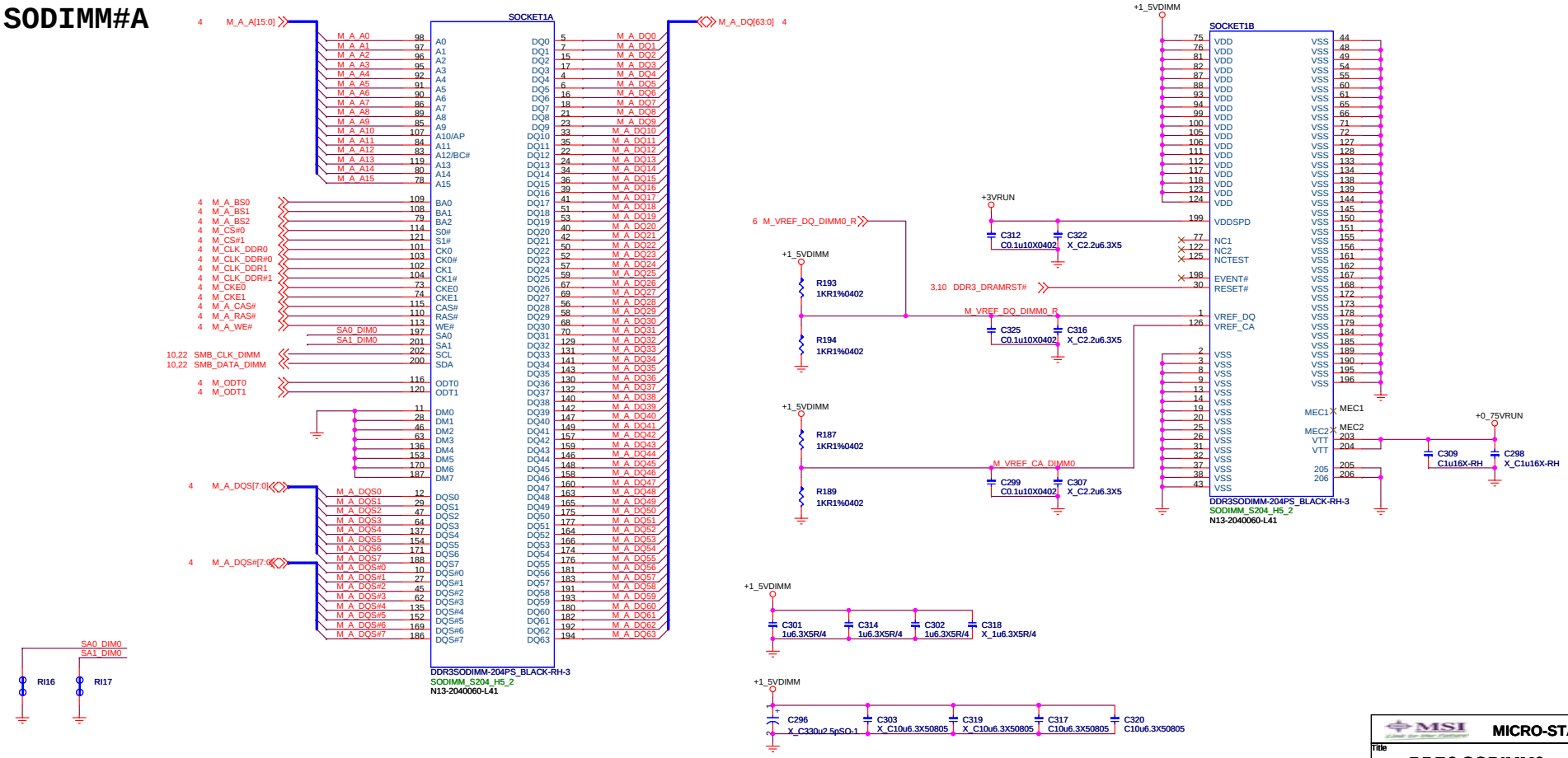
SODIMM#A



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Title: DDR3 SODIMM0			
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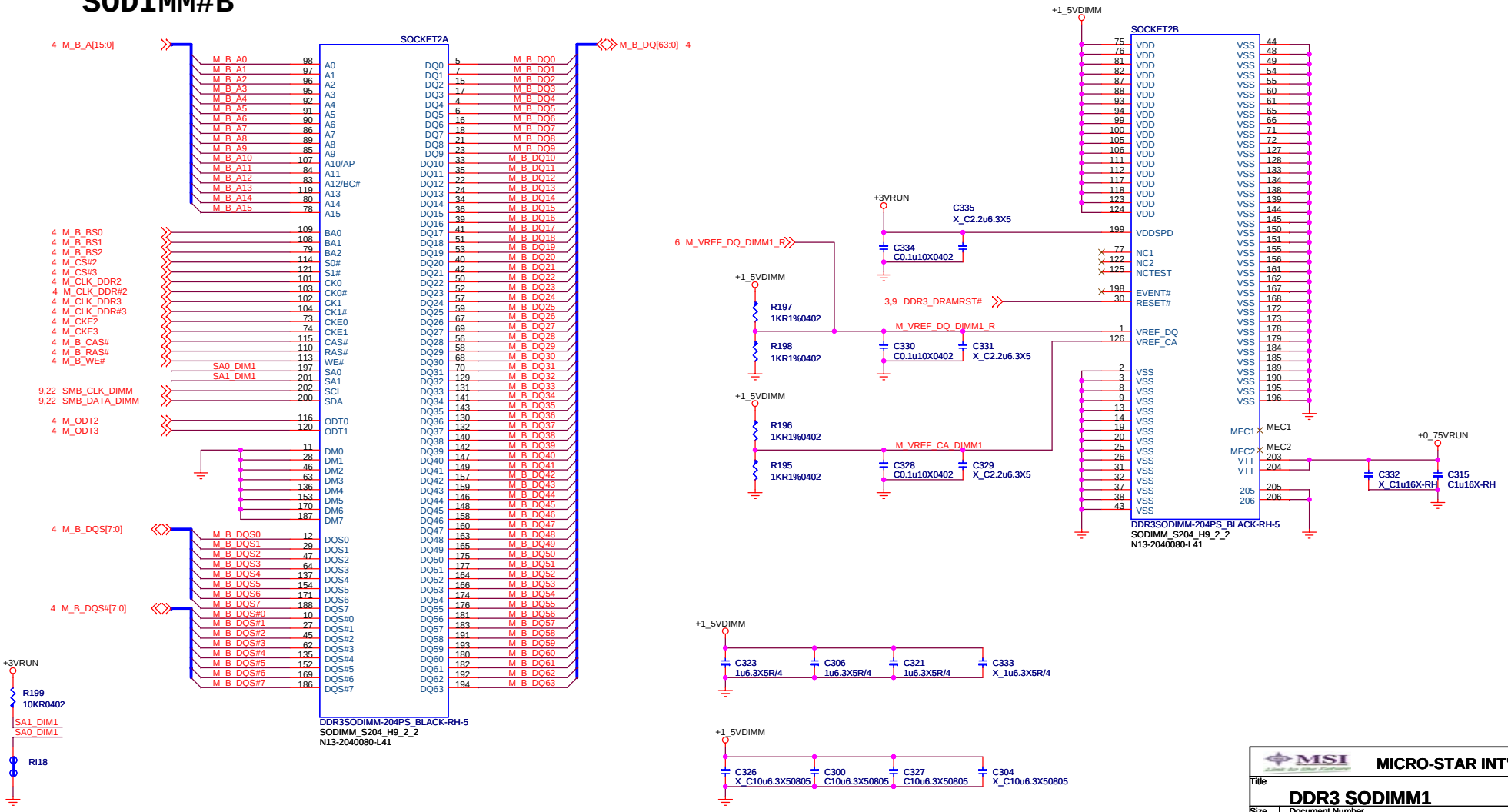
SODIMM#B



MICRO-STAR INT'L CO.,LTD.			
Title: DDR3 SODIMM1			
Size: Custom	Document Number: MS-16GB		Rev: 1.0
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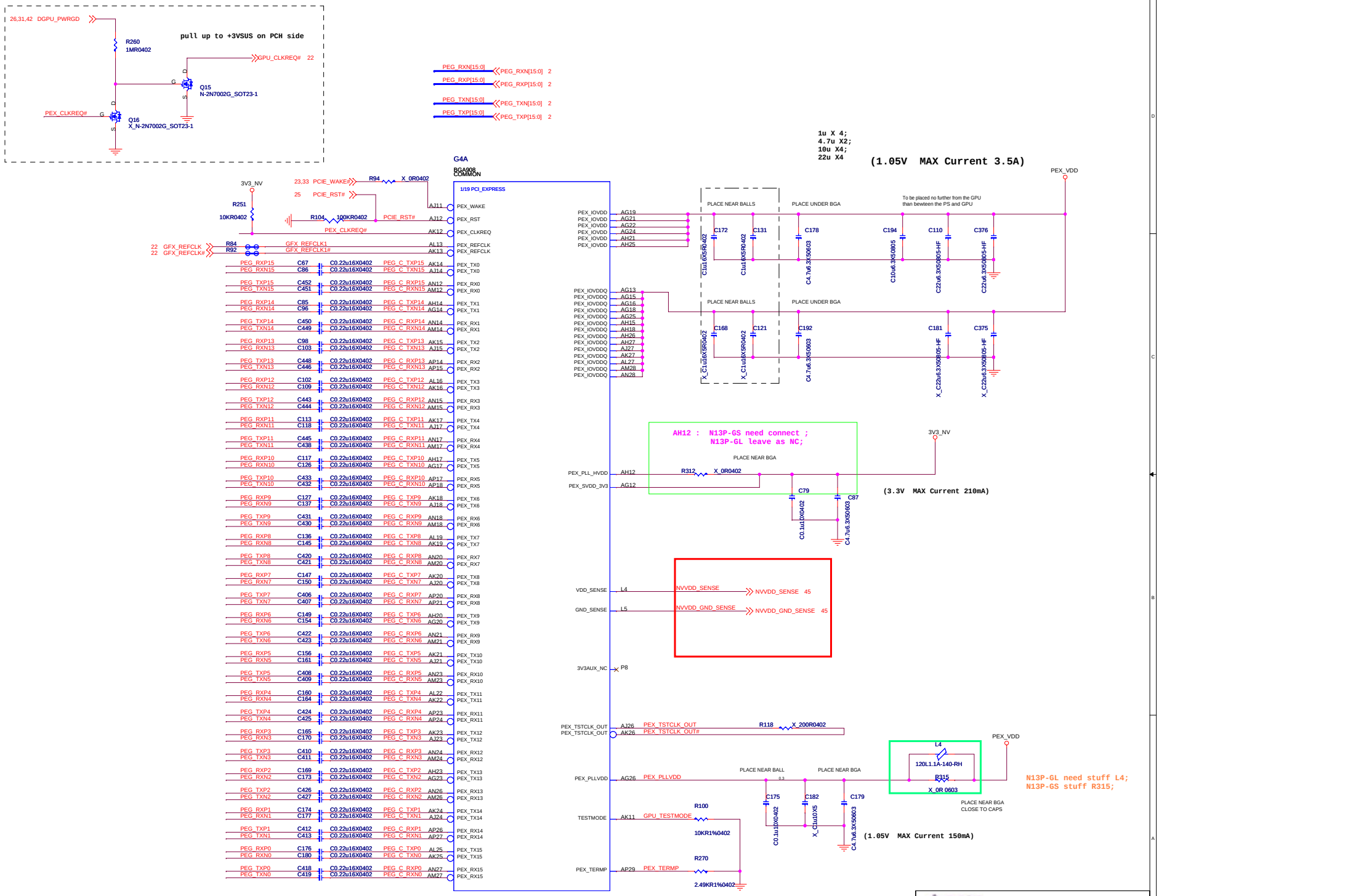

Title	N13P-GS/GL_PCIE Host
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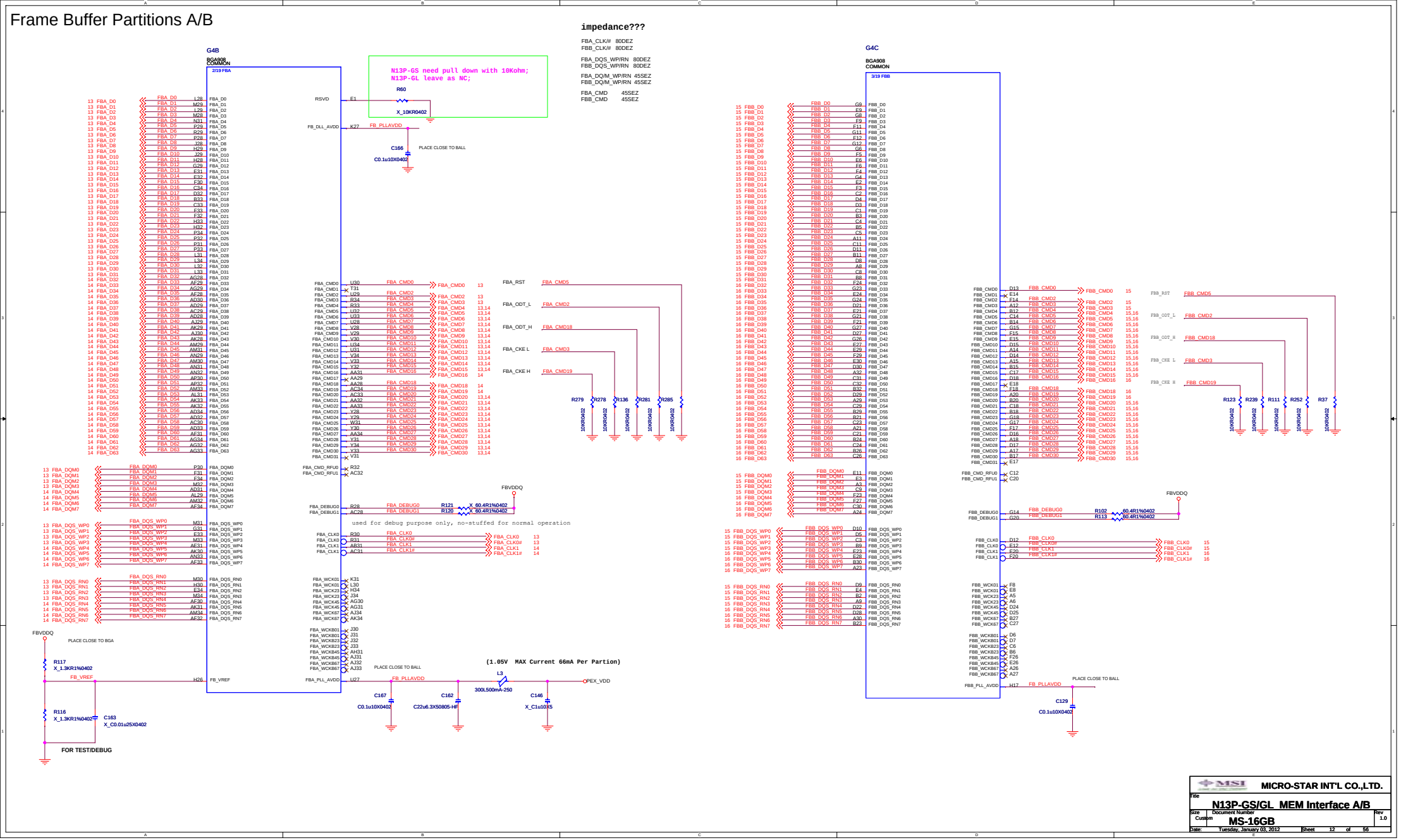
Frame Buffer Partitions A/B



MICRO-STAR INT'L CO.,LTD.			
Title: N13P-GS/GL MEM Interface A/B			
Size: Custom	Document Number: MS-16GB		Rev: 1.0
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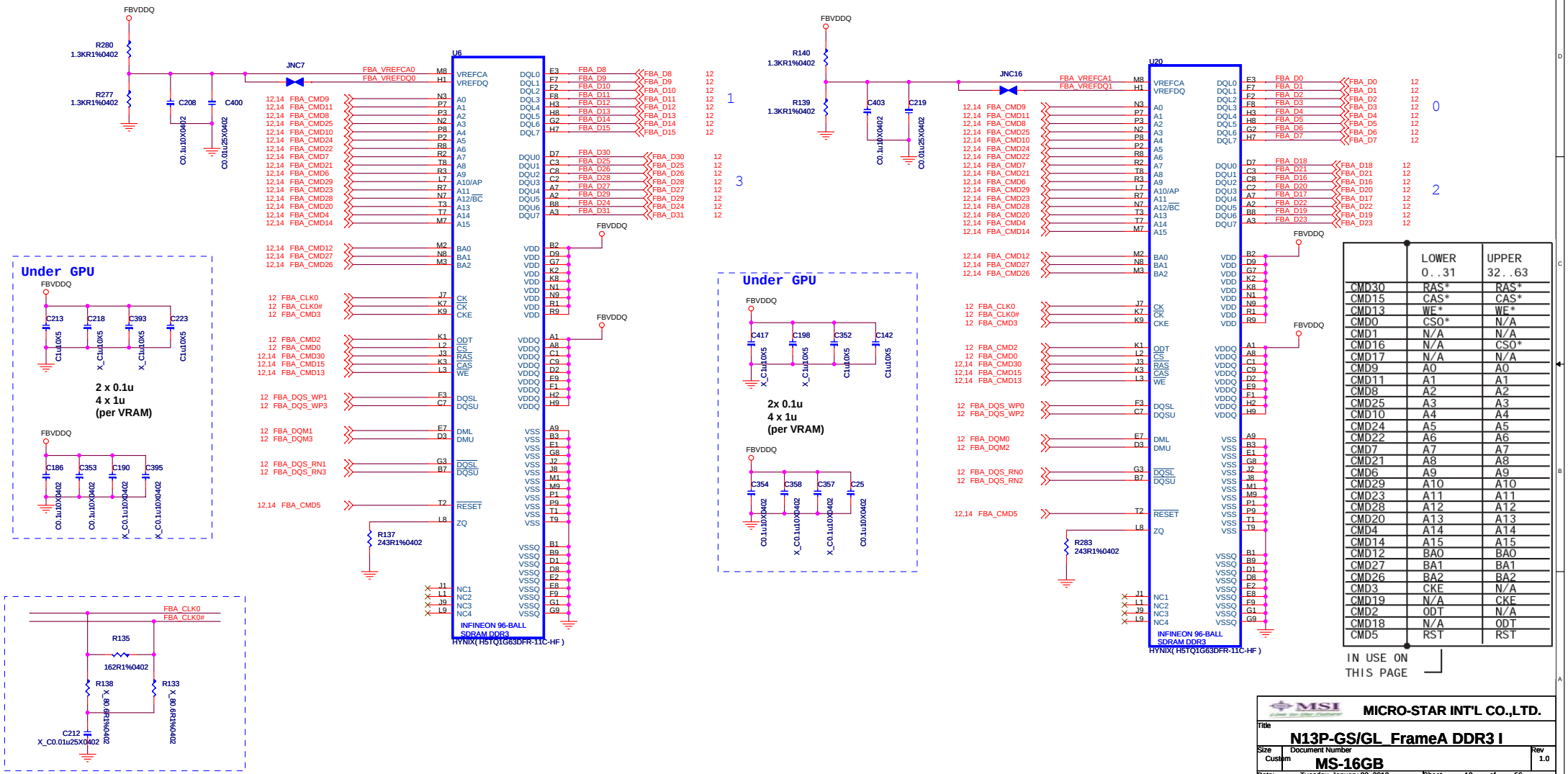
Memory Lower Partition A



	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

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MICRO-STAR INT'L CO.,LTD.

Title: N13P-GS/GL FrameA DDR3 I

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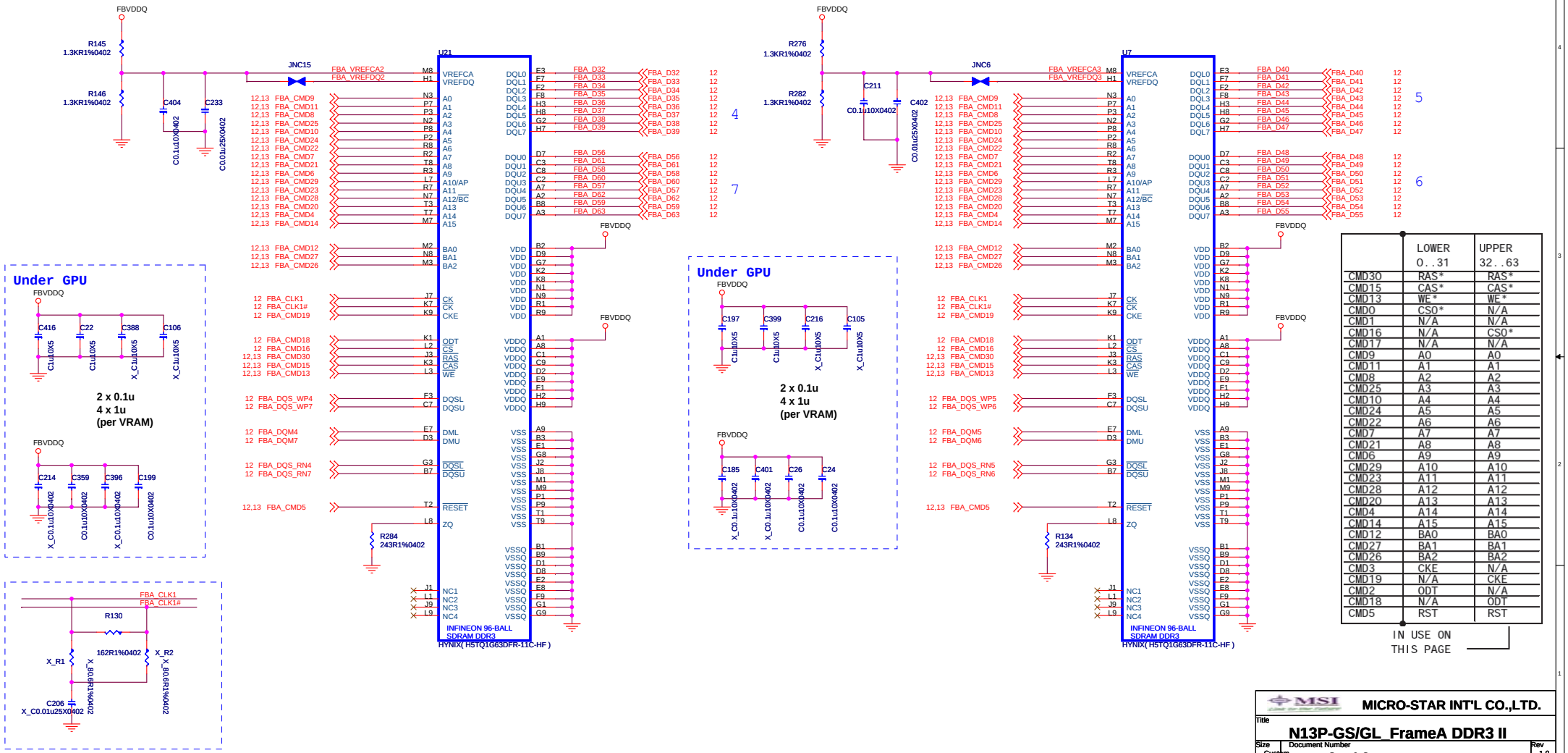
Memory Upper Partition A



	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

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MSI MICRO-STAR INT'L CO.,LTD.

Title: N13P-GS/GL FrameA DDR3 II

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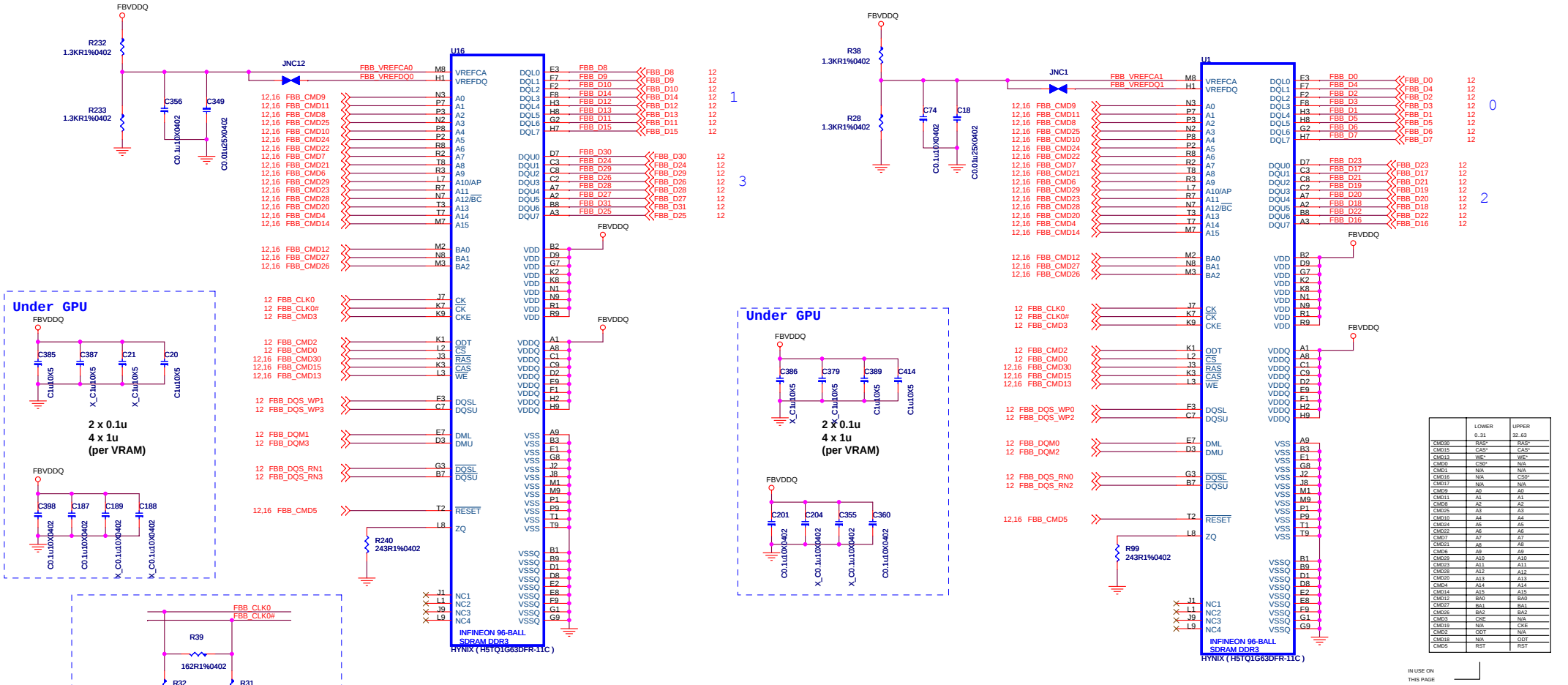
Memory Lower Partition B



	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

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MSI	MICRO-STAR INT'L CO.,LTD.	
Title	N13P-GS/GL_FrameB DDR3 I	
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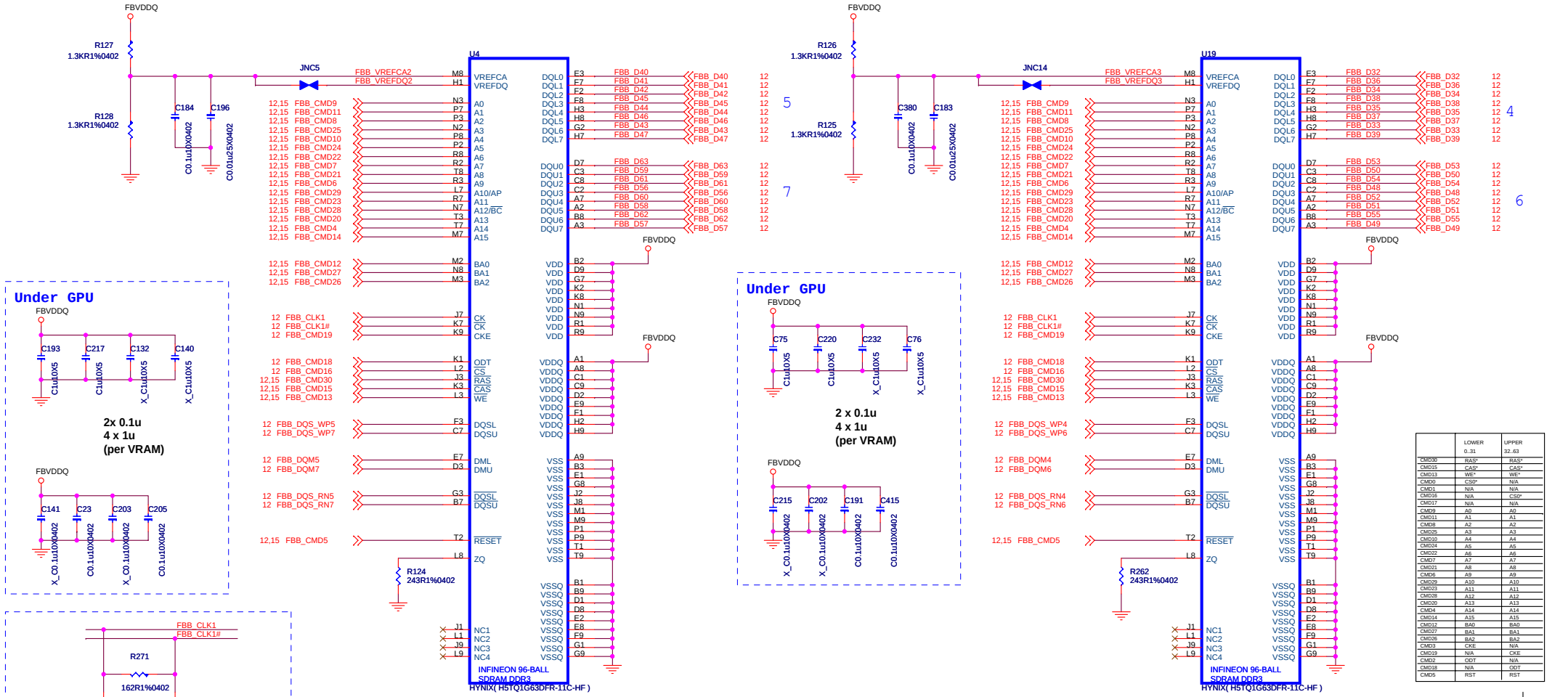
Memory Upper Partition B



	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

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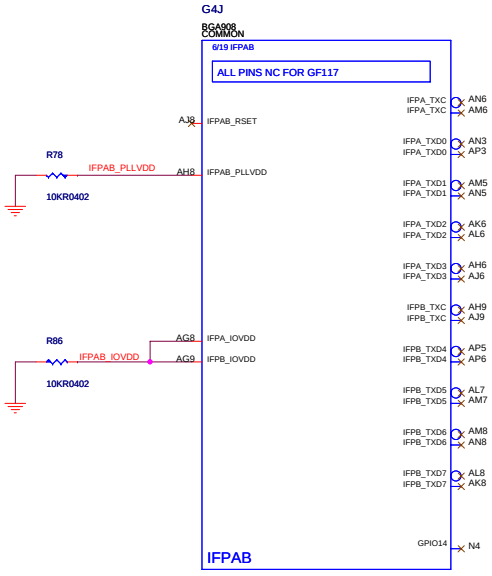
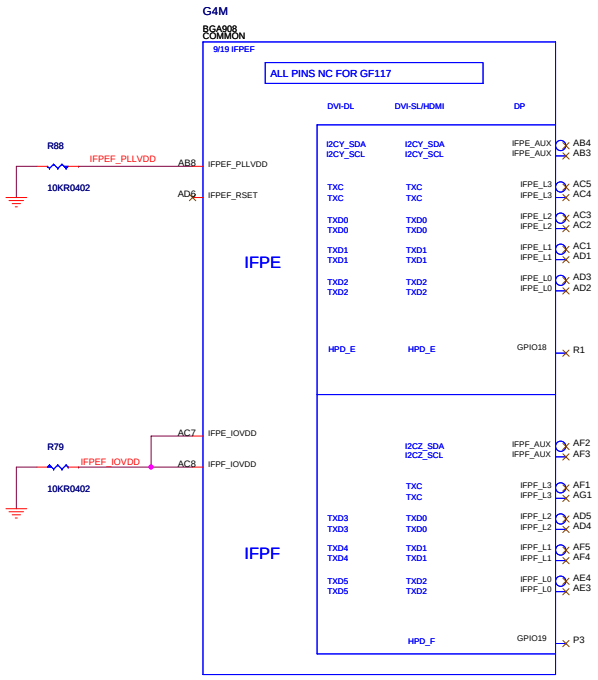
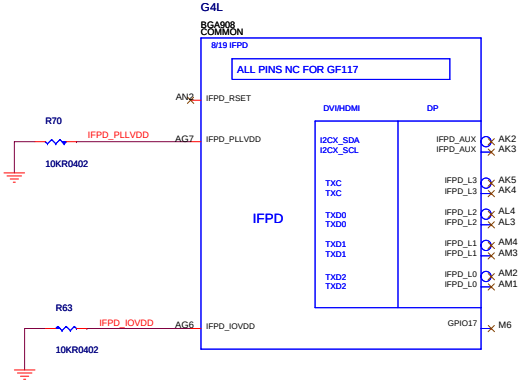
IFPA/B LVDS Dual Link



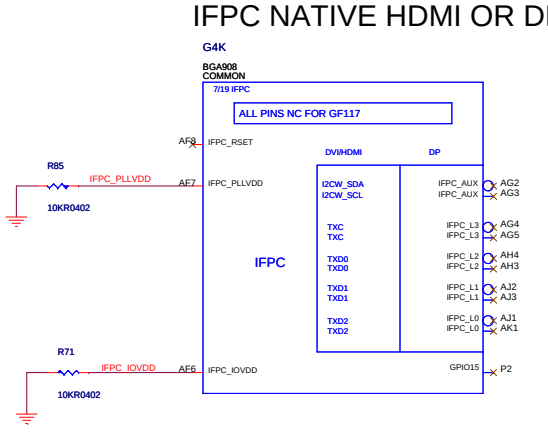
IFPE/F Dual Link TMDS DVI-I



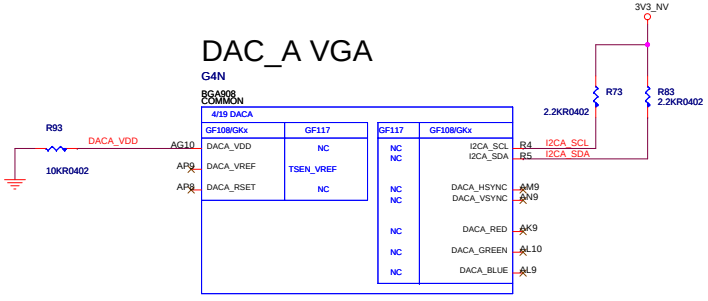
IFPD DUAL MODE DP



IFPC NATIVE HDMI OR DP



DAC_A VGA



MSI MICRO-STAR INT'L CO.,LTD.

Title

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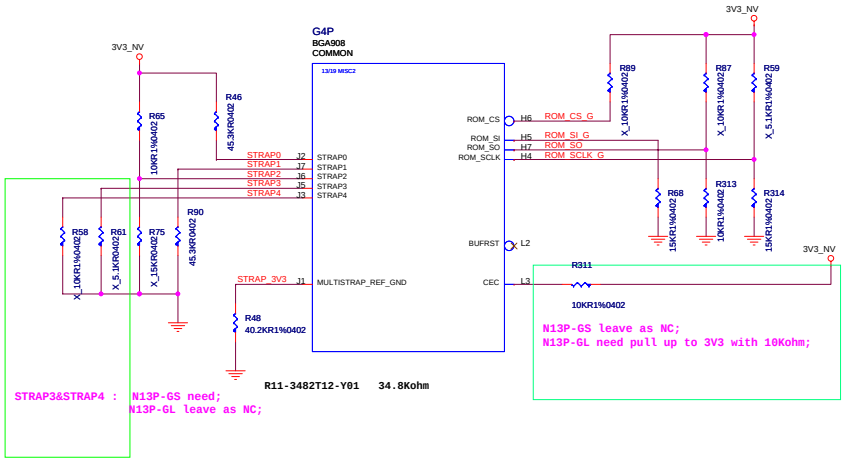
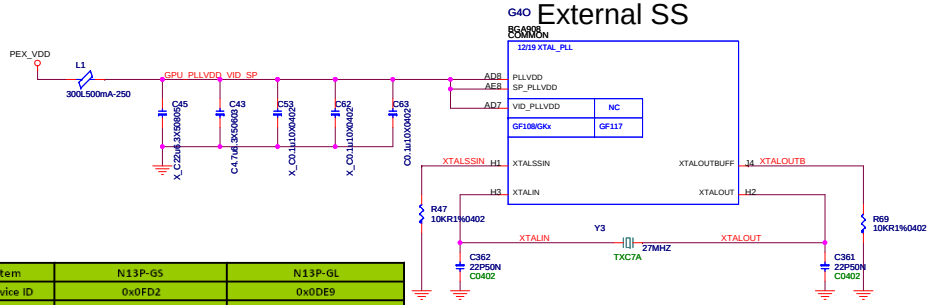
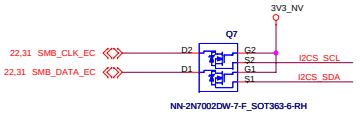
GPIOs, Thermal Sensor, I2C/GPIO Expanders



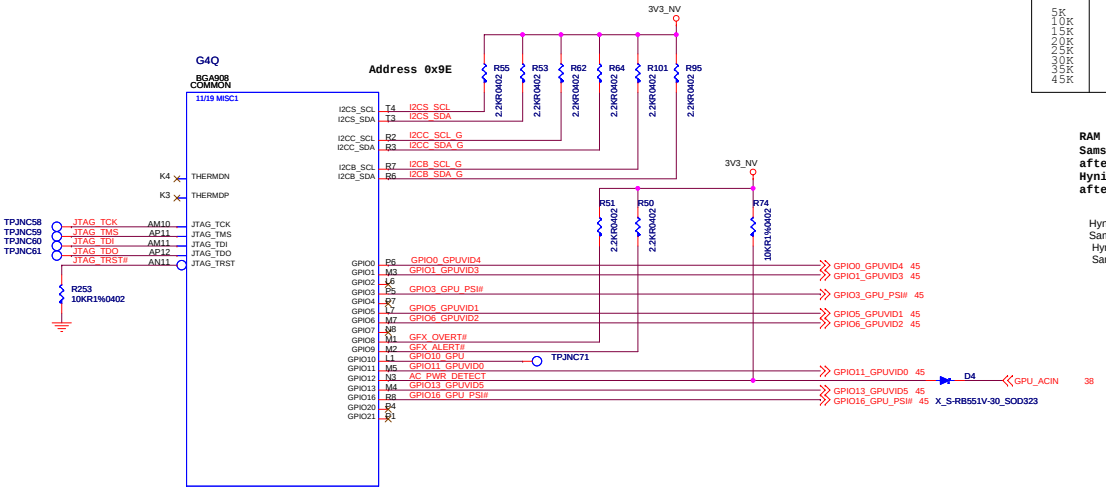


Item	N13P-GS	N13P-GL
Device ID	0x0FD2	0x0DE9
Package	GB4-128	GB4-128
Internal P/N	GK107, 28nm	GF108, 40nm
ROM_SI	Hynix 64x16, 15k pull down	Hynix 64x16, 15k pull down
	Samsung 64x16, 20k pull down	Samsung 64x16, 20k pull down
	Hynix 128x16, 35k pull down	Hynix 128x16, 35k pull down
	Samsung 128x16, 45k pull down	Samsung 128x16, 45k pull down
ROM_SO	0x9, 10k pull high	10k pull low
ROM_SCLK	0x8, 5k PU	15k pull low
Strap0	0xF, 45k pull up	45k pull up
Strap1	0x6, 35k pull down	45k pull down
Strap2	15k pull down	10k pull up
Strap3	5k pull down	NC
Strap4	30k pull low	NC
NVVDD Boot Voltage	0.9V	0.95V



Rvalue	Pull up	Pull down
5K	1000	0000
10K	1001	0001
15K	1010	0010
20K	1011	0011
25K	1100	0100
30K	1101	0101
35K	1110	0110
45K	1111	0111

EDID define resolution 1111



RAM CFG:
Samsung strap 0x3, K4W1G1646G-BC11 after date code 1113;
Hynix strap 0x2, H5TQ1G63DFR- 11C after date code 1104

Hynix 64Mx16--------PD15K;
Samsung 64Mx16----PD20K;
Hynix 128Mx16------- PD35K;
Samsung 128Mx16----PD45K;

notebook

Strap Pin	straping bit3	straping bit2	straping bit1	straping bit0
ROM_SCLK	PCI_DEVID[4]	SUB_VENDOR	PCI_DEVID[5]	PEX_PLL_EN_TERM
	1	0 no video bios ROM	0	0
ROM_SI	RAM_CFG[3]	RAM_CFG[2]	RAM_CFG[1]	RAM_CFG[0]
	0	0	1	0 (1)
ROM_SO	FB[1]	FB[0]	SMB_ALT_ADDR	VGA_DEVICE
	1 (0) FB Aperture size 256MB Default	0	0 not multi- GPU usage	1 VGA device
STRAP0	USER[3]	USER[2]	USER[1]	USER[0]
	1	1	1	1
STRAP1	3GIO_PAD_CFG_ADR[3]	3GIO_PAD_CFG_ADR[2]	3GIO_PAD_CFG_ADR[1]	3GIO_PAD_CFG_ADR[0]
	0	1	1	0
STRAP2	PCI_DEVID[3]	PCI_DEVID[2]	PCI_DEVID[1]	PCI_DEVID[0]
	0 DID of N13P-GS ES: TBD/OS: 0x0FD2	0	1	0
STRAP3	SOR3_EXPOSED	SOR2_EXPOSED	SOR1_EXPOSED	SOR0_EXPOSED
	0	0	0	0
STRAP4	RESERVED	PCIE_SPEED_CHANGE_GEN3	PCIE_MAX_SPEED	DP_PLL_VDD33V
	0 (1)	0	1	1

MICRO-STAR INT'L CO.,LTD.

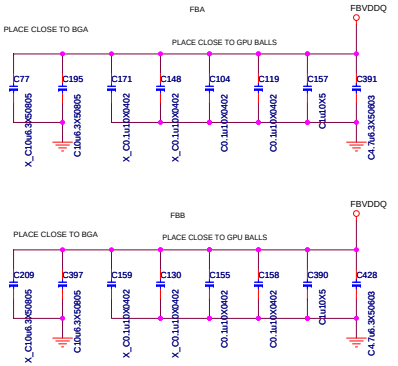
Title: N13P-GS/GL_Thermal, GPIOs

Size: Custom | Document Number: MS-16GB | Rev: 1.0

Date: Tuesday, January 03, 2012 | Sheet 18 of 56

Power/Decoupling: NVVDD,3V3_NV,GRND,and Optional

GPU FBVDDQ Decoupling



CALIBRATION PIN	DDR3(ohm)
FB_CALx_PD_VDDQ	40.2
FB_CALx_PU_GND	42.2
FB_CALx_TERM_GND	51.1

G4D

BGA908 COMMON

15/19 FBVDDQ

FBVDDQ

AA27 AA30 AB27 AB33 AC27 AD27 AE27 AE27 AG27 B13 B16 B19 E13 E16 E19 H10 H11 H12 H13 H14 H15 H16 H18 H19 H20 H21 H22 H23 H24 H8 H9 L27 M27 N27 P27 R27 T27 T30 T33 V27 W27 W30 W33 Y27 — FBVDDQ

FBVDDQ_PROBE — F1 — FBVDDQ_PROBE — TPJNC52

GND_PROBE — F2 — GND_PROBE — TPJNC51

FB_CAL_PD_VDDQ — J27 — FB_CAL_PD_VDDQ — R115 40.2R1%0402

FB_CAL_PU_GND — H27 — FB_CAL_PU_GND — R122 42.2R1%0402

FB_CALTERM_GND — H25 — FB_CAL_TERM_GND — R119 51.1R1%0402

DDR3 51.1ohm

FBVDDQ

PLACE CLOSE TO GPU BALLS

G4E

BGA908 COMMON

14/19 NVVDD

Voltage range 0.7125~1.15V

NVVDD

AA12 AA14 AA16 AA19 AA21 AA23 AB13 AB15 AB17 AB18 AB20 AB22 AC12 AC14 AC16 AC19 AC21 AC23 M12 M14 M16 M19 M21 M23 N13 N15 N17 N18 N20 N22 P12 P14 P16 P19 P21 P23 R13 R15 R17 R18 R20 R22 T12 T14 T16 T19 T21 T23 U13 U15 U17 U18 U20 U22 V13 V15 V17 V18 V20 V22 W12 W14 W16 W19 W21 W23 Y13 Y15 Y17 Y18 Y20 Y22 — VDD

Design guide suggest:
10x 4.7u under GPU;
8x 0.1u under GPU;
5x 4.7u near GPU;
1x 47u near;
1x 22u near;
1x 330u unstuff;

PLACE UNDER GPU

C346 C99 C342 C19 C115 C112 C111 C351 — X_C0.1u10X0402

C124 C125 C16 C151 C133 C153 C101 — X_C4.7u6.3X5S603

C134 C100 C122 C152 C114 C135 — X_C4.7u6.3X5S603 / C4.7u6.3X5S608

C17 C84 — C22u6.3X5S805-HF

PLACE NEAR GPU

G4G

BGA908 COMMON

16/19 GND_1/2

A2 AA17 AA18 AA20 AA22 AB12 AB14 AB16 AB19 AB2 AB21 AB23 AB28 AB30 AB32 AB5 AB7 AC13 AC15 AC17 AC18 AA13 AC20 AC22 AE2 AE28 AE30 AE32 AE33 AE5 AE7 AH10 AA15 AH13 AH16 AH19 AH2 AH22 AH24 AH28 AH29 AH30 AH32 AH33 AH5 AH7 AJ7 AK10 AK7 AL12 AL14 AL15 AL17 AL18 AL2 AL20 AL21 AL23 AL24 AL26 AL28 AL30 AL32 AL33 AL5 AM13 AM16 AM19 AM22 — GND

AM25 AN1 AN10 AN13 AN16 AN19 AN22 AN25 AN30 AN34 AN4 AN7 AP2 AP33 B1 B10 B22 B25 B28 B31 B34 B4 B7 C10 C13 C19 C22 C25 C28 C7 D2 D31 D33 E10 E22 E25 E5 E7 F28 F7 G10 G13 G16 G19 G2 G22 G25 G28 G3 G30 G32 G33 G5 G7 K2 K28 K30 K32 K33 K5 K7 M13 M15 M17 M18 M20 M22 N12 N14 N16 — GND

G4F

BGA908 COMMON

18/19 NC/VDD33

3V3_NV

PLACE NEAR BALLS

R317 0R 0603

C81 C88 C80 C89 — C0.1u10X0402 — X_C0.1u10X0402

C97 C60 — X_C10u10X5 / C4.7u6.3X5S603

PLACE NEAR BGA

J8 K8 L8 M8 — VDD33

NC AC6 NC AJ28 NC AJ4 NC AJ5 NC AL11 NC C15 NC D19 NC D20 NC D23 NC D26 NC H31 NC J28 NC L32 — NC

G4H

BGA908 COMMON

To be configured as needed on the PCB

10/19 XVDD

CONFIGURABLE POWER CHANNELS

XVDD U1 U2 U3 U4 U5 U6 U7 U8 V1 V2 V3 V4 V5 V6 V7 V8 W2 W3 W4 W5 W7 W8 Y1 Y2 Y3 Y4 Y5 Y6 Y7 Y8 AA1 AA2 AA3 AA4 AA5 AA6 AA7 AA8

G4I

BGA908 COMMON

17/19 GND_2/2

N19 N2 N21 N23 N28 N30 N32 N33 N5 N7 P13 P15 P17 P18 P20 P22 R12 R14 R16 R19 R21 R23 T13 T15 T17 T18 T2 T20 T22 — GND

T28 T32 T5 T7 U12 U14 U16 U19 U21 U23 V12 V14 V16 V19 V21 V23 W13 W15 W17 W18 W20 W22 W28 Y12 Y14 Y16 Y19 Y21 Y23 — GND

AG11 — GND — AH11

GND_OPT C16 GND_OPT W32

Optional CMD GNDs (2)
NC for 4-Lyr cards

MSI	MICRO-STAR INT'L CO.,LTD.		
Title	N13P-GS/GL Power & GND		
Size: Custom	Document Number: MS-16GB		Rev: 1.0
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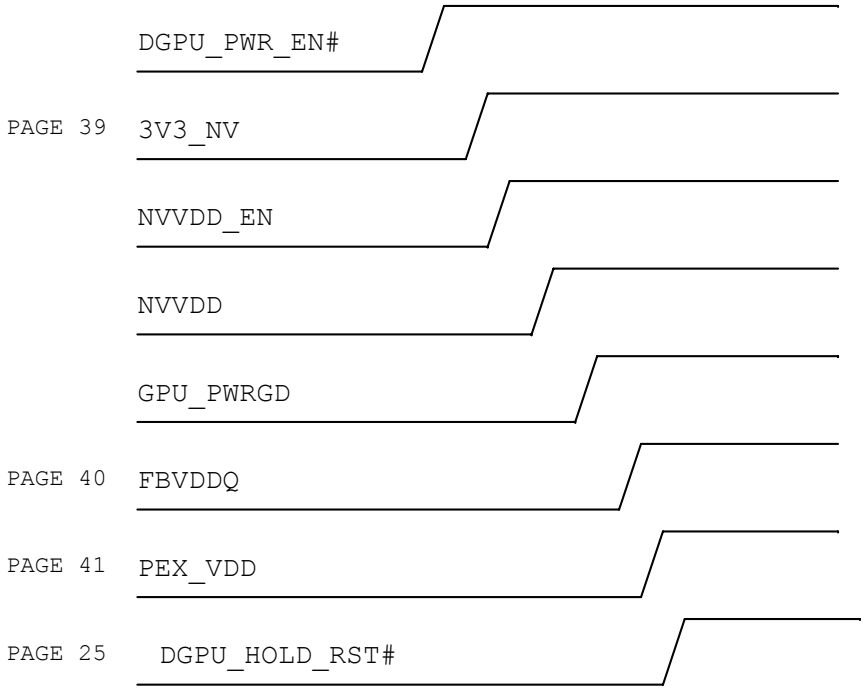


GPU Power Sequence

MICRO-STAR INT'L CO.,LTD.

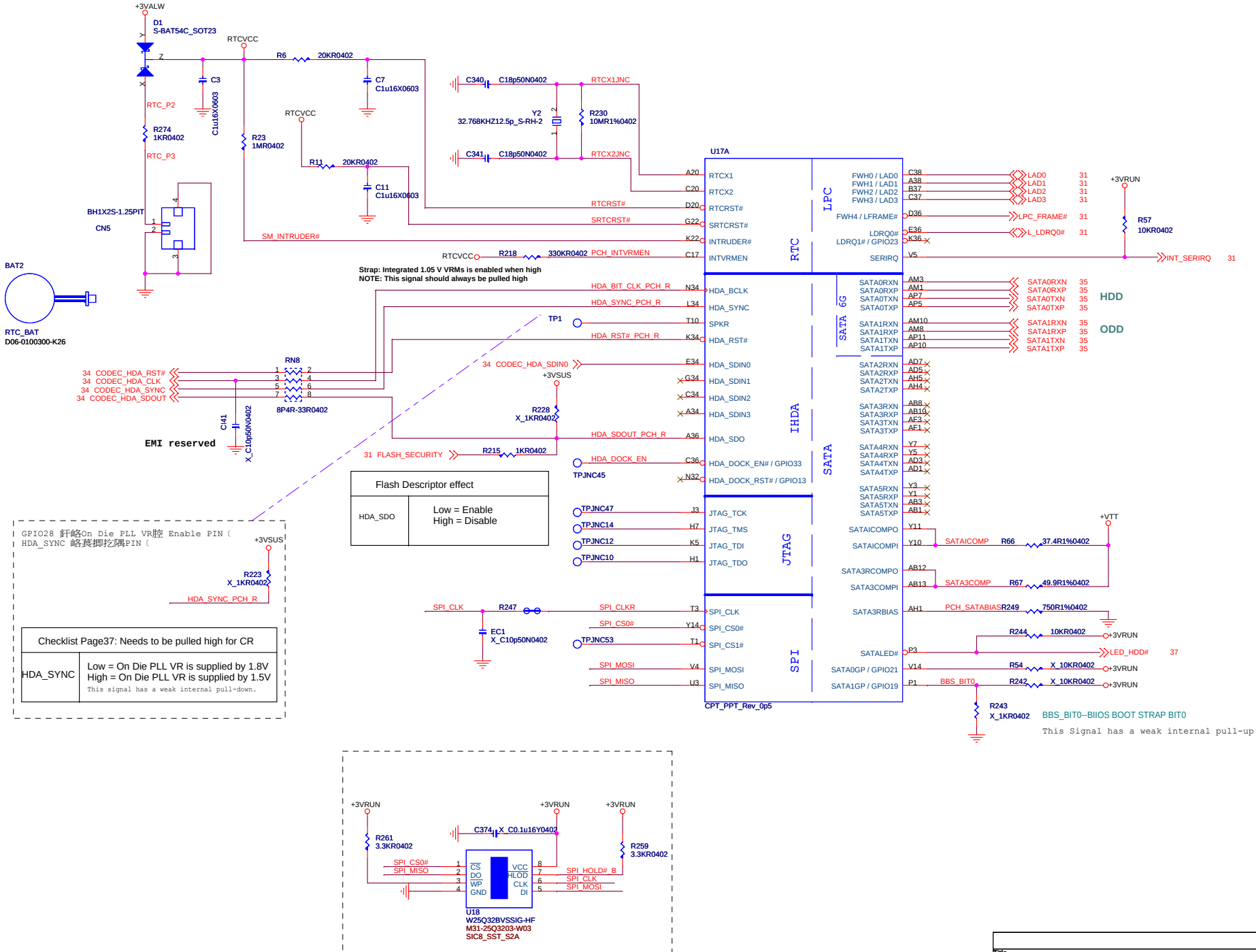
Title

N13P-GS/GL_Power Sequence

Size	Document Number	Rev
A	MS-16GB	1.0

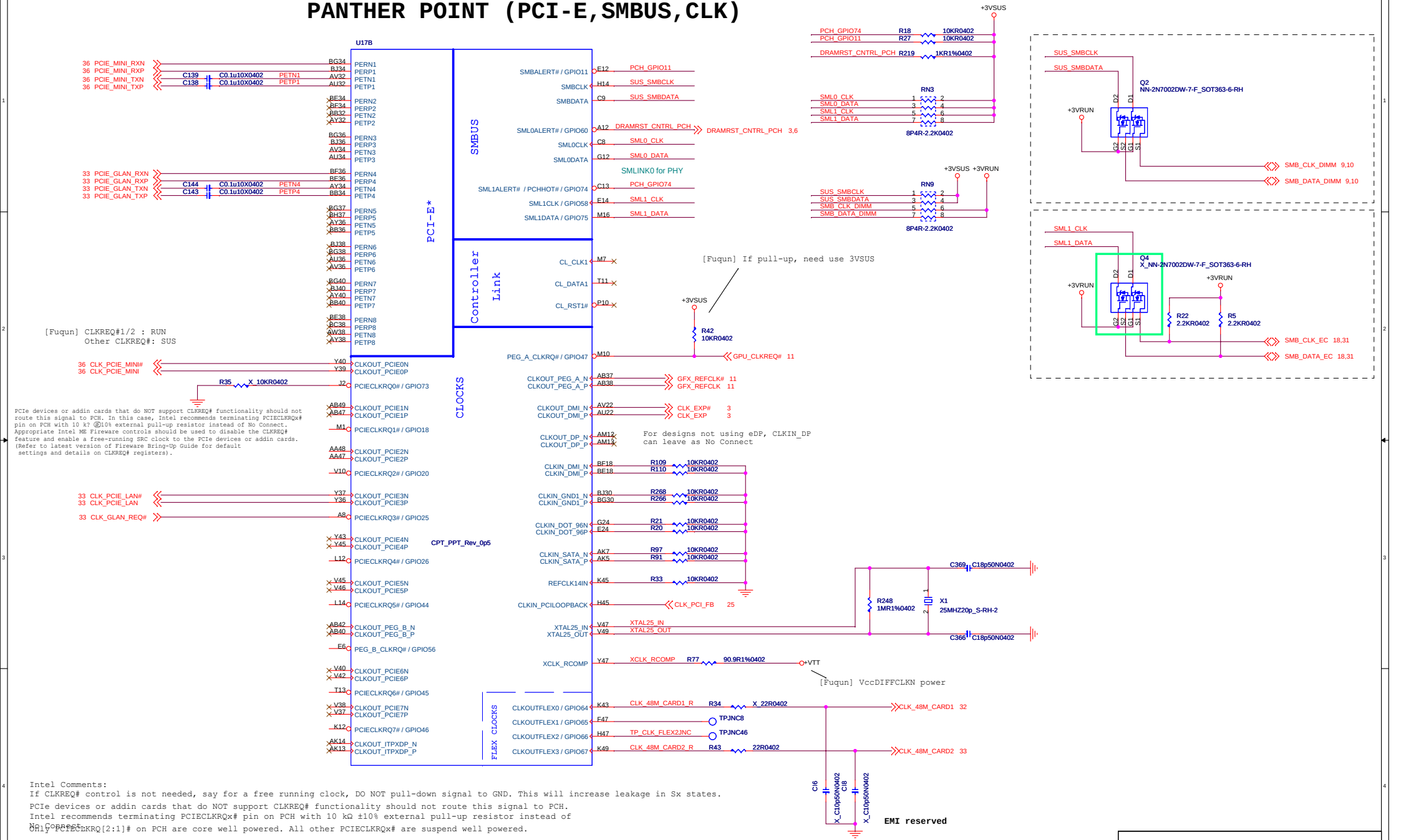
Date: Tuesday, January 03, 2012 Sheet 20 of 56

PANTHER POINT (HDA,JTAG,SATA)



Title	PCH-1 (HDA/JTAG/SATA)		
Size: Custom	Document Number: MS-16GB		Rev: 1.0
Date: Tuesday, January 03, 2012	Sheet 21 of 56		

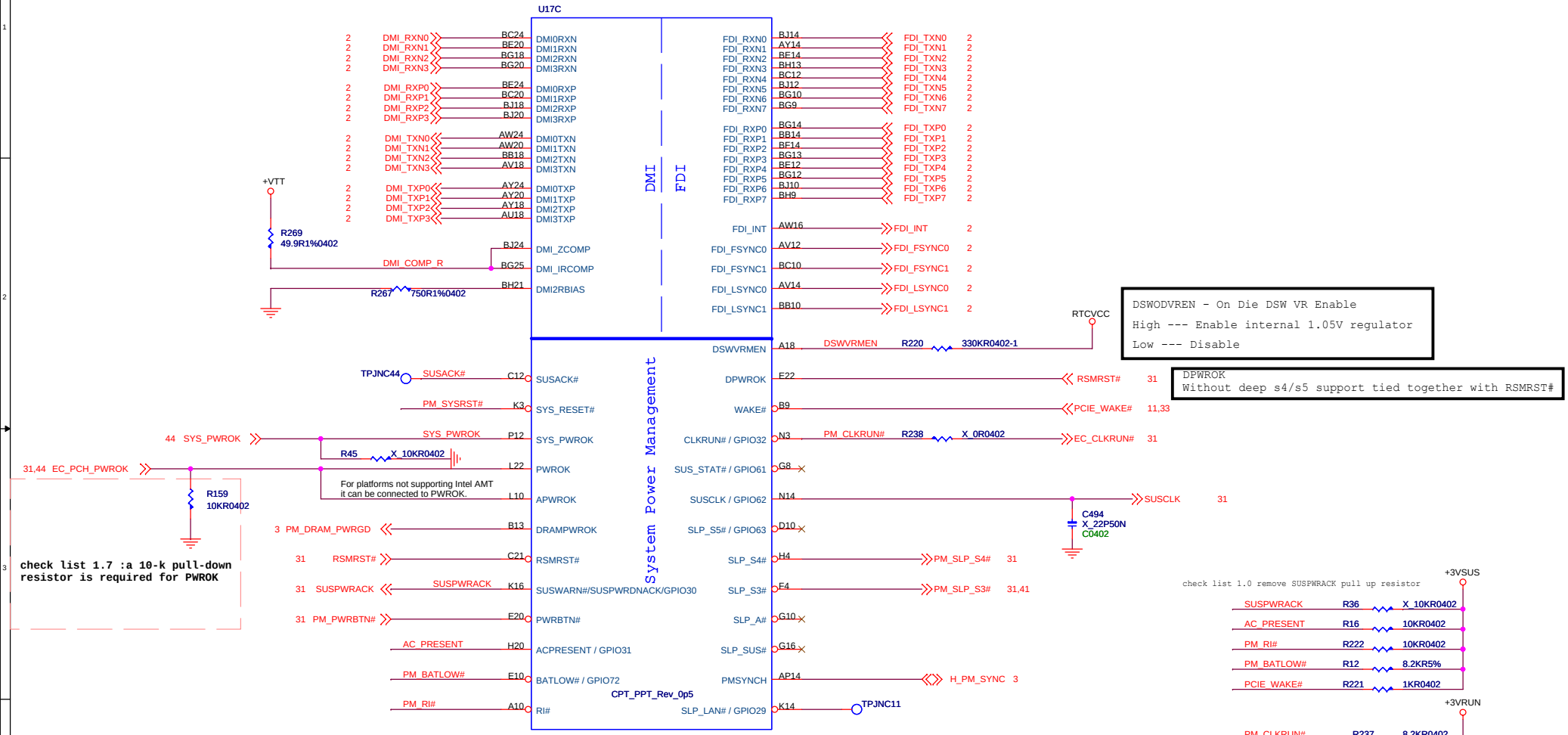
PANTHER POINT (PCI-E,SMBUS,CLK)



Intel Comments:
If CLKREQ# control is not needed, say for a free running clock, DO NOT pull-down signal to GND. This will increase leakage in Sx states.
PCIe devices or addin cards that do NOT support CLKREQ# functionality should not route this signal to PCH.
Intel recommends terminating PCIECLKRQx# pin on PCH with 10 kΩ ±10% external pull-up resistor instead of No Connect.
Only PCIECLKRQ[2:1]# on PCH are core well powered. All other PCIECLKRQx# are suspend well powered.

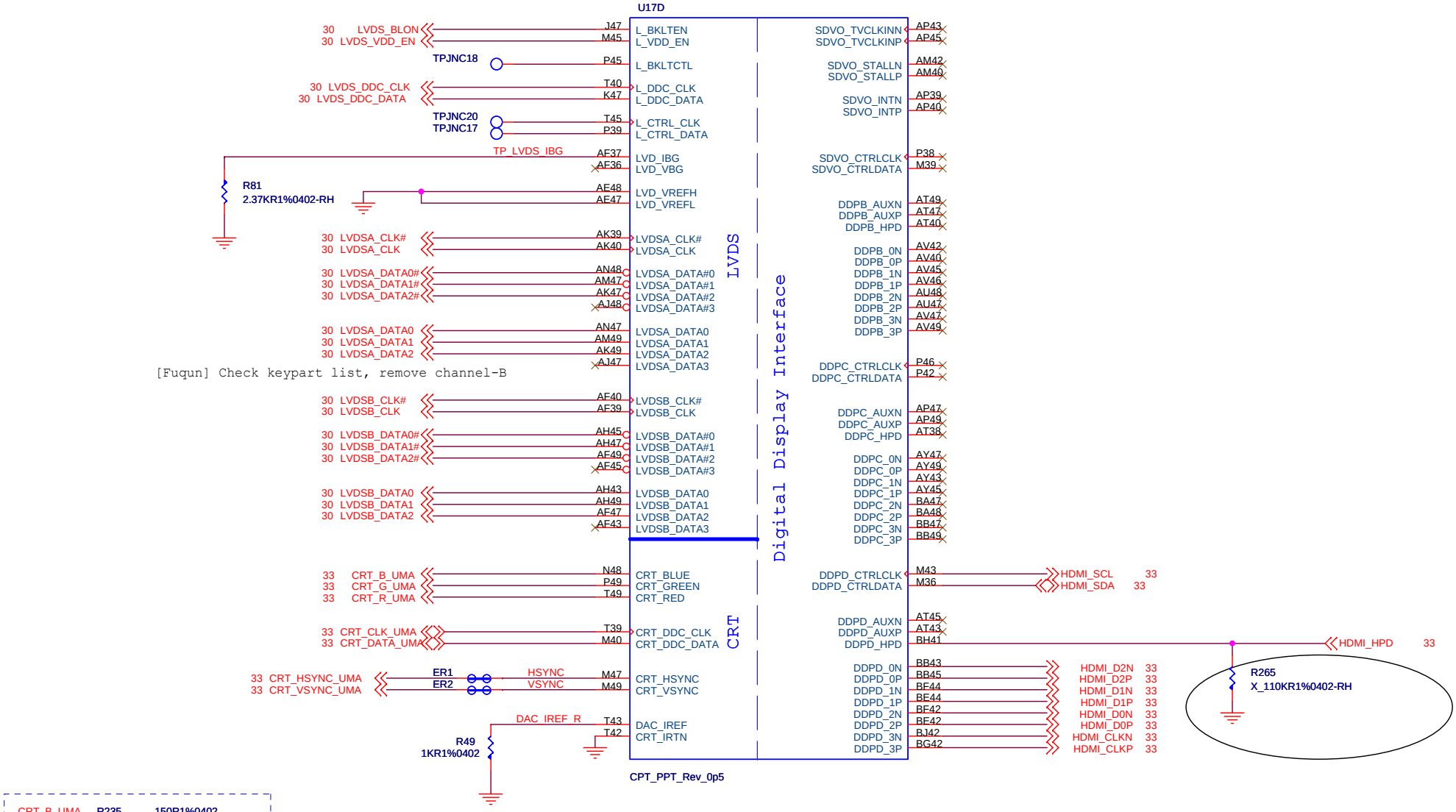
Title	PCH-2 (PCI-E/SMBUS/CLK)		
Size: Custom	Document Number: MS-16GB		Rev: 1.0
Date: Tuesday, January 03, 2012	Sheet 22 of 56		

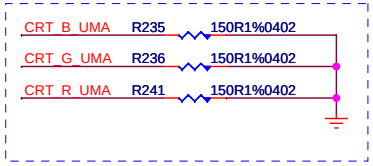
PANTHER POINT (DMI,FDI,GPIO)



Title	PCH-3 (DMI/FDI/GPIO)	
Size: Custom	Document Number: MS-16GB	Rev: 1.0
Date: Tuesday, January 03, 2012	Sheet 23 of 56	

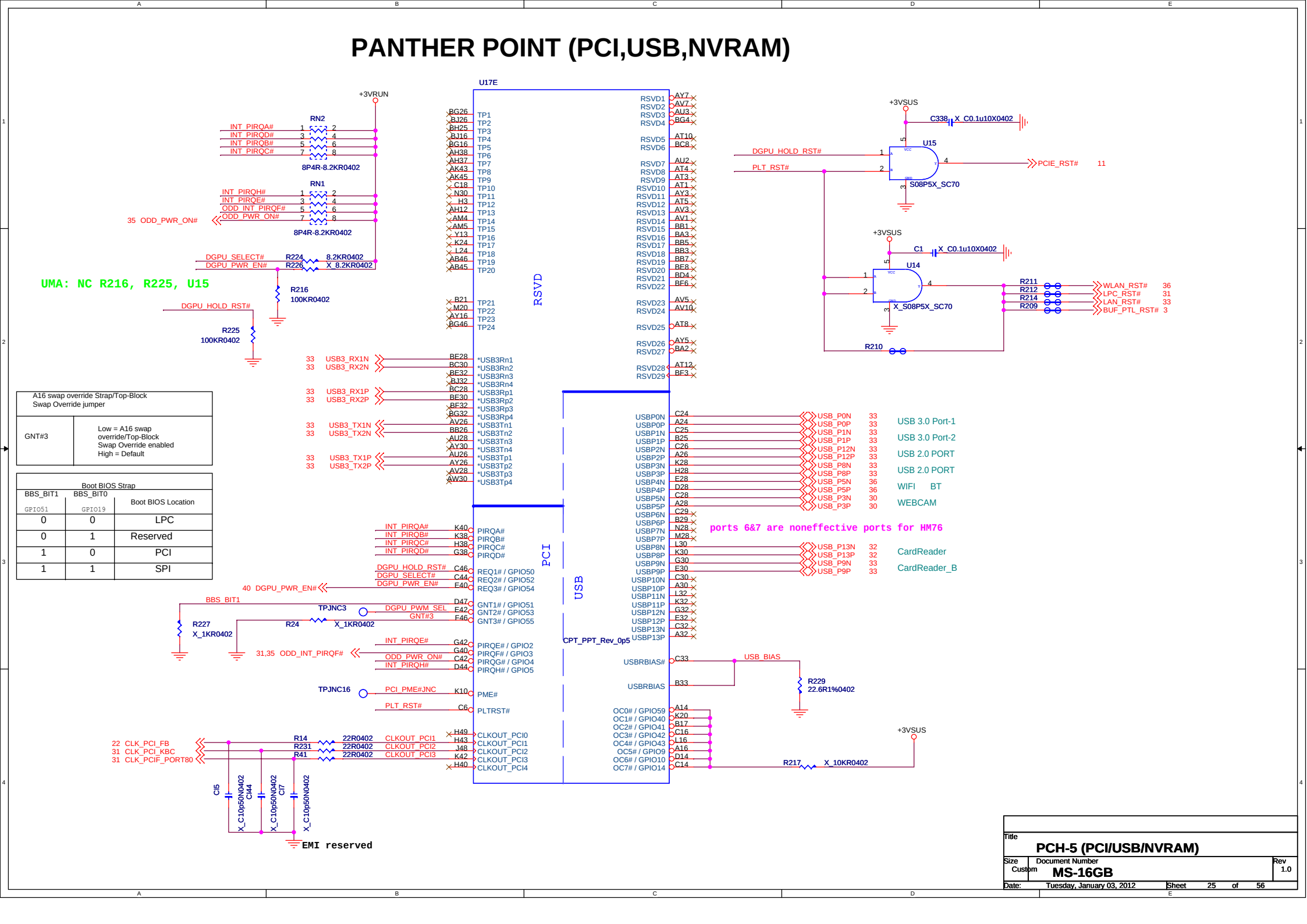
PANTHER POINT (LVDS,DDI)





Title	PCH-4 (LVDS/DDI)	
Size: Custom	Document Number: MS-16GB	Rev: 1.0
Date: Tuesday, January 03, 2012	Sheet 24 of 56	

PANTHER POINT (PCI,USB,NVRAM)



Title	PCH-5 (PCI/USB/NVRAM)
Size: Custom	Document Number: MS-16GB
Rev	1.0
Date: Tuesday, January 03, 2012	Sheet 25 of 56

PANTHER POINT (GPIO,VSS_NCTF,RSVD)

PLL ON DIE VR_ENABLE	
GPIO28	Internal pull high (Enable)
	Low: Disable

DMI & FDI Termination Voltage		
NV_CLE	Set to VSS when LOW	Sandy Bridge
	Set to VCC when High	Ivy Bridge

when use as the chipset test interface,GPIO28 signal needs to be pulled up to 3.3V_SUS with 4.7K resistor to ensure proper strap setting

DF_TVS:
Sandy Bridge + Ivy Bridge Compatible:
Connect DF_TVS signal of the PCH to PROC_SELECT# of the processor through a 1KΩ5% series resistor. PROC_SELECT# also needs a 2.2KΩ5% pull up resistor to PCH VccDFTERM rail.

[Fuqun] VccDFTERM power

U17F

GPIO

TPJNC21	PCH_GPIO0	T7	BMBUSY# / GPIO0	TACH4 / GPIO68	C40
internal pull up 31	KBSMI#	A42	TACH1 / GPIO1	TACH5 / GPIO69	B41
TPJNC2	PCH_GPIO6	H36	TACH2 / GPIO6	TACH6 / GPIO70	C41
internal pull up 31	KBSCI#	E38	TACH3 / GPIO7	TACH7 / GPIO71	A40
TPJNC1	ICC_EN#	C10	GPIO8		
TPJNC7	PCH_GPIO12	C4	LAN_PHY_PWR_CTRL / GPIO12		
+3VSUS R30 X_10KR0402	TLSEN	G2	GPIO15	A20GATE	P4 → H_A20GATE 31
TPJNC54	JTAG_SATA4GP	U2	SATA4GP / GPIO16	PECI	AU16 R257 X_0R0402 → H_PECI 3,31
				RCIN#	P5 → KBRST# 31
11,31,42 DGPU_PWRGD		D40	TACH0 / GPIO17	PROCPWRGD	AY11 → H_CPUPWRGD 3
TPJNC19	BIOS_REC	T5	SCLOCK / GPIO22	THRMTRIP#	AY10 PCH_THRMTRIP# R R258 390R0402_1% → H_THRMTRIP# 3
+3VSUS TPJNC9	HOST_ALERT#2	E8	*GPIO24	INIT3_3V#	T14
R44 X_4.7KR0402 TPJNC5	DSW wake up event	E16	GPIO27	DF_TVS	AY1 NV_CLE R263 1KR0402 → +1_8VRUN R264 2.2KR0402 → H_SNB_IVB# 3
R52 X_10KR0402	PLL_ODVR_EN	P8	GPIO28		
TPJNC48	STP_PCI#	K1	STP_PCI# / GPIO34	TS_VSS1	AH8
TPJNC13	EDID_SELECT#	K4	GPIO35	TS_VSS2	AK11
TPJNC22	PCH_GPIO36	V8	SATA2GP / GPIO36	TS_VSS3	AH10
TPJNC15	PCH_GPIO37	M5	SATA3GP / GPIO37	TS_VSS4	AK10
TPJNC50	MFG_MODE	N2	SLOAD / GPIO38	NC_1	P37
TPJNC49	CRB_SV_DET	M3	SDATAOUT0 / GPIO39		
TPJNC24	TEST_SET_UP	V13	SDATAOUT1 / GPIO48	VSS_NCTF_15	BG2
TPJNC55	CRIT_TEMP_REP#	V3	*SATA5GP / GPIO49 / TEMP_ALERT#	VSS_NCTF_16	BG48
+3VSUS R29 X_10KR0402				VSS_NCTF_17	BH3
31 SCI_WAKE_UP#		D6	GPIO57	VSS_NCTF_18	BH47

JNC4

CPU/MISC

NCTF

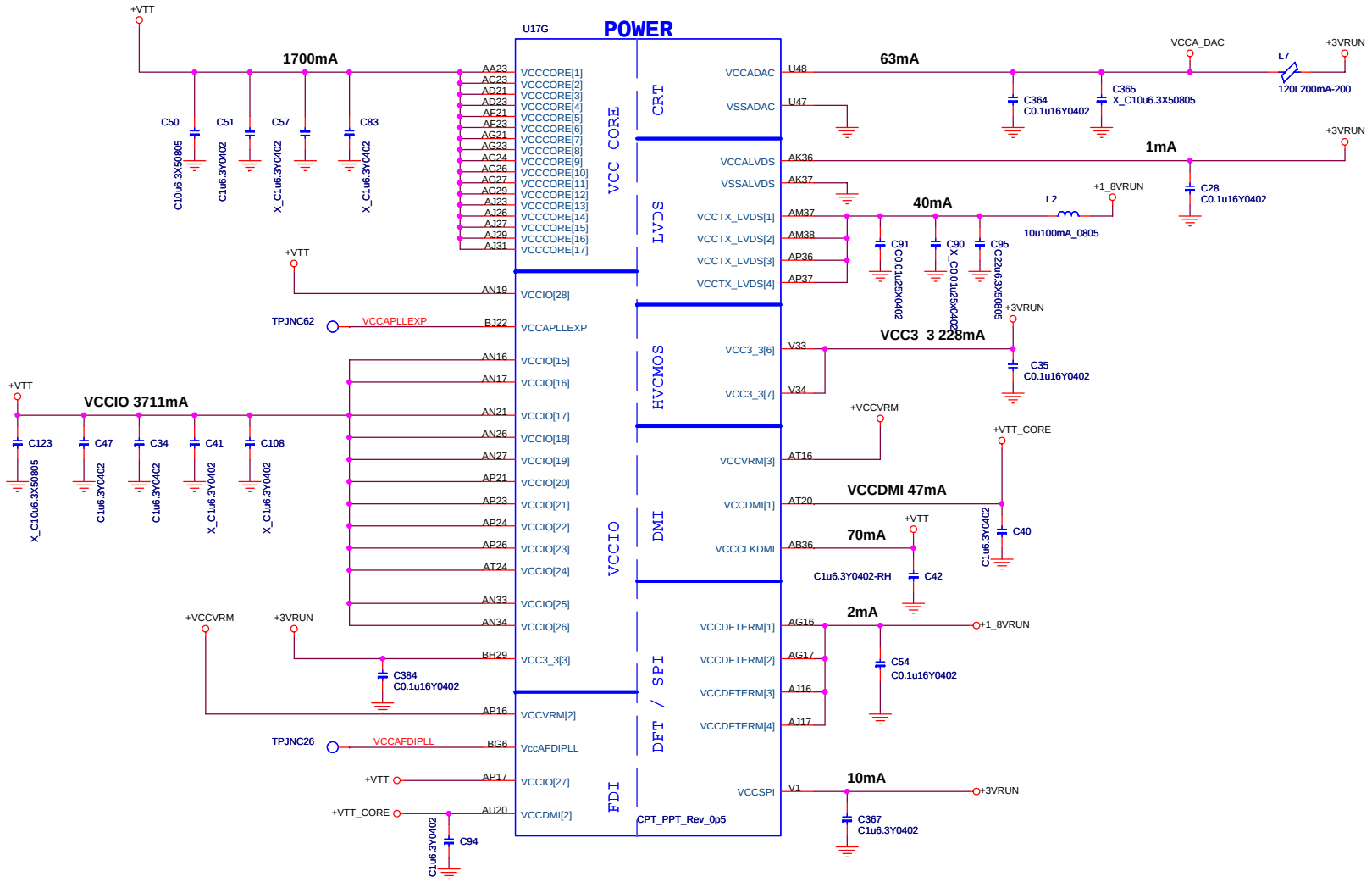
A4	VSS_NCTF_1	VSS_NCTF_19	BJ4
A44	VSS_NCTF_2	VSS_NCTF_20	BJ44
A45	VSS_NCTF_3	VSS_NCTF_21	BJ45
A46	VSS_NCTF_4	VSS_NCTF_22	BJ46
A5	VSS_NCTF_5	VSS_NCTF_23	BJ5
A6	VSS_NCTF_6	VSS_NCTF_24	BJ6
B3	VSS_NCTF_7	VSS_NCTF_25	C2
B47	VSS_NCTF_8	VSS_NCTF_26	C48
BD1	VSS_NCTF_9	VSS_NCTF_27	D1
BD49	VSS_NCTF_10	VSS_NCTF_28	D49
BE1	VSS_NCTF_11	VSS_NCTF_29	E1
BE49	VSS_NCTF_12	VSS_NCTF_30	E49
BF1	VSS_NCTF_13	VSS_NCTF_31	F1
BF49	VSS_NCTF_14	VSS_NCTF_32	F49

CPT_PPT_Rev_0p5

??

Title	PCH-6 (GPIO/NCTF/RSVD)		
Size: Custom	Document Number: MS-16GB		Rev: 1.0
Date: Tuesday, January 03, 2012	Sheet 26 of 56		

PANTHER POINT (POWER)



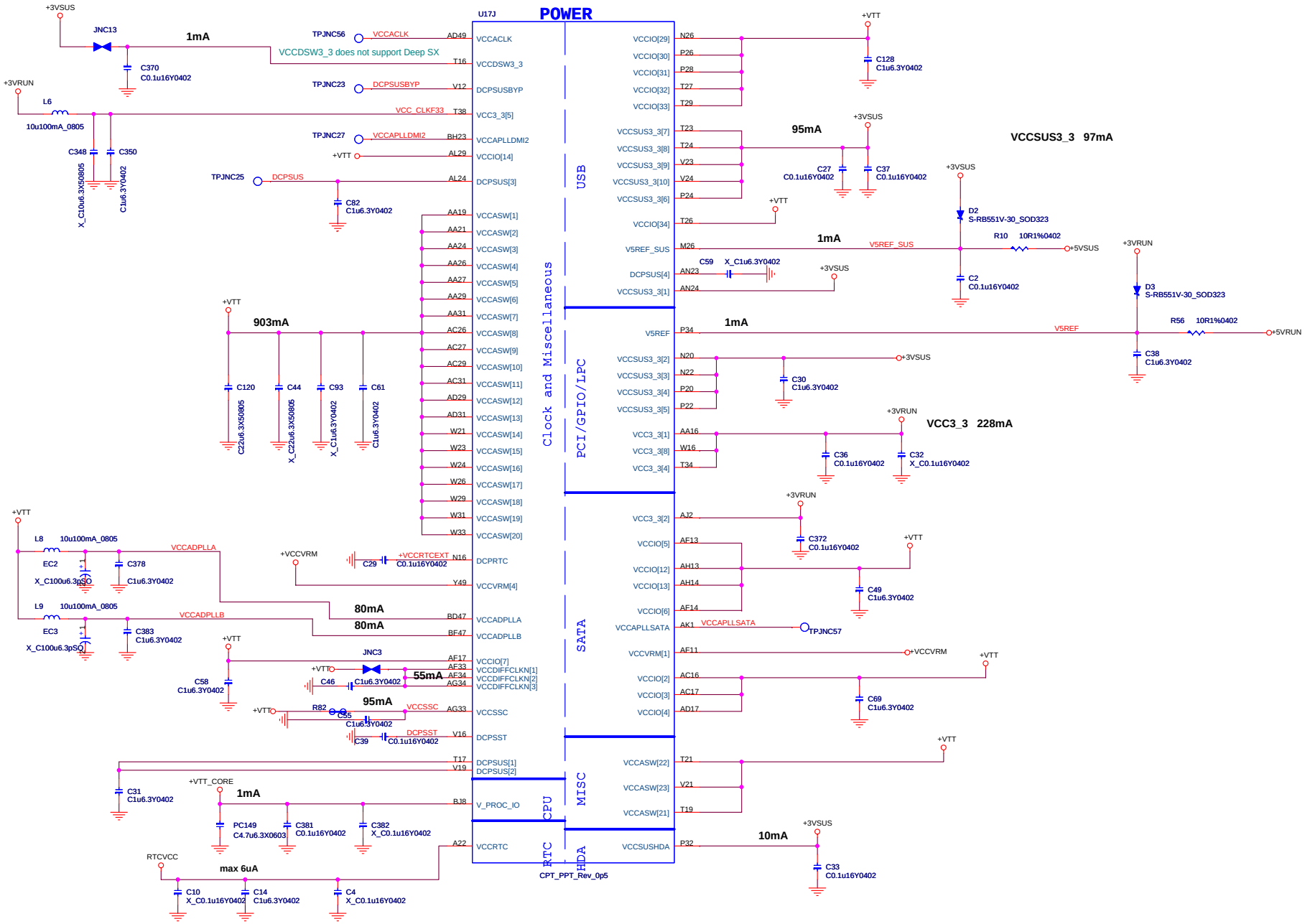
GPIO28 釬峪On Die PLL VR腔 Enable PIN〔
HDA_SYNC 峪蓁捌圪隅PIN〔

Checklist Page37: Needs to be pulled high for CR	
HDA_SYNC	Low = On Die PLL VR is supplied by 1.8V High = On Die PLL VR is supplied by 1.5V This signal has a weak internal pull-down.

The VCCVRM rail (1.5 V) powers an internal voltage regulator module (VRM) that regulates clean 1.05-V voltage supply for analog rails (VccAPLLEXP, VccaPLLDMI2, and VccAPLLSATA). This solution will allow us to remove the LC filter requirements for those rails, thereby reducing platform BOM cost. VCCVRM is enabled by default via internal pull up to GPIO28,

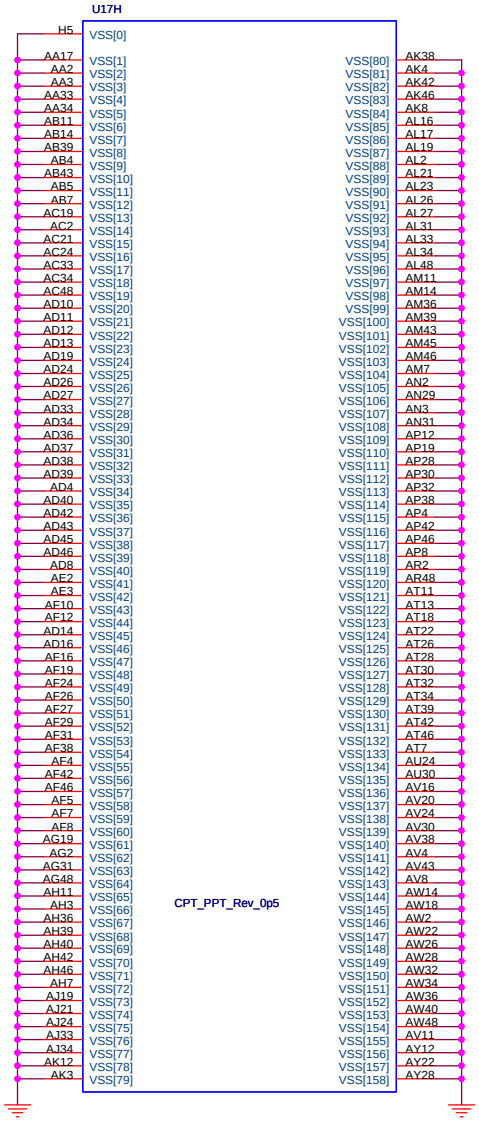
Title	PCH-7 (POWER)	
Size: Custom	Document Number: MS-16GB	Rev: 1.0
Date: Tuesday, January 03, 2012	Sheet 27 of 56	

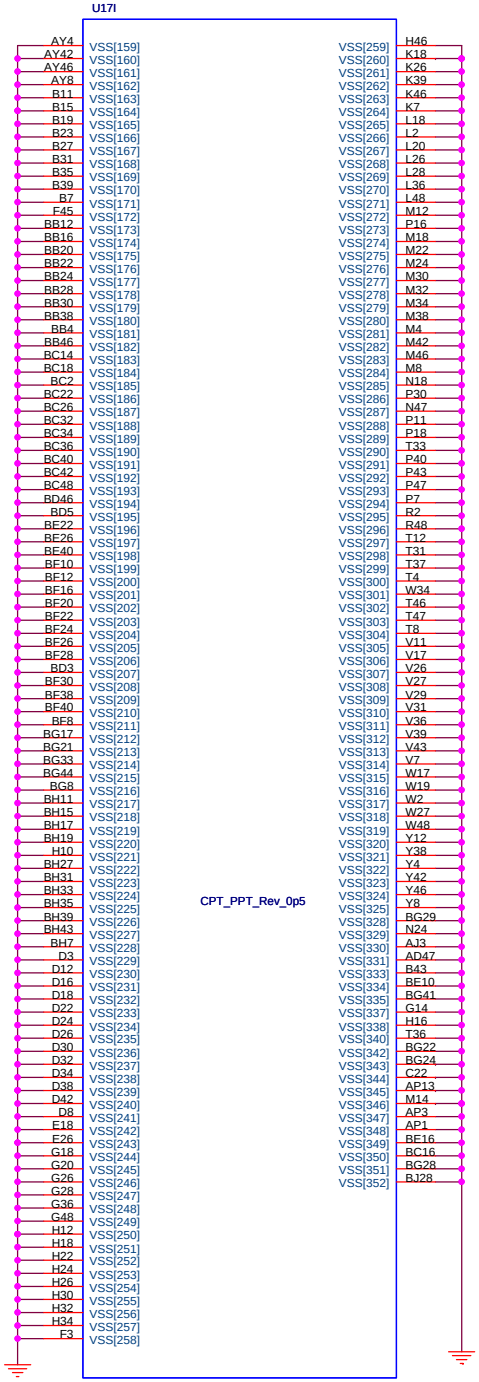
PANTHER POINT (POWER)



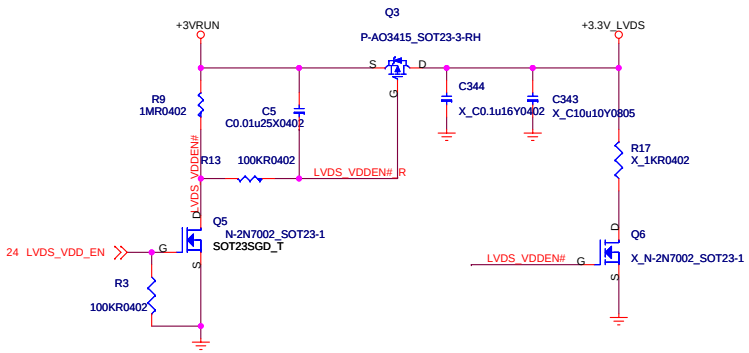
Title	PCH-8 (POWER)
Size	Custom
Document Number	MS-16GB
Rev	1.0
Date:	Tuesday, January 03, 2012
Sheet	28 of 56

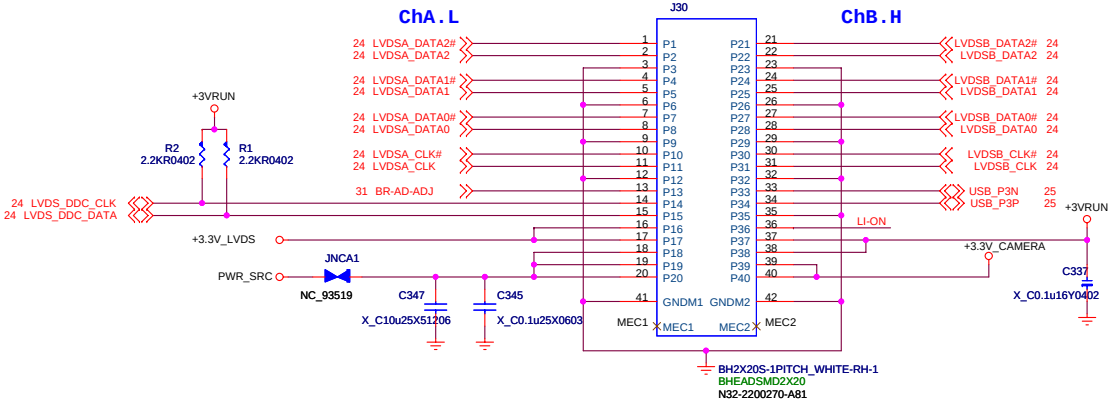
PANTHER Point (GND)

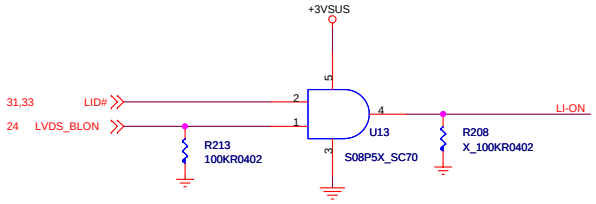




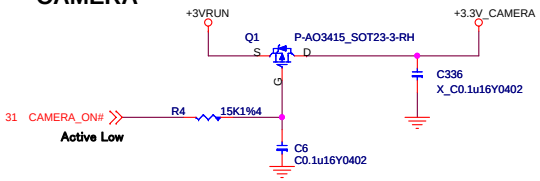
Title	PCH-9 (GND)	
Size: Custom	Document Number: MS-16GB	Rev: 1.0
Date: Tuesday, January 03, 2012	Sheet 29 of 56	





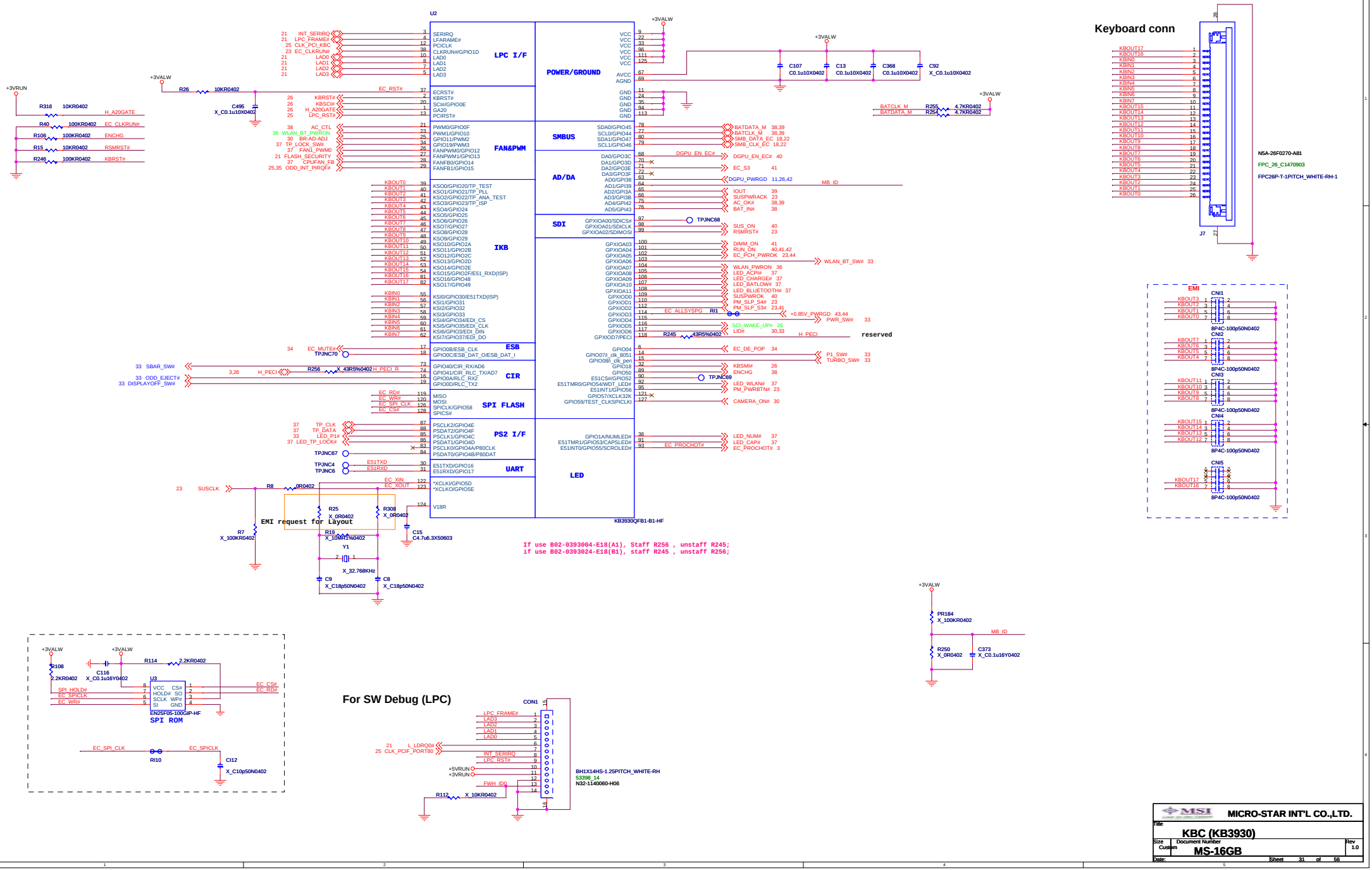


CAMERA



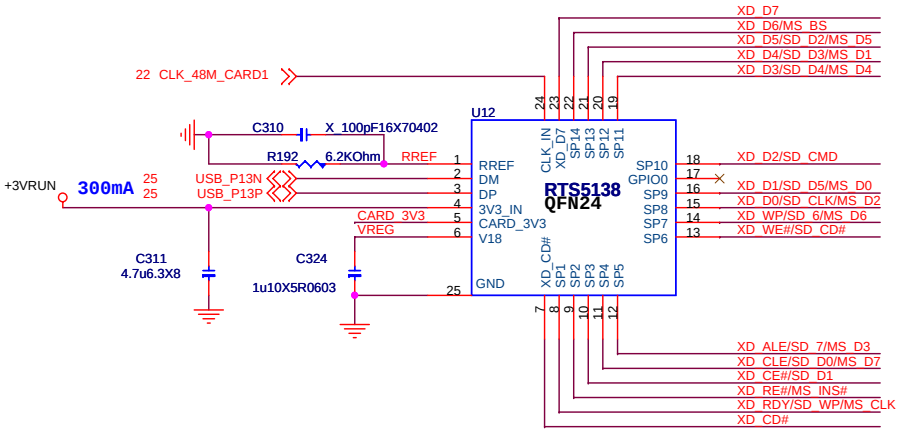
MSI MICRO-STAR INT'L CO.,LTD.

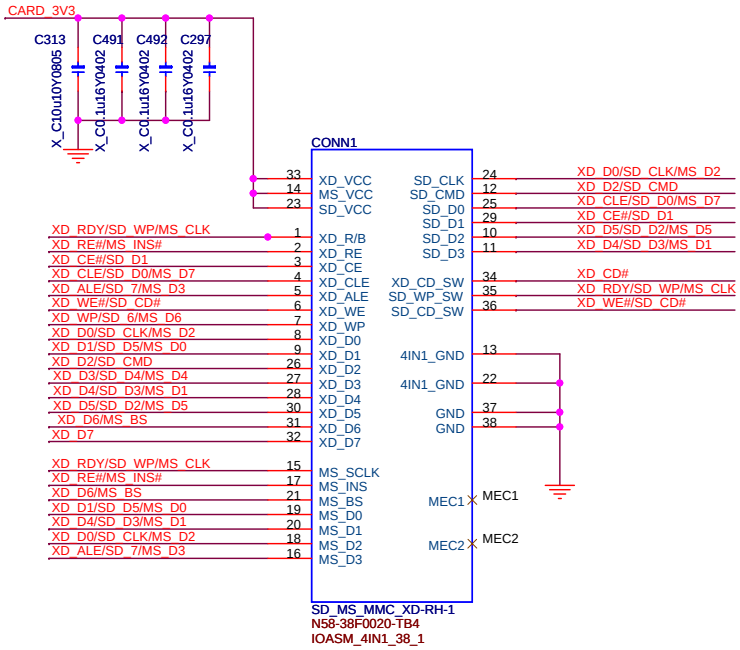
Title	LVDS, Camera	
Size: Custom	Document Number: MS-16GB	Rev: 1.0
Date:	Sheet 30 of 56	


U2
LPC I/F
POWER/GROUND
SMBUS
FAN&PWM
AD/DA
SDI
IKB
ESB
CIR
SPI FLASH
PS2 I/F
UART
LED
KB3930QFB1-B1-HF
Keyboard conn
N5A-26F0270-A81
FPC_26_C1470903
FPC26P-T-1PITCH_WHITE-RH-1
EMI request for Layout
If use B02-0393004-E18(A1), Staff R256 , unstaff R245;
if use B02-0393024-E18(B1), staff R245 , unstaff R256;
SPI ROM
EN25F05-100GIP-HF
For SW Debug (LPC)
BH1X14HS-1.25PITCH_WHITE-RH
53398_14
N32-1140060-H06
MICRO-STAR INT'L CO.,LTD.
KBC (KB3930)
MS-16GB

Card Reader controller RTS5138

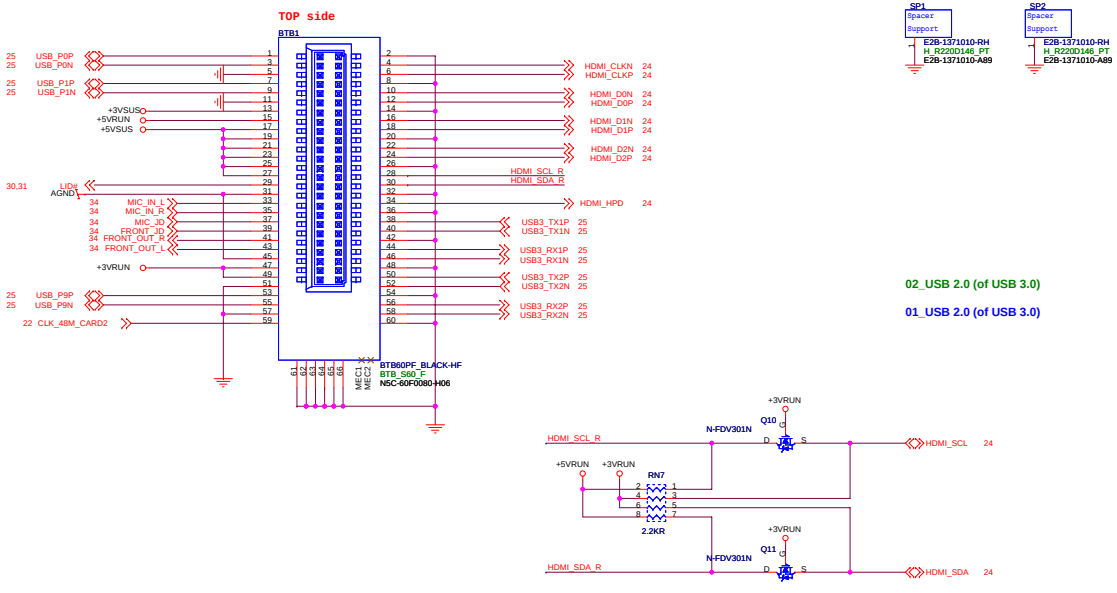
CFG for 16GB





MSI	MICRO-STAR INT'L CO.,LTD.	
Title	CardReader	
Size B	Document Number MS-16GB	Rev 1.0
Date:	Sheet 32 of 56	

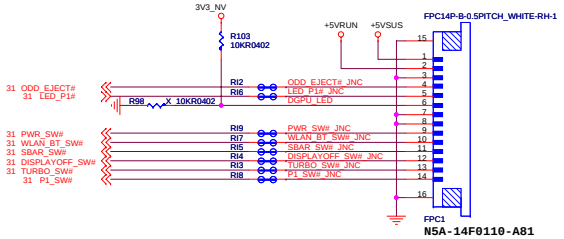
[B] board: HDMI,Audio,USB x 2,CardReader

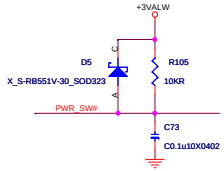


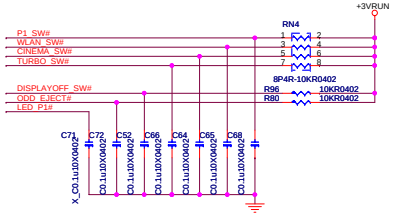
02_USB 2.0 (of USB 3.0)

01_USB 2.0 (of USB 3.0)

[C] board

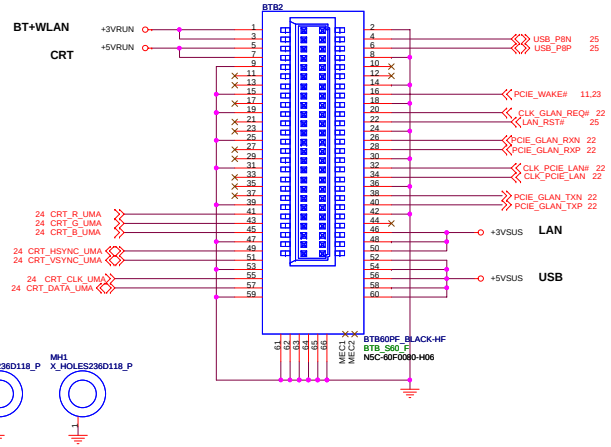




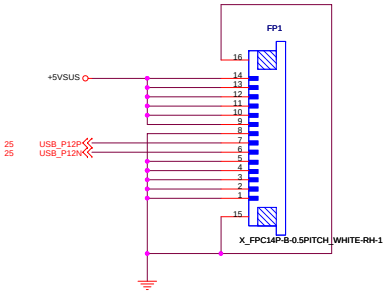


EMI reserved

[A] board: USB,LAN,CRT,BT+WLAN



For 175X [E] board

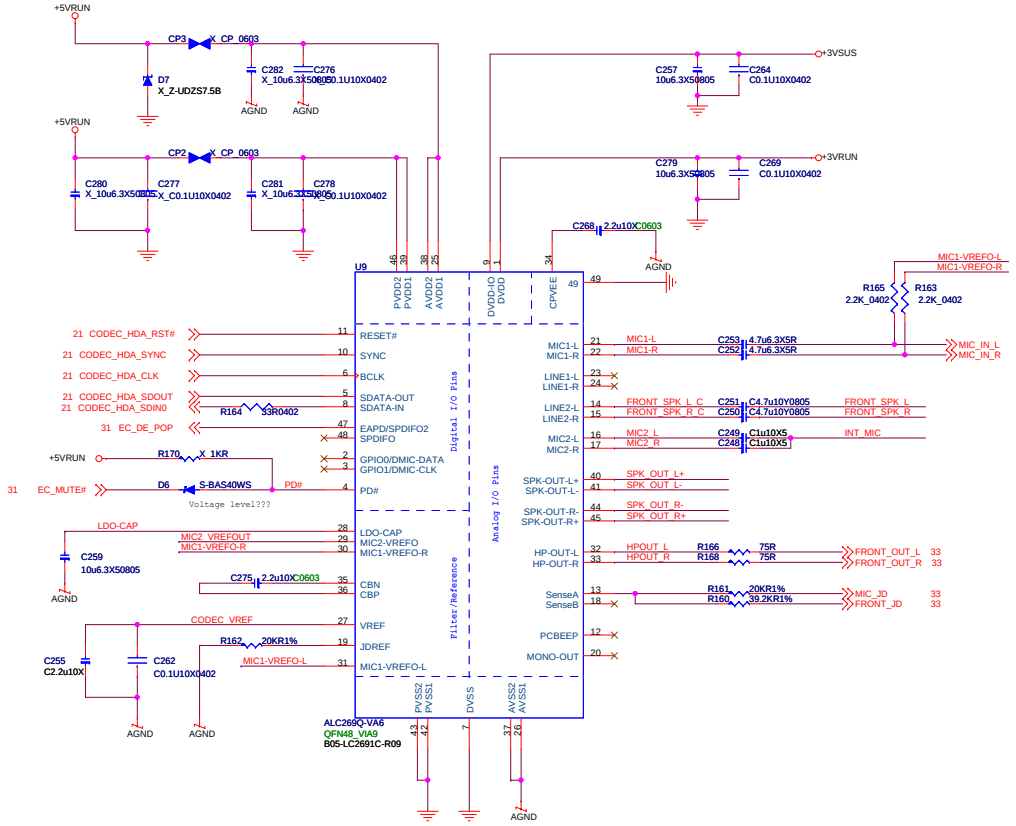


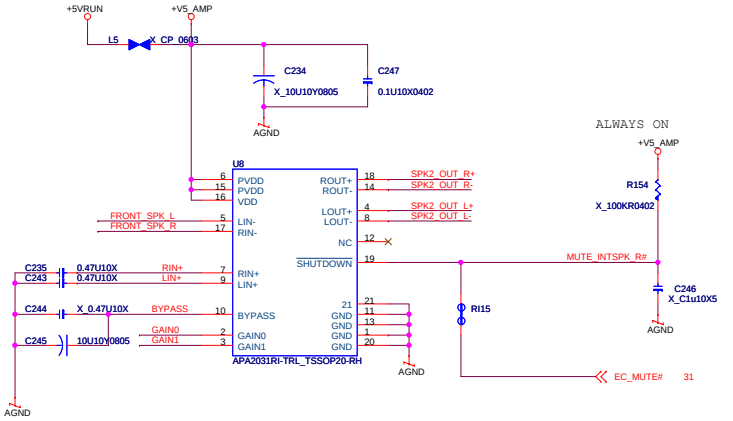
MICRO-STAR INT'L CO.,LTD.

Title: BTB PCIE Connectors

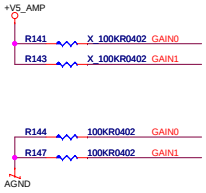
Size: Custom | Document Number: MS-16GB | Rev: 1.0

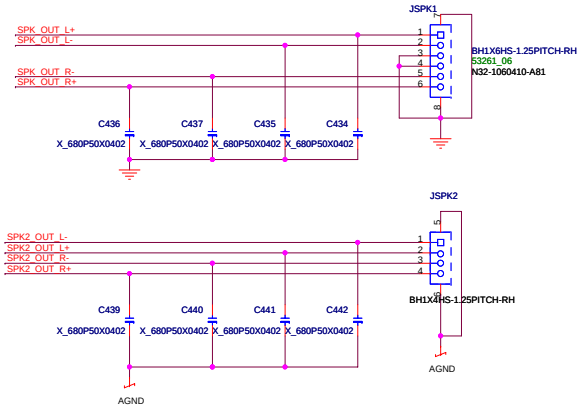
Date: | Sheet 33 of 56

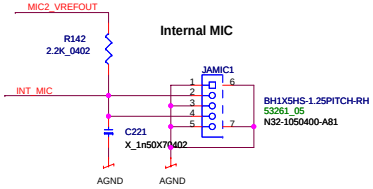


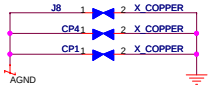


For APA2031			For FAN7031			
Av	GAIN0	GAIN1	Av	GAIN0	GAIN1	SE/BTL#
6dB	0	0	6dB	0	0	0
10dB	0	1	10dB	0	1	0
15.6dB	1	0	15.6dB	1	0	0
21.6dB	1	1	21.6dB	1	1	0
4.3dB	X	X	4.3dB	X	X	1









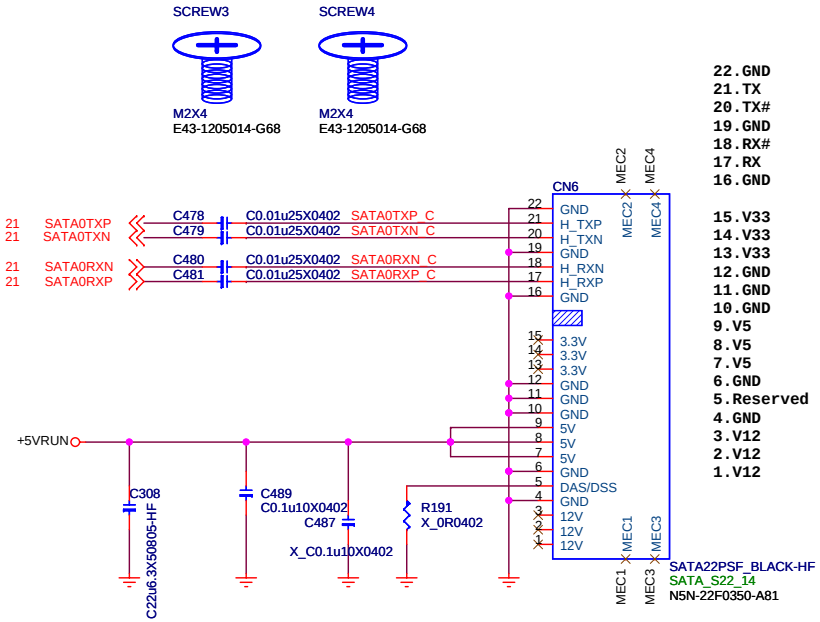
MSI MICRO-STAR INT'L CO.,LTD.

Title: Audio ALC269/ AMP(APA2031)

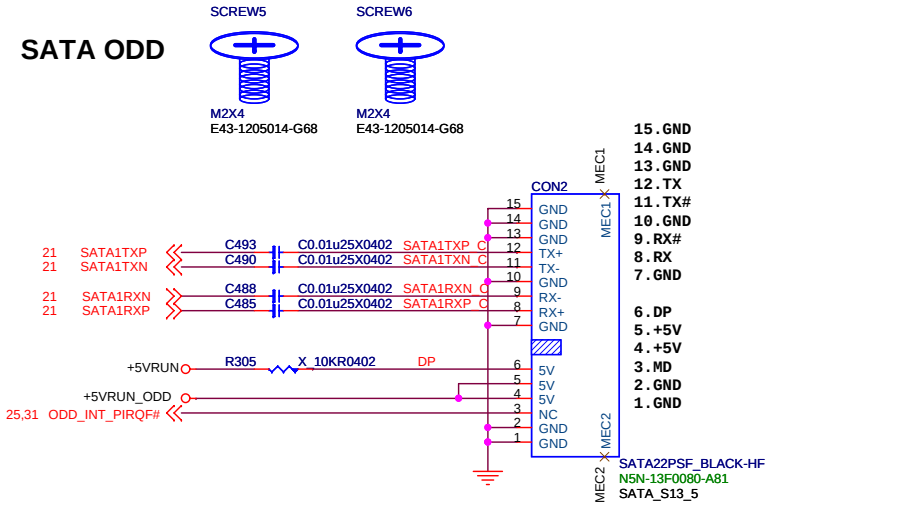
Size: C | Document Number: MS-16GB | Rev: 1.0

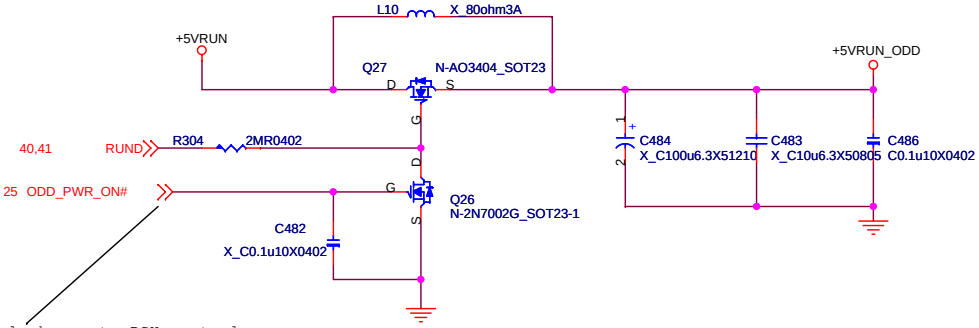
Date: | Sheet 34 of 56

SATA HDD



SATA ODD



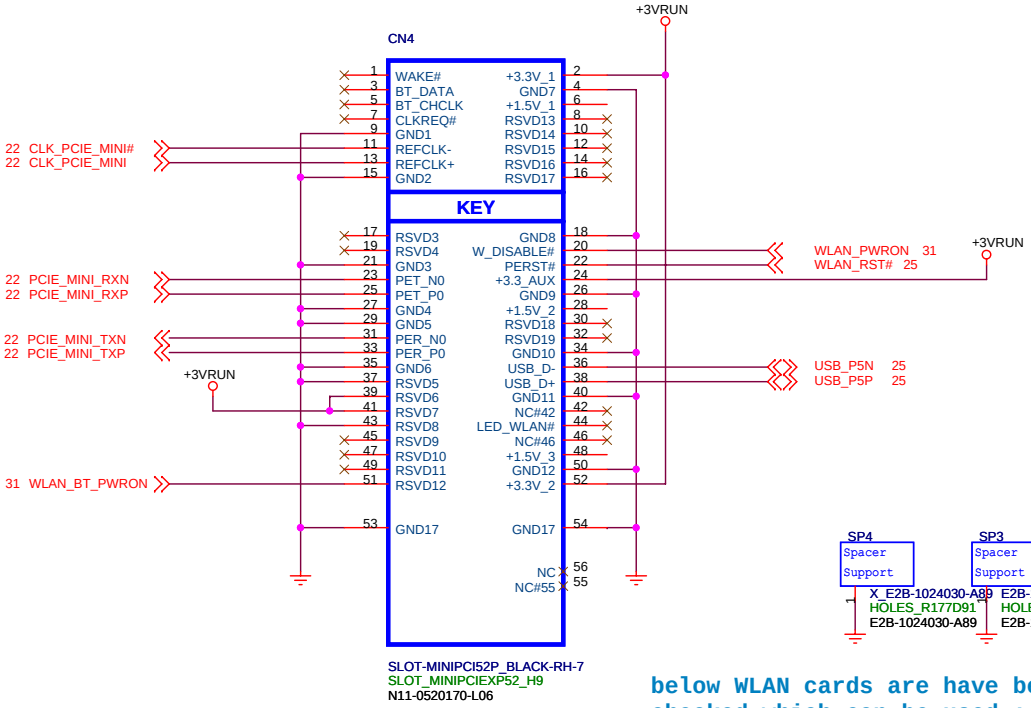


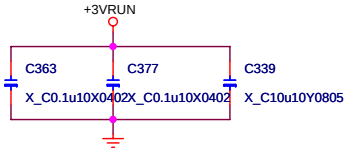
[Fuqun] EC control change to PCH control

MICRO-STAR INT'L CO.,LTD.

Title: HDD, ODD		
Size: B	Document Number: MS-16GB	Rev: 1.0
Date:	Sheet 35 of 56	

WLAN





delete 1.5vrun because no wireless card in product AVL
use this voltage

PIN51 for intel N130 BT control &AW-NB087H BT control;
PIN5 for AW-NB041H BT control;

AW-NB087H BT do not use USB interface,it only share PCIE interface.

below WLAN cards are have been checked which can be used :
Intel N130/N135;
AW-NB100H/NE785H/NE139H;

MICRO-STAR INT'L CO.,LTD.

Title: WLAN, BT		
Size: B	Document Number: MS-16GB	Rev: 1.0
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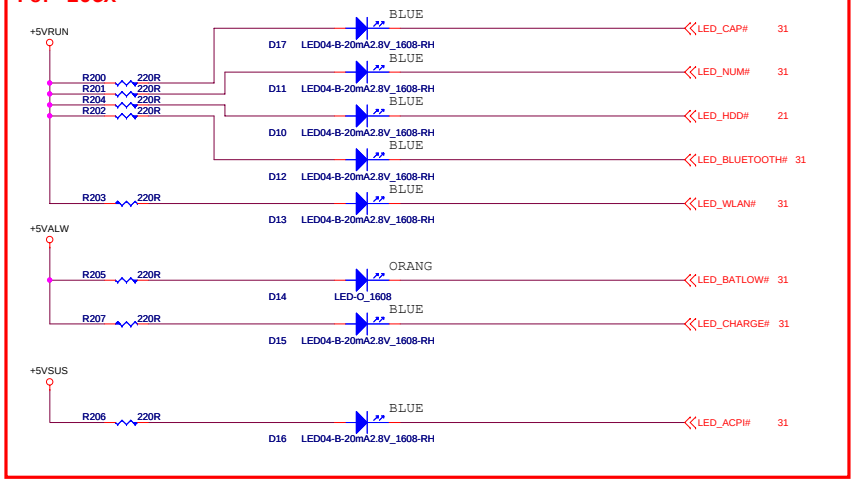
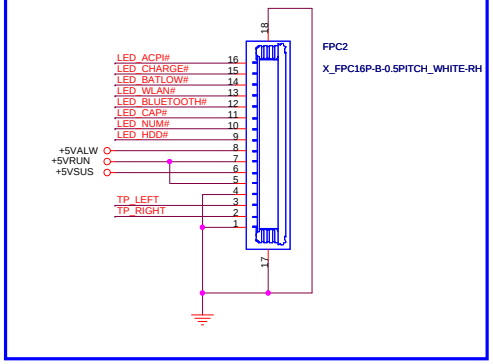
LED

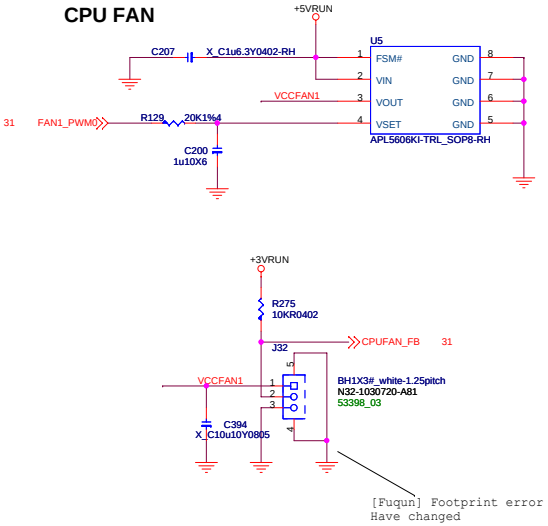
For 16GX



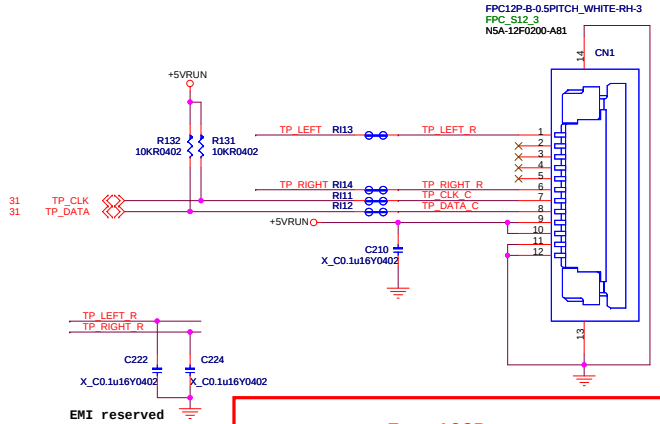
For 175X [D] board



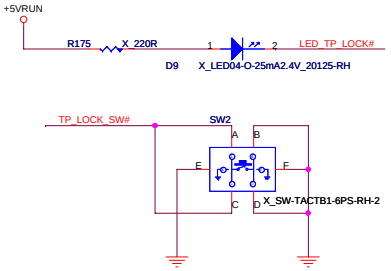
CPU FAN



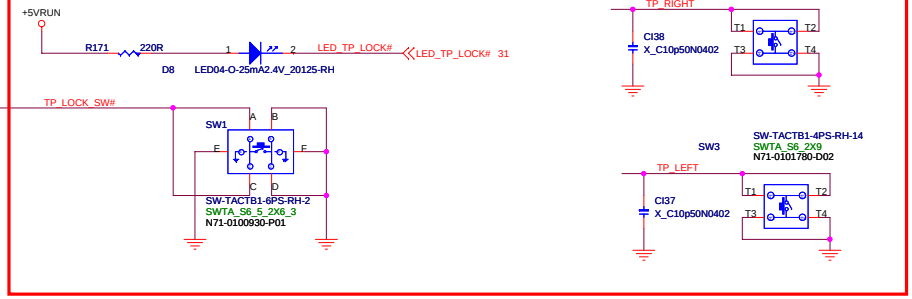
Touch Pad



For 175X



For 16GB



MSI	MICRO-STAR INT'L CO.,LTD.	
Title: TP, LED, FAN		
Size: Custom	Document Number: MS-16GB	Rev: 1.0
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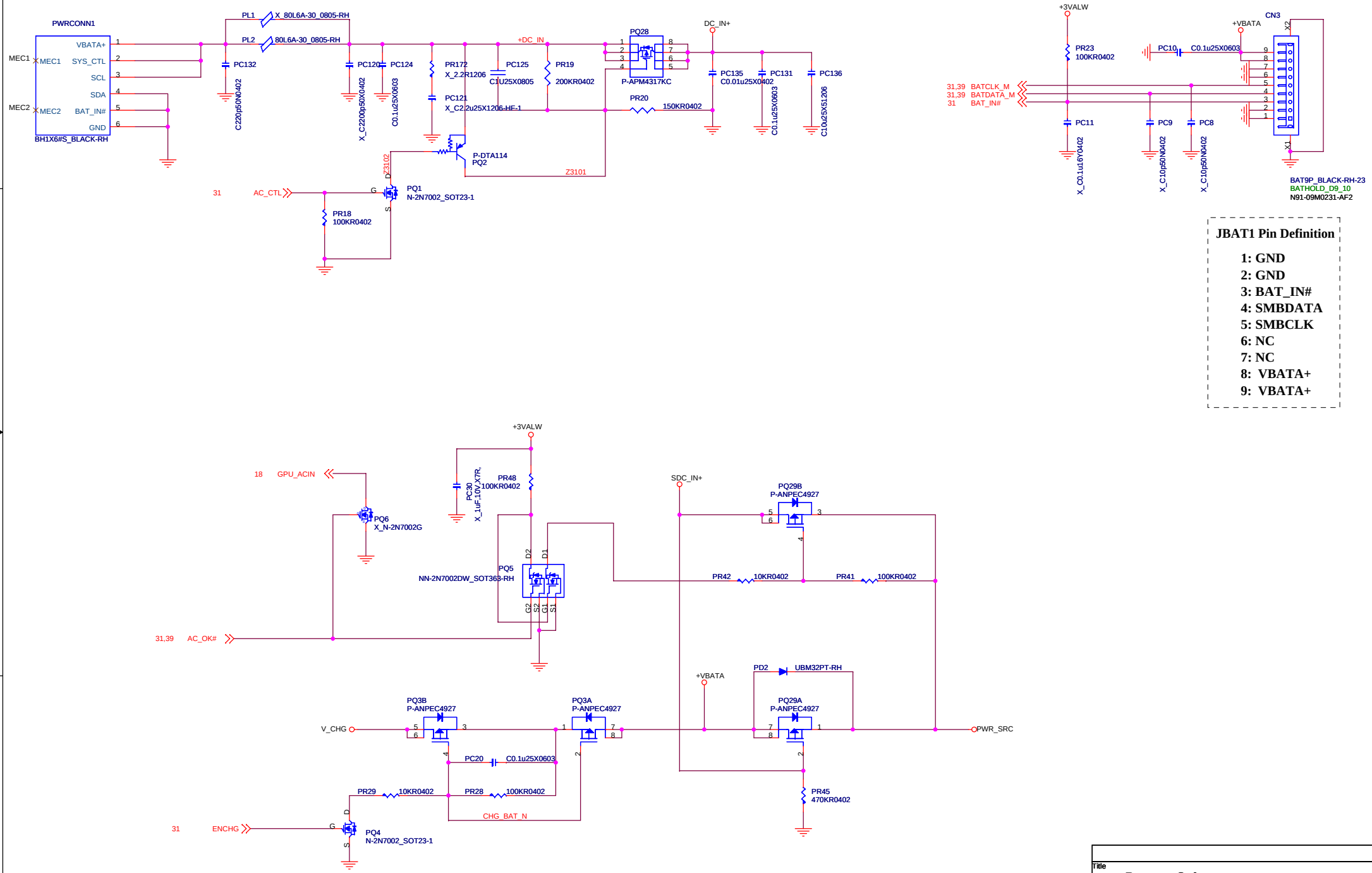
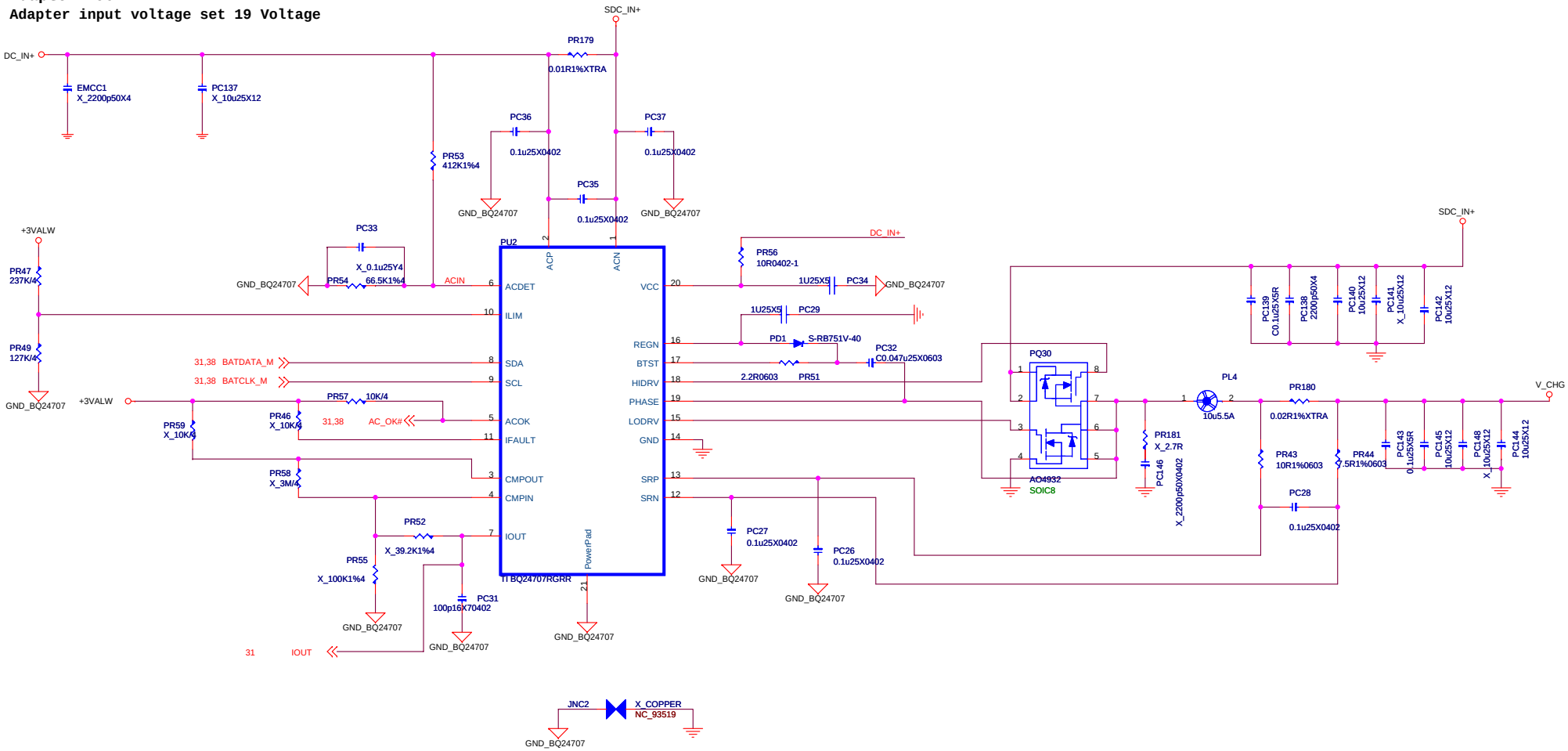


JBAT1 Pin Definition

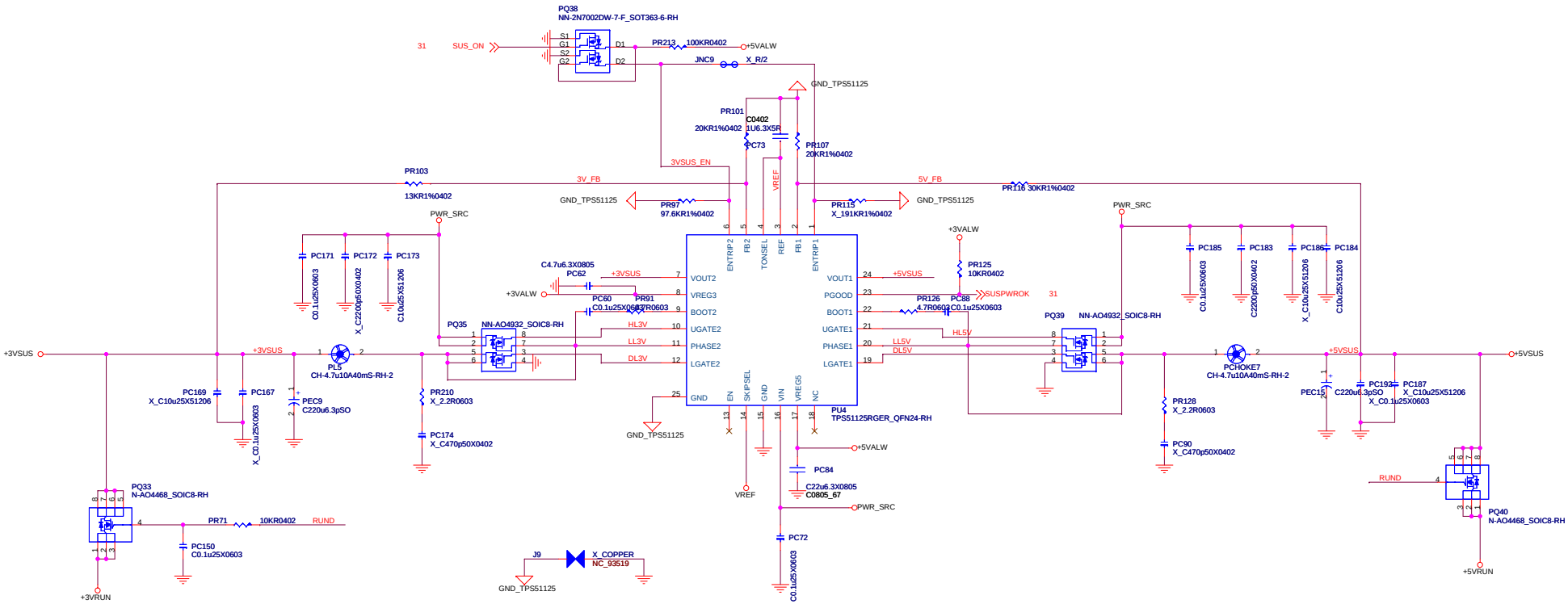
1: GND
2: GND
3: BAT_IN#
4: SMBDATA
5: SMBCLK
6: NC
7: NC
8: VBATA+
9: VBATA+

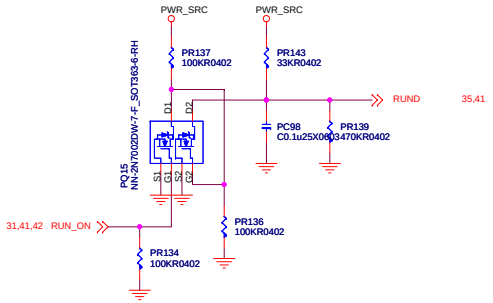
Title	Battery Select		
Size: Custom	Document Number: MS-16GB		Rev: 1.0
Date: Tuesday, January 03, 2012		Sheet 38 of 56	

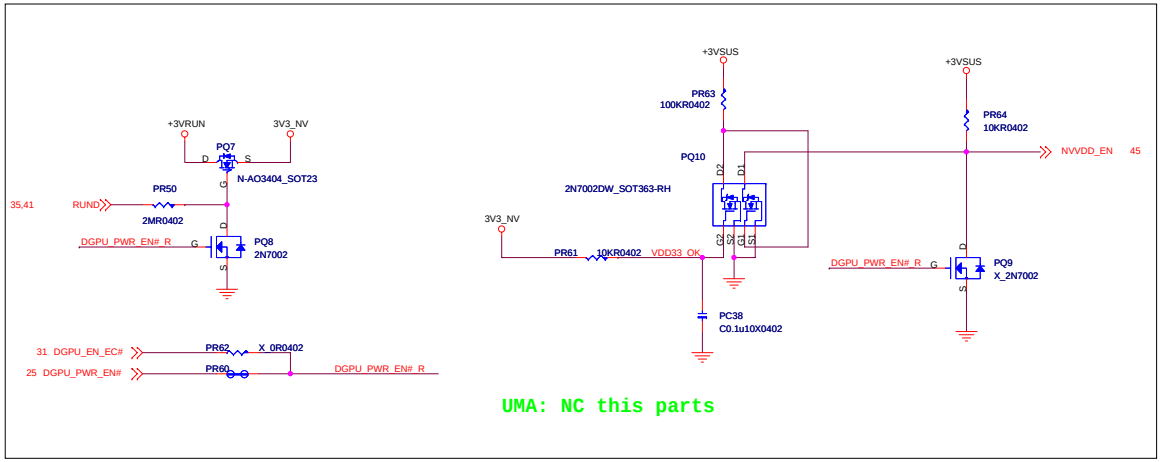
Adapter= 90W
Adapter input voltage set 19 Voltage



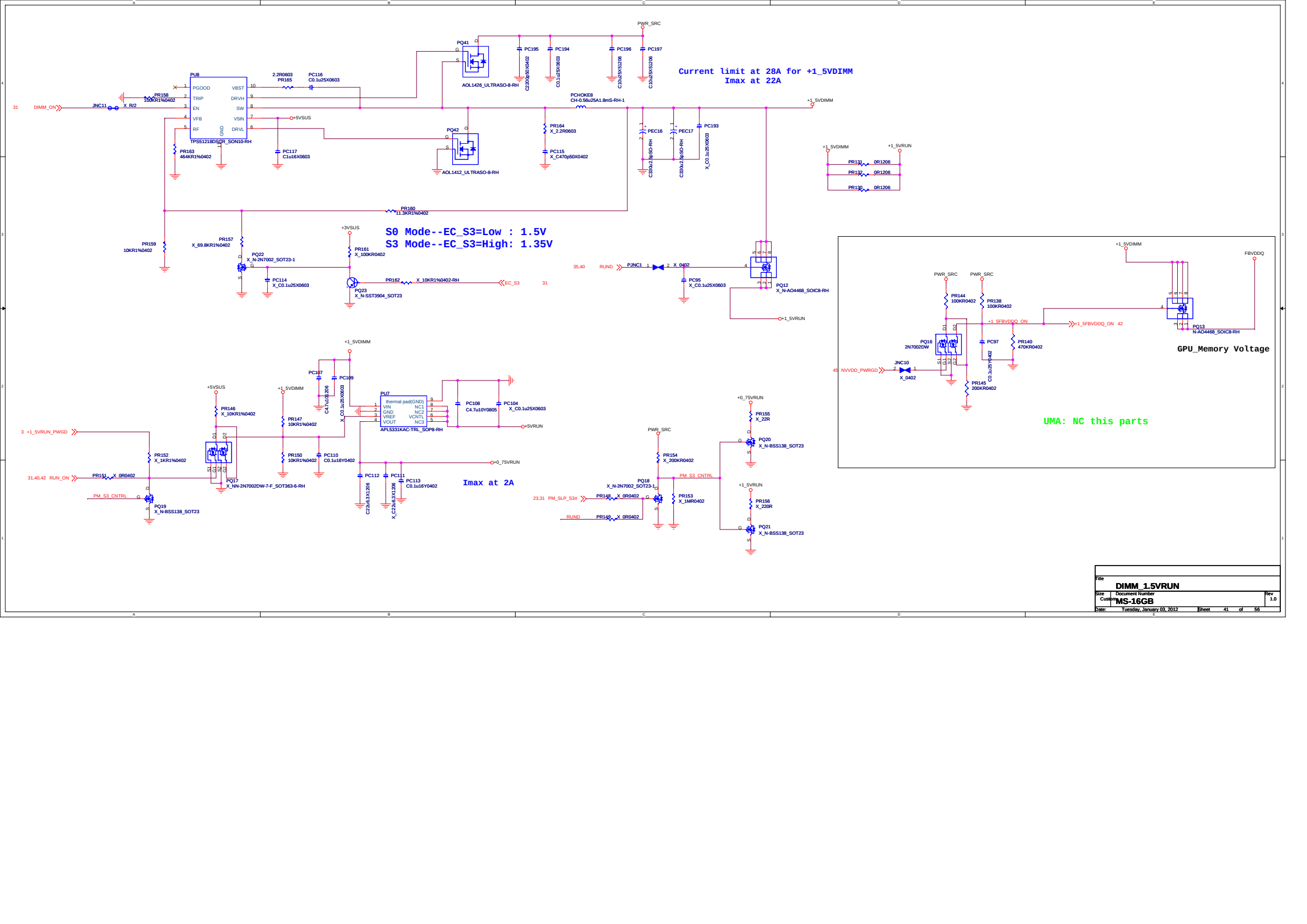
MSI	MICRO-STAR INT'L CO.,LTD.		
Title: Charger			
Size: Custom	Document Number: MS-16GB	Rev: 1.0	
Date: Tuesday, January 03, 2012	Sheet 39 of 56		

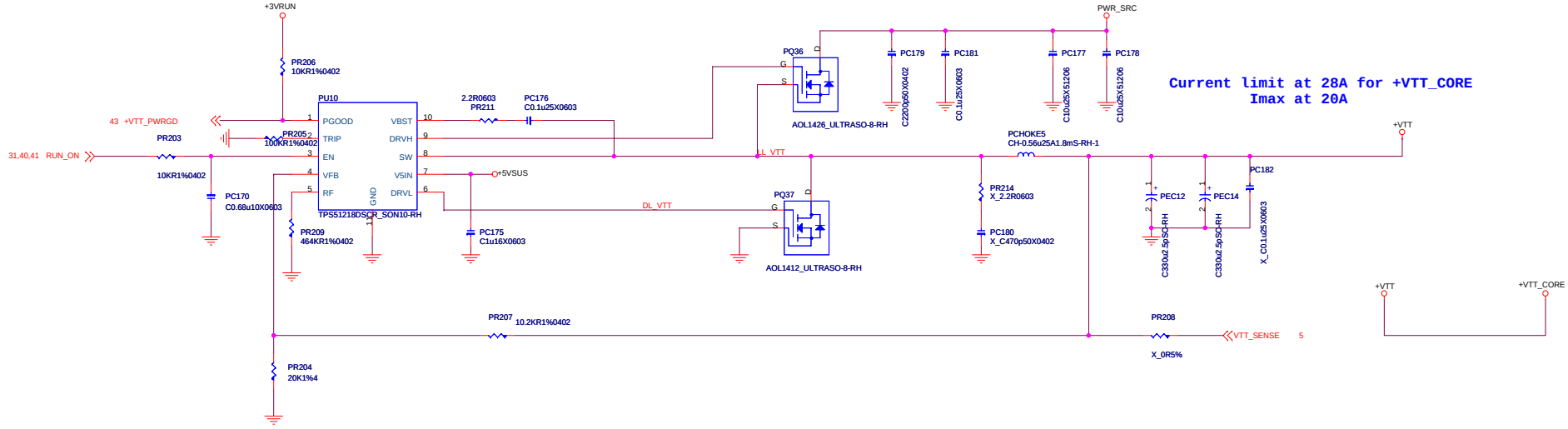


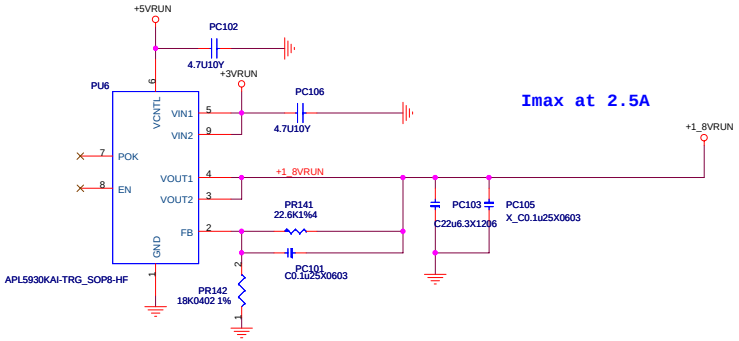


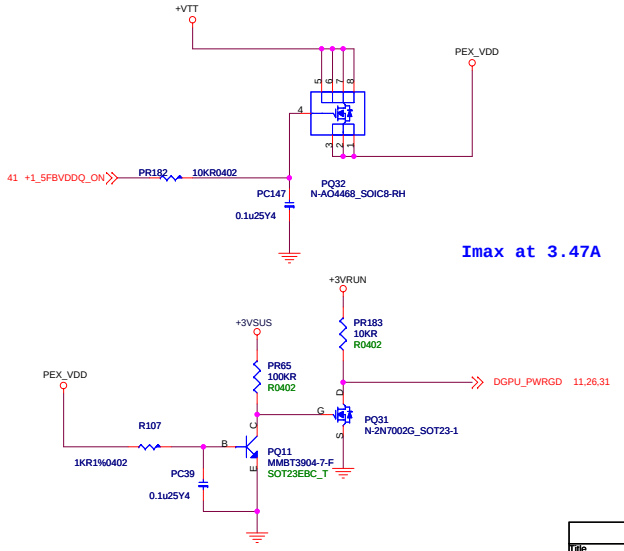


Title: System Power			
Size: Custom	Document Number: MS-16GB		Rev: 1.0
Date: Tuesday, January 03, 2012	Sheet 40 of 56		

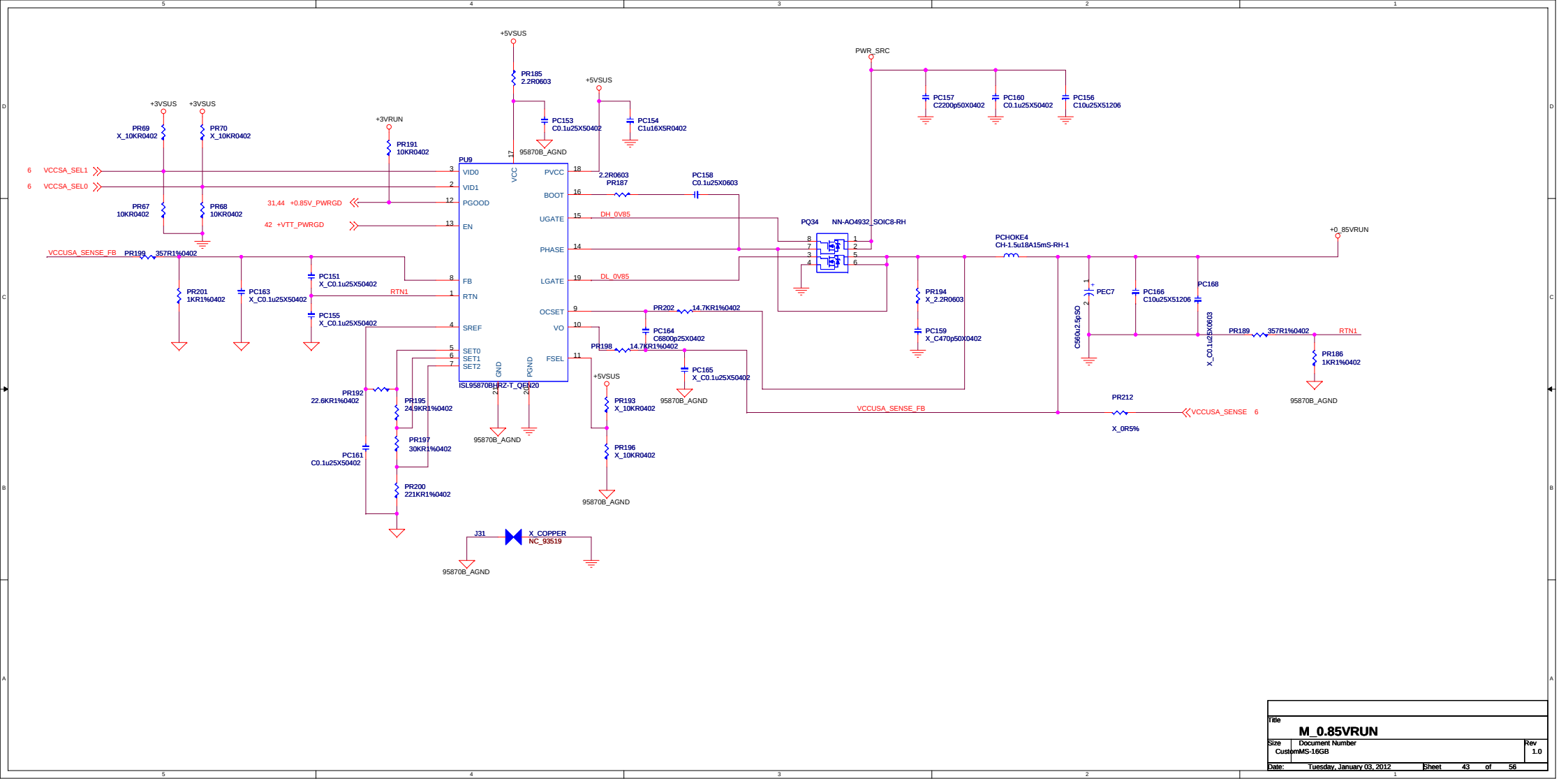

Current limit at 28A for +1_5VDIMM
Imax at 22A
S0 Mode--EC_S3=Low : 1.5V
S3 Mode--EC_S3=High: 1.35V
Imax at 2A
GPU_Memory Voltage
UMA: NC this parts
PWR_SRC
+1_5VDIMM
+1_5VRUN
+5VSUS
+2VSUS
+0_75VRUN
+5VRUN
FBVDDQ
PU8
TPS51218DSCR_SON10-RH
PQ41
AOL1426_ULTRASO-8-RH
PQ42
AOL1412_ULTRASO-8-RH
PCHOKE8
CH-0.56u25A1.8mS-RH-1
PQ22
X_N-2N7002_SOT23-1
PQ23
X_N-SST3904_SOT23
PQ12
X_N-AO4468_SOIC8-RH
PQ13
N-AO4468_SOIC8-RH
PQ16
2N7002DW
PQ17
X_NN-2N7002DW-7-F_SOT363-6-RH
PQ18
X_N-2N7002_SOT23-1
PQ19
X_N-BSS138_SOT23
PQ20
X_N-BSS138_SOT23
PQ21
X_N-BSS138_SOT23
PU7
APL5331KAC-TRL_SOP8-RH
JNC11
JNC10
PJNC1
DIMM_ON
RUND
NVVDD_PWRGD
RUN_ON
PM_S3_CNTRL
PM_SLP_S3#
+1_5VRUN_PWGD
EC_S3
+1_5FBVDDQ_ON
PR158 100KR1%0402
PR159 10KR1%0402
PR160 11.3KR1%0402
PR163 464KR1%0402
PR164 X_2.2R0603
PR165 2.2R0603
PR131 0R1206
PR132 0R1206
PR130 0R1206
PR144 100KR0402
PR138 100KR0402
PR140 470KR0402
PR145 200KR0402
PR146 X_10KR1%0402
PR147 10KR1%0402
PR150 10KR1%0402
PR151 X_0R0402
PR152 X_1KR1%0402
PR153 X_1MR0402
PR154 X_200KR0402
PR155 X_22R
PR156 X_220R
PR157 X_69.8KR1%0402
PR161 X_100KR0402
PR162 X_10KR1%0402-RH
PR148 X_0R0402
PR149 X_0R0402
PC116 C0.1u25X0603
PC117 C1u16X0603
PC114 X_C0.1u25X0603
PC95 X_C0.1u25X0603
PC97 C0.1u25Y0402
PC107 C47u10X1206
PC109 X_C0.1u25X0603
PC108 C4.7u10Y0805
PC104 X_C0.1u25X0603
PC110 C0.1u16Y0402
PC112 C22u6.3X1206
PC111 X_C22u6.3X1206
PC113 C0.1u16Y0402
PC115 X_C470p50X0402
PC193 X_C0.1u25X0603
PC195 C220p50X0402
PC194 C0.1u25X0603
PC196 C10u25X1206
PC197 C10u25X1206
PEC16 C330u2.5vSO-RH
PEC17 C330u2.5vSO-RH
X_0402
X_R/2
Title
DIMM_1.5VRUN
Size
Custom
Document Number
MS-16GB
Rev
1.0
Date: Tuesday, January 03, 2012
Sheet 41 of 56



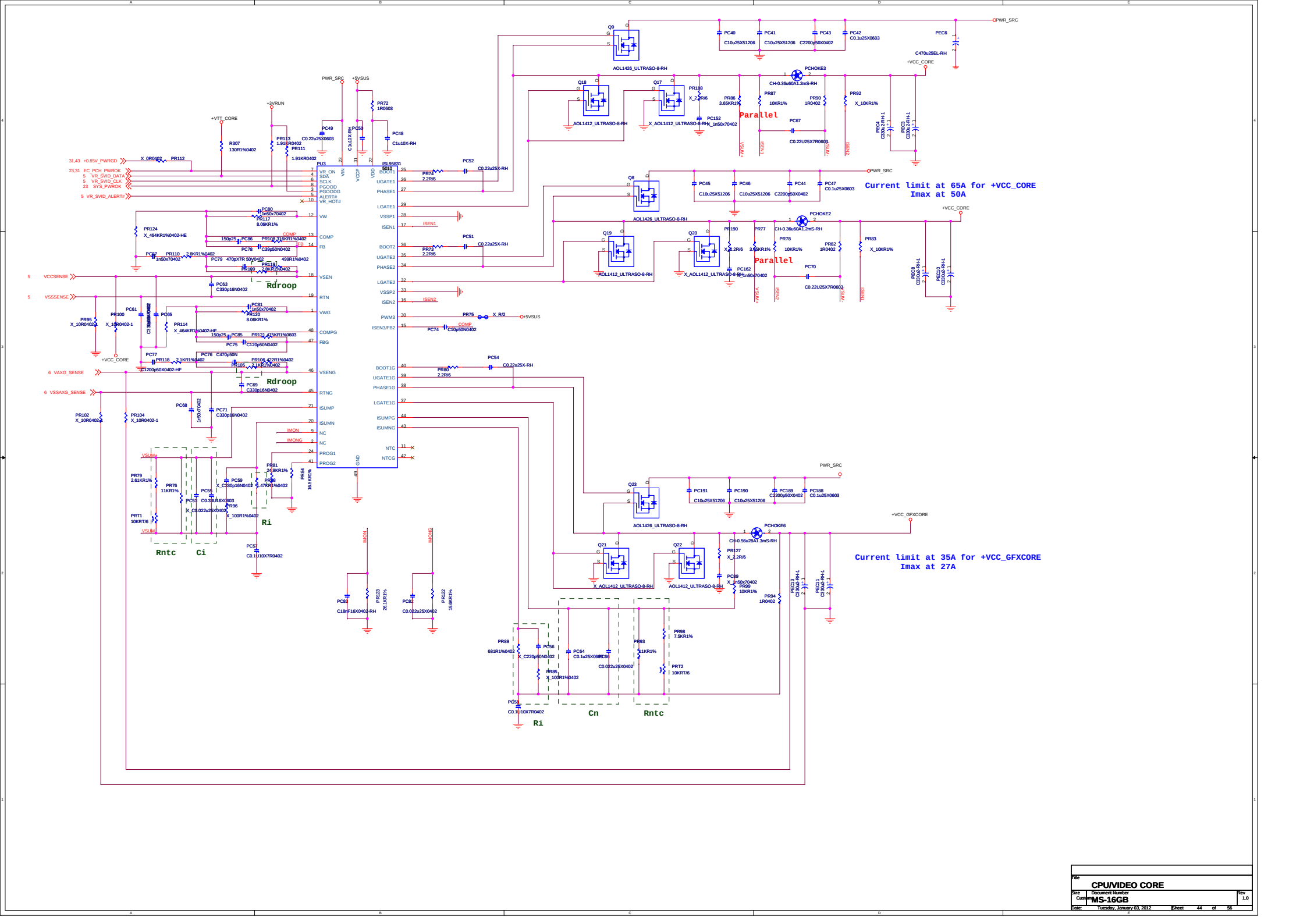




Title	VTT_1.8VRUN	
Size: Custom	Document Number: MS-16GB	Rev: 1.0
Date: Tuesday, January 03, 2012	Sheet 42 of 56	



Title	M_0.85VRUN	
Size	Document Number	Rev
Custom	MS-16GB	1.0
Date: Tuesday, January 03, 2012	Sheet 43 of 56	


Current limit at 65A for +VCC_CORE
Imax at 50A
Current limit at 35A for +VCC_GFXCORE
Imax at 27A
Parallel
Parallel
Rdroop
Rdroop
Rntc
Ci
Ri
Cn
Rntc
Ri
ISL95831
PWR_SRC
+5VSUS
+3VRUN
+VTT_CORE
+VCC_CORE
+VCC_GFXCORE
AOL1426_ULTRASO-8-RH
AOL1412_ULTRASO-8-RH
X_AOL1412_ULTRASO-8-RH
CH-0.36u60A1.2mS-RH
CH-0.56u28A1.3mS-RH
C470u25EL-RH
VCCSENSE
VSSSENSE
VAXG_SENSE
VSSAXG_SENSE
CPU/VIDEO CORE
MS-16GB
Rev 1.0
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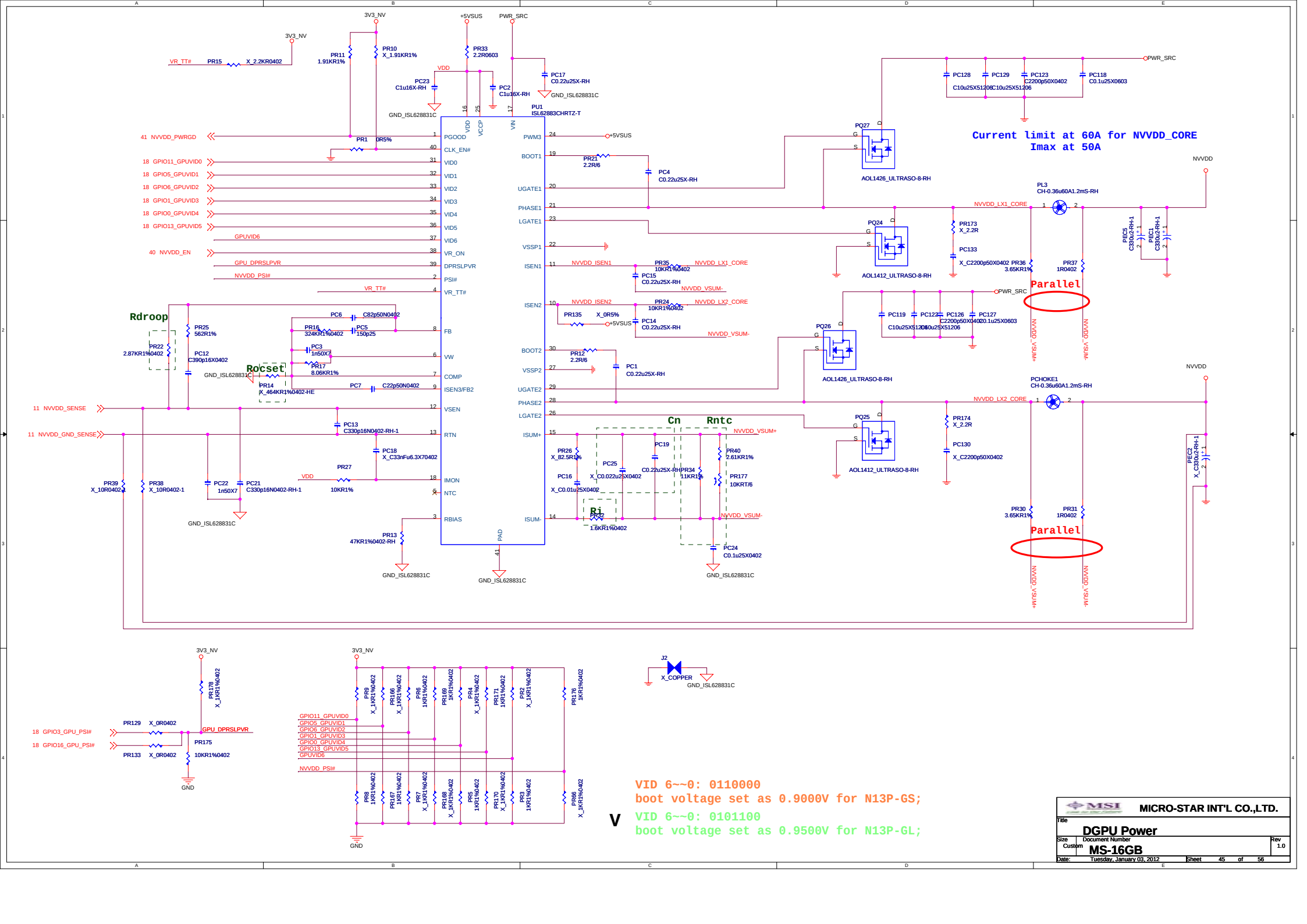
Sheet 44 of 56


Current limit at 60A for NVVDD_CORE
Imax at 50A
Rdroop
Rocset
Cn
Rntc
Ri
Parallel
Parallel
PU1
ISL62883CHRTZ-T
PGOOD
CLK_EN#
VID0
VID1
VID2
VID3
VID4
VID5
VID6
VR_ON
DPRSLPVR
PSI#
VR_TT#
FB
VW
COMP
ISEN3/FB2
VSEN
RTN
IMON
NTC
RBIAS
PAD
PWM3
BOOT1
UGATE1
PHASE1
LGATE1
VSSP1
ISEN1
ISEN2
BOOT2
VSSP2
UGATE2
PHASE2
LGATE2
ISUM+
ISUM-
VDD
VCCP
VIN
AOL1426_ULTRASO-8-RH
AOL1412_ULTRASO-8-RH
AOL1426_ULTRASO-8-RH
AOL1412_ULTRASO-8-RH
PL3
CH-0.36u60A1.2mS-RH
PCHOKE1
CH-0.36u60A1.2mS-RH
NVVDD_LX1_CORE
NVVDD_LX2_CORE
NVVDD_ISEN1
NVVDD_ISEN2
NVVDD_VSUM-
NVVDD_VSUM+
PWR_SRC
NVVDD
3V3_NV
+5VSUS
GND_ISL628831C
VID 6~~0: 0110000
boot voltage set as 0.9000V for N13P-GS;
VID 6~~0: 0101100
boot voltage set as 0.9500V for N13P-GL;
V
MICRO-STAR INT'L CO.,LTD.
DGPU Power
MS-16GB
Custom
Rev 1.0
Tuesday, January 03, 2012
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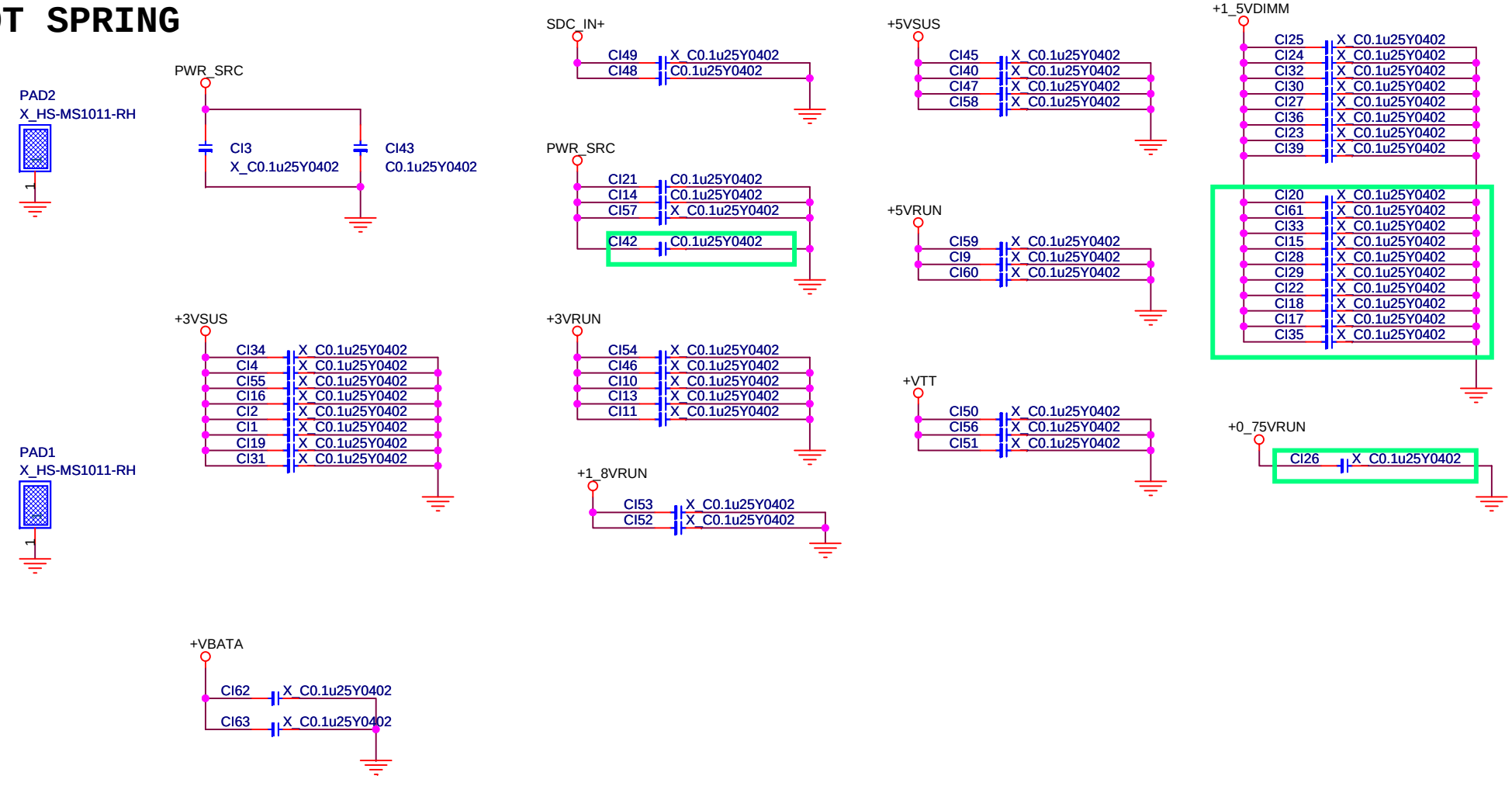
BOT SPRING



MSI Link to the Future	MICRO-STAR INT'L CO.,LTD.	
Title: EMI		
Size: Custom	Document Number: MS-16GB	Rev: 1.0
Date: Tuesday, January 03, 2012	Sheet 46 of 56	

HOLES_8X8_D3MM_VIA8
MH11 X_8x8

HOLES_8X8_D3MM_VIA3
MH2 X_8x8

HOLES_8X8_D3MM_VIA3
MH9 X_8x8

HOLES_8X8_D3MM_VIA5
MH4 X_8x8

HOLES_8X8_D3MM_VIA8
MH8 X_8x8

HOLES_8X8_D3MM_VIA5
MH3 X_8x8

MH10
X_8.5x8.5

HOLES_8X8_D3MM_VIA3
MH7 X_8x8

HOLES_8X8_D3MM_VIA8
MH6 X_8x8

HOLES_8X8_D3MM_VIA8
MH12 X_8x8

NPTH118
H1

NPTH118
H5

HOLES_NR91D91
H4
X_ME_ SCREW HOLE

FM19 FM6 FM18 FM10
FM2 FM9 FM8 FM13 FM17
FM3 FM16 FM4 FM15 FM5
FM7 FM14 FM11 FM12 FM1

MYLAR15
MECH,DDR_MYLAR
E2P-7512011-G40

MYLAR6
HDD_SPONGE
E2Y-7510411-G40

MYLAR13
PANEL&COVER_GAP
E2Y-3514921-Y40

MYLAR22
KB_FLOATING_RUBBER
E2Y-7511811-Y40

MYLAR4
KB_FLOATING_MYLAR
E2P-7511211-G40

MYLAR21
KB_FLOATING_RUBBER
E2Y-7511811-Y40

MYLAR20
KB_FLOATING_RUBBER
E2Y-7511811-Y40

MYLAR16
MB_TO_SHEILDING_MYLAR
E2P-6G12811-G40

MYLAR11
KB_FLOATING
E2Y-7511711-Y40

MYLAR17
X_DDR MYLAR
E26-1022220-Y42

MYLAR14
PRESS_RUBBER
E2Y-7511011-Y40

MYLAR12
TP_LED_MYLAR
E2P-7511411-G40

MYLAR23
X_HDD,WASHER
E2Y-Z001711-G40

MYLAR24
X_HDD,WASHER
E2Y-Z001711-G40

MYLAR27
CMOS BATTERY ADHESIVE
E2Y-1213111-G40

MYLAR25
X_ODD,WASHER
E2Y-Z001711-G40

MYLAR26
X_ODD,WASHER
E2Y-Z001711-G40

CPU

CPU_H2
X_CPU SCREW HOLE
HOLES_R276D185P_PT

CPU_H3
X_CPU SCREW HOLE
HOLES_R276D185P_PT

CPU_H4 X_CPU SCREW HOLE
HOLES_R276D185P_PT

CPU_H1 X_CPU SCREW HOLE
HOLES_R276D185P_PT

UME3
CPU BRACKET
CPU BRACKET
307-6G10212-A89

PCH

PCH_ SCREW HOLE
HOLES_R193D138_PT
E2B-163B010-L63

PCH_ SCREW HOLE
HOLES_R193D138_PT
E2B-163B010-L63

PCH_H2
PCH_H1
SCREW1
SCREW2
M2X3
E43-1203003-G68
M2X3
E43-1203003-G68

UME2
SB HEATSINK
SB HEATSINK
E31-0403231-TA9

GPU

GPU SCREW HOLE
HOLES_R236D91_PT
E2B-16GM010-A89

GPU SCREW HOLE
HOLES_R236D91_PT
E2B-16GM010-A89

H3
H2

RACK1
X_RACK1
E2P-6310611-K23

RACK2
X_RACK1
E2P-6310611-K23

UME1
HDMI ROYALTY
HDMI ROYALTY
Y01-RHDMI03-000

PCB1
PCB

MICRO-STAR INT'L CO.,LTD.

Title: Screw / ME

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Single-end

TOP

J29 — L1_6mil_45_Ohm — GND2 — X_H1X2M_BLACK-RH

J15 — L1_4.5mil_50_Ohm — GND2 — X_H1X2M_BLACK-RH

IN3

J26 — L3_8mil_40_Ohm — GND2 — X_H1X2M_BLACK-RH

J28 — L3_6.5mil_45_Ohm — GND2 — X_H1X2M_BLACK-RH

J14 — L3_5mil_50_Ohm — GND2 — X_H1X2M_BLACK-RH

IN4

J25 — L4_8mil_40_Ohm — GND5 — X_H1X2M_BLACK-RH

J22 — L4_6.5mil_45_Ohm — GND5 — X_H1X2M_BLACK-RH

J20 — L4_5mil_50_Ohm — GND5 — X_H1X2M_BLACK-RH

BOTTOM

J13 — L6_8mil_37.5_Ohm — GND5 — X_H1X2M_BLACK-RH

J19 — L6_6mil_45_Ohm — GND5 — X_H1X2M_BLACK-RH

J21 — L6_4.5mil_50_Ohm — GND5 — X_H1X2M_BLACK-RH

Differential signal

TOP

J1 — L1_DIFF_4.5/4.5/4.5_85 Ohm+ / L1_DIFF_4.5/4.5/4.5_85 Ohm- — X_H1X4_black-RH — GND2

J11 — L1_DIFF_4.5/6/4.5_90 Ohm+ / L1_DIFF_4.5/6/4.5_90 Ohm- — X_H1X4_black-RH — GND2

J12 — L1_DIFF_4.5/12/4.5_100 Ohm+ / L1_DIFF_4.5/12/4.5_100 Ohm- — X_H1X4_black-RH — GND2

J3 — L1_DIFF_5/4/5_80 Ohm+ / L1_DIFF_5/4/5_80 Ohm- — X_H1X4_black-RH — GND2

J10 — L1_DIFF_6/9/6_80 Ohm+ / L1_DIFF_6/9/6_80 Ohm- — X_H1X4_black-RH — GND2

IN3

J6 — L3_DIFF_5/4/5_80 Ohm+ / L3_DIFF_5/4/5_80 Ohm- — X_H1X4_black-RH — GND2

J5 — L3_DIFF_5/4.5/5_85 Ohm+ / L3_DIFF_5/4.5/5_85 Ohm- — X_H1X4_black-RH — GND2

J27 — L3_DIFF_5/6/5_90 Ohm+ / L3_DIFF_5/6/5_90 Ohm- — X_H1X4_black-RH — GND2

J4 — L3_DIFF_6.5/7/6.5_80 Ohm+ / L3_DIFF_6.5/7/6.5_80 Ohm- — X_H1X4_black-RH — GND2

IN4

J24 — L4_DIFF_5/4/5_80 Ohm+ / L4_DIFF_5/4/5_80 Ohm- — X_H1X4_black-RH — GND5

J18 — L4_DIFF_5/4.5/5_85 Ohm+ / L4_DIFF_5/4.5/5_85 Ohm- — X_H1X4_black-RH — GND5

BOTTOM

J23 — L6_DIFF_4.5/6/4.5_90 Ohm+ / L6_DIFF_4.5/6/4.5_90 Ohm- — X_H1X4_black-RH — GND5

J17 — L6_DIFF_5/4/5_80 Ohm+ / L6_DIFF_5/4/5_80 Ohm- — X_H1X4_black-RH — GND5

J16 — L6_DIFF_6/9/6_80 Ohm+ / L6_DIFF_6/9/6_80 Ohm- — X_H1X4_black-RH — GND5

Title: Impedance		
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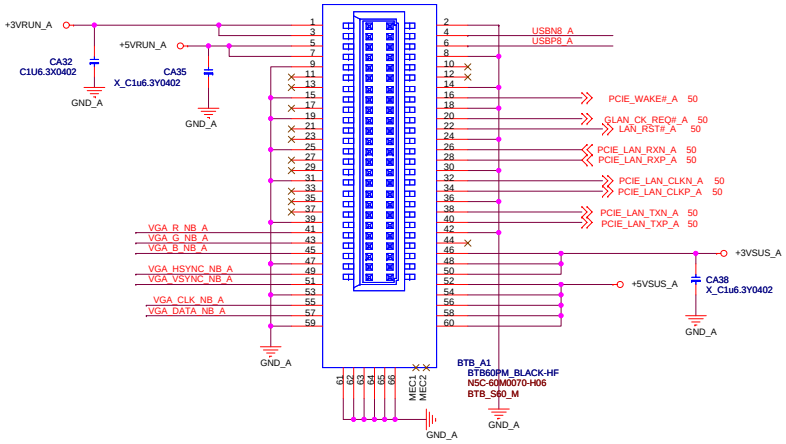
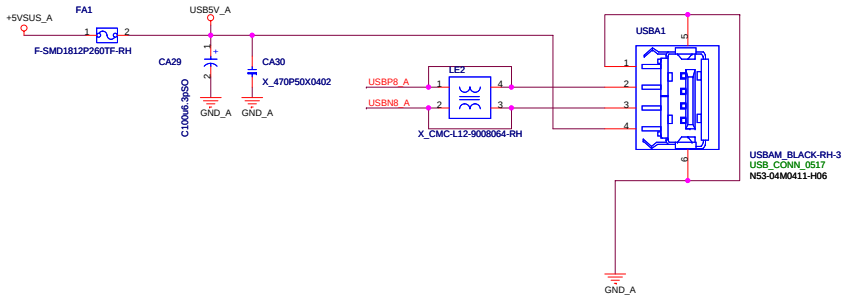
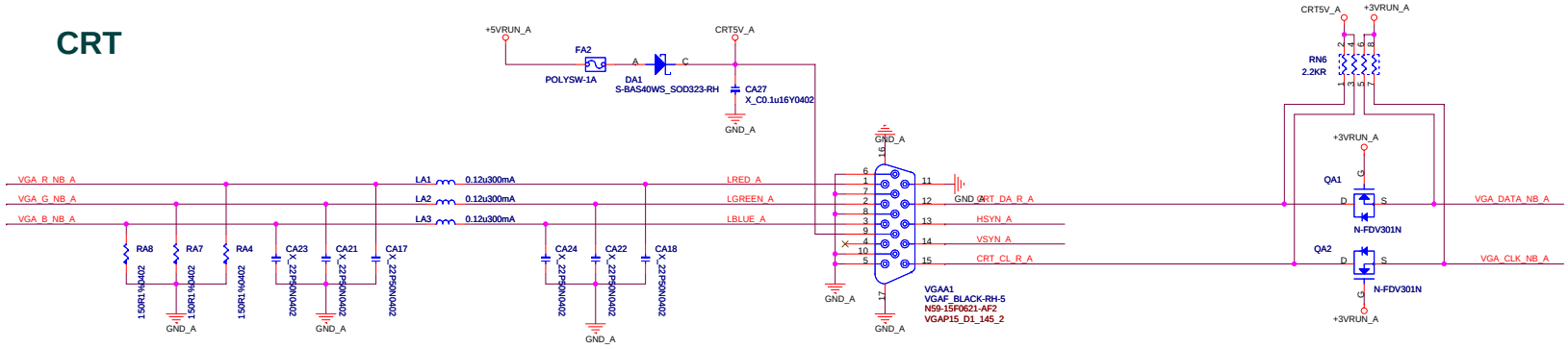
60PIN BTB I/O Connector(VGA, LAN, USB)

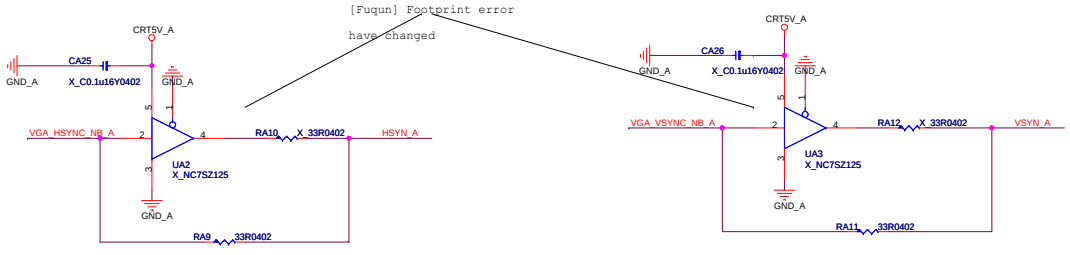


USB



CRT





MSI	MICRO-STAR INT'L CO.,LTD.	
Title	[A] CRT/USB/BT/CONN	
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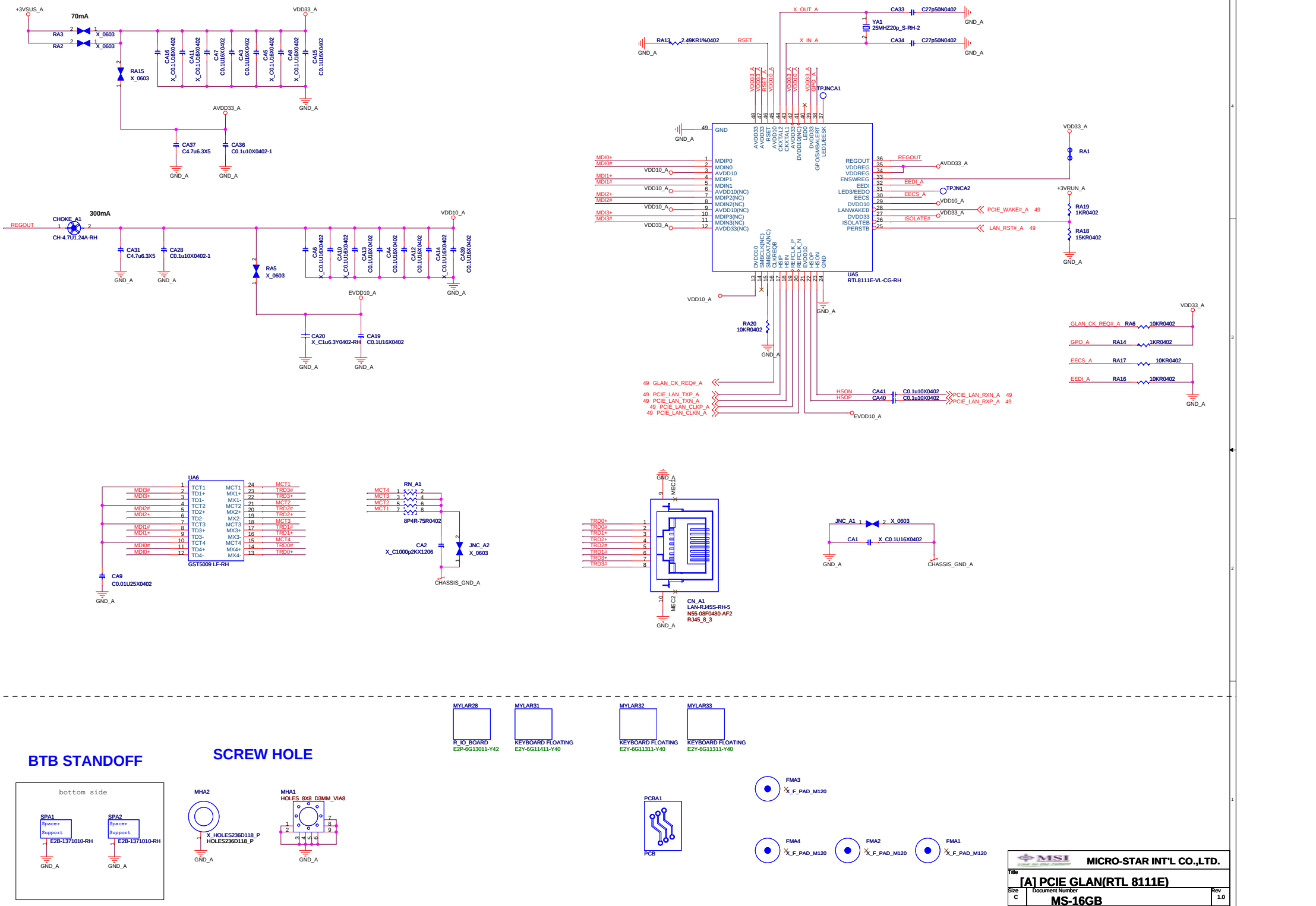
+3VSUS_A
70mA
RA3
RA2
X_0603
RA15
X_0603
VDD33_A
CA16
CA11
CA7
CA3
CA5
CA8
CA15
C0.1U16X0402
AVDD33_A
CA37
C4.7u6.3X5
CA36
C0.1u10X0402-1
GND_A
REGOUT
CHOKE_A1
300mA
CH-4.7U1.24A-RH
CA31
C4.7u6.3X5
CA28
C0.1u10X0402-1
RA5
X_0603
VDD10_A
CA6
CA10
CA13
CA4
CA12
CA14
CA39
EVDD10_A
CA20
X_C1u6.3Y0402-RH
CA19
C0.1U16X0402
X_OUT_A
X_IN_A
CA33
CA34
C27p50N0402
YA1
25MHZ20p_S-RH-2
RA13
2.49KR1%0402
RSET
TPJNCA1
UA5
RTL8111E-VL-CG-RH
MDI0+
MDI0#
MDI1+
MDI1#
MDI2+
MDI2#
MDI3+
MDI3#
REGOUT
AVDD33_A
EEDI_A
TPJNCA2
EECS_A
PCIE_WAKE#_A
ISOLATE#
LAN_RST#_A
RA1
RA19
1KR0402
RA18
15KR0402
+3VRUN_A
RA20
10KR0402
49 GLAN_CK_REQ#_A
49 PCIE_LAN_TXP_A
49 PCIE_LAN_TXN_A
49 PCIE_LAN_CLKP_A
49 PCIE_LAN_CLKN_A
HSON
HSOP
CA41
CA40
C0.1u10X0402
PCIE_LAN_RXN_A
PCIE_LAN_RXP_A
GLAN_CK_REQ#_A
RA6
10KR0402
GPO_A
RA14
1KR0402
EECS_A
RA17
10KR0402
EEDI_A
RA16
10KR0402
UA6
GST5009 LF-RH
CA9
C0.01U25X0402
RN_A1
8P4R-75R0402
CA2
X_C1000p2KX1206
JNC_A2
X_0603
CHASSIS_GND_A
CN_A1
LAN-RJ45S-RH-5
N55-08F0480-AF2
RJ45_8_3
JNC_A1
CA1
X_C0.1U16X0402
CHASSIS_GND_A
MYLAR28
R_IO_BOARD
E2P-6G13011-Y42
MYLAR31
KEYBOARD FLOATING
E2Y-6G11411-Y40
MYLAR32
KEYBOARD FLOATING
E2Y-6G11311-Y40
MYLAR33
KEYBOARD FLOATING
E2Y-6G11311-Y40
BTB STANDOFF
bottom side
SPA1
SPA2
Spacer
Support
E2B-1371010-RH
SCREW HOLE
MHA2
X_HOLES236D118_P
HOLES236D118_P
MHA1
HOLES_8X8_D3MM_VIA8
PCBA1
PCB
FMA3
FMA4
FMA2
FMA1
X_F_PAD_M120
MICRO-STAR INT'L CO.,LTD.
[A] PCIE GLAN(RTL 8111E)
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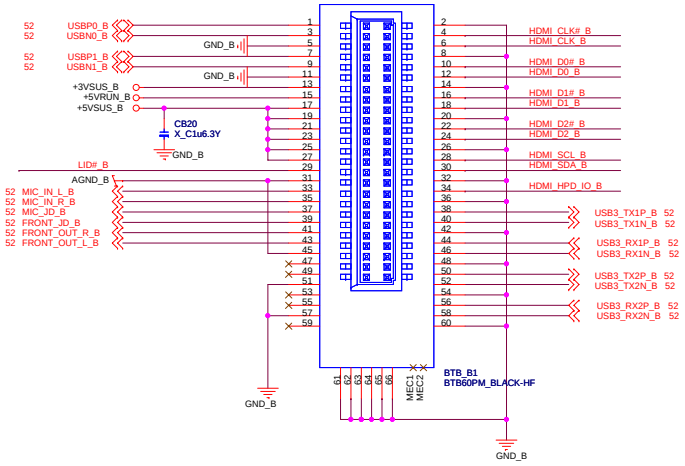
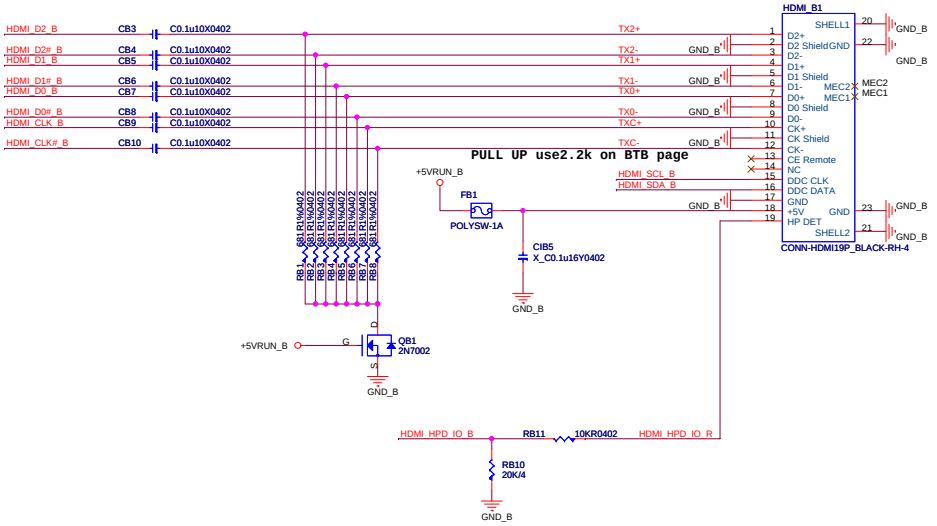
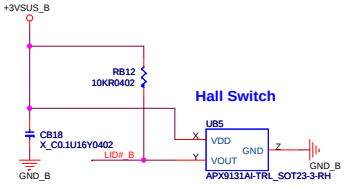
(左側 board to board CONN1: HDMI,Audio, LED,LID)



HDMI



LID



MSI	MICRO-STAR INT'L CO.,LTD.	
Title	[B] HDMI/Cardreader/CONN	
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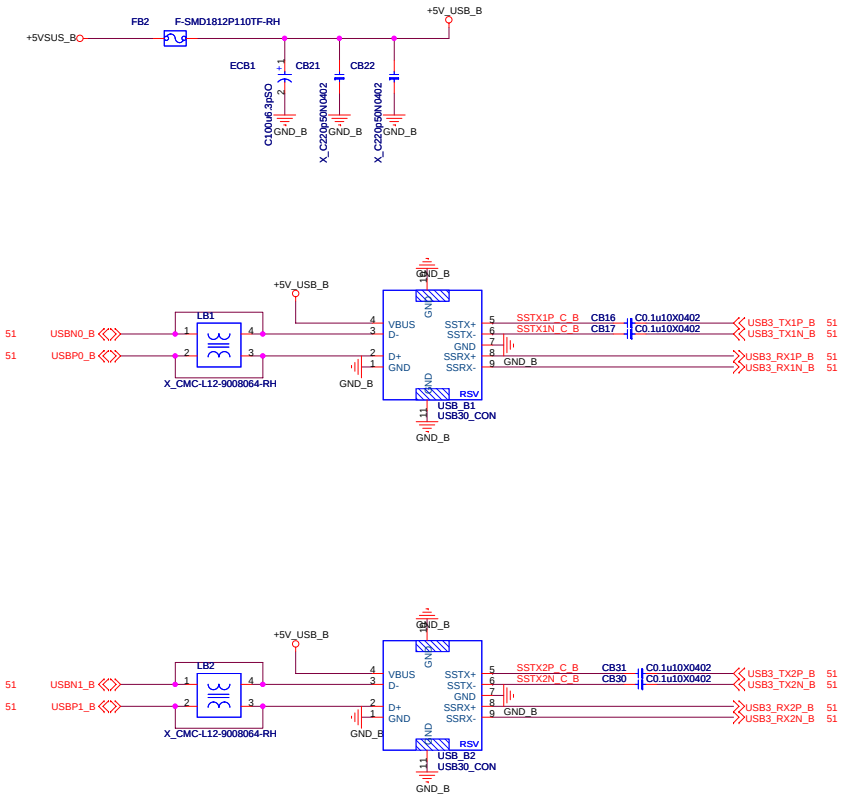
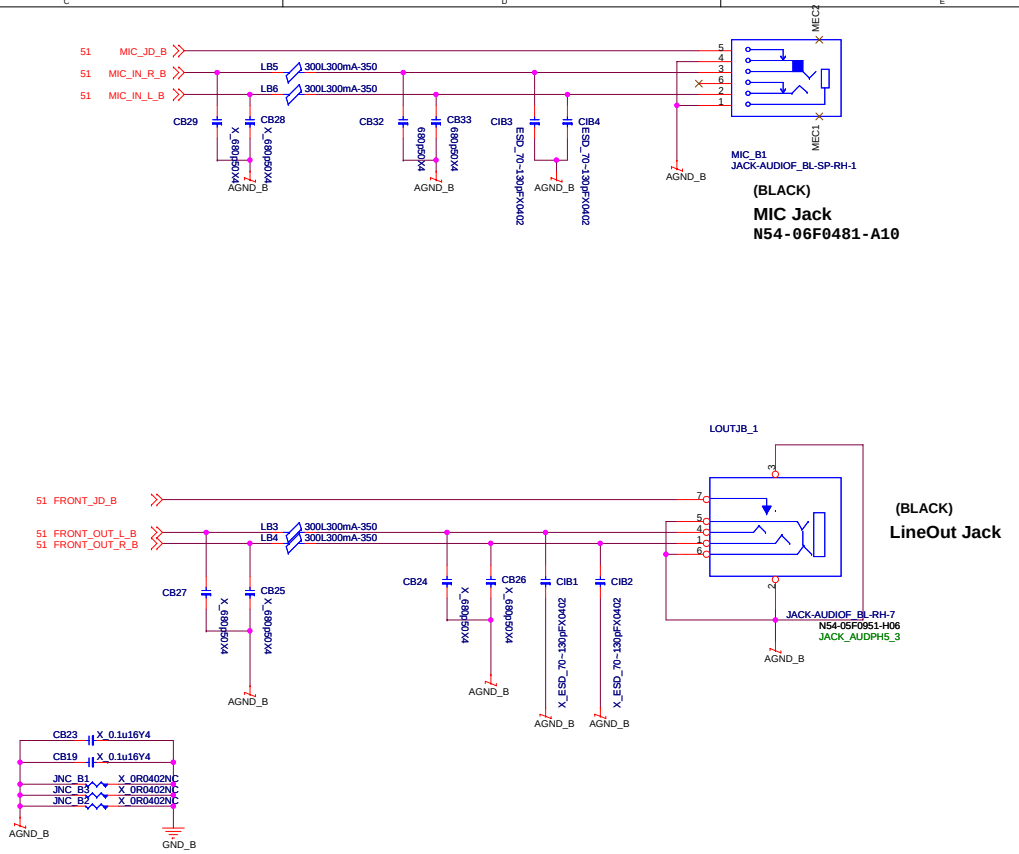
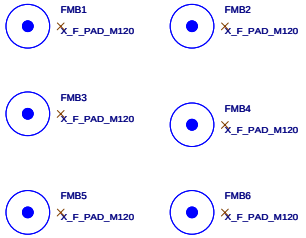
USB

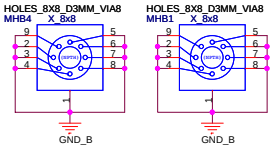


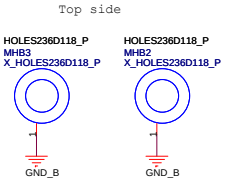
Audio Jack

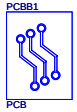




SCREW HOLE







MSI MICRO-STAR INT'L CO.,LTD.

Title: [B] Audio, USB3.0

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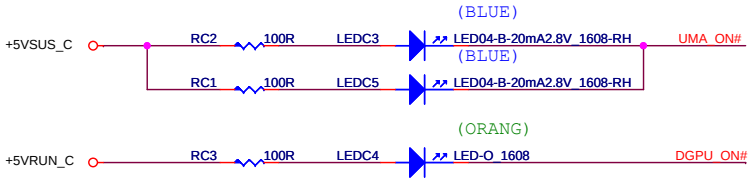
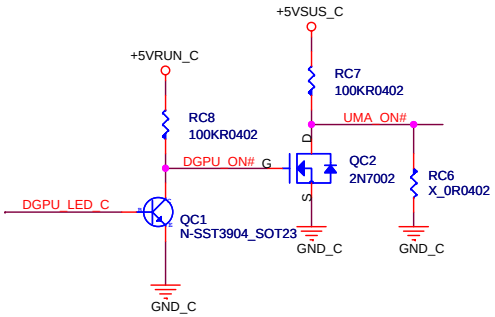
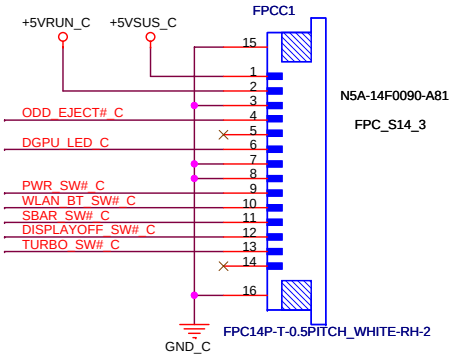
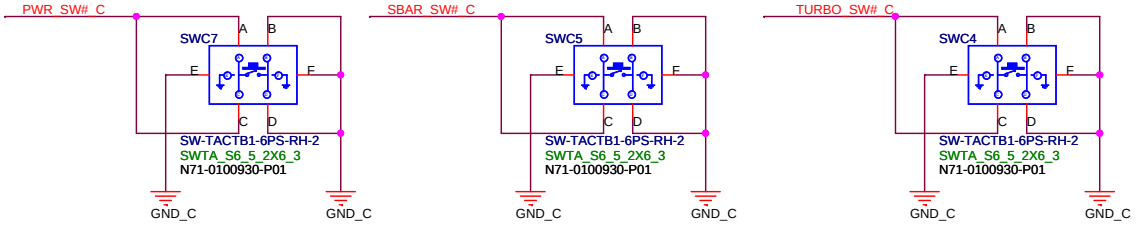
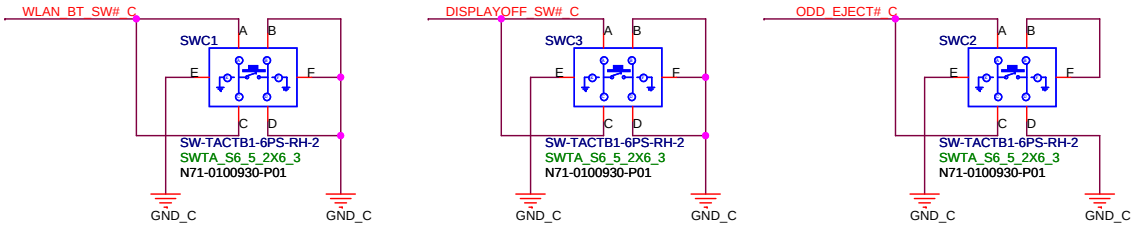
RC7 connection change from
+5VRUN_C to +5VSUS_C in 0B Ver .

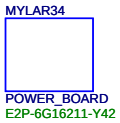


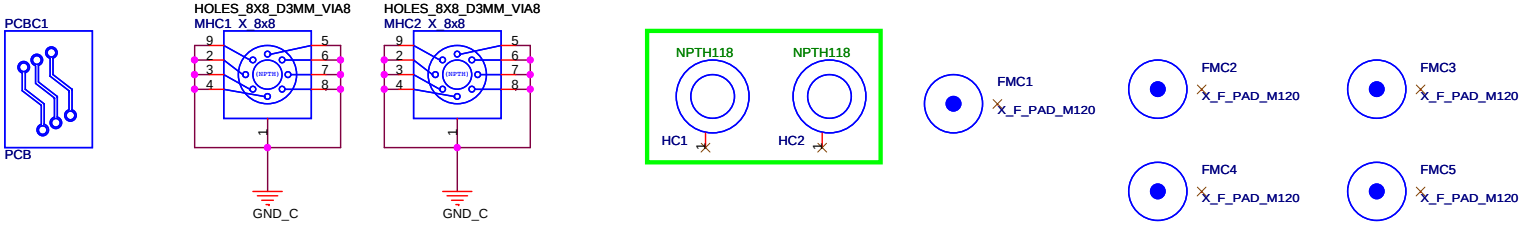












MICRO-STAR INT'L CO.,LTD.

Title: [C] PWR_SW /LED Launch Board

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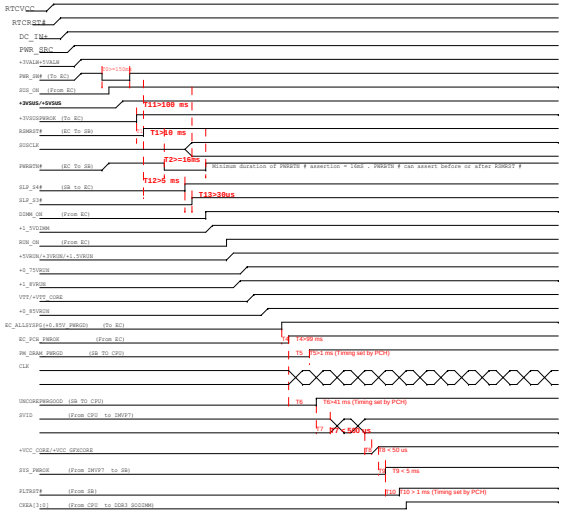
S5-S0

EC programming timing

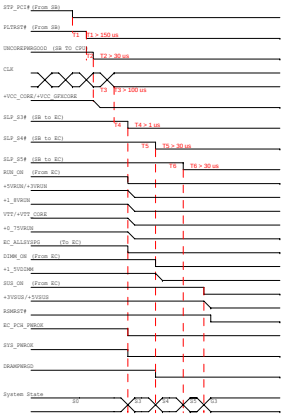
Intel Chief River timing SPEC



S0-S5

EC programming timing

Intel chief River timing SPEC



0705:

1 LOUTJB_3000

2 CHOKE_A3000

3 PWRCONN3000

MICRO-STAR INT'L CO.,LTD.

Title: HISTORY

Size: D | Document Number: MS-16GB | Rev: 1.0

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