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**MSI CONFIDENTIAL**

**HP Gwen X3 (HP SCH P/N:718773-000)**  
**HP Mordred X3 (HP SCH P/N:718773-000)**

uATX(244 mm X 244 mm) (MS-7860 0C)

**CPU:** Intel Haswell Processor

HP P/N	Description
718772-001	PCA,GWEN
718773-000	SCH,GWEN
718774-001	PCB,GWEN

**System Chipset:** Intel Lynx Point Chipset

HP P/N	Description
718775-001	PCA,MORDRED
718773-000	SCH,MORDRED
718774-001	PCB,MORDRED

**OnBoard Chipset:**  
 AZALIA Codec: Realtek ALC 221  
 LAN: Realtek RTL8151GH-CG 10/100/1000 NIC  
 SIO: Nuvoton NPCD379H  
 Flash ROM: 64 Mb

**Main Memory:** DDRIII (1333/1600MHz) \* 4 (Dual Channel)

**Expansion Slots:**  
 PCI Express (X16) Slot \* 1  
 PCI Express (X1) Slot \* 3  
 DDI Port Slot \*1

**PWM:**  
 Controller: ISL95816HRZ  
 Controller: NCP1587GDR2G

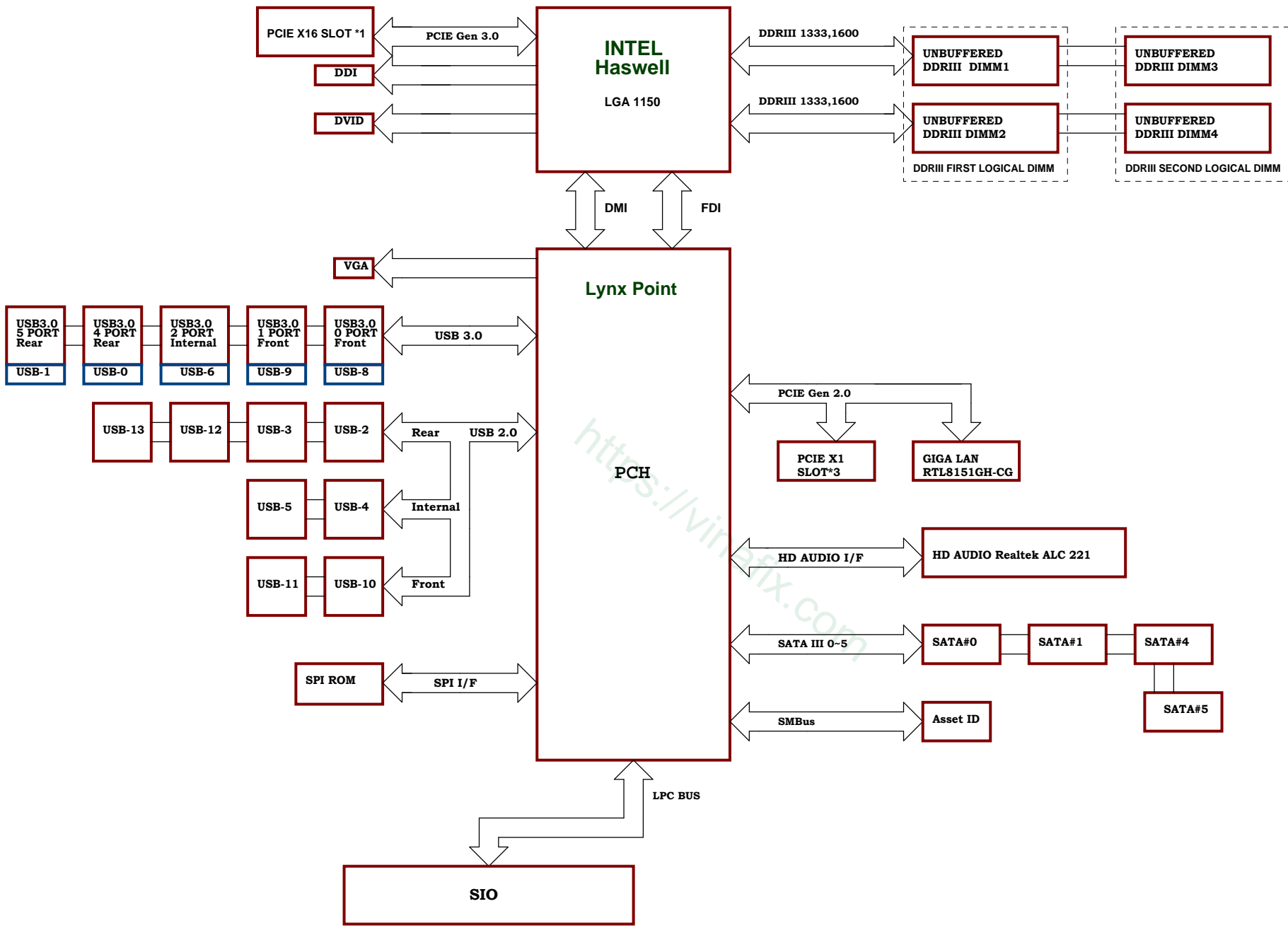
**BOM DISTRIBUTION RULE**  
 Gwen,Mordred  
 (BOM,BOM)

**Other:**  
 SATA \*4  
 USB3.0 \*5 (Rear\*2 Front\*2 Internal\*1)  
 USB2.0 \*8 (Rear\*4 Front\*2 Internal\*2)  
 DVI PORT\*1  
 VGA PORT \*1  
 PRINT Header \*1  
 COM PORT \*1  
 COM Header \*1

Release Date : Tuesday, March 19, 2013  
**HP Restricted Secret**

<b>MICRO-STAR INT'L CO.,LTD</b>		
HP SCH P/N: 718773-000(MSI MS-7860)		
Size Custom	Document Description <b>Cover Sheet</b>	Rev X3
Date:	Sheet 1 of 55	

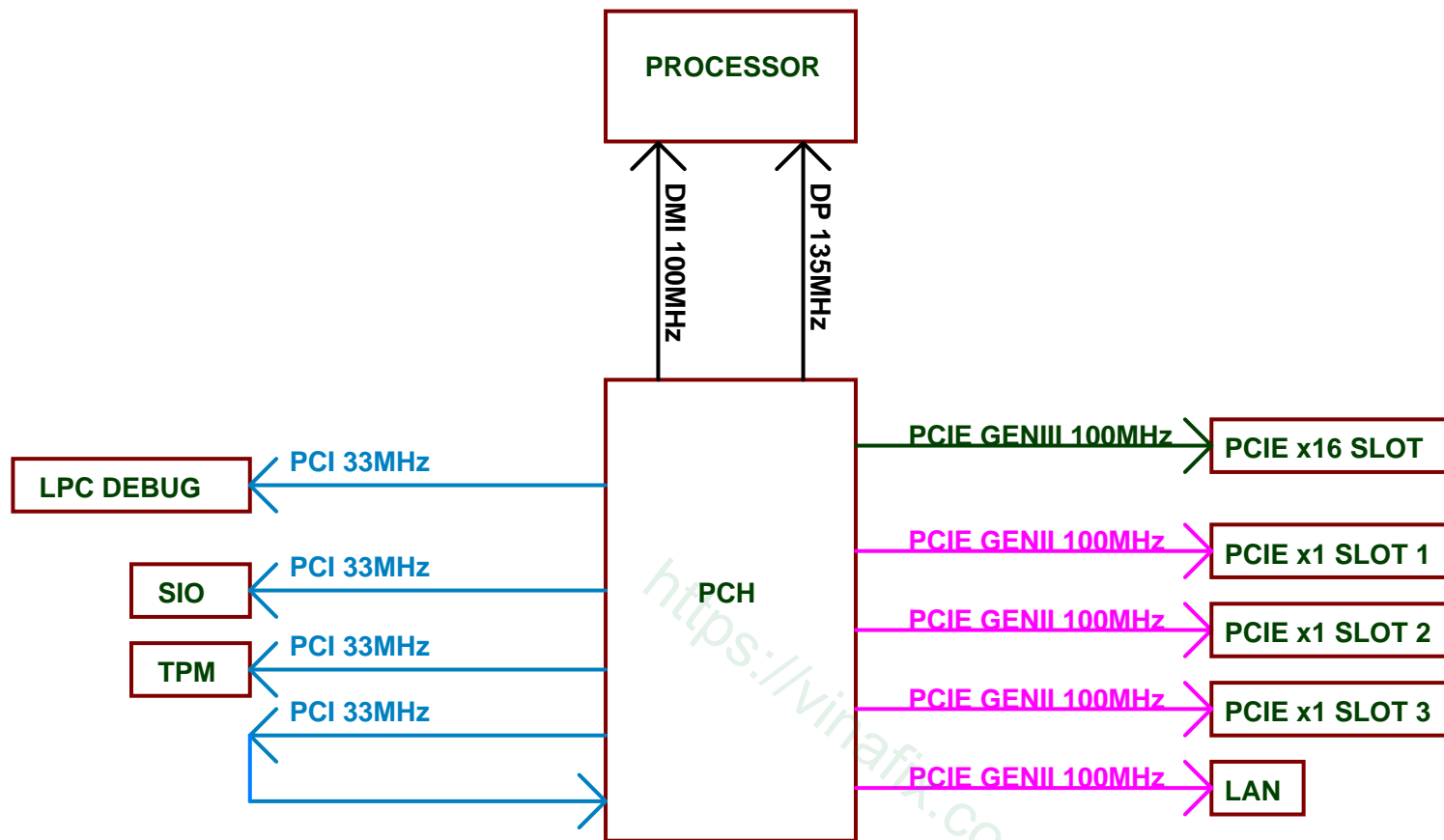




Release Date : Tuesday, March 19, 2013

**HP Restricted Secret**

	<b>MICRO-STAR INT'L CO.,LTD</b>	
	HP SCH P/N: 718773-000(MSI MS-7860)	
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Date:	Sheet 2 of 55	

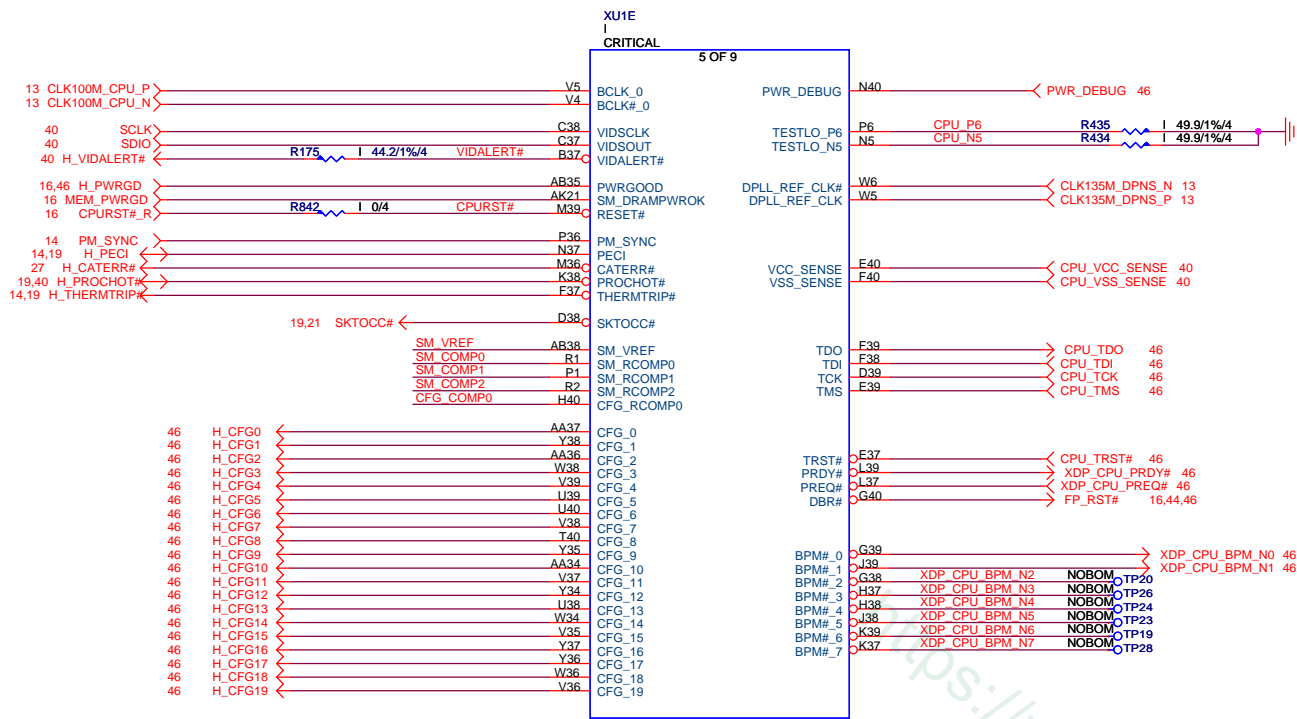


Release Date : Tuesday, March 19, 2013

**HP Restricted Secret**

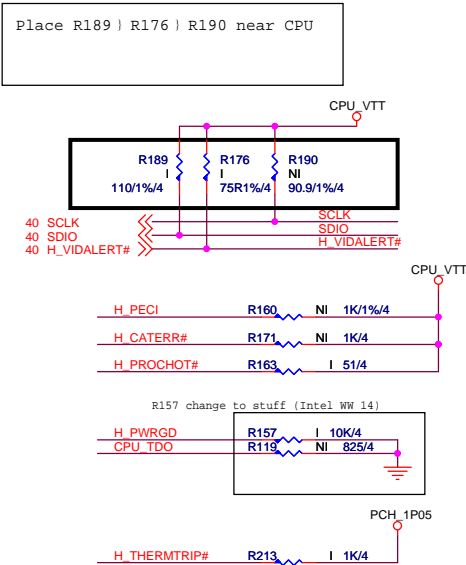
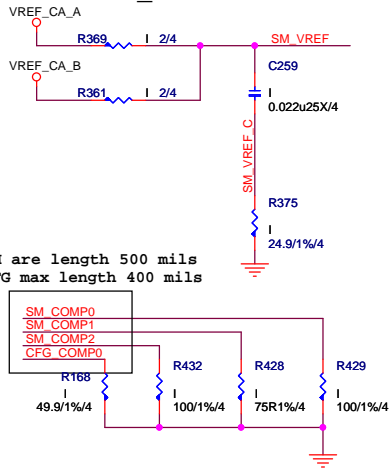


MICRO-STAR INT'L CO.,LTD		
HP SCH P/N: 718773-000(MSI MS-7860)		
Size Custom	Document Description <b>Clock Distribution</b>	Rev X3
Date:	Sheet 3	of 55

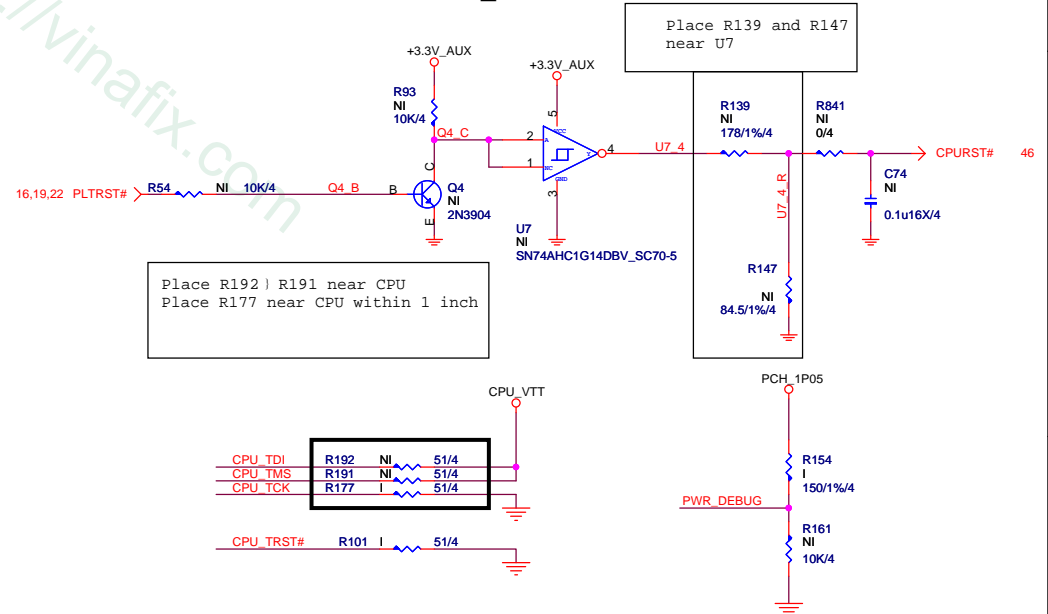


**CPU2\_2 N12-150A010-L06**  
**AVL:N12-150A020-F02**

**MEM\_VREF Control**



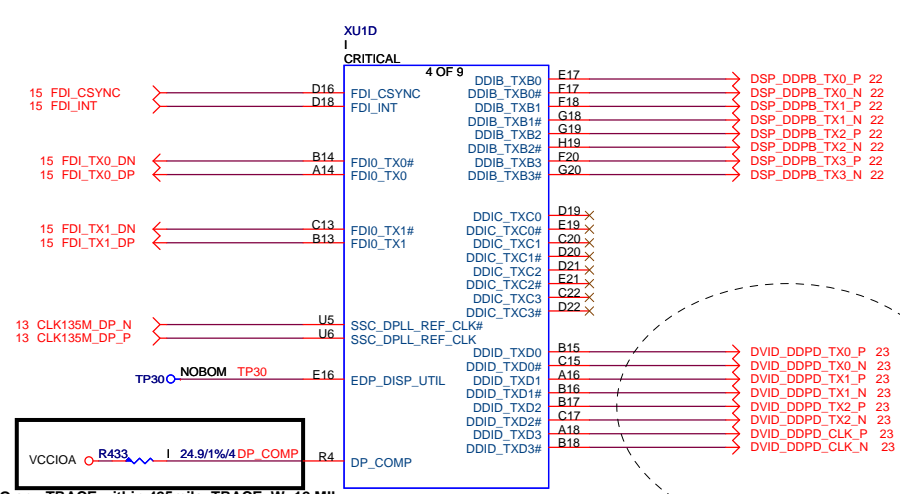
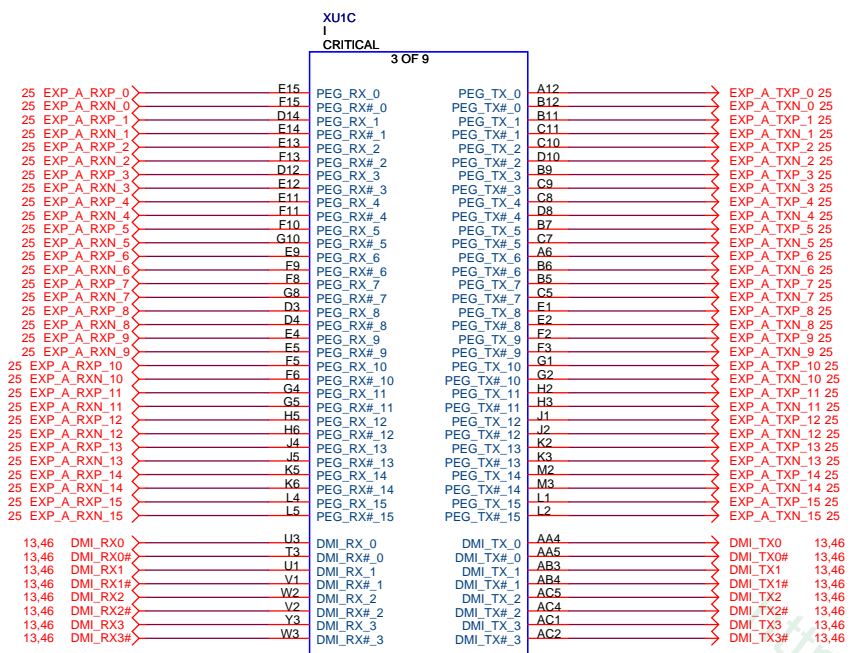
**CPU\_RESET#**



Release Date : Tuesday, March 19, 2013

**HP Restricted Secret**

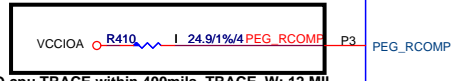
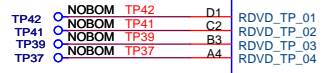
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	<b>HP SCH P/N: 718773-000(MSI MS-7860)</b>	
Size Custom	Document Description <b>CPU-CLK/Control</b>	Rev X3
Date:	Sheet 4 of 55	



COLSE TO cpu TRACE within 425mils, TRACE W: 12 MIL

**N12-150A010-L06**  
**AVL:N12-150A020-F02**

SI: 894794



COLSE TO cpu TRACE within 400mils, TRACE W: 12 MIL

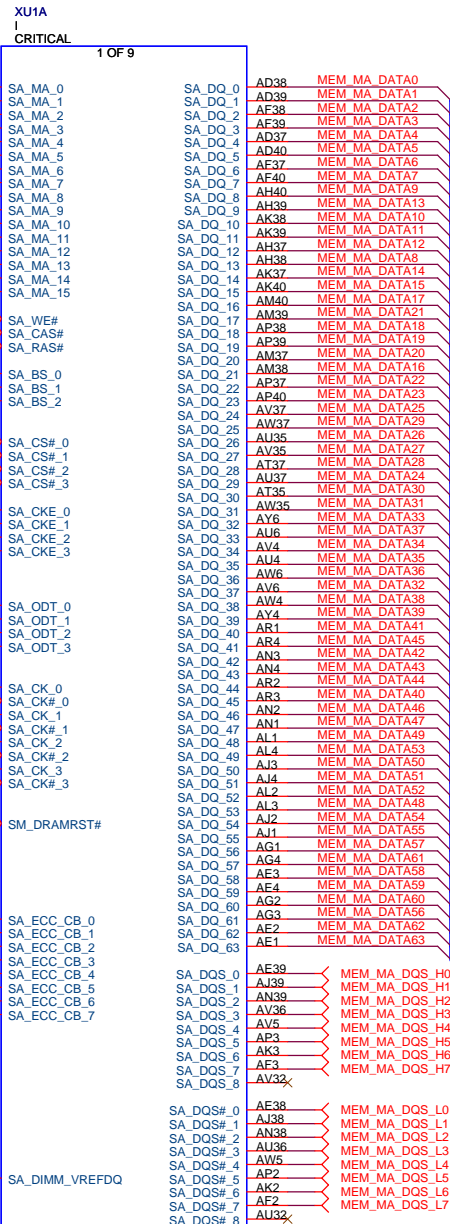
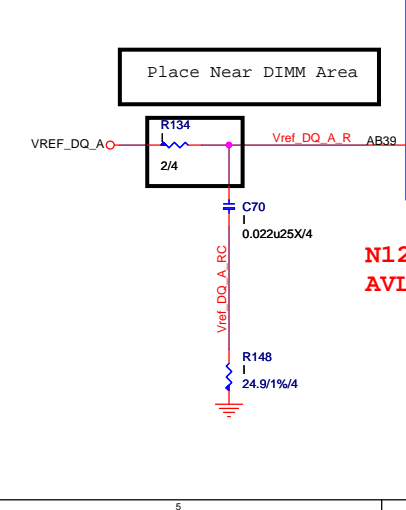
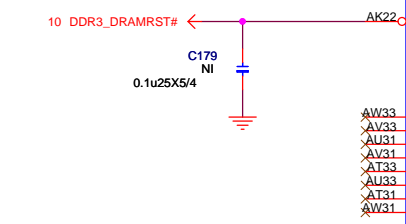
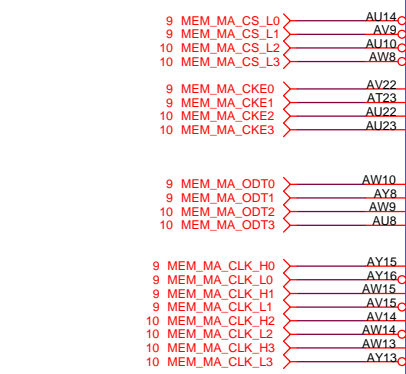
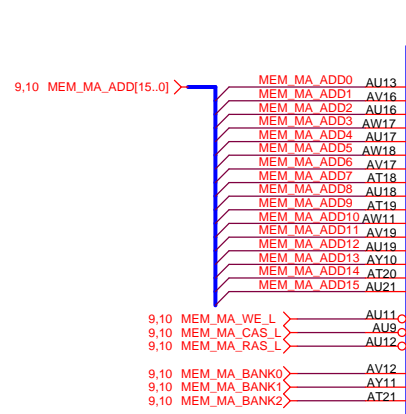
**N12-150A010-L06**  
**AVL:N12-150A020-F02**

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Release Date : Tuesday, March 19, 2013

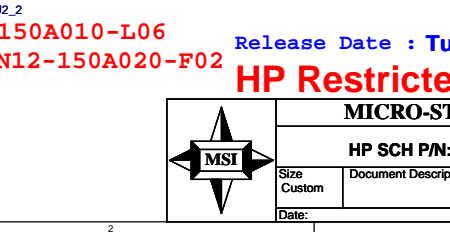
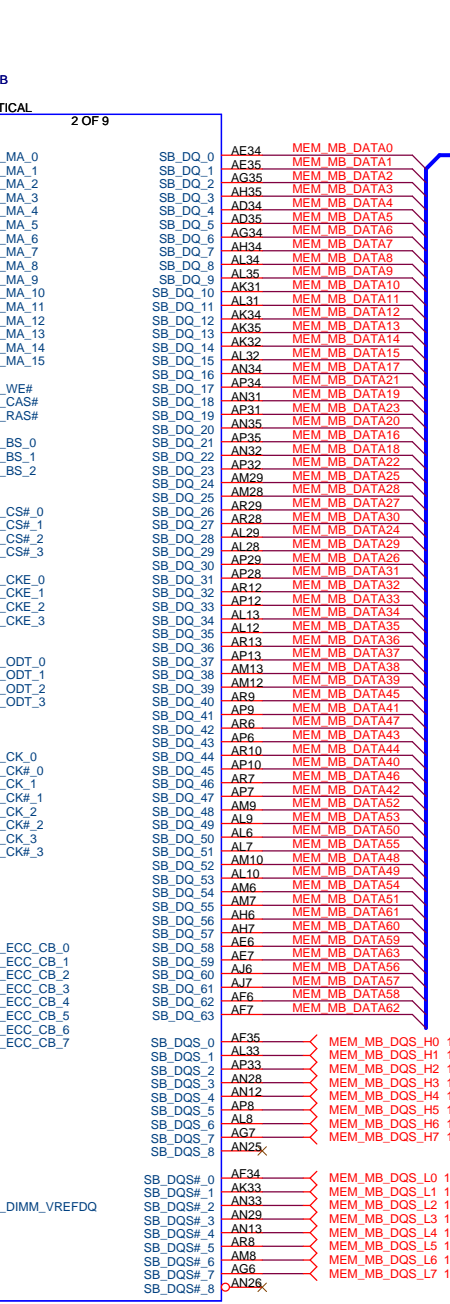
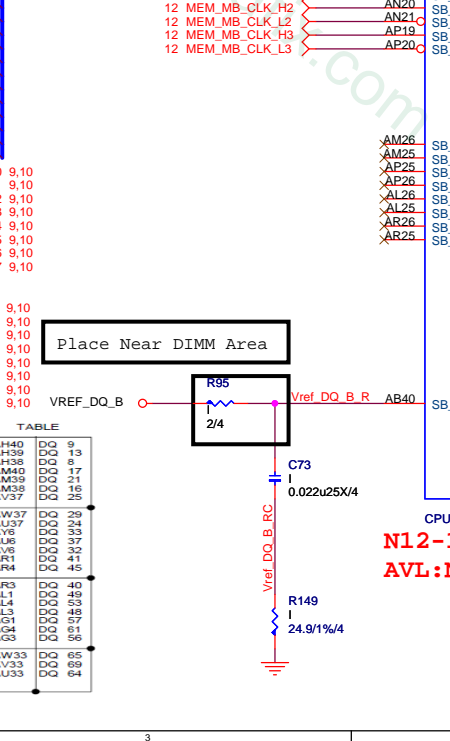
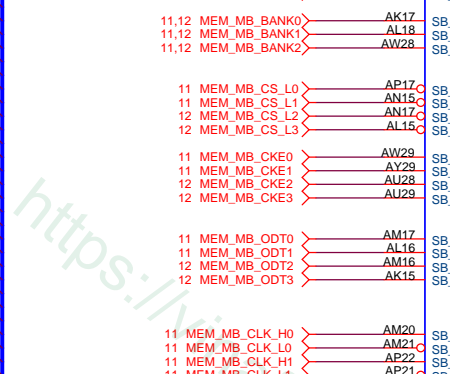
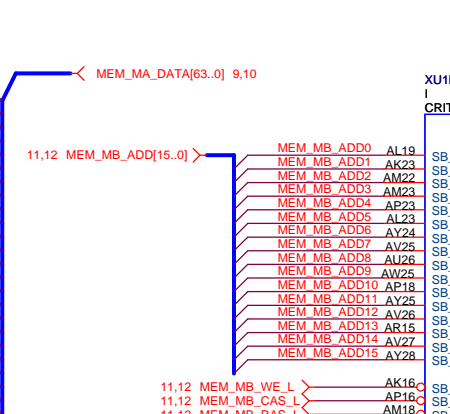
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Size Custom	Document Description <b>CPU-PEG/MISC</b>	Rev X3
Date:	Sheet 5 of 55	



BIT SWIZZLE TABLE

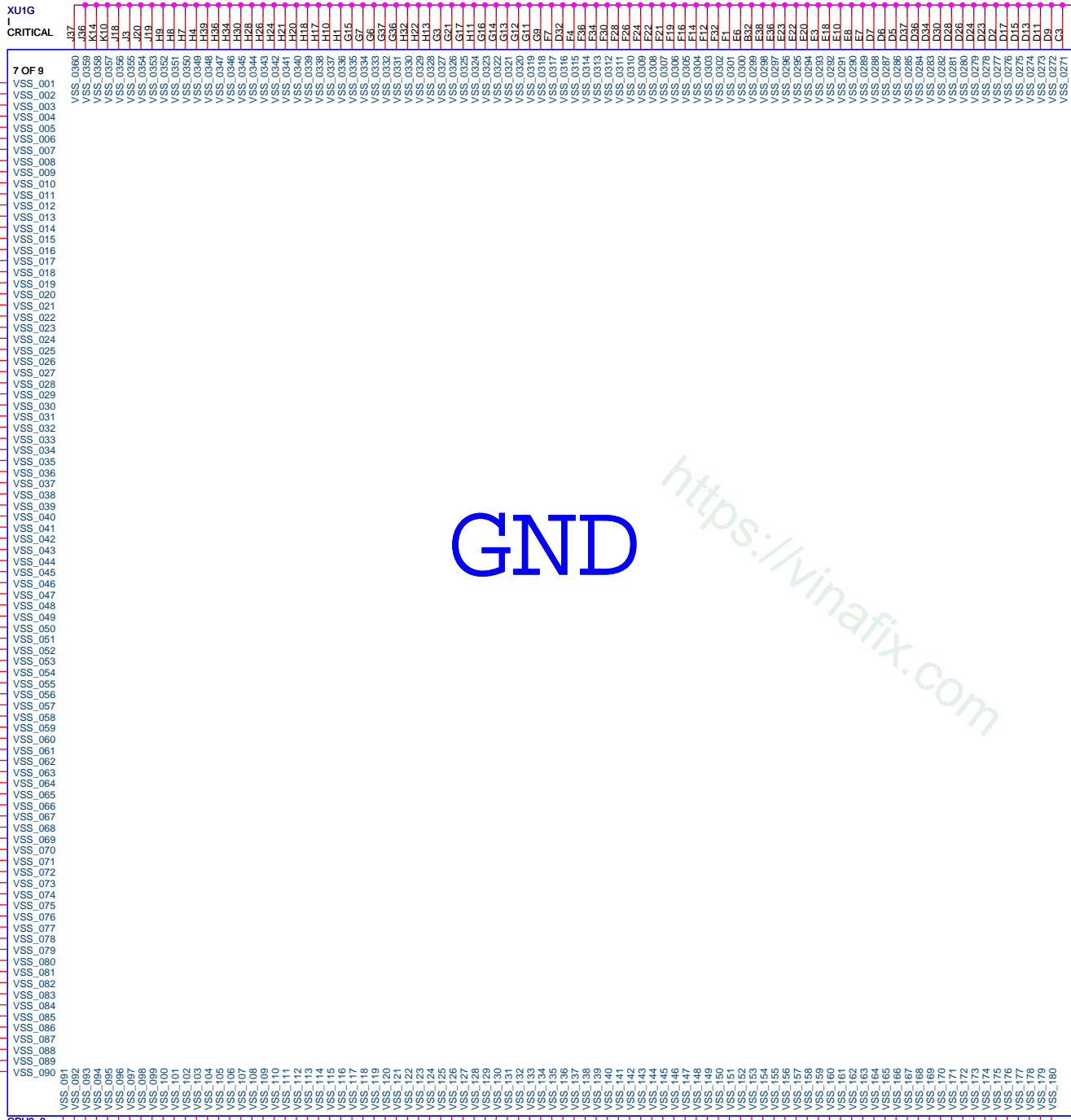
DDR0_DQ[8]	AH40	DQ	9
DDR0_DQ[9]	AH39	DQ	13
DDR0_DQ[13]	AH38	DQ	8
DDR0_DQ[16]	AM40	DQ	17
DDR0_DQ[17]	AM39	DQ	21
DDR0_DQ[21]	AM38	DQ	16
DDR0_DQ[24]	AV37	DQ	25
DDR0_DQ[25]	AW37	DQ	29
DDR0_DQ[32]	AU37	DQ	33
DDR0_DQ[33]	AV6	DQ	32
DDR0_DQ[36]	AH38	DQ	45
DDR0_DQ[37]	AV6	DQ	32
DDR0_DQ[40]	AR1	DQ	41
DDR0_DQ[41]	AR4	DQ	45
DDR0_DQ[45]	AR3	DQ	40
DDR0_DQ[46]	AL1	DQ	49
DDR0_DQ[53]	AL3	DQ	48
DDR0_DQ[54]	AG1	DQ	59
DDR0_DQ[57]	AG4	DQ	61
DDR0_DQ[61]	AG3	DQ	56
DDR0_DQ[64]	AW33	DQ	65
DDR0_DQ[65]	AU33	DQ	68
DDR0_DQ[69]	AU33	DQ	64



HSW DQ MAPPING TABLE

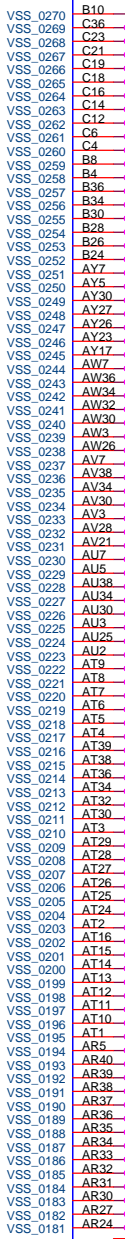
HD PIN NAME	Pin#	MC DQ#
DDR1_DQ[0]	AE34	DQ 7
DDR1_DQ[1]	AE35	DQ 2
DDR1_DQ[2]	AG35	DQ 2
DDR1_DQ[3]	AH35	DQ 3
DDR1_DQ[4]	AD34	DQ 4
DDR1_DQ[5]	AD34	DQ 5
DDR1_DQ[6]	AH34	DQ 6
DDR1_DQ[7]	AL34	DQ 7
DDR1_DQ[8]	AL35	DQ 8
DDR1_DQ[9]	AK31	DQ 9
DDR1_DQ[10]	AL31	DQ 10
DDR1_DQ[11]	AK34	DQ 11
DDR1_DQ[12]	AK35	DQ 12
DDR1_DQ[13]	AK32	DQ 13
DDR1_DQ[14]	AL32	DQ 14
DDR1_DQ[15]	AH34	DQ 15
DDR1_DQ[16]	AL35	DQ 16
DDR1_DQ[17]	AK31	DQ 17
DDR1_DQ[18]	AL31	DQ 18
DDR1_DQ[19]	AK31	DQ 19
DDR1_DQ[20]	AK31	DQ 20
DDR1_DQ[21]	AK31	DQ 21
DDR1_DQ[22]	AK31	DQ 22
DDR1_DQ[23]	AK31	DQ 23
DDR1_DQ[24]	AK31	DQ 24
DDR1_DQ[25]	AK31	DQ 25
DDR1_DQ[26]	AK31	DQ 26
DDR1_DQ[27]	AK31	DQ 27
DDR1_DQ[28]	AK31	DQ 28
DDR1_DQ[29]	AK31	DQ 29
DDR1_DQ[30]	AK31	DQ 30
DDR1_DQ[31]	AK31	DQ 31
DDR1_DQ[32]	AR12	DQ 32
DDR1_DQ[33]	AP12	DQ 33
DDR1_DQ[34]	AL13	DQ 34
DDR1_DQ[35]	AL12	DQ 35
DDR1_DQ[36]	AR13	DQ 36
DDR1_DQ[37]	AP13	DQ 37
DDR1_DQ[38]	AM13	DQ 38
DDR1_DQ[39]	AM12	DQ 39
DDR1_DQ[40]	AP10	DQ 40
DDR1_DQ[41]	AP9	DQ 41
DDR1_DQ[42]	AP7	DQ 42
DDR1_DQ[43]	AP6	DQ 43
DDR1_DQ[44]	AR10	DQ 44
DDR1_DQ[		





GND

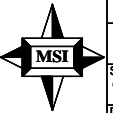
<https://vinafix.com>



N12-150A010-L06  
 AVL:N12-150A020-F02

Release Date : Tuesday, March 19, 2013

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<b>HP SCH P/N: 718773-000(MSI MS-7860)</b>		
Size Custom	Document Description <b>CPU-GND</b>	Rev X3
Date:	Sheet 8 of 55	

# DDR3 DIMM\_A1

WHITE COLOR  
N13-2401611-F02

Palce Caps Between CHA And CHB

6,10 MEM\_MA\_DATA[63..0] ← MEM\_MA\_DATA[63..0]

VCC\_DDR

+3.3V VTT\_DDR

+3.3V

XMM4  
INI  
CRITICAL

- MEM\_MA\_DATA0 3
- MEM\_MA\_DATA1 4
- MEM\_MA\_DATA2 9
- MEM\_MA\_DATA3 10
- MEM\_MA\_DATA4 122
- MEM\_MA\_DATA5 123
- MEM\_MA\_DATA6 128
- MEM\_MA\_DATA7 129
- MEM\_MA\_DATA8 12
- MEM\_MA\_DATA9 13
- MEM\_MA\_DATA10 18
- MEM\_MA\_DATA11 19
- MEM\_MA\_DATA12 31
- MEM\_MA\_DATA13 32
- MEM\_MA\_DATA14 37
- MEM\_MA\_DATA15 38
- MEM\_MA\_DATA16 21
- MEM\_MA\_DATA17 22
- MEM\_MA\_DATA18 27
- MEM\_MA\_DATA19 28
- MEM\_MA\_DATA20 40
- MEM\_MA\_DATA21 41
- MEM\_MA\_DATA22 46
- MEM\_MA\_DATA23 47
- MEM\_MA\_DATA24 30
- MEM\_MA\_DATA25 31
- MEM\_MA\_DATA26 36
- MEM\_MA\_DATA27 37
- MEM\_MA\_DATA28 49
- MEM\_MA\_DATA29 50
- MEM\_MA\_DATA30 55
- MEM\_MA\_DATA31 56
- MEM\_MA\_DATA32 61
- MEM\_MA\_DATA33 62
- MEM\_MA\_DATA34 87
- MEM\_MA\_DATA35 88
- MEM\_MA\_DATA36 200
- MEM\_MA\_DATA37 201
- MEM\_MA\_DATA38 206
- MEM\_MA\_DATA39 207
- MEM\_MA\_DATA40 90
- MEM\_MA\_DATA41 91
- MEM\_MA\_DATA42 96
- MEM\_MA\_DATA43 97
- MEM\_MA\_DATA44 99
- MEM\_MA\_DATA45 210
- MEM\_MA\_DATA46 215
- MEM\_MA\_DATA47 218
- MEM\_MA\_DATA48 99
- MEM\_MA\_DATA49 100
- MEM\_MA\_DATA50 105
- MEM\_MA\_DATA51 106
- MEM\_MA\_DATA52 18
- MEM\_MA\_DATA53 219
- MEM\_MA\_DATA54 224
- MEM\_MA\_DATA55 225
- MEM\_MA\_DATA56 108
- MEM\_MA\_DATA57 109
- MEM\_MA\_DATA58 114
- MEM\_MA\_DATA59 115
- MEM\_MA\_DATA60 227
- MEM\_MA\_DATA61 227
- MEM\_MA\_DATA62 233
- MEM\_MA\_DATA63 234

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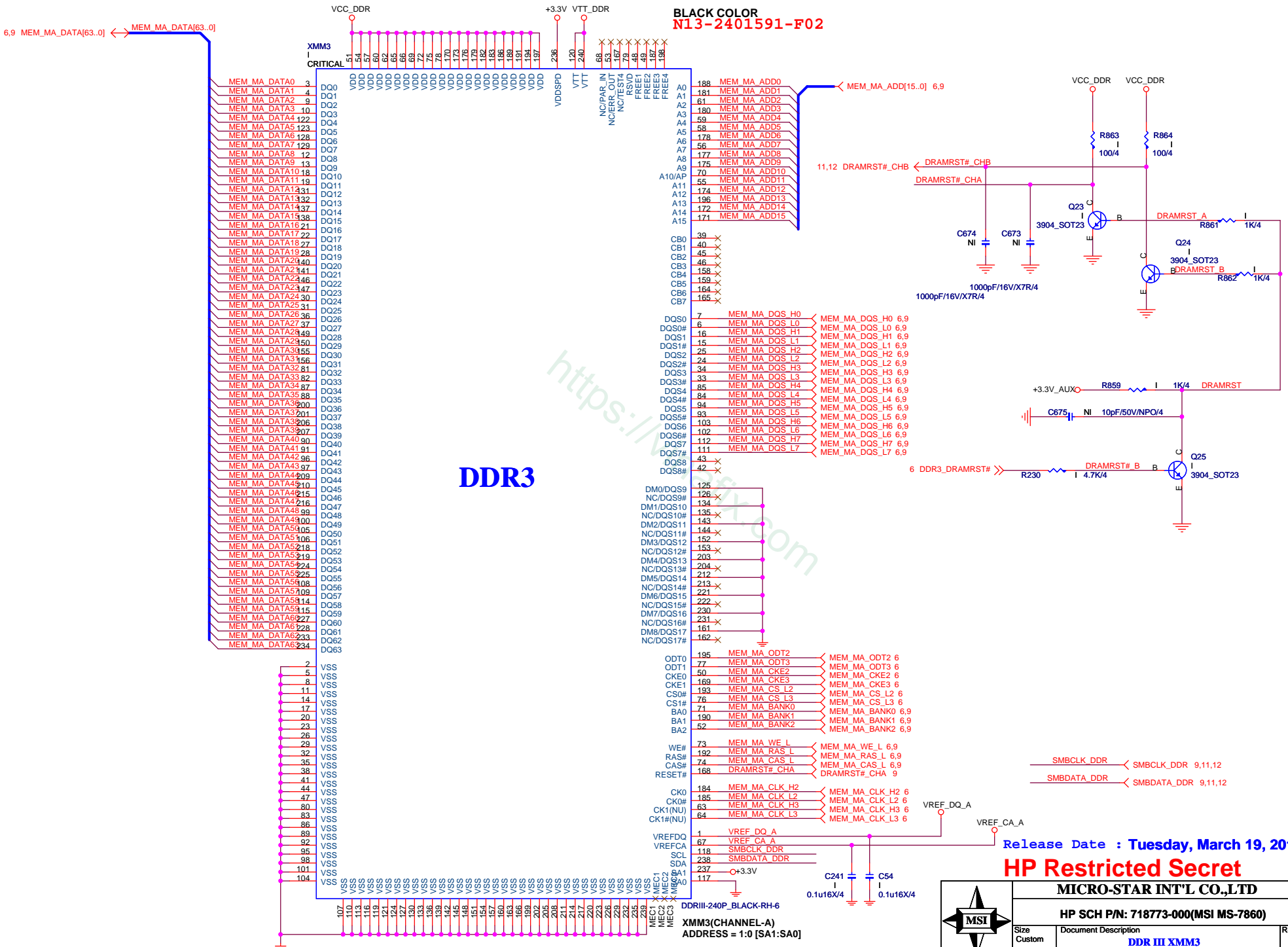
MEM\_MA\_ADD15

MEM\_MA\_ADD15</

# DDR3 DIMM\_A2

BLACK COLOR  
N13-2401591-F02

DDR3



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Date:	Sheet 10 of 55	

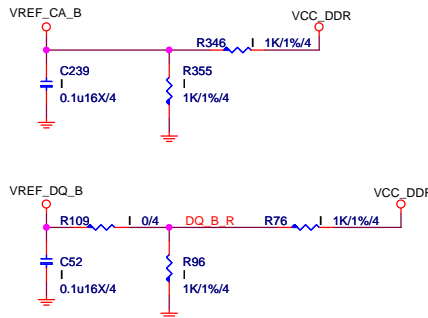
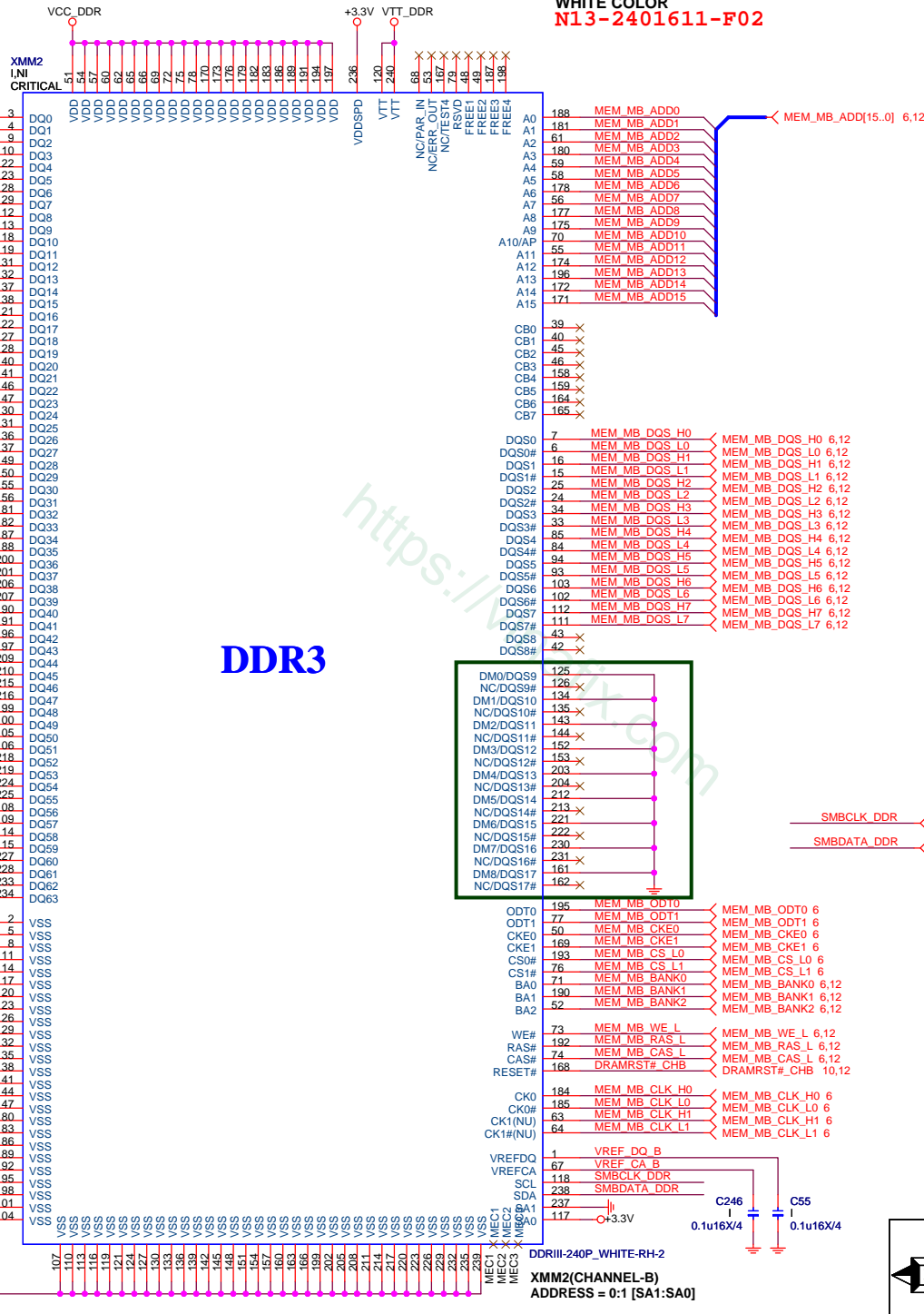


DDR3-240P\_BLACK-RH-6  
XMM3(CHANNEL-A)  
ADDRESS = 1:0 [SA1:SA0]

# DDRIII DIMM\_B1

WHITE COLOR  
N13-2401611-F02

6.12 MEM\_MB\_DATA[63..0] ←



SMBCLK\_DDR ← SMBCLK\_DDR 9,10,12  
SMBDATA\_DDR ← SMBDATA\_DDR 9,10,12

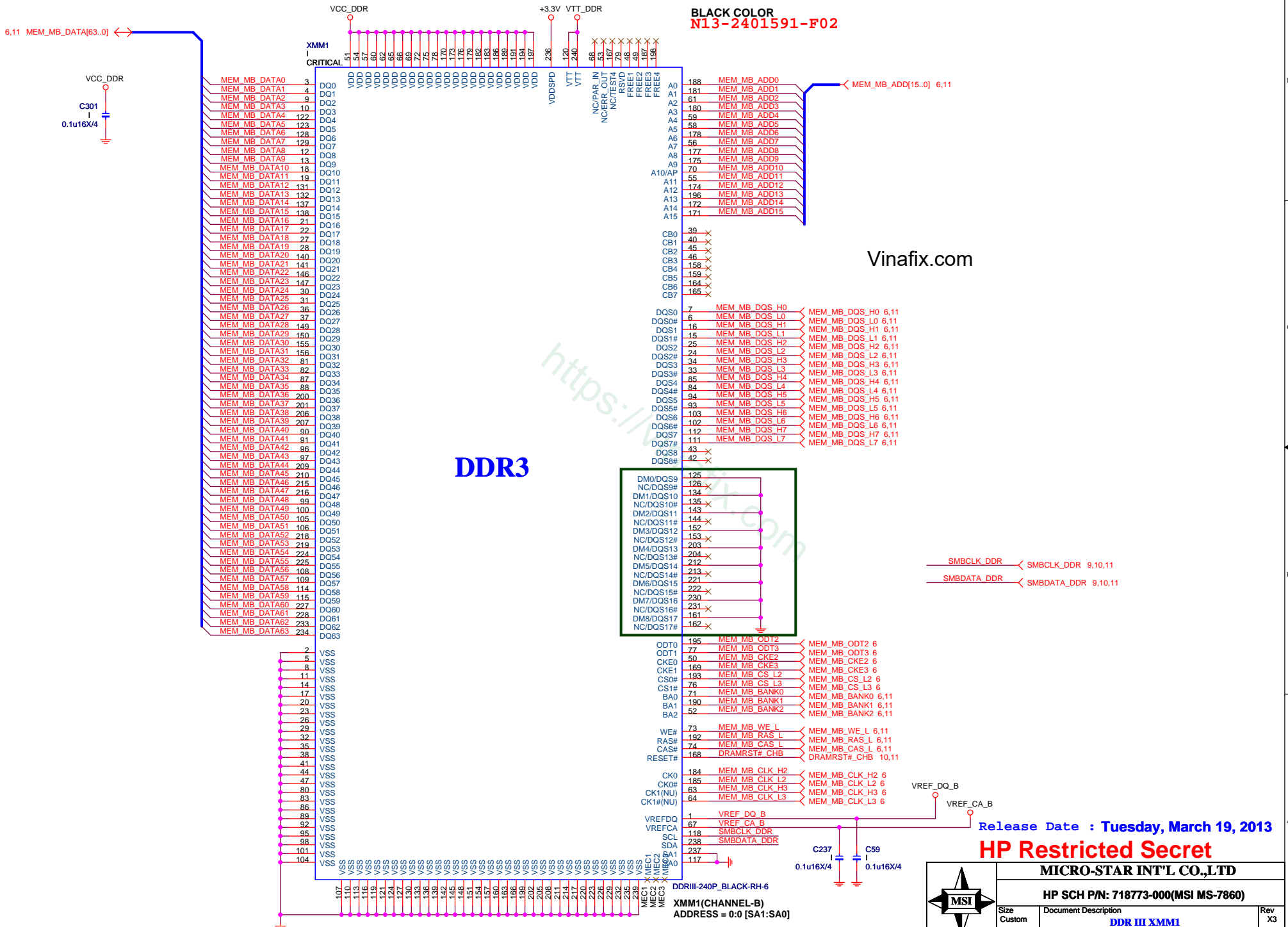
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<b>HP SCH P/N: 718773-000(MSI MS-7860)</b>		
Size Custom	Document Description <b>DDR III XMM2</b>	Rev X3
Date:	Sheet 11 of 55	

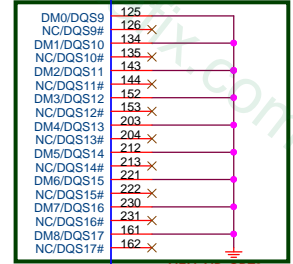
# DDR3 DIMM\_B2

BLACK COLOR  
N13-2401591-F02



Vinafix.com

DDR3



SMBCLK\_DDR < SMBCLK\_DDR 9,10,11  
SMBDATA\_DDR < SMBDATA\_DDR 9,10,11

Release Date : Tuesday, March 19, 2013

**HP Restricted Secret**

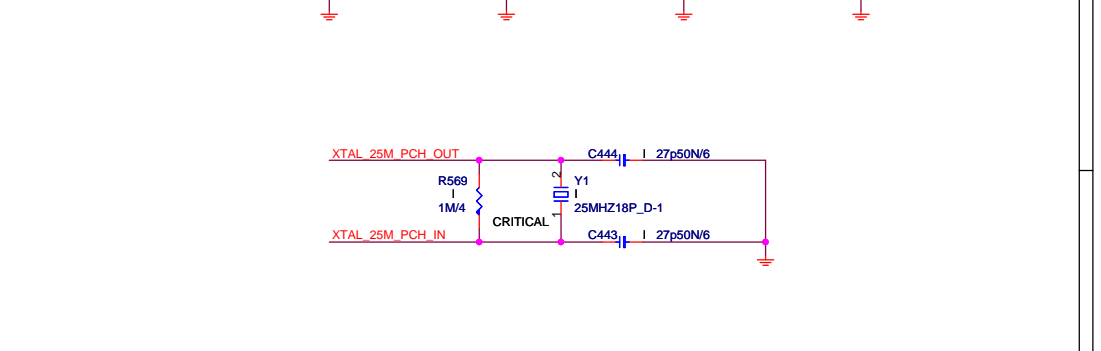
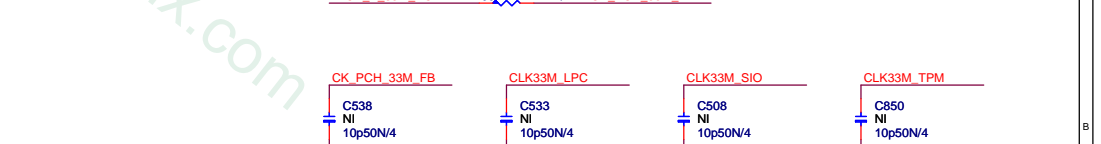
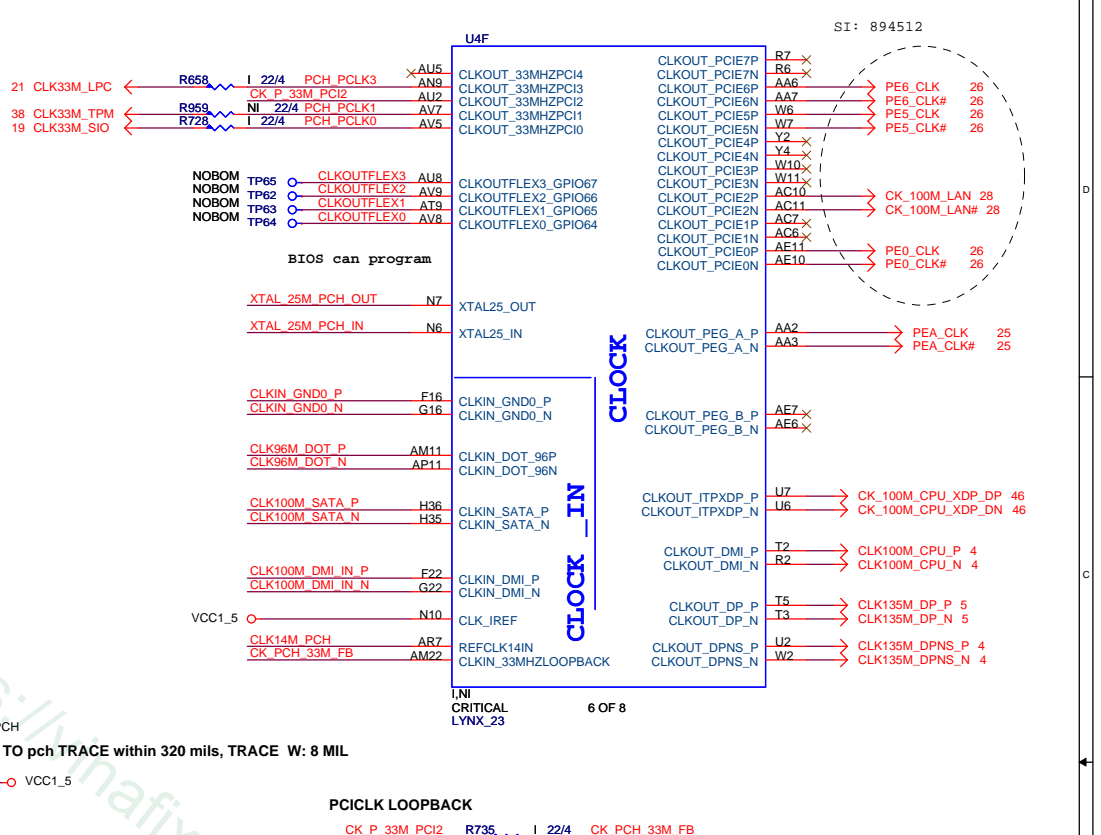
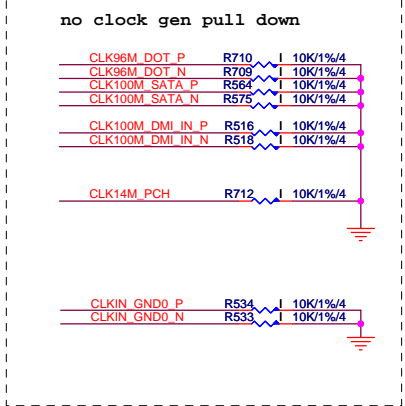
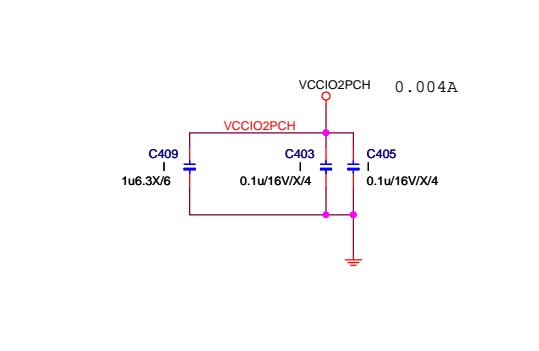
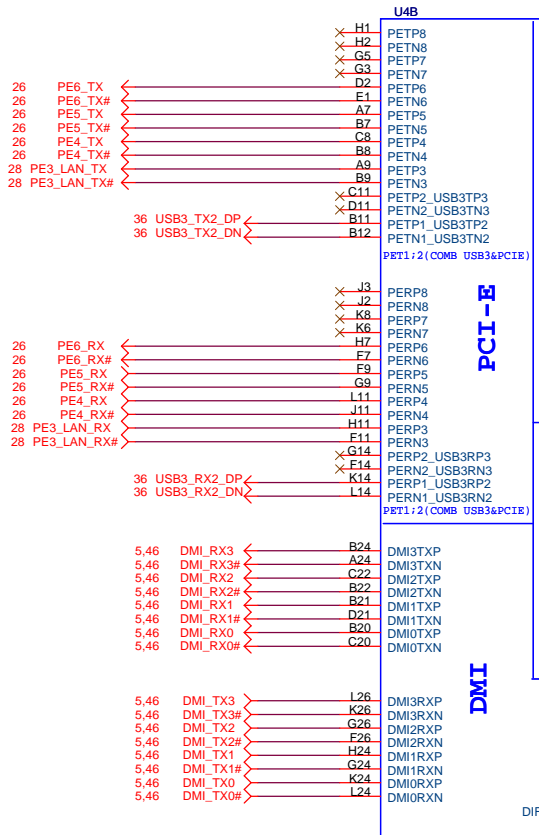
MICRO-STAR INT'L CO.,LTD

HP SCH P/N: 718773-000(MSI MS-7860)

Size Custom	Document Description	Rev X3
	DDR III XMM1	
Date:	Sheet 12 of 55	



DDR3-240P\_BLACK-RH-6  
XMM1(CHANNEL-B)  
ADDRESS = 0:0 [SA1:SA0]

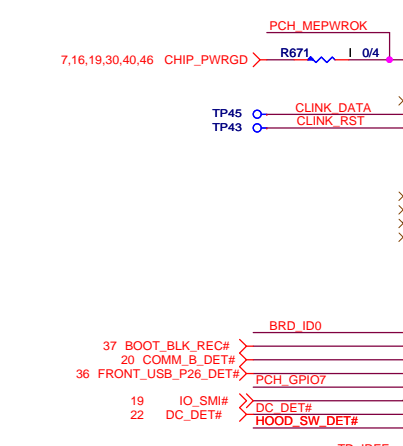


Release Date : Tuesday, March 19, 2013  
**HP Restricted Secret**

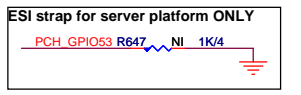
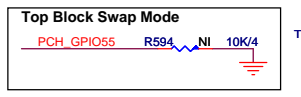
**MICRO-STAR INT'L CO.,LTD**

HP SCH P/N: 718773-000(MSI MS-7860)

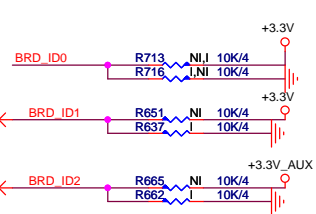
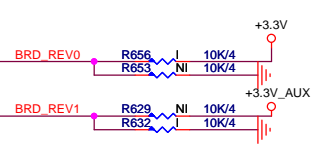
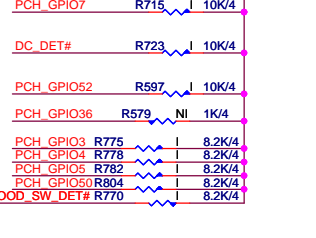
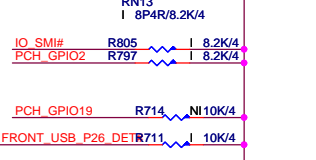
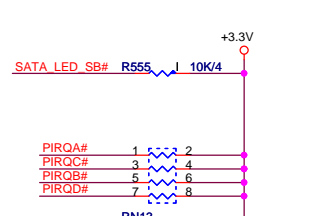
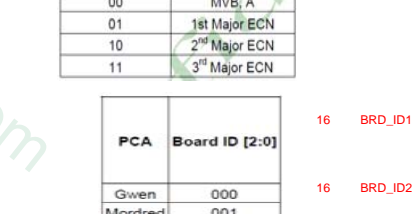
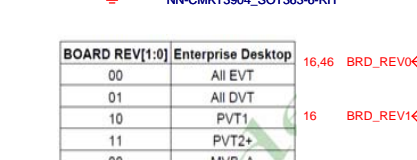
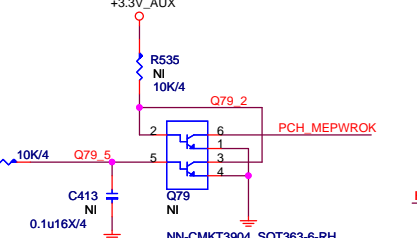
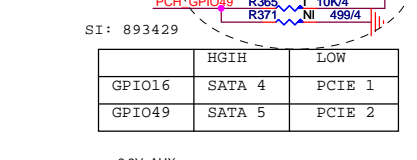
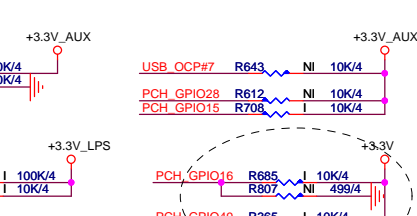
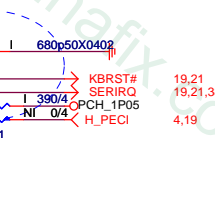
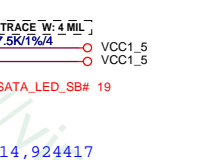
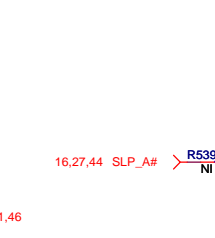
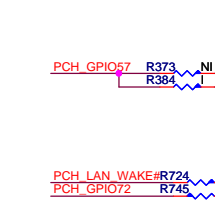
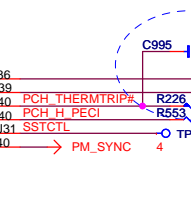
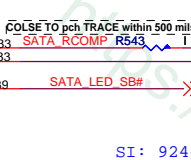
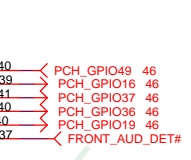
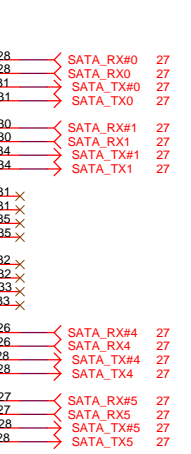
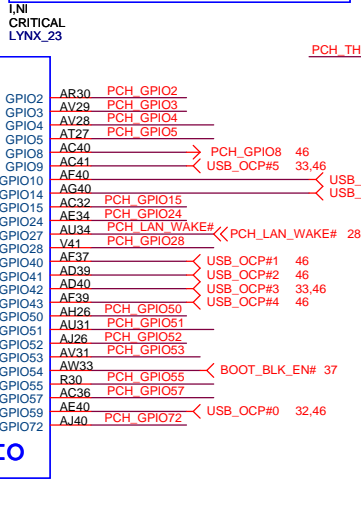
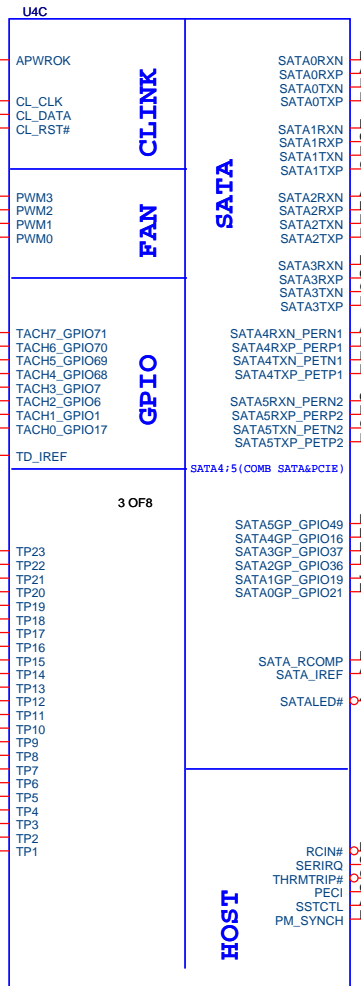
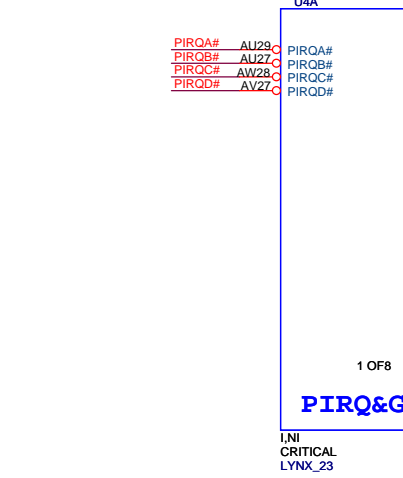
Size Custom	Document Description	Rev X3
PCH-PCIe/DMI/USB/CLK		
Date:	Sheet 13 of 55	



BOOT DEVICE	GPIO51	GPIO19
SPI	float	float
PCI	float	0
LPC	0	0

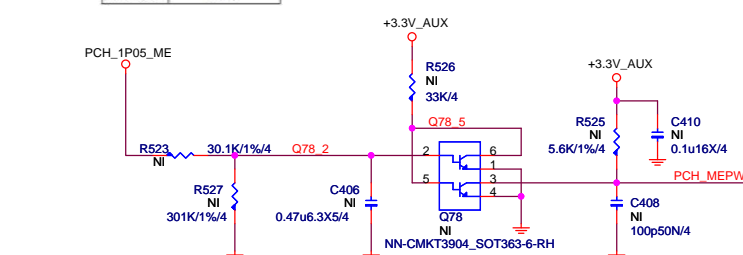


TLS confidentiality	GPIO37
EN	1
DIS_EN	0 (Internal pull down)



BOARD REV[1:0]	Enterprise Desktop
00	All EVT
01	All DVT
10	PVT1
11	PVT2+
00	MVB; A
01	1st Major ECN
10	2nd Major ECN
11	3rd Major ECN

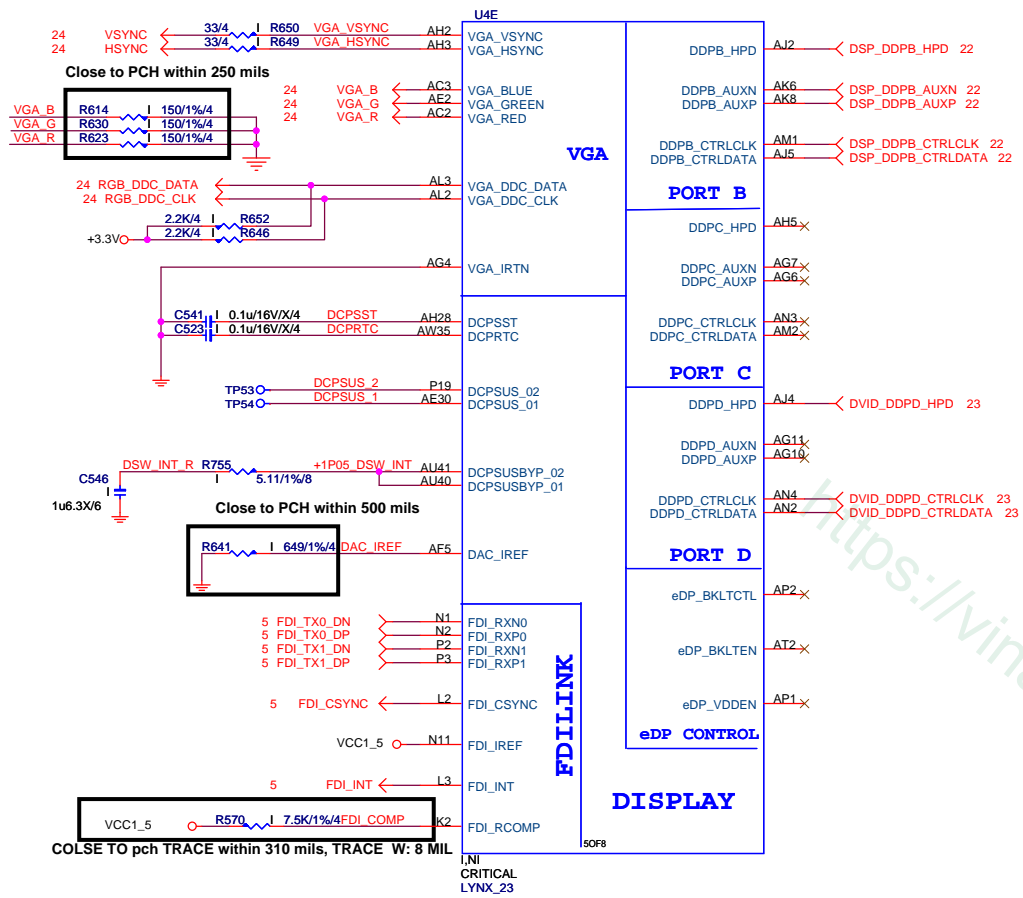
PCA	Board ID [2:0]
Gwen	000
Mordred	001
Aronдите	011



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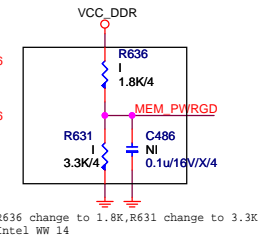
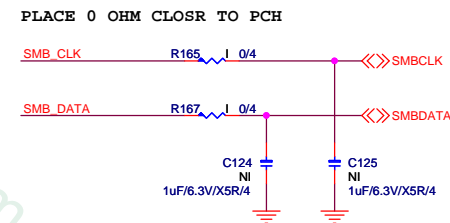
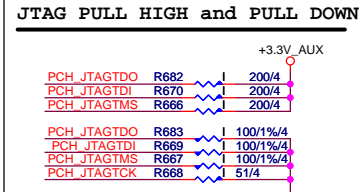
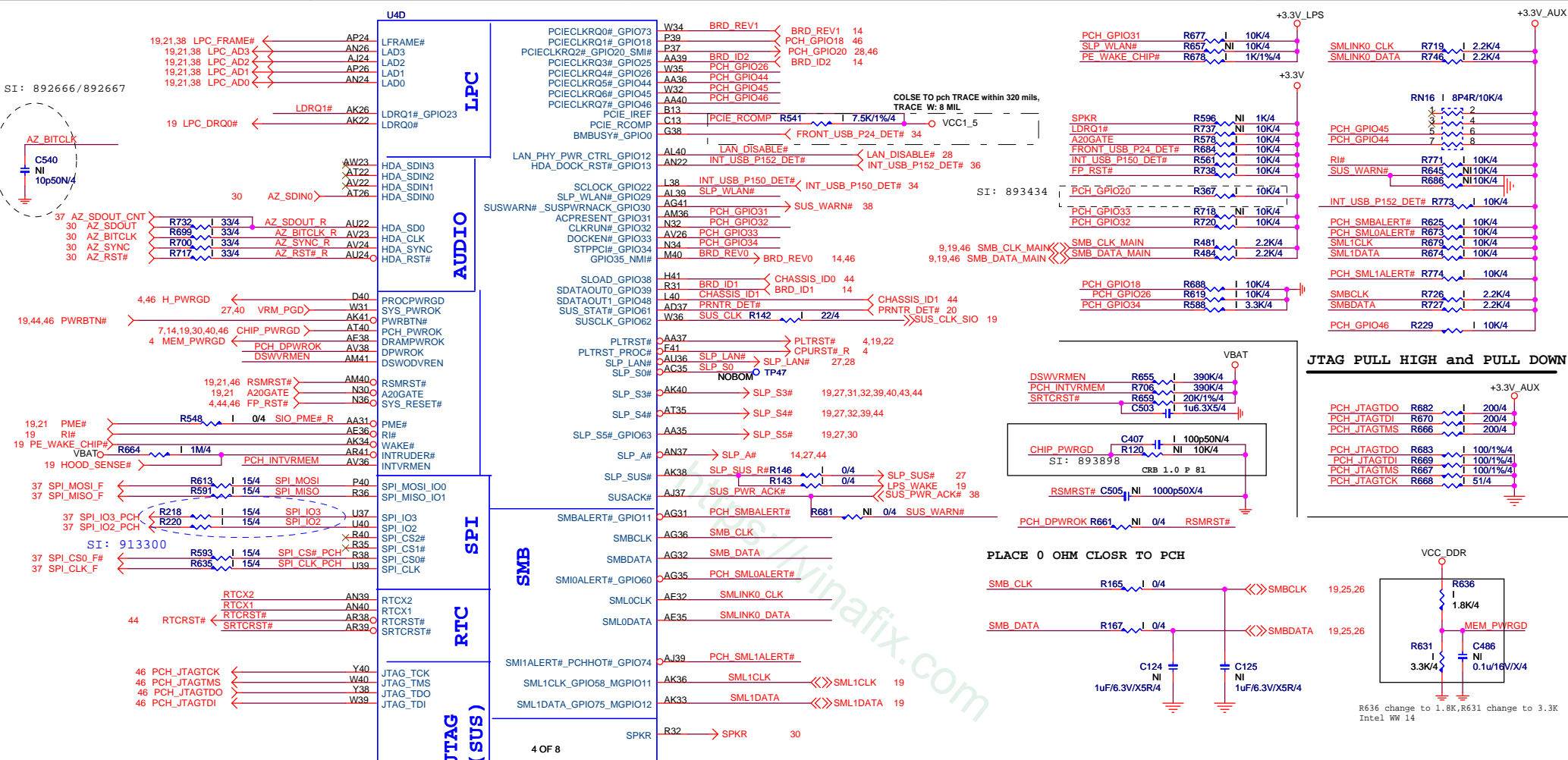
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	<b>HP SCH P/N: 718773-000(MSI MS-7860)</b>	
Size Custom	Document Description <b>PCH-SATA/HOST/GPIO</b>	Rev X3
Date:	Sheet 14 of 55	



Release Date : Tuesday, March 19, 2013

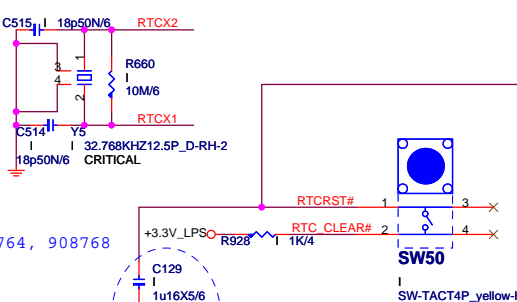
**HP Restricted Secret**

<b>MSI</b>		
<b>MICRO-STAR INT'L CO.,LTD</b>		
<b>HP SCH P/N: 718773-000(MSI MS-7860)</b>		
Size Custom	Document Description <b>PCH-DDI/VGA</b>	Rev X3
Date:	Sheet 15 of 55	



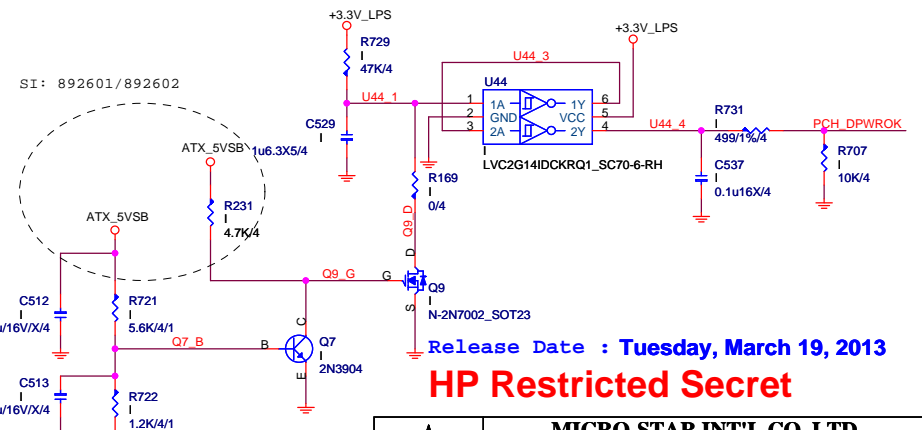
**RTC Block**

Close to PCH



**Vinafix.com**

**N91-01F0201-L06**



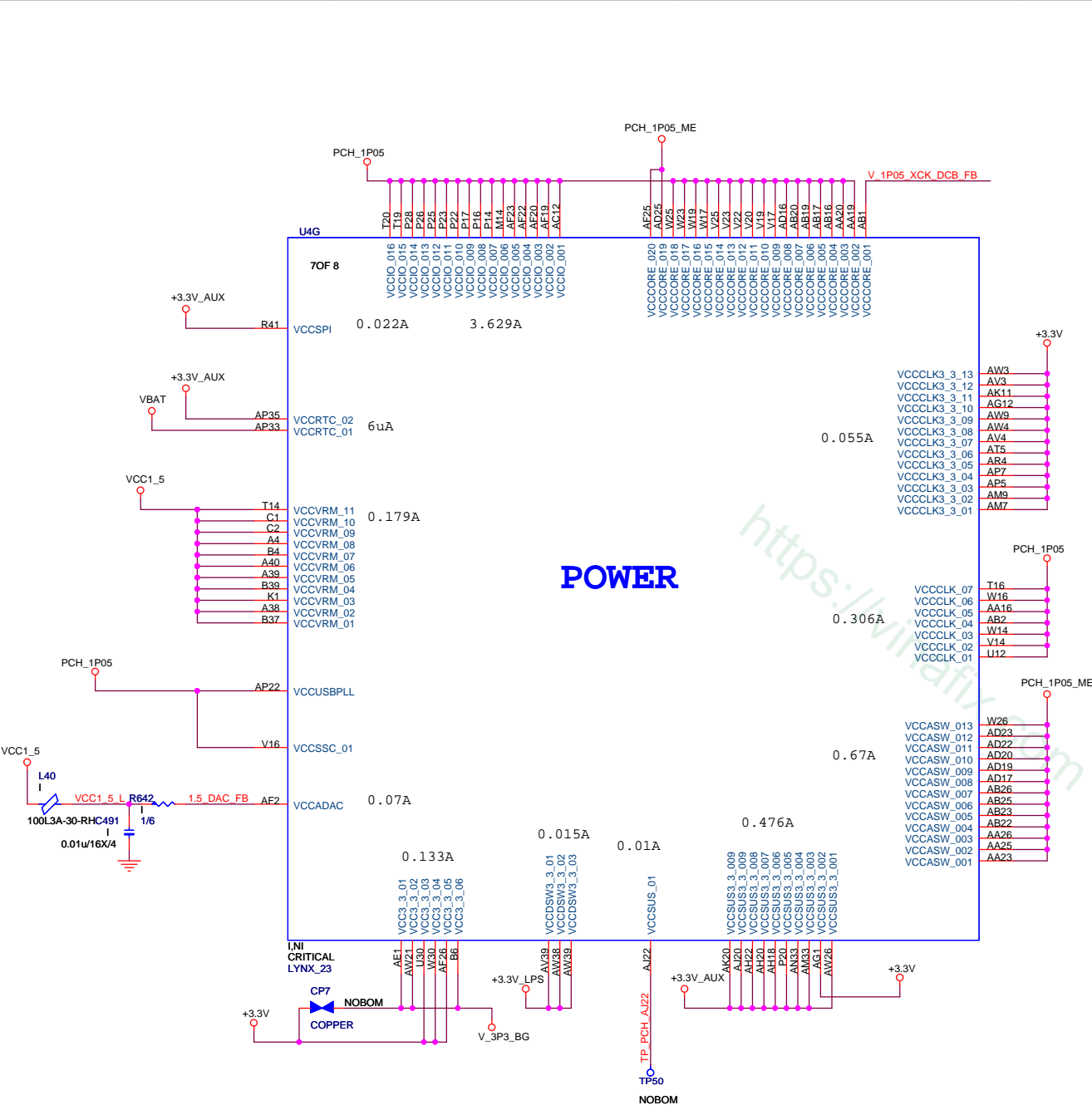
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**MICRO-STAR INT'L CO.,LTD**

**HP SCH P/N: 718773-000(MSI MS-7860)**

Size Custom Document Description **PCH-SMB/LPC/AUDIO/RTC** Rev X3

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Place C283 } C237 near P14, P16, P17, P26, P28  
 C285 near M14 C288 near U12 C289 near W14  
 C291 near AB2 C295 near V16 C297 near AA16, W16  
 C300 near AP22, AF19

Place C303 near AV4, AR4, AT5, AP5  
 C634 near AG1 C633 near W30 C304 near AF26

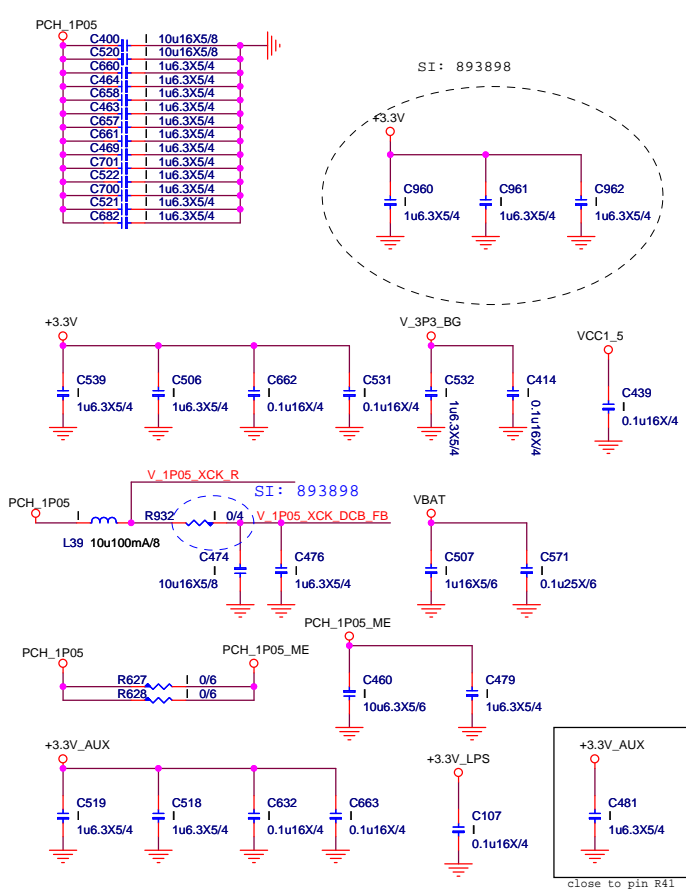
Place C630 near AN33 C301 near AK20  
 C631 near AW26 C302 near AP35

Place C635 near T14

Place C636 near AW39

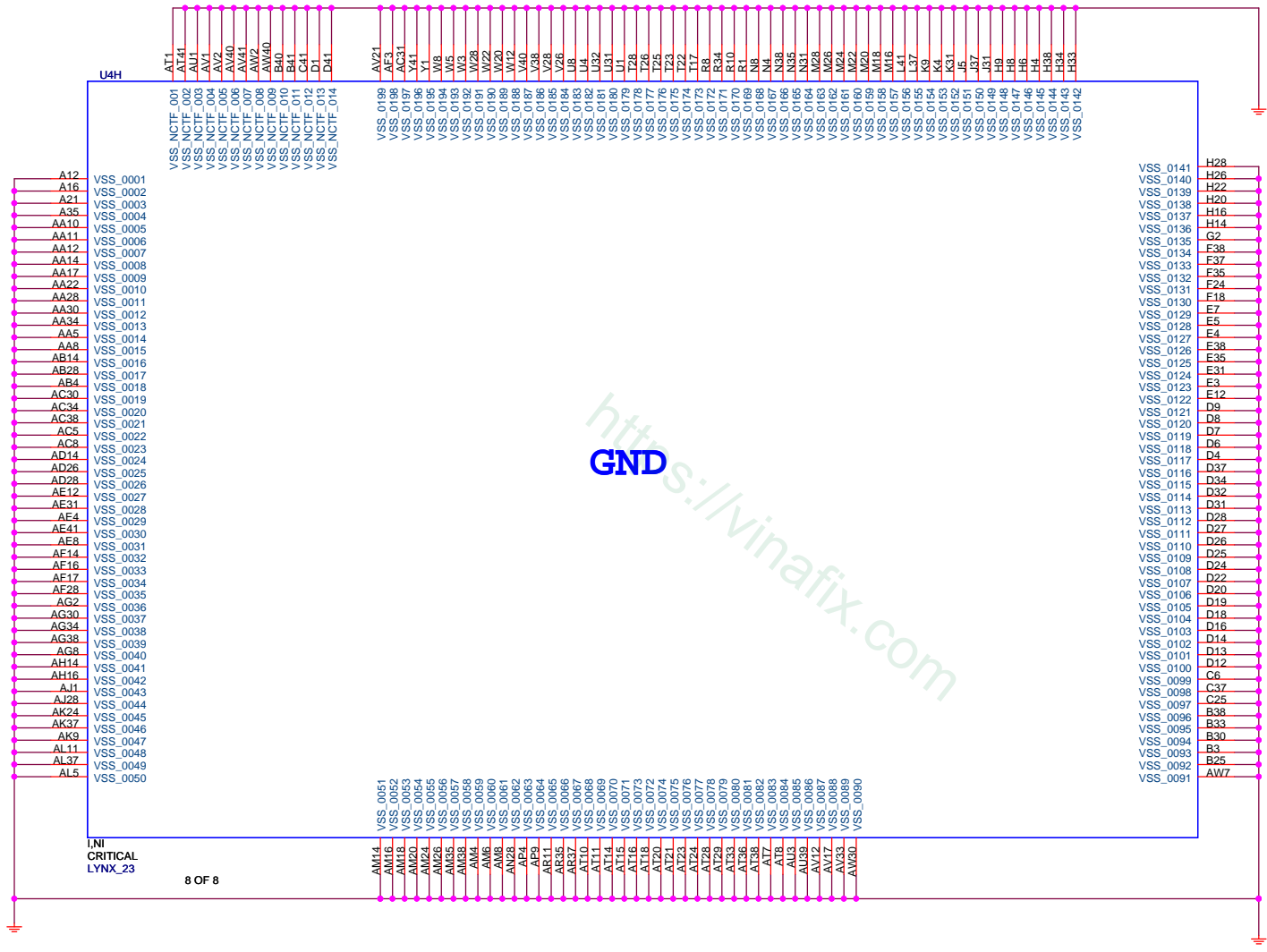
Place C312 } C311 near AD17, AD19

Place C306 near AW21 C632 near B6



Release Date : Tuesday, March 19, 2013  
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	<b>MICRO-STAR INT'L CO.,LTD</b>		
	<b>HP SCH P/N: 718773-000(MSI MS-7860)</b>		
Size Custom	Document Description <b>PCH-Power</b>	Rev X3	
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- A12 VSS\_0001
- A16 VSS\_0002
- A21 VSS\_0003
- A35 VSS\_0004
- AA10 VSS\_0005
- AA11 VSS\_0006
- AA12 VSS\_0007
- AA14 VSS\_0008
- AA17 VSS\_0009
- AA22 VSS\_0010
- AA28 VSS\_0011
- AA30 VSS\_0012
- AA34 VSS\_0013
- AA5 VSS\_0014
- AA8 VSS\_0015
- AB14 VSS\_0016
- AB28 VSS\_0017
- AB4 VSS\_0018
- AC30 VSS\_0019
- AC34 VSS\_0020
- AC38 VSS\_0021
- AC5 VSS\_0022
- AC8 VSS\_0023
- AD14 VSS\_0024
- AD26 VSS\_0025
- AD28 VSS\_0026
- AE12 VSS\_0027
- AE31 VSS\_0028
- AE4 VSS\_0029
- AE41 VSS\_0030
- AE8 VSS\_0031
- AE14 VSS\_0032
- AE16 VSS\_0033
- AE17 VSS\_0034
- AE28 VSS\_0035
- AG2 VSS\_0036
- AG30 VSS\_0037
- AG34 VSS\_0038
- AG38 VSS\_0039
- AG8 VSS\_0040
- AH14 VSS\_0041
- AH16 VSS\_0042
- AJ1 VSS\_0043
- AJ28 VSS\_0044
- AK24 VSS\_0045
- AK37 VSS\_0046
- AK9 VSS\_0047
- AL11 VSS\_0048
- AL37 VSS\_0049
- AL5 VSS\_0050

- AT1 VSS\_NCTF\_001
- AT41 VSS\_NCTF\_002
- AL1 VSS\_NCTF\_003
- AV1 VSS\_NCTF\_004
- AV2 VSS\_NCTF\_005
- AV3 VSS\_NCTF\_006
- AV4 VSS\_NCTF\_007
- AV40 VSS\_NCTF\_008
- AW40 VSS\_NCTF\_009
- B40 VSS\_NCTF\_010
- B41 VSS\_NCTF\_011
- C41 VSS\_NCTF\_012
- D41 VSS\_NCTF\_013
- D41 VSS\_NCTF\_014

- AM14 VSS\_0051
- AM18 VSS\_0052
- AM20 VSS\_0053
- AM24 VSS\_0054
- AM26 VSS\_0055
- AM35 VSS\_0056
- AM38 VSS\_0057
- AM41 VSS\_0058
- AM4 VSS\_0059
- AM8 VSS\_0060
- AN28 VSS\_0061
- AP4 VSS\_0062
- AP4 VSS\_0063
- AP4 VSS\_0064
- AR34 VSS\_0065
- AR34 VSS\_0066
- AR37 VSS\_0067
- AT10 VSS\_0068
- AT11 VSS\_0069
- AT14 VSS\_0070
- AT15 VSS\_0071
- AT18 VSS\_0072
- AT20 VSS\_0073
- AT21 VSS\_0074
- AT22 VSS\_0075
- AT23 VSS\_0076
- AT24 VSS\_0077
- AT28 VSS\_0078
- AT33 VSS\_0079
- AT36 VSS\_0080
- AT38 VSS\_0081
- AT7 VSS\_0082
- AT7 VSS\_0083
- AT8 VSS\_0084
- AT8 VSS\_0085
- AV12 VSS\_0086
- AV17 VSS\_0087
- AV21 VSS\_0088
- AV33 VSS\_0089
- AV30 VSS\_0090

- VSS\_0141 H28
- VSS\_0140 H26
- VSS\_0135 H22
- VSS\_0138 H20
- VSS\_0137 H16
- VSS\_0136 H14
- VSS\_0135 G2
- VSS\_0134 F38
- VSS\_0133 F37
- VSS\_0132 F35
- VSS\_0131 F24
- VSS\_0130 F18
- VSS\_0129 E7
- VSS\_0128 E5
- VSS\_0127 E4
- VSS\_0127 E38
- VSS\_0126 E35
- VSS\_0125 E31
- VSS\_0124 E3
- VSS\_0123 E12
- VSS\_0122 D9
- VSS\_0121 D8
- VSS\_0120 D7
- VSS\_0119 D6
- VSS\_0118 D4
- VSS\_0117 D37
- VSS\_0116 D34
- VSS\_0115 D32
- VSS\_0114 D31
- VSS\_0113 D28
- VSS\_0112 D27
- VSS\_0111 D26
- VSS\_0110 D25
- VSS\_0108 D24
- VSS\_0107 D22
- VSS\_0106 D20
- VSS\_0105 D19
- VSS\_0104 D18
- VSS\_0103 D16
- VSS\_0102 D14
- VSS\_0101 D13
- VSS\_0100 D12
- VSS\_0099 C8
- VSS\_0099 C37
- VSS\_0098 C25
- VSS\_0097 B38
- VSS\_0096 B33
- VSS\_0094 B30
- VSS\_0093 B3
- VSS\_0092 B25
- VSS\_0091 AW7

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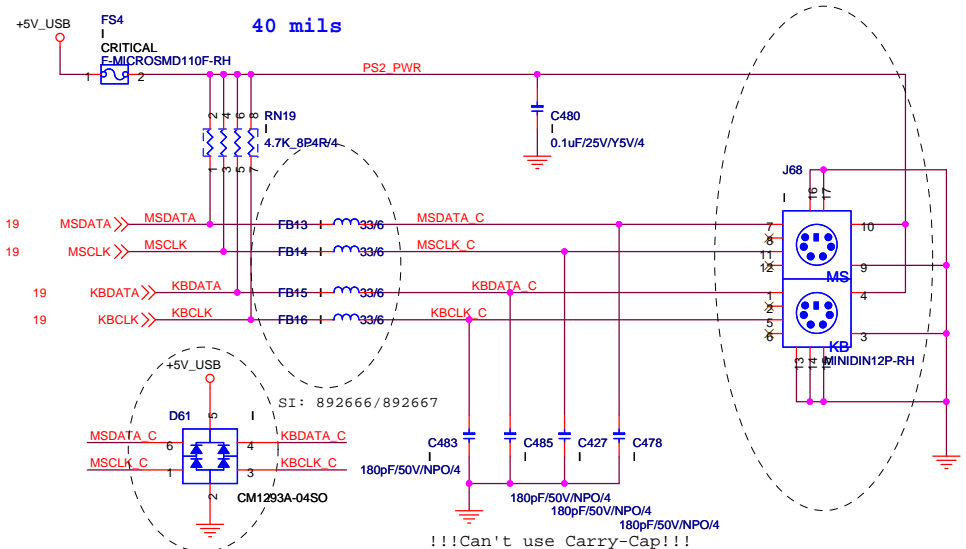


MICRO-STAR INT'L CO.,LTD		
HP SCH P/N: 718773-000(MSI MS-7860)		
Size Custom	Document Description <b>PCH-GND</b>	Rev X3
Date:	Sheet 18 of 55	



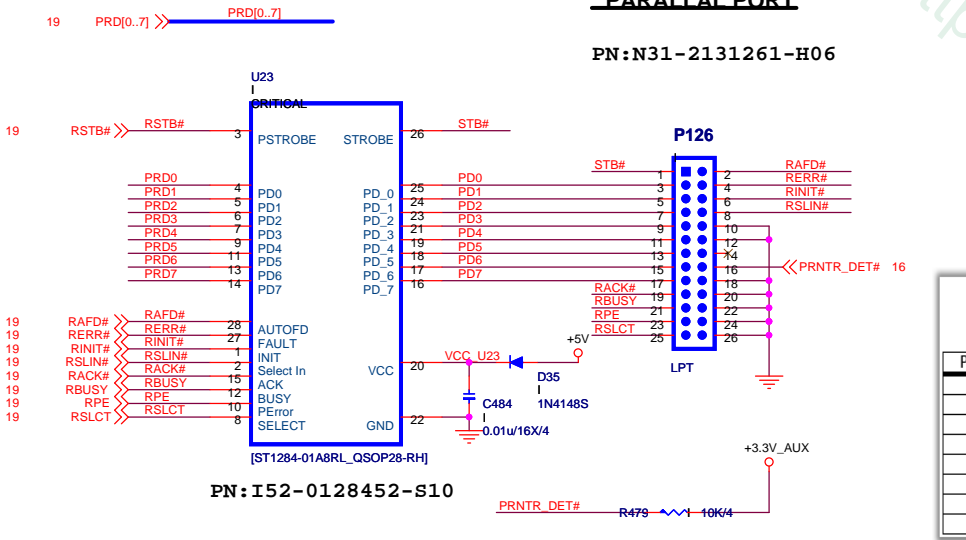
**PS2 KEYBOARD & MOUSE CONNECTOR**

SI: 892604/892605



**PARALLEL PORT**

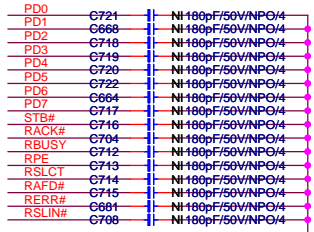
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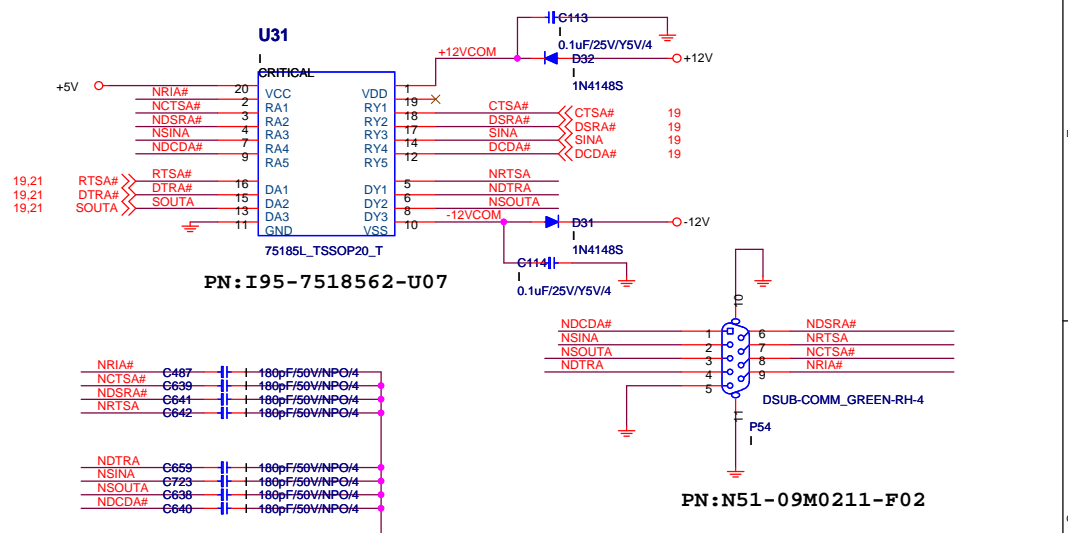
PN: I52-0128452-S10

Parallel Port 2 x13 header

PIN #	SIGNAL NAME	SIGNAL NAME	PIN #
1	LPT_STB#	XAFD#	2
3	LPT_SPD0	ERROR#	4
5	LPT_SPD1	XINIT#	6
7	LPT_SPD2	XSLIN#	8
9	LPT_SPD3	GND	10
11	LPT_SPD4	GND	12
13	LPT_SPD5	GND	14
15	LPT_SPD6	PRT_DET#	16
17	LPT_SPD7	GND	18
19	ACK#	GND	20
21	BUSY	GND	22
23	PE	LDT_RST#	24
	SLCT	GND	26



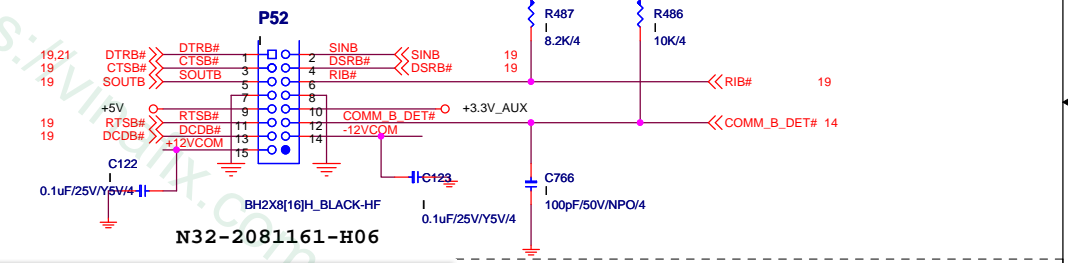
**SERIAL PORT 1**



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PN: N51-09M0211-F02

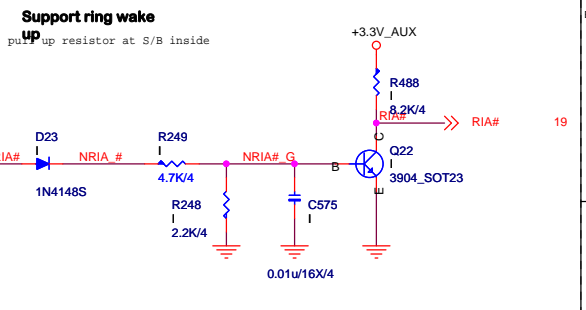
**SERIAL PORT 2**



N32-2081161-H06

TABLE 12  
FLOATING SERIAL PORT PIN DEFINITION (TOP VIEW)

Pin #	Signal Name	Signal Name	Pin #
1	DTR#	RXD	2
3	CTS#	DSR#	4
5	TXD	RI#	6
7	GND	GND	8
9	+5V	+3.3 VAUX	10
11	RTS#	COMM B DETECT#	12
13	DCC#	-12 V (THRU DIODE)	14
15	+12 V (THRU DIODE)	KEY	16

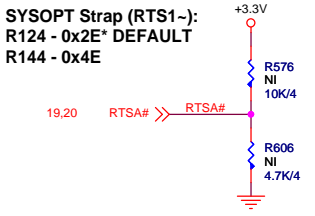


Release Date : Tuesday, March 19, 2013

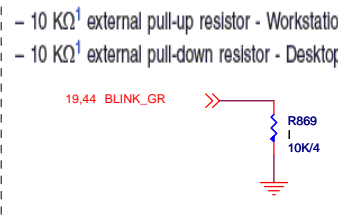
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**HP SEH P/N: 718773-000(MSI MS-7860)**  
 Document Description  
**KB / MS / COM / LPT**  
 Date: \_\_\_\_\_ Sheet 20 of 55

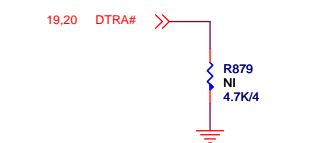
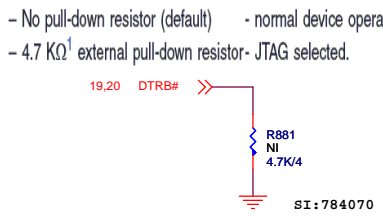
**SYSOPT Strap (RTS1-):**  
**R124 - 0x2E\* DEFAULT**  
**R144 - 0x4E**



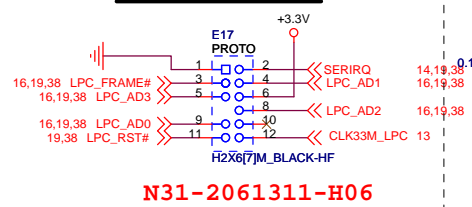
- 10 KΩ<sup>1</sup> external pull-up resistor - Workstations pins default.  
 - 10 KΩ<sup>1</sup> external pull-down resistor - Desktop pins default.



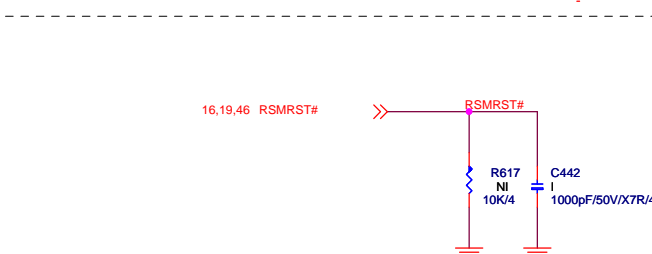
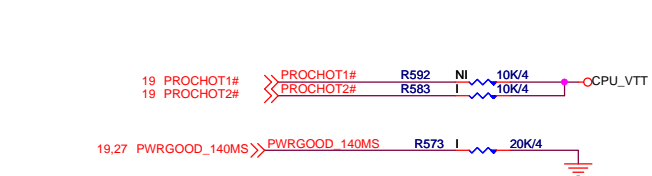
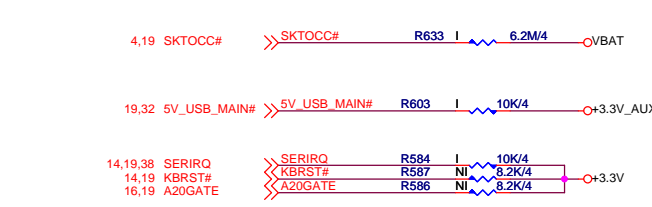
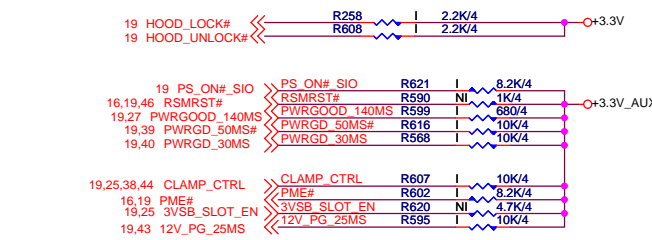
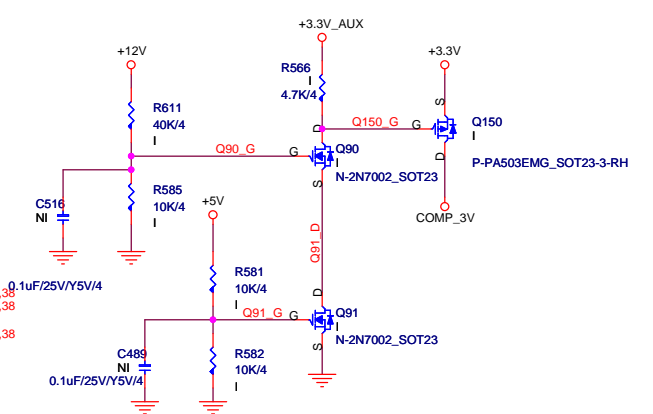
- No pull-down resistor (default) - normal device operation.  
 - 4.7 KΩ<sup>1</sup> external pull-down resistor - JTAG selected.



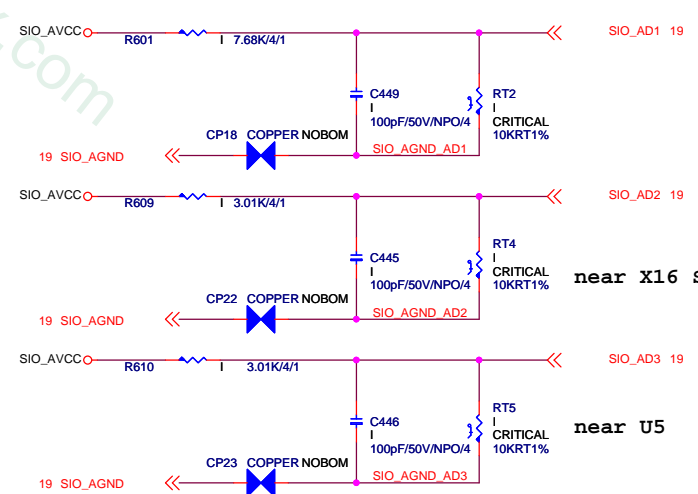
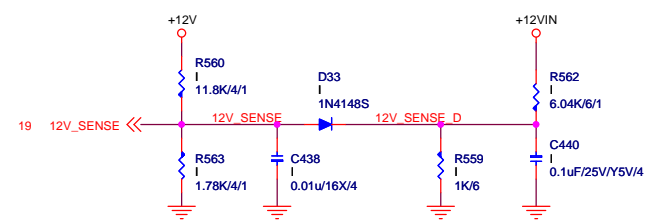
### LPC Debug



**N31-2061311-H06**



<https://vinafix.com>

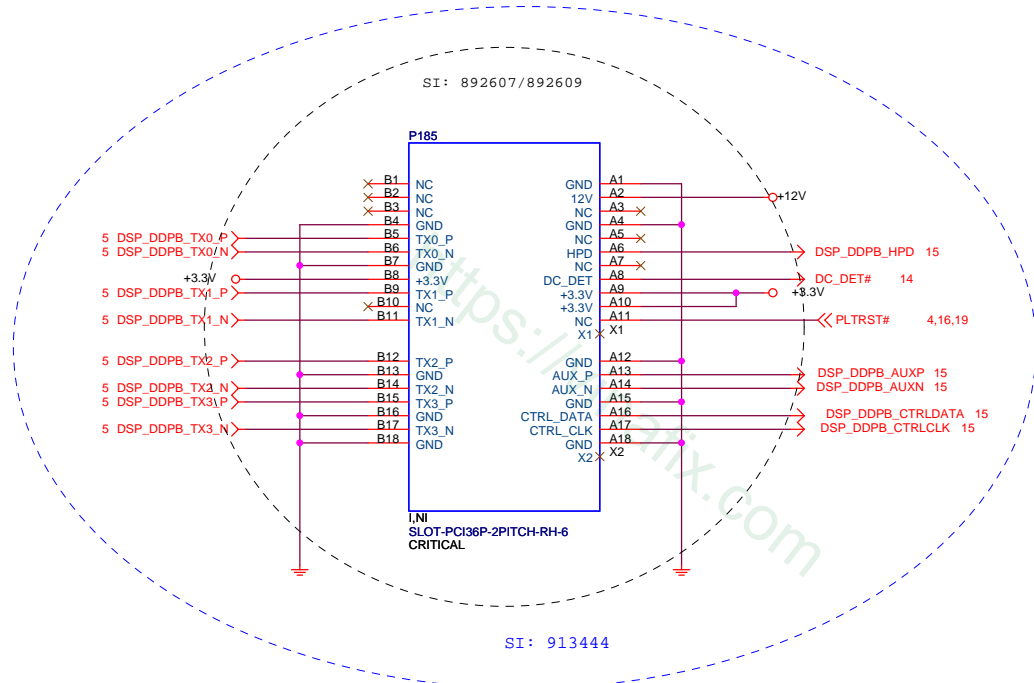


Release Date : Tuesday, March 19, 2013

**HP Restricted Secret**

<b>MICRO-STAR INT'L CO.,LTD</b>		
<b>HP SCH P/N: 718773-000(MSI MS-7860)</b>		
	Size Custom	Document Description
	<b>SIO- PULL UP/DOWN/PS_ON</b>	
Date:	Sheet 21 of 55	Rev X3

# DDI Port Slot



Release Date : Tuesday, March 19, 2013

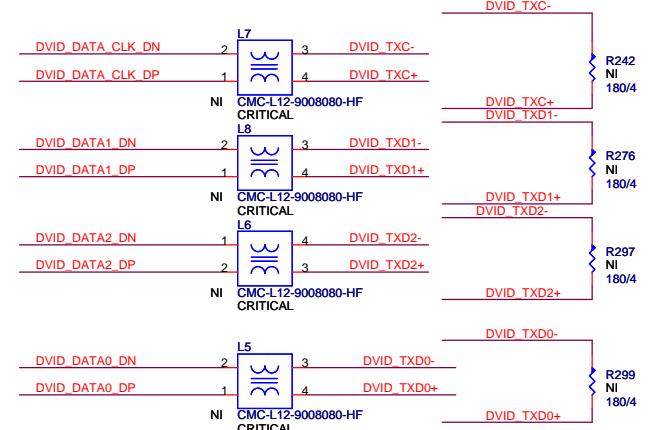
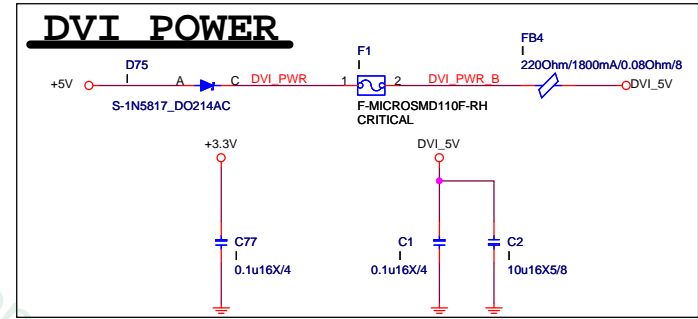
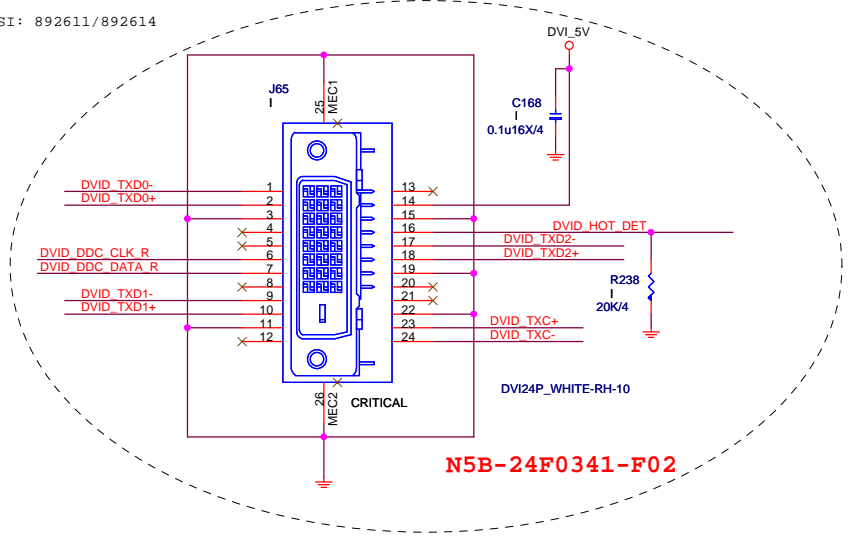
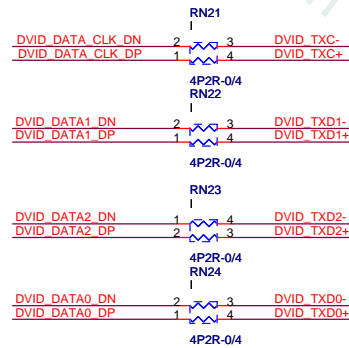
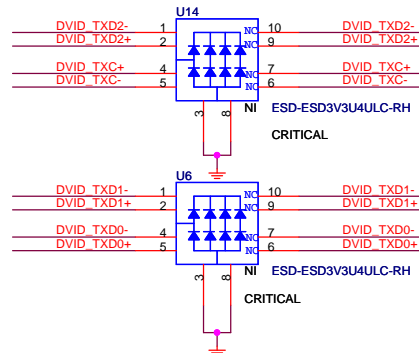
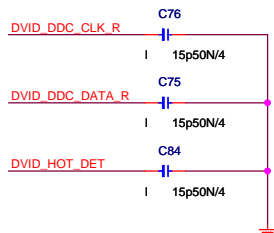
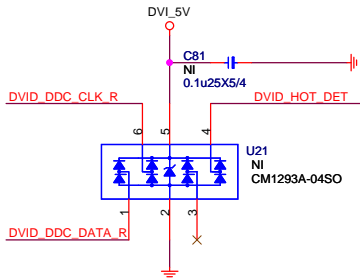
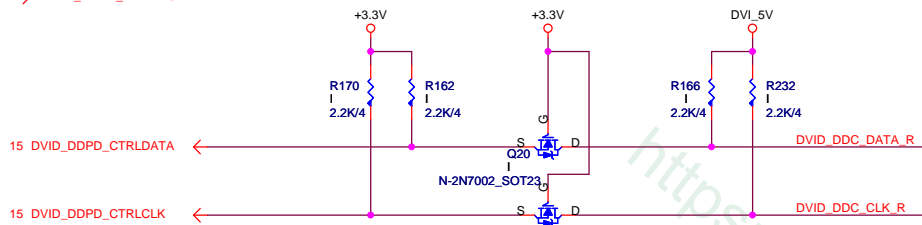
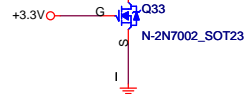
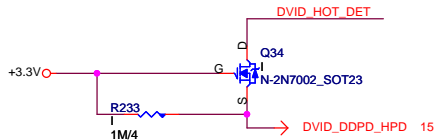
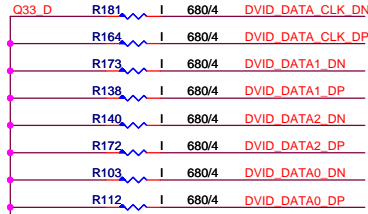
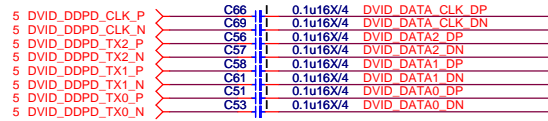
**HP Restricted Secret**



MICRO-STAR INT'L CO.,LTD		
HP SCH P/N: 718773-000(MSI MS-7860)		
Size Custom	Document Description DDI Port Slot	Rev X3
Date:	Sheet 22 of 55	

# DVID level shifter

SI: 892611/892614



Release Date : Tuesday, March 19, 2013

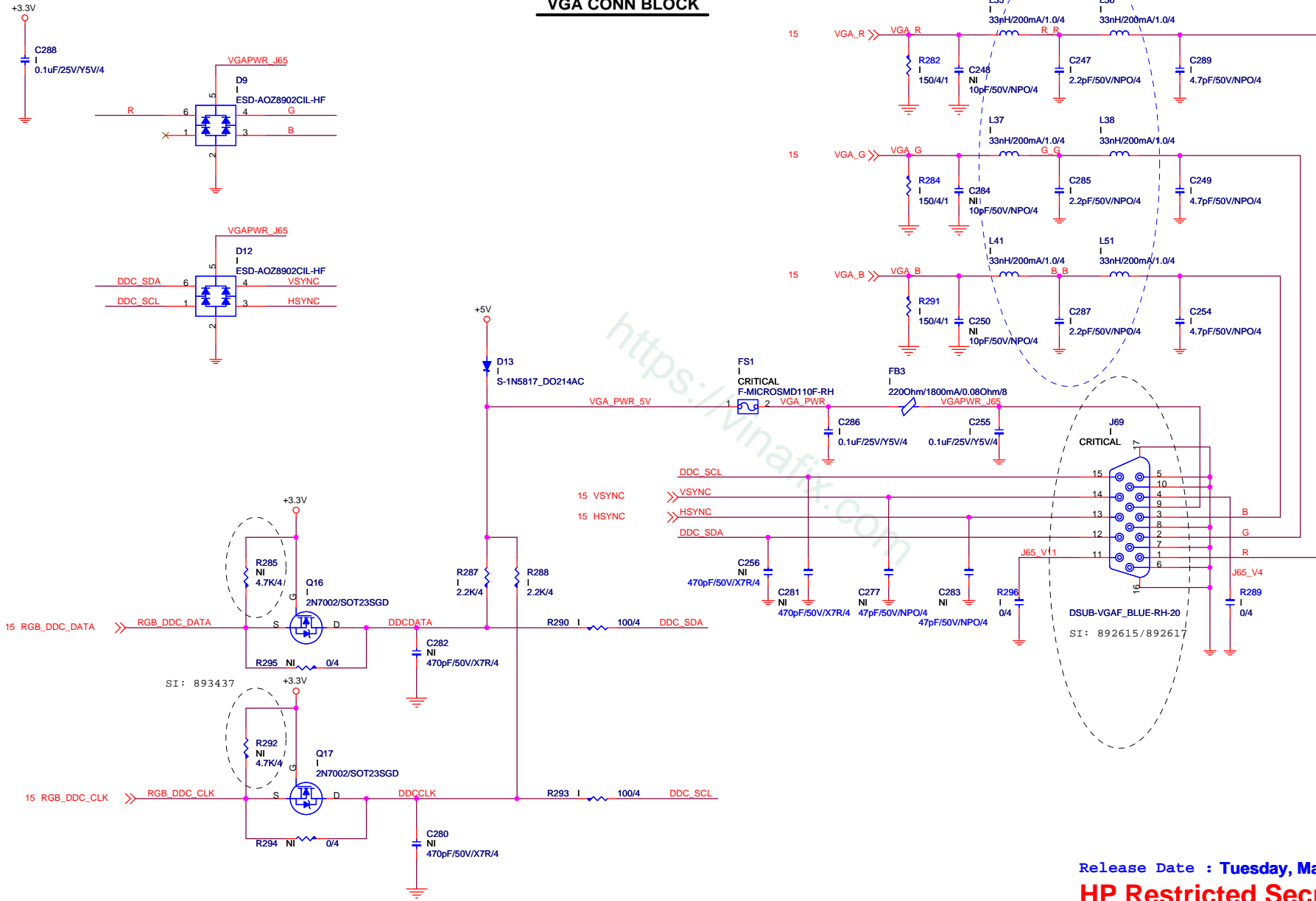
**HP Restricted Secret**

	<b>MICRO-STAR INT'L CO.,LTD</b>	
	HP SCH P/N: 718773-000(MSI MS-7860)	
Size Custom	Document Description <b>DVI Port CONN</b>	Rev X3
Date:	Sheet 23 of 55	

# VGA CONN BLOCK

SI: 908746, 908748

close VGA connector

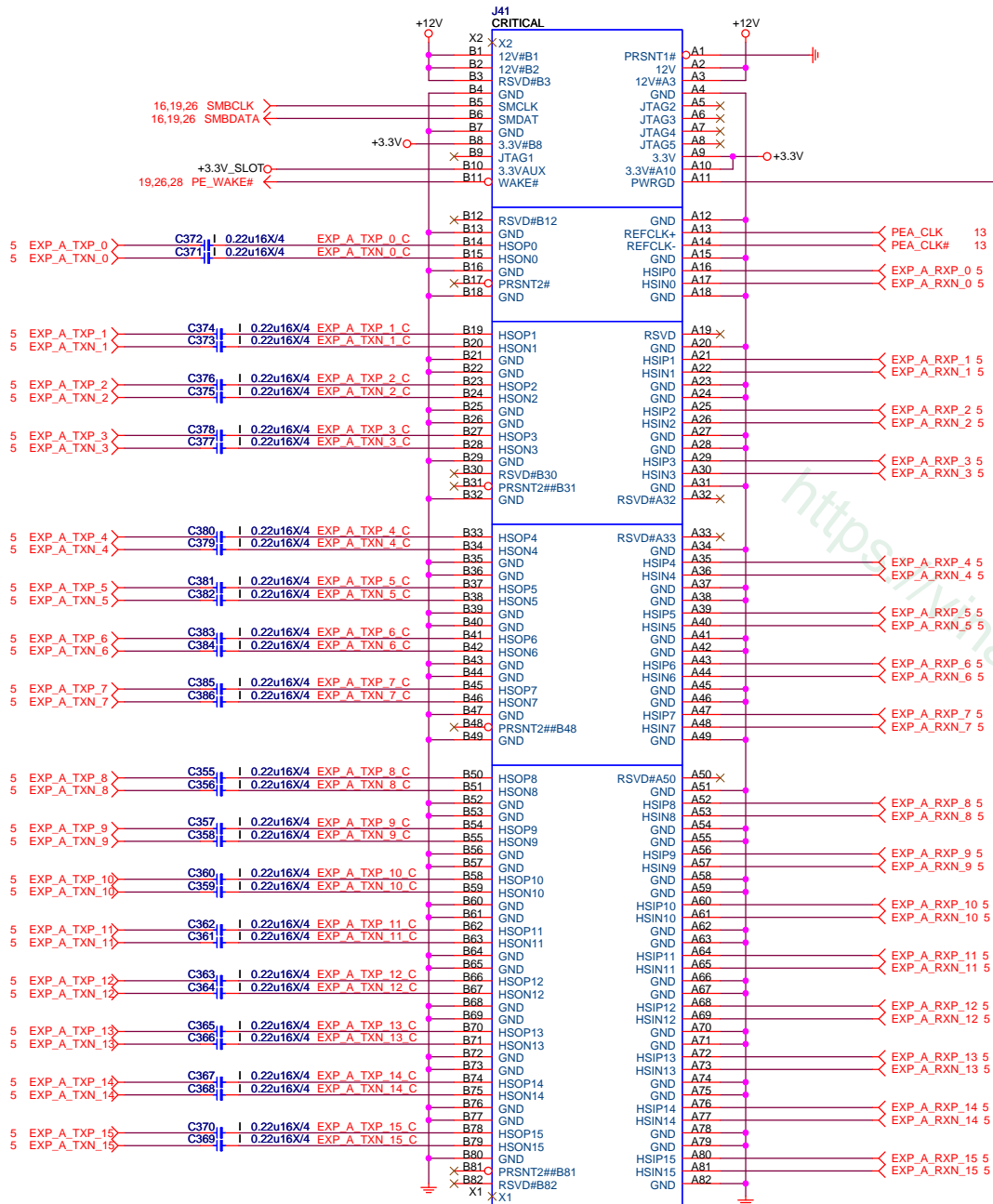


Release Date : Tuesday, March 19, 2013

**HP Restricted Secret**

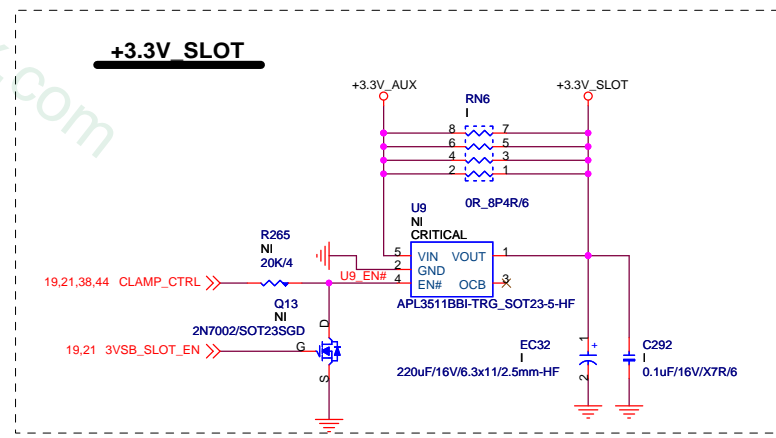
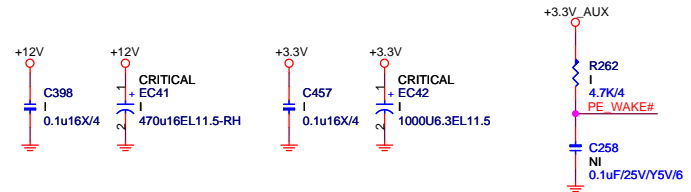
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	HP SCH P/N: 718773-000(MSI MS-7860)	
	Size Custom	Document Description <b>VGA CONN</b>
Date:	Sheet 24 of 55	

# PCI EXPRESS X16 SLOT



SLOT-PCI164P\_BLACK-2PITCH-RH-20

**N11-1641151-L06**



Release Date : Tuesday, March 19, 2013

**HP Restricted Secret**

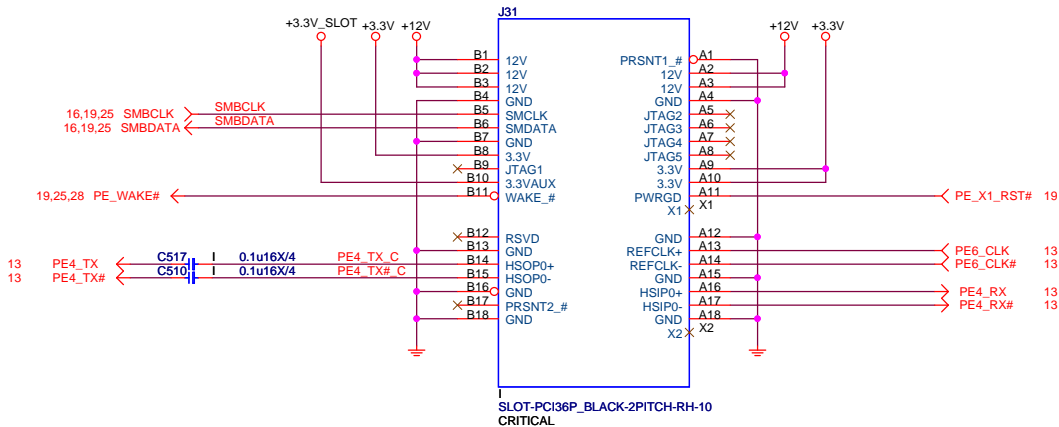
**MICRO-STAR INT'L CO.,LTD**

HP SCH P/N: 718773-000(MSI MS-7860)

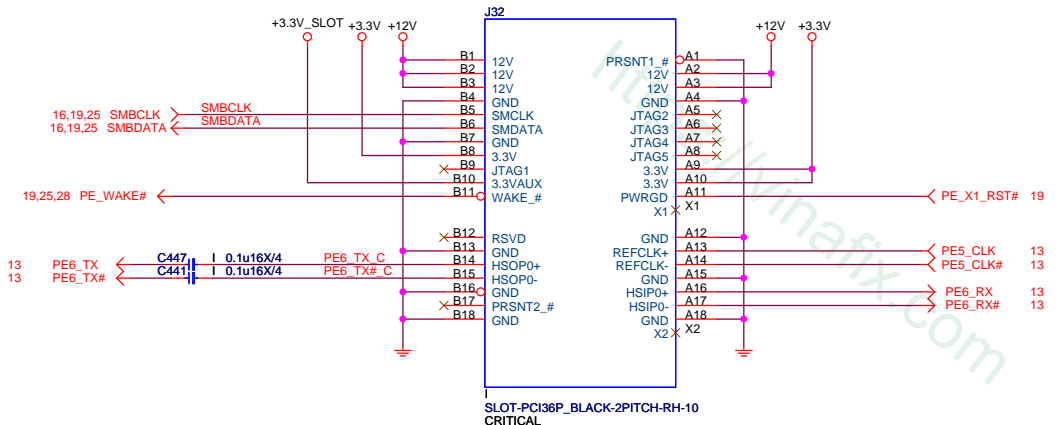
Size Custom	Document Description	Rev X3
PCIE x16 Slot		
Date:	Sheet 25 of 55	



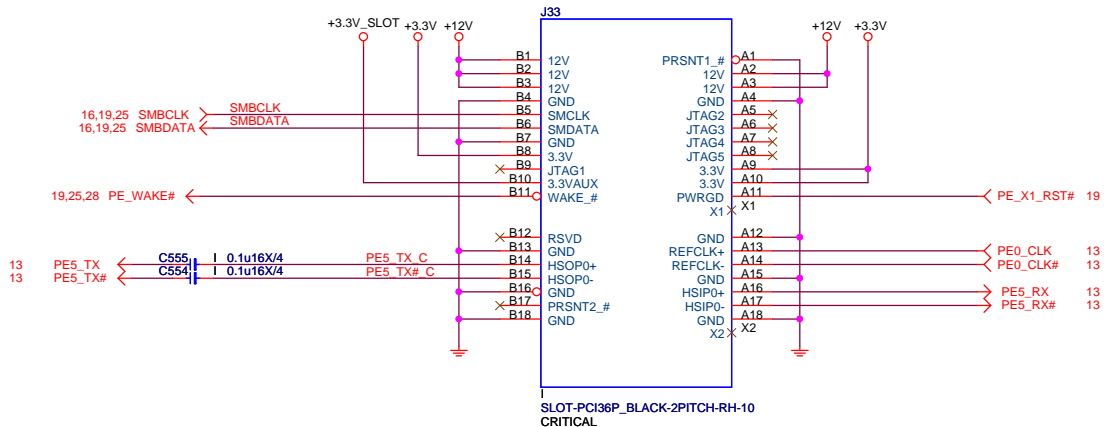
### PCI EXPRESS x1-PORT



### PCI EXPRESS x1-PORT



### PCI EXPRESS x1-PORT



N11-0360381-L06

Vinafix.com

Release Date : Tuesday, March 19, 2013

**HP Restricted Secret**

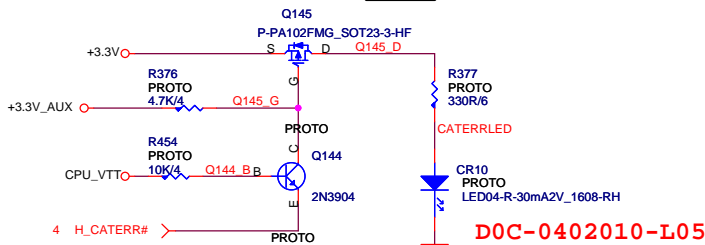
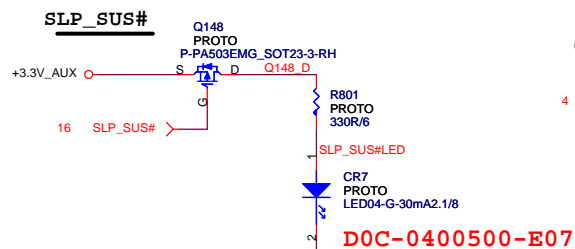
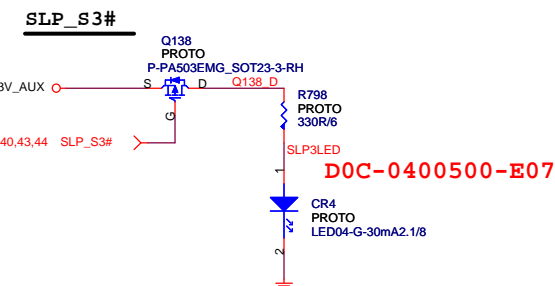
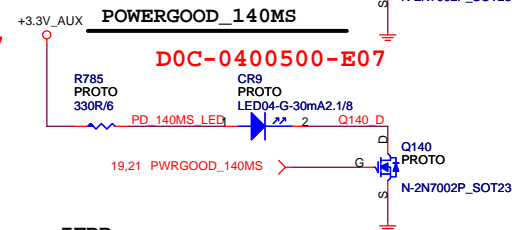
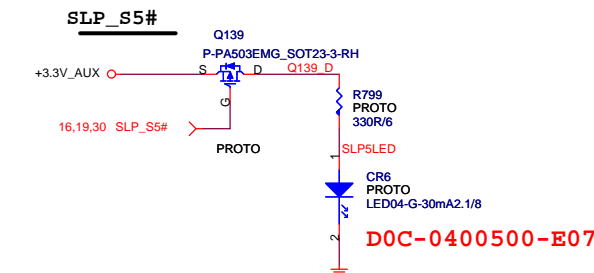
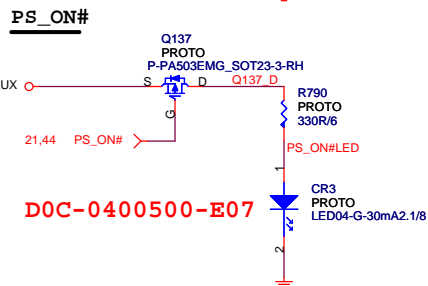
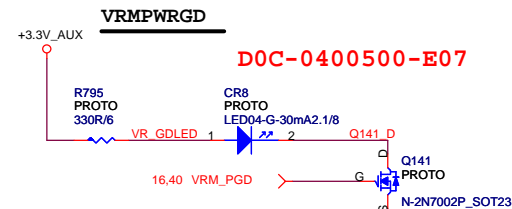
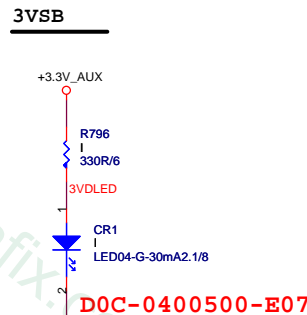
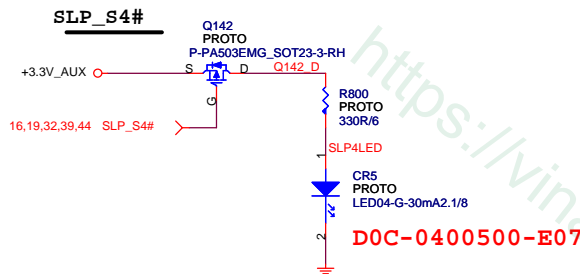
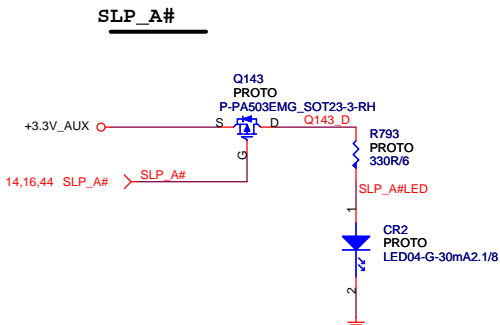
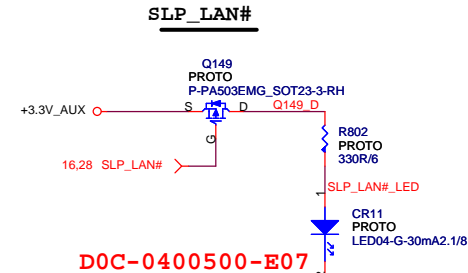
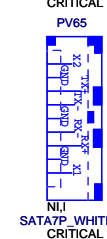
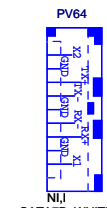
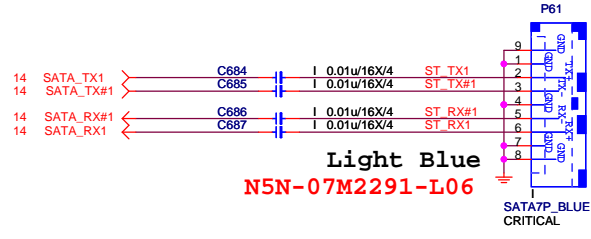
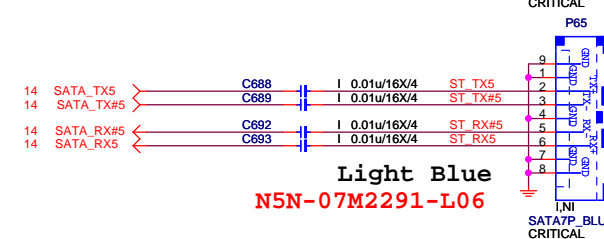
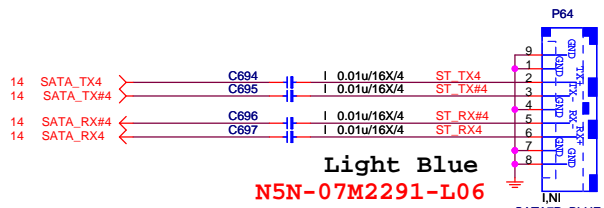
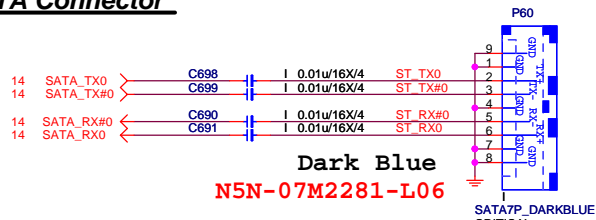
MICRO-STAR INT'L CO.,LTD

HP SCH P/N: 718773-000(MSI MS-7860)



Size Custom	Document Description <b>PCIE x1 Slots</b>	Rev X3
Date:	Sheet 26 of 55	

# SATA Connector

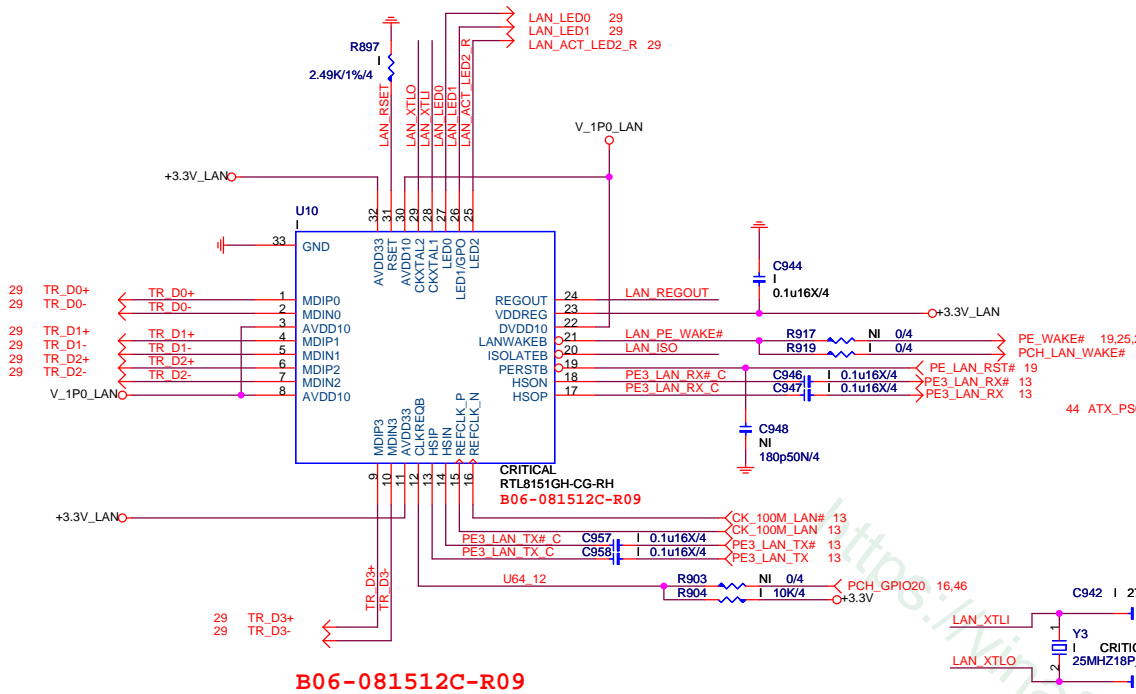


Release Date : Tuesday, March 19, 2013

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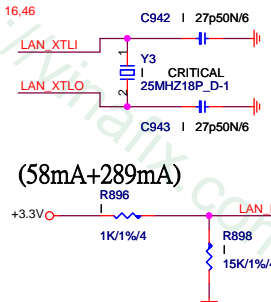
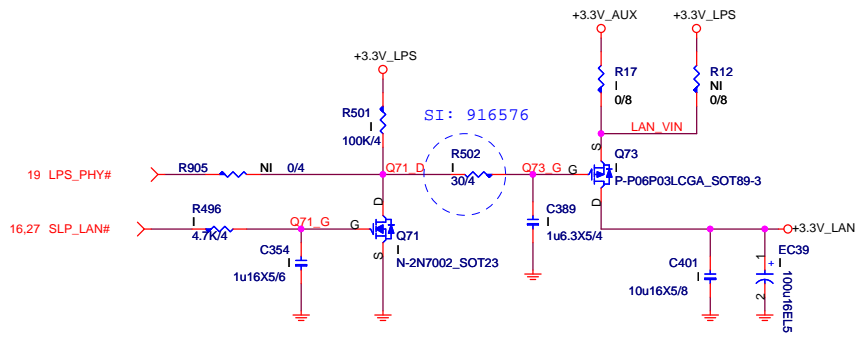
<b>MSI</b>		
<b>MICRO-STAR INT'L CO.,LTD</b>		
<b>HP SCH P/N: 718773-000(MSI MS-7860)</b>		
Size Custom	Document Description <b>SATA/LED</b>	Rev X3
Date:	Sheet 27 of 55	

# Gigabit LAN RTL8151GH-CG

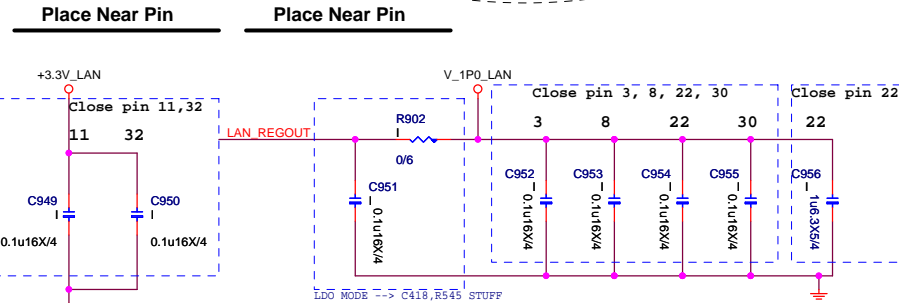


B06-081512C-R09

## LAN Power



(58mA+289mA)



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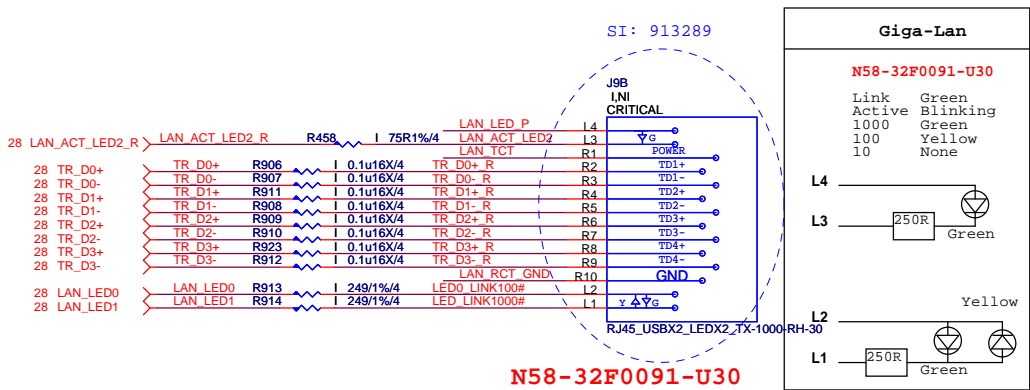
MICRO-STAR INT'L CO.,LTD

HP SCH P/N: 718773-000(MSI MS-7860)



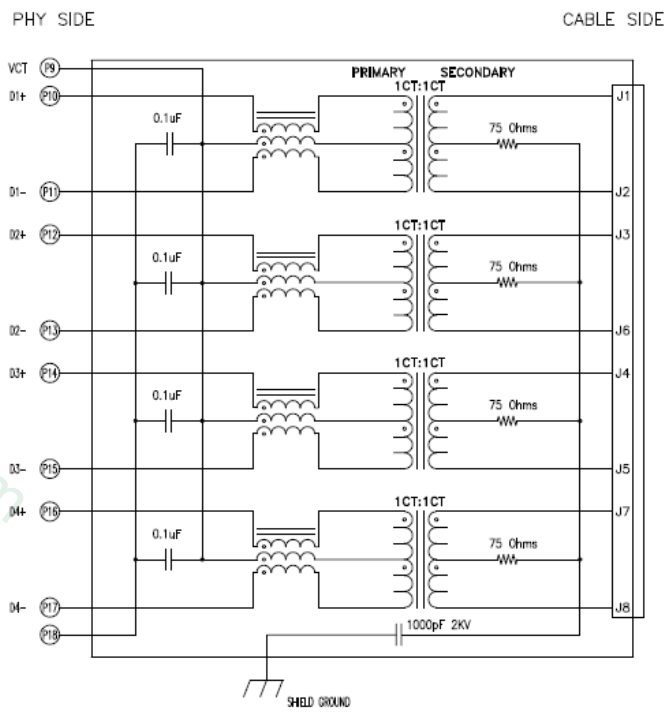
Size Custom	Document Description <b>Gigabit LAN-RTL8151GH-CG</b>	Rev X3
Date:	Sheet 28 of 55	

# LAN Connector

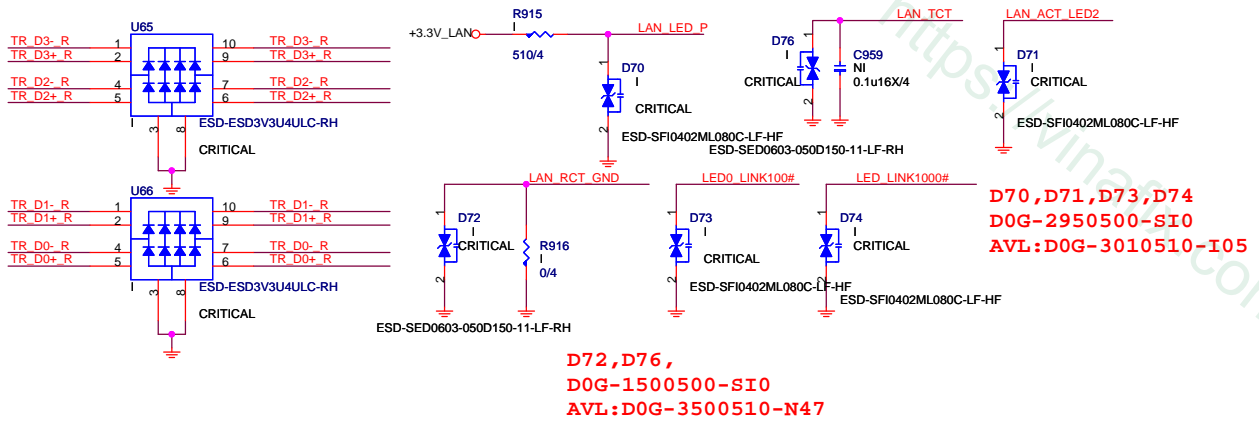


Function	Link LED	Speed LED
10Mb Link	Green (solid)	Off
100Mb Link	Green (solid)	Yellow (solid)
1000Mb Link	Green (solid)	Green (solid)
10Mb Data Transfer	Green (blink)	Off
100Mb Data Transfer	Green (blink)	Yellow (solid)
1000Mb Data Transfer	Green (blink)	Green (solid)

## SCHEMATIC



## ESD



Release Date : Tuesday, March 19, 2013

**HP Restricted Secret**

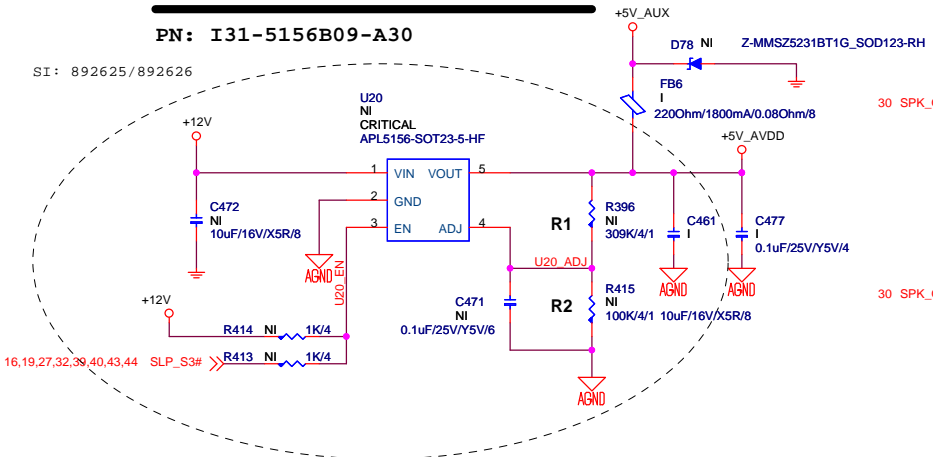
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	HP SCH P/N: 718773-000(MSI MS-7860)	
	Size Custom	Document Description <b>LAN CONNECTOR</b>
Date:	Sheet 29 of 55	



# AUDIO CODEC REGULATORS

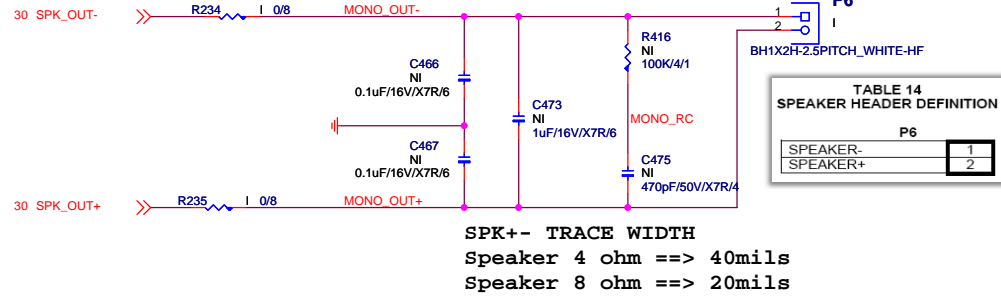
PN: I31-5156B09-A30

SI: 892625/892626



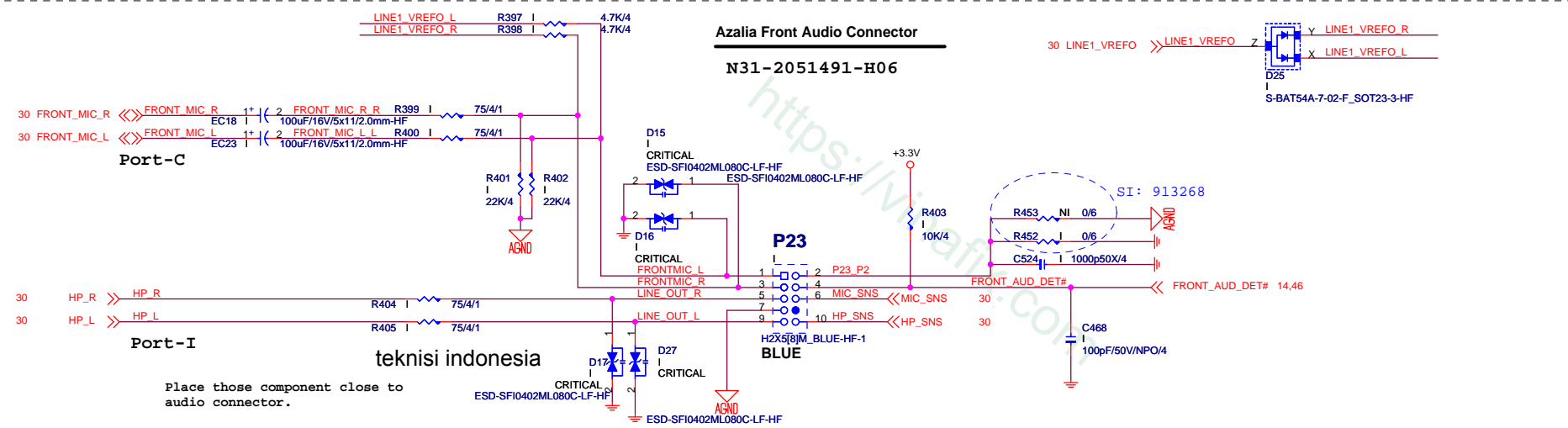
# SPEAKER HEADER

P/N:N32-1020521-H06



# Alalia Front Audio Connector

N31-2051491-H06

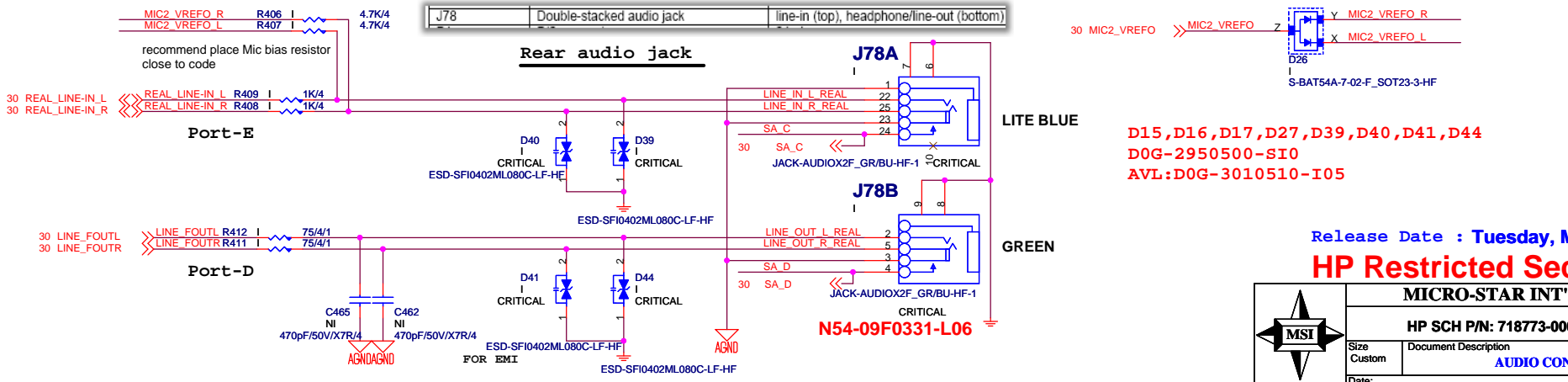


teknisi indonesia

Place those component close to audio connector.

# Rear audio jack

J78 Double-stacked audio jack line-in (top), headphone/line-out (bottom)



Release Date : Tuesday, March 19, 2013

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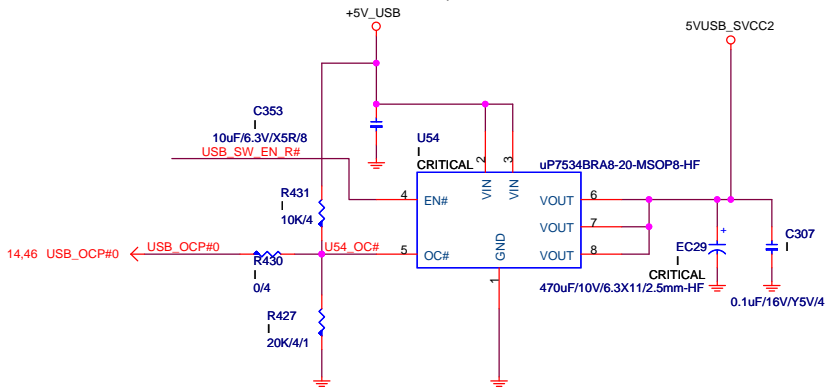
MICRO-STAR INT'L CO.,LTD

HP SCH P/N: 718773-000(MSI MS-7860)

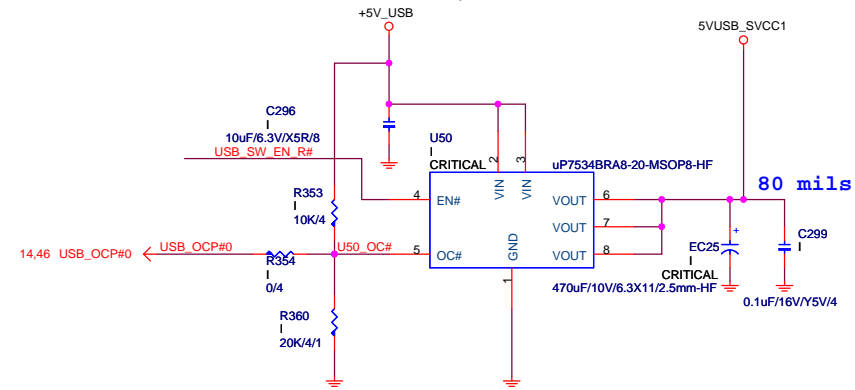


Size Custom	Document Description	Rev X3
AUDIO CONNECTOR		
Date:	Sheet 31	of 55

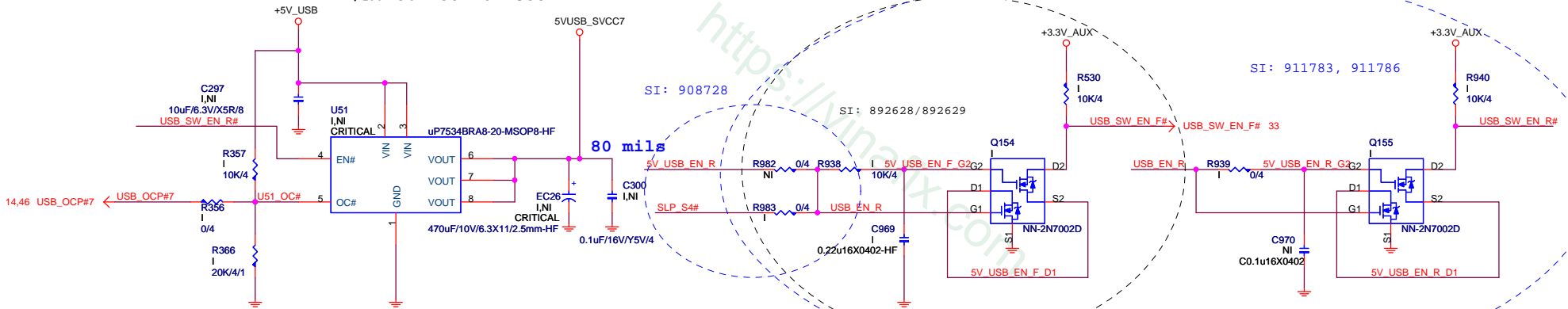
**POWER CIRCUIT FOR USB PORT 2,3**  
P/N: I36-7534B02-U33



**POWER CIRCUIT FOR USB PORT 0,1**  
P/N: I36-7534B02-U33



**POWER CIRCUIT FOR USB PORT 12,13**  
P/N: I36-7534B02-U33



**USB POWER**



**I32-0750109-U33**

CRB: MODE Low support S0/S3  
Hi support S0/S3/S4/S5

Release Date : Tuesday, March 19, 2013

**HP Restricted Secret**

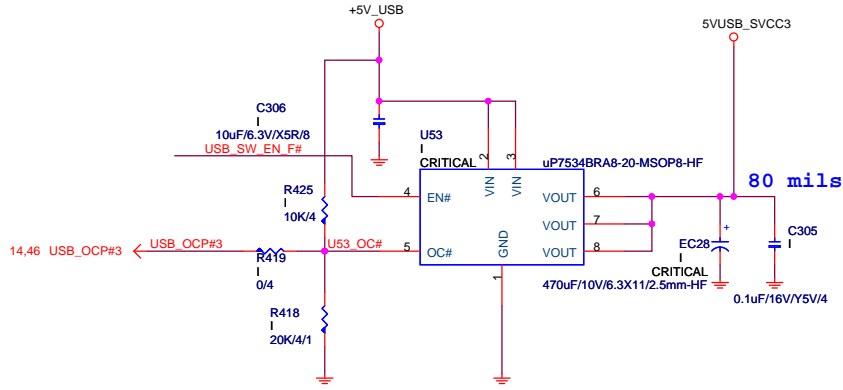
**MICRO-STAR INT'L CO.,LTD**

**HP SCH P/N: 718773-000(MSI MS-7860)**

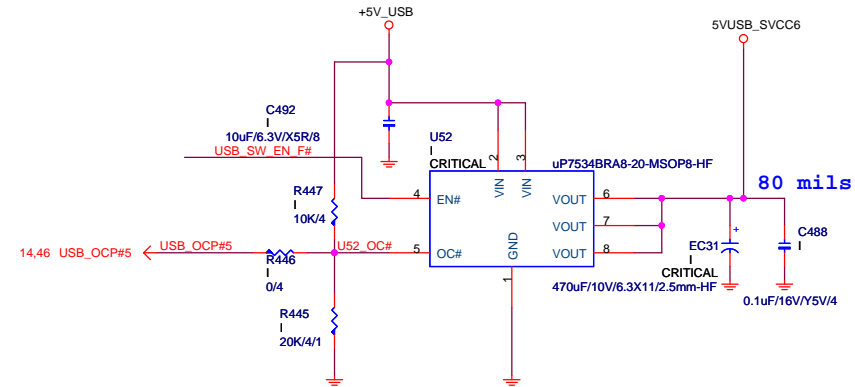
Size Custom	Document Description	Rev X3
Rear USB POWER		
Date:	Sheet 32	of 55



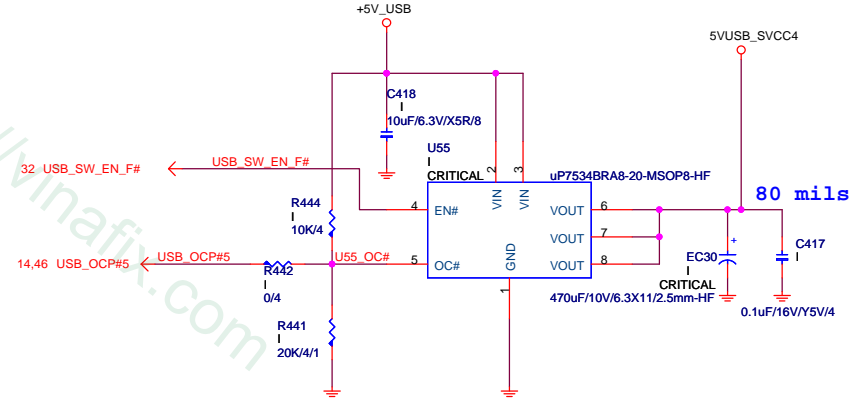
**POWER CIRCUIT FOR USB PORT 4,5,6**  
P/N: I36-7534B02-U33



**POWER CIRCUIT FOR USB PORT 10,11**  
P/N: I36-7534B02-U33



**POWER CIRCUIT FOR USB PORT 8,9**  
P/N: I36-7534B02-U33



Release Date : Tuesday, March 19, 2013

**HP Restricted Secret**

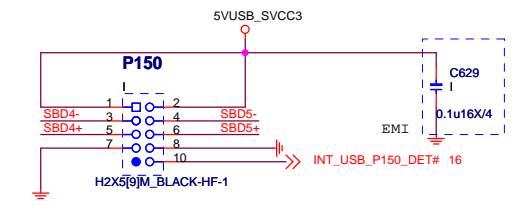
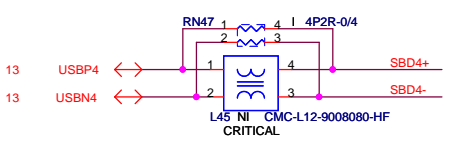
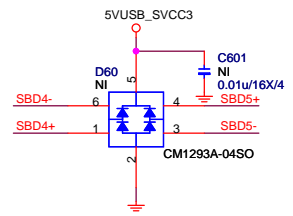
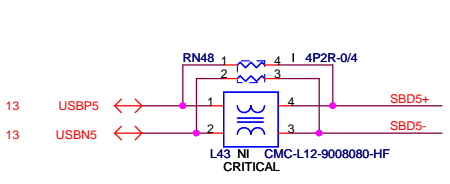


MICRO-STAR INT'L CO.,LTD

HP SCH P/N: 718773-000(MSI MS-7860)

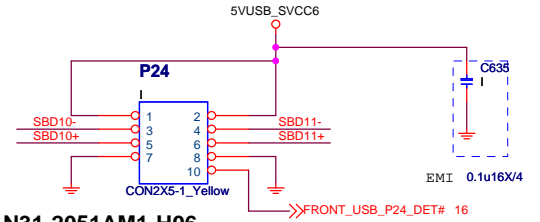
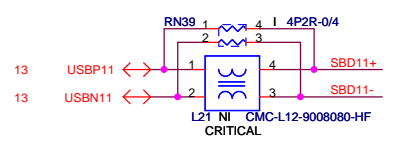
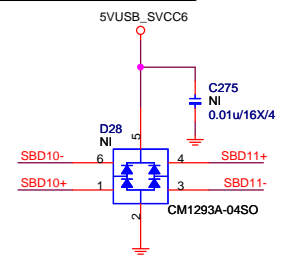
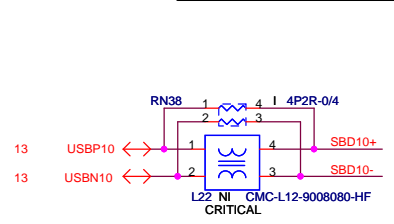
Size Custom	Document Description <b>Front USB POWER</b>	Rev X3
Date:	Sheet 33 of 55	

**Internal USB Connector For USB Port 4 / 5**



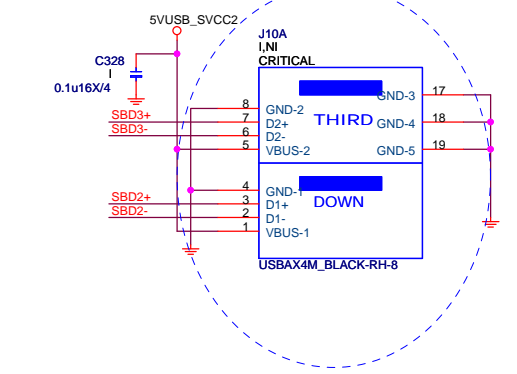
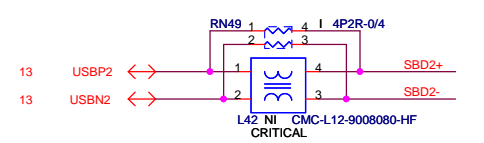
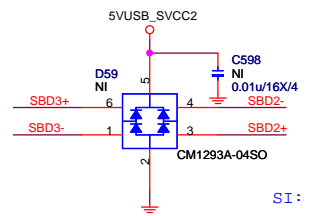
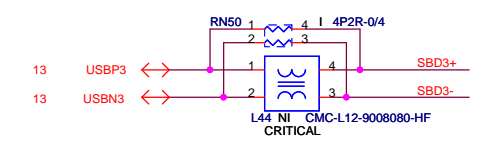
**N31-2051BG1-H06**  
COLOR BLACK

**Front Panel USB Connector For USB Port 10 / 11**

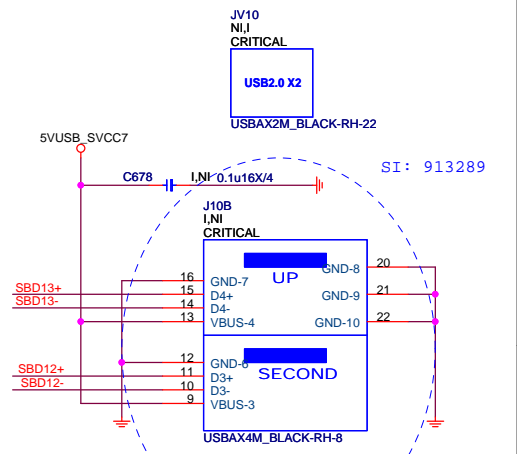
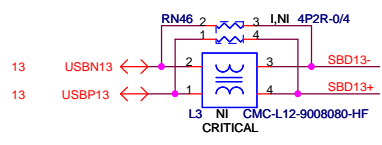
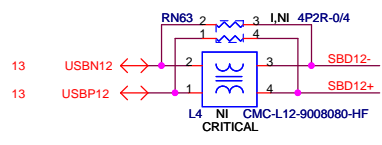
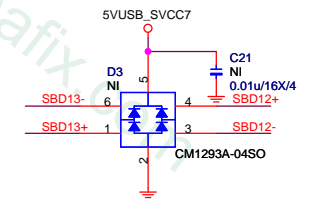


**N31-2051AM1-H06**  
COLOR YELLOW

**Rear USB Connector For USB Port 2/3**



SI: 913289



Release Date : Tuesday, March 19, 2013

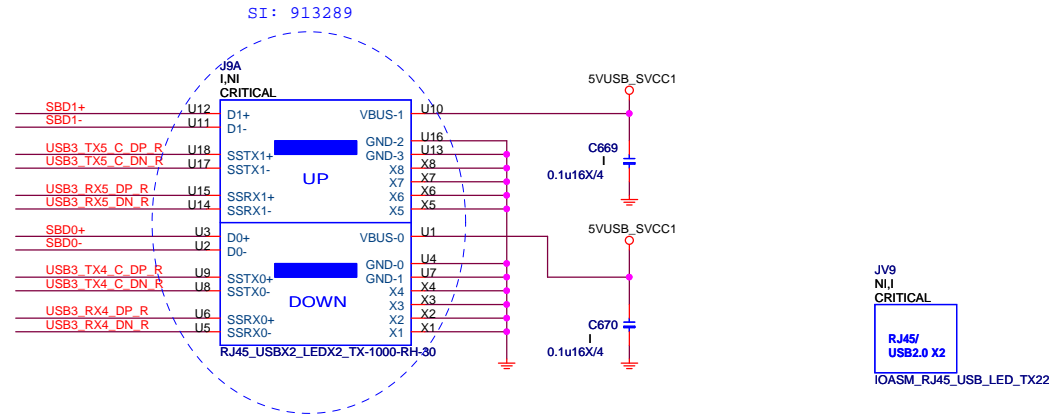
**HP Restricted Secret**

MICRO-STAR INT'L CO.,LTD

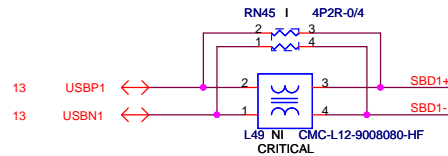
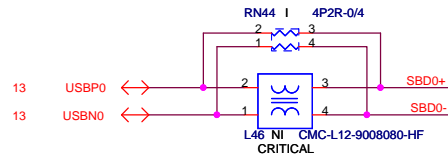
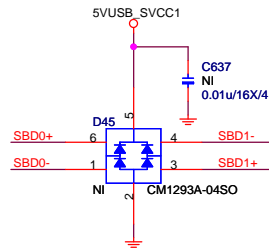
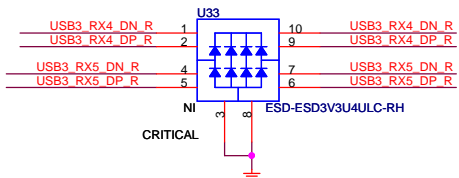
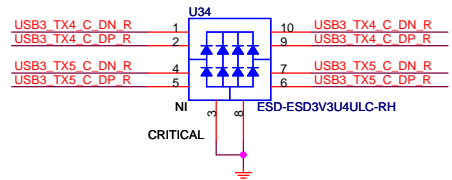
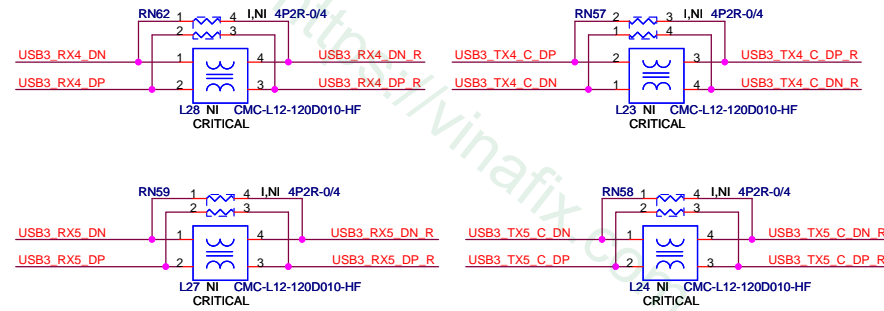
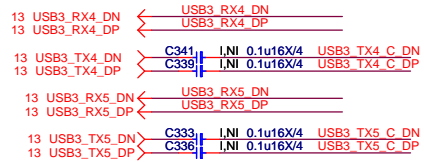
HP SCH P/N: 718773-000(MSI MS-7860)

Size Custom	Document Description	Rev X3
	USB2.0	





**REAR USB3.0 Connector For USB3.0 Port 4 /5**



Release Date : Tuesday, March 19, 2013

**HP Restricted Secret**

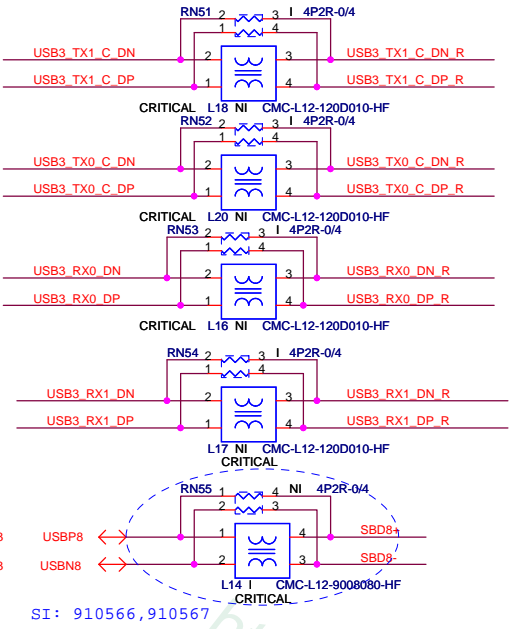
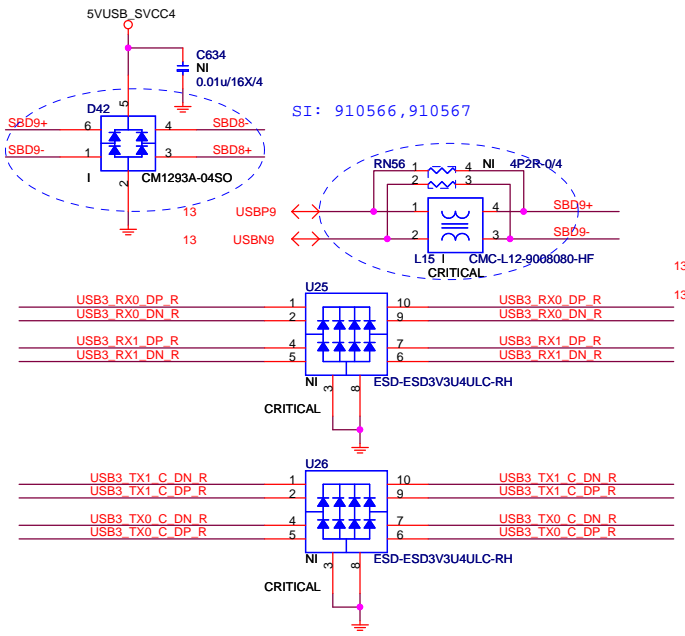
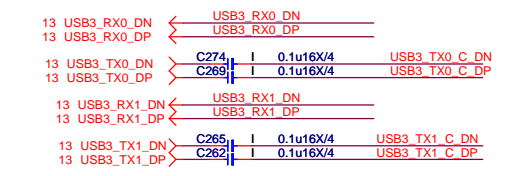
MICRO-STAR INT'L CO.,LTD

HP SCH P/N: 718773-000(MSI MS-7860)

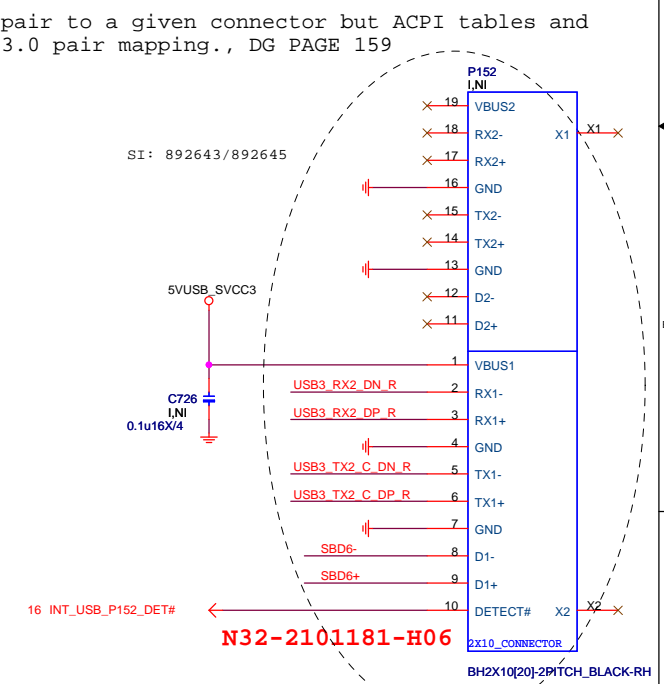
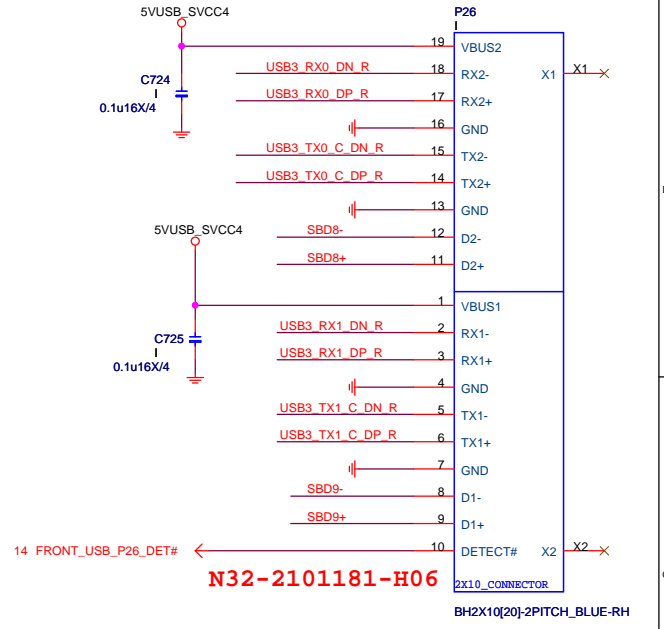
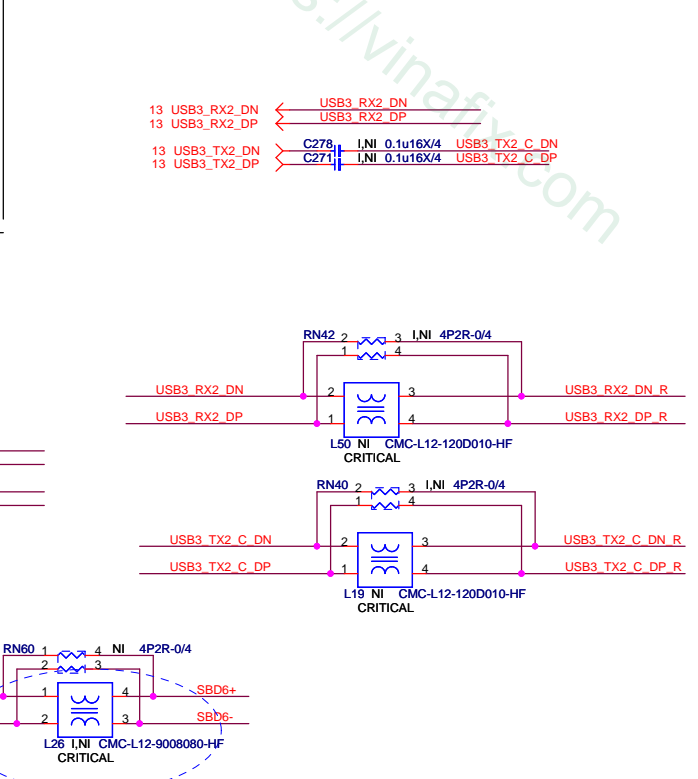
Size Custom	Document Description	Rev X3
Rear USB 3.0		
Date:	Sheet 35 of 55	



**FRONT USB3.0 Connector For USB3.0 Port 1 / 2**



The six USB 3.0 pairs can be mapped with any USB 2.0 pair to a given connector but ACPI tables and BIOS should be updated to reflect the USB 2.0 to USB 3.0 pair mapping., DG PAGE 159

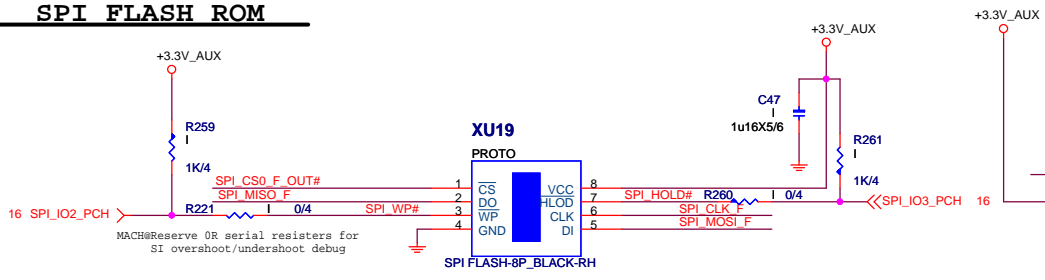


Release Date : Tuesday, March 19, 2013  
**HP Restricted Secret**

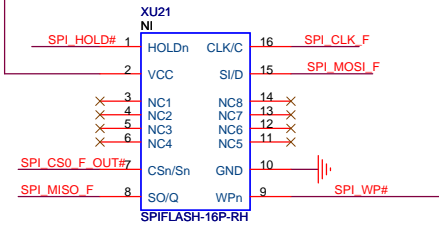
<b>MICRO-STAR INT'L CO.,LTD</b>		
<b>HP SCH P/N: 718773-000(MSI MS-7860)</b>		
Size Custom	Document Description	Rev X3
<b>Front USB 3.0</b>		
Date:	Sheet 36	of 55



### SPI FLASH ROM

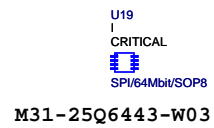


### SPI 64M ROM1

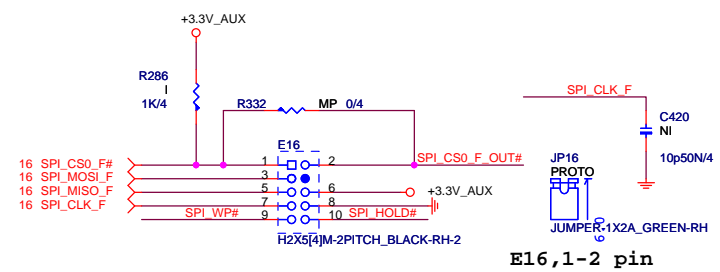


PN:N14-0160010-L06

### BIOS

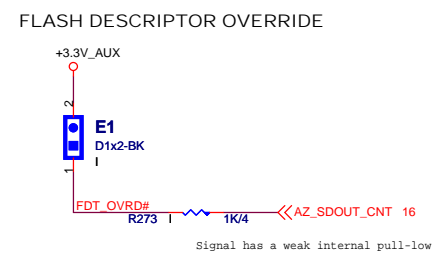


### SPI DEBUG PROT



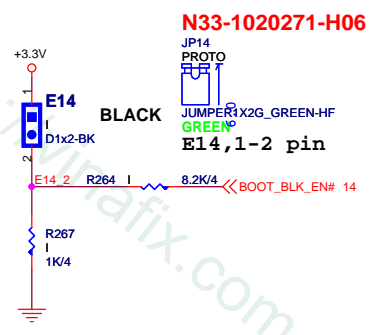
E16, 1-2 pin

### Flash Descriptor Override Header (ME\_DIS)



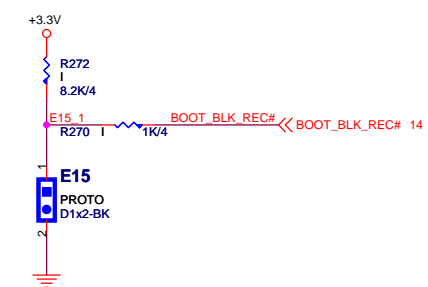
N31-1020151-H06

### BOOT BLOCK WRITE JUMPER

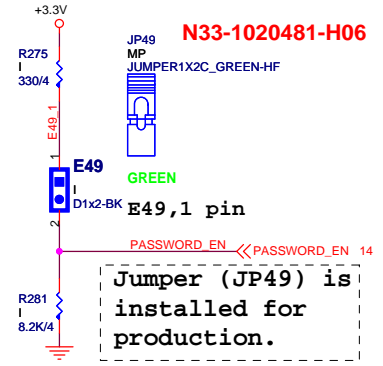


E14, 1-2 pin

### BOOT BLOCK RECOVERY HEADER



### PASSWORD JUMPER

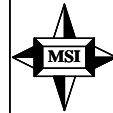


Jumper (JP49) is installed for production.

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**HP Restricted Secret**

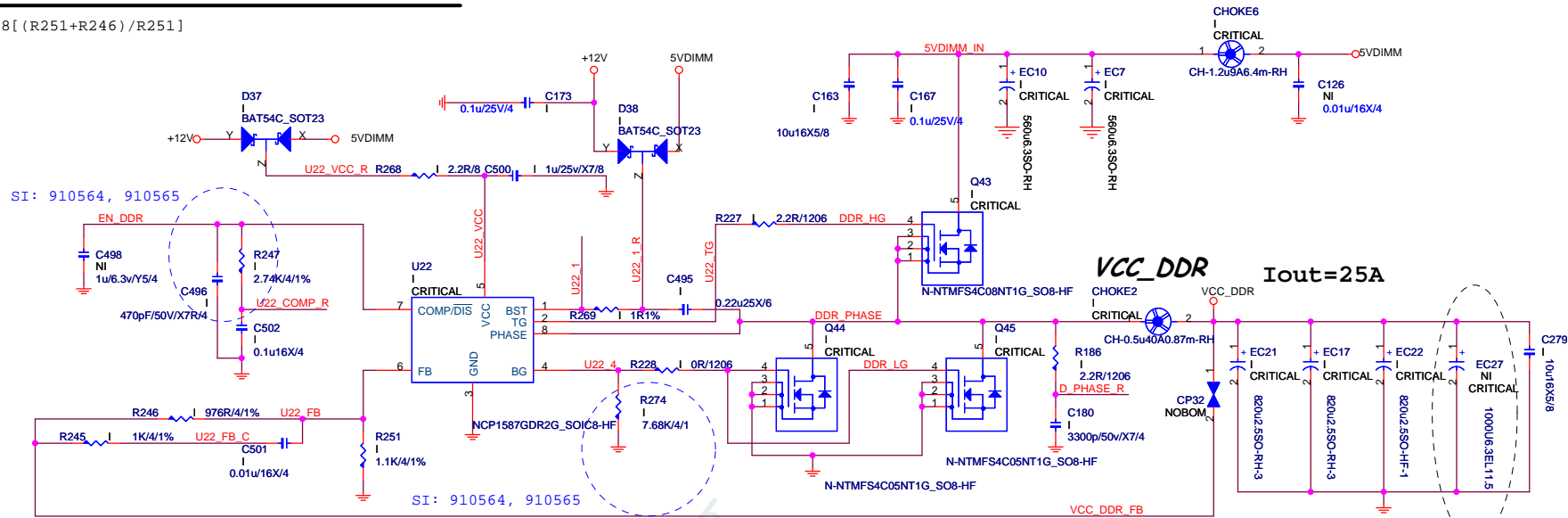
<b>MICRO-STAR INT'L CO.,LTD</b>		
HP SCH P/N: 718773-000(MSI MS-7860)		
Size Custom	Document Description <b>Header/ SPI</b>	Rev X3
Date:	Sheet 37 of 55	



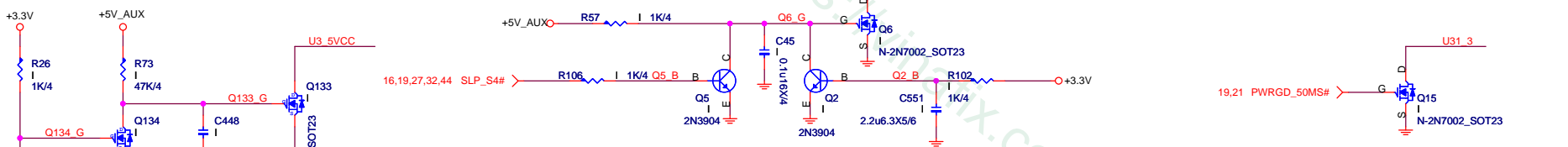


# DDRIII DIMM Power

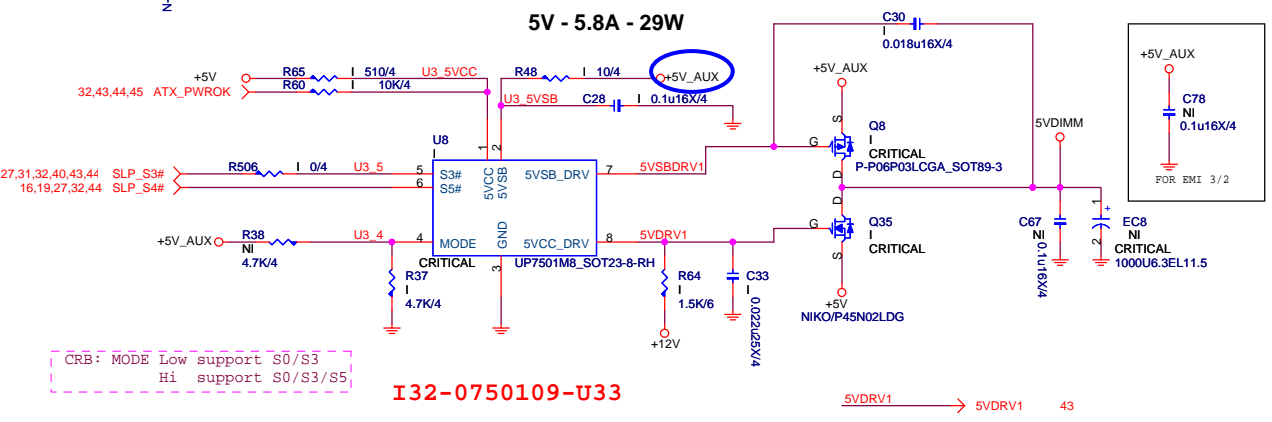
$$V_{out} = 0.8[(R251+R246)/R251]$$



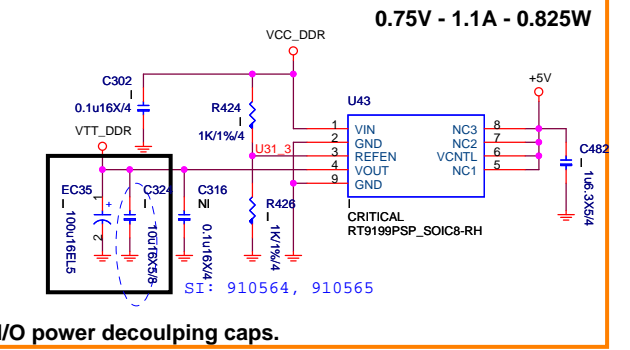
## For special PSU sequence



# DDRIII Regulator Power Source



# DDRIII Termination Power



CRB: MODE Low support S0/S3  
Hi support S0/S3/S5

I32-0750109-U33

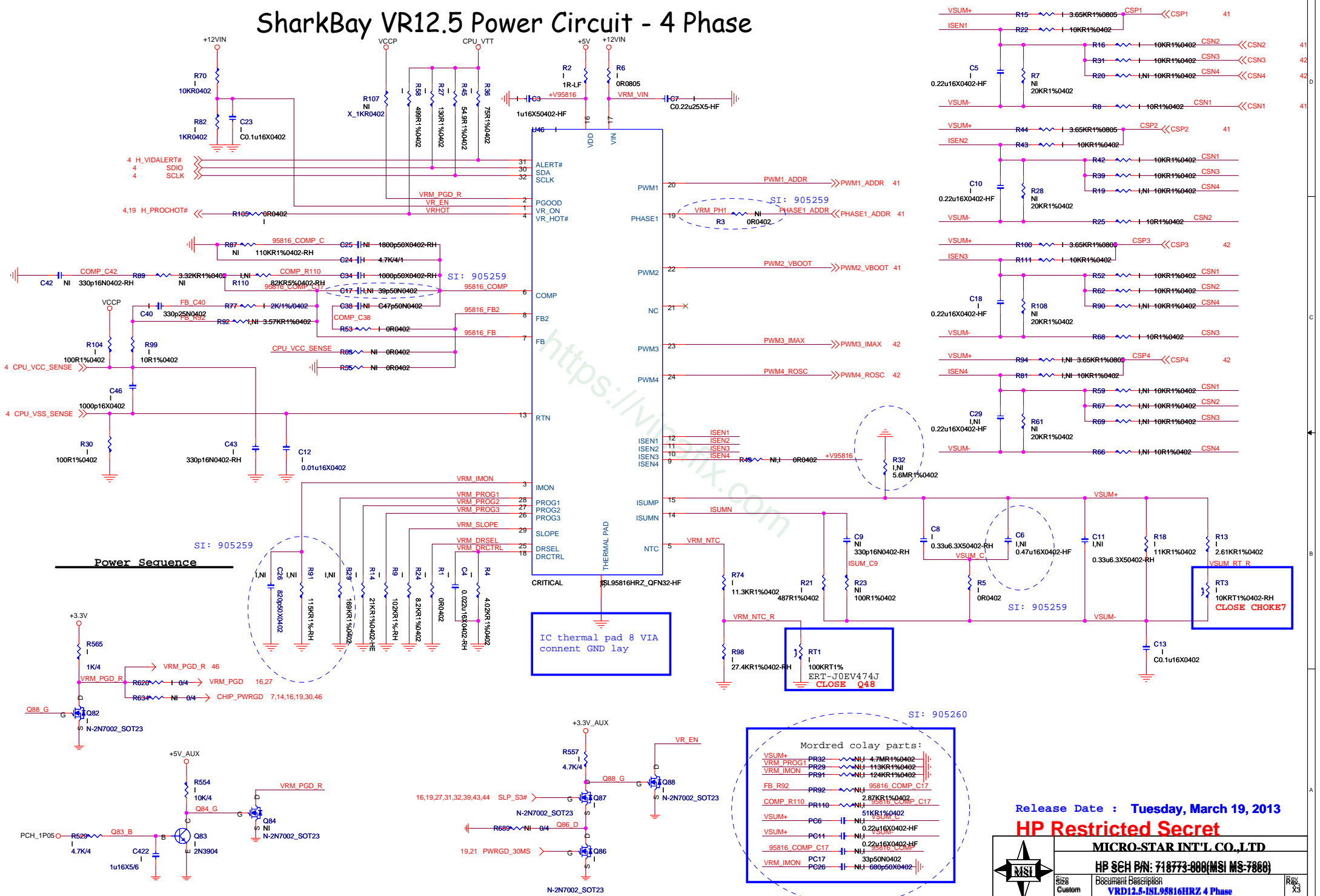
5VDRV1 → 5VDRV1 43

Release Date : Tuesday, March 19, 2013

**HP Restricted Secret**

<b>MSI</b>		
<b>MICRO-STAR INT'L CO.,LTD</b>		
<b>HP SCH P/N: 718773-000(MSI MS-7860)</b>		
Size Custom	Document Description <b>DDR Power</b>	Rev X3
Date:	Sheet 39	of 55

# SharkBay VR12.5 Power Circuit - 4 Phase

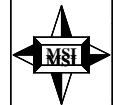


**Power Sequence**

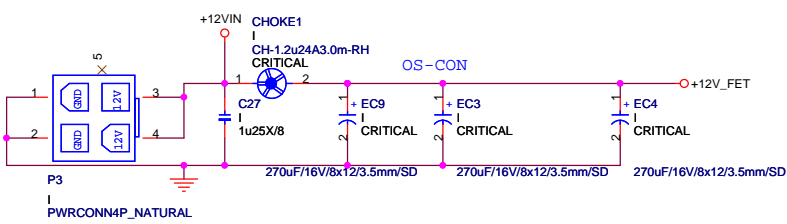
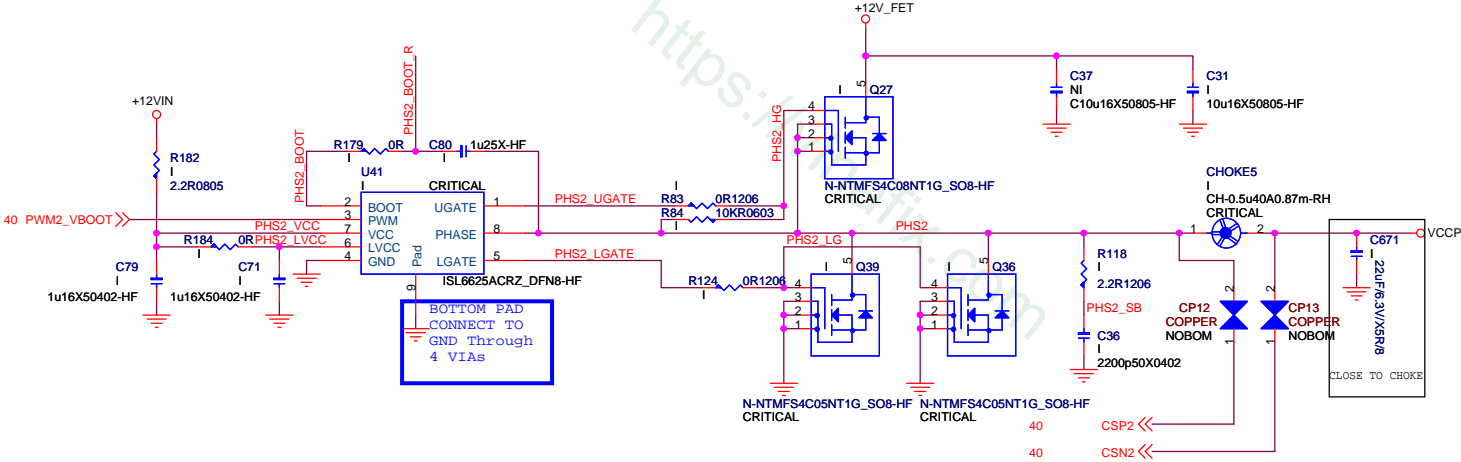
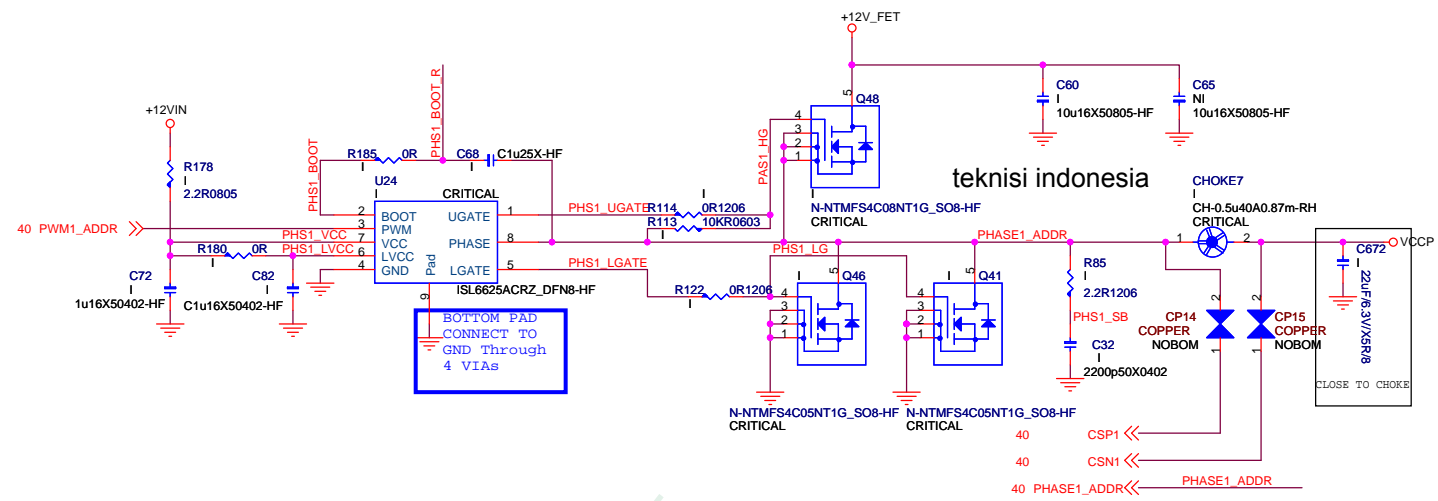
- Mordred colay parts:
- VSUM+ PR32 NI 4.7MR1%0402
  - VRM PROG1 PR29 NI 113KR1%0402
  - VRM IMON PR91 NI 124KR1%0402
  - FB\_R92 PR92 NI 95816\_COMP\_C17
  - COMP\_R110 PR110 NI 287KR1%0402
  - VSUM+ PC6 NI 0.22u16X0402-HF
  - VSUM+ PC14 NI 0.22u16X0402-HF
  - 95816\_COMP\_C17 NI 95816\_COMP\_C17
  - VRM IMON PC17 NI 33p50N0402
  - PC26 NI 680p50X0402

Release Date : Tuesday, March 19, 2013

**HP Restricted Secret**



MICRO-STAR INT'L CO., LTD	
HP SCH P/N: 718773-000(MSI MS-7860)	
Size Custom	Document Description
VRD12.5-ISL95816HRZ 4 Phase	
Date:	Sheet 40 of 55



tekniisi indonesia

<https://www.tekniisi.com>

Release Date : Tuesday, March 19, 2013

**HP Restricted Secret**

MICRO-STAR INT'L CO.,LTD

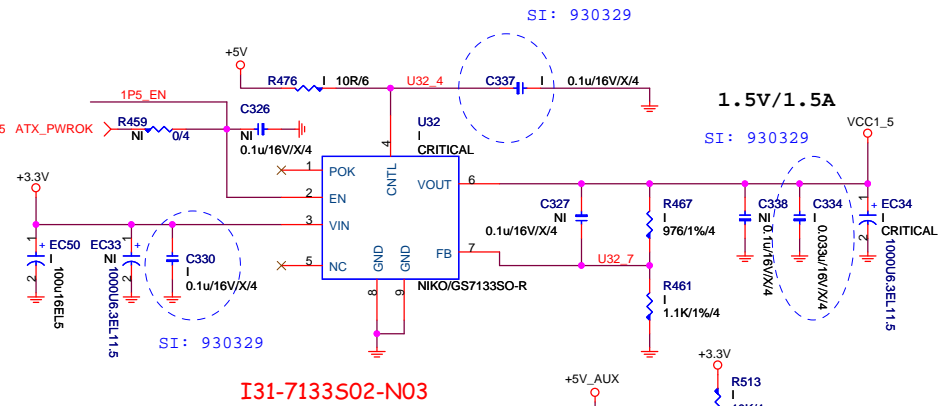
HP SCH P/N: 718773-000(MSI MS-7860)

Size Custom Document Description VCCP-1 Rev X3

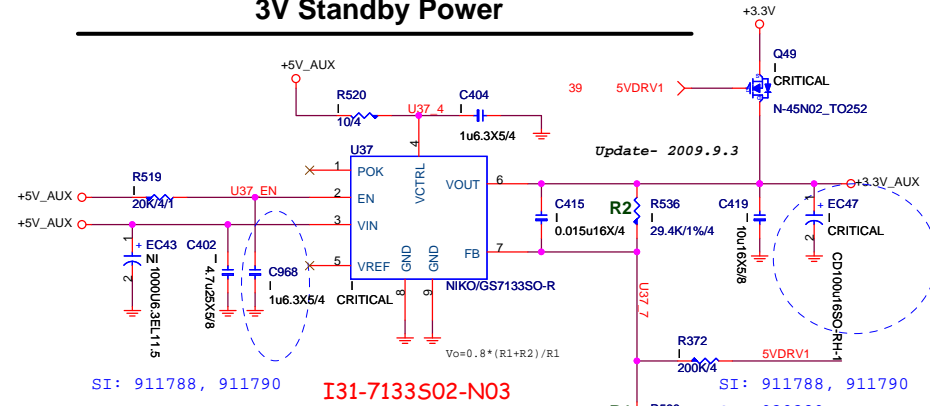




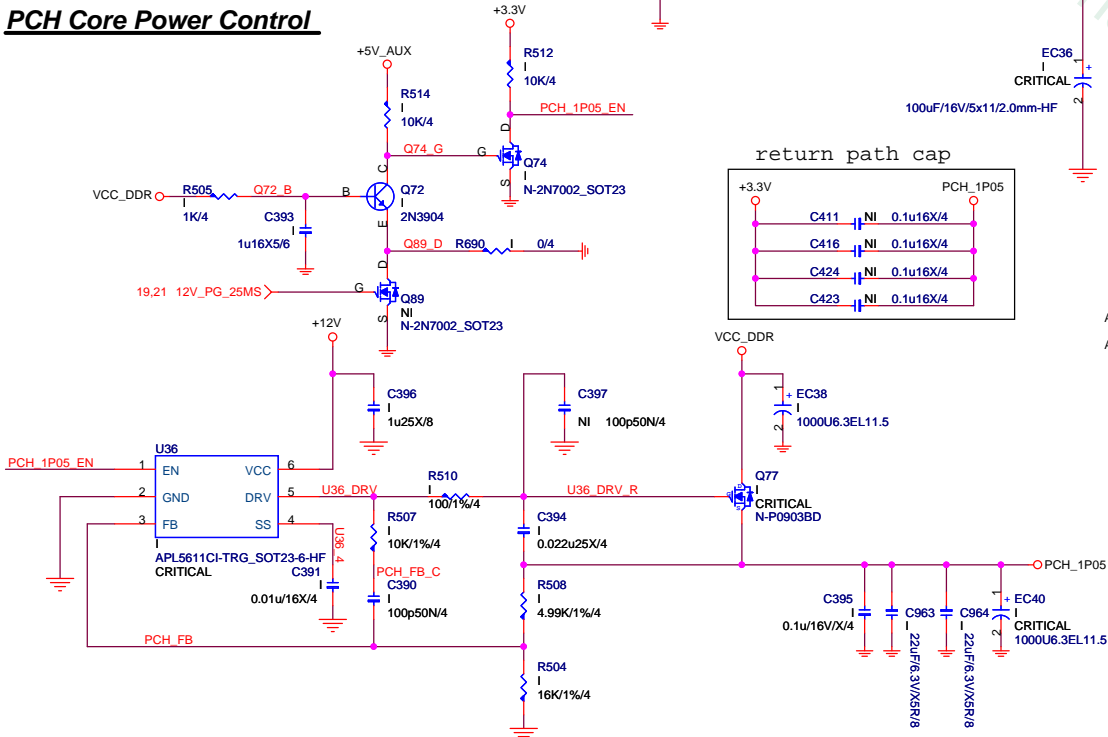
# 1.5V Power



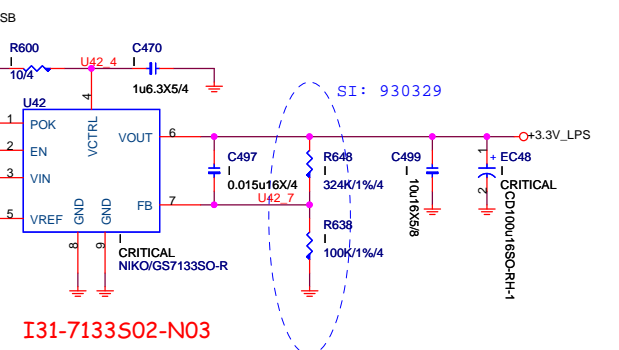
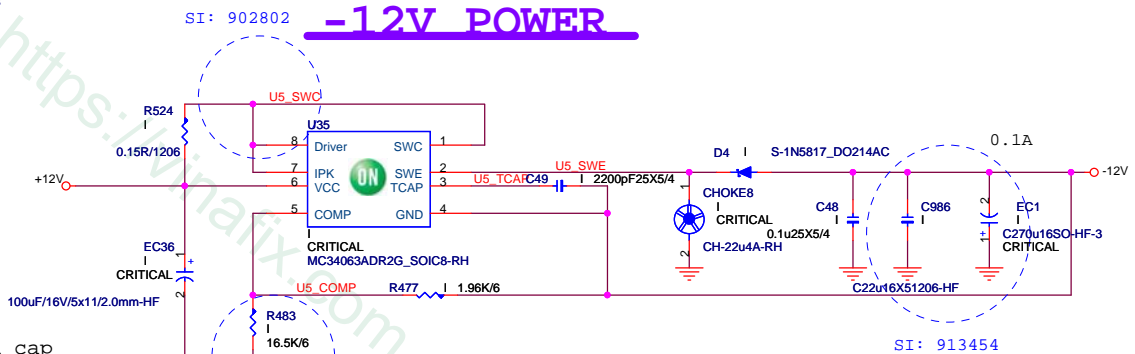
# 3V Standby Power



# PCH Core Power Control



# -1.2V POWER



Release Date : Tuesday, March 19, 2013

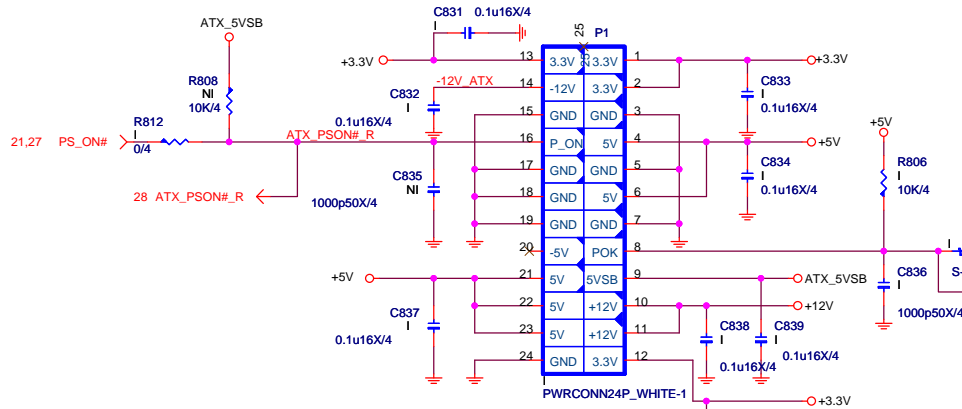
**HP Restricted Secret**

<b>MSI</b>		
<b>MICRO-STAR INT'L CO.,LTD</b>		
<b>HP SCH P/N: 718773-000(MSI MS-7860)</b>		
Size Custom	Document Description	Rev X3
<b>PCH &amp; ME Core Power</b>		
Date:	Sheet 43 of 55	

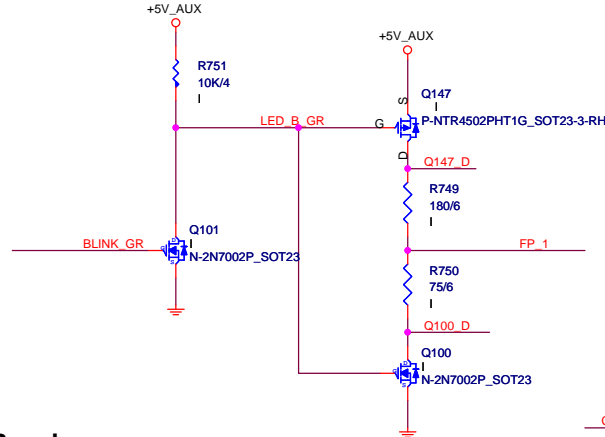
# ATX Power Connector / Front Panel / LED/DSW

## +5V AUX Power Switch Tune ATX\_5VSB inrush current to 2A from 4A

### ATX CONNECTOR

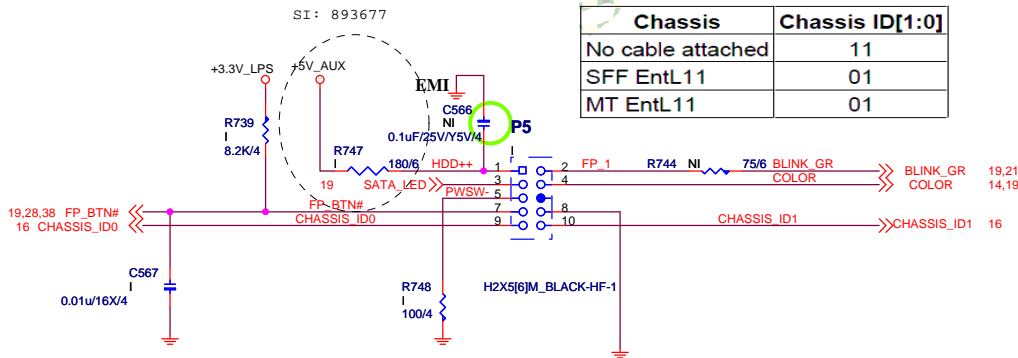


N93-24M0131-H06



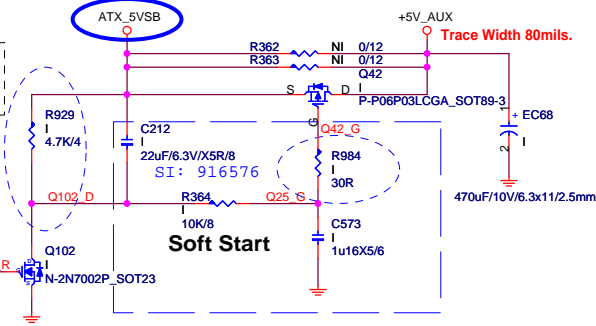
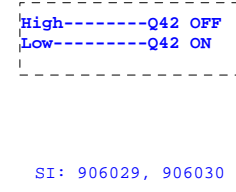
### Front Panel

PN:N31-2051641-H06

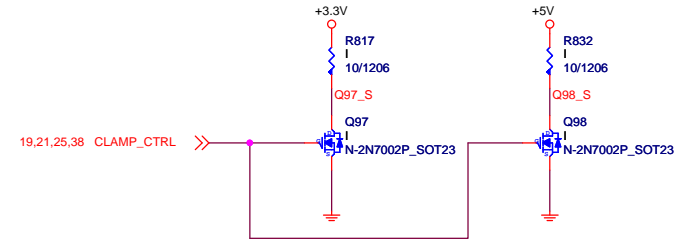


### CHASSIS ID[1:0]

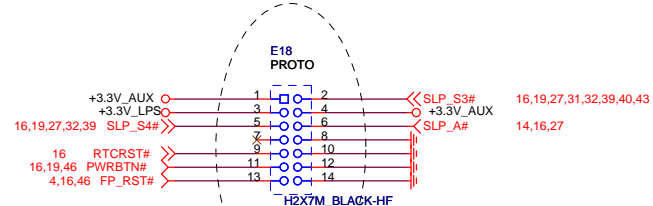
Chassis	Chassis ID[1:0]
No cable attached	11
SFF EntL11	01
MT EntL11	01



### BLEED-OFF CIRCUIT



SI: 892659/892663

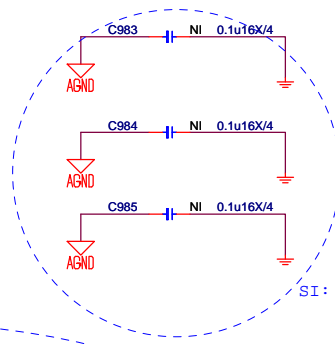
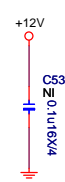
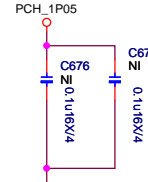
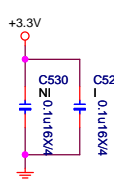
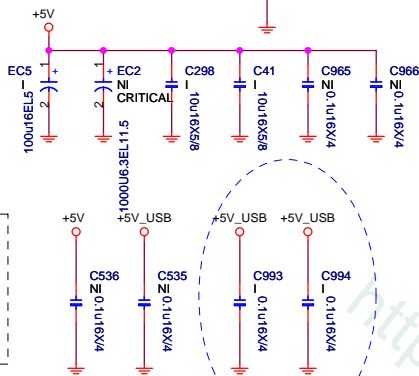
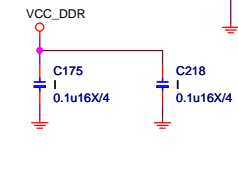
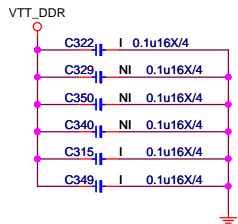
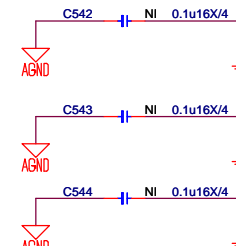
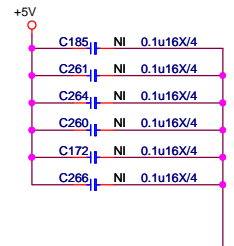
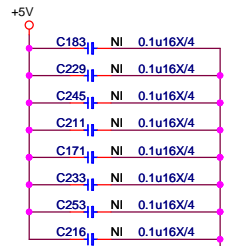
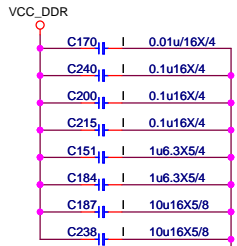
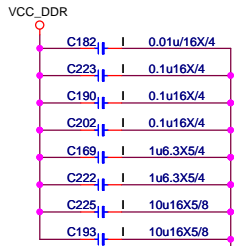
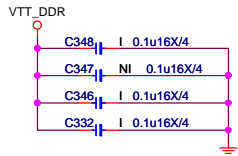


Release Date : Tuesday, March 19, 2013

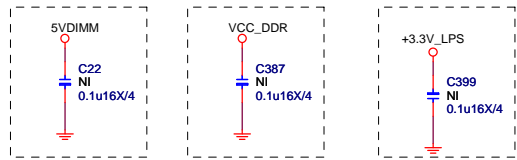
**HP Restricted Secret**

		MICRO-STAR INT'L CO.,LTD	
		HP SCH P/N: 718773-000(MSI MS-7860)	
Size Custom	Document Description	ATX/F_Panel/EMI	
Date:		Sheet 44	of 55

# EMI CAPs

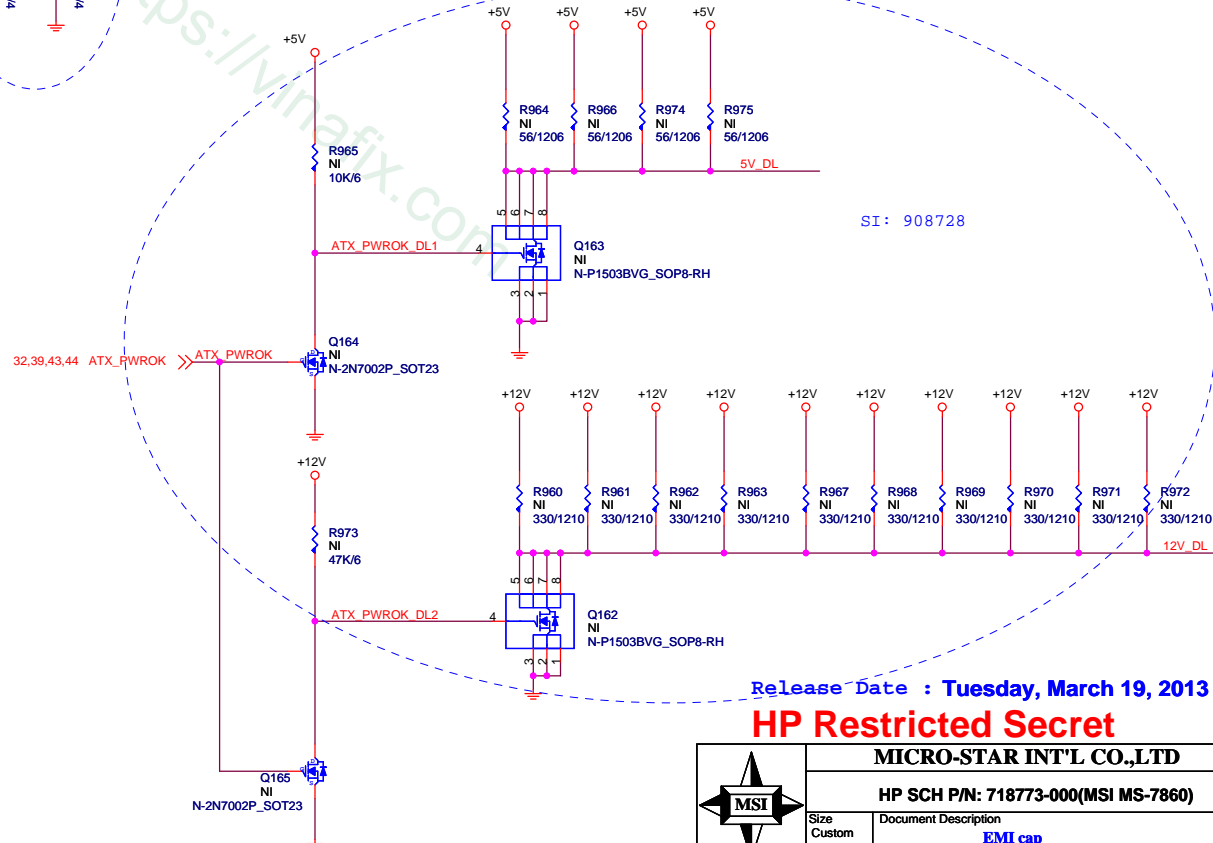
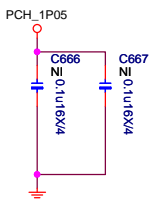
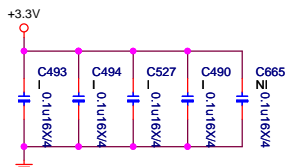


SI: 913414



SI: 930329

## For Moat CAP



SI: 908728

Release Date : Tuesday, March 19, 2013

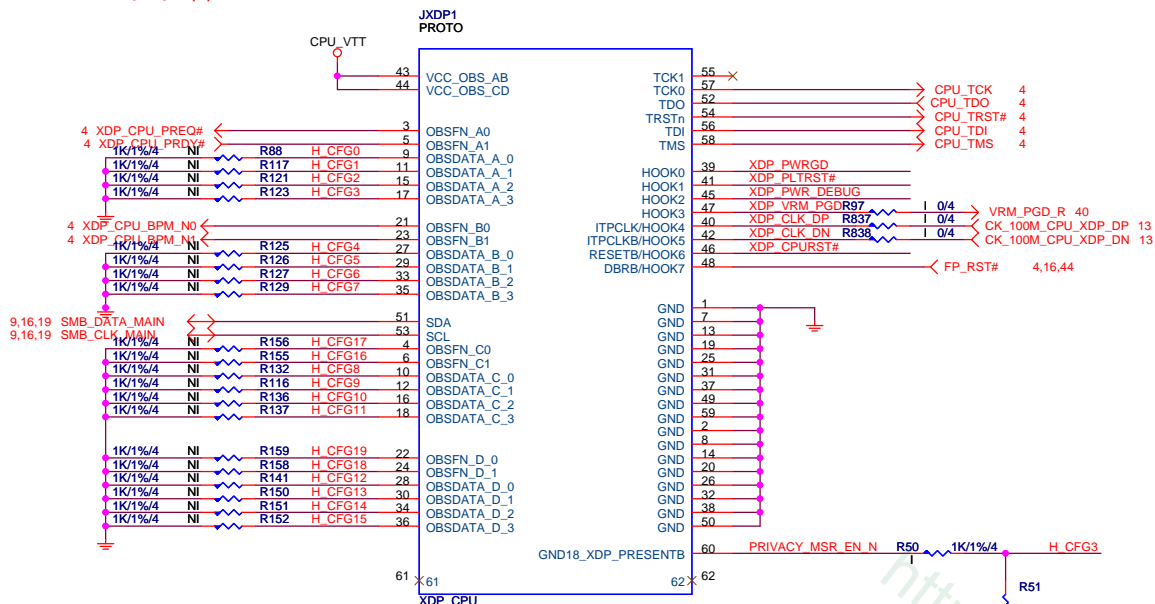
**HP Restricted Secret**



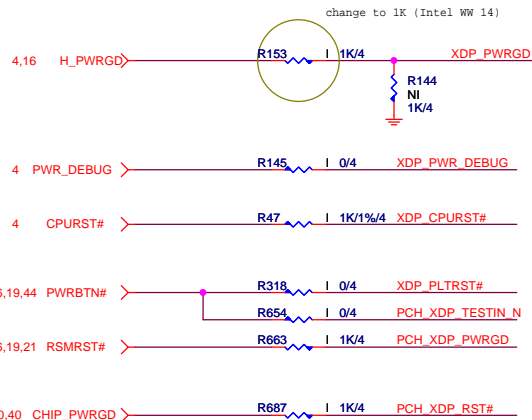
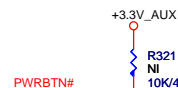
MICRO-STAR INT'L CO.,LTD		
HP SCH P/N: 718773-000(MSI MS-7860)		
Size Custom	Document Description	Rev X3
EMI cap		
Date:	Sheet 45 of 55	

4 H\_CFG[19..0] ← H\_CFG[19..0]

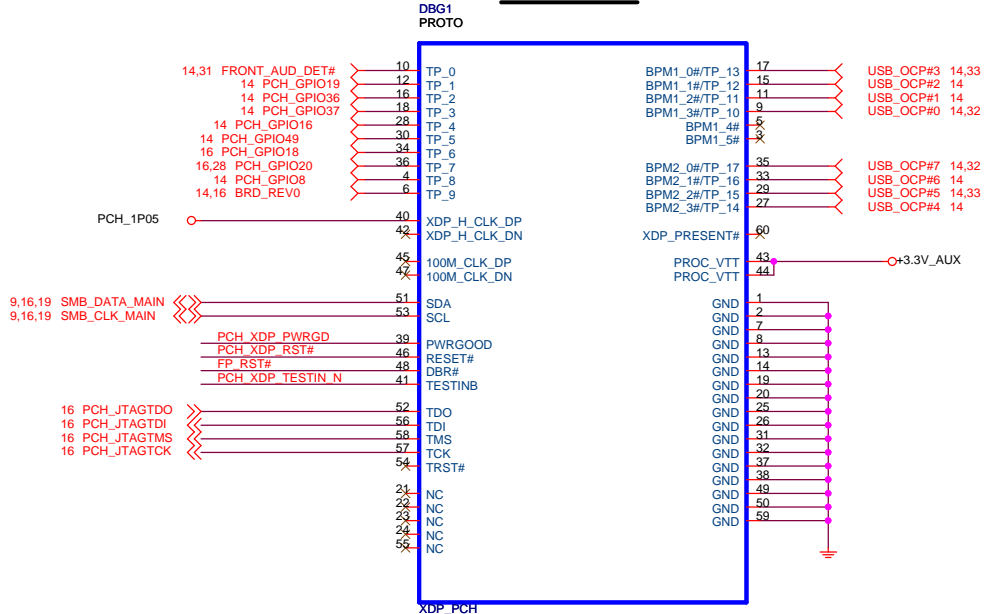
### Reserve debug port 5020



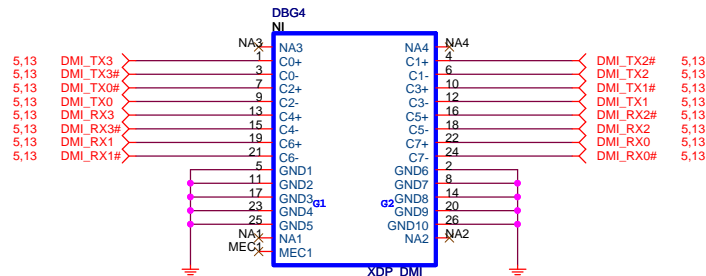
CPU\_TDO R839 I 51/4  
PLACE NEAR XDP CONNECTOR



### PCH XDP




### DMI XDP

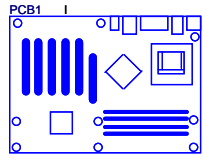


Release Date : Tuesday, March 19, 2013

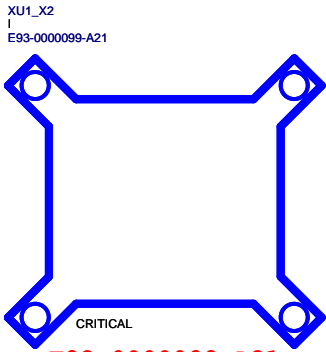
## HP Restricted Secret

		<b>MICRO-STAR INT'L CO.,LTD</b>	
		HP SCH P/N: 718773-000(MSI MS-7860)	
Size Custom	Document Description	CPU/PCH/DMI XDP	
Date:		Rev X3	

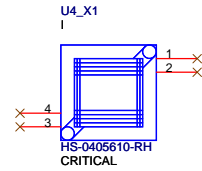
**Manual Parts**



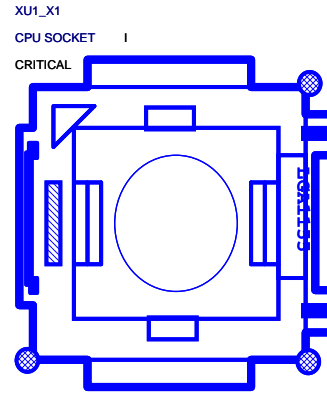
CRITICAL PCB1



E93-000099-A21  
AVL:E22-B009010-C22



U4\_X1\_1 CRITICAL  
U4\_X1\_2 CRITICAL



E21-AC71010-L06  
AVL:E21-7826010-F02

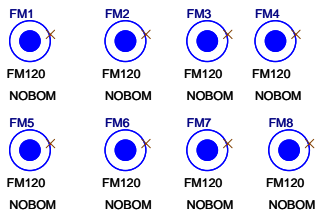
**Simulation**



AVL: D06-0100161-F52  
D06-0100101-K26

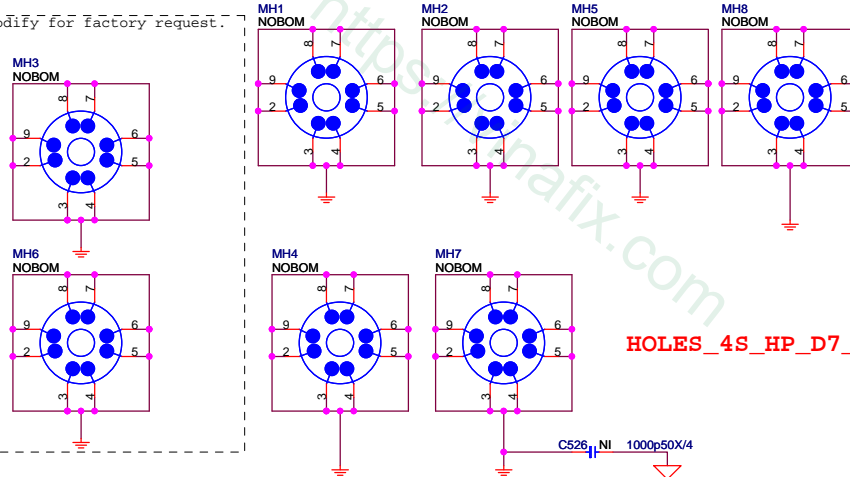
D06-0100101-P01

**Optics Orientation Holes**



**Mounting Holes**

Modify for factory request.



HOLES\_4S\_HP\_D7\_1

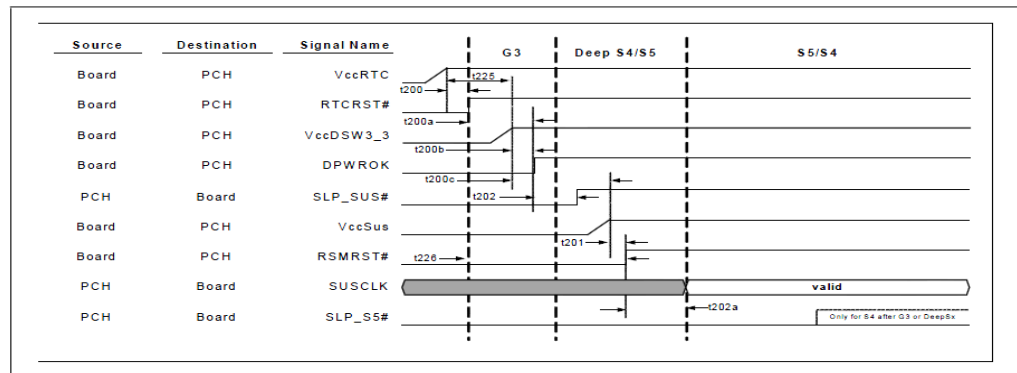
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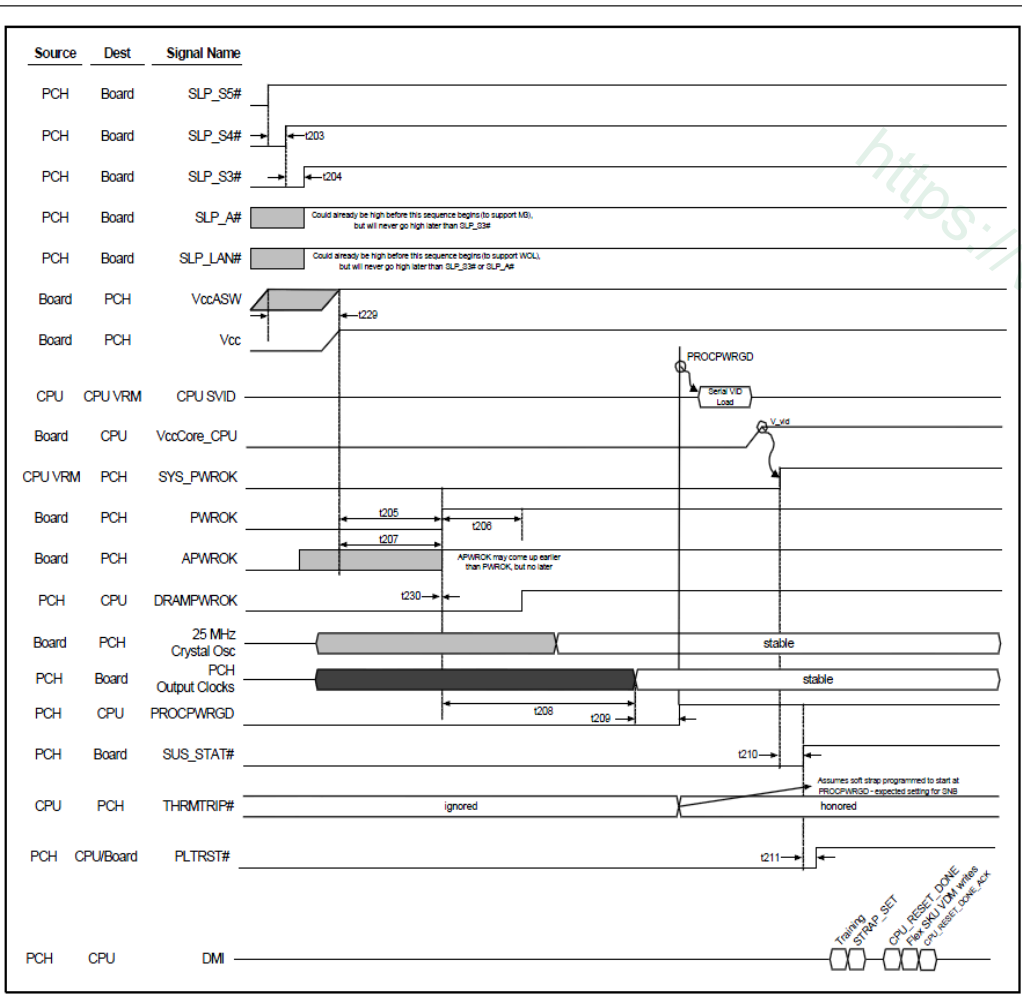


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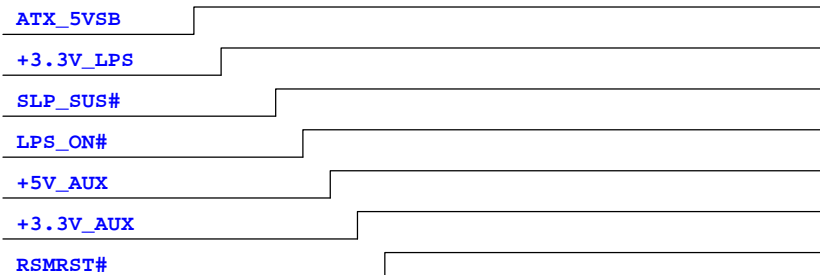
### G3 w/RTC Loss to S4/S5 (With Deep Sx Support) Timing Diagram



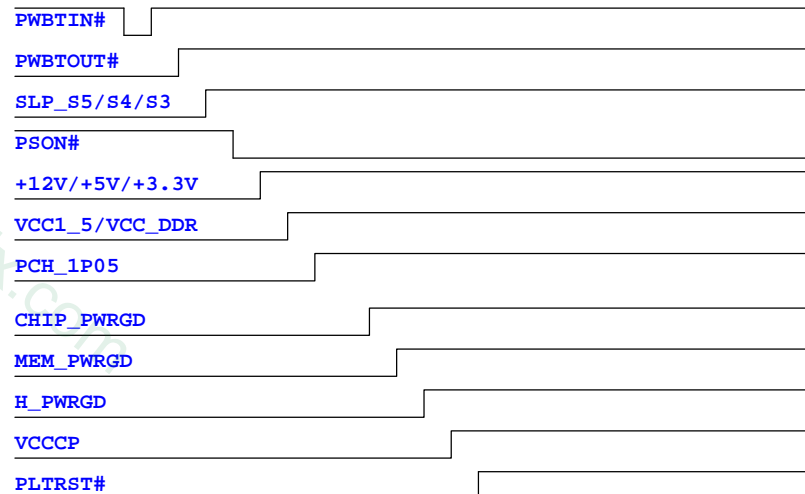
### S5 to S0 Timing Diagram



### G3-S5



### S5-S0

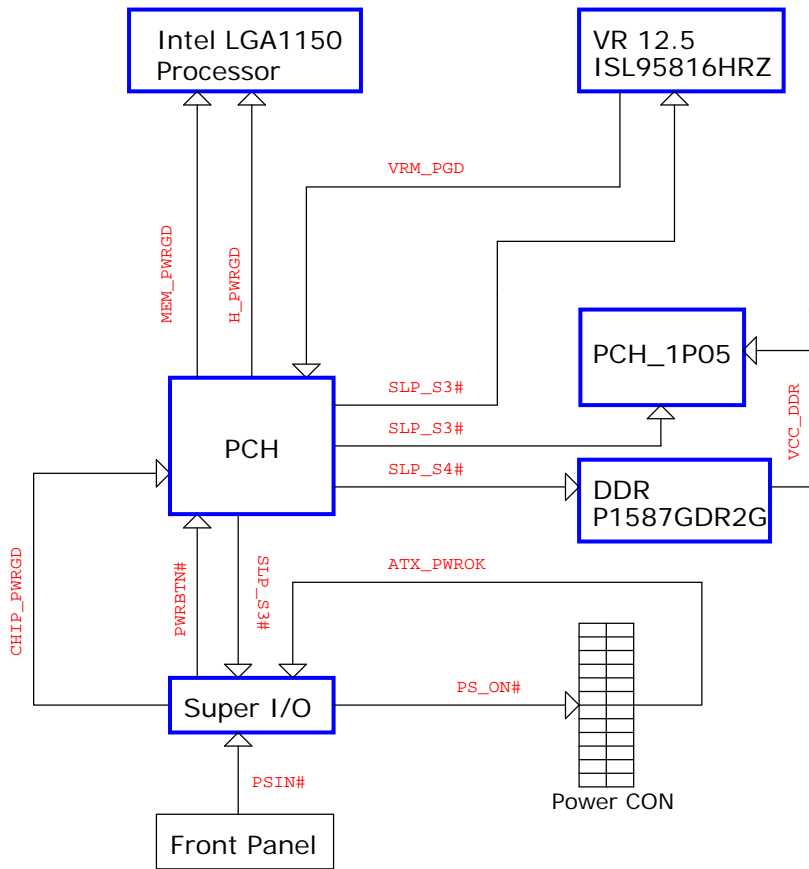


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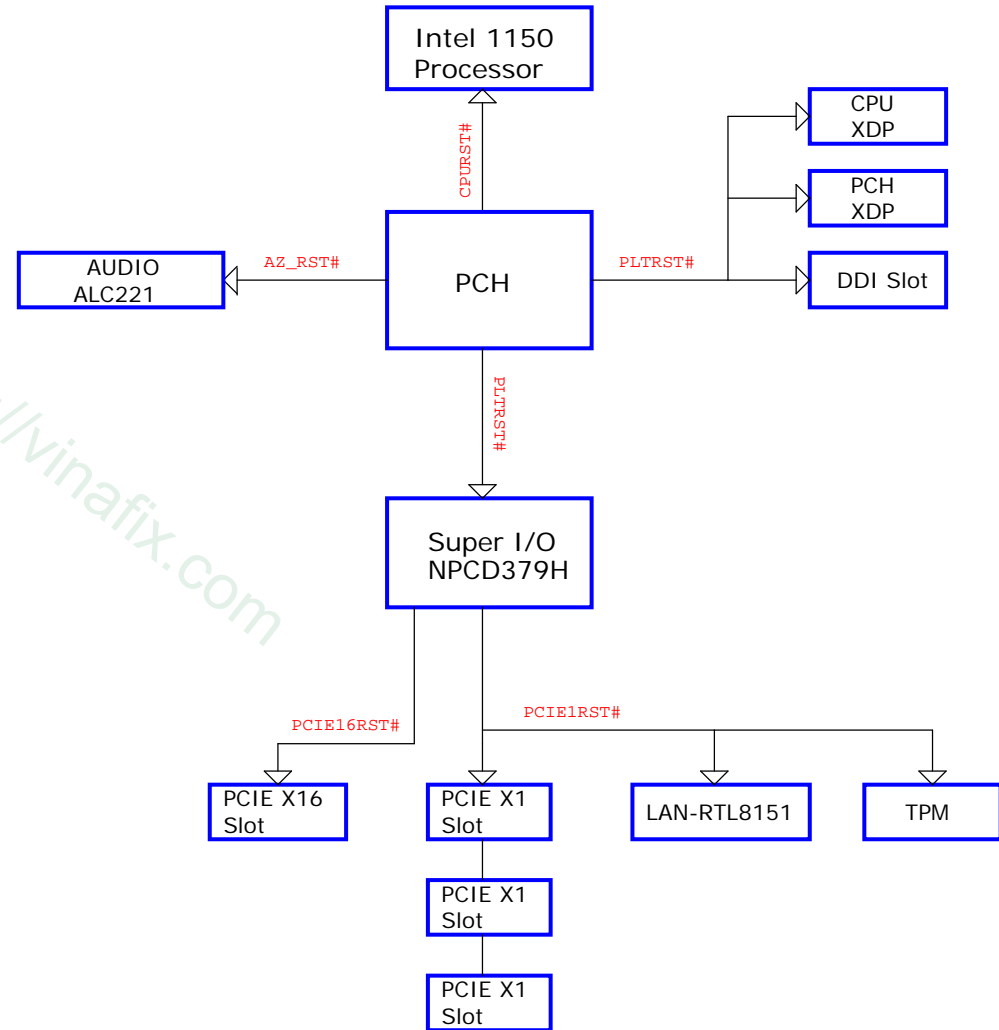
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# PWROK MAP



# RESET MAP



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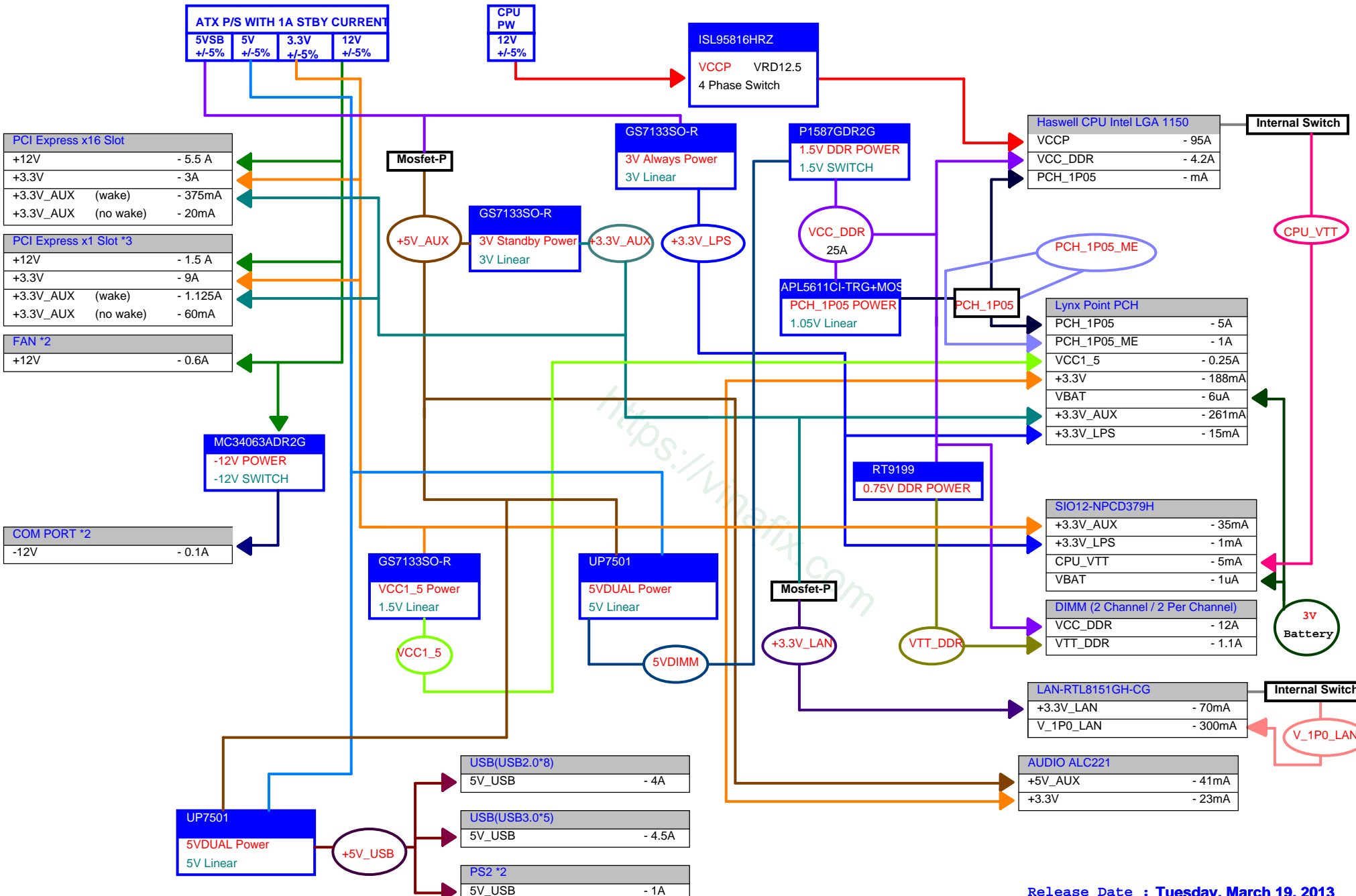
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# PCH

GPIO	I/O/NC	Power	Tol	Default	MB Function
GPIO[0]	I/O	Main	3.3V	GPI	FRONT_USB_P24_DET#
GPIO[1]	I/O	Main	3.3V	GPI	PCH_GPIO1
GPIO[2]	I/O	Main	5V	GPI	PCH_GPIO2
GPIO[3]	I/O	Main	5V	GPI	PCH_GPIO3
GPIO[4]	I/O	Main	5V	GPI	PCH_GPIO4
GPIO[5]	I/O	Main	5V	GPI	PCH_GPIO5
GPIO[6]	I/O	Main	3.3V	GPI	IO_SMI#
GPIO[7]	I/O	Main	3.3V	GPI	PCH_GPIO7
GPIO[8]	I/O	Resume	3.3V	GPO	PCH_GPIO8
GPIO[9]	I/O	Resume	3.3V	Native	USB_OCP#5
GPIO[10]	I/O	Resume	3.3V	Native	USB_OCP#6
GPIO[11]	I/O	Resume	3.3V	Native	PCH_SMBALERT#
GPIO[12]	I/O	Resume	3.3V	Native	LAN_DISABLE#
GPIO[13]	I/O	Resume	3.3V	GPI	INT_USB_P151_DET#
GPIO[14]	I/O	Resume	3.3V	Native	GPIO14
GPIO[15]	I/O	Resume	3.3V	GPO	PCH_GPIO15
GPIO[16]	I/O	Main	3.3V	GPI	PCH_GPIO16
GPIO[17]	I/O	Main	3.3V	GPI	PCH_GPIO17
GPIO[18]	I/O	Main	3.3V	Native	PCH_GPIO18
GPIO[19]	I/O	Main	3.3V	GPI	PCH_GPIO19
GPIO[20]	I/O	Main	3.3V	Native	PCIECLKREQ2#
GPIO[21]	I/O	Main	3.3V	GPI	FRONT_AUD_DET#
GPIO[22]	I/O	Main	3.3V	GPI	INT_USB_P150_DET#

GPIO[23]	I/O	Main	3.3V	Native	LDRQ1#
GPIO[24]	I/O	Resume	3.3V	GPO	PCH_GPIO24
GPIO[25]	I/O	Resume	3.3V	Native	BRD_ID2
GPIO[26]	I/O	Resume	3.3V	Native	PCH_GPIO26
GPIO[27]	I/O	DSW	3.3V	GPI	PCH_LAN_WAKE#
GPIO[28]	I/O	Resume	3.3V	GPO	PCH_GPIO28
GPIO[29]	I/O	Resume	3.3V	Native	SLP_WLAN#
GPIO[30]	I/O	Resume	3.3V	GPI	PCH_SUSWARN#
GPIO[31]	I/O	DSW	3.3V	GPI	PCH_GPIO31
GPIO[32]	I/O	Main	3.3V	GPO	PCH_GPIO32
GPIO[33]	I/O	Main	3.3V	GPO	PCH_GPIO33
GPIO[34]	I/O	Main	3.3V	GPI	PCH_GPIO34
GPIO[35]	I/O	Main	3.3V	GPO	BRD_REV0
GPIO[36]	I/O	Main	3.3V	GPI	PCH_GPIO36

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# PCH

<b>GPIO</b>	<b>I/O/NC</b>	<b>Power</b>	<b>Tol</b>	<b>Default</b>	<b>MB Function</b>
GPIO[37]	I/O	Main	3.3V	GPI	PCH_GPIO37
GPIO[38]	I/O	Main	3.3V	GPI	CHASSIS_ID0
GPIO[39]	I/O	Main	3.3V	GPI	BRD_ID1
GPIO[40]	I/O	Resume	3.3V	Native	USB_OCP#1
GPIO[41]	I/O	Resume	3.3V	Native	USB_OCP#2
GPIO[42]	I/O	Resume	3.3V	Native	USB_OCP#3
GPIO[43]	I/O	Resume	3.3V	Native	USB_OCP#4
GPIO[44]	I/O	Resume	3.3V	Native	PCIECLKREQ5#
GPIO[45]	I/O	Resume	3.3V	Native	PCH_GPIO45
GPIO[46]	I/O	Resume	3.3V	Native	PCH_GPIO46
GPIO[48]	I/O	Main	3.3V	GPI	CHASSIS_ID1
GPIO[49]	I/O	Main	3.3V	GPI	PCH_GPIO49
GPIO[50]	I/O	Main	3.3V	GPI	PCH_GPIO50
GPIO[51]	I/O	Main	3.3V	GPO	PCH_GPIO51
GPIO[52]	I/O	Main	3.3V	GPI	PCH_GPIO52
GPIO[53]	I/O	Main	3.3V	GPO	PCH_GPIO53
GPIO[54]	I/O	Main	3.3V	GPI	BOOT_BLK_EN#
GPIO[55]	I/O	Main	3.3V	GPO	PCH_GPIO55
GPIO[57]	I/O	Resume	3.3V	GPI	PCH_GPIO57
GPIO[58]	I/O	Resume	3.3V	Native	SML1CLK
GPIO[59]	I/O	Resume	3.3V	Native	USB_OCP#0
GPIO[60]	I/O	Resume	3.3V	Native	PCH_SML0ALERT#

GPIO[61]	I/O	Resume	3.3V	Native	PRNTER_DET#
GPIO[62]	I/O	Resume	3.3V	Native	SUS_CLK
GPIO[63]	I/O	Resume	3.3V	Native	SLP_S5#
GPIO[64]	I/O	CORE	3.3V	Native	CLKOUTFLEX0
GPIO[65]	I/O	CORE	3.3V	Native	CLKOUTFLEX1
GPIO[66]	I/O	CORE	3.3V	Native	CLKOUTFLEX2
GPIO[67]	I/O	CORE	3.3V	Native	CLKOUTFLEX3
GPIO[68]	I/O	CORE	3.3V	GPI	FRONT_USB_P26_DET#
GPIO[69]	I/O	CORE	3.3V	GPI	COMM_B_DET#
GPIO[70]	I/O	CORE	3.3V	GPI	BOOT_BLK_REC#
GPIO[71]	I/O	CORE	3.3V	GPI	BRD_ID0
GPIO[72]	I/O	DSW	3.3V	Native	PCH_GPIO72
GPIO[73]	I/O	Resume	3.3V	Native	BRD_REV1
GPIO[74]	I/O	Resume	3.3V	Native	PCH_SML1ALERT#
GPIO[75]	I/O	Resume	3.3V	Native	SML1DATA

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Pin	Default Function / Alternate Functions	Buffer Type	Buffer Power Wells	Motherboard Function
1	CLAMP_CTRL	OD <sub>S</sub>	VS <sub>B3</sub>	BLEED OFF CIRCUIT
2	SLP_S4#	IN <sub>TS4</sub>	VS <sub>B3</sub>	SLP_S4#
3	SLP_S5#	IN <sub>TS4</sub>	VS <sub>B3</sub>	SLP_S5#
4	SLP_S3#	IN <sub>TS4</sub>	VS <sub>B3</sub>	SLP_S3#
5	SIOPME#	OD <sub>S</sub> O <sub>4B</sub>	VS <sub>B3</sub>	RI#
6	RSMRST#	O <sub>3S</sub>	VS <sub>B3</sub>	RSMRST#
7	PME_IN#	IN <sub>TS</sub>	VS <sub>B3</sub>	PME status
8	BLINK_GR	O <sub>2020</sub>	VS <sub>B3</sub>	Power LED driver
9	COLOR	O <sub>2020</sub>	VS <sub>B3</sub>	Power LED driver
10	VSS	I	GND	GND
11	PWRGD_OUT	OD <sub>S</sub>	VS <sub>B3</sub>	PWRGD_140ms
12	PS_ON#	OD <sub>S</sub>	VS <sub>B3</sub>	PS_ON#
13	TACH1	IN <sub>TS</sub>	VDD3	SYS_FAN_TACH
14	CLOCKI32	IN <sub>TS</sub>	VS <sub>B3</sub>	SUS_CLK_IO
15	3V_AUX_SLOT_ON	O <sub>4B</sub>	VS <sub>B3</sub>	3V_AUX_SLOT_ON
16	VS <sub>B3</sub>	I	PWR	VS <sub>B3</sub>
17	VCORF	I	N/A	VCORF
18	LDRG#	O <sub>PC1</sub>	VDD3	LDRG#
19	LAD3	IN <sub>PC1</sub> O <sub>PC1</sub>	VDD3	LAD3
20	LAD0	IN <sub>PC1</sub> O <sub>PC1</sub>	VDD3	LAD0
21	LAD2	IN <sub>PC1</sub> O <sub>PC1</sub>	VDD3	LAD2
22	VSS	I	PWR	GND
23	LAD1	IN <sub>PC1</sub> O <sub>PC1</sub>	VDD3	LAD1
24	SER_IRQ	IN <sub>PC1</sub> O <sub>PC1</sub>	VDD3	SERIRQ
25	PCI_RESET#	IN <sub>PC1</sub>	VDD3	PLTRST#
26	PCI_CLK	IN <sub>PC1</sub>	VDD3	33MHz
27	LFRANE#	IN <sub>PC1</sub>	VDD3	LFRANE#
28	VS <sub>B3</sub>	I	PWR	VS <sub>B3</sub>
29	GPRST3#	O <sub>14</sub>	VS <sub>B3</sub>	PCIE_X16 RESET#
30	INTRUDER#	IN <sub>TS</sub>	V <sub>BAT</sub>	HOOD_SENSE#
31	5V_USB_CTRL	O <sub>4B</sub>	VS <sub>B3</sub>	5V_USB_EN
32	HDLOCK#	OD <sub>12</sub>	VDD3	HOOD_LOCK#
33	GPIO01	IN <sub>TS</sub> OD <sub>4B</sub>	VS <sub>B3</sub>	
34	HDUNLOCK#	OD <sub>12</sub>	VDD3	HOOD_UNLOCK#
35	HD_LED_IN#	IN <sub>TS</sub>	VDD3	Hard Drive LED Input
36	CPU_PRNT1#	IN <sub>TS</sub>	V <sub>BAT</sub>	CPU detection
37	VBAT	I	PWR	

38	12V_VSB_COMP	IN <sub>COMP2</sub>	VS <sub>B3</sub>	
39	COMP_IN3	IN <sub>COMP3</sub>	VS <sub>B3</sub>	
40	COMP_IN1	IN <sub>COMP1</sub>	VS <sub>B3</sub>	5V voltage monitor
41	COMP_IN2	IN <sub>COMP2</sub>	VS <sub>B3</sub>	12V voltage monitor
42	AVCC	I	PWR	AVCC
43	AD1	IN <sub>PC1</sub> O <sub>PC1</sub>	VDD3	AD1
44	AD2	IN <sub>PC1</sub> O <sub>PC1</sub>	VDD3	AD2
45	AD3	IN <sub>PC1</sub> O <sub>PC1</sub>	VDD3	AD3
46	FSPL_STR	IN <sub>TS</sub>	AVCC	FSPL_STR
47	AGND	I	GND	AGND
48	PWBTOUT#	IN <sub>TS4</sub>	VLPS	PWBTOUT#
49	PWBTIN#	IN <sub>TS4</sub>	VLPS	PWBTIN#
50	LPS_WAKE	IN <sub>TS</sub>	VLPS	LPS_WAKE
51	LPS_PHY#	O <sub>4B</sub>	VLPS	LPS_PHY#
52	LPS_ON#	O <sub>4B</sub>	VLPS	LPS_ON#
53	VLPS	I	PWR	VLPS
54	VTT	I	PWR	VTT
55	THERMTRIP#	IN <sub>AGTL</sub>	VTT	THERMTRIP#
56	TSL_SCL	IN <sub>TS</sub> O <sub>TS1</sub>	VTT	TSL_SCL
57	PROCHOT1#	IN <sub>AGTL</sub> OD <sub>AGTL24</sub>	VTT	PROCHOT1#
58	PECI	IN <sub>PE1</sub> O <sub>PE1</sub>	VTT	PECI
59	PROCHOT2#	IN <sub>AGTL</sub> OD <sub>AGTL24</sub>	VTT	PROCHOT2#
60	VSS	I	PWR	GND
61	PWM2	OD <sub>12</sub> O <sub>S12</sub>	VDD3	SYS-FANPWM_REAR
62	HMSCL	IN <sub>SM</sub> OD <sub>S</sub>	VS <sub>B3</sub>	HMSCL
63	PWM1	OD <sub>12</sub> O <sub>S12</sub>	VDD3	SYS-FANPWM_FRONT
64	HMSDA	IN <sub>SM</sub> OD <sub>S</sub>	VS <sub>B3</sub>	HMSDA
65	HD_LED_OUT	OD <sub>16</sub>	VS <sub>B3</sub>	Hard Drive LED Output
66	WAKE_OUT#	OD <sub>12</sub> O <sub>S12</sub>	VS <sub>B3</sub>	Wake Disable Output
67	GPIO15(EV6#)	IN <sub>TS</sub>	VS <sub>B3</sub>	PCI_Express_Wake#
68	AMP_ON	O <sub>4B</sub>	VS <sub>B3</sub>	AMP_ON
69	AMP_ON#	O <sub>4B</sub>	VS <sub>B3</sub>	AMP_ON#
70	OPRST2#	O <sub>14/14</sub>	VS <sub>B3</sub>	PE_RST#_OUT
71	12V_PG_25MS	OD <sub>S</sub>	VS <sub>B3</sub>	12V_PG_25MS
72	KBDRST#	IN <sub>TS</sub> OD <sub>14</sub>	VDD3	KBDRST#
73	AUDIO_BEEP	O <sub>4B</sub>	VS <sub>B3</sub>	DIAG Beep
74	TACH2	IN <sub>TS</sub>	VDD3	TACH2
75	VS <sub>B3</sub>	I	PWR	VS <sub>B3</sub>
76	KBDAT	IN <sub>TS</sub> OD <sub>14</sub>	VDD3	KBDAT
77	MDAT	IN <sub>TS</sub> OD <sub>14</sub>	VDD3	MSDATA
78	SLIN_ASTRB#	OD <sub>14</sub> O <sub>14/14</sub>	VDD3	RSLIN#
79	KBCLK	IN <sub>TS</sub> OD <sub>14</sub>	VDD3	KBCLK
80	MCLK	IN <sub>TS</sub> OD <sub>14</sub>	VDD3	MCLK
81	PD3	IN <sub>TS</sub> O <sub>14/14</sub>	VDD3	PD3
82	PD4	IN <sub>TS</sub> O <sub>14/14</sub>	VDD3	PD4

83	INIT#	OD <sub>14</sub> O <sub>14/14</sub>	VDD3	INIT#
84	VSS	I	PWR	GND
85	PD1	IN <sub>TS</sub> O <sub>14/14</sub>	VDD3	PD1
86	PD6	IN <sub>TS</sub> O <sub>14/14</sub>	VDD3	PD6
87	PD0	IN <sub>TS</sub> O <sub>14/14</sub>	VDD3	PD0
88	PD2	IN <sub>TS</sub> O <sub>14/14</sub>	VDD3	PD2
89	PD7	IN <sub>TS</sub> O <sub>14/14</sub>	VDD3	PD7
90	PD5	IN <sub>TS</sub> O <sub>14/14</sub>	VDD3	PD5
91	STB_WWRITE#	OD <sub>14</sub> O <sub>14/14</sub>	VDD3	RSTB#
92	ERR#	IN <sub>TS</sub>	VDD3	RERR#
93	VS <sub>B3</sub>	I	PWR	VS <sub>B3</sub>
94	AFD_DSTRB#	OD <sub>14</sub> O <sub>14/14</sub>	VDD3	RAFD#
95	PE	IN <sub>TS</sub>	VDD3	RPE
96	GA20	IN <sub>TS</sub> O <sub>14/14</sub>	VDD3	GA20
97	ACK#	IN <sub>TS</sub>	VDD3	RACK#
98	SLCT	IN <sub>TS</sub>	VDD3	RSLCT
99	BUST_WAIT#	IN <sub>TS</sub>	VDD3	RBUSY
100	TACH3	INTS	VDD3	TACH3
101	SMB1SDA	SW <sub>SM</sub>	VDD3	SMB_DATA_MAIN
102	PWRGD_PS	IN <sub>TS4</sub>	VS <sub>B3</sub>	PWROK_PS
103	SMB2SDA	SW <sub>SM</sub>	VDD3	SMB_DATA_RESUME
104	PWRGD_O2#	OD <sub>S</sub>	VS <sub>B3</sub>	PWRGD_50MS#
105	PWM3#	OD <sub>12</sub> O <sub>S12</sub>	VDD3	PSU-FANPWM
106	5V_USB_MAIN#	OD <sub>S</sub>	VS <sub>B3</sub>	5V_USB_MAIN#
107	PWRGD_O1	OD <sub>S</sub>	VS <sub>B3</sub>	PWRGD_30MS
108	VSS	I	PWR	GND
109	SMB1SCL	SW <sub>SM</sub>	VDD3	SMB_CLK_MAIN
110	SMB1#	OD <sub>S</sub>	VDD3	IO_SMB1#
111	SMB2SDL	SW <sub>SM</sub>	VDD3	SMB_CLK_RESUME
112	DSR1#	IN <sub>TS</sub>	VDD3	DSRA#
113	RI1#	IN <sub>TS</sub>	VDD3	RIA#
114	CTS1#	IN <sub>TS</sub>	VDD3	CTSA#
115	DCD1#	IN <sub>TS</sub>	VDD3	DCDA#
116	SIN1	IN <sub>TS</sub>	VDD3	SINA
117	RTS1#	O <sub>4B</sub>	VDD3	RTSA#
118	DTR#_BOUT1	O <sub>4B</sub>	VDD3	DTRA#
119	SOUT1	O <sub>4B</sub>	VDD3	SOUTA
120	DCD2#	IN <sub>TS</sub>	VDD3	DCDB#
121	SOUT2	O <sub>4B</sub>	VDD3	SOUTB
122	VS <sub>B3</sub>	I	PWR	VS <sub>B3</sub>
123	DTR#_BOUT2	O <sub>4B</sub>	VDD3	DTRB#
124	RI2#	IN <sub>TS</sub>	VDD3	RIB#
125	RTS2#	O <sub>4B</sub>	VDD3	RTSB#
126	SIN2	IN <sub>TS</sub>	VDD3	SINB
127	DSR2#	IN <sub>TS</sub>	VDD3	DSRB#
128	CTS2#	IN <sub>TS</sub>	VDD3	CTSB#

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	<b>GPIO Table3</b>	
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Gwen/Mordred X1

(SI number: Gwen/Mordred)

2012/10/22

PAGE 7: Changed R436 from 3.16K ohm to 2.67K ohm.(SI number: 892595/892596)
PAGE 16: Modified R721 and R231 pull-up well from +5V\_AUX to ATX\_5VSB.(SI number: 892601/892602)
PAGE 20: Modified J68 to separated connector J66 and J67(HP spec change).(SI number: 892604/892605)
PAGE 22: Modified DP to DDI connector (HP spec change).
Add: J34.
Remove: C120,C117,C115,C110,C100,C108,C95,C98,C96,C99,C80,Q26,F2,R194,R199,
RN29,RN30,RN31,RN32,R421,R188,R210,R183,C132,R530,Q30,R196,
R278,Q28,R201,R206,U16,U45,U30,Q31,Q32,R211,R212,C149,C159,C165,C171,
C79,C71,R193,J64,L13,L12,L9,L11(SI number: 892607/892609)

PAGE 23: Modified DP header to DVID connector (HP spec change).
Remove: C121,C118,C111,C116,C101,C109,C97,C102,C103,C104,R202,R214,RN33,RN34,
RN35,RN36,L32,L33,L10,L34,R423,R215,R204,R185,C133,R544,Q51,R205,R279,
Q55,U17,U15,U39,Q40,R224,Q56,R222,C150,C162,C166,C174,C82,Q52,R217,R216,
F3,C83,C72,R223,P55

Add: C66,C69,C56,C57,C58,C61,C51,C53,R233,Q34,C81,U21,C76,C75,C84,U14,U6,
R181,R164,R173,R138,R140,R172,R103,R112,Q33,R170,R162,Q20,Q29,R166,R232,
RN21,RN22,RN23,RN24,L7,L8,L6,L5,R242,R276,R297,R299,D75,F1,FB4,C77,C1,
C2,R238,C168,J65(SI number:892611/892614)

PAGE 24: Modified J69 to J65(HP spec change).(SI number: 892615/892617)

PAGE30:Change audio mapping to follow reference circuit. C450
change to connect from ul3 pin17 to pin15: C451 change to
connect from ul3 pin16 to pin14 (SI number: 892619/892622)

PAGE30:Modify audio circuit by audio vendor review. FB12
connect to +3.3V,U19 pin9 connect to R918 and R844 (SI
number: 892625/892626)

PAGE31:Modify audio circuit by audio vendor review.
R413,U20,R396,C471,R415 changed to NI; added FB6,D78;
deleted D24 (SI number: 892625/892626 )

PAGE32:Add USB switch control circuit
Added R530,Q92 (SI number: 892628/892629)

PAGE33:Deleted USB charging circuit by HP changed specification .
Deleted C181,C188,Q60,Q59,C186,C196,R725,R740,R112,R103,R299,R87,
C51,U38,R77,R232,R110,R118,U63,R893,R895,R892,C586,
R730,R138,R233,Q103,Q104 (SI number: 892633/892634)

PAGE34:Deleted USB P151 Header circuit by HP changed specification .
Deleted RN63,L4,RN46,L3,D3,C21,P151,C630 (SI number: 892635/892637)

PAGE35:Deleted USB2.0x2 connector and added USB3.0x2+USB2.0x2
connector circuit by HP changed specification . Deleted
J891,J82,JV81,RN60,L26,
RN61,L25,RN40,L19,RN41,L47,RN42,L50,RN43,
L48,C677,C278,C271,C266,C263,U27,U28,D30,C345; added
J10,JV10,D3,C21,RN63,L4,RN46,L3 (SI number: 892639/892640)

PAGE36:Added USB P152 Header circuit by HP changed specification . Added
U27,U28,D30,C345,C278,C271,RN42,L50,RN40,L19,RN60,L26,C726,P152(SI number: 892643/892645)

PAGE38:Modify Fan circuit ;EC6 and C204 changed from NI to I (SI number: 892646/892649)

PAGE39:Added EC cap for DDR power by power team suggestion ;Added EC27(SI number: 892651/892654)

PAGE40:Modify CPU power circuit by power team suggestion ;R104,R67,R96,R49 changed
from 6.2K to 6.34K ohm (SI number: 892656/892658)

PAGE44:Modify APS header circuit ;E18 pin 4 changed from SLP\_S#5 to +3.3V\_AUX.
(SI number: 892659/892663)

2012/10/23

PAGE16:Reserve C540 for EMI.(SI number: 892666/892667)
PAGE20:Change FB13, FB14, FB15,FB16 from 0 ohm to 33 ohm for EMI.(SI number:892666/892667)
PAGE20:Add D61 for EMI.(SI number: 892666/892667)
PAGE24: Delete D10, D11 for EMI.(SI number: 892666/892667)

2012/10/24

PAGE 14: Modify R807 and R371 from 10k ohm to 499 ohm by Intel review.(SI number:893429)
PAGE 16: Rename PCIECLKREQ#5 to PCH\_GPIO44 by Intel review.(SI number:893434)
PAGE 16: Rename PCIECLKREQ#2 to PCH\_GPIO20 and modify R367 to NI by Intel review.(SI number:893434)
PAGE 24: Modify R285 and R292 from I to NI by Intel review.(SI number:893437)
PAGE 28: Add R920, R921,modify R900 to 0ohm, modify Q135 to 2N7002 by Intel review.(SI number:893435)
PAGE 21: Modify C445,C446 and C449 from NI to I by SIO vendor review.(SI number:893439)
PAGE 30: Modify C455 from 0.1uF to 10uF by audio vendor review.(SI number:892625)

2012/10/25

PAGE 42: Power team suggest to modify C647,C649,C644,C646,C648,C650,C652,
C653,C654,C655 from I to NI.(SI number:893441)
PAGE 17: Delete C683,C524 and add C960,C961,C962 by Intel review.(SI number:893898)
PAGE 43: Add C963,C964 by Intel review.(SI number:893898)

PAGE 16: Modify R738 from 2.2k ohm to 10k ohm,
modify R120 from 100k ohm to 10k ohm and modify to NI by Intel review.(SI number:893898)

2012/10/26

PAGE 44: Modify R747 from 75 ohm to 180 ohm and connect to +5V\_AUX.(SI number:893677)

2012/10/30

PAGE 38: Delete 3/4 pin system fan colay circuit:
Delete: R36,C23,R499,R497,U67,R283,Q80,R236(SI number:896536)
PAGE 13: Modified PCIE clock mapping by HP requirement:
Connect PE6\_CLK to J31, PE5\_CLK to J32, PE0\_CLK to J33.(SI number:894512)

PAGE 43: Modify EC1 from 270uF to 100uF by power team suggestion.(SI number:895385)

2012/11/01

PAGE 05: Modify DVI port mapping port D by HP requirement.(SI number: 894794)

2012/11/02

PAGE 45: Add C965, C966 for EMI.(SI number:896534)

2012/11/09

PAGE 23/24: Seperate J65 (DVI+VGA) into J65 (DVI) and J69 (VGA).(SI number:892615/892617)
PAGE 14: Modified net PCH\_GPIO1 to DC\_DET# and connected to J34.(SI number:896525)

PAGE 40: Modified CPU PWM solution from NCP81102MNTXG to ISL95816HRZ.
Delete: R34,R1,C19,R31,R14,R15,C5,C18,R5,R13,R3,R16,C7,R4,R24,R30,C16,R22,R11,C17,R840,R7,R6,C15,R56,R55,R99,
R100,R131,RT3,R114,C40,R130,R91,R92,R74,R44,C26,R9,R32,C3,R63,R69,R62,C31,R90,R113,R122,R133,C46,
R81,R105,R104,C43,C44,R59,R70,R67,C34,C32,R82,R94,R98,C42,C38,R53,C24,C25,R49,R20,R28,R27,R39,RT1,
C12,C11,R19,R21,R10,C6,R124,R68,R108,R41,R107,R58,R89,R33,C20,R42,R35,R558.
Add: R70,R82,C23,R107,R58,R27,R45,R36,R105,C25,R87,C24,C34,C17,R110,R89,C42,C38,R53,R63,R55,R77,R92,C40,
R99,C46,R104,R30,C43,C12,R4,C4,R1,R24,R9,R14,R29,R91,C26,R2,C3,R6,C7,R3,R49,R15,R22,R16,R31R20,R8,
R44,R43,R42,R39,R19,R25,R28,C10,R100,R111,R108,C18,R52,R62,R90,R68,R94,R81,R61,C29,R59,R67,R69,R66,
R32,R74,R98,RT1,R21,C9,R23,C8,C6,R5,C11,R18,C13,R13,RT3.(SI number:896517)

2012/11/13

PAGE 31: Add R452, R453 and C524 and connect to pin 2 of P23 by HP suggestion.(SI number:)
PAGE 45: Add C183,C229,C245,C211,C171,C233,C253,C216,C185,C261,C264,C260,C172,C266,C530,C528,C676,C677,C534
by HP suggestion.(SI number:)
PAGE 47: Add C526 by HP suggestion.(SI number:)
PAGE 47: MH7 connect to GND by HP suggestion.(SI number:)

2012/11/14

PAGE 42: Modified EC24 from I to NI by power team suggestion.(SI number:898665)
PAGE 39: Add C173 by power team suggestion.(SI number:898666)
PAGE 45: Add C535, C536, C542,C543,C544 for EMI.(SI number:898667)

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Gwen X1

2013/01/15

2012/11/20

PAGE 35: Separate J10 to J81 and J82 by HP spec change.(SI number:898670)
PAGE 40: Modified C24 to 4.7k ohm and modified NI to I by power team suggestion(SI number: 898673)
PAGE 22: Modify DP header to 2X10 pin by HP spec change.(SI number:898672 )

PAGE 36: 3 ports USB2.0 signal integrity test is fail.Modify D42,D30,L14,L15,L26 to I and modify RN55,RN56,RN60 to NI.(SI:910566,910567)

PAGE 30: Reserve this circuit to avoid ALC221 POP noise form CODE. Delete R480,R198,R860,Q128,Q146. Add Q160,Q161,R953,R954,R955,R956C982,D80. Modify R953 from 1Kohm to 4.7Kohm. (SI:912682,912689)

Gwen/Mordred X2

2013/01/03

PAGE 29/35: The one PCB leverage proposal from MSI had been approved and will implement into EVT-2 phase. Modify J9 from RJ45+USB2.0 to RJ45+USB3.0 connector.(SI:913289)

PAGE 45: Add several stitching capacitors (layer change) in EVT2 PCB by MSI EMI engineers suggestion. Add C983, C984 and C985. (SI:913414)

PAGE 34: The one PCB leverage proposal from MSI had been approved and will implement into EVT-2 phase.Combine J81 and J82 USB 2.0 port to J10 USB2.0 X4 connector.(SI:913289)

PAGE 43: Modify -12V circuit by MSI power engineer suggestion. Add C986. Modify EC1 to 270uF and R483 to 16.5k ohm. (SI:913414)

PAGE 30:Rear Line in port malfunction. Modify R386 from 20k ohm to 39.2k ohm.(SI:903668,903669)

2013/01/28

PAGE 44: UUT can not enter S5 Max Power Saving mode. Add R929 .(SI:906029,906030)

PAGE 28: Modify +3.3V\_LAN circuit to follow power design rule. Modify R502 from 1K ohm to 30 ohm. (SI:916576)

PAGE 43: There is no function for COM port.Connect Pin 8 of U35 to U5\_SWC.(SI:902802)

Gwen/Mordred X3

PAGE 39: DDR power dynamic Load test is fail. Moidy C496 from 1000pF to 470pF; Modify R247 from 2k ohm to 2.74k ohm;Modify R274 from 12k ohm to 7.68k ohm;Modify C324 from NI to I.(SI:910564,910565)

2013/03/19

PAGE 17:amelot PCA Mordred/Gwen Schematic review bt Intel schematic review feedback .Add R932 .(SI:893898)

PAGE 40: Modify HP Gwen/Mordred Cpu Power circuit to meet the test of Intel CPU power transient. Modify R3 from I to NI. For Gwen: Modify R91 from 110K ohm to 115K ohm.Modify C17 from 68 pF to 39 pF. (SI:905259) For Mordred: Modify PR91 from 113K ohm to 124K ohm. (SI:905260)

PAGE 31: Change front IO P23 pin2 from AGND to GND, Modify R453 to NI and R452 to I.(SI:913268)

PAGE 38: Reserve TPM circuit. Add U40,R959,R981,R957,R958,C850,C987,C988,C989,C990. (SI:929486)

2013/01/08

PAGE 16: A item of power on sequence signal integrity test is fail.Modify C129 from 2.2uF to 1uF.(SI:908764,908768)

PAGE 45: Reserve Dummy load circuit. Add Q162,Q164,Q165,R960,R961,R962,R963,R964,R965,966,R967,R968,R969,R970,R971, R972,R973,R974,R975. (SI:908728)

PAGE 40: Modify HP Gwen/Mordred Cpu Power circuit to meet the test of Intel CPU power transient. For Gwen: Modify R32 from 4.7M ohm to 5.6M ohm.Modify R91 from 137K ohm to 110K ohm.Modify R92 from 3.83K ohm to 3.57K ohm.Modify C6 from 0.22uF to 0.47uF. Modify C17 from 100pF to 68pF.Modify C26 from 0.01uF to 820pF(SI:905259) Add Mordred colay parts: PR32, PR91, PR92, PR29, PR110, PC6, PC11, PC17, PC26(SI:905260)

PAGE 44: Modify +5V\_AUX circuit to follow power design rule. Add R984. (SI:916576)

2013/01/14

PAGE 28: Use WAKE # signal can support OBFF function. Modify R919 from I to N;Add Q151, Q152, Q153, R933, R934, R935, R936, R937, R951.(SI:912719)

PAGE 30: Reserve audio codec ALC221-VA and ALC221-VB colay circuit. Add R976,R977,R978,979,C991,C992. (SI:930271)

PAGE 28: Modify Lan disable circuit to ensure same circuit with HP other projects. Delete R900, R920, Q135 (SI:912753)

PAGE 28: Remove OBFF circuit. Modify R919 from IN to I and delete Q151,Q152,R933,R934,R935,R951. (SI:912719)

PAGE 32:+5 V\_USB inrush current will cause the voltage drop.Delete Q92; Add Q154, Q155,R938, R939, R940, C969, C970.(SI:911783,911786)

PAGE 32: Use SLP\_S4# to control USB switch IC. Add R982 and R983. (SI:908728)

PAGE 43: +3.3V\_AUX inrush current will cause the voltage drop of +5V\_AUX.Modify R519 from 4.7k ohm to 20k ohm. Add C968 and modify EC47 to NI.(SI:911788,911790)

PAGE 43: Modify LDO Power circuit VCC1\_5, +3.3V\_AUX and +3.3V\_LPS to meet the phase margin and gain margin test. Modify C330 and C337 from NI to I. Modify C334 from 0.1uF to 0.033 uF for VCC1\_5. Modify EC47 from EL cap 1000uF to solid cap 100uF for +3.3V\_AUX. Modify R648 from 32.4K ohm to 324K ohm. Modify R638 from 10K ohm to 100K ohm for +3.3V\_LPS. (SI:930329)

PAGE 22: Modify DP connector circuit. Modify P185 to PCIE X1 slot. Delete FS2,R930,R931,R193,R174,R196,R183,R752.(SI:913444)

PAGE 45: Add several capacitors at +5V\_USB by MSI EMI engineers suggestion. Add C993 and C994 (SI:930302)

PAGE 16: Support SPI BIOS Quad IO Operation mode in EVT2 PCB.Modify R218, R220 to I.(SI:913300)

PAGE 21/30: Modify Amplifier Enable circuit to avoid ALC221 POP noise form CODE. Add D81. Modify R953 from 4.7K ohm to 20K ohm. Moify R599 from 1K ohm to 680 ohm. (SI:912682,912689)

PAGE 24: Rise time ,fall time and pk-pk noise of D-Sub signal Integrity Items are fail.Modify L35,L36,L37,L38,L41,L51 to 33 nH.(SI:908746,908748)

PAGE 14: UUT shutdown after 8 error beep sounds if BBR jumper installed. Add C995. Modify R226 from 1K ohm to 390 ohm. (SI: 924414,924417)

PAGE 14: Modify Board Rev to 01. Modify R656 from NI to I and modify R653 from I to NI.

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