



MS-7992

Ver:10

CPU

AMD M3 Phenom/Athlon 64 FX AM3/AM3R2

System Chipset

AMD RX980

ATI SB950

On Board Chip

FINTEK Super I/O -- F71878AD

LAN --I211

HD Codec --ALC1150

ASM1143 USB3.0

BIOS -- SPI ROM 64Mb

Main Memory

DDR III X 4 (Max 32GB)

Expansion Slots

PCI-E X 16*1

PCI-E X 8 *1

PCI-E X 1 *3

PCI 2.2 Slot X 1

PWM

Controller--UPI1601 6+2 Phase

Vcore 6 Phase (MOS HIGHX2 LOWX2)

Vnb 2 Phase (MOS HIGHX2 LOWX2)

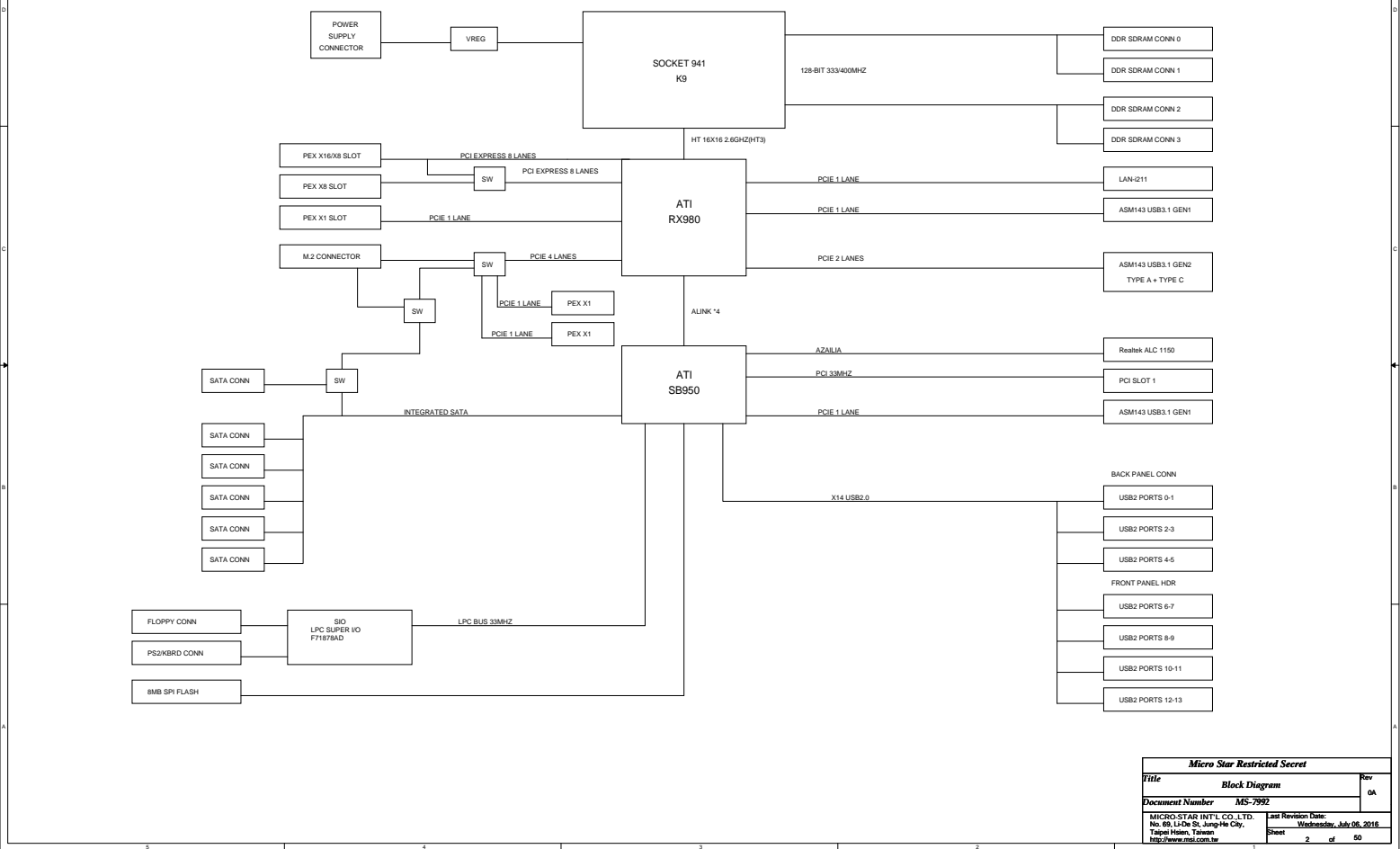
Clock Generator

Controller--RTM880N-793

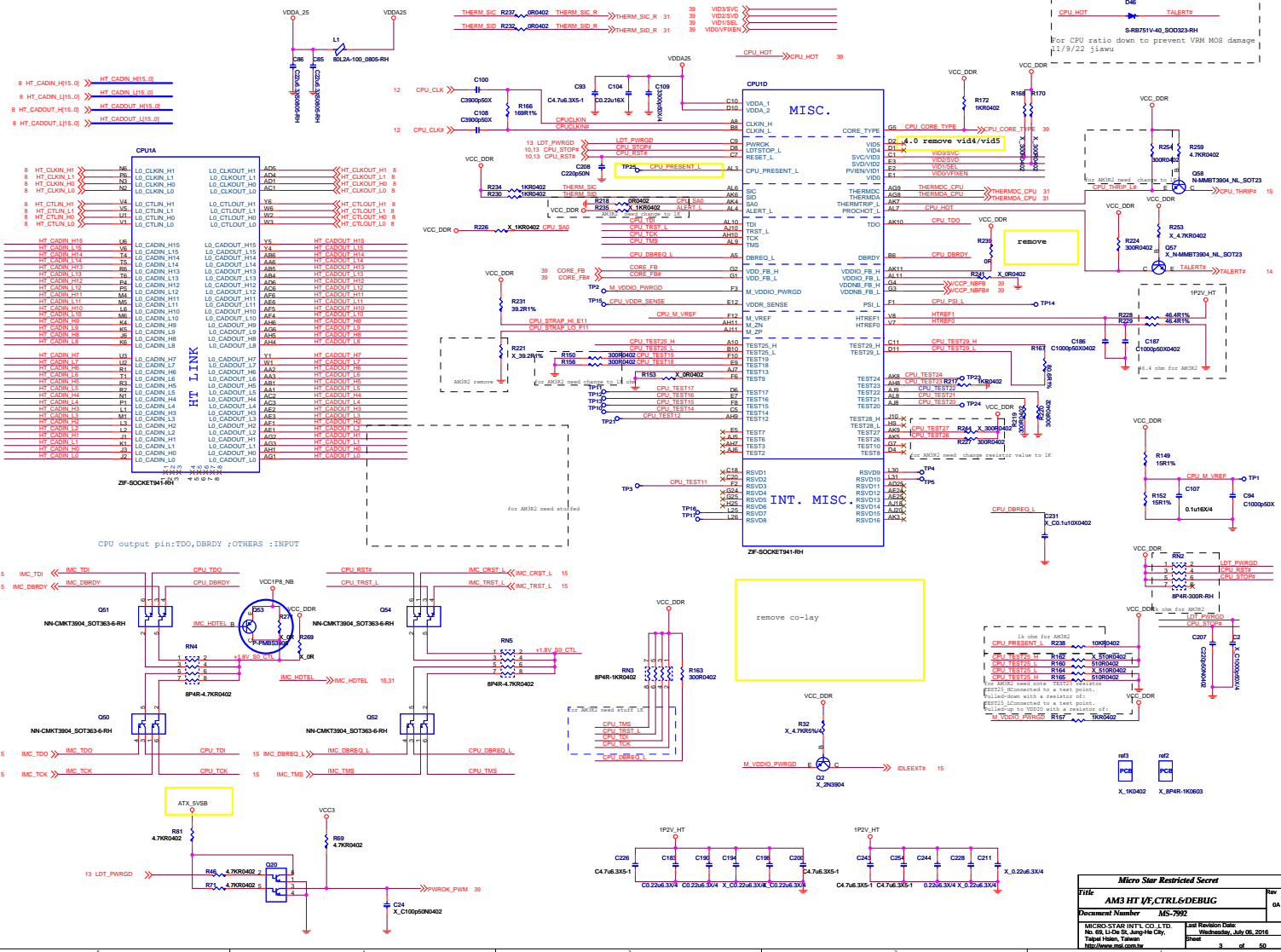
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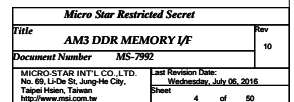
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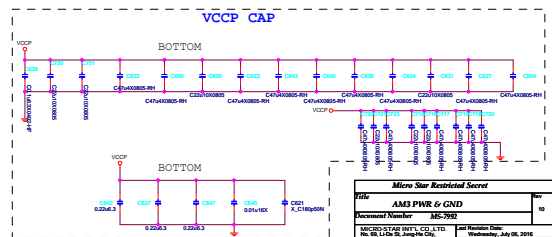
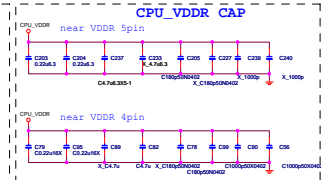
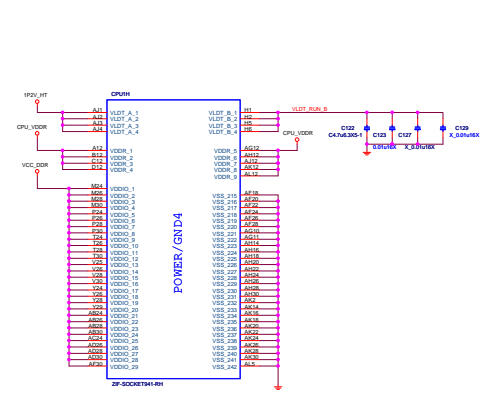
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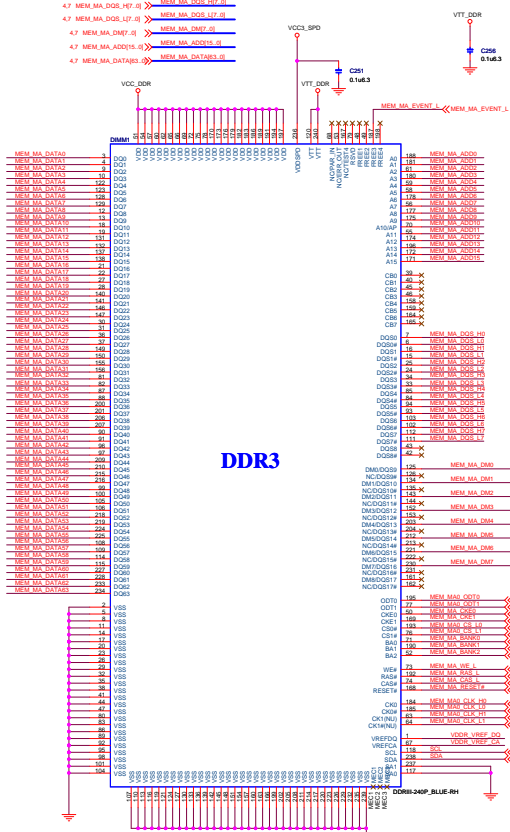
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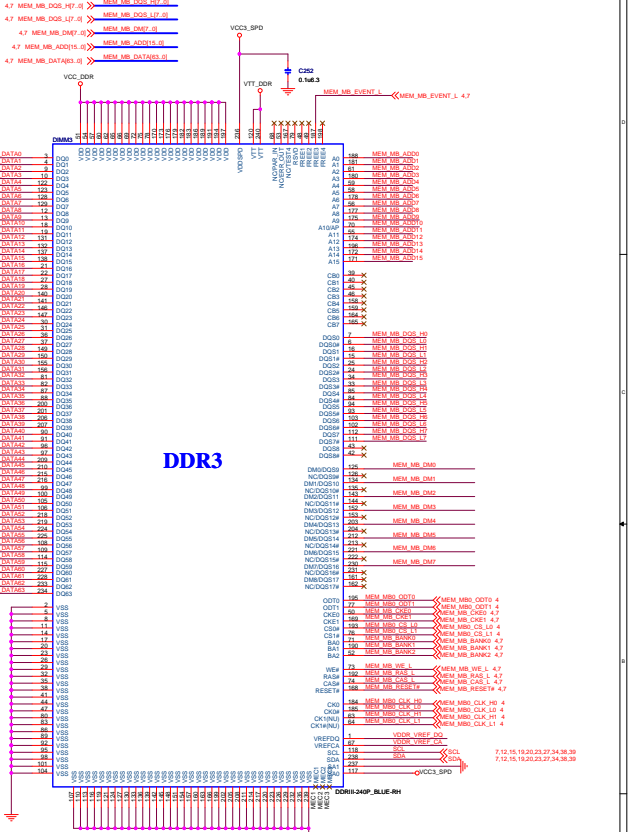
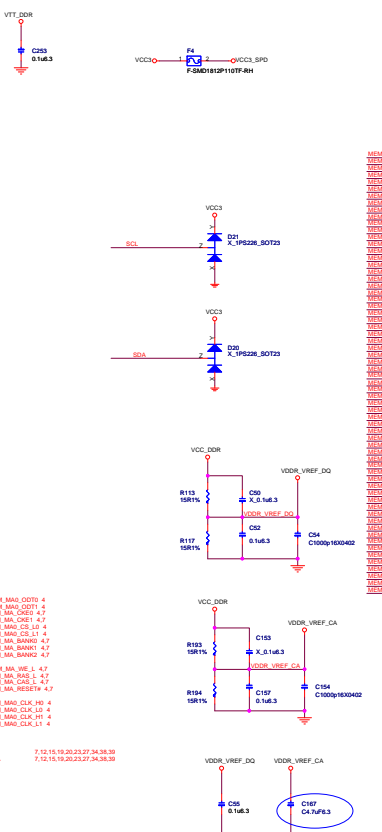


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AM3 PWR & GND	10
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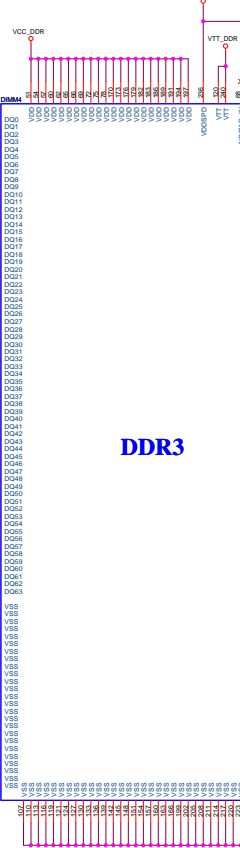
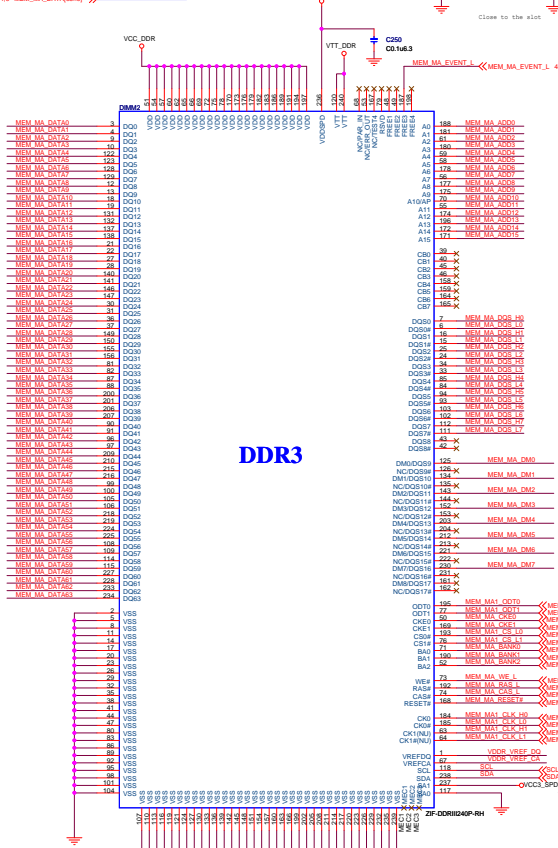
SMBus Addressing

SMBus 0	
Device	8-bit Address (hex)
DIM0A0	A.0
DIM0B0	A.2
DIM0A1	A.4
DIM0B1	A.6



4.6 MEM_MA_DQS_H7_0 MEM_MA_DQS_H7_0
4.6 MEM_MA_DQS_H7_1 MEM_MA_DQS_H7_1
4.6 MEM_MA_DM7_0 MEM_MA_DM7_0
4.6 MEM_MA_DM7_1 MEM_MA_DM7_1
4.6 MEM_MA_ADD015_0 MEM_MA_ADD015_0
4.6 MEM_MA_DATA03_0 MEM_MA_DATA03_0

4.6 MEM_MB_DQS_H7_0 MEM_MB_DQS_H7_0
4.6 MEM_MB_DQS_H7_1 MEM_MB_DQS_H7_1
4.6 MEM_MB_DM7_0 MEM_MB_DM7_0
4.6 MEM_MB_DM7_1 MEM_MB_DM7_1
4.6 MEM_MB_ADD015_0 MEM_MB_ADD015_0
4.6 MEM_MB_DATA03_0 MEM_MB_DATA03_0



20 GFX_RX15P>>N6>>GFX_RX15P>>GFX_TX15P>>N3>>GFX_TX15P>>20
20 GFX_RX14P>>M6>>GFX_RX14P>>GFX_TX14P>>M2>>GFX_TX14P>>20
20 GFX_RX14N>>M4>>GFX_RX14N>>GFX_TX14N>>M1>>GFX_TX14N>>20
20 GFX_RX13P>>L6>>GFX_RX13P>>GFX_TX13P>>L3>>GFX_TX13P>>20
20 GFX_RX13N>>L4>>GFX_RX13N>>GFX_TX13N>>L2>>GFX_TX13N>>20
20 GFX_RX12P>>K6>>GFX_RX12P>>GFX_TX12P>>K2>>GFX_TX12P>>20
20 GFX_RX12N>>K4>>GFX_RX12N>>GFX_TX12N>>K1>>GFX_TX12N>>20
20 GFX_RX11P>>J6>>GFX_RX11P>>GFX_TX11P>>J2>>GFX_TX11P>>20
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20 GFX_RX8P>>F6>>GFX_RX8P>>GFX_TX8P>>F2>>GFX_TX8P>>20
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19 GFX_RX7P>>D6>>GFX_RX7P>>GFX_TX7P>>D2>>GFX_TX7P>>19
19 GFX_RX7N>>D4>>GFX_RX7N>>GFX_TX7N>>D1>>GFX_TX7N>>19
19 GFX_RX6P>>B6>>GFX_RX6P>>GFX_TX6P>>B2>>GFX_TX6P>>19
19 GFX_RX6N>>B4>>GFX_RX6N>>GFX_TX6N>>B1>>GFX_TX6N>>19
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19 GFX_RX4N>>E6>>GFX_RX4N>>GFX_TX4N>>E1>>GFX_TX4P>>19
19 GFX_RX3P>>D8>>GFX_RX3P>>GFX_TX3P>>D2>>GFX_TX3P>>19
19 GFX_RX3N>>D7>>GFX_RX3N>>GFX_TX3N>>D1>>GFX_TX3N>>19
19 GFX_RX2P>>E9>>GFX_RX2P>>GFX_TX2P>>E2>>GFX_TX2P>>19
19 GFX_RX2N>>E8>>GFX_RX2N>>GFX_TX2N>>E1>>GFX_TX2N>>19
19 GFX_RX1P>>D10>>GFX_RX1P>>GFX_TX1P>>D2>>GFX_TX1P>>19
19 GFX_RX1N>>D9>>GFX_RX1N>>GFX_TX1N>>D1>>GFX_TX1N>>19
19 GFX_RX0P>>C11>>GFX_RX0P>>GFX_TX0P>>C2>>GFX_TX0P>>19
19 GFX_RX0N>>C10>>GFX_RX0N>>GFX_TX0N>>C1>>GFX_TX0N>>19

XAC9>>GFX2_RX15P>>GFX2_TX15P>>AE9>>
XAD9>>GFX2_RX10N>>GFX2_TX10N>>AG9>>
XAE9>>GFX2_RX14P>>GFX2_TX14P>>AM9>>
XAF9>>GFX2_RX14N>>GFX2_TX14N>>AL9>>
XAG9>>GFX2_RX13P>>GFX2_TX13P>>AN9>>
XAH9>>GFX2_RX13N>>GFX2_TX13N>>AO9>>
XAI9>>GFX2_RX12P>>GFX2_TX12P>>AP9>>
XAJ9>>GFX2_RX12N>>GFX2_TX12N>>AQ9>>
XAK9>>GFX2_RX11P>>GFX2_TX11P>>AR9>>
XAL9>>GFX2_RX11N>>GFX2_TX11N>>AS9>>
XAM9>>GFX2_RX10P>>GFX2_TX10P>>AT9>>
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XAP9>>GFX2_RX9N>>GFX2_TX9N>>AW9>>
XAQ9>>GFX2_RX8P>>GFX2_TX8P>>AX9>>
XAR9>>GFX2_RX8N>>GFX2_TX8N>>AY9>>
XAS9>>GFX2_RX7P>>GFX2_TX7P>>AZ9>>
XAT9>>GFX2_RX7N>>GFX2_TX7N>>BA9>>
XAU9>>GFX2_RX6P>>GFX2_TX6P>>BB9>>
XAV9>>GFX2_RX6N>>GFX2_TX6N>>BC9>>
XAW9>>GFX2_RX5P>>GFX2_TX5P>>BD9>>
XAX9>>GFX2_RX5N>>GFX2_TX5N>>BE9>>
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XBE9>>GFX2_RX1P>>GFX2_TX1P>>BL9>>
XBF9>>GFX2_RX1N>>GFX2_TX1N>>BM9>>
XBG9>>GFX2_RX0P>>GFX2_TX0P>>BN9>>
XBH9>>GFX2_RX0N>>GFX2_TX0N>>BO9>>

XAD11>>GPP_RX9P>>GPP_TX9P>>AH19>>
XAD12>>GPP_RX9N>>GPP_TX9N>>AH29>>
XAE11>>GPP_RX8P>>GPP_TX8P>>AG19>>
XAE12>>GPP_RX8N>>GPP_TX8N>>AG29>>
XAF11>>GPP_RX7P>>GPP_TX7P>>AM19>>
XAF12>>GPP_RX7N>>GPP_TX7N>>AM29>>
XAG11>>GPP_RX6P>>GPP_TX6P>>AN19>>
XAG12>>GPP_RX6N>>GPP_TX6N>>AN29>>
XAH11>>GPP_RX5P>>GPP_TX5P>>AP19>>
XAH12>>GPP_RX5N>>GPP_TX5N>>AP29>>
XAI11>>GPP_RX4P>>GPP_TX4P>>AQ19>>
XAI12>>GPP_RX4N>>GPP_TX4N>>AQ29>>
XAJ11>>GPP_RX3P>>GPP_TX3P>>AR19>>
XAJ12>>GPP_RX3N>>GPP_TX3N>>AR29>>
XAK11>>GPP_RX2P>>GPP_TX2P>>AS19>>
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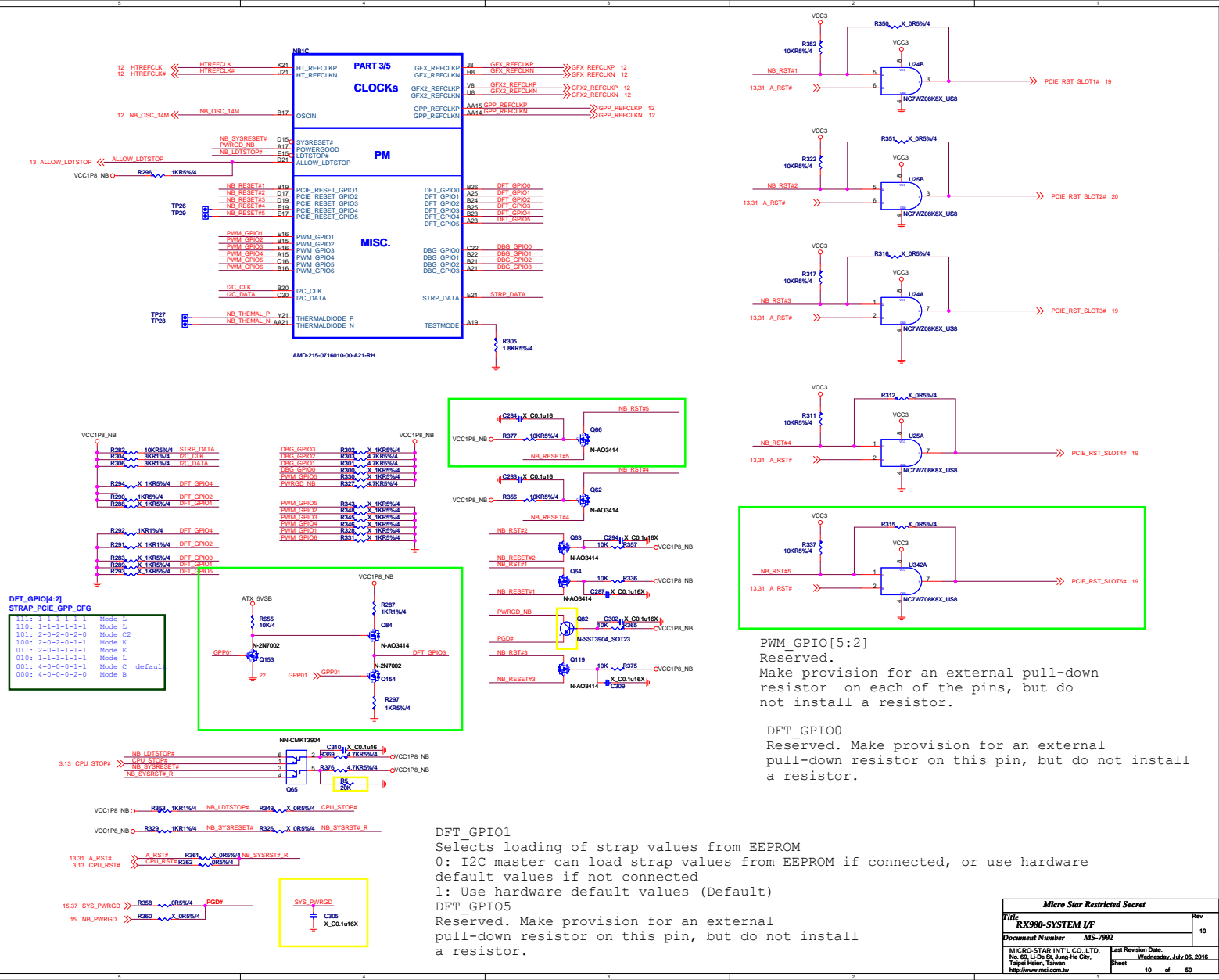
AC21>>SB_RX3P>>SB_TX3P>>AG22>>
AG22>>A_TX3P_G>>C059>>
AG23>>SB_RX3N>>SB_TX3N>>AG23>>
AG23>>A_TX3N_G>>C059>>
AG24>>SB_RX2P>>SB_TX2P>>AG24>>
AG24>>A_TX2P_G>>C059>>
AG25>>SB_RX2N>>SB_TX2N>>AG25>>
AG25>>A_TX2N_G>>C059>>
AG26>>SB_RX1P>>SB_TX1P>>AG26>>
AG26>>A_TX1P_G>>C059>>
AG27>>SB_RX1N>>SB_TX1N>>AG27>>
AG27>>A_TX1N_G>>C059>>
AG28>>SB_RX0P>>SB_TX0P>>AG28>>
AG28>>A_TX0P_G>>C059>>
AG29>>SB_RX0N>>SB_TX0N>>AG29>>
AG29>>A_TX0N_G>>C059>>

AE20>>PCE_BCALRP>>
AE20>>PCE_BCALRN>>
AE10>>PCE_RCALRP>>
AE10>>PCE_RCALRN>>
E14>>PCE_TCALRP>>
E14>>PCE_TCALRN>>

Spacing : 6mil

AMD-215-0718010-00-A21-RH

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Document Number	MS-7992	
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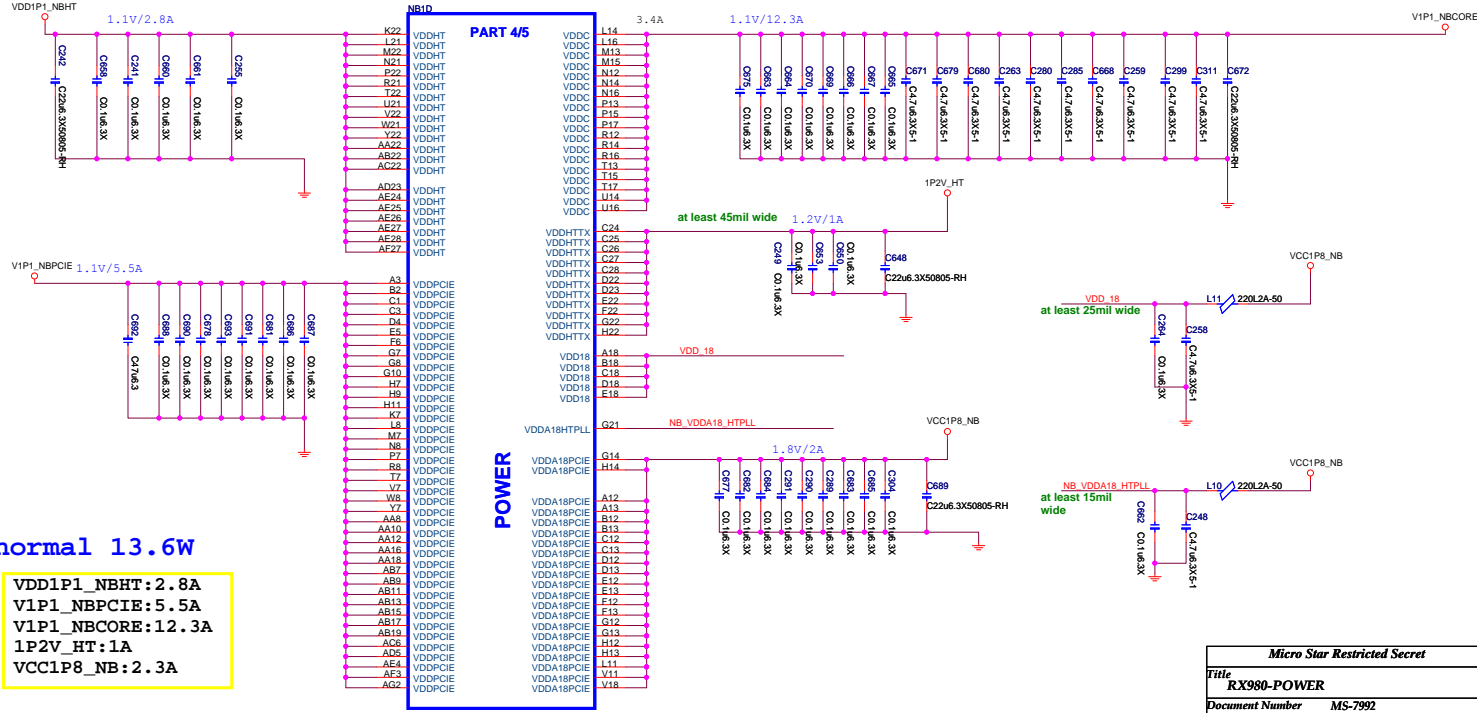
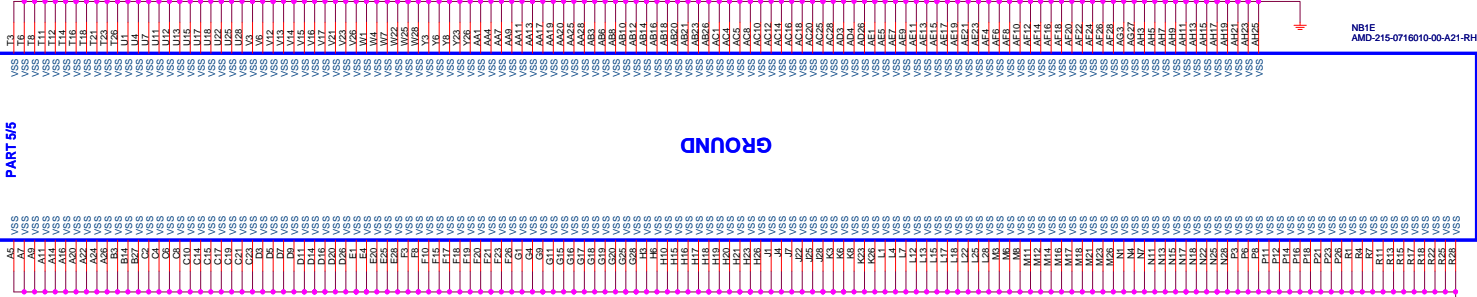


PWM_GPIO[5:2]
Reserved.
Make provision for an external pull-down resistor on each of the pins, but do not install a resistor.

DFT_GPIO0
Reserved. Make provision for an external pull-down resistor on this pin, but do not install a resistor.

DFT_GPIO1
Selects loading of strap values from EEPROM
0: I2C master can load strap values from EEPROM if connected, or use hardware default values if not connected
1: Use hardware default values (Default)
DFT_GPIO5
Reserved. Make provision for an external pull-down resistor on this pin, but do not install a resistor.

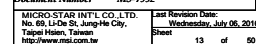
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Document Number	MS-7992	10
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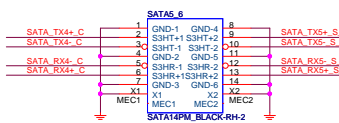


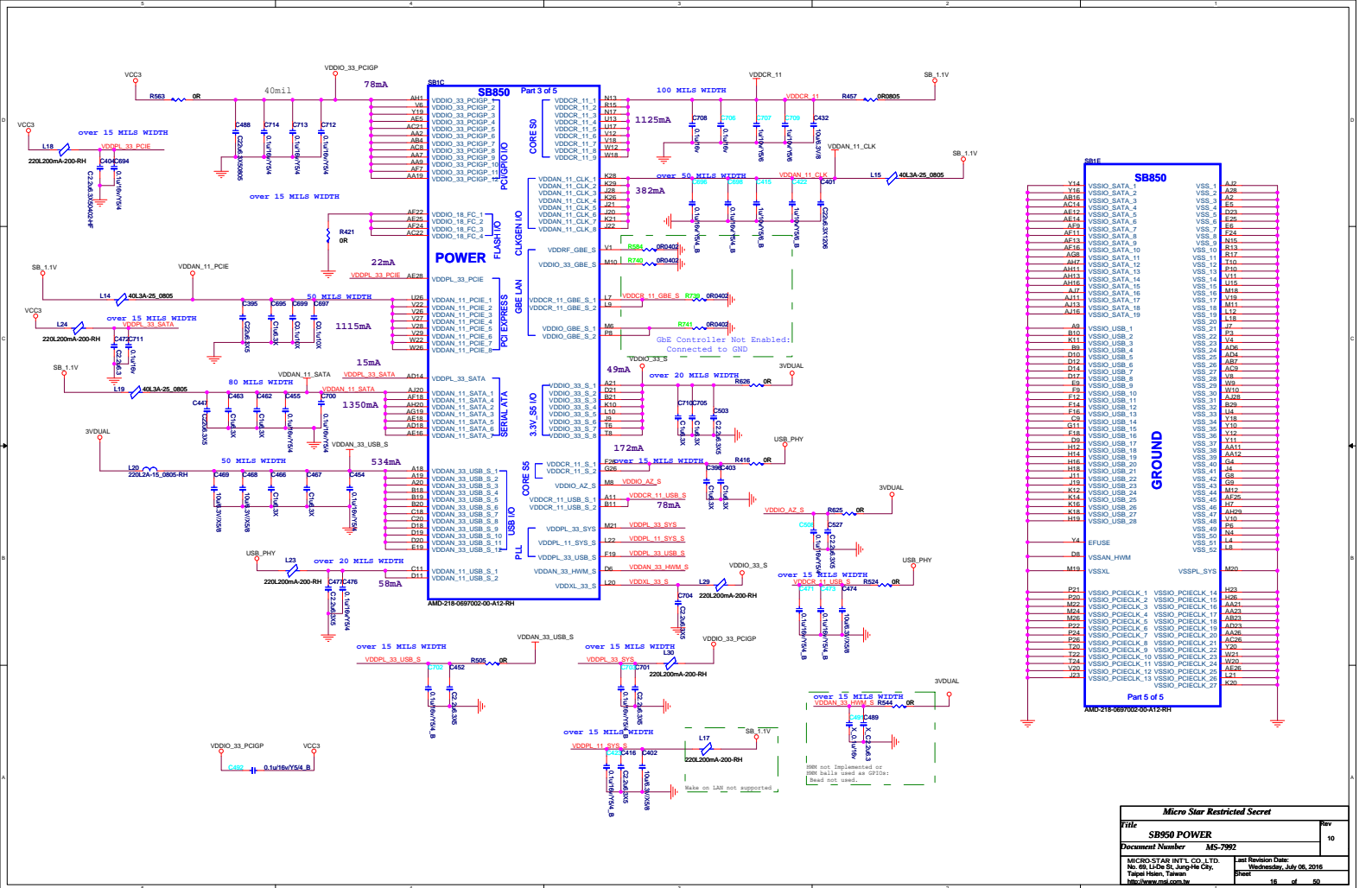
normal 13.6W

VDD1P1_NBHT:2.8A
V1P1_NBPICIE:5.5A
V1P1_NBCORE:12.3A
1P2V_HT:1A
VCC1P8_NB:2.3A

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RX980-POWER		10
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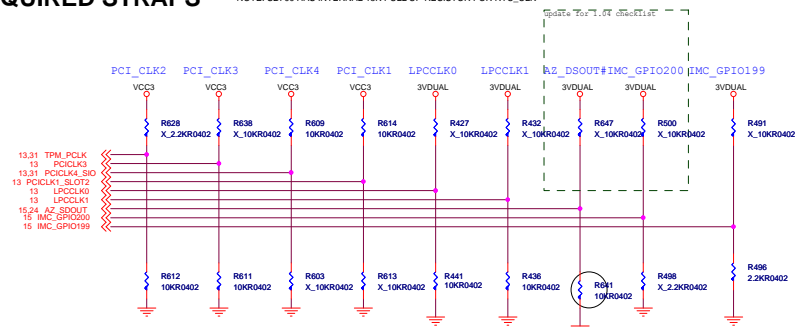






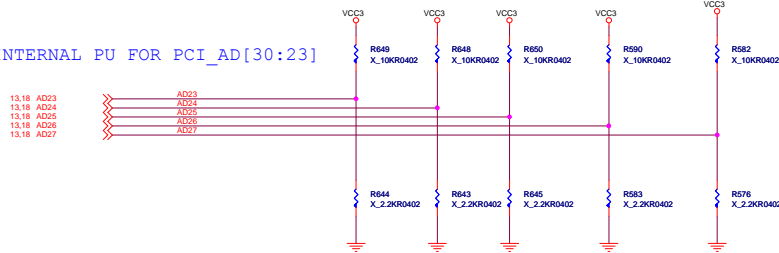
REQUIRED STRAPS

NOTE: SB700 HAS INTERNAL 15K PULL UP RESISTOR FOR RTC_CLK



	PCI_CLK1	PCI_CLK2	PCI_CLK3	PCI_CLK4	LPC_CLK0	LPC_CLK1	AZ_DSOUT#	IMC_GPIO200	IMC_GPIO199
PULL HIGH	ALLOW PCIE GEN2 DEFAULT	WATCHDOG TIMER ON NB_PWRGD ENABLED DEFAULT	USE DEBUG STRAPS DEFAULT	NON-FUSION CPU CLOCK MODE DEFAULT	UEC ENABLE DEFAULT	CLKGEN ENABLED DEFAULT		ROM TYPE: H, H = Reserved H, L = SPI ROM DEFAULT	
PULL LOW	FORCE PCIE GEN1	WATCHDOG TIMER ON NB_PWRGD DISABLED DEFAULT	IGNORE DEBUG STRAPS DEFAULT	FUSION CPU CLOCK MODE DEFAULT	DISABLE EC DEFAULT	CLKGEN DISABLED DEFAULT	PERFORMANCE MODE DEFAULT	L, H = LPC ROM L, L = FWH ROM	

SB800 HAS 15K INTERNAL PU FOR PCI_AD[30:23]

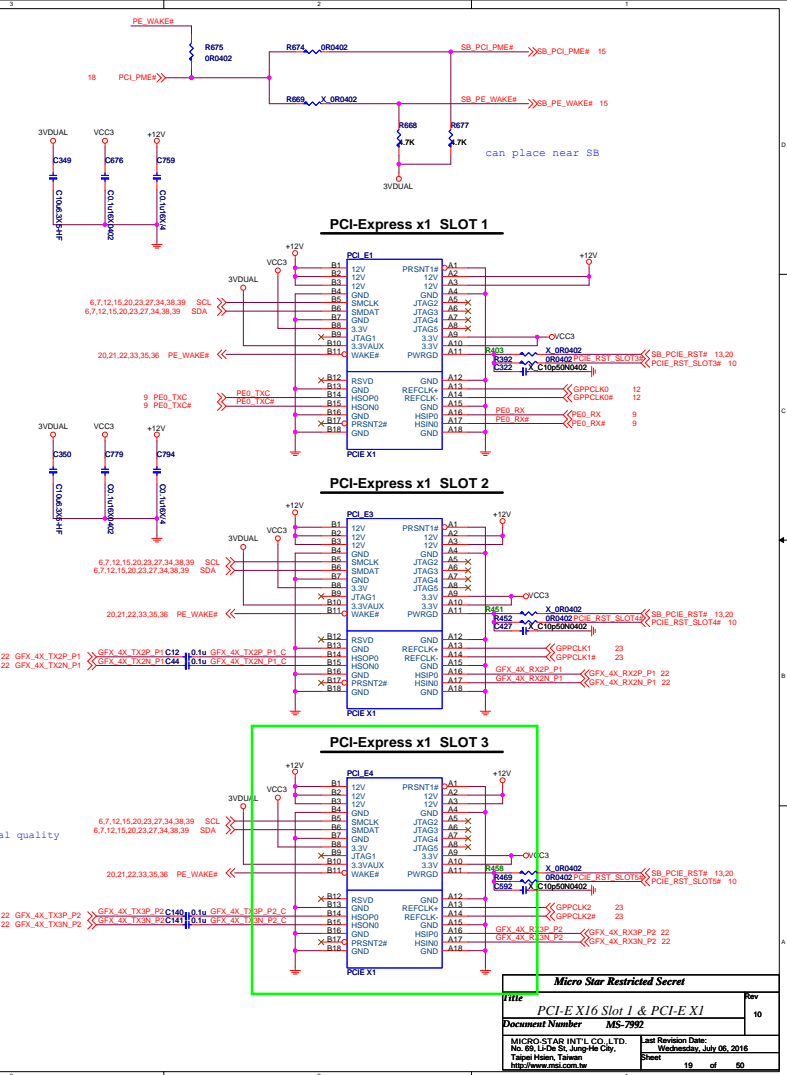
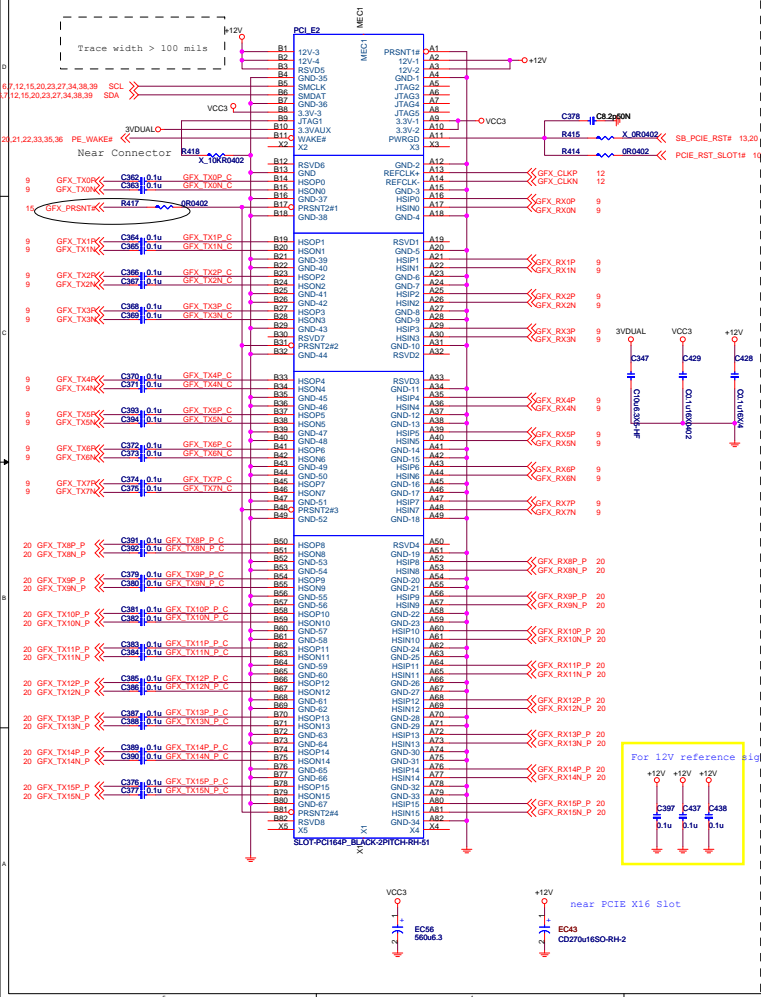


DEBUG STRAPS

	PCI_AD27	PCI_AD26	PCI_AD25	PCI_AD24	PCI_AD23
PULL HIGH	USE PCI PLL DEFAULT	DISABLE ILA AUTORUN DEFAULT	USE FC PLL DEFAULT	USE DEFAULT PCIE STRAPS DEFAULT	DISABLE PCI MEM BOOT DEFAULT
PULL LOW	BYPASS PCI PLL	ENABLE ILA AUTORUN	BYPASS FC PLL	USE EEPROM PCIE STRAPS	ENABLE PCI MEM BOOT

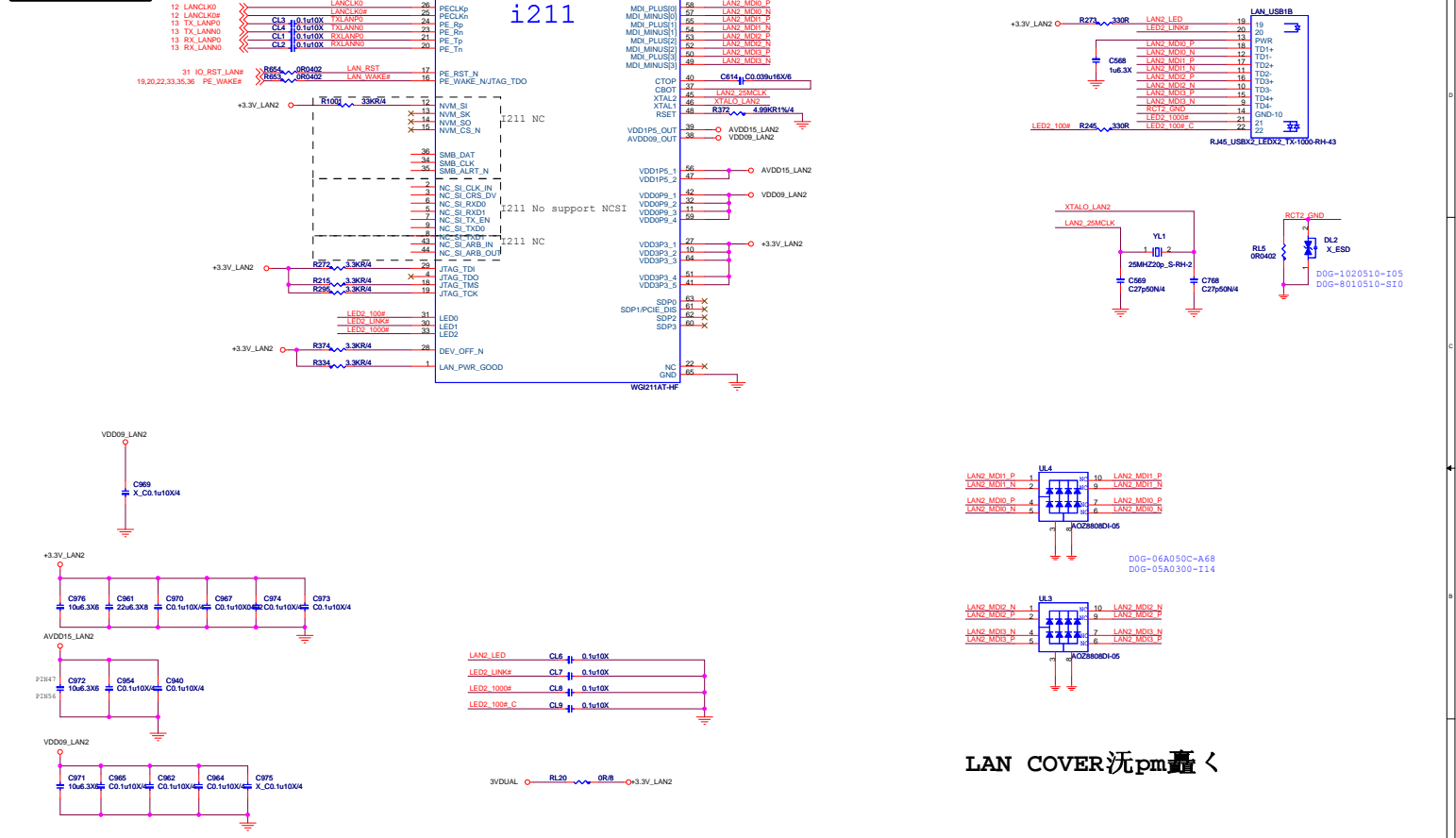
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Document Number	MS-7992	
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PCI EXPRESS 16



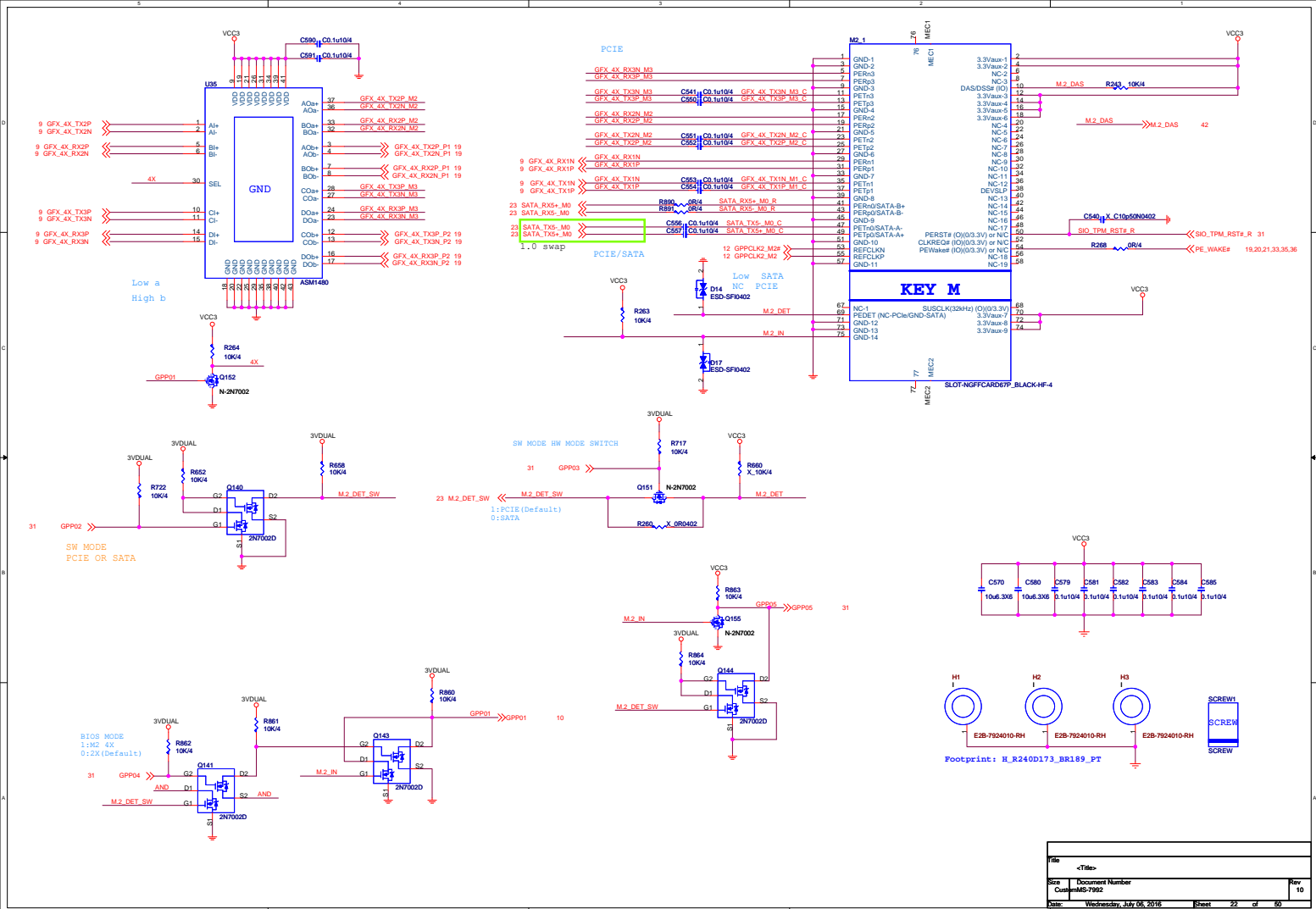
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Title	PCI-E X16 Slot 1 & PCI-E X1	Rev 10
Document Number	MS-7992	
MICRO-STAR INT'L CO., LTD.	last Revision Date	Wednesday, July 06, 2016
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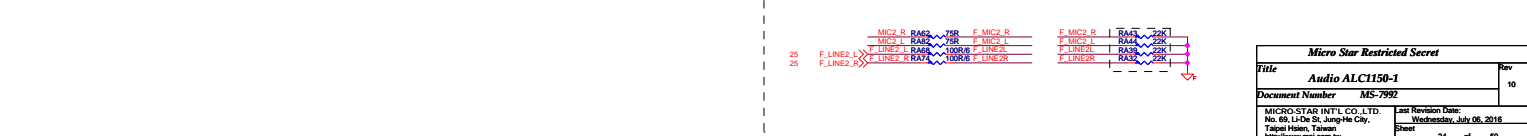
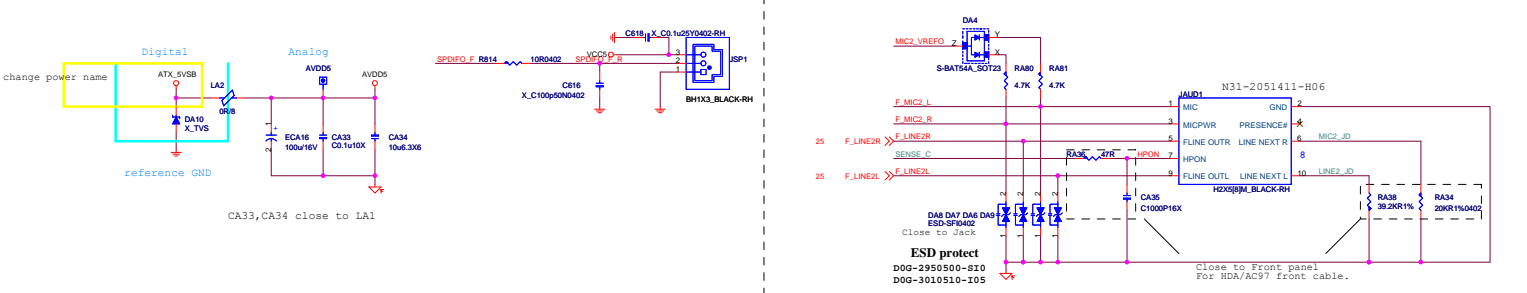
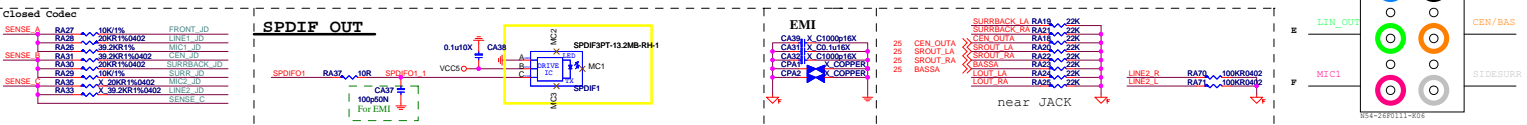
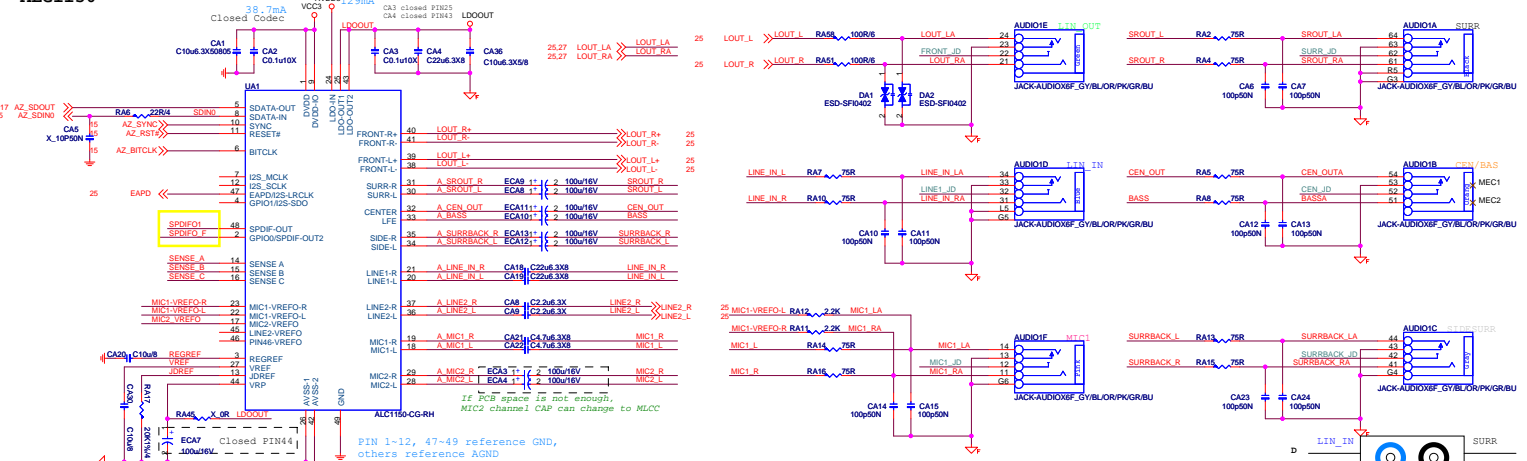
LAN2-- I211AT

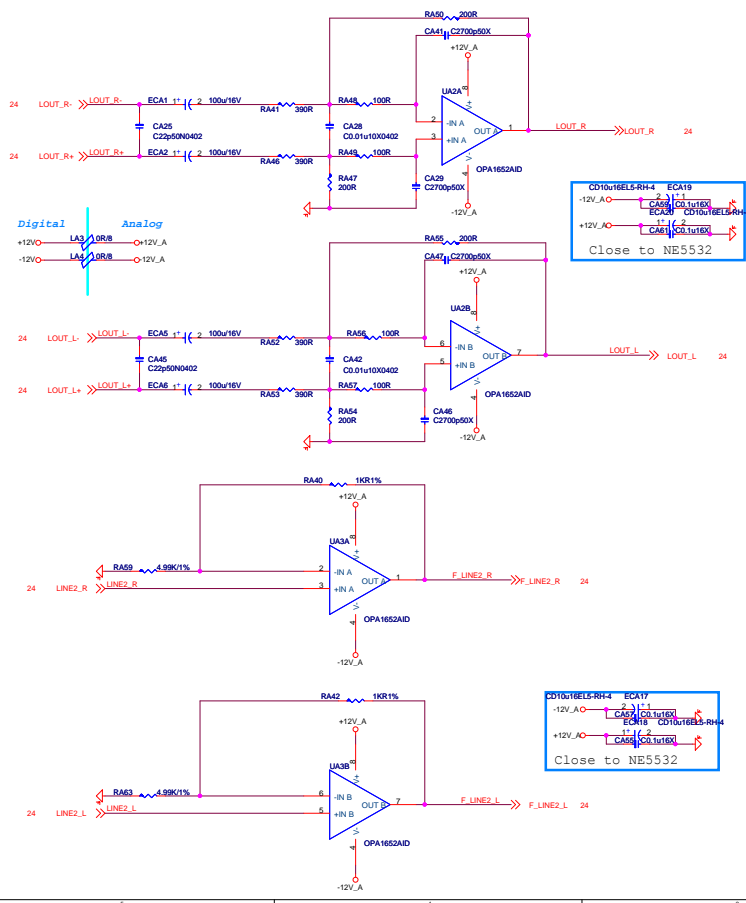


LAN COVER洗pm轟く

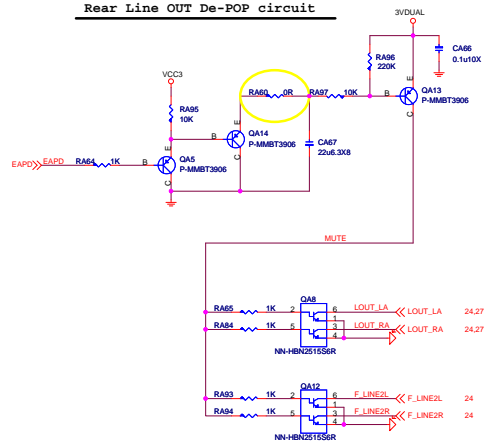
Micro Star Restricted Secret		
Title	LAN - Killer F2205	Rev 10
Document Number	MS-7992	
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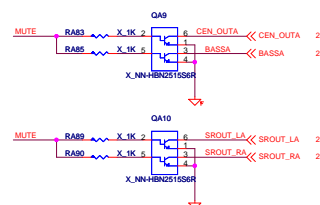




Rear Line OUT De-POP circuit

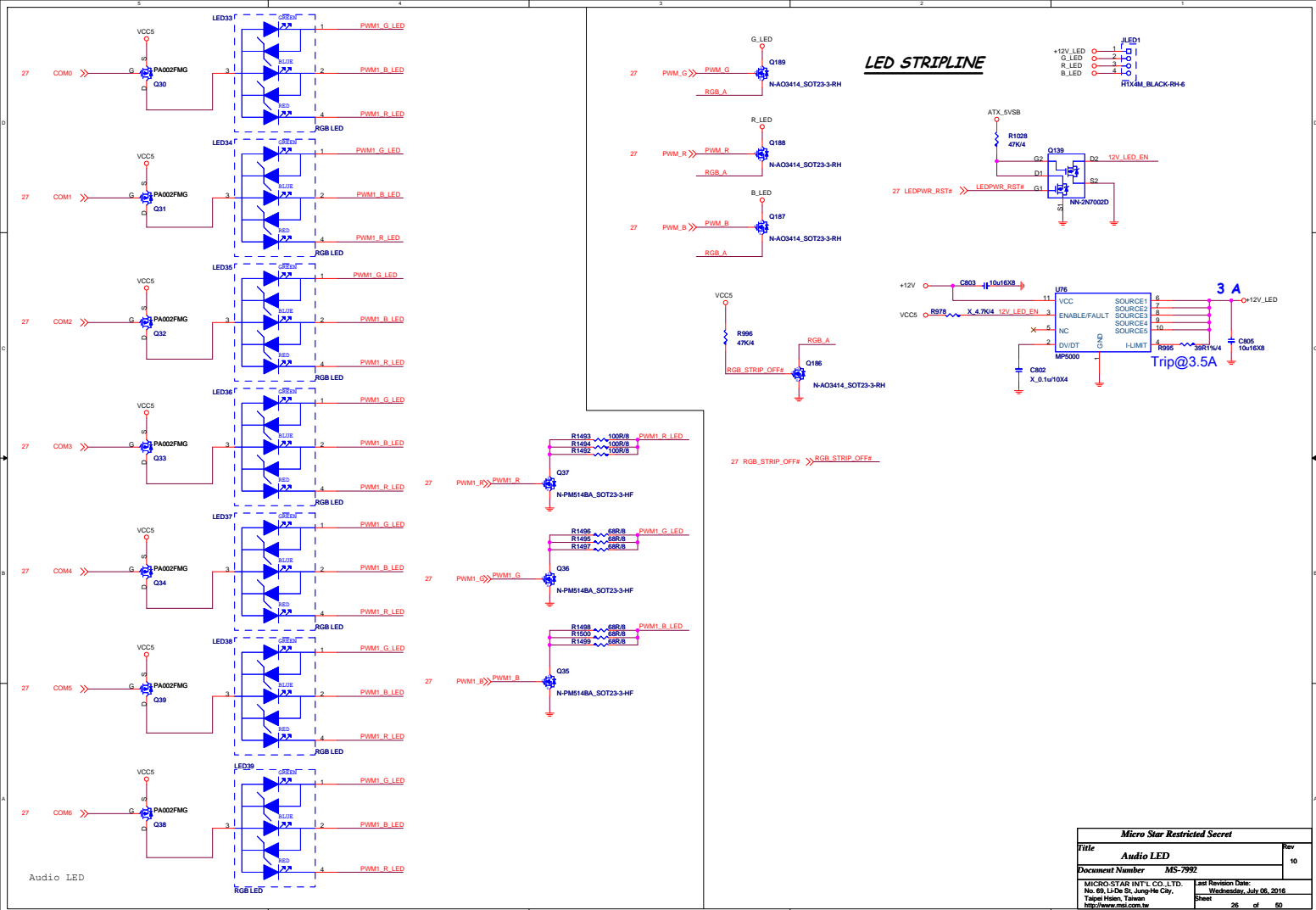


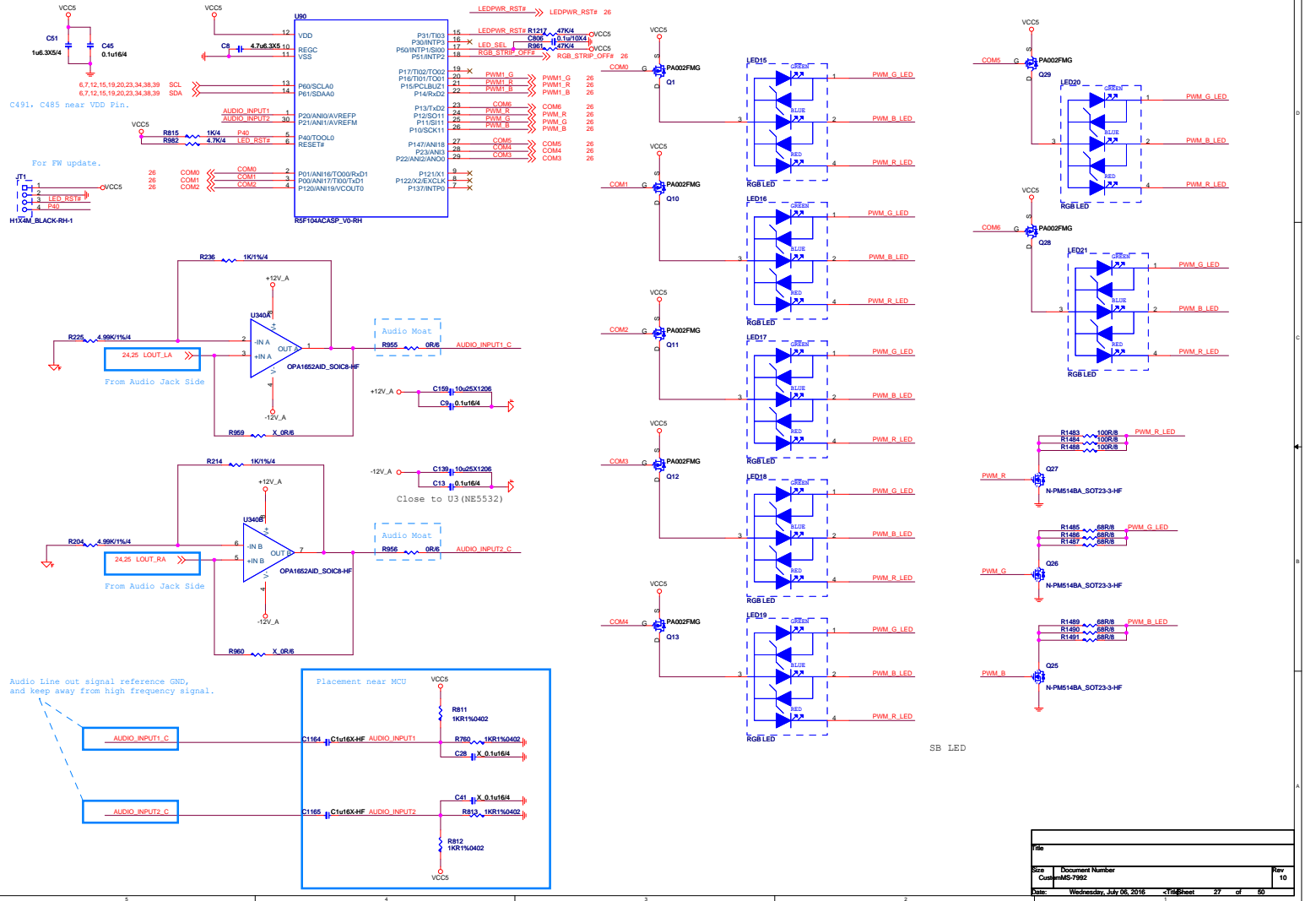
(add de-pop circuit by PM spec or customer request)



Remove SURRBACK de-pop

Micro Star Restricted Secret		
Title	Audio ALC1150-2	Rev 10
Document Number	MS-7992	
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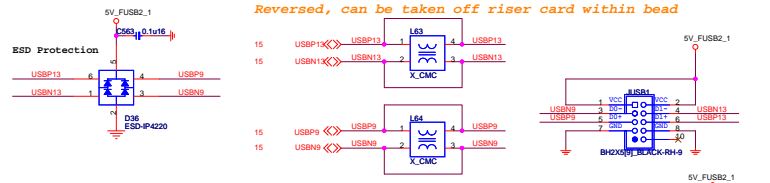


File				
Size	Document Number			Rev
C491, C485 near VDD Pin.	6.7	15	12.15.19	27
For FW update.				
Size	Document Number			Rev
6.7	15	12.15.19	27	27
H154M_BLACK-RH-1				
RSF10MACASP-V0-RH				

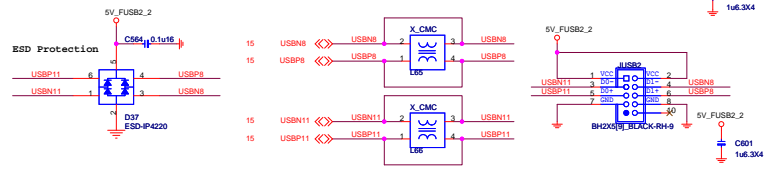
Micro Star Restricted Secret		
Title	FAN	Rev
Document Number	MS-7992	10
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan Internet: GOMALW		Last Revision Date: Wednesday, July 06, 2016
Sheet		28 of 60

FRONT PANEL USB CONNECTOR FOR USB PORT 6,7

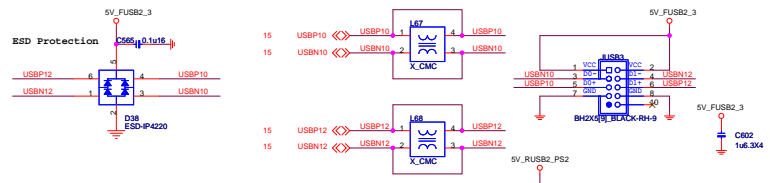
Reversed, can be taken off riser card within bead



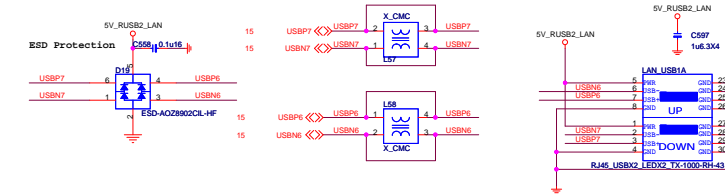
FRONT PANEL USB CONNECTOR FOR USB PORT 8,9



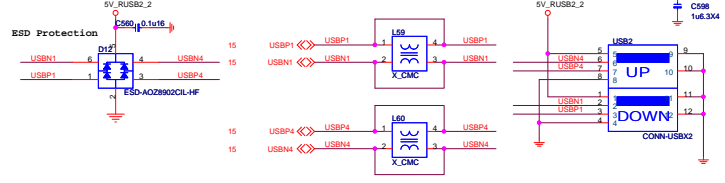
FRONT PANEL USB CONNECTOR FOR USB PORT 10,11



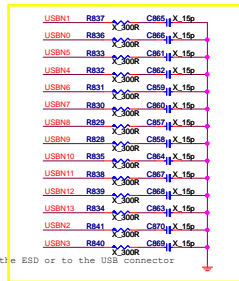
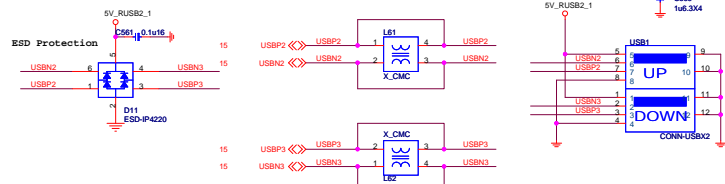
REAR PANEL USB CONNECTOR FOR USB PORT 0,1



REAR PANEL USB CONNECTOR FOR USB PORT 2,3

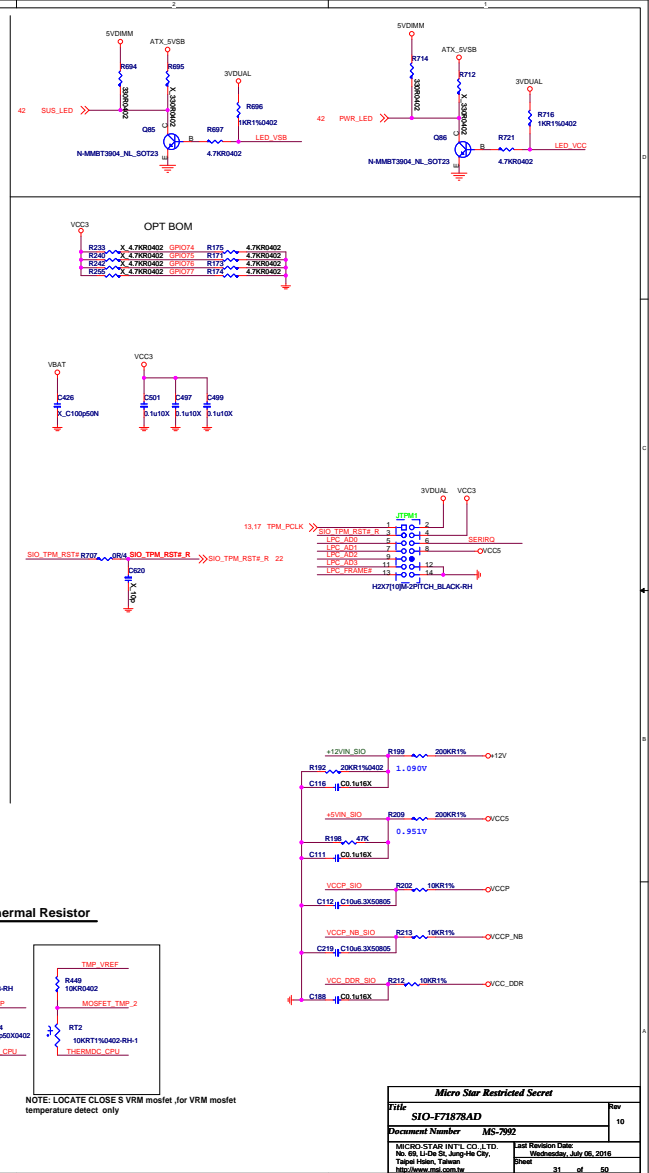


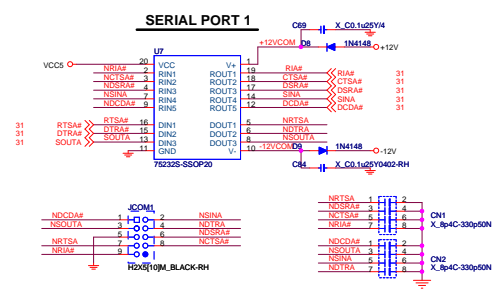
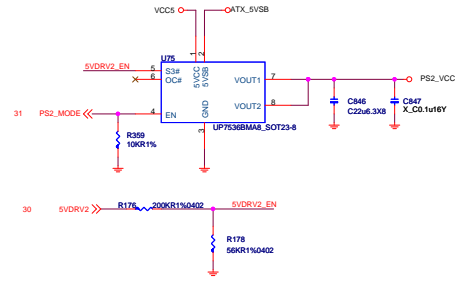
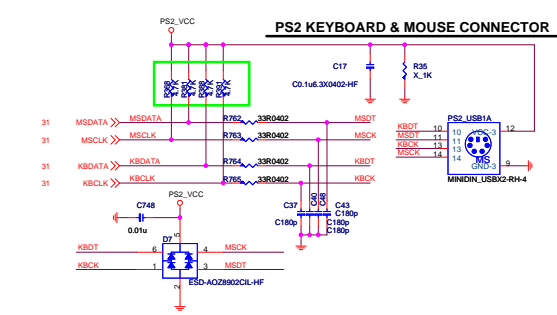
REAR PANEL USB CONNECTOR FOR USB PORT 4,5



close to the ESD or to the USB connector

Micro Star Restricted Secret		
Title	USB CONNECTORS	Rev 10
Document Number	MS-7992	
MICRO-STAR INT'L CO., LTD. No. 68, Li-Jen St., Jung-Yue City, Taipei Hsien, Taiwan http://www.msi.com.tw		
last Revision Date:	Wednesday, July 06, 2016	Sheet 29 of 80





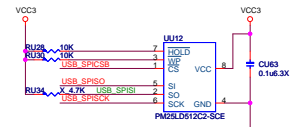
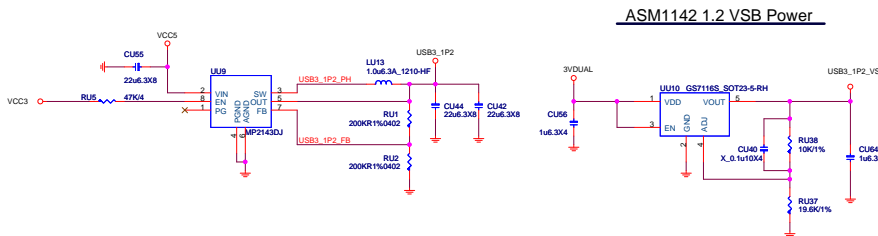
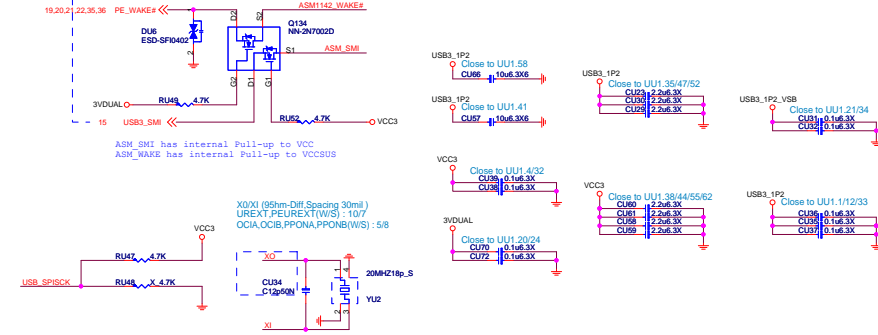
Micro Star Restricted Secret		
Title	COM&PS2	Rev 10
Document Number	MS-7992	
MACRO STAR INT'L CO. LTD. No. 89, Li-De St., Jung-Hsi City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date Wednesday, July 06, 2016
		Sheet 32 of 50

Power Consumption

USB1142

Module Pin	Module Label	Header Pin	Header Label
13	TPUSB0	4	VCC1N
14	TPUSB1	5	VCC1P
16	TPUSB2	6	EXT_L
20	3V/DUAL	7	VCCUS1N
21	USB3_1P2_VSB	8	VCCUS1P
66	GND	9	VCCUS2N
15	TPUSB3	10	VCCUS2P
		11	VDD1N
		12	VDD1P
		13	VDD2N
		14	VDD2P
		15	VDDU1N
		16	VDDU2N

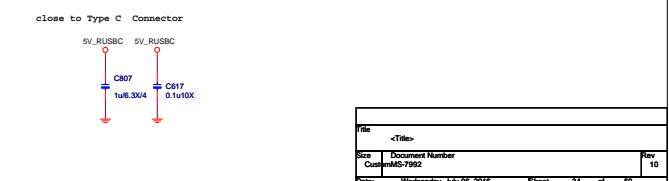
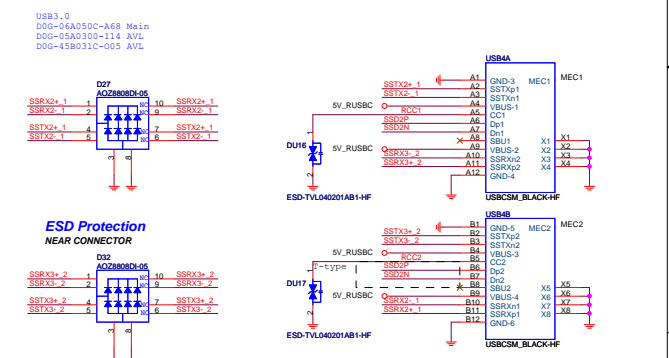
ASIM142-RH-1



ASM1042 & ASM1142 firmware difference
please contact vendor FAE

Current Mode

L = Default for 900mA
M = Mid (500K) for 1.5A
H = High (10K) for 3A

[illegible]

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Size	Document Number		Rev
Custom	MS-7992		10

Use 0.22uF cap for GEN3 , use Gen2 use 0.1uf by Upstream SPEC

CLK Rule (Follow SB PDG)
12 CK_USB_DP
12 CK_USB_DN

9 ASM_F_USB_RXP1
9 ASM_F_USB_RXN1
9 ASM_F_USB_TXP1
9 ASM_F_USB_TXN1

PCIe Rule (Follow SB PDG)

31.336 ASMUSB_RST#

ASM1142_WAKE#

ASM_SMI

VCC3

RU16 80.6K/1%

CU49 1u6.3X

USB_SPSCK1

RU54 4.7K

RU53 4.7K

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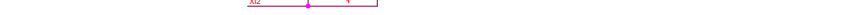
RU-241 4.7K

</

use 0.220F cap for GEN3 , use GEN2 use 0.101 by Upstream SPEC



```
(Intel SKL Use GPP_C23)
```



2. A VTB hole 62

1.) USB3.1 to Connector Total Length < 1.5"



ASMI142	E49111A	U54111A	1111A	1111A	1979.6(111W)
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ACM1142 1.2 VOLTAGE

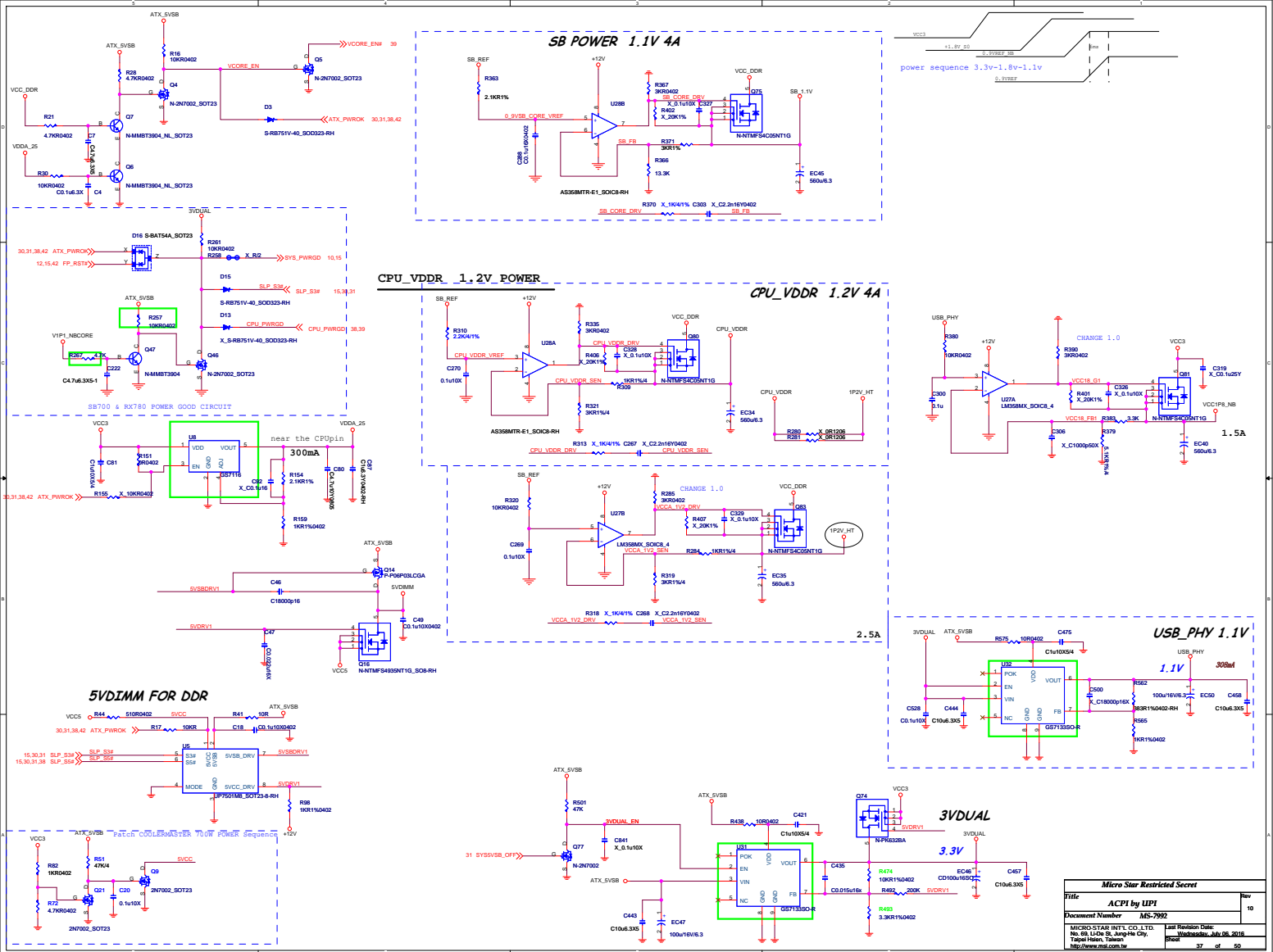


LET FROM

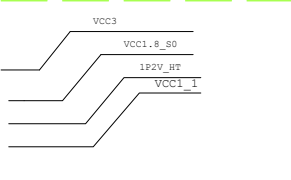


please contact vendor FAE

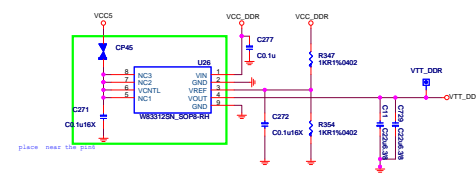
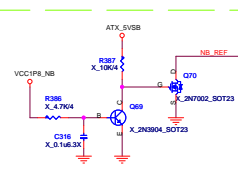
Date: Wednesday, July 06, 2016 Sheet 36 of 50



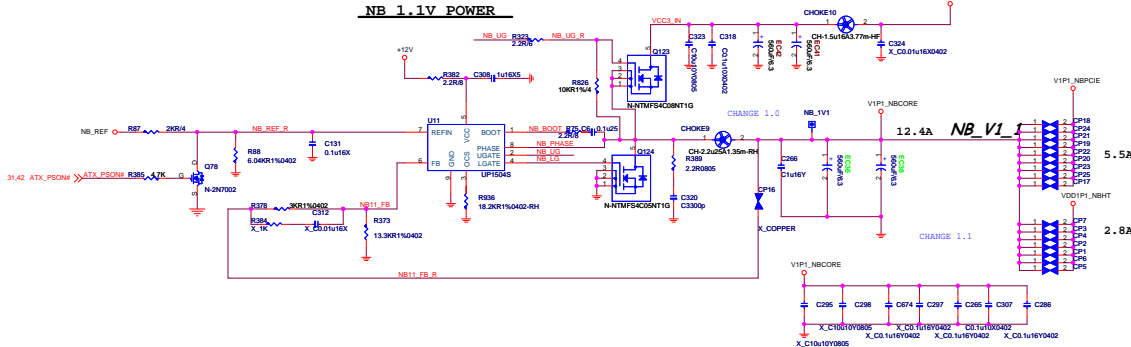
RX780 power up sequence



Reserve for RX980 PS



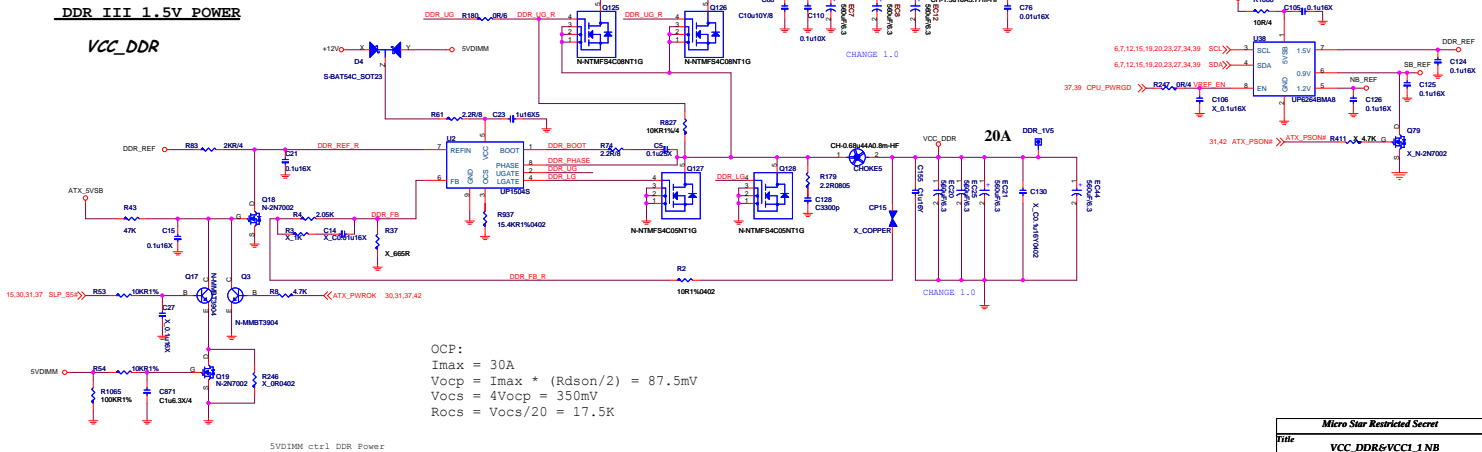
NB 1.1V POWER



OCP:
 $I_{max} = 20A$
 $V_{ocp} = I_{max} * (R_{ds(on)} / 2) = 50mV$
 $V_{ocs} = 4V_{ocp} = 200mV$
 $R_{ocs} = V_{ocs} / 20 = 10K$

DDR III 1.5V POWER

VCC_DDR

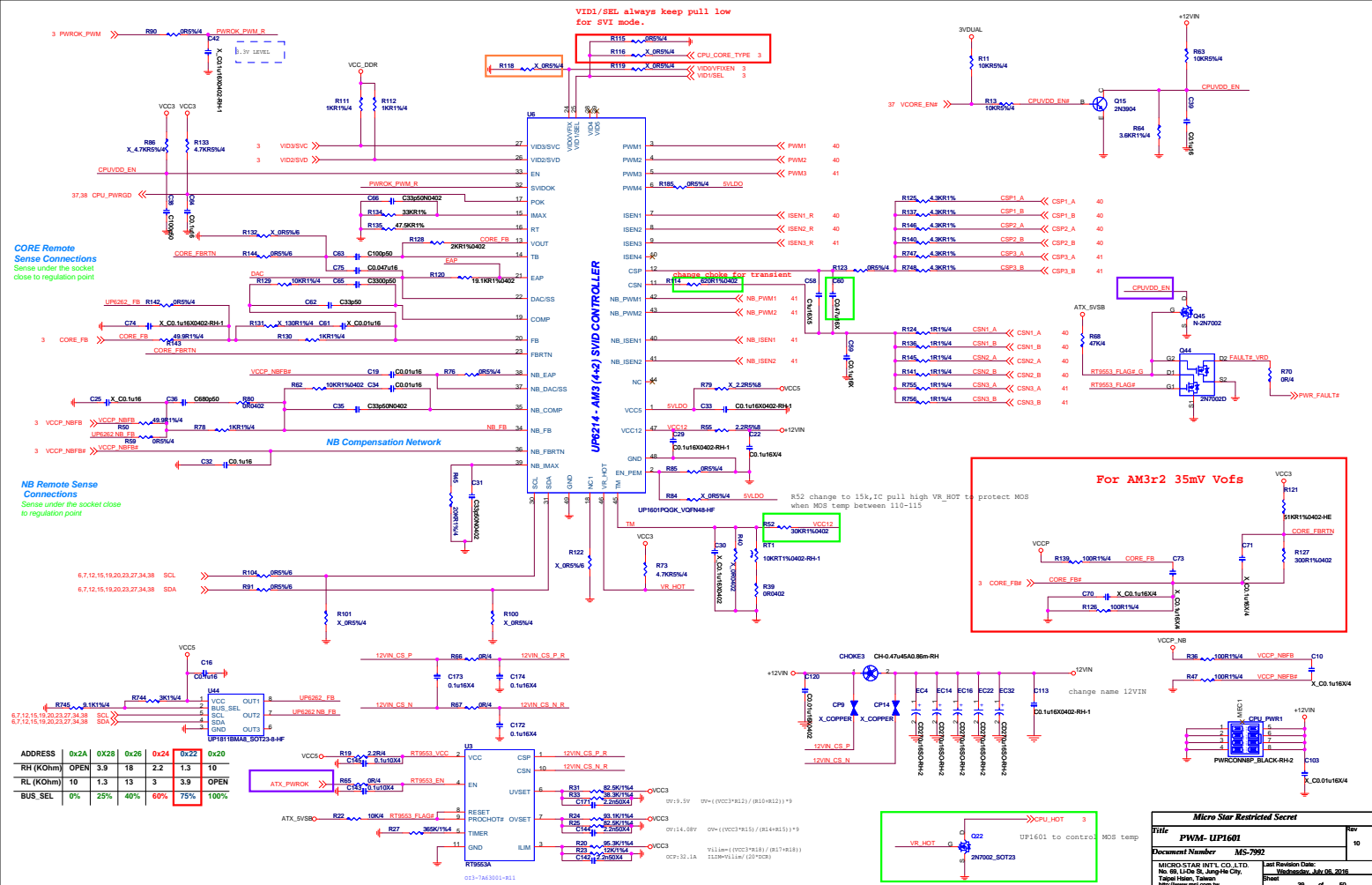


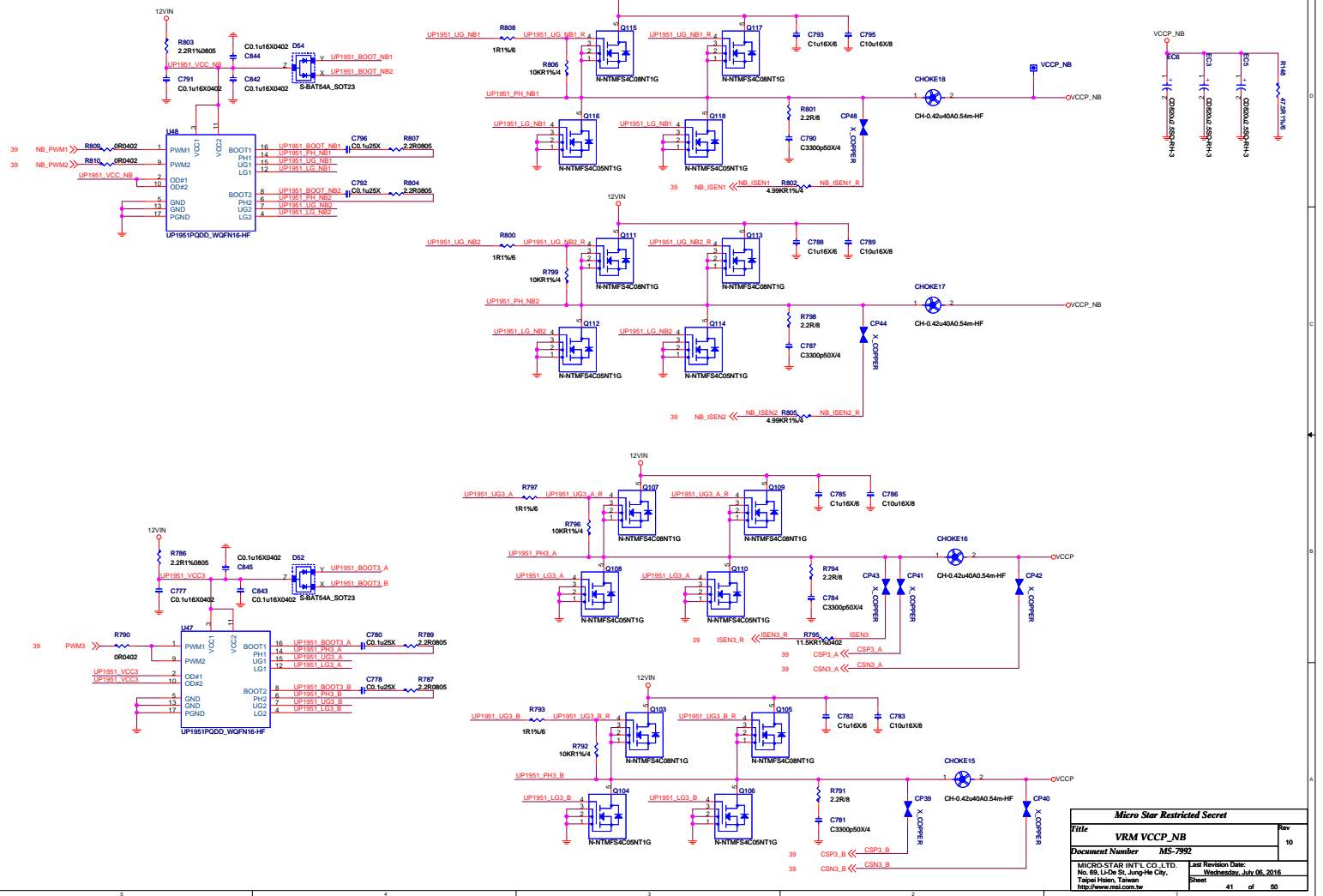
OCP:
 $I_{max} = 30A$
 $V_{ocp} = I_{max} * (R_{ds(on)} / 2) = 87.5mV$
 $V_{ocs} = 4V_{ocp} = 350mV$
 $R_{ocs} = V_{ocs} / 20 = 17.5K$

SVDDIMM ctrl DDR Power

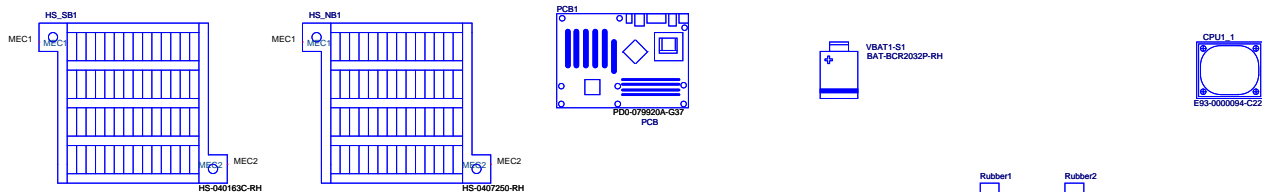
Micro Star Restricted Secret		
Title	VCC_DDR&VCC1_1_NB	Rev 10
Document Number	MS-7892	
MICRO-STAR INT'L CO., LTD. No. 56, Lida St., Junghe City, Taippei Hsien, Taiwan		
File Revision Date	Wednesday, July 26, 2018	
Drawn	38	of 50

VID1/SEL always keep pull low for SVI mode.





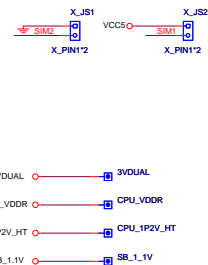
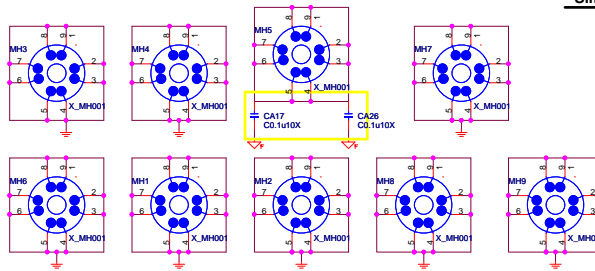
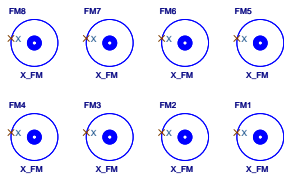
Micro Star Restricted Secret		
Title	VRM VCCP_NB	Rev 10
Document Number	MS-7992	
MACRO STAR INT'L CO., LTD. No. 69, Li-De St., Jung-Hsi City, Taipei Hsien, Taiwan		last Revision Date: Wednesday, July 06, 2016
Sheet	41	of 50



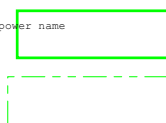
Mounting Holes

Simulation

Optics Orientation Holes



change power name



U31_LABEL
Label
E21-797801-035
U31_LABEL

LA1
AMI_BIOS
LABEL
BIOS_LABEL

Steel
Label
E21-797801-035
Steel

Nahmic
Label
E21-797801-035
Nahmic

AUD_COVER
Audio
Cover
E21-797801-035

Micro Star Restricted Secret		
Title	MANUAL PARTS	Rev
Document Number	MS-7992	10
MICRO-STAR INT'L CO., LTD. No. 88, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Wednesday, July 06, 2016 Sheet 44 of 50