



# MS-7992

## Ver:11

### 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

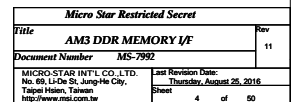
Controller--RTM880N-793

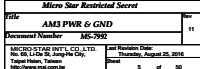
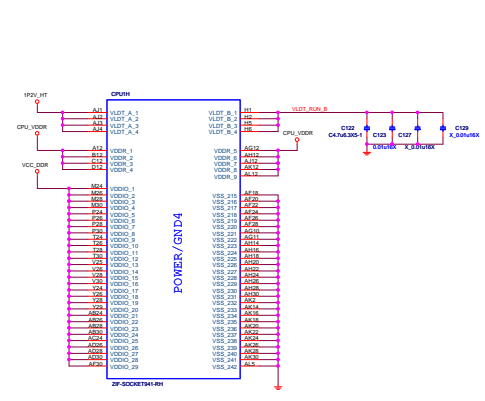
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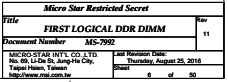
Micro Star Restricted Secret		
Title	Cover Sheet	Rev
Document Number	MS-7992	11
MACRO STAR INT'L CO., LTD. No. 69, Li-De St., Jung-Hsi City, Taipei Hsien, Taiwan <a href="http://www.msi.com.tw">http://www.msi.com.tw</a>		Last Revision Date: Thursday, August 26, 2016
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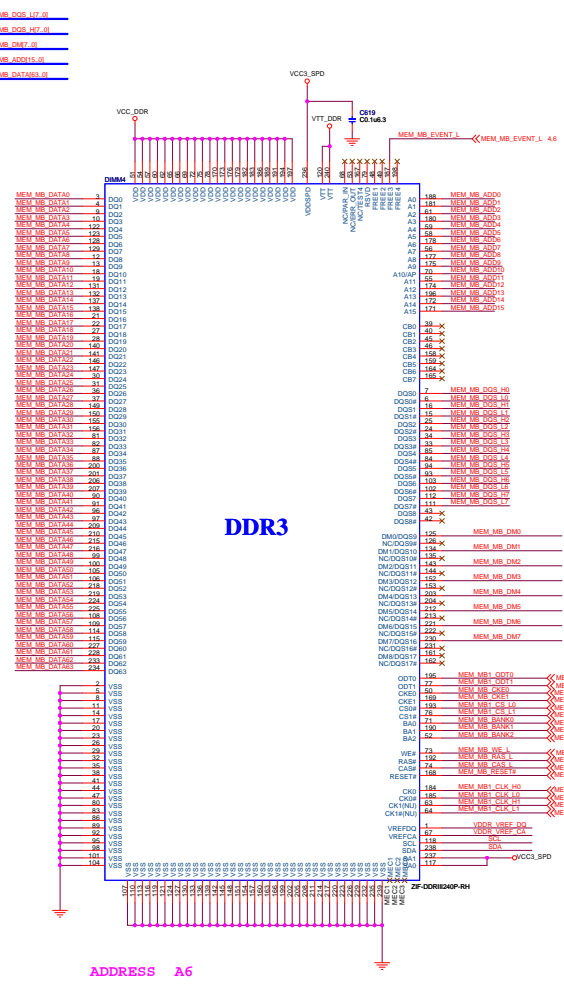
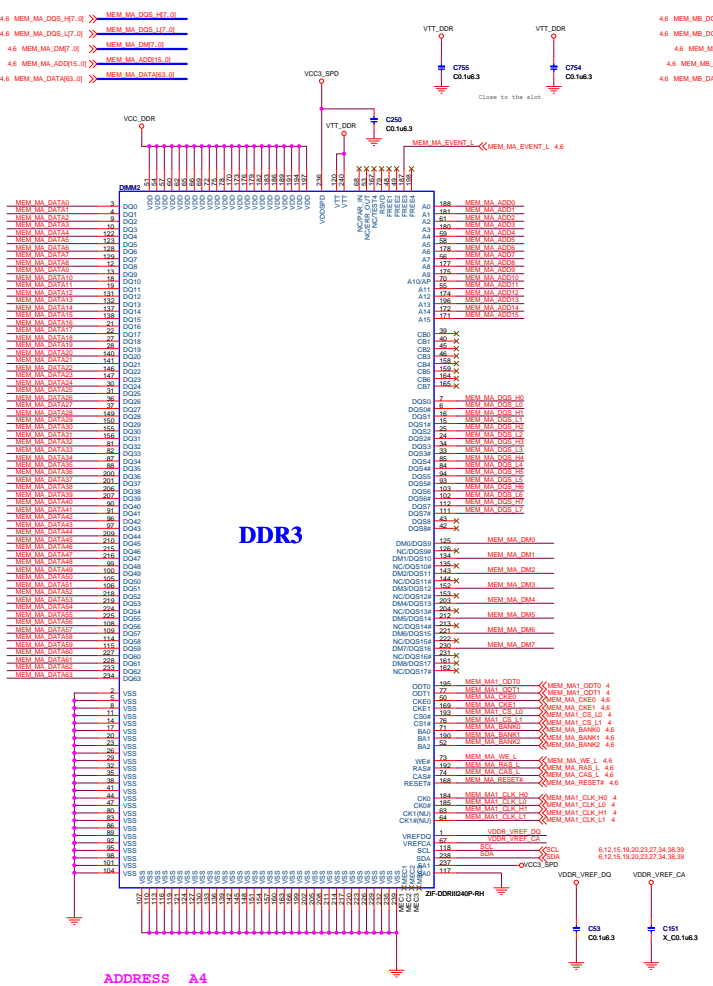








SMBus 0	
Device	8-bit Address (hex)
DIMMA0	A0
DIMMB0	A2
DIMMA1	A4
DIMMB1	A6







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  
20 GFX\_RX11N>>J4>>GFX\_RX11N>>GFX\_TX11N>>J1>>GFX\_TX11N>>20  
20 GFX\_RX10P>>H6>>GFX\_RX10P>>GFX\_TX10P>>H2>>GFX\_TX10P>>20  
20 GFX\_RX10N>>H4>>GFX\_RX10N>>GFX\_TX10N>>H1>>GFX\_TX10N>>20  
20 GFX\_RX9P>>G6>>GFX\_RX9P>>GFX\_TX9P>>G2>>GFX\_TX9P>>20  
20 GFX\_RX9N>>G4>>GFX\_RX9N>>GFX\_TX9N>>G1>>GFX\_TX9N>>20  
20 GFX\_RX8P>>F6>>GFX\_RX8P>>GFX\_TX8P>>F2>>GFX\_TX8P>>20  
20 GFX\_RX8N>>F4>>GFX\_RX8N>>GFX\_TX8N>>F1>>GFX\_TX8P>>20  
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  
19 GFX\_RX5P>>A6>>GFX\_RX5P>>GFX\_TX5P>>A2>>GFX\_TX5P>>19  
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19 GFX\_RX4P>>E7>>GFX\_RX4P>>GFX\_TX4P>>E2>>GFX\_TX4P>>19  
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>>E11>>GFX\_RX1N>>GFX\_TX1N>>E1>>GFX\_TX1N>>19  
19 GFX\_RX0P>>F11>>GFX\_RX0P>>GFX\_TX0P>>F2>>GFX\_TX0P>>19  
19 GFX\_RX0N>>F11>>GFX\_RX0N>>GFX\_TX0N>>F1>>GFX\_TX0N>>19

PCIE GPP1

XAC9>>GFX2\_RX15P>>GFX2\_TX15P>>AE9>>  
XAD9>>GFX2\_RX14N>>GFX2\_TX14N>>AG9>>  
XAE9>>GFX2\_RX14P>>GFX2\_TX14P>>AG8>>  
XAF9>>GFX2\_RX14N>>GFX2\_TX14N>>AG7>>  
XAG9>>GFX2\_RX13P>>GFX2\_TX13P>>AG6>>  
XAH9>>GFX2\_RX13N>>GFX2\_TX13N>>AG5>>  
XAI9>>GFX2\_RX12P>>GFX2\_TX12P>>AG4>>  
XAJ9>>GFX2\_RX12N>>GFX2\_TX12N>>AG3>>  
XAK9>>GFX2\_RX11P>>GFX2\_TX11P>>AG2>>  
XAL9>>GFX2\_RX11N>>GFX2\_TX11N>>AG1>>  
XAM9>>GFX2\_RX10P>>GFX2\_TX10P>>AG0>>  
XAN9>>GFX2\_RX9P>>GFX2\_TX9P>>AC9>>  
XAO9>>GFX2\_RX9N>>GFX2\_TX9N>>AC8>>  
XAP9>>GFX2\_RX8P>>GFX2\_TX8P>>AC7>>  
XAQ9>>GFX2\_RX8N>>GFX2\_TX8N>>AC6>>  
XAR9>>GFX2\_RX7P>>GFX2\_TX7P>>AC5>>  
XAS9>>GFX2\_RX7N>>GFX2\_TX7N>>AC4>>  
XAT9>>GFX2\_RX6P>>GFX2\_TX6P>>AC3>>  
XAU9>>GFX2\_RX6N>>GFX2\_TX6N>>AC2>>  
XAV9>>GFX2\_RX5P>>GFX2\_TX5P>>AC1>>  
XAW9>>GFX2\_RX5N>>GFX2\_TX5N>>AC0>>  
XAX9>>GFX2\_RX4P>>GFX2\_TX4P>>AC9>>  
XAY9>>GFX2\_RX4N>>GFX2\_TX4N>>AC8>>  
XAZ9>>GFX2\_RX3P>>GFX2\_TX3P>>AC7>>  
XBA9>>GFX2\_RX3N>>GFX2\_TX3N>>AC6>>  
XBB9>>GFX2\_RX2P>>GFX2\_TX2P>>AC5>>  
XBC9>>GFX2\_RX2N>>GFX2\_TX2N>>AC4>>  
XBD9>>GFX2\_RX1P>>GFX2\_TX1P>>AC3>>  
XBE9>>GFX2\_RX1N>>GFX2\_TX1N>>AC2>>  
XBF9>>GFX2\_RX0P>>GFX2\_TX0P>>AC1>>  
XBG9>>GFX2\_RX0N>>GFX2\_TX0N>>AC0>>

PCIE GPP2

XAD11>>GPP\_RX9P>>GPP\_TX9P>>AH19>>  
XAD12>>GPP\_RX9N>>GPP\_TX9N>>AH18>>  
XAD13>>GPP\_RX8P>>GPP\_TX8P>>AH17>>  
XAD14>>GPP\_RX8N>>GPP\_TX8N>>AH16>>  
XAD15>>GPP\_RX7P>>GPP\_TX7P>>AH15>>  
XAD16>>GPP\_RX7N>>GPP\_TX7N>>AH14>>  
XAD17>>GPP\_RX6P>>GPP\_TX6P>>AH13>>  
XAD18>>GPP\_RX6N>>GPP\_TX6N>>AH12>>  
XAD19>>GPP\_RX5P>>GPP\_TX5P>>AH11>>  
XAD20>>GPP\_RX5N>>GPP\_TX5N>>AH10>>  
XAD21>>GPP\_RX4P>>GPP\_TX4P>>AH9>>  
XAD22>>GPP\_RX4N>>GPP\_TX4N>>AH8>>  
XAD23>>GPP\_RX3P>>GPP\_TX3P>>AH7>>  
XAD24>>GPP\_RX3N>>GPP\_TX3N>>AH6>>  
XAD25>>GPP\_RX2P>>GPP\_TX2P>>AH5>>  
XAD26>>GPP\_RX2N>>GPP\_TX2N>>AH4>>  
XAD27>>GPP\_RX1P>>GPP\_TX1P>>AH3>>  
XAD28>>GPP\_RX1N>>GPP\_TX1N>>AH2>>  
XAD29>>GPP\_RX0P>>GPP\_TX0P>>AH1>>  
XAD30>>GPP\_RX0N>>GPP\_TX0N>>AH0>>

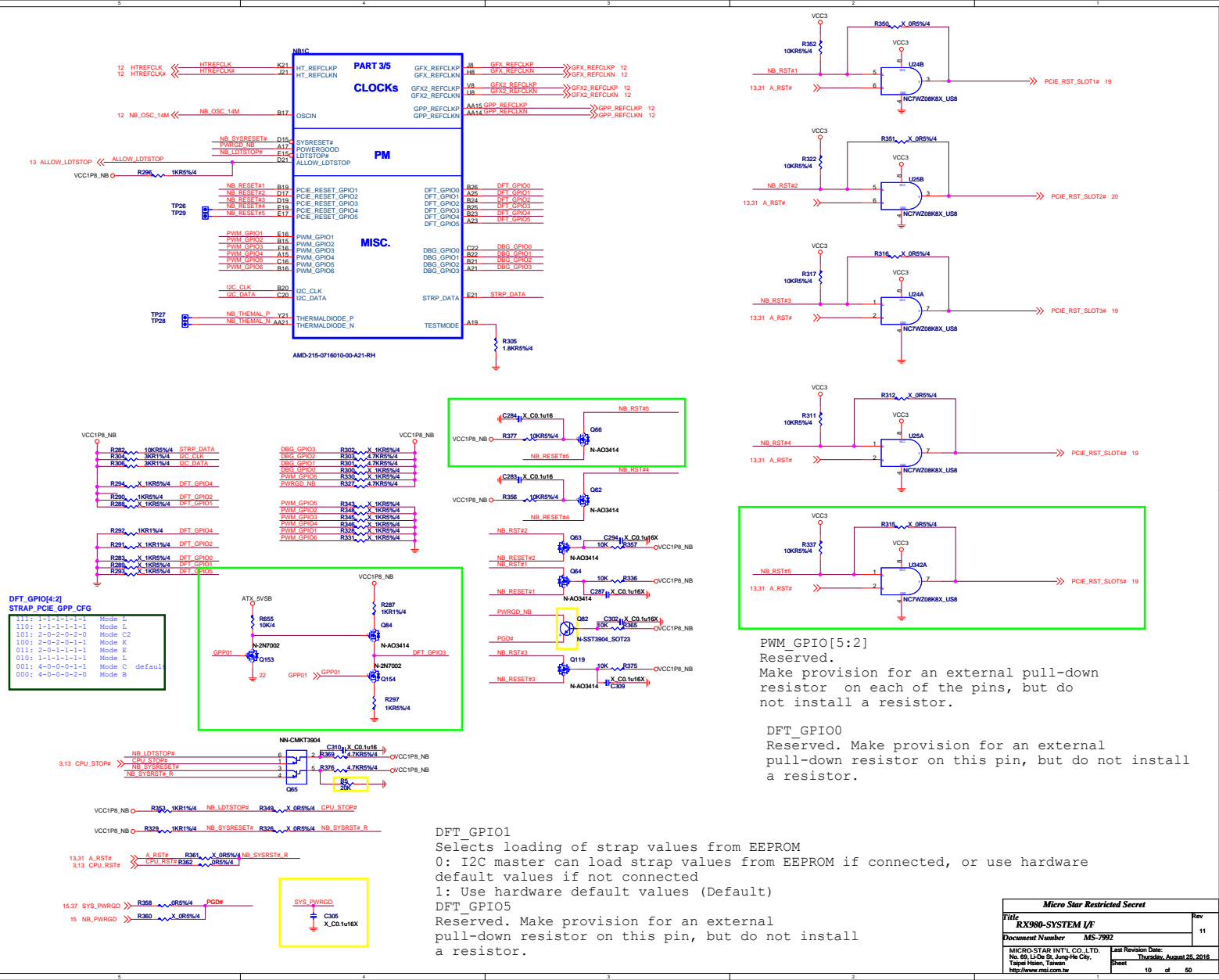
PCIE GPP3

XAD31>>GPP\_RX4P>>GPP\_TX4P>>AH19>>  
XAD32>>GPP\_RX4N>>GPP\_TX4N>>AH18>>  
XAD33>>GPP\_RX3P>>GPP\_TX3P>>AH17>>  
XAD34>>GPP\_RX3N>>GPP\_TX3N>>AH16>>  
XAD35>>GPP\_RX2P>>GPP\_TX2P>>AH15>>  
XAD36>>GPP\_RX2N>>GPP\_TX2N>>AH14>>  
XAD37>>GPP\_RX1P>>GPP\_TX1P>>AH13>>  
XAD38>>GPP\_RX1N>>GPP\_TX1N>>AH12>>  
XAD39>>GPP\_RX0P>>GPP\_TX0P>>AH11>>  
XAD40>>GPP\_RX0N>>GPP\_TX0N>>AH10>>

PCIE ALINK

AC21>>SB\_RX3P>>SB\_TX3P>>AG22>>  
AC22>>SB\_RX3N>>SB\_TX3N>>AG21>>  
AC23>>SB\_RX2P>>SB\_TX2P>>AG20>>  
AC24>>SB\_RX2N>>SB\_TX2N>>AG19>>  
AC25>>SB\_RX1P>>SB\_TX1P>>AG18>>  
AC26>>SB\_RX1N>>SB\_TX1N>>AG17>>  
AC27>>SB\_RX0P>>SB\_TX0P>>AG16>>  
AC28>>SB\_RX0N>>SB\_TX0N>>AG15>>

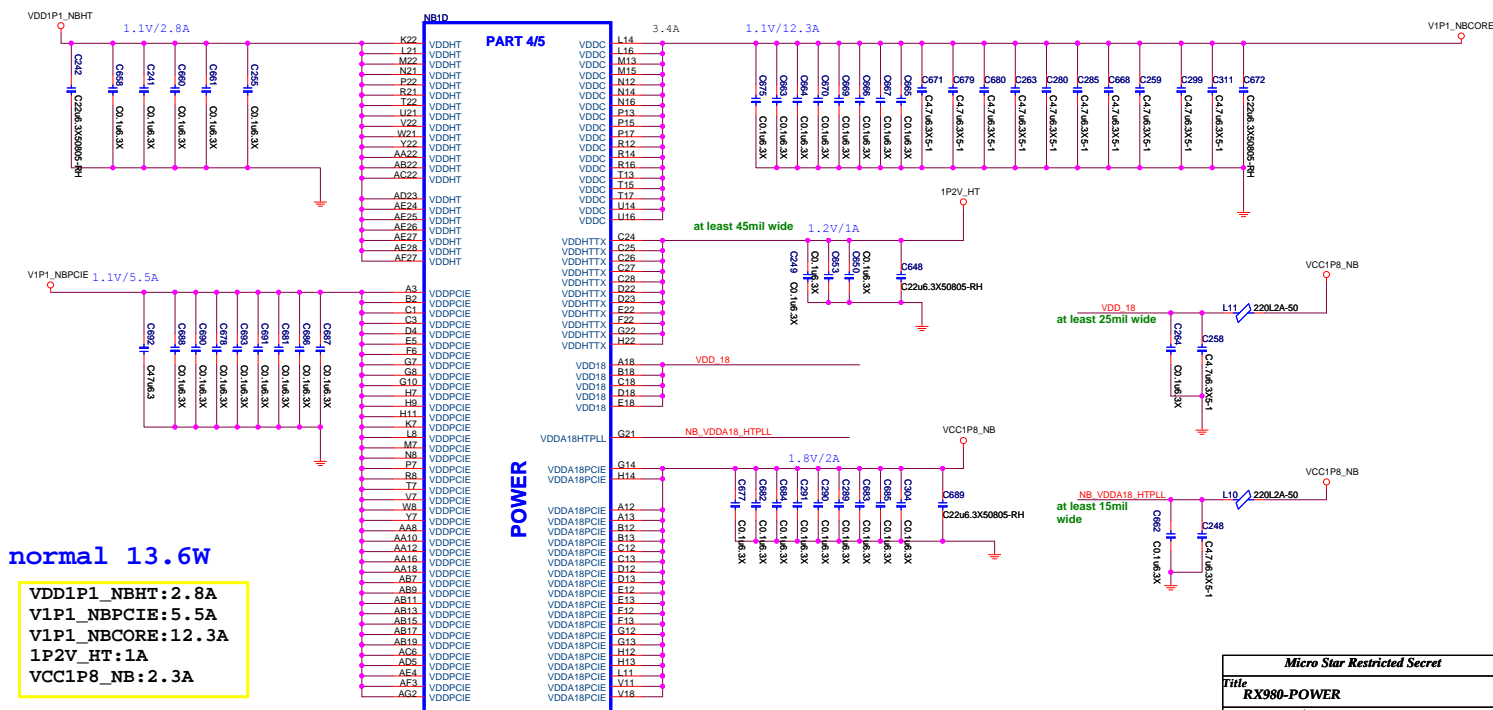
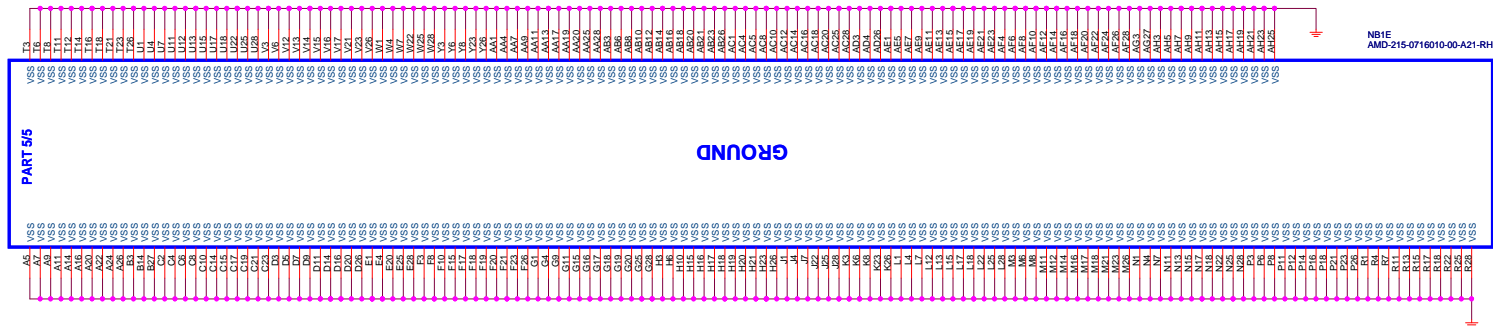
AMD-215-0718010-00-A21-RH



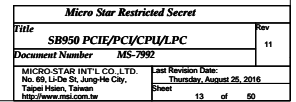
PWM\_GPIO[5:2]  
Reserved.  
Make provision for an external pull-down resistor on each of the pins, but do not install a resistor.

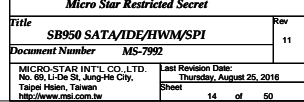
DFT\_GPIO0  
Reserved. Make provision for an external pull-down resistor on this pin, but do not install a resistor.

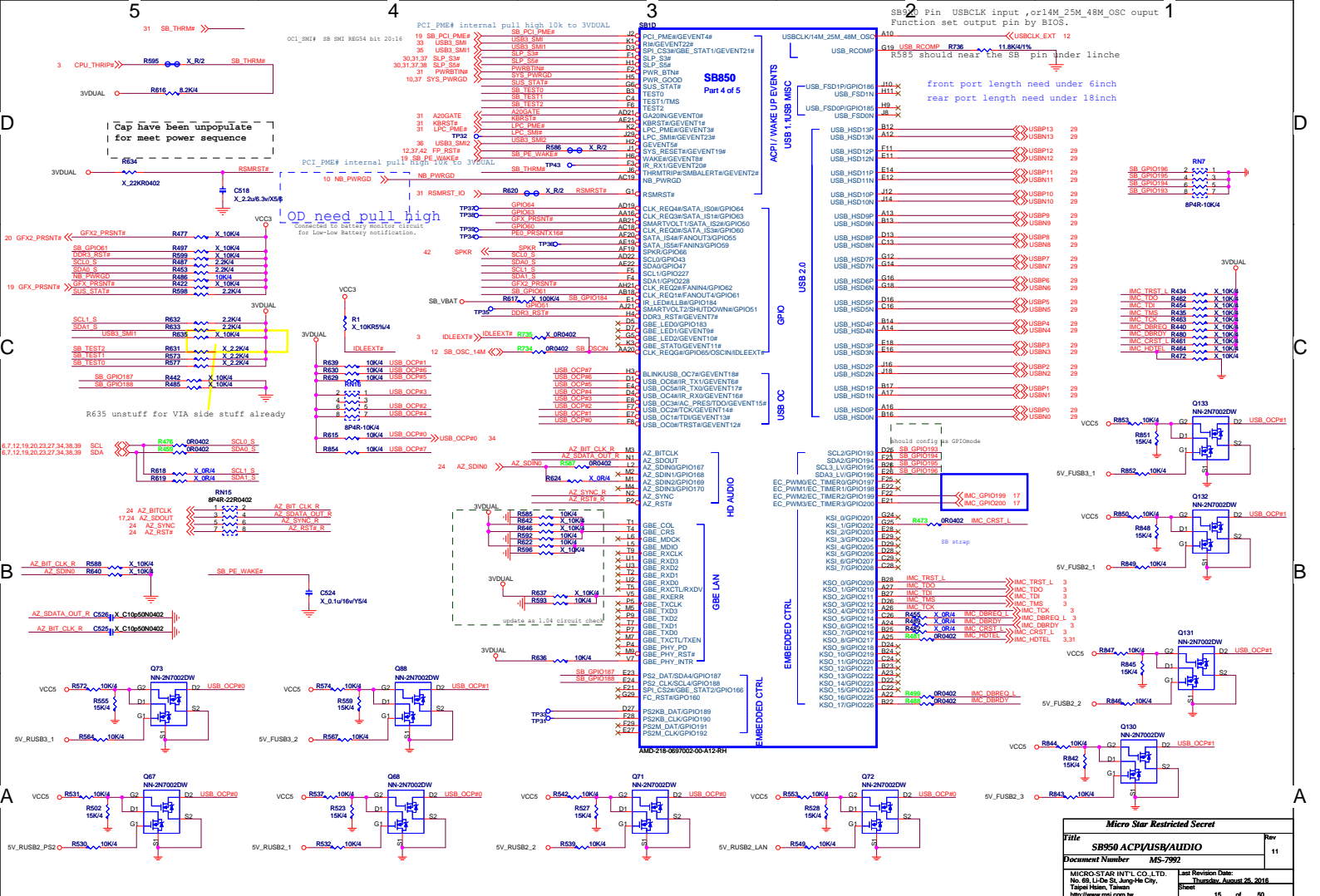
DFT\_GPIO1  
Selects loading of strap values from EEPROM  
0: I2C master can load strap values from EEPROM if connected, or use hardware default values if not connected  
1: Use hardware default values (Default)  
DFT\_GPIO5  
Reserved. Make provision for an external pull-down resistor on this pin, but do not install a resistor.

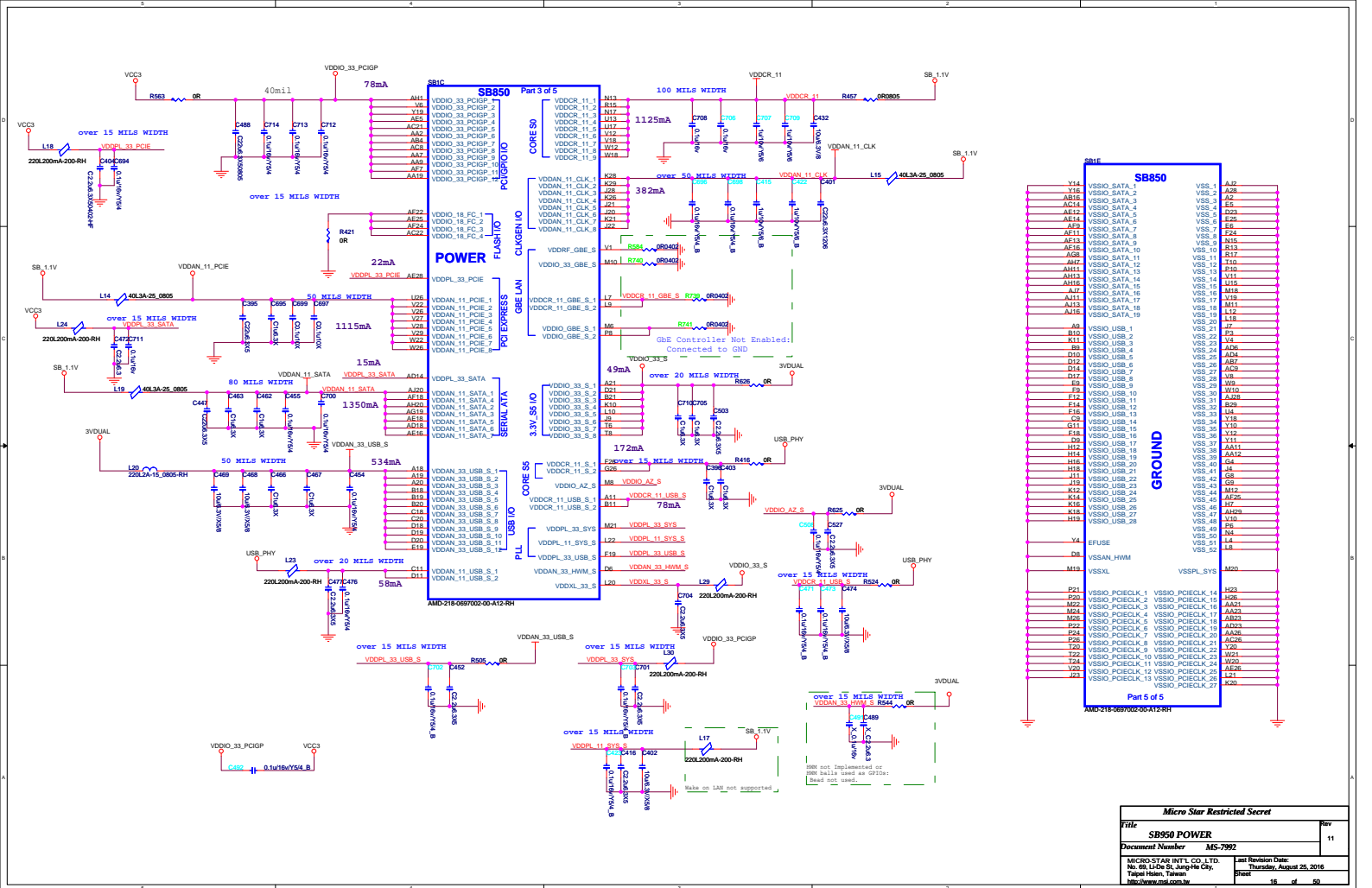








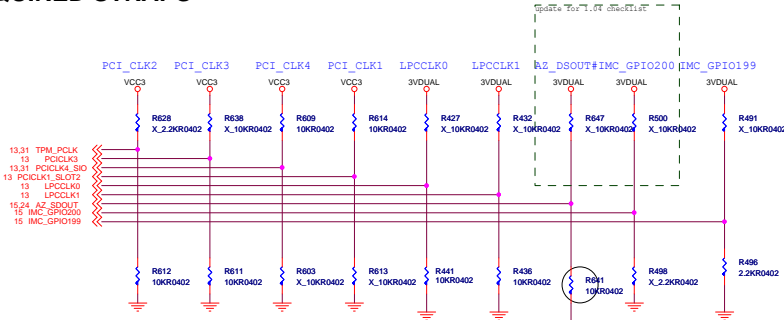






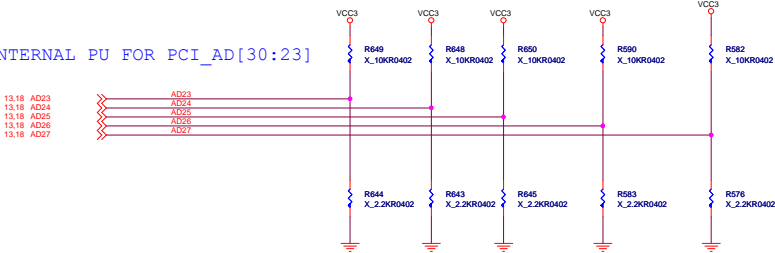
REQUIRED STRAPS

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]

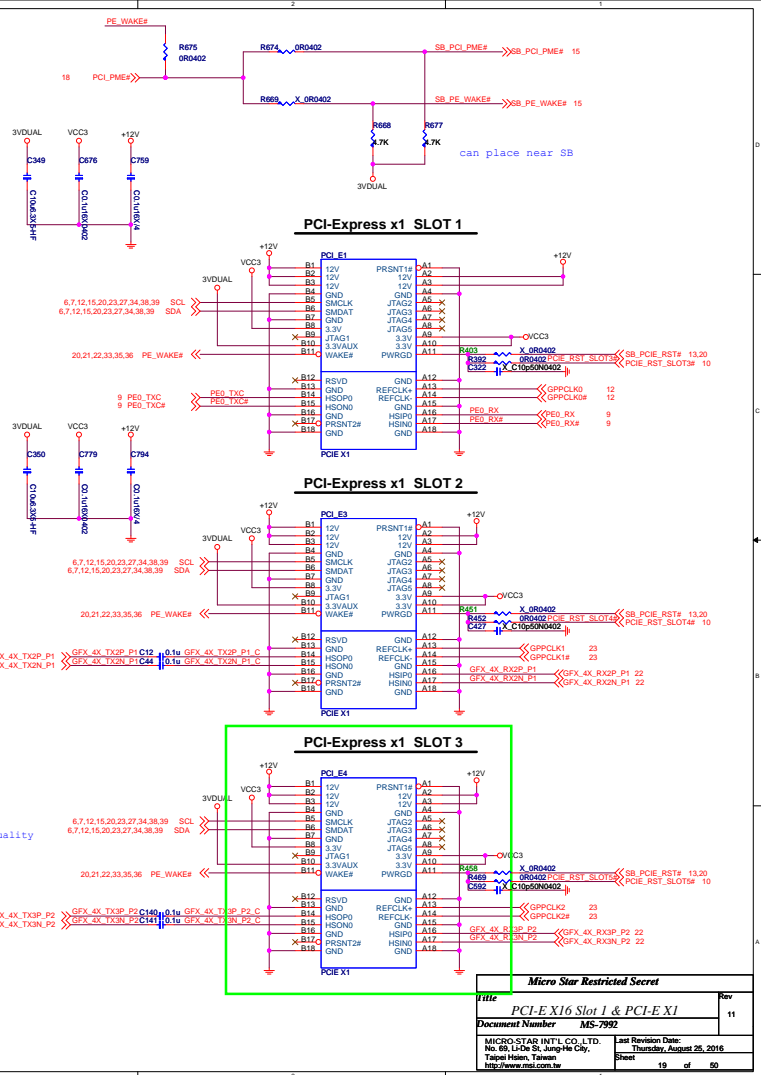


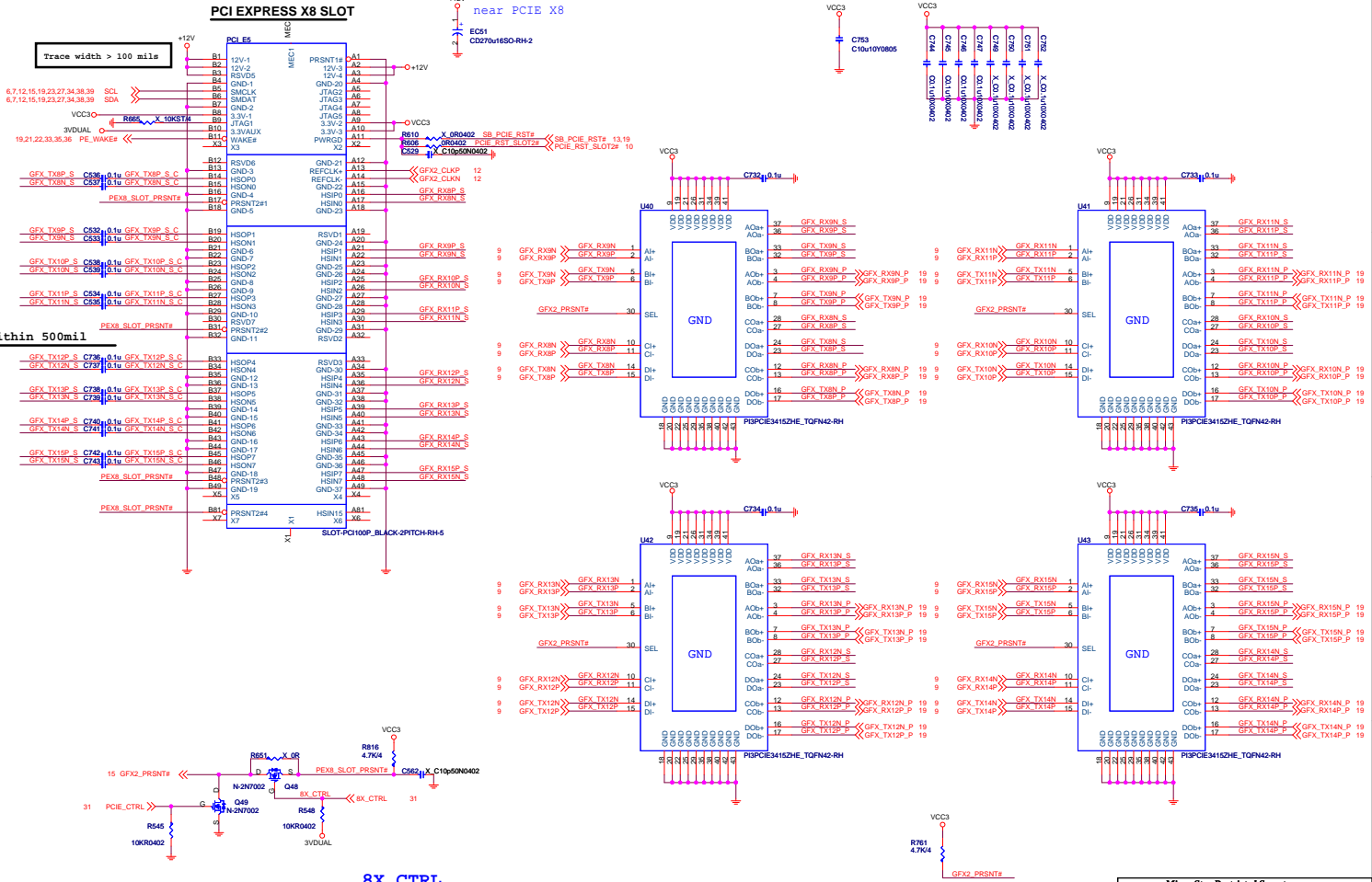
DEBUG STRAPS

	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

Micro Star Restricted Secret		
Title	SB950 STRAPS	Rev 11
Document Number	MS-7992	
MICRO-STAR INT'L CO., LTD. No. 66, Li-Fu St., Jung-Hsi City, Taipei Hsien, Taiwan <a href="http://www.msi.com.tw">http://www.msi.com.tw</a>		
Last Revision Date:		Thursday, August 25, 2016
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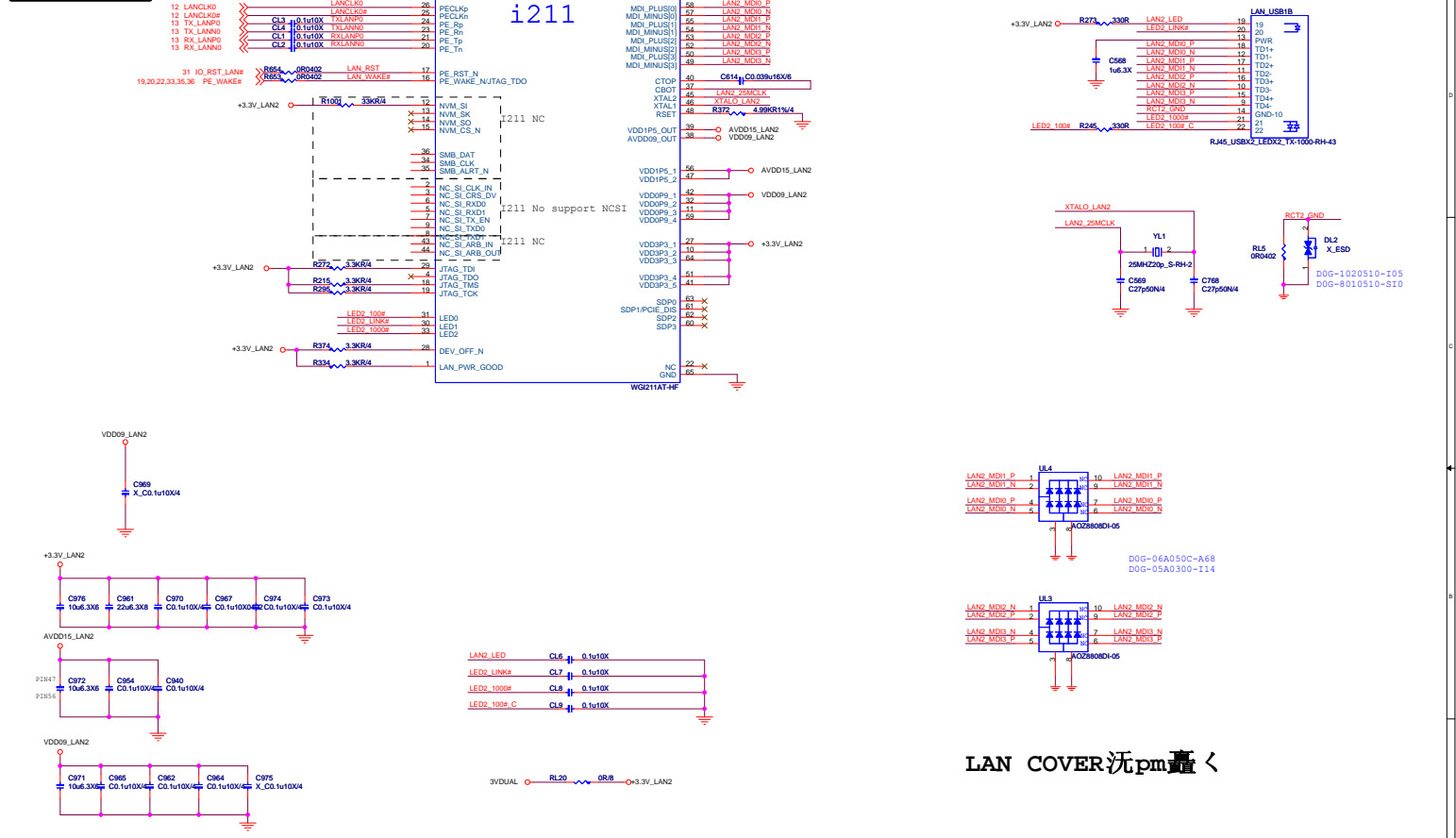


8X\_CTRL

0: BIOS MODE  
1: HW MODE

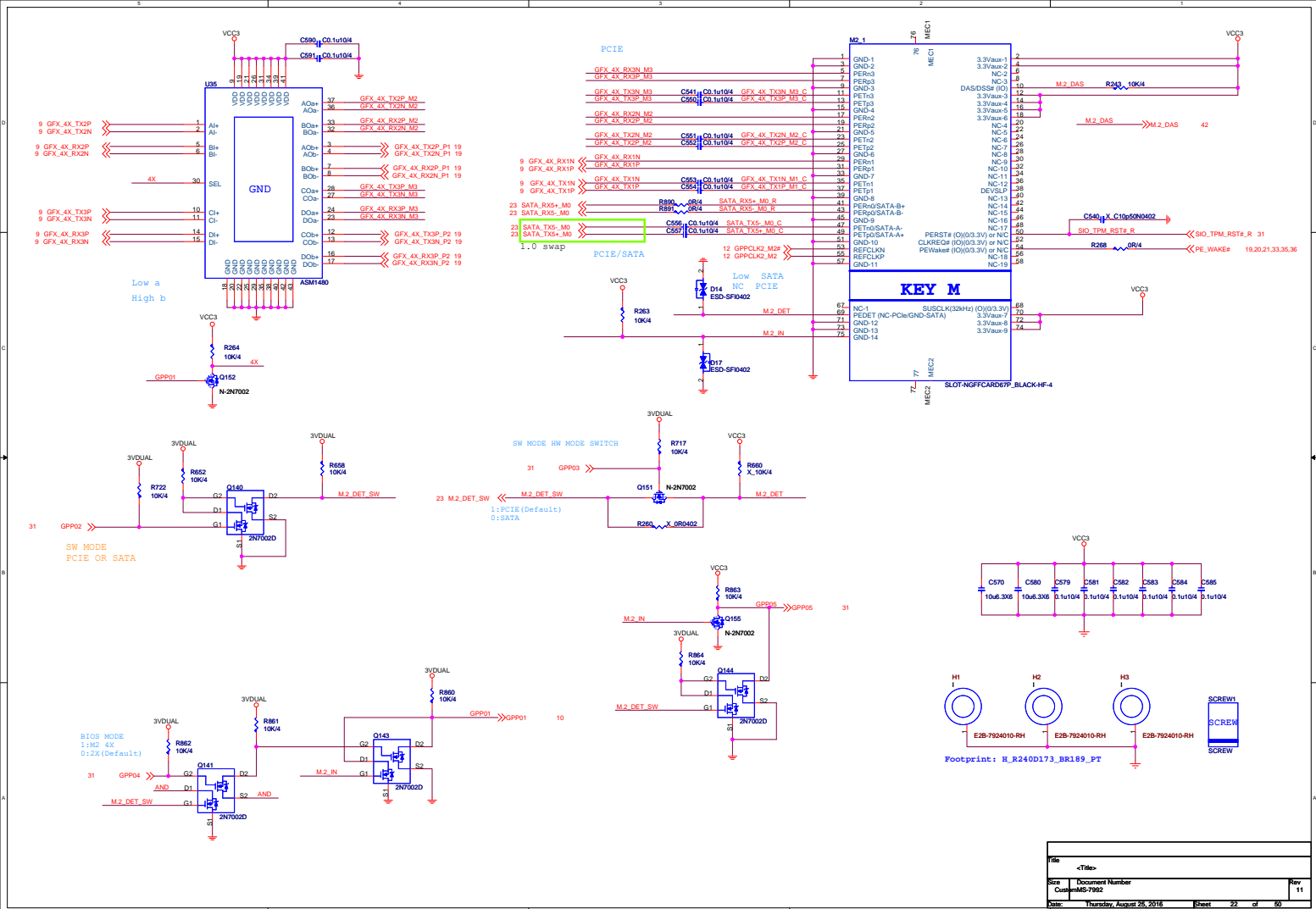
Micro Star Restricted Secret		
Title	PCI.E X8	Rev 11
Document Number	MS-7992	
MICRO STAR INT'L CO., LTD. No. 89, Li-De St., Jung-Hsue City, Taipei Hsien, Taiwan <a href="http://www.msi.com.tw">http://www.msi.com.tw</a>		1st Revision Date: Thursday, August 26, 2016
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LAN2-- I211AT

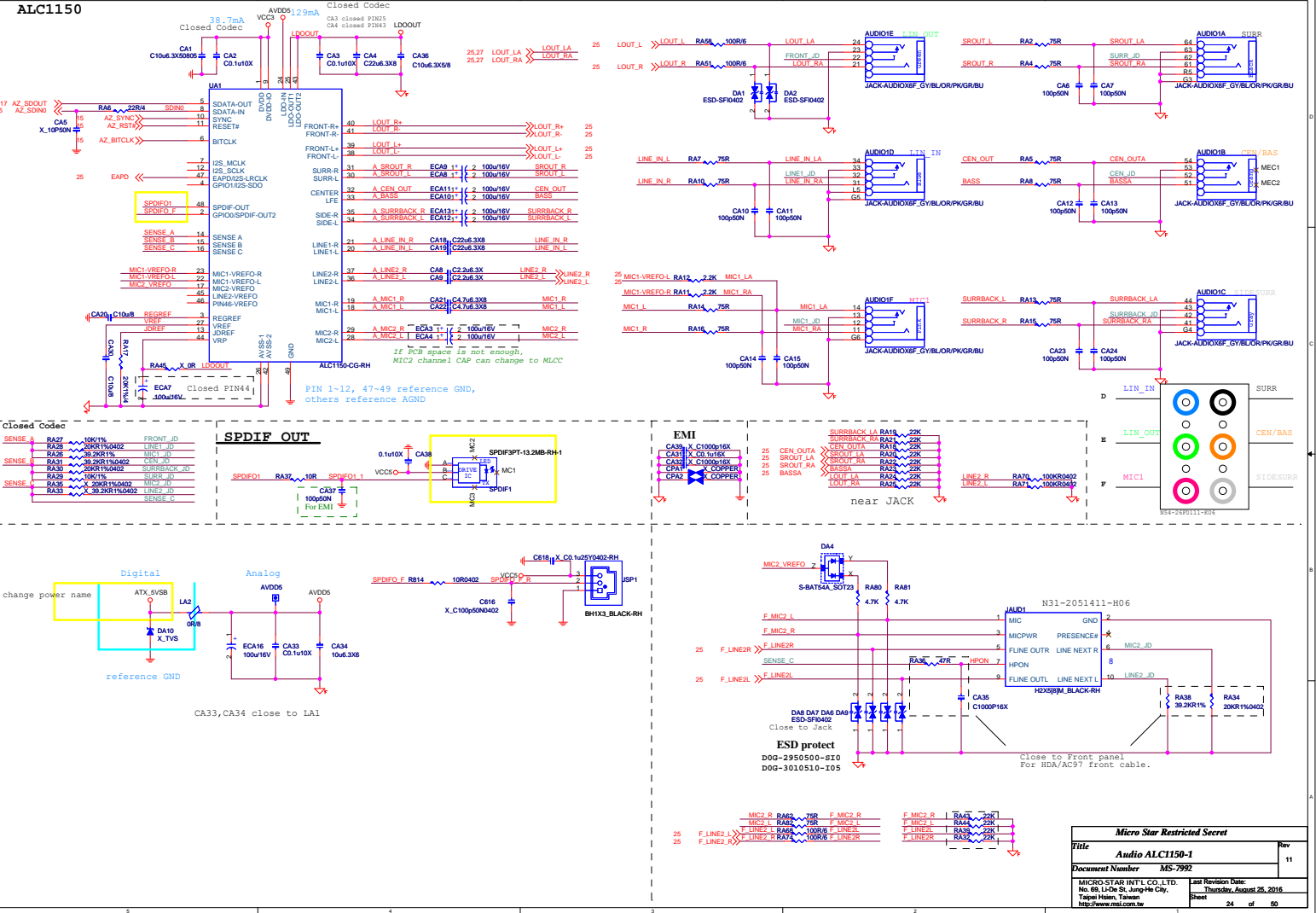


LAN COVER洗pm轟く

Micro Star Restricted Secret		
Title	LAN - Killer E2205	Rev 11
Document Number	MS-7992	
MACRO STAR INT'L CO. LTD. No. 69, Li-De St., Jung-Ha City, Taipei Hsien, Taiwan http://www.msi.com.tw		Rev 11
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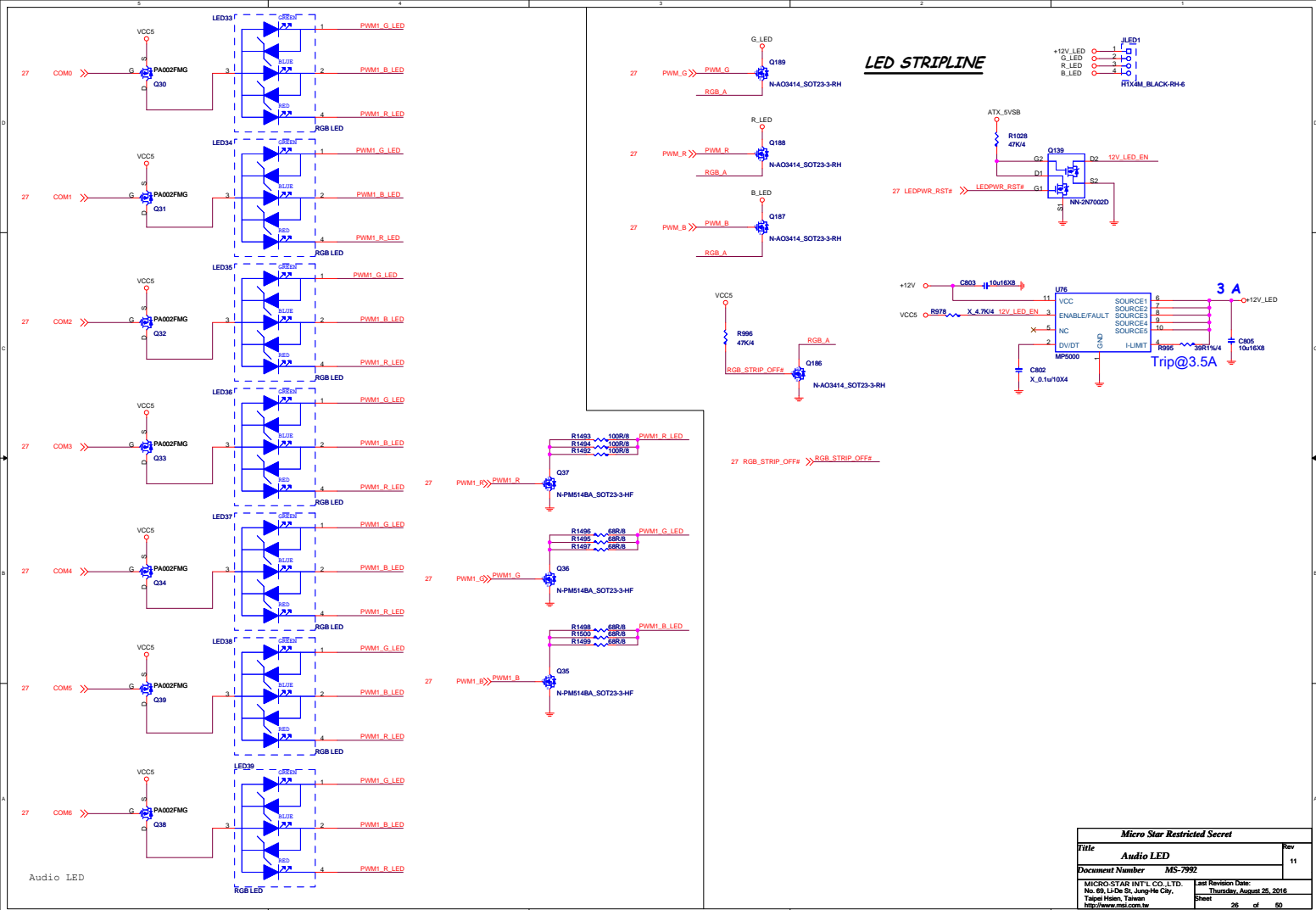


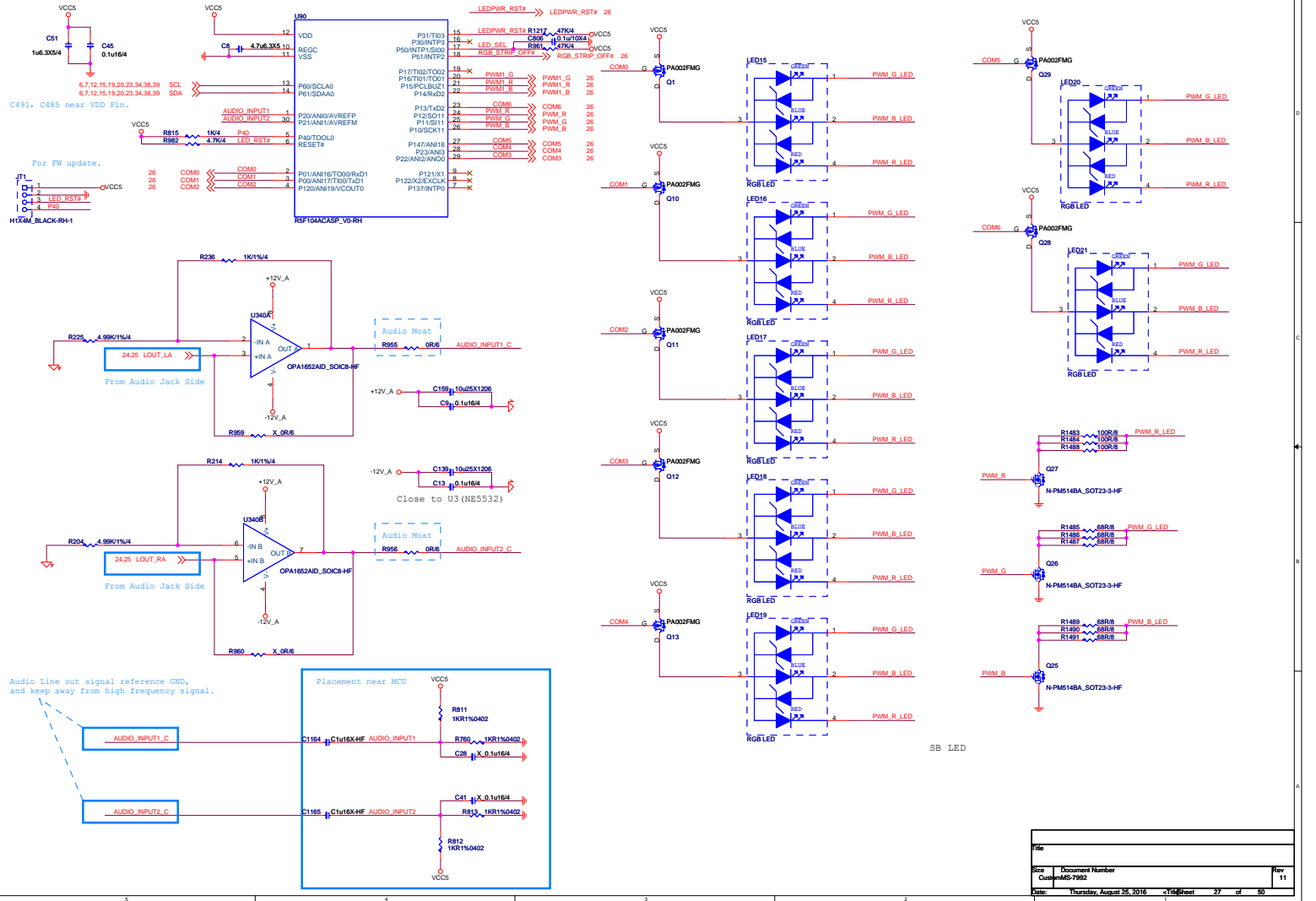








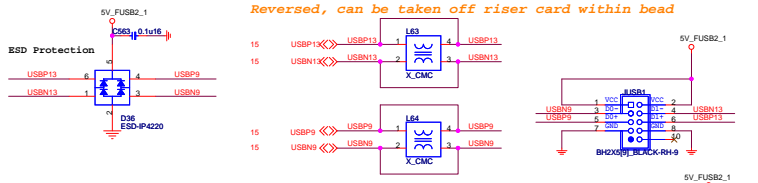




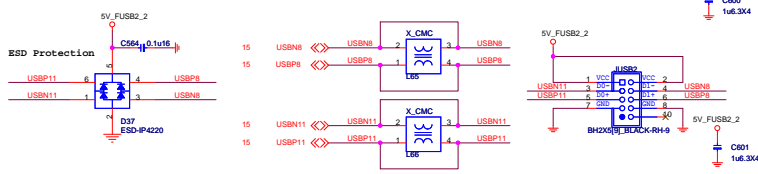


# FRONT PANEL USB CONNECTOR FOR USB PORT 6,7

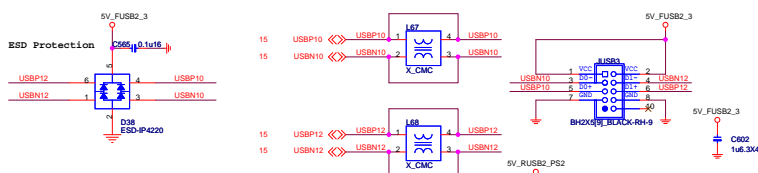
Reversed, can be taken off riser card within bead



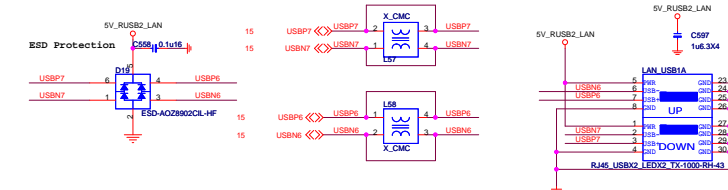
## FRONT PANEL USB CONNECTOR FOR USB PORT 8,9



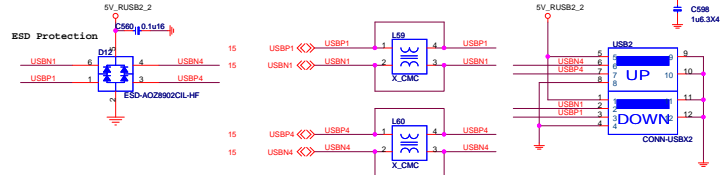
## FRONT PANEL USB CONNECTOR FOR USB PORT 10,11



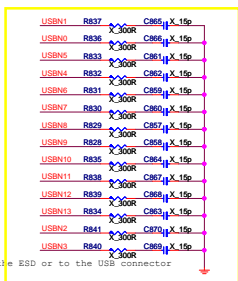
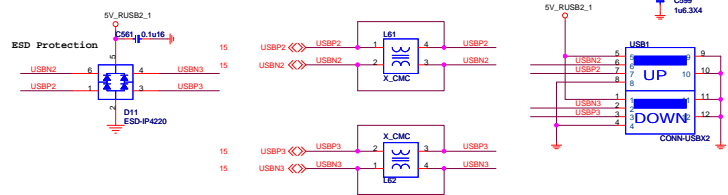
# REAR PANEL USB CONNECTOR FOR USB PORT 0,1



## REAR PANEL USB CONNECTOR FOR USB PORT 2,3



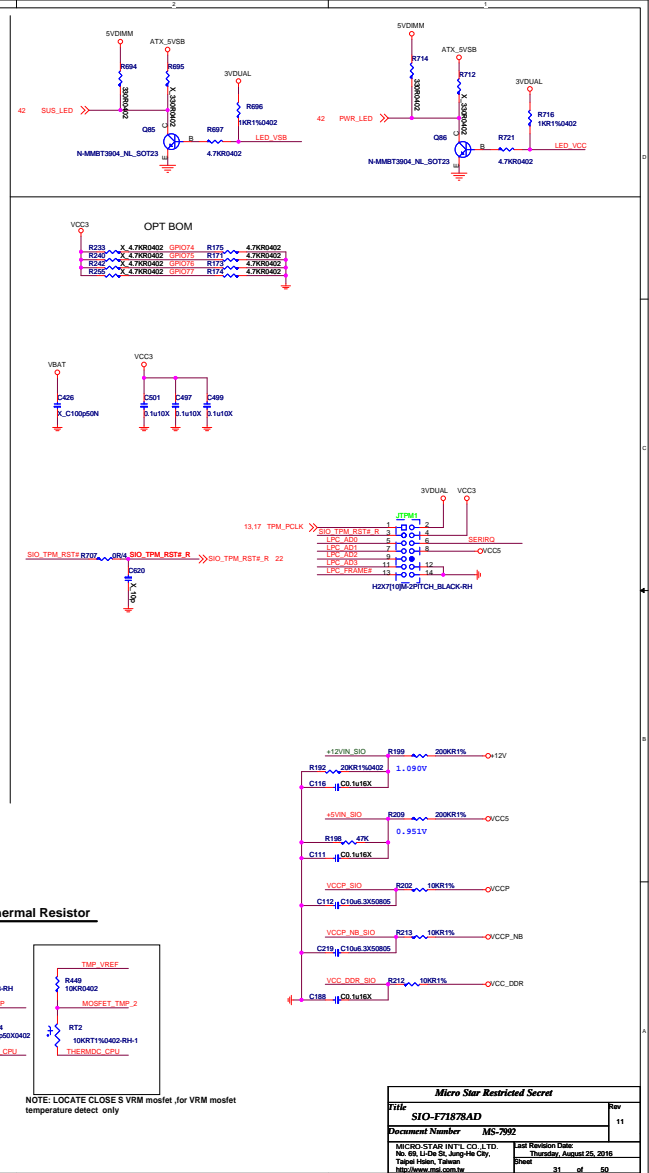
## REAR PANEL USB CONNECTOR FOR USB PORT 4,5



close to the ESD or to the USB connector

Micro Star Restricted Secret		
Title	Rev	
USB CONNECTORS	11	
Document Number	MS-7992	
MICRO-STAR INT'L CO., LTD.		
No. 68, Li-Jen St., Jung-Ye City,		
Taipei Hsien, Taiwan		
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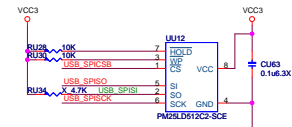
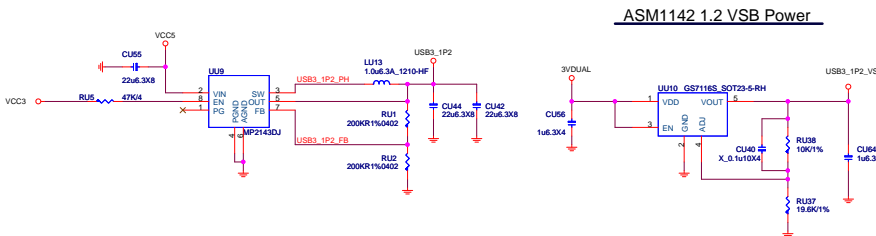
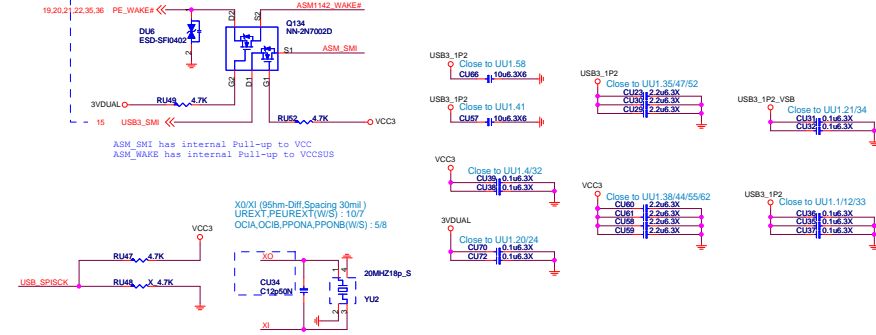


	1	0
STRAF_TIMING	TIMING AND	GPIO Intel Cougar
OTPA#	FAN start duty is 40%	FAN start duty is 100%
SOUTA	4E (default)	2E
FANCTL1	PMW mode	DAC mode(default)
FANCTL2	PMW mode	DAC mode(default)
FANCTL3	PMW mode	DAC mode(default)
SOUTB	Enable 80 Port	Disable 80 Port(Default)
RTSA#	Default is alarm mode.	Force mode(disabled)



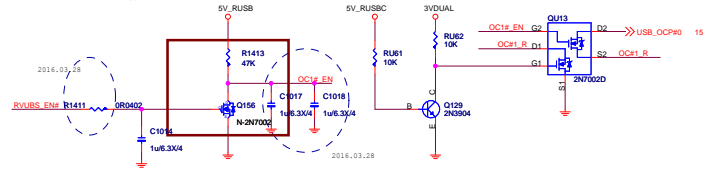


### Power Consumption

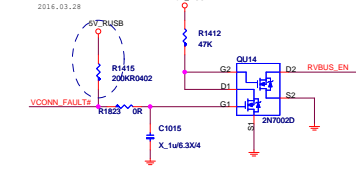


ASM1042 & ASM1142 firmware difference  
please contact vendor FAE

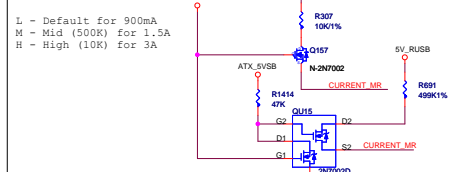
## VBUS OC#



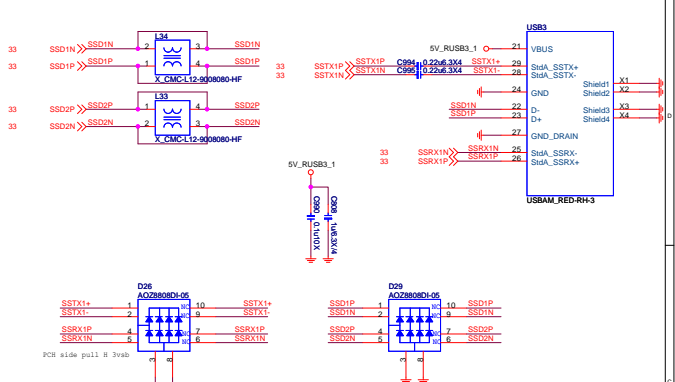
## VCOM OC#



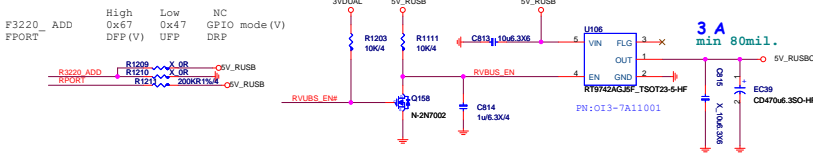
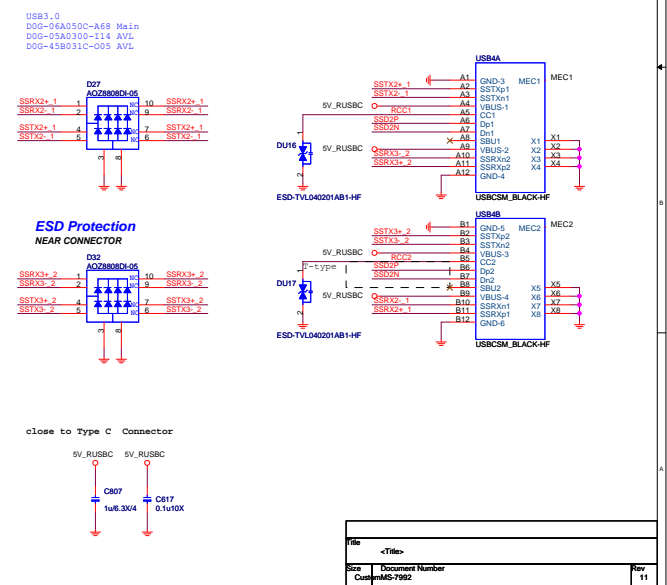
## Current Mode



## TYPE-A

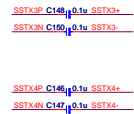


## TYPE-C

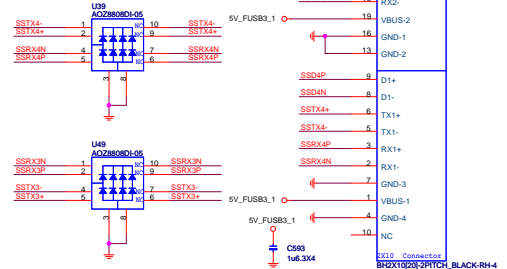
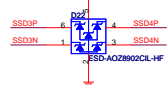


File	<Title>
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	3.3V	1.2V	3.3VSUS	1.05VSUS(1.2VSUS)	Total Power
ASM1142	245mA	634mA	1mA	1mA	1573.8(mW)



\_\_\_\_\_

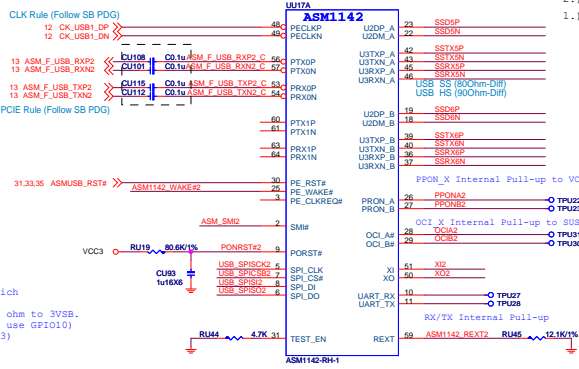


ASM1042 & ASM1142 firmware difference  
please contact vendor FAE

<b>Micro Star Restricted Secret</b>		
<b>Title</b>	<b>VIA USB3.0-2</b>	<b>Rev</b>
<b>Document Number</b>	<b>MS-7992</b>	<b>11</b>
<b>MICRO-STAR INT'L CO., LTD.</b> No. 69, Li-De St., Jung-Ho City, Taipei Hsien, Taiwan <a href="http://www.msi.com.tw">http://www.msi.com.tw</a>		<b>Last Revision Date:</b> Thursday, August 25, 2016 <b>Sheet</b> 35 of 50

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

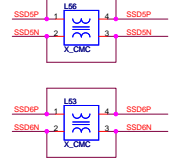
CLK Rule (Follow SB PDG)  
12 CK\_USB1\_DP  
12 CK\_USB1\_DN  
13 ASM\_F\_USB\_RXP2  
13 ASM\_F\_USB\_RXN2  
13 ASM\_F\_USB\_TXP2  
13 ASM\_F\_USB\_TXN2  
PCIe Rule (Follow SB PDG)



Layout Guide:

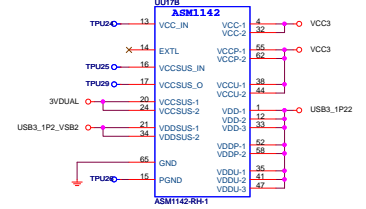
2.) VIA hole <2

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

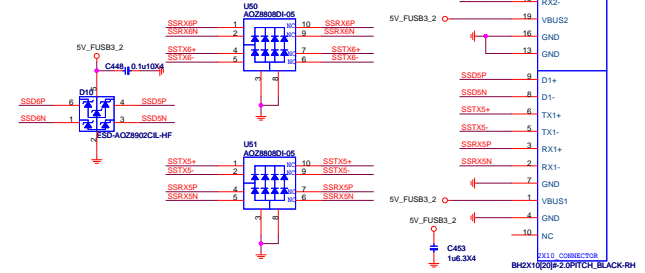
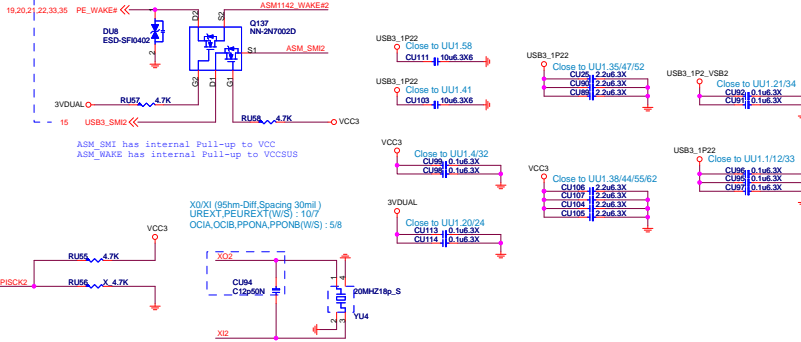


Power Consumption

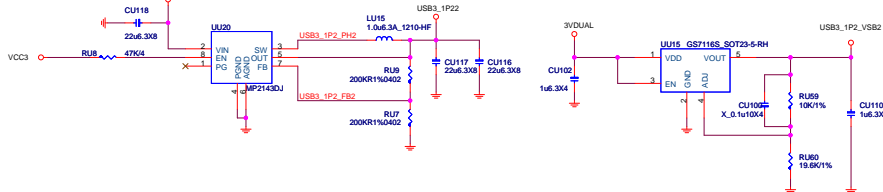
ASM1142	3.3V	1.2V	3.3VSUS	1.05VSUS(1.2VSUS)	Total Power
	245mA	634mA	1mA	1mA	1573.8(mW)



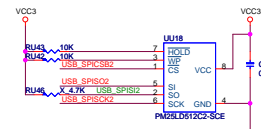
SMI connect to GPI which support smi function. SB side pull high 10K ohm to 3VSB. (Intel EX & 9X series use GPIO10) (Intel SKL use GPIO\_C23)



### ASM1142 1.2 VSB Power

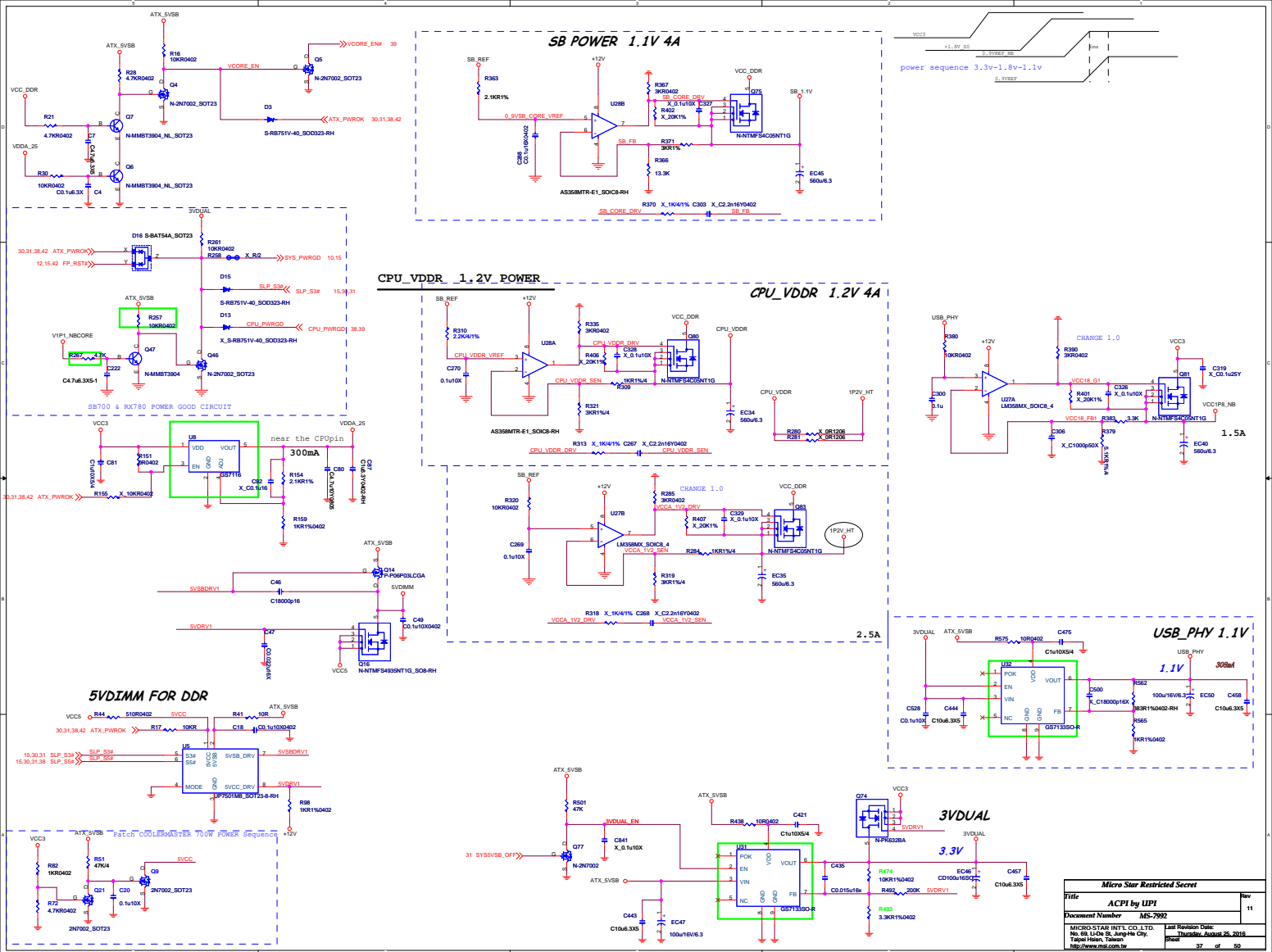


### EEPROM

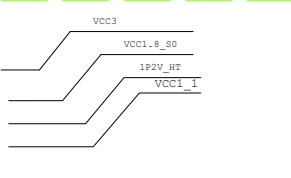


ASM1042 & ASM1142 firmware difference please contact vendor FAE

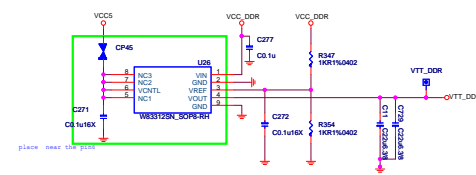
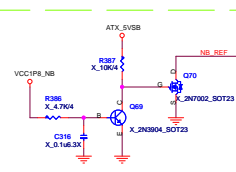
File	<Title>	Rev
Size	Document Number	11
Date	Thursday, August 28, 2016	58 of 59



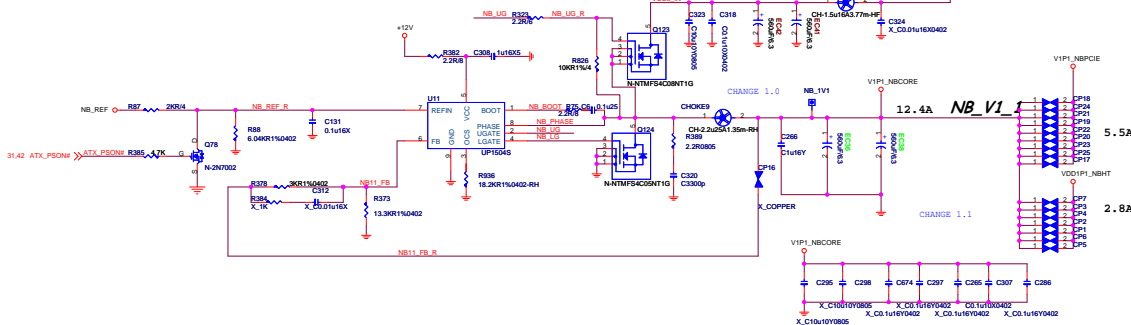
## RX780 power up sequence



## Reserve for RX980 PS

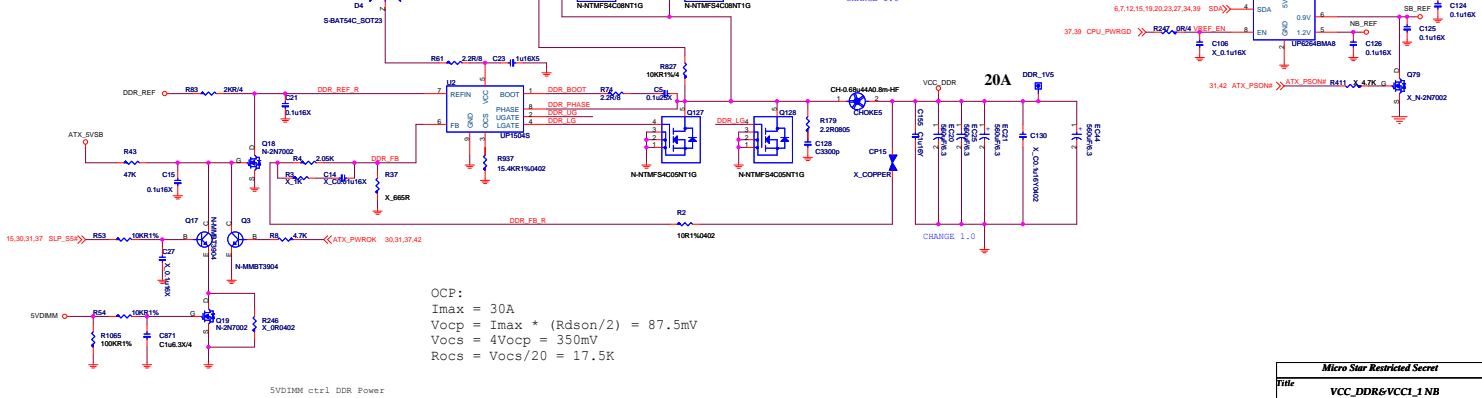


## NB 1.1V POWER



## DDR III 1.5V POWER

## VCC\_DDR



Micro Star Restricted Secret		
Title	VCC_DDR&VCC1_1_NB	Rev 11
Document Number	MS-7892	
MICRO-STAR INTERNATIONAL CO., LTD. No. 58, Udaan St., Junghe City, Taichung, Taiwan		
File Revision Date	Thursday, August 26, 2010	
Sheet	38	of 50

Micro Star Restricted Secret

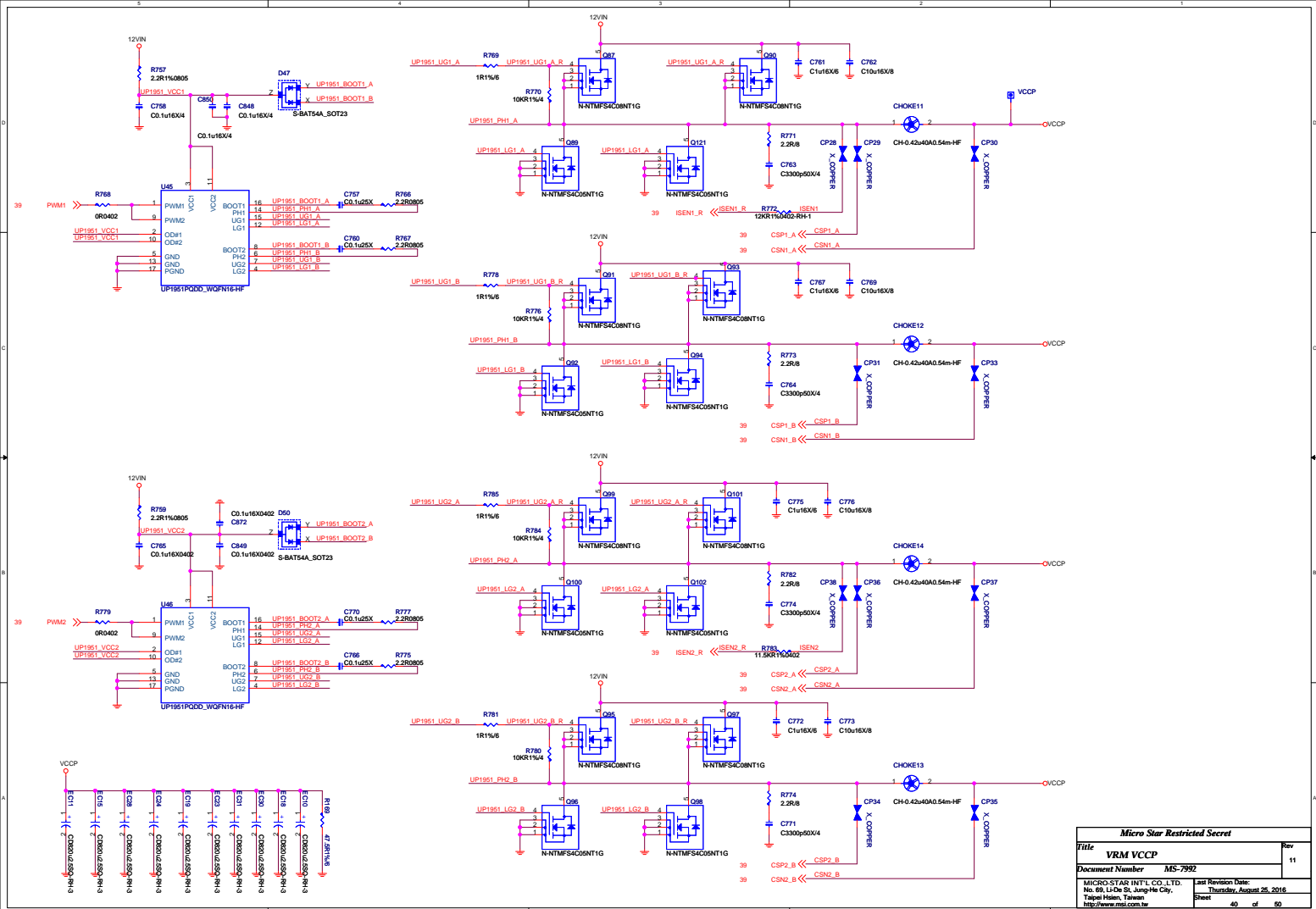
Title: Pwm-UP1601

Document Number: MS-792

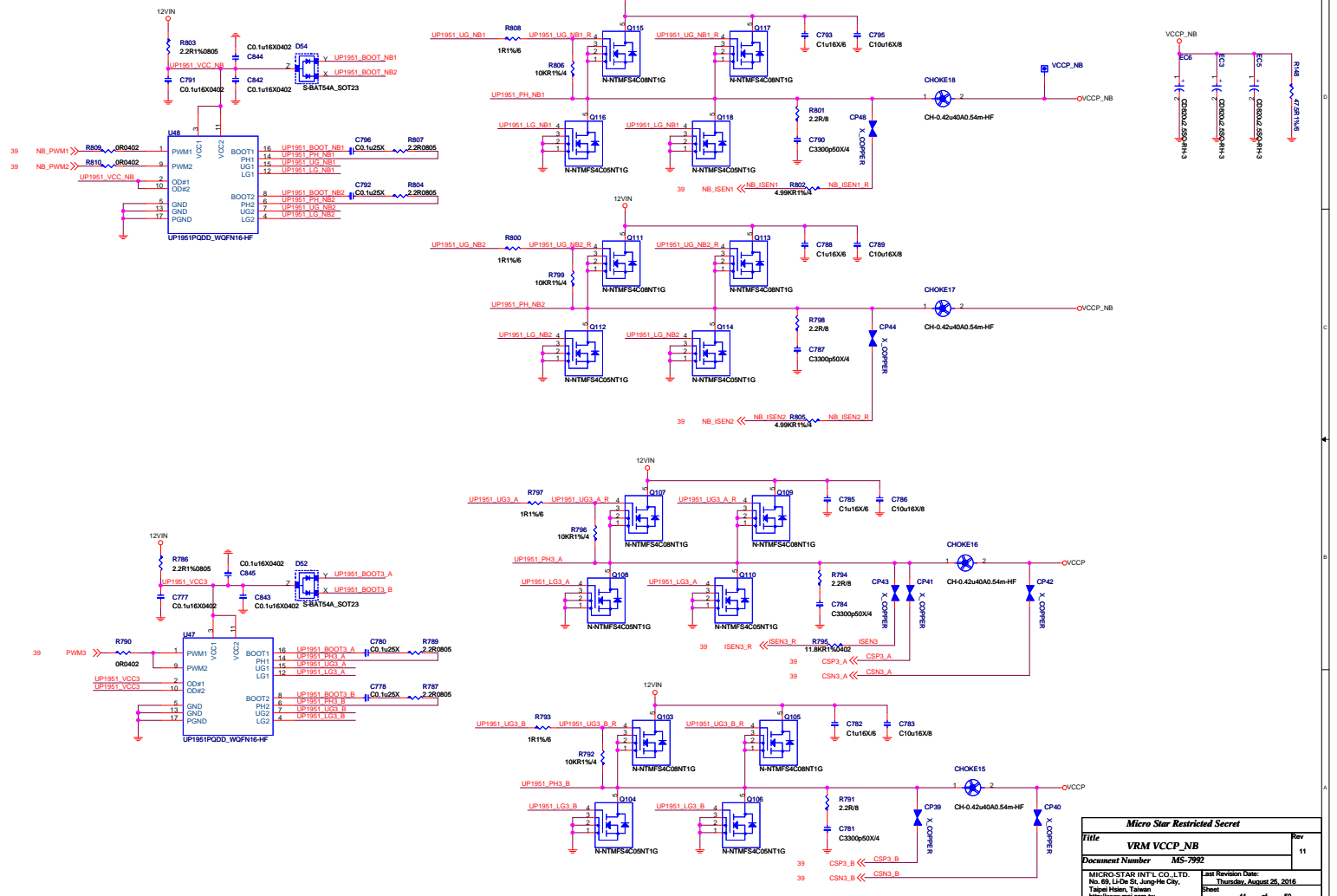
Micro-Star Int'l. Co., Ltd.  
No. 1, Lane 2, Jung-Ho City,  
Taippei Hsien, Taiwan  
Phone: (886) 2-2790-8888

Last Revision Date: 2012/12/12

Revision: 1.0

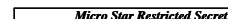




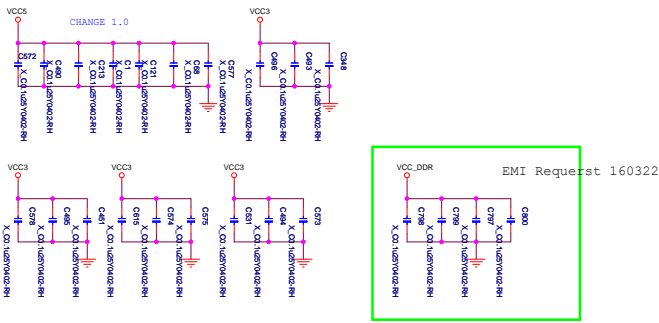


Micro Star Restricted Secret		
Title	VRM VCCP_NB	Rev 11
Document Number	MS-7992	
MACRO STAR INT'L CO., LTD. No. 69, Li-De St., Jung-Hsue City, Taipei Hsien, Taiwan <a href="http://www.msi.com.tw">http://www.msi.com.tw</a>		
and Revision Date	Thursday, August 26, 2016	
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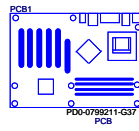
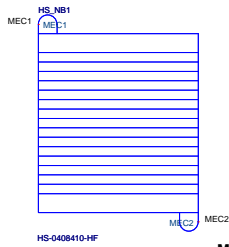
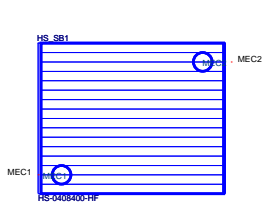
### Intel Front Panel



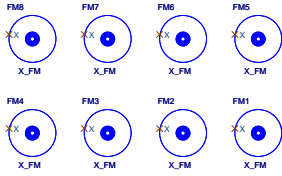
<b>Title</b> <i>ATX/Front Panel</i>		<b>Rev</b> 11
<b>Document Number</b> MS-7992		
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan <a href="http://www.msi.com.tw">http://www.msi.com.tw</a>		<b>Last Revision Date:</b> Thursday, August 25, 2016 <b>Sheet</b> 42 of 50



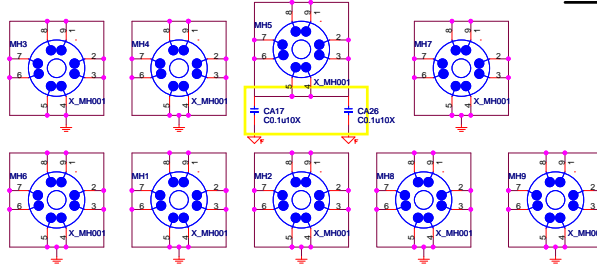
Micro Star Restricted Secret		
Title	EMI Cap	Rev
Document Number	MS-7992	11
MACRO STAR INT'L CO. LTD. No. 69, Li-De St., Jung-Hsi City, Taipei Hsien, Taiwan <a href="http://www.msi.com.tw">http://www.msi.com.tw</a>		
Last Revision Date		Thursday, August 26, 2016
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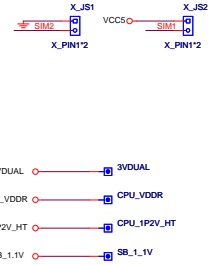
### Optics Orientation Holes



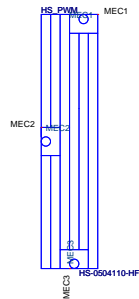
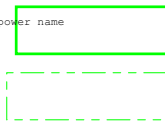
### Mounting Holes



### Simulation



change power name



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Title	MANUAL PARTS	Rev
Document Number	MS-7992	11
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