MS-7642 VER:10

CPU:

AMD AM3 (HT 3.0)

System Chipset:

AMD/ATI RS880D

AMD/ATI SB850

On Board Chipset:

FINTEK Super I/O -- F71889
LAN -- RTL8111DL
HD Codec -- ALC889
USB3.0 -- NEC uPD720200
PATA -- JMICRON JMB368
BIOS -- SPI ROM 8M

Main Memory:

DDR III X 4 (Max 8GB)

Expansion Slots:

PCI-E X 16 *2
PCI-E X 1 *1
PCI 2.2 Slot X 1

Clock Generator:

Controller--REALTEK RTM880N-793

PWM:

ISL6323+ISL6212

Title	Cover Sheet	Rev 0A
Document Number	MS-7642	

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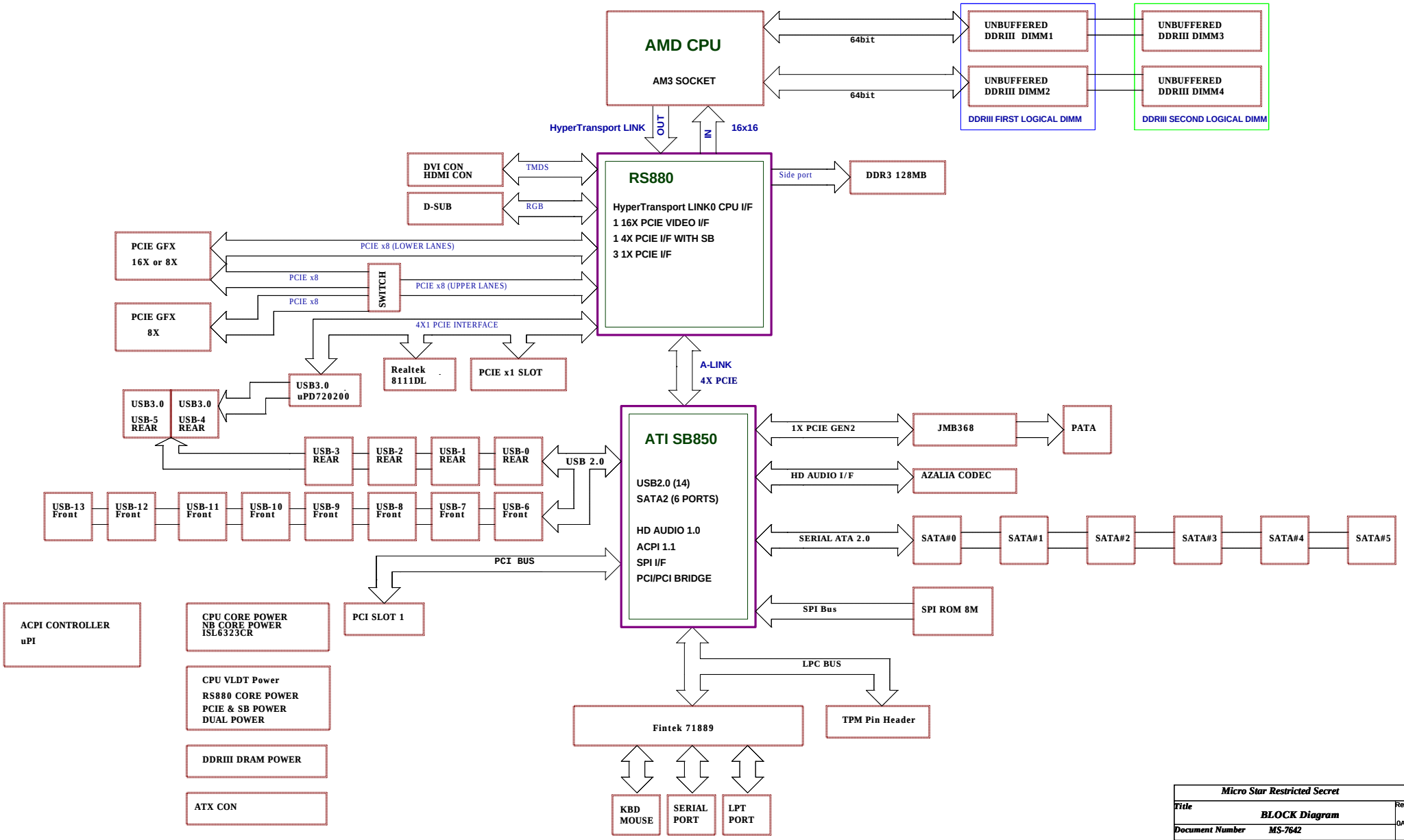
Project RS-880D BLOCK DIAGRAM



Micro Star Restricted Secret	
Title **BLOCK Diagram**	Rev 0A
Document Number **MS-7642**	
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SB850 GPIO Config

GPIO Name	Type	Function description	Pin	Page
GA20IN/GEVENT0#	I	GA20IN		
PCI_PME#/GEVENT3#	I	LPC_PME#		
LPC_PME#/GEVENT4#	I	PCIPME#		
WAKE#/GEVENT8#	I	WAKE#		
USB_OC0#/GEVENT12#	I	USB_OC0#		
USB_OC1#/GEVENT13#	I	USB_OC1#		
SYS_RESET#/GEVENT19#	I	SYS_RESET#		
SERIRQ/GPIO48	I/O	SERIRQ		
GPIO50	I	DUALX8_EN#		
SATA_ACT#/GPIO67	O	SATA_ACT#		
TALERT#/GPIO174	I	TALERT#		

F71889 GPIO Config

GPIO Name	Type	Function description	Pin	Page
GPIO27	I	DISPLAY_TYPE		
GPIO26	I	CPU_FAN_TYPE		
GPIO00	O	KB_SEL		

PCI Config.

DEVICE	MCP1 INT Pin	REQ# / GNT#	IDSEL	CLOCK
PCI Slot 1	PCI_INTE# PCI_INTF# PCI_INTG# PCI_INTH#	PREQ#0 PGNT#0	AD21	PCICLK0

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Title	*GPIO Configuration*	Rev 0A
Document Number	*MS-7642*	

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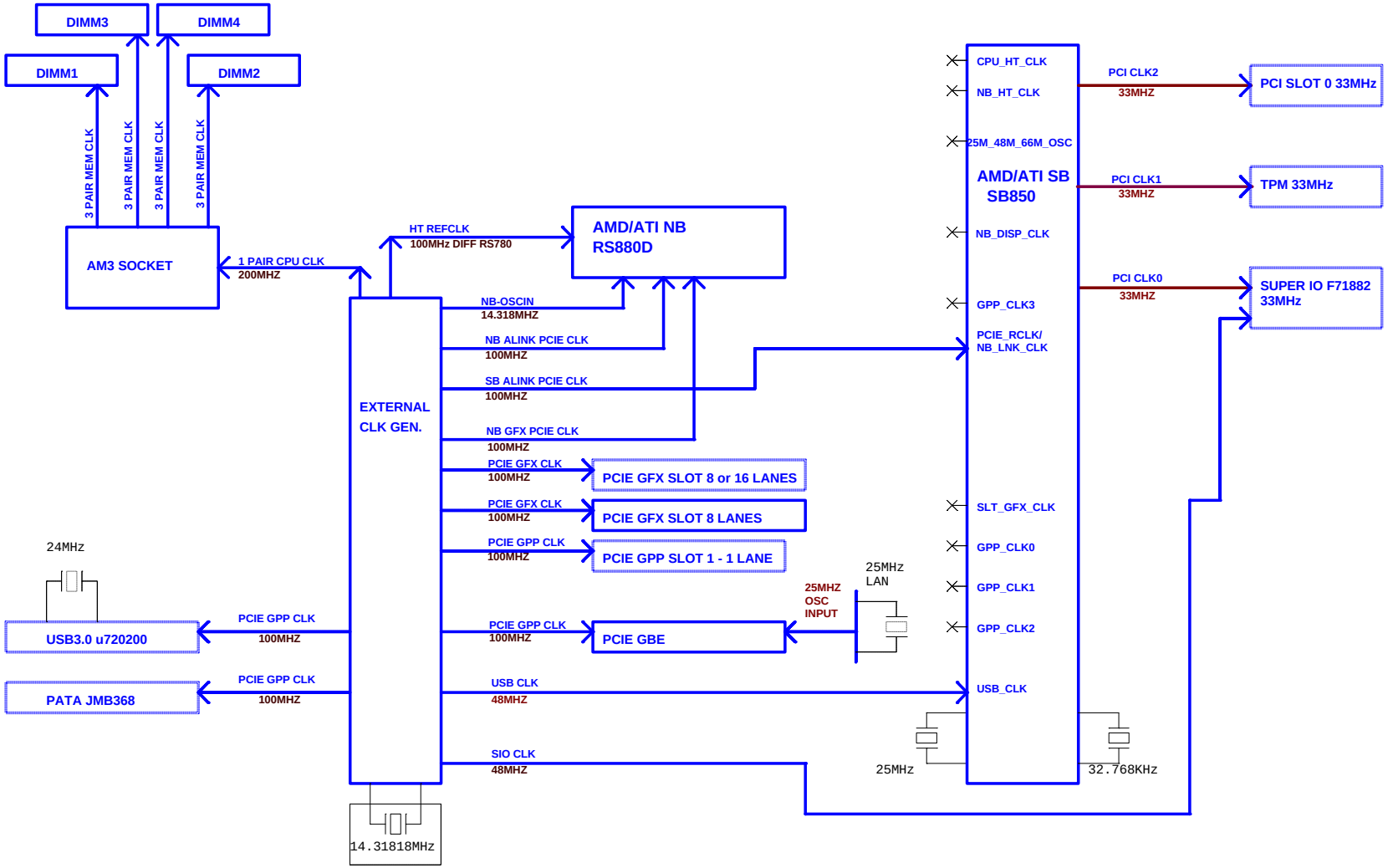

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Title	*Clock Distribution*	Rev 0A
Document Number	*MS-7642*	

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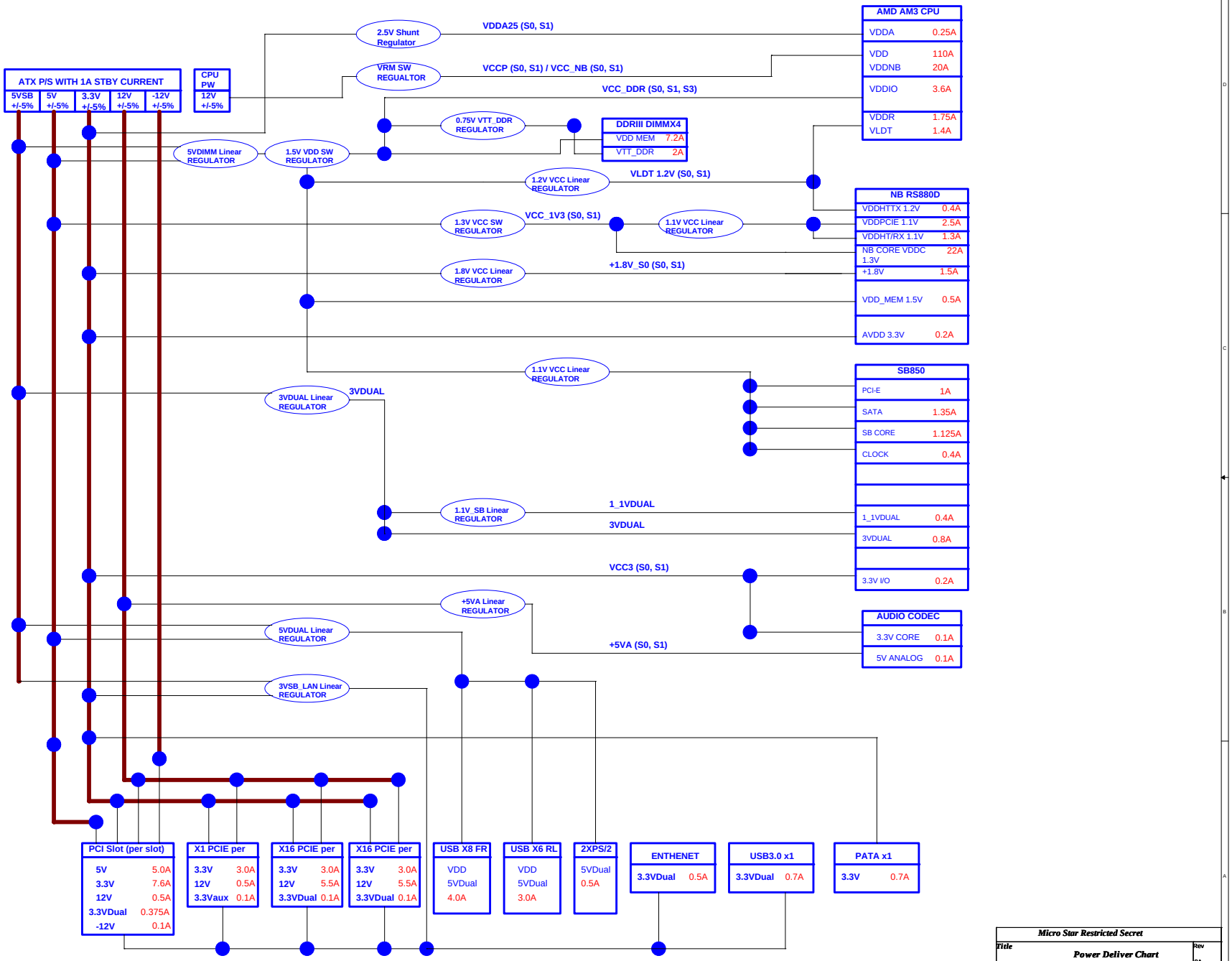
Power Deliver Chart



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Title	*Power Deliver Chart*	Rev 0A
Document Number	*MS-7596*	

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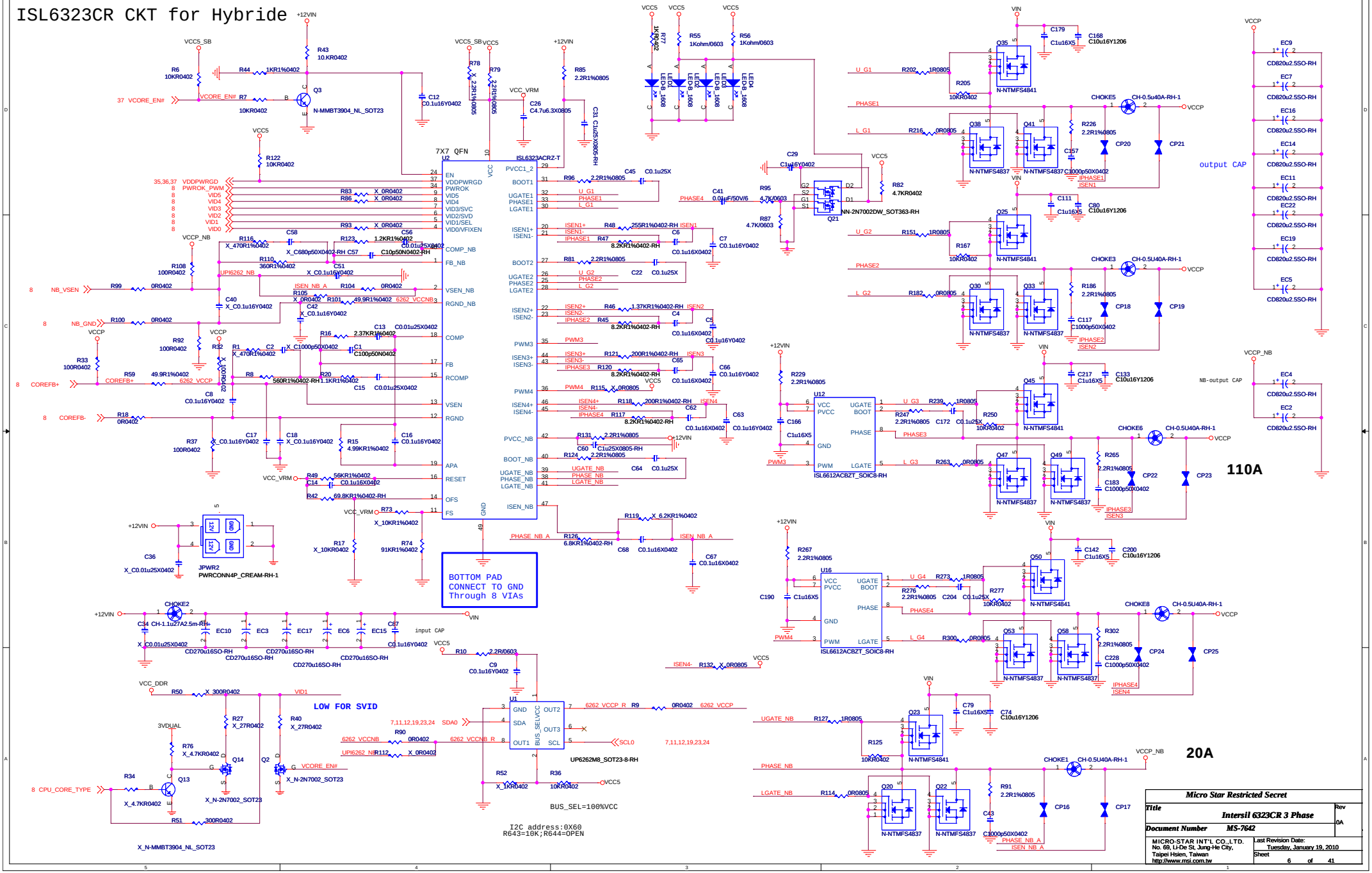
ISL6323CR CKT for Hybride



Micro Star Restricted Secret	
Title	Intersil 6323CR 3 Phase
Rev	0A
Document Number	MS-7642
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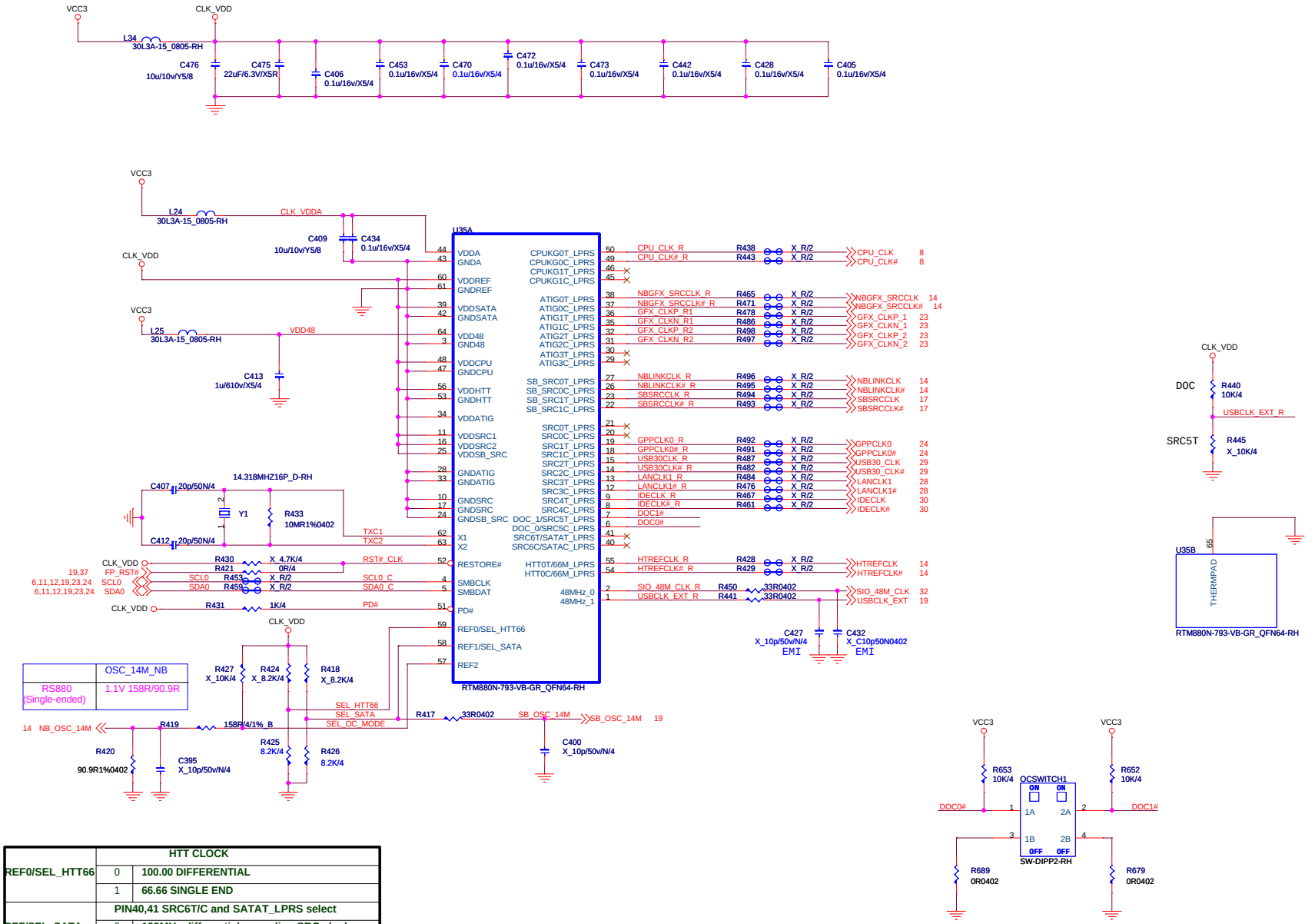

	HTT CLOCK	
REF0/SEL_HTT66	0	100.00 DIFFERENTIAL
	1	66.66 SINGLE END
	PIN40,41 SRC6T/C and SATAT_LPRS select	
REF/SEL_SATA	0	100MHz differential spreading SRC clock
	1	100MHz non-spreading differential SATA clock
	atched input to select pin functionality	
REF2	0	ATIG/SRC PCIE Gen2 Mode with limited overclocking ability
	1	ATIG/SRC PCIE Gen1 Mode with higher overclocking ability

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Title: Clock-Gen ICS9LPRS477

Rev: 0A

Document Number: MS-7642

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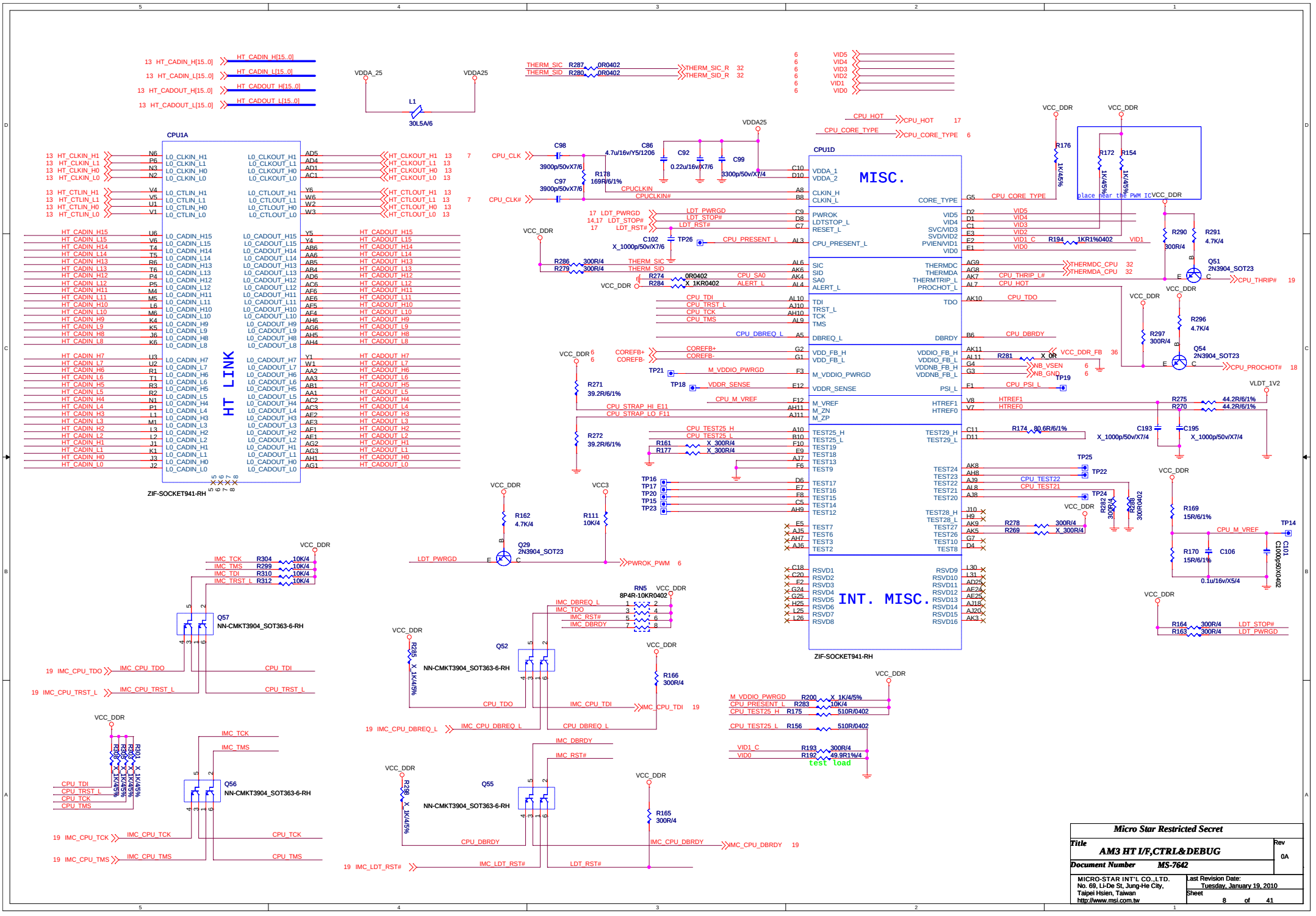
CPU1A
HT LINK
ZIF-SOCKET941-RH
CPU1D
MISC.
INT. MISC.
ZIF-SOCKET941-RH
L1
30L5A6
Q29
2N3904_SOT23
Q51
2N3904_SOT23
Q54
2N3904_SOT23
Q57
NN-CMKT3904_SOT363-6-RH
Q52
NN-CMKT3904_SOT363-6-RH
Q56
NN-CMKT3904_SOT363-6-RH
Q55
NN-CMKT3904_SOT363-6-RH
RN5
8P4R-10KR0402
place near the PWM IC
test load
Micro Star Restricted Secret
Title
AM3 HT I/F,CTRL&DEBUG
Rev
0A
Document Number
MS-7642
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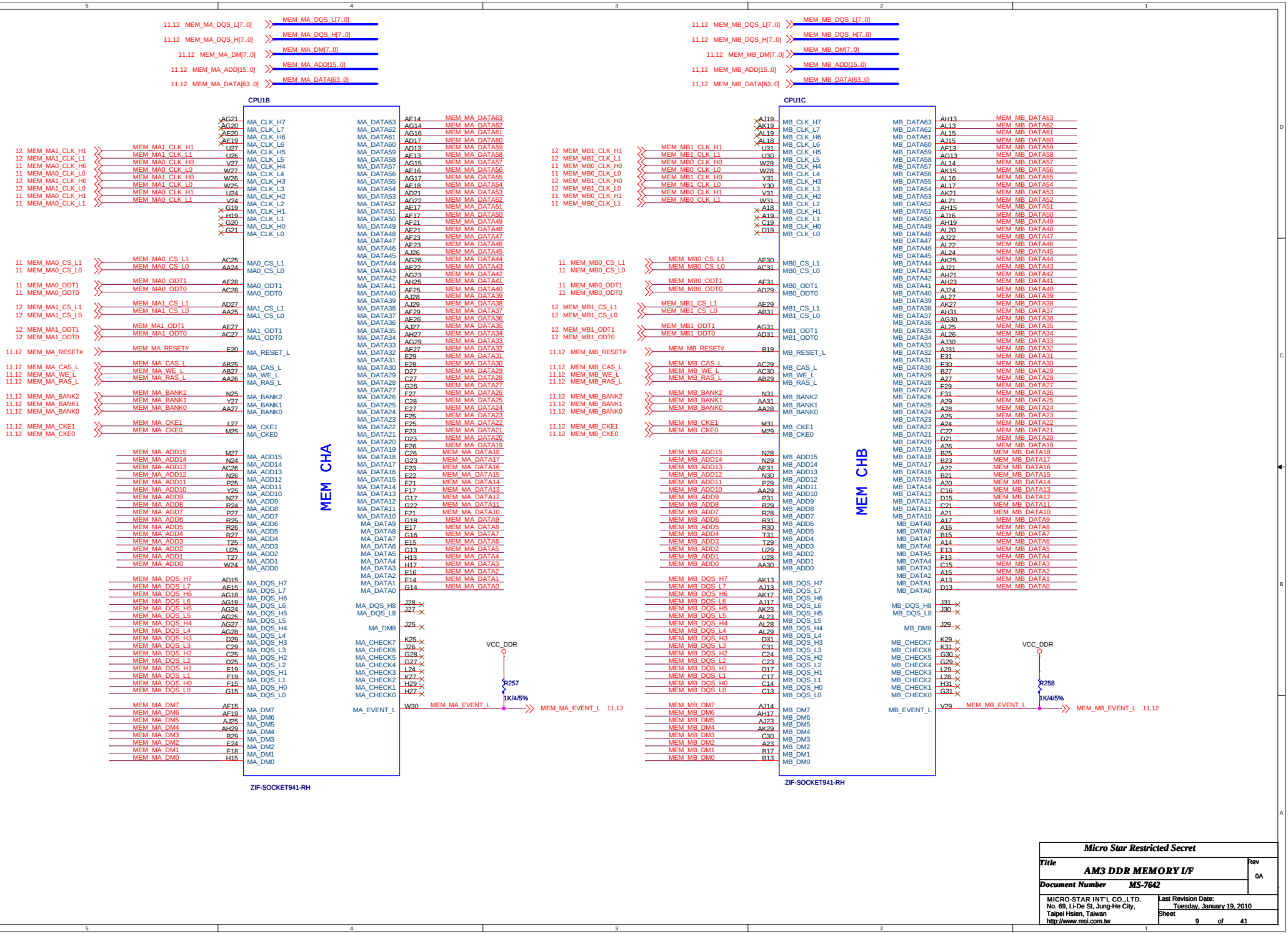
41



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Title: AM3 DDR MEMORY I/F	Rev: 0A
Document Number: MS-7642	

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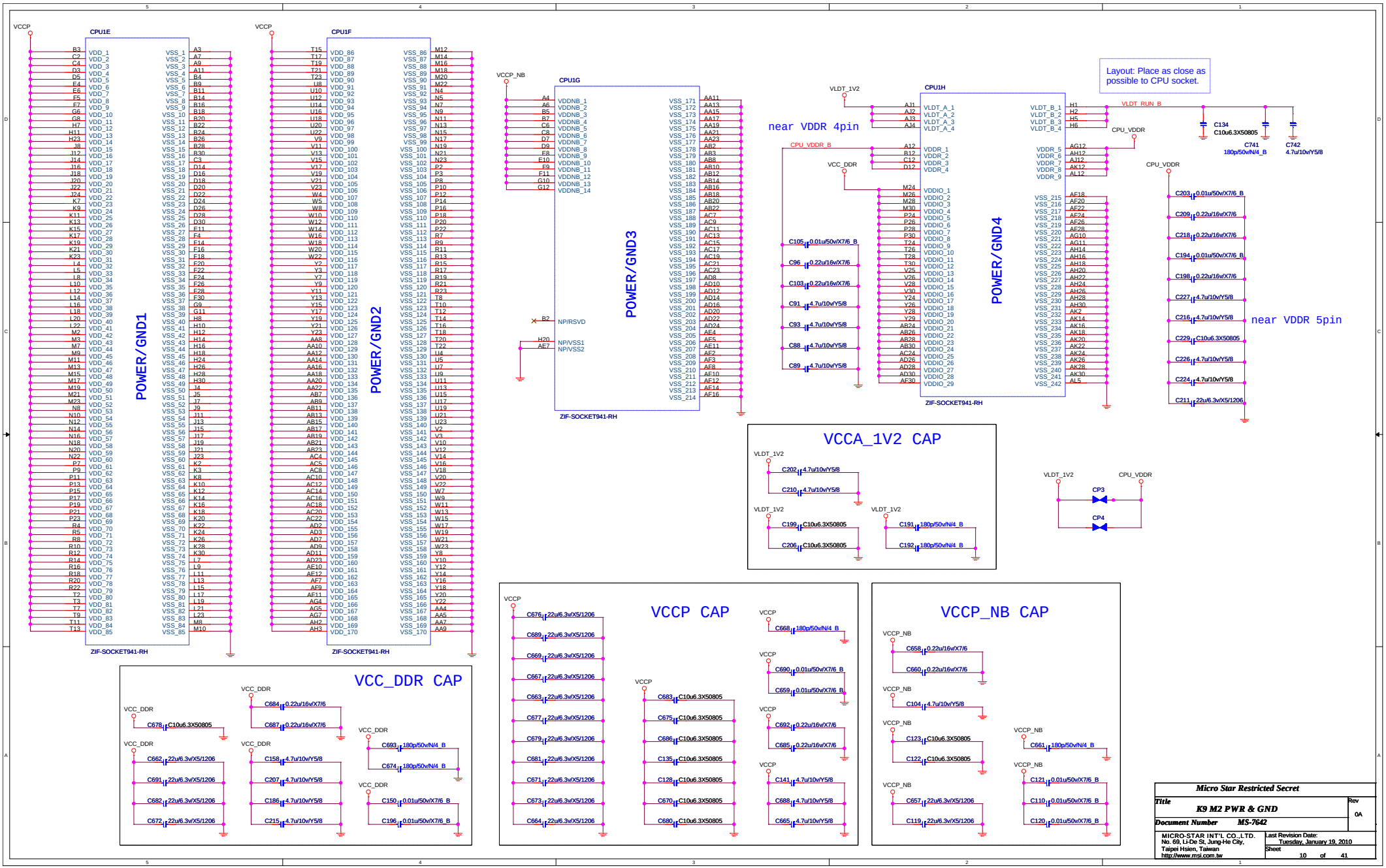
CPU1E
POWER/GND1
ZIF-SOCKET941-RH
CPU1F
POWER/GND2
ZIF-SOCKET941-RH
CPU1G
POWER/GND3
ZIF-SOCKET941-RH
CPU1H
POWER/GND4
ZIF-SOCKET941-RH
Layout: Place as close as possible to CPU socket.
near VDDR 4pin
near VDDR 5pin
VCCA_1V2 CAP
VCCP CAP
VCCP_NB CAP
VCC_DDR CAP
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K9 M2 PWR & GND
MS-7642
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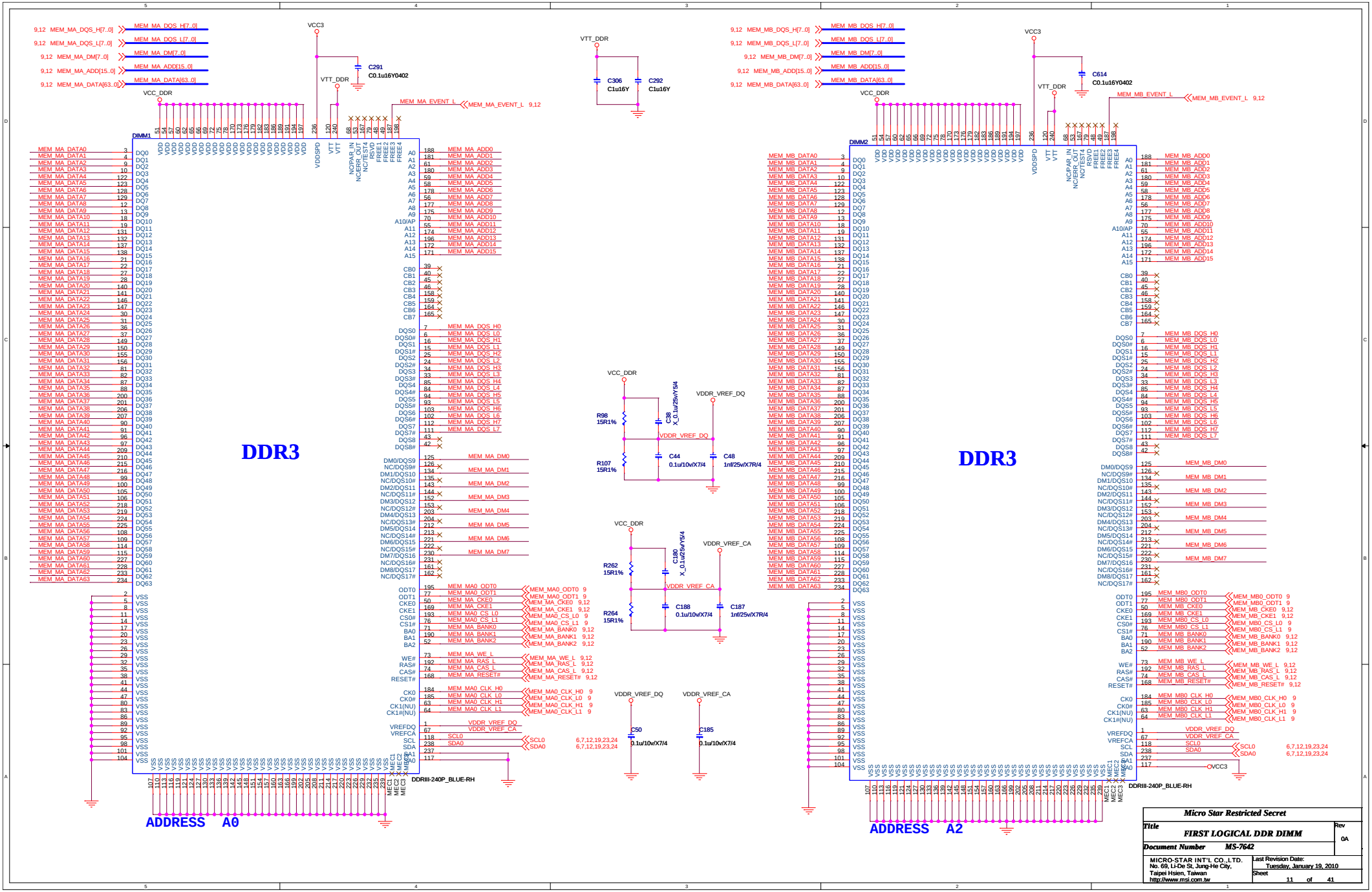
DDR3
DDR3
ADDRESS A0
ADDRESS A2
DIMM1
DIMM2
DDRIII-240P_BLUE-RH
DDRIII-240P_BLUE-RH
VCC3
VTT_DDR
VCC_DDR
C291
C0.1u16Y0402
C306
C1u16Y
C292
C1u16Y
C614
C0.1u16Y0402
R98
15R1%
R107
15R1%
R262
15R1%
R264
15R1%
C38
X_0.1u/25v/Y5/4
C44
0.1u/10w/X7/4
C48
1nf/25w/X7R/4
C180
X_0.1u/25w/Y5/4
C188
0.1u/10w/X7/4
C187
1nf/25w/X7R/4
C50
0.1u/10w/X7/4
C185
0.1u/10w/X7/4
VDDR_VREF_DQ
VDDR_VREF_CA
MEM_MA_EVENT_L
MEM_MB_EVENT_L
Micro Star Restricted Secret
FIRST LOGICAL DDR DIMM
Rev 0A
Document Number MS-7642
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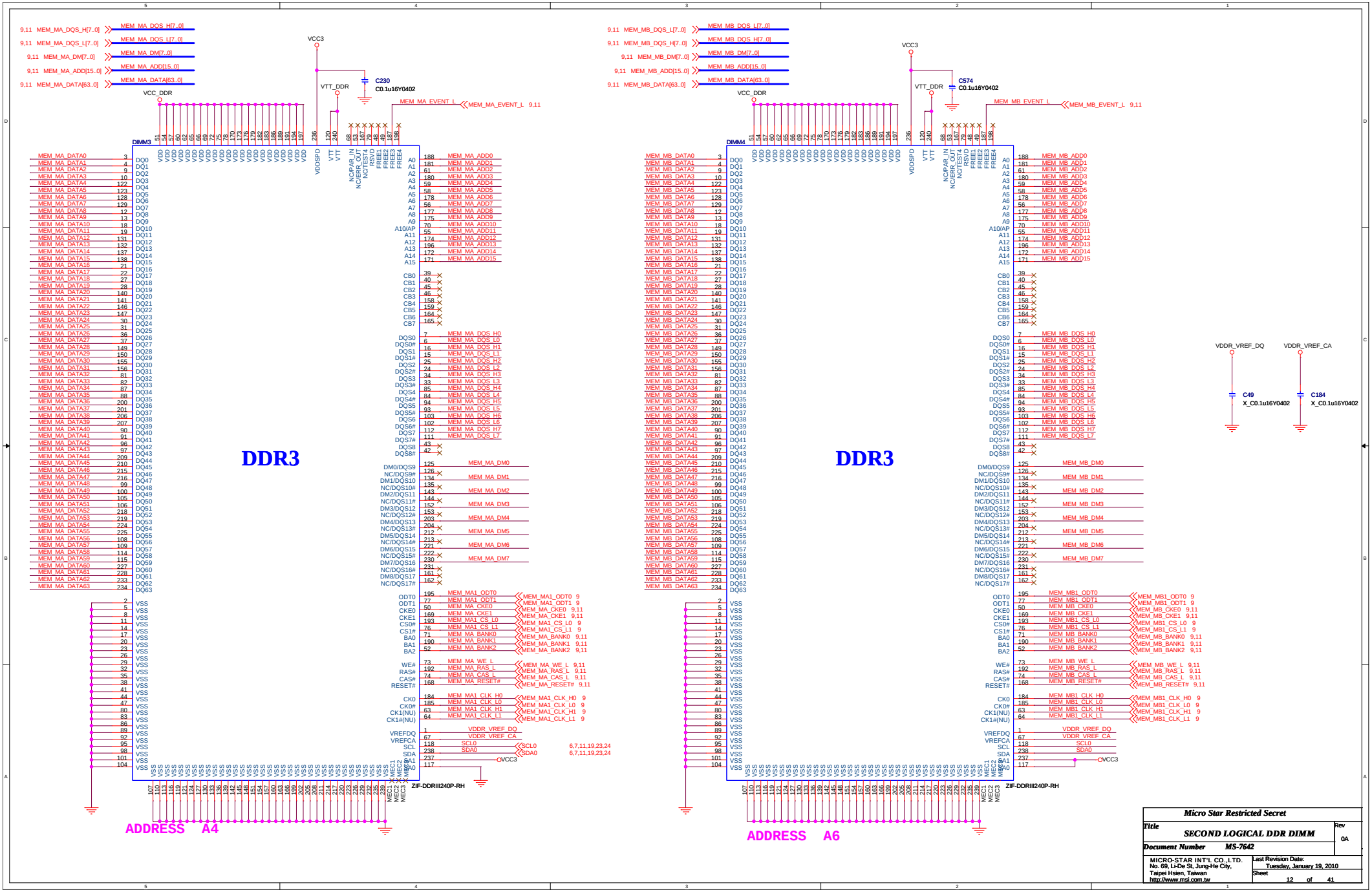

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Title: SECOND LOGICAL DDR DIMM	Rev: 0A
Document Number: MS-7642	
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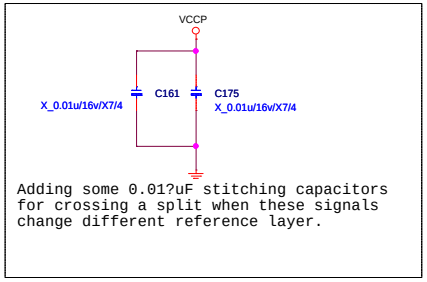

RS880 Display Port Support (muxed on GFX)

DP0	GFX_TX0,TX1,TX2 and TX3 AUX0 and HPD0
DP1	GFX_TX4,TX5,TX6 and TX7 AUX1 and HPD1

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Title	*RS780-HT L*
Rev	0A
Document Number	*MS-7642*

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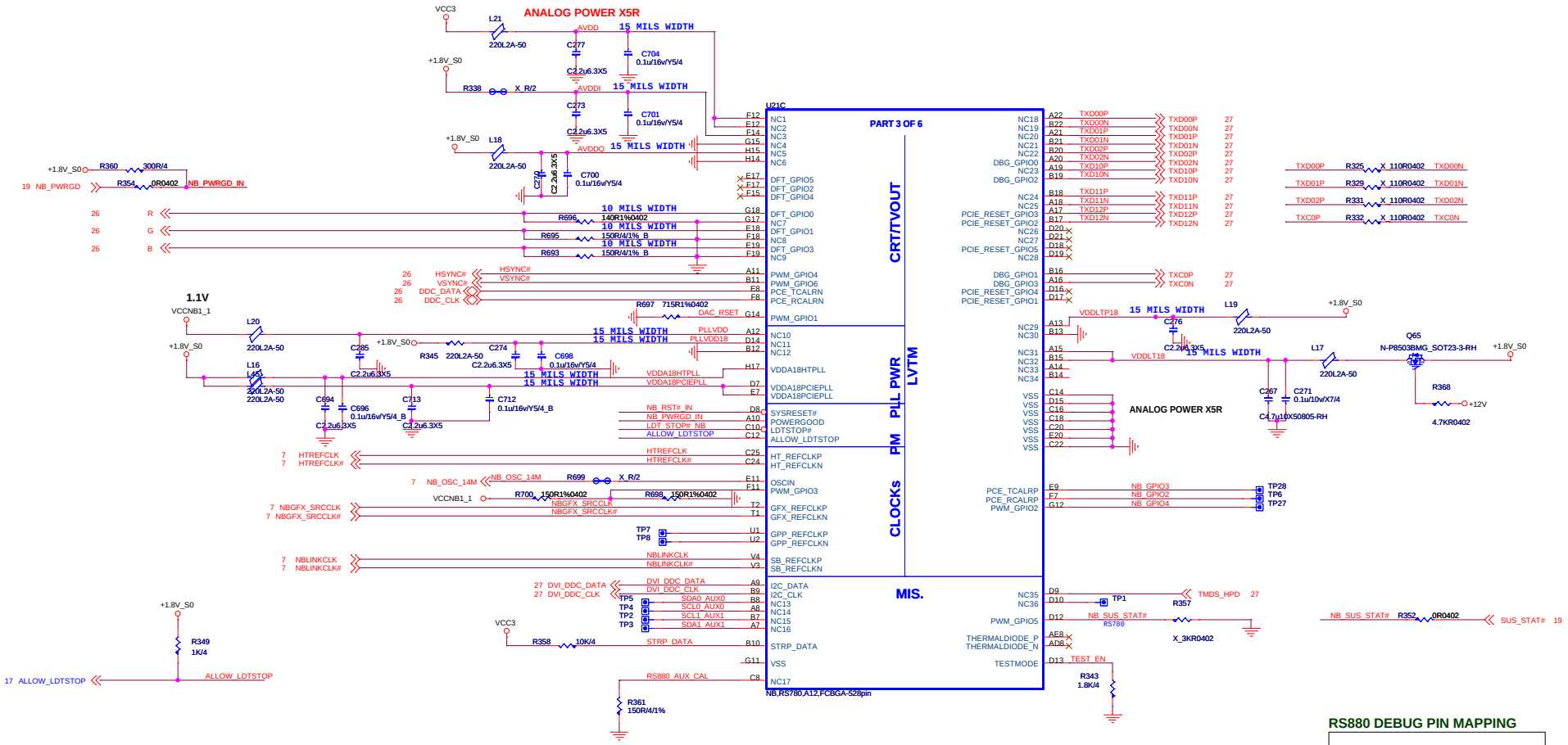

RS880 DEBUG PIN MAPPING

DEBUG_OUT0	LVDS_DIGON
DEBUG_OUT1	LVDS_ENA_BL
DEBUG_OUT2	LVDS_BLON
DEBUG_OUT3	TMDS_HPD
DEBUG_OUT4	AUX1N
DEBUG_OUT5	AUX1P
DEBUG_OUT6	HPD
DEBUG_OUT7	AUX_CAL

RS880 JTAG PIN MAPPING

	RX780	RS740/RS780
TRST	TEST_EN	TEST_EN
TMS(TP220)	PCIE_RST3(TP222)	DDC_DATA(TP223)
TDI	I2C_DATA	I2C_DATA
TCK	I2C_CLK	I2C_CLK
TDO(TP218)	PWM_GPIO6(TP219)	TMDS_HPD(TP221)

RS880: SIDE-PORT MEMORY ENABLE

```
Enables Side port memory
1.  Disable
0 : Enable

RS880:  pin HSYNC
```

RS880: STRAP_DEBUG_BUS_GPIO_ENABLE

```
Enables the Test Debug Bus using GPIO and/or memory IO
0 : Enable
1 :  Disable

RS880: pin VSYNC
```

RS880: LOAD_EEPROM_STRAPS

```
Selects Loading of STRAPS from EPROM
1 : Bypass the loading of EEPROM straps and use Hardware Default Values
0 : I2C Master can load strap values from EEPROM if connected, or use
default values if not connected

RS880: pin SUS_STAT#
```

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Title	RS780-SYSTEM I/F
Rev	0A
Document Number	MS-7642

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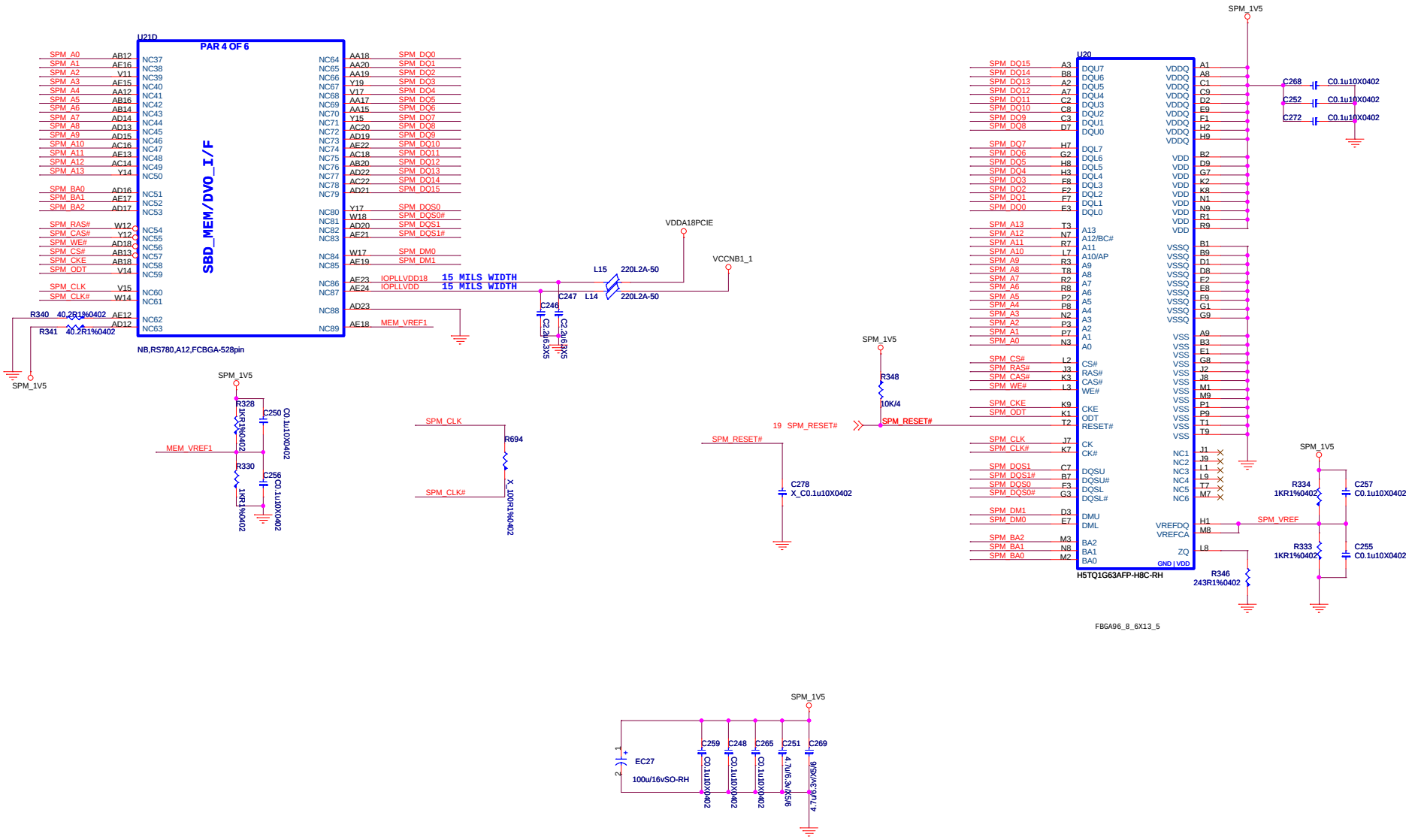

Micro Star Restricted Secret		
Title	***RS780-SPMEM/STRAPS***	Rev 0A
Document Number	***MS-7642***	
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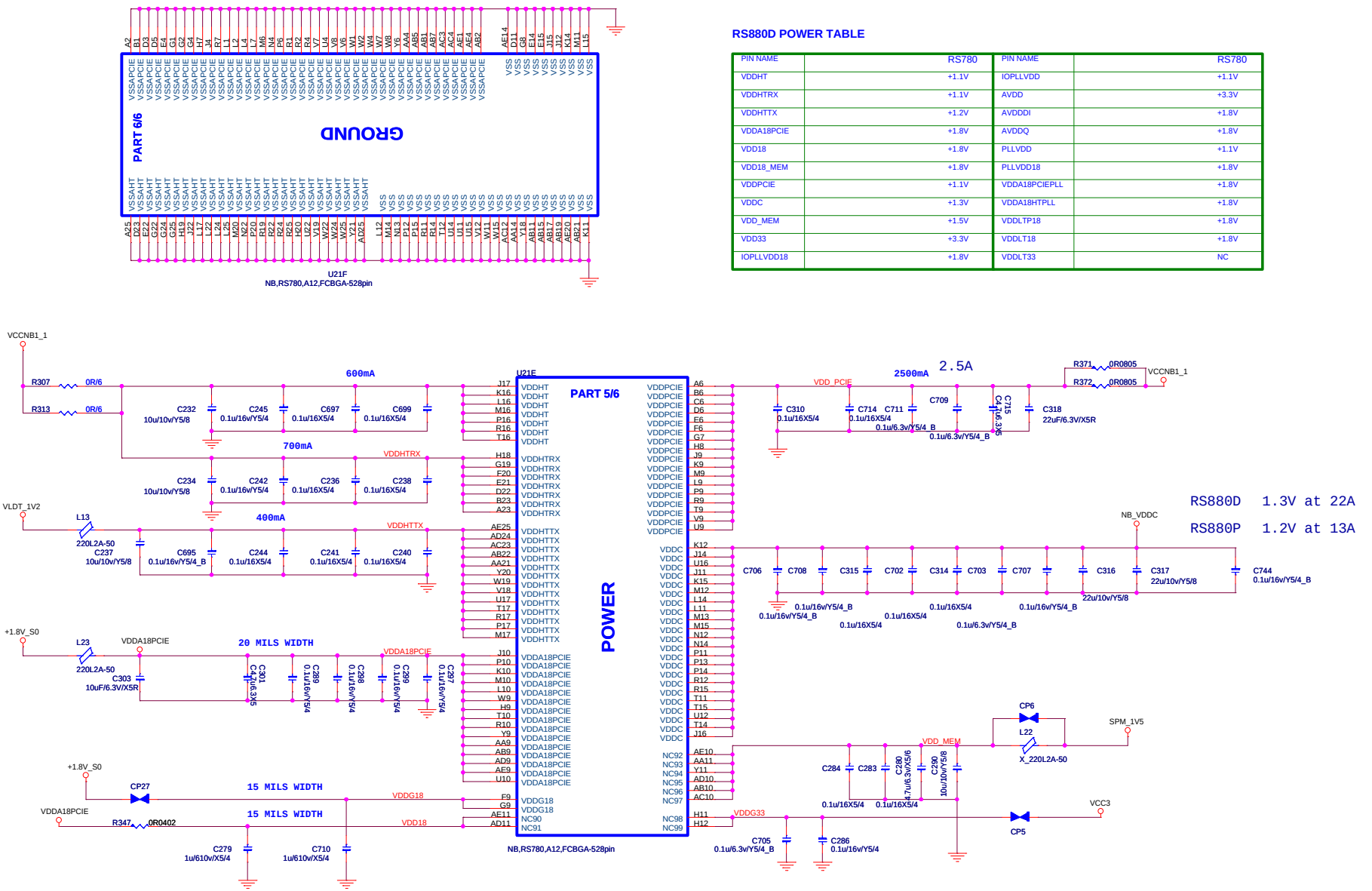

RS880D POWER TABLE

PIN NAME	RS780	PIN NAME	RS780
VDDHT	+1.1V	IOPLLVDD	+1.1V
VDDHTRX	+1.1V	AVDD	+3.3V
VDDHTTX	+1.2V	AVDDDI	+1.8V
VDDA18PCIE	+1.8V	AVDDQ	+1.8V
VDD18	+1.8V	PLLVDD	+1.1V
VDD18_MEM	+1.8V	PLLVDD18	+1.8V
VDDPCIE	+1.1V	VDDA18PCIEPLL	+1.8V
VDDC	+1.3V	VDDA18HTPLL	+1.8V
VDD_MEM	+1.5V	VDDLTP18	+1.8V
VDD33	+3.3V	VDDLT18	+1.8V
IOPLLVDD18	+1.8V	VDDLT33	NC

Micro Star Restricted Secret			
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Document Number	*MS-7642*		
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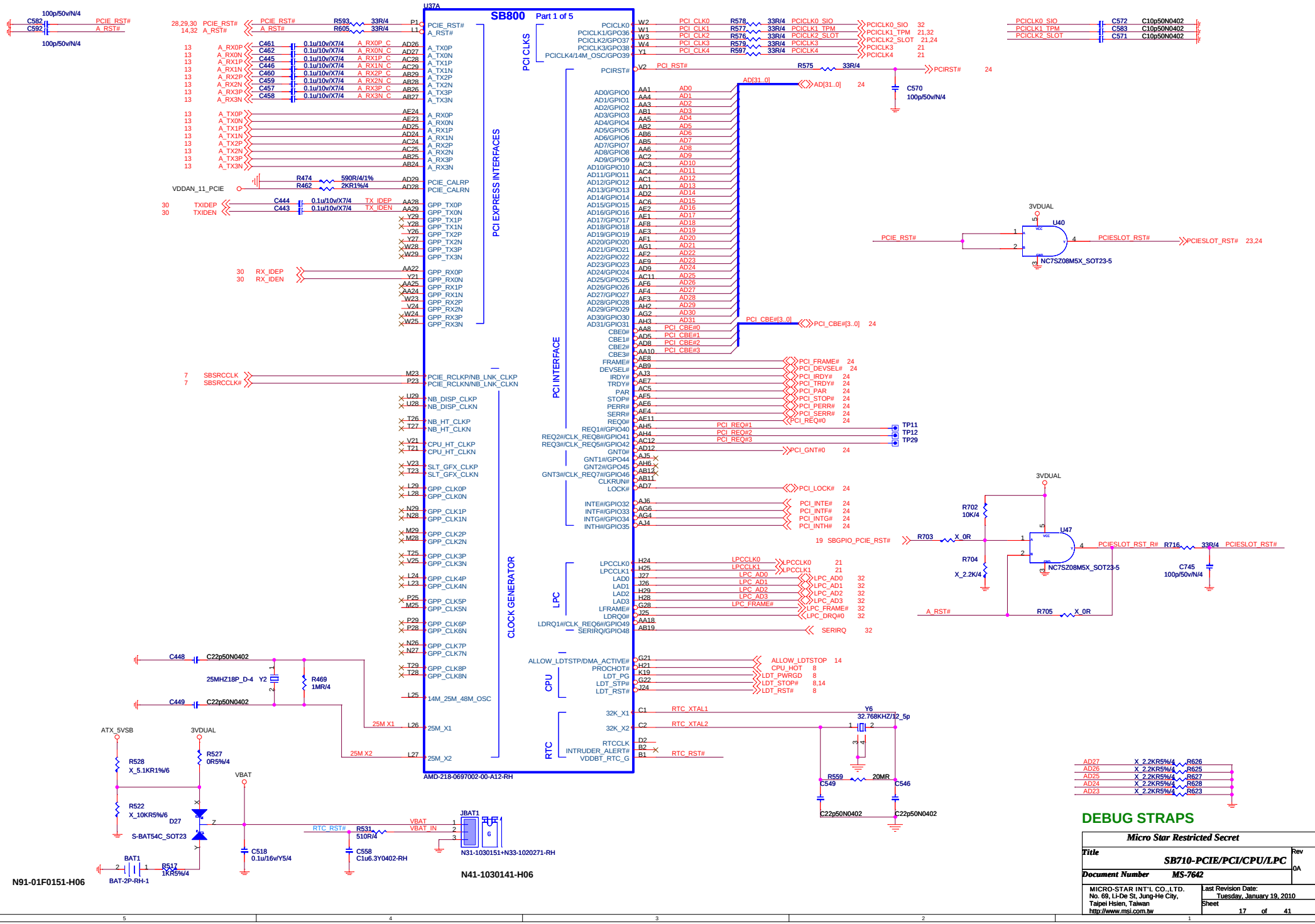
SB800
Part 1 of 5
U37A
PCI CLKS
PCI EXPRESS INTERFACES
PCI INTERFACE
CLOCK GENERATOR
LPC
CPU
RTC
AMD-218-0697002-00-A12-RH
DEBUG STRAPS
Micro Star Restricted Secret
SB710-PCIE/PCI/CPU/LPC
MS-7642
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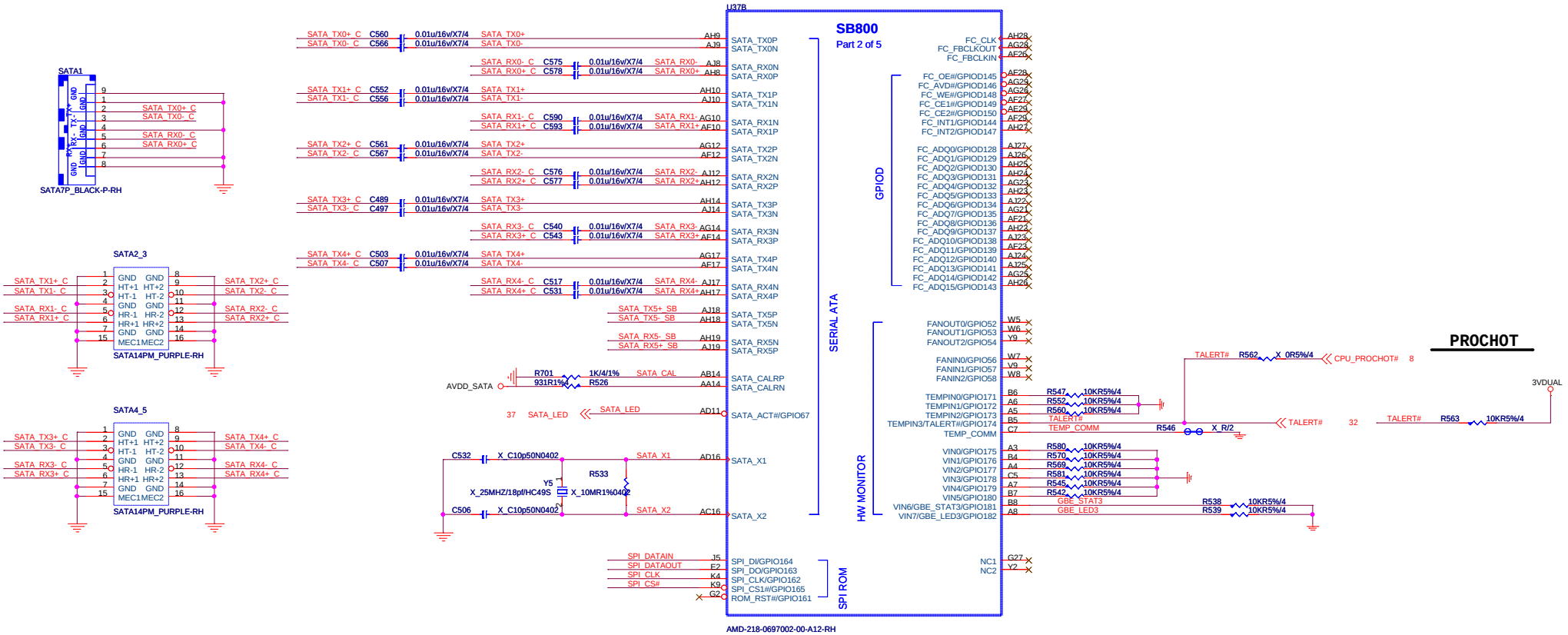
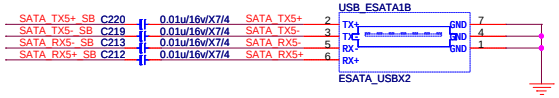
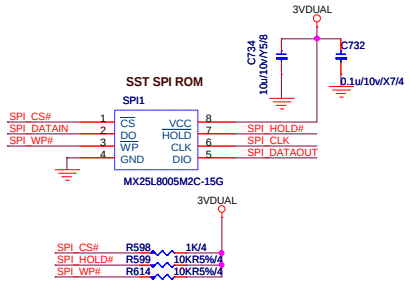
N91-01F0151-H06
N41-1030141-H06

Impendance 90 Ohm,refer to AN_SB700AB2

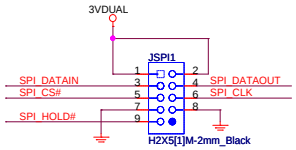






SPI FLASH MEMORY

SPI DEBUG PORT



Part Number : N31-2051451-H06

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Title	*SB710-SATA/IDE/HWM/SPI*
Rev	0A
Document Number	*MS-7642*
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PCI_PME# internal pull high 10k to 3V

U37D

SB800
Part 4 of 5

ACPI / WAKE UP EVENTS
USB 1.1 USB MISC
GPIO
USB 2.0
USB OC
HD AUDIO
GBE LAN
EMBEDDED CTRL
EMBEDDED CTRL

90 Ohm

GPIO200 GPIO199

ROM TYPE: H, H = Reserved
H, L = SPI ROM DEFAULT
L, H = LPC ROM
L, L = FWH ROM

Reserved for EMI 0906

For EMI(closed SB)

AMD-218-0697002-00-A12-RH

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Title	SB710-ACPI/GPIO/USB/AUDIO
Rev	0A
Document Number	MS-7642
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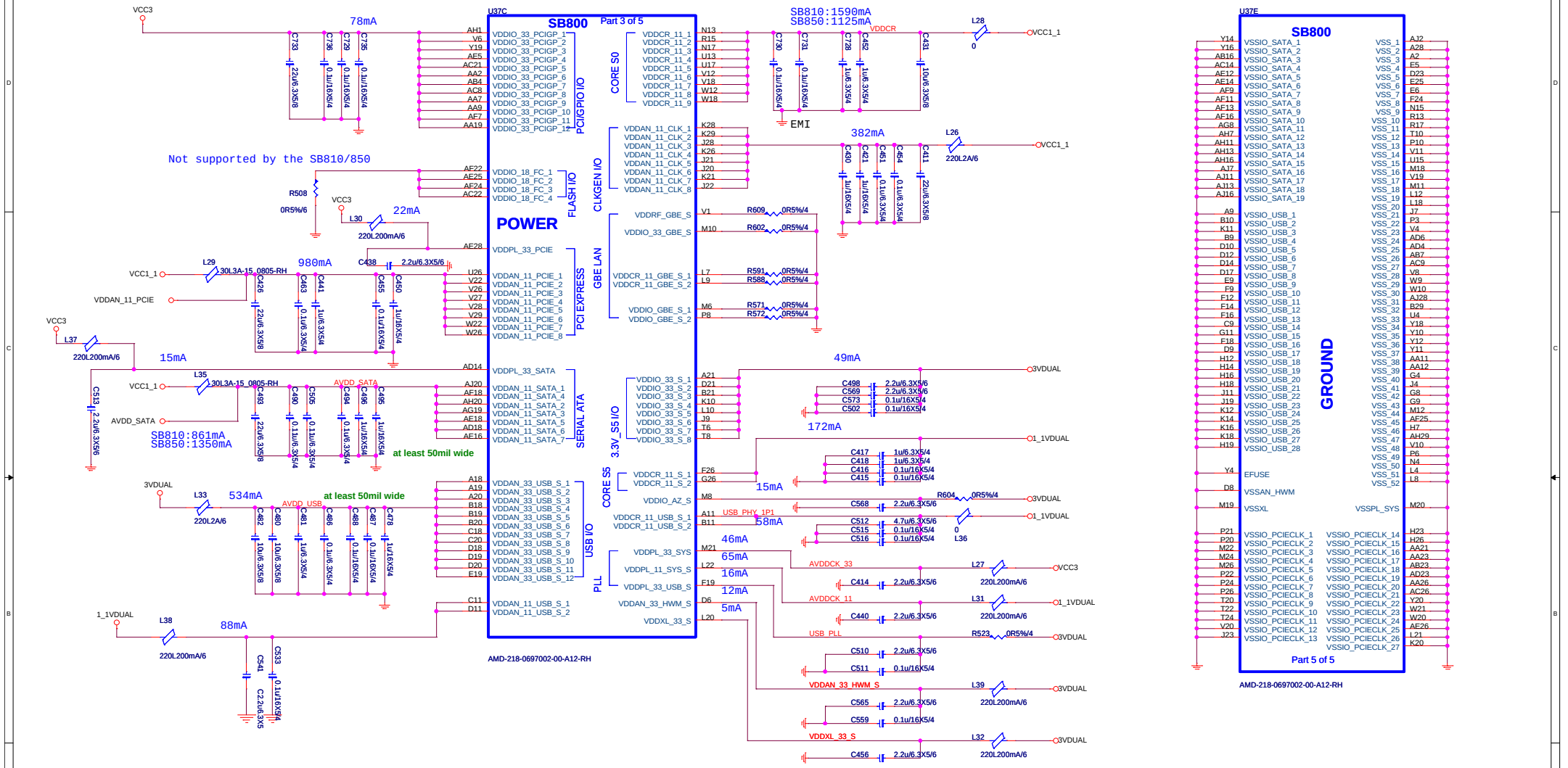

Micro Star Restricted Secret

Title	SB710-POWER & DECOUPLING	Rev 0A
Document Number	MS-7642	

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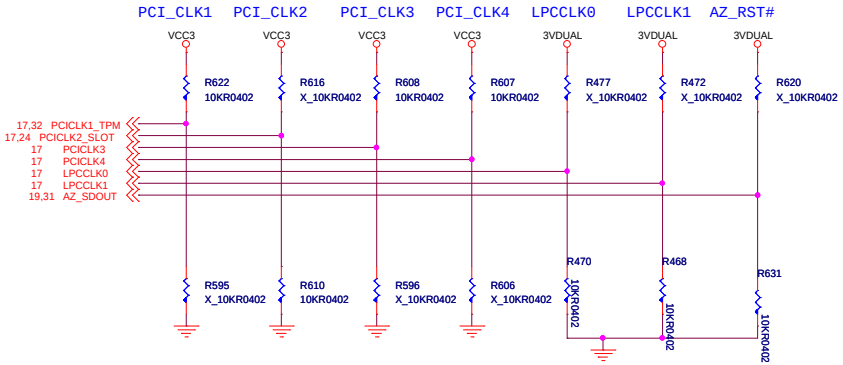
REQUIRED STRAPS

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



	AZ_SDOUT	PCI_CLK1	PCI_CLK2	PCI_CLK3	PCI_CLK4	LPC_CLK0	LPC_CLK1	
PULL HIGH	CoreSpeedMode Low Power mode	PCIE at GEN2 mode DEFAULT	Watchdog timer Enable	Enable Debug Straps DEFAULT	Reserved DEFAULT	EC ENABLE	Integrated clock mode	
PULL LOW	CoreSpeedMode Performance mode DEFAULT	PCIE at GEN1 mode	Watchdog timer Disable DEFAULT	Disable Debug Straps	Reserved	EC DISABLE DEFAULT	External clock mode DEFAULT	

DEBUG STRAPS

SB700 HAS 15K INTERNAL PU FOR PCI_AD[30:23]

	PCI_AD28	PCI_AD27	PCI_AD26	PCI_AD25	PCI_AD24	PCI_AD23
PULL HIGH	USE LONG RESET DEFAULT	USE PCI PLL DEFAULT	USE ACPI BCLK DEFAULT	USE IDE PLL DEFAULT	USE DEFAULT PCIE STRAPS DEFAULT	RESERVED
PULL LOW	USE SHORT RESET	BYPASS PCI PLL	BYPASS ACPI BCLK	BYPASS IDE PLL	USE EEPROM PCIE STRAPS	

Title	*SB710-STRAPS*
Rev	0A
Document Number	*MS-7642*
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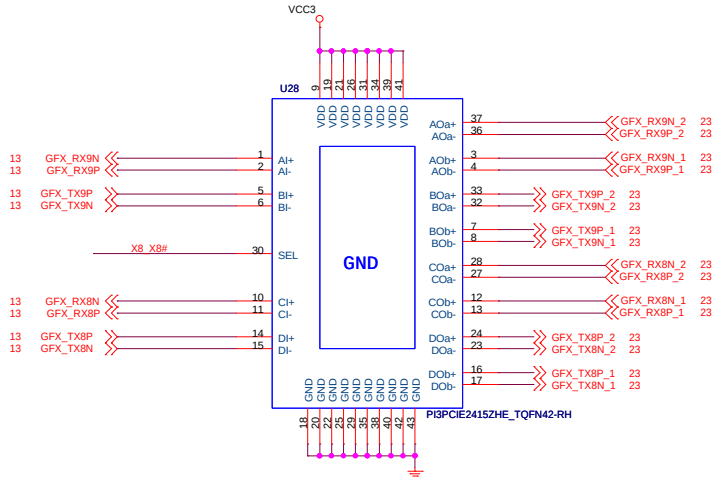

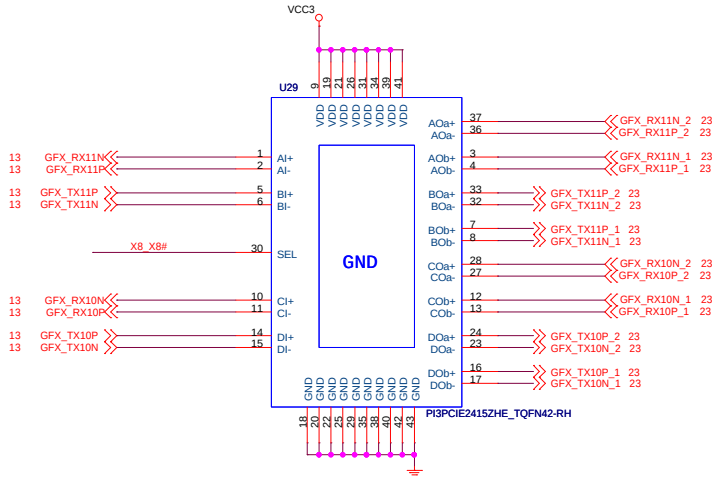

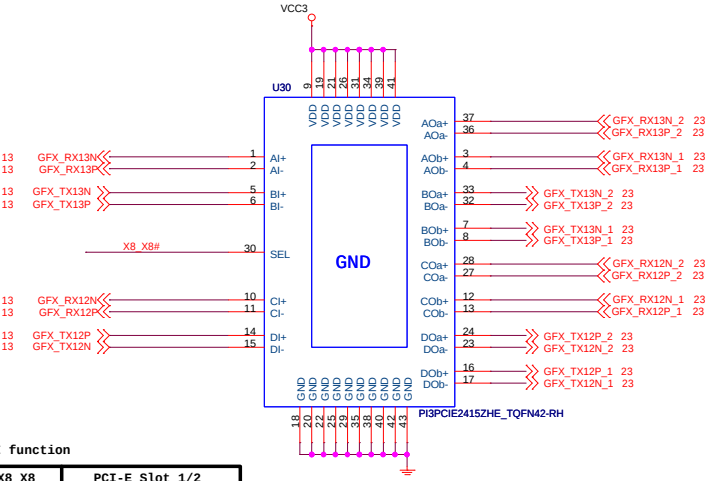

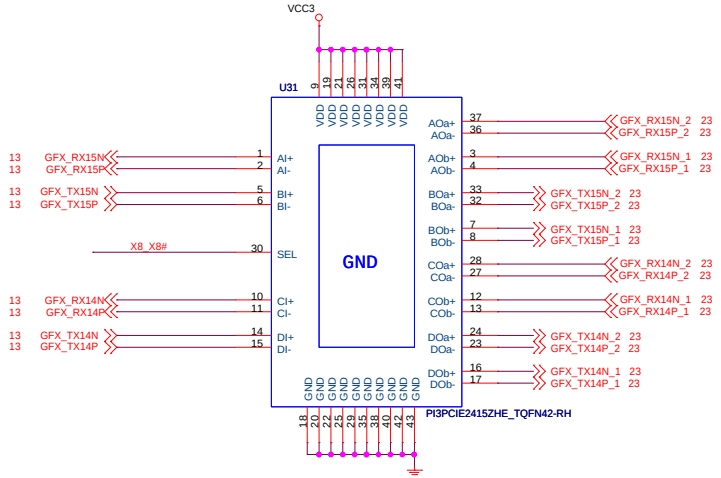

Digital Switch SEL pin **SLI function**

DualX8_En#	Output	X8_X8	PCI-E_Slot 1/2
1	b	1	X16
0	a	0	X8 / X8

Micro Star Restricted Secret	
Title PCI Slot 1 2	Rev 0A
Document Number ***MS-7642***	
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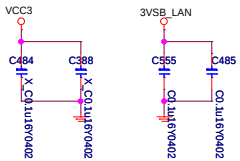
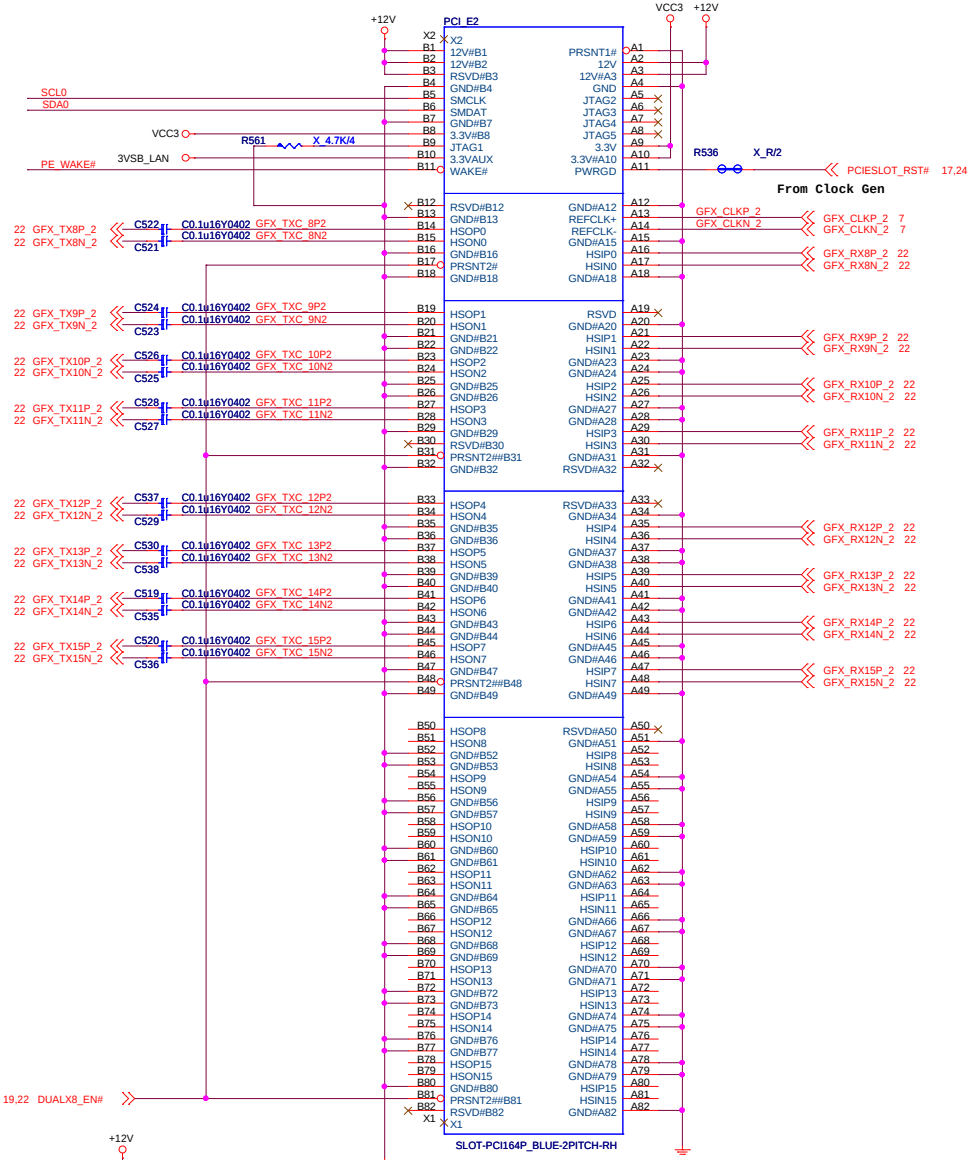
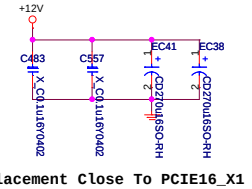
PCI EXPRESS x16 Slot

N11-1640401-K06



PCI EXPRESS x16 Slot





Placement Close To PCIE16_X1

Micro Star Restricted Secret		
Title	*PCI EXPRESS X16 & X1 SLOT*	Rev 0A
Document Number	*MS-7642*	
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Tuesday, January 19, 2010	
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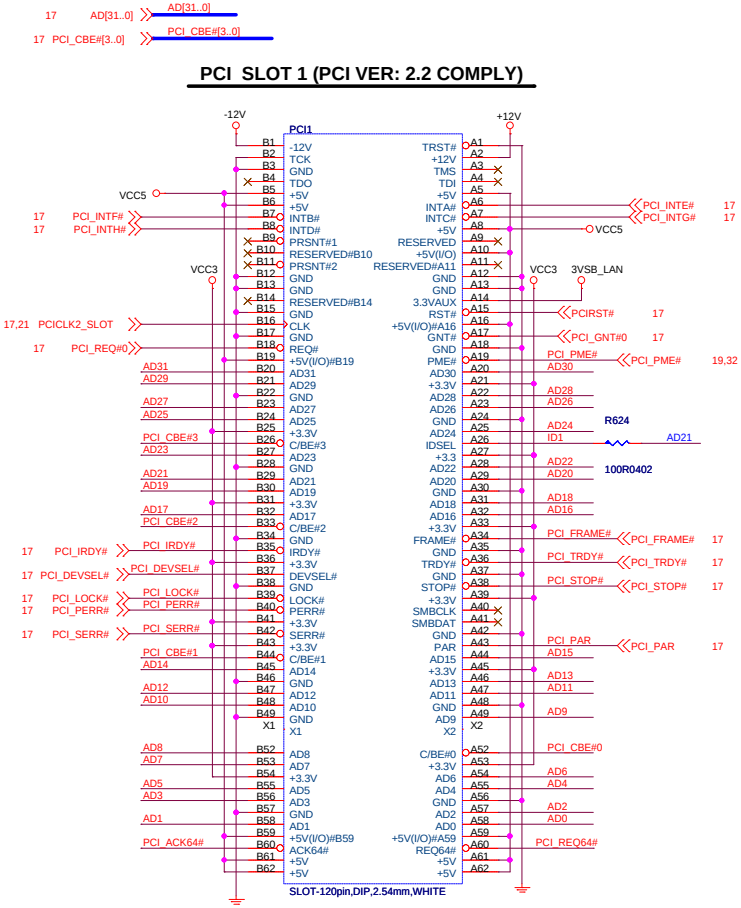
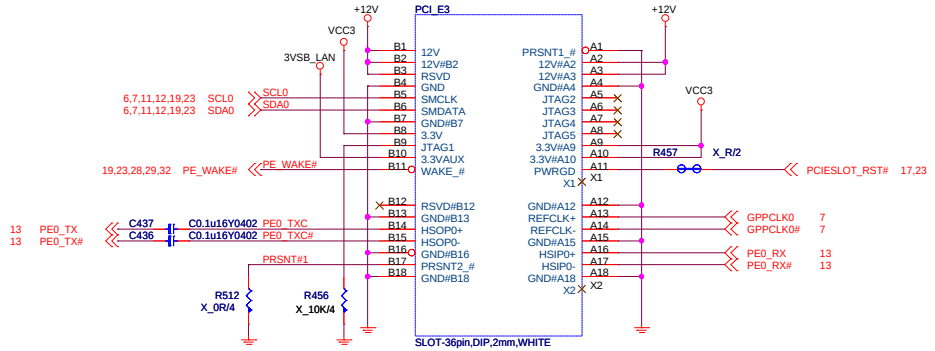
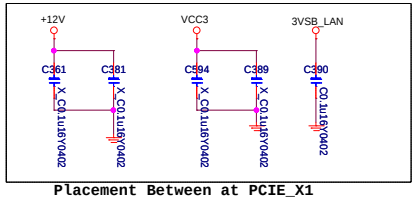
PCI SLOT 1 (PCI VER: 2.2 COMPLY)



IDSEL = AD21
MASTER = PCI_REQ#0
PCI_GNT#0

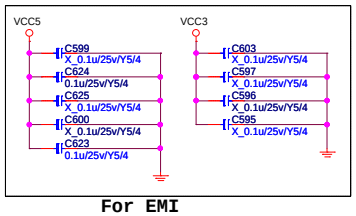
PCI EXPRESS 1 Slot-1



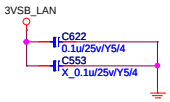


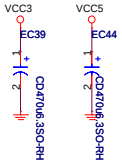
Placement Between at PCIE_X1

PCI SLOT DECOUPLING CAPACITORS

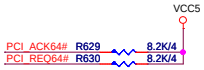


For EMI





PCI PULL-UP / DOWN RESISTORS



Micro Star Restricted Secret		
Title	PCI Slot 1 2	Rev 0A
Document Number	*MS-7642*	
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Tuesday, January 19, 2010	
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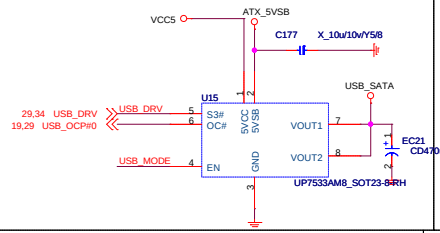
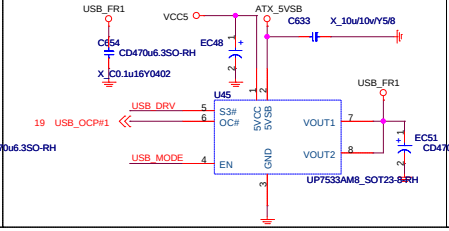
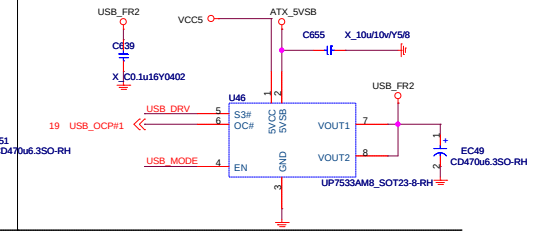
POWER CIRCUIT FOR USB PORT 2,3



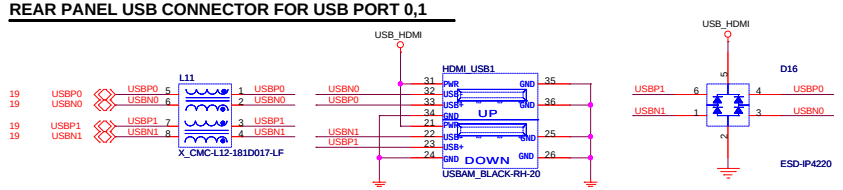
POWER CIRCUIT FOR USB PORT 6,7



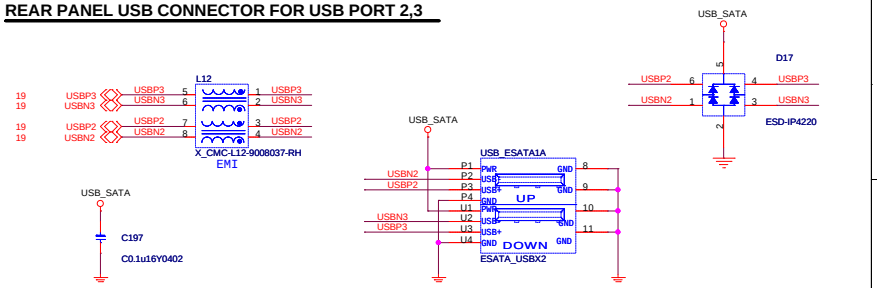
POWER CIRCUIT FOR USB PORT 8,9



REAR PANEL USB CONNECTOR FOR USB PORT 0,1

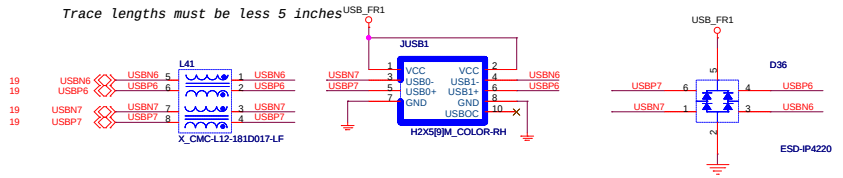


REAR PANEL USB CONNECTOR FOR USB PORT 2,3

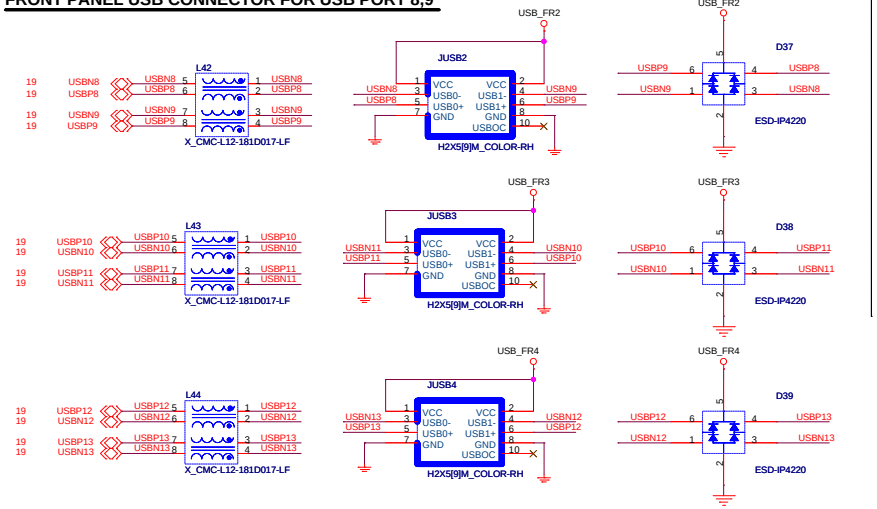


NEAR USB CONNECTOR

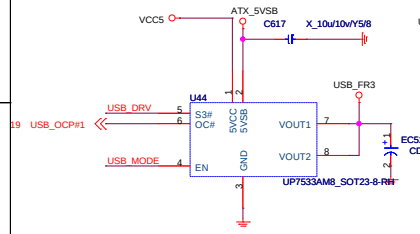
FRONT PANEL USB CONNECTOR FOR USB PORT 6,7



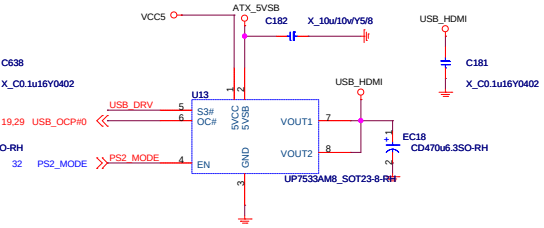
FRONT PANEL USB CONNECTOR FOR USB PORT 8,9

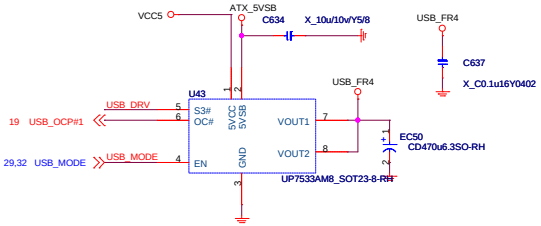


POWER CIRCUIT FOR USB PORT 10,11



POWER CIRCUIT FOR USB PORT 0,1





Micro Star Restricted Secret

Title	USB Connection
Rev	0A
Document Number	MS-7642

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Last Revision Date: Tuesday, January 19, 2010

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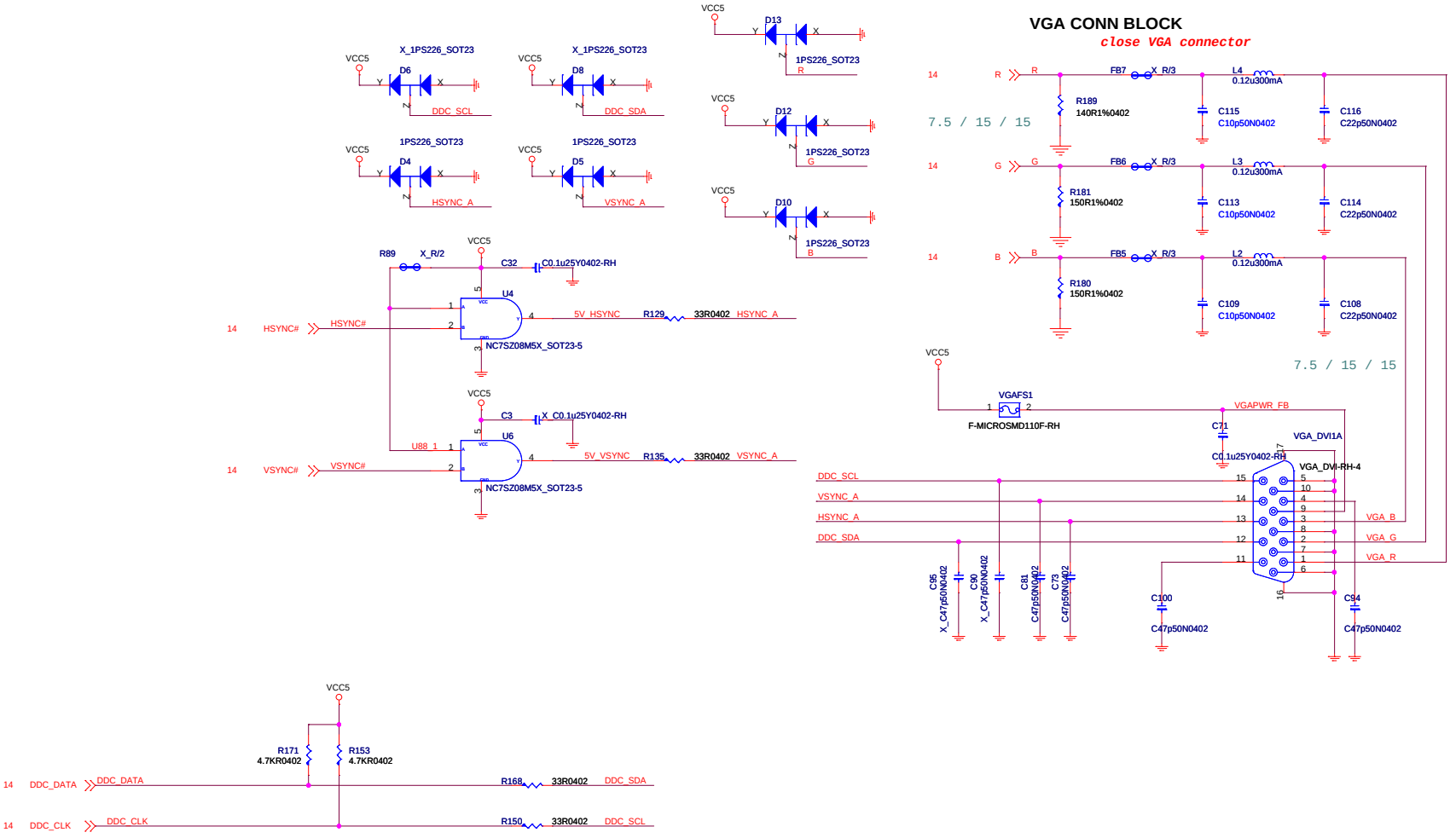

Micro Star Restricted Secret	
Title **VGA Connection**	Rev 0A
Document Number **MS-7642**	
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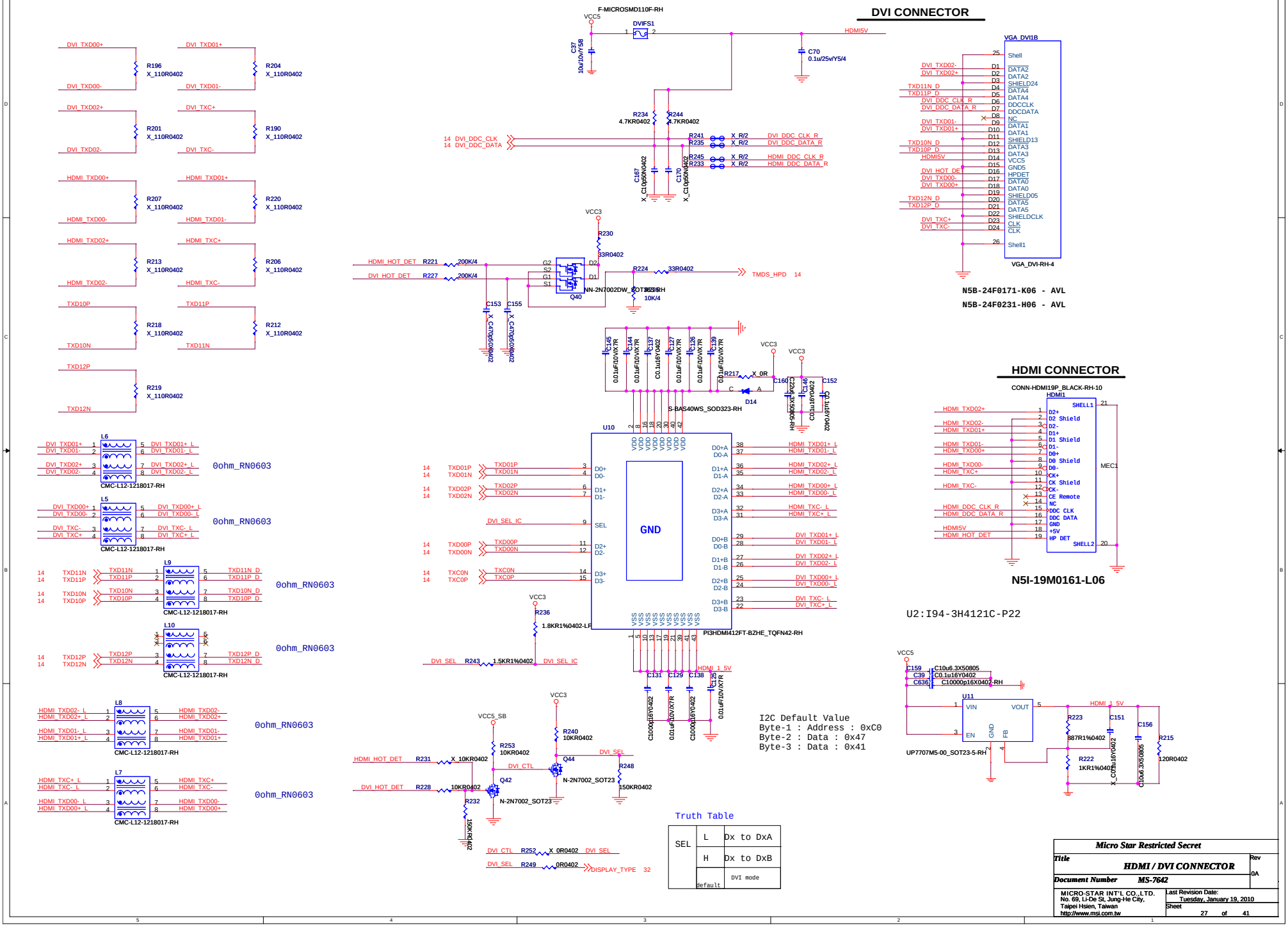
DVI CONNECTOR
HDMI CONNECTOR
F-MICROSMD110F-RH
VGA_DVI1B
VGA_DVI-RH-4
N5B-24F0171-K06 - AVL
N5B-24F0231-H06 - AVL
CONN-HDMI19P_BLACK-RH-10
N5I-19M0161-L06
U2:I94-3H4121C-P22
PI3HDMI412FT-BZHE_TQFN42-RH
GND
S-BAS40WS_SOD323-RH
NN-2N7002DW_SOT363-RH
CMC-L12-1218017-RH
0ohm_RN0603
I2C Default Value
Byte-1 : Address : 0xC0
Byte-2 : Data : 0x47
Byte-3 : Data : 0x41
Truth Table
SEL
L
Dx to DxA
H
Dx to DxB
default
DVI mode
Micro Star Restricted Secret
Title
HDMI / DVI CONNECTOR
Rev
0A
Document Number
MS-7642
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Taipei Hsien, Taiwan
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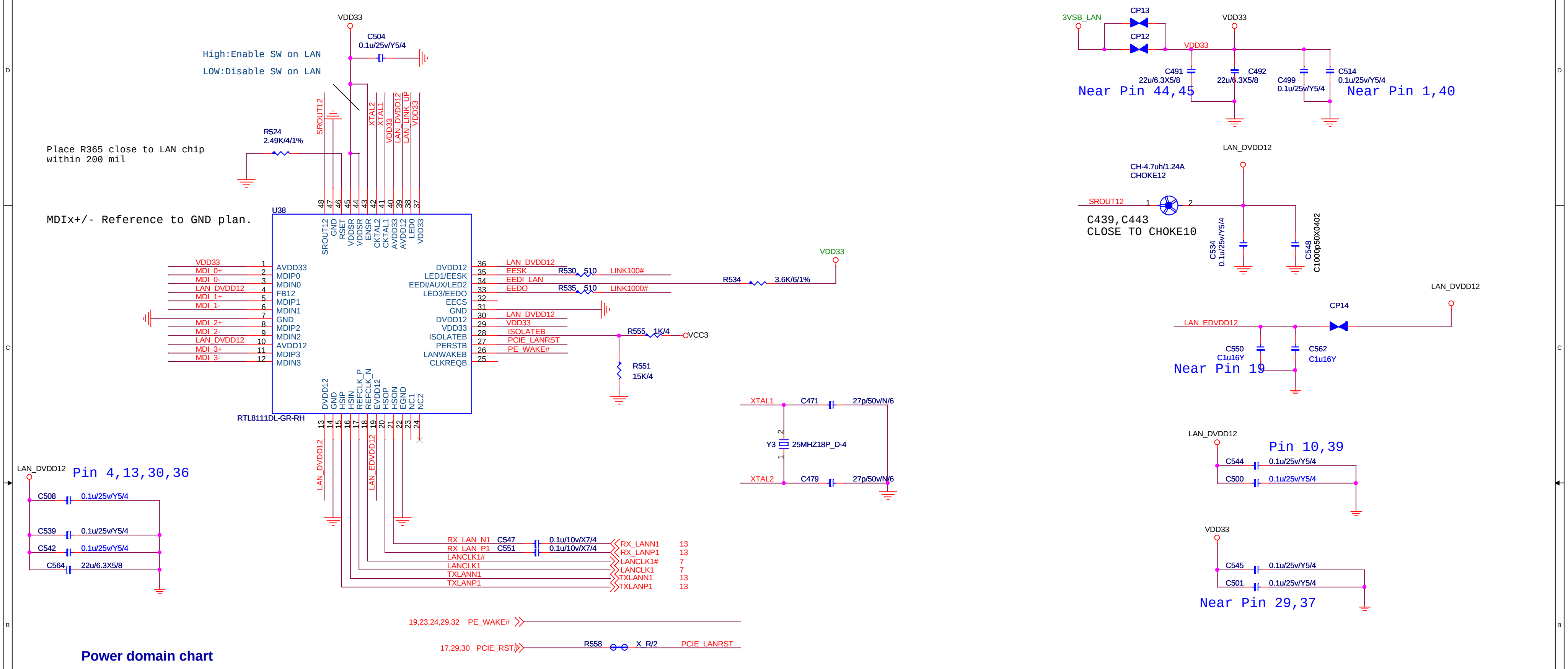
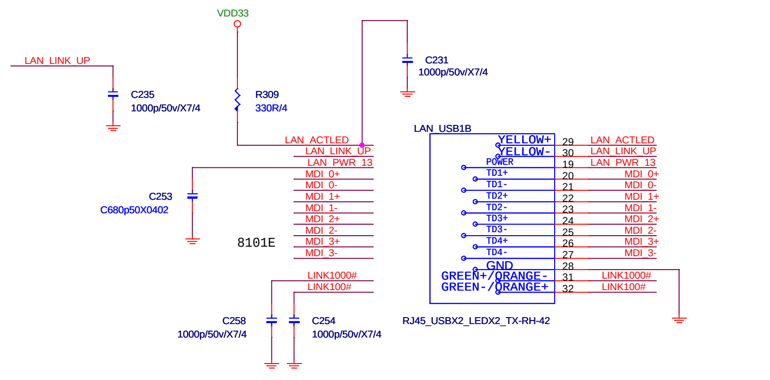


Power domain chart

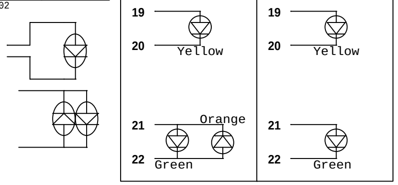
	RTL8111DL
AVDD33	3.3V
VDDSR	3.3V
VDD33	3.3V
EVDD12	1.2V
DVDD12	1.2V
AVDD12	1.2V



Power comsuption	1G	100M
3.3V	103mA	TBD
1.5V	367mA	TBD
1.8V	198mA	TBD

N58-16F0031-F02

Giga-Lan	10/100-Lan
N58-22F0081-S42	N58-22F0061-S42 N58-22F0061-F02
Link Yellow Active Blinking 1000 Orange 100 Green 10 None	Link Yellow Active Blinking 100 Green 10 None



Micro Star Restricted Secret	
Title	LAN - Realtek 8111DL
Rev	0A
Document Number	MS-7642
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Tuesday, January 19, 2010
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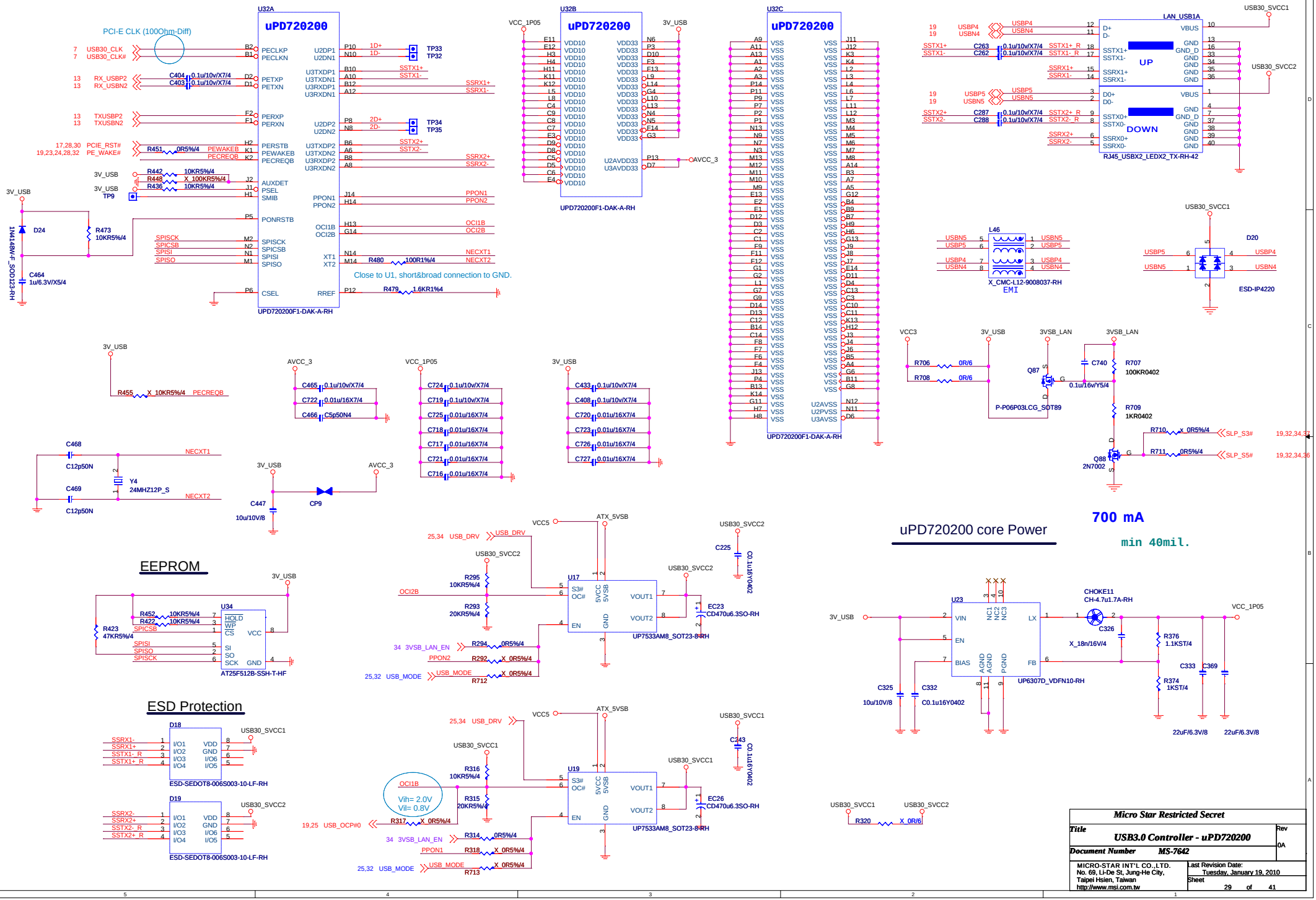
PCI-E CLK (100Ohm-Diff)
U32A
uPD720200
UPD720200F1-DAK-A-RH
U32B
uPD720200
UPD720200F1-DAK-A-RH
U32C
uPD720200
UPD720200F1-DAK-A-RH
Close to U1, short&broad connection to GND.
LAN_USB1A
UP
DOWN
RJ45_USBX2_LEDX2_TX-RH-42
L46
X_CMC-L12-9008037-RH
EMI
D20
ESD-IP4220
Y4
24MHZ12P_S
CP9
EEPROM
U34
AT25F512B-SSH-T-HF
U17
U19
UP7533AM8_SOT23-8-RH
uPD720200 core Power
700 mA
min 40mil.
U23
UP6307D_VDFN10-RH
CHOKE11
CH-4.7u1.7A-RH
ESD Protection
D18
D19
ESD-SEDOT8-006S003-10-LF-RH
Micro Star Restricted Secret
Title
USB3.0 Controller - uPD720200
Rev
0A
Document Number
MS-7642
MICRO-STAR INT'L CO.,LTD.
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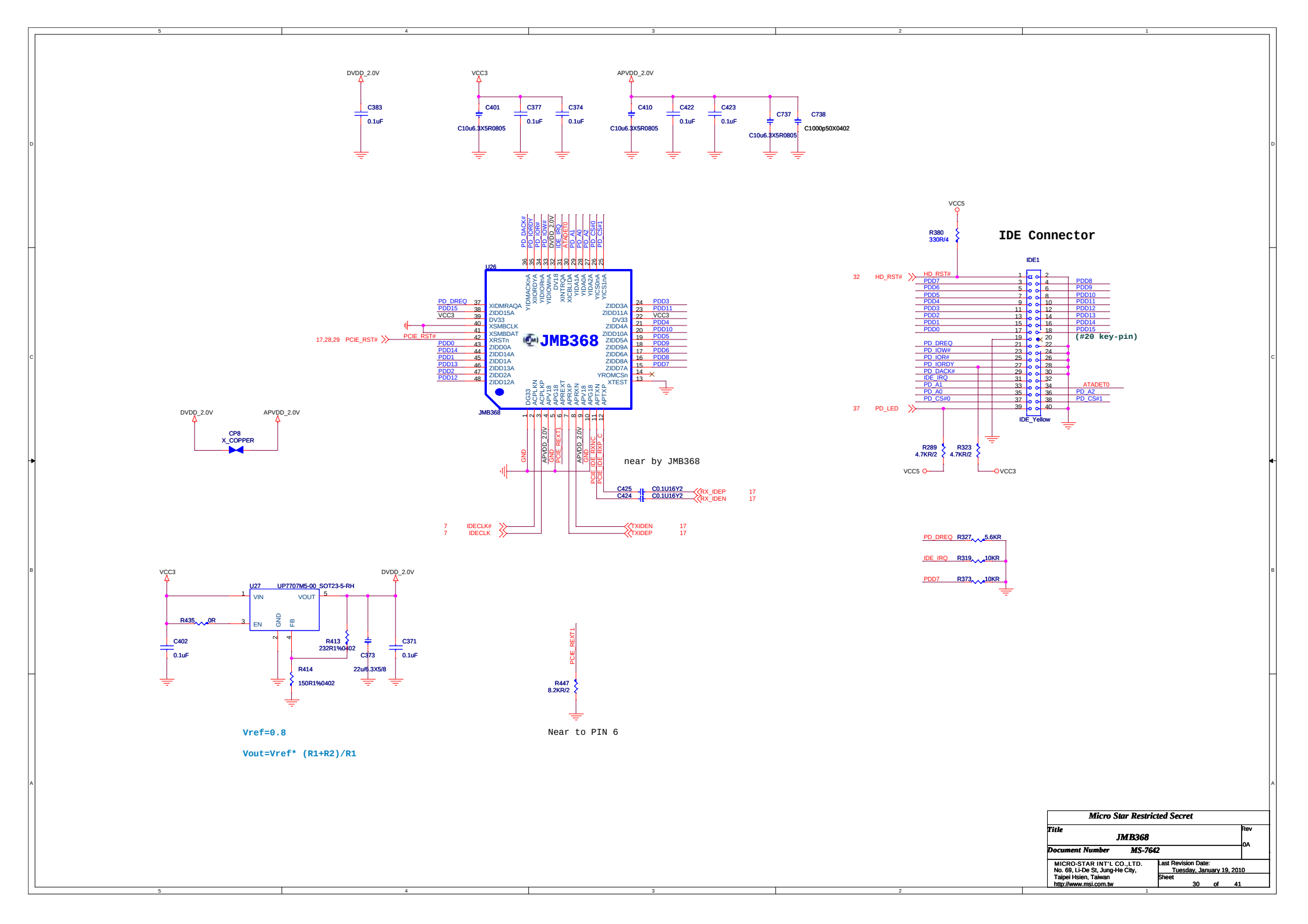
of
41



Micro Star Restricted Secret		
Title	*JMB368*	Rev 0A
Document Number	*MS-7642*	
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Tuesday, January 19, 2010	
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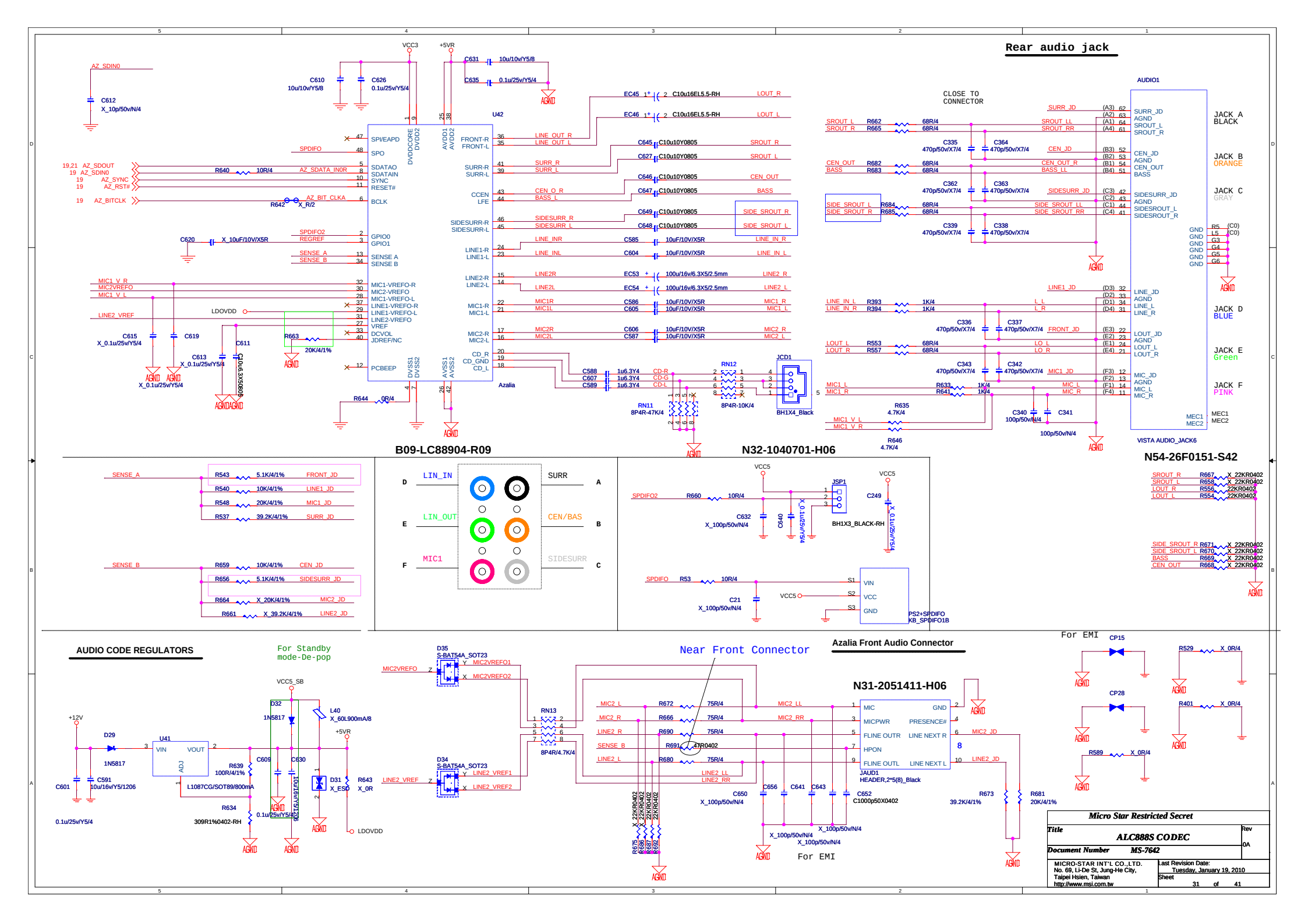
Rear audio jack
B09-LC88904-R09
N32-1040701-H06
N54-26F0151-S42
AUDIO CODE REGULATORS
For Standby mode-De-pop
Near Front Connector
Azalia Front Audio Connector
N31-2051411-H06
For EMI
For EMI
CLOSE TO CONNECTOR
VISTA AUDIO_JACK6
JACK A BLACK
JACK B ORANGE
JACK C GRAY
JACK D BLUE
JACK E Green
JACK F PINK
Micro Star Restricted Secret
ALC888S CODEC
Document Number MS-7642
Rev 0A
MICRO-STAR INT'L CO.,LTD.
No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan
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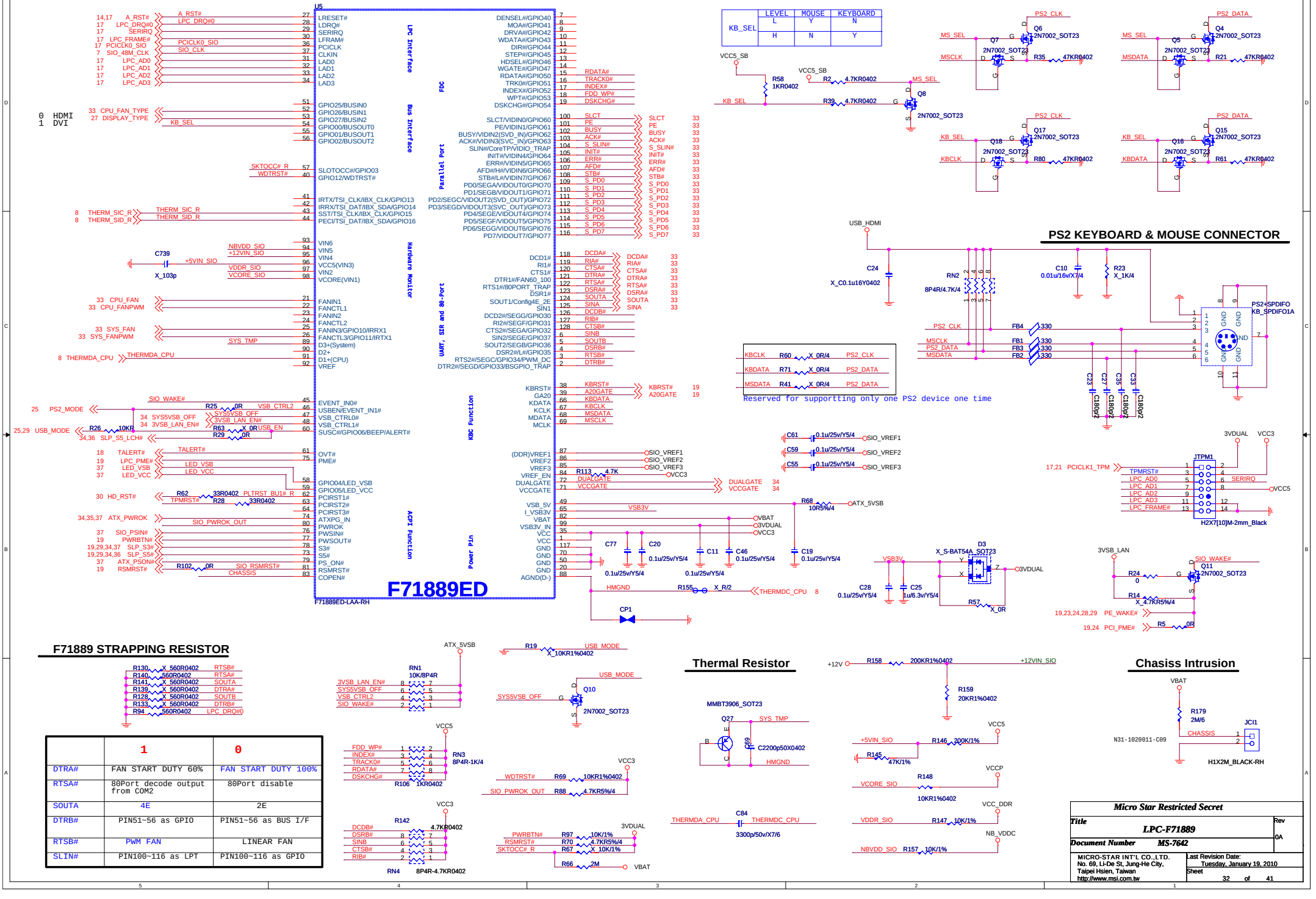

KB_SEL	LEVEL	MOUSE	KEYBOARD
	L	Y	N
	H	N	Y

	1	0
DTRA#	FAN START DUTY 60%	FAN START DUTY 100%
RTSA#	80Port decode output from COM2	80Port disable
SOUTA	4E	2E
DTRB#	PIN51~56 as GPIO	PIN51~56 as BUS I/F
RTSB#	PWM FAN	LINEAR FAN
SLIN#	PIN100~116 as LPT	PIN100~116 as GPIO

Micro Star Restricted Secret

Title	LPC-F71889
Rev	0A
Document Number	MS-7642

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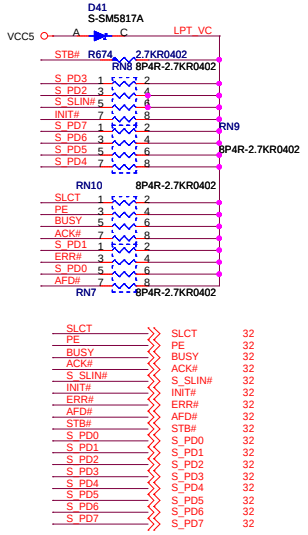
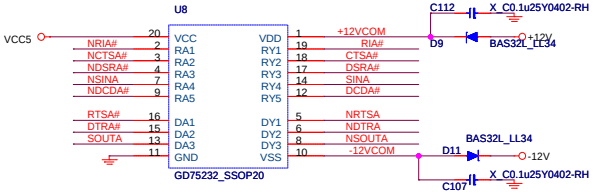
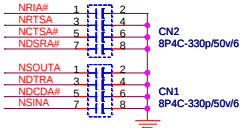
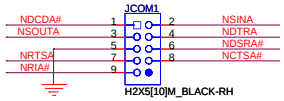
PARALLAL PORT



SERIAL PORT 1

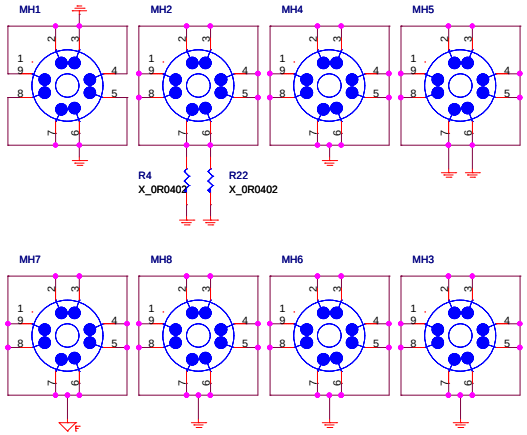




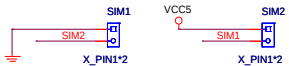


N31-2051331-H06

Mounting Holes



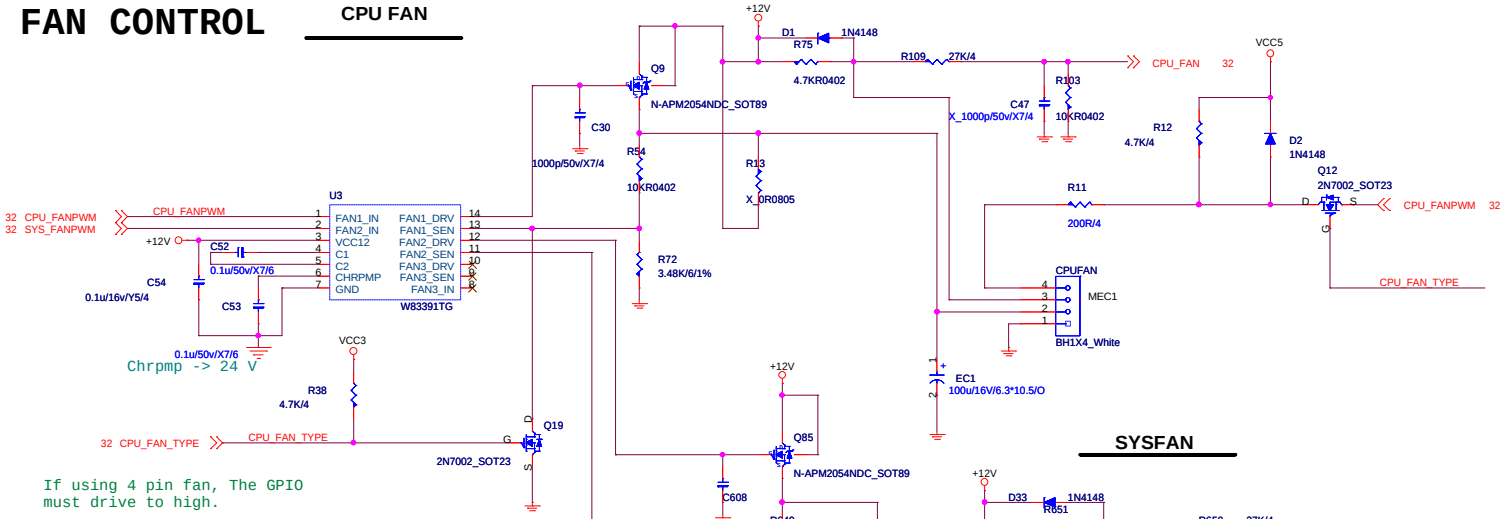
Simulation



FAN CONTROL

CPU FAN

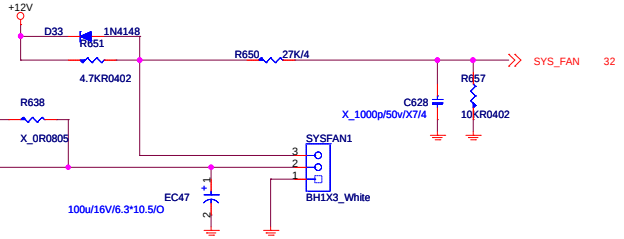
If using 3 pin fan, The Q6 will turn off to avoid the VCC5(R57) bias to CPU_FANPWM.



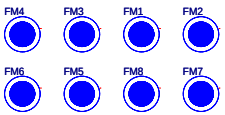
If using 4 pin fan, The GPIO must drive to high.

If using 3 pin fan, The GPIO must drive to low.

SYSFAN



Optics Orientation Holes



Micro Star Restricted Secret	
Title: COM/LPT/ FAN	Rev: 0A
Document Number: MS-7596	
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Tuesday, January 19, 2010
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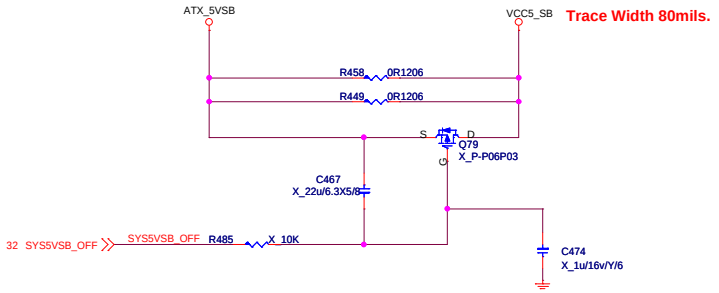
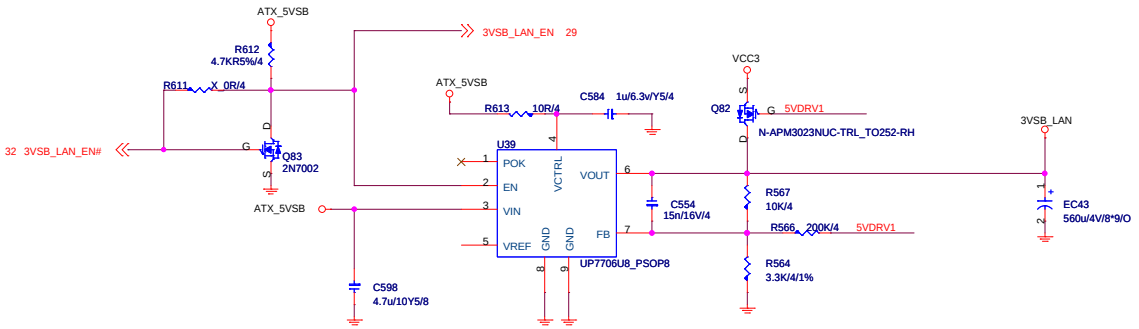
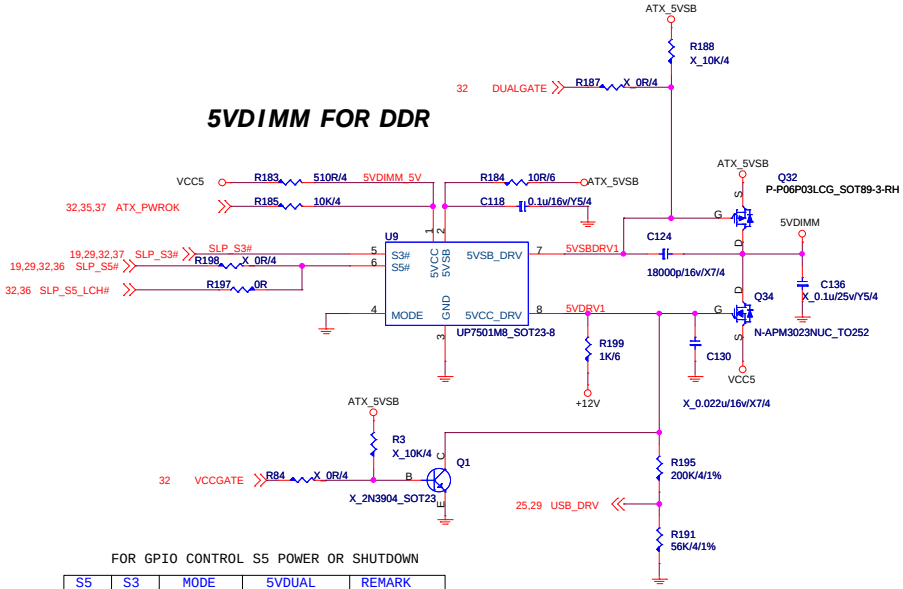
5VSB Power Switch



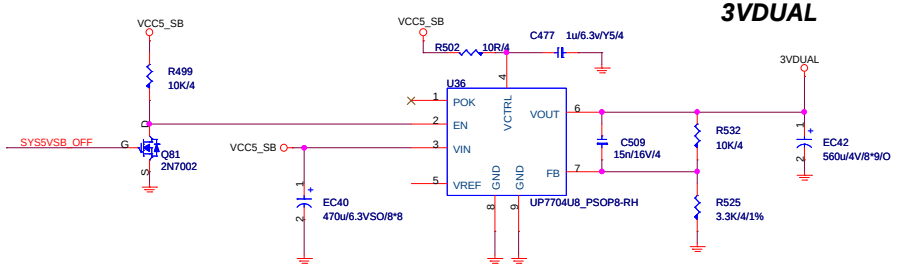
Deep Mode WOL LAN Power CTRL Circuit



5VDIMM FOR DDR



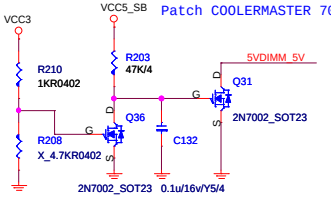
3VDUAL



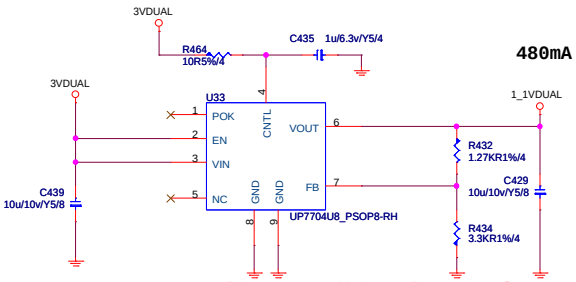
FOR GPIO CONTROL S5 POWER OR SHUTDOWN

S5	S3	MODE	5VDUAL	REMARK
1	1	X	VCC5	S0/S1/S2
1	0	X	VCC5_SB	S3
0	X	1	VCC5_SB	S4/S5
0	X	0	SHUTDOWM	S4/S5

Patch COOLERMASTER 700W POWER Sequence



480mA



Vout : 0.9 [(R432+R434))/R434] = 1.1 Volt
Vout : 0.9 [(1.27K+3.3K) /3.3K] = 1.1 Volt

1P1V_SB_DUAL for SB, 480mA S0 - S5

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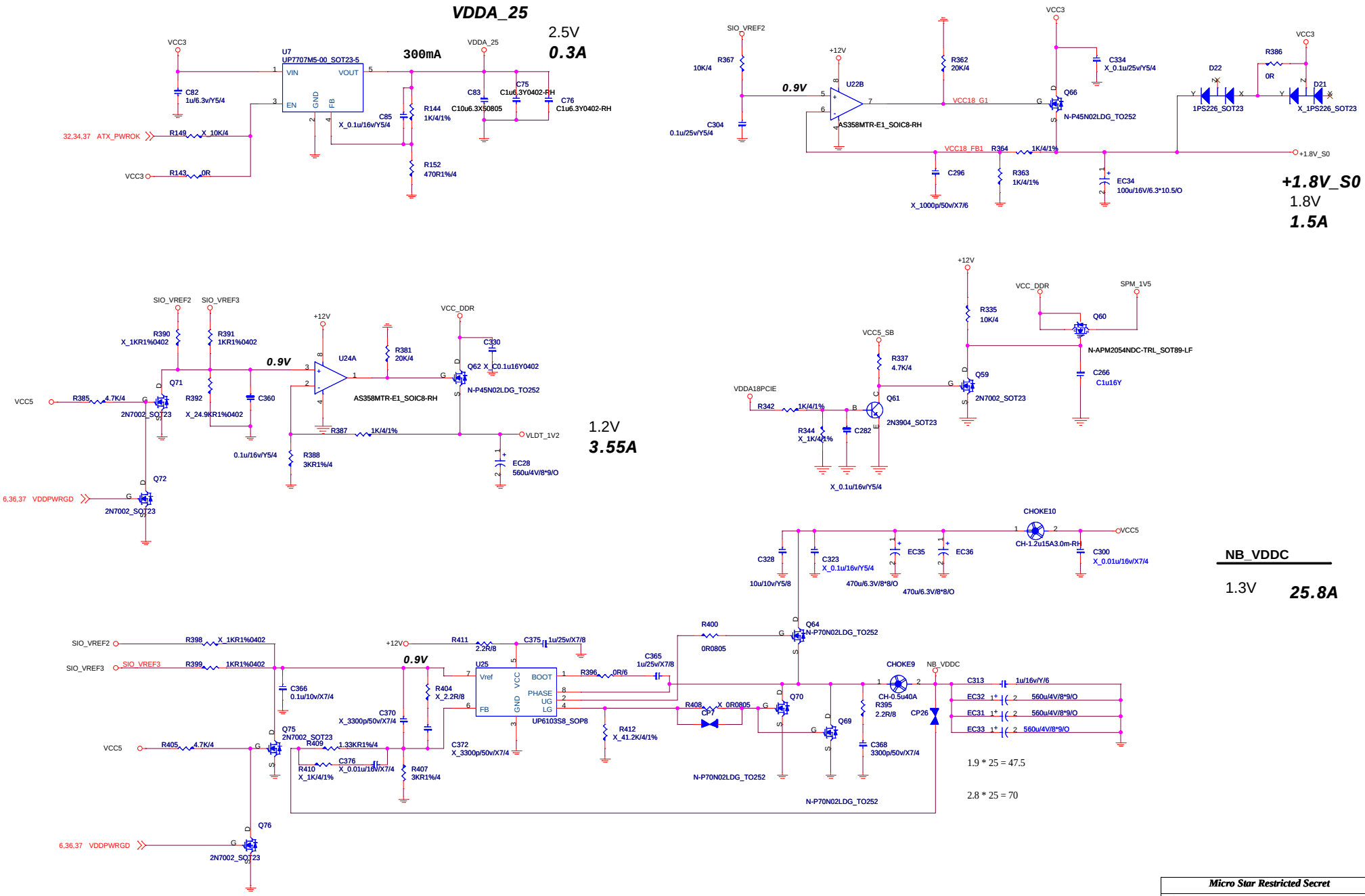

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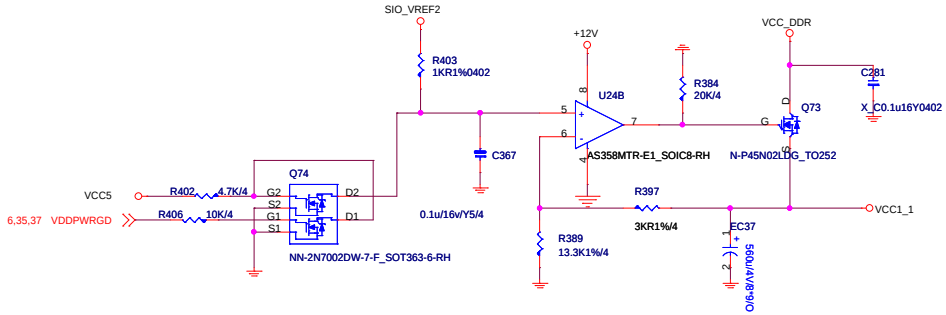
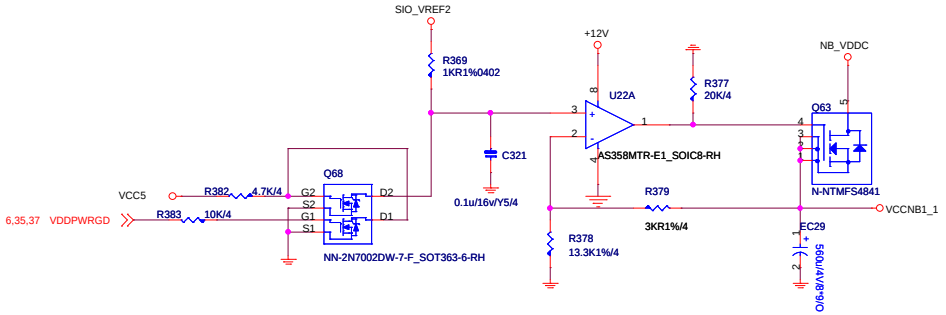
NB/SB 1.1V POWER

VCC1_1 3.8A



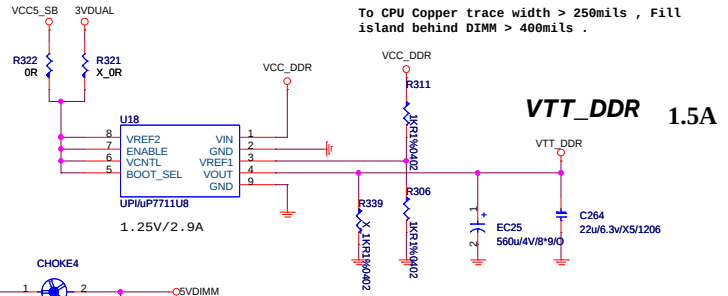
VCCNB1_1 3.8A



DDR VTT Power

To CPU Copper trace width > 250mils , Fill island behind DIMM > 400mils .

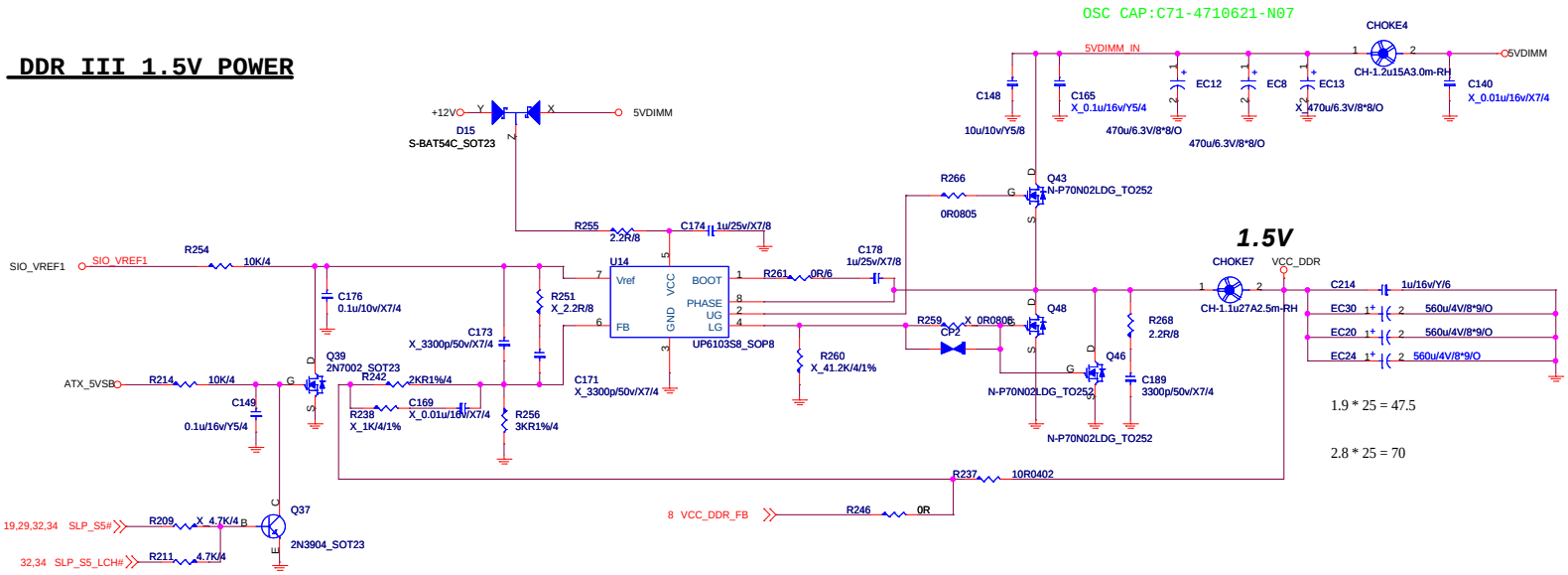
VTT_DDR 1.5A



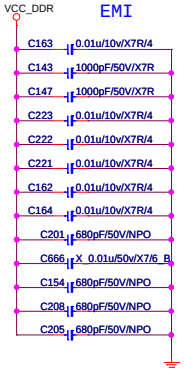
DDR III 1.5V POWER

OSC CAP:C71-4710621-N07

1.5V



EMI



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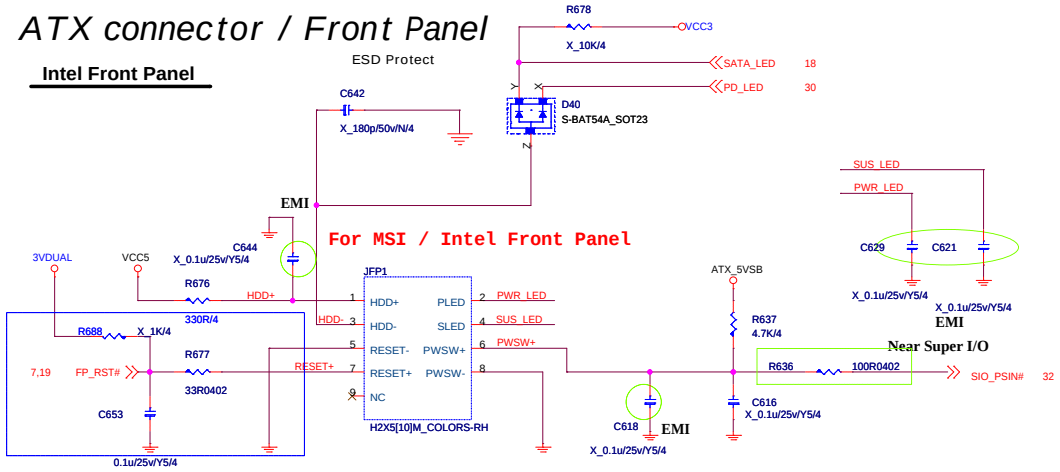
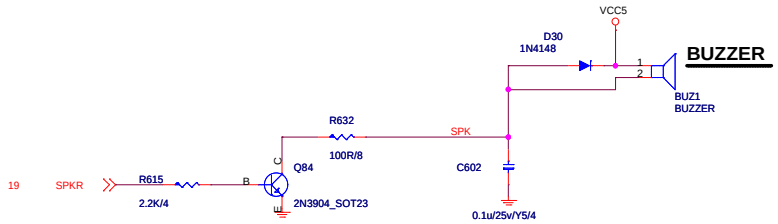
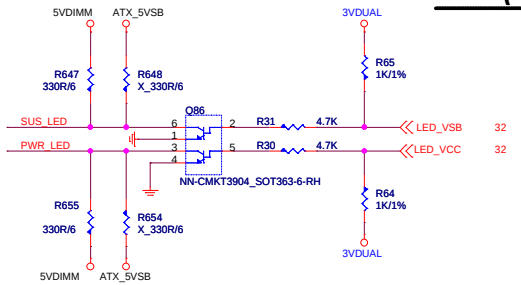
ATX connector / Front Panel

Intel Front Panel

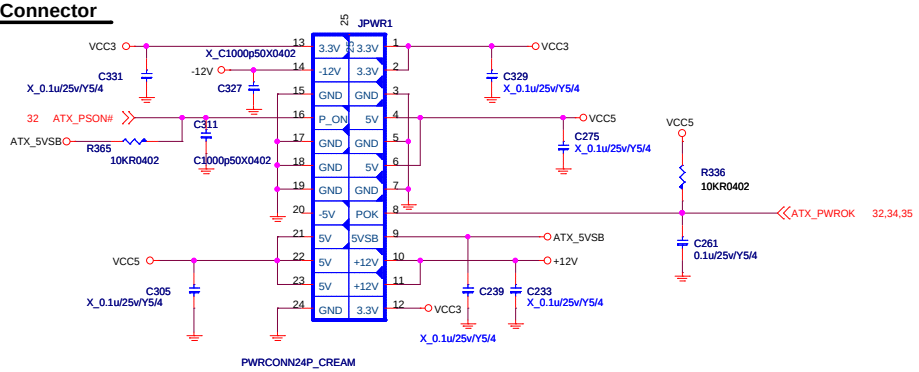


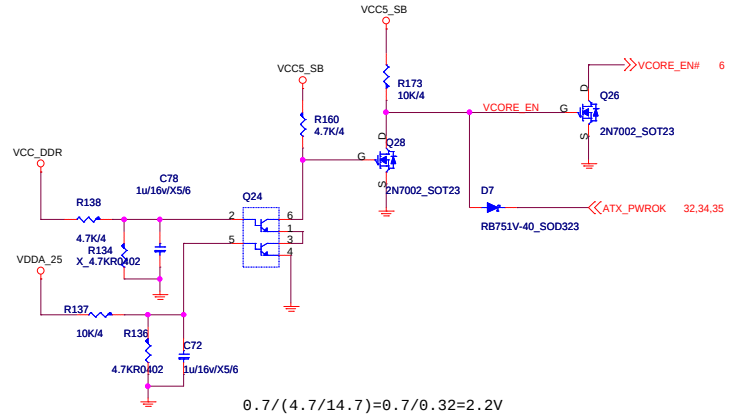


LED (for Fintek 71889)



ATX Connector





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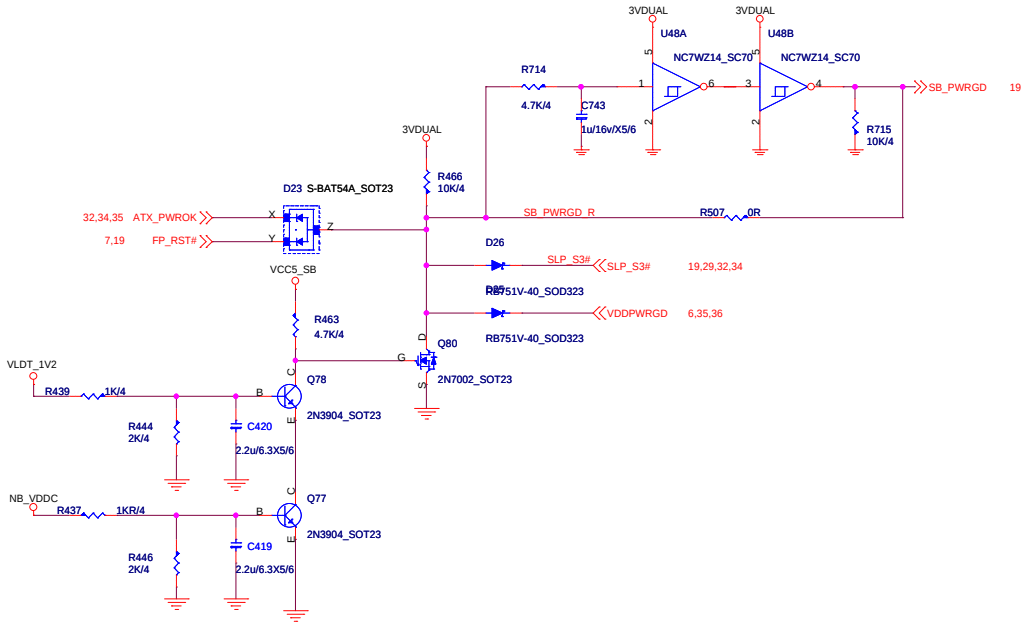

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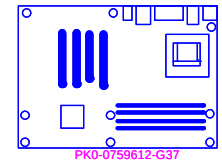
PCB

PCB1

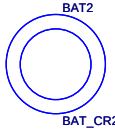


PK0-0759612-G37

PCB : 1080

BATTERY

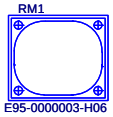
BAT2



BAT_CR2032

CPU RM

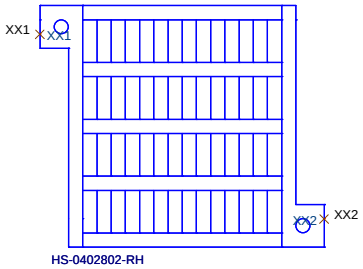
RM1



E95-0000003-H06

NB HEAT-SINK

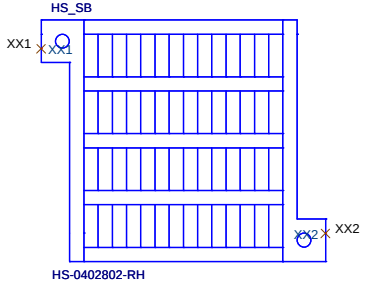
HS_NB



HS-0402802-RH

SB HEAT-SINK

HS_SB



HS-0402802-RH

HDMI

HDMI_Royalty

HDMI

MK1

G51-M1SP540

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