MS-7676

UATX Ver:10

CPU:

INTEL - Sandy Bridge LGA 1155

System Chipset:

INTEL - Cougar Point PCH

OnBoard Chipset:

Clock Gen:IDT 4106
HD Audio Codec:RTL892
LAN:RTL 8111E 10/100/1000
SIO:FIN71889AD
Flash ROM: 64 Mb SPI (PCH)* 2

Main Memory:

DDRIII (1066/1333MHz) * 4 (Dual Channel)

Expansion Slots:

PCI Express (X16) Slot * 1
PCI Express (X4) Slot * 1
PCI Express (X1) Slot * 2

PWM:

Controller:VRD12 UPI6234 (6+2-Phase)Dr.MOS

CPU+GPU
Controller:uP6113 Dr.MOS
CPU VTT CPU SA
Controller:uP6103A
DDR PCH

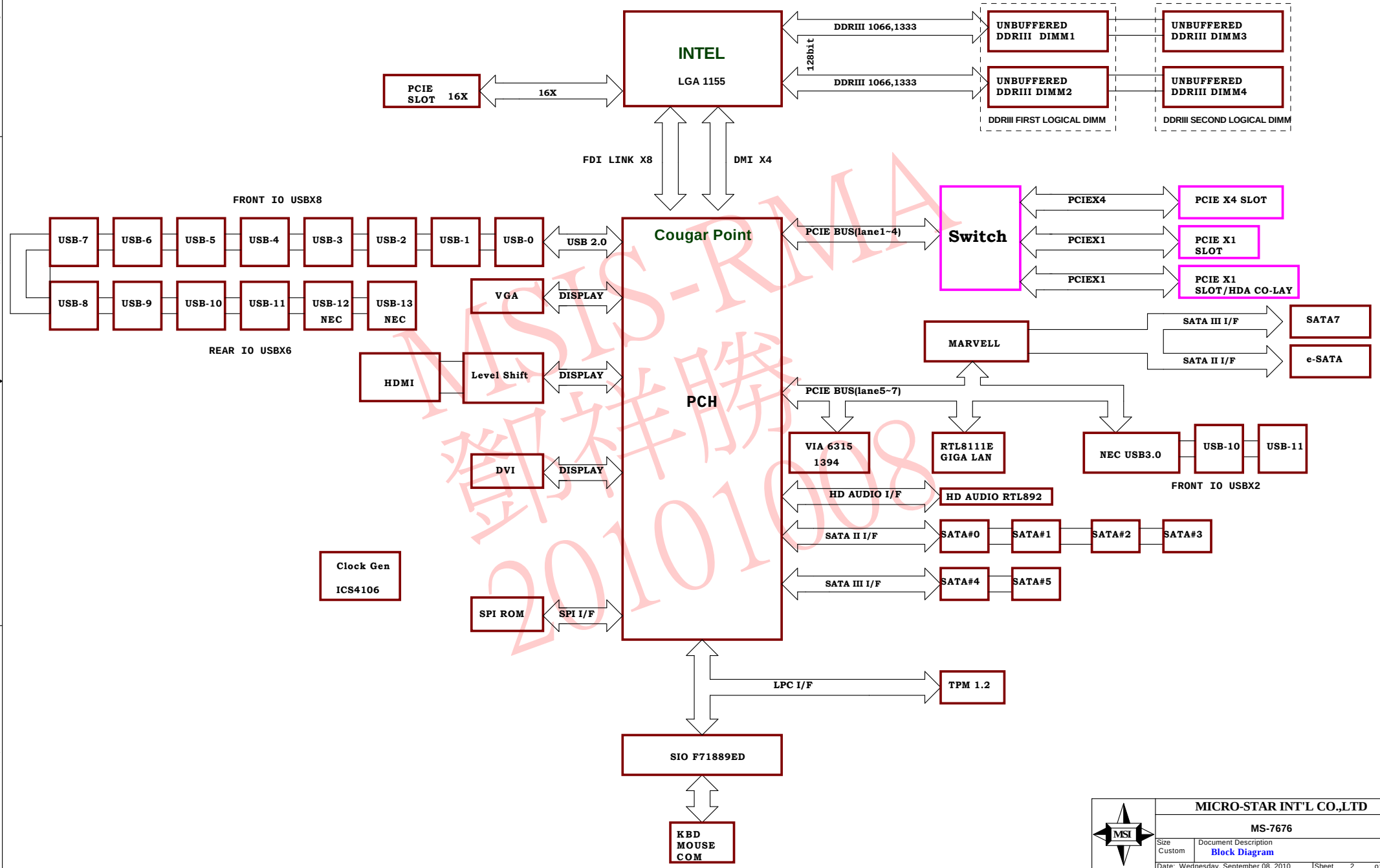
ACPI:

UPI

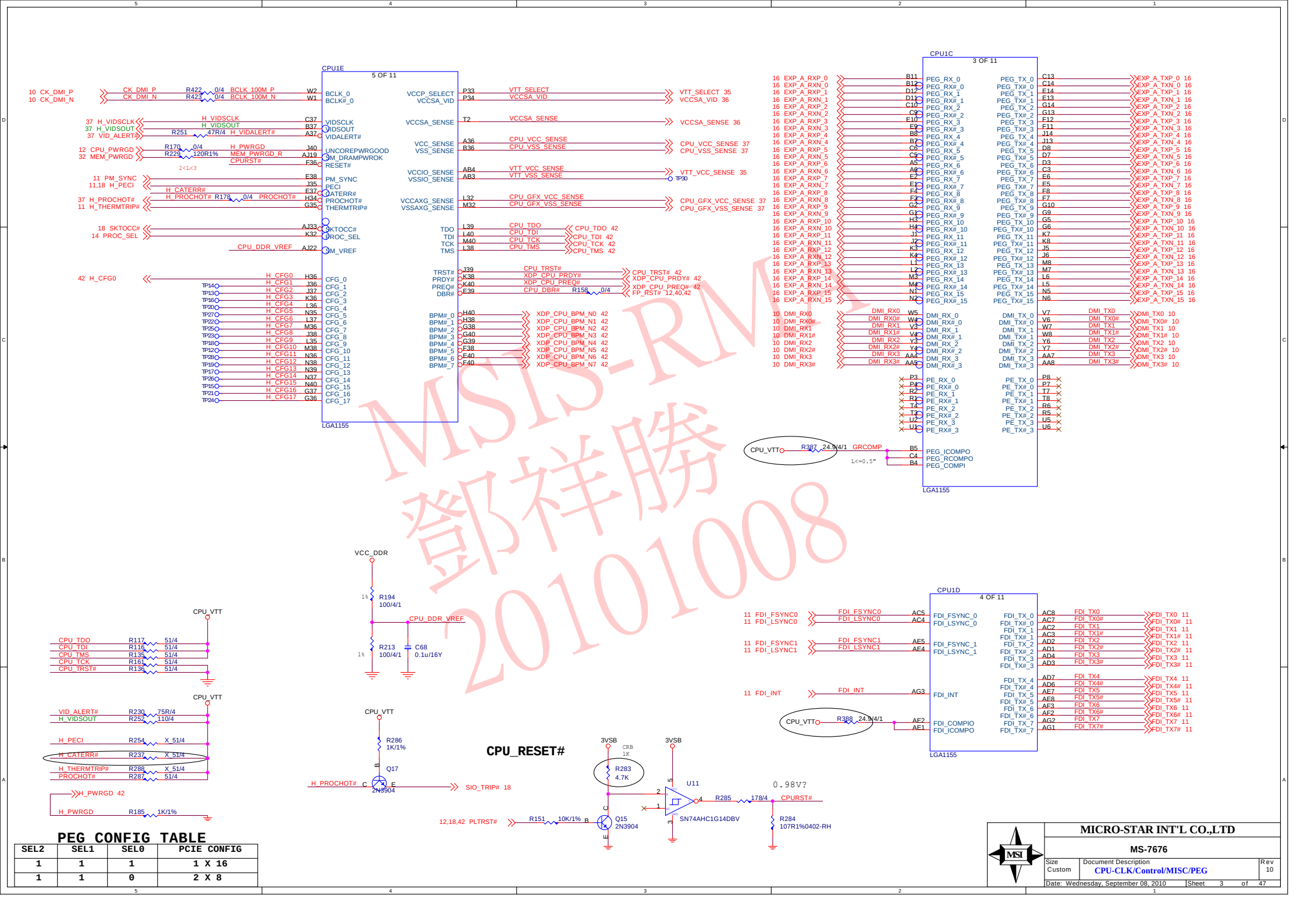
Other:

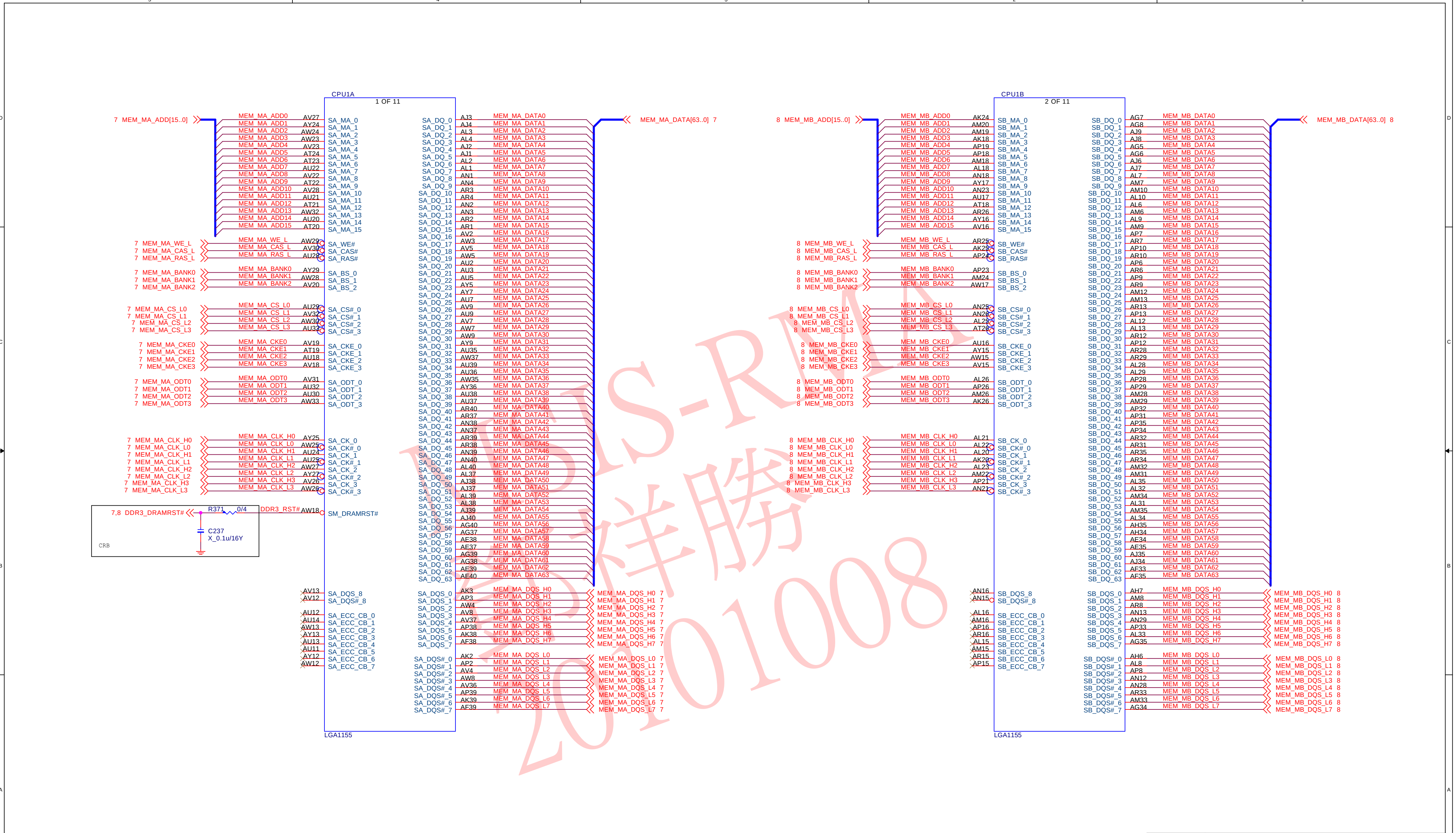
SATA3.0 x2 + SATA2.0 x4 (PCH)
SATA3.0X1 + e-SATA X1(MARVELL)
USB2.0 RearX4 Front x8(PCH)
USB3.0 RearX2 (NEC uPD720200)
1394 Controller - VT6315N-CE
D-SUB *1
DVI-D PORT*1
HDMI *1
TPM Header *1
COM Header *1
on BOARD BUZZER

MICRO-STAR INT'L CO.,LTD
MS-7676
Size: Custom | Document Description: Cover Sheet | Rev: 10
Date: Wednesday, September 08, 2010 | Sheet 1 of 47



MICRO-STAR INT'L CO.,LTD		
MS-7676		
Size: Custom	Document Description: Block Diagram	Rev: 10
Date: Wednesday, September 08, 2010	Sheet 2 of 47	


CPU1E
5 OF 11
LGA1155
CPU1C
3 OF 11
LGA1155
CPU1D
4 OF 11
LGA1155
CPU_RESET#
PEG CONFIG TABLE
SEL2 SEL1 SEL0 PCIE CONFIG
1 1 1 1 X 16
1 1 0 2 X 8
MICRO-STAR INT'L CO.,LTD
MS-7676
Size Custom
Document Description
CPU-CLK/Control/MISC/PEG
Rev 10
Date: Wednesday, September 08, 2010
Sheet 3 of 47

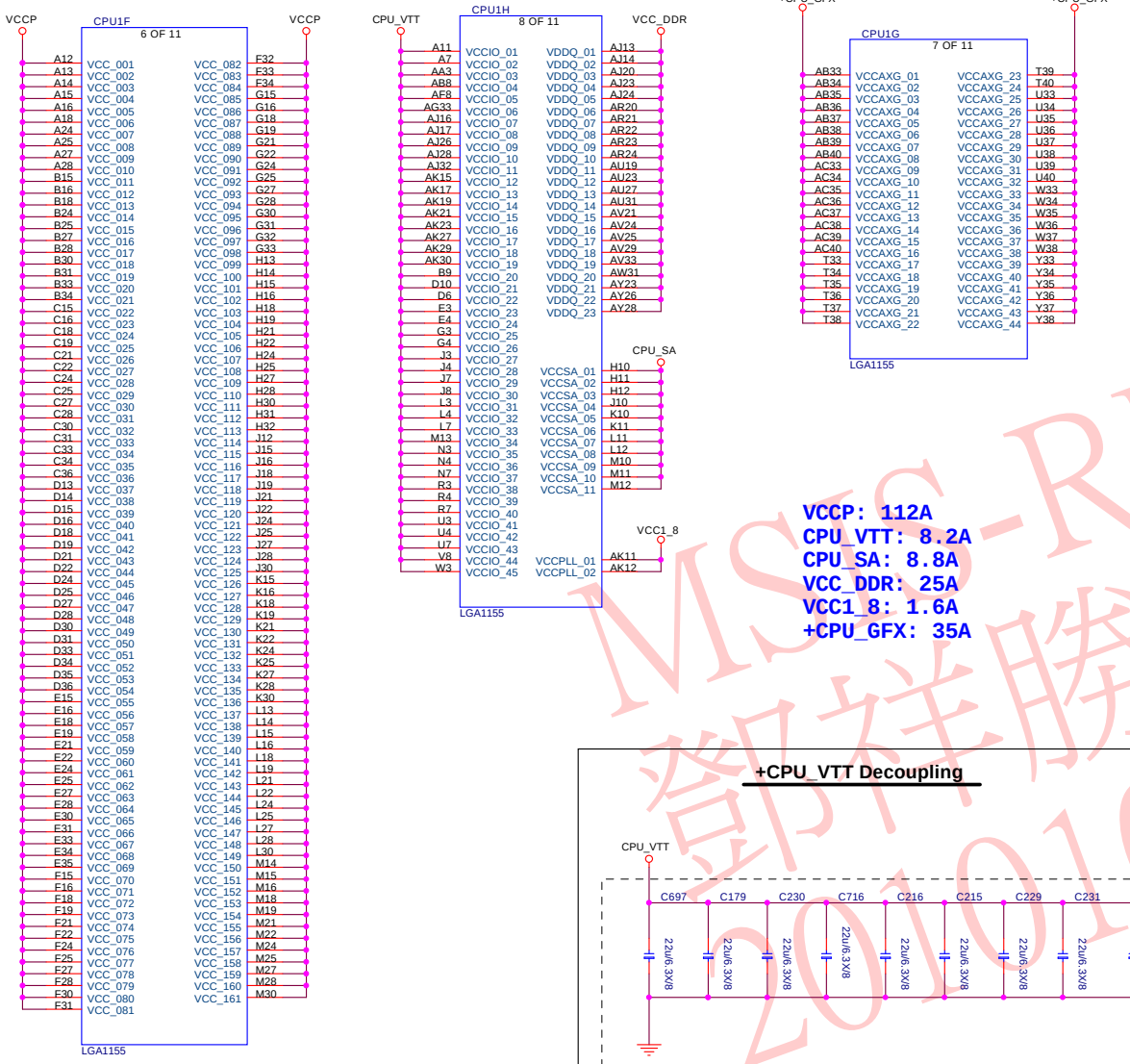


MICRO-STAR INT'L CO.,LTD

MS-7676

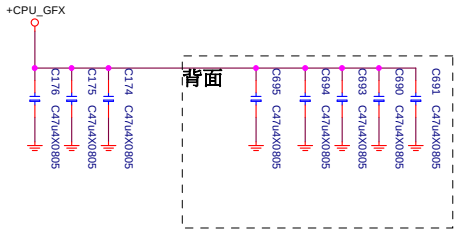
Size	Document Description	Rev
Custom	CPU-Memory	10

Date: Wednesday, September 08, 2010 Sheet 4 of 47



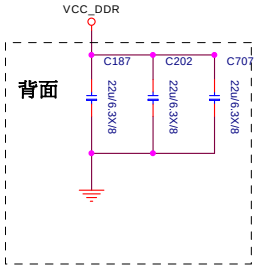
VCCP: 112A
CPU_VTT: 8.2A
CPU_SA: 8.8A
VCC_DDR: 25A
VCC1_8: 1.6A
+CPU_GFX: 35A

+CPU_GFX Decoupling

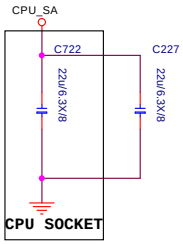


CPU SOCKET CAVITY CAPS

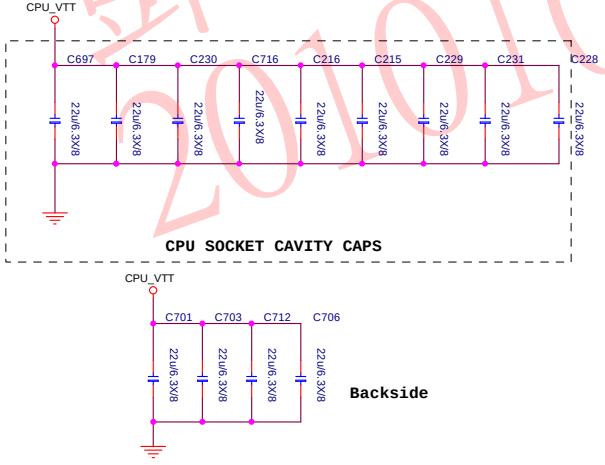
+1.5V_DDR3-Decoupling



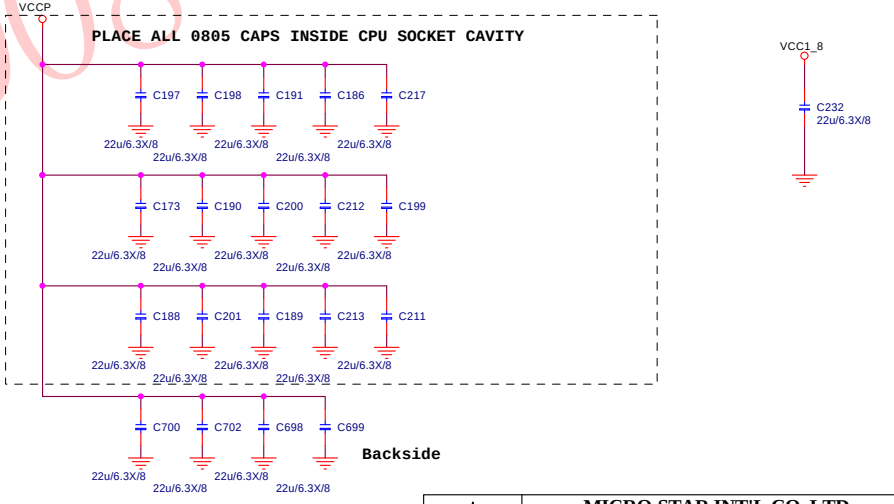
CPU SOCKET CAVITY CAPS



+CPU_VTT Decoupling



+CPU_VCCP-Decoupling

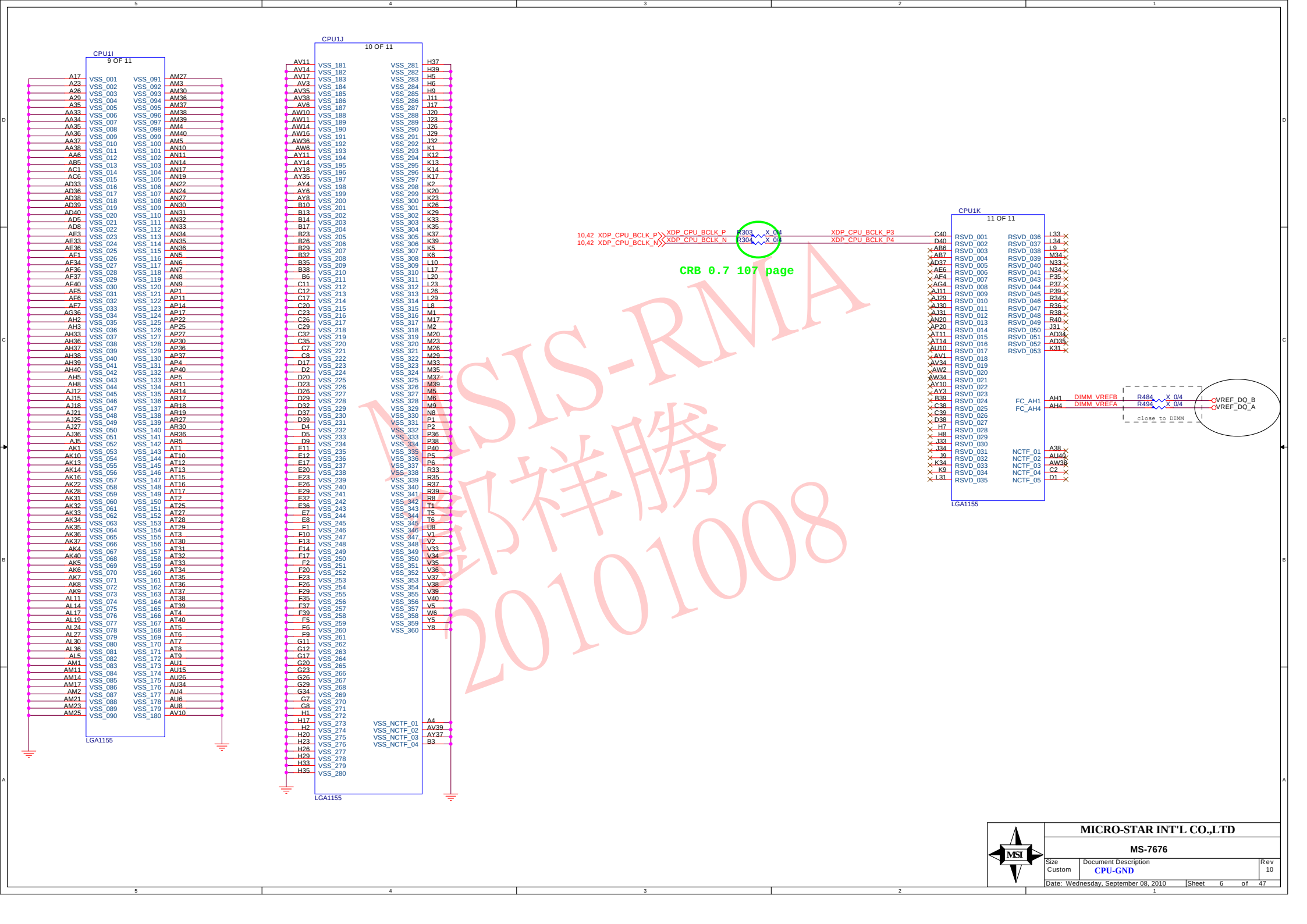


MICRO-STAR INT'L CO.,LTD

MS-7676

Size	Document Description	Rev
Custom	CPU-Power	10

Date: Wednesday, September 08, 2010 Sheet 5 of 47



MICRO-STAR INT'L CO.,LTD	
MS-7676	
Size: Custom	Document Description: CPU-GND
Rev: 10	
Date: Wednesday, September 08, 2010	Sheet 6 of 47

DDRIII DIMM_A0

DDRIII DIMM_A1

DDR3

DDR3

Place close to DIMM1

Place close to DIMM1 with DIMM2

Place close to DIMM2

UPI VOLTAGE CONSOLE

UPI VOLTAGE CONSOLE

uP6262

uP6262 use BMA8
PN:I34-6262B09-U33

Slave Address=26
RH=18K,RL=13K

DIMM1(CHANNEL-A)
ADDRESS = 0:0 [SA1:SA0]

DIMM2(CHANNEL-A)
ADDRESS = 0:1 [SA1:SA0]

A0 A1 B0 B1

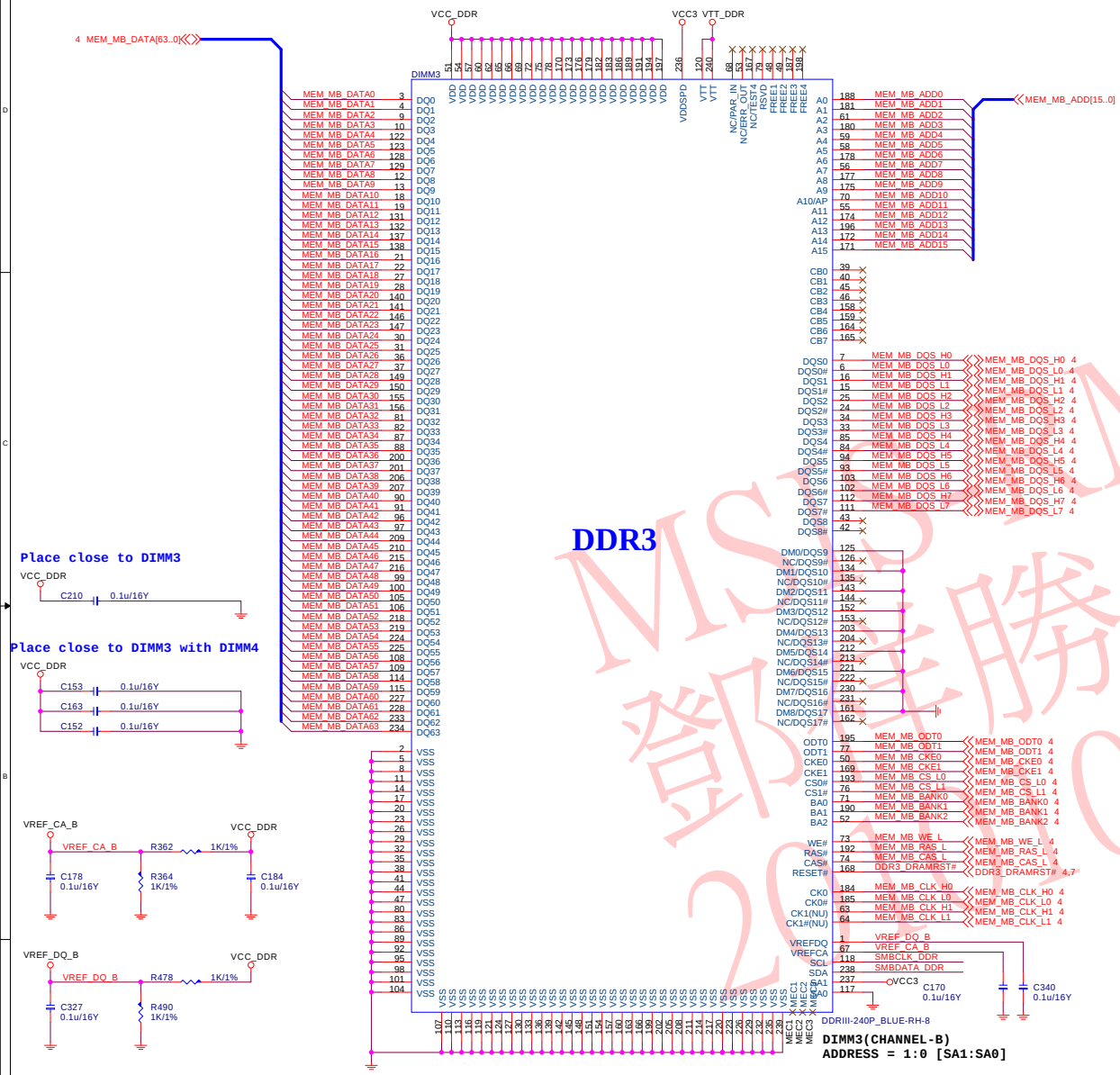
MICRO-STAR INT'L CO.,LTD

MS-7676

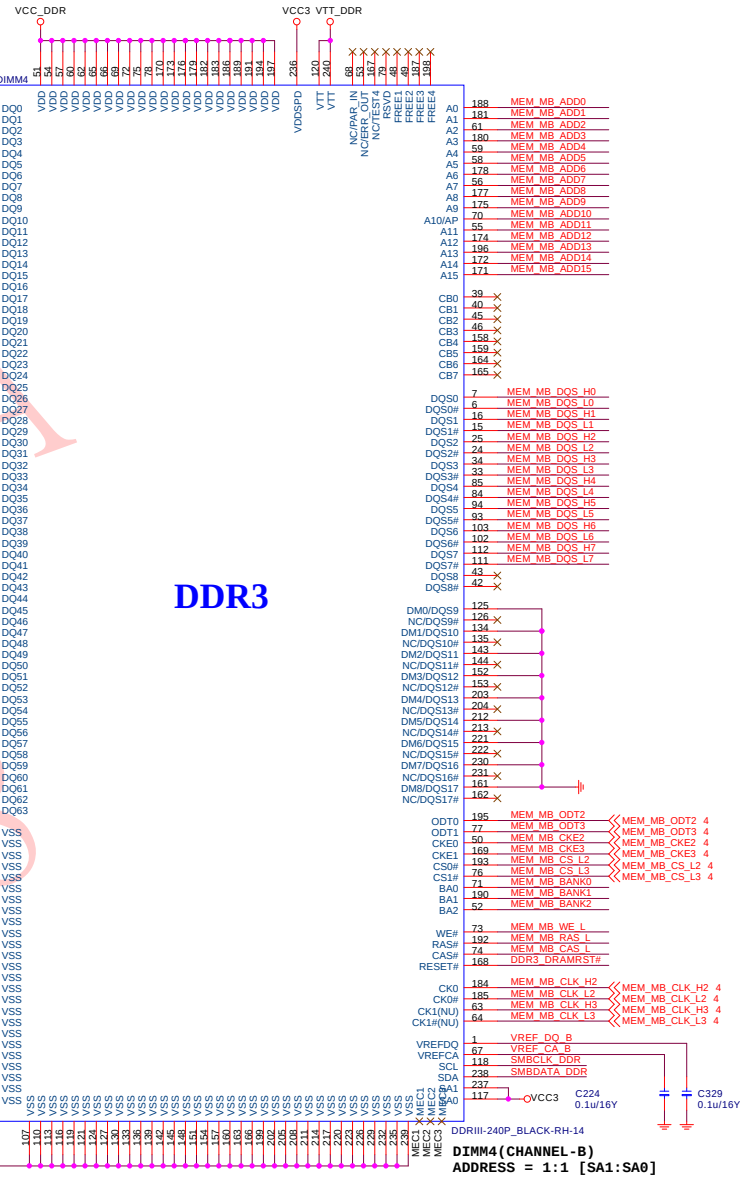
DDR III DIMM 1 / DIMM 2

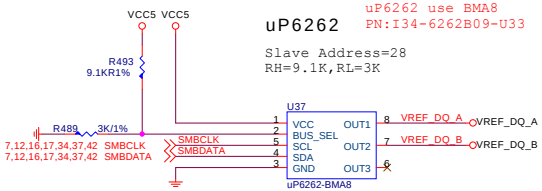
Date: Wednesday, September 08, 2010 Sheet 7 of 47

DDRIII DIMM_B0



DDRIII DIMM_B1

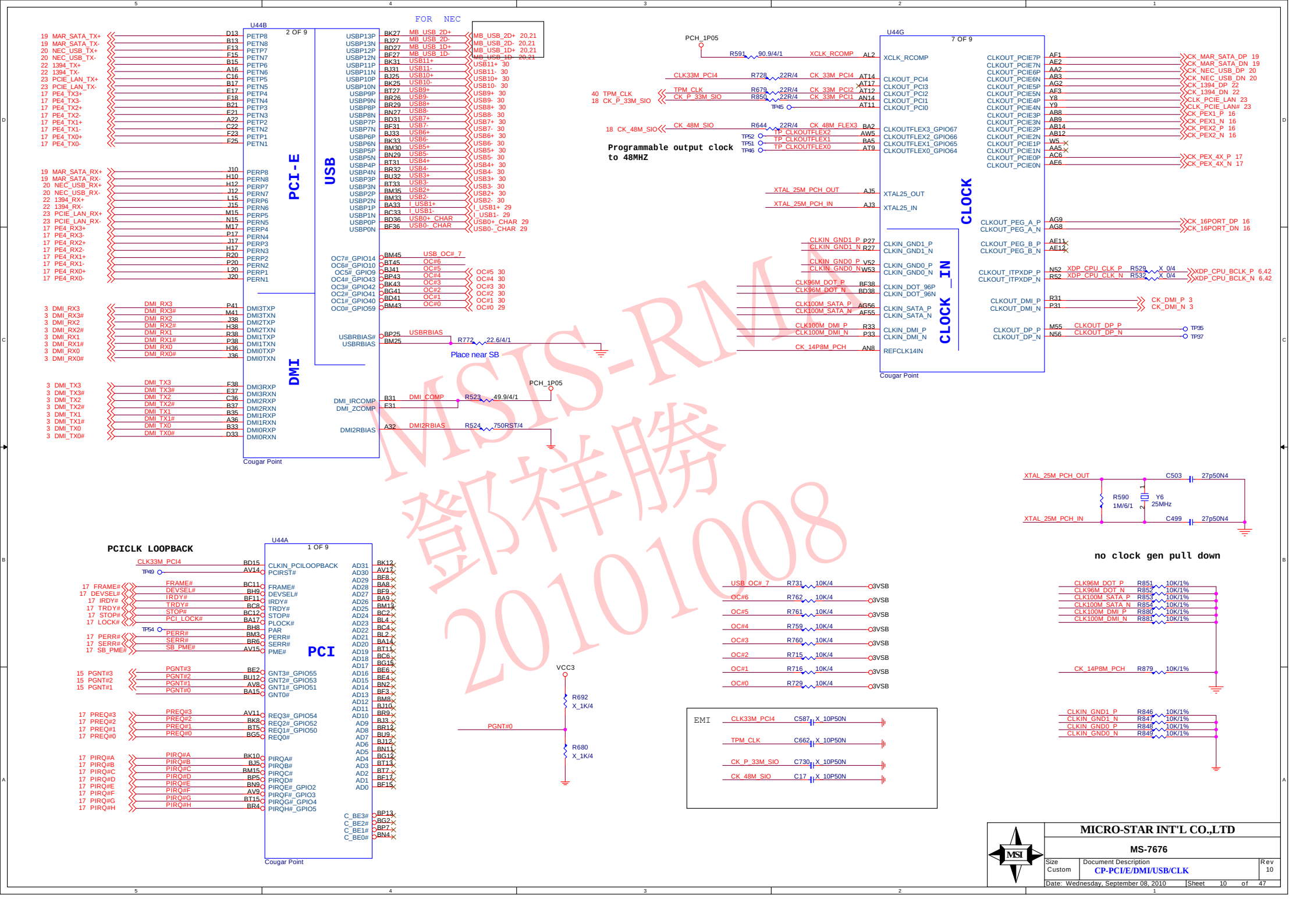




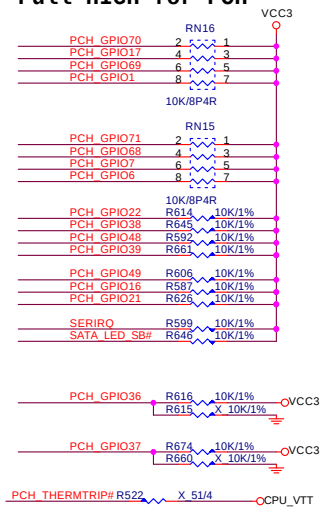
SMBCLK_DDR SMBCLK_DDR 7
SMBDATA_DDR SMBDATA_DDR 7

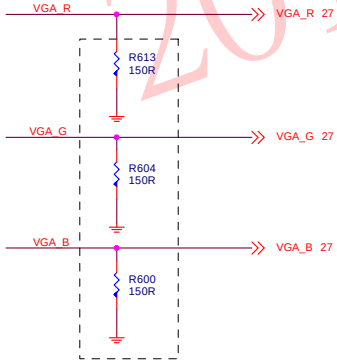
MICRO-STAR INT'L CO.,LTD	
MS-7676	
Size: Custom	Document Description: DDR III DIMM 3 / DIMM 4
Rev: 10	
Date: Wednesday, September 08, 2010	Sheet 8 of 47

	MICRO-STAR INT'L CO.,LTD	
	MS-7676	
Size: Custom	Document Description: CLK GEN4106	Rev: 10
Date: Wednesday, September 08, 2010	Sheet 9 of 47	


FOR NEC
U44B
2 OF 9
PCI-E
USB
DMI
Cougar Point
Place near SB
U44G
7 OF 9
CLOCK
CLOCK_IN
Cougar Point
Programmable output clock to 48MHZ
U44A
1 OF 9
PCI
PCICLK LOOPBACK
Cougar Point
EMI
no clock gen pull down
MSIS-RMA
部祥勝
20101008
MICRO-STAR INT'L CO.,LTD
MS-7676
CP-PCI/E/DMI/USB/CLK
Size Custom
Rev 10
Date: Wednesday, September 08, 2010
Sheet 10 of 47

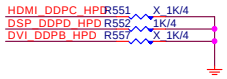
Pull HIGH for PCH



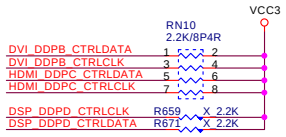


Close to PCH within 250 mils.

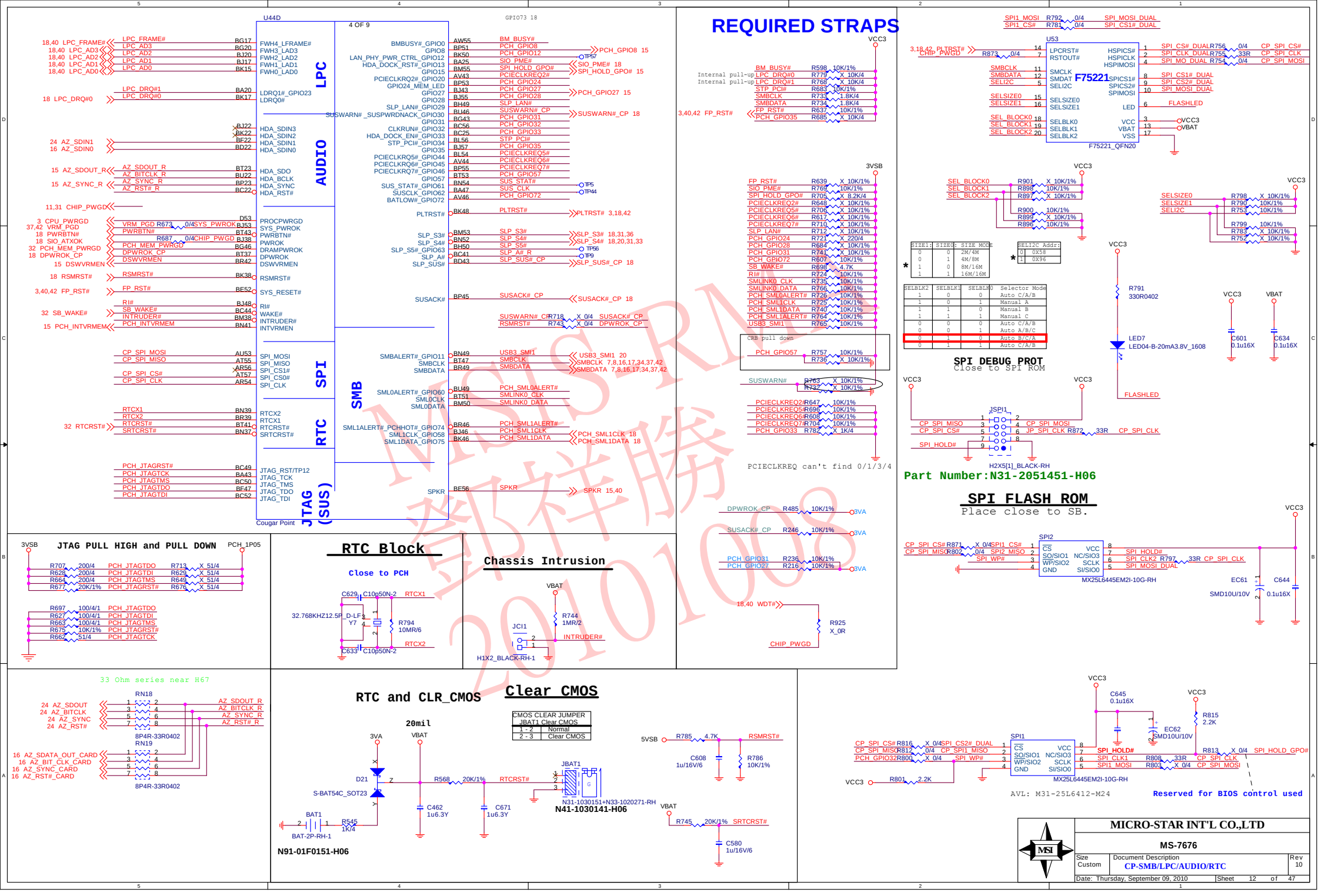
No VGA(pull down)



Enable VGA(CTRLCLK/DATA Pull High)



MICRO-STAR INT'L CO.,LTD		
MS-7676		
Size: Custom	Document Description: CP-SATA/HOST/FAN/GPIO/VGA	Rev: 10
Date: Wednesday, September 08, 2010	Sheet 11 of 47	


U44D
4 OF 9
LPC
AUDIO
SPI
SMB
RTC
JTAG (SUS)
Cougar Point
REQUIRED STRAPS
SPI DEBUG PROT
Close to SPI ROM
SPI FLASH ROM
Place close to SB.
Part Number:N31-2051451-H06
JTAG PULL HIGH and PULL DOWN
RTC Block
Close to PCH
Chassis Intrusion
Clear CMOS
RTC and CLR_CMOS
N91-01F0151-H06
N41-1030141-H06
MICRO-STAR INT'L CO.,LTD
MS-7676
CP-SMB/LPC/AUDIO/RTC
Reserved for BIOS control used

Change to 10UH if VCCA_DPLLA/VCCA_DPLLB has noise issue.

PCH_1P05

R514 X_0/8 VCCAFDIPLL
C414 10u6.3X8

R595 X_0/4 VCCACLK
NO THIS PIN

R515 X_0/8 VCCAPLLDMI2
C417 10u6.3X8
C424 1u/6.3V/4

R642 0/8 VCCCLKDMI
C553 10u6.3X8
C554 1u/6.3V/4

R535 0/8 VCCA_DPLLA
EC46 CD100u16SO-RH-2
C460 X_10u6.3X8
C472 1u/6.3V/4

R572 0/8 VCCA_DPLLB
EC47 CD100u16SO-RH-2
C477 X_10u6.3X8
C478 1u/6.3V/4

PCH_1P05

DMI PLL FILTER

L21 X_L1U_500mA_0805 VCCAPLLEXP
C418 X_10u6.3X8
C425 1u/6.3V/4

SATA PLL FILTER

L22 X_L10U_100mA_0805 VCCAPLLSATA
C458 X_10u6.3X8
C464 1u/6.3V/4

PCH_1P05

U44H
8 OF 9
Cougar Point

CPU_VTT D55 V_PROC_IO
CPU_VTT B56 V_PROC_IO_NCTF
B41 VCCDMI_02
E41 VCCDMI_01
C428 1u/6.3V/4
VCCAPLLDMI2 A19 VCCAPLLDMI2
VCCCLKDMI AJ20 VCCCLKDMI
5VREF BF1 V5REF
5VREF_SUS BT25 V5REF_SUS
+3.3V_DAC AT1 VCCADAC
VCCACLK AL5 VCCACLK
VCCA_DPLLA AB1 VCCADPLLA
VCCA_DPLLB AC2 VCCADPLLB
VCCAPLLSATA U56 VCCAPLLSATA
VCCAPLLEXP B53 VCCAPLLEXP
VCCAFDIPLL C54 VCCAFDIPLL
3VSB AV28 VCCSUSHDA
VCC3 AN52 VCCSPI
VCC1_8 R2 VCCVRM_04
R54 VCCVRM_03
R56 VCCVRM_02
AJ1 VCCVRM_01
C427 1u/6.3V/4 DCPSUS A39 DCPSUS_03
TP43 AT41 DCPSUS_02
TP42 AA32 DCPSUS_01
C578 0.1u/10X DCPRTC BR54 DCPRTC
BT56 DCPRTC_NCTF
TP50 AV41 DCPSUSBYP
C520 0.1u/10X DCPSST BA46 DCPSST
3VA
VBAT BU42 VCCRTC
AV40 VCCDSW3_3
C738 0.1u/10X
PCH_1P05 AG15 VCCDIFFCLKN_03
AE17 VCCDIFFCLKN_02
AE15 VCCDIFFCLKN_01
PCH_1P05 CP5 X_COPPER VCCSSC
VCC1_8 R554 0/6
VCC3 R558 X_0/6
VCCNAND C454 X_0.1u/16Y

PCH_1P05 R549 X_0/8
VCC1_8 R548 0/8

PCH_1P05
VCCCORE_022 AR34
VCCCORE_021 AR32
VCCCORE_020 AN34
VCCCORE_019 AN32
VCCCORE_018 AL34
VCCCORE_017 AL32
VCCCORE_016 AJ36
VCCCORE_015 AJ34
VCCCORE_014 AJ32
VCCCORE_013 AG34
VCCCORE_012 AG32
VCCCORE_011 AE36
VCCCORE_010 AE34
VCCCORE_009 AE32
VCCCORE_008 AE30
VCCCORE_007 AE28
VCCCORE_006 AE24
VCCCORE_005 AC32
VCCCORE_004 AC30
VCCCORE_003 AC28
VCCCORE_002 AC26
VCCCORE_001 AC24

VCCASW_023 AU36
VCCASW_022 AU30
VCCASW_021 AR38
VCCASW_020 AR36
VCCASW_019 AR30
VCCASW_018 AR28
VCCASW_017 AR26
VCCASW_016 AR24
VCCASW_015 AN28
VCCASW_014 AN26
VCCASW_013 AN24
VCCASW_012 AN22
VCCASW_011 AL28
VCCASW_010 AL24
VCCASW_009 AJ28
VCCASW_008 AJ26
VCCASW_007 AJ24
VCCASW_006 AG28
VCCASW_005 AG26
VCCASW_004 AG24
VCCASW_003 AU34
VCCASW_002 AV36
VCCASW_001 AU32

VCCSUS3_3_011 BT35
VCCSUS3_3_010 AU38
VCCSUS3_3_009 AT40
VCCSUS3_3_008 BK36
VCCSUS3_3_007 BJ36
VCCSUS3_3_006 AY33
VCCSUS3_3_005 AY31
VCCSUS3_3_004 AY32
VCCSUS3_3_003 AY30
VCCSUS3_3_002 U31
VCCSUS3_3_001

VCCSSC_02 AE20
VCCSSC_01 AC20
VCCDFTERM T57
VCCDFTERM T55
VCC3_3_10 AV20
VCC3_3_09 AU20
VCC3_3_08 AU22
VCC3_3_07 AN38
VCC3_3_06 AL38
VCC3_3_05 BD20
VCC3_3_04 BD17
VCC3_3_03 BC17
VCC3_3_02 AE57
VCC3_3_01

3VSB
VCC3

POWER

PCH_1P05: 7.66A
CPU_VTT: 0.058A
VCC1_8: 0.159A
VCC3: 0.697A
3VSB: 0.11A
5VREF: 0.001A
5VREF_SUS: 0.001A

5VREF & 5VREF_SUS Sequencing Circuit

VCC3 Q64 2N3904 C565 1u/6.3V/4
VCC5 R699 10/4 5VREF
C564 0.1u16X

3VSB Q69 2N3904 C605 0.1u16X
5VSB R780 100/4/1 5VREF_SUS
C597 0.1u16X

VCC3 CP4 X_COPPER +3.3V_DAC
Near ball AF1
C536 0.1u/10X

PCH decoupling cap

VBAT C604 C611 1uF/10V/Y5V/6 0.1u/16Y

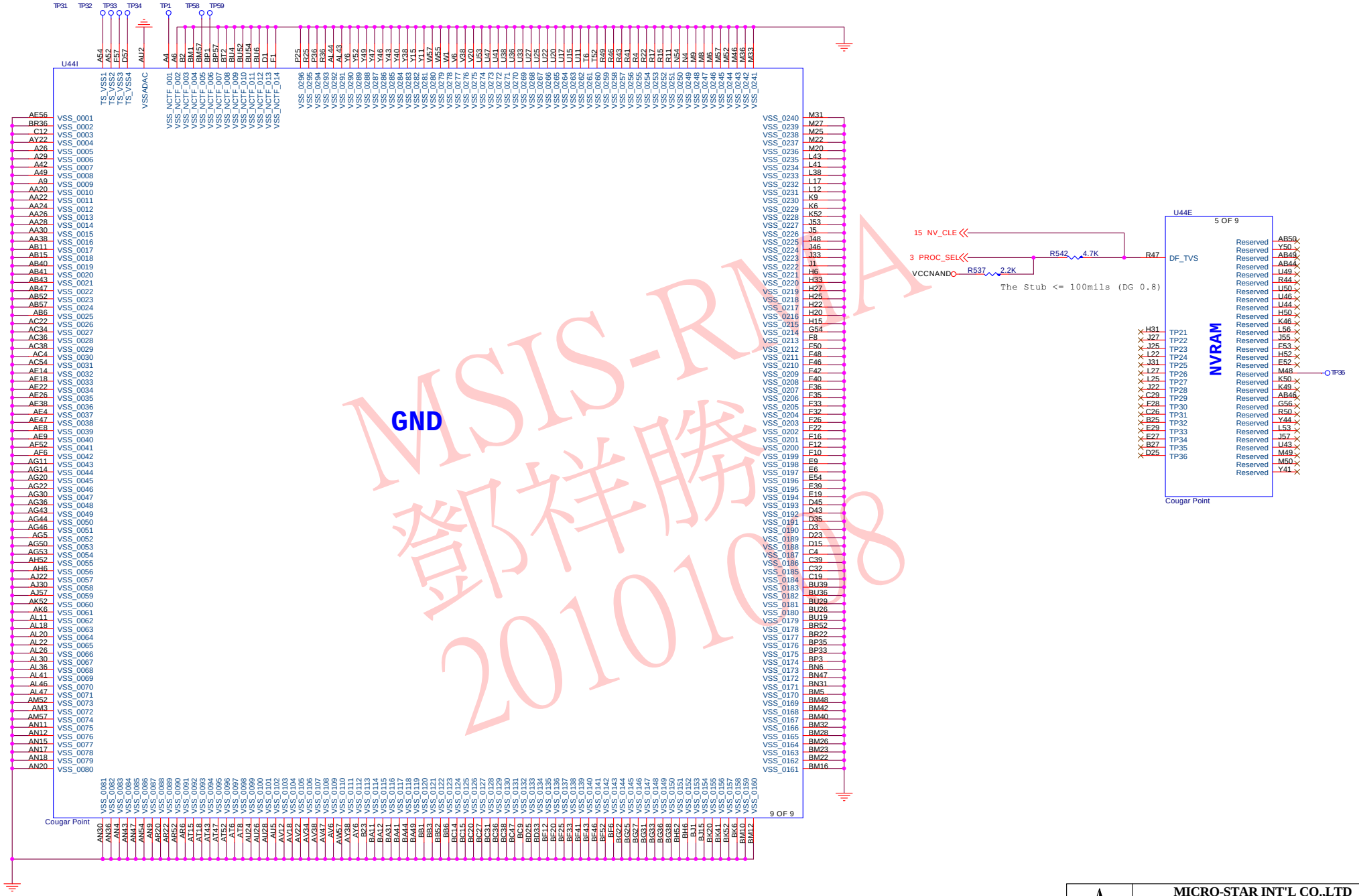
VCC3 C482 C575 C491 C431 C537 C594 C583 1uF/10V/Y5V/6
0.1u/16Y X_0.1u/16Y 0.1u/16Y 4.7uf/10V/X5R/8
X_0.1u/16Y X_0.1u/16Y

CPU_VTT C412 C421 C429 0.1u/16Y 0.1u/16Y
4.7uf/10V/X5R/8

3VSB C586 C595 0.1u/16Y 0.1u/16Y

PCH_1P05 C729 C402 C411 C734 C410 C457 C735 C733 C731 C737 C736 C732 0.1u/16Y
10u6.3X8 10u6.3X8 4.7uf/10V/X5R/8 X_0.1u/16Y X_0.1u/16Y
1uF/10V/Y5V/6 1uF/10V/Y5V/6 10u6.3X8 1uF/10V/Y5V/6 0.1u/16Y X_0.1u/16Y

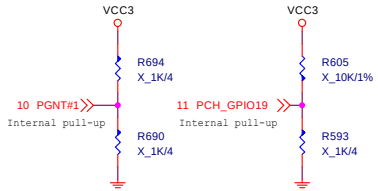
MICRO-STAR INT'L CO.,LTD
MS-7676
Size: Custom | Document Description: CP-POWER | Rev: 10
Date: Wednesday, September 08, 2010 | Sheet 13 of 47

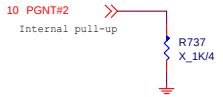


MICRO-STAR INT'L CO.,LTD		
MS-7676		
Size: Custom	Document Description: CP-GND/NVRAM	Rev: 10
Date: Wednesday, September 08, 2010	Sheet 14 of 47	

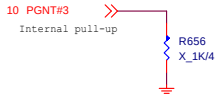
PCH Straps

BOOT DEVICE	GNT1	SATA1GP/GPIO19
LPC	0	0
PCI	1	0
SPI	1	1

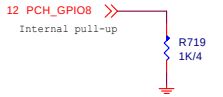




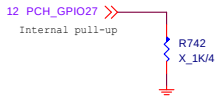
DMI AC/DC MODE
0 : AC
1 : DC *



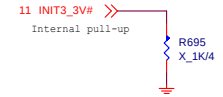
Topblock swap override when pull-low
Signal has a weak internal pull-up



GPIO8
0 : Integrated Clocking Enable (FCIM)*
1 : Buffer Through Mode Enable (BTM)

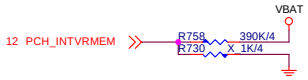


GPIO28
0 : OD PLL VR disabled
1 : OD PLL VR enabled *
Signal has a weak internal pull-up



INT3_3V#
0 : ????????????????
1 : ???????????????? *

1: INIT3_3V to asserted for 16 PCI clock to reset the processor by some evens occur.
0: Can not to reset the processor.

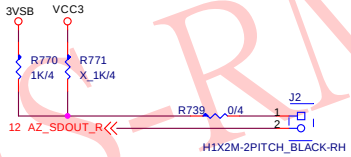


INTVRMEN
0: DISABLE INTERNAL VRM
1: ENABLE INTERNAL VRM *

When these voltageregulators are enabled, the integrated GbE only operates at 10/100 Mbps during S3-S5.

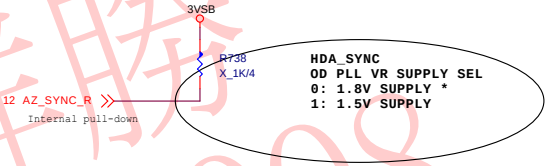
DSWVRMEN
0 : Disable Internal Deep Sleep 1.05 V regulators.
1 : Enable Internal Deep Sleep 1.05 V regulators.

This signal enables the internal Deep Sleep 1.05 V regulators. Must beconnected even when not supporting DSW.



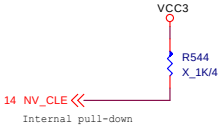
HDA_SDO
Disable ME in Manufacturing Mode
when pull LOW ????

HDA_SDO has internal pull down.
Default should be connected to SDIN of codec, no pull up/down.
To Disable ME need to have a jumper to pull high

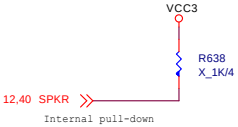


HDA_SYNC
OD PLL VR SUPPLY SEL
0: 1.8V SUPPLY *
1: 1.5V SUPPLY

GPIO15
0 : TLS CIPHER SUITE WITH NO CONFIDENTIALITY *
1 : TLS CIPHER SUITE WITH CONFIDENTIALITY



DMI/FDI TERMINATION VOLTAGE
DC COUPLED: TX/RX TO VCC ISF SAMPLED HIGH
DC COUPLED: TX/RX TO VSS IF SAMPLED LOW *?
AC COUPLED: TX SET TO VCC/2, RX SET TO VSS REGARDLESS OF THIS STRAP



SPKR
0 : EN TCO REBOOT *
1 : DIS TCO REBOOT

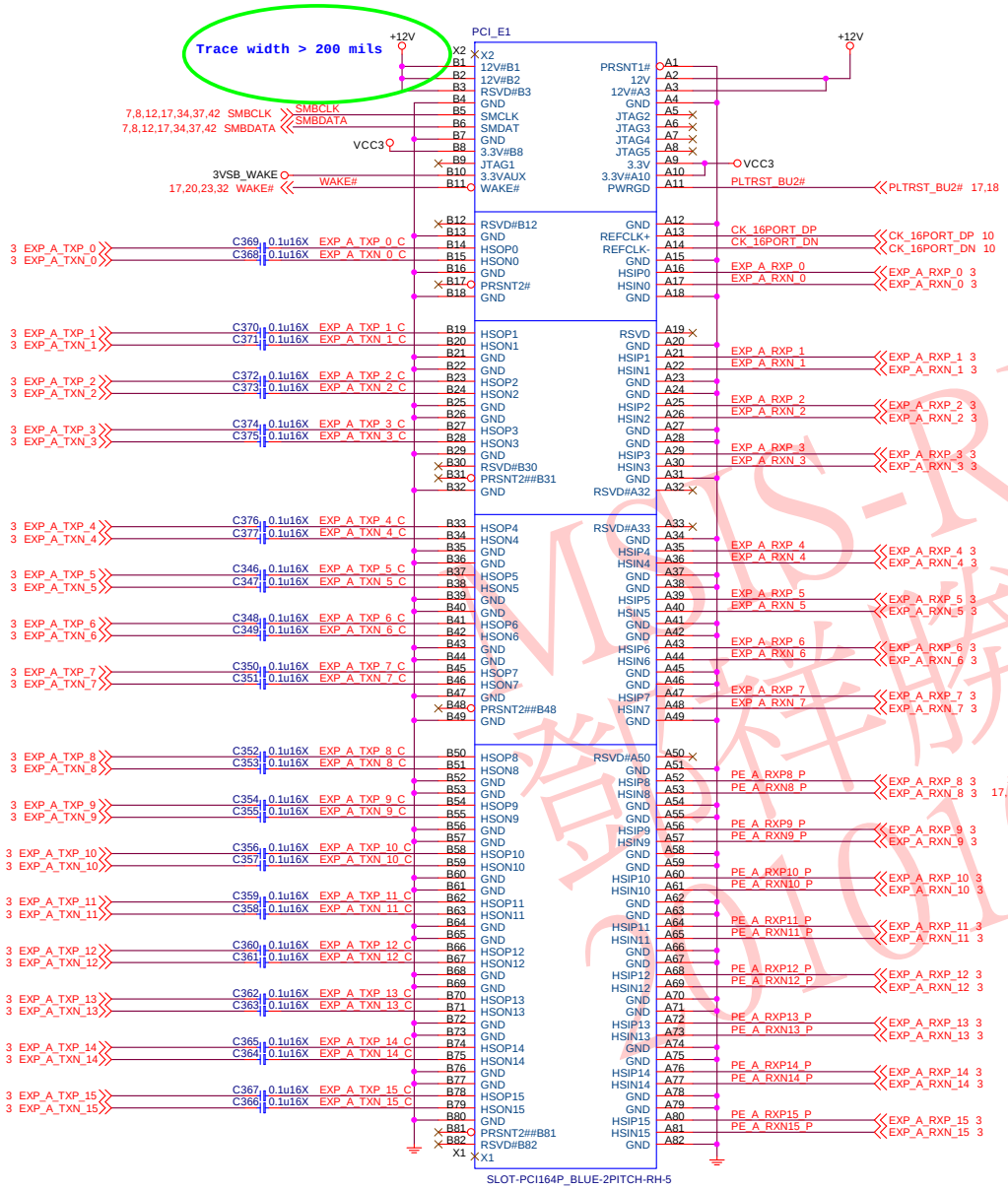
MICRO-STAR INT'L CO.,LTD

MS-7676

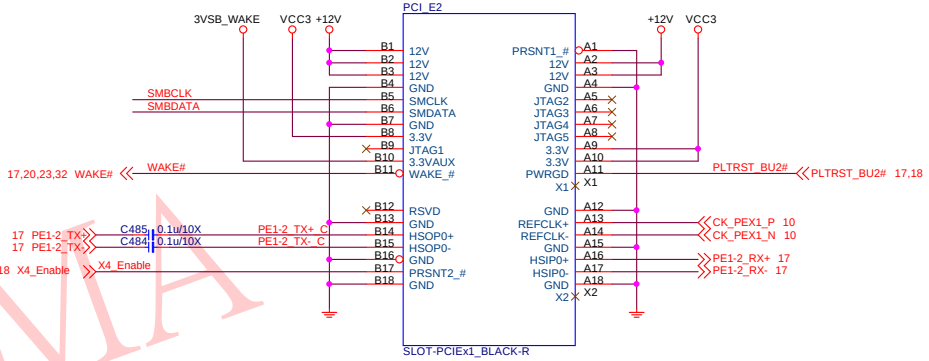
Size	Document Description	Rev
Custom	CP-Strap	10

Date: Wednesday, September 08, 2010 | Sheet 15 of 47

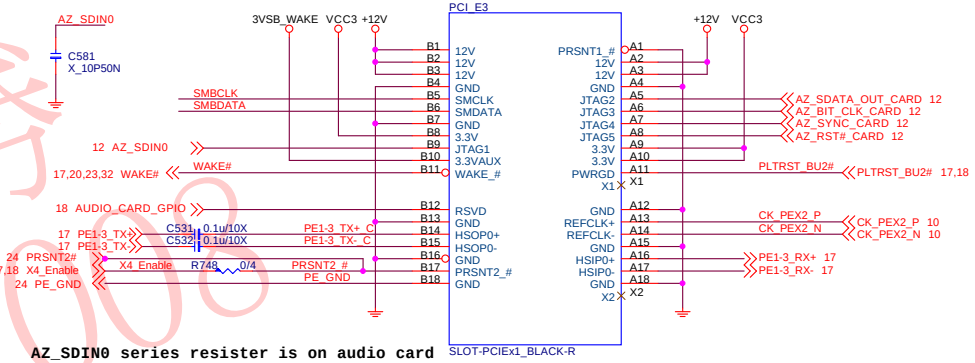
PCI_Express X16 Slot



PCI EXPRESS x1-PORT

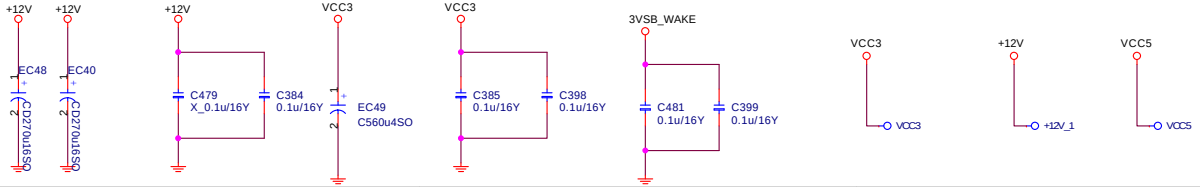


PCI EXPRESS x1-PORT



AZ_SDIN0 series resister is on audio card

AUDIO_CARD_GPIO
HI:LED OFF
LOW:LED ON



MICRO-STAR INT'L CO.,LTD		
MS-7676		
Size: Custom	Document Description: PCIE x16 /x1 /x1HDA CO-LAY	Rev: 10
Date: Wednesday, September 08, 2010	Sheet 16 of 47	

PCI_Express X4 Slot
(Share with PCI_E x1 Slots)

Trace width > 200 mils

PCI_E4

SLOT-PCI164P_BLUE-2PITCH-RH-5

PI2PCIE2412ZHE_TQFN42-RH

PCI PULL-UP / DOWN RESISTORS

8.2K/4/8P4R

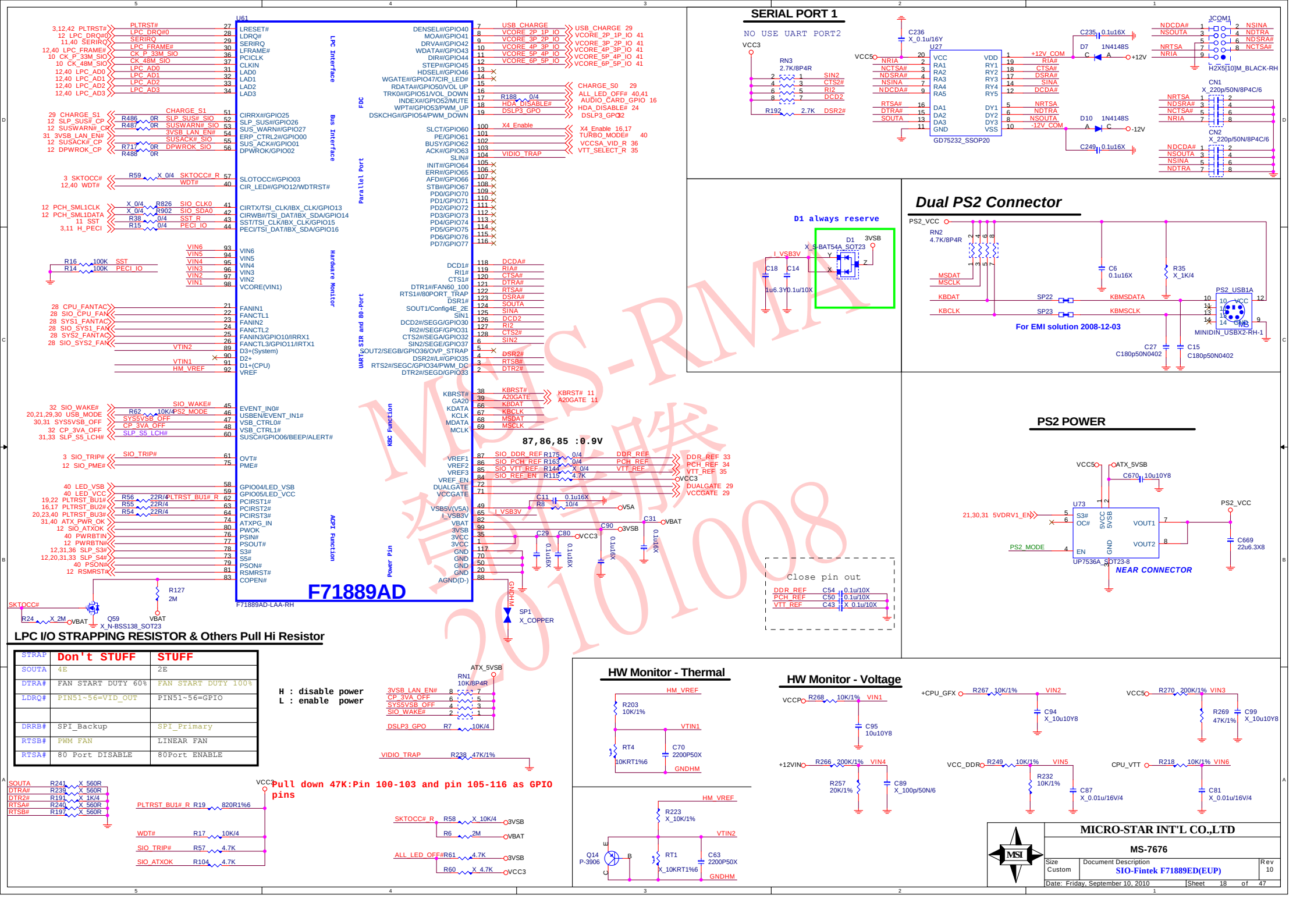
Digital Switch SEL pin

SEL (X4 Slot_Enable)	Output	PCI-E_Slot
Hi	B2	X4 / X0 / X0
Low	B1	X2 / X1 / X1

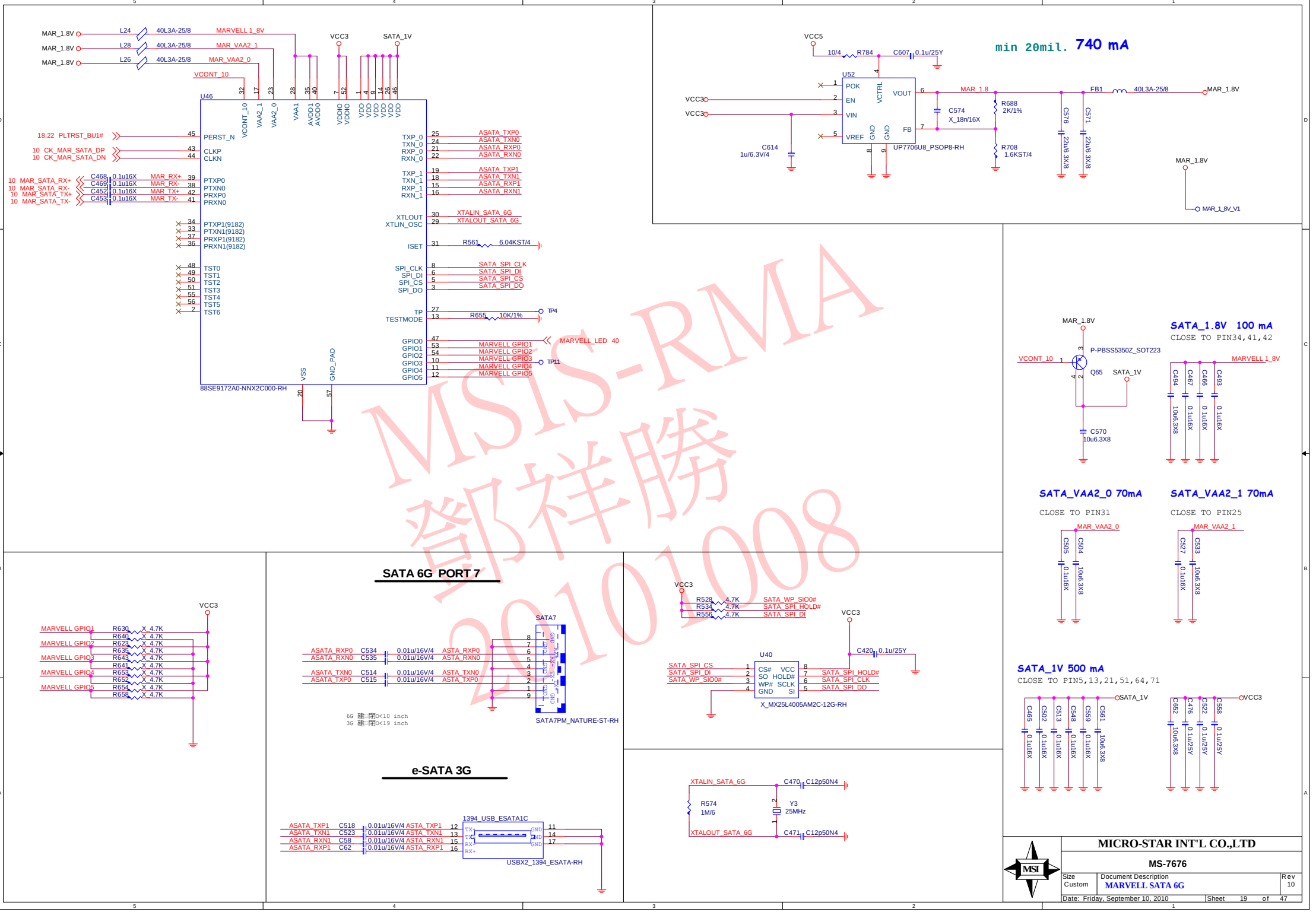
2010.05.27

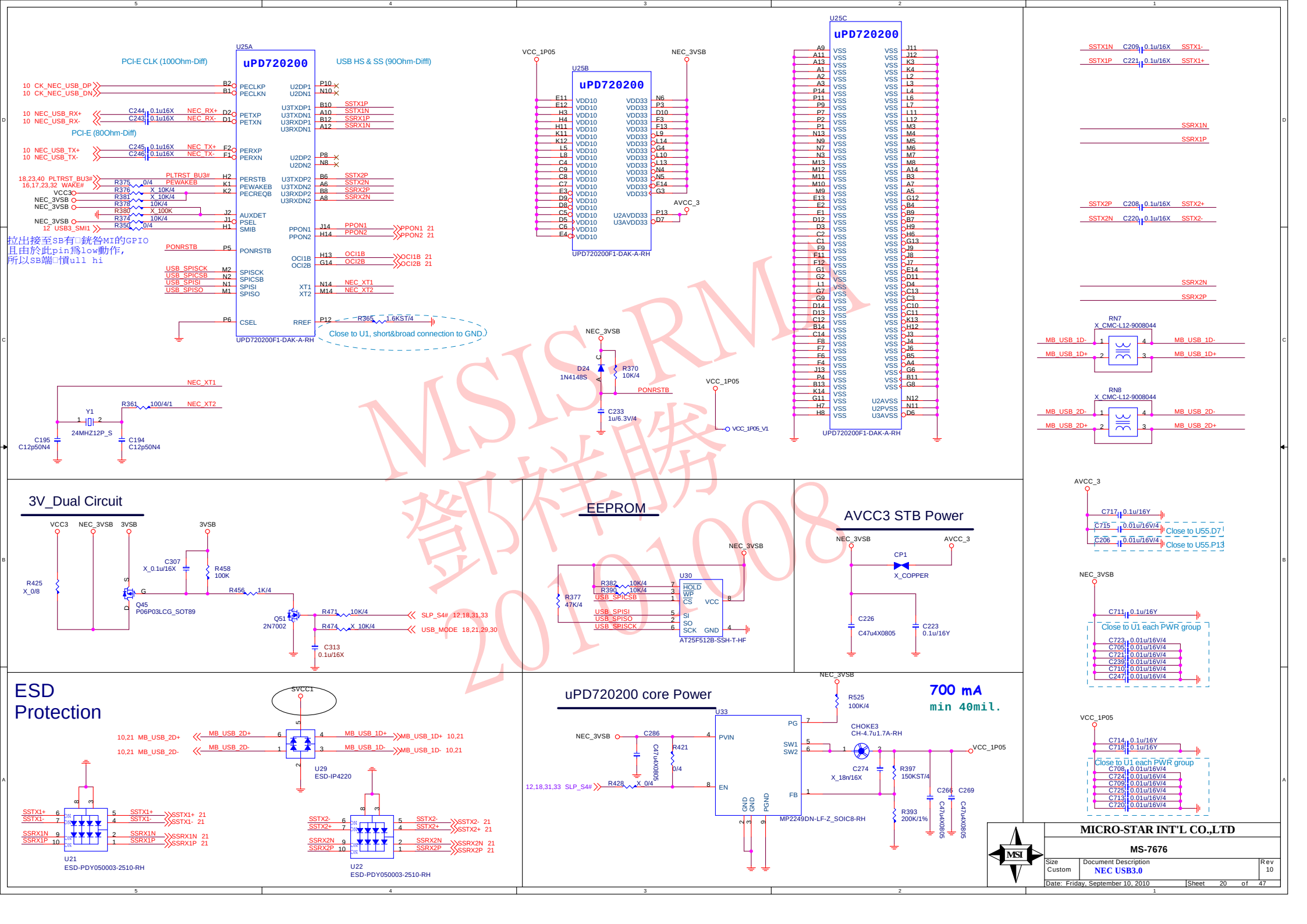
GPIO for BIOS use

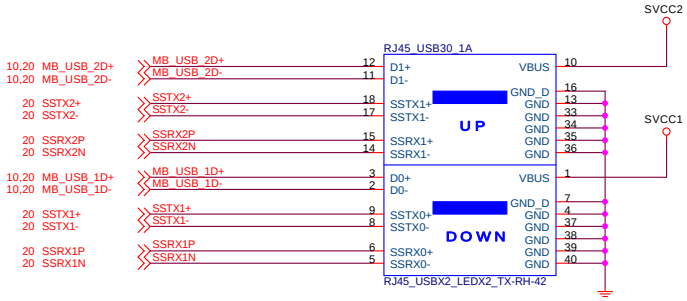
MICRO-STAR INT'L CO.,LTD	
MS-7676	
Size: Custom	Document Description: PCIEx4 Slots — Rev: 10
Date: Wednesday, September 08, 2010	Sheet 17 of 47

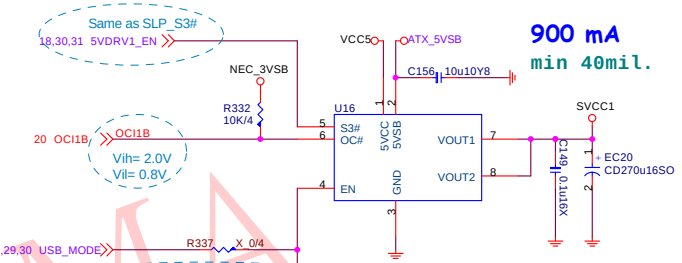


STRAP	Don't STUFF	STUFF
SOUTA	4E	2E
DTRA#	FAN START DUTY 60%	FAN START DUTY 100%
LDRQ#	PIN51~56=VID_OUT	PIN51~56=GPIO
DRRB#	SPI_Backup	SPI_Primary
RTSB#	PWM FAN	LINEAR FAN
RTSA#	80 Port DISABLE	80Port ENABLE

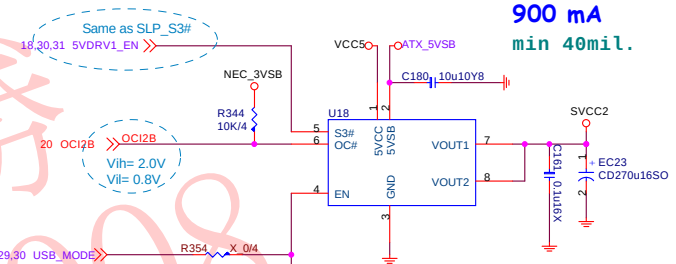



PCI-E CLK (100Ohm-Diff)
USB HS & SS (90Ohm-Diffl)
PCI-E (80Ohm-Diff)
uPD720200
U25A
U25B
U25C
UPD720200F1-DAK-A-RH
拉出接至SB有□銑咎MI的GPIO
且由於此pin爲low動作,
所以SB端□憤ull hi
Close to U1, short&broad connection to GND.
3V_Dual Circuit
EEPROM
AVCC3 STB Power
ESD
Protection
uPD720200 core Power
700 mA
min 40mil.
MICRO-STAR INT'L CO.,LTD
MS-7676
NEC USB3.0
Date: Friday, September 10, 2010
Sheet 20 of 47



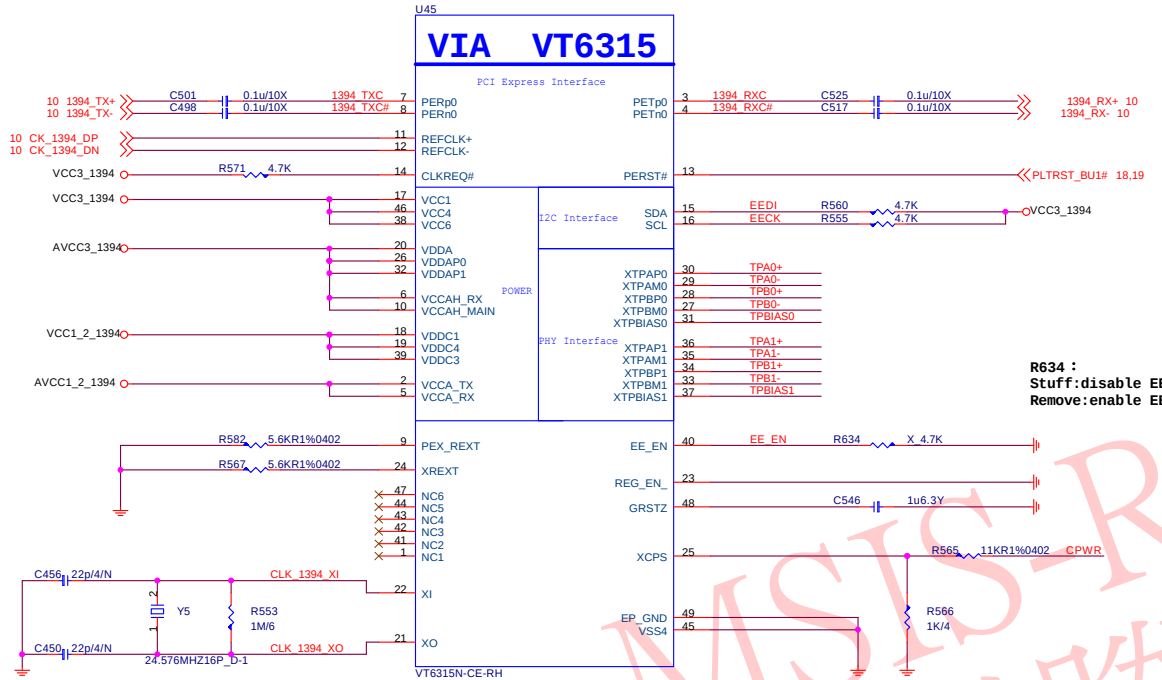


All power sources of uPD720200 are supplied, PPONx is enable.
PPONx is low when OCIx going to low.

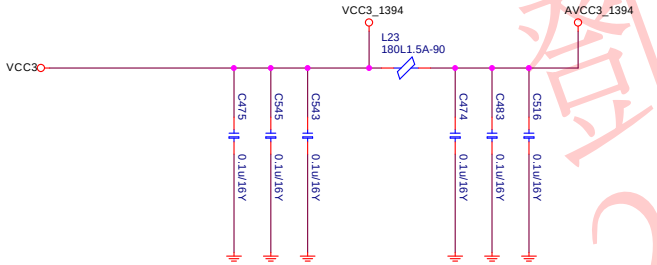


MICRO-STAR INT'L CO.,LTD		
MS-7676		
Size: Custom	Document Description: NEC USB3.0 POWER & CONNECT	Rev: 10
Date: Wednesday, September 08, 2010	Sheet 21 of 47	

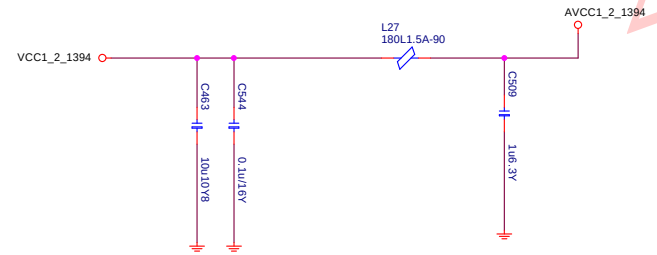
1394 CONTROLLER



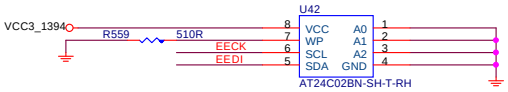
R634 :
Stuff:disable EE PROM
Remove:enable EE PROM



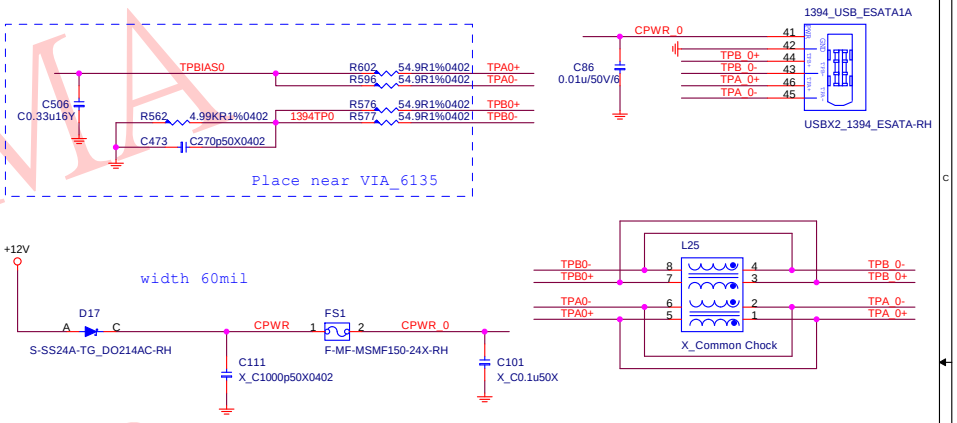
close to chip of all Cap.



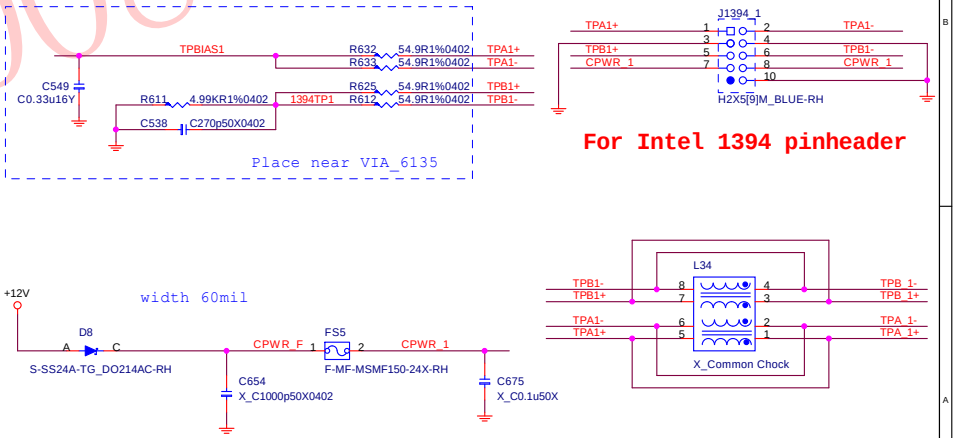
EE PROM



Rear 1394 port



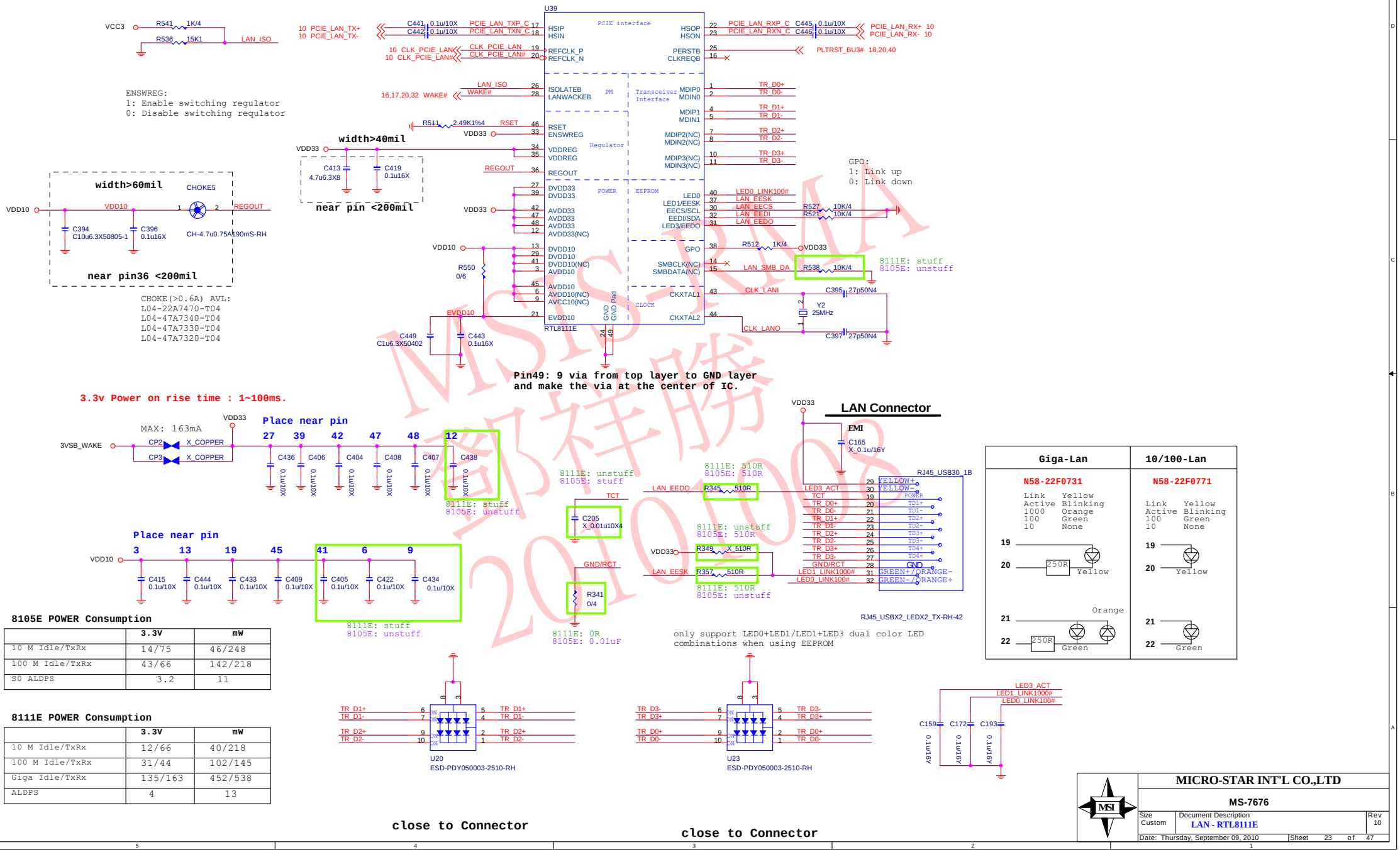
Front 1394 pin header



MICRO-STAR INT'L CO.,LTD	
MS-7676	
Size: Custom	Document Description: 1394 Controller - VT6315N-CE
Rev: 10	
Date: Wednesday, September 08, 2010	Sheet 22 of 47

RTL8111E Giga LAN

RTL8105E 10/100M LAN



8105E POWER Consumption

	3.3V	mW
10 M Idle/TxRx	14/75	46/248
100 M Idle/TxRx	43/66	142/218
S0 ALDPS	3.2	11

8111E POWER Consumption

	3.3V	mW
10 M Idle/TxRx	12/66	40/218
100 M Idle/TxRx	31/44	102/145
Giga Idle/TxRx	135/163	452/538
ALDPS	4	13

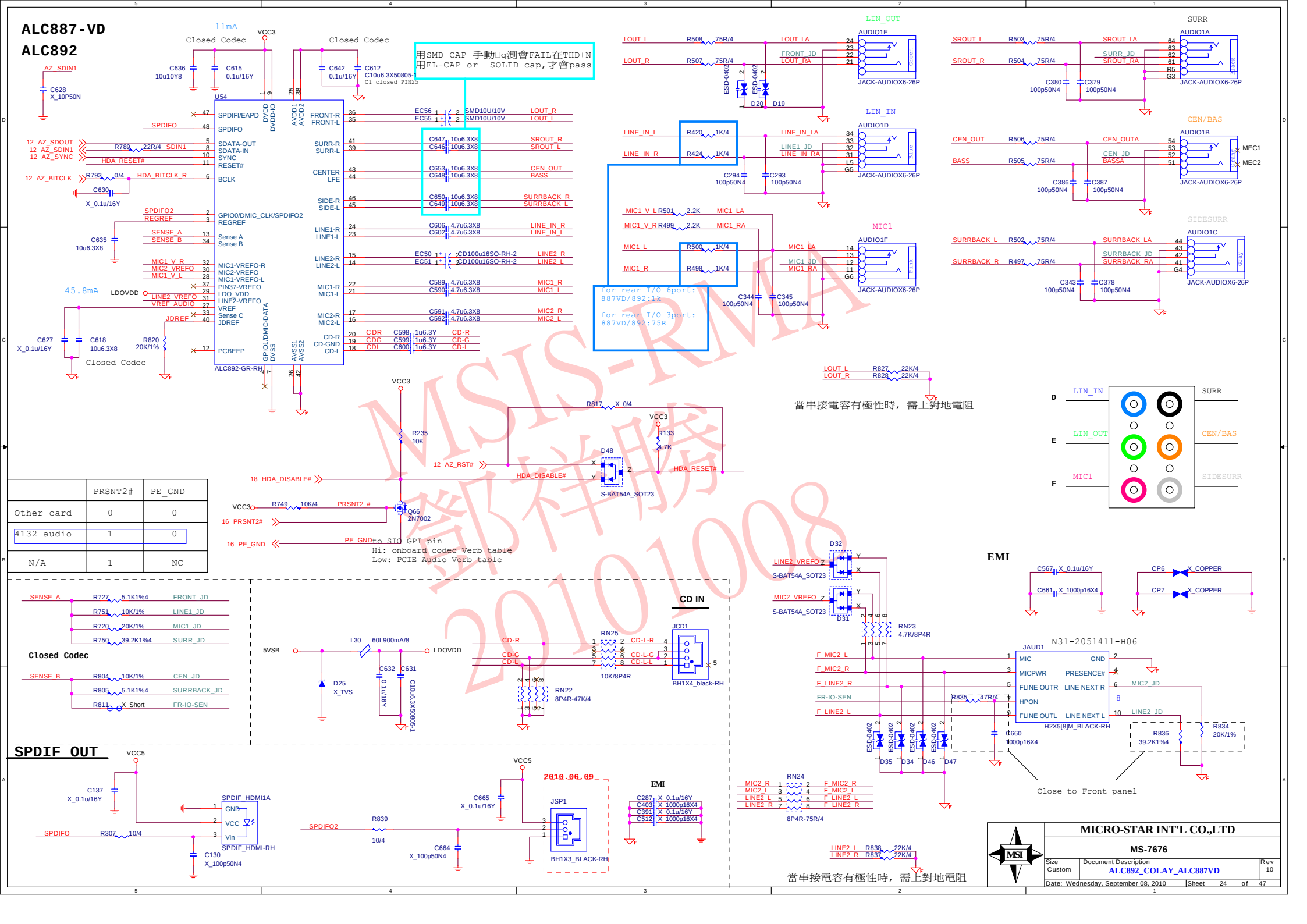
MICRO-STAR INT'L CO.,LTD

MS-7676

Size: Custom | Document Description: LAN - RTL8111E | Rev: 10

Date: Thursday, September 09, 2010 | Sheet 23 of 47

ALC887-VD
ALC892



	PRSNT2#	PE_GND
Other card	0	0
4132 audio	1	0
N/A	1	NC

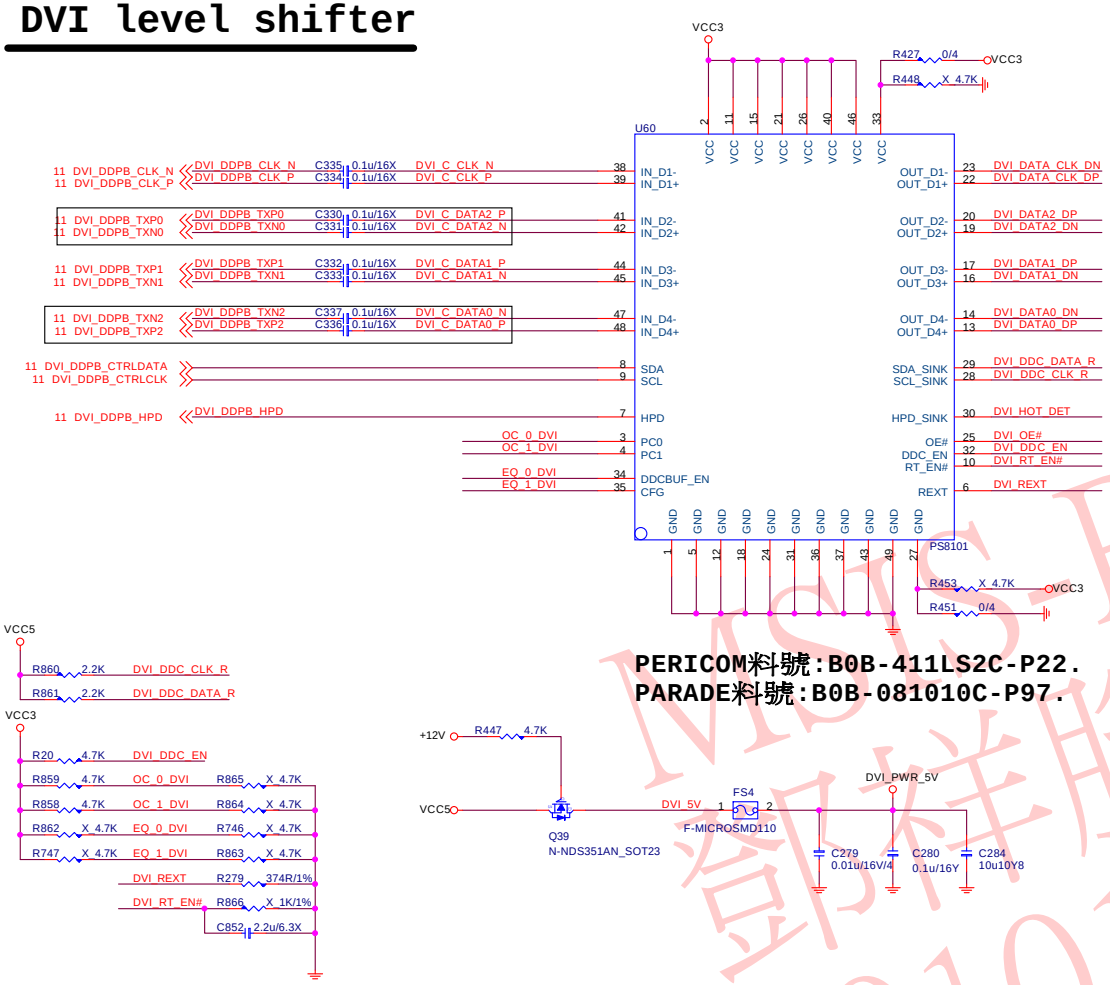
MICRO-STAR INT'L CO.,LTD

MS-7676

Size	Document Description	Rev
Custom	ALC892_COLAY_ALC887VD	10

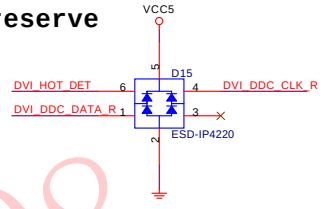
Date: Wednesday, September 08, 2010 Sheet 24 of 47

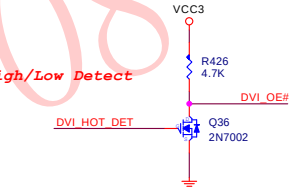
DVI level shifter



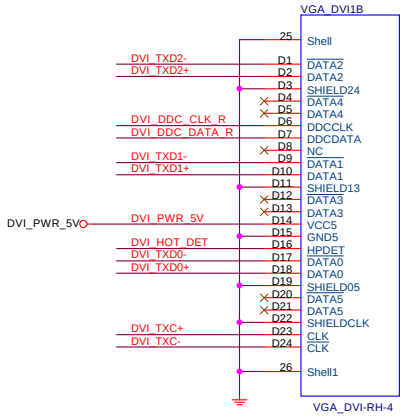
PERICOM料號:B0B-411LS2C-P22.
PARADE料號:B0B-081010C-P97.

reserve





注 NHigh/Low Detect



	"0"	"1"	note
DDC_EN	DDC level shifter disable	DDC level shifter enable	internal pull-up at ~500K ohm.
RT_EN#	Input 50 ohm termination resistor enable	the input termination ; resistors are set to high impedances	internal pull-down at ~500K ohm.
OE#	enable	the chip is power down and input termination resistors will be at high impedance.	internal pull-down at ~500K ohm.
HPD_SINK	disable	enable	internal pull-down at ~200K ohm; 5V tolerant.
DDCBUF_EN	For DDC level shifitng configuration, please refer to Table.		internal pull-down at ~500K ohm.
REXT			analog current generation.

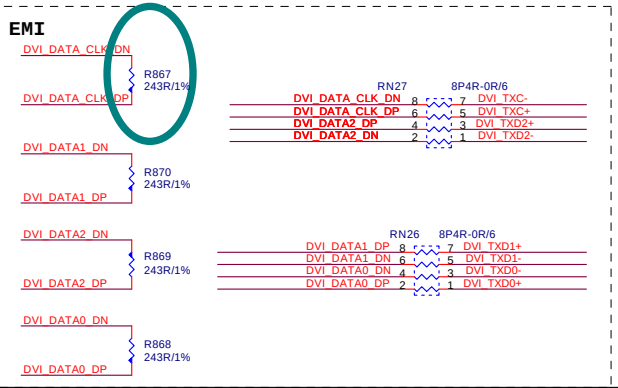
[DDC_EN, DDCBUF_EN, OE#]	DDC Passive Switch	DDC Active Buffer
1, 0, X	On	Off
1, 1, 0	Off	On
1, 1, 1	Off	Off
0, X, X	Off	Off

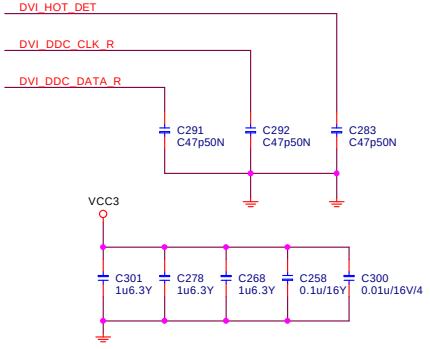
PC1, PC0		note
00	8 dB	internal pull-down at ~500K ohm.
01	4 dB	
10	12 dB	
11	0 dB	

Table 8-1. PCH PCI Express Tx/RX - HDMI Signal Mappings

Port	Digital Display Interface Differential Pairs	HDMI Signals	PCH Digital Display Interface Pins
Port B	DDSP_B_TX0_DN	TMDSB_DATA2#	DDPB_0N
	DDSP_B_TX0_DP	TMDSB_DATA2	DDPB_0P
	DDSP_B_TX1_DN	TMDSB_DATA1#	DDPB_1N
	DDSP_B_TX1_DP	TMDSB_DATA1	DDPB_1P
	DDSP_B_TX2_DN	TMDSB_DATA0#	DDPB_2N
	DDSP_B_TX2_DP	TMDSB_DATA0	DDPB_2P
	DDSP_B_TX3_DN	TMDSB_CLK#	DDPB_3N
	DDSP_B_TX3_DP	TMDSB_CLK	DDPB_3P
	DDPB_HPD	DDSP_B_HPD0	Hot plug detect used by HDMI Port B.
	SDVO_CTRLCLK	HDMIB_CTRL_CLK	HDMI DDC lines for Port B
	SDVO_CTRLDATA	HDMIB_CTRL_DATA	

EMI





MICRO-STAR INT'L CO.,LTD

MS-7676

Size	Document Description	Rev
Custom	DVI transfer	10

Date: Wednesday, September 08, 2010 Sheet 25 of 47

HDMI level shifter

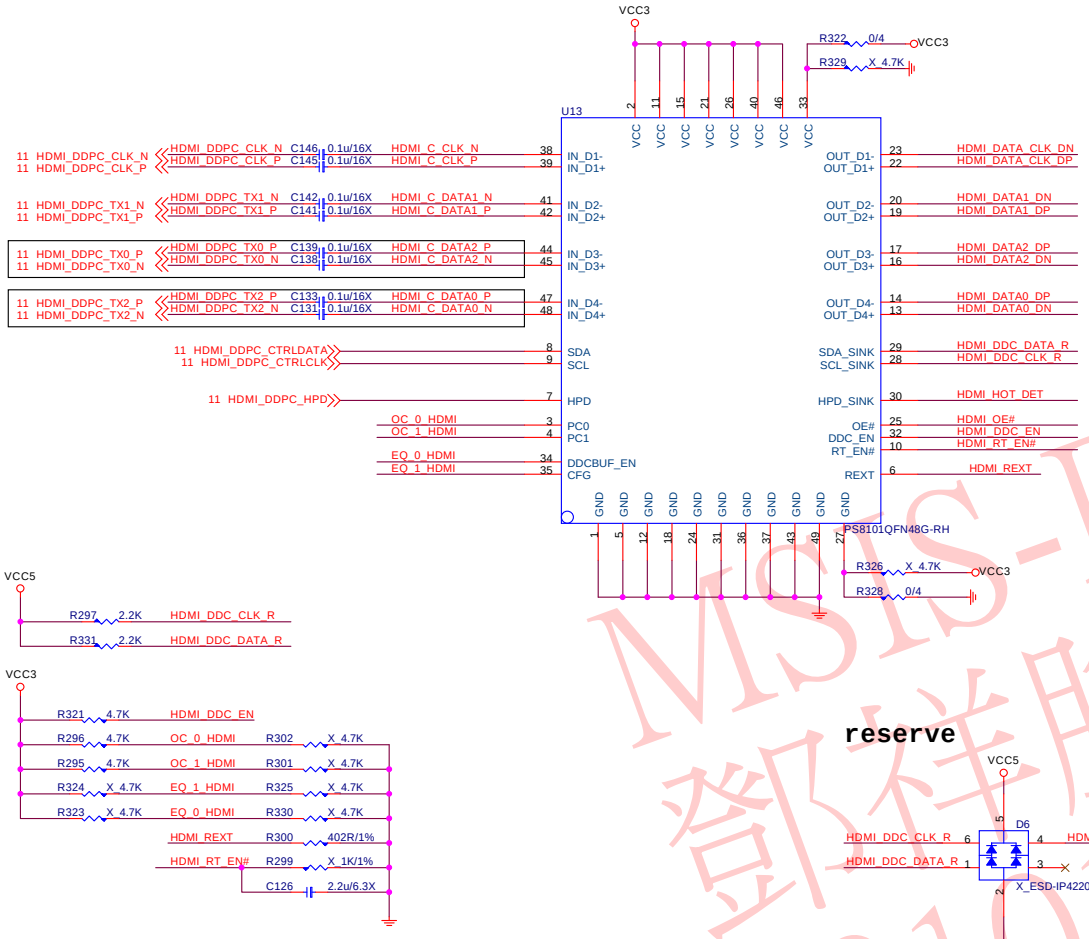
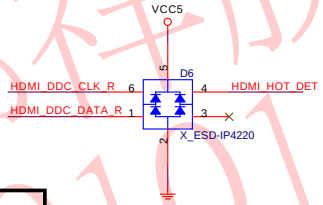
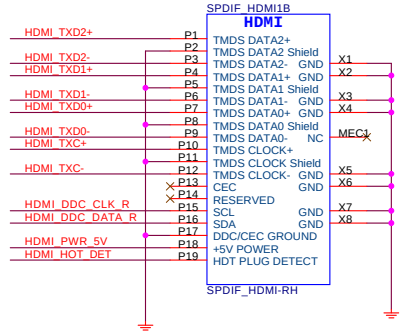


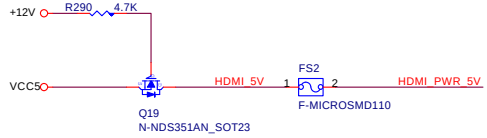
Table 8-1. PCH PCI Express Tx/RX - HDMI Signal Mappings

Port	Digital Display Interface Differential Pairs	HDMI Signals	PCH Digital Display Interface Pins
Port B	DDSP_B_TX0_DN	TMDSB_DATA2#	DDPB_0N
	DDSP_B_TX0_DP	TMDSB_DATA2	DDPB_0P
	DDSP_B_TX1_DN	TMDSB_DATA1#	DDPB_1N
	DDSP_B_TX1_DP	TMDSB_DATA1	DDPB_1P
	DDSP_B_TX2_DN	TMDSB_DATA0#	DDPB_2N
	DDSP_B_TX2_DP	TMDSB_DATA0	DDPB_2P
	DDSP_B_TX3_DN	TMDSB_CLK#	DDPB_3N
	DDSP_B_TX3_DP	TMDSB_CLK	DDPB_3P
	DDPB_HPD	DDSP_B_HPD0	Hot plug detect used by HDMI Port B.
	SDVO_CTRLCLK	HDMIB_CTRL_CLK	HDMI DDC lines for Port B
	SDVO_CTRLDATA	HDMIB_CTRL_DATA	

reserve





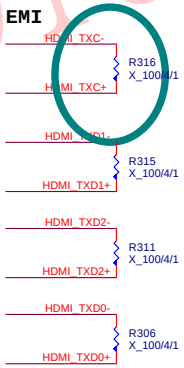


	"0"	"1"	note
DDC_EN	DDC level shifter disable	DDC level shifter enable	internal pull-up at ~500K ohm.
RT_EN#	Input 50 ohm termination resistor enable	the input termination ; resistors are set to high impedances	internal pull-down at ~500K ohm.
OE#	enable	the chip is power down and input termination resistors will be at high impedance.	internal pull-down at ~500K ohm.
HPD_SINK	disable	enable	internal pull-down at ~200K ohm; 5V tolerant.
DDCBUF_EN	For DDC level shifitng configuration, please refer to Table.		internal pull-down at ~500K ohm.
REXT			analog current generation.

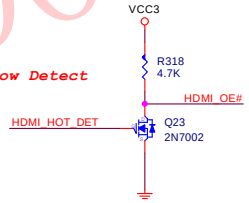
[DDC_EN, DDCBUF_EN, OE#]	DDC Passive Switch	DDC Active Buffer
1, 0, X	On	Off
1, 1, 0	Off	On
1, 1, 1	Off	Off
0, X, X	Off	Off

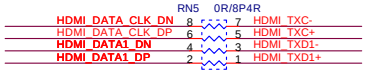
PC1, PC0		note
00	8 dB	internal pull-down at ~500K ohm.
01	4 dB	
10	12 dB	
11	0 B	

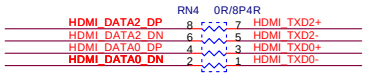
EMI

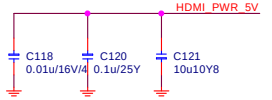


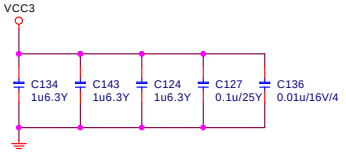
注 NHigh/Low Detect











MICRO-STAR INT'L CO.,LTD

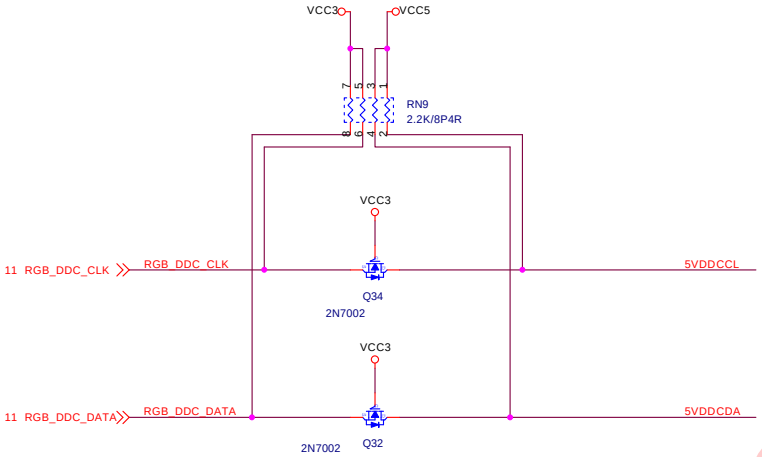
MS-7676

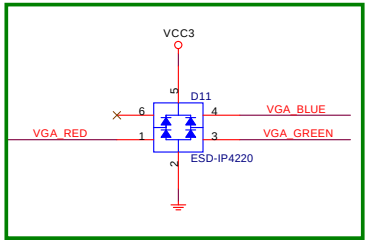
Size: Custom | Document Description: HDMI | Rev: 10

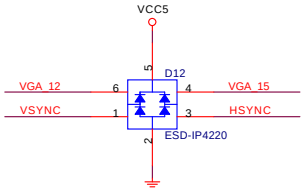
Date: Friday, September 10, 2010 | Sheet 26 of 47

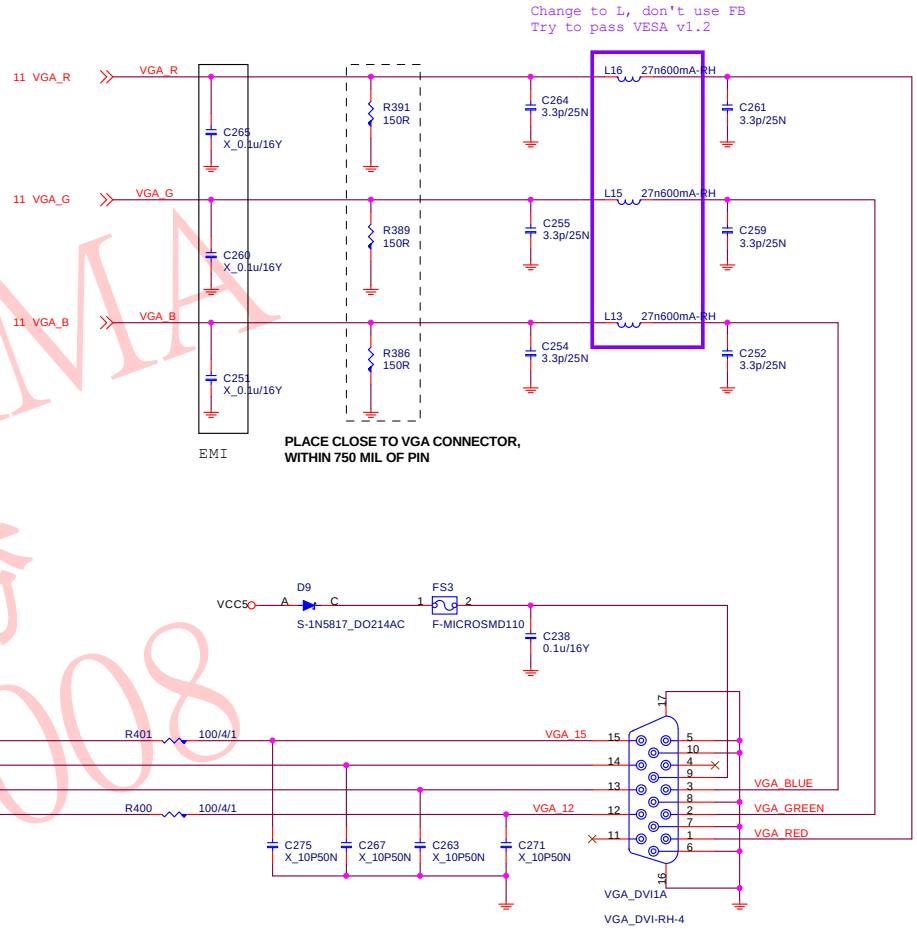
D-Sub

Level shift



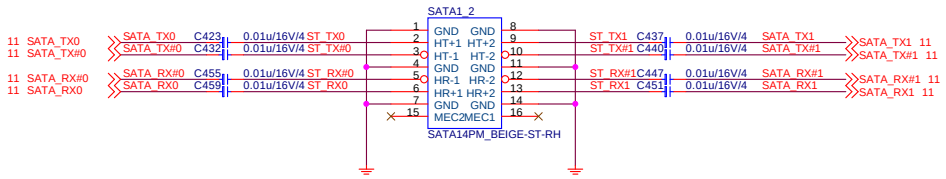




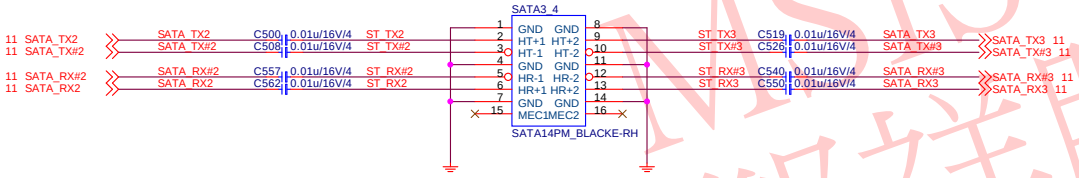


MICRO-STAR INT'L CO.,LTD		
MS-7676		
Size: Custom	Document Description: VGA	Rev: 10
Date: Friday, September 10, 2010	Sheet 27 of 47	

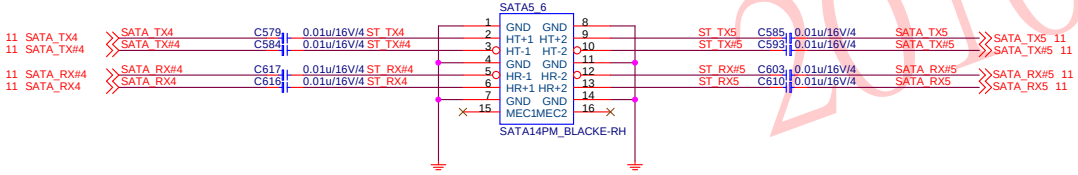
SATA 6G PORT 0,1



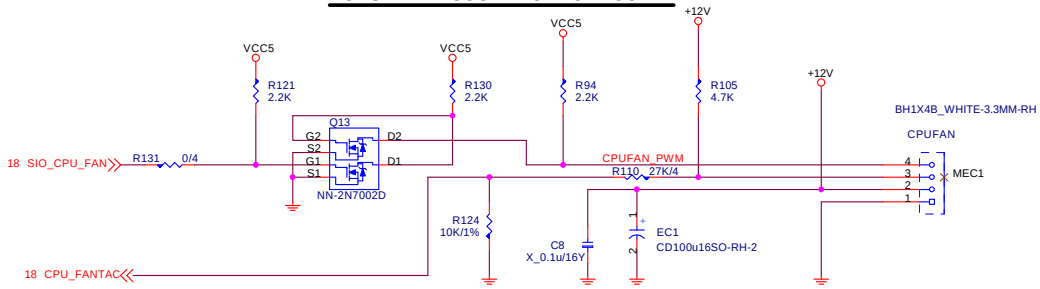
SATA 3G PORT 2,3



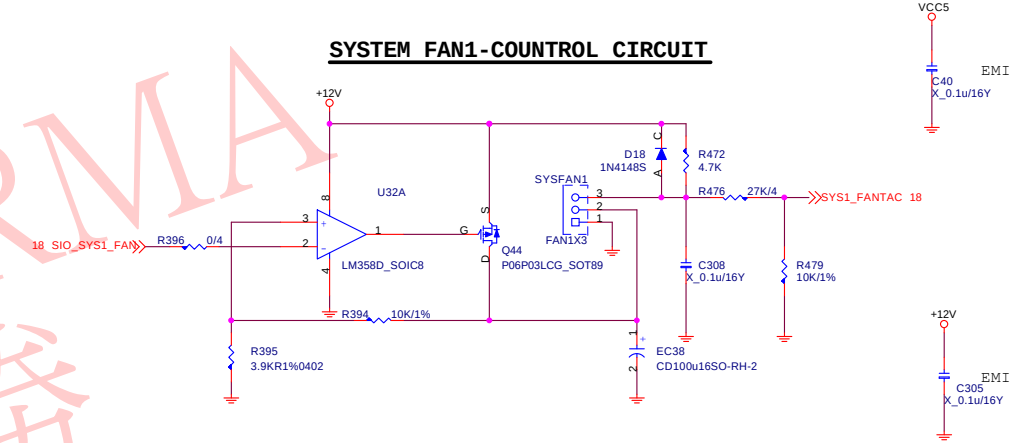
SATA 3G PORT 4,5



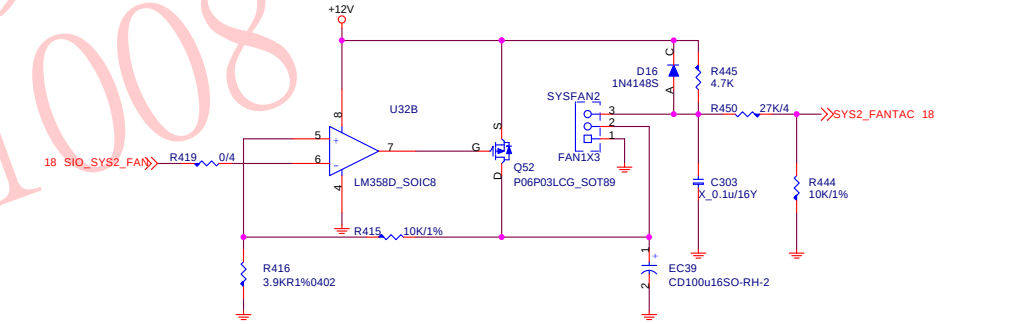
CPU FAN-COUNTROL CIRCUIT



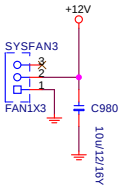
SYSTEM FAN1-COUNTROL CIRCUIT



SYSTEM FAN2-COUNTROL CIRCUIT

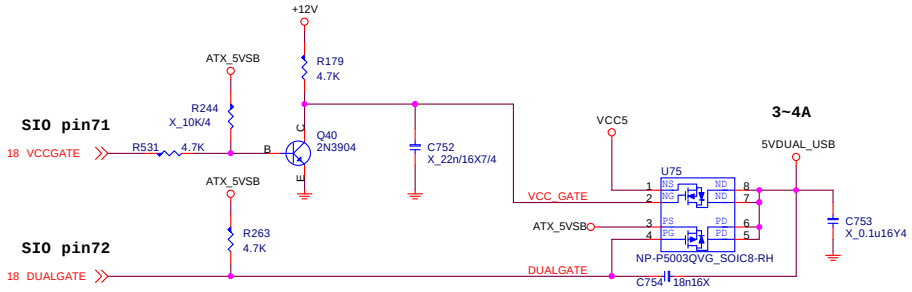


SYSTEM FAN3-12V



MICRO-STAR INT'L CO.,LTD	
MS-7676	
Size: Custom	Document Description: SATA / FAN Control
Rev: 10	
Date: Wednesday, September 08, 2010	Sheet 28 of 47

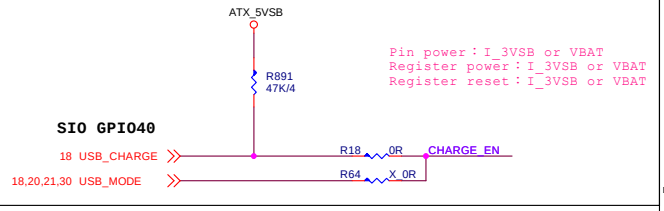
5VDUAL_USB



SIO GPIO40 Pin7 (I_VSB3V)

USB_CHARGE: (OD)
0: Don't support USB charge and resume.
1: Support USB charge and resume.

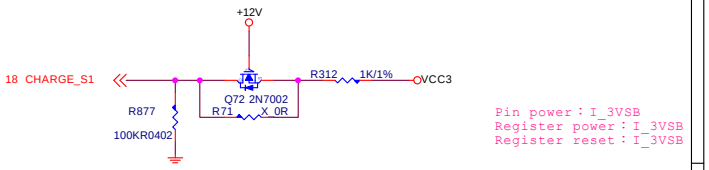
Power plug in , H/W default support USB charge.

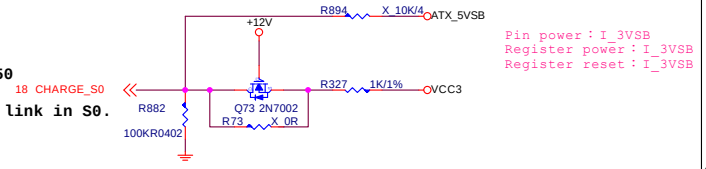


SIO GPIO025 (I_VSB3V)
SIO GPIO050 (I_VSB3V)

CHARGE_S1: (PUSH PULL)
CHARGE_S0: (PUSH PULL)

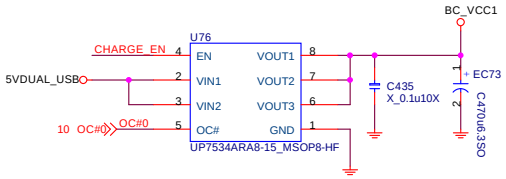
	S0	S1
AUTO:	0	0
DCP :	0	1
A :	1	0
Y :	1	1





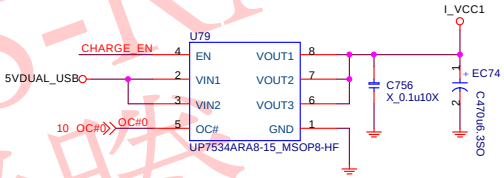
USB POWER FOR PORT 0 for USBCharging

MAX 1.7A

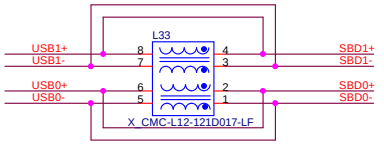


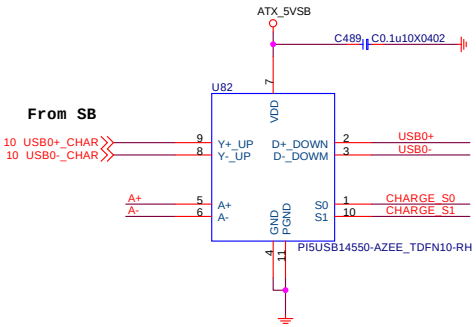
USB POWER FOR PORT 1 for USBCharging

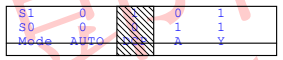
MAX 1.7A

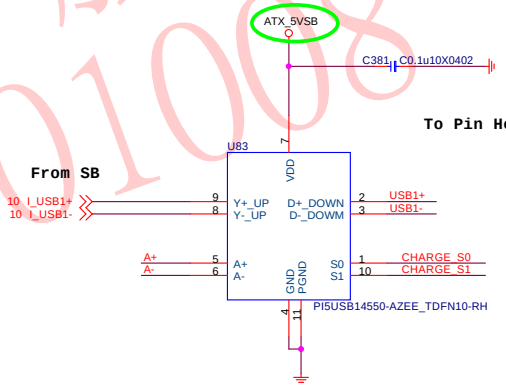


H/W default support auto charging in S3/S4/S5 and usb link in S0.

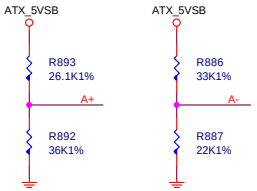




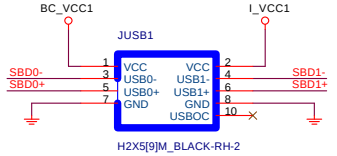




PI5USB14550 has internal EDS diode.



D+ pull High 2.75 V，
D- pull High 2.05V。
皆可對 i-Pad / i-Phone / i-Pod進行充電。



MICRO-STAR INT'L CO.,LTD

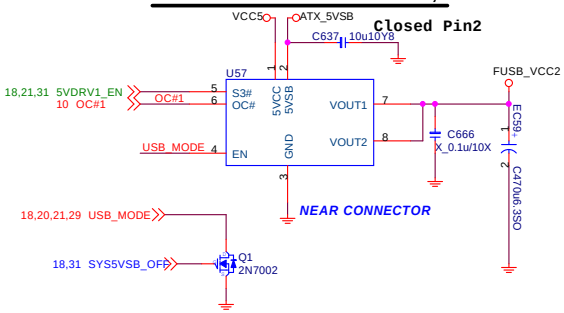
MS-7676

Size	Document Description	Rev
Custom	USB Charger	10

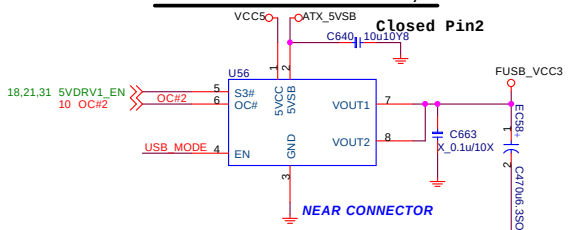
Date: Friday, September 10, 2010 Sheet 29 of 47

Front USB Connector

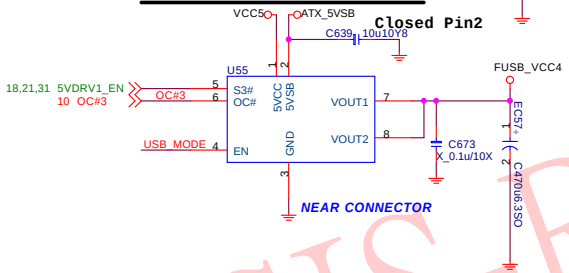
USB POWER REAL PORT 2,3



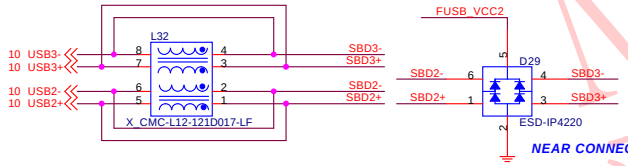
USB POWER FOR PORT 4,5



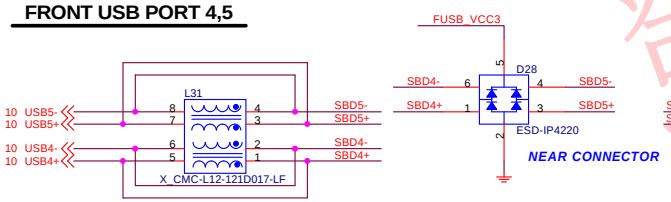
USB POWER FOR PORT 6,7



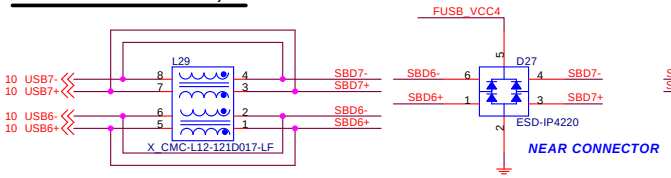
FRONT USB PORT 2,3



FRONT USB PORT 4,5

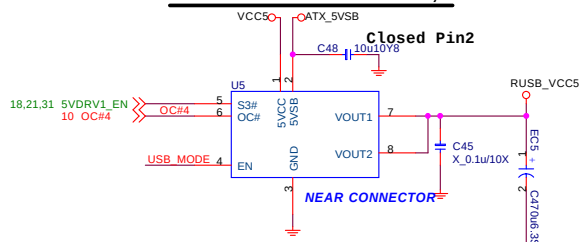


FRONT USB PORT 6,7

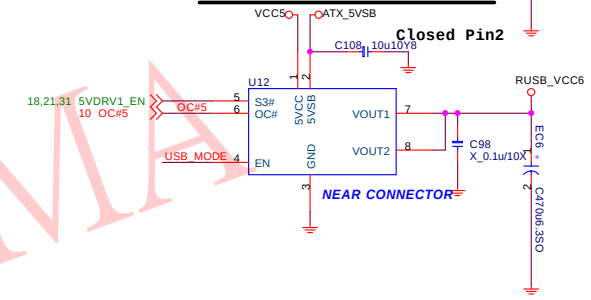


Rear USB Connector

USB POWER FOR PORT 6,7

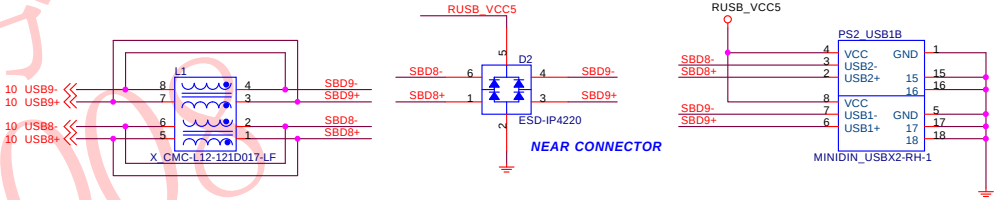


USB POWER FOR PORT 8,9

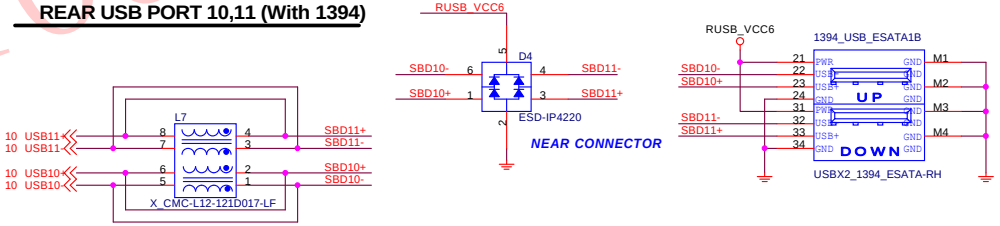


USB_MODE for USB voltage
H:Follow 5VSB
L:Always off

REAR USB PORT 8,9 (With PS2)



REAR USB PORT 10,11 (With 1394)



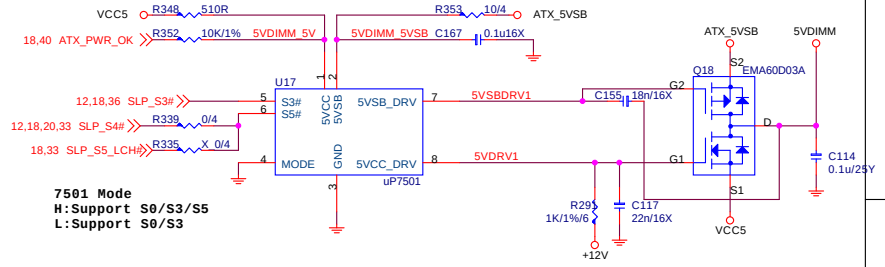
MICRO-STAR INT'L CO.,LTD

MS-7676

Size	Document Description	Rev
Custom	USB Connector	10

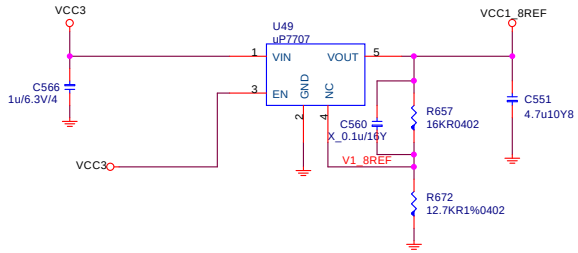
Date: Wednesday, September 08, 2010 | Sheet 30 of 47

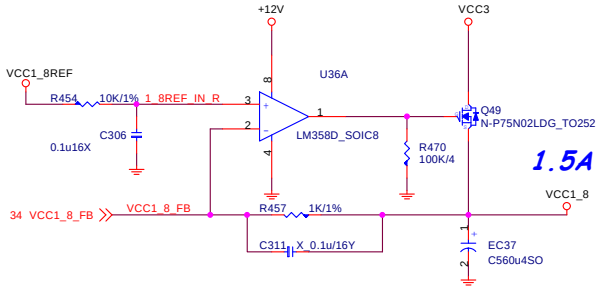
5VDIMM FOR DDR

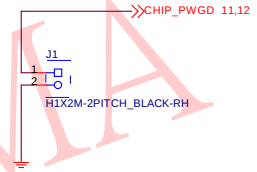


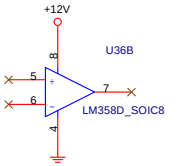
7501 Mode
H:Support S0/S3/S5
L:Support S0/S3

VCC1_8REF

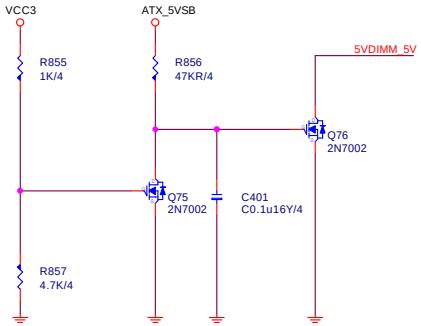




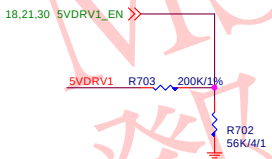




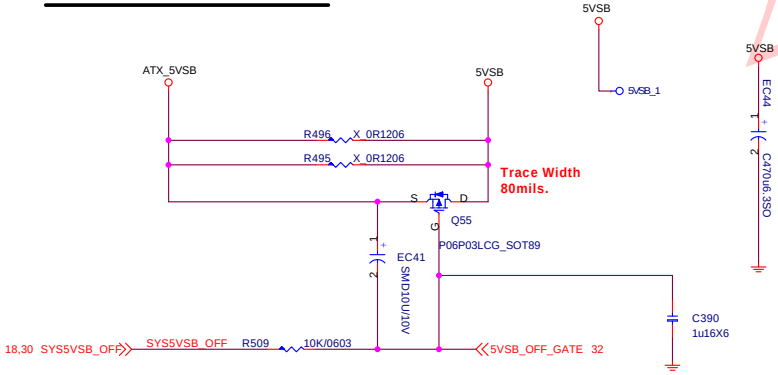
Patch COOLERMASTER 700W POWER Sequence



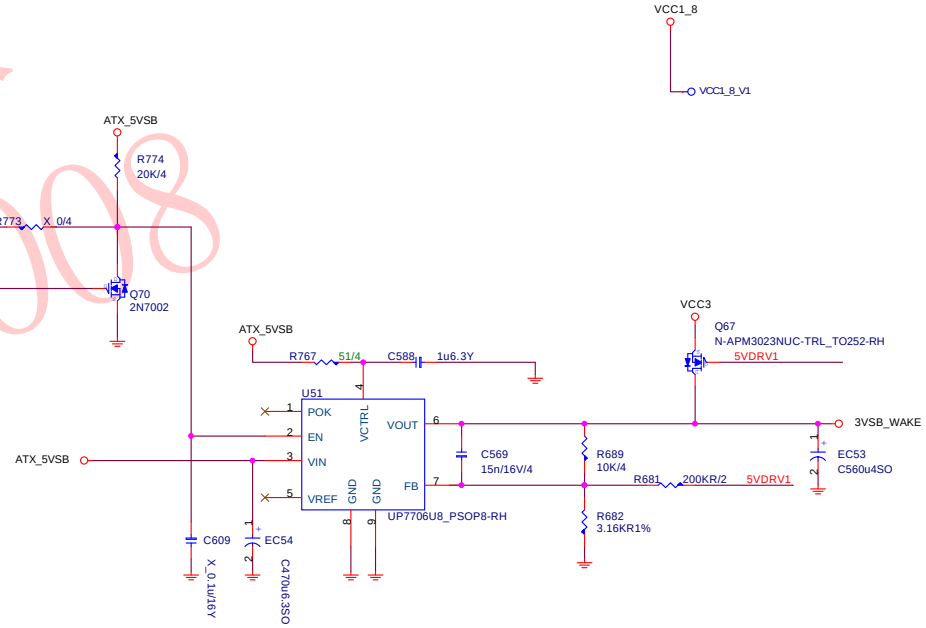
USB MODE



5VSB Power Switch



3VSB_WAKE



3VSB supply to PCH and other device. Turn off when Deep S3/S5.
+3VSB_WAKE supply to PCI Slot and LAN power.Turn off when Deep S3/S5 w/o WOL.

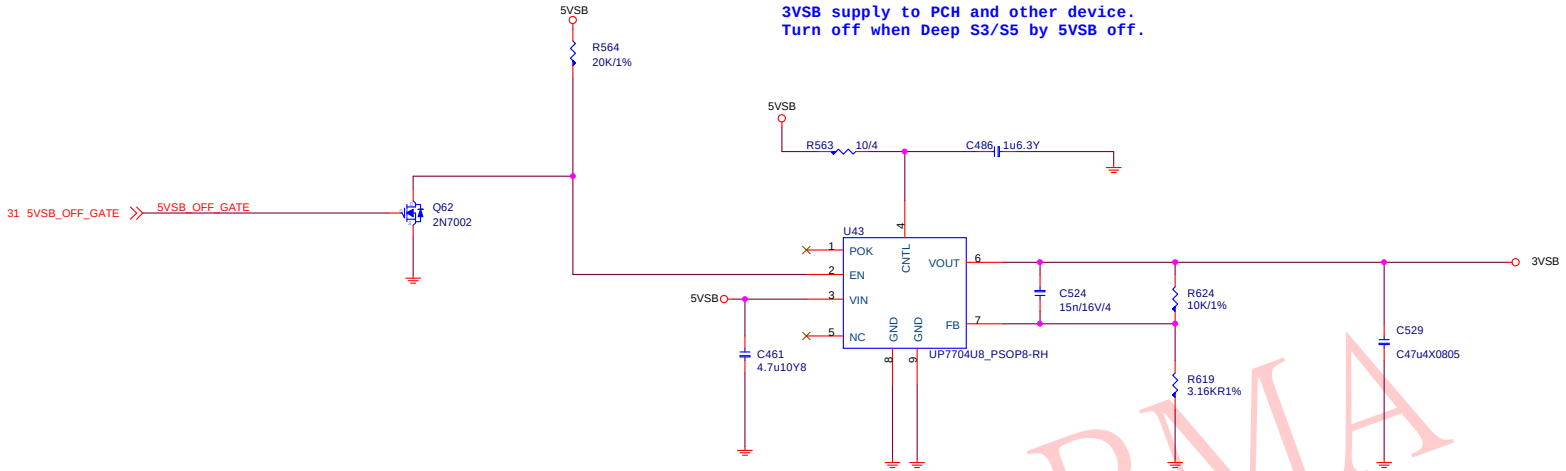
MICRO-STAR INT'L CO.,LTD

MS-7676

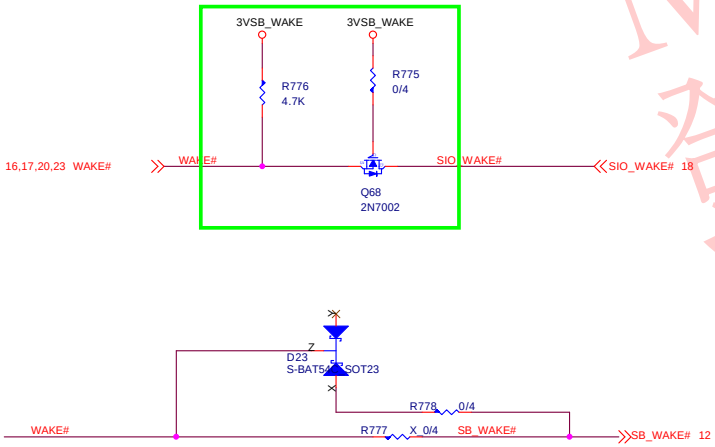
Size	Document Description	Rev
Custom	ACPI controller UPI	10

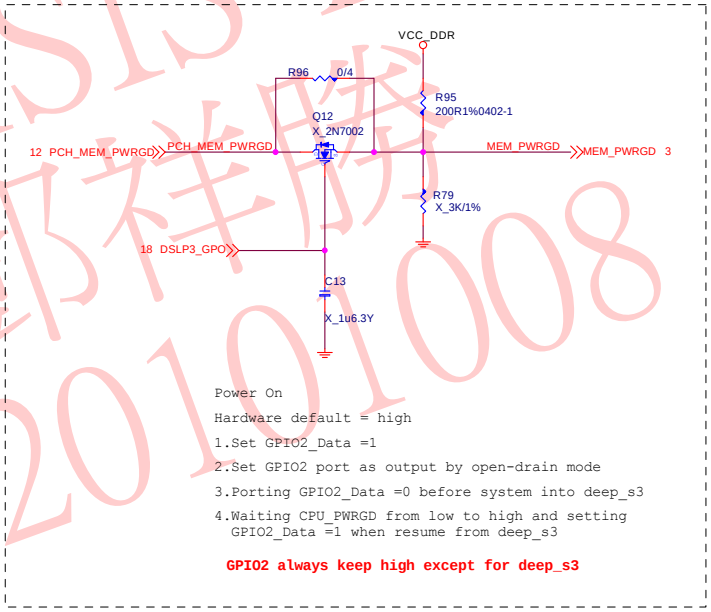
Date: Wednesday, September 08, 2010 | Sheet 31 of 47

Deep Mode WOL LAN Power CTRL Circuit

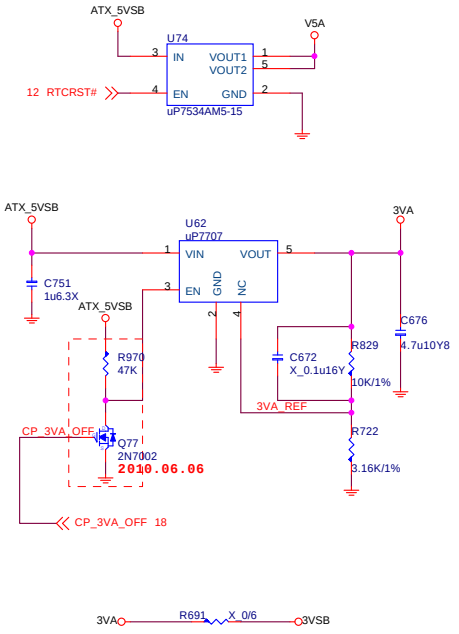


LAN/PCIE/PCI Wake Up CTRL Circuit





RTCRST patch circuit for clr-CMOS PCH will wake up issue



MICRO-STAR INT'L CO.,LTD		
MS-7676		
Size: Custom	Document Description: Power Saving circuit	Rev: 10
Date: Wednesday, September 08, 2010	Sheet 32 of 47	

DDR Power:1.5V

DDR3_1.5V 4.5A+15A+1A=20.5A

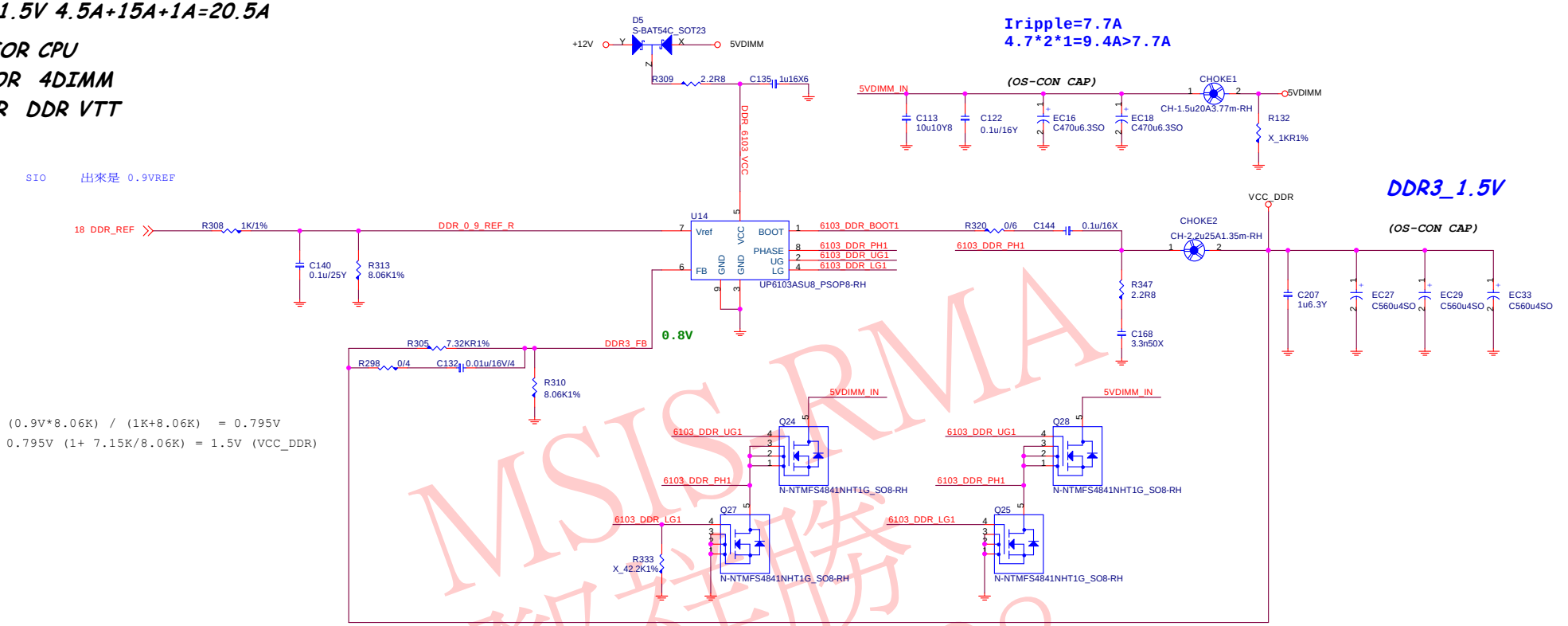
4.5A FOR CPU
15A FOR 4DIMM
1A FOR DDR VTT

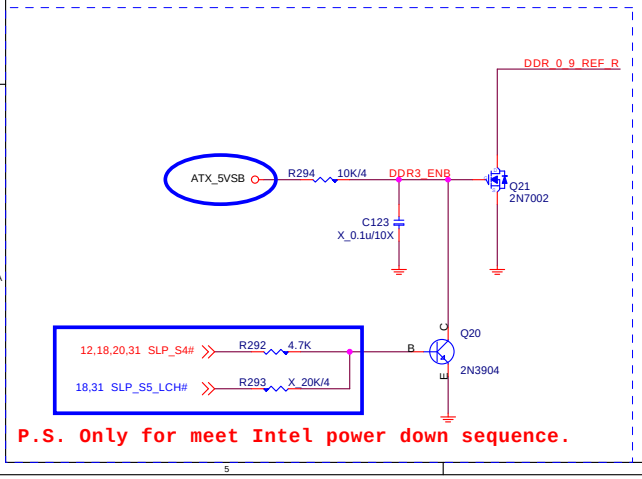
SIO 出來是 0.9VREF

Iripple=7.7A
4.7*2*1=9.4A>7.7A

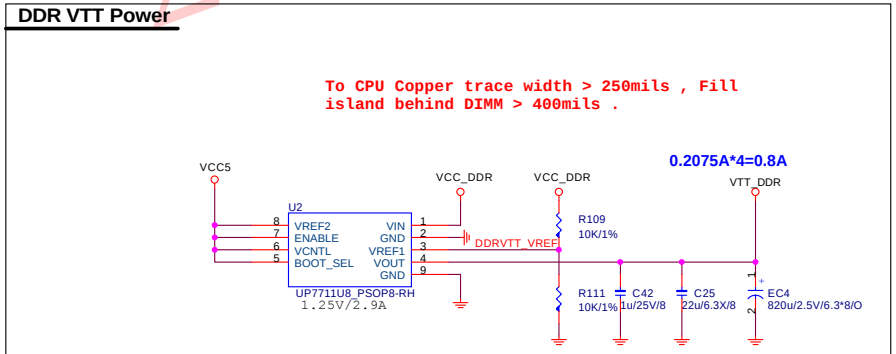
DDR3_1.5V

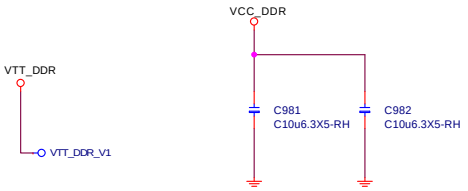
(0.9V*8.06K) / (1K+8.06K) = 0.795V
0.795V (1+ 7.15K/8.06K) = 1.5V (VCC_DDR)





DDR VTT Power





MICRO-STAR INT'L CO.,LTD

MS-7676

Size	Document Description	Rev
Custom	DDR Power - uP6103 1-Phase	10

Date: Wednesday, September 08, 2010 Sheet 33 of 47

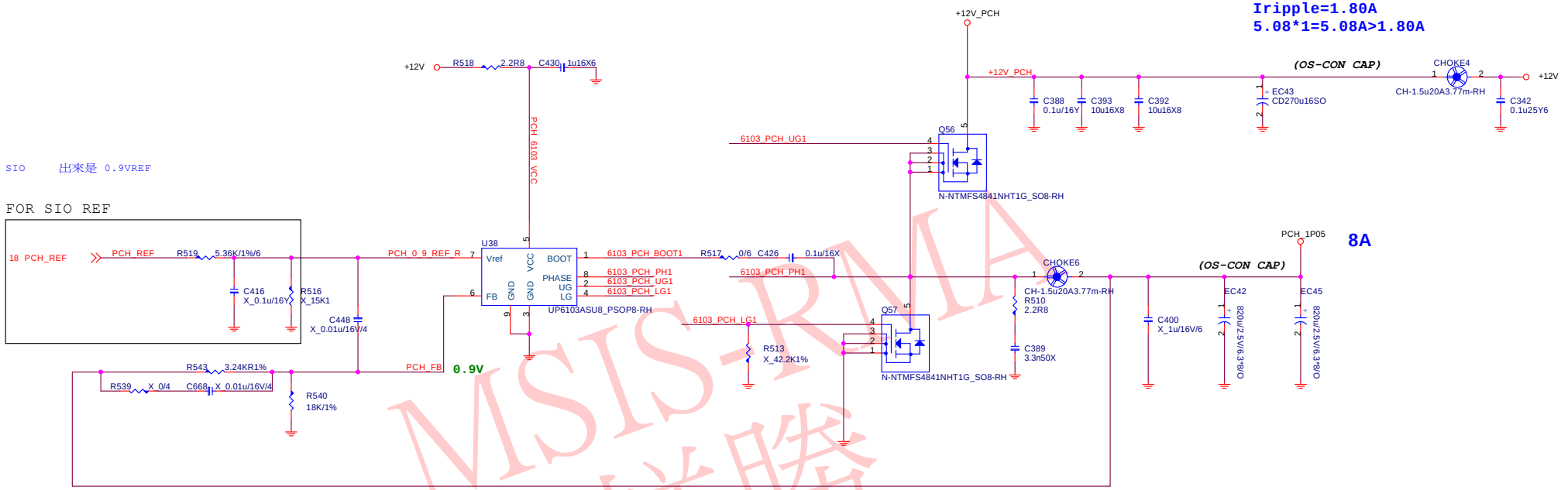
PCH Power:1.05V

PCH Core 6.2A+1.8A=8A

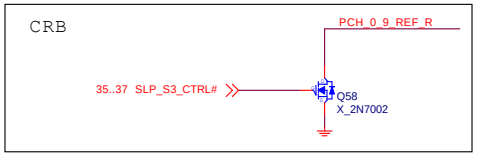
6.2A FOR PCH

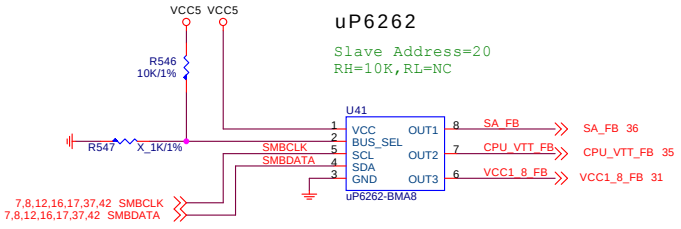
1.8A FOR ME CORE

Iripple=1.80A
5.08*1=5.08A>1.80A



UPI VOLTAGE CONSOLE





MICRO-STAR INT'L CO.,LTD

MS-7676

Size	Document Description	Rev
Custom	PCH Power - uP6103 1-Phase	10

Date: Wednesday, September 08, 2010 Sheet 34 of 47

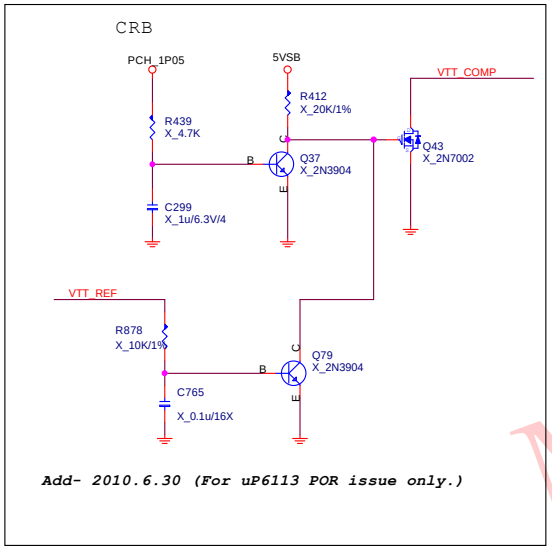
CPU_VTT:1.05/1.00

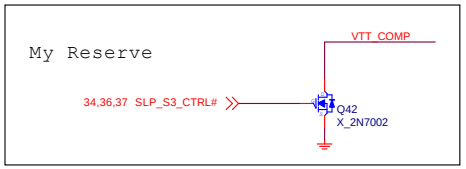
CPU VTT 8.5A

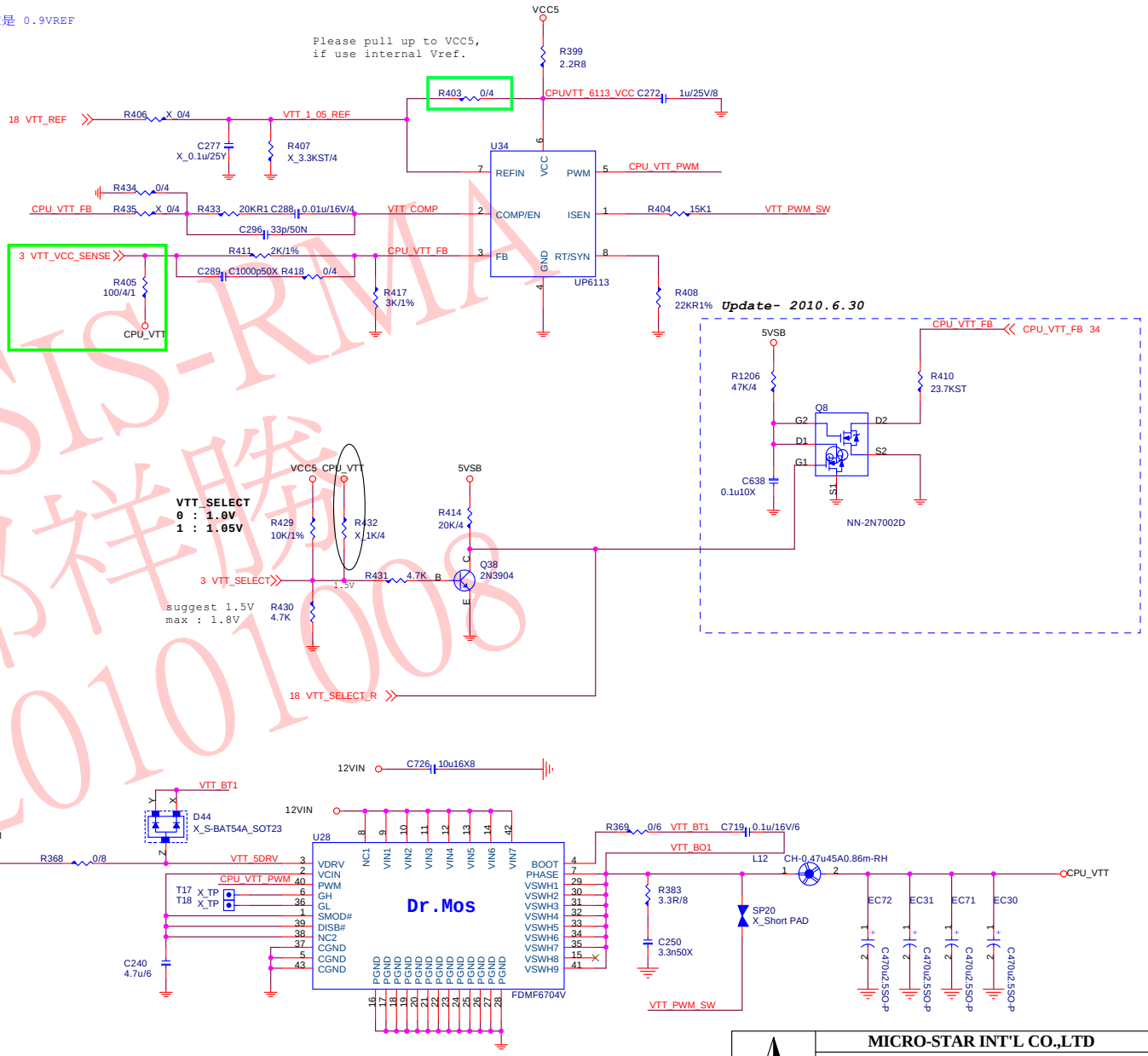
8.5A FOR CPU

SIO 出來是 0.9VREF

Please pull up to VCC5,
if use internal Vref.





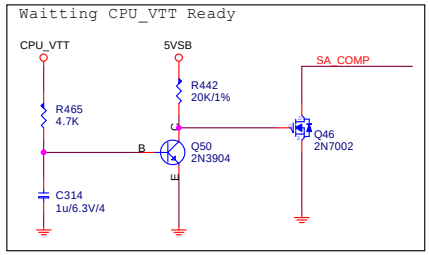


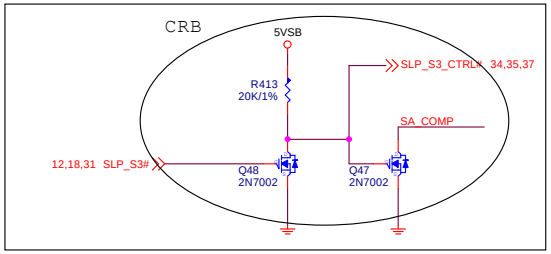
MICRO-STAR INT'L CO.,LTD		
MS-7676		
Size: Custom	Document Description: CPU_VTT - uP6113- 1-Phase	Rev: 10
Date: Wednesday, September 08, 2010	Sheet 35 of 47	

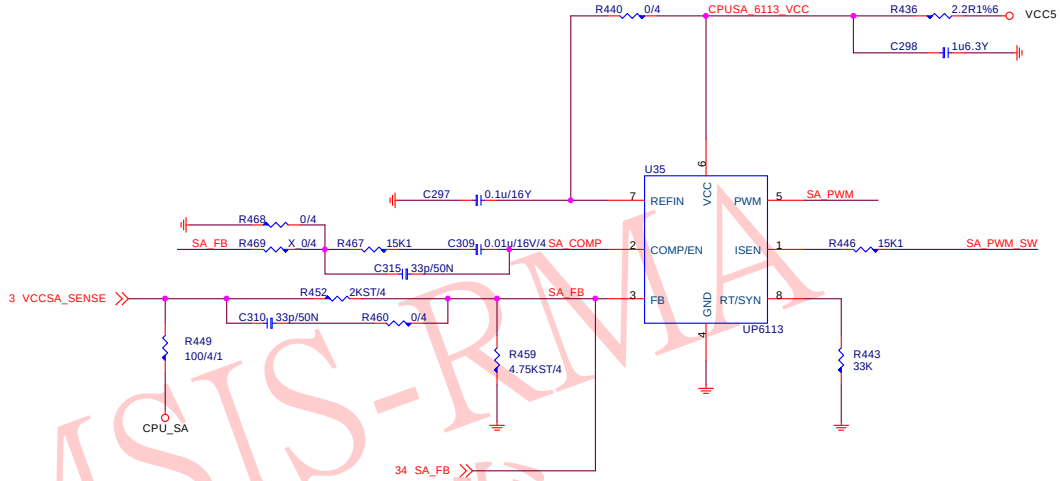
CPU_SA:0.925/0.85

SA Core =8.8A

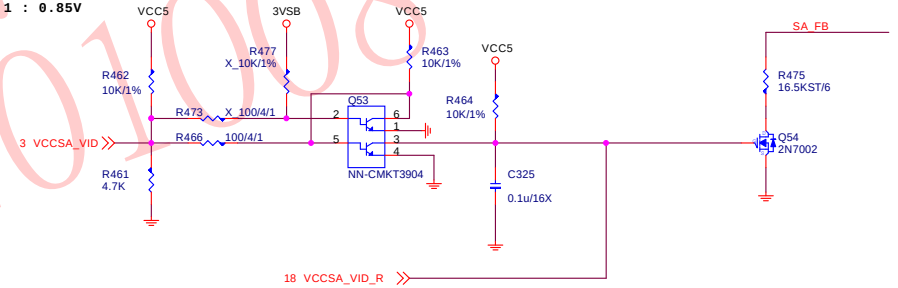
Please pull up to VCC5,
if use internal Vref.

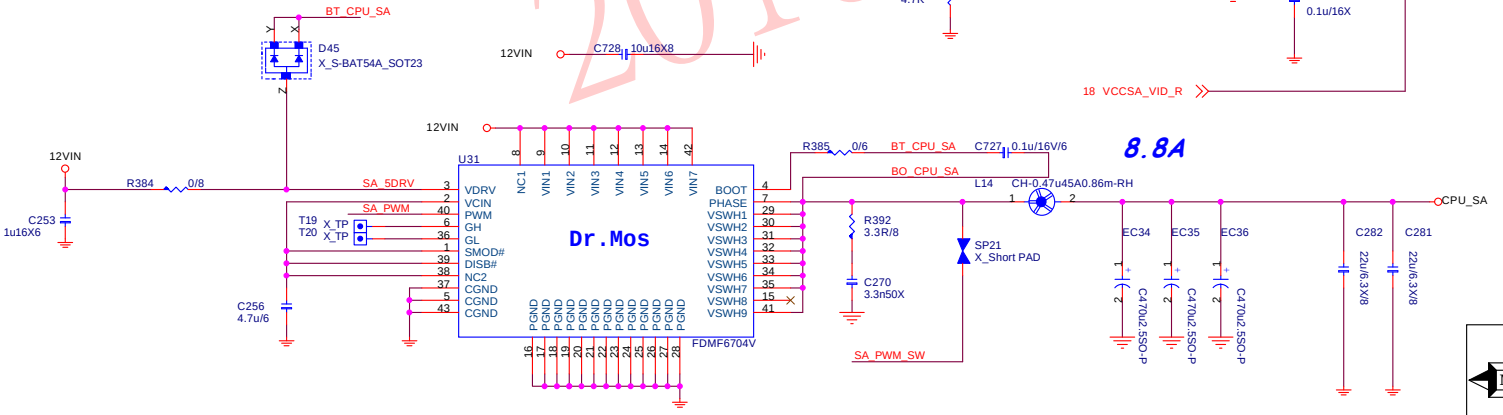




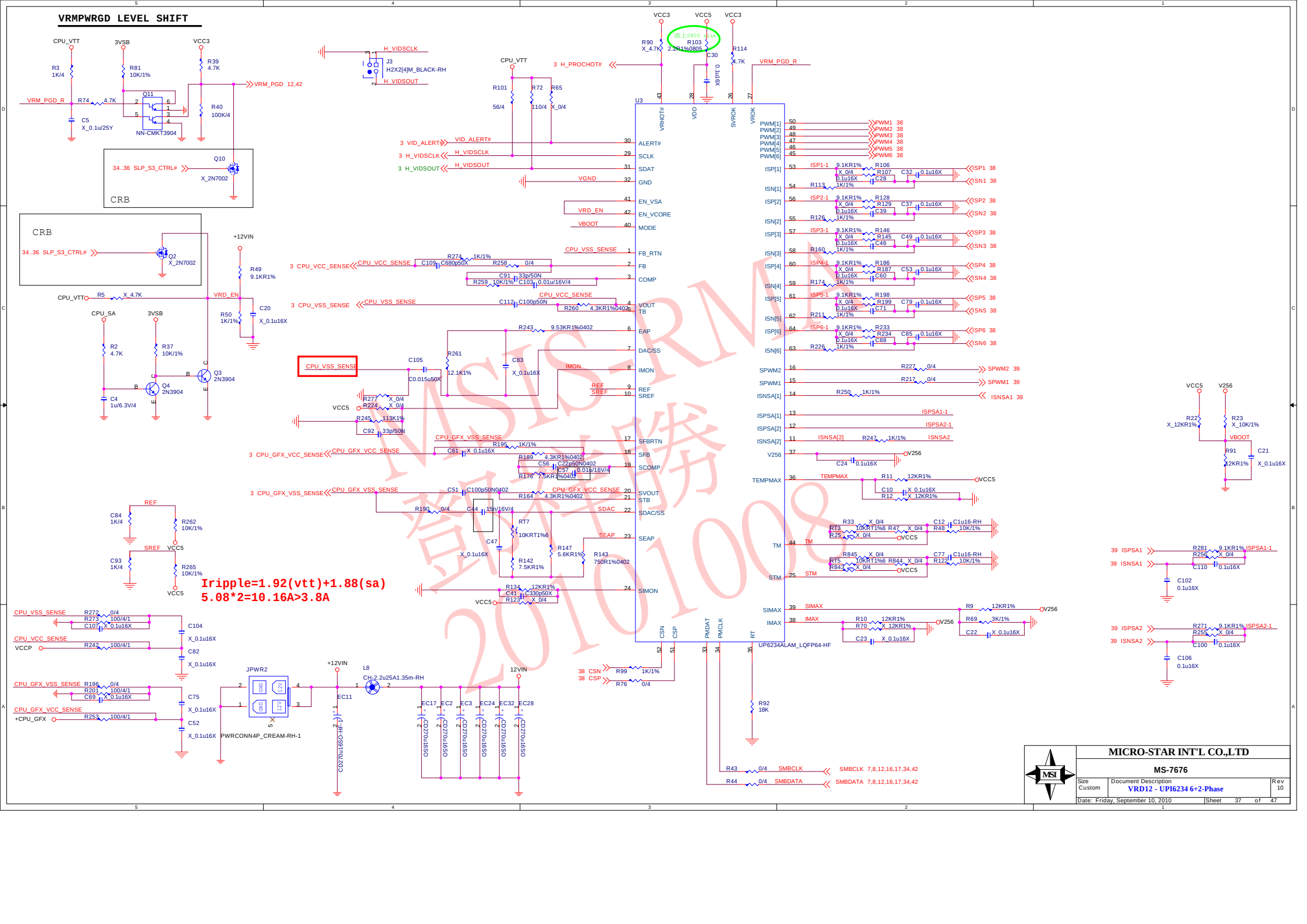


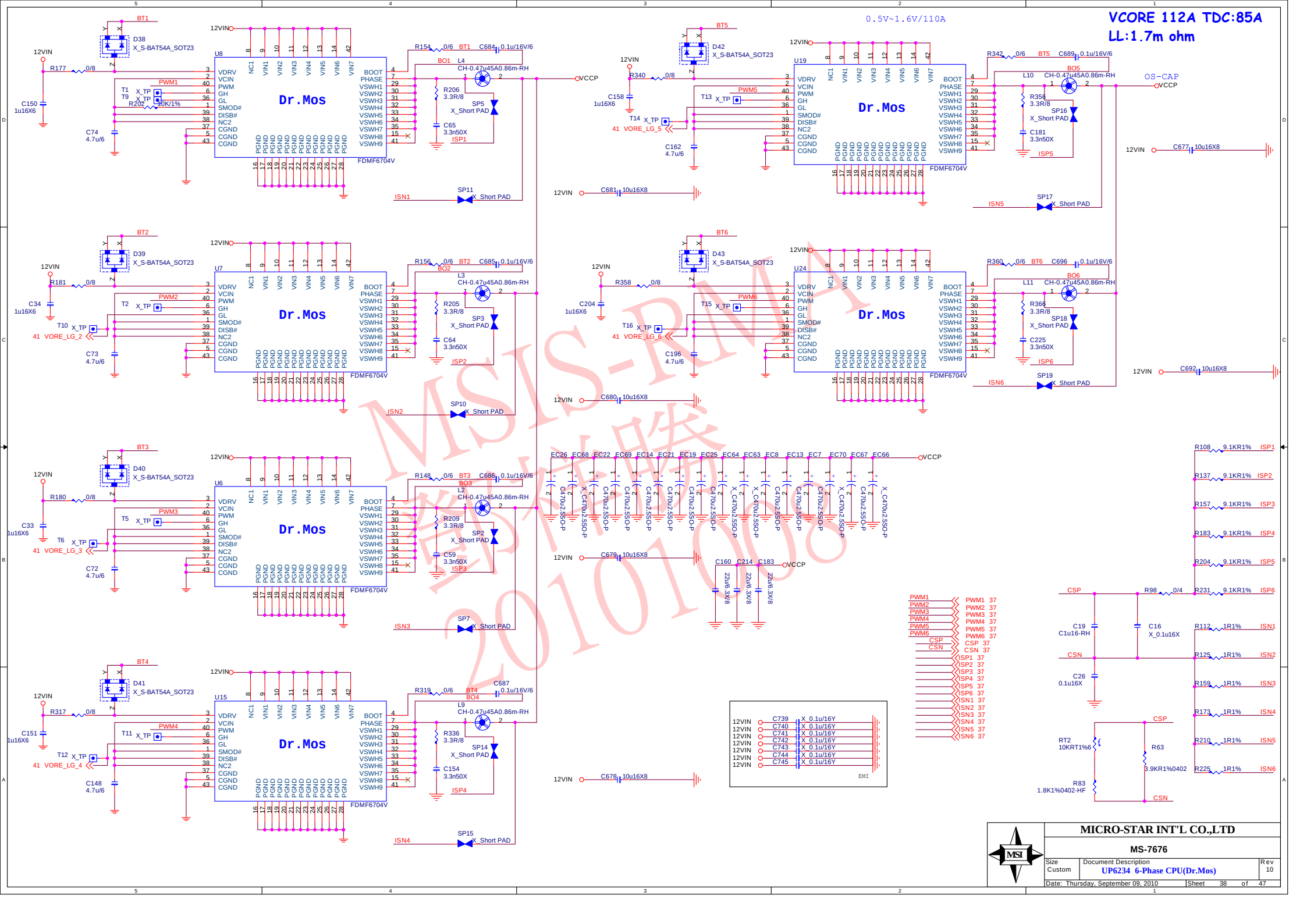
VCCSA_VID
0 : 0.925V
1 : 0.85V

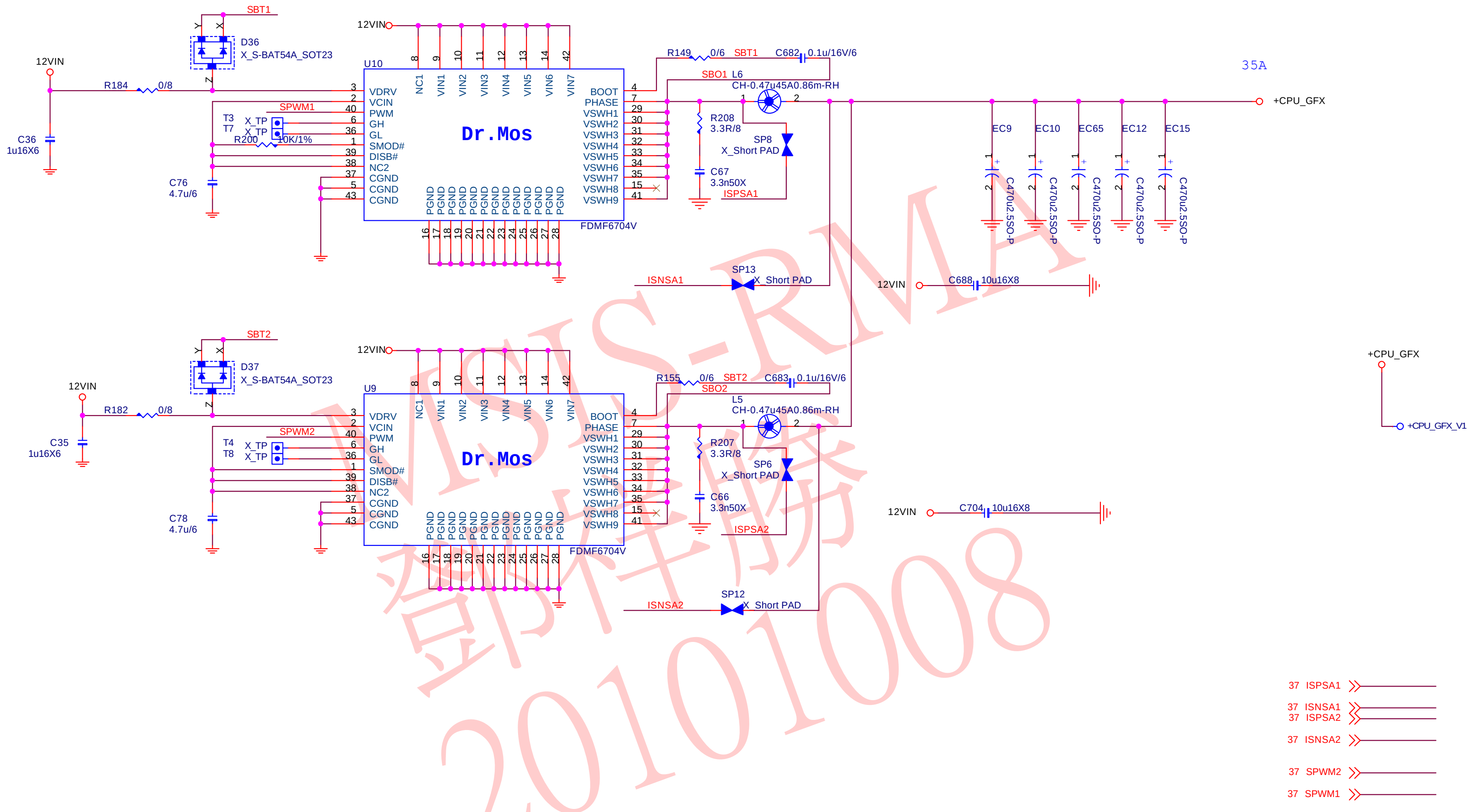




MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7676	
Size: Custom	Document Description: CPU_SA - uP6113 1-Phase	Rev: 10
Date: Friday, September 10, 2010	Sheet 36 of 47	


VRMPWRGD LEVEL SHIFT
CRB
CRB
Iripple=1.92(vtt)+1.88(sa)
5.08*2=10.16A>3.8A
U3
UP6234ALAM_LQFP64-HF
MICRO-STAR INT'L CO.,LTD
MS-7676
VRD12 - UPI6234 6+2-Phase
Date: Friday, September 10, 2010
Sheet 37 of 47
Rev 10


VCORE 112A TDC:85A
LL:1.7m ohm
0.5V~1.6V/110A
Dr.Mos
FDMF6704V
U8
U19
U7
U24
U6
U15
BT1
BT2
BT3
BT4
BT5
BT6
D38 X_S-BAT54A_SOT23
D39 X_S-BAT54A_SOT23
D40 X_S-BAT54A_SOT23
D41 X_S-BAT54A_SOT23
D42 X_S-BAT54A_SOT23
D43 X_S-BAT54A_SOT23
12VIN
VCCP
OS-CAP
PWM1
PWM2
PWM3
PWM4
PWM5
PWM6
VORE_LG_2
VORE_LG_3
VORE_LG_4
VORE_LG_5
VORE_LG_6
ISN1
ISN2
ISN3
ISN4
ISN5
ISN6
ISP1
ISP2
ISP3
ISP4
ISP5
ISP6
CH-0.47u45A0.86m-RH
EMI
MICRO-STAR INT'L CO.,LTD
MS-7676
UP6234 6-Phase CPU(Dr.Mos)
Date: Thursday, September 09, 2010
Sheet 38 of 47
Rev 10



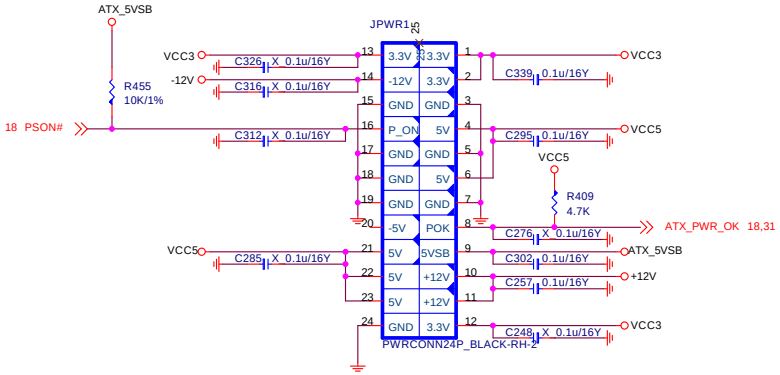
MICRO-STAR INT'L CO.,LTD

MS-7676

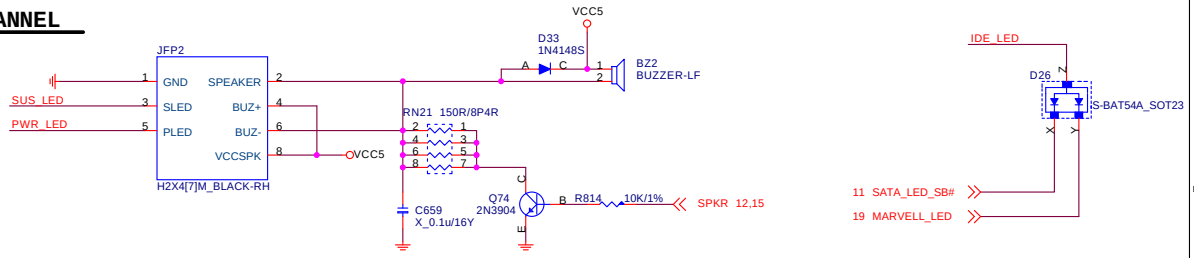
Size	Document Description	Rev
Custom	UP6234 2-Phase GPU(Dr.Mos)	10

Date: Friday, September 10, 2010 | Sheet 39 of 47

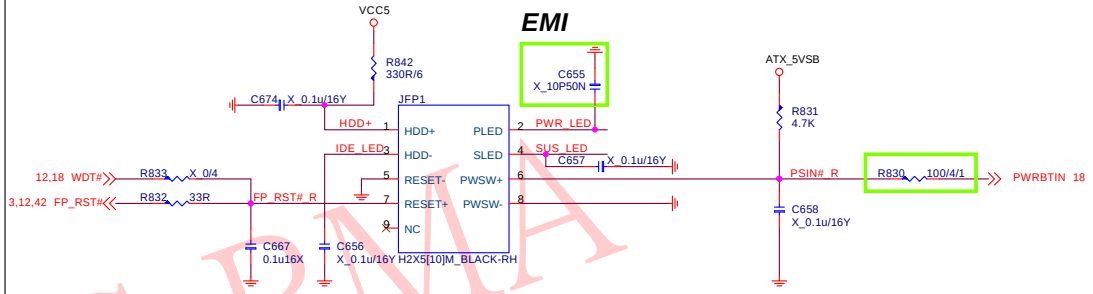
ATX POWER CONNECTOR



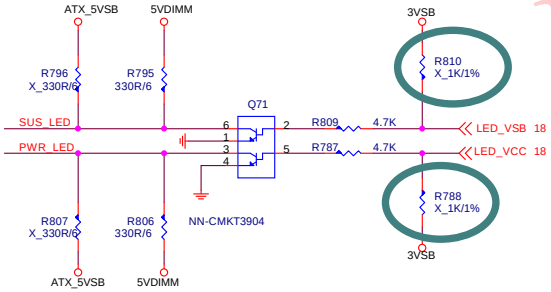
FRONT PANNEL



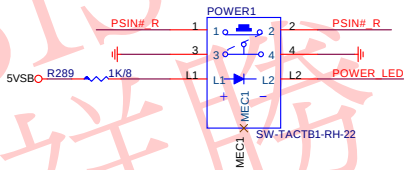
EMI



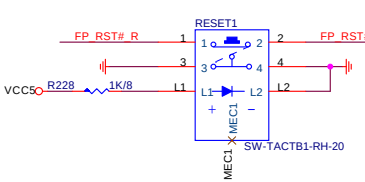
LED (for Fintek 71889)



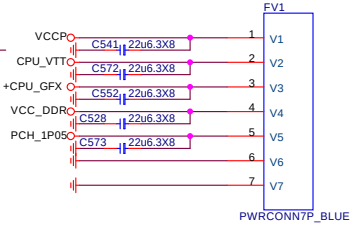
POWER ON BUTTON



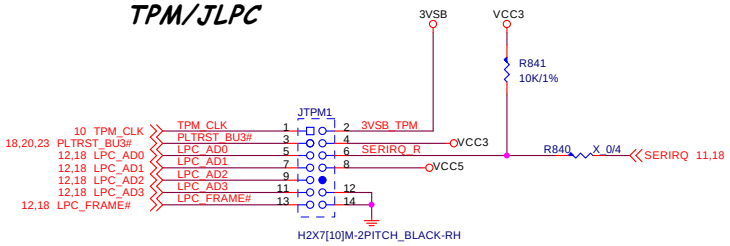
RESET BUTTON



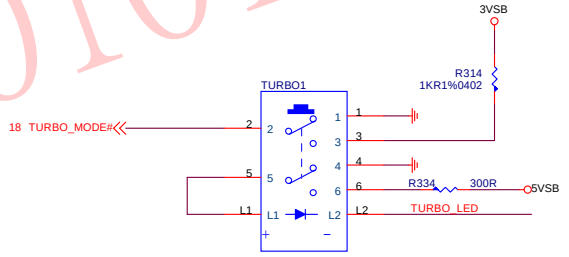
電壓測點

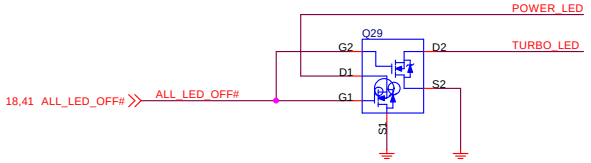


TPM/JLPC



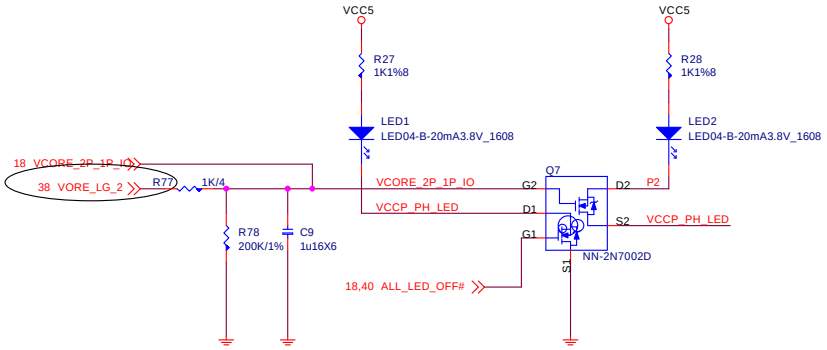
DPS Turbo Button

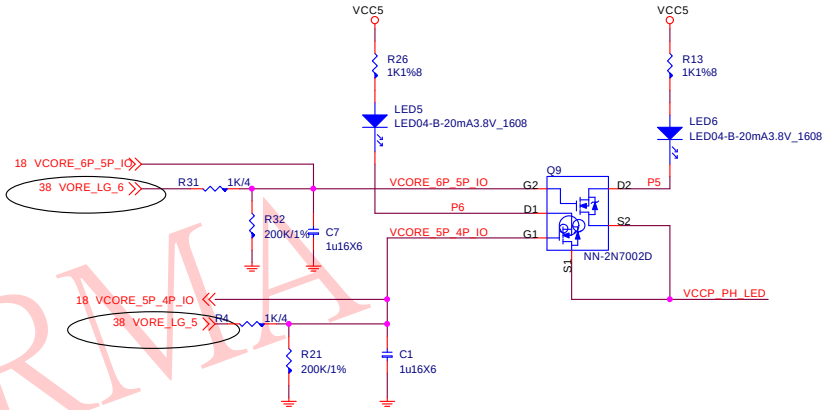


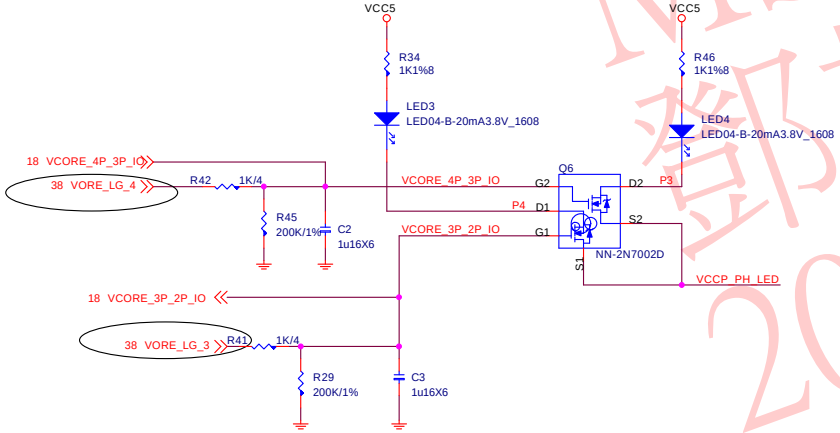


MICRO-STAR INT'L CO.,LTD		
MS-7676		
Size: Custom	Document Description: ATX PWR-Connector & Front Panel & EMI	Rev: 10
Date: Wednesday, September 08, 2010	Sheet 40 of 47	

all on board LED switch

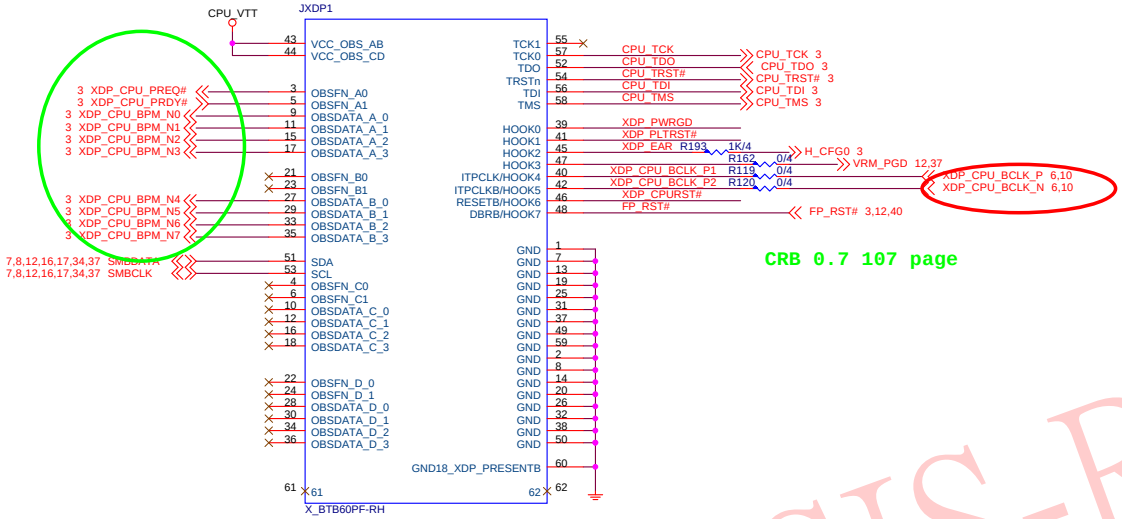






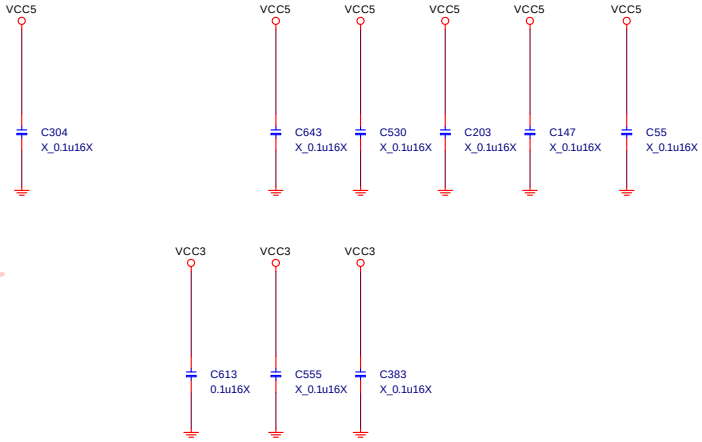
MICRO-STAR INT'L CO.,LTD	
MS-7676	
Size: Custom	Document Description: PHASE Dropping & PSI & LED
Rev: 10	
Date: Wednesday, September 08, 2010	Sheet 41 of 47

Reserve debug port 5020

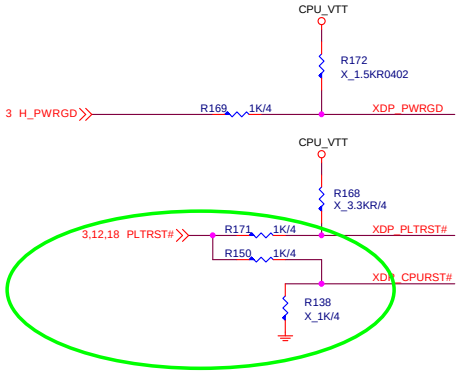


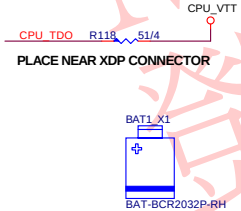
CRB 0.7 107 page

PCH XDP



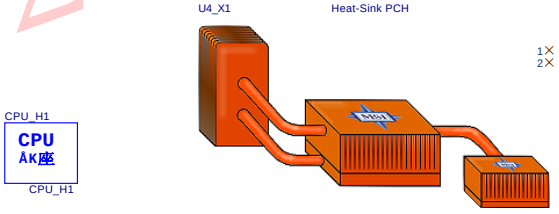
PCH XDP PWRGD/RESET



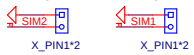


CPU Heat-pipe

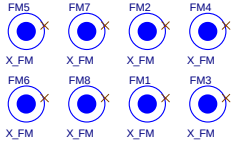
PK0-0767610-E48競華,27,寶安恩斯邁廠(MSIS)
PK0-0767610-G37,精成,27,寶安恩斯邁廠(MSIS)



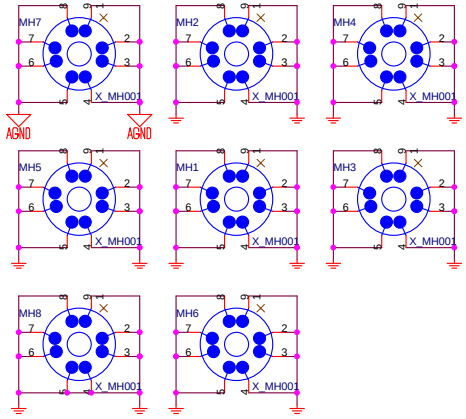
Simulation



Optical Fiducial Marks-120



Mounting Holes



MICRO-STAR INT'L CO.,LTD		
MS-7676		
Size: Custom	Document Description: XDP / Manual Parts	Rev: 10
Date: Thursday, September 09, 2010	Sheet 42 of 47	