MS-7821

ATX

Ver: 12

Intel -Shark Bay plamform Z87

CPU:

Marswell LGA1150

System Chipset:

Lynx Point

Onboard Chip:

HD Audio Codec:ALC1150
LAN-Killer E2205
SIO:Fintek NTC6799D
Flash ROM: SPI 64 MB

Main Memory:

*DDRIII (800/1066/1333MHz) * 4 (Dual Channel)*

ACPI:

UPI

PWM:

VRD12 -UP1649-8Phase

Expansion Slots:

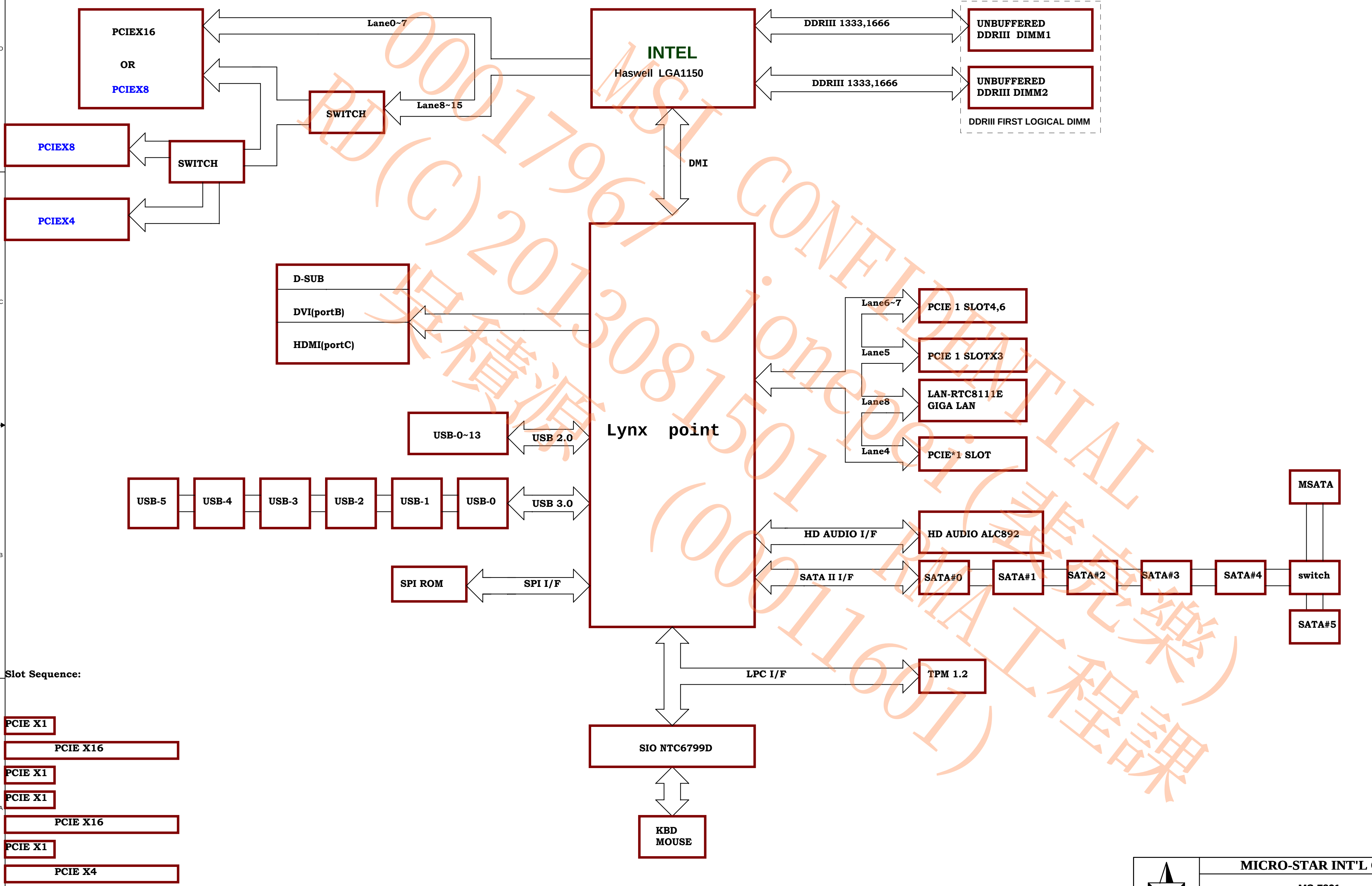
*PCI Express (X16) Slot *3*
*PCI Express (X1) Slot * 4*

Other:

SATA3.0 x6 (PCH)
*REAR USB2.0 *2*
*FRONT USB2.0 *6*
*REAL USB3.0 *4*
*FRONT USB3.0 *2*

MICRO-STAR INT'L CO.,LTD		
MS-7821		
Size: Custom	Document Description: Cover Sheet	Rev: 12
Date: Monday, March 18, 2013	Sheet 1 of 43	

MS-7821 Block Diagram



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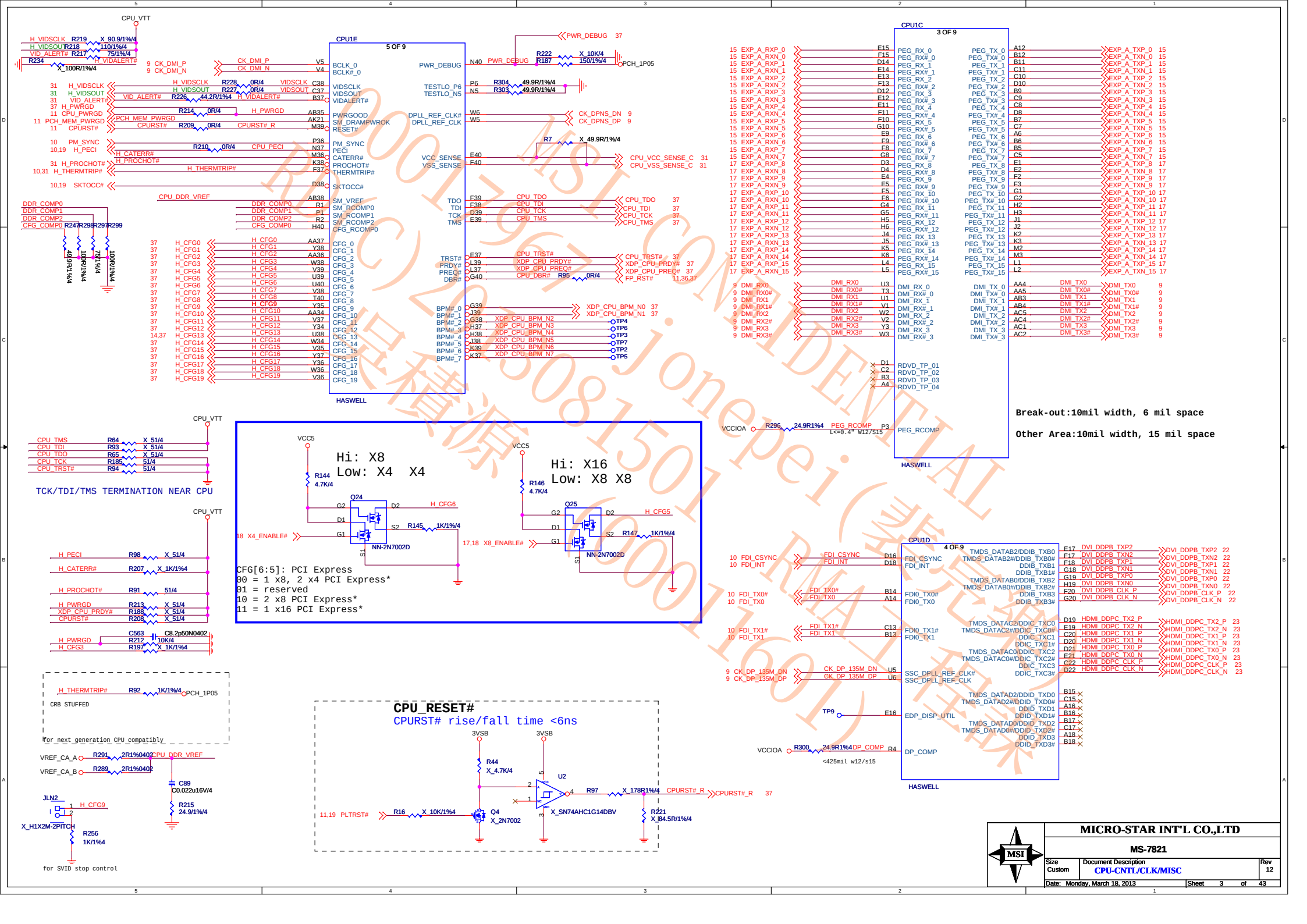
Size	Document Description	Rev
Custom	Block Diagram	12

Date: Monday, March 18, 2013 Sheet 2 of 43


CPU_VTT
CPU1E
5 OF 9
HASWELL
CPU1C
3 OF 9
CPU1D
4 OF 9
Break-out:10mil width, 6 mil space
Other Area:10mil width, 15 mil space
TCK/TDI/TMS TERMINATION NEAR CPU
Hi: X8
Low: X4 X4
Hi: X16
Low: X8 X8
CFG[6:5]: PCI Express
00 = 1 x8, 2 x4 PCI Express*
01 = reserved
10 = 2 x8 PCI Express*
11 = 1 x16 PCI Express*
CRB STUFFED
for next generation CPU compatibly
for SVID stop control
CPU_RESET#
CPURST# rise/fall time <6ns
MICRO-STAR INT'L CO.,LTD
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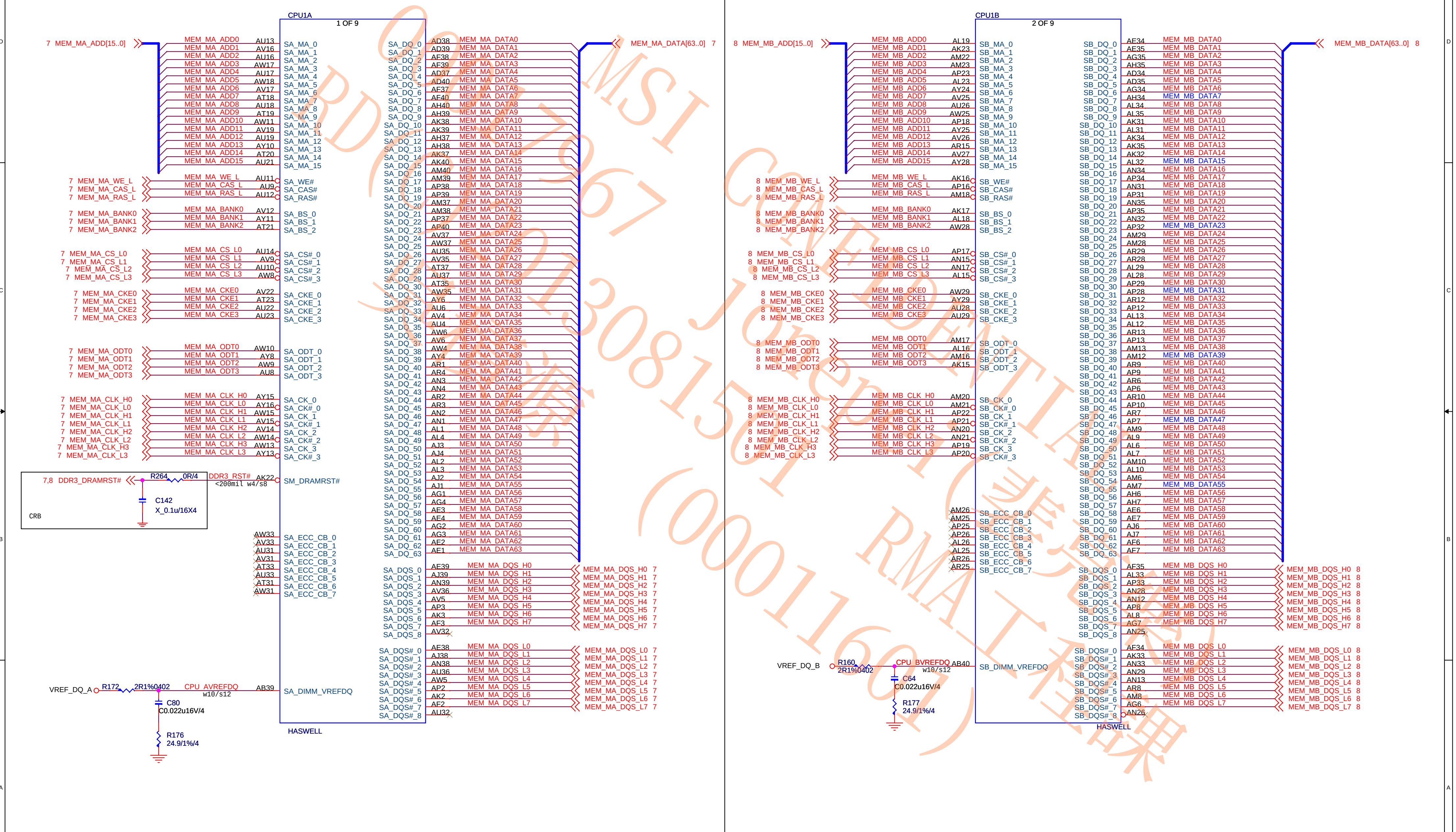
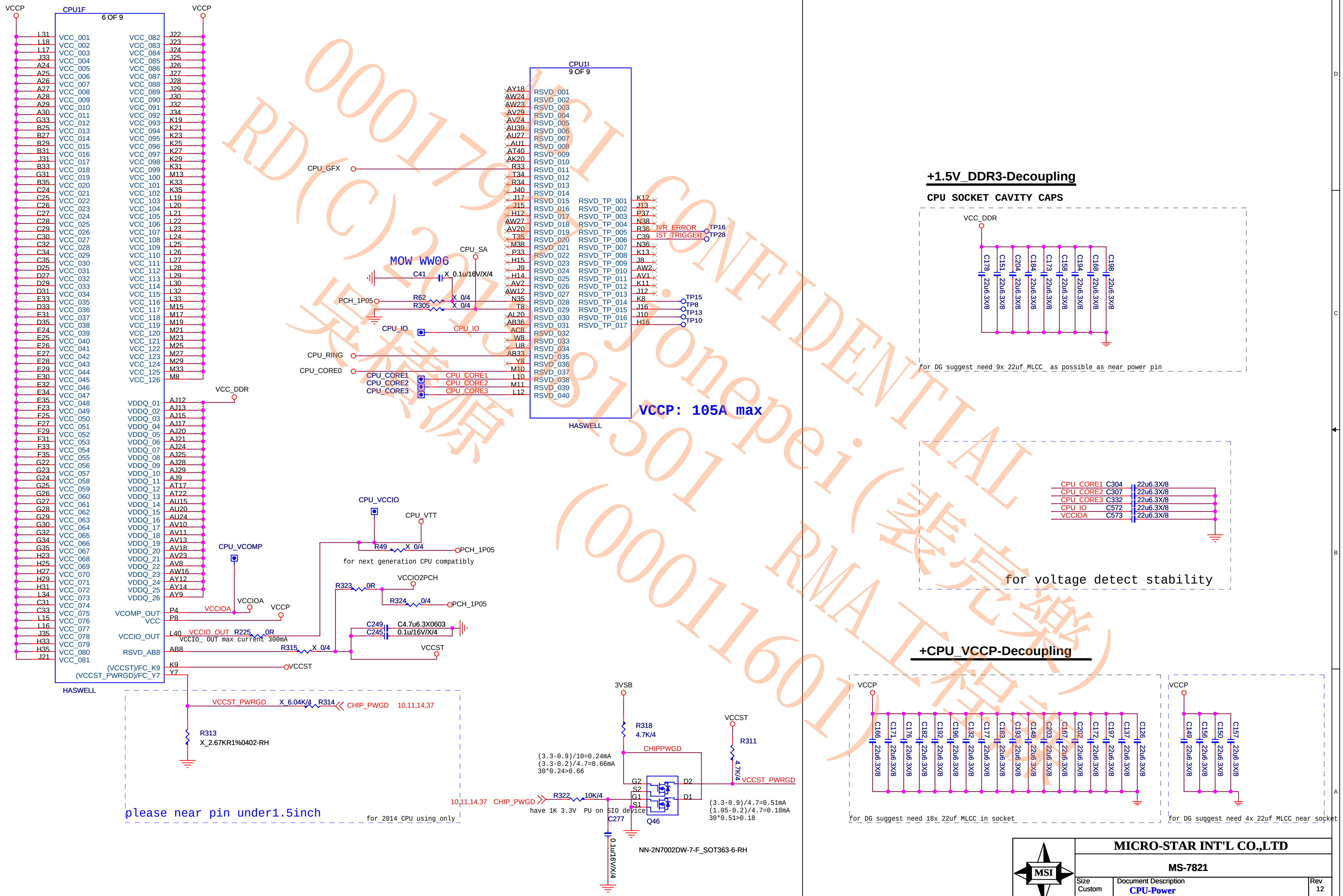
Size
Custom
Document Description
CPU-CNTL/CLK/MISC
Rev
12
Date: Monday, March 18, 2013
Sheet 3 of 43



MICRO-STAR INT'L CO.,LTD	
MS-7821	
Size: Custom	Document Description: **CPU-Memory** — Rev 12
Date: Monday, March 18, 2013	Sheet 4 of 43



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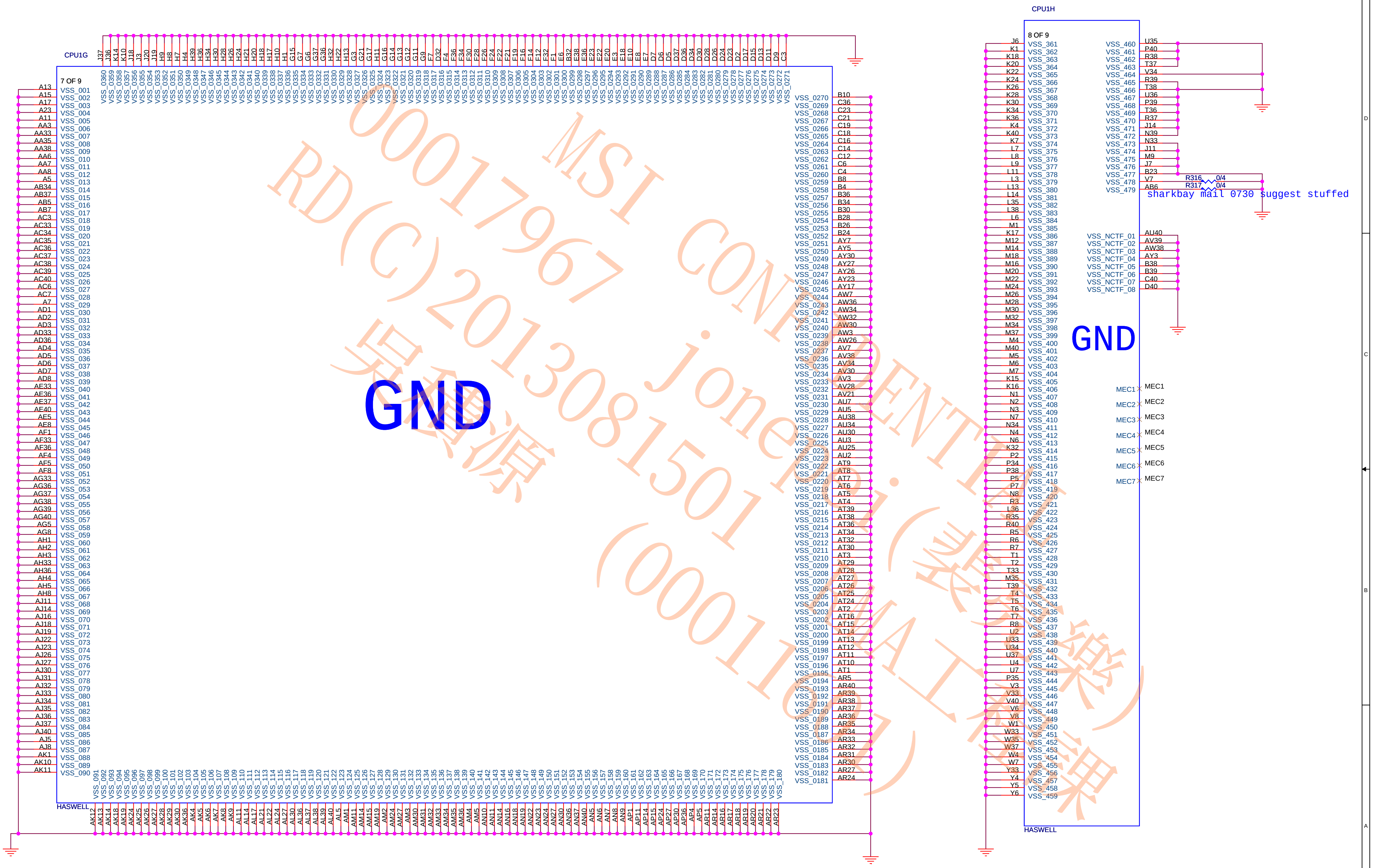
MS-7821

Size	Document Description	Rev
Custom	CPU-Power	12

Date: Monday, March 18, 2013 | Sheet 5 of 43



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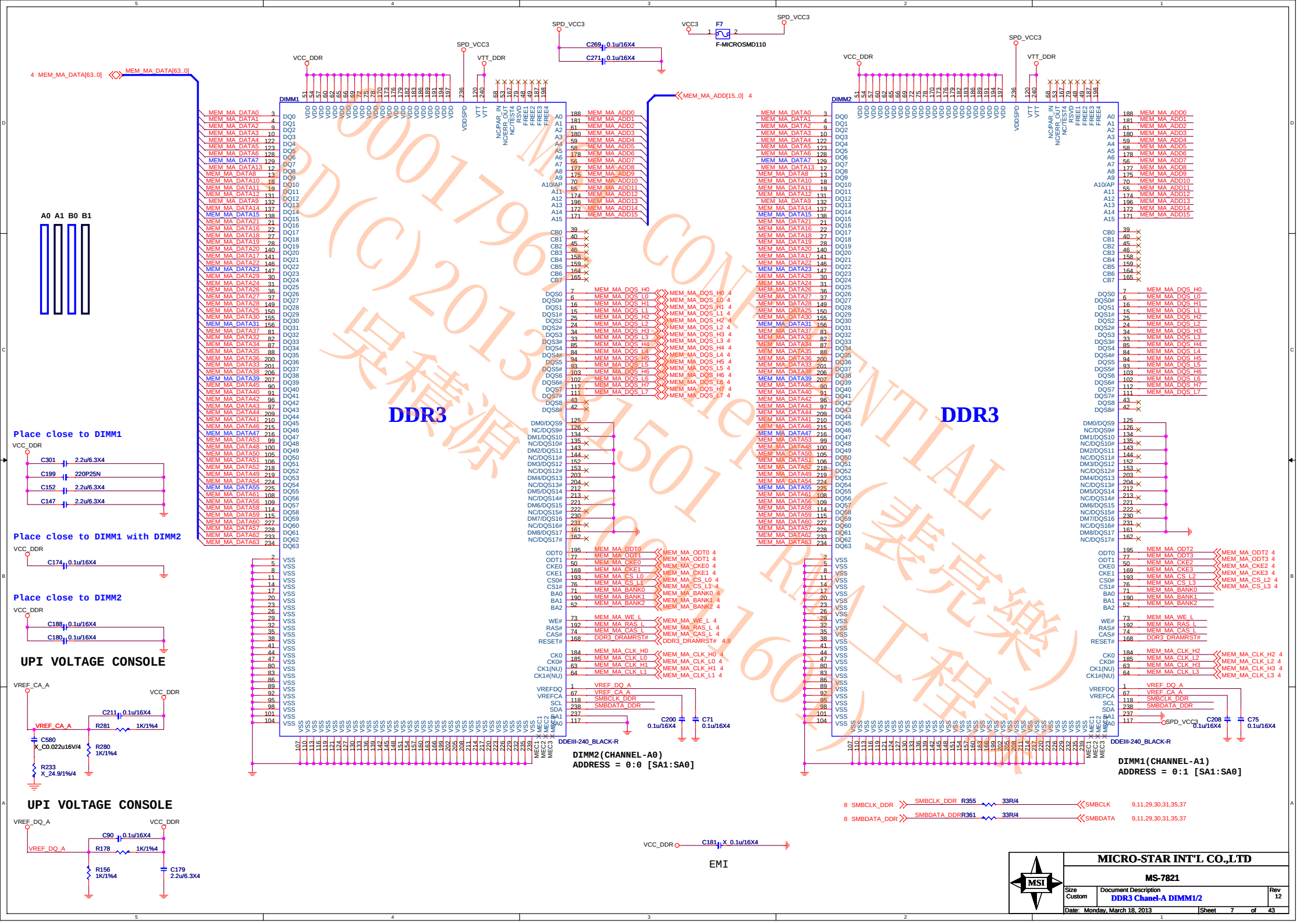
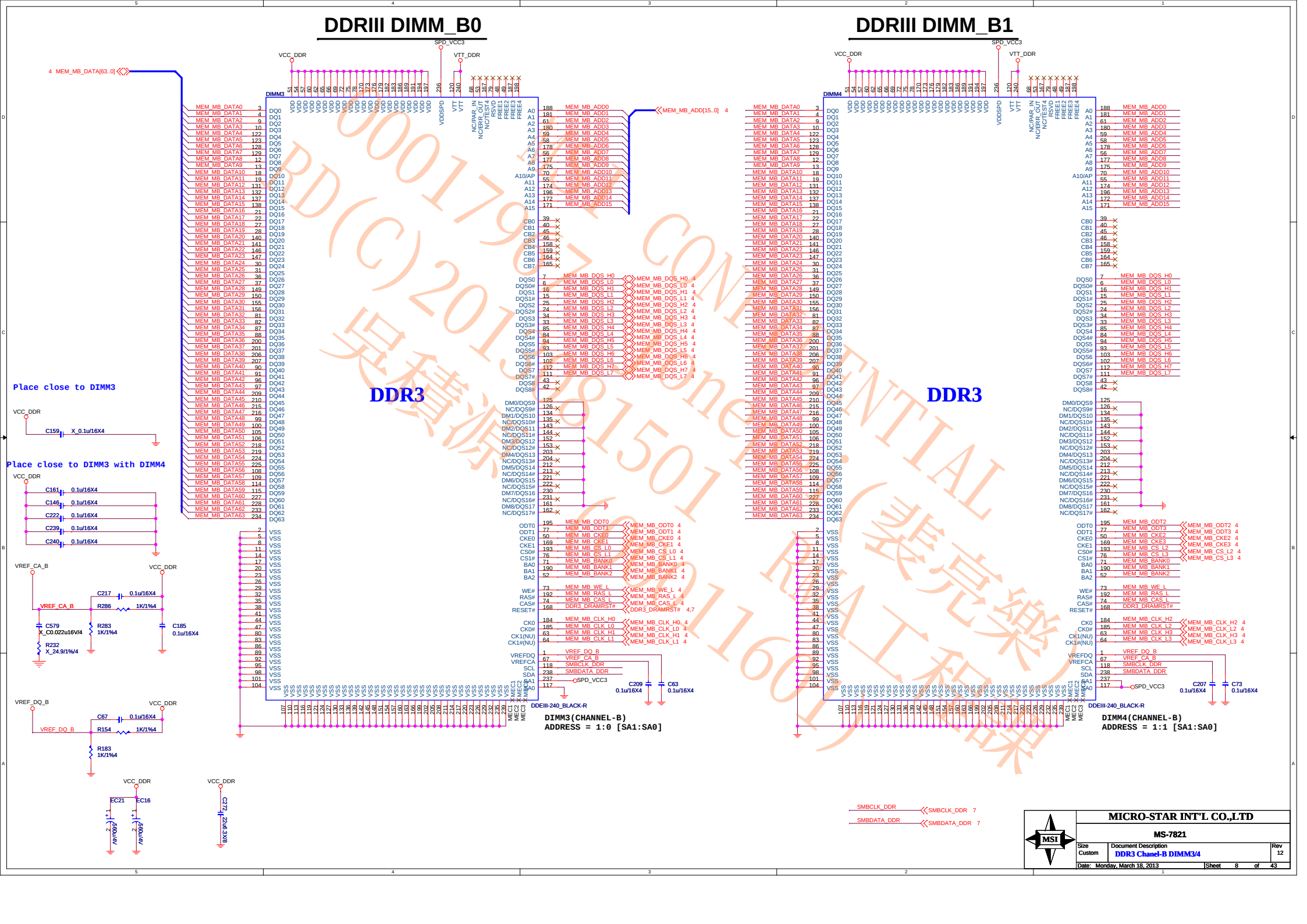
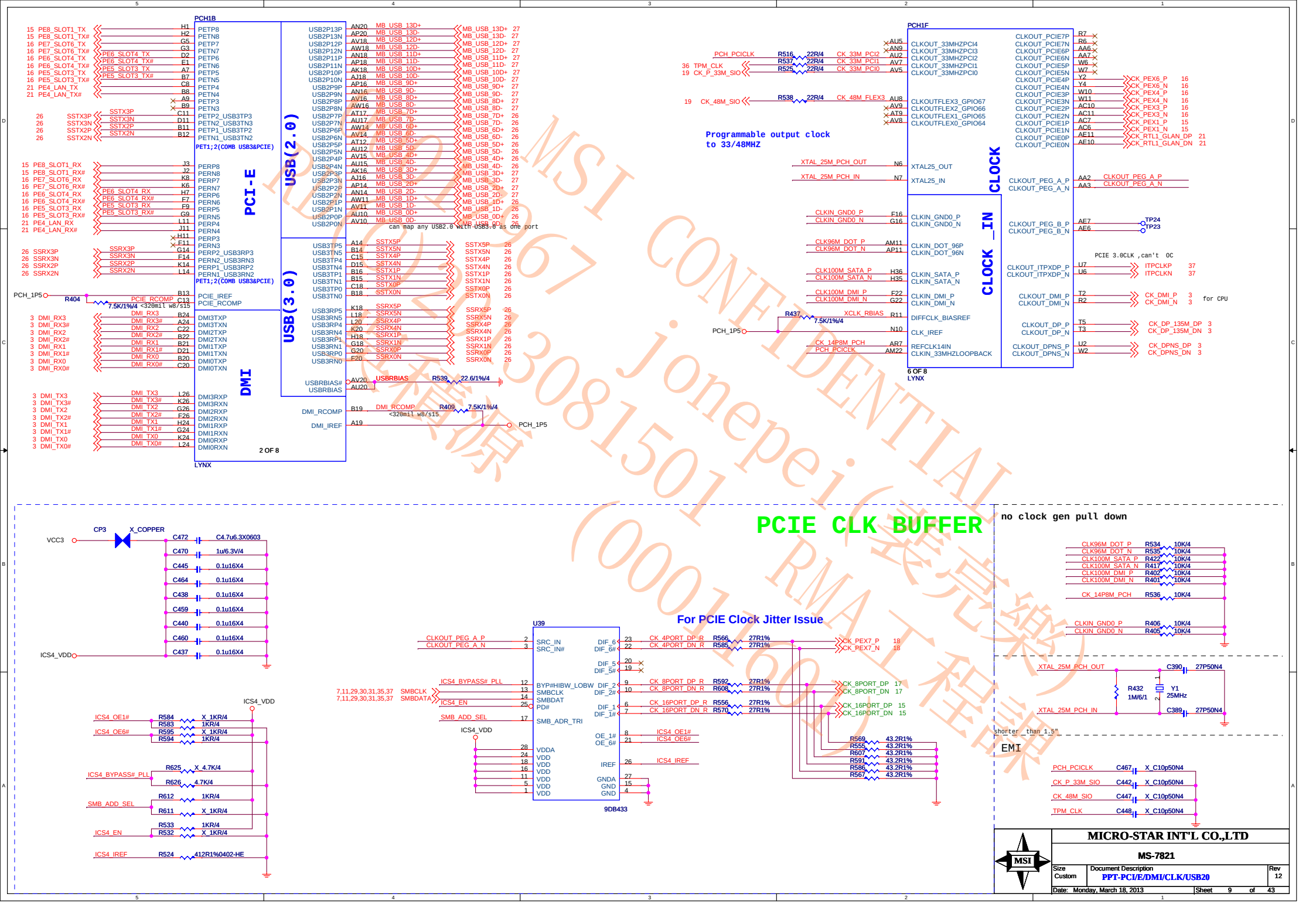
MS-7821

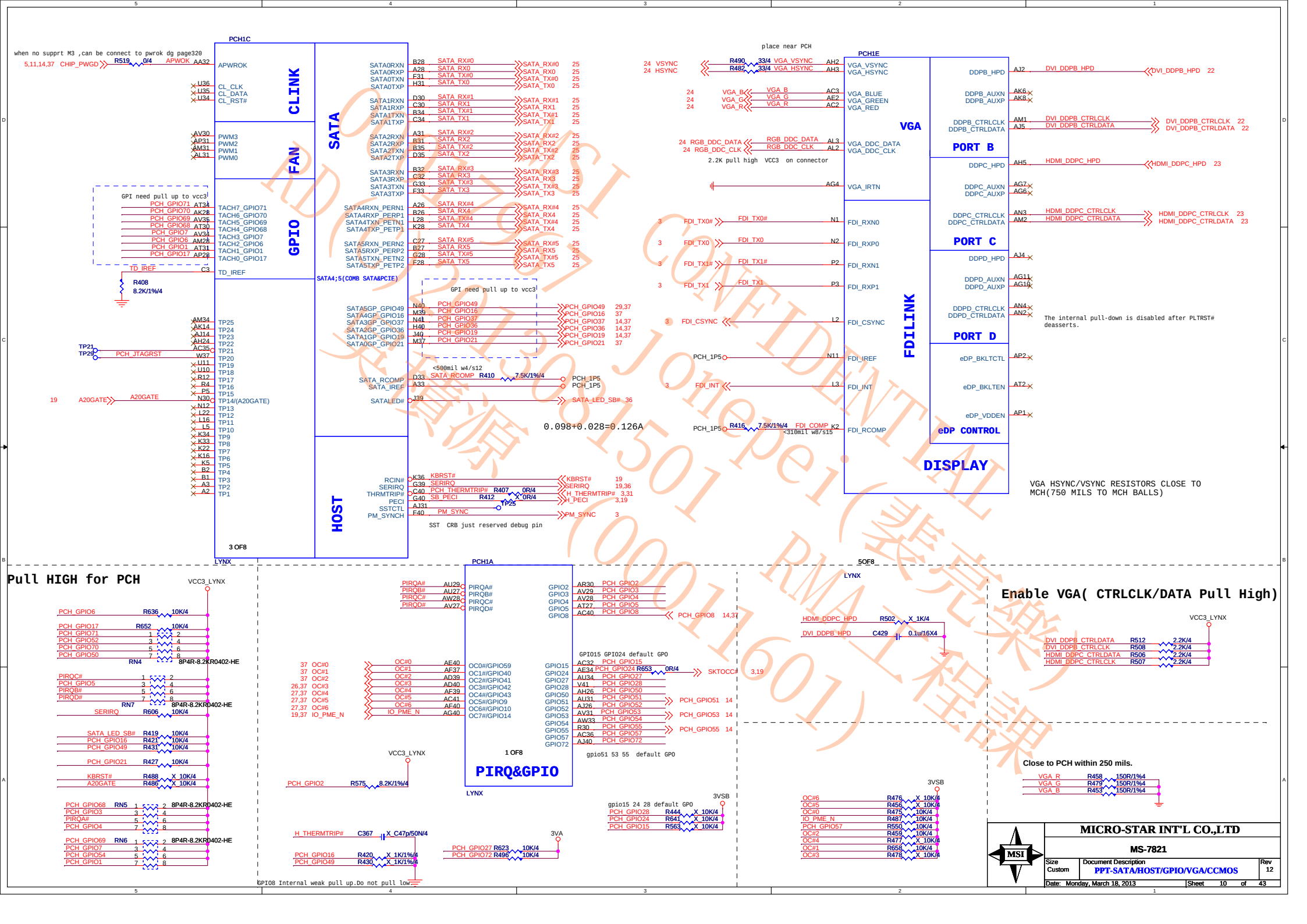
Size	Document Description	Rev
Custom	CPU-GND	12

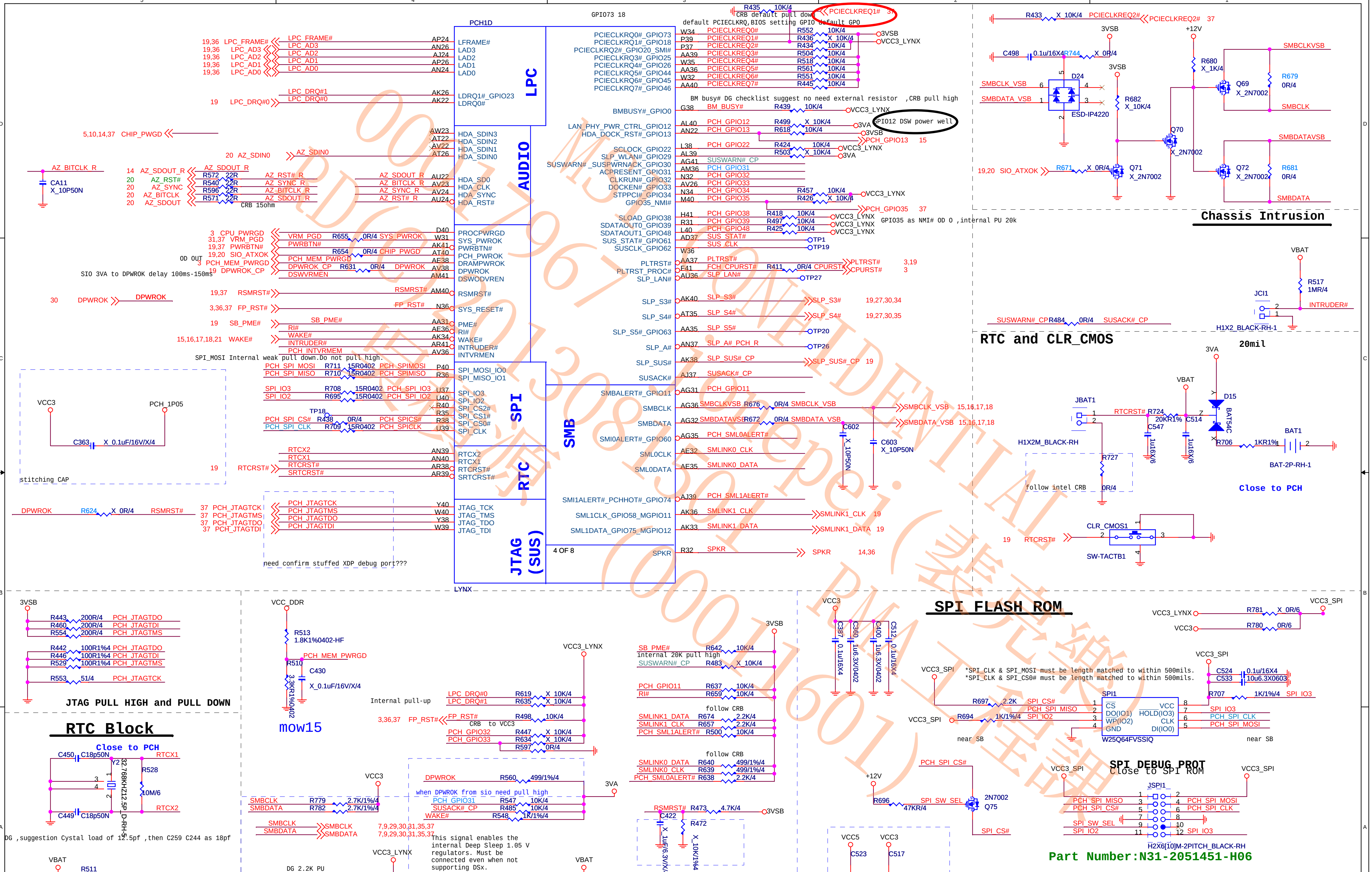
Date: Monday, March 18, 2013 | Sheet 6 of 43


DDR3
DDR3
DIMM1
DIMM2
DDEIII-240_BLACK-R
DDEIII-240_BLACK-R
DIMM2(CHANNEL-A0)
ADDRESS = 0:0 [SA1:SA0]
DIMM1(CHANNEL-A1)
ADDRESS = 0:1 [SA1:SA0]
MEM_MA_DATA[63..0]
MEM_MA_ADD[15..0]
SPD_VCC3
VCC_DDR
VTT_DDR
F-MICROSMD110
A0 A1 B0 B1
Place close to DIMM1
Place close to DIMM1 with DIMM2
Place close to DIMM2
UPI VOLTAGE CONSOLE
UPI VOLTAGE CONSOLE
EMI
SMBCLK_DDR R355 33R/4
SMBDATA_DDR R361 33R/4
MICRO-STAR INT'L CO.,LTD
MS-7821
DDR3 Chanel-A DIMM1/2
Monday, March 18, 2013
Sheet 7 of 43


DDRIII DIMM_B0
DDRIII DIMM_B1
DDR3
DDR3
DIMM3(CHANNEL-B)
ADDRESS = 1:0 [SA1:SA0]
DIMM4(CHANNEL-B)
ADDRESS = 1:1 [SA1:SA0]
Place close to DIMM3
Place close to DIMM3 with DIMM4
MICRO-STAR INT'L CO.,LTD
MS-7821
DDR3 Chanel-B DIMM3/4
Monday, March 18, 2013


PCH1B
PCI-E
USB(2.0)
USB(3.0)
DMI
2 OF 8
LYNX
PCH1F
CLOCK
CLOCK_IN
6 OF 8
LYNX
Programmable output clock
to 33/48MHZ
PCIE CLK BUFFER
For PCIE Clock Jitter Issue
no clock gen pull down
EMI
MICRO-STAR INT'L CO.,LTD
MS-7821
PPT-PCI/E/DMI/CLK/USB20
Monday, March 18, 2013


PCH1C
CLINK
FAN
GPIO
SATA
HOST
PCH1E
VGA
PORT B
PORT C
PORT D
FDILINK
eDP CONTROL
DISPLAY
PCH1A
PIRQ&GPIO
Pull HIGH for PCH
Enable VGA(CTRLCLK/DATA Pull High)
MICRO-STAR INT'L CO.,LTD
MS-7821
PPT-SATA/HOST/GPIO/VGA/CCMOS
Monday, March 18, 2013



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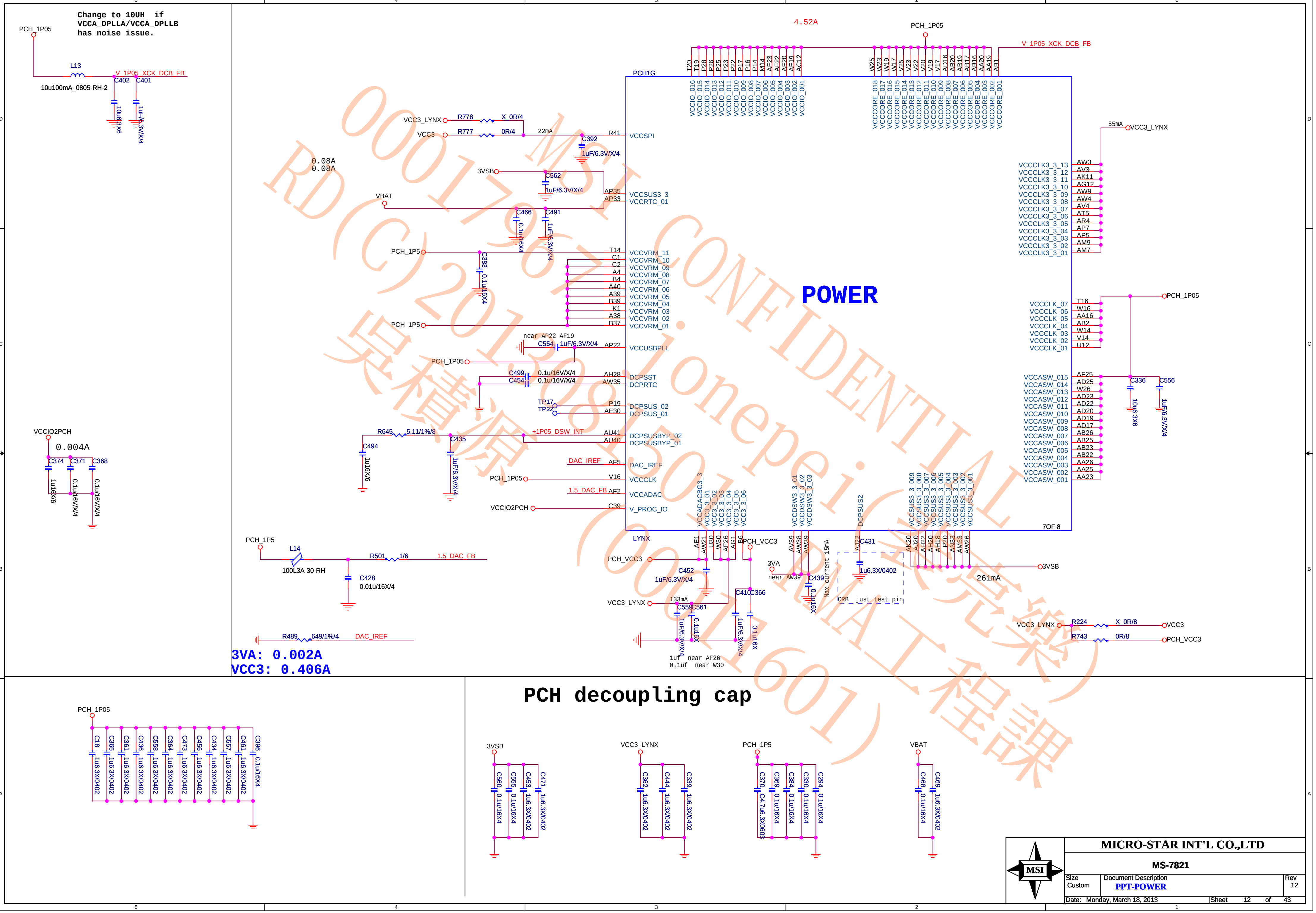
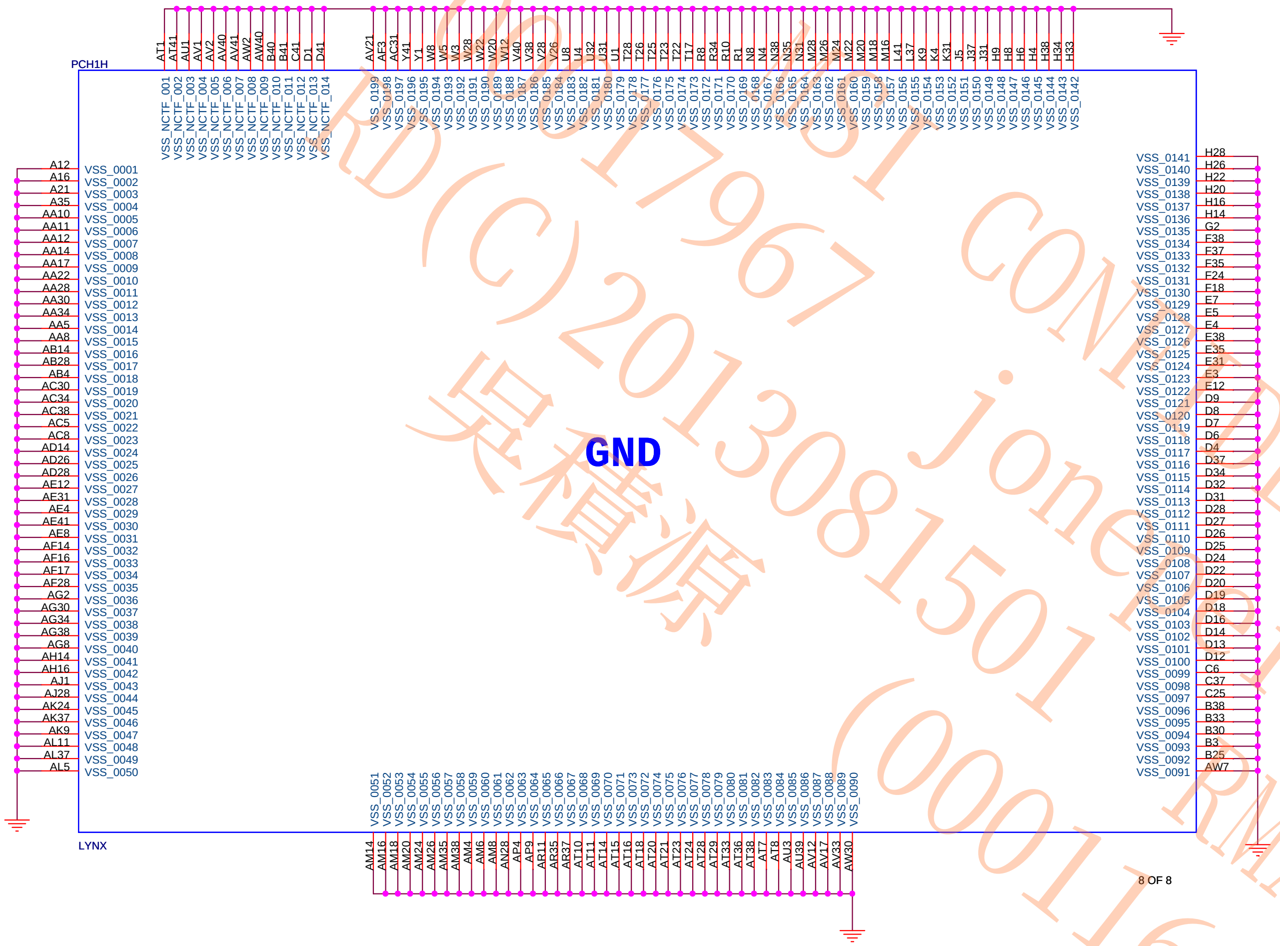
Size: Custom | Document Description: PPT-SMB/LPC/AUDIO/RTC/SPI | Rev: 12

Date: Monday, March 18, 2013 | Sheet 11 of 43


Change to 10UH if
VCCA_DPLLA/VCCA_DPLLB
has noise issue.
PCH_1P05
L13
10u100mA_0805-RH-2
V_1P05_XCK_DCB_FB
C402
C401
10u/6.3X6
1uF/6.3V/X/4
4.52A
PCH_1P05
V_1P05_XCK_DCB_FB
PCH1G
VCC3_LYNX
R778
X_0R/4
VCC3
R777
0R/4
22mA
R41
VCCSPI
C392
1uF/6.3V/X/4
0.08A
0.08A
3VSB
C562
1uF/6.3V/X/4
AP35
AP33
VCCSUS3_3
VCCRTC_01
VBAT
C466
C491
0.1u/16X4
1uF/6.3V/X/4
PCH_1P5
C383
0.1u/16X4
VCCVRM_11
VCCVRM_10
VCCVRM_09
VCCVRM_08
VCCVRM_07
VCCVRM_06
VCCVRM_05
VCCVRM_04
VCCVRM_03
VCCVRM_02
VCCVRM_01
near AP22 AF19
C554
1uF/6.3V/X/4
AP22
VCCUSBPLL
PCH_1P05
C499
0.1u/16V/X/4
C454
0.1u/16V/X/4
AH28
AW35
DCPSST
DCPRTC
TP17
TP22
P19
AE30
DCPSUS_02
DCPSUS_01
R645
5.11/1%/8
+1P05_DSW_INT
AU41
AU40
DCPSUSBYP_02
DCPSUSBYP_01
C494
1u16X6
C435
1uF/6.3V/X/4
DAC_IREF
AF5
DAC_IREF
V16
VCCCLK
1.5_DAC_FB
AF2
VCCADAC
VCCIO2PCH
C39
V_PROC_IO
POWER
VCCCLK3_3_13
VCCCLK3_3_12
VCCCLK3_3_11
VCCCLK3_3_10
VCCCLK3_3_09
VCCCLK3_3_08
VCCCLK3_3_07
VCCCLK3_3_06
VCCCLK3_3_05
VCCCLK3_3_04
VCCCLK3_3_03
VCCCLK3_3_02
VCCCLK3_3_01
55mA
VCC3_LYNX
VCCCLK_07
VCCCLK_06
VCCCLK_05
VCCCLK_04
VCCCLK_03
VCCCLK_02
VCCCLK_01
PCH_1P05
VCCASW_015
VCCASW_014
VCCASW_013
VCCASW_012
VCCASW_011
VCCASW_010
VCCASW_009
VCCASW_008
VCCASW_007
VCCASW_006
VCCASW_005
VCCASW_004
VCCASW_003
VCCASW_002
VCCASW_001
C336
C556
10u6.3X6
1uF/6.3V/X/4
7OF 8
VCCIO2PCH
0.004A
C374
C371
C368
1u16X6
0.1u/16V/X/4
0.1u/16V/X/4
PCH_1P5
L14
100L3A-30-RH
R501
1/6
1.5_DAC_FB
C428
0.01u/16X/4
LYNX
PCH_VCC3
PCH_VCC3
C452
1uF/6.3V/X/4
3VA
near AW39
C439
C431
1u6.3X/0402
Max current 15mA
CRB just test pin
3VSB
261mA
133mA
VCC3_LYNX
C559
C561
C410
C366
1uf near AF26
0.1uf near W30
VCC3_LYNX
R224
X_0R/8
VCC3
R743
0R/8
PCH_VCC3
R489
649/1%/4
DAC_IREF
3VA: 0.002A
VCC3: 0.406A
PCH decoupling cap
PCH_1P05
C18
C365
C361
C436
C558
C364
C473
C456
C434
C557
C461
C396
1u6.3X/0402
0.1u/16X4
3VSB
C560
C555
C453
C471
VCC3_LYNX
C362
C444
C339
PCH_1P5
C370
C369
C384
C330
C294
C4.7u6.3X0603
VBAT
C468
C469
MSI
MICRO-STAR INT'L CO.,LTD
MS-7821
Size
Custom
Document Description
PPT-POWER
Rev
12
Date: Monday, March 18, 2013
Sheet 12 of 43



MICRO-STAR INT'L CO.,LTD

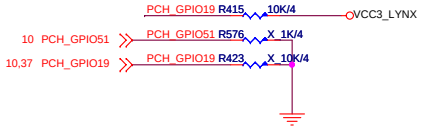
MS-7821

Size	Document Description	Rev
Custom	PPT-GND/NVRAM/USB30	12

Date: Monday, March 18, 2013 | Sheet 13 of 43

PCH Straps

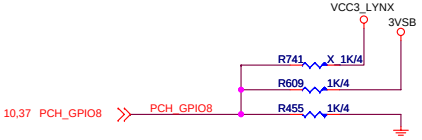
BOOT DEVICE	GPIO51	GPIO19
LPC	0	0
SPI	1	1



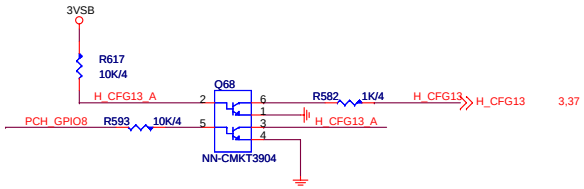
Top Block Swap Mode:
Connect to ground with 4.7k Ohm weak pulldown resistor.

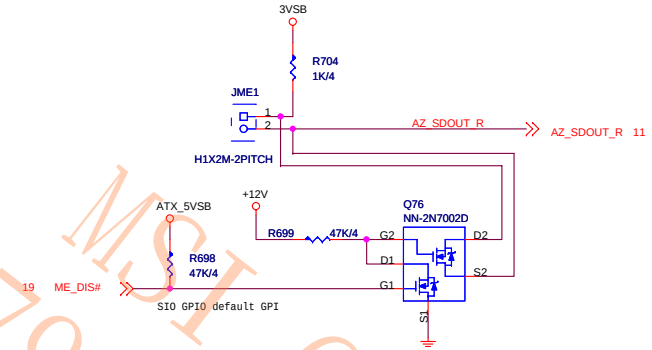
Internal pull-up

Connect to ground with 1k Ohm pull-down resistor.

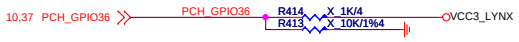


Internal pull-up

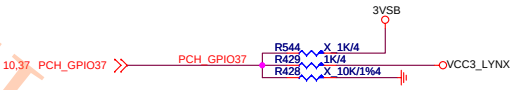




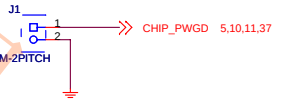
Default
Do not pull high.
Disable ME in Manufacturing Mode
Connect to VccSusHDA with 1k Ohm pull-up resistor through a jumper.



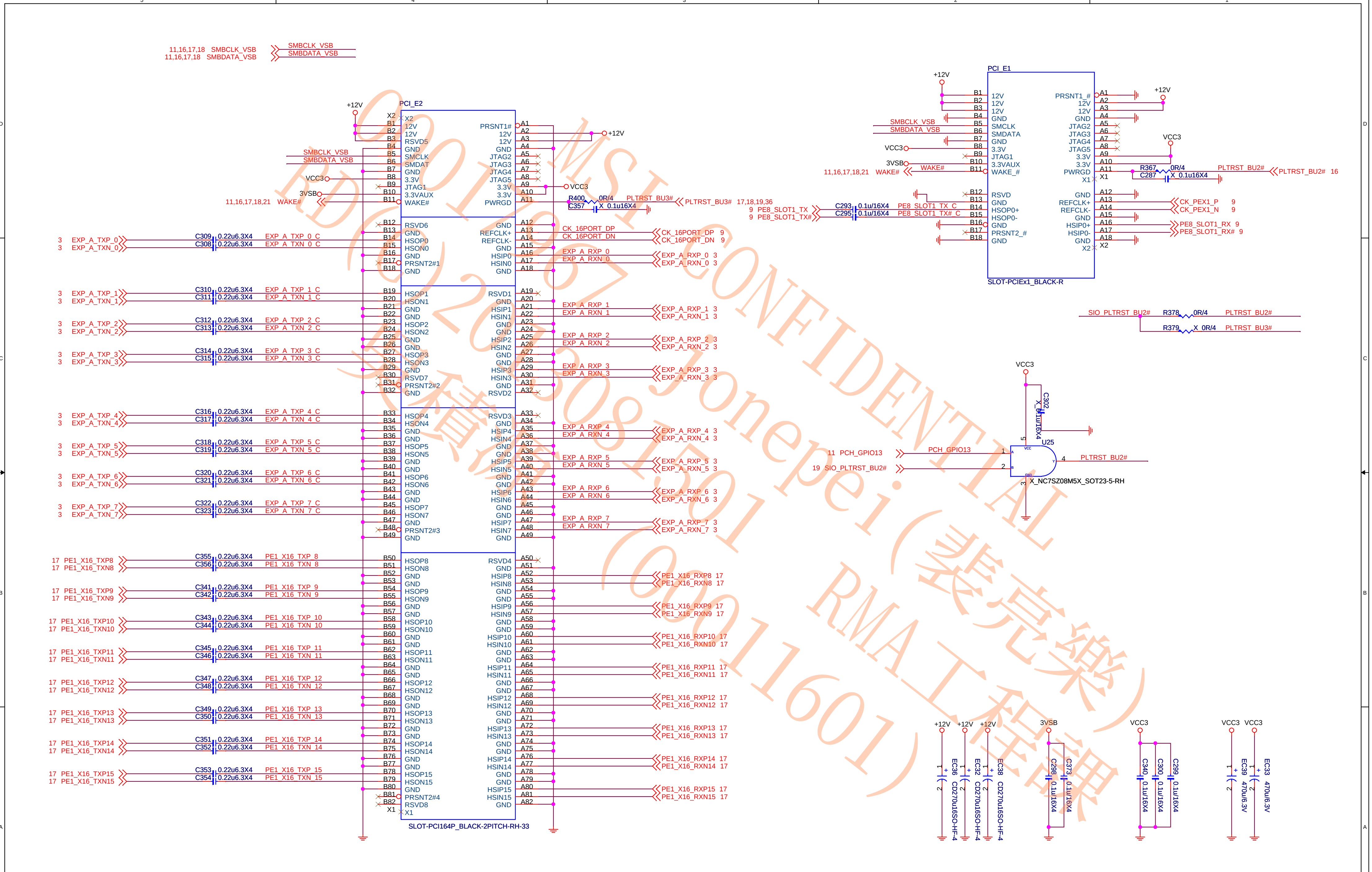
Internal weak pull down. Do not pull high.



GPIO37 Enable TLS:
Pull up with 1k Ohm to VccSus3.3.
Default (Disable TLS):
Leave NC. Internal pull down.



MICRO-STAR INT'L CO.,LTD		
MS-7821		
Size: Custom	Document Description: PPT Strap	Rev: 12
Date: Monday, March 18, 2013	Sheet 14 of 43	



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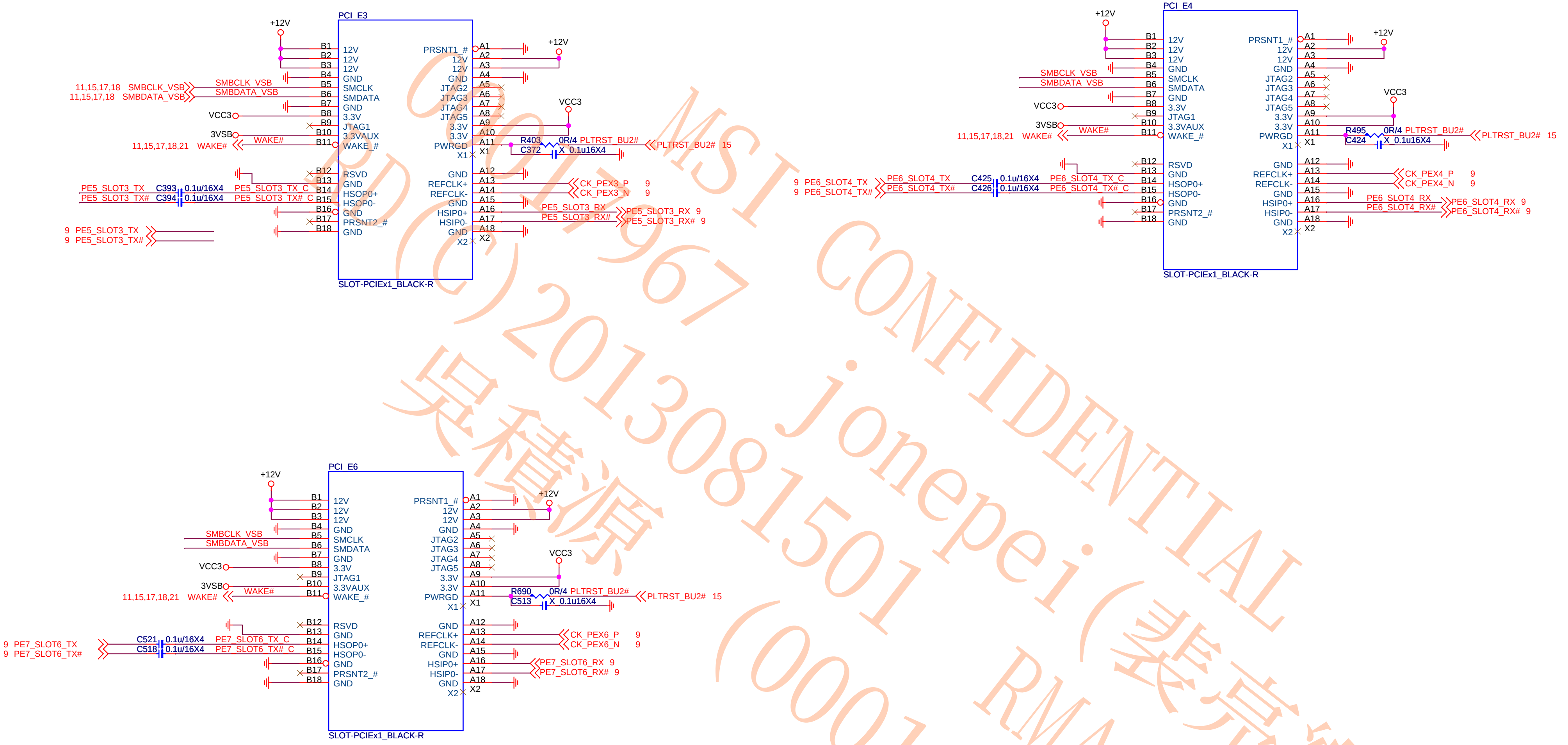
MS-7821

Size	Document Description	Rev
Custom	PCIE1(X1) & PCIE2(X16) Slots	12

Date: Monday, March 18, 2013 Sheet 15 of 43



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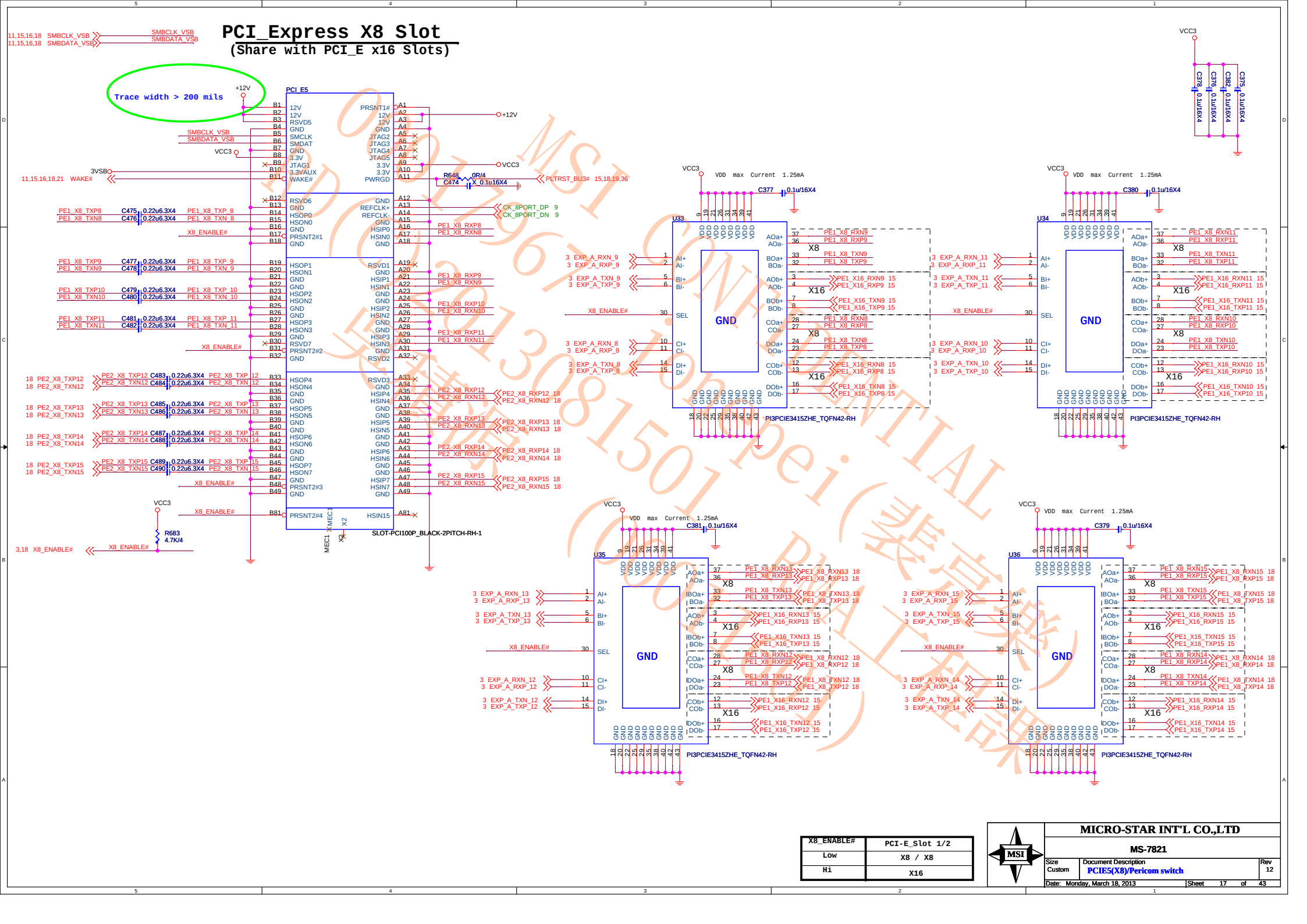
MS-7821

Size	Document Description	Rev
Custom	PCIE3(X1) & PCIE4(X1) Slots	12

Date: Monday, March 18, 2013 | Sheet 16 of 43

PCI_Express X8 Slot
(Share with PCI_E x16 Slots)



X8_ENABLE#	PCI-E_Slot 1/2
Low	X8 / X8
Hi	X16

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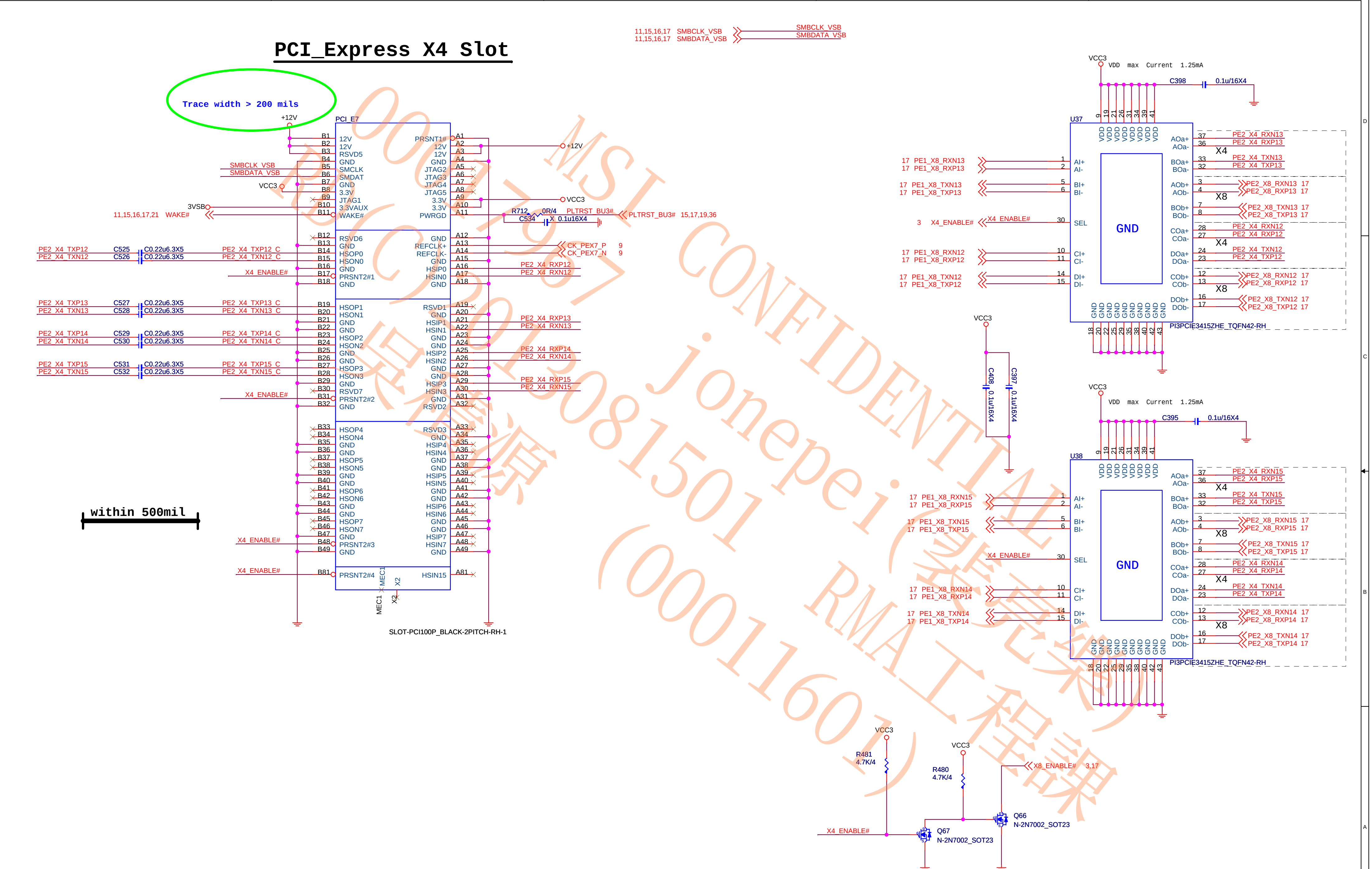
Size	Document Description	Rev
Custom	PCIE5(X8)/Pericom switch	12

Date: Monday, March 18, 2013 Sheet 17 of 43

PCI_Express X4 Slot



X4_ENABLE#	PCI-E_Slot 5/7
Low	X4 / X4
Hi	X8/0

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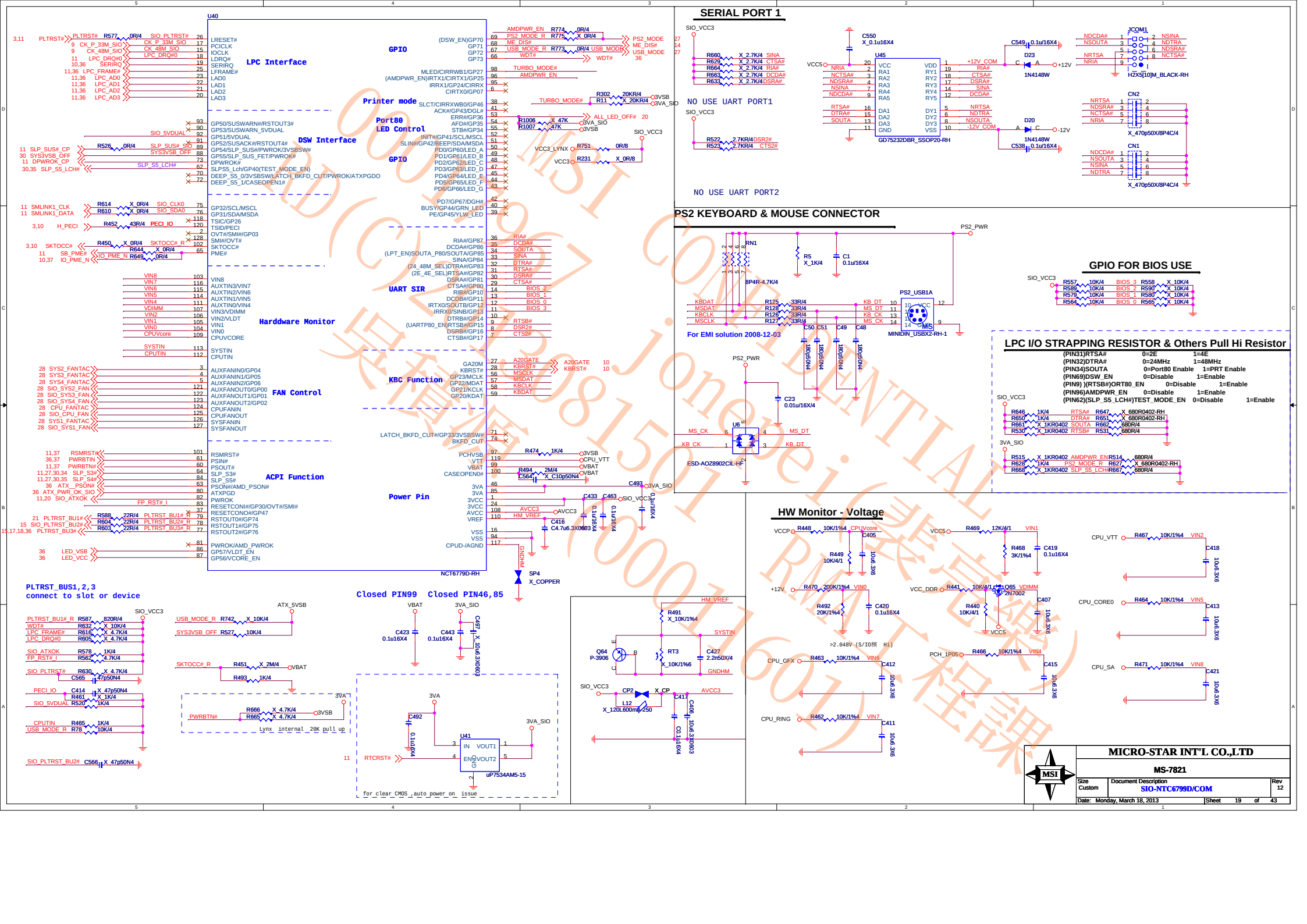
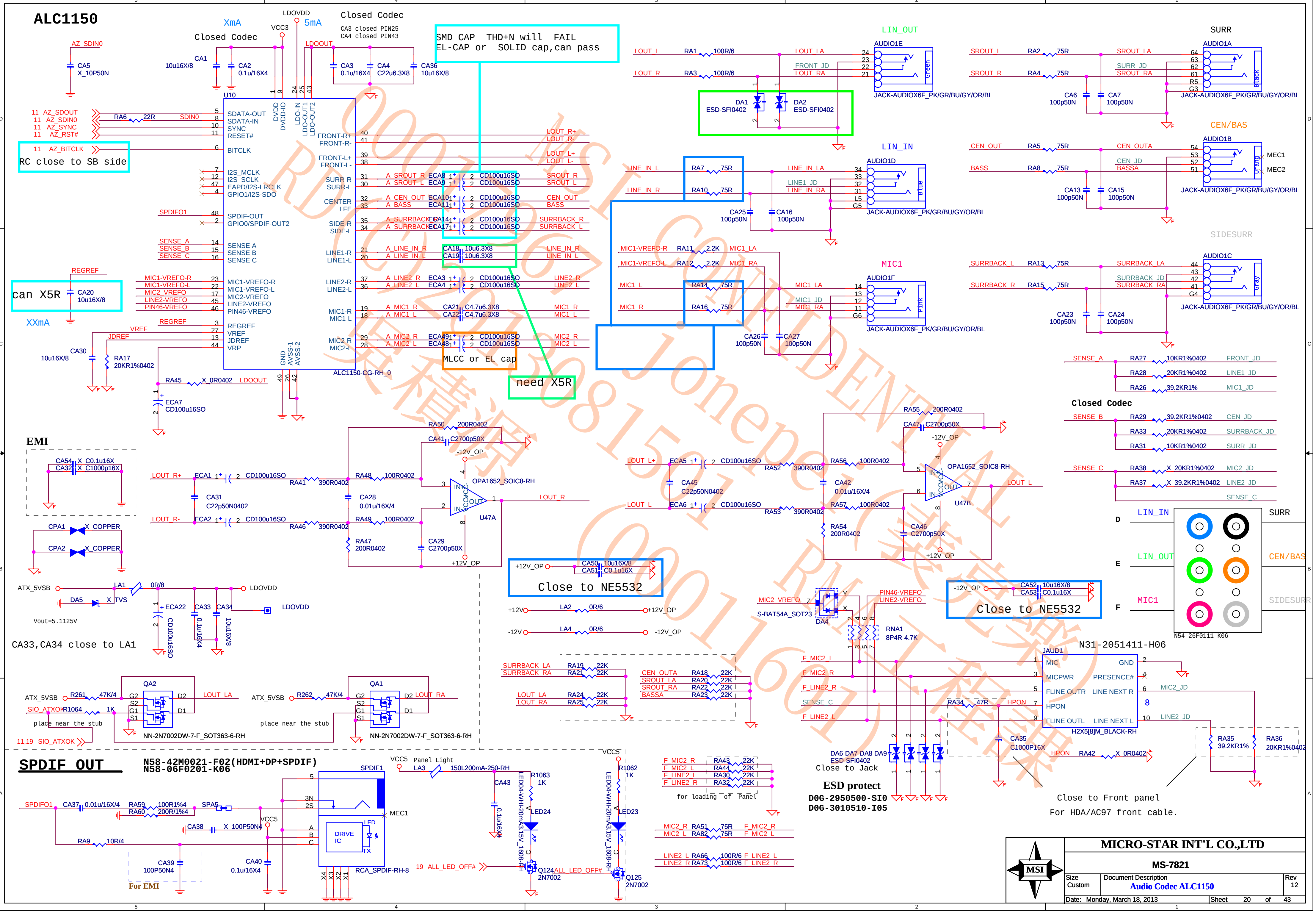
MS-7821

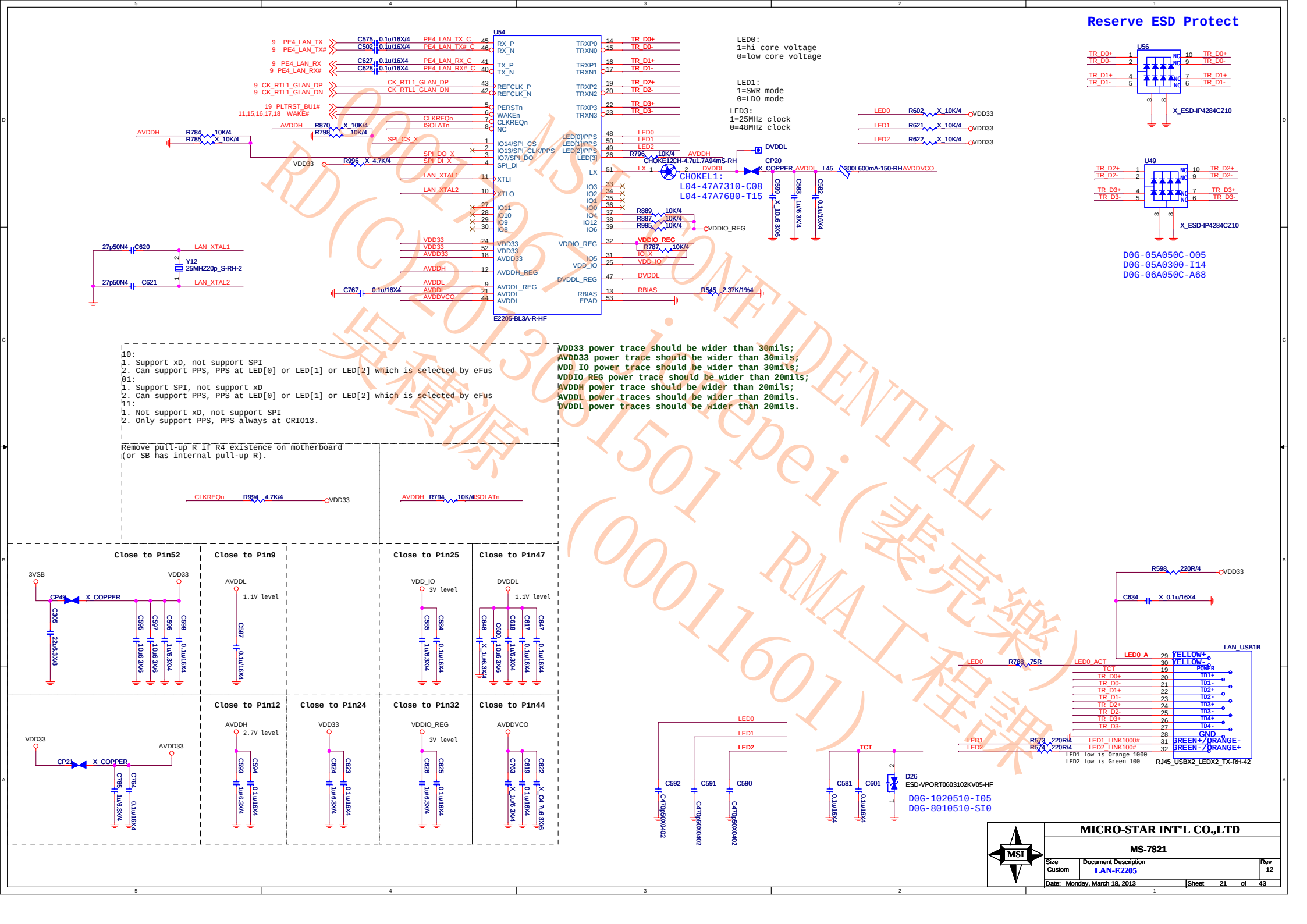
Size: Custom | Document Description: PCIE(X4) & PCIE(X1) slots | Rev: 12

Date: Monday, March 18, 2013 | Sheet 18 of 43

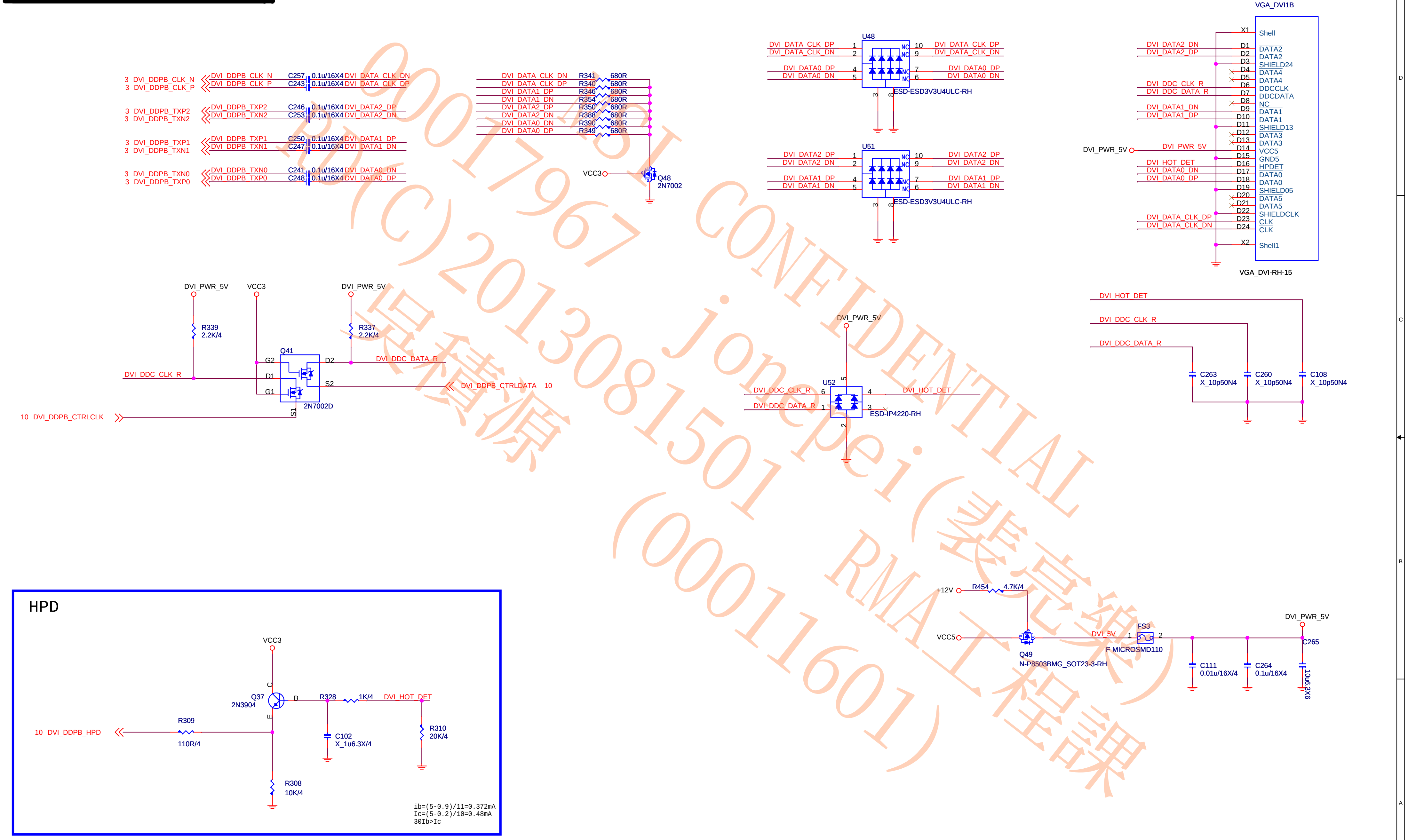

SERIAL PORT 1
NO USE UART PORT1
NO USE UART PORT2
PS2 KEYBOARD & MOUSE CONNECTOR
GPIO FOR BIOS USE
LPC I/O STRAPPING RESISTOR & Others Pull Hi Resistor
(PIN31)RTSA# 0=2E 1=4E
(PIN32)DTRA# 0=24MHz 1=48MHz
(PIN34)SOUTA 0=Port80 Enable 1=PRT Enable
(PIN69)DSW_EN 0=Disable 1=Enable
(PIN9)(RTSB#)ORT80_EN 0=Disable 1=Enable
(PIN96)AMDPWR_EN 0=Disable 1=Enable
(PIN62)(SLP_S5_LCH#)TEST_MODE_EN 0=Disable 1=Enable
HW Monitor - Voltage
U40
NCT6779D-RH
LPC Interface
GPIO
Printer mode
Port80
LED Control
DSW Interface
UART SIR
Harddware Monitor
KBC Function
FAN Control
ACPI Function
Power Pin
PLTRST_BUS1,2,3
connect to slot or device
Closed PIN99
Closed PIN46,85
for clear CMOS ,auto power on issue
MICRO-STAR INT'L CO.,LTD
MS-7821
SIO-NTC6799D/COM
Rev 12
Monday, March 18, 2013
Sheet 19 of 43



ALC1150
XmA
5mA
LDOVDD
VCC3
Closed Codec
CA3 closed PIN25
CA4 closed PIN43
SMD CAP THD+N will FAIL
EL-CAP or SOLID cap,can pass
RC close to SB side
can X5R
XXmA
MLCC or EL cap
need X5R
ALC1150-CG-RH_0
LIN_OUT
LIN_IN
MIC1
SURR
CEN/BAS
SIDESURR
JACK-AUDIOX6F_PK/GR/BU/GY/OR/BL
ESD-SFI0402
OPA1652_SOIC8-RH
Close to NE5532
EMI
Vout=5.1125V
CA33,CA34 close to LA1
place near the stub
NN-2N7002DW-7-F_SOT363-6-RH
SPDIF OUT
N58-42M0021-F02(HDMI+DP+SPDIF)
N58-06F0201-K06
RCA_SPDIF-RH-8
For EMI
Panel Light
for loading of Panel
Close to Jack
ESD protect
D0G-2950050-SI0
D0G-3010510-I05
N31-2051411-H06
H2X5[8]M_BLACK-RH
N54-26F0111-K06
Close to Front panel
For HDA/AC97 front cable.
MICRO-STAR INT'L CO.,LTD
MS-7821
Size Custom
Document Description
Audio Codec ALC1150
Rev 12
Date: Monday, March 18, 2013
Sheet 20 of 43


Reserve ESD Protect
U54
E2205-BL3A-R-HF
LED0:
1=hi core voltage
0=low core voltage
LED1:
1=SWR mode
0=LDO mode
LED3:
1=25MHz clock
0=48MHz clock
CHOKEL1:
L04-47A7310-C08
L04-47A7680-T15
D0G-05A050C-O05
D0G-05A0300-I14
D0G-06A050C-A68
10:
1. Support xD, not support SPI
2. Can support PPS, PPS at LED[0] or LED[1] or LED[2] which is selected by eFus
01:
1. Support SPI, not support xD
2. Can support PPS, PPS at LED[0] or LED[1] or LED[2] which is selected by eFus
11:
1. Not support xD, not support SPI
2. Only support PPS, PPS always at CRIO13.
VDD33 power trace should be wider than 30mils;
AVDD33 power trace should be wider than 30mils;
VDD_IO power trace should be wider than 30mils;
VDDIO_REG power trace should be wider than 20mils;
AVDDH power trace should be wider than 20mils;
AVDDL power traces should be wider than 20mils.
DVDDL power traces should be wider than 20mils.
Remove pull-up R if R4 existence on motherboard
(or SB has internal pull-up R).
Close to Pin52
Close to Pin9
Close to Pin25
Close to Pin47
Close to Pin12
Close to Pin24
Close to Pin32
Close to Pin44
LAN_USB1B
RJ45_USBX2_LEDX2_TX-RH-42
D26
ESD-VPORT0603102KV05-HF
D0G-1020510-I05
D0G-8010510-SI0
MICRO-STAR INT'L CO.,LTD
MS-7821
LAN-E2205
Monday, March 18, 2013

DVI level shifter

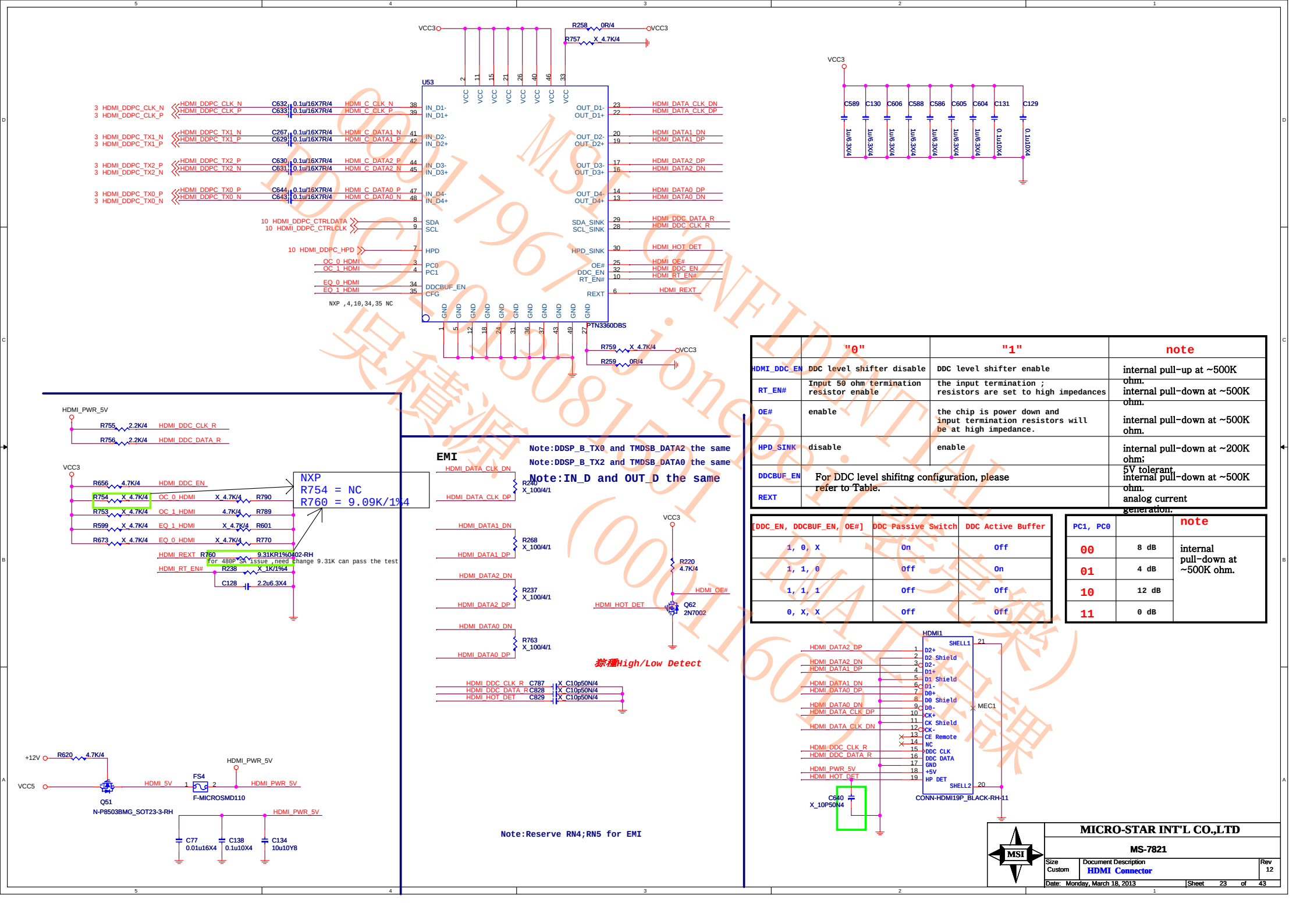


MICRO-STAR INT'L CO.,LTD

MS-7821

Size	Document Description	Rev
Custom	DVI transfer	12

Date: Monday, March 18, 2013 Sheet 22 of 43



	"0"	"1"	note
HDMI_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	

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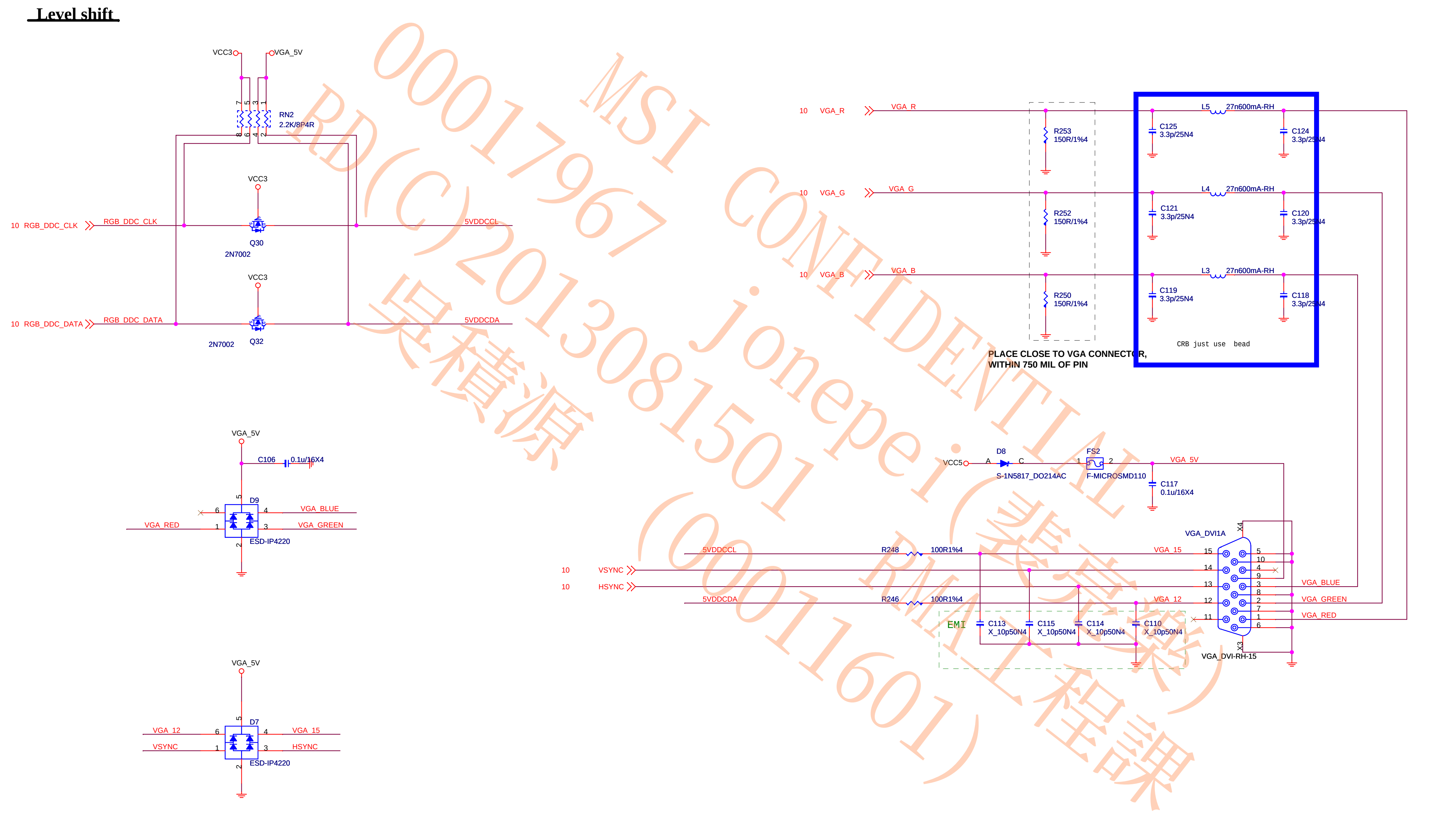
MS-7821	
Size: Custom	Document Description: HDMI Connector
Rev: 12	
Date: Monday, March 18, 2013	Sheet 23 of 43

D-Sub

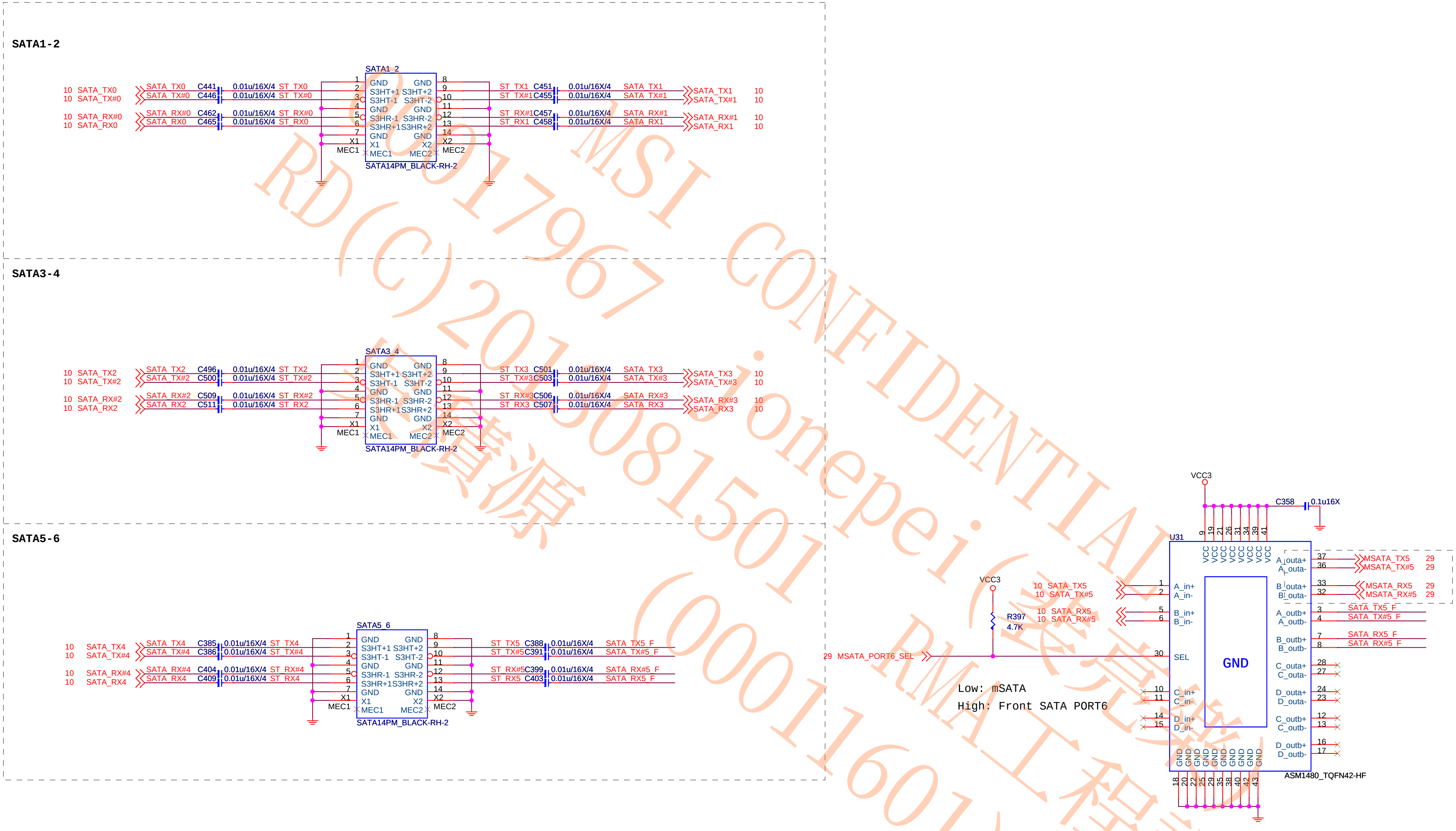


MICRO-STAR INT'L CO.,LTD

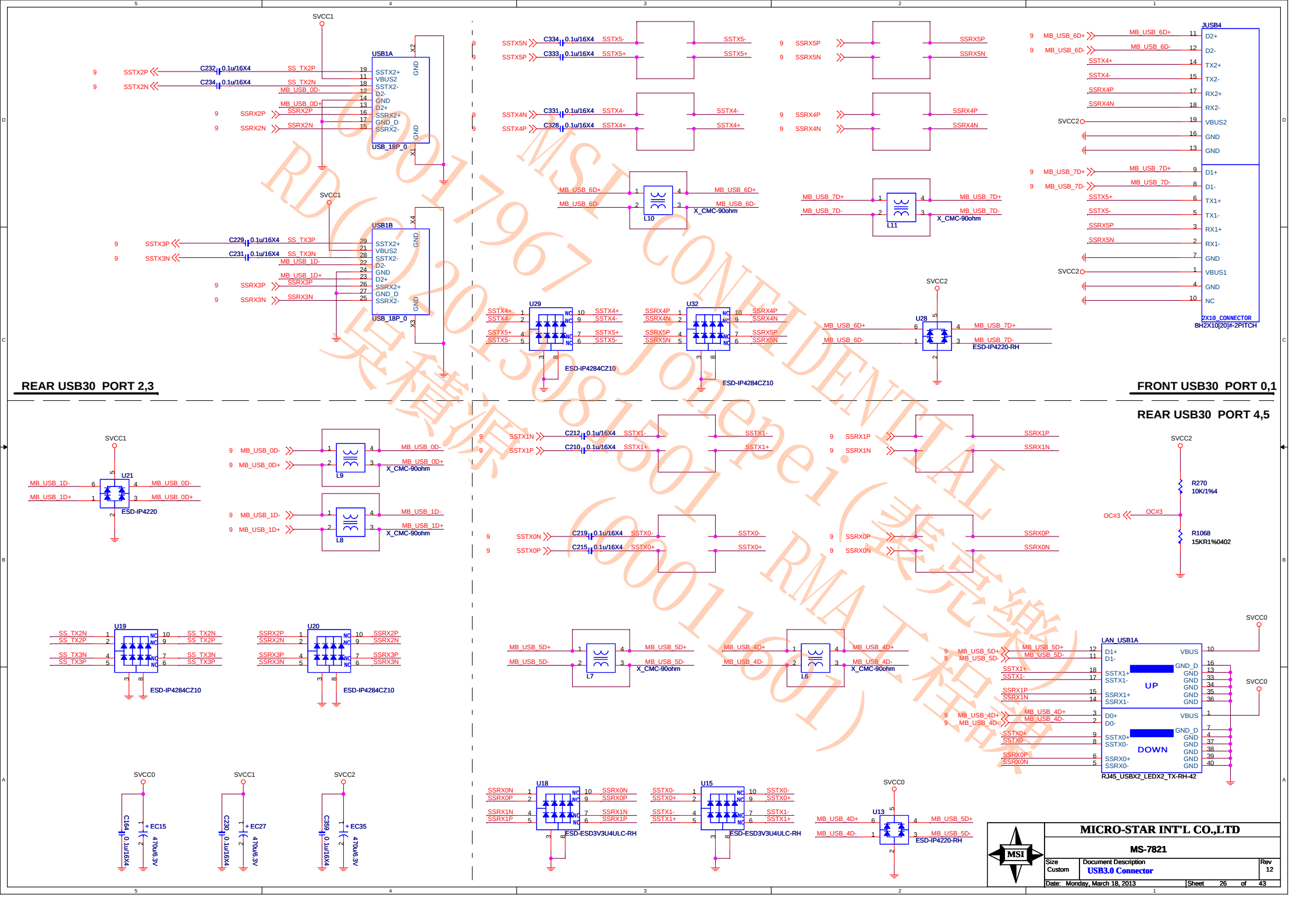
MS-7821

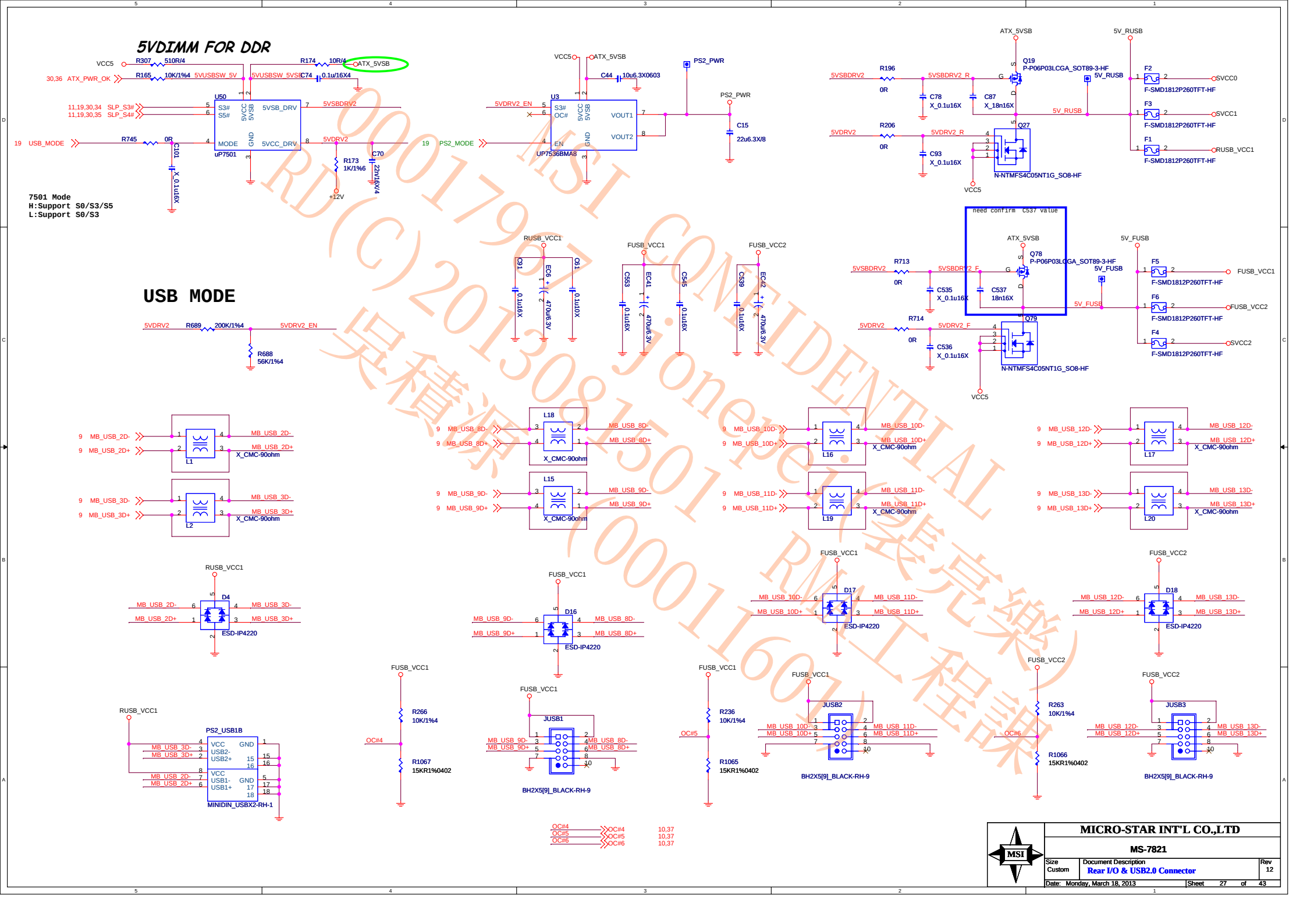
Size	Document Description	Rev
Custom	VGA Connector	12

Date: Monday, March 18, 2013 Sheet 24 of 43

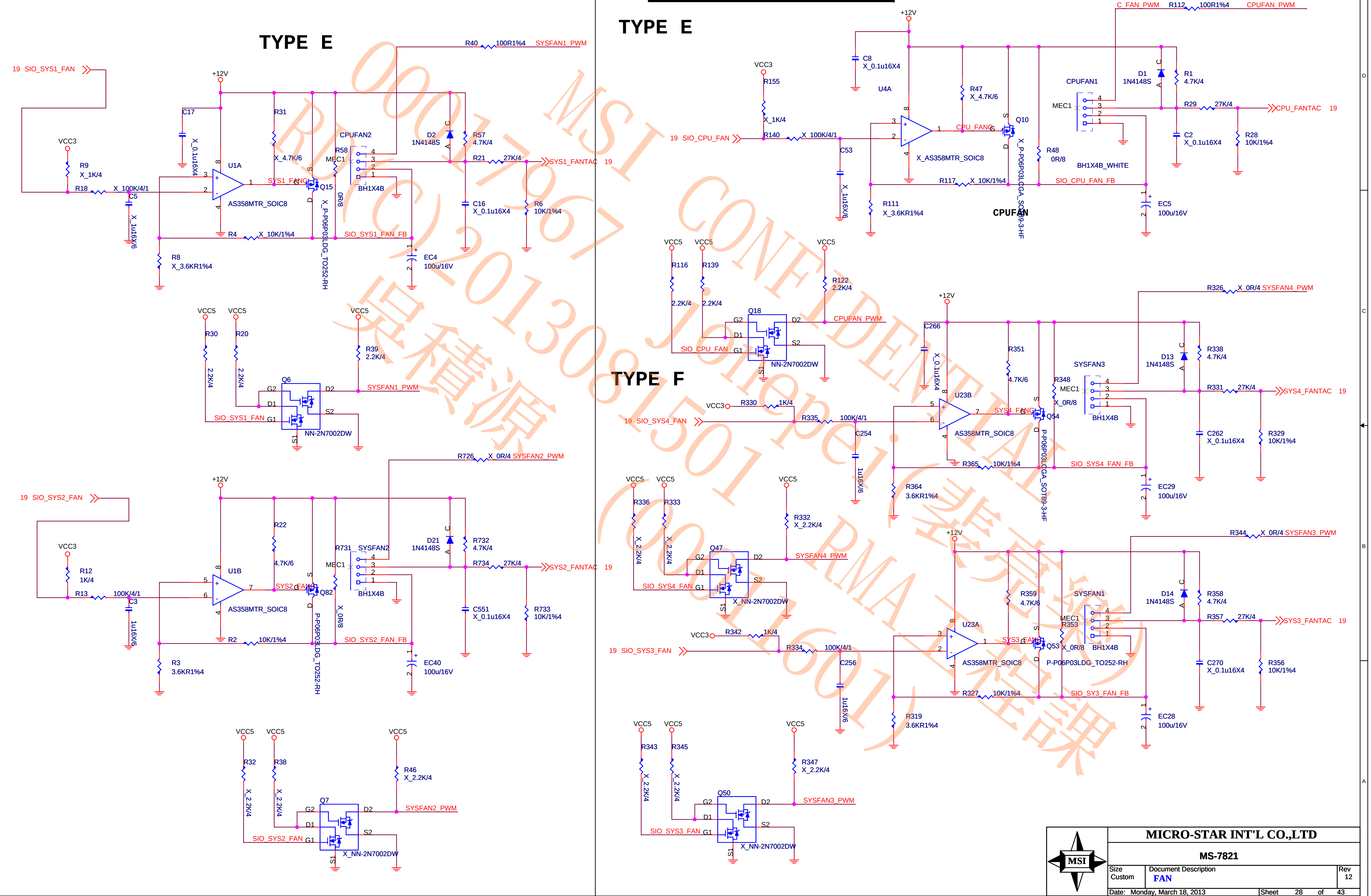


MICRO-STAR INT'L CO.,LTD	
MS-7821	
Size: Custom	Document Description: SATA Connector
Rev: 12	
Date: Monday, March 18, 2013	Sheet 25 of 43


REAR USB30 PORT 2,3
FRONT USB30 PORT 0,1
REAR USB30 PORT 4,5
USB1A
USB1B
USB_18P_0
JUSB4
2X10_CONNECTOR
BH2X10[20]#-2PITCH
LAN_USB1A
RJ45_USBX2_LEDX2_TX-RH-42
UP
DOWN
ESD-IP4284CZ10
ESD-IP4220
ESD-IP4220-RH
ESD-ESD3V3U4ULC-RH
X_CMC-90ohm
MICRO-STAR INT'L CO.,LTD
MS-7821
USB3.0 Connector
Monday, March 18, 2013
Sheet 26 of 43
Rev 12


5VDIMM FOR DDR
7501 Mode
H:Support S0/S3/S5
L:Support S0/S3
USB MODE
MINIDIN_USBX2-RH-1
ESD-IP4220
BH2X5[9]_BLACK-RH-9
N-NTMFS4C05NT1G_SO8-HF
F-SMD1812P260TFT-HF
X_CMC-90ohm
need confirm C537 value
MICRO-STAR INT'L CO.,LTD
MS-7821
Rear I/O & USB2.0 Connector
Monday, March 18, 2013
Sheet 27 of 43

FAN-COUNTROL CIRCUIT



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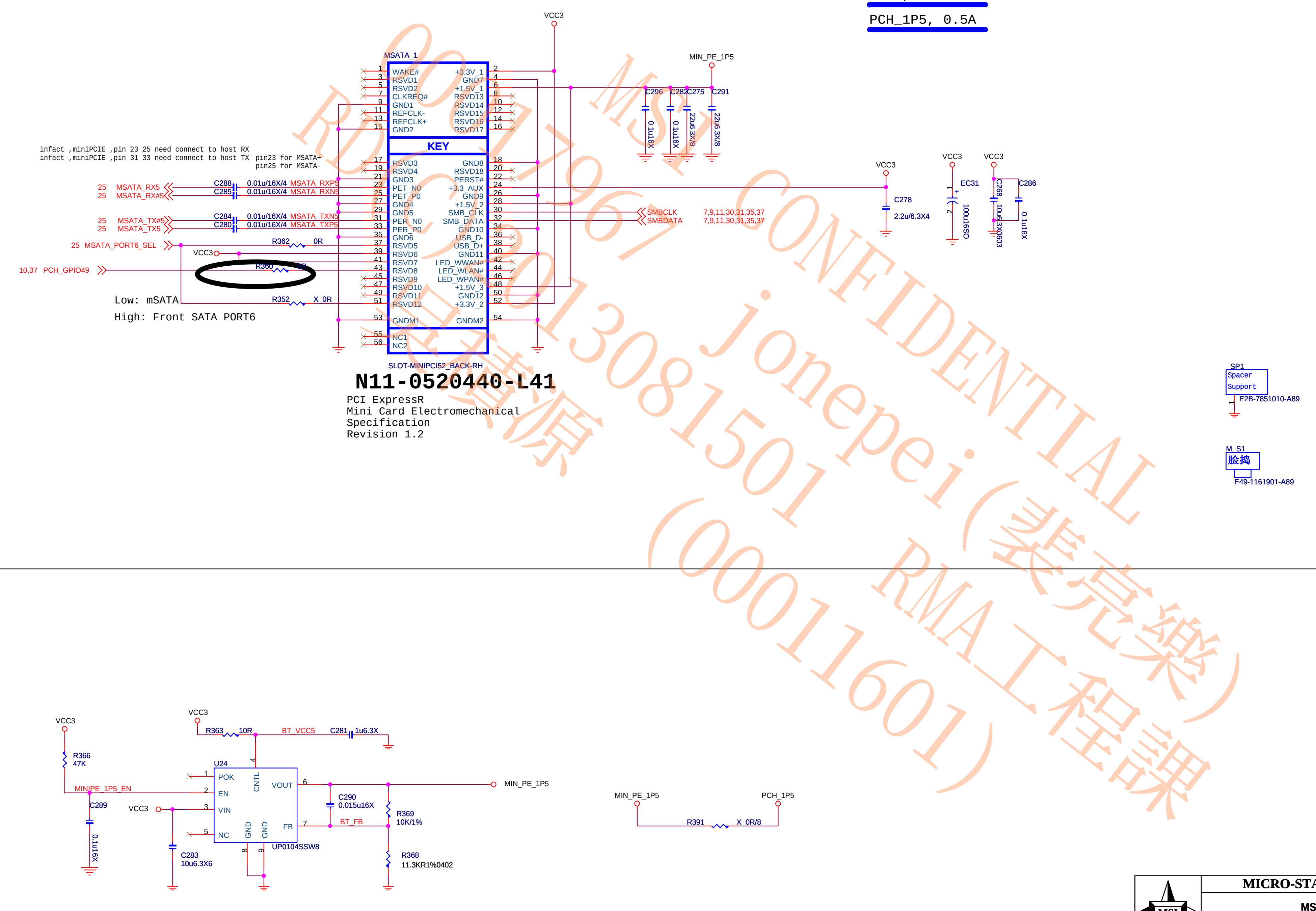
MS-7821		
Size: Custom	Document Description: FAN	Rev: 12
Date: Monday, March 18, 2013	Sheet 28 of 43	

mSATA support only

VCC3, 1.5A

PCH_1P5, 0.5A

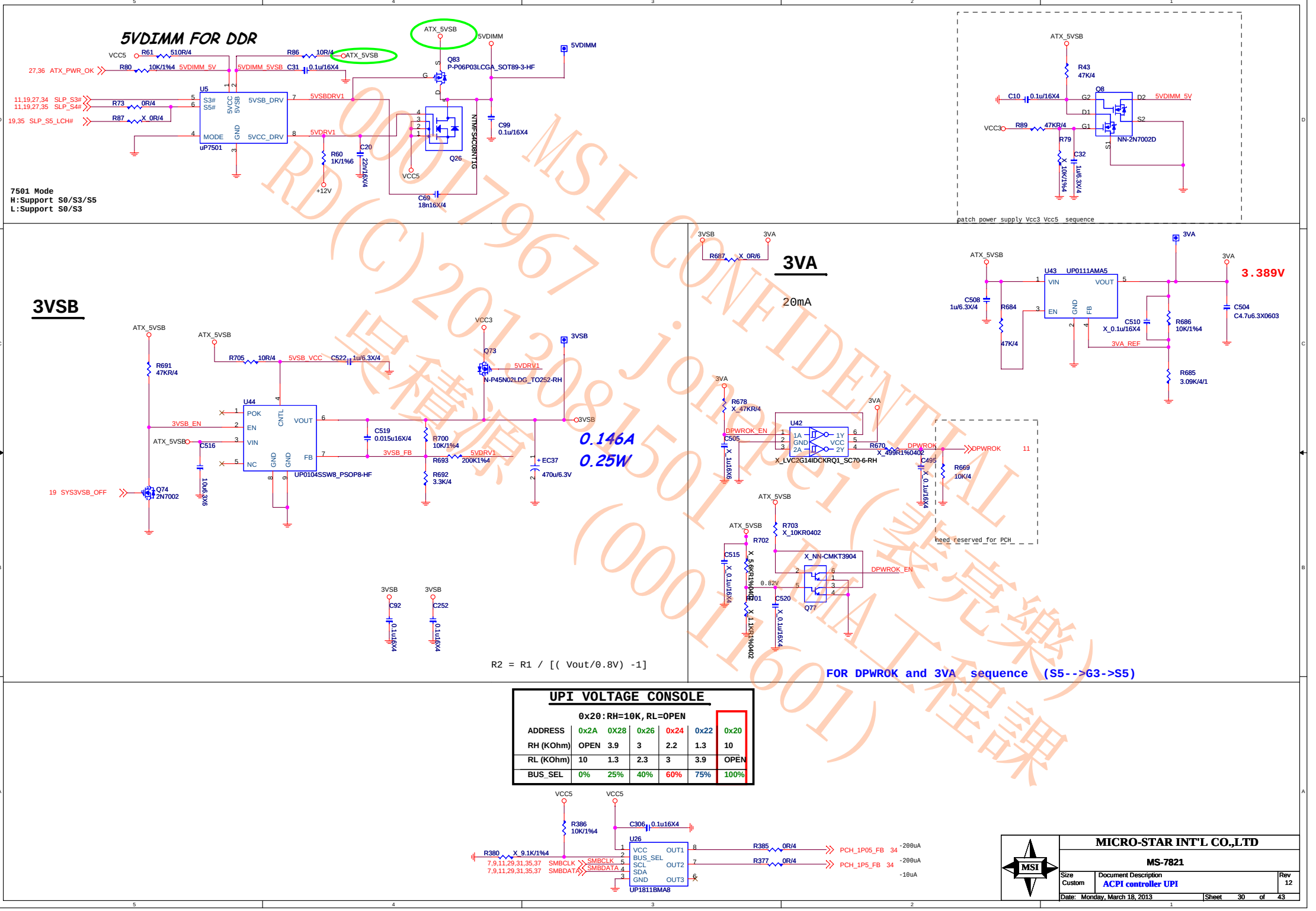


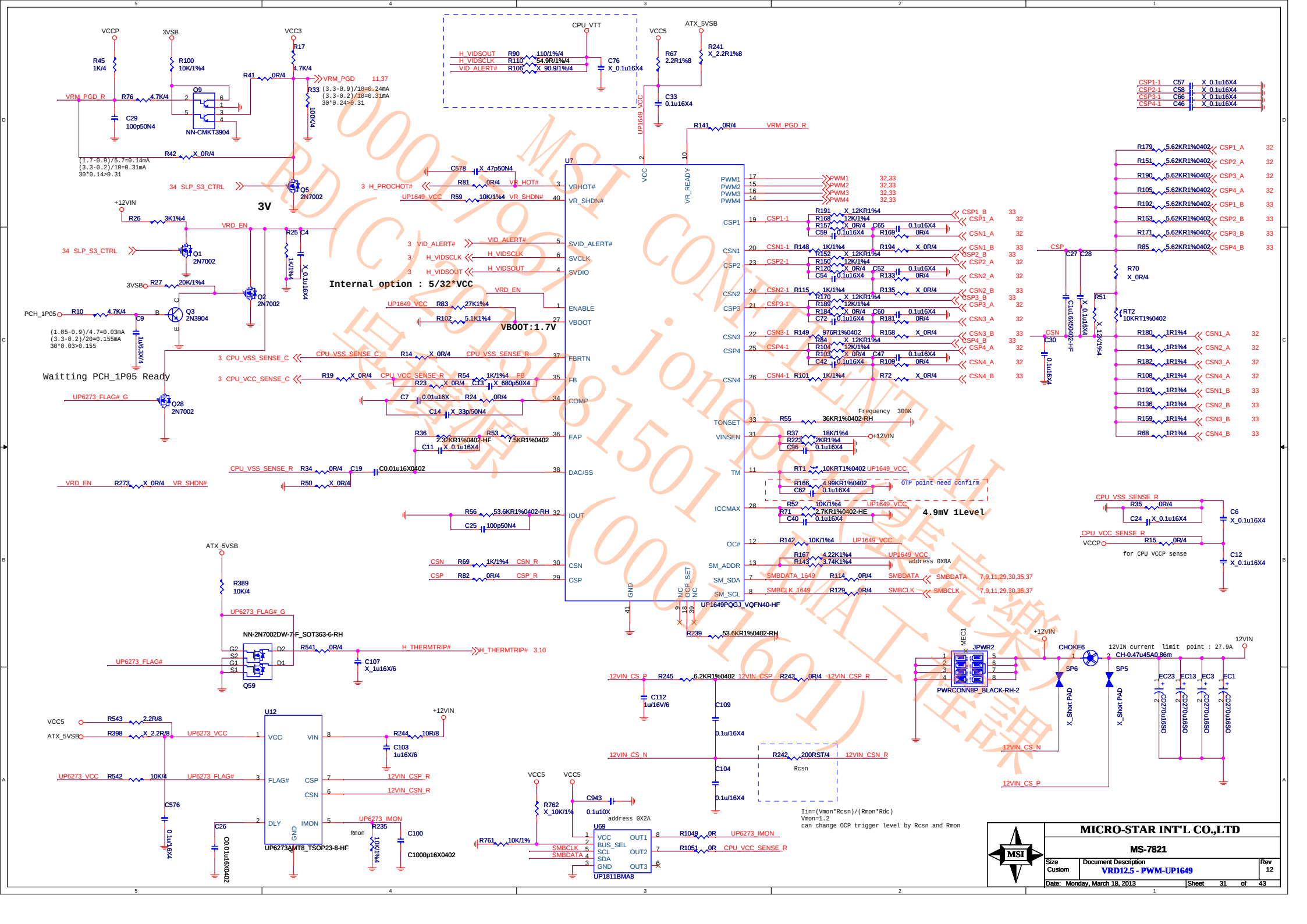
MICRO-STAR INT'L CO.,LTD

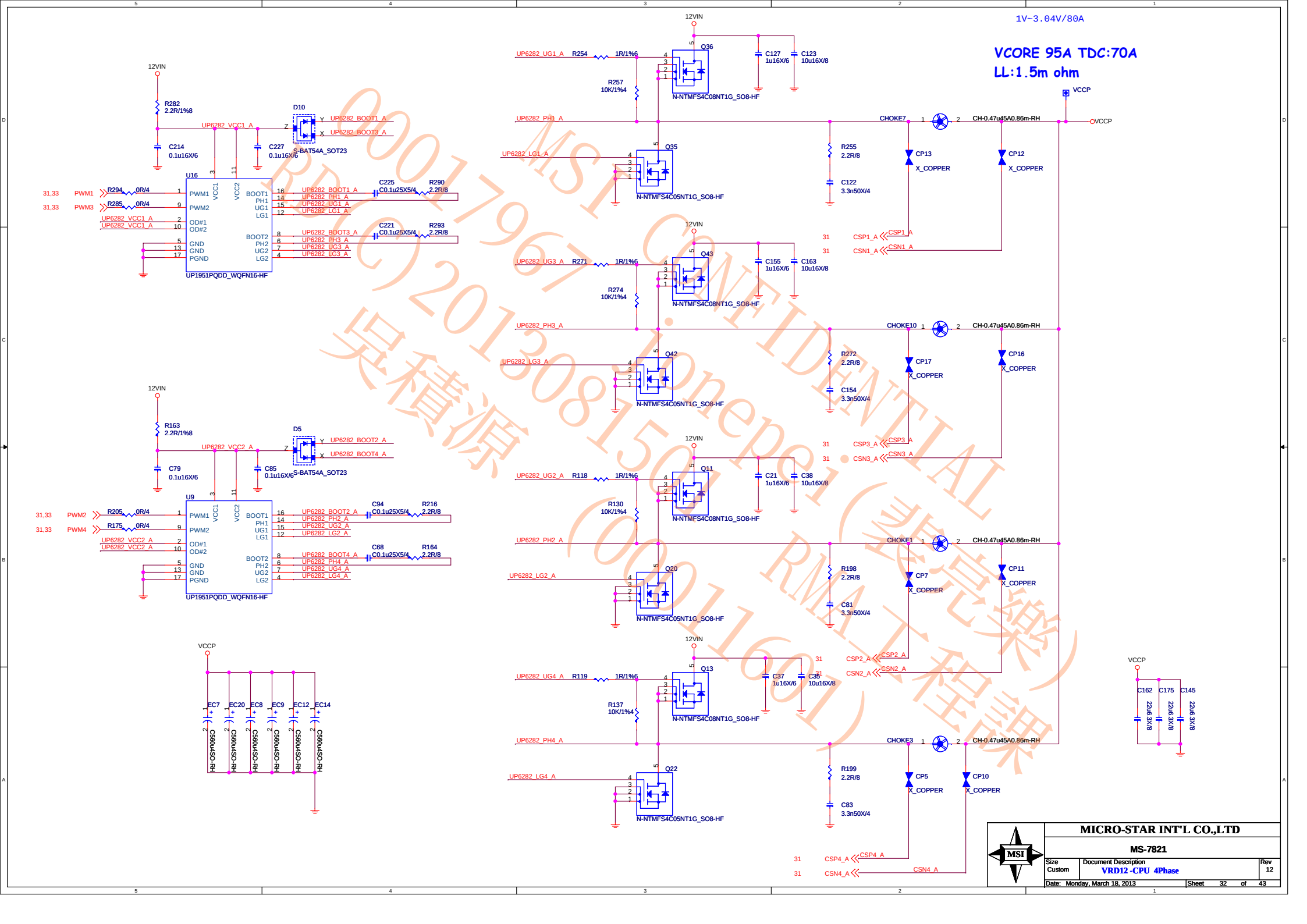
MS-7821

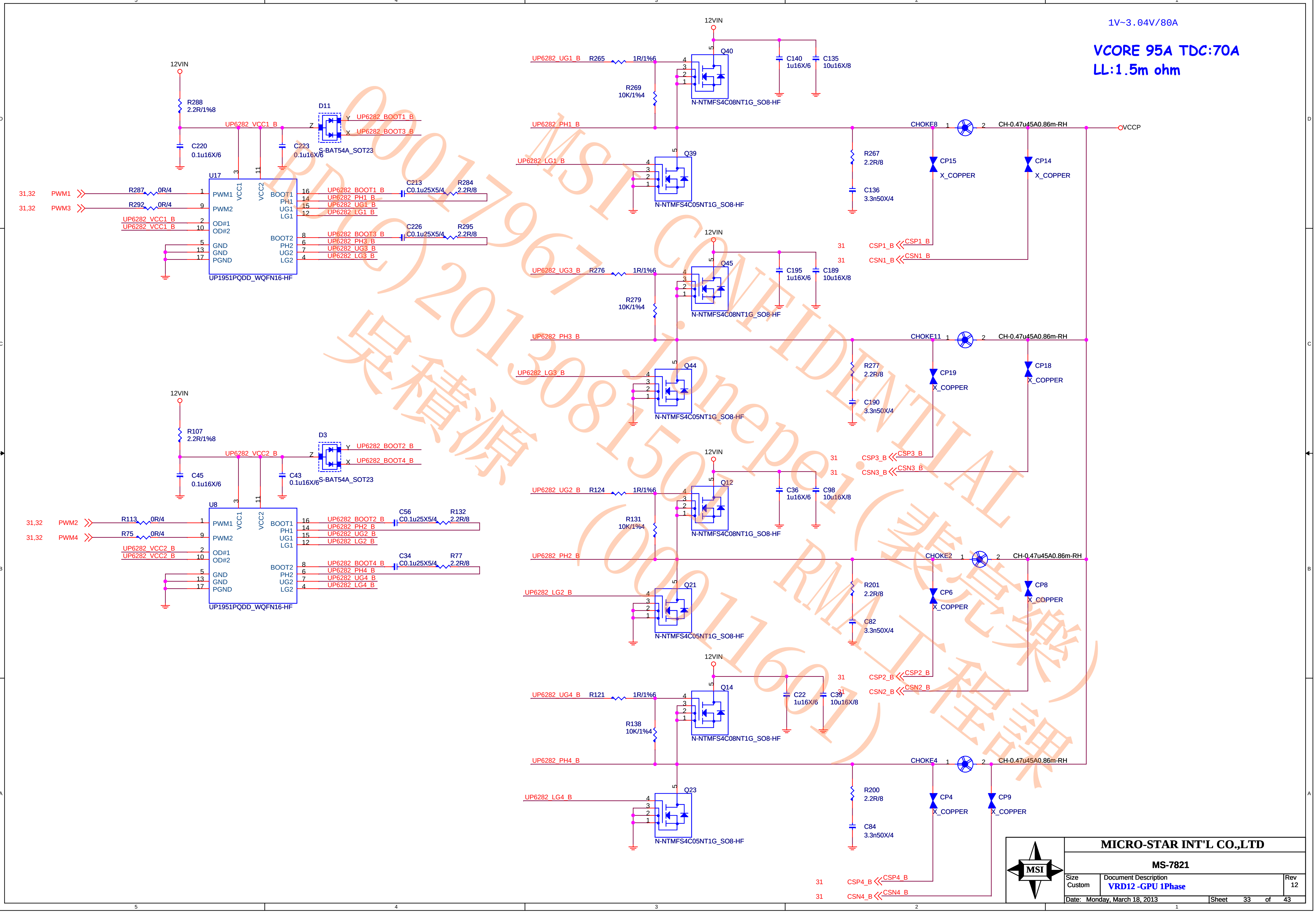
Size	Document Description	Rev
Custom	MSATA	12

Date: Monday, March 18, 2013 Sheet 29 of 43

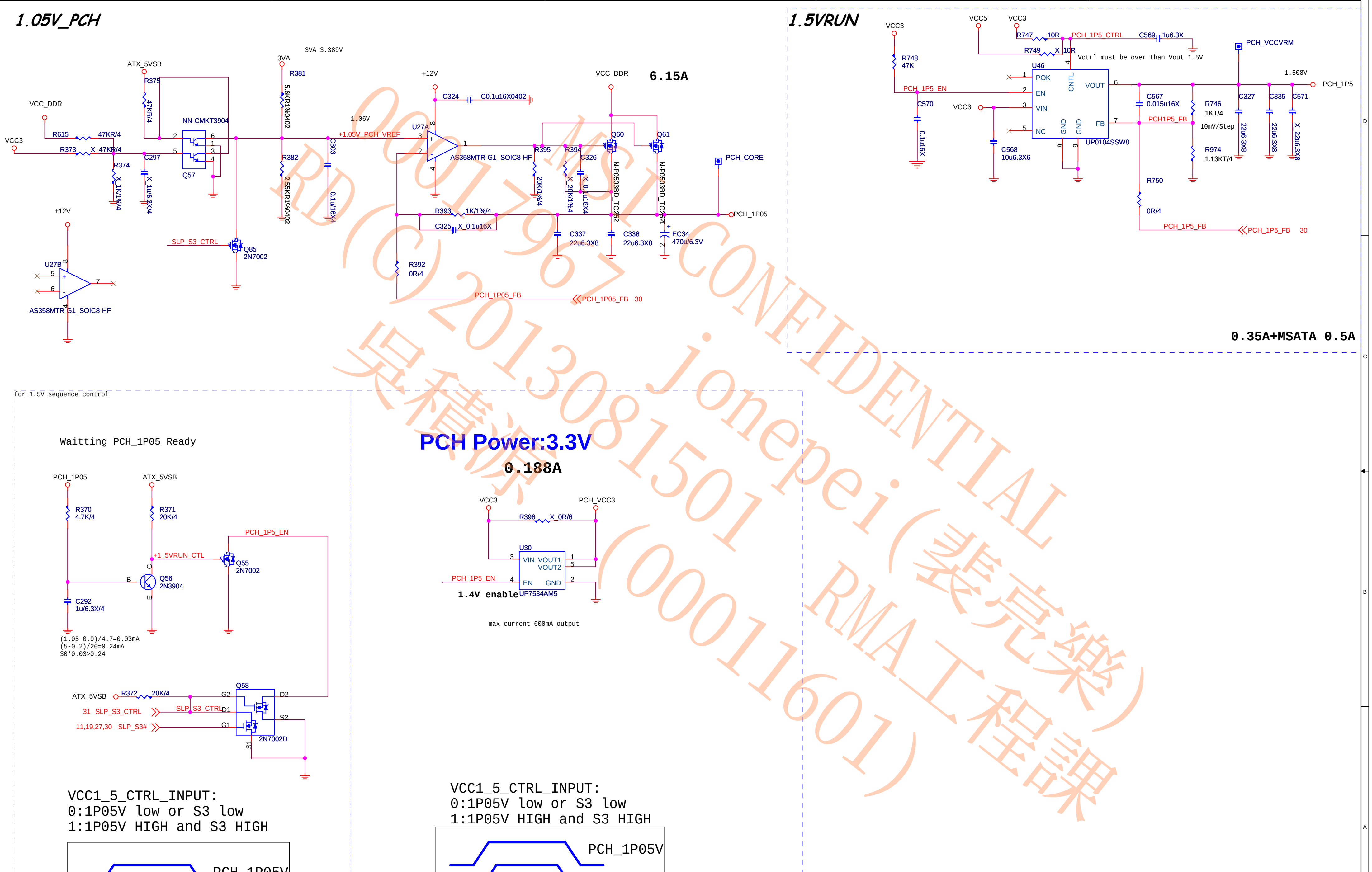

5VDIMM FOR DDR
ATX_5VSB
5VDIMM
Q83
P-P06P03LCGA_SOT89-3-HF
VCC5
R61 510R/4
R80 10K/1%4
27,36 ATX_PWR_OK
5VDIMM_5V
R86 10R/4
5VDIMM_5VSB
C31 0.1u/16X4
11,19,27,34 SLP_S3#
11,19,27,35 SLP_S4#
19,35 SLP_S5_LCH#
R73 0R/4
R87 X_0R/4
U5
S3#
S5#
MODE
uP7501
5VCC
5VSB
GND
5VSB_DRV
5VCC_DRV
5VSBDRV1
5VDRV1
R60 1K/1%6
C20 22n/16X4
+12V
Q26
NTMFS4C08NT1G
C99 0.1u/16X4
C69 18n16X/4
7501 Mode
H:Support S0/S3/S5
L:Support S0/S3
patch power supply Vcc3 Vcc5 sequence
R43 47K/4
C10 0.1u/16X4
Q8
NN-2N7002D
R89 47KR/4
R79
C32 1u/6.3X/4
3VSB
ATX_5VSB
R691 47KR/4
R705 10R/4
5VSB_VCC
C522 1u/6.3X/4
Q73
N-P45N02LDG_TO252-RH
3VSB_EN
C516
10u/6.3X6
19 SYS3VSB_OFF
Q74
2N7002
U44
POK
EN
VIN
NC
CNTL
VOUT
GND
FB
UP0104SSW8_PSOP8-HF
C519 0.015u16X/4
R700 10K/1%4
3VSB_FB
R693 200K1%4
R692 3.3K/4
EC37 470u/6.3V
0.146A
0.25W
C92
C252
R2 = R1 / [(Vout/0.8V) -1]
3VA
20mA
R687 X_0R/6
R678 X_47KR/4
DPWROK_EN
C505
U42
X_LVC2G14IDCKRQ1_SC70-6-RH
R670 X_499R1%0402
DPWROK
C495 X_0.1u/16X4
R669 10K/4
need reserved for PCH
R703 X_10KR0402
R702
C515 X_0.1u/16X4
X_NN-CMKT3904
0.82V
R701 X_1.1K1%0402
C520 X_0.1u/16X4
Q77
U43 UP0111AMA5
VIN
VOUT
EN
GND
FB
C508 1u/6.3X/4
R684 47K/4
C510 X_0.1u/16X4
3VA_REF
R686 10K/1%4
R685 3.09K/4/1
C504 C4.7u6.3X0603
3.389V
UPI VOLTAGE CONSOLE
0x20:RH=10K,RL=OPEN
ADDRESS 0x2A 0X28 0x26 0x24 0x22 0x20
RH (KOhm) OPEN 3.9 3 2.2 1.3 10
RL (KOhm) 10 1.3 2.3 3 3.9 OPEN
BUS_SEL 0% 25% 40% 60% 75% 100%
R386 10K/1%4
C306 0.1u16X4
R380 X_9.1K/1%4
7,9,11,29,31,35,37 SMBCLK
7,9,11,29,31,35,37 SMBDATA
U26
VCC
BUS_SEL
SCL
SDA
GND
OUT1
OUT2
OUT3
UP1811BMA8
R385 0R/4
R377 0R/4
PCH_1P05_FB 34
PCH_1P5_FB 34
-200uA
-200uA
-10uA
FOR DPWROK and 3VA sequence (S5-->G3->S5)
MICRO-STAR INT'L CO.,LTD
MS-7821
Size Custom
Document Description ACPI controller UPI
Rev 12
Date: Monday, March 18, 2013
Sheet 30 of 43


U7
UP1649PQGJ_VQFN40-HF
U12
UP6273AMT8_TSOP23-8-HF
U69
UP1811BMA8
Internal option : 5/32*VCC
VB0OT:1.7V
3V
Waitting PCH_1P05 Ready
Frequency 300K
OTP point need confirm
4.9mV 1Level
for CPU VCCP sense
Iin=(Vmon*Rcsn)/(Rmon*Rdc)
Vmon=1.2
can change OCP trigger level by Rcsn and Rmon
MICRO-STAR INT'L CO.,LTD
MS-7821
VRD12.5 - PWM-UP1649
Monday, March 18, 2013


1V~3.04V/80A
VCORE 95A TDC:70A
LL:1.5m ohm
12VIN
VCCP
UP1951PQDD_WQFN16-HF
N-NTMFS4C08NT1G_SO8-HF
N-NTMFS4C05NT1G_SO8-HF
S-BAT54A_SOT23
CH-0.47u45A0.86m-RH
X_COPPER
MICRO-STAR INT'L CO.,LTD
MS-7821
VRD12 -CPU 4Phase
Date: Monday, March 18, 2013
Sheet 32 of 43



1V~3.04V/80A
VCORE 95A TDC:70A
LL:1.5m ohm
12VIN
R288
2.2R/1%8
UP6282_VCC1_B
C220
0.1u16X/6
C223
0.1u16X/6
D11
S-BAT54A_SOT23
UP6282_BOOT1_B
UP6282_BOOT3_B
U17
UP1951PQDD_WQFN16-HF
PWM1
PWM2
OD#1
OD#2
GND
GND
PGND
VCC1
VCC2
BOOT1
PH1
UG1
LG1
BOOT2
PH2
UG2
LG2
31,32 PWM1
31,32 PWM3
R287 0R/4
R292 0R/4
C213 C0.1u25X5/4
R284 2.2R/8
C226 C0.1u25X5/4
R295 2.2R/8
UP6282_PH1_B
UP6282_UG1_B
UP6282_LG1_B
UP6282_PH3_B
UP6282_UG3_B
UP6282_LG3_B
R107
2.2R/1%8
UP6282_VCC2_B
C45
0.1u16X/6
C43
0.1u16X/6
D3
S-BAT54A_SOT23
UP6282_BOOT2_B
UP6282_BOOT4_B
U8
UP1951PQDD_WQFN16-HF
31,32 PWM2
31,32 PWM4
R113 0R/4
R75 0R/4
C56 C0.1u25X5/4
R132 2.2R/8
C34 C0.1u25X5/4
R77 2.2R/8
UP6282_PH2_B
UP6282_UG2_B
UP6282_LG2_B
UP6282_PH4_B
UP6282_UG4_B
UP6282_LG4_B
Q40
N-NTMFS4C08NT1G_SO8-HF
R265 1R/1%6
R269 10K/1%4
C140 1u16X/6
C135 10u16X/8
Q39
N-NTMFS4C05NT1G_SO8-HF
CHOKE8
CH-0.47u45A0.86m-RH
VCCP
R267 2.2R/8
C136 3.3n50X/4
CP15 X_COPPER
CP14 X_COPPER
31 CSP1_B
31 CSN1_B
Q45
R276 1R/1%6
R279 10K/1%4
C195 1u16X/6
C189 10u16X/8
Q44
CHOKE11
R277 2.2R/8
C190 3.3n50X/4
CP19 X_COPPER
CP18 X_COPPER
31 CSP3_B
31 CSN3_B
Q12
R124 1R/1%6
R131 10K/1%4
C36 1u16X/6
C98 10u16X/8
Q21
CHOKE2
R201 2.2R/8
C82 3.3n50X/4
CP6 X_COPPER
CP8 X_COPPER
31 CSP2_B
31 CSN2_B
Q14
R121 1R/1%6
R138 10K/1%4
C22 1u16X/6
C39 10u16X/8
Q23
CHOKE4
R200 2.2R/8
C84 3.3n50X/4
CP4 X_COPPER
CP9 X_COPPER
31 CSP4_B
31 CSN4_B
MSI
MICRO-STAR INT'L CO.,LTD
MS-7821
Size Custom
Document Description
VRD12 -GPU 1Phase
Rev 12
Date: Monday, March 18, 2013
Sheet 33 of 43



1.05V_PCH
3VA 3.389V
ATX_5VSB
R375 47KR/4
NN-CMKT3904
Q57
VCC_DDR
R615 47KR/4
VCC3
R373 X_47KR/4
R374 X_1K/1%/4
C297 X_1u/6.3X/4
3VA
R381 5.6KR1%0402
R382 2.55KR1%0402
C303 0.1u/16X4
1.06V
+1.05V_PCH_VREF
+12V
C324 C0.1u16X0402
U27A
AS358MTR-G1_SOIC8-HF
R395 20K/1%/4
R394 X_20K/1%/4
C326 X_0.1u16X4
VCC_DDR
6.15A
Q60 N-P0503BD_TO252
Q61 N-P0503BD_TO252
PCH_CORE
R393 1K/1%/4
C325 X_0.1u16X
C337 22u6.3X8
C338 22u6.3X8
EC34 470u/6.3V
PCH_1P05
SLP_S3_CTRL
Q85 2N7002
+12V
U27B
AS358MTR-G1_SOIC8-HF
R392 0R/4
PCH_1P05_FB
PCH_1P05_FB 30
1.5VRUN
VCC3
R748 47K
VCC5
VCC3
R747 10R
PCH_1P5_CTRL
C569 1u6.3X
R749 X_10R
Vctrl must be over than Vout 1.5V
PCH_VCCVRM
U46
POK EN VIN NC CNTL VOUT GND GND FB
UP0104SSW8
PCH_1P5_EN
C570 0.1u16X
VCC3
C568 10u6.3X6
C567 0.015u16X
R746 1KT/4
PCH1P5_FB
10mV/Step
R974 1.13KT/4
1.508V
C327 22u6.3X8
C335 22u6.3X8
C571 X_22u6.3X8
PCH_1P5
R750 0R/4
PCH_1P5_FB
PCH_1P5_FB 30
0.35A+MSATA 0.5A
for 1.5V sequence control
Waitting PCH_1P05 Ready
PCH_1P05
ATX_5VSB
R370 4.7K/4
R371 20K/4
PCH_1P5_EN
+1_5VRUN_CTL
Q55 2N7002
Q56 2N3904
C292 1u/6.3X/4
(1.05-0.9)/4.7=0.03mA
(5-0.2)/20=0.24mA
30*0.03>0.24
ATX_5VSB
R372 20K/4
Q58
31 SLP_S3_CTRL
11,19,27,30 SLP_S3#
SLP_S3_CTRL
G2 D1 G1 D2 S2 S1
2N7002D
VCC1_5_CTRL_INPUT:
0:1P05V low or S3 low
1:1P05V HIGH and S3 HIGH
PCH_1P05V
VCC1_5
PCH Power:3.3V
0.188A
VCC3
PCH_VCC3
R396 X_0R/6
U30
VIN VOUT1 VOUT2 EN GND
UP7534AM5
PCH_1P5_EN
1.4V enable
max current 600mA output
VCC1_5_CTRL_INPUT:
0:1P05V low or S3 low
1:1P05V HIGH and S3 HIGH
PCH_1P05V
PCH_VCC3

MICRO-STAR INT'L CO.,LTD

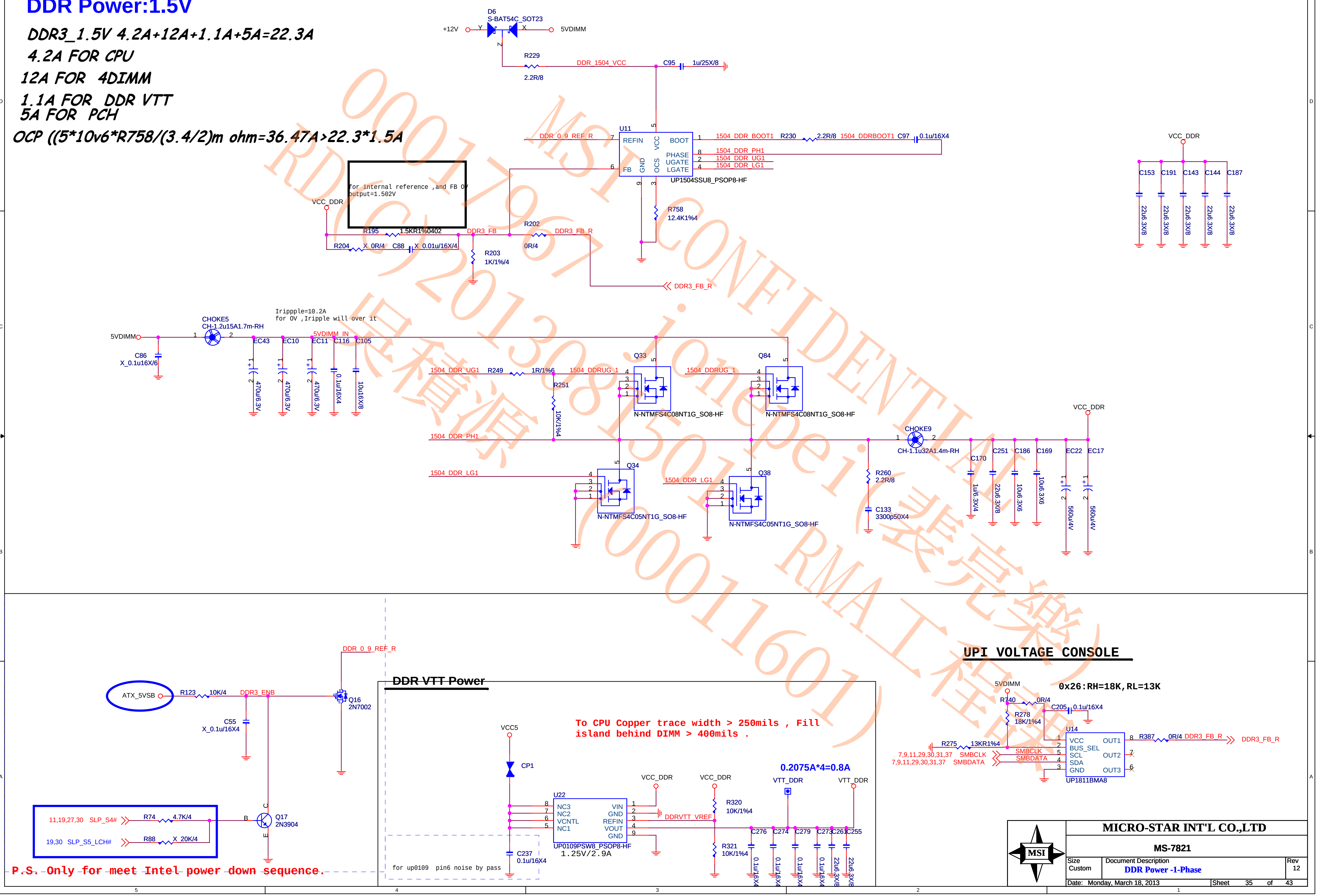
MS-7821

Size	Document Description	Rev
Custom	VTT POWER- uP1513	12

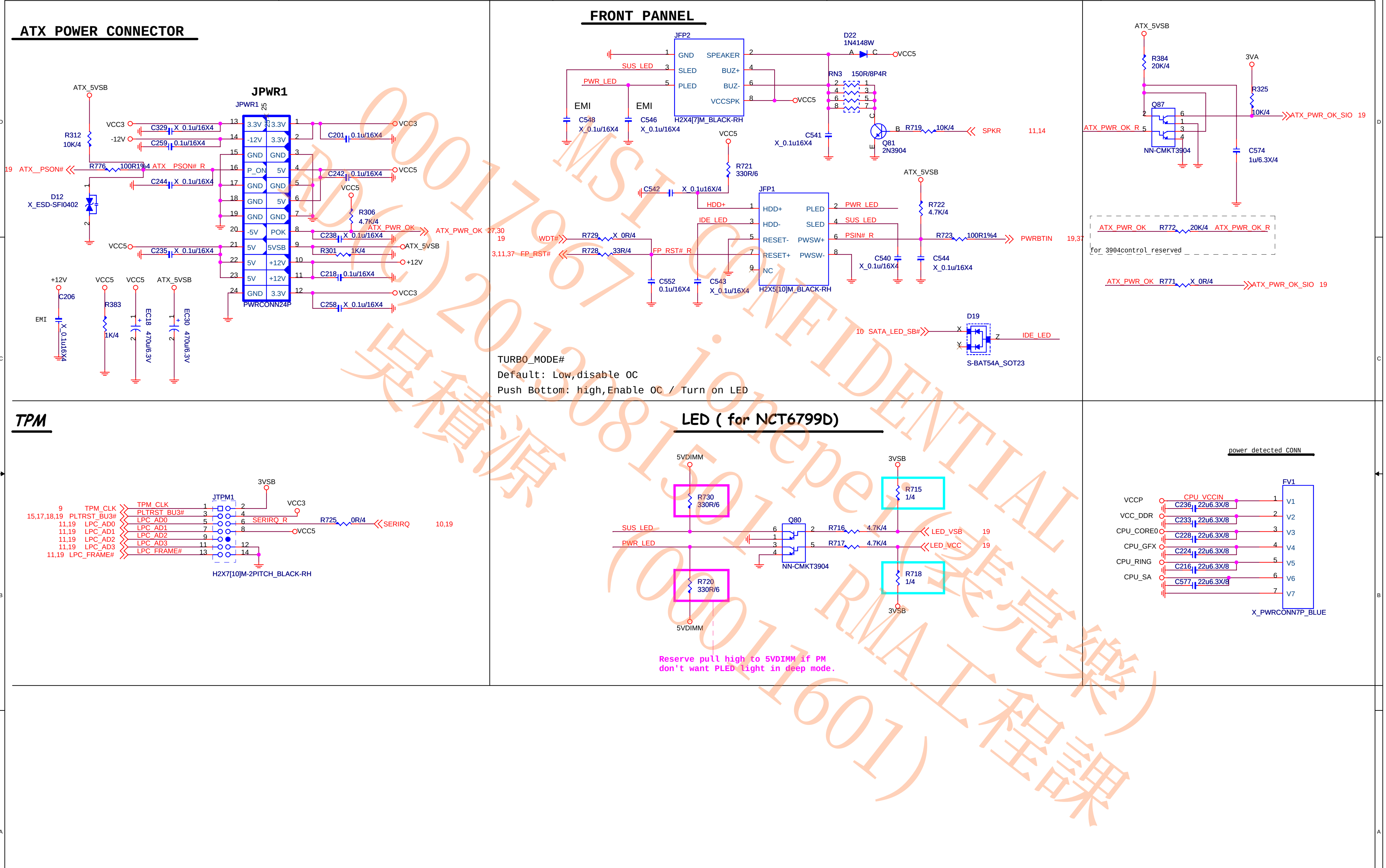
Date: Monday, March 18, 2013 Sheet 34 of 43

DDR Power:1.5V

DDR3_1.5V 4.2A+12A+1.1A+5A=22.3A
4.2A FOR CPU
12A FOR 4DIMM
1.1A FOR DDR VTT
5A FOR PCH
*OCP ((5*10v6*R758/(3.4/2)m ohm=36.47A>22.3*1.5A*



MICRO-STAR INT'L CO.,LTD			
MS-7821			
Size: Custom	Document Description: DDR Power -1-Phase		Rev: 12
Date: Monday, March 18, 2013	Sheet 35 of 43		



MICRO-STAR INT'L CO.,LTD

MS-7752

Size	Document Description	Rev
Custom	ATX F_Panel/EMI/TPM	12

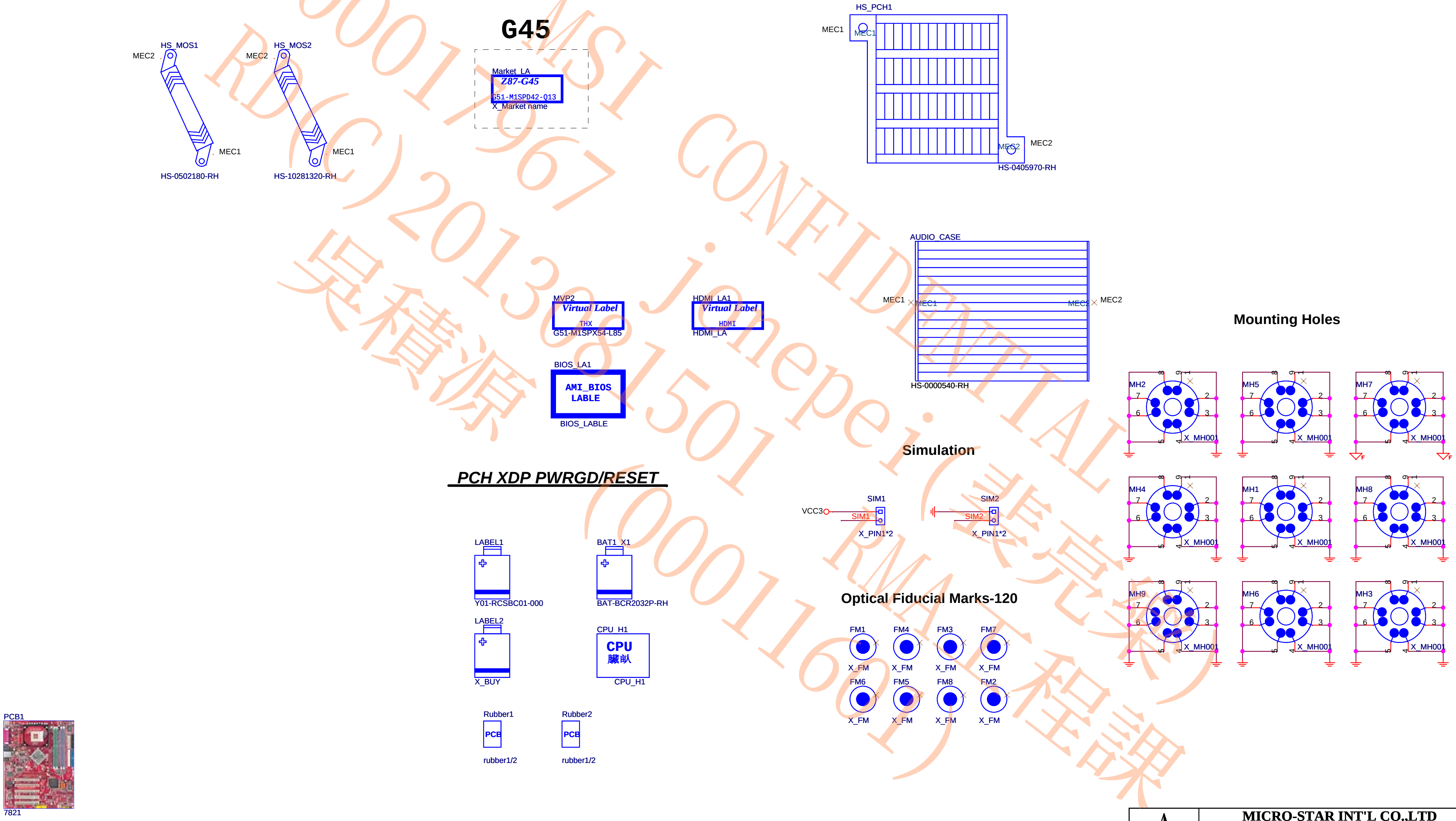
Date: Monday, March 18, 2013 Sheet 36 of 43

MICRO-STAR INT'L CO.,LTD

MS-7821

Size	Document Description	Rev
Custom	CPU_SA - OP+MOS-Phase	12

Date: Monday, March 18, 2013 | Sheet 37 of 43


G45
HS_MOS1
MEC2
MEC1
HS-0502180-RH
HS_MOS2
MEC2
MEC1
HS-10281320-RH
Market_LA
Z87-G45
G51-M1SPD42-Q13
X_Market name
HS_PCH1
MEC1
MEC2
HS-0405970-RH
AUDIO_CASE
MEC1
MEC2
HS-0000540-RH
MVP2
Virtual Label
THX
G51-M1SPX54-L85
HDMI_LA1
Virtual Label
HDMI
HDMI_LA
BIOS_LA1
AMI_BIOS LABLE
BIOS_LABLE
Mounting Holes
MH2
MH5
MH7
MH4
MH1
MH8
MH9
MH6
MH3
X_MH001
Simulation
VCC3
SIM1
X_PIN1*2
SIM2
X_PIN1*2
PCH XDP PWRGD/RESET
LABEL1
Y01-RCSBC01-000
BAT1_X1
BAT-BCR2032P-RH
LABEL2
X_BUY
CPU_H1
CPU
CPU_H1
Optical Fiducial Marks-120
FM1
FM4
FM3
FM7
FM6
FM5
FM8
FM2
X_FM
Rubber1
PCB
rubber1/2
Rubber2
PCB
rubber1/2
PCB1
7821

MICRO-STAR INT'L CO.,LTD		
MS-7821		
Size: Custom	Document Description: Manual Parts	Rev: 12
Date: Monday, March 18, 2013	Sheet 38 of 43	

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7821	
Size: Custom	Document Description: EMI CAP	Rev: 12
Date: Monday, March 18, 2013	Sheet 39 of 43	