MS-A6131 Ver: 2.0

CPU:
Celeron 1037,BGA- 1023pin

System Chipset:
Intel NM70

OnBoard Chipset:
HD Audio Codec:ALC887 CG
LAN:Realtek RTL8111G
SIO : NUVOTON NCT6104
CARD READER :Realtek RTS5249
Single Touch MER4485
USB3.0 : Asmedia1042AE

Main Memory:
DDRIII (1066/1333MHz) * 1

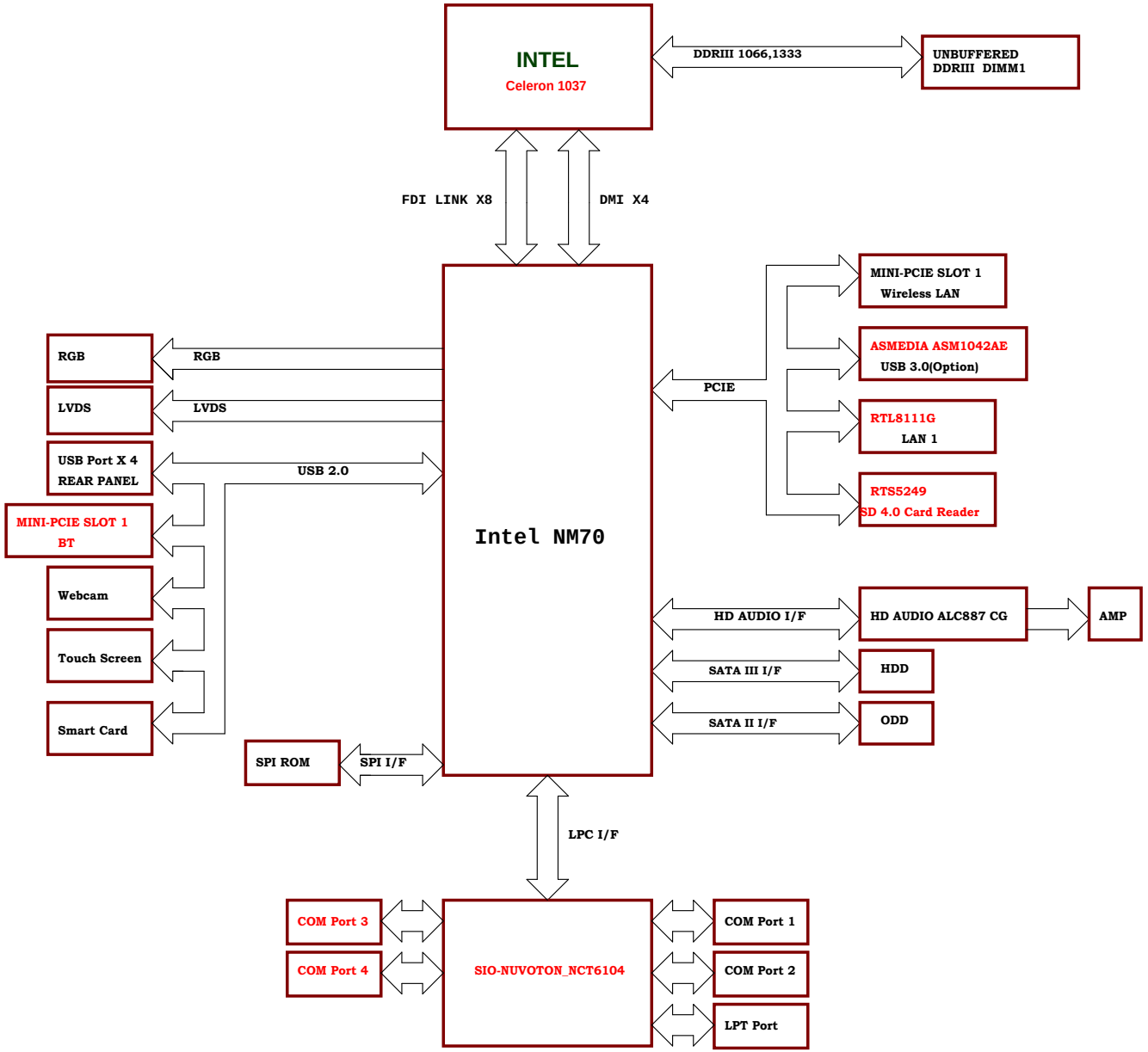
Expansion Slots:
MINIPCI Express (X1) Slot * 1

PWM:
Controller:ISL95837 1+1Phase CPU+GPU
Controller:TPS51211 CPU_VTT
Controller:TPS51216 VCC_DDR

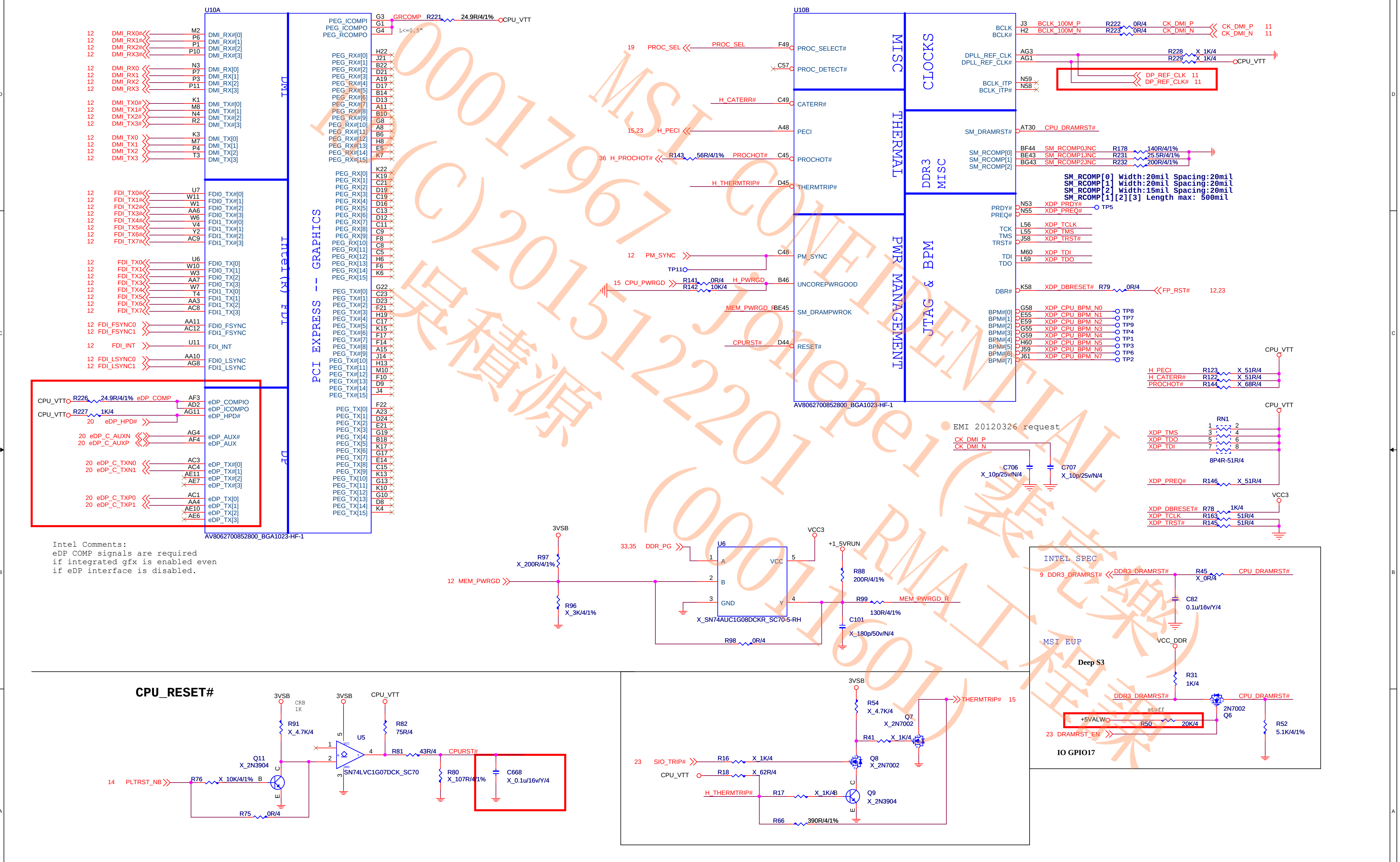
Other:
VGA * 1
eDP * 1
USB2.0 * 4(colay with USB 3.0 * 2)
SATA 3.0 * 1(HDD)
SATA 2.0 * 1(ODD)
LPT Port * 1
COM Port * 4
Card reader * 1(3 in 1)
Smart Card * 1

MS-A6131 Ver : 2.0

Block Diagram



MSI	MICRO-STAR INT'L CO.,LTD	
	MS-A613	
Size: Custom	Document Description: Block Diagram	Rev: 21
Date: Friday, July 24, 2015	Sheet 2 of 43	



Intel Comments:
eDP COMP signals are required
if integrated gfx is enabled even
if eDP interface is disabled.

MICRO-STAR INT'L CO.,LTD

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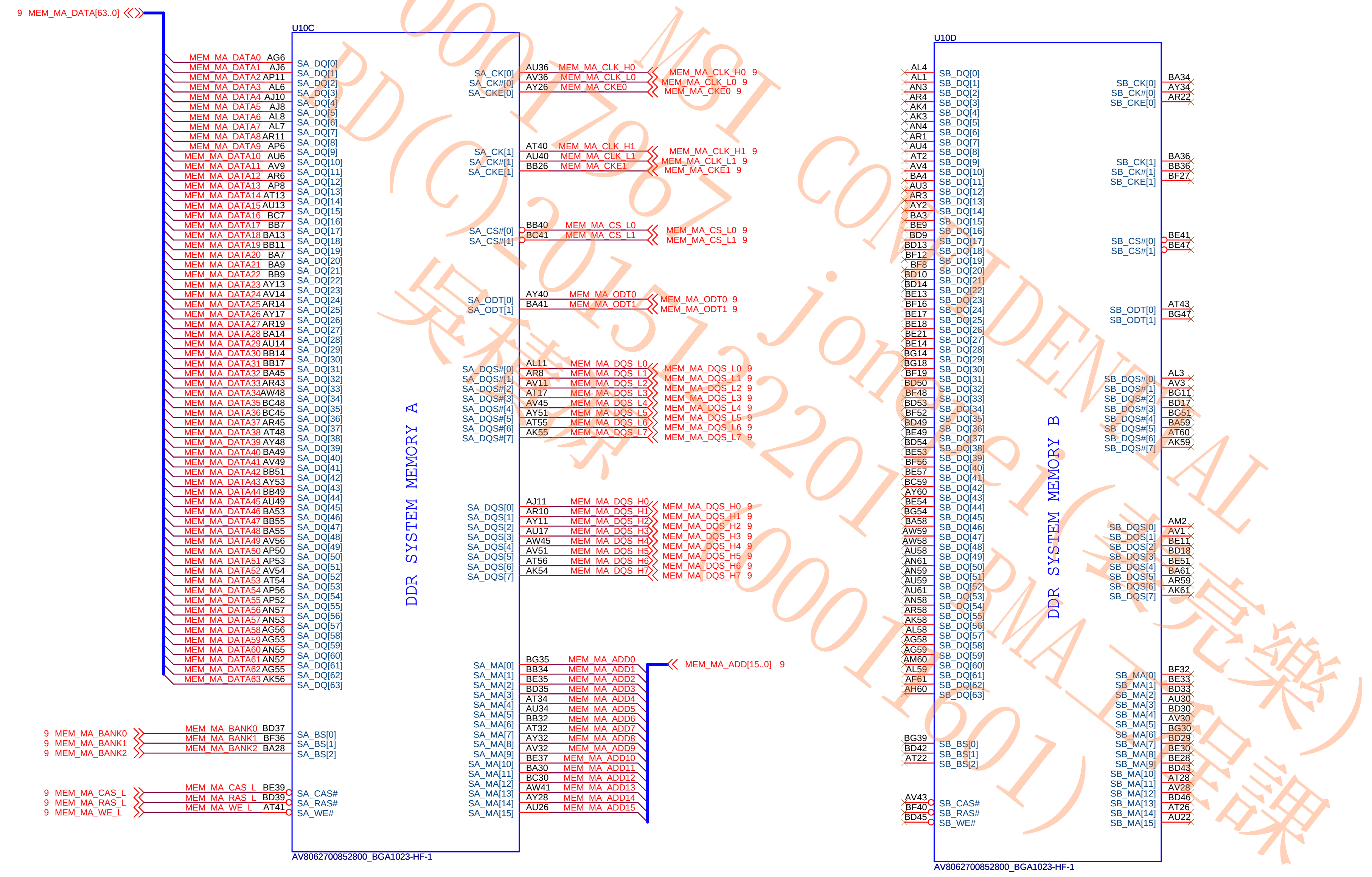
Size	Document Description	Rev
Custom	PROCESSOR-1 (HOST BUS)	21

Date: Friday, July 24, 2015 Sheet 3 of 43

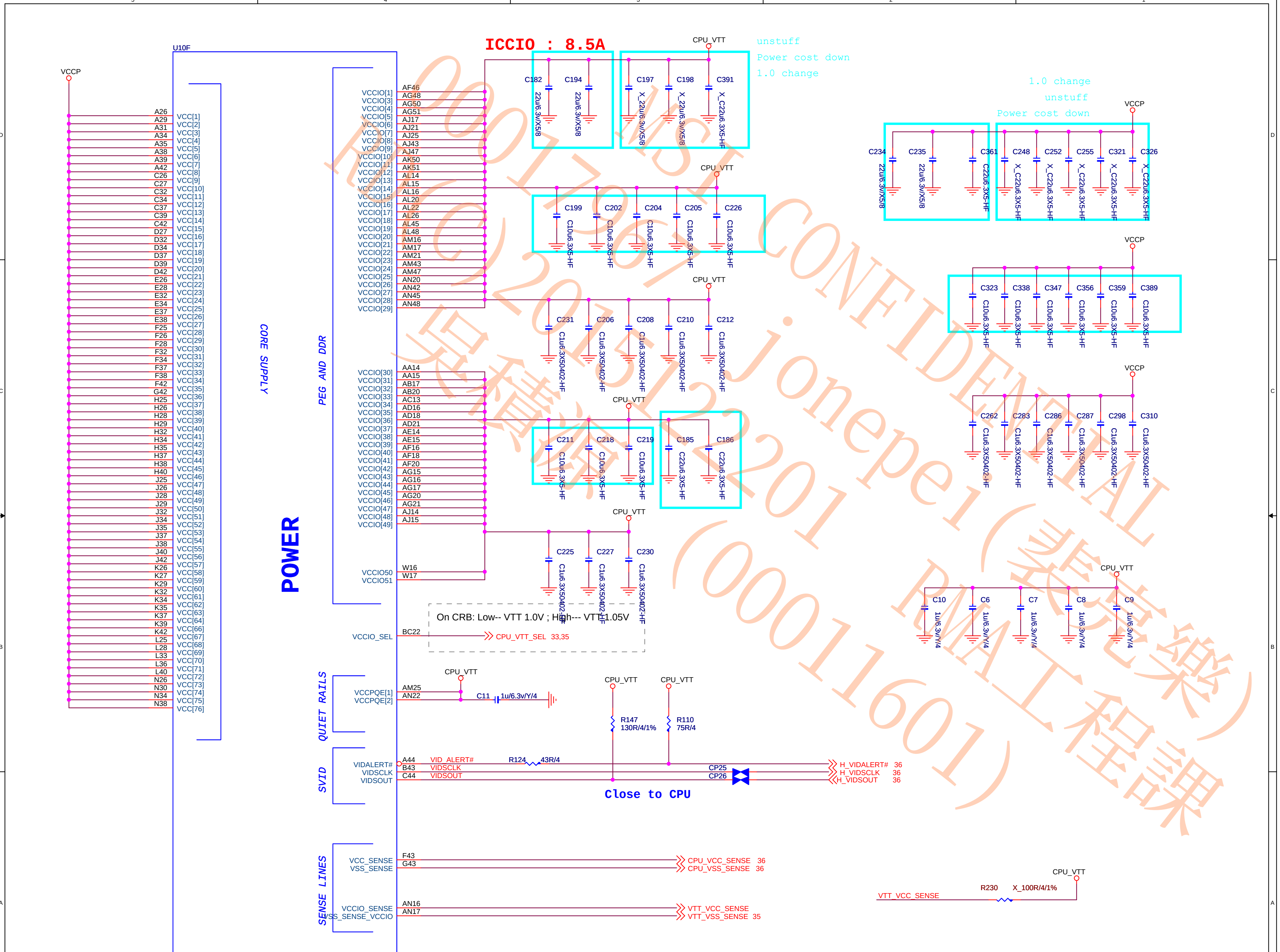


MICRO-STAR INT'L CO.,LTD

MS-A613

Size	Document Description	Rev
Custom	PROCESSOR-2 (DDR3)	21

Date: Friday, July 24, 2015 Sheet 4 of 43



MICRO-STAR INT'L CO.,LTD

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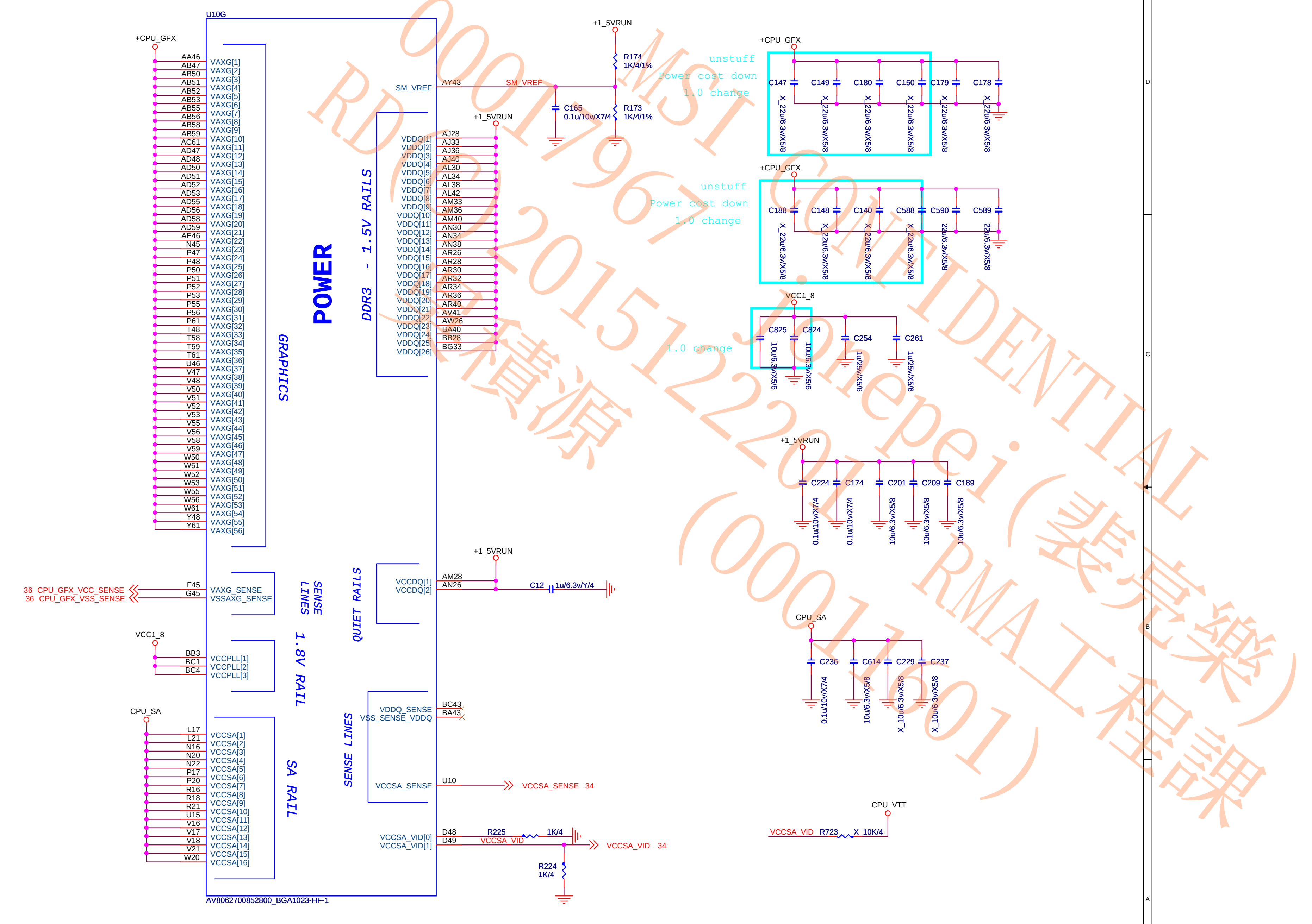
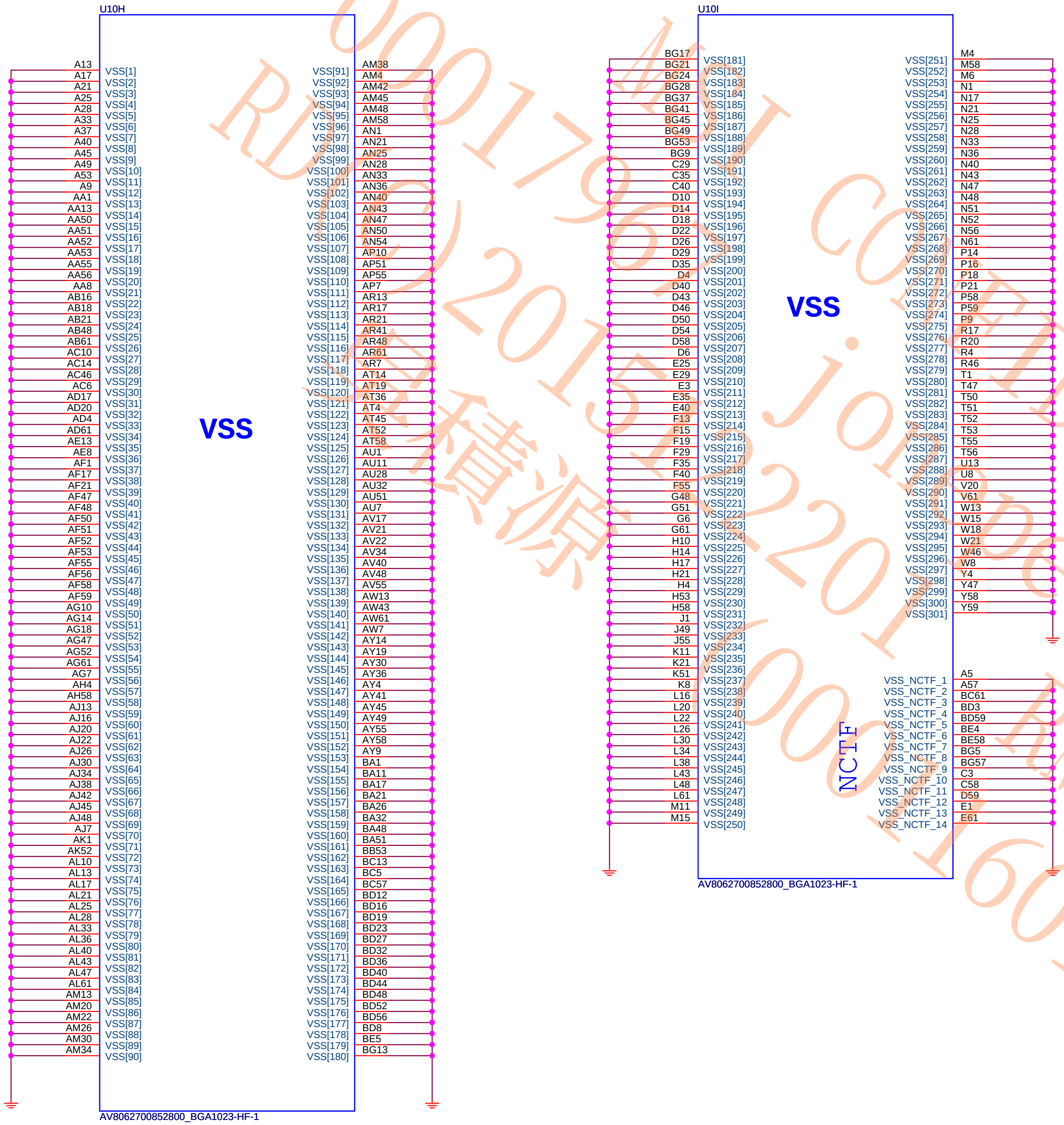
Size	Document Description	Rev
Custom	PROCESSOR-3 (POWER)	21

Date: Friday, July 24, 2015 | Sheet 5 of 43



MICRO-STAR INT'L CO.,LTD		
MS-A613		
Size: Custom	Document Description: PROCESSOR-4 (GRAPHICS POWER)	Rev: 21
Date: Friday, July 24, 2015	Sheet 6 of 43	



MICRO-STAR INT'L CO.,LTD

MS-A613

Size	Document Description	Rev
Custom	PROCESSOR-5 (GND)	21

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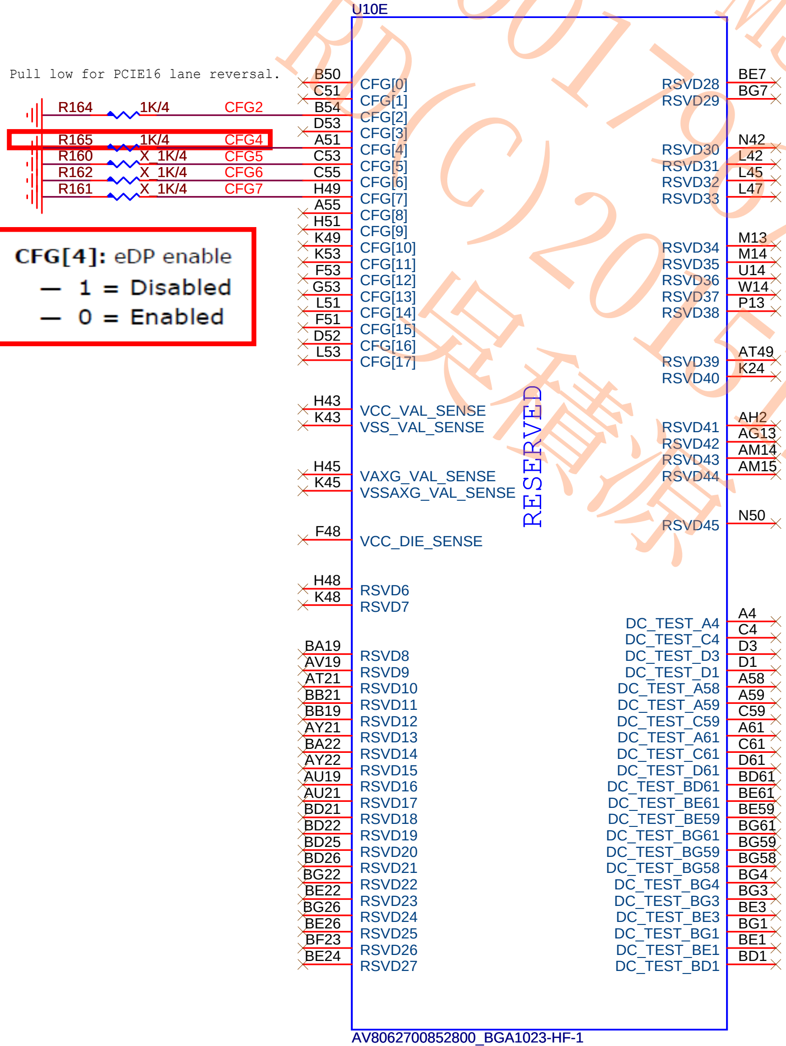
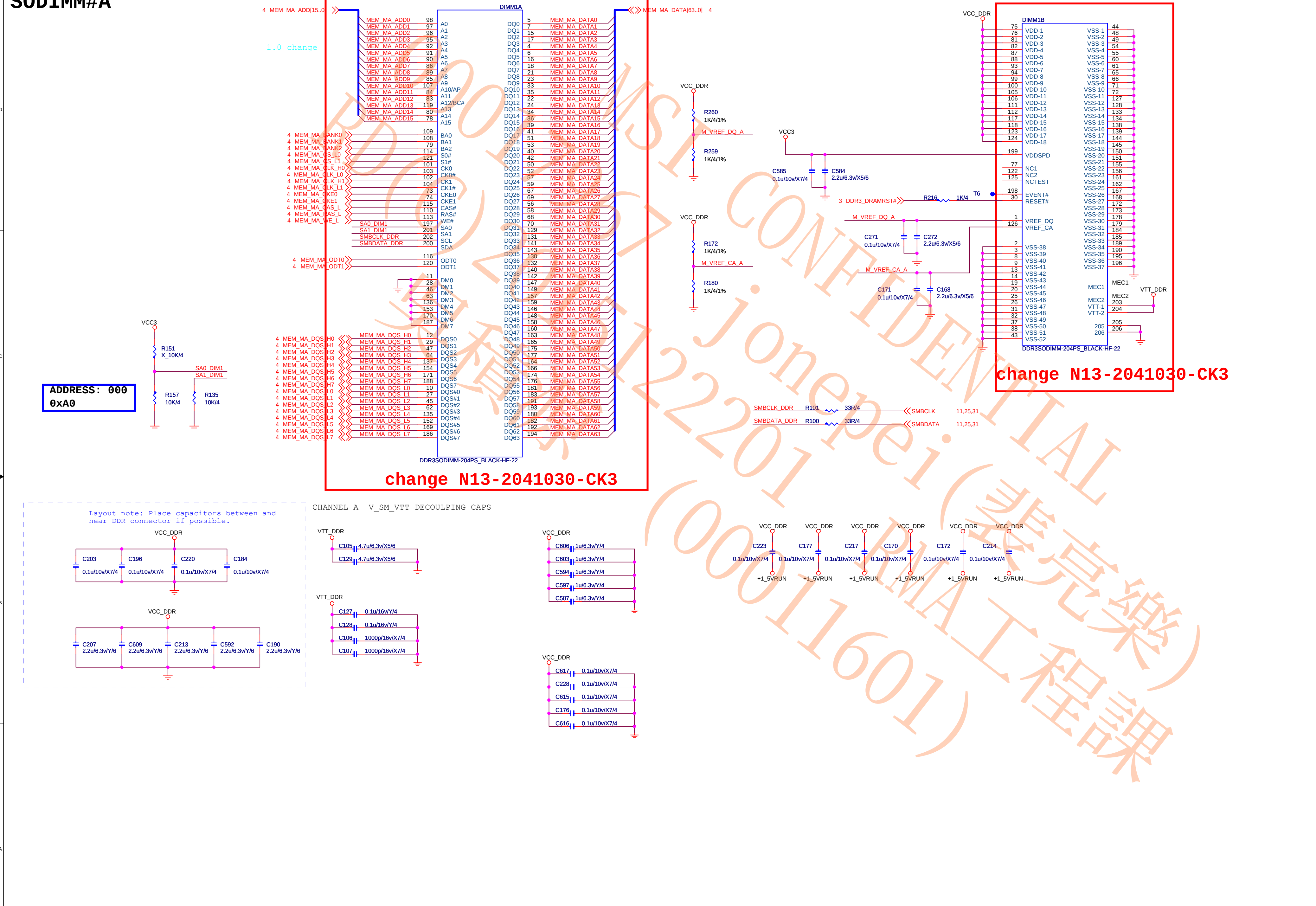
SANDYBRIDGE PROCESSOR (RESERVED)

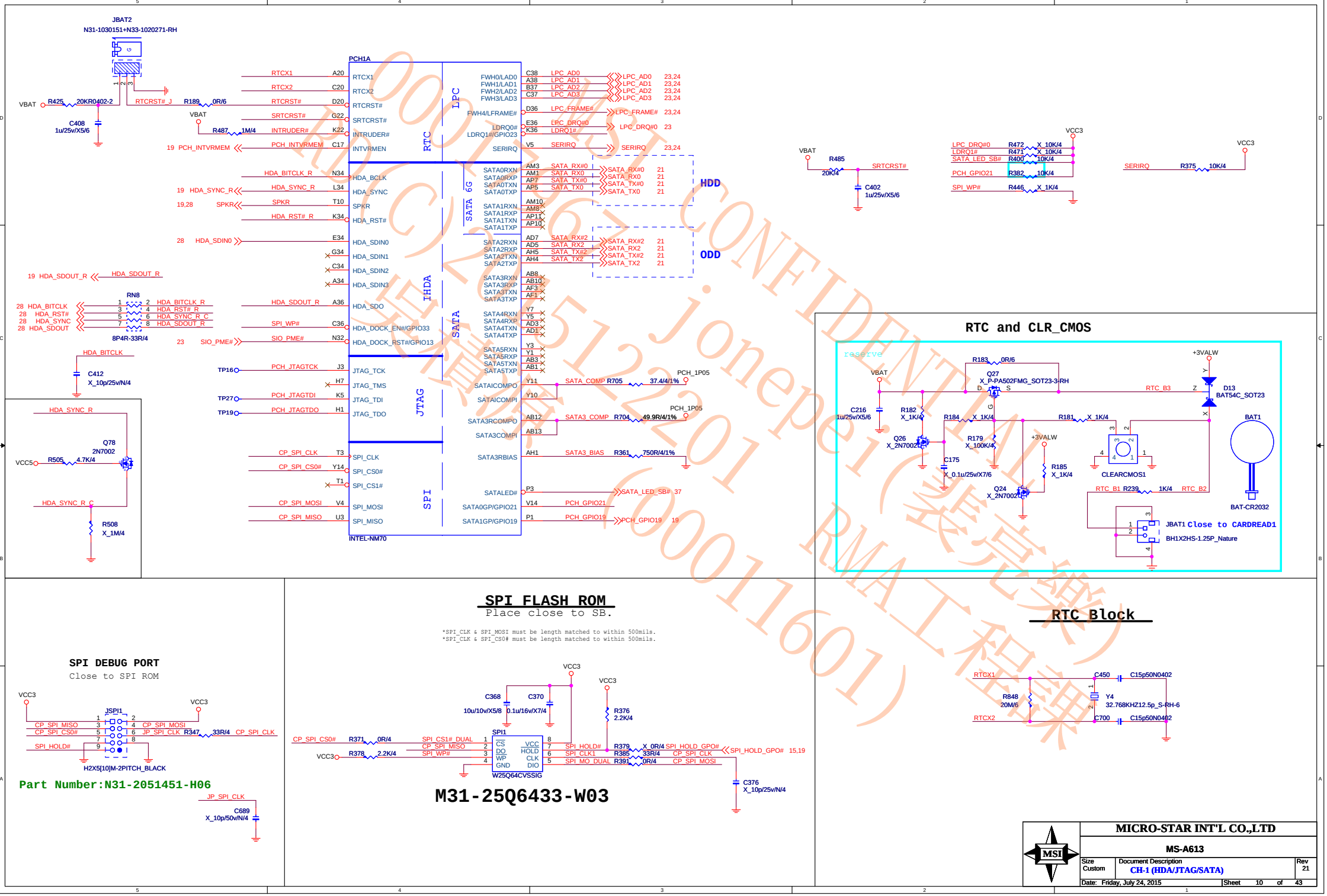


MICRO-STAR INT'L CO.,LTD		
MS-A613		
Size: Custom	Document Description: PROCESSOR-6 (RESERVE)	Rev: 21
Date: Friday, July 24, 2015	Sheet 8 of 43	

SODIMM#A



MICRO-STAR INT'L CO.,LTD		
MS-A613		
Size C	Document Description DDR III SODIMM1	Rev 21
Date: Friday, July 24, 2015	Sheet 9 of 43	


JBAT2
N31-1030151+N33-1020271-RH
PCH1A
RTCX1
RTCX2
RTCRST#
SRTCRST#
INTRUDER#
PCH_INTVRMEM
HDA_BITCLK_R
HDA_SYNC_R
SPKR
HDA_RST#_R
HDA_SDIN0
HDA_SDOUT_R
SPI_WP#
SIO_PME#
PCH_JTAGTCK
PCH_JTAGTDI
PCH_JTAGTDO
CP_SPI_CLK
CP_SPI_CS0#
CP_SPI_MOSI
CP_SPI_MISO
LPC
RTC
IHDA
SATA 6G
JTAG
SPI
SATA
FWH0/LAD0
FWH1/LAD1
FWH2/LAD2
FWH3/LAD3
FWH4/LFRAME#
LDRQ0#
LDRQ1#/GPIO23
SERIRQ
SATA0RXN
SATA0RXP
SATA0TXN
SATA0TXP
SATA1RXN
SATA1RXP
SATA1TXN
SATA1TXP
SATA2RXN
SATA2RXP
SATA2TXN
SATA2TXP
SATA3RXN
SATA3RXP
SATA3TXN
SATA3TXP
SATA4RXN
SATA4RXP
SATA4TXN
SATA4TXP
SATA5RXN
SATA5RXP
SATA5TXN
SATA5TXP
SATAICOMPO
SATAICOMPI
SATA3RCOMPO
SATA3COMPI
SATA3RBIAS
SATALED#
SATA0GP/GPIO21
SATA1GP/GPIO19
INTEL-NM70
HDD
ODD
RN8
8P4R-33R/4
RTC and CLR_CMOS
reserve
CLEARCMOS1
BAT-CR2032
JBAT1 Close to CARDREAD1
BH1X2HS-1.25P_Nature
SPI DEBUG PORT
Close to SPI ROM
JSPI1
H2X5[10]M-2PITCH_BLACK
Part Number:N31-2051451-H06
SPI FLASH ROM
Place close to SB.
*SPI_CLK & SPI_MOSI must be length matched to within 500mils.
*SPI_CLK & SPI_CS0# must be length matched to within 500mils.
SPI1
W25Q64CVSSIG
M31-25Q6433-W03
RTC Block
MICRO-STAR INT'L CO.,LTD
MS-A613
CH-1 (HDA/JTAG/SATA)
Date: Friday, July 24, 2015
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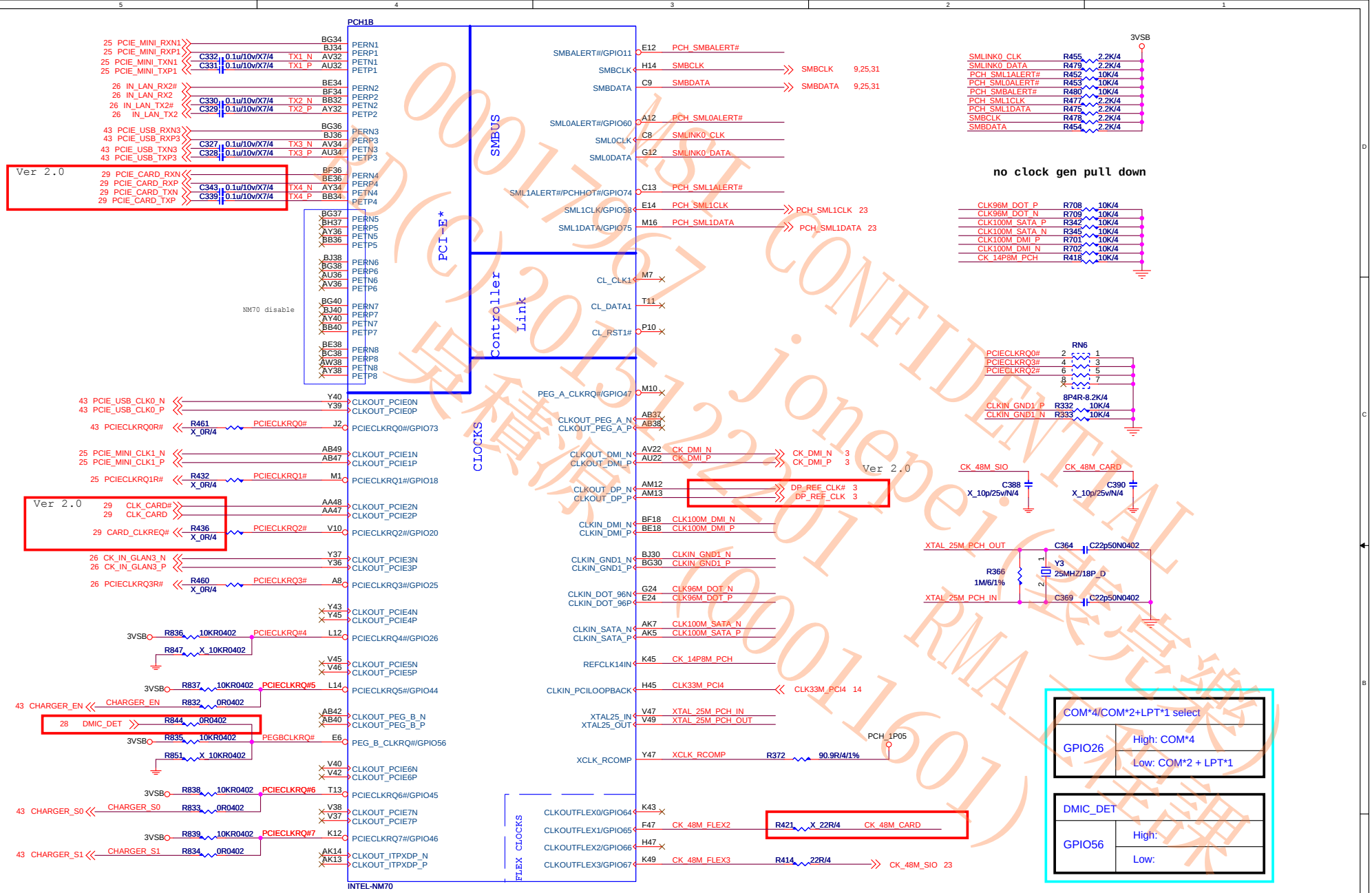
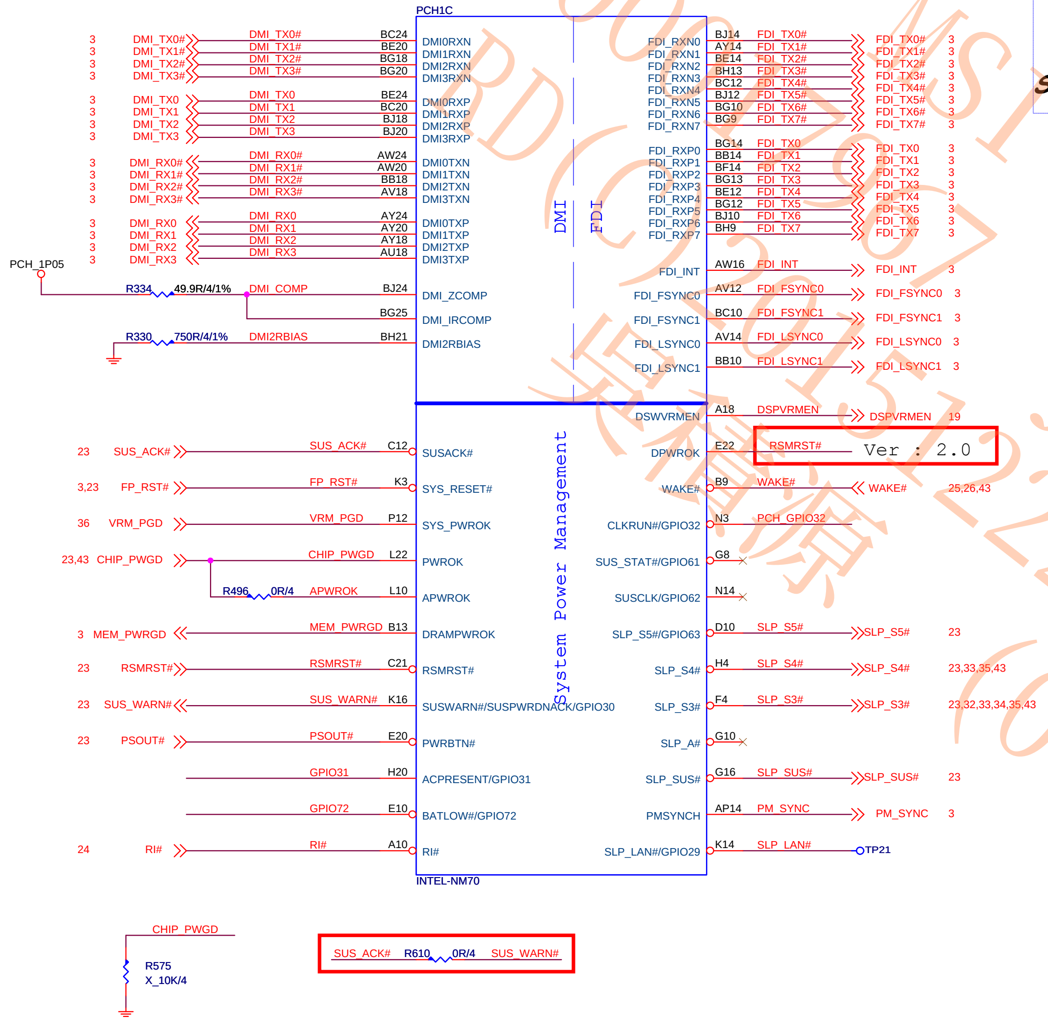
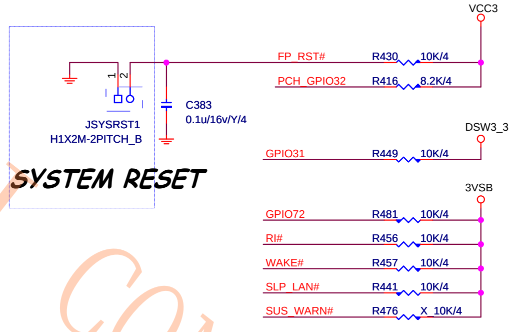


Intel Comments:
If CLKREQ# control is not needed, say for a free running clock, DO NOT pull-down signal to GND. This will increase leakage in Sx states.

PCIe devices or addin cards that do NOT support CLKREQ# functionality should not route this signal to PCH.
Intel recommends terminating PCIECLKRQx# pin on PCH with 10 kΩ ±10% external pull-up resistor instead of No Connect.
Only PCIECLKRQ[2:1]# on PCH are core well powered. All other PCIECLKRQx# are suspend well powered.

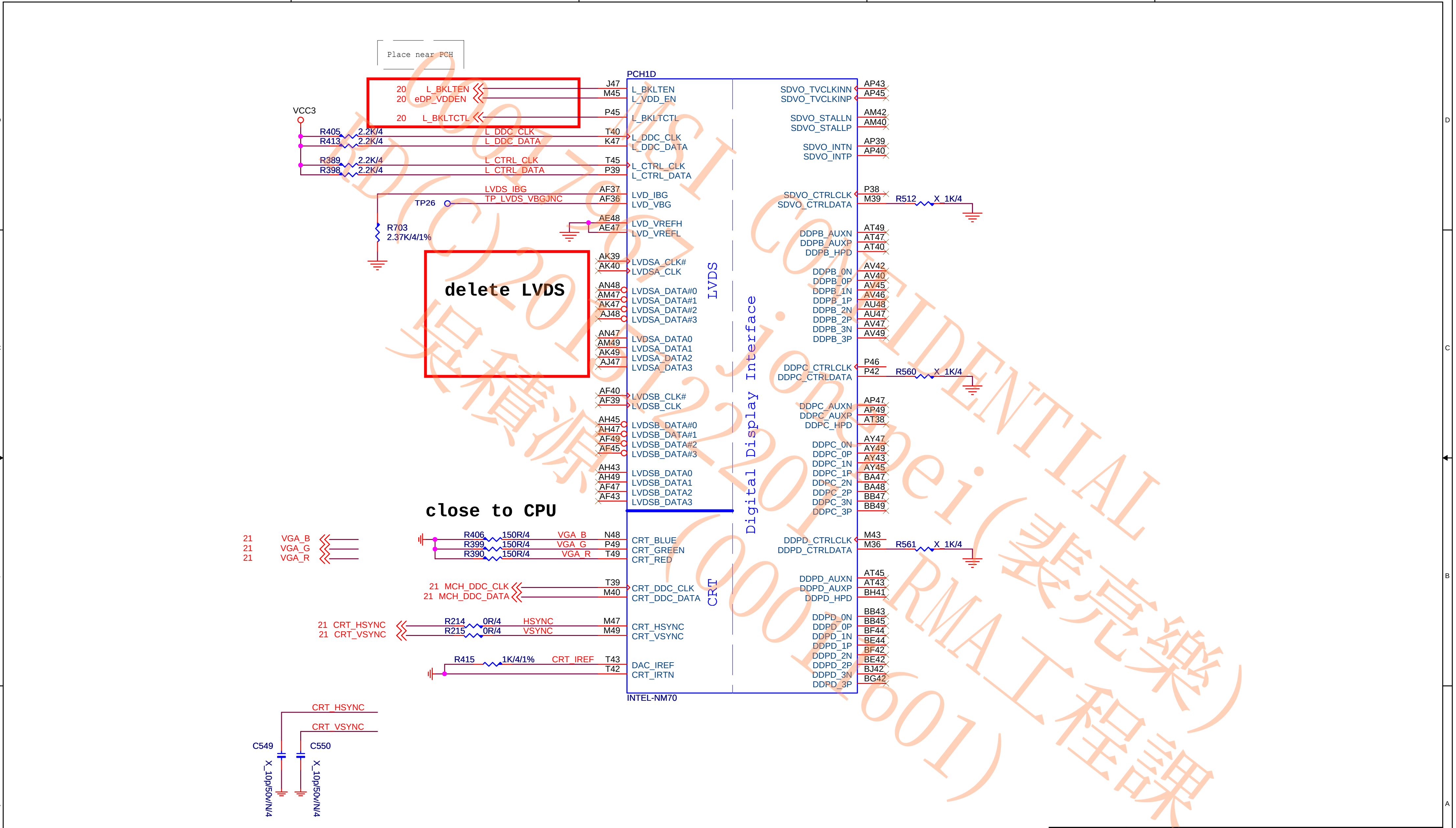
MICRO-STAR INT'L CO.,LTD	
MS-A613	
Size: Custom	Document Description: PCH-2 (PCI-E/SMBUS/CLK)
Rev: 21	
Date: Friday, July 24, 2015	Sheet 11 of 43





Intel® NM70 Chipset SKU

Feature Set		SKU Name: Intel® NM70 Chipset
PCI Express* 2.0 Ports		4[4]
PCI Interface[5]		No
Total number of USB ports		8[6]
• USB 3.0 Capable Ports (SuperSpeed and all USB 2.0 speeds)		0
• USB 2.0 Only Ports		8
Total number of SATA ports		4[7]
• SATA Ports (6 Gb/s, 3 Gb/s, and 1.5 Gb/s)		1[8]
• SATA Ports (3 Gb/s and 1.5 Gb/s only)		3
HDMI*/DVI/SDVO/DisplayPort*/eDP*		Yes
VGA/LVDS		Yes
Integrated Graphics Support		Yes
Intel® Wireless Display 3.0		No
Intel® Rapid Storage Technology	AHCI	Yes
	RAID 0/1/5/10 Support	No
	Intel® Smart Response Technology	No
Intel® Anti-Theft Technology		No
Intel® Active Management Technology 8.0		No
Intel® Small Business Advantage		No
Intel® Rapid Start Technology		No
ACPI S1 State Support		Yes



MICRO-STAR INT'L CO.,LTD

MS-A613

Size	Document Description	Rev
B	PCH-4 (LVDS/DDI/VGA)	21

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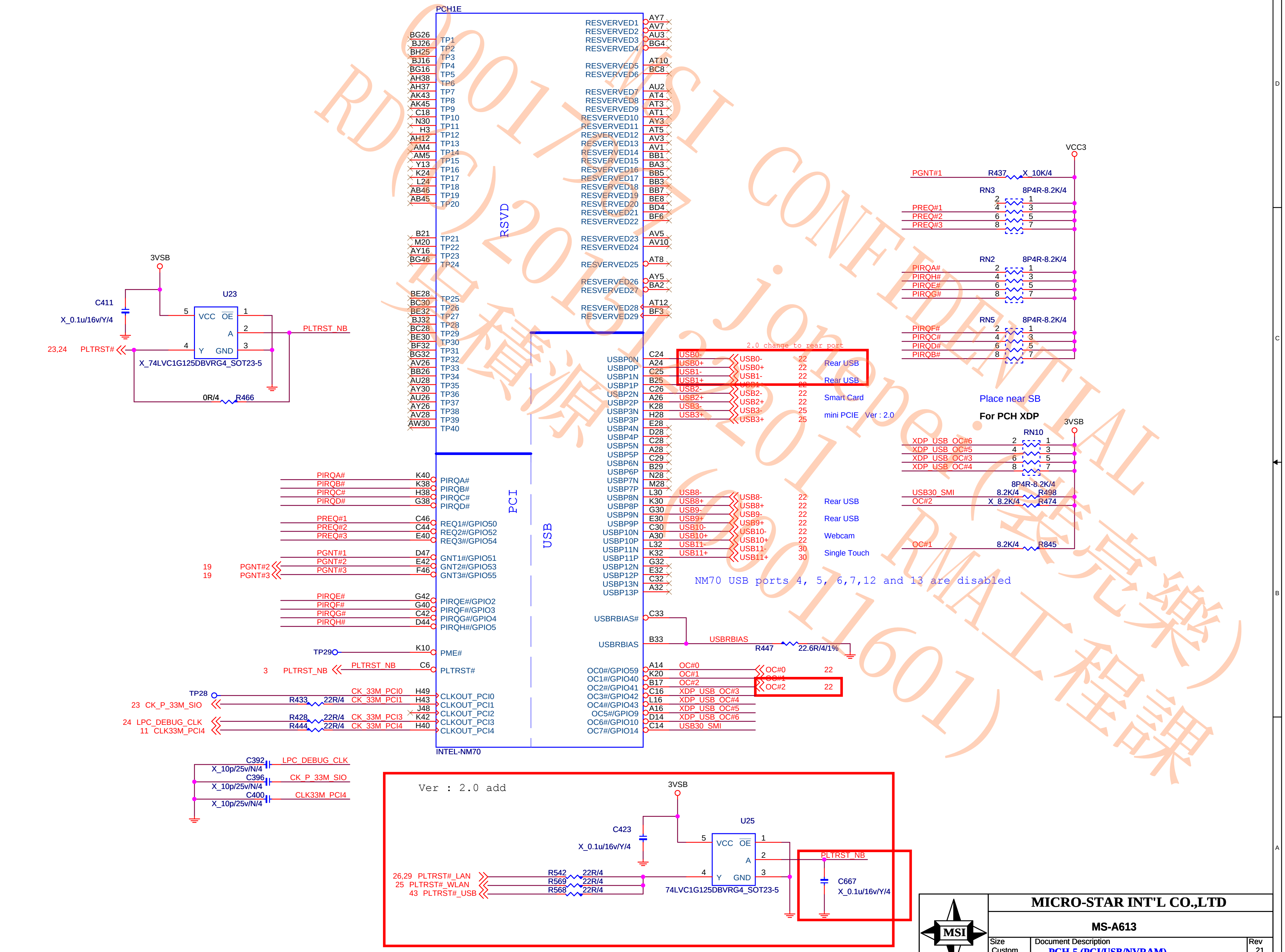
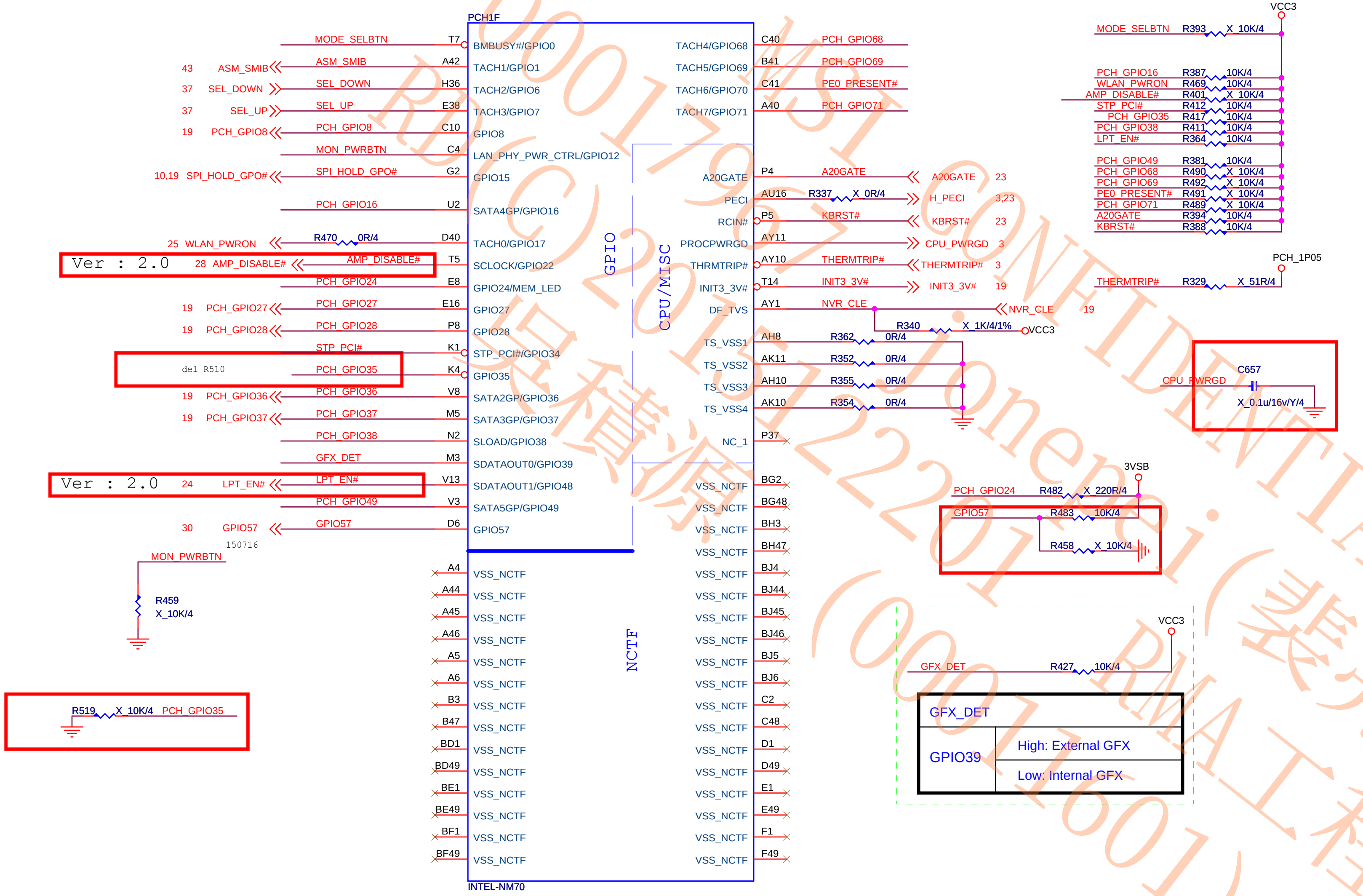


MICRO-STAR INT'L CO.,LTD

MS-A613

Size	Document Description	Rev
Custom	PCH-5 (PCI/USB/NVRAM)	21

Date: Friday, July 24, 2015 Sheet 14 of 43



GFX_DET	
GPIO39	High: External GFX
	Low: Internal GFX

DMIC_DET	
GPIO35	High: External GFX
	Low: Internal GFX

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MS-A613

Size: Custom | Document Description: PCH-6 (GPIO/NCTF/RSVD) | Rev: 21

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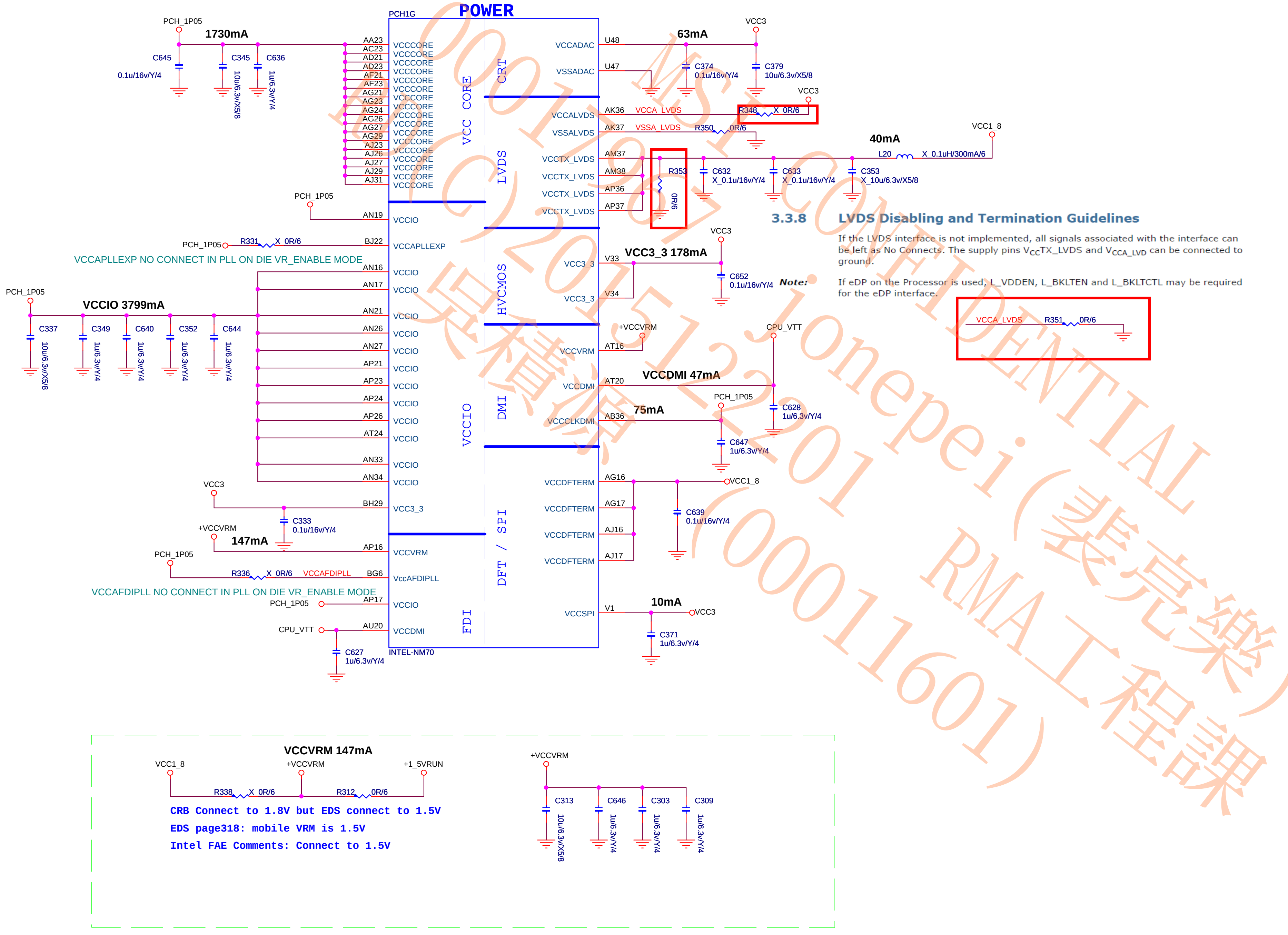
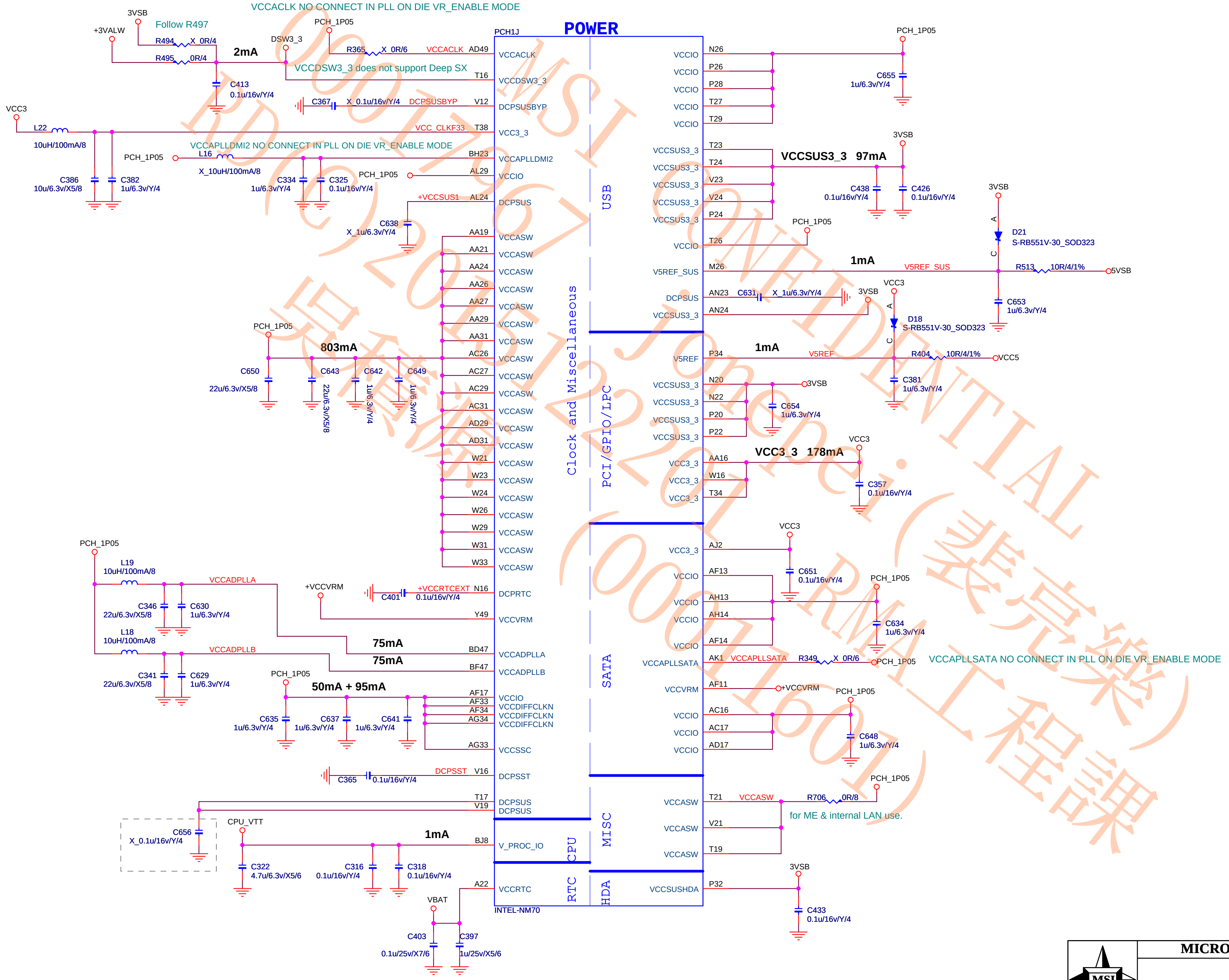


MICRO-STAR INT'L CO.,LTD

MS-A613

Size	Document Description	Rev
Custom	PCH-7 (POWER)	21

Date: Friday, July 24, 2015 Sheet 16 of 43



MICRO-STAR INT'L CO.,LTD		
MS-A613		
Size: Custom	Document Description: PCH-8 (POWER)	Rev: 21
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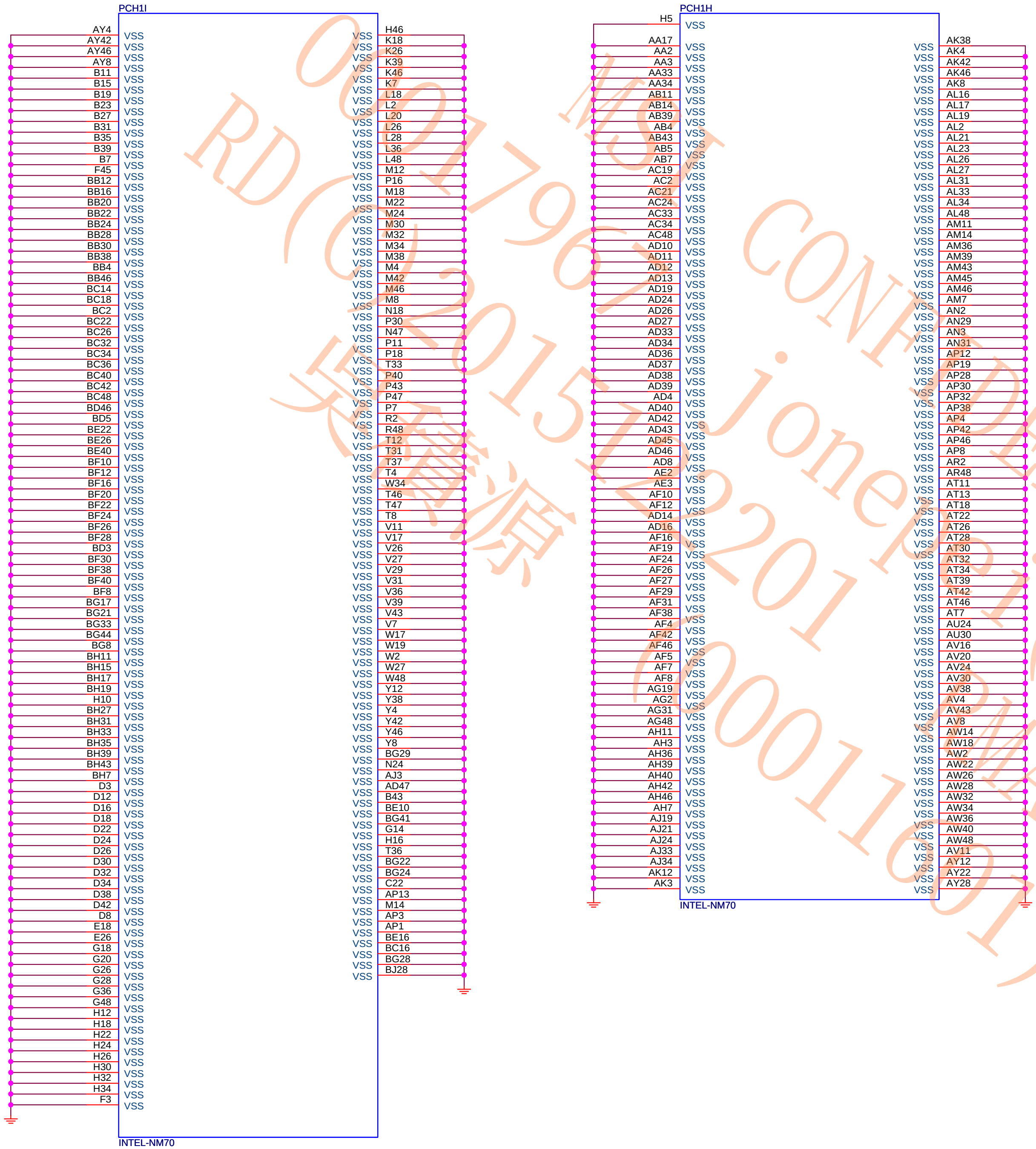

MICRO-STAR INT'L CO.,LTD

MS-A613

Size	Document Description	Rev
Custom	PCH-9 (GND)	21

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CP REQUIRED STRAPS

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

10 PCH_GPIO19 R408 10K/4 VCC3
R407 X_1K/4

DMI termination voltage override	
GPIO36	Low-- TX,RX terminated to same vlotage (DC coupling mode)default

GPIO36 --CRB connector to 3V

FDI termination voltage override	
GPIO37	Low-- TX,RX terminated to same vlotage (DC coupling mode)default

15 PCH_GPIO36 PCH_GPIO36 R374 X_10K/4 R370 10K/4 VCC3
Internal pull-DOWN

Cougar point EDS PAGE:93 This signal should not be pull high

PCH EDS1.0:GPIO36&37 should not be pulled high when strap is sampled.
PCH EDS1.1:GPIO36&37 when pins are unused as SATAGP or GPIO, terminate them to VSS via 8.2k-10k resistor.

Cougar point EDS PAGE:93 This signal should not be pull high

15 PCH_GPIO37 PCH_GPIO37 R420 X_10K/4 R419 10K/4 VCC3
Internal pull-DOWN

14 PGNT#2 R445 X_1K/4
Internal pull-up

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

10 HDA_SYNC_R R484 1K/4 3VSB

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

VCC3
R493 X_1K/4/1%
10 HDA_SDOUT_R HDA_SDOUT_R
R473 X_1K/4/1%

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

14 PGNT#3 R438 X_4.7K/4
Internal pull-up

the signal is
sampled low, this indicates that the
system is strapped to the "top-block swap" mode.
The status of this strap is readable

3VSB
10,15 SPI_HOLD_GPO# SPI_HOLD_GPO# R435 X_8.2K/4

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

VCC1_8
R344 1K/4
3 PROC_SEL R343 4.7K/4 NVR_CLE 15
Sugar Bay / Huron River IVB Ready

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

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

3VSB
15 PCH_GPIO8 PCH_GPIO8 R515 X_10K/4 R507 1K/4
Internal pull-up

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

VBAT
10 PCH_INTVRMEM PCH_INTVRMEM R450 330K/4

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

15 PCH_GPIO28 PCH_GPIO28 R434 X_1K/4
Internal pull-up

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

PLL ON DIE VR_ENABLE	
GPIO28	Internal pull high (Enable)
	Low: Disable

DSW3_3
15 PCH_GPIO27 PCH_GPIO27 R514 10K/4 R506 X_1K/4

In Deep Sleep Power Well.
If not used,require a weak pull-up(8.2k~10k) to VccDSW3_3

VBAT
12 DSPVRMEN DSPVRMEN R451 390K/4

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.

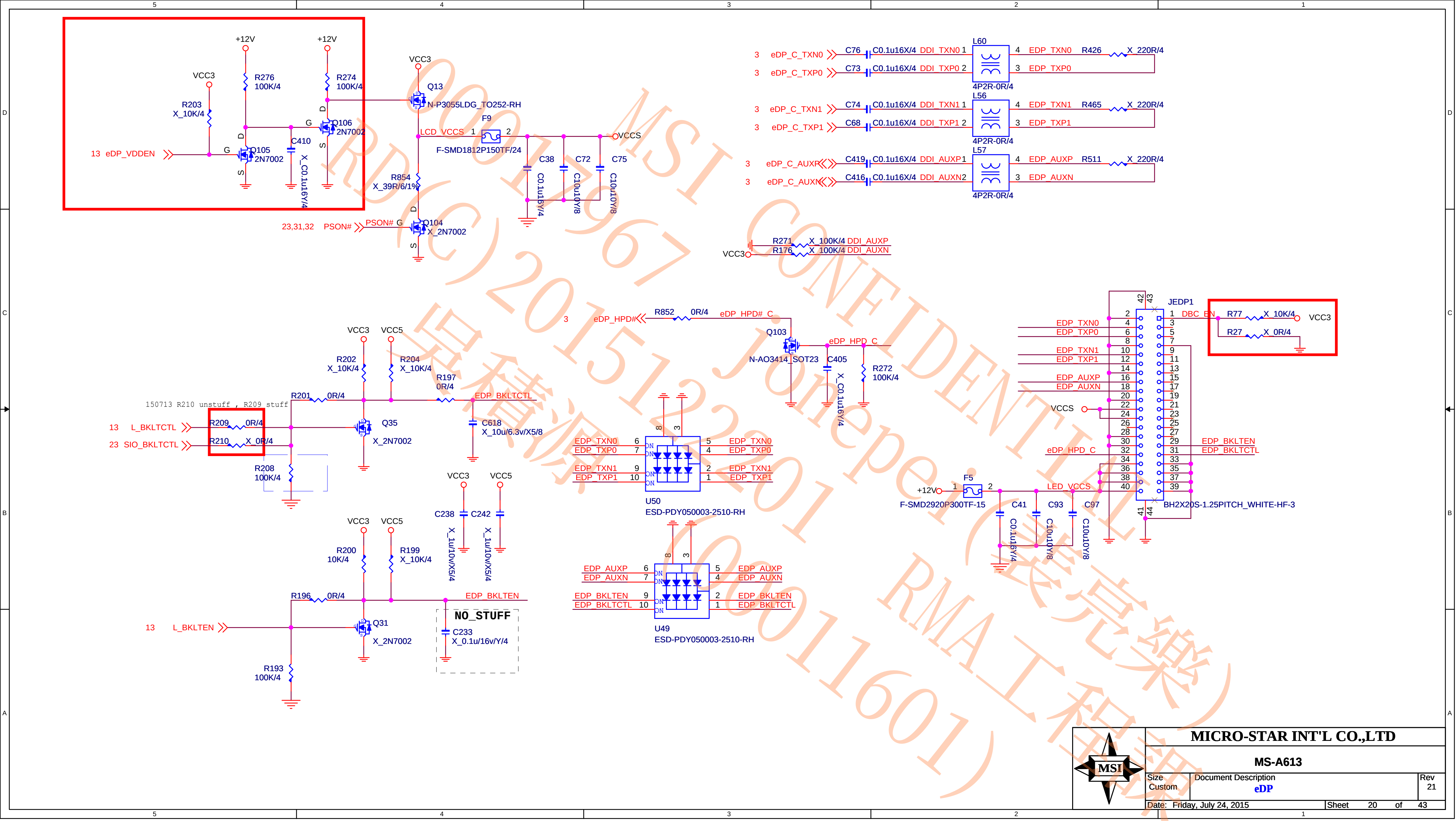
15 INIT3_3V# INIT3_3V# R486 X_1K/4
Internal pull-up

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

1. This signal should not be pulled low.
2. The internal pull-up is disabled after PLTRST# deasserts.

VCC3
10,28 SPKR SPKR R373 X_8.2K/4
Internal pull-DOWN

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



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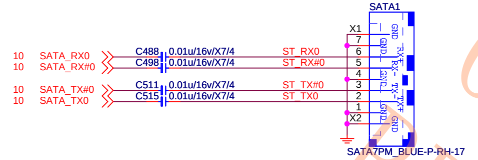
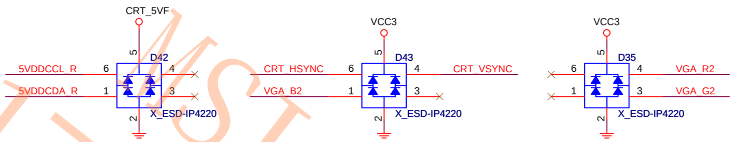
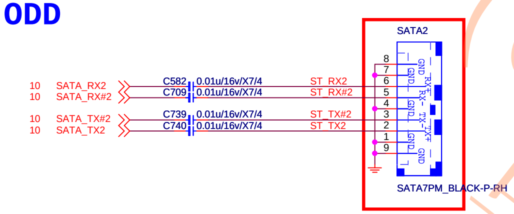
SATA HDD 2.5"

N5N-07M2101-H06(SATA3,Blue)



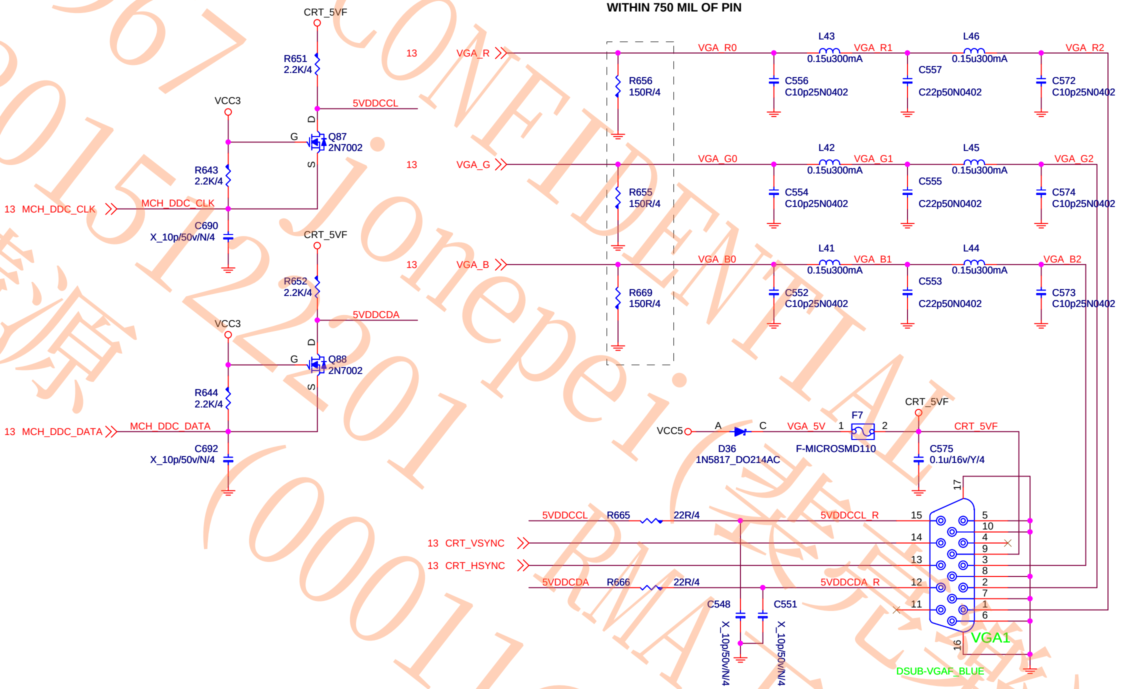


SATA ODD

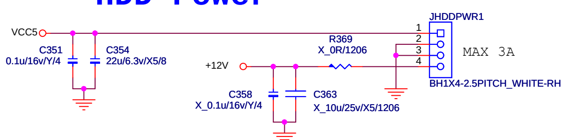


VGA (D-Sub) Connector

PLACE CLOSE TO VGA CONNECTOR,
WITHIN 750 MIL OF PIN



HDD Power

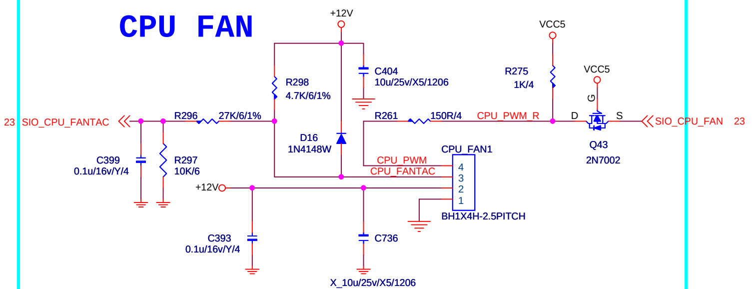


N32-1040D31-H06

更改為N32-1040D31-H06，增加定位柱

add CPU fan 1.0 change

CPU FAN



del C733 , C734

N51-15F0381-F02
Right Angle

Cougar Point Platform Controller Hub

External Design Specification (EDS)

PCH Display Interfaces

The PCH's analog port uses an integrated 350 MHz RAMDAC that can directly drive a standard progressive scan analog monitor up to a resolution of 2048x1536 pixels with 32-bit color at 75 Hz.

Each Digital port is capable of driving a digital display up to 2560x1600 @ 60 Hz using DP and 1920x 1200 @ 60 Hz using HDMI, DVI (with reduced blanking).

LVDS 15.6" 1366 x 768 pixels resolution.

MICRO-STAR INT'L CO.,LTD		
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Size: Custom	Document Description: SATA / VGA / CPUFAN	Rev: 21
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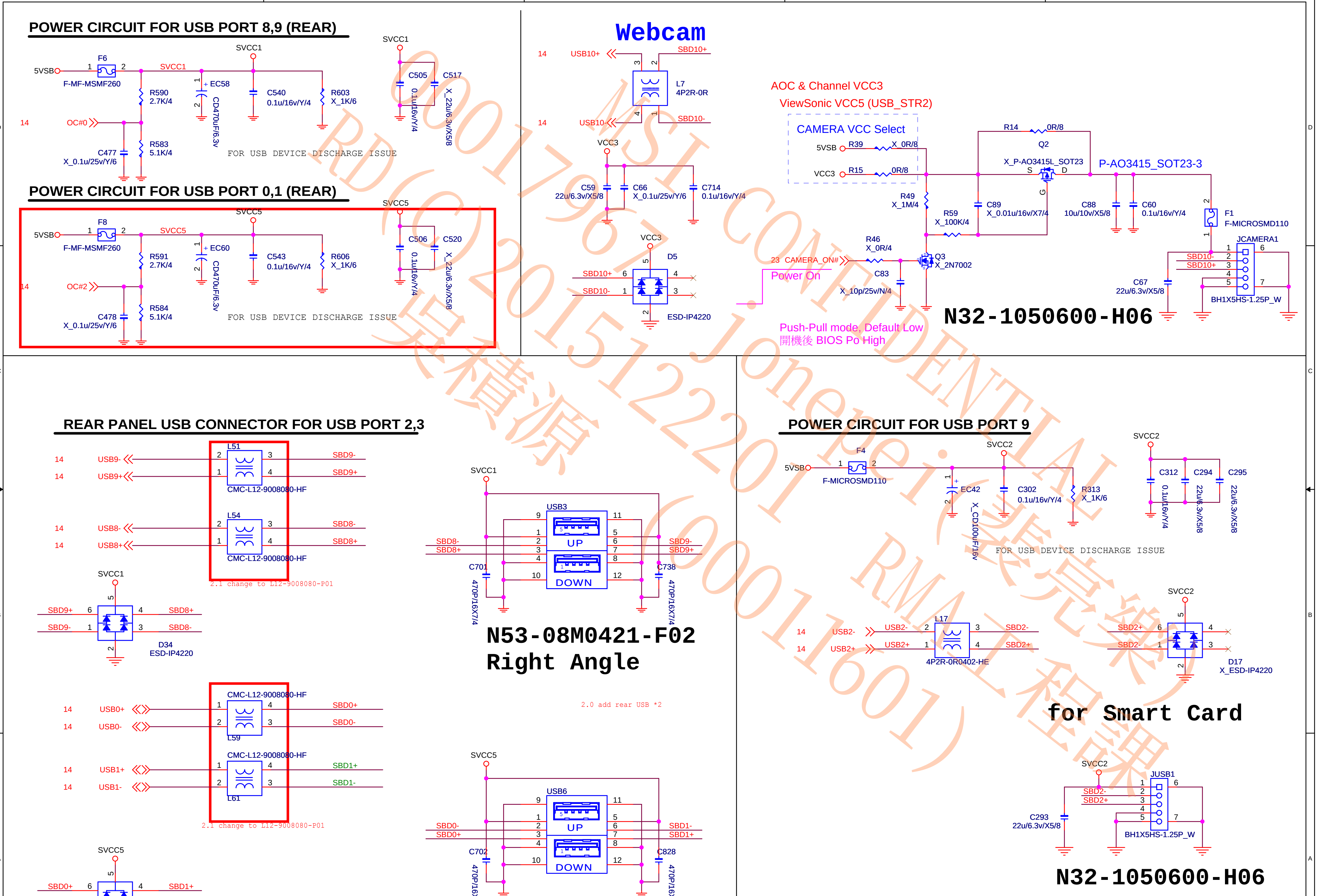

MICRO-STAR INT'L CO.,LTD

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Size: Custom | Document Description: USB / WebCAM / SmartCard | Rev: 21

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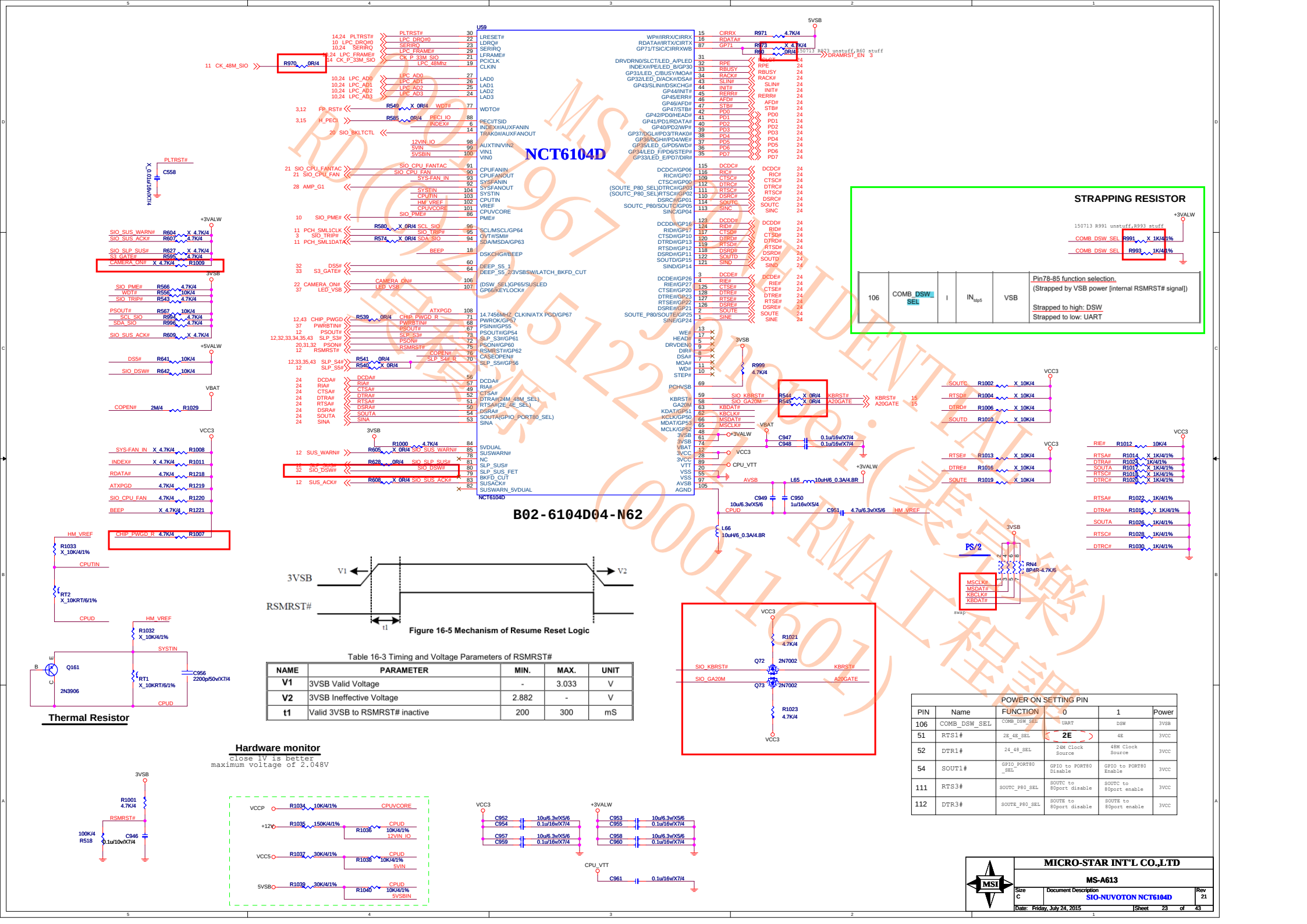

Table 16-3 Timing and Voltage Parameters of RSMRST#

NAME	PARAMETER	MIN.	MAX.	UNIT
V1	3VSB Valid Voltage	-	3.033	V
V2	3VSB Ineffective Voltage	2.882	-	V
t1	Valid 3VSB to RSMRST# inactive	200	300	mS

Figure 16-5 Mechanism of Resume Reset Logic

MICRO-STAR INT'L CO.,LTD			
MS-A613			
Size C	Document Description SIO-NUVOTON NCT6104D		Rev 21
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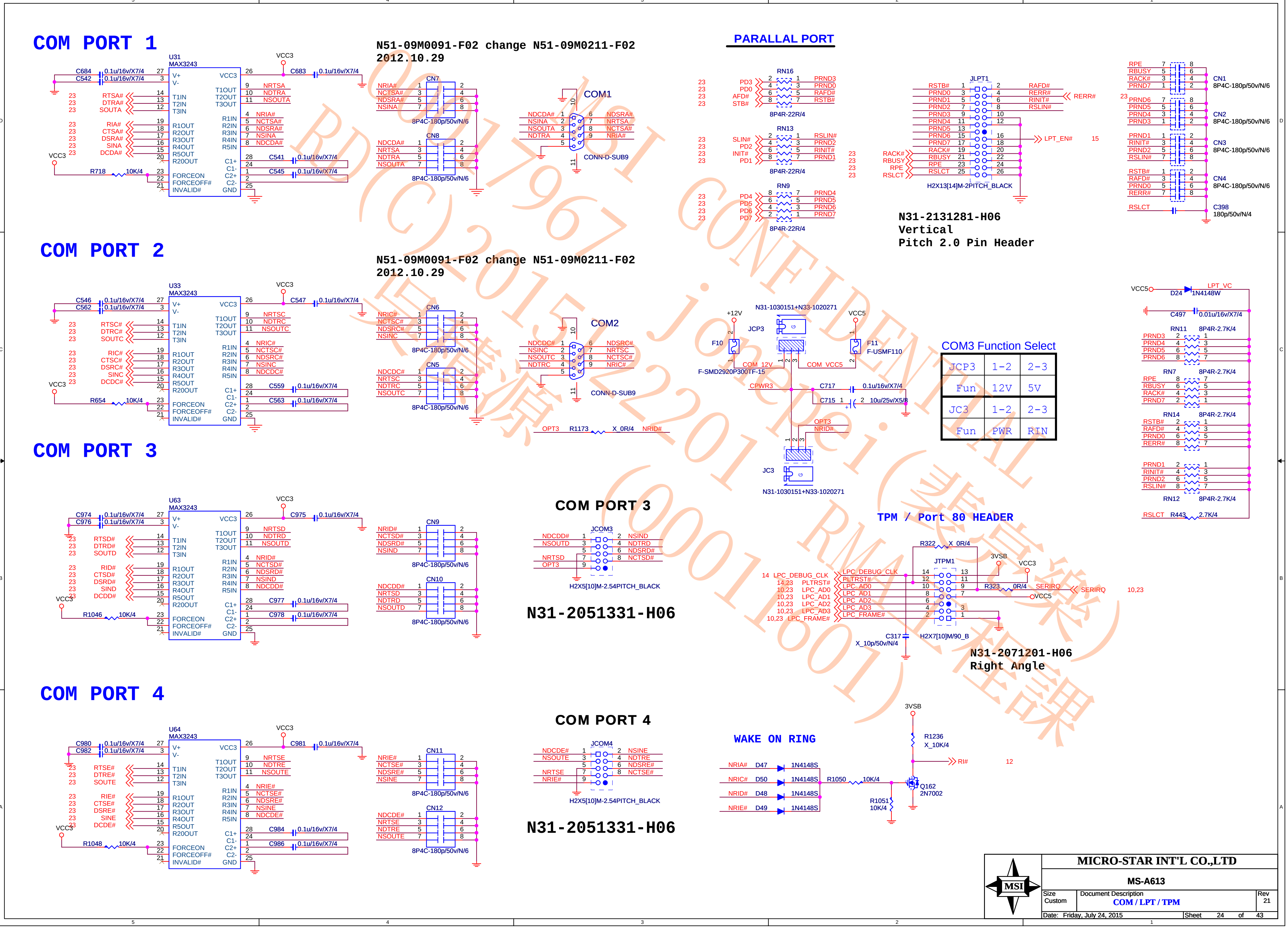
COM PORT 1
U31
MAX3243
N51-09M0091-F02 change N51-09M0211-F02
2012.10.29
COM1
CONN-D-SUB9
COM PORT 2
U33
MAX3243
N51-09M0091-F02 change N51-09M0211-F02
2012.10.29
COM2
CONN-D-SUB9
COM PORT 3
U63
MAX3243
COM PORT 3
JCOM3
H2X5[10]M-2.54PITCH_BLACK
N31-2051331-H06
COM PORT 4
U64
MAX3243
COM PORT 4
JCOM4
H2X5[10]M-2.54PITCH_BLACK
N31-2051331-H06
PARALLEL PORT
JLPT1
H2X13[14]M-2PITCH_BLACK
N31-2131281-H06
Vertical
Pitch 2.0 Pin Header
COM3 Function Select
JCP3 | 1-2 | 2-3
Fun | 12V | 5V
JC3 | 1-2 | 2-3
Fun | PWR | RIN
TPM / Port 80 HEADER
JTPM1
H2X7[10]M/90_B
N31-2071201-H06
Right Angle
WAKE ON RING
MICRO-STAR INT'L CO.,LTD
MS-A613
Size: Custom
Document Description: COM / LPT / TPM
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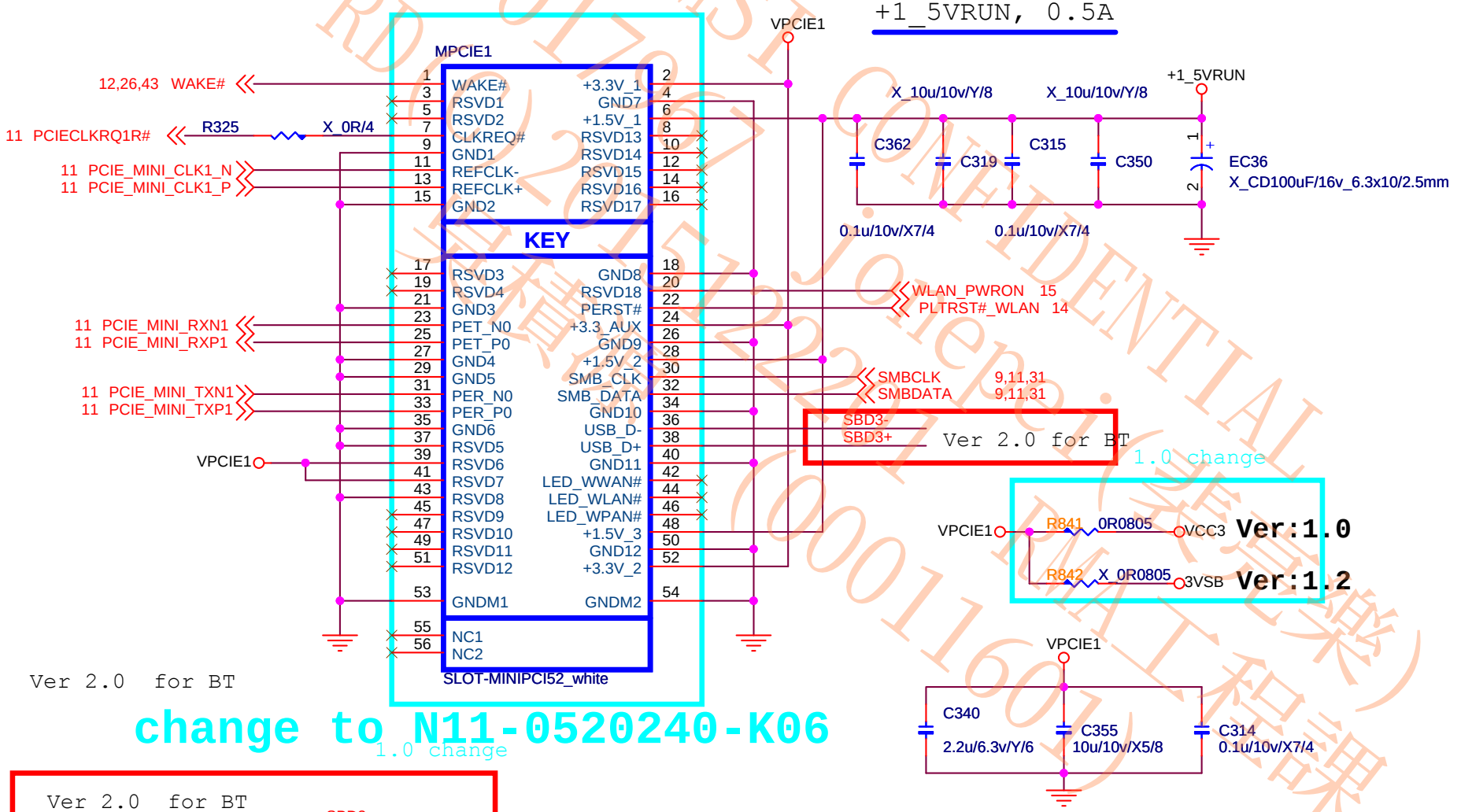
Wireless Card

VCC3, 1.5A

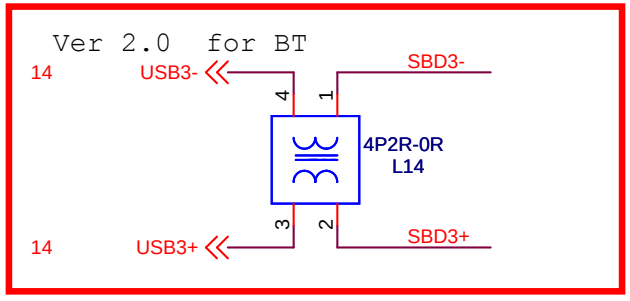
+1_5VRUN, 0.5A



Ver 2.0 for BT

change to N11-0520240-K06

1.0 change



SP2
Spacer
Support

MICRO-STAR INT'L CO.,LTD		
MS-A613		
Size A	Document Description MINI-PCIE Slot	Rev 21
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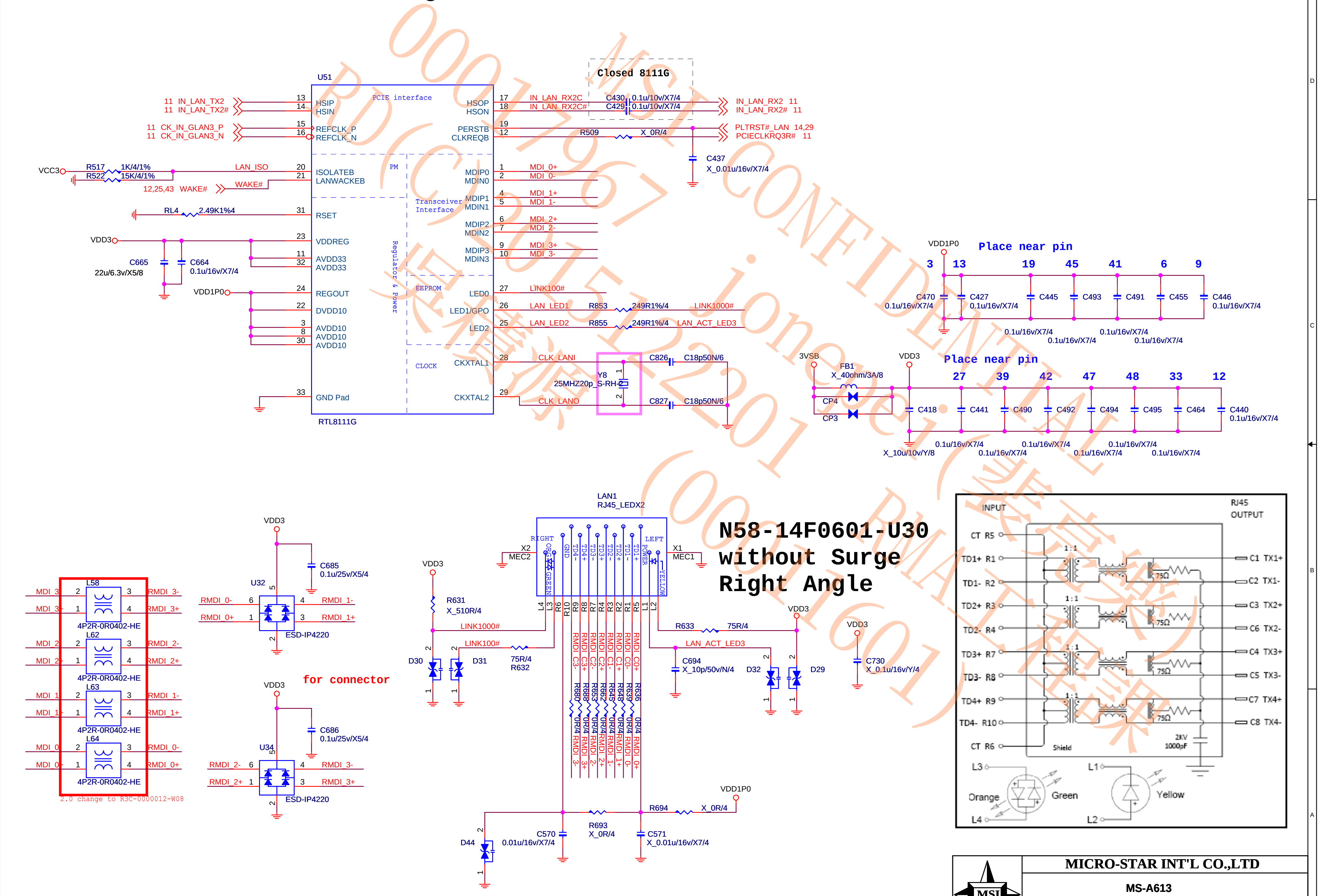
RTL8111G Giga LAN 1



MICRO-STAR INT'L CO.,LTD		
MS-A613		
Size: Custom	Document Description: Giga LAN RTL8111G	Rev: 21
Date: Friday, July 24, 2015	Sheet 26 of 43	

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-A613	
Size: Custom	Document Description: --	Rev: 21
Date: Friday, July 24, 2015	Sheet 27 of 43	

Pin 25&38請走Codec下方最短路徑直接連接，
並最少40mils線寬

11mA
Closed Codec
VCC3
C448 10u/10v/X5/8
C451 0.1u/25w/Y/6
887_LDOOUT
C679 22u/6.3v/X5/8
C513 0.1u/25w/Y/6
C360 C10u6.3X5-HF
C679緊近pin25
C513/C360緊近pin38

U26
CODEC_AMP_SD#
EPAD/SPDIF-IN
SPDIF-OUT
SDATA-OUT
SDATA-IN
SYNC
RESET#
BCLK
GPIO0/DMIC-CLK/SPDIF-OUT2
REGREF
Sense A
Sense B
MIC1-VREFO-R
MIC2-VREFO
MIC1-VREFO-L
PIN37-VREFO
LDO-IN
LINE2-VREFO
VREF
Sense C
JDREF
BEEP
GPIO1/DMIC-DATA
DVSS
LDO-OUT1
LDO-OUT2
DVDD
DVDD-IO
AVSS1
AVSS2
FRONT-R
FRONT-L
SURR-R
SURR-L
CENTER
LFE
SIDE-R
SIDE-L
LINE1-R
LINE1-L
LINE2-R
LINE2-L
MIC1-R
MIC1-L
MIC2-R
MIC2-L
CD-R
CD-GND
CD-L
ALC887-VD2-CG

HDA_SDIN0_R
C452 X_10p/50v/N/4
HDA_SDOUT
HDA_SDIN0
HDA_SYNC
HDA_RST#
R520 33R/4
HDA_BITCLK
R521 0R/4
HDA_BITCLK_RA
C453 X_0.1u/25v/Y/4
Ver 2.0 D-MIC
DMIC_CLK
R563 0R/4
DMIC_CLK_C
REGREF
C456 X_10p/50v/N/4
C447 10u/6.3v/X5/8
SENSE_A
MIC1_V_R
MIC2_VREFO
MIC1_V_L
45.8mA
LDOVDD
887_VREF
JDREF
C532 0.1u/25v/Y/6
C536 10u/6.3v/X5/8
R602 20K/4/1%
Closed Codec
DMIC_DATA
Ver 2.0 D-MIC
10,19 SPKR
AUDIO_BEEP
887_BEEP
R533 4.7K/4
R534 4.7K/4
C454 1u/10v/X5/4

LINE_OUTR
LINE_OUTL
EC59 10uF/16v/4x5x1.5mm
EC57 10uF/16v/4x5x1.5mm
LOUT_R
LOUT_L
C496 0.1u/25v/X7/6
C485 0.1u/25v/X7/6
PC_LOUT_R
PC_LOUT_L
MIC1R
MIC1L
C534 4.7u/6.3v/X5/6
C535 4.7u/6.3v/X5/6
MIC1_R
MIC1_L
MIC2R
MIC2L
C675 1u/6.3v/X5/6
C673 1u/6.3v/X5/6
MIC2-IN

B05-LC88714-R09

LOUT_R R659 75R/4
LOUT_L R660 75R/4
LOUT_RC
LOUT_LC
L39 300L/4 0.25A/0.38
L40 300L/4 0.25A/0.38
R687 22K/4/1%
R686 22K/4/1%
C565 680p/50v/X7/4
C567 680p/50v/X7/4
C566 X_680p/50v/X7/4
C568 X_680p/50v/X7/4
LOUT_RA
LOUT_LA
FRONT_JD
D39
D40 ESD-SFI0402ML080C
ESD-SFI0402ML080C
AUDIO1
JACK-AUDIOF_BL

N54-05F1221-H06
Right Angle

MIC1_V_R R681 2.2K/4/1%
MIC1_V_L R685 2.2K/4/1%
MIC1_R R661 1K/4
MIC1_L R658 1K/4
L37 300L/4 0.25A/0.38
L38 300L/4 0.25A/0.38
C561 470p/50v/X7/4
C564 470p/50v/X7/4
MIC1-R_IN
MIC1-L_IN
MIC1_JD
D38 ESD-SFI0402ML080C
D41 ESD-SFI0402ML080C
MIC1
JACK-AUDIOF_BL

R
L
G
1 3 2 4
BRD file
SCHEMATIC
1 3 5 2 4
L R G
3.5
14.0

Ver 2.0 D-MIC
VCC3 R133 0R
VCC5 R134 X_0R
DMIC_CLK
DMIC_DATA
11 DMIC_DET R564 0R/4
R4 X_0R/4
JDMIC1
BH1X5HS-1.25PITCH_WHITE-RH-1

SENSE_A
R714 5.1K/4/1%
R713 20K/4/1%
FRONT_JD
MIC1_JD
Closed Codec

5VSB
L28 60L/L8_0.9A/0.1
C533 0.1u/16v/Y/4
C487 10u/6.3v/X5/8
LDOVDD
Closed L28

C663 X_0.1u/16v/X7/4
C473 X_0.1u/16v/X7/4
C577 X_0.1u/16v/X7/4
FOR EMI

C576 X_1000p/50v/X7/4
C569 0.1u/16v/X7/4
C502 0.1u/16v/X7/4
LDOVDD
CP24
C538 X_0.1u/16v/X7/4

MIC2_VREFO R562 2.2K/4/1%
MIC2-IN
D23 ESD-PVI100505301T
JAMIC1
X_BH12HS-1.25P_Nature
150713 JAMIC1 unstuff

N32-1020900-H06

U37
PC_LOUT_L
C669 0.1u/25v/X7/6
AMP_EN#
PVCC
LOUTP
LOUTN
PVCC
C678 220p/16v/X7/4
R715 120K/4/1%
LINN
LINP
SHUTDOWN
PVDDL
LOUTP
PGNDL
PGNDL
LOUTN
PVDDL
COSC
ROSC
AGND
THMR_PAD
RINN
RINP
BYPASS
PVDDR
ROUTP
PGNDR
PGNDR
ROUTN
PVDDR
NC
VOLUME
VDD
PC_LOUT_R
C666 0.1u/25v/X7/6
C670 1u/25v/X5/6
PVCC
ROUTP
ROUTN
PVCC
PVCC
C677 10u/6.3v/X5/8
TPA2008D2PWPR_HTSSOP24

R716 2K/4/1%
R712 X_20K/4
AMP_G1
R717 2.43K/4/1%

As close as chip possible
PVCC
C671 0.1u/16v/Y/4
C461 10u/10v/X5/8
L26 80L/8_3A/0.04
5VSB
PVCC
C674 0.1u/16v/Y/4
C462 10u/10v/X5/8
L27 80L/8_3A/0.04
PVCC
C682 0.1u/16v/Y/4
C676 0.1u/16v/Y/4
C672 0.1u/16v/Y/4

ROUTP L31 80L/8_3A/0.04
ROUTN L30 80L/8_3A/0.04
AMP_R+
AMP_R-
JAMPR1
C525 680p/50v/X7/4
C524 680p/50v/X7/4
BH1X2HS-1.25P_Red

N32-10200B0-H06

LOUTP L33 80L/8_3A/0.04
LOUTN L32 80L/8_3A/0.04
AMP_L+
AMP_L-
JAMPL1
C523 680p/50v/X7/4
C522 680p/50v/X7/4
BH1X2HS-1.25P_Nature

N32-1020900-H06

VCC3
R525 10K/4
R526 10K/4
CODEC_AMP_SD#
R559 0R/4
15 AMP_DISABLE#
AMP_DISABLE#
R523 X_0R/4
R524 10K/4
D22
AMP_EN#
BAT54A_SOT23
CP23
C519 X_0.1u/16v/X7/4

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MS-A613		
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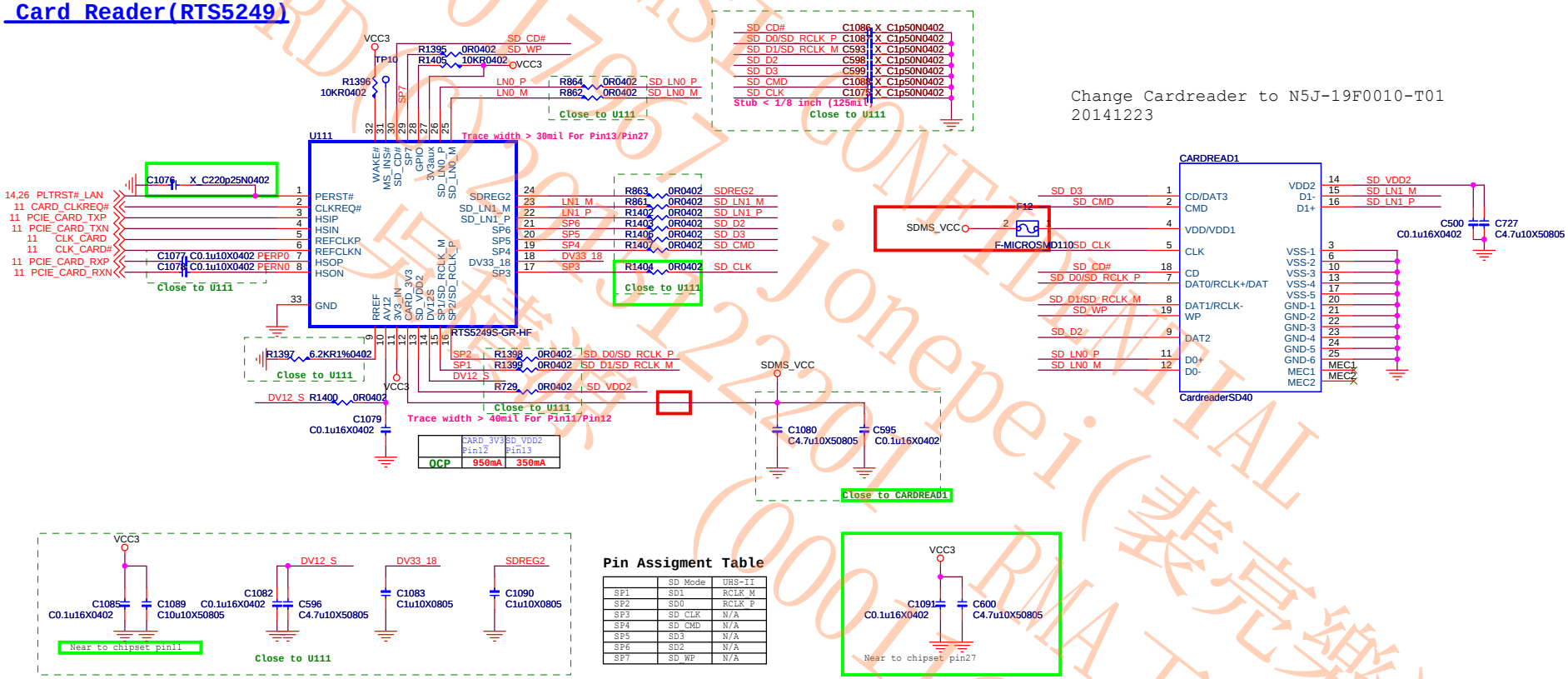
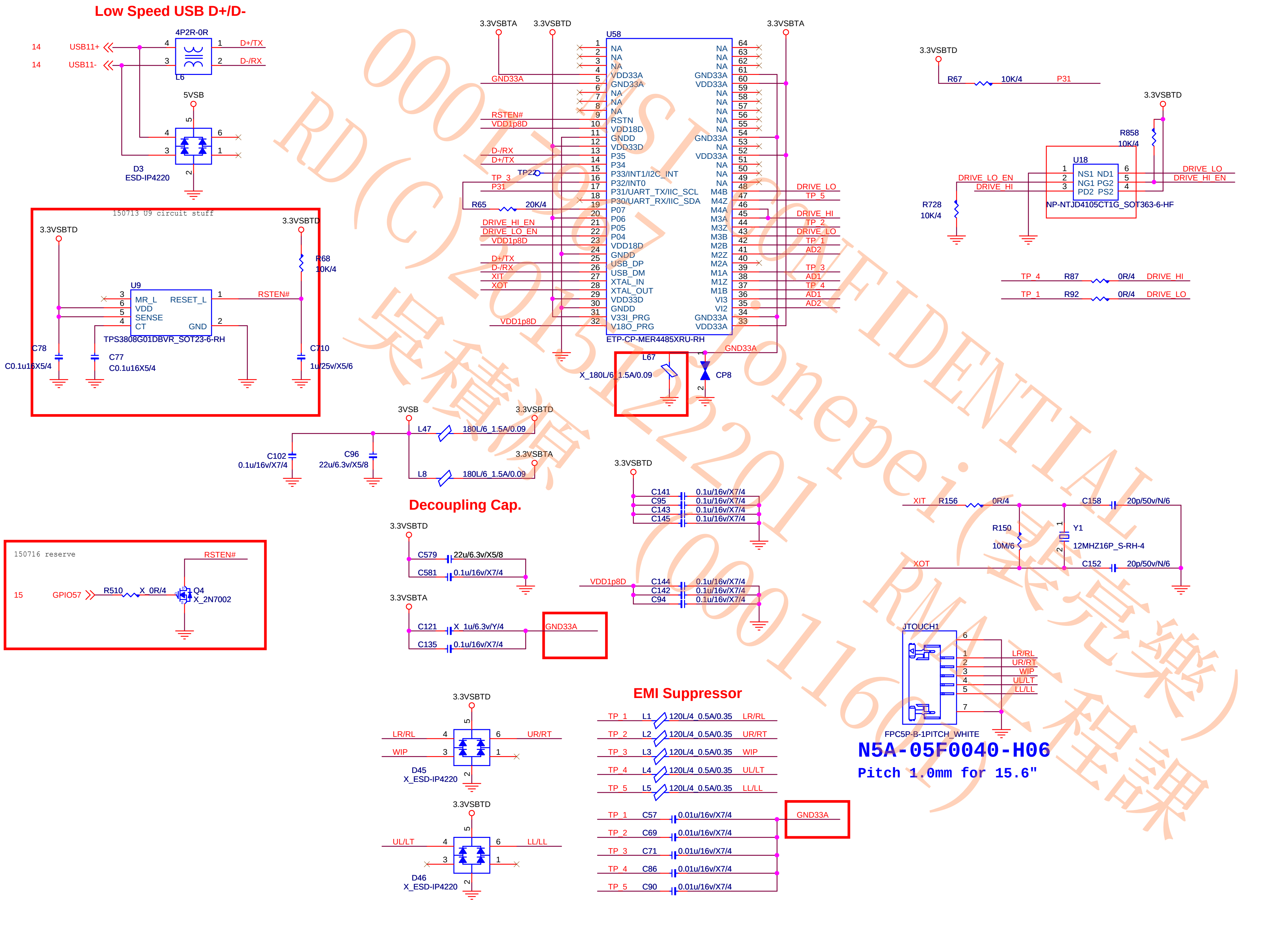
Card Reader(RTS5249)



	SD_Mode	UHS-II
SP1	SD1	RCLK_M
SP2	SD0	RCLK_P
SP3	SD_CLK	N/A
SP4	SD_CMD	N/A
SP5	SD3	N/A
SP6	SD2	N/A
SP7	SD_WP	N/A

	MICRO-STAR INT'L CO.,LTD	
	MS-A613	
Size: Custom	Document Description: CARD READER_RTS5249	Rev: 21
Date: Monday, July 27, 2015	Sheet 29 of 43	



MICRO-STAR INT'L CO.,LTD

MS-A613

Size: Custom | Document Description: Single Touch Panel IC_MER4485 | Rev 21

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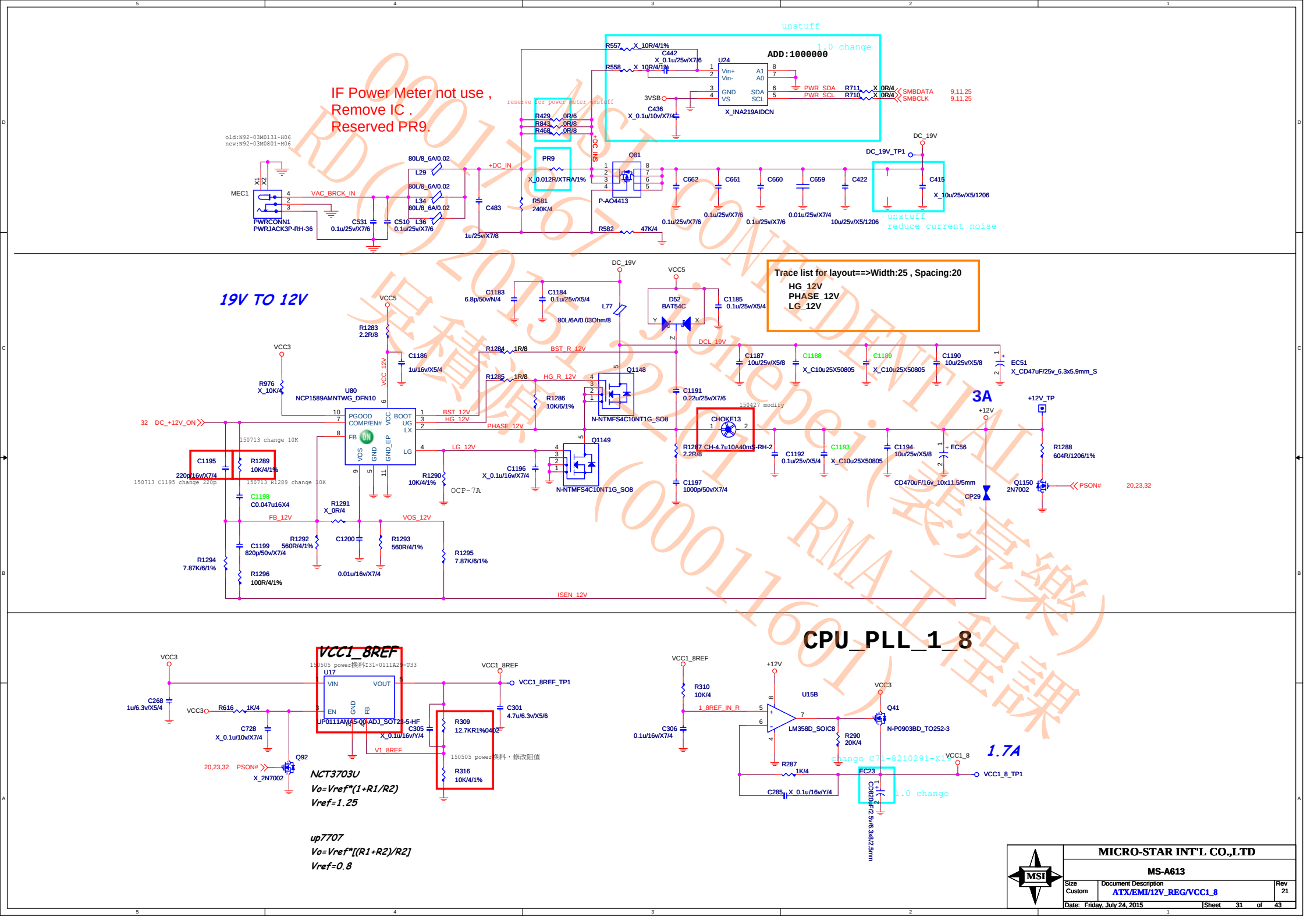
unstuff
1.0 change
ADD:1000000
R557 X_10R/4/1%
C442 X_0.1u/25v/X7/6
R558 X_10R/4/1%
U24
X_INA219AIDCN
3VSB
C436 X_0.1u/10v/X7/4
PWR_SDA R711 X_0R/4
PWR_SCL R710 X_0R/4
SMBDATA 9,11,25
SMBCLK 9,11,25
IF Power Meter not use ,
Remove IC .
Reserved PR9.
reserve for power meter unstuff
R429 0R/6
R843 0R/8
R468 0R/8
PR9
X_0.012R/XTRA/1%
SW_DC+
Q81
P-AO4413
R581 240K/4
R582 47K/4
+DC_IN
old:N92-03M0131-H06
new:N92-03M0801-H06
MEC1
PWRCONN1
PWRJACK3P-RH-36
VAC_BRCK_IN
C531 0.1u/25v/X7/6
C510 0.1u/25v/X7/6
L29 80L/8_6A/0.02
L34 80L/8_6A/0.02
L36 80L/8_6A/0.02
C483 1u/25v/X7/8
C662 0.1u/25v/X7/6
C661 0.1u/25v/X7/6
C660 0.1u/25v/X7/6
C659 0.01u/25v/X7/4
C422 10u/25v/X5/1206
DC_19V
DC_19V_TP1
C415 X_10u/25v/X5/1206
unstuff
reduce current noise
19V TO 12V
Trace list for layout==>Width:25 , Spacing:20
HG_12V
PHASE_12V
LG_12V
C1183 6.8p/50v/N/4
C1184 0.1u/25v/X5/4
L77 80L/6A/0.03Ohm/8
D52 BAT54C
C1185 0.1u/25v/X5/4
DCL_19V
R1283 2.2R/8
VCC_12V
C1186 1u/16v/X5/4
R1284 1R/8
BST_R_12V
R1285 1R/8
HG_R_12V
R976 X_10K/4
U80
NCP1589AMNTWG_DFN10
PGOOD
COMP/EN#
FB
VCC
BOOT
UG
LX
LG
VOS
GND
GND_EP
BST_12V
HG_12V
PHASE_12V
Q1148
N-NTMFS4C10NT1G_SO8
R1286 10K/6/1%
C1191 0.22u/25v/X7/6
C1187 10u/25v/X5/8
C1188 X_C10u25X50805
C1189 X_C10u25X50805
C1190 10u/25v/X5/8
EC51 X_CD47uF/25v_6.3x5.9mm_S
150427 modify
3A
+12V_TP
32 DC_+12V_ON
150713 change 10K
C1195 220p/16v/X7/4
150713 C1195 change 220p
R1289 10K/4/1%
150713 R1289 change 10K
C1198 C0.047u16X4
R1291 X_0R/4
FB_12V
VOS_12V
Q1149
R1290 10K/4/1%
OCP~7A
C1196 X_0.1u/16v/X7/4
CHOKE13
R1287 CH-4.7u10A40mS-RH-2
2.2R/8
C1192 0.1u/25v/X5/4
C1193
C1194 10u/25v/X5/8
EC56
CD470uF/16v_10x11.5/5mm
CP29
Q1150 2N7002
PSON# 20,23,32
R1288 604R/1206/1%
C1199 820p/50v/X7/4
R1292 560R/4/1%
C1200 0.01u/16v/X7/4
R1293 560R/4/1%
R1294 7.87K/6/1%
R1295 7.87K/6/1%
R1296 100R/4/1%
ISEN_12V
VCC1_8REF
150505 power換料131-0111A2?-U33
U17
UP0111AM5-00-ADJ_SOT23-5-HF
VIN
VOUT
EN
GND
FB
C268 1u/6.3v/X5/4
R616 1K/4
C728 X_0.1u/10v/X7/4
C305 X_0.1u/16v/Y/4
V1_8REF
R309 12.7KR1%0402
150505 power換料，修改阻值
R316 10K/4/1%
C301 4.7u/6.3v/X5/6
VCC1_8REF_TP1
Q92
X_2N7002
NCT3703U
Vo=Vref*(1+R1/R2)
Vref=1.25
up7707
Vo=Vref*[(R1+R2)/R2]
Vref=0.8
CPU_PLL_1_8
R310 10K/4
1_8REF_IN_R
C306 0.1u/16v/X7/4
U15B
LM358D_SOIC8
Q41
N-P0903BD_TO252-3
R290 20K/4
1.7A
Change C71-8210291-X19
R287 1K/4
C285 X_0.1u/16v/Y/4
EC23
CD820uF/2.5v/6.3x6/2.5mm
VCC1_8
VCC1_8_TP1
1.0 change
MICRO-STAR INT'L CO.,LTD
MS-A613
Size Custom
Document Description ATX/EMI/12V_REG/VCC1_8
Rev 21
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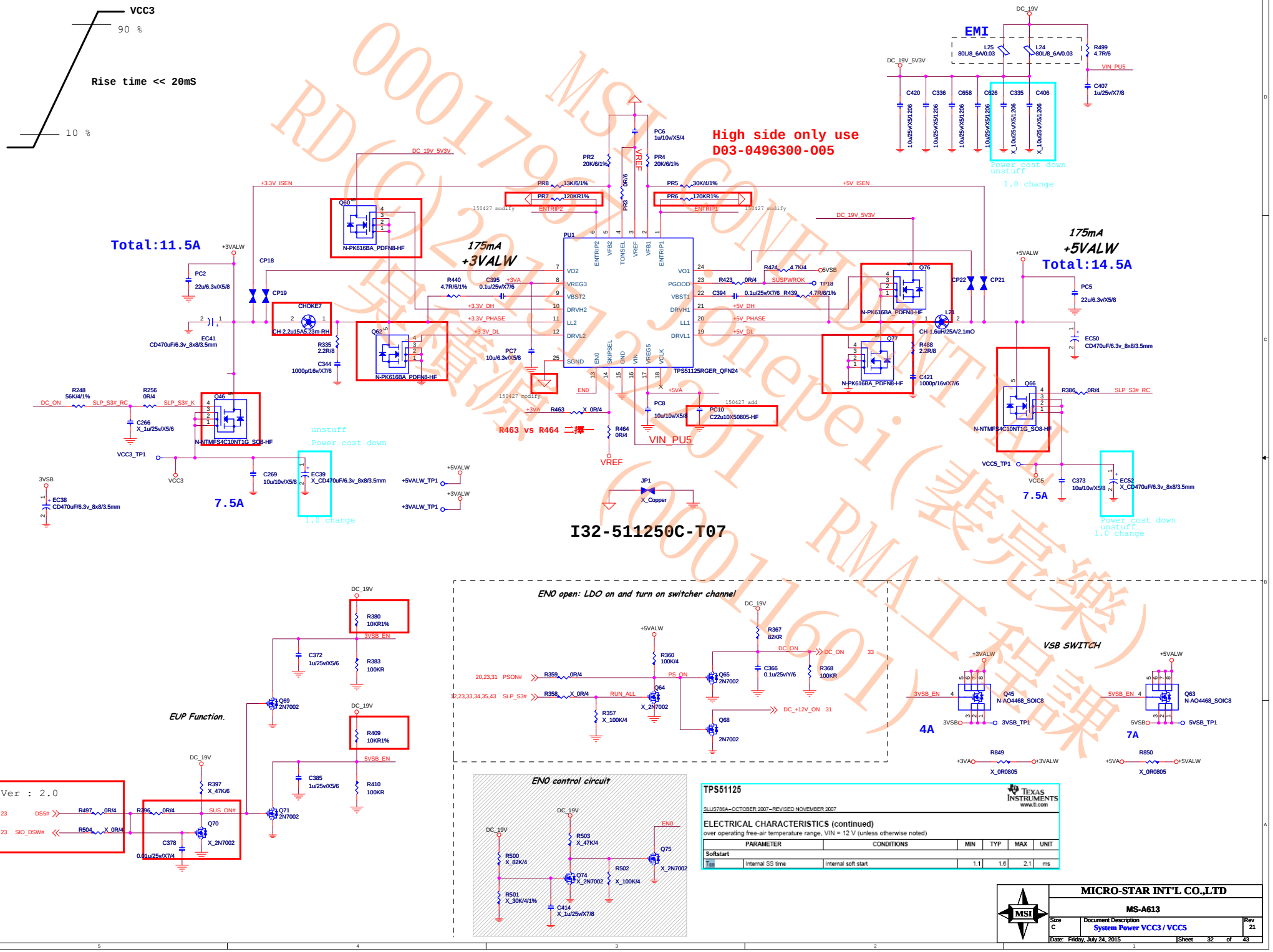
VCC3
90 %
10 %
Rise time << 20mS
High side only use
D03-0496300-005
EMI
Total:11.5A
175mA
+3VALW
Total:14.5A
+5VALW
I32-511250C-T07
R463 vs R464 二擇一
7.5A
4A
7A
VSB SWITCH
ENO open: LDO on and turn on switcher channel
EUP Function.
ENO control circuit
Ver : 2.0
TPS51125
ELECTRICAL CHARACTERISTICS (continued)
over operating free-air temperature range, VIN = 12 V (unless otherwise noted)
Softstart
Internal SS time
Internal soft start
1.1
1.6
2.1
ms
MICRO-STAR INT'L CO.,LTD
MS-A613
System Power VCC3 / VCC5
Friday, July 24, 2015
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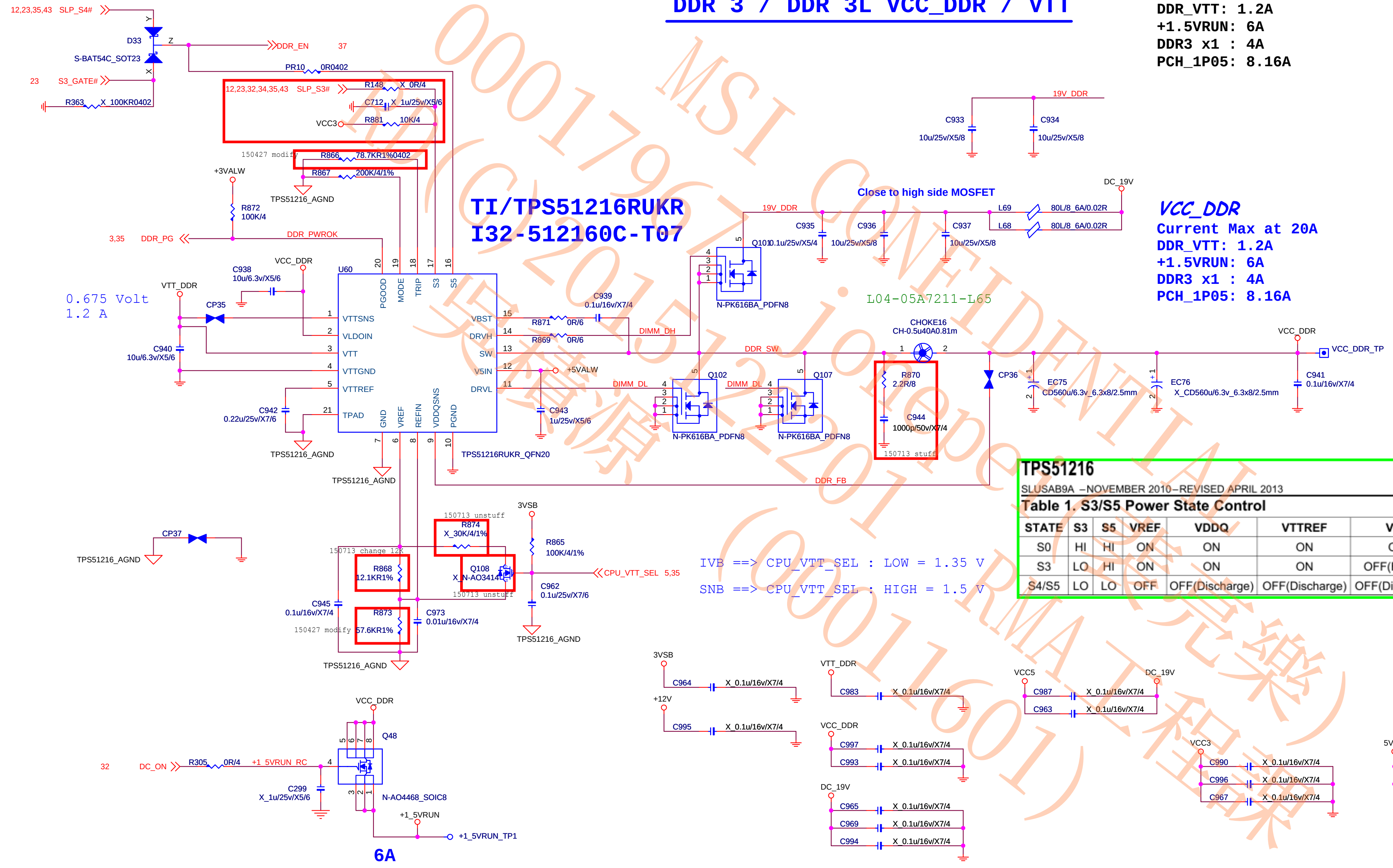
DDR 3 / DDR 3L VCC_DDR / VTT

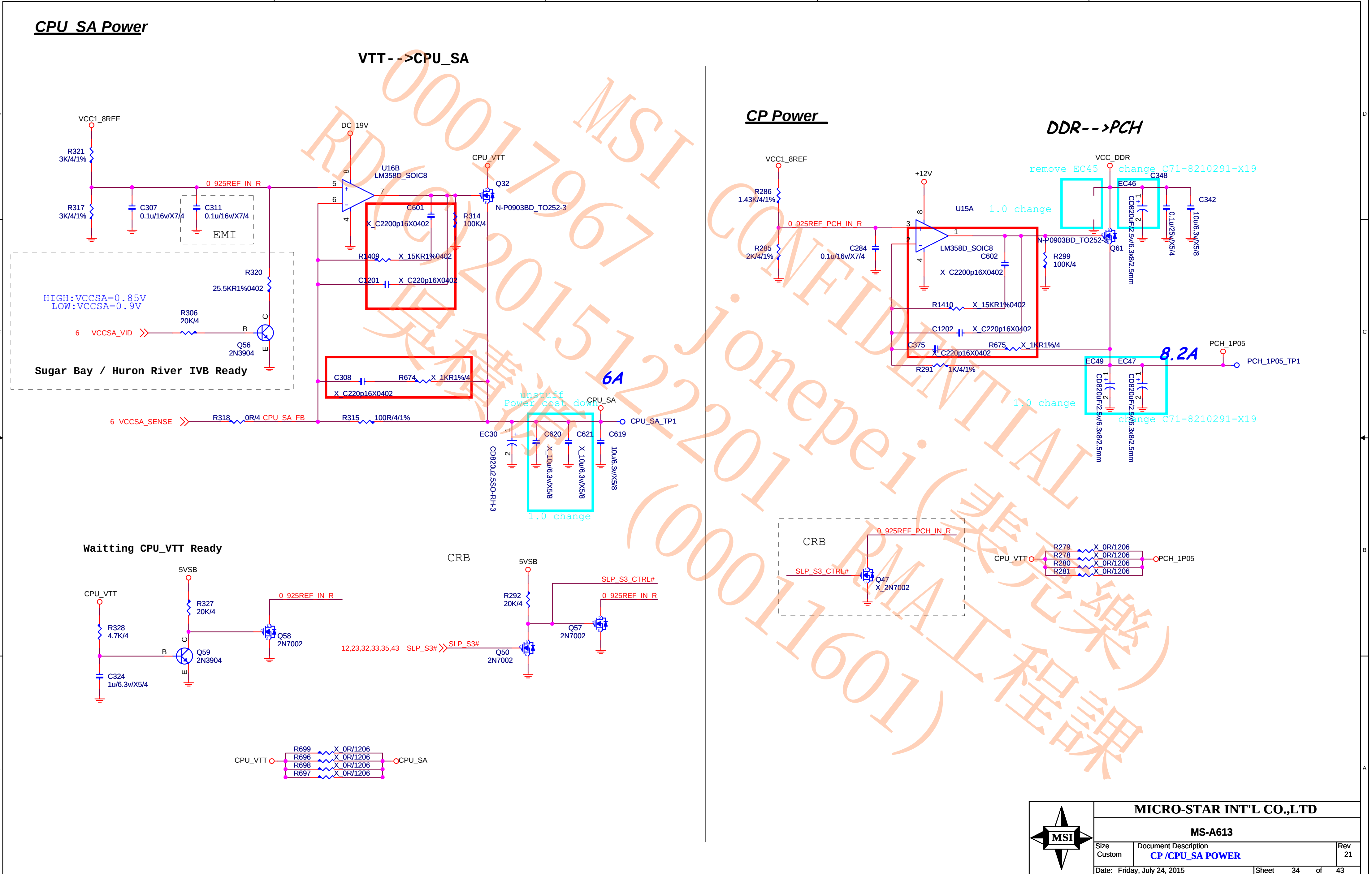
VCC_DDR
Current Max at 20A
DDR_VTT: 1.2A
+1.5VRUN: 6A
DDR3 x1 : 4A
PCH_1P05: 8.16A

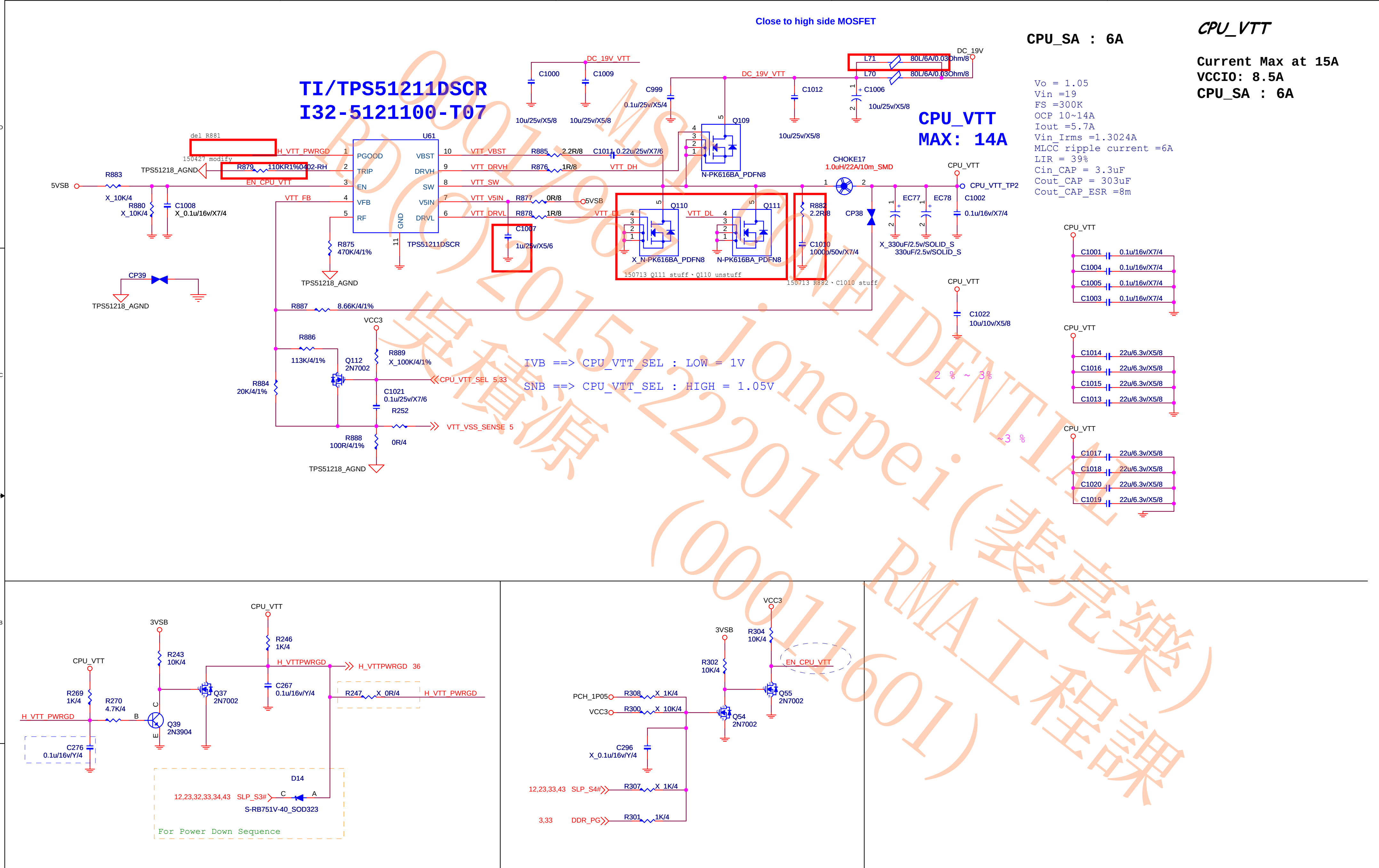


TPS51216
SLUSAB9A – NOVEMBER 2010 – REVISED APRIL 2013

Table 1. S3/S5 Power State Control

STATE	S3	S5	VREF	VDDQ	VTTREF	VTT
S0	HI	HI	ON	ON	ON	ON
S3	LO	HI	ON	ON	ON	OFF(High-Z)
S4/S5	LO	LO	OFF	OFF(Discharge)	OFF(Discharge)	OFF(Discharge)





1. Rocest = Iout*DCR/Iocset ; Iocset = 10uA

If DCR = 1m ; Iout = 20A, Rocest = 20A*1m/10uA --> Rocset = 2K

2. Csen = L/Rocset*DCR

If DCR = 1m ; L = 1U, Csen = 1U/2K*1m --> Csen = 0.5U

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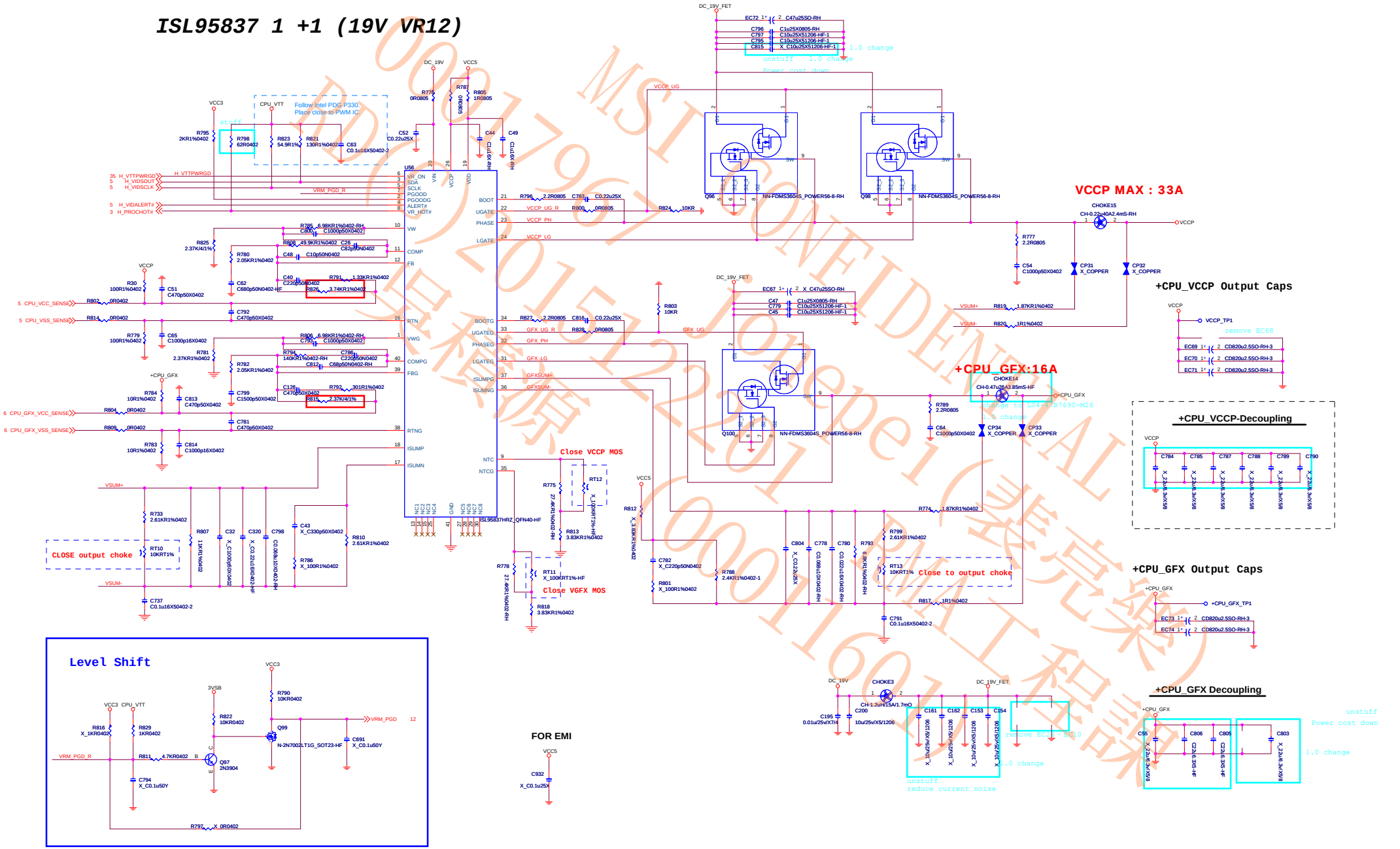
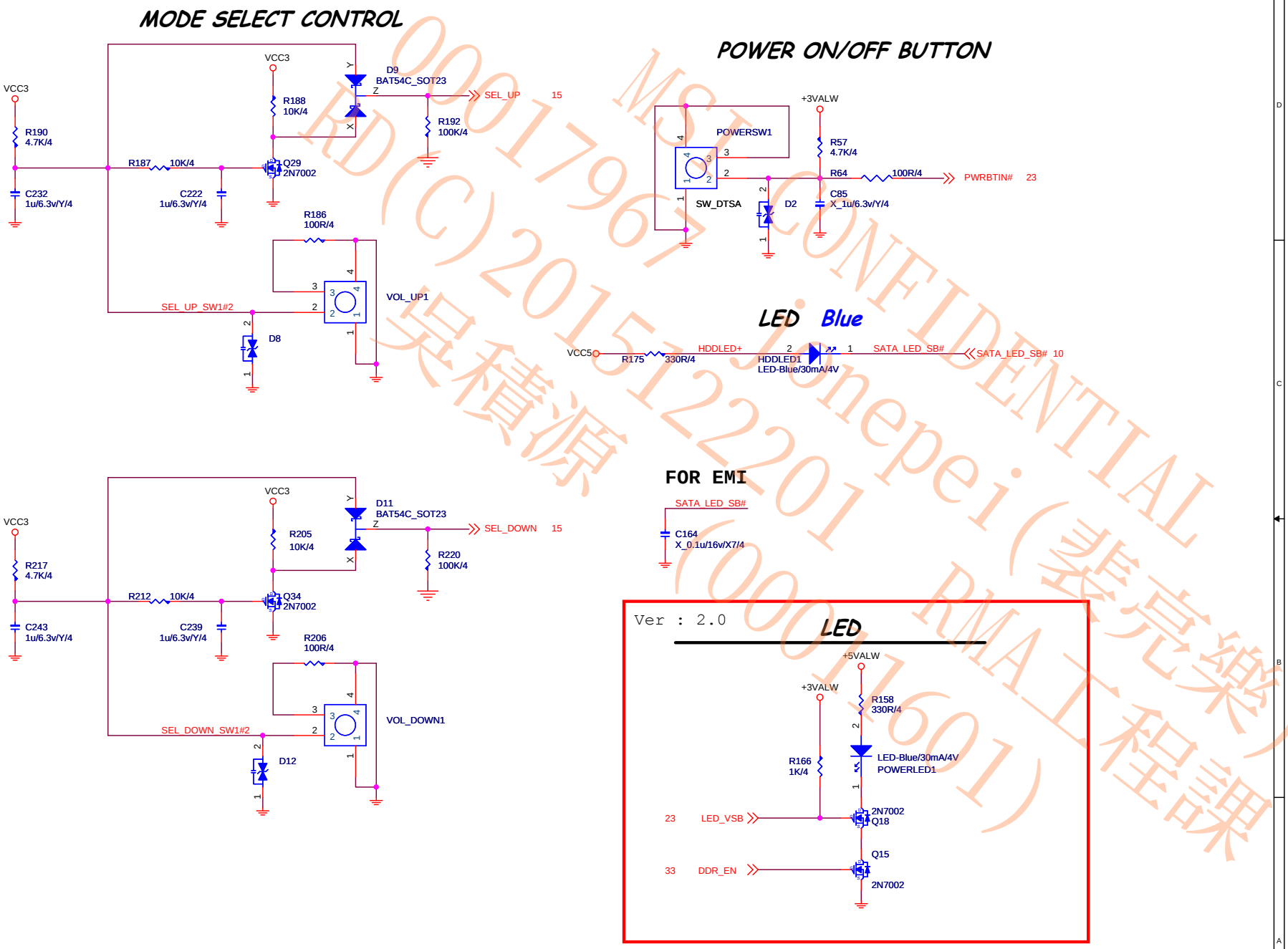
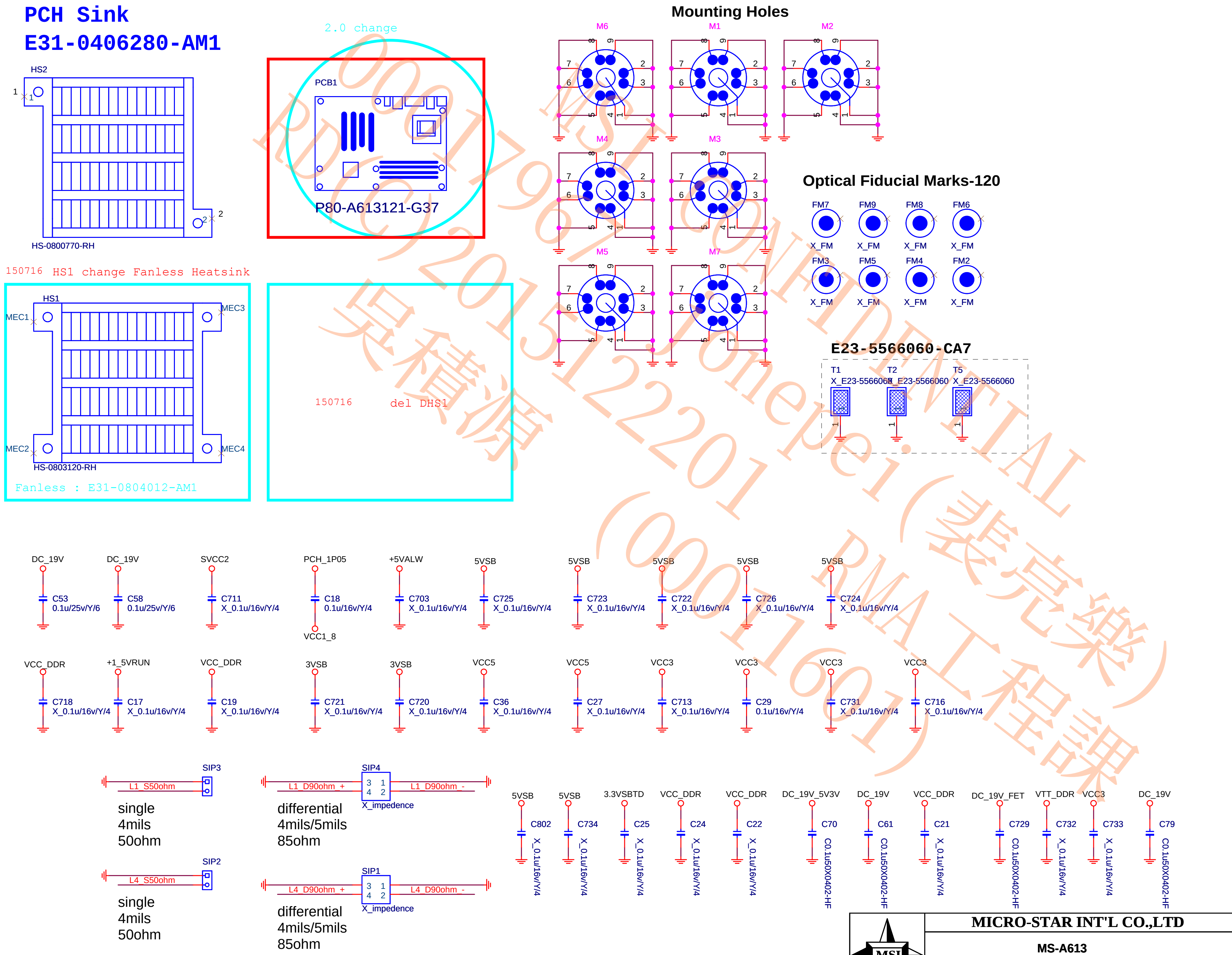
ISL95837 1 +1 (19V VR12)





MSI	MICRO-STAR INT'L CO.,LTD	
	MS-A613	
Size: Custom	Document Description: HOT KEY / LED	Rev: 21
Date: Friday, July 24, 2015	Sheet 37 of 43	



MICRO-STAR INT'L CO.,LTD

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Size	Document Description	Rev
Custom	Manual parts	21

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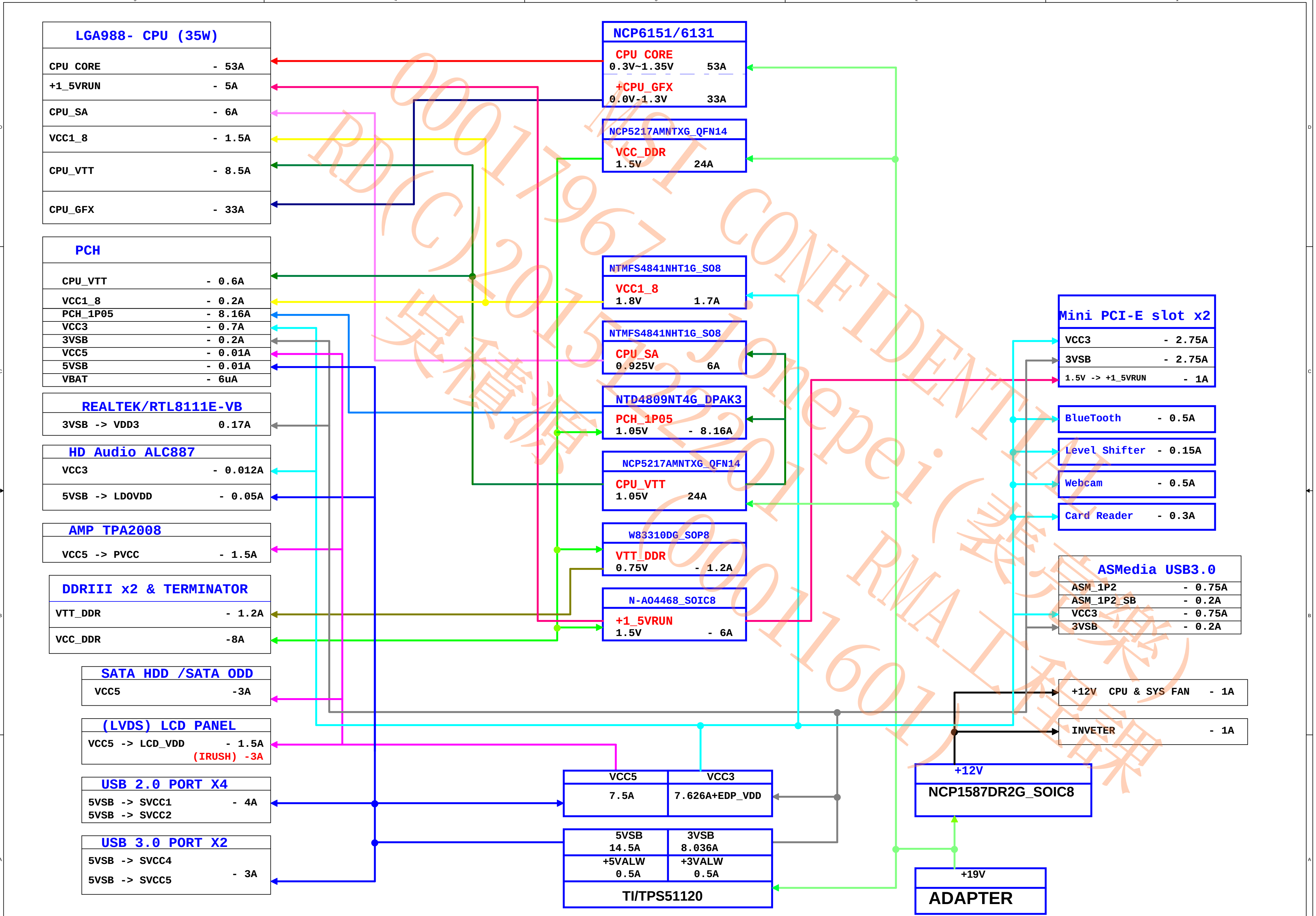

MICRO-STAR INT'L CO.,LTD

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Size	Document Description	Rev
C	Power Delivery	21

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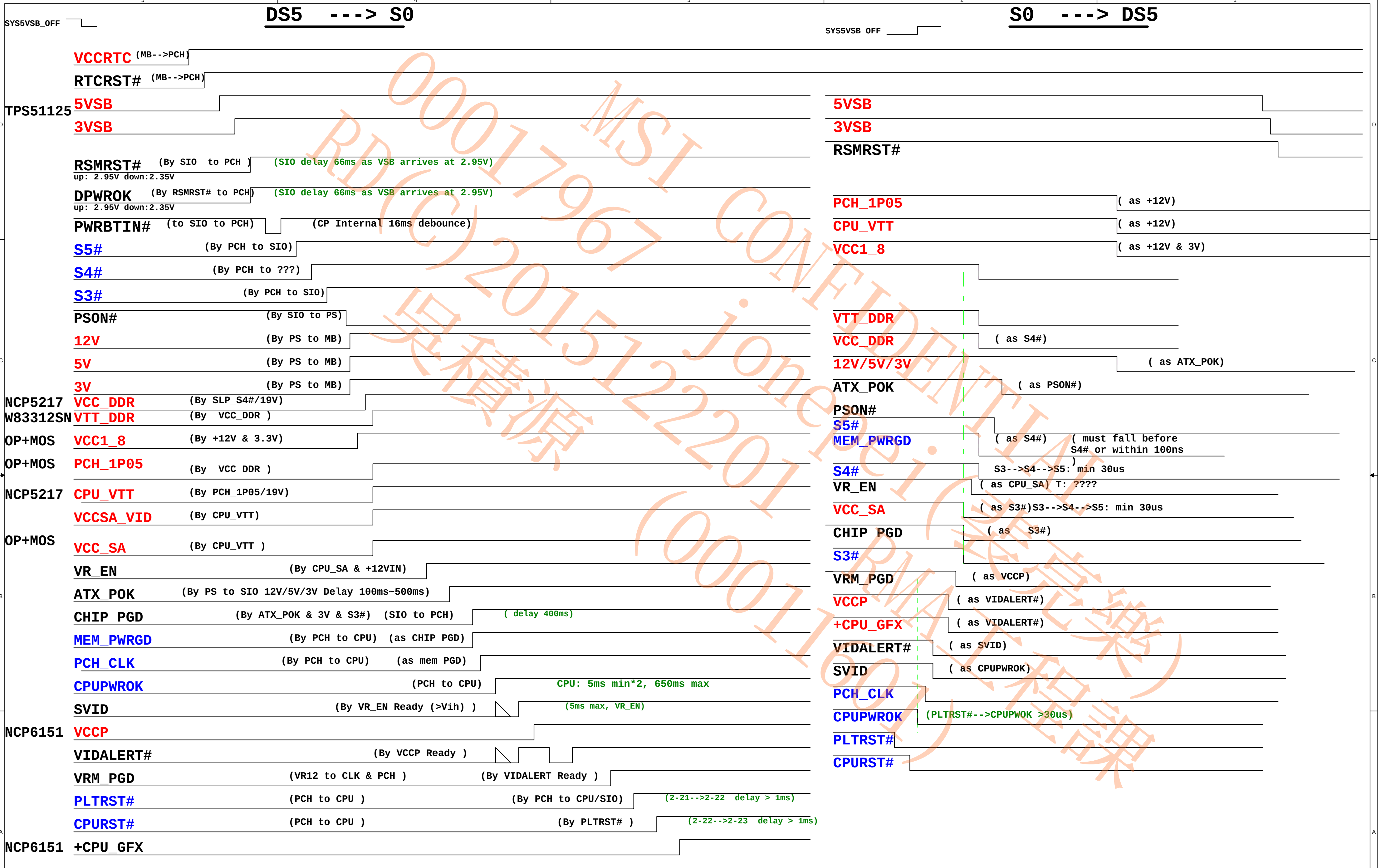

MICRO-STAR INT'L CO.,LTD

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Size	Document Description	Rev
Custom	POWER SEQENCES	21

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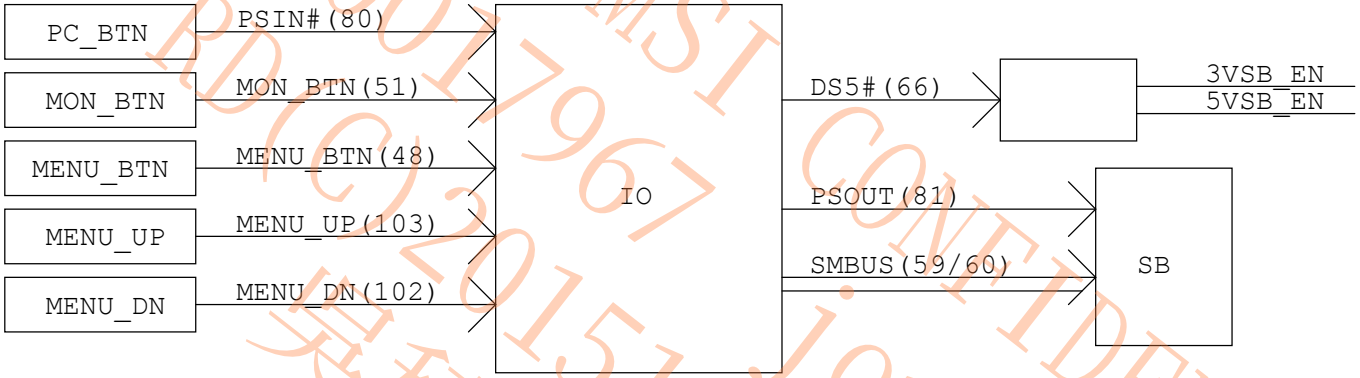

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-A613	
Size: Custom	Document Description: S I/O BLOCK DIAGRAM	Rev: 21
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A613(A615) Schematic History(2.0)

2015/03/26 2.0 circuit(change from A613 1.0)

LVDS線路改EDP線路
SIO(U59)改NCT6104
COM port 2個改4個
Lan connector 2個改1個，chip 換PTL8111G
AMIC線路改DMIC線路
Card reader改SD 4.0[chip(U111)換RT5249]
U58改MER4485(single touch)
Asmedia USB3.0(U57)換ASM1042AE
DDR power(U60)換TPS51216
CPU VTT power(U61)換TPS51211

2015/07/13

Page.38	del HS1，DHS1 change E31-0804012-AM1
Page.33	Q108、R847 unstuff R868 change 12.1K
Page.23	R973、R1009 unstuff , R60 stuff
Page.20	R210 unstuff , R209 stuff
Page.30	U9 circuit stuff
Page.36	power team suggestion: R826 change 3.74K , R815 change 2.37K
Page.33	R870、C944 stuff
Page.35	Q110 unstuff , Q111 stuff R882、C1010 stuff
Page.31	R1289 change 10K , C1195 change 220p
Page.28	JAMIC1 unsuff
Page.23	R991 unstuff,R993 stuff

PCB 2.1 Hostory

2015/07/14

Page.33	U60 pin.17 , add R881、C712、R148(reserve).

2015/07/20

Page.36	CP31、CP32、CP33、CP34 footprint change NC_93519_2

2015/07/22

Page.22	L51、L54、L59、L61 change L12-9008080-P01
Page.X	Add C657、C667、C668 for EMI

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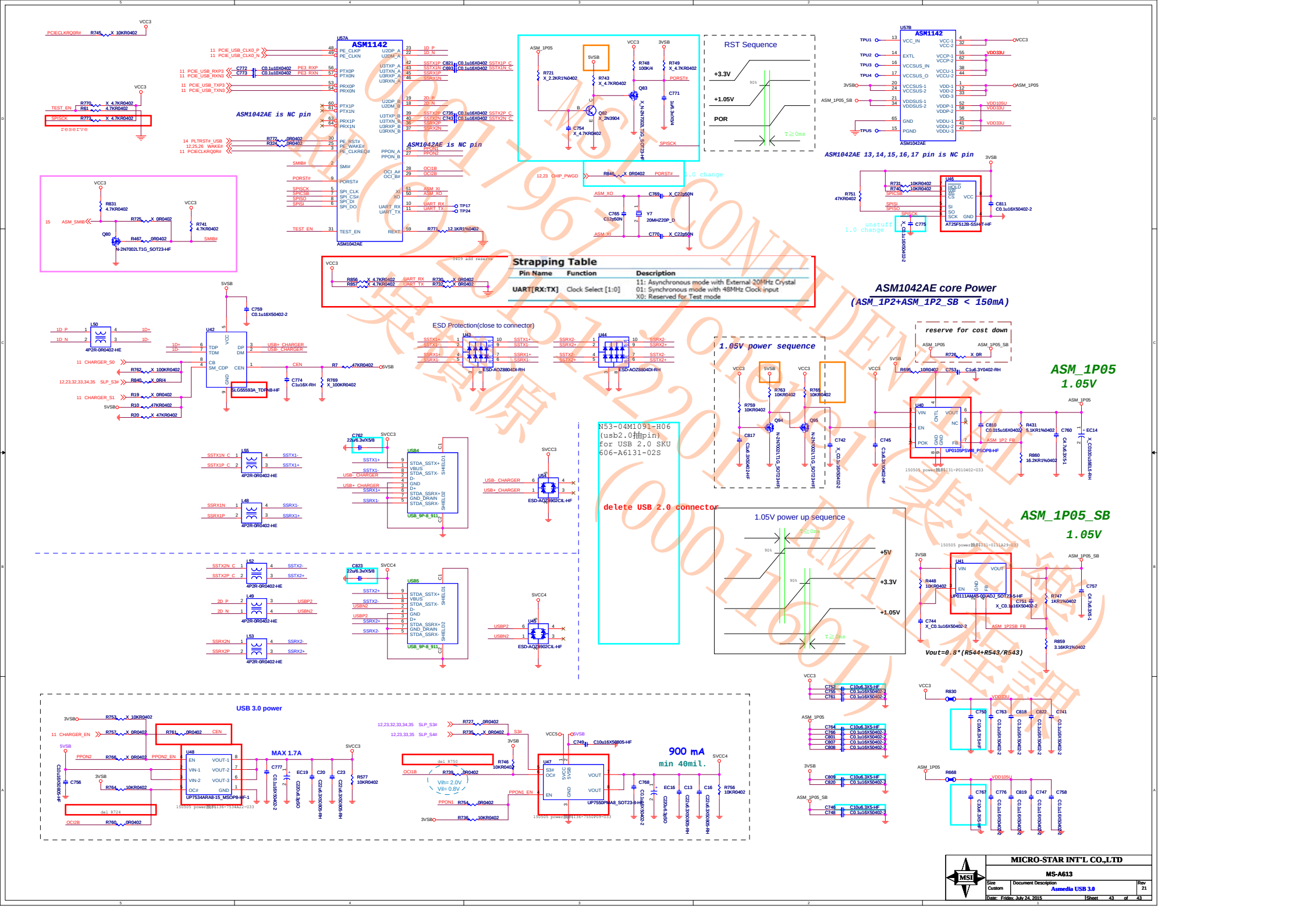
ASM1042AE is NC pin
ASM1042AE is NC pin
ASM1042AE 13,14,15,16,17 pin is NC pin
RST Sequence
+3.3V
+1.05V
POR
Strapping Table
Pin Name
Function
Description
UART[RX:TX]
Clock Select [1:0]
11: Asynchronous mode with External 20MHz Crystal
01: Synchronous mode with 48MHz Clock input
X0: Reserved for Test mode
ASM1042AE core Power
(ASM_1P2+ASM_1P2_SB < 150mA)
ESD Protection(close to connector)
1.05V power sequence
reserve for cost down
ASM_1P05
1.05V
ASM_1P05_SB
1.05V
N53-04M1091-H06
(usb2.0单port)
for USB 2.0 SKU
606-A6131-02S
delete USB 2.0 connector
1.05V power up sequence
+5V
+3.3V
+1.05V
Vout=0.8*(R544+R543/R543)
USB 3.0 power
MAX 1.7A
900 mA
min 40mil.
MICRO-STAR INT'L CO.,LTD
MS-A613
Asmedia USB 3.0
Rev 21
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