MS-7A48

ATX:243*183

Ver: 1.0

Intel -SkyLake-S plamform

CPU:

LGA1151

*CPU POWER PAK *3 Phase*

*GT POWER PAK *2 Phase*

Onboard Chip:

HD Audio Codec: ALC887

SIO: NCT6793D

Flash ROM: SPI 64 MB

DP to VGA: ITE6515

Main Memory:

*DDR4 * 2 (Dual Channel)*

ACPI:

5VDAUL:uP7501

5VDIMM:uP7501

3VSB:GS7133

3VDSW:GS7116S

Expansion Slots:

*PCI Express (X16) Slot * 1*

*PCI Express (X1) Slot * 3*

System Chipset:

PCH-H :H110

PWM:

VCORE - RT3606BC

DDR - RT8231AGQW

DDR - VPP25 - MP21473

PCH(1.0V) - RT8125E

VCCSA - RT8125E

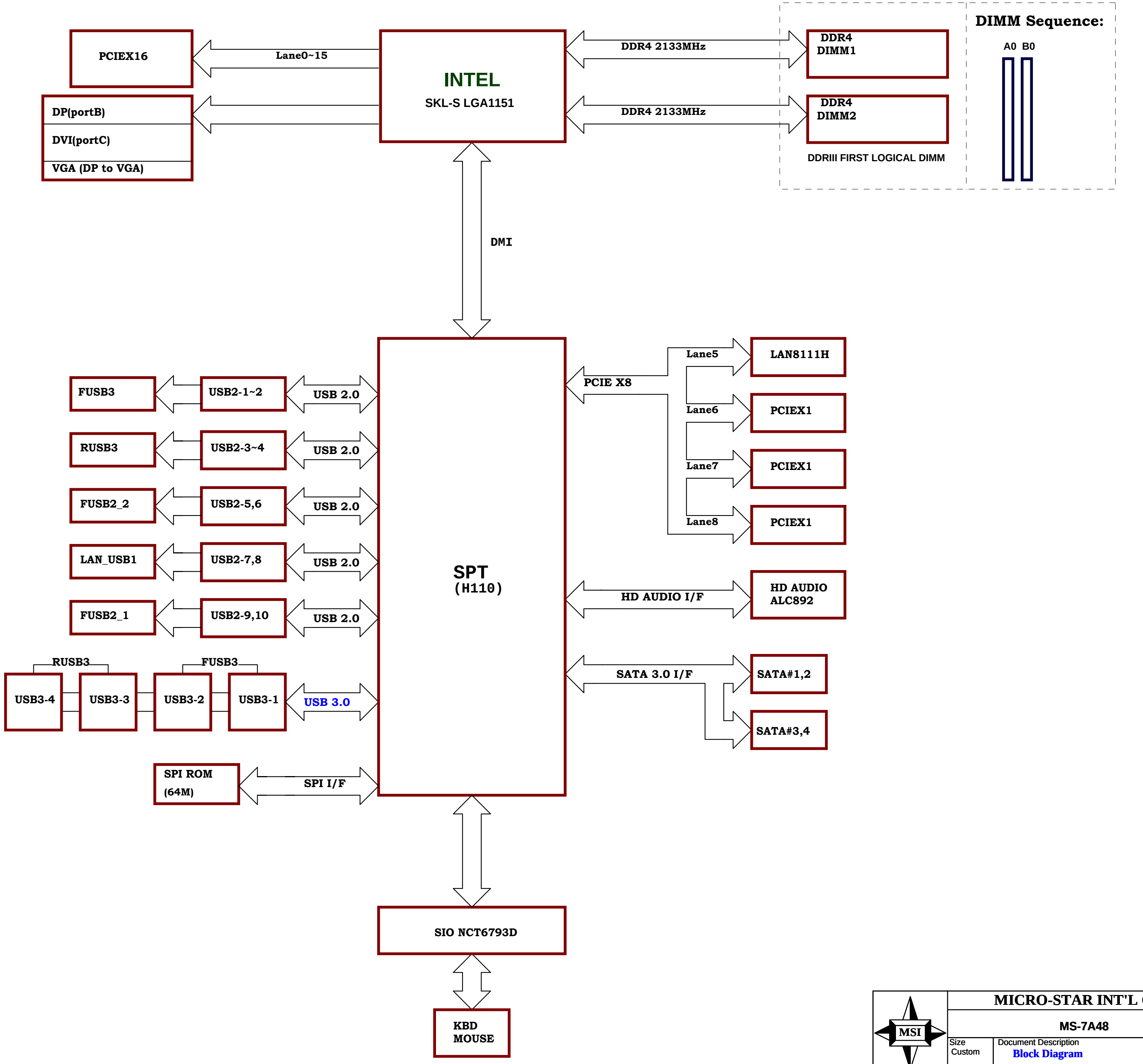
VCCIO - NB681(Converter)

LDO:

VCCSTPLL - GS7133

MICRO-STAR INT'L CO.,LTD		
MS-7A48		
Size: Custom	Document Description: Cover Sheet	Rev: 1.0
Date: Wednesday, January 06, 2016	Sheet 1 of 49	

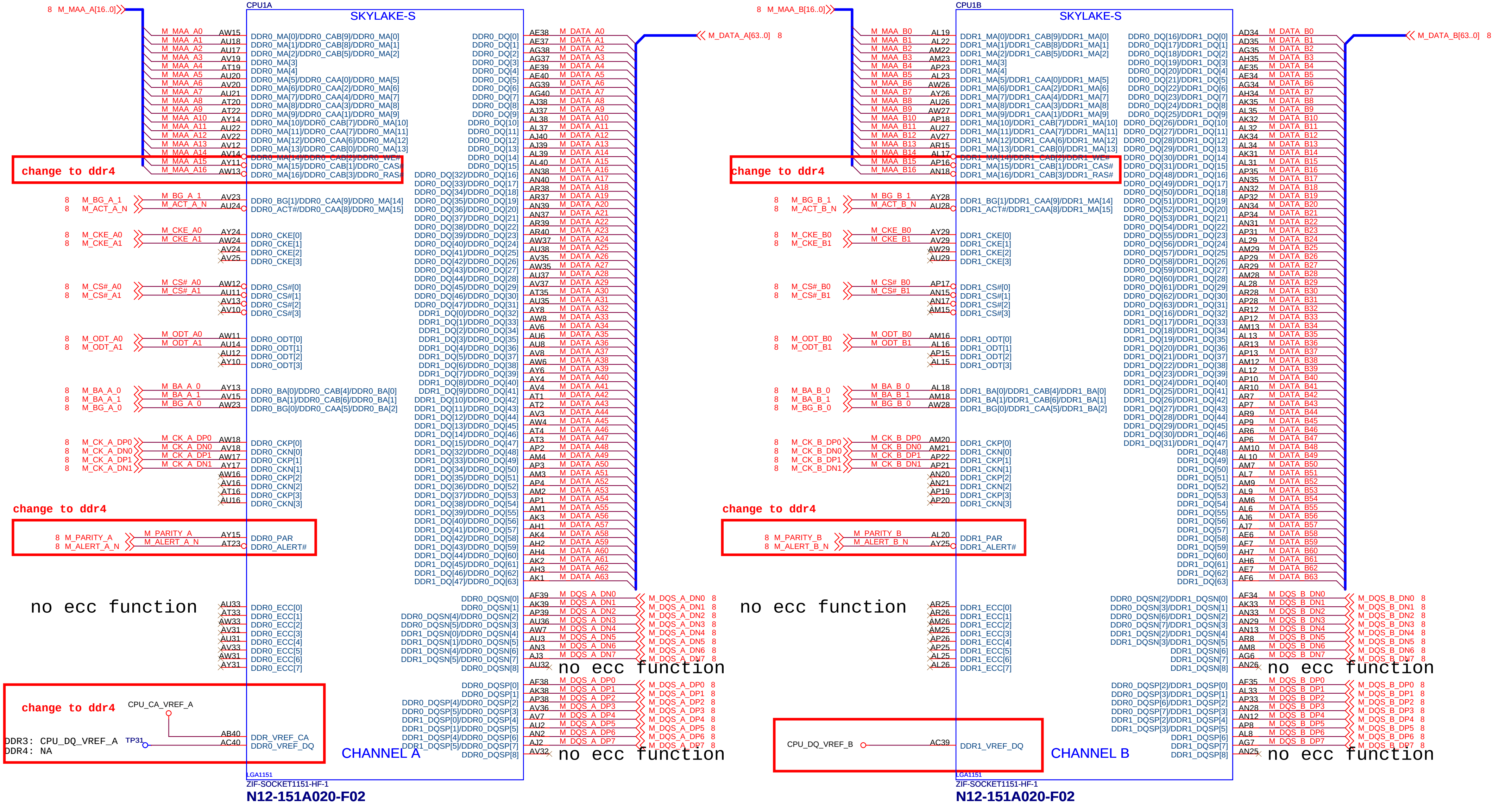
MS-7A48 Block Diagram



Slot Sequence:

PCIE X16	(By CPU)
PCIE X1	(By PCH)
PCIE X1	(By PCH)
PCIE X1	(By PCH)

MICRO-STAR INT'L CO.,LTD		
MS-7A48		
Size: Custom	Document Description: Block Diagram	Rev: 1.0
Date: Friday, December 25, 2015	Sheet 2 of 49	

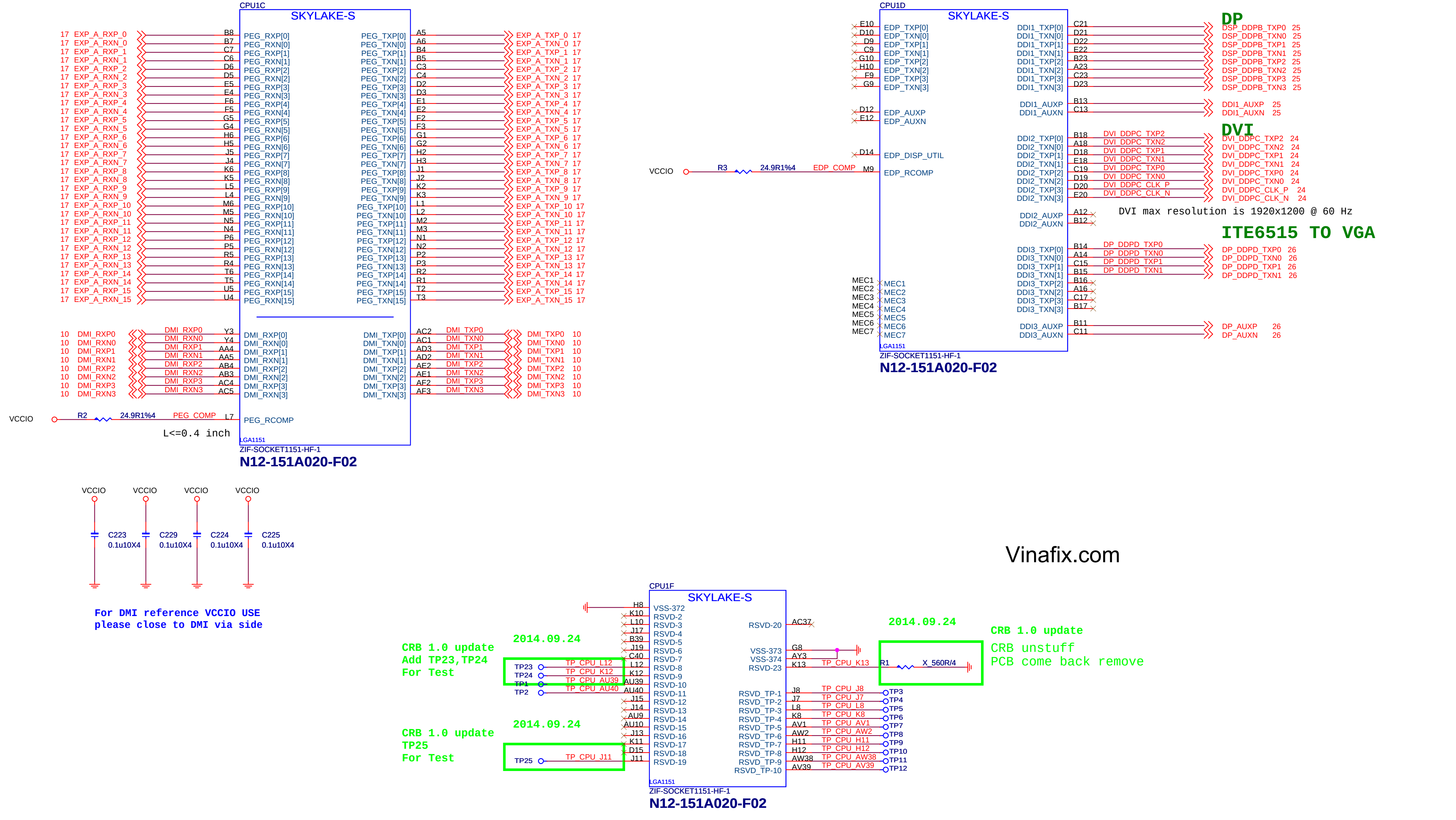


MICRO-STAR INT'L CO.,LTD

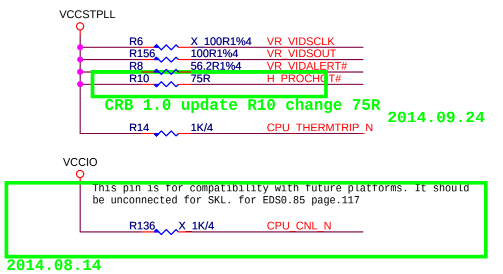
MS-7A48

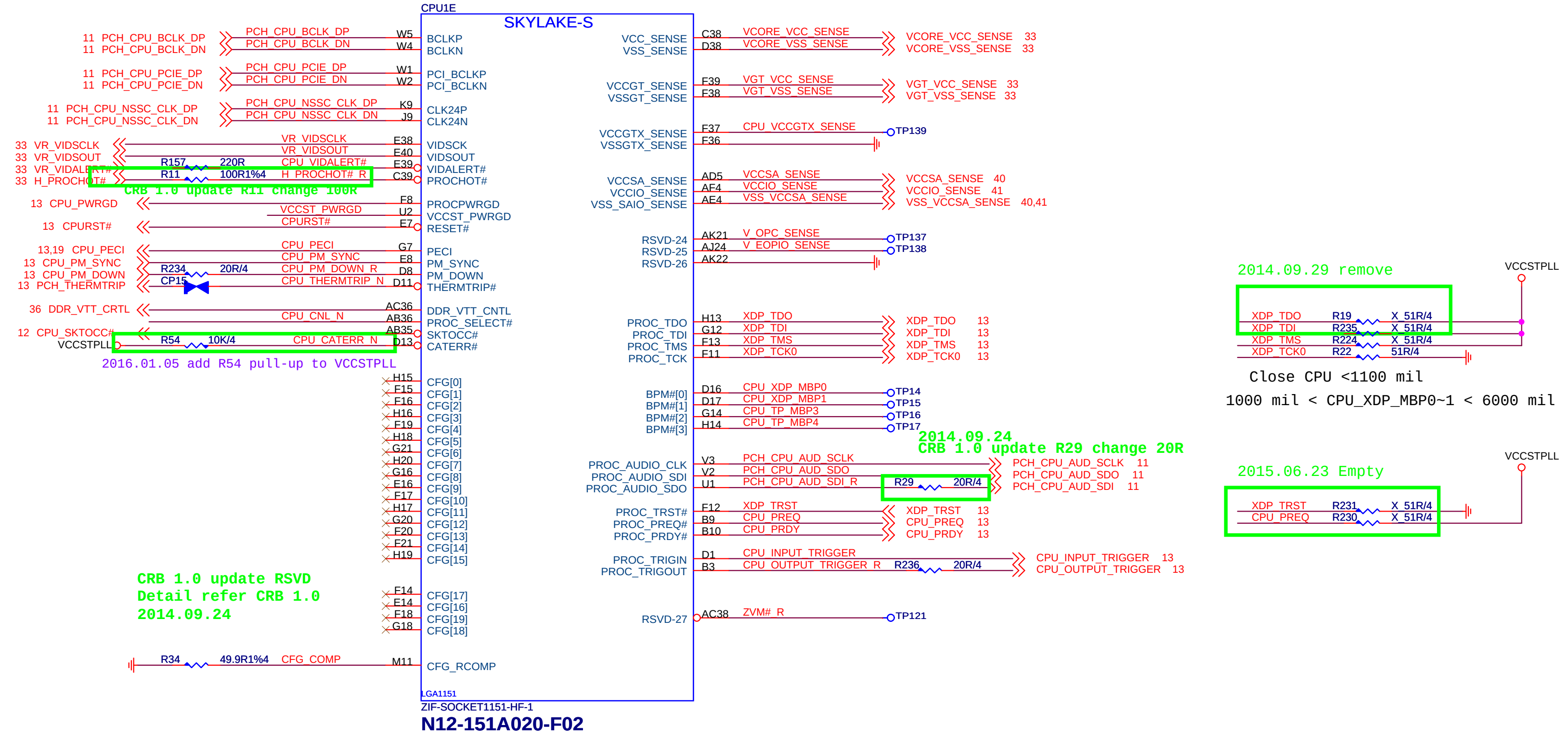
Size	Document Description	Rev
Custom	CPU-Memory	1.0

Date: Tuesday, January 12, 2016 Sheet 3 of 49



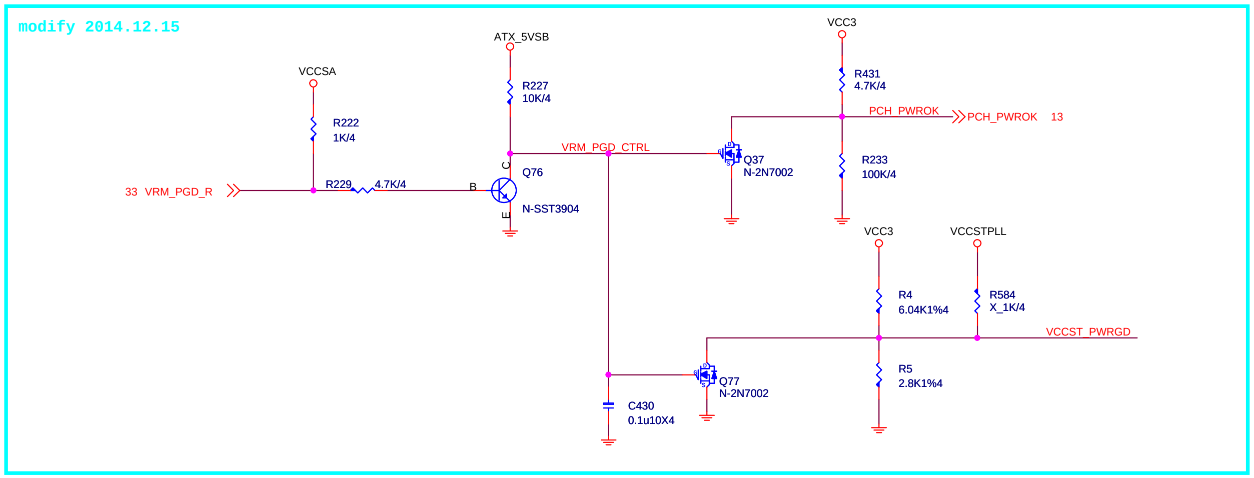
MICRO-STAR INT'L CO.,LTD	
MS-7A48	
Size: Custom	Document Description: CPU-PEG/Display
Rev	1.0
Date: Tuesday, January 12, 2016	Sheet 4 of 49

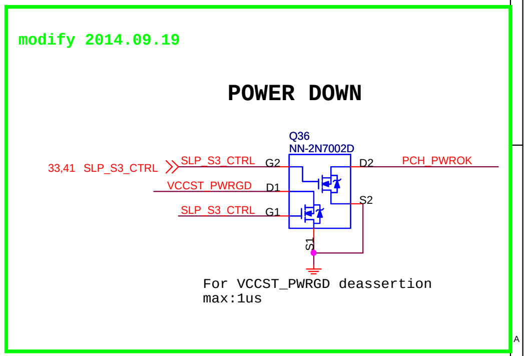




CFG Strap

	HIGH	LOW	DESCRIPTION
0	No Lock	Lock	PCU PLL lock
1			RSVD
2	NORM	REVERSE	PEG_LANE_REVERSAL
3			RSVD
4	DISABLE	ENABLE	eDP
5	DISABLE	ENABLE	PEG0CFGSEL[0]
6	DISABLE	ENABLE	PEG0CFGSEL[1]
7	RESET#	BIOS REQ	PEG_DEFER_TRAINING
8			RSVD
9			RSVD
10			RSVD
11			RSVD
12			RSVD
13			RSVD
14	RSVD		
15	RSVD		





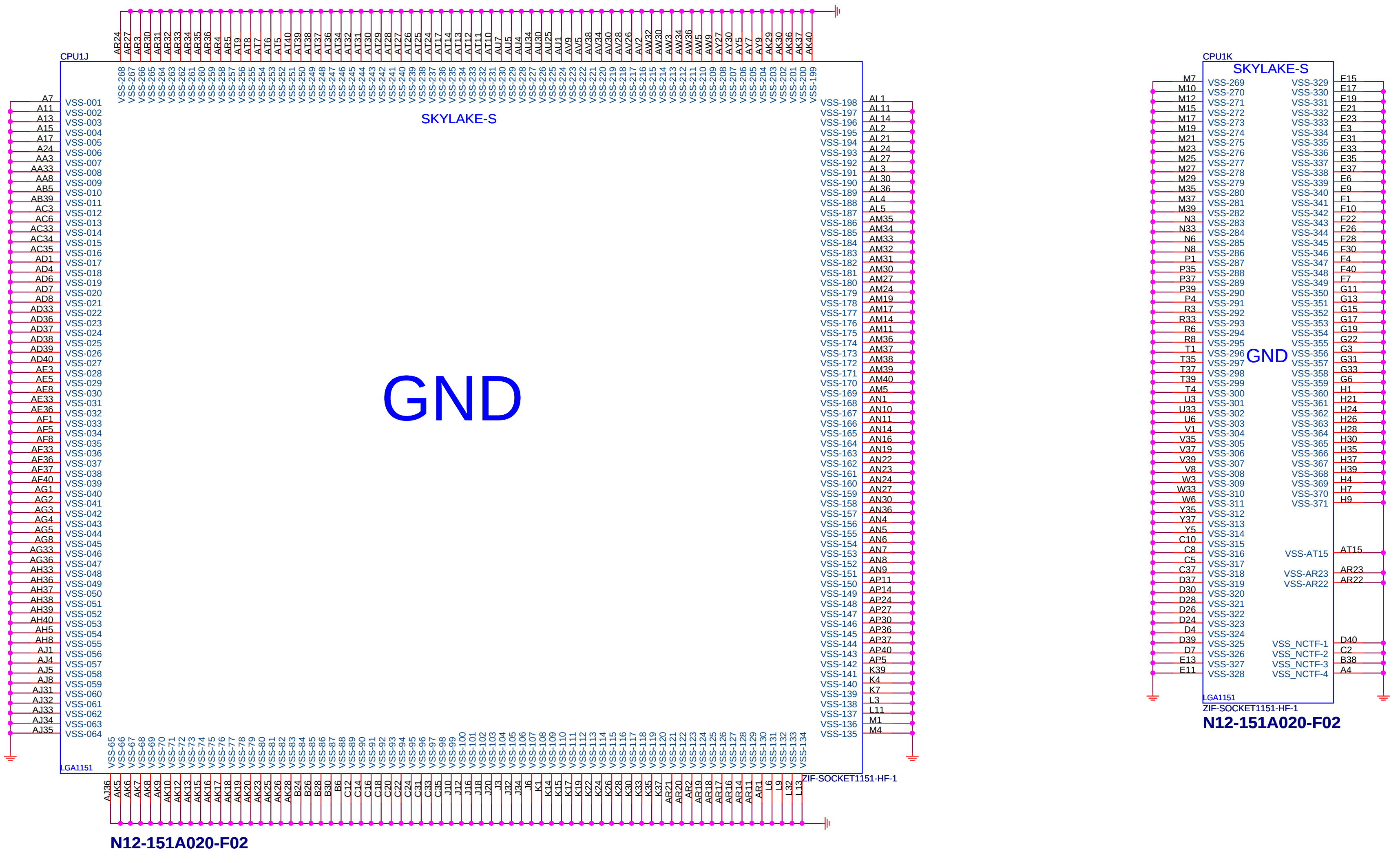
MICRO-STAR INT'L CO.,LTD

MS-7A48

Size	Document Description	Rev
Custom	CPU-Control/MISC/CFG/Audio	1.0

Date: Wednesday, January 13, 2016 Sheet 5 of 49

MICRO-STAR INT'L CO.,LTD		
MS-7A48		
Size: Custom	Document Description: CPU-Power	Rev: 1.0
Date: Tuesday, January 12, 2016	Sheet 6 of 49	

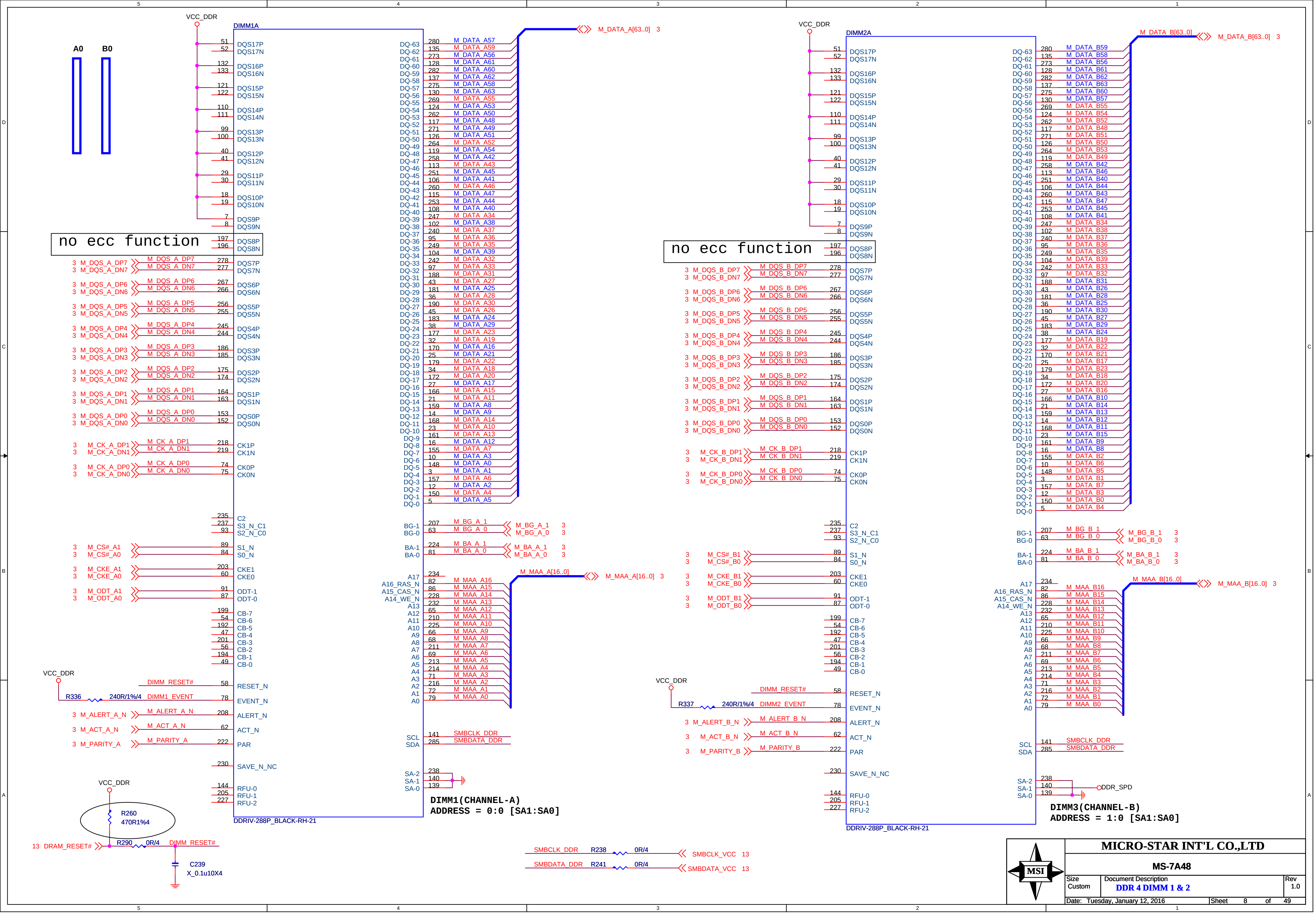


MICRO-STAR INT'L CO.,LTD

MS-7A48

Size	Document Description	Rev
Custom	CPU-GND	1.0

Date: Thursday, December 24, 2015 Sheet 7 of 49

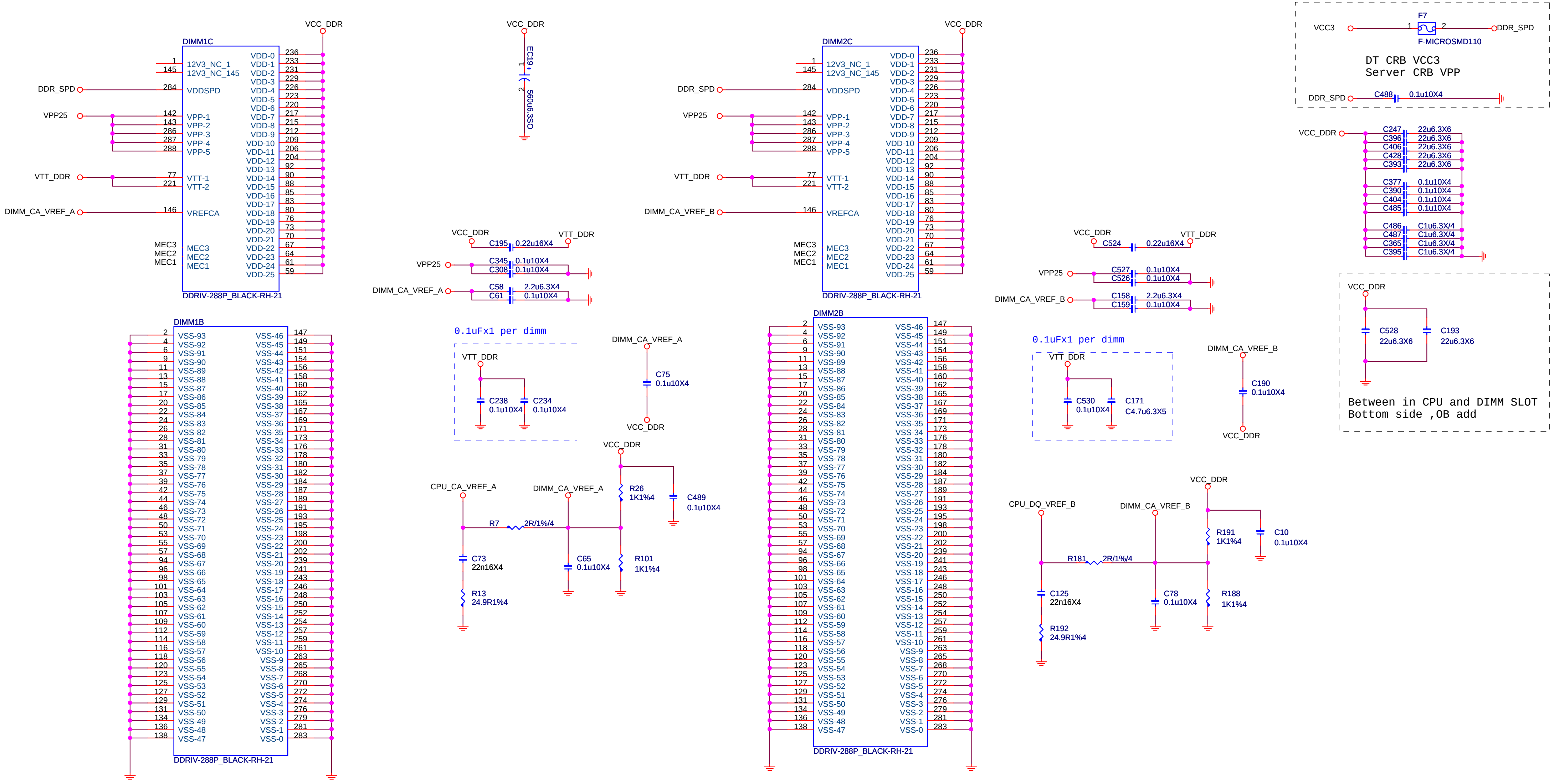


MICRO-STAR INT'L CO.,LTD

MS-7A48

Size	Document Description	Rev
Custom	DDR 4 DIMM 1 & 2	1.0

Date: Tuesday, January 12, 2016 Sheet 8 of 49

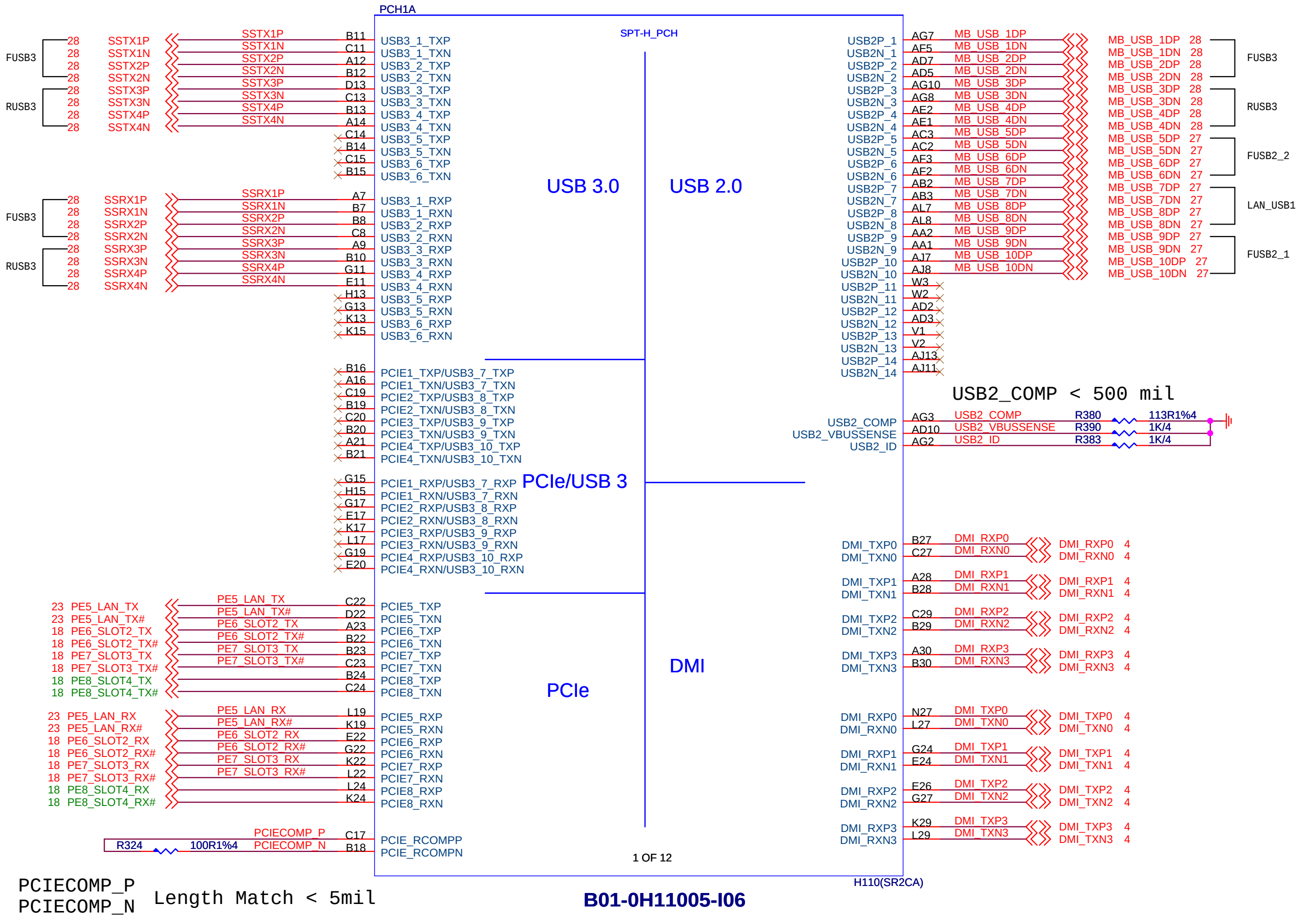


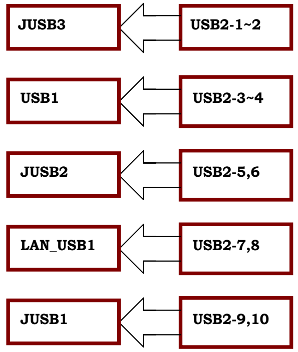
MICRO-STAR INT'L CO.,LTD

MS-7A48

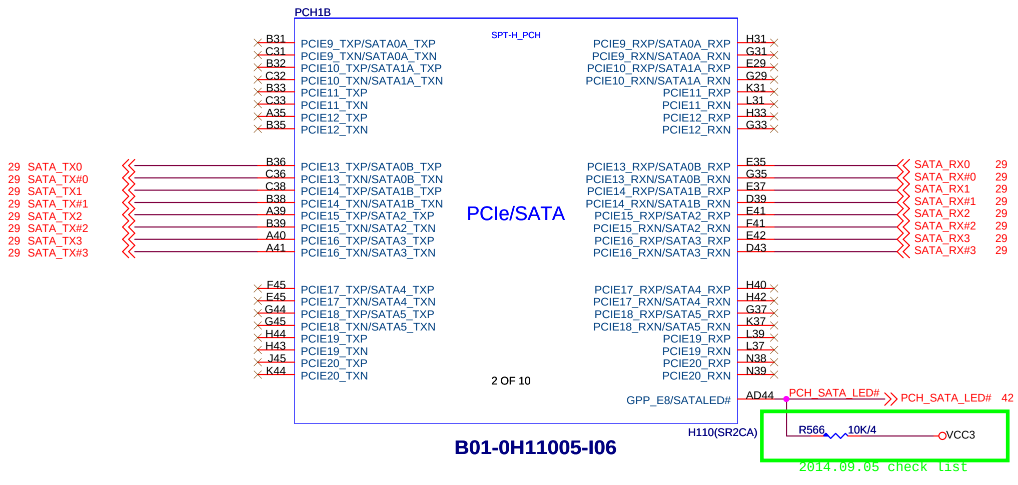
Size	Document Description	Rev
Custom	09 DDR4-POWER/GND 1 & 2	1.0

Date: Monday, December 28, 2015 | Sheet 9 of 49





	USB3[5-6]	USB3[7-8]
H110	X	X
B150	V	X
Q150	V	V
H170	V	X
Z170	V	X
Q170	V	X



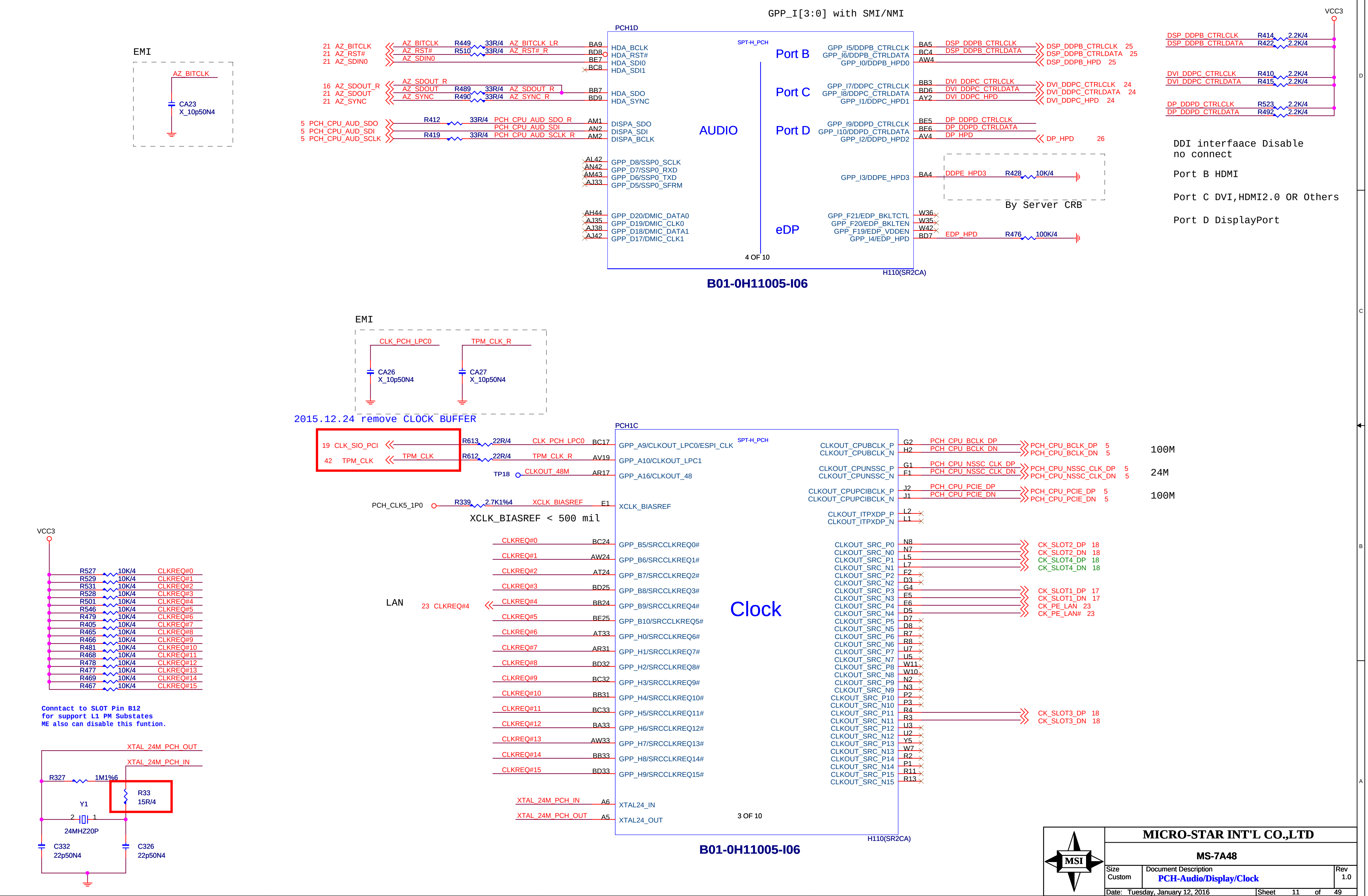
Vinafix.com

MICRO-STAR INT'L CO.,LTD

MS-7A48

Size	Document Description	Rev
Custom	PCH-USB/PCIE/DMI/SATA	1.0

Date: Tuesday, January 12, 2016 Sheet 10 of 49

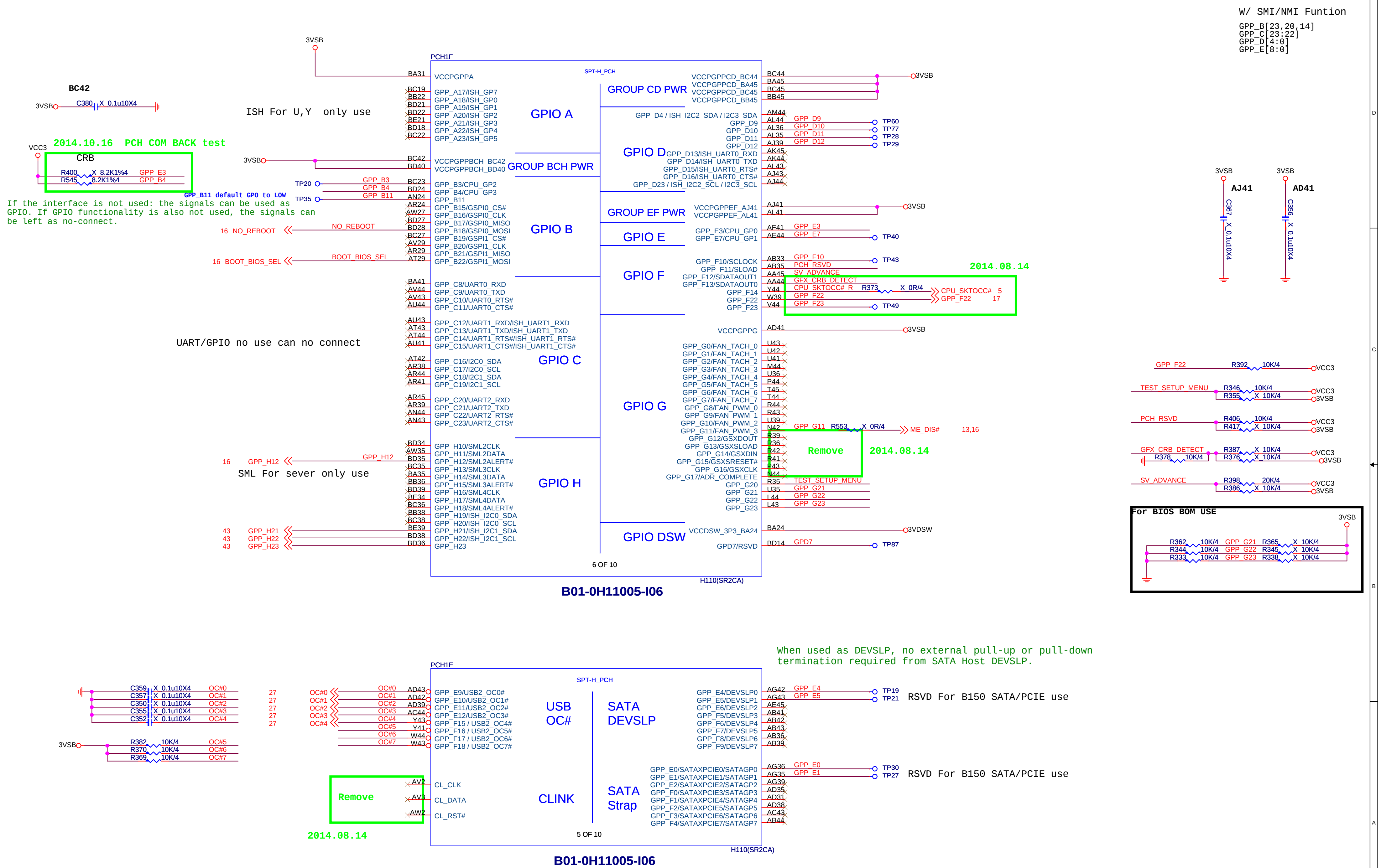


MICRO-STAR INT'L CO.,LTD

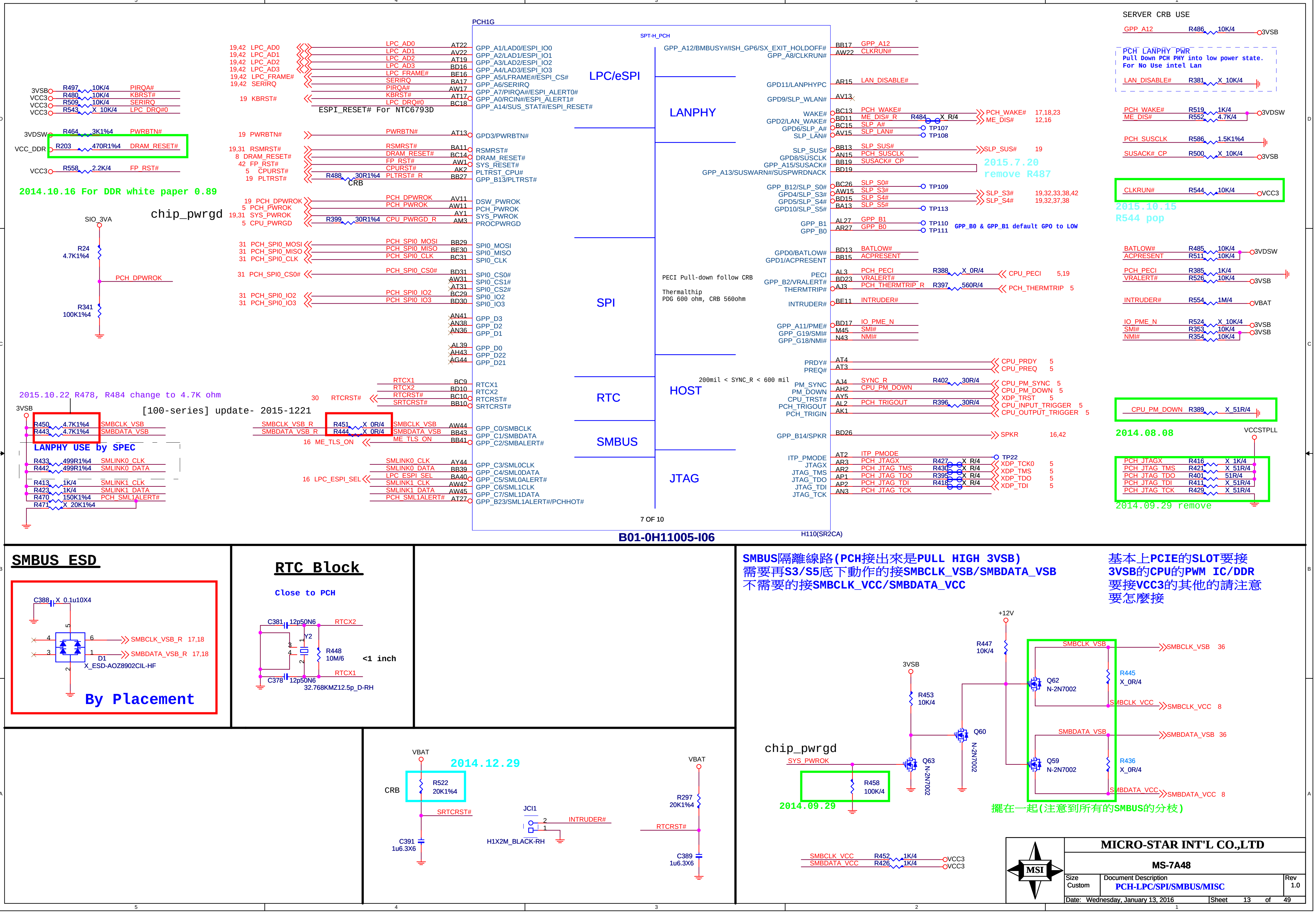
MS-7A48

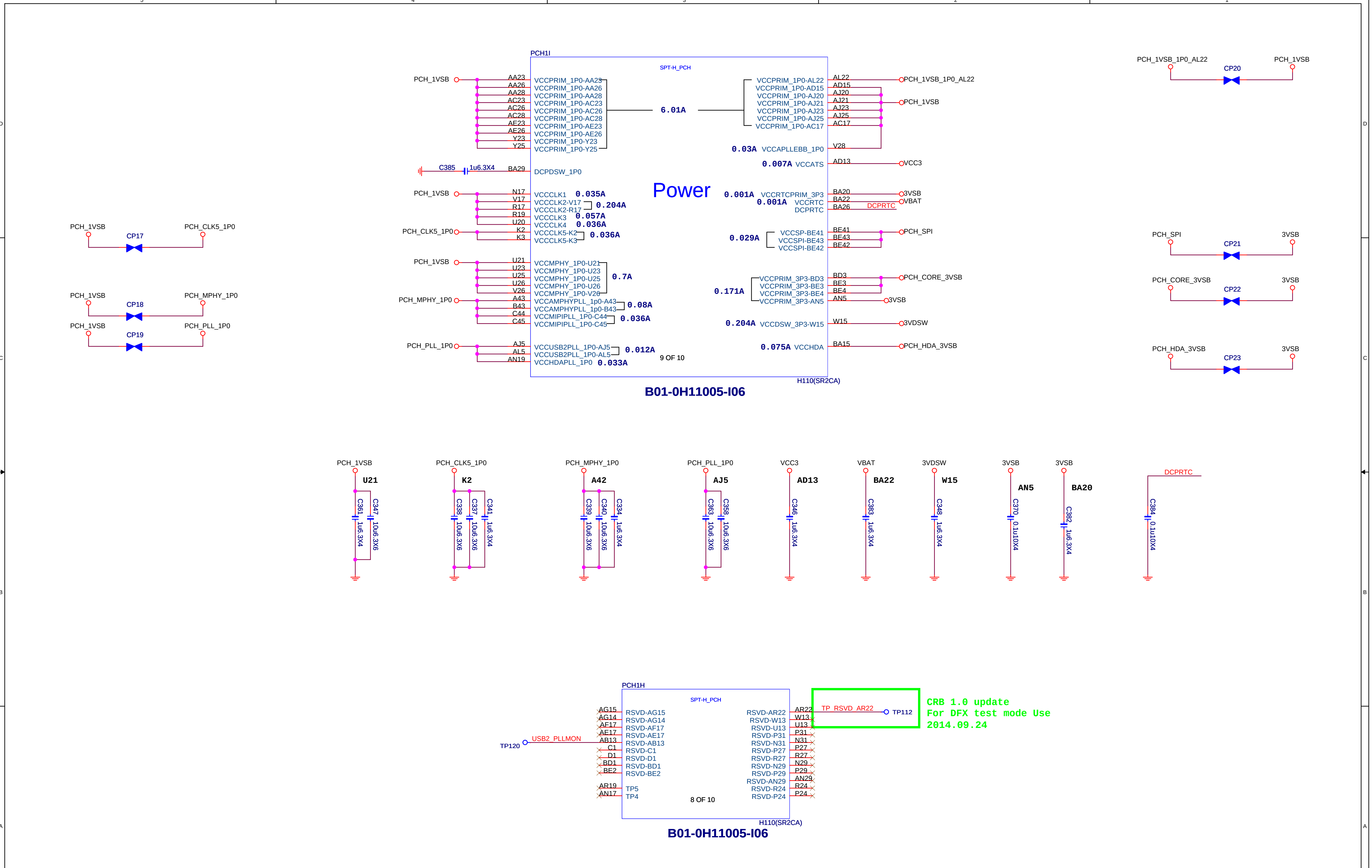
Size	Document Description	Rev
Custom	PCH-Audio/Display/Clock	1.0

Date: Tuesday, January 12, 2016 Sheet 11 of 49

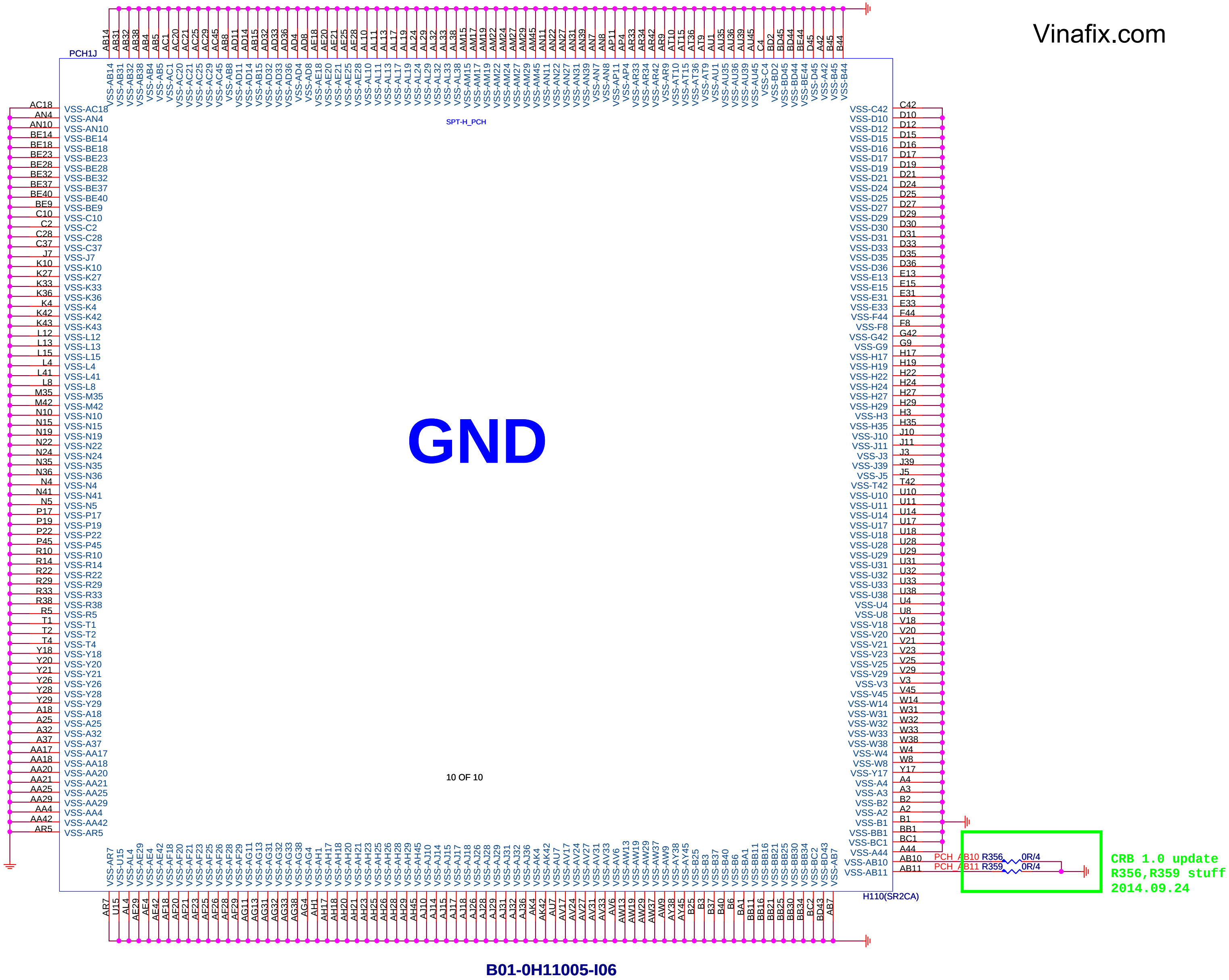


MICRO-STAR INT'L CO.,LTD			
MS-7A48			
Size: Custom	Document Description: PCH-GPIO/USBOC#/SATASTRAP		Rev 1.0
Date: Tuesday, January 12, 2016	Sheet 12 of 49		


PCH1G
SPT-H_PCH
LPC/eSPI
LANPHY
SPI
RTC
HOST
SMBUS
JTAG
7 OF 10
B01-0H11005-I06
H110(SR2CA)
SERVER CRB USE
PCH LANPHY PWR
Pull Down PCH PHY into low power state.
For No Use intel Lan
ESPI_RESET# For NTC6793D
2014.10.16 For DDR white paper 0.89
chip_pwrgd
SIO_3VA
CRB
2015.7.20
remove R487
2015.10.15
R544 pop
GPP_B0 & GPP_B1 default GPO to LOW
PECI Pull-down follow CRB
Thermaltrip
PDG 600 ohm, CRB 560ohm
200mil < SYNC_R < 600 mil
2014.08.08
2014.09.29 remove
2015.10.22 R478, R484 change to 4.7K ohm
[100-series] update- 2015-1221
LANPHY USE by SPEC
SMBUS ESD
By Placement
X_ESD-AOZ8902CIL-HF
RTC Block
Close to PCH
<1 inch
32.768KMZ12.5p_D-RH
SMBUS隔離線路(PCH接出來是PULL HIGH 3VSB)
需要再S3/S5底下動作的接SMBCLK_VSB/SMBDATA_VSB
不需要的接SMBCLK_VCC/SMBDATA_VCC
基本上PCIE的SLOT要接
3VSB的CPU的PWM IC/DDR
要接VCC3的其他的請注意
要怎麼接
擺在一起(注意到所有的SMBUS的分枝)
2014.12.29
2014.09.29
H1X2M_BLACK-RH
MICRO-STAR INT'L CO.,LTD
MS-7A48
Size Custom
Document Description
PCH-LPC/SPI/SMBUS/MISC
Rev 1.0
Date: Wednesday, January 13, 2016
Sheet 13 of 49



MICRO-STAR INT'L CO.,LTD		
MS-7A48		
Size: Custom	Document Description: PCH-Power	Rev: 1.0
Date: Tuesday, January 12, 2016	Sheet 14 of 49	



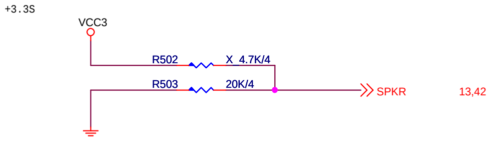
MICRO-STAR INT'L CO.,LTD

MS-7A48

Size	Document Description	Rev
Custom	PCH-GND	1.0

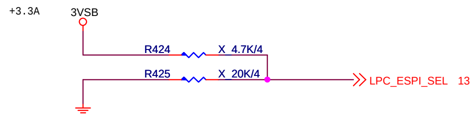
Date: Thursday, December 24, 2015 Sheet 15 of 49

TOP Swap



Internal pull-down 20K is disabled after PLTRST#

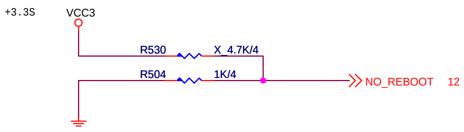
LPC eSPI Mode



0 : LPC
1 : eSPI

Internal pull-down 20K is disabled after RSMRST

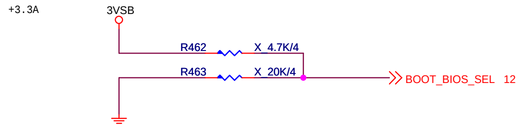
No Reboot



0 : DISABLE (Default)
1 : ENABLE

Internal pull-down 20K is disabled after PLTRST#

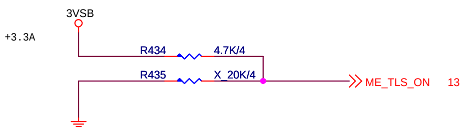
Boot BIOS



0 : SPI
1 : LPC

Internal pull-down 20K is disabled after PLTRST

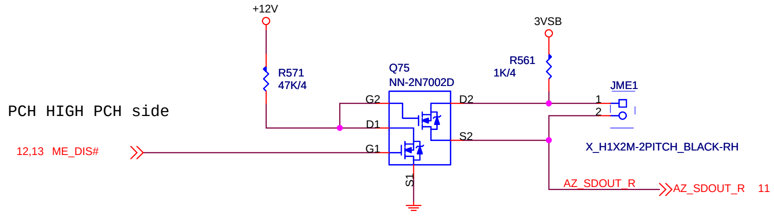
AMT and SBA with confidentiality



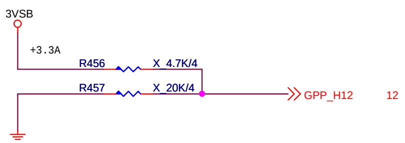
0 : DISABLE
1 : ENABLE (Default)

Internal pull-down 20K is disabled after RSMRST

HDA_SDO



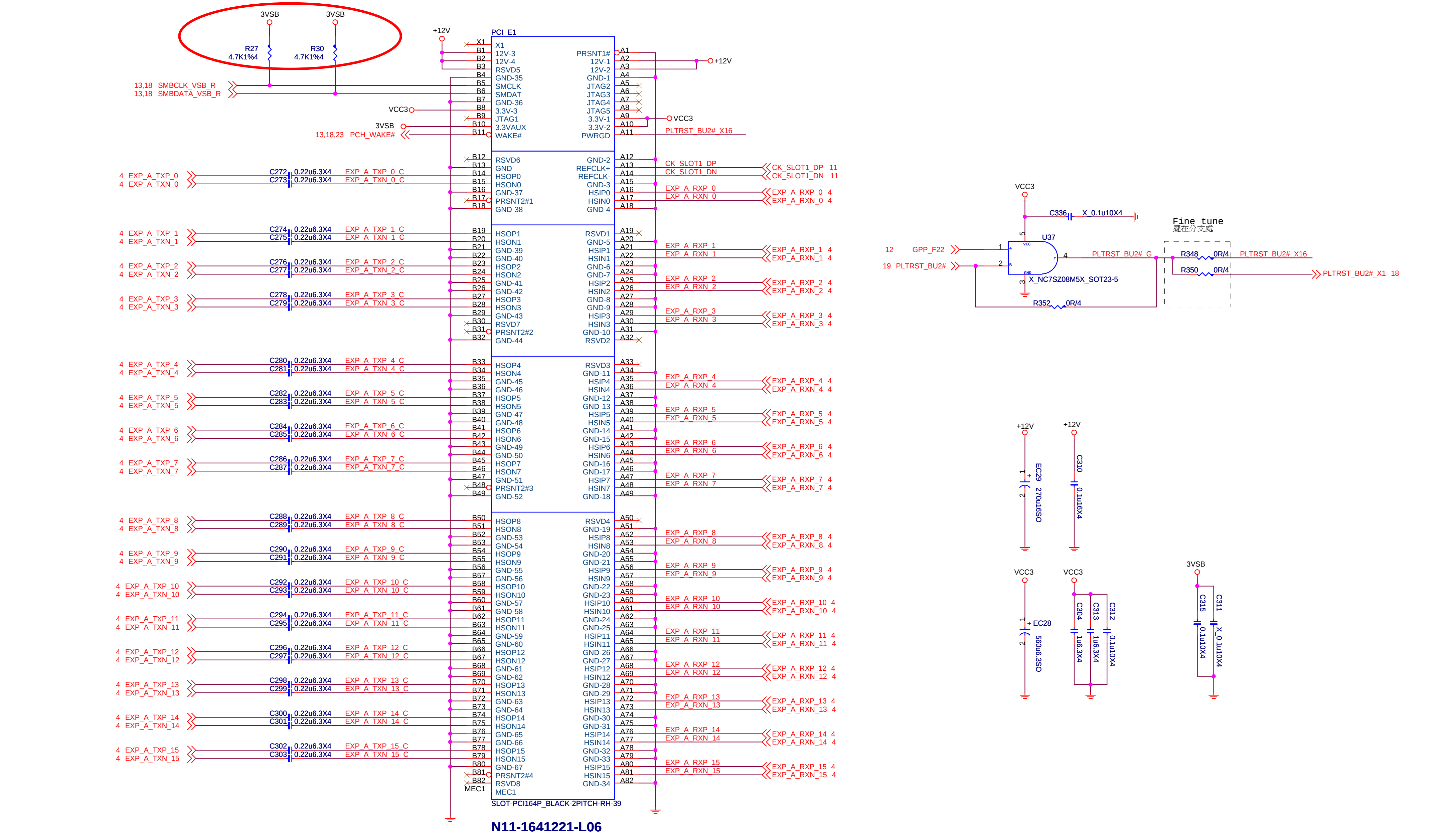
ESPI FLASH SHARING MODE



0 : MASTER ATTACHED FLASH SHARING
1 : SLAVE ATTACHED FLASH SHARING

Internal pull-down 20K is disabled after RSMRST

MICRO-STAR INT'L CO.,LTD		
MS-7A48		
Size Custom	Document Description **PCH-Strap**	Rev 1.0
Date: Tuesday, January 12, 2016	Sheet 16 of 49	



MICRO-STAR INT'L CO.,LTD

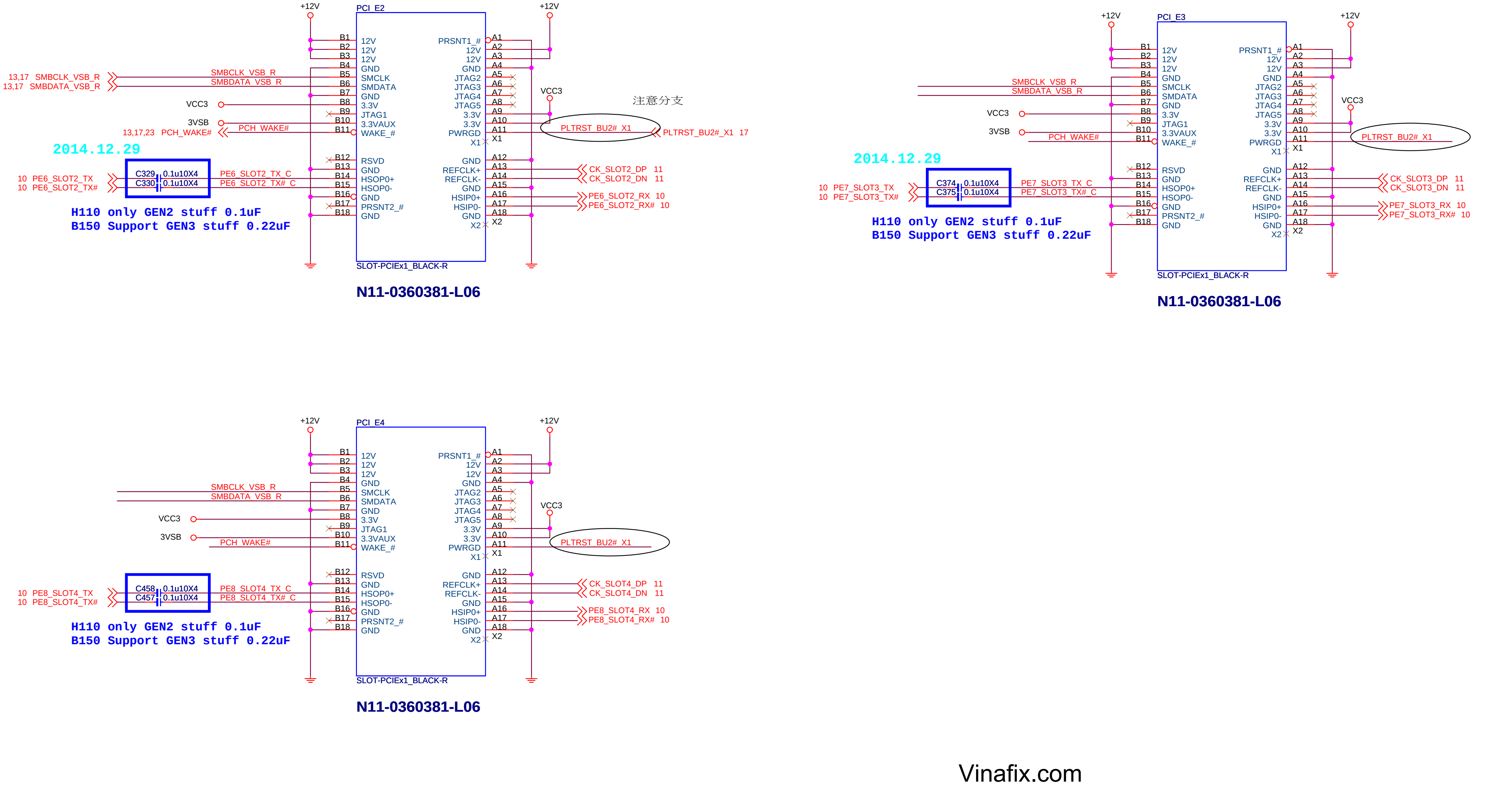
MS-7A48

Size: Custom

Document Description: PCIE SLOT-CPU(X16)

Rev 1.0

Date: Tuesday, January 12, 2016 Sheet 17 of 49

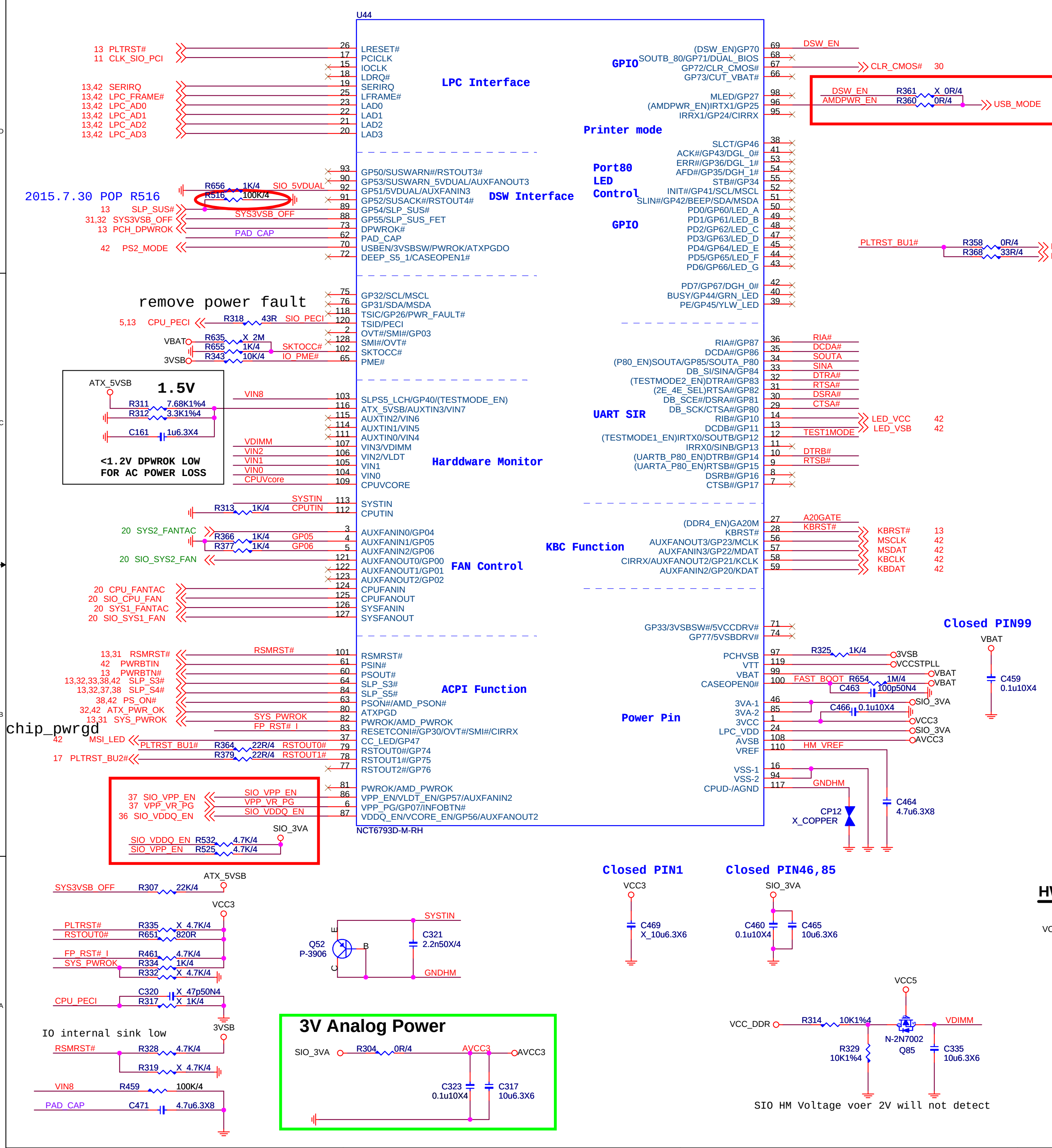


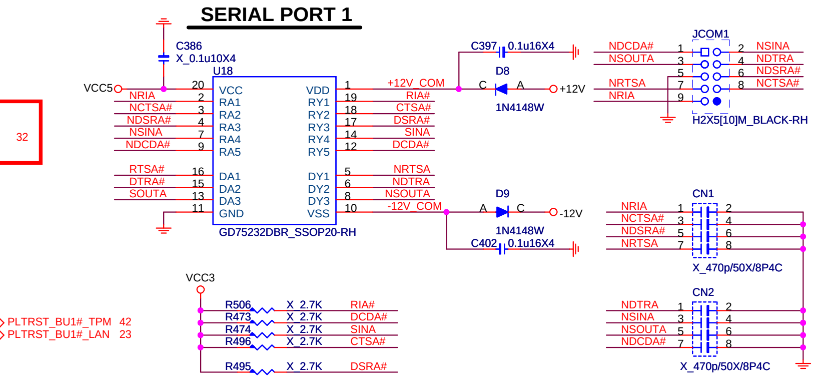
MICRO-STAR INT'L CO.,LTD

MS-7A48

Size	Document Description	Rev
Custom	PCIE SLOT-PCH(X1)	1.0

Date: Tuesday, January 12, 2016 Sheet 18 of 49

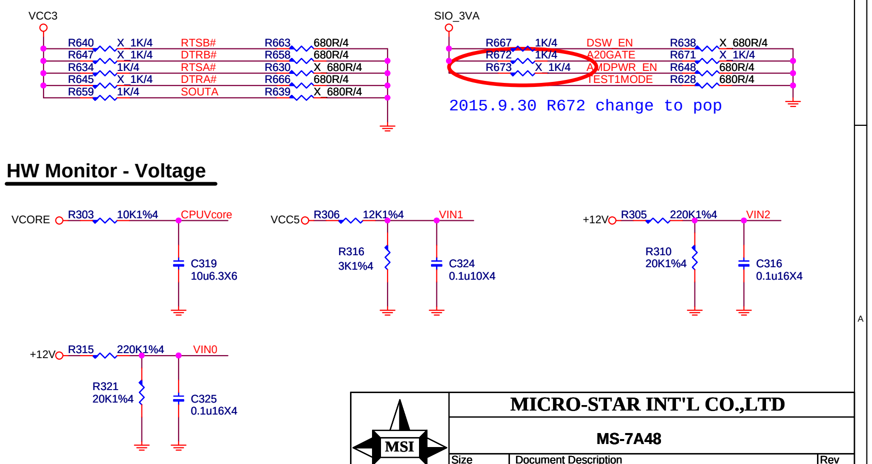




POWER ON STRAPPING PIN FOR NCT6792

PIN	6792 NAME	Circuit NAME	0	1	Strap Point
	UARTA_P80_EN	RTSB#	DISABLE UARTA80	ENABLE UARTA80	LRESET
10	UARTB_P80_EN	DTRB#	DISABLE UARTB80	ENABLE UARTB80	LRESET
12	TEST1MODE_EN	TEST1MODE	DISABLE TEST1MODE	ENABLE TEST1MODE	LRESET
31	2E_4E_SEL	RTSA#	I/O ADDRESS 2E	I/O ADDRESS 4E	LRESET
32	24_48_SEL	DTRA#	24M CLOCK SOURCE	48M CLOCK SOURCE	INTERNAL PWROK
34	P80_EN	SOUTA	ENABLE Non_PORT80	ENABLE PORT80	LRESET
62	TESTMODE_EN	SLP_S5_LCH#	DISABLE TESTMODE	ENABLE TESTMODE	INTERNAL RSMRST
69	DSW_EN	DSW_EN	DISABLE INTEL DSW	ENABLE INTEL DSW	INTERNAL RSMRST
96	AMDPWR_EN	AMDPWR_EN	DISABLE AMD PWR SEQ	ENABLE AMD PWR SEQ	INTERNAL RSMRST

Note:
If PIN34 strapping low,BIOS must programming LPT or GPIO



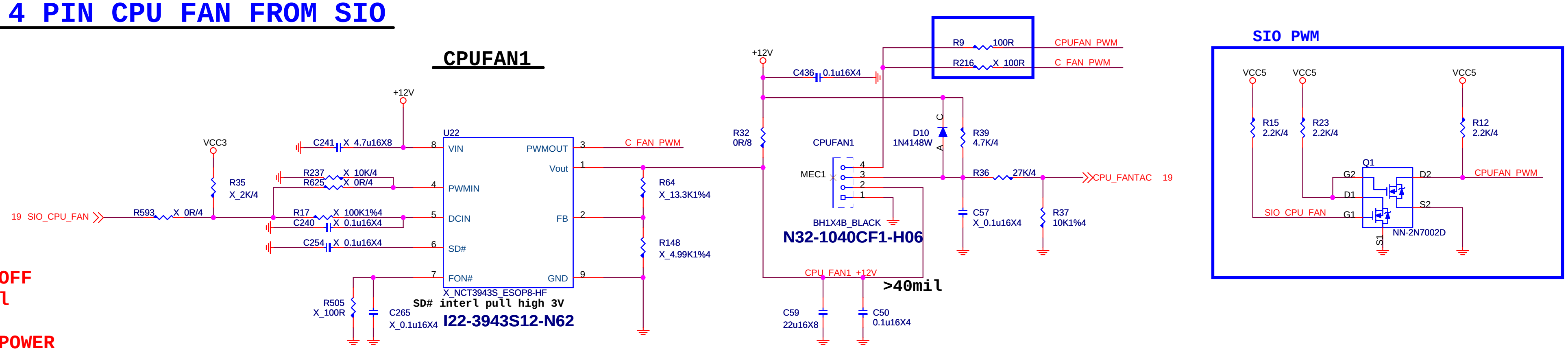
MICRO-STAR INT'L CO.,LTD

MS-7A48

Size: Custom | Document Description: SIO-NCT6793D | Rev 1.0

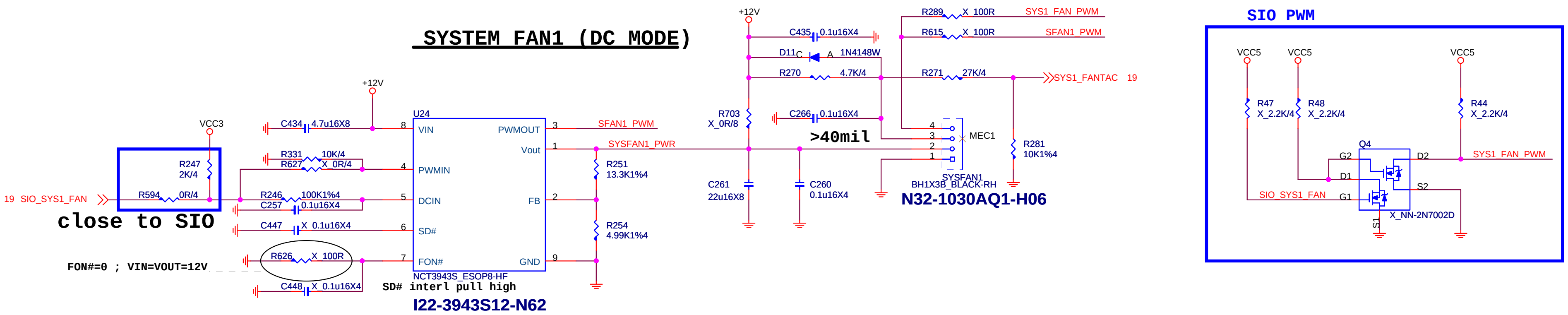
Date: Wednesday, January 13, 2016 | Sheet 19 of 49

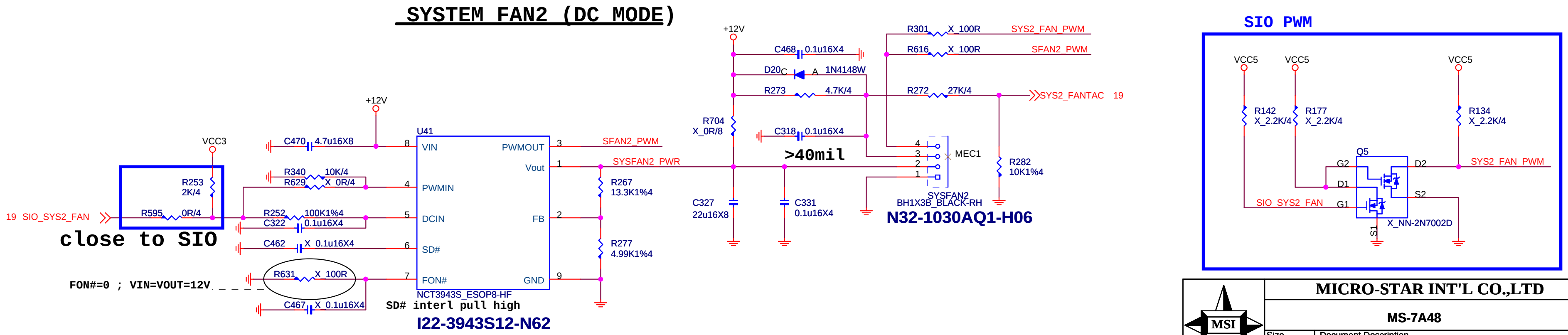
Type G : 4 PIN CPU FAN FROM SIO



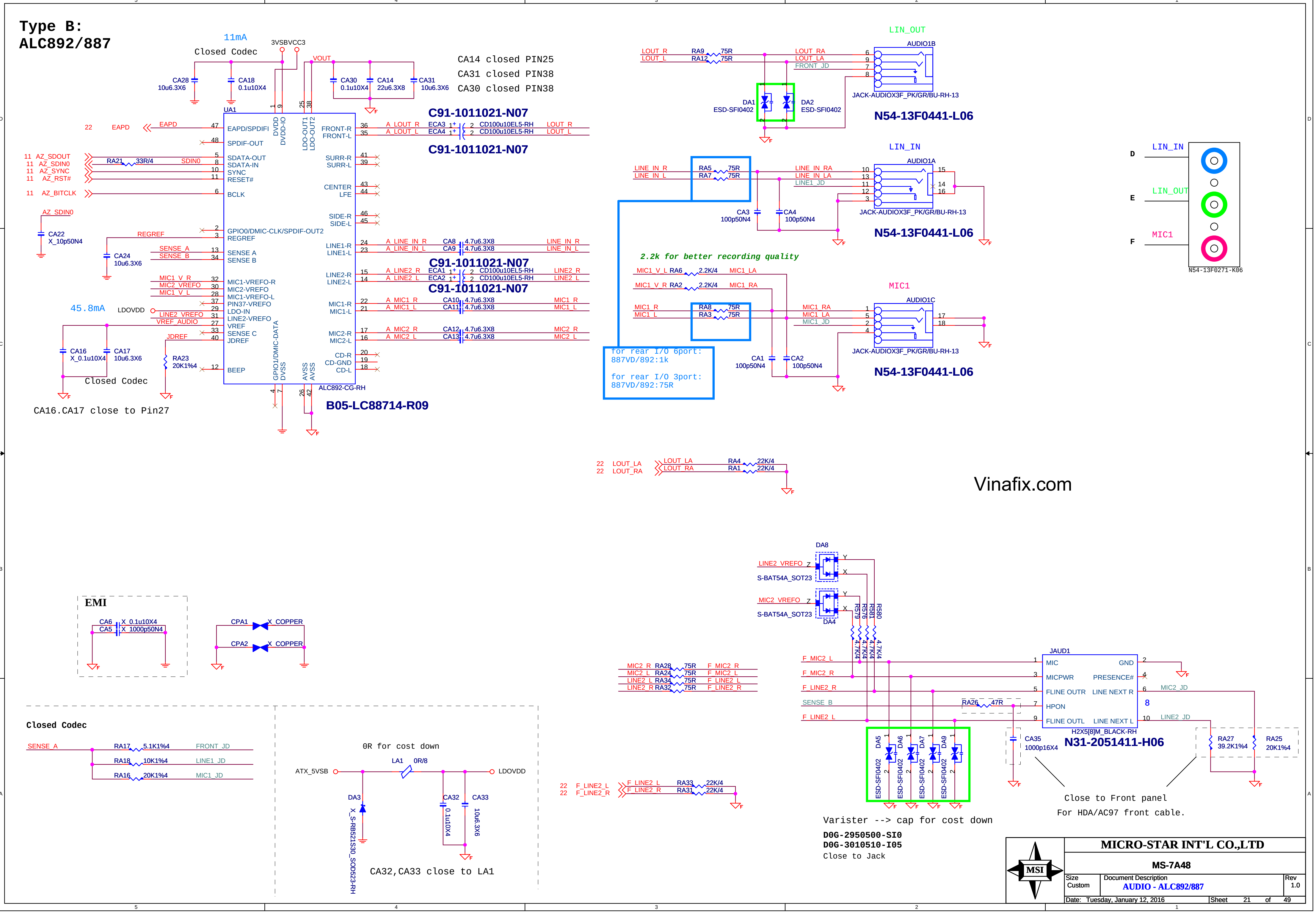
CPUFAN_PWR_OFF
GPIO Control
Deafult GPI
If USE CUT POWER
1.OPEN DRAIN LOW:SD# LOW Active，CPUFAN(PIN2)= 0V
2.OPEN DRAIN : SD# Internal Pull high，CPUFAN(PIN2)=12V

Type H : 4 PIN SYS FAN FROM SIO





MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7A48	
Size Custom	Document Description FAN CONTROLLOR	Rev 1.0
Date: Tuesday, January 12, 2016	Sheet 20 of 49	



MICRO-STAR INT'L CO.,LTD

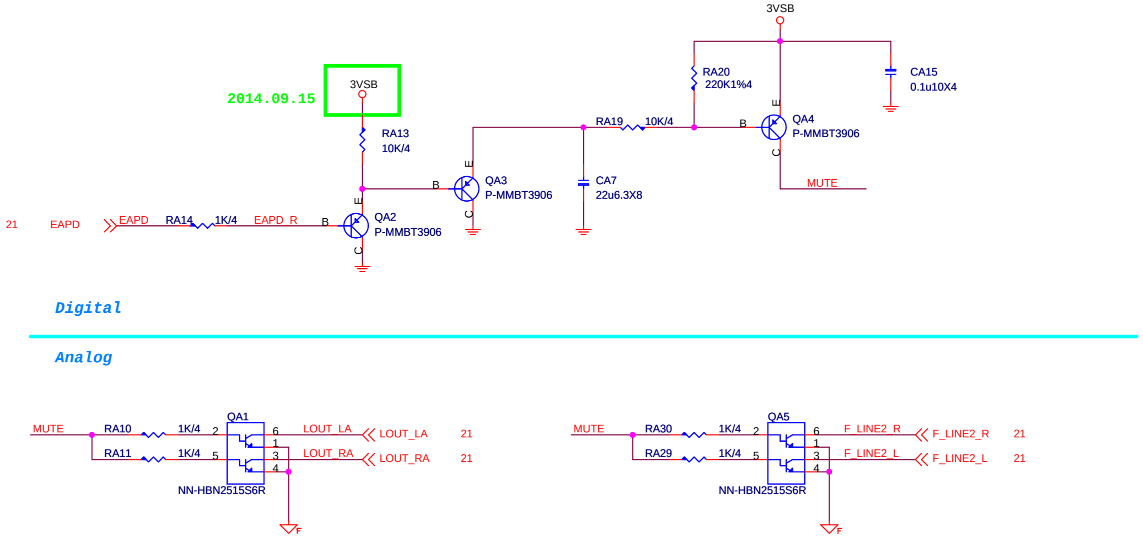
MS-7A48

Size	Document Description	Rev
Custom	AUDIO - ALC892/887	1.0

Date: Tuesday, January 12, 2016 Sheet 21 of 49

Rear Line OUT De-POP circuit

De-pop circuit for Rear Line out & Front Headphone out)

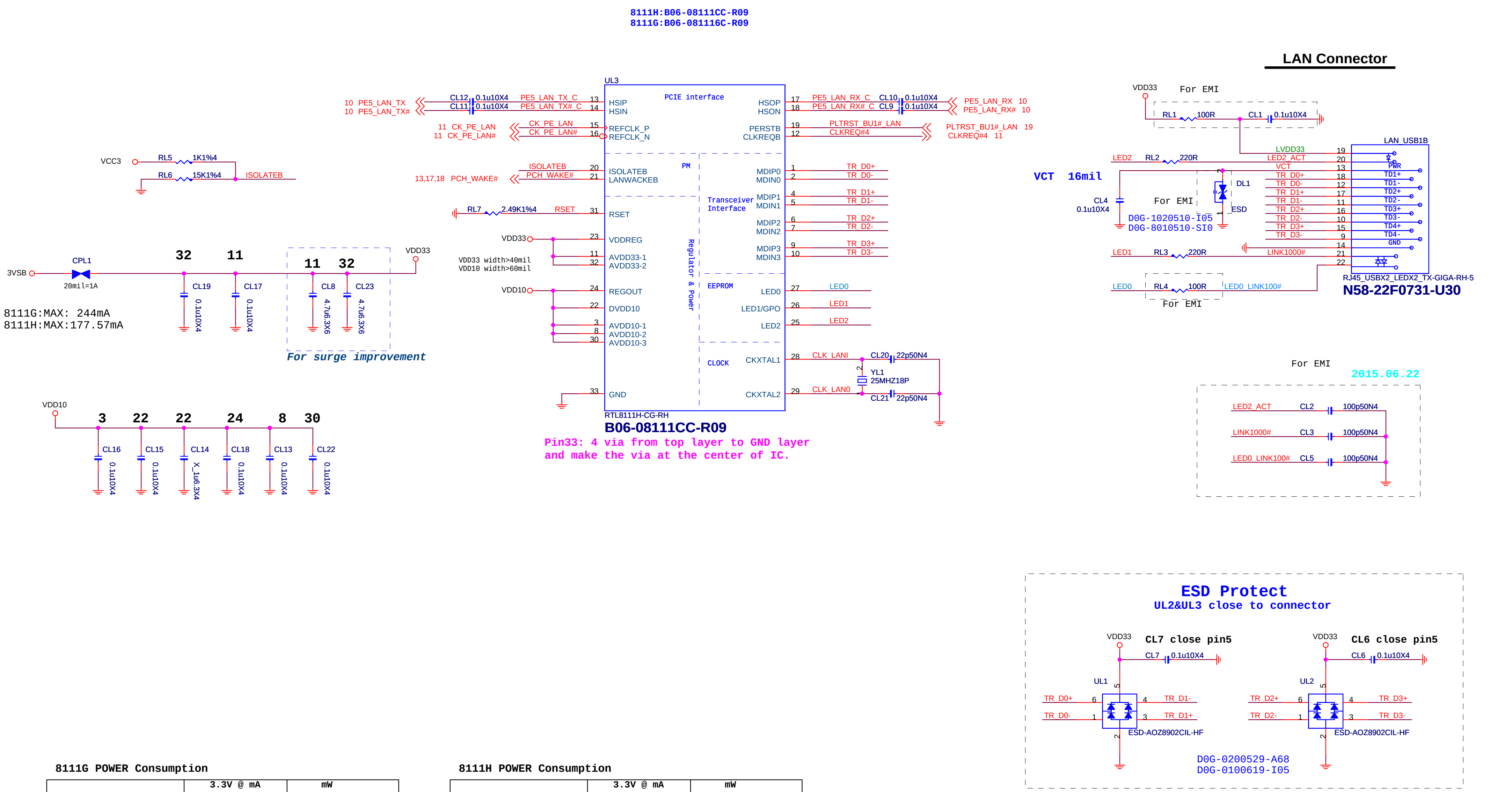


History:

2014/02/13: stuff de-pop circuit of Line out & HP out.

MICRO-STAR INT'L CO.,LTD		
MS-7A48		
Size: Custom	Document Description: AUDIO - depop circuit	Rev: 1.0
Date: Tuesday, January 12, 2016	Sheet 22 of 49	

RTL8111G/RTL8111H Giga LAN



8111G POWER Consumption

	3.3V @ mA	mW
10 M Idle/TxRx	17.15/116.7	56.6/385.1
100 M Idle/TxRx	71.45/129.5	235.8/427.4
Giga Idle/TxRx	179.1/243.9	591/804.9
ALDPS	6.41	21.15

8111H POWER Consumption

	3.3V @ mA	mW
10 M Idle/TxRx	9.9/84.69	32.67/279.48
100 M Idle/TxRx	48.11/92.44	158.76/305.05
Giga Idle/TxRx	124.5/177.57	410.85/585.98
ALDPS	5.50	18.15

MICRO-STAR INT'L CO.,LTD

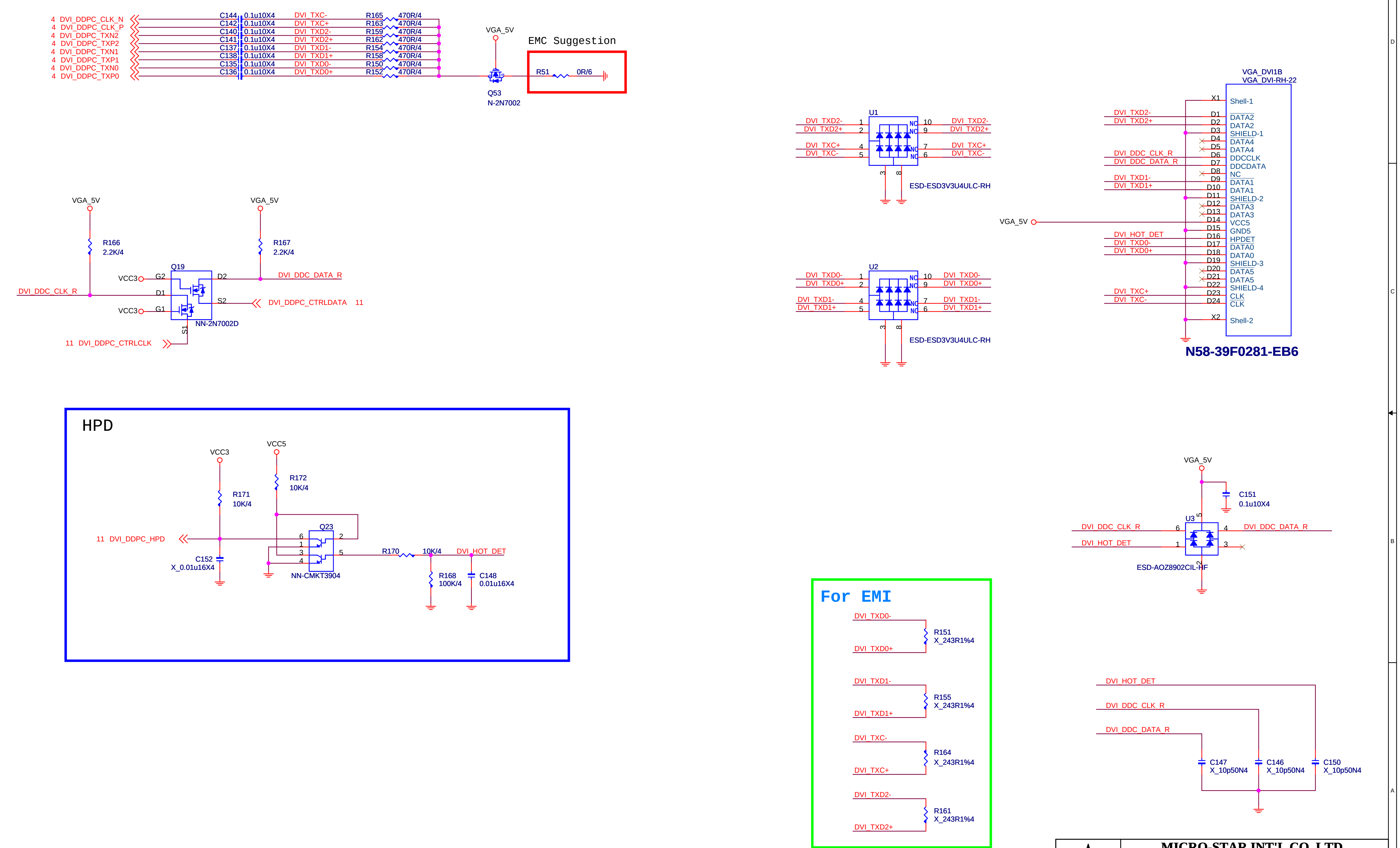
MS-7A48

Size	Document Description	Rev
Custom	LAN - RTL8111H	1.0

Date: Wednesday, January 13, 2016 Sheet 23 of 49

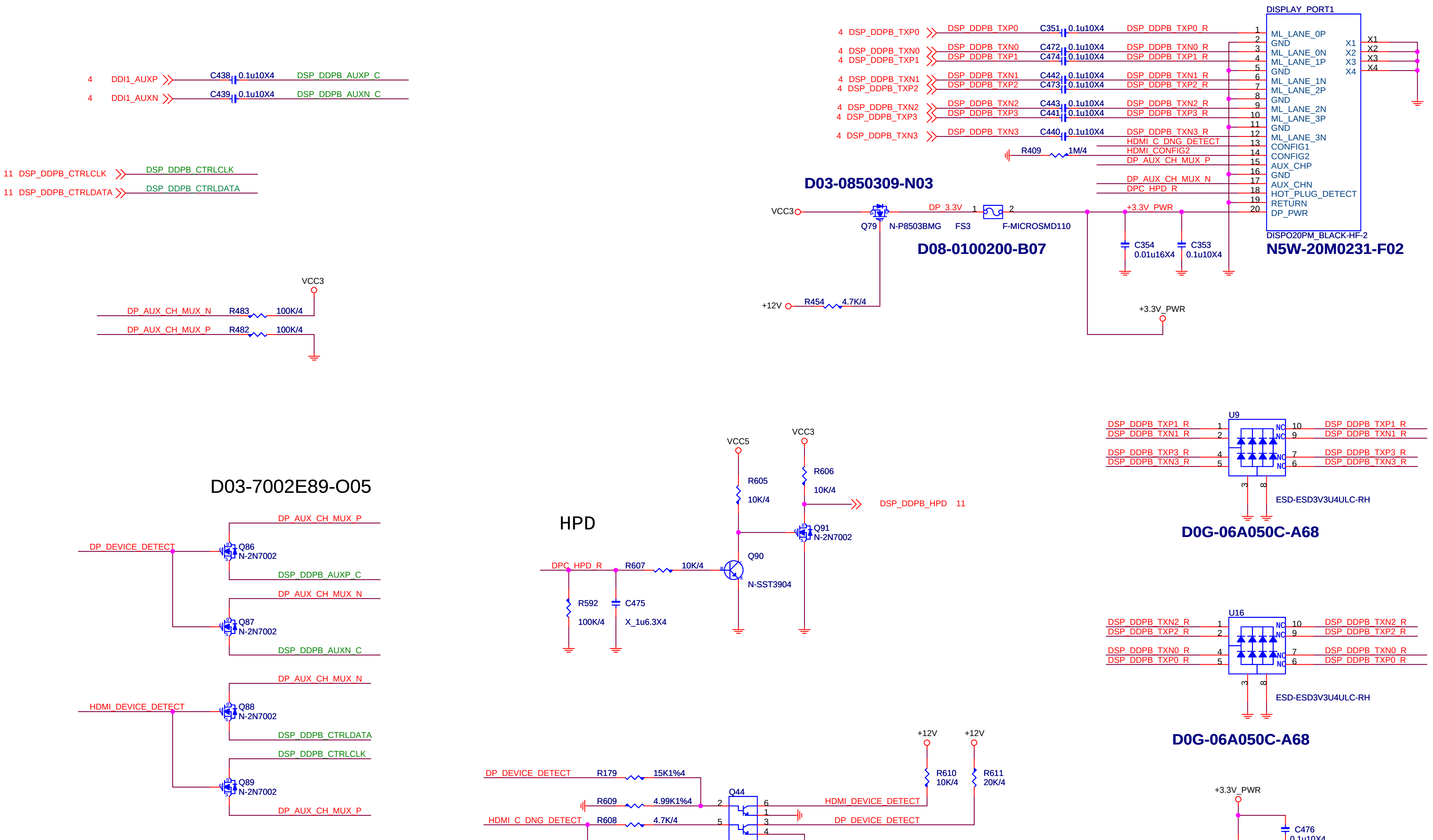
DVI level shifter

VGA: resolution of 2048x1536 pixels with 32-bit color at 75 Hz (4:3 QXGA)



MICRO-STAR INT'L CO.,LTD		
MS-7A48		
Size: Custom	Document Description: DVI — teknisi indonesia	Rev 1.0
Date: Wednesday, January 13, 2016	Sheet 24 of 49	

DISPLAY PORT



	DP	HDMI
HDMI_C_DNG_DETECT	L	H
DP_DEVICE_DETECT	H	L
HDMI_DEVICE_DETECT	L	H

MICRO-STAR INT'L CO.,LTD

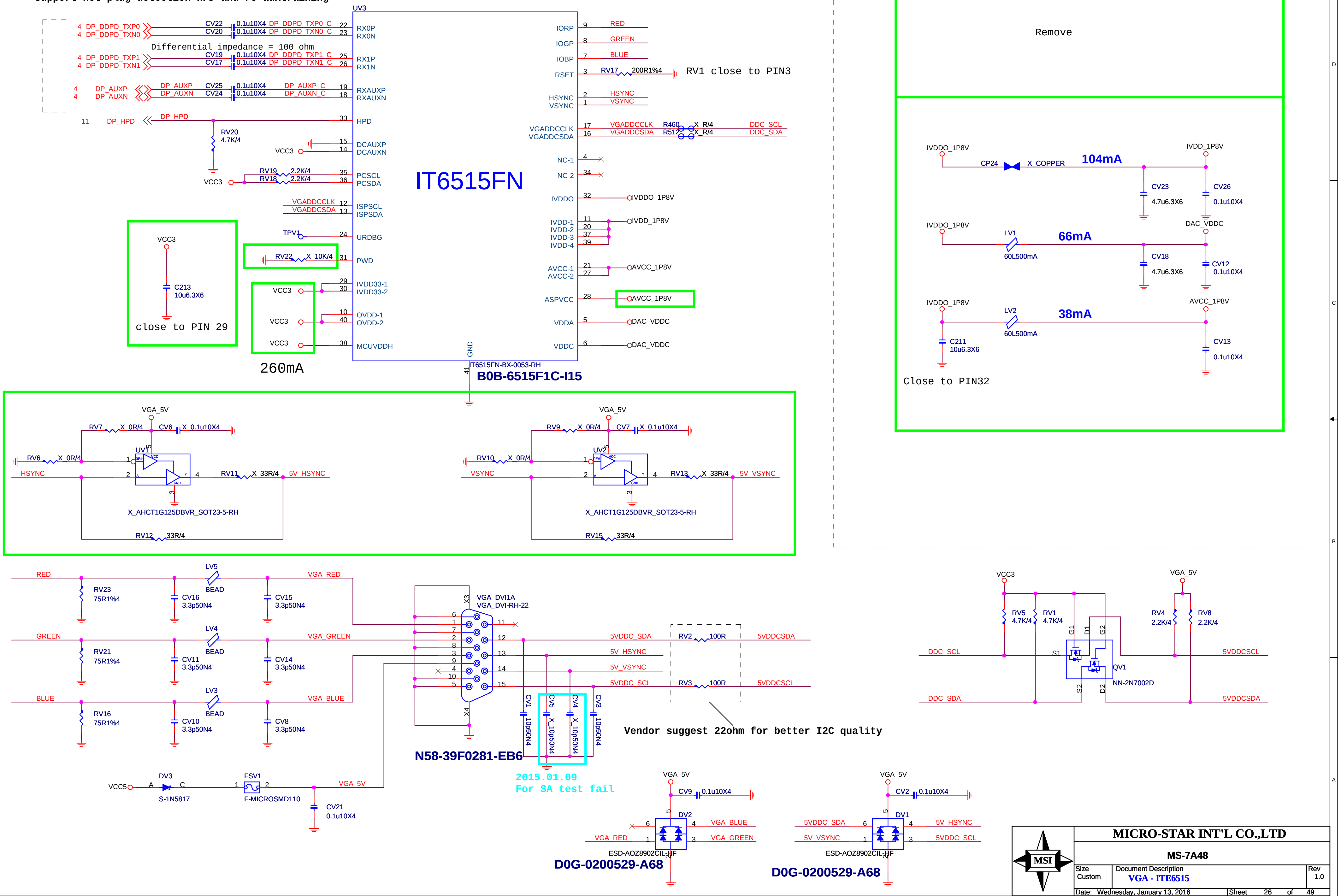
MS-7A48

Size	Document Description	Rev
Custom	Display Port Connector	1.0

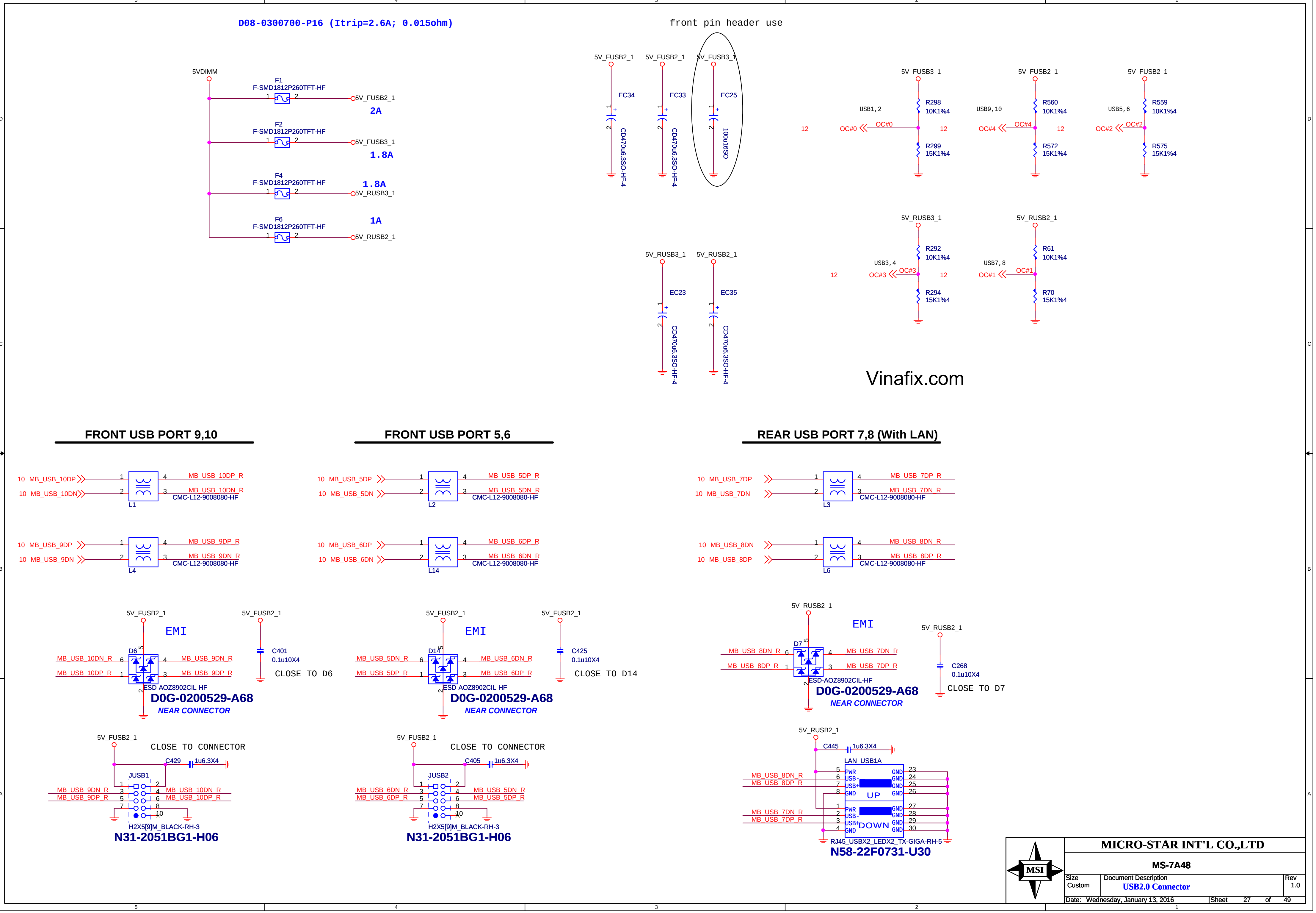
Date: Wednesday, January 13, 2016 Sheet 25 of 49

Note:

If connect to eDP port,must confirm whether it support hot plug detection HPD and re-auxtraining



MICRO-STAR INT'L CO.,LTD			
MS-7A48			
Size: Custom	Document Description: VGA - ITE6515		Rev: 1.0
Date: Wednesday, January 13, 2016	Sheet 26 of 49		

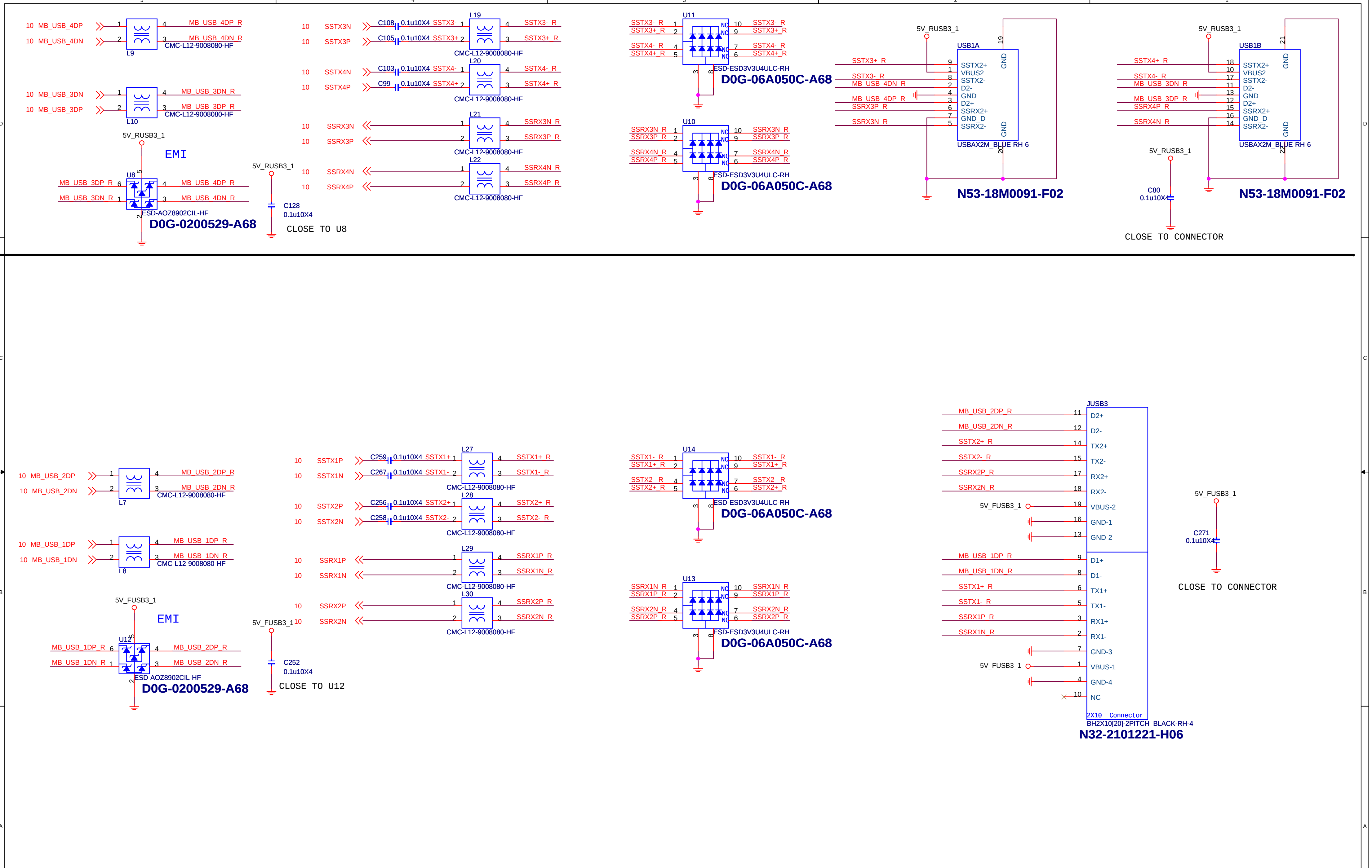


MICRO-STAR INT'L CO.,LTD

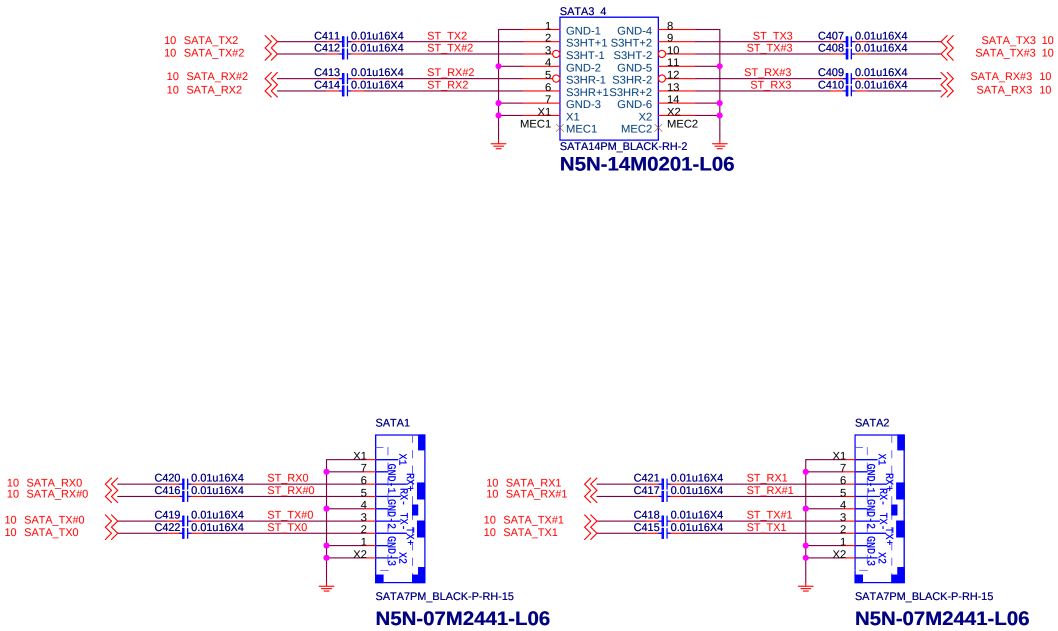
MS-7A48

Size	Document Description	Rev
Custom	USB2.0 Connector	1.0

Date: Wednesday, January 13, 2016 Sheet 27 of 49



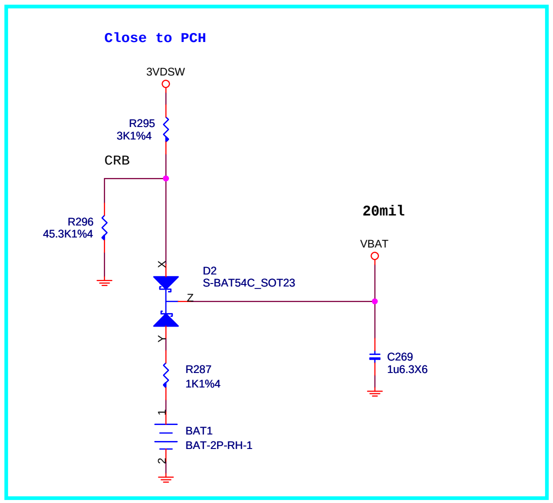
MICRO-STAR INT'L CO.,LTD			
MS-7A48			
Size: Custom	Document Description: Rear USB3 & Front Connector		Rev: 1.0
Date: Wednesday, January 13, 2016	Sheet 28 of 49		



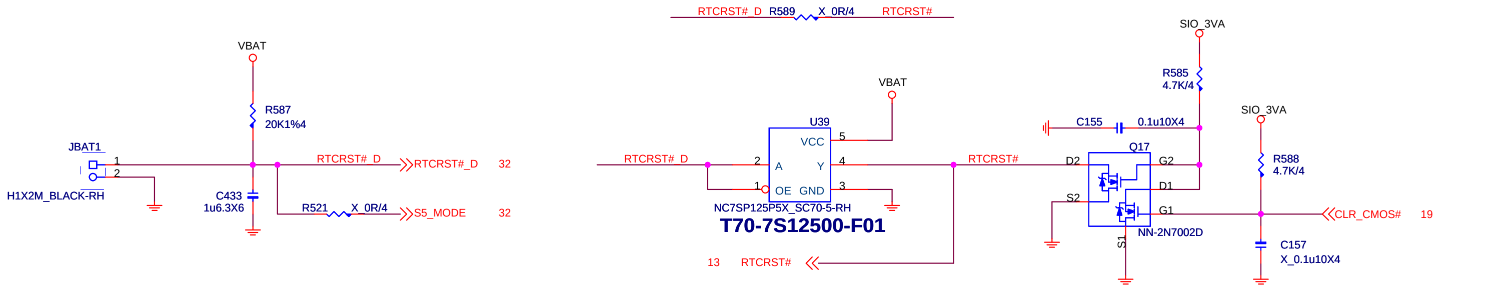
MICRO-STAR INT'L CO.,LTD		
MS-7A48		
Size: Custom	Document Description: **SATA connector**	Rev: 1.0
Date: Tuesday, January 12, 2016	Sheet 29 of 49	

G3 Status

CUT_VBAT



Vinafix.com



tri-state		
INPUT		outout pin4
PIN1	PIN2	
L	H	H
L	L	L
H	X	Z

	R589	U39	R587	C433
USE U39 Auto CLR_CMOS	X	O	O	O
NOT USE U39 Auto CLR_CMOS	O	X	X	X

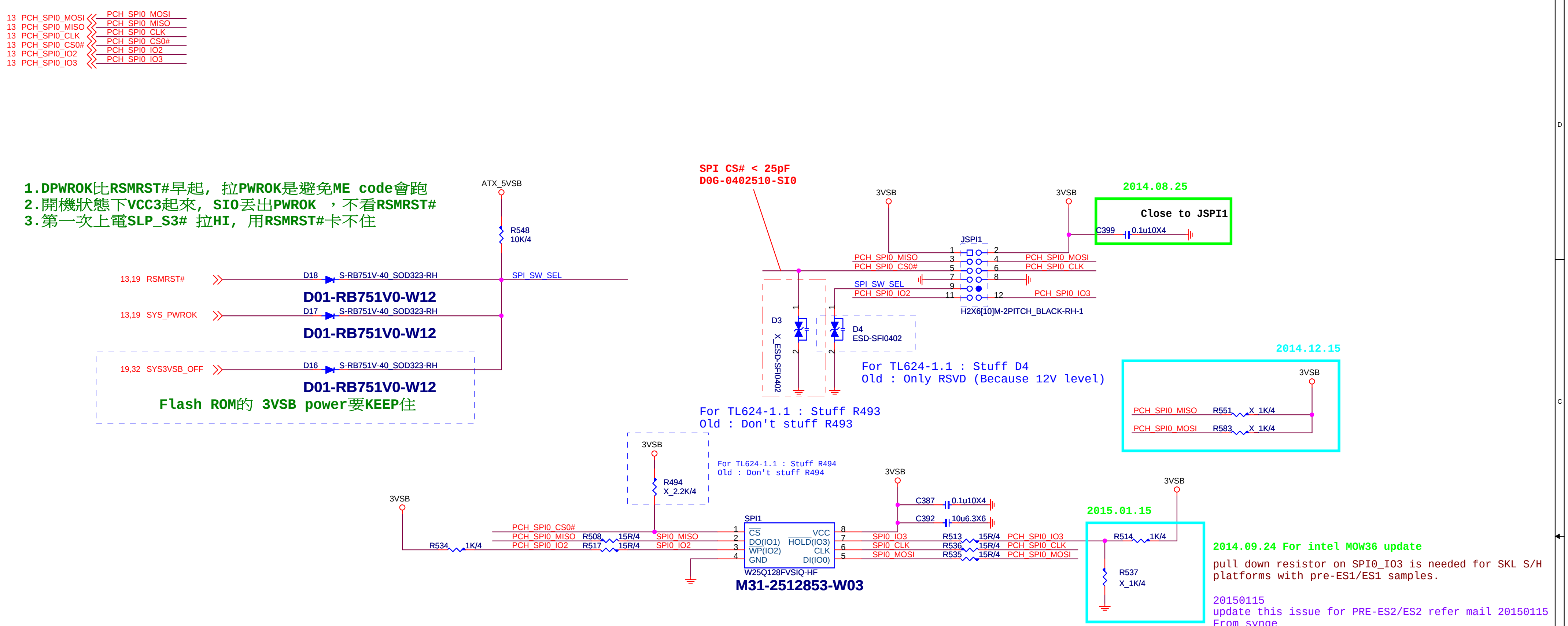
MSI

MICRO-STAR INT'L CO.,LTD

MS-7A48

Size	Document Description	Rev
Custom	CUT_VABT circuit	1.0

Date: Tuesday, January 12, 2016 Sheet 30 of 49



* if you not support Standby power in S5 Status, component Q14.G Pull-high to +12V & Q14 MOS select 2N7002

* if you support Standby power in S5 Status(Ex; PCH is B75 Chipset) , component Q14.G Pull-high to ATX_5VSB , Q14 must select "Vth" under 1V (Component Suggestion as below)

D03-0341409-A68 / D03-0230019-A30

MICRO-STAR INT'L CO.,LTD

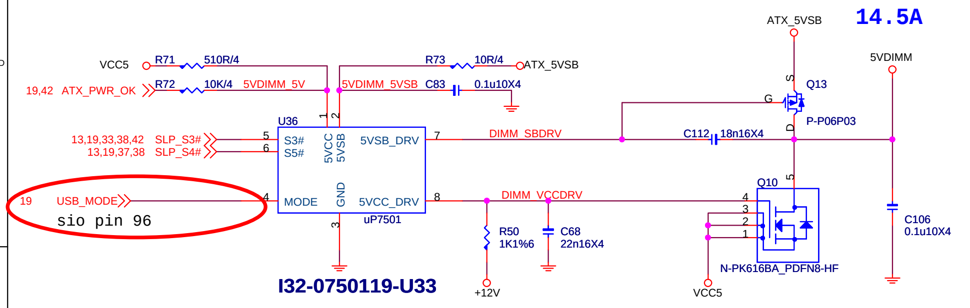
MS-7A48

Size	Document Description	Rev
Custom	BIOS ROM	1.0

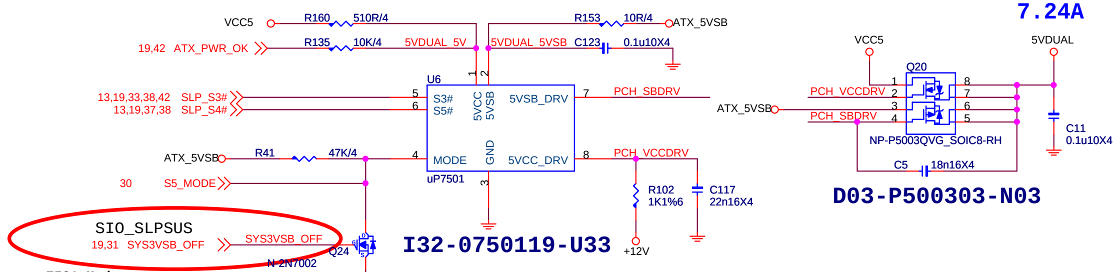
Date: Tuesday, January 12, 2016 Sheet 31 of 49

5VDIMM FOR DDR & USB

DDR:7.9A USB:6.6A



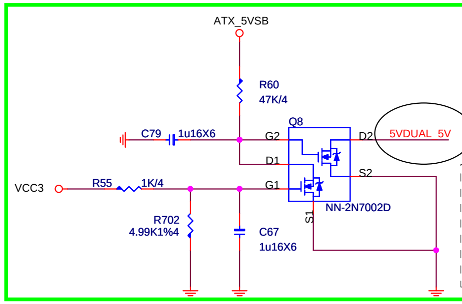
5VDUAL FOR PCH_1VSB



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

SYS3VSB_OFF (DSW POWER CONTROL)
default is set to 1 to cut off the standby power
DSW S5 (HIGH): USB no power
S5 (LOW): USB have power

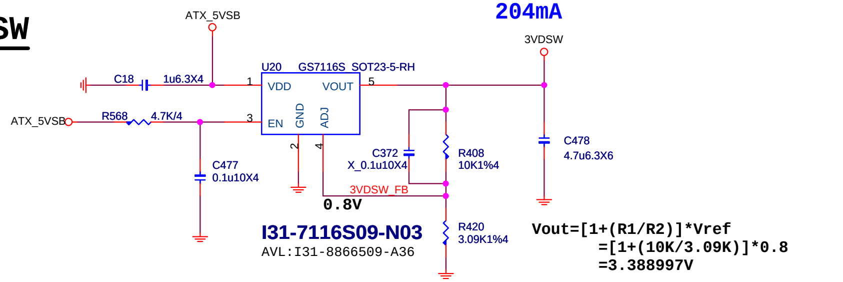
S5#	S3#	MODE	5VDIMM	Remark
1	1	X	VCC5	S0
1	0	X	5VSB	S3
0	X	1	5VSB	S4/S5
0	X	0	Shutdown	S4/S5



For power 700W solution (only for uP7501+uP7506 for 3VSB solution)
The power supply VCC3 delay 12ms after VCC5 assert.
The chip U7501 5VDRV1 work when the VCC5 ready
(When VCC5 up to 4.2V and the 5VDRV1 delay 6ms assert), but
VCC3 not ready and let the 3VSB sequence fail.

3VDSW

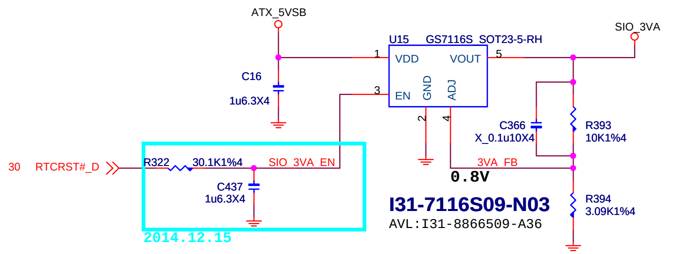
204mA



Vout=[1+(R1/R2)]*Vref
=[1+(10K/3.09K)]*0.8
=3.388997V

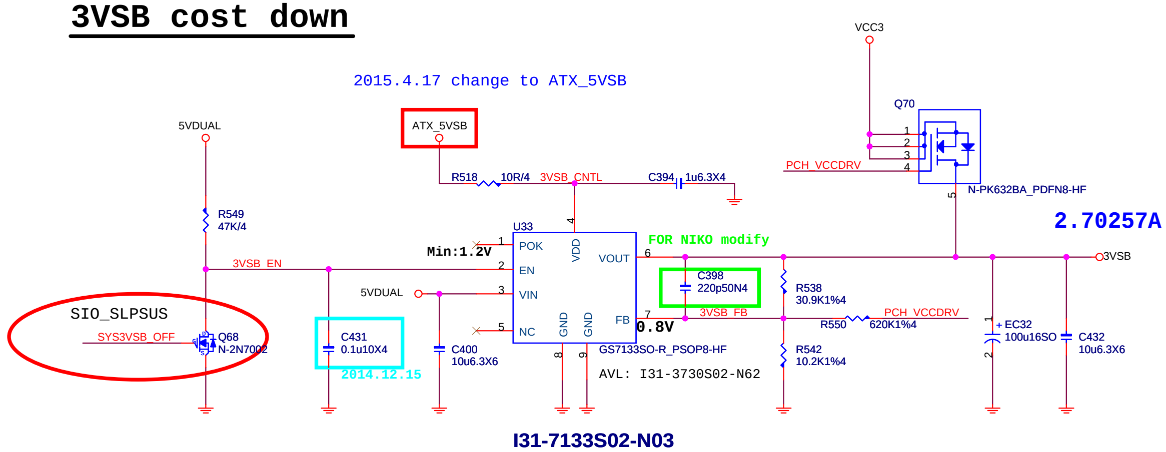
SIO_3VA

20mA

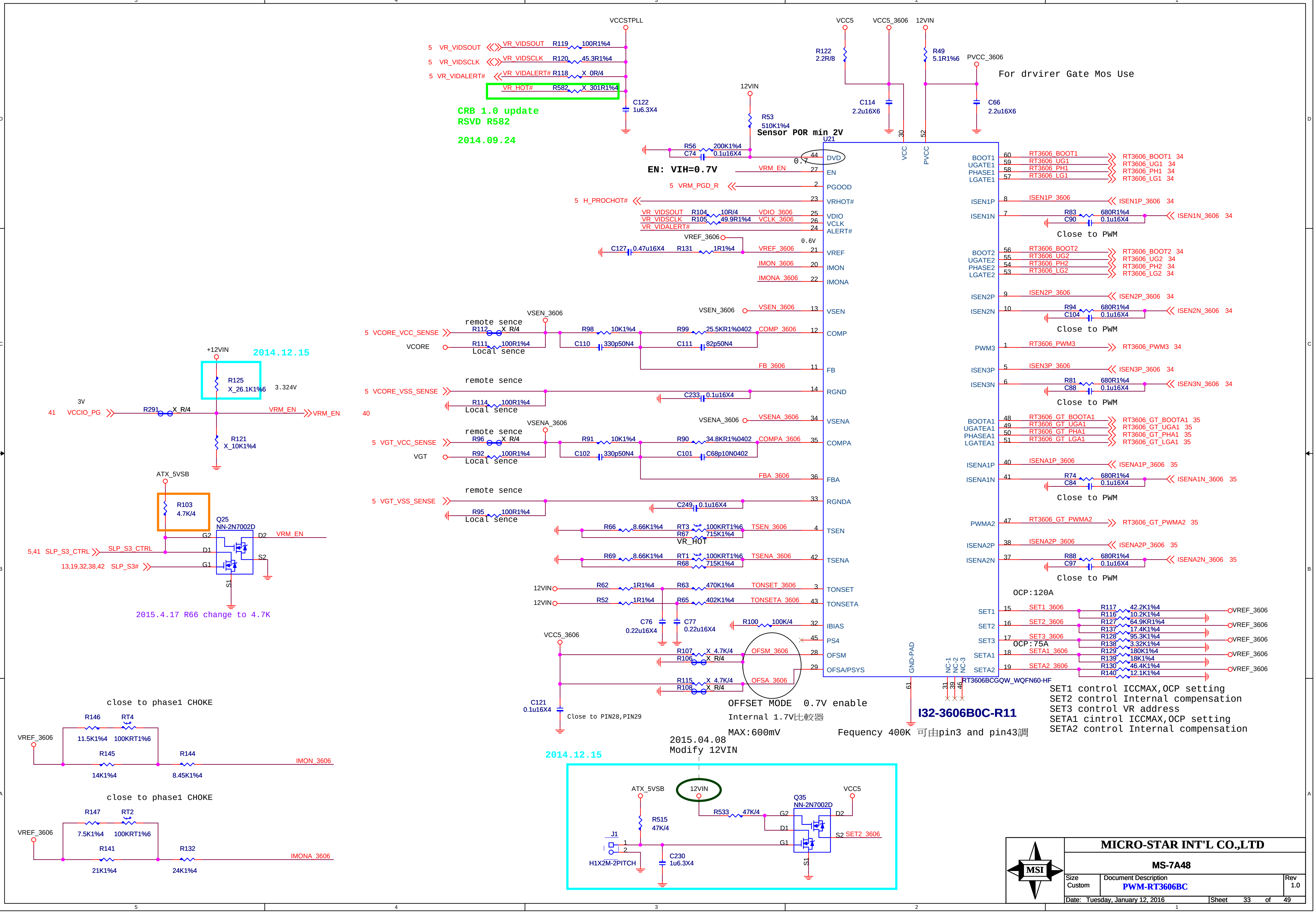


3VSB cost down

2015.4.17 change to ATX_5VSB

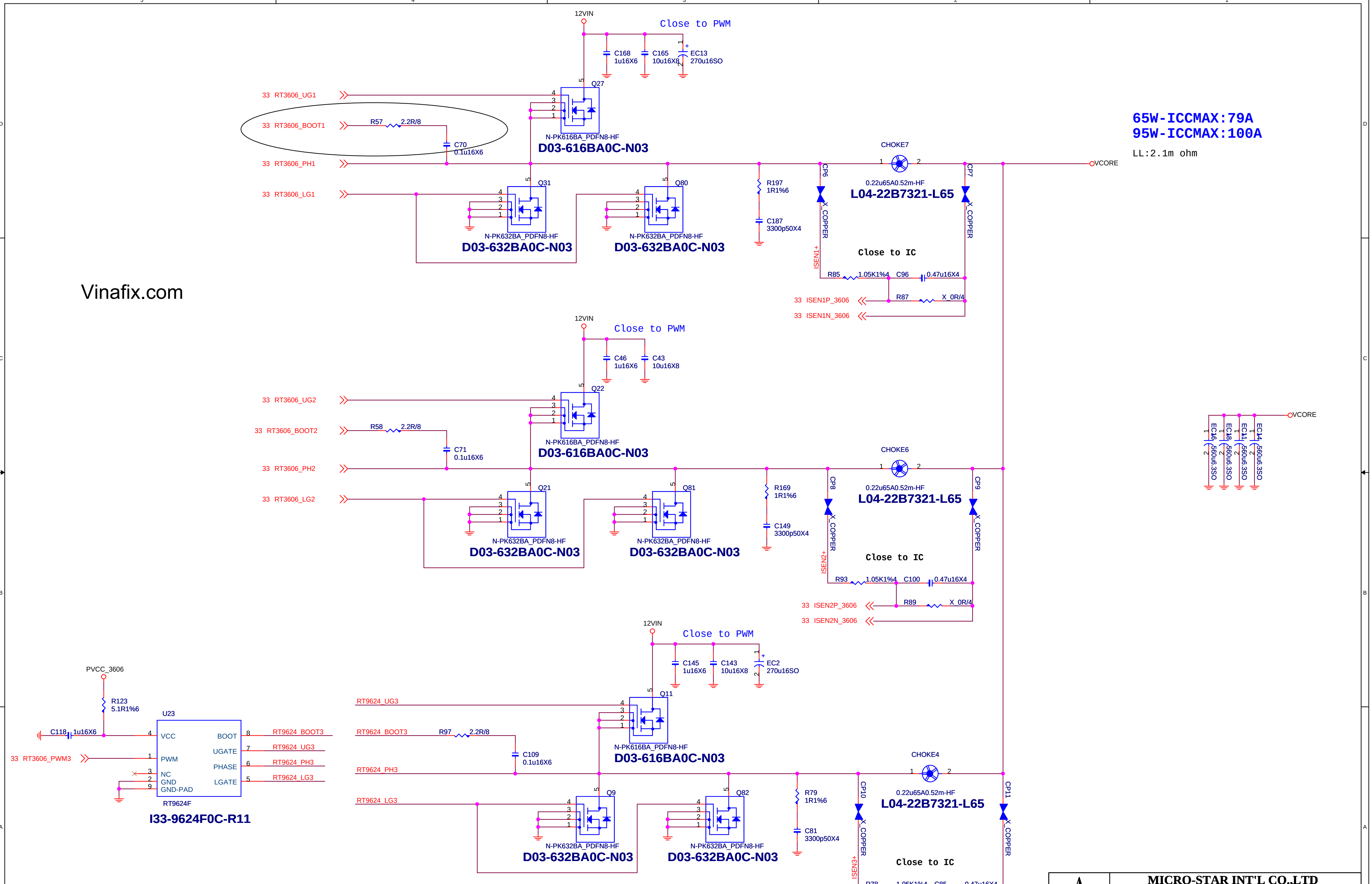


MICRO-STAR INT'L CO.,LTD		
MS-7A48		
Size: Custom	Document Description: ACPI CONTROLLER	Rev: 1.0
Date: Wednesday, January 13, 2016	Sheet 32 of 49	



Size	Document Description	Rev
Custom	PWM-RT3606BC	1.0

Date: Tuesday, January 12, 2016 Sheet 33 of 49

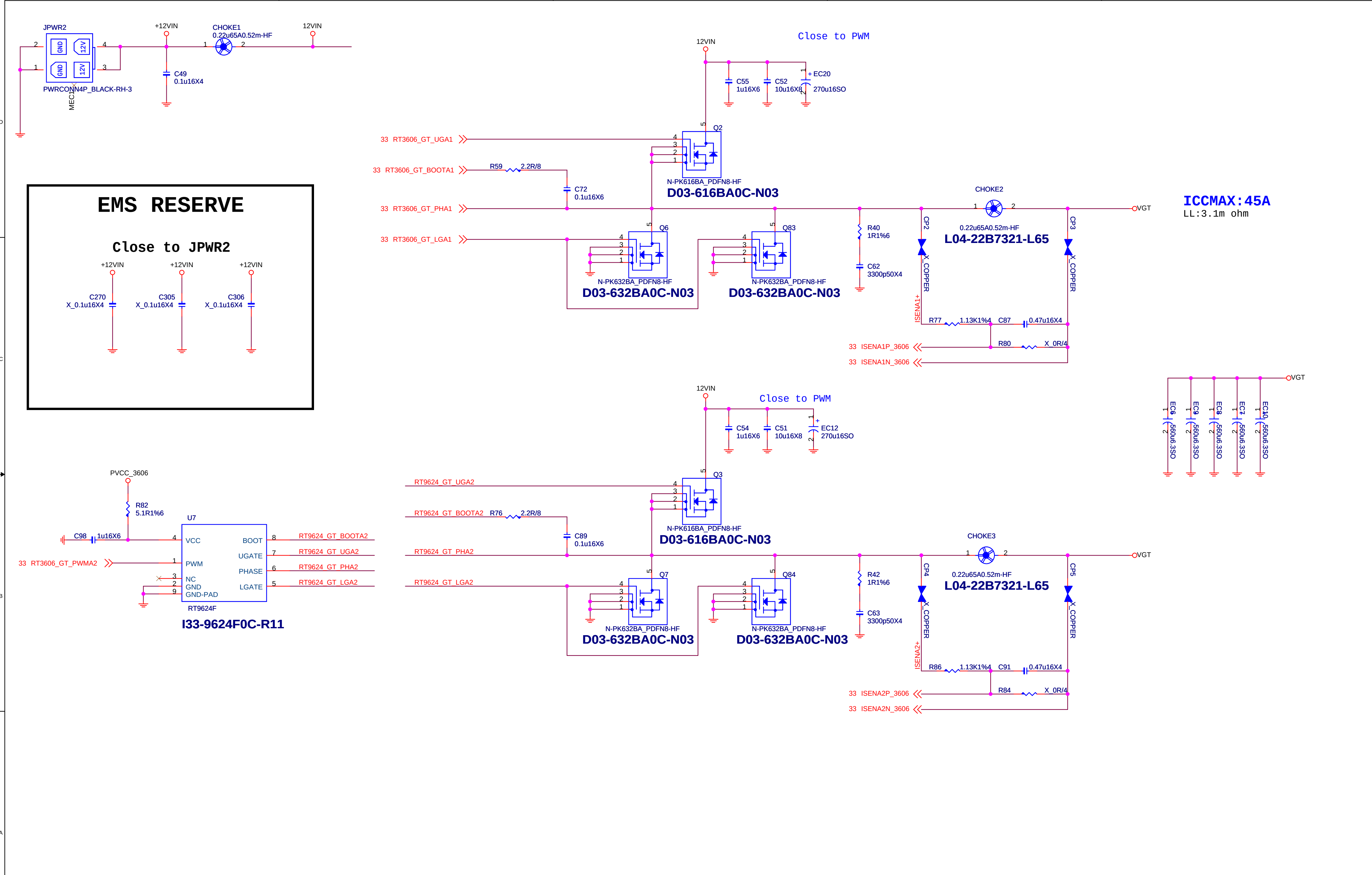


MICRO-STAR INT'L CO.,LTD

MS-7A48

Size	Document Description	Rev
Custom	VCORE(P-PAK) PHASE1-3	1.0

Date: Wednesday, January 13, 2016 | Sheet 34 of 49



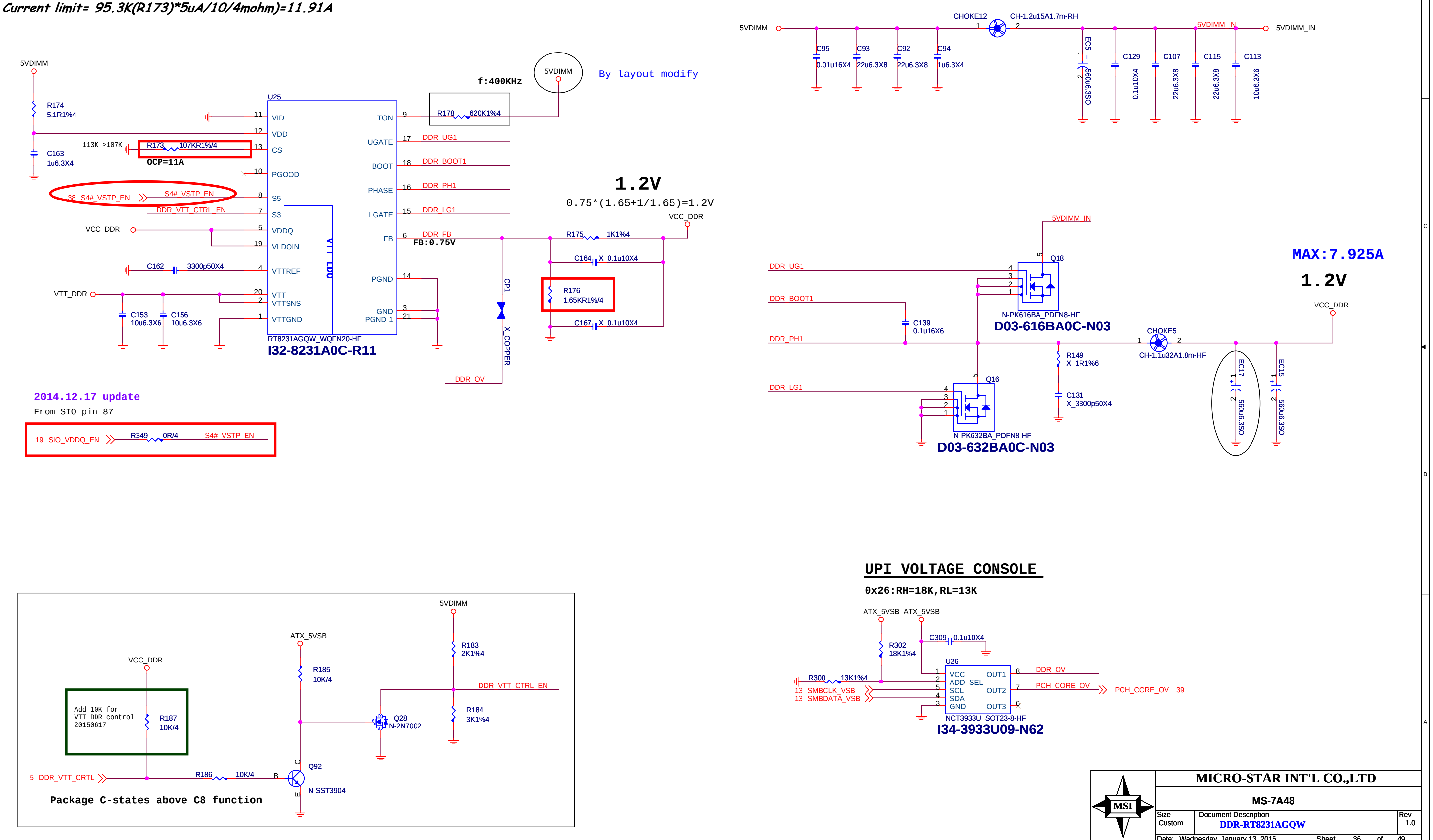
MSI	MICRO-STAR INT'L CO.,LTD		
	MS-7A48		
Size: Custom	Document Description: VGT(P-PAK) PHASE1-2		Rev 1.0
Date: Tuesday, January 12, 2016		Sheet 35 of 49	

DDR Power:1.2V,7.925A

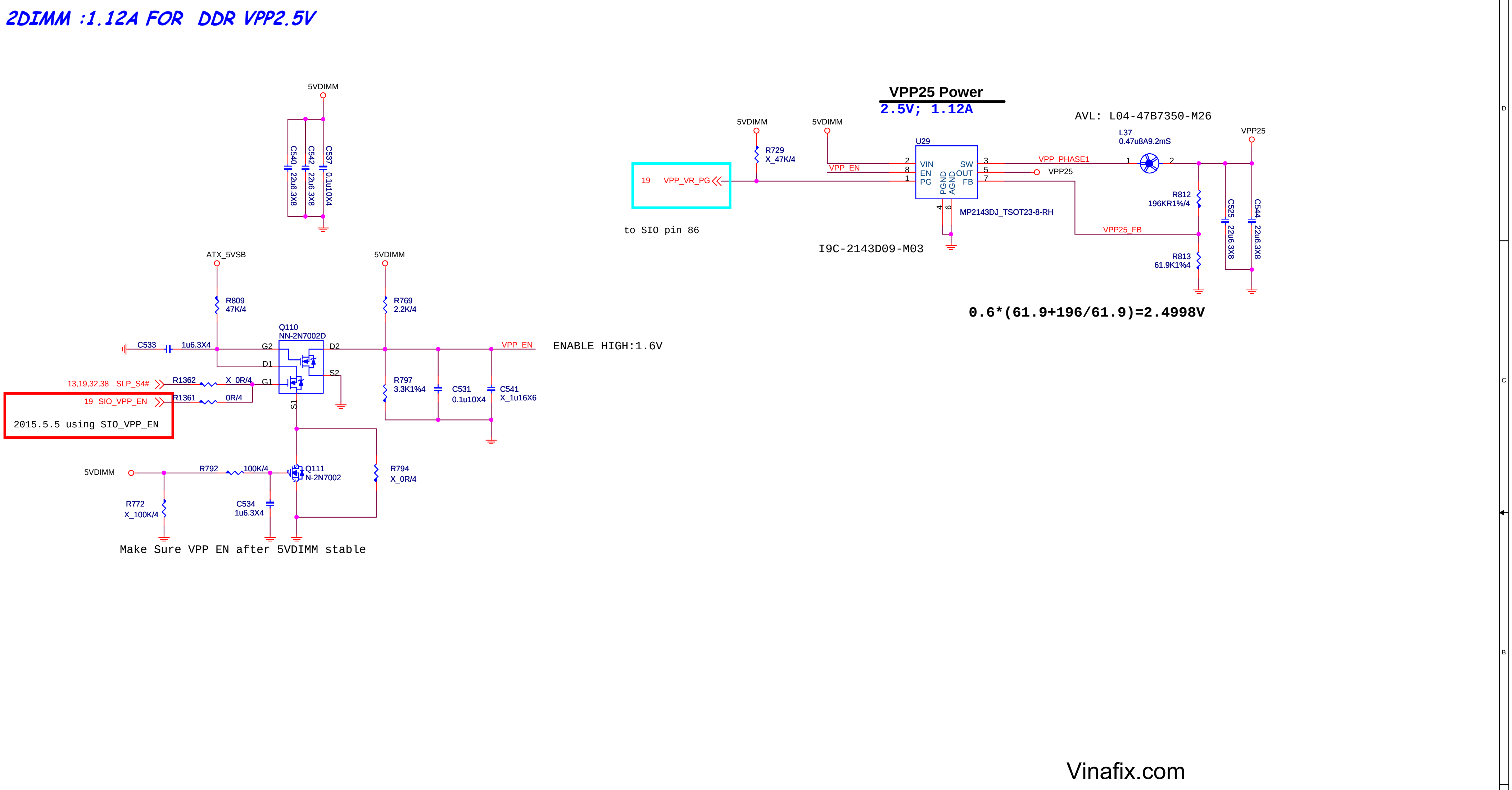
2.8A FOR CPU
4.8A FOR 2DIMM DDR4
0.375A FOR VTT_DDR

*OCP =7.925A*1.5=11.8875A*
*Current limit= 95.3K(R173)*5uA/10/4mohm)=11.91A*

```
Irms = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
     = 9.357 * 0.44
     = 4.154A
```



MICRO-STAR INT'L CO.,LTD		
MS-7A48		
Size: Custom	Document Description: DDR-RT8231AGQW	Rev: 1.0
Date: Wednesday, January 13, 2016	Sheet 36 of 49	

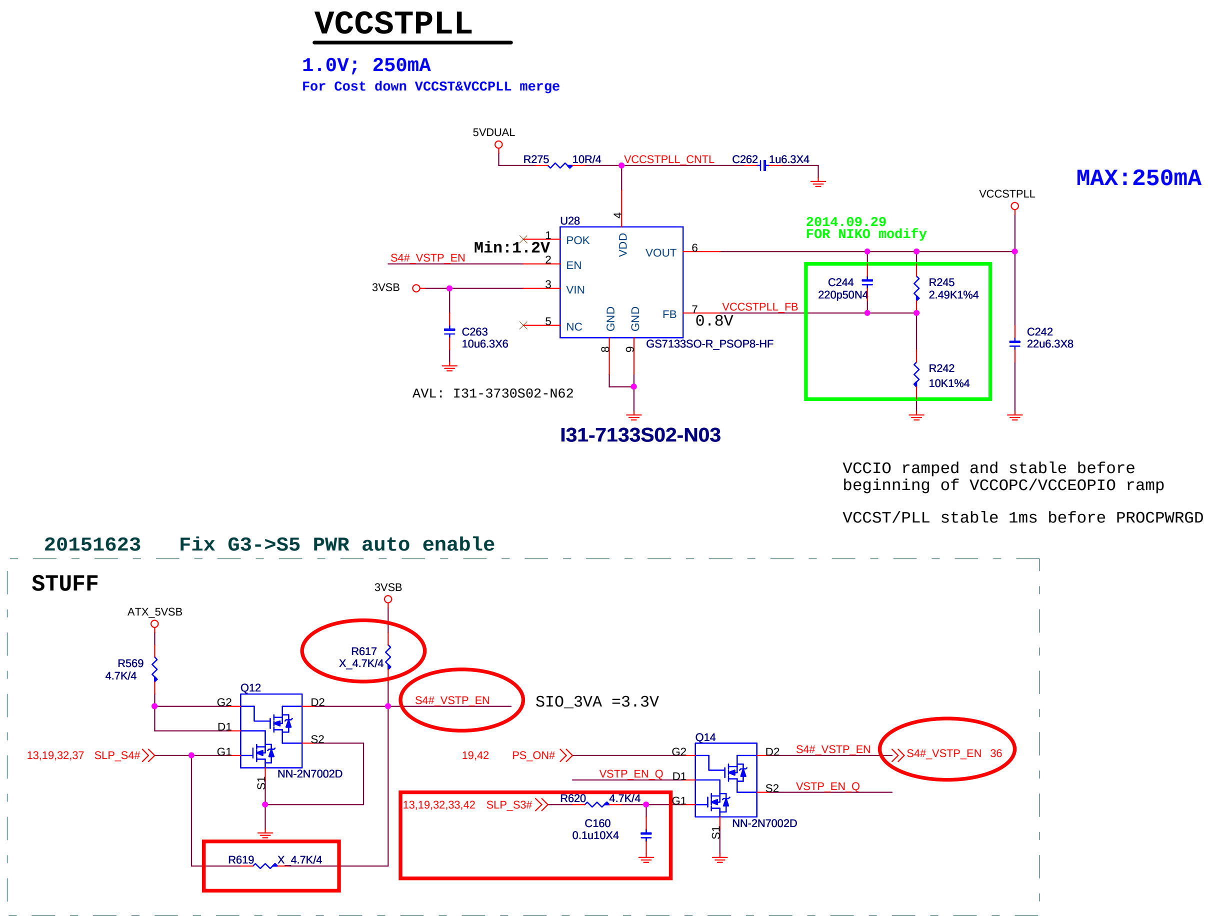


MICRO-STAR INT'L CO.,LTD

MS-7A48

Size	Document Description	Rev
Custom	DDR-MP2143-VPP25	1.0

Date: Wednesday, January 13, 2016 Sheet 37 of 49



MICRO-STAR INT'L CO.,LTD		
MS-7A48		
Size: Custom	Document Description: CPU PWR_ST/PLL	Rev: 1.0
Date: Tuesday, January 12, 2016	Sheet 38 of 49	

PCH_1VSB

1.0V; 7.24A

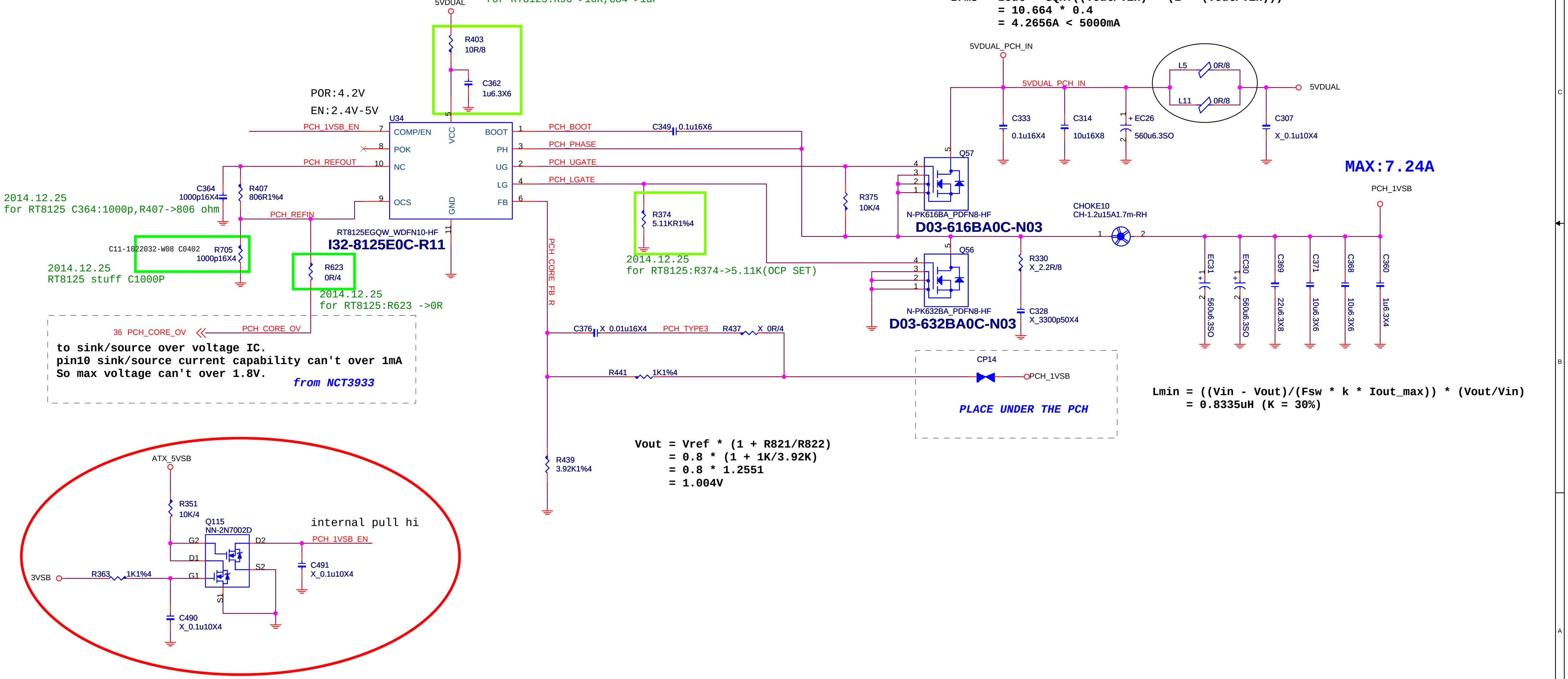
OCP = 15.996A

Rocset = 1.5 * Imax * Rdson(low) / Iocset
       = 1.5 * 7.24 * 4.6mohm / 10uA
       = 4.9956K

Rdson(low)4.5V
D03-4C05N03-O05 : 5 mohm
D03-632BA0C-N03 : 4.6mohm
D03-3056M00-U47 : 6.2mohm

Rocs:7.87K,OCP:
D03-4C05N03-O05 : 15.74A
D03-632BA0C-N03 : 17.1A
use UBIQ MOS need Check

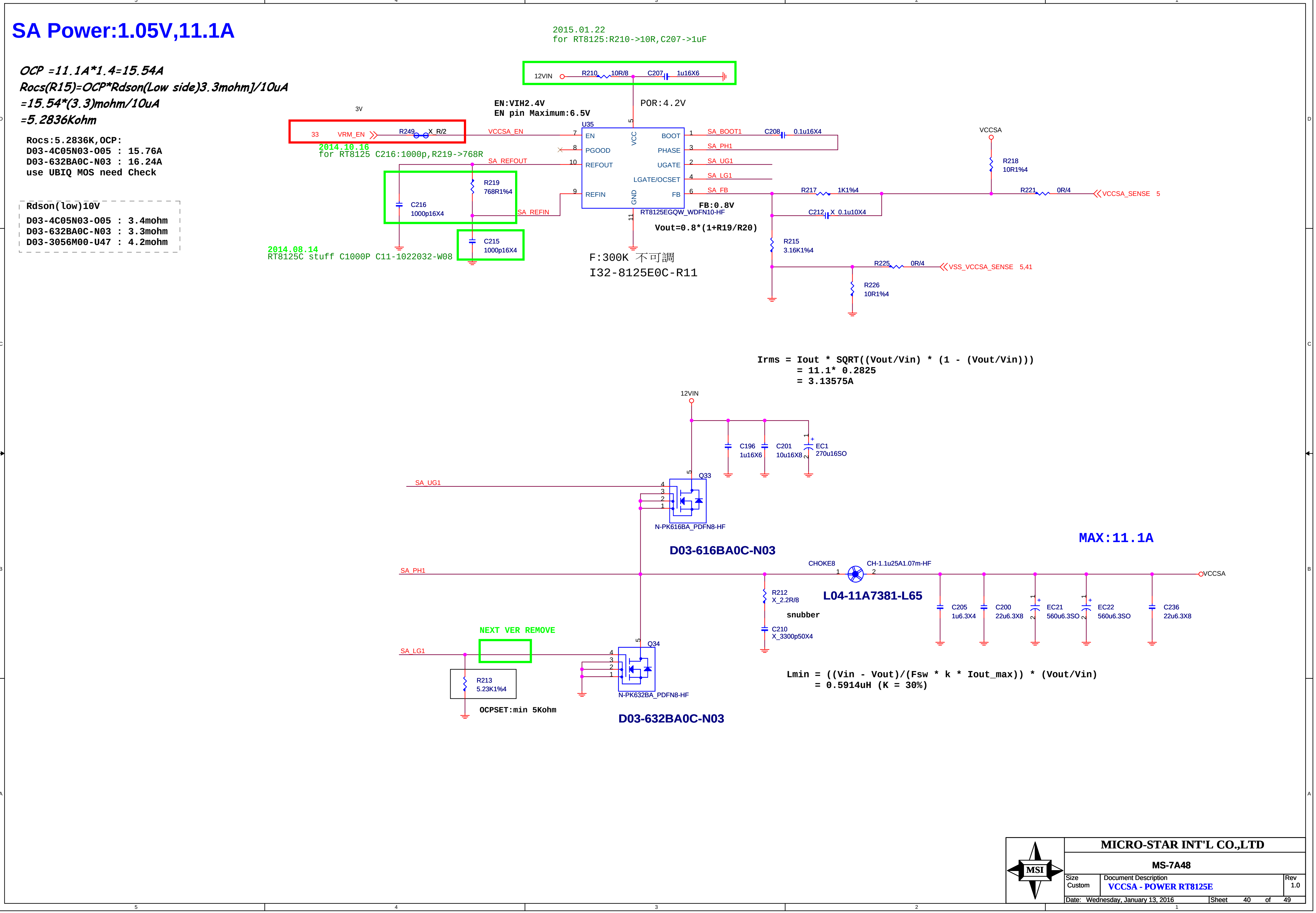
Irms = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
     = 10.664 * 0.4
     = 4.2656A < 5000mA



Lmin = ((Vin - Vout)/(Fsw * k * Iout_max)) * (Vout/Vin)
     = 0.8335uH (K = 30%)

Vout = Vref * (1 + R821/R822)
     = 0.8 * (1 + 1K/3.92K)
     = 0.8 * 1.2551
     = 1.004V

MICRO-STAR INT'L CO.,LTD		
MS-7A48		
Size: Custom	Document Description: PCH Core power	Rev: 1.0
Date: Wednesday, January 13, 2016	Sheet 39 of 49	



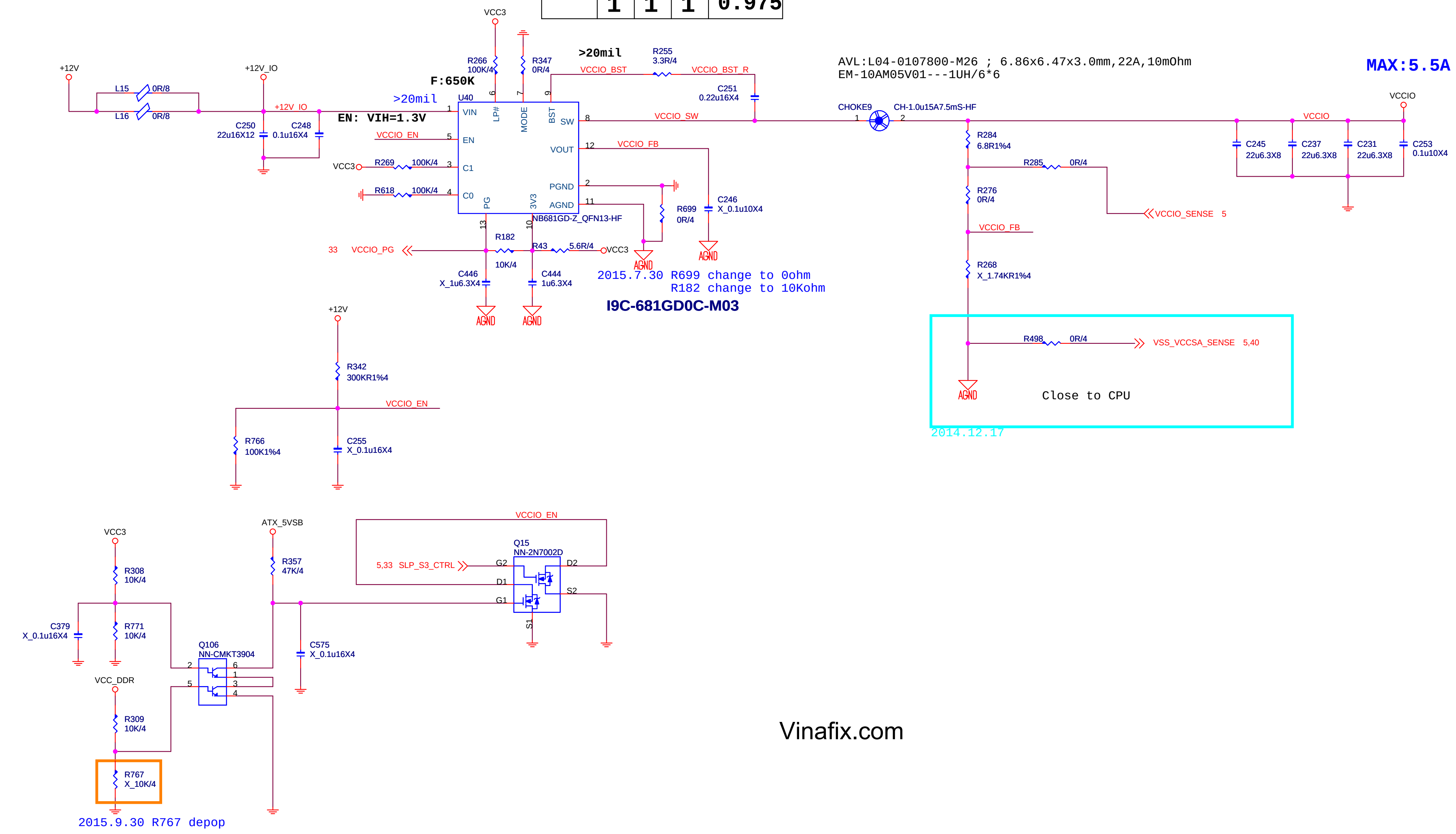
SA Power:1.05V,11.1A
2015.01.22
for RT8125:R210->10R,C207->1uF
OCP =11.1A*1.4=15.54A
Rocs(R15)=OCP*Rdson(Low side)3.3mohm]/10uA
=15.54*(3.3)mohm/10uA
=5.2836Kohm
Rocs:5.2836K,OCP:
D03-4C05N03-005 : 15.76A
D03-632BA0C-N03 : 16.24A
use UBIQ MOS need Check
Rdson(low)10V
D03-4C05N03-005 : 3.4mohm
D03-632BA0C-N03 : 3.3mohm
D03-3056M00-U47 : 4.2mohm
3V
12VIN
R210 10R/8
C207 1u16X6
EN:VIH2.4V
EN pin Maximum:6.5V
POR:4.2V
33 VRM_EN
R249 X_R/2
VCCSA_EN
2014.10.16
for RT8125 C216:1000p,R219->768R
SA_REFOUT
U35
EN
PGOOD
REFOUT
REFIN
VCC
GND
BOOT
PHASE
UGATE
LGATE/OCSET
FB
RT8125EGQW_WDFN10-HF
SA_BOOT1
C208 0.1u16X4
SA_PH1
SA_UG1
SA_LG1
SA_FB
FB:0.8V
Vout=0.8*(1+R19/R20)
C216 1000p16X4
R219 768R1%4
SA_REFIN
C215 1000p16X4
2014.08.14
RT8125C stuff C1000P C11-1022032-W08
F:300K 不可調
I32-8125E0C-R11
VCCSA
R218 10R1%4
R217 1K1%4
R221 0R/4
VCCSA_SENSE 5
C212 X_0.1u10X4
R215 3.16K1%4
R225 0R/4
VSS_VCCSA_SENSE 5,41
R226 10R1%4
Irms = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
= 11.1* 0.2825
= 3.13575A
12VIN
C196 1u16X6
C201 10u16X8
EC1 270u16SO
SA_UG1
Q33
N-PK616BA_PDFN8-HF
D03-616BA0C-N03
MAX:11.1A
SA_PH1
CHOKE8
CH-1.1u25A1.07m-HF
VCCSA
R212 X_2.2R/8
snubber
C210 X_3300p50X4
L04-11A7381-L65
C205 1u6.3X4
C200 22u6.3X8
EC21 560u6.3SO
EC22 560u6.3SO
C236 22u6.3X8
NEXT VER REMOVE
SA_LG1
R213 5.23K1%4
OCPSET:min 5Kohm
Q34
N-PK632BA_PDFN8-HF
D03-632BA0C-N03
Lmin = ((Vin - Vout)/(Fsw * k * Iout_max)) * (Vout/Vin)
= 0.5914uH (K = 30%)
MSI
MICRO-STAR INT'L CO.,LTD
MS-7A48
Size Custom
Document Description
VCCSA - POWER RT8125E
Rev 1.0
Date: Wednesday, January 13, 2016
Sheet 40 of 49

VCCIO

0.95V; 5.5A

IMAX 6A
ILIMIT=8.5~9A

	LP#	C1	C0	VOUT(V)
VCCIO	0	X	X	0
	1	0	0	0.85
	1	0	1	0.875
	1	1	0	0.95
	1	1	1	0.975

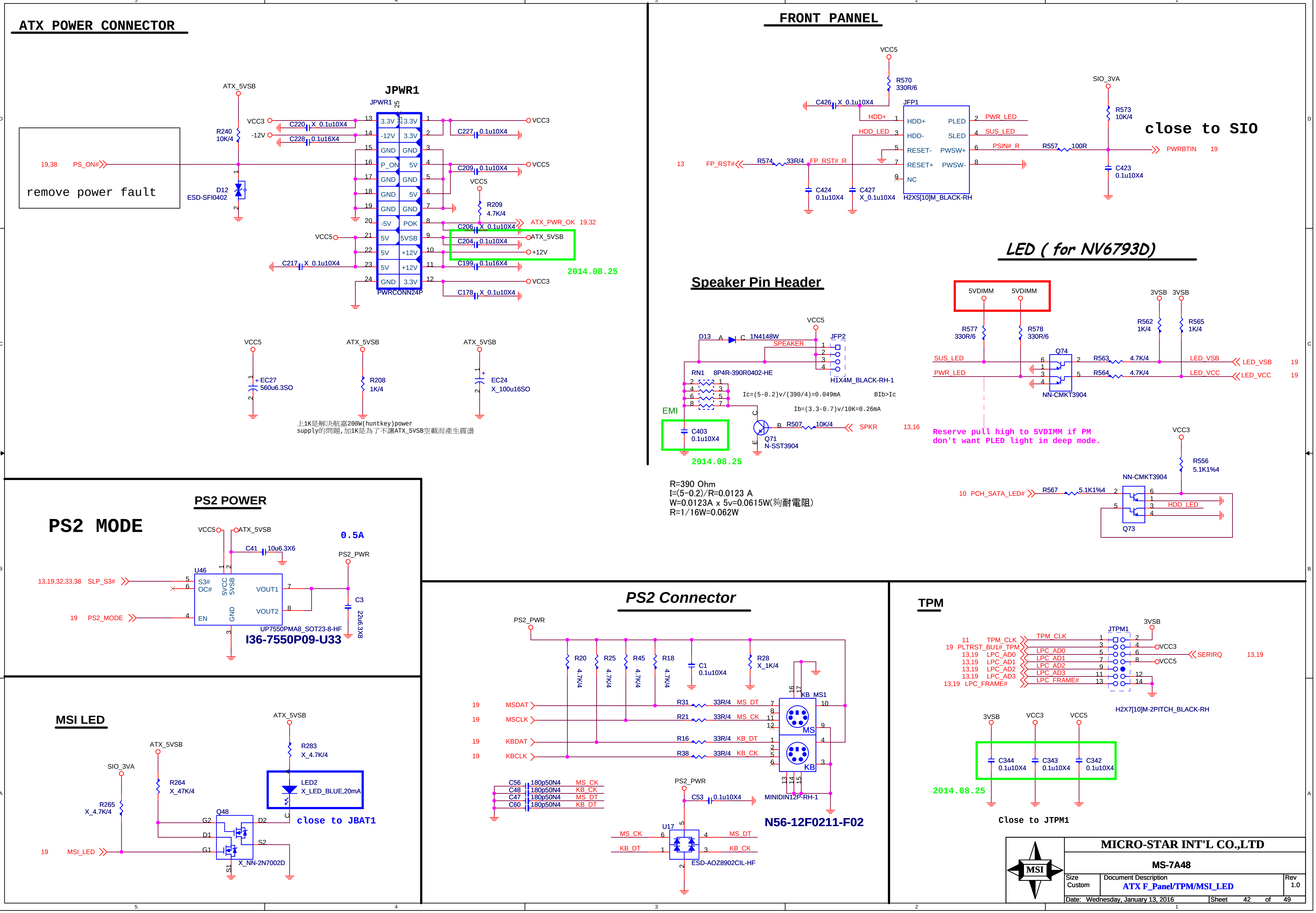


MICRO-STAR INT'L CO.,LTD

MS-7A48

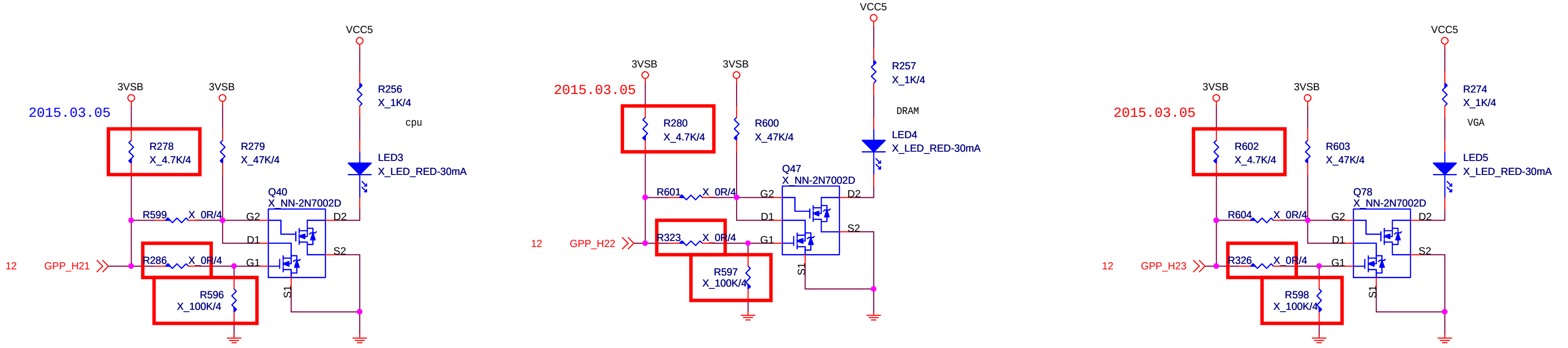
Size	Document Description	Rev
Custom	VCCIO - POWER NB671	1.0

Date: Tuesday, January 12, 2016 Sheet 41 of 49


ATX POWER CONNECTOR
JPWR1
PWRCONN24P
remove power fault
PS_ON#
ATX_5VSB
R240 10K/4
D12 ESD-SFI0402
C220 X_0.1u10X4
C228 0.1u16X4
C227 0.1u10X4
C209 0.1u10X4
C206 X_0.1u10X4
C204 0.1u10X4
C199 0.1u16X4
C178 X_0.1u10X4
C217 X_0.1u10X4
R209 4.7K/4
ATX_PWR_OK 19,32
2014.08.25
EC27 560u6.3SO
R208 1K/4
EC24 X_100u16SO
上1K是解決航嘉200W(huntkey)power
supply的問題,加1K是為了不讓ATX_5VSB空載而產生震盪
FRONT PANNEL
JFP1
H2X5[10]M_BLACK-RH
R570 330R/6
C426 X_0.1u10X4
R573 10K/4
R574 33R/4
R557 100R
C423 0.1u10X4
C424 0.1u10X4
C427 X_0.1u10X4
PWR_LED
SUS_LED
PSIN#_R
PWRBTIN 19
FP_RST# 13
close to SIO
LED (for NV6793D)
Speaker Pin Header
D13 1N4148W
SPEAKER
JFP2
H1X4M_BLACK-RH-1
RN1 8P4R-390R0402-HE
Ic=(5-0.2)v/(390/4)=0.049mA
IB>Ic
Ib=(3.3-0.7)v/10K=0.26mA
EMI
C403 0.1u10X4
R507 10K/4
SPKR 13,16
Q71 N-SST3904
R=390 Ohm
I=(5-0.2)/R=0.0123 A
W=0.0123A x 5v=0.0615W(夠耐電阻)
R=1/16W=0.062W
5VDIMM
R577 330R/6
R578 330R/6
R562 1K/4
R565 1K/4
Q74 NN-CMKT3904
R563 4.7K/4
R564 4.7K/4
LED_VSB 19
LED_VCC 19
Reserve pull high to 5VDIMM if PM
don't want PLED light in deep mode.
R556 5.1K1%4
R567 5.1K1%4
10 PCH_SATA_LED#
Q73 NN-CMKT3904
HDD_LED
PS2 POWER
PS2 MODE
0.5A
U46
UP7550PMA8_SOT23-8-HF
I36-7550P09-U33
C41 10u6.3X6
C3 22u6.3X8
13,19,32,33,38 SLP_S3#
19 PS2_MODE
PS2_PWR
PS2 Connector
R20 4.7K/4
R25 4.7K/4
R45 4.7K/4
R18 4.7K/4
C1 0.1u10X4
R28 X_1K/4
R31 33R/4
R21 33R/4
R16 33R/4
R38 33R/4
MSDAT MSCLK KBDAT KBCLK
KB_MS1
MINIDIN12P-RH-1
N56-12F0211-F02
C56 C48 C47 C60 180p50N4
C53 0.1u10X4
U17 ESD-AOZ8902CIL-HF
TPM
JTPM1
H2X7[10]M-2PITCH_BLACK-RH
TPM_CLK
PLTRST_BUF1#_TPM
LPC_AD0 LPC_AD1 LPC_AD2 LPC_AD3
LPC_FRAME#
SERIRQ 13,19
C344 0.1u10X4
C343 0.1u10X4
C342 0.1u10X4
2014.08.25
Close to JTPM1
MSI LED
R283 X_4.7K/4
LED2 X_LED_BLUE,20mA
close to JBAT1
R264 X_47K/4
R265 X_4.7K/4
Q48 X_NN-2N7002D
19 MSI_LED
MICRO-STAR INT'L CO.,LTD
MS-7A48
Size Custom
Document Description
ATX F_Panel/TPM/MSI_LED
Rev 1.0
Date: Wednesday, January 13, 2016
Sheet 42 of 49

DEBUG LED

DEBUG LED若有要上件,其中R278,R599,R280,R601,R602,R604不上件,其餘皆要上件

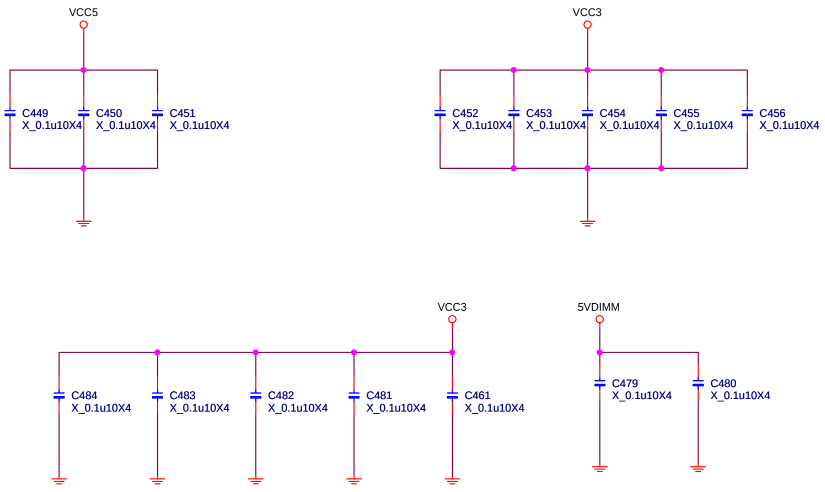


GPIO / LED	GPP_H21	GPP_H21	GPP_H21
亮	GPI (default LOW)	GPI (default LOW)	GPI (default LOW)
滅	HIGH	HIGH	HIGH

關機斷電狀態下，3個LED先維持default全亮(Eup Enable 會全滅)，開機通電後，首先進行CPU check（請研究可否blink），check PASS後則CPU LED滅掉，接著依序進行Memory與VGA的check，LED的行為相同。因此最後正常順利開機後，三個LED燈都是滅掉的。（系統重啟或其他原因造成系統重開機，則LED仍按上述行為動作）

MICRO-STAR INT'L CO.,LTD	
MS-7A48	
Size: Custom	Document Description: ATX F_Panel/TPM/MSI_LED
Rev: 1.0	
Date: Tuesday, January 12, 2016	Sheet 43 of 49

EMI CAP



MICRO-STAR INT'L CO.,LTD

MS-7A48

Size	Document Description	Rev
Custom	EMI	1.0

Date: Thursday, January 07, 2016 Sheet 44 of 49

BAT1_X1
BAT-BCR2032P-RH

CPU_H1
CPU 鐵座
CPU_H1
E21-7869020-F02

LABEL1
H110M
H110M
G51-M1SPJ45-Q13

LABEL2
AMI
AMI
G51-M1SPXXA-A09

PCB1

7A48-1.0
PK0-07A4810-G37
PK0-07A4810-G37 精成-深圳,23,寶安恩斯邁廠(MSIS)
PK0-07A4810-E48,競華,23,寶安恩斯邁廠(MSIS)

HS_PCH1
MEC1
MEC1
MEC2
MEC2
HS-0403980-RH
E31-0403980-K08

Simulation

SIM2 SIM4 X_PIN1*2
SIM1 SIM3 X_PIN1*2

VCC_DDR	VCC_DDR
VTT_DDR	VTT_DDR
5VDIMM	5VDIMM
5VDUAL	5VDUAL
3VSB	3VSB
VBAT	VBAT
3VDSW	3VDSW
PCH_1VSB	PCH_1VSB
VCORE	VCORE
VGT	VGT
VCCSA	VCCSA
VCCSTPLL	VCCSTPLL
VCCIO	VCCIO

Optical Fiducial Marks-120

FM3 X_FM
FM2 X_FM
FM1 X_FM
FM4 X_FM
FM5 X_FM
FM6 X_FM
FM7 X_FM

Mounting Holes

MH1 X_MH001
MH3 X_MH001
MH5 X_MH001
MH2 X_MH001
MH4 X_MH001
MH6 X_MH001

CA34 0.1u10X4
CA29 0.1u10X4

MSI
MICRO-STAR INT'L CO.,LTD
MS-7A48
Size: Custom
Document Description: Manual Parts
Rev: 1.0
Date: Wednesday, January 13, 2016
Sheet 45 of 49