

MS-7A39 Ver:2.0

CPU:
AMD AM4

System Chipset:
Promontory A320
(Value DIY or System Builder)

Main Memory:
DDR IV * 2 MAX:64 GB

VRM
RT8894 3+2

On Board Chipset:
LPC Super I/O --NCT6795
LAN RTL8111H

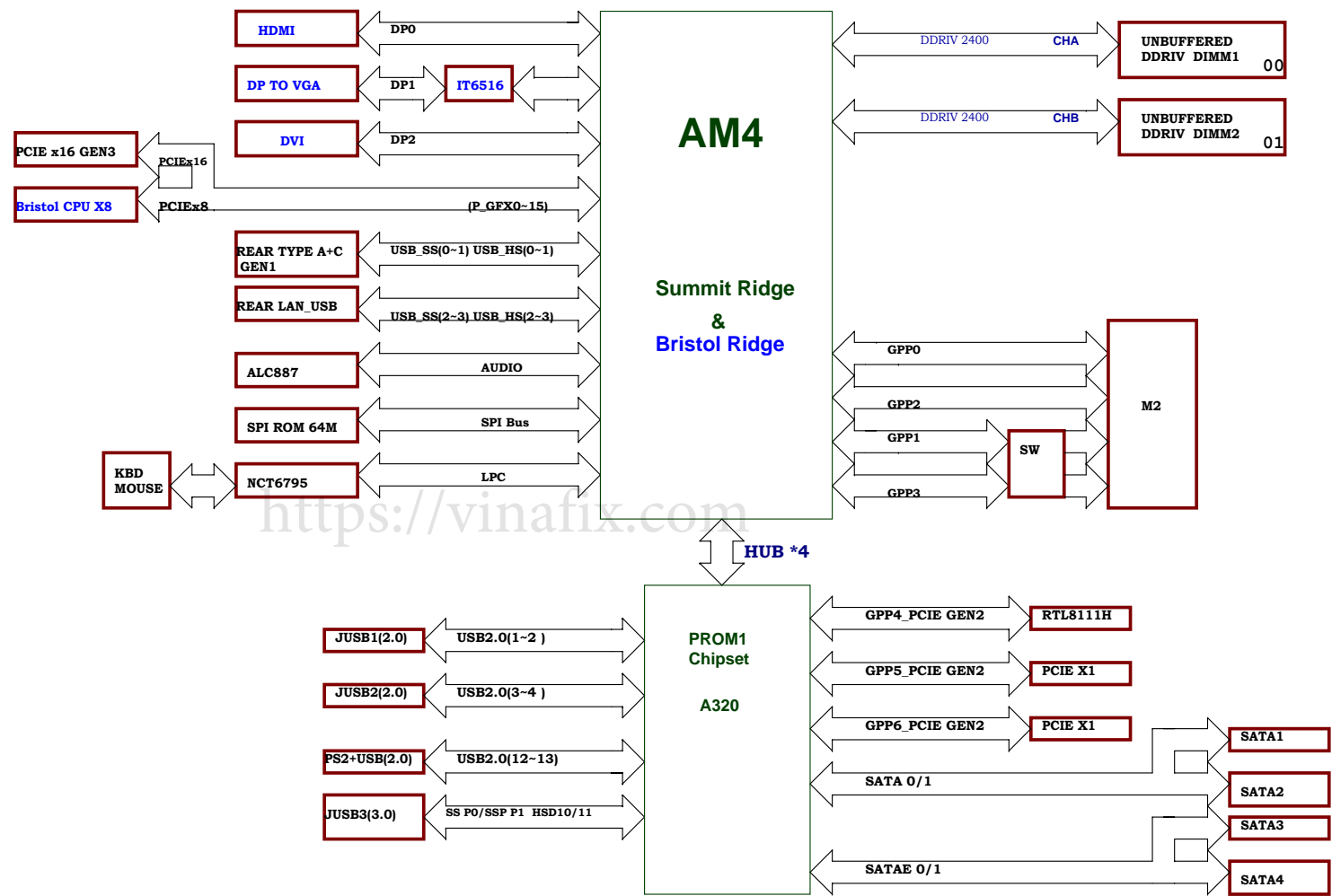
Azalia CODEC - Realtek
ALC887

Expansion Slots:

From CPU
PCI Express X16 Slot * 1
PCI Express X1 Slot * 1
PCI Express X1 Slot * 1

OCP IC:
UP6273

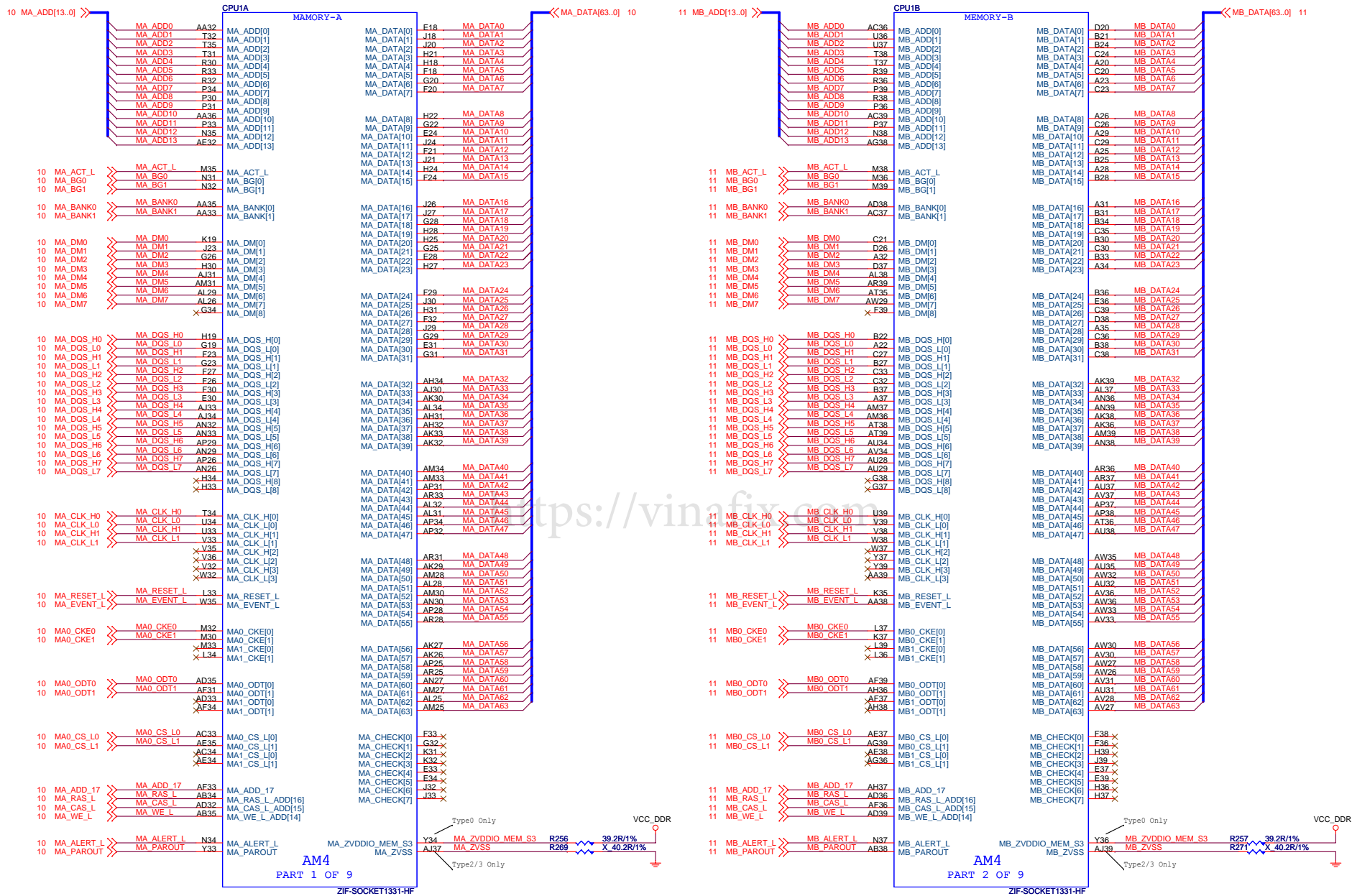
FUSION BLOCK DIAGRAM

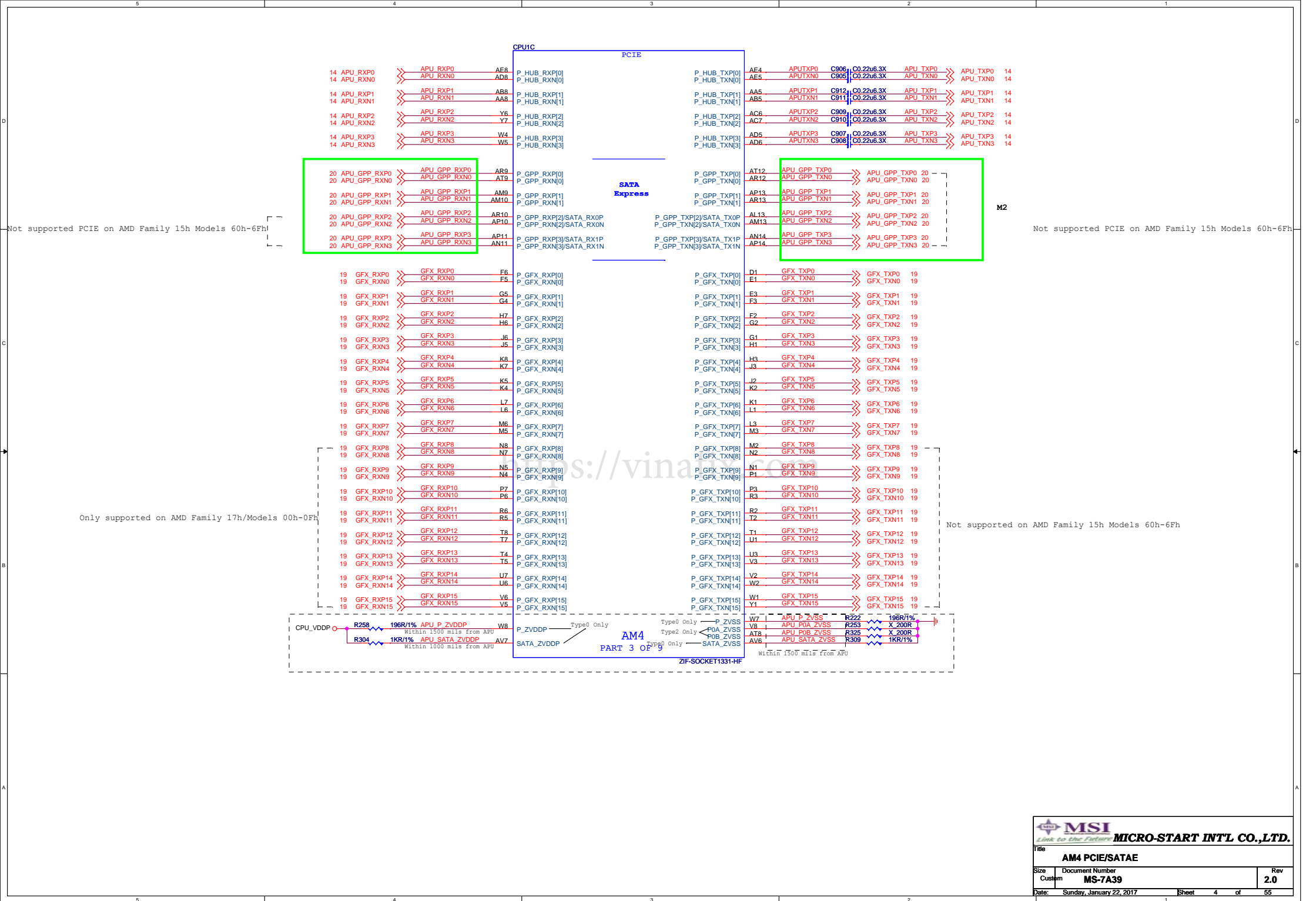


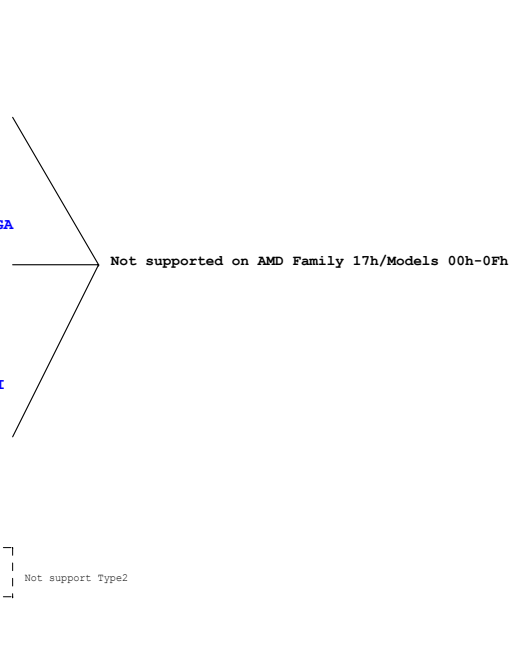
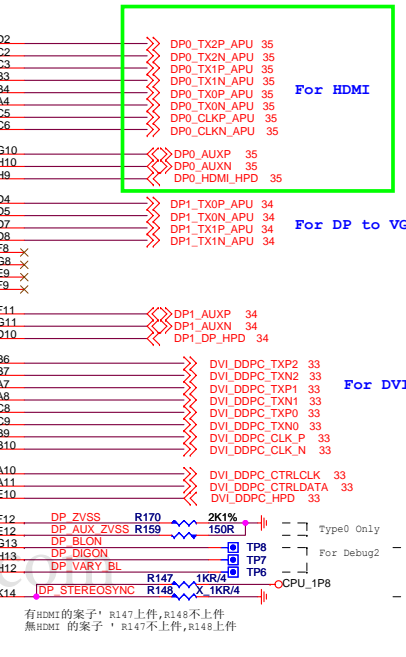
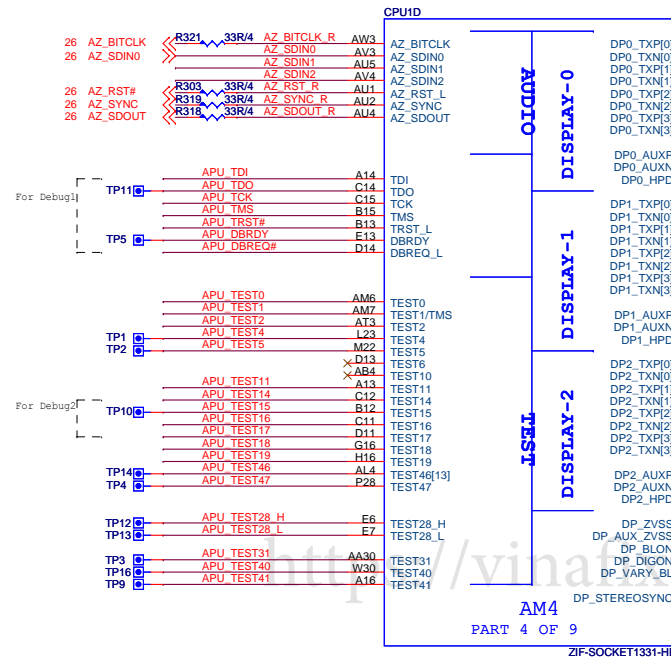
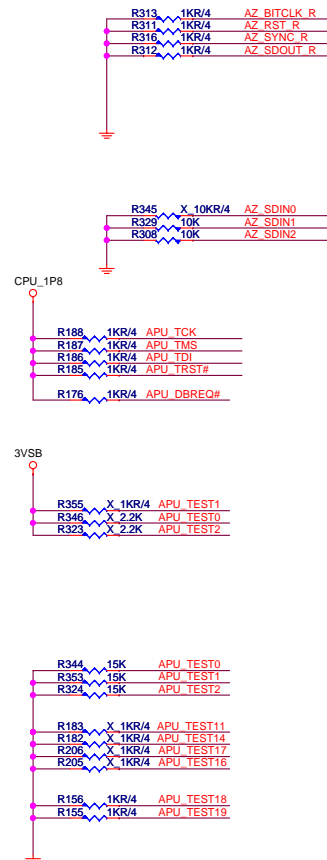
AMD AM4

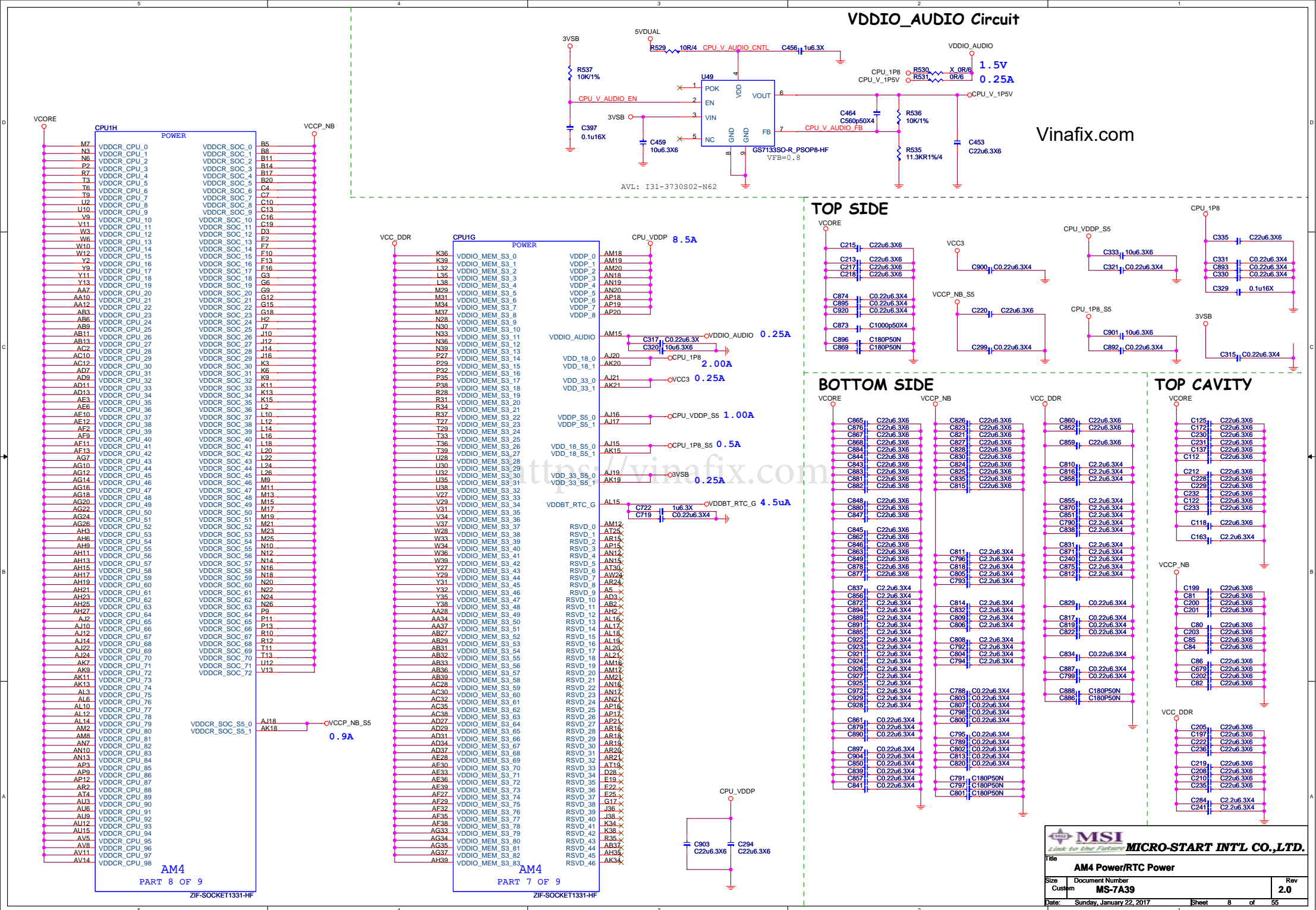
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29 DVI Connector	
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31 ACPI uPI-5VDIMM&3VSB	
32 PM-NB681-1.05V/GS7133-2.5V	
33 DDR PWR VPP25/VTM-MP2143	
34 DDR Power-RT8231AGQW	
35 CPU Power 1P8V-MP2147	

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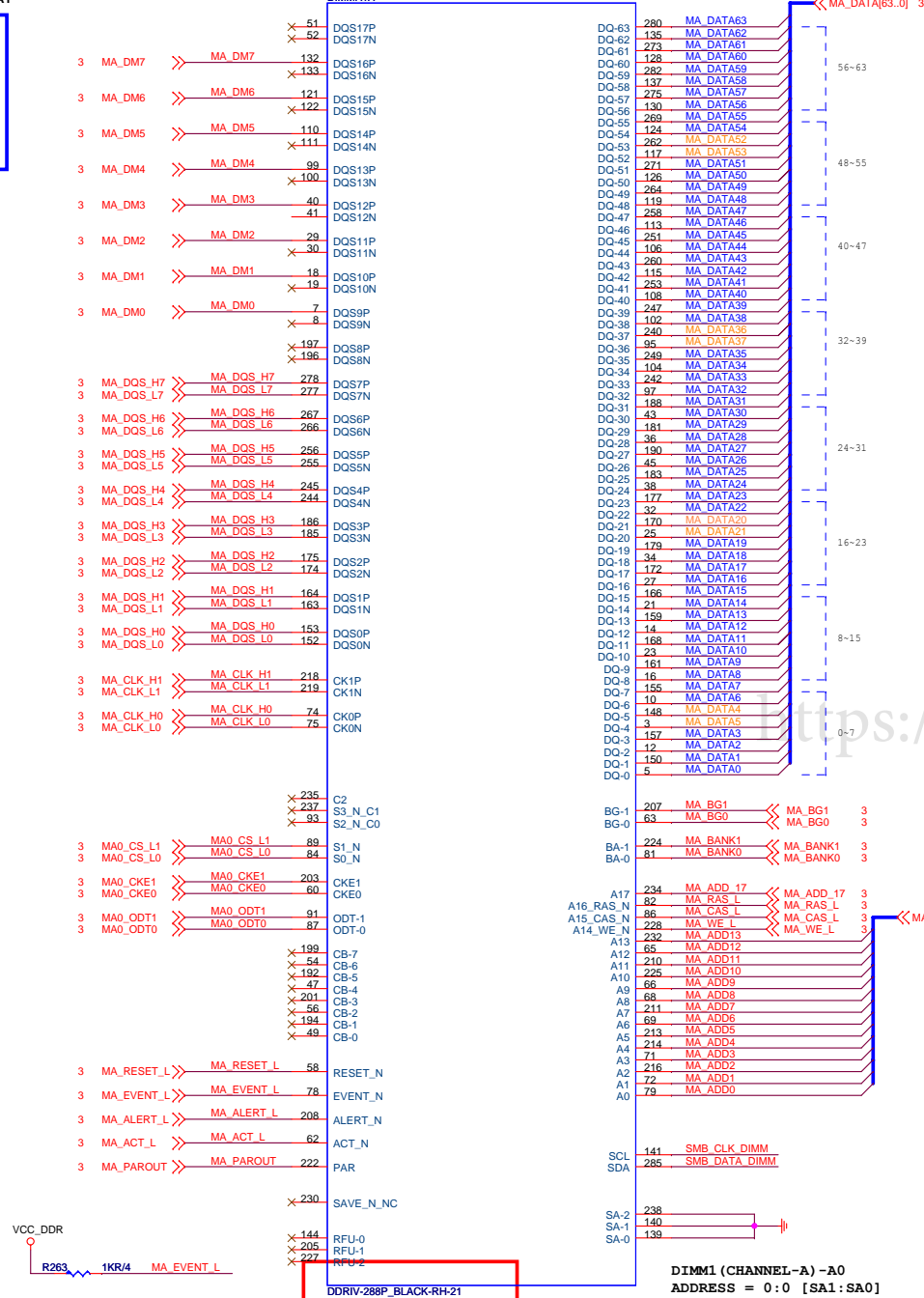
GND

<https://vinafix.com>

AM4
PART 9 OF 9

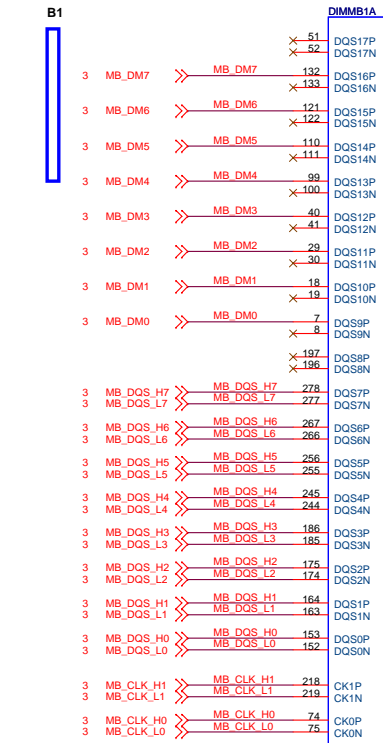
A1

DIMMA1A

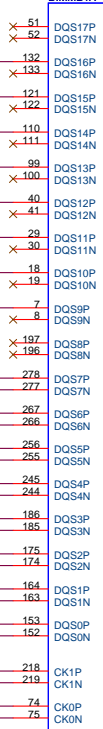


DIMM1 (CHANNEL-A) -A0
ADDRESS = 0:0 [SA1:SA0]

6.43,46,51 SCLK0 >>> SCLK0 R427 OR/4 SMB_CLK_DIMM >>> SMB_CLK_DIMM 11
6.43,46,51 SDATA0 >>> SDATA0 R431 OR/4 SMB_DATA_DIMM >>> SMB_DATA_DIMM 11

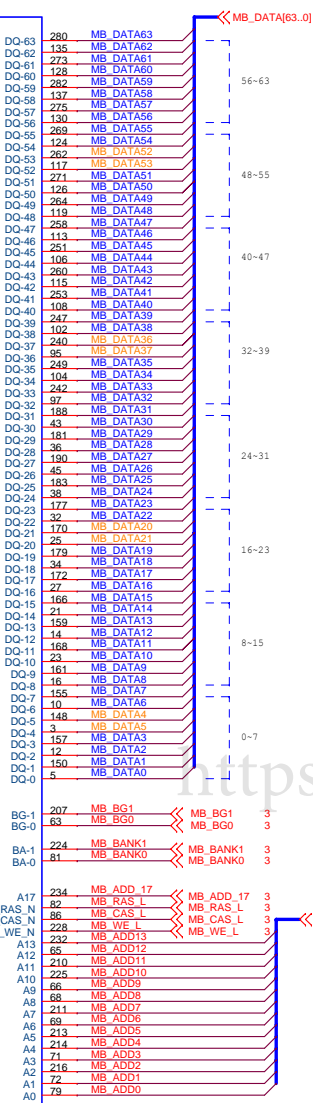


DIMMB1A



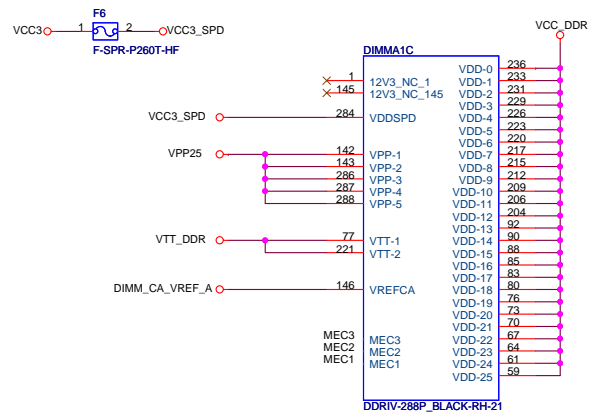
DDRIV-288P BLACK-RH-21

⚡️ AFootprint

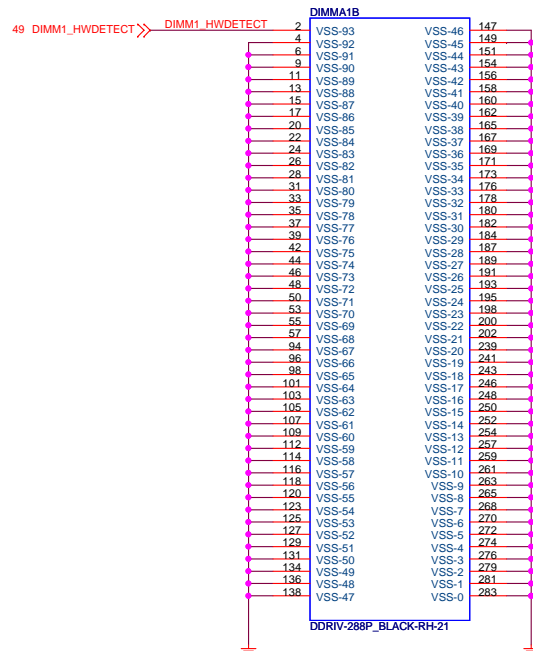
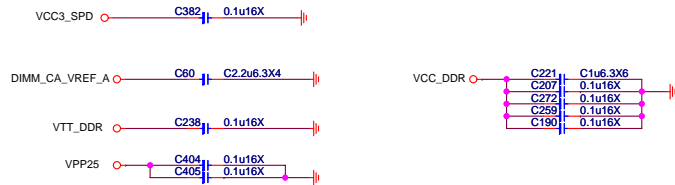


DIMM3 (CHANNEL-B) -A2
ADDRESS = 0:1 [SA1:SA0]

<https://vinafix.com>

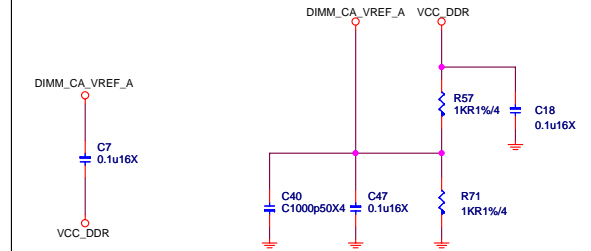


DIMM SLOT PN BY SPEC

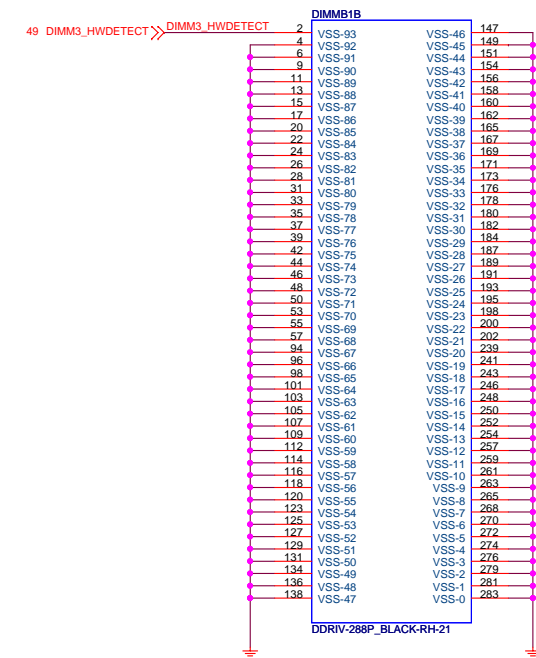
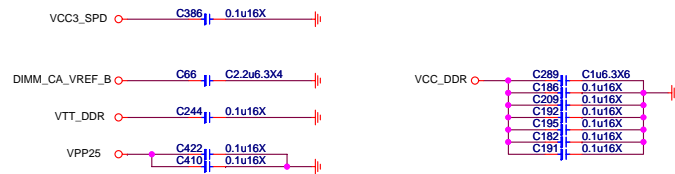
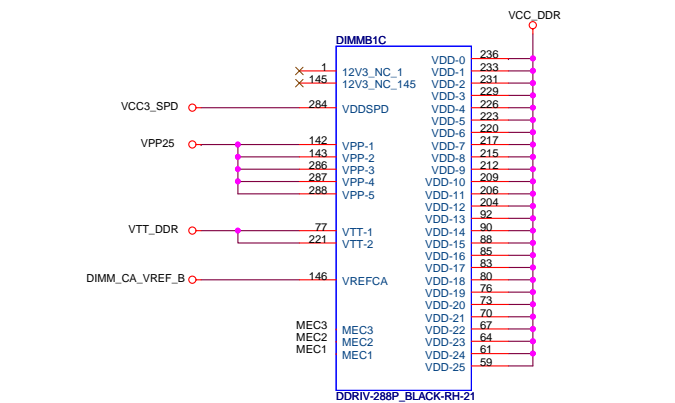


DDR VREF

(place resistors close to DIMMs)

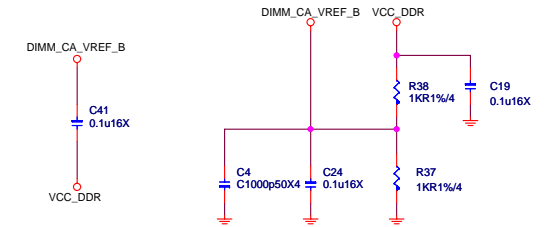


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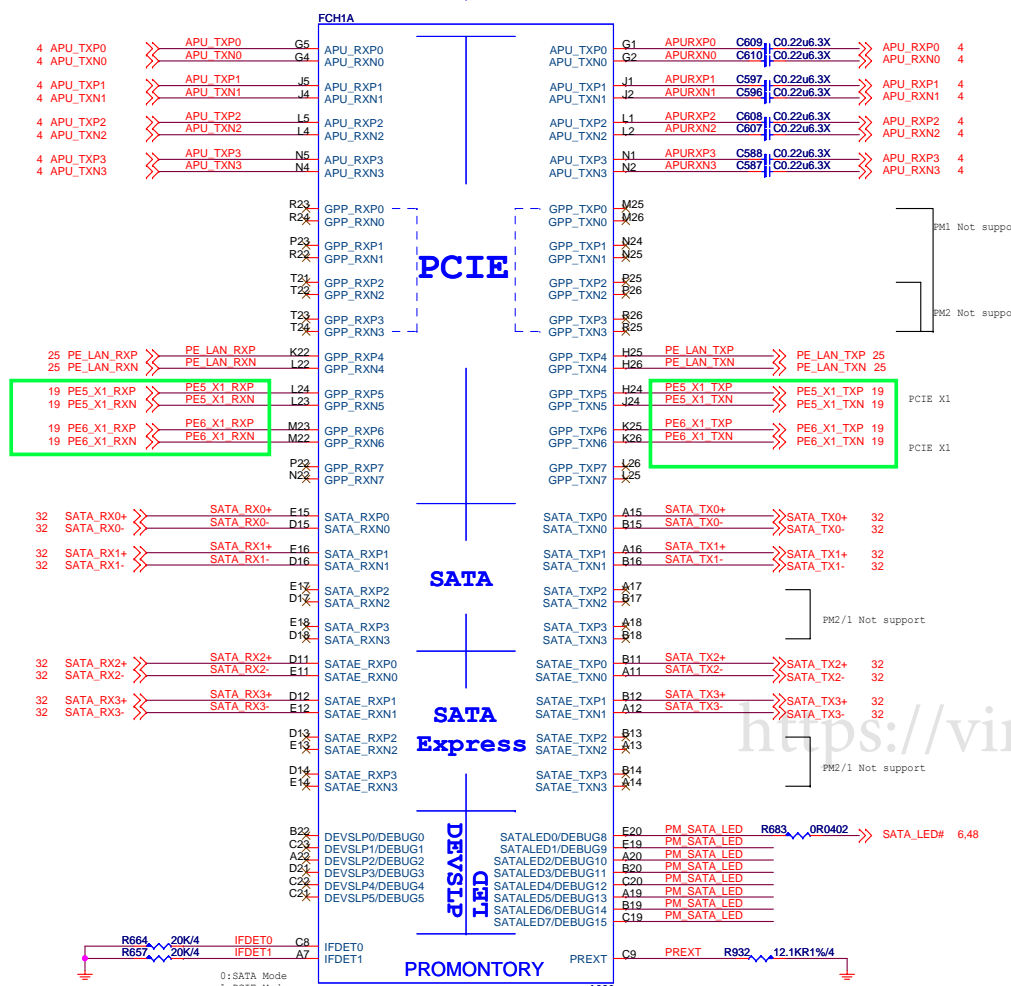


DDR VREF

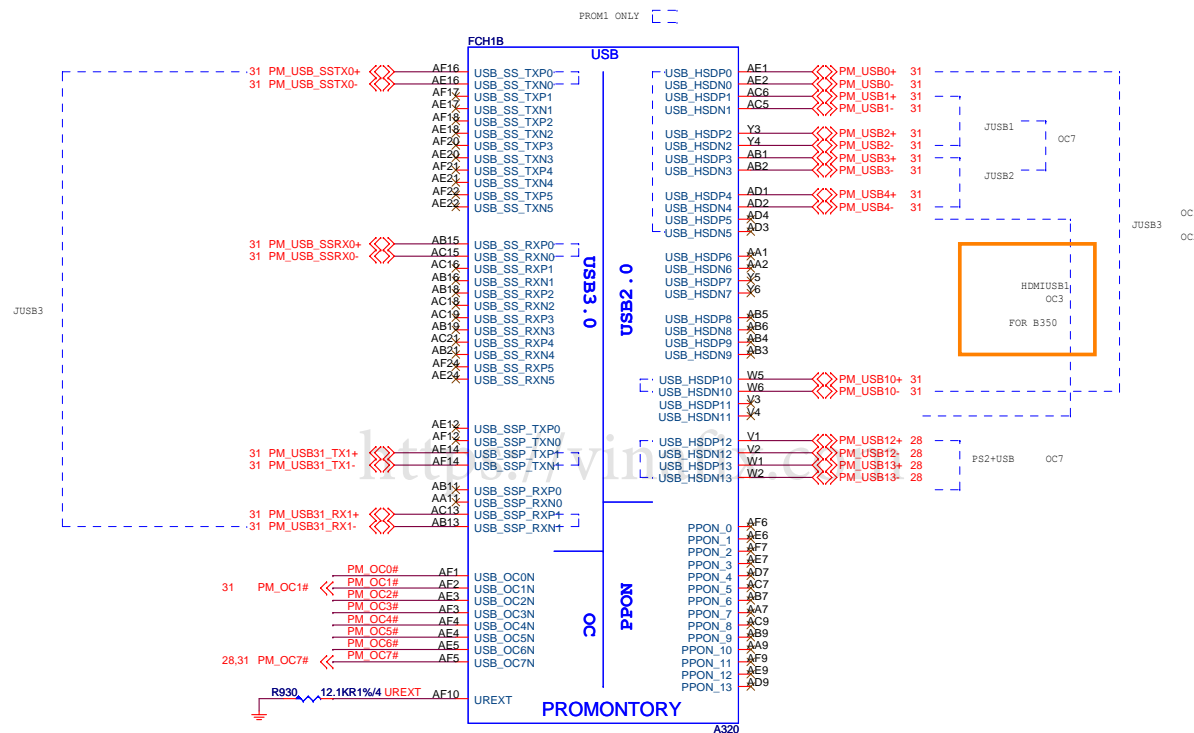
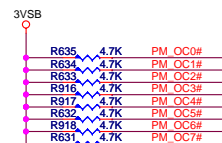
(place resistors close to DIMMs)



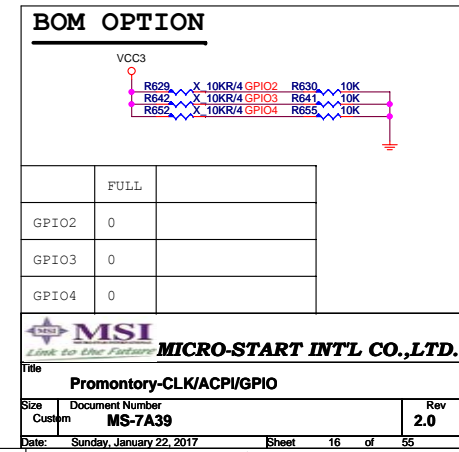
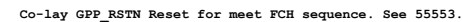
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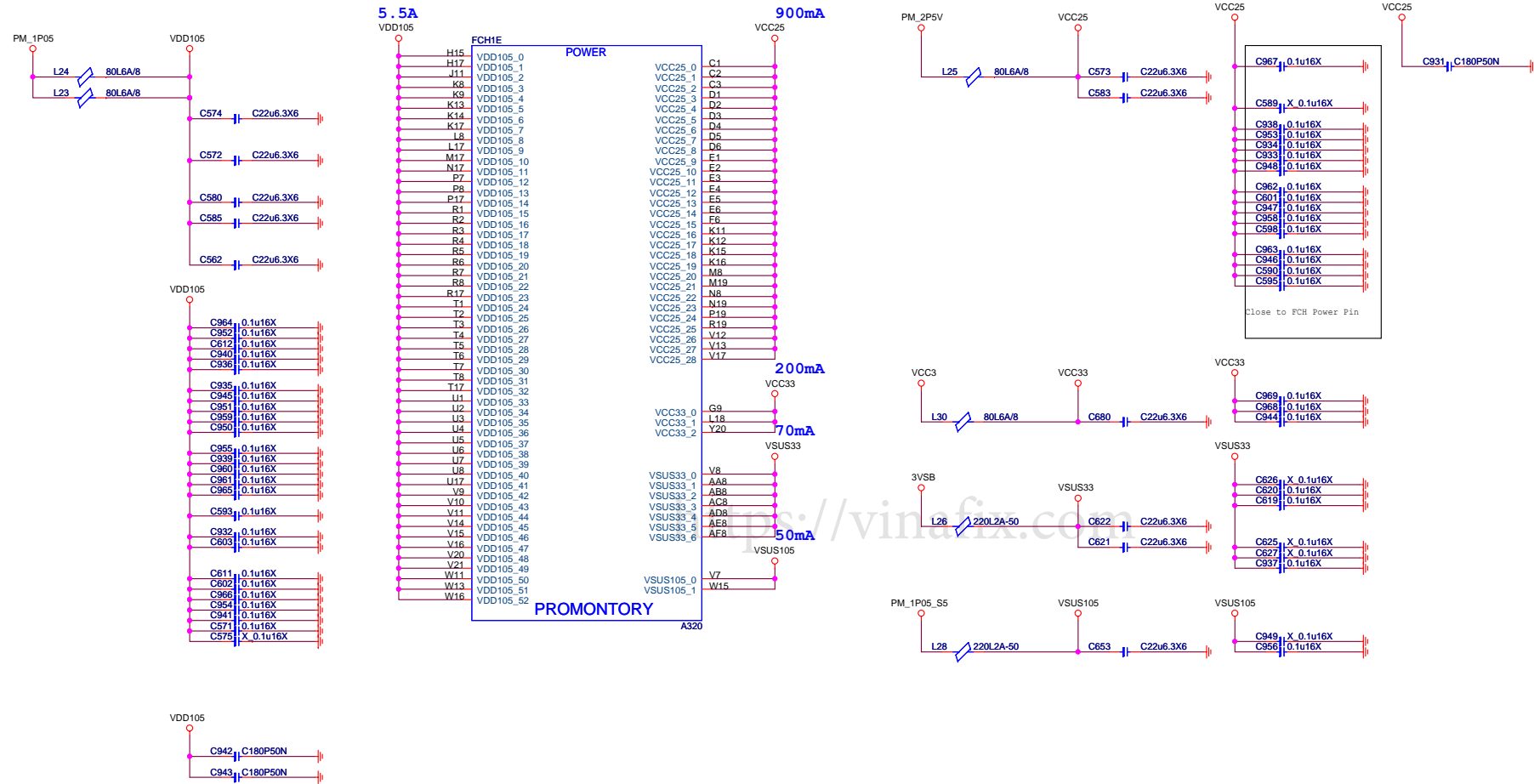


REF1
APRO LED
X_REF1



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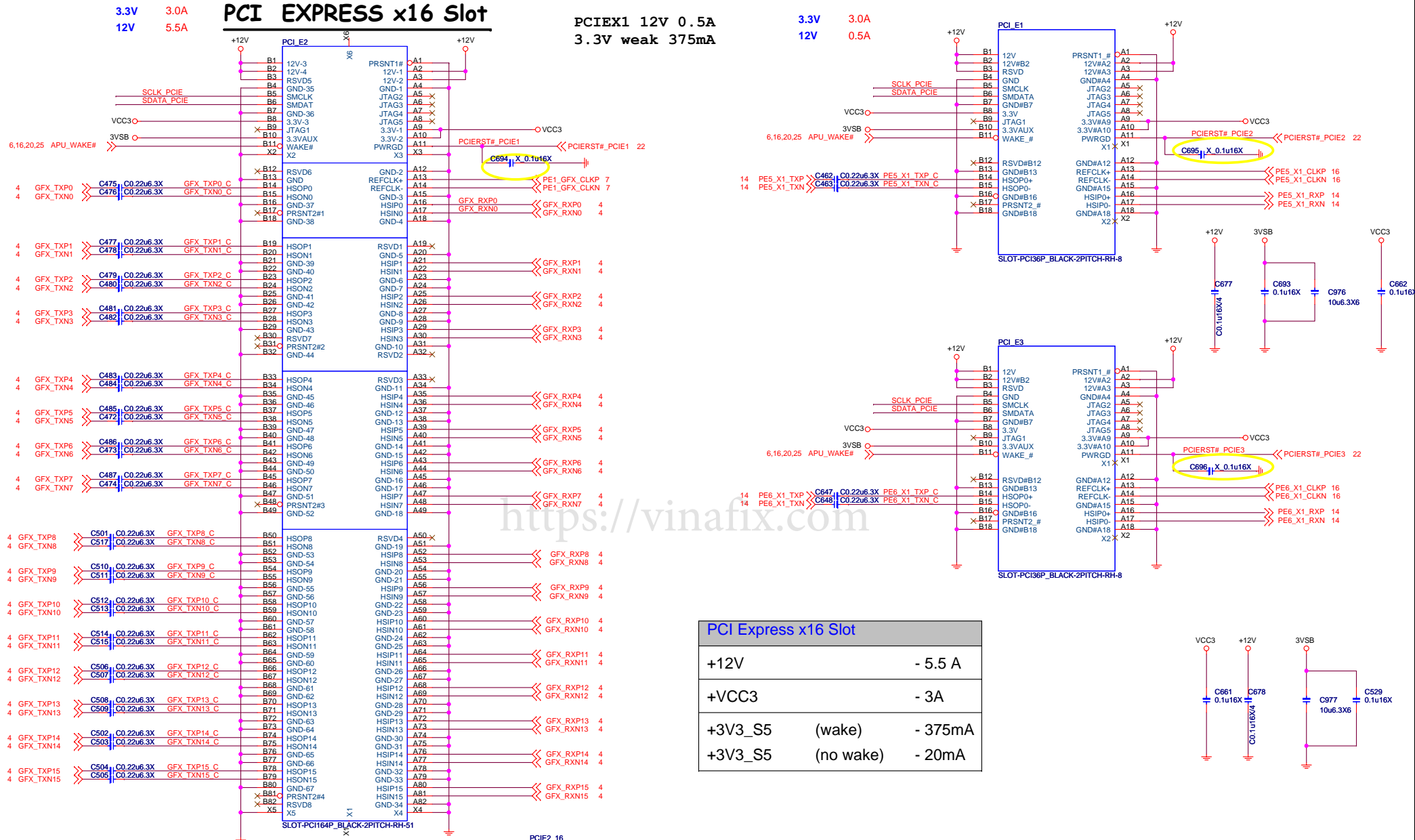
GND

PROMONTORY

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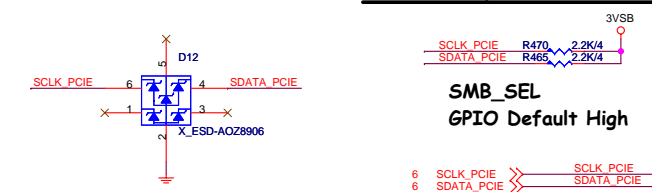
PCI EXPRESS x16 Slot

PCIEX1 12V 0.5A
3.3V weak 375mA



PCI Express x16 Slot	
+12V	- 5.5 A
+VCC3	- 3A
+3V3_S5 (wake)	- 375mA
+3V3_S5 (no wake)	- 20mA

SMBus separate circuit



MICRO-START INT'L CO.,LTD.

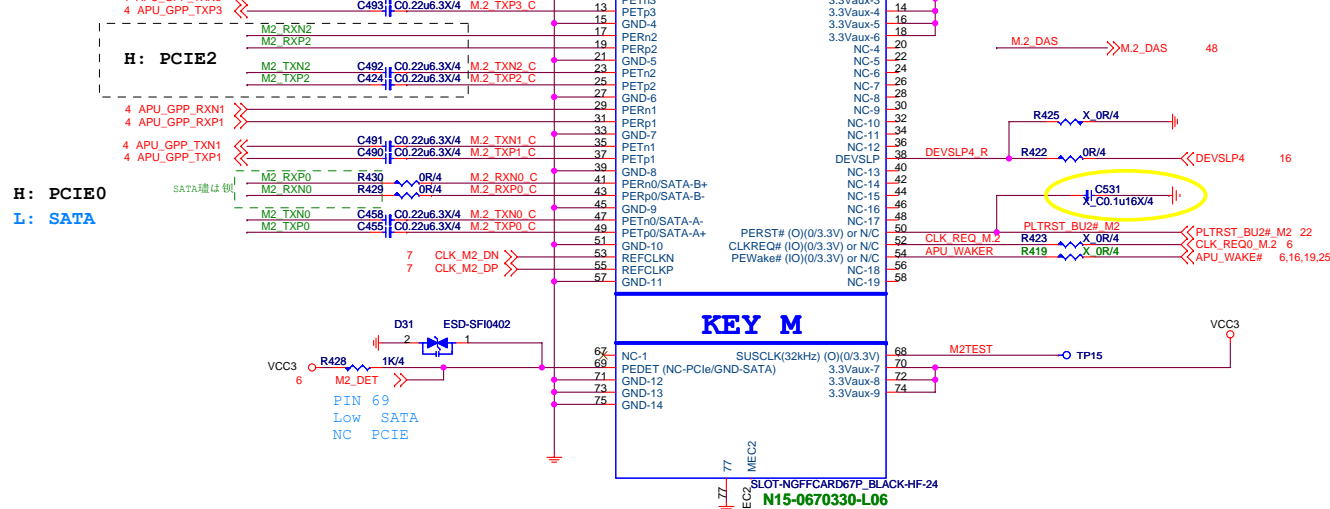
PCIE X16(X1*2) SLOT

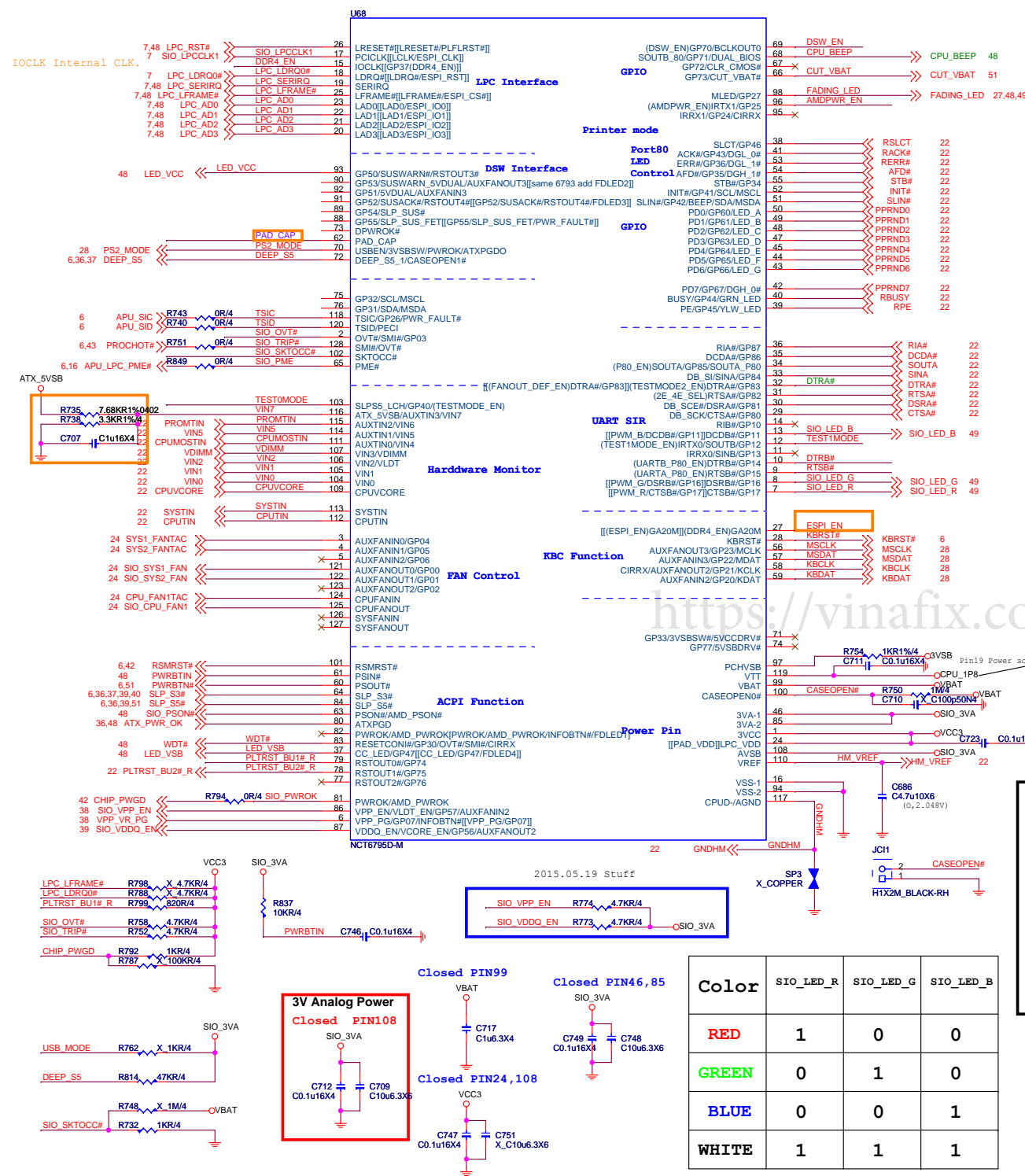
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Document Number: **MS-7A39**
Date: Sunday, January 22, 2017
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Rev: **2.0**

M.2 Connector

3.3V@2.5A





POWER ON STRAPPING PIN FOR NCT6793/6795

PIN	6793/6795 NAME	Circuit NAME	0	1	Strap Point
9	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
15	6793 test point 6795 DDR4_EN	6793 test point 6795 DDR4_EN	6793 NA 6795 Disable	6793 NA 6795 Enable	
27	6793 DDR4_EN 6795 ESPI_EN	A20GATE	6793 Disable 6795 Disable	6793 Enable 6795 Enable	
31	2E_4E_SEL	RTSA#	I/O ADDRESS 2E	I/O ADDRESS 4E	LRESET
32	6793 TESTMOD2_EN 6795 FANOUT_DEF_EN	DTRA#	6793 disable 6795 default 50%	6793 Enable 6795 default 100%	INTERNAL PWROK
34	P80_EN	SOUTA	ENABLE Non_PORT80	ENABLE PORT80	LRESET
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
103	TESTMODE_EN	WDT#	DISABLE TESTMODE	ENABLE TESTMODE	INTERNAL RSMRST

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

Co-Lay NCT6795

(PIN9) (RTSB#) 80_ENA	0=Disable	1=Enable
(PIN10) (DTRB#) 80_ENB	0=Disable	1=Enable
(PIN32) (DTRA#) FANOUT	0=50%	1=100%
(PIN12) TEST_MODE_EN1	0=Disable	1=Enable
(PIN103) TEST_MODE_EN0	0=Disable	1=Enable
(PIN27) ESPI_EN0	0=LPC	1=ESPI
(PIN15) DDR4_EN	0=Disable	1=Enable

2015.05.19 Stuff

SIO_VPP_EN	R774	4.7KR/4	SIO_VPP
SIO_VDDQ_EN	R773	4.7KR/4	SIO_VDDQ

3V Analog Power

Closed PIN108

Closed PIN99

Closed PIN46,85

Closed PIN24,108

Color	SIO_LED_R	SIO_LED_G	SIO_LED_B
RED	1	0	0
GREEN	0	1	0
BLUE	0	0	1
WHITE	1	1	1

SIO_3VA

R772 1KR/4 DDR4_EN

R778 1KR/4 DTRB#

R766 1KR/4 RTSB#

R771 680R/4

R770 1KR/4 DTRA#

R777 680R/4

R821 1KR/4

R829 680R/4

TEST1MODE R783 680R/4

TESTMODE R744 680R/4

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SIO NCT5565

Size Custom

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Inform BIOS disable VIN2 with Power Fault

VCCP_NB ○ R532 10KR1%4 VIN2

R542 X_10KR1%4

C547 10u6.3X/6

CPU_VDDP ○ R541 10KR1%4 VIN5

C555 10u6.3X/6

VCORE ○ R374 10KR1%4

C359 10u6.3X/6

VCC_DDR ○ R534 10KR1%4

C558 10u6.3X/6

VCCP_NB CPU_VDDP VCORE VCC_DDR

For CPU Under Socket

HM_VREF 21

R722 10K/1%

CPUTIN 21

RT6 10KRT1%0402

C685 C2200p50X

GNDHM 21

For System Close to SIO

SYSTIN 21

Q53 P-3906

C488 2.2n50X/4

GNDHM

Close to CPU MOS

HM_VREF 21

R551 10KRT1%4

PROMTIN 21

RT2 10KRT1%0402

C533 C2200p50X/4

GNDHM 21

Close to CPU MOS

PROM RESET

SIO 21 PLTRST_BU2#_R >> PLTRST_BU2#

PROM 6,25 PM_GPP_RST >> PLTRST_BU2#

Co-lay FCH Reset for meet FCH sequence. See 55553.

Pin Connections:

- R842 X 2.7K/4 SINA
- R820 X 2.7K/4 CTSIA#
- R830 X 2.7K/4 RDAI#
- R838 X 2.7K/4 DSAI#
- R828 X 2.7K/4 DSAI#

NO USE UART PORT1

Microcontroller Pinout:

- VCC5 20
- VCC 2
- RA1 3
- RA2 4
- RA3 5
- RA4 6
- RA5 7
- NR1A 8
- NCTSA# 9
- NSRA# 10
- NSINA 11
- NDCDA# 12
- RTSA# 16
- DTRA# 15
- SOUTA 13
- DA1 14
- DA2 15
- DA3 16
- DY1 17
- DY2 18
- DY3 19
- VSS 20

Connector Pinout:

- CN3: 1 NRTSA, 2 NSRA#, 3 NCTSA#, 4 NSINA, 5 DSAI#, 6 RDAI#, 7 NR1A, 8
- CN4: 1 NDCDA#, 2 NSOUTA, 3 NSINA, 4 NDTRA, 5 NSOUTA, 6 NSINA, 7 NDTRA, 8

D45 1N4148W

VCC5 LPT_VG

C656 C0.1u16X/4

PPRND3 PPRND2 PPRND1 PPRND0 PPRND4 PPRND5 PPRND6 PPRND7 STB# SLIN# INIT# AFD# RACK# RBUSY RPE RSLCT RERR# PRND0 PRND1 PRND2 PRND3 PRND4 PRND5 PRND6 PRND7 RSTB# RSLIN# RINIT# RAFD# RACK# RBUSY RPE RSLCT RERR#

R707 33R/4 R736 33R/4 R760 33R/4 R700 33R/4 R701 33R/4 R733 33R/4 R746 33R/4 R780 33R/4 R725 33R/4 R745 33R/4 R757 33R/4 R782 33R/4 RACK# RBUSY RPE RSLCT RERR# R716 2.7K/4 R727 2.7K/4 R741 2.7K/4 R763 2.7K/4 R719 2.7K/4 R739 2.7K/4 R749 2.7K/4 R781 2.7K/4 R726 2.7K/4 R747 2.7K/4 R767 2.7K/4 R784 2.7K/4 R729 2.7K/4 R756 2.7K/4 R775 2.7K/4 R723 2.7K/4 R715 2.7K/4

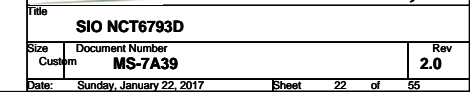
JLPT1

RSTB# PRND0 PRND1 PRND2 PRND3 PRND4 PRND5 PRND6 PRND7 RACK# RBUSY RPE RSLCT

RAFD# RERR# RINIT# RSLIN#


H2XT326JM_BLACK-RH

N31-2131131-H06

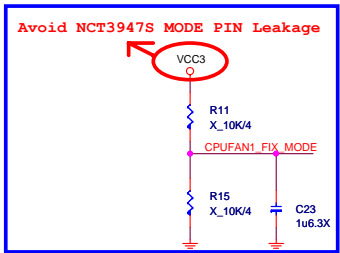


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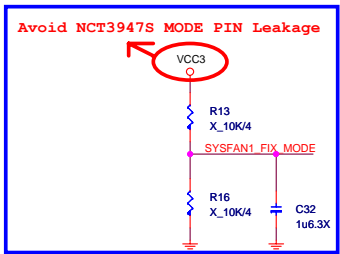
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Manual parts					
Size	Document Number				Rev
Custom	MS-7A39				2.0
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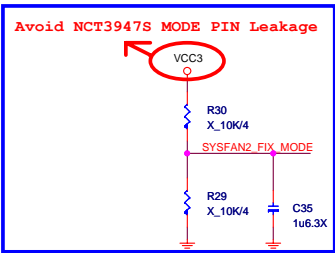
TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE
2.GPIO バイオス伝 PWM/DC MODE



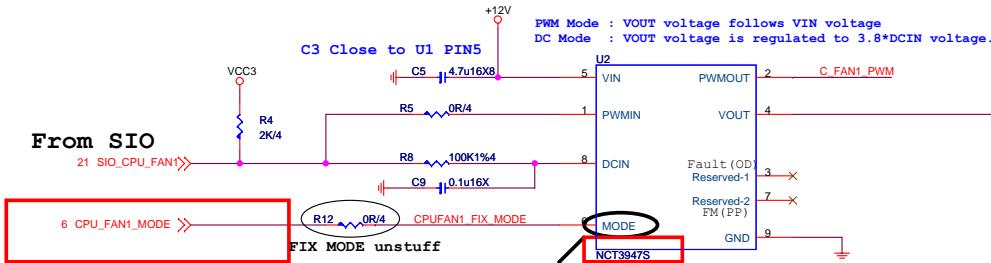
Resever For FIX DC or PWM MODE USE By PM SPEC



Resever For FIX DC or PWM MODE USE By PM SPEC



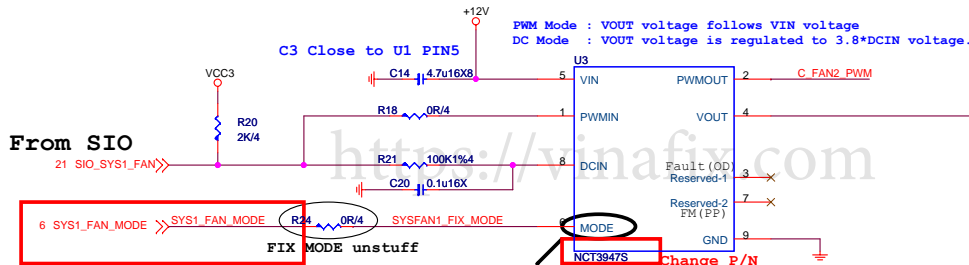
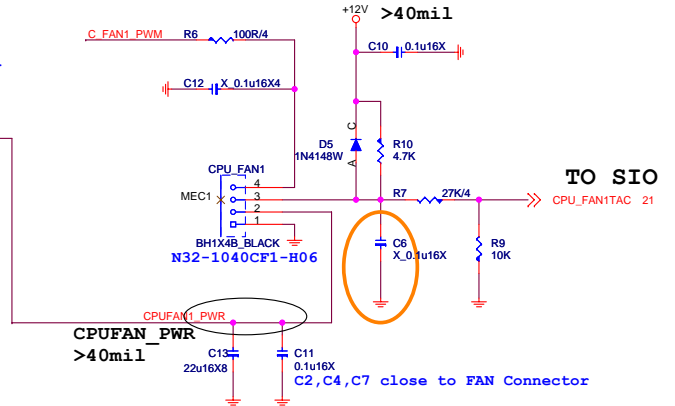
Resever For FIX DC or PWM MODE USE By PM SPEC



GPIO Control

	MODE (PIN7)
PWM MODE	HIGH
DC MODE	LOW
AUTO MODE	GPI (Floating)

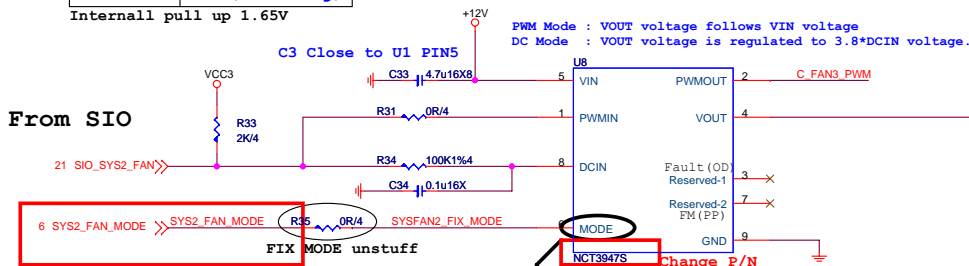
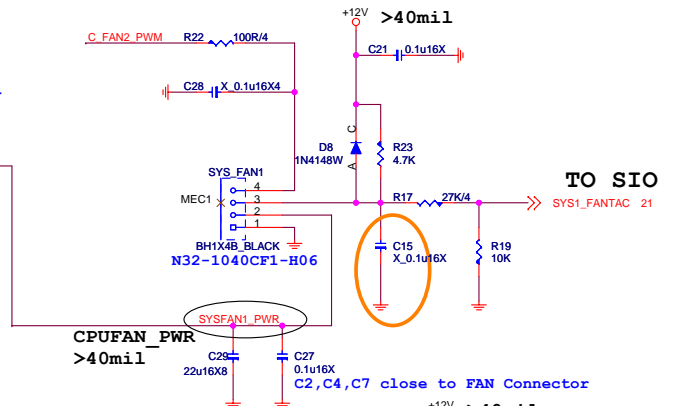
Internall pull up 1.65V



GPIO Control

	MODE (PIN7)
PWM MODE	HIGH
DC MODE	LOW
AUTO MODE	GPI (Floating)

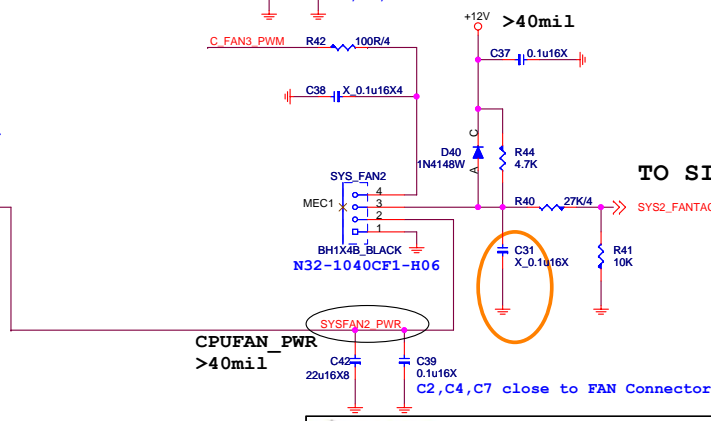
Internall pull up 1.65V



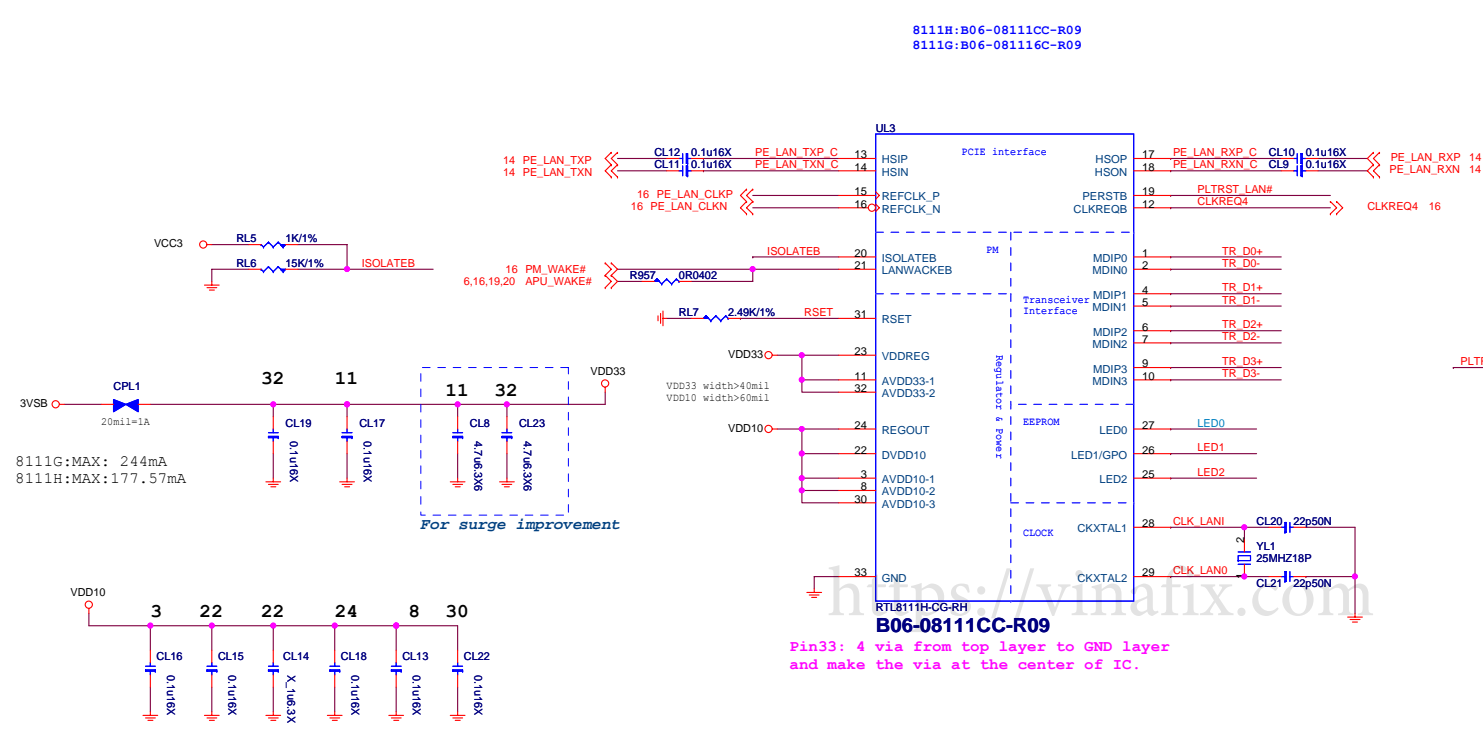
GPIO Control

	MODE (PIN7)
PWM MODE	HIGH
DC MODE	LOW
AUTO MODE	GPI (Floating)

Internall pull up 1.65V



RTL8111G/RTL8111H Giga LAN

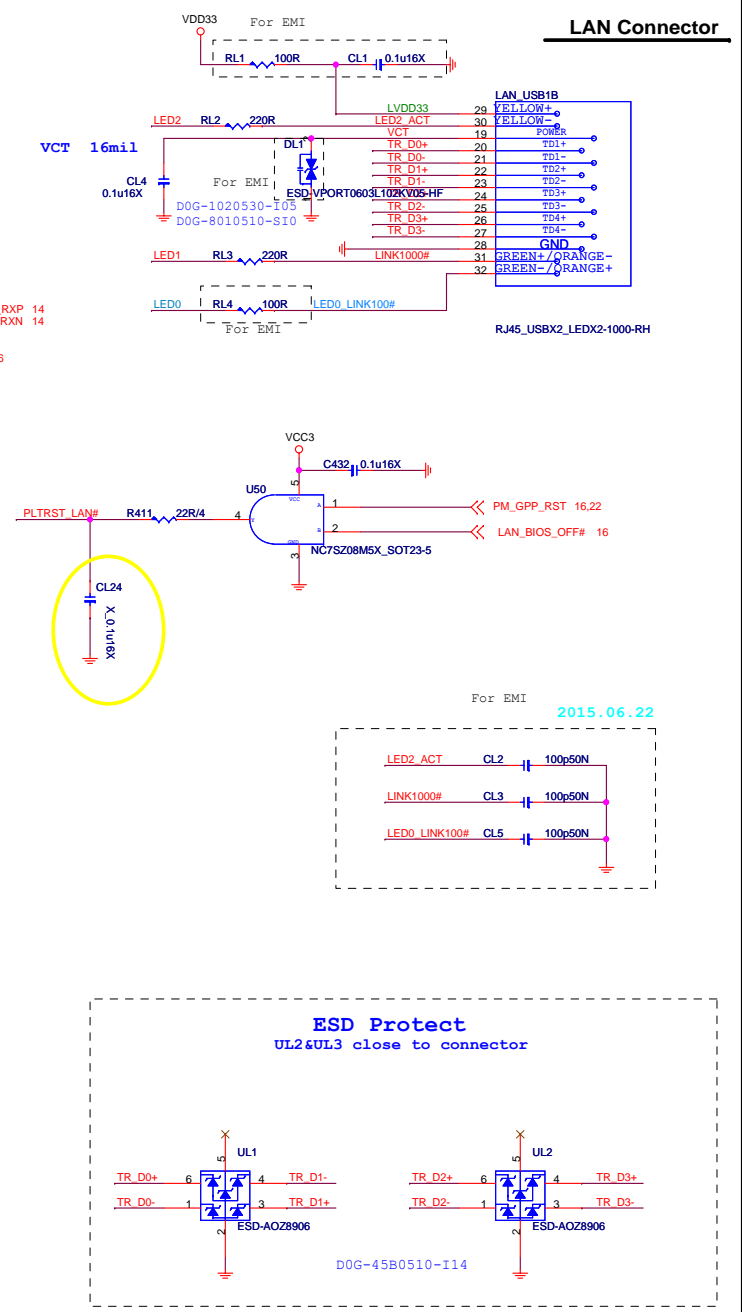


8111G POWER Consumption

	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



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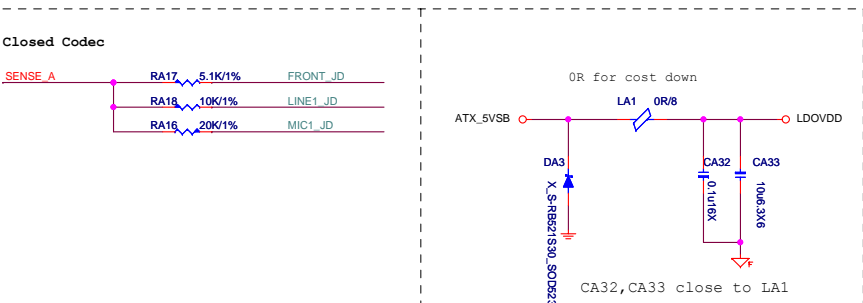
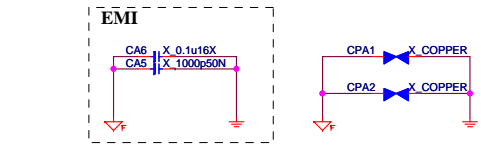
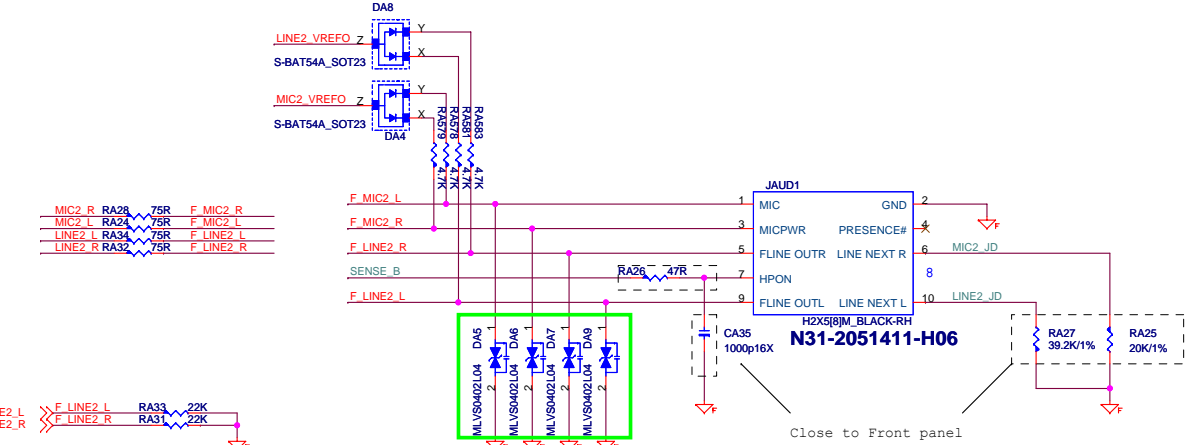
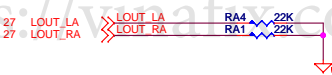
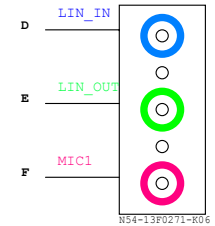
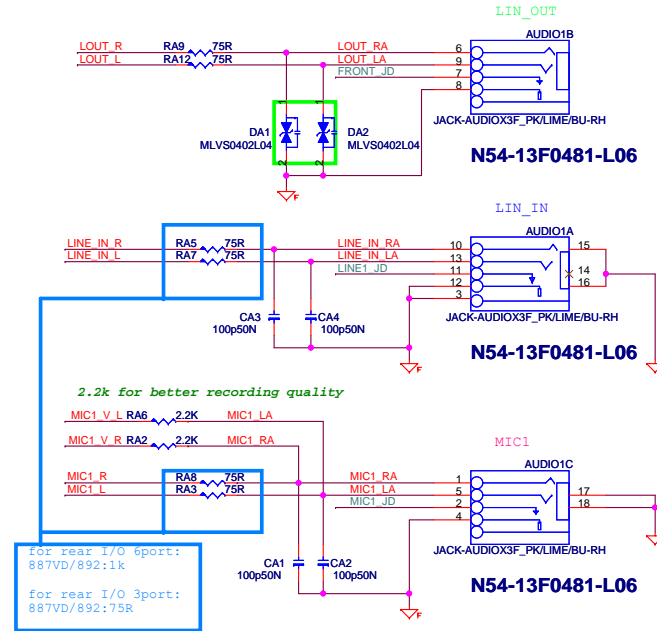
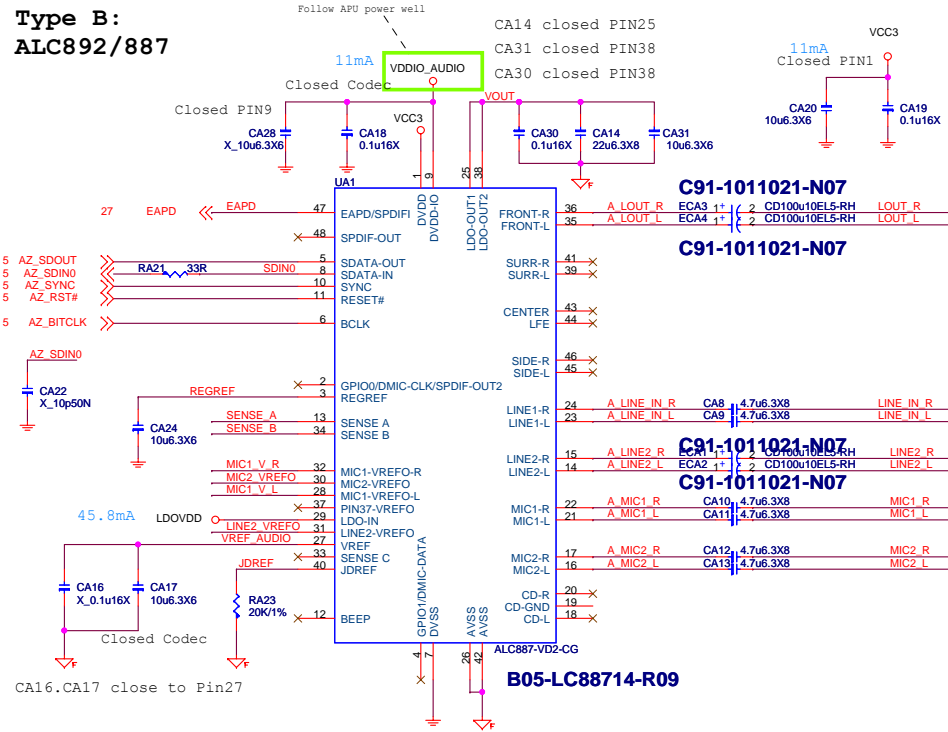
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Size: Custom
Document Number: **MS-7A39**
Date: Sunday, January 22, 2017

Customer: teknisi indonesia
Rev: **2.0**

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Type B: ALC892/887



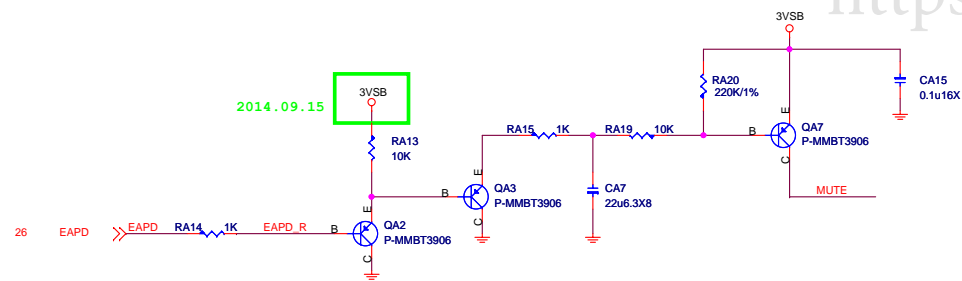
Varistor --> cap for cost down
D0G-2710510-I05
D0G-2950500-SI0
Close to Jack

Close to Front panel	
For HDA/AC97 front cable.	
MSI	
Link to the Future	
MICRO-START INT'L CO.,LTD.	
Title	
Audio ALC887-1	
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Rev	2.0

Rear Line OUT De-POP circuit

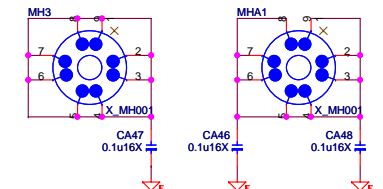
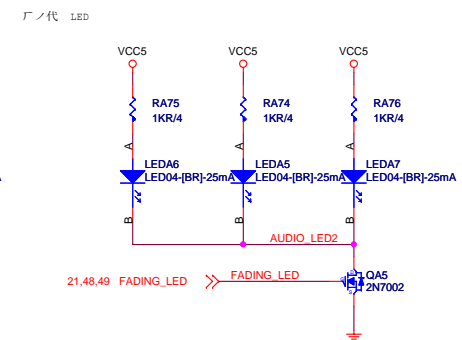
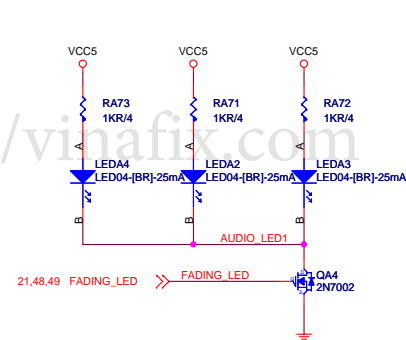
De-pop circuit for Rear Line out & Front Headphone out)

2014.09.15

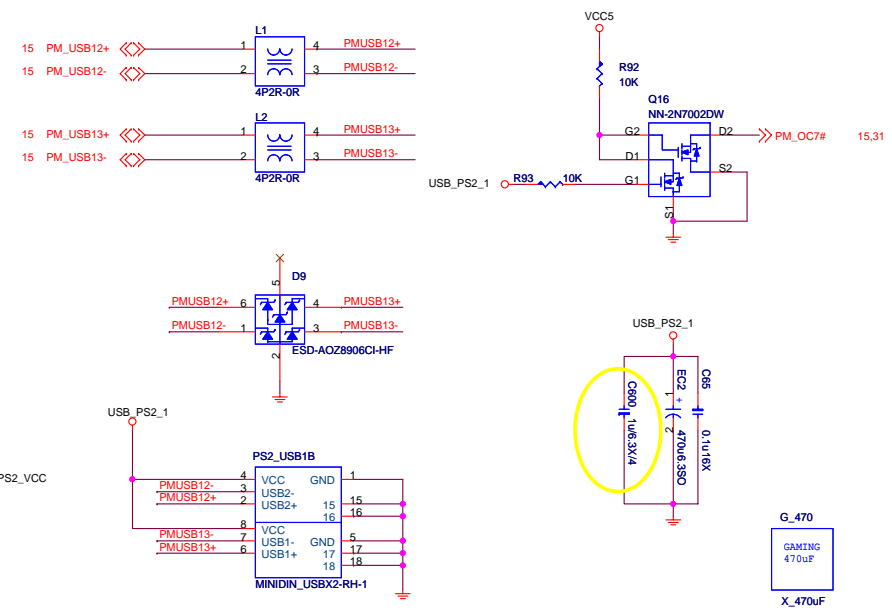
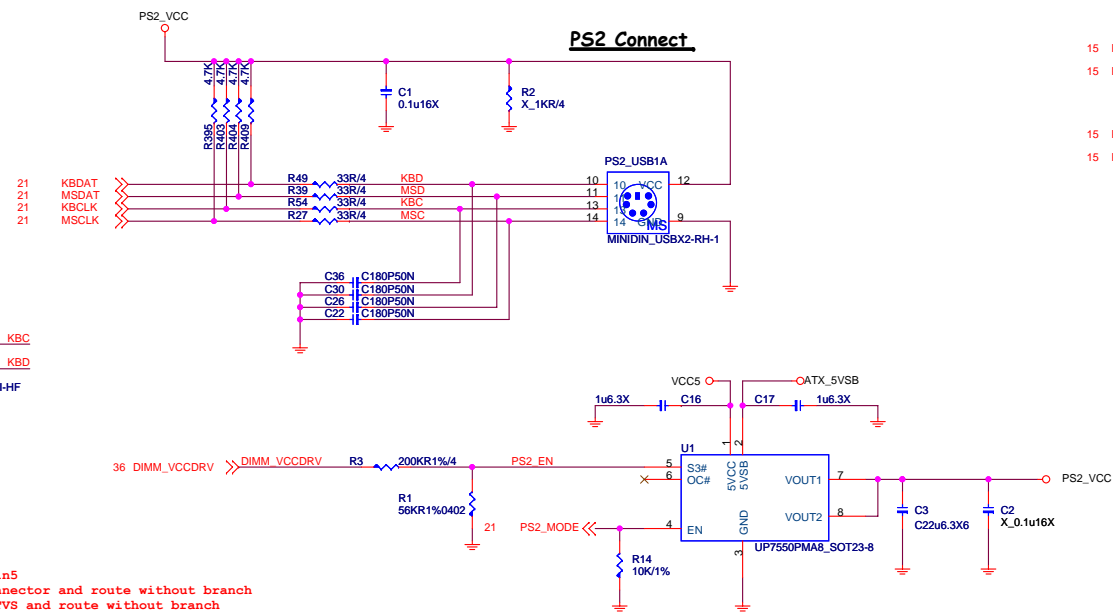


Digital

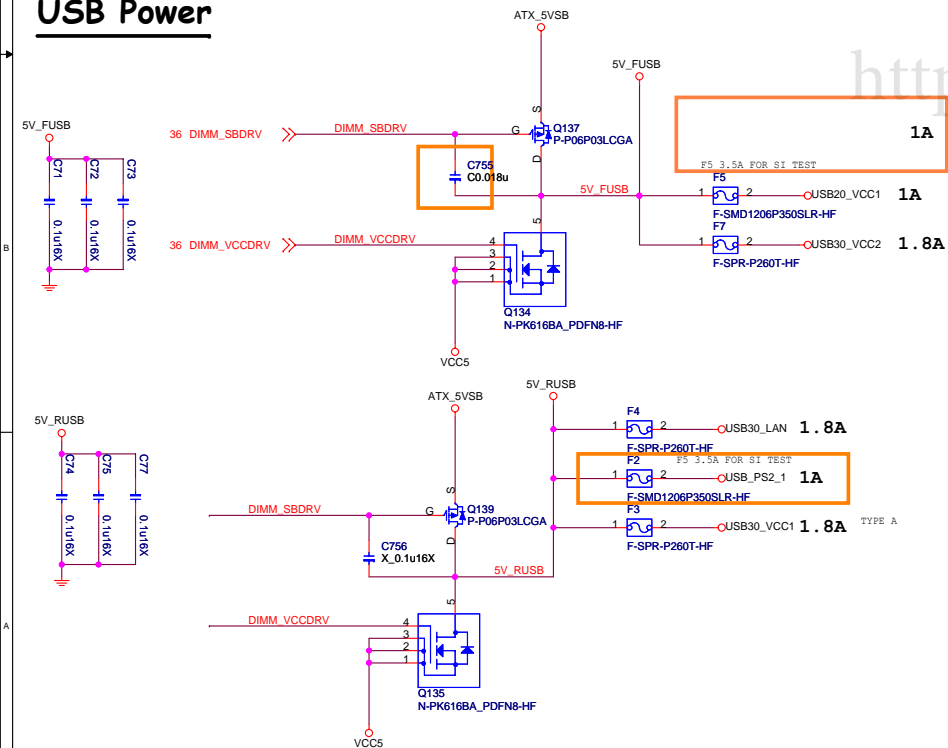
Analog



PS2+USB



USB Power

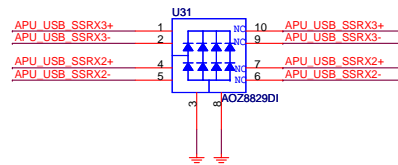
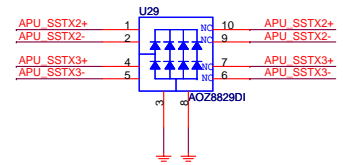
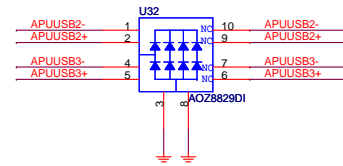
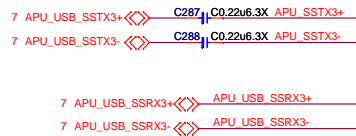
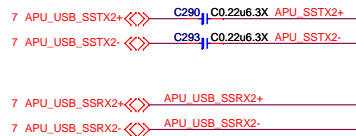
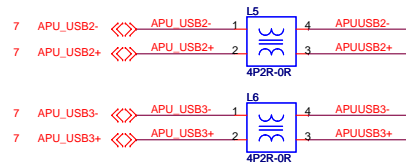


USB3.1 GEN1

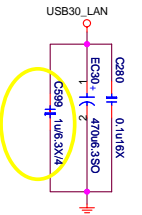
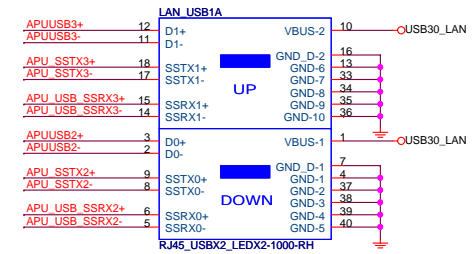
VR Sloution U2 redriver

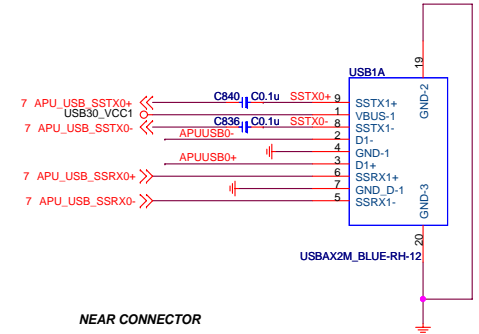
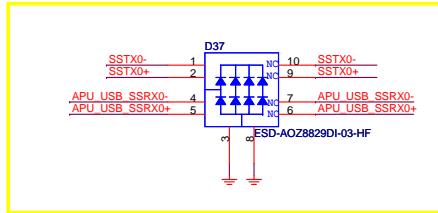
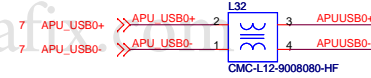
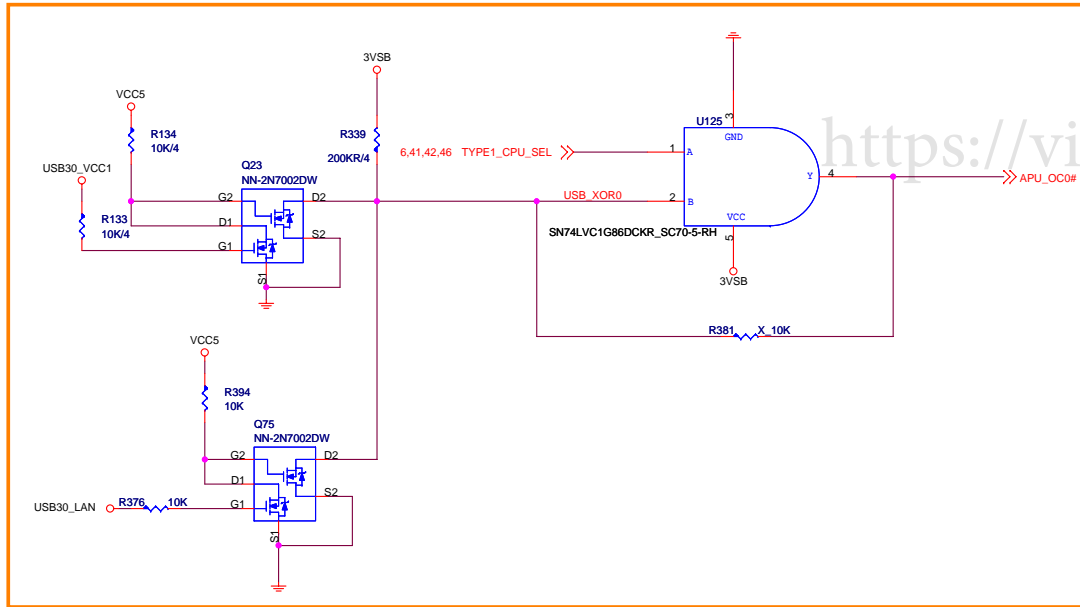
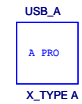
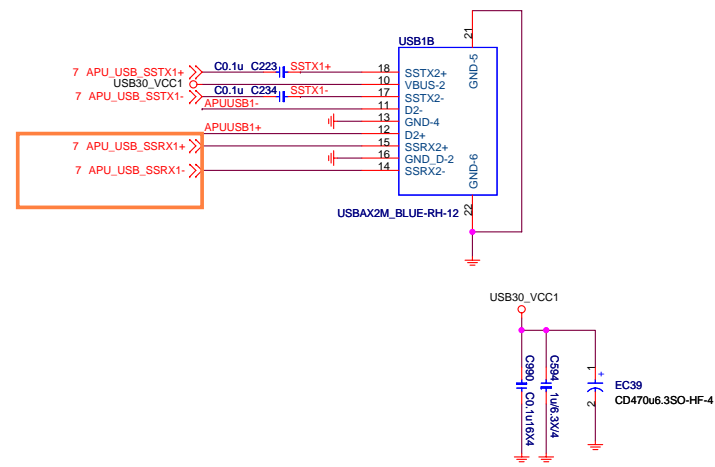
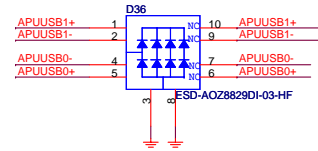
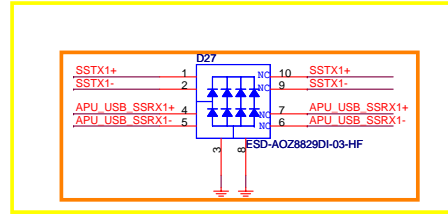
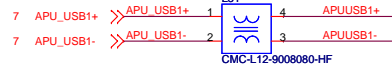
Vinafix.com

<https://vinafix.com>



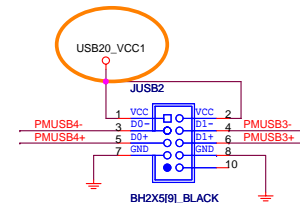
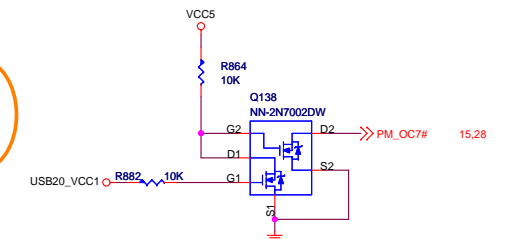
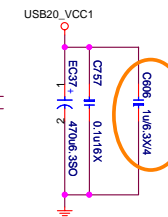
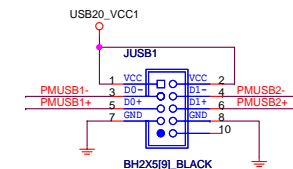
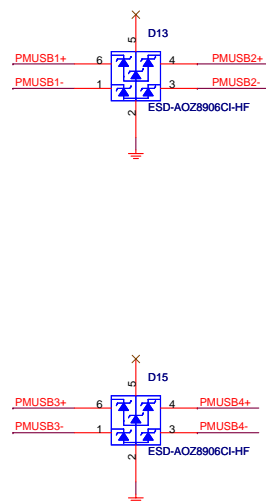
LAN+USB





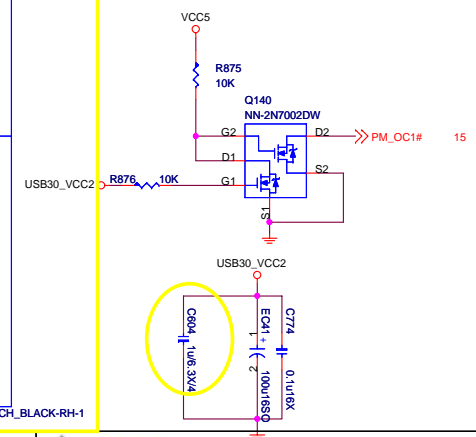
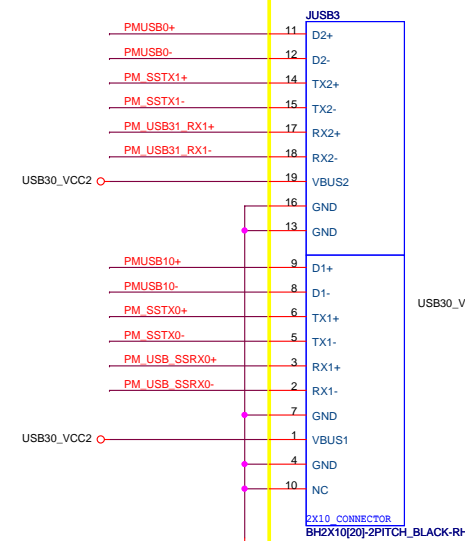
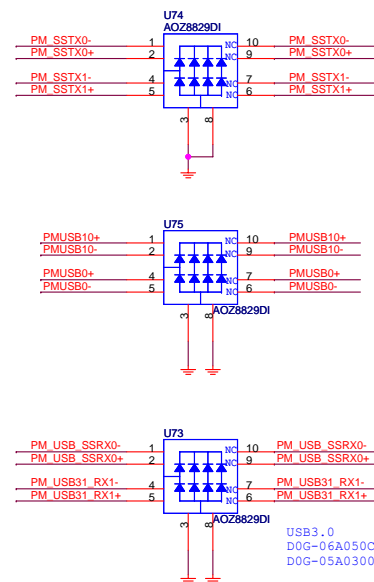
NEAR CONNECTOR


Front USB2.0



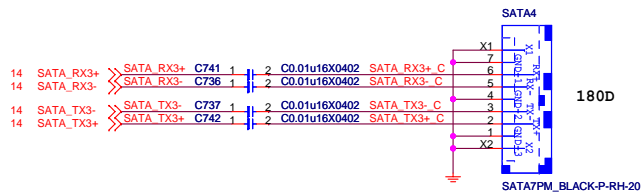
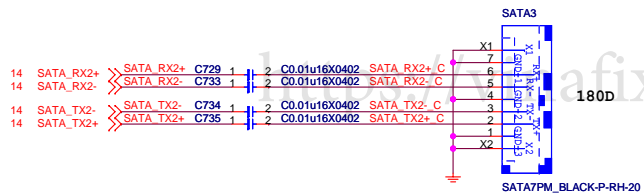
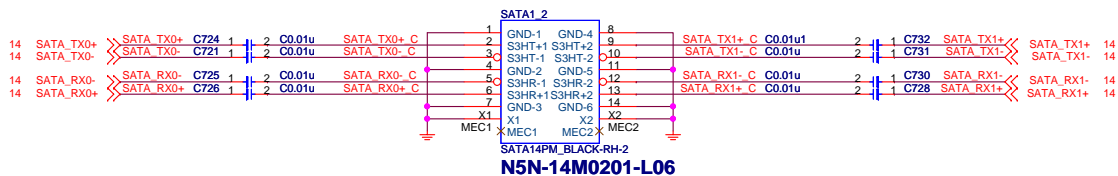
Front USB3.1 GEN1

<https://vinafix.com>



 MSI <i>Link to the Future</i>				MICRO-START INTL CO.,LTD.			
Title USB Front Side							
Size		Document Number				Rev	
Custom		MS-7A39				2.0	
Date: Sunday, January 22, 2017				Sheet 31		of 55	

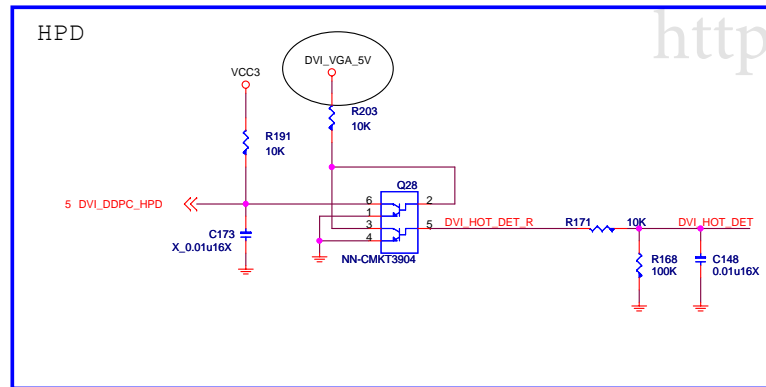
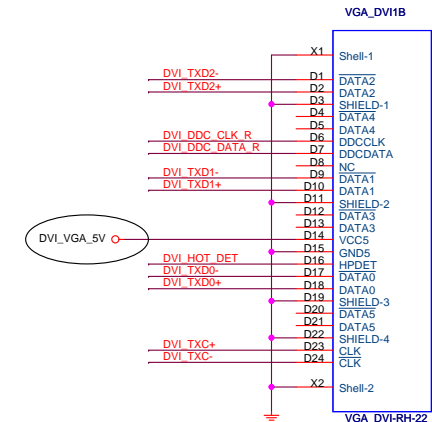
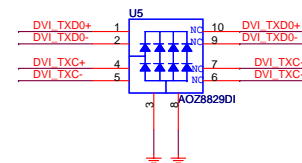
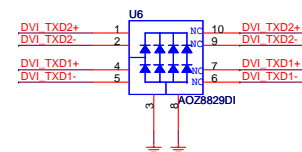
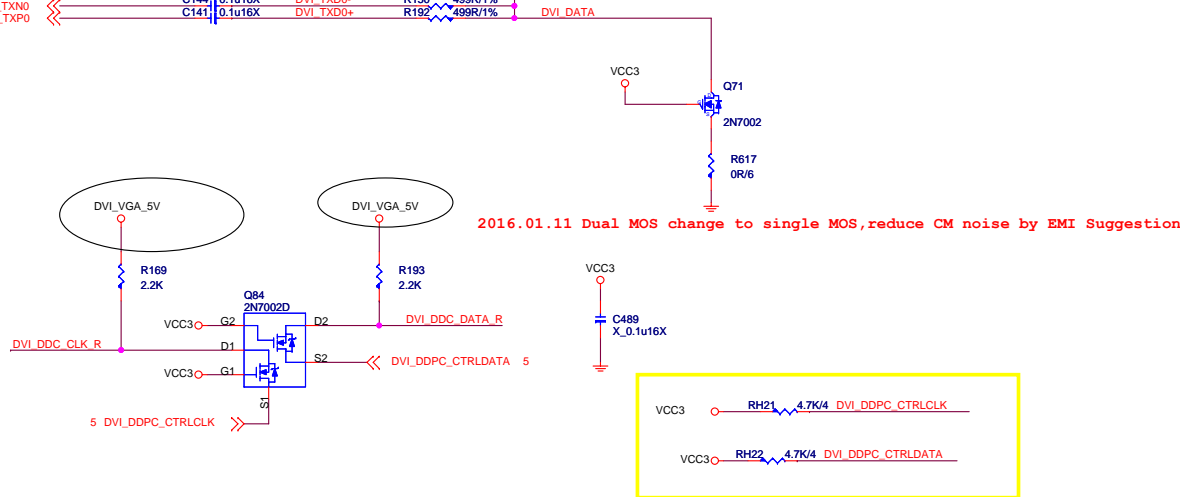
SATA Connector



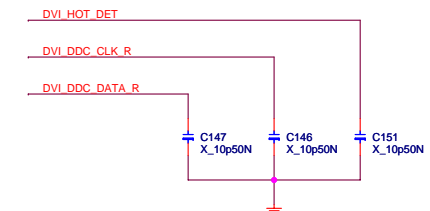
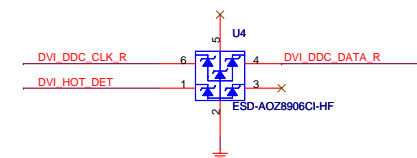
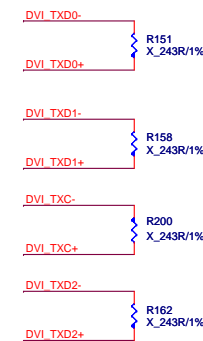
DVI level shifter

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

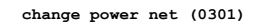
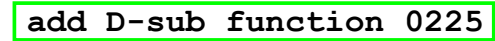
5 DVI_DDPC_CLK_N << C154 0.1u16X DVI_TXC- R165 499R/1%
5 DVI_DDPC_CLK_P C159 0.1u16X DVI_TXC+ R201 499R/1%
5 DVI_DDPC_TXN2 C149 0.1u16X DVI_TXD2- R194 499R/1%
5 DVI_DDPC_TXN2 C171 0.1u16X DVI_TXD2+ R164 499R/1%
5 DVI_DDPC_TXP2 C169 0.1u16X DVI_TXD1- R207 499R/1%
5 DVI_DDPC_TXN1 C143 0.1u16X DVI_TXD1+ R160 499R/1%
5 DVI_DDPC_TXP1 C144 0.1u16X DVI_TXD0- R150 499R/1%
5 DVI_DDPC_TXN0 C141 0.1u16X DVI_TXD0+ R192 499R/1%
5 DVI_DDPC_TXP0



For EMI



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



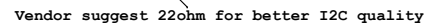
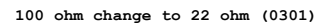
HSYNC RV16 33R/4 5V_HSYNC VSYNC RV20 33R/4 5V_VSYNC

PIN 5 NC

20160525

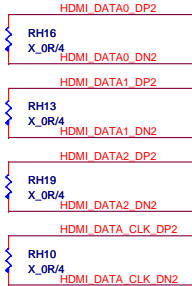
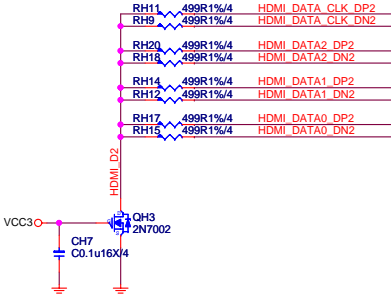
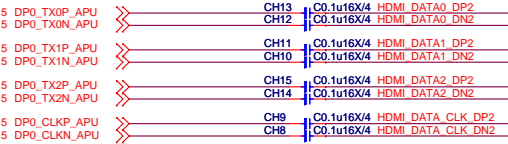


20160525

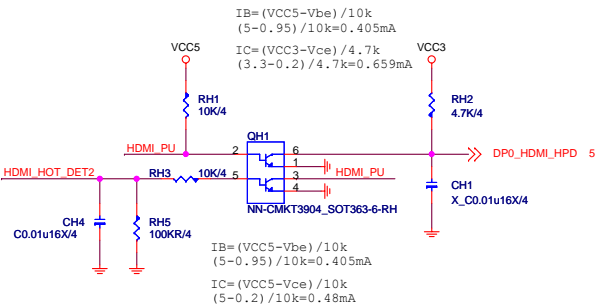


HDMI CONNECTOR

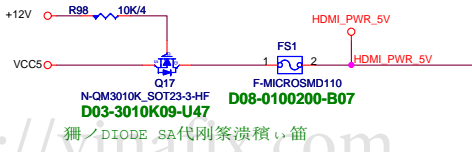
For HDMI 1.4



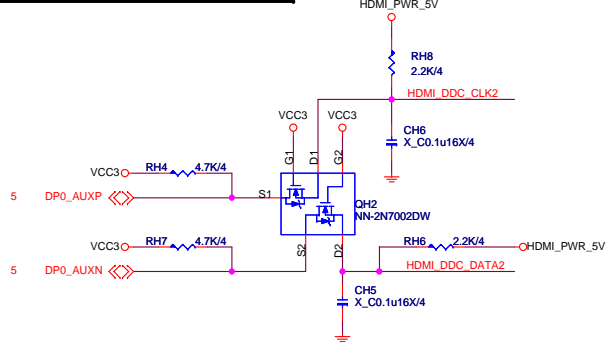
HPD Circuit



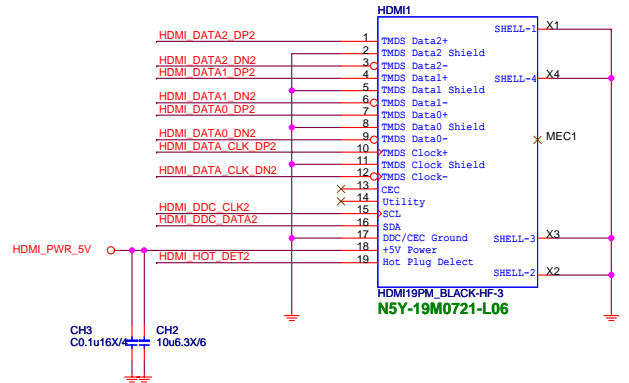
Connector Power



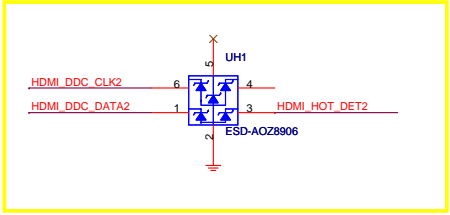
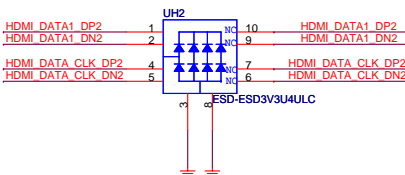
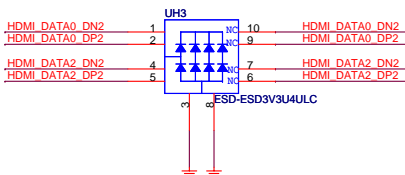
AUX Level Shifter



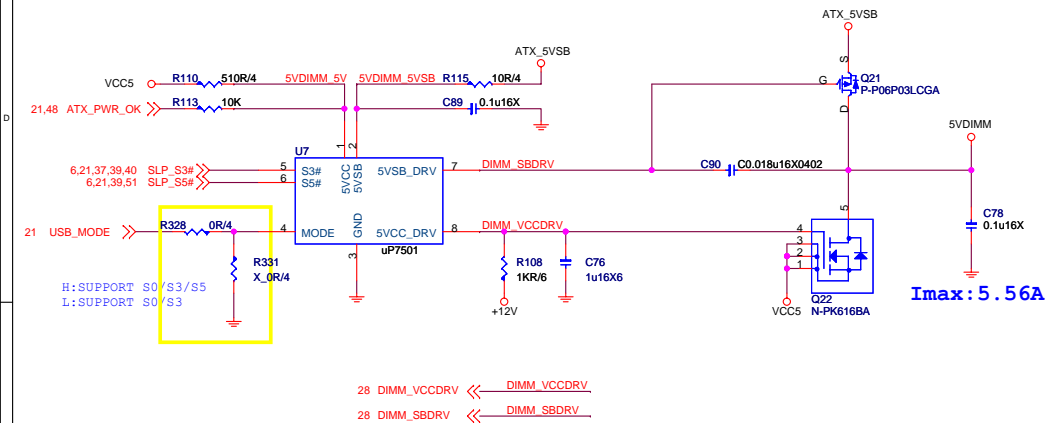
Connector



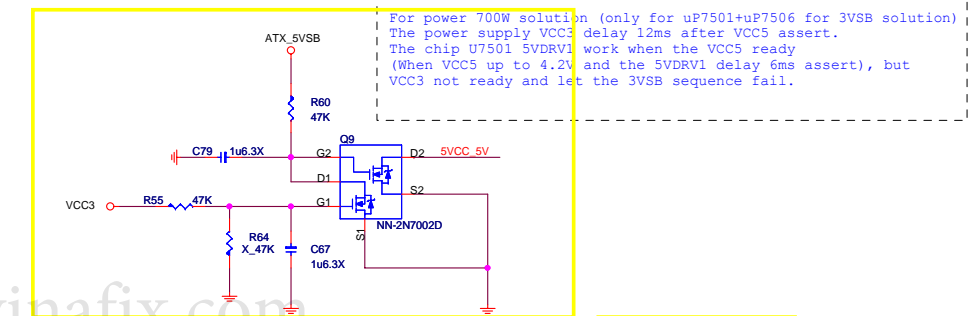
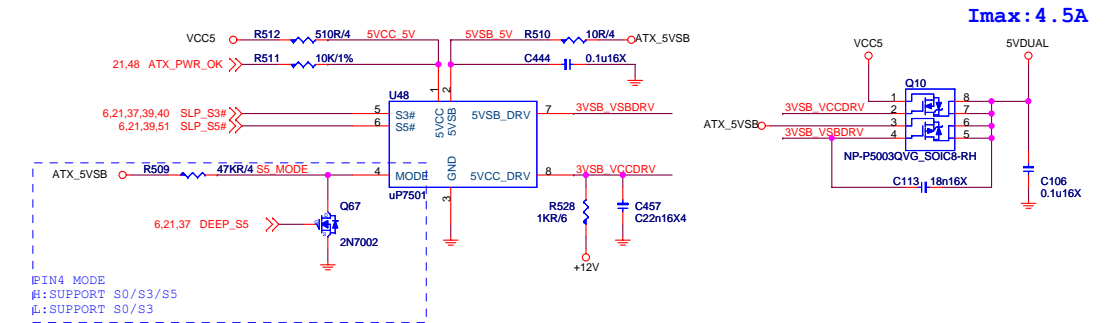
For EMI



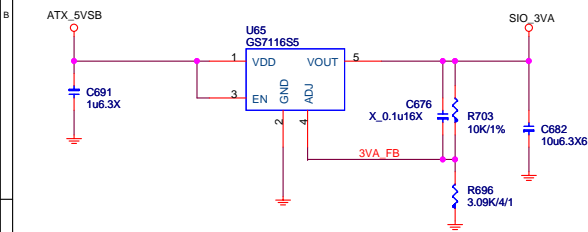
5VDIMM FOR DDR



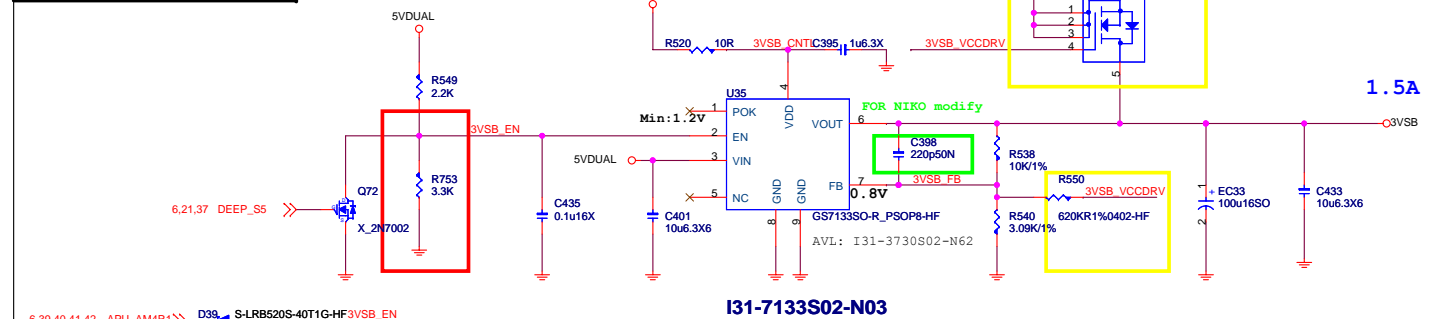
5VDUAL For 3VSB CPU 1.8V VDDP



SIO_3VA



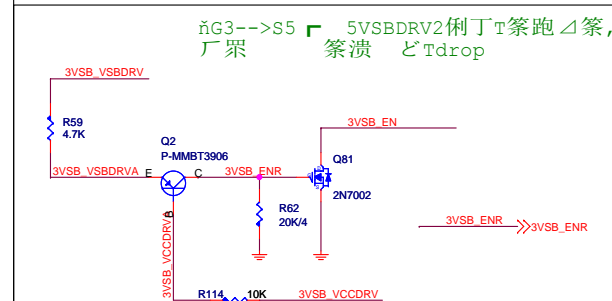
3VSB cost down



3VSB cost down

3.3V@1.4959A

1.05V@0.05A
VDDBT_RTC_G@4.5uA
FCH@0.07A
CPU@0.25A
PCI-E*3 @1.125A
USB TYPE-C @0.9mA



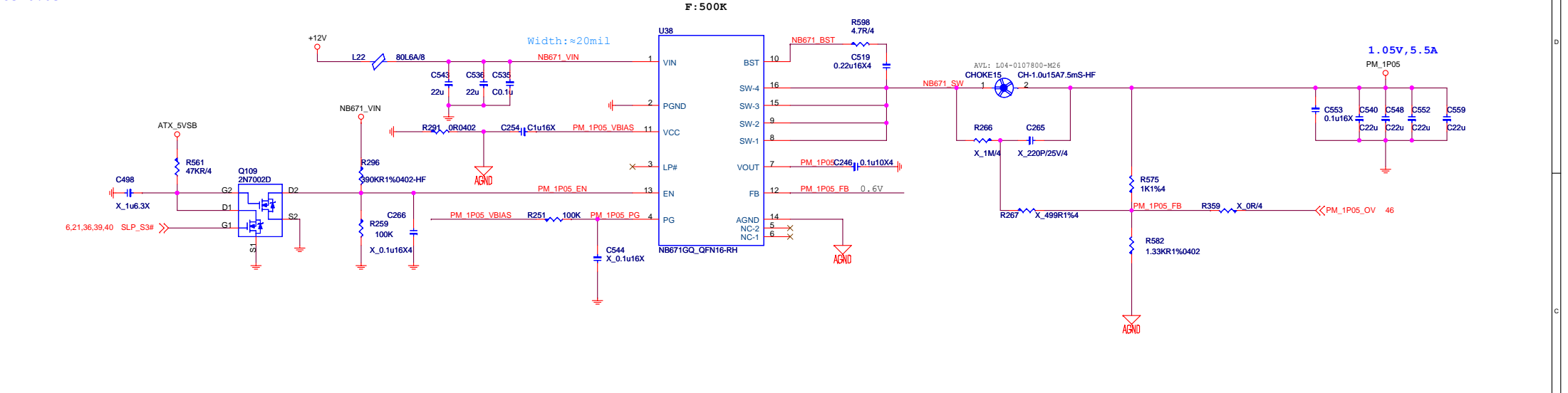
FOR Promontory 1.05V_S0

1.05V
S0:5.5A
S5:0.05A

support OV=>NB685
not support OV=> NB681

IMAX 10A
ILIMIT=10A~12A
IOC=ILIMIT+40%*IMAX/2=12A~14A.

0.7776uH≤L≤1.1664uH

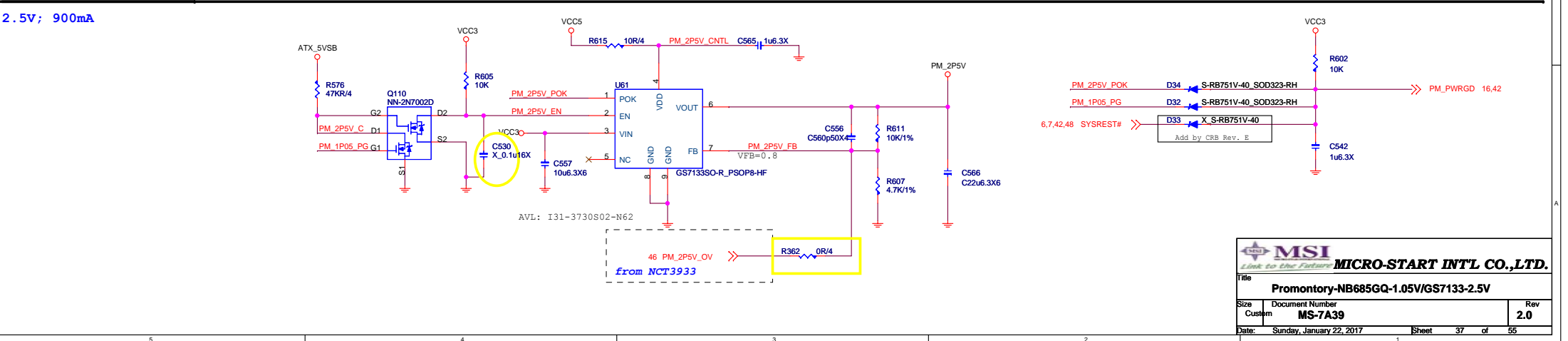


FOR Promontory 1.05V_S5

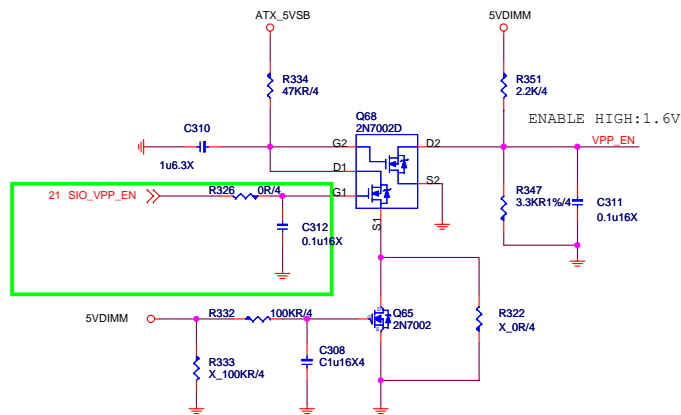
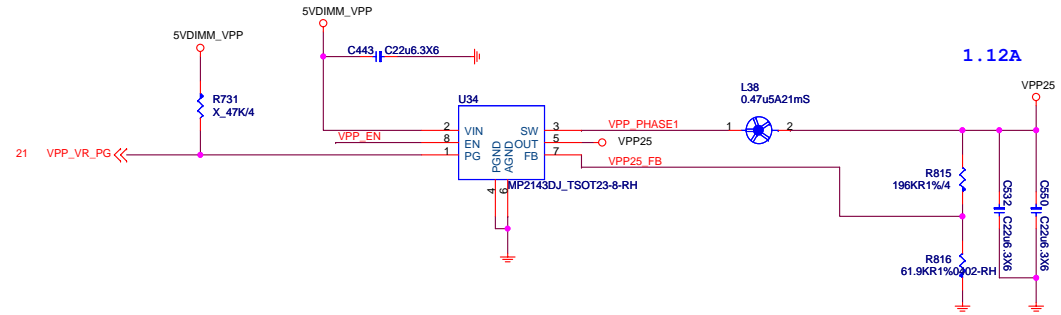
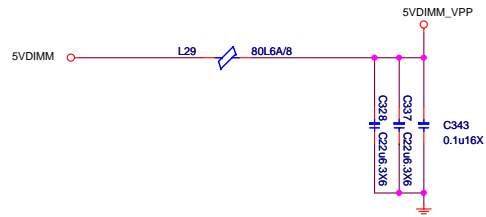
0.05A

Promontory-2.5V

2.5V; 900mA



2DIMM :1.12A FOR DDR VPP2.5V



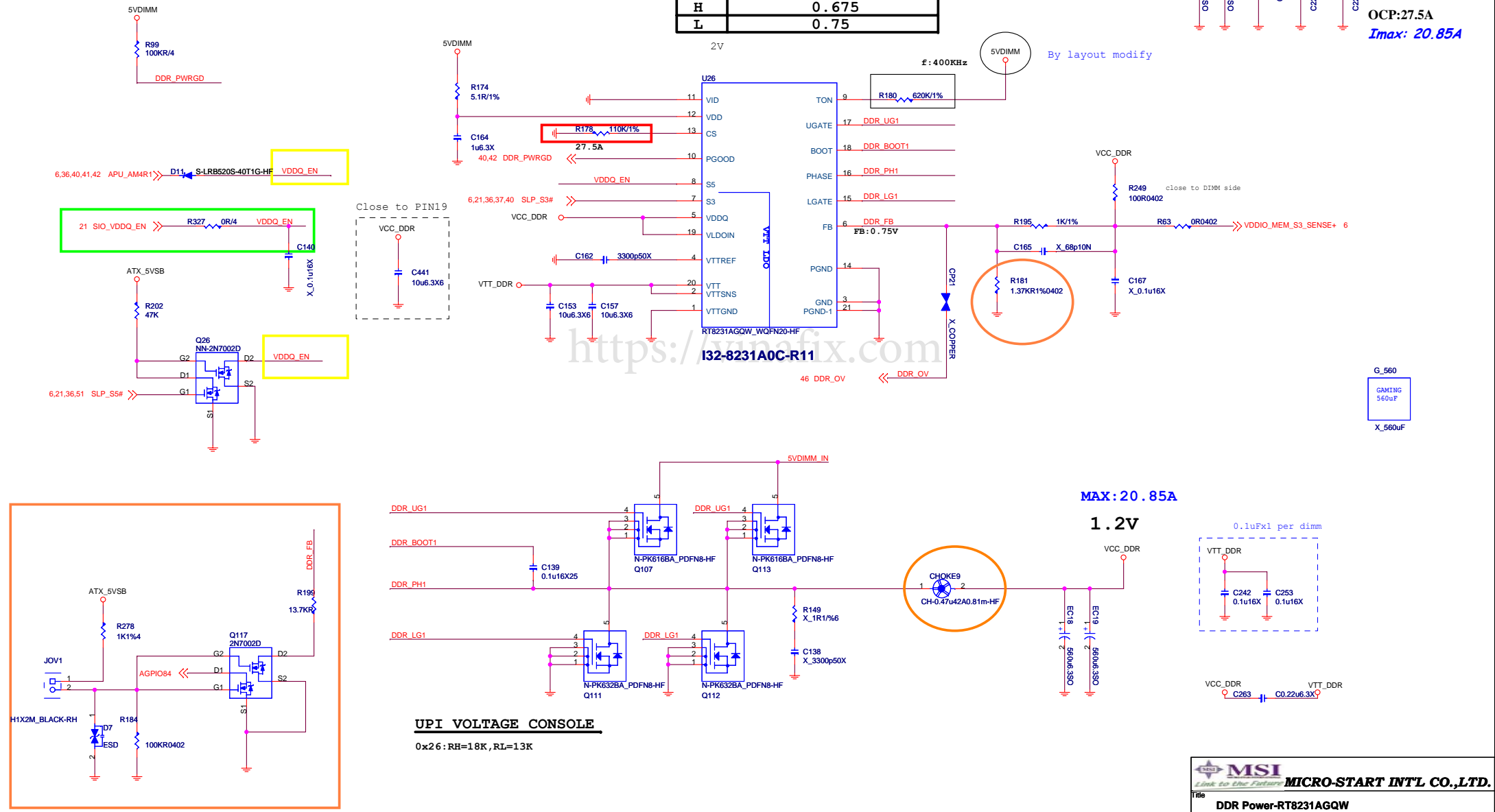
Vinafix.com

DDR4_1.2V 15.5A+4.75A+0.6A=20.85A
15.5A FOR CPU
4.75A FOR 2DIMM
0.3*2=0.6A FOR DDR VTT
OCP = 7.925A*1.5=11.8875A
Current limit= 110K(R178)*5uA/10/4mohm)=33A

$I_{rms} = I_{out} * \sqrt{D/N - (D)^2}$
 $VCCDDR:$
 $D = V_{out}/V_{in} = 1.2/5 = 0.24$
 $N = \text{Phase number} = 1$
 $= 20.85A * \sqrt{0.24 - 0.0576}$
 $= 5.21A$

OCP:27.5A
I_{max}: 20.85A

VID	Reference Voltage (V)
H	0.675
L	0.75



FOR CPU 1.8V S5

0.5A

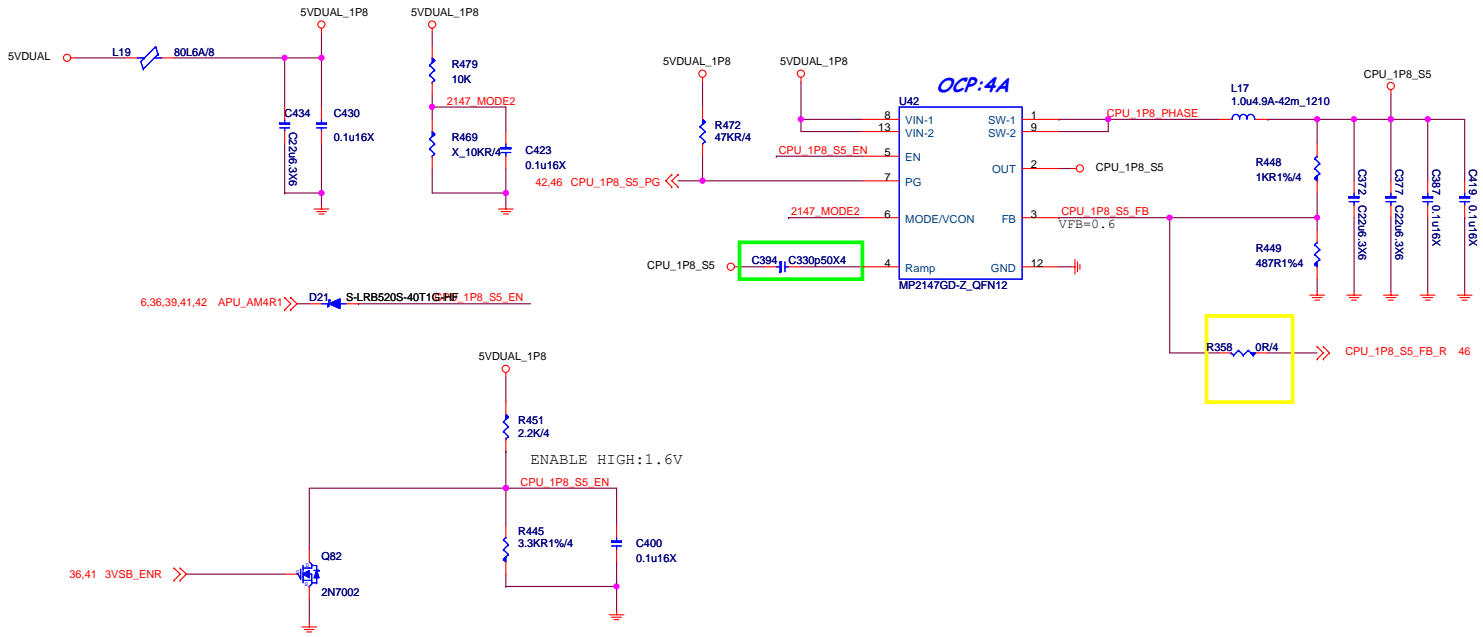
FOR VCCP_SOC_S5

0.9A

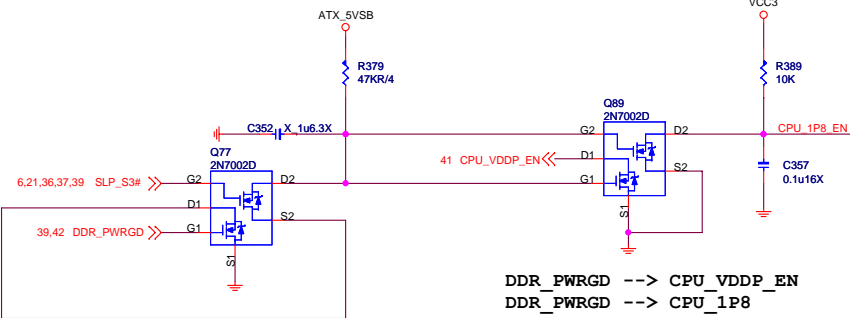
FOR CPU 1.8V S0

2.0A

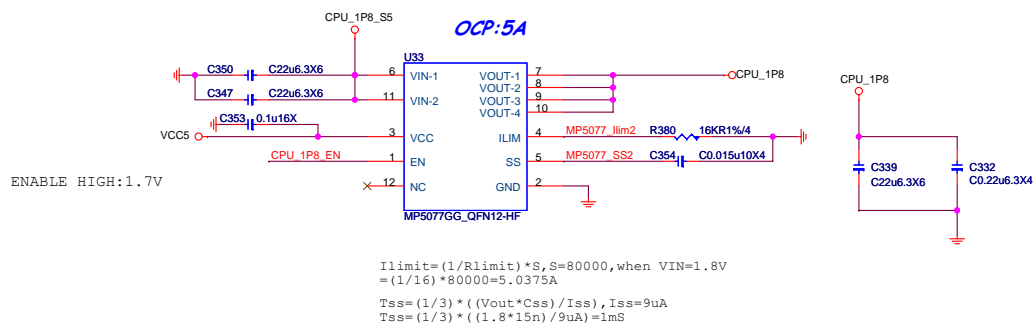
0.5A + 2.0A + 0.9A = 3.4A



<https://vinafix.com>



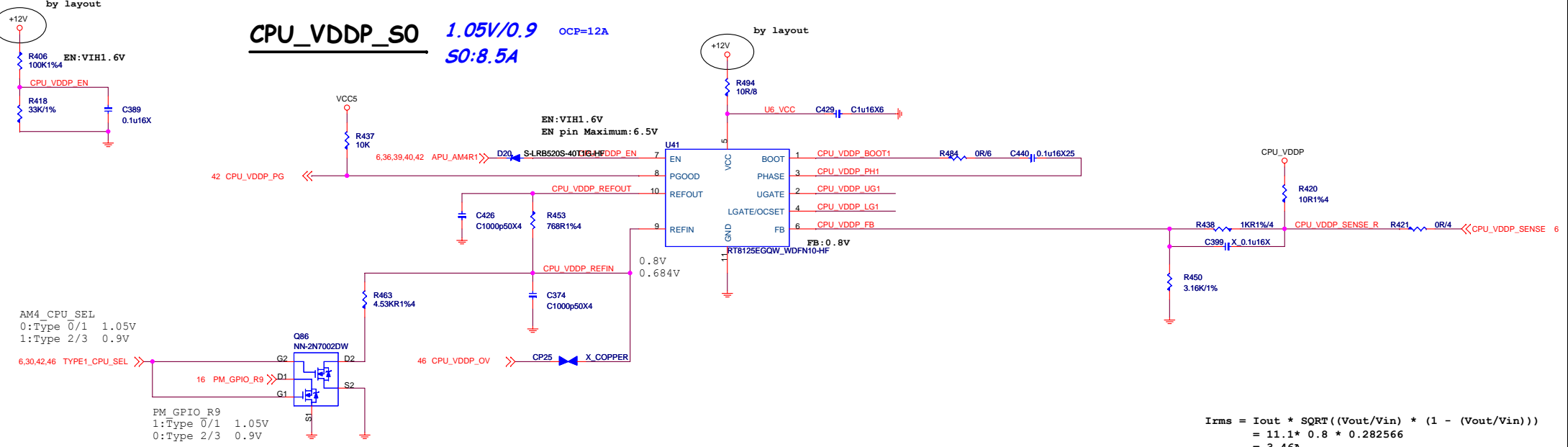
DDR_PWRGD --> CPU_VDDP_EN
DDR_PWRGD --> CPU_1P8



$I_{limit} = (1/R_{limit}) * S, S=80000, \text{when } VIN=1.8V$
 $= (1/16) * 80000 = 5.0375A$
 $T_{ss} = (1/3) * ((V_{out} * C_{ss}) / I_{ss}), I_{ss}=9uA$
 $T_{ss'} = (1/3) * ((1.8 * 15n) / 9uA) = 1ms$

CPU_VDDP_S0

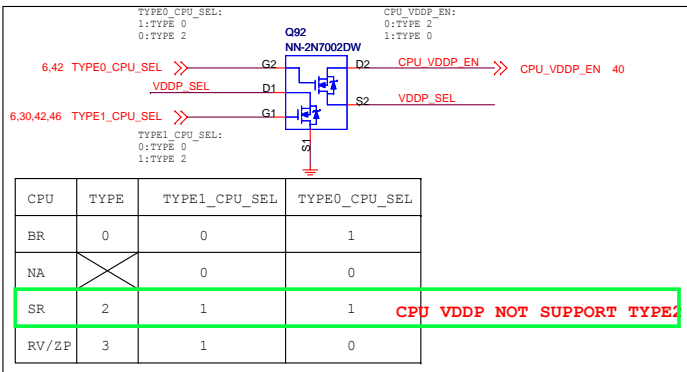
1.05V/0.9
S0:8.5A



$$I_{rms} = I_{out} * \sqrt{(V_{out}/V_{in}) * (1 - (V_{out}/V_{in}))}$$

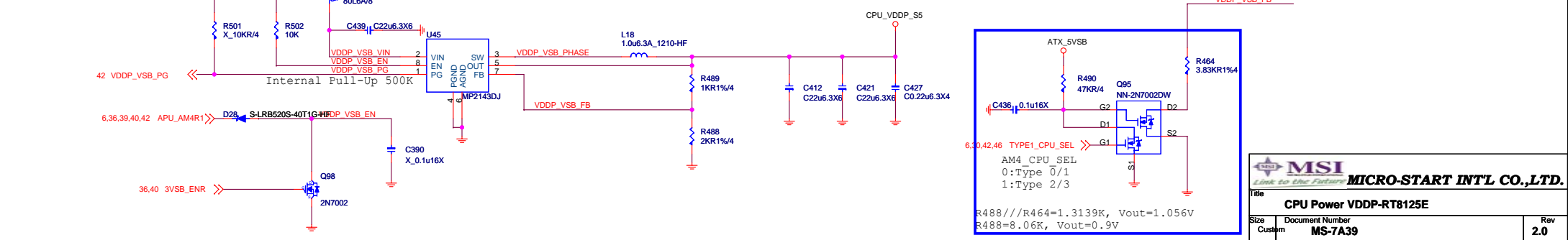
$$= 11.1 * 0.8 * 0.282566$$

$$= 3.46A$$



VDDP_S5 1.05V/0.9

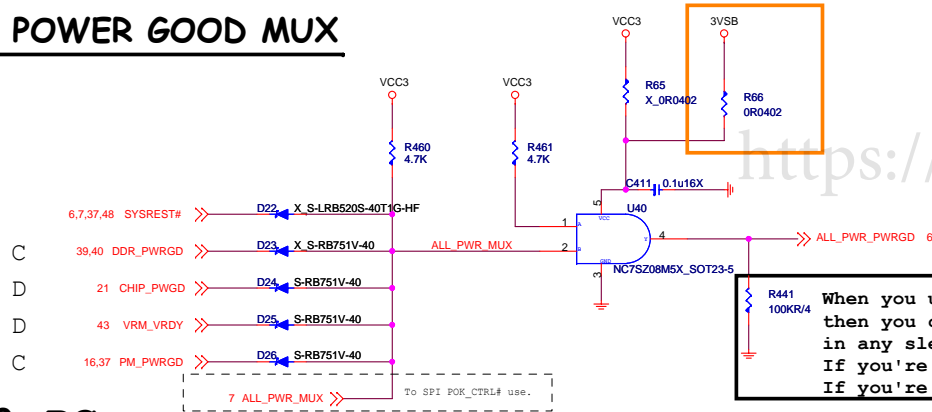
S5:1A



CPU	TYPE	TYPE1_CPU_SEL	TYPE0_CPU_SEL
BR	0	0	1
NA	2	0	0
SR	2	1	1
RV/ZP	3	1	0

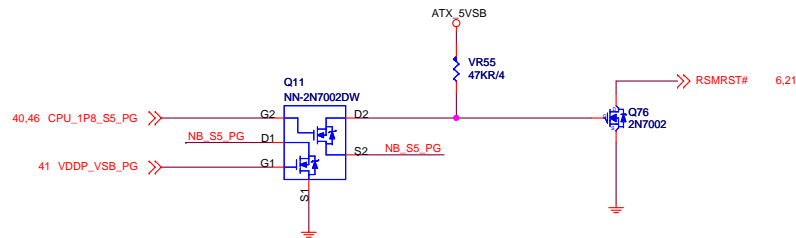
CPU VDDP NOT SUPPORT TYPE2

ALL POWER GOOD MUX

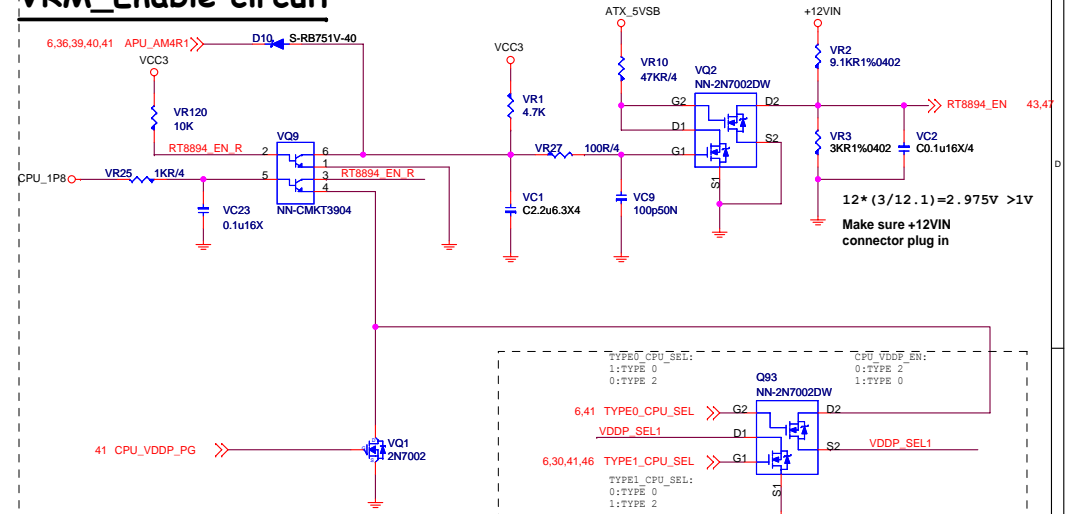


S0 PG

S5 PG



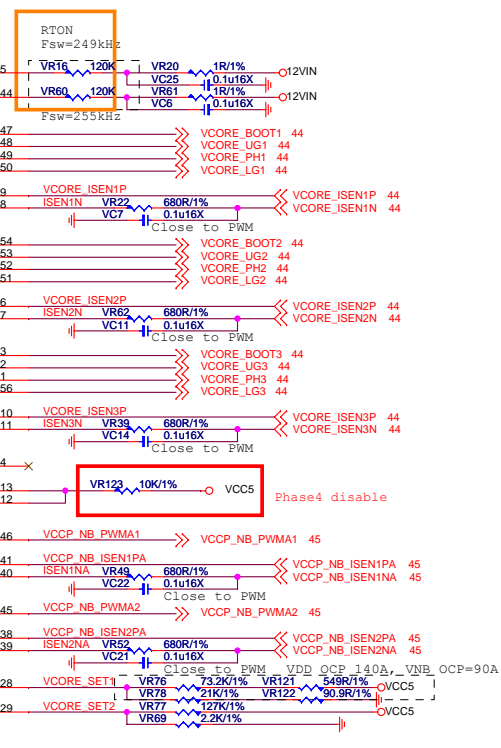
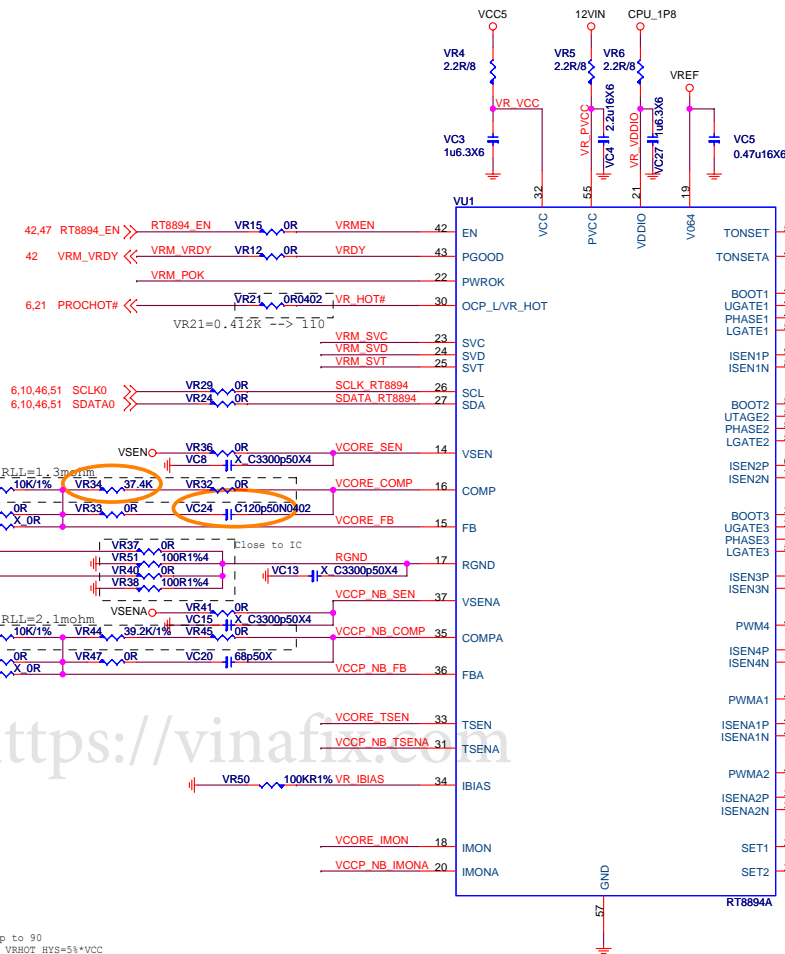
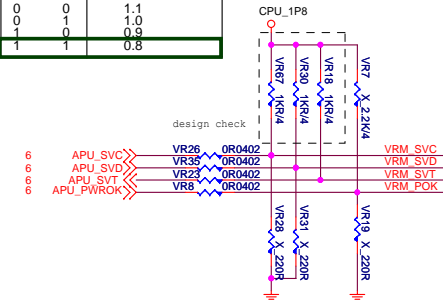
VRM_Enable circuit



CPU VDDP NOT SUPPORT TYPE2

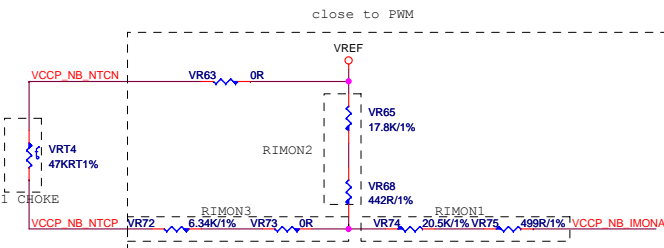
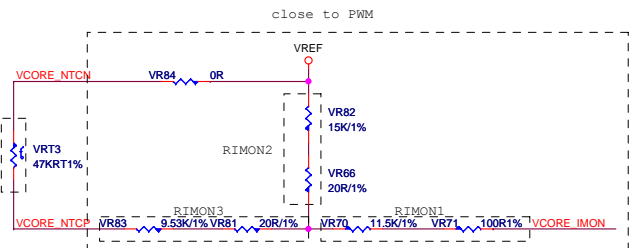
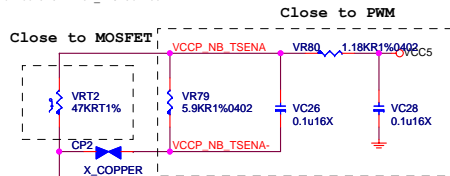
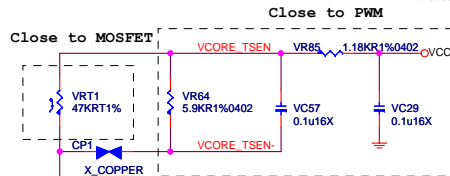
CPU	TYPE	TYPE1_CPU_SEL	TYPE0_CPU_SEL
BR	0	0	1
NA	X	0	0
SR	2	1	1
RV/ZP	3	1	0

		BOOT VOLTAGE
SVC	SVD	Pre_PWROK Metal VID
0	0	1.1
0	1	1.0
1	0	0.9
1	1	0.8

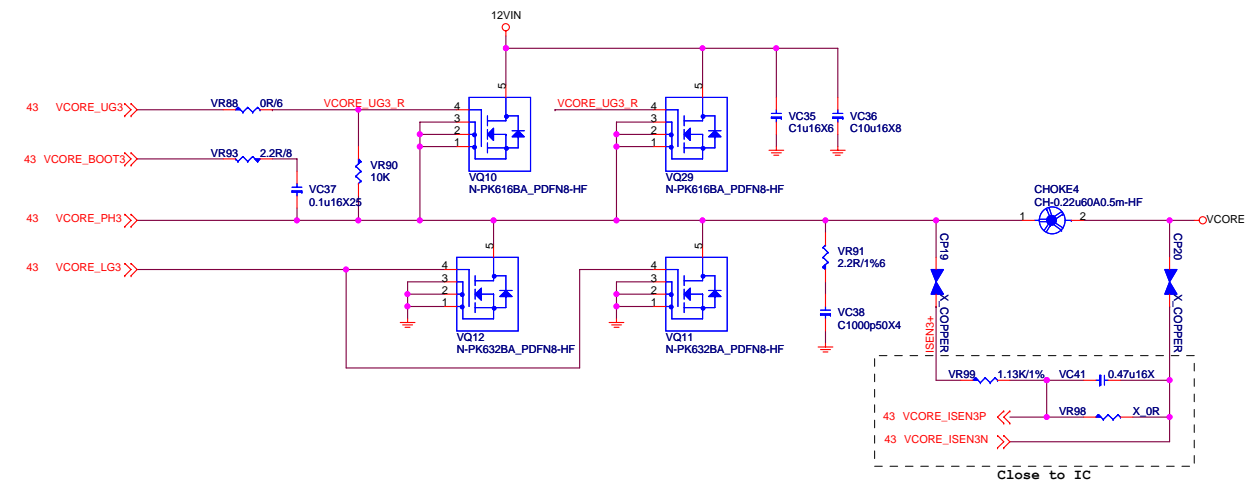
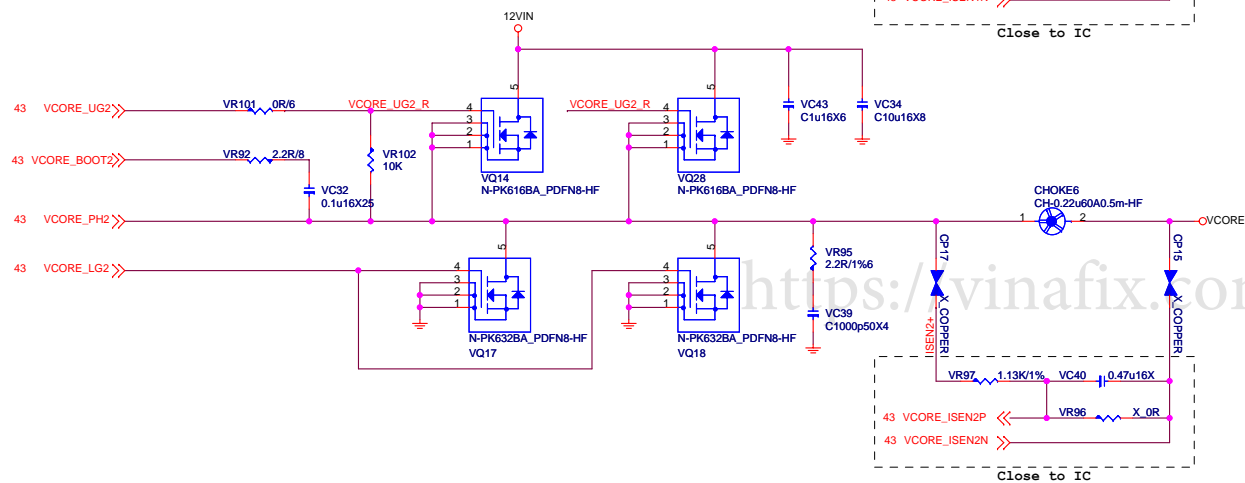
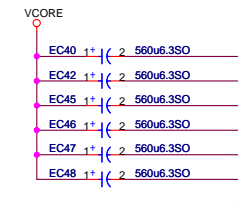
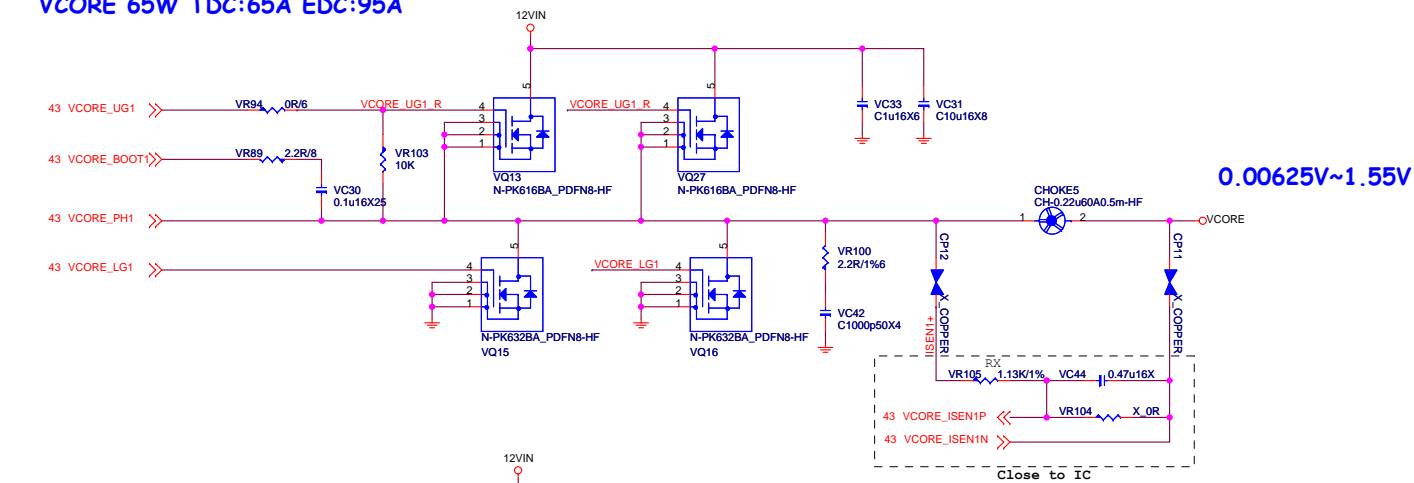


```
SET1 control ICCMAX,OCP setting
SET2 control Internal compensation
```

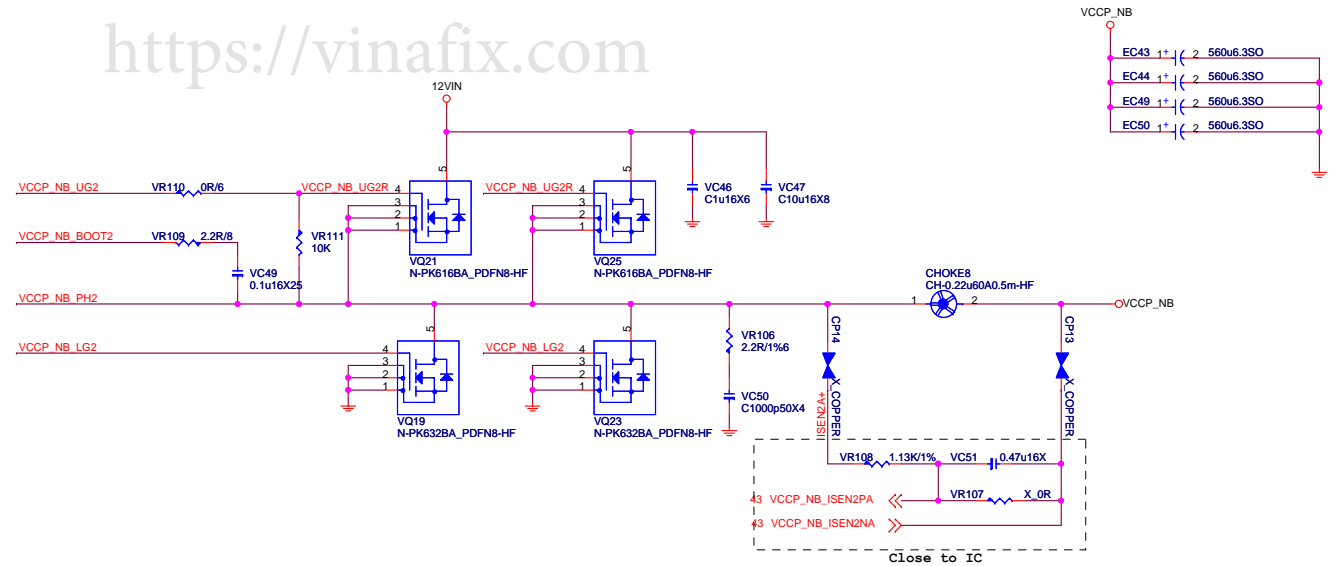
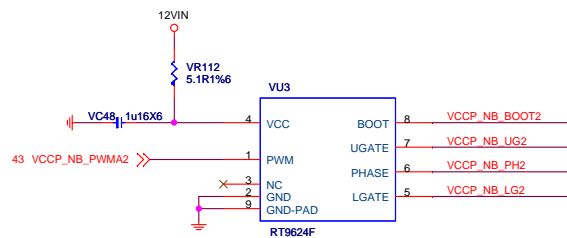
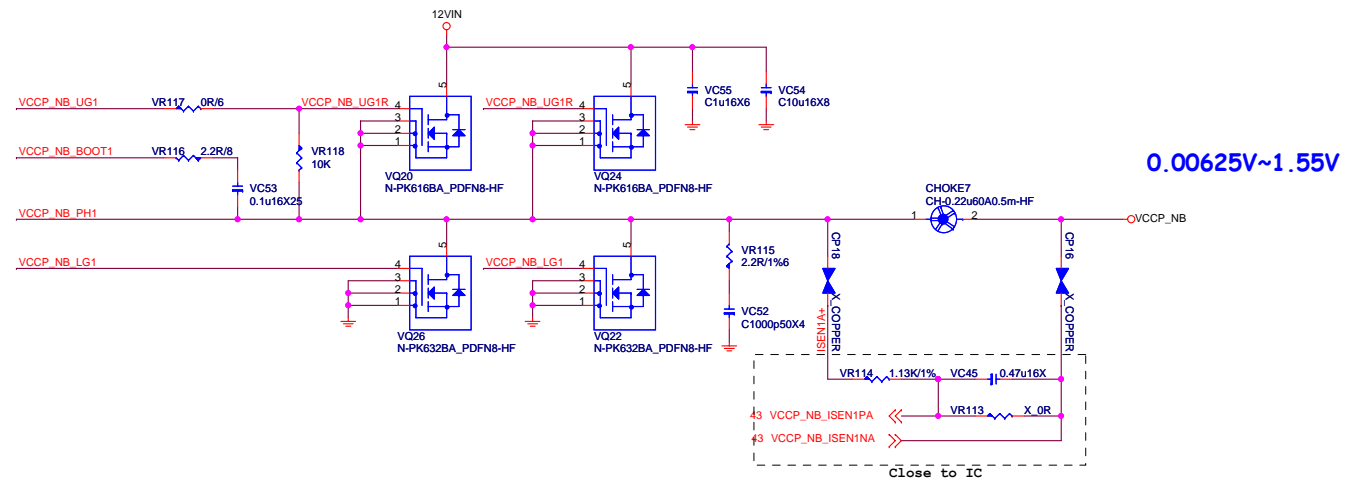
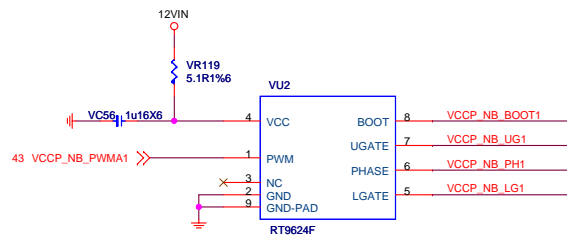
```
VCORE IccMAX: 125A =>OCP=>140A
VCC_NB IccMAX: 75A =>OCP=> 95A
```



VCORE 95W TDC:80A EDC:125A
VCORE 65W TDC:65A EDC:95A



VCCP_NB 95W TDC:50A EDC:75A
VCCP_NB 65W TDC:50A EDC:75A



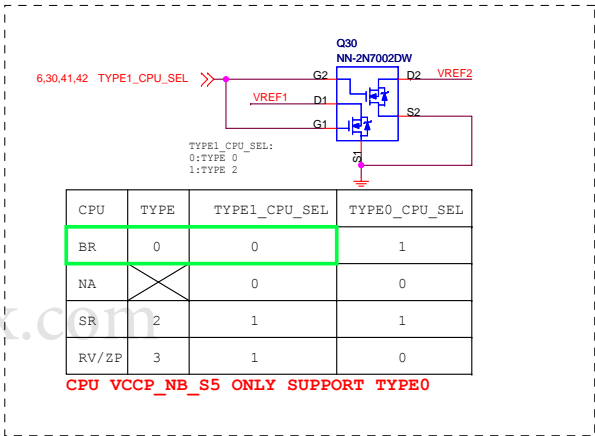
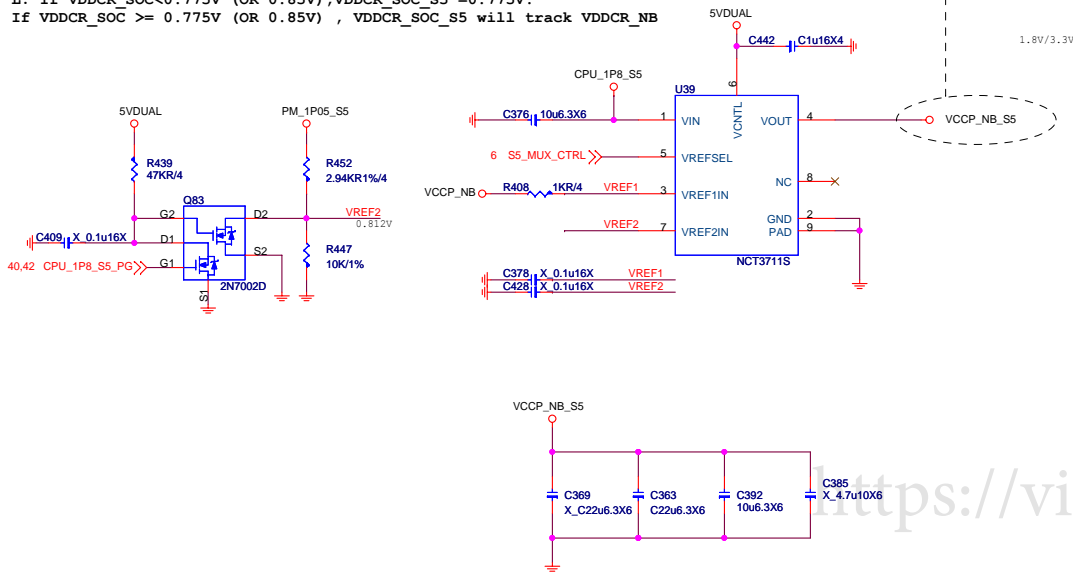
<https://vinafix.com>

FOR VCCP_SOC_S5
0.9A

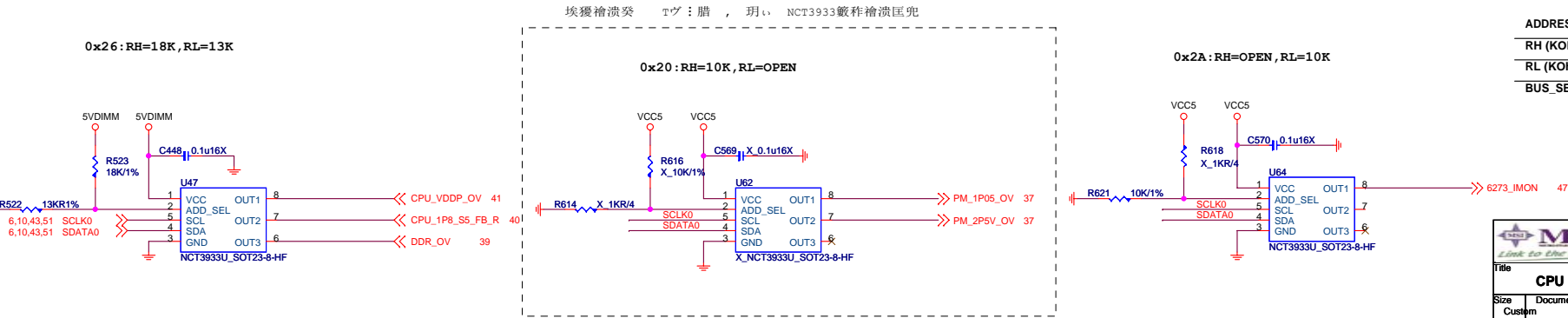
TYPE0 Only

S5_MUX_CTRL
HIGH:S0
LOW: S3/S5

H: +VDDCR_FCH ALW will track VDDNB
L: If VDDCR_SOC<0.775V (OR 0.85V),VDDCR_SOC_S5 =0.775V.
If VDDCR_SOC >= 0.775V (OR 0.85V) , VDDCR_SOC_S5 will track VDDCR_NB




Over Voltage Control IC



UPI VOLTAGE CONSOLE

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%

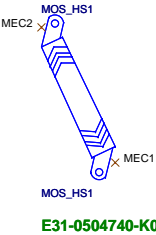
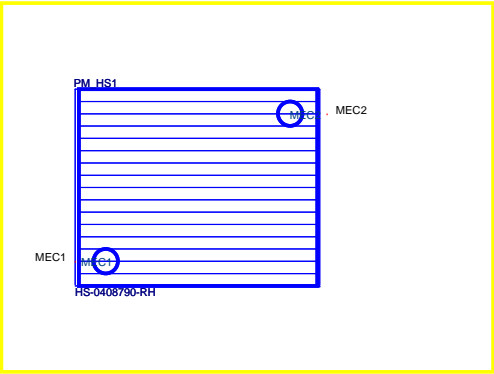
**MICRO-START INT'L CO.,LTD.**

Title
CPU Power NB Switch / NCT3933 OV

Size Custom	Document Number MS-7A39	Rev 2.0
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Date: Sunday, January 22, 2017 Sheet 46 of 55

HEAT SINK

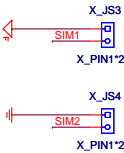


CPU Socket



RETENTION MODULE

Simulation



MANUAL PART

- HDMI_LA1

Y01-RHDMI03-000

SSE_LA1

X_Y02-MA00101-SSE

XSP_LA1

Y02-MA00401-XSP

CFOS_LA1

Y02-MU00170-CFO
- MKT2

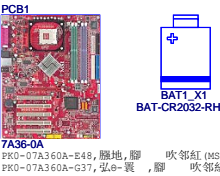
G51-M1SPK3T-Q13

MKT1

G51-M1SPK3T-Q13

BIOS_LABEL

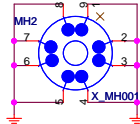
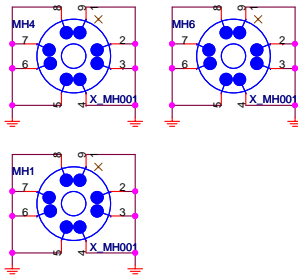
G51-M1SPXXX-A09



7A36-0A
PFO-07A360A-E48, 腳 吹 鄰 紅 (MSIS)
PFO-07A360A-G37, 腳 吹 鄰 紅 (MSIS)

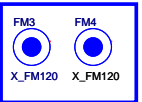
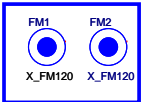
<https://vinafix.com>

Optics Orientation Holes




5010

5020



OPT	Configure	BOM	Function
		601-7A36-A01	XXXX



MICRO-START INTL CO.,LTD.

Title: **BOM OPTION**

Size	Document Number	Rev
Custom	MS-7A39	2.0

Date: Tuesday, January 24, 2017 Sheet 50 of 55

