MS-7A72

ATX

Ver: 1.0

Intel -Kabylake plamform Z270 / H270 / B250

CPU:

Kabylake-S

System Chipset:

Z270 Colay H270 and B250

Onboard Chip:

HD Audio Codec : ALC887
LAN : Intel I219
SIO : Nuvoton 6795
Flash ROM : 16MB GSE Z270
8MB GSE Lite For H270 / B250

Main Memory:

*DDRIV (800/1066/1333/1600/2133MHz) * 4 (Dual Channel)*

ACPI:

NIKO/UPI

PWM:

RT3606BC

Expansion Slots:

*PCI Express (X16) Slot *1*
*PCI Express (X4) Slot * 1*
*PCI Express (X1) Slot * 3*
*PCI Slot * 1*
*M2 * 2 (22110 and 2280)*

Other:

SATA3.0 x6 (PCH)
*FRONT USB2.0 *4*
*FRONT USB3.0 *4(B250 only 2)*
*REAR USB2.0 *2*
*REAR USB3.0 *4*
REAR USB3.1 TYPE A+C

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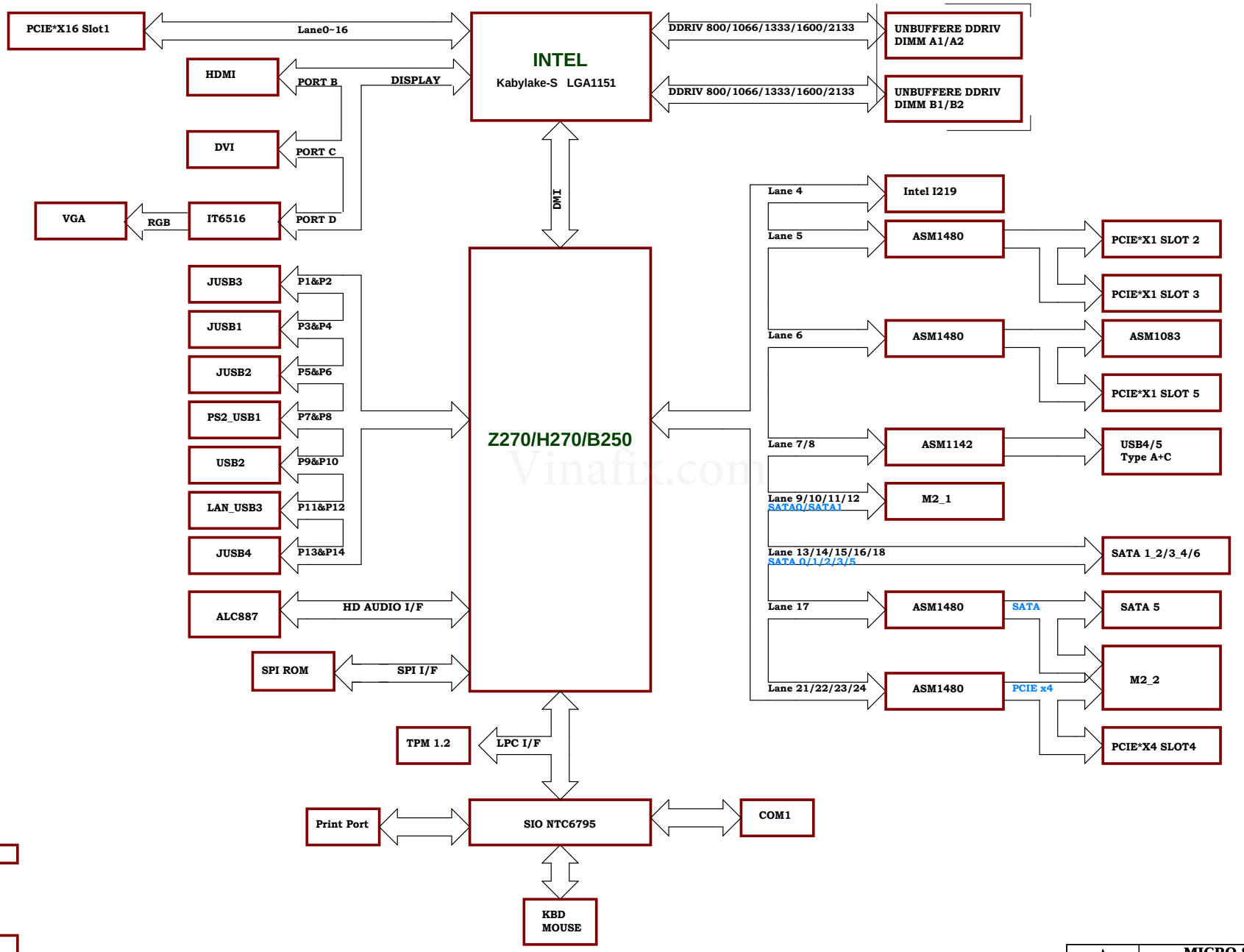
MS-7A72 Block Diagram



Slot Sequence:

- PCIE X16
- PCIE X1
- PCIE X1
- PCIE X4
- PCIE X1
- PCI

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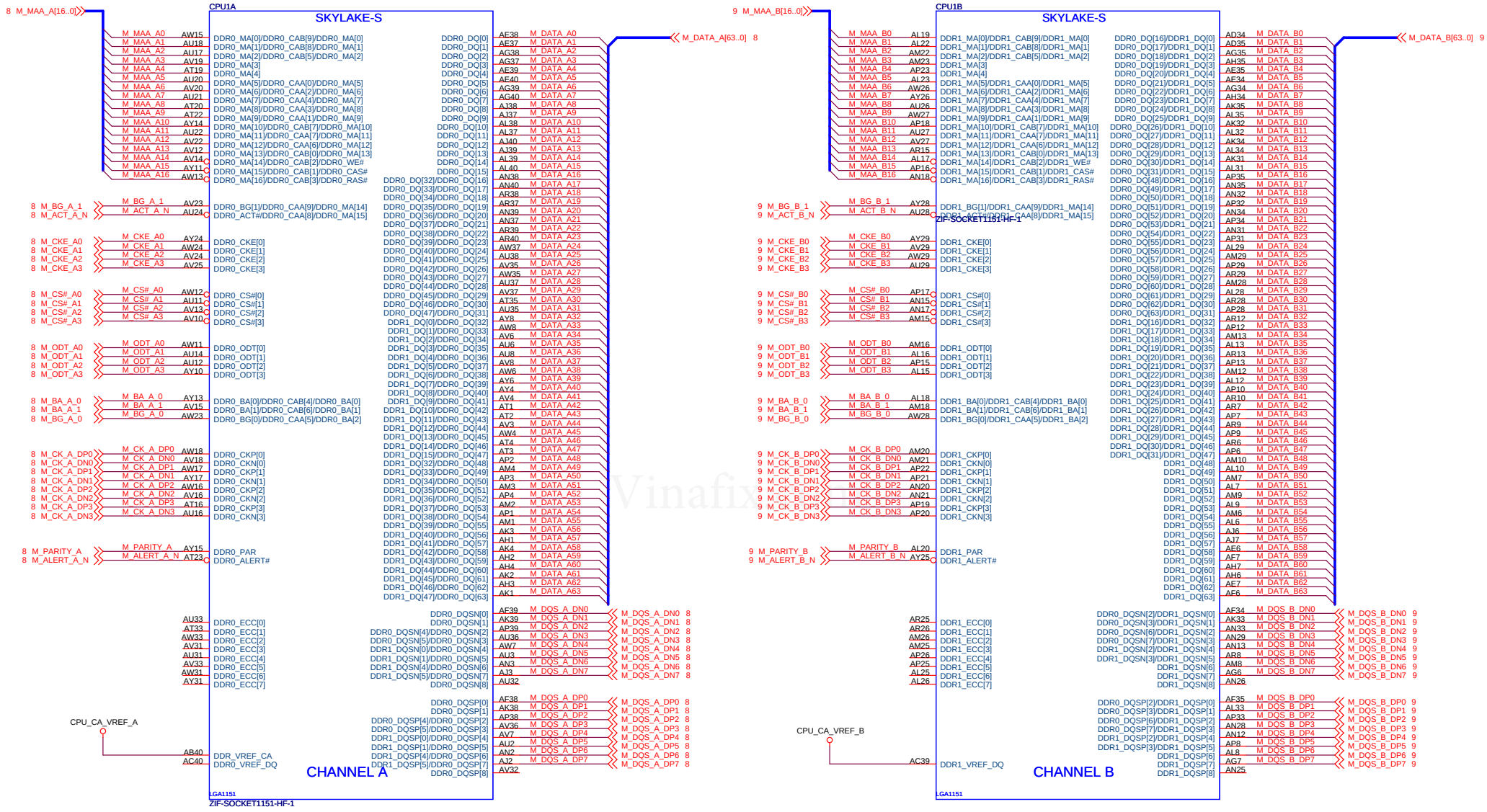
SOCKET PN N12-151A010-L06



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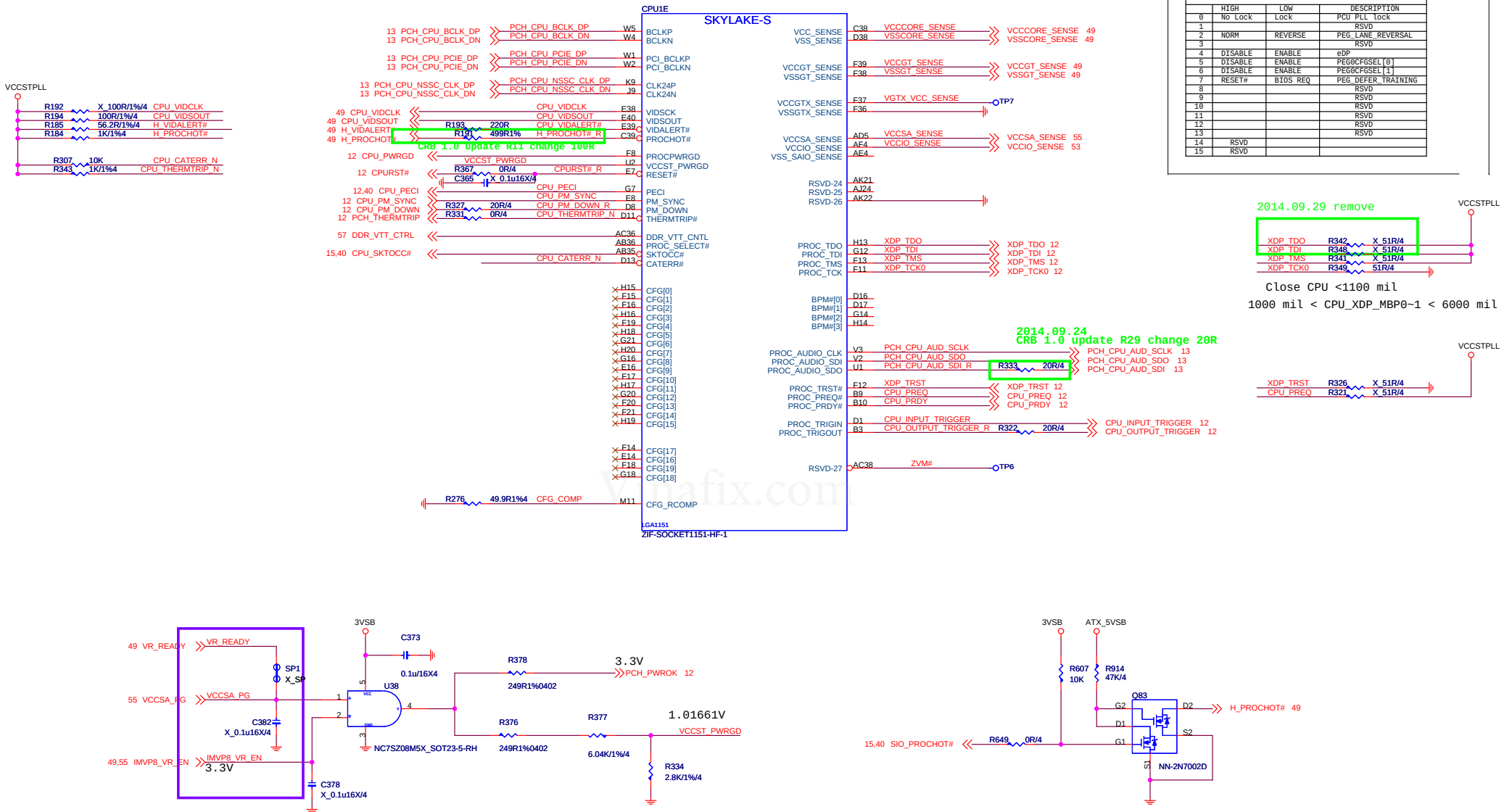
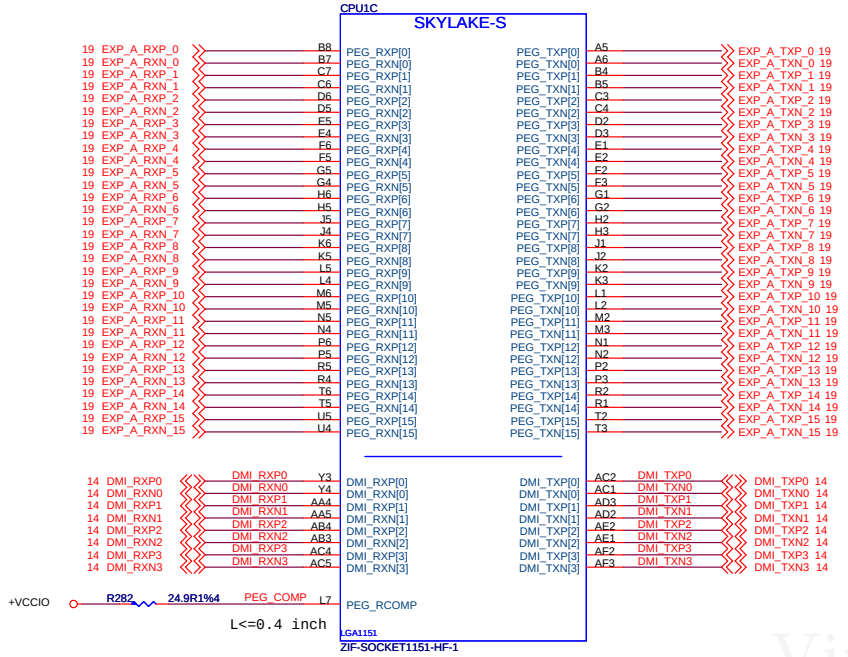
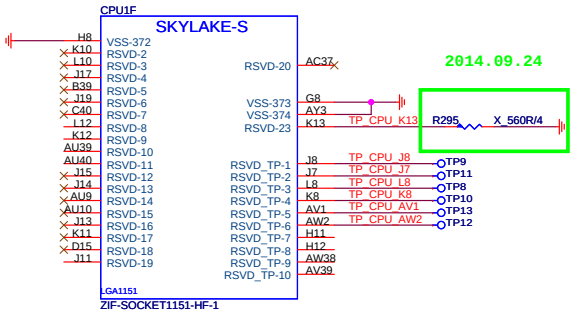
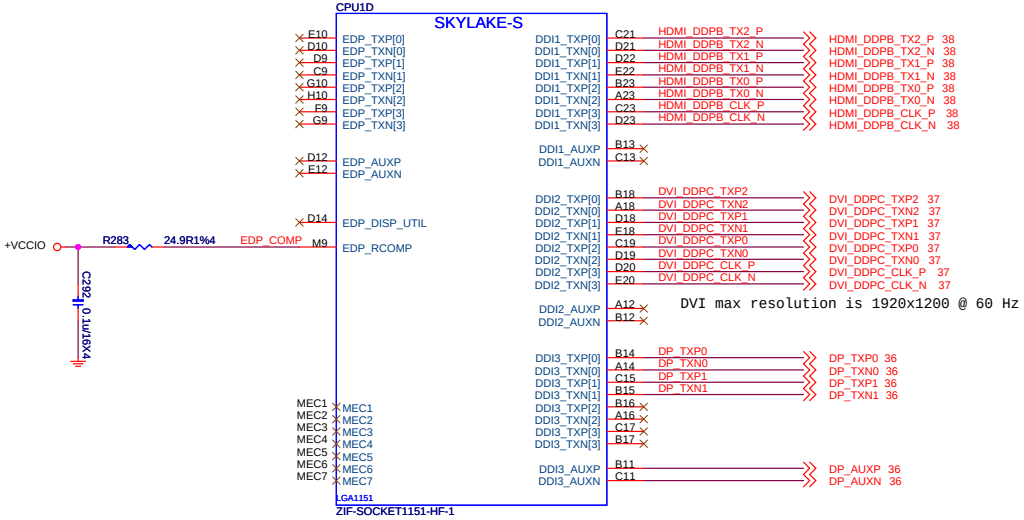


	HIGH	LOW	DESCRIPTION
0	No Lock	Lock	PCU PLL lock
1			RSVD
2	NORM	REVERSE	PEG_LANE_REVERSAL
3			RSVD
4	DISABLE	ENABLE	eDP
5	DISABLE	ENABLE	PEG0CFGSEL[0]
6	DISABLE	ENABLE	PEG0CFGSEL[1]
7	RESET#	BIOS REQ	PEG_DEFER_TRAINING
8			RSVD
9			RSVD
10			RSVD
11			RSVD
12			RSVD
13			RSVD
14	RSVD		
15	RSVD		







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MS-7A72	
Size: Custom	Document Description: CPU-PEG/Display
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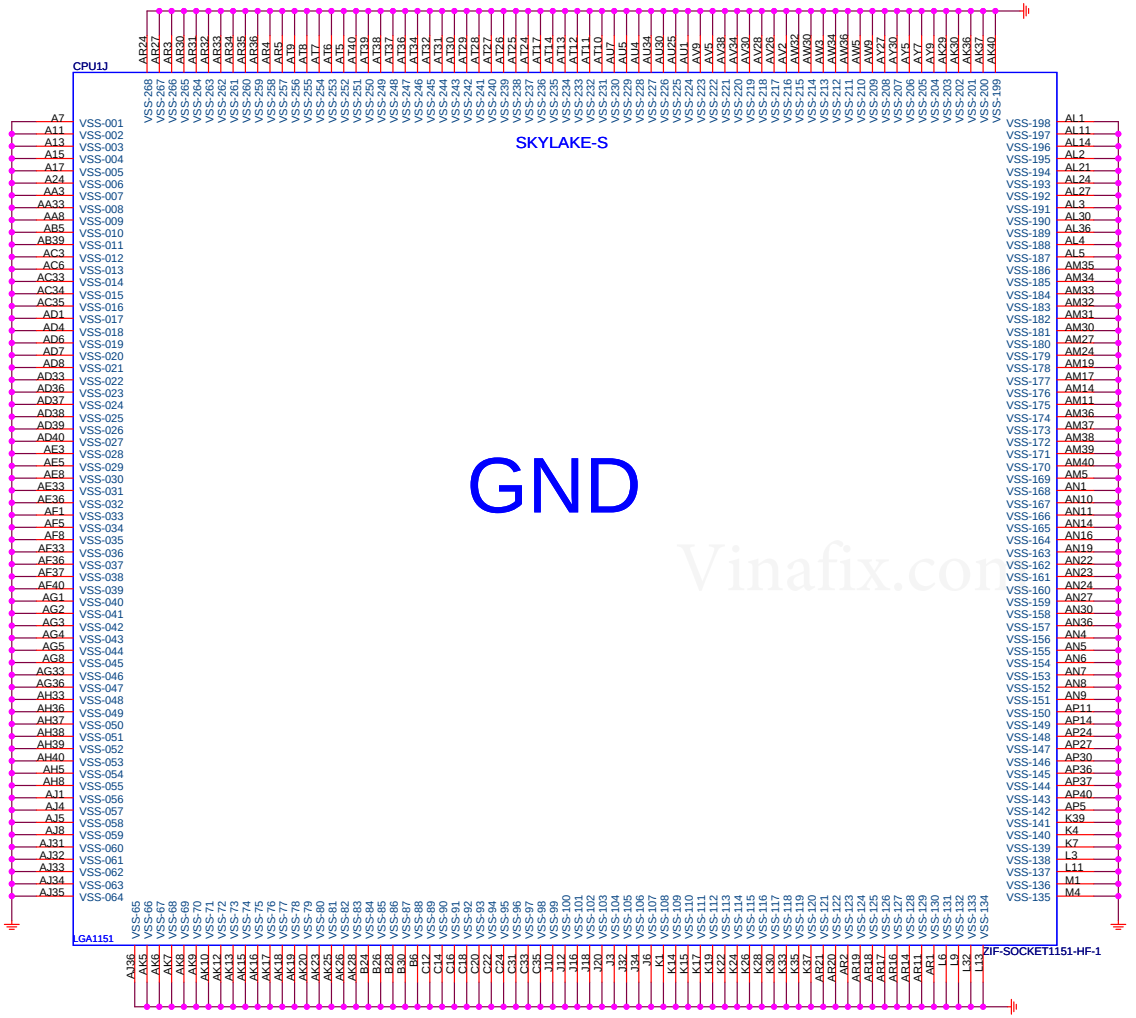

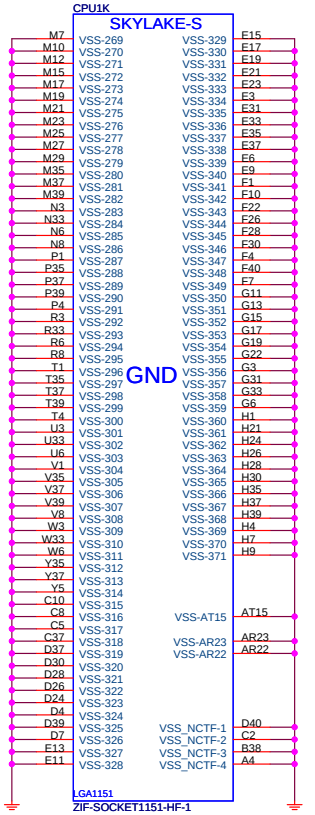

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7A72	
Size: Custom	Document Description: CPU-GND	Rev: 1.0
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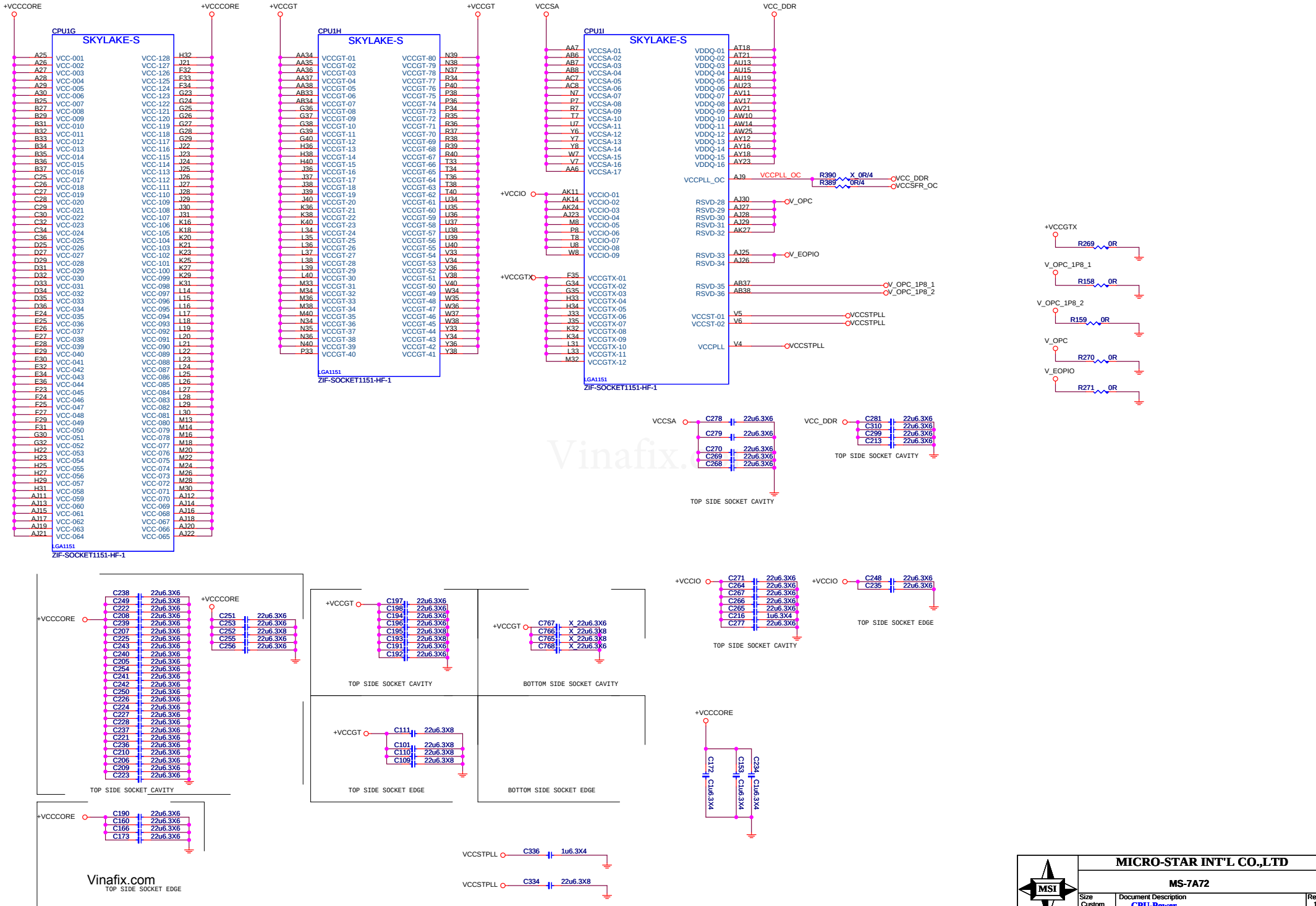

MICRO-STAR INT'L CO.,LTD	
MS-7A72	
Size: Custom	Document Description: CPU-Power
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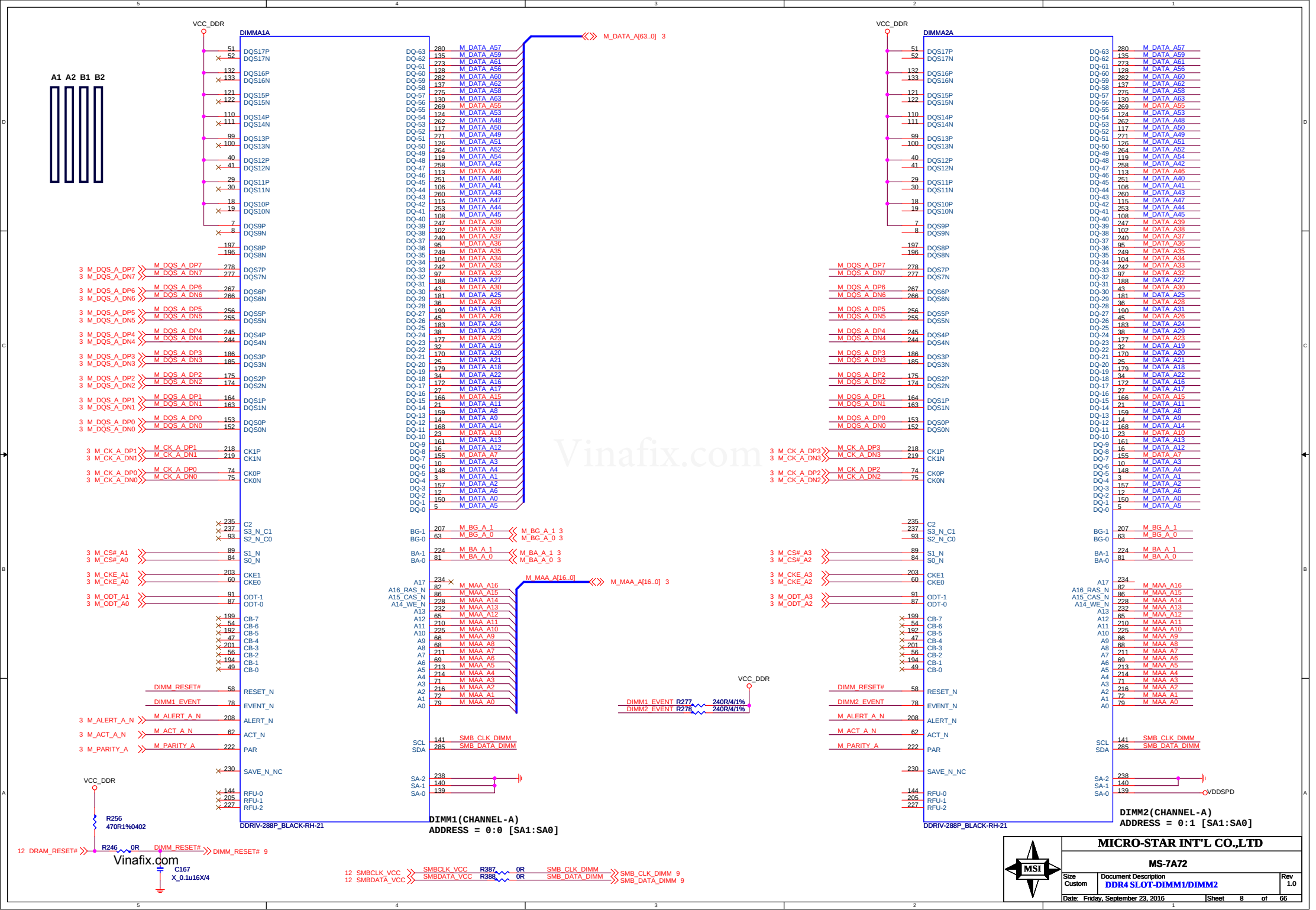
Date: Friday, September 23, 2016	Sheet 7 of 66



MICRO-STAR INT'L CO.,LTD	
MS-7A72	
Size: Custom	Document Description: DDR4 SLOT-DIMM1/DIMM2
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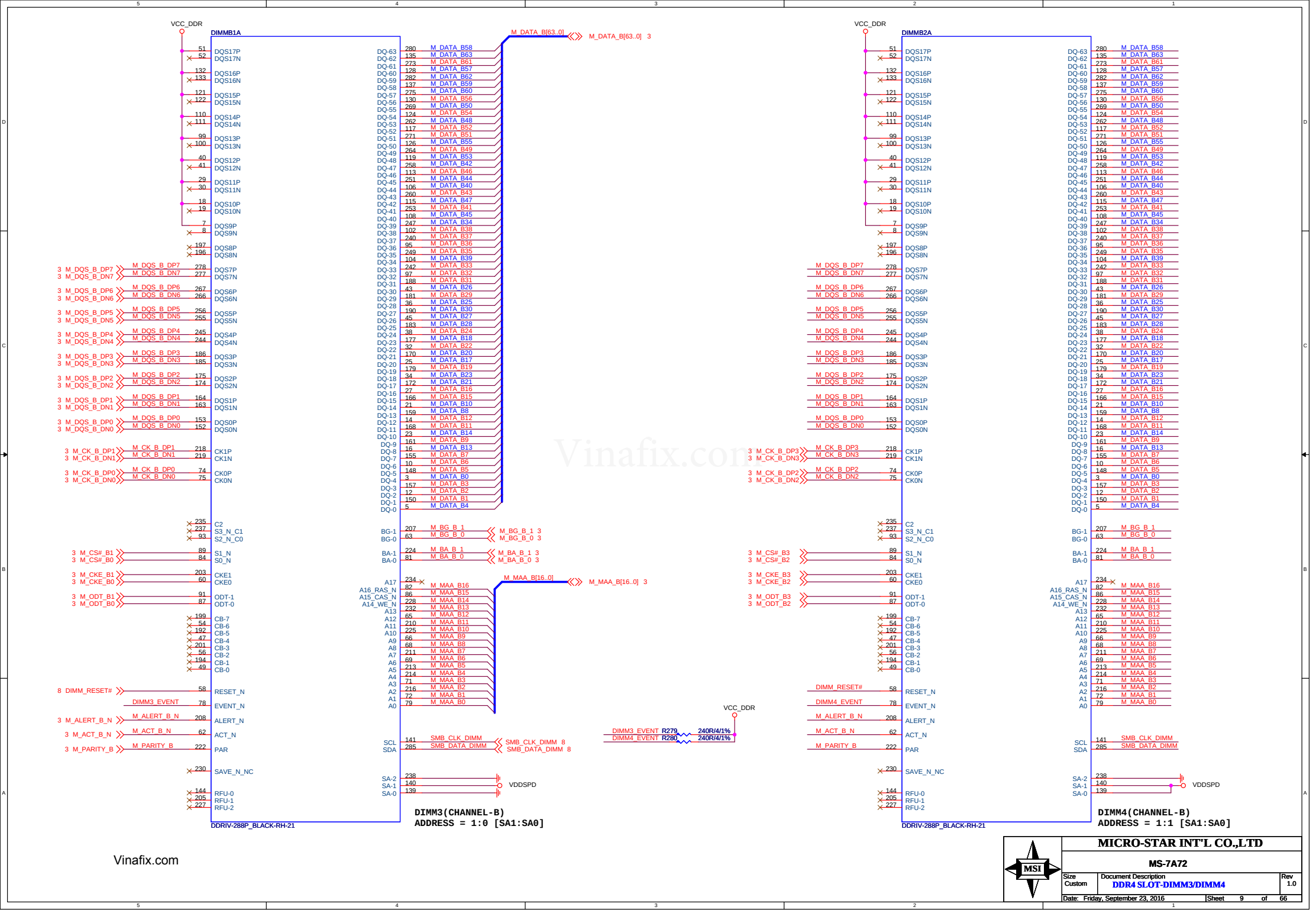
VCC_DDR
DIMMB1A
M_DATA_B[63..0]
M_DATA_B[63..0] 3
DQS17P
DQS17N
DQS16P
DQS16N
DQS15P
DQS15N
DQS14P
DQS14N
DQS13P
DQS13N
DQS12P
DQS12N
DQS11P
DQS11N
DQS10P
DQS10N
DQS9P
DQS9N
DQS8P
DQS8N
DQS7P
DQS7N
DQS6P
DQS6N
DQS5P
DQS5N
DQS4P
DQS4N
DQS3P
DQS3N
DQS2P
DQS2N
DQS1P
DQS1N
DQS0P
DQS0N
CK1P
CK1N
CK0P
CK0N
C2
S3_N_C1
S2_N_C0
S1_N
S0_N
CKE1
CKE0
ODT-1
ODT-0
CB-7
CB-6
CB-5
CB-4
CB-3
CB-2
CB-1
CB-0
RESET_N
EVENT_N
ALERT_N
ACT_N
PAR
SAVE_N_NC
RFU-0
RFU-1
RFU-2
DDRIV-288P_BLACK-RH-21
M_BG_B_1
M_BG_B_0
M_BA_B_1
M_BA_B_0
M_MAA_B[16..0]
M_MAA_B[16..0] 3
SMB_CLK_DIMM
SMB_DATA_DIMM
SMB_CLK_DIMM 8
SMB_DATA_DIMM 8
SA-2
SA-1
SA-0
VDDSPD
DIMM3_EVENT R279 240R/4/1%
DIMM4_EVENT R280 240R/4/1%
DIMM3(CHANNEL-B)
ADDRESS = 1:0 [SA1:SA0]
DIMMB2A
DIMM4(CHANNEL-B)
ADDRESS = 1:1 [SA1:SA0]
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MS-7A72
Size
Custom
Document Description
DDR4 SLOT-DIMM3/DIMM4
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1.0
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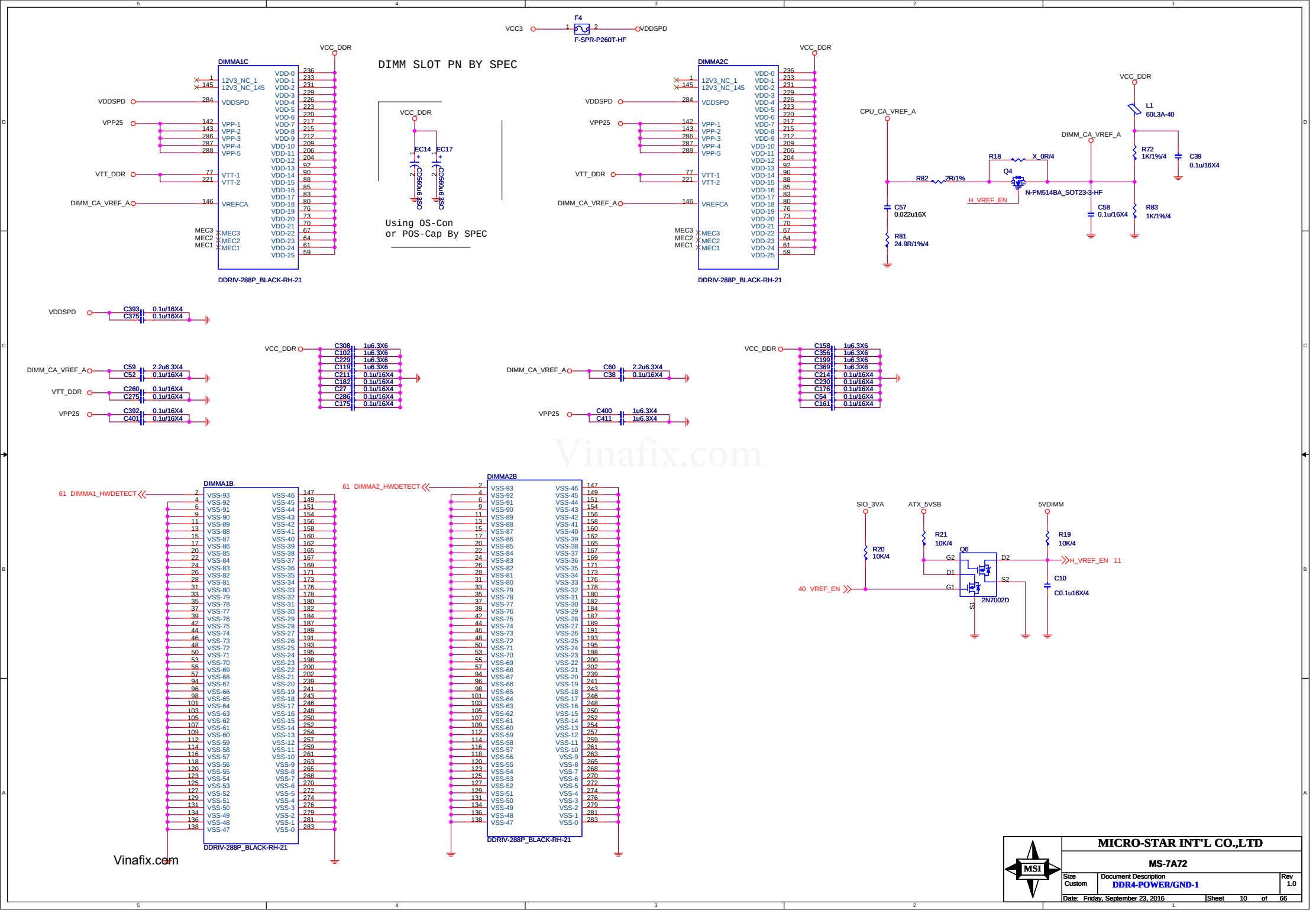

MICRO-STAR INT'L CO.,LTD	
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Size: Custom	Document Description: DDR4-POWER/GND-1
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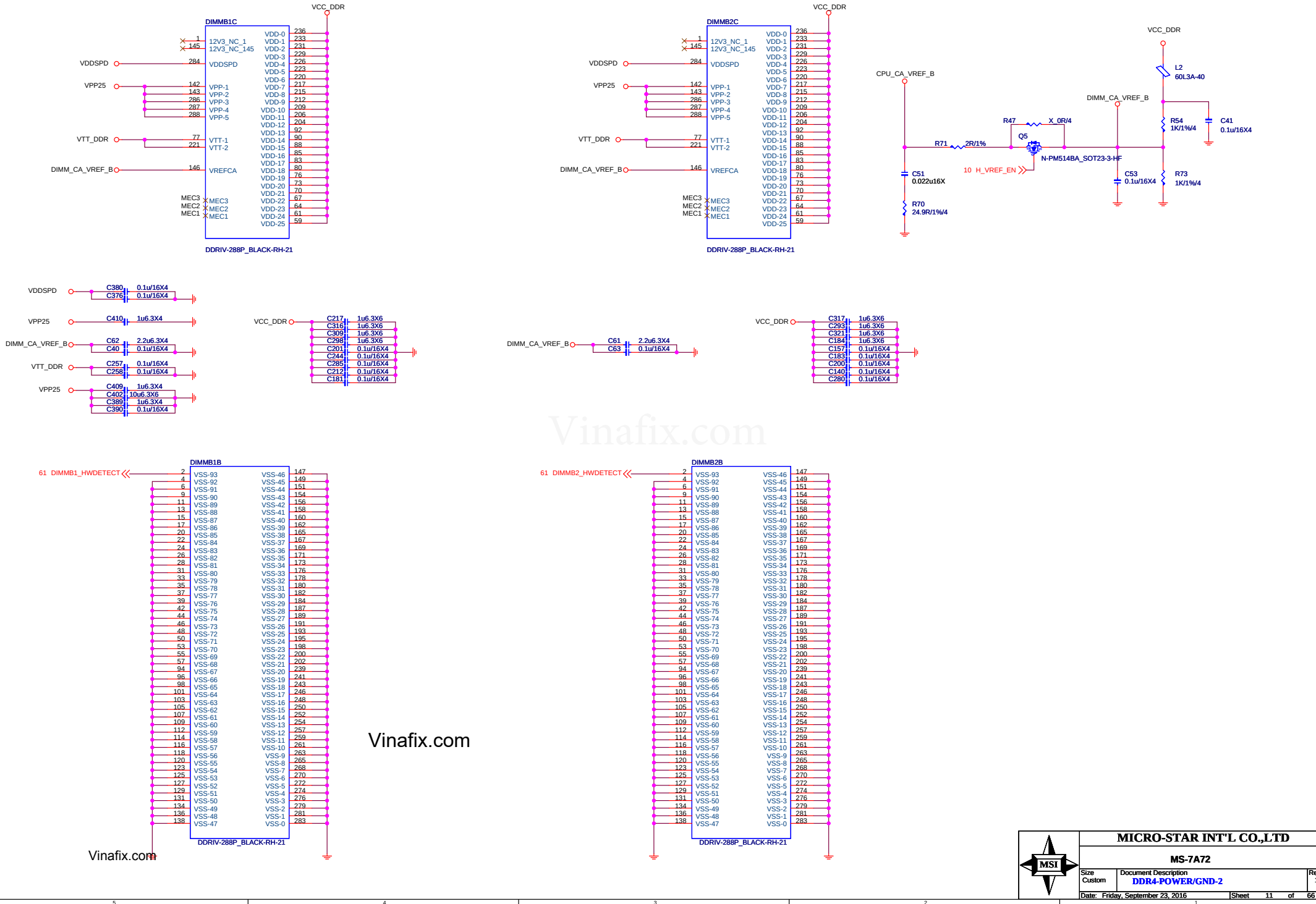

MICRO-STAR INT'L CO.,LTD			
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Size: Custom	Document Description: DDR4-POWER/GND-2		Rev: 1.0
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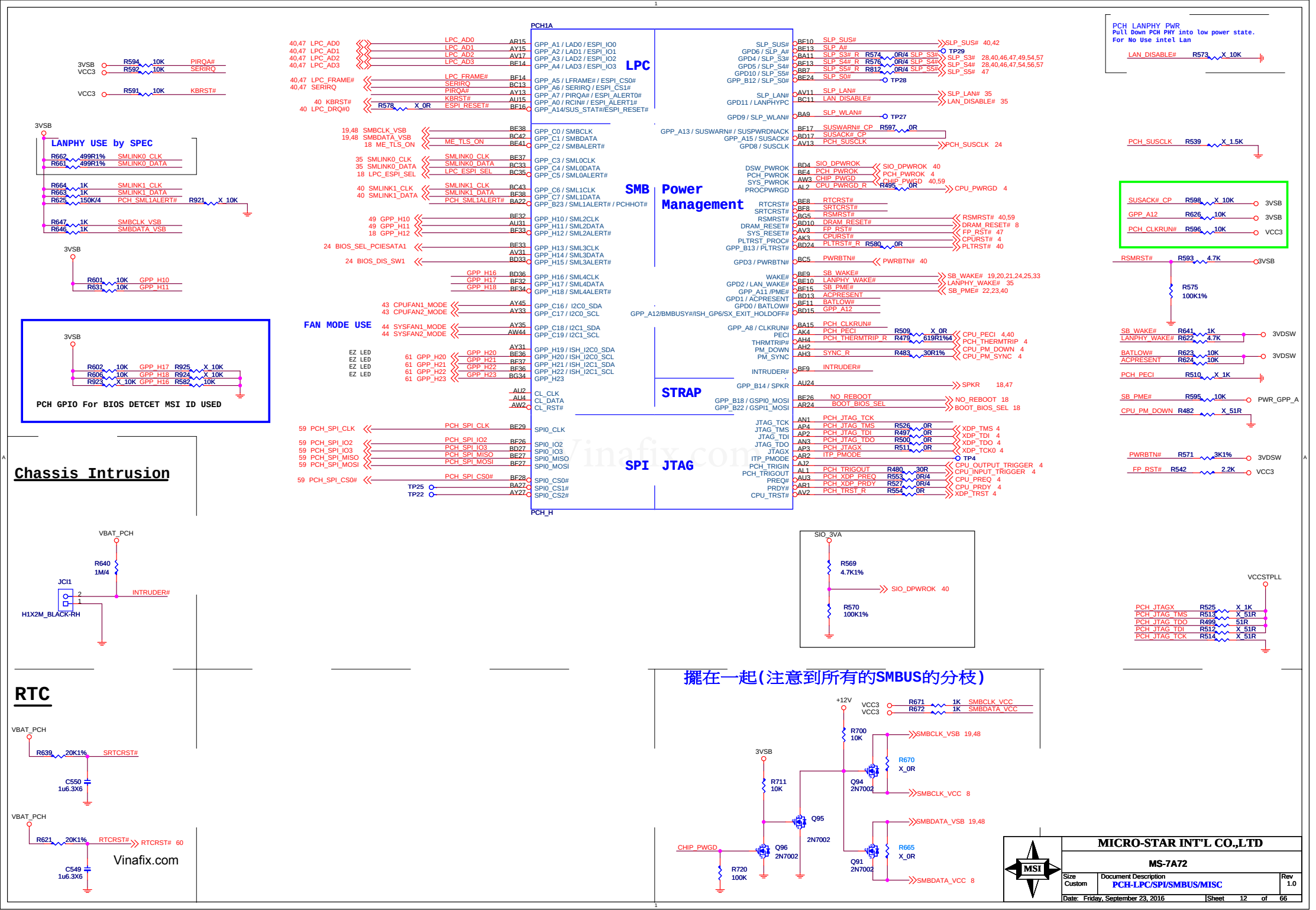
PCH1A
LPC
SMB
Power Management
STRAP
SPI
JTAG
PCH_H
LANPHY USE by SPEC
FAN MODE USE
PCH GPIO For BIOS DETCET MSI ID USED
PCH_LANPHY_PWR
Pull Down PCH PHY into low power state.
For No Use intel Lan
Chassis Intrusion
RTC
摆在一起(注意到所有的SMBUS的分枝)
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MS-7A72
PCH-LPC/SPI/SMBUS/MISC
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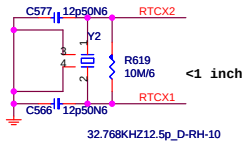
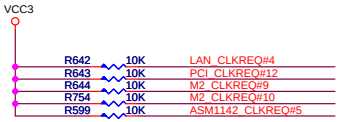
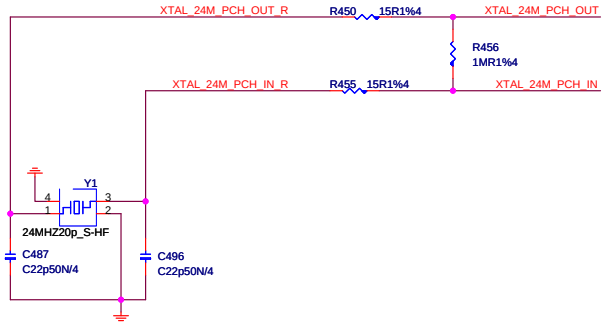
PCH_CLK

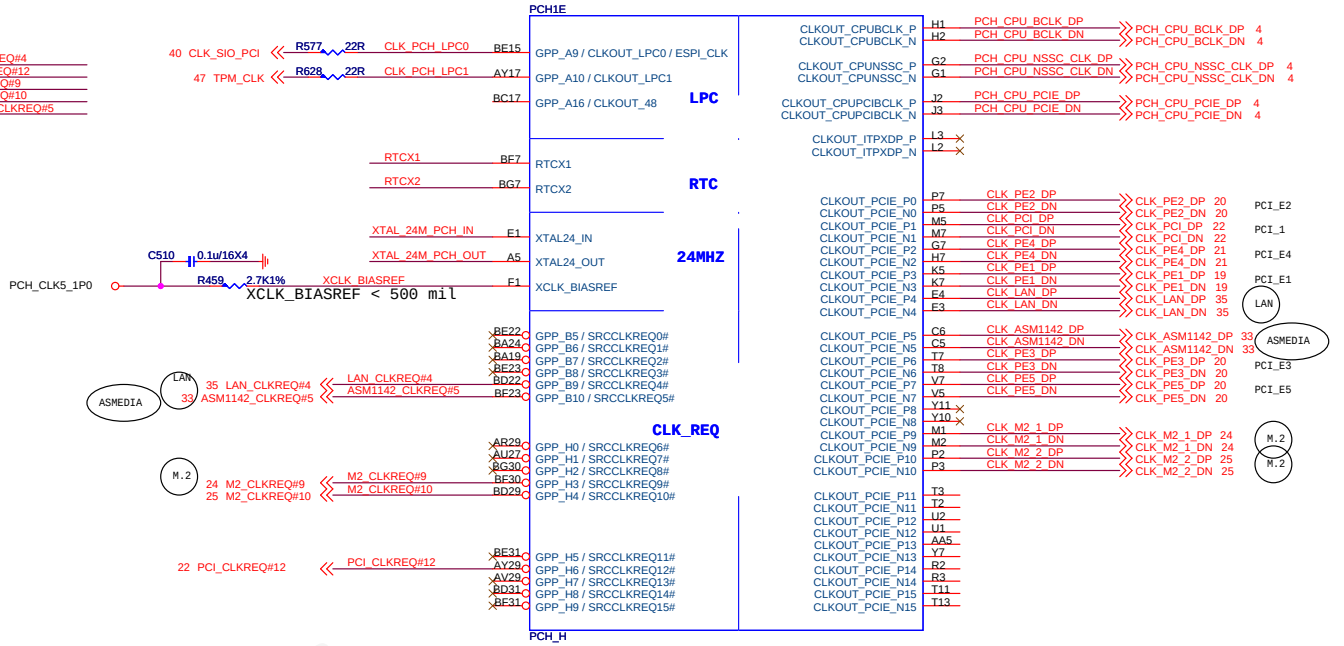
RTC Block

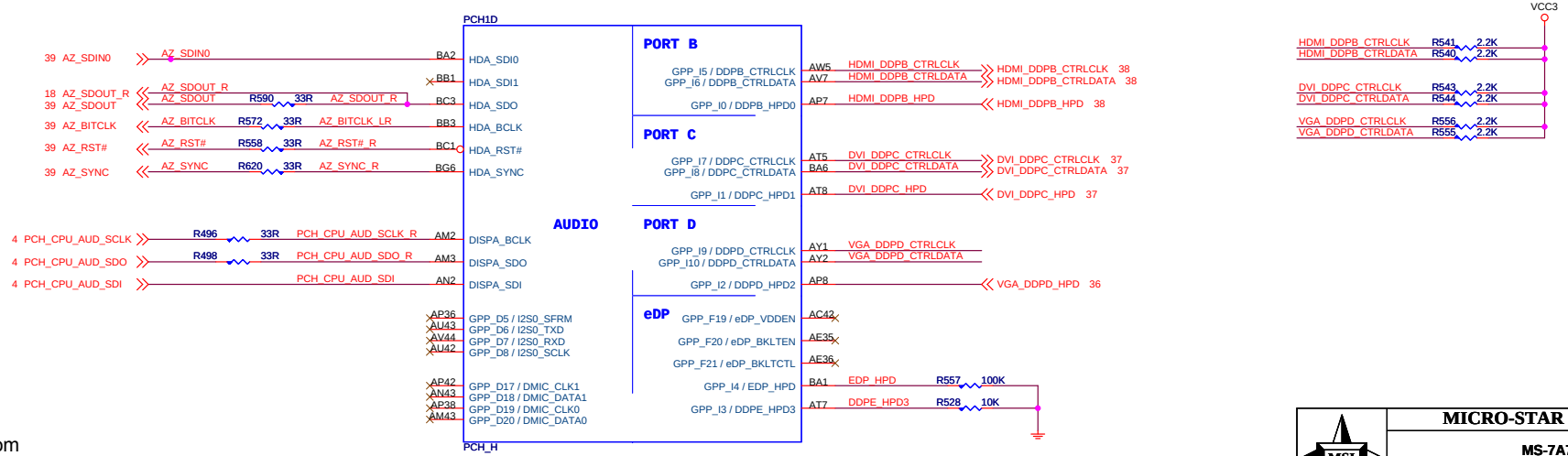
Close to PCH











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Custom	PCH-Clock/Audio	1.0

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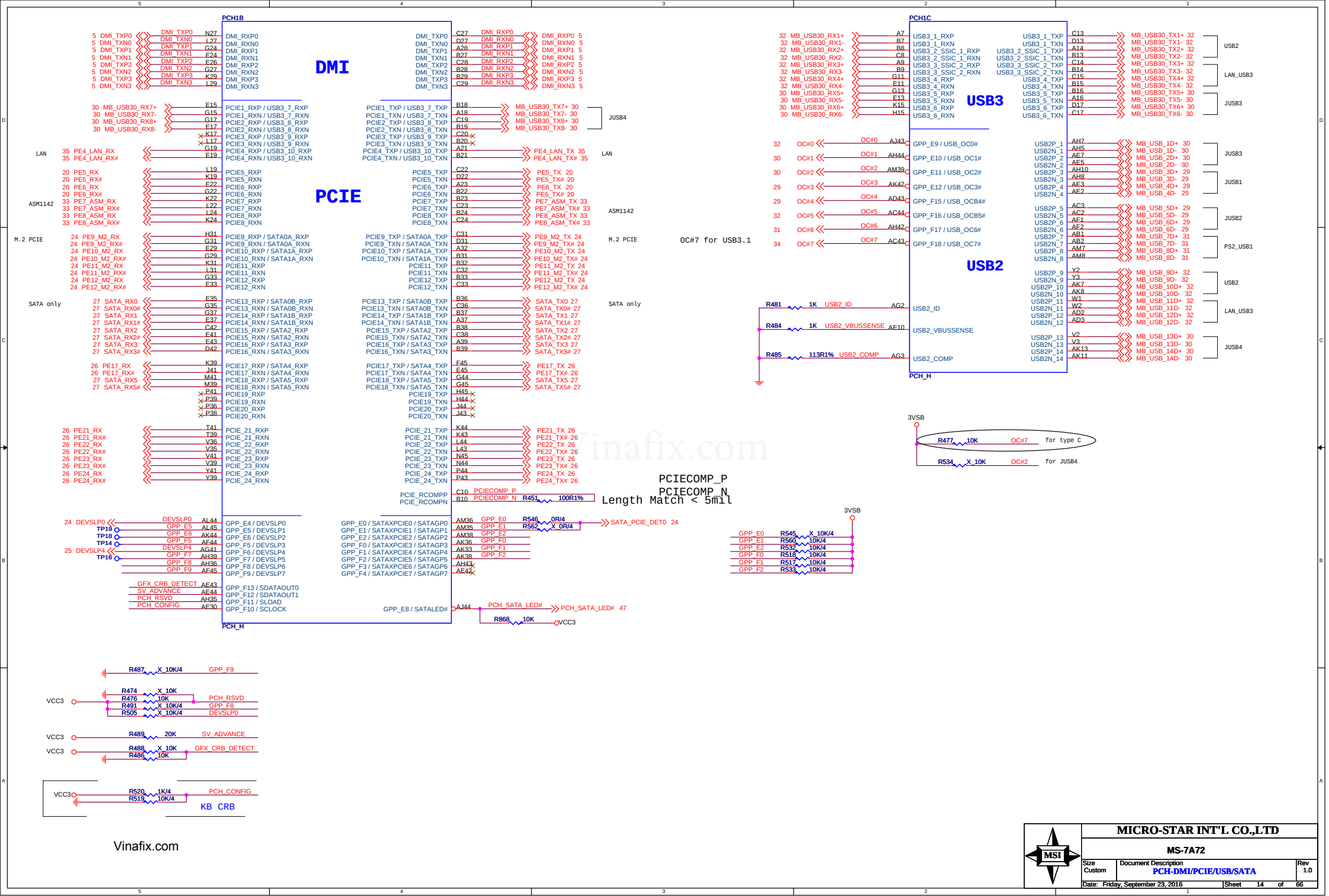

MICRO-STAR INT'L CO.,LTD	
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Size: Custom	Document Description: PCH-DMI/PCIE/USB/SATA
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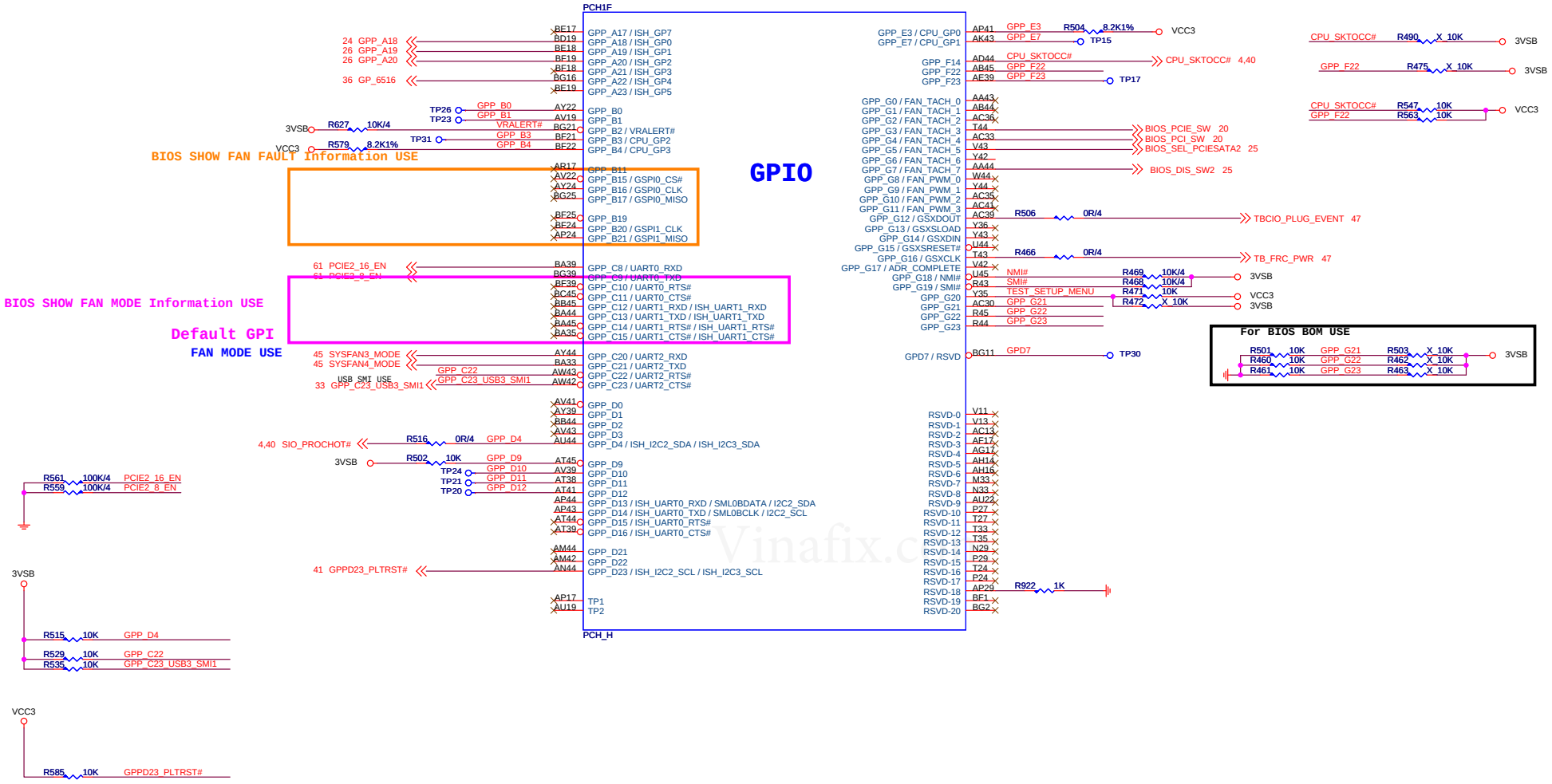

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MSI	MICRO-STAR INT'L CO.,LTD	
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Size: Custom	Document Description: PCH-GPIO/RSVD	Rev: 1.0
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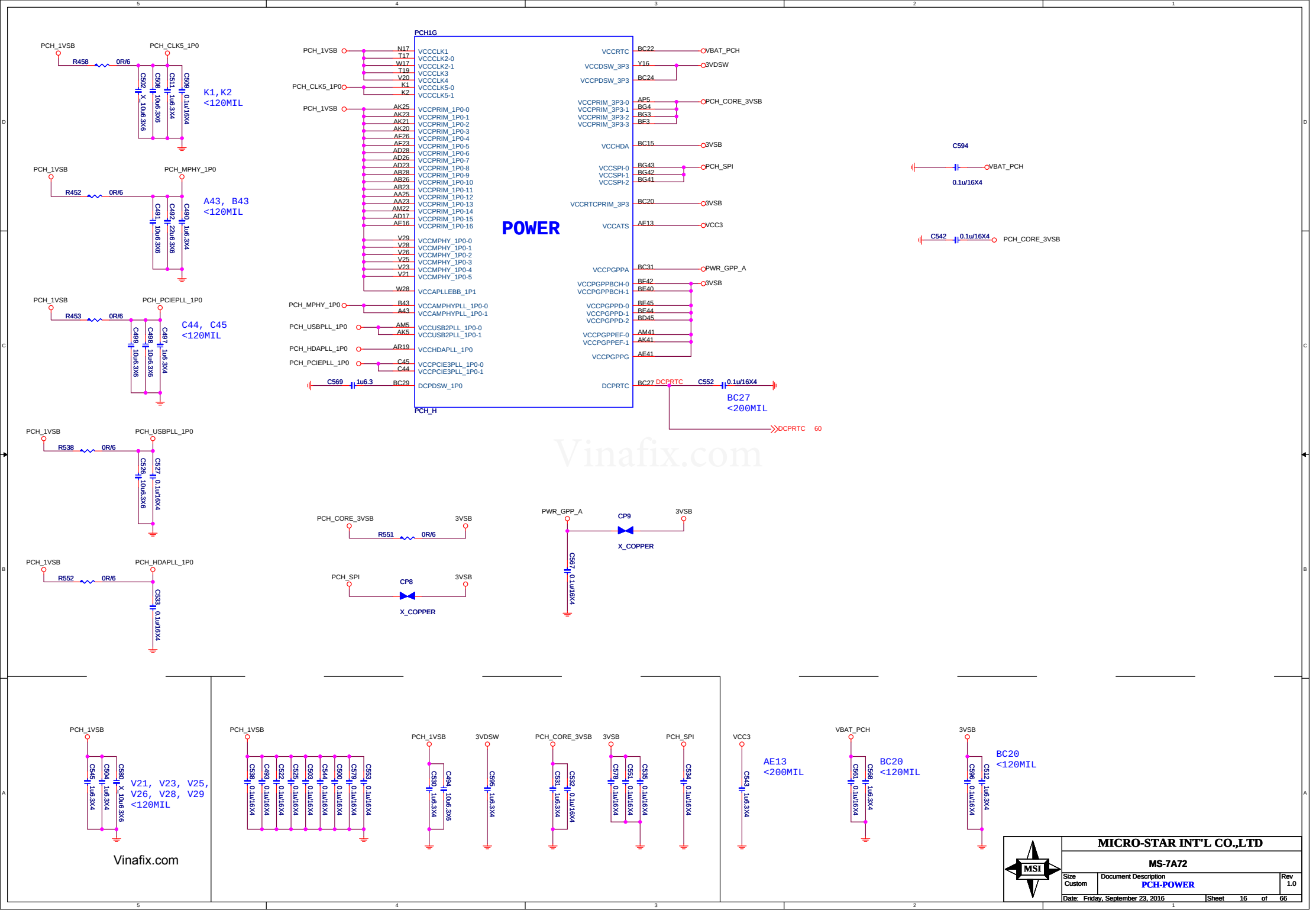
PCH1G
POWER
PCH_H
PCH_1VSB
PCH_CLK5_1P0
PCH_MPHY_1P0
PCH_PCIEPLL_1P0
PCH_USBPLL_1P0
PCH_HDAPLL_1P0
PCH_CORE_3VSB
PCH_SPI
PWR_GPP_A
3VSB
3VDSW
VBAT_PCH
VCC3
DCPRTC
K1,K2 <120MIL
A43, B43 <120MIL
C44, C45 <120MIL
BC27 <200MIL
AE13 <200MIL
BC20 <120MIL
BC20 <120MIL
V21, V23, V25, V26, V28, V29 <120MIL
X_COPPER
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MICRO-STAR INT'L CO.,LTD
MS-7A72
PCH-POWER
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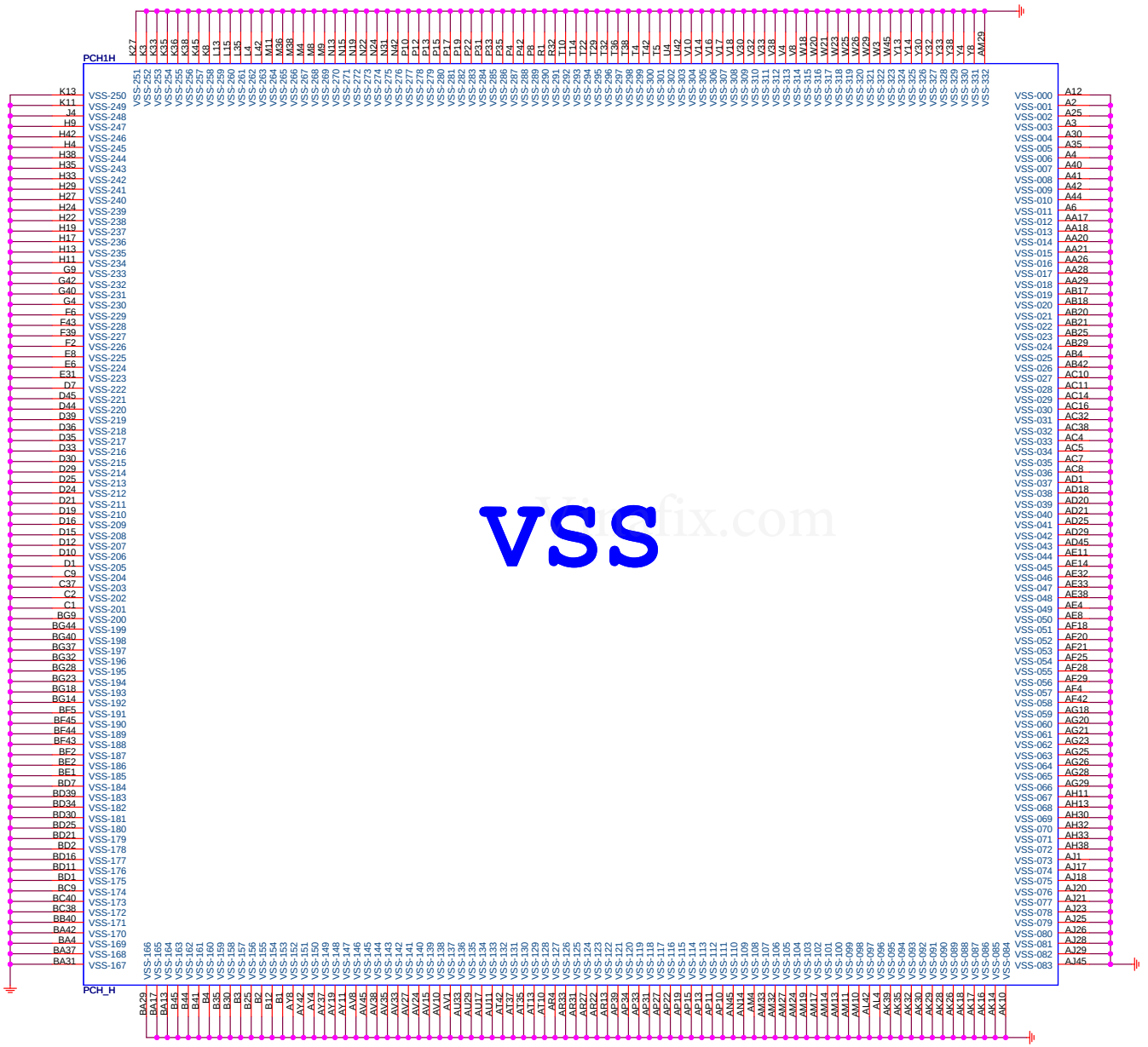

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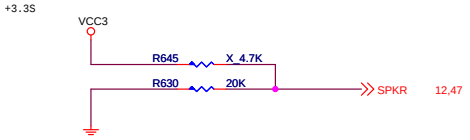
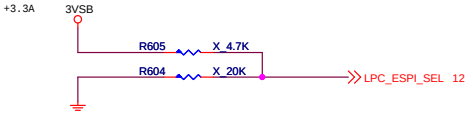
TOP Swap



Internal pull-down is disabled after PLTRST#

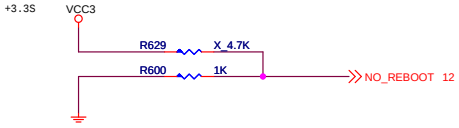
LPC eSPI Mode



0 : LPC
1 : eSPI

Internal pull-down is disabled after RSMRST

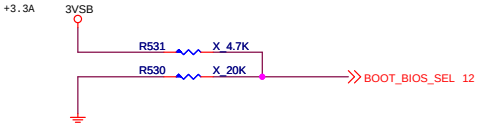
No Reboot



0 : DISABLE (Default)
1 : ENABLE

Internal pull-down is disabled after PLTRST#

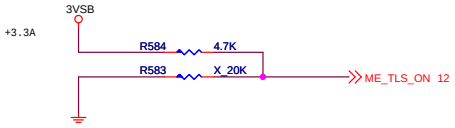
Boot BIOS



0 : SPI
1 : LPC

Internal pull-down is disabled after PLTRST

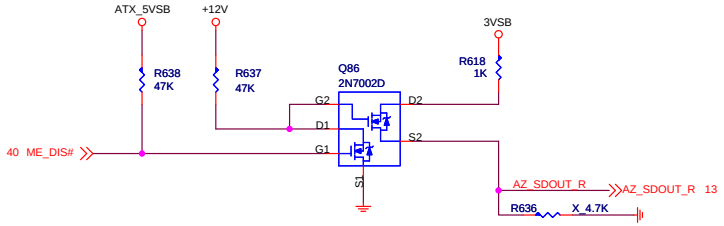
AMT and SBA with confidentiality



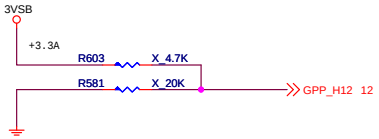
0 : DISABLE
1 : ENABLE (Default)

Internal pull-down is disabled after RSMRST

HDA_SDO



ESPI FLASH SHARING MODE



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

Internal pull-down is disabled after RSMRST

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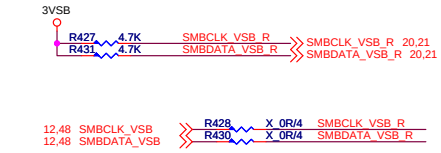
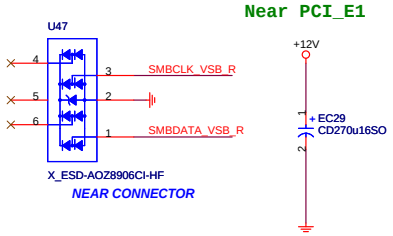
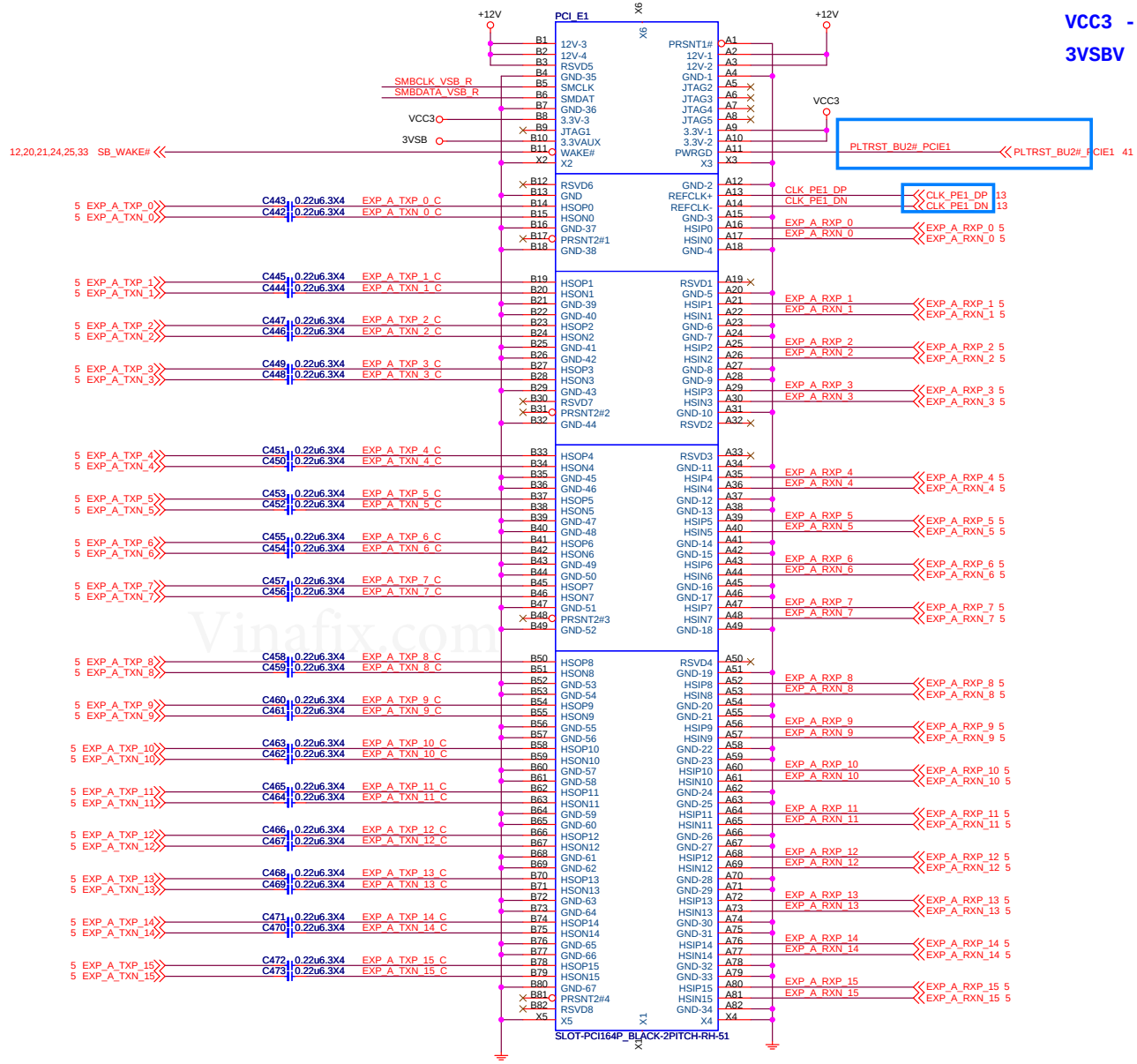
12V - 5.5A

VCC3 - 3A

3VSBV - 375mA







MICRO-STAR INT'L CO.,LTD	
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Size: Custom	Document Description: PCIE SLOT (X16)
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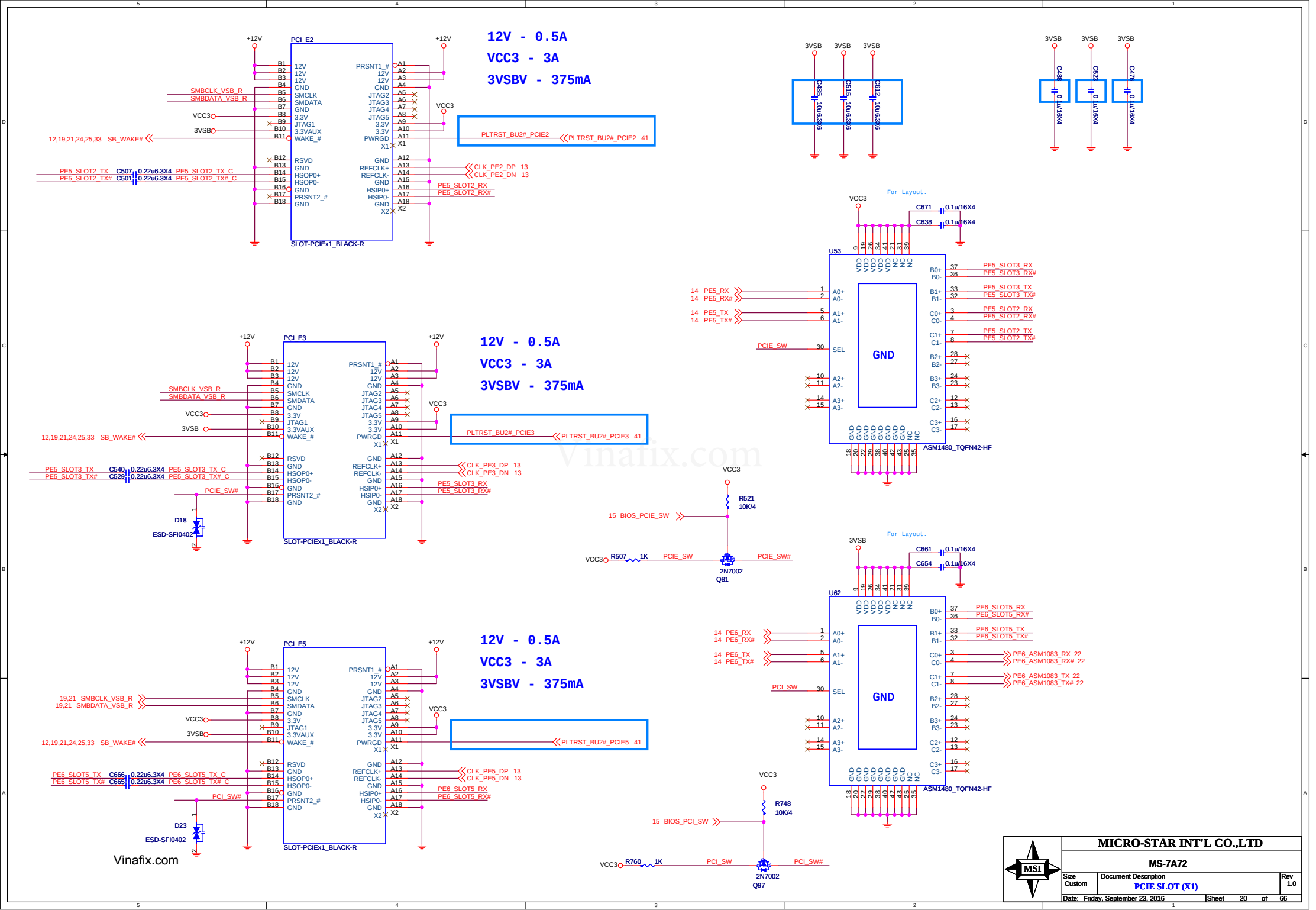
12V - 0.5A
VCC3 - 3A
3VSBV - 375mA
PCI_E2
SLOT-PCIEx1_BLACK-R
PLTRST_BU2#_PCIE2
PLTRST_BU2#_PCIE2 41
CLK_PE2_DP 13
CLK_PE2_DN 13
PE5_SLOT2_RX
PE5_SLOT2_RX#
PE5_SLOT2_TX
PE5_SLOT2_TX#
C507 0.22u6.3X4
C501 0.22u6.3X4
SMBCLK_VSB_R
SMBDATA_VSB_R
SB_WAKE#
C485 10u6.3X6
C515 10u6.3X6
C612 10u6.3X6
C488 0.1u/16X4
C523 0.1u/16X4
C476 0.1u/16X4
For Layout.
C671 0.1u/16X4
C638 0.1u/16X4
U53
ASM1480_TQFN42-HF
GND
PCIE_SW
PE5_RX
PE5_RX#
PE5_TX
PE5_TX#
PE5_SLOT3_RX
PE5_SLOT3_RX#
PE5_SLOT3_TX
PE5_SLOT3_TX#
PE5_SLOT2_RX
PE5_SLOT2_RX#
PE5_SLOT2_TX
PE5_SLOT2_TX#
PCI_E3
SLOT-PCIEx1_BLACK-R
PLTRST_BU2#_PCIE3
PLTRST_BU2#_PCIE3 41
CLK_PE3_DP 13
CLK_PE3_DN 13
PE5_SLOT3_RX
PE5_SLOT3_RX#
PE5_SLOT3_TX
PE5_SLOT3_TX#
C540 0.22u6.3X4
C529 0.22u6.3X4
PCIE_SW#
D18
ESD-SFI0402
R521 10K/4
15 BIOS_PCIE_SW
R507 1K
PCIE_SW
PCIE_SW#
2N7002
Q81
C661 0.1u/16X4
C654 0.1u/16X4
U62
ASM1480_TQFN42-HF
GND
PCI_SW
PE6_RX
PE6_RX#
PE6_TX
PE6_TX#
PE6_ASM1083_RX 22
PE6_ASM1083_RX# 22
PE6_ASM1083_TX 22
PE6_ASM1083_TX# 22
PCI_E5
SLOT-PCIEx1_BLACK-R
PLTRST_BU2#_PCIE5
PLTRST_BU2#_PCIE5 41
CLK_PE5_DP 13
CLK_PE5_DN 13
PE6_SLOT5_RX
PE6_SLOT5_RX#
PE6_SLOT5_TX
PE6_SLOT5_TX#
C666 0.22u6.3X4
C665 0.22u6.3X4
PCI_SW#
D23
ESD-SFI0402
19,21 SMBCLK_VSB_R
19,21 SMBDATA_VSB_R
R748 10K/4
15 BIOS_PCI_SW
R760 1K
PCI_SW
PCI_SW#
2N7002
Q97
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MS-7A72
Size Custom
Document Description
PCIE SLOT (X1)
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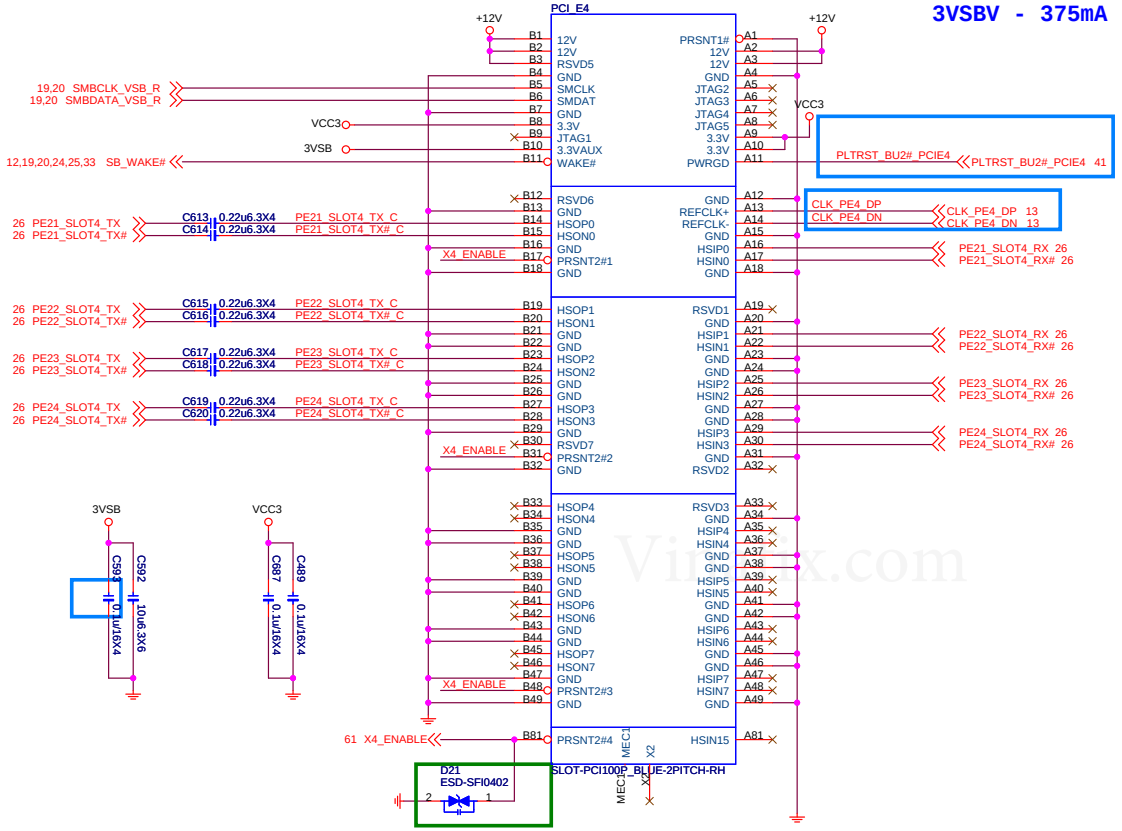
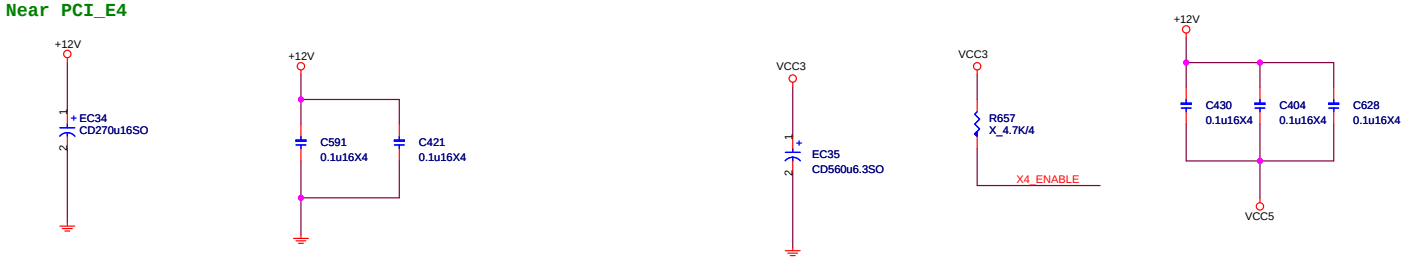
PCI_Express X4 Slot

12V - 2.1A
VCC3 - 3A
3VSBV - 375mA



Near PCI_E4



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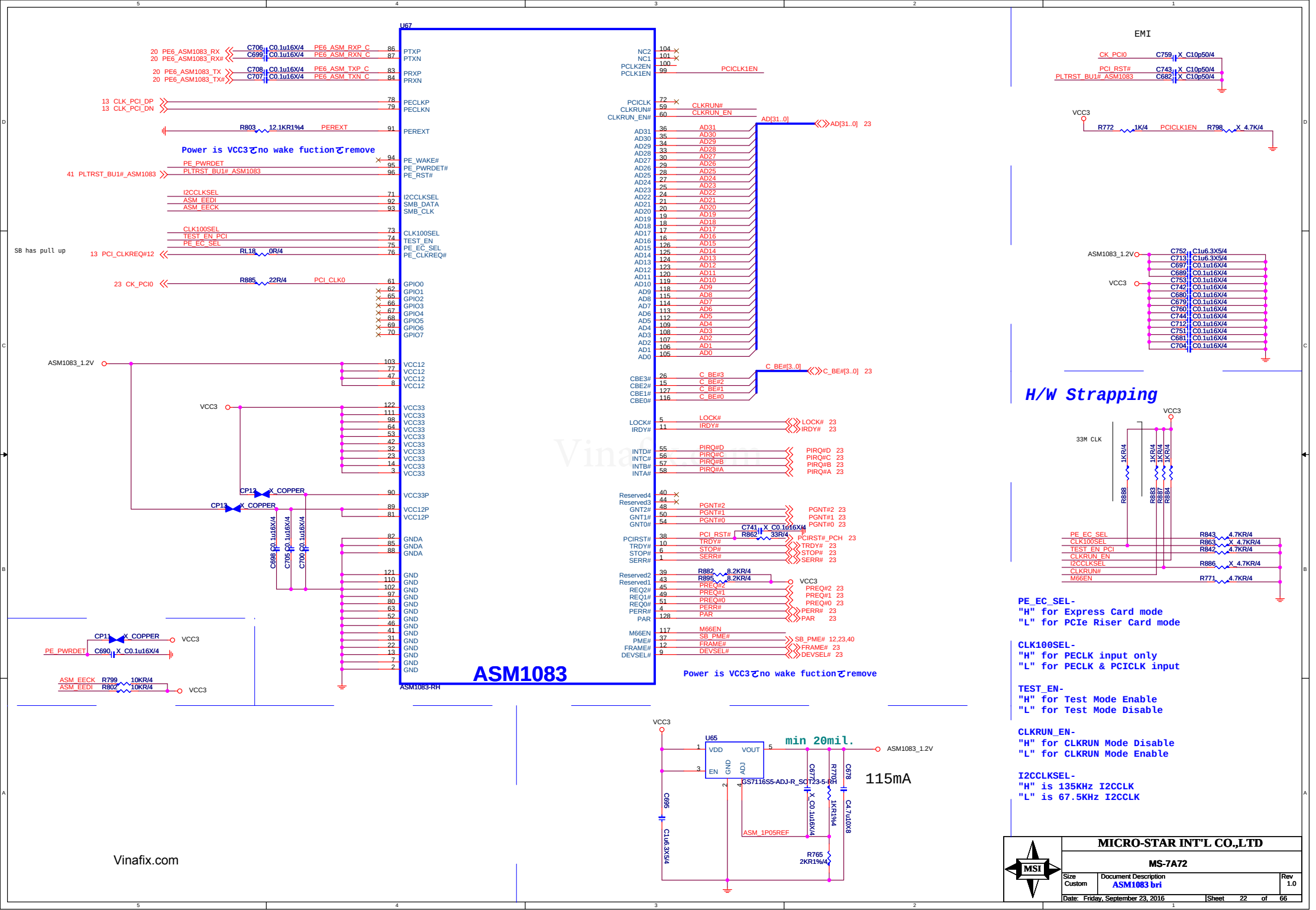
U67
ASM1083
ASM1083-RH
Power is VCC3 no wake fuction remove
Power is VCC3 no wake fuction remove
SB has pull up
EMI
H/W Strapping
PE_EC_SEL-
"H" for Express Card mode
"L" for PCIe Riser Card mode
CLK100SEL-
"H" for PECLK input only
"L" for PECLK & PCICLK input
TEST_EN-
"H" for Test Mode Enable
"L" for Test Mode Disable
CLKRUN_EN-
"H" for CLKRUN Mode Disable
"L" for CLKRUN Mode Enable
I2CCLKSEL-
"H" is 135KHz I2CCLK
"L" is 67.5KHz I2CCLK
U65
GS7116S5-ADJ-R_SOT23-5-RH
min 20mil.
115mA
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MS-7A72
ASM1083 bri
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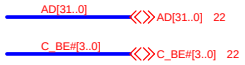
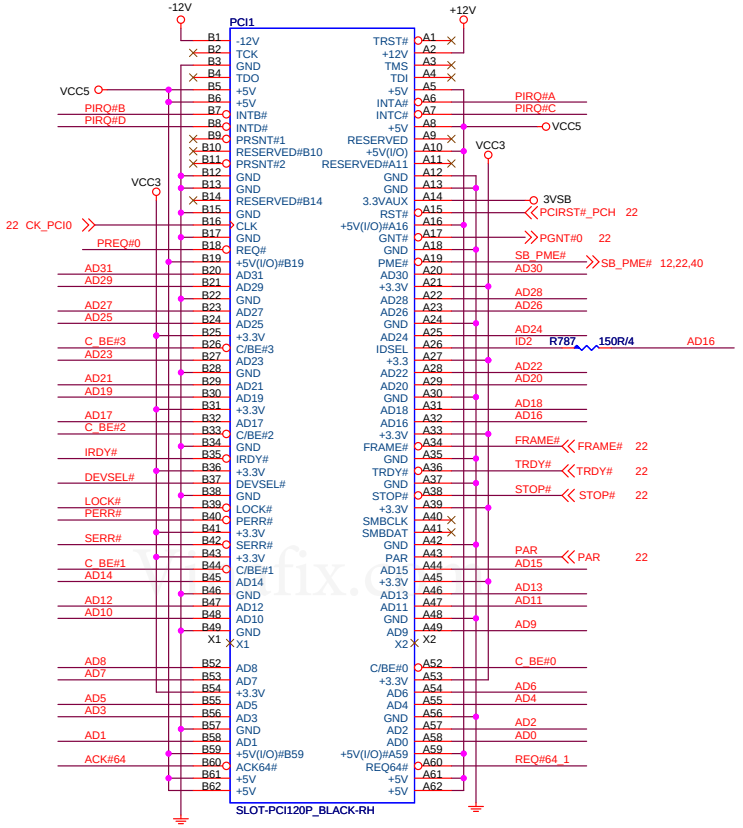
PCI

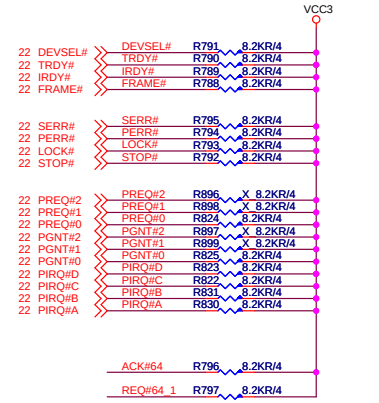
3.3Vaux:0.375*2=0.75A(wake)
0.02*2=0.04A(no wake)
VCC3 :7.6*2=15.2A
VCC5:5*2=10A
+12V:0.5*2=1A
-12V:0.1*2=0.2A



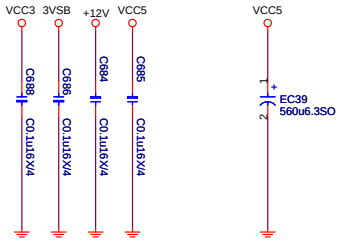


IDSEL = AD16
MASTER = PREQ#0
PIRQ#A

PCI PULL-UP / DOWN RESISTORS



EMI:close pin



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Size: Custom	Document Description: PCI SLOTx2	Rev: 1.0
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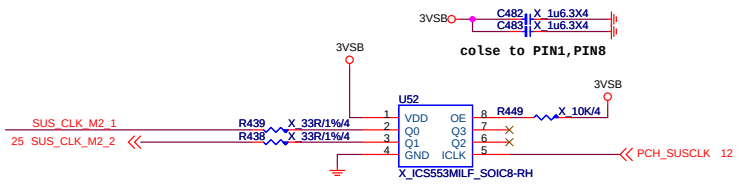
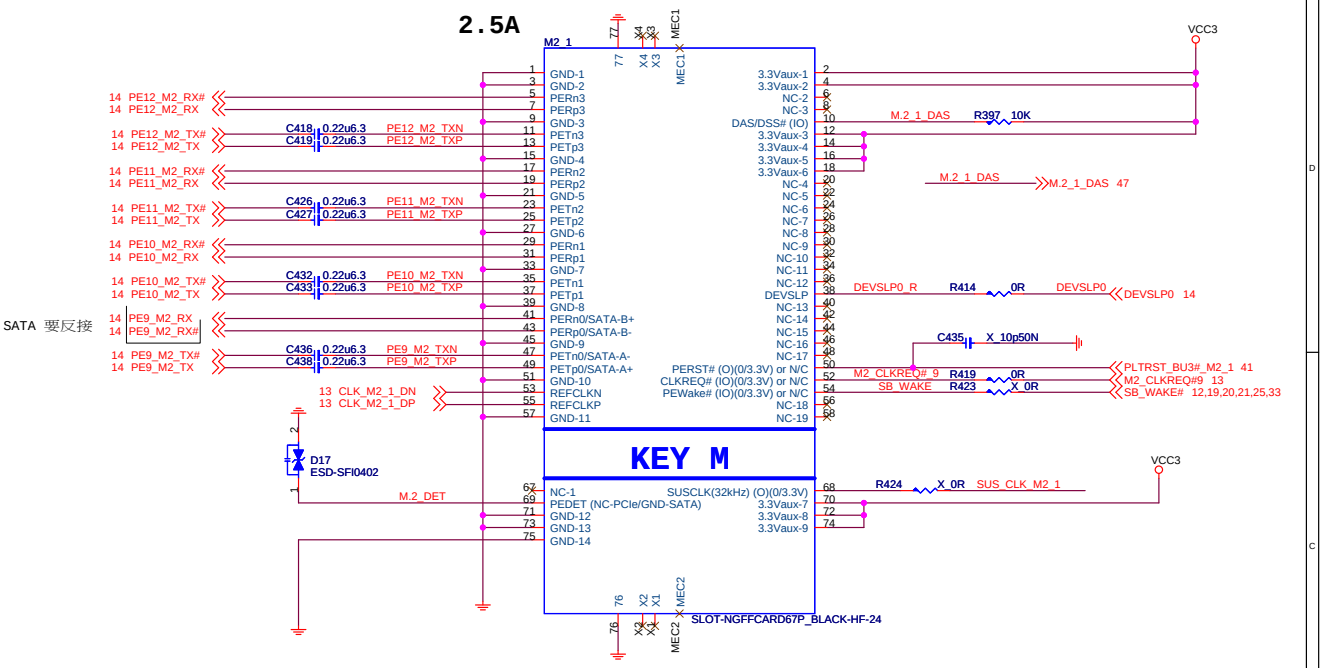
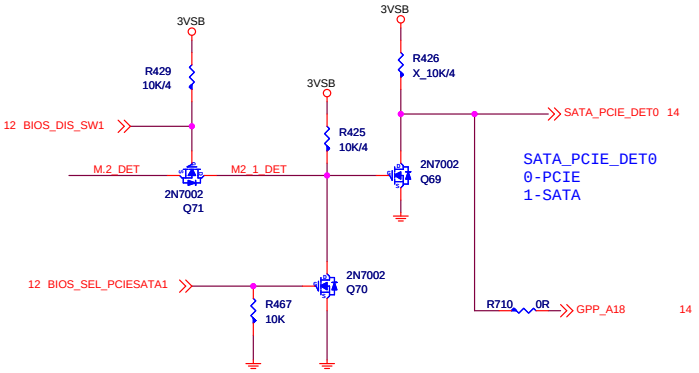
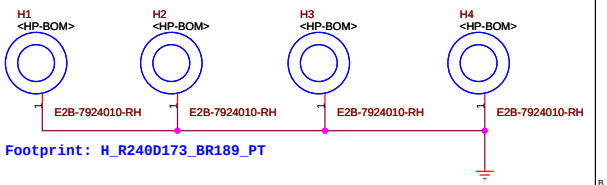


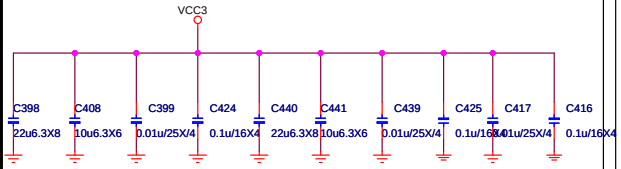




BIOS_MODE

BIOS_DIS_SW	*BIOS_SEL_PCIESATA1*	*Mode*
0	*1*	*M2-SATA*
0	*0*	*M2-PCIE*
GPI	*GPI*	*AUTO*





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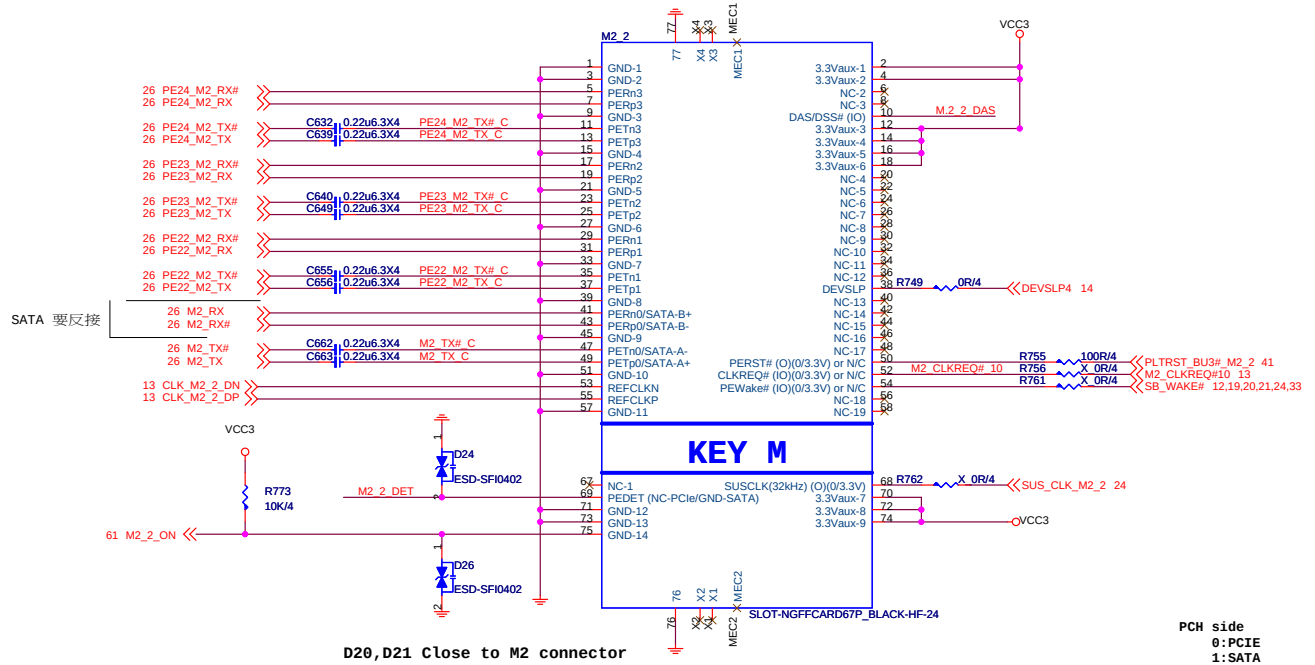

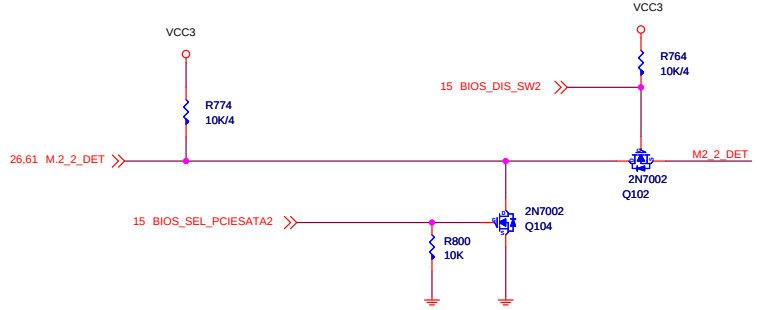

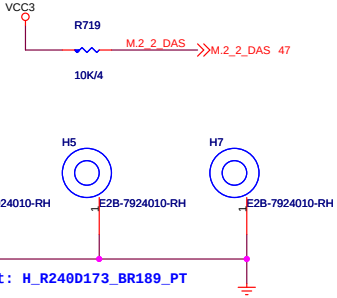

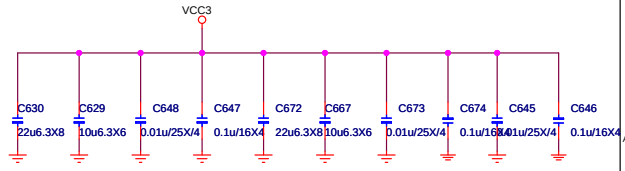

BIOS_MODE

BIOS_DIS_SW2	*BIOS_SEL_PCIESATA2*	*Mode*
1	*0*	*M2-PCIE*
0	*1*	*X4 SLOL-PCIE*
GPI	*GPI*	*GPI*

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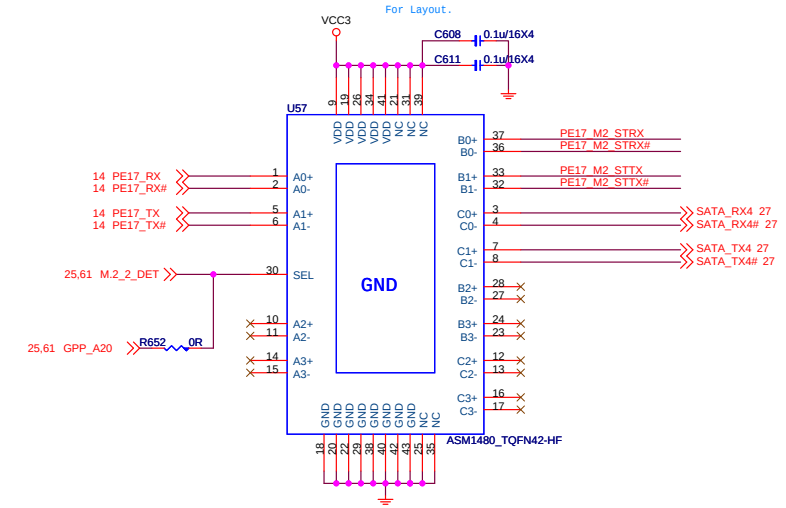

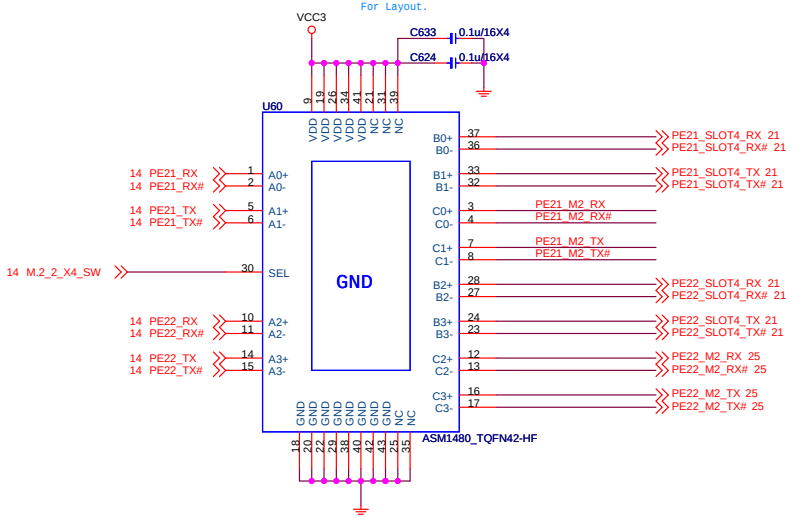

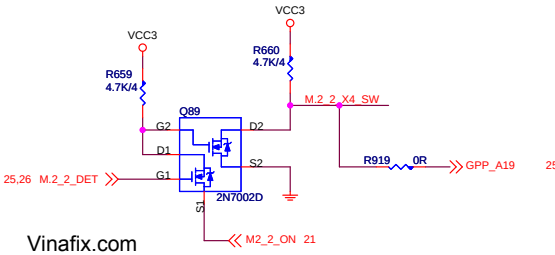

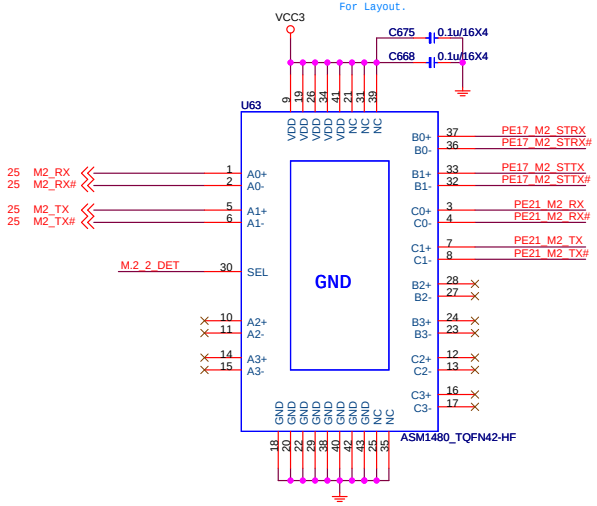

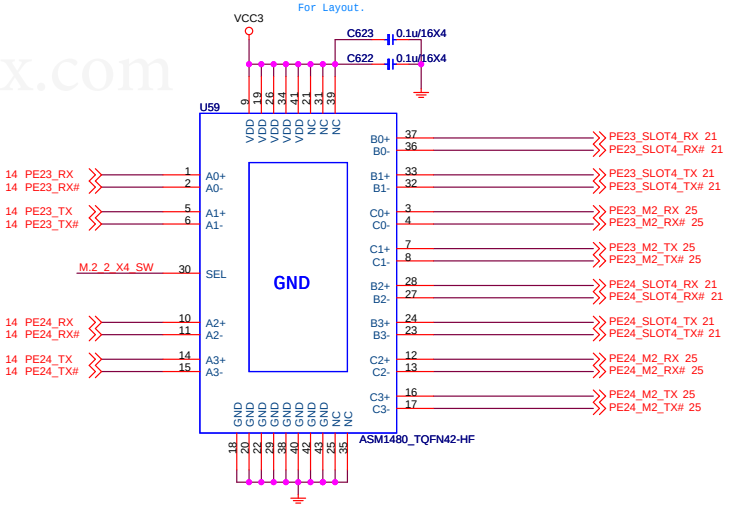

	M2_2_ON	M.2_2_X4_SW	M.2 SATA	M.2 PCIE	X4 SLOT	SATA5
Default	V	V	X	X	V	V
M.2_2 PCIE	X	X	X	V	X	V
M.2_2 SATA	X	V	V	X	V	X

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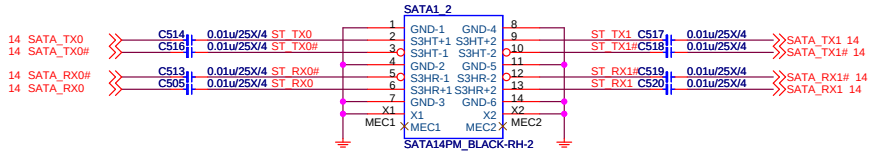

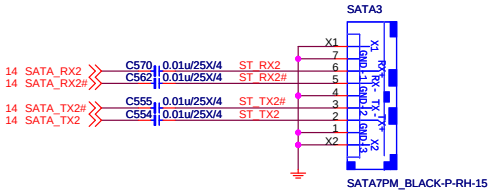

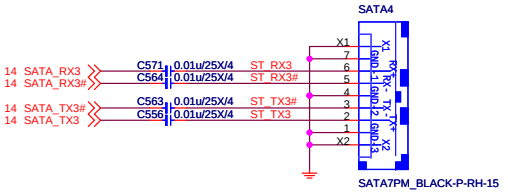

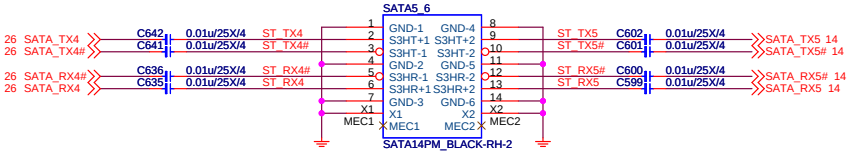

MICRO-STAR INT'L CO.,LTD

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Custom	SATA Express/SATA Connector	1.0

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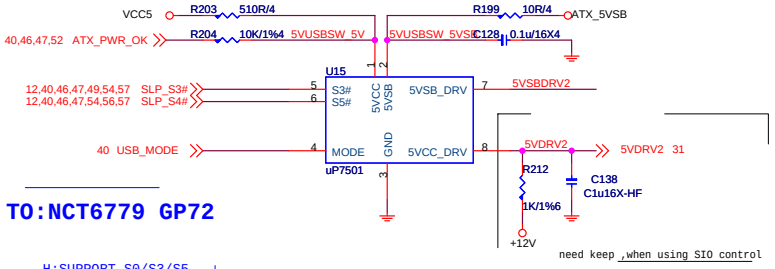
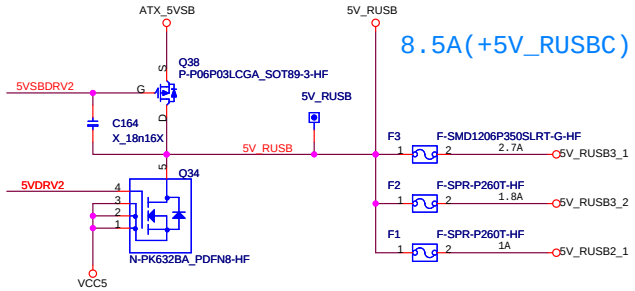
REAR USB PORT POWER



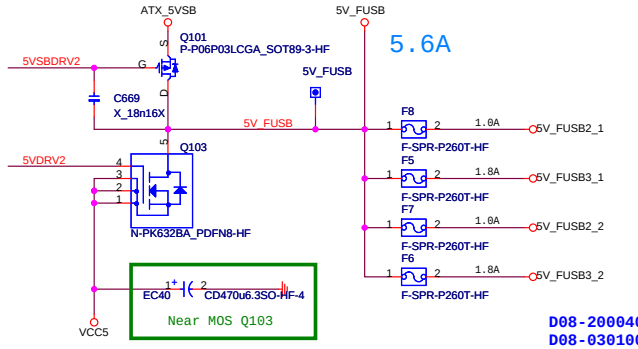
TO:NCT6779 GP72

H:SUPPORT S0/S3/S5
L:SUPPORT S0/S3

5VDRV2, 5VSBDRV2 width 12mil,
Do NOT route near the edge of a board.



need confirm C780 value



P-MOS
D03-06P0319-N03

N-MOS
D03-510BA0C-N03
D03-3056M00-U47
D03-4C05N03-O05
D03-3830D09-N47
D03-632BA0C-N03

D08-2000400-P16 (Itrip=3.5A; 0.003ohm)
D08-0301000-P16 (Itrip=2.6A; 0.015ohm)

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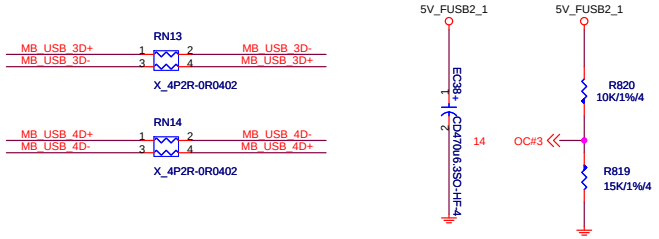
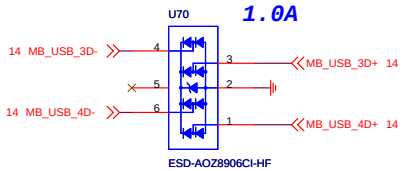
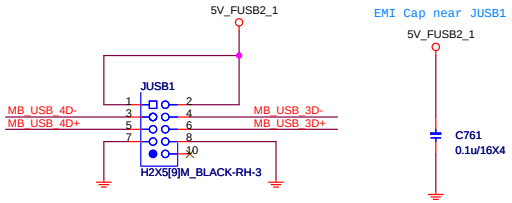
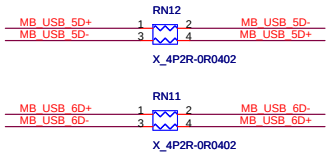
FRONT USB2.0 PORT 3,4

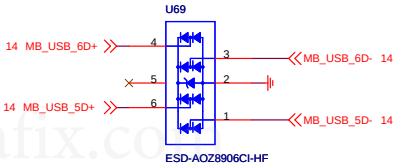


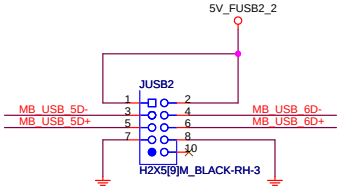


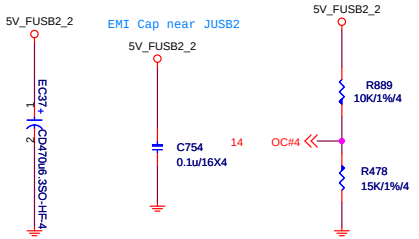


FRONT USB2.0 PORT 5,6









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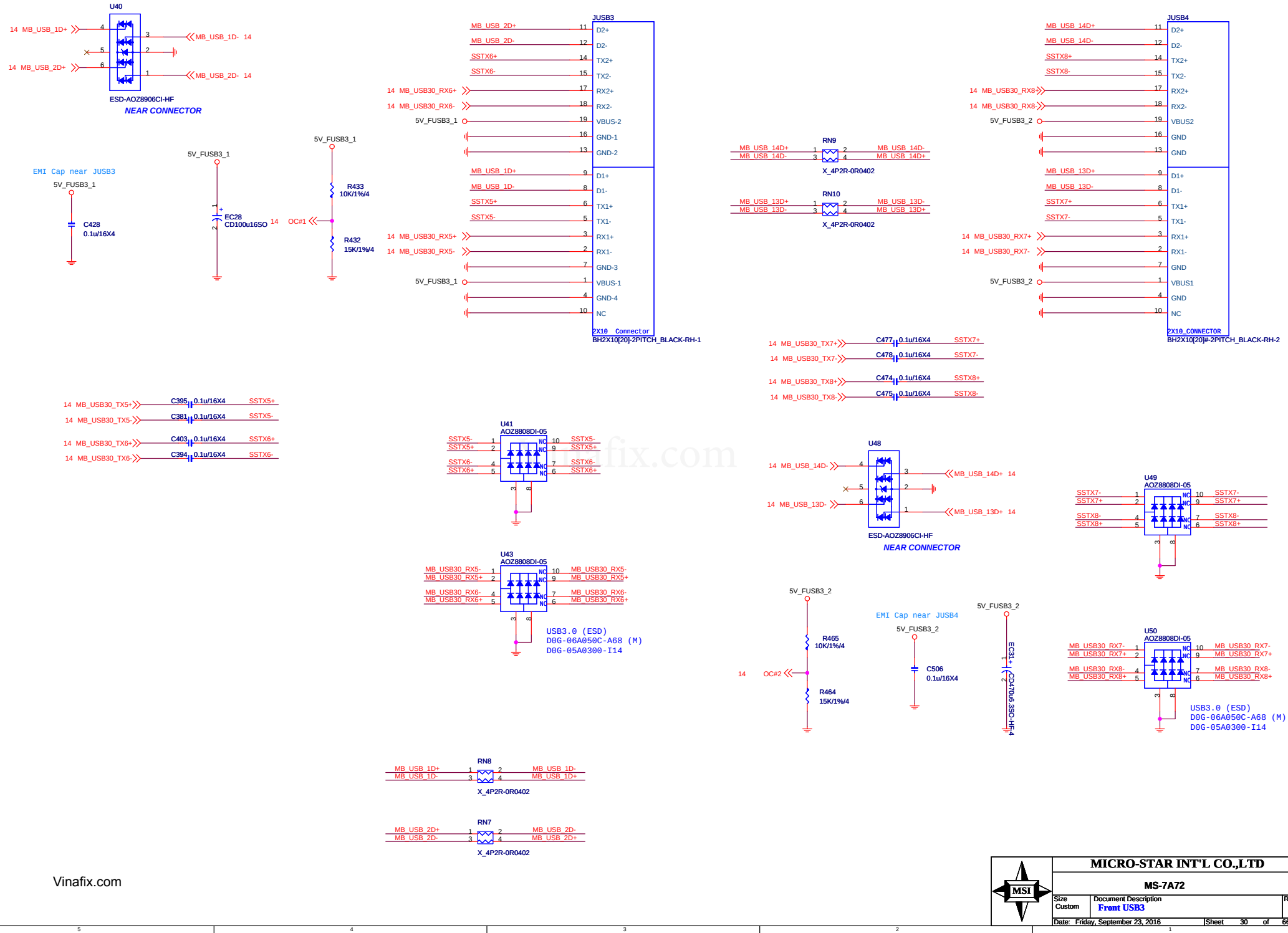

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Size: Custom	Document Description: Front USB3	Rev: 1.0
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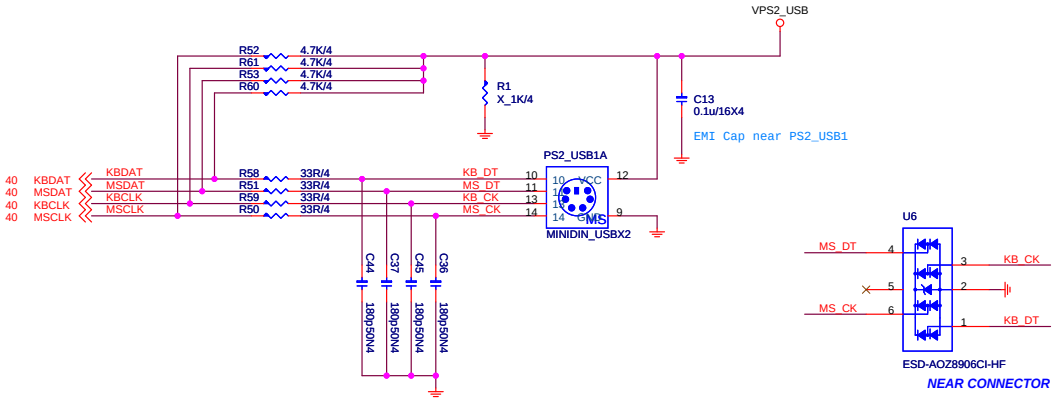
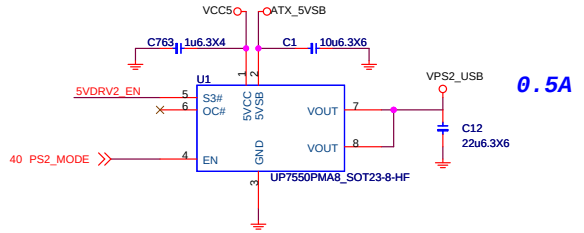
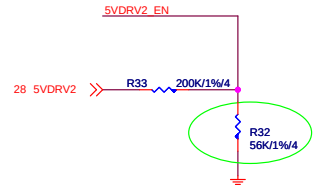
PS2 KEYBOARD & MOUSE CONNECTOR

PS2 Connector



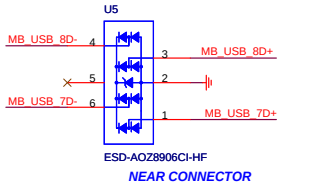
PS2 Power

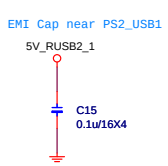


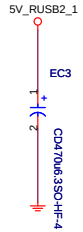


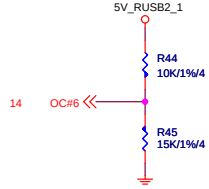
USB MODE

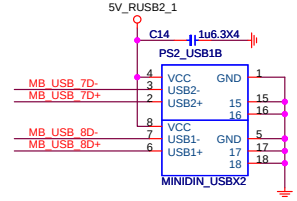
PS2_USB

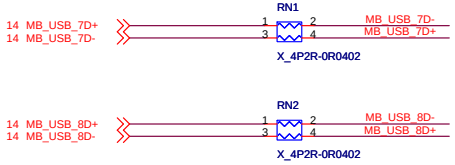












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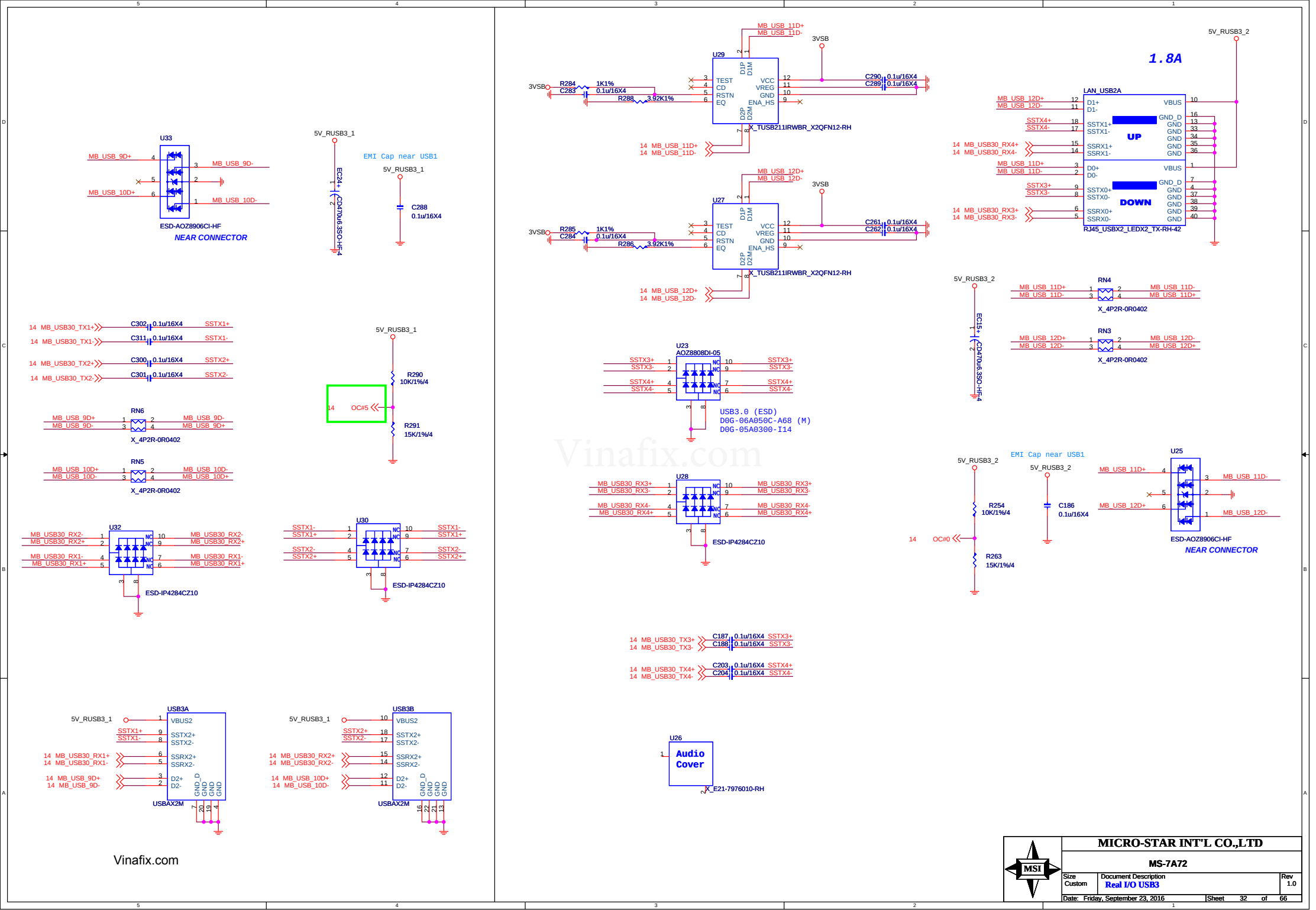
U33
MB_USB_9D+
MB_USB_10D+
MB_USB_9D-
MB_USB_10D-
ESD-AOZ8906CI-HF
NEAR CONNECTOR
5V_RUSB3_1
EC24
CD470x63SO-HF4
EMI Cap near USB1
C288
0.1u/16X4
MB_USB_11D+
MB_USB_11D-
3VSB
U29
R284
1K1%
C283
0.1u/16X4
R288
3.92K1%
C290
C289
X_TUSB211IRWBR_X2QFN12-RH
MB_USB_12D+
MB_USB_12D-
U27
R285
C284
R286
C261
C262
1.8A
LAN_USB2A
UP
DOWN
RJ45_USBX2_LEDX2_TX-RH-42
SSTX1+
SSTX1-
SSTX2+
SSTX2-
SSTX3+
SSTX3-
SSTX4+
SSTX4-
MB_USB30_RX1+
MB_USB30_RX1-
MB_USB30_RX2+
MB_USB30_RX2-
MB_USB30_RX3+
MB_USB30_RX3-
MB_USB30_RX4+
MB_USB30_RX4-
RN6
RN5
X_4P2R-0R0402
R290
10K/1%/4
R291
15K/1%/4
OC#5
U32
U30
ESD-IP4284CZ10
U23
AOZ8808DI-05
USB3.0 (ESD)
D0G-06A050C-A68 (M)
D0G-05A0300-I14
U28
RN4
RN3
EC15
R254
10K/1%/4
R263
15K/1%/4
OC#0
C186
0.1u/16X4
U25
C302
C311
C300
C301
C187
C188
C203
C204
USB3A
USB3B
USBAX2M
U26
Audio
Cover
X_E21-7976010-RH
Vinafix.com
MICRO-STAR INT'L CO.,LTD
MS-7A72
Size
Custom
Document Description
Real I/O USB3
Rev
1.0
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Minimun gap should be greater of
>15mil with other signal.

Chip to Connector ~1.5 inch.

Power Consumption

	3.3V	1.2V(1.05V	3.3VSUS	1.05VSUS(1.2VSUS)	2.5V	Total Power
ASM1142	245mA	634mA	1mA	1mA		1573.8(mW)
ASM2142	TDP	TDP	TDP	TDP	300mA(TDP)	TDP

Layout Guide:

1.) USB3.1 to Connector Total Length < 1.5"
2.) VIA hole <2

ASM1142/ASM1042 RU14 0 RU19 X
ASM2142 RU14 X RU19 0

CLK Rule (Follow SB PDG)

PCIE Rule (Follow SB PDG)

USB HS (90Ohm-Diff)

USB SS (80Ohm-Diff)

PPON_X Internal Pull-up to VCC3

OCI_X Internal Pull-up to SUS

RX/TX Internal Pull-up

SMI connect to GPI which
support smi function.
SB side pull high 10K ohm to 3VSB.
(Intel 8X & 9X series use GPIO10)
(Intel SKL use GPP_C23)

ASM_SMI has internal Pull-up to VCC
ASM_WAKE has internal Pull-up to VCCSUS

X0/XI (95hm-Diff,Spacing 10mil)
HCLKT,PEUREXT(W/S) : 10/7
OCIA,OCIB,PPONA,PPONB(W/S) : 5/8

ASM1142 RU7/RU9 200K/187K__1.24V
ASM1142 RU7/RU9 100K/100K__1.2V
ASM2142/ASM1042AE RU7/RU9 196K/261K__1.05V

ASM1142 1.2 VCC Power

ASM1142 1.2 VSB Power

ASM1142 RU11 18K___1.24V
ASM1142 RU11 19.6K__1.2V
ASM2142/ASM1042AE RU11 31.6K__1.05V

ASM1142/ASM1042AE unstuff
ASM2142 stuff

EEPROM

ASM1142/ASM1042AE UU4 M31-2551222-M24(512K bit)
ASM2142 UU4 M31-25L1022-M24(1M bit)

ASM2142 RU13 X RU12 0
ASM1142/ASM1042 RU13 0 RU12 X

ASM1042AE RU27 0 RU41 X
ASM2142/ASM1142 RU27 X RU41 0

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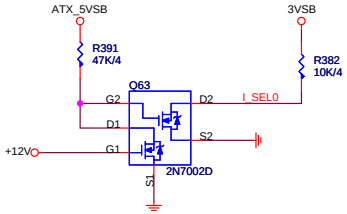
Current Mode

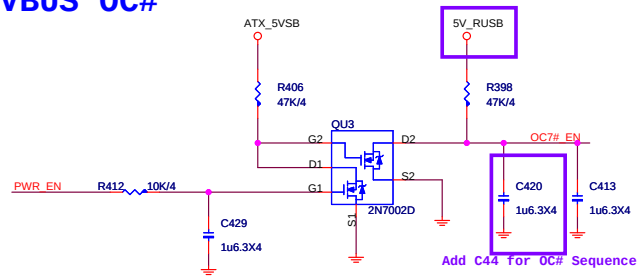


I_SEL0 : I_SEL1

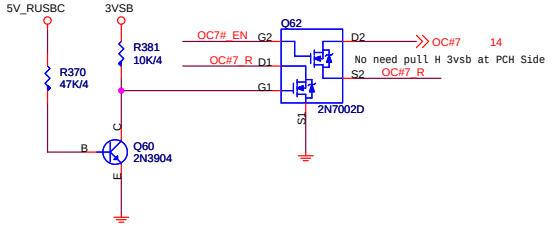
X	0	Default for 900mA
0	1	1.5A @5V
1	1	3A @5V

1.5A under S3 mode
3A under S0 mode

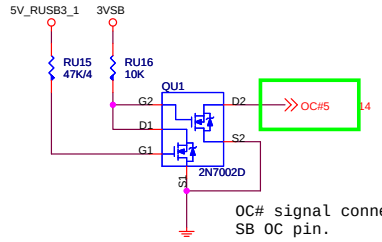
VBUS OC#



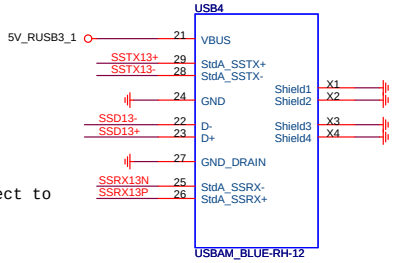
Add C44 for OC# Sequence

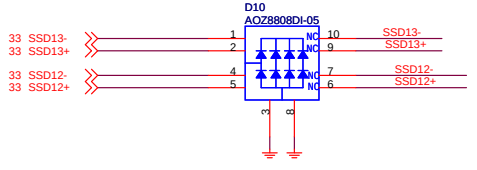


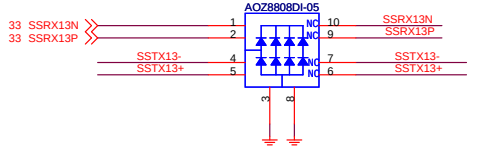
TYPE-A

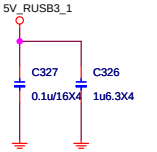


OC# signal connect to
SB OC pin.



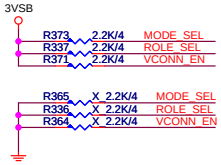






close to Connector USB4

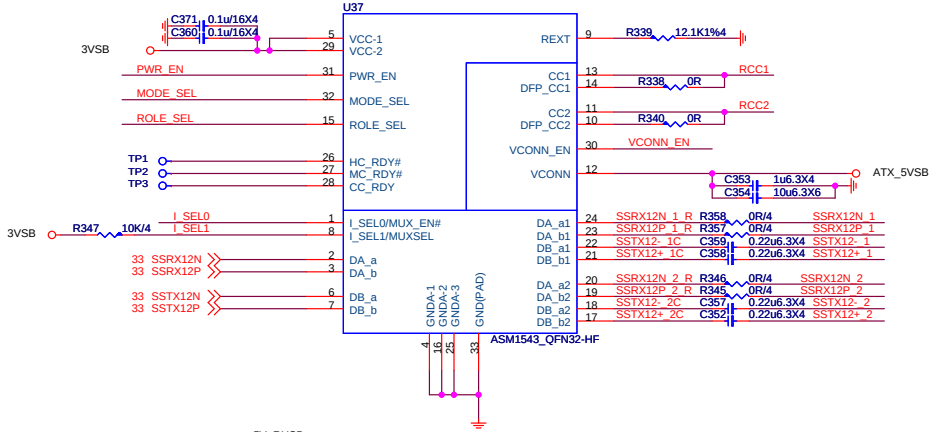
USB Type-C MUX with Configuration Channel (CC)

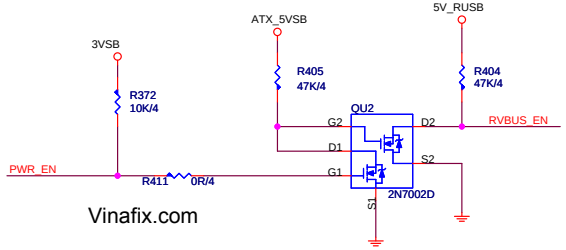


MODE_SEL	
1	CCL MODE (default)
0	Mux MODE

ROLE_SEL	
1	DFP role (default)
0	UFP role

VCONN_EN	
1	enable
0	disable





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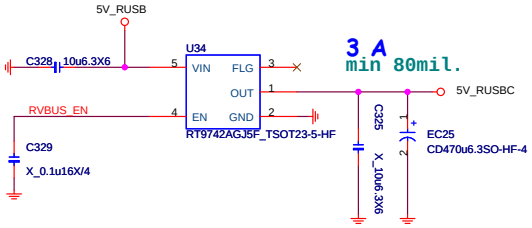
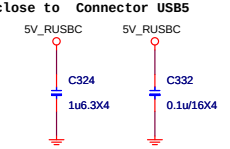
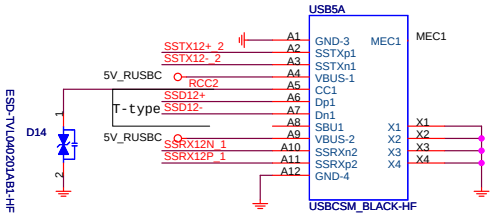


3 A
min 80mil.

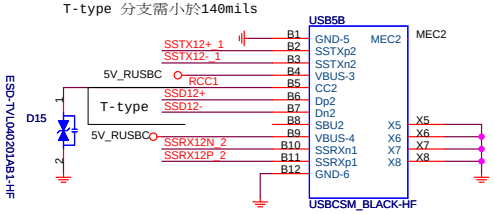
TYPE-C

close to Connector USB5



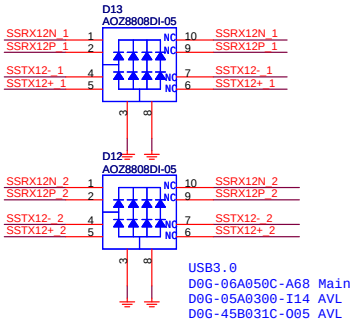


T-type 分支需小於140mils



ESD Protection

NEAR CONNECTOR



USB3.0
D0G-06A050C-A68 Main
D0G-05A0300-I14 AVL
D0G-45B031C-O05 AVL

MICRO-STAR INT'L CO.,LTD

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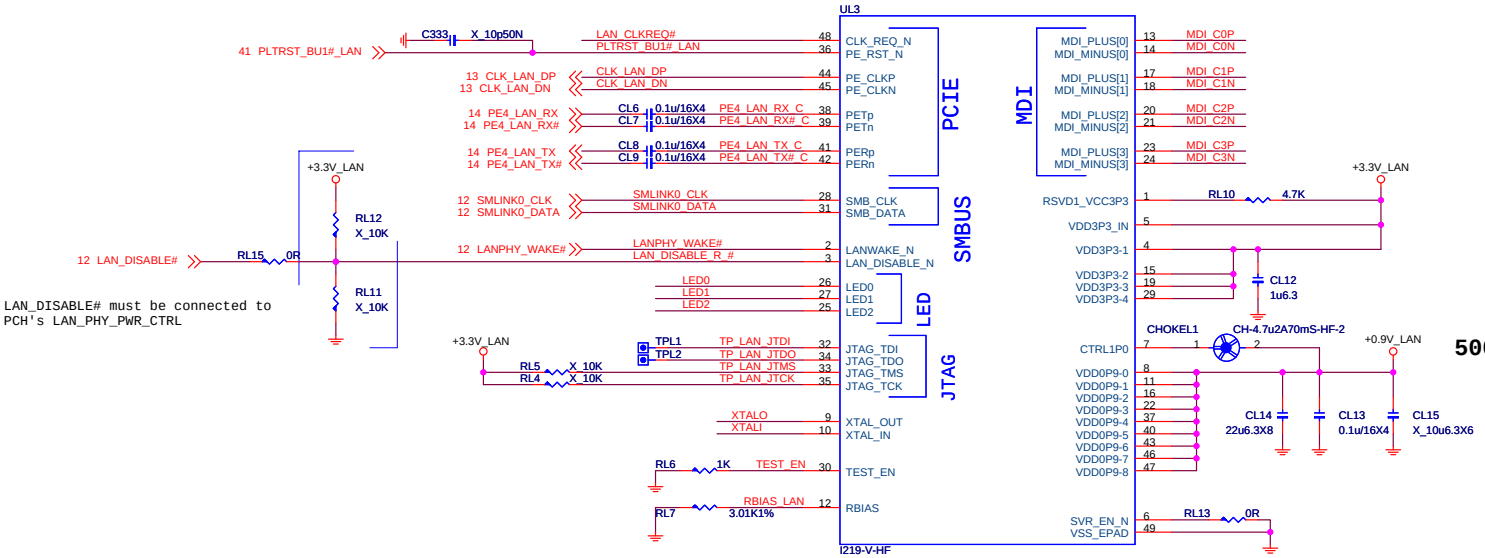
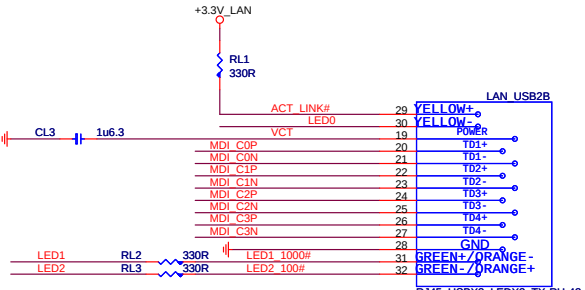
Intel Lan- I219

8111H:B06-08111CC-R09
8111G:B06-081116C-R09

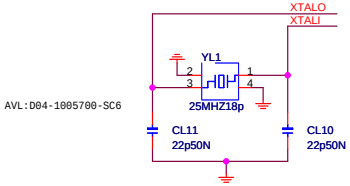


500mA

LAN Connector

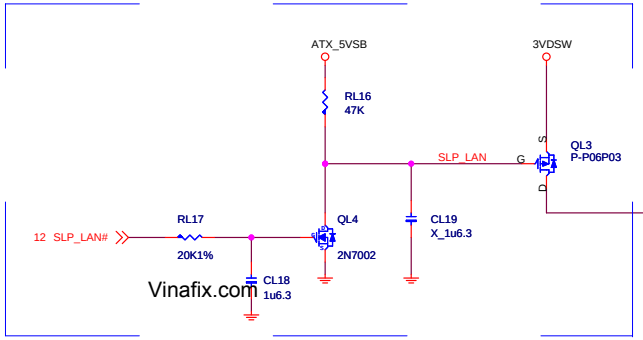


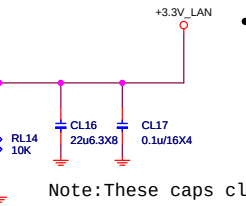
PCH's PCIECLKRQ<n> port mustbe mapped to PCH's PET/R<n+1>port.
If CLK_REQ_N is not used, pin48 is pulled up 10KR to 3.3V_LAN



The 10Kohm pull-up resistor (RL18) of CLK_REQ_N
is connected to 3.3V Suspend/Core/etc.
power well, depending on the power well
of PCH's input PCIECLKRQ<n> buffer.

support WOL from Deep Sx:
Power source from 3VA (DSW power) & make sure MAX current is enough to support i218/i219.

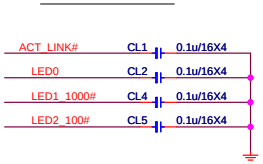




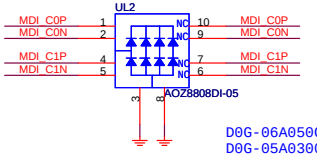
+3.3V_LAN
I218:132mA
I219:542mW

Note:These caps closed to PHY

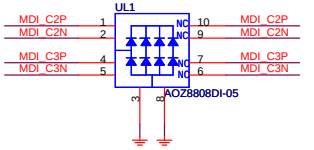
For EMI



UL2&UL3 close to connector



D0G-06A050C-A68
D0G-05A0300-I14



Do not pair MDI0 and MDI1 on the same TVSdevice (avoid LAN POE connecting issue). Otherpairing combination is ok.

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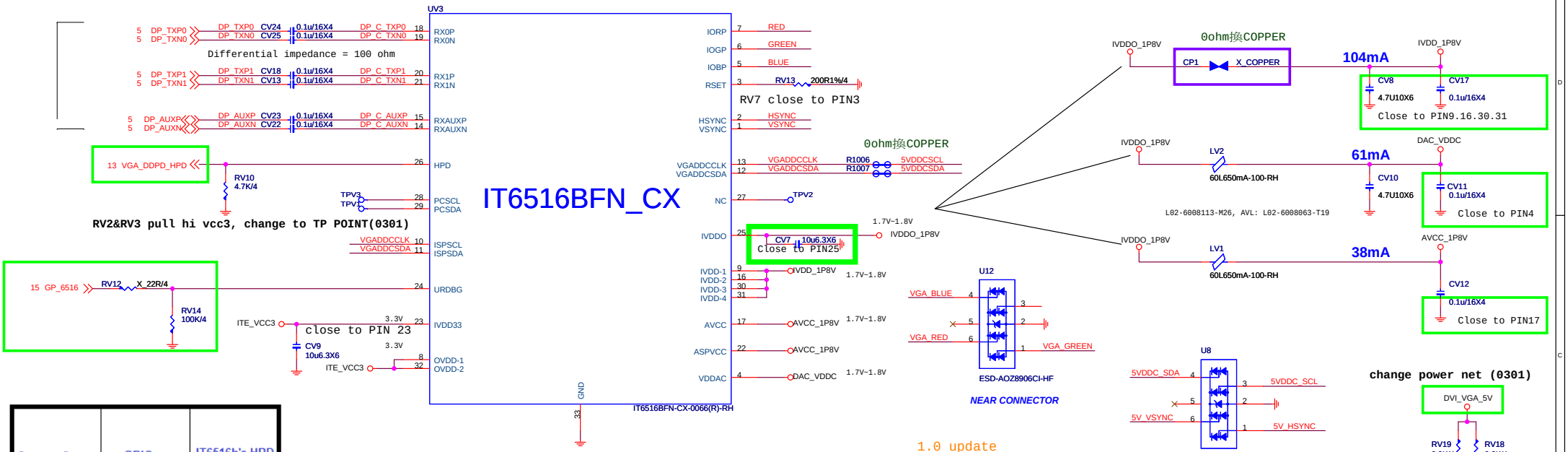
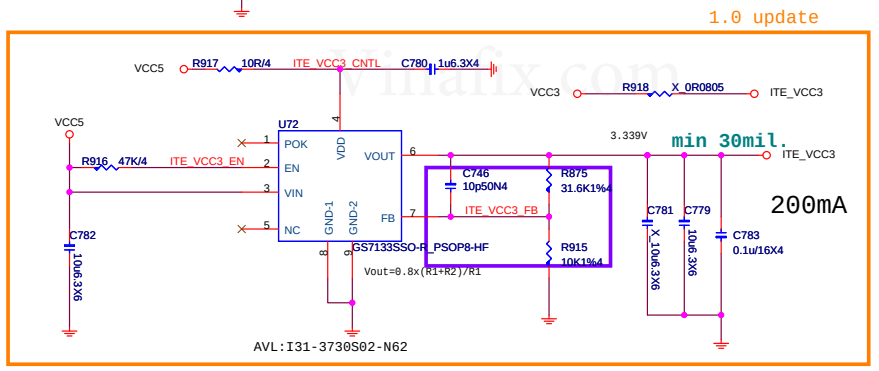
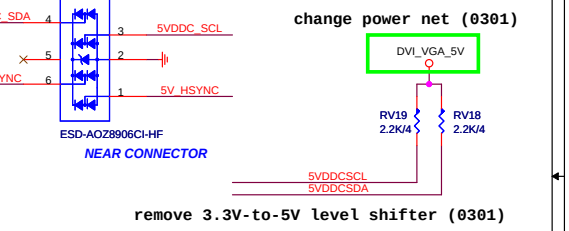
Note:
If connect to eDP port,must confirm whether it support hot plug detection HPD and re-auxtraining

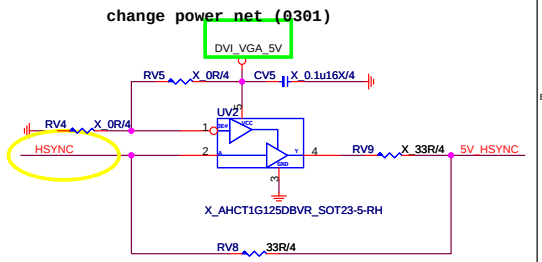
add D-sub function 0225

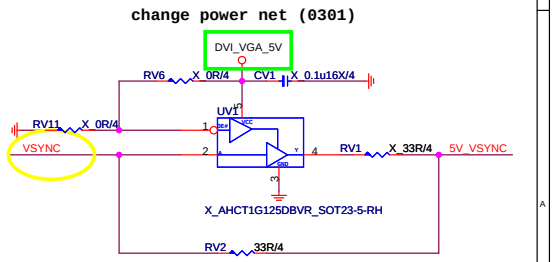


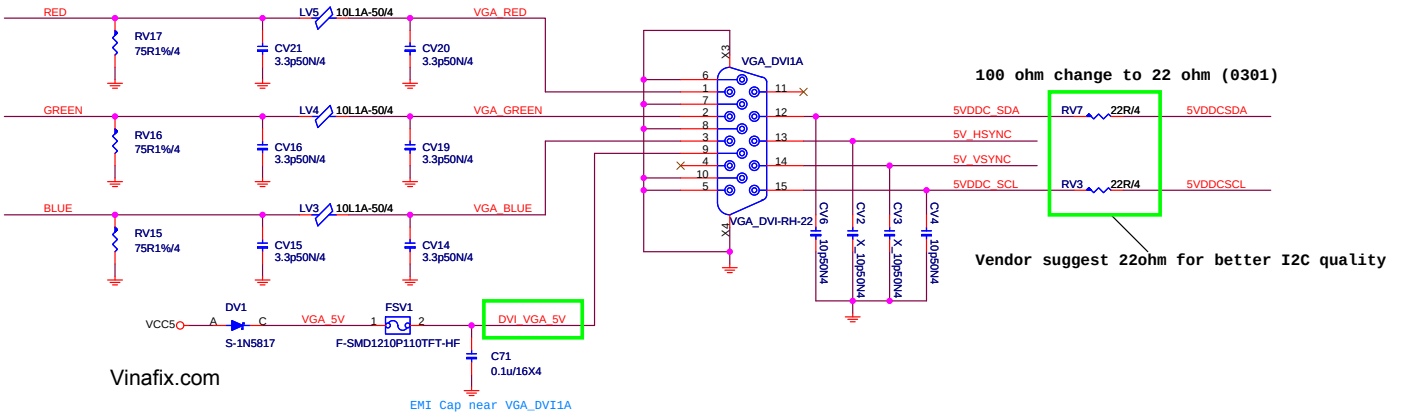
System Status	GPIO	IT6516b's HPD
Legacy Mode (VBIOS) /DOS MOde	HIGH	Force HIGH
Windows /UEFI Mode (GOP)	LOW	Depend on VGA device's plug/unplug











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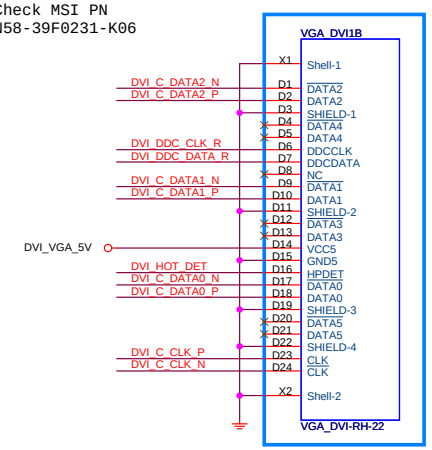
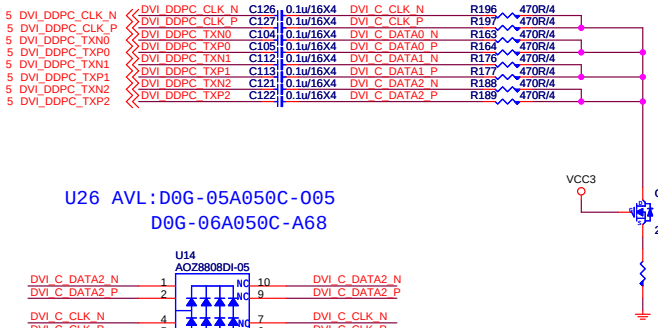
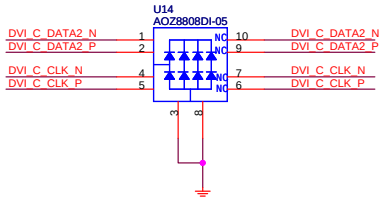
VGA: resolution of 2048x1536 pixels with 32-bit color at 75 Hz (4:3 QXGA)

Check MSI PN
N58-39F0231-K06





U26 AVL:D0G-05A050C-O05
D0G-06A050C-A68



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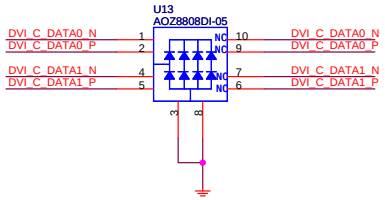
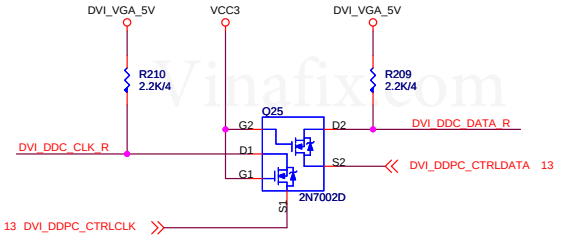
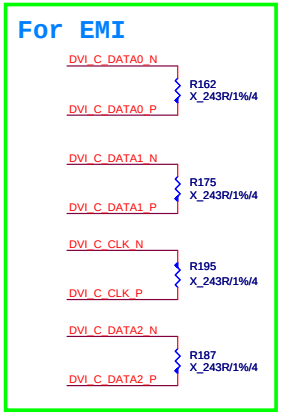
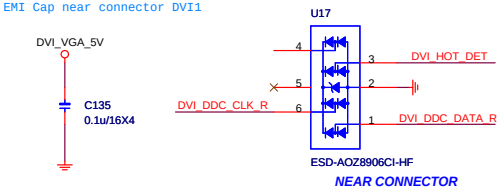
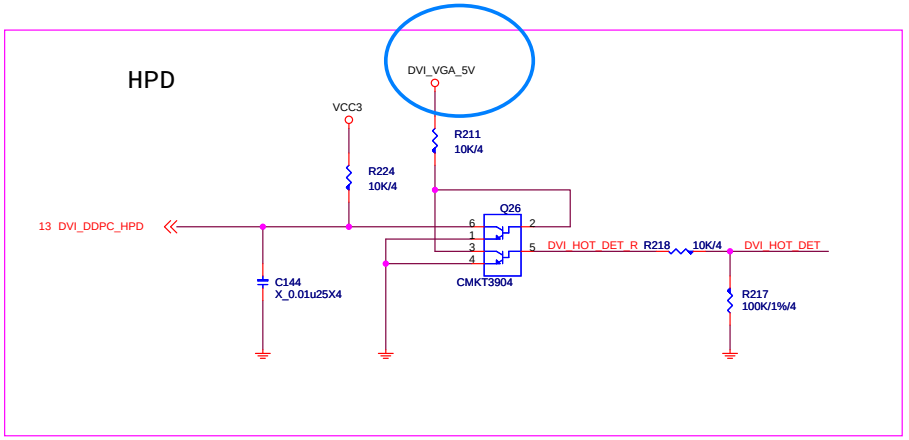


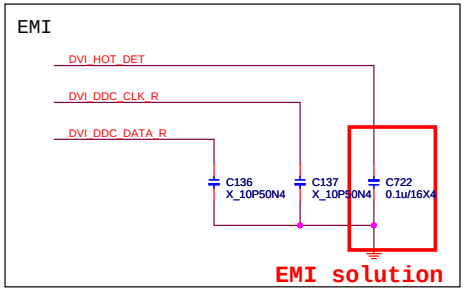




EMI Cap near connector DVI1







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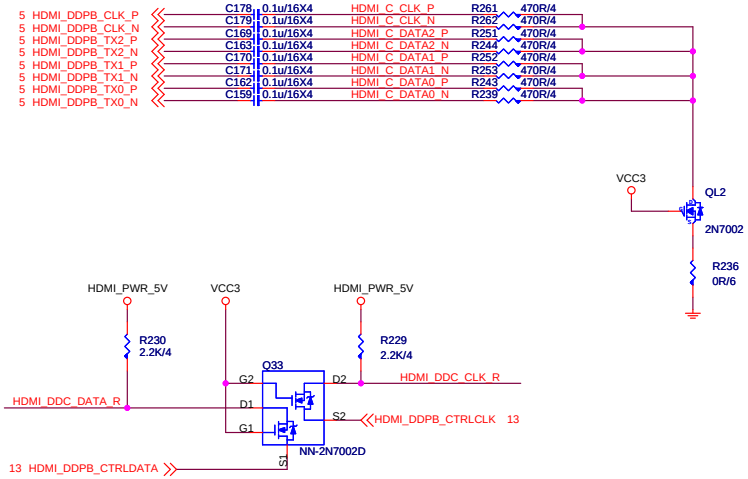
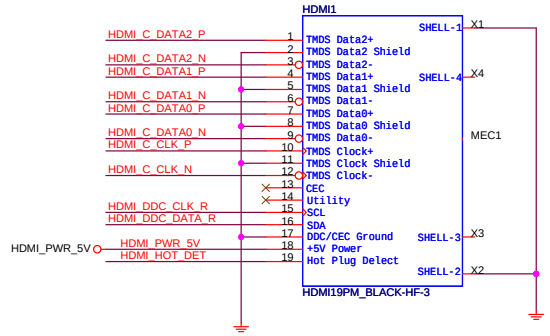
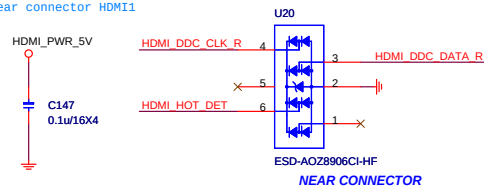
HDMI, DVI : 1920x1200 at 60 Hz (16:10 WUXGA)

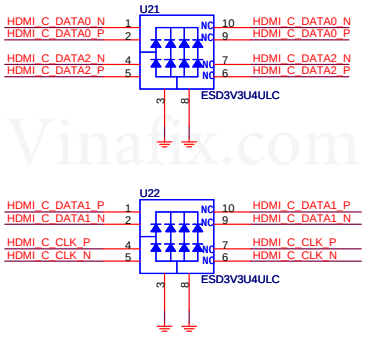


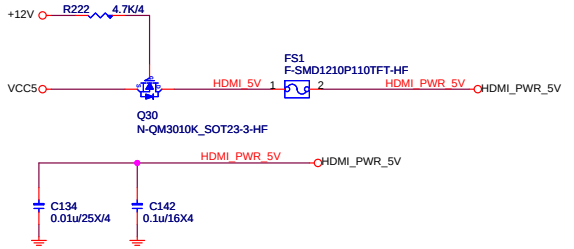


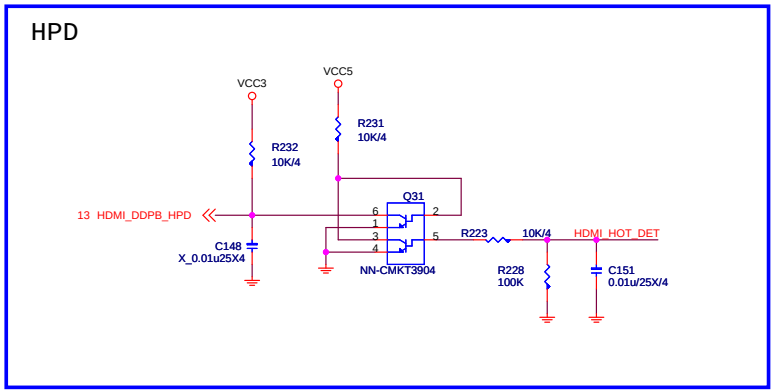
EMI Cap near connector HDMI1

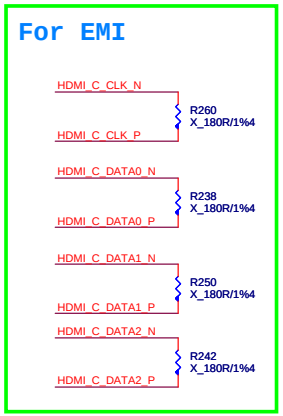


NEAR CONNECTOR









MICRO-STAR INT'L CO.,LTD

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Type B:
ALC892/887

CA4 closed PIN25
CA3 closed PIN38
CA38 closed PIN38

11mA Closed Codec

11mA Closed PIN9

SMD CAP: Fail to test THD+N
EL/SOLID cap: Test THD+N will Pass

150311 change Audio cap

150311 change Audio cap

150311 6 port change to 3 port

45.8mA

Closed Codec

CA29.CA30 close to Pin27

2.2k for better recording quality

for rear I/O 6port: 887VD/892:1k

for rear I/O 3port: 887VD/892:75R

EMI 移除電容且換package0805

Rear Line OUT De-POP circuit

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

0R for cost down

CA33,CA34 close to LA1

Varister --> cap for cost down

D0G-2950500-SI0
D0G-3010510-I05
Close to Jack

Close to Front panel
For HDA/AC97 front cable.

N31-2051411-H06

Digital

Analog

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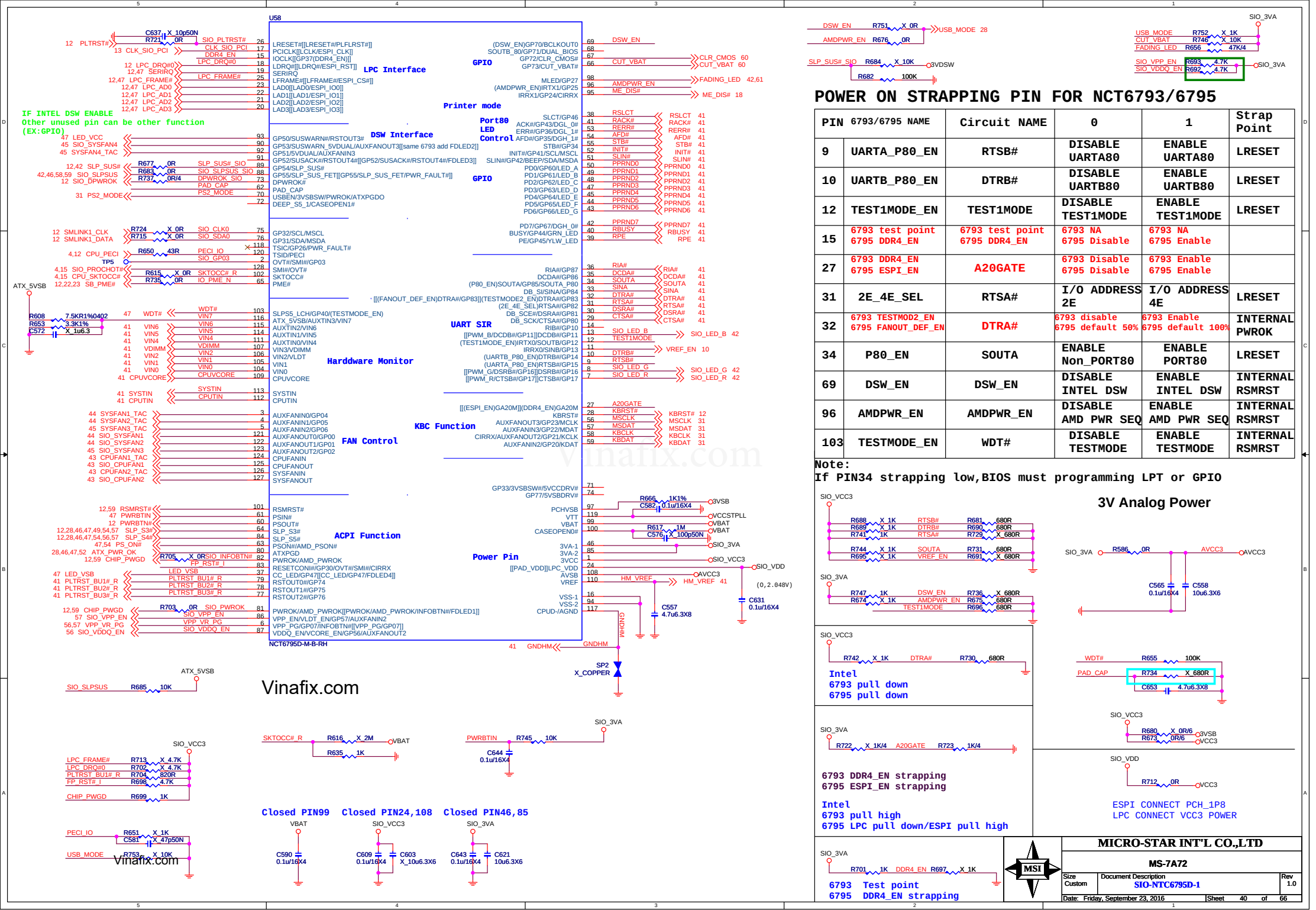

POWER ON STRAPPING PIN FOR NCT6793/6795

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

3V Analog Power

6793 DDR4_EN strapping
6795 ESPI_EN strapping

Intel
6793 pull high
6795 LPC pull down/ESPI pull high

6793 Test point
6795 DDR4_EN strapping

ESPI CONNECT PCH_1P8
LPC CONNECT VCC3 POWER

Intel
6793 pull down
6795 pull down

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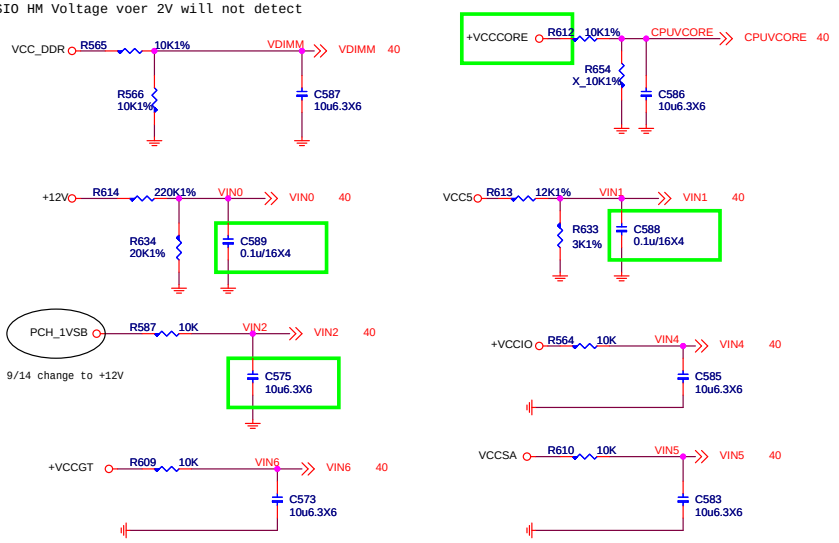
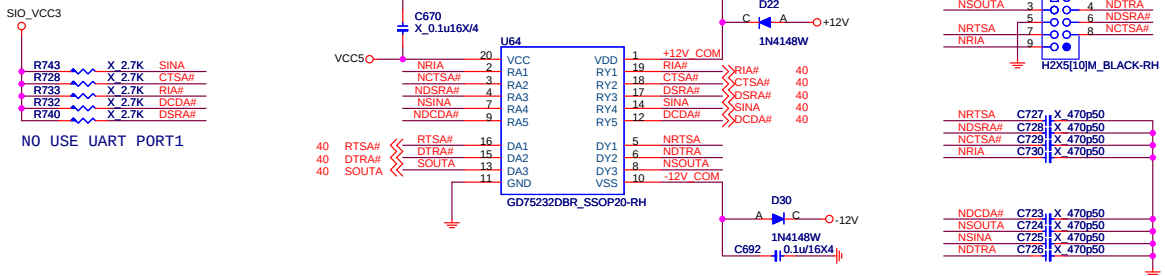
HW Monitor - Voltage

SIO HM Voltage voer 2V will not detect

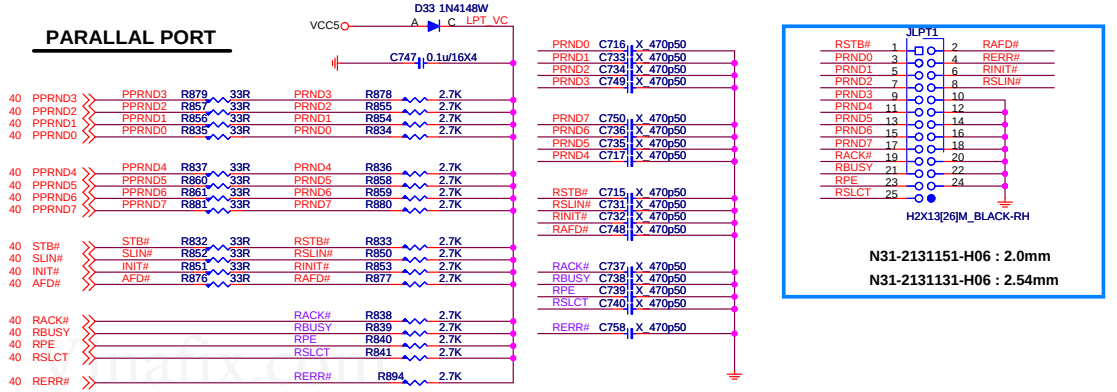


Thermal Monitor

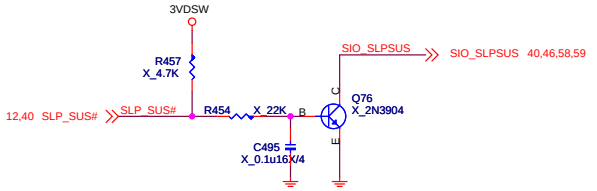
SERIAL PORT 1

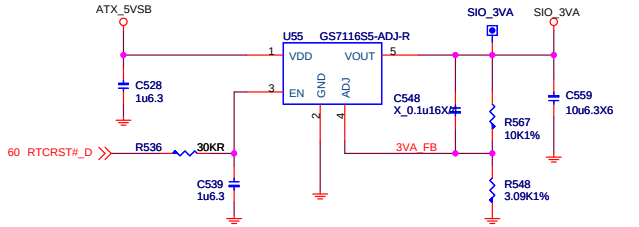


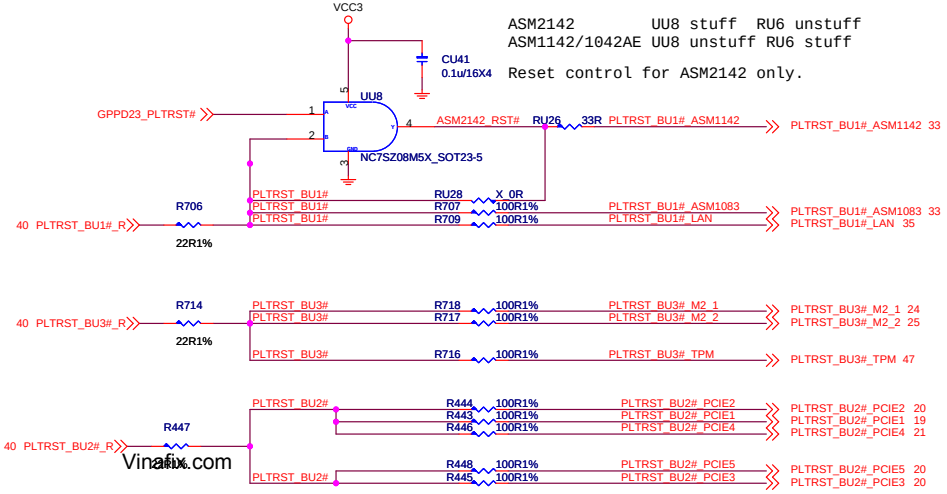
PARALLAL PORT



SLP_SUS Co-lay circuit







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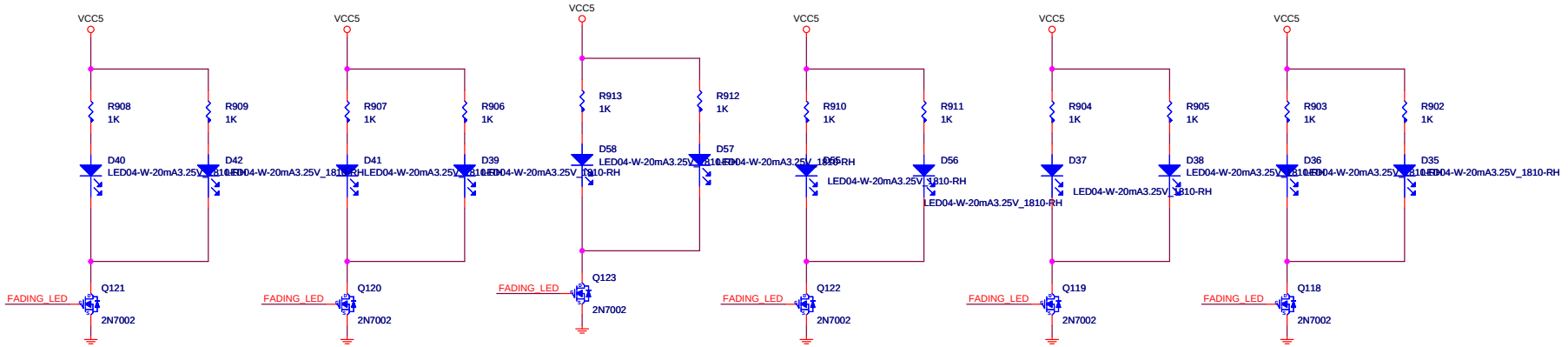
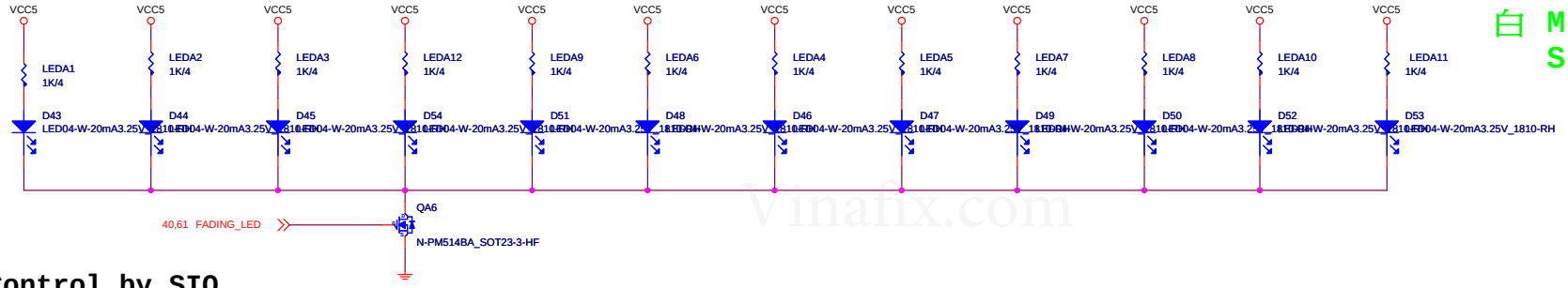
BOTTOM LED



AUDIO LED

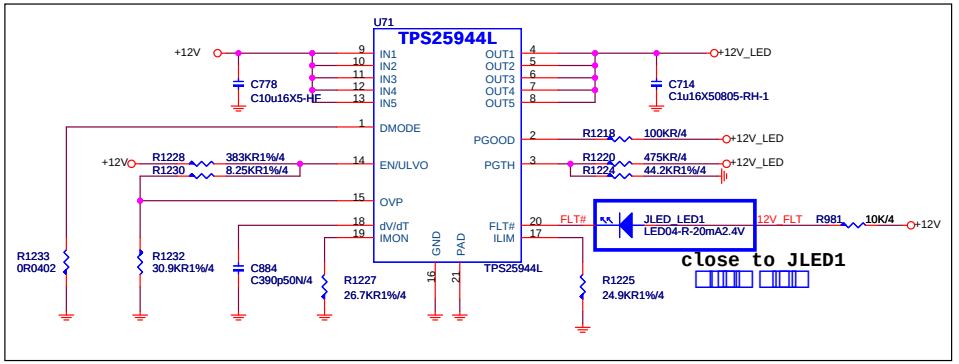
Audio moat is transparent and width 40mil



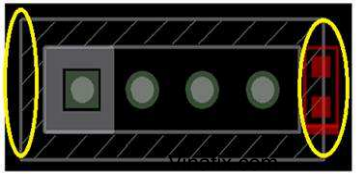
Bottom LED
白 M : D0C-040T300-H91
S : D0C-040S300-E07

LED Control by SIO

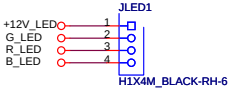
2016.07.06 Use TPS25944L

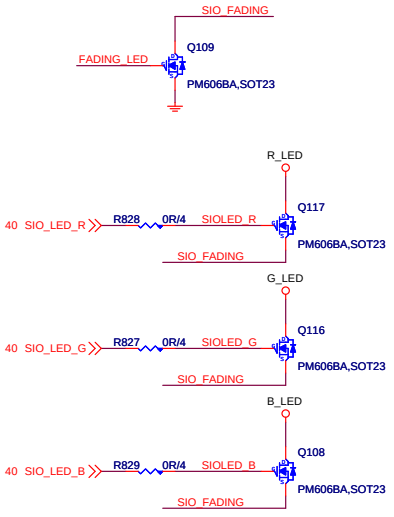


close to JLED1

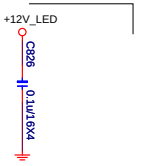


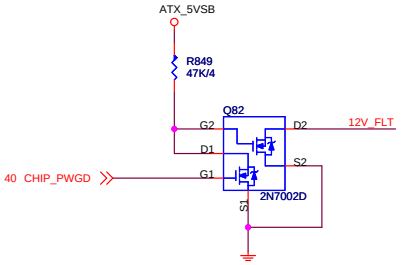
JLED1電源警示燈請擺在旁側



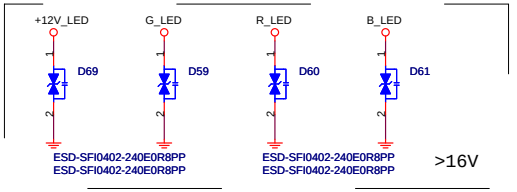


2016.08.02 Add +12V_LED 0.1uF





2016.08.02 stuff ESD



>16V

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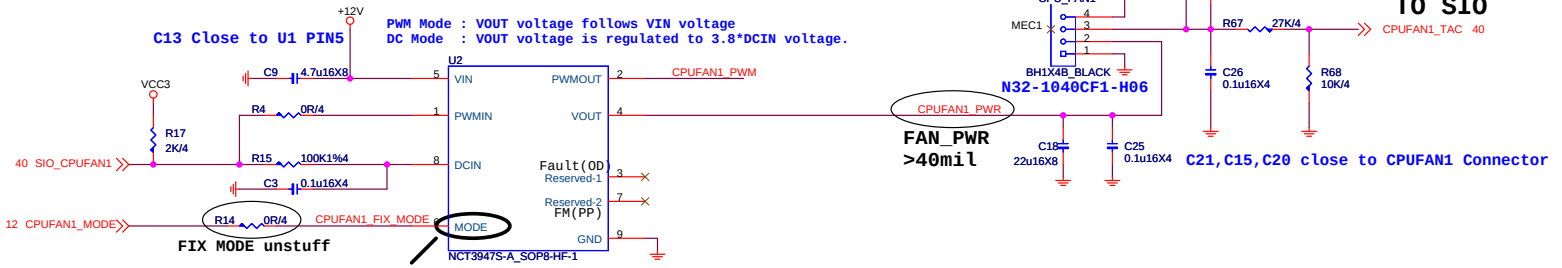
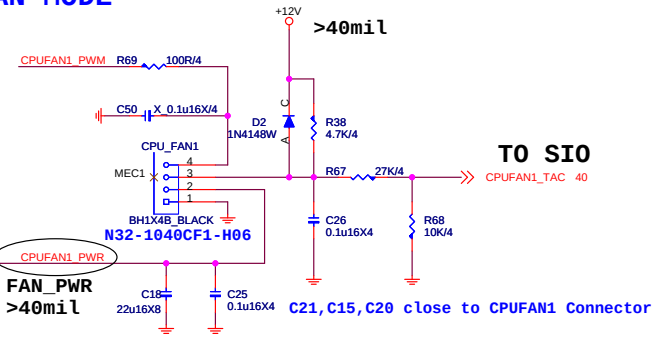
TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE

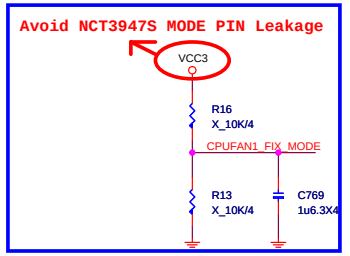
1.PWM/DC/OCP LED(現在是改成R/G/B3色LED)
2.GPIO可以由BIOS切換 PWM/DC MODE
3.OCP拉回GPIO給BIOS認
4.PWM OR DC FAN拉回GPIO給BIOS認
5.FAN轉速加快的時候由SOFTWARE 控制GPIO讓燈的變化



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

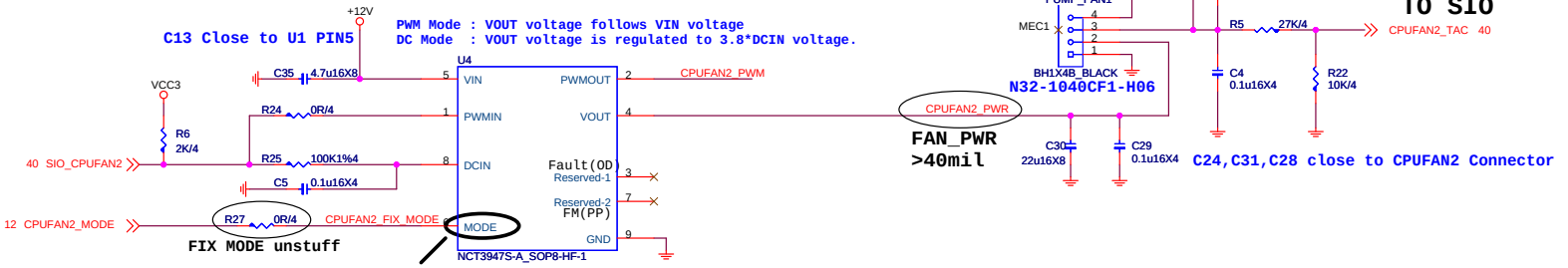
Internall pull up 1.65V





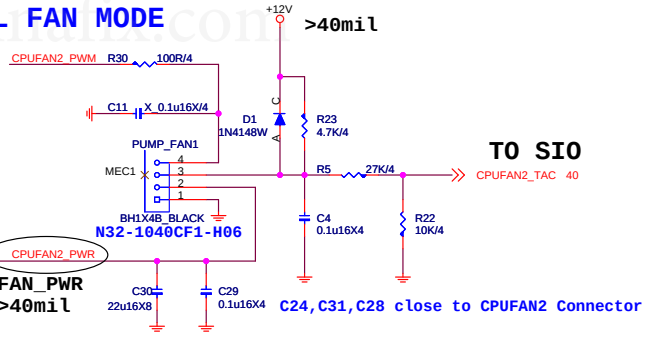
Resever For FIX DC or PWM MODE USE By PM SPEC

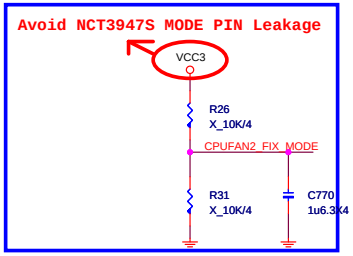
TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE



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

Internall pull up 1.65V





Resever For FIX DC or PWM MODE USE By PM SPEC

1.MODE : USE MODE PIN change FAN MODE(PWM or DC FAN)
2.FAULT : USE FAULT PIN Triger OVT/OCP Protection,LOW Atcive (Reserve NEW IC)
3.FM : USE FM PIN For BIOS USE to Detect PWM or DC FAN & Show information(Reserve NEW IC)

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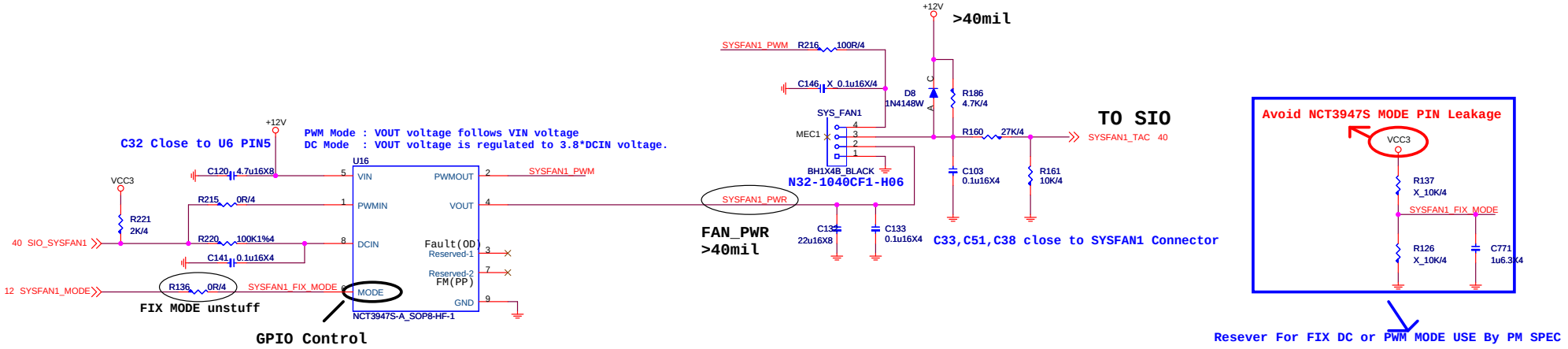
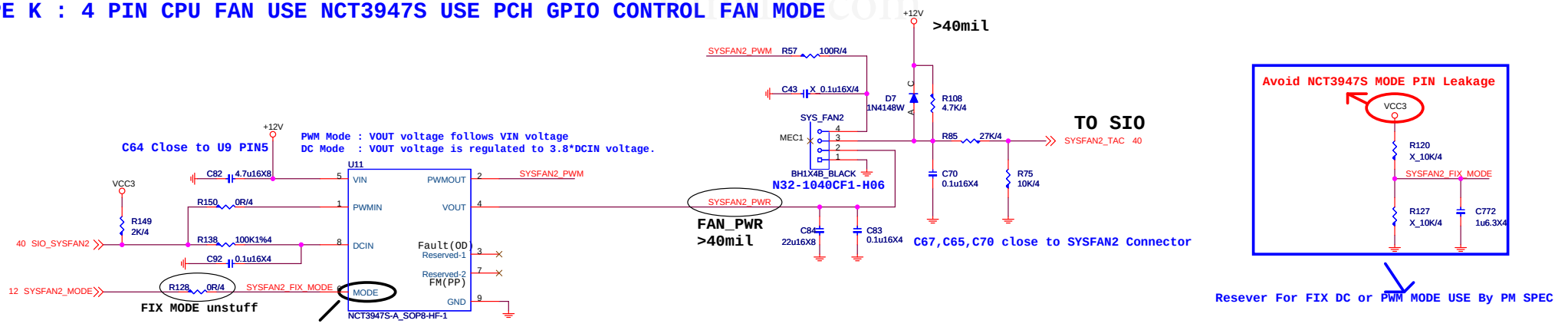
TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE



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

Internall pull up 1.65V

TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE



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

Internall pull up 1.65V

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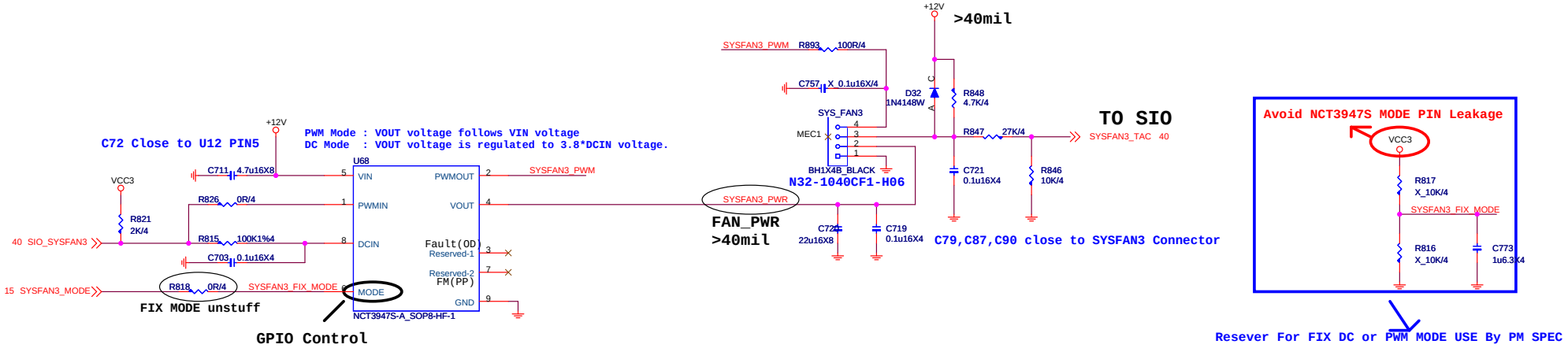
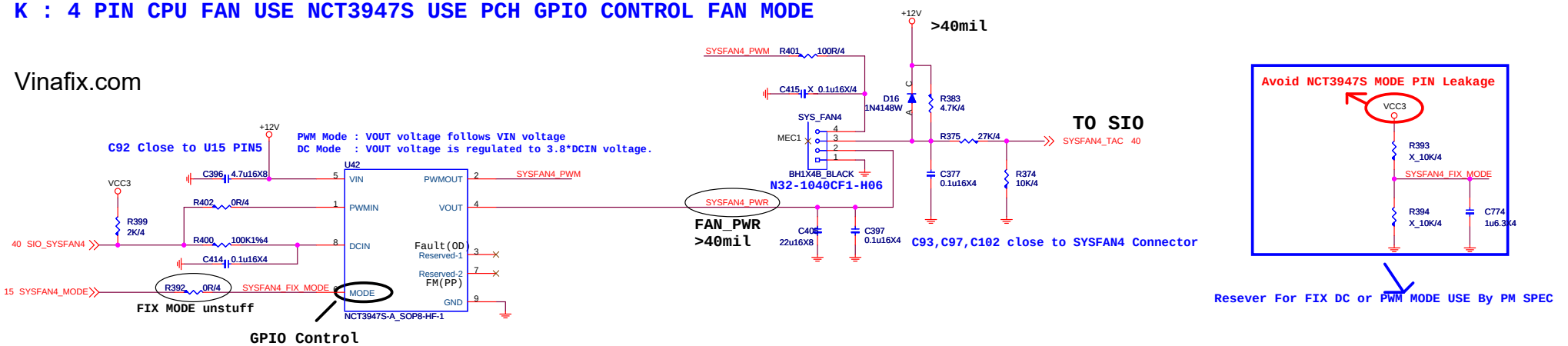
TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE



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

Internall pull up 1.65V

TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE



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

Internall pull up 1.65V

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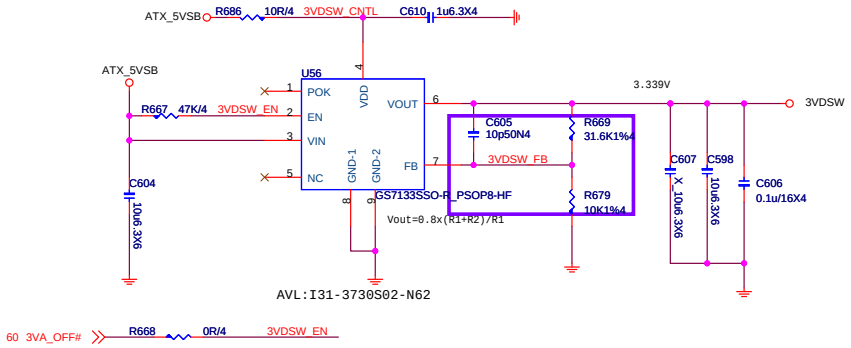
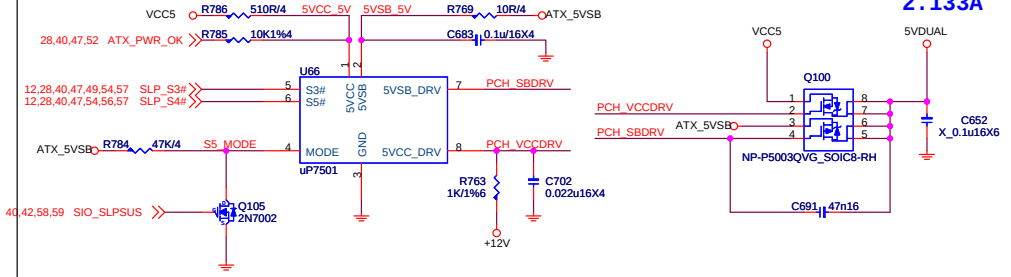
3VDSW

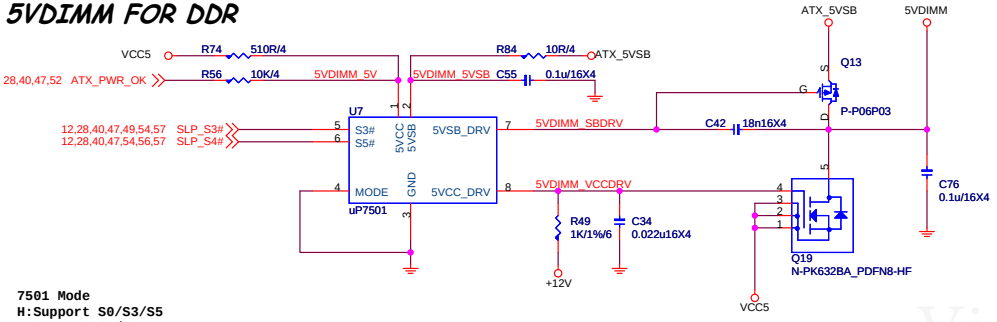


5VDUAL

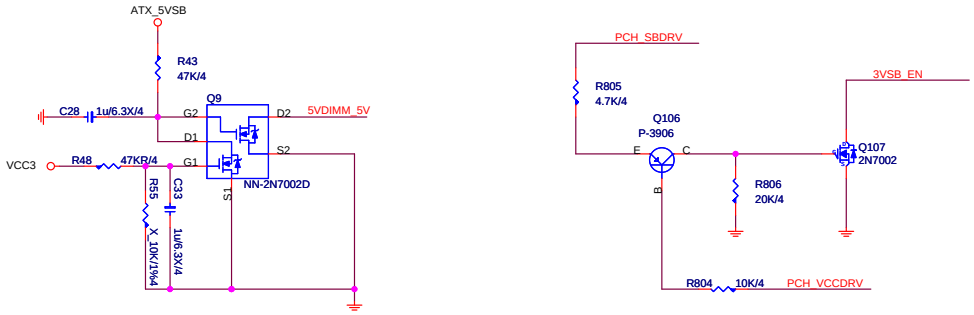
5VDUAL is power source of 1P0SB



5VDIMM FOR DDR

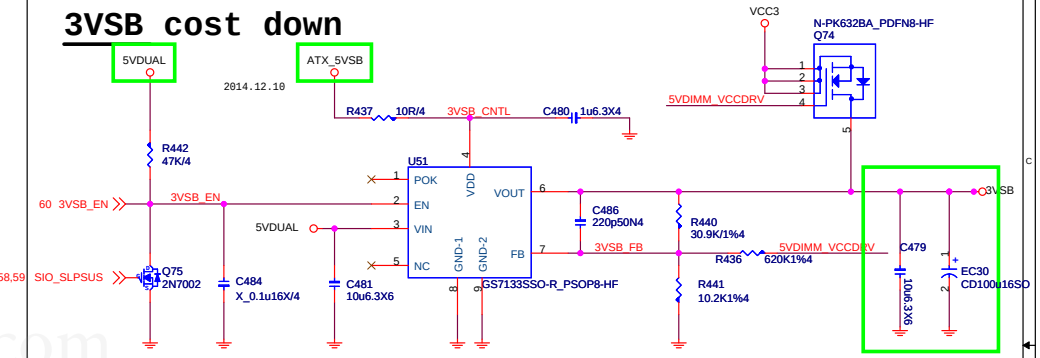


7501 Mode
H:Support S0/S3/S5
L:Support S0/S3



防G3-->S5底下5VSBDRV2瞬間有電變沒電,使得下一級電壓爬升有drop

3VSB cost down



AVL:I31-3730S02-N62 2014.10.15 update

VFB=3.224V for S0->S3 3VSB voltage raise & ATX_5VSB drop.

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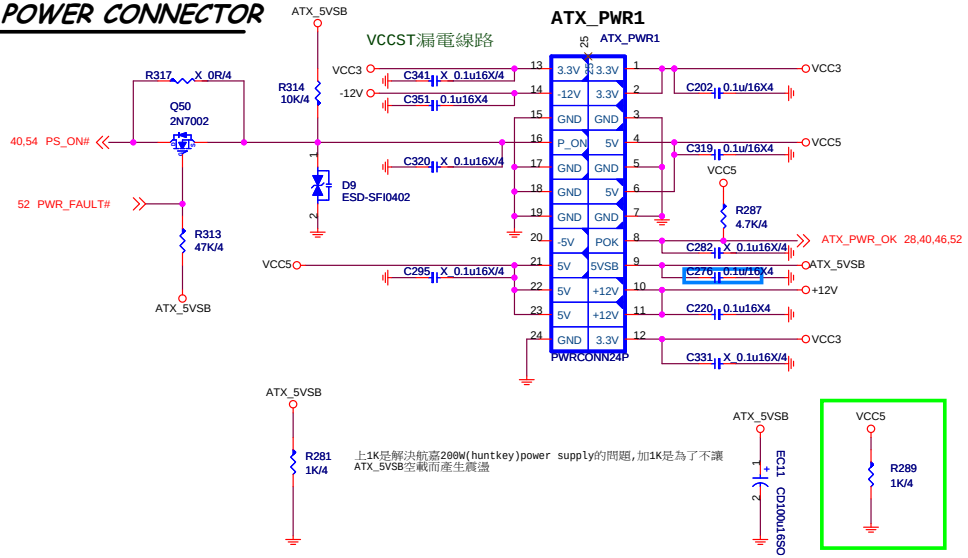
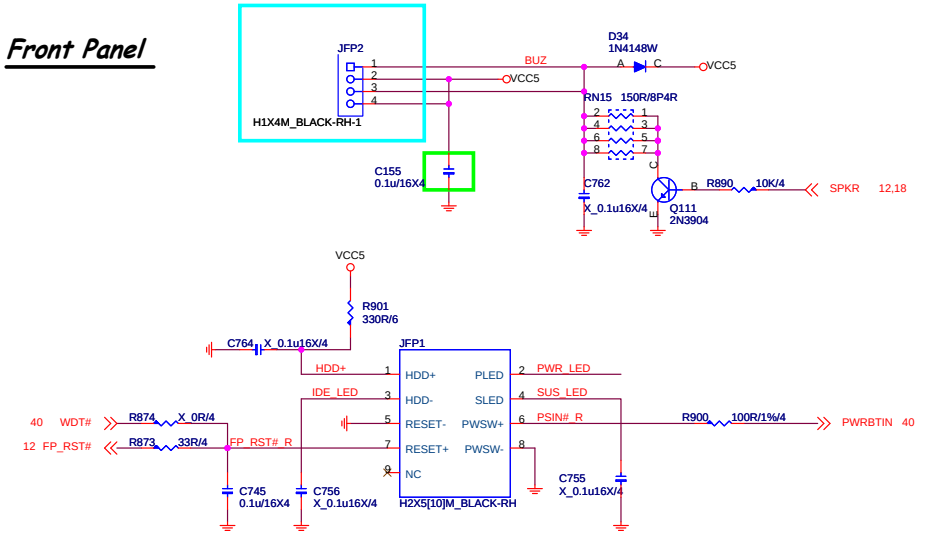
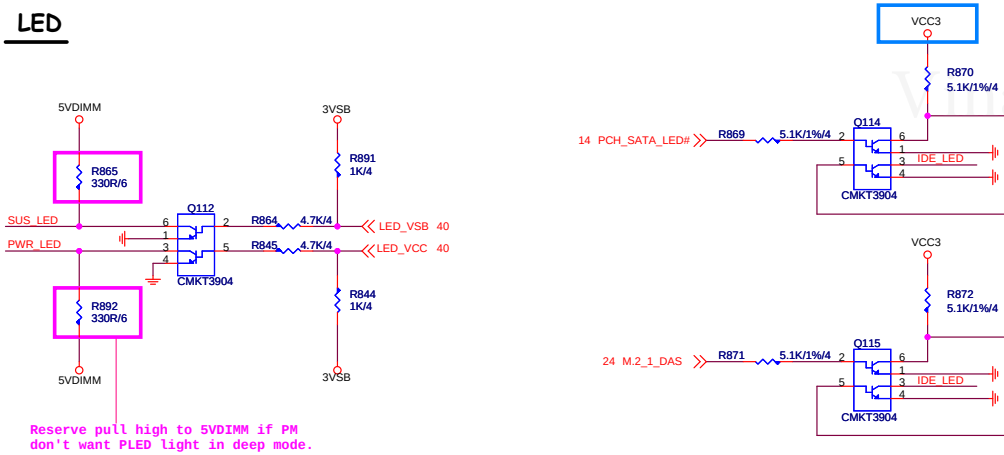
ATX POWER CONNECTOR

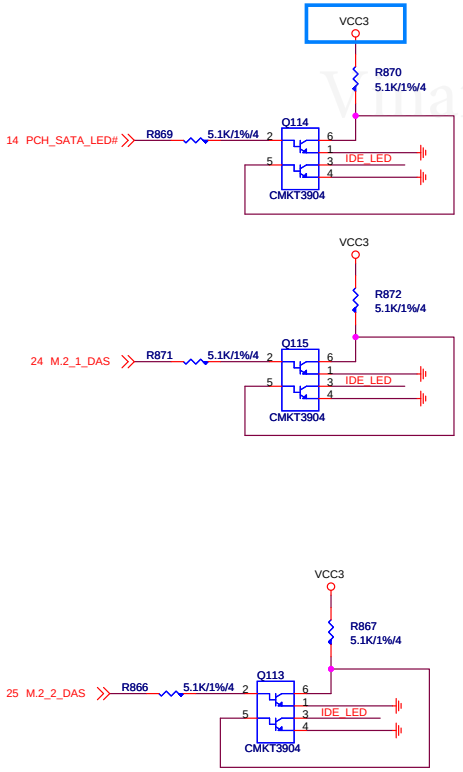


Front Panel

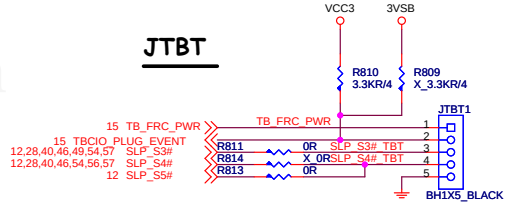


LED

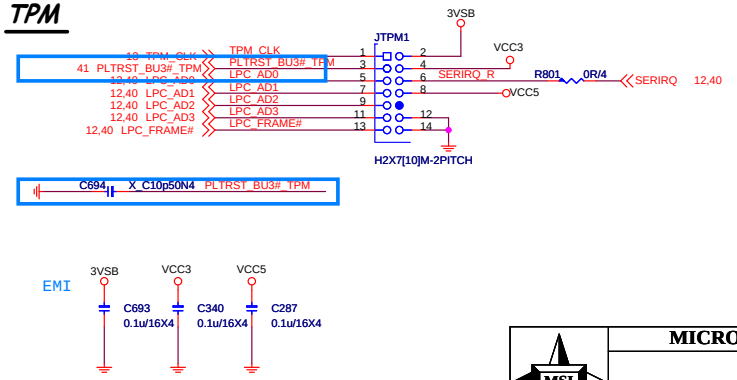




JTBT



TPM



Vinafix.com

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Size: Custom	Document Description: ATX Power/F_Panel	Rev: 1.0
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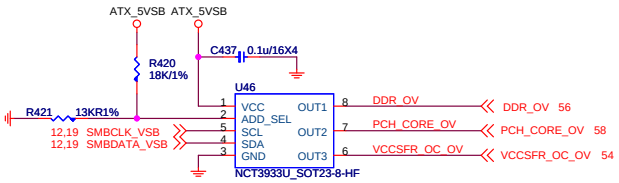
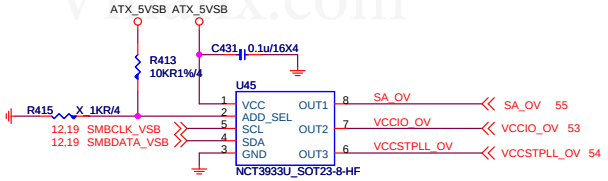
Remove Cut Power.

UPI VOLTAGE CONSOLE

0x26:RH=18K,RL=13K



0x20:RH=10K,RL=OPEN



ADDRESS	0x2A	0X28	0x26	0x24	0x22	0x20
RH (KOhm)	OPEN	3.9	3	2.2	1.3	10
RL (KOhm)	10	1.3	2.3	3	3.9	OPEN
BUS_SEL	0%	25%	40%	60%	75%	100%

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Size	Document Description	Rev
Custom	OV-NCT3933/GPIO-NCT5605	1.0

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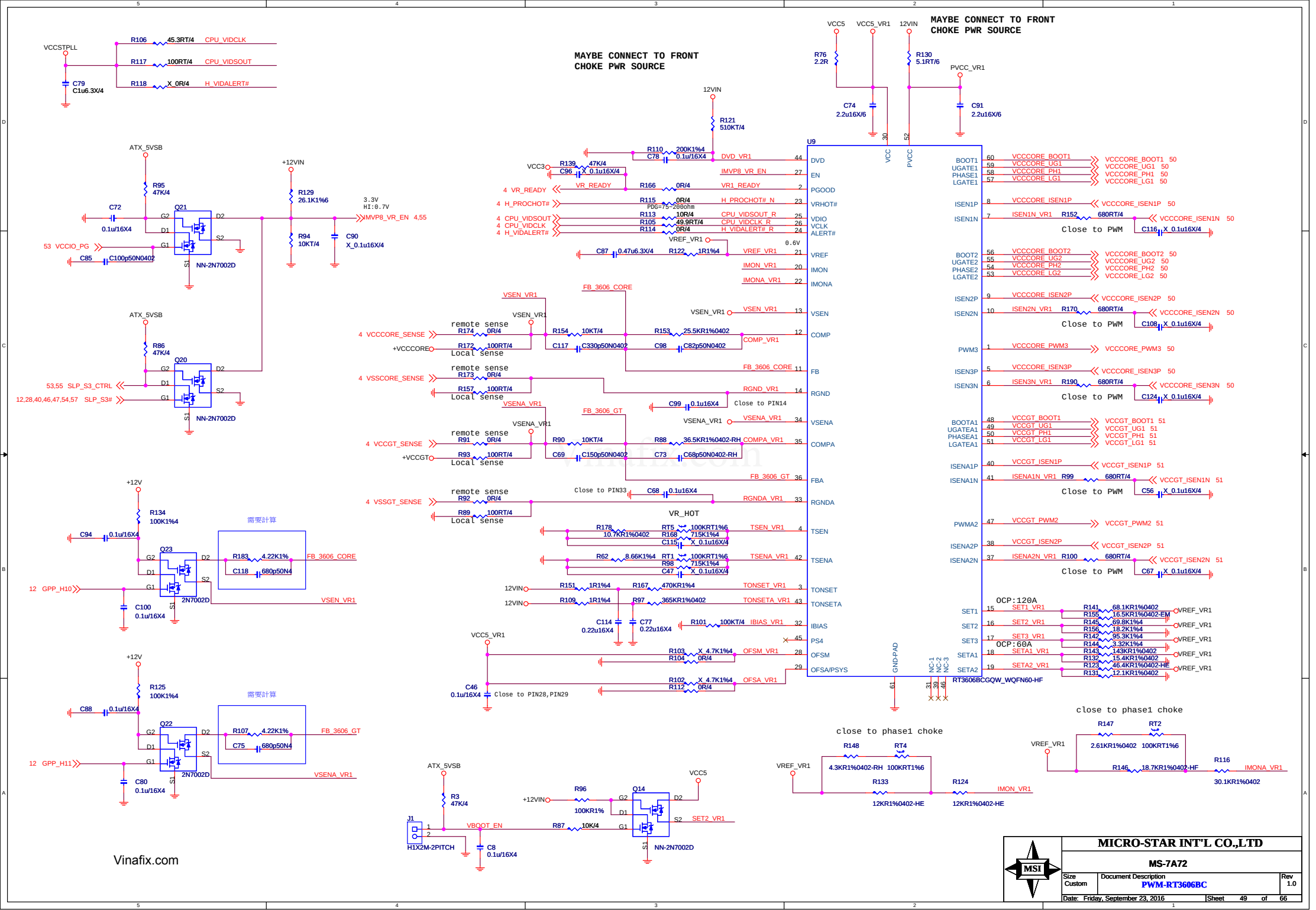
MAYBE CONNECT TO FRONT CHOKE PWR SOURCE
MAYBE CONNECT TO FRONT CHOKE PWR SOURCE
U9
RT3606BCGQW_WQFN60-HF
close to phase1 choke
close to phase1 choke
Close to PWM
OCP:120A
OCP:60A
需要計算
需要計算
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PWM-RT3606BC
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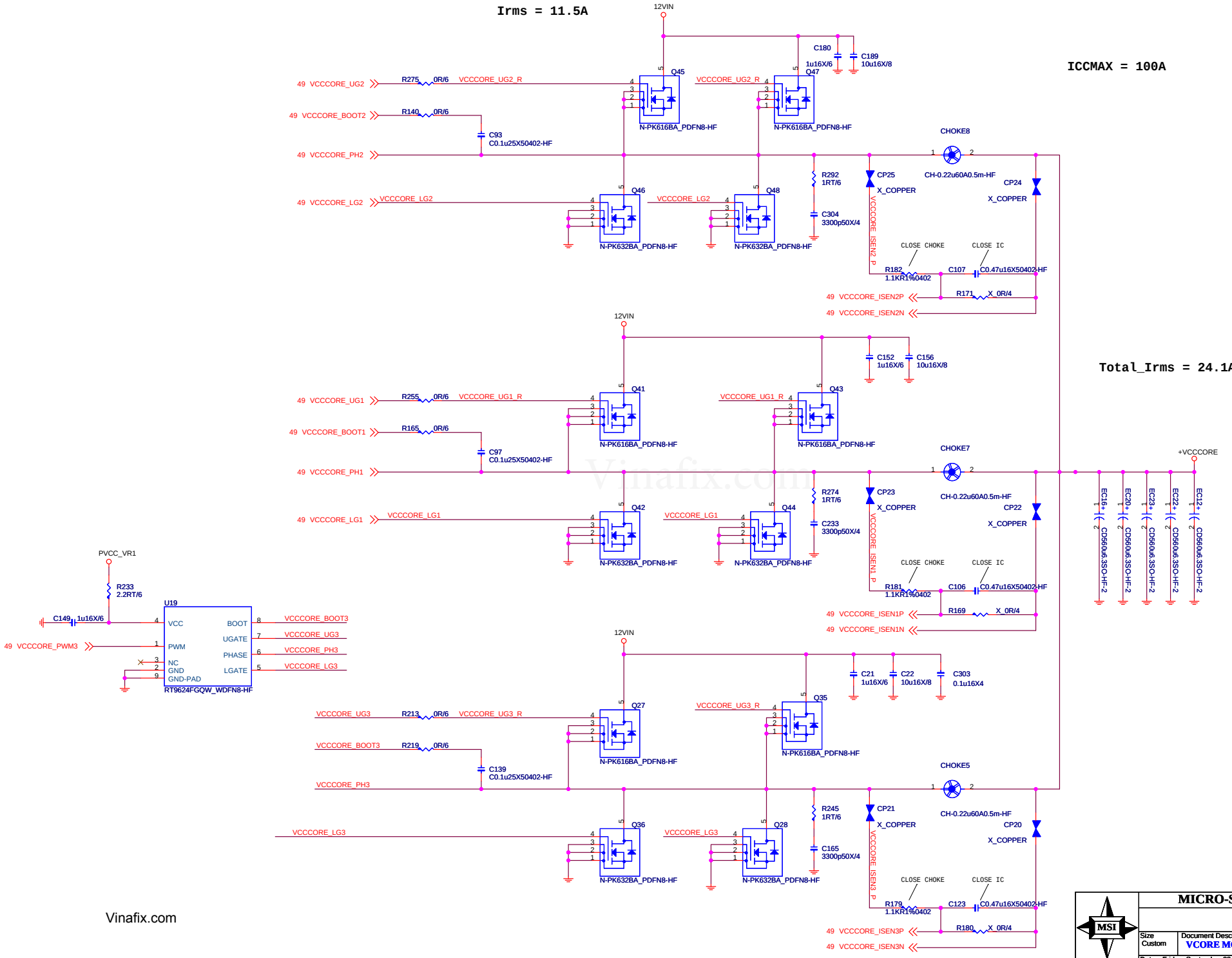
Irms = 11.5A

ICCMAX = 100A

Total_Irms = 24.1A



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Size: Custom | Document Description: VCORE MOS-PHASE 1~4 | Rev: 1.0

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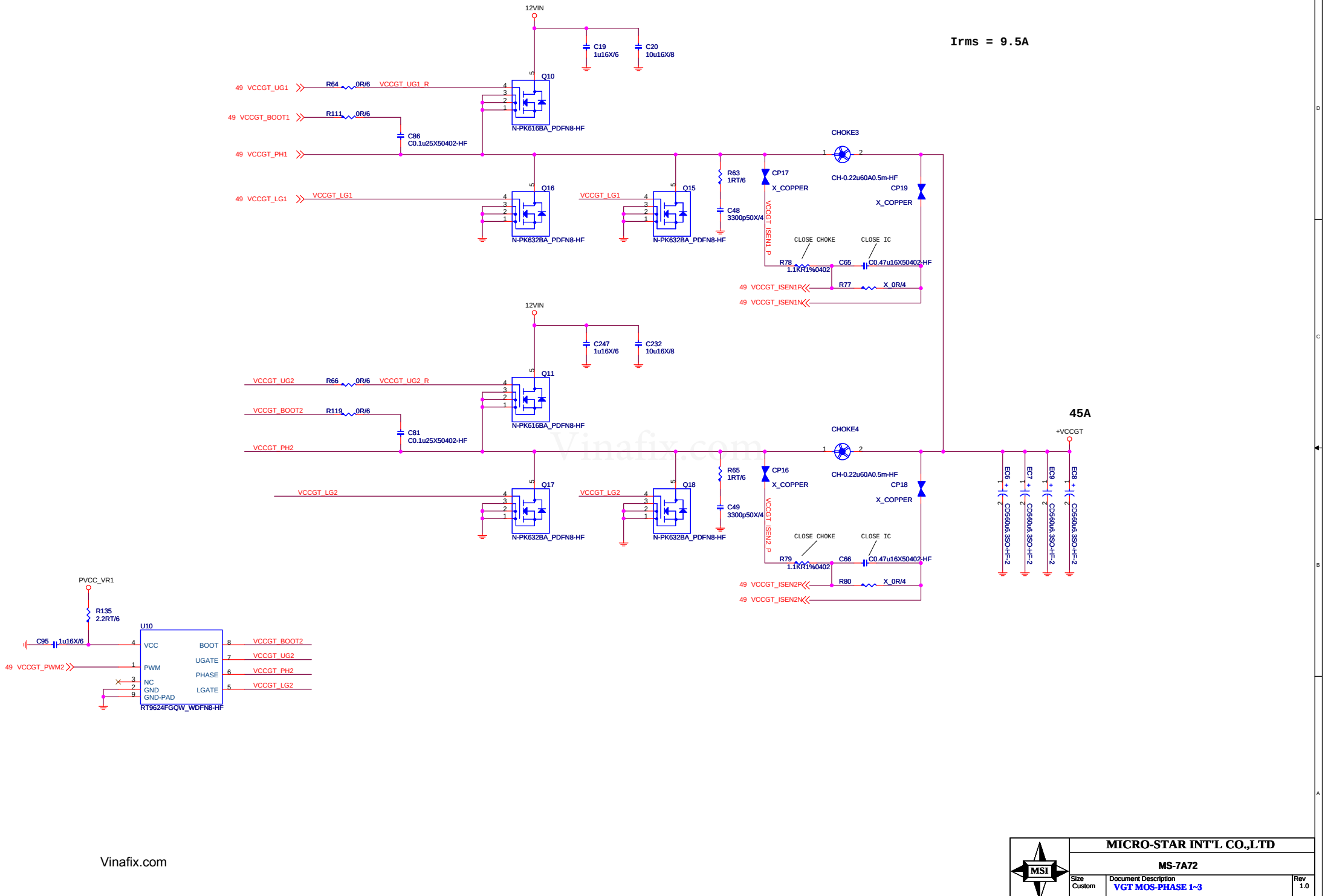
Irms = 9.5A
45A
12VIN
C19
1u16X/6
C20
10u16X/8
Q10
N-PK616BA_PDFN8-HF
49 VCCGT_UG1
R64
0R/6
VCCGT_UG1_R
49 VCCGT_BOOT1
R111
0R/6
C86
C0.1u25X50402-HF
49 VCCGT_PH1
Q16
N-PK632BA_PDFN8-HF
49 VCCGT_LG1
VCCGT_LG1
Q15
N-PK632BA_PDFN8-HF
R63
1RT/6
C48
3300p50X/4
CP17
X_COPPER
CHOKE3
CH-0.22u60A0.5m-HF
CP19
X_COPPER
VCCGT_ISEN1_P
CLOSE CHOKE
CLOSE IC
R78
1.1KR1%0402
C65
C0.47u16X50402-HF
49 VCCGT_ISEN1P
R77
X_0R/4
49 VCCGT_ISEN1N
12VIN
C247
1u16X/6
C232
10u16X/8
Q11
N-PK616BA_PDFN8-HF
VCCGT_UG2
R66
0R/6
VCCGT_UG2_R
VCCGT_BOOT2
R119
0R/6
C81
C0.1u25X50402-HF
VCCGT_PH2
Q17
N-PK632BA_PDFN8-HF
VCCGT_LG2
Q18
N-PK632BA_PDFN8-HF
R65
1RT/6
C49
3300p50X/4
CP16
X_COPPER
CHOKE4
CH-0.22u60A0.5m-HF
CP18
X_COPPER
VCCGT_ISEN2_P
CLOSE CHOKE
CLOSE IC
R79
1.1KR1%0402
C66
C0.47u16X50402-HF
49 VCCGT_ISEN2P
R80
X_0R/4
49 VCCGT_ISEN2N
+VCCGT
EC6
EC7
EC9
EC8
CD560J6.3SO-HF-2
PVCC_VR1
R135
2.2RT/6
U10
C95
1u16X/6
49 VCCGT_PWM2
VCC
PWM
NC
GND
GND-PAD
BOOT
UGATE
PHASE
LGATE
VCCGT_BOOT2
VCCGT_UG2
VCCGT_PH2
VCCGT_LG2
RT9624FGQW_WDFN8-HF
Vinafix.com
MICRO-STAR INT'L CO.,LTD
MS-7A72
Size
Custom
Document Description
VGT MOS-PHASE 1~3
Rev
1.0
Date: Friday, September 23, 2016
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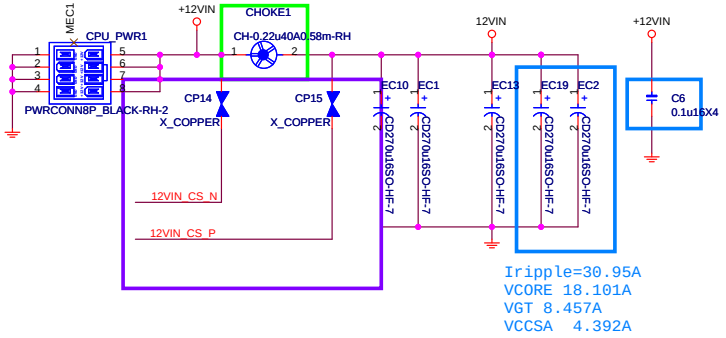
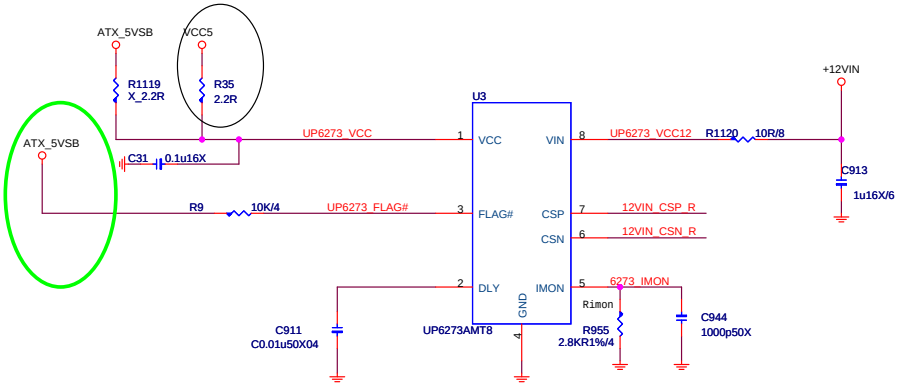
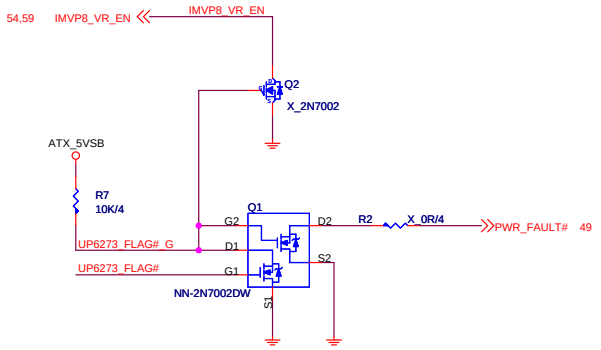


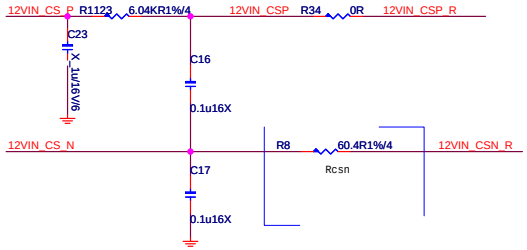
POWER METER
OCP: 120A



Iin=(Vmon*Rcsn)/(Rmon*Rdc)
Vmon=1.2
can change OCP trigger level by Rcsn and Rmon

(1.2 * 0.2) / (10K* 0.3m) = 80A





MICRO-STAR INT'L CO.,LTD

MS-7A72

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Custom	UP6273	1.0

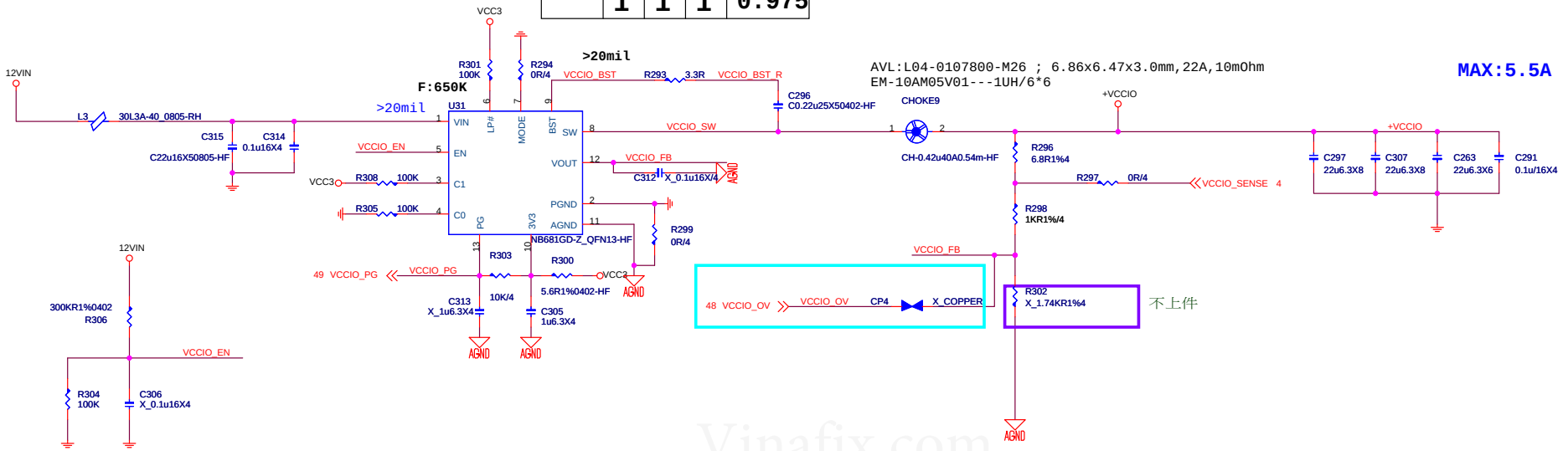
Date: Friday, September 23, 2016 Sheet 52 of 66

VCCIO

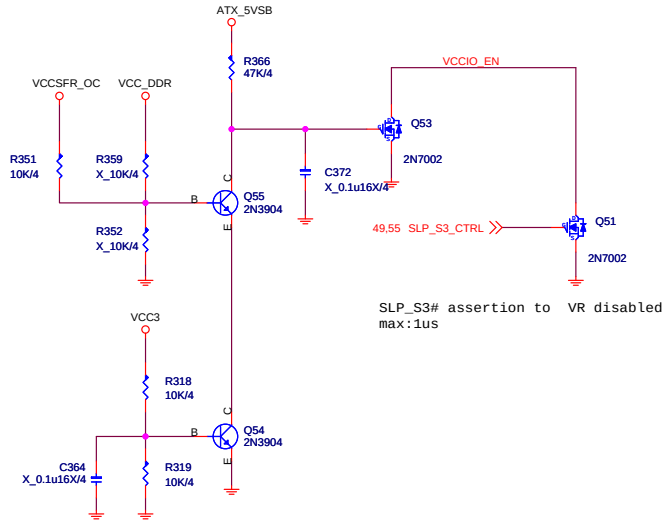
0.95V; 5.5A

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



2014.12.17



SLP_S3# assertion to VR disabled
max:1us

MICRO-STAR INT'L CO.,LTD

MS-7A72

Size: Custom | Document Description: CPU PWR_VCCIO | Rev: 1.0

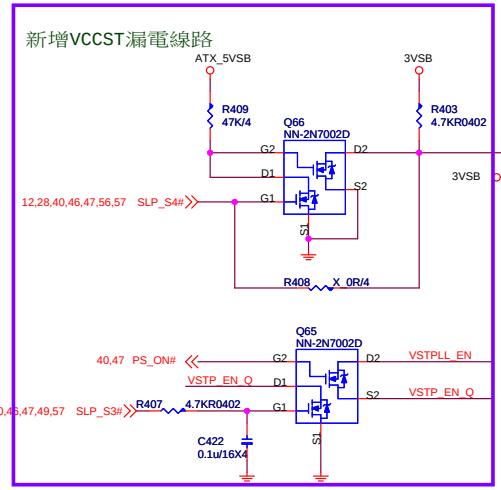
Date: Friday, September 23, 2016 | Sheet 53 of 66

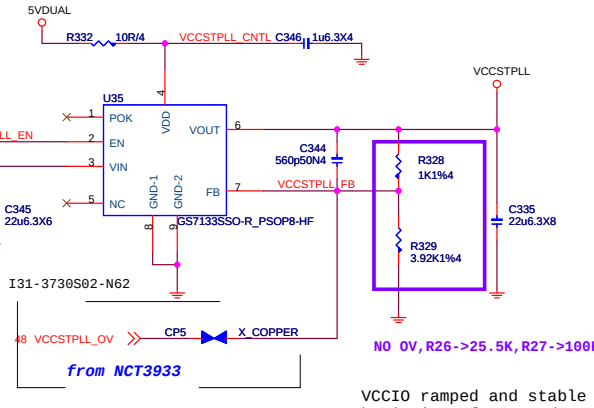
VCCSTPLL

1.0V; 250mA

For Cost down VCCST&VCCPLL merge

for Gaming3/5, Classic, ECO and H110





NO OV,R26->25.5K,R27->100K, C178 unstuff

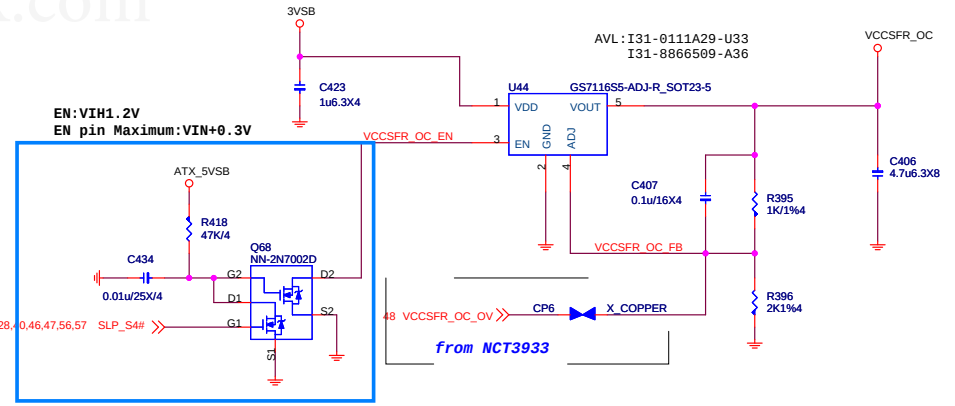
VCCIO ramped and stable before beginning of VCCOPC/VCCEOPIO ramp

VCCST/PLL stable 1ms before PROCPWRGD

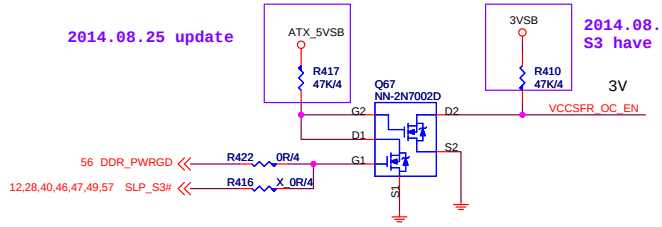
VCCPLL_OC

1.2V; 110mA

2014.08.21 update



2014.08.25 update



2014.08.25 update
S3 have power

MICRO-STAR INT'L CO.,LTD		
MS-7A72		
Size: Custom	Document Description: CPU PWR_ST/PLL	Rev: 1.0
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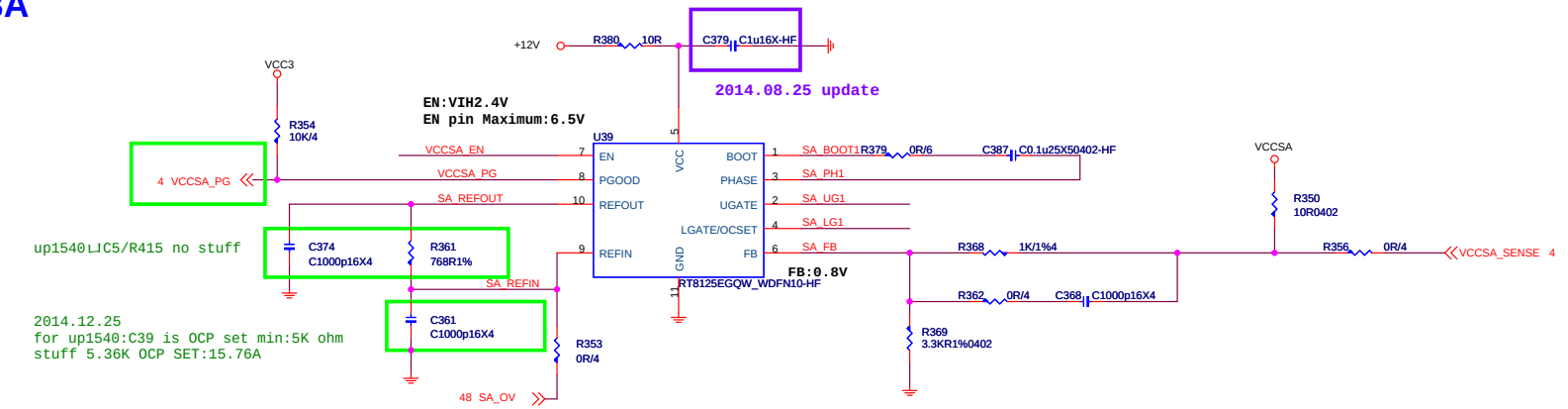
SA Power:1.05V,12.3A

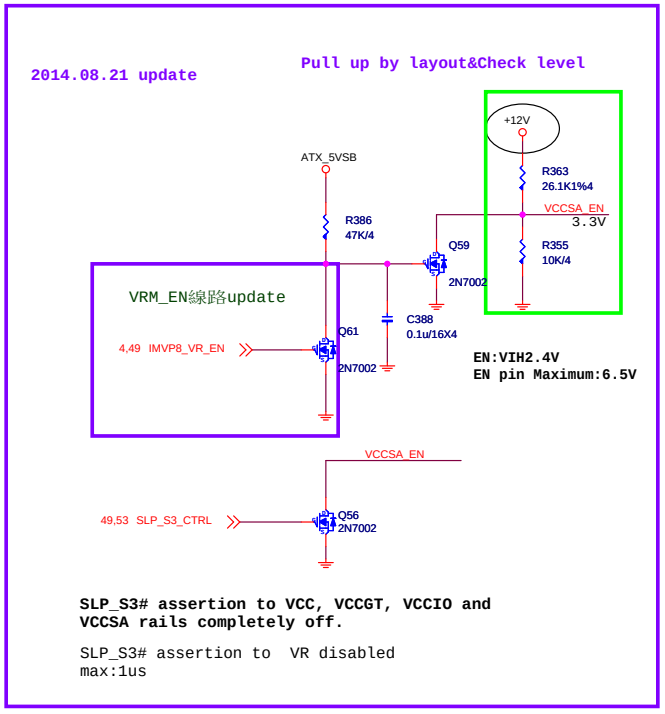
Rocpset:5.6K
*OCP=Rocset*Rdson(Low side)/10uA*
*=5.6K*3.3mohm/10uA*
=18.48A

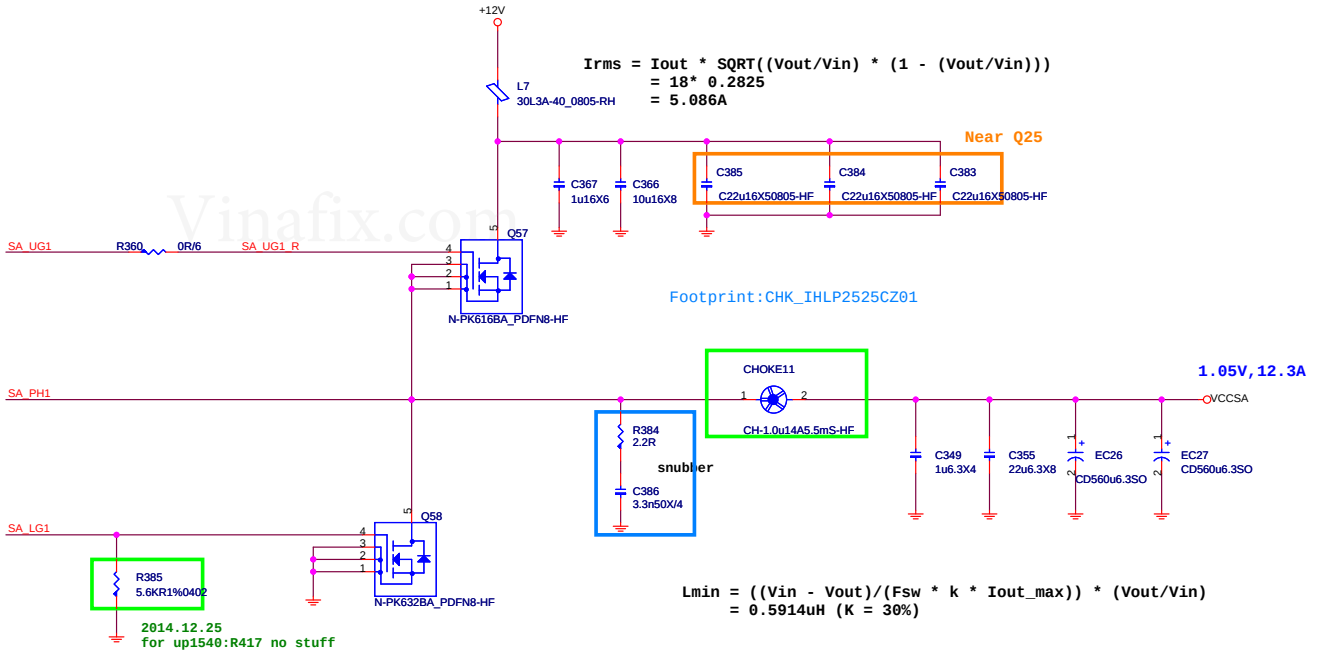
Rocs:5.76K,OCP:
D03-4C05N03-O05 : 16.94A
D03-632BA0C-N03 : 17.45A
use UBIQ MOS need Check

Rdson(low)10V
D03-4C05N03-O05 : 3.4mohm
D03-632BA0C-N03 : 3.3mohm
D03-3056M00-U47 : 4.2mohm



Vinafix.com





MICRO-STAR INT'L CO.,LTD	
MS-7A72	
Size: Custom	Document Description: CPU PWR_SA-RT8125C
Rev: 1.0	
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DDR4_1.2V 2.5A+9.5A+1.2A=13.2A

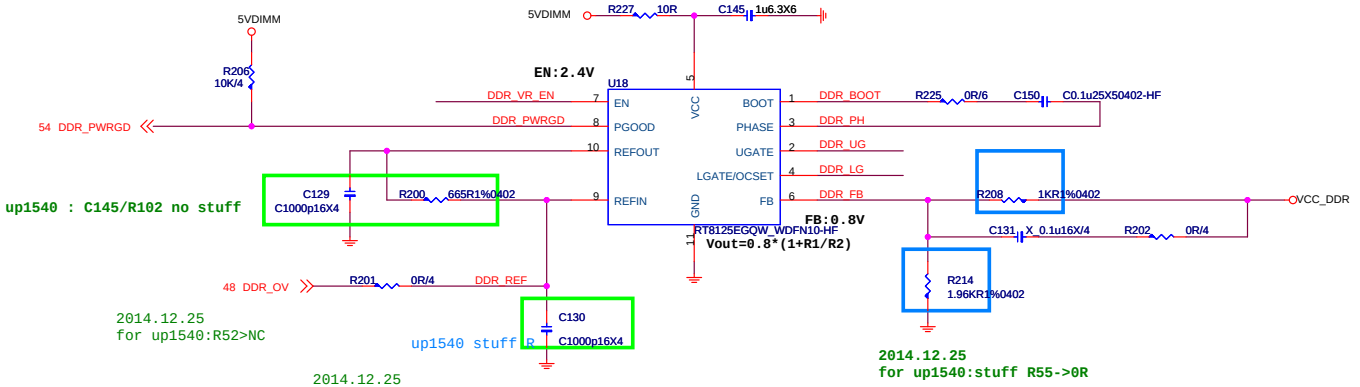
2.5A FOR CPU

9.5A FOR 4DIMM

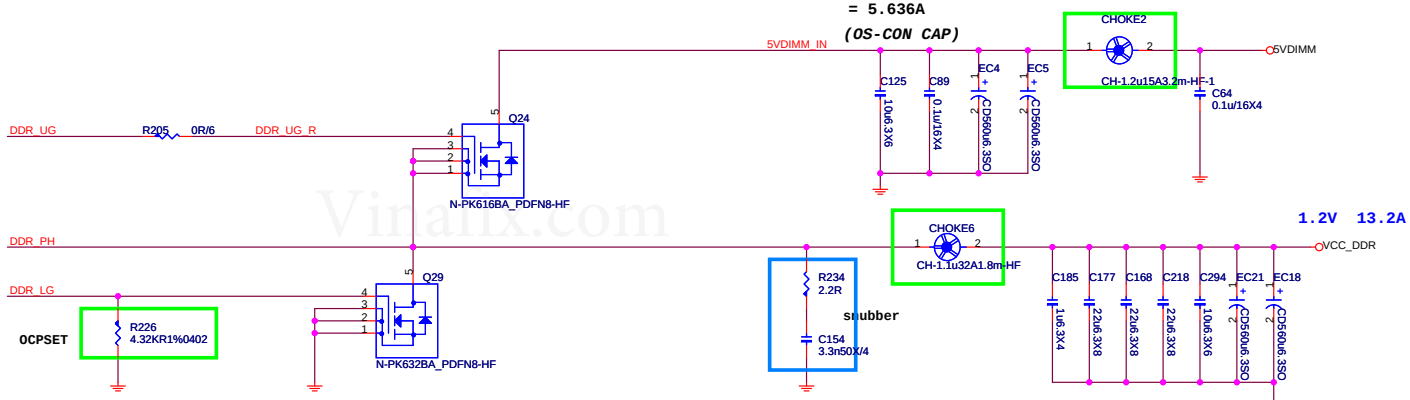
1.2A FOR DDR VTT

Rocpset:4.32K
OCP=Rocset*Rdson(Low side)/10uA
=4.32K*4.6mohm/10uA
=19.87A

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



Irms = Iout * SQRT{(Vout/Vin) * [1 - (Vout/Vin)]}
= 13.2* 0.427
= 5.636A
(OS-CON CAP)

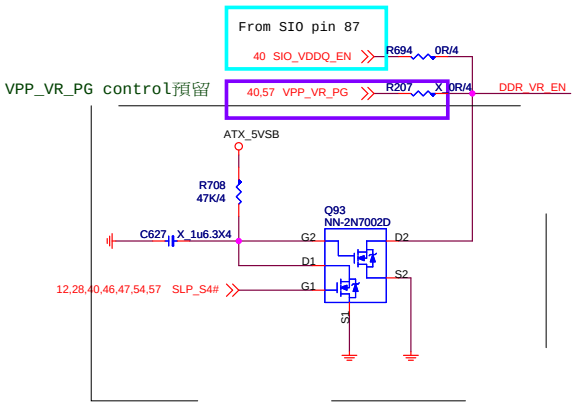


2014.12.25
for up1540:R95 ->NC

Datasheet公式計算
Lmin = ((Vin - 1.2V)/(Fsw * k * Iout_max)) * (Vout/Vin)
= 0.7677uH (K = 30%)

若帶入CAP ESR計算,0.2432uH＜L＜1.2897uH

2014.12.17 update



MICRO-STAR INT'L CO.,LTD
MS-7A72
Size: Custom
Document Description: DDR4 Power-RT8125C
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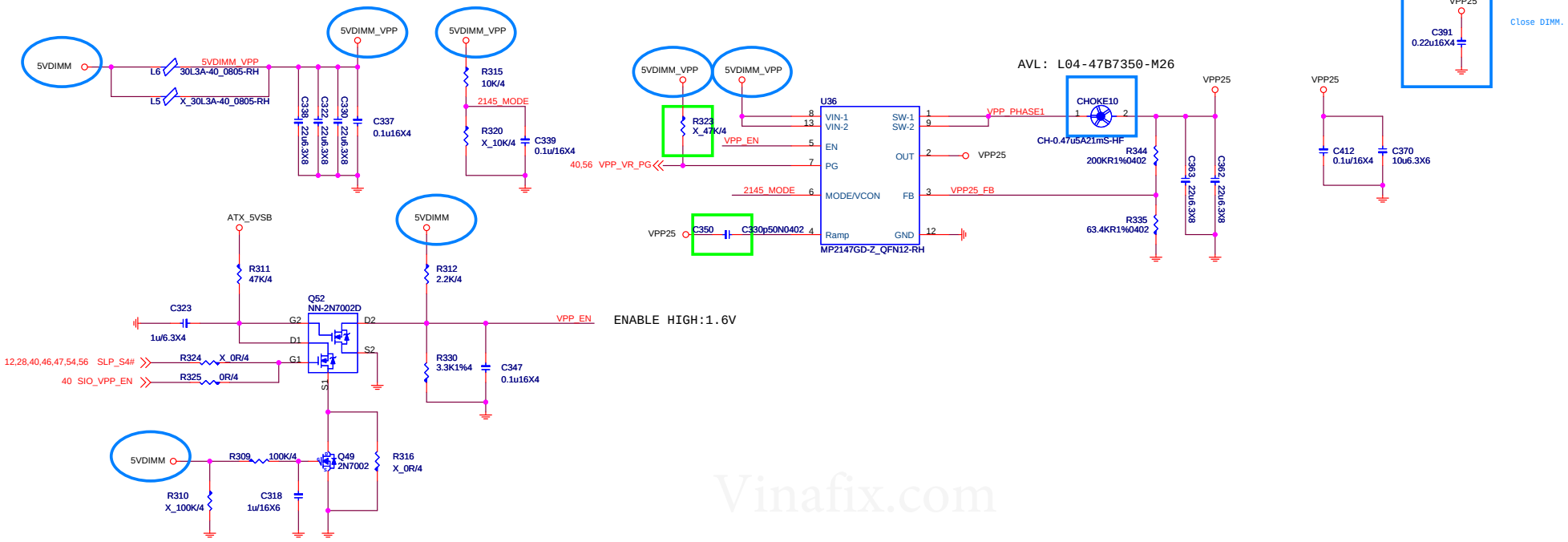
4DIMM :2.24A FOR DDR VPP2.5V

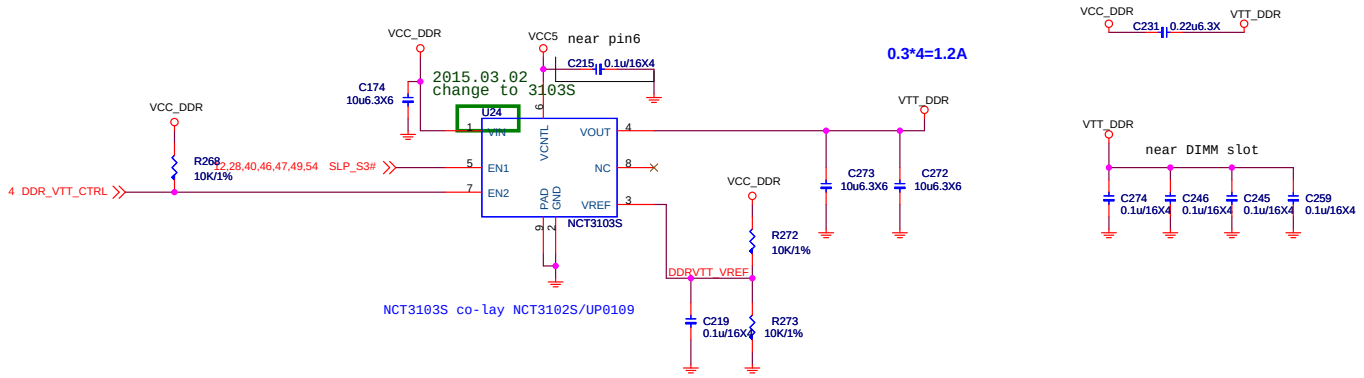
VPP25 Power

2.5V; 2.24A



To make sure VPP EN after 5VDIMM stable

DDR VTT Power



MICRO-STAR INT'L CO.,LTD	
MS-7A72	
Size: Custom	Document Description: DDR4 Power-VPP25
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PCH_1VSB

1.0V; 11A

Rocpset:3.48K
OCP=Rocset*Rdson(Low side)/10uA
=3.48K*4.6mohm/10uA
=16A

Rocs:7.87K,OCP:
D03-4C05N03-005 : 15.74A
D03-632BA0C-N03 : 17.1A
use UBIQ MOS need Check

Rdson(low)4.5V
D03-3116M00-U47 : 3.6 mohm
D03-632BA0C-N03 : 4.6mohm
D03-3056M00-U47 : 6.2mohm

L04-47B7730-T15 for OC, Gaming 10, 9, 7, 5
L04-12A7321-L65 for Gaming 3, SLI, ECO
L04-12A7721-T15 for cost down

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

5VDUAL
R725 10R/6
2014.08.25:Change 1u/0603
C650 1u6.3X6
U61
PCH_1VSB_EN
2014.08.21 update
PCH_REFOUT
C660 1000p16X4
R758 665R1%0402
2014.12.25
for up1540:C236&R204 ->NC
PCH_REFIN
C659 1000p16X4
R759 0R/4
2014.12.25
for up1540:C193 is OCP set min:5Kohm
R185 stuff 7.87K OCP SET:15.74A
48 PCH_CORE_OV
EN PGOOD REFOUT REFIN VCC GND BOOT PHASE UGATE LGATE/OCSET FB
RT8125EGQW_WDFN10-HF
PCH_BOOT R727 0R/6 PCH_R_BOOT C634 C0.1u25X50402-HF
PCH_PHASE
PCH_UGATE R687 0R/6 PCH_R_UGATE
PCH_LGATE
PCH_CORE_FB_R
R726 3.48KR1%0402-HF
2014.12.25
for up1540:R177->NC
C657 X_0.01u25X4
PCH_TYPE3
R738 X_0R/4
R739 1K1%4
R750 3.92K1%4
to sink/source over voltage IC.
pin10 sink/source current capability can't over 1mA
So max voltage can't over 1.8V.
from NCT3933

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

5VDUAL_PCH_IN
L10 30L6A-10_0805-RH-1
L9 X_30L6A-10_0805-RH-1
5VDUAL
C625 C0.1u16X/4
C626 C10u16X/8
EC36 CD560u6.3SO
too Big
C651 X_C0.1u16X/4
MAX:10.664A
Q92 N-PK616BA_PDFN8-HF
Q90 N-PK632BA_PDFN8-HF
L04-01072H0-T15
AVL: L04-0107800-M26
CHOKE12 CH-1.0u14A5.5mS-HF
R648 2.2R
C597 3300p50X/4
PCH_1VSB
PCH Bottom
EC32 CD560u6.3SO
EC33 CD560u6.3SO
C537 22u6.3X8
C547 10u6.3X6
C536 10u6.3X6
C546 1u6.3X4
C775 22u6.3X6
C776 22u6.3X6
CP7
PCH_1VSB
PLACE UNDER THE PCH

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

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5VDUAL
R757 X_47K/4
PCH_1VSB_EN
PCH_1VSB_EN 60
C658 X_0.1u16X/4
0728: Change net name
ATX_5VSB
R768 10K/4
OPC_1P8_EN#
Q98 2N7002
C676 X_0.1u16X/4
Q99 2N3904
3VSB
R783 1K1%4
R782 2.21KR1%4
Vinafix.com
0902 : Stuff R when NO PCH_1P8 & V_OPC_1P8

PCH_1VSB_EN
40,42,46,59 SIO_SLPSUS
Q110 2N7002

MICRO-STAR INT'L CO.,LTD		
MS-7A72		
Size: Custom	Document Description: PCH Core Power-UP1540Q	Rev: 1.0
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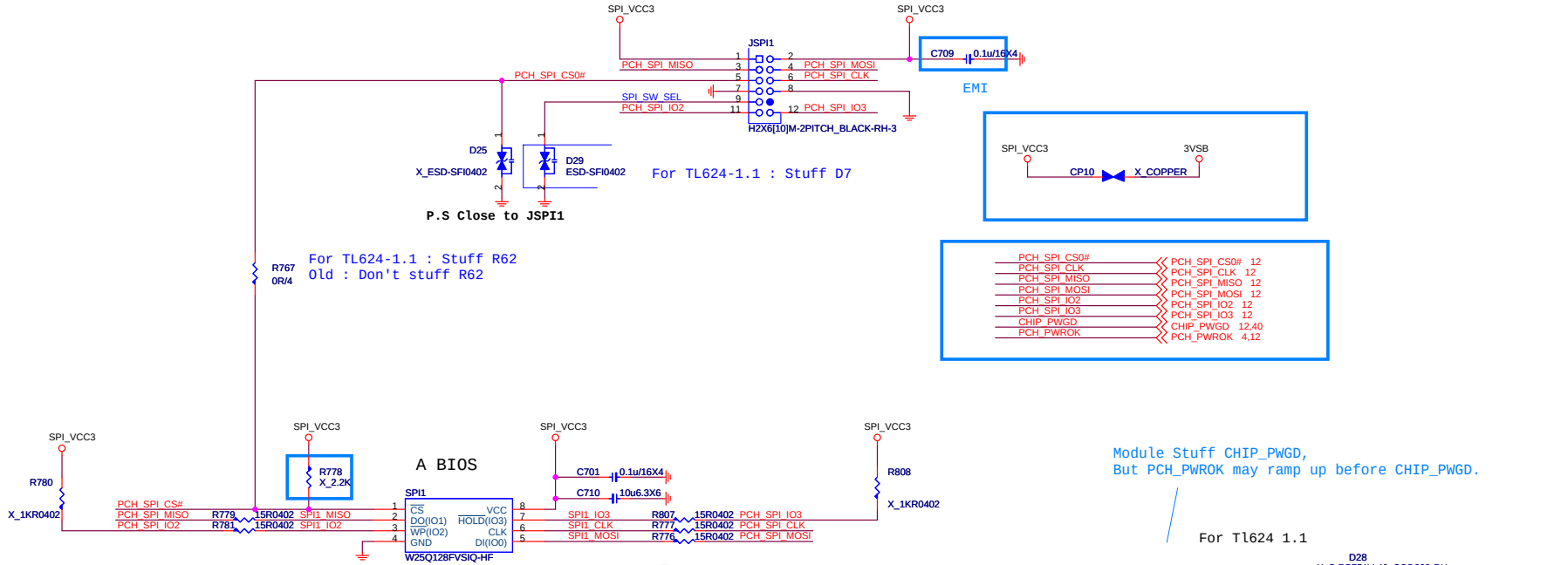

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7A72	
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Function 1		
IN		OUT
INPUT1	INPUT2	OUTPUT1
0	1	1
1	0	0
1	1	0
0	0	0

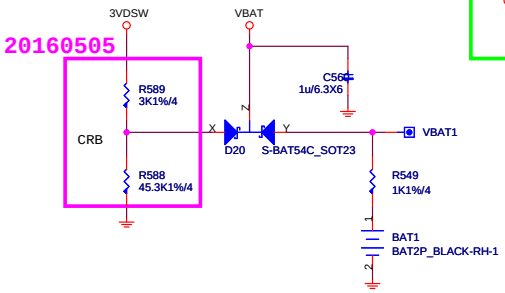
Default

Function 2				
IN		OUT		
INPUT3 & lowswitch EN	INPUT4	OUTPUT2	OUTPUT3	VOUT
0	0	0	1	1
1	0	1	1	0 (discharge)
0	1	1	0	0 (discharge)
1	1	1	0	0 (discharge)

Default

Co-Lay NOT U18 , Stuff R260

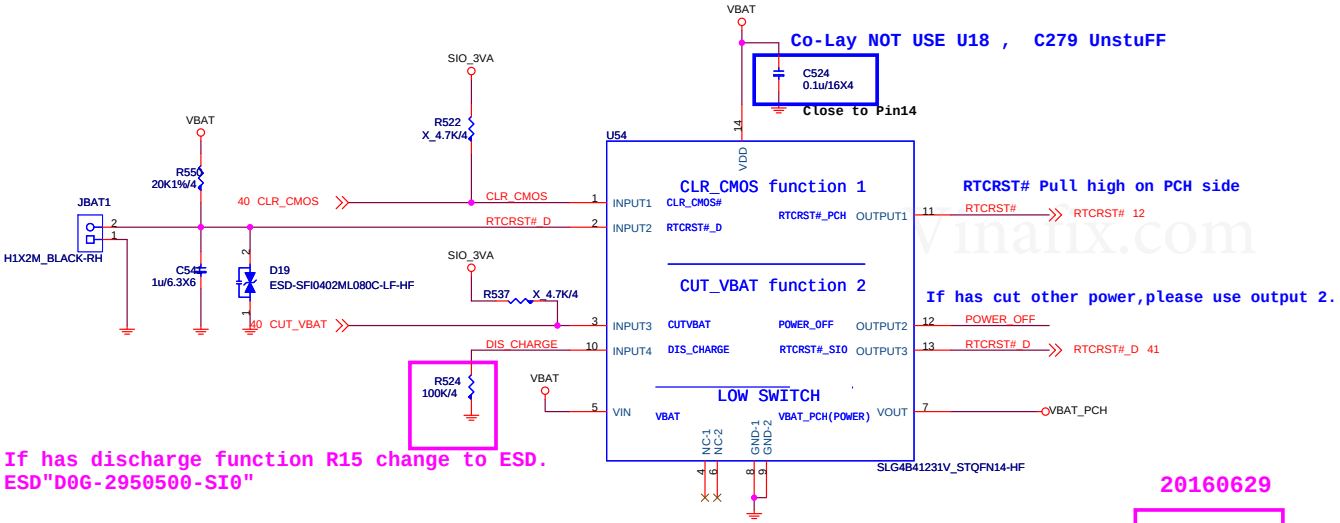
20160505



Co-Lay NOT USE U1 , R20 STUFF

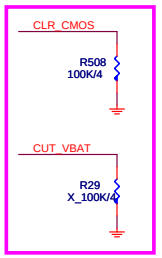
If STUFF R20 Please Check RTCRST# Double Pull High

Co-Lay NOT USE U18 , C279 UnstuFF

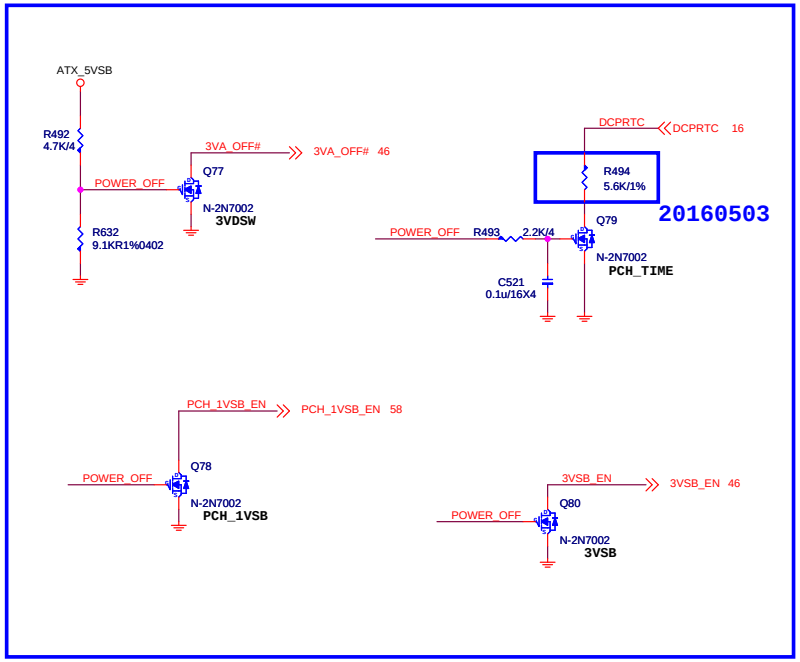


If has discharge function R15 change to ESD.
ESD"D0G-2950500-SI0"

20160629



Co-Lay NOT USE U1 , ALL UNSTUFF



MICRO-STAR INT'L CO.,LTD

MS-7A72

Size: Custom | Document Description: SLG46117V | Rev: 1.0

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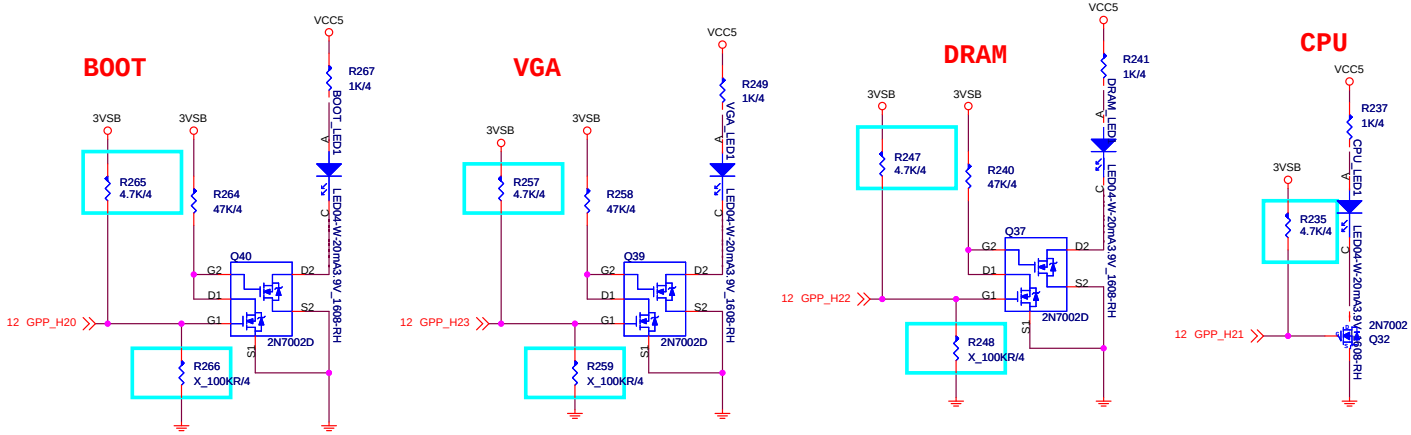
EZ Debug



Vinafix.com

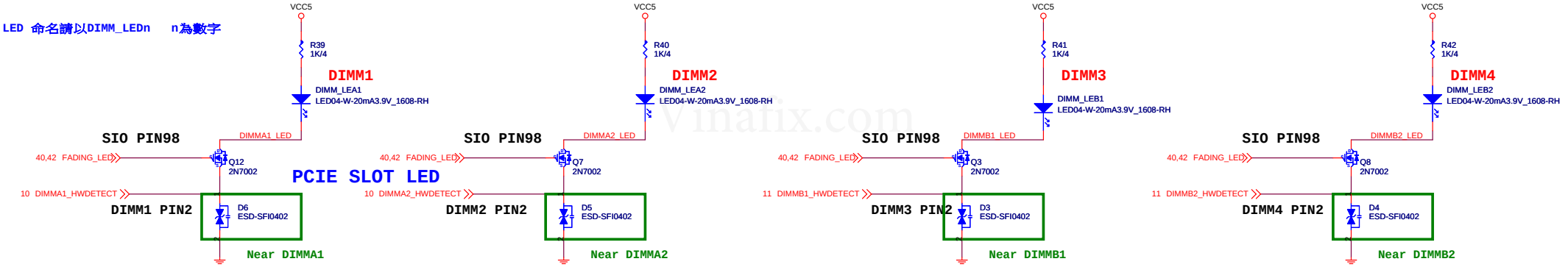
TOP LED

紅 M:D0C-040P100-H91
S:D0C-040S500-E07

白 M:D0C-040T200-H91
S:D0C-040S200-E07

DIMM

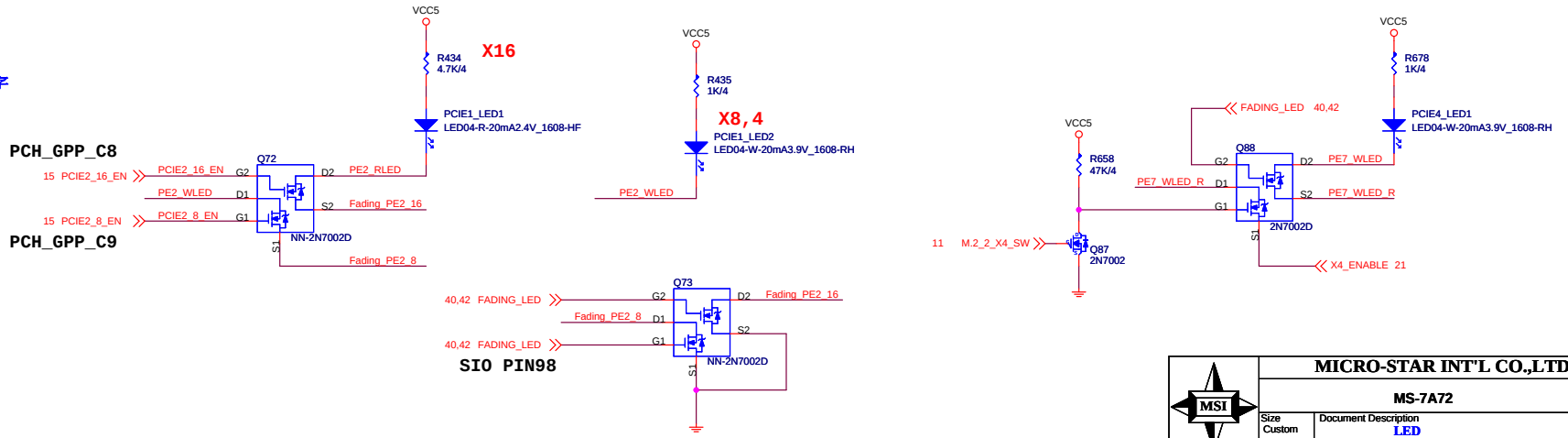
LED 命名請以DIMM_LEDn n為數字



PCIE

PCIE SLOT LED 命名請以PCIE_LEDn n為數字

GPIO / LED	GPP_C8	GPP_C9
亮	GPO PO HIGH	GPO PO HIGH
滅	GPI (default LOW)	GPI (default LOW)



Vinafix.com

MSI	MICRO-STAR INT'L CO.,LTD		
	MS-7A72		
Size Custom	Document Description LED		Rev 1.0
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PCB

PCB1

7A72_10

PD0-07A7210-G37,精成-深圳,23,寶安恩斯邁廠(MSIS)
PD0-07A7210-G37,精成-深圳,77,寶安恩斯邁廠(MSIS)
PD0-07A7210-E48,競華,23,寶安恩斯邁廠(MSIS)
PD0-07A7210-E48,競華,77,寶安恩斯邁廠(MSIS)

CPU Socket

CPU_H1

CPU
鐵座

CPU_H1

HDMI_LABLE

Label
HDMI

HDMI LABEL

HDMI Virtual Part Number

Battery

BAT1_X1

BAT-BCR2032P-RH

LABLE1

Label
THX

USB3.1

MKT_LABLE

MKT

MKT

MKT_B250

MKT

MKT

MKT_H270

MKT

MKT

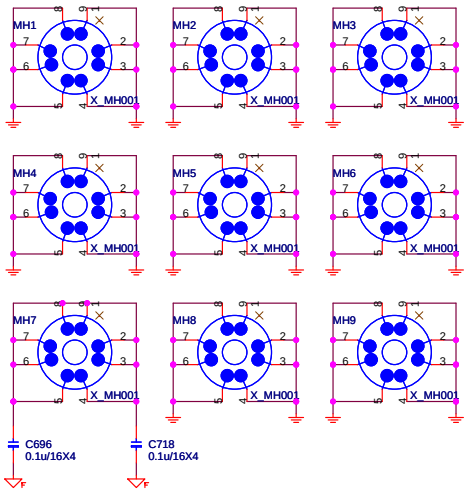
BIOS Label

AMI_LABLE

AMI_BIOS
LABLE

BIOS_LABLE

Mounting Holes



PCH_H270

Z170

GS1-M1SPG53-Q1S

Makeket name

PCH_B250

Z170

GS1-M1SPG53-Q1S

Makeket name

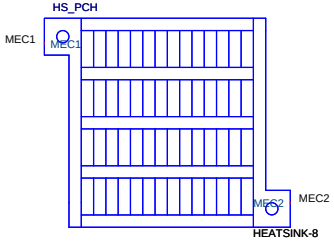
SPI_BH

Z170

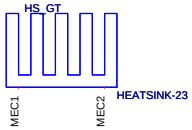
GS1-M1SPG53-Q1S

Makeket name

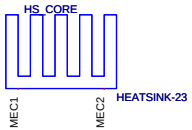
HS_PCH



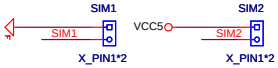
MOS1 Heatsink



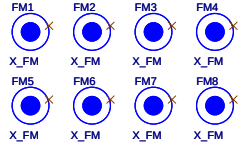
MOS2 Heatsink



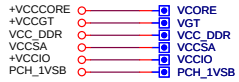
Simulation

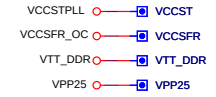


Optical Fiducial Marks-120



Test point





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Size	Document Description	Rev
Custom	Manual parts	1.0

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