

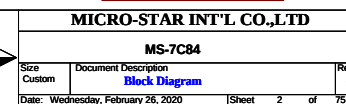
AMD AM4

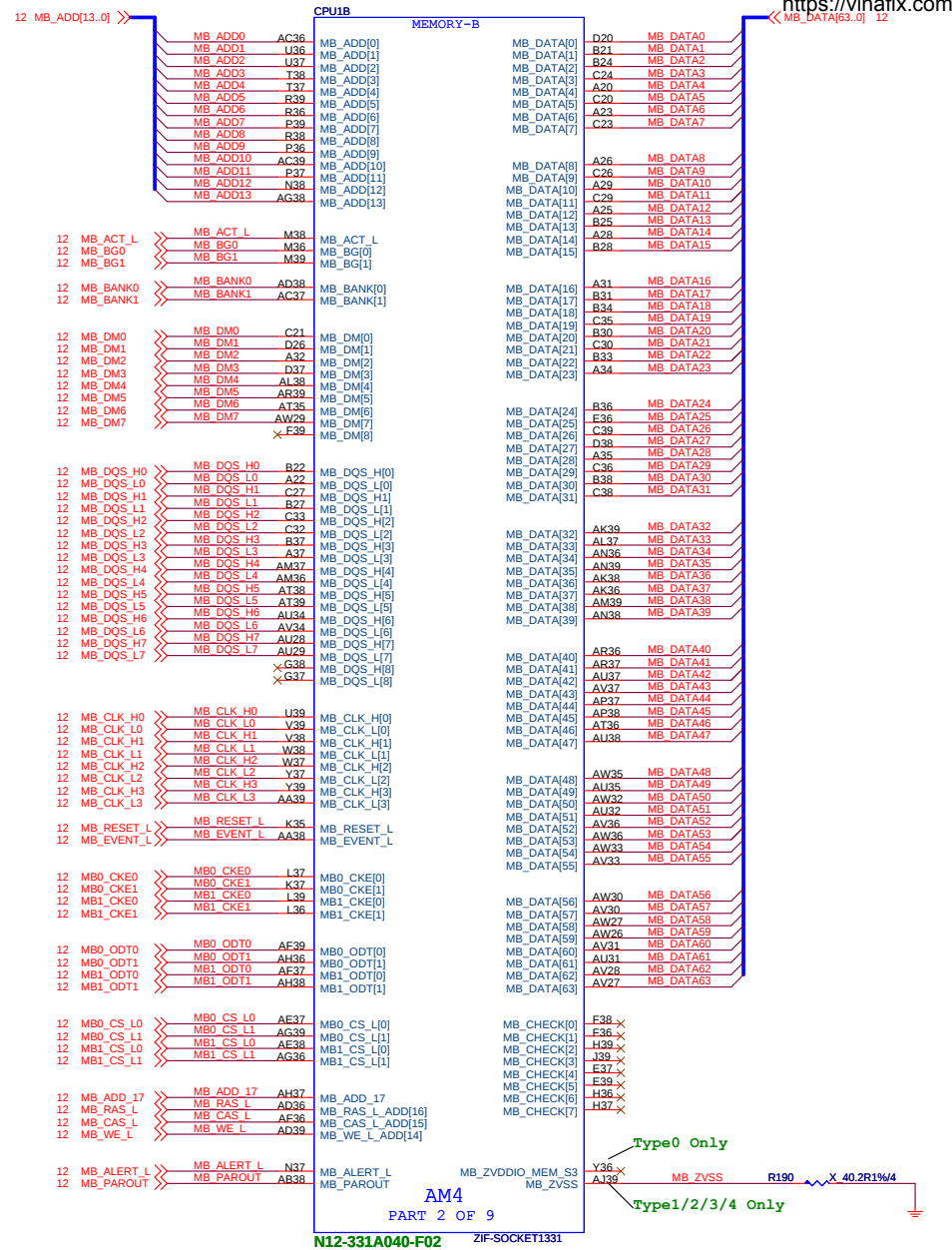
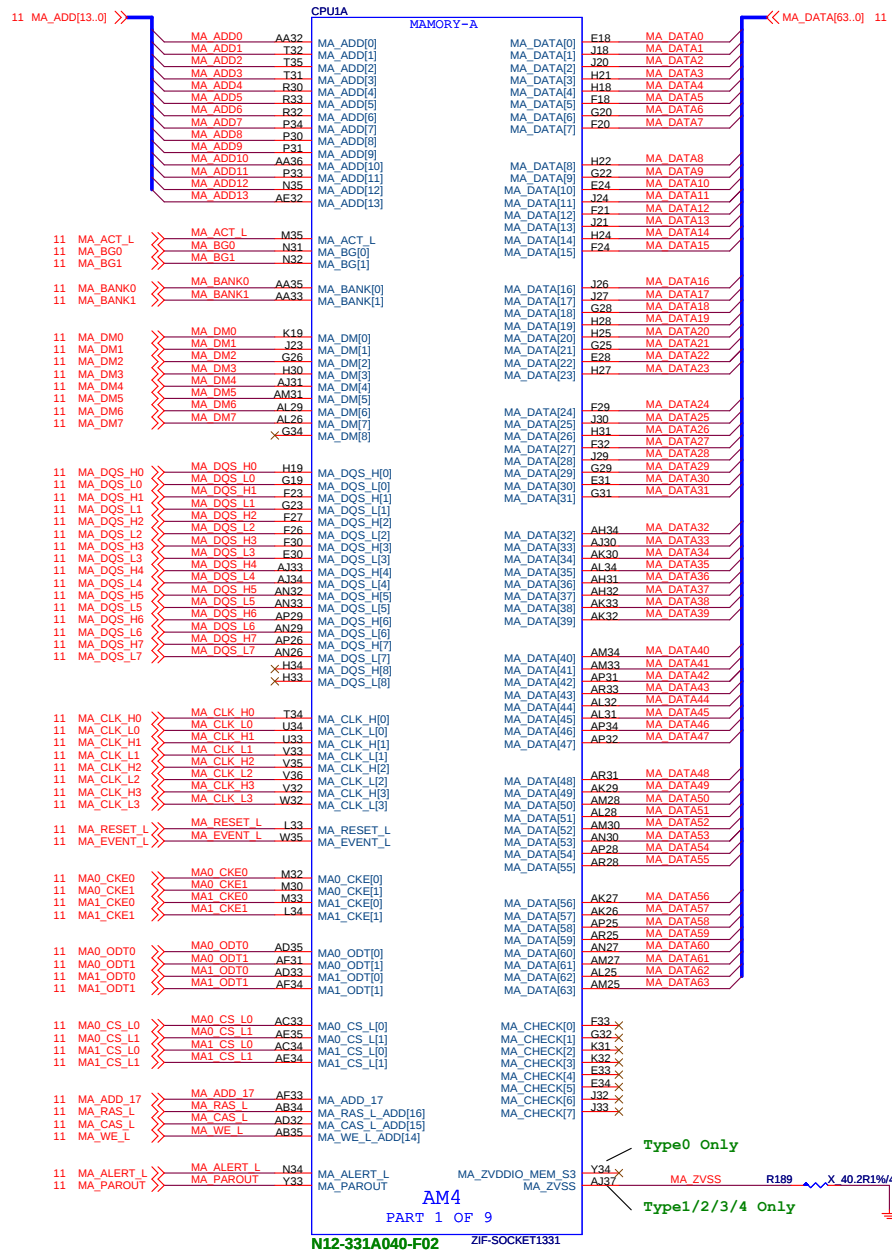
GAMING EDGE AC

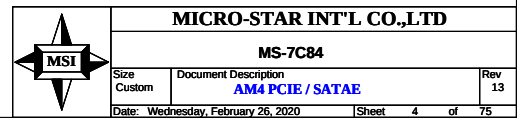
01	Cover Sheet	36	LAN - I211AT	66	MCU - LED Control
02	Block Diagram	37	Audio ALC1220P-VB	67	LED - Power / JPIPE
03	FM4 DDR4 I / F	38	Audio DePop	68	LED - JLED1 / 2 / 3 / 4
04	AM4 PCIE / SATAE	39	USB Power - UP7501	69	LED - Mystic Light - 1
05	AM4 Display / Audio	40	Front USB2.0 Header	70	LED - Mystic Light - 2
06	AM4 SVI / ACPI / GPIO	41	Front USB3.0 Header	71	BOM Option
07	AM4 LPC / SPI / USB / CLK / STRAP	42	Rear USB3.0 + PS2	72	Manual Parts
08-09	AM4 Power / VDDIO_AUDIO Power / GND	43	Rear USB3.0	73	PG MAP
10	RTC / CMOS	44	Rear USB3.1 Type A / redrive	74	GPIO MAP
11-14	DDR4 - POWER / GND	45	Rear USB3.1 Type A / mux	75	Power Sequence
15	Promontory - PCIE / SATA / SATAE	46	DP	76	Power Delivery
16	Promontory - USB / OC	47	HDMI	77	History
17	Promontory - CLK / ACPI / GPIO	48	CPU power UP9505 10+2		
18-19	Promontory - Power / GND	49	CPU power Phase 1-4		
20	PCI_E2 (X16)	50	CPU power Phase 5-10		
21	PCI_E4 (X8)	51	CPU power NB 1-2		
22	PCIE Switch X16 / X8	52	CPU power NB_S5		
23	PCI_E1_E3_E5 (X1)	53	CPU power 1.8_S0 / S5		
24	PCI_E6 (X4)	54	CPU power VDDP - TPS56C215		
25	PCIE Switch X4 / M2_2	55	VRM PWRGD		
26	M.2_1	56	DDR Power - RT8125E		
27	M.2_2	57	DDR Power - VPP25 / VTT		
28	M.2_3 (WIFI+BT)	58	PROM - SY8288RAC / 1.05V		
29	SIO NCT6797D-M	59	PROM - GS7133 / 2.5V		
30	SIO HW Monitor / NCT7718W	60	OV Control - NCT3933		
31	FAN TYPE-J CPUFAN1	61	OV 12VIN - RT9553B		
32	FAN TYPE-J PUMPFAN1	62	ACPI - 3VSB / 5VDIMM		
33	FAN TYPE-K SYSFAN1/2	63	ATX Power - FrpntPanel / EMI		
34	FAN TYPE-K SYSFAN3/4	64	LED - EZDEBUG / AMP		
35	FAN GPIO NCT5605	65	LED - DIMM / PCIE SLOT		

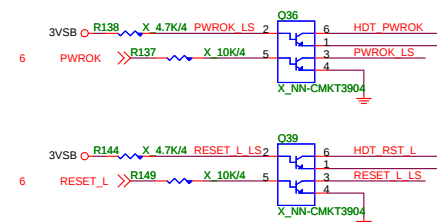
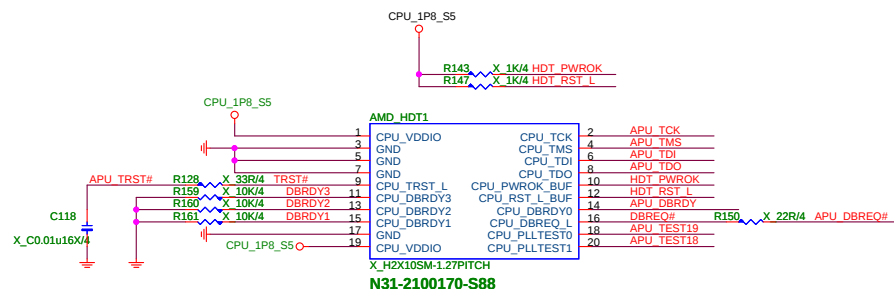
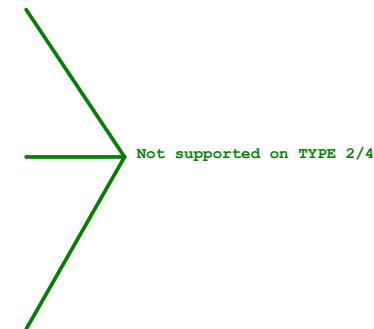


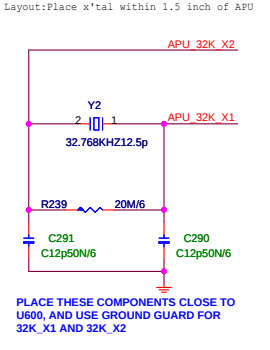
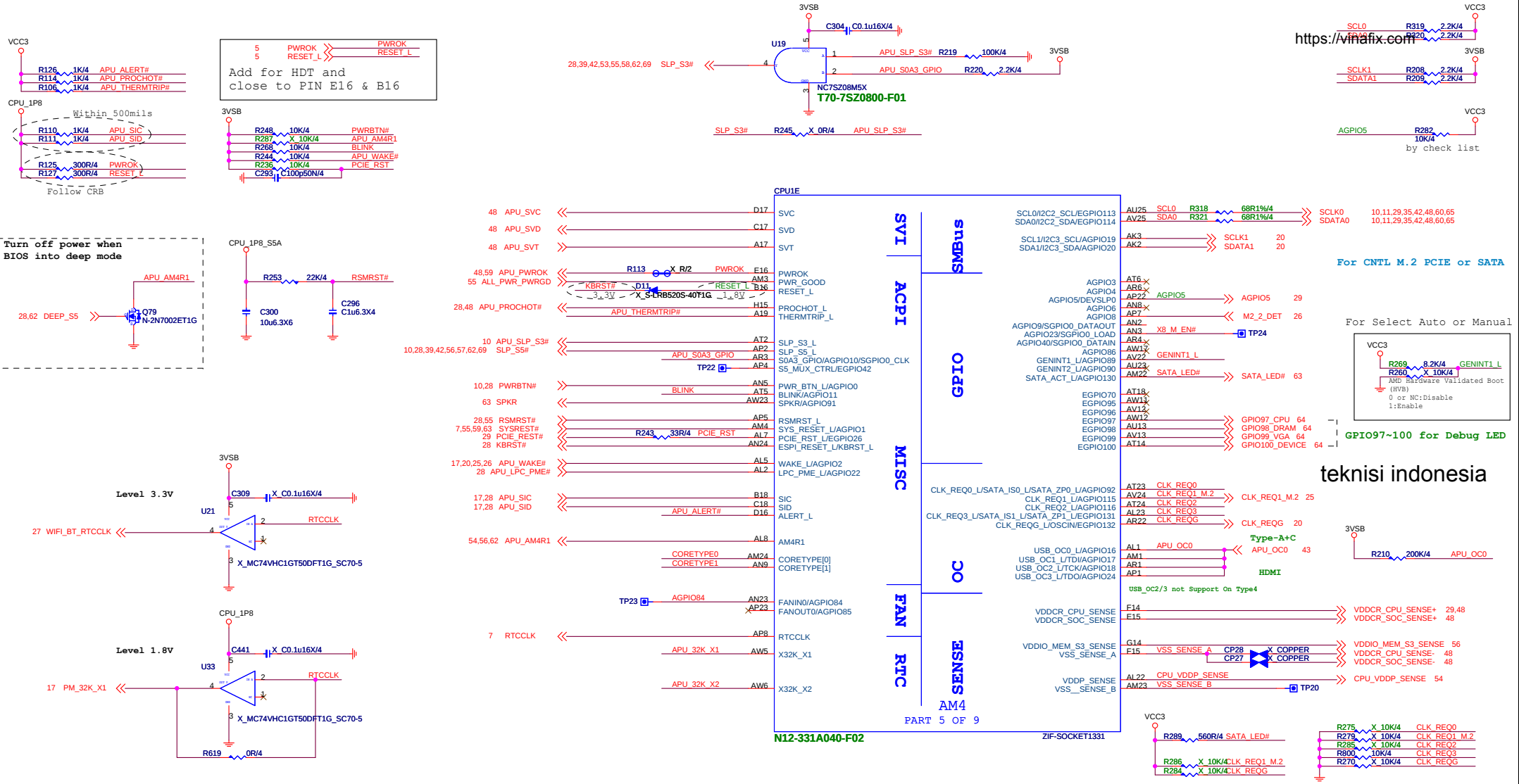
MICRO-STAR INT'L CO.,LTD			
MS-7C84			
Size Custom	Document Description Cover Sheet	Rev 13	
Date: Wednesday, February 26, 2020	Sheet	1	of 75





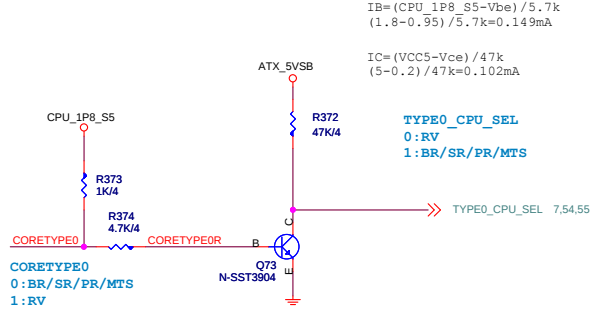






AM4 CPU TYPE Circuit

CORETYPE1 R288 1K/4 O3VSB



SPEC no Support

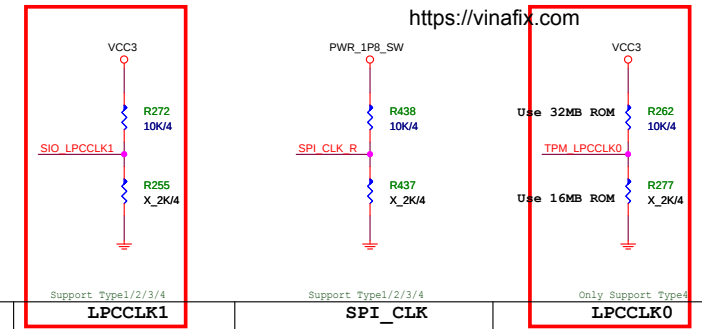
CPU	TYPE	CORETYPE 1	CORETYPE 0
BR	0	0	0
NA		0	1
SR	2	1	0
RV/ZP	3	1	1
MTS	4	1	1



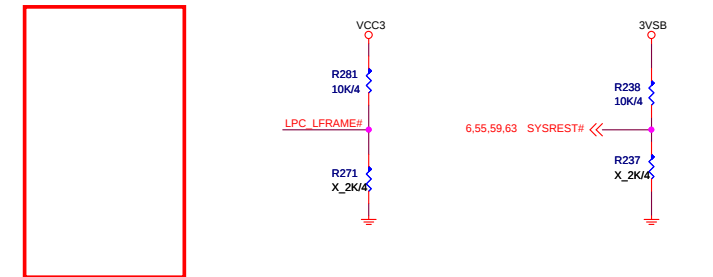
MICRO-STAR INT'L CO.,LTD			
MS-7C84			
Size	Document Description	Rev	
Custom	AM4 SVI/ ACPI/ GPIO	13	
Date:	Wednesday, February 26, 2020	Sheet	6 of 75

Strapping Options

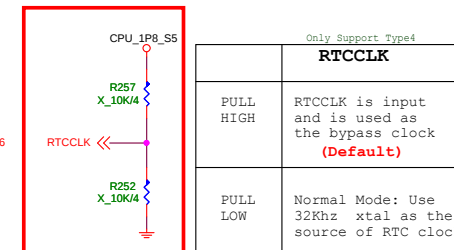
<https://vinafix.com>



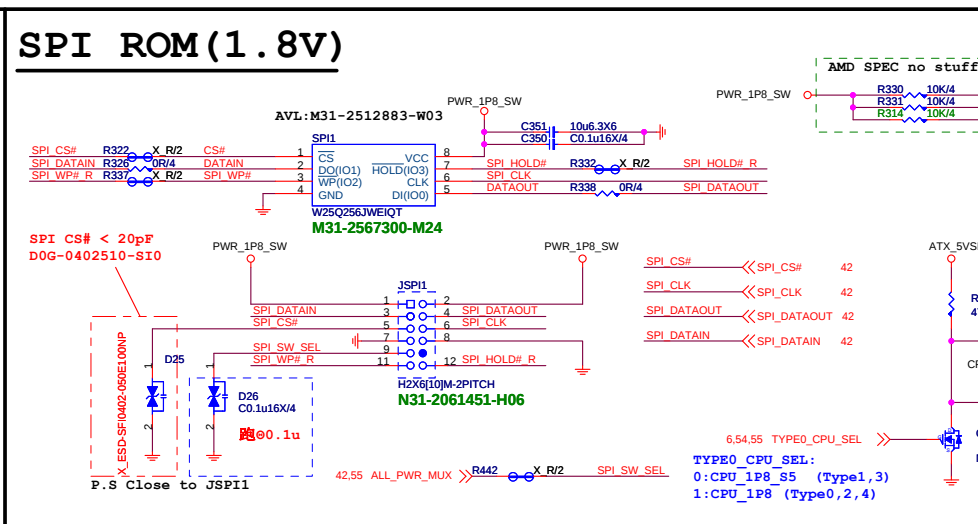
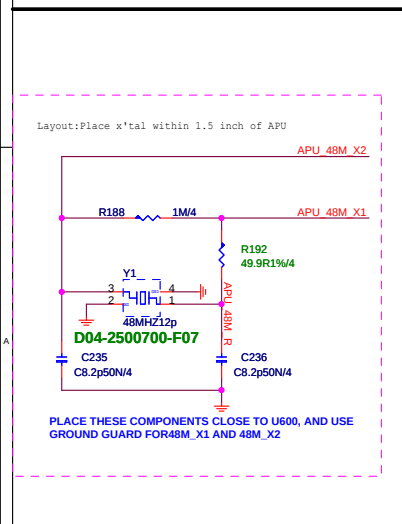
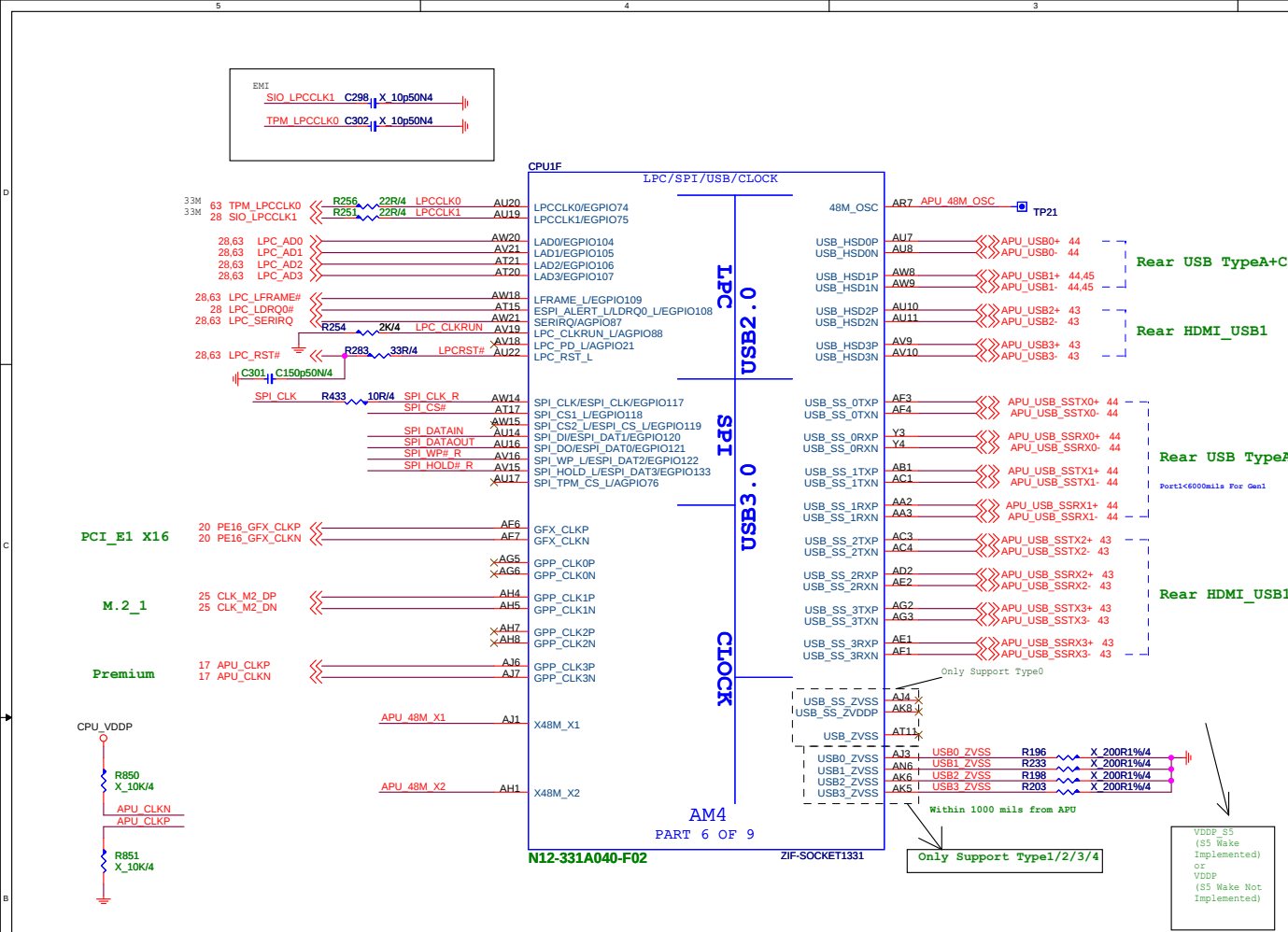
	LPCCLK1	SPI_CLK	LPCCLK0
PULL HIGH	Configured for Internal clock generator (Default)	Use 48Mhz crystal clock and generate both internal and external clocks (Default)	PSP should modify SPI page register bits [25:24] to remap physical ROM to upper image (Default)
PULL LOW	Configured for External clock generator ????	Use 100Mhz PCIE clock as reference clock and generate internal clocks only	PSP should not modify SPI page register bits [25:24]



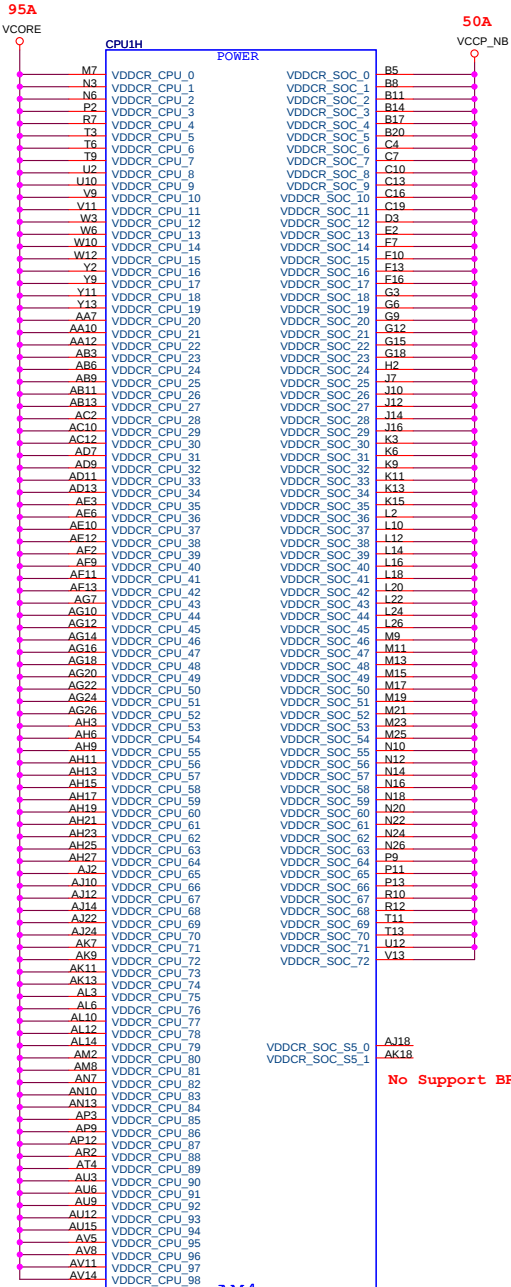
	AGPIO3	LFRAME	SYSREST#
PULL HIGH	Enhanced Reset logic (Default)	SPI ROM (Default)	Normal reset mode (Default)
PULL LOW	Traditional Reset logic	LPC ROM	short reset mode



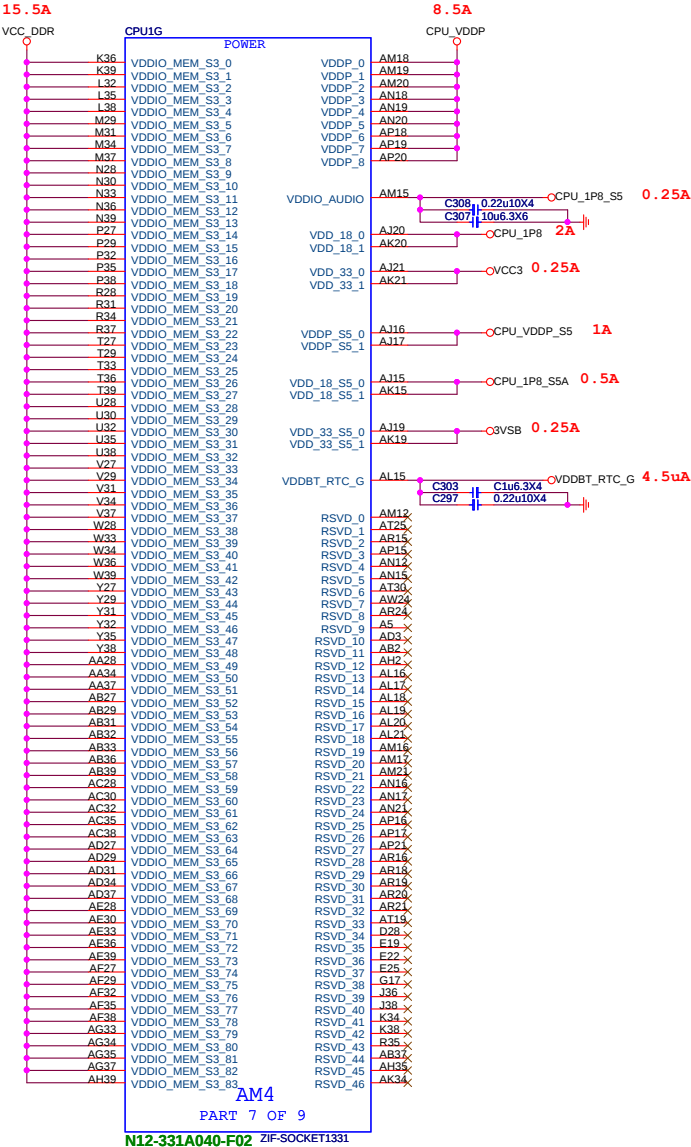
MICRO-STAR INT'L CO.,LTD		
MS-7C84		
Size	Document Description	Rev
Custom	AM4 LPC / SPI / USB / CLK / STRAP	13
Date:	Wednesday, February 26, 2020	Sheet 7 of 75

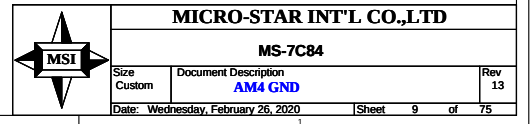


Vinafix.com

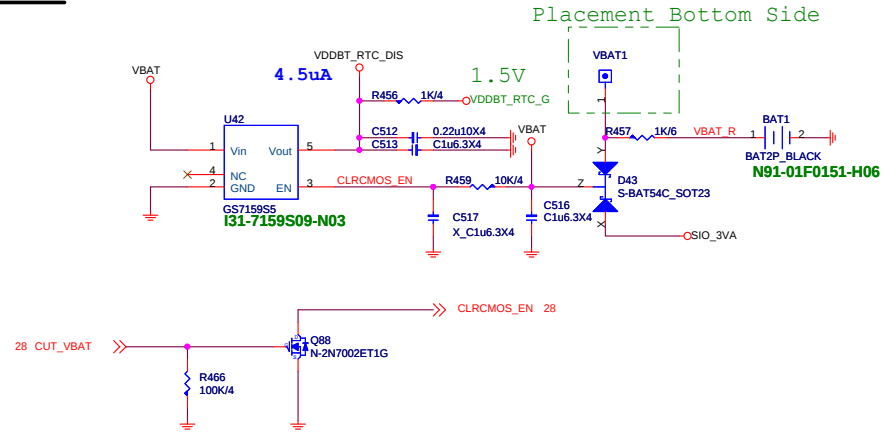


No Support BR SPEC

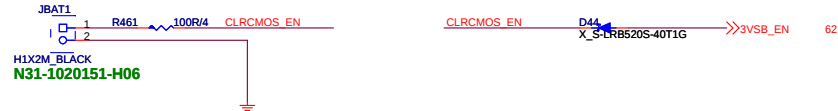




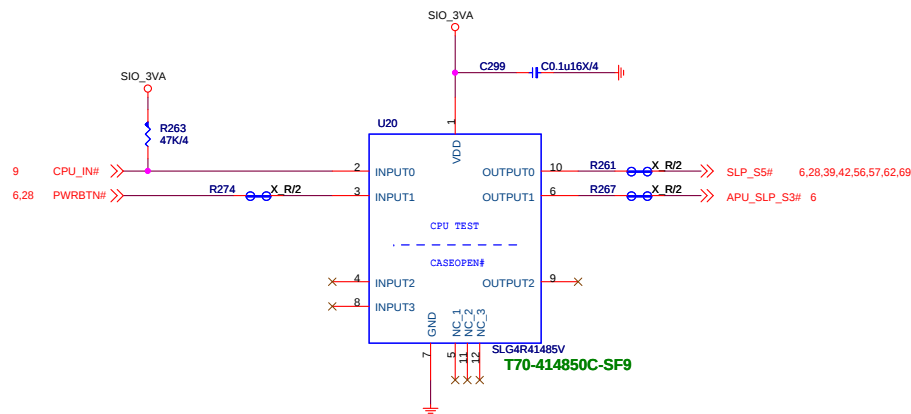
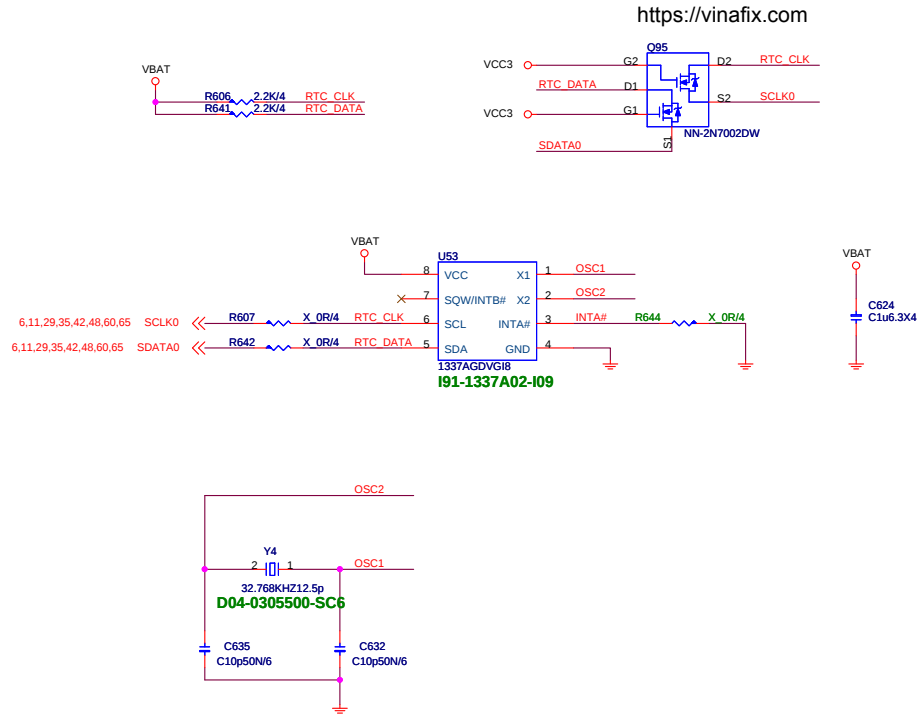
RTC & Clear CMOS Circuit

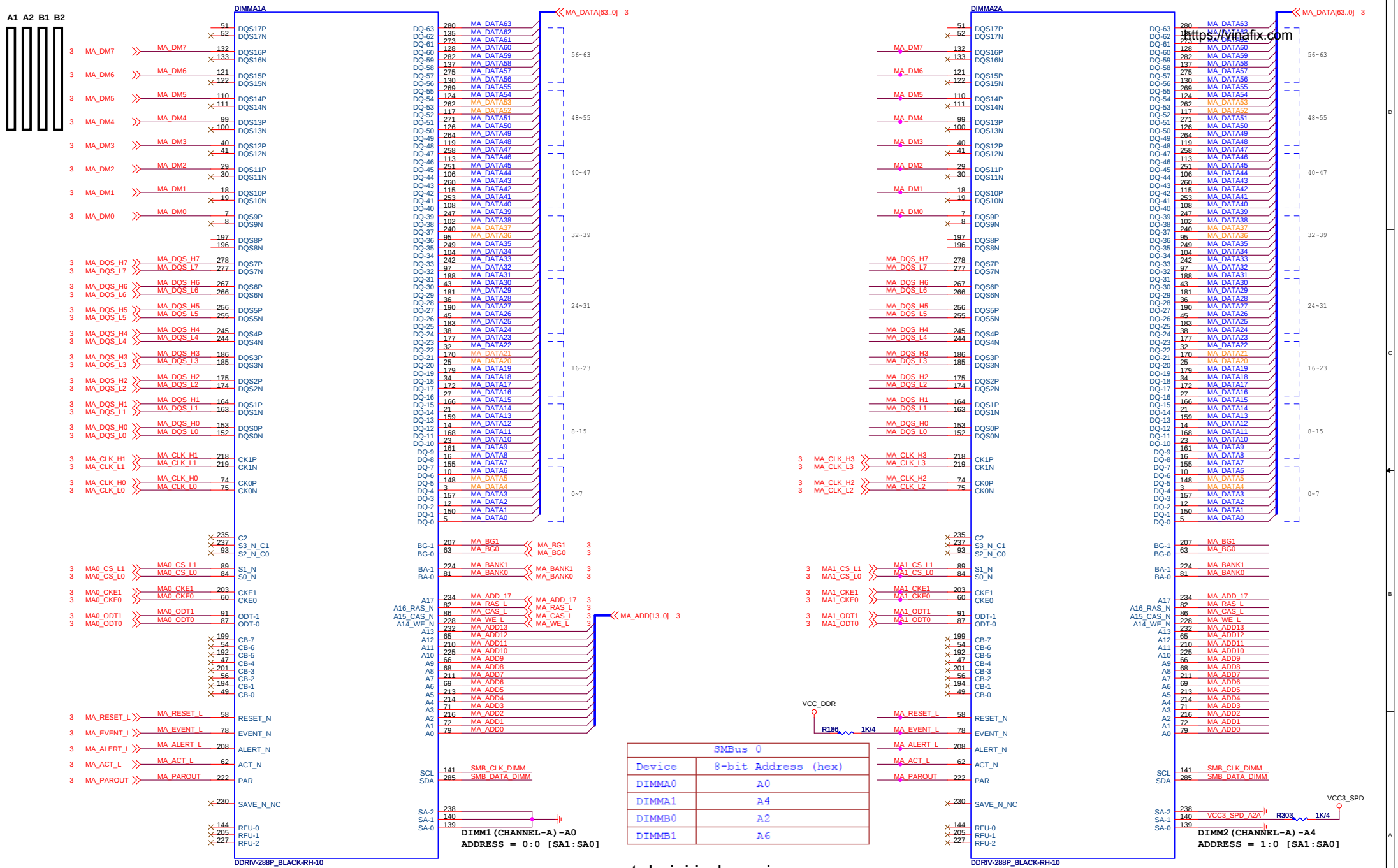


Clear CMOS button



RTC Backup





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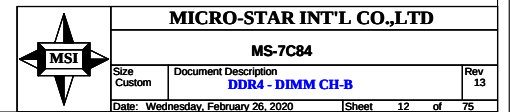
6,10,29,35,42,48,60,65 SCLK0 R333 X R/2 SMB_CLK_DIMM 12
6,10,29,35,42,48,60,65 SDATA0 R328 X R/2 SMB_DATA_DIMM 12

MICRO-STAR INT'L CO.,LTD

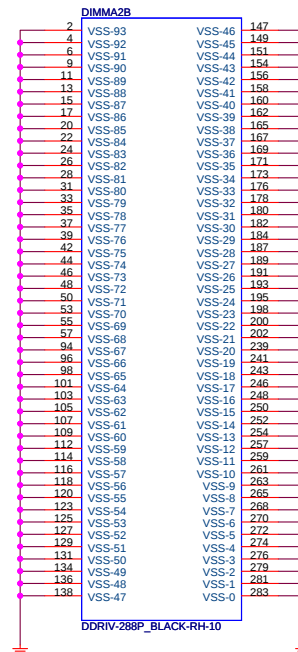
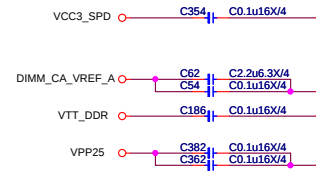
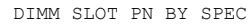
MS-7C84

Size Custom Document Description **DDR4 - DIMM CH-A** Rev 13

Date: Wednesday, February 26, 2020 Sheet 11 of 75



F5
VCC3 — 1 —  — 2 — VCC3_SPD
F-SPR-P260T-2.6A
D08-0301000-P16

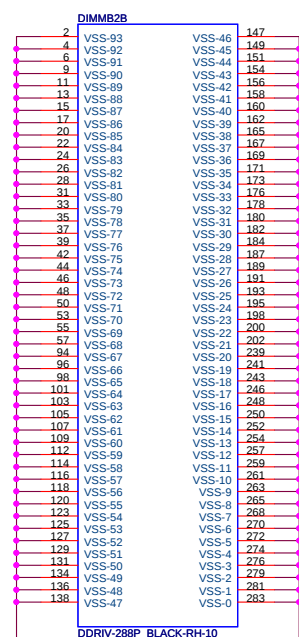
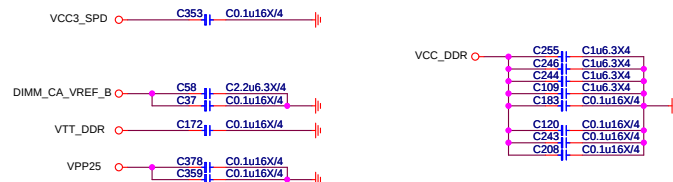
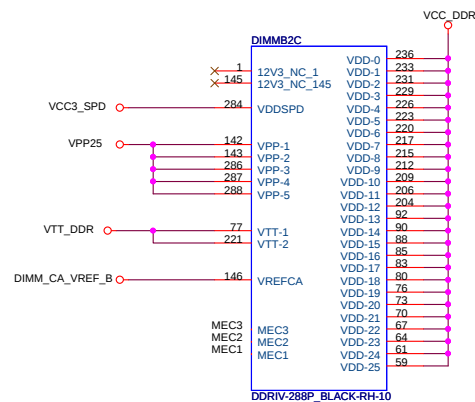
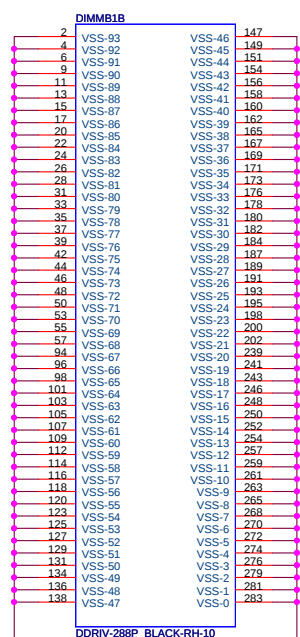
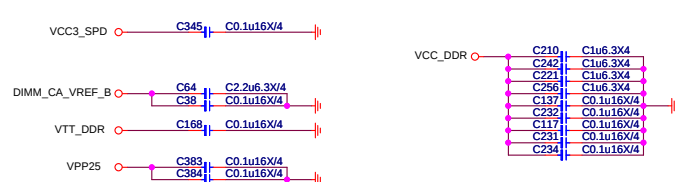
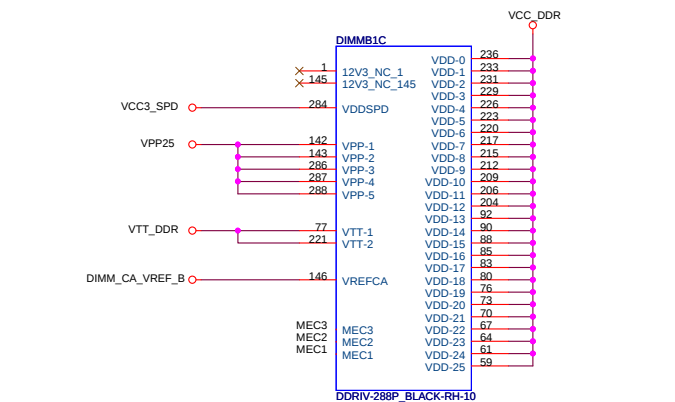


(place resistors close to DIMMs) <https://vinafix.com>



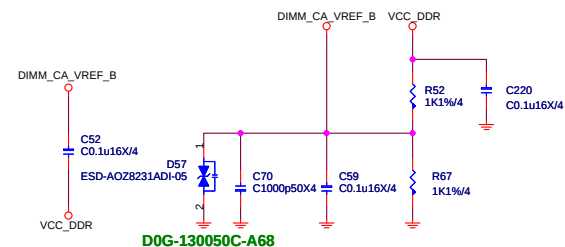
MS-7C84

Size Custom	Document Description DDR4 - POWER/GND-1	Rev 13
Date: Wednesday, February 26, 2020		Sheet 13 of 75



DDR VREF

(place resistors close to DIMMs) <https://vinafix.com>

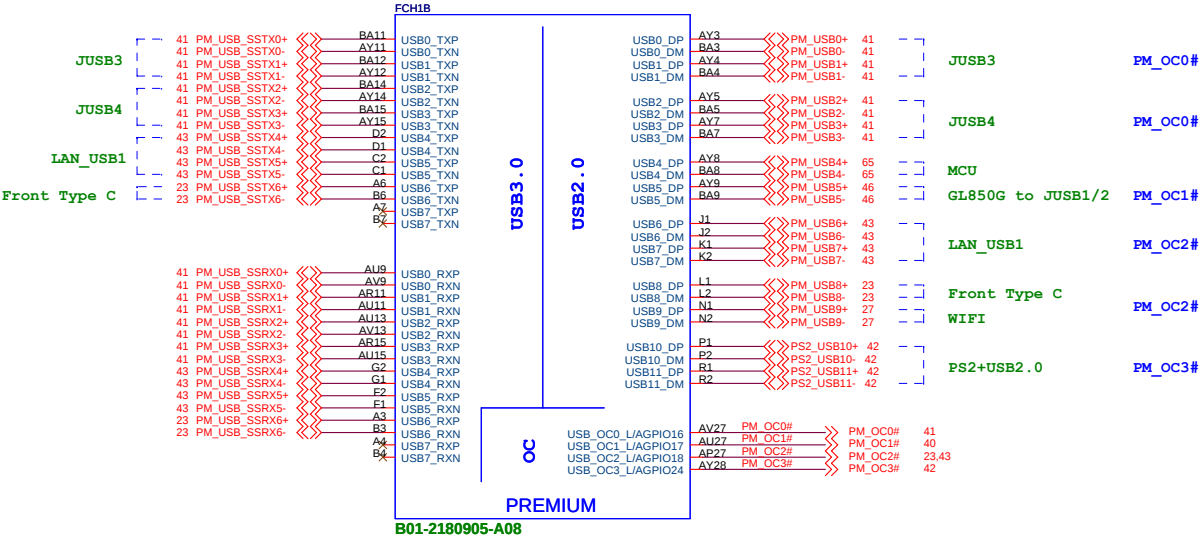


MICRO-STAR INT'L CO.,LTD

MS-7C84

Size Custom	Document Description DDR4 - POWER/GND-2
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Rev	13
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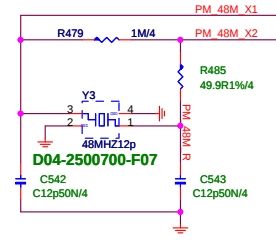
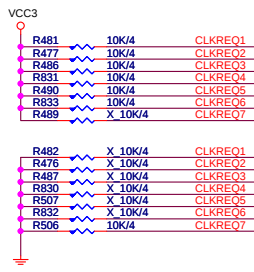
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USB 3.2 Port 0 - 3 and USB 2.0 Port 0 - 5	Host Controller 0 (HC0)	USB_OC0_L/AGPIO16 USB_OC1_L/AGPIO17
USB 3.2 Port 4 - 7 and USB 2.0 Port 6 - 11	Host Controller 1 (HC1)	USB_OC2_L/AGPIO18 USB_OC3_L/AGPIO24



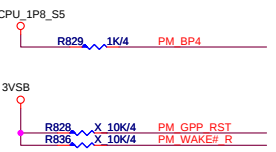
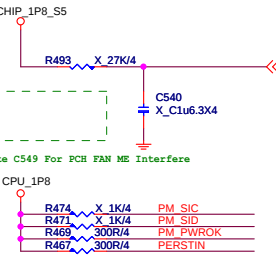
MICRO-STAR INT'L CO.,LTD

MS-7C84

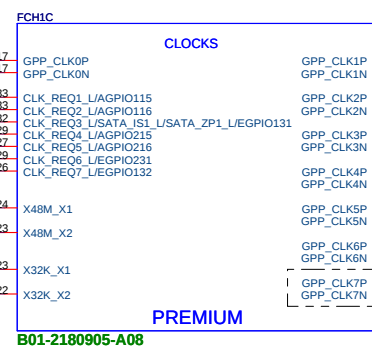
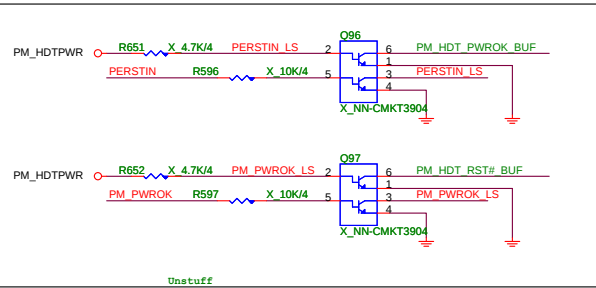
Size Custom	Document Description Premium - USB/OC	Rev 13
Date: Wednesday, February 26, 2020	Sheet 16 of 75	



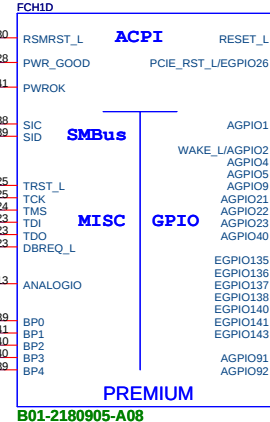
WIFI+BT
LAN
PCIE_E2
PCIE_E3
M_2_2



PREMIUM CHIPSET HDT

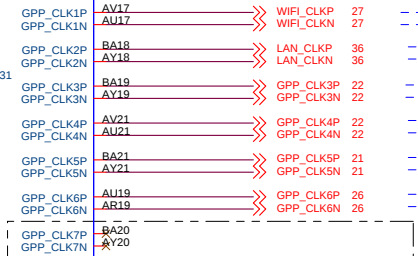


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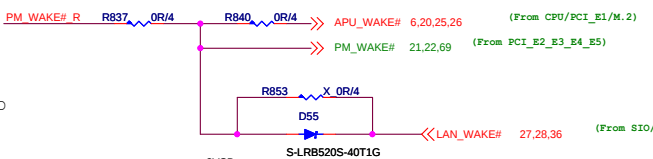
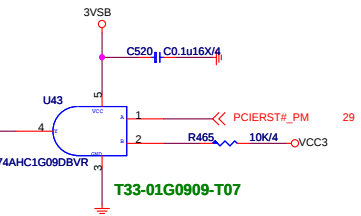


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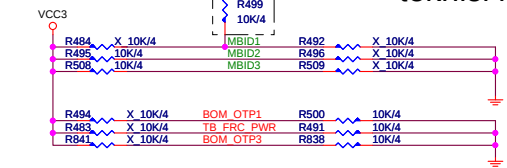
PREMIUM



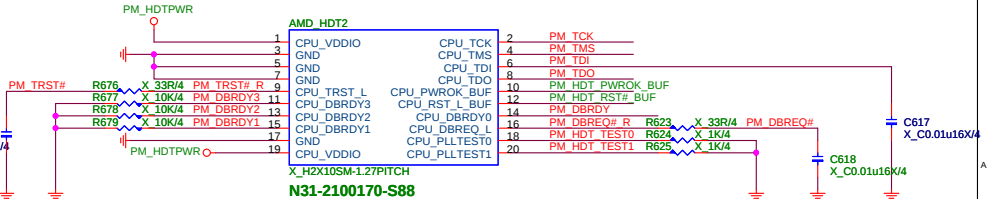
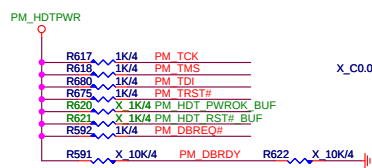
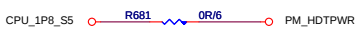
WIFI+BT
LAN
PCIE_E2
PCIE_E4x1
PCIE_E3x4
M2_2



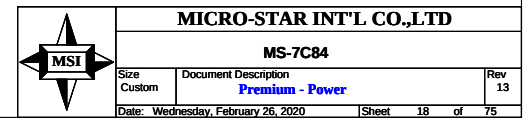
BOM OPTION

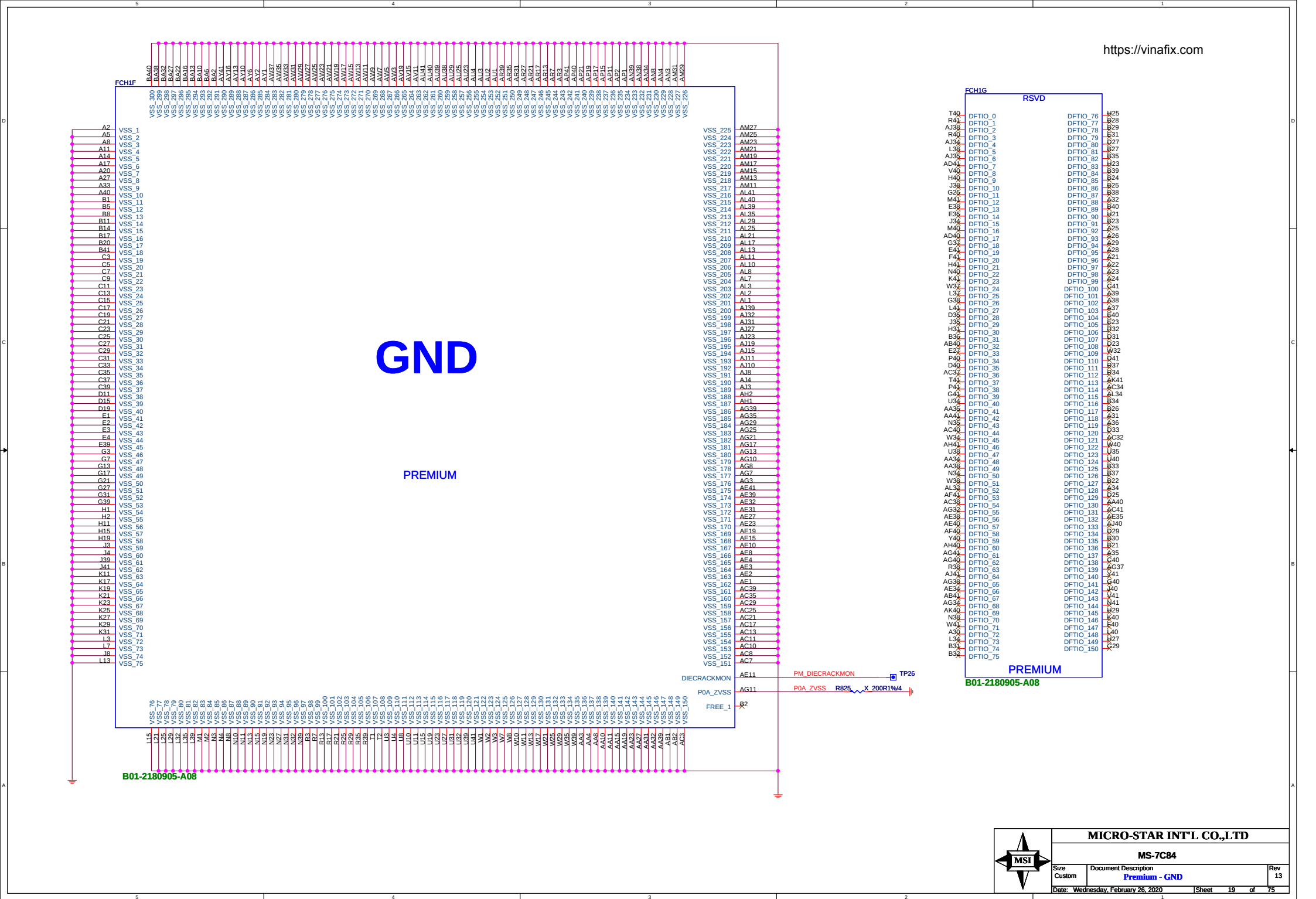


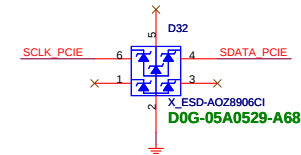
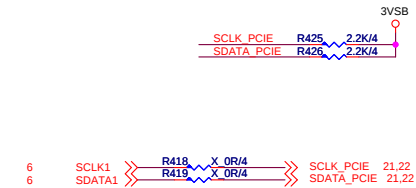
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MICRO-STAR INT'L CO.,LTD			
MS-7C84			
Size	Document Description	Rev	
Custom	Premium - CLK/ACPI/GPIO	13	
Date:	Wednesday, February 26, 2020	Sheet	17 of 75

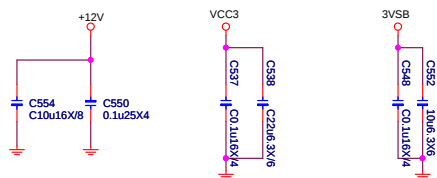




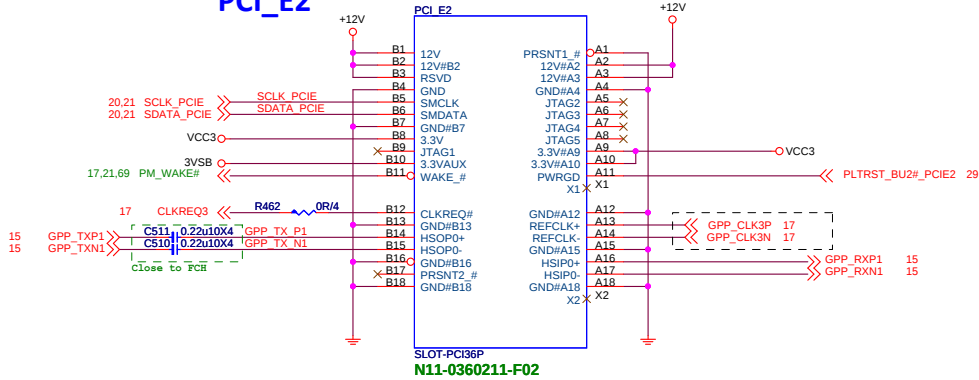
 PCI_E1

A circuit diagram showing a 12V battery connected to a 10uF capacitor. The battery is represented by a red circle with a '+' sign and the text '+12V'. The capacitor is represented by two parallel blue lines with the text 'C588' and 'C10u16X/8' next to it. The circuit is completed by a red ground symbol at the bottom.

	MICRO-STAR INT'L CO.,LTD		
	MS-7C84		
	Size Custom	Document Description PCI_E1 (X16)	Rev 13
	Date: Wednesday, February 26, 2020		Sheet 20 of 75

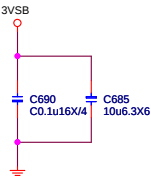
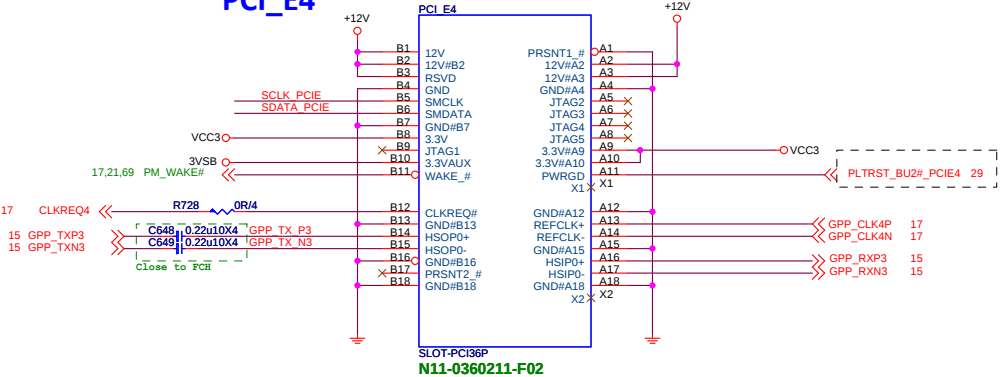


PCI_E2



PCI_E2 & PCIE_E4がち, PCIE_E2 & PCIE_E4 端TPCIE device PCIE_E4 線

PCI_E4



PCI Express x1 Slot *3

+12V	- 1.5 A
+VCC3	- 9A
+3V3_S5 (wake)	- 1125mA
+3V3_S5 (no wake)	- 60mA



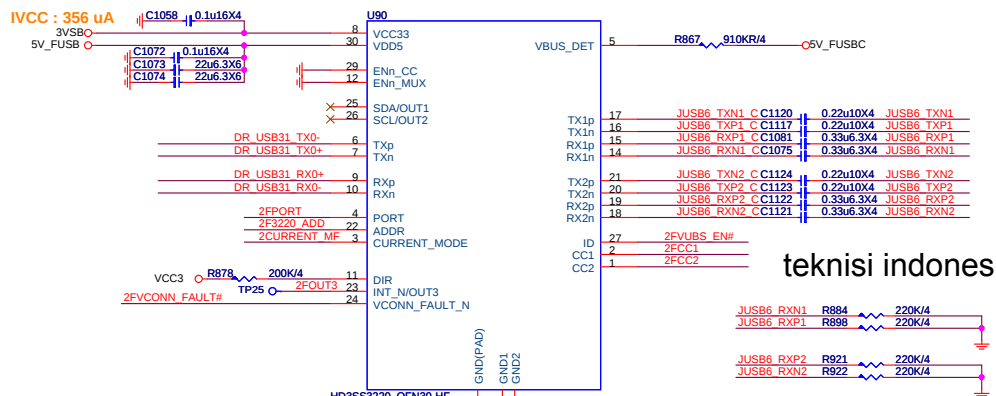
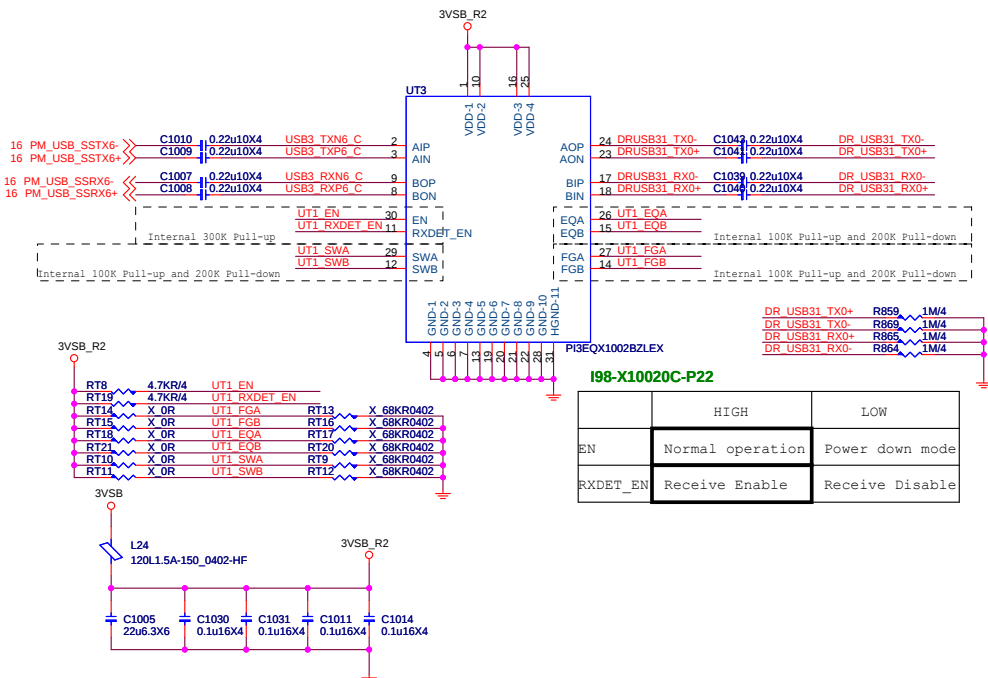
MICRO-STAR INT'L CO.,LTD

MS-7C84

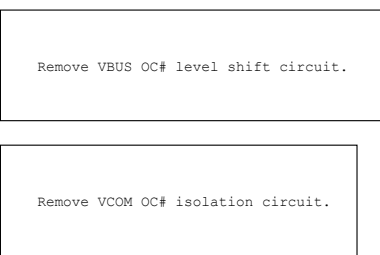
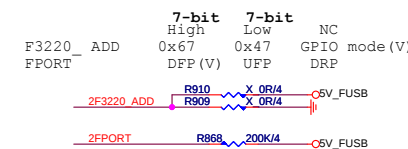
Size	Document Description	Rev
Custom	PCIE Switch PCI_E2 / E4 / E5 (X1)	13
Date:	Wednesday, February 26, 2020	Sheet 22 of 75

USB 3.1-Type-C USB Type-C MUX with Configuration Channel (CC)

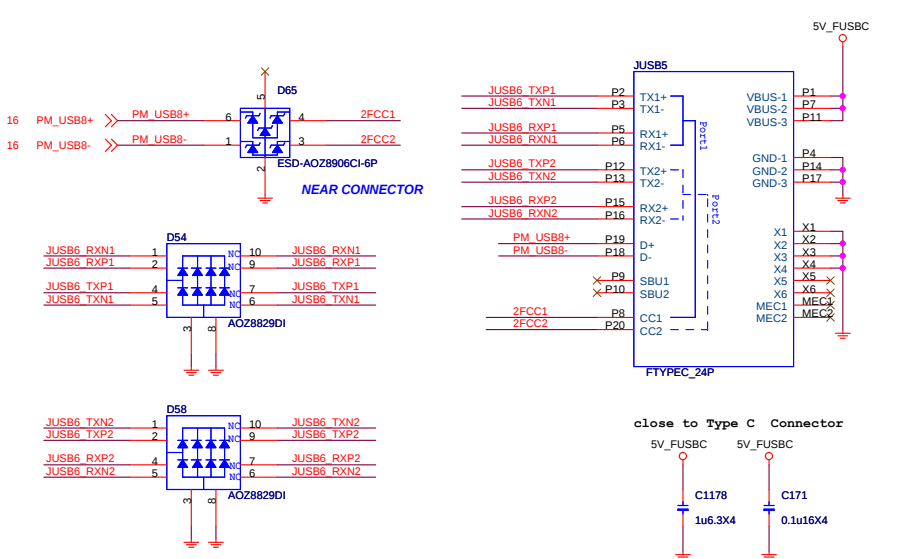
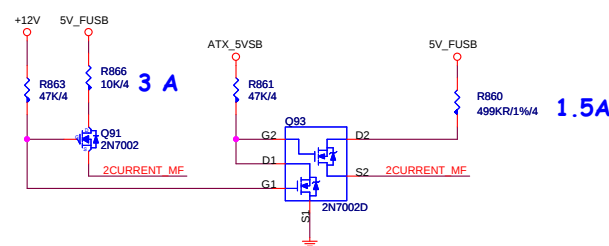
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Current Mode



ESD Protection
NEAR CONNECTOR

MICRO-STAR INT'L CO.,LTD
MS-7C84
Size Custom Document Description Front USB Type-C Gen2 Rev 13
Date: Wednesday, February 26, 2020 Sheet 23 of 75



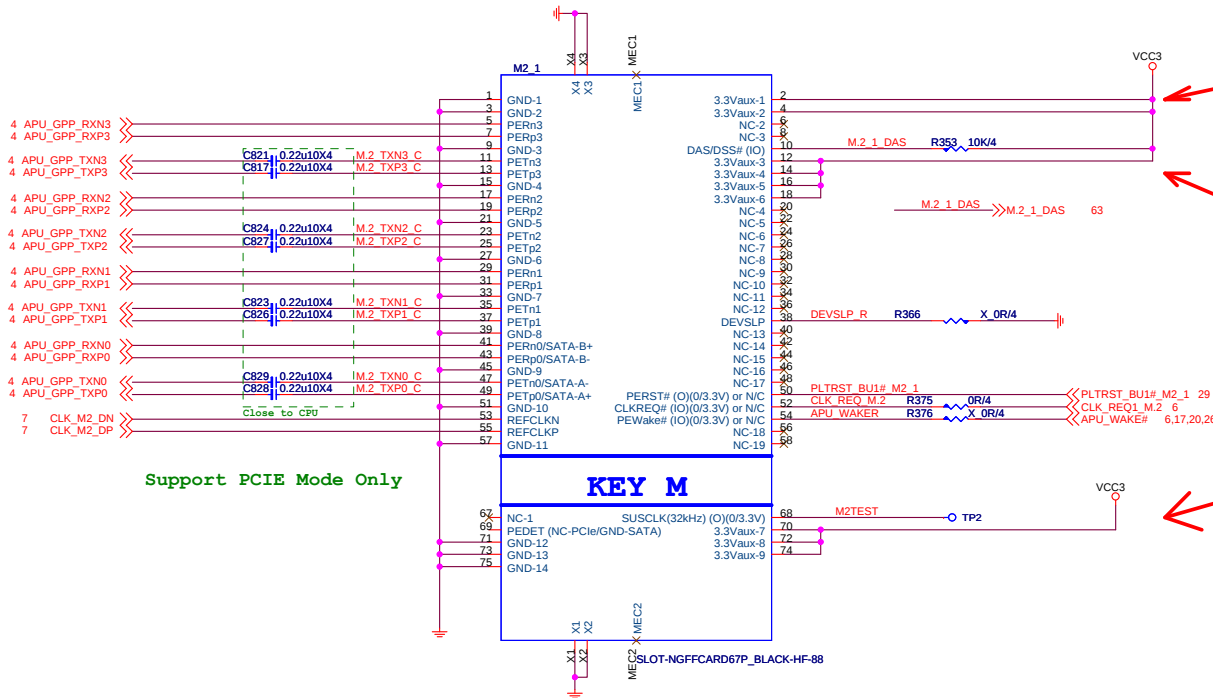
MICRO-STAR INT'L CO.,LTD		
MS-7C84		
Size Custom	Document Description LED Switch	Rev 13
Date: Wednesday, February 26, 2020		Sheet 24 of 75

M.2 1 Connector

VCC3 4.25A

Max: 14W

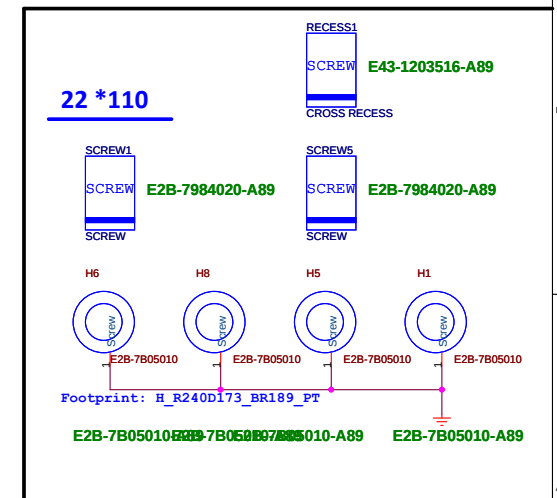
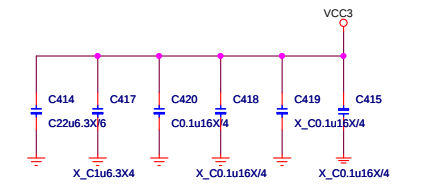
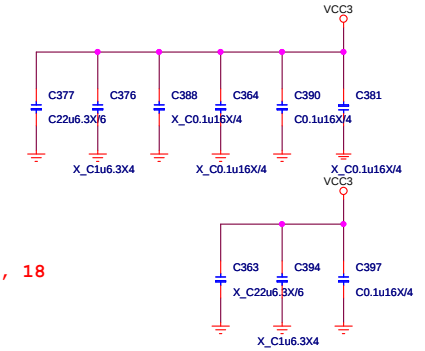
<https://vinafix.com>



Close to PIN2, 4

Close to PIN12, 14, 16, 18

Close to PIN70, 72, 74



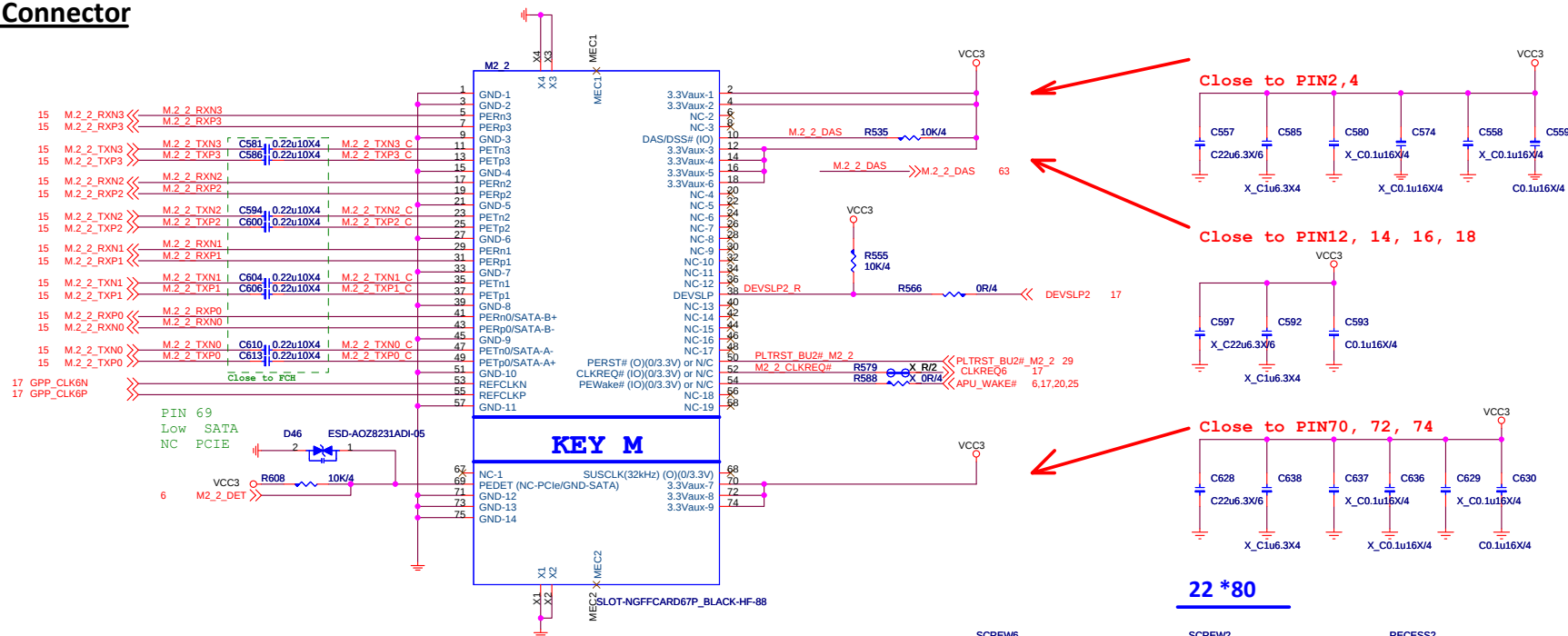
MICRO-STAR INT'L CO.,LTD

MS-7C84

Size	Document Description	Rev
Custom	M2_1	13
Date: Wednesday, February 26, 2020	Sheet 25 of 75	

M.2 2 Connector

VCC3 4.25A
Max: 14W
<https://vinafix.com>



Support PCIE and SATA Mode



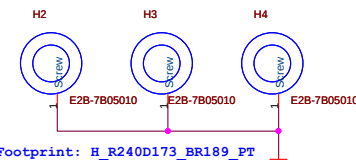
E2B-7984020-A89



E2B-7984020-A89



E43-1203516-A89



Footprint: H_R240D173_BR189_PT

E2B-7B05010-A89 E2B-7B05010-A89
E2B-7B05010-A89

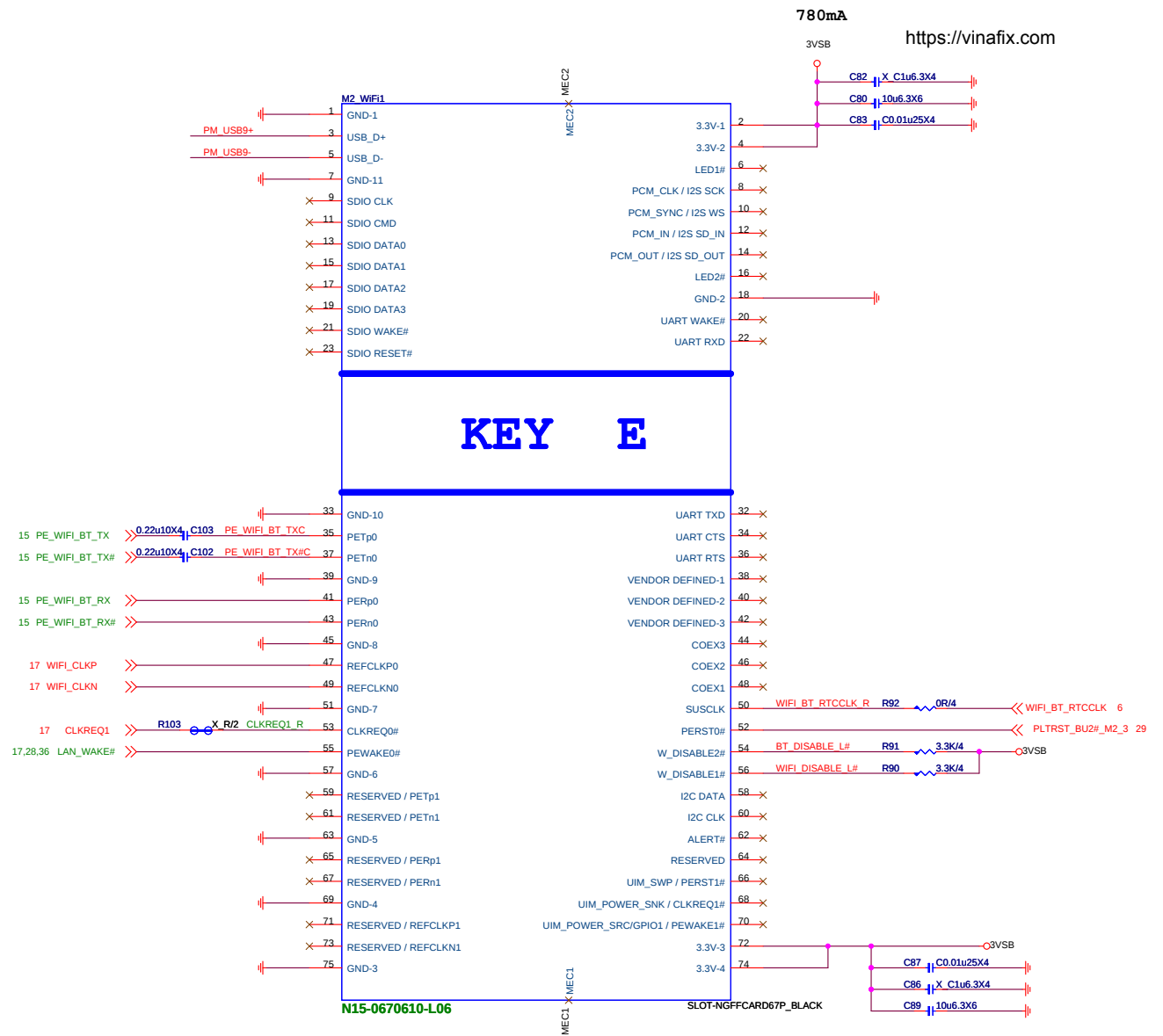
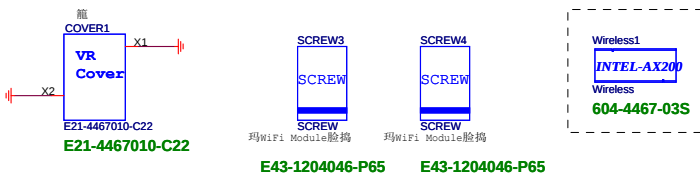
Vinafix.com



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MS-7C84

Size Custom	Document Description M2_2	Rev 13
Date: Wednesday, February 26, 2020		Sheet 26 of 75



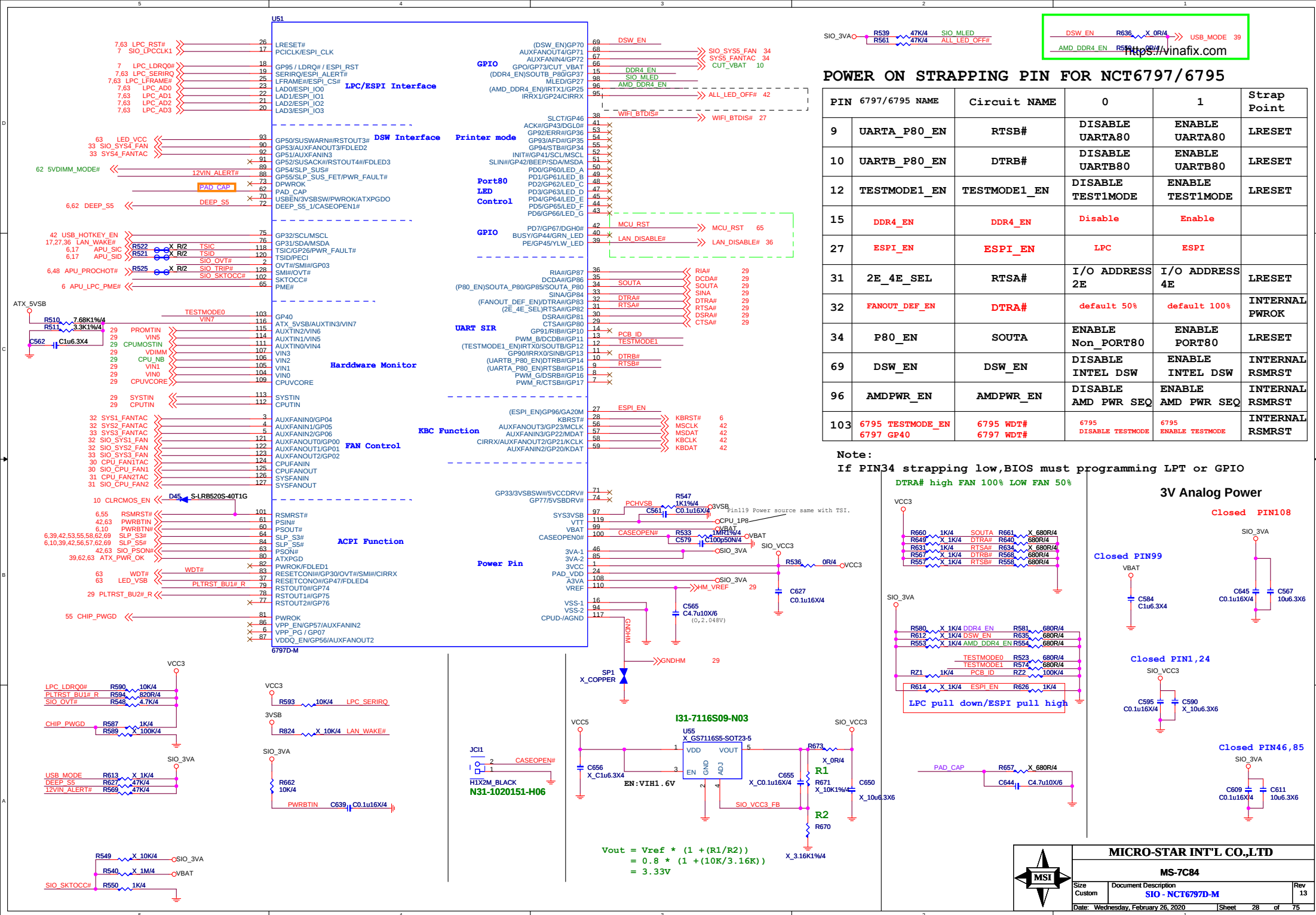
10uF+0.1uF+0.01uF at one end of socket in support of 3.3 V3V pins 2 and 4.
10uF+0.1uF+0.01uF at the other end of the socket in support of 3.3 V3V pins 70 and 72.



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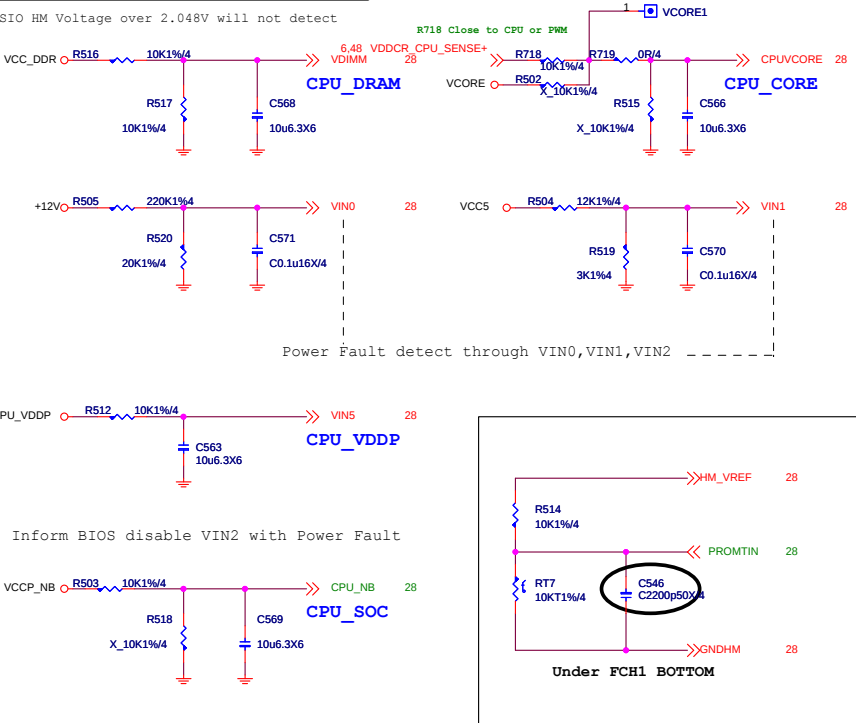
MS-7C84

Size Custom	Document Description M2_WIFI+BT	Rev 13
Date: Wednesday, February 26, 2020	Sheet 27 of 75	

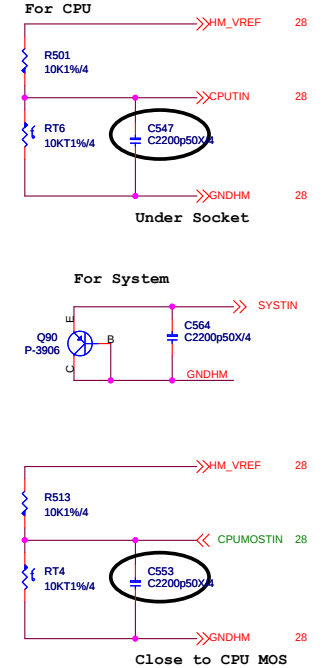


HW Monitor - Voltage

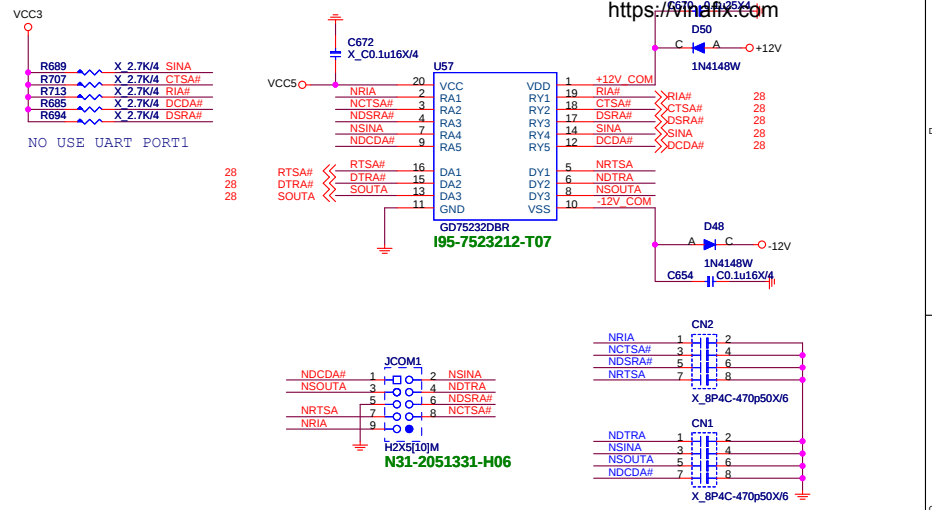
SIO HM Voltage over 2.048V will not detect



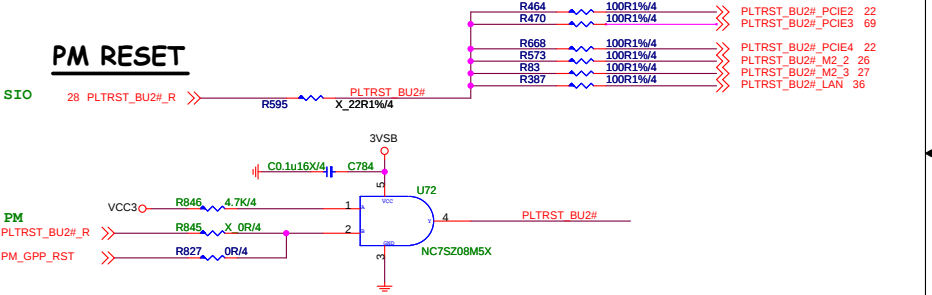
TEMP SENSOR



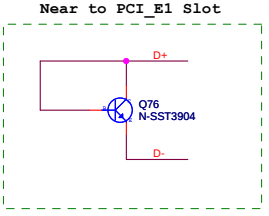
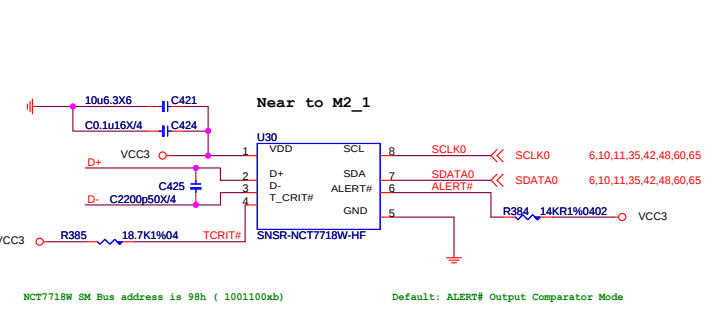
COM PORT



PM RESET

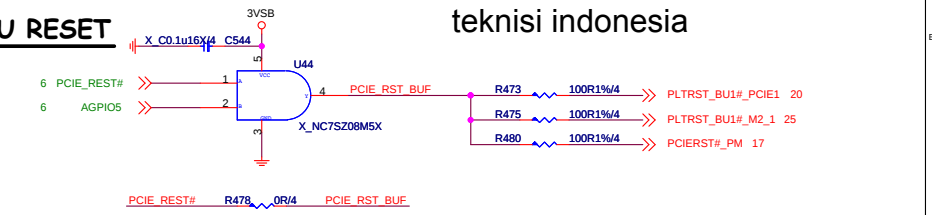


NCT7718W

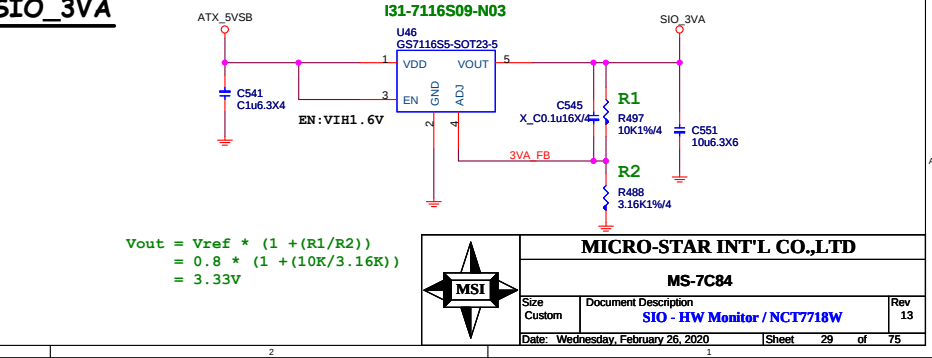


Layout notice:
1. Put the C1 2200pF to close the NCT7718W.
2. Add Ground Shielding For D+ and D- Traces.
3. D+/D- Route Has to be Away From the High Noise Area.
4. The Recommended Traces Width and Ground Shielding Spacing are 10mils.

CPU RESET



SIO_3VA



TEMPERATURE (°C)	T_CRIT#				
	2KΩ	7.5KΩ	10.5KΩ	14KΩ	18.7KΩ
ALERT#	2KΩ	77	87	97	107
	7.5KΩ	79	89	99	109
	10.5KΩ	81	91	101	111
	14KΩ	83	93	103	113
	18.7KΩ	85	95	105	115

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MS-7C84

Size	Document Description	Rev
Custom	SIO - HW Monitor / NCT7718W	13

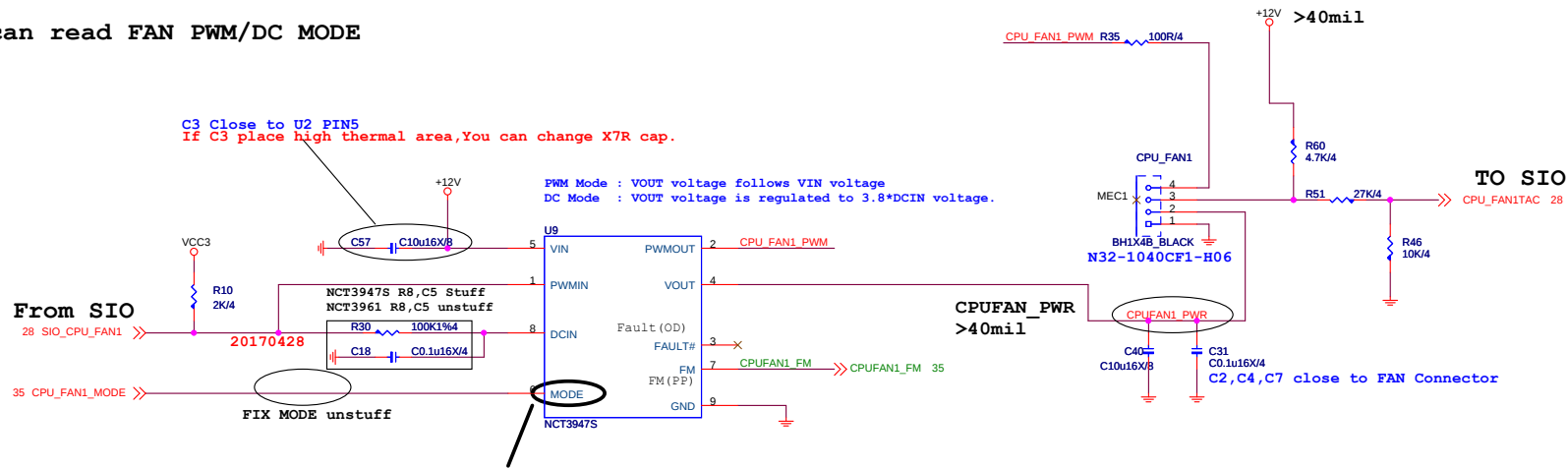
Date: Wednesday, February 26, 2020 | Sheet 29 of 75

TYPE L : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO

https://vinafix.com

CPUFAN1

- 1.Mode GPIO BIOS can swtich PWM/DC MODE
- 2.FM:BIOS can read FAN PWM/DC MODE



GPIO Control

	PCH GPIO
PWM MODE	HIGH
DC MODE	LOW
AUTO MODE	GPI (Floating) Default

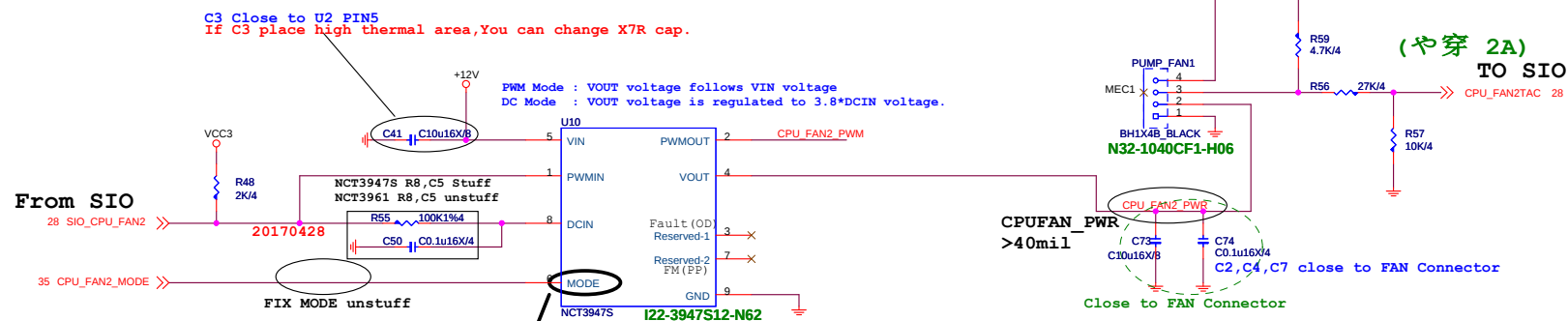
NCT3947S Internall pull up 1.65V

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

https://vinafix.com

1.Mode GPIO BIOS can swtich PWM/DC MODE

PUMPFAN1



GPIO Control

	PCH GPIO
PWM MODE	HIGH
DC MODE	LOW
AUTO MODE	GPI(Floating) Default

NCT3947S Internall pull up 1.65V

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MS-7C84

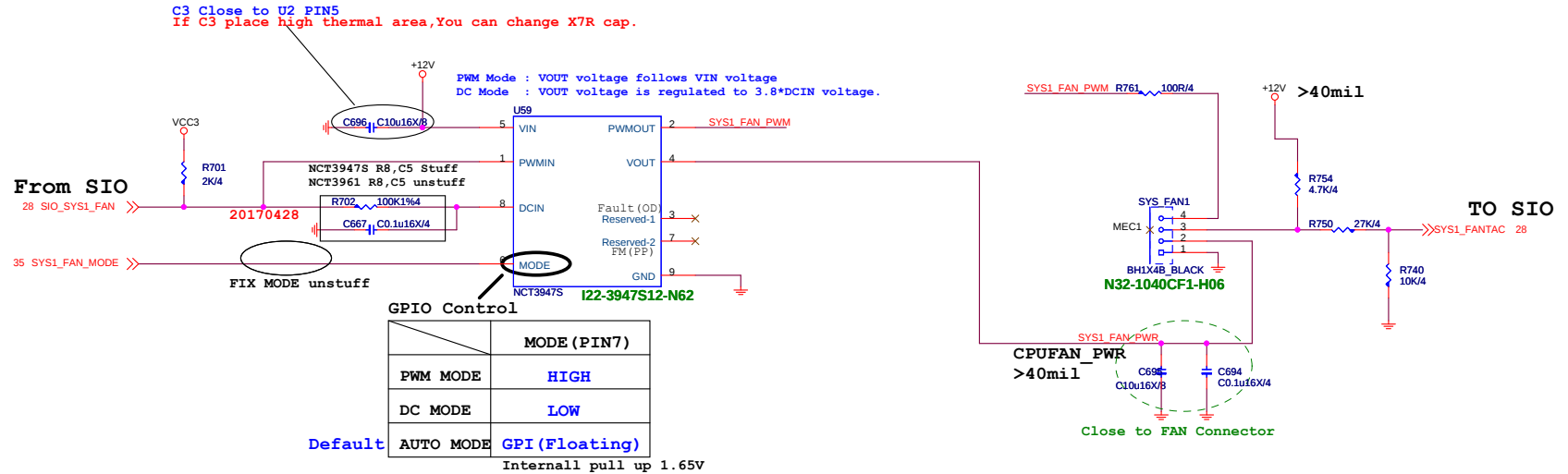
Size Custom	Document Description FAN TYPE-K PUMPFAN1	Rev 13
Date: Wednesday, February 26, 2020	Sheet 31 of 75	

SYSFAN1

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

1.Mode GPIO BIOS can swtich PWM/DC MODE

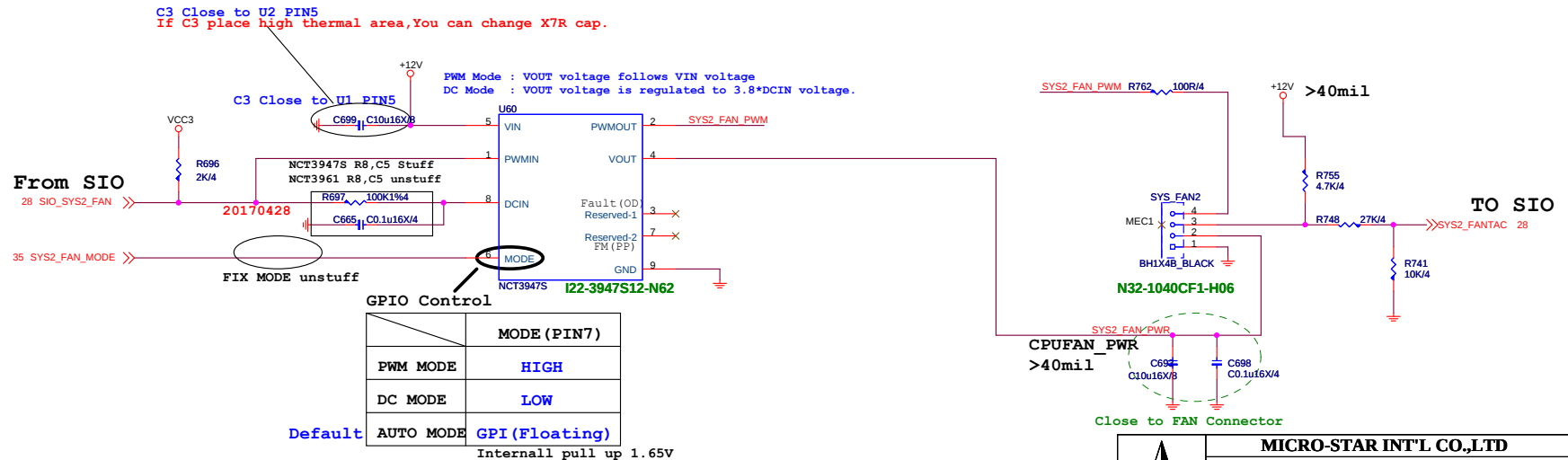
<https://vinafix.com>



SYSFAN2

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

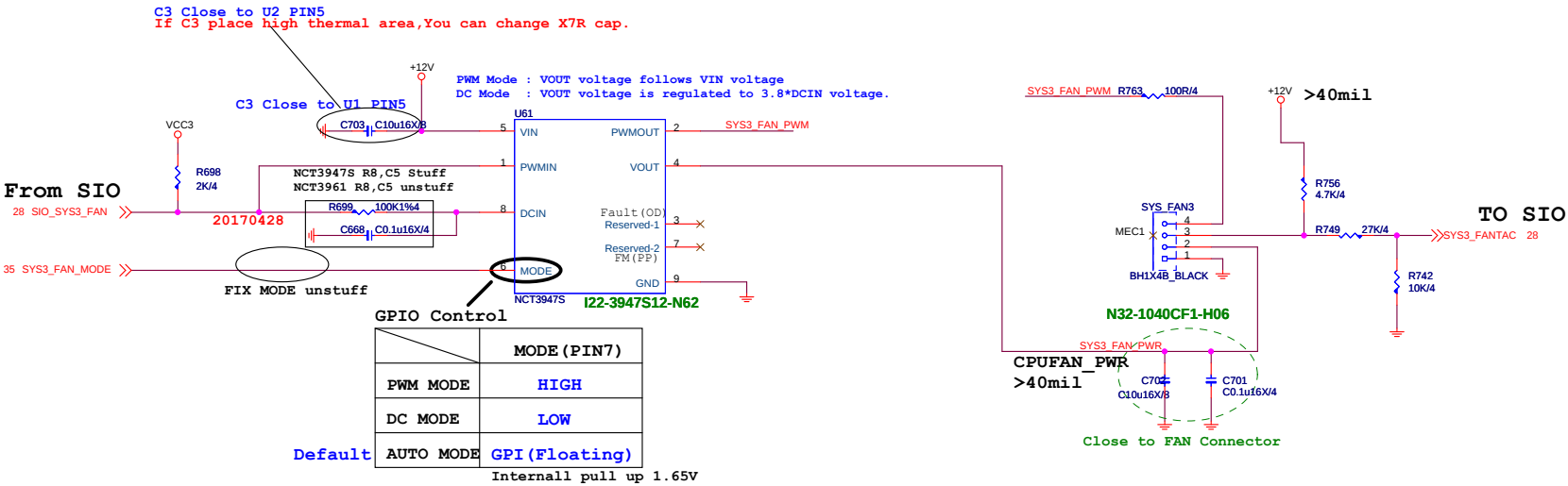
1.Mode GPIO BIOS can swtich PWM/DC MODE



SYSFAN3

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

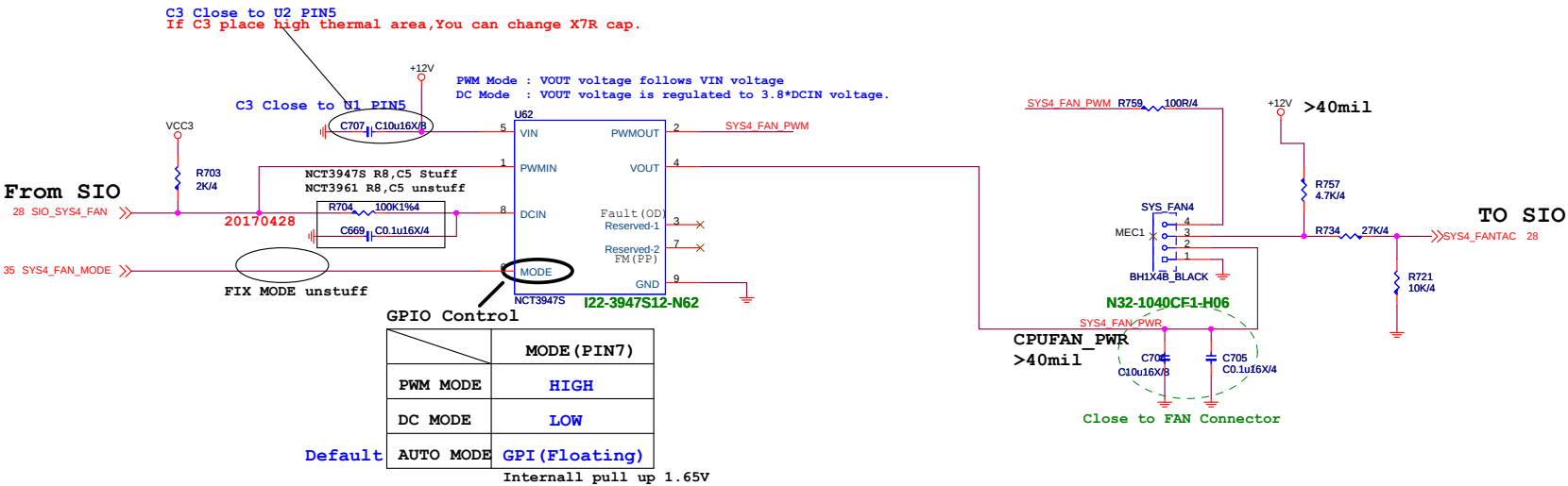
1.Mode GPIO BIOS can swtich PWM/DC MODE



SYSFAN4

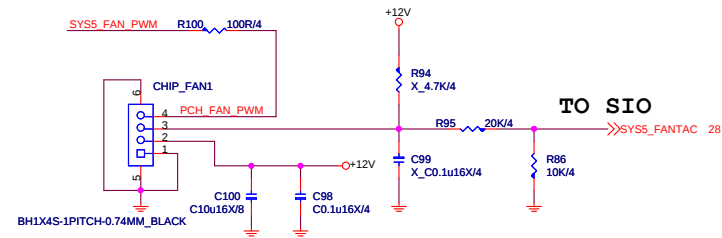
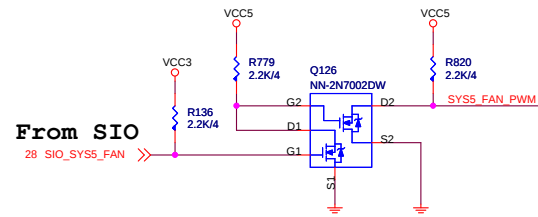
TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE

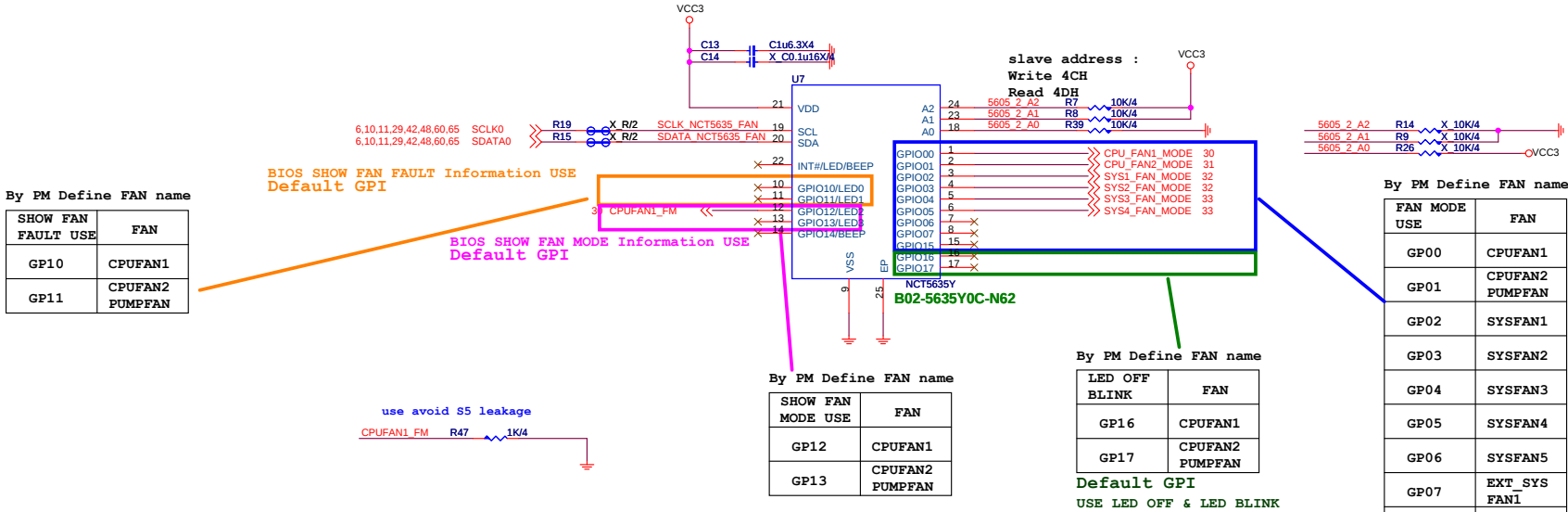
1.Mode GPIO BIOS can swtich PWM/DC MODE



PCH_FAN

<https://vinafix.com>





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MS-7C84

Size Custom	Document Description FAN GPIO NCT5635	Rev 13
Date: Wednesday, February 26, 2020	Sheet 35 of 75	

RTL8125B 10/100/1000/2.5G LAN Controller

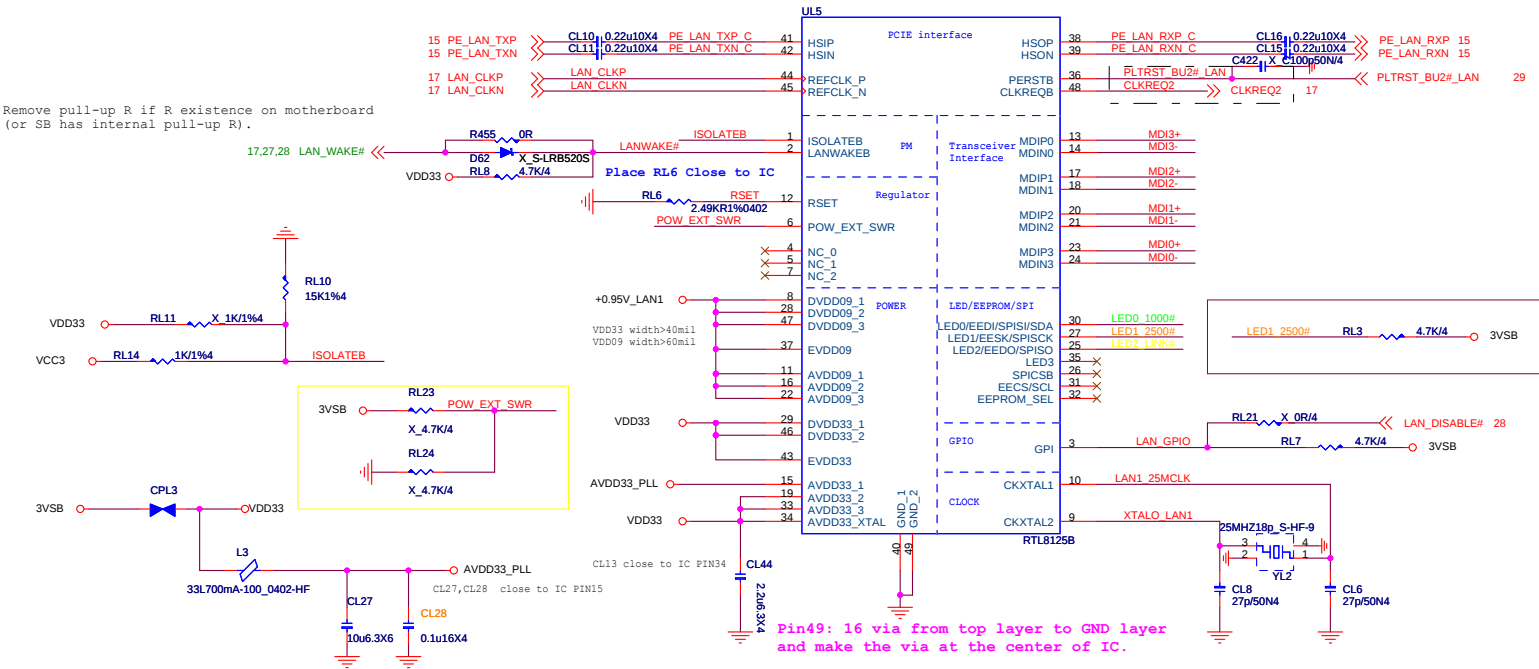
ESD Protect
UL1&UL2 close to connector
<https://vinafix.com>

MDI3+ 1 MDI3- 2 MDI2+ 3 MDI2- 4 MDI1+ 5 MDI1- 6 MDI0+ 7 MDI0- 8 MDI0+ 9 MDI0- 10

ESD-UT148ZAD5A-HF

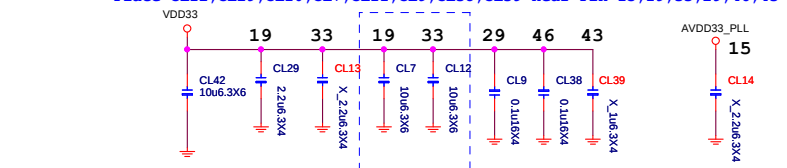
ESD-UT148ZAD5A-HF

Remove pull-up R if R existence on motherboard (or SB has internal pull-up R).



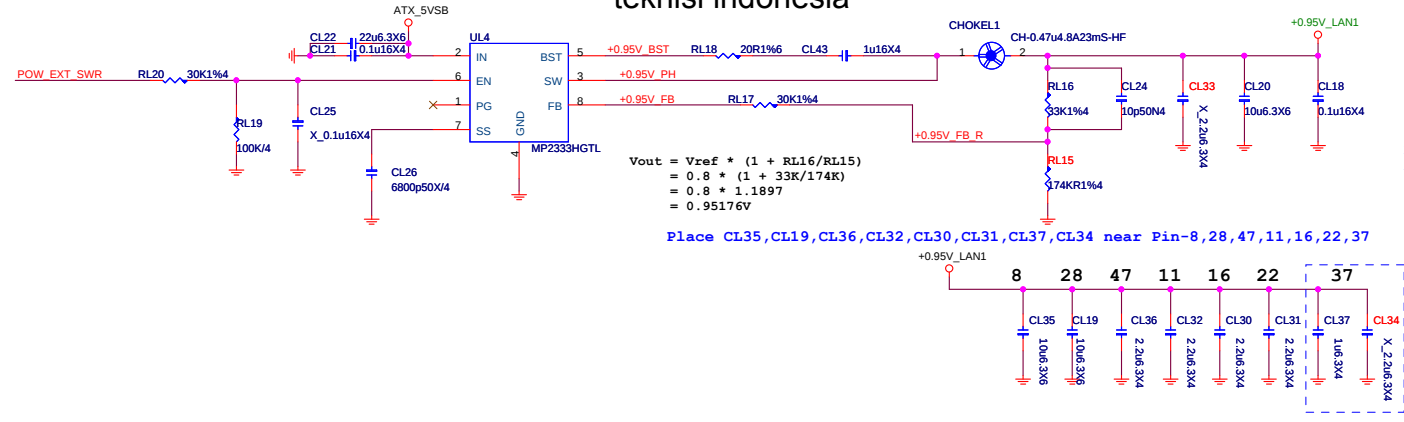
For special purpose, the GPIO Pin can be the LAN_DISABLE# Pin. LAN_DISABLE# must be connected to PCH's GPIO/LANPHYPC output. This GPIO Pin must be set as "LANPHYPC" Function through FITC tool. The signal does not require pull-up. RL11 resistor is no-stuff default (for testing purpose)

Place CL12,CL29,CL10,CL7,CL11,CL9,CL38,CL39 near Pin-15,19,33,29,46,43

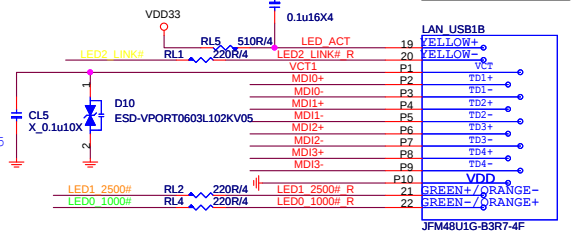


teknisi indonesia

For surge improvement



LAN Connector

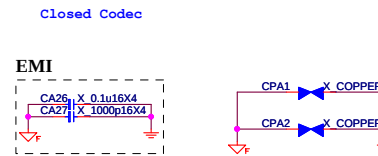
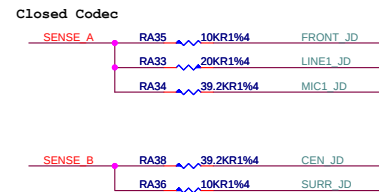
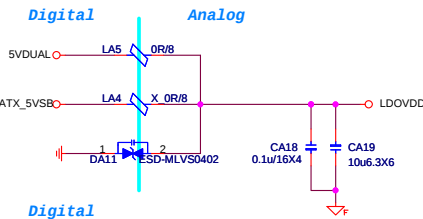
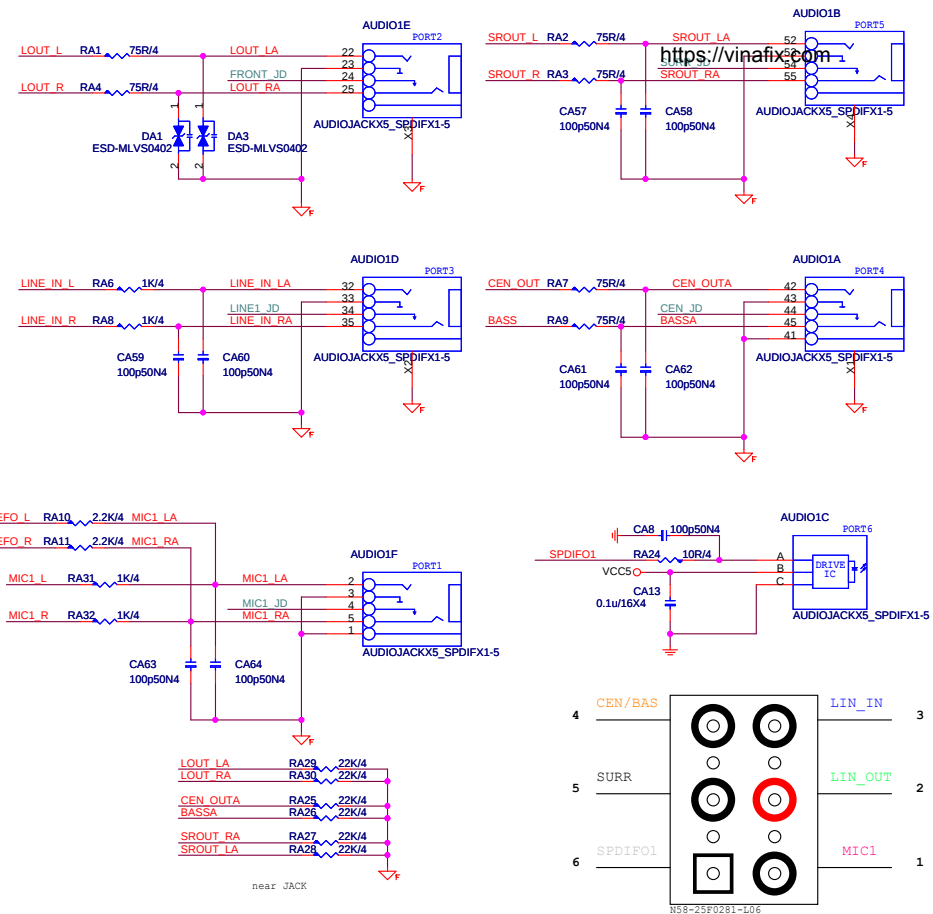
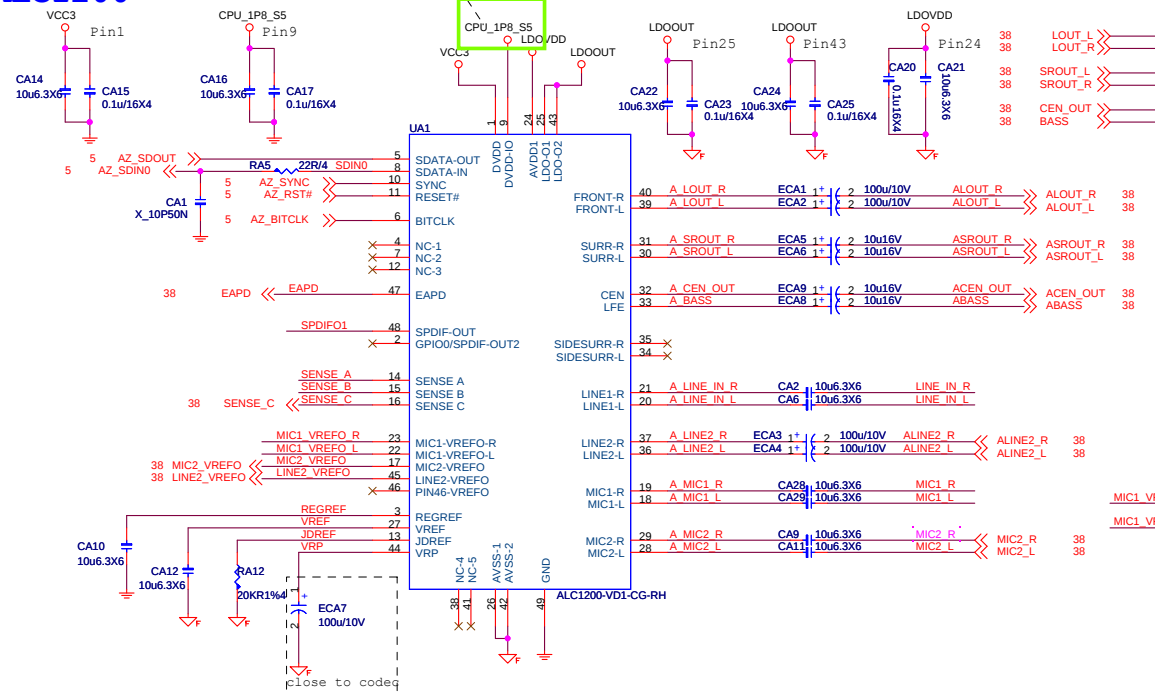


MICRO-STAR INT'L CO.,LTD
MS-7C84
Size Custom Document Description LAN - I211AT Rev 13
Date: Wednesday, February 26, 2020 Sheet 36 of 75

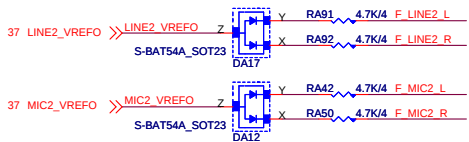
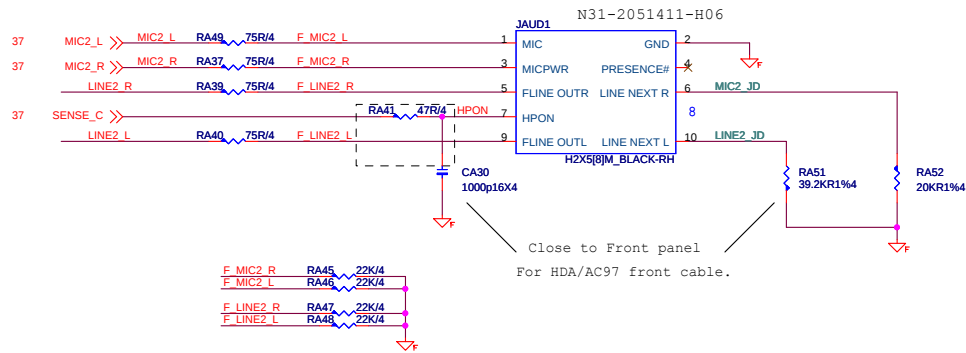
ALC1200

follow PCH power well

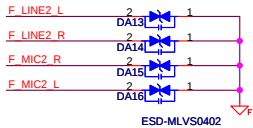
PIN 1~12, 47~49 reference GND, others reference AGND



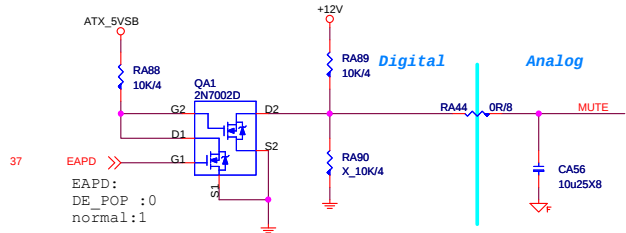
MICRO-STAR INT'L CO.,LTD			
MS-7C84			
Size	Document Description	Rev	
Custom	Audio ALC1200	13	
Date:	Wednesday, February 26, 2020	Sheet	37 of 75



Close to Jack
ESD protect
D0G-2710510-I05
D0G-2950500-SI0

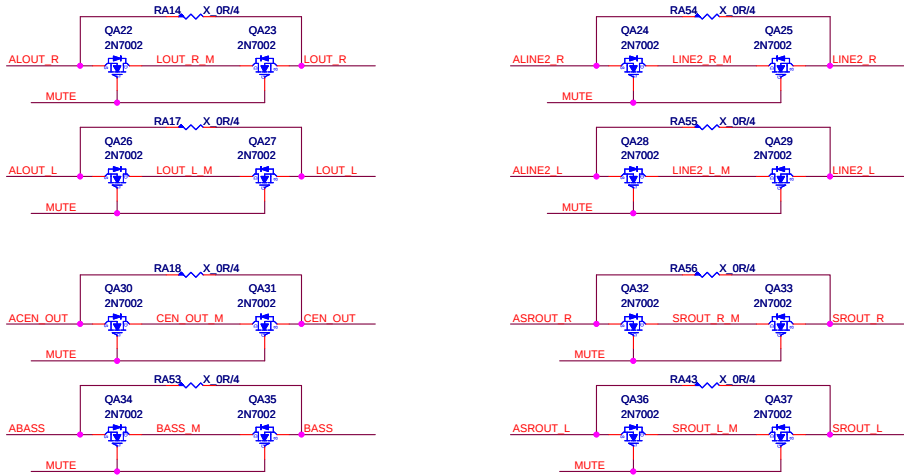


De-POP circuit

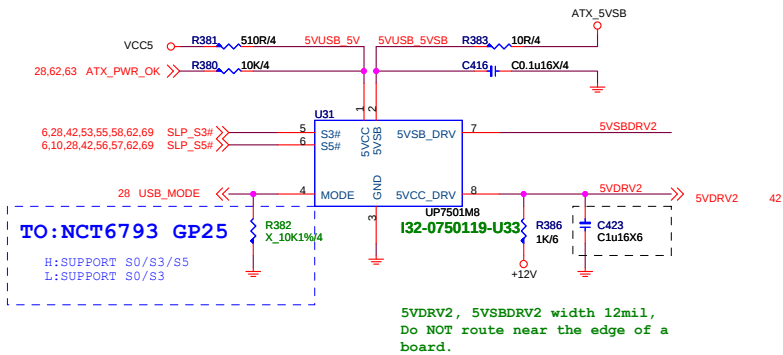


Vinafix.com

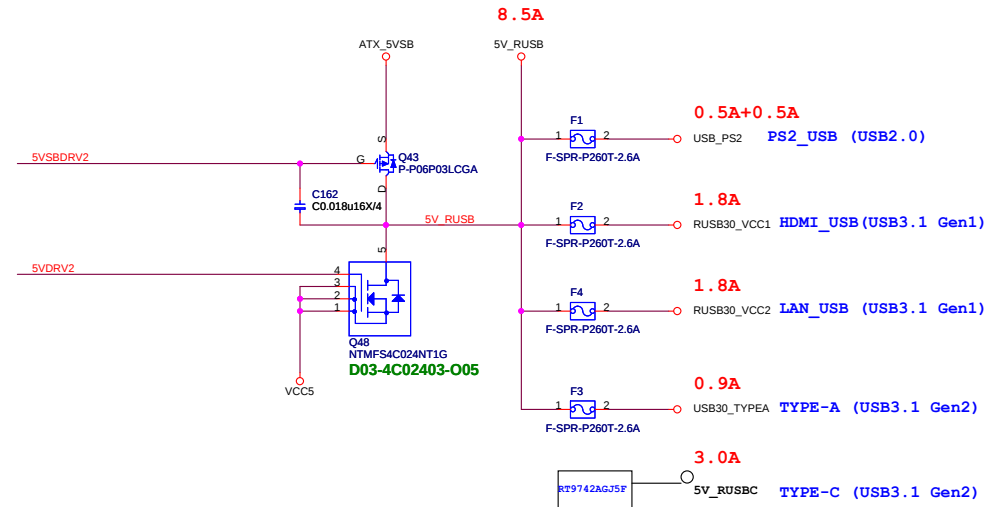
- LOUT_L 37
- LOUT_R 37
- SROUT_L 37
- SROUT_R 37
- CEN_OUT BASS 37
- ALINE2_R 37
- ALINE2_L 37
- ALOUT_R 37
- ALOUT_L 37
- ASROUT_R 37
- ASROUT_L 37
- ACEN_OUT ABASS 37



USB Power

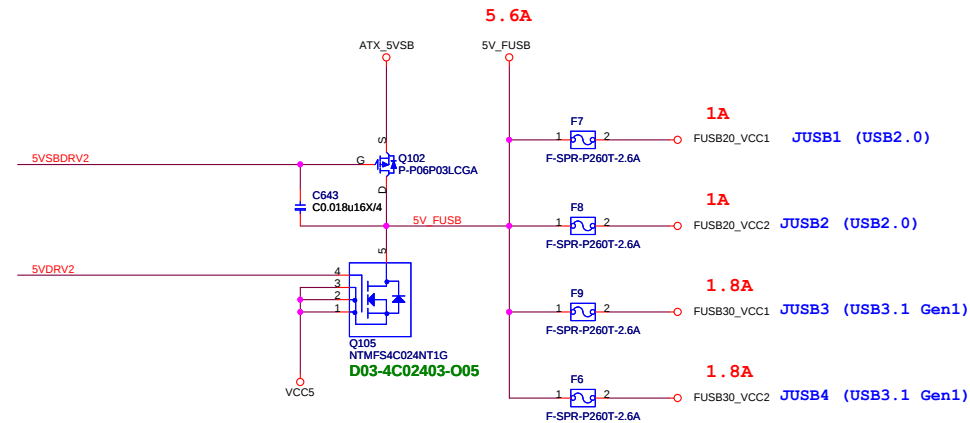


Rear USB Port Power



<https://vinafix.com>

Front USB Port Power

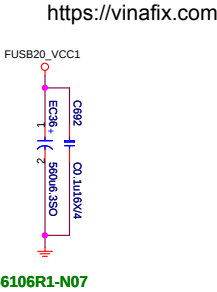
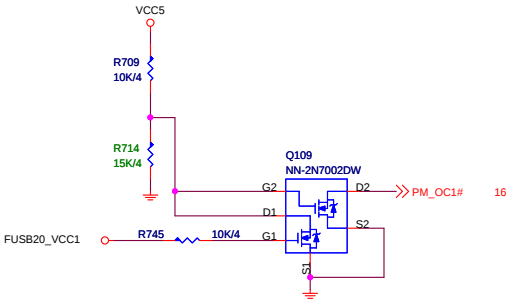
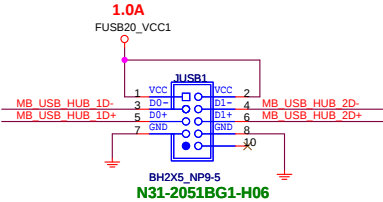
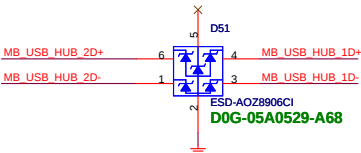
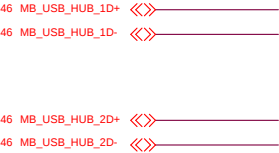


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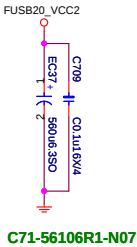
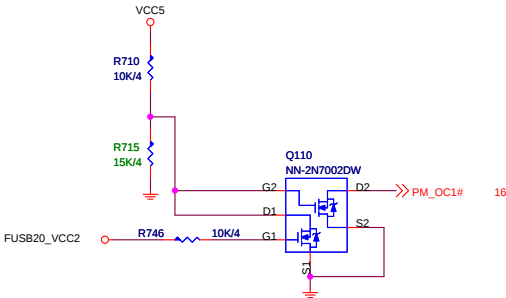
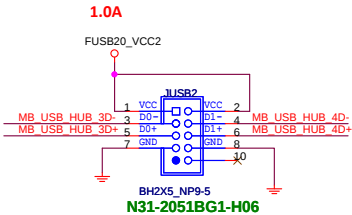
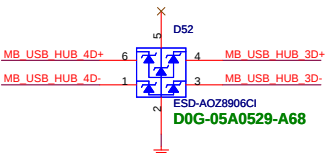
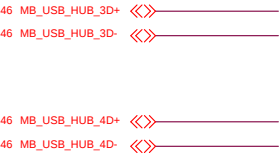
MS-7C84

Size Custom	Document Description USB Power - UP7501	Rev 13
Date: Wednesday, February 26, 2020		Sheet 39 of 75

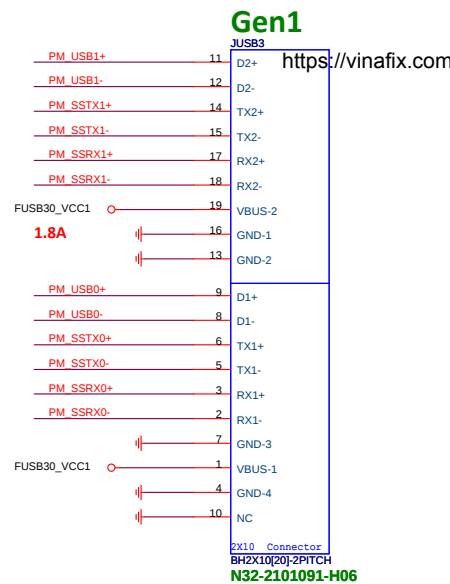
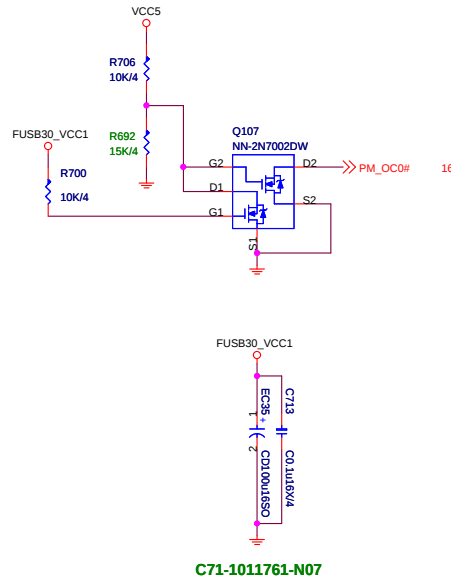
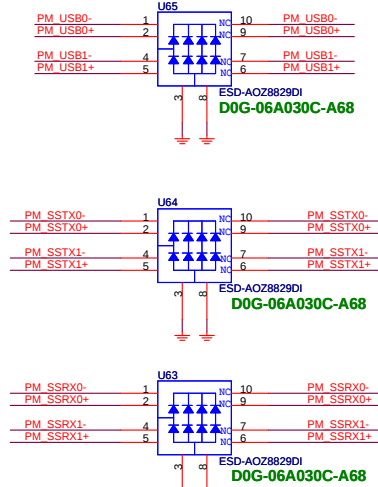
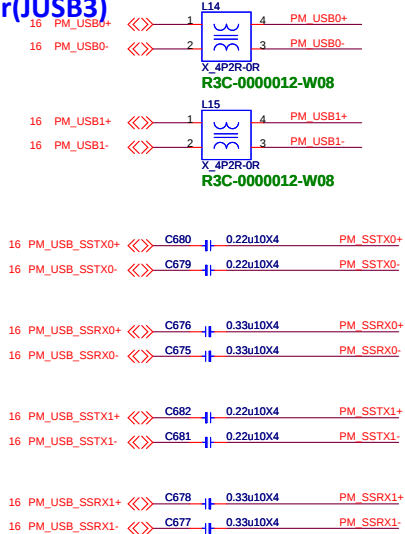
Front USB2.0 (JUSB1)



Front USB2.0 (JUSB2)

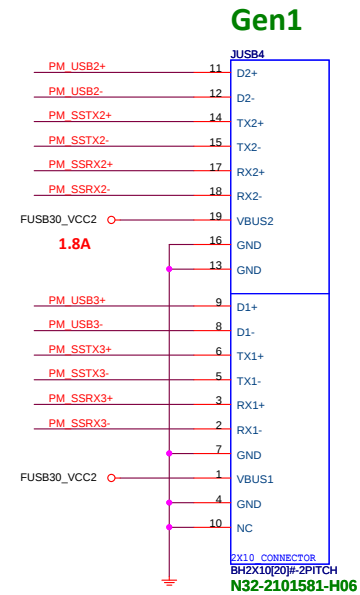
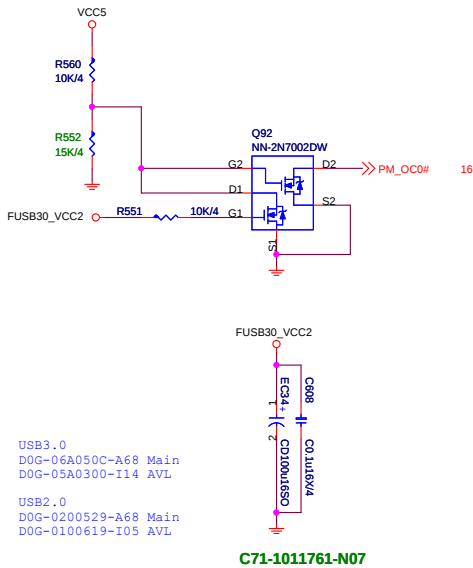
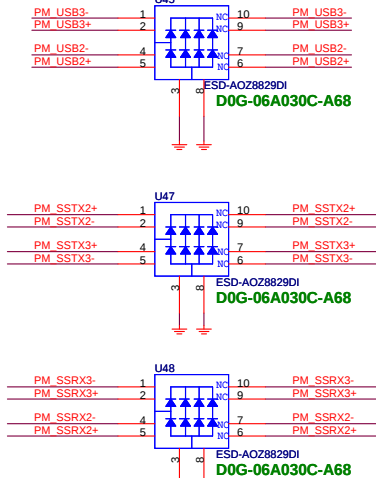
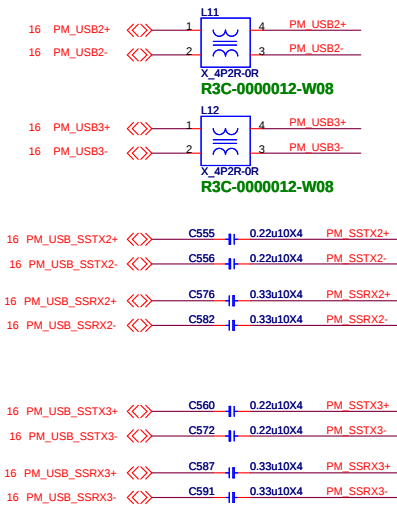


Front USB3 180 BOX Header(JUSB3)



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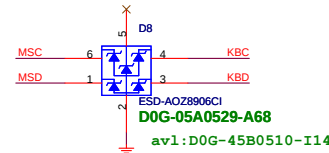
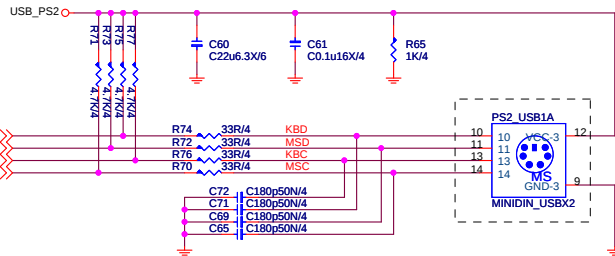
Front USB3 90 BOX Header(JUSB4)



PS2

5V@1A

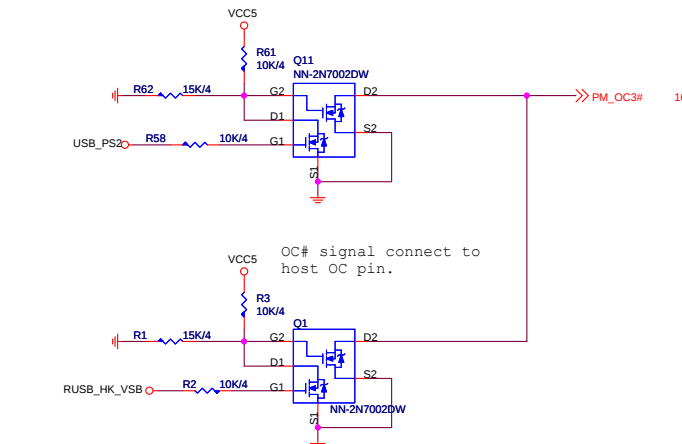
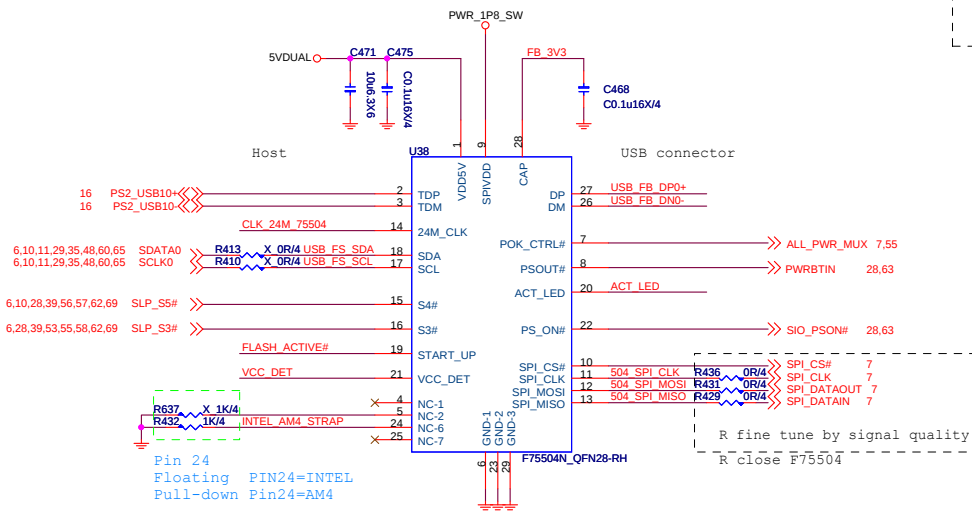
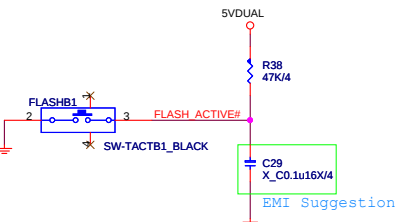
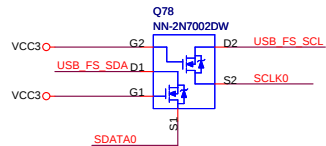
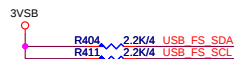
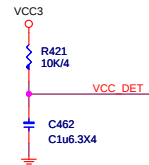
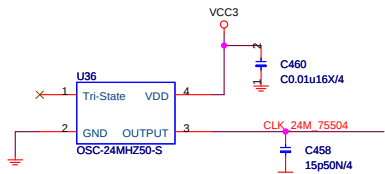
layout note:
C21 must close to TVS pin5
TVS must near KB MS1 connector and route without branch
Varistor must close to TVS and route without branch



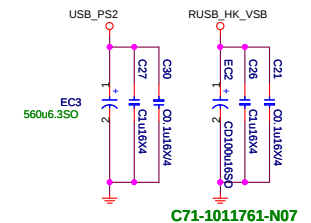
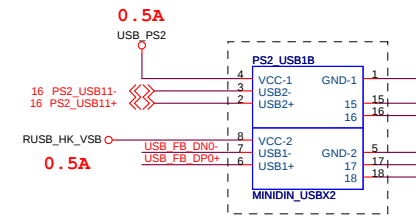
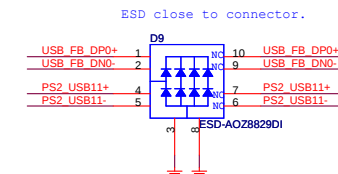
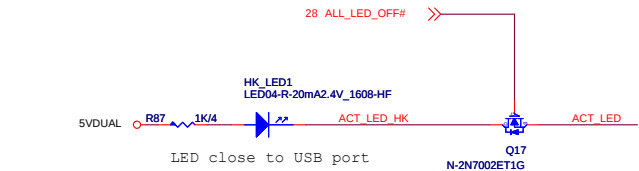
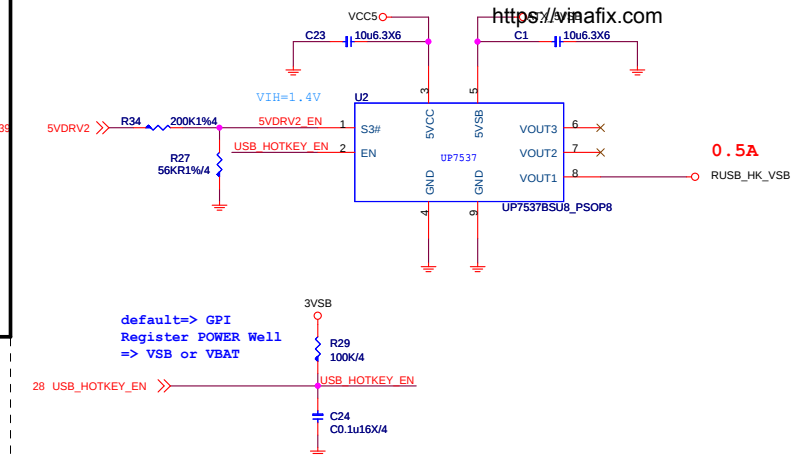
USB2.0 Flash BIOS

F75504 layout placement must meet to spi/usb trace length spec with host.
As for as possible place near to host.

CLK running in S0, don't require in sleep



HOTKEY POWER



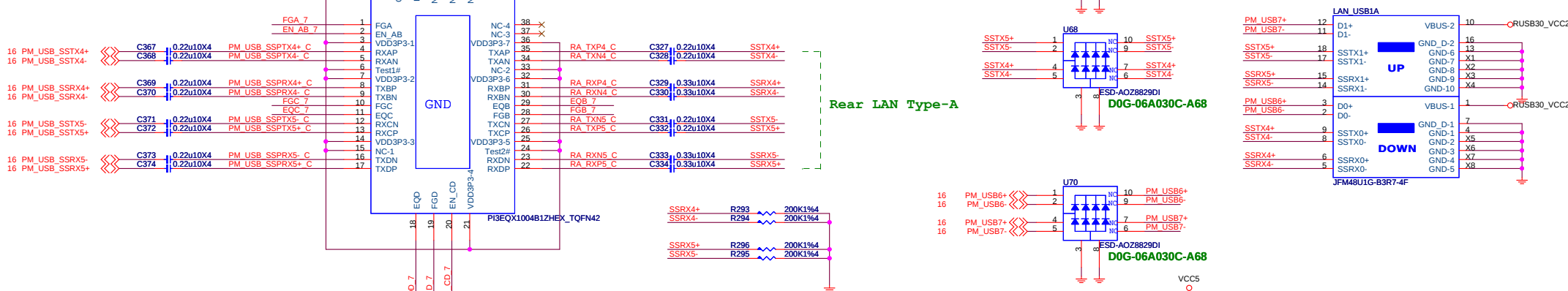
MICRO-STAR INT'L CO.,LTD			
MS-7C84			
Size	Document Description	Rev	
Custom	Rear USB2.0 + PS2	13	
Date: Wednesday, February 26, 2020	Sheet	42	of 75

LAN USB3.1 Gen2 Type-A

<https://vinafix.com>

Gen2

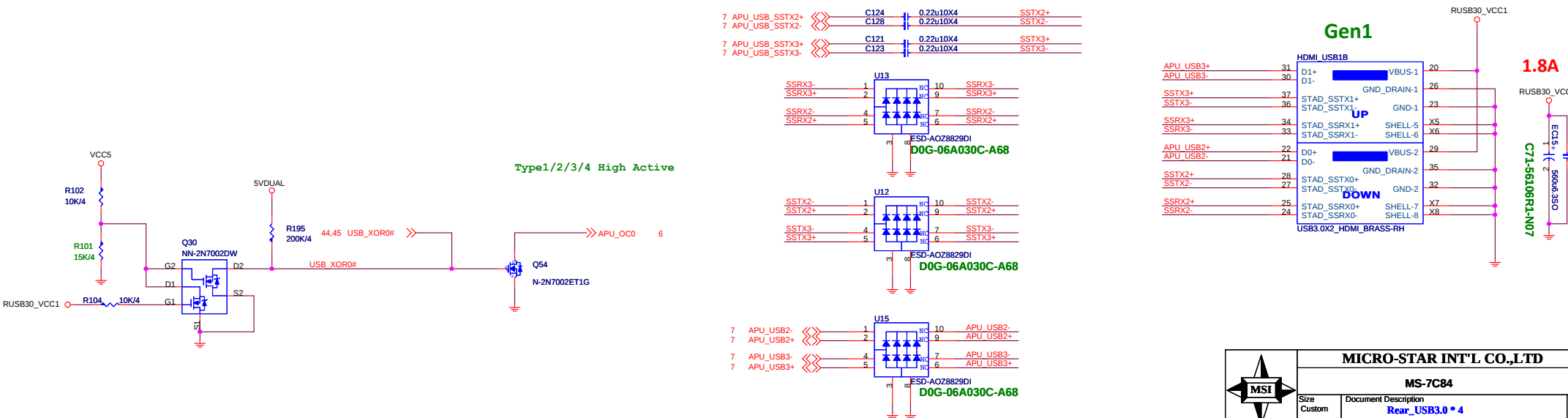
1.8A



HDMI USB3.1 Gen1 Type-A

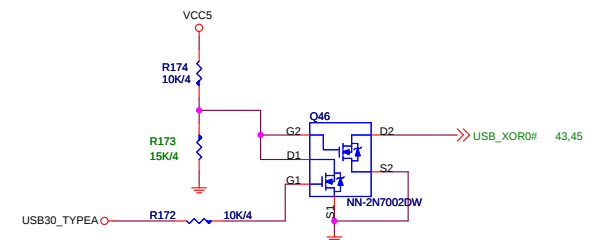
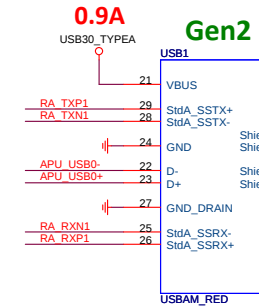
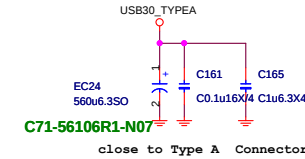
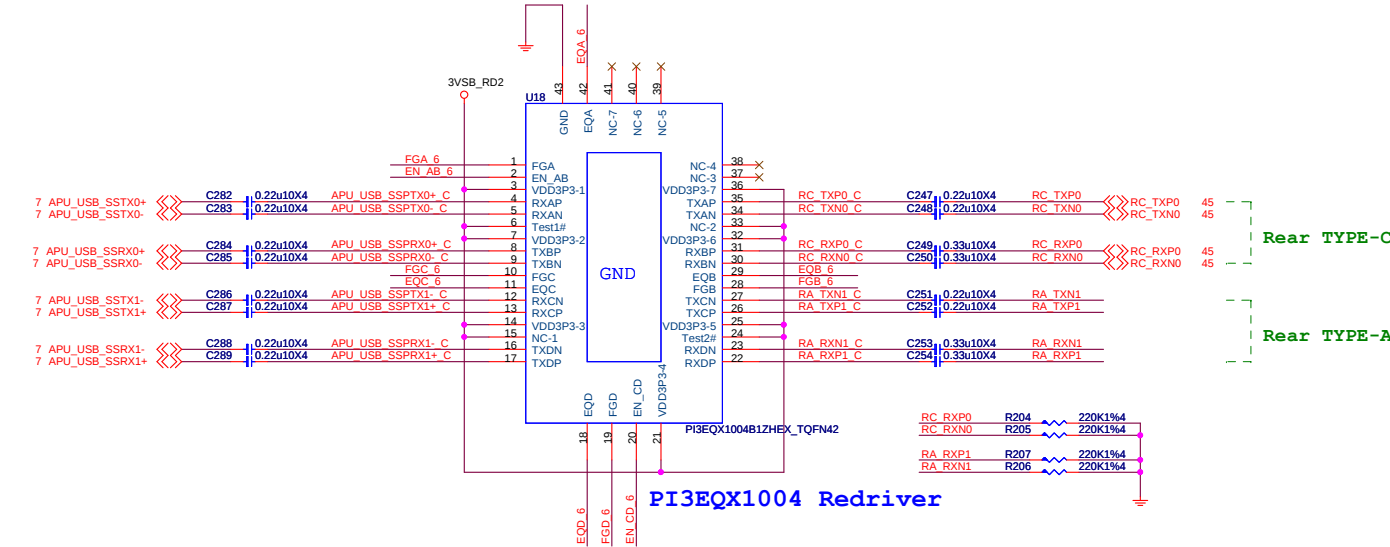
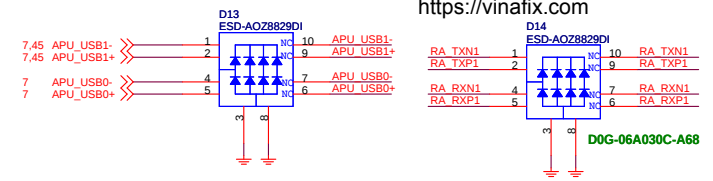
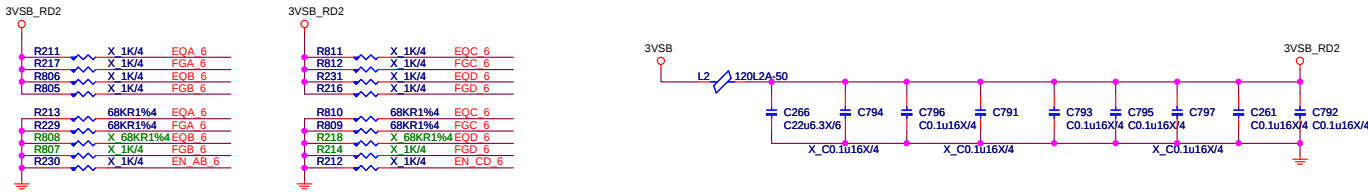
Gen1

1.8A



			
MICRO-STAR INT'L CO.,LTD			
MS-7C84			
Size	Document Description	Rev	
Custom	Rear_USB3.0 * 4	13	
Date:	Wednesday, February 26, 2020	Sheet	43 of 75

USB3.1 Gen2 Redriver + Type-A



USB Type-C MUX with Configuration Channel (CC)



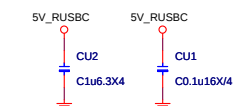
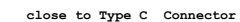
The diagram illustrates the pin connections for the N53-24M0040-L06 component, divided into two main sections: USB2 and USB_CSM_BLACK.

USB2 Section:

- Top Connections:** RC3320 TXP2 (A2), RC3320 TXN2 (A3), RC3320 RXP2 (B11), RC3320 RXN2 (B10), APU USB1+ (A7), and APU USB1- (A8).
- Left Connections:** T-type だち電 140mils, 7.44 APU USB1+, and 7.44 APU USB1-.
- Internal Components:** ESD-AOZ8131DI and RC2.
- Right Connections:** S5TXP1, S5TXN1, B3, S5SRXP1, S5SRXN1, DP1, DN1, CC1, and SBU1.
- Far Right Connections:** 5V_RUSBC, A4, A9, B4, B9, A1, A12, B1, B12, and a ground connection.

USB_CSM_BLACK Section:

- Top Connections:** RC3320 TXP1 (B2), RC3320 TXN1 (B3), RC3320 RXP1 (A11), and RC3320 RXN1 (A10).
- Left Connections:** T-type だち電 140mils, 7.44 APU USB1+, and 7.44 APU USB1-.
- Internal Components:** ESD-AOZ8131DI and RC1.
- Right Connections:** S5TXP2, S5TXN2, B3, S5SRXP2, S5SRXN2, DP2, DN2, CC2, and SBU2.
- Far Right Connections:** MEC1, MEC2, X1, X2, X3, X4, X5, X6, X7, X8, and a ground connection.

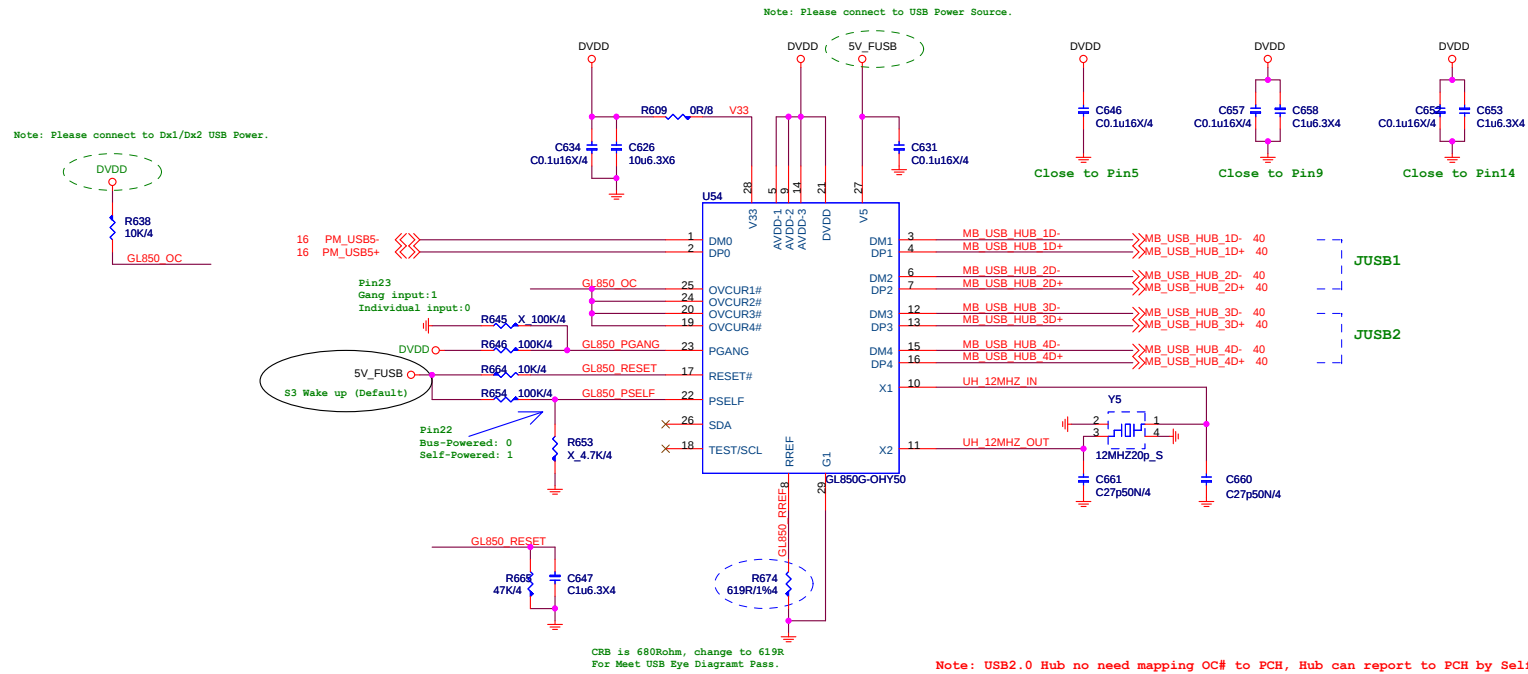


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MICRO-STAR INT'L CO.,LTD			
MS-7C84			
Size Custom	Document Description Rear USB3.1 Type C / MUX		Rev 13
Date: Wednesday, February 26, 2020		Sheet 45 of 75	

5V_FUSB



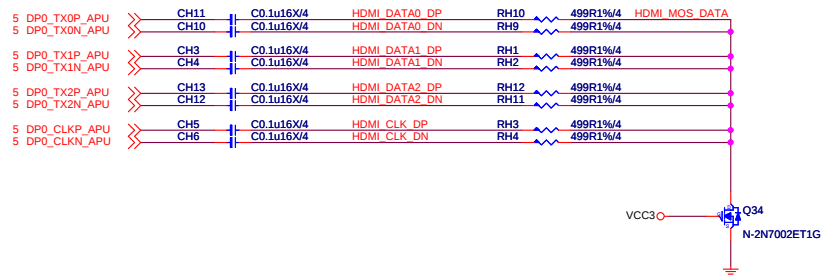
MICRO-STAR INT'L CO.,LTD

MS-7C84

Size Custom	Document Description GL850G	Rev 13
Date: Wednesday, February 26, 2020	Sheet 46 of 75	

HDMI CONNECTOR

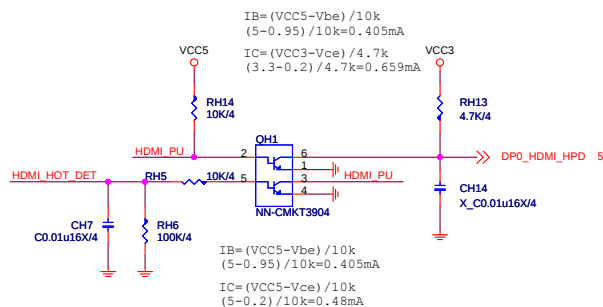
For HDMI 1.4



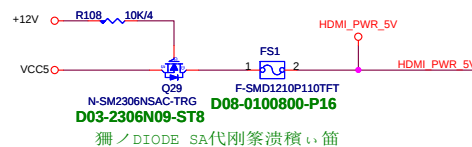
埃RH6/RH12/RH15/RH16
For 糠 VCC5繙牟

For EMI

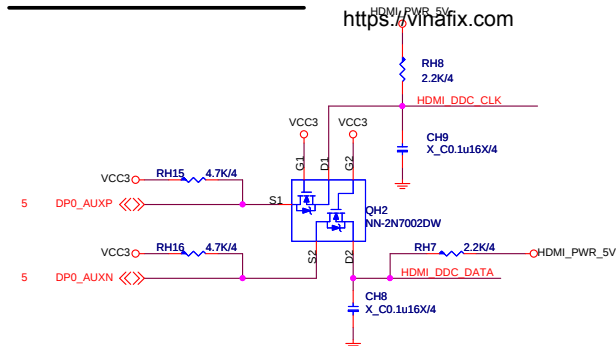
HPD Circuit



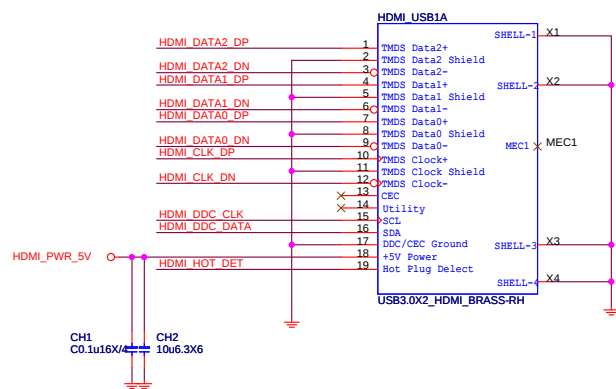
Connector Power



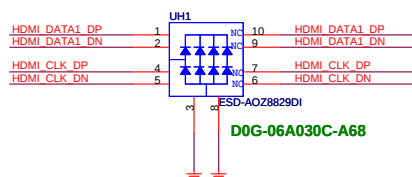
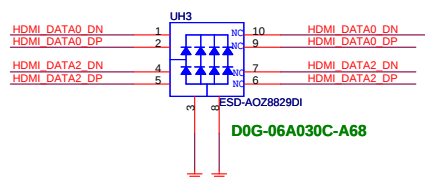
AUX Level Shifter



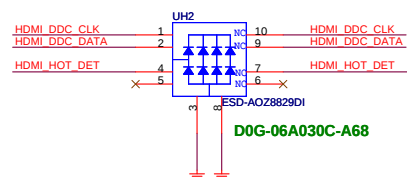
Connector

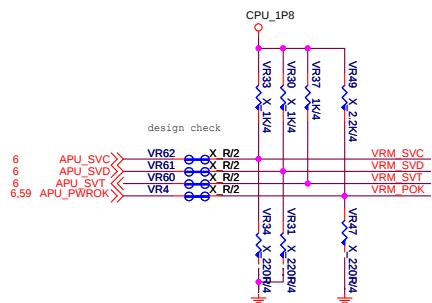


For EMI



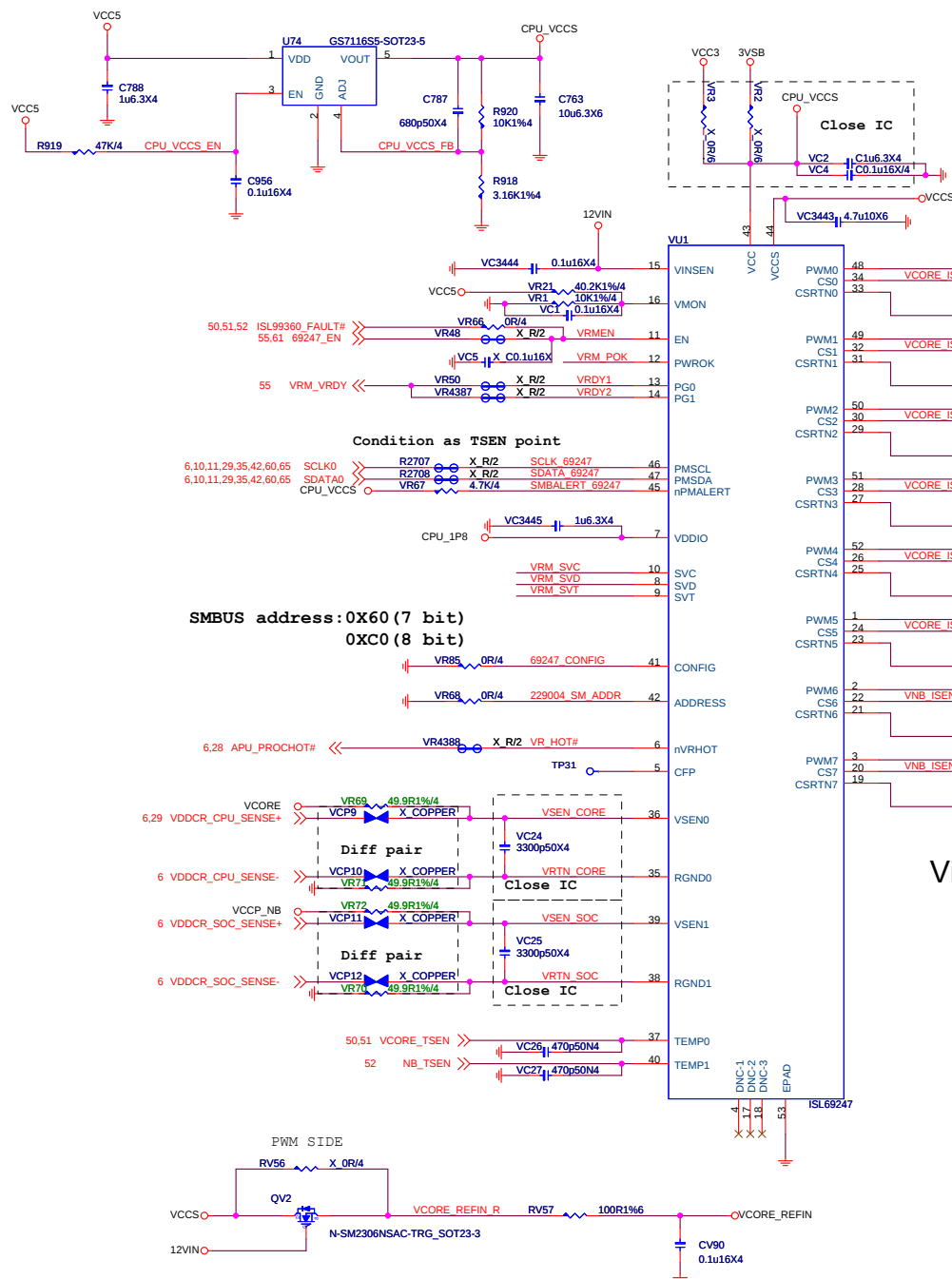
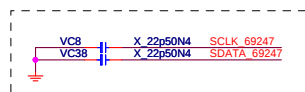
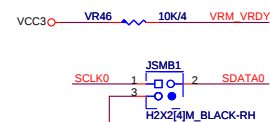
棕種:環潰5V策ン



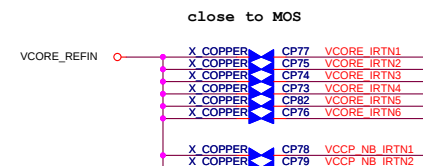


Note: VID Override Circuit

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



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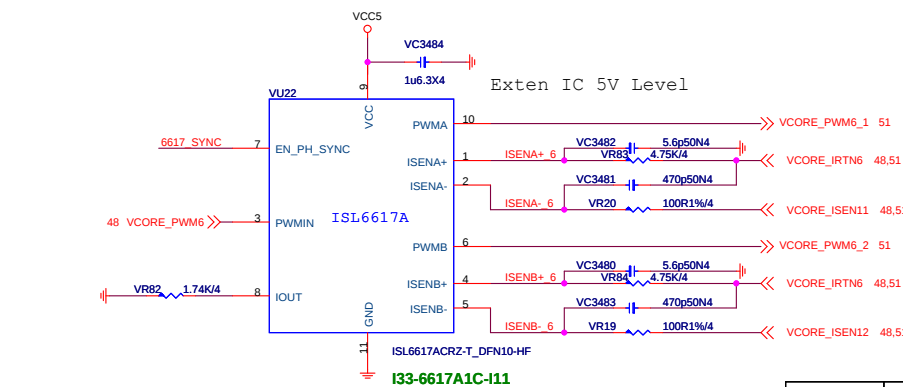
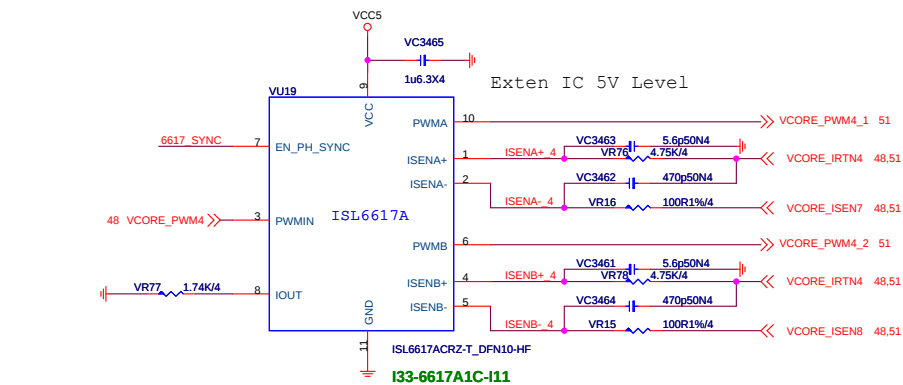
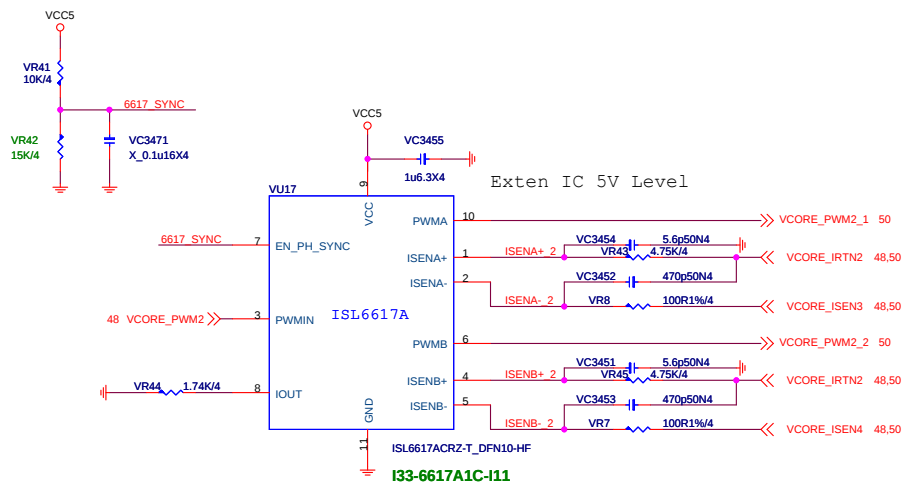
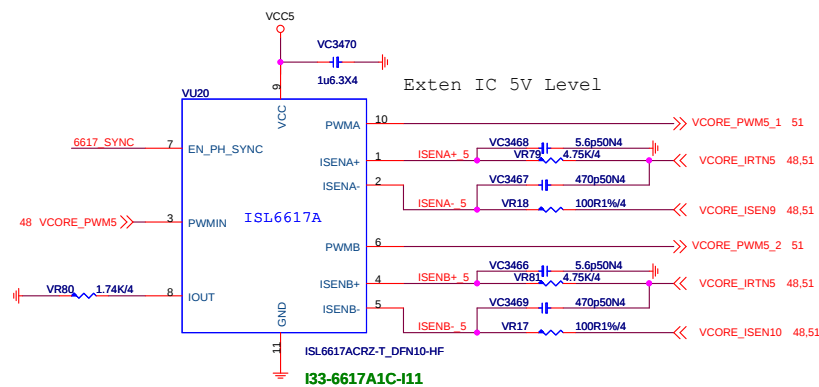
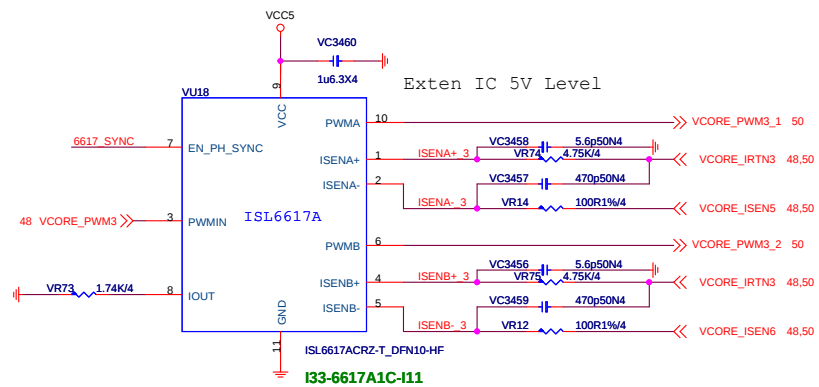
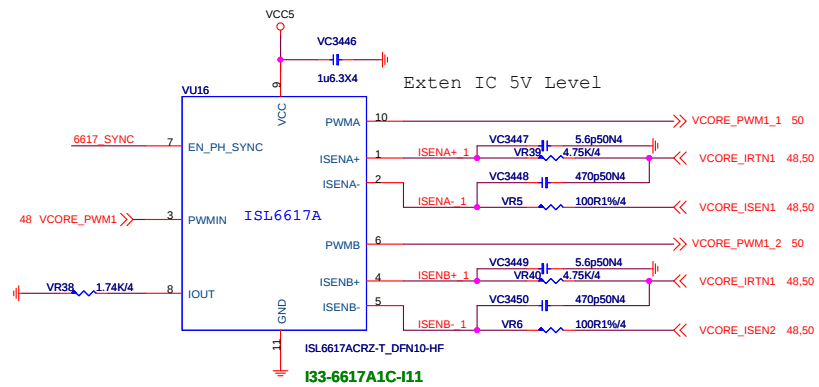
MICRO-STAR INT'L CO.,LTD

MS-7C84

Size	Document Description	Rev
Custom	CPU Power IR35201 8+2	13
Date: Wednesday, February 26, 2020	Sheet 48 of 75	

CPU_CORE Driver IC

VCORE Double 12-PHASE

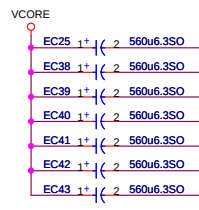
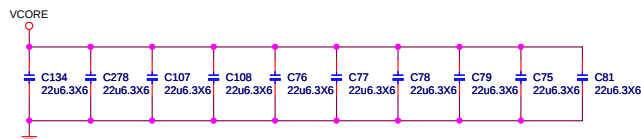
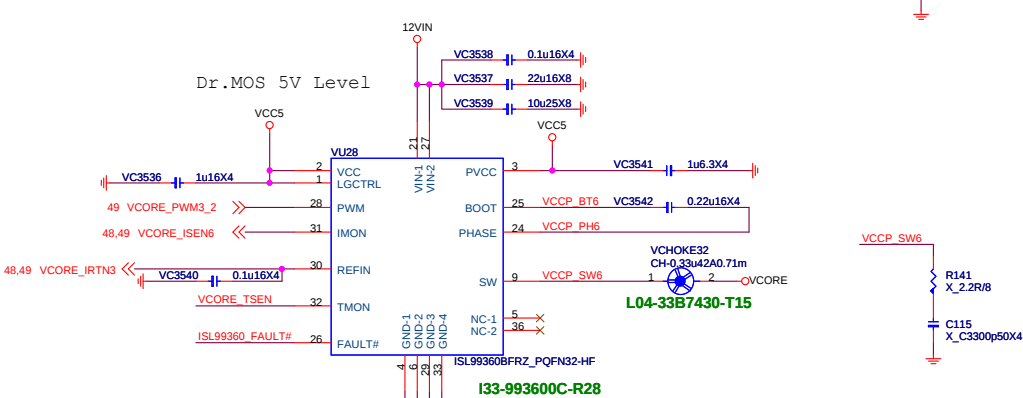
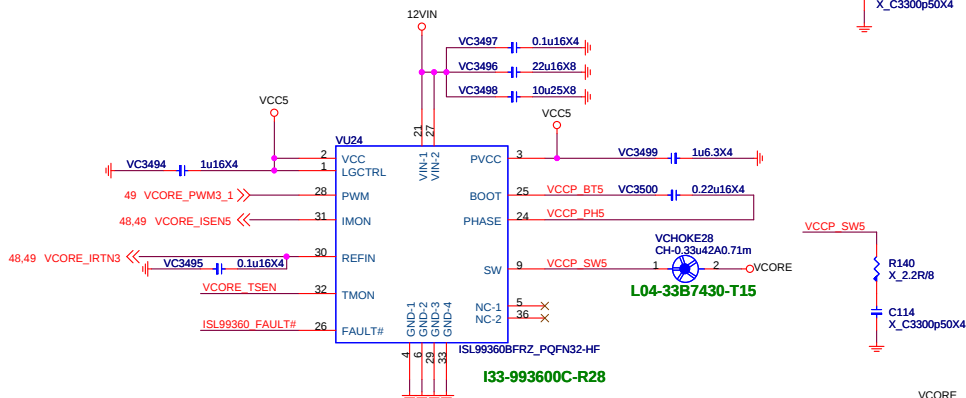
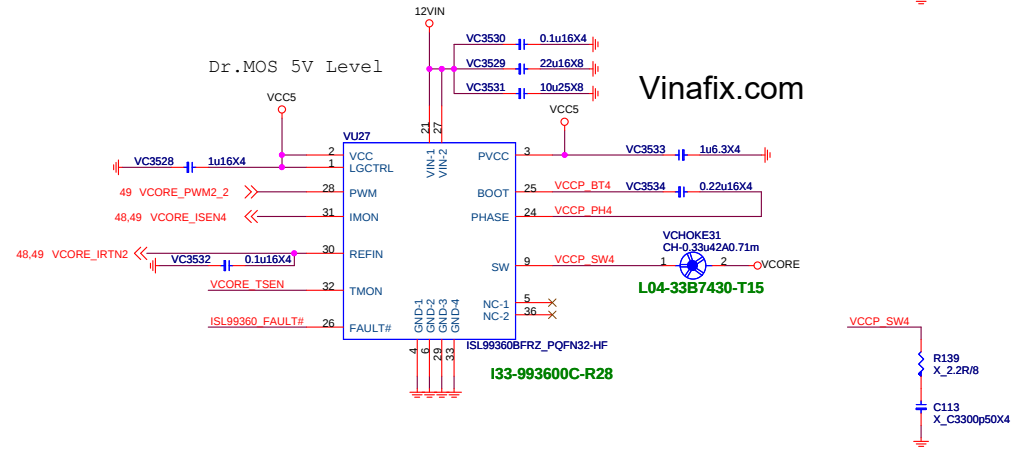
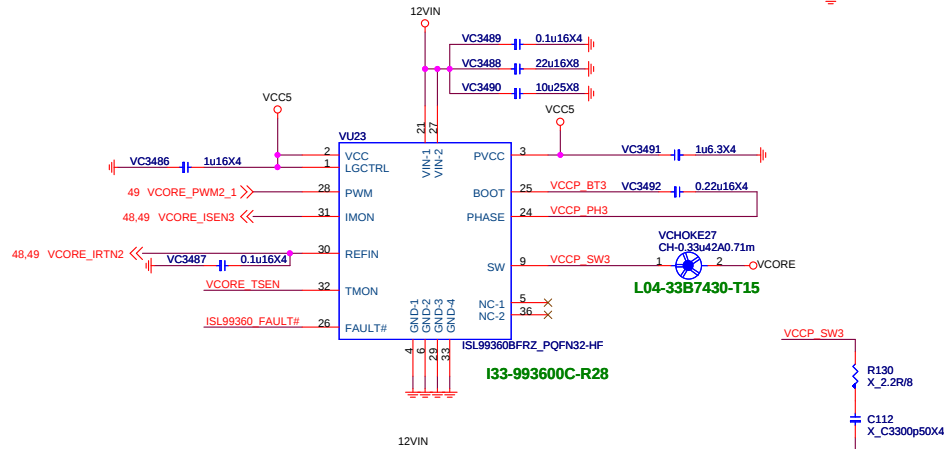
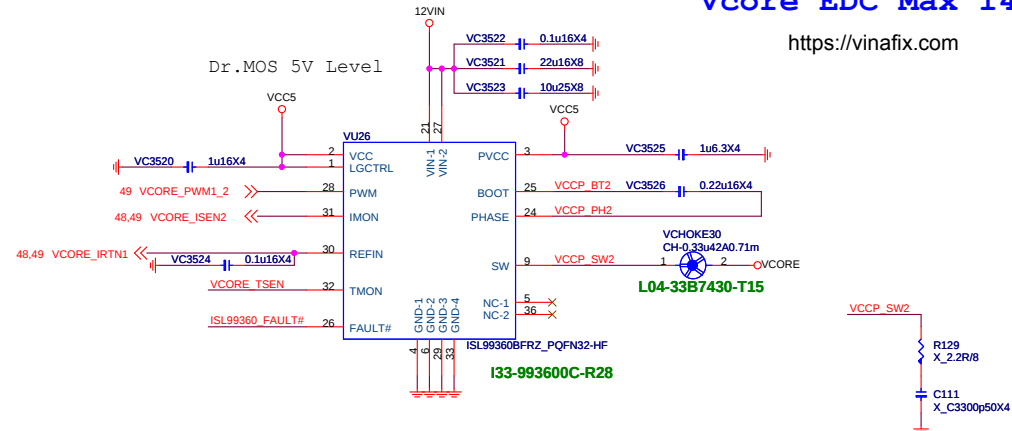
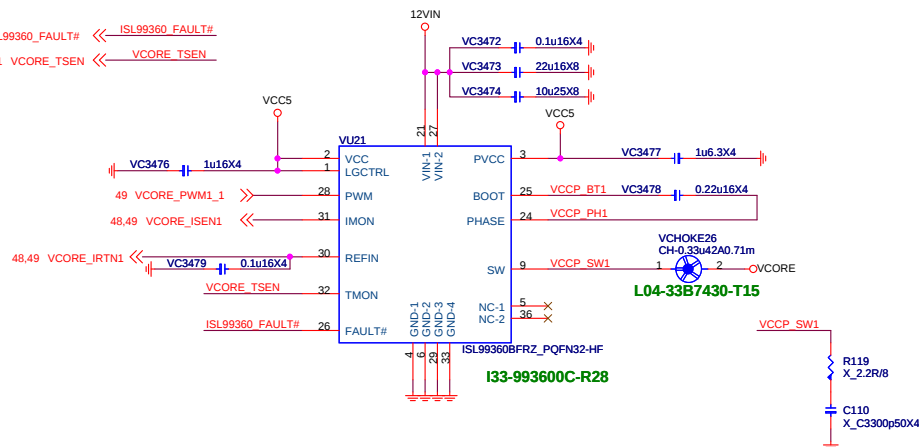
<https://vinafix.com>

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MS-7C84

Size	Document Description	Rev
Custom	CPU Power Driver IC IR3598	13
Date:	Wednesday, February 26, 2020	Sheet 49 of 75

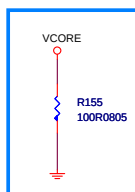
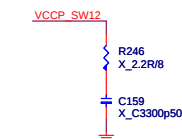
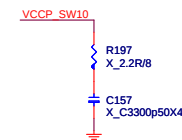
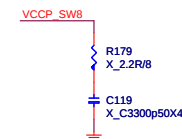
48,51,52 ISL99360_FAULT# << ISL99360_FAULT#
48,51 Vcore_TSEN << Vcore_TSEN

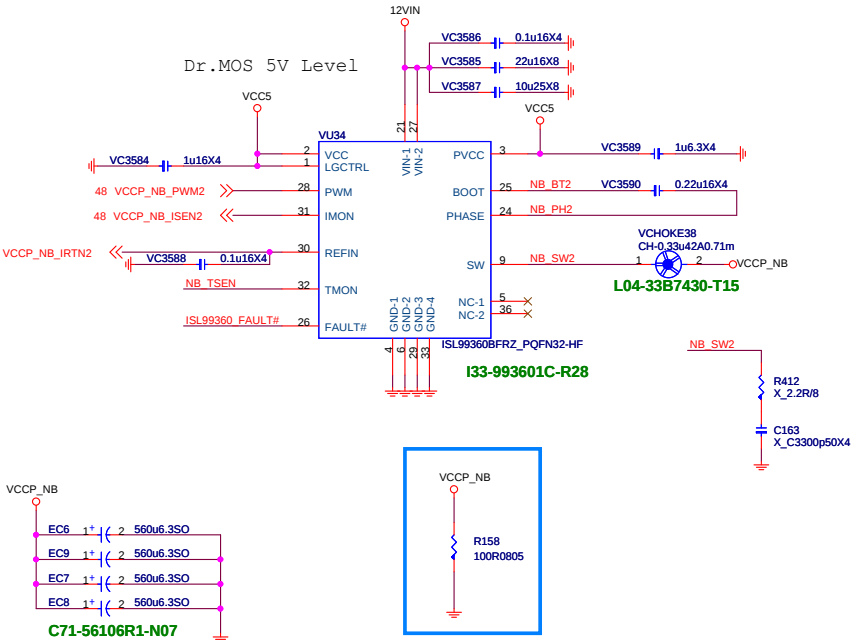


MICRO-STAR INT'L CO.,LTD

MS-7C84

Size	Document Description	Rev
Custom	CPU Power Vcore Phase 1-6	13
Date:	Wednesday, February 26, 2020	Sheet 50 of 75



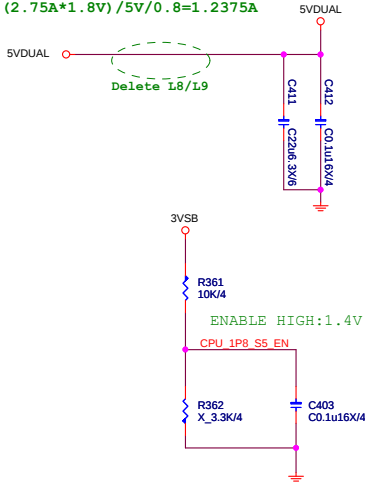


```
CPU: VDD_18_S5@0.5A
CPU: VDDIO_Audio@0.25A
CHIP: VDD_18_S5@0.1A
```

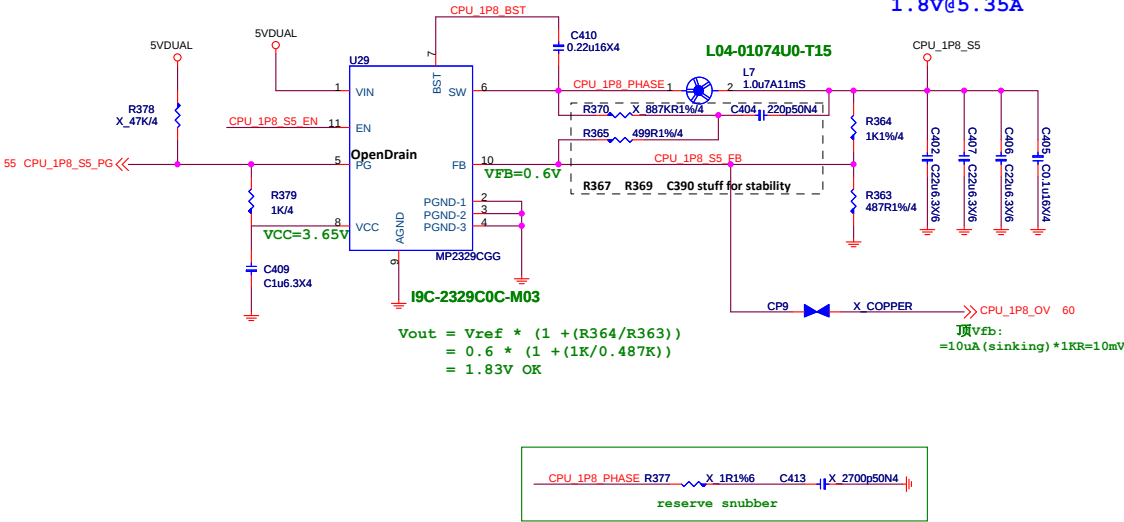
```
CPU: VDD_18_S5@0.5A
CPU: VDDIO_Audio@0.25A
CHIP: VDD_18_S5@0.1A
```

```
CPU_1P8: 2.5A
CPU_VDDP_S5: 1A
CHIP_SOC_S5: 1A
```

Input Current=
 $(2.75\text{A} \times 1.8\text{V}) / 5\text{V} / 0.8 = 1.2375\text{A}$

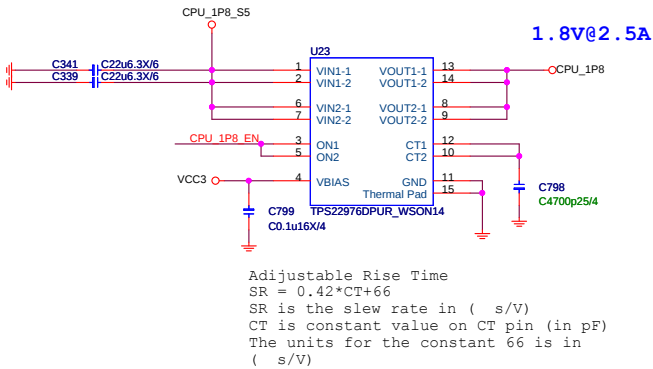
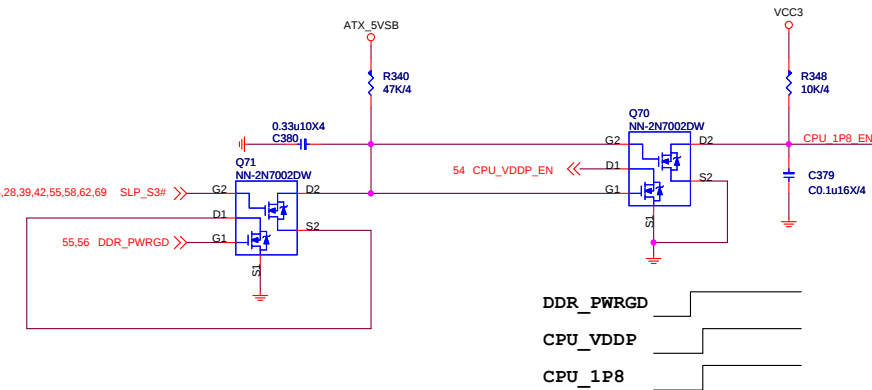


CPU_1P8_BST CPU_1P8_BST_R >50 mils.



CPU 1P8V

CPU: VDD_18@2A
CHIP: VDD_18@0.5A



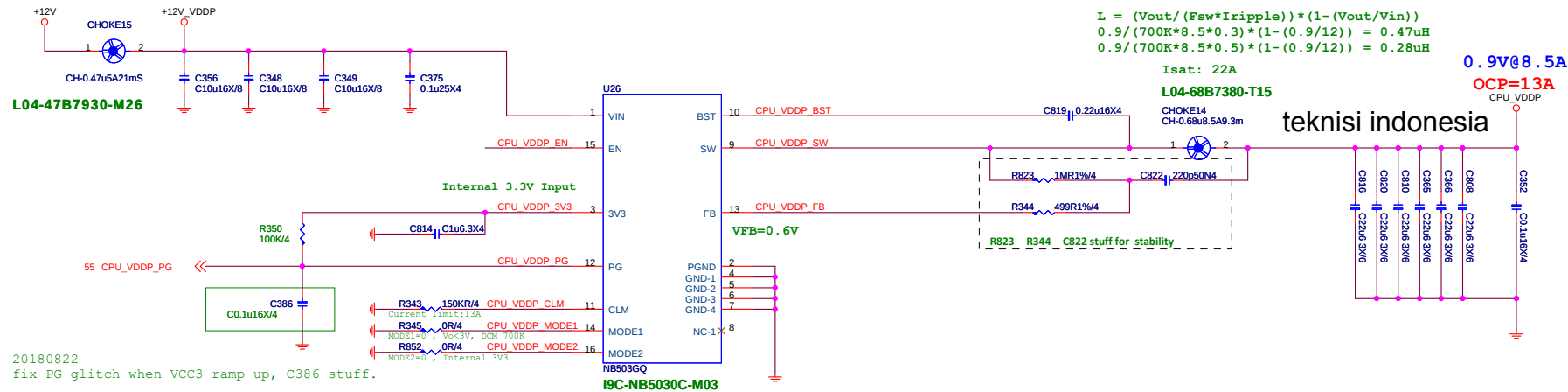
MICRO-STAR INT'L CO.,LTD			
MS-7C84			
Size Custom	Document Description CPU Power 1.8_50 / S5		Rev 13
Date: Wednesday, February 26, 2020		Sheet 53 of	75

CPU VDDP

CPU: VDDP@8.5A

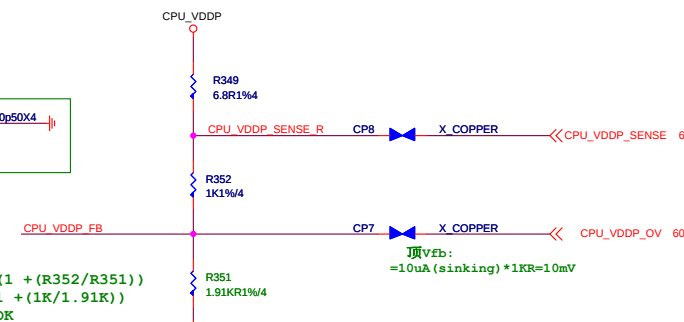
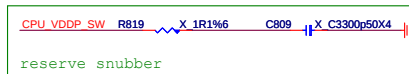
Input Current = $(8.5A \cdot 0.9V) / 12V / 0.8 = 0.8A$
Choke Isat = 8A
 $I_{rms} = I_{out} \cdot \sqrt{((V_o/V_i) \cdot (1 - (V_o/V_i)))}$
 $= 13 \cdot \sqrt{((0.9/12) \cdot (1 - (0.9/12)))} = 3.42A$
Choke Irms = 5 A

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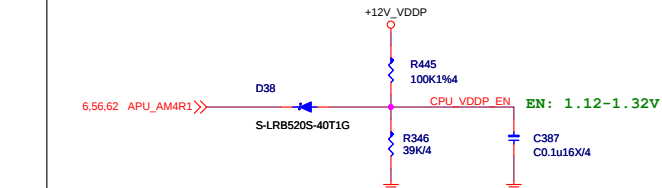


No support BR SPEC

CPU_VDDP_EN:
X: BR/SR/PR/MTS
O: RV
1: BR/SR/PR/MTS



CPU	TYPE	TYPE0_CPU_SEL	CPU_VDDP_EN
BR	0	1	0
NA	0	0	0
SR	2	1	1
RV/ZP	3	0	1
MTS	4	1	1

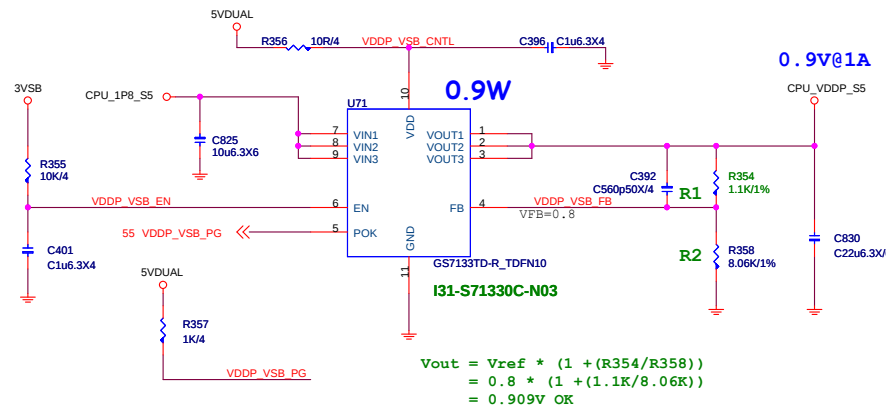


$$V_{out} = V_{ref} \cdot (1 + (R_{352}/R_{351}))$$
$$= 0.6 \cdot (1 + (1K/1.91K))$$
$$= 0.914V \text{ OK}$$

$$V_{vfb} = 10\mu A (\text{sinking}) \cdot 1K\Omega = 10mV$$

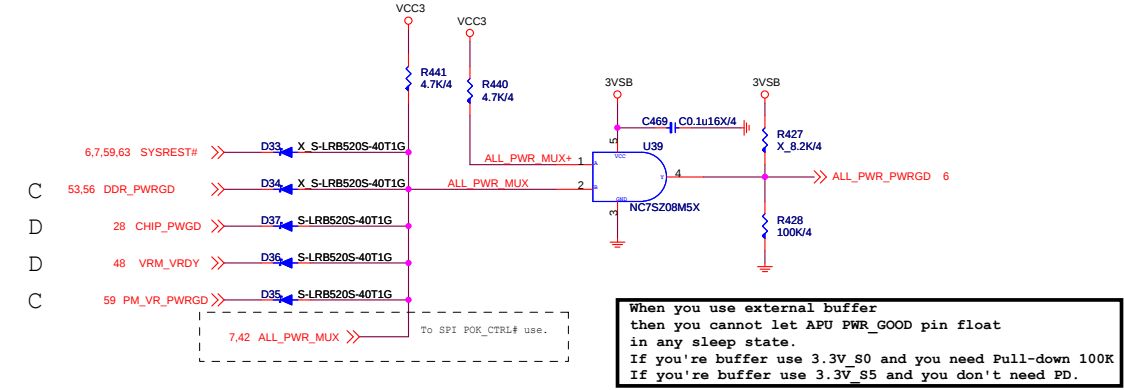
CPU VDDP S5

CPU: VDDP_S5@1A

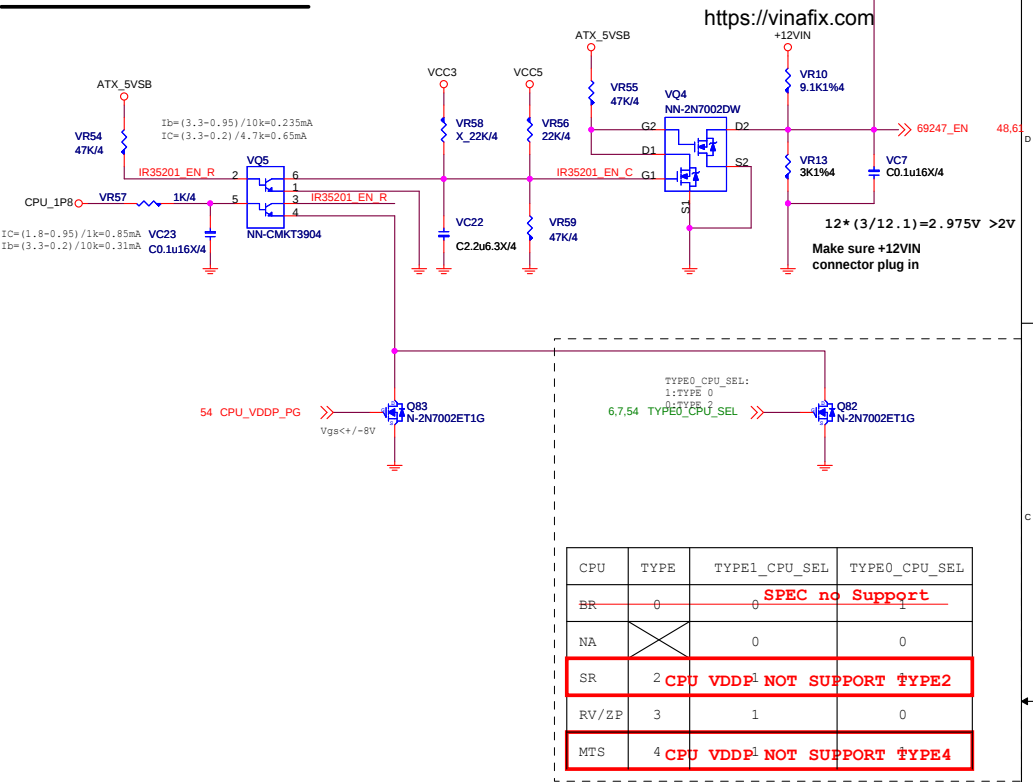


ALL POWER GOOD MUX

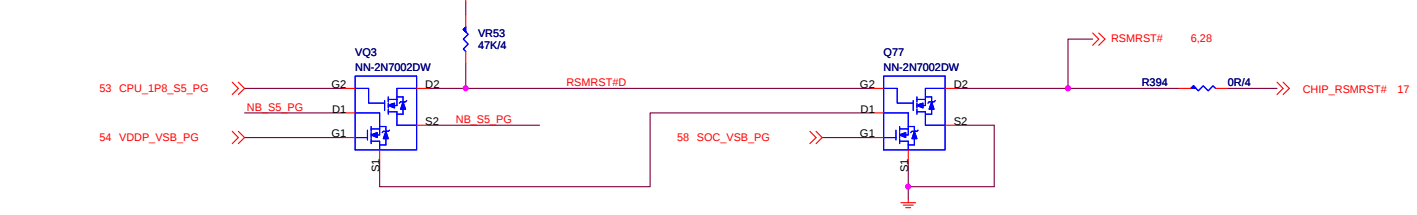
S0 PG



VRM_Enable circuit



S5 PG



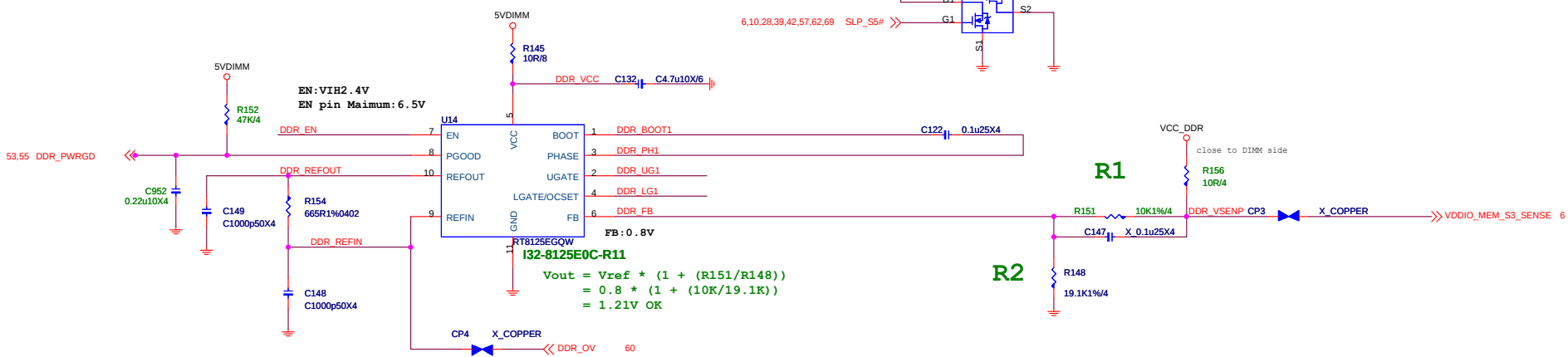
15.5A For CPU
9.5A For 4DIMM
1.2A For DDR VTT
OCP = 39.3A; Choke Isat=42A

$R_{DS(on)} (Low\ Side) \ 5V$
 $D03-4C02403-005:3.3 \sim 4m\Omega$
 $4m\Omega / 2pcs = 2m\Omega$

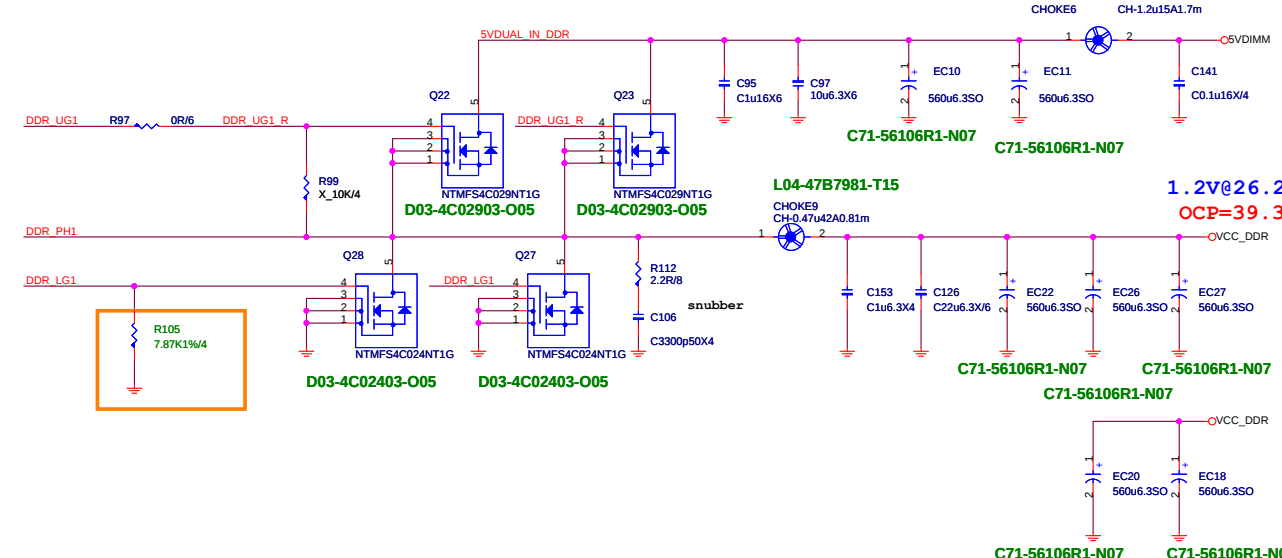
$R_{OCSET} = \frac{I_{VALLEY} \times R_{LGS(ON)}}{I_{OCSET}}$

OCP (blue arrow) MOSFET (red arrow)

Current Sensing				
Locat			1	0



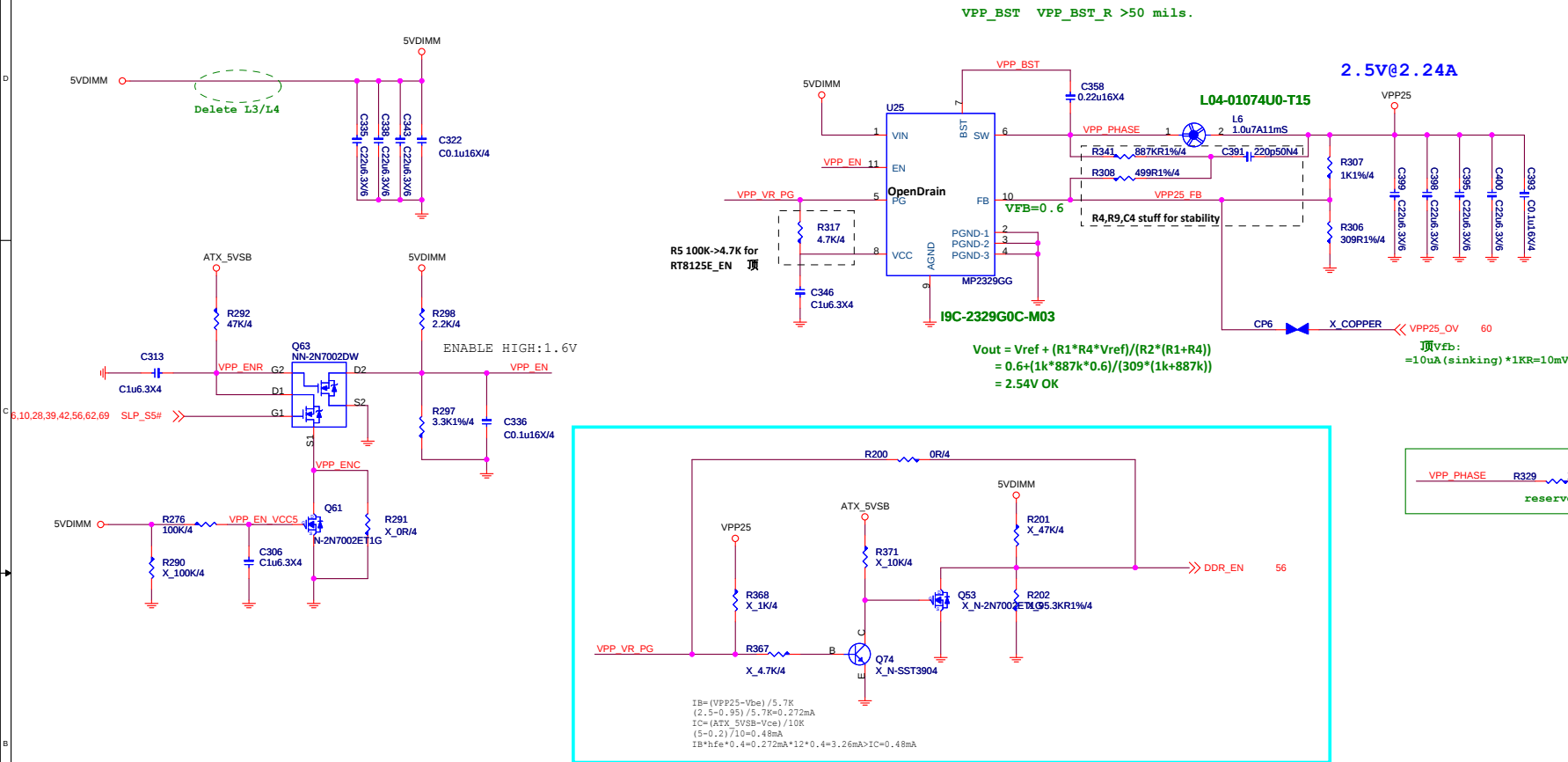
L04-12A7811-T15



	MICRO-STAR INT'L CO.,LTD		
	MS-7C84		
	Size	Document Description	Rev
	Custom	DDR Power - 8125E	15
Date: Wednesday, February 26, 2020		Sheet 56 of 73	

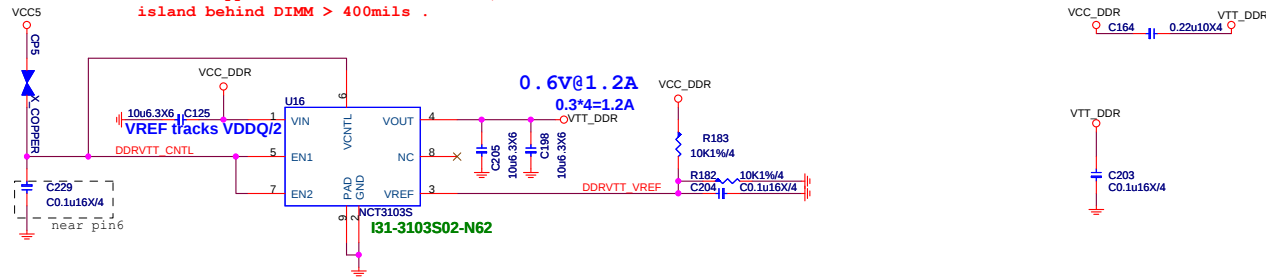
2.5V@2.24A

<https://vinafix.com>



0.6V@1.2A

To CPU Copper trace width > 250mils , Fill island behind DIMM > 400mils .



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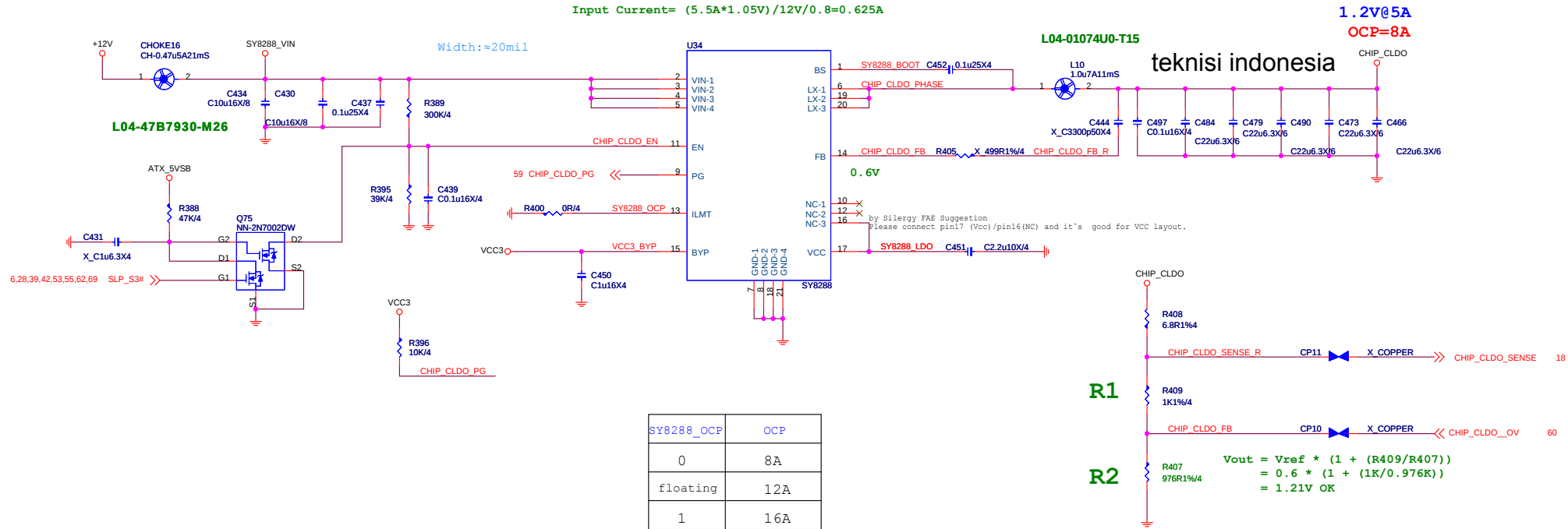
MS-7C84

Size Custom	Document Description DDR VPP25 / VTT	Rev 13
Date: Wednesday, February 26, 2020	Sheet 57 of 75	

CHIP CLDO

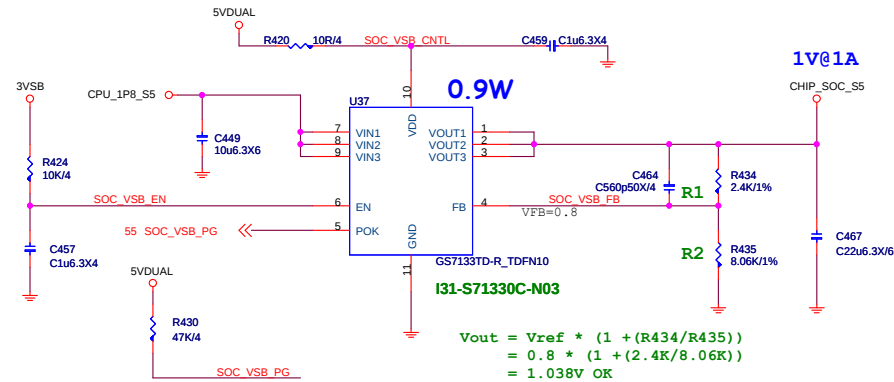
CHIP: VDD_CLDO@5A

https://vinafix.com



CHIP SOC S5

CHIP: VDDCR_SOC_S5@1A



MICRO-STAR INT'L CO.,LTD		
MS-7C84		
Size Custom	Document Description PROM - SY8288RAC / 1.05V	Rev 13
Date: Wednesday, February 26, 2020	Sheet 58 of 75	

CHIP SOC

CHIP: VDDCR_SOC@9A

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Input Current = $(12A \cdot 1V) / 12V / 0.8 = 1.25A$
 Choke Isat = 8A
 $I_{rms} = I_{out} \cdot \sqrt{(V_o/V_i) \cdot (1 - (V_o/V_i))}$
 $= 12 \cdot \sqrt{(1/12) \cdot (1 - (1/12))} = 3.316A$
 Choke Irms = 5 A

$L = (V_{out} / (F_{sw} \cdot I_{ripple})) \cdot (1 - (V_{out}/V_{in}))$
 $1 / (700K \cdot 12 \cdot 0.3) \cdot (1 - (1/12)) = 0.432\mu H$
 $1 / (700K \cdot 12 \cdot 0.5) \cdot (1 - (1/12)) = 0.218\mu H$

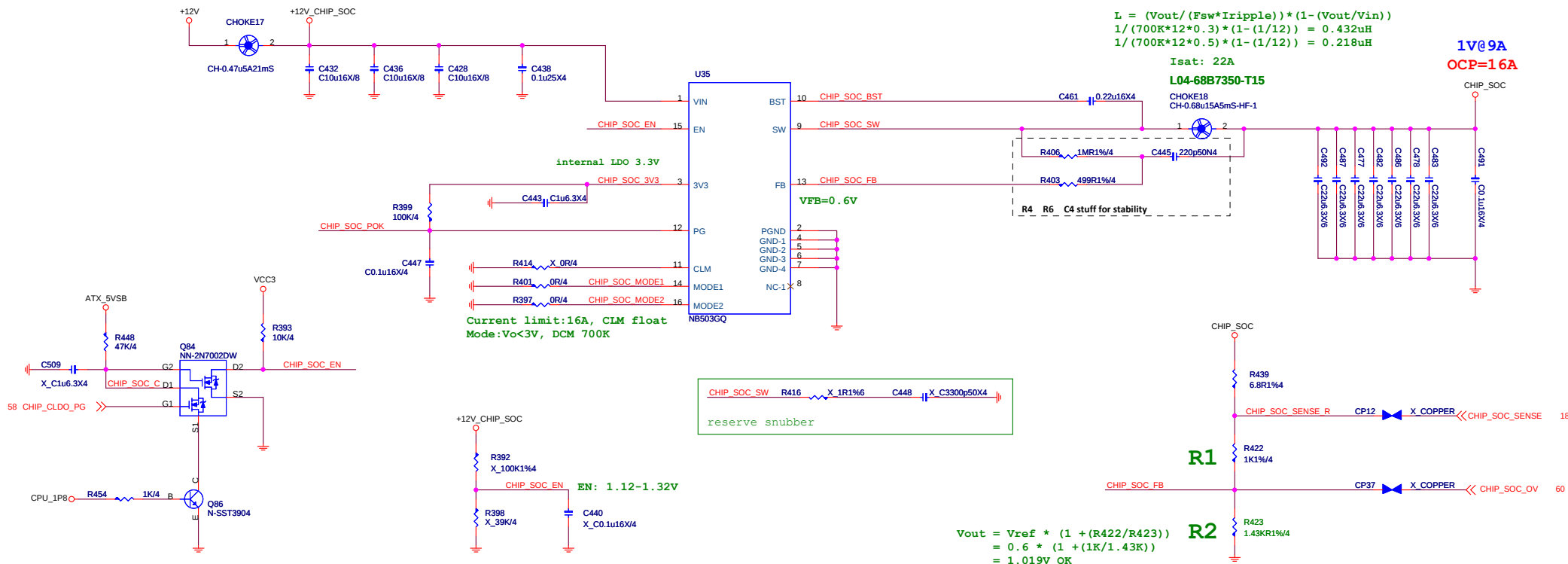
Isat: 22A

L04-68B7350-T15

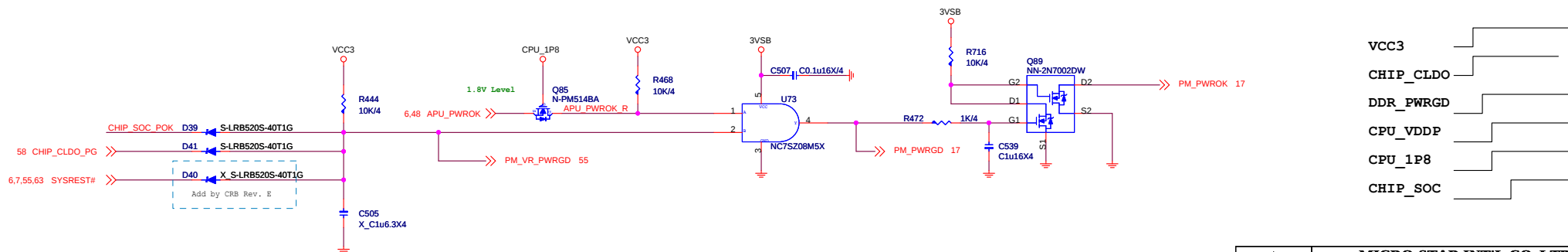
CH0KE18
CH-0.68u15A5ms-HF-1

1V@9A

OCP=16A



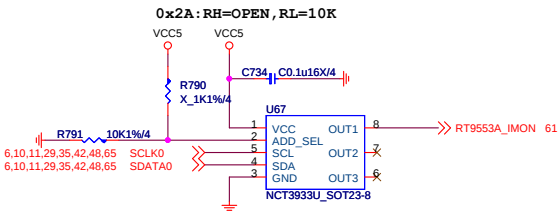
S0 PG



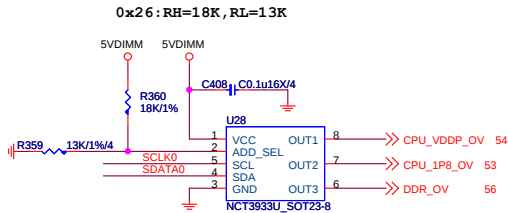
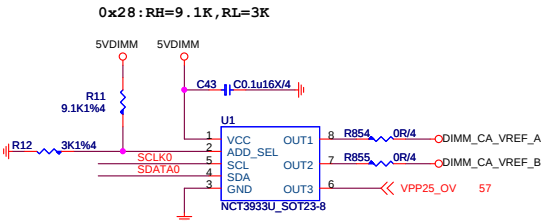
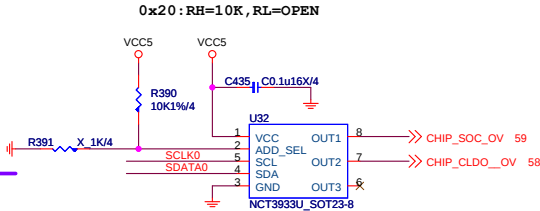
MICRO-STAR INT'L CO.,LTD			
MS-7C84			
Size	Document Description	Rev	
Custom	PROM - NB503 / 1.0V	13	
Date:	Wednesday, February 26, 2020	Sheet	59 of 75

Over Voltage Control IC

https://vinafix.com



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%



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%

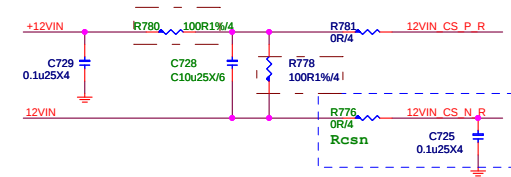


MICRO-STAR INT'L CO.,LTD

MS-7C84

Size Custom	Document Description OV Control - NCT3933	Rev 13
Date: Wednesday, February 26, 2020		Sheet 60 of 75

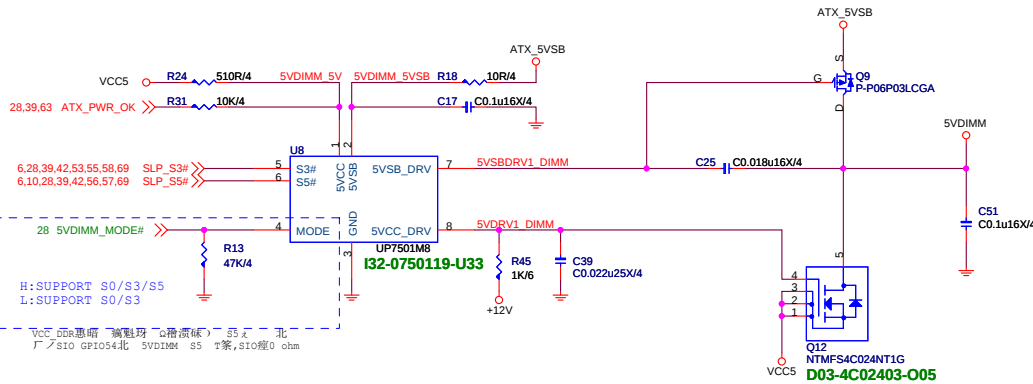
RT9553B CURRENT SENSE <https://vinafix.com>



MS-7C84

Size Custom	Document Description OCP 12VIN - RT9533B	Rev 13
Date: Wednesday, February 26, 2020		Sheet 61 of 75

5VDIMM FOR DDR



3VSB cost down

3.3V@3.363A

CPU: VDD_33_S5@0.25A

CHIP: VDD_33_S5@0.1A

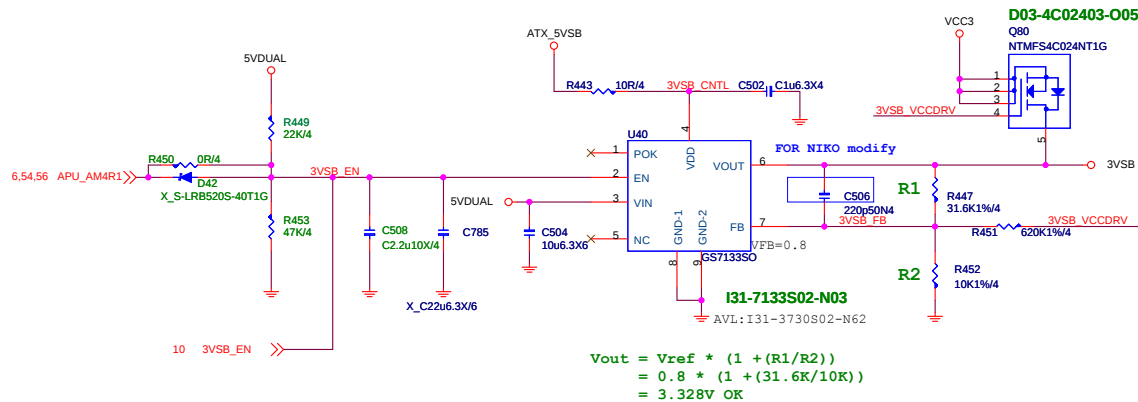
PCIE*4@1.5A

M.2_WIFI@0.78A

LAN@0.065A

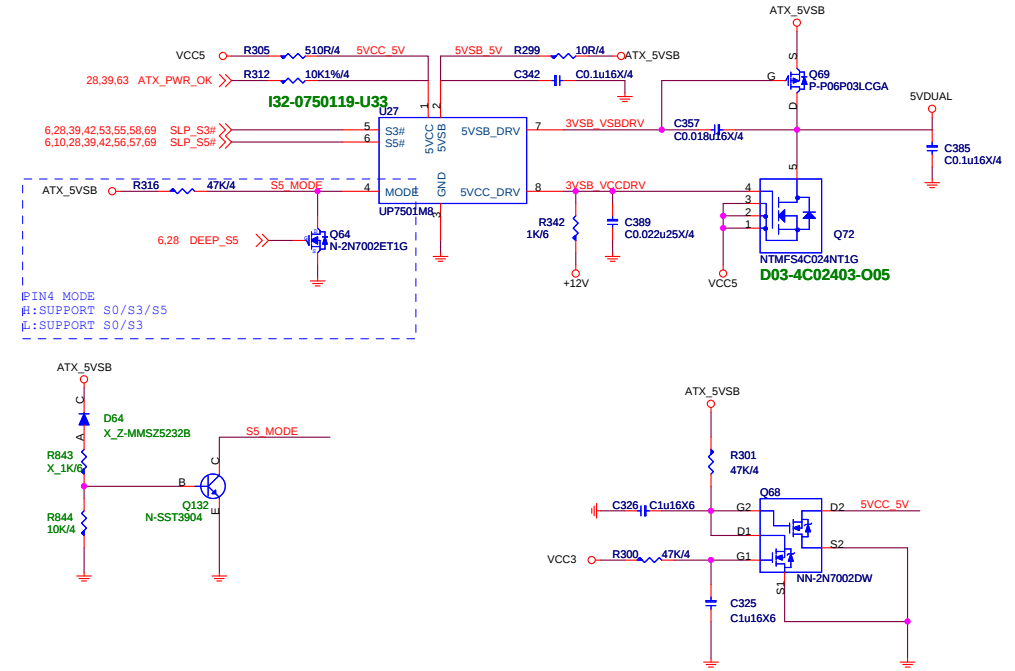
Redriver*2@0.668A

USB TYPE-C@0.9mA

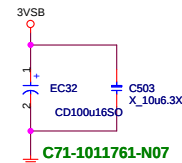


5VDUAL For 3VSB CPU 1.8V
VDDP

<https://vinafix.com>



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

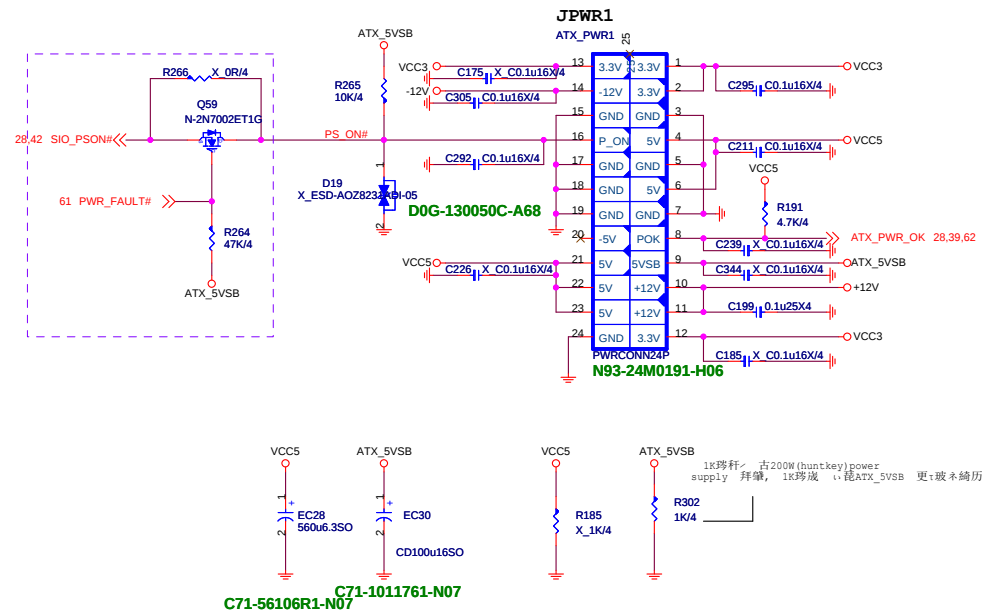


MICRO-STAR INT'L CO.,LTD

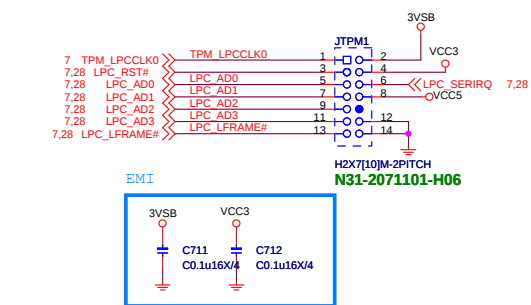
MS-7C84

Size Custom	Document Description ACPI - 3VSB / 5VDIMM	Rev 13
Date: Wednesday, February 26, 2020	Sheet 62 of 75	

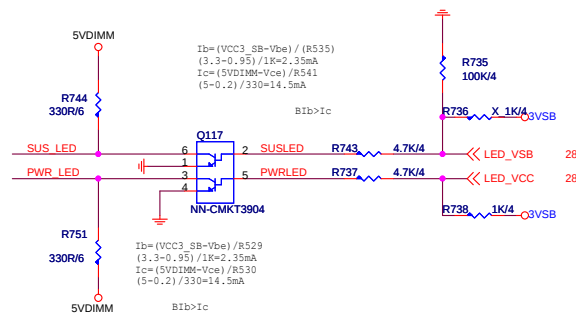
ATX POWER CONNECTOR



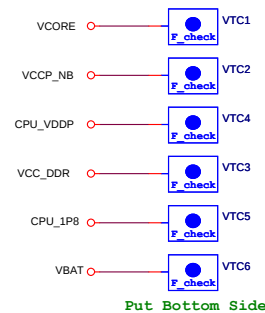
TPM



LED (for NCT6797D)

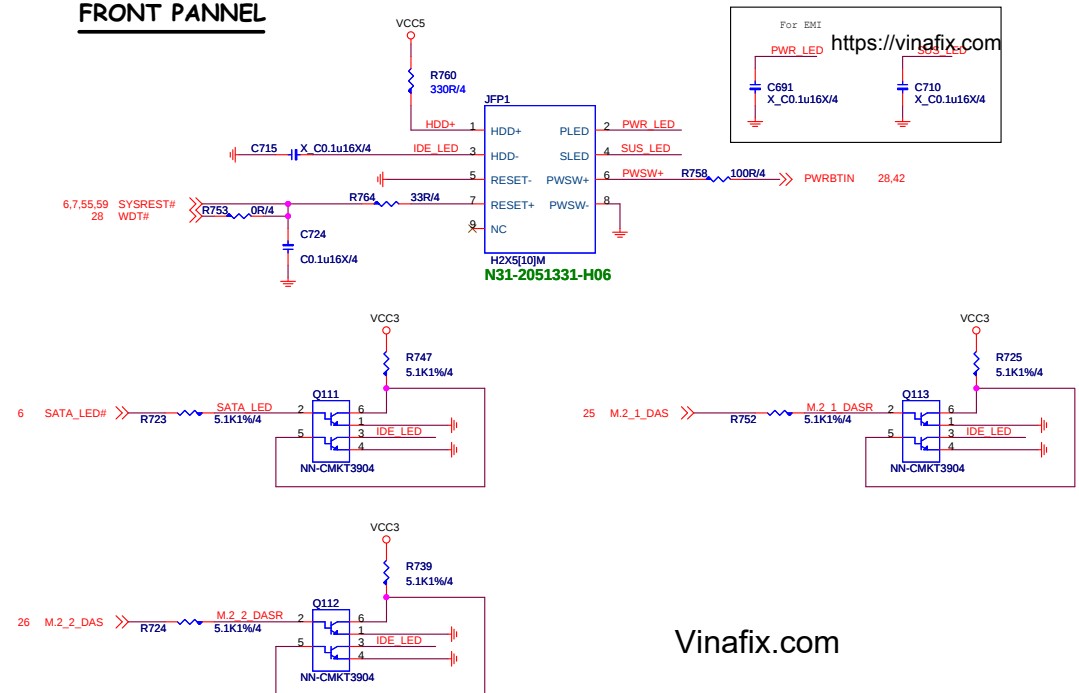


Factory check point

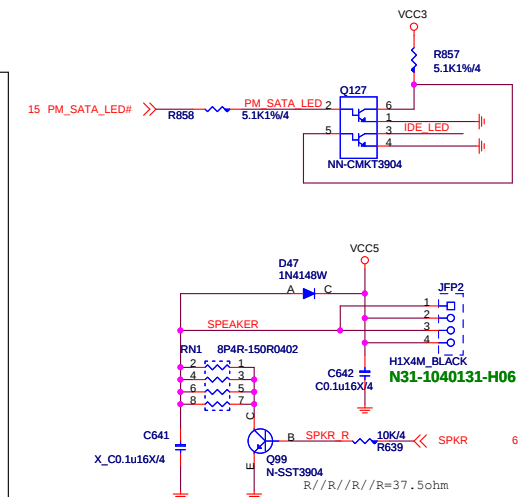
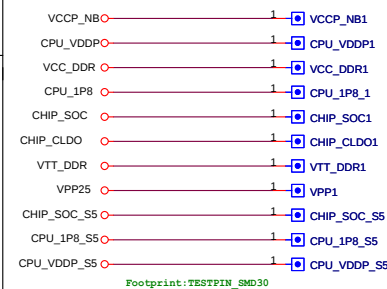


Put Bottom Side

FRONT PANNEL



Voltage Measure Point



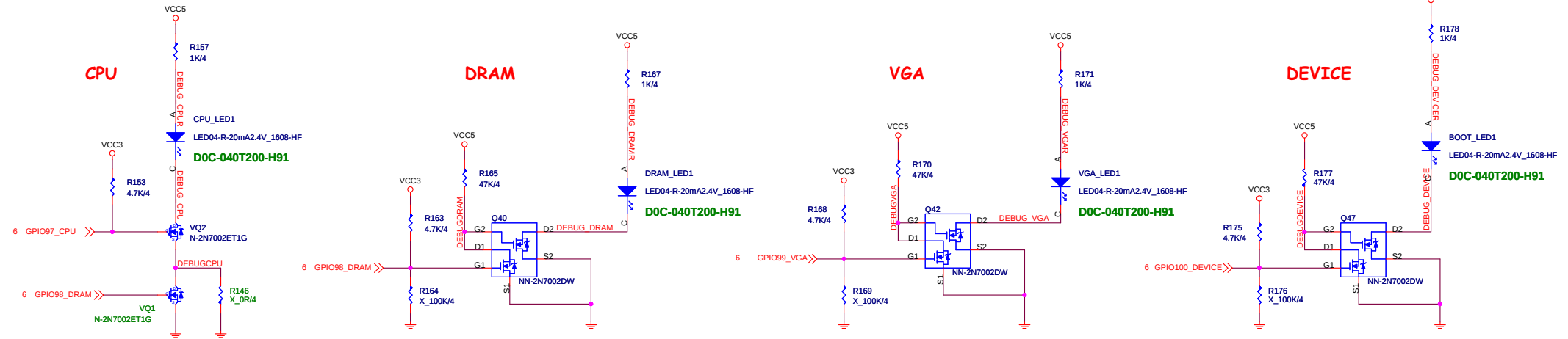
MICRO-STAR INT'L CO.,LTD

MS-7C84

Size	Document Description
Custom	ATX Power - FrontPanel / EMI

Rev
13

EZ Debug LED



LED 獵蝨蝟 蝟盤CPU LED 狂奔

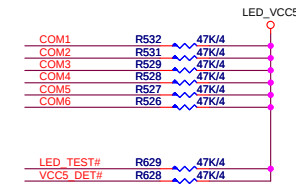
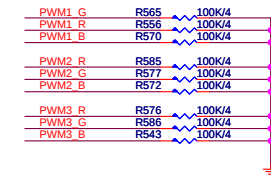
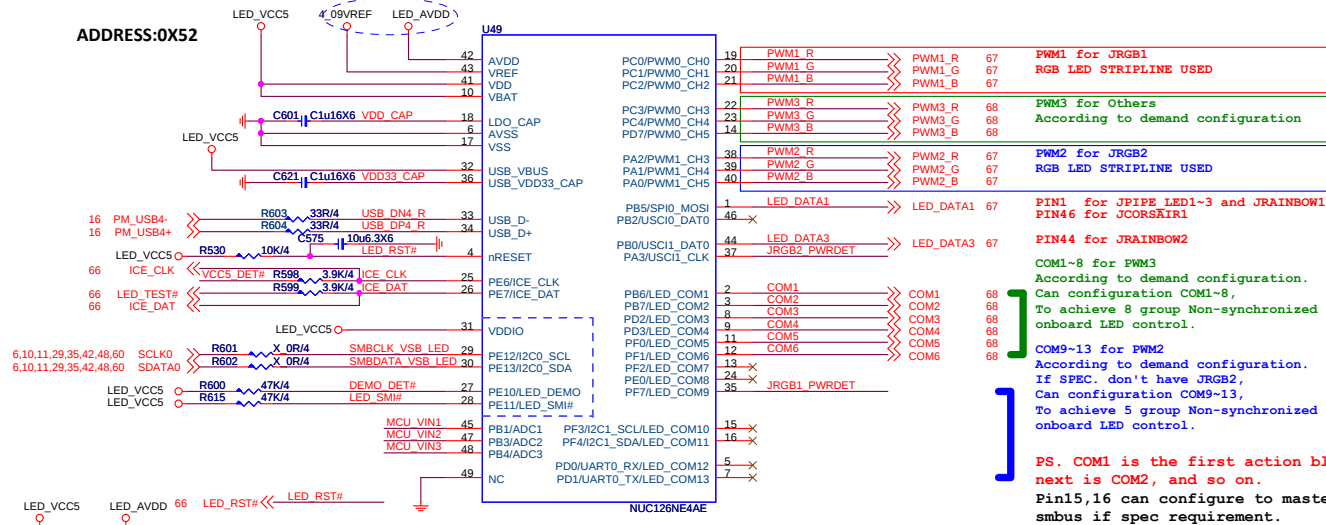
LED GPIO	GPIO97	GPIO98	GPIO99	GPIO100
獵	GPI PULL HIGH	GPO PO LOW	GPO PO LOW	GPO PO LOW
蝨	GPO LOW	GPO HIGH (default HIGH)	GPO HIGH (default HIGH)	GPO HIGH (default HIGH)

AMD AMP Detect LED

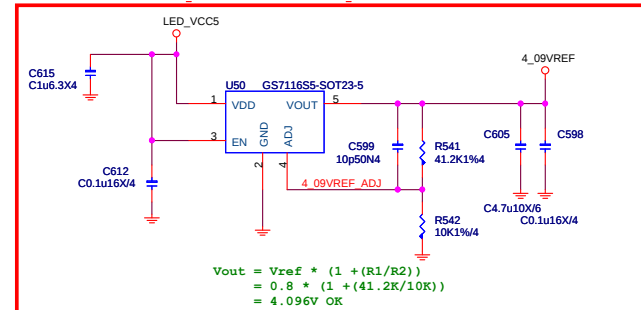
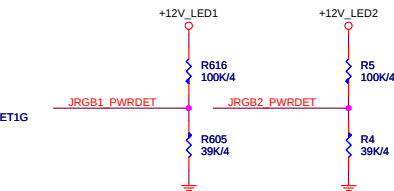
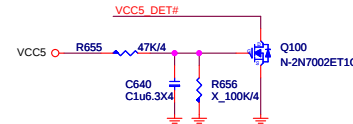
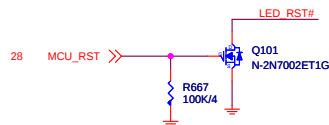
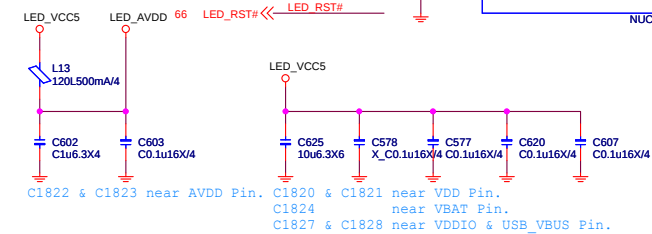
48 PIN LED MCU

If you use ADC function, need to separate VREF from AVDD and 4_09VREF stuff for VREF.

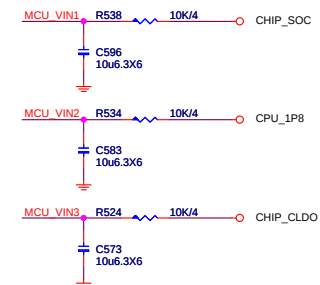
<https://vinafix.com>



PS. COM1 is the first action block,
next is COM2, and so on.
Pin15,16 can configure to master
smbus if spec requirement.



Option Spec For Voltage Monitor Require.



Control	Net Name	PWM USE
PCH	LED_DATA1	No Use
AUDIO Cover	LED_GPIO_01	No Use
MOS/IO cover	LED_GPIO_02	No Use
JRAINBOW1	LED_GPIO_03	No Use
JCOSAIR1	LED_DATA2	No Use
JRGB1/JRGB2	PWM1/ PWM2	PWM1/ PWM2
Board Side LED	COM 1~8	PWM3
Board Side LED	COM 9~13	PWM2

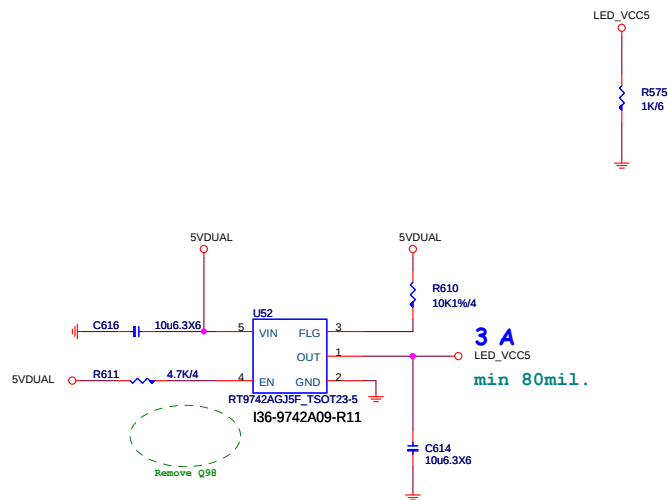


MICRO-STAR INT'L CO.,LTD

MS-7C84

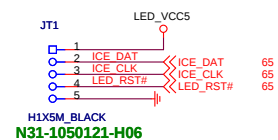
Size Custom	Document Description MCU - LED Control	Rev 13
Date: Wednesday, February 26, 2020		Sheet 65 of 75

EXTERNAL POWER INPUT



External Power

JT1 for FW update



JF1 For Factory Test



1 PCH HEATSINK LED

<https://vinafix.com>

2 AUDIO/IO Cover LED

3 MOS HEATSINK LED

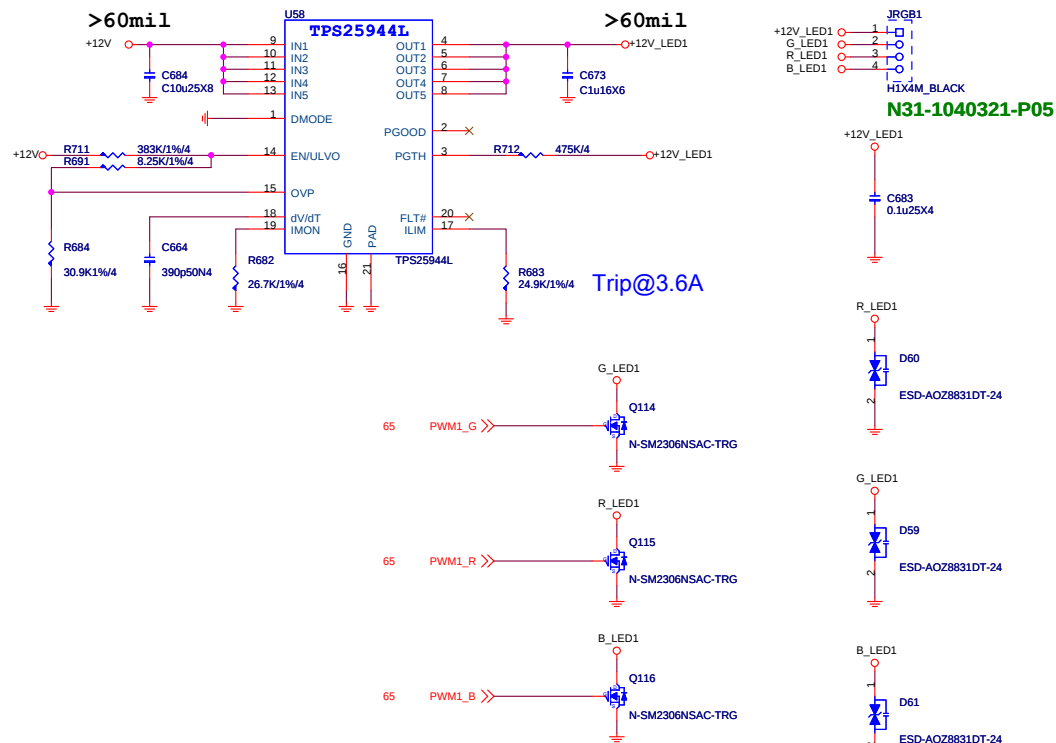
JPIPE:PIN1:output ,PIN2:input
PIN2:MCU IN
PIN1:HEATSINK OUT



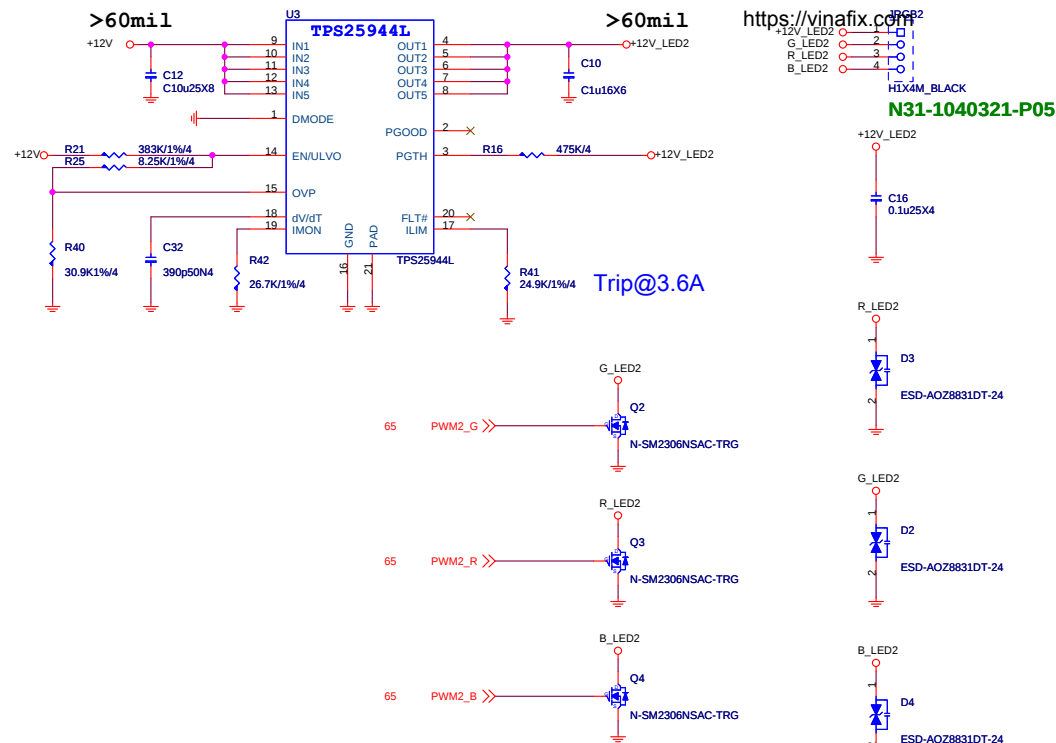
MICRO-STAR INT'L CO.,LTD

MS-7C84

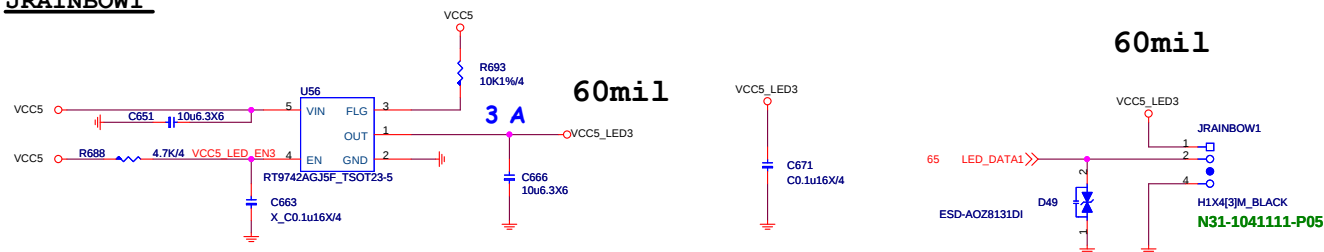
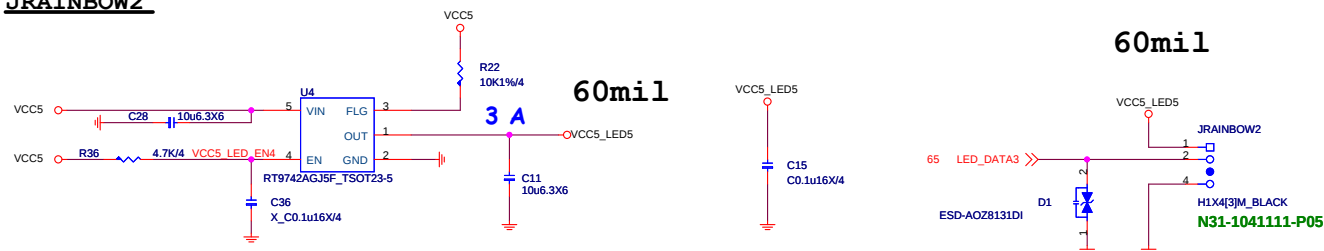
Size Custom	Document Description LED - Power / JPIPE	Rev 13
Date: Wednesday, February 26, 2020	Sheet 66 of 75	

JRGB1

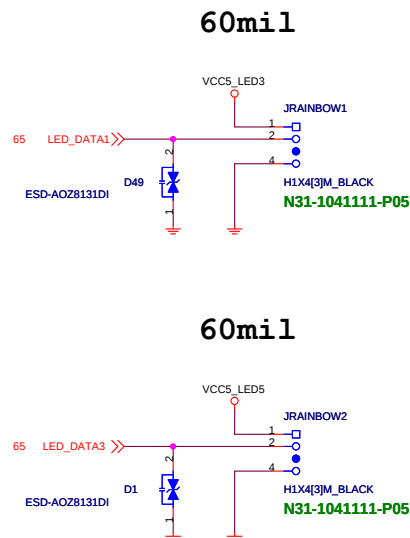
钼LED 緋兵 (RGB)
 ---- PCB ゆ 瑛 (JRGB1)
 ---- も 爹 RGB 钼纒や穿夾非 5050 RGB LED 緋兵 (12V/G/R/B), 緋兵罷块 笨蹂綜 歳3 蛙 (12 工痲),
 期岸綜 歳2そへ

JRGB2

钼LED 繚兵 (RGB)
 ---- PCB ゆ 瑛 (JRGB2)
 ---- 期 爹 RGB 钼繚や穿夹非 5050 RGB LED 繚兵 (12V/G/R/B) , 繚兵耀块 笨蹂综 歳3 蚌 (12 工 痲) ,
 期萃综 歳2そへ

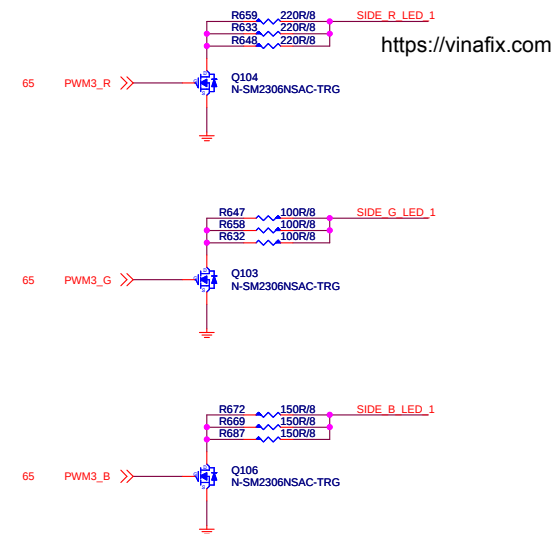
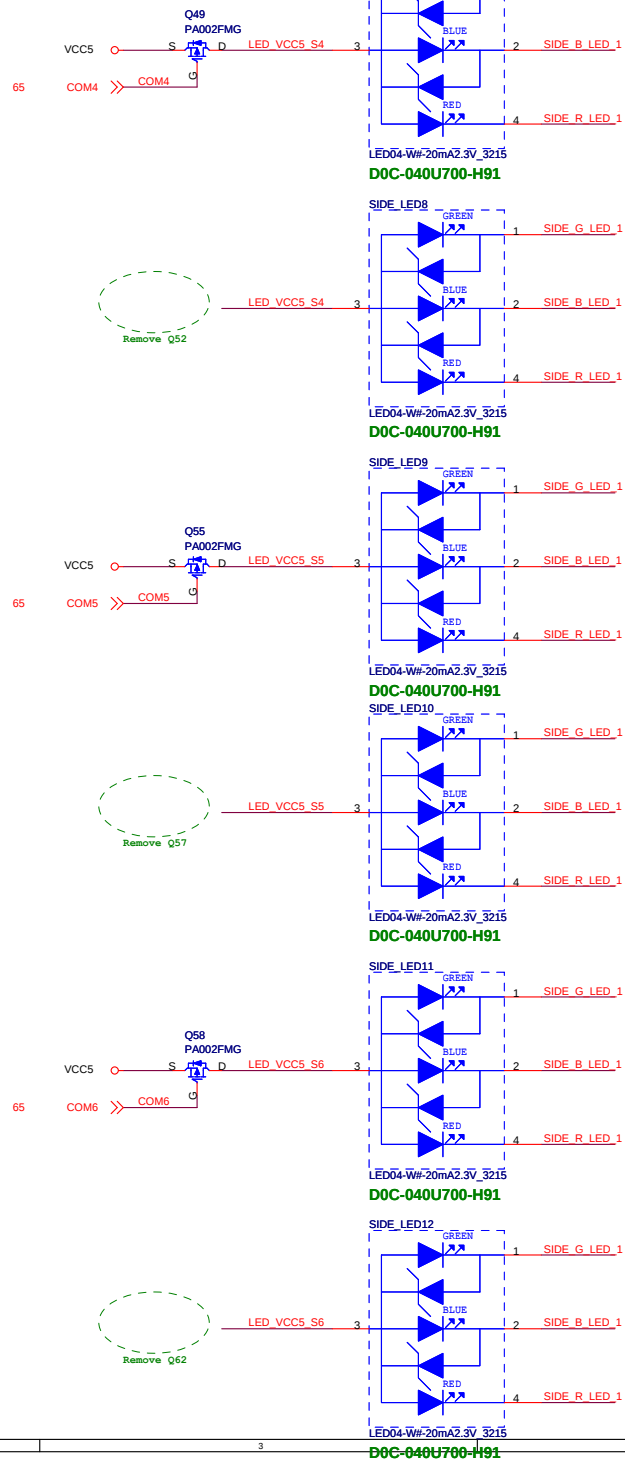
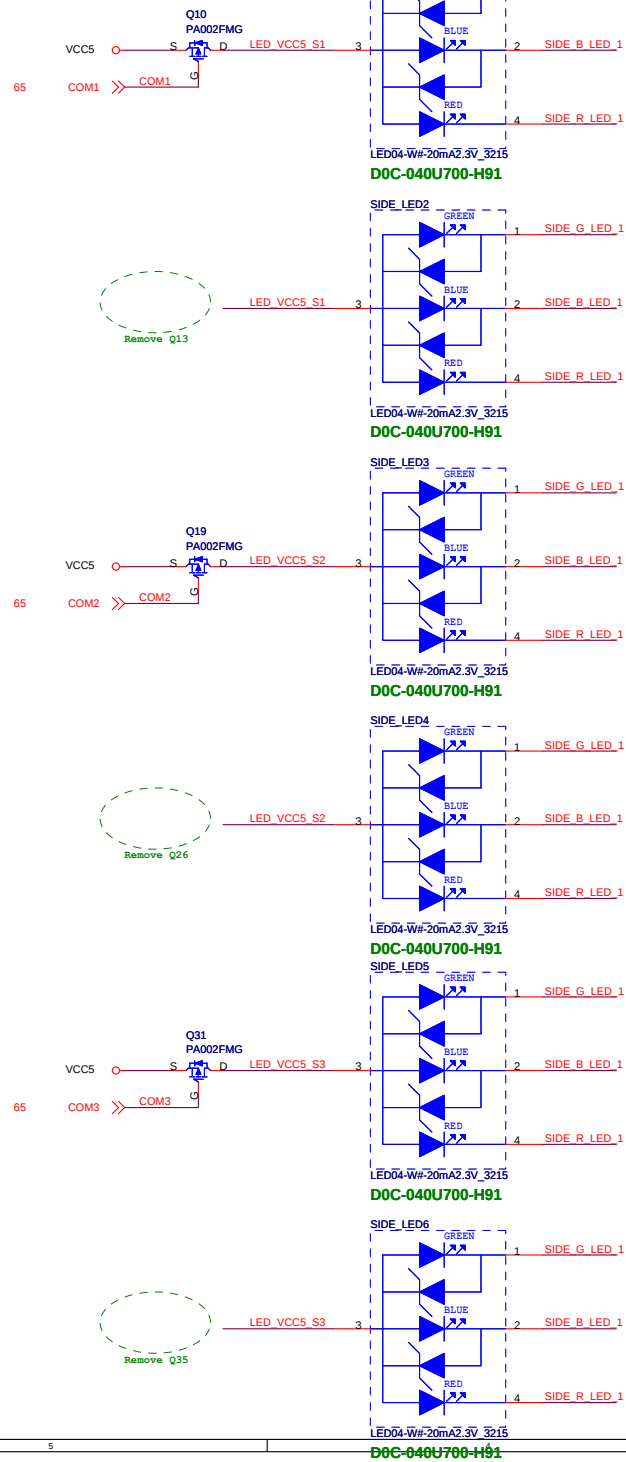
JRAINBOW1JRAINBOW2

JCORSAIR1

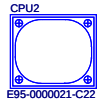


MICRO-STAR INT'L CO.,LTD			
MS-7C84			
Size Custom	Document Description LED - JLED1/2/3/4		Rev 13
Date: Wednesday, February 26, 2020		Sheet	67 of 75

Sidebar LED *12

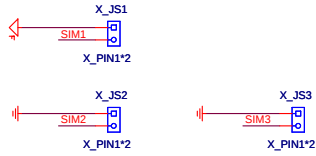


CPU Socket

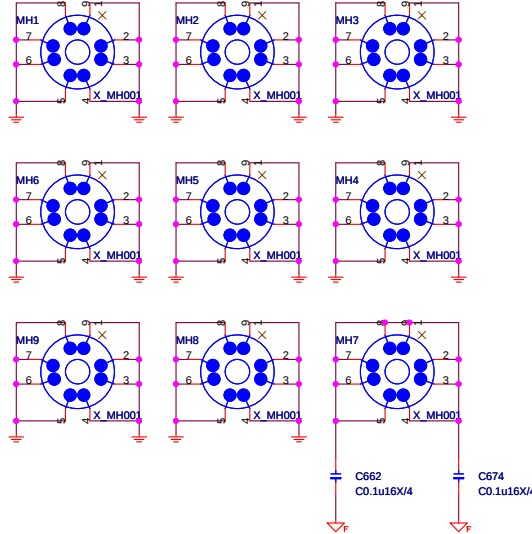


E95-0000022-A91

Simulation



Optics Orientation Holes



MANUAL PART

<https://vinafix.com>

UEF1
G51-M1SPXXA-A09
G51-M1SPXXA-A09

HDMI_LA1
Label
HDMI
HDMI LABEL
Y01-RHDMI03-000

GMBH1
Y02-MU00100-NAH
Y02-MU00170-CFO

XSP1T1
X_Y02-MA00401-XSP
Y02-MA00401-XSP

SSE1
X_Y02-MA00101-SSE
Y02-MA00101-SSE

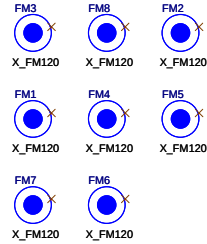
PCB

PCB

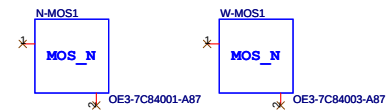


7C84-1.3
PD0-07C8413-E48

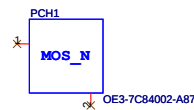
REF
Label
HDMI



MOS HEATSINK



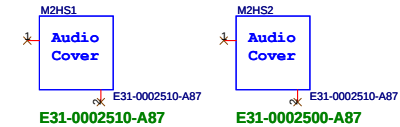
PCH HEATSINK



Audio COVER



M2 COVER



IO COVER

COVER3
Label
IO COVER
E22-7C84010-C22
E22-7C84010-C22

DDR COVER