

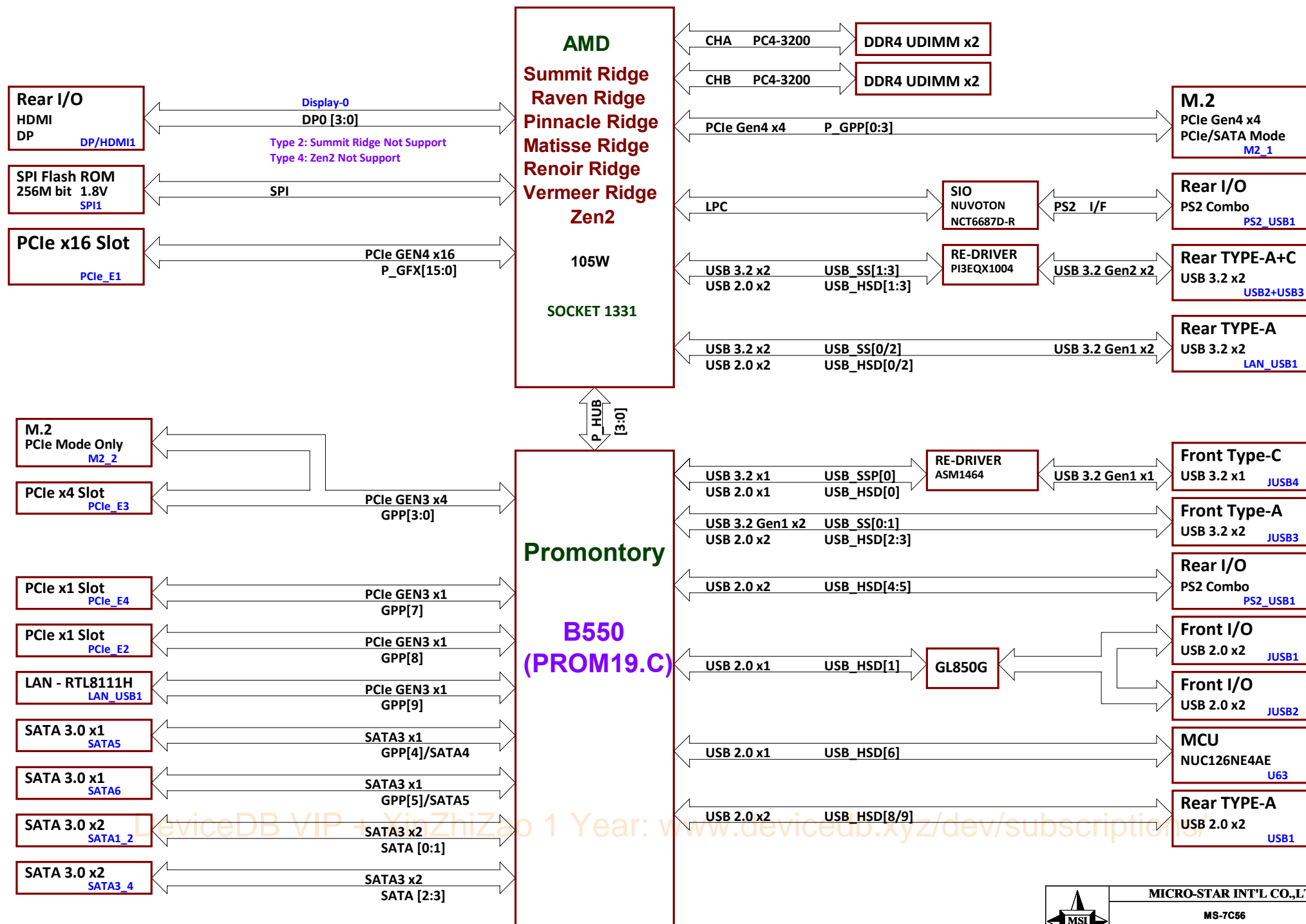
AMD AM4

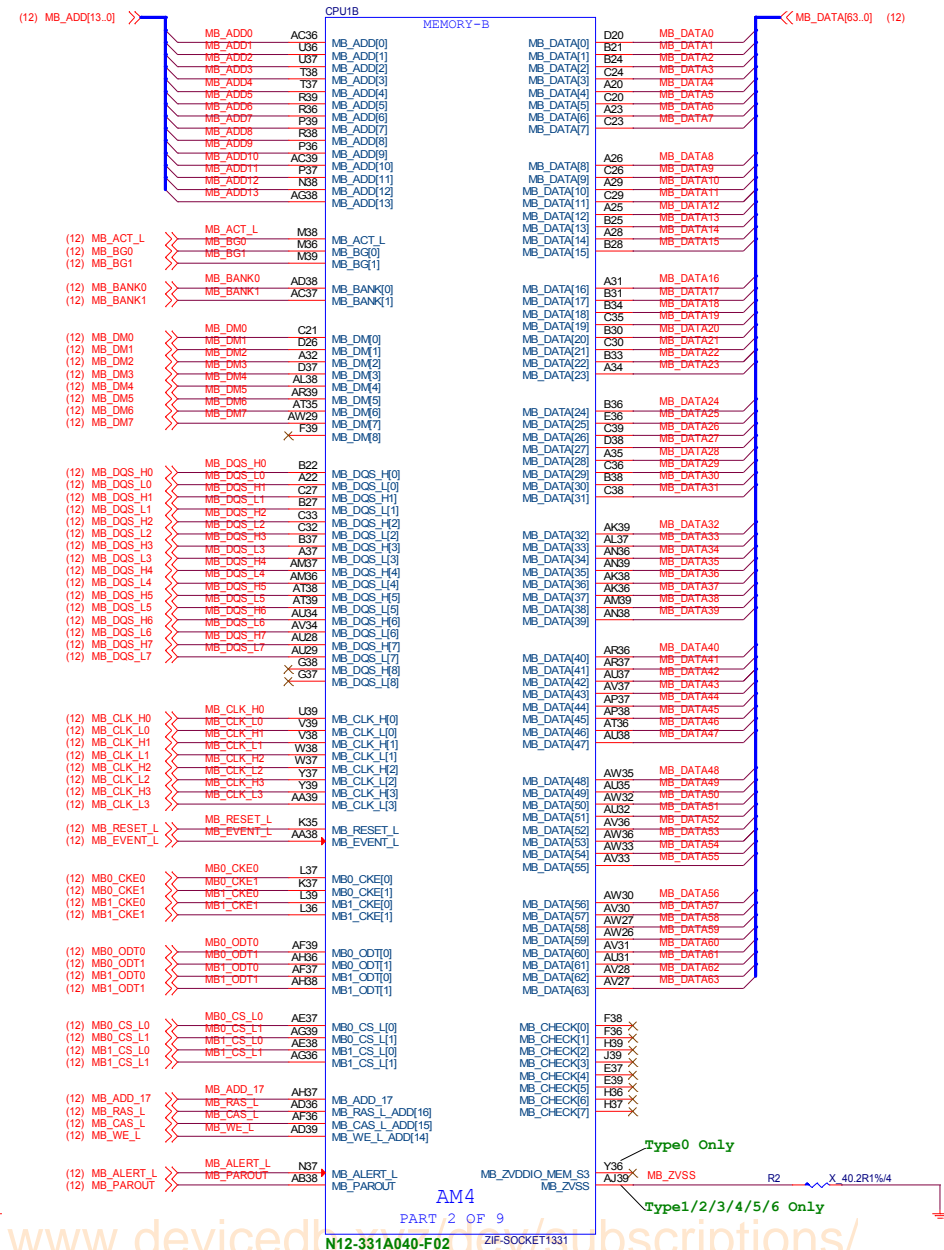
B550

MS-7C56-20

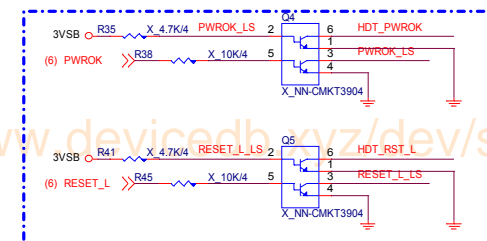
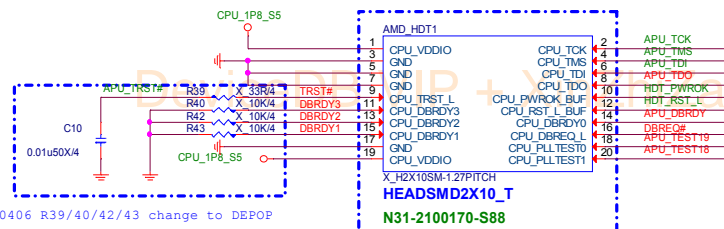
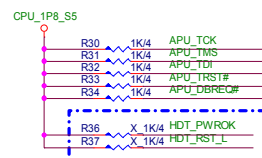
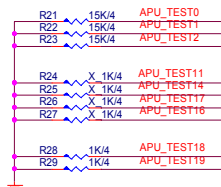
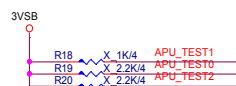
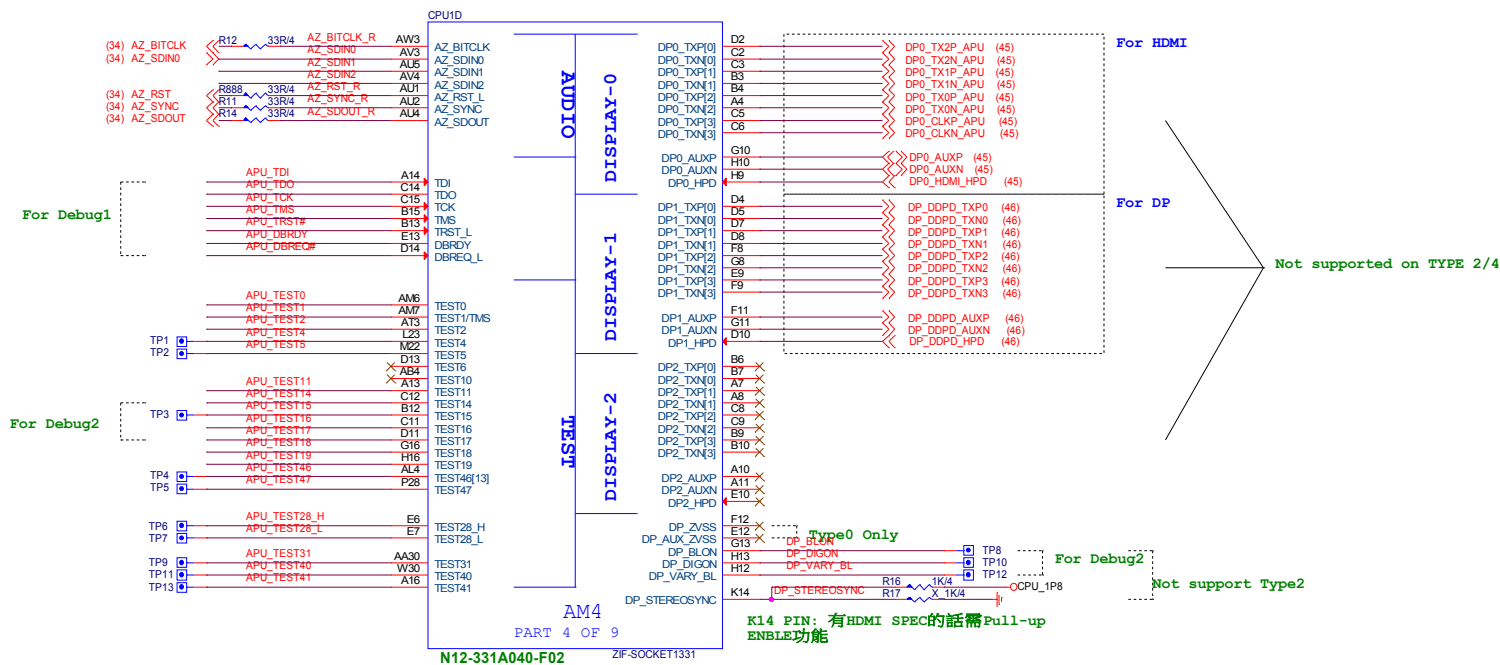
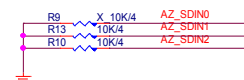
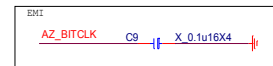
01	Cover Sheet	36	USB Power - UP7501	67	LED - Mystic Light
02	Block Diagram	37	Front USB2.0 Header	68	BOM Option
03	FM4 DDR4 I / F	38	Front USB3.2 G1 Header	69	Manual Parts
04	AM4 PCIE / SATAE	39	Front USB3.2 G1 TypeC	70	SMB MAP
05	AM4 Display / Audio	40	Rear USB2.0+PS2+F75504A	71	PG MAP
06	AM4 SVI / ACPI / GPIO	41	Rear USB3.2 G1 / USB2.0	72	GPIO MAP
07	AM4 LPC / SPI / USB / CLK / STRAP	42	Rear USB3.2 G2 TypeA/Redrive	73	Power Sequence
08-09	AM4 Power / VDDIO_AUDIO Power / GND	43	Rear USB3.2 G2 Type C / MUX	74	Power Map
10	RTC / CMOS	44	GL850G	75	History
11-14	DDR4 - POWER / GND	45-46	HDMI/DP		
15	Promontory - PCIE / SATA / SATAE	47	CPU Power IR35201 10+2		
16	Promontory - USB / OC	48	CPU PWR PH-Doube		
17	Promontory - CLK / ACPI / GPIO	49	CPU Power Vocre Phase 1- 6		
18-19	Promontory - Power / GND	50	CPU Power Vocre Phase 7- 10		
20	PCI_E1 (X16)	51	CPU Power NB Phase 1-2		
21	PCI_E3 (X4)	52	CPU power 1.8_S0 / S5		
22	PCI_E2/E4 (X1)	53	CPU power VDDP - NB503		
23	PCIE GEN3 SWITCH	54	VRM PWRGD		
24	M2_1 PCIE/SATA(KEY_M)	55	DDR Power - RT8125H		
25	M2_2 PCIE Only(KEY_M)	56	DDR PWR-MP2329G-VPP25 / VTT		
26	SIO - NCT6687D-R	57	PM - SY8288/PM_1P05/PM_2P5V		
27	SIO HW Monitor/COM	58	PM -TPS22976DPUR_VCC33		
28	FAN TYPE-N CPUFAN1	59	OV Control - NCT3933		
29	FAN TYPE-M PUMPFAN1	60	OV 12VIN - RT9553B		
30	FAN TYPE-M SYSFAN1/2	61	ACPI - 3VSB / 5VDIMM		
31	FAN TYPE-M SYSFAN3/4	62	ATX Power - FrpntPanel / EMI		
32	FAN TYPE-M SYSFAN5/6	63	LED - EZDEBUG / AMP		
33	LAN - RTL8111H	64	MCU - LED Control		
34	Audio ALC892-CG	65	LED - Power		
35	Audio DePop	66	LED - JRGB1_JRANBOW1/2		

DeviceDB VIP - Xinzhizao 1 Year: www.device-db.com/dev/subscriptions/

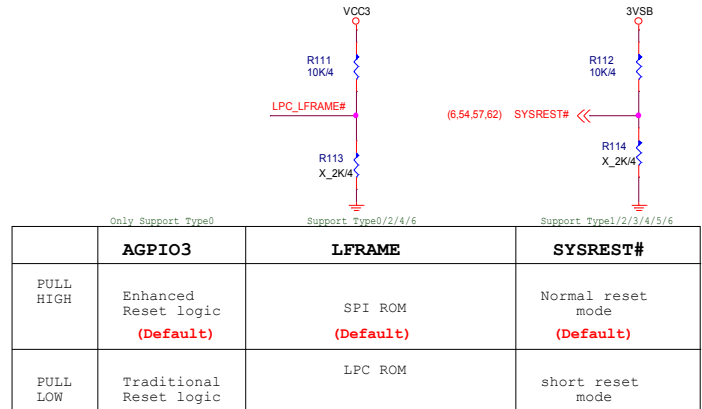
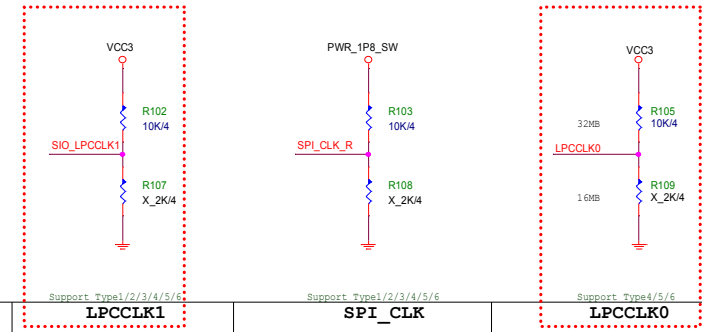




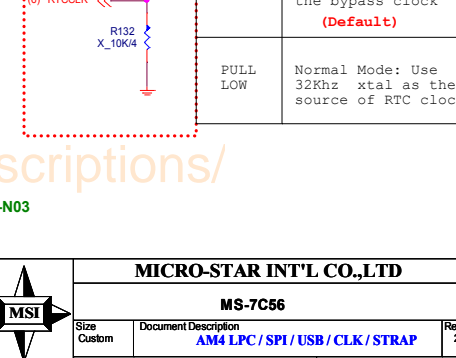
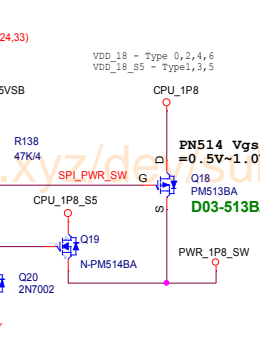
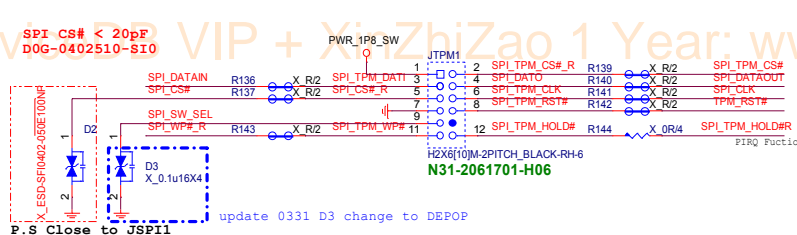
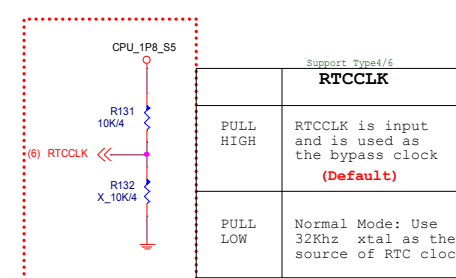
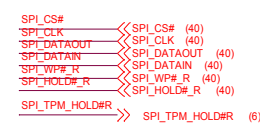
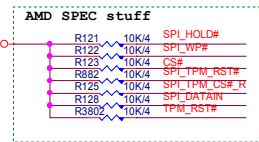
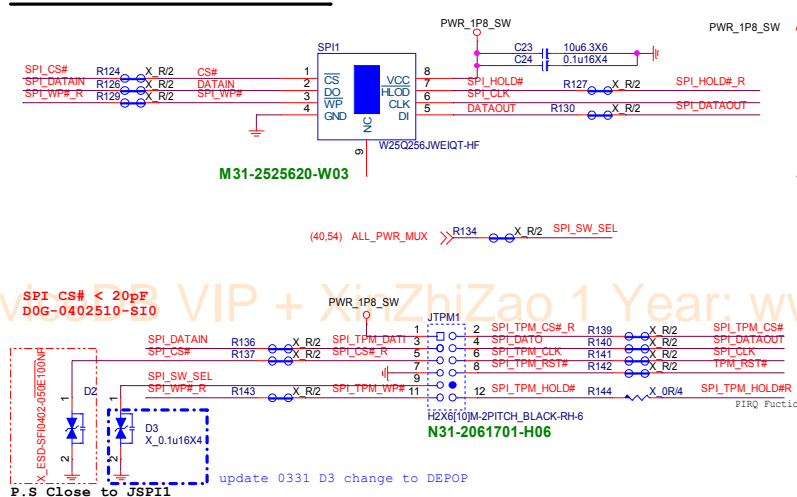
DeviceD274711XinZhiZao 1 Year: www.deviceD274711XinZhiZao.com/subscriptions/

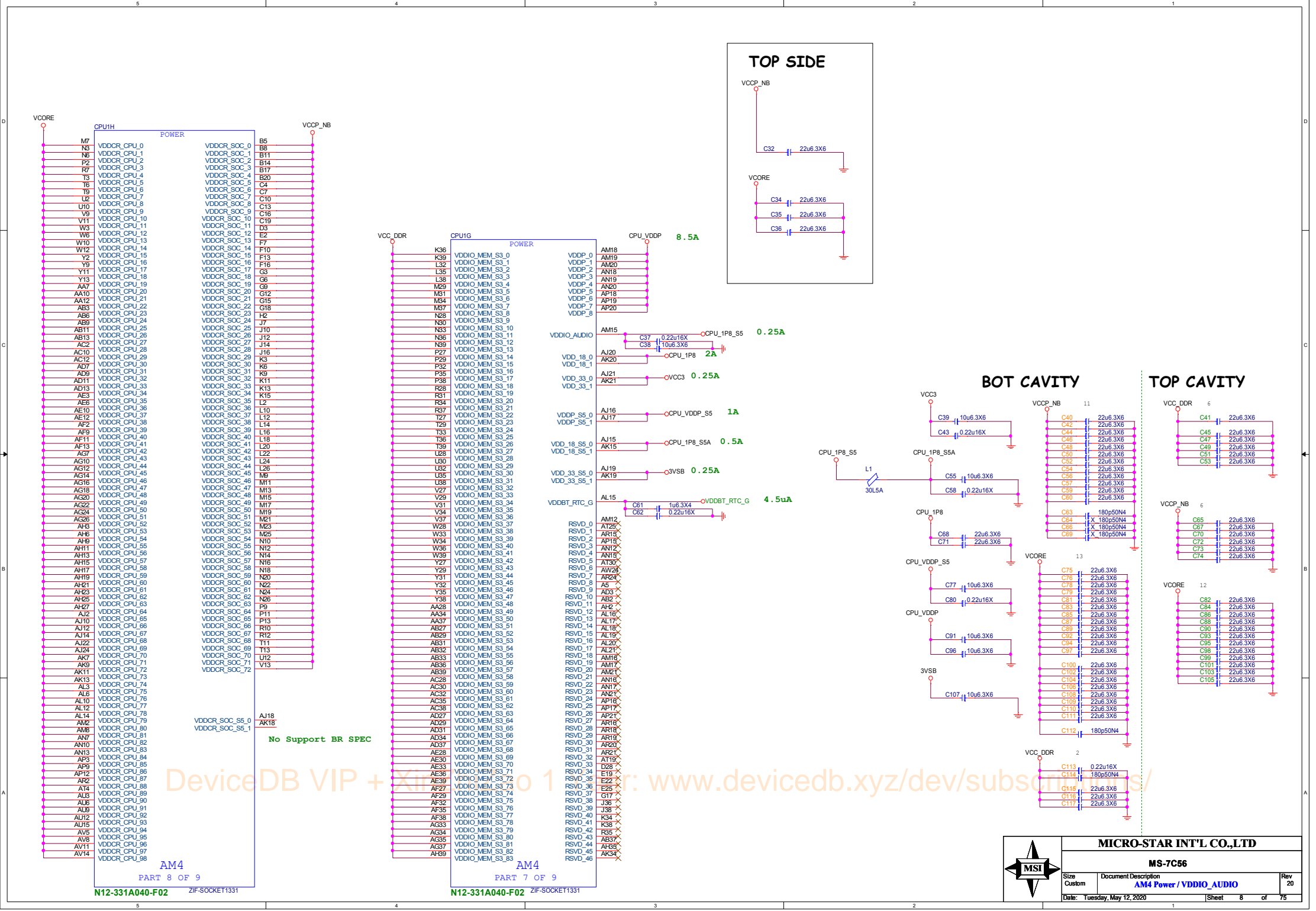


Strapping Options



SPI ROM(1.8V)



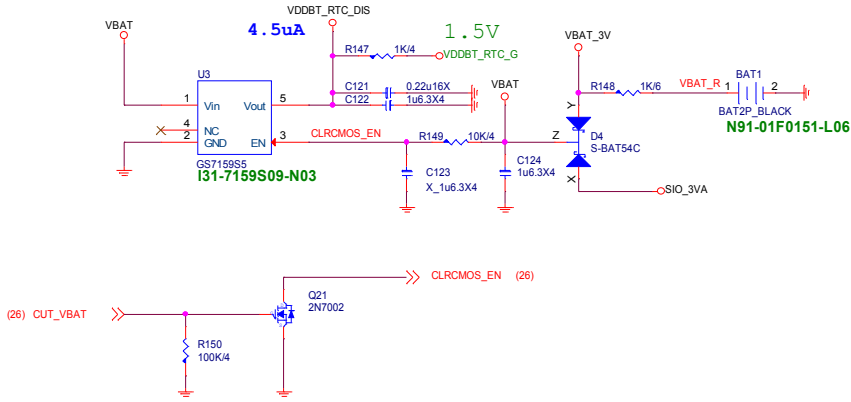


GND

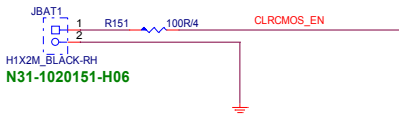
AM4
PART 9 OF 9

DeviceDB VIP + 1 Year. www.device-db.xyz/dev/subscriptions/

RTC & Clear CMOS Circuit



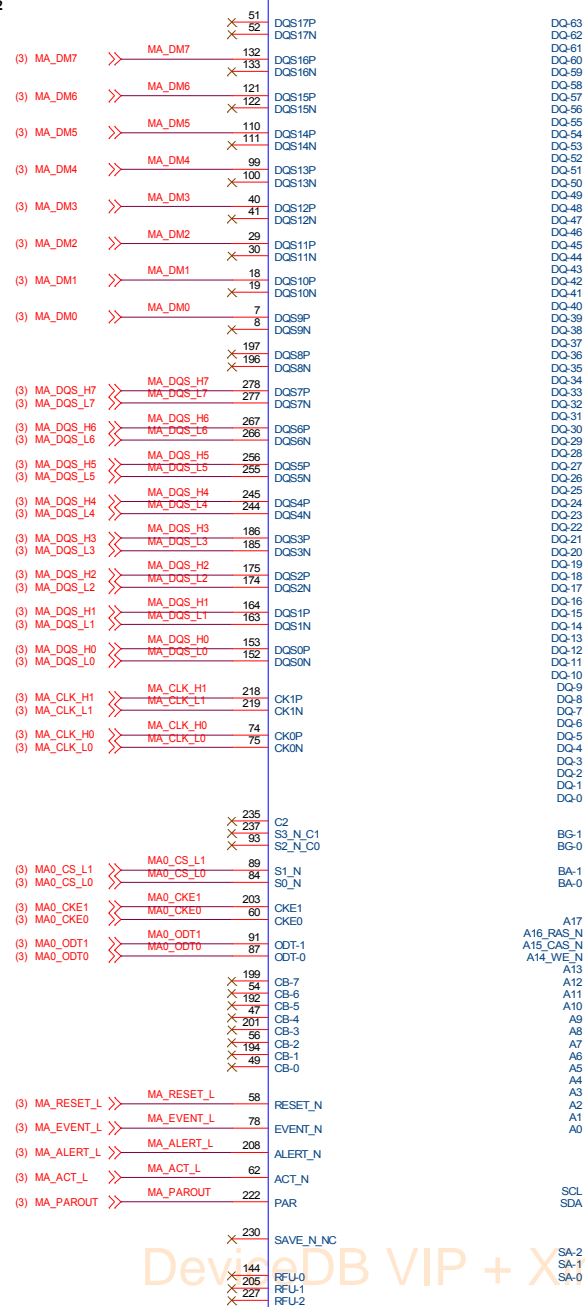
Clear CMOS button



DeviceDB VIP + XinZhiZao 1 Year: www.devedb.xyz/dev/subscriptions/

A1 A2 B1 B2

DIMMA1A

DDR4-288P_BLACK-RH-8
N13-2881281-L06

AVL: N13-2880441-F02

MA_DATA[63..0] (3,11)

MA_ADD[13..0] (3)


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

SMBus 0	
Device	8-bit Address (hex)
DIMMA0	A0
DIMMA1	A4
DIMMB0	A2
DIMMB1	A6

(6,24,59) SCLK0 >> SCLK0 R154 X R/2 SMB_CLK_DIMM
(6,24,59) SDA0 >> SDA0 R155 X R/2 SMB_DATA_DIMM (12)

DIMMA2A

DDR4-288P_BLACK-RH-8
N13-2881281-L06DIMM2 (CHANNEL-A) -A4
ADDRESS = 1:0 [SA1:SA0]



MICRO-STAR INT'L CO.,LTD

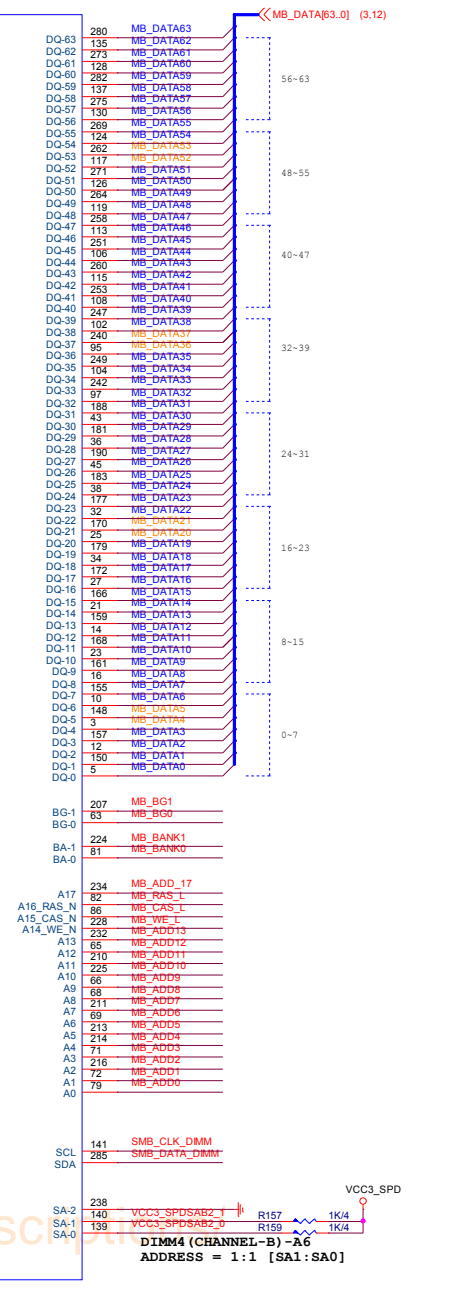
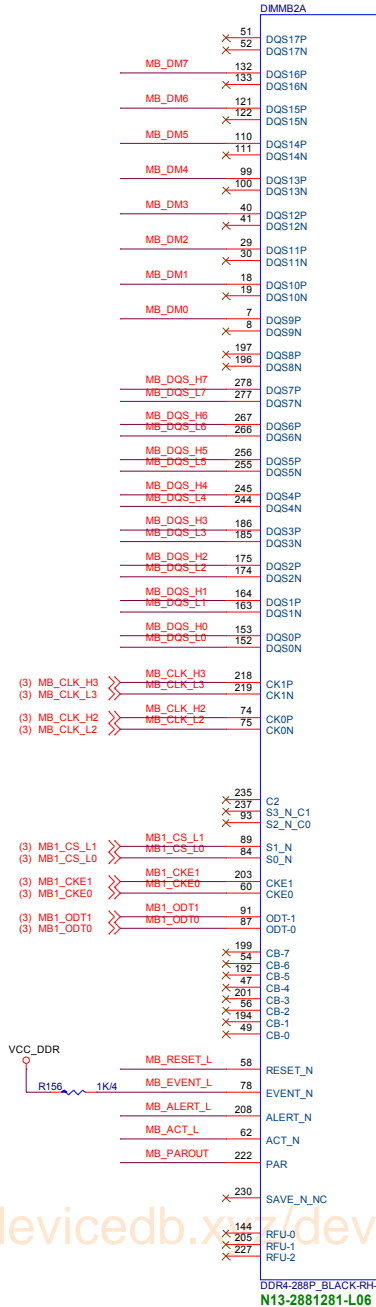
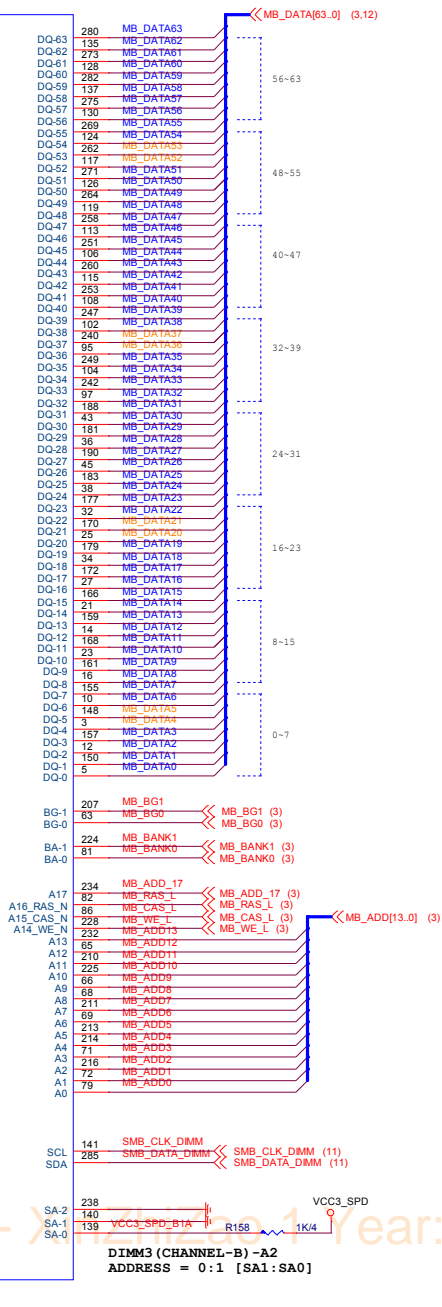
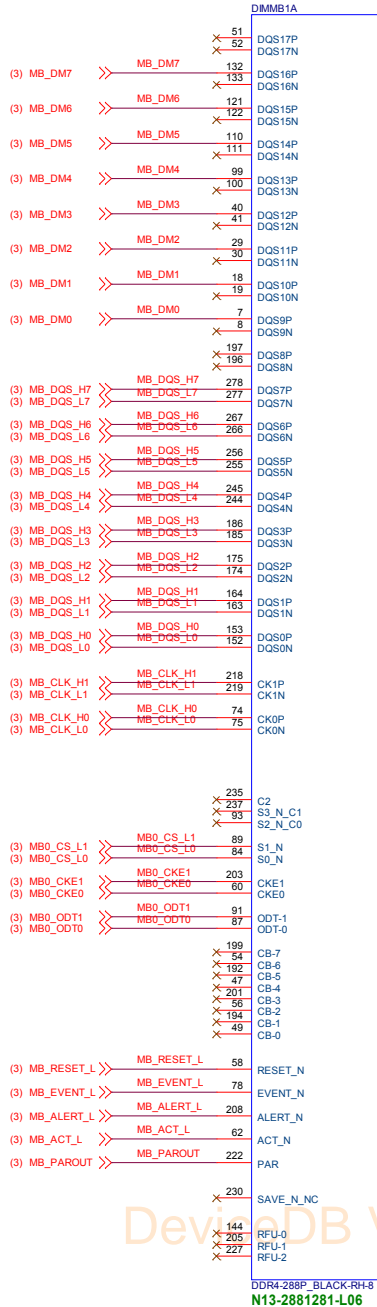
MS-7C56

Size Custom Document Description
DDR4 - DIMM CH-A

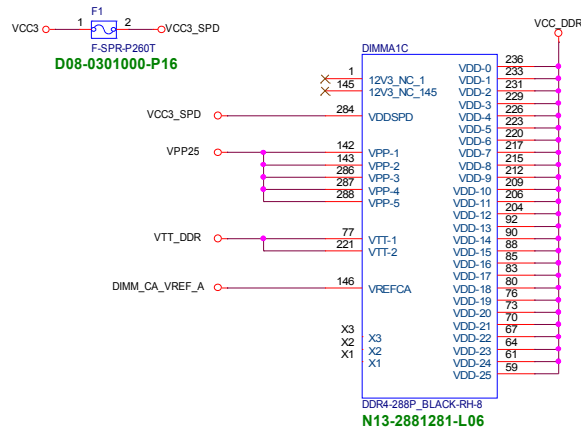
Rev 20

Date: Tuesday, May 12, 2020

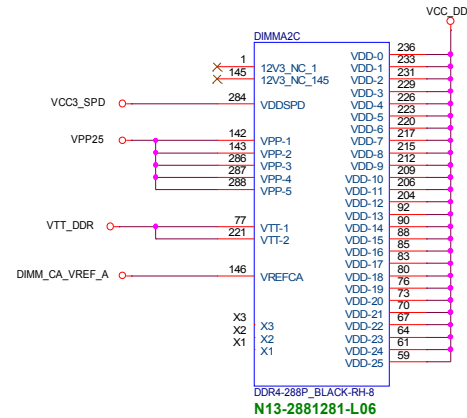
Sheet 11 of 75



av1:D08-0301100-B07

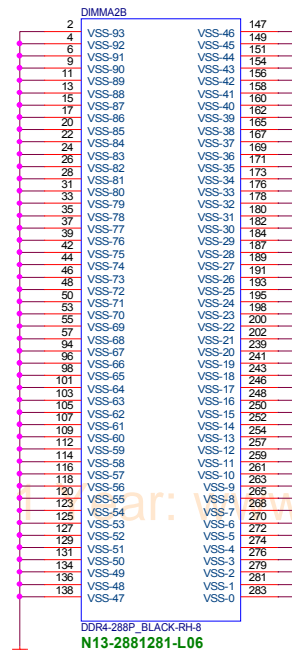
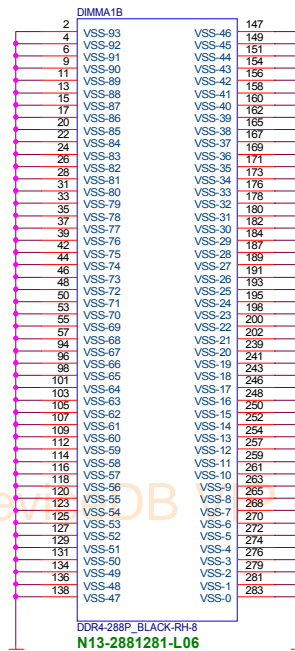
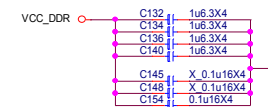
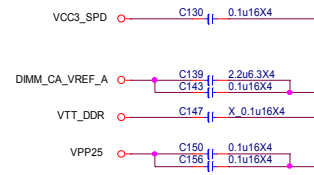
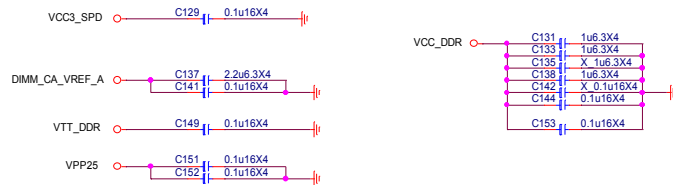
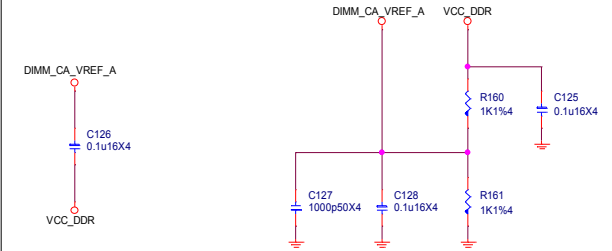


DIMM SLOT PN BY SPEC



DDR VREF

(place resistors close to DIMMs)



Dev/DB + XinZhiZao

www.devicedb.xyz/dev/subscriptions/



MICRO-STAR INT'L CO.,LTD

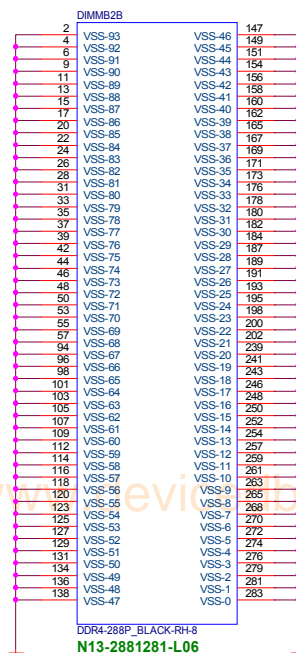
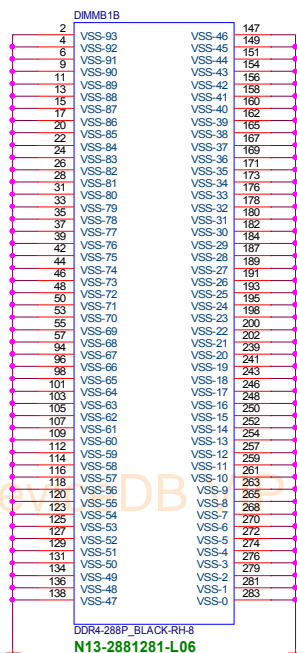
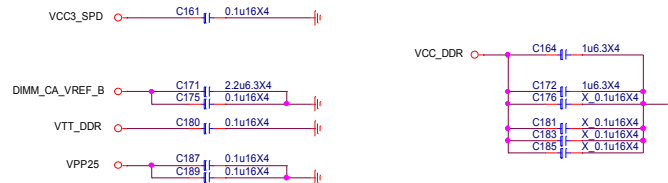
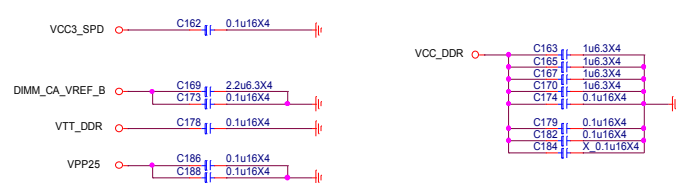
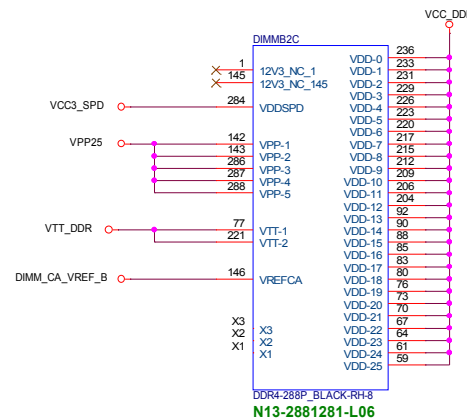
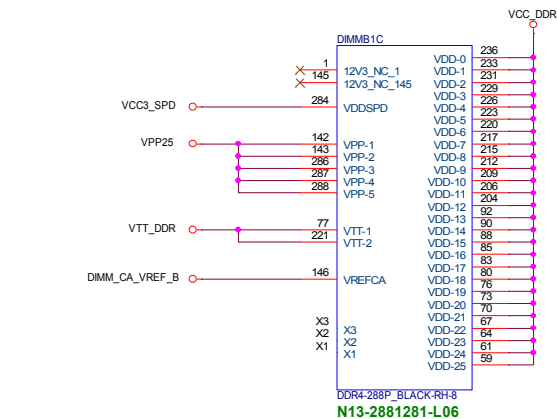
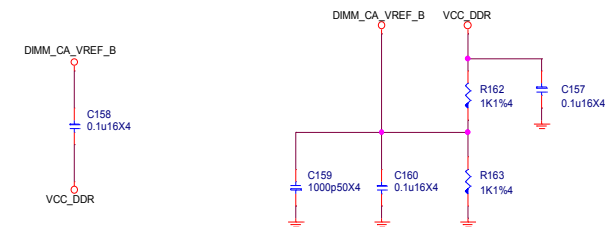
MS-7C56

Size Custom Document Description DDR4 - POWER/GND-1 Rev 20

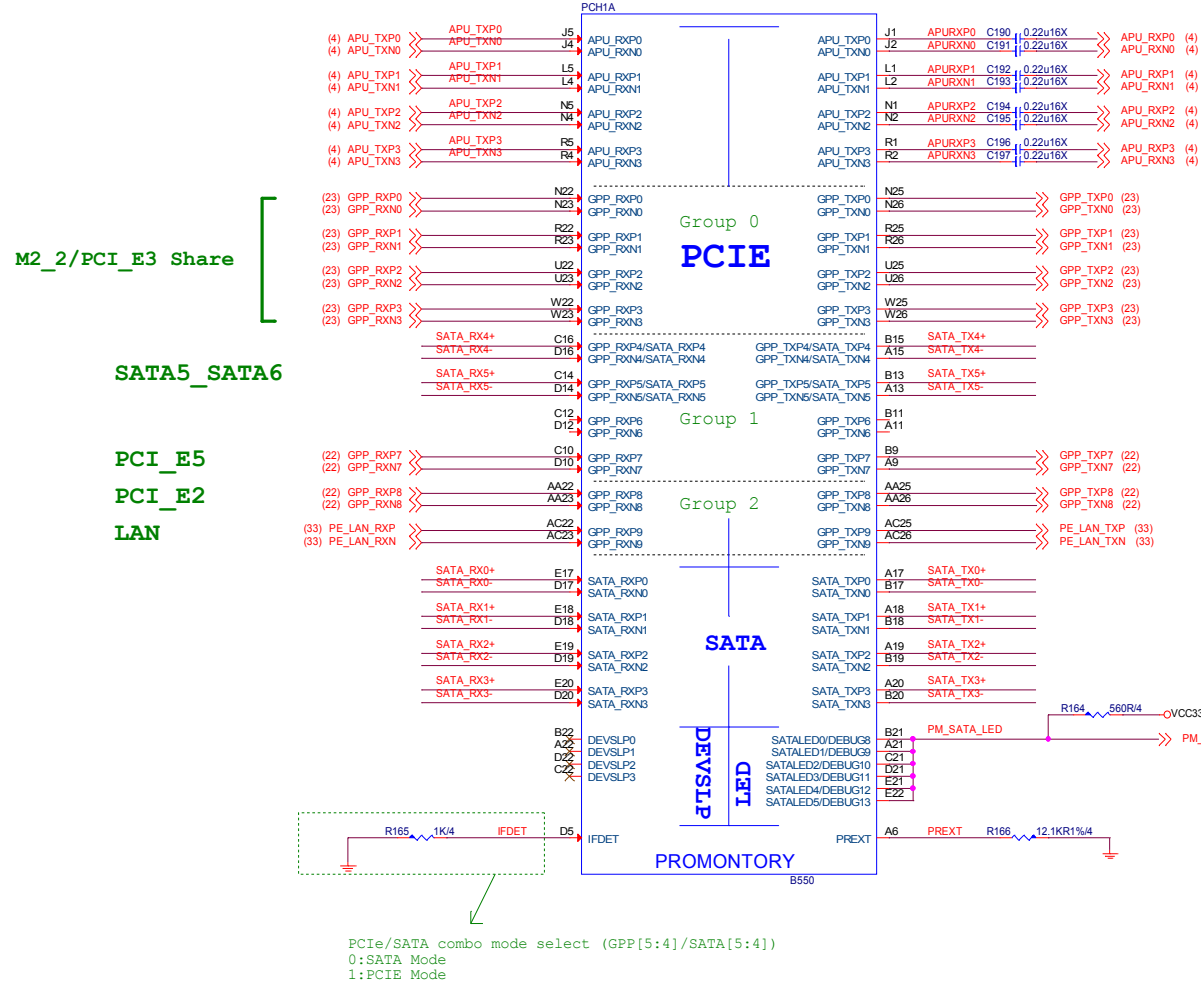
Date: Tuesday, May 12, 2020 Sheet 13 of 75

DDR VREF

(place resistors close to DIMMs)

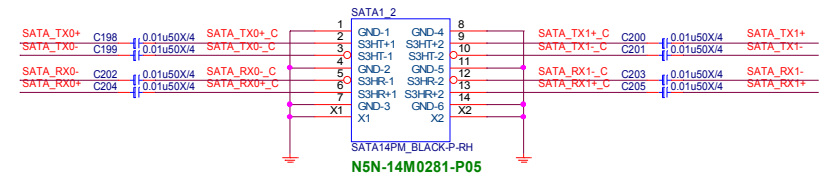


Download + XinZhiZao 1 Year: www.xinzhihao.com/dev/subscriptions/

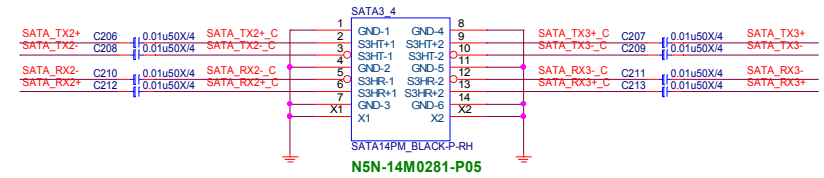


SATA Connector

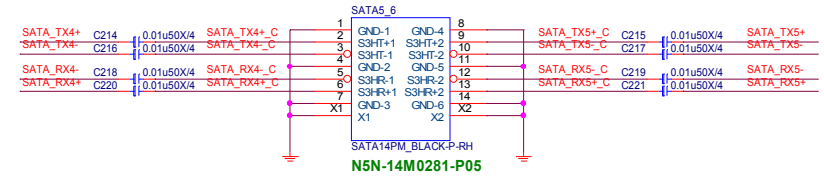
SATA1_2



SATA3_4



SATA5_6



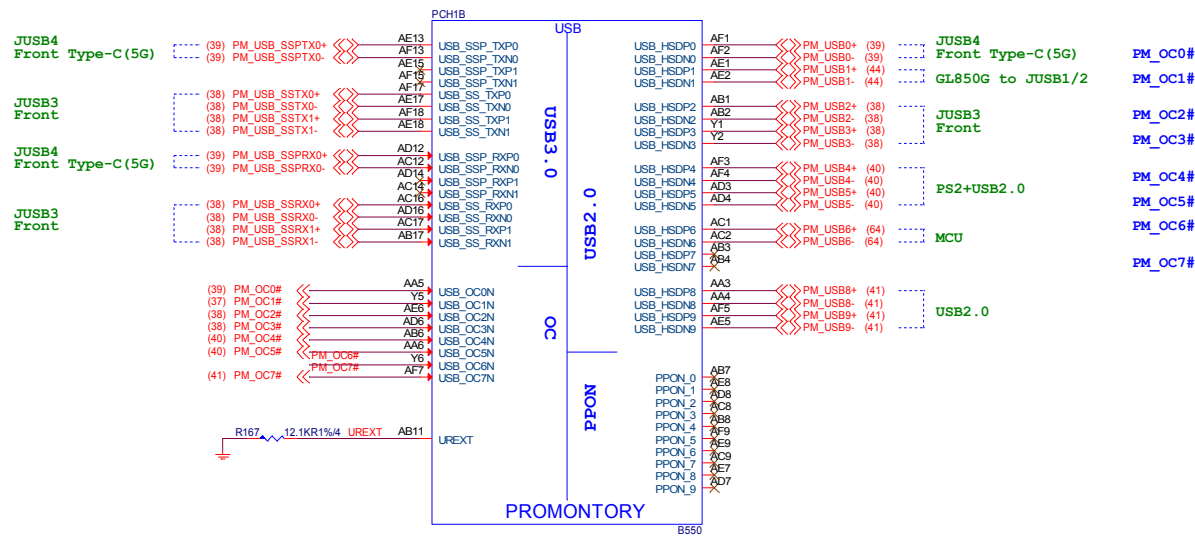
DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/



MICRO-STAR INT'L CO.,LTD

MS-7C56

Size	Document Description	Rev
Custom	Premium - PCIE/SATA	20
Date:	Tuesday, May 12, 2020	Sheet 15 of 75



USB mapping

USB_SSP_TX/RX[0] + USB_HSDP/N[0] + USB_OC0N
USB_SSP_TX/RX[1] + USB_HSDP/N[1] + USB_OC1N

USB_SS_TX/RX[0] + USB_HSDP/N[2] + USB_OC2N
USB_SS_TX/RX[1] + USB_HSDP/N[3] + USB_OC3N

USB_HSDP/N[4] + USB_OC4N

USB_HSDP/N[5] + USB_OC5N

USB_HSDP/N[6] + USB_OC6N

USB_HSDP/N[7] + USB_OC7N

USB_HSDP/N[8] + USB_OC7N

USB_HSDP/N[9] + USB_OC7N

PM_OC0#

PM_OC1#

PM_OC2#

PM_OC3#

PM_OC4#

PM_OC5#

PM_OC6#

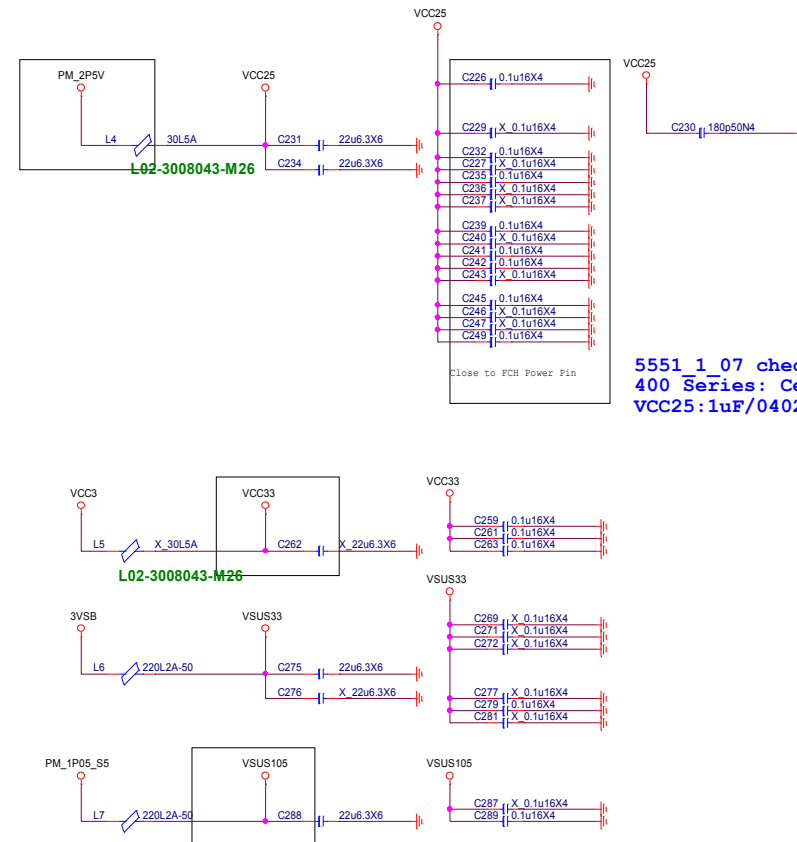
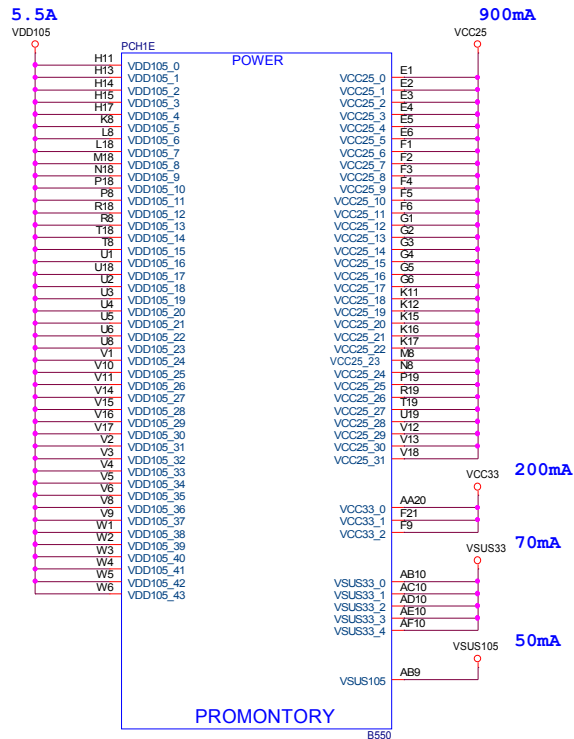
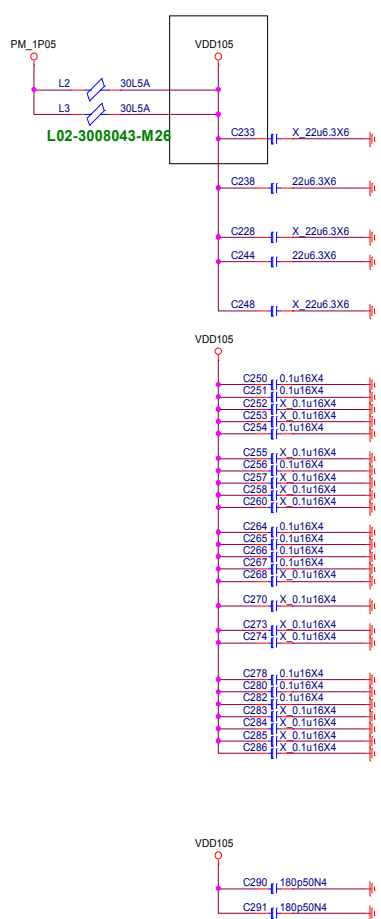
PM_OC7#

PS2+USB2.0

MCU

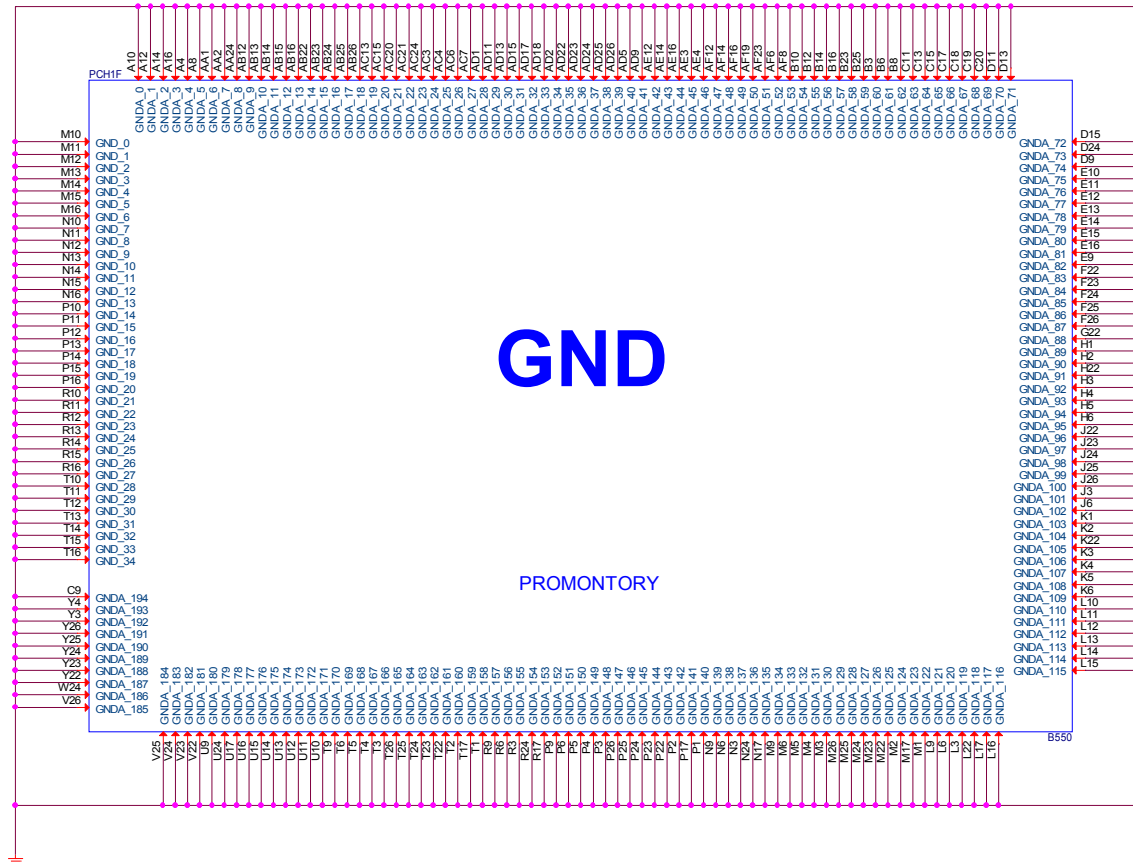
USB2.0

DeviceDB VIP + XinZhiZao 1 Year: www.devedb.xyz/dev/subscriptions/



5551_1_07 check list
400 Series: Ceramic capacitors.
VCC25:1uF/0402

DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

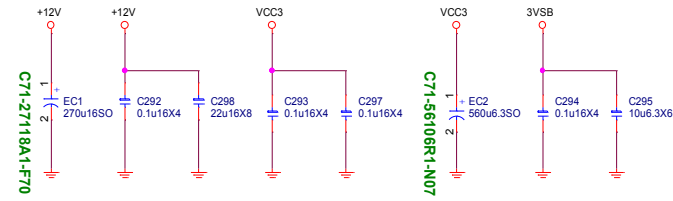
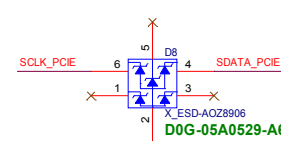


DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

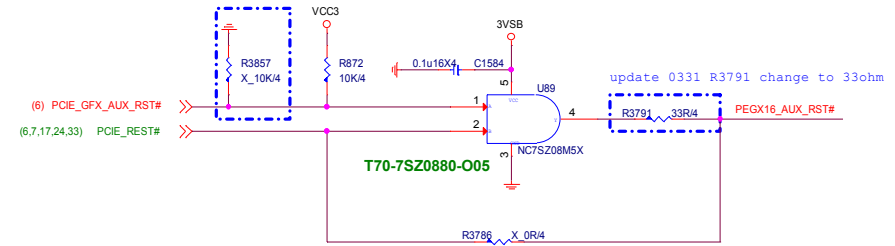
PCI EXPRESS x16 Slot

PCI_E1

SMB_SEL
GPIO Default High



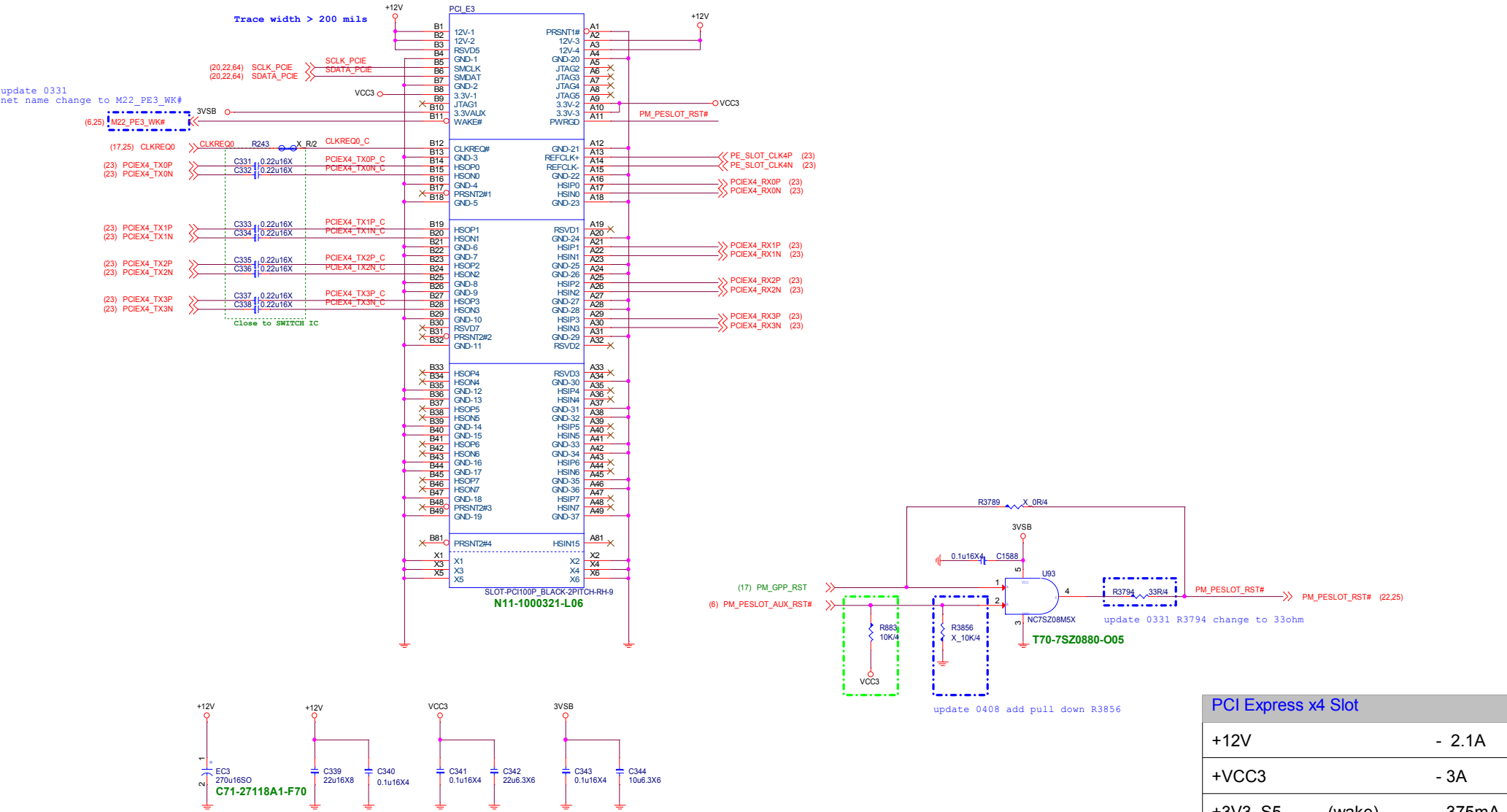
update 0408 add pull down R38567



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

PCI EXPRESS x4 SLOT

PCI_E3 X4

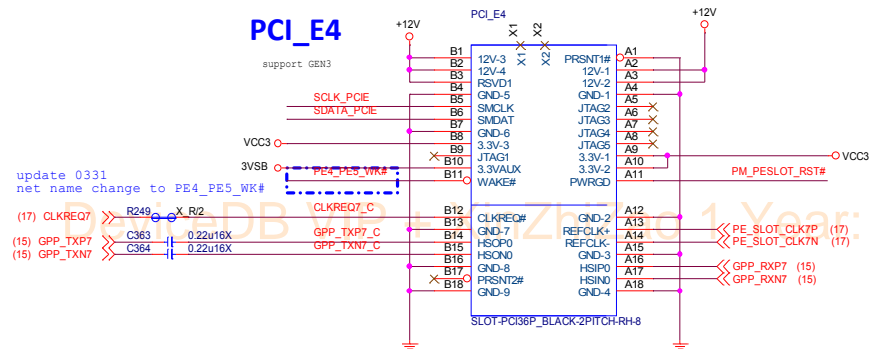
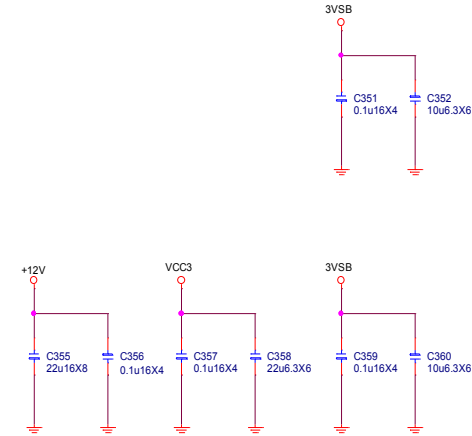


PCI Express x4 Slot	
+12V	- 2.1A
+VCC3	- 3A
+3V3_S5 (wake)	- 375mA
+3V3_S5 (no wake)	- 20mA

(20,21,64) SCLK_PCIE >> SCLK_PCIE

(20,21,64) SDATA_PCIE >> SDATA_PCIE

```
update 0331
net name change to PE4_PE5_WK#
```



PCI Express x1 Slot *3	
+12V	- 1.5 A
+VCC3	- 9A
+3V3_S5 (wake)	- 1.125A
+3V3_S5 (no wake)	- 20mA



MICRO-STAR INT'L CO.,LTD

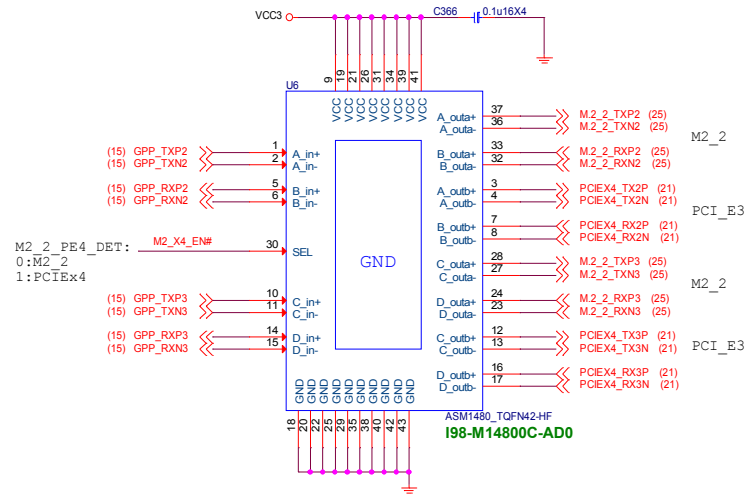
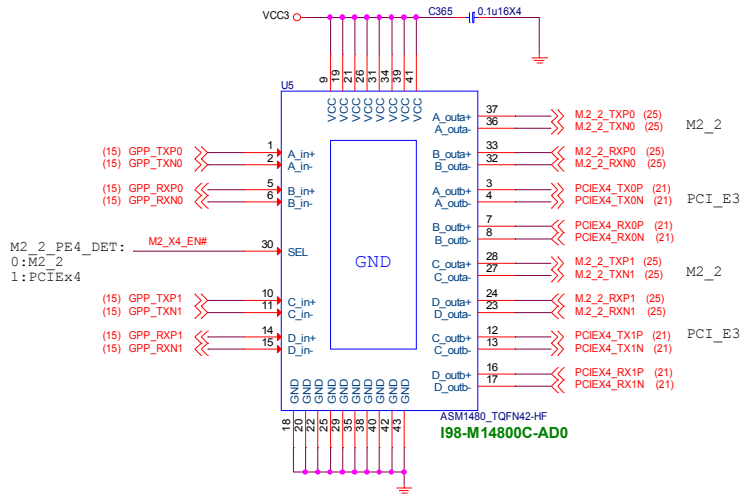
MS-7C56

Size	Document Description
Custom	PCI_E2/E4_X1

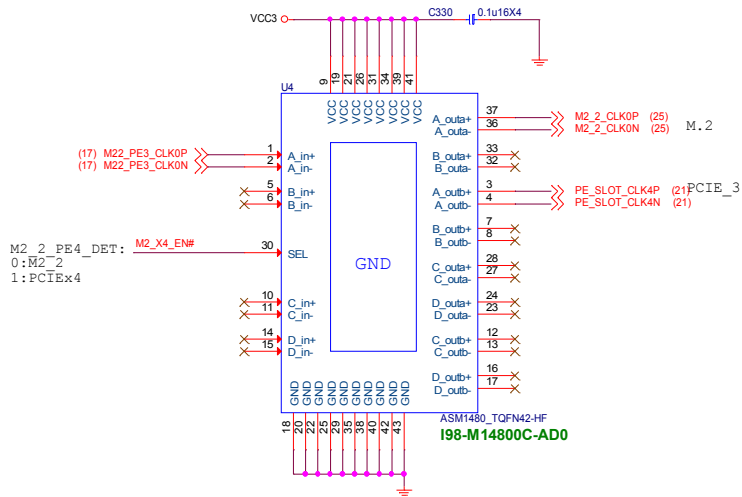
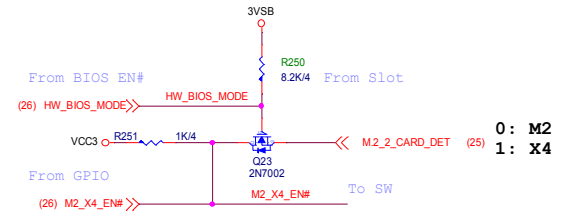
Rev
20

Date: Tuesday, May 12, 2020

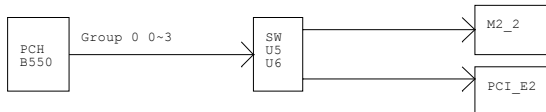
Sheet 22 of 75



PCIE Lanes control circuit

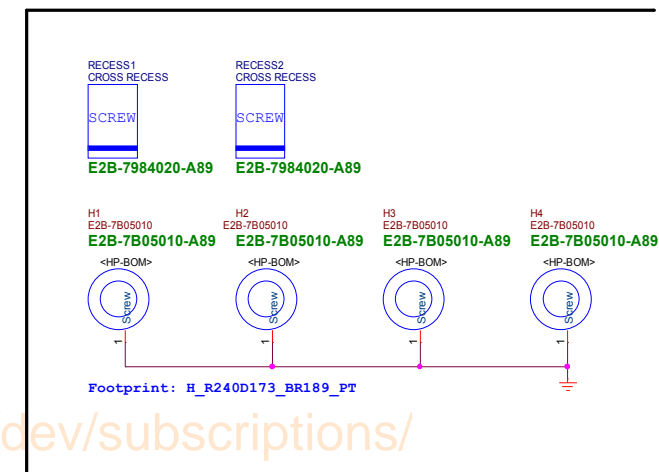
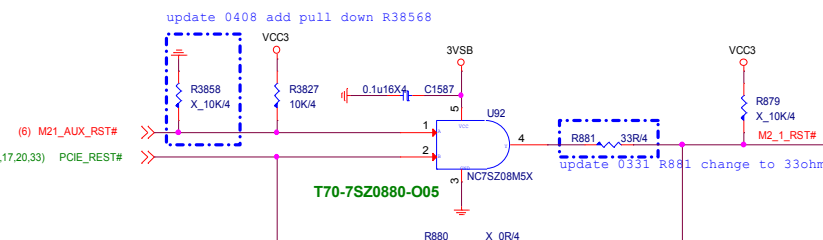
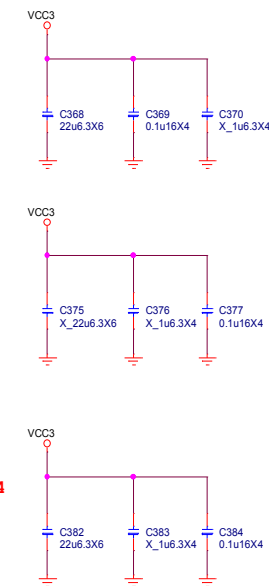


DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/



VCC3 4.25A
Max: 14W

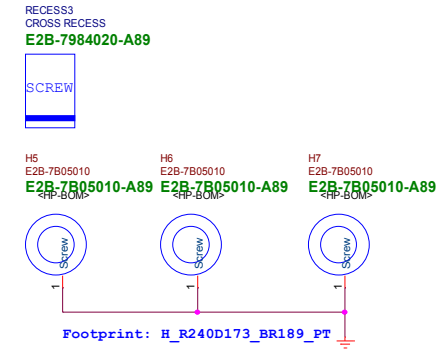
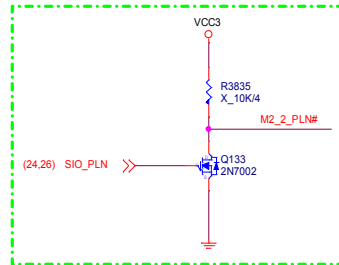
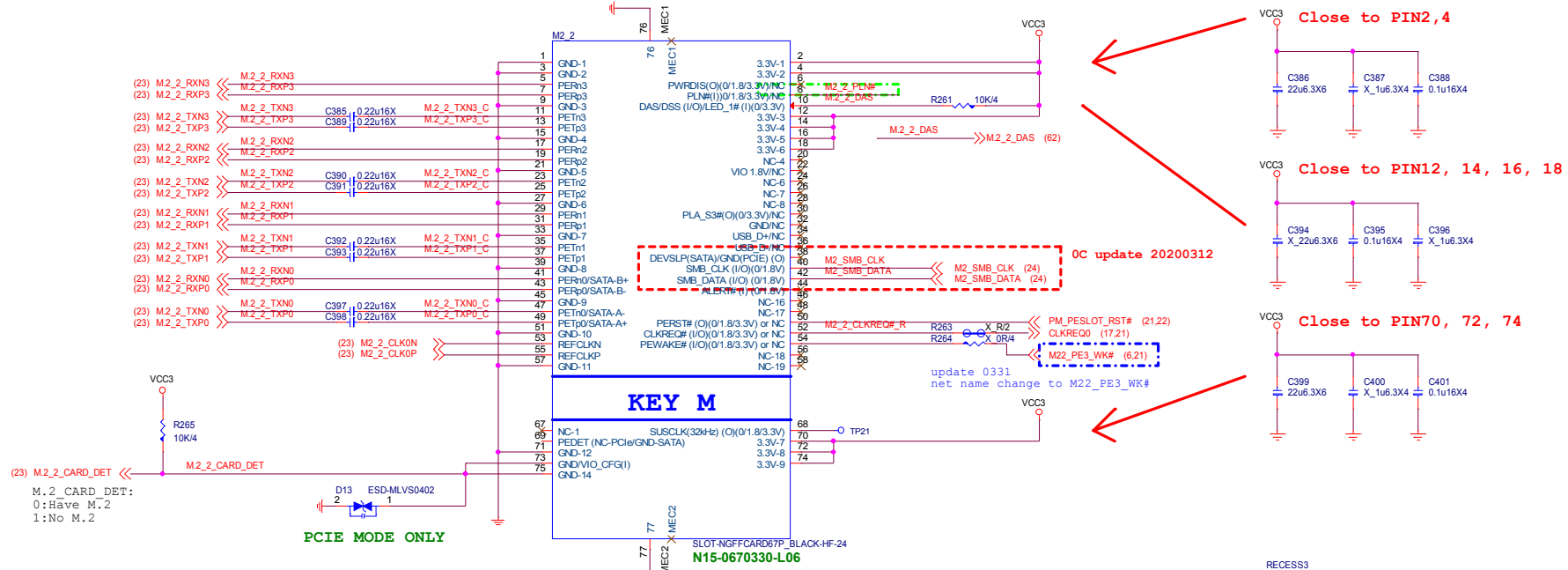
LANE REVERSE TO SUPPORT SATA SSD



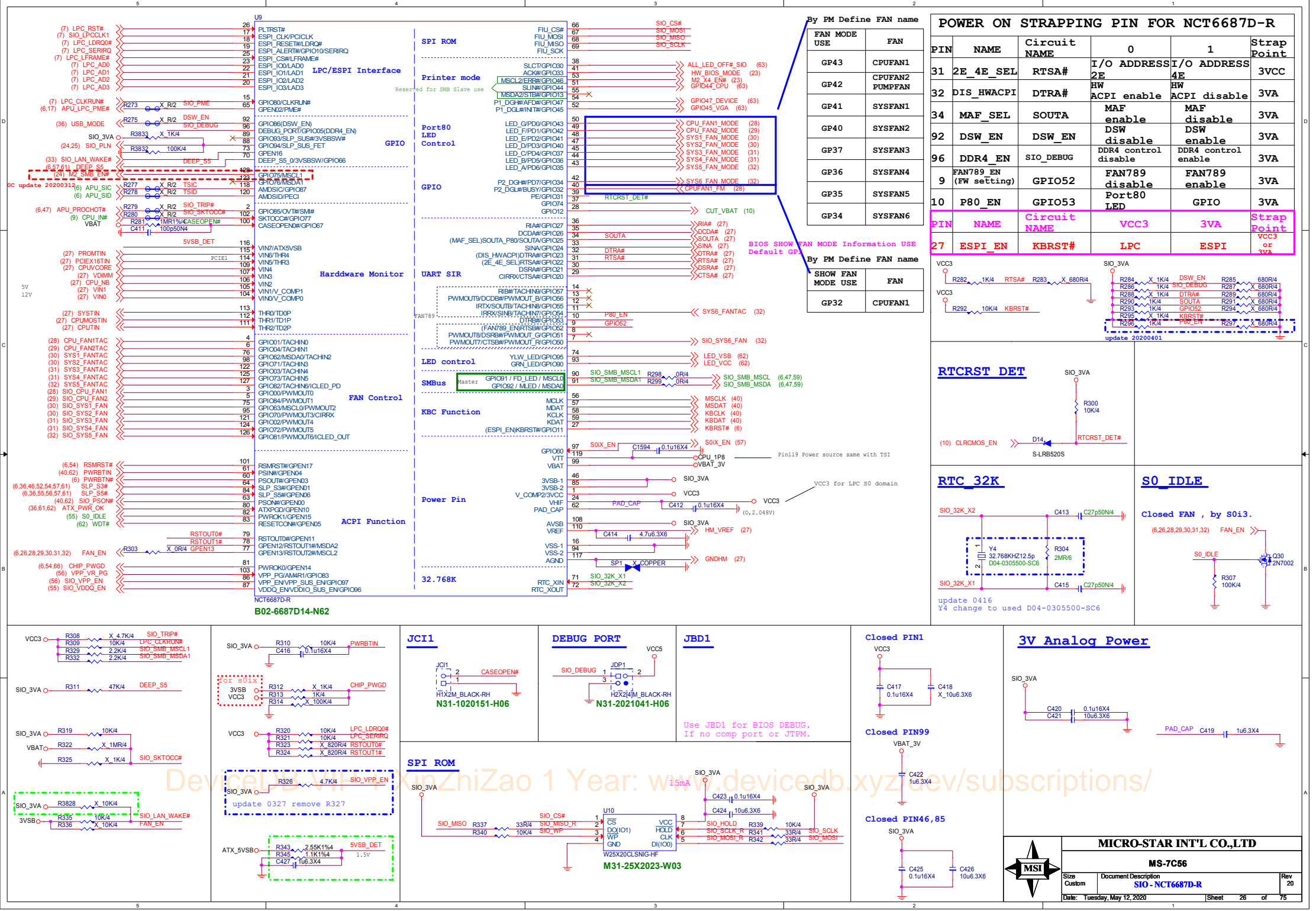
M.2 2 Connector

M2下方零件擺放限高要小於0.9mm的零件

VCC3 4.25A
Max: 14W

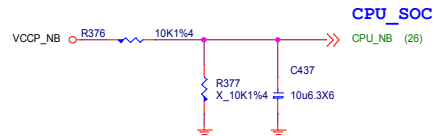
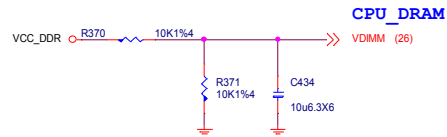
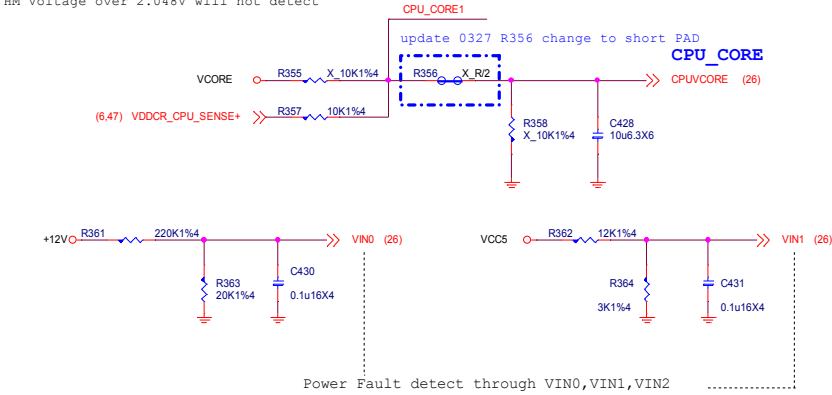


DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

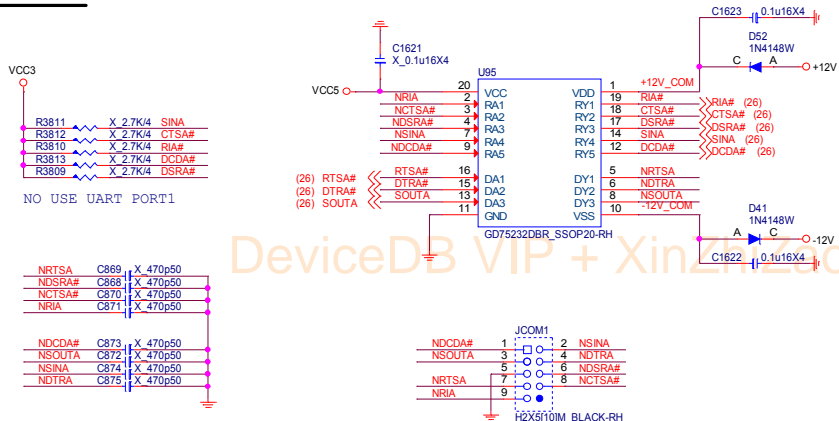


HW Monitor - Voltage

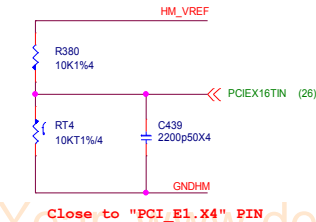
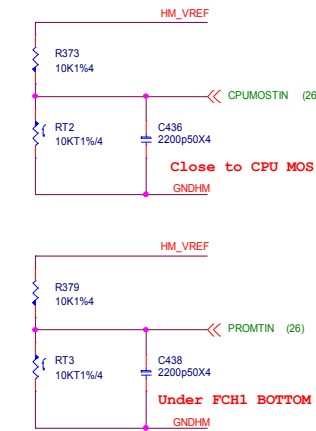
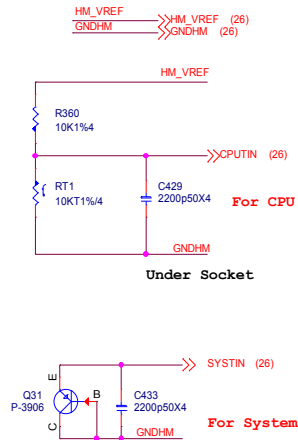
SIO HM Voltage over 2.048V will not detect



COM 1



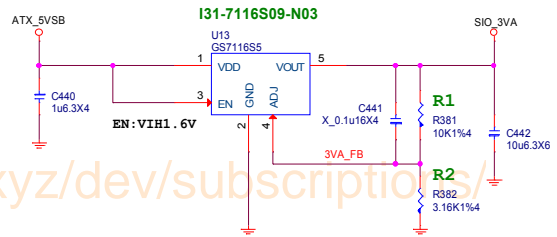
TEMP SENSOR



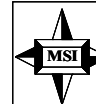
PM RESET

CPU RESET

SIO_3VA



$$\begin{aligned} V_{out} &= V_{ref} * (1 + (R1/R2)) \\ &= 0.8 * (1 + (10K/3.16K)) \\ &= 3.33V \end{aligned}$$



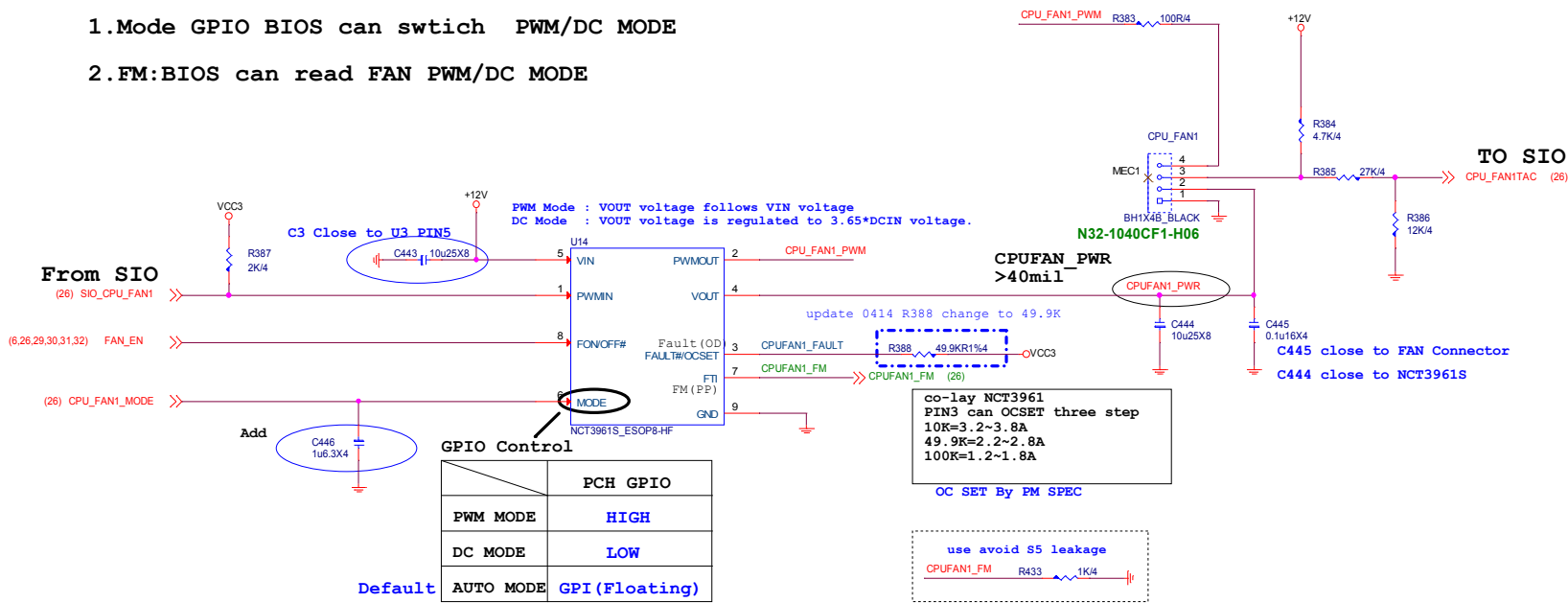
MICRO-STAR INT'L CO.,LTD

MS-7C56

Size	Document Description	Rev
Custom	SIO - HW Monitor/COM	20
Date: Tuesday, May 12, 2020		Sheet 27 of 75

CPUFAN1 TYPE N : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

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

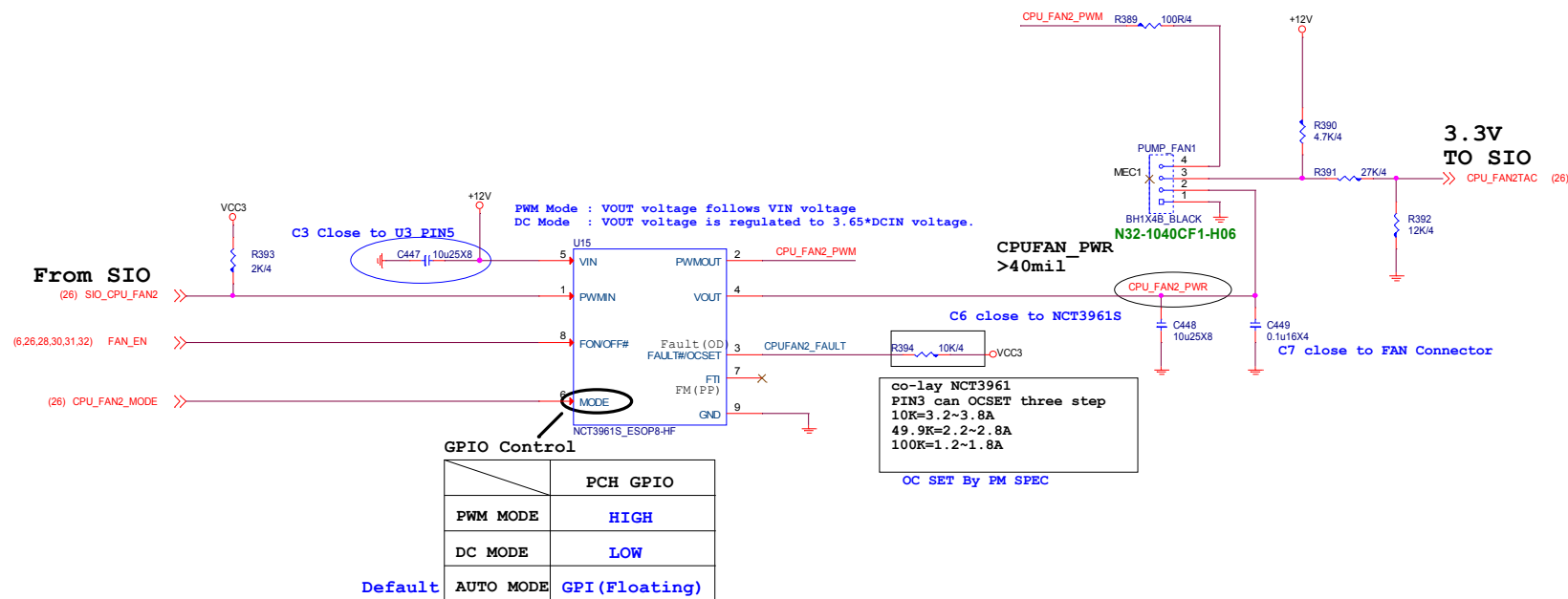


DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

PUMPFAN1

TYPE M : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

1.Mode GPIO BIOS can swtich PWM/DC MODE

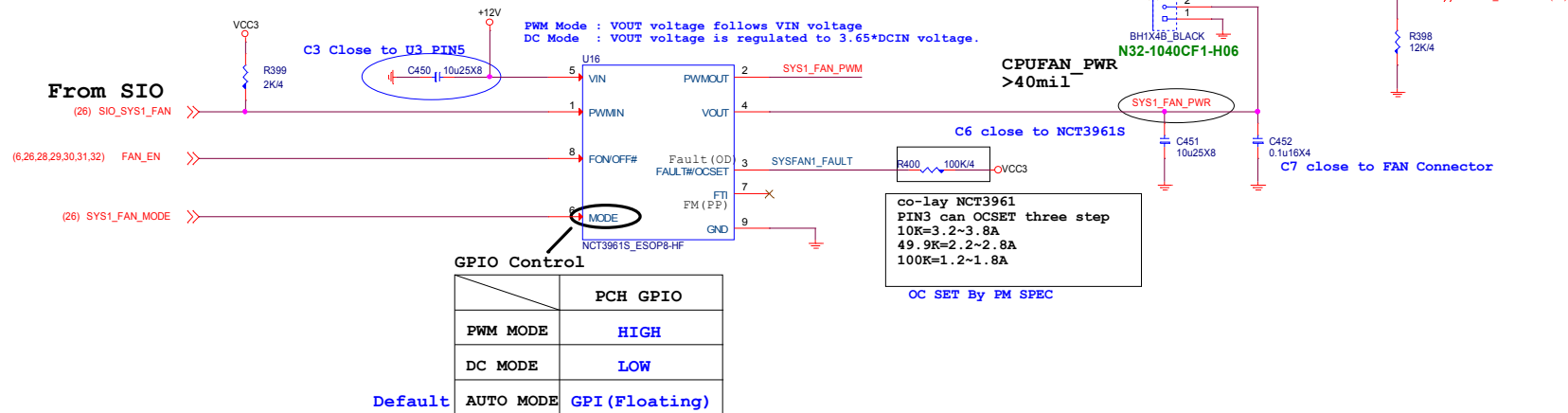


DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

SYSFAN1

TYPE M : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

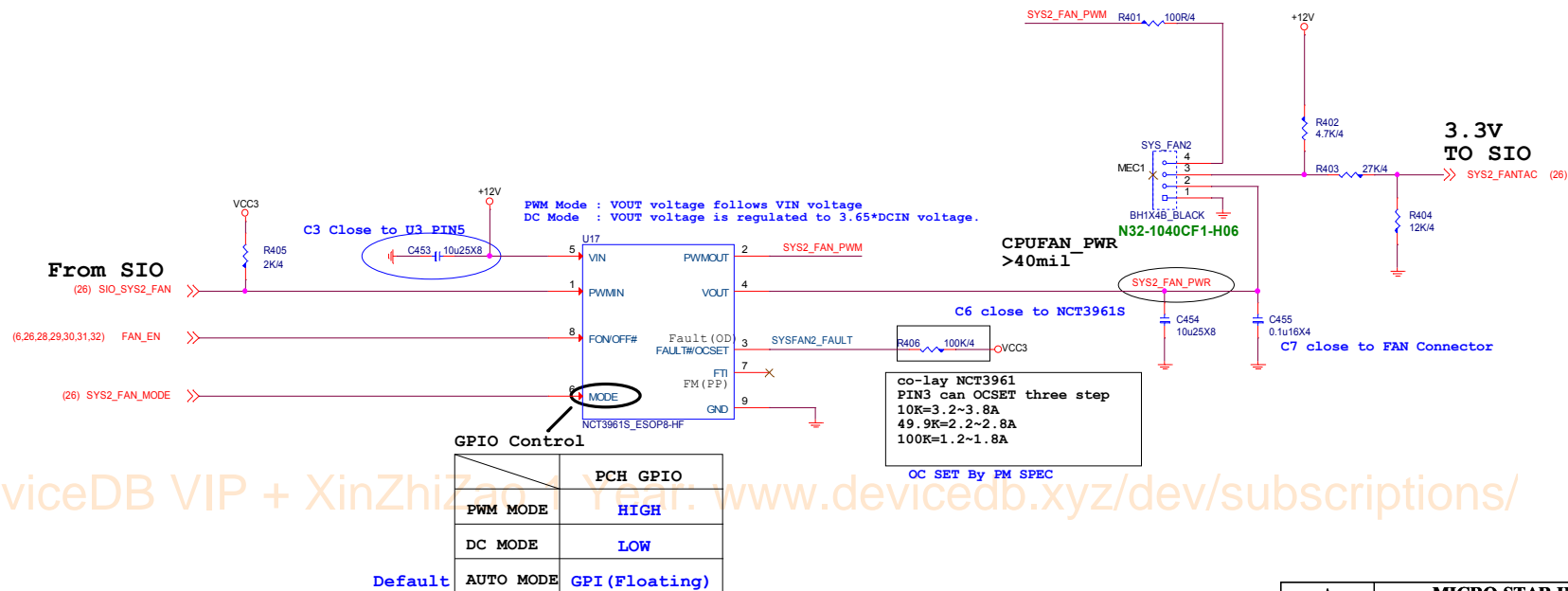
1.Mode GPIO BIOS can switch PWM/DC MODE



SYSFAN2

TYPE M : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

1.Mode GPIO BIOS can switch PWM/DC MODE

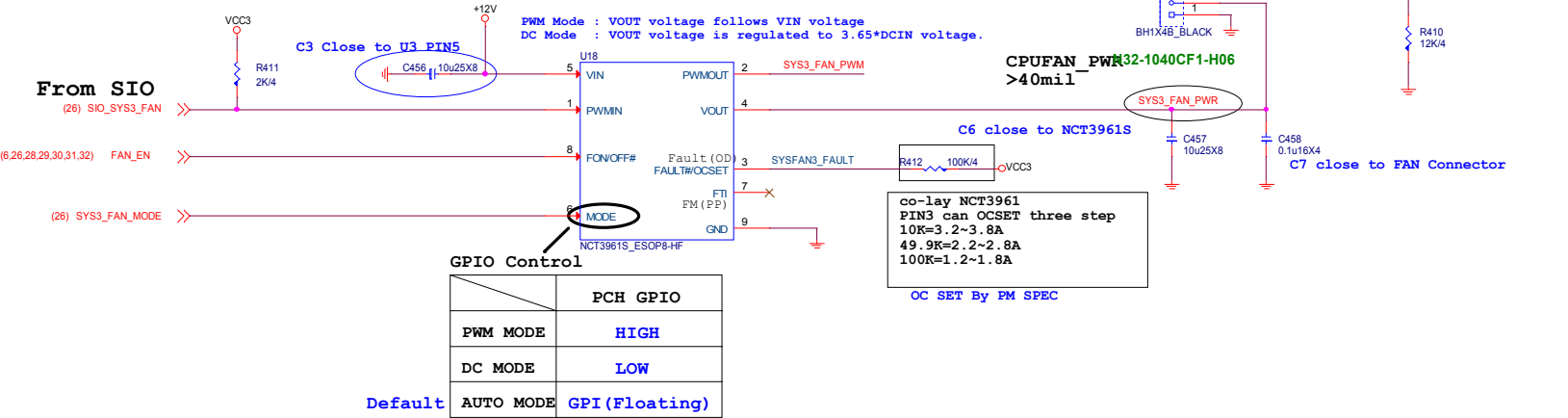


DeviceDB VIP + XinZhiZao Year: www.device-db.xyz/dev/subscriptions/

SYSFAN3

TYPE M : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

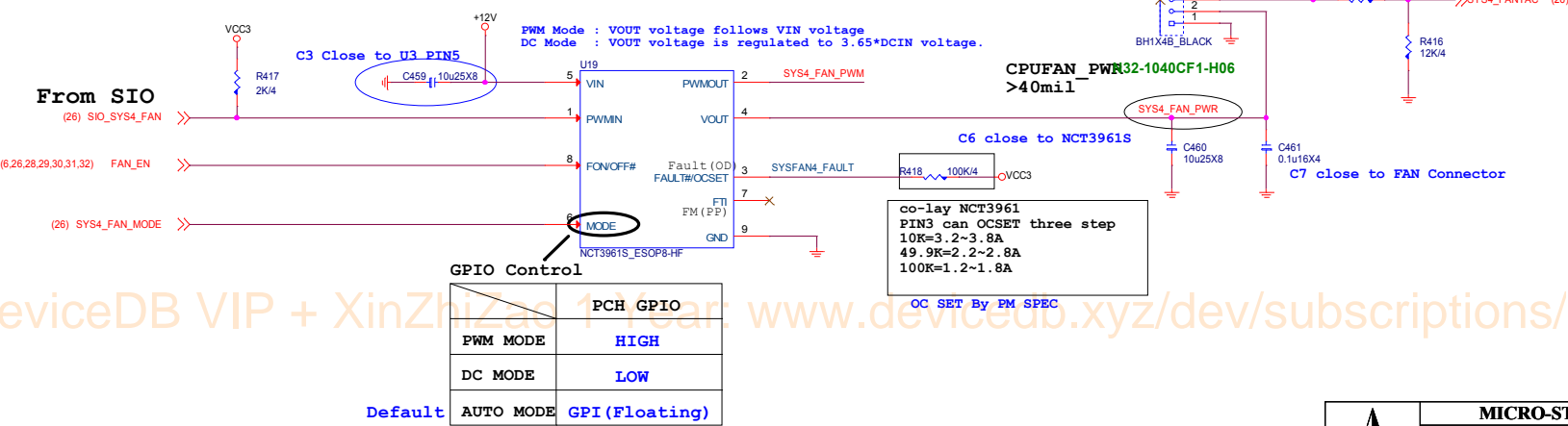
1.Mode GPIO BIOS can swtich PWM/DC MODE



SYSFAN4

TYPE M : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

1.Mode GPIO BIOS can swtich PWM/DC MODE



DeviceDB VIP + XinZhiZas 1 Year: www.deviceub.xyz/dev/subscriptions/



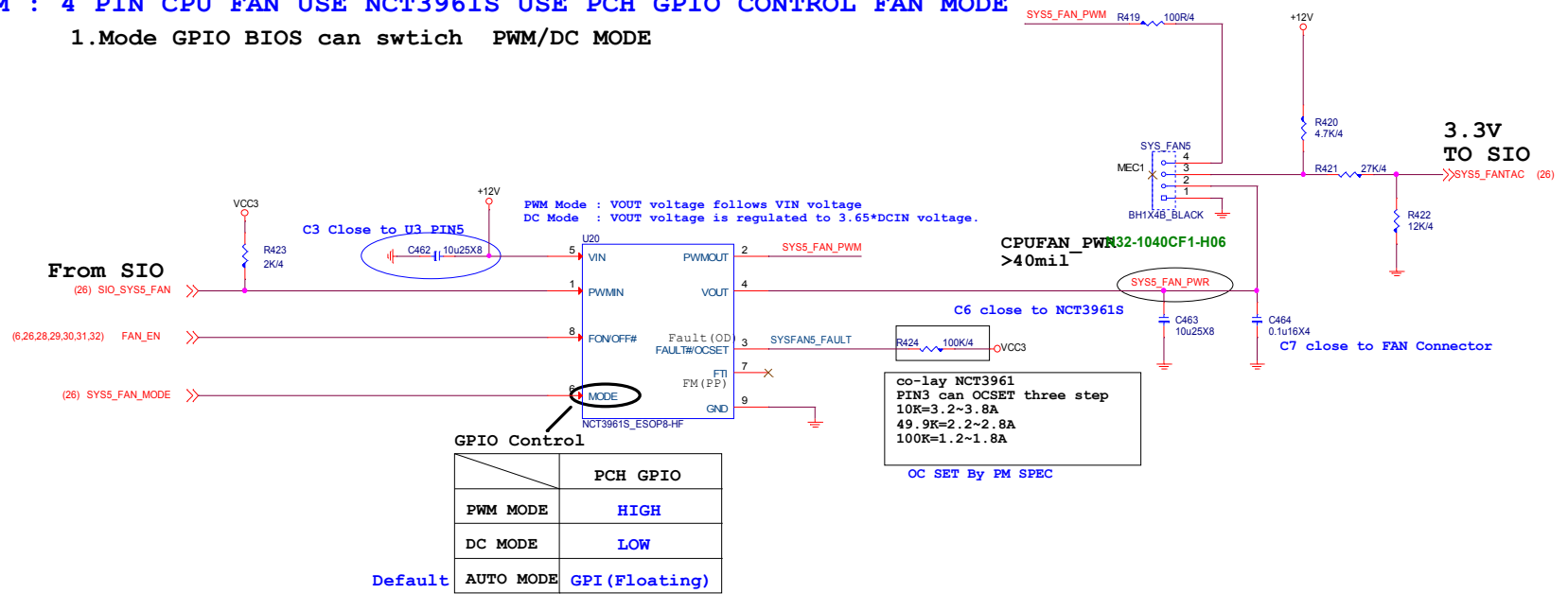
MICRO-STAR INT'L CO.,LTD

MS-7C56

Size Custom	Document Description FAN TYPE-K SYSFAN3/4	Rev 20
Date: Tuesday, May 12, 2020 Sheet 31 of 75		

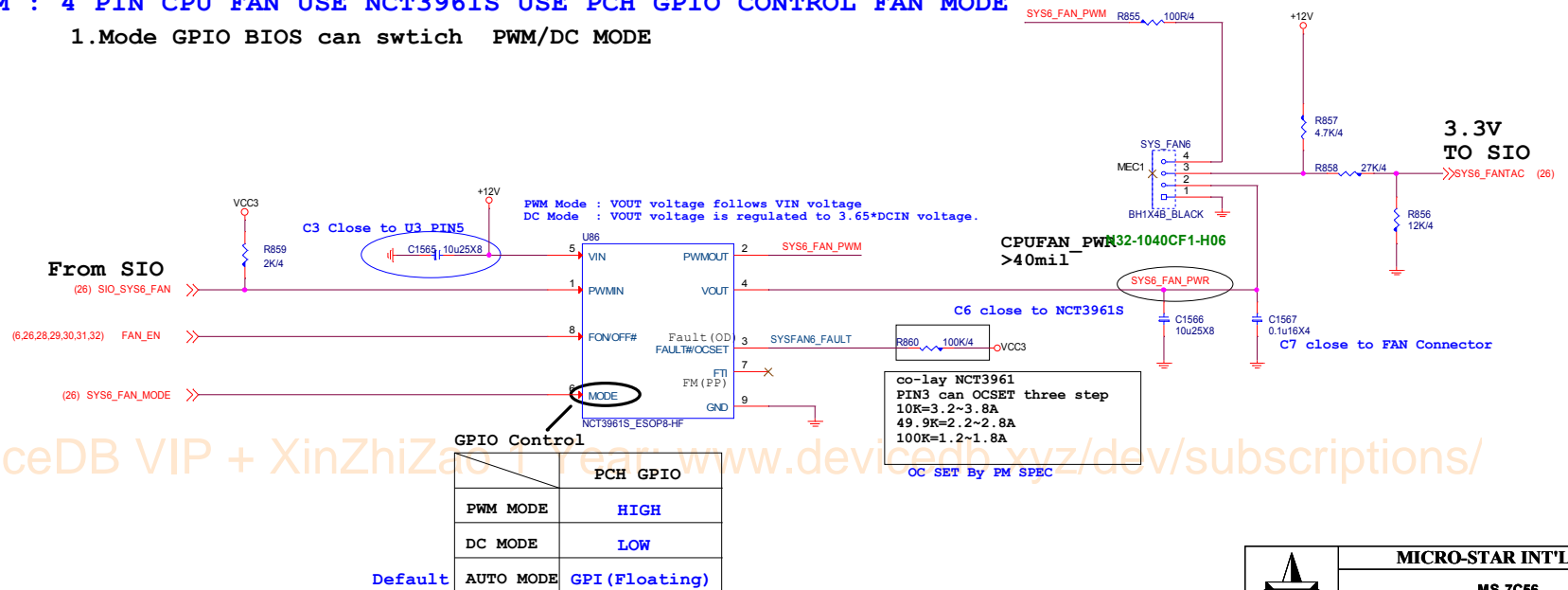
SYSFAN5 TYPE M : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

1.Mode GPIO BIOS can swtich PWM/DC MODE



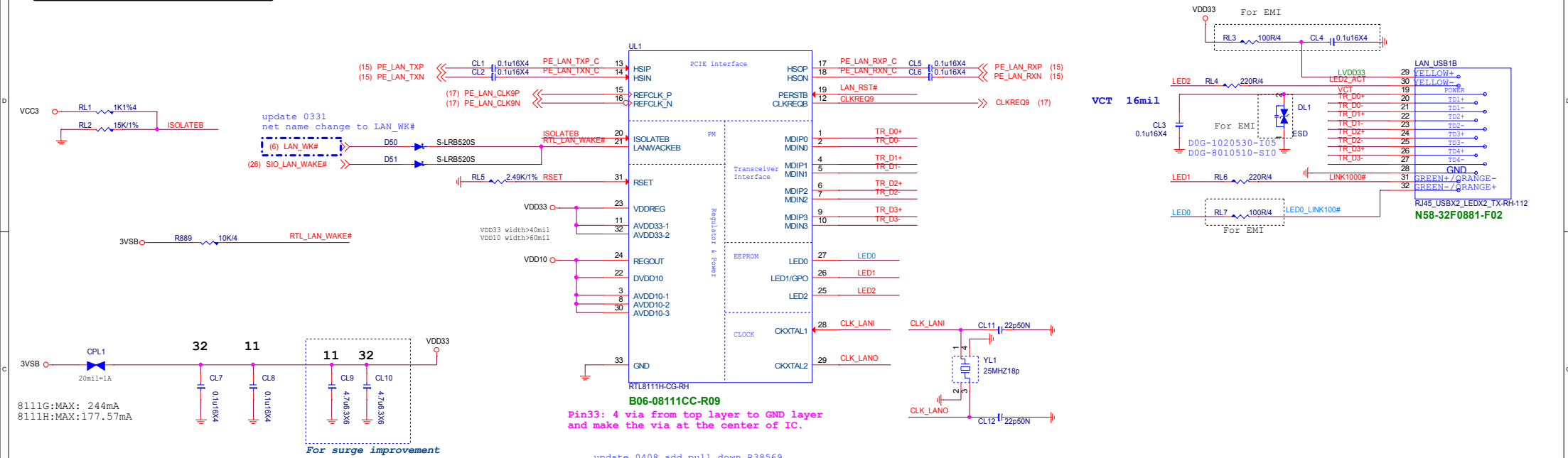
SYSFAN6 TYPE M : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

1.Mode GPIO BIOS can swtich PWM/DC MODE



RTL8111H Giga LAN

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



8111G POWER Consumption

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

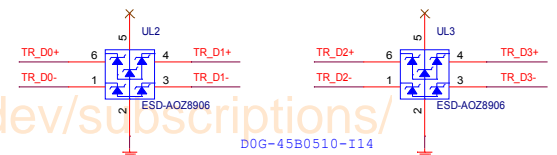
8111H POWER Consumption

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

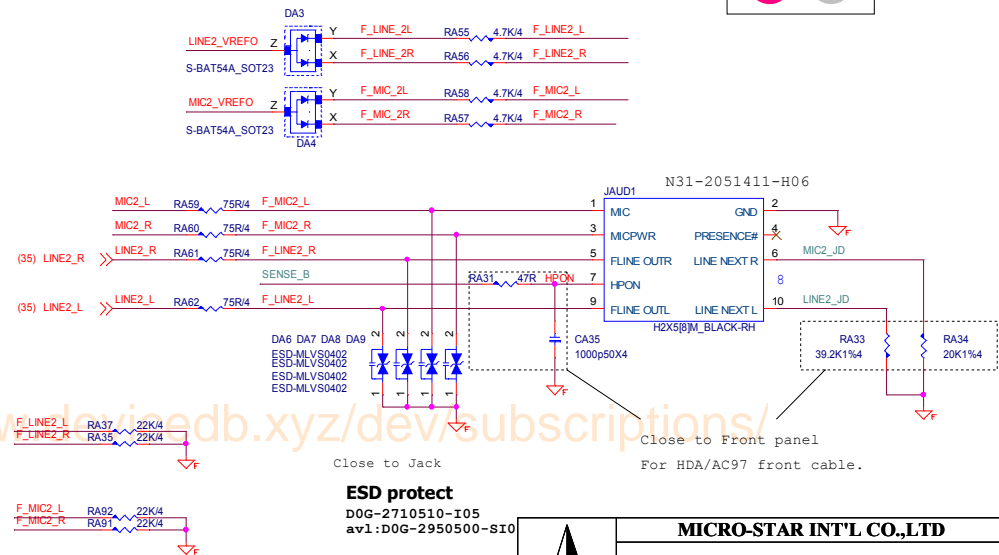
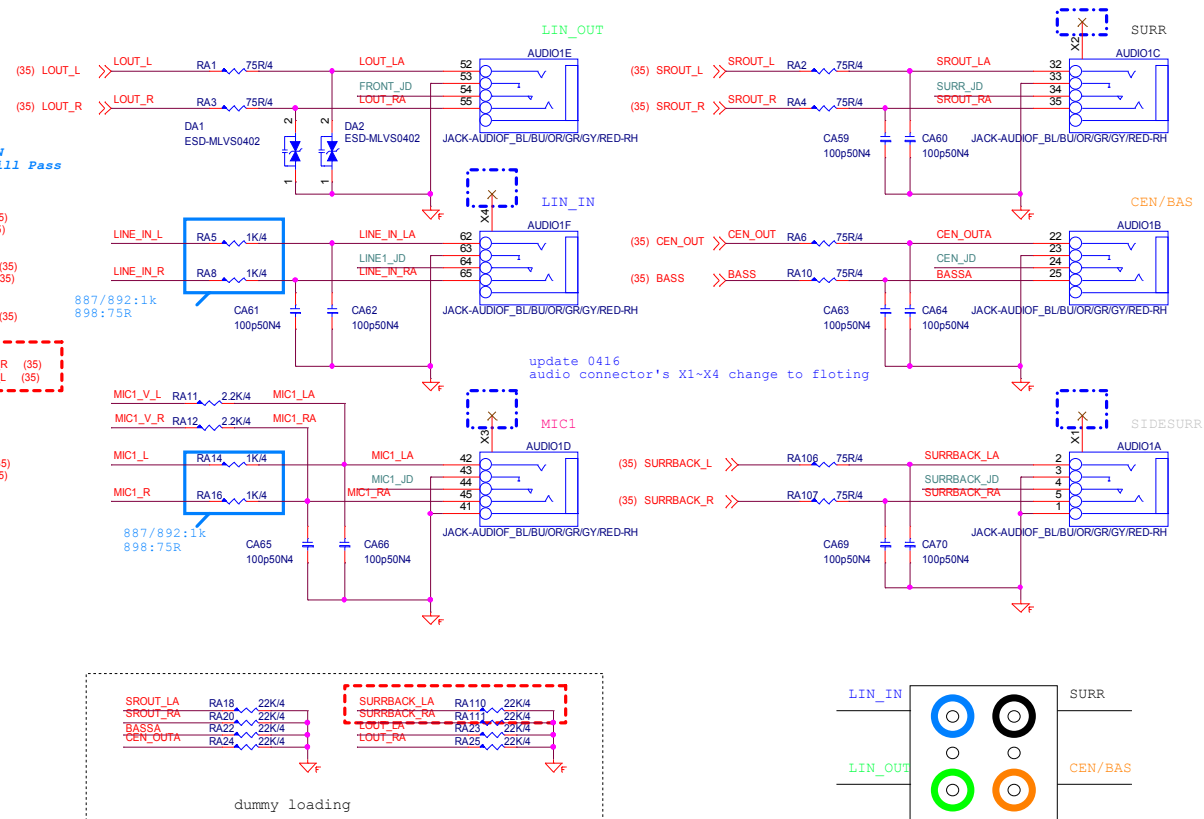
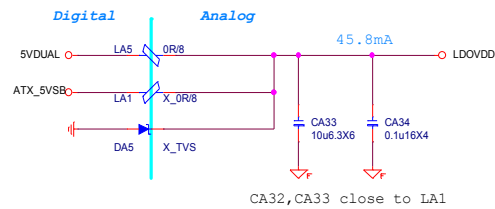
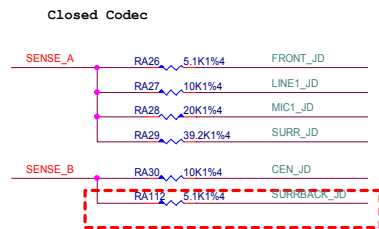
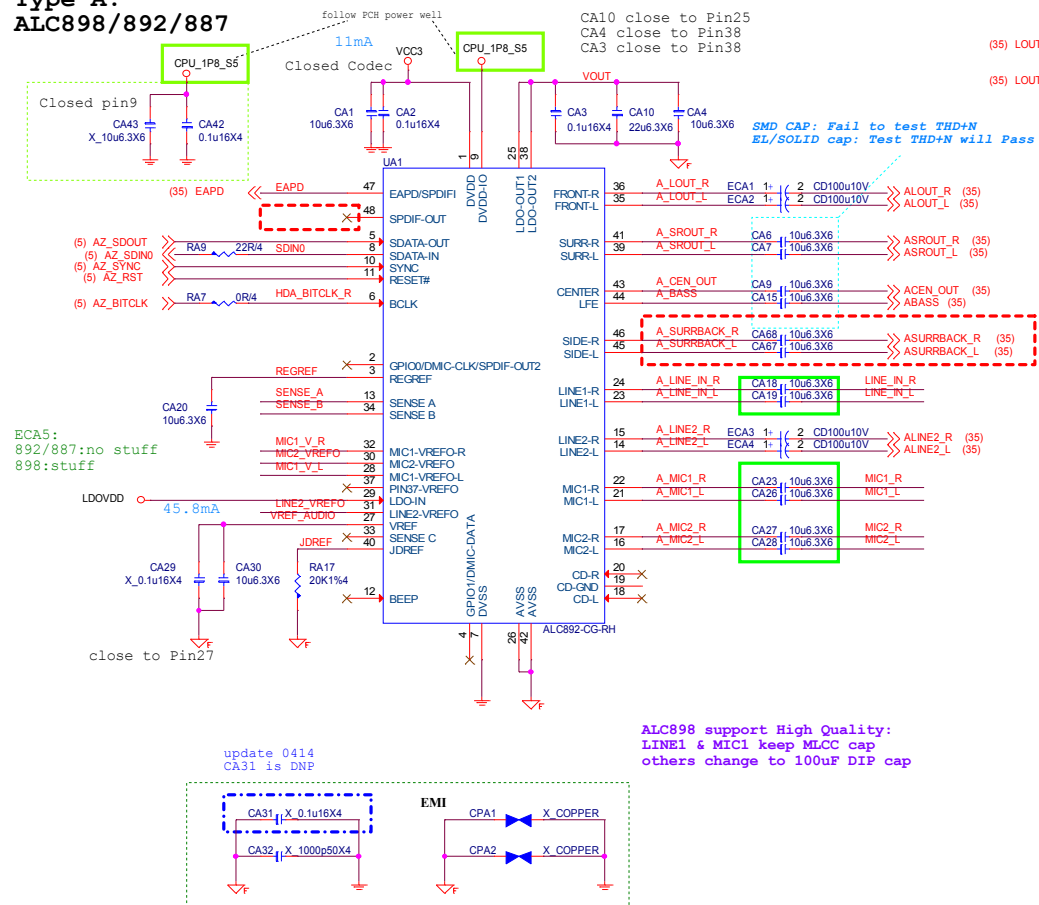
DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

ESD Protect

UL2&UL3 close to connector



Type A:
ALC898/892/887

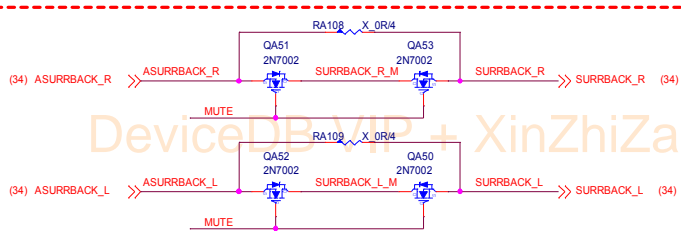
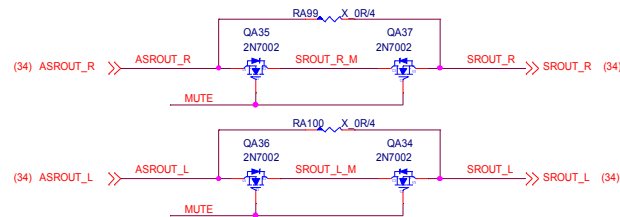
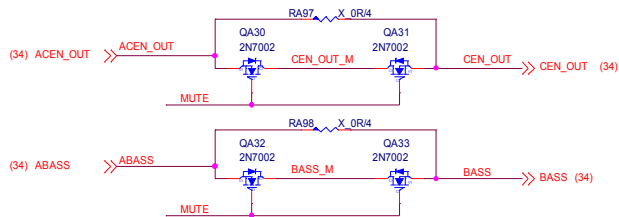
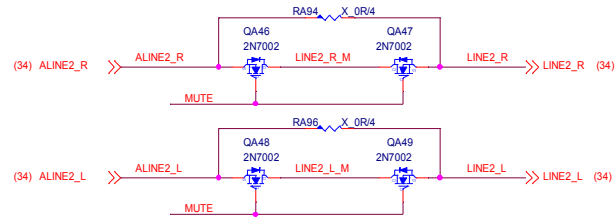
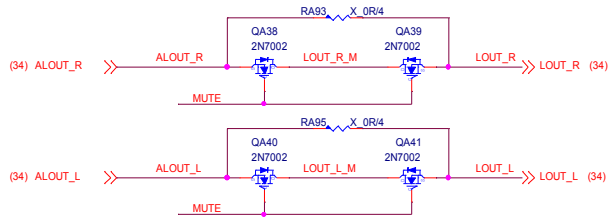
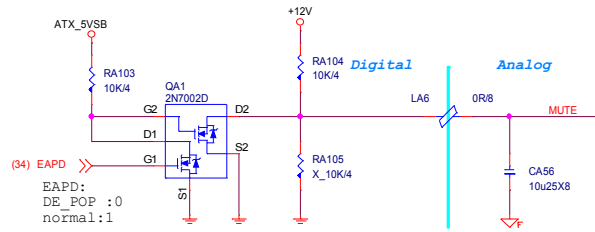


MICRO-STAR INT'L CO.,LTD

MS-7C56

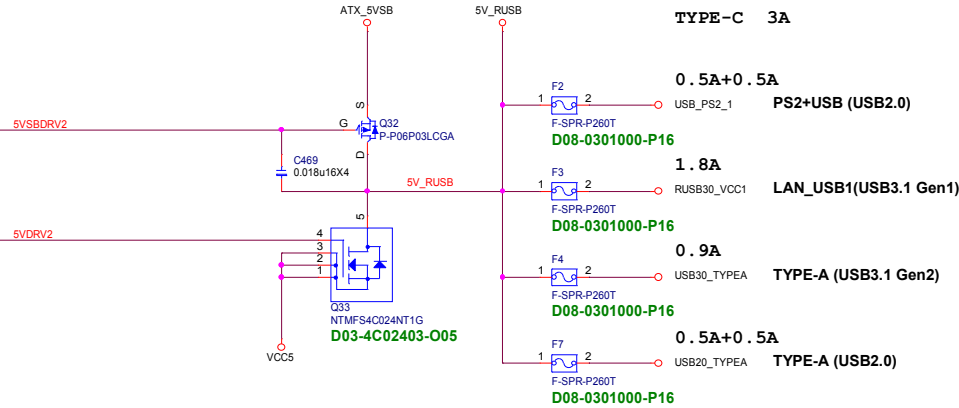
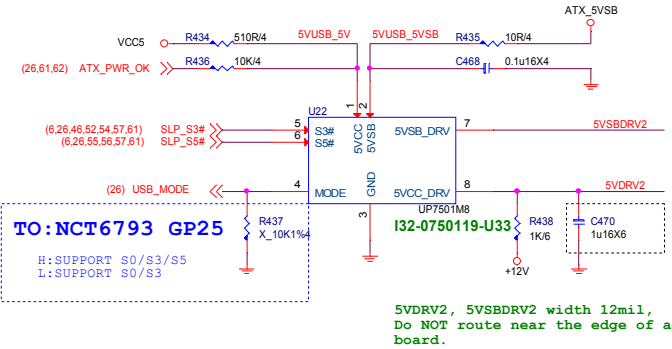
Size Custom	Document Description Audio ALC892-CG	Rev 20
Date: Tuesday, May 12, 2020	Sheet 34 of 75	

De-POP circuit



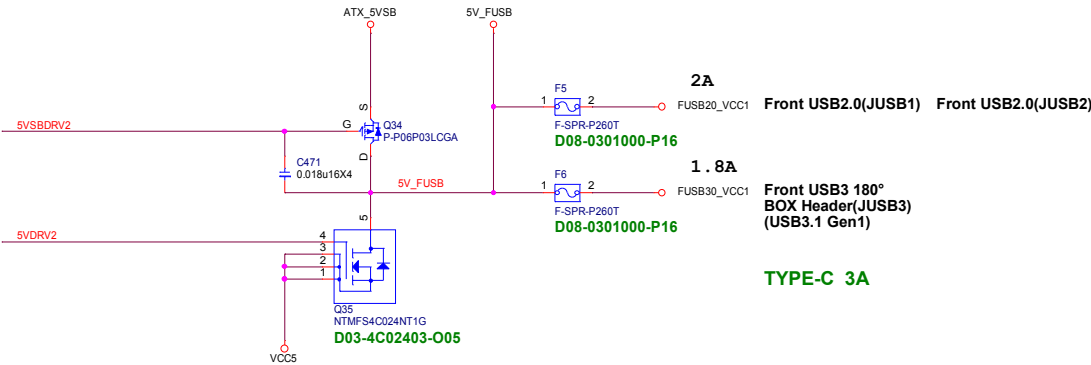
DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

USB Power



Rear (7.7A)

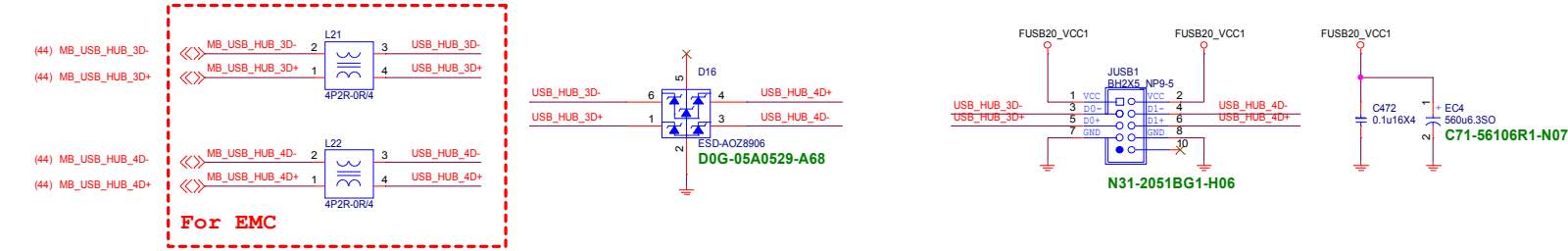
Front (6.8A)



DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

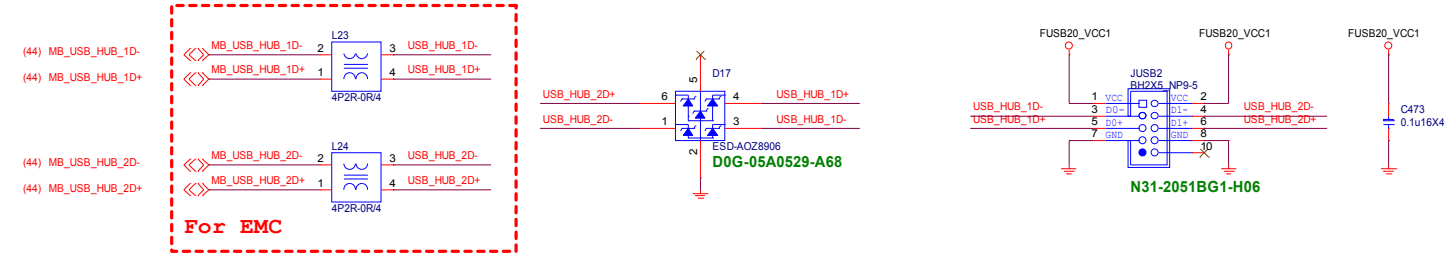
Front USB2.0 (JUSB1) Form GL850G USB2.0 HUB

5V@1A

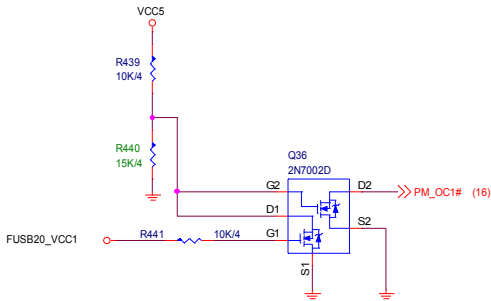


Front USB2.0 (JUSB2) Form GL850G USB2.0 HUB

5V@1A



Front USB2.0 OC



DeviceDB VIP + XinZhiZao 1 Year: www.devicedb.xyz/dev/subscriptions/

**Front USB3 180°
BOX Header(JUSB3)
5V@1.8A**

(16) PM_USB2+ <> PM_USB2+
(16) PM_USB2- <> PM_USB2-

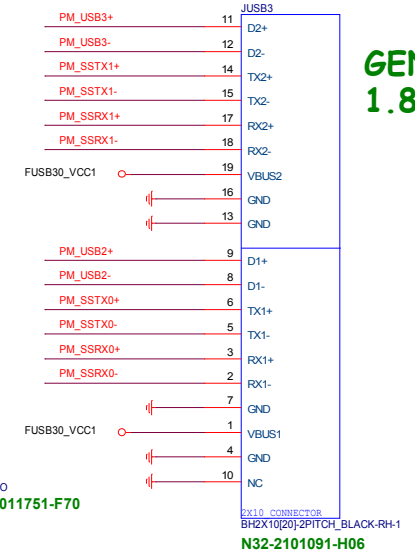
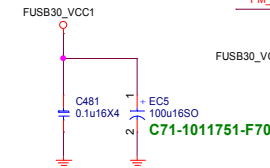
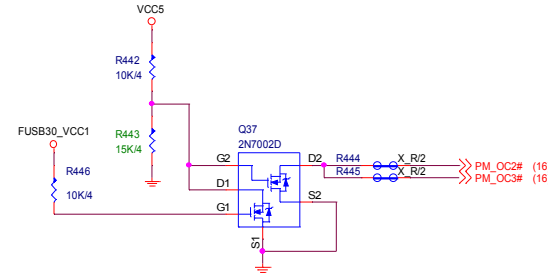
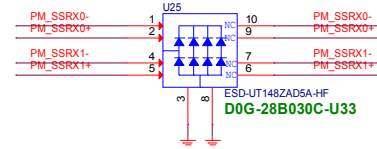
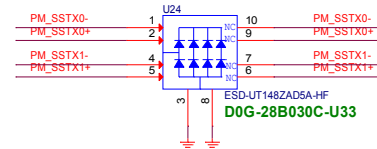
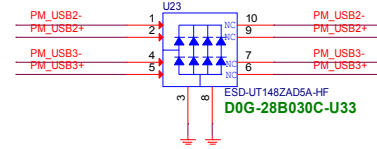
(16) PM_USB3+ <> PM_USB3+
(16) PM_USB3- <> PM_USB3-

(16) PM_USB_SSTX0+ <> C474 0.22u16X PM_SSTX0+
(16) PM_USB_SSTX0- <> C475 0.22u16X PM_SSTX0-

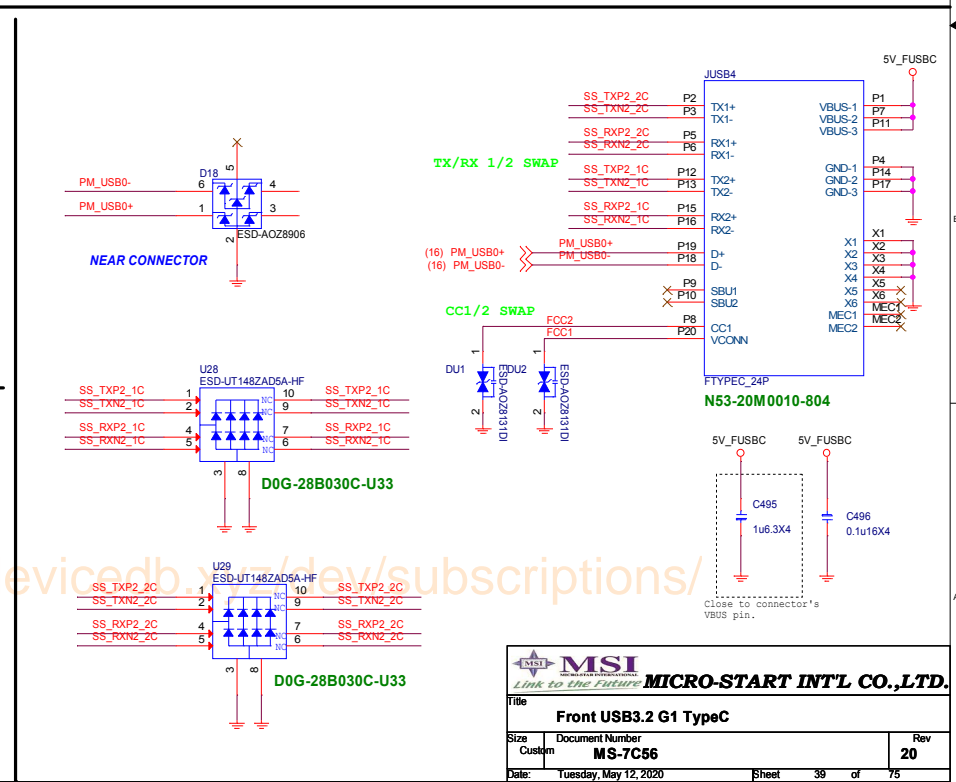
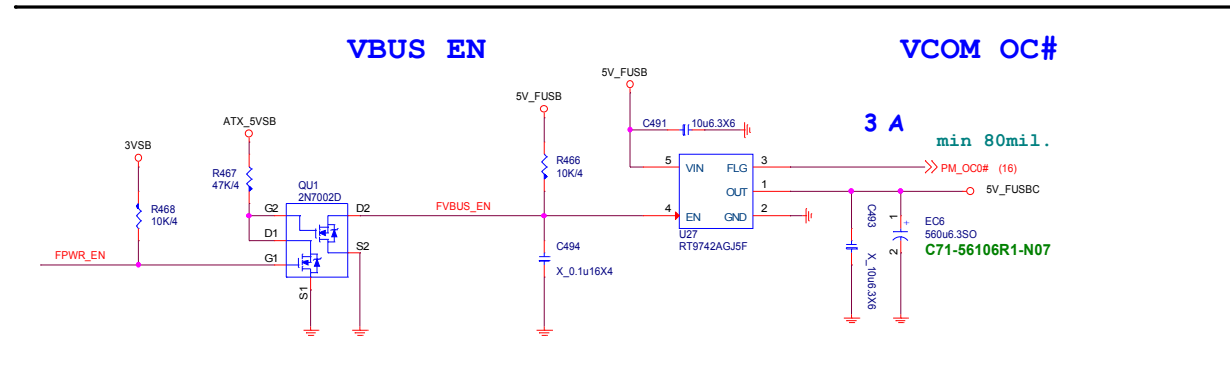
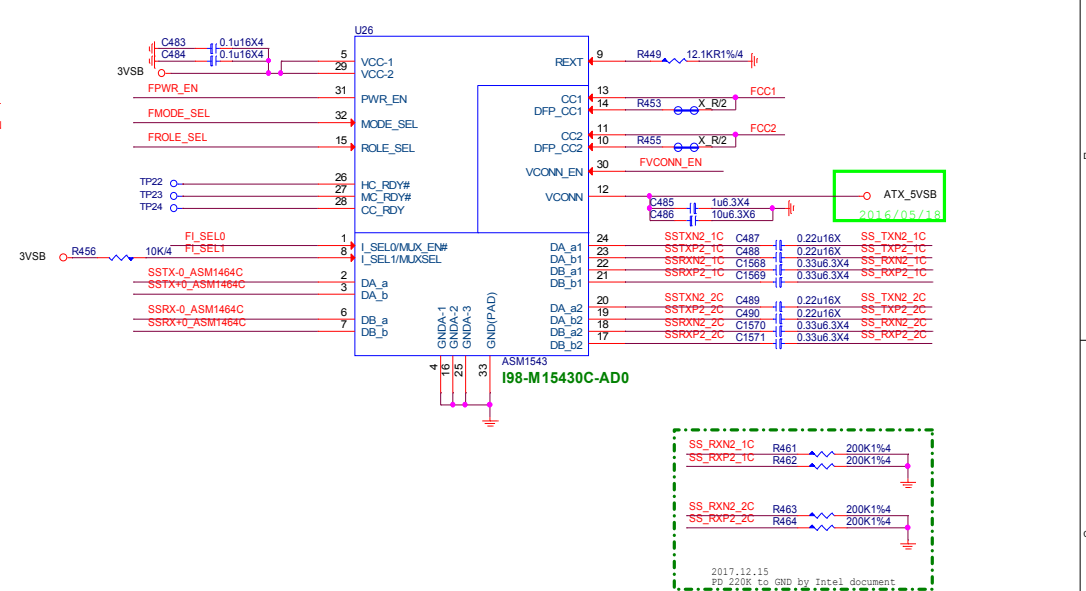
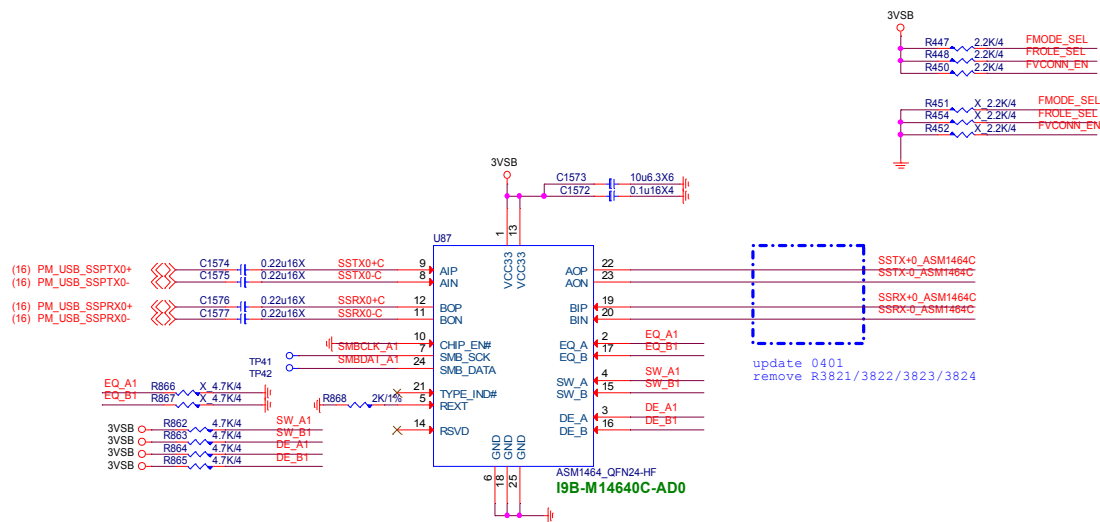
(16) PM_USB_SSRX0+ <> C476 0.33u6.3X4 PM_SSRX0+
(16) PM_USB_SSRX0- <> C477 0.33u6.3X4 PM_SSRX0-

(16) PM_USB_SSTX1+ <> C478 0.22u16X PM_SSTX1+
(16) PM_USB_SSTX1- <> C479 0.22u16X PM_SSTX1-

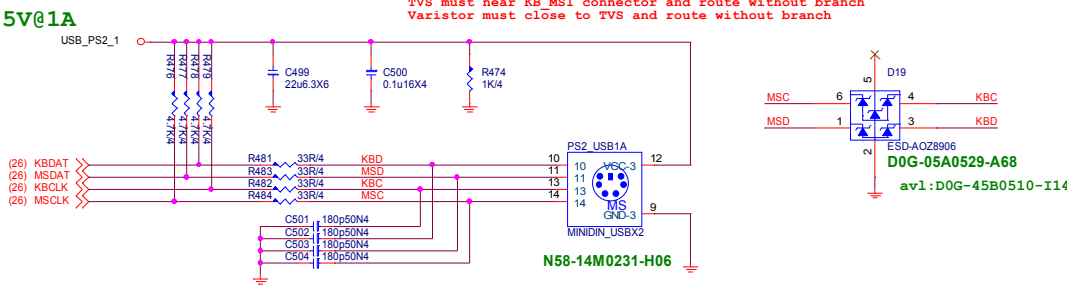
(16) PM_USB_SSRX1+ <> C480 0.33u6.3X4 PM_SSRX1+
(16) PM_USB_SSRX1- <> C482 0.33u6.3X4 PM_SSRX1-



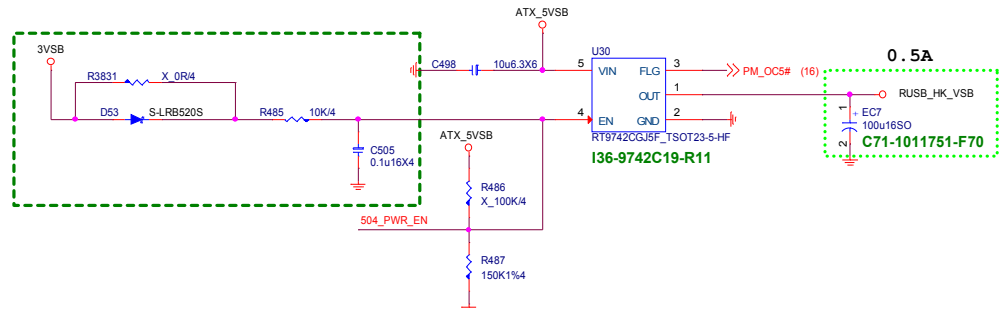
DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/



PS2+USB (USB2.0)



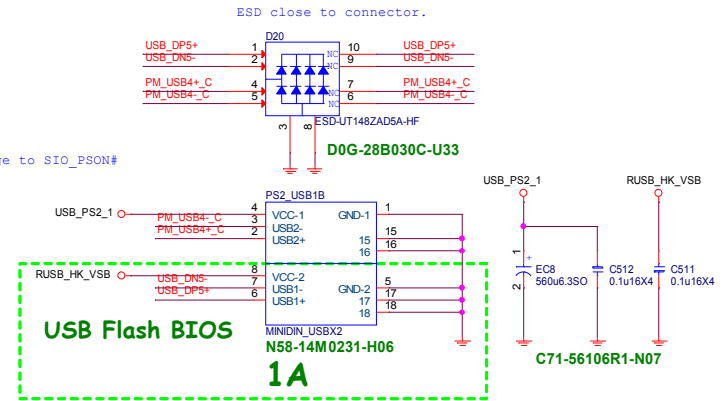
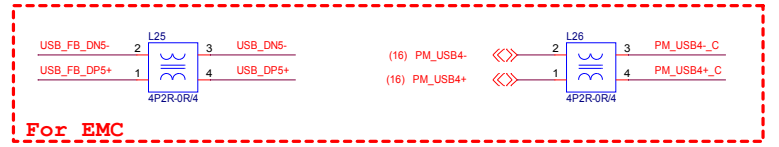
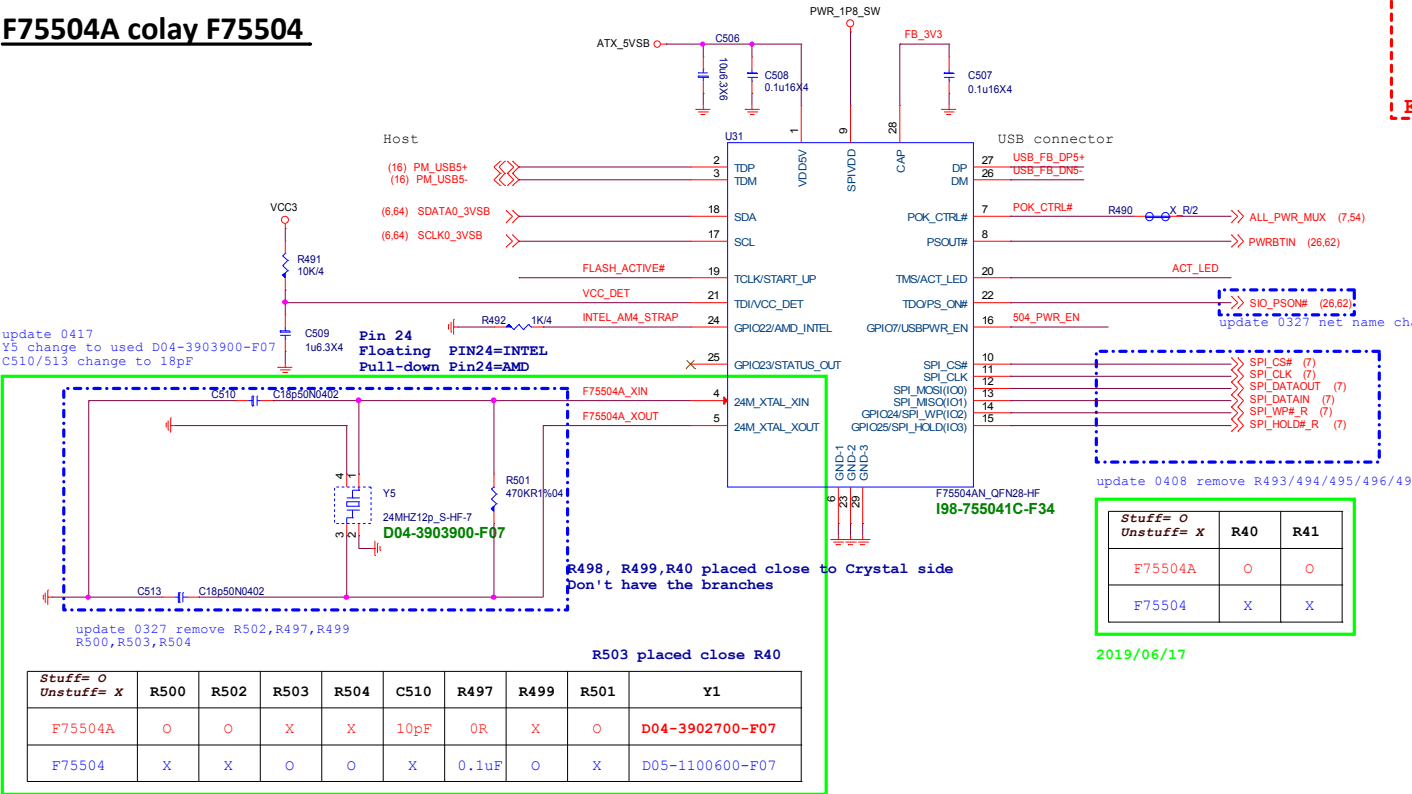
HOTKEY POWER



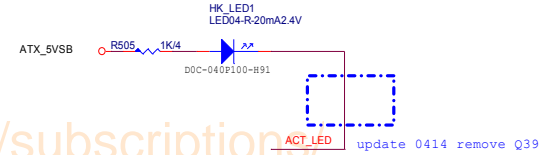
USB Flash BIOS

F75504A colay F75504

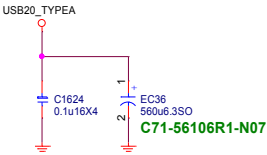
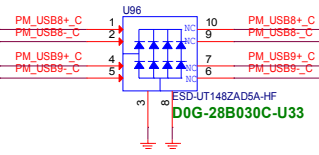
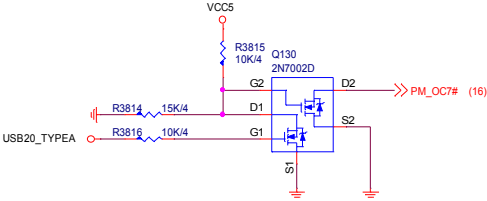
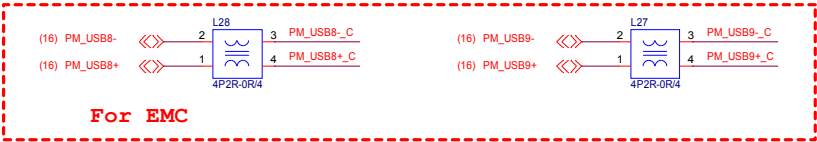
F75504A/F75504 layout placement must meet to spi/usb trace length spec with host.
As for as possible place near to host.



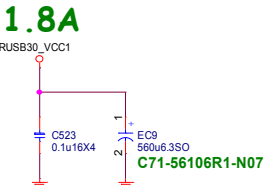
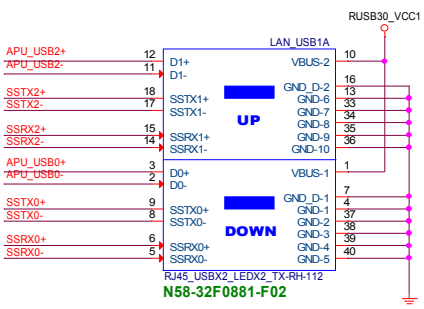
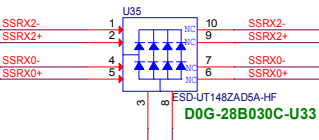
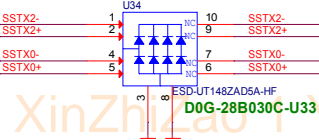
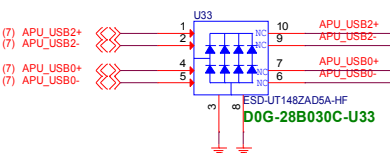
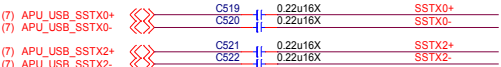
LED close to USB port



Rear USB2.0 5V@0.5A+0.5A

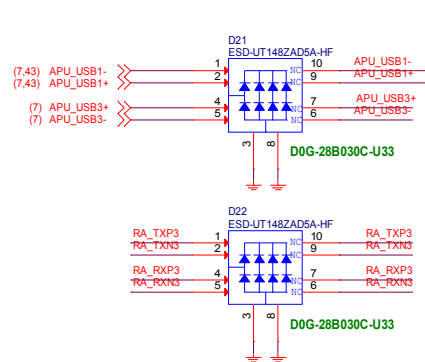
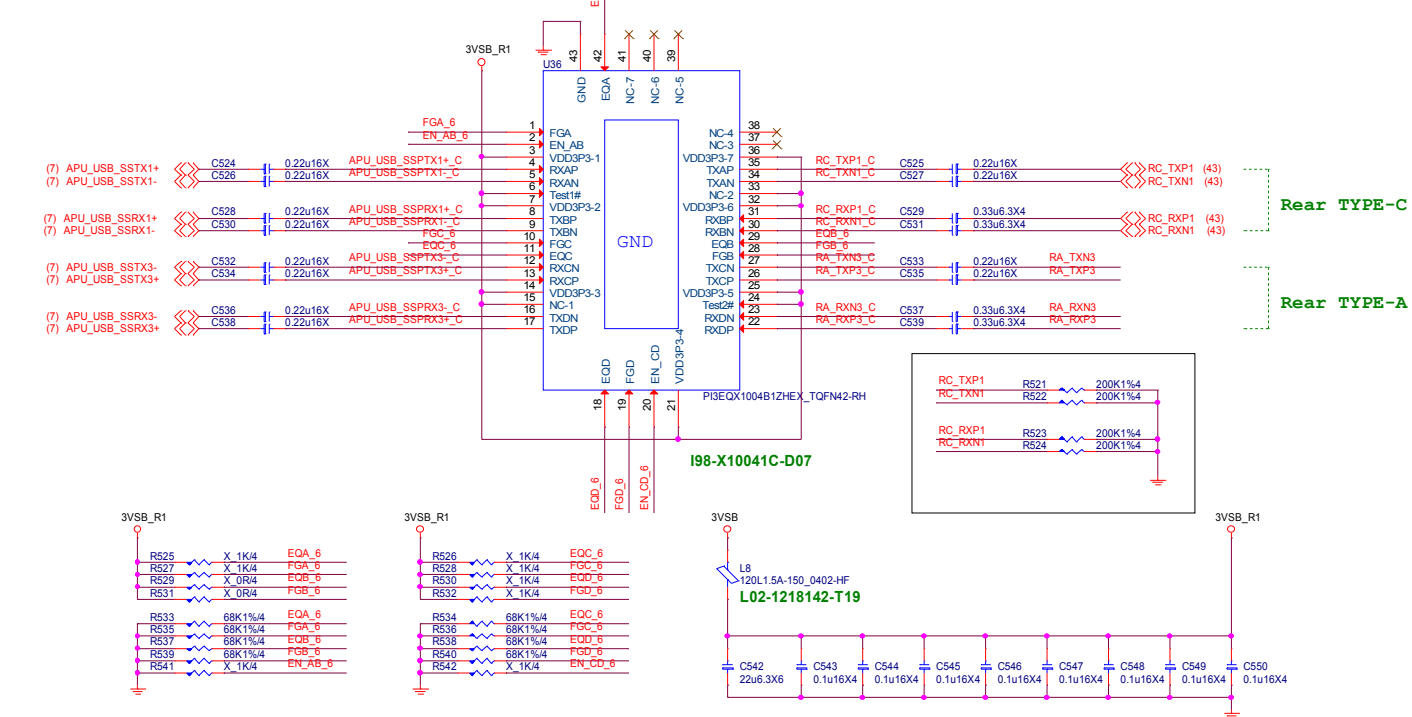


Rear USB3.1 GEN1 5V@1.8A

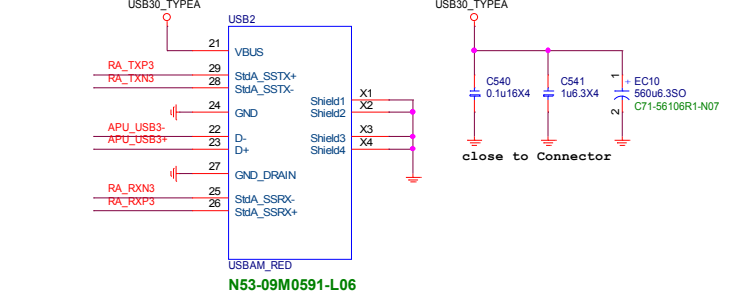


DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

TYPE-A PI3EQX1004 Redriver



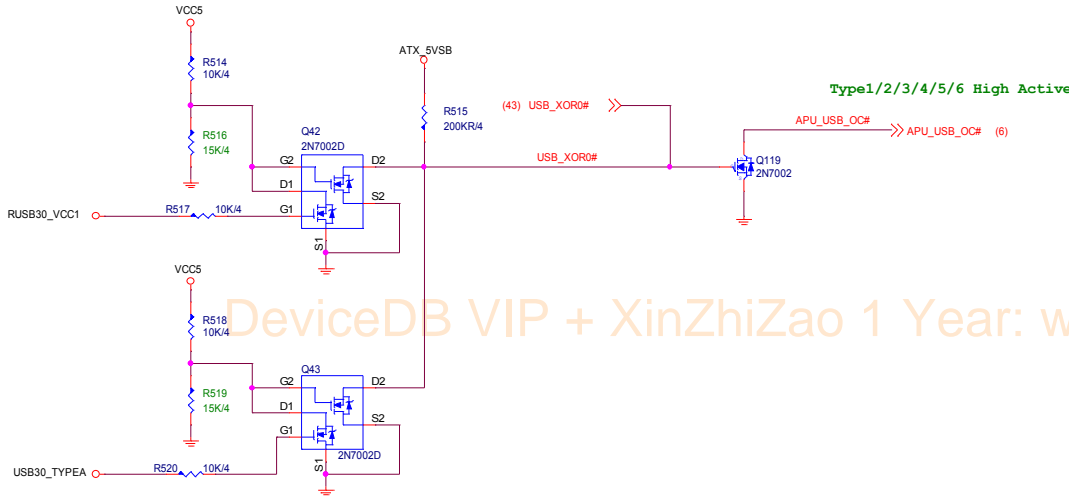
GEN2 0.9A



EQ	dB		EQ	FG
0	10.9	0 to GND	R	R
R	6.7	68K to GND	R	-1.5
F	8.9	NC	F	0
1	13.1	0 to VDD	1	2

APU_USB_SSTX1	A	R	R
APU_USB_SSRX1	B	R	R
APU_USB_SSTX3	C	R	0
APU_USB_SSRX3	D	R	0

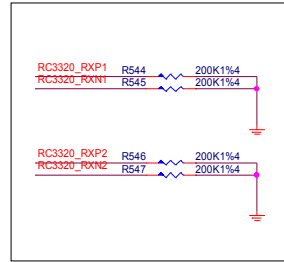
CPU USB_OC



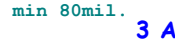
DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

USB 3.1-Type-C

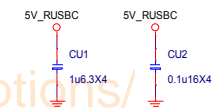
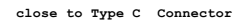
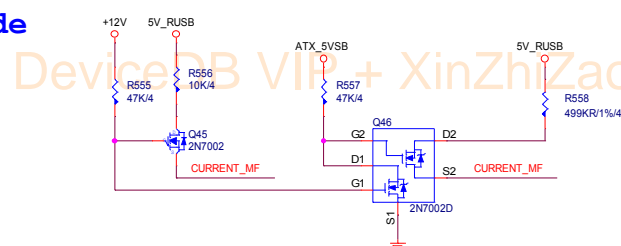
USB Type-C MUX with Configuration Channel (CC)



VBUS EN



Current Mode



MICRO-STAR INT'L CO.,LTD

MS-7C56

Rear USB3.1 Type C / mux

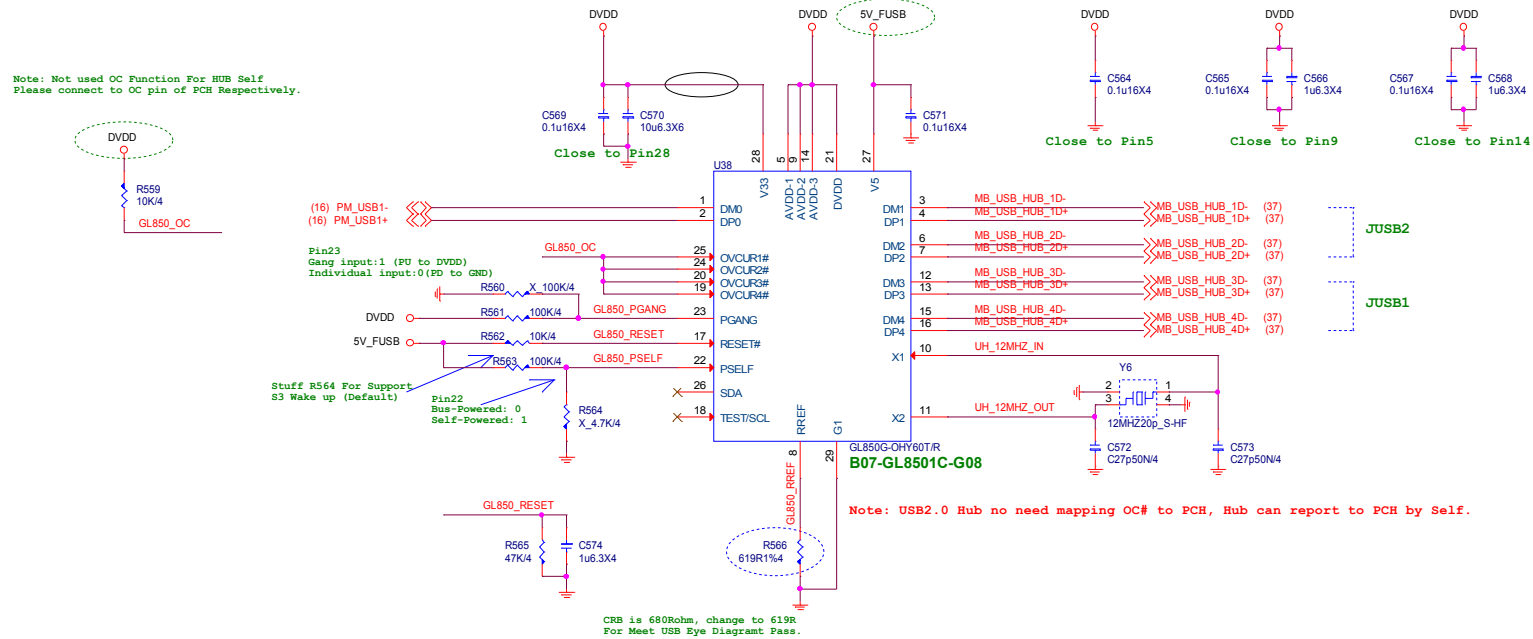
Date: Tuesday, May 12, 2020

Sheet 43 of 75

5V_FUSB

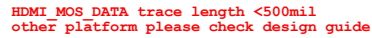
Note: Not used OC Function For HUB Self
Please connect to OC pin of PCH Respectively.

Note: Please connect to USB Power Source.



DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

For HDMI 1.4



$I_B = (V_{CC5} - V_{be}) / 10k$
 $(5 - 0.95) / 10k = 0.405mA$
 $I_C = (V_{CC3} - V_{ce}) / 4.7k$
 $(3.3 - 0.2) / 4.7k = 0.659mA$

$I_B = (V_{CC5} - V_{be}) / 10k$
 $(5 - 0.95) / 10k = 0.405mA$
 $I_C = (V_{CC5} - V_{ce}) / 10k$
 $(5 - 0.2) / 10k = 0.48mA$

如果用DIODE SA測試電壓會不過

The diagram illustrates the pin connections for the N58-39M0111-F82 HDMI connector. It is divided into two main sections: DP_HDMI1B (left) and DP_HDMI-RH-1 (right).

DP_HDMI1B Pin Connections:

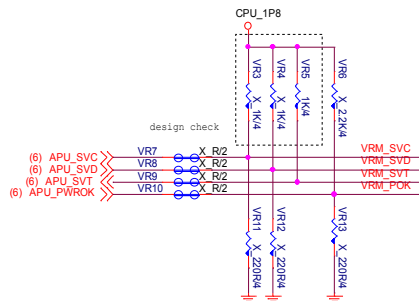
- Pin 21: HDMI_DATA2_DP
- Pin 23: HDMI_DATA2_DN
- Pin 24: HDMI_DATA1_DP
- Pin 26: HDMI_DATA1_DN
- Pin 27: HDMI_DATA0_DP
- Pin 29: HDMI_DATA0_DN
- Pin 30: HDMI_DATA_CLK_DP
- Pin 32: HDMI_DATA_CLK_DN
- Pin 35: HDMI_DDC_CLK
- Pin 36: HDMI_DDC_DATA
- Pin 38: +5V POWER
- Pin 39: HOT PLUG DETECT-2

DP_HDMI-RH-1 Pin Connections:

- Pin 22: TMS DATA2 Shield
- Pin 25: TMS DATA1 Shield
- Pin 28: TMS DATA0 Shield
- Pin 31: TMS CLOCK Shield
- Pin 33: CEC
- Pin 34: RESERVED
- Pin 37: DDC/CEC GROUND
- Pin 38: MEC1
- Pin 39: X3
- Pin 40: X4

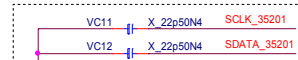
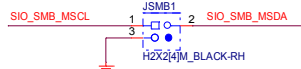
Other Components:

- CH13: 0.1uF X4 capacitor connected to the +5V POWER pin (38).
- CH14: 10uF 3X6 capacitor connected to the +5V POWER pin (38).

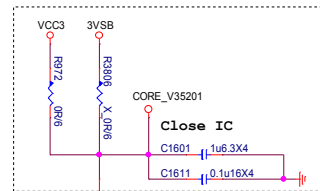
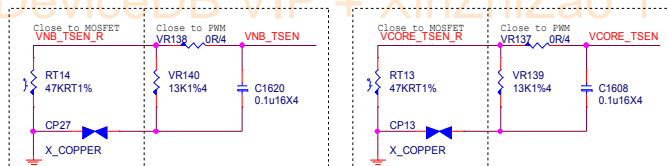
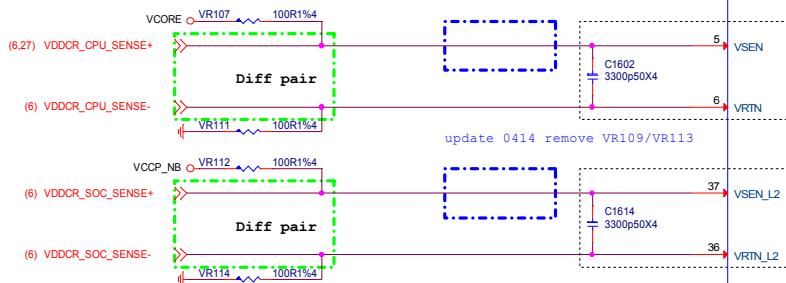
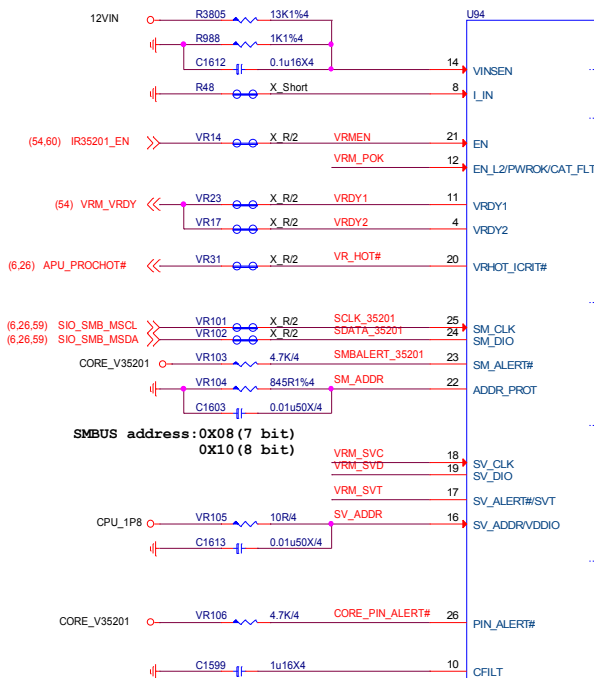
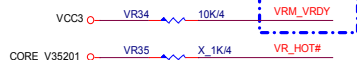


Note: VID Override Circuit

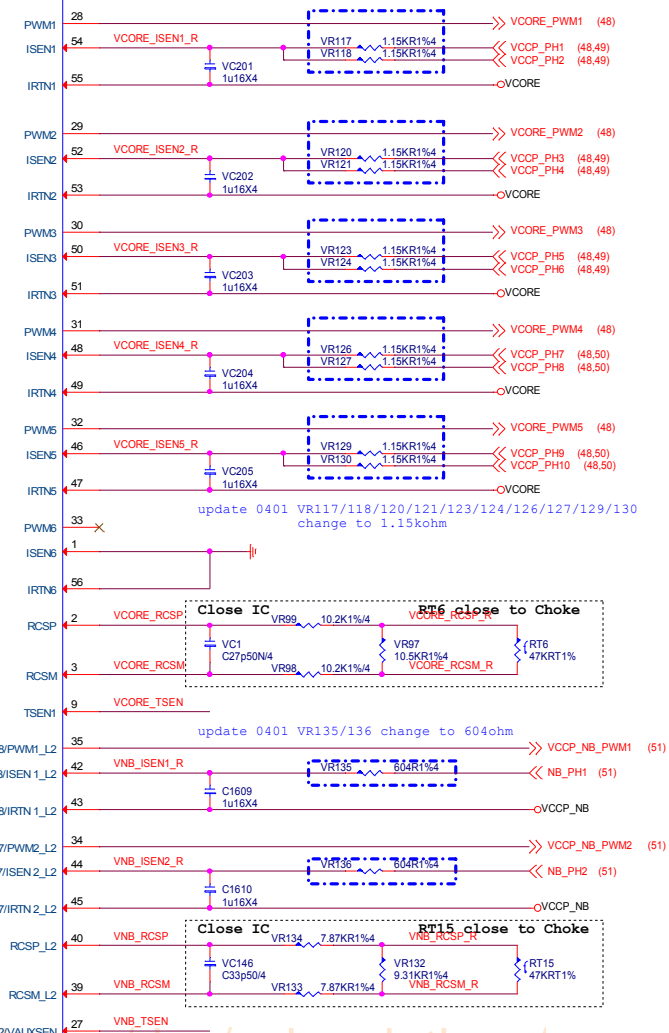
BOOT VOLTAGE		Pre_PWROK Metal VID
SVC	SVD	
0	0	1.1
0	1	1.0
1	0	0.9
1	1	0.8



update 0423 3V pull up change to VRM_VRDY



VCCORE: ICCMax 140A
LL: 1.3mohm
OCP: 220A(10 x 22A)
SOC: ICCMax 75A
LL: 2.1ohm
OCP: 90A



DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/



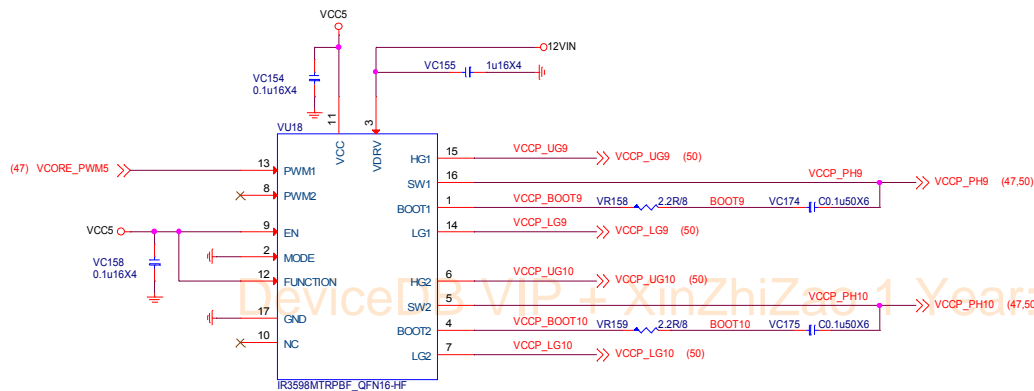
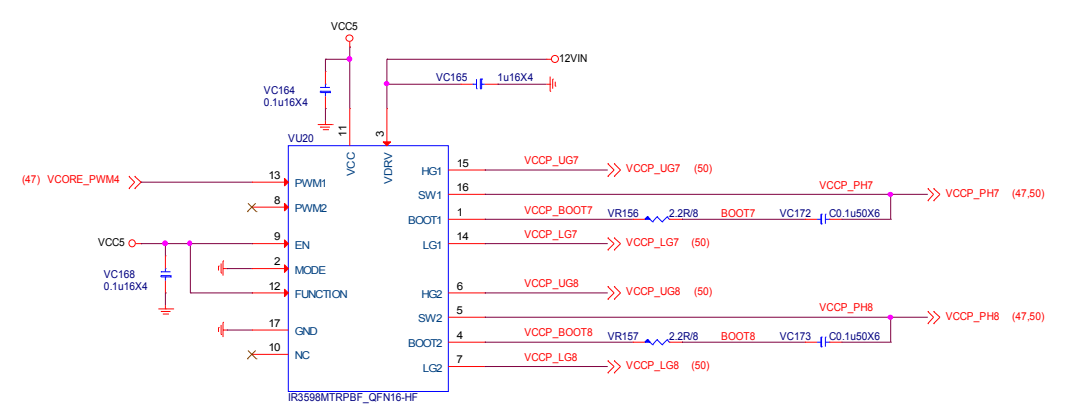
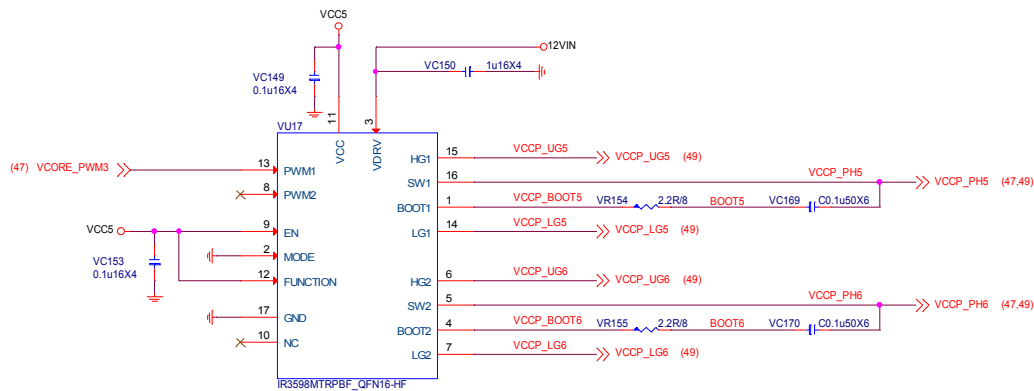
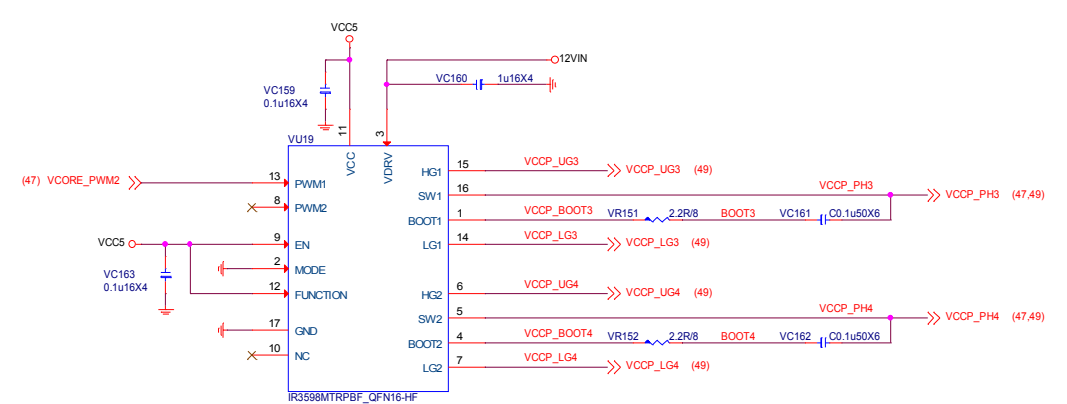
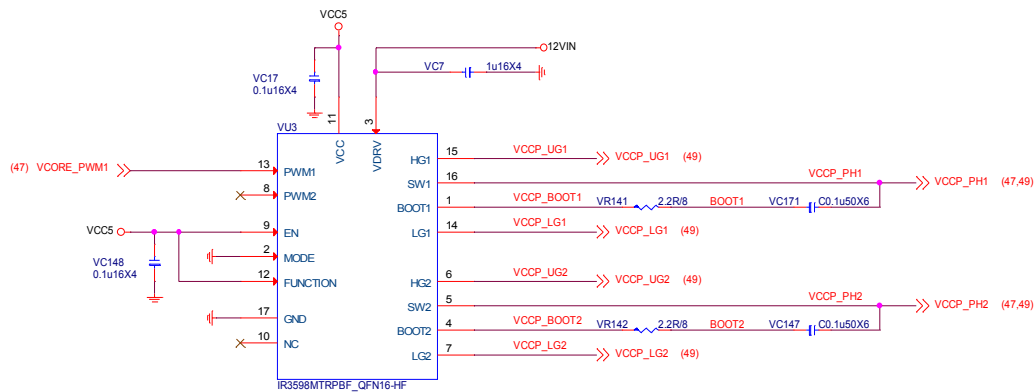
MICRO-STAR INT'L CO.,LTD

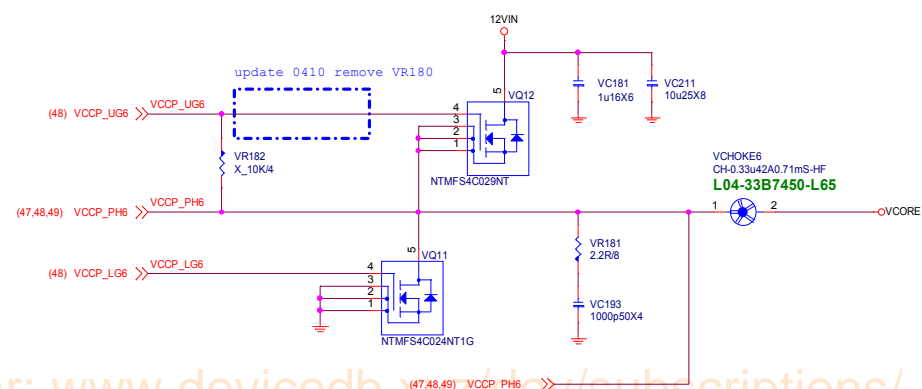
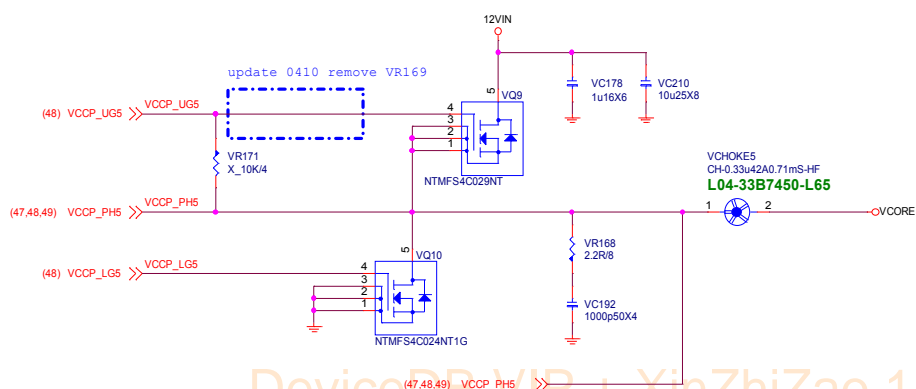
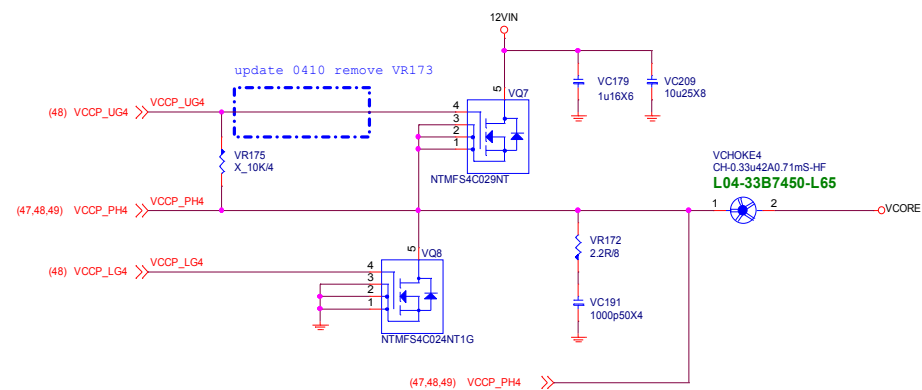
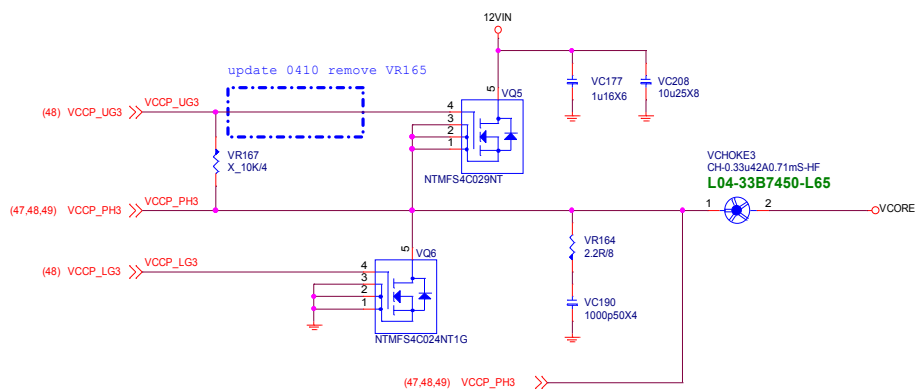
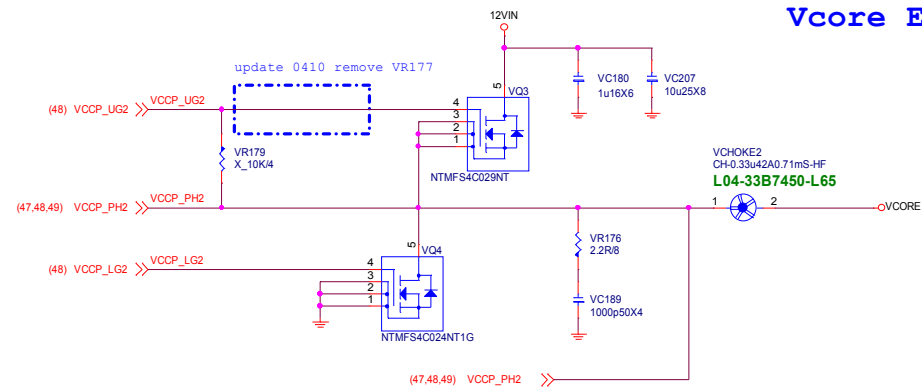
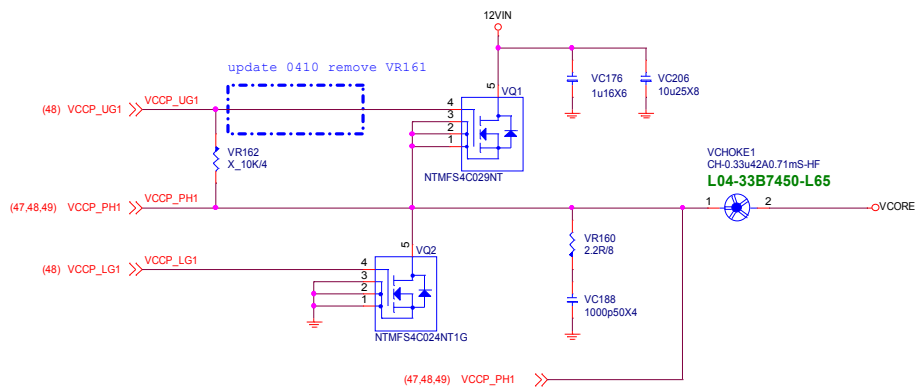
MS-7C56

Size	Document Description	Rev
Custom	CPU Power RAA229004 10+2	20
Date: Wednesday, May 13, 2020	Sheet 47 of 75	

CPU_CORE Driver IC

VCORE Double 10-PHASE





DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

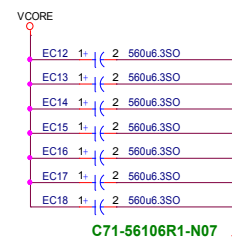
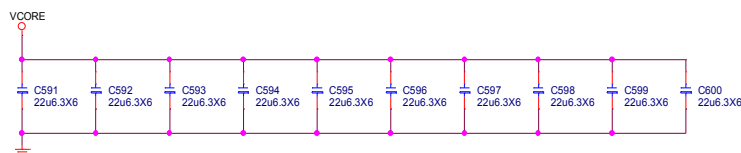
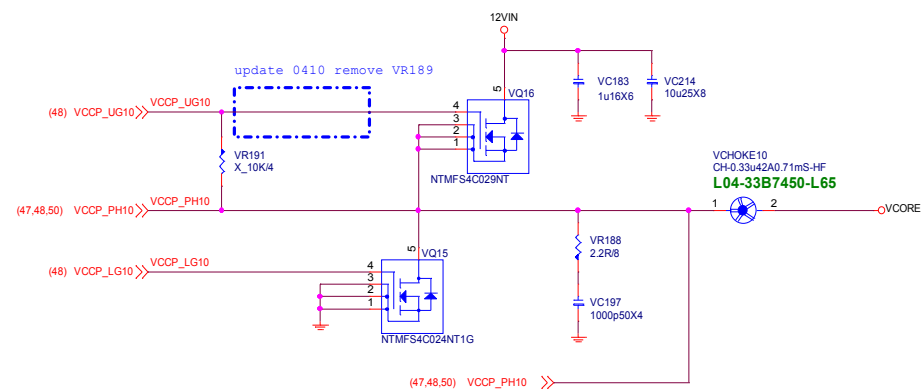
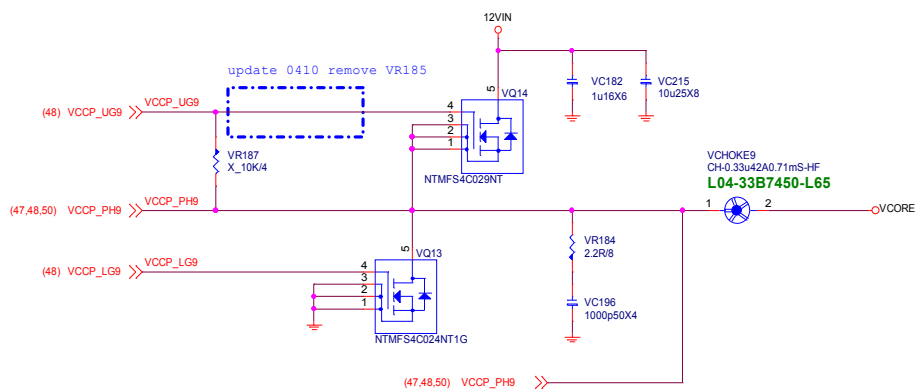
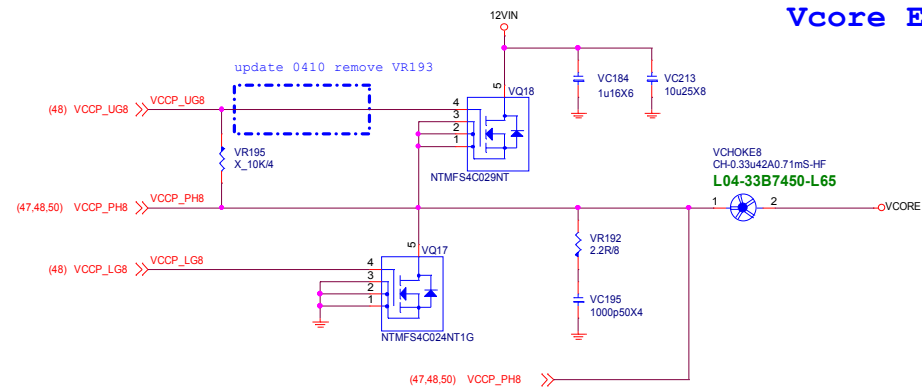
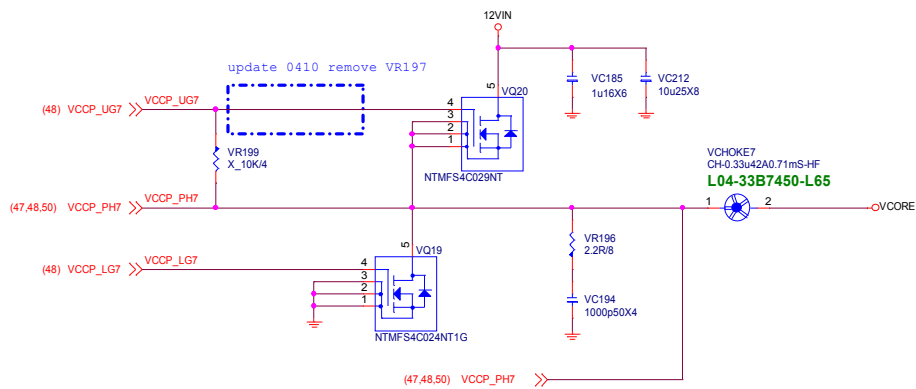


MICRO-STAR INT'L CO.,LTD

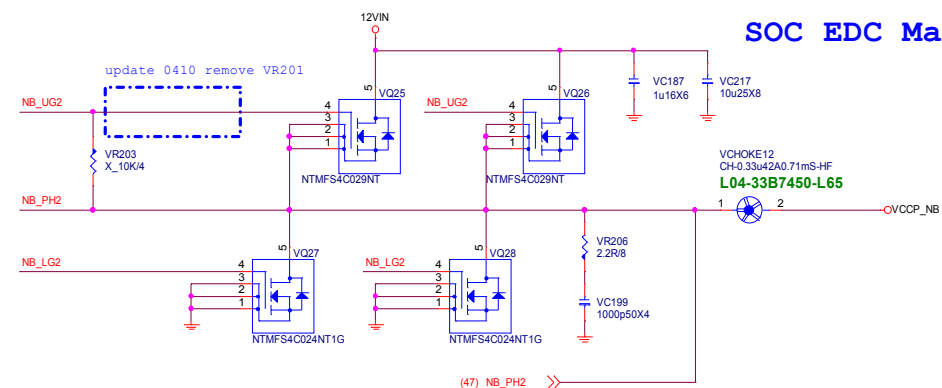
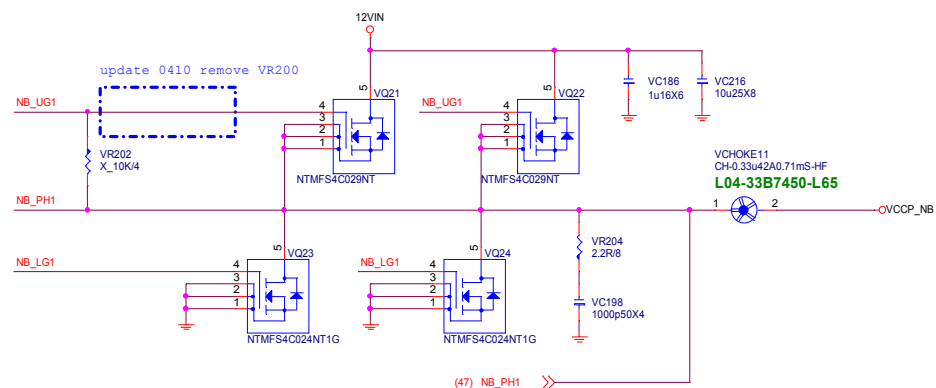
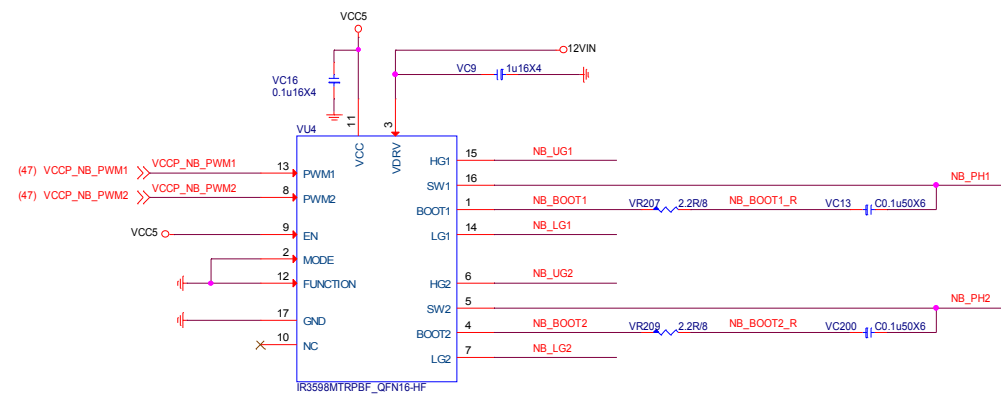
MS-7C56

Size	Document Description	Rev
Custom	CPU Power Vcore Phase 1-6	20
Date: Tuesday, May 12, 2020	Sheet 49 of 75	

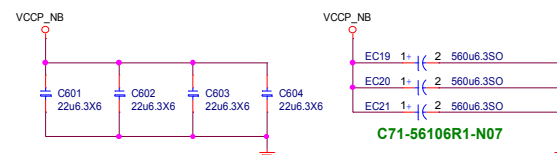
Vcore EDC Max 140A



DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/



SOC EDC Max 75A

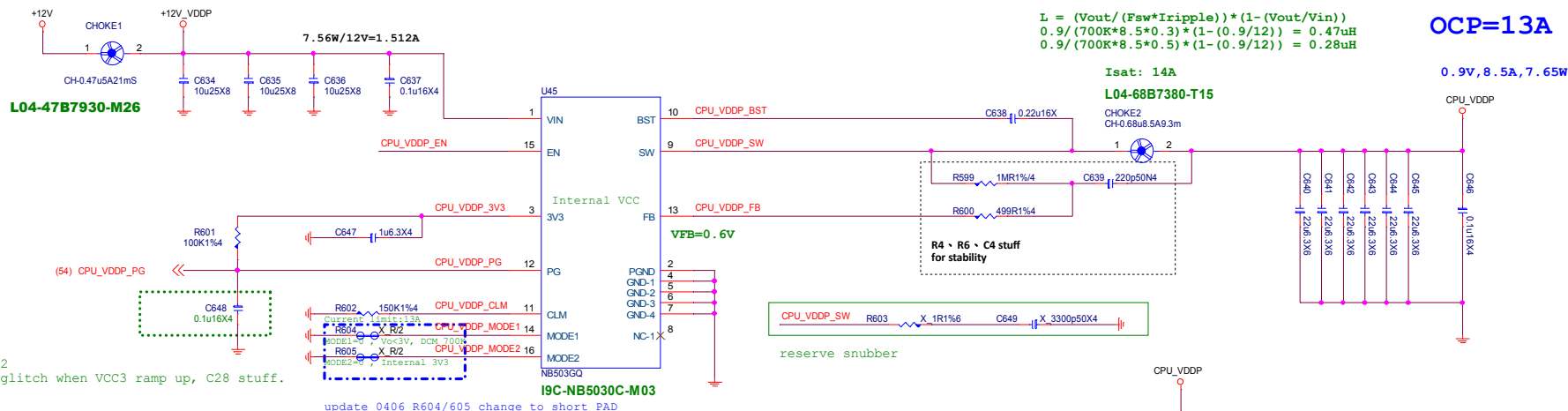


DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

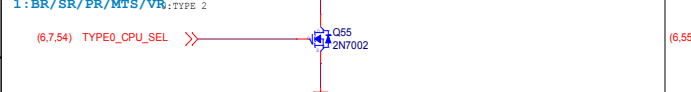
CPU_VDDP_S0

0.9V@S0:8.5A

Input Current = $(13A \cdot 0.9V) / 12V / 0.8 = 1.22A$
 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 I_rms = 5A



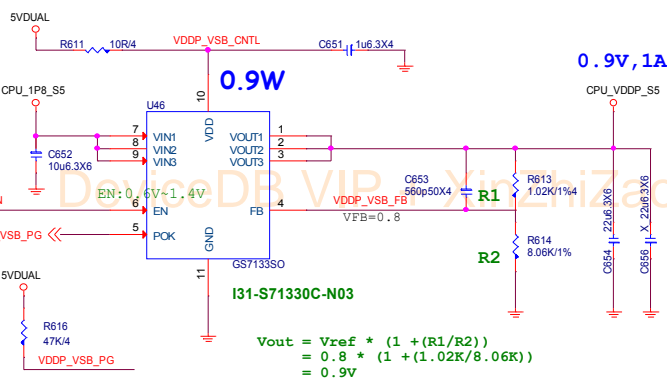
TYPE0_CPU_SEL
0:RV/RR
1:BR/SR/PR/MTS/VR



CPU	TYPE	TYPE0_CPU_SEL	TYPE1_CPU_SEL	CPU_VDDP_EN
BR	0	1	0	SR-RR-Support
NA		0	0	0
SR	2	1	0	CPU VDDP NOT SUPPORT TYPE2
RV/RR	3/5	0	1	1
MTS/VR	4/6	1	0	CPU VDDP NOT SUPPORT TYPE4/6

CPU_VDDP_S5

0.9V
S5:1A



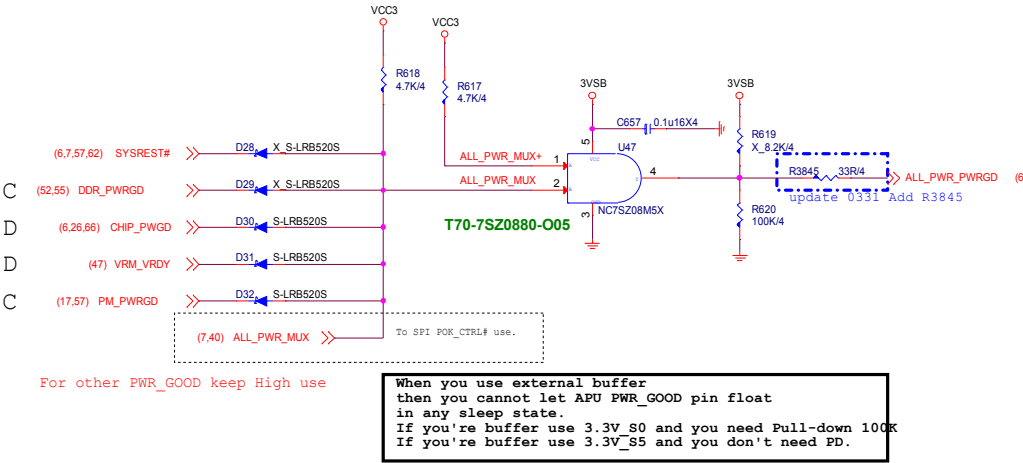
$$V_{out} = V_{ref} + (R1 \cdot R4 \cdot V_{ref}) / (R2 \cdot (R1 + R4))$$

$$= 0.6 + (1k \cdot 1000k \cdot 0.6) / (1.96K \cdot (1k + 1000k))$$

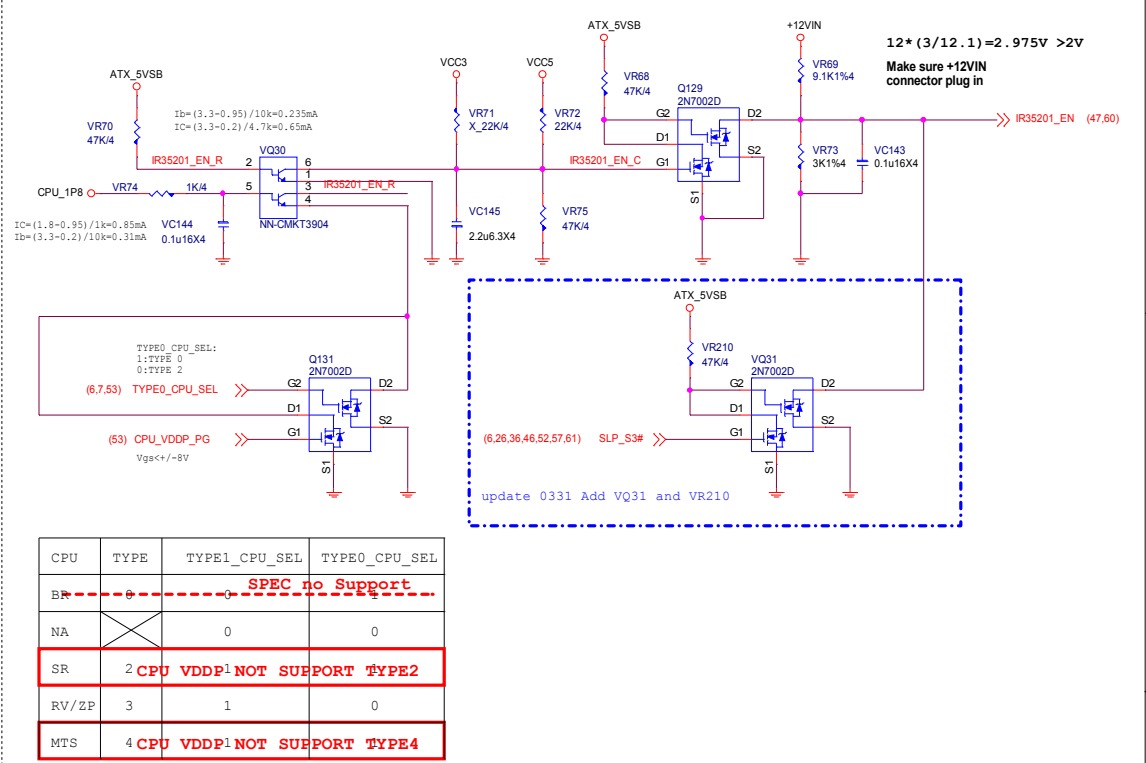
$$= 0.9058V$$

ALL POWER GOOD MUX

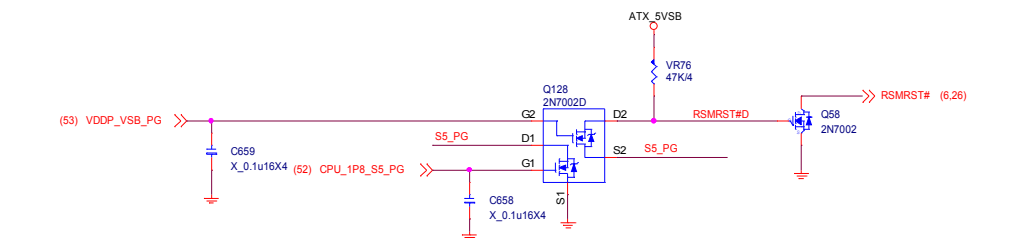
S0 PG



VRM_Enable circuit



S5 PG



DeviceDB VIP + XinZhiZao 1 Year: www.devedb.xyz/dev/subscriptions/

DDR4_1.2V@28.7A

18A FOR CPU

9.5A FOR 4DIMM

1.2A FOR DDR VTT

Rocset=1.5*Imax*Rdson(Low side)/Iocset

=1.5*28.7A*2mohm/10uA

=8.61K

OCP = 35A; Choke Isat=50A

Rocset = 1.5 * Imax * Rdson(low) / Iocset

R639 = 35 * 2mohm / 10uA

R639 = 7K

Rdson(Low Side) 5V

D03-4C02403-005:3.3 ~ 4mohm

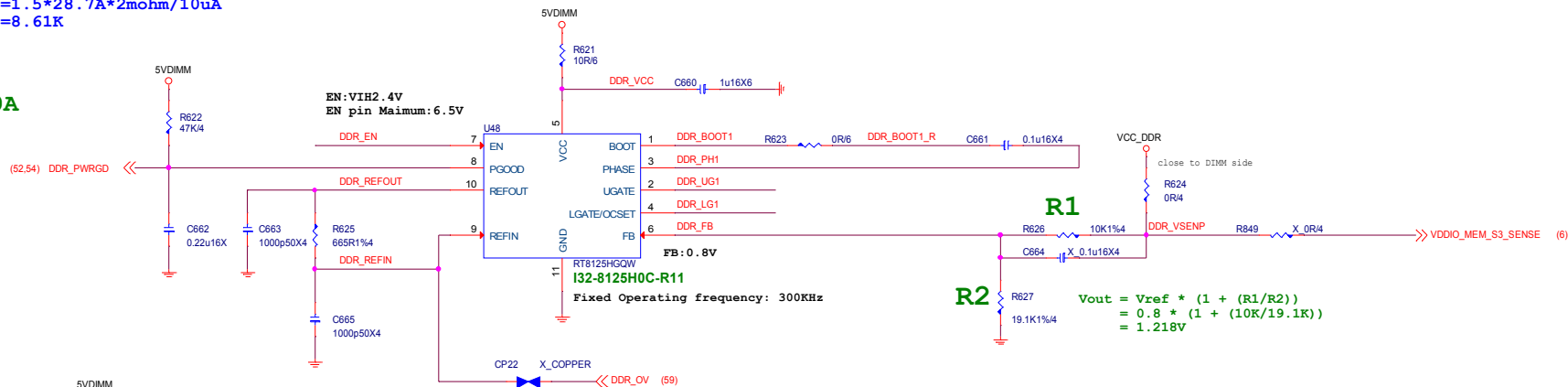
DDR_VR_EN
FROM SIO_VDDQ_EN:R230/R220 stuff
FROM VPP_VR_PG:R230/R220 un stuff

Default:FCCM
4.5V:FCCM
2.37V:DEM

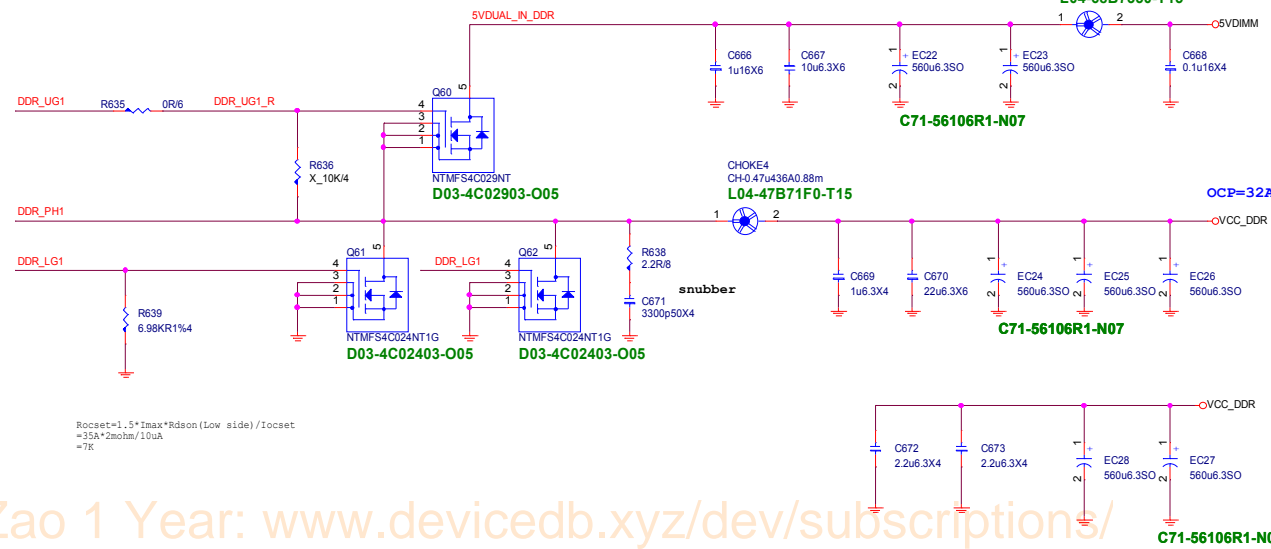
update 0327 remove VPP_VR_PG
0423 R633 change to short PAD

update 0327 remove Q64 and R640

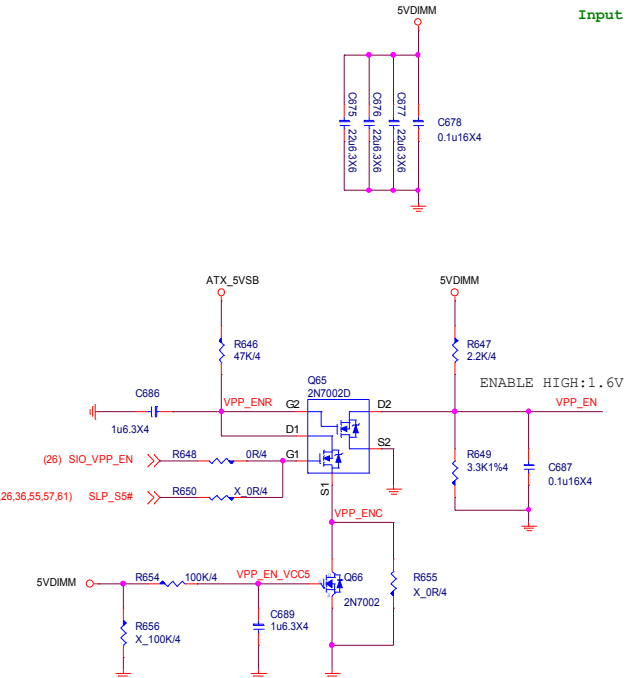
DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/



Input Current=(28.7*1.2)/5/0.8=8.61A

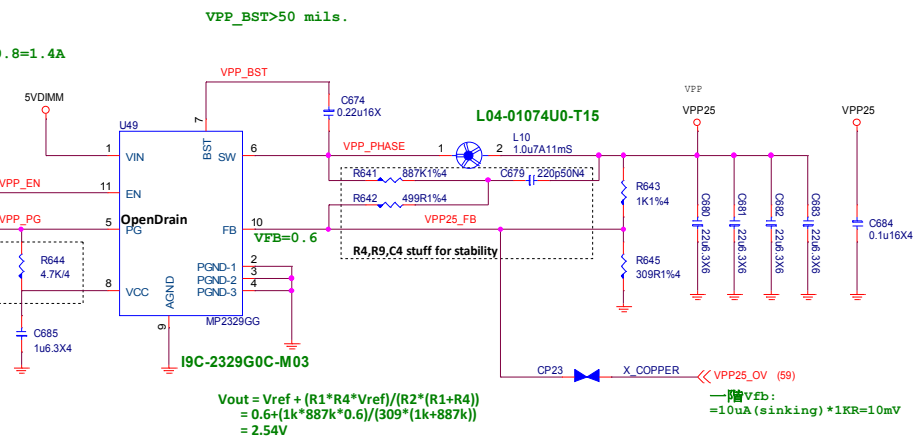


4DIMM : VPP25
2.5V@2.24A



Input Current=(2.24*2.5)/5/0.8=1.4A

R5 100K->4.7K for RT8125E_EN 台階

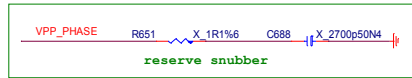


VPP_BST>50 mils.

L04-01074U0-T15

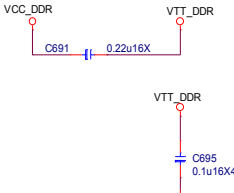
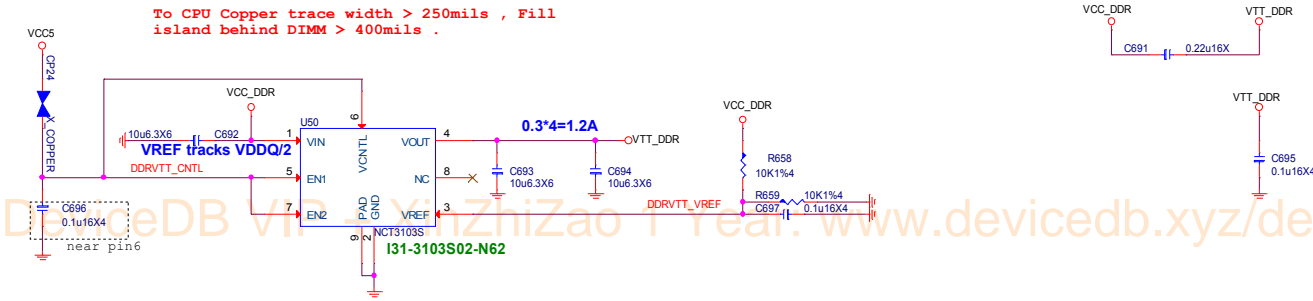
$V_{out} = V_{ref} + (R1 \cdot R4 \cdot V_{ref}) / (R2 \cdot (R1 + R4))$
 $= 0.6 + (1k \cdot 887k \cdot 0.6) / (309 \cdot (1k + 887k))$
 $= 2.54V$

— 隨 Vfb :
=10uA(sinking) *1KR=10mV



DDR VTT Power

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

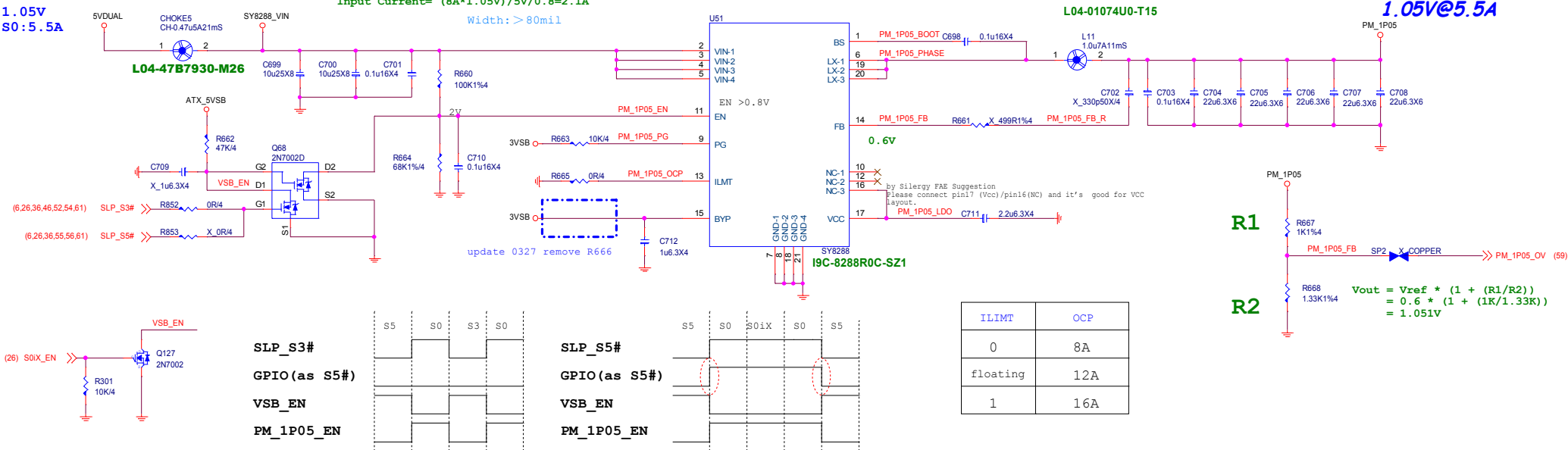


FOR Promontory 1.05V_S0

1.05V
S0:5.5A

Input Current= $(8A \cdot 1.05V) / 5V / 0.8 = 2.1A$

Width: > 80mil



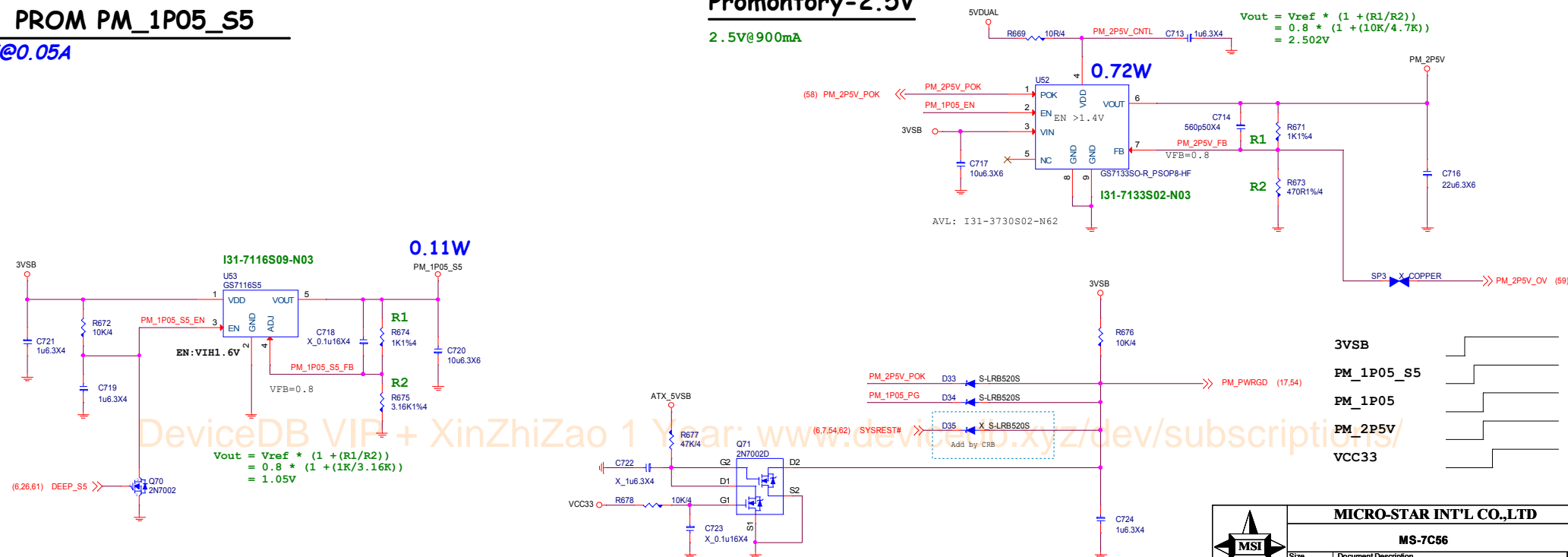
ILIMT	OCF
0	8A
floating	12A
1	16A

FOR PROM PM_1P05_S5

1.05V@0.05A

Promontory-2.5V

2.5V@900mA



MICRO-STAR INT'L CO.,LTD

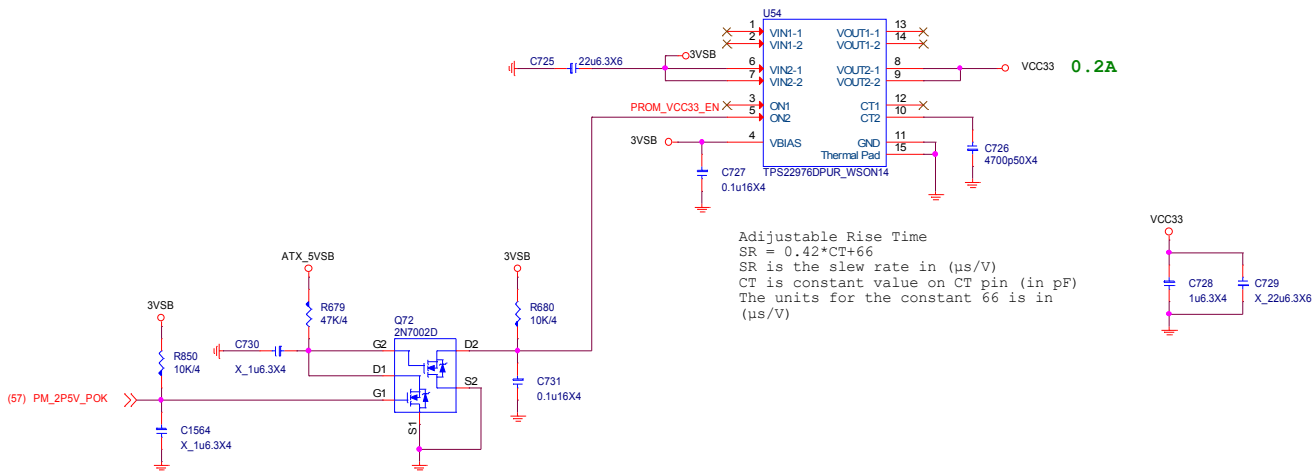
MS-7C56

Size	Document Description
Custom	PM - SY8288/PM_1P05/PM_2P5V

Date: Tuesday, May 12, 2020	Sheet 57 of 75
-----------------------------	----------------

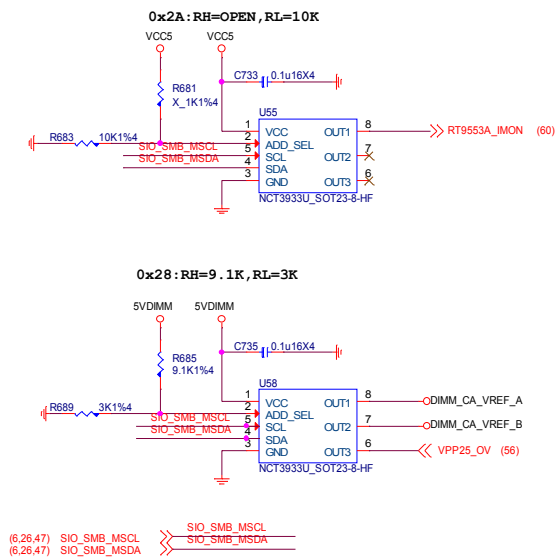
PROM VCC33

VCC33@0.2A

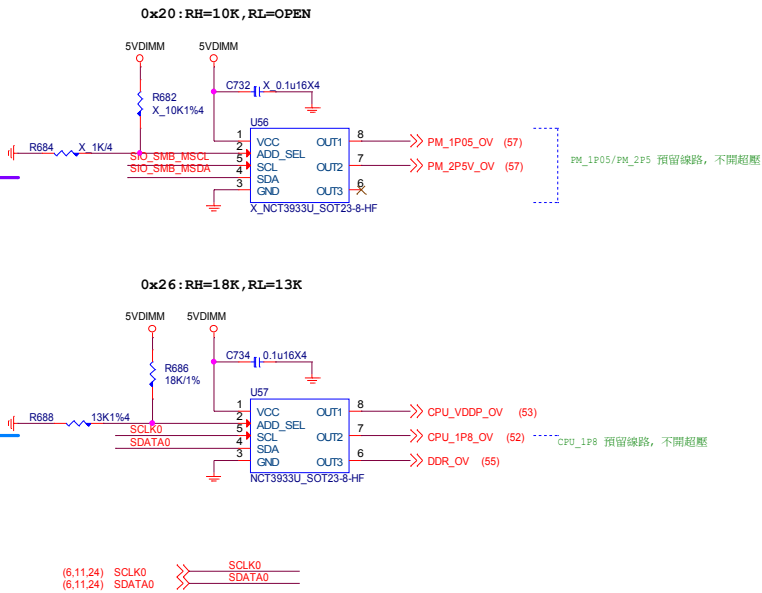


DeviceDB VIP + XinZhiZao 1 Year: www.devicedb.xyz/dev/subscriptions/

Over Voltage Control IC

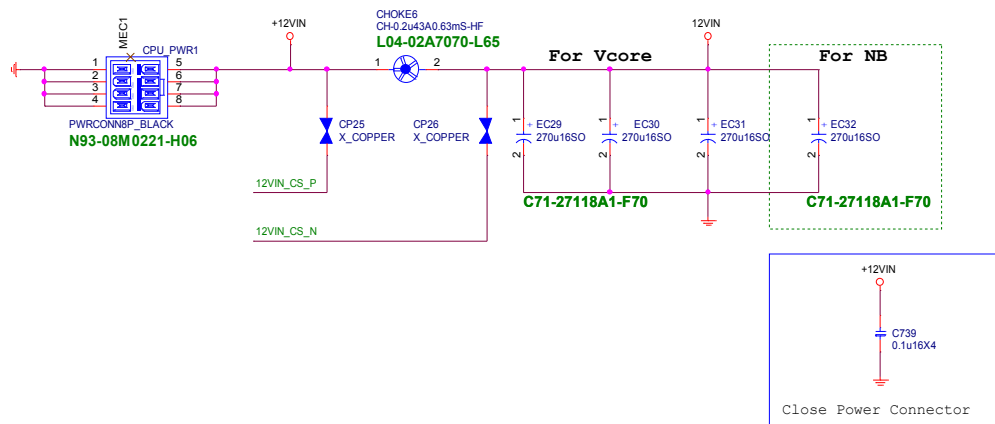


UPI VOLTAGE CONSOLE						
ADDRESS	0x2A	0x28	0x26	0x24	0x22	0x20
RH (KOhm)	OPEN	3.9	3	2.2	1.3	10
RL (KOhm)	10	1.3	2.3	3	3.9	OPEN
BUS_SEL	0%	25%	40%	60%	75%	100%



DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

CPU POWER CONNECTOR



```
(set OCP=35A)
(35.01~45.83A)
```

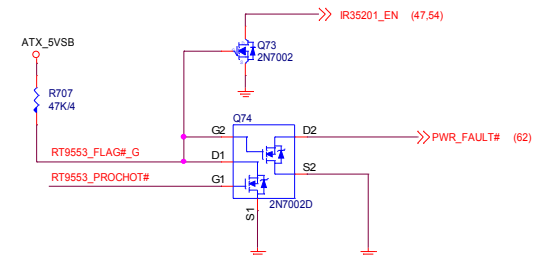
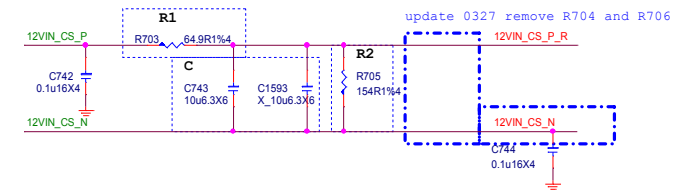
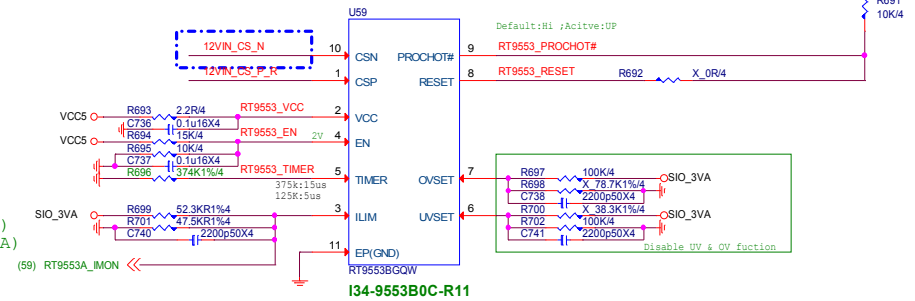
$$\Delta V_{ILIM} = 10\mu A * [(60.4K * 40.2K) / (60.4K + 40.2K)] = 226mV$$

$$I_{sense} = V_{ILIM} / 100 * R_{sense}$$

$$\Delta I_{sense} = 226\text{mV} / 100 * 0.39\text{m} = 5.795\text{A}$$

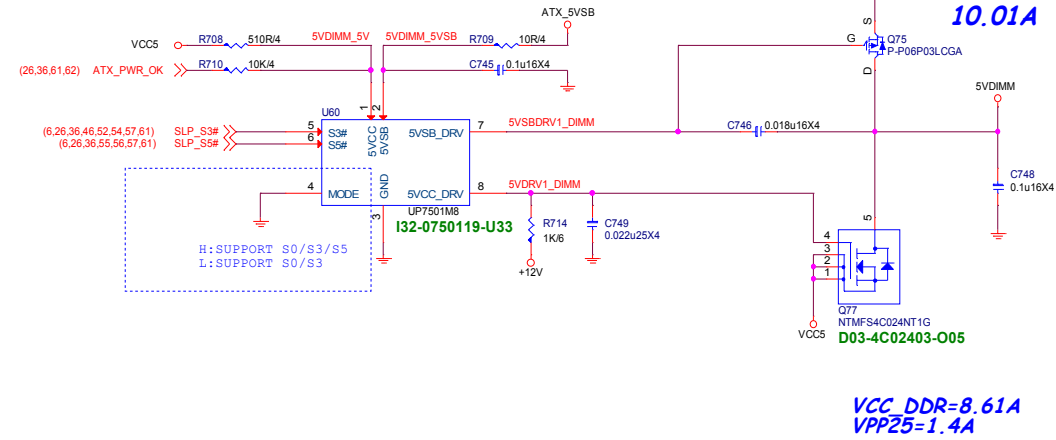


RT9553 PIN5: When start OV/UV, RESET delay time can meet SPEC 15us.



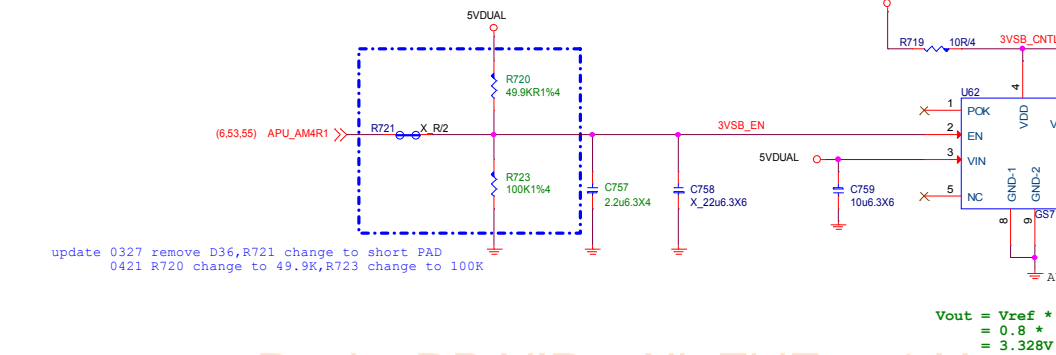
Vcore	SOC
$D = V_{out}/V_{in}$ $V_{in} = 12$ > input voltage $V_{out} = 2$ > output Vcore $D = 0.166667$	$D = V_{out}/V_{in}$ $V_{in} = 12$ > input voltage $V_{out} = 1.55$ > output Vcore $D = 0.129167$
$I_o = I_{core(max)} * 0.8$ $I_{core(max)} = 200$ > Vcore current $I_{avg} = 160$ A	$I_o = I_{core(max)} * 0.8$ $I_{core(max)} = 75$ > Vcore current $I_{avg} = 60$ A
$I_{ripple} = \{ I_o * \sqrt{D} * \sqrt{(1-D)} \} / \text{Phase}$ $\text{Phase} = 10$ phase $I_{ripple} = 5.962848$ A	$I_{ripple} = \{ I_o * \sqrt{D} * \sqrt{(1-D)} \} / \text{Phase}$ $\text{Phase} = 2$ phase $I_{ripple} = 10.06153$ A
How many pcs. Of Cap. $I_{ripple}(cap) = 4700$ m A $COE_{TEMP} = 1$ $\text{Input Cap.} = 2$ pcs.	How many pcs. Of Cap. $I_{ripple}(cap) = 4700$ m A $COE_{TEMP} = 1$ $\text{Input Cap.} = 3$ pcs.

5VDIMM FOR DDR

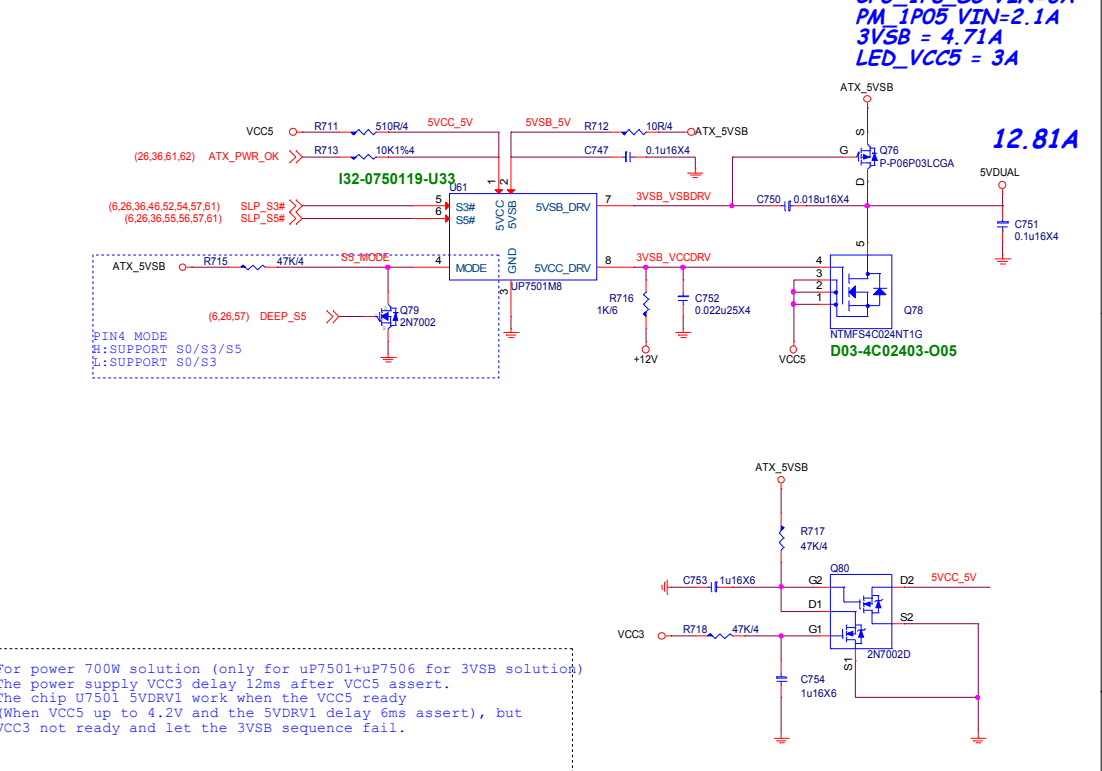


3VSB cost down
3.3V@4.305A

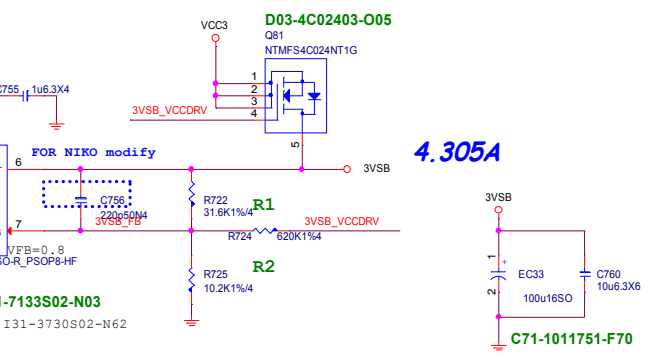
CPU:VDD_33_S5=0.25A
CHIP:VDD_33_S5=0.07A
PCIE=(375mA*5)=1.875A
M.2WIFI= 0.78A
RT8111H LAN=0.18A
PM_1P05_S5 :0.05A
PM_2P5V :0.9A(Modern Standby)
PCH VCC33 :0.2A(Modern Standby)



5VDUAL For 3VSB/CPU1.8V/VDDP

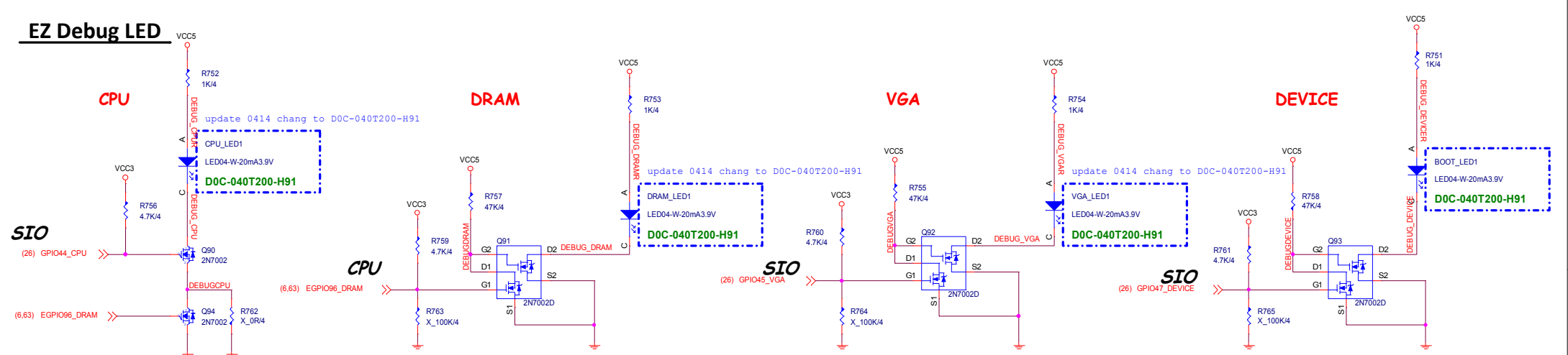


For power 700W solution (only for uP7501+uP7506 for 3VSB solution)
The power supply VCC3 delay 12ms after VCC5 assert.
The chip U7501 5VDRV1 work when the VCC5 ready
(When VCC5 up to 4.2V and the 5VDRV1 delay 6ms assert), but
VCC3 not ready and let the 3VSB sequence fail.



DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

EZ Debug LED



LED GPIO	GPIO44	EGPI096	GPIO45	GPIO47	default Input
亮	OPEN-Drain	GPO LOW	GPO LOW	GPO LOW	
滅	GPO LOW	GPO HIGH	OPEN-Drain	OPEN-Drain	

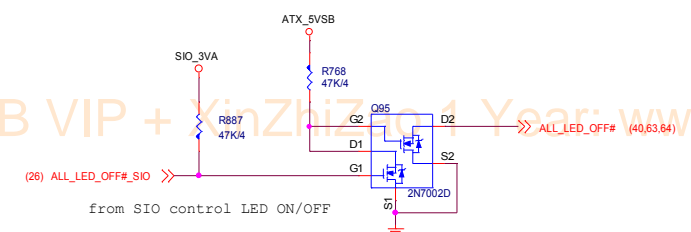
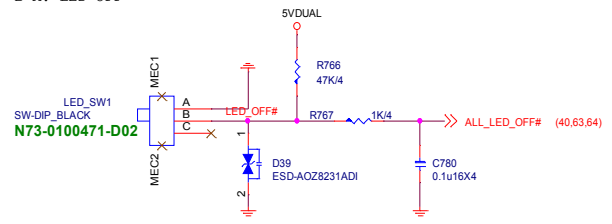
LED亮燈時同時將CPU LED關掉

LED_SW1 FORM SIO

D0C-040P100-H91/D0C-040S500-E07

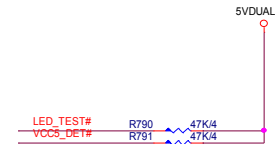
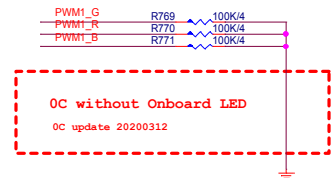
LED SW1 for ALL LED OFF

B-C: LED ON(default)
B-A: LED OFF



DeviceDB VIP + XinZhiZuo 4 Year: www.device-db.xyz/dev/subscriptions/

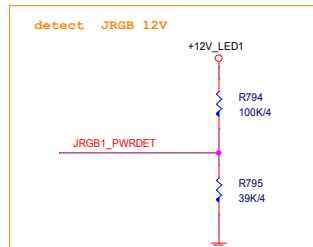
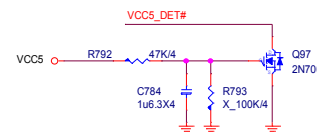
If you use ADC function, need to separate VREF from AVDD and 4_09VREF stuff for VREF.



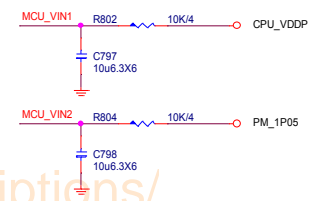
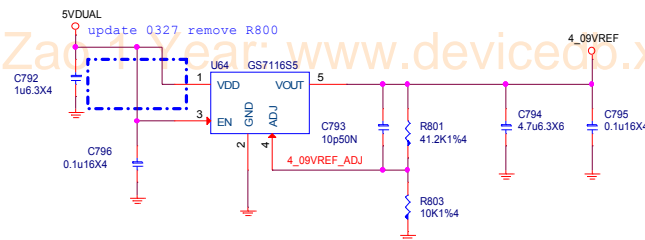
COM9~13 for PWM2
According to demand configuration.
If SPEC. don't have JRGB2,
Can configuration COM9~13,
To achieve 5 group Non-synchronized
onboard LED control.

PS. COM1 is the first action block,
next is COM2, and so on.

Pin15,16 can configure to master
smbus if spec requirement.



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
JCORSAIR1	LED_DATA2	No Use
JRGB1/JRGB2	PWM1/ PWM2	PWM1/ PWM2
Board Side LED	COM 1~8	PWM3
Board Side LED	COM 9~13	PWM2



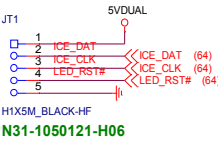
EXTERNAL POWER INPUT

External Power

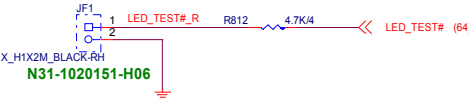
1 PCH HEATSINK LED

For MOS

JT1 for FW update

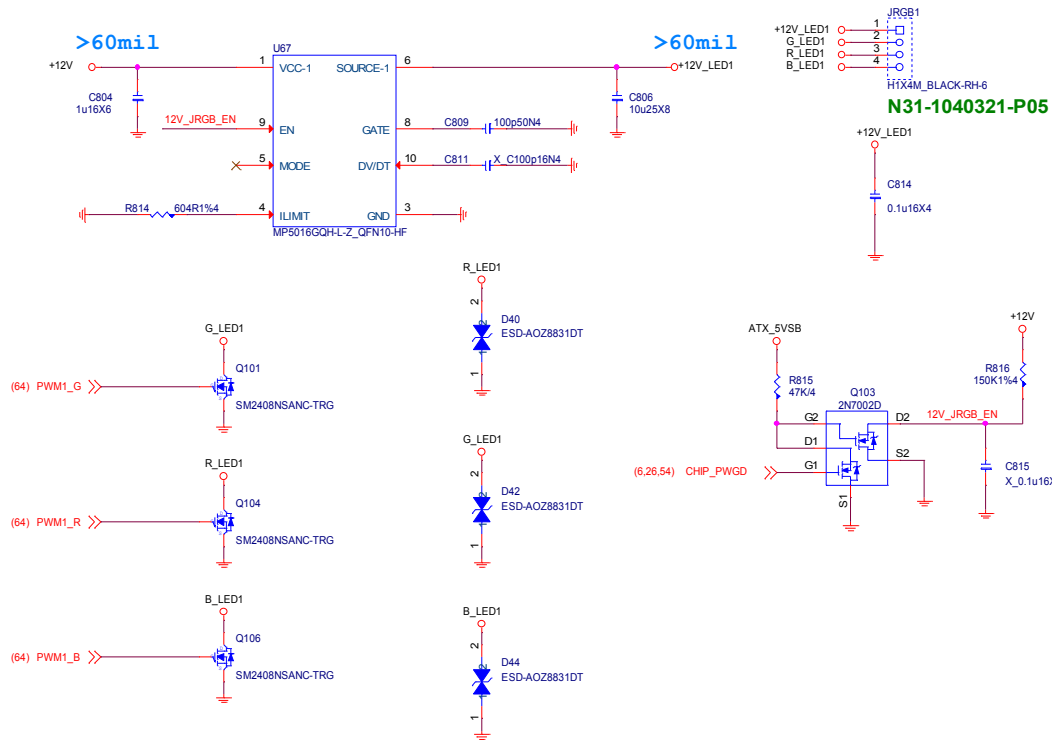


JF1 for Factory test



DeviceDB VIP + XinZhiZao 1 Year: www.device-db.xyz/dev/subscriptions/

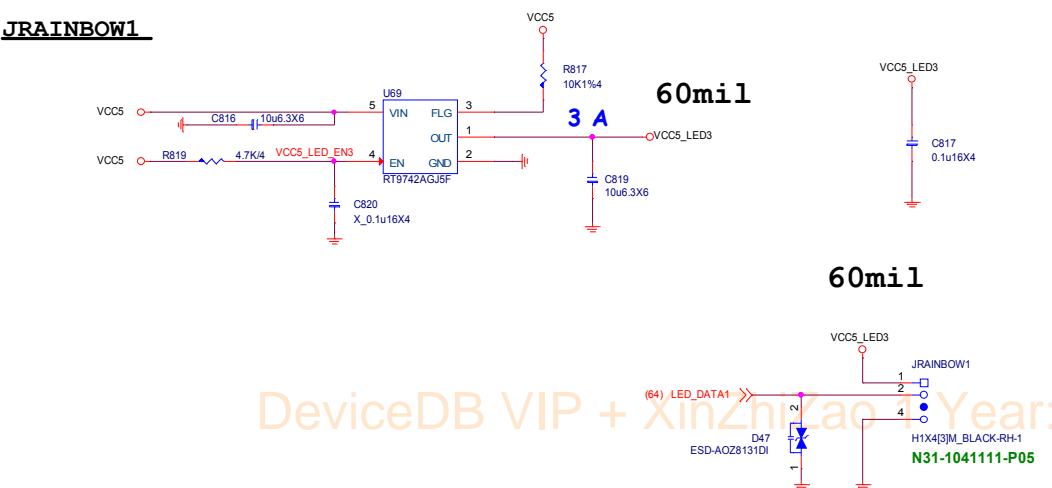
JRGB1



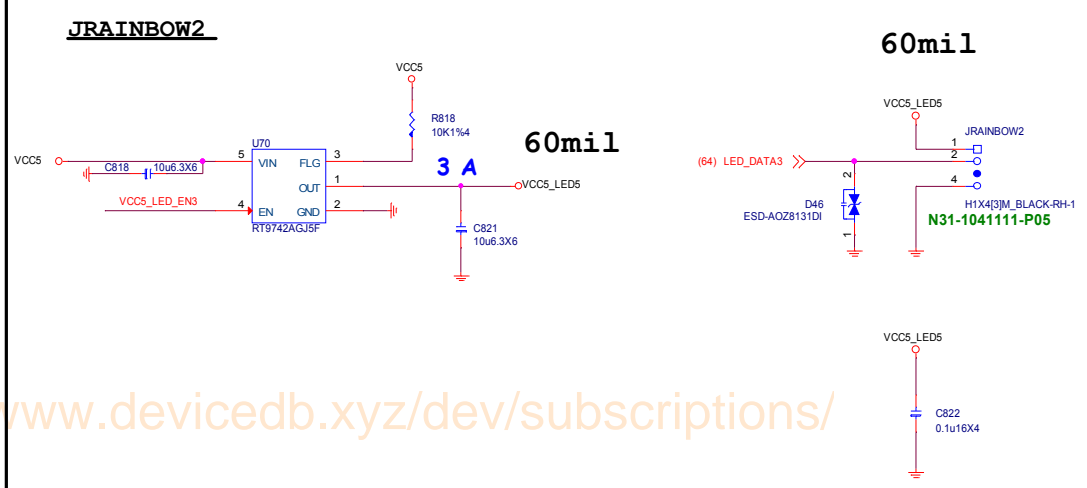
JRGB2



JRAINBOW1



JRAINBOW2

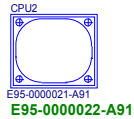


DeviceDB VIP + XinZhiAo 1 Year: www.device-db.xyz/dev/subscriptions/

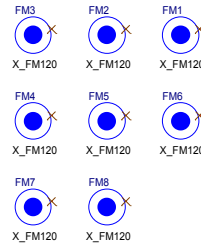
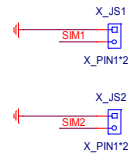
DeviceDB VIP + XinZhiZao 1 Year: www.devedb.xyz/dev/subscriptions/

DeviceDB VIP + XinZhiZao 1 Year: www.devedb.xyz/dev/subscriptions/

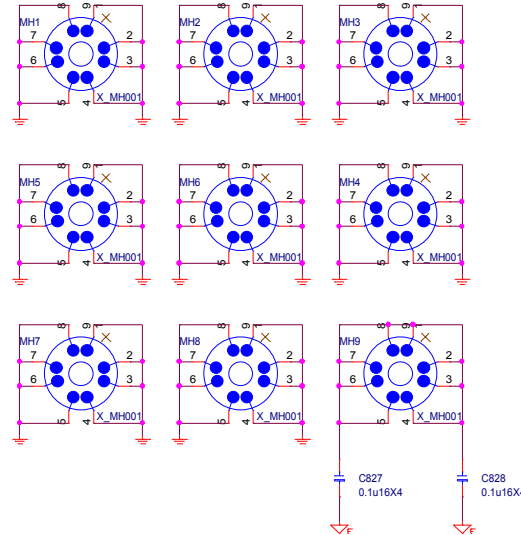
CPU Socket



Simulation



Optics Orientation Holes




MANUAL PART

AMI_LAB1
[REDACTED]
G51-M1SPXXA-A09
G51-M1SPXXA-A09

CFOS1 <MSI-BOM>
XXXXXXXXXX
 X_Y02-MU00170-CFO
Y02-MU00170-CFO

HDMI_LA1
Label
HDMI
HDMI LABEL
Y01-RHDMI03-000

MKT_LA1

X_MKT LABEL
G51-M1SPP78-Q13

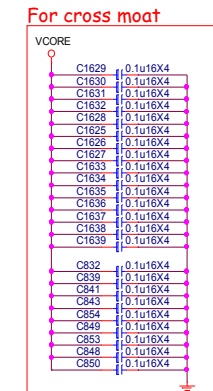
NAHIMIC_LA1

 X_NAHIMIC_LA1
 Y02-MU00100-NAH

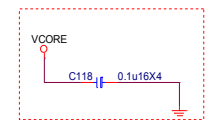


AVL:
D06-0100161-F52
D06-0100101-K26

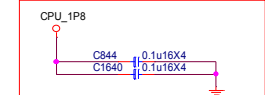
Moat CAP



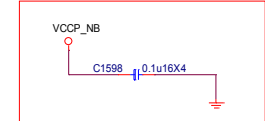
add for cross moat



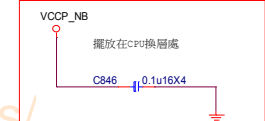
For cross moat



For SVID cross moat

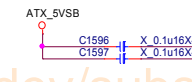


For cross moat

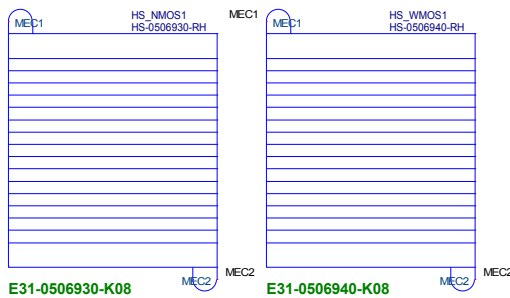


For cross moat

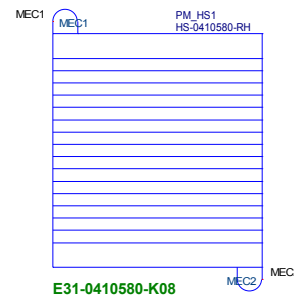
Reserve for bypass 12VIN noise use



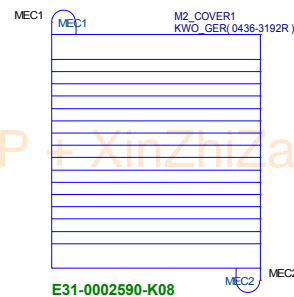
MOS HEATSINK



PCH HEATSINK



M2 HEATSINK



MICRO-STAR INT'L CO.,LTD

MS-7C56

Size Custom	Document Description Manual Parts	Rev 20
Date: Tuesday, May 12, 2020		Sheet 69 of 75