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MS-7B29

Intel -CoffeeLake-S plamform

CPU:
LGA1151
*CPU POWER PAK *4 Phase*
*GT POWER PAK *2 Phase*

Onboard Chip:
SIO: NCT5567D
HD Audio Codec: ALC887
LAN: RTL8111H
Flash ROM: SPI 128 MB
DP to VGA: RTD2166
CUT VBAT: SLG4B41231

Main Memory:
*DDR4 * 2 (Dual Channel)*

ACPI:
5VDAUL: uP7501
5VDIMM: uP7501
3VSB: GS7133+N MOS
1P8_VSB: GS7133
3VDSW: GS7116
VCCSTPLL: GS7133

Expansion Slots:
*PCI Express (X16) Slot * 1*
*PCI Express (X1) Slot * 2*

System Chipset:
Cannon Lake H310

PWM:
VCORE - RT3607
DDR - RT8231
DDR VPP25 - MP2143
PCH(1.05V) - RT8125E
VCCSA - NB685
VCCIO - SY8288

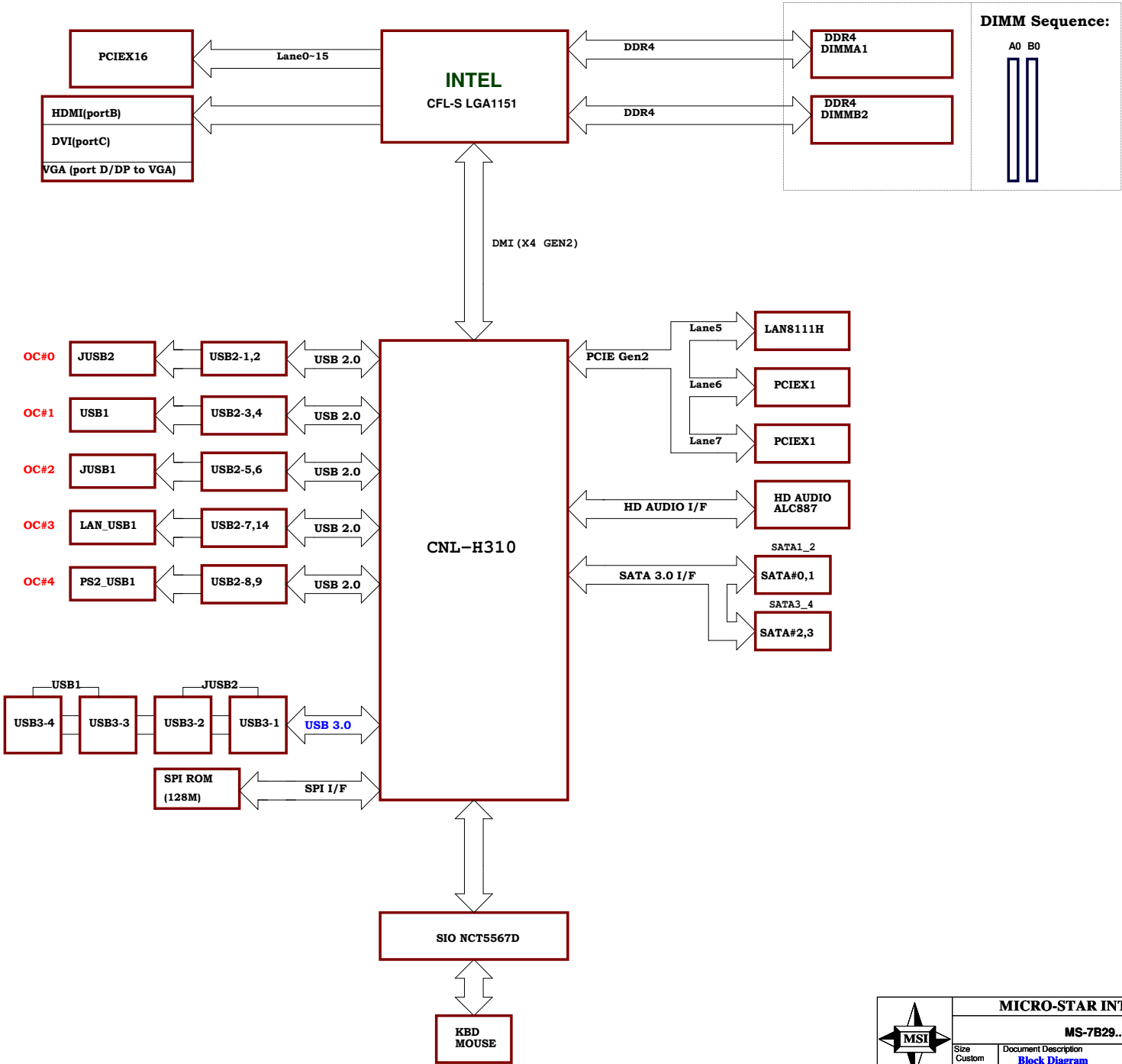


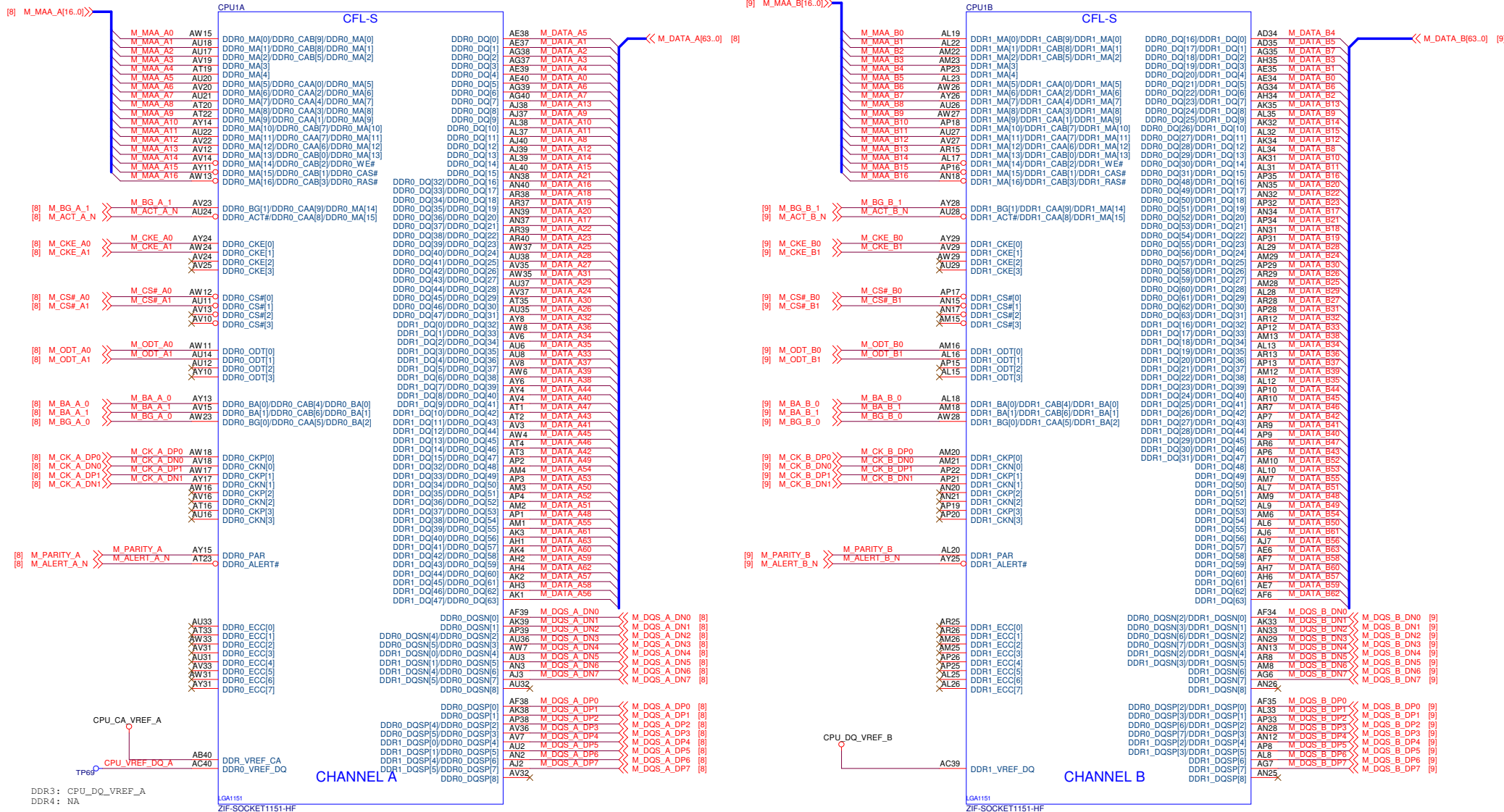
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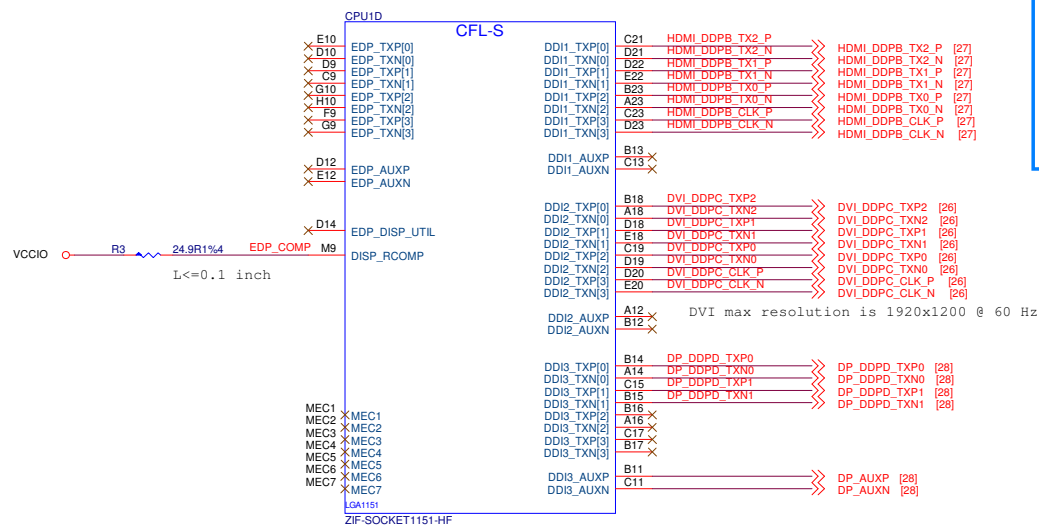
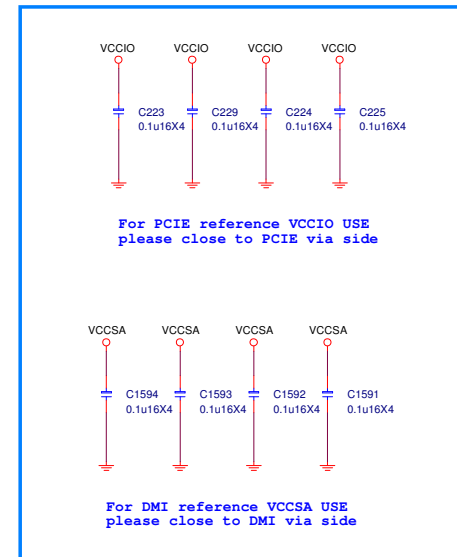
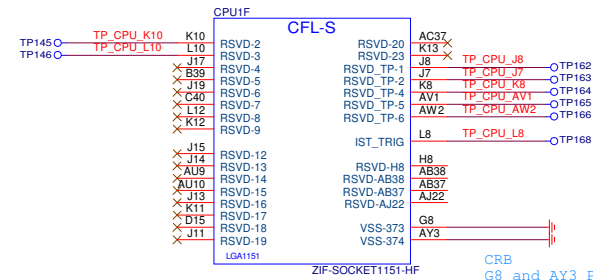
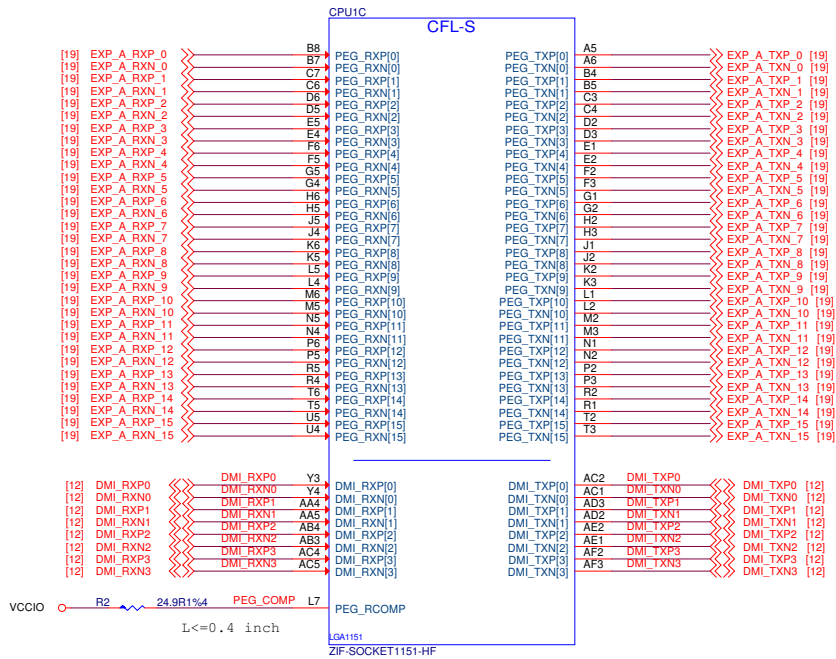
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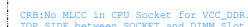
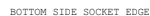
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MS-7B33 Block Diagram



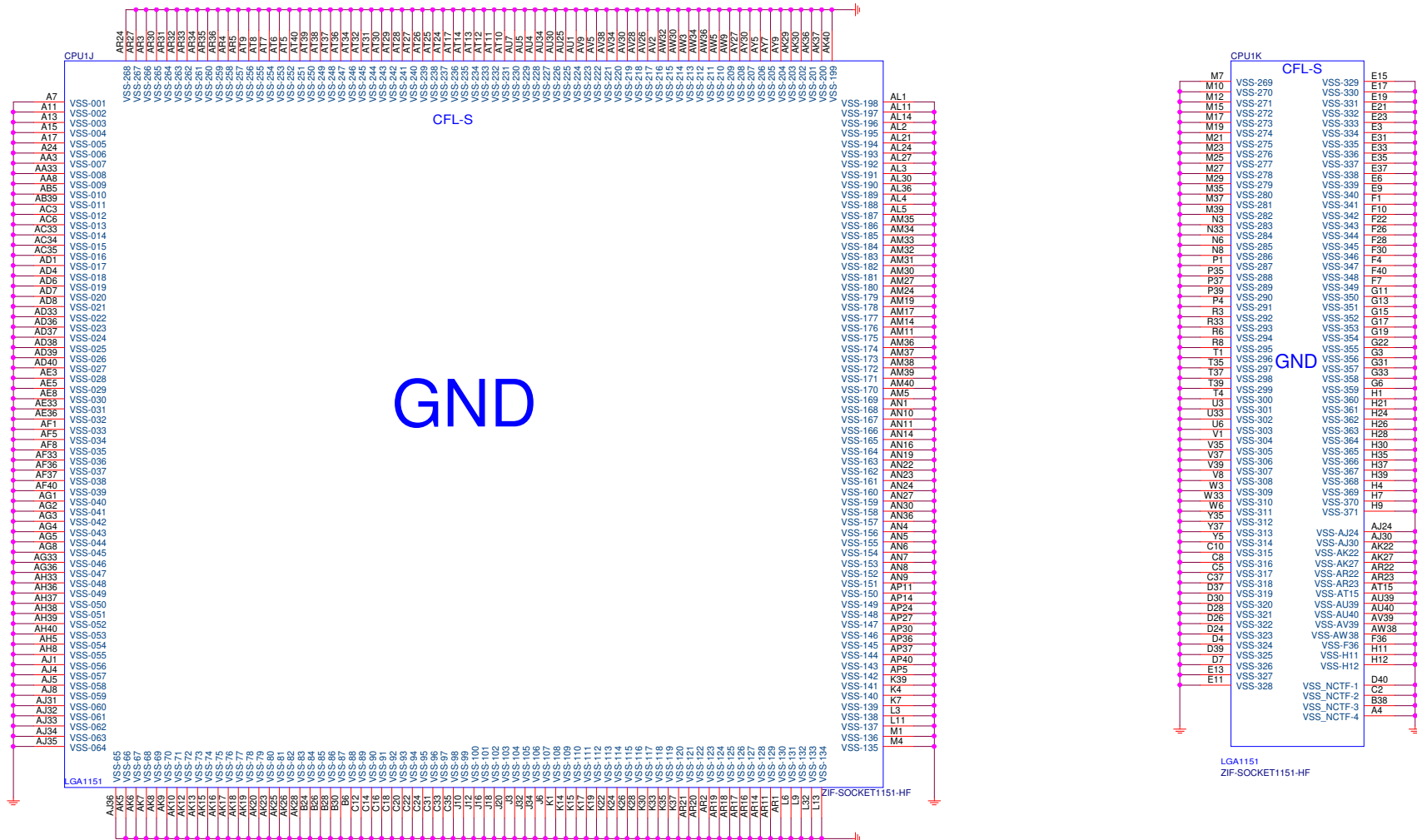


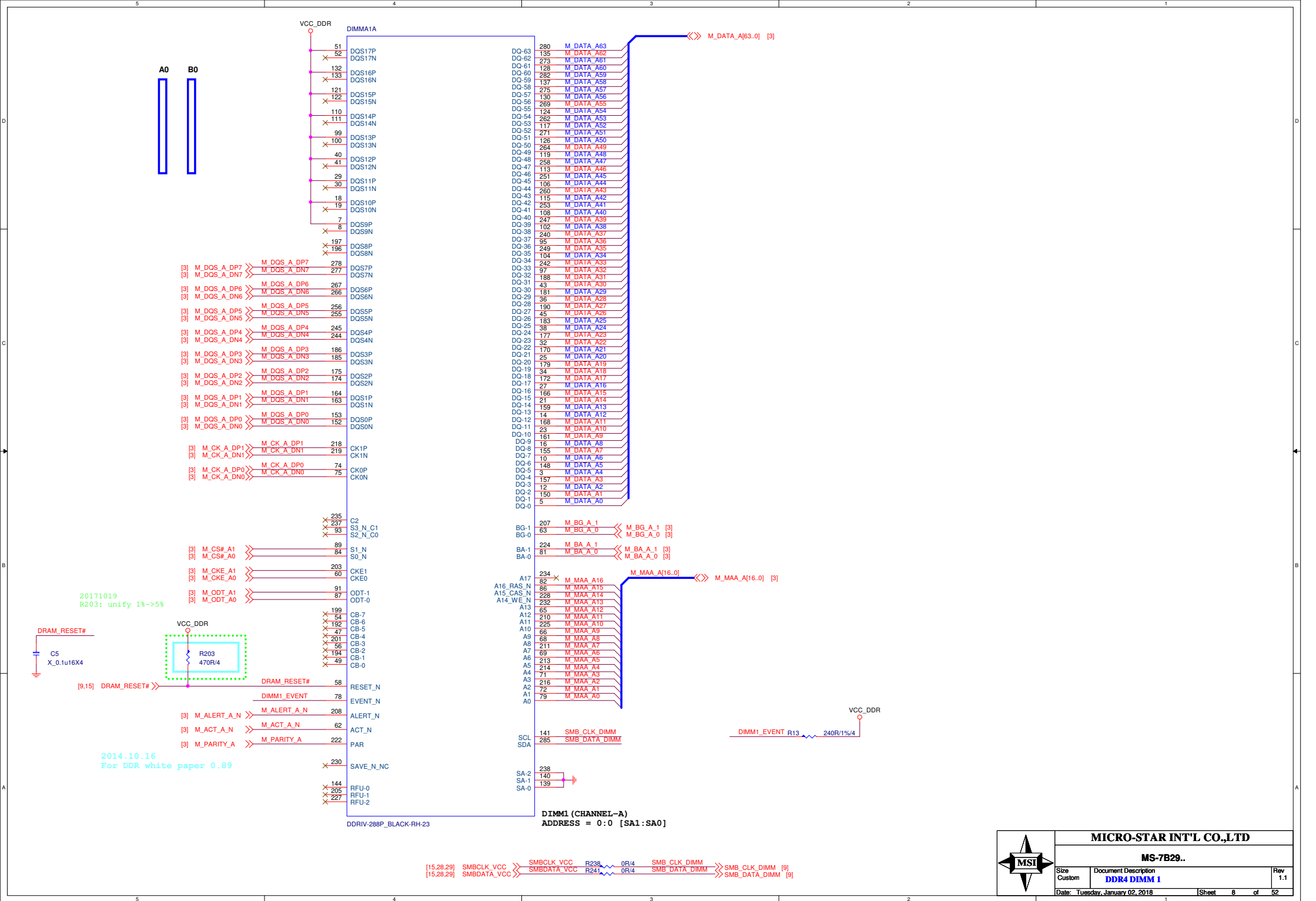


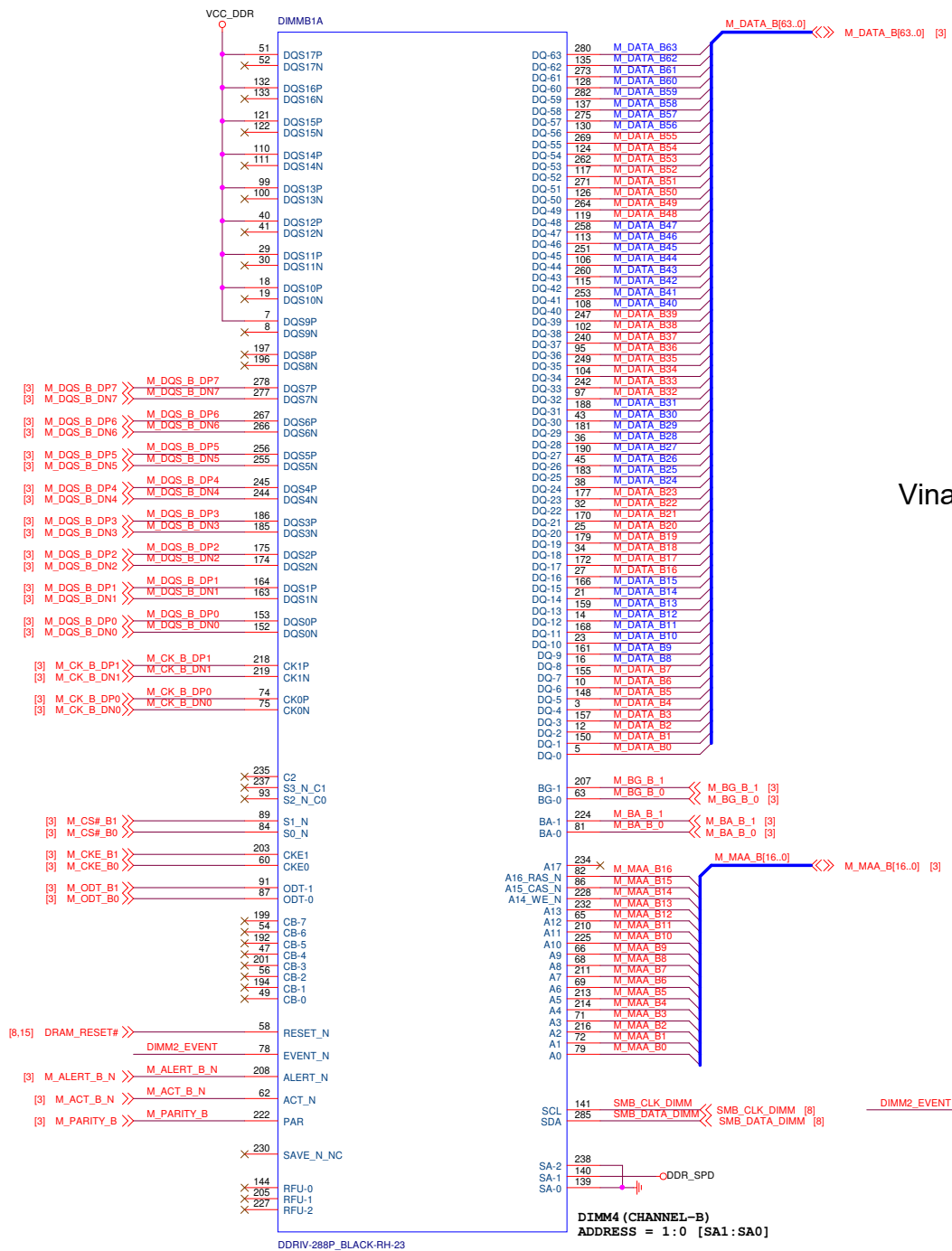


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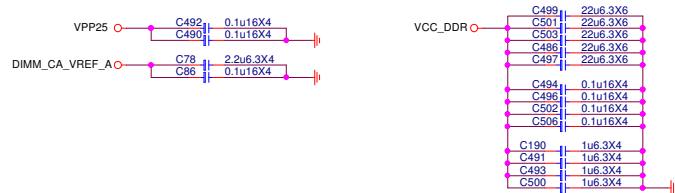
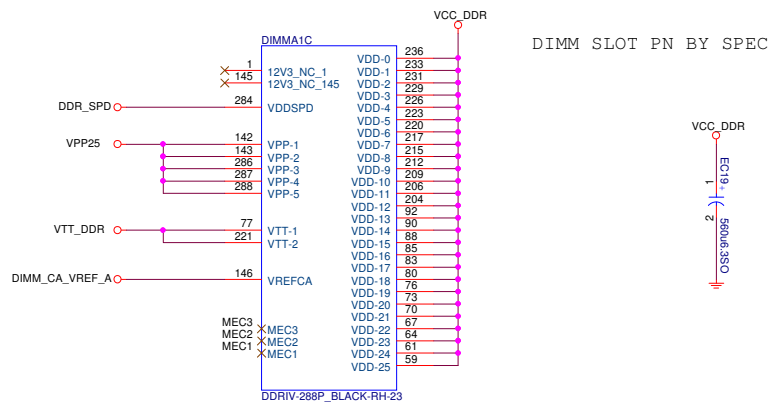




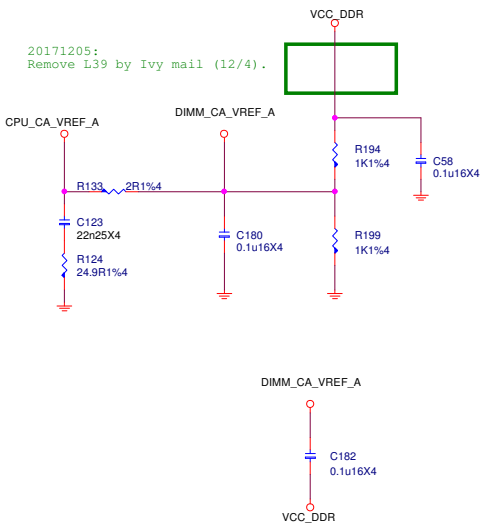
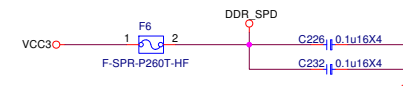
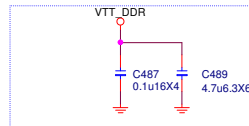
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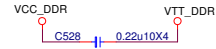
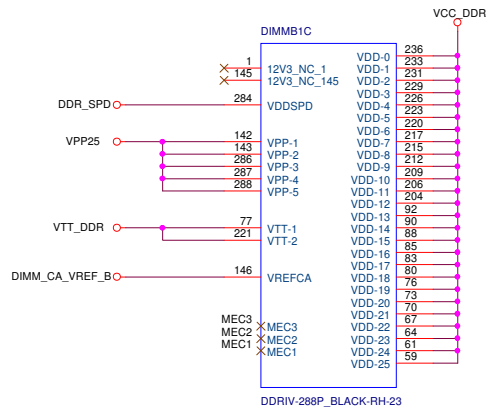


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Size Custom	Document Description DDR4 DIMM 2	Rev 1.1
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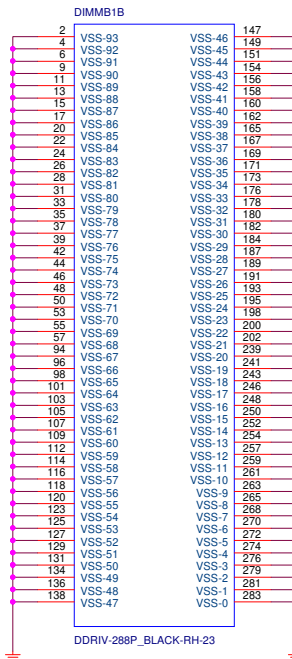
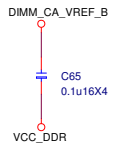
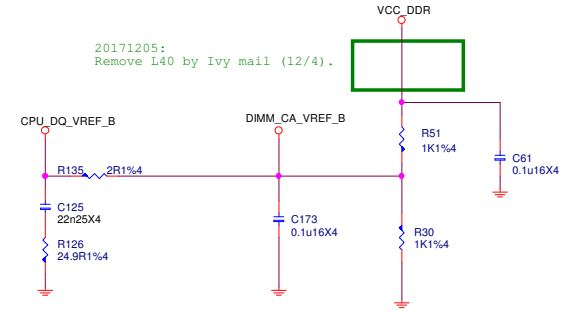
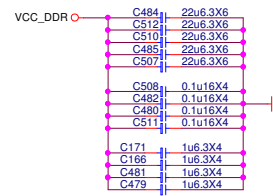
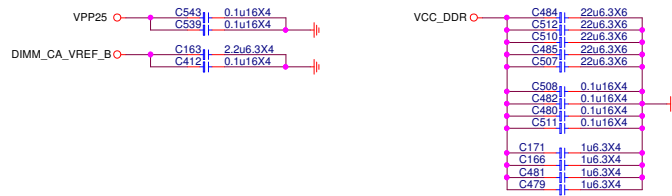


0.1uFx1 per dimm

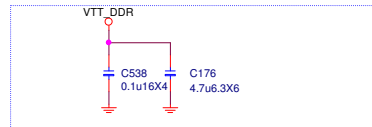




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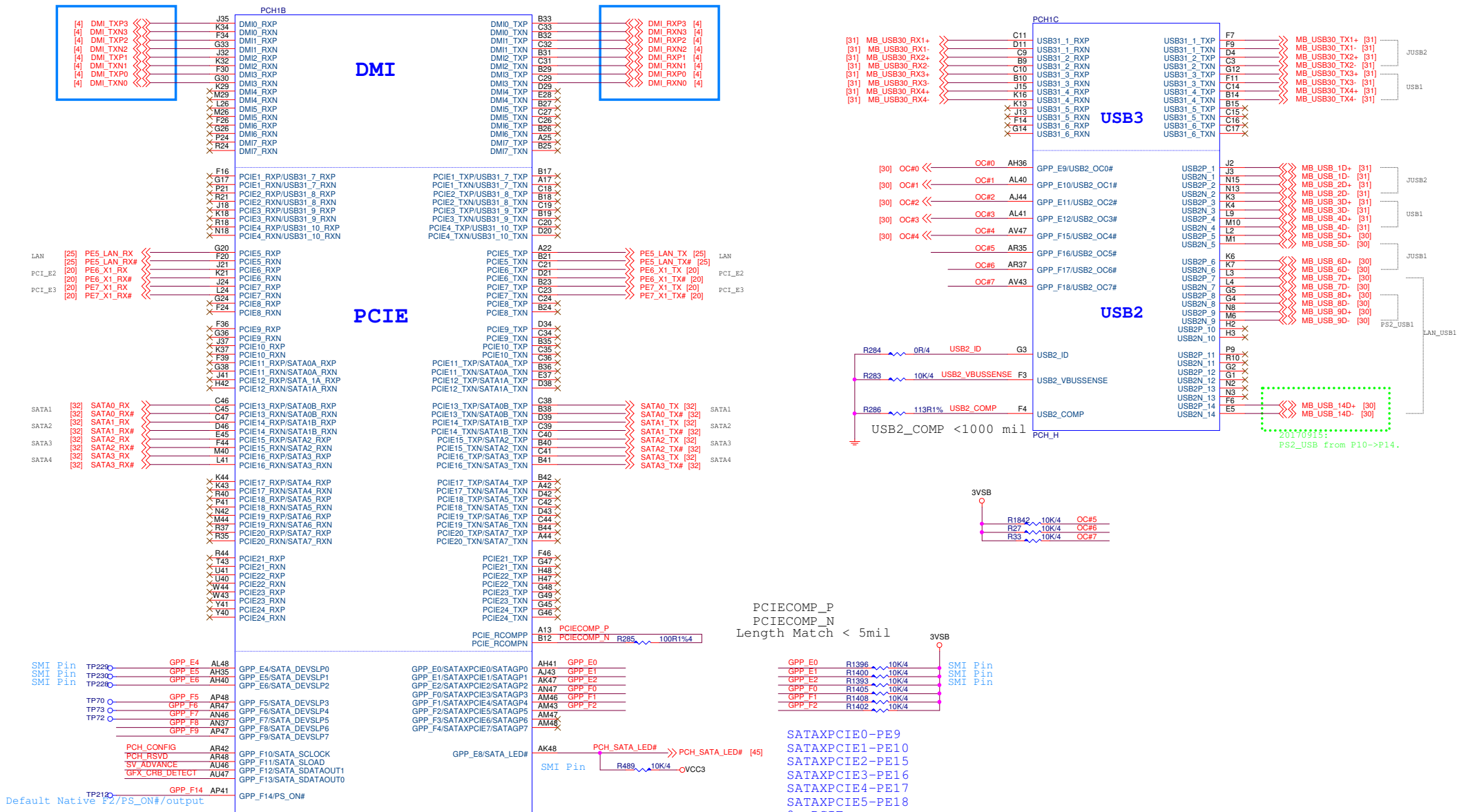


0.1uFxl per dimm



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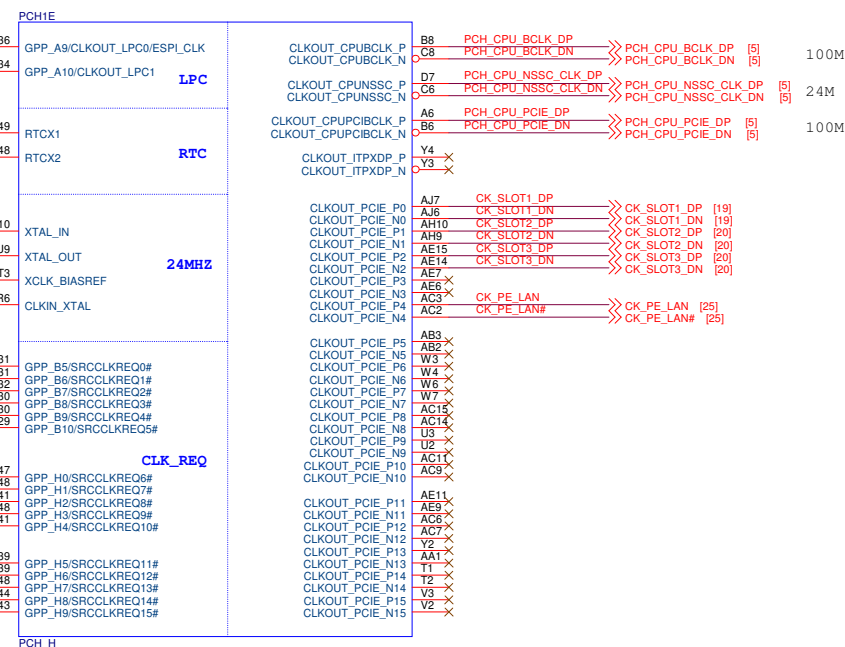
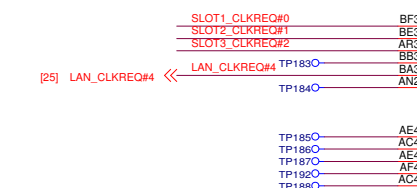
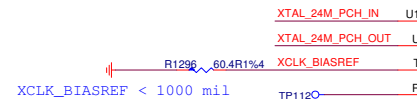
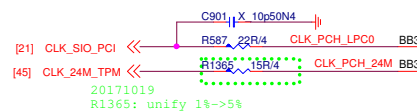
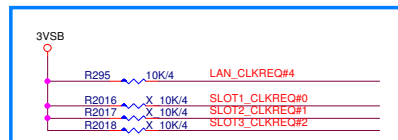
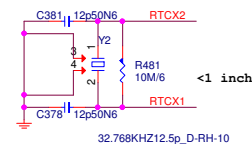
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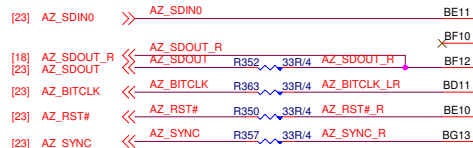
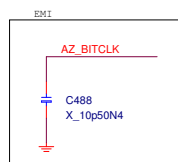
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Close to PCH

Close to PCH

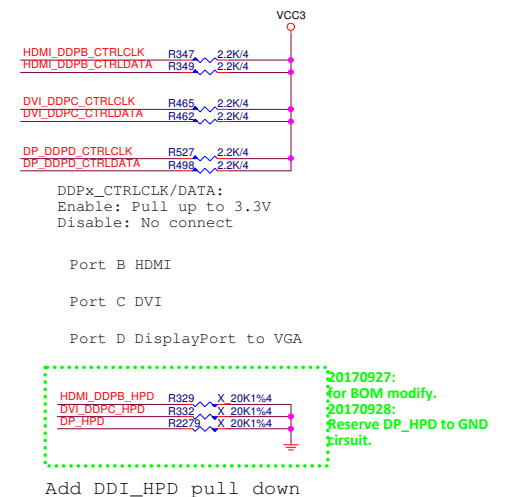
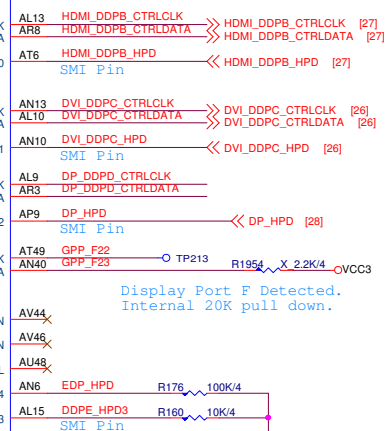
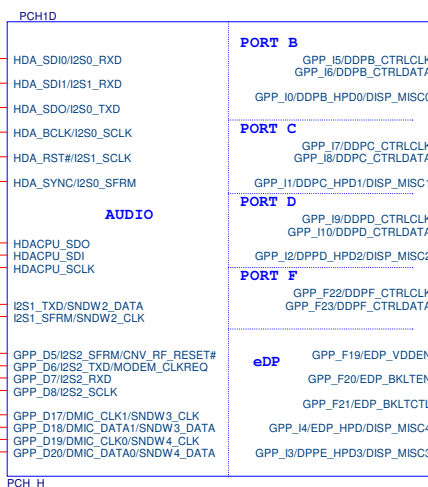


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Default Native F3/CNV RF R ESET#.

Default Native F3/MODEM_CLKREQ.

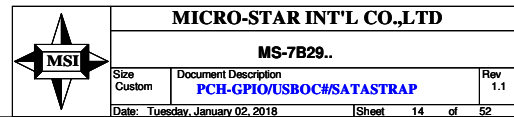
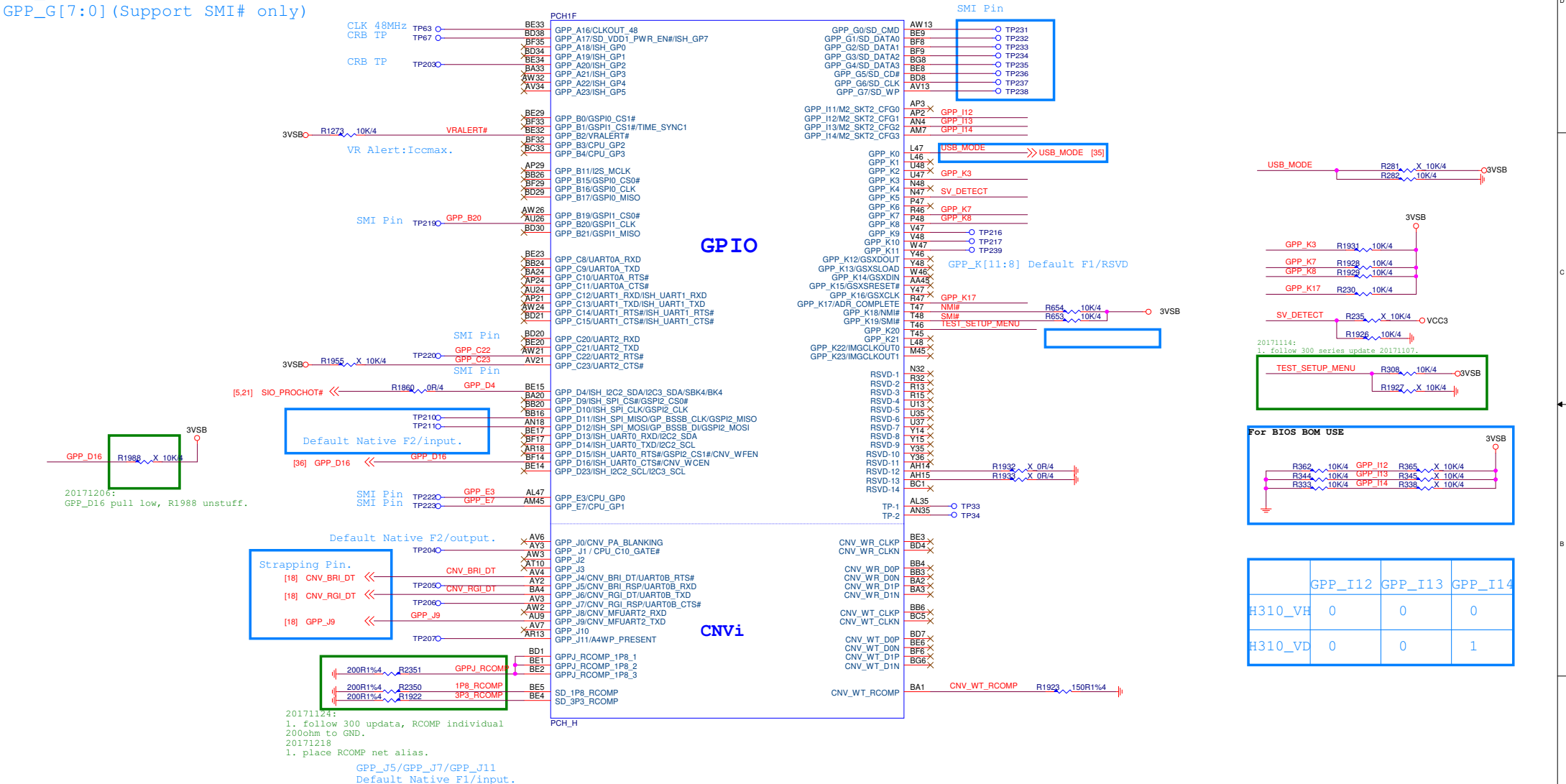


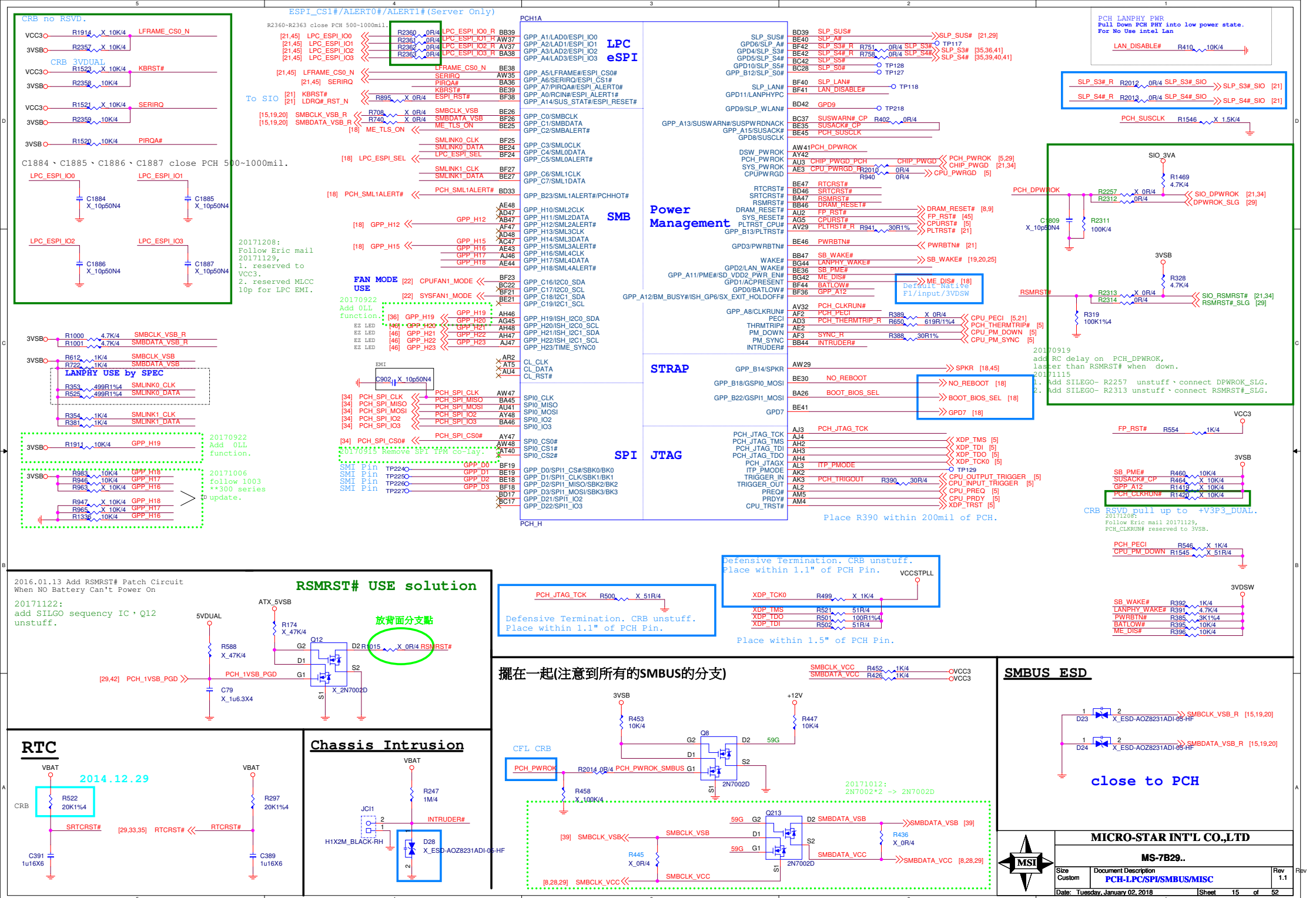
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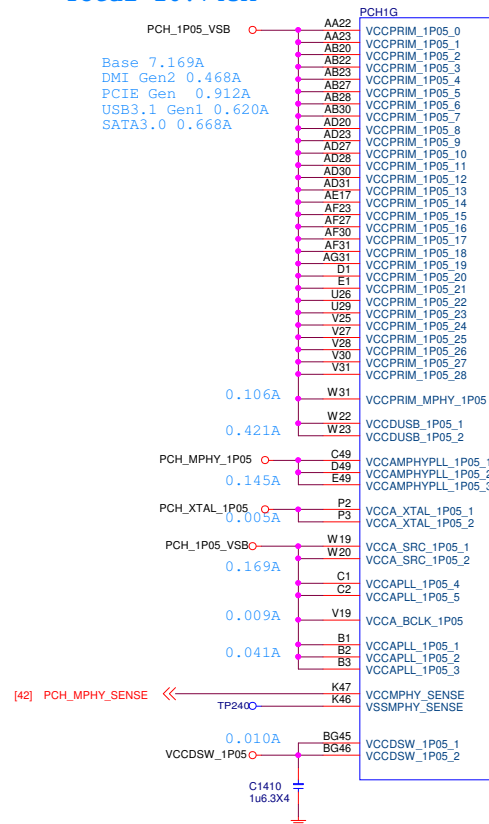
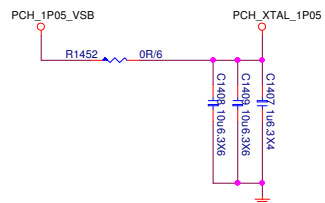
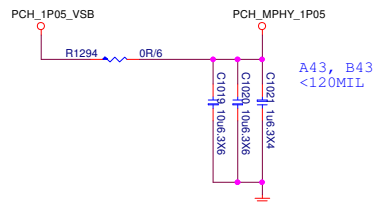
GPP_G[7:0] (Support SMI# only)



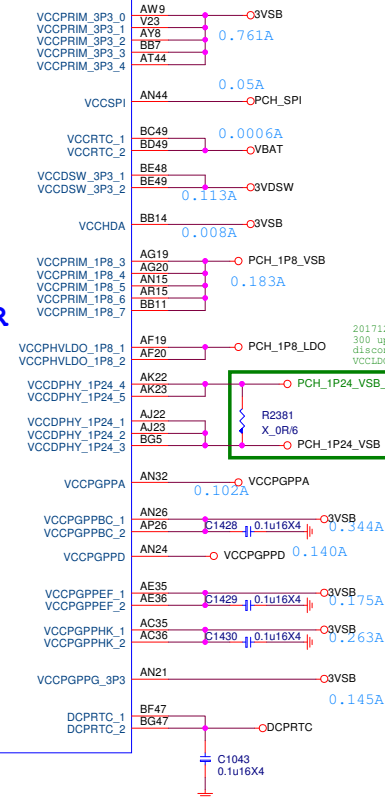


PCH_1P05_VSB
Total 10.743A

```
Base 7.169A
DMI Gen2 0.468A
PCIE Gen 0.912A
USB3.1 Gen1 0.620A
SATA3.0 0.668A
```

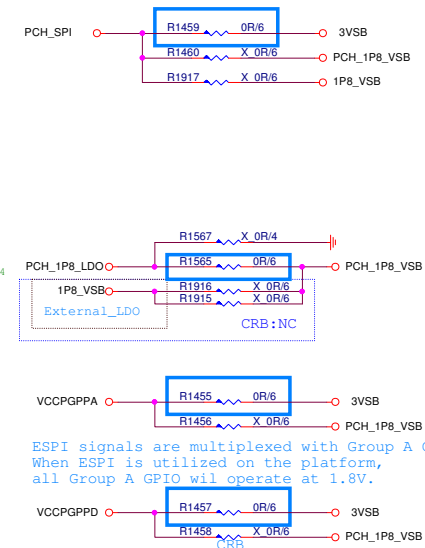


POWER

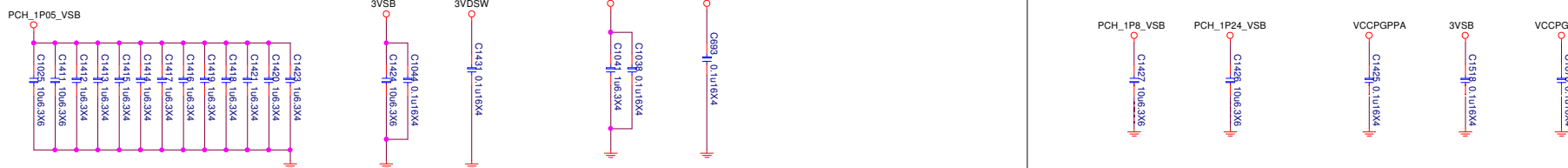


3VSB
Total 1.988A

PCH_1P8_VSB
Total 0.483A



ESPI signals are multiplexed with Group A GPIOs. When ESPI is utilized on the platform, all Group A GPIO will operate at 1.8V.



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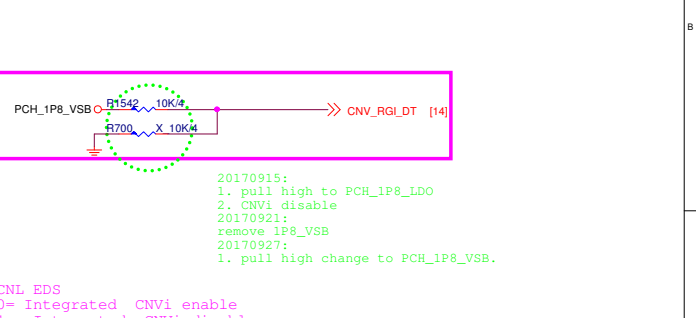
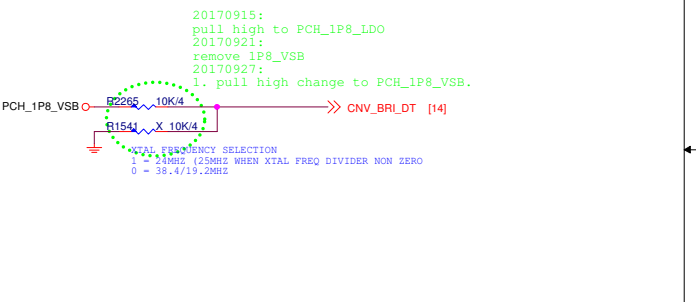
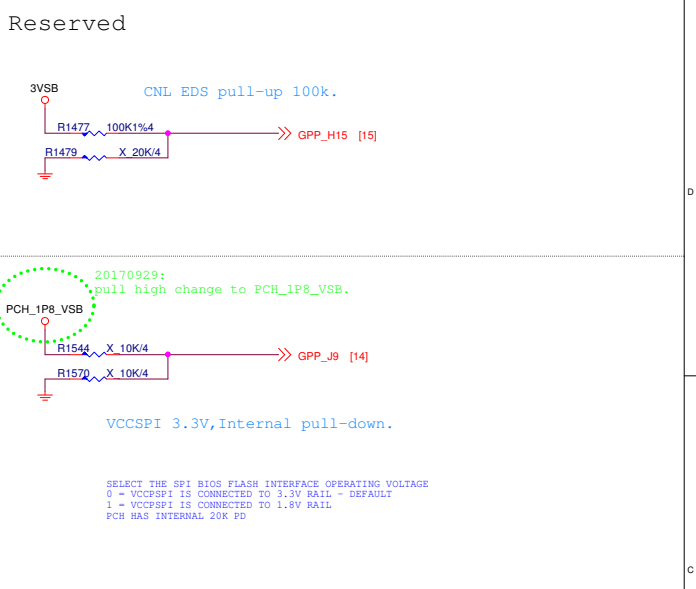
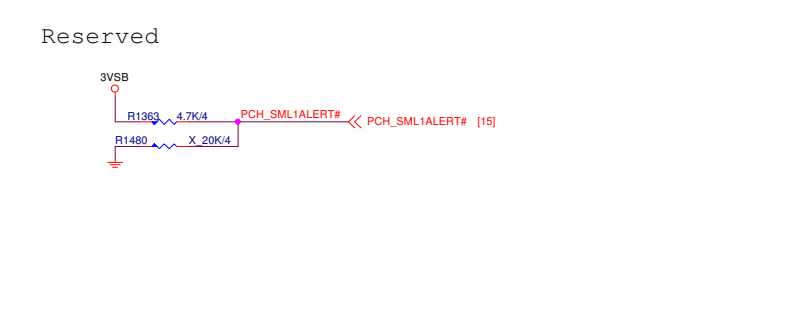
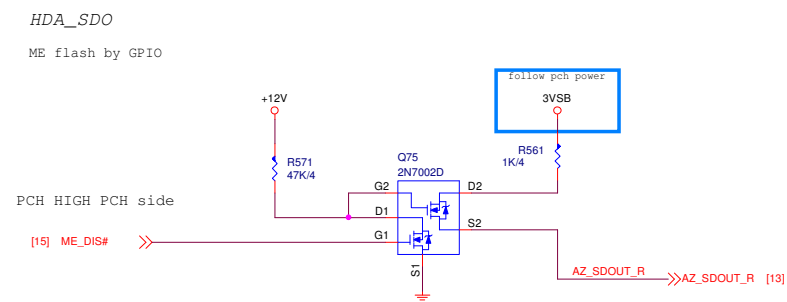
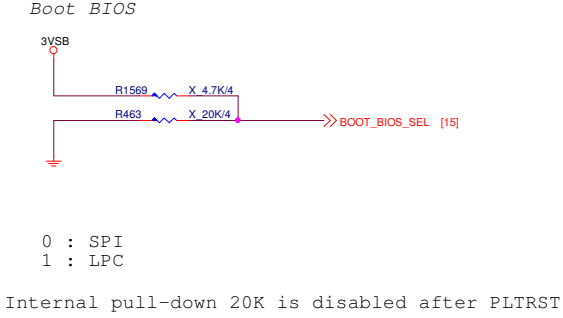
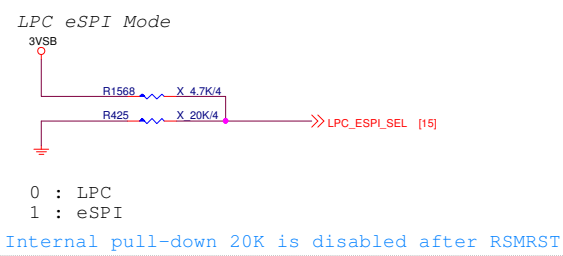
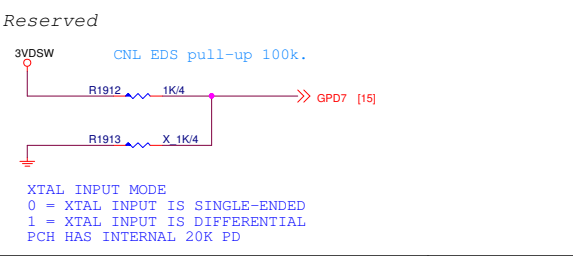
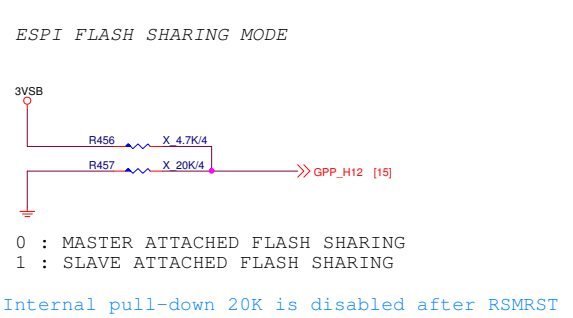
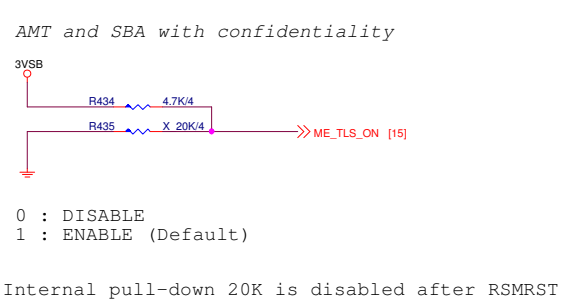
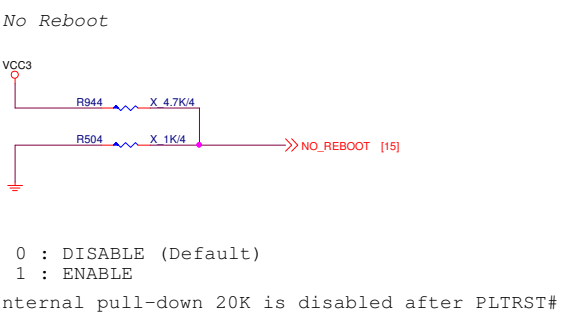
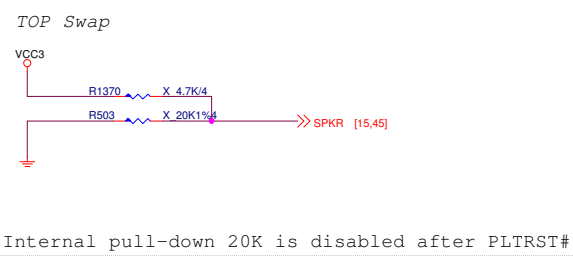
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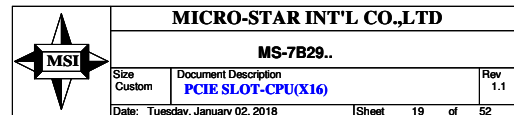


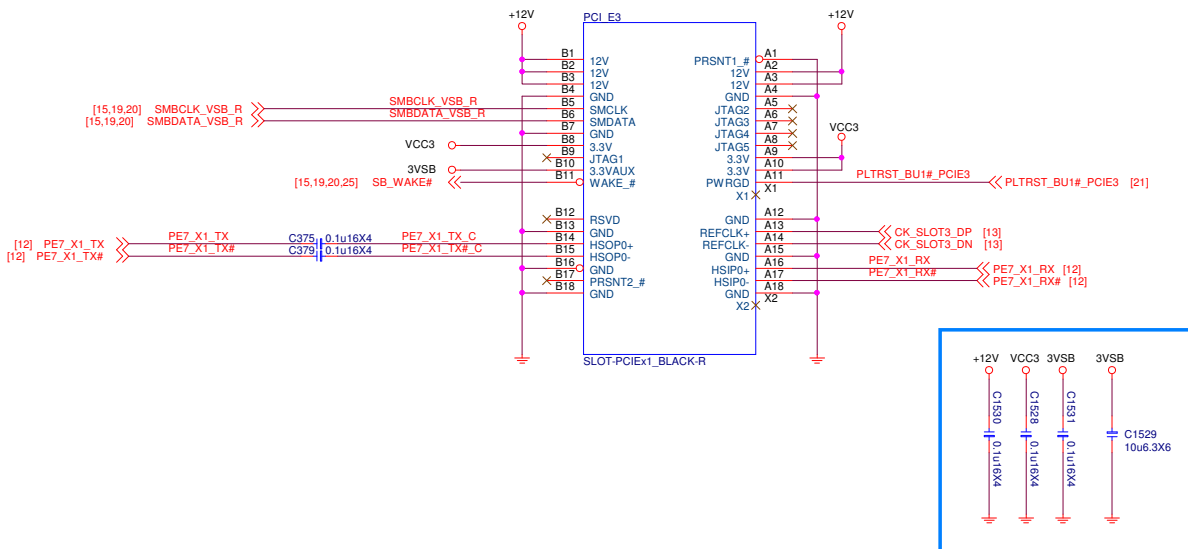
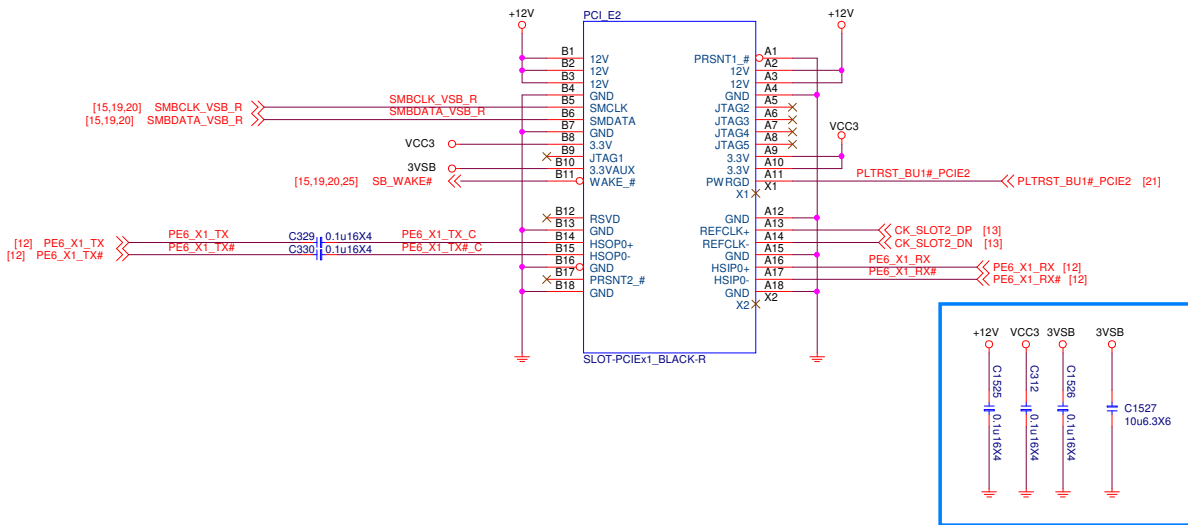
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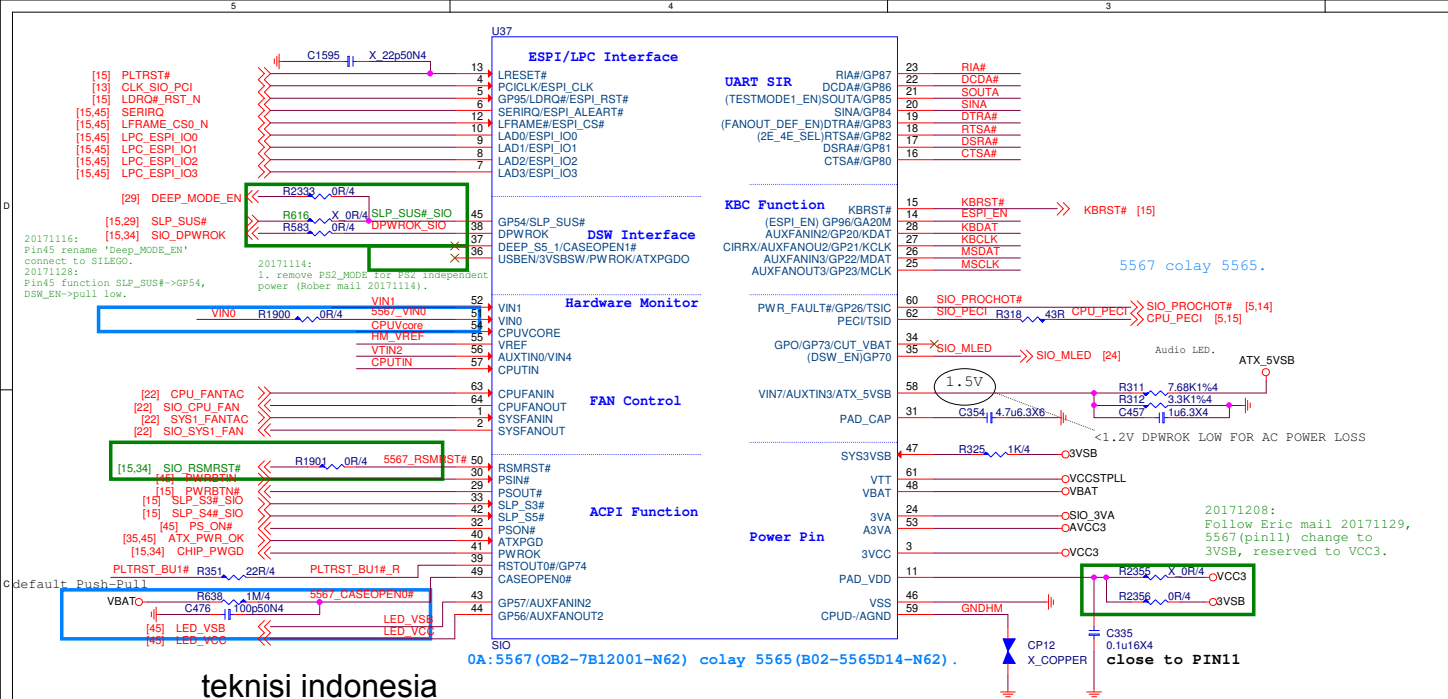
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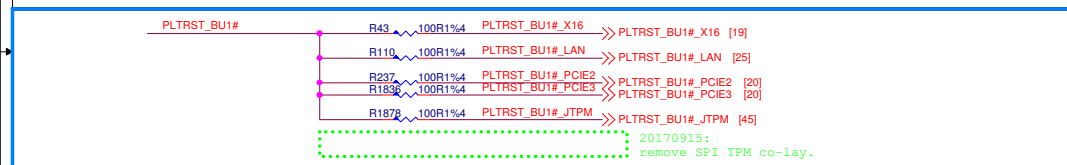




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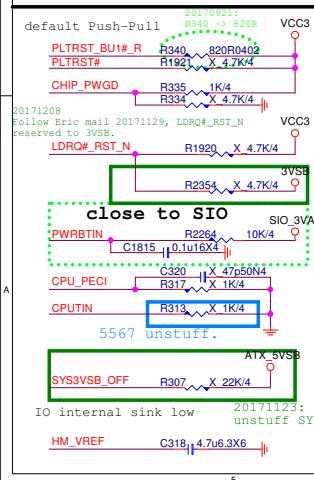
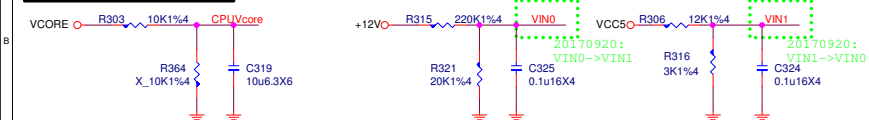


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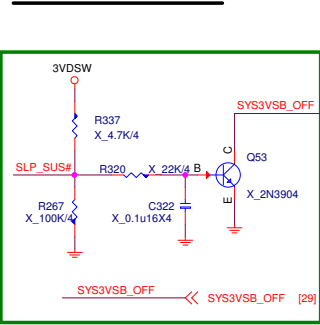


5567 colay 5565.

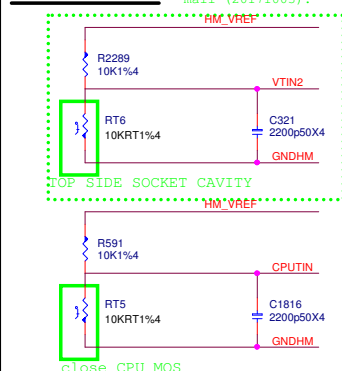
HW Monitor - Voltage



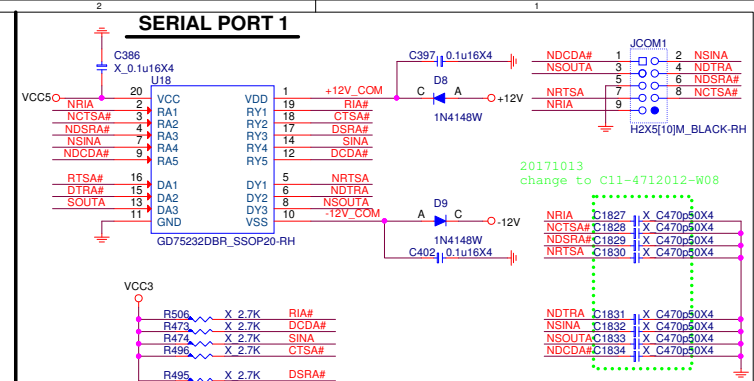
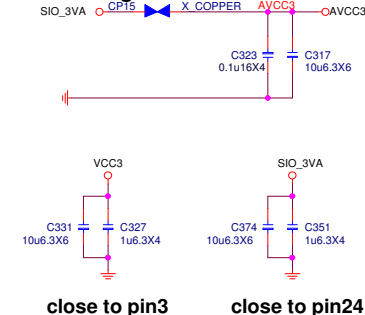
5565D DSW SUPPORT



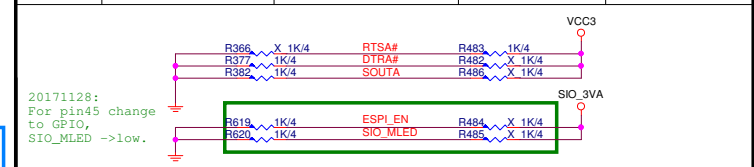
Thermal Monitor



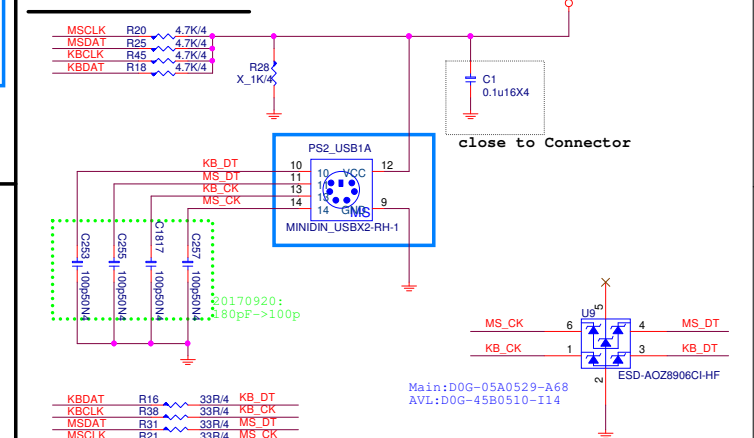
3V Analog Power



PIN	5567D NAME	Circuit NAME	0	1
18	2E_4E_SEL	RTSA#	I/O ADDRESS 2E	I/O ADDRESS 4E
19	FANOUT_DEF_EN	DTRA#	CPU FANOUT default RPM 50%	CPU FANOUT default RPM 100%
21	TESTMODE1_EN	SOUTA	DISABLE TESTMODE	ENABLE TESTMODE
14	ESPI_EN	GA20M	ENABLE LPC	ENABLE ESPI
35	DSW_EN	DSW_EN	DISABLE	ENABLE DSW_EN



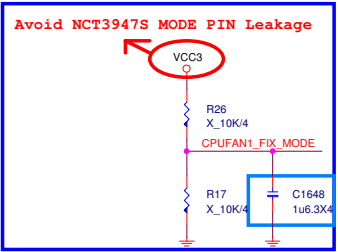
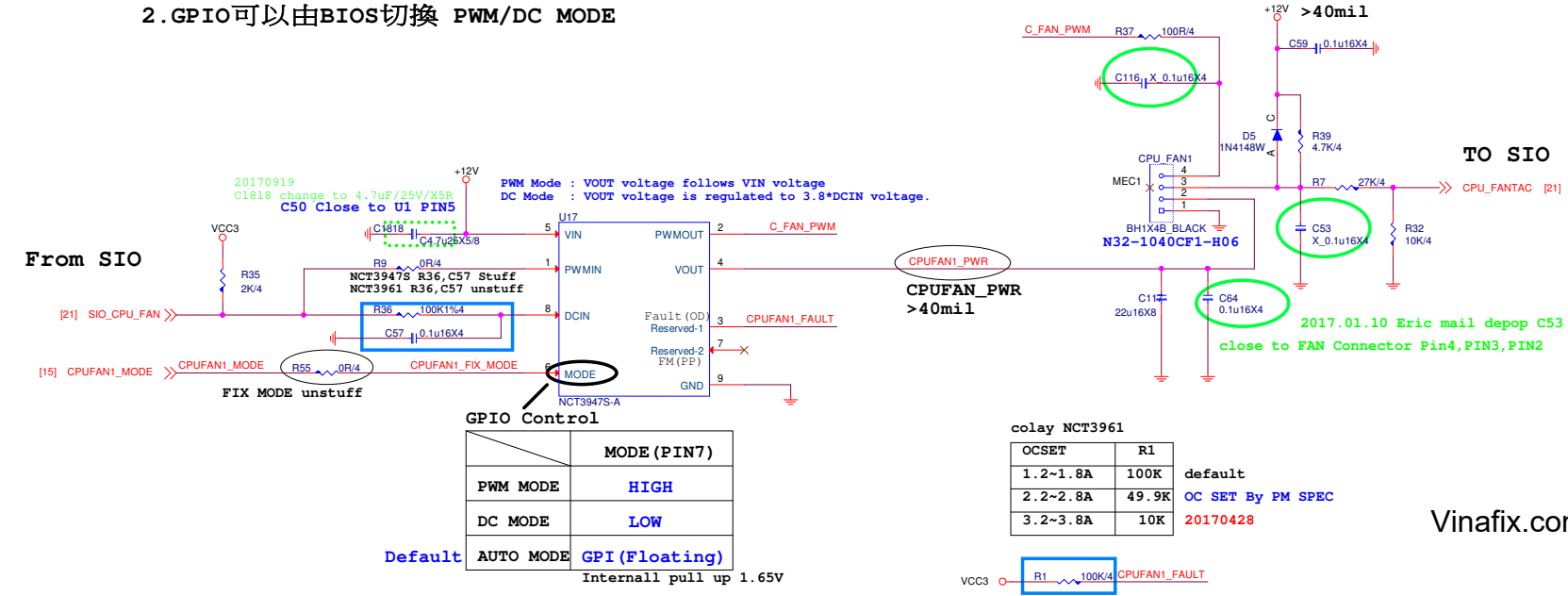
PS2 Connector



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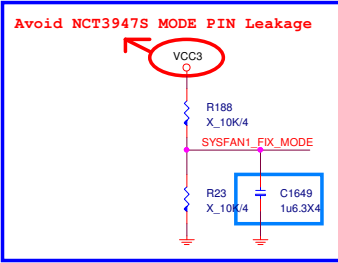
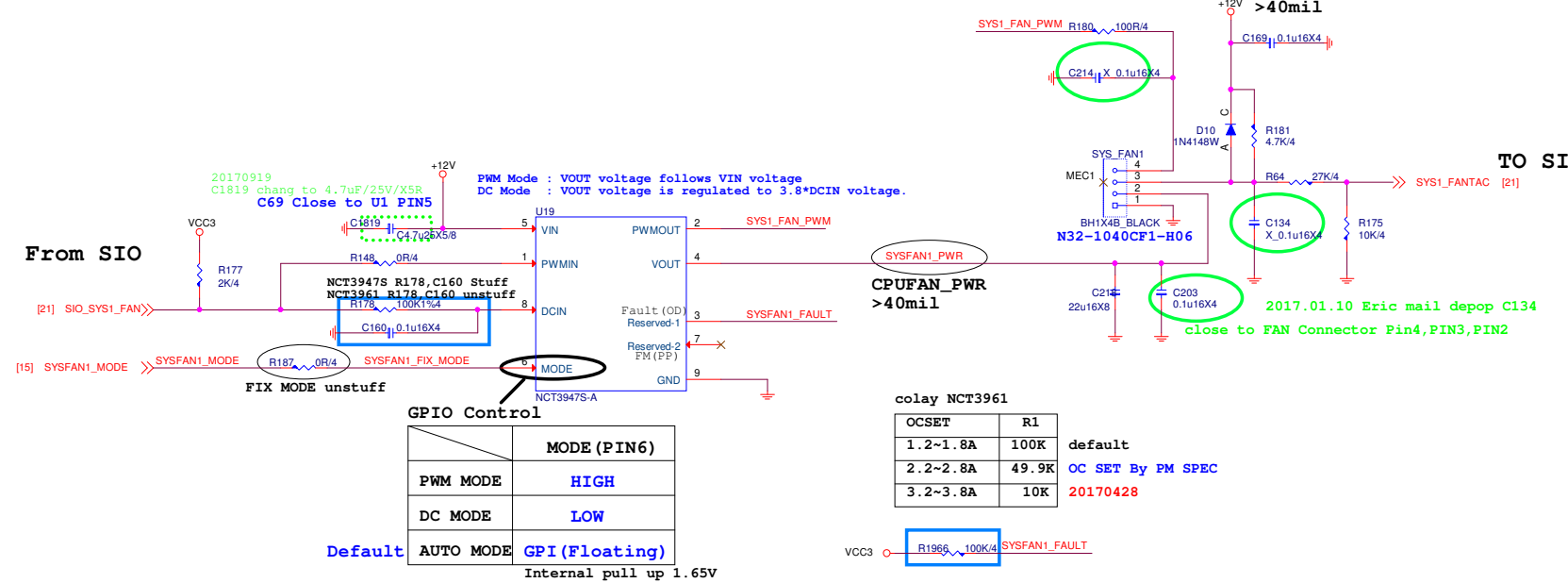
TYPE K : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE

2.GPIO可以由BIOS切换 PWM/DC MODE



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

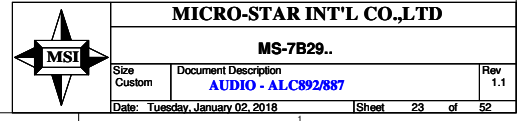
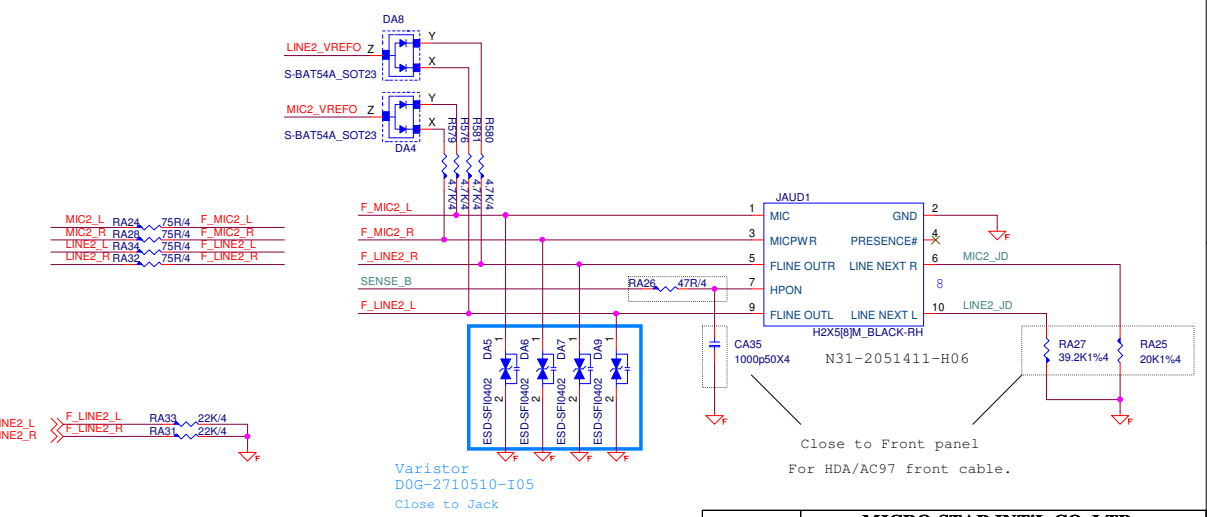
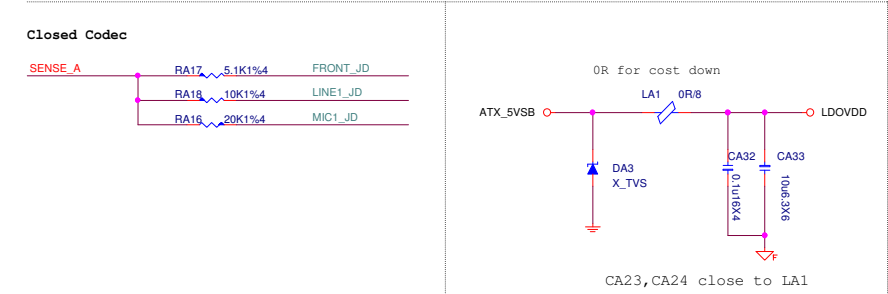
2.GPIO可以由BIOS切换 PWM/DC MODE



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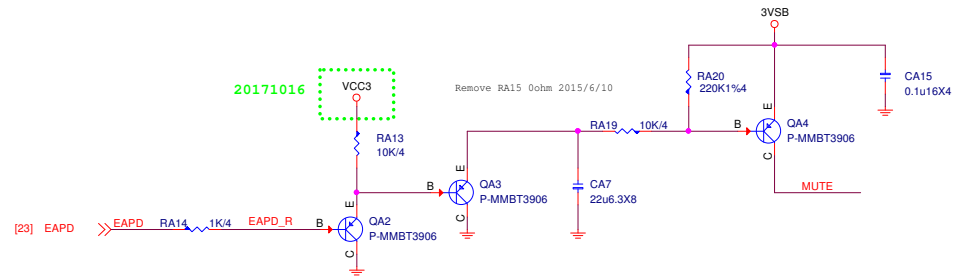
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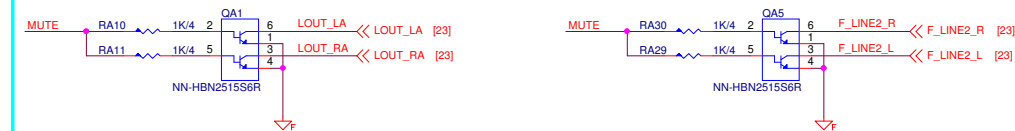
Rear Line OUT De-POP circuit

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



Digital

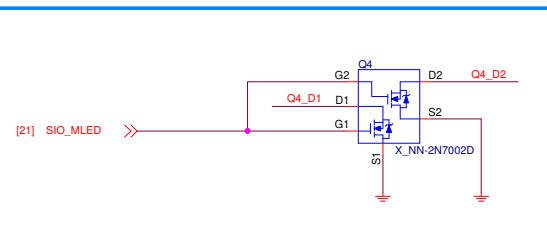
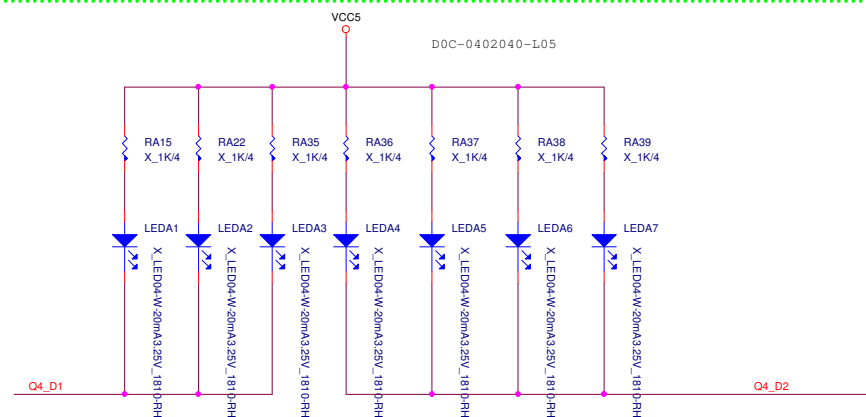
Analog



Vinafix.com

Audio LED

20170915:
Cancel Audio LED



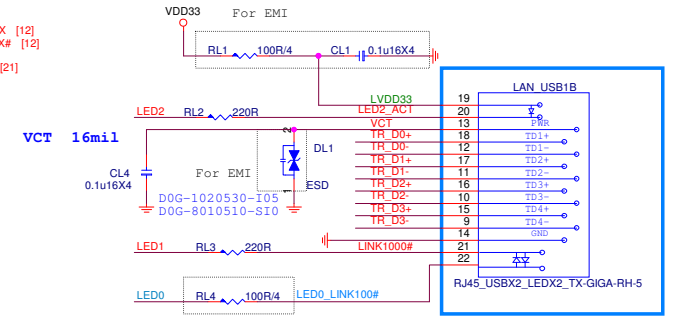
2016.01.12:Modify Q4 to Dual 7002 & Remove OR

RTL8111G/RTL8111H Giga LAN

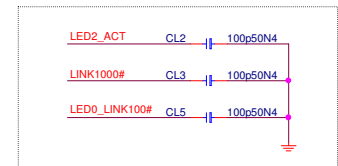
8111H:B06-08111CC-R09
8111G:B06-081116C-R09

LAN_CLKREQ#4_R R1014 0R/4 >>> LAN_CLKREQ#4 [13]

LAN Connector

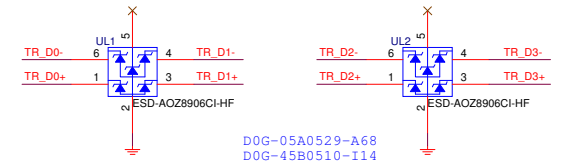


For EMI



ESD Protect

UL1 & UL2 close to connector



8111G POWER Consumption

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

8111H POWER Consumption

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

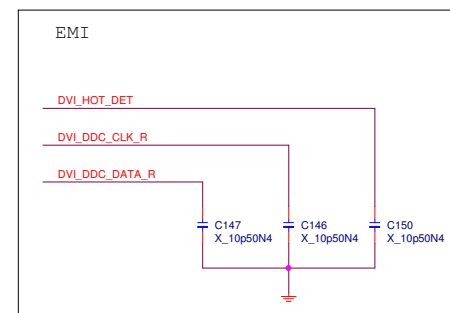
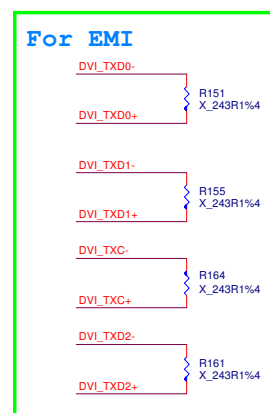
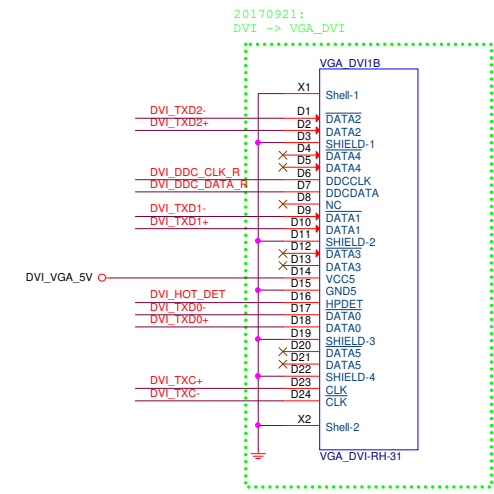


MICRO-STAR INT'L CO.,LTD

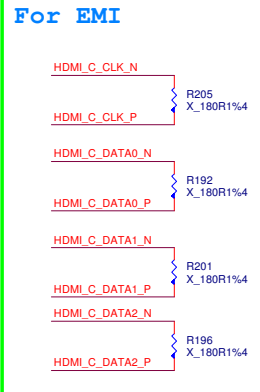
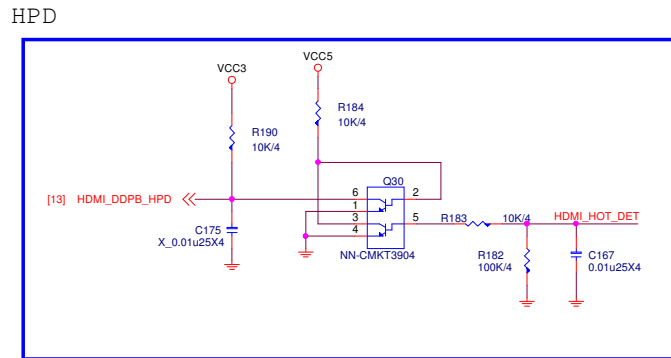
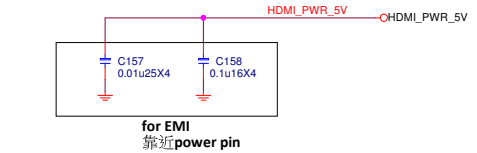
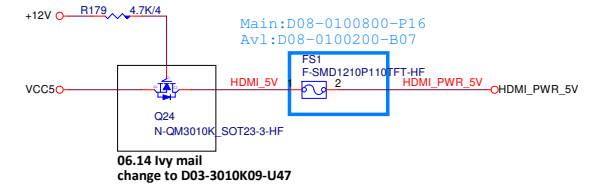
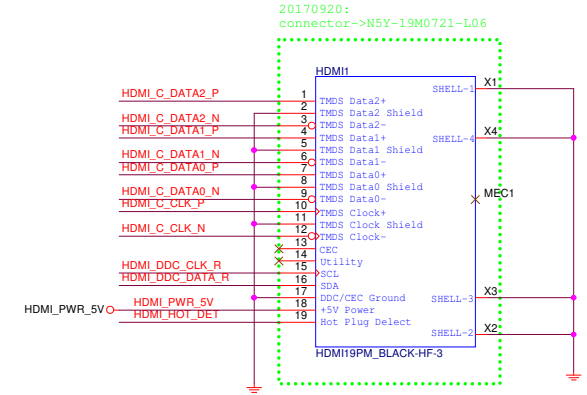
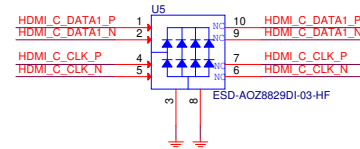
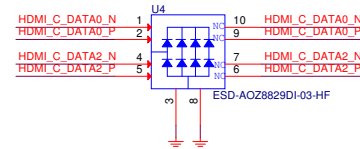
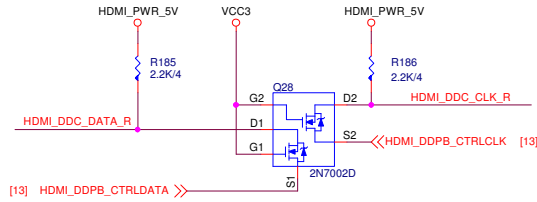
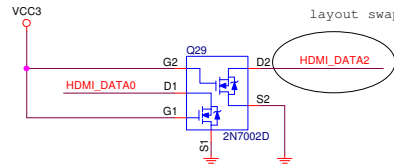
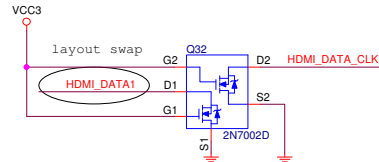
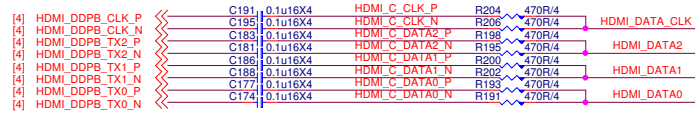
MS-7B29..

Size	Document Description	Rev
Custom	LAN - RTL8111H	1.1
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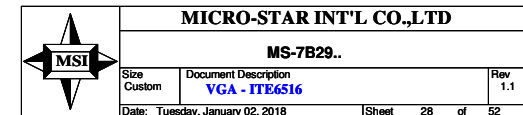
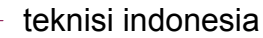
VGA: resolution of 2048x1536 pixels with 32-bit color at 75 Hz (4:3 QXGA)



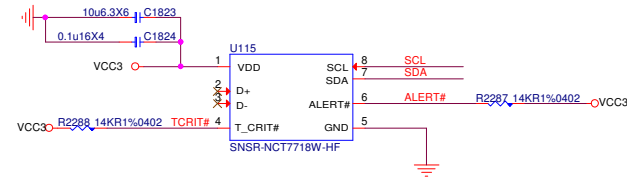
HDMI, DVI : 1920x1200 at 60 Hz (16:10 WUXGA)



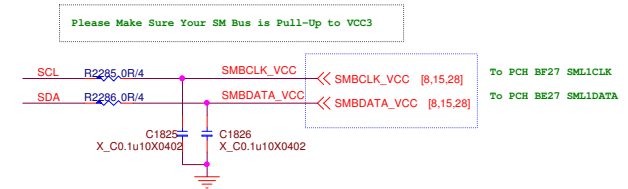
If connect to eDP port,must confirm whether it support hot plug detection HPD and re-auxtraining

RTD2166

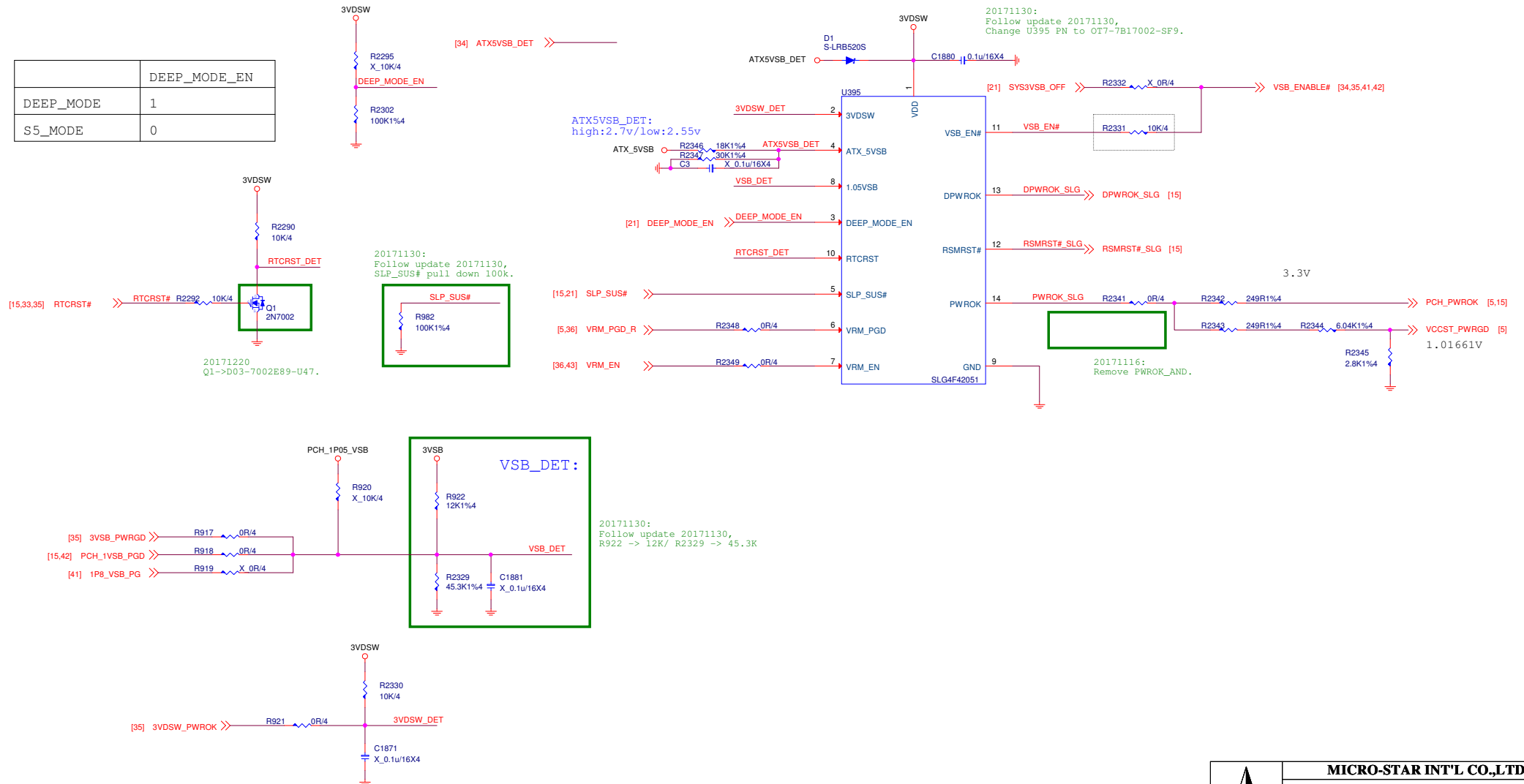
TEMPERATURE (°C)		T_CRIT#				
		2KΩ	7.5KΩ	10.5KΩ	14KΩ	18.7KΩ
ALERT#	2KΩ	77	87	97	107	117
	7.5KΩ	79	89	99	109	119
	10.5KΩ	81	91	101	111	121
	14KΩ	83	93	103	113	123
	18.7KΩ	85	95	105	115	125



Default: ALERT# Output Comparator Mode

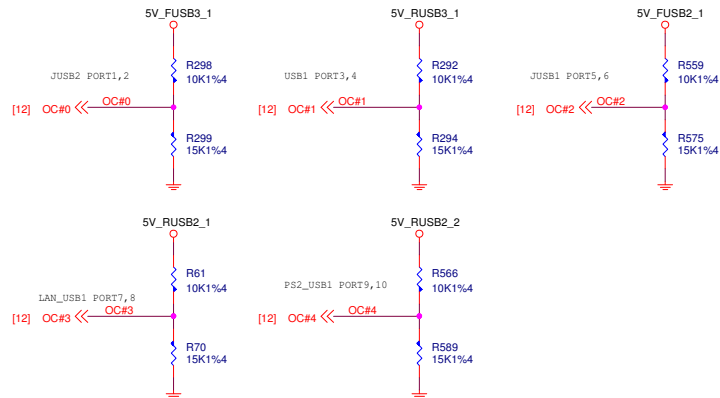
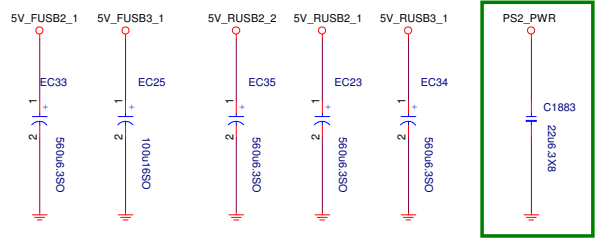
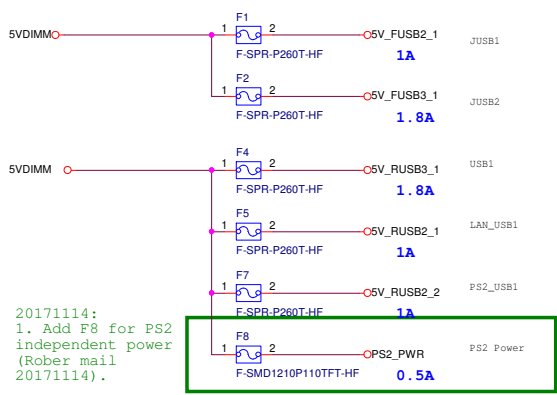


	DEEP_MODE_EN
DEEP_MODE	1
S5_MODE	0



MS-7B29..

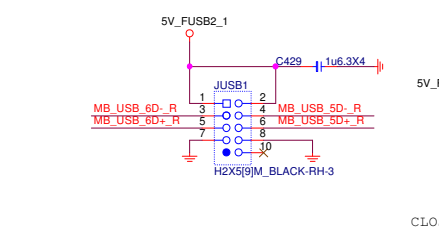
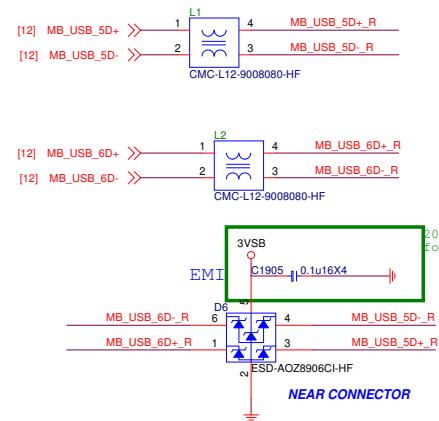
Size Custom	Document Description M.2-SLOT1	Rev 1.1
Date: Tuesday, January 02, 2018	Sheet 29 of 52	



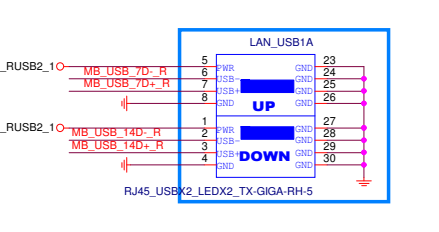
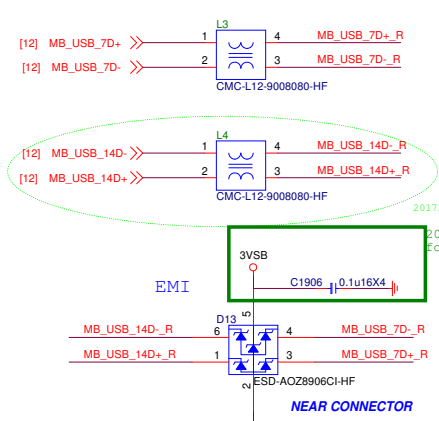
USB CONN	USB POWER	PCH PORT	OC# SIGNAL
JUSB2	5V_FUSB3_1	Port1,2	OC#0
USB1	5V_RUSB3_1	Port3,4	OC#1
JUSB1	5V_FUSB2_1	Port5,6	OC#2
LAN_USB1	5V_RUSB2_1	Port7,14	OC#3
PS2_USB1	5V_RUSB2_2	Port8,9	OC#4

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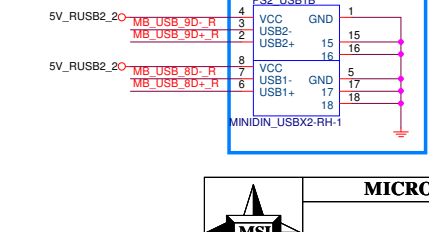
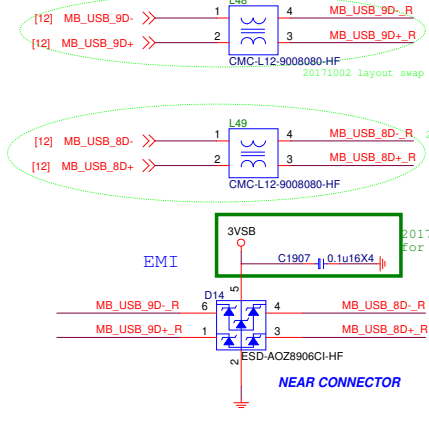
JUSB2 PORT 5,6

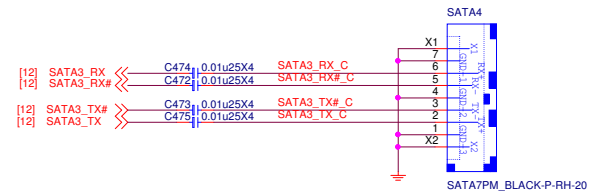
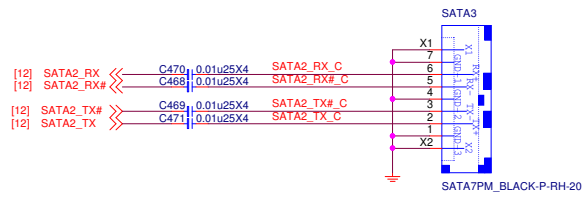
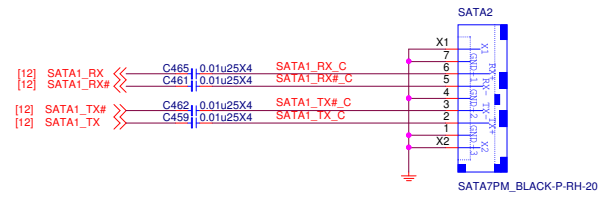
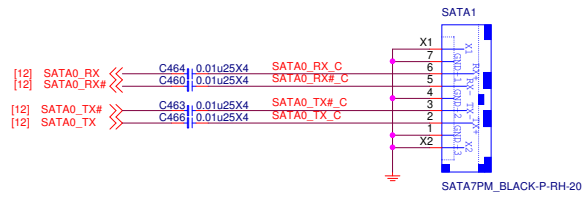


LAN_USB1 PORT 7, 14



PS2_USB1 PORT 8, 9



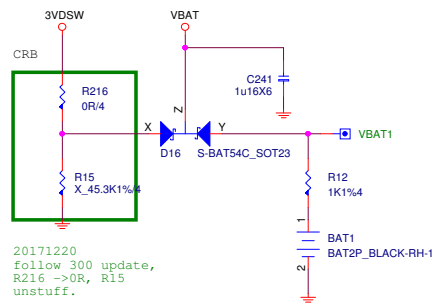


MICRO-STAR INT'L CO.,LTD

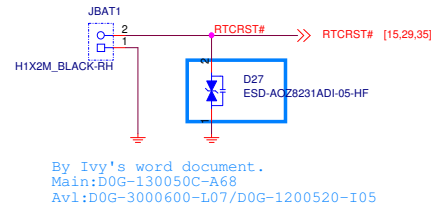
MS-7B29..

Size Custom	Document Description SATA connector	Rev 1.1
Date: Tuesday, January 02, 2018		
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VBAT



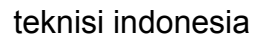
20171220
follow 300 update,
R216 ->0R, R15
unstuff.



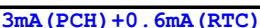
By Ivy's word document.
Main:D0G-130050C-A68
Av1:D0G-3000600-L07/D0G-1200520-I05

Vinafix.com

(3A for DDR, 6.6A for USB)

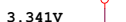


20mA

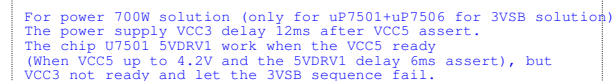


3.3V; 113.6mA

Current Limit: 3.8A



5VDUAL is power source of 1P0SB, 1.8PSB & 3VSB



Vinafix.com

3.3V; 3.67A

Current Limut: 6A



20171213:
Remove 10uF

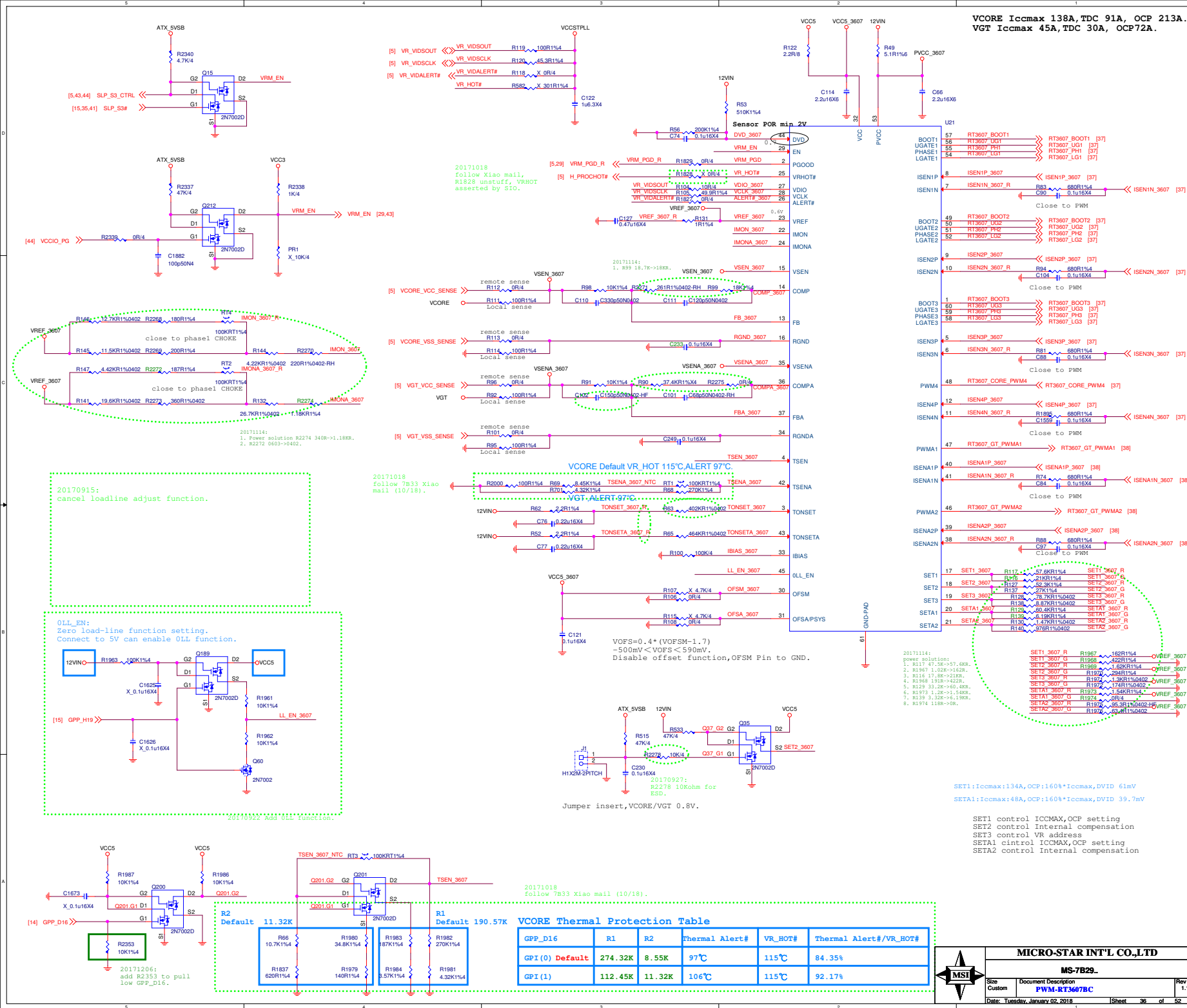
20171218:
R2368 change to 47Kohm.

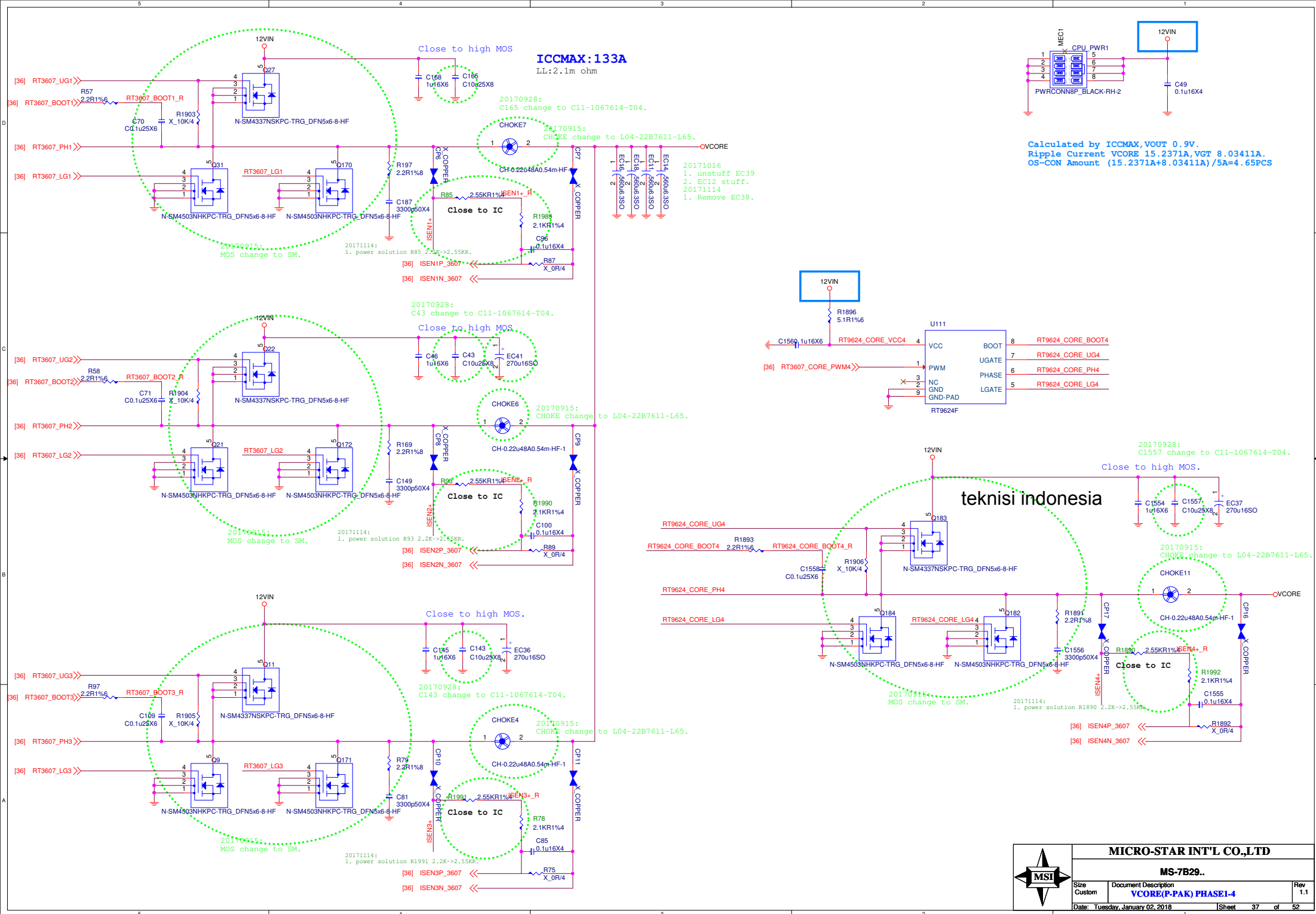
MICRO-STAR INT'L CO.,LTD

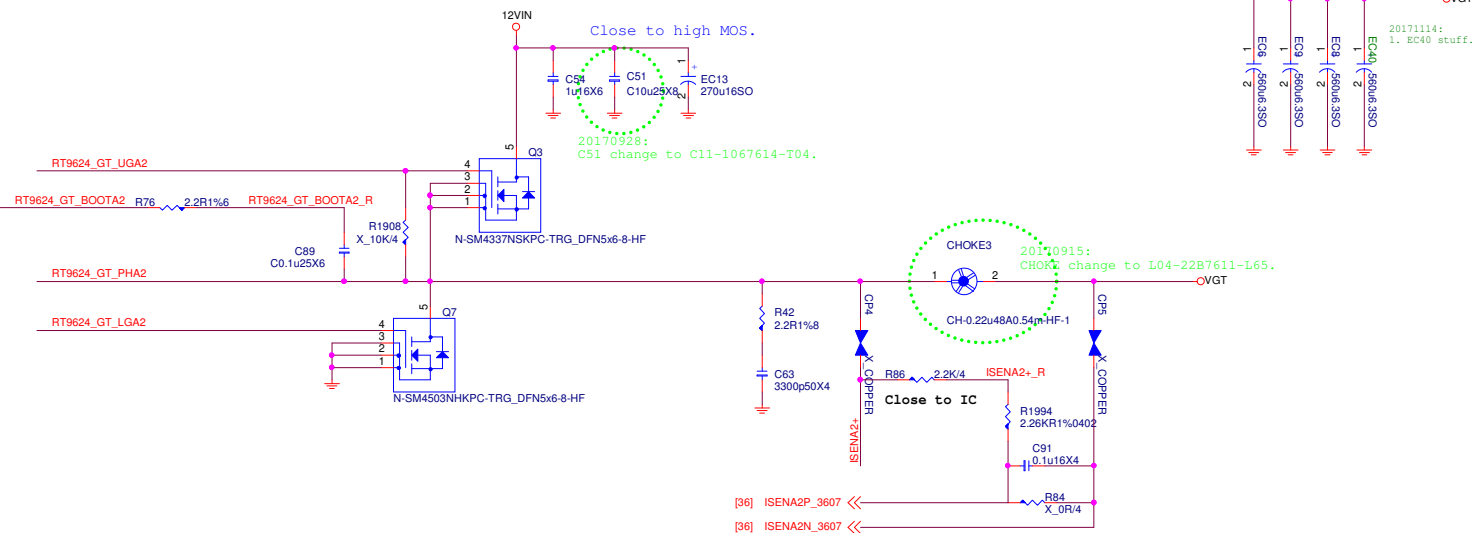
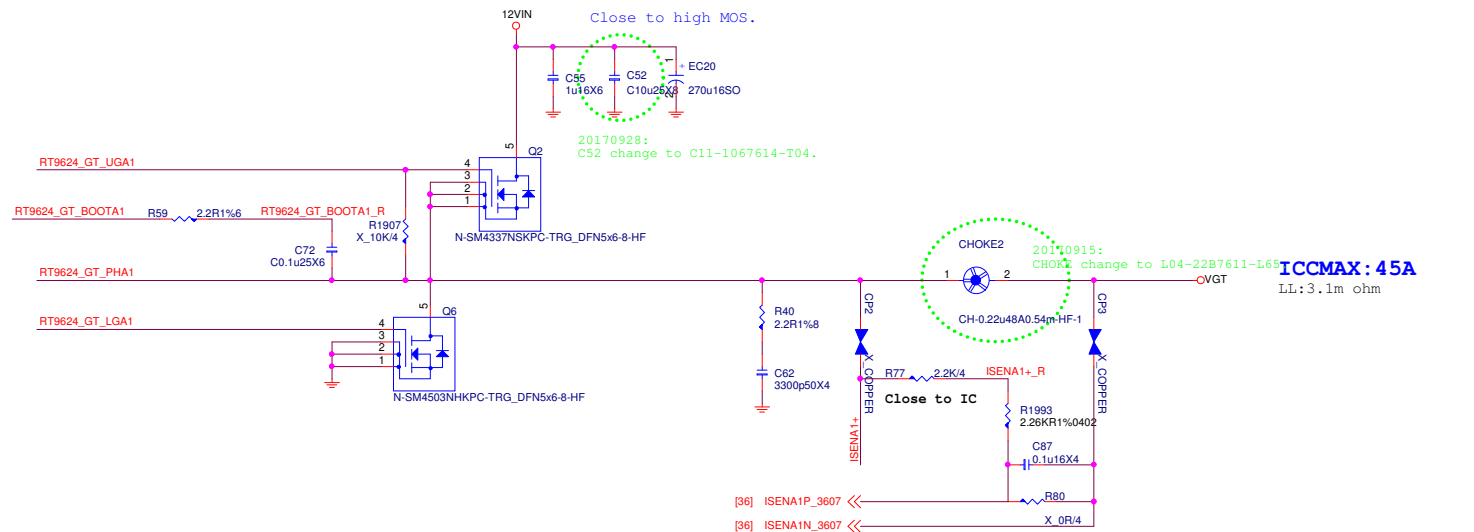
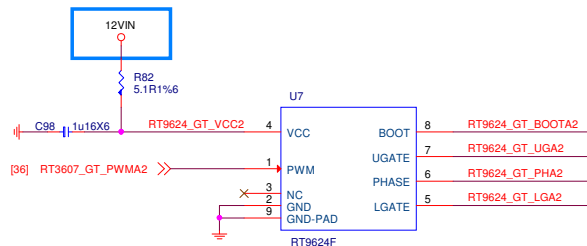
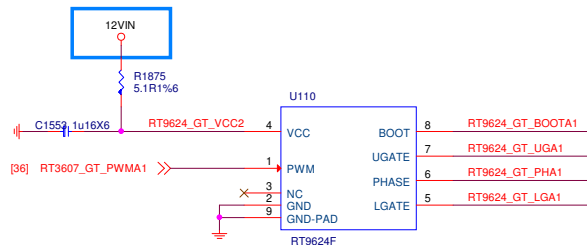
MS-7B29..

Size	Document Description
Custom	ACPI CONTROLLER

Rev
1.1

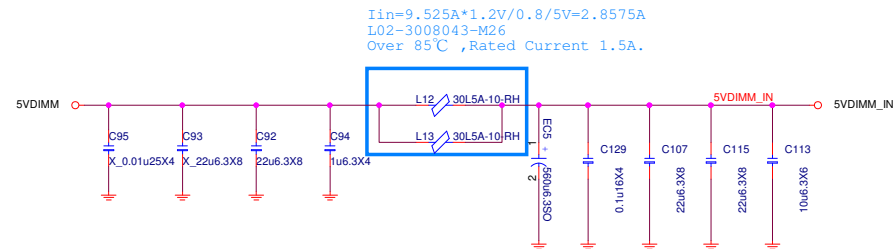




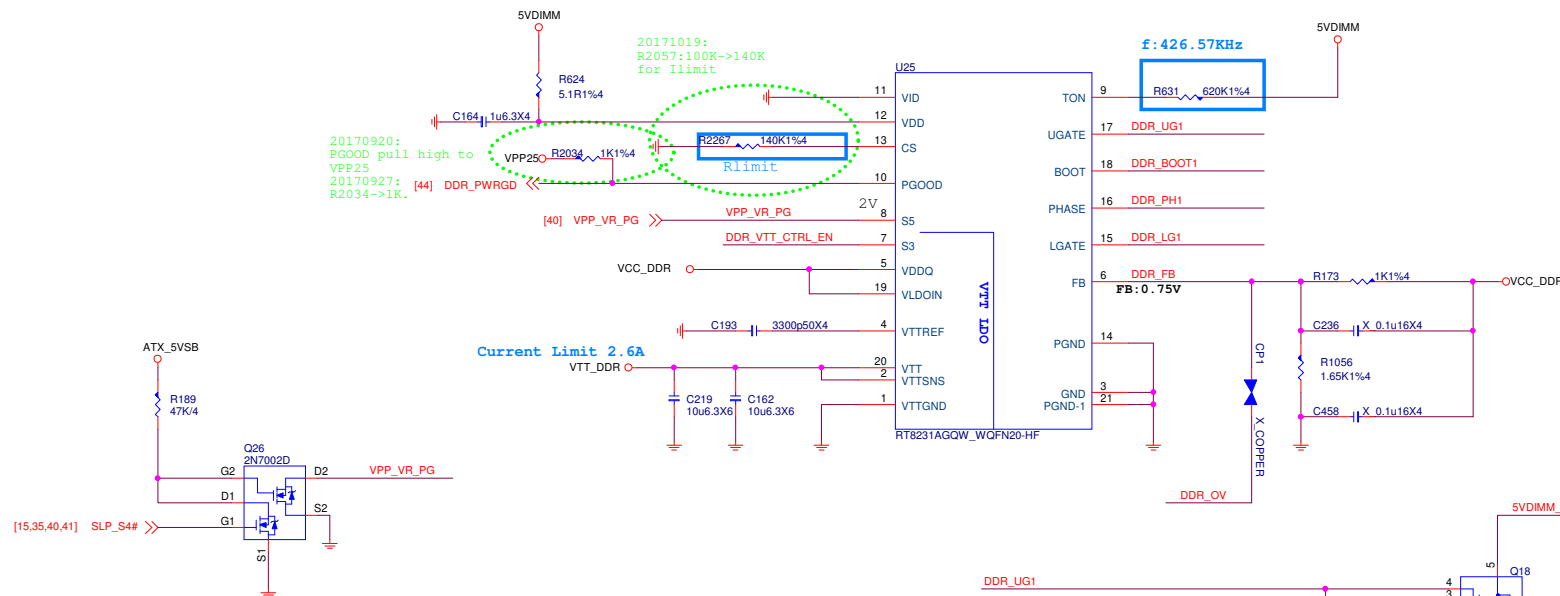


$$0.4V \leq R_{limit} * 5\mu A \leq 3V$$

VID	Reference Voltage (V)
H	0.675
L	0.75

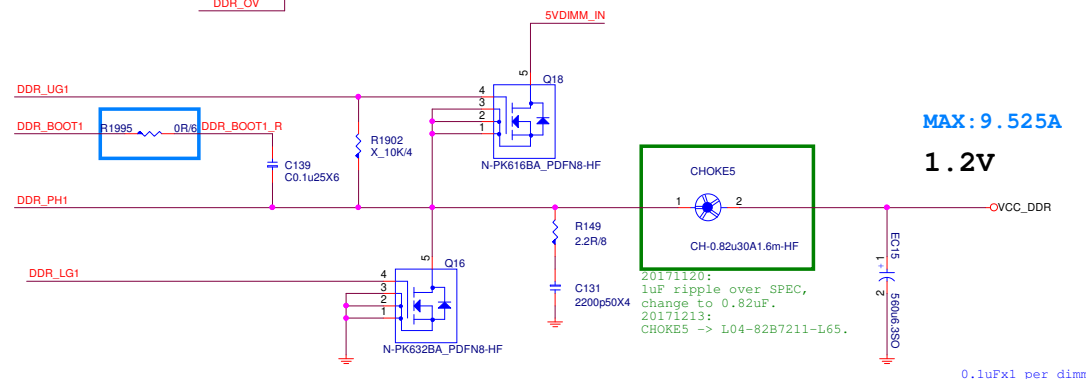
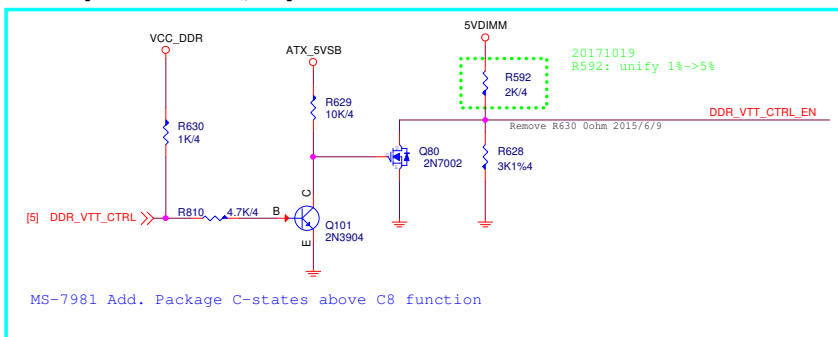


```
Irms = Iout * SQRT((Vout/Vin) * (1-(Vout/Vin)))
      = 9.525 * 0.427
      = 4.06797A
```

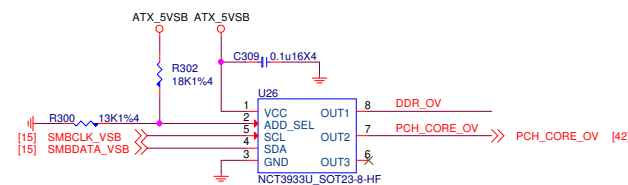


Vinafix.com

VPP ramp down after VDDQ ramp down

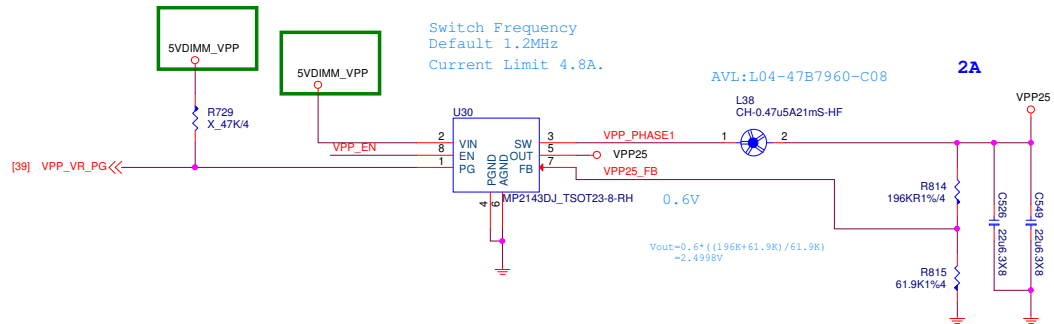


0x26: RH=18K, RL=13K



MICRO-STAR INT'L CO.,LTD			
MS-7B29..			
Size Custom	Document Description DDR-RT8231	Rev 1.	
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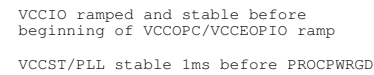
VPP25 Power
2.5V; 2A



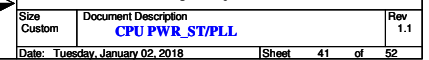
ENABLE HIGH:1.6V

Make Sure VPP EN after 5VDIMM stable

1.05V; 250mA



Current Limit: 3.8A



PCH_1VSB

1.05V; 10.285A

OCP:
 $I_{valley} = (I_{ocset} * R_{ocset}) / R_{lqds(on)}$
 $= (10\mu A * 7.15K\Omega) / 4.6m\Omega$
 $= 15.54A$

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

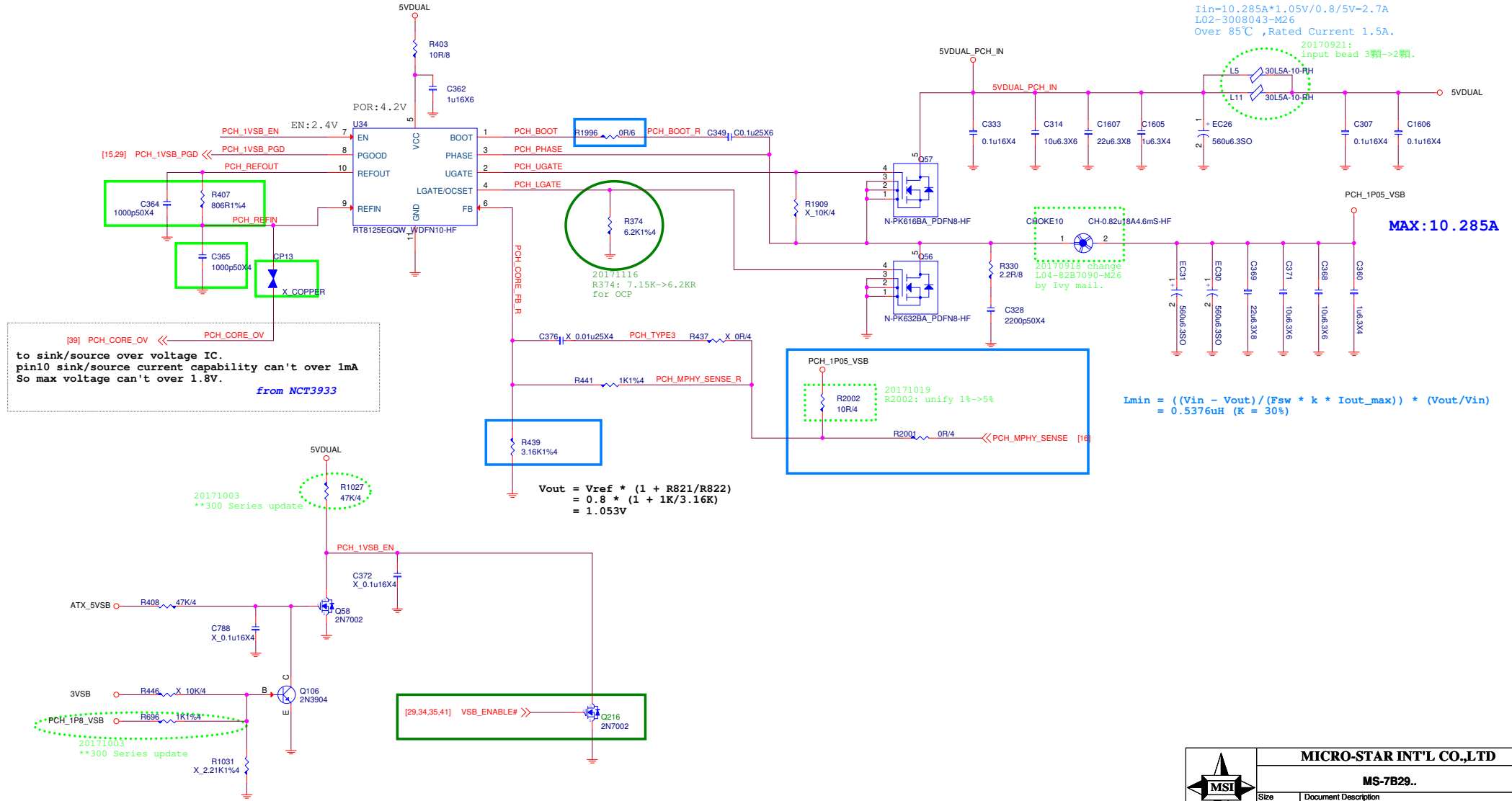
$$= 16.685 * 0.407$$

$$= 6.79A$$

$$I_{in} = 10.285A * 1.05V / 0.8 / 5V = 2.7A$$

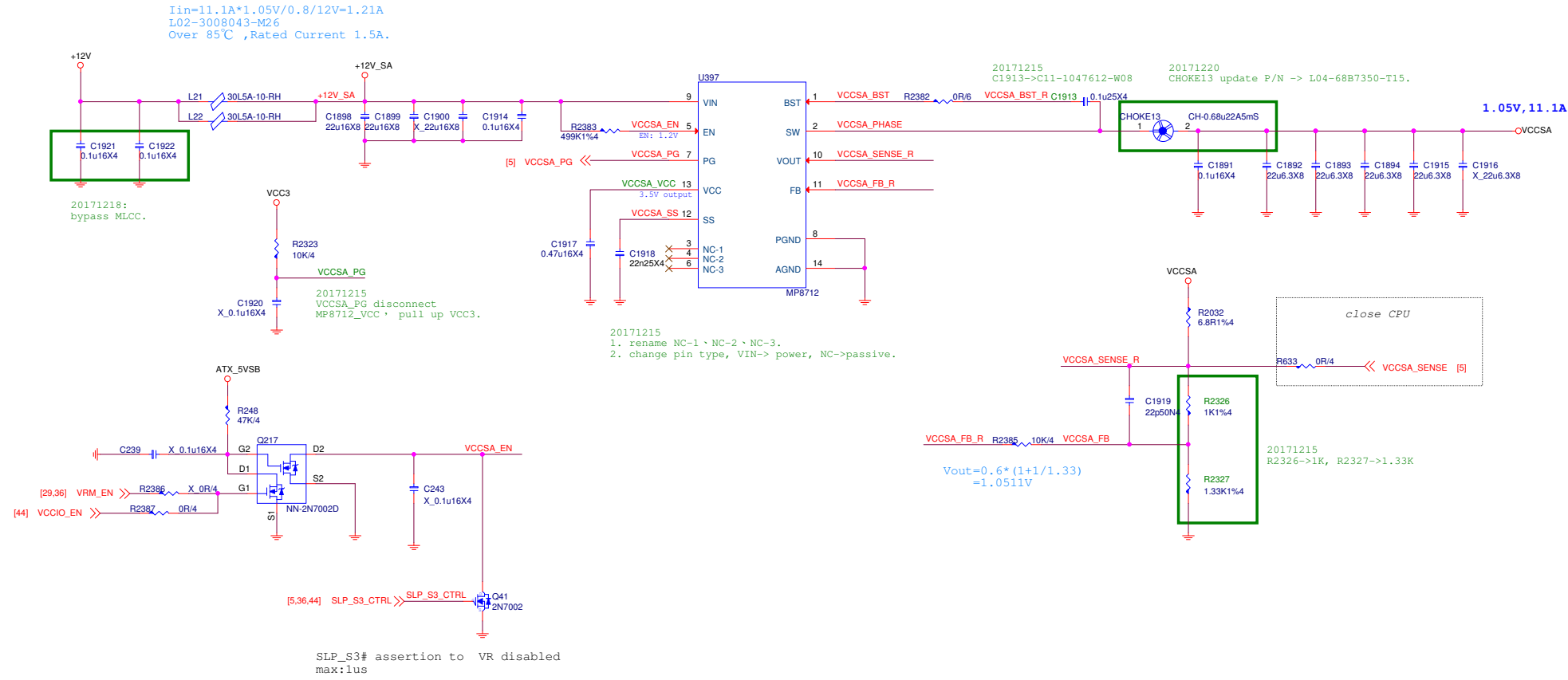
L02-3008043-M26
 Over 85°C, Rated Current 1.5A.

20170921:
 input bead 3顆->2顆.



SA Power:1.05V,11.1A

Current Limit: 19.5A
Fs: 500KHz



Vinafix.com

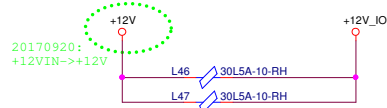
VCCIO

0.95V; 6.4A

OCP: 12A (floating)

20170919

TPS22976 -> SY8288 by Ivy mail (20170918).

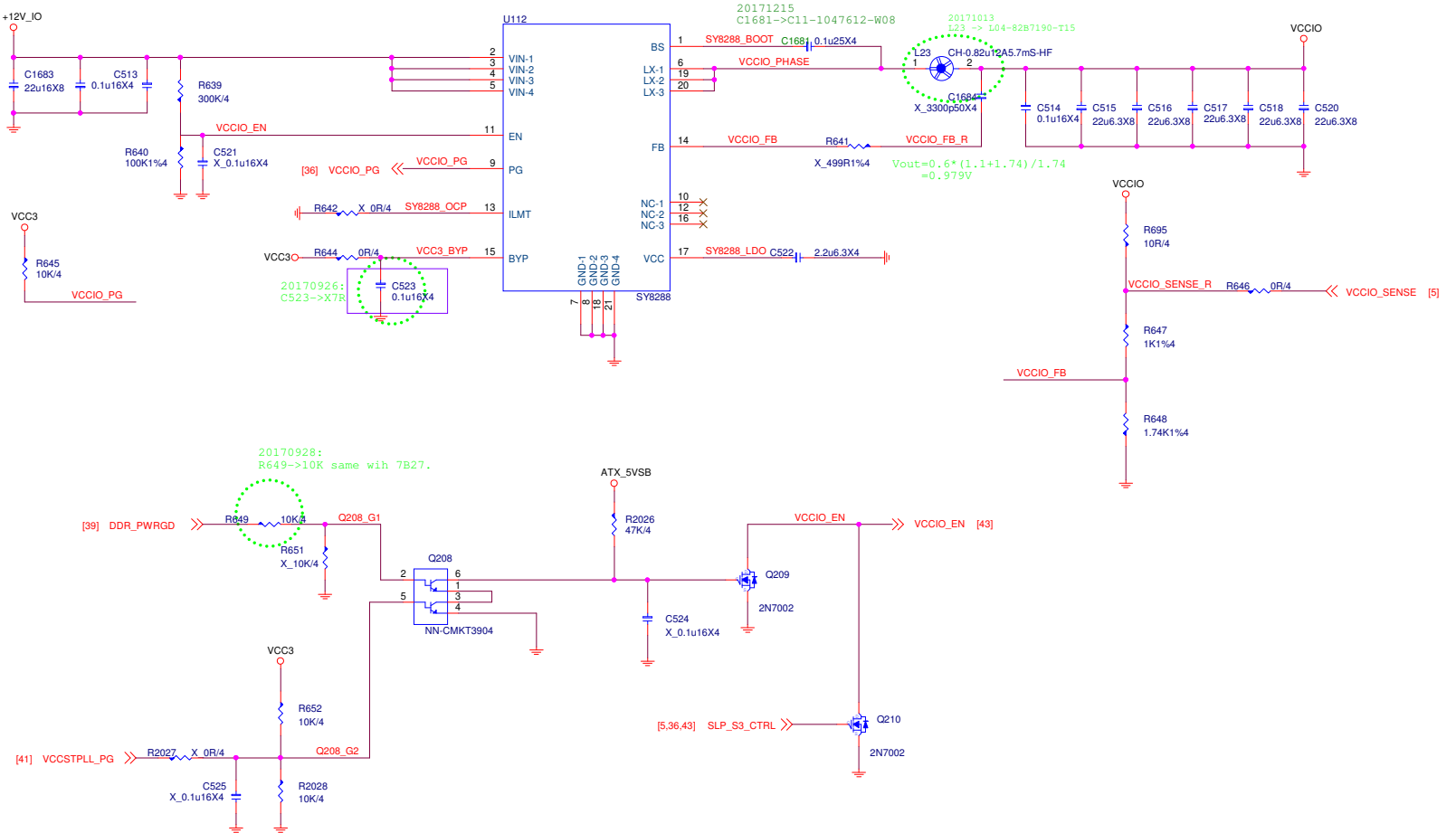


$$I_{in} = 6.4A \times 0.95V / 0.8 / 12V = 0.63A$$

L02-3008043-M26

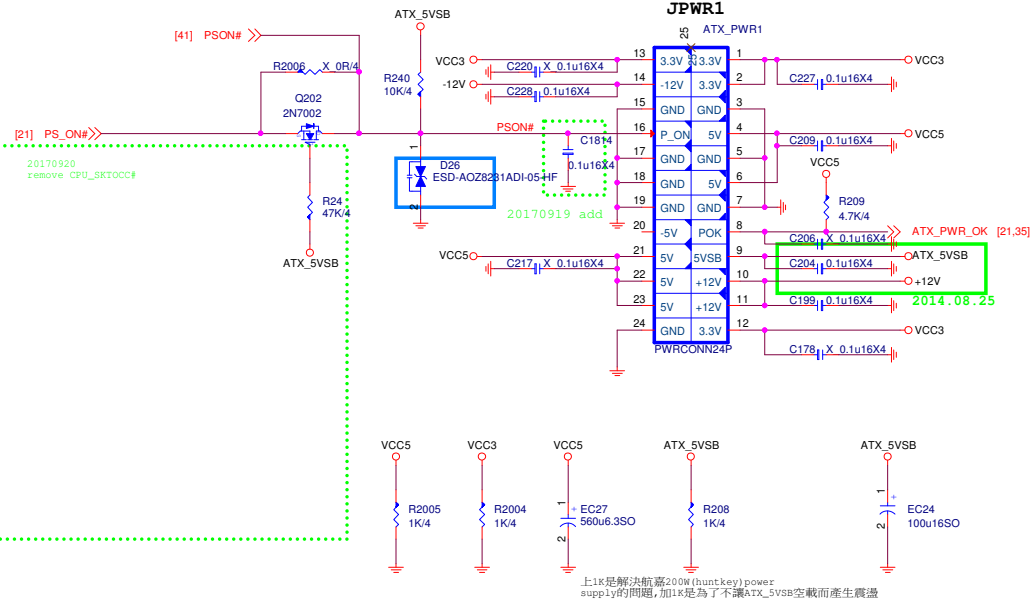
Over 85°C ,Rated Current 1.5A.

SY8288_pin13	OCP
0	8A
floating	12A
1	16A

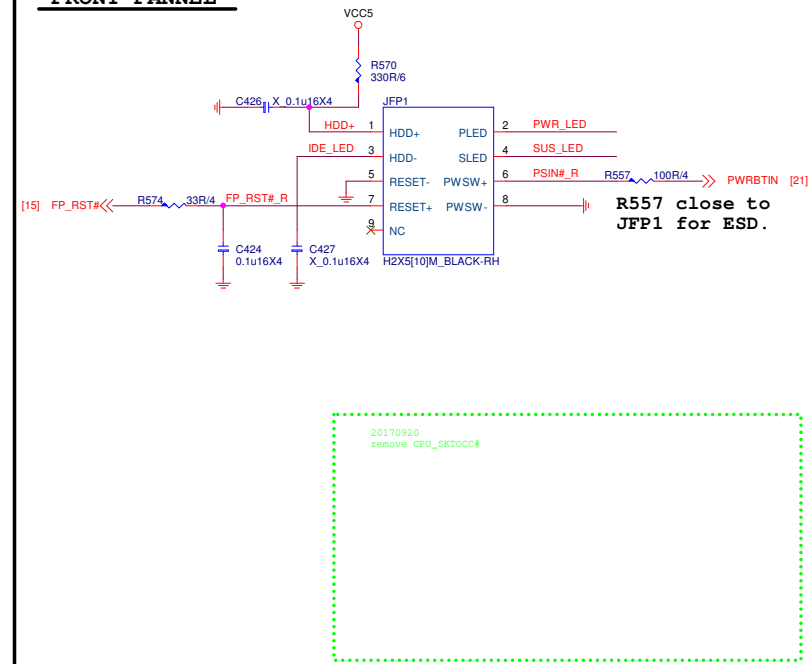


ATX POWER CONNECTOR

D26:By Ivy's word document.
Main:D0G-130050C-A68
Av1:D0G-3000600-L07/D0G-1200520-I05



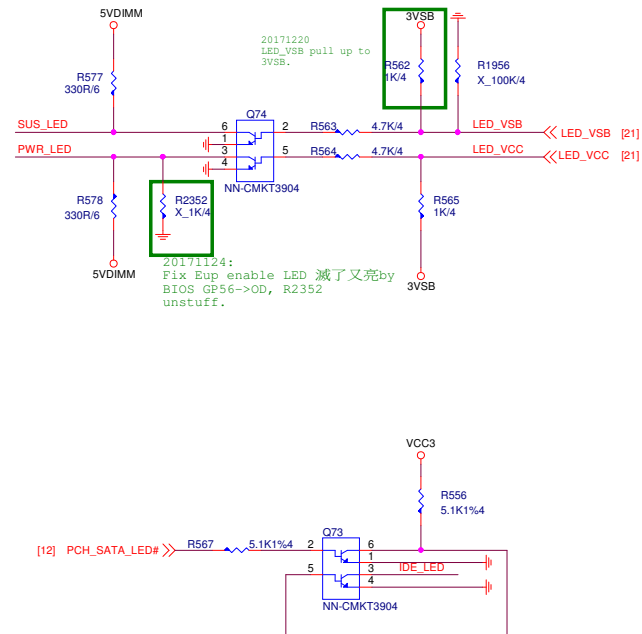
FRONT PANNEL



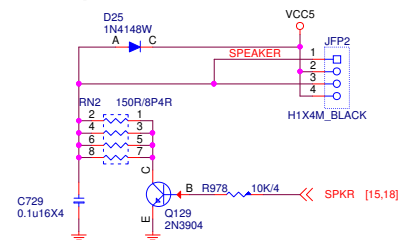
20171114:
1. Remove PS2 independent power
(Rober mail 20171114).

PS2 POWER

LED

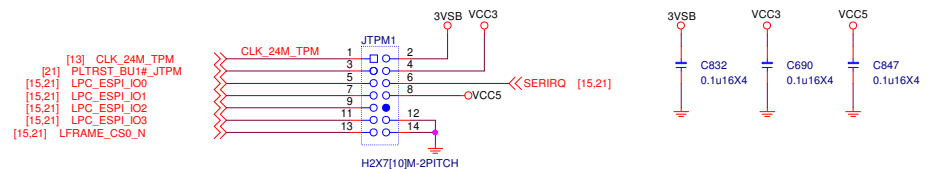


Speaker Pin Header



TPM

Don't colay espi debug.

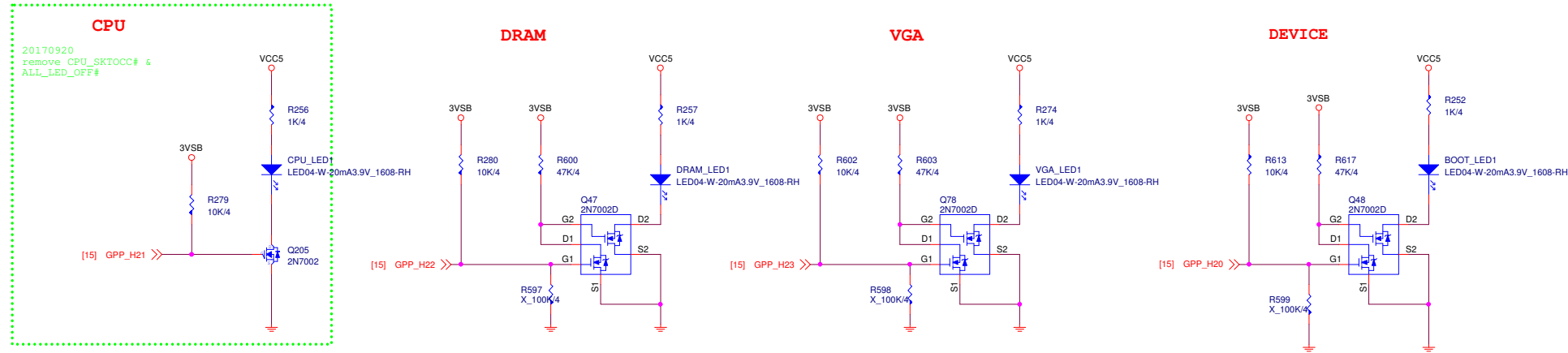


MICRO-STAR INT'L CO.,LTD

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Size	Document Description	Rev
Custom	ATX F_Panel/TPM/MSI_LED	1.1
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DEBUG LED




LED\	PCH_GP20	PCH_GP21	PCH_GP22	PCH_GP23
亮	NATIVE PULL HIGH	GPO PULL HIGH	GPO PULL HIGH	NATIVE PULL HIGH
滅	NATIVE LOW	GPO LOW (default LOW)	GPO LOW (default LOW)	GPO LOW (default LOW)

LED
RED:D0C-040P100-H91
AVL:D0C-040S500-E07

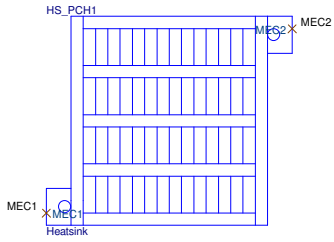
WHI:D0C-040T200-H91
AVL:D0C-040S200-E07

- 關機斷電狀態下，3個LED先維持default全暗，開機通電後：
1. 首先進行CPU checkCPU LED 亮，check PASS後則CPU LED滅掉。
 2. 接著依序進行Memory /memory LED亮check PASS後則memory LED滅掉。
 3. VGA的check/VGA LED亮，check PASS後則VGA LED滅掉。
 4. 因此最後正常順利開機後，三個LED燈都是滅掉的。（系統重啟或其他原因造成系統重開機，則LED仍按上述行為動作）

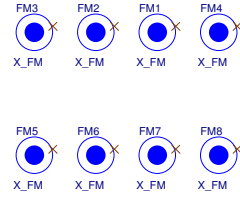
EMI CAP



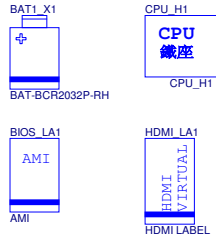
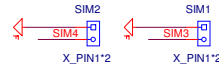
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Optical Fiducial Marks-120



Simulation



Mounting Holes

