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48	OV-NCT3933
49	PWM-RT3606BC VCORE+VGT
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52	PWR_12V OCP - UP6273A
53	CPU_FWR_VCCIO - NB681G
54	CPU_FWR_ST/PLL
55	CPU_FWR_SA-RT8125E
56	DDR4 Power-RT8125E
57	DDR4 Power-VPP25
58	PCH Core Power-RT8125E
59	SPI ROM
60	Clear CMOS SLG4B41231V
61	Manual parts
62	CLOCK MAP
63	GPIO MAP
64	POWER MAP
65	Power Sequence
66	Revision History

MS-7A71

Ver: 1.2 ATX
PCB size : 304.8mm * 225mm

Intel -Kabylake Plamform Z270

CPU: System Chipset: Z270

Kabylake-S

Onboard Chip:

HD Audio Codec : ALC892

LAN : Realtek RTL8111H

SIO : Nuvoton 6795

Flash ROM : 16MB Z270

U3.1 Gen2 : ASM2142 (option)

Main Memory:

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

ACPI:

NIKO/IUPI

PWM:

RT3606BC

Expansion Slots:

PCI Express (X16) Slot *1

PCI Express (X4) Slot *1

PCI Express (X1) Slot *4

M2 M-Key *1

Display :

DISPLAY PORT

DVI

VGA-ITE6516 DDI to D-SUB

Other:

SATA3.0 *6

FRONT USB2.0 *4

FRONT USB3.0 *4

REAR USB3.0 GEN1 Z270 *4

REAR USB3.1 GEN2 TYPE A *2 (option)



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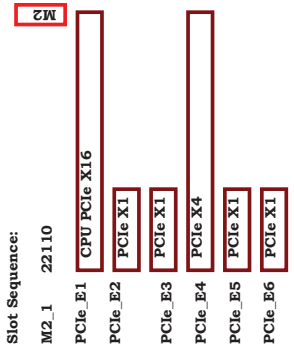
MS-7A71

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Cover Sheet

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Rev, 1.2
Sheet 1 of 65

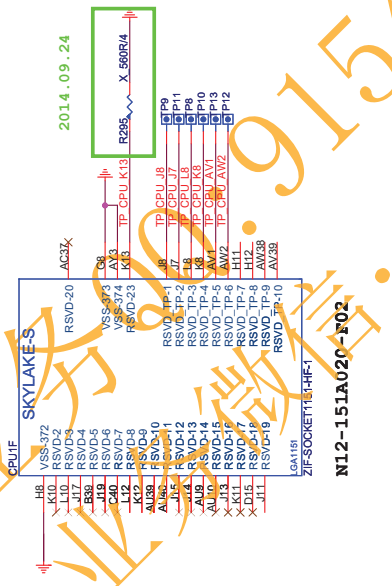
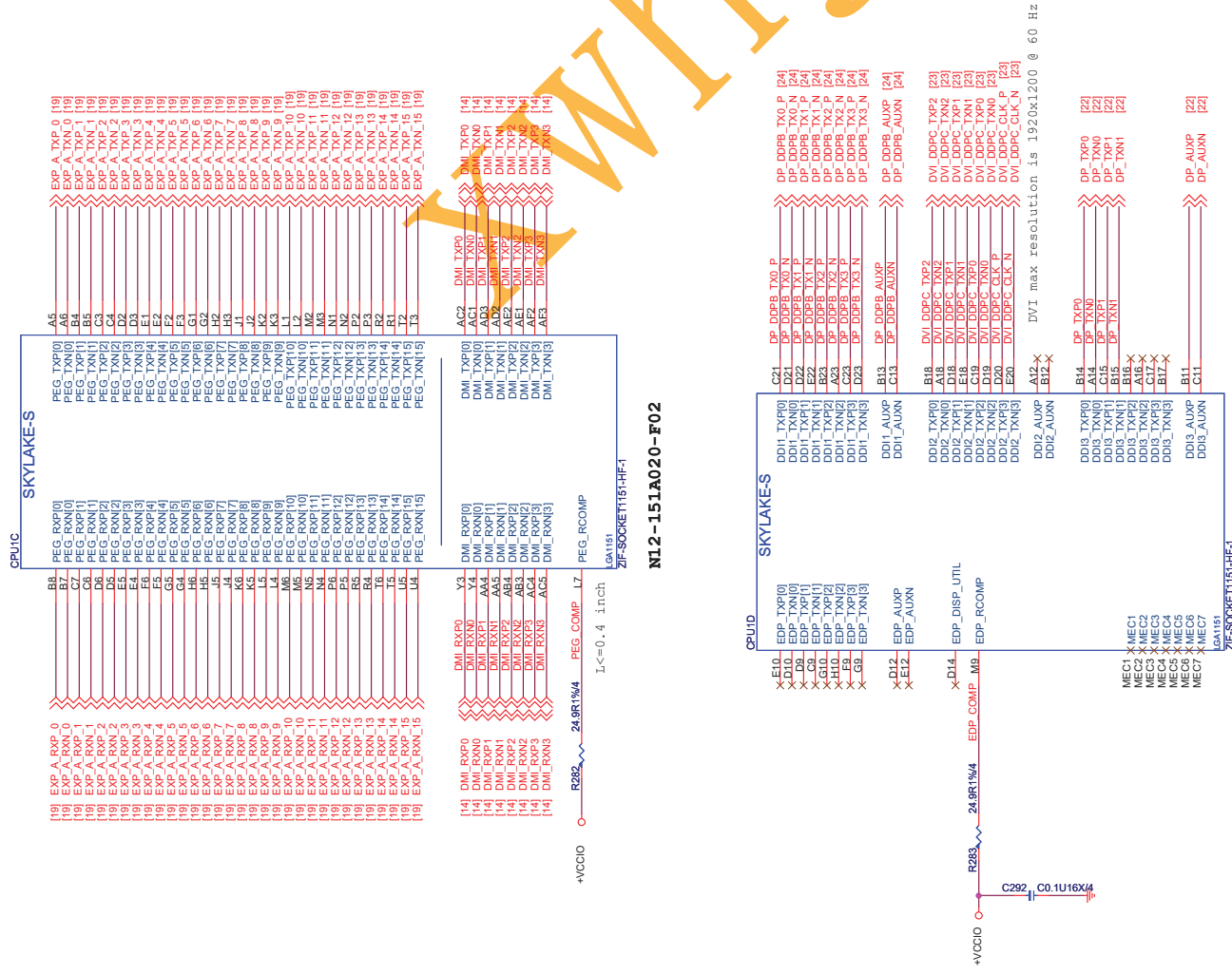
Diagram illustrating the connection of various components to a motherboard:

- UNBUFFERED DDR4 DIMM A1/A2** (DIMM A1/A2)
- UNBUFFERED DDR4 DIMM B1/B2** (DIMM B1/B2)
- Realtek RTL8111H** (Ethernet)
- PCIEX1 SLOT2**
- PCIEX1 SLOT 3**
- PCIEX1 SLOT 5**
- PCIEX1 SLOT 6**
- PCIEX4 SLOT4**
- SATA 1/2/3, 4/5, 6**
- M2 1 2260, 2280, 22110**



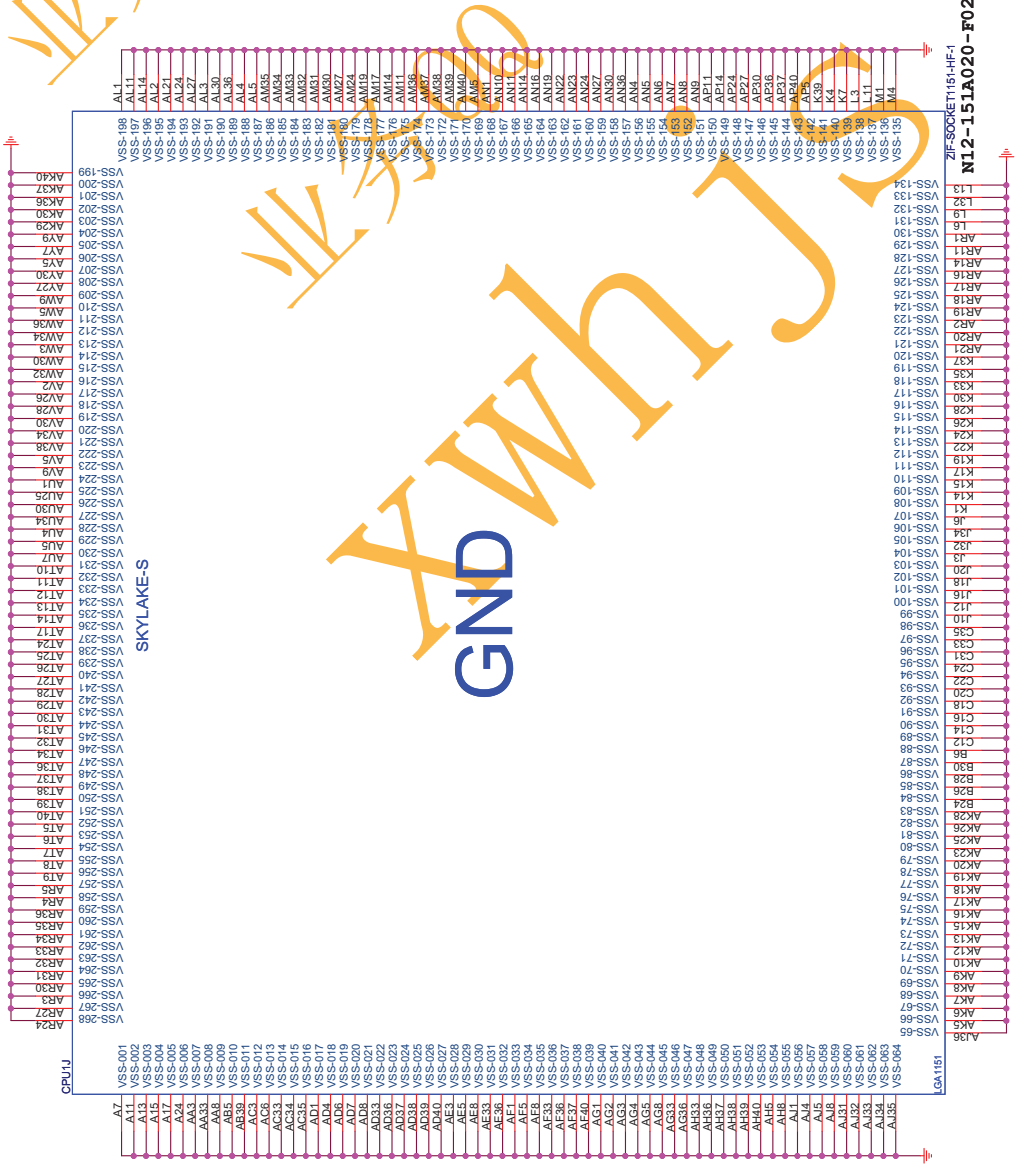
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0	NO LOCK	LOCK
1		PCI FULL LOCK
2		PCI LOCK REVERSAL
3	NORM	REVERSE
4	DISABLE	ENABLE
5	DISABLE	ENABLE
6	REVERSE	LOCK
7	REVERT	PCI FULL LOCK
8	REVERT	PCI FULL LOCK
9		NO LOCK
10		NO LOCK
11		NO LOCK
12		NO LOCK
13		NO LOCK
14	RVD	RVD
15	RVD	RVD





N12-151A020-E02

业务微信: 8951600031



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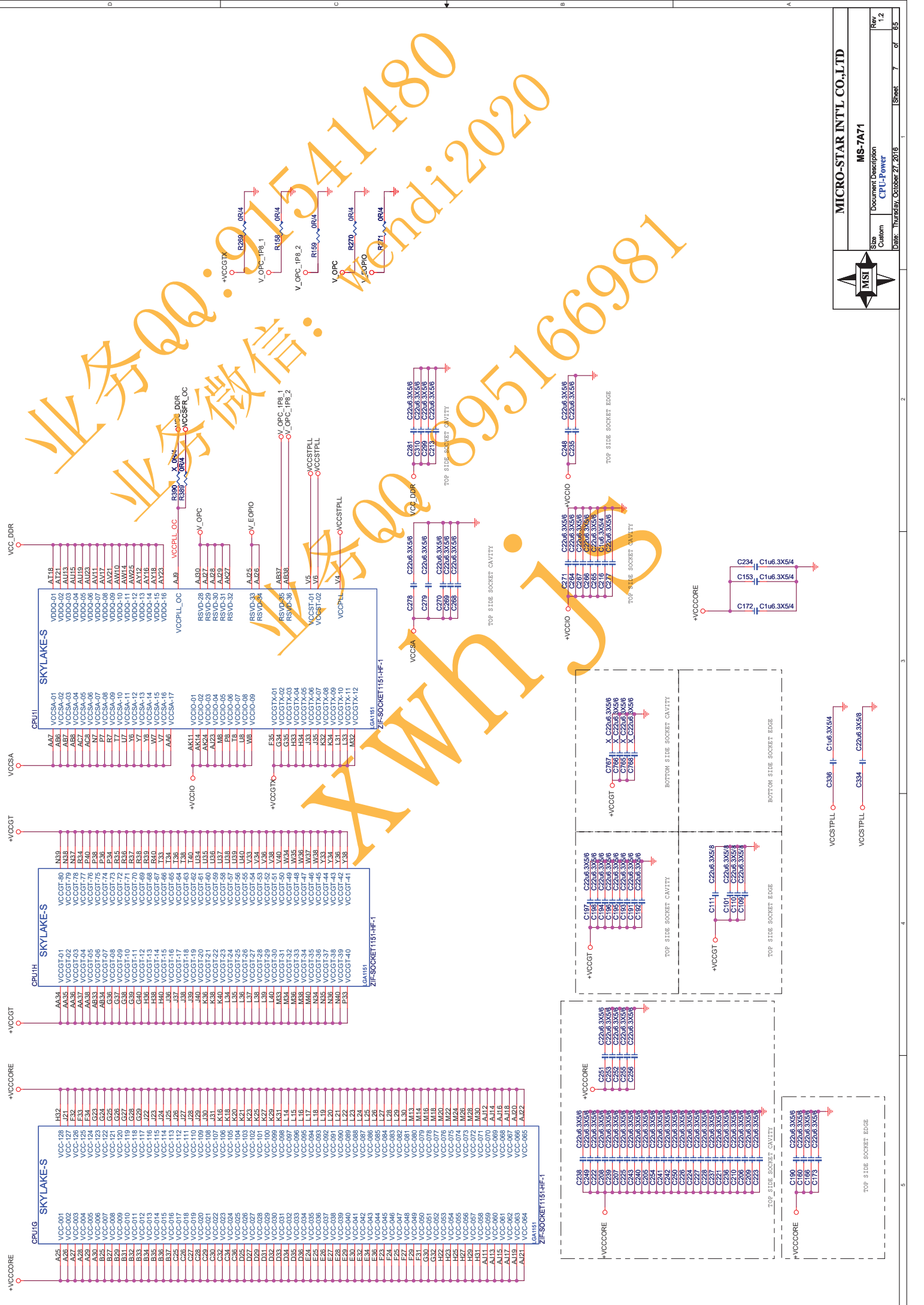
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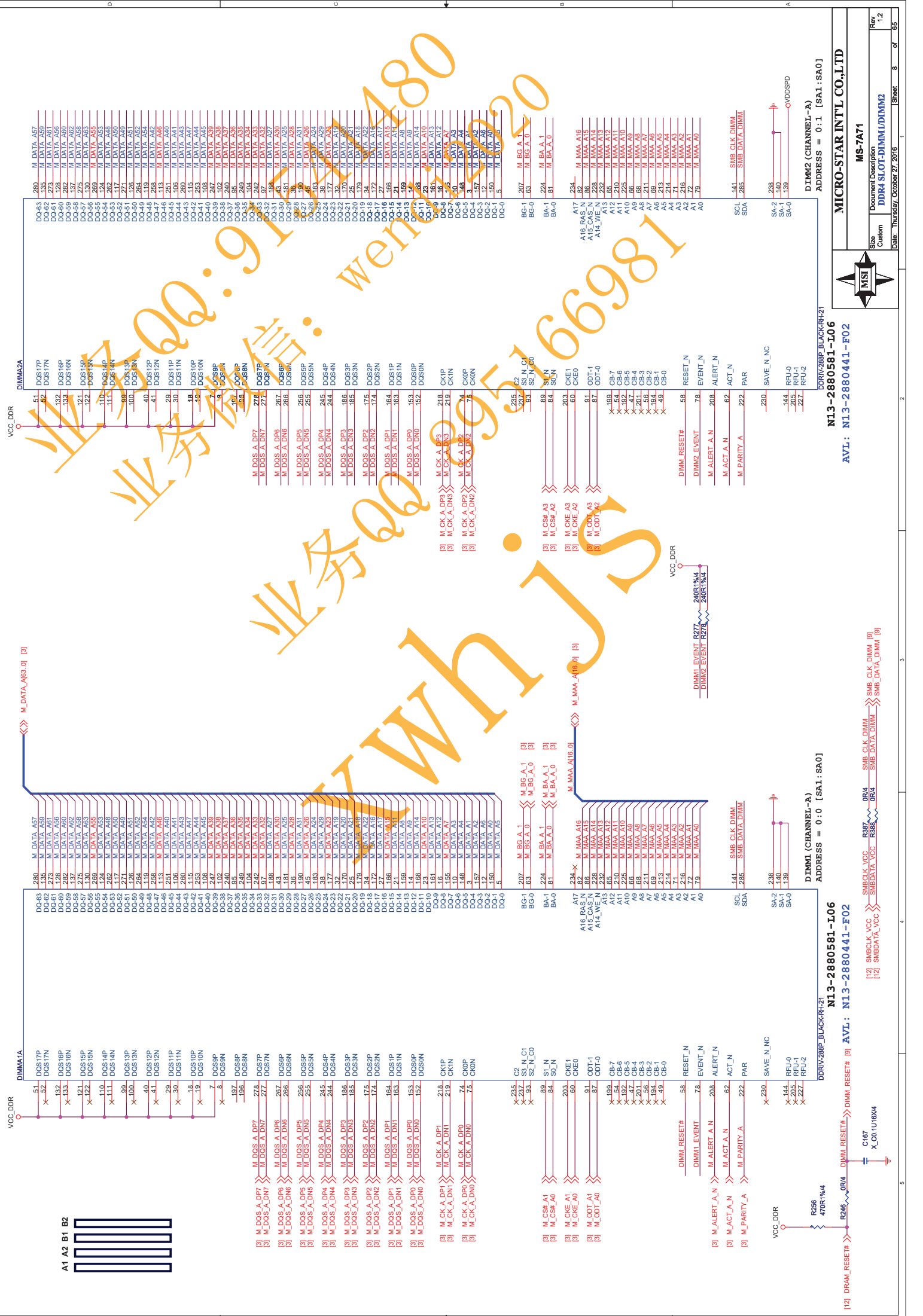
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Custom

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Size

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Document Description

DDR4 SLOT-DIMM1/DIMM2

Rev.

1/2

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N13-2880581-L06

AVL: N13-2880441-F02

DRIV288F_BLACK-R1-21

DIMM1 (CHANNEL-A)

ADDRESS = 0:0 [SA1:SA0]

DRIV288F_BLACK-R1-21

DIMM2 (CHANNEL-A)

ADDRESS = 0:1 [SA1:SA0]

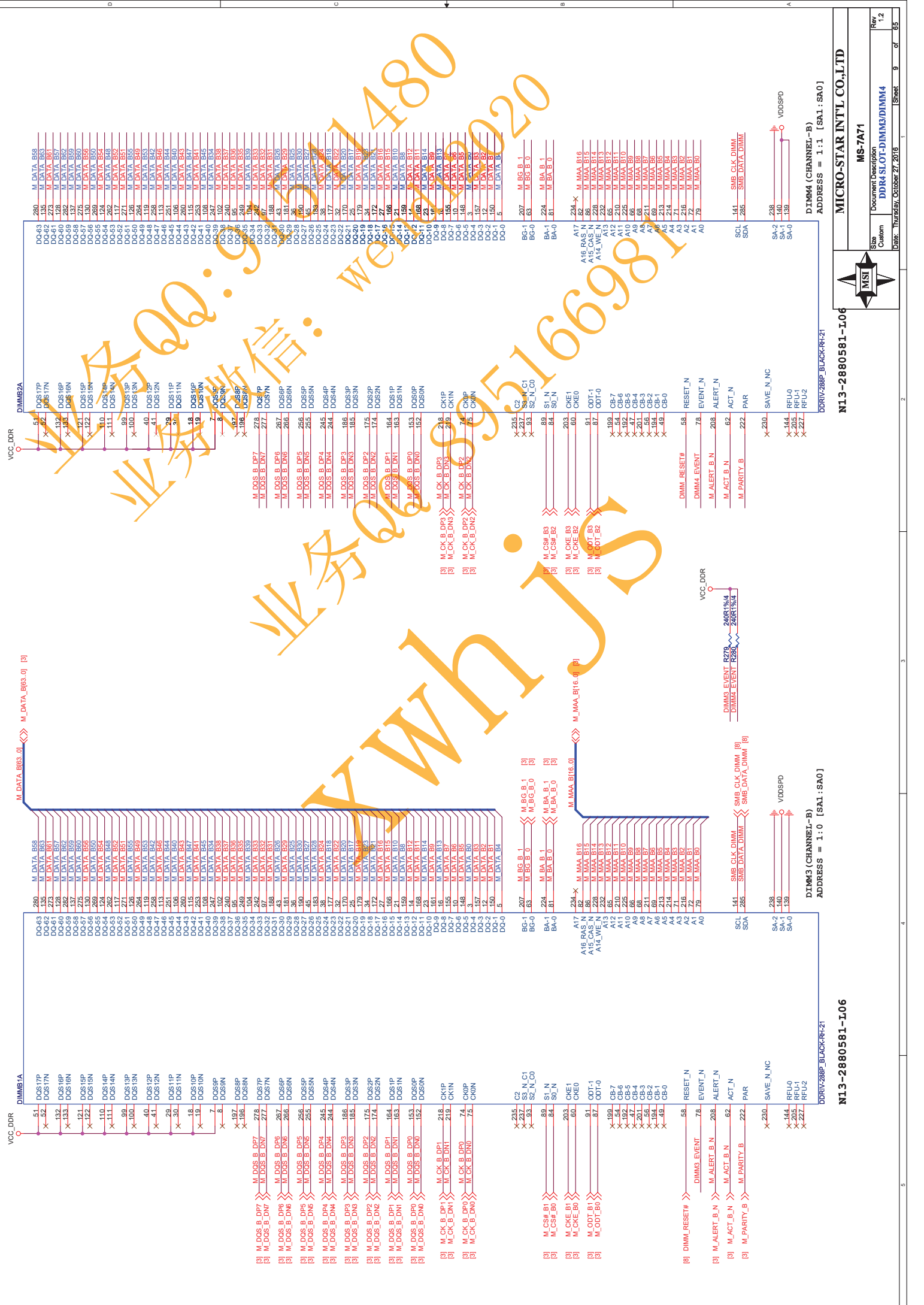
DRIV288F_BLACK-R1-21

N13-2880581-L06

AVL: N13-2880441-F02

[12] SMBCLK_VCC >> SMBCLK_VCC R387 0R4 >> SMB_CLK_DIMM [9] >> SMB_CLK_DIMM [9] >> SMB_CLK_DIMM [9]
[12] SMBDATA_VCC >> SMBDATA_VCC R388 0R4 >> SMB_DATA_DIMM [9] >> SMB_DATA_DIMM [9] >> SMB_DATA_DIMM [9]

[12] DRAM_RESET# >> DIMM_RESET# [9] >> DIMM_RESET# [9] >> DIMM_RESET# [9] >> DIMM_RESET# [9]
C167 X_C0:1U16V4



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DDR4 SLOT-DIMM3/DIMM4

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Rev

1.2

Date: Thursday, October 27, 2016

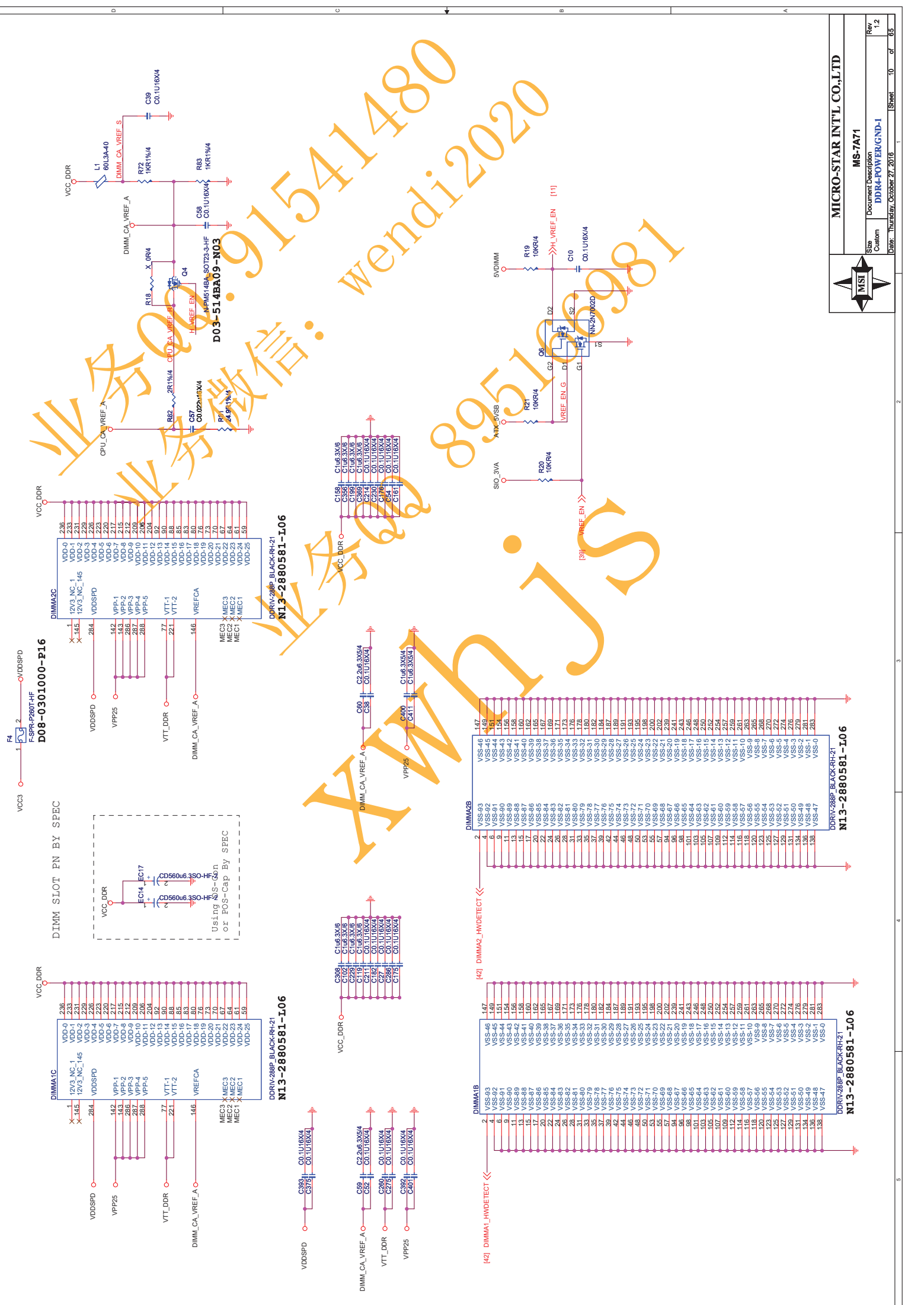
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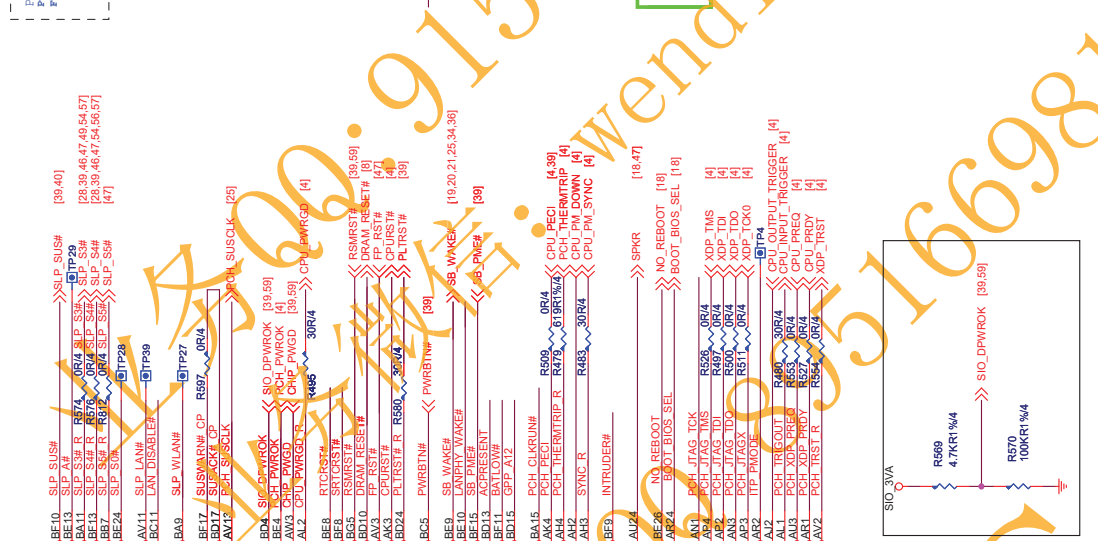
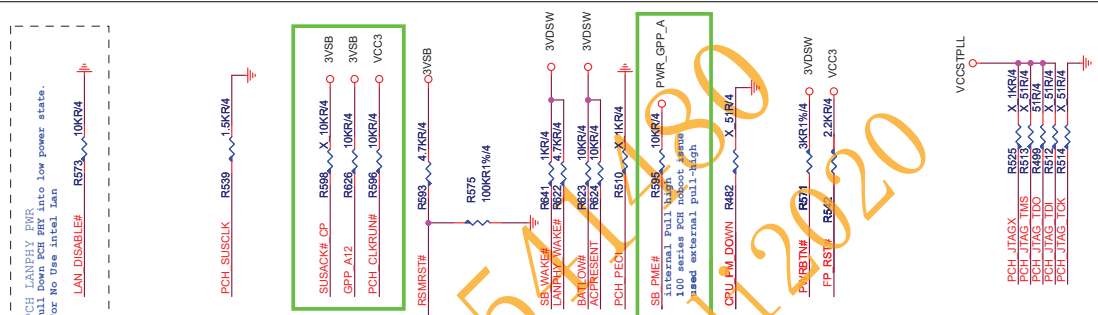
Rev

1.2

Date: Thursday, October 27, 2016

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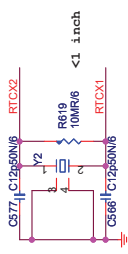




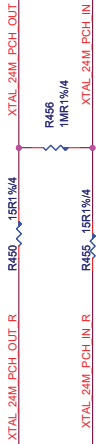
PCH_CLK

RTC_Block

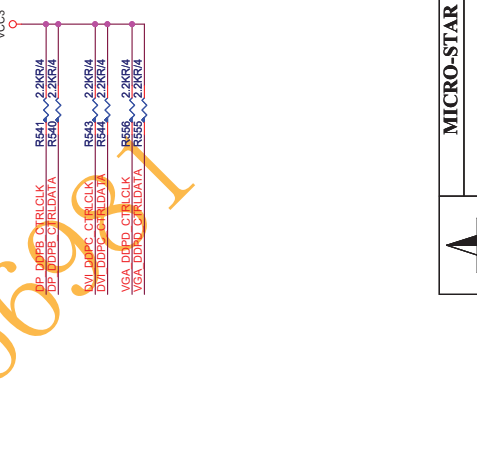
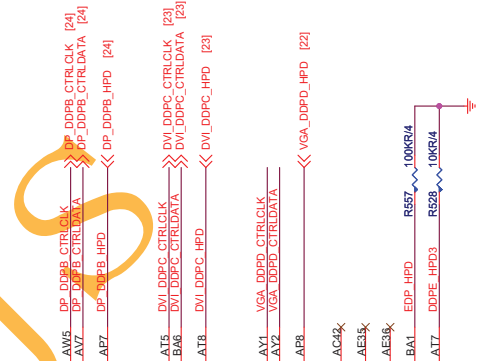
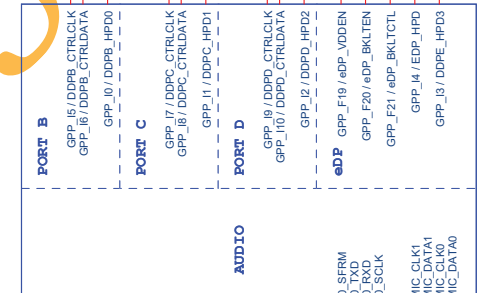
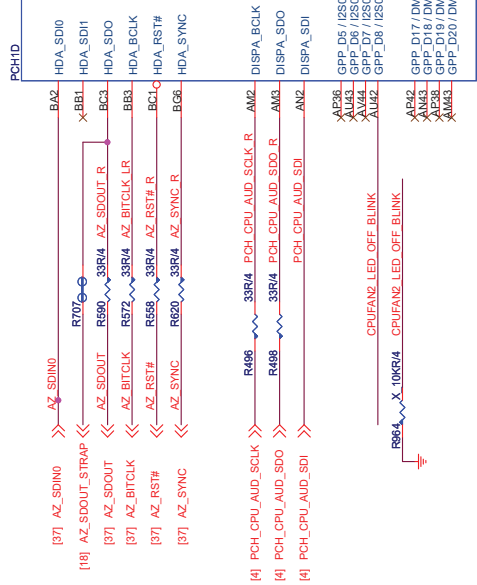
Close to PCH



D04-0305901-F07



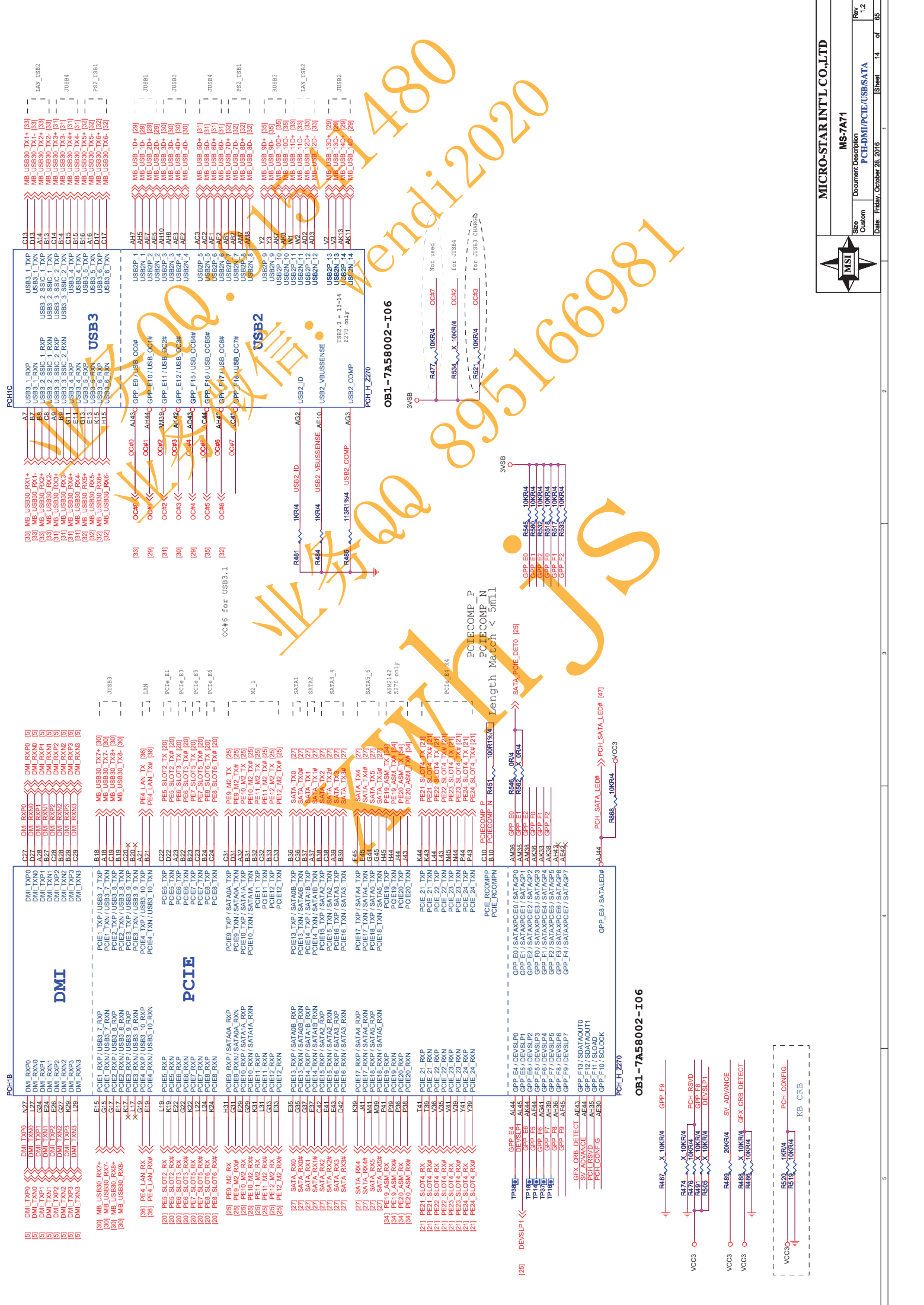
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PCH_H_Z270

PCIECOMPN

PCIECOMPP

PCIECOMPN

PCIECOMPP

PCIECOMPN

PCIECOMPP

PCIECOMPN

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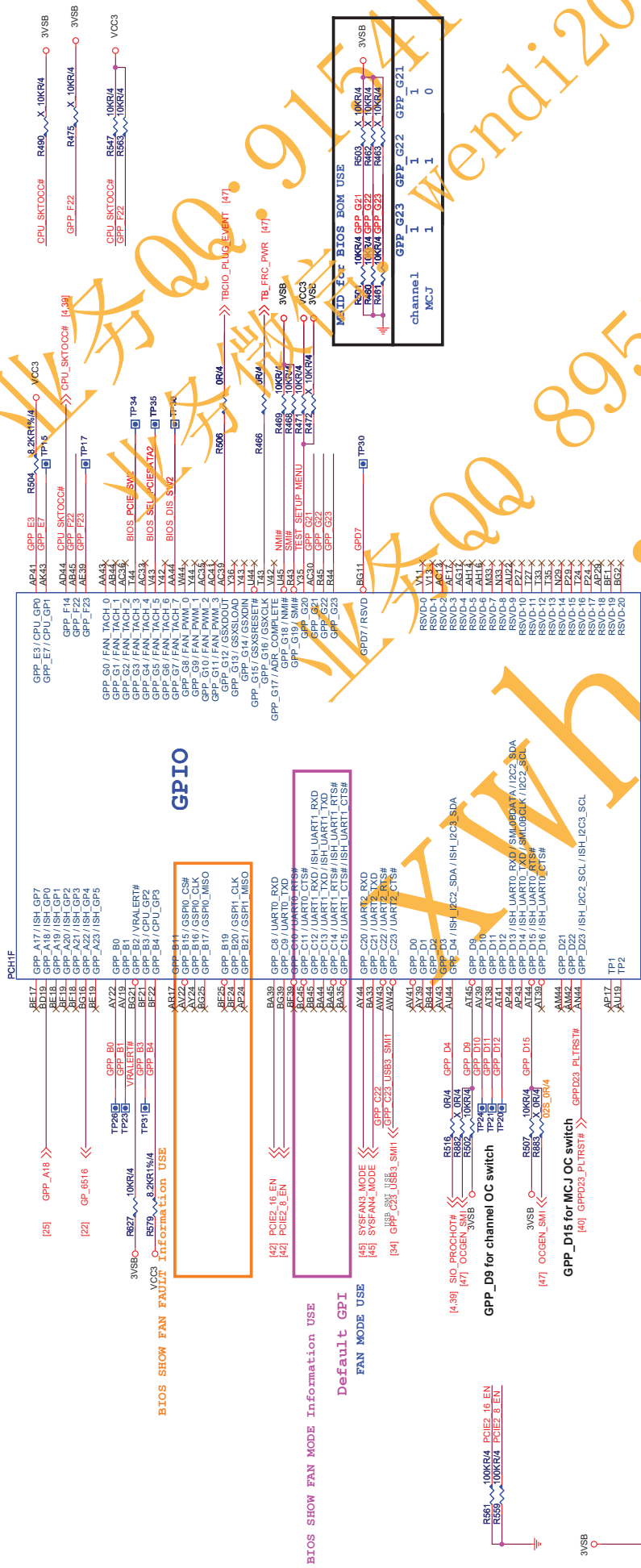
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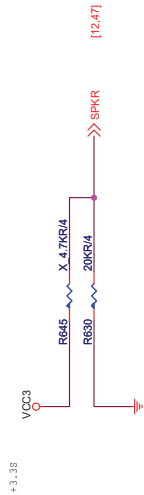
PCIECOMPP



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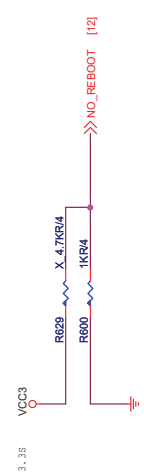
K13	VSS-260	VSS-000	A12
K11	VSS-249	VSS-001	A2
J4	VSS-248	VSS-002	A25
H2	VSS-247	VSS-003	A30
H4	VSS-246	VSS-004	A35
H38	VSS-244	VSS-005	A4
H33	VSS-243	VSS-006	A40
H29	VSS-242	VSS-007	A41
H27	VSS-240	VSS-008	A42
H24	VSS-239	VSS-009	A43
H24	VSS-238	VSS-010	A44
H19	VSS-236	VSS-011	A45
H13	VSS-235	VSS-012	A46
H9	VSS-234	VSS-013	A47
G42	VSS-233	VSS-014	A48
G4	VSS-230	VSS-015	A49
G40	VSS-231	VSS-016	A50
F43	VSS-229	VSS-017	A51
F39	VSS-227	VSS-018	A52
F2	VSS-226	VSS-019	A53
E6	VSS-225	VSS-020	A54
E31	VSS-224	VSS-021	A55
D7	VSS-222	VSS-022	A56
D43	VSS-221	VSS-023	A57
D39	VSS-220	VSS-024	A58
D36	VSS-218	VSS-025	A59
D35	VSS-217	VSS-026	A60
D30	VSS-216	VSS-027	A61
D29	VSS-215	VSS-028	A62
D25	VSS-213	VSS-029	A63
D24	VSS-212	VSS-030	A64
D19	VSS-211	VSS-031	A65
D16	VSS-209	VSS-032	A66
D15	VSS-208	VSS-033	A67
D10	VSS-207	VSS-034	A68
D1	VSS-205	VSS-035	A69
C9	VSS-204	VSS-036	A70
C2	VSS-203	VSS-037	A71
C1	VSS-202	VSS-038	A72
BG9	VSS-199	VSS-039	A73
BG44	VSS-198	VSS-040	A74
BG37	VSS-189	VSS-041	A75
BG32	VSS-186	VSS-042	A76
BG28	VSS-185	VSS-043	A77
BG18	VSS-184	VSS-044	A78
BF5	VSS-181	VSS-045	A79
BF43	VSS-180	VSS-046	A80
BF3	VSS-179	VSS-047	A81
BF2	VSS-178	VSS-048	A82
BF2	VSS-177	VSS-049	A83
BF2	VSS-176	VSS-050	A84
BD7	VSS-166	VSS-051	A85
BD39	VSS-164	VSS-052	A86
BD34	VSS-162	VSS-053	A87
BD32	VSS-161	VSS-054	A88
BD21	VSS-160	VSS-055	A89
BD2	VSS-159	VSS-056	A90
BD16	VSS-157	VSS-057	A91
BD1	VSS-156	VSS-058	A92
BC9	VSS-174	VSS-059	A93
BC40	VSS-173	VSS-060	A94
BC4	VSS-172	VSS-061	A95
BA40	VSS-171	VSS-062	A96
BA42	VSS-169	VSS-063	A97
BA4	VSS-168	VSS-064	A98
BA37	VSS-167	VSS-065	A99
BA3	VSS-166	VSS-066	A100
BA17	VSS-165	VSS-067	A101
BA13	VSS-164	VSS-068	A102
BA12	VSS-163	VSS-069	A103
BA11	VSS-162	VSS-070	A104
BA10	VSS-161	VSS-071	A105
BA9	VSS-160	VSS-072	A106
BA8	VSS-159	VSS-073	A107
BA7	VSS-158	VSS-074	A108
BA6	VSS-157	VSS-075	A109
BA5	VSS-156	VSS-076	A110
BA4	VSS-155	VSS-077	A111
BA3	VSS-154	VSS-078	A112
BA2	VSS-153	VSS-079	A113
BA1	VSS-152	VSS-080	A114
BA0	VSS-151	VSS-081	A115
BA0	VSS-150	VSS-082	A116
BA0	VSS-149	VSS-083	A117
BA0	VSS-148	VSS-084	A118
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BA0	VSS-120	VSS-112	A146
BA0	VSS-119	VSS-113	A147
BA0	VSS-118	VSS-114	A148
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BA0	VSS-102	VSS-130	A164
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BA0	VSS-85	VSS-147	A181
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BA0	VSS-83	VSS-149	A183
BA0	VSS-82	VSS-150	A184
BA0	VSS-81	VSS-151	A185
BA0	VSS-80	VSS-152	A186
BA0	VSS-79	VSS-153	A187
BA0	VSS-78	VSS-154	A188
BA0	VSS-77	VSS-155	A189
BA0	VSS-76	VSS-156	A190
BA0	VSS-75	VSS-157	A191
BA0	VSS-74	VSS-158	A192
BA0	VSS-73	VSS-159	A193
BA0	VSS-72	VSS-160	A194
BA0	VSS-71	VSS-161	A195
BA0	VSS-70	VSS-162	A196
BA0	VSS-69	VSS-163	A197
BA0	VSS-68	VSS-164	A198
BA0	VSS-67	VSS-165	A199
BA0	VSS-66	VSS-166	A200

OB1-7A58002-I06



Internal pull-down is disabled after PLTRST#

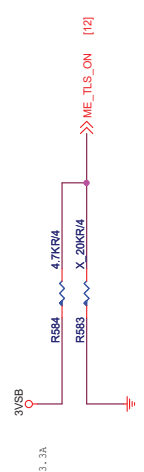
No Reboot



- 0 : DISABLE (Default)
- 1 : ENABLE

Internal pull-down is disabled after PLTRST#

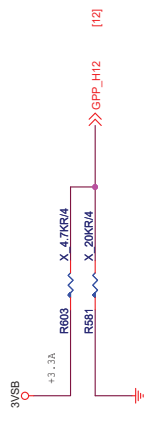
AMT and SBA with confidentiality



- 0 : DISABLE
- 1 : ENABLE (Default)

Internal pull-down is disabled after RSMRST

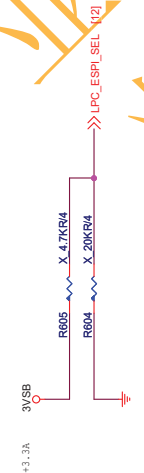
ESPI FLASH SHARING MODE



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

Internal pull-down is disabled after RSMRST

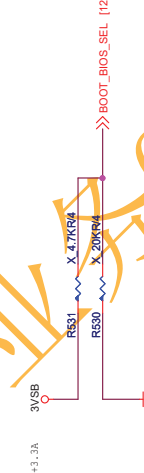
LPC eSPI Mode



- 0 : LPC
- 1 : eSPI

Internal pull-down is disabled after RSMRST

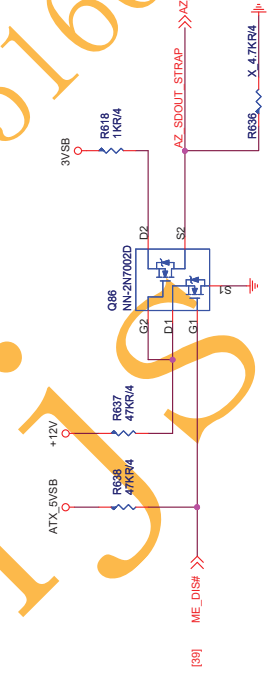
Boot BIOS

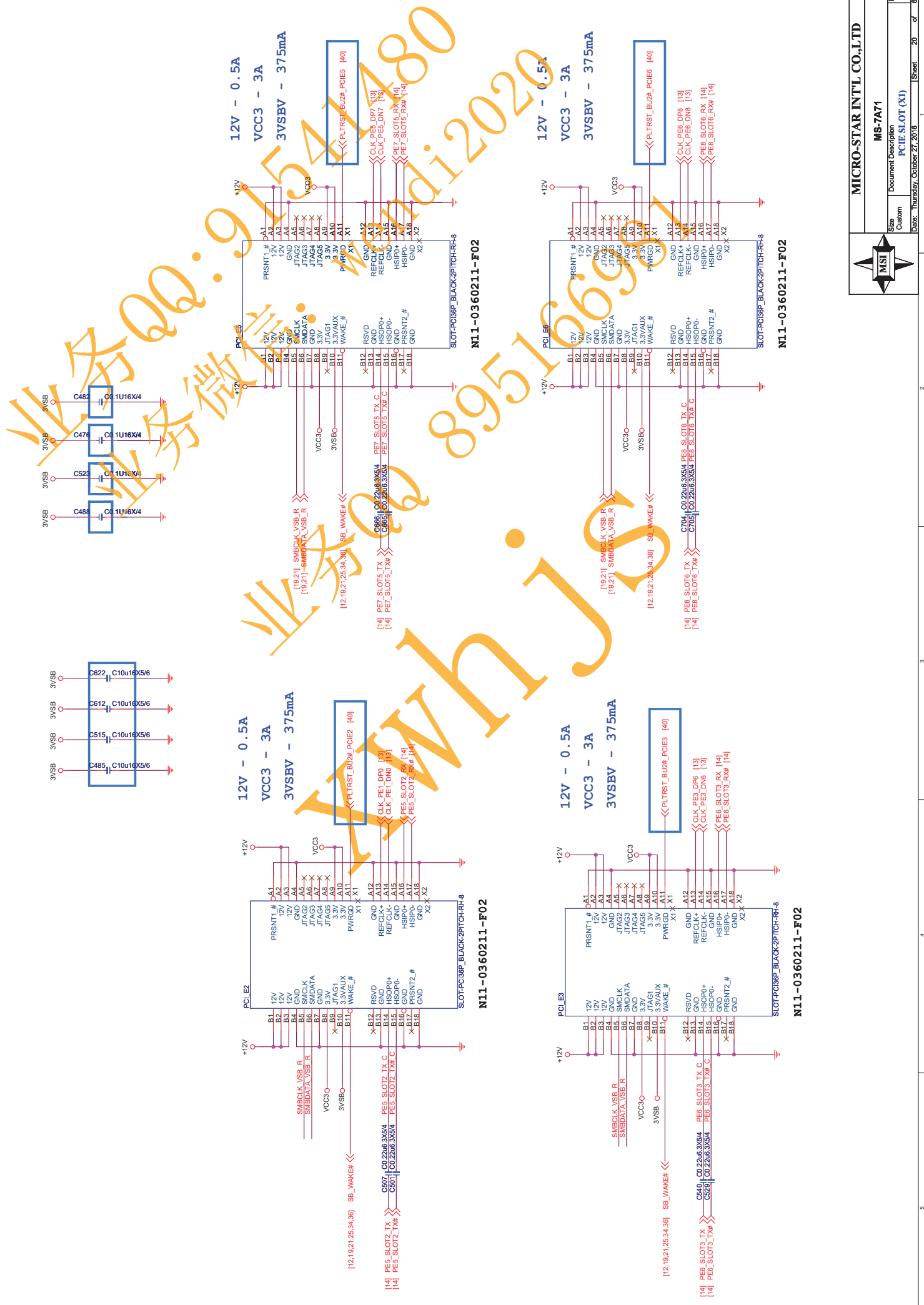


- 0 : SPI
- 1 : LPC

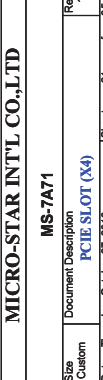
Internal pull-down is disabled after PLTRST

HDA_SDO





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

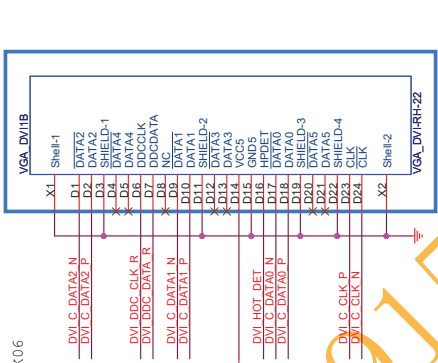


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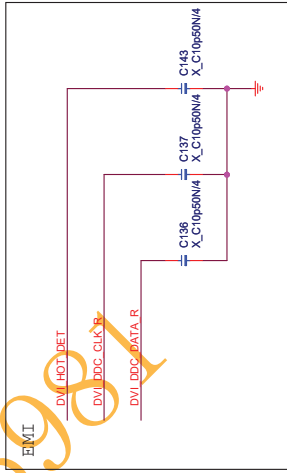
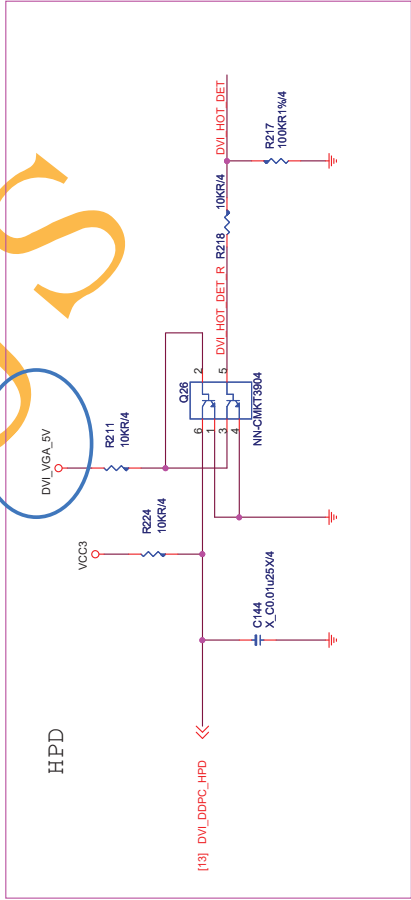
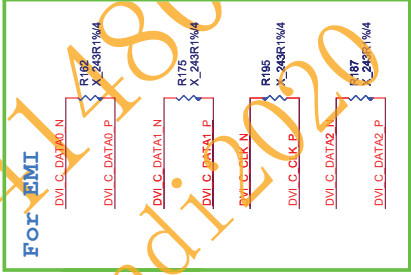
Size	Document Description
Custom	VGA - ITE6516

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

Check MSI PN
N58-39F0231-K06



N58-39F0281-C67



MICRO-STAR INT'L CO.,LTD

MS-7A71

Document Description
DVI Connector

Size
Custom

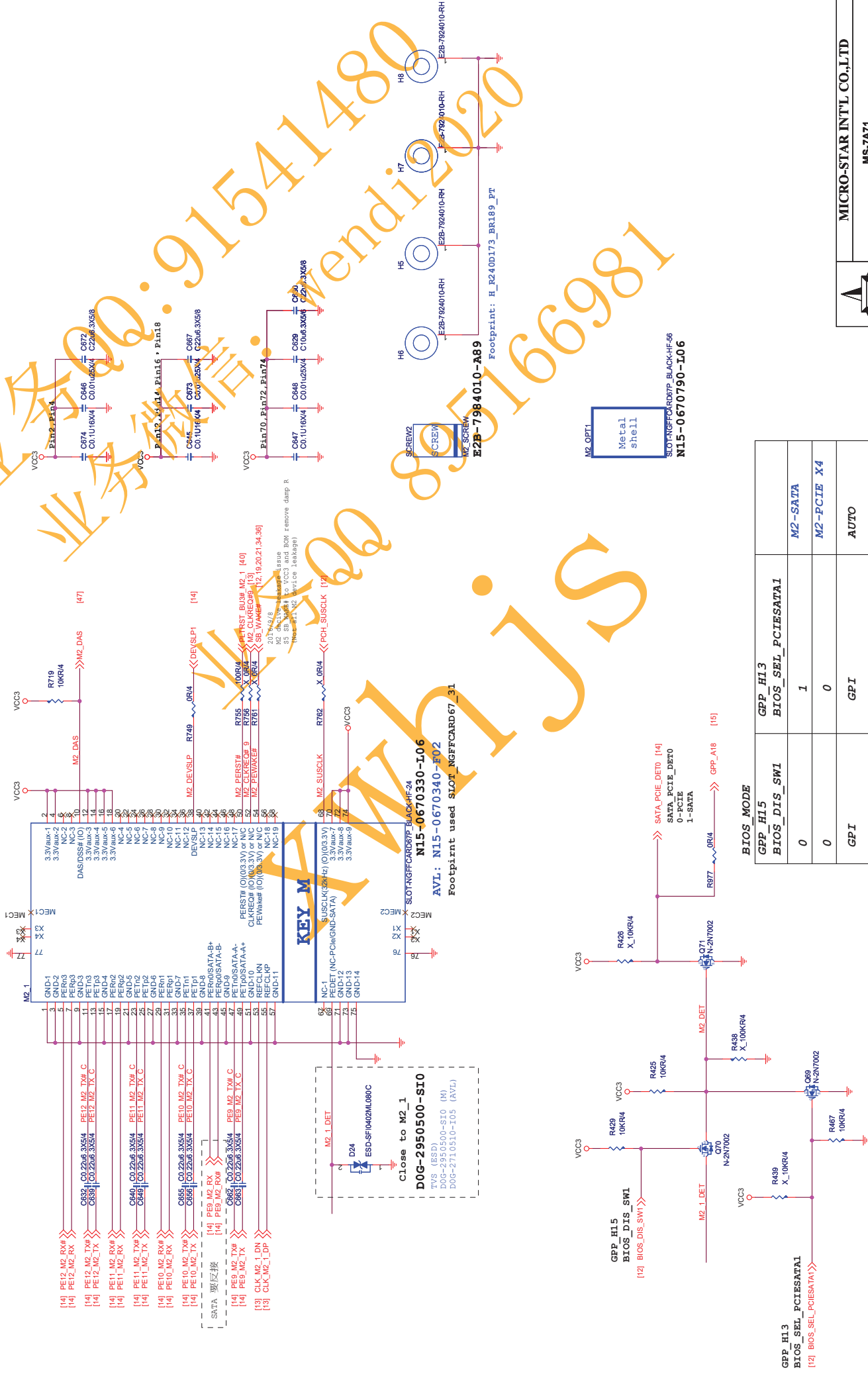
Date: Thursday, October 27, 2016

Sheet 23 of 65

Rev. 1/2



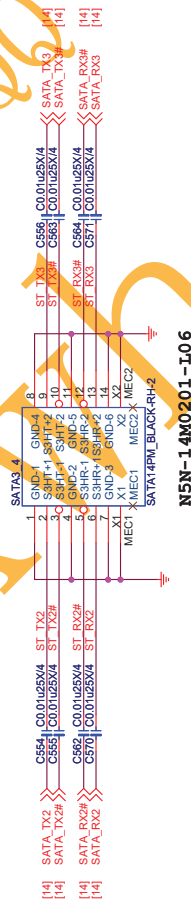
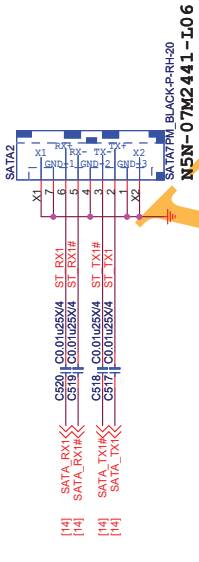
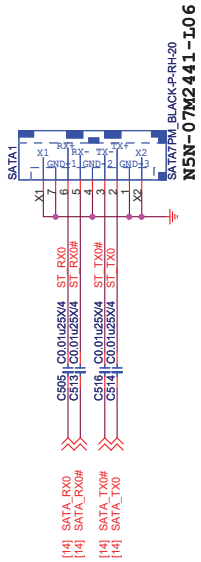
M2_1 2242/2260/2280/22110
(PCIeX4 mode and SATA mode)



业务QQ:91541480
业务微信: wendi2020
业务QQ 895166981
XWhJS

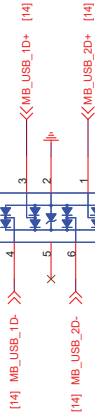
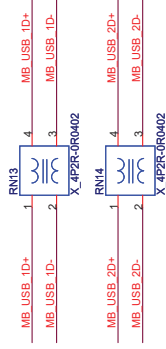
MICRO-STAR INT'L CO.,LTD	
MS-7A71	
Size Custom	Document Description NA
Date: Thursday, October 27, 2016	Rev. 1,2
1	26 of 65

业务QQ: 91541480
业务微信: wendi2020
业务QQ: 895166981



FRONT USB2.0 PORT 3,4

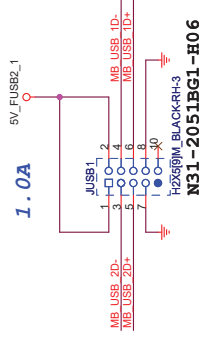
ComChoke co-lay 4P2R-OR0402
Footprint: FILTER_S4_RN4P2R_COLAY
Default ComChoke: I12-9006080-F01
4P2R-OR0402: R3C-0000012-W08



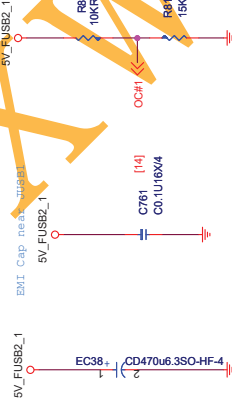
D0G-05A0529-A68

AVL: D0G-45B0510-I14

1.0A



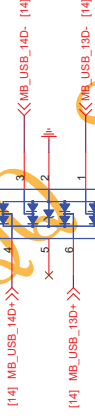
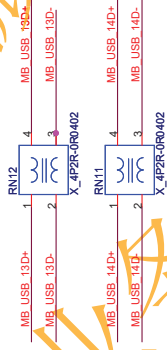
N31-2051BG1-H06



C71-47106K1-A05

FRONT USB2.0 PORT 5,6 (Z270 only)

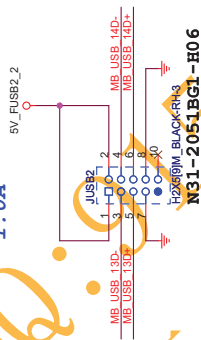
ComChoke co-lay 4P2R-OR0402
Footprint: FILTER_S4_RN4P2R_COLAY
Default ComChoke: I12-9006080-F01
4P2R-OR0402: R3C-0000012-W08



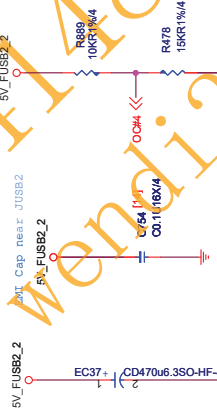
D0G-05A0529-A68

AVL: D0G-45B0510-I14

1.0A



N31-2051BG1-H06



C71-47106K1-A05



MICRO-STAR INT'L CO.,LTD

MS-7A71

Document Description
Front USB2

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USB POWER PORT 1 For USB Charging



MICRO-STAR IN



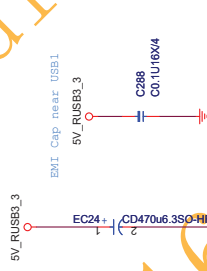
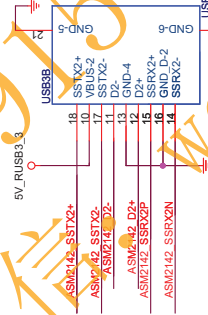
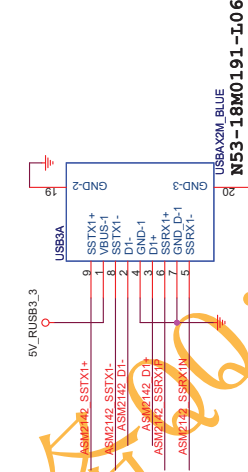
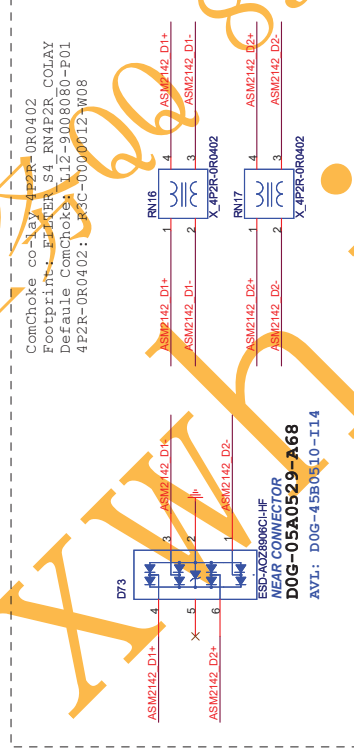
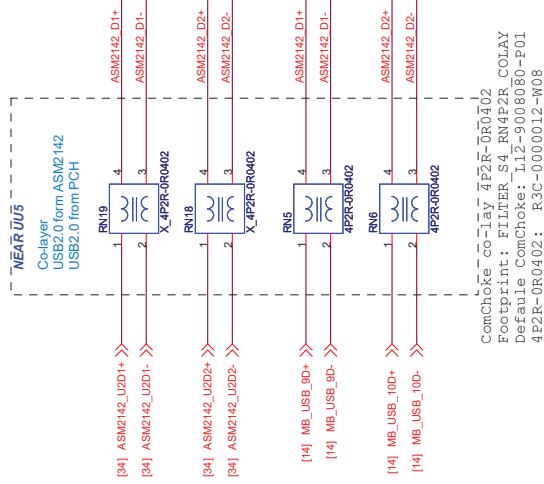
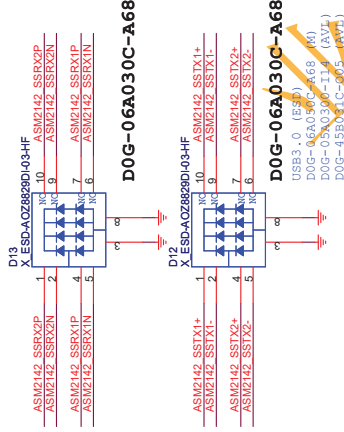
MS-7A71

Document Description
Front USB3 / CH

Size Custom	Document Description Front USB3 / CHARGE	Rev 1.2
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ESD Protection
NEAR CONNECTOR



C71-47106F1-A05

[14] OC#5

OC# signal connect to
SB OC pin.



MICRO-STAR INT'L CO.,LTD	
MS-7A71	
Size Custom	Document Description USB3.1 TYPE A CON
Date: Thursday, October 27, 2016	Rev. 1.2
Sheet 35 of 65	

3.3V@177.57mA

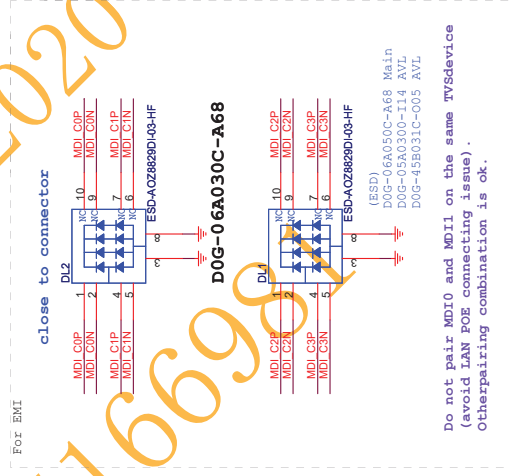
```

PIN19:
INTEL platform connect to PLT_RST#,

```



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

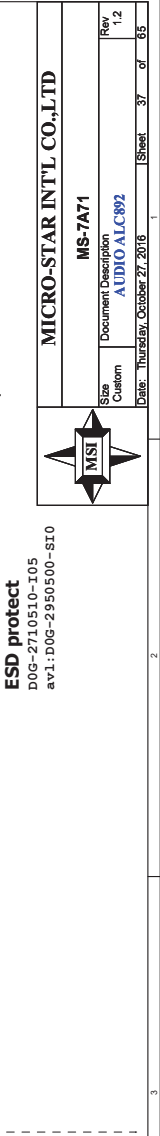
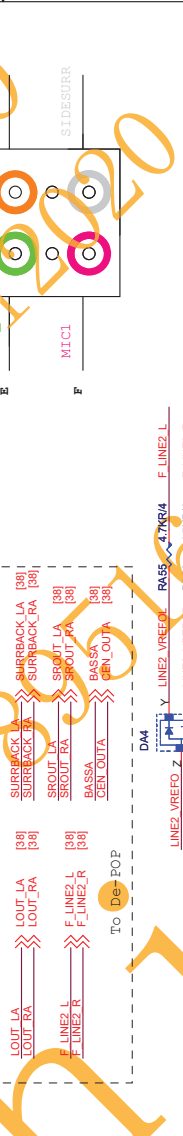
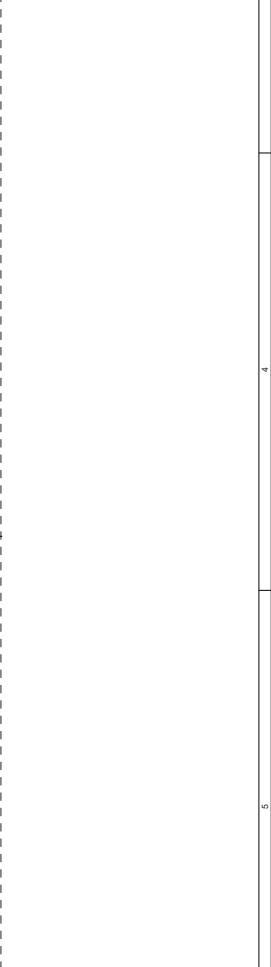
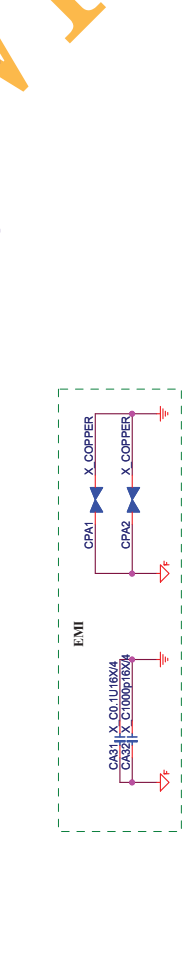


Do not pair MDIO0 and MDI1 on the same TVSdevice (avoid LAN POE connecting issue). Otherpairing combination is ok.



CA2 close to Pin25
CA4 close to Pin38
CA39 close to Pin38

CA4 close to Pin38
CA39 close to Pin38



D0G-2/10510-105
avl:D0G-2950500-SI0

Size Custom	Document Description AUDIO ALC892	MS-7A71
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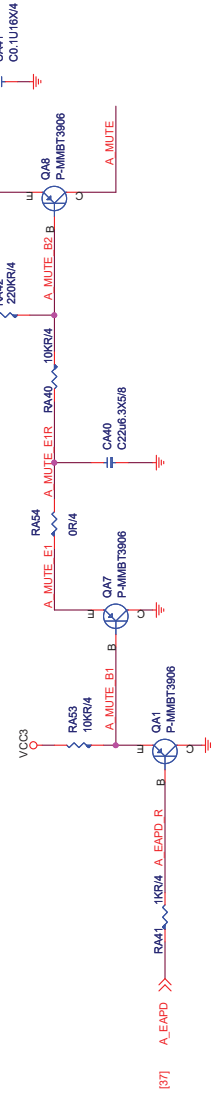
Size	Document Description
Custom	AUDIO ALC892

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

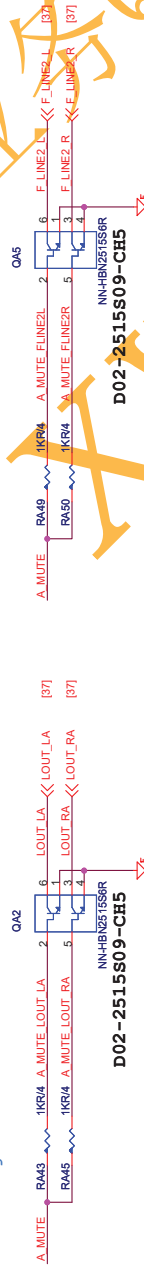
History:

2014/02/13: stuff de-pop circuit of Line out & HP out.

Digital

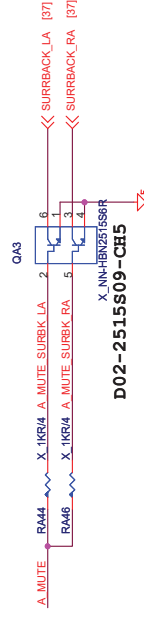
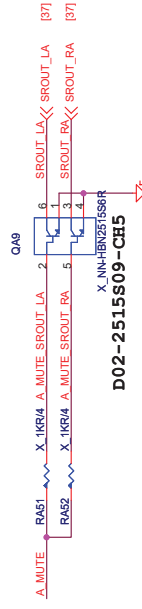
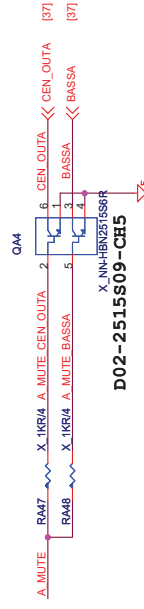


Analog



(add de-pop circuit by PM spec or customer request,
NOTE: add de-pop circuit need to change CA5,CA11, CA12, CA13, CA21, CA22 to TVS)

NOTE: add de-pop circuit need to change CA5,CA11, CA12, CA13, CA21, CA22 to TVS)



MICRO-STAR INT'L CO., LTD

MS-7A71

Size	Document Description
Custom	AUDIO AI

Size Custom	Document Description AUDIO ALC892 De-POP	Rev 1.2
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SIO HM Voltage voer 2V will not detect

D02-0390629-005

S10 VCC3



R51-0103T22-M09



N31-1020151-H06

SLP SUS Co-lay circuit



ent Description

IO-NTC6795D-2

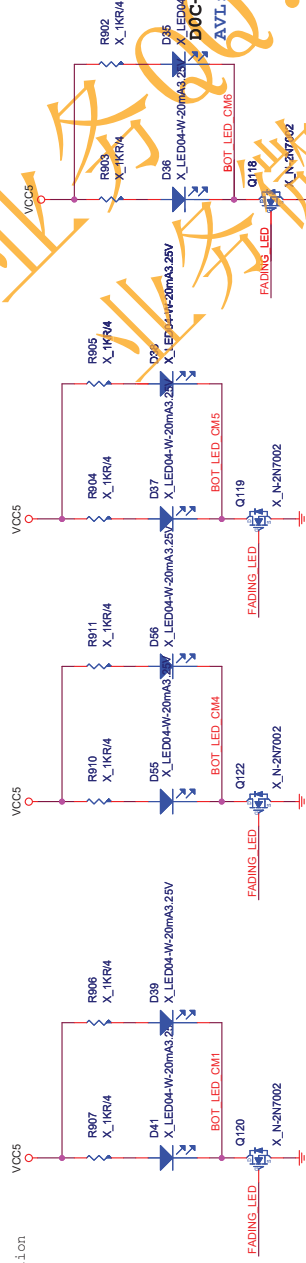
December 31, 2016

—

BOTTOM LED

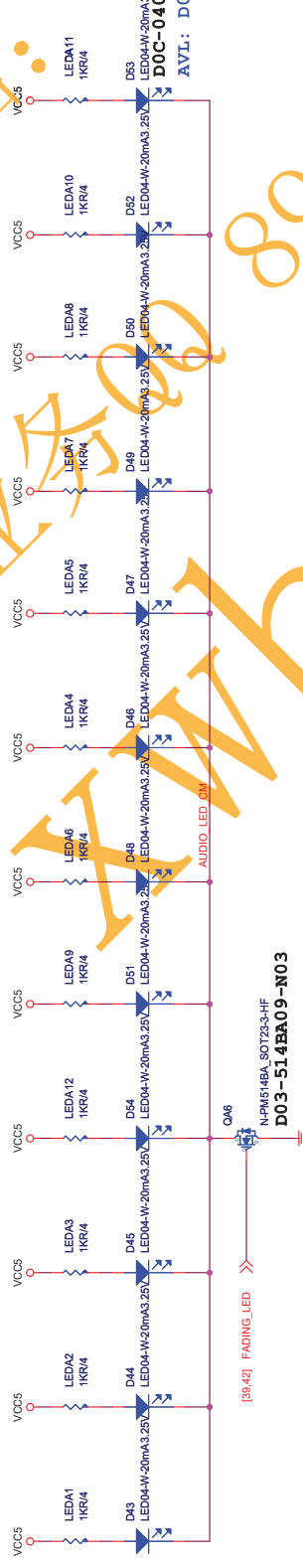
PCB bottom side Screw holes
LED White : D0C-040T300-H91 * 8pcs

2016.08.22 Remove Bottom LED function



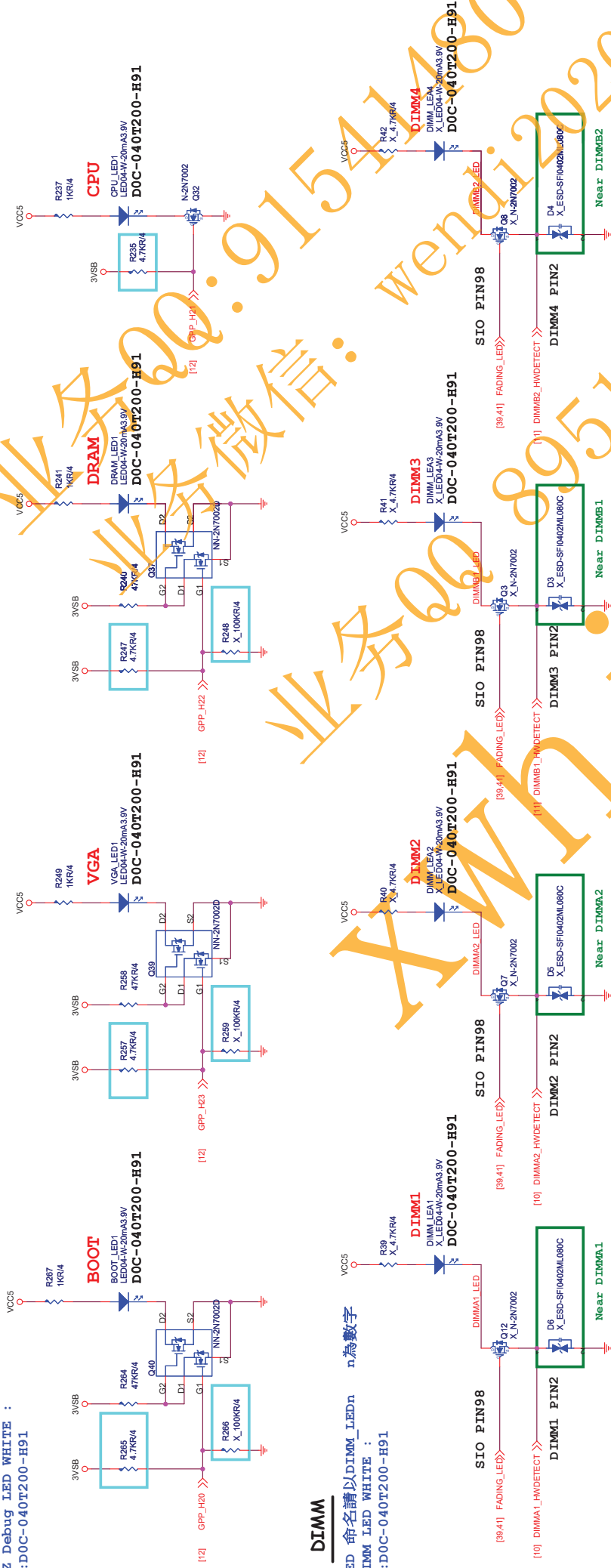
AUDIO LED

Audio Moat Line LED Red :
LED White : D0C-040T300-H91 * 12pcs
Audio moat is transparent and width 40mil



EZ Debug

EZ Debug LED WHITE :
M:D0C-040T200-H91



DIMM

LED 命名請以DIMM_LEDn n為數字
DIMM LED WHITE :
M:D0C-040T200-H91

PCIE

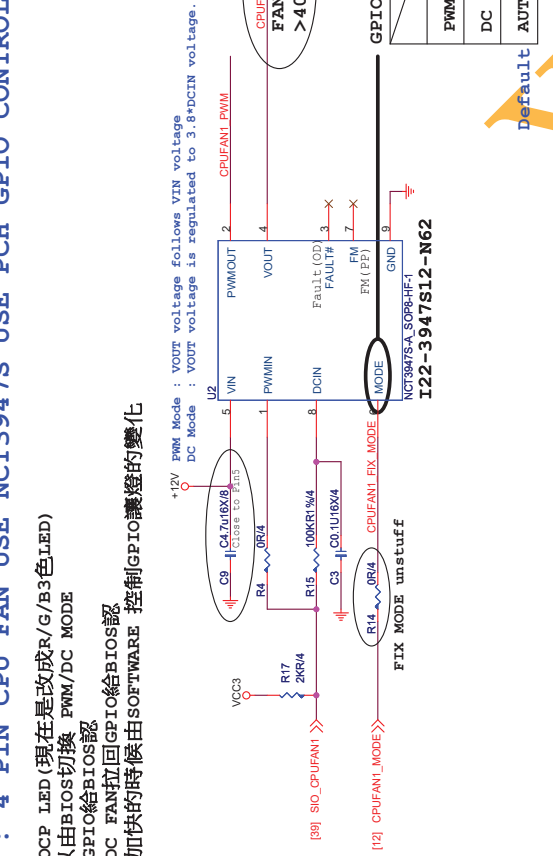
PCIE SLOT LED

PCIE SLOT LED 命名請以PCIE_LEDn n為數字
PCIE x16 紅 : M:D0C-040P100-H91 / S:D0C-040S500-E07
PCIE x4 白 : D0C-040T200-H91 / S:D0C-040S200-E07
PCIE x1 白 : D0C-040T200-H91 / S:D0C-040S200-E07

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

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

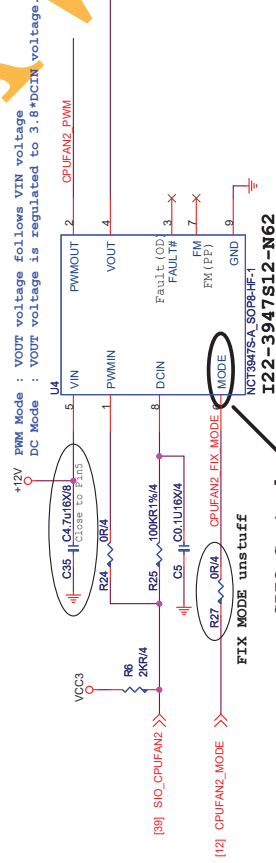
1. PWM/DC/OC LED (現在是改成R/G/B3色LED)
2. GPIO可以由BIOS切換 PWM/DC MODE
3. GPIO拉回GPIO給BIOS認
4. PWM OR DC FAN拉回GPIO給BIOS認
5. FAN轉速加快的時候由SOFTWARE 控制GPIO讓燈的變化



GPIO Control	
	PWM MODE
	DC MODE
	AUTO MODE

Default	AUTO MODE	GPI (Floating)
		Internall pull up 1.65V

TYPEK : 4 PIN CPU FAN USE NCT3947S USE PCH GPIO CONTROL FAN MODE (2A pump FAN)



GPIO Control	
	MODE (PIN7)
PWM MODE	HIGH
DC MODE	LOW
Default	GPIO (Floating)

Default

Internall pull up 1.65V	0.000000
-------------------------	----------

1.MODE : USE MODE PIN change FAN MODE(PWM or DC FAN)

- 2.FAULT : USE FAULT PIN Trigger OVT/OC Protection,LOW Atctive (Reserve NEW IC)
3.FM : USE FM PIN For BIOS USE to Detect PWM or DC FAN & Show information(Reserve NEW IC)



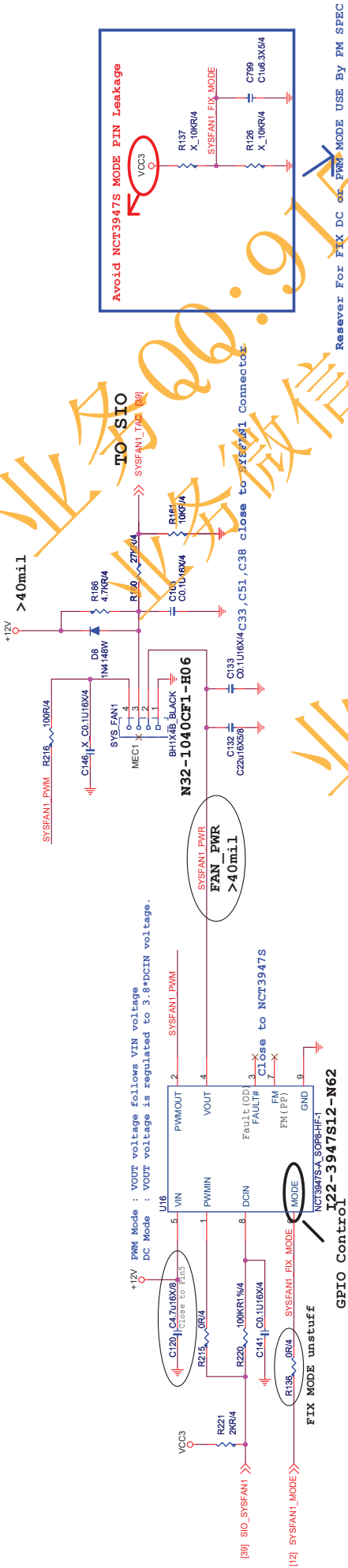
MICRO-STAR INT'L CO., LTD.

MS-7A71

Size	Document Description
Custom	CPU FAN1 / PUMP FAN1

Date: Thursday, October 27, 2016	Sheet 43 of 65
----------------------------------	----------------

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

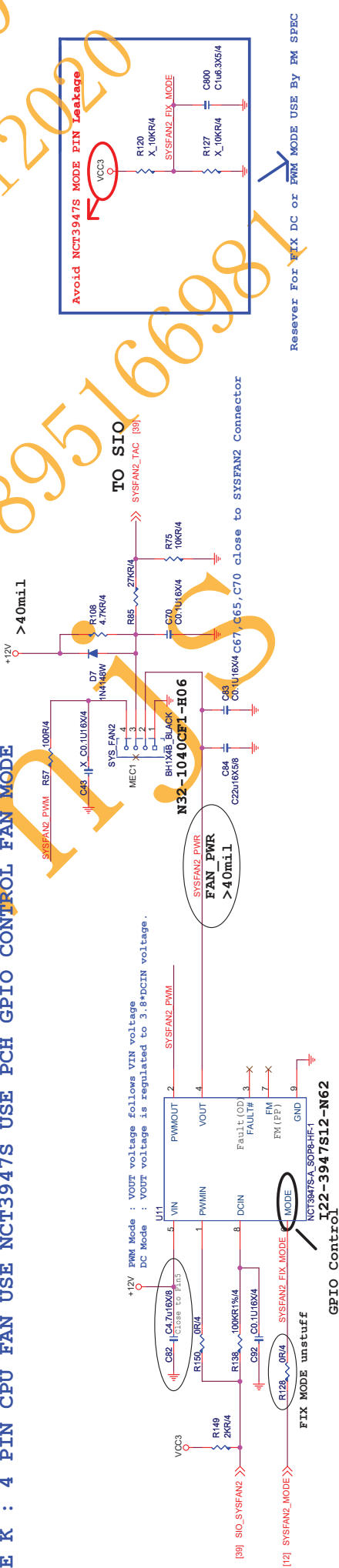


GPIO Control	
MODE (PIN7)	
PWM MODE	HIGH
DC MODE	LOW
AUTO MODE	GPI (Floating)

Default

Internall pull up 1.65V

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



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

Default

Internall pull up 1.65V



MICRO-STAR INT'L CO.,LTD

MS-7A71

Document Description
SYSTEM FAN I/2

Rev. 1/2
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Sheet 44 of 65

>40mil

+12V

D32 NM148HT

R82 47K

C79 0.1u6X4

J1-E06

VCC3

Avoid NCT3947S MODE PIN Leakage

SYSFAN_TAC [39]

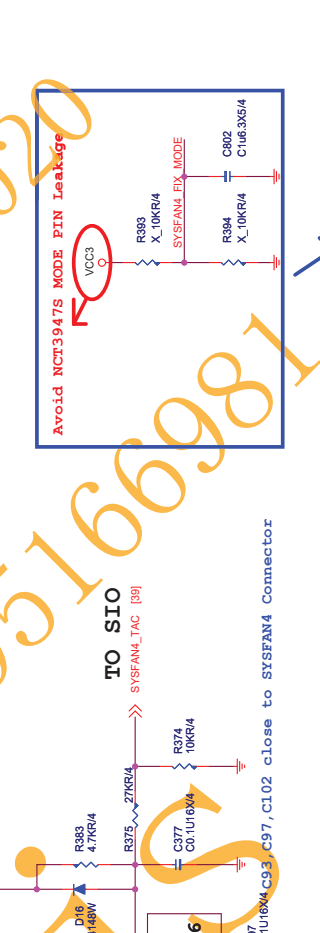
R84 10K54

C721 0.1u6X4

C90 C1u63X54

TO SIO

RESERVE FOR FIX DC OR PWM MODE USE BY PM SPEC



Default	AUTO MODE	GPI (Floating)
Internall pull up 1.65V		

AUTO MODE	GPI (Floating)
-----------	----------------

Internall pull up 1.65V

3VDSW

3VDSW



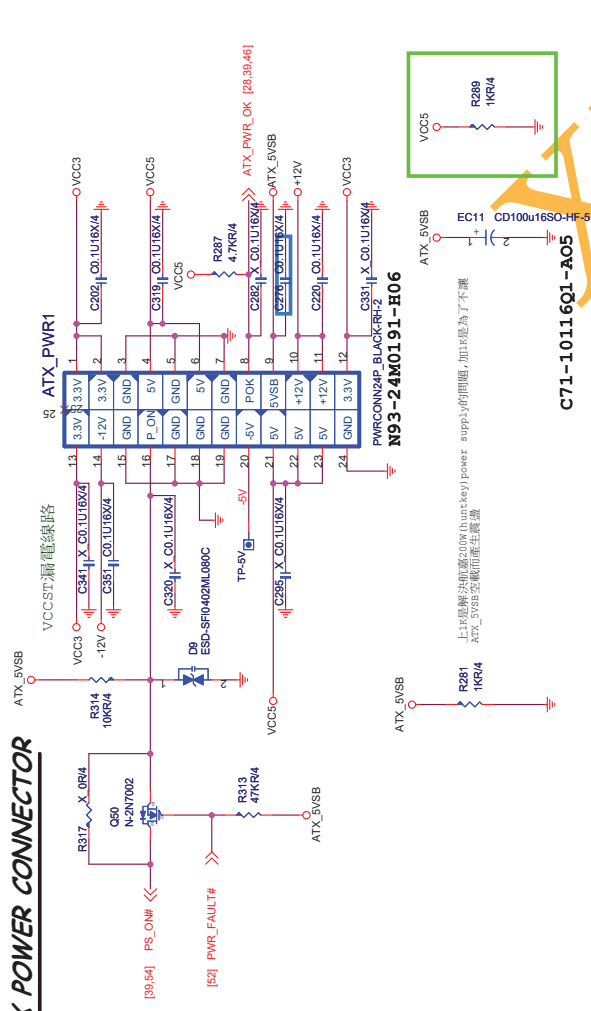
5V DIMM FOR DDR



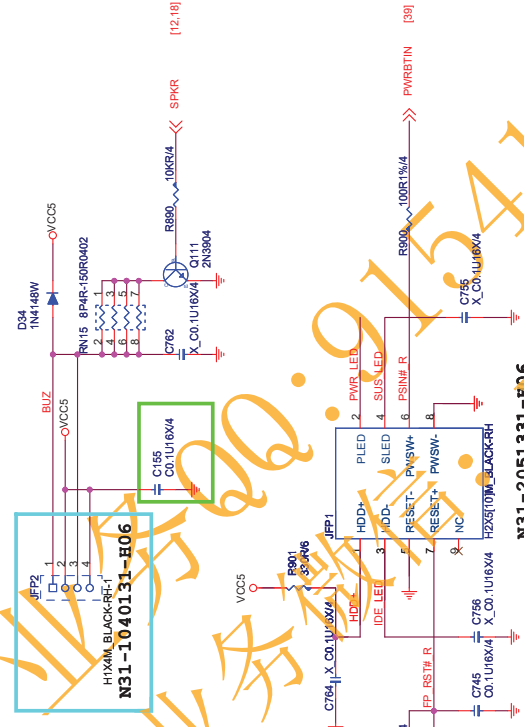
2022/02 2022/02/01

2022/02 2022/02/01

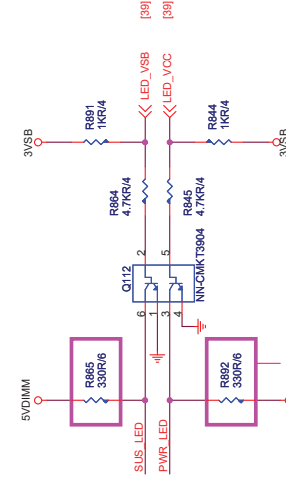
ATX POWER CONNECTOR



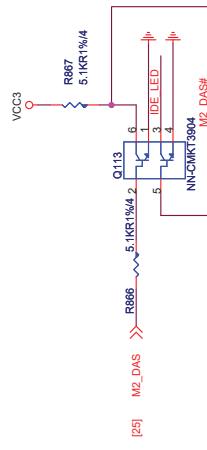
Front Panel



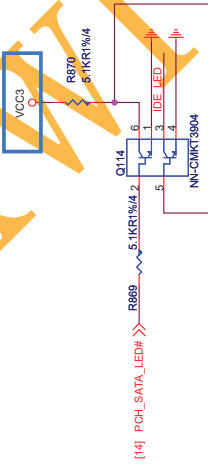
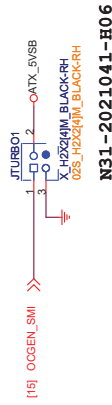
LED



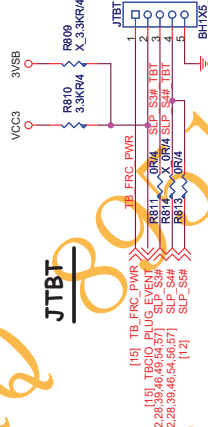
Reserve pull high to 5VDIMM if PM
don't want PRED light in deep mode



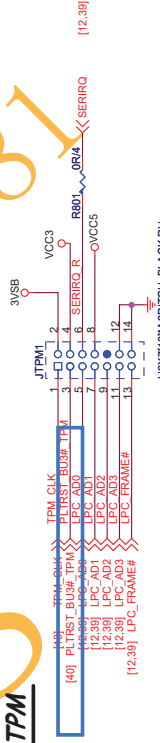
External Turbo switch pin header



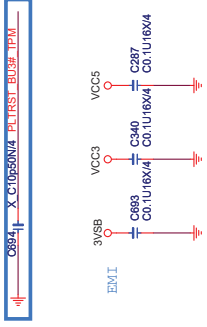
JTBT



TPM



N31-2071101-H06



MICRO-STAR INT'L CO., LTD

MS-7A71

Size Custom	Document Description ATX Power/F_Panel/JTPM/JTBT	Rev 1.2
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Rev	1.2
Doc	MSI
Size	Custom
Date	Friday, October 28, 2016
Sheet	49 of 85

2016.9.30 New RT3606 LL disable
(上件 by PM request)

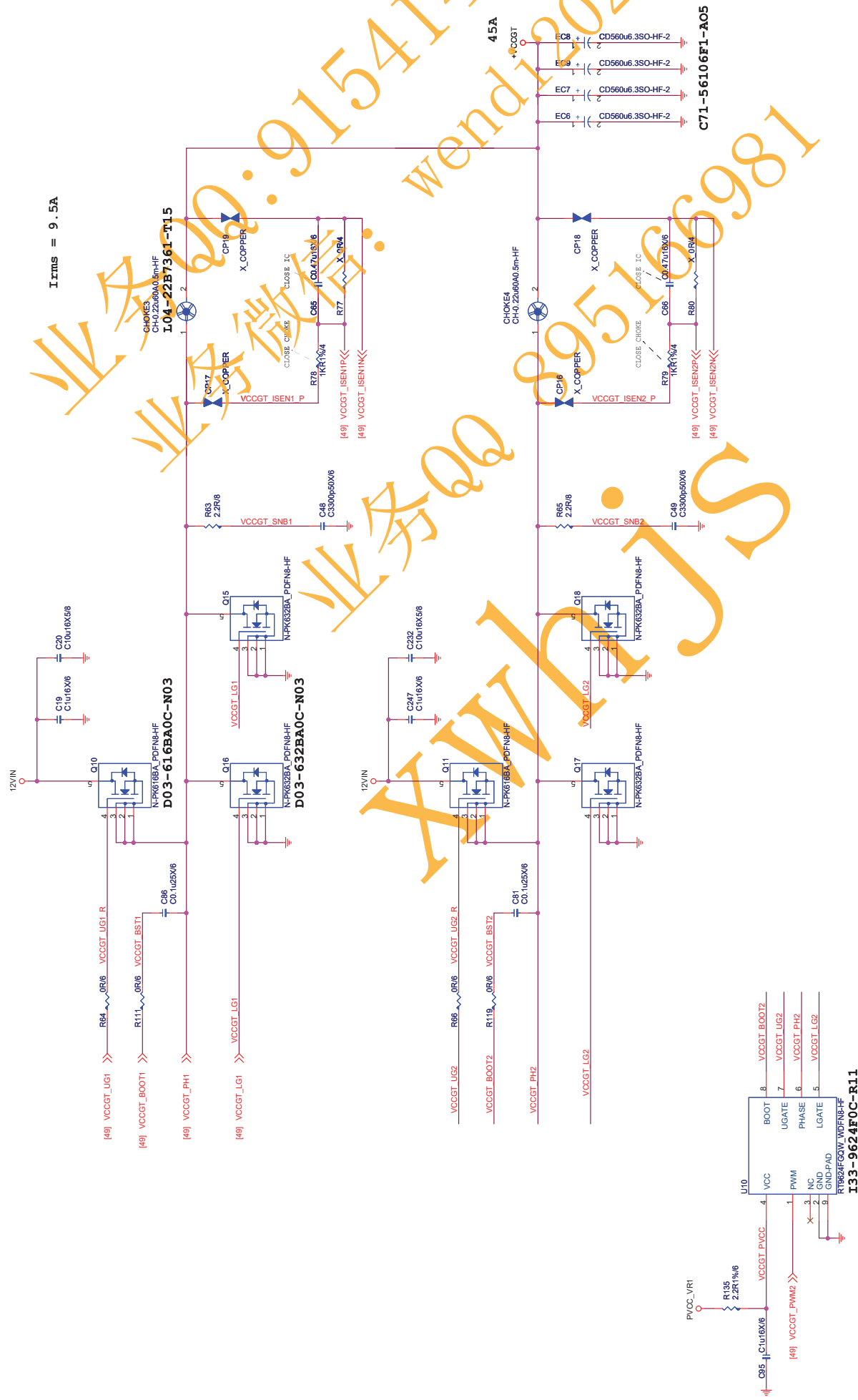
2016.8.9
Vcore: R153 = 25.5K
VCCGT: R146 = 19.6K, R123 = 46.4K, R131 = 12.1K

2016.9.6
Vcore: R167 = 422K (keep 422K), R141 = 42.2K, R155 = 10.2K, R142 = 174K
R178 = 8.66K, R168 = 732K (keep 715K), R145 = 82.5K, R156 = 21.5K
VCCGT: R137 = 365K, R147 = 5.43K, R68 = 36.3K, R143 = 121K, R132 = 12.1K
R62 = 8.66K, R36 = 732K (keep 715K)

2016.10.27
Vcore: R153 = 24.3K, R133 = 12K, R148 = 5.1K, R124 = 10.2K
Vcore: R182 = R191 = R179 = 910K, R171 = R169 = R180 = NC
VCCGT: R116 = 31.6K, R78 = R79 = 1K

J1 no CPU boot for manufactury.





2016.6.16
Over Current Protection change used I71-6273A09-U33
Pin3 FLAG# power change to ATX_5VSB



```
Vmon = ( Iin x Rmon x Rdc ) / Rcsn
Vmon=1.2V, Iin = 15A, Rcsn = 86.6R
Rdc = 0.58m ohm ( DCR of the input inductor )
--> Rmon = 11.94mR
```

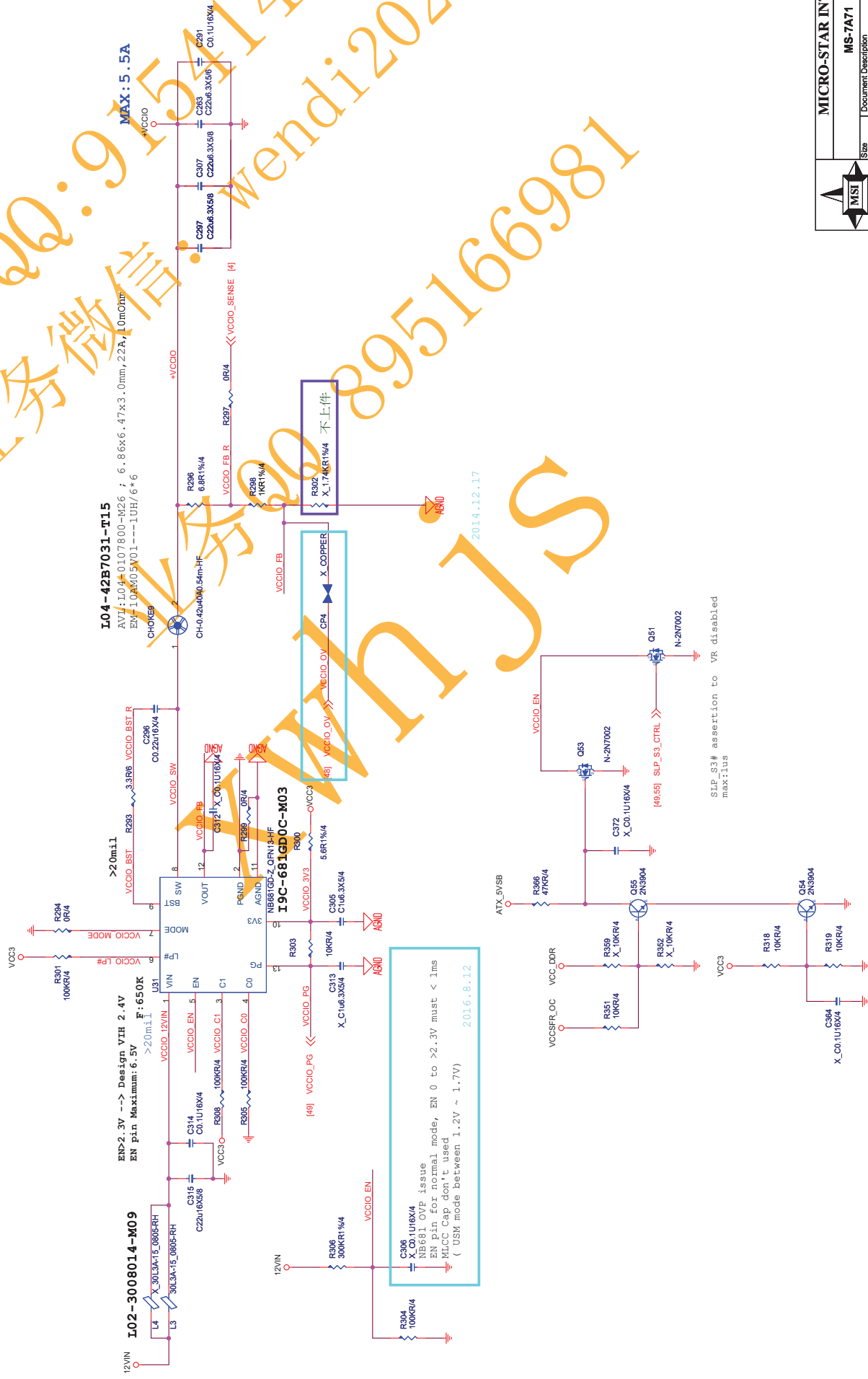
$$V_{mon} = 1.2V, \quad R_{csn} = 86.6\Omega, \quad R_{dc} = 0.58m\Omega$$
$$I_{in} = (1.2 * 86.6) / (11.8K * 0.58m) = 15.18 A$$

2. $R_{\text{mon}} = 8.2 \text{ KR}$



TI TATT-8 5~94

	IP#	CI	C0	VOUT (V)
VCCIO	0	X	X	0
	1	0	0	0.85
	1	0	1	0.875
	1	1	0	0.95
	1	1	1	0.975



MICRO-STAR INT'L CO., LTD.

MS-7A71

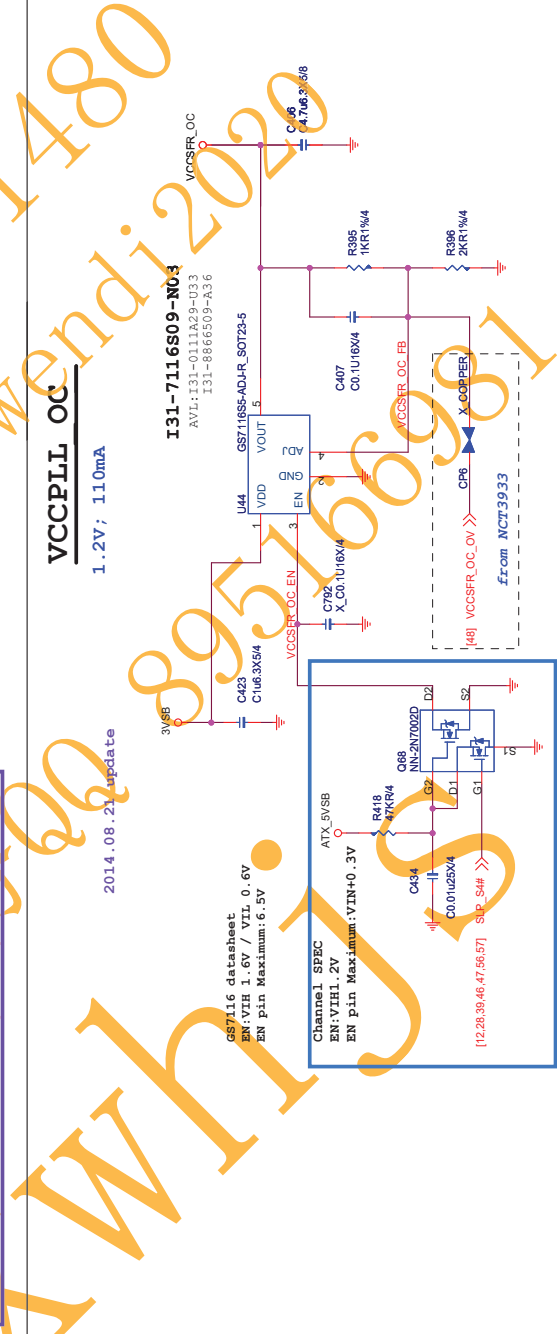
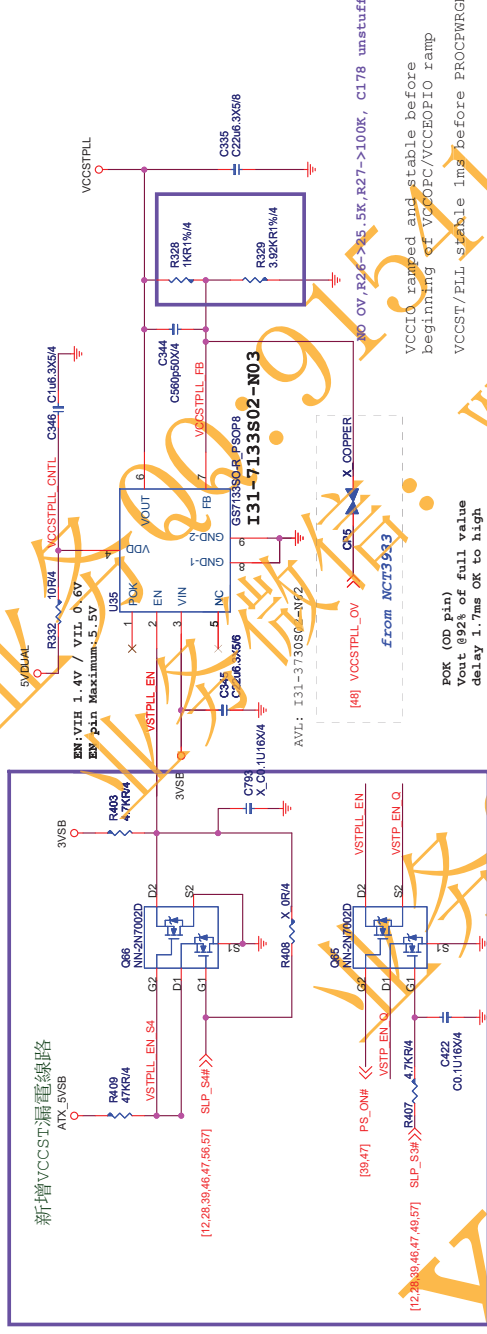
Size Custom	Document Description CPU
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Size Custom	Document Description CPU PWR VCCIO - NB68IG	Rev 1.2
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VCCSTPLL

for Gaming3/5, Classic, ECO and H110

1.0V; 250mA
For Cost down VCCSTPLL merge



MSI	
Size	Custom
Document Description	CPU PWR_ST/PLL
Rev	1.2
Date	Friday, October 28, 2016
Sheet	54 of 85

MICRO-STAR INT'L CO.,LTD

MS-7A71

SA Power:1.05V,12.3A

Rocpset:5.49K

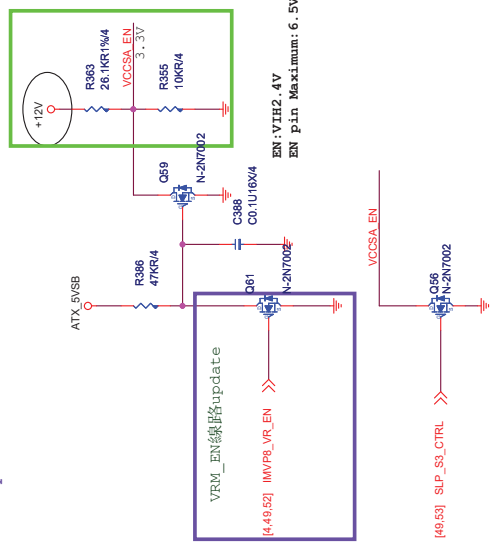
OCp=Rocset*Rdson(Low side)/10uA
=7.32K*2.5mohm/10uA
=18.3A

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

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

2014.08.21 update

Pull up by layout&check level



SLP_S3# assertion to VCC, VCCGT, VCCIO and VCCSA rails completely off.

SLP_S3# assertion to VR disabled max:1us

I02-3008014-M09

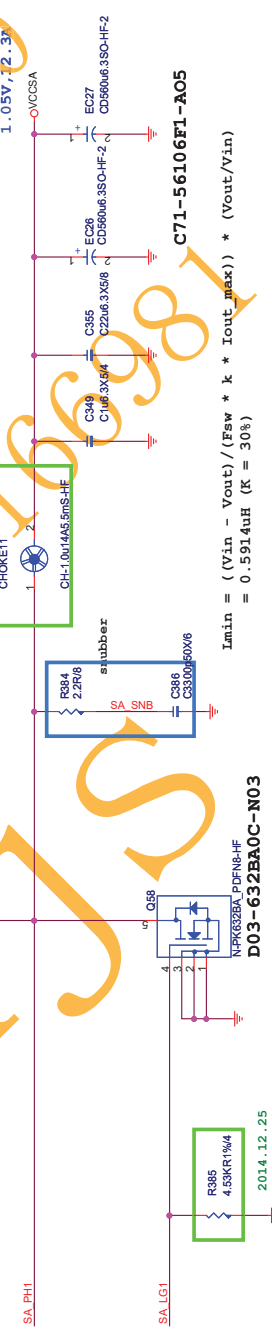
$$I_{rms} = I_{out} * \sqrt{((V_{out}/V_{in}) * (1 - (V_{out}/V_{in})))}$$
$$= 1.8 * 0.2825$$
$$= 0.5086A$$



Footbridge: CH1-1H2525CZ01

D03-616A0C-N03

I04-0107350-M26



D03-632BA0C-N03

2014.12.25
for up1540:R417 no stuff
2016.8.9
4.53K for OCP=18.3A

$$L_{min} = ((V_{in} - V_{out}) / (F_{sw} * k * I_{out_max})) * (V_{out}/V_{in})$$
$$= 0.5914uH \quad (K = 30\%)$$

C71-56106F1-A05



MICRO-STAR INT'L CO.,LTD

MS-7A71

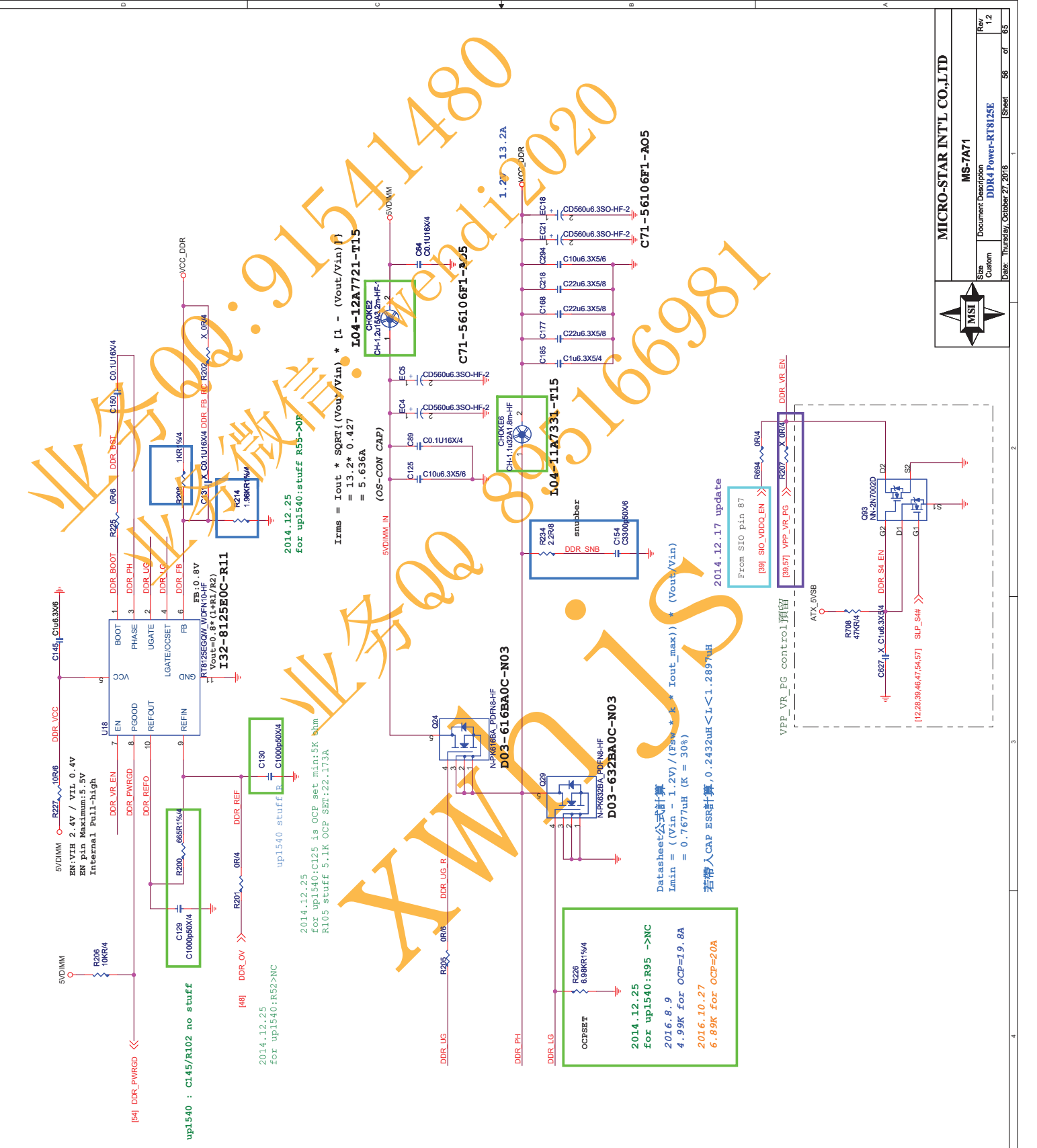
Size	Document Description	Rev
Custom	CPU PWR SA-RT8125E	1,2
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DDR4_1.2V 2.5A+9.5A+1.2A=13.2A
 2.5A FOR CPU
 9.5A FOR 4DIMM
 1.2A FOR DDR VTT

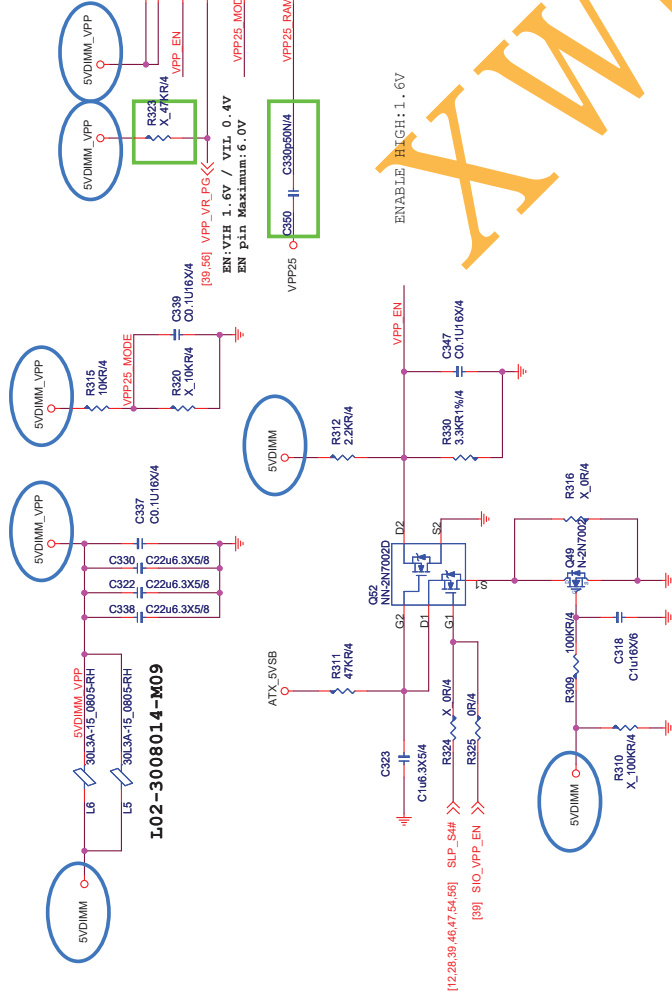
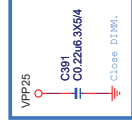
OCp = 13.2A * 1.5 = 19.8A
 Rocs(R3) = OCp * Rdson (Low side) / 2 / 10uA
 = 19.8A * (4.6/2)mohm / 10uA
 = 4.95kohm < 5K ohm

Rocpset: 4.3K
 OCp = Rocset * Rdson (Low side) / 10uA
 = 4.75K * 4.6mohm / 10uA
 = 21.85A

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

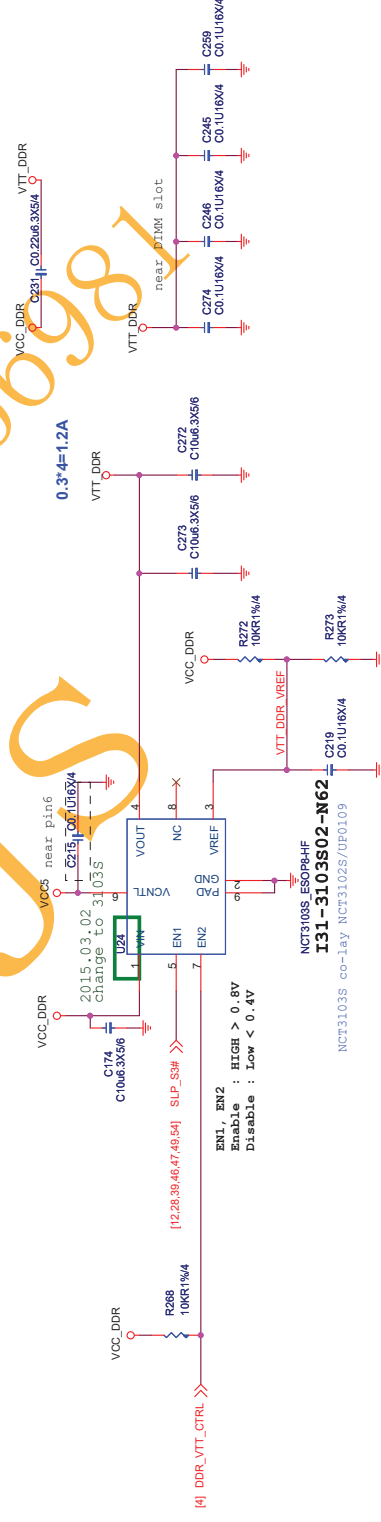


VPP25 Power
2.5V; 2.24A



To make sure VPP EN after 5VDIMM stable

DDR VTT Power



PCH 1VSB

1.0V; 11A

OCp = 16.69A

OCp = 10uA*7.68K / 4.6 mohm
= 16.69 A

Rocs: 7.87K, OCP:

D03-4C05N03-O05 : 15.74A
D03-632BA0C-N03 : 17.1A
use UBIQ MOS need Check

EN_VTH 2.4V / VIL 0.4V
EN pin Maximum: 5.5V
Internal Pull-high

2014.08.21 update

2014.12.25

For up1540:C236&R204 ->NC

2014.12.25

For up1540:C193 is OCP set min:5kohm
R185 stuff 7.87K OCP SET:15.74A

[48] PCH_CORE_OV

to sink/source over voltage IC.
pin10 sink/source current capability can't over 1mA
So max voltage can't over 1.8V.

from NCT3933

$$\begin{aligned} V_{out} &= V_{ref} * (1 + R821/R822) \\ &= 0.8 * (1 + 1K/3.92K) \\ &= 0.8 * 1.2551 \\ &= 1.004V \end{aligned}$$

0728: Change net name

0502 : Stuff R when NO PCH_IP8 & V_OPC_IP8

Rds(on (low side mosfet) 4.5V
D03-3116M00-U47 : 3.6 mohm
D03-632BA0C-N03 : 4.6mohm
D03-3056M00-U47 : 6.2mohm

I04-47B7730-T15 for OC, Gaming 10, 9, 7, 5
I04-12A7321-L65 for Gaming 3, SUII, ECO
I04-12A7721-T15 for cost down

I02-3008014-M09

too Big

MAX: 10.664A

C71-56106F1-A05

D03-616BA0C-N03

I32-8125E0C-R11

L04-01073F0-M26

2016.08.15
change used
I04-01073F0-M26

AVL: I04-0107800-M26

D03-632BA0C-N03

PLACE UNDER THE PCH
X_COPPER

C71-56106F1-A05

$$\begin{aligned} I_{min} &= ((V_{in} - V_{out}) / (F_{sw} * k * I_{out_max})) * (V_{out} / V_{in}) \\ I_{min} &= 0.8335uH (K = 30\%) \end{aligned}$$



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PCH Core Power-RT8125E

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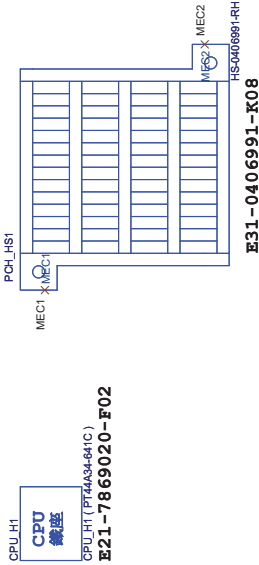
PCB



PK0-07A7111-E48

PK0-07A7111-E48, 寶安恩斯邁廠 (MSIS)
PK0-07A7111-G37, 寶安恩斯邁廠 (MSIS)

CPU Socket metal sheet



BIOS Label



G51-M1SPXXA-A09

USB3.1 Label



G51-M1SPG42-Q13

MARKET Label 1



Channel Z270-A PRO



G51-M1SPG62-Q13

MARKET Label 2

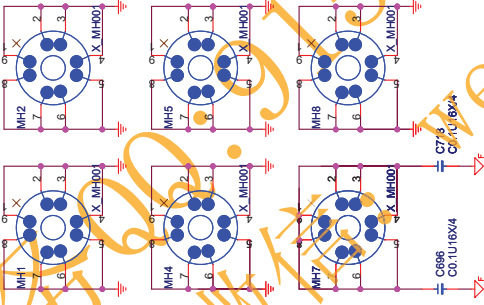


MKT Channel Z270-A PRO



G51-M1SPK63-Q13

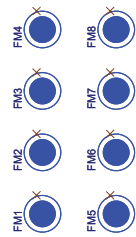
Mounting Holes



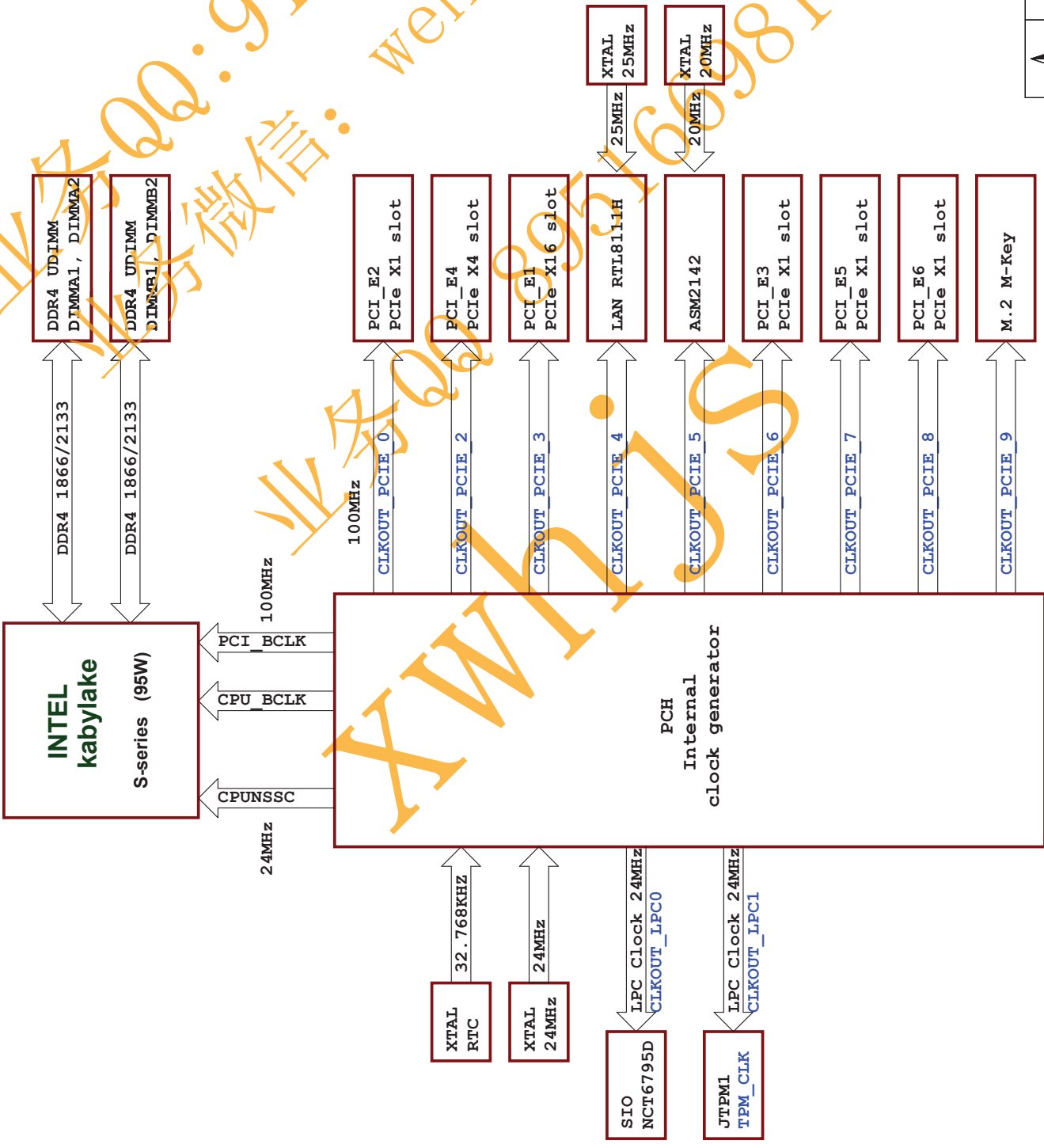
Simulation



Optical Fiducial Marks-120



CLOCK MAP



ALL GPIO SUPPORT SCI

GPP_XX	DEFUALT	NMI/SMI
GPP_B14	GPO	Y
GPP_B20	GPI	Y
GPP_B23	GPO	Y
GPP_C22-23	GPI	Y
GPP_D0-4	GPI	Y
GPP_E0-8	GPI	Y
GPP_I0-3	GPI	Y

3.3V
GPP_I0~I10
GPD0~11

1.8V or 3.3V
GPP_A0~A23
GPP_B0~B23
GPP_C0~C23
GPP_D0~D23
GPP_E0~E12
GPP_F0~F23
GPP_G0~G23
GPP_H0~H23

业务QQ: 91541480

业务微信: wendi2020

业务QQ 895166981

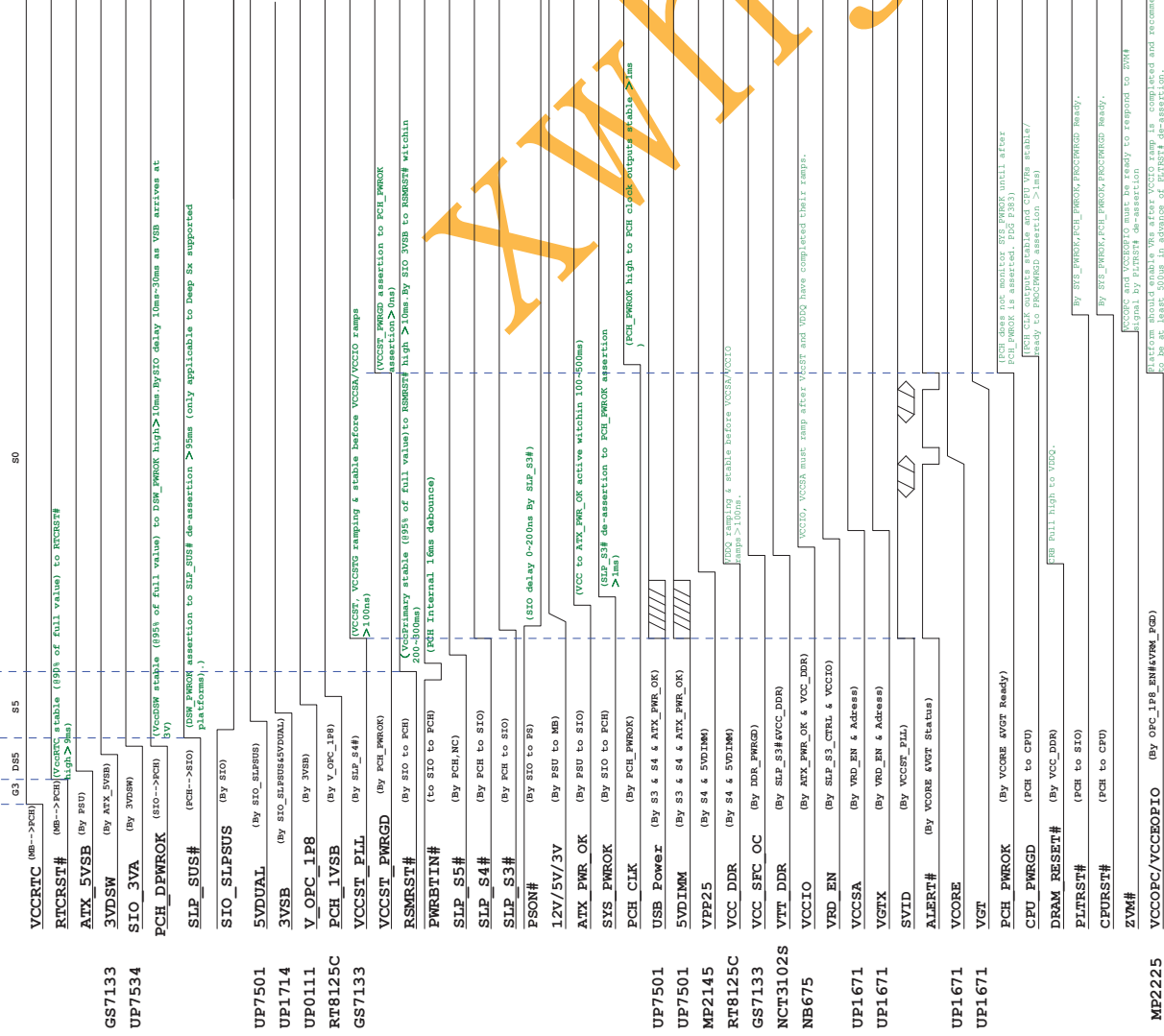
XwhjS



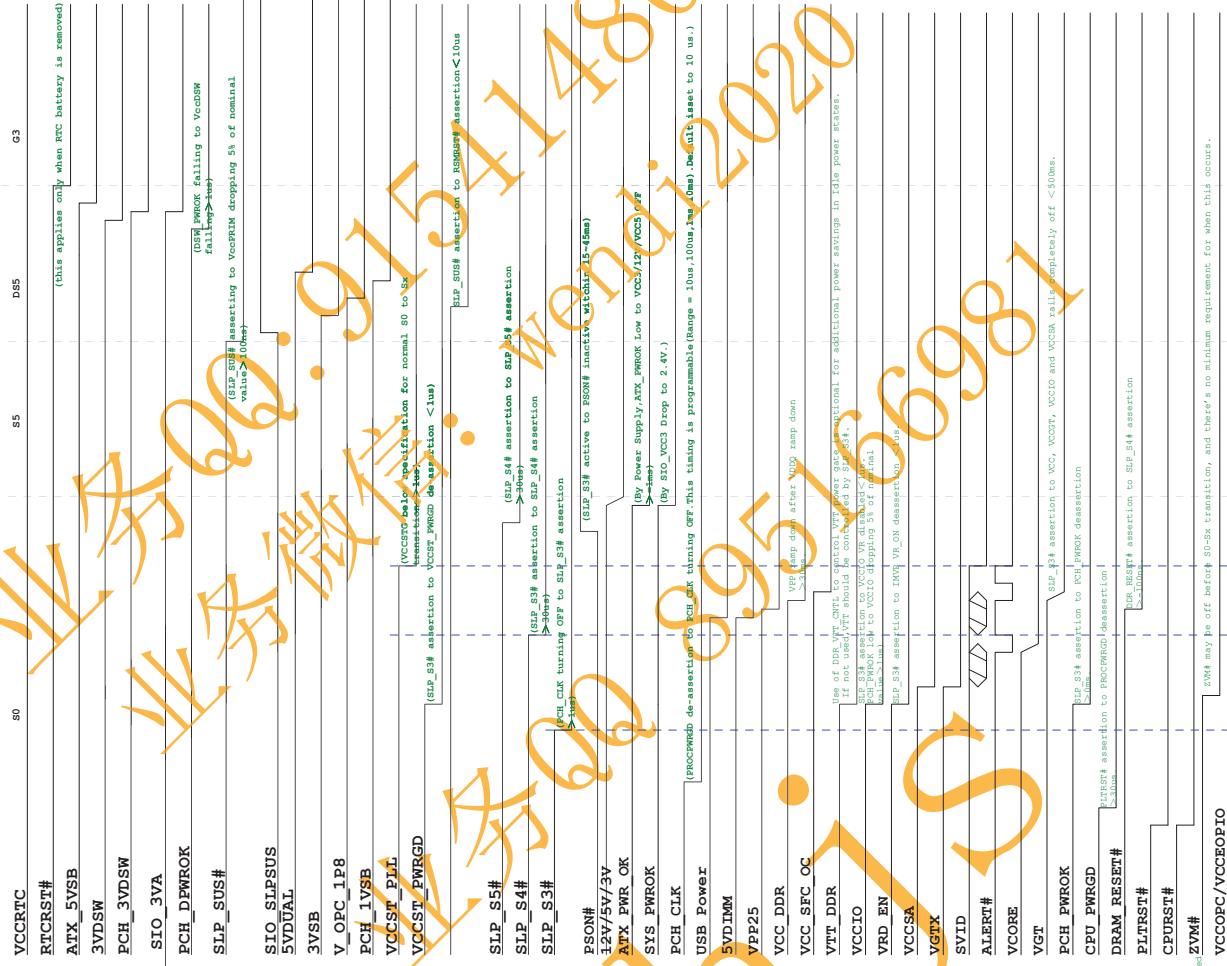
Power Delivery



Power On Sequence



Power Down Sequence



MICRO-STAR INT'L CO., LTD.

MS-7A71

Document Description

Power Sequence

Rev. 1.1

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MS-7A71 Revision History List

Ver.	DATE	Schematic Change List	
0A	2016.7.26 2016.9.8	MS-7A71 base-on MS-7A72-0A MS-7A71-0A don't gerber out	
1.0	2016.9.8 2016.9.13 2016.9.14	MS-7A71-10 Gerber out. No generation 7A71-1.0 NEW BOM, and revision	
1.1	2016.9.19 2016.9.22 2016.9.23 2016.9.30	SCH : LAN change used RTL8111H MS-7A71-1.1 Gerber out. Create 7A71-1.1 NEW BOM (01S, 02S, 03S) BOM : JLED, OCP1 issue remove JLED_OCPI, Q123, R849, R965 BOM : +12VIN OCP set 21A, R10 change used 8.2KR1%0402 BOM : RT3603 LL disable remove C75, C80, C88, C94, C100, C118, Q22, Q23, R107, R125, R134, R183 BOM : Remove R66 and add R658 10KR0402 for 03S ASM2142 new BIOS. BOM : Add MOS heatsink MOS-H_HS1 E31-0504200-K08 and MOS-W_HS1 E31-0504220-K08 BOM : Add MKT Label G51-M1SPK62-Q13 for 01S and G51-M1SPK63-Q13 for 02S BOM : 01S remove bottom LED function. Parts remove D35,D36,D37,D38,D39,D41, D55,D56,Q118,Q119,Q120,Q122,R902,R903,R904,R905,R906,R907,R910,R911 BOM : 01S & 02S remove DIMM LED function. Parts remove D3,D4,D5,D6, DIMM_LEA1,DIMM_LEA2,DIMM_LEA3,DIMM_LEA4,Q3,Q7,Q8,Q12,R39,R40,R41,R42 BOM : 01S & 02S remove PCIe LED function. Parts remove PCIE2_LED2,PCIE2_LEDW1,PCIE4_LED4,Q72,Q73,Q88,R434,R435,R678 BOM : U58 P/N change used B02-6795D04-N62 and R609 change used R11-7681T12-W08 BOM : UU5 P/N change used B02-02142C-AD0 BOM : 80 port E18 issue, PCH PLL power C491,C498 change used C11-2267313-T04 and C492 change used C11-1067313-W08 BOM : D64, D65 change used D0G-45B0510-114 and add AVL D0G-0200529-A68, D0G-05A0529-A68 BOM : D12,D13,D66,D67,D69,D70,D71,DL1,DL2,U23,U28,U41,U43,U49,U50,U30,U32 change used D0G-06A030C-A68 and add AVL D0G-05A0300-114, D0G-45B031C-005	Page. 36 Page. 41 Page. 52 Page. 49 Page. 12 Page. 61 Page. 41 Page. 42 Page. 42 Page. 39 Page. 34 Page. 46
(004)	2016.10.12	SCH : DP no display issue the net swap TX0 and TX2 of CPU side. SCH : Audio issue LA1 source change to ATX_5VSB SCH : UA1 pin9 CA42, CA43 power change to 3VSB SCH : M2_1 PCIe and SATA mode detect add R977 0R0402 link to GPP_A18 SCH : RT3606 LL disable circuit modify the add Q127, C806, C807 JLED SCH : Delete circuit LOCP_FLTID# Q123, R965 and SCH : Delete JLED_OCPI LED and the R849 change used 100KR0402 link to LOCP_FLT#. SCH : C746 change used Clul6X0603 SCH : Add LED default red color circuit the add R971, R972, R973, R974, R975, R976	Page. 5 Page. 37 Page. 15,25 Page. 49 Page. 41
1.2	2016.10.24	BOM : 02S add R883 for JTURBO1 OC switch BOM : 02S add Q84 and remove JEXT_TR1 BOM : 01S, 02S footprint size issue the F3 change used D08-2000400-P16 [Power solution BOM modify] VCORE: R182, R181, R179 change to 910 ohm for RC match Remove R171, R169, R180 to NC for IMON R133 to 12K, R148 change to 5.1K, R124 to 10.7K for IMON loadline R153 Change to 24.3k VCCGT: R78, R79 Change to 1K for RC match R116 Change to 31.6K for IMON PCH: R726 change to 5.62K for OCP17.8A DDR: R226 change to 6.98K for OCP 20A	Page. 15 Page. 14 Page. 28 Page. 50 Page. 49 Page. 49 Page. 51 Page. 58 Page. 56

Ver.	DATE	Schematic Change List

MS-7A71 BOM List

Schematic Cfg	ERP NO.	Remark
CFG-7A71Z-0A	NA	Do not gerber-out
CFG-7A71Z-10	NA	Z270 for channel
CFG-7A71Z-11	601-7A71-01S	Z270 for channel
CFG-7A71Z-MCJ	601-7A71-02S	OPT:A Z270-S for MCJ
CFG-7A71Z-FULL	601-7A71-03S	OPT:B Z270 for full function
CFG-7A71Z-12	NA	Z270-Profior channel



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Revision History

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