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# MS-7A62

ATX 304.8mm*225mm

Ver: 1.0

## Intel -Kabylake plamform

### CPU:

*kabylake-S*

### System Chipset:

*Z270/H270/B250*

### Onboard Chip:

*HD Audio Codec:ALC1220*
*LAN:Killer E2500 colay E2400*
*SIO:Nuvoton 6795*
*Flash ROM: SPI 128MB*

### Main Memory:

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

### ACPI:

*NIKO/UPI*

### PWM:

*UPI9508*

### Expansion Slots:

*PCI Express (X16) Slot *1*
*PCI Express (X8) Slot *1*
*PCI Express (X4) Slot * 1*
*PCI Express (X1 ) Slot * 3*
*M2 * 2*

### Other:

*SATA3.0 x6 (PCH)*
*FRONT USB2.0 *2*
*REAR USB2.0 *2*
*FRONTUSB3.0 *4*
*REAR USB3.0 *4*
*REAR USB TYPE A+C*

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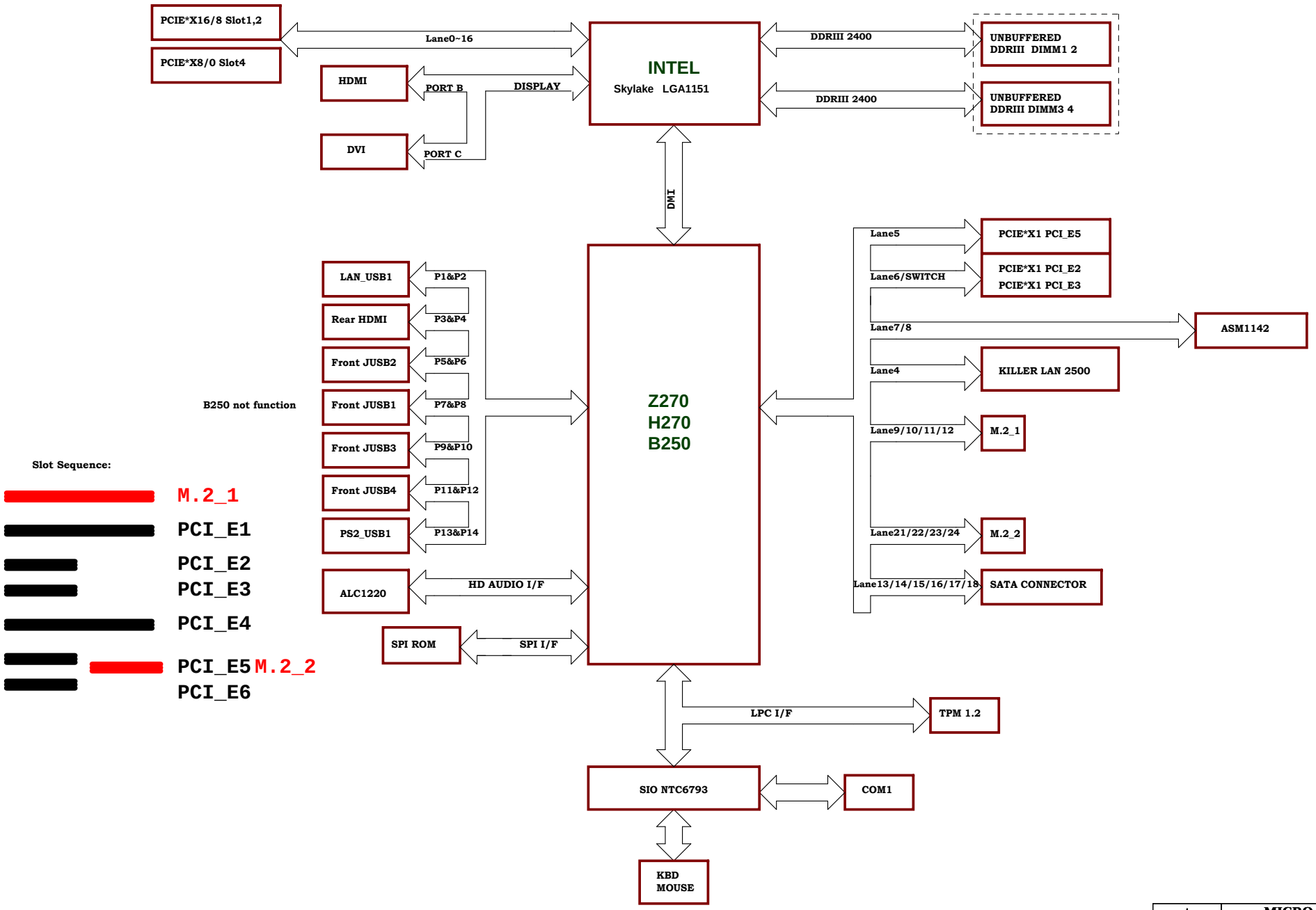
# MS-7A62 Block Diagram

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| Size: Custom | Document Description: Block Diagram |
| Rev: 1.0 | |
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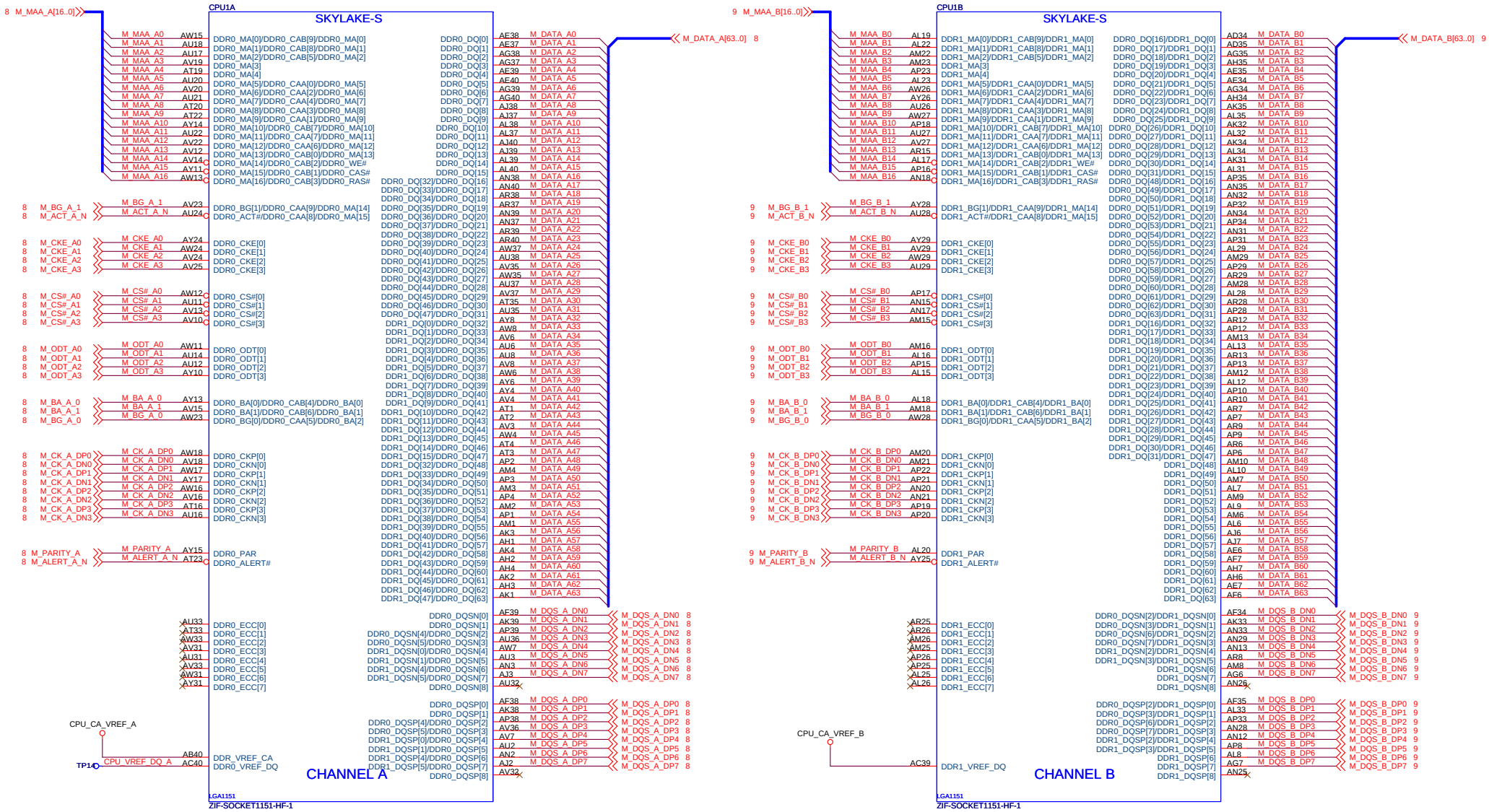


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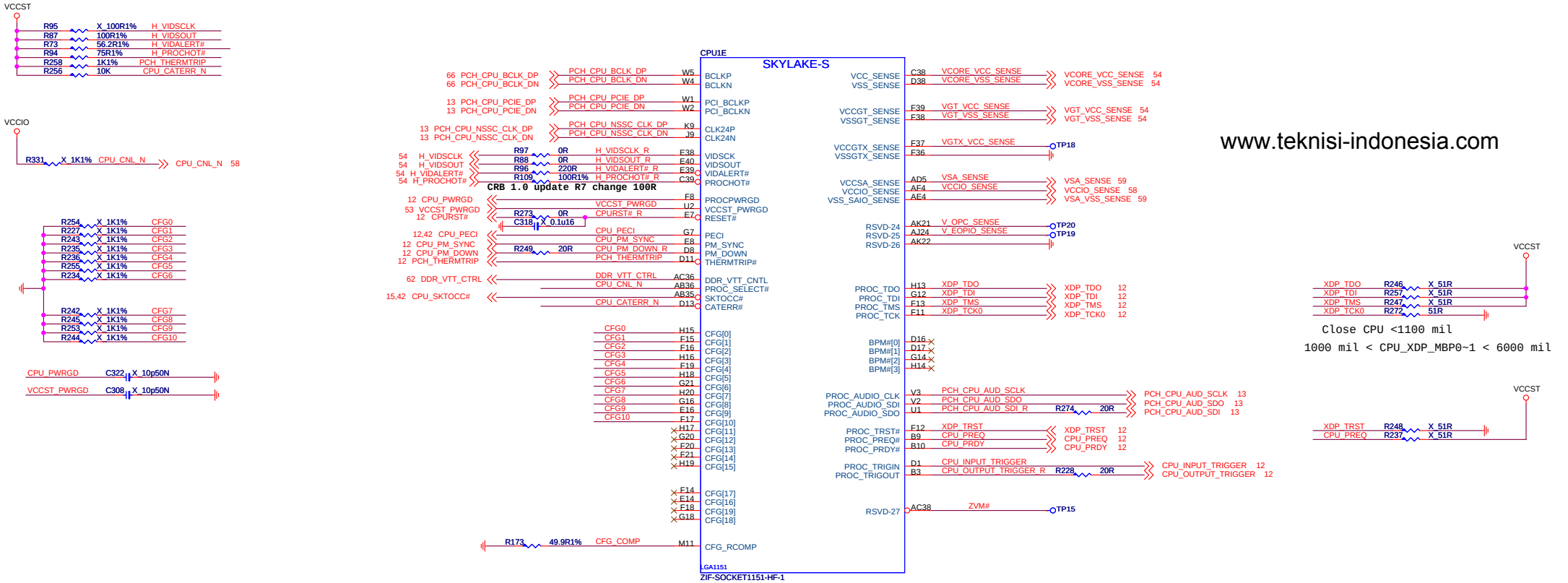


## CFG Strap

CFG Table

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

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MS-7A62

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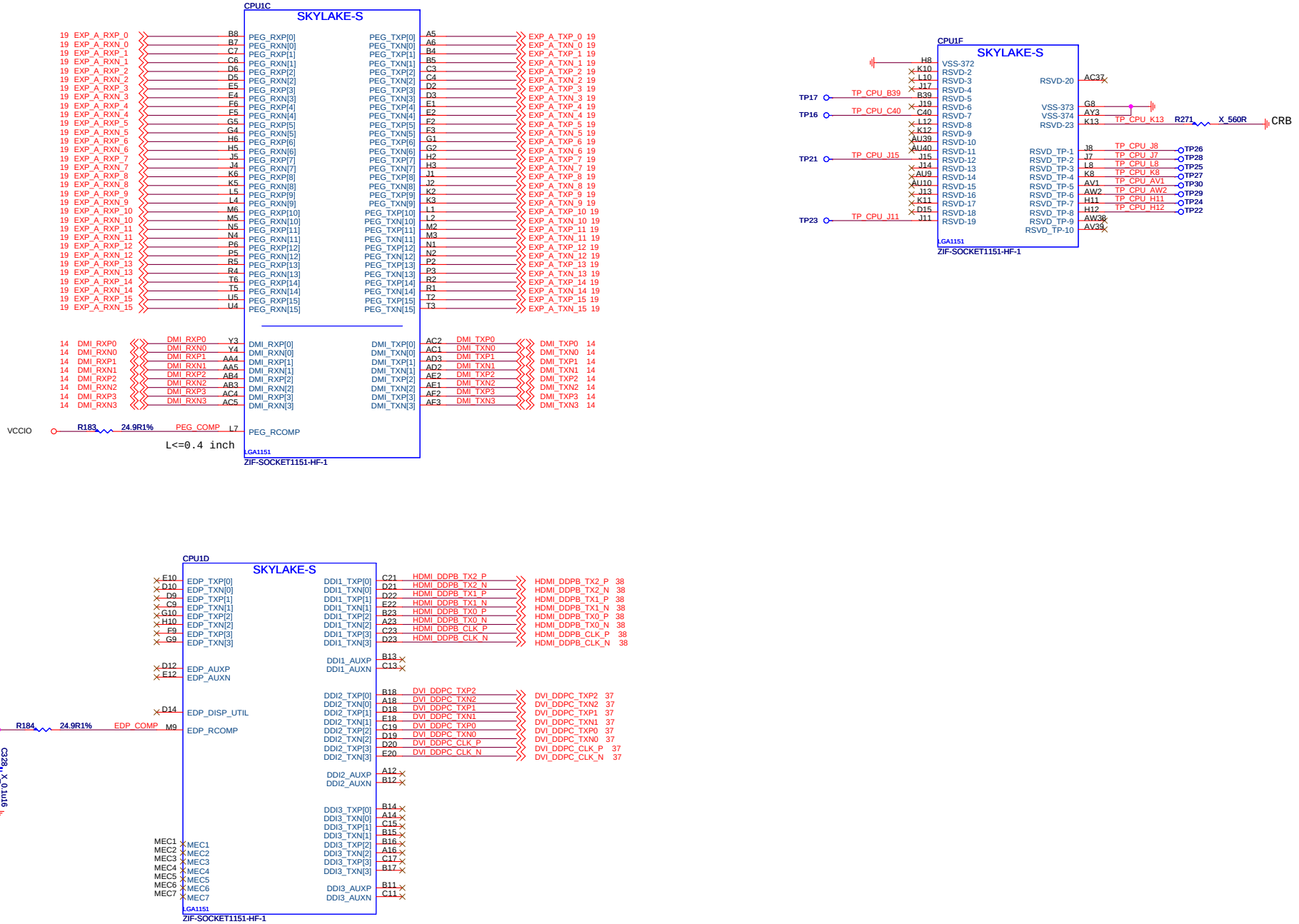


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| MSI | MICRO-STAR INT'L CO.,LTD | |
| | MS-7A62 | |
| Size: Custom | Document Description: CPU-PEG/Display | Rev: 1.0 |
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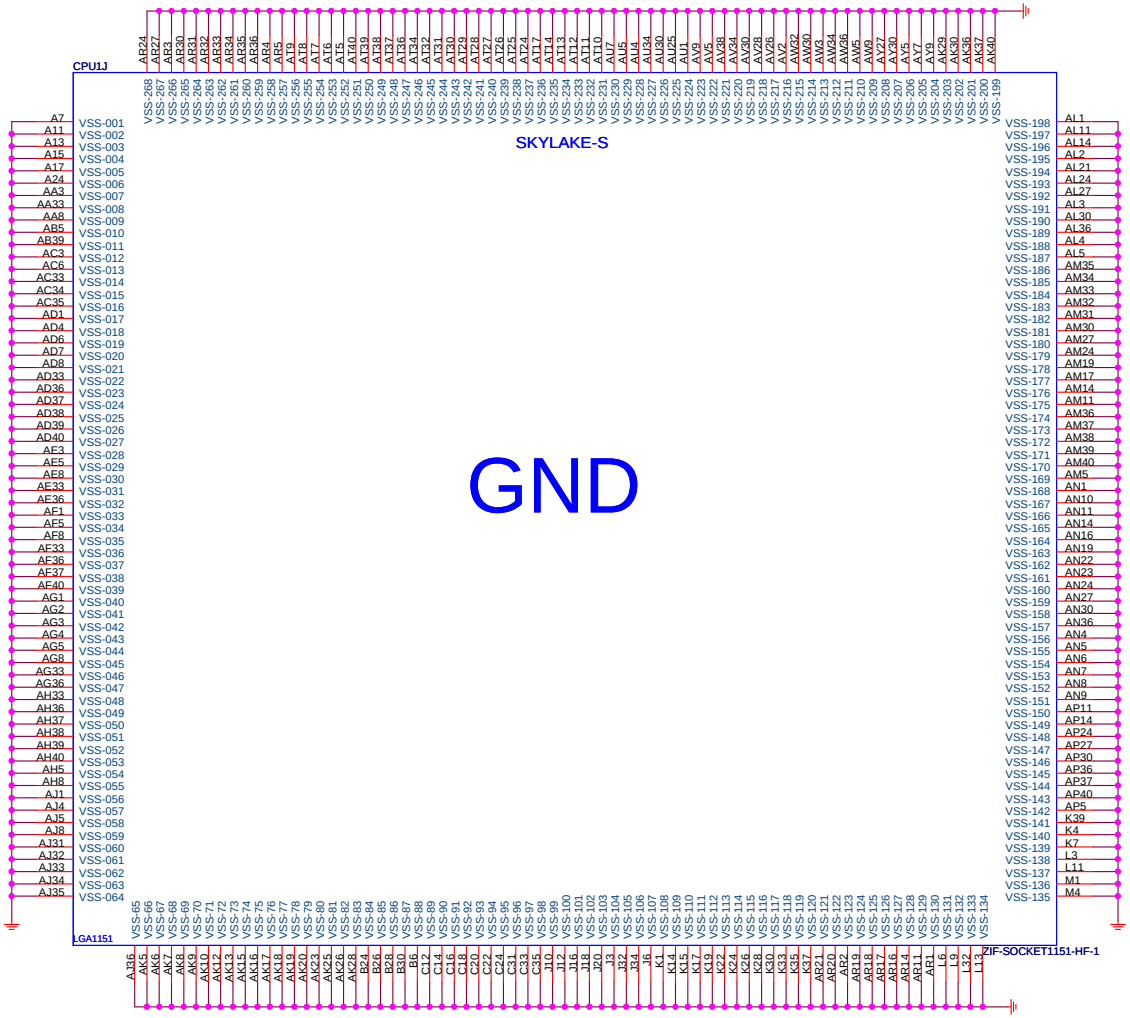


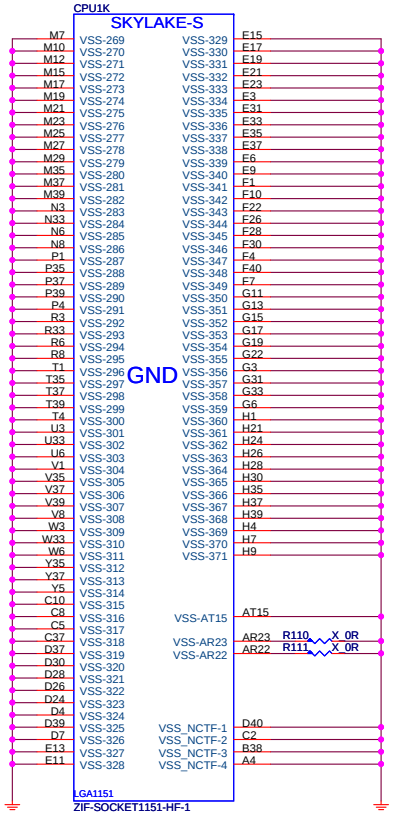


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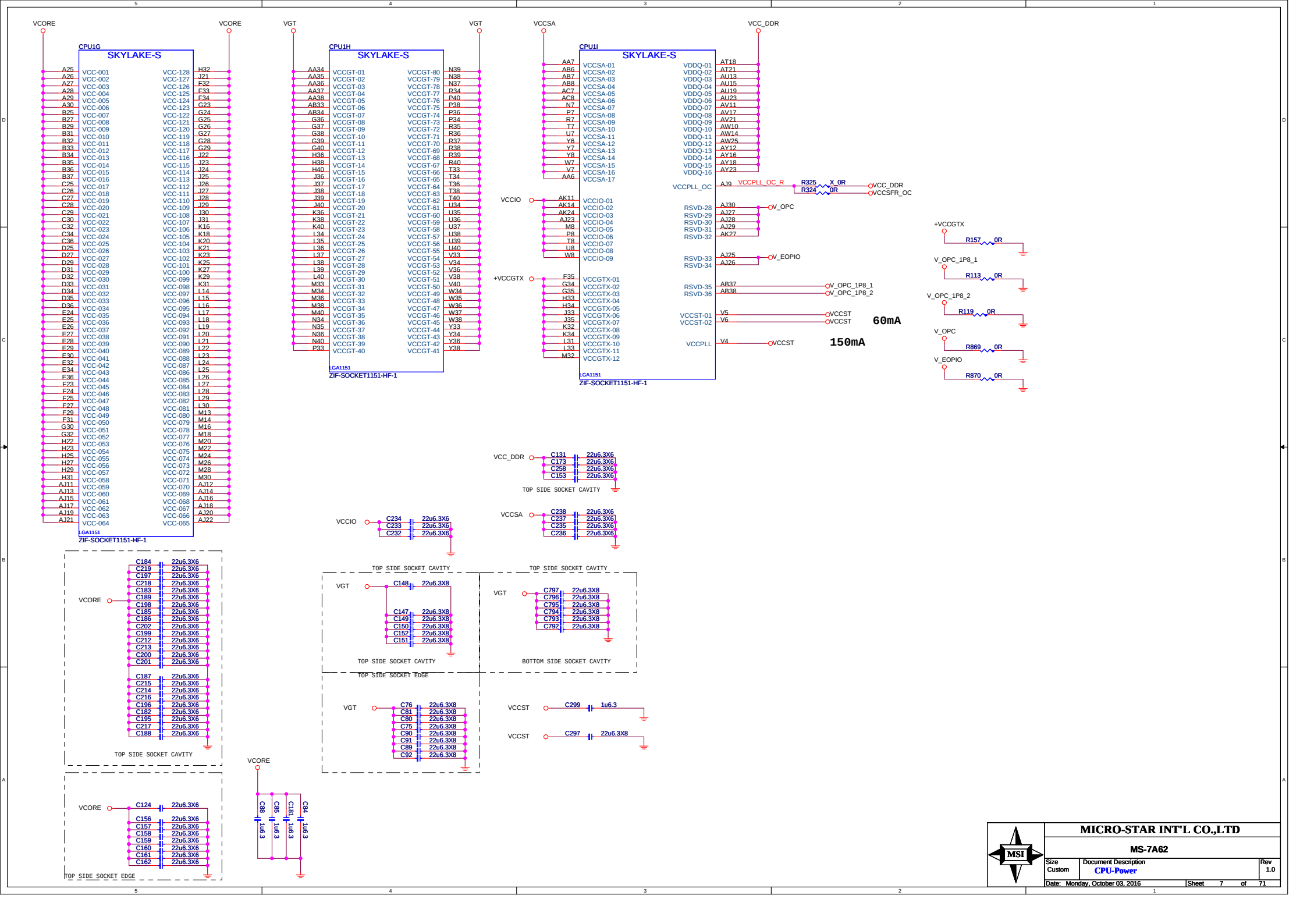
VCORE
CPU1G
SKYLAKE-S
VCC-001 VCC-002 VCC-003 VCC-004 VCC-005 VCC-006 VCC-007 VCC-008 VCC-009 VCC-010 VCC-011 VCC-012 VCC-013 VCC-014 VCC-015 VCC-016 VCC-017 VCC-018 VCC-019 VCC-020 VCC-021 VCC-022 VCC-023 VCC-024 VCC-025 VCC-026 VCC-027 VCC-028 VCC-029 VCC-030 VCC-031 VCC-032 VCC-033 VCC-034 VCC-035 VCC-036 VCC-037 VCC-038 VCC-039 VCC-040 VCC-041 VCC-042 VCC-043 VCC-044 VCC-045 VCC-046 VCC-047 VCC-048 VCC-049 VCC-050 VCC-051 VCC-052 VCC-053 VCC-054 VCC-055 VCC-056 VCC-057 VCC-058 VCC-059 VCC-060 VCC-061 VCC-062 VCC-063 VCC-064
VCC-065 VCC-066 VCC-067 VCC-068 VCC-069 VCC-070 VCC-071 VCC-072 VCC-073 VCC-074 VCC-075 VCC-076 VCC-077 VCC-078 VCC-079 VCC-080 VCC-081 VCC-082 VCC-083 VCC-084 VCC-085 VCC-086 VCC-087 VCC-088 VCC-089 VCC-090 VCC-091 VCC-092 VCC-093 VCC-094 VCC-095 VCC-096 VCC-097 VCC-098 VCC-099 VCC-100 VCC-101 VCC-102 VCC-103 VCC-104 VCC-105 VCC-106 VCC-107 VCC-108 VCC-109 VCC-110 VCC-111 VCC-112 VCC-113 VCC-114 VCC-115 VCC-116 VCC-117 VCC-118 VCC-119 VCC-120 VCC-121 VCC-122 VCC-123 VCC-124 VCC-125 VCC-126 VCC-127 VCC-128
LGA1151
ZIF-SOCKET1151-HF-1
VGT
CPU1H
SKYLAKE-S
VCCGT-01 VCCGT-02 VCCGT-03 VCCGT-04 VCCGT-05 VCCGT-06 VCCGT-07 VCCGT-08 VCCGT-09 VCCGT-10 VCCGT-11 VCCGT-12 VCCGT-13 VCCGT-14 VCCGT-15 VCCGT-16 VCCGT-17 VCCGT-18 VCCGT-19 VCCGT-20 VCCGT-21 VCCGT-22 VCCGT-23 VCCGT-24 VCCGT-25 VCCGT-26 VCCGT-27 VCCGT-28 VCCGT-29 VCCGT-30 VCCGT-31 VCCGT-32 VCCGT-33 VCCGT-34 VCCGT-35 VCCGT-36 VCCGT-37 VCCGT-38 VCCGT-39 VCCGT-40
VCCGT-41 VCCGT-42 VCCGT-43 VCCGT-44 VCCGT-45 VCCGT-46 VCCGT-47 VCCGT-48 VCCGT-49 VCCGT-50 VCCGT-51 VCCGT-52 VCCGT-53 VCCGT-54 VCCGT-55 VCCGT-56 VCCGT-57 VCCGT-58 VCCGT-59 VCCGT-60 VCCGT-61 VCCGT-62 VCCGT-63 VCCGT-64 VCCGT-65 VCCGT-66 VCCGT-67 VCCGT-68 VCCGT-69 VCCGT-70 VCCGT-71 VCCGT-72 VCCGT-73 VCCGT-74 VCCGT-75 VCCGT-76 VCCGT-77 VCCGT-78 VCCGT-79 VCCGT-80
LGA1151
ZIF-SOCKET1151-HF-1
VCCSA
CPU1I
SKYLAKE-S
VCCSA-01 VCCSA-02 VCCSA-03 VCCSA-04 VCCSA-05 VCCSA-06 VCCSA-07 VCCSA-08 VCCSA-09 VCCSA-10 VCCSA-11 VCCSA-12 VCCSA-13 VCCSA-14 VCCSA-15 VCCSA-16 VCCSA-17
VCCIO-01 VCCIO-02 VCCIO-03 VCCIO-04 VCCIO-05 VCCIO-06 VCCIO-07 VCCIO-08 VCCIO-09
VCCGTX-01 VCCGTX-02 VCCGTX-03 VCCGTX-04 VCCGTX-05 VCCGTX-06 VCCGTX-07 VCCGTX-08 VCCGTX-09 VCCGTX-10 VCCGTX-11 VCCGTX-12
VDDQ-01 VDDQ-02 VDDQ-03 VDDQ-04 VDDQ-05 VDDQ-06 VDDQ-07 VDDQ-08 VDDQ-09 VDDQ-10 VDDQ-11 VDDQ-12 VDDQ-13 VDDQ-14 VDDQ-15 VDDQ-16
VCCPLL_OC
RSVD-28 RSVD-29 RSVD-30 RSVD-31 RSVD-32
RSVD-33 RSVD-34
RSVD-35 RSVD-36
VCCST-01 VCCST-02
VCCPLL
LGA1151
ZIF-SOCKET1151-HF-1
VCC_DDR
VCCPLL_OC_R
R325 X_0R
R324 0R
VCCSFR_OC
V_OPC
V_EOPIO
60mA
150mA
+VCCGTX
R157 0R
V_OPC_1P8_1
R113 0R
V_OPC_1P8_2
R119 0R
V_OPC
R869 0R
V_EOPIO
R870 0R
C131 C173 C258 C153 22u6.3X6
TOP SIDE SOCKET CAVITY
C234 C233 C232 22u6.3X6
C238 C237 C235 C236 22u6.3X6
C184 C219 C197 C218 C183 C189 C198 C185 C186 C202 C199 C212 C213 C200 C201 22u6.3X6
C187 C215 C214 C216 C196 C182 C195 C217 C188 22u6.3X6
C148 C147 C149 C150 C152 C151 22u6.3X8
C797 C796 C795 C794 C793 C792 22u6.3X8
BOTTOM SIDE SOCKET CAVITY
TOP SIDE SOCKET EDGE
C76 C81 C80 C75 C90 C91 C89 C92 22u6.3X8
C299 1u6.3
C297 22u6.3X8
C124 C156 C157 C158 C159 C160 C161 C162 22u6.3X6
C88 C85 C181 C84 1u6.3
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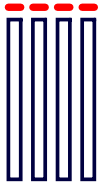

VCC_DDR

DIMMA1A

M_DATA_A[63..0] 3

DQS17P 51
DQS17N 52
DQS16P 132
DQS16N 133
DQS15P 121
DQS15N 122
DQS14P 110
DQS14N 111
DQS13P 99
DQS13N 100
DQS12P 40
DQS12N 41
DQS11P 29
DQS11N 30
DQS10P 18
DQS10N 19
DQS9P 7
DQS9N 8
DQS8P 197
DQS8N 196
DQS7P 278
DQS7N 277
DQS6P 267
DQS6N 266
DQS5P 256
DQS5N 255
DQS4P 245
DQS4N 244
DQS3P 186
DQS3N 185
DQS2P 175
DQS2N 174
DQS1P 164
DQS1N 163
DQS0P 153
DQS0N 152

3 M_DQS_A_DP7 M_DQS_A_DP7
3 M_DQS_A_DN7 M_DQS_A_DN7
3 M_DQS_A_DP6 M_DQS_A_DP6
3 M_DQS_A_DN6 M_DQS_A_DN6
3 M_DQS_A_DP5 M_DQS_A_DP5
3 M_DQS_A_DN5 M_DQS_A_DN5
3 M_DQS_A_DP4 M_DQS_A_DP4
3 M_DQS_A_DN4 M_DQS_A_DN4
3 M_DQS_A_DP3 M_DQS_A_DP3
3 M_DQS_A_DN3 M_DQS_A_DN3
3 M_DQS_A_DP2 M_DQS_A_DP2
3 M_DQS_A_DN2 M_DQS_A_DN2
3 M_DQS_A_DP1 M_DQS_A_DP1
3 M_DQS_A_DN1 M_DQS_A_DN1
3 M_DQS_A_DP0 M_DQS_A_DP0
3 M_DQS_A_DN0 M_DQS_A_DN0

3 M_CK_A_DP1 M_CK_A_DP1 218 CK1P
3 M_CK_A_DN1 M_CK_A_DN1 219 CK1N
3 M_CK_A_DP0 M_CK_A_DP0 74 CK0P
3 M_CK_A_DN0 M_CK_A_DN0 75 CK0N

C2 235
S3_N_C1 237
S2_N_C0 93

3 M_CS#_A1 89 S1_N
3 M_CS#_A0 84 S0_N
3 M_CKE_A1 203 CKE1
3 M_CKE_A0 60 CKE0
3 M_ODT_A1 91 ODT-1
3 M_ODT_A0 87 ODT-0

CB-7 199
CB-6 54
CB-5 192
CB-4 47
CB-3 201
CB-2 56
CB-1 194
CB-0 49

DIMM_RESET# 58 RESET_N
DIMM1_EVENT 78 EVENT_N
3 M_ALERT_A_N M_ALERT_A_N 208 ALERT_N
3 M_ACT_A_N M_ACT_A_N 62 ACT_N
3 M_PARITY_A M_PARITY_A 222 PAR

SAVE_N_NC 230

RFU-0 144
RFU-1 205
RFU-2 227

DQ-63 280 M_DATA_A57
DQ-62 135 M_DATA_A59
DQ-61 273 M_DATA_A61
DQ-60 128 M_DATA_A56
DQ-59 282 M_DATA_A60
DQ-58 137 M_DATA_A62
DQ-57 275 M_DATA_A58
DQ-56 130 M_DATA_A63
DQ-55 269 M_DATA_A55
DQ-54 124 M_DATA_A53
DQ-53 262 M_DATA_A48
DQ-52 117 M_DATA_A50
DQ-51 271 M_DATA_A49
DQ-50 126 M_DATA_A51
DQ-49 264 M_DATA_A52
DQ-48 119 M_DATA_A54
DQ-47 258 M_DATA_A42
DQ-46 113 M_DATA_A46
DQ-45 251 M_DATA_A40
DQ-44 106 M_DATA_A41
DQ-43 260 M_DATA_A43
DQ-42 115 M_DATA_A47
DQ-41 253 M_DATA_A44
DQ-40 108 M_DATA_A45
DQ-39 247 M_DATA_A39
DQ-38 102 M_DATA_A38
DQ-37 240 M_DATA_A37
DQ-36 95 M_DATA_A36
DQ-35 249 M_DATA_A35
DQ-34 104 M_DATA_A34
DQ-33 242 M_DATA_A33
DQ-32 97 M_DATA_A32
DQ-31 188 M_DATA_A27
DQ-30 43 M_DATA_A30
DQ-29 181 M_DATA_A25
DQ-28 36 M_DATA_A28
DQ-27 190 M_DATA_A31
DQ-26 45 M_DATA_A26
DQ-25 183 M_DATA_A24
DQ-24 38 M_DATA_A29
DQ-23 177 M_DATA_A23
DQ-22 32 M_DATA_A19
DQ-21 170 M_DATA_A20
DQ-20 25 M_DATA_A21
DQ-19 179 M_DATA_A18
DQ-18 34 M_DATA_A22
DQ-17 172 M_DATA_A16
DQ-16 27 M_DATA_A17
DQ-15 166 M_DATA_A15
DQ-14 21 M_DATA_A11
DQ-13 159 M_DATA_A8
DQ-12 14 M_DATA_A9
DQ-11 168 M_DATA_A14
DQ-10 23 M_DATA_A10
DQ-9 161 M_DATA_A13
DQ-8 16 M_DATA_A12
DQ-7 155 M_DATA_A7
DQ-6 10 M_DATA_A3
DQ-5 148 M_DATA_A4
DQ-4 3 M_DATA_A1
DQ-3 157 M_DATA_A2
DQ-2 12 M_DATA_A6
DQ-1 150 M_DATA_A0
DQ-0 5 M_DATA_A5

BG-1 207 M_BG_A_1 M_BG_A_1 3
BG-0 63 M_BG_A_0 M_BG_A_0 3
BA-1 224 M_BA_A_1 M_BA_A_1 3
BA-0 81 M_BA_A_0 M_BA_A_0 3

M_MAA_A[16..0]

A17 234
A16_RAS_N 82 M_MAA_A16
A15_CAS_N 86 M_MAA_A15
A14_WE_N 228 M_MAA_A14
A13 232 M_MAA_A13
A12 65 M_MAA_A12
A11 210 M_MAA_A11
A10 225 M_MAA_A10
A9 66 M_MAA_A9
A8 68 M_MAA_A8
A7 211 M_MAA_A7
A6 69 M_MAA_A6
A5 213 M_MAA_A5
A4 214 M_MAA_A4
A3 71 M_MAA_A3
A2 216 M_MAA_A2
A1 72 M_MAA_A1
A0 79 M_MAA_A0

M_MAA_A[16..0] 3

SCL 141 SMB_CLK_DIMM
SDA 285 SMB_DATA_DIMM

SA-2 238
SA-1 140
SA-0 139

DDRIV-288P_BLACK-RH-21

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

VCC_DDR

DIMM1_EVENT R174 240R1%
DIMM2_EVENT R175 240R1%

VCC_DDR

R149 470R1%

12 DRAM_RESET# R146 0R DIMM_RESET# DIMM_RESET# 9

C125 X_0.1u16

12,52,66 SMBCLK_VCC SMBCLK_VCC R335 0R SMB_CLK_DIMM SMB_CLK_DIMM 9
12,52,66 SMBDATA_VCC SMBDATA_VCC R336 0R SMB_DATA_DIMM SMB_DATA_DIMM 9

VCC_DDR

DIMMA2A

DQS17P 51
DQS17N 52
DQS16P 132
DQS16N 133
DQS15P 121
DQS15N 122
DQS14P 110
DQS14N 111
DQS13P 99
DQS13N 100
DQS12P 40
DQS12N 41
DQS11P 29
DQS11N 30
DQS10P 18
DQS10N 19
DQS9P 7
DQS9N 8
DQS8P 197
DQS8N 196
DQS7P 278
DQS7N 277
DQS6P 267
DQS6N 266
DQS5P 256
DQS5N 255
DQS4P 245
DQS4N 244
DQS3P 186
DQS3N 185
DQS2P 175
DQS2N 174
DQS1P 164
DQS1N 163
DQS0P 153
DQS0N 152

M_DQS_A_DP7 278
M_DQS_A_DN7 277
M_DQS_A_DP6 267
M_DQS_A_DN6 266
M_DQS_A_DP5 256
M_DQS_A_DN5 255
M_DQS_A_DP4 245
M_DQS_A_DN4 244
M_DQS_A_DP3 186
M_DQS_A_DN3 185
M_DQS_A_DP2 175
M_DQS_A_DN2 174
M_DQS_A_DP1 164
M_DQS_A_DN1 163
M_DQS_A_DP0 153
M_DQS_A_DN0 152

3 M_CK_A_DP3 M_CK_A_DP3 218 CK1P
3 M_CK_A_DN3 M_CK_A_DN3 219 CK1N
3 M_CK_A_DP2 M_CK_A_DP2 74 CK0P
3 M_CK_A_DN2 M_CK_A_DN2 75 CK0N

C2 235
S3_N_C1 237
S2_N_C0 93

3 M_CS#_A3 89 S1_N
3 M_CS#_A2 84 S0_N
3 M_CKE_A3 203 CKE1
3 M_CKE_A2 60 CKE0
3 M_ODT_A3 91 ODT-1
3 M_ODT_A2 87 ODT-0

CB-7 199
CB-6 54
CB-5 192
CB-4 47
CB-3 201
CB-2 56
CB-1 194
CB-0 49

DIMM_RESET# 58 RESET_N
DIMM2_EVENT 78 EVENT_N
M_ALERT_A_N 208 ALERT_N
M_ACT_A_N 62 ACT_N
M_PARITY_A 222 PAR

SAVE_N_NC 230

RFU-0 144
RFU-1 205
RFU-2 227

DQ-63 280 M_DATA_A57
DQ-62 135 M_DATA_A59
DQ-61 273 M_DATA_A61
DQ-60 128 M_DATA_A56
DQ-59 282 M_DATA_A60
DQ-58 137 M_DATA_A62
DQ-57 275 M_DATA_A58
DQ-56 130 M_DATA_A63
DQ-55 269 M_DATA_A55
DQ-54 124 M_DATA_A53
DQ-53 262 M_DATA_A48
DQ-52 117 M_DATA_A50
DQ-51 271 M_DATA_A49
DQ-50 126 M_DATA_A51
DQ-49 264 M_DATA_A52
DQ-48 119 M_DATA_A54
DQ-47 258 M_DATA_A42
DQ-46 113 M_DATA_A46
DQ-45 251 M_DATA_A40
DQ-44 106 M_DATA_A41
DQ-43 260 M_DATA_A43
DQ-42 115 M_DATA_A47
DQ-41 253 M_DATA_A44
DQ-40 108 M_DATA_A45
DQ-39 247 M_DATA_A39
DQ-38 102 M_DATA_A38
DQ-37 240 M_DATA_A37
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DQ-35 249 M_DATA_A35
DQ-34 104 M_DATA_A34
DQ-33 242 M_DATA_A33
DQ-32 97 M_DATA_A32
DQ-31 188 M_DATA_A27
DQ-30 43 M_DATA_A30
DQ-29 181 M_DATA_A25
DQ-28 36 M_DATA_A28
DQ-27 190 M_DATA_A31
DQ-26 45 M_DATA_A26
DQ-25 183 M_DATA_A24
DQ-24 38 M_DATA_A29
DQ-23 177 M_DATA_A23
DQ-22 32 M_DATA_A19
DQ-21 170 M_DATA_A20
DQ-20 25 M_DATA_A21
DQ-19 179 M_DATA_A18
DQ-18 34 M_DATA_A22
DQ-17 172 M_DATA_A16
DQ-16 27 M_DATA_A17
DQ-15 166 M_DATA_A15
DQ-14 21 M_DATA_A11
DQ-13 159 M_DATA_A8
DQ-12 14 M_DATA_A9
DQ-11 168 M_DATA_A14
DQ-10 23 M_DATA_A10
DQ-9 161 M_DATA_A13
DQ-8 16 M_DATA_A12
DQ-7 155 M_DATA_A7
DQ-6 10 M_DATA_A3
DQ-5 148 M_DATA_A4
DQ-4 3 M_DATA_A1
DQ-3 157 M_DATA_A2
DQ-2 12 M_DATA_A6
DQ-1 150 M_DATA_A0
DQ-0 5 M_DATA_A5

BG-1 207 M_BG_A_1
BG-0 63 M_BG_A_0
BA-1 224 M_BA_A_1
BA-0 81 M_BA_A_0

A17 234
A16_RAS_N 82 M_MAA_A16
A15_CAS_N 86 M_MAA_A15
A14_WE_N 228 M_MAA_A14
A13 232 M_MAA_A13
A12 65 M_MAA_A12
A11 210 M_MAA_A11
A10 225 M_MAA_A10
A9 66 M_MAA_A9
A8 68 M_MAA_A8
A7 211 M_MAA_A7
A6 69 M_MAA_A6
A5 213 M_MAA_A5
A4 214 M_MAA_A4
A3 71 M_MAA_A3
A2 216 M_MAA_A2
A1 72 M_MAA_A1
A0 79 M_MAA_A0

SCL 141 SMB_CLK_DIMM
SDA 285 SMB_DATA_DIMM

SA-2 238
SA-1 140
SA-0 139 VDDSPD

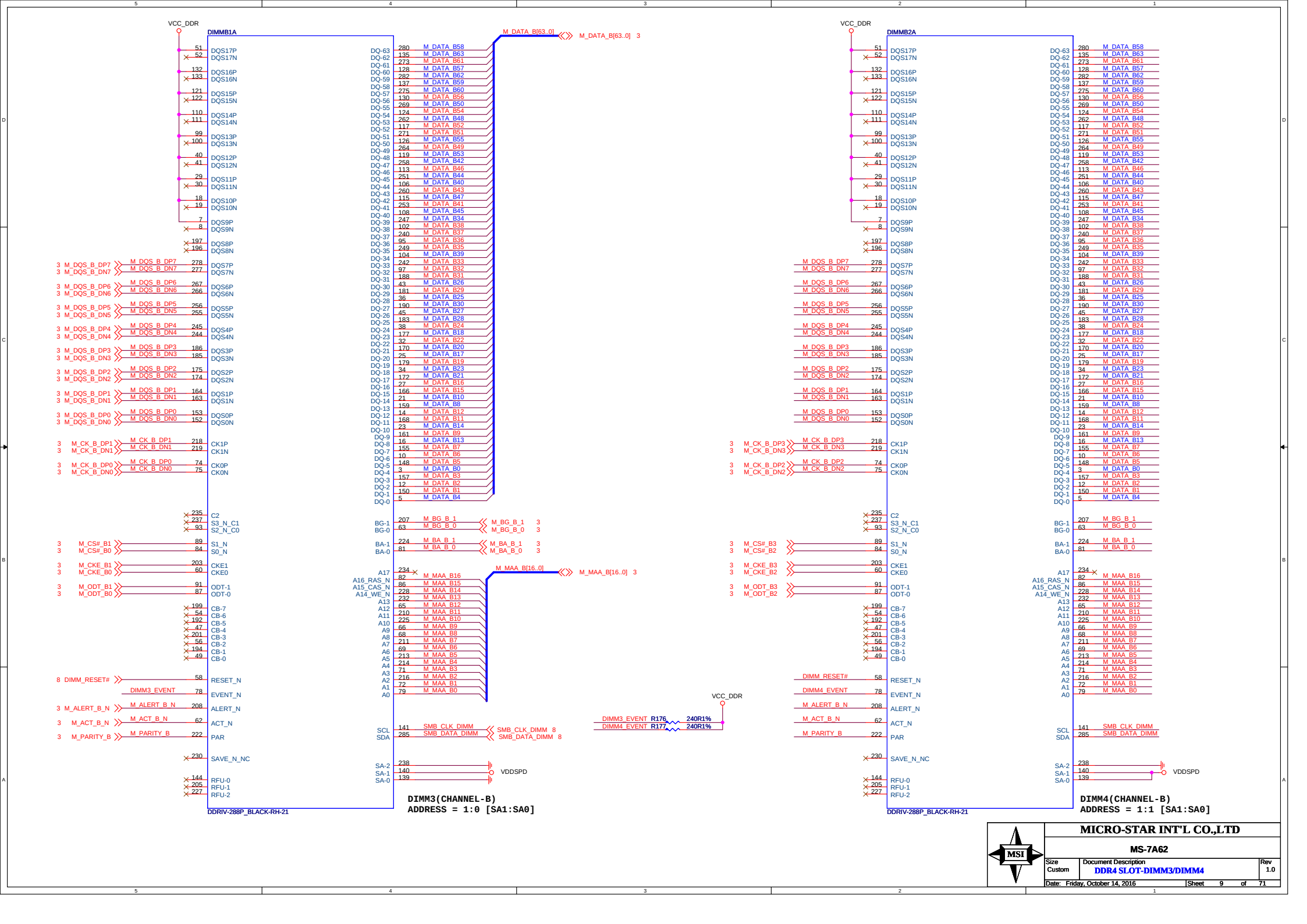
DDRIV-288P_BLACK-RH-21

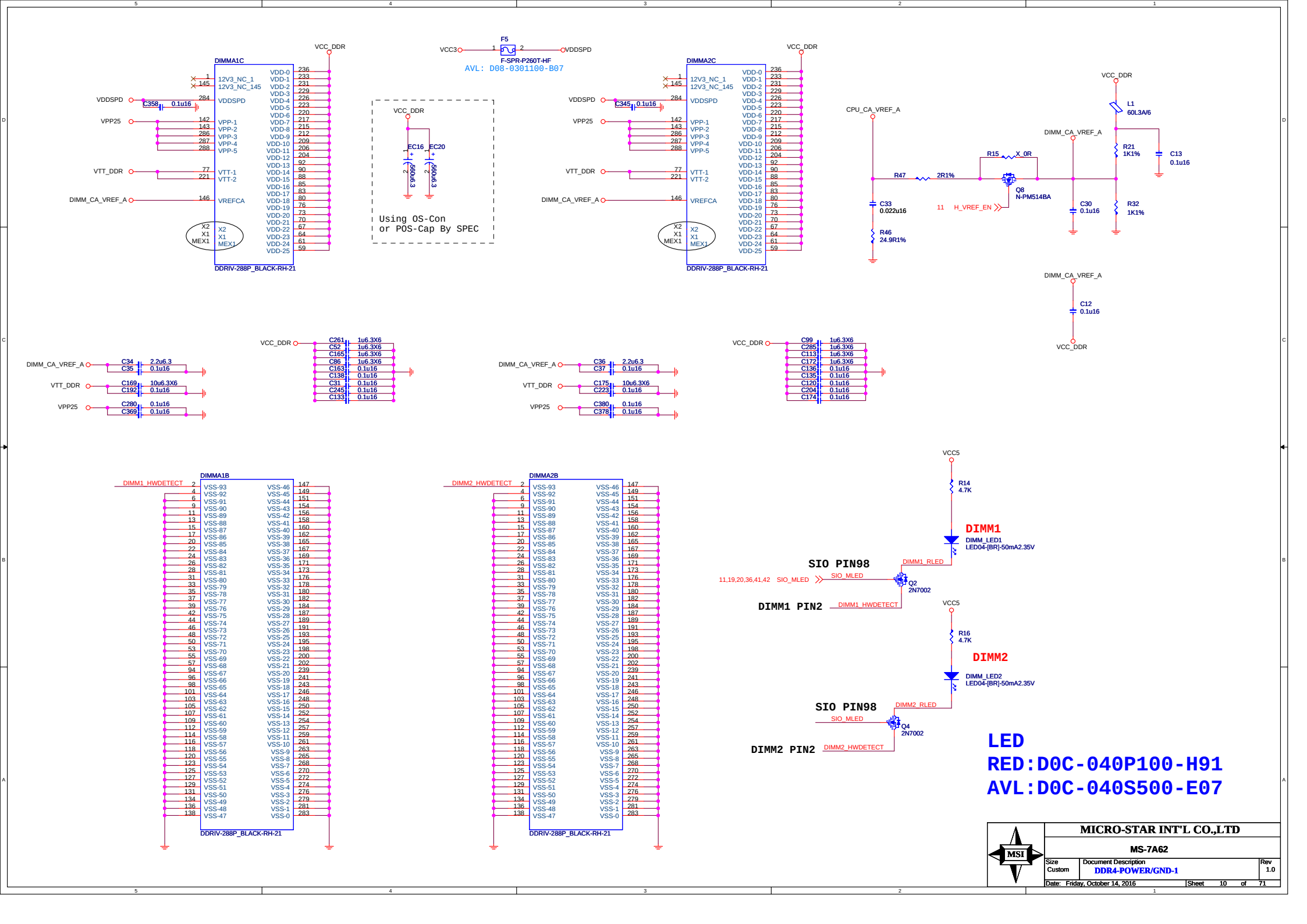
**DIMM2(CHANNEL-A)**
**ADDRESS = 0:1 [SA1:SA0]**

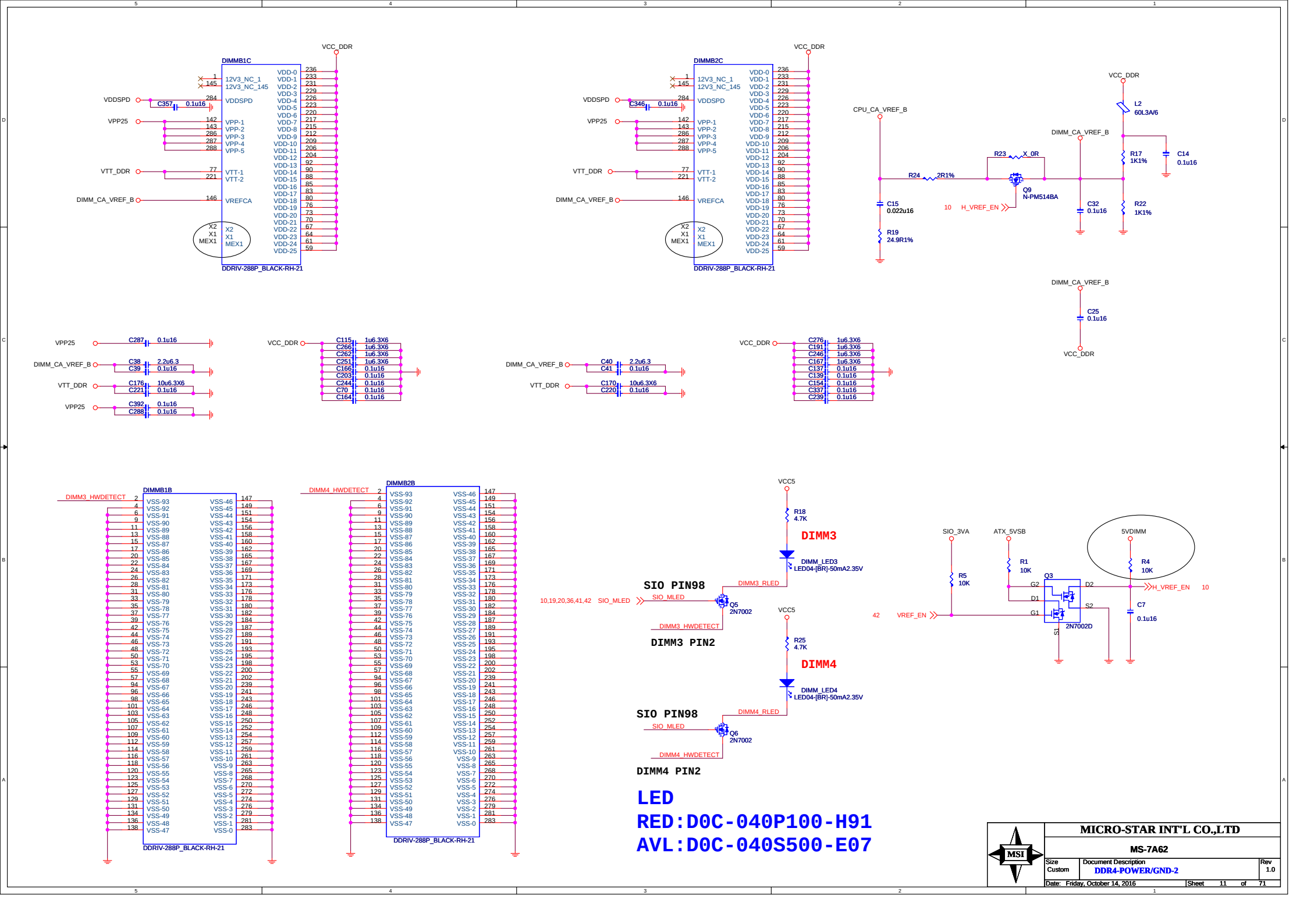
MICRO-STAR INT'L CO.,LTD

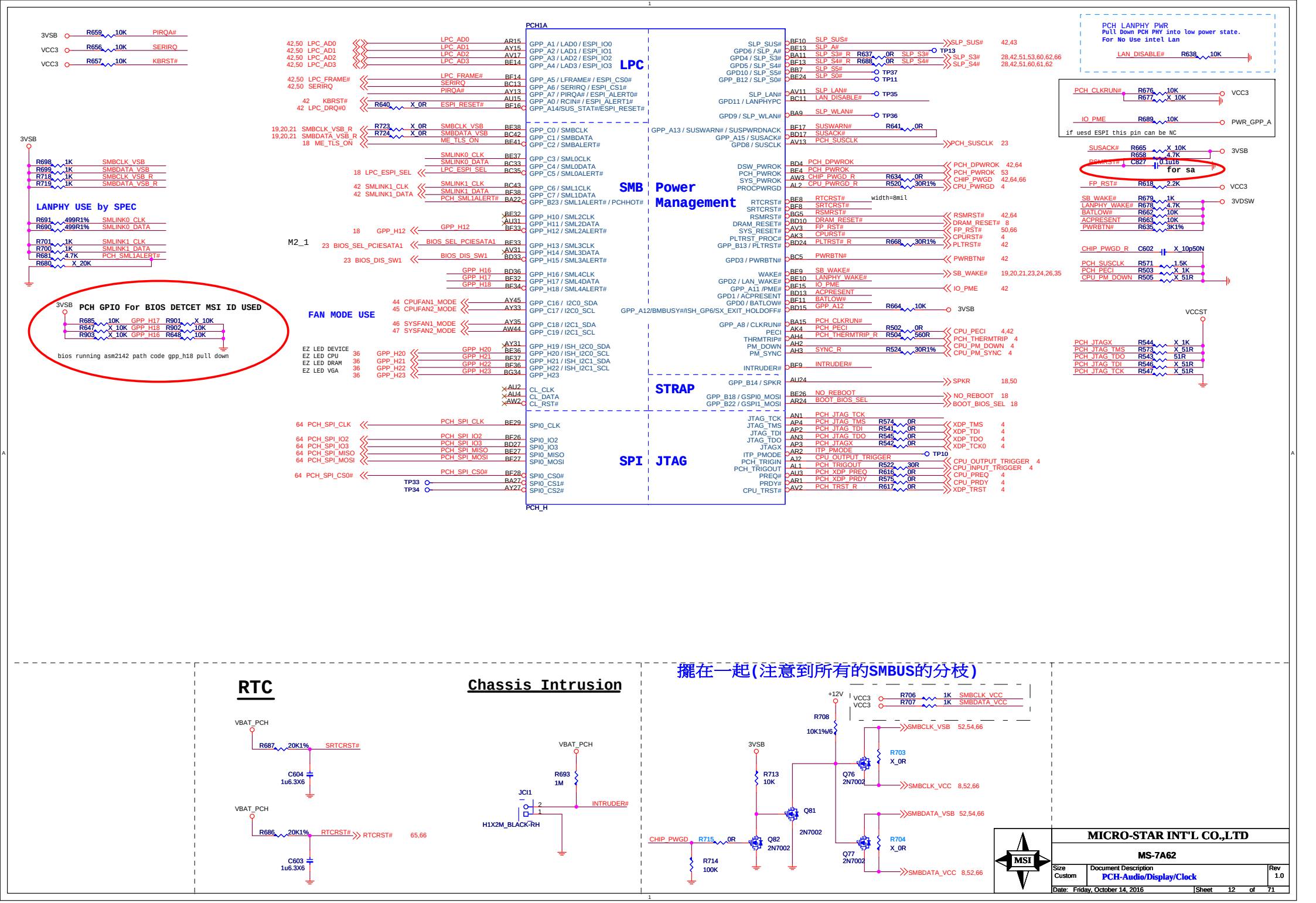
MS-7A62

| Size | Document Description | Rev |
|---|---|---|
| Custom | DDR4 SLOT-DIMM1/DIMM2 | 1.0 |
| Date: Friday, October 14, 2016 | Sheet 8 of 71 | |


VCC_DDR
DIMMB1A
M_DATA_B[63..0]
M_DATA_B[63..0] 3
DQS17P
DQS17N
DQS16P
DQS16N
DQS15P
DQS15N
DQS14P
DQS14N
DQS13P
DQS13N
DQS12P
DQS12N
DQS11P
DQS11N
DQS10P
DQS10N
DQS9P
DQS9N
DQS8P
DQS8N
DQS7P
DQS7N
DQS6P
DQS6N
DQS5P
DQS5N
DQS4P
DQS4N
DQS3P
DQS3N
DQS2P
DQS2N
DQS1P
DQS1N
DQS0P
DQS0N
CK1P
CK1N
CK0P
CK0N
C2
S3_N_C1
S2_N_C0
S1_N
S0_N
CKE1
CKE0
ODT-1
ODT-0
CB-7
CB-6
CB-5
CB-4
CB-3
CB-2
CB-1
CB-0
RESET_N
EVENT_N
ALERT_N
ACT_N
PAR
SAVE_N_NC
RFU-0
RFU-1
RFU-2
M_BG_B_1
M_BG_B_0
M_BA_B_1
M_BA_B_0
M_MAA_B[16..0]
M_MAA_B[16..0] 3
A17
A16_RAS_N
A15_CAS_N
A14_WE_N
SMB_CLK_DIMM
SMB_DATA_DIMM
SMB_CLK_DIMM 8
SMB_DATA_DIMM 8
SA-2
SA-1
SA-0
VDDSPD
DDRIV-288P_BLACK-RH-21
DIMM3_EVENT R176 240R1%
DIMM4_EVENT R177 240R1%
VCC_DDR
DIMM3(CHANNEL-B)
ADDRESS = 1:0 [SA1:SA0]
VCC_DDR
DIMMB2A
DIMM_RESET#
DIMM4_EVENT
VDDSPD
DDRIV-288P_BLACK-RH-21
DIMM4(CHANNEL-B)
ADDRESS = 1:1 [SA1:SA0]
MICRO-STAR INT'L CO.,LTD
MS-7A62
Size
Custom
Document Description
DDR4 SLOT-DIMM3/DIMM4
Rev
1.0
Date: Friday, October 14, 2016
Sheet 9 of 71


DIMMA1C
DDRIV-288P_BLACK-RH-21
VCC_DDR
VDDSPD
VPP25
VTT_DDR
DIMM_CA_VREF_A
C358 0.1u16
F5
F-SPR-P260T-HF
AVL: D08-0301100-B07
VCC3
Using OS-Con
or POS-Cap By SPEC
EC16 560u6.3
EC20 560u6.3
DIMMA2C
C345 0.1u16
CPU_CA_VREF_A
R47 2R1%
C33 0.022u16
R46 24.9R1%
R15 X_0R
Q8 N-PM514BA
11 H_VREF_EN
L1 60L3A/6
R21 1K1%
R32 1K1%
C13 0.1u16
C30 0.1u16
C12 0.1u16
C34 2.2u6.3
C35 0.1u16
C169 10u6.3X6
C192 0.1u16
C280 0.1u16
C369 0.1u16
C261 1u6.3X6
C52 1u6.3X6
C165 1u6.3X6
C86 1u6.3X6
C163 0.1u16
C138 0.1u16
C31 0.1u16
C245 0.1u16
C133 0.1u16
C36 2.2u6.3
C37 0.1u16
C175 10u6.3X6
C223 0.1u16
C380 0.1u16
C378 0.1u16
C99 1u6.3X6
C285 1u6.3X6
C113 1u6.3X6
C172 1u6.3X6
C136 0.1u16
C135 0.1u16
C120 0.1u16
C204 0.1u16
C174 0.1u16
DIMMA1B
DIMM1_HWDETECT
DIMMA2B
DIMM2_HWDETECT
VCC5
R14 4.7K
DIMM1
DIMM_LED1
LED04-[BR]-50mA2.35V
SIO PIN98
DIMM1_RLED
SIO_MLED
11,19,20,36,41,42 SIO_MLED
Q2 2N7002
DIMM1 PIN2
DIMM1_HWDETECT
R16 4.7K
DIMM2
DIMM_LED2
LED04-[BR]-50mA2.35V
DIMM2_RLED
Q4 2N7002
DIMM2 PIN2
DIMM2_HWDETECT
LED
RED:D0C-040P100-H91
AVL:D0C-040S500-E07
MICRO-STAR INT'L CO.,LTD
MS-7A62
Size Custom
Document Description
DDR4-POWER/GND-1
Rev 1.0
Date: Friday, October 14, 2016
Sheet 10 of 71


DIMMB1C
DDRIV-288P_BLACK-RH-21
VCC_DDR
VDDSPD
VPP25
VTT_DDR
DIMM_CA_VREF_B
C357 0.1u16
DIMMB2C
C346 0.1u16
CPU_CA_VREF_B
DIMM_CA_VREF_B
L2 60L3A/6
R23 X_0R
R24 2R1%
R17 1K1%
C14 0.1u16
C15 0.022u16
R19 24.9R1%
Q9 N-PM514BA
C32 0.1u16
R22 1K1%
10 H_VREF_EN
C25 0.1u16
C287 0.1u16
C38 2.2u6.3
C39 0.1u16
C176 10u6.3X6
C221 0.1u16
C392 0.1u16
C288 0.1u16
C115 1u6.3X6
C266 1u6.3X6
C262 1u6.3X6
C251 1u6.3X6
C166 0.1u16
C203 0.1u16
C244 0.1u16
C70 0.1u16
C164 0.1u16
C40 2.2u6.3
C41 0.1u16
C170 10u6.3X6
C220 0.1u16
C276 1u6.3X6
C191 1u6.3X6
C246 1u6.3X6
C167 1u6.3X6
C137 0.1u16
C139 0.1u16
C154 0.1u16
C337 0.1u16
C239 0.1u16
DIMMB1B
DIMMB2B
DIMM3_HWDETECT
DIMM4_HWDETECT
SIO PIN98
DIMM3 PIN2
DIMM4 PIN2
10,19,20,36,41,42 SIO_MLED
SIO_MLED
DIMM3_RLED
DIMM4_RLED
DIMM3_HWDETECT
DIMM4_HWDETECT
R18 4.7K
R25 4.7K
DIMM3
DIMM4
DIMM_LED3 LED04-[BR]-50mA2.35V
DIMM_LED4 LED04-[BR]-50mA2.35V
Q5 2N7002
Q6 2N7002
SIO_3VA
ATX_5VSB
5VDIMM
R5 10K
R1 10K
R4 10K
Q3
2N7002D
42 VREF_EN
H_VREF_EN 10
C7 0.1u16
LED
RED:D0C-040P100-H91
AVL:D0C-040S500-E07
MICRO-STAR INT'L CO.,LTD
MS-7A62
Size Custom
Document Description
DDR4-POWER/GND-2
Rev 1.0
Date: Friday, October 14, 2016
Sheet 11 of 71




# RTC




# Chassis Intrusion

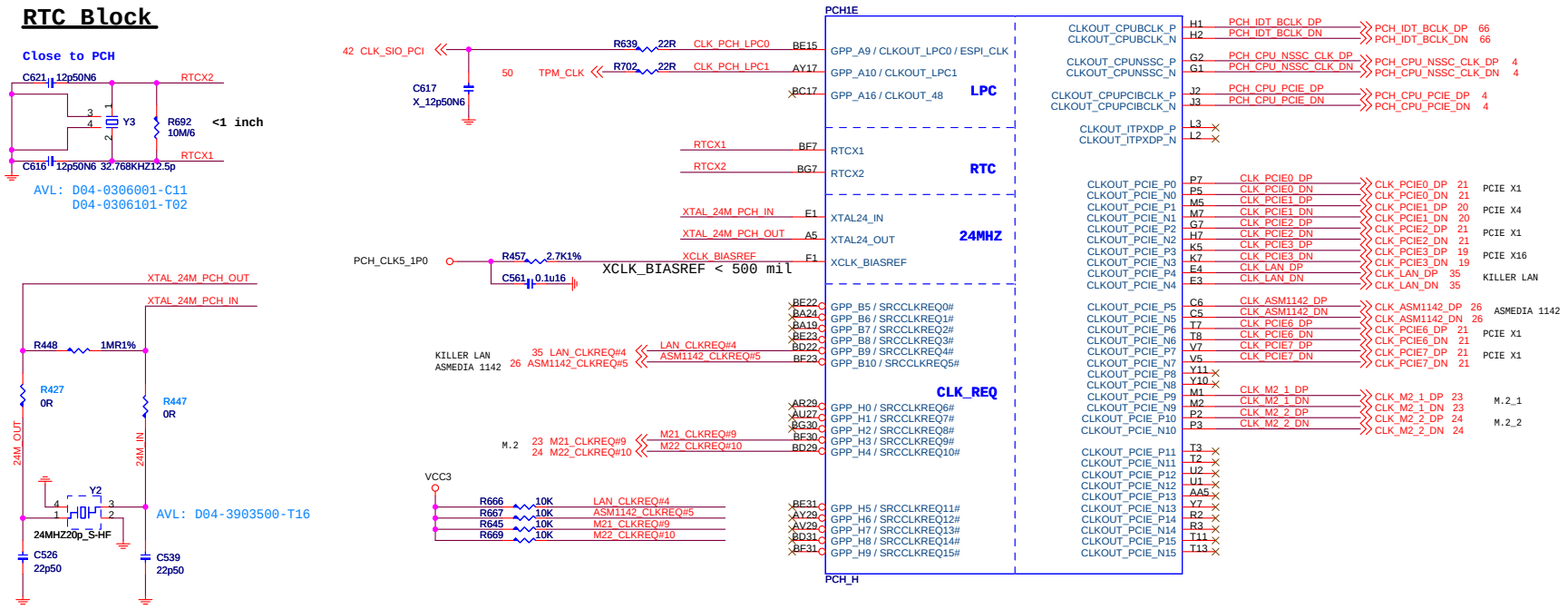



## 摆在一起(注意到所有的SMBUS的分枝)

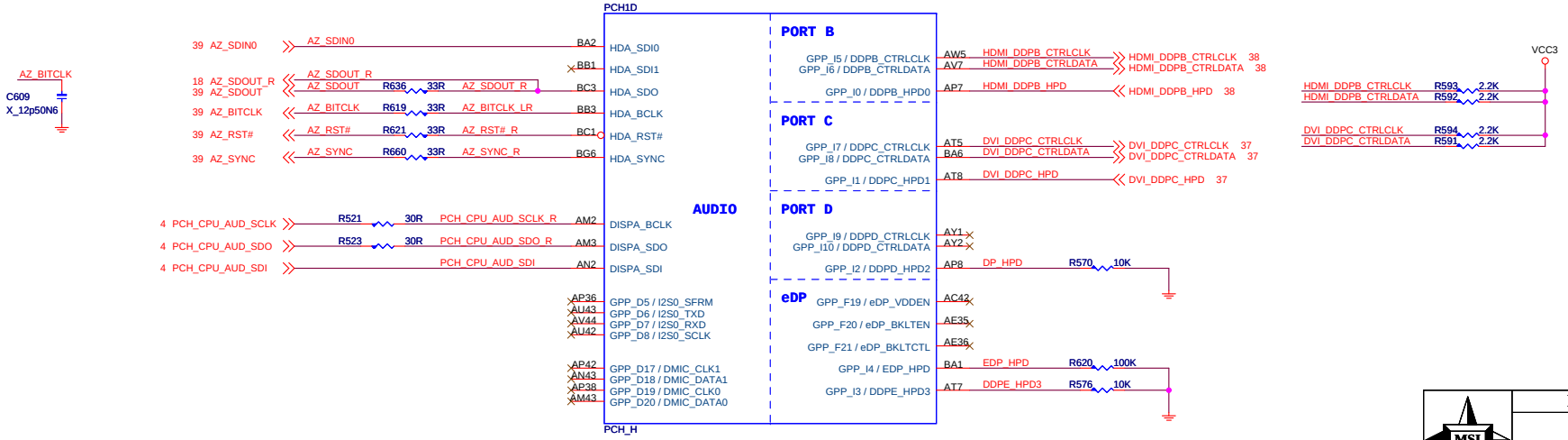



| | |
|---|---|
| MICRO-STAR INT'L CO.,LTD | |
| MS-7A62 | |
| Size: Custom | Document Description: PCH-Audio/Display/Clock |
| Rev: 1.0 | |
| Date: Friday, October 14, 2016 | Sheet 12 of 71 |

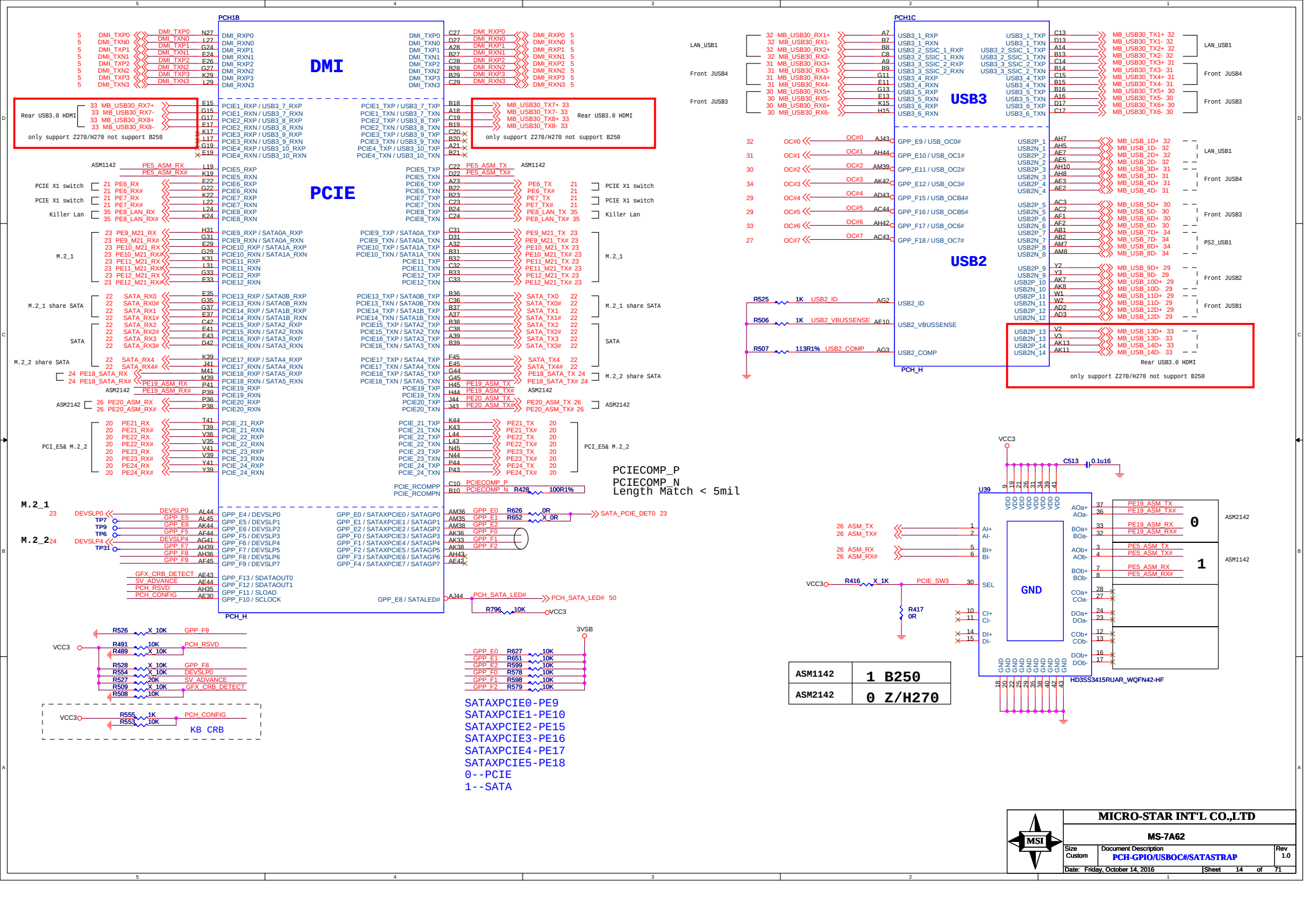
# PCH_CLK






| | |
|---|---|
| MICRO-STAR INT'L CO.,LTD | |
| MS-7A62 | |
| Size: Custom | Document Description: PCH-USB/PCIE/DMI/SATA |
| Rev: 1.0 | |
| Date: Friday, October 14, 2016 | Sheet 13 of 71 |


PCH1B
DMI
PCIE
PCH_H
PCH1C
USB3
USB2
PCH_H
Rear USB3.0 HDMI
only support Z270/H270 not support B250
PCIECOMP_P
PCIECOMP_N
Length Match < 5mil
SATAXPCIE0-PE9
SATAXPCIE1-PE10
SATAXPCIE2-PE15
SATAXPCIE3-PE16
SATAXPCIE4-PE17
SATAXPCIE5-PE18
0--PCIE
1--SATA
KB CRB
HD3SS3415RUAR_WQFN42-HF
ASM1142 1 B250
ASM2142 0 Z/H270
MICRO-STAR INT'L CO.,LTD
MS-7A62
PCH-GPIO/USBOC#/SATASTRAP
Rev 1.0
Date: Friday, October 14, 2016
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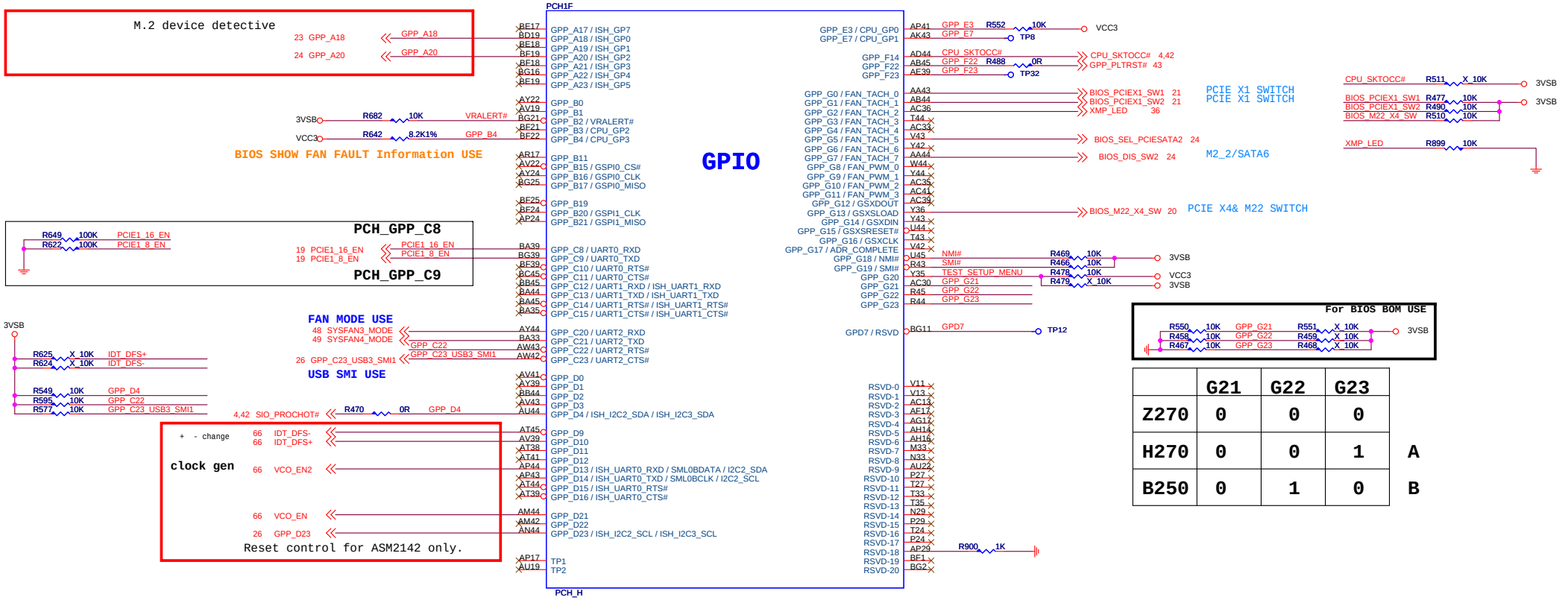


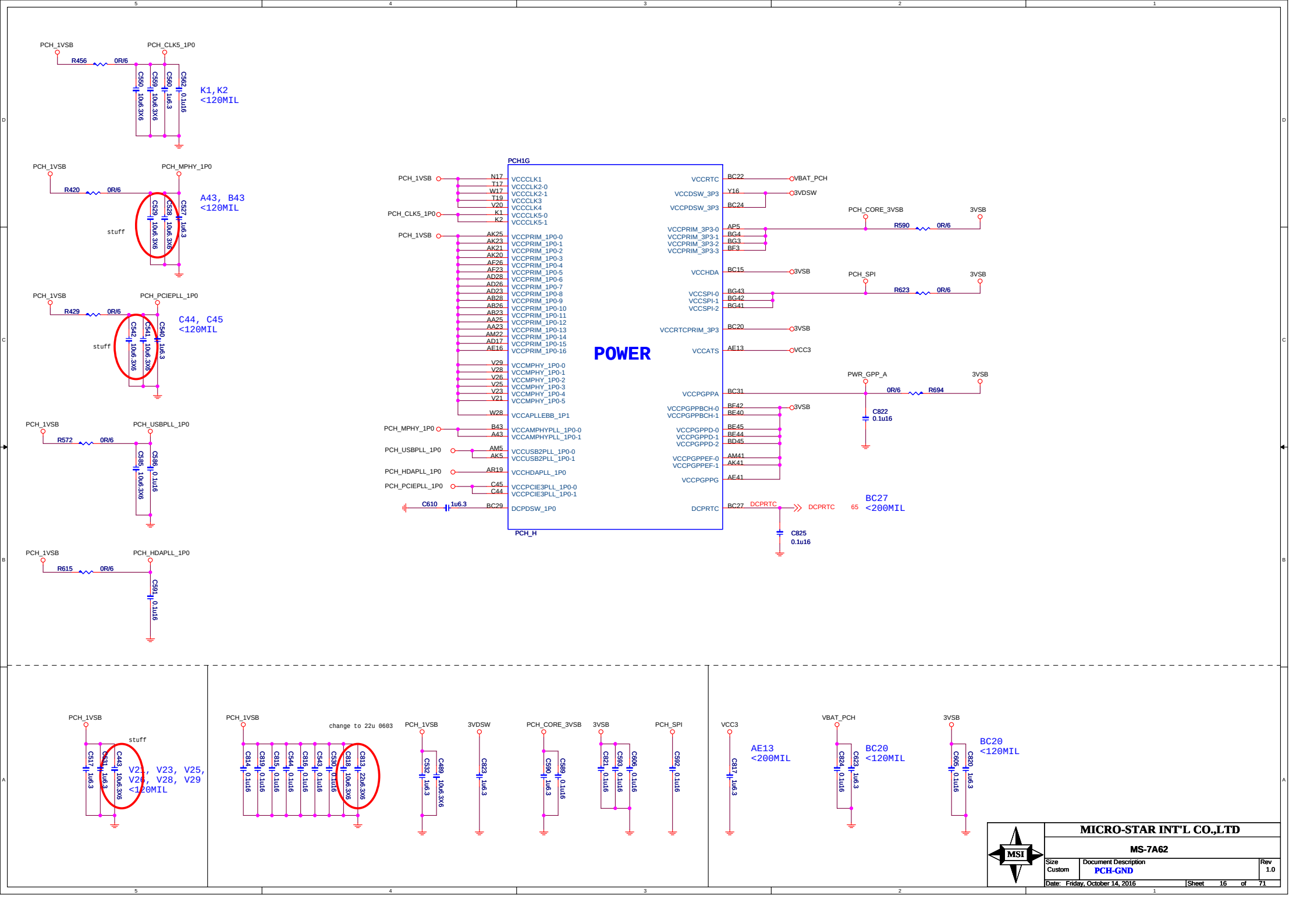

| | G21 | G22 | G23 | |
|---|---|---|---|---|
| Z270 | 0 | 0 | 0 | |
| H270 | 0 | 0 | 1 | A |
| B250 | 0 | 1 | 0 | B |

MICRO-STAR INT'L CO.,LTD

MS-7A62

| Size | Document Description | Rev |
|---|---|---|
| Custom | PCH-LPC/SPI/SMBUS/MISC | 1.0 |

Date: Friday, October 14, 2016 Sheet 15 of 71


PCH_1VSB
PCH_CLK5_1P0
R456 0R/6
C550 10u6.3X6
C559 10u6.3X6
C560 1u6.3
C562 0.1u16
K1,K2
<120MIL
PCH_1VSB
PCH_MPHY_1P0
R420 0R/6
C529 10u6.3X6
C528 10u6.3X6
C527 1u6.3
stuff
A43, B43
<120MIL
PCH_1VSB
PCH_PCIEPLL_1P0
R429 0R/6
C542 10u6.3X6
C541 10u6.3X6
C540 1u6.3
stuff
C44, C45
<120MIL
PCH_1VSB
PCH_USBPLL_1P0
R572 0R/6
C585 10u6.3X6
C586 0.1u16
PCH_1VSB
PCH_HDAPLL_1P0
R615 0R/6
C591 0.1u16
PCH1G
PCH_1VSB
PCH_CLK5_1P0
PCH_1VSB
PCH_MPHY_1P0
PCH_USBPLL_1P0
PCH_HDAPLL_1P0
PCH_PCIEPLL_1P0
C610 1u6.3
N17 VCCCLK1
T17 VCCCLK2-0
W17 VCCCLK2-1
T19 VCCCLK3
V20 VCCCLK4
K1 VCCCLK5-0
K2 VCCCLK5-1
AK25 VCCPRIM_1P0-0
AK23 VCCPRIM_1P0-1
AK21 VCCPRIM_1P0-2
AK20 VCCPRIM_1P0-3
AF26 VCCPRIM_1P0-4
AF23 VCCPRIM_1P0-5
AD28 VCCPRIM_1P0-6
AD26 VCCPRIM_1P0-7
AD23 VCCPRIM_1P0-8
AB28 VCCPRIM_1P0-9
AB26 VCCPRIM_1P0-10
AB23 VCCPRIM_1P0-11
AA25 VCCPRIM_1P0-12
AA23 VCCPRIM_1P0-13
AM22 VCCPRIM_1P0-14
AD17 VCCPRIM_1P0-15
AE16 VCCPRIM_1P0-16
V29 VCCMPHY_1P0-0
V28 VCCMPHY_1P0-1
V26 VCCMPHY_1P0-2
V25 VCCMPHY_1P0-3
V23 VCCMPHY_1P0-4
V21 VCCMPHY_1P0-5
W28 VCCAPLLEBB_1P1
B43 VCCAMPHYPLL_1P0-0
A43 VCCAMPHYPLL_1P0-1
AM5 VCCUSB2PLL_1P0-0
AK5 VCCUSB2PLL_1P0-1
AR19 VCCHDAPLL_1P0
C45 VCCPCIE3PLL_1P0-0
C44 VCCPCIE3PLL_1P0-1
BC29 DCPDSW_1P0
POWER
PCH_H
VCCRTC BC22 VBAT_PCH
VCCDSW_3P3 Y16 3VDSW
VCCPDSW_3P3 BC24
VCCPRIM_3P3-0 AP5
VCCPRIM_3P3-1 BG4
VCCPRIM_3P3-2 BG3
VCCPRIM_3P3-3 BF3
PCH_CORE_3VSB
R590 0R/6
3VSB
VCCHDA BC15 3VSB
VCCSPI-0 BG43
VCCSPI-1 BG42
VCCSPI-2 BG41
PCH_SPI
R623 0R/6
3VSB
VCCRTCPRIM_3P3 BC20 3VSB
VCCATS AE13 VCC3
VCCPGPPA BC31
PWR_GPP_A
0R/6 R694
3VSB
C822 0.1u16
VCCPGPPBCH-0 BF42
VCCPGPPBCH-1 BE40
3VSB
VCCPGPPD-0 BE45
VCCPGPPD-1 BE44
VCCPGPPD-2 BD45
VCCPGPPEF-0 AM41
VCCPGPPEF-1 AK41
VCCPGPPG AE41
DCPRTC BC27 DCPRTC
DCPRTC 65
BC27
<200MIL
C825 0.1u16
PCH_1VSB
stuff
C517 1u6.3
C514 1u6.3
C443 10u6.3X6
V22, V23, V25,
V26, V28, V29
<120MIL
PCH_1VSB
change to 22u 0603
C814 0.1u16
C819 0.1u16
C815 0.1u16
C544 0.1u16
C816 0.1u16
C543 0.1u16
C530 0.1u16
C818 10u6.3X6
C813 22u6.3X6
PCH_1VSB
C532 1u6.3
C489 10u6.3X6
3VDSW
C823 1u6.3
PCH_CORE_3VSB
C590 1u6.3
C589 0.1u16
3VSB
C821 0.1u16
C593 0.1u16
C606 0.1u16
PCH_SPI
C592 0.1u16
VCC3
C817 1u6.3
AE13
<200MIL
VBAT_PCH
C824 0.1u16
C623 1u6.3
BC20
<120MIL
3VSB
C605 0.1u16
C820 1u6.3
BC20
<120MIL
MSI
MICRO-STAR INT'L CO.,LTD
MS-7A62
Size Custom
Document Description PCH-GND
Rev 1.0
Date: Friday, October 14, 2016
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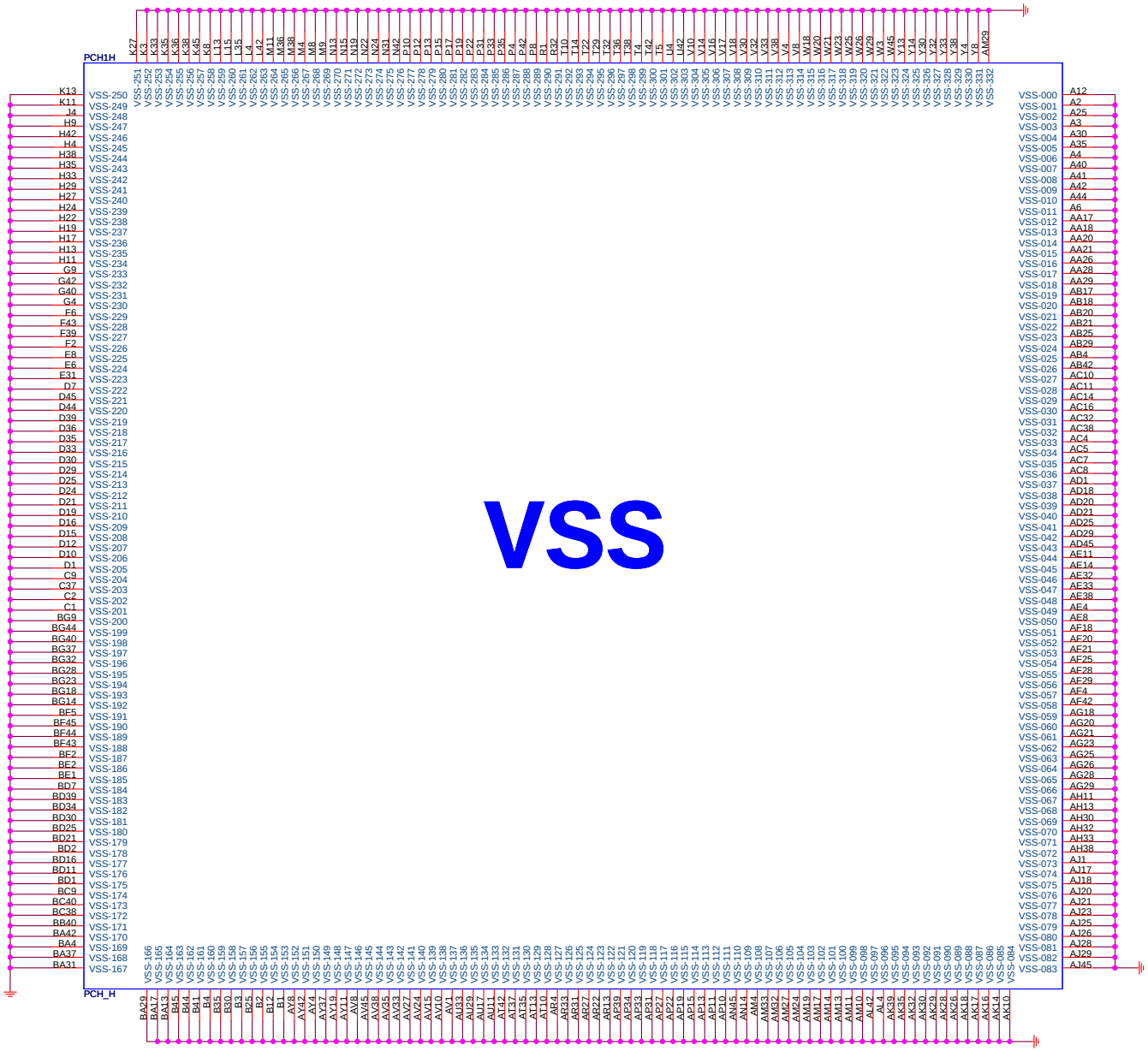
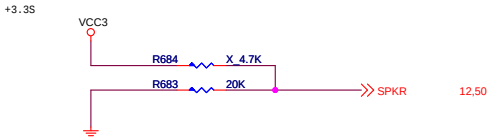


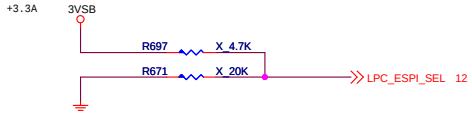

| | |
|---|---|
| MICRO-STAR INT'L CO.,LTD | |
| MS-7A62 | |
| Size: Custom | Document Description: PCH-Power |
| Rev: 1.0 | |
| Date: Monday, October 03, 2016 | Sheet 17 of 71 |

*TOP Swap*




Internal pull-down is disabled after PLTRST#

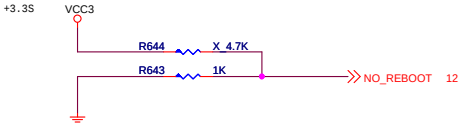
*LPC eSPI Mode*




0 : LPC
1 : eSPI

Internal pull-down is disabled after RSMRST

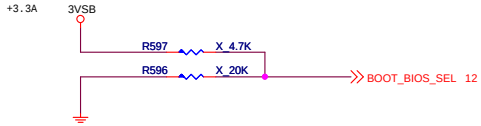
*No Reboot*




0 : DISABLE (Default)
1 : ENABLE

Internal pull-down is disabled after PLTRST#

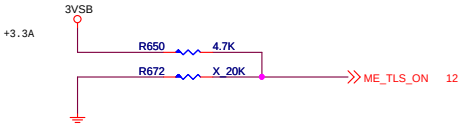
*Boot BIOS*




0 : SPI
1 : LPC

Internal pull-down is disabled after PLTRST

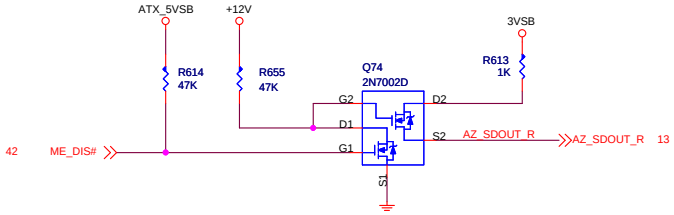
*AMT and SBA with confidentiality*



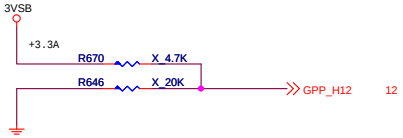

0 : DISABLE
1 : ENABLE (Default)

Internal pull-down is disabled after RSMRST

*HDA_SDO*




*ESPI FLASH SHARING MODE*




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

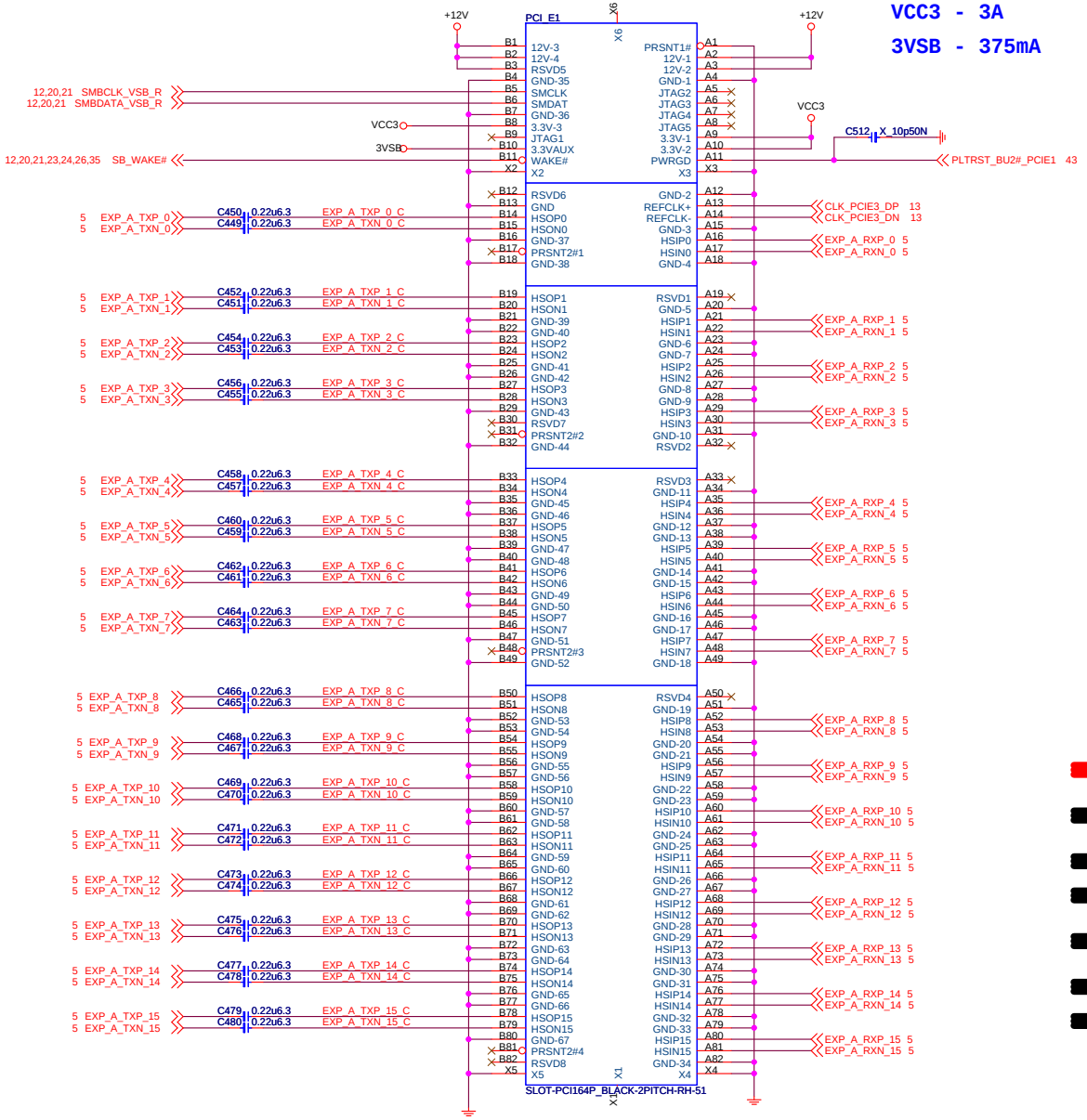
Internal pull-down is disabled after RSMRST



| | |
|---|---|
| MICRO-STAR INT'L CO.,LTD | |
| MS-7A62 | |
| Size: Custom | Document Description: PCH-Strap |
| Rev: 1.0 | |
| Date: Friday, October 14, 2016 | Sheet 18 of 71 |

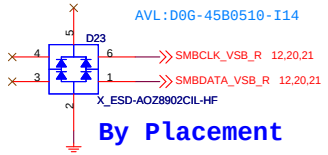
# N11-1641491-L06
# Footprint:SLOT_PCIEXP164_13_TEST

**12V - 5.5A**
**VCC3 - 3A**
**3VSB - 375mA**

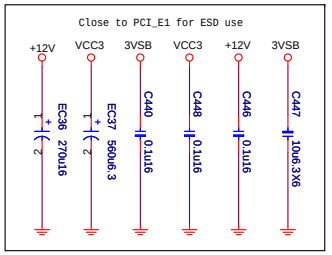


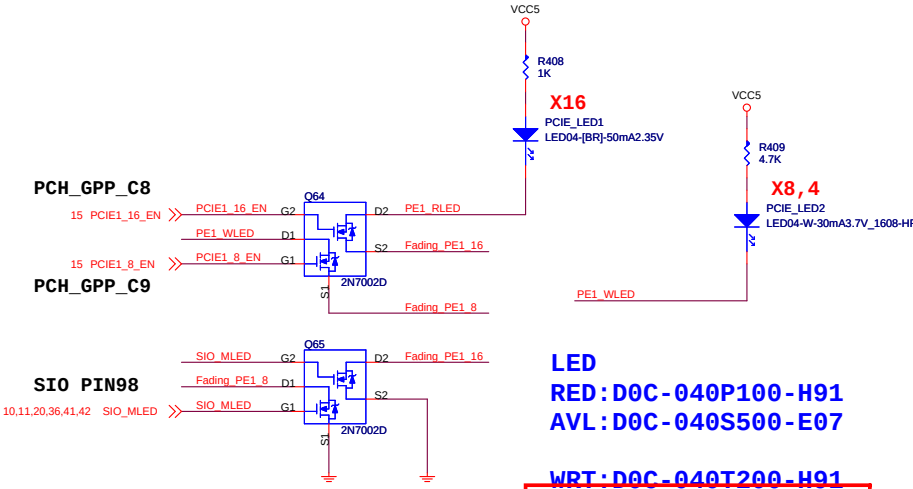

**X2.X3.X4.X5 connect to gnd for emi**

## SMBUS_ESD



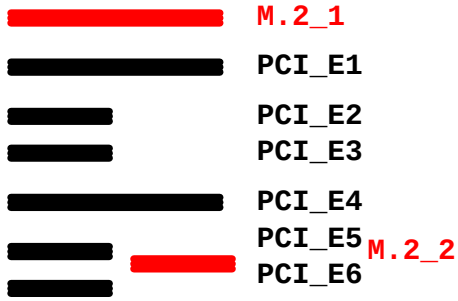

**By Placement**



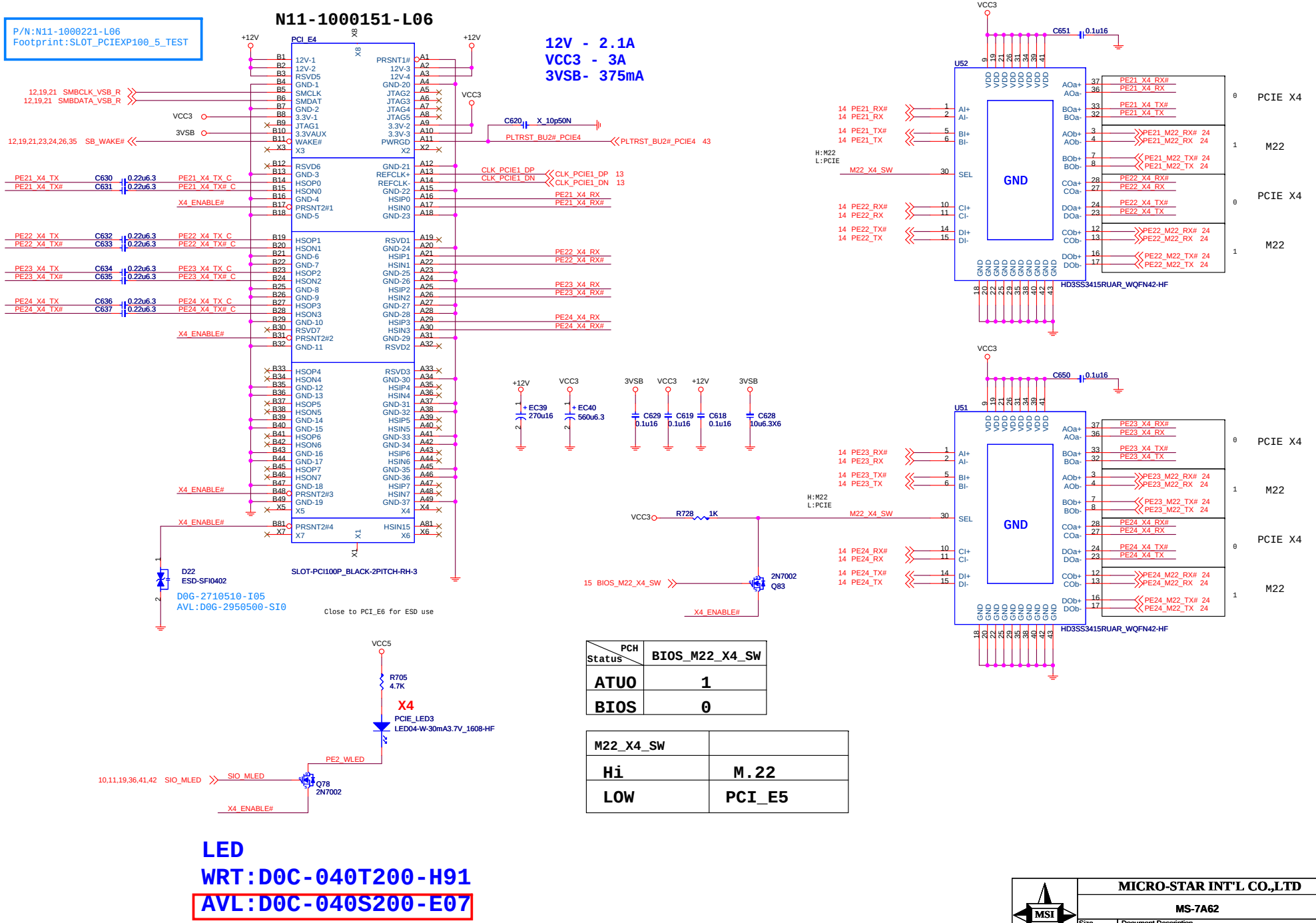

**LED**
**RED:D0C-040P100-H91**
**AVL:D0C-040S500-E07**

**WRT:D0C-040T200-H91**
**AVL:D0C-040S200-E07**




| | |
|---|---|
| MICRO-STAR INT'L CO.,LTD | |
| MS-7A62 | |
| Size: Custom | Document Description: PCIE SLOT (X16) |
| Rev: 1.0 | |
| Date: Friday, October 14, 2016 | Sheet 19 of 71 |

# PCI_Express X4 Slot (From PCH X4)



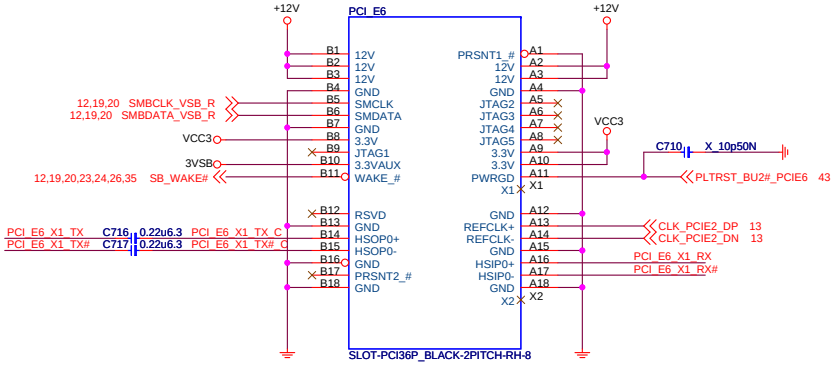

| PCH Status | BIOS_M22_X4_SW |
|---|---|
| ATUO | 1 |
| BIOS | 0 |

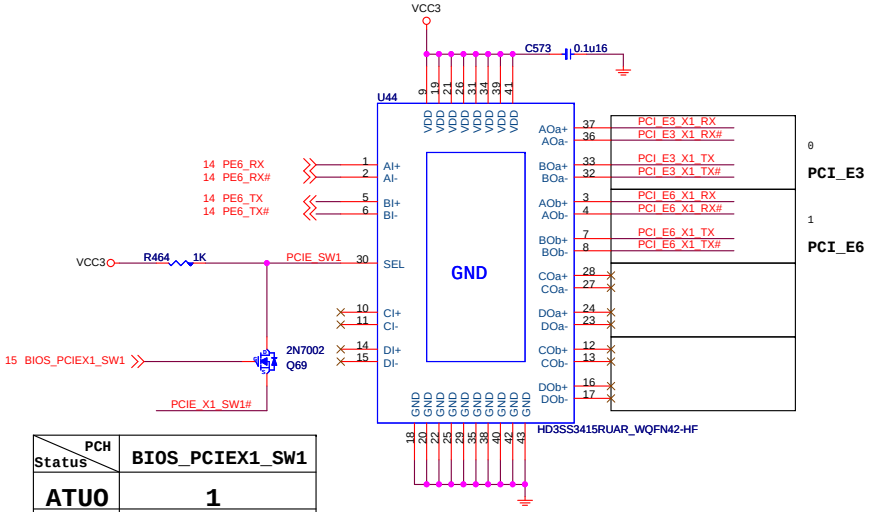
| M22_X4_SW | |
|---|---|
| Hi | M.22 |
| LOW | PCI_E5 |

**LED**
**WRT:D0C-040T200-H91**
**AVL:D0C-040S200-E07**

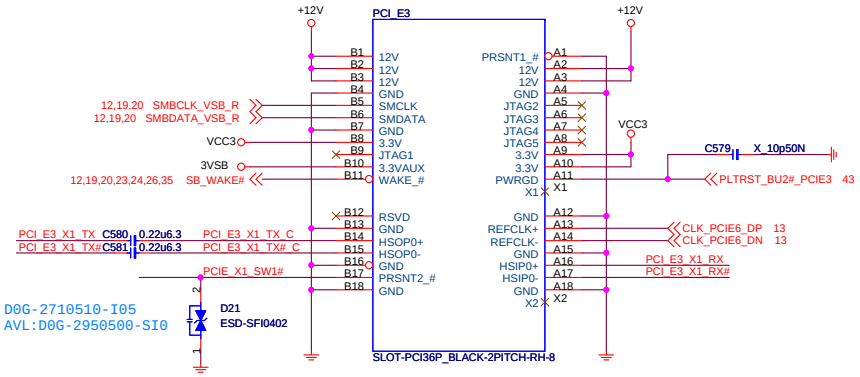
| | |
|---|---|
| MICRO-STAR INT'L CO.,LTD | |
| MS-7A62 | |
| Size: Custom | Document Description: PCIE SLOT-CPU (X8)/(X4)/LED |
| Rev: 1.0 | |
| Date: Friday, October 14, 2016 | Sheet 20 of 71 |

N11-0360441-L06

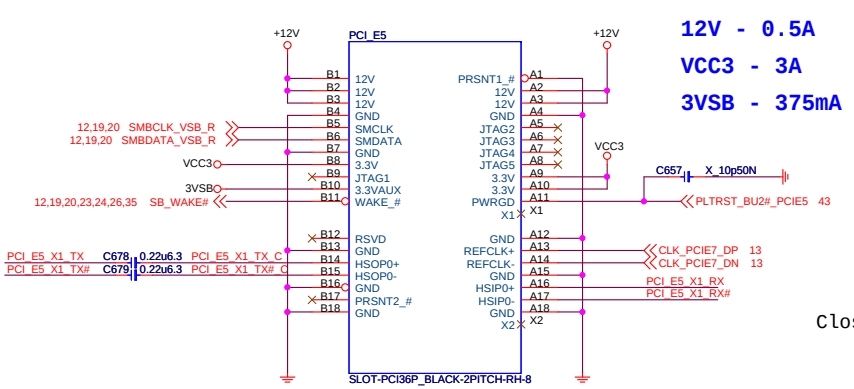



| PCH Status | BIOS_PCIEX1_SW1 |
|---|---|
| ATUO | 1 |
| BIOS | 0 |



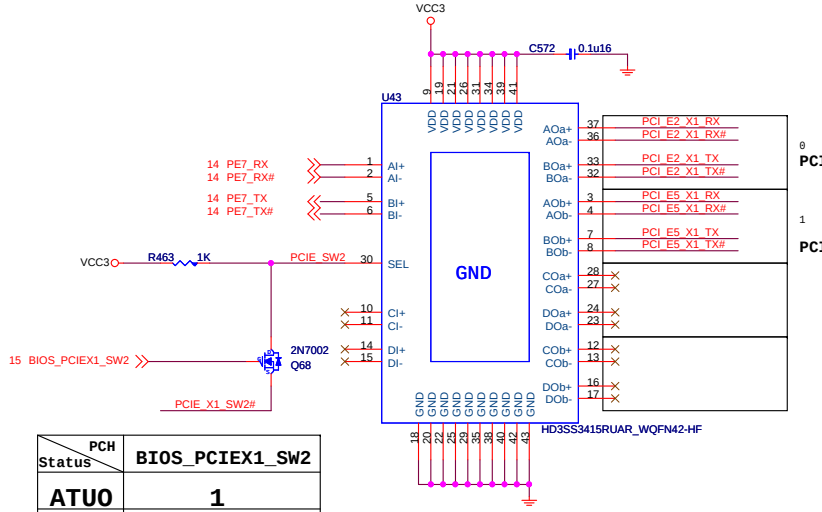

N11-0360441-L06



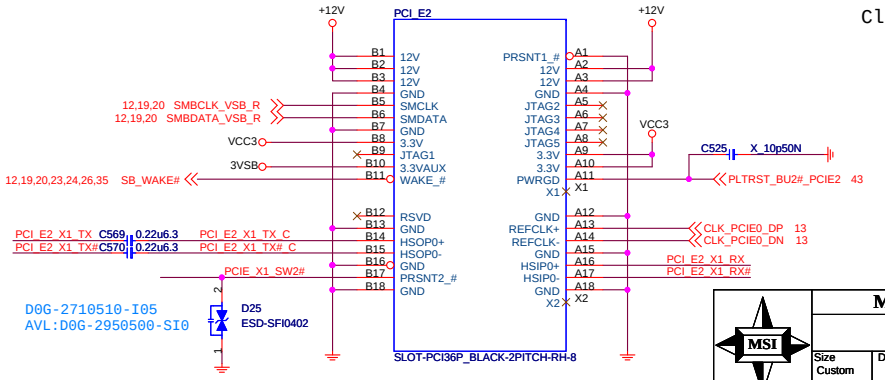

12V - 0.5A

VCC3 - 3A

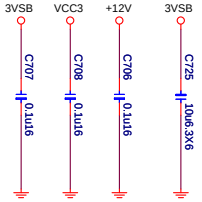
3VSB - 375mA



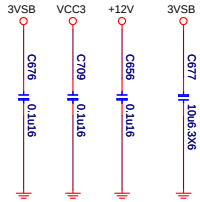

| PCH Status | BIOS_PCIEX1_SW2 |
|---|---|
| ATUO | 1 |
| BIOS | 0 |



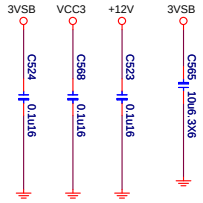

Close to PCI_E6 for ESD use



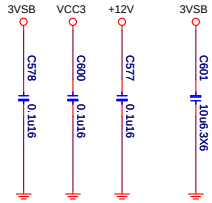

Close to PCI_E5 for ESD use




Close to PCI_E2 for ESD use

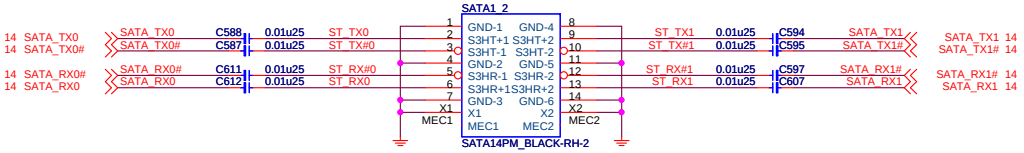



Close to PCI_E3 for ESD use



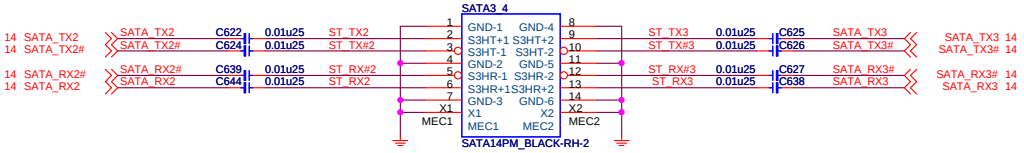

| MICRO-STAR INT'L CO.,LTD | | |
|---|---|---|
| MS-7A62 | | |
| Size: Custom | Document Description: PCIE SLOT-PCH (X1)/Switch | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 21 of 71 | |

## N5N-14M0201-L06

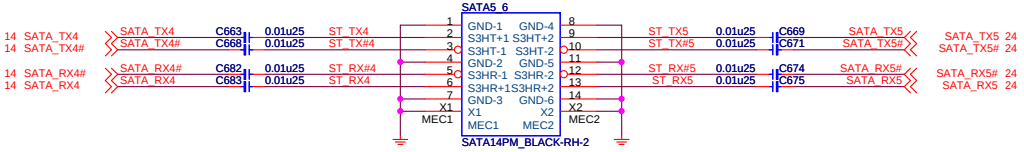



**M.2_1 use SATA Function, SATA1&SATA2 not support**

## N5N-14M0201-L06




## N5N-14M0201-L06



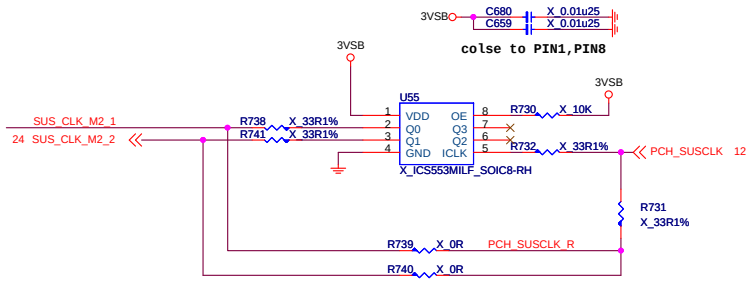

**M.2_2 use SATA Function, SATA6 not support**

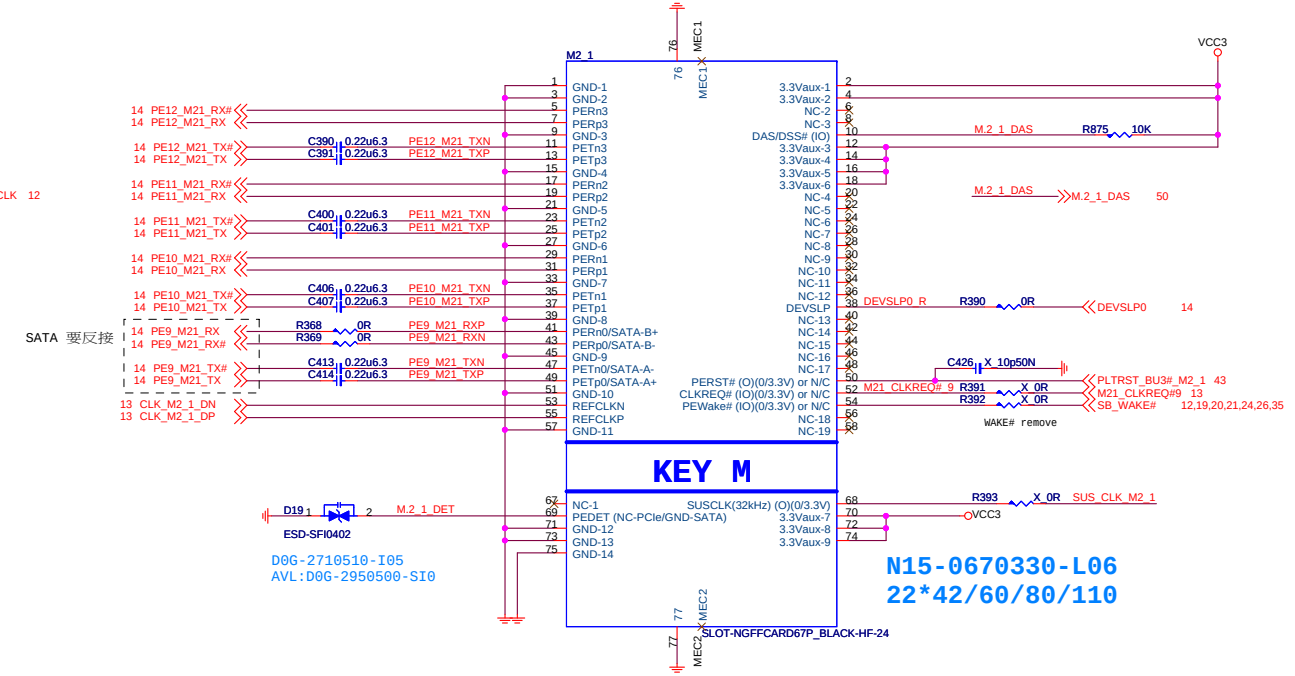
MICRO-STAR INT'L CO.,LTD

MS-7A62

| Size | Document Description | Rev |
|---|---|---|
| Custom | SATA Connector | 1.0 |

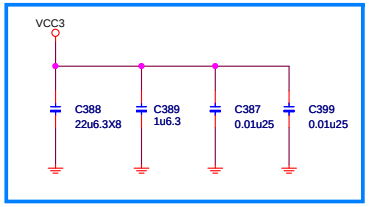
Date: Friday, October 14, 2016 Sheet 22 of 71



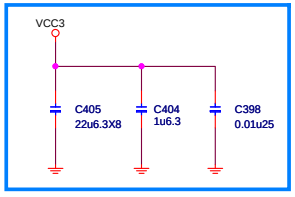




M.2 VCC3>=2.5A

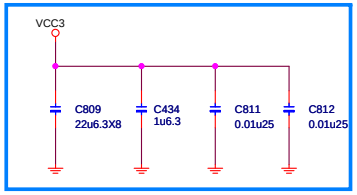
Near Pin2,Pin4

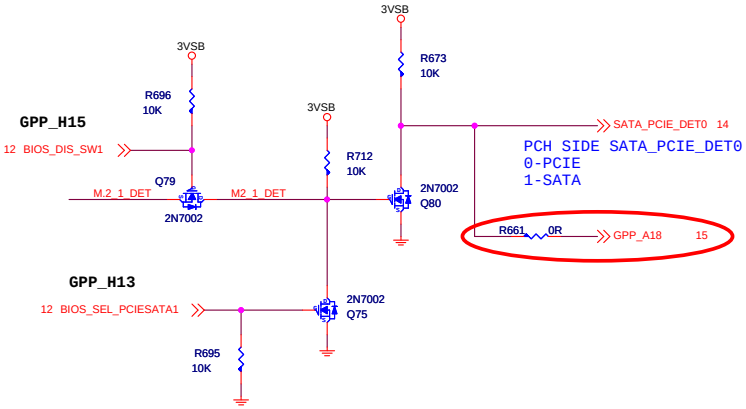



Near Pin12,Pin14,Pin16,Pin18




Near Pin70,Pin72,Pin74

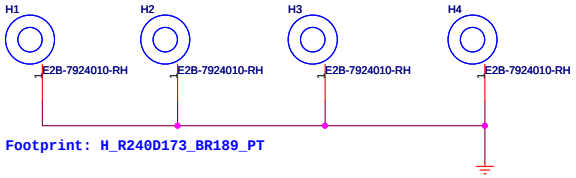



***BIOS_MODE***

| *BIOS_DIS_SW1* | *BIOS_SEL_PCIESATA1* | *Mode* |
|---|---|---|
| *0* | *1* | *M2-SATA* |
| *0* | *0* | *M2-PCIE* |
| *GPI* | *GPI* | *AUTO* |

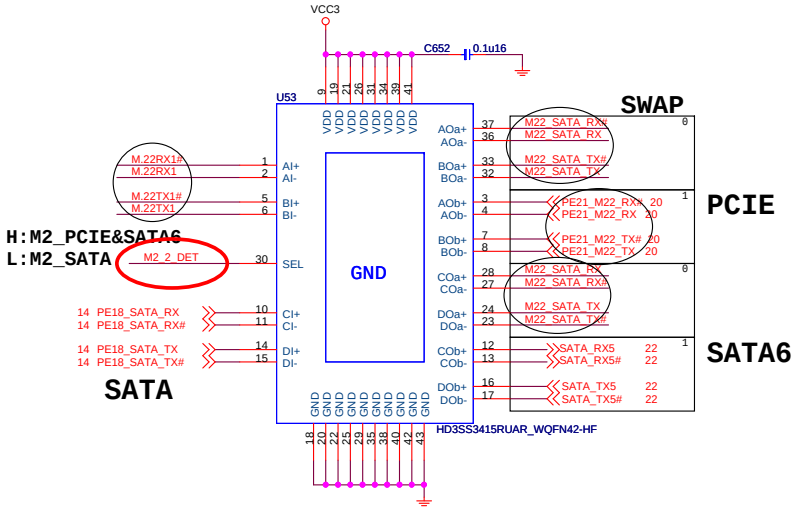
**E2B-7924010-A89**

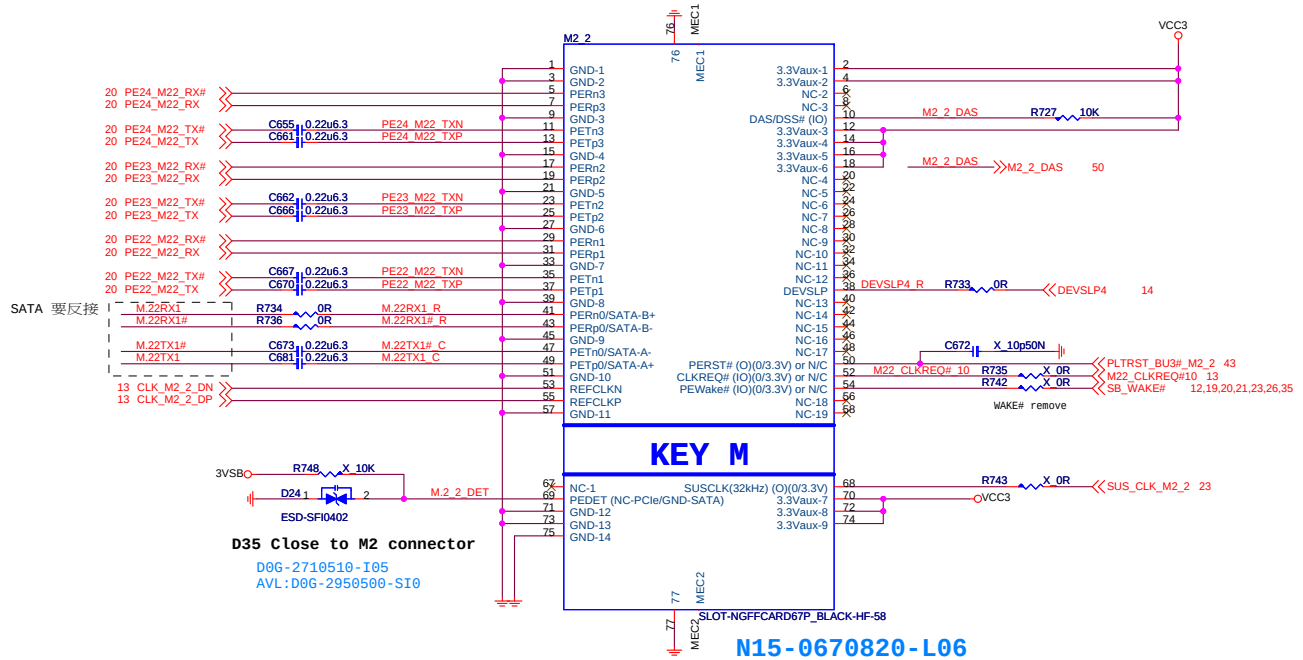



**Footprint: H_R240D173_BR189_PT**


**E2B-7984010-A89**

| MICRO-STAR INT'L CO.,LTD | | |
|---|---|---|
| MS-7A62 | | |
| Size: Custom | Document Description: M.2-SLOT1 | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 23 of 71 | |

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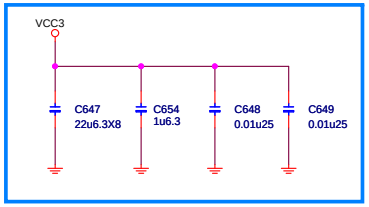
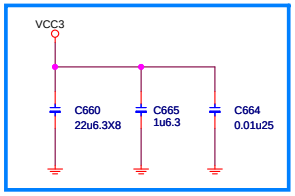
N15-0670820-L06
22*42/60/80

M.2 VCC3>=2.5A

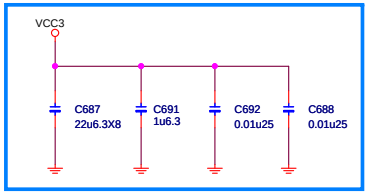
Near Pin2,Pin4

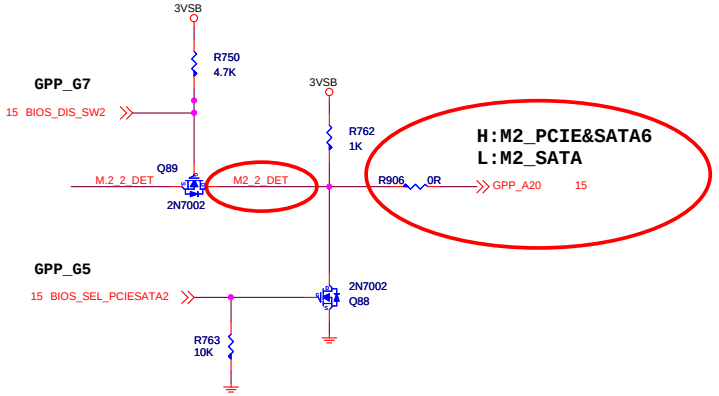



Near Pin12,Pin14,Pin16,Pin18




Near Pin70,Pin72,Pin74

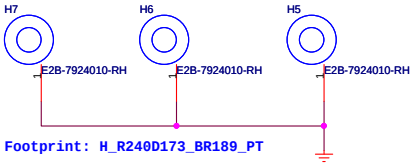



***BIOS_MODE***

| *BIOS_DIS_SW2* | *BIOS_SEL_PCIESATA2* | *Mode* |
|---|---|---|
| *0* | *1* | *M2-SATA* |
| *0* | *0* | *M2-PCIE/SATA PORT* |
| *GPI(1)* | *0* | *AUTO* |

E2B-7924010-A89





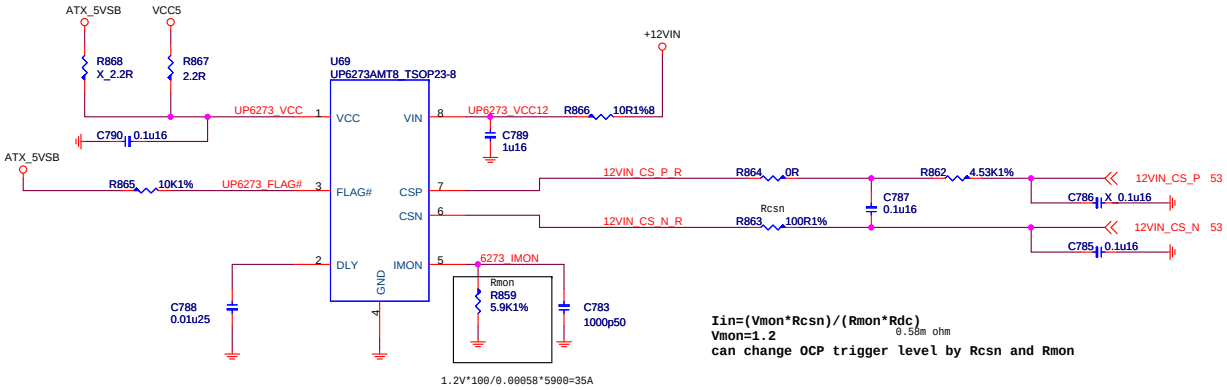
E2B-7984010-A89

MICRO-STAR INT'L CO.,LTD

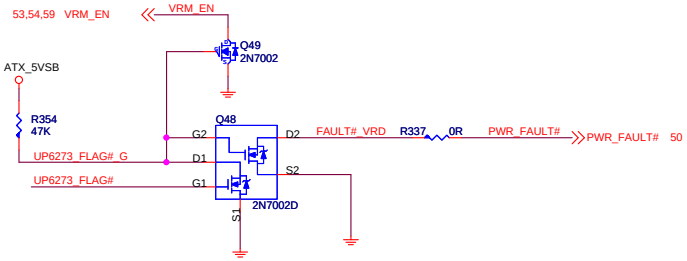
MS-7A62

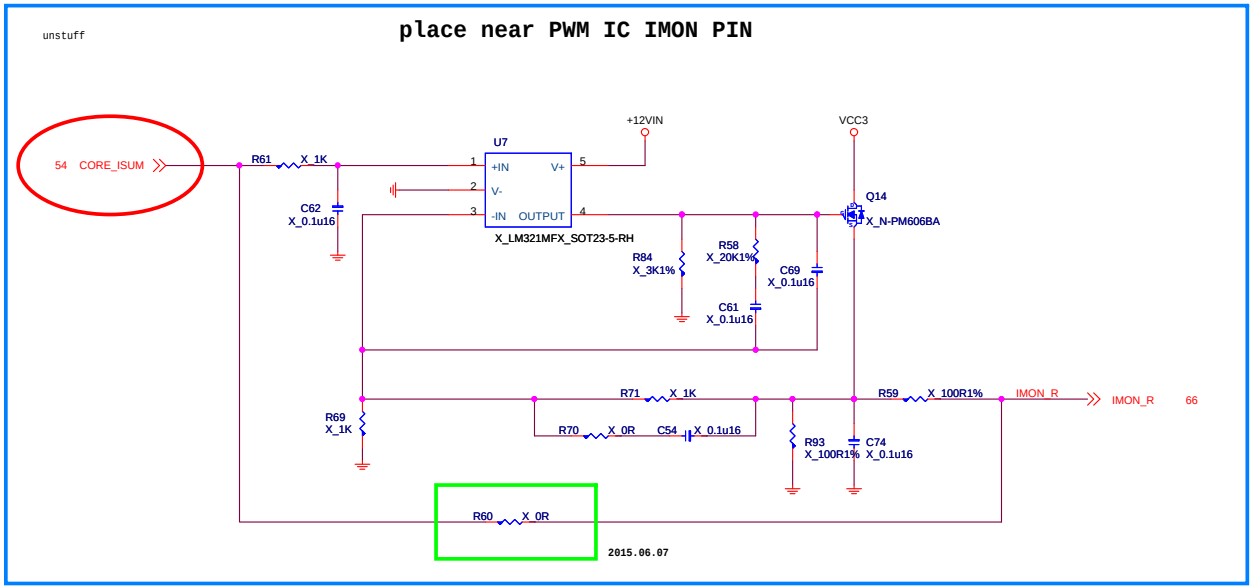
Size: Custom | Document Description: M.2-SLOT2 | Rev: 1.0

Date: Friday, October 14, 2016 | Sheet 24 of 71




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




| | | |
|---|---|---|
| MICRO-STAR INT'L CO.,LTD | | |
| MS-7A62 | | |
| Size: Custom | Document Description | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 25 of 71 | |

Minimun gap should be greater of
>15mil with other signal.

**Power Consumption**

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

CLK Rule (Follow SB PDG)

PCIE Rule (Follow SB PDG)

B250 PE5
Z/H270 PE19

USB HS (90Ohm-Diff)

Chip to Connector ¯1.5 inch.

USB SS (90Ohm-Diff)

USB HS (90Ohm-Diff)

USB SS (80Ohm-Diff)

PPON_X Internal Pull-up to VCC3

OCI_X Internal Pull-up to SUS

RX/TX Internal Pull-up

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

D0G-2710510-I05
AVL:D0G-2950500-SI0

B02-021421C-AD0 Z270/H270 **A1**
B02-011422C-AD0 B250

Layout Guide:

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

ASM1142 RU13 unstuff RU12 stuff
ASM2142 RU12 unstuff RU13 stuff

ASM2142 UU8 stuff RU27 unstuff
ASM1142 UU8 unstuff RU27 stuff
Reset control for ASM2142 only.

ASM1142 RU15 unstuff RU14 stuff
ASM1142 RU15 stuff RU14 unstuff

X0/XI (95hm-Diff,Spacing 30mil )
UREXT,PEUREXT(W/S) : 10/7
OCIA,OCIB,PPONA,PPONB(W/S) : 5/8

YU1 D04-0901200-F07
D04-0901100-T16

atx5vsb change to vcc5

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

## ASM1142 1.2 VCC Power

SN:L01-0107118-M26

ASM1142 RU3/RU4 200K/187K__1.24V
ASM2142 RU3/RU4 196K/261K__1.05V

## ASM1142 1.2 VSB Power

ASM1142 RU6 19.6K__1.2V
ASM2142 RU6 31.6K__1.05V

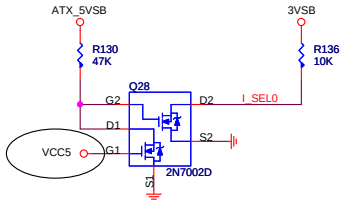
## EEPROM

ASM1142 UU3 M31-2551222-M24
ASM2142 UU3 M31-25L1022-M24

ASM1142 unstuff
ASM2142 stuff

| | |
|---|---|
| MICRO-STAR INT'L CO.,LTD | |
| MS-7A62 | |
| Size: Custom | Document Description: ASM 1142 |
| Rev: 1.0 | |
| Date: Friday, October 14, 2016 | Sheet 26 of 71 |

## Current Mode

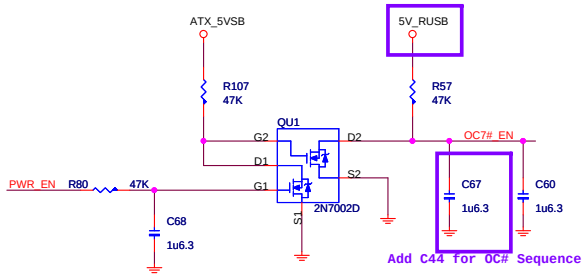


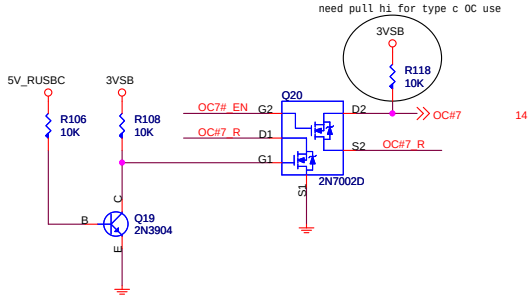

I_SEL0 : I_SEL1

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

*1.5A under S3 mode*
*3A under S0 mode*

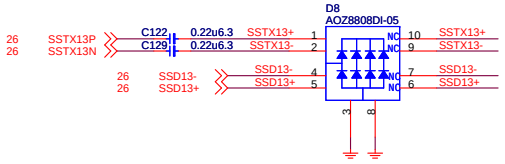
## VBUS OC#

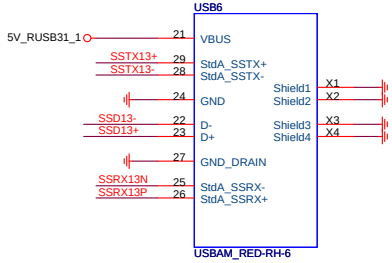


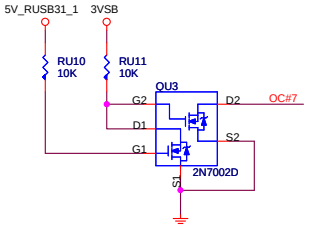



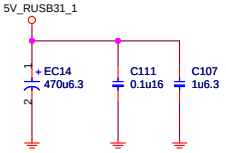

## TYPE-A

### N53-09M0861-L06

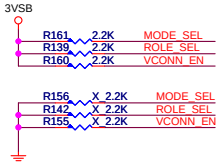


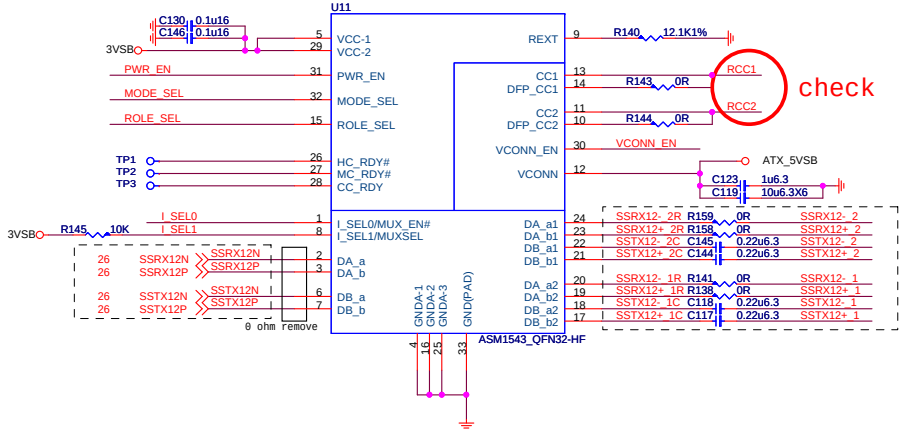

## USB Type-C MUX with Configuration Channel (CC)

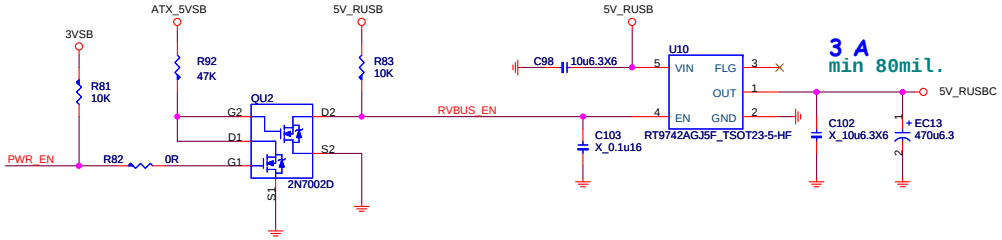



| MODE_SEL | |
|---|---|
| 1 | CCL MODE (default) |
| 0 | Mux MODE |

| ROLE_SEL | |
|---|---|
| 1 | DFP role (default) |
| 0 | UFP role |

| VCONN_EN | |
|---|---|
| 1 | enable |
| 0 | disable |

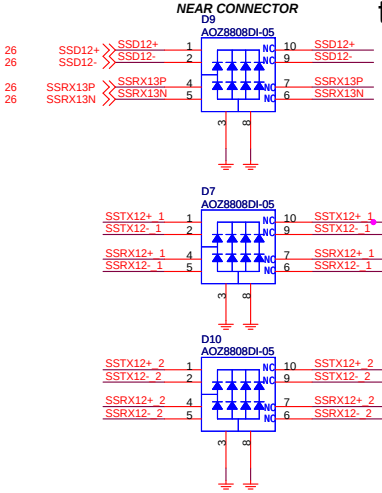



## TYPE-C

### ESD Protection

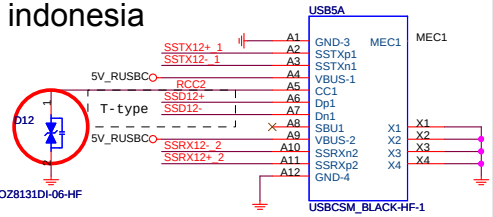
*NEAR CONNECTOR*



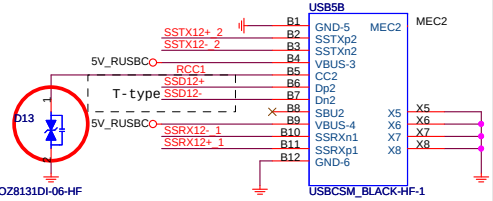

USB3.0 (ESD)
D0G-06A030C-A68 (M)
D0G-05A0300-I14
D0G-06A050C-A68
D0G-05A056C-I05
D0G-45B031C-005

### N53-24M0180-L06

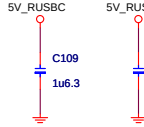
teknisi indonesia




USB3.0 (ESD)
D0G-12A060C-A68 T-type 分支需小於140mils

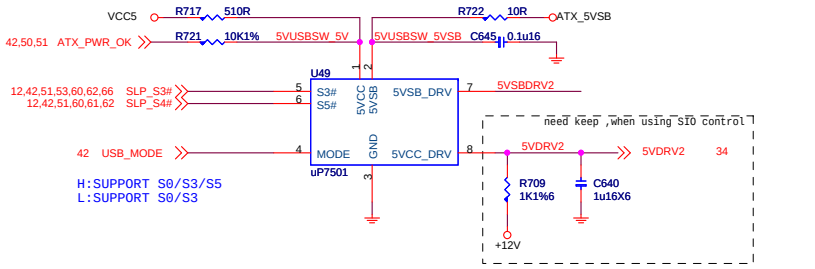



close to Type C Connector

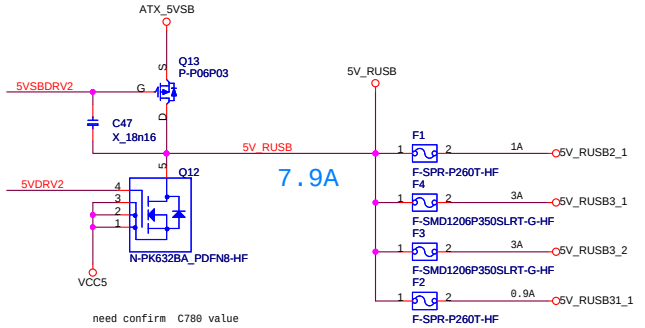



| | | |
|---|---|---|
| MSI | MICRO-STAR INT'L CO.,LTD | |
| | MS-7A62 | |
| Size: Custom | Document Description: USB TYPE C | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 27 of 71 | |

# USB PORT POWER




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



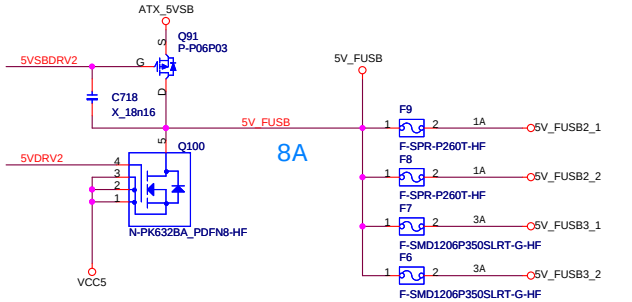

**PS2_USB/USB2.0**

**LAN/USB3.0**

**HDMI/USB3.0**

**TYPE A/USB3.1**

3.5A(Itrip=3.5A; 0.003ohm)
D08-2000400-P16
D08-2000400-L07
2.6A (Itrip=2.6A; 0.015ohm)
D08-0301000-P16
D08-0301100-B07




**JUSB3/USB2.0**

**JUSB4/USB2.0**

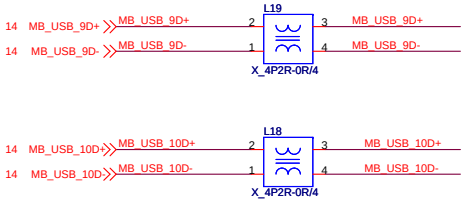
**JUSB1/USB3.0**

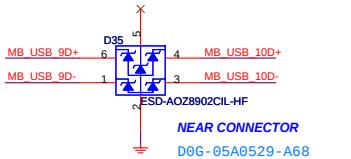
**JUSB2/USB3.0**

P-MOS
D03-06P0319-N03
N-MOS
D03-510BA0C-N03
D03-3056M00-U47
D03-4C05N03-O05
D03-3830D09-N47
D03-632BA0C-N03

**F6 B150 no use**

| | | |
|---|---|---|
| MICRO-STAR INT'L CO.,LTD | | |
| MS-7A62 | | |
| Size: Custom | Document Description: USB POWER UP7501 | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 28 of 71 | |

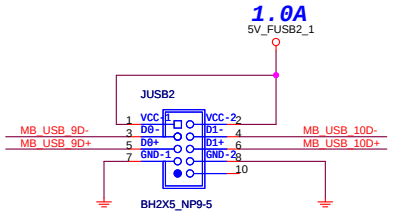



NEAR CONNECTOR

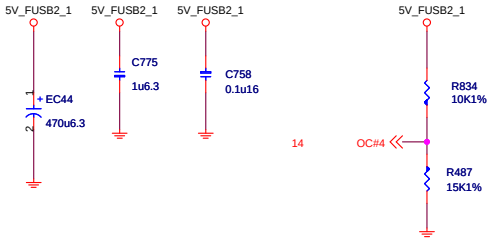
D0G-05A0529-A68

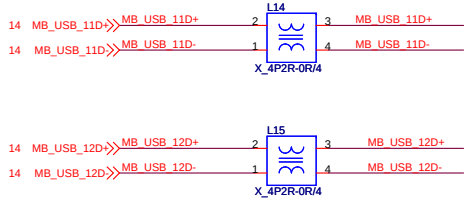
AVL:D0G-45B0510-I14

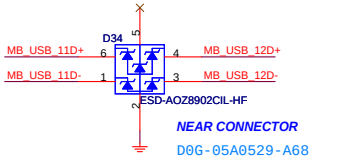



**N31-2051BG1-H06**

EMI Cap near Connector.



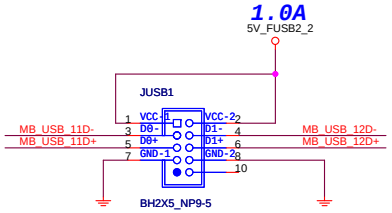




NEAR CONNECTOR

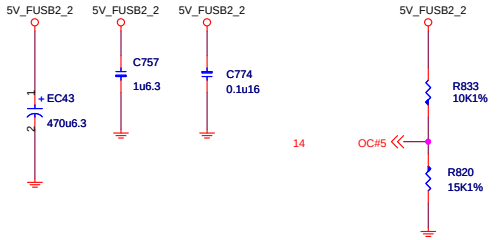
D0G-05A0529-A68

AVL:D0G-45B0510-I14

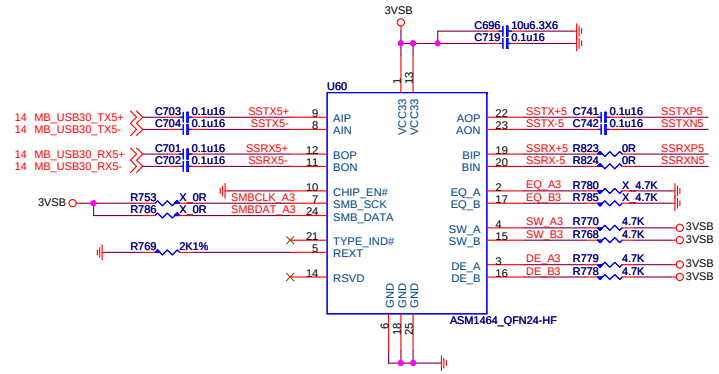


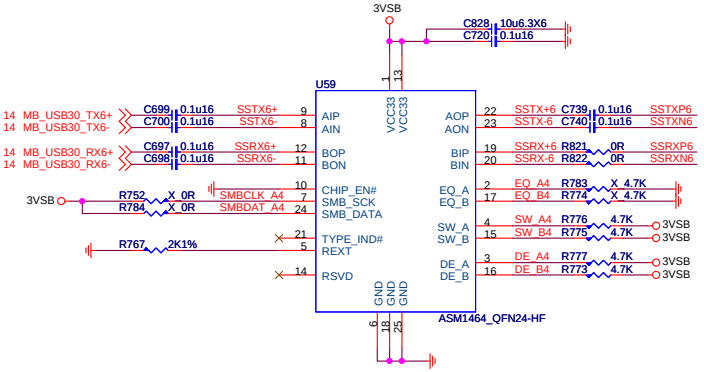

**N31-2051BG1-H06**

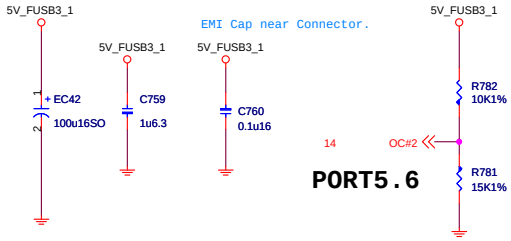
EMI Cap near Connector.

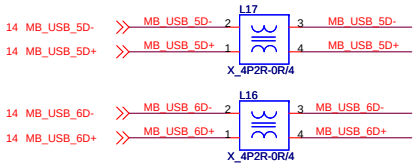


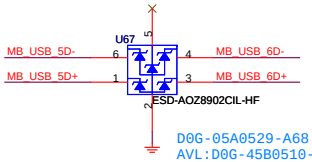

| | | |
|---|---|---|
| MICRO-STAR INT'L CO.,LTD | | |
| MS-7A62 | | |
| Size: Custom | Document Description: Front USB20 | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 29 of 71 | |

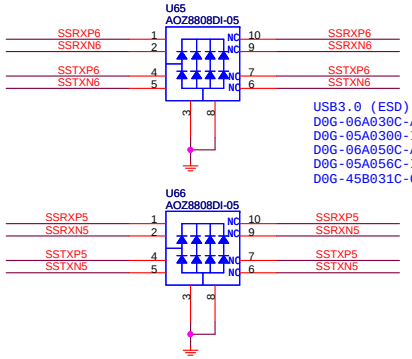


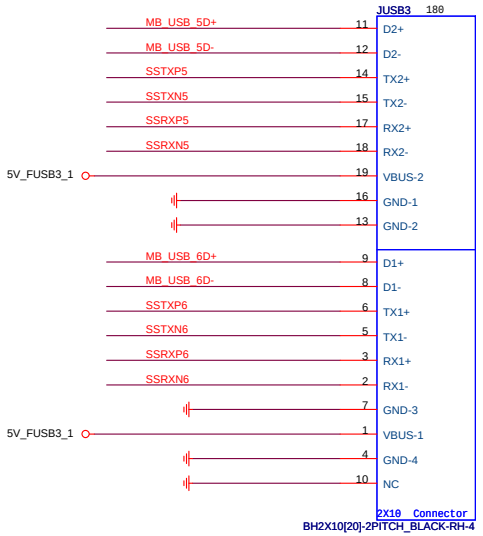



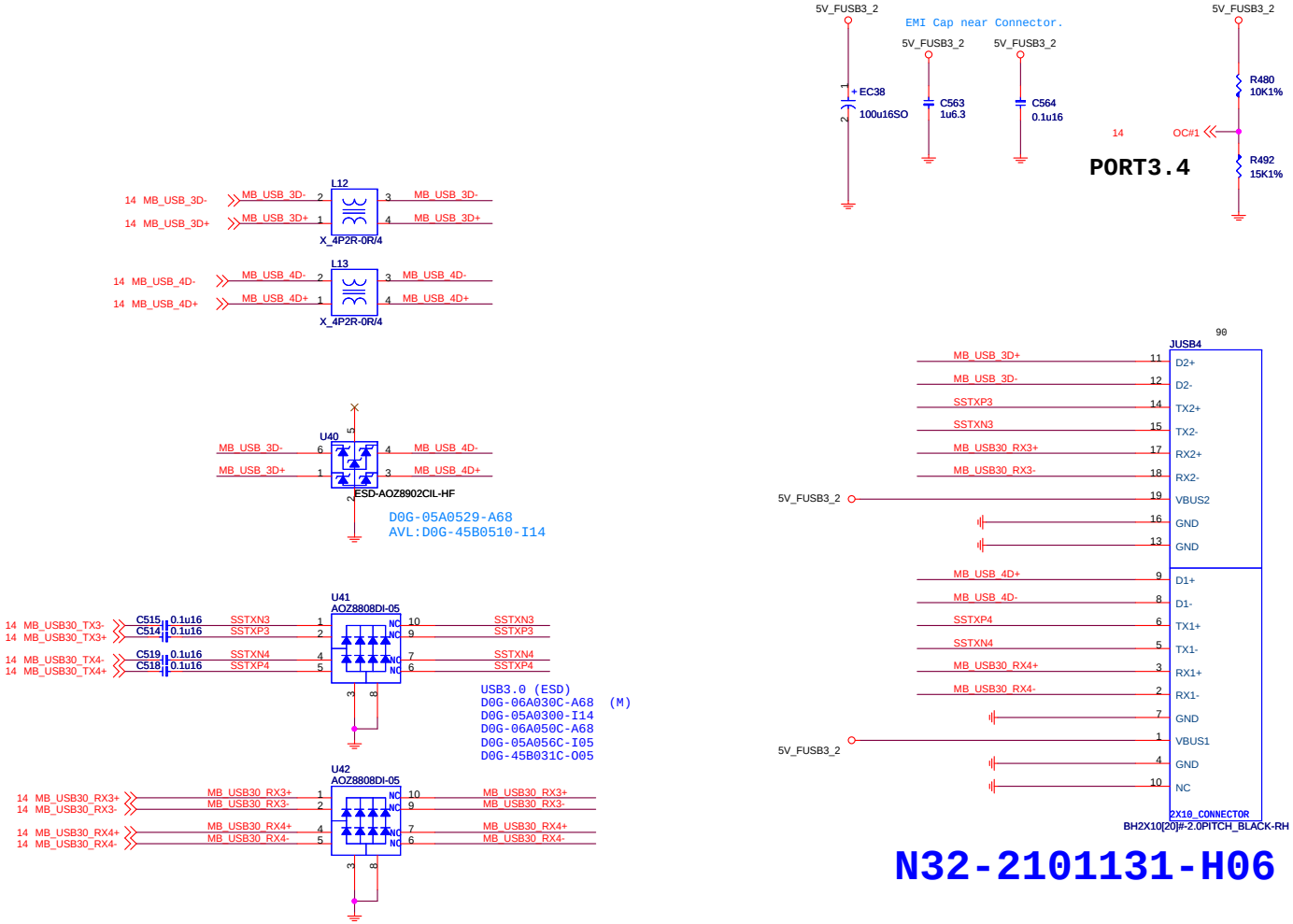




# N32-2101221-H06

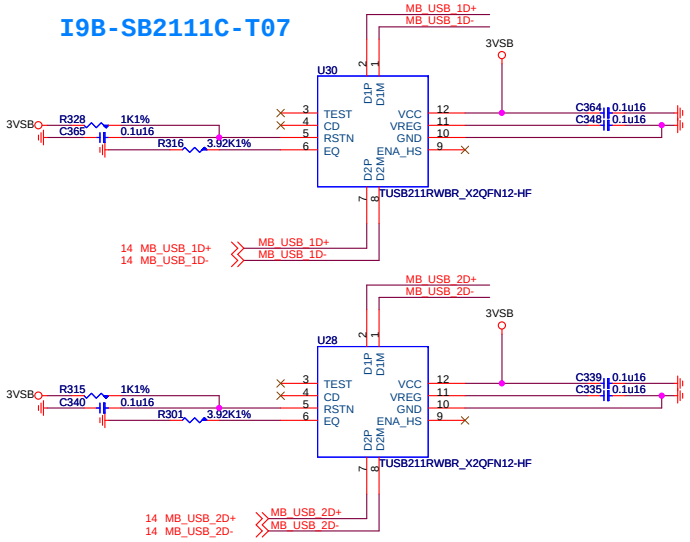
| | | |
|---|---|---|
| MSI | MICRO-STAR INT'L CO.,LTD | |
| | MS-7A62 | |
| Size: Custom | Document Description: Front USB3.0 (Z270/H270/B250) | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 30 of 71 | |

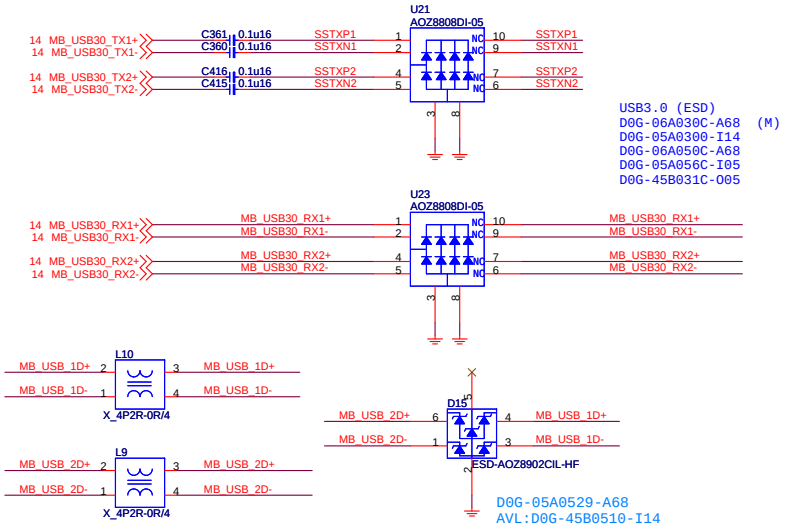



**N32-2101131-H06**

| | | |
|---|---|---|
| MSI | MICRO-STAR INT'L CO.,LTD | |
| | MS-7A62 | |
| Size: Custom | Document Description: Front USB3.0 (Z270/H270/B250) | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 31 of 71 | |

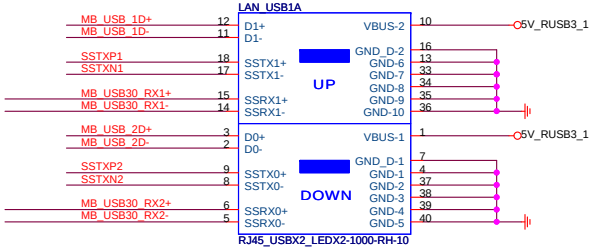
# LAN USB3.0 VR PORT
# H270/B250 no VR function
# remove redriver u3.

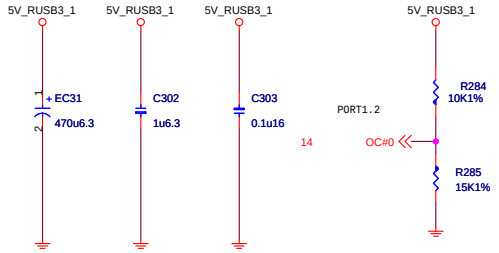


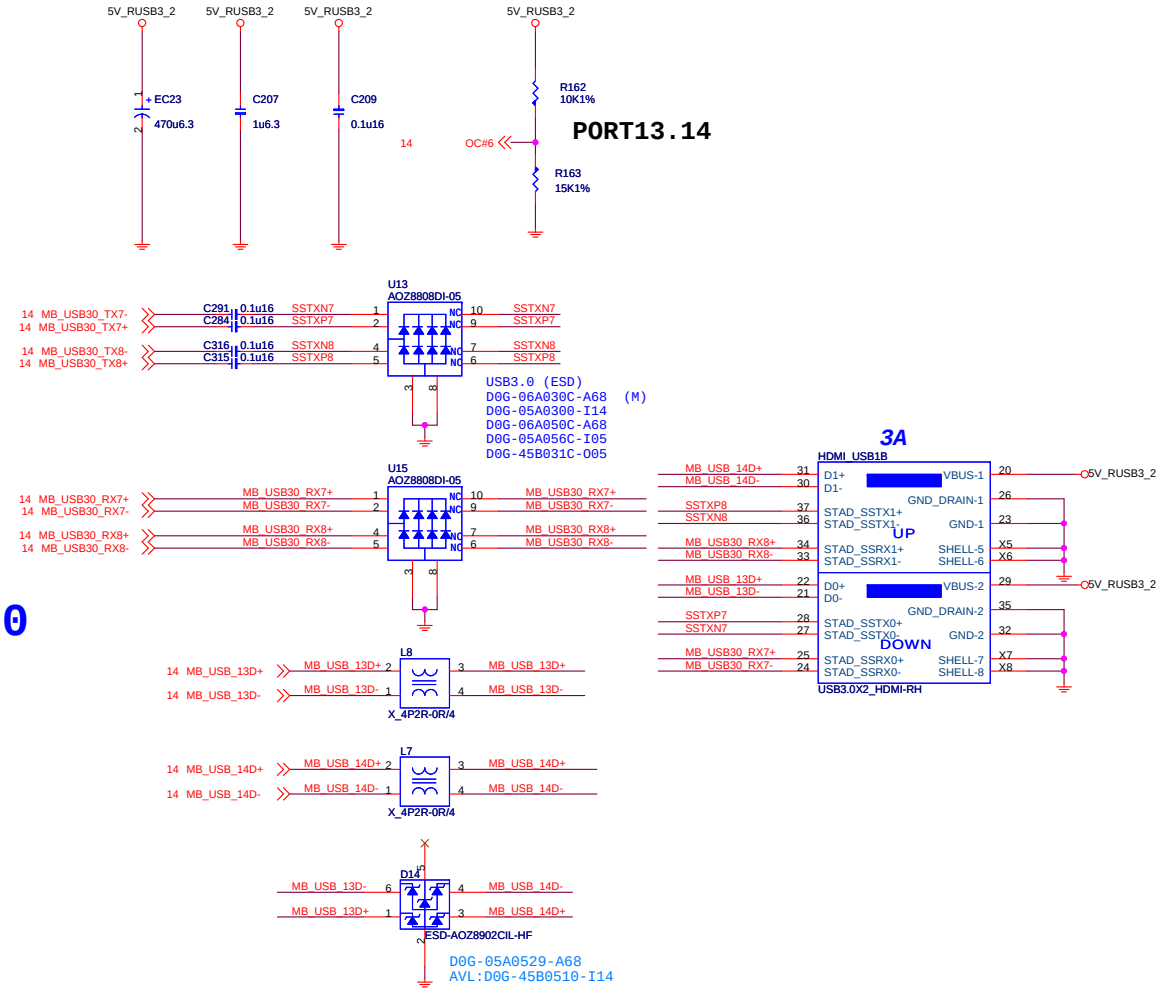







| | | |
|---|---|---|
| MICRO-STAR INT'L CO.,LTD | | |
| MS-7A62 | | |
| Size: Custom | Document Description: LAN/USB3.0 Rear | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 32 of 71 | |




**only support Z270/H270**
**not support B250**
**remove redriver u3.u2**

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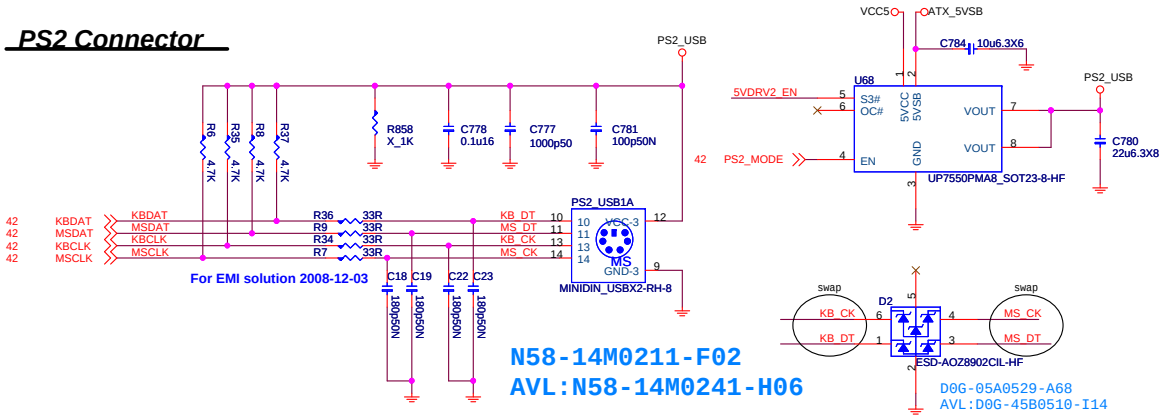
| | | |
|---|---|---|
| MSI | MICRO-STAR INT'L CO.,LTD | |
| | MS-7A62 | |
| Size: Custom | Document Description: HDMI/USB3.0 Rear(Z270/H270) | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 33 of 71 | |

## PS2 Connector

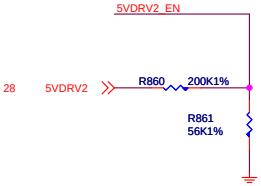






**0.5A**

## USB MODE



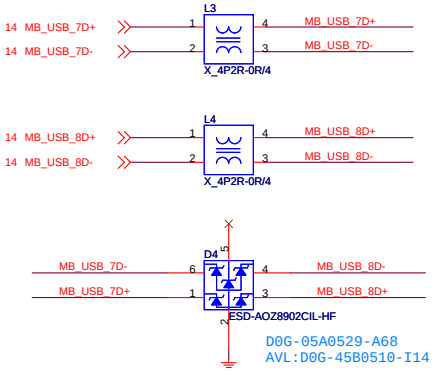




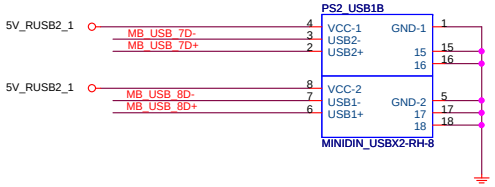
**N58-14M0211-F02**
**AVL:N58-14M0241-H06**

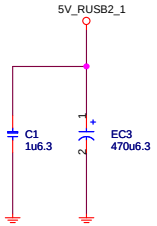
D0G-05A0529-A68
AVL:D0G-45B0510-I14

## PS_USB1 Connector

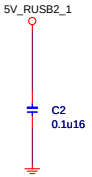


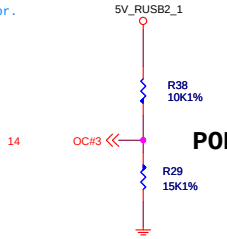

D0G-05A0529-A68
AVL:D0G-45B0510-I14




EMI Cap near Connector.




## PORT7.8

| | | |
|---|---|---|
| MICRO-STAR INT'L CO.,LTD | | |
| MS-7A62 | | |
| Size: Custom | Document Description: PS2/USB2.0 Rear | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 34 of 71 | |

# E2500 GIGA LAN

**B06-E25000C-R54 colay B06-E24000C-R54**

151.6mA

3VSB — CP8 X_COPPER — VDD33

1 1 1 1 1

C502 10u6.3X6 | C501 10u6.3X6 | C486 1u6.3 | C487 0.1u16 | C485 X_1000p10

VDD33 — CP6 X_COPPER — AVDD33

place near pin <200mil

C445 1u6.3 | C431 0.1u16

Close to Pin16

AVDDH

place near pin <200mil

9 9 22

C435 1u6.3 | C436 0.1u16 | C433 0.1u16

DVDDL

place near pin <200mil

C497 1u6.3 | C498 0.1u16

Close to Pin37

AVDDL

place near pin <200mil

6 6 13 19 31

C430 1u6.3 | C432 0.1u16 | C495 0.1u16 | C444 0.1u16 | C494 0.1u16

PIN2:
AMD platform connect to PCIE_RST#,
don't connect to A-RST#.
INTEL platform connect to PLT_RST#,

E2400:B06-E24000C-R54

U37

14 PE8_LAN_TX — C506 0.1u16 — PE8_LAN_TX_C
14 PE8_LAN_TX# — C507 0.1u16 — PE8_LAN_TX# C

13 CLK_LAN_DP
13 CLK_LAN_DN

C484 X_10p50N
43 PLTRST_BU1#_LAN
R394 2.37K1%

PCIE interface: RX_P, RX_N, REFCLK_P, REFCLK_N, PERSTn, RBIAS, PPS, TX_P, TX_N, WAKEn, CLKREQn

Media interface: TRXP0/TRXN0, TRXP1/TRXN1, TRXP2/TRXN2, TRXP3/TRXN3

Power: VDD33, AVDD33, LX, DVDDL_REG, AVDDL_REG, AVDDL-1, AVDDL-2, AVDDL-3, AVDDL-4, AVDDH_REG, AVDDH, NC, GND

Test: DEBUGMODE[0], TESTMODE[0], TESTMODE[1], TESTMODE[2]

LED: LED[0], LED[1], LED[2]

CLOCK: XTLI, XTLO

PE8_LAN_RX_C C483 0.1u16 — PE8_LAN_RX 14
PE8_LAN_RX# C C482 0.1u16 — PE8_LAN_RX# 14

SB_WAKE# — CLKREQn — VR108 0R — SB_WAKE# 12,19,20,21,23,24,26
LAN_CLKREQ#4 13

TR_D0+ / TR_D0-
TR_D1+ / TR_D1-
TR_D2+ / TR_D2-
TR_D3+ / TR_D3-

R398 30K — VDD33

LED0 — R407 X 10K — VDD33
LED1 — R404 X 10K
LED2 — R397 X 10K

Reserve for strap hi

LAN_XTAL1 — Y1 — LAN_XTAL2
C437 22p50N — C438 22p50N
25MHZ18p_S-HF-9

D04-1006700-F07
AVL:D04-1000640-T16

DVDDL — Close to pin40
CHOKE8 CH-4.7u2A70mS-HF-2
L04-47A7870-C08
L04-47A7690-M26
L04-47A7070-T19
C500 X_1000p10 | C499 0.1u16 | C508 10u6.3X6
LX should be wider than 30 mils.

CP12 X_COPPER

AVDDL — L11 300L600mA-150

AVDDVCO — C496 0.1u16 | C505 X_1u6.3 | C504 X_4.7u6.3X6

AVDDH

near pin34 <200mil

9 GND via

E2500-RIV1-RL-HF

20141217 update
CHOKE8: L04-47A70E0-T19
AVL: L04-47A7870-C08
L04-47A7690-M26

L2:
L02-3018023-C08
L02-3018023-T19

SB_WAKE# — R401 X 4.7K
LAN_CLKREQ#4 — R399 X 4.7K
check SB

**note:**

LED0:
1=High core voltage
0=Low core voltage

LED1:
1=SWR mode
0=LDO mode

LED2:
1=25MHz clock
0=48MHz clock

VDD33 >= 30mils;
AVDDH >= 20mils;
AVDDL >= 20mils.
DVDDL >= 20mils.
Pin LX to L1 >= 30mils.

## EMC

U19 — AOZ8808DI-05
U18 — AOZ8808DI-05

TR_D0+ / TR_D0-
TR_D1+ / TR_D1-
TR_D2+ / TR_D2-
TR_D3+ / TR_D3-

Close to LAN conn.

LED0_ACT — CL2 470p50
LED1_LINK1000# — CL3 470p50
LED2_LINK100# — CL4 470p50

USB3.0 (ESD)
D0G-06A030C-A68 (M)
D0G-05A0300-I14
D0G-06A050C-A68
D0G-05A056C-I05
D0G-45B031C-O05

TCT — C295 0.1u16

20151109 update
DL1
ESD-VPORT0603L102KV05-HF
Main:D0G-1020530-I05
AVL :D0G-8010510-SI0

Close to LAN conn.

VDD33 — RL1 220R — for EMI — CL1 X 0.1u16

N58-32F0381-F02

LAN_USB1B

LAN_LED_VCC5
LED0 — RL2 75R — R238 330R/8

LED0_A — LED0_ACT — TCT — TR_D0+ — TR_D0- — TR_D1+ — TR_D1- — TR_D2+ — TR_D2- — TR_D3+ — TR_D3-

LEDVCC — RJ1 — RJ2 — RJ3 — RJ4 — RJ5 — RJ6 — RJ7 — RJ8 — GND

LED1 — RL3 220R — LED1_LINK1000#
LED2 — RL4 220R — LED2_LINK100#

YELLOW+ / YELLOW- / GREEN+/ORANGE- / GREEN-/ORANGE+

RJ45_USBX2_LEDX2-1000-RH-10

LED1 low is Orange 1000
LED2 low is Green 100

VCC5 — RL5 10K — QL1 2N7002

LED ON/OFF by SIO GP10

42 ALL_LED_OFF# — ALL_LED_OFF#

CL5 0.1u16

Q36 P-PA502FMG AVL:D03-2413P09-ST8

LAN_LED_VCC5

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Size: Custom | Document Description: Killer Lan-E2500/E2400 | Rev: 1.0

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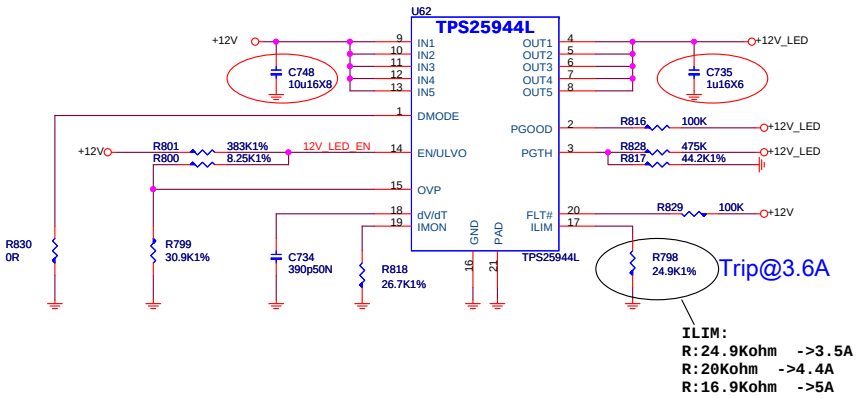
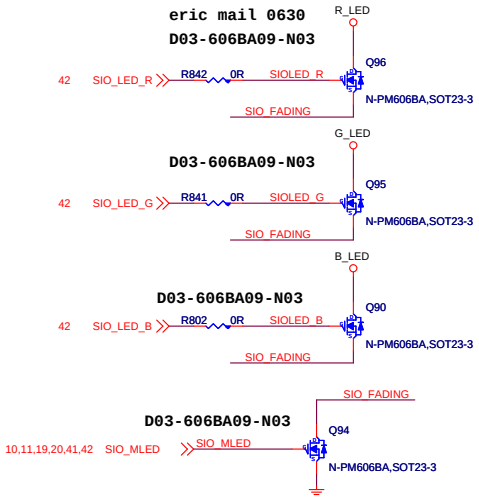
## LED STRIPLINE

2016.07.06 Use TPS25944L

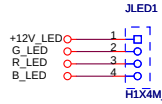



ILIM:
R:24.9Kohm ->3.5A
R:20Kohm ->4.4A
R:16.9Kohm ->5A

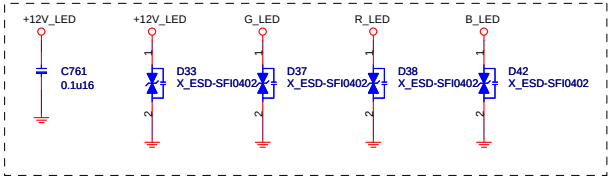
eric mail 0630




## N31-1040321-P05

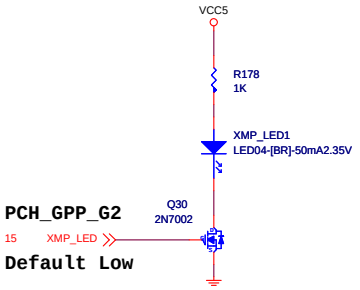



2016.07.06 only reserve now

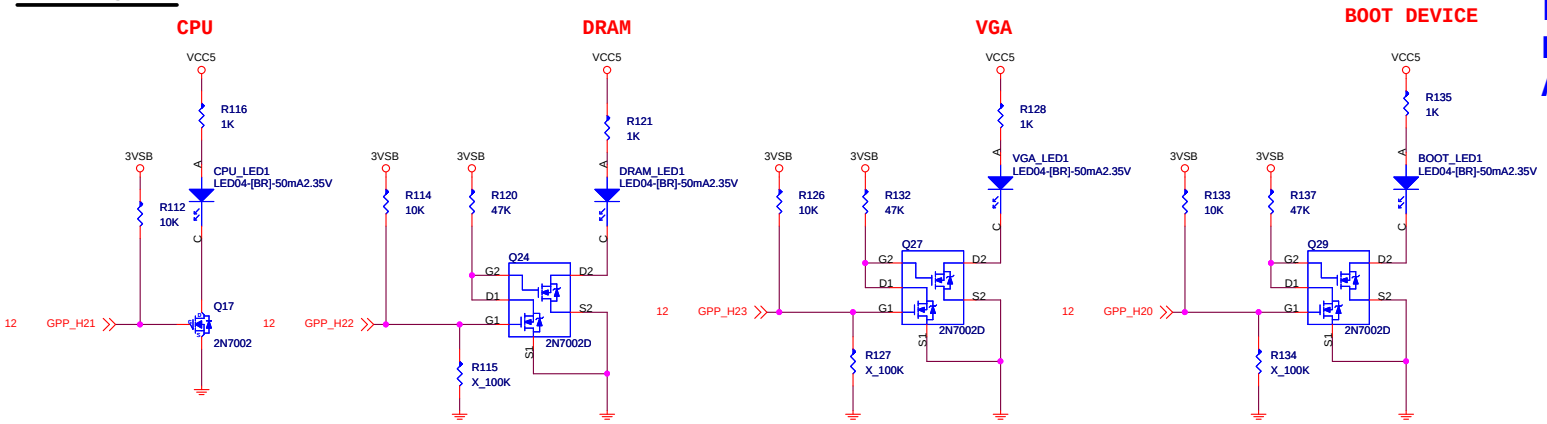





## XMP_LED




## EZ Debug LED




## LED

**RED:D0C-040P100-H91**

**AVL:D0C-040S500-E07**

| GPIO / LED | GPP_H21 | GPP_H22 | GPP_H23 | GPP_H20 |
|---|---|---|---|---|
| 亮 | GPI PULL HIGH | GPO PO LOW | GPO PO LOW | GPO PO LOW |
| 滅 | GPO LOW | GPO HIGH (default HIGH) | GPO HIGH (default HIGH) | GPO HIGH (default HIGH) |

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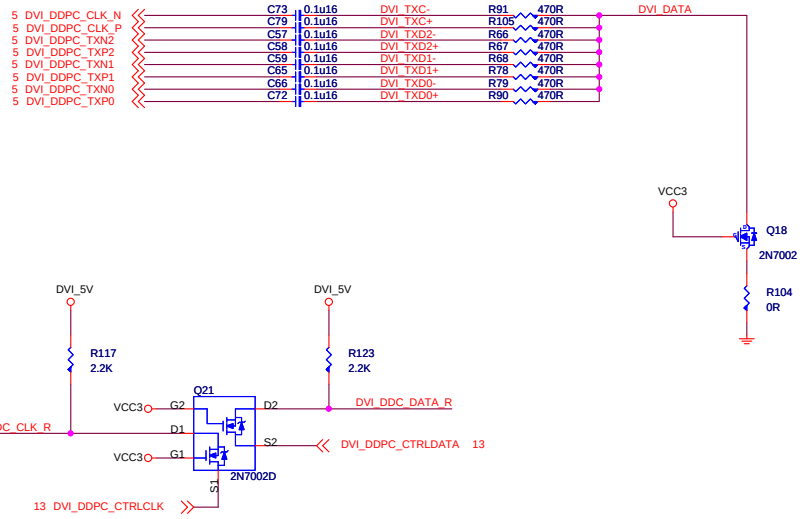
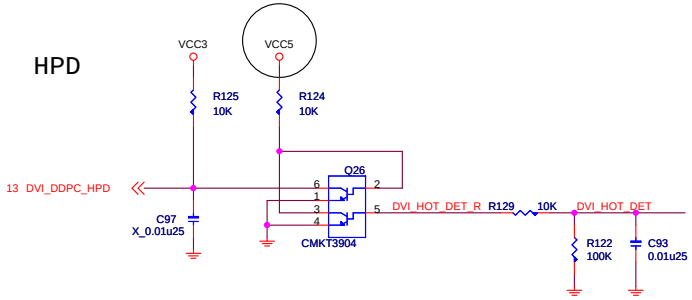
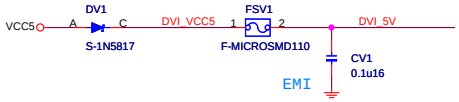
# DVI level shifter

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

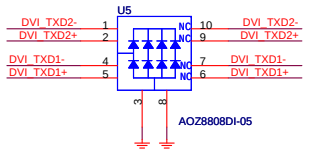


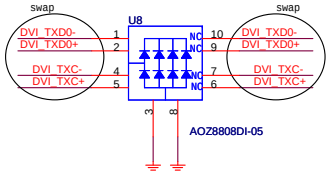



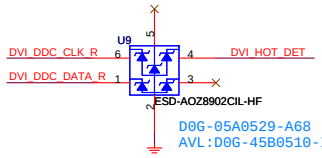

D08-0100200-B07
D08-0100800-P16



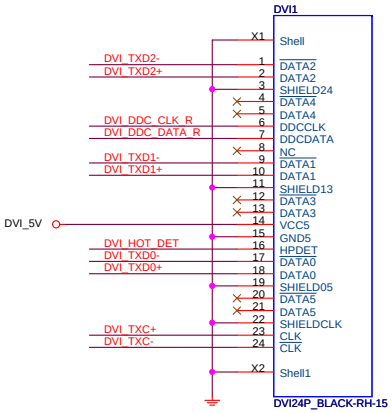

EMI



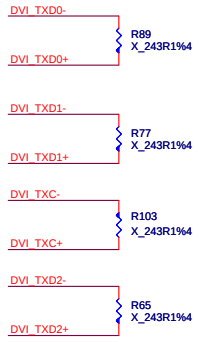



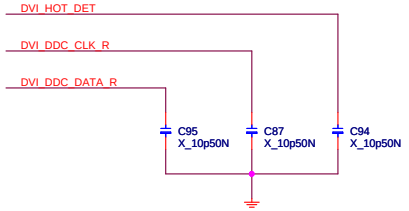

D0G-05A0529-A68
AVL:D0G-45B0510-I14




**N5B-24F0661-EB6**




For EMI




| | | |
|---|---|---|
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| MS-7A62 | | |
| Size: Custom | Document Description: DVI | Rev: 1.0 |
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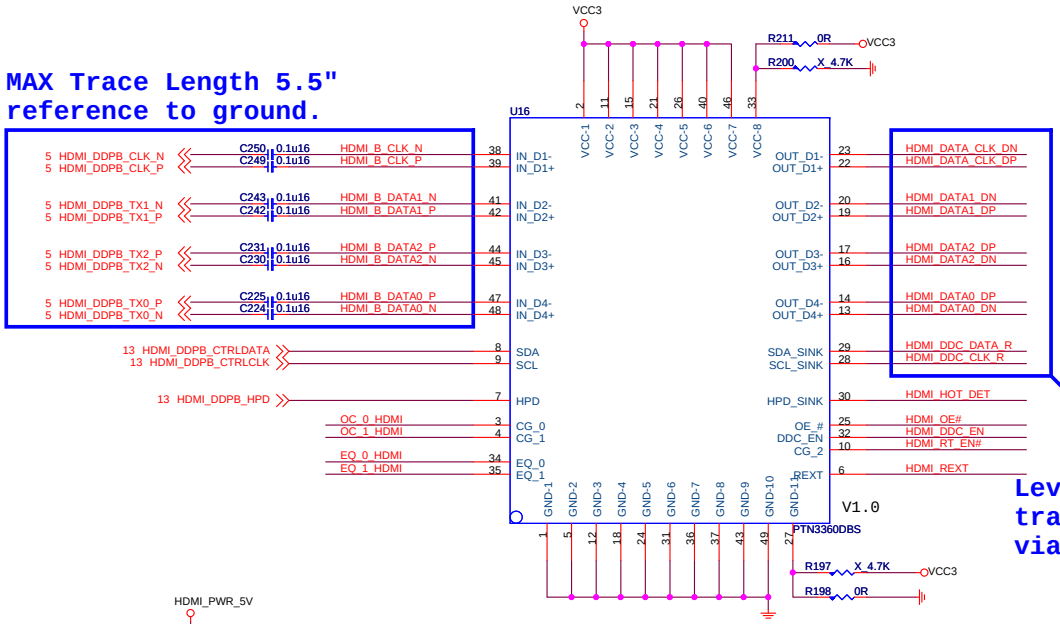
# HDMI level shifter

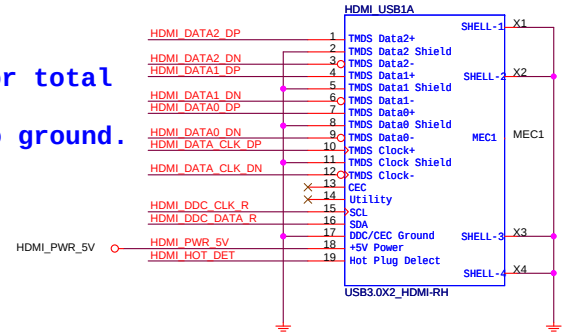
**MAX Trace Length 5.5" reference to ground.**

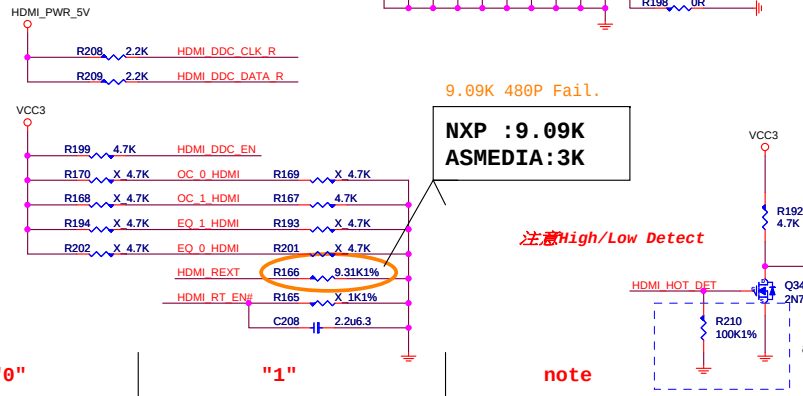



**Level Shift to HDMI connector total trace length > 0.9” ; < 1”**
**via count ≦ 2 ,reference to ground.**

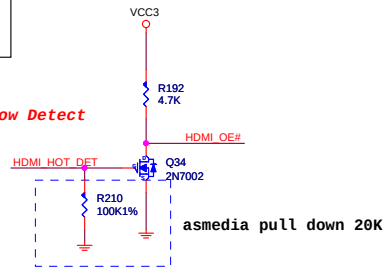
**Table 8-1. PCH PCI Express Tx/RX - HDMI Signal Mappings**

| Port | Digital Display Interface Differential Pairs | HDMI Signals | PCH Digital Display Interface Pins |
|---|---|---|---|
| Port B | DDSP_B_TX0_DN | TMDSB_DATA2# | DDPB_0N |
| | DDSP_B_TX0_DP | TMDSB_DATA2 | DDPB_0P |
| | DDSP_B_TX1_DN | TMDSB_DATA1# | DDPB_1N |
| | DDSP_B_TX1_DP | TMDSB_DATA1 | DDPB_1P |
| | DDSP_B_TX2_DN | TMDSB_DATA0# | DDPB_2N |
| | DDSP_B_TX2_DP | TMDSB_DATA0 | DDPB_2P |
| | DDSP_B_TX3_DN | TMDSB_CLK# | DDPB_3N |
| | DDSP_B_TX3_DP | TMDSB_CLK | DDPB_3P |
| | DDPB_HPD | DDSP_B_HPD0 | Hot plug detect used by HDMI Port B. |
| | SDVO_CTRLCLK | HDMIB_CTRL_CLK | HDMI DDC lines for Port B |
| | SDVO_CTRLDATA | HDMIB_CTRL_DATA | |




*注意High/Low Detect*



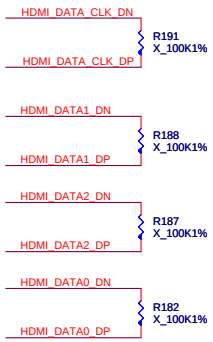

asmedia pull down 20K

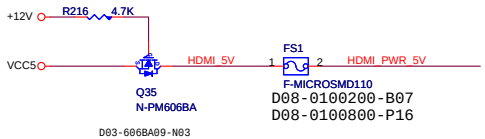
| | "0" | "1" | note |
|---|---|---|---|
| DDC_EN | DDC level shifter disable | DDC level shifter enable | internal pull-up at ~500K ohm. |
| RT_EN# | Input 50 ohm termination resistor enable | the input termination ; resistors are set to high impedances | internal pull-down at ~500K ohm. |
| OE# | enable | the chip is power down and input termination resistors will be at high impedance. | internal pull-down at ~500K ohm. |
| HPD_SINK | disable | enable | internal pull-down at ~200K ohm; 5V tolerant. |
| DDCBUF_EN | For DDC level shifitng configuration, please refer to Table. | | internal pull-down at ~500K ohm. |
| REXT | | | analog current generation. |

| [DDC_EN, DDCBUF_EN, OE#] | DDC Passive Switch | DDC Active Buffer |
|---|---|---|
| 1, 0, X | On | Off |
| 1, 1, 0 | Off | On |
| 1, 1, 1 | Off | Off |
| 0, X, X | Off | Off |

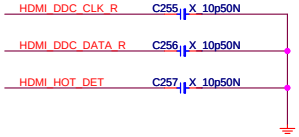
| PC1, PC0 | | note |
|---|---|---|
| 00 | 8 dB | internal pull-down at ~500K ohm. |
| 01 | 4 dB | |
| 10 | 12 dB | |
| 11 | 0 dB | |

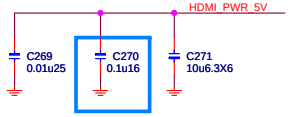
**EMI**

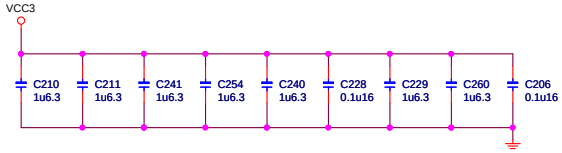



**EMI cap.**

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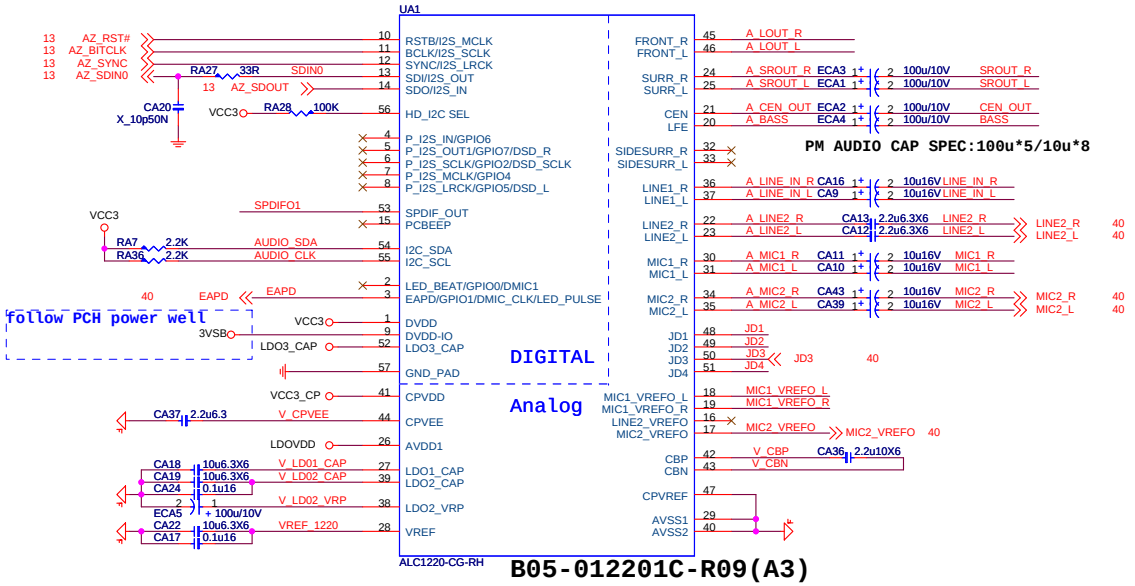
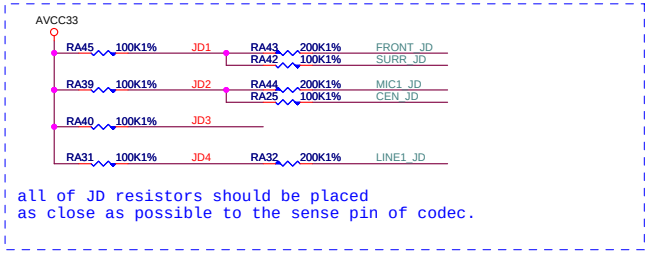
# ALC1220



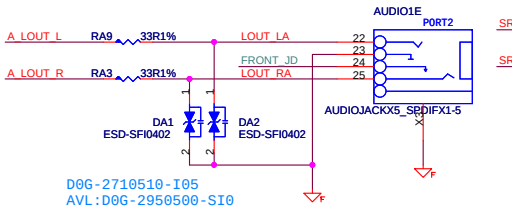

**B05-012201C-R09(A3)**

PM AUDIO CAP SPEC:100u*5/10u*8

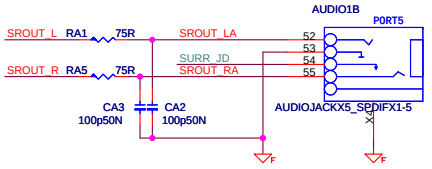
follow PCH power well

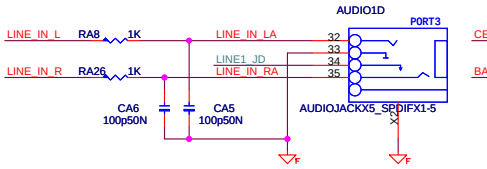


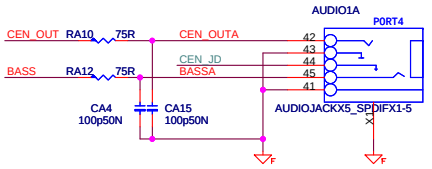

all of JD resistors should be placed
as close as possible to the sense pin of codec.

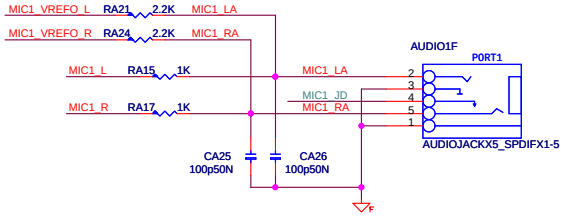


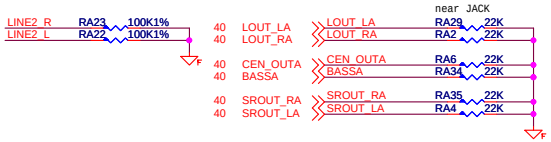

D0G-2710510-I05
AVL:D0G-2950500-SI0

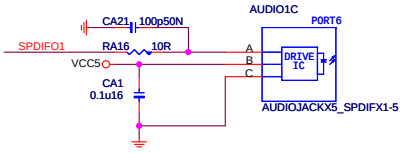


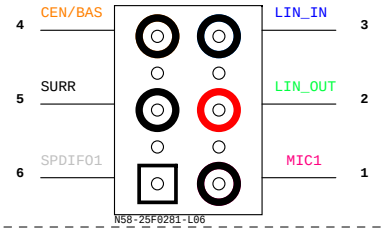



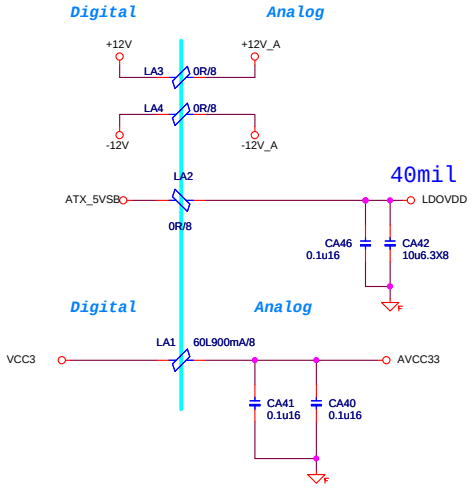



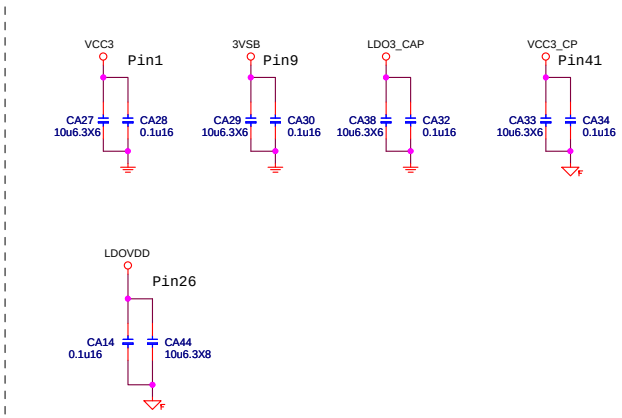




**N58-25F0271-L06**

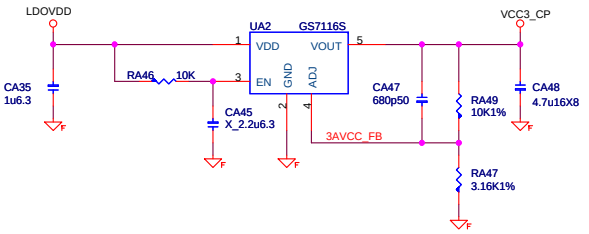


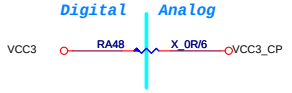



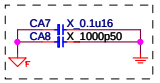

***CPVDD POWER:ATX5VSB will Leakage to CVDD by ALC1220, so CVDD must keep 3.3V***

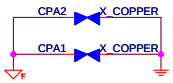
CPVDD:150mA




EMI

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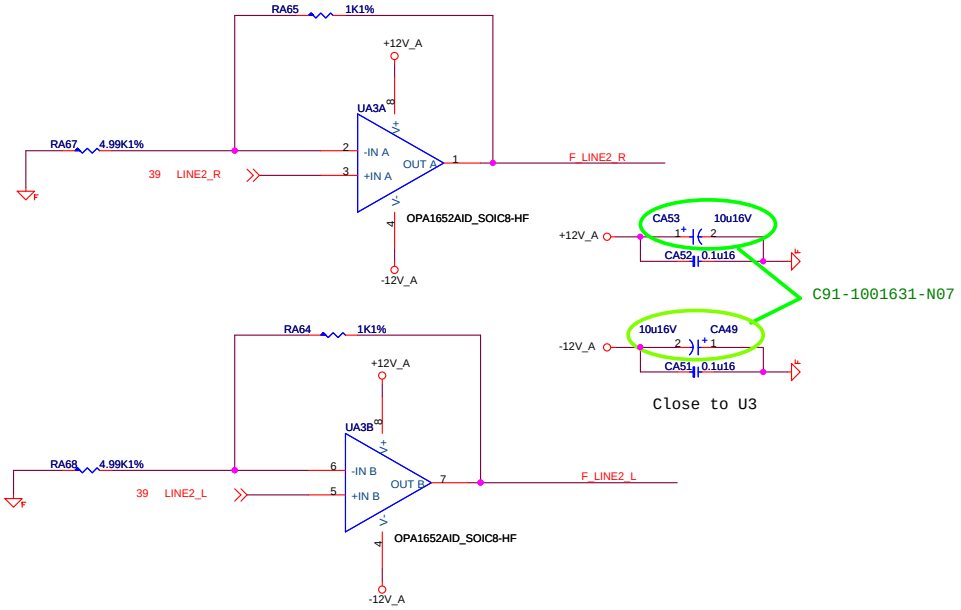
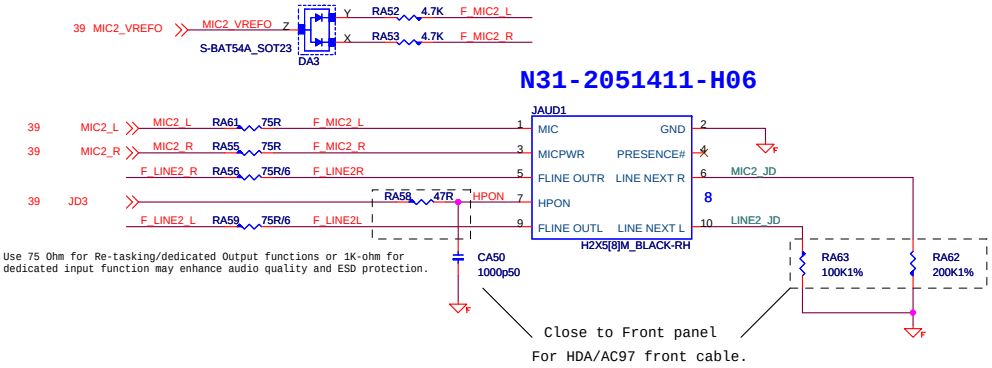
|---|---|---|
| MS-7A62 | | |
| Size: Custom | Document Description: AUDIO ACL1220-1 | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 39 of 71 | |

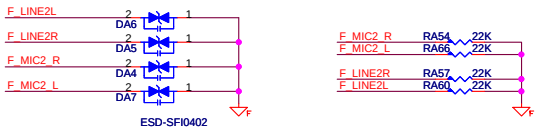



**ESD protect**

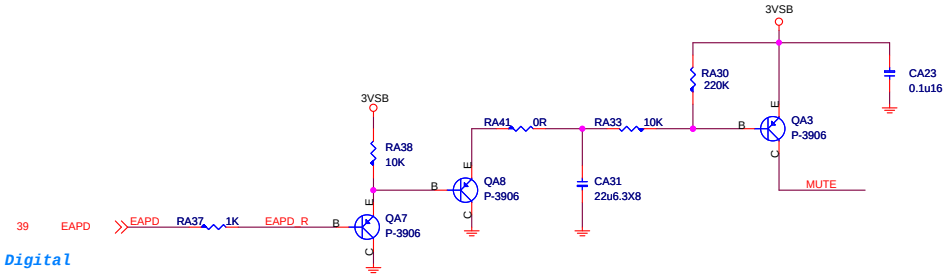
Close to Jack

D0G-2710510-I05
AVL:D0G-2950500-SI0



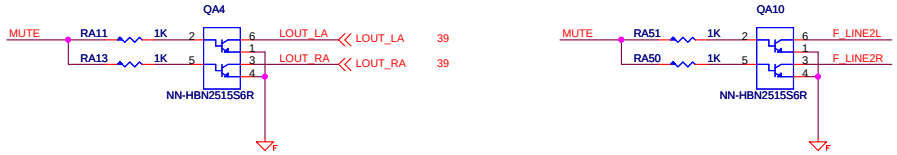

## Rear Line OUT De-POP circuit

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

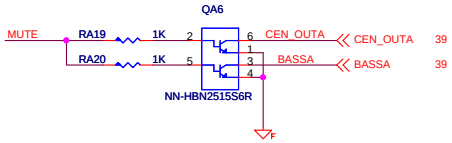


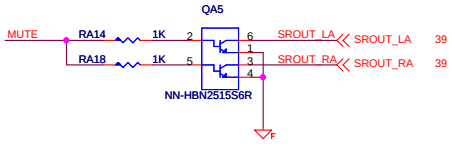

*Digital*

*Analog*




*(add de-pop circuit by PM spec or customer request,*
*NOTE: add de-pop circuit need to change CA6,CA7, CA12, CA13, CA23, CA24 to TVS)*




| | | |
|---|---|---|
| MICRO-STAR INT'L CO.,LTD | | |
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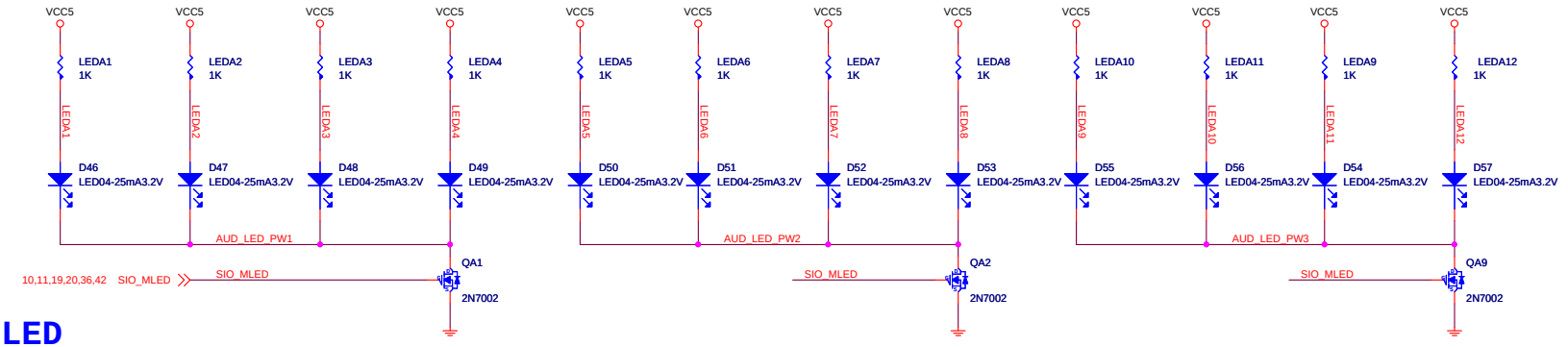
| Size: Custom | Document Description: AUDIO ACL1220-2 | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 40 of 71 | |

0.16w*12=1.92w
1.92w/5=0.384A

Audio moat is transparent and width 40mil




# LED
# RED:D0C-040S600-E07

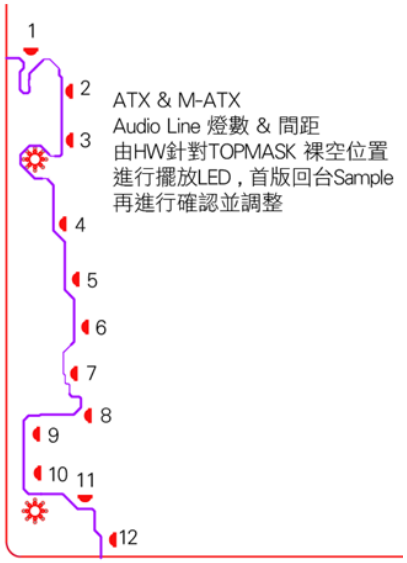


置於HS 背後需與國格討論，LED總功率算法
：每顆燈0.16W X
(Final 總燈數)

By Model

E21-7978010-A91
20*19.15*8.6mm

E21-7980010-A91
14*12.2*6.6mm




| | |
|---|---|
| MICRO-STAR INT'L CO.,LTD | |
| MS-7A62 | |
| Size: Custom | Document Description: AUDIO ACL1220-3 |
| Rev: 1.0 | |
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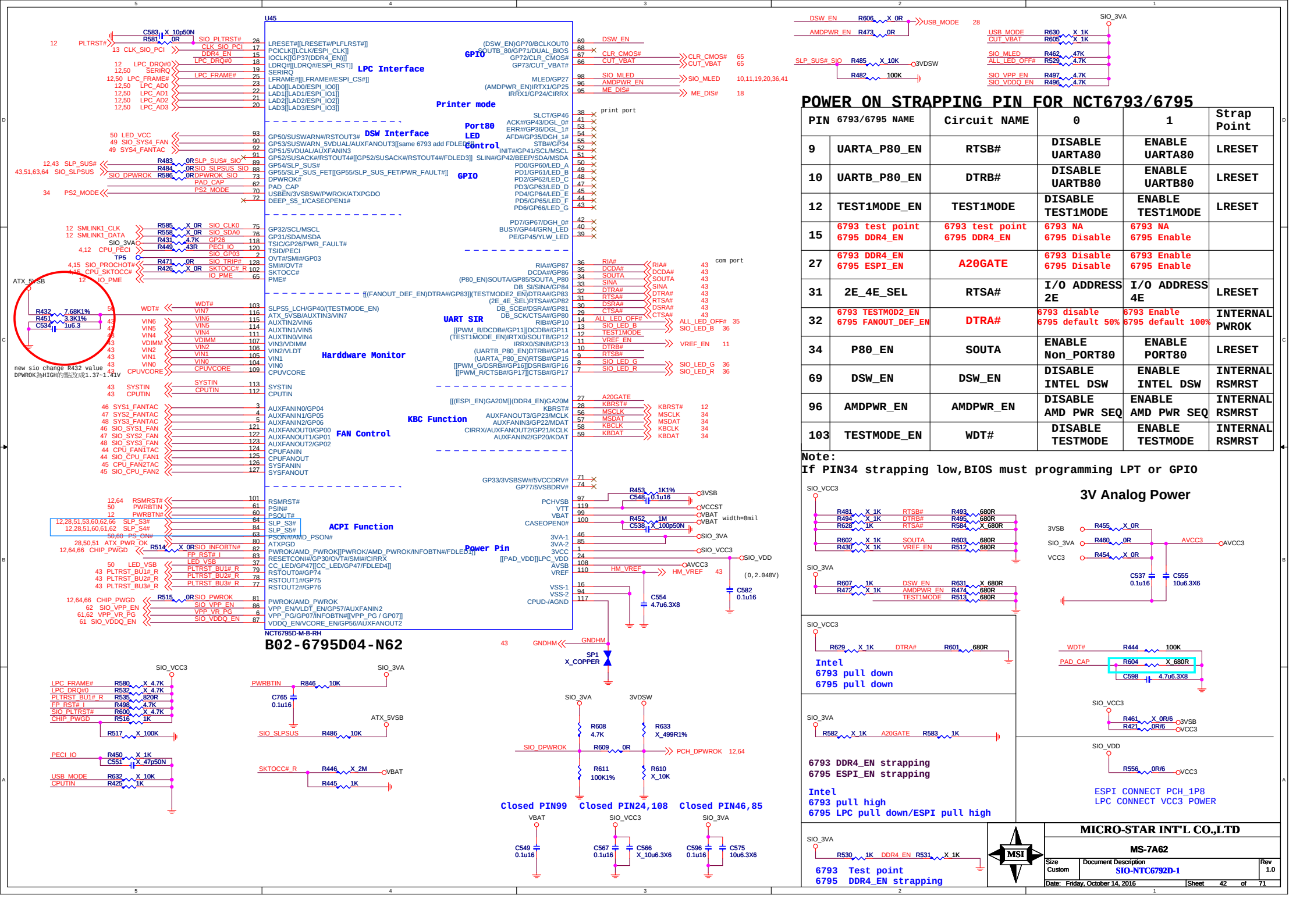


| PIN | 6793/6795 NAME | Circuit NAME | 0 | 1 | Strap Point |
|---|---|---|---|---|---|
| 9 | UARTA_P80_EN | RTSB# | DISABLE UARTA80 | ENABLE UARTA80 | LRESET |
| 10 | UARTB_P80_EN | DTRB# | DISABLE UARTB80 | ENABLE UARTB80 | LRESET |
| 12 | TEST1MODE_EN | TEST1MODE | DISABLE TEST1MODE | ENABLE TEST1MODE | LRESET |
| 15 | 6793 test point<br>6795 DDR4_EN | 6793 test point<br>6795 DDR4_EN | 6793 NA<br>6795 Disable | 6793 NA<br>6795 Enable | |
| 27 | 6793 DDR4_EN<br>6795 ESPI_EN | A20GATE | 6793 Disable<br>6795 Disable | 6793 Enable<br>6795 Enable | |
| 31 | 2E_4E_SEL | RTSA# | I/O ADDRESS 2E | I/O ADDRESS 4E | LRESET |
| 32 | 6793 TESTMOD2_EN<br>6795 FANOUT_DEF_EN | DTRA# | 6793 disable<br>6795 default 50% | 6793 Enable<br>6795 default 100% | INTERNAL PWROK |
| 34 | P80_EN | SOUTA | ENABLE Non_PORT80 | ENABLE PORT80 | LRESET |
| 69 | DSW_EN | DSW_EN | DISABLE INTEL DSW | ENABLE INTEL DSW | INTERNAL RSMRST |
| 96 | AMDPWR_EN | AMDPWR_EN | DISABLE AMD PWR SEQ | ENABLE AMD PWR SEQ | INTERNAL RSMRST |
| 103 | TESTMODE_EN | WDT# | DISABLE TESTMODE | ENABLE TESTMODE | INTERNAL RSMRST |

## HW Monitor - Voltage

2016/6/17 eric mail Q71 remove

VCC_DDR R419 10K1% VDIMM VDIMM 42
R418 10K1%
C516 10u6.3X6

VCORE R436 10K1% CPUVCORE CPUVCORE 42
R435 X_10K1%
C536 10u6.3X6

+12V R440 220K1% VIN0 VIN0 42
R442 20K1%
C558 0.1u16

VCC5 R437 12K1% VIN1 VIN1 42
R439 3K1%
C557 0.1u16

PCH_1VSB R438 10K1% VIN2 VIN2 42
C556 10u6.3X6

BIOS REQUEST FROM VIN2 POWER FAULT DISABLE.

VCCIO R423 10K1% VIN4 VIN4 42
C535 10u6.3X6

VGT R433 10K1% VIN6 VIN6 42
C552 10u6.3X6

VCCSA R434 10K1% VIN5 VIN5 42
C553 10u6.3X6

## Thermal Monitor

HM_VREF HM_VREF 42
R422 X_10K1%
SYSTIN SYSTIN 42
Q66 P-3906
RT6 X_10KRT1%4
C520 2.2n50
GNDHM GNDHM 42

HM_VREF
R424 10K1%
CPUTIN CPUTIN 42
RT3 10KT1%
C521 0.1u16
GNDHM

C11-2222022-W08/Y01/S02
,CAP MLCC,2200pF,50V,X7R,0402,10%,0.5mm,HALOGEN FREE

## SERIAL PORT 1

SIO_VCC3
R757 X_2.7K SINA
R755 X_2.7K CTSA#
R754 X_2.7K RIA#
R758 X_2.7K DCDA#
R756 X_2.7K DSRA#
NO USE UART PORT1

C705 X_0.1u16
VCC5
U61
NRIA NCTSA# NDSRA# NSINA NDCDA#
RTSA# DTRA# SOUTA
VCC RA1 RA2 RA3 RA4 RA5 GND
DA1 DA2 DA3
VDD RY1 RY2 RY3 RY4 RY5 VSS
DY1 DY2 DY3
+12V_COM RIA# CTSA# DSRA# SINA DCDA#
NRTSA NDTRA NSOUTA -12V_COM
GD75232DBR_SSOP20-RH

C723 0.1u16
D28 1N4148W +12V
D29 1N4148W -12V
C724 0.1u16

JCOM1
NDCDA# NSOUTA NRTSA NRIA
NSINA NDTRA NDSRA# NCTSA# RIA#
H2X5[10]M_BLACK-RH

NRTSA C746 X_470p50
NDSRA# C732 X_470p50
NCTSA# C747 X_470p50
NRIA C733 X_470p50
NDCDA# C743 X_470p50
NSOUTA C744 X_470p50
NSINA C745 X_470p50
NDTRA C731 X_470p50

## SIO_3VA

ATX_5VSB
C614 1u6.3
U48 GS7116S
VDD VOUT EN GND ADJ
SIO_3VA
C599 X_0.1u16
C613 4.7u16X8
R653 10K1%
R674 3.09K1%
3VA_FB
65 RTCRST#_D R675 30K RTCRST#_D_SIO
C615 1u6.3

## SLP_SUS Co-lay circuit

3VDSW
R441 X_4.7K
SIO_SLPSUS SIO_SLPSUS 42,51,63,64
12,42 SLP_SUS# SLP_SUS#
R443 X_22K
Q67 X_2N3904
C522 X_0.1u16

PLTRST_BU1# R536 100R1% PLTRST_BU1#_ASM1142 PLTRST_BU1#_ASM1142 26
42 PLTRST_BU1#_R R533 22R1%
PLTRST_BU1# R518 100R1% PLTRST_BU1#_LAN PLTRST_BU1#_LAN 35
42 PLTRST_BU3#_R R557 22R1%
PLTRST_BU3# R560 100R1% PLTRST_BU3#_M2_1 PLTRST_BU3#_M2_1 23
PLTRST_BU3# R587 100R1% PLTRST_BU3#_M2_2 PLTRST_BU3#_M2_2 24
PLTRST_BU3# R561 100R1% PLTRST_BU3#_TPM PLTRST_BU3#_TPM 50

near sio
VCCSA VCC_SA
VCC_DDR VCC_DDR
VGT VGT
VCORE V_CORE

VCC3
PCH Side RSVD Pull high to 3VSB.
C608 X_0.1u16
15 GPP_PLTRST# U47 X_NC7SZ08M5X
PE_RESET_N R654 100R1% PLTRST_BU2#_PCIE1 PLTRST_BU2#_PCIE1 19 X16

PLTRST_BU2# R564 0R
R562 100R1% PLTRST_BU2#_PCIE2 PLTRST_BU2#_PCIE2 21 X1
R612 100R1% PLTRST_BU2#_PCIE6 PLTRST_BU2#_PCIE6 21 X1
42 PLTRST_BU2#_R R534 22R1%
R563 100R1% PLTRST_BU2#_PCIE3 PLTRST_BU2#_PCIE3 21 X1
R588 100R1% PLTRST_BU2#_PCIE5 PLTRST_BU2#_PCIE5 21 X1
R559 100R1% PLTRST_BU2#_PCIE4 PLTRST_BU2#_PCIE4 20 X4

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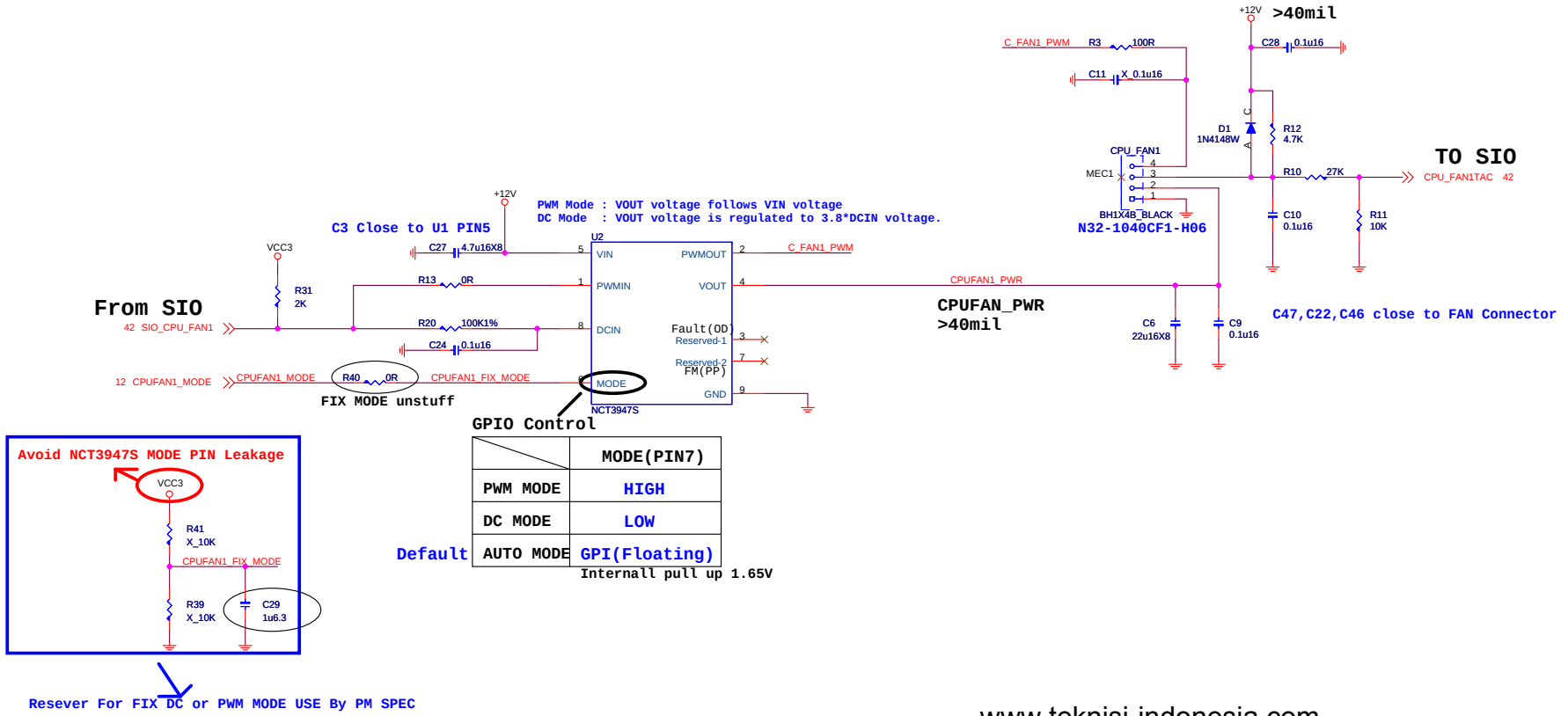
Size Custom
Document Description SIO-NTC6792D-2
Rev 1.0
Date: Friday, October 14, 2016 Sheet 43 of 71

# 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




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

Internall pull up 1.65V



| | | |
|---|---|---|
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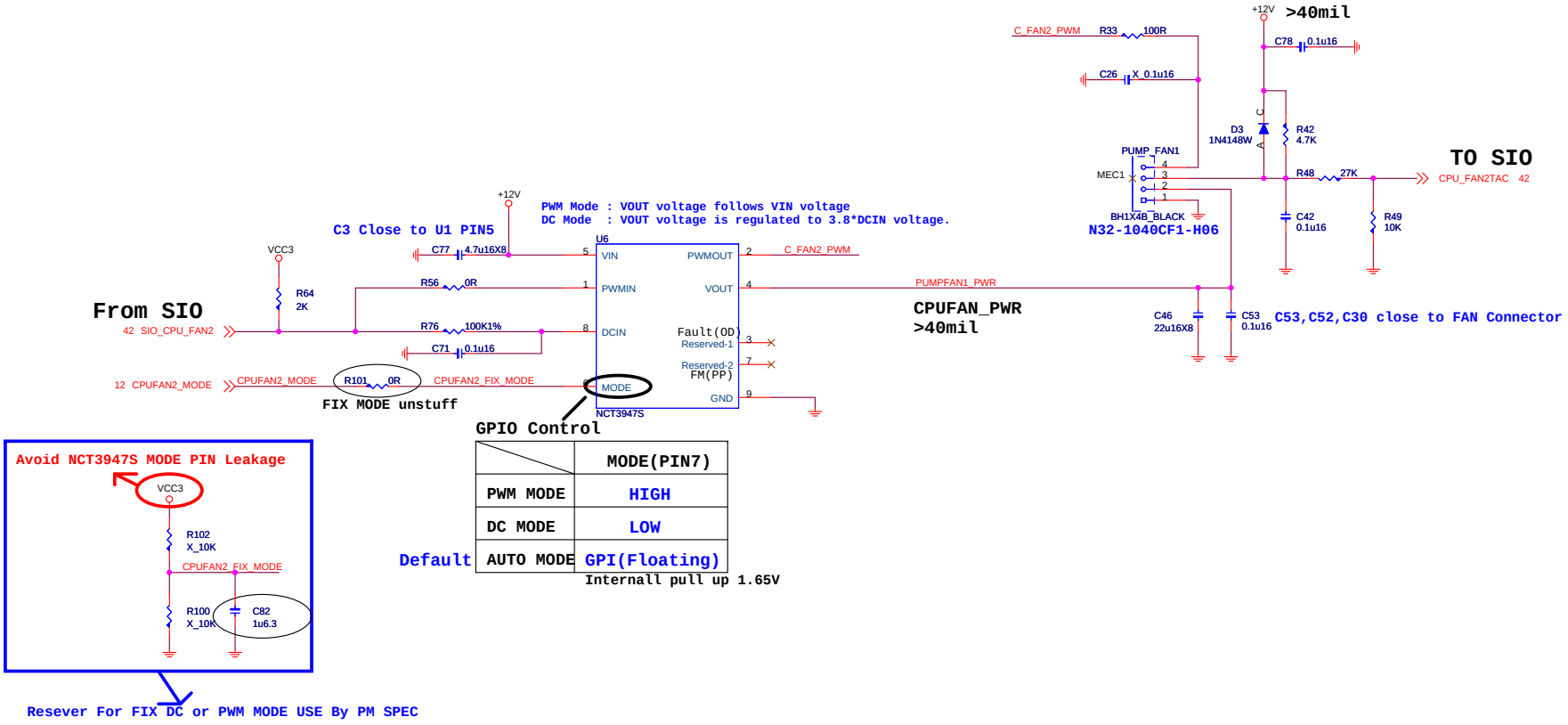
| MS-7A62 | | |
| Size: Custom | Document Description: CPU FAN1 | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 44 of 71 | |

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

## 2.GPIO可以由BIOS切換 PWM/DC MODE




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

Internall pull up 1.65V

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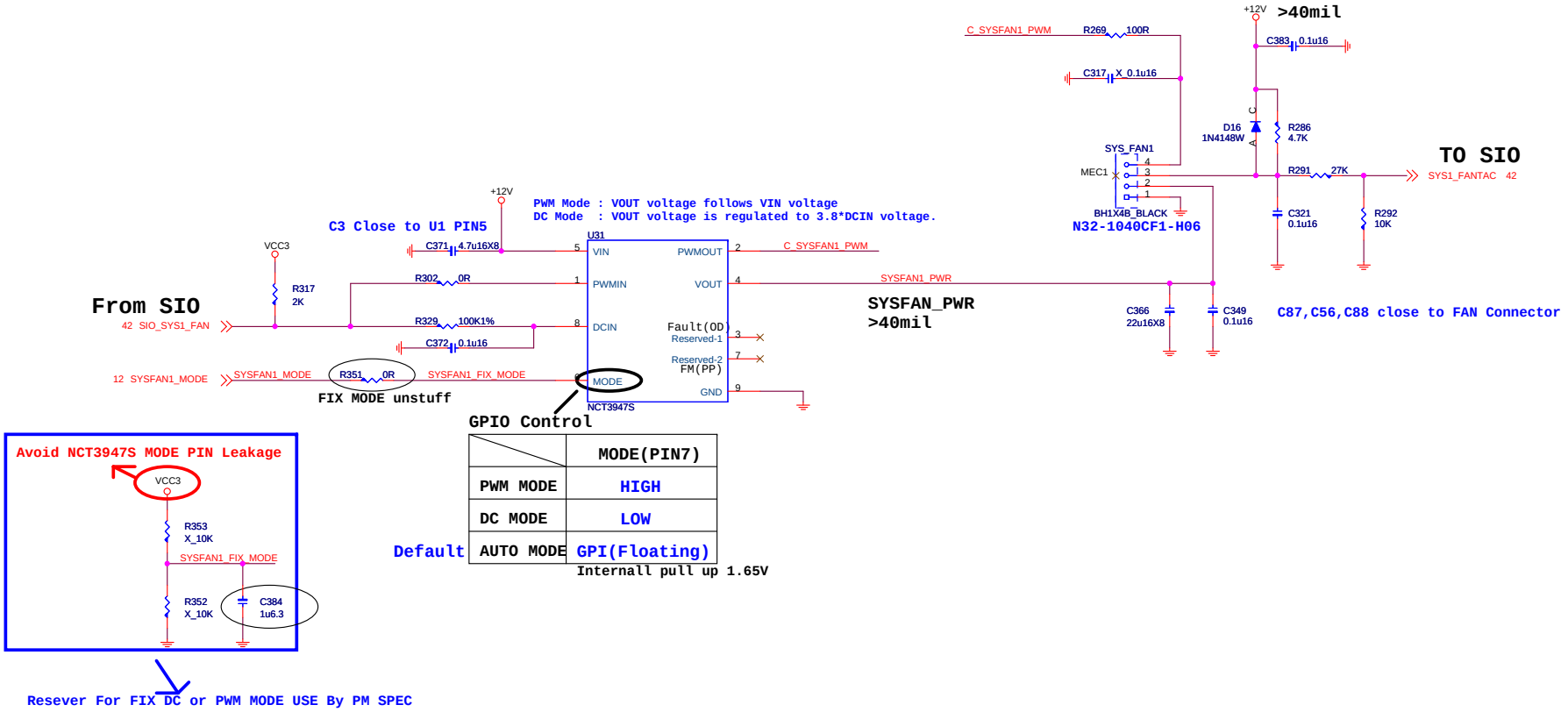
MS-7A62

Size: Custom | Document Description: CPU FAN2 | Rev: 1.0

Date: Friday, October 14, 2016 | Sheet 45 of 71

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

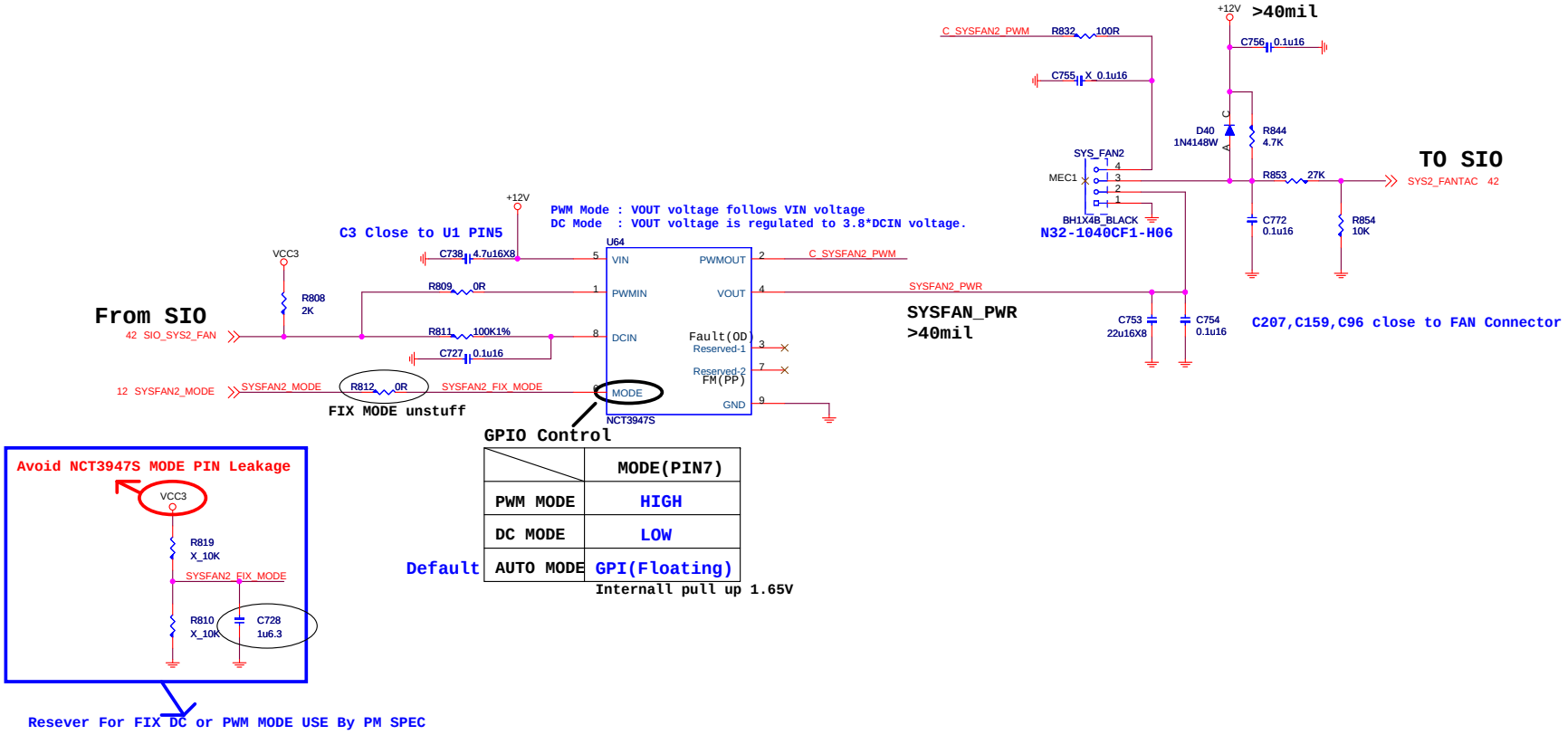
## 2.GPIO可以由BIOS切換 PWM/DC MODE




| MICRO-STAR INT'L CO.,LTD | | |
|---|---|---|
| MS-7A62 | | |
| Size: Custom | Document Description: SYSTEM FAN1 | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 46 of 71 | |

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

## 2.GPIO可以由BIOS切換 PWM/DC MODE




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

Internall pull up 1.65V

| | | |
|---|---|---|
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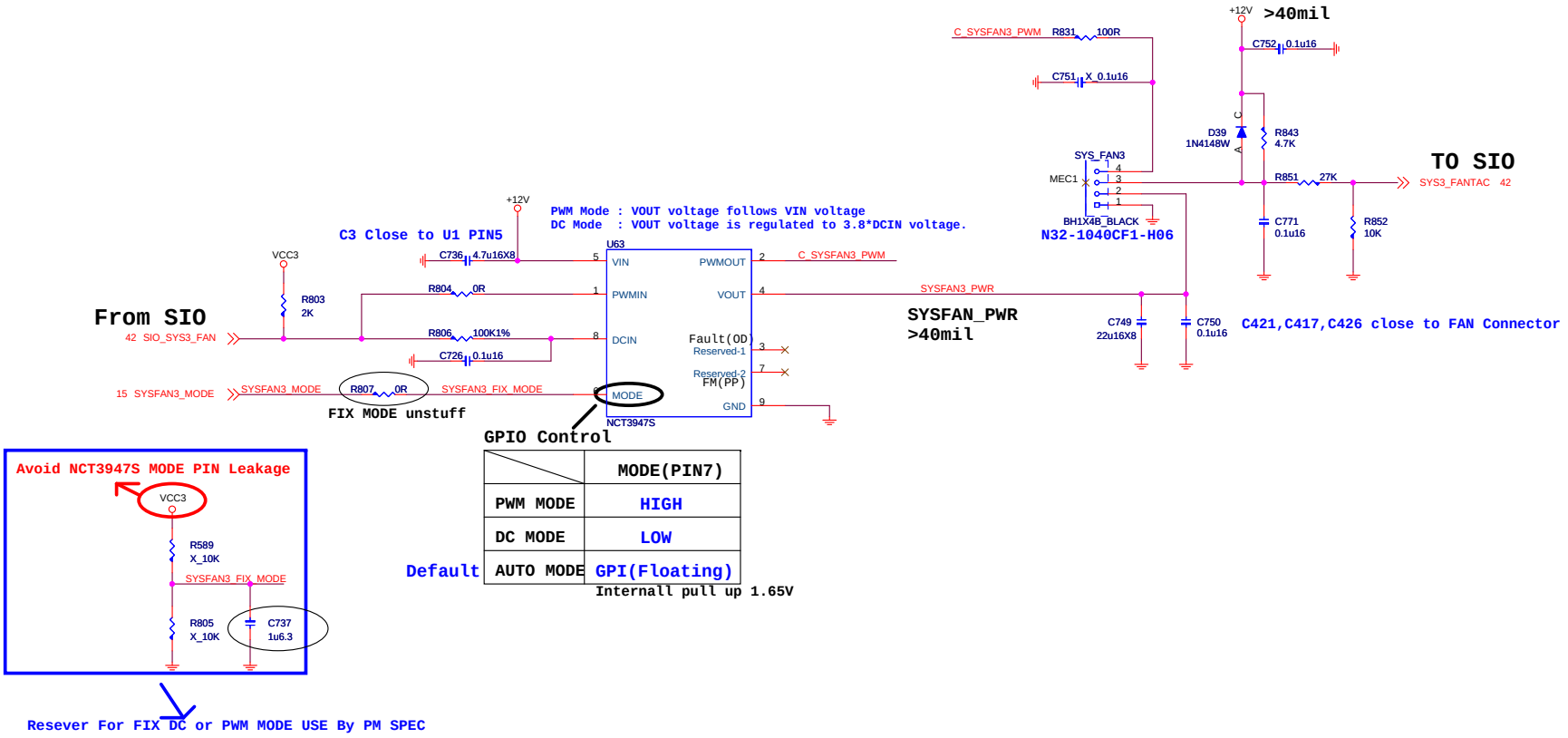
| Size: Custom | Document Description: SYSTEM FAN2 | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 47 of 71 | |

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

## 2.GPIO可以由BIOS切換 PWM/DC MODE




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

Internall pull up 1.65V

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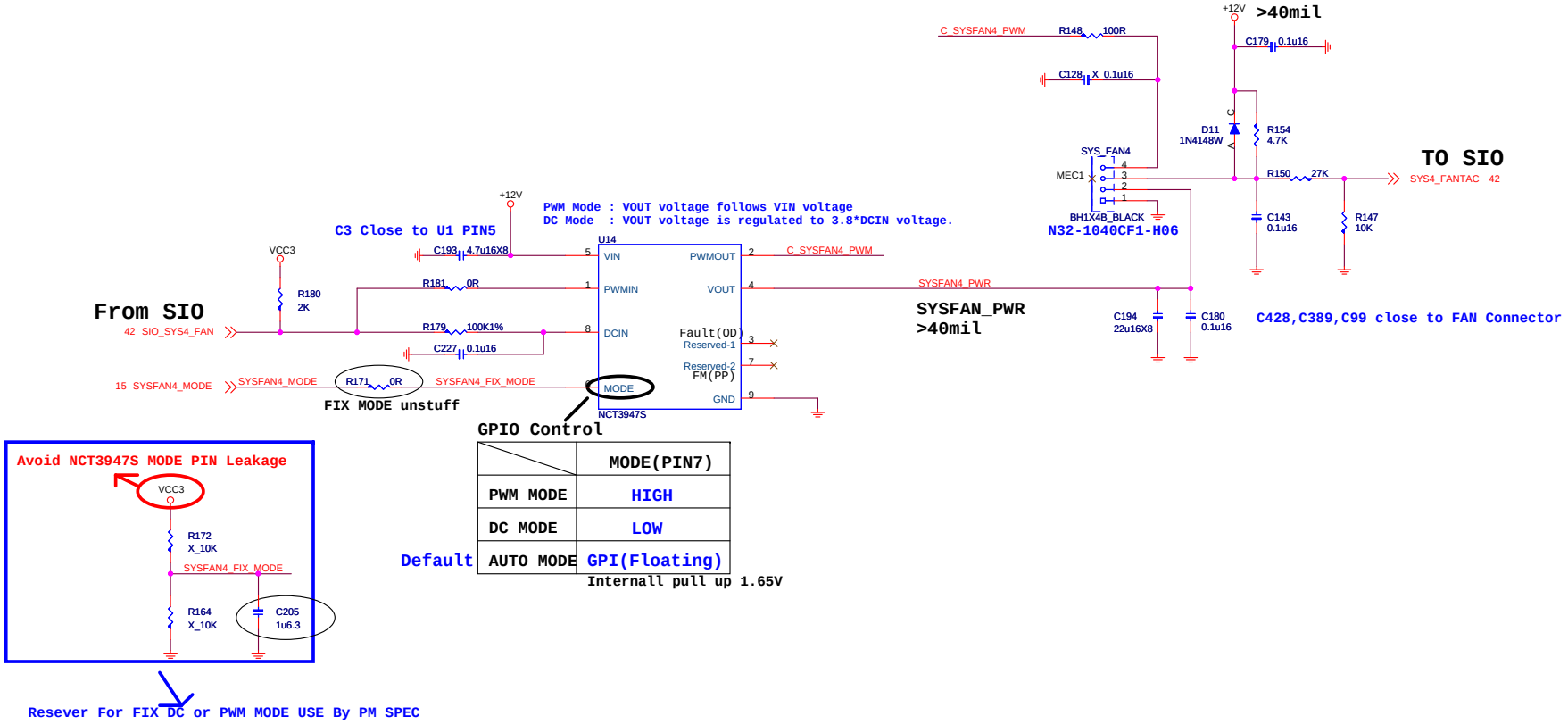
Size: Custom | Document Description: SYSTEM FAN3 | Rev: 1.0

Date: Friday, October 14, 2016 | Sheet 48 of 71

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

## 2.GPIO可以由BIOS切換 PWM/DC MODE




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

Internall pull up 1.65V



| | | |
|---|---|---|
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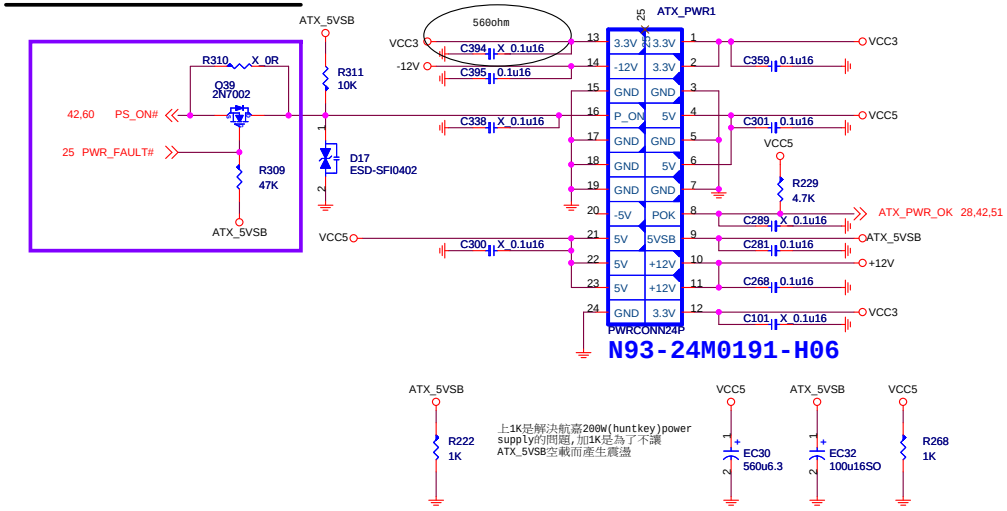
| | MS-7A62 | |
| Size: Custom | Document Description: SYSTEM FAN4 | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 49 of 71 | |

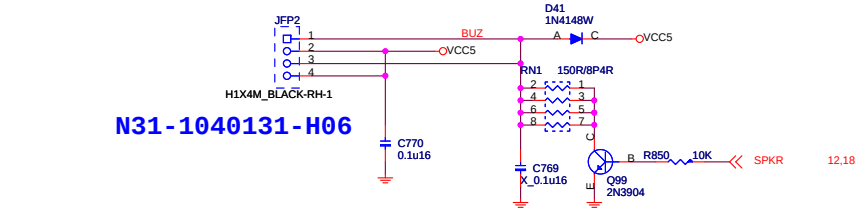
## ATX POWER CONNECTOR

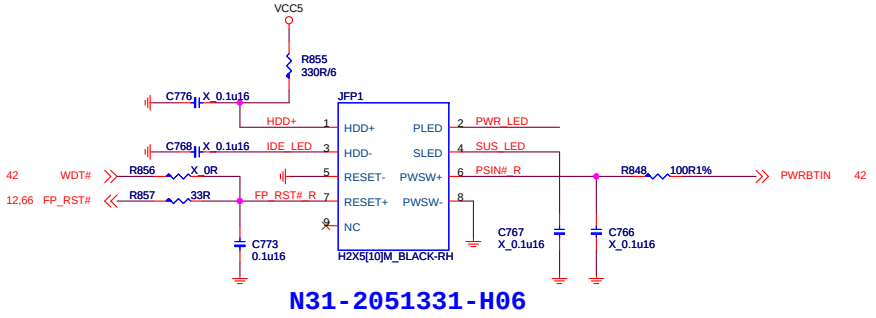




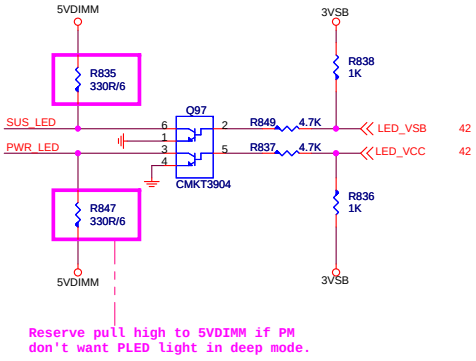


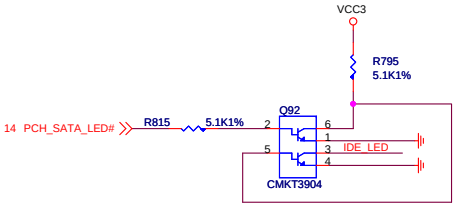
## Front Panel

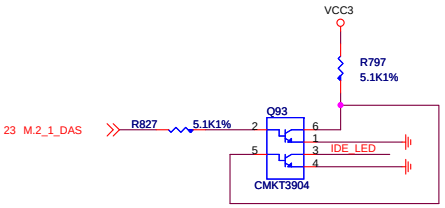


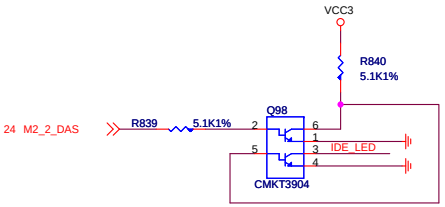




## LED

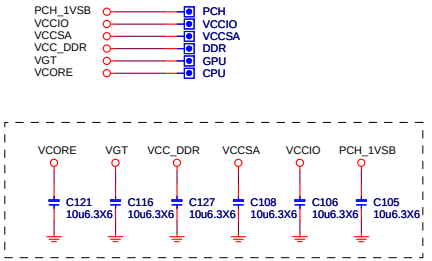


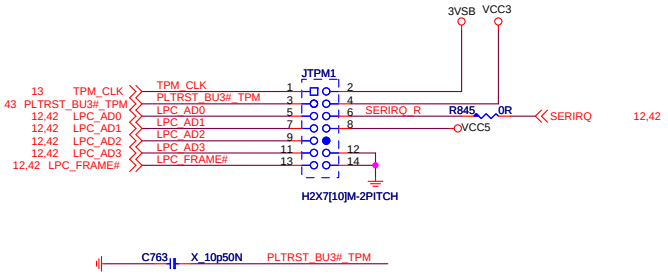



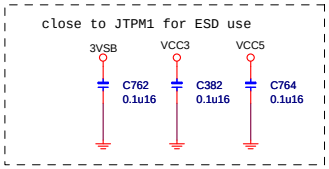



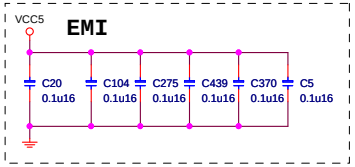

## Voltage test point




## TPM

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|---|---|---|
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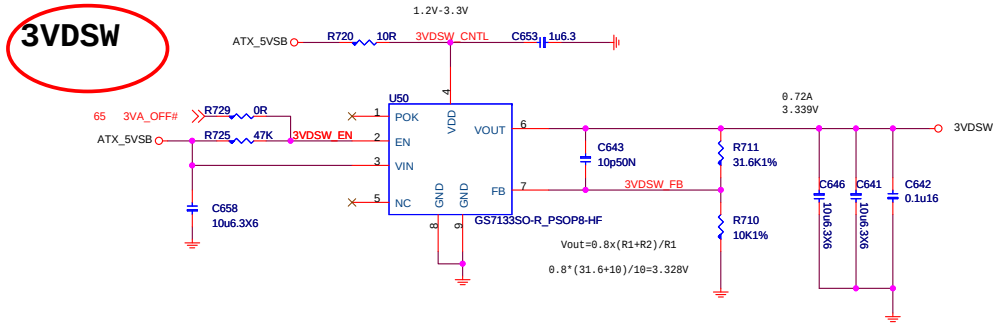
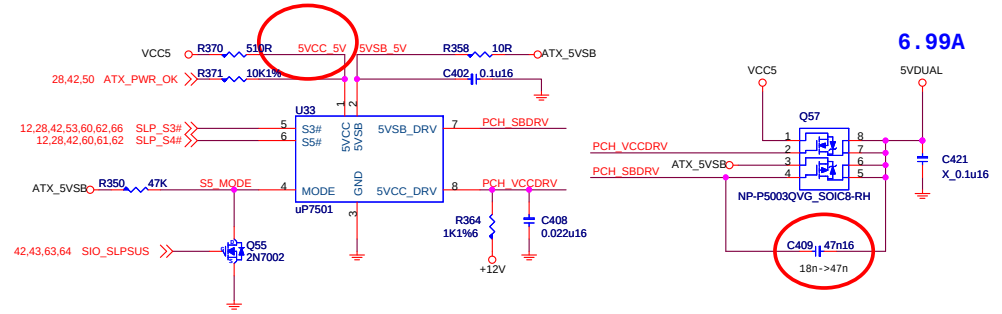
## 3VDSW

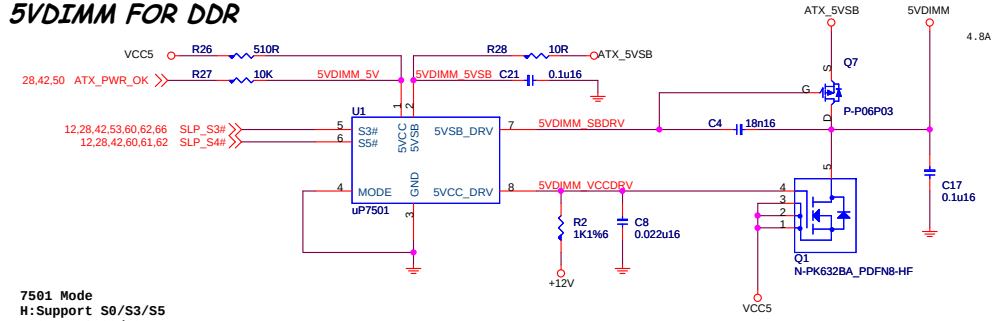



## 5VDUAL

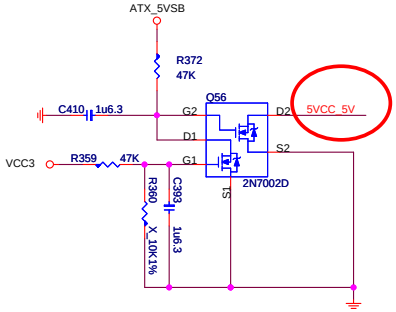
5VDUAL is power source of 1P0SB



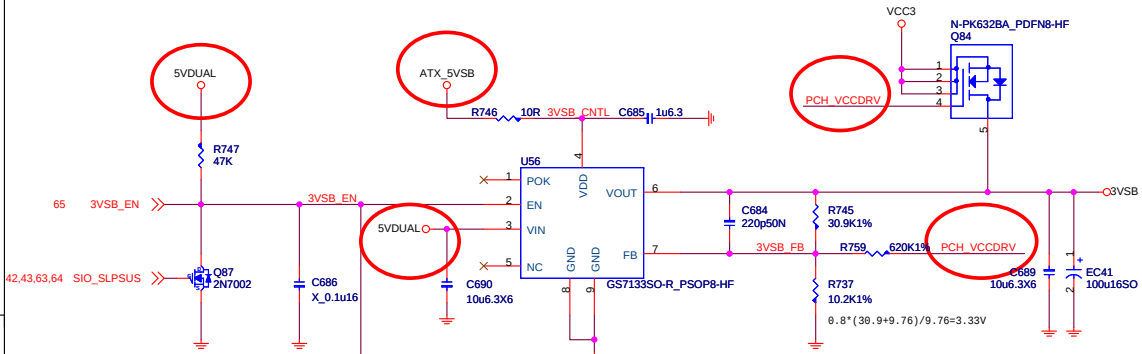

## 5VDIMM FOR DDR



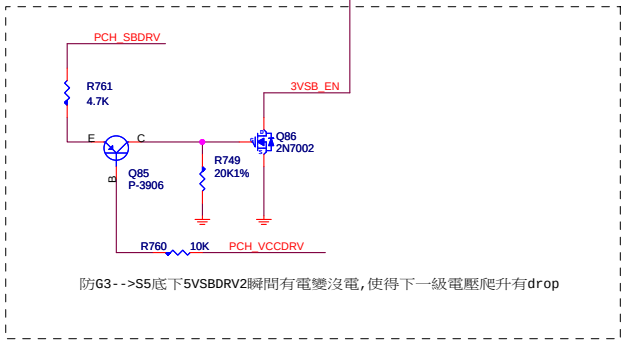

**7501 Mode**
**H:Support S0/S3/S5**
**L:Support S0/S3**




## 3VSB cost down




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




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

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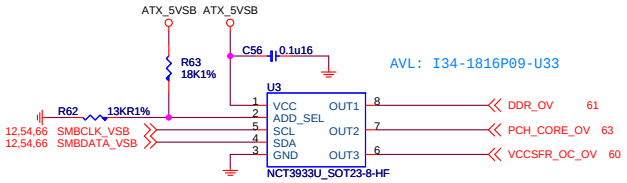
| ADDRESS | 0x2A | 0X28 | 0x26 | 0x24 | 0x22 | 0x20 |
|---|---|---|---|---|---|---|
| RH (KOhm) | OPEN | 3.9 | 3 | 2.2 | 1.3 | 10 |
| RL (KOhm) | 10 | 1.3 | 2.3 | 3 | 3.9 | OPEN |
| BUS_SEL | 0% | 25% | 40% | 60% | 75% | 100% |

## UPI VOLTAGE CONSOLE

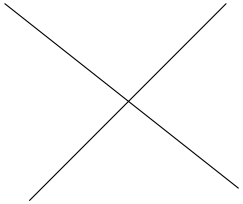
**0x26:RH=18K,RL=13K**




VCC_DDR
PCH_1VSB
VCCSFR_OC

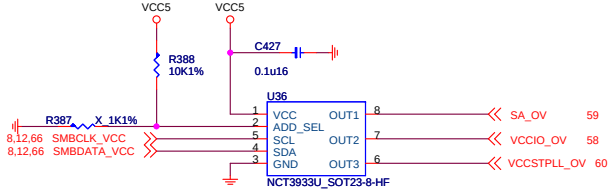
## UPI VOLTAGE CONSOLE

**0x28:RH=9.1K,RL=3K**



## UPI VOLTAGE CONSOLE

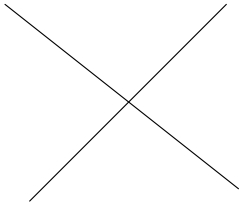
**0x20:RH=10K,RL=OPEN**



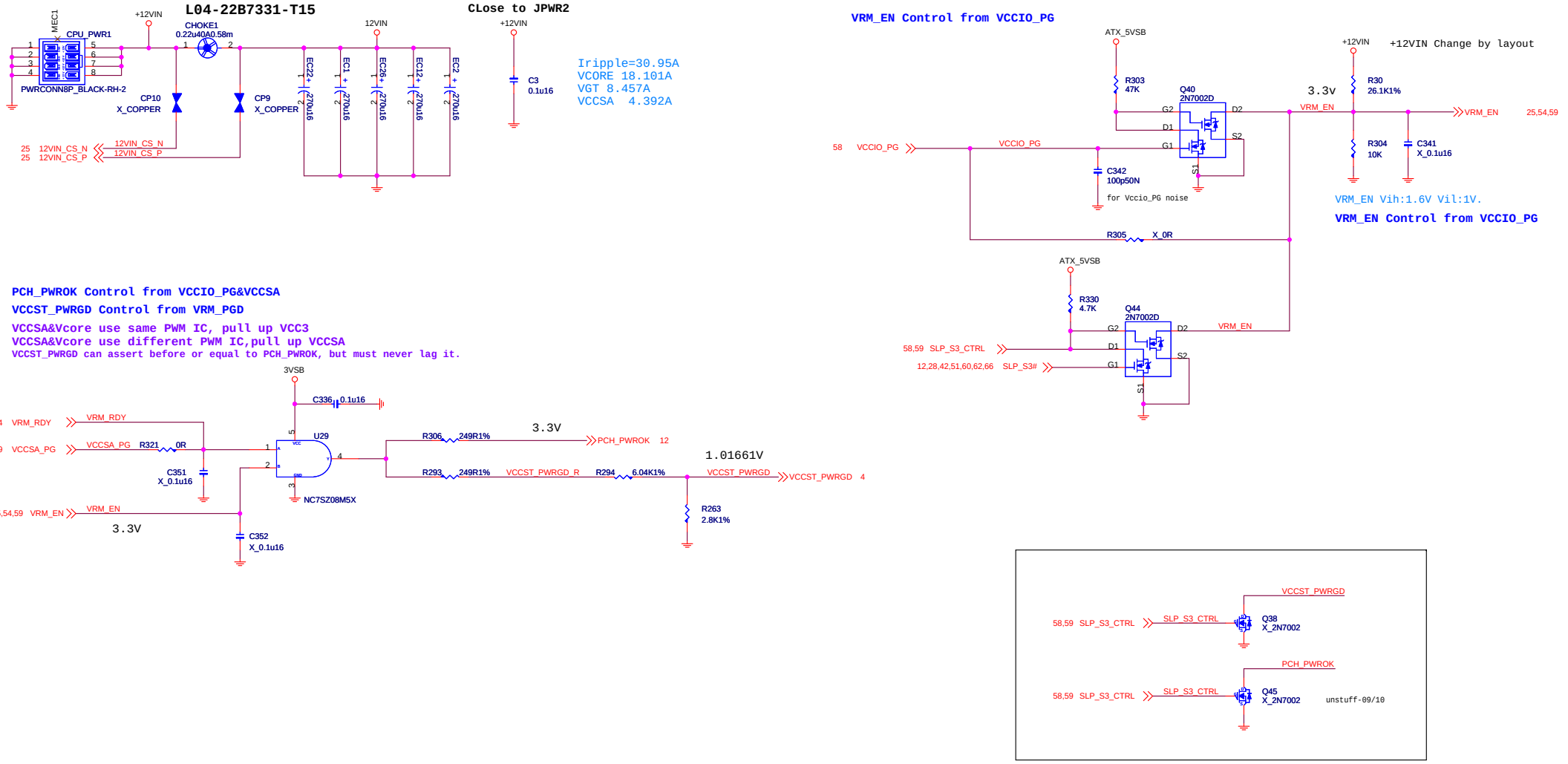

VCCSA
VCCIO
VCCST

## UPI VOLTAGE CONSOLE

**0x2A:RH=Open,RL=10K**



| | | | |
|---|---|---|---|
| MICRO-STAR INT'L CO.,LTD | | | |
| MS-7A62 | | | |
| Size: Custom | Document Description: OV-NCT3933/GPIO-NCT5605 | | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 52 of 71 | | |

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|---|---|---|
| MICRO-STAR INT'L CO.,LTD | | |
| MS-7A62 | | |
| Size: Custom | Document Description: PWM/VRM/Sqence | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 53 of 71 | |

*Vcore: ICC Max 100A*
*LL: 2.1 mohm*
*OCP: 200A*
*VGT: ICC Max 48A*
*LL: 3.1 mohm*
*OCP: 75A*

Close IC

VR13=48.7K,for VGT ICCMAX=48A.
VR17=100K,for VCORE ICCMAX=100A.

SMBus address=8Ah
R255=38.5K
vboot=1.05V

J1 0 :1.05V
J1 X : 0V

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PROG1: For 4+1 Setting
PROG2: Vboot 0V SMBUS Adress 8Ah.
PROG3: For Phase Extension Enable.

25K ohm for 400kHz

Diff pair

Diff pair

Close Phase1 CHOKE

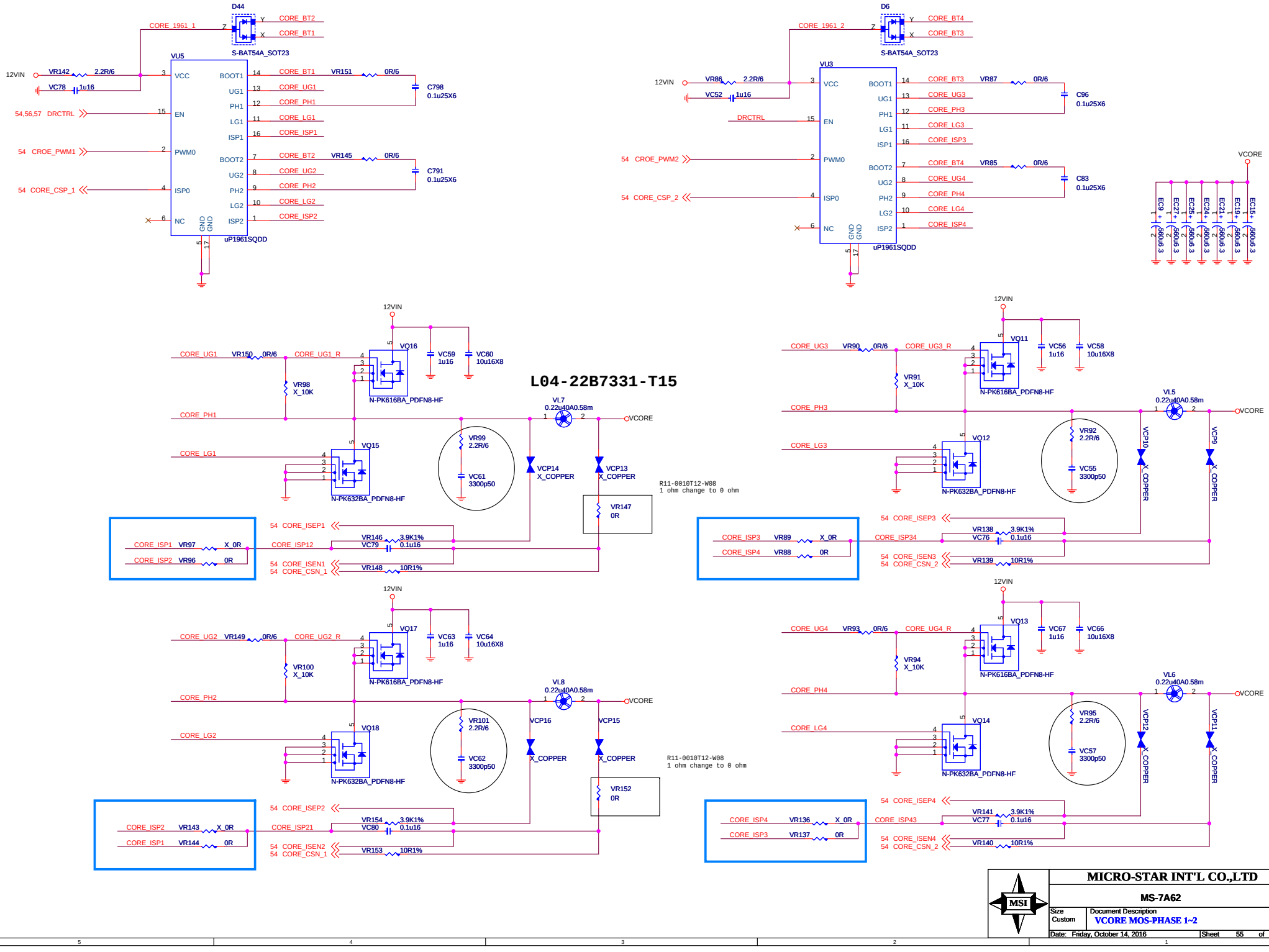
Close Phase1 MOS

static

load line

**I32-9508Q0C-U33**

| | |
|---|---|
| MICRO-STAR INT'L CO.,LTD | |
| MS-7A62 | |
| Size: Custom | Document Description: PWM-UP9508 VCORE+VGT |
| Rev: 1.0 | |
| Date: Friday, October 14, 2016 | Sheet 54 of 71 |


D44
S-BAT54A_SOT23
CORE_1961_1
CORE_BT2
CORE_BT1
VU5
uP1961SQDD
12VIN
VR142 2.2R/6
VC78 1u16
54,56,57 DRCTRL
54 CROE_PWM1
54 CORE_CSP_1
VCC
EN
PWM0
ISP0
NC
BOOT1
UG1
PH1
LG1
ISP1
BOOT2
UG2
PH2
LG2
ISP2
GND
CORE_BT1
CORE_UG1
CORE_PH1
CORE_LG1
CORE_ISP1
CORE_BT2
CORE_UG2
CORE_PH2
CORE_LG2
CORE_ISP2
VR151 0R/6
VR145 0R/6
C798 0.1u25X6
C791 0.1u25X6
D6
S-BAT54A_SOT23
CORE_1961_2
CORE_BT4
CORE_BT3
VU3
uP1961SQDD
VR86 2.2R/6
VC52 1u16
DRCTRL
54 CROE_PWM2
54 CORE_CSP_2
CORE_BT3
CORE_UG3
CORE_PH3
CORE_LG3
CORE_ISP3
CORE_BT4
CORE_UG4
CORE_PH4
CORE_LG4
CORE_ISP4
VR87 0R/6
VR85 0R/6
C96 0.1u25X6
C83 0.1u25X6
VCORE
EC9 560u6.3
EC27 560u6.3
EC25 560u6.3
EC24 560u6.3
EC21 560u6.3
EC19 560u6.3
EC15 560u6.3
L04-22B7331-T15
12VIN
CORE_UG1
VR150 0R/6
CORE_UG1_R
VQ16
N-PK616BA_PDFN8-HF
VC59 1u16
VC60 10u16X8
VR98 X_10K
CORE_PH1
VQ15
N-PK632BA_PDFN8-HF
CORE_LG1
VR99 2.2R/6
VC61 3300p50
VL7 0.22u40A0.58m
VCORE
VCP14 X_COPPER
VCP13 X_COPPER
VR147 0R
R11-0010T12-W08
1 ohm change to 0 ohm
CORE_ISP1 VR97 X_0R
CORE_ISP2 VR96 0R
CORE_ISP12
54 CORE_ISEP1
VR146 3.9K1%
VC79 0.1u16
54 CORE_ISEN1
54 CORE_CSN_1
VR148 10R1%
CORE_UG3
VR90 0R/6
CORE_UG3_R
VQ11
VC56 1u16
VC58 10u16X8
VR91 X_10K
CORE_PH3
VQ12
CORE_LG3
VR92 2.2R/6
VC55 3300p50
VL5 0.22u40A0.58m
VCP10 X_COPPER
VCP9 X_COPPER
CORE_ISP3 VR89 X_0R
CORE_ISP4 VR88 0R
CORE_ISP34
54 CORE_ISEP3
VR138 3.9K1%
VC76 0.1u16
54 CORE_ISEN3
54 CORE_CSN_2
VR139 10R1%
CORE_UG2
VR149 0R/6
CORE_UG2_R
VQ17
VC63 1u16
VC64 10u16X8
VR100 X_10K
CORE_PH2
VQ18
CORE_LG2
VR101 2.2R/6
VC62 3300p50
VL8 0.22u40A0.58m
VCP16 X_COPPER
VCP15 X_COPPER
VR152 0R
R11-0010T12-W08
1 ohm change to 0 ohm
CORE_ISP2 VR143 X_0R
CORE_ISP1 VR144 0R
CORE_ISP21
54 CORE_ISEP2
VR154 3.9K1%
VC80 0.1u16
54 CORE_ISEN2
54 CORE_CSN_1
VR153 10R1%
CORE_UG4
VR93 0R/6
CORE_UG4_R
VQ13
VC67 1u16
VC66 10u16X8
VR94 X_10K
CORE_PH4
VQ14
CORE_LG4
VR95 2.2R/6
VC57 3300p50
VL6 0.22u40A0.58m
VCP12 X_COPPER
VCP11 X_COPPER
CORE_ISP4 VR136 X_0R
CORE_ISP3 VR137 0R
CORE_ISP43
54 CORE_ISEP4
VR141 3.9K1%
VC77 0.1u16
54 CORE_ISEN4
54 CORE_CSN_2
VR140 10R1%
MICRO-STAR INT'L CO.,LTD
MS-7A62
Size Custom
Document Description
VCORE MOS-PHASE 1~2
Rev 1.0
Date: Friday, October 14, 2016
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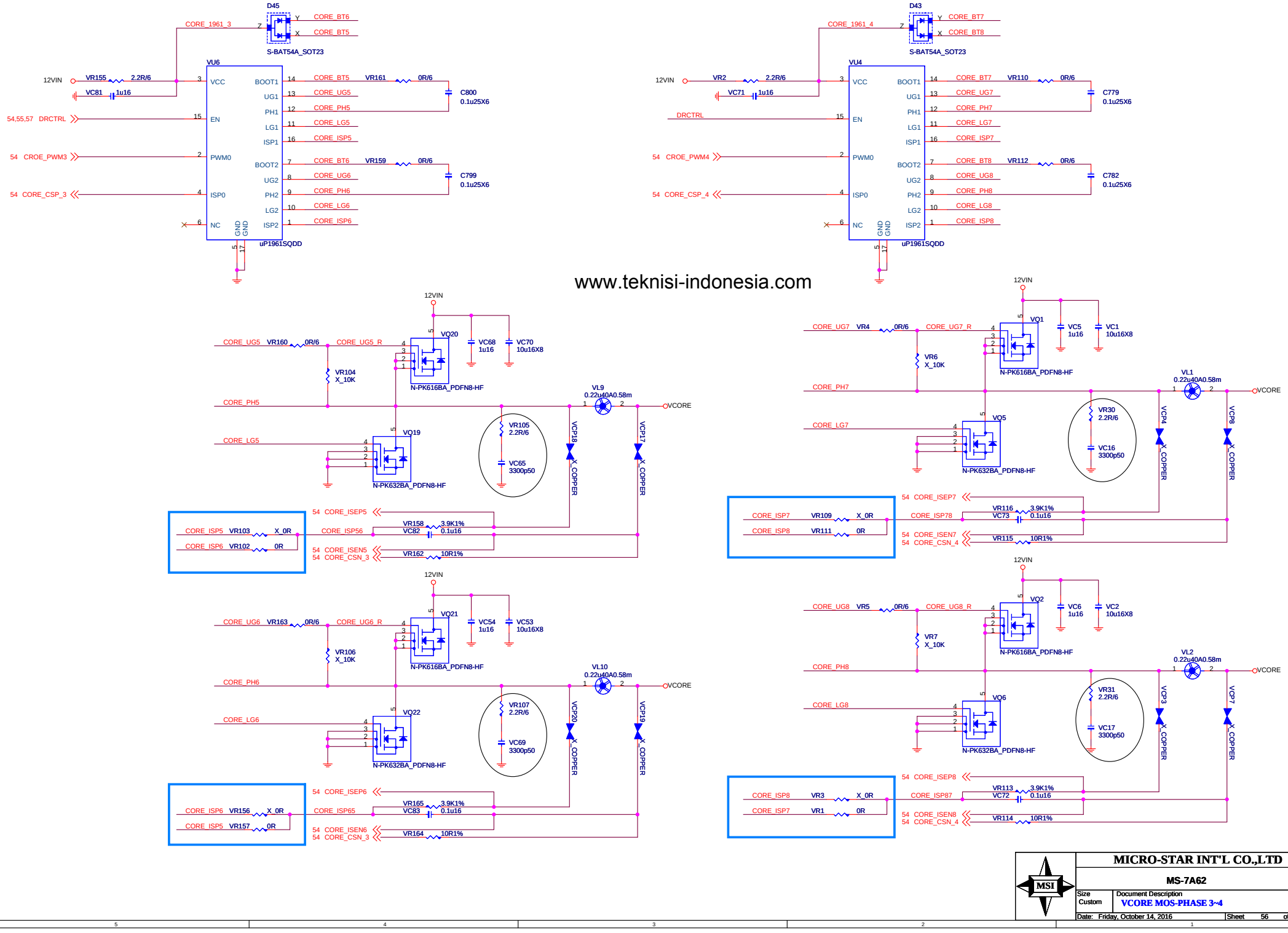
D45
S-BAT54A_SOT23
CORE_1961_3
CORE_BT6
CORE_BT5
VU6
uP1961SQDD
12VIN
VR155 2.2R/6
VC81 1u16
54,55,57 DRCTRL
54 CROE_PWM3
54 CORE_CSP_3
VCC
EN
PWM0
ISP0
NC
GND
BOOT1
UG1
PH1
LG1
ISP1
BOOT2
UG2
PH2
LG2
ISP2
VR161 0R/6
C800 0.1u25X6
CORE_UG5
CORE_PH5
CORE_LG5
CORE_ISP5
VR159 0R/6
C799 0.1u25X6
CORE_UG6
CORE_PH6
CORE_LG6
CORE_ISP6
D43
S-BAT54A_SOT23
CORE_1961_4
CORE_BT7
CORE_BT8
VU4
VR2 2.2R/6
VC71 1u16
54 CROE_PWM4
54 CORE_CSP_4
VR110 0R/6
C779 0.1u25X6
CORE_UG7
CORE_PH7
CORE_LG7
CORE_ISP7
VR112 0R/6
C782 0.1u25X6
CORE_UG8
CORE_PH8
CORE_LG8
CORE_ISP8
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VQ20
VQ19
VQ21
VQ22
VQ1
VQ5
VQ2
VQ6
N-PK616BA_PDFN8-HF
N-PK632BA_PDFN8-HF
VC68 1u16
VC70 10u16X8
VC54 1u16
VC53 10u16X8
VC5 1u16
VC1 10u16X8
VC6 1u16
VC2 10u16X8
VR104 X_10K
VR106 X_10K
VR6 X_10K
VR7 X_10K
VL9 0.22u40A0.58m
VL10 0.22u40A0.58m
VL1 0.22u40A0.58m
VL2 0.22u40A0.58m
VCORE
VR105 2.2R/6
VC65 3300p50
VR107 2.2R/6
VC69 3300p50
VR30 2.2R/6
VC16 3300p50
VR31 2.2R/6
VC17 3300p50
VCP18
VCP17
VCP20
VCP19
VCP4
VCP8
VCP3
VCP7
X_COPPER
CORE_ISP5 VR103 X_0R
CORE_ISP6 VR102 0R
CORE_ISP56
54 CORE_ISEP5
54 CORE_ISEN5
54 CORE_CSN_3
VR158 3.9K1%
VC82 0.1u16
VR162 10R1%
CORE_ISP6 VR156 X_0R
CORE_ISP5 VR157 0R
CORE_ISP65
54 CORE_ISEP6
54 CORE_ISEN6
54 CORE_CSN_3
VR165 3.9K1%
VC83 0.1u16
VR164 10R1%
CORE_ISP7 VR109 X_0R
CORE_ISP8 VR111 0R
CORE_ISP78
54 CORE_ISEP7
54 CORE_ISEN7
54 CORE_CSN_4
VR116 3.9K1%
VC73 0.1u16
VR115 10R1%
CORE_ISP8 VR3 X_0R
CORE_ISP7 VR1 0R
CORE_ISP87
54 CORE_ISEP8
54 CORE_ISEN8
54 CORE_CSN_4
VR113 3.9K1%
VC72 0.1u16
VR114 10R1%
MICRO-STAR INT'L CO.,LTD
MS-7A62
Size
Custom
Document Description
VCORE MOS-PHASE 3~4
Rev
1.0
Date: Friday, October 14, 2016
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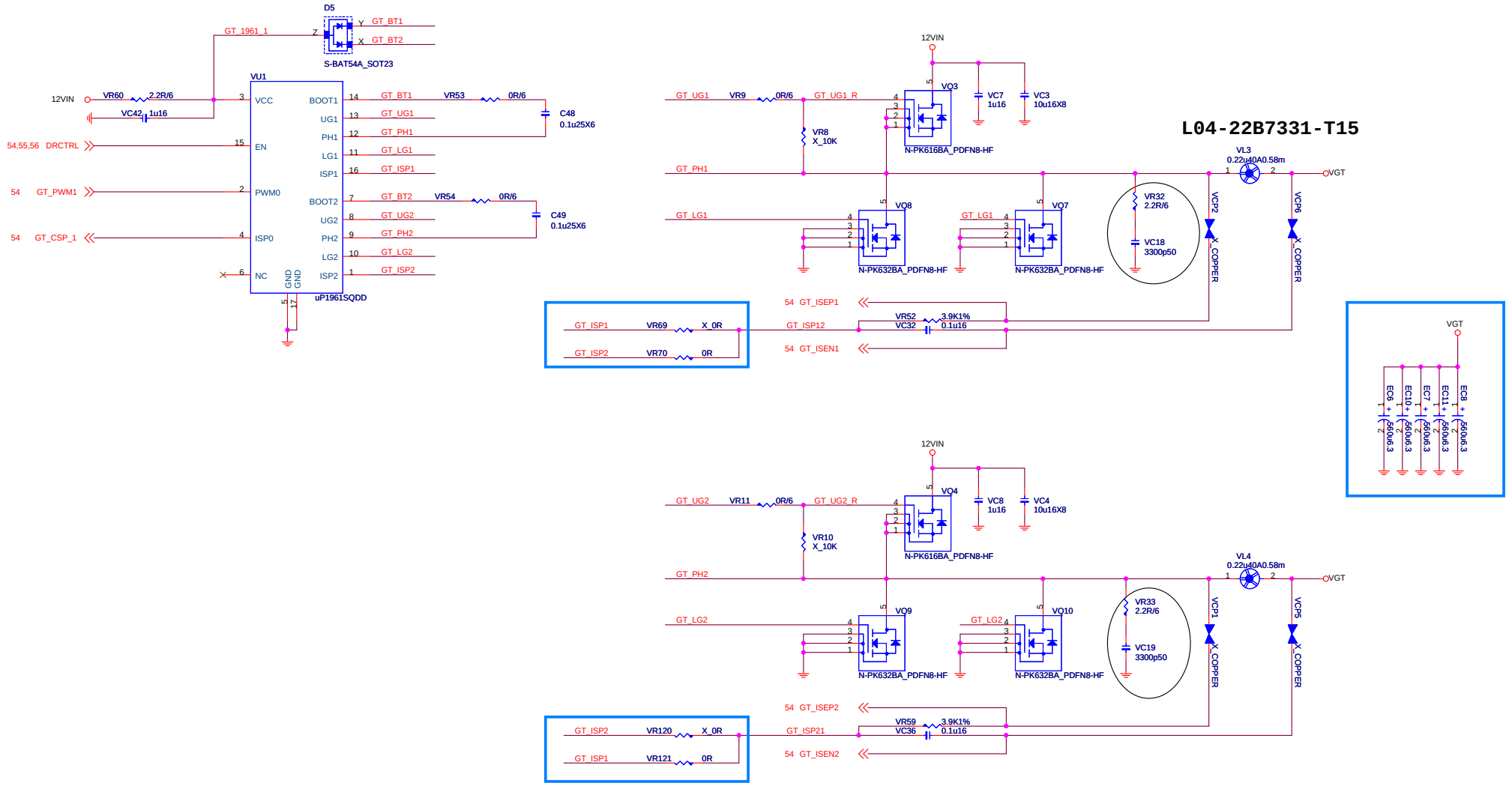


| | | |
|---|---|---|
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| MS-7A62 | | |
| Size: Custom | Document Description: VGT MOS-PHASE 1~2 | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 57 of 71 | |

# VCCIO

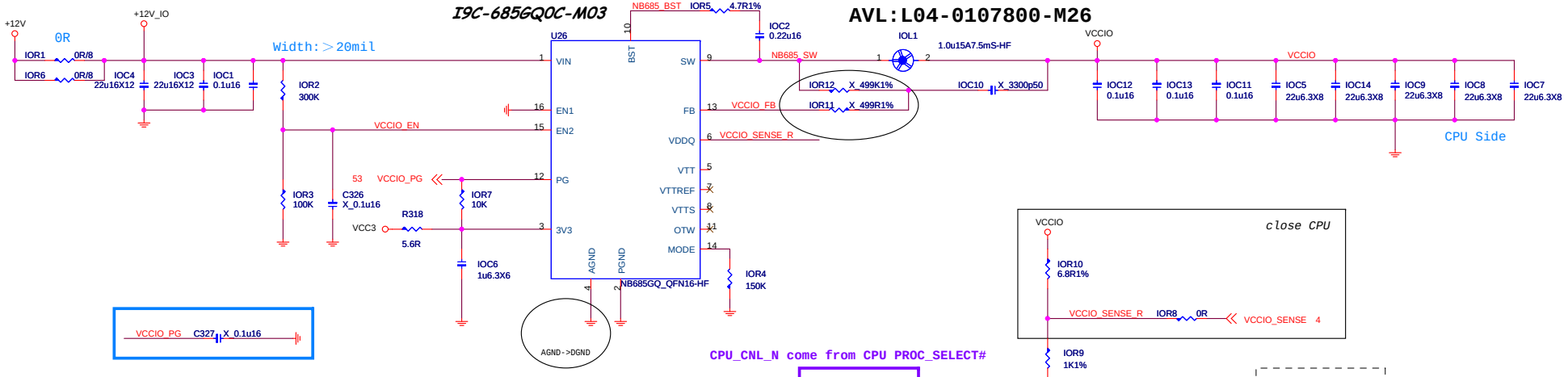
0.95V; 5.5A

IMAX 10A
ILIMIT=10A~12A
IOC=ILIMIT+40%*IMAX/2=12A~14A.

support 0V=>NB685

0.7776uH≒L≒1.1664uH

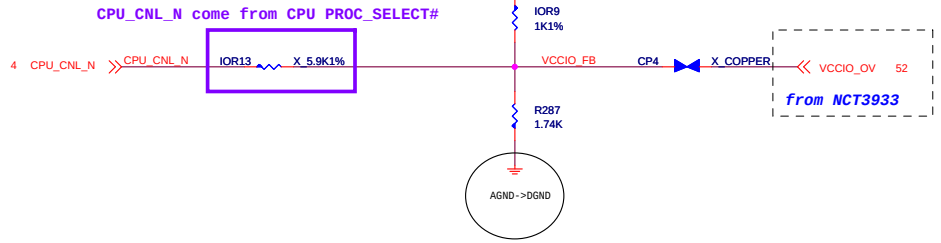
L04-01072H0-T15
AVL:L04-0107800-M26





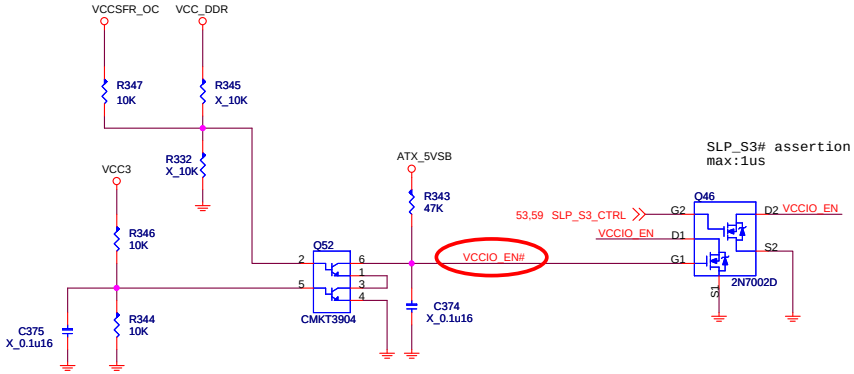


CPU_CNL_N come from CPU PROC_SELECT#




SLP_S3# assertion to VCCIO VR disabled ＜1uS.

SLP_S3# assertion to VCC, VCCGT, VCCIO and VCCSA rails completely off. <500ms




SLP_S3# assertion to VR disabled
max:1us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Size: Custom
Document Description: CPU PWR_VCCIO
Rev: 1.0
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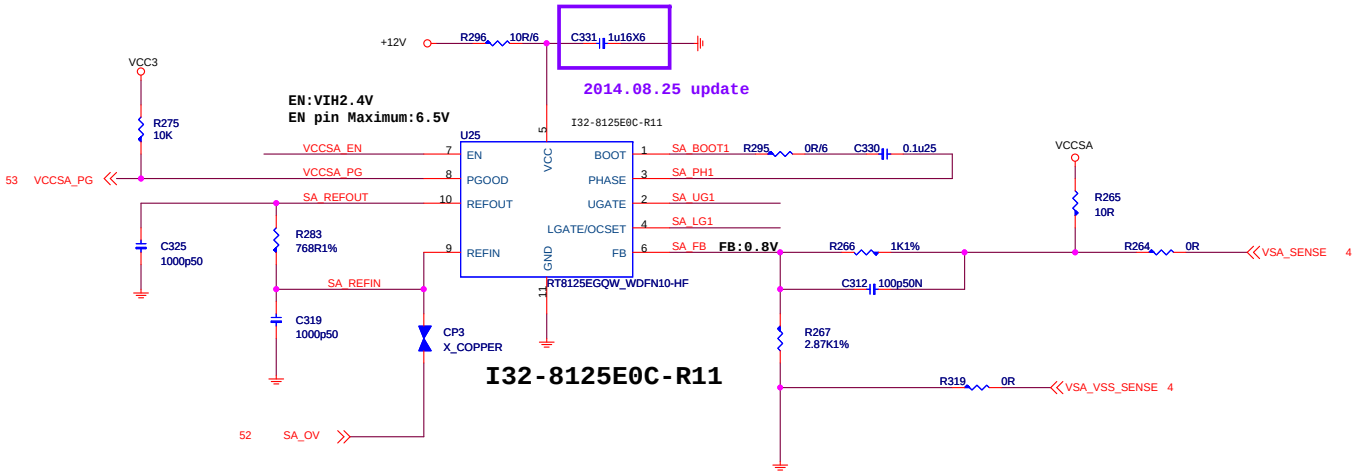
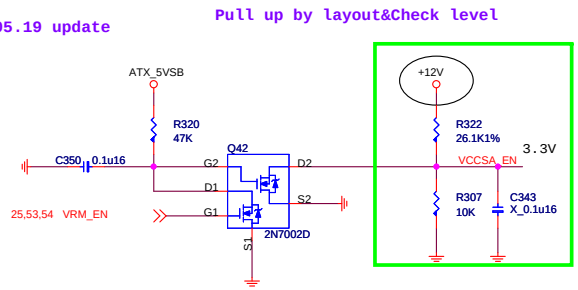
# SA Power:1.05V,11.1A

*OCP =11.1A*1.4=15.54A*
*Rocs(R417)=OCP*Rdson(Low side)3.4mohm]/10uA*
*=15.54*(3.4)mohm/10uA*
*=5.2836Kohm*

**Rocs:5.2836K,OCP:**
**D03-4C05N03-O05 : 15.76A**
**D03-632BA0C-N03 : 16.24A**
**use UBIQ MOS need Check**

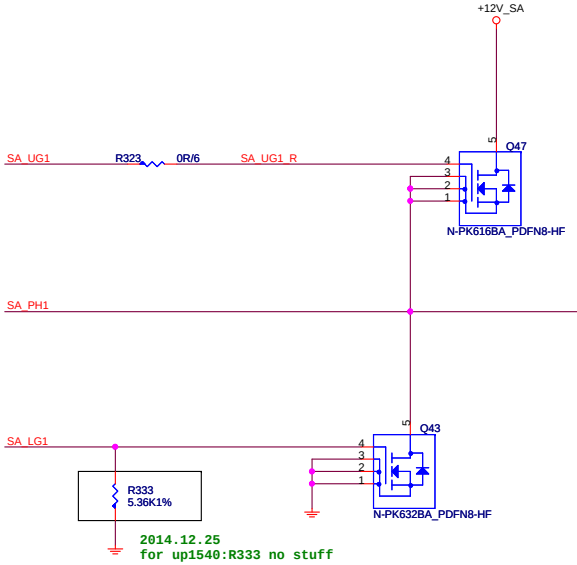
**Rdson(low)10V**
**D03-4C05N03-O05 : 3.4mohm**
**D03-632BA0C-N03 : 3.3mohm**
**D03-3056M00-U47 : 4.2mohm**



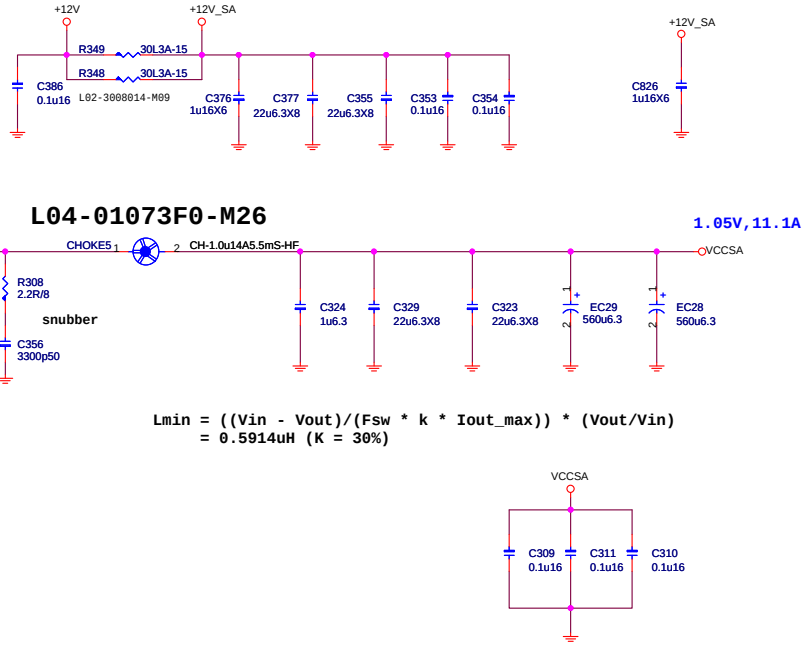




**SLP_S3# assertion to VCC, VCCGT, VCCIO and VCCSA rails completely off.**

SLP_S3# assertion to VR disabled
max:1us




**Irms = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))**
**= 18* 0.2825**
**= 5.086A**




**Lmin = ((Vin - Vout)/(Fsw * k * Iout_max)) * (Vout/Vin)**
**= 0.5914uH (K = 30%)**




| | | |
|---|---|---|
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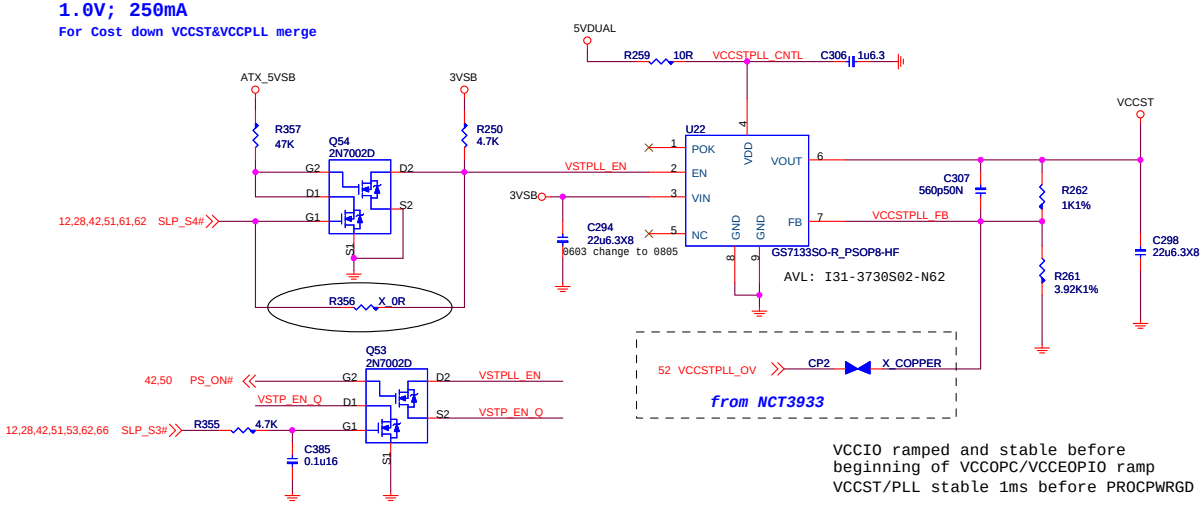
| MS-7A62 | | |
| Size: Custom | Document Description: CPU PWR_SA-RT8125C | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 59 of 71 | |

# VCCST

*for Gaming3/5, Classic, ECO and H110*

**1.0V; 250mA**

**For Cost down VCCST&VCCPLL merge**

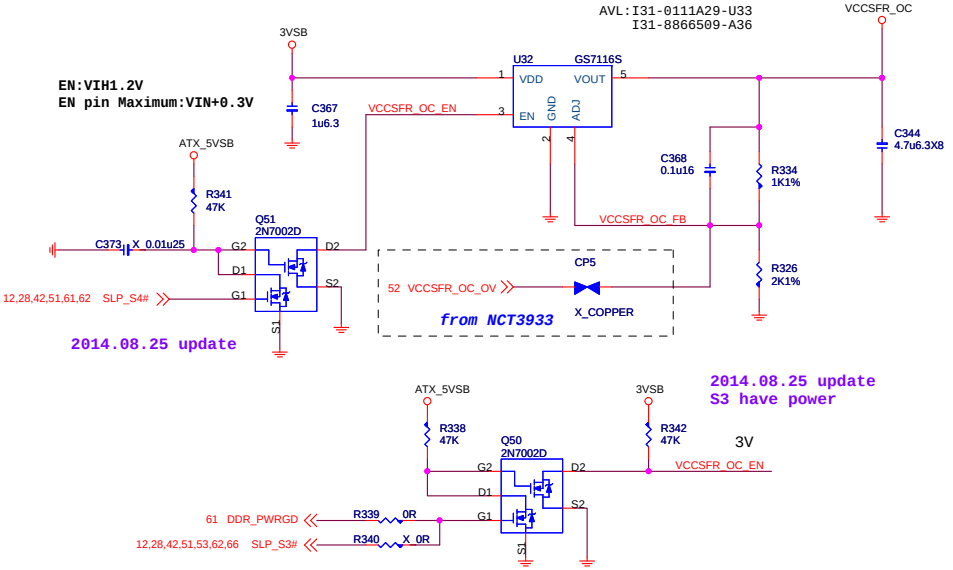



VCCIO ramped and stable before beginning of VCCOPC/VCCEOPIO ramp
VCCST/PLL stable 1ms before PROCPWRGD

# VCCPLL_OC

**2014.08.21 update**

**1.2V; 110mA**




| | | |
|---|---|---|
| MSI | MICRO-STAR INT'L CO.,LTD | |
| | MS-7A62 | |
| Size: Custom | Document Description: CPU PWR_ST/PLL | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 60 of 71 | |

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:7.32K

OCP=Rocset*Rdson(Low side)/10uA

=7.32K*3.6mohm/10uA

=20.3A

Rdson(low)4.5V

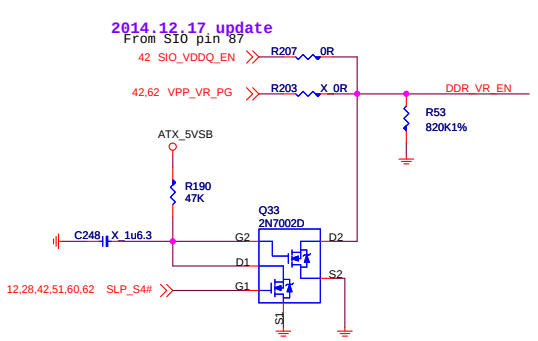
D03-4C05N03-O05 : 5 mohm

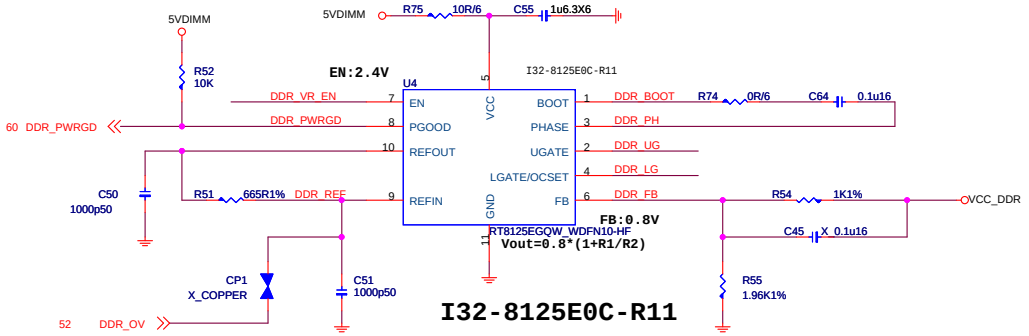
D03-632BA0C-N03 : 4.6mohm

D03-3056M00-U47 : 6.2mohm

2014.12.17 update

From SIO pin 87



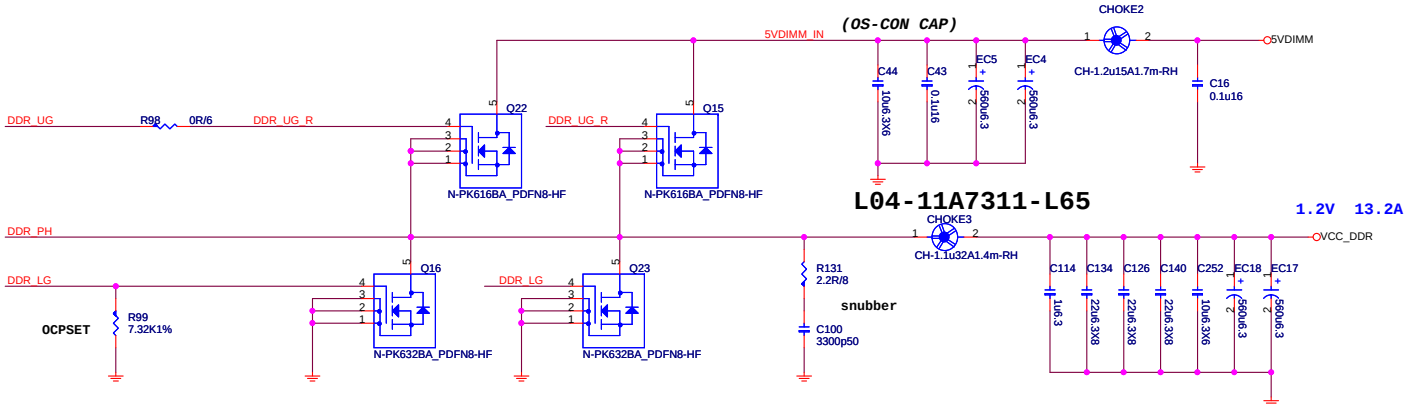




Irms = Iout * SQRT{(Vout/Vin) * [1 - (Vout/Vin)]}

= 13.2* 0.427

= 5.636A

L04-12A7321-L65




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

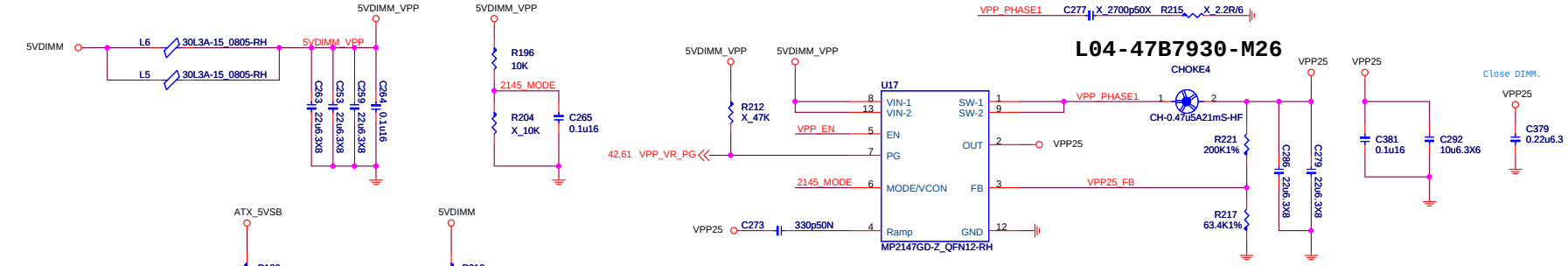
CAP ESR:0.2432uH≒ L ≒1.2897uH

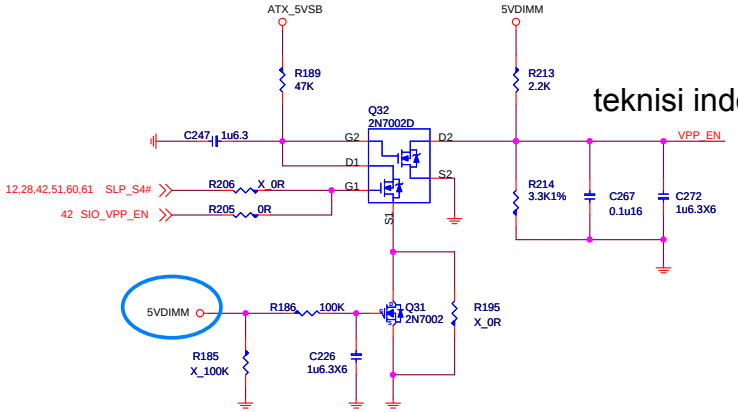
| | | |
|---|---|---|
| MSI | MICRO-STAR INT'L CO.,LTD | |
| | MS-7A62 | |
| Size: Custom | Document Description: DDR4 Power-RT8125C | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 61 of 71 | |

4DIMM :2.84A FOR DDR VPP2.5V

## VPP25 Power

2.5V; 2.24A

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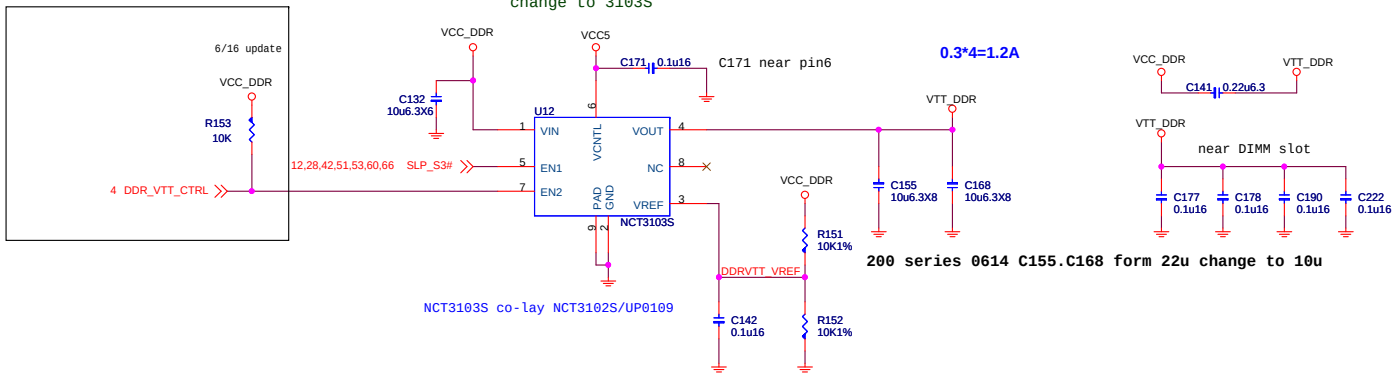
ENABLE HIGH:1.6V

To make sure VPP EN after 5VDIMM stable

## DDR VTT Power

2015.03.02
change to 3103S




NCT3103S co-lay NCT3102S/UP0109

200 series 0614 C155.C168 form 22u change to 10u

| | | |
|---|---|---|
| MICRO-STAR INT'L CO.,LTD | | |
| MS-7A62 | | |
| Size: Custom | Document Description: DDR4 Power-VPP25 | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 62 of 71 | |

# PCH_1VSB

**1.0V; 11A**

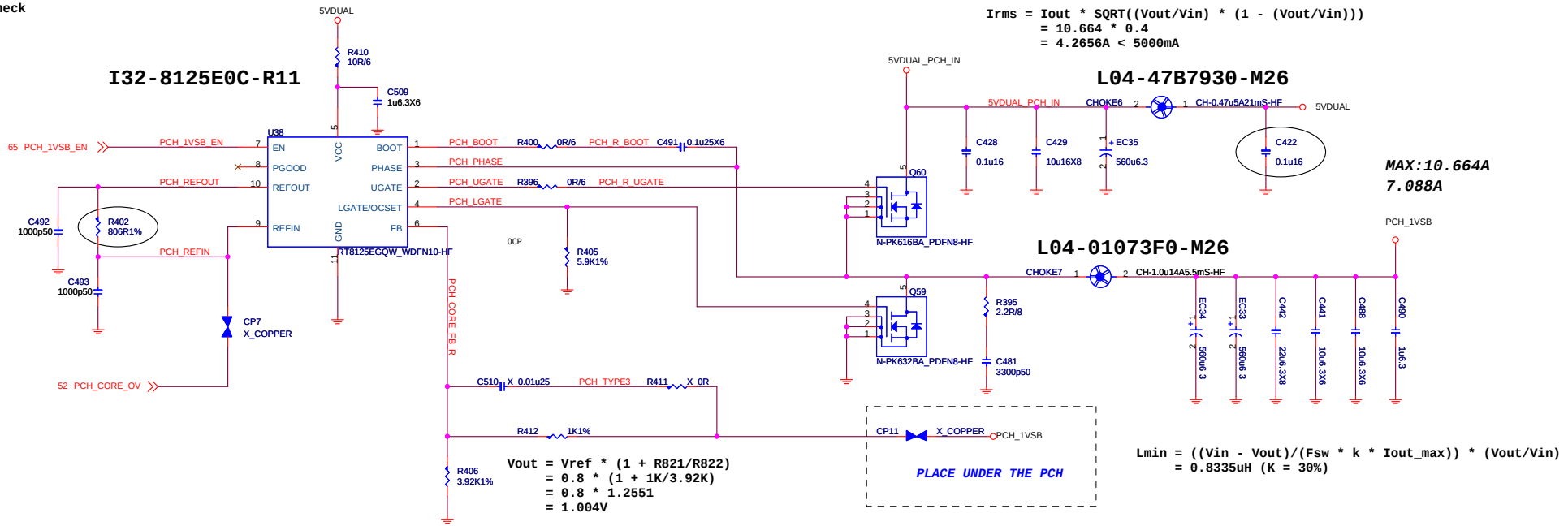
OCP = 16.21A

Rocset = 1.5 * Imax * Rdson(low) / Iocset
= 1.5 * 10.664 * 5mohm / 10uA
= 7.998K

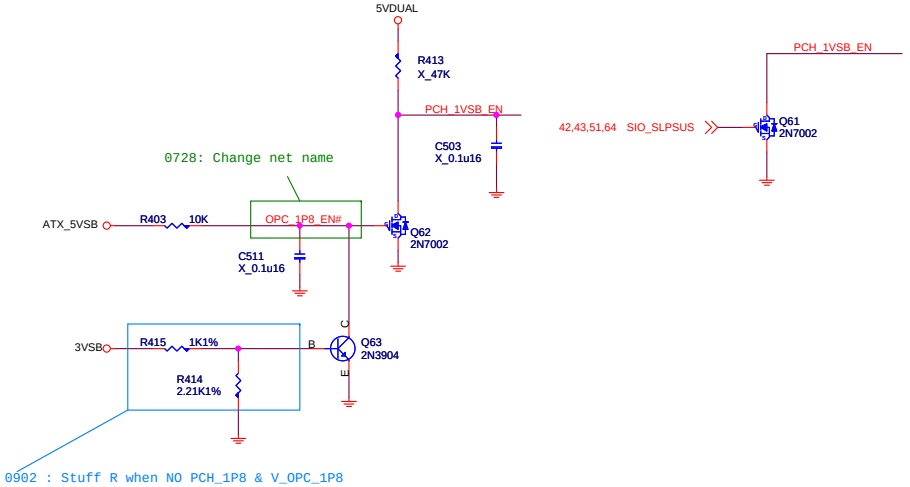
Rocs:7.87K,OCP:
D03-4C05N03-005 : 15.74A
D03-632BA0C-N03 : 17.1A
use UBIQ MOS need Check

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

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




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

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| Size | Document Description | Rev |
|---|---|---|
| Custom | PCH Core Power-RT8125 | 1.0 |

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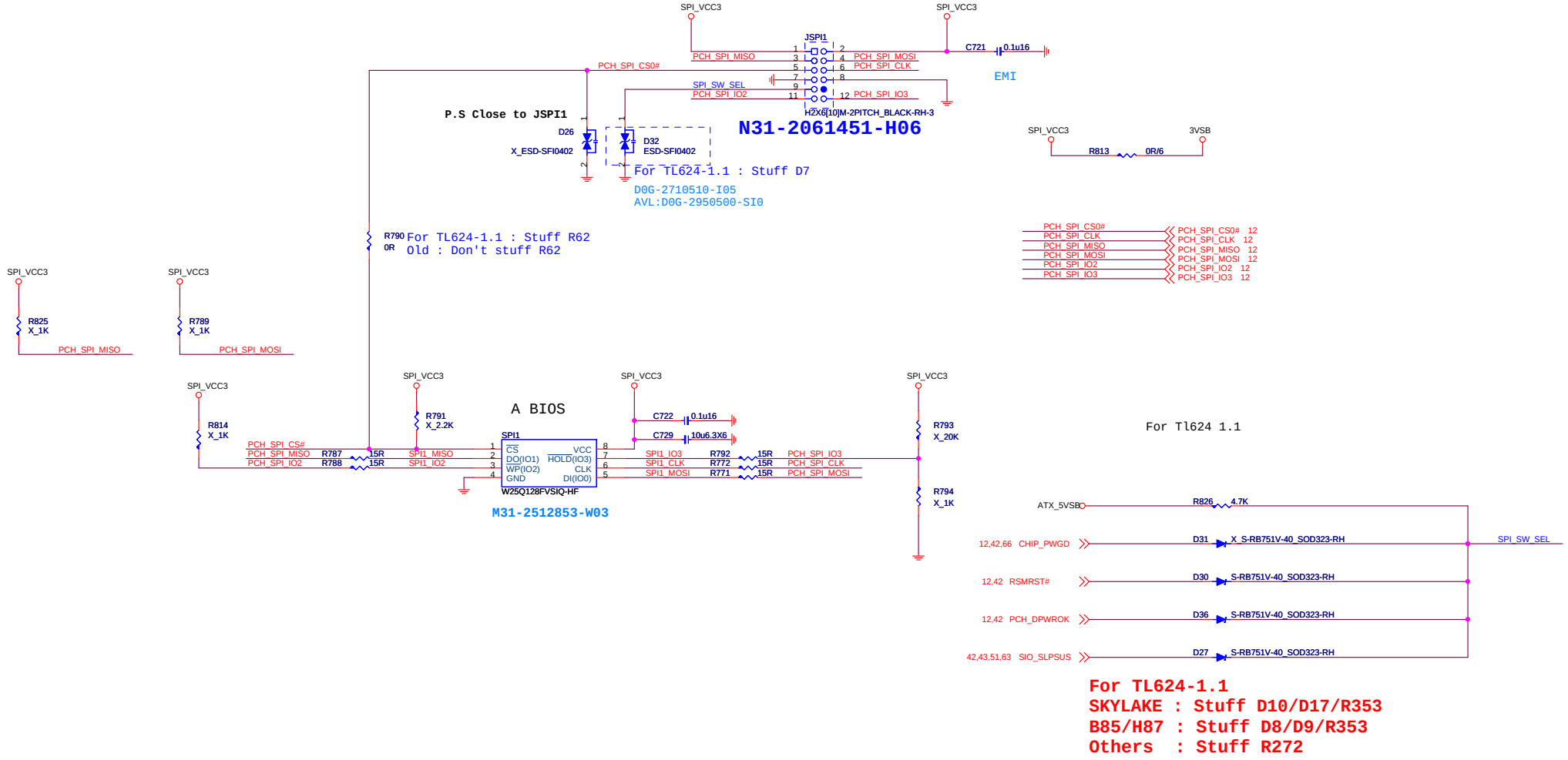


| | | |
|---|---|---|
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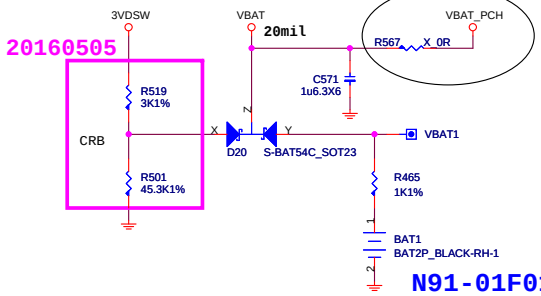
| MS-7A62 | | |
| Size: Custom | Document Description: BIOS | Rev: 1.0 |
| Date: Friday, October 14, 2016 | Sheet 64 of 71 | |

# CLR_CMOS

Co-Lay NOT U12 , Stuff R141




Default

| Function 1 | | |
|---|---|---|
| IN | | OUT |
| INPUT1 | INPUT2 | OUTPUT1 |
| 0 | 1 | 1 |
| 1 | 0 | 0 |
| 1 | 1 | 0 |
| 0 | 0 | 0 |

Default

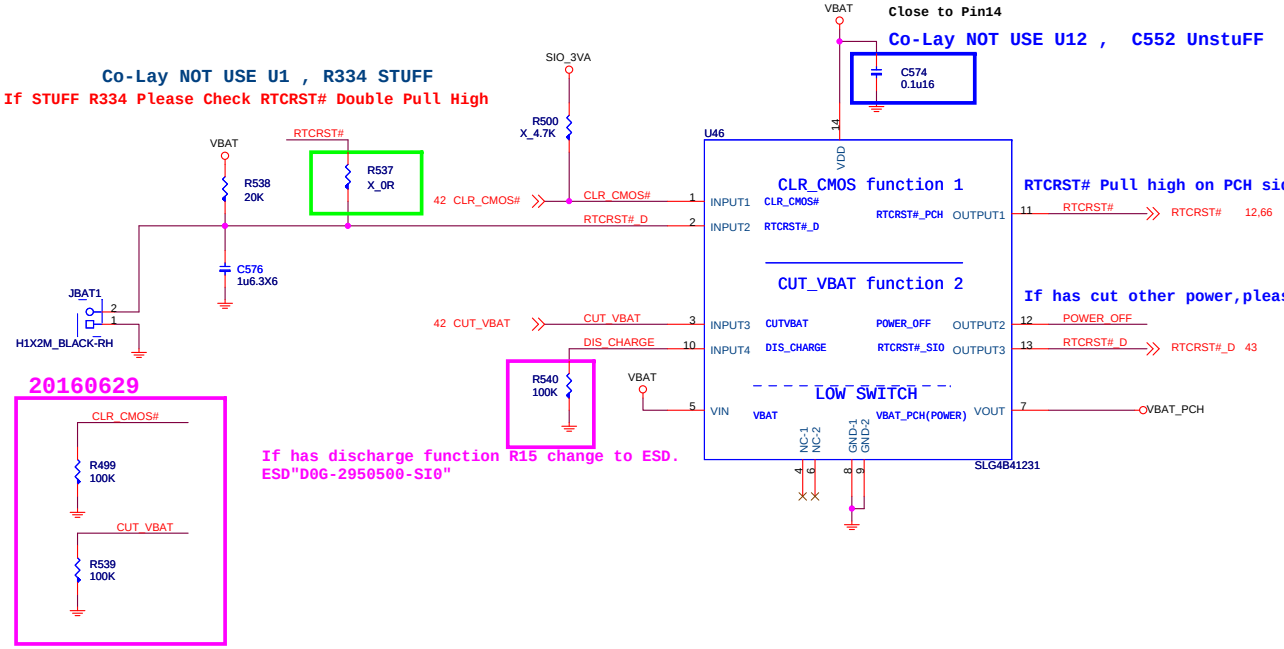
| Function 2 | | | | |
|---|---|---|---|---|
| IN | | OUT | | |
| INPUT3 & lowswitch EN | INPUT4 | OUTPUT2 | OUTPUT3 | VOUT |
| 0 | 0 | 0 | 1 | 1 |
| 1 | 0 | 1 | 1 | 0 (discharge) |
| 0 | 1 | 1 | 0 | 0 (discharge) |
| 1 | 1 | 1 | 0 | 0 (discharge) |

Co-Lay NOT USE U1 , R334 STUFF

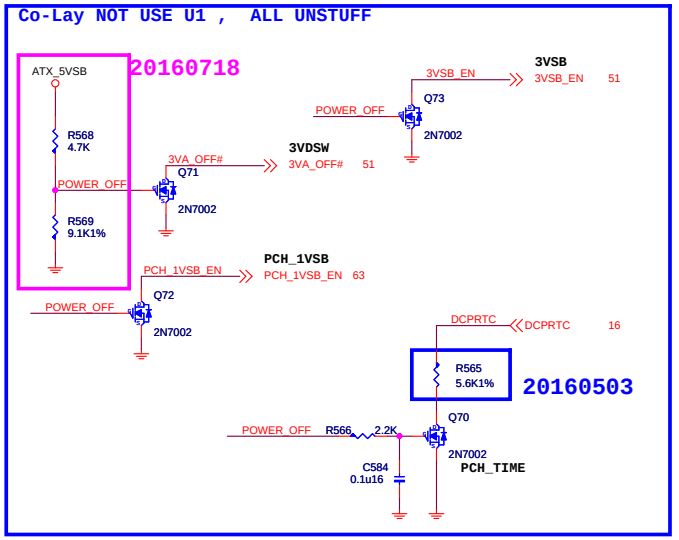
If STUFF R334 Please Check RTCRST# Double Pull High

Close to Pin14

Co-Lay NOT USE U12 , C552 UnstuFF




Co-Lay NOT USE U1 , ALL UNSTUFF





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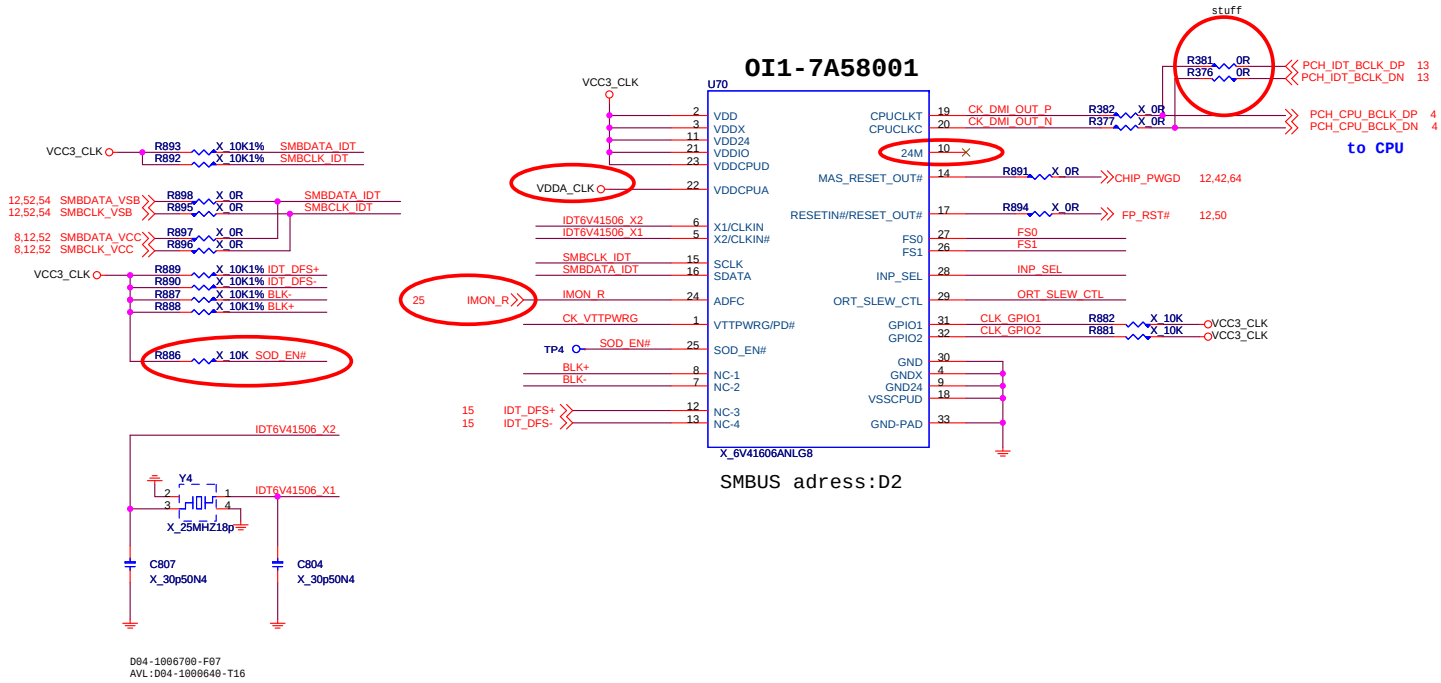
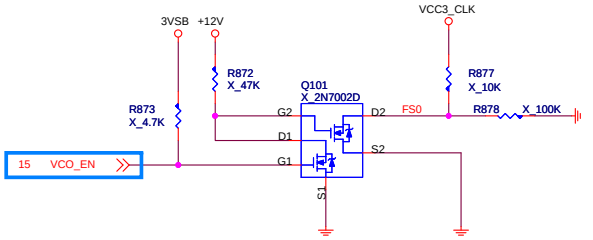
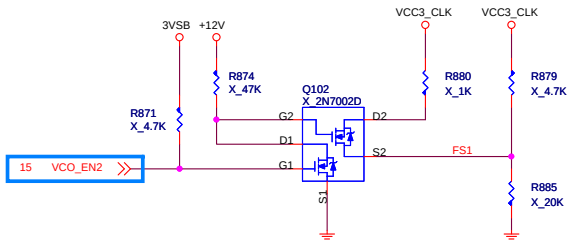
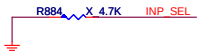


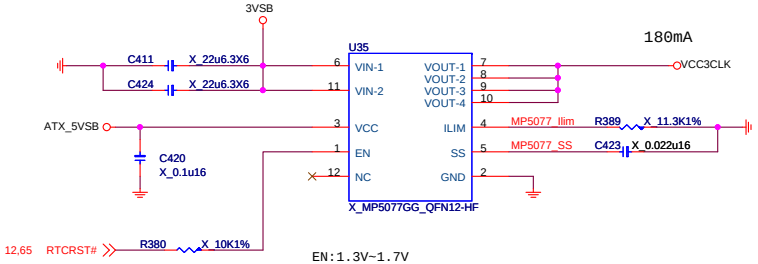



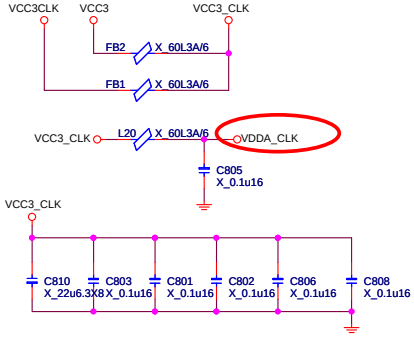



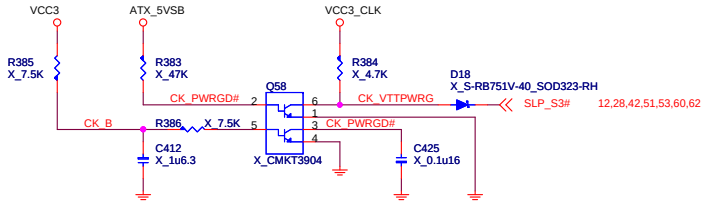

| FS1 | FS0 | VCO Frequency |
|---|---|---|
| 0 | 0 | VCO 200MHz |
| 0 | 1 | VCO 400MHz (default) |
| 1 | 0 | VCO 1000MHz |
| 1 | 1 | VCO 100MHz |




| INP_SEL | |
|---|---|
| 0 | 25MHz crystal input |
| 1 | 100MHz differential input |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|---|---|---|
| Custom | CLK Gen- IDT 6V41606A | 0A |

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## PCB

PCB1

7A62_0A

PD0-07A620A-G37
PD0-07A620A-E48

HDMI_LABLE
HDMI LABLE
X_HDMI LABEL

AMI_LABLE
AMI_BIOS LABLE
BIOS_LABLE

Steel_LABLE
SteelSeries LABLE
Steel_LABLE1

Nahimic_LABLE
Nahimic LABLE
Nahimic_LABLE1

MK_LABLE1
MARKET LABLE
MK_Z270

MK_LABLE2
MARKET LABLE
X_MK_H270

MK_LABLE3
MARKET LABLE
X_MK_B250

H270
PCH H270
X_H270

B250
PCH B250
X_B250

H270:OB1-7A58003-I06
Z270:OB1-7A58002-I06
B250:OB1-7A58004-I06

H270:G51-M1SPK20-Q13
Z270:G51-M1SPK19-Q13
B250:G51-M1SPK21-Q13

ASM_1142
ASM 1142
X_ASM1142

R10000
R 200K ohm
X_200K1%

R10002
R 187K ohm
X_187K1%

R10001
R 19.6K ohm
X_16.9K1%

ASPI ROOM
SPI ROOM ASM 1142
X_M31-2551222-M24

BAT1_X1
BAT-BCR2032P-RH

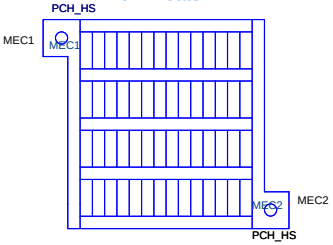
CPU_H1
CPU 鐵座
CPU_H1

HDMI001
HDMI B250 one port
X_N5Y-19M0721-L06

TYPEC001
TYPE C
X_N53-09M0591-L06

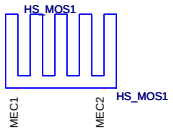
TYPEC002
USB 3.1 GEN 2
X_N53-24M0040-L06

## PCH Heatsink




E31-0408640-K08

HS_MOS1




E31-0504340-K08

## AUDIO Cover

Audio_Cover
Audio Cover
E21-7A62010-RH

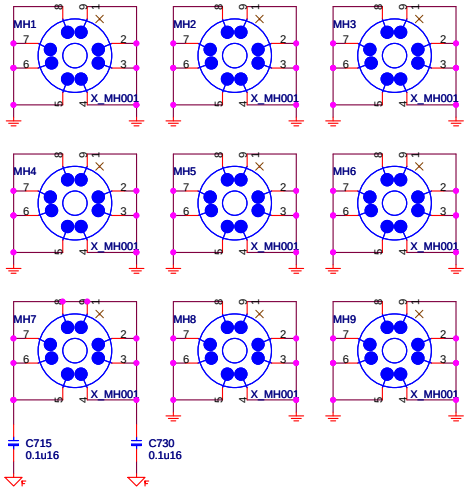
E21-7A62010-A91

## VR Cover

VR_COVER
VR Cover
X1
X2
E21-7A63020-RH

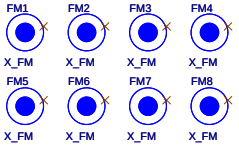
E21-7A63020-A91

## Mounting Holes




## Simulation


## Optical Fiducial Marks-120



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|---|---|---|
| Custom | Manual parts | 1.0 |

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