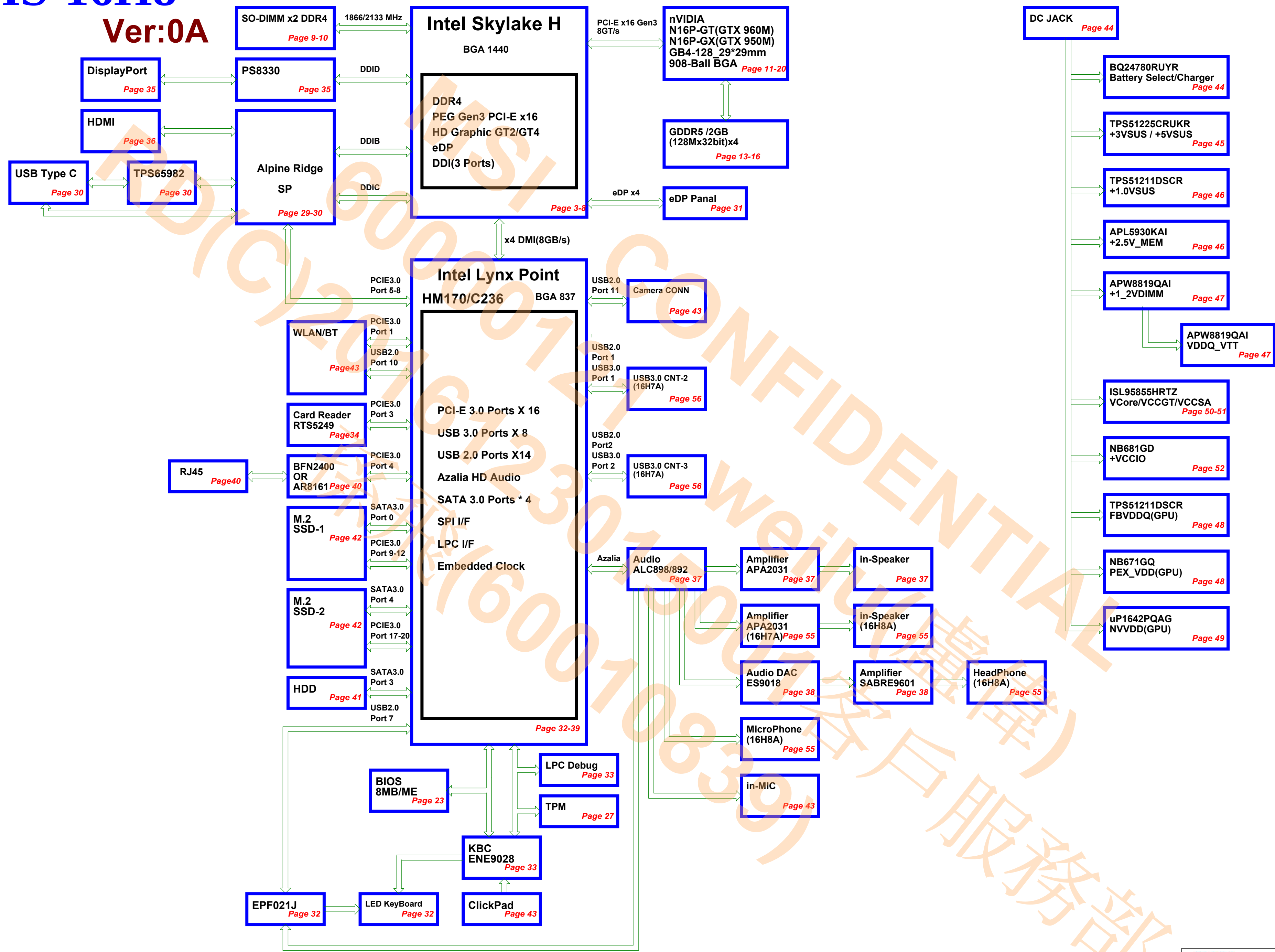
MS-16H8

Ver:0A

Intel Skylake Platform



SO-DIMM x2 DDR4
Page 9-10
1866/2133 MHz
Intel Skylake H
BGA 1440
DDR4
PEG Gen3 PCI-E x16
HD Graphic GT2/GT4
eDP
DDI(3 Ports)
Page 3-8
PCI-E x16 Gen3 8GT/s
nVIDIA
N16P-GT(GTX 960M)
N16P-GX(GTX 950M)
GB4-128_29*29mm
908-Ball BGA
Page 11-20
GDDR5 /2GB
(128Mx32bit)x4
Page 13-16
eDP x4
eDP Panal
Page 31
DisplayPort
Page 35
PS8330
Page 35
DDID
HDMI
Page 36
DDIB
USB Type C
Page 30
TPS65982
Page 30
Alpine Ridge
SP
Page 29-30
DDIC
x4 DMI(8GB/s)
PCIE3.0
Port 5-8
Intel Lynx Point
HM170/C236
BGA 837
PCI-E 3.0 Ports X 16
USB 3.0 Ports X 8
USB 2.0 Ports X14
Azalia HD Audio
SATA 3.0 Ports * 4
SPI I/F
LPC I/F
Embedded Clock
Page 32-39
WLAN/BT
Page43
PCIE3.0
Port 1
USB2.0
Port 10
Card Reader
RTS5249
Page34
PCIE3.0
Port 3
RJ45
Page40
BFN2400
OR
AR8161
Page 40
PCIE3.0
Port 4
M.2
SSD-1
Page 42
SATA3.0
Port 0
PCIE3.0
Port 9-12
M.2
SSD-2
Page 42
SATA3.0
Port 4
PCIE3.0
Port 17-20
HDD
Page 41
SATA3.0
Port 3
USB2.0
Port 7
USB2.0
Port 11
Camera CONN
Page 43
USB2.0
Port 1
USB3.0
Port 1
USB3.0 CNT-2
(16H7A)
Page 56
USB2.0
Port2
USB3.0
Port 2
USB3.0 CNT-3
(16H7A)
Page 56
Azalia
Audio
ALC898/892
Page 37
Amplifier
APA2031
Page 37
in-Speaker
Page 37
Amplifier
APA2031
(16H7A)
Page 55
in-Speaker
(16H8A)
Page 55
Audio DAC
ES9018
Page 38
Amplifier
SABRE9601
Page 38
HeadPhone
(16H8A)
Page 55
MicroPhone
(16H8A)
Page 55
in-MIC
Page 43
LPC Debug
Page 33
BIOS
8MB/ME
Page 23
TPM
Page 27
KBC
ENE9028
Page 33
EPF021J
Page 32
LED KeyBoard
Page 32
ClickPad
Page 43
DC JACK
Page 44
BQ24780RUYR
Battery Select/Charger
Page 44
TPS51225CRUKR
+3VSUS / +5VSUS
Page 45
TPS51211DSCR
+1.0VSUS
Page 46
APL5930KAI
+2.5V_MEM
Page 46
APW8819QAI
+1_2VDIMM
Page 47
APW8819QAI
VDDQ_VTT
Page 47
ISL95855HRTZ
VCore/VCCGT/VCCSA
Page 50-51
NB681GD
+VCCIO
Page 52
TPS51211DSCR
FBVDDQ(GPU)
Page 48
NB671GQ
PEX_VDD(GPU)
Page 48
uP1642PQAG
NVVDD(GPU)
Page 49

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Title: Block Diagram

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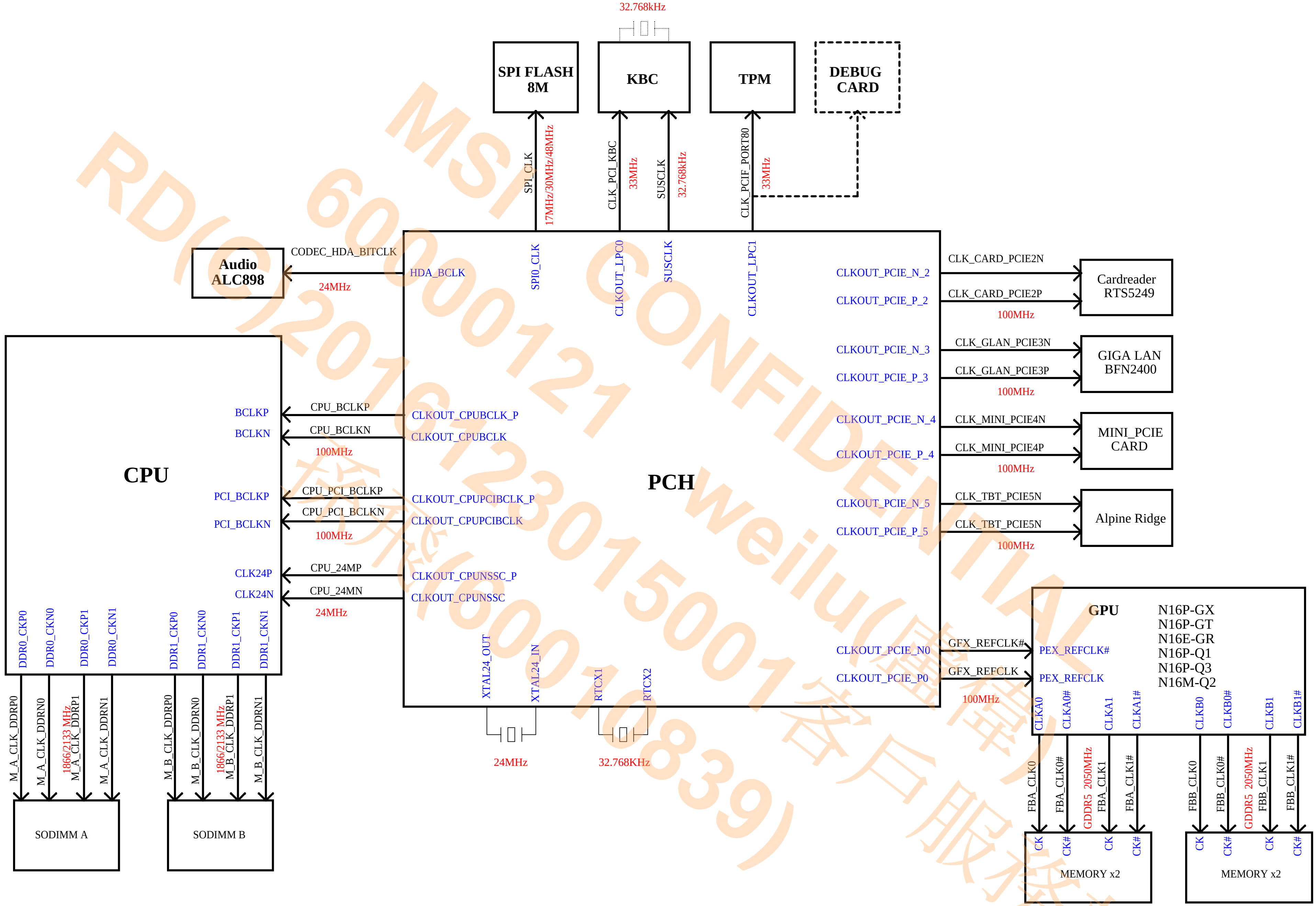
32.768kHz
SPI FLASH 8M
KBC
TPM
DEBUG CARD
SPI_CLK
17MHz/30MHz/48MHz
CLK_PCI_KBC
33MHz
SUSCLK
32.768kHz
CLK_PCIF_PORT80
33MHz
Audio ALC898
CODEC_HDA_BITCLK
24MHz
HDA_BCLK
SPI0_CLK
CLKOUT_LPC0
SUSCLK
CLKOUT_LPC1
PCH
CLKOUT_PCIE_N_2
CLKOUT_PCIE_P_2
CLK_CARD_PCIE2N
CLK_CARD_PCIE2P
100MHz
Cardreader RTS5249
CLKOUT_PCIE_N_3
CLKOUT_PCIE_P_3
CLK_GLAN_PCIE3N
CLK_GLAN_PCIE3P
100MHz
GIGA LAN BFN2400
CLKOUT_PCIE_N_4
CLKOUT_PCIE_P_4
CLK_MINI_PCIE4N
CLK_MINI_PCIE4P
100MHz
MINI_PCIE CARD
CLKOUT_PCIE_N_5
CLKOUT_PCIE_P_5
CLK_TBT_PCIE5N
CLK_TBT_PCIE5N
100MHz
Alpine Ridge
CPU
BCLKP
BCLKN
CPU_BCLKP
CPU_BCLKN
100MHz
CLKOUT_CPUBCLK_P
CLKOUT_CPUBCLK
PCI_BCLKP
PCI_BCLKN
CPU_PCI_BCLKP
CPU_PCI_BCLKN
100MHz
CLKOUT_CPUPCIBCLK_P
CLKOUT_CPUPCIBCLK
CLK24P
CLK24N
CPU_24MP
CPU_24MN
24MHz
CLKOUT_CPUNSSC_P
CLKOUT_CPUNSSC
DDR0_CKP0
DDR0_CKN0
DDR0_CKP1
DDR0_CKN1
DDR1_CKP0
DDR1_CKN0
DDR1_CKP1
DDR1_CKN1
M_A_CLK_DDRP0
M_A_CLK_DDRN0
1866/2133 MHz
M_A_CLK_DDRP1
M_A_CLK_DDRN1
M_B_CLK_DDRP0
M_B_CLK_DDRN0
1866/2133 MHz
M_B_CLK_DDRP1
M_B_CLK_DDRN1
SODIMM A
SODIMM B
XTAL24_OUT
XTAL24_IN
24MHz
RTCX1
RTCX2
32.768KHz
CLKOUT_PCIE_N0
CLKOUT_PCIE_P0
GFX_REFCLK#
GFX_REFCLK
100MHz
GPU
N16P-GX
N16P-GT
N16E-GR
N16P-Q1
N16P-Q3
N16M-Q2
PEX_REFCLK#
PEX_REFCLK
CLKA0
CLKA0#
CLKA1
CLKA1#
CLKB0
CLKB0#
CLKB1
CLKB1#
FBA_CLK0
FBA_CLK0#
GDDR5 2050MHz
FBA_CLK1
FBA_CLK1#
FBB_CLK0
FBB_CLK0#
GDDR5 2050MHz
FBB_CLK1
FBB_CLK1#
CK
CK#
CK
CK#
MEMORY x2
CK
CK#
CK
CK#
MEMORY x2

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Title: CLock Delivery chart

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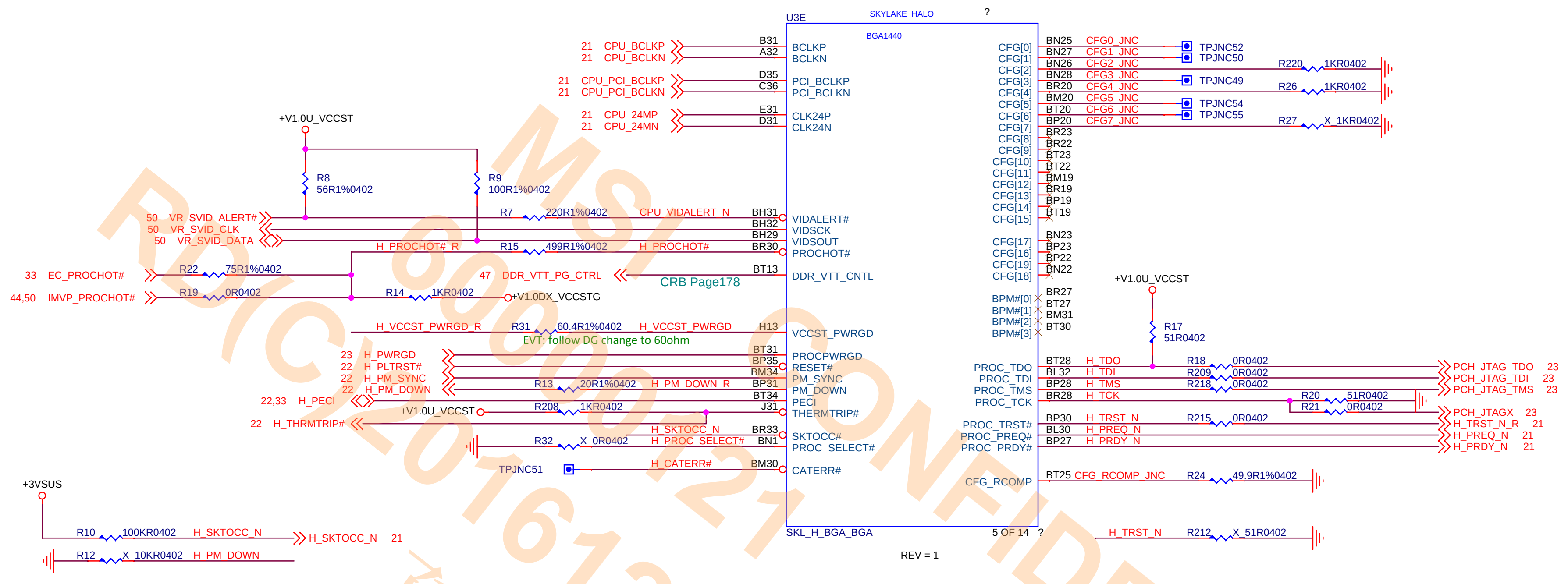
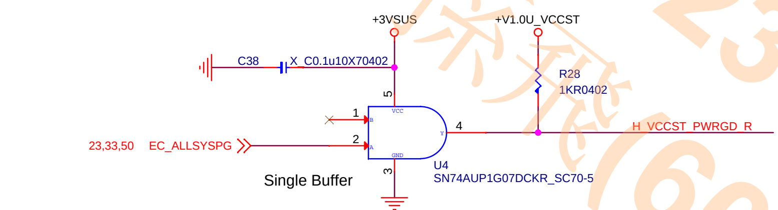

U3E
SKYLAKE_HALO
BGA1440
21 CPU_BCLKP
21 CPU_BCLKN
21 CPU_PCI_BCLKP
21 CPU_PCI_BCLKN
21 CPU_24MP
21 CPU_24MN
BCLKP
BCLKN
PCI_BCLKP
PCI_BCLKN
CLK24P
CLK24N
+V1.0U_VCCST
R8 56R1%0402
R9 100R1%0402
50 VR_SVID_ALERT#
50 VR_SVID_CLK
50 VR_SVID_DATA
R7 220R1%0402 CPU_VIDALERT_N
H_PROCHOT#_R R15 499R1%0402 H_PROCHOT#
VIDALERT#
VIDSCK
VIDSOUT
PROCHOT#
33 EC_PROCHOT# R22 75R1%0402
44,50 IMVP_PROCHOT# R19 0R0402
47 DDR_VTT_PG_CTRL
CRB Page178
DDR_VTT_CNTL
R14 1KR0402 +V1.0DX_VCCSTG
H_VCCST_PWRGD_R R31 60.4R1%0402 H_VCCST_PWRGD
EVT: follow DG change to 60ohm
VCCST_PWRGD
23 H_PWRGD
22 H_PLTRST#
22 H_PM_SYNC
22 H_PM_DOWN
R13 20R1%0402 H_PM_DOWN_R
22,33 H_PECI
+V1.0U_VCCST R208 1KR0402
22 H_THRMTRIP#
H_SKTOCC_N
R32 X_0R0402 H_PROC_SELECT#
TPJNC51 H_CATERR#
PROCPWRGD
RESET#
PM_SYNC
PM_DOWN
PECI
THERMTRIP#
SKTOCC#
PROC_SELECT#
CATERR#
SKL_H_BGA_BGA
5 OF 14
REV = 1
CFG[0] ... CFG[19]
CFG0_JNC TPJNC52
CFG1_JNC TPJNC50
CFG2_JNC R220 1KR0402
CFG3_JNC TPJNC49
CFG4_JNC R26 1KR0402
CFG5_JNC TPJNC54
CFG6_JNC TPJNC55
CFG7_JNC R27 X_1KR0402
BPM#[0] BPM#[1] BPM#[2] BPM#[3]
+V1.0U_VCCST
R17 51R0402
PROC_TDO H_TDO R18 0R0402 PCH_JTAG_TDO 23
PROC_TDI H_TDI R209 0R0402 PCH_JTAG_TDI 23
PROC_TMS H_TMS R218 0R0402 PCH_JTAG_TMS 23
PROC_TCK H_TCK R20 51R0402 R21 0R0402 PCH_JTAGX 23
PROC_TRST# H_TRST_N R215 0R0402 H_TRST_N_R 21
PROC_PREQ# H_PREQ_N H_PREQ_N 21
PROC_PRDY# H_PRDY_N H_PRDY_N 21
CFG_RCOMP CFG_RCOMP_JNC R24 49.9R1%0402
H_TRST_N R212 X_51R0402
+3VSUS
R10 100KR0402 H_SKTOCC_N H_SKTOCC_N 21
R12 X_10KR0402 H_PM_DOWN



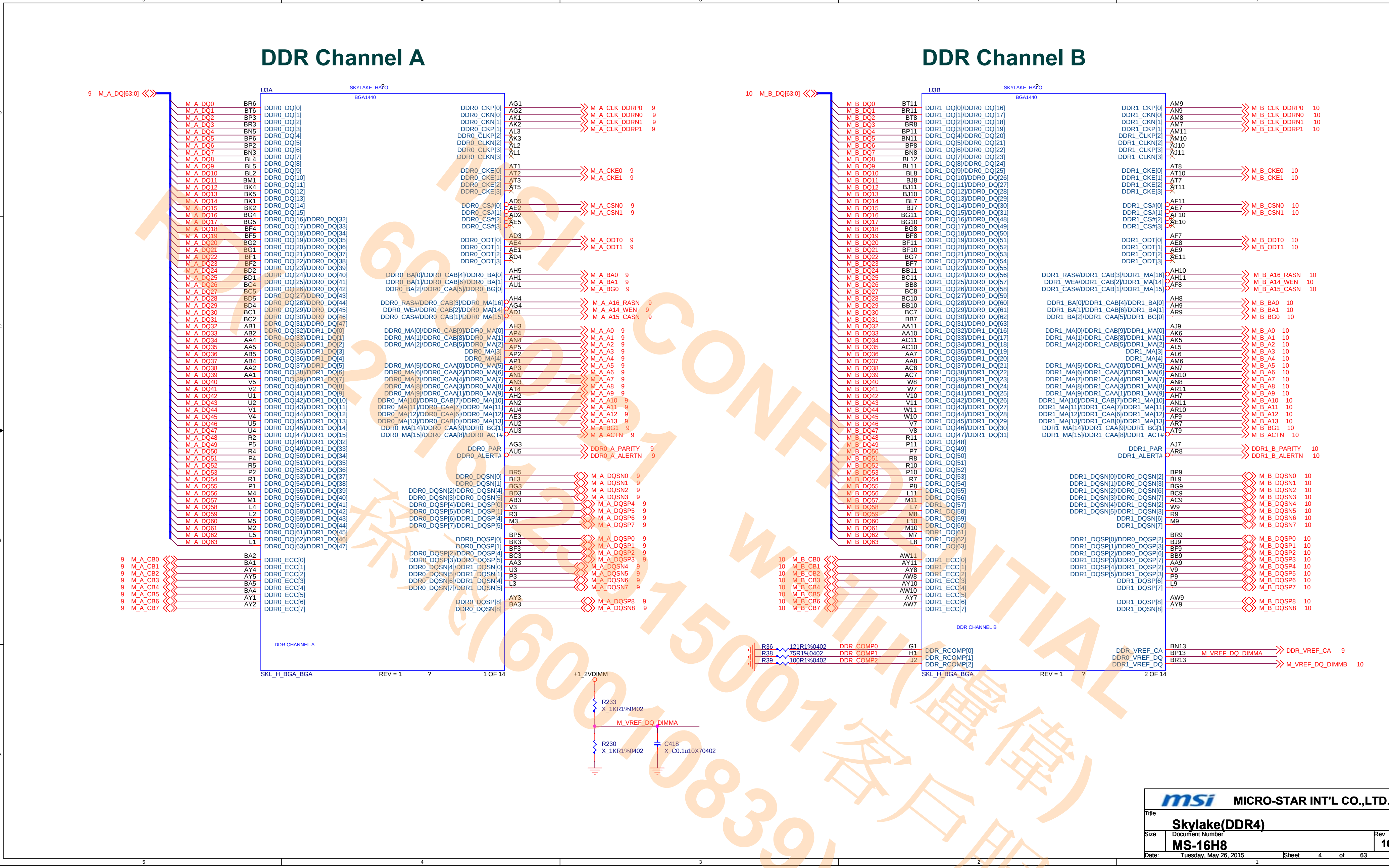
EVT: Add circuit for VCCST_PWRGD power sequence

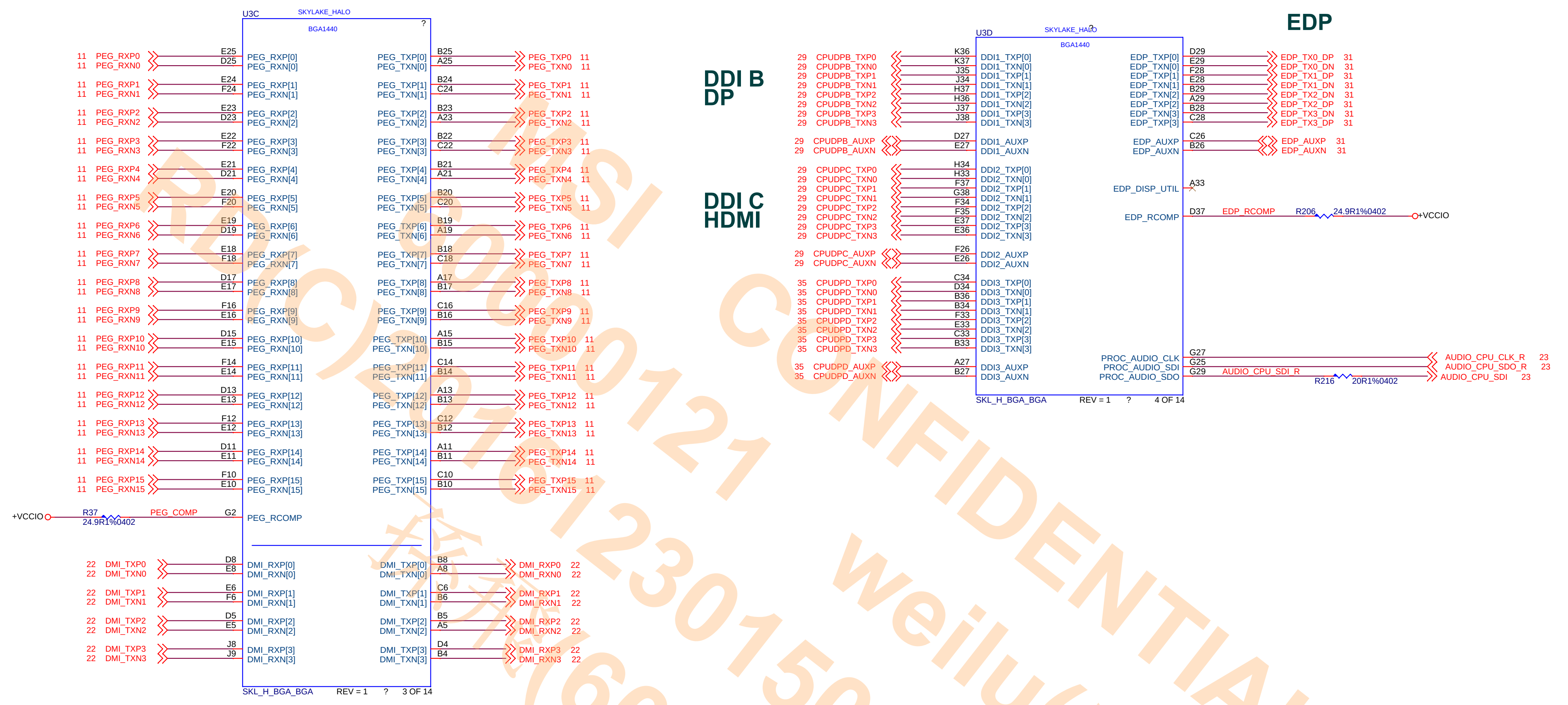
PCI Express* Static x16 Lane Numbering Reversal	
CFG2	1 = Normal operation 0 = Lane numbers reserved

Display Port Presence strap	
CFG4	1:Disabled - No Physical Display Port attached to Embedded DisplayPort*. No connect for disable. 0:Enabled - A Display Port device is connected to the Embedded Display Port. Pull-down to GND through a 1 K¦¸ ¡À5% resistor to enable port

PCI Express* Bifurcation	
CFG[6:5]	00 = 1x8, 2x4 PCI Express* 01 = reserved 10 = 2x8 PCI Express* 11 = 1x16 PCI Express* Recommend 1K ¦¸ ¡À5% pull-down resistor to GND.

PEG Training	
CFG7	1 = (default) PEG train immediately following RESET# de assertion. 0 = PEG wait BIOS for training.




U3C
SKYLAKE_HALO
BGA1440
PEG_RXP[0] … PEG_RXP[15]
PEG_RXN[0] … PEG_RXN[15]
PEG_TXP[0] … PEG_TXP[15]
PEG_TXN[0] … PEG_TXN[15]
PEG_RCOMP
+VCCIO
R37
24.9R1%0402
PEG_COMP
DMI_RXP[0] … DMI_RXP[3]
DMI_RXN[0] … DMI_RXN[3]
DMI_TXP[0] … DMI_TXP[3]
DMI_TXN[0] … DMI_TXN[3]
SKL_H_BGA_BGA
REV = 1
3 OF 14
DDI B
DP
DDI C
HDMI
EDP
U3D
SKYLAKE_HALO
BGA1440
DDI1_TXP[0] … DDI1_TXP[3]
DDI1_TXN[0] … DDI1_TXN[3]
DDI1_AUXP
DDI1_AUXN
DDI2_TXP[0] … DDI2_TXP[3]
DDI2_TXN[0] … DDI2_TXN[3]
DDI2_AUXP
DDI2_AUXN
DDI3_TXP[0] … DDI3_TXP[3]
DDI3_TXN[0] … DDI3_TXN[3]
DDI3_AUXP
DDI3_AUXN
CPUDPB_TXP0 … CPUDPB_TXN3
CPUDPB_AUXP
CPUDPB_AUXN
CPUDPC_TXP0 … CPUDPC_TXN3
CPUDPC_AUXP
CPUDPC_AUXN
CPUDPD_TXP0 … CPUDPD_TXN3
CPUDPD_AUXP
CPUDPD_AUXN
EDP_TXP[0] … EDP_TXP[3]
EDP_TXN[0] … EDP_TXN[3]
EDP_AUXP
EDP_AUXN
EDP_DISP_UTIL
EDP_RCOMP
EDP_TX0_DP
EDP_TX0_DN
EDP_TX1_DP
EDP_TX1_DN
EDP_TX2_DP
EDP_TX2_DN
EDP_TX3_DP
EDP_TX3_DN
R206
24.9R1%0402
+VCCIO
PROC_AUDIO_CLK
PROC_AUDIO_SDI
PROC_AUDIO_SDO
AUDIO_CPU_CLK_R
AUDIO_CPU_SDO_R
AUDIO_CPU_SDI_R
AUDIO_CPU_SDI
R216
20R1%0402
SKL_H_BGA_BGA
REV = 1
4 OF 14

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Title: **Skylake(DMI/Display)**

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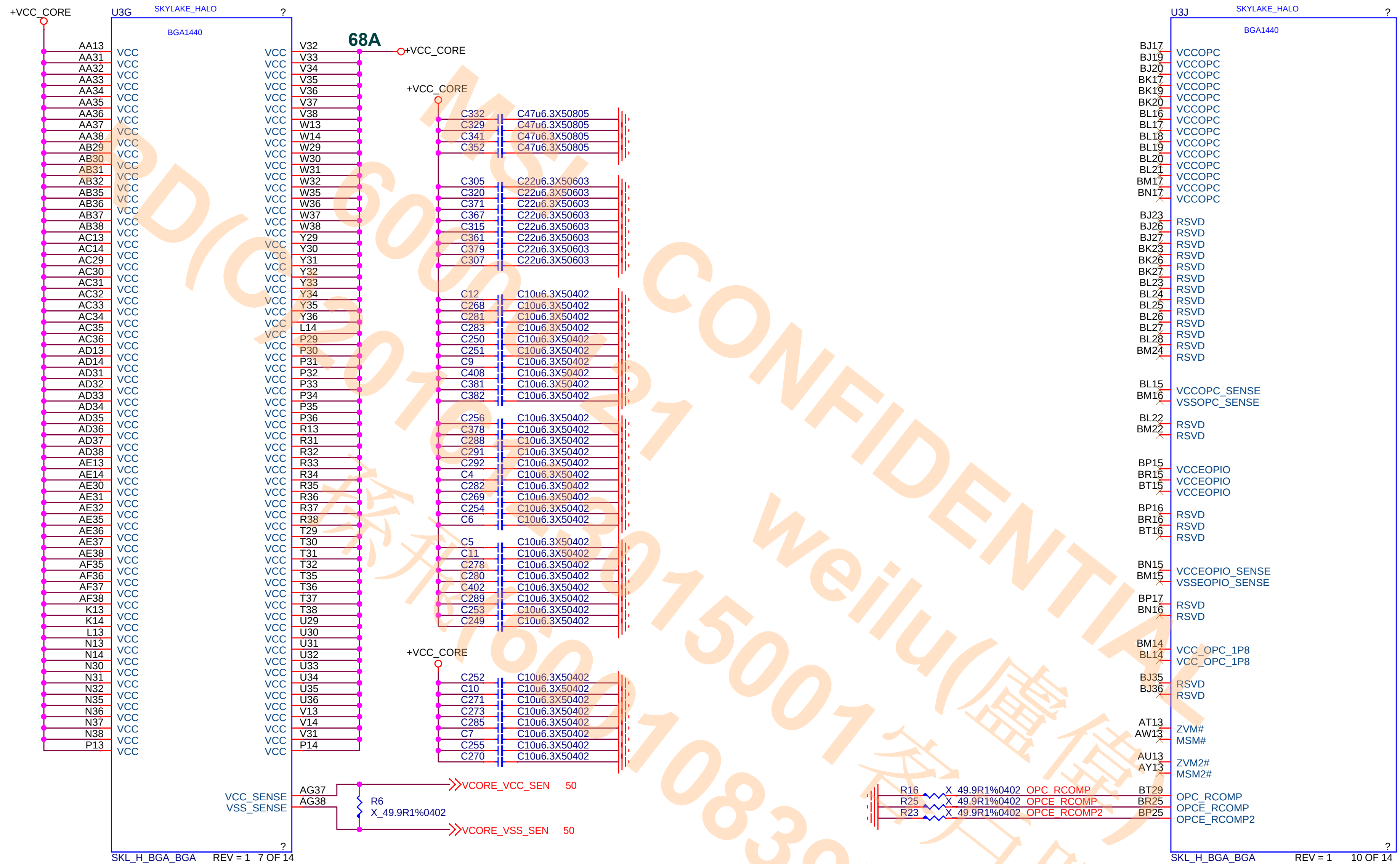
+VCC_CORE
U3G
SKYLAKE_HALO
BGA1440
?
AA13 AA31 AA32 AA33 AA34 AA35 AA36 AA37 AA38 AB29 AB30 AB31 AB32 AB35 AB36 AB37 AB38 AC13 AC14 AC29 AC30 AC31 AC32 AC33 AC34 AC35 AC36 AD13 AD14 AD31 AD32 AD33 AD34 AD35 AD36 AD37 AD38 AE13 AE14 AE30 AE31 AE32 AE35 AE36 AE37 AE38 AF35 AF36 AF37 AF38 K13 K14 L13 N13 N14 N30 N31 N32 N35 N36 N37 N38 P13
VCC
V32 V33 V34 V35 V36 V37 V38 W13 W14 W29 W30 W31 W32 W35 W36 W37 W38 Y29 Y30 Y31 Y32 Y33 Y34 Y35 Y36 L14 P29 P30 P31 P32 P33 P34 P35 P36 R13 R31 R32 R33 R34 R35 R36 R37 R38 T29 T30 T31 T32 T35 T36 T37 T38 U29 U30 U31 U32 U33 U34 U35 U36 V13 V14 V31 P14
68A
+VCC_CORE
C332 C329 C341 C352 C47u6.3X50805
C305 C320 C371 C367 C315 C361 C379 C307 C22u6.3X50603
C12 C268 C281 C283 C250 C251 C9 C408 C381 C382 C10u6.3X50402
C256 C378 C288 C291 C292 C4 C282 C269 C254 C6 C10u6.3X50402
C5 C11 C278 C280 C402 C289 C253 C249 C10u6.3X50402
C252 C10 C271 C273 C285 C7 C255 C270 C10u6.3X50402
VCC_SENSE AG37
VSS_SENSE AG38
R6
X_49.9R1%0402
VCORE_VCC_SEN 50
VCORE_VSS_SEN 50
SKL_H_BGA_BGA REV = 1 7 OF 14
U3J
SKYLAKE_HALO
BGA1440
BJ17 BJ19 BJ20 BK17 BK19 BK20 BL16 BL17 BL18 BL19 BL20 BL21 BM17 BN17 VCCOPC
BJ23 BJ26 BJ27 BK23 BK26 BK27 BL23 BL24 BL25 BL26 BL27 BL28 BM24 RSVD
BL15 VCCOPC_SENSE
BM16 VSSOPC_SENSE
BL22 BM22 RSVD
BP15 BR15 BT15 VCCEOPIO
BP16 BR16 BT16 RSVD
BN15 VCCEOPIO_SENSE
BM15 VSSEOPIO_SENSE
BP17 BN16 RSVD
BM14 BL14 VCC_OPC_1P8
BJ35 BJ36 RSVD
AT13 ZVM#
AW13 MSM#
AU13 ZVM2#
AY13 MSM2#
R16 X_49.9R1%0402 OPC_RCOMP BT29 OPC_RCOMP
R25 X_49.9R1%0402 OPCE_RCOMP BR25 OPCE_RCOMP
R23 X_49.9R1%0402 OPCE_RCOMP2 BP25 OPCE_RCOMP2
SKL_H_BGA_BGA REV = 1 10 OF 14

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Title	Skylake(Power1)	
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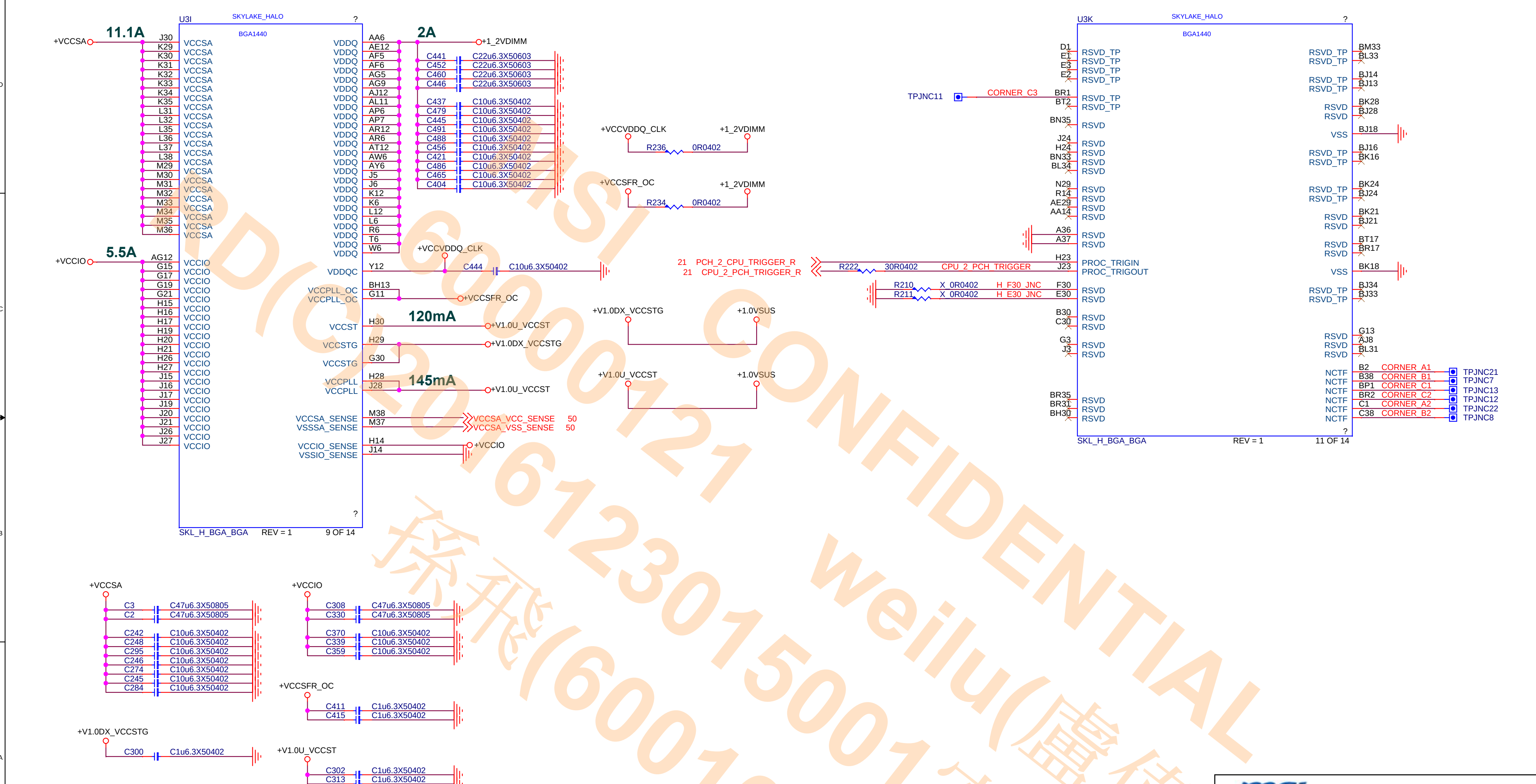
U3I
SKYLAKE_HALO
BGA1440
+VCCSA
11.1A
J30 K29 K30 K31 K32 K33 K34 K35 L31 L32 L35 L36 L37 L38 M29 M30 M31 M32 M33 M34 M35 M36
VCCSA
+VCCIO
5.5A
AG12 G15 G17 G19 G21 H15 H16 H17 H19 H20 H21 H26 H27 J15 J16 J17 J19 J20 J21 J26 J27
VCCIO
VDDQ
AA6 AE12 AF5 AF6 AG5 AG9 AJ12 AL11 AP6 AP7 AR12 AR6 AT12 AW6 AY6 J5 J6 K12 K6 L12 L6 R6 T6 W6
2A
+1_2VDIMM
C441 C452 C460 C446 C22u6.3X50603
C437 C479 C445 C491 C488 C456 C421 C486 C465 C404 C10u6.3X50402
VDDQC Y12 +VCCVDDQ_CLK C444 C10u6.3X50402
VCCPLL_OC BH13 G11 +VCCSFR_OC
120mA
VCCST H30 +V1.0U_VCCST
VCCSTG H29 G30 +V1.0DX_VCCSTG
145mA
VCCPLL H28 J28 +V1.0U_VCCST
VCCSA_SENSE M38 VCCSA_VCC_SENSE 50
VSSSA_SENSE M37 VCCSA_VSS_SENSE 50
VCCIO_SENSE H14 +VCCIO
VSSIO_SENSE J14
SKL_H_BGA_BGA REV = 1 9 OF 14
+VCCVDDQ_CLK R236 0R0402 +1_2VDIMM
+VCCSFR_OC R234 0R0402 +1_2VDIMM
+V1.0DX_VCCSTG +1.0VSUS
+V1.0U_VCCST +1.0VSUS
U3K
SKYLAKE_HALO
BGA1440
D1 E1 E3 E2 RSVD_TP
TPJNC11 CORNER_C3 BR1 BT2 RSVD_TP
BN35 J24 H24 BN33 BL34 N29 R14 AE29 AA14 A36 A37 RSVD
21 PCH_2_CPU_TRIGGER_R H23 PROC_TRIGIN
21 CPU_2_PCH_TRIGGER_R R222 30R0402 CPU_2_PCH_TRIGGER J23 PROC_TRIGOUT
R210 X_0R0402 H_F30_JNC F30
R211 X_0R0402 H_E30_JNC E30
B30 C30 G3 J3 BR35 BR31 BH30 RSVD
BM33 BL33 BJ14 BJ13 RSVD_TP
BK28 BJ28 RSVD
BJ18 VSS
BJ16 BK16 BK24 BJ24 RSVD_TP
BK21 BJ21 BT17 BR17 RSVD
BK18 VSS
BJ34 BJ33 RSVD_TP
G13 AJ8 BL31 RSVD
NCTF B2 CORNER_A1 TPJNC21
NCTF B38 CORNER_B1 TPJNC7
NCTF BP1 CORNER_C1 TPJNC13
NCTF BR2 CORNER_C2 TPJNC12
NCTF C1 CORNER_A2 TPJNC22
NCTF C38 CORNER_B2 TPJNC8
SKL_H_BGA_BGA REV = 1 11 OF 14
+VCCSA C3 C2 C47u6.3X50805
C242 C248 C295 C246 C274 C245 C284 C10u6.3X50402
+VCCIO C308 C330 C47u6.3X50805
C370 C339 C359 C10u6.3X50402
+VCCSFR_OC C411 C415 C1u6.3X50402
+V1.0DX_VCCSTG C300 C1u6.3X50402
+V1.0U_VCCST C302 C313 C1u6.3X50402

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Title: Skylake(Power2)

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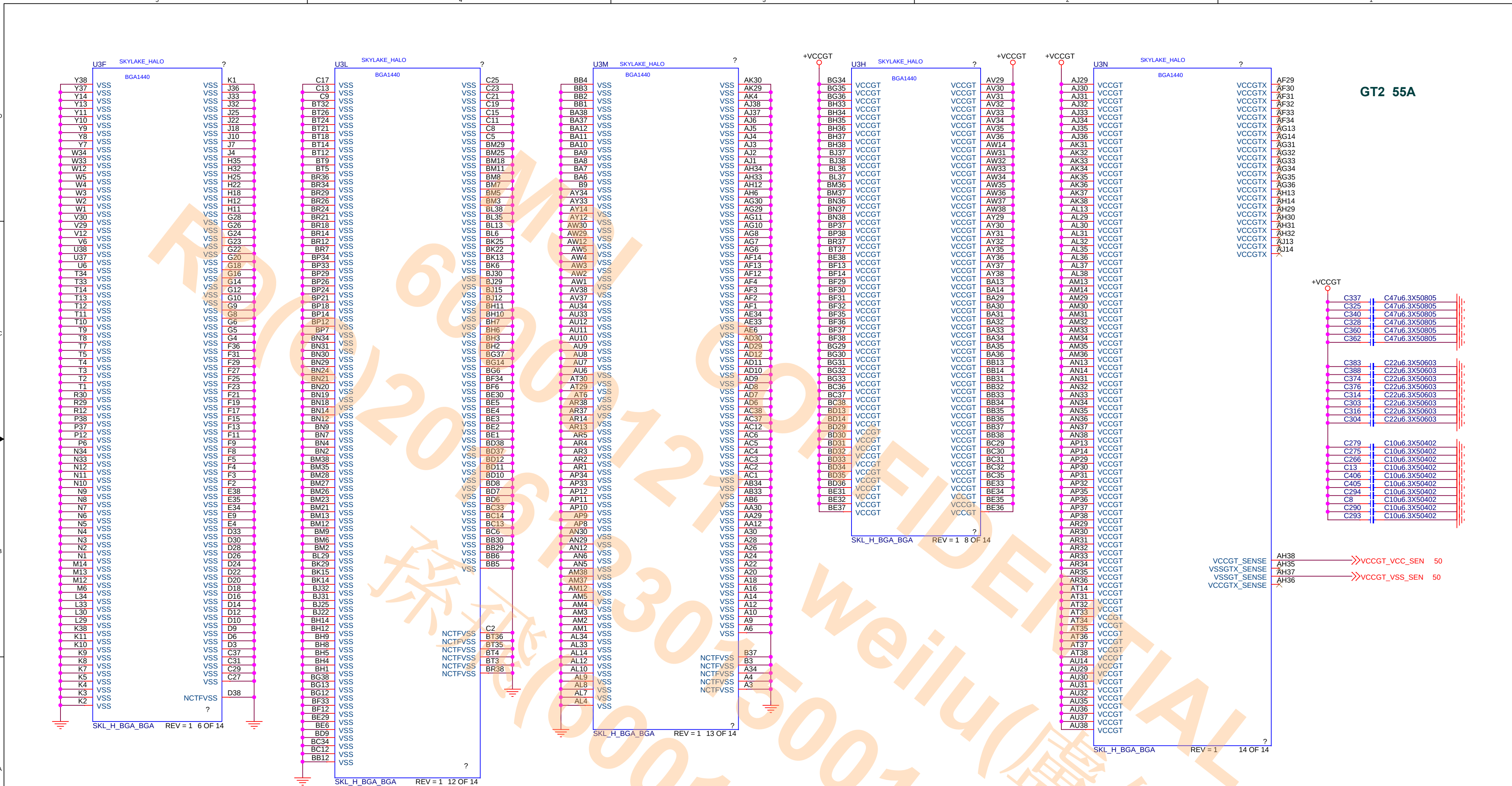
U3F SKYLAKE_HALO BGA1440
VSS
NCTFVSS
SKL_H_BGA_BGA REV = 1 6 OF 14
U3L SKYLAKE_HALO BGA1440
VSS
NCTFVSS
SKL_H_BGA_BGA REV = 1 12 OF 14
U3M SKYLAKE_HALO BGA1440
VSS
NCTFVSS
SKL_H_BGA_BGA REV = 1 13 OF 14
+VCCGT
U3H SKYLAKE_HALO BGA1440
VCCGT
SKL_H_BGA_BGA REV = 1 8 OF 14
U3N SKYLAKE_HALO BGA1440
VCCGT
VCCGTX
VCCGT_SENSE
VSSGTX_SENSE
VSSGT_SENSE
VCCGTX_SENSE
VCCGT_VCC_SEN 50
VCCGT_VSS_SEN 50
SKL_H_BGA_BGA REV = 1 14 OF 14
GT2 55A
C337 C47u6.3X50805
C325 C47u6.3X50805
C340 C47u6.3X50805
C328 C47u6.3X50805
C360 C47u6.3X50805
C362 C47u6.3X50805
C383 C22u6.3X50603
C388 C22u6.3X50603
C374 C22u6.3X50603
C376 C22u6.3X50603
C314 C22u6.3X50603
C303 C22u6.3X50603
C316 C22u6.3X50603
C304 C22u6.3X50603
C279 C10u6.3X50402
C275 C10u6.3X50402
C266 C10u6.3X50402
C13 C10u6.3X50402
C406 C10u6.3X50402
C405 C10u6.3X50402
C294 C10u6.3X50402
C8 C10u6.3X50402
C290 C10u6.3X50402
C293 C10u6.3X50402

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Title	Skylake(Power3)	
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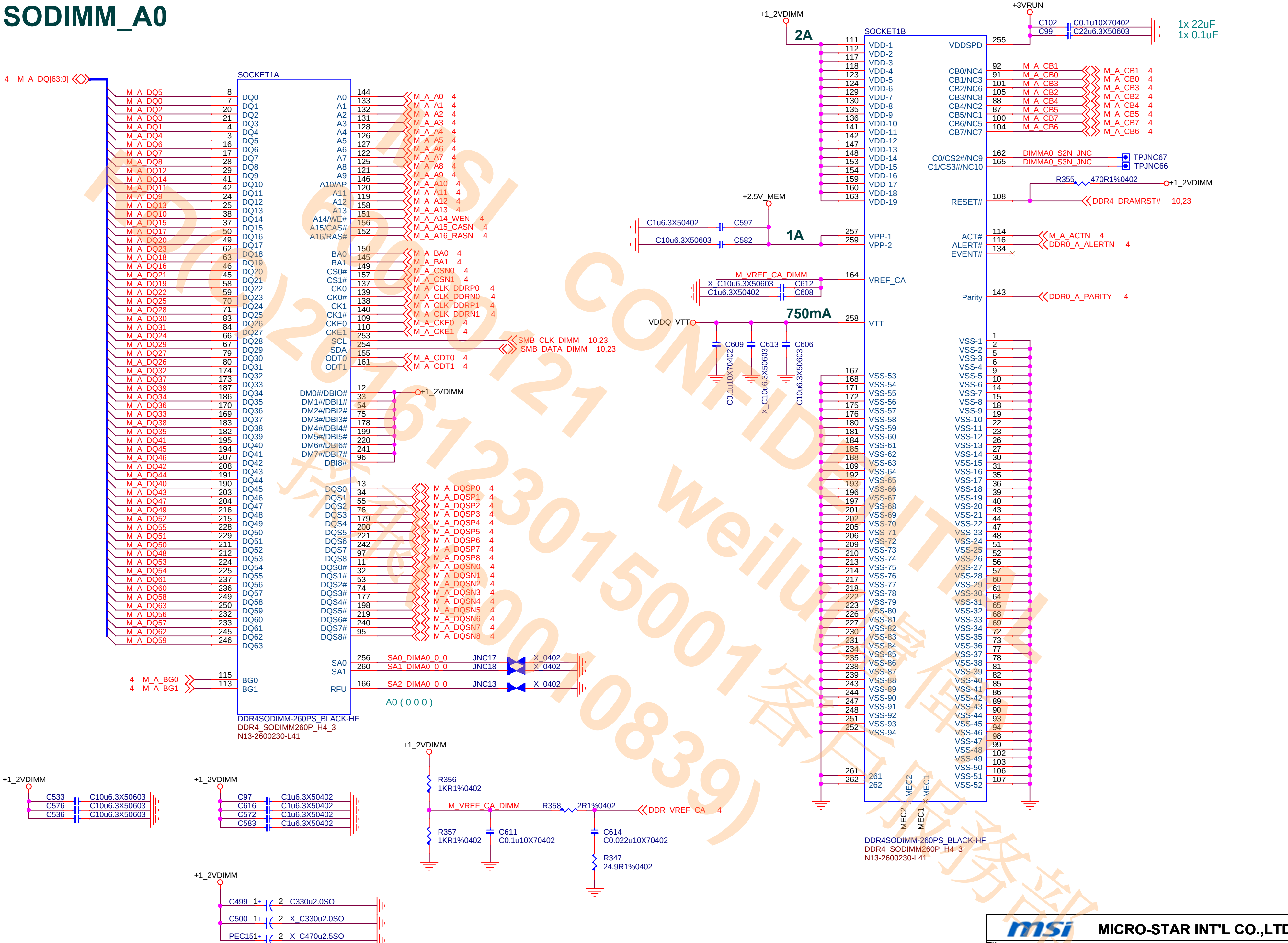
SOCKET1A
SOCKET1B
4 M_A_DQ[63:0]
DDR4SODIMM-260PS_BLACK-HF
DDR4_SODIMM260P_H4_3
N13-2600230-L41
+1_2VDIMM
+3VRUN
+2.5V_MEM
2A
1A
750mA
1x 22uF
1x 0.1uF
VDDSPD
VREF_CA
VTT
VPP-1
VPP-2
RESET#
ACT#
ALERT#
EVENT#
Parity
M_A_ACTN
DDR0_A_ALERTN
DDR0_A_PARITY
DDR4_DRAMRST#
DIMMA0_S2N_JNC
DIMMA0_S3N_JNC
TPJNC67
TPJNC66
M_VREF_CA_DIMM
DDR_VREF_CA
VDDQ_VTT
SMB_CLK_DIMM
SMB_DATA_DIMM
SA0_DIMA0_0_0
SA1_DIMA0_0_0
SA2_DIMA0_0_0
A0 (0 0 0)
M_A_BG0
M_A_BG1
R355 470R1%0402
R356 1KR1%0402
R357 1KR1%0402
R358 2R1%0402
R347 24.9R1%0402
C611 C0.1u10X70402
C614 C0.022u10X70402
C102 C0.1u10X70402
C99 C22u6.3X50603
C597 C1u6.3X50402
C582 C10u6.3X50603
C612 X_C10u6.3X50603
C608 C1u6.3X50402
C609 C0.1u10X70402
C613 X_C10u6.3X50603
C606 C10u6.3X50603
C533 C10u6.3X50603
C576 C10u6.3X50603
C536 C10u6.3X50603
C97 C1u6.3X50402
C616 C1u6.3X50402
C572 C1u6.3X50402
C583 C1u6.3X50402
C499 C330u2.0SO
C500 X_C330u2.0SO
PEC151 X_C470u2.5SO
MEC1
MEC2

MICRO-STAR INT'L CO.,LTD.

Title: DDR4_SODIMM_A

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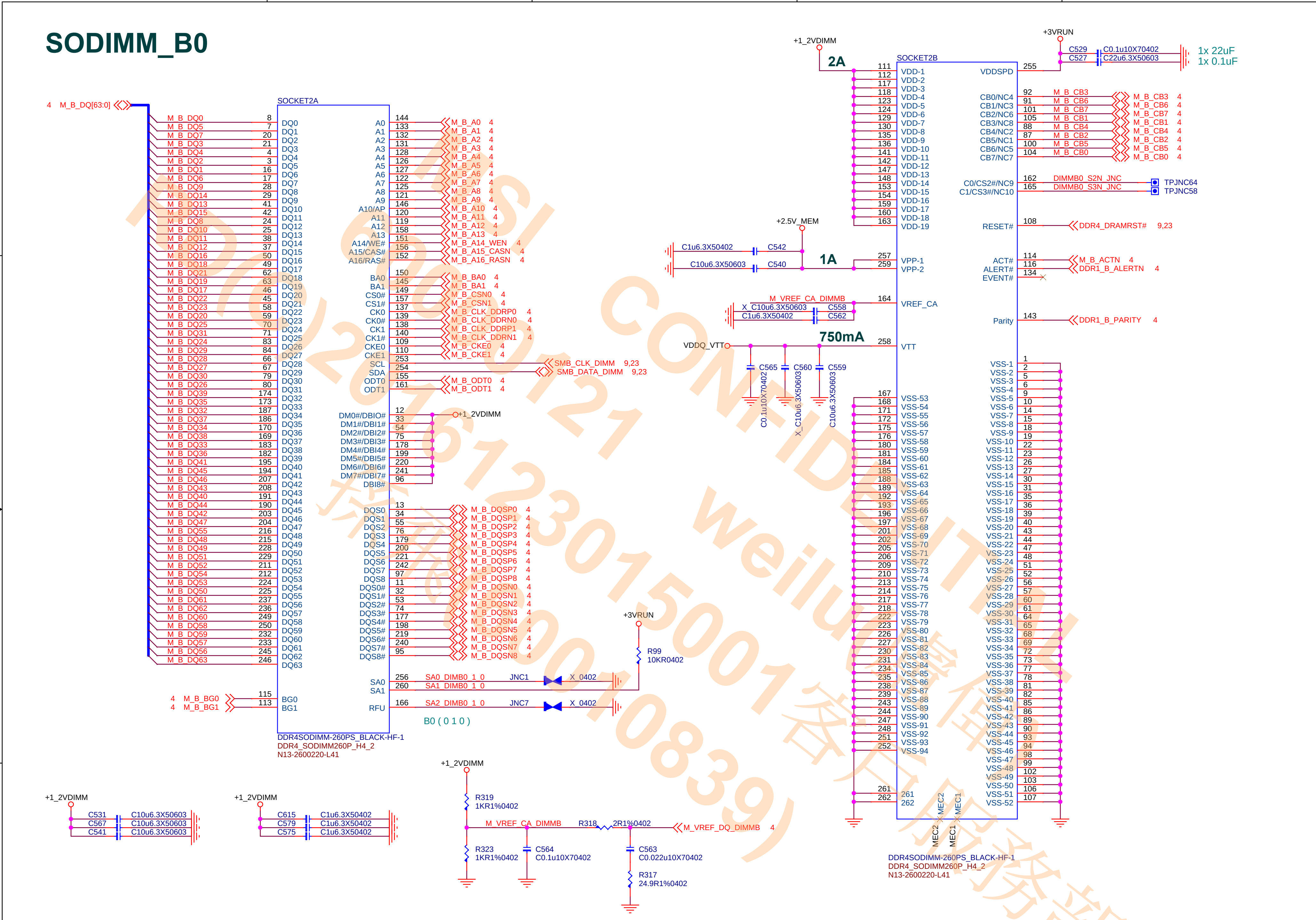
SODIMM_B0



SOCKET2A
M_B_DQ[63:0]
DQ0 … DQ63
A0 … A13
A10/AP
A14/WE#
A15/CAS#
A16/RAS#
BA0
BA1
CS0#
CS1#
CK0
CK0#
CK1
CK1#
CKE0
CKE1
SCL
SDA
ODT0
ODT1
DM0#/DBI0# … DM7#/DBI7#
DBI8#
DQS0 … DQS8
DQS0# … DQS8#
SA0
SA1
RFU
BG0
BG1
M_B_BG0
M_B_BG1
SMB_CLK_DIMM 9,23
SMB_DATA_DIMM 9,23
SA0_DIMB0_1_0
SA1_DIMB0_1_0
SA2_DIMB0_1_0
JNC1
JNC7
X_0402
B0 (0 1 0)
+3VRUN
R99
10KR0402
DDR4SODIMM-260PS_BLACK-HF-1
DDR4_SODIMM260P_H4_2
N13-2600220-L41
SOCKET2B
+1_2VDIMM
2A
VDD-1 … VDD-19
+2.5V_MEM
1A
VPP-1
VPP-2
C1u6.3X50402
C542
C10u6.3X50603
C540
M_VREF_CA_DIMMB
VREF_CA
X_C10u6.3X50603
C558
C1u6.3X50402
C562
750mA
VDDQ_VTT
VTT
C565
C560
C559
C0.1u10X70402
X_C1u6.3X50603
C10u6.3X50603
VDDSPD
C529
C0.1u10X70402
C527
C22u6.3X50603
1x 22uF
1x 0.1uF
CB0/NC4 … CB7/NC7
M_B_CB0 … M_B_CB7
C0/CS2#/NC9
C1/CS3#/NC10
DIMMB0_S2N_JNC
DIMMB0_S3N_JNC
TPJNC64
TPJNC58
RESET#
DDR4_DRAMRST# 9,23
ACT#
ALERT#
EVENT#
M_B_ACTN 4
DDR1_B_ALERTN 4
Parity
DDR1_B_PARITY 4
VSS-1 … VSS-94
MEC2
MEC1
C531
C567
C541
C10u6.3X50603
C615
C579
C575
C1u6.3X50402
R319
1KR1%0402
M_VREF_CA_DIMMB
R318
2R1%0402
M_VREF_DQ_DIMMB 4
R323
1KR1%0402
C564
C0.1u10X70402
C563
C0.022u10X70402
R317
24.9R1%0402

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Title	DDR4_SODIMM_B	
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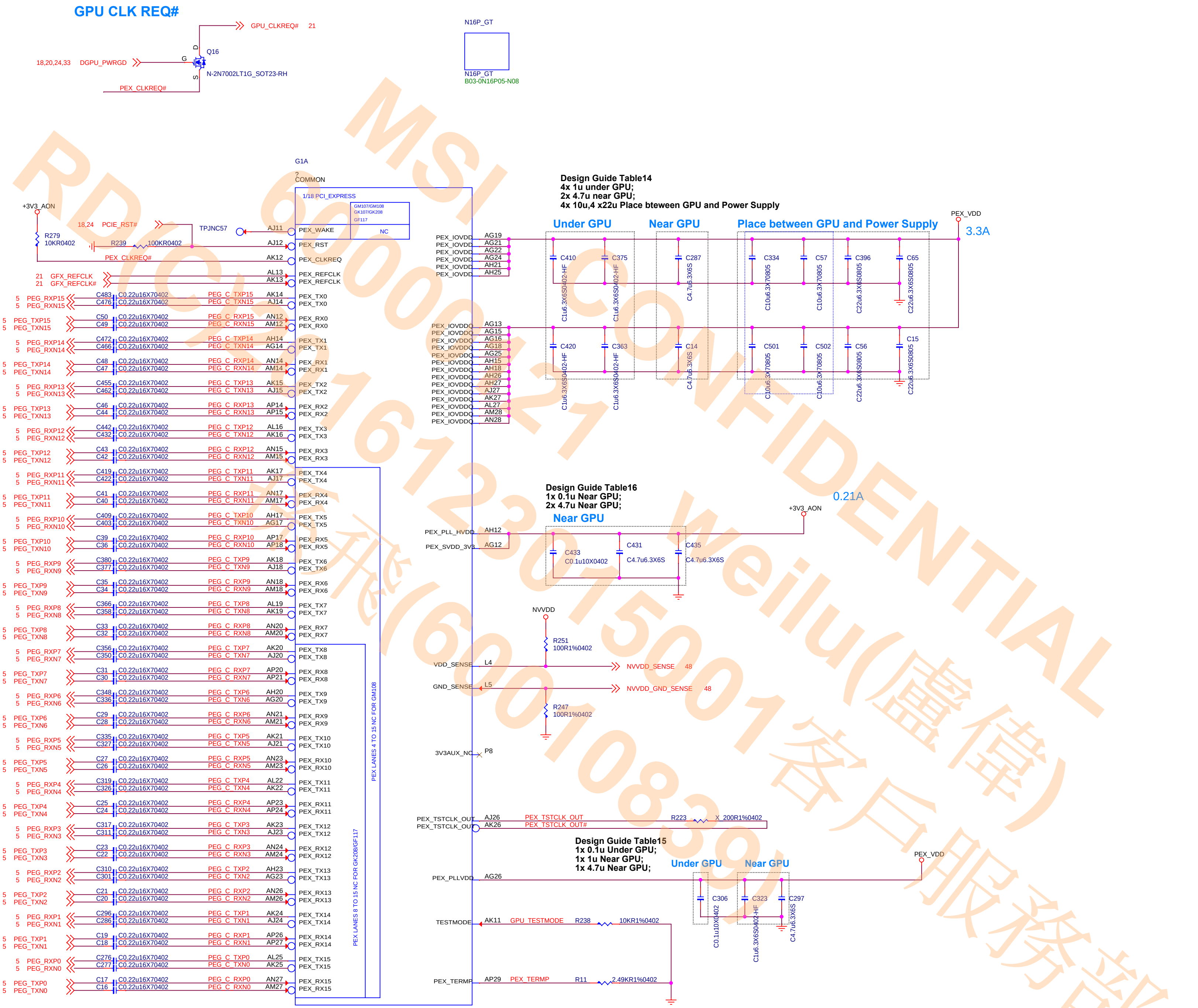
N16P-GX (PCI-Express Gen3 x16 Interface)


GPU CLK REQ#
GPU_CLKREQ# 21
18,20,24,33 DGPU_PWRGD
Q16
N-2N7002LT1G_SOT23-RH
PEX_CLKREQ#
N16P_GT
B03-0N16P05-N08
G1A
COMMON
1/18 PCI_EXPRESS
+3V3_AON
R279
10KR0402
18,24 PCIE_RST#
TPJNC57
R239
100KR0402
21 GFX_REFCLK
21 GFX_REFCLK#
PEX_WAKE
PEX_RST
PEX_CLKREQ
PEX_REFCLK
PEX LANES 4 TO 15 NC FOR GM108
PEX LANES 8 TO 15 NC FOR GK208/GF117
Design Guide Table14
4x 1u under GPU;
2x 4.7u near GPU;
4x 10u,4 x22u Place bteween GPU and Power Supply
Under GPU
Near GPU
Place between GPU and Power Supply
PEX_VDD
3.3A
Design Guide Table16
1x 0.1u Near GPU;
2x 4.7u Near GPU;
Near GPU
0.21A
PEX_PLL_HVDD
PEX_SVDD_3V3
NVVDD
R251
100R1%0402
VDD_SENSE
NVVDD_SENSE 48
GND_SENSE
NVVDD_GND_SENSE 48
R247
100R1%0402
3V3AUX_NC
PEX_TSTCLK_OUT
PEX_TSTCLK_OUT#
R223
200R1%0402
Design Guide Table15
1x 0.1u Under GPU;
1x 1u Near GPU;
1x 4.7u Near GPU;
Under GPU
Near GPU
PEX_PLLVDD
TESTMODE
GPU_TESTMODE
R238
10KR1%0402
PEX_TERMP
R11
2.49KR1%0402

MICRO-STAR INT'L CO.,LTD.		
Title	N16P-GX_PCI-E Host	
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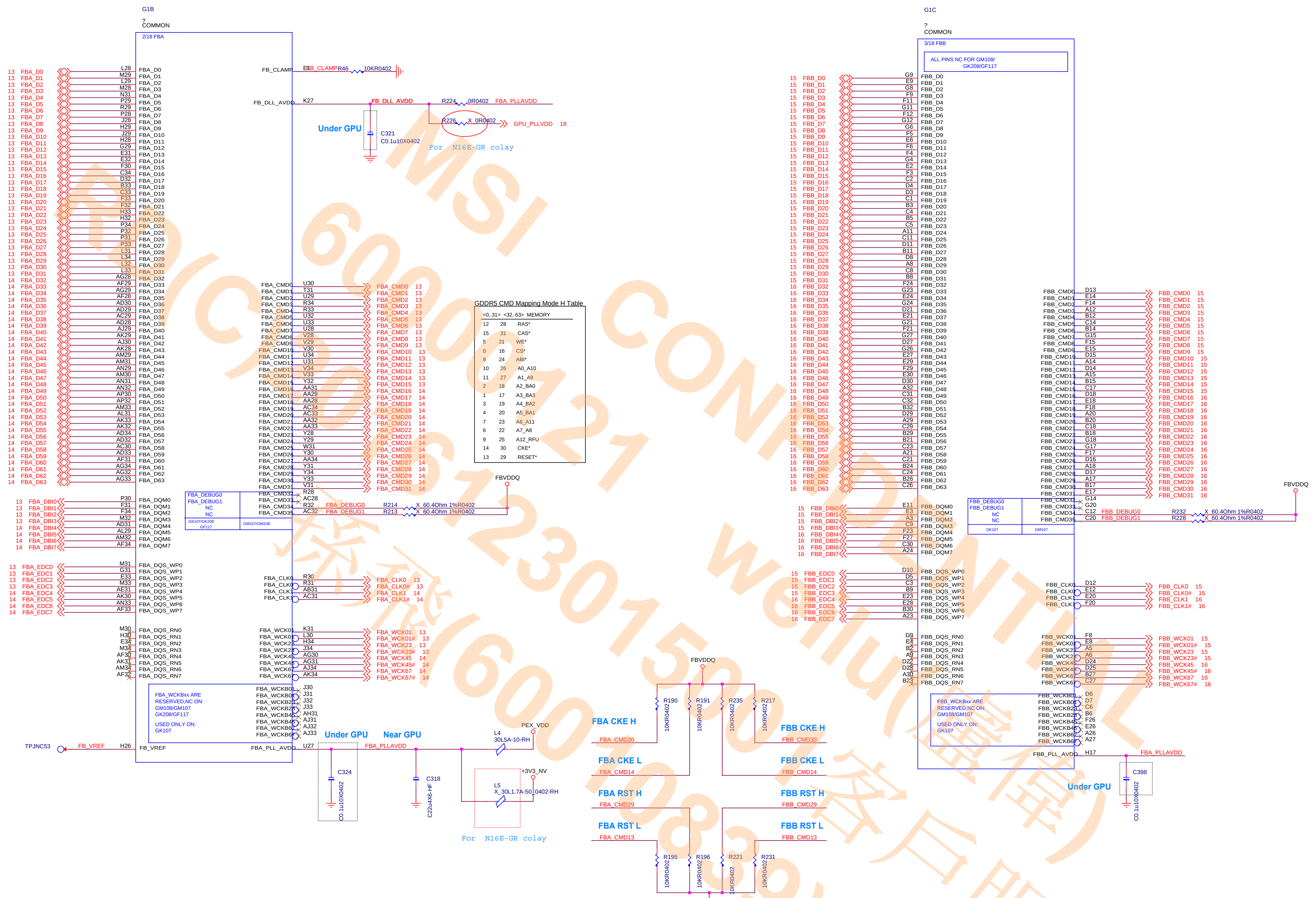
N16P-GX (Frame Buffer Interface)


G1B
COMMON
2/18 FBA
FB_CLAMP
FB_DLL_AVDD
FB_DLL_AVDD
R224 0R0402 FBA_PLLAVDD
R226 X_0R0402 GPU_PLLVDD 18
Under GPU
C321 C0.1u10X0402
For N16E-GR colay
GDDR5 CMD Mapping Mode H Table
FBA_DEBUG0
FBA_DEBUG1
FBVDDQ
FBA_WCKBxx ARE RESERVED,NC ON: GM108/GM107 GK208/GF117
USED ONLY ON: GK107
TPJNC53 FB_VREF
FBA_PLL_AVDD
Under GPU
Near GPU
PEX_VDD
L4 30L5A-10-RH
C324
C318
+3V3_NV
L5 X_30L1.7A-50_0402-RH
For N16E-GR colay
FBVDDQ
R190 R191 R235 R217
R195 R196 R221 R231
FBA CKE H
FBA CKE L
FBA RST H
FBA RST L
FBB CKE H
FBB CKE L
FBB RST H
FBB RST L
G1C
COMMON
3/18 FBB
ALL PINS NC FOR GM108/ GK208/GF117
FBB_DEBUG0
FBB_DEBUG1
R232 X_60.4Ohm 1%R0402
R228 X_60.4Ohm 1%R0402
FBB_WCKBxx ARE RESERVED,NC ON: GM108/GM107
USED ONLY ON: GK107
FBB_PLL_AVDD
FBA_PLLAVDD
Under GPU
C398

MICRO-STAR INT'L CO.,LTD.

Title	N16P-GX_MEM IF A/B	
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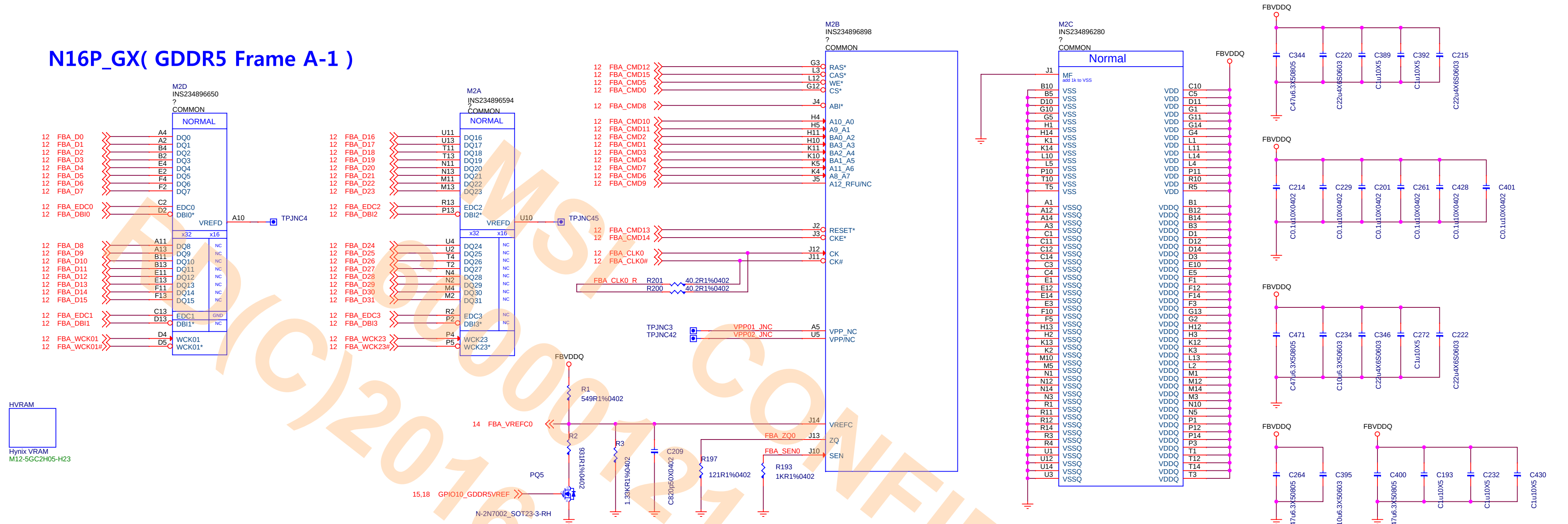
N16P_GX(GDDR5 Frame A-1)



M2D
INS234896650
COMMON
NORMAL
FBA_D0
FBA_D1
FBA_D2
FBA_D3
FBA_D4
FBA_D5
FBA_D6
FBA_D7
FBA_EDC0
FBA_DBI0
VREFD
TPJNC4
FBA_D8
FBA_D9
FBA_D10
FBA_D11
FBA_D12
FBA_D13
FBA_D14
FBA_D15
FBA_EDC1
FBA_DBI1
FBA_WCK01
FBA_WCK01#
M2A
INS234896594
COMMON
NORMAL
FBA_D16
FBA_D17
FBA_D18
FBA_D19
FBA_D20
FBA_D21
FBA_D22
FBA_D23
FBA_EDC2
FBA_DBI2
TPJNC45
FBA_D24
FBA_D25
FBA_D26
FBA_D27
FBA_D28
FBA_D29
FBA_D30
FBA_D31
FBA_EDC3
FBA_DBI3
FBA_WCK23
FBA_WCK23#
M2B
INS234896898
COMMON
FBA_CMD12
FBA_CMD15
FBA_CMD5
FBA_CMD0
FBA_CMD8
FBA_CMD10
FBA_CMD11
FBA_CMD2
FBA_CMD3
FBA_CMD1
FBA_CMD4
FBA_CMD7
FBA_CMD6
FBA_CMD9
FBA_CMD13
FBA_CMD14
FBA_CLK0
FBA_CLK0#
FBA_CLK0_R
R201 40.2R1%0402
R200 40.2R1%0402
TPJNC3
TPJNC42
VPP01_JNC
VPP02_JNC
RAS*
CAS*
WE*
CS*
ABI*
RESET*
CKE*
CK
CK#
VPP_NC
VPP/NC
VREFC
ZQ
SEN
FBVDDQ
R1 549R1%0402
FBA_VREFC0
R2 931R1%0402
R3 1.33KR1%0402
C209 C820p50X0402
R197 121R1%0402
R193 1KR1%0402
FBA_ZQ0
FBA_SEN0
PQ5
GPIO10_GDDR5VREF
N-2N7002_SOT23-3-RH
M2C
INS234896280
COMMON
Normal
MF
VSS
VDD
VSSQ
VDDQ
FBVDDQ
C344 C220 C389 C392 C215
C214 C229 C201 C261 C428 C401
C471 C234 C346 C272 C222
C264 C395 C400 C193 C232 C430
HVRAM
Hynix VRAM
M12-5GC2H05-H23

MICRO-STAR INT'L CO.,LTD.

Title	N16P-GX_GDDR5 Frame A-1
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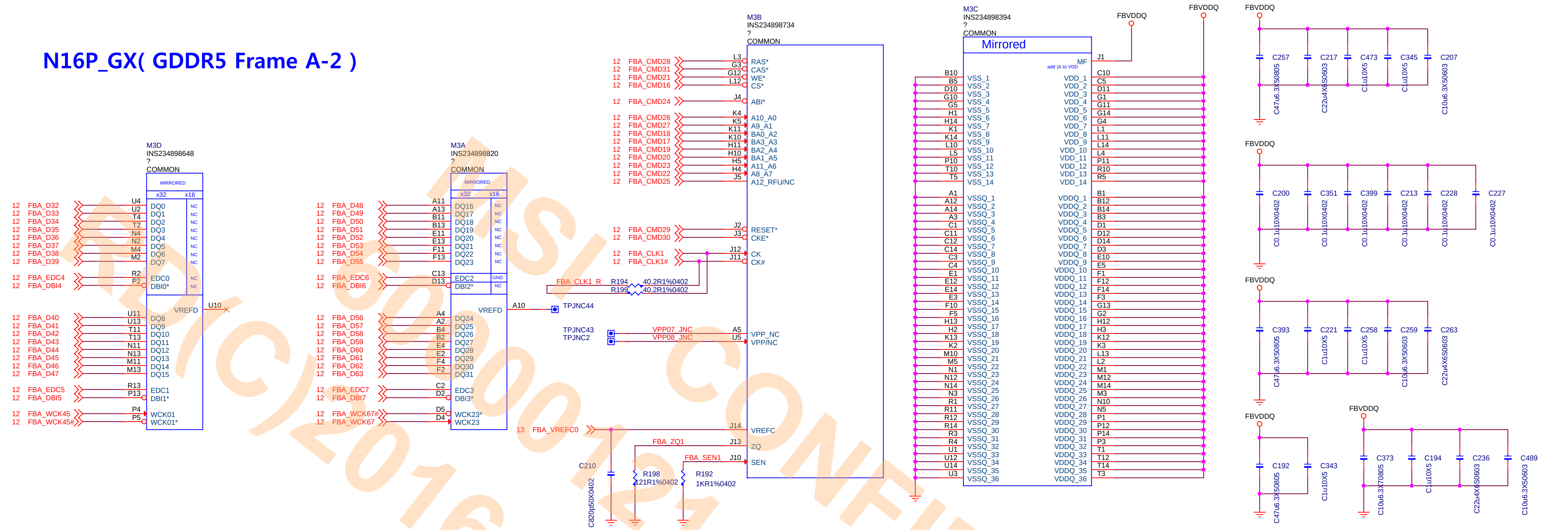
N16P_GX(GDDR5 Frame A-2)


M3D
INS234898648
COMMON
MIRRORED
M3A
INS234898820
COMMON
M3B
INS234898734
COMMON
M3C
INS234898394
COMMON
Mirrored
FBVDDQ
FBA_D32 FBA_D33 FBA_D34 FBA_D35 FBA_D36 FBA_D37 FBA_D38 FBA_D39
FBA_EDC4 FBA_DBI4
FBA_D40 FBA_D41 FBA_D42 FBA_D43 FBA_D44 FBA_D45 FBA_D46 FBA_D47
FBA_EDC5 FBA_DBI5
FBA_WCK45 FBA_WCK45#
FBA_D48 FBA_D49 FBA_D50 FBA_D51 FBA_D52 FBA_D53 FBA_D54 FBA_D55
FBA_EDC6 FBA_DBI6
FBA_D56 FBA_D57 FBA_D58 FBA_D59 FBA_D60 FBA_D61 FBA_D62 FBA_D63
FBA_EDC7 FBA_DBI7
FBA_WCK67# FBA_WCK67
FBA_CMD28 FBA_CMD31 FBA_CMD21 FBA_CMD16 FBA_CMD24
FBA_CMD26 FBA_CMD27 FBA_CMD18 FBA_CMD17 FBA_CMD19 FBA_CMD20 FBA_CMD23 FBA_CMD22 FBA_CMD25
FBA_CMD29 FBA_CMD30
FBA_CLK1 FBA_CLK1#
FBA_CLK1_R
R194 40.2R1%0402
R199 40.2R1%0402
TPJNC44 TPJNC43 TPJNC2
VPP07_JNC VPP08_JNC
FBA_VREFC0
FBA_ZQ1
FBA_SEN1
C210 C820p50X0402
R198 121R1%0402
R192 1KR1%0402
RAS* CAS* WE* CS* ABI*
A10_A0 A9_A1 BA0_A2 BA3_A3 BA2_A4 BA1_A5 A11_A6 A8_A7 A12_RFU/NC
RESET* CKE* CK CK#
VPP_NC VPP/NC
VREFC ZQ SEN
VREFD
C257 C217 C473 C345 C207
C200 C351 C399 C213 C228 C227
C393 C221 C258 C259 C263
C192 C343
C373 C194 C236 C489

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Title: N16P-GX_GDDR5 Frame A-2
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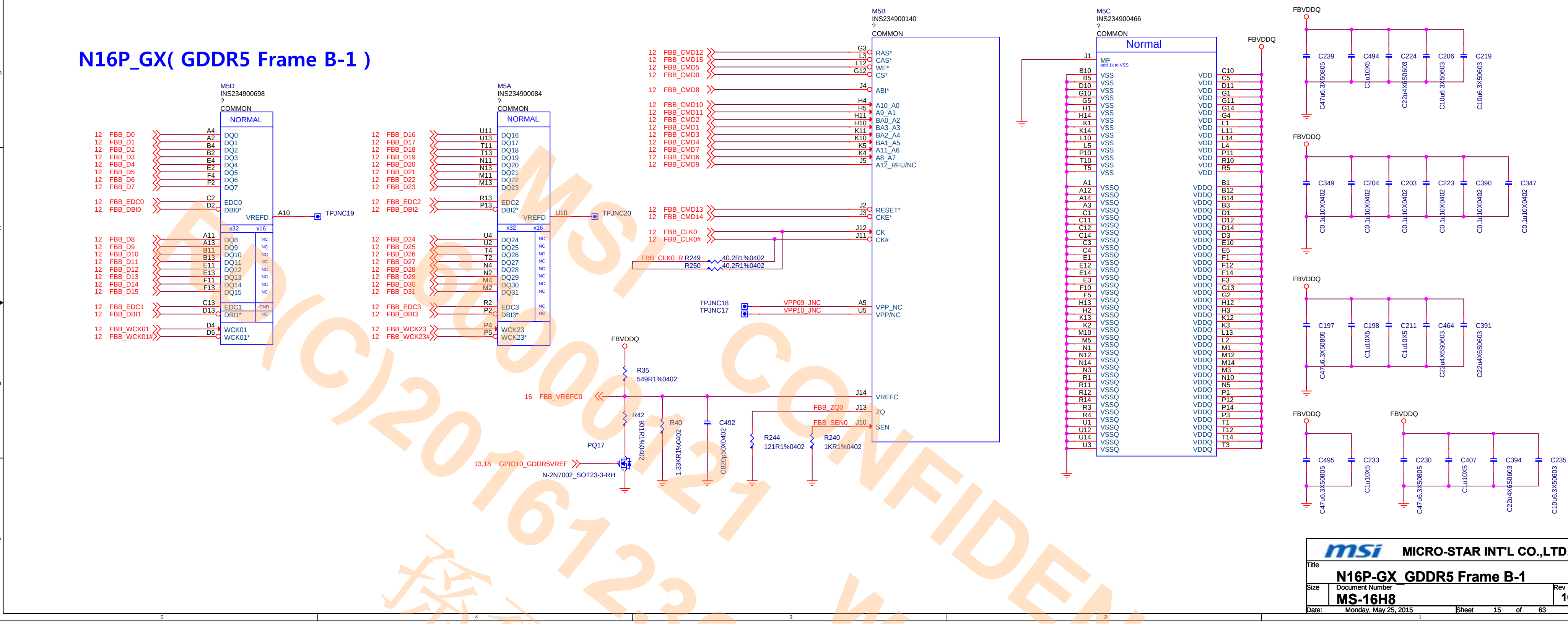
N16P_GX(GDDR5 Frame B-1)



msi	MICRO-STAR INT'L CO.,LTD.
Title	N16P-GX_GDDR5 Frame B-1
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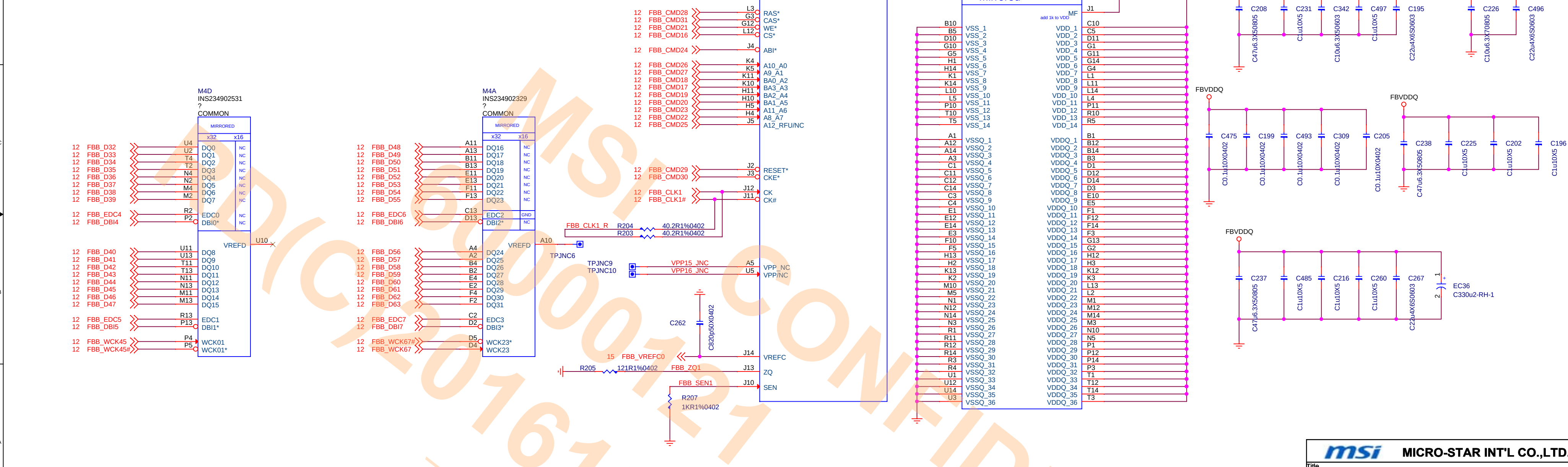
N16P_GX(GDDR5 Frame B-2)



M4D
INS234902531
COMMON
M4A
INS234902329
COMMON
M4B
INS234902405
COMMON
M4C
INS234902051
COMMON
Mirrored
FBVDDQ
FBB_CMD28
FBB_CMD31
FBB_CMD21
FBB_CMD16
FBB_CMD24
FBB_CMD26
FBB_CMD27
FBB_CMD18
FBB_CMD17
FBB_CMD19
FBB_CMD20
FBB_CMD23
FBB_CMD22
FBB_CMD25
FBB_CMD29
FBB_CMD30
FBB_CLK1
FBB_CLK1#
RAS*
CAS*
WE*
CS*
ABI*
RESET*
CKE*
CK
CK#
VREFC
ZQ
SEN
VPP_NC
VPP/NC
FBB_CLK1_R
R204
R203
40.2R1%0402
TPJNC6
TPJNC9
TPJNC10
VPP15_JNC
VPP16_JNC
C262
C820p50X0402
FBB_VREFC0
R205
121R1%0402
FBB_ZQ1
FBB_SEN1
R207
1KR1%0402
FBB_EDC4
FBB_DBI4
FBB_EDC5
FBB_DBI5
FBB_WCK45
FBB_WCK45#
FBB_EDC6
FBB_DBI6
FBB_EDC7
FBB_DBI7
FBB_WCK67#
FBB_WCK67
VREFD
U10
A10
C208
C231
C342
C497
C195
C226
C496
C475
C199
C493
C309
C205
C238
C225
C202
C196
C237
C485
C216
C260
C267
EC36
C330u2-RH-1

MICRO-STAR INT'L CO.,LTD.

Title: N16P-GX_GDDR5 Frame B-2

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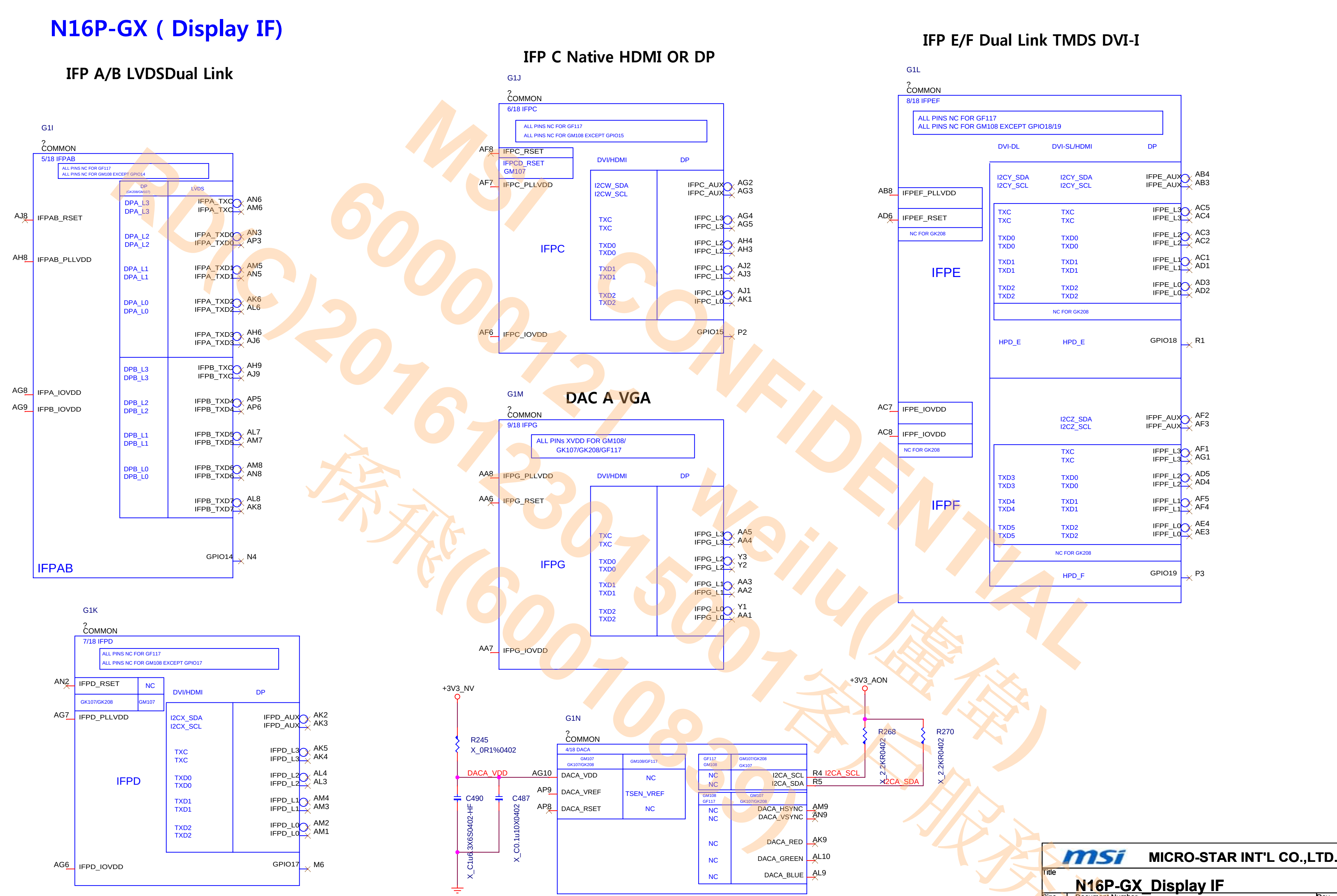
N16P-GX (Display IF)



IFP A/B LVDSDual Link
G1I
COMMON
5/18 IFPAB
ALL PINS NC FOR GF117
ALL PINS NC FOR GM108 EXCEPT GPIO14
DP
LVDS
AJ8 IFPAB_RSET
AH8 IFPAB_PLLVDD
AG8 IFPA_IOVDD
AG9 IFPB_IOVDD
DPA_L3 IFPA_TXC AN6 AM6
DPA_L2 IFPA_TXD0 AN3 AP3
DPA_L1 IFPA_TXD1 AM5 AN5
DPA_L0 IFPA_TXD2 AK6 AL6
IFPA_TXD3 AH6 AJ6
DPB_L3 IFPB_TXC AH9 AJ9
DPB_L2 IFPB_TXD4 AP5 AP6
DPB_L1 IFPB_TXD5 AL7 AM7
DPB_L0 IFPB_TXD6 AM8 AN8
IFPB_TXD7 AL8 AK8
GPIO14 N4
IFPAB
IFP C Native HDMI OR DP
G1J
COMMON
6/18 IFPC
ALL PINS NC FOR GF117
ALL PINS NC FOR GM108 EXCEPT GPIO15
AF8 IFPC_RSET
IFPCD_RSET GM107
AF7 IFPC_PLLVDD
DVI/HDMI
DP
I2CW_SDA I2CW_SCL IFPC_AUX AG2 AG3
TXC IFPC_L3 AG4 AG5
TXD0 IFPC_L2 AH4 AH3
TXD1 IFPC_L1 AJ2 AJ3
TXD2 IFPC_L0 AJ1 AK1
IFPC
AF6 IFPC_IOVDD
GPIO15 P2
DAC A VGA
G1M
COMMON
9/18 IFPG
ALL PINs XVDD FOR GM108/ GK107/GK208/GF117
AA8 IFPG_PLLVDD
AA6 IFPG_RSET
DVI/HDMI
DP
TXC IFPG_L3 AA5 AA4
TXD0 IFPG_L2 Y3 Y2
TXD1 IFPG_L1 AA3 AA2
TXD2 IFPG_L0 Y1 AA1
IFPG
AA7 IFPG_IOVDD
IFP E/F Dual Link TMDS DVI-I
G1L
COMMON
8/18 IFPEF
ALL PINS NC FOR GF117
ALL PINS NC FOR GM108 EXCEPT GPIO18/19
DVI-DL
DVI-SL/HDMI
DP
AB8 IFPEF_PLLVDD
AD6 IFPEF_RSET
NC FOR GK208
I2CY_SDA I2CY_SCL I2CY_SDA I2CY_SCL IFPE_AUX AB4 AB3
TXC TXC IFPE_L3 AC5 AC4
TXD0 TXD0 IFPE_L2 AC3 AC2
TXD1 TXD1 IFPE_L1 AC1 AD1
TXD2 TXD2 IFPE_L0 AD3 AD2
NC FOR GK208
HPD_E HPD_E GPIO18 R1
IFPE
AC7 IFPE_IOVDD
AC8 IFPF_IOVDD
NC FOR GK208
I2CZ_SDA I2CZ_SCL IFPF_AUX AF2 AF3
TXC IFPF_L3 AF1 AG1
TXD3 TXD0 IFPF_L2 AD5 AD4
TXD4 TXD1 IFPF_L1 AF5 AF4
TXD5 TXD2 IFPF_L0 AE4 AE3
NC FOR GK208
IFPF
HPD_F GPIO19 P3
G1K
COMMON
7/18 IFPD
ALL PINS NC FOR GF117
ALL PINS NC FOR GM108 EXCEPT GPIO17
AN2 IFPD_RSET NC
GK107/GK208 GM107
AG7 IFPD_PLLVDD
DVI/HDMI
DP
I2CX_SDA I2CX_SCL IFPD_AUX AK2 AK3
TXC IFPD_L3 AK5 AK4
TXD0 IFPD_L2 AL4 AL3
TXD1 IFPD_L1 AM4 AM3
TXD2 IFPD_L0 AM2 AM1
IFPD
AG6 IFPD_IOVDD
GPIO17 M6
+3V3_NV
R245 X_0R1%0402
DACA_VDD
C490 X_C1u6.3X6S0402-HF
C487 X_C0.1u10X0402
G1N
COMMON
4/18 DACA
GM107 GK107/GK208
GM108/GF117
AG10 DACA_VDD NC
AP9 DACA_VREF TSEN_VREF
AP8 DACA_RSET NC
GF117 GM108
GM107/GK208 GK107
NC I2CA_SCL R4 I2CA_SCL
NC I2CA_SDA R5 I2CA_SDA
GM108 GF117
GM107 GK107/GK208
NC DACA_HSYNC AM9
NC DACA_VSYNC AN9
NC DACA_RED AK9
NC DACA_GREEN AL10
NC DACA_BLUE AL9
+3V3_AON
R268 X_2.2KR0402
R270 X_2.2KR0402

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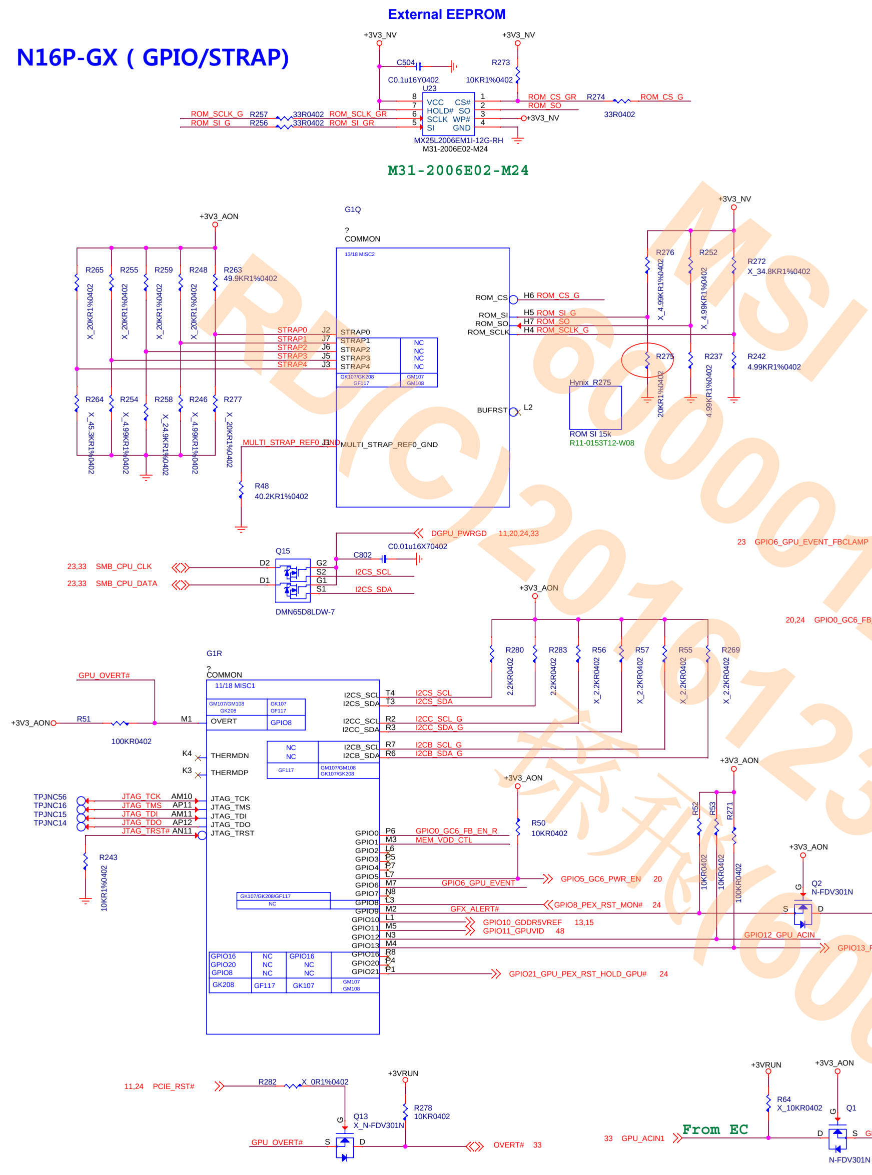
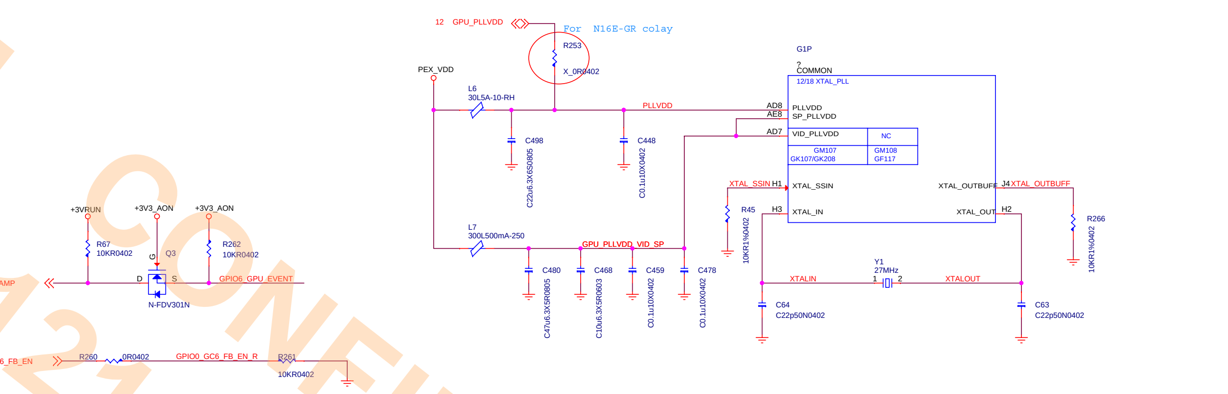
N16P-GX (GPIO/STRAP)

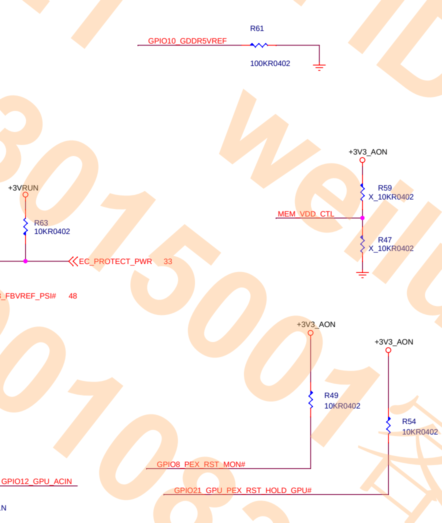
External EEPROM



External EEPROM
+3V3_NV
C504
C0.1u16Y0402
R273
10KR1%0402
U23
VCC CS#
HOLD# SO
SCLK WP#
SI GND
MX25L2006EM1I-12G-RH
M31-2006E02-M24
ROM_SCLK_G
ROM_SI_G
R257
R256
33R0402
ROM_SCLK_GR
ROM_SI_GR
ROM_CS_GR
ROM_SO
R274
ROM_CS_G
M31-2006E02-M24
+3V3_AON
G1Q
COMMON
STRAP0
STRAP1
STRAP2
STRAP3
STRAP4
MULTI_STRAP_REF0_GND
ROM_CS
ROM_SI
ROM_SO
ROM_SCLK
BUFRST
R265
R255
R259
R248
R263
49.9KR1%0402
R264
R254
R258
R246
R277
R48
40.2KR1%0402
Hynix_R275
ROM SI 15k
R11-0153T12-W08
DGPU_PWRGD
C802
C0.01u16X70402
SMB_CPU_CLK
SMB_CPU_DATA
I2CS_SCL
I2CS_SDA
Q15
DMN65D8LDW-7
G1R
COMMON
11/18 MISC1
GPU_OVERT#
+3V3_AON
R51
100KR0402
OVERT
THERMDN
THERMDP
JTAG_TCK
JTAG_TMS
JTAG_TDI
JTAG_TDO
JTAG_TRST
TPJNC56
TPJNC16
TPJNC15
TPJNC14
R243
10KR1%0402
I2CS_SCL
I2CS_SDA
I2CC_SCL
I2CC_SDA
I2CB_SCL
I2CB_SDA
GPIO0_GC6_FB_EN_R
MEM_VDD_CTL
GPIO6_GPU_EVENT
GFX_ALERT#
GPIO10_GDDR5VREF
GPIO11_GPUVID
R280
R283
R56
R57
R55
R269
R50
10KR0402
11,24 PCIE_RST#
R282
X_0R1%0402
Q13
X_N-FDV301N
R278
10KR0402
GPU_OVERT#
OVERT#



+3V3_NV
R276
R252
R272
X_34.8KR1%0402
R275
R237
R242
4.99KR1%0402
12 GPU_PLLVDD
For N16E-GR colay
R253
X_0R0402
PEX_VDD
L6
30L5A-10-RH
PLLVDD
G1P
COMMON
12/18 XTAL_PLL
PLLVDD
SP_PLLVDD
VID_PLLVDD
C498
C448
XTAL_SSIN
XTAL_IN
XTAL_OUTBUFF
XTAL_OUTBUFF
XTAL_OUT
R45
R266
L7
300L500mA-250
GPU_PLLVDD_VID_SP
C480
C468
C459
C478
XTALIN
XTALOUT
Y1
27MHz
C64
C22p50N0402
C63
C22p50N0402
+3VRUN
+3V3_AON
R67
10KR0402
Q3
N-FDV301N
R262
10KR0402
23 GPIO6_GPU_EVENT_FBCLAMP
GPIO6_GPU_EVENT
20,24 GPIO0_GC6_FB_EN
R260
0R0402
GPIO0_GC6_FB_EN_R
R261
10KR0402

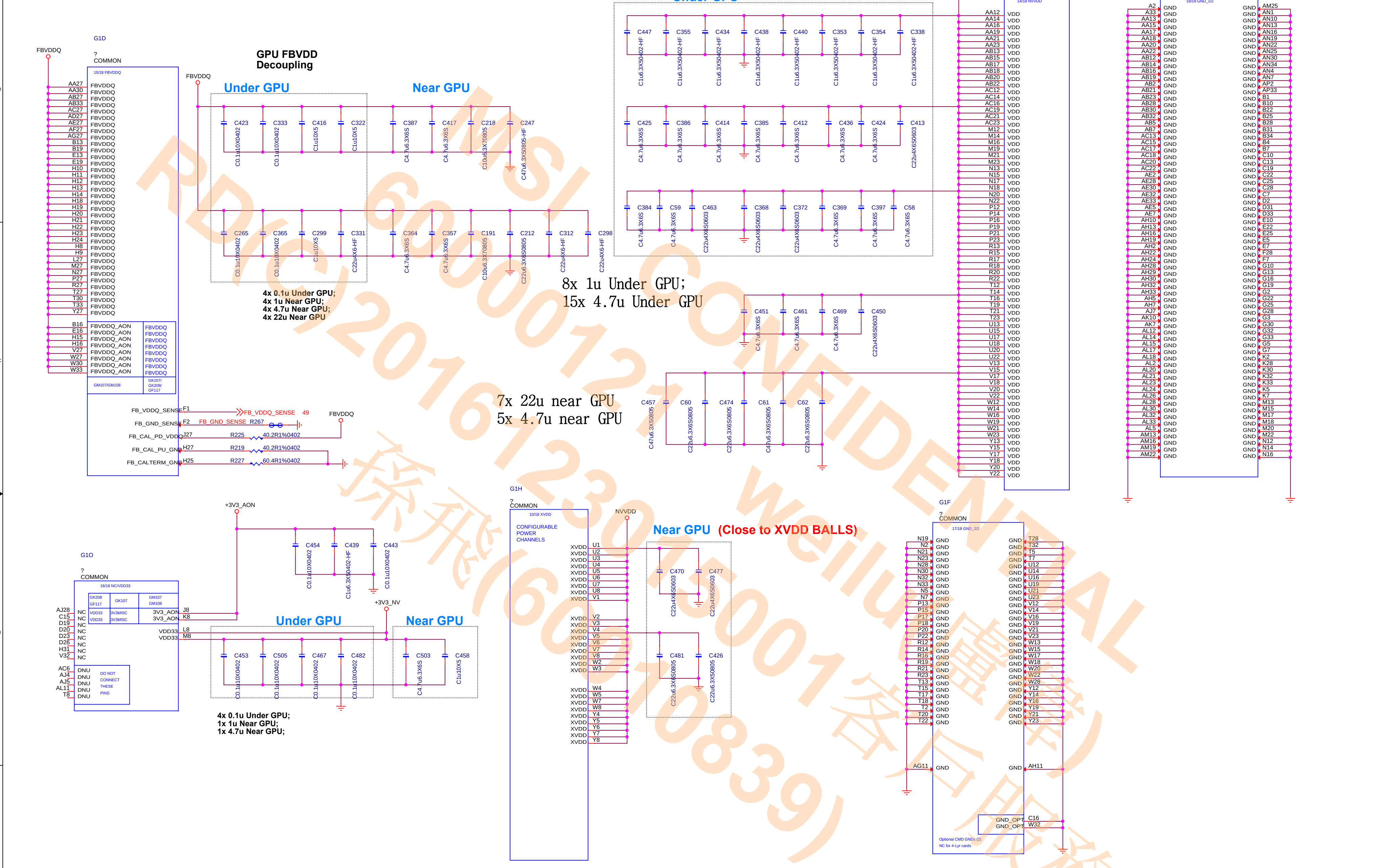


R61
GPIO10_GDDR5VREF
100KR0402
+3V3_AON
R52
R53
R271
GPIO5_GC6_PWR_EN 20
GPIO8_PEX_RST_MON# 24
GPIO13_FBVREF_PSI# 48
GPIO21_GPU_PEX_RST_HOLD_GPU# 24
Q2
N-FDV301N
R63
10KR0402
EC_PROTECT_PWR 33
GPIO12_GPU_ACIN
MEM_VDD_CTL
R59
X_10KR0402
R47
X_10KR0402
R49
10KR0402
R54
10KR0402
+3VRUN
+3V3_AON
R64
X_10KR0402
Q1
N-FDV301N
33 GPU_ACIN1
From EC
GPIO12_GPU_ACIN
GPIO8_PEX_RST_MON#
GPIO21_GPU_PEX_RST_HOLD_GPU#

Item	Location	N16P-GX
Strap Mode	R48	MULTISTRAP_REF_GND,40.2K PD to GND
Device ID		0x0FE4
Package		GB4B-128
Memory Type		GDDR5
ROM_SI	R275	0x2,Hynix 2G, 15kohm Pull Down H5GC4H24MFR-T2C
	R275	0x3,Samsung 2G, 20kohm Pull Down K4G41325FC-HC03
	R275	0x4,Micron 2G, 24.9kohm Pull Down EDW4032BABG-60-F
ROM_SO	R237	0x0,4.99kohm Pull Down
ROM_SCLK	R242	0x0,4.99kohm Pull Down
Strap0	R263	49.9kohm pull up to +3V3_AON
Strap1	R248 R246	Do no stuff
Strap2	R259 R258	Do no stuff
Strap3	R255 R254	Do no stuff
Strap4	R265 R264	Do no stuff

Pin Name	Normal function	I/O	Functional Description	
GPIO0	GC6_FB_EN	O	FB Enable GC62.0	10K PD
GPIO1	MEM_VDD_CTL	O	Memory Voltage Control	PU,PD to set
GPIO2	NC LCD_BL_PWM	O	Panel Backlight PWM	100K PD
GPIO3	NC LCD_PWR_EN	O	Panel power Enable	100K PD
GPIO4	NC LCD_BL_EN	O	Panel Backlight Enable	100K PD
GPIO5	GC6_PWR_EN	O	GPU Power Sequence for GC2.0	10K PU 3V3_AON
GPIO6	GPU_EVENT*	I	GPU Wake for GC2.0	10K PU 3V3_AON
GPIO7	NC 3DStereo/Debug	O	3D Vision L/R Signal	100K PD
GPIO8	SYS_PEX_RST_MON*	I	SYS Side PCIE reset monitor	10K PU 3V3_AON
GPIO9	Therm_Alert*/ERR	I/O	Thermal ALERT	10K PU 3V3_AON
GPIO10	GDDR5VREF	O	Memory VREF Control	100K PD
GPIO11	GPIO11_GPUVID	O	GPU Core VDD PWM control signal	
GPIO12	GPU_ACIN	I	AC power detect	100K PU 3V3_AON
GPIO13	FBVREF_PSI#	O	Phase Shedding	
GPIO14	NC	I	Hot plug dectect for IFPA	
GPIO15	NC	I	Hot plug detect for IFPC	
GPIO16	NC	O		
GPIO17	NC	I	Hot plug detect for IFPD	
GPIO18	NC	I	Hot plug detect for IFPE	
GPIO19	NC	I	Hot plug detect for IFPF	
GPIO21	GPU_PEX_RST_HOLD_GPU#	O	GPU PCIe self-reset contrl	10K PU 3V3_AON
OVER	OVERT	I/O	Catastrophic over temp	100K PU 3V3_AON

N16P-GX(Power & GND)



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Title: N16P-GX_Power & GND

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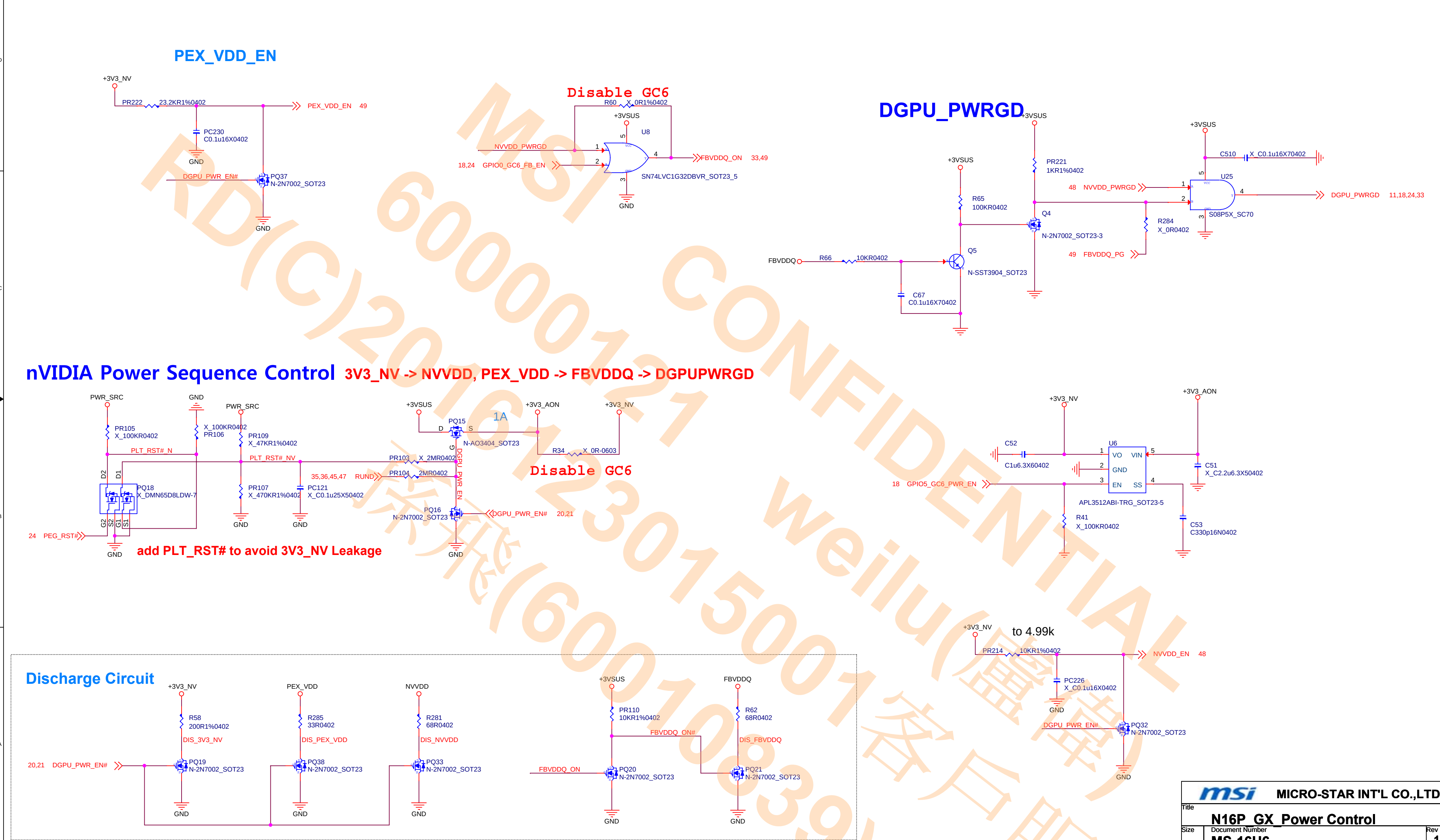
DGPU_Power Control


PEX_VDD_EN
+3V3_NV
PR222 23.2KR1%0402
PEX_VDD_EN 49
PC230 C0.1u16X0402
GND
DGPU_PWR_EN#
PQ37 N-2N7002_SOT23
Disable GC6
R60 X_0R1%0402
+3VSUS
U8
NVVDD_PWRGD
18,24 GPIO0_GC6_FB_EN
FBVDDQ_ON 33,49
SN74LVC1G32DBVR_SOT23_5
DGPU_PWRGD
PR221 1KR1%0402
R65 100KR0402
Q4 N-2N7002_SOT23-3
48 NVVDD_PWRGD
C510 X_C0.1u16X70402
U25 S08P5X_SC70
DGPU_PWRGD 11,18,24,33
R284 X_0R0402
49 FBVDDQ_PG
FBVDDQ
R66 10KR0402
Q5 N-SST3904_SOT23
C67 C0.1u16X70402
nVIDIA Power Sequence Control
3V3_NV -> NVVDD, PEX_VDD -> FBVDDQ -> DGPUPWRGD
PWR_SRC
PR105 X_100KR0402
X_100KR0402 PR106
PR109 X_47KR1%0402
PLT_RST#_N
PLT_RST#_NV
PQ18 X_DMN65D8LDW-7
PR107 X_470KR1%0402
PC121 X_C0.1u25X50402
35,36,45,47 RUN#
PR103 X_2MR0402
PR104 2MR0402
+3V3_AON
+3V3_NV
PQ15 N-AO3404_SOT23
1A
R34 X_0R-0603
Disable GC6
DGPU_PWR_EN
PQ16 N-2N7002_SOT23
DGPU_PWR_EN# 20,21
24 PEG_RST#
add PLT_RST# to avoid 3V3_NV Leakage
C52 C1u6.3X60402
U6 APL3512ABI-TRG_SOT23-5
VO VIN GND EN SS
18 GPIO5_GC6_PWR_EN
C51 X_C2.2u6.3X50402
R41 X_100KR0402
C53 C330p16N0402
to 4.99k
PR214 10KR1%0402
NVVDD_EN 48
PC226 X_C0.1u16X0402
DGPU_PWR_EN#
PQ32 N-2N7002_SOT23
Discharge Circuit
R58 200R1%0402
DIS_3V3_NV
20,21 DGPU_PWR_EN#
PQ19 N-2N7002_SOT23
PEX_VDD
R285 33R0402
DIS_PEX_VDD
PQ38 N-2N7002_SOT23
NVVDD
R281 68R0402
DIS_NVVDD
PQ33 N-2N7002_SOT23
PR110 10KR1%0402
FBVDDQ_ON#
FBVDDQ_ON
PQ20 N-2N7002_SOT23
R62 68R0402
DIS_FBVDDQ
PQ21 N-2N7002_SOT23

MICRO-STAR INT'L CO.,LTD.			
Title	N16P_GX_Power Control		
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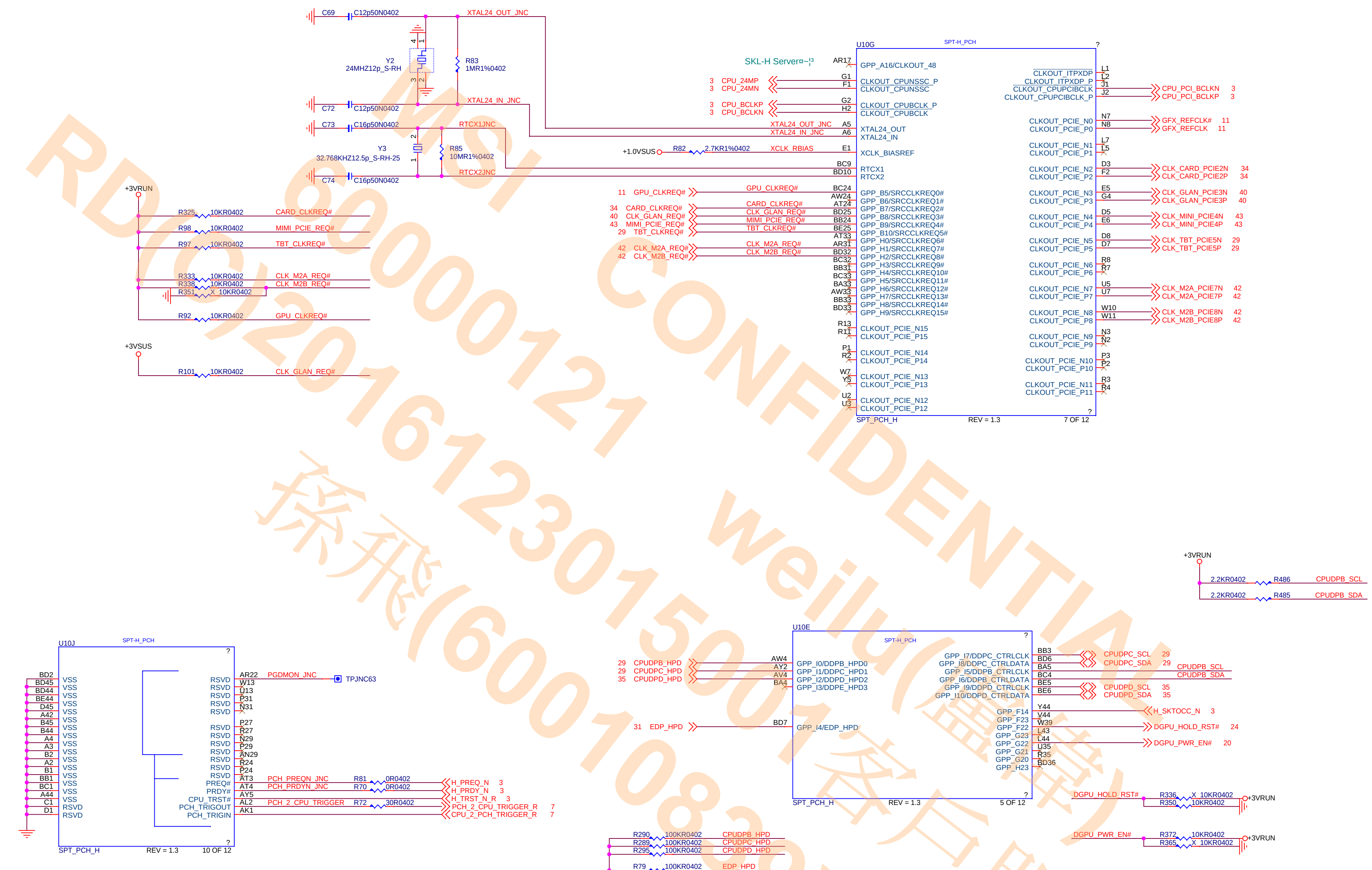
U10G
SPT-H_PCH
SPT_PCH_H
REV = 1.3
7 OF 12
GPP_A16/CLKOUT_48
CLKOUT_CPUNSSC_P
CLKOUT_CPUNSSC
CLKOUT_CPUBCLK_P
CLKOUT_CPUBCLK
XTAL24_OUT
XTAL24_IN
XCLK_BIASREF
RTCX1
RTCX2
GPP_B5/SRCCLKREQ0#
GPP_B6/SRCCLKREQ1#
GPP_B7/SRCCLKREQ2#
GPP_B8/SRCCLKREQ3#
GPP_B9/SRCCLKREQ4#
GPP_B10/SRCCLKREQ5#
GPP_H0/SRCCLKREQ6#
GPP_H1/SRCCLKREQ7#
GPP_H2/SRCCLKREQ8#
GPP_H3/SRCCLKREQ9#
GPP_H4/SRCCLKREQ10#
GPP_H5/SRCCLKREQ11#
GPP_H6/SRCCLKREQ12#
GPP_H7/SRCCLKREQ13#
GPP_H8/SRCCLKREQ14#
GPP_H9/SRCCLKREQ15#
CLKOUT_PCIE_N15
CLKOUT_PCIE_P15
CLKOUT_PCIE_N14
CLKOUT_PCIE_P14
CLKOUT_PCIE_N13
CLKOUT_PCIE_P13
CLKOUT_PCIE_N12
CLKOUT_PCIE_P12
CLKOUT_ITPXDP
CLKOUT_ITPXDP_P
CLKOUT_CPUPCIBCLK
CLKOUT_CPUPCIBCLK_P
CLKOUT_PCIE_N0
CLKOUT_PCIE_P0
CLKOUT_PCIE_N1
CLKOUT_PCIE_P1
CLKOUT_PCIE_N2
CLKOUT_PCIE_P2
CLKOUT_PCIE_N3
CLKOUT_PCIE_P3
CLKOUT_PCIE_N4
CLKOUT_PCIE_P4
CLKOUT_PCIE_N5
CLKOUT_PCIE_P5
CLKOUT_PCIE_N6
CLKOUT_PCIE_P6
CLKOUT_PCIE_N7
CLKOUT_PCIE_P7
CLKOUT_PCIE_N8
CLKOUT_PCIE_P8
CLKOUT_PCIE_N9
CLKOUT_PCIE_P9
CLKOUT_PCIE_N10
CLKOUT_PCIE_P10
CLKOUT_PCIE_N11
CLKOUT_PCIE_P11
CPU_PCI_BCLKN 3
CPU_PCI_BCLKP 3
GFX_REFCLK# 11
GFX_REFCLK 11
CLK_CARD_PCIE2N 34
CLK_CARD_PCIE2P 34
CLK_GLAN_PCIE3N 40
CLK_GLAN_PCIE3P 40
CLK_MINI_PCIE4N 43
CLK_MINI_PCIE4P 43
CLK_TBT_PCIE5N 29
CLK_TBT_PCIE5P 29
CLK_M2A_PCIE7N 42
CLK_M2A_PCIE7P 42
CLK_M2B_PCIE8N 42
CLK_M2B_PCIE8P 42
SKL-H Server
3 CPU_24MP
3 CPU_24MN
3 CPU_BCLKP
3 CPU_BCLKN
XTAL24_OUT_JNC
XTAL24_IN_JNC
+1.0VSUS
R82 2.7KR1%0402
XCLK_BIASREF
11 GPU_CLKREQ#
34 CARD_CLKREQ#
40 CLK_GLAN_REQ#
43 MIMI_PCIE_REQ#
29 TBT_CLKREQ#
42 CLK_M2A_REQ#
42 CLK_M2B_REQ#
C69 C12p50N0402
C72 C12p50N0402
C73 C16p50N0402
C74 C16p50N0402
Y2 24MHZ12p_S-RH
R83 1MR1%0402
Y3 32.768KHZ12.5p_S-RH-25
R85 10MR1%0402
XTAL24_OUT_JNC
XTAL24_IN_JNC
RTCX1JNC
RTCX2JNC
+3VRUN
R325 10KR0402 CARD_CLKREQ#
R98 10KR0402 MIMI_PCIE_REQ#
R97 10KR0402 TBT_CLKREQ#
R333 10KR0402 CLK_M2A_REQ#
R338 10KR0402 CLK_M2B_REQ#
R351 X_10KR0402
R92 10KR0402 GPU_CLKREQ#
+3VSUS
R101 10KR0402 CLK_GLAN_REQ#
+3VRUN
2.2KR0402 R486 CPUDPB_SCL
2.2KR0402 R485 CPUDPB_SDA
U10J
SPT-H_PCH
SPT_PCH_H
REV = 1.3
10 OF 12
VSS
RSVD
PREQ#
PRDY#
CPU_TRST#
PCH_TRIGOUT
PCH_TRIGIN
PGDMON_JNC
TPJNC63
PCH_PREQN_JNC R81 0R0402 H_PREQ_N 3
PCH_PRDYN_JNC R70 0R0402 H_PRDY_N 3
H_TRST_N_R 3
PCH_2_CPU_TRIGGER R72 30R0402 PCH_2_CPU_TRIGGER_R 7
CPU_2_PCH_TRIGGER_R 7
U10E
SPT-H_PCH
SPT_PCH_H
REV = 1.3
5 OF 12
GPP_I0/DDPB_HPD0
GPP_I1/DDPC_HPD1
GPP_I2/DDPD_HPD2
GPP_I3/DDPE_HPD3
GPP_I4/EDP_HPD
GPP_I7/DDPC_CTRLCLK
GPP_I8/DDPC_CTRLDATA
GPP_I5/DDPB_CTRLCLK
GPP_I6/DDPB_CTRLDATA
GPP_I9/DDPD_CTRLCLK
GPP_I10/DDPD_CTRLDATA
GPP_F14
GPP_F23
GPP_F22
GPP_G23
GPP_G22
GPP_G21
GPP_G20
GPP_H23
29 CPUDPB_HPD
29 CPUDPC_HPD
35 CPUDPD_HPD
31 EDP_HPD
CPUDPC_SCL 29
CPUDPC_SDA 29
CPUDPB_SCL
CPUDPB_SDA
CPUDPD_SCL 35
CPUDPD_SDA 35
H_SKTOCC_N 3
DGPU_HOLD_RST# 24
DGPU_PWR_EN# 20
DGPU_HOLD_RST# R336 X_10KR0402 +3VRUN
R350 10KR0402
DGPU_PWR_EN# R372 10KR0402 +3VRUN
R365 X_10KR0402
R290 100KR0402 CPUDPB_HPD
R289 100KR0402 CPUDPC_HPD
R295 100KR0402 CPUDPD_HPD
R79 100KR0402 EDP_HPD

Signal	GPIO Assignment
DGPU_PWR_EN#	GPP_G22
DGPU_PWROK	NA
DGPU_HOLD_RST#	GPP_F22

msi MICRO-STAR INT'L CO.,LTD.

Title: **PCH-1 (CLK/DDI)**

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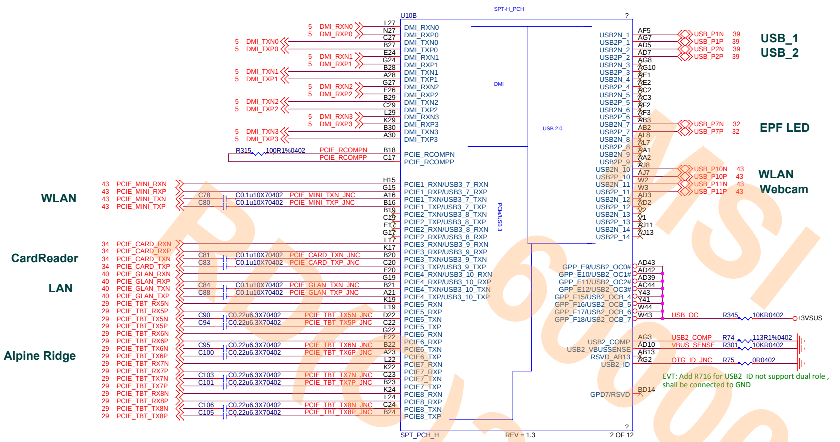
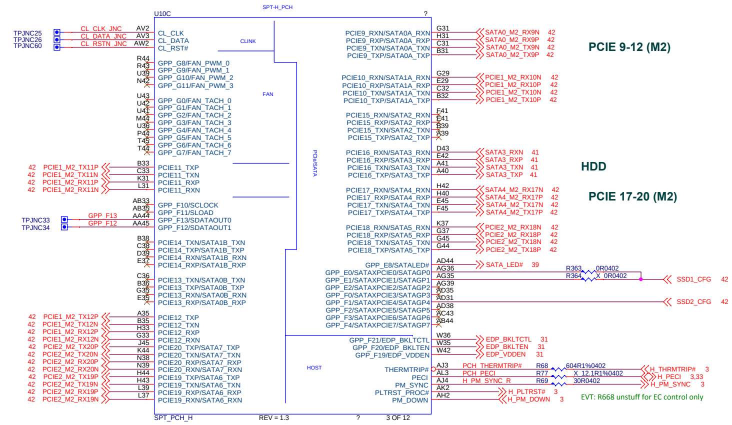
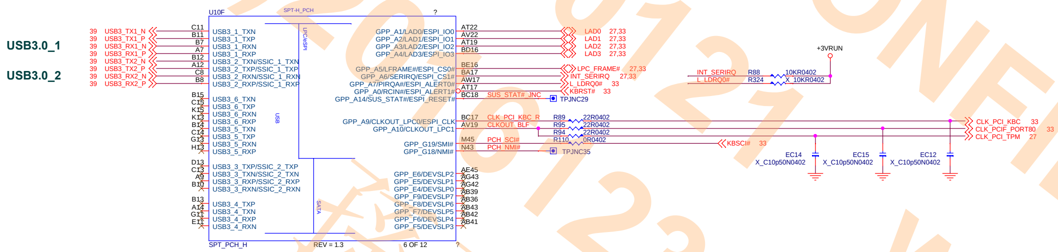


USB			
USB 2.0	USB 3.0	Device	Note
1	1	USB 3.0 Port 1	16H7A
2	2	USB 3.0 Port 2	16H7A
3			NC
4			NC
5			NC
6			NC
7		EPF021	
8			NC
9			NC
10		WLAN	
11		WebCam	
12			NC
13			NC
14			NC





High Speed I/O Ports			
	HM170	C236	Device
1	USB3.0/PCIE	USB3.0/PCIE	WLAN
2	USB3.0/PCIE	USB3.0/PCIE	NC
3	PCIE	USB3.0/PCIE	CardReader
4	PCIE	USB3.0/PCIE	LAN
5	PCIE	PCIE	Alpine Ridge
6	PCIE	PCIE	
7	PCIE	PCIE	
8	PCIE	PCIE	
9	SATA/PCIE	SATA/PCIE	M.2 SSD 1
10	SATA/PCIE	SATA/PCIE	
11	PCIE	PCIE	
12	PCIE	PCIE	
13	PCIE	SATA/PCIE	NC
14	PCIE	SATA/PCIE	NC
15	SATA/PCIE	SATA/PCIE	NC
16	SATA/PCIE	SATA/PCIE	HDD
17	N/A	SATA/PCIE	M.2 SSD 2
18	N/A	SATA/PCIE	
19	N/A	SATA/PCIE	
20	N/A	SATA/PCIE	

MICRO-STAR INT'L CO.,LTD.

Title: PCH-2 (USB/SATA/PCIE)

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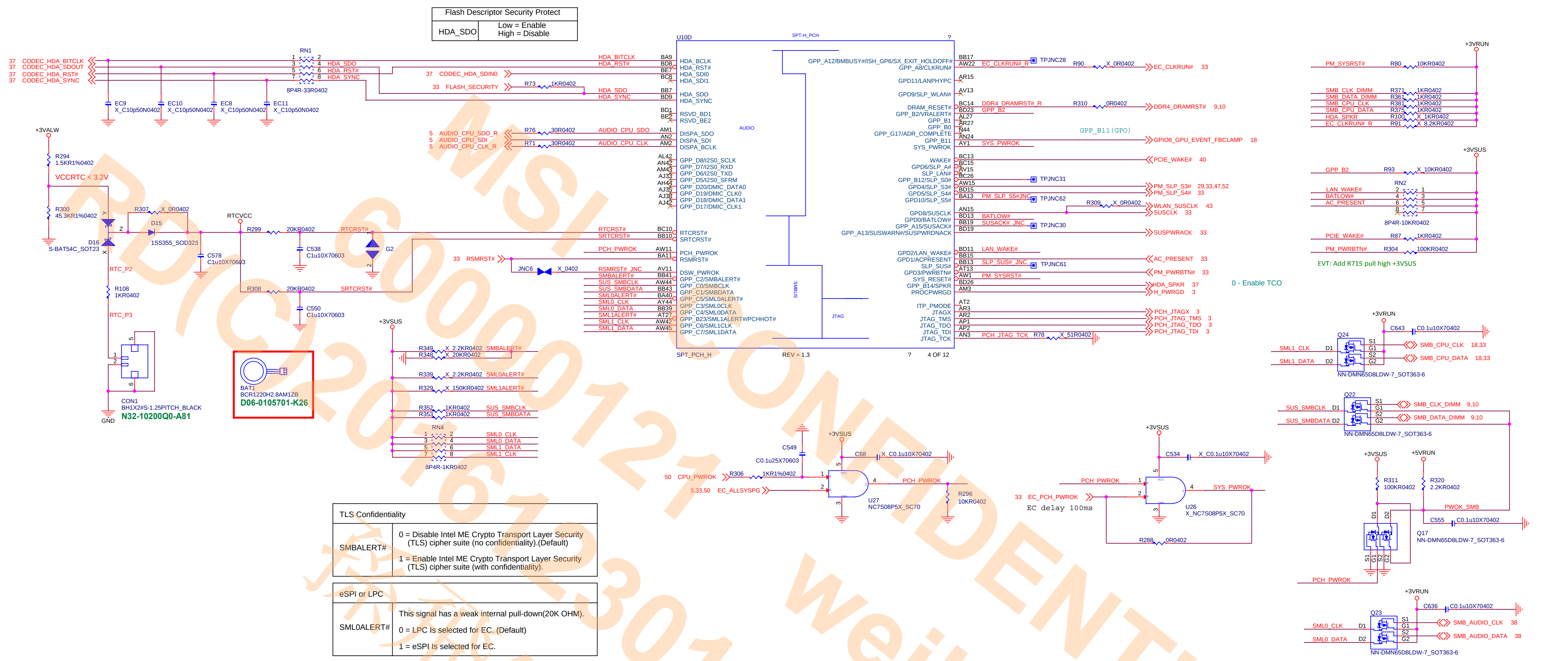
Flash Descriptor Security Protect
HDA_SDO
Low = Enable
High = Disable
U10D
SPT-H_PCH
HDA_BCLK
HDA_RST#
HDA_SDI0
HDA_SDI1
HDA_SDO
HDA_SYNC
RSVD_BD1
RSVD_BE2
DISPA_SDO
DISPA_SDI
DISPA_BCLK
AUDIO
RTCRST#
SRTCRST#
PCH_PWROK
RSMRST#
DSW_PWROK
SMBUS
JTAG
SPT_PCH_H
REV = 1.3
4 OF 12
+3VALW
VCCRTC < 3.2V
RTCVCC
RTC_P2
RTC_P3
CON1
BH1X2#S-1.25PITCH_BLACK
N32-10200Q0-A81
GND
BAT1
BCR1220H2.8AM128
D06-0105701-K26
+3VSUS
+3VRUN
+5VRUN
EC delay 100ms
0 - Enable TCO
EVT: Add R715 pull high +3VSUS
U27
NC7S08P5X_SC70
U26
X_NC7S08P5X_SC70
Q24
Q22
Q17
Q23
NN-DMN65D8LDW-7_SOT363-6

TLS Confidentiality	
SMBALERT#	0 = Disable Intel ME Crypto Transport Layer Security (TLS) cipher suite (no confidentiality).(Default) 1 = Enable Intel ME Crypto Transport Layer Security (TLS) cipher suite (with confidentiality).

eSPI or LPC	
SML0ALERT#	This signal has a weak internal pull-down(20K OHM). 0 = LPC is selected for EC. (Default) 1 = eSPI is selected for EC.

SML1ALERT# / PCHHOT# / GPP_B23	
SML1ALERT#	When used as PCHHOT#, a 150k weak board pull-up is recommended to ensure it does not override the internal pull-down strap sampling.

MICRO-STAR INT'L CO.,LTD.

Title	PCH-3 (HDA/RTC/SMBUS)	
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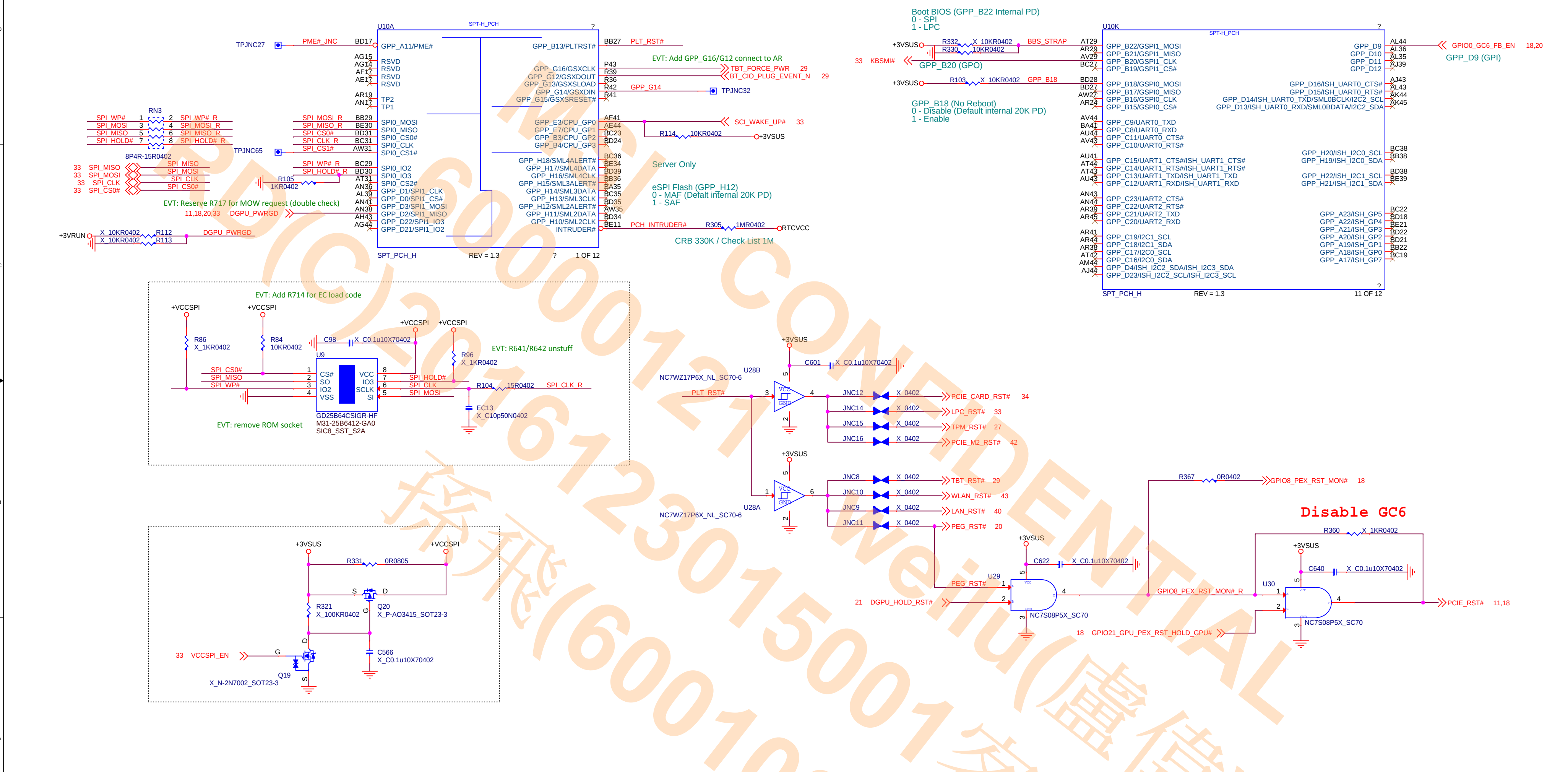

Boot BIOS (GPP_B22 Internal PD)
0 - SPI
1 - LPC
GPP_B20 (GPO)
GPP_B18 (No Reboot)
0 - Disable (Default internal 20K PD)
1 - Enable
GPP_D9 (GPI)
U10A
SPT-H_PCH
GPP_A11/PME#
GPP_B13/PLTRST#
EVT: Add GPP_G16/G12 connect to AR
GPP_G16/GSXCLK
GPP_G12/GSXDOUT
GPP_G13/GSXSLOAD
GPP_G14/GSXDIN
GPP_G15/GSXSRESET#
TBT_FORCE_PWR
BT_CIO_PLUG_EVENT_N
SPI0_MOSI
SPI0_MISO
SPI0_CS0#
SPI0_CLK
SPI0_CS1#
SPI0_IO2
SPI0_IO3
SPI0_CS2#
SCI_WAKE_UP#
Server Only
eSPI Flash (GPP_H12)
0 - MAF (Defalt internal 20K PD)
1 - SAF
PCH_INTRUDER#
INTRUDER#
CRB 330K / Check List 1M
SPT_PCH_H
REV = 1.3
1 OF 12
EVT: Reserve R717 for MOW request (double check)
DGPU_PWRGD
U10K
GPP_B22/GSPI1_MOSI
GPP_B21/GSPI1_MISO
GPP_B20/GSPI1_CLK
GPP_B19/GSPI1_CS#
GPP_B18/GSPI0_MOSI
GPP_B17/GSPI0_MISO
GPP_B16/GSPI0_CLK
GPP_B15/GSPI0_CS#
GPIO0_GC6_FB_EN
11 OF 12
EVT: Add R714 for EC load code
GD25B64CSIGR-HF
M31-25B6412-GA0
SIC8_SST_S2A
EVT: R641/R642 unstuff
EVT: remove ROM socket
NC7WZ17P6X_NL_SC70-6
PCIE_CARD_RST#
LPC_RST#
TPM_RST#
PCIE_M2_RST#
TBT_RST#
WLAN_RST#
LAN_RST#
PEG_RST#
GPIO8_PEX_RST_MON#
Disable GC6
DGPU_HOLD_RST#
GPIO8_PEX_RST_MON#_R
GPIO21_GPU_PEX_RST_HOLD_GPU#
PCIE_RST#
NC7S08P5X_SC70
VCCSPI_EN
X_N-2N7002_SOT23-3
X_P-AO3415_SOT23-3

MICRO-STAR INT'L CO.,LTD.

Title: **PCH-4 (SPI/GPIO)**

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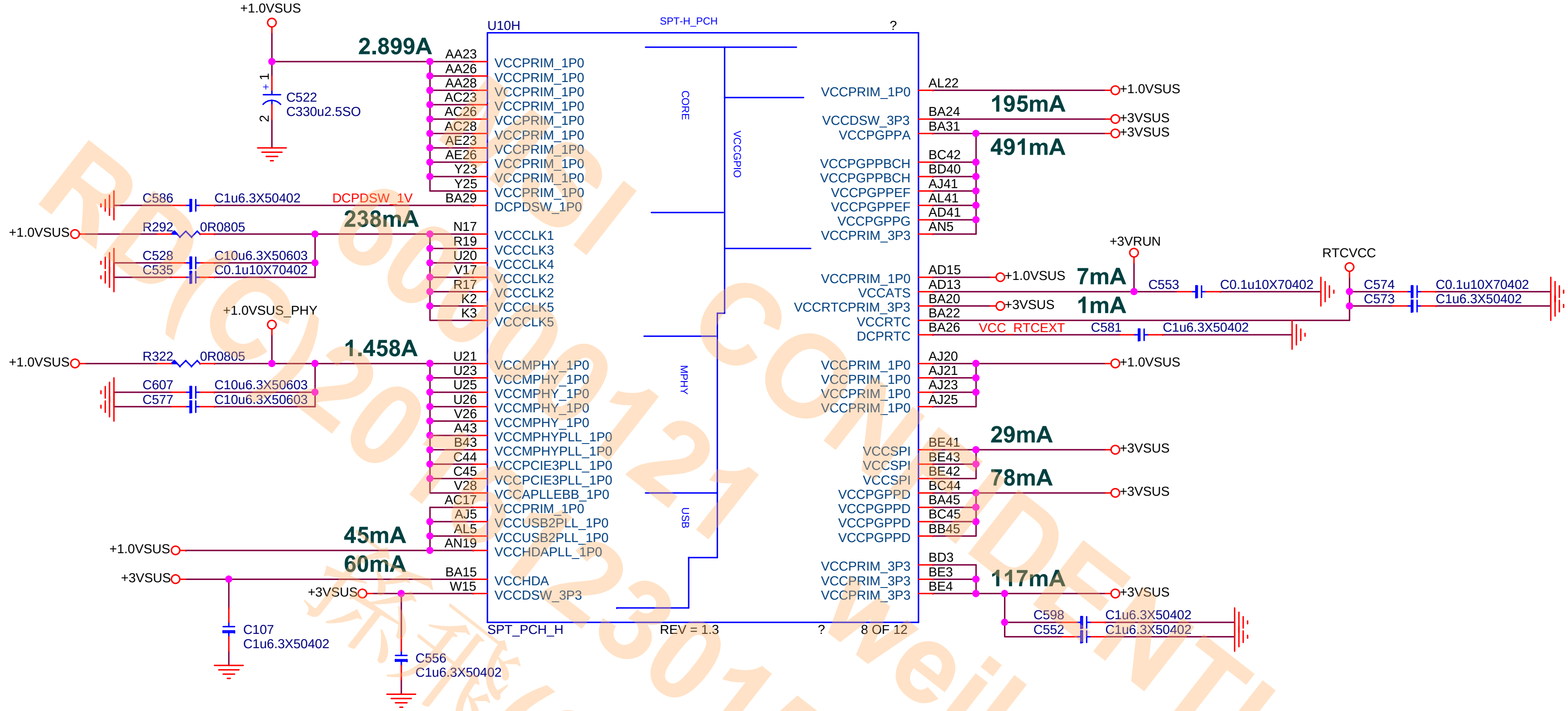
U10H
SPT-H_PCH
SPT_PCH_H
REV = 1.3
8 OF 12
CORE
VCCGPIO
MPHY
USB
+1.0VSUS
C522
C330u2.5SO
2.899A
AA23 AA26 AA28 AC23 AC26 AC28 AE23 AE26 Y23 Y25
VCCPRIM_1P0
C586
C1u6.3X50402
DCPDSW_1V
BA29
DCPDSW_1P0
R292
0R0805
238mA
N17 R19 U20 V17 R17 K2 K3
VCCCLK1
VCCCLK3
VCCCLK4
VCCCLK2
VCCCLK2
VCCCLK5
VCCCLK5
C528
C10u6.3X50603
C535
C0.1u10X70402
+1.0VSUS_PHY
R322
0R0805
1.458A
U21 U23 U25 U26 V26 A43 B43 C44 C45 V28 AC17 AJ5 AL5 AN19
VCCMPHY_1P0
VCCMPHYPLL_1P0
VCCPCIE3PLL_1P0
VCCAPLLEBB_1P0
VCCPRIM_1P0
VCCUSB2PLL_1P0
VCCHDAPLL_1P0
C607
C10u6.3X50603
C577
C10u6.3X50603
45mA
60mA
+3VSUS
BA15
W15
VCCHDA
VCCDSW_3P3
C107
C1u6.3X50402
C556
C1u6.3X50402
AL22
VCCPRIM_1P0
195mA
BA24
BA31
VCCDSW_3P3
VCCPGPPA
491mA
BC42 BD40 AJ41 AL41 AD41 AN5
VCCPGPPBCH
VCCPGPPBCH
VCCPGPPEF
VCCPGPPEF
VCCPGPPG
VCCPRIM_3P3
+3VRUN
RTCVCC
AD15 AD13 BA20 BA22 BA26
VCCPRIM_1P0
VCCATS
VCCRTCPRIM_3P3
VCCRTC
DCPRTC
7mA
1mA
C553
C0.1u10X70402
C574
C0.1u10X70402
C573
C1u6.3X50402
VCC_RTCEXT
C581
C1u6.3X50402
AJ20 AJ21 AJ23 AJ25
29mA
BE41 BE43 BE42
VCCSPI
78mA
BC44 BA45 BC45 BB45
VCCPGPPD
117mA
BD3 BE3 BE4
VCCPRIM_3P3
C598
C1u6.3X50402
C552
C1u6.3X50402

MICRO-STAR INT'L CO.,LTD.

Title
PCH-5 (Power)

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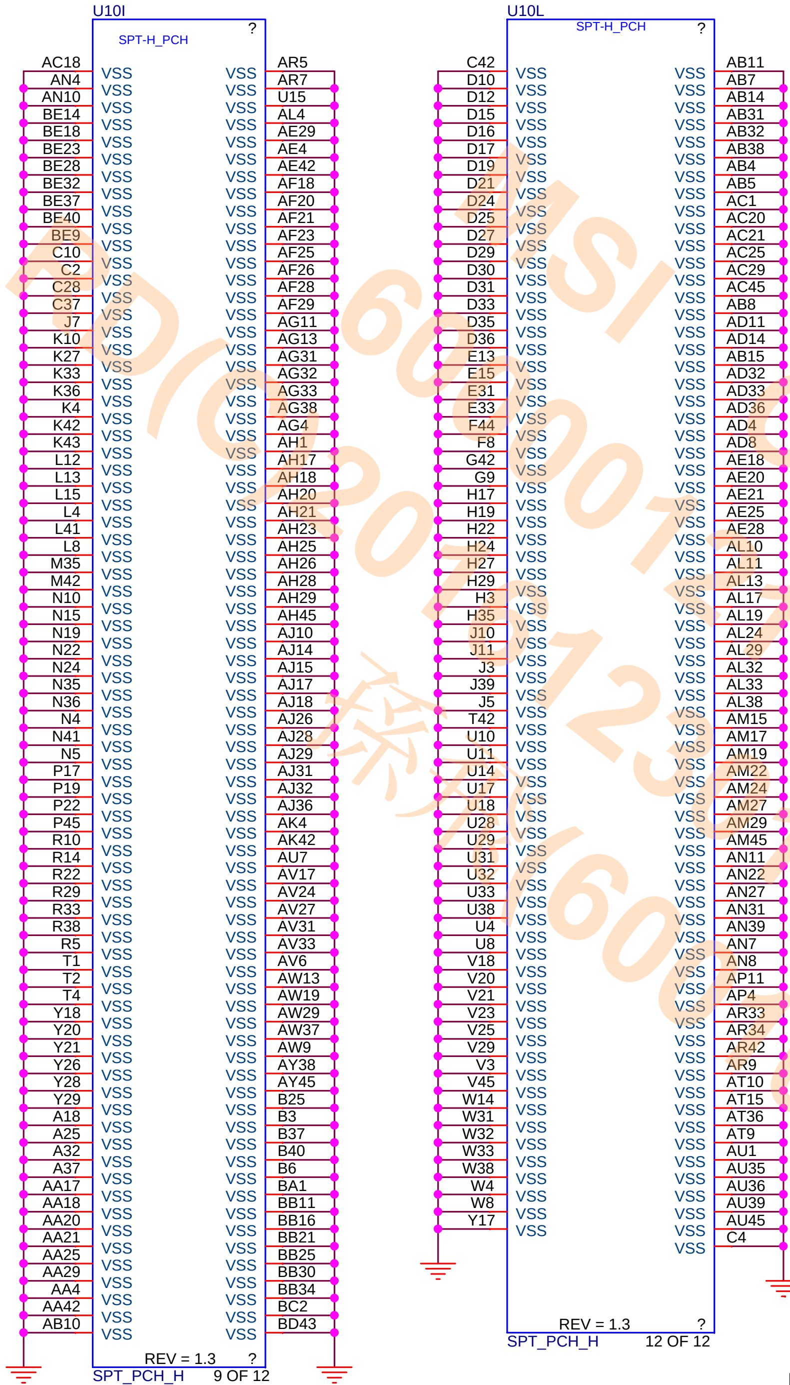

U10I
SPT-H_PCH
AC18 AN4 AN10 BE14 BE18 BE23 BE28 BE32 BE37 BE40 BE9 C10 C2 C28 C37 J7 K10 K27 K33 K36 K4 K42 K43 L12 L13 L15 L4 L41 L8 M35 M42 N10 N15 N19 N22 N24 N35 N36 N4 N41 N5 P17 P19 P22 P45 R10 R14 R22 R29 R33 R38 R5 T1 T2 T4 Y18 Y20 Y21 Y26 Y28 Y29 A18 A25 A32 A37 AA17 AA18 AA20 AA21 AA25 AA29 AA4 AA42 AB10
AR5 AR7 U15 AL4 AE29 AE4 AE42 AF18 AF20 AF21 AF23 AF25 AF26 AF28 AF29 AG11 AG13 AG31 AG32 AG33 AG38 AG4 AH1 AH17 AH18 AH20 AH21 AH23 AH25 AH26 AH28 AH29 AH45 AJ10 AJ14 AJ15 AJ17 AJ18 AJ26 AJ28 AJ29 AJ31 AJ32 AJ36 AK4 AK42 AU7 AV17 AV24 AV27 AV31 AV33 AV6 AW13 AW19 AW29 AW37 AW9 AY38 AY45 B25 B3 B37 B40 B6 BA1 BB11 BB16 BB21 BB25 BB30 BB34 BC2 BD43
VSS
REV = 1.3
SPT_PCH_H 9 OF 12
U10L
SPT-H_PCH
C42 D10 D12 D15 D16 D17 D19 D21 D24 D25 D27 D29 D30 D31 D33 D35 D36 E13 E15 E31 E33 F44 F8 G42 G9 H17 H19 H22 H24 H27 H29 H3 H35 J10 J11 J3 J39 J5 T42 U10 U11 U14 U17 U18 U28 U29 U31 U32 U33 U38 U4 U8 V18 V20 V21 V23 V25 V29 V3 V45 W14 W31 W32 W33 W38 W4 W8 Y17
AB11 AB7 AB14 AB31 AB32 AB38 AB4 AB5 AC1 AC20 AC21 AC25 AC29 AC45 AB8 AD11 AD14 AB15 AD32 AD33 AD36 AD4 AD8 AE18 AE20 AE21 AE25 AE28 AL10 AL11 AL13 AL17 AL19 AL24 AL29 AL32 AL33 AL38 AM15 AM17 AM19 AM22 AM24 AM27 AM29 AM45 AN11 AN22 AN27 AN31 AN39 AN7 AN8 AP11 AP4 AR33 AR34 AR42 AR9 AT10 AT15 AT36 AT9 AU1 AU35 AU36 AU39 AU45 C4
VSS
REV = 1.3
SPT_PCH_H 12 OF 12

MICRO-STAR INT'L CO.,LTD.

Title: **PCH-06 (GND)**

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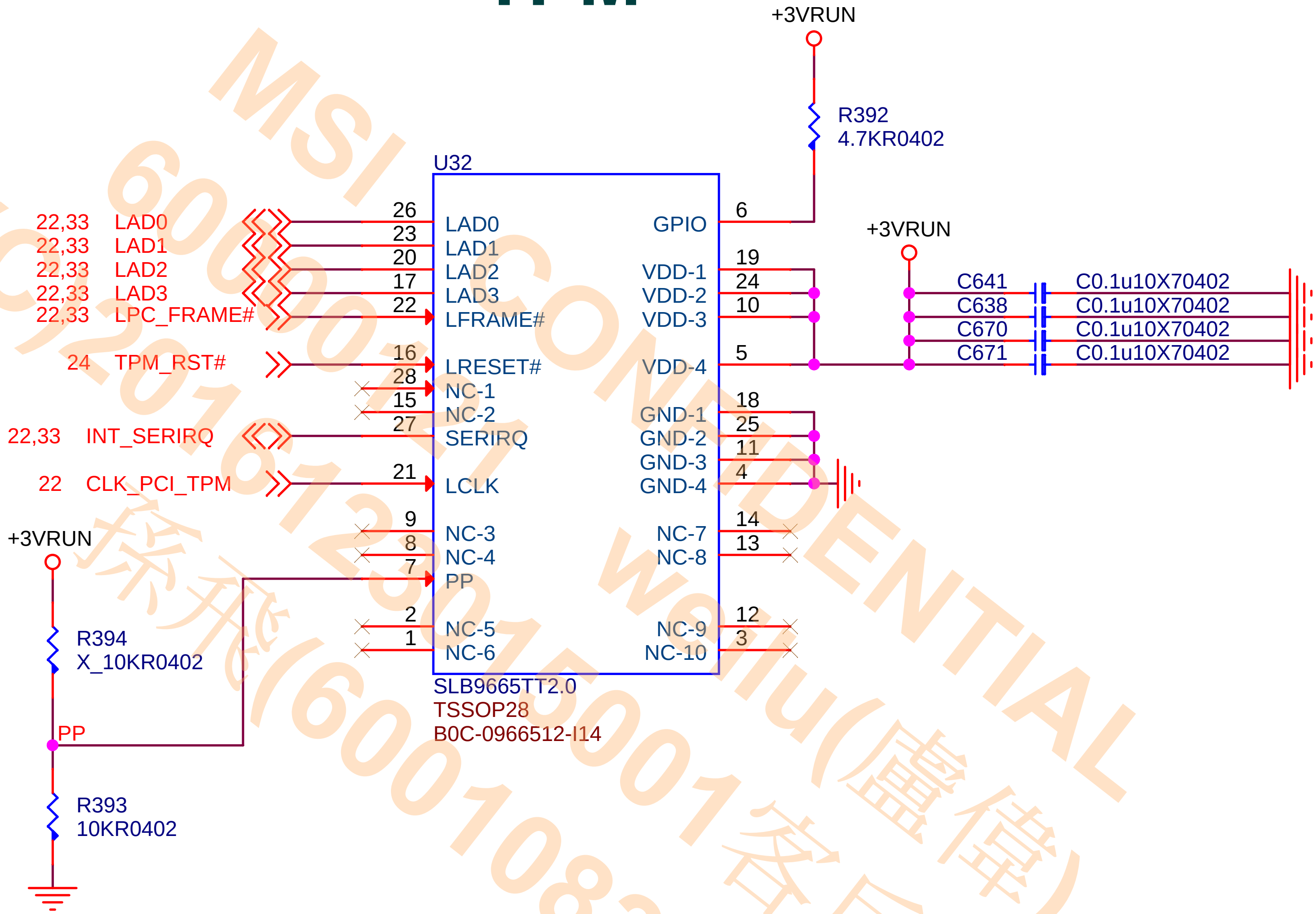
TPM



+3VRUN
R392
4.7KR0402
U32
22,33 LAD0
22,33 LAD1
22,33 LAD2
22,33 LAD3
22,33 LPC_FRAME#
24 TPM_RST#
22,33 INT_SERIRQ
22 CLK_PCI_TPM
26 LAD0
23 LAD1
20 LAD2
17 LAD3
22 LFRAME#
16 LRESET#
28 NC-1
15 NC-2
27 SERIRQ
21 LCLK
9 NC-3
8 NC-4
7 PP
2 NC-5
1 NC-6
GPIO 6
VDD-1 19
VDD-2 24
VDD-3 10
VDD-4 5
GND-1 18
GND-2 25
GND-3 11
GND-4 4
NC-7 14
NC-8 13
NC-9 12
NC-10 3
+3VRUN
C641 C0.1u10X70402
C638 C0.1u10X70402
C670 C0.1u10X70402
C671 C0.1u10X70402
SLB9665TT2.0
TSSOP28
B0C-0966512-I14
+3VRUN
R394
X_10KR0402
PP
R393
10KR0402

MICRO-STAR INT'L CO.,LTD.

Title	TPM	
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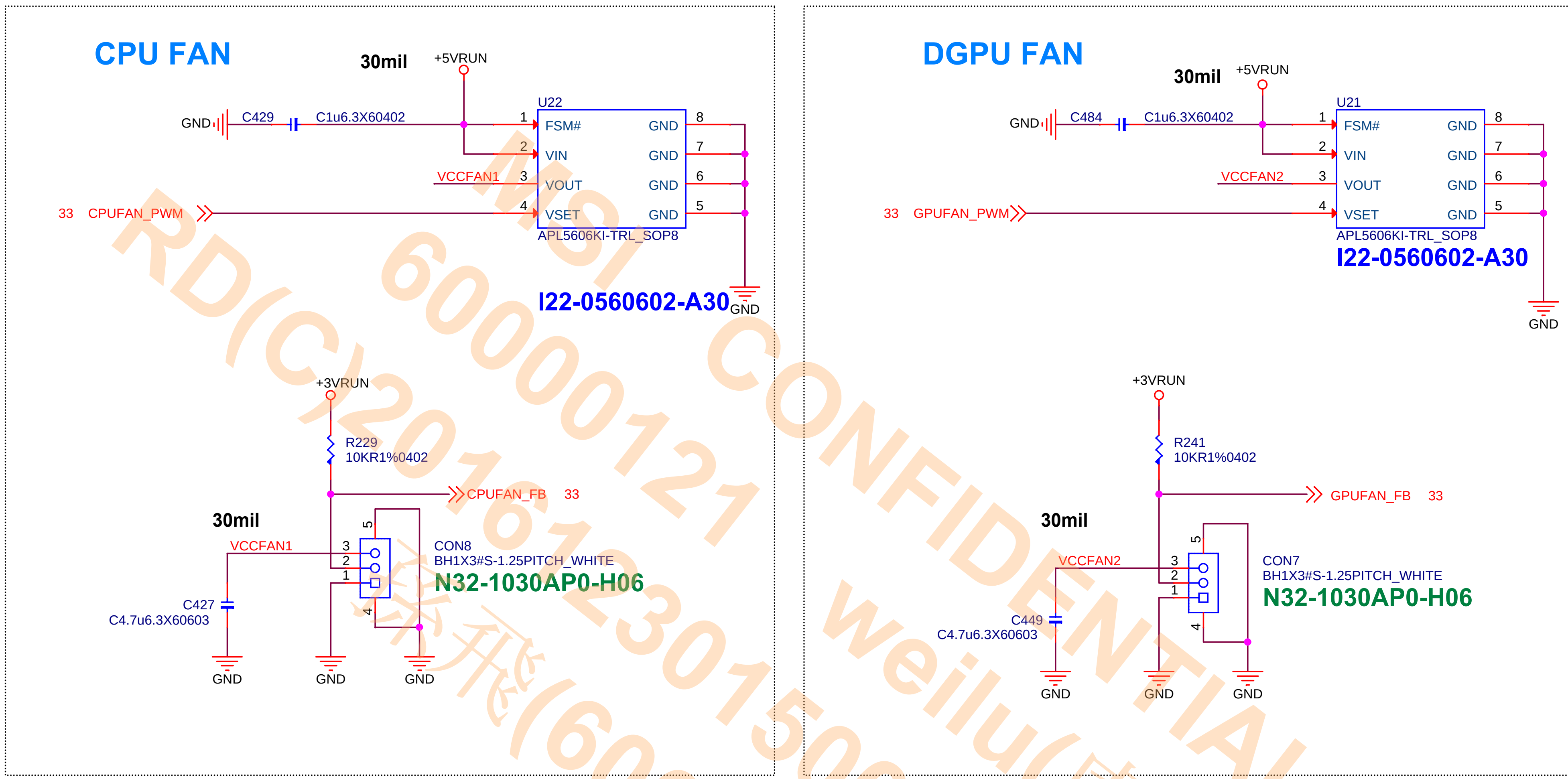
CPU FAN
30mil
+5VRUN
GND
C429
C1u6.3X60402
U22
1 FSM#
2 VIN
3 VOUT
4 VSET
GND 8
GND 7
GND 6
GND 5
VCCFAN1
33 CPUFAN_PWM
APL5606KI-TRL_SOP8
I22-0560602-A30
GND
+3VRUN
R229
10KR1%0402
CPUFAN_FB 33
30mil
VCCFAN1
CON8
BH1X3#S-1.25PITCH_WHITE
N32-1030AP0-H06
C427
C4.7u6.3X60603
GND
GND
GND
DGPU FAN
30mil
+5VRUN
GND
C484
C1u6.3X60402
U21
1 FSM#
2 VIN
3 VOUT
4 VSET
GND 8
GND 7
GND 6
GND 5
VCCFAN2
33 GPUFAN_PWM
APL5606KI-TRL_SOP8
I22-0560602-A30
GND
+3VRUN
R241
10KR1%0402
GPUFAN_FB 33
30mil
VCCFAN2
CON7
BH1X3#S-1.25PITCH_WHITE
N32-1030AP0-H06
C449
C4.7u6.3X60603
GND
GND
GND

MICRO-STAR INT'L CO.,LTD.

Title
CPU FAN/DGPU FAN

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Thunderbolt

GPIO	Internal		Power Rail
GPIO_0	10K	PU	VCC3V3_LC
GPIO_1	10K	PU	VCC3V3_LC
GPIO_2	100K	PD	
GPIO_3	100K	PD	
GPIO_4	10K	PU	VCC3V3_LC
GPIO_5	10K	PU	VCC3V3_LC
GPIO_6	100K	PD	
GPIO_7	100K	PD	
GPIO_8	100K	PD	
POC_GPIO_0	10K	PU	VCC3V3_TBT_SX
POC_GPIO_1	10K	PU	VCC3V3_TBT_SX
POC_GPIO_2	100K	PD	
POC_GPIO_3	100K	PD	
POC_GPIO_4	10K	PU	VCC3V3_TBT_SX
POC_GPIO_5	10K	PU	VCC3V3_TBT_SX
POC_GPIO_6	100K	PD	

Supported types of Flash Memory	
Manufacturer	Type
AMIC	A25L080
Spansion	S25FL208K
Winbond	W25Q80DV

MICRO-STAR INT'L CO.,LTD.

Title: Alpine Ridge (1)

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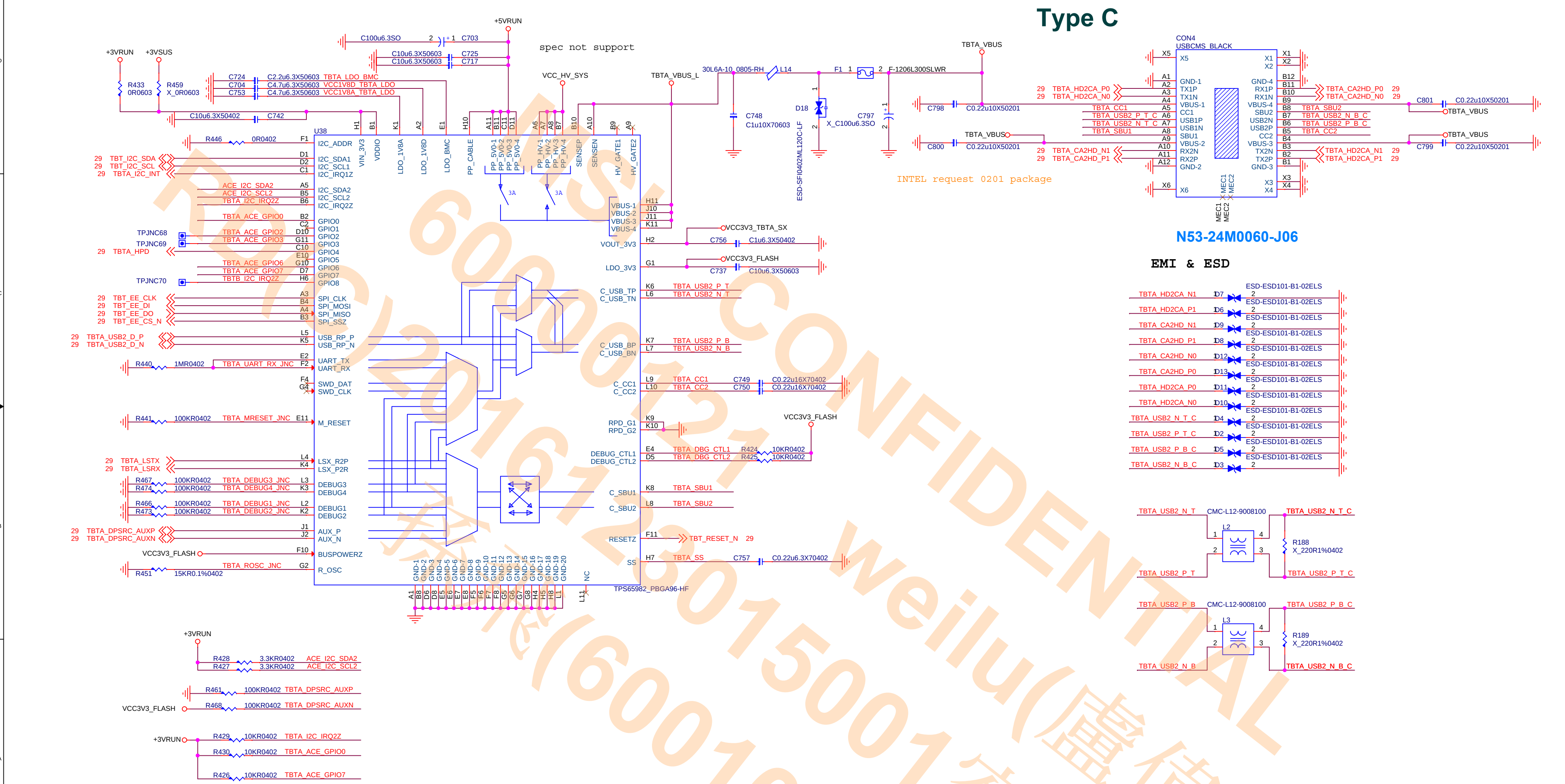
Type C



MICRO-STAR INT'L CO.,LTD.

Title	Apline Ridge (2)
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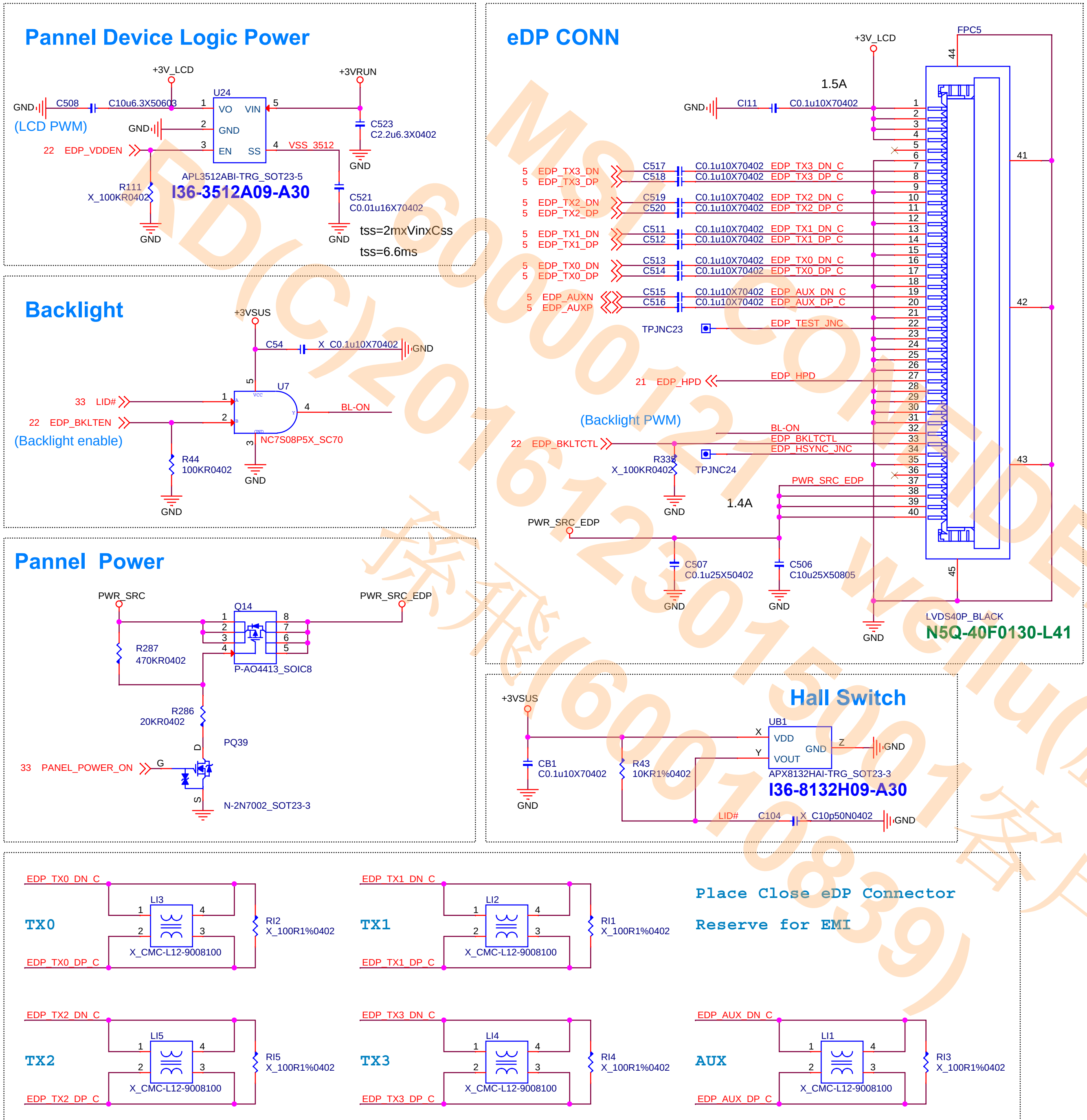
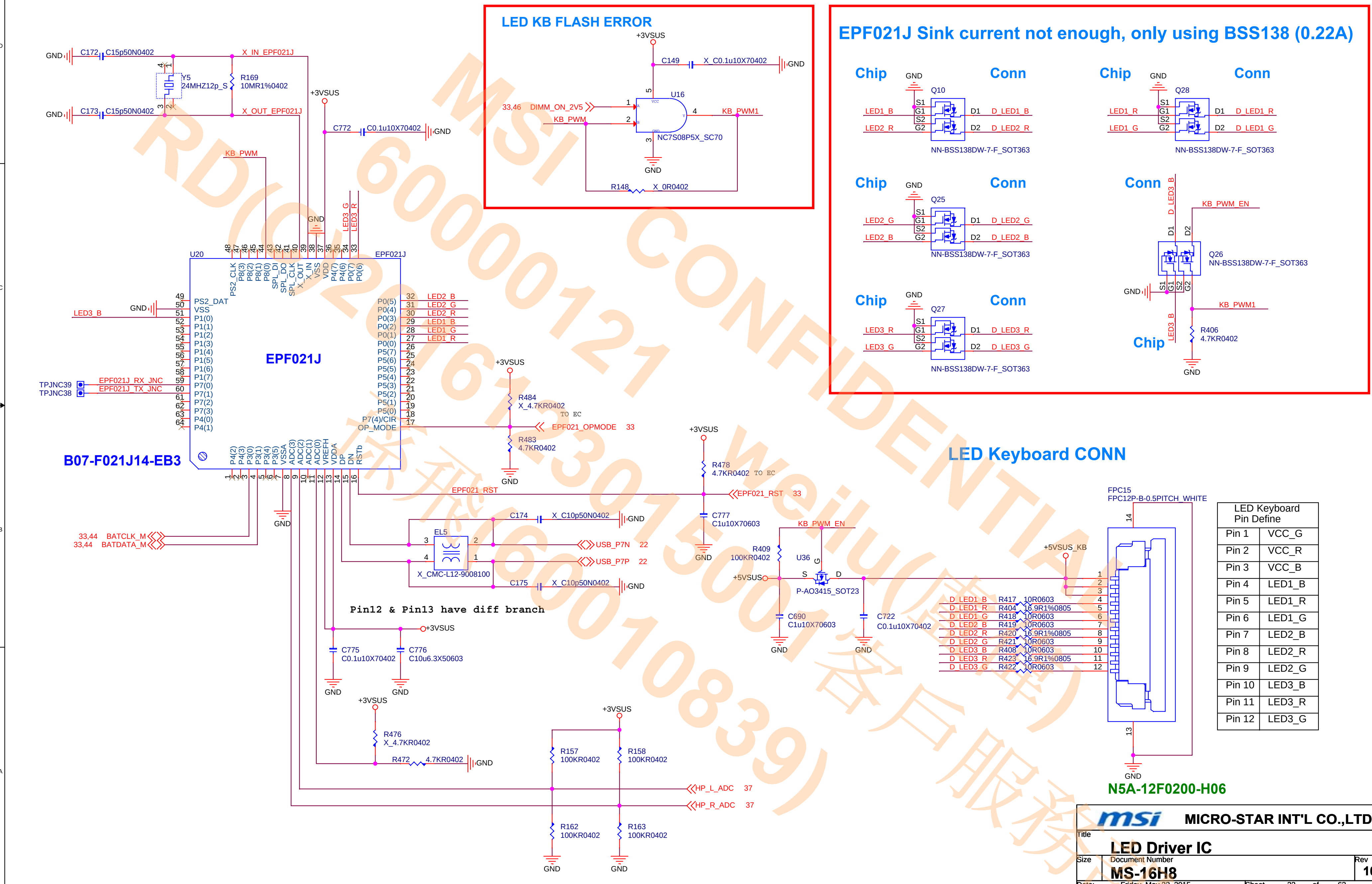

Pannel Device Logic Power
+3V_LCD
+3VRUN
C508 C10u6.3X50603
U24
VO VIN
GND
EN SS
(LCD PWM)
22 EDP_VDDEN
C523 C2.2u6.3X0402
VSS_3512
APL3512ABI-TRG_SOT23-5
I36-3512A09-A30
R111 X_100KR0402
C521 C0.01u16X70402
tss=2mxVinxCss
tss=6.6ms
GND
Backlight
+3VSUS
C54 X_C0.1u10X70402
33 LID#
22 EDP_BKLTEN
(Backlight enable)
U7
BL-ON
NC7S08P5X_SC70
R44 100KR0402
Pannel Power
PWR_SRC
PWR_SRC_EDP
Q14
R287 470KR0402
P-AO4413_SOIC8
R286 20KR0402
PQ39
33 PANEL_POWER_ON
N-2N7002_SOT23-3
eDP CONN
+3V_LCD
FPC5
1.5A
CI11 C0.1u10X70402
5 EDP_TX3_DN
5 EDP_TX3_DP
5 EDP_TX2_DN
5 EDP_TX2_DP
5 EDP_TX1_DN
5 EDP_TX1_DP
5 EDP_TX0_DN
5 EDP_TX0_DP
5 EDP_AUXN
5 EDP_AUXP
TPJNC23
EDP_TEST_JNC
21 EDP_HPD
(Backlight PWM)
22 EDP_BKLTCTL
EDP_HSYNC_JNC
R338 X_100KR0402
TPJNC24
PWR_SRC_EDP
1.4A
C507 C0.1u25X50402
C506 C10u25X50805
LVDS40P_BLACK
N5Q-40F0130-L41
Hall Switch
+3VSUS
UB1
VDD GND VOUT
CB1 C0.1u10X70402
R43 10KR1%0402
APX8132HAI-TRG_SOT23-3
I36-8132H09-A30
LID#
C104 X_C10p50N0402
TX0
TX1
TX2
TX3
AUX
X_CMC-L12-9008100
X_100R1%0402
Place Close eDP Connector
Reserve for EMI

LCD Module Pin Define

Pin No	Symbol	Description
1	WP	EEPROM Write Protect(Keep open)
2	H_GND	High Speed Ground(0V)
3	eDP_Rx_3N	Complement Signal Link Lane 3
4	eDP_Rx_3P	True Signal Link Lane 3
5	H_GND	High Speed Ground(0V)
6	eDP_Rx_2N	Complement Signal Link Lane 2
7	eDP_Rx_2P	True Signal Link Lane 2
8	H_GND	H_GND
9	eDP_Rx_1N	Complement Signal Link Lane 1
10	eDP_Rx_1P	True Signal Link Lane 1
11	H_GND	H_GND
12	eDP_Rx_0N	Complement Signal Link Lane 0
13	eDP_Rx_0P	True Signal Link Lane 0
14	H_GND	H_GND
15	eDP_AUX_CH_P	True Signal Aux Channel
16	eDP_AUX_CH_N	Complement Signal Aux Channel
17	H_GND	H_GND
18	LCD_VCC	LCD logic and driver power
19	LCD_VCC	LCD logic and driver power
20	LCD_VCC	LCD logic and driver power
21	LCD_VCC	LCD logic and driver power
22	TEST	LCD Test Port
23	LCD_GND	LCD logic and driver ground(0V)
24	LCD_GND	LCD logic and driver ground(0V)
25	LCD_GND	LCD logic and driver ground(0V)
26	LCD_GND	LCD logic and driver ground(0V)
27	eDP_HPD	HPD signal pin
28	BL_GND	Backlight ground(0V)
29	BL_GND	Backlight ground(0V)
30	BL_GND	Backlight ground(0V)
31	BL_GND	Backlight ground(0V)
32	BL_ENABLE	Backlight enable
33	BL_PWM_DIM	System PWM signal input
34	SDA	I2C-bus Data
35	SCL	I2C-bus Clock
36	BL_PWR	Backlight power (5~21V)
37	BL_PWR	Backlight power (5~21V)
38	BL_PWR	Backlight power (5~21V)
39	BL_PWR	Backlight power (5~21V)
40	HSYNC	HSYNC output from Tcon

LED Driver IC(EPF021J)



LED Keyboard Pin Define

Pin	Signal
Pin 1	VCC_G
Pin 2	VCC_R
Pin 3	VCC_B
Pin 4	LED1_B
Pin 5	LED1_R
Pin 6	LED1_G
Pin 7	LED2_B
Pin 8	LED2_R
Pin 9	LED2_G
Pin 10	LED3_B
Pin 11	LED3_R
Pin 12	LED3_G

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Title: LED Driver IC

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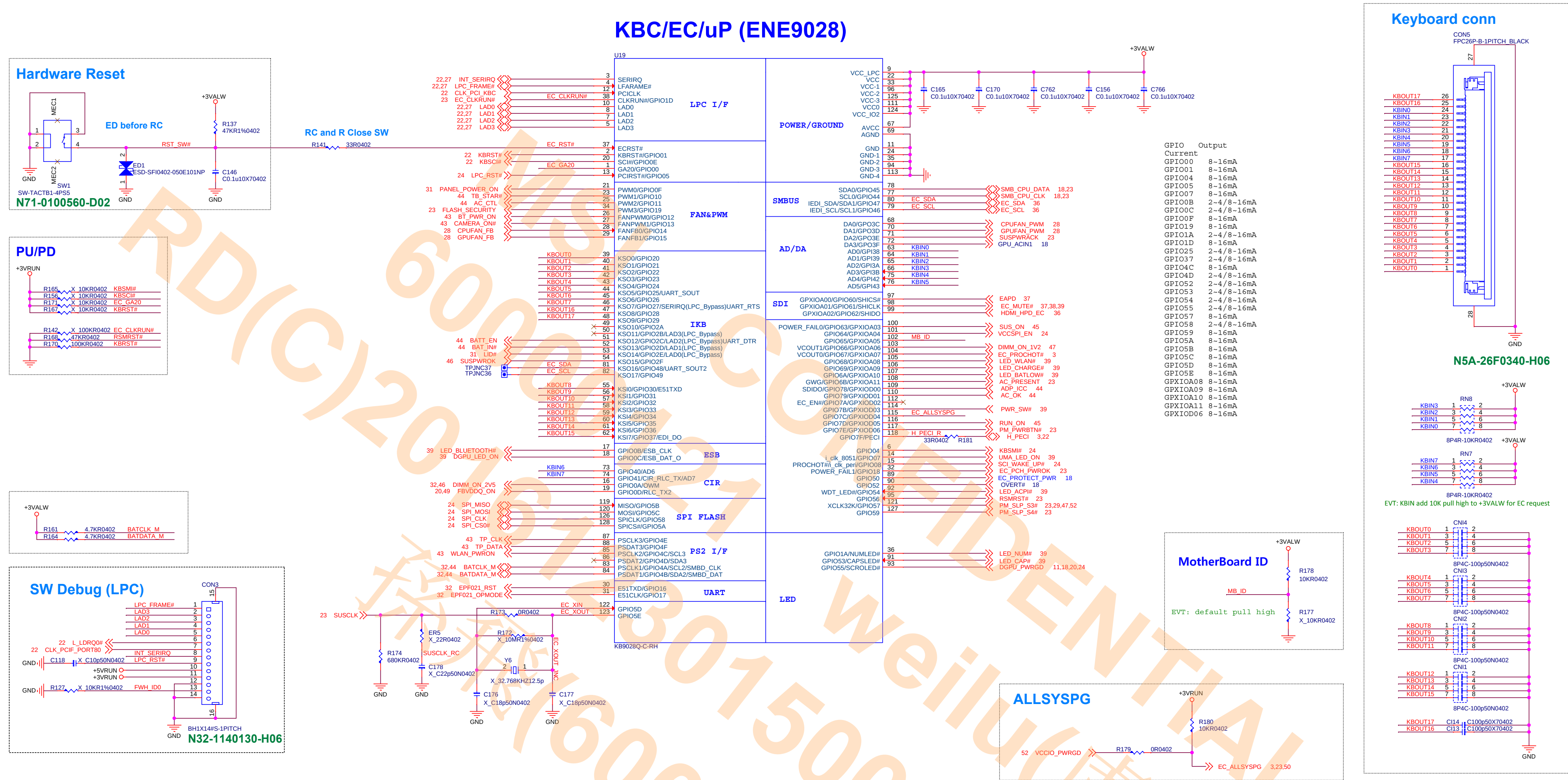
KBC/EC/uP (ENE9028)



GPIO	Output Current
GPIO00	8~16mA
GPIO01	8~16mA
GPIO04	8~16mA
GPIO05	8~16mA
GPIO07	8~16mA
GPIO0B	2~4/8~16mA
GPIO0C	2~4/8~16mA
GPIO0F	8~16mA
GPIO19	8~16mA
GPIO1A	2~4/8~16mA
GPIO1D	8~16mA
GPIO25	2~4/8~16mA
GPIO37	2~4/8~16mA
GPIO4C	8~16mA
GPIO4D	2~4/8~16mA
GPIO52	2~4/8~16mA
GPIO53	2~4/8~16mA
GPIO54	2~4/8~16mA
GPIO55	2~4/8~16mA
GPIO57	8~16mA
GPIO58	2~4/8~16mA
GPIO59	8~16mA
GPIO5A	8~16mA
GPIO5B	8~16mA
GPIO5C	8~16mA
GPIO5D	8~16mA
GPIO5E	8~16mA
GPXIOA08	8~16mA
GPXIOA09	8~16mA
GPXIOA10	8~16mA
GPXIOA11	8~16mA
GPXIOD06	8~16mA

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Title: KBC (ENE9028)

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CardReader (RTS5249)

Power Trace

Pin11(3V3_IN) / Pin 12(CARD_3V3)trace fixed width is 40 mils (minimum)

Pin27(3V3aux) / Pin 13(SD_VDD2)trace fixed width is 30 mils (minimum)

Pin10(AV12) / Pin 14(DV12S) / Pin 18(DV33_18) / Pin 24(SDREG2)trace fixed width is 20 mils (minimum)

Keep the trace routing lengths is limit to 200 mils

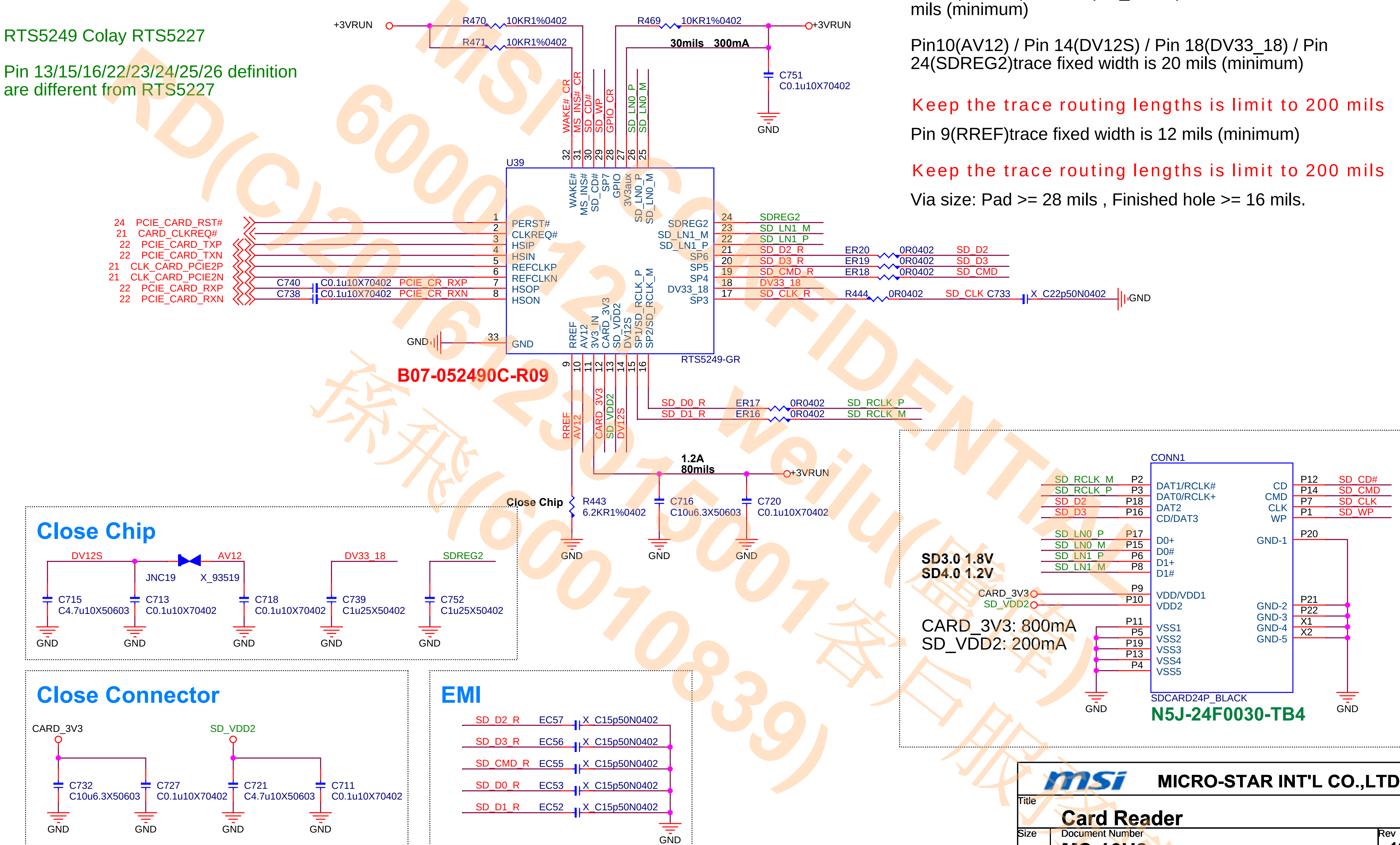
Pin 9(RREF)trace fixed width is 12 mils (minimum)

Keep the trace routing lengths is limit to 200 mils

Via size: Pad >= 28 mils , Finished hole >= 16 mils.

RTS5249 Colay RTS5227

Pin 13/15/16/22/23/24/25/26 definition are different from RTS5227



U39
RTS5249-GR
B07-052490C-R09
+3VRUN
R470 10KR1%0402
R471 10KR1%0402
R469 10KR1%0402
30mils 300mA
C751 C0.1u10X70402
GND
PERST#
CLKREQ#
HSIP
HSIN
REFCLKP
REFCLKN
HSOP
HSON
SDREG2
SD_LN1_M
SD_LN1_P
SP6
SP5
SP4
DV33_18
SP3
24 PCIE_CARD_RST#
21 CARD_CLKREQ#
22 PCIE_CARD_TXP
22 PCIE_CARD_TXN
21 CLK_CARD_PCIE2P
21 CLK_CARD_PCIE2N
22 PCIE_CARD_RXP
22 PCIE_CARD_RXN
C740 C0.1u10X70402 PCIE_CR_RXP
C738 C0.1u10X70402 PCIE_CR_RXN
SD_D2_R ER20 0R0402 SD_D2
SD_D3_R ER19 0R0402 SD_D3
SD_CMD_R ER18 0R0402 SD_CMD
DV33_18
SD_CLK_R R444 0R0402 SD_CLK C733 X_C22p50N0402
SD_D0_R ER17 0R0402 SD_RCLK_P
SD_D1_R ER16 0R0402 SD_RCLK_M
1.2A
80mils
Close Chip
R443 6.2KR1%0402
C716 C10u6.3X50603
C720 C0.1u10X70402
Close Chip
DV12S
AV12
JNC19
X_93519
DV33_18
SDREG2
C715 C4.7u10X50603
C713 C0.1u10X70402
C718 C0.1u10X70402
C739 C1u25X50402
C752 C1u25X50402
Close Connector
CARD_3V3
SD_VDD2
C732 C10u6.3X50603
C727 C0.1u10X70402
C721 C4.7u10X50603
C711 C0.1u10X70402
EMI
SD_D2_R EC57 X_C15p50N0402
SD_D3_R EC56 X_C15p50N0402
SD_CMD_R EC55 X_C15p50N0402
SD_D0_R EC53 X_C15p50N0402
SD_D1_R EC52 X_C15p50N0402
CONN1
SD3.0 1.8V
SD4.0 1.2V
CARD_3V3: 800mA
SD_VDD2: 200mA
DAT1/RCLK#
DAT0/RCLK+
DAT2
CD/DAT3
D0+
D0#
D1+
D1#
VDD/VDD1
VDD2
VSS1
VSS2
VSS3
VSS4
VSS5
CD
CMD
CLK
WP
GND-1
GND-2
GND-3
GND-4
GND-5
SD_CD#
SD_CMD
SD_CLK
SD_WP
SDCARD24P_BLACK
N5J-24F0030-TB4

msi	MICRO-STAR INT'L CO.,LTD.
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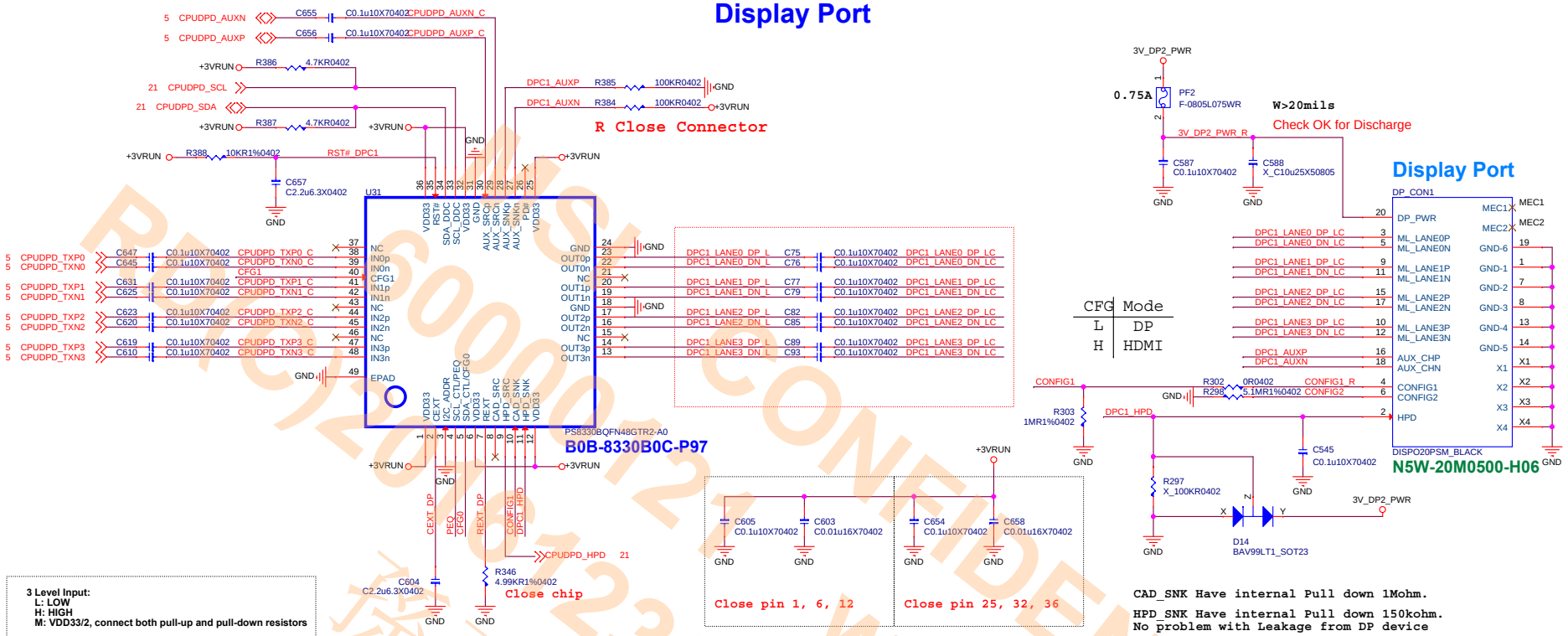
Display Port



MSI	MICRO-STAR INT'L CO.,LTD.		
Title	DP with Repeater		
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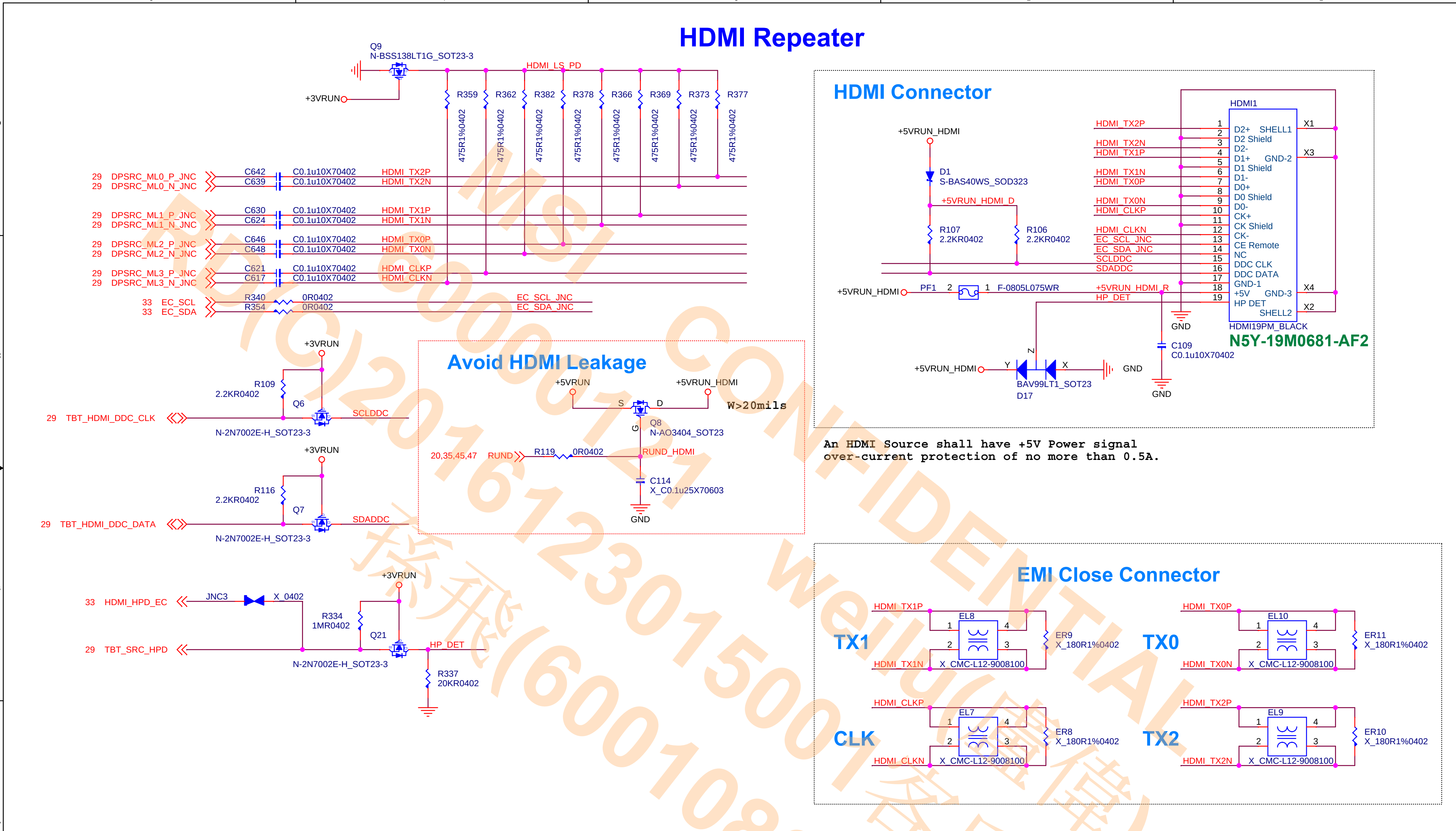
HDMI Repeater


HDMI Repeater
HDMI Connector
Avoid HDMI Leakage
EMI Close Connector
Q9 N-BSS138LT1G_SOT23-3
+3VRUN
HDMI_LS_PD
R359 R362 R382 R378 R366 R369 R373 R377
475R1%0402
29 DPSRC_ML0_P_JNC
29 DPSRC_ML0_N_JNC
29 DPSRC_ML1_P_JNC
29 DPSRC_ML1_N_JNC
29 DPSRC_ML2_P_JNC
29 DPSRC_ML2_N_JNC
29 DPSRC_ML3_P_JNC
29 DPSRC_ML3_N_JNC
33 EC_SCL
33 EC_SDA
C642 C639 C630 C624 C646 C648 C621 C617
C0.1u10X70402
HDMI_TX2P
HDMI_TX2N
HDMI_TX1P
HDMI_TX1N
HDMI_TX0P
HDMI_TX0N
HDMI_CLKP
HDMI_CLKN
R340 0R0402
R354 0R0402
EC_SCL_JNC
EC_SDA_JNC
R109 2.2KR0402
Q6 N-2N7002E-H_SOT23-3
29 TBT_HDMI_DDC_CLK
SCLDDC
R116 2.2KR0402
Q7 N-2N7002E-H_SOT23-3
29 TBT_HDMI_DDC_DATA
SDADDC
+5VRUN
+5VRUN_HDMI
W>20mils
Q8 N-AO3404_SOT23
20,35,45,47 RUND
R119 0R0402
RUND_HDMI
C114 X_C0.1u25X70603
GND
33 HDMI_HPD_EC
JNC3 X_0402
R334 1MR0402
Q21
29 TBT_SRC_HPD
N-2N7002E-H_SOT23-3
HP_DET
R337 20KR0402
D1 S-BAS40WS_SOD323
+5VRUN_HDMI_D
R107 2.2KR0402
R106 2.2KR0402
PF1 F-0805L075WR
+5VRUN_HDMI_R
HP_DET
BAV99LT1_SOT23
D17
C109 C0.1u10X70402
HDMI1
D2+ D2 Shield D2- D1+ D1 Shield D1- D0+ D0 Shield D0- CK+ CK Shield CK- CE Remote NC DDC CLK DDC DATA GND-1 +5V HP DET
SHELL1 GND-2 GND-3 SHELL2
X1 X2 X3 X4
HDMI19PM_BLACK
N5Y-19M0681-AF2
EC_SCL_JNC
EC_SDA_JNC
SCLDDC
SDADDC
TX1
EL8 X_CMC-L12-9008100
ER9 X_180R1%0402
TX0
EL10 X_CMC-L12-9008100
ER11 X_180R1%0402
CLK
EL7 X_CMC-L12-9008100
ER8 X_180R1%0402
TX2
EL9 X_CMC-L12-9008100
ER10 X_180R1%0402

An HDMI Source shall have +5V Power signal over-current protection of no more than 0.5A.

MICRO-STAR INT'L CO.,LTD.			
Title	HDMI Repeater		
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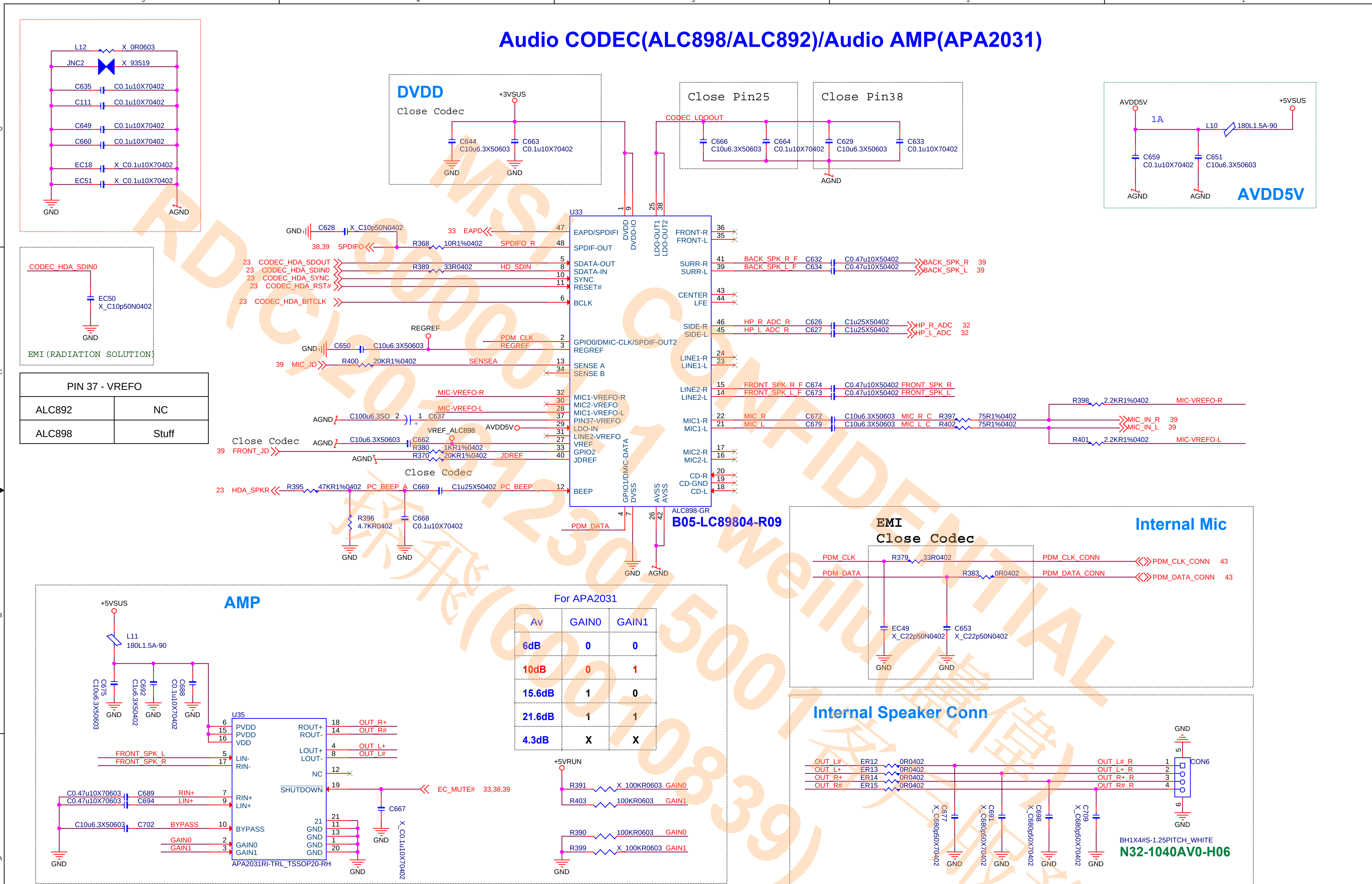
Audio CODEC(ALC898/ALC892)/Audio AMP(APA2031)


DVDD
Close Codec
+3VSUS
C644 C10u6.3X50603
C663 C0.1u10X70402
Close Pin25
Close Pin38
CODEC_LDOOUT
C666 C10u6.3X50603
C664 C0.1u10X70402
C629 C10u6.3X50603
C633 C0.1u10X70402
AVDD5V
+5VSUS
1A
L10 180L1.5A-90
C659 C0.1u10X70402
C651 C10u6.3X50603
AVDD5V
L12 X_0R0603
JNC2 X_93519
C635 C0.1u10X70402
C111 C0.1u10X70402
C649 C0.1u10X70402
C660 C0.1u10X70402
EC18 X_C0.1u10X70402
EC51 X_C0.1u10X70402
GND
AGND
CODEC_HDA_SDIN0
EC50 X_C10p50N0402
EMI(RADIATION SOLUTION)
U33
EAPD/SPDIFI
SPDIF-OUT
SDATA-OUT
SDATA-IN
SYNC
RESET#
BCLK
GPIO0/DMIC-CLK/SPDIF-OUT2
REGREF
SENSE A
SENSE B
MIC1-VREFO-R
MIC2-VREFO
MIC1-VREFO-L
PIN37-VREFO
LDO-IN
LINE2-VREFO
VREF
GPIO2
JDREF
BEEP
FRONT-R
FRONT-L
SURR-R
SURR-L
CENTER
LFE
SIDE-R
SIDE-L
LINE1-R
LINE1-L
LINE2-R
LINE2-L
MIC1-R
MIC1-L
MIC2-R
MIC2-L
CD-R
CD-GND
CD-L
ALC898-GR
B05-LC89804-R09
CODEC_HDA_SDOUT
CODEC_HDA_SDIN0
CODEC_HDA_SYNC
CODEC_HDA_RST#
CODEC_HDA_BITCLK
BACK_SPK_R
BACK_SPK_L
HP_R_ADC
HP_L_ADC
FRONT_SPK_R
FRONT_SPK_L
MIC_IN_R
MIC_IN_L
MIC-VREFO-R
MIC-VREFO-L
HDA_SPKR
FRONT_JD
MIC_JD
PDM_CLK
PDM_DATA
Close Codec
EMI
Internal Mic
R379 33R0402
R383 0R0402
EC49 X_C22p50N0402
C653 X_C22p50N0402
PDM_CLK_CONN
PDM_DATA_CONN
AMP
+5VSUS
L11 180L1.5A-90
C675 C10u6.3X50603
C692 C1u6.3X50402
C688 C0.1u10X70402
U35
PVDD
VDD
LIN-
RIN-
RIN+
LIN+
BYPASS
GAIN0
GAIN1
ROUT+
ROUT-
LOUT+
LOUT-
NC
SHUTDOWN
APA2031RI-TRL_TSSOP20-RH
EC_MUTE#
C667 X_C0.1u10X70402
+5VRUN
R391 X_100KR0603
R403 100KR0603
R390 100KR0603
R399 X_100KR0603
Internal Speaker Conn
ER12 0R0402
ER13 0R0402
ER14 0R0402
ER15 0R0402
CON6
BH1X4#S-1.25PITCH_WHITE
N32-1040AV0-H06

PIN 37 - VREFO	
ALC892	NC
ALC898	Stuff

For APA2031

Av	GAIN0	GAIN1
6dB	0	0
10dB	0	1
15.6dB	1	0
21.6dB	1	1
4.3dB	X	X

MICRO-STAR INT'L CO.,LTD.

Title: Audio CODEC/Audio AMP

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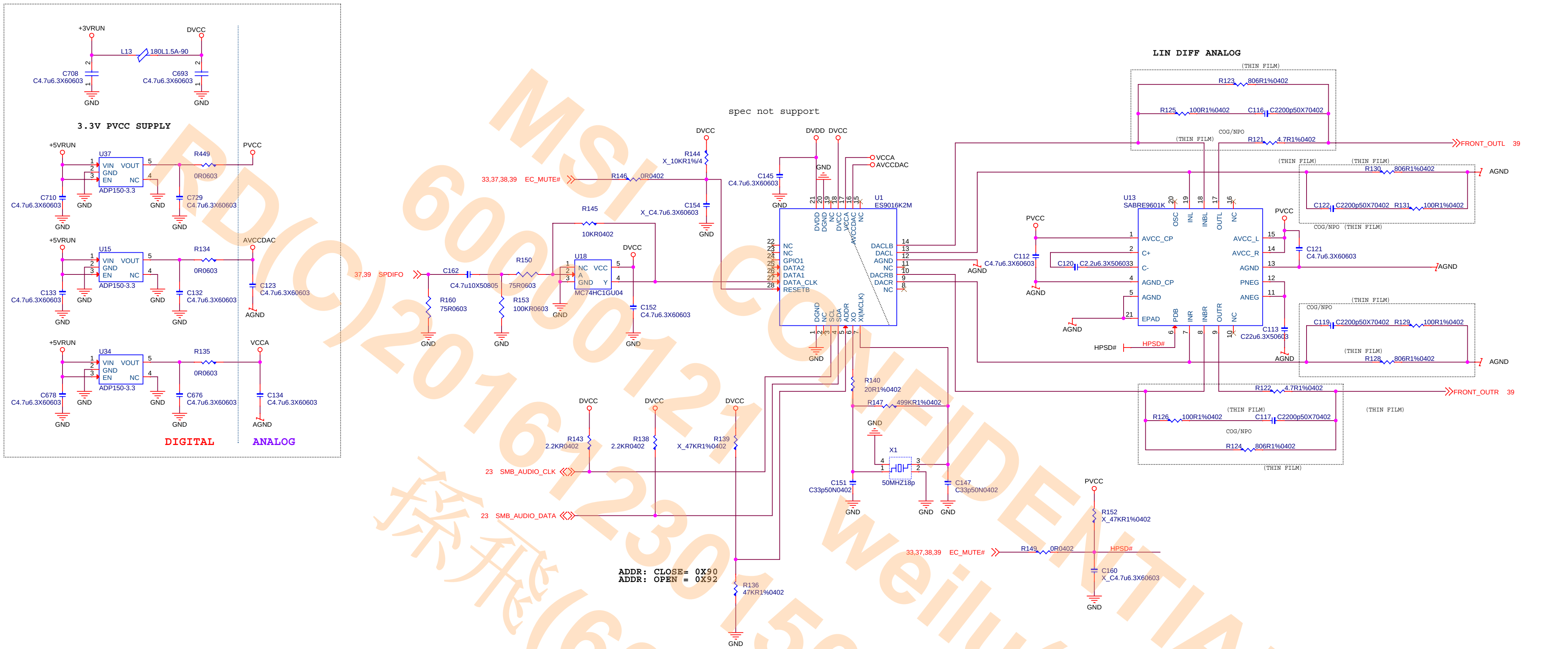
Audio DAC(ES9018)/Headphone Driver(SABRE9601)



3.3V PVCC SUPPLY
+3VRUN
DVCC
L13 180L1.5A-90
C708 C4.7u6.3X60603
C693 C4.7u6.3X60603
GND
+5VRUN
U37 ADP150-3.3
VIN VOUT GND EN NC
R449 0R0603
PVCC
C710 C4.7u6.3X60603
C729 C4.7u6.3X60603
U15 ADP150-3.3
R134 0R0603
AVCCDAC
C133 C4.7u6.3X60603
C132 C4.7u6.3X60603
C123 C4.7u6.3X60603
AGND
U34 ADP150-3.3
R135 0R0603
VCCA
C678 C4.7u6.3X60603
C676 C4.7u6.3X60603
C134 C4.7u6.3X60603
DIGITAL
ANALOG
spec not support
R144 X_10KR1%/4
33,37,38,39 EC_MUTE#
R146 0R0402
C154 X_C4.7u6.3X60603
R145 10KR0402
37,39 SPDIFO
C162 C4.7u10X50805
R150 75R0603
U18 MC74HC1GU04
NC VCC A GND Y
R160 75R0603
R153 100KR0603
C152 C4.7u6.3X60603
DVDD
C145 C4.7u6.3X60603
VCCA
AVCCDAC
U1 ES9016K2M
DVDD DGND NC DVCC VCCA AVCCDAC NC
NC NC GPIO1 DATA2 DATA1 DATA_CLK RESETB
DACLB DACL AGND NC DACRB DACR NC
DGND NC SCL SDA ADDR XO XI(MCLK)
R140 20R1%0402
R147 499KR1%0402
X1 50MHZ18p
C151 C33p50N0402
C147 C33p50N0402
R143 2.2KR0402
R138 2.2KR0402
R139 X_47KR1%0402
23 SMB_AUDIO_CLK
23 SMB_AUDIO_DATA
ADDR: CLOSE= 0X90
ADDR: OPEN = 0X92
R136 47KR1%0402
LIN DIFF ANALOG
(THIN FILM)
R123 806R1%0402
R125 100R1%0402
C116 C2200p50X70402
COG/NPO
R121 4.7R1%0402
FRONT_OUTL 39
R130 806R1%0402
C122 C2200p50X70402
R131 100R1%0402
U13 SABRE9601K
OSC INL INBL OUTL NC
AVCC_CP C+ C- AGND_CP AGND EPAD
AVCC_L AVCC_R AGND PNEG ANEG
PDB INR INBR OUTR NC
C112 C4.7u6.3X60603
C120 C2.2u6.3X506033
C121 C4.7u6.3X60603
C113 C22u6.3X50603
HPSD#
C119 C2200p50X70402
R129 100R1%0402
R128 806R1%0402
R122 4.7R1%0402
FRONT_OUTR 39
R126 100R1%0402
C117 C2200p50X70402
R124 806R1%0402
R152 X_47KR1%0402
R149 0R0402
C160 X_C4.7u6.3X60603

msi	MICRO-STAR INT'L CO.,LTD.	
Title	Audio DAC/Headphone Driver	
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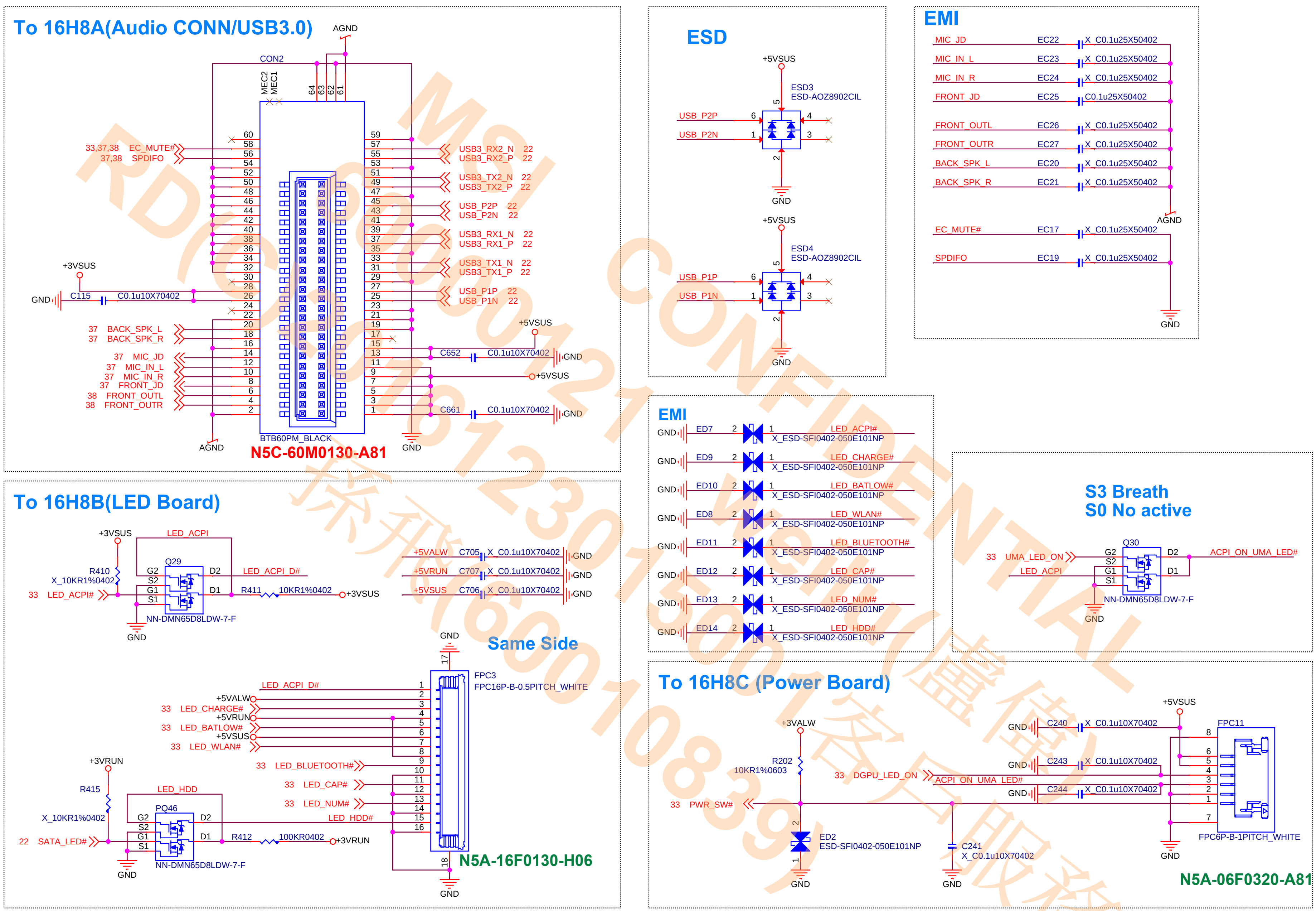
BTB CONN



MICRO-STAR INT'L CO.,LTD.

Title: BTB CONN

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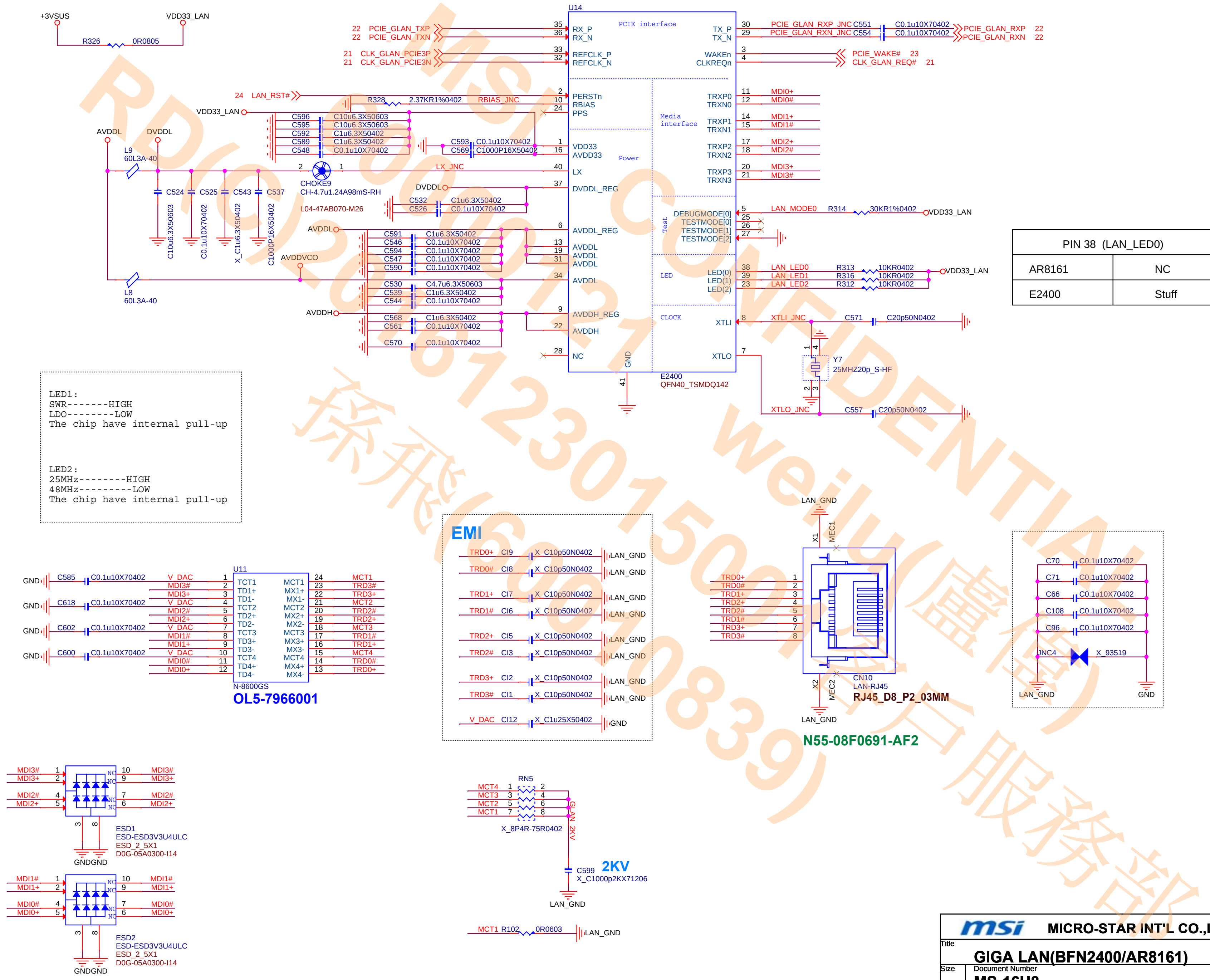
GIGA LAN(BFN2400/AR8161)



U14
PCIE interface
RX_P
RX_N
REFCLK_P
REFCLK_N
TX_P
TX_N
WAKEn
CLKREQn
PERSTn
RBIAS
PPS
VDD33
AVDD33
LX
DVDDL_REG
AVDDL_REG
AVDDL
AVDDH_REG
AVDDH
NC
Media interface
TRXP0
TRXN0
TRXP1
TRXN1
TRXP2
TRXN2
TRXP3
TRXN3
DEBUGMODE[0]
TESTMODE[0]
TESTMODE[1]
TESTMODE[2]
LED(0)
LED(1)
LED(2)
CLOCK
XTLI
XTLO
E2400
QFN40_TSMDQ142
PCIE_GLAN_TXP
PCIE_GLAN_TXN
CLK_GLAN_PCIE3P
CLK_GLAN_PCIE3N
PCIE_GLAN_RXP
PCIE_GLAN_RXN
PCIE_WAKE#
CLK_GLAN_REQ#
LAN_RST#
+3VSUS
VDD33_LAN
R326 0R0805
AVDDL
DVDDL
L9 60L3A-40
L8 60L3A-40
CHOKE9 CH-4.7u1.24A98mS-RH
L04-47AB070-M26
AVDDVCO
AVDDH
Y7 25MHZ20p_S-HF
XTLI_JNC
XTLO_JNC
LAN_LED0
LAN_LED1
LAN_LED2
U11
N-8600GS
OL5-7966001
EMI
LAN_GND
CN10
LAN-RJ45
RJ45_D8_P2_03MM
N55-08F0691-AF2
ESD1
ESD-ESD3V3U4ULC
ESD_2_5X1
D0G-05A0300-I14
ESD2
ESD-ESD3V3U4ULC
ESD_2_5X1
D0G-05A0300-I14
RN5
X_8P4R-75R0402
C599
X_C1000p2KX71206
2KV
MCT1 R102 0R0603

PIN 38 (LAN_LED0)	
AR8161	NC
E2400	Stuff

LED1:
SWR-------HIGH
LDO--------LOW
The chip have internal pull-up

LED2:
25MHz--------HIGH
48MHz---------LOW
The chip have internal pull-up

msi	MICRO-STAR INT'L CO.,LTD.
Title	GIGA LAN(BFN2400/AR8161)
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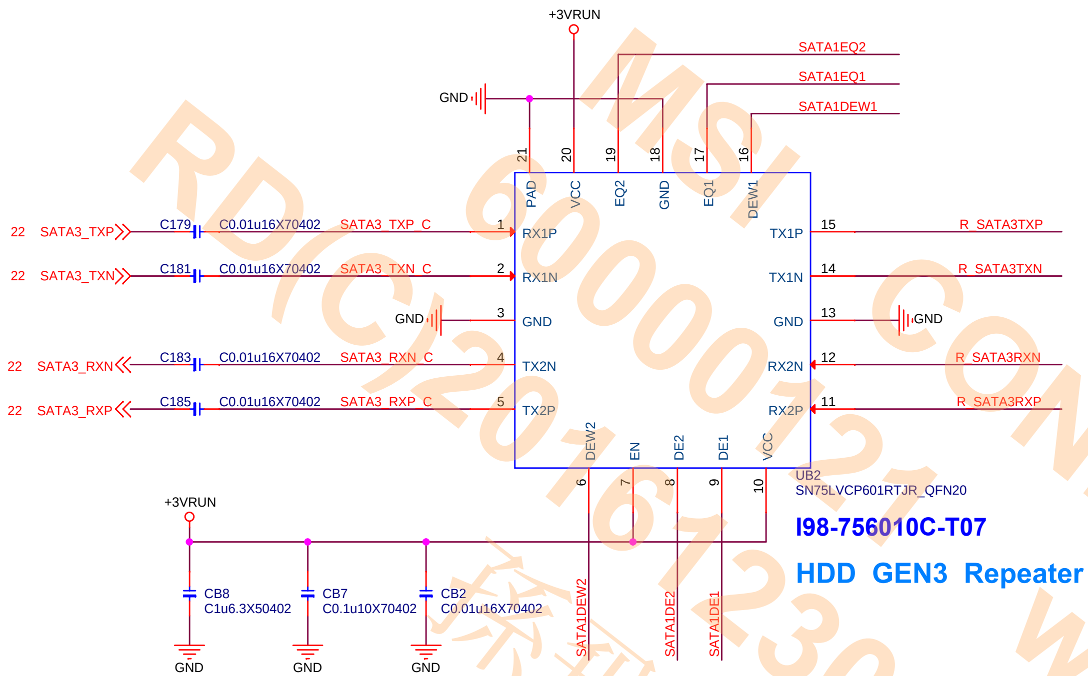
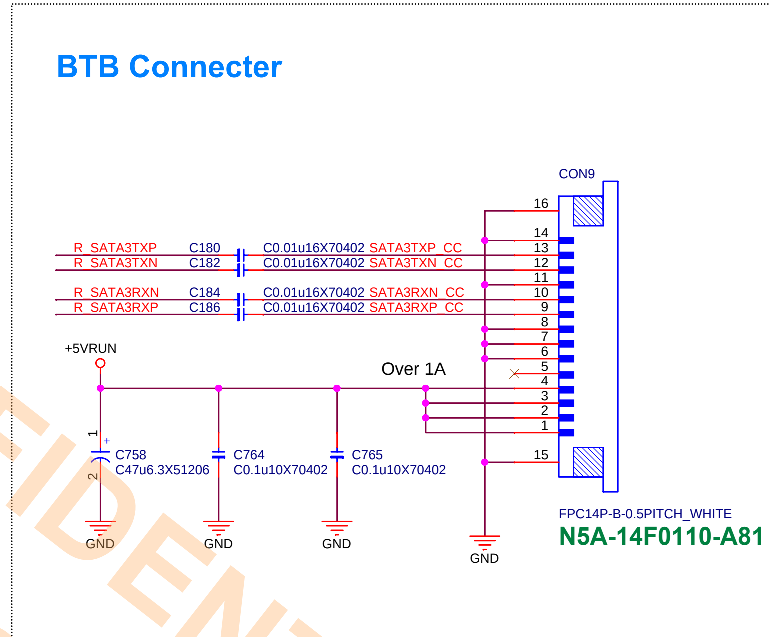
HDD (With Repeater)

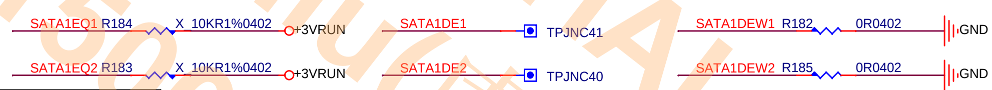
+3VRUN:80mA



+3VRUN
GND
SATA1EQ2
SATA1EQ1
SATA1DEW1
PAD
VCC
EQ2
GND
EQ1
DEW1
22 SATA3_TXP
C179 C0.01u16X70402 SATA3_TXP_C
22 SATA3_TXN
C181 C0.01u16X70402 SATA3_TXN_C
22 SATA3_RXN
C183 C0.01u16X70402 SATA3_RXN_C
22 SATA3_RXP
C185 C0.01u16X70402 SATA3_RXP_C
RX1P
RX1N
GND
TX2N
TX2P
TX1P
TX1N
GND
RX2N
RX2P
R_SATA3TXP
R_SATA3TXN
R_SATA3RXN
R_SATA3RXP
DEW2
EN
DE2
DE1
VCC
UB2
SN75LVCP601RTJR_QFN20
I98-756010C-T07
HDD GEN3 Repeater
+3VRUN
CB8 C1u6.3X50402
CB7 C0.1u10X70402
CB2 C0.01u16X70402
SATA1DEW2
SATA1DE2
SATA1DE1



BTB Connecter
CON9
R_SATA3TXP C180 C0.01u16X70402 SATA3TXP_CC
R_SATA3TXN C182 C0.01u16X70402 SATA3TXN_CC
R_SATA3RXN C184 C0.01u16X70402 SATA3RXN_CC
R_SATA3RXP C186 C0.01u16X70402 SATA3RXP_CC
+5VRUN
Over 1A
C758 C47u6.3X51206
C764 C0.1u10X70402
C765 C0.1u10X70402
GND
FPC14P-B-0.5PITCH_WHITE
N5A-14F0110-A81



TI SN75LVCP601RTJR HW Setting

DE1/DE2	CH1/CH2De-Emphasis dB(at 6Gbps)	DQ1/DQ2	CH1/CH2De-Emphasis dB(at 6Gbps)
NC(default)	-4	NC(default)	0
0	0	0	7
1	-2	1	14

DEW1/DEW2	Device Function --> De Width for CH1/CH2
0	De-emphasis Pulse duration, short(recommended setting when linkoperates at SATA 1.5/3/6 Gbps)
1(default)	De-emphasis Pulse duration, long(recommended setting when linkoperates at SATA 1.5/3/6 Gbps)

msi MICRO-STAR INT'L CO.,LTD.

Title: HDD With Repeater

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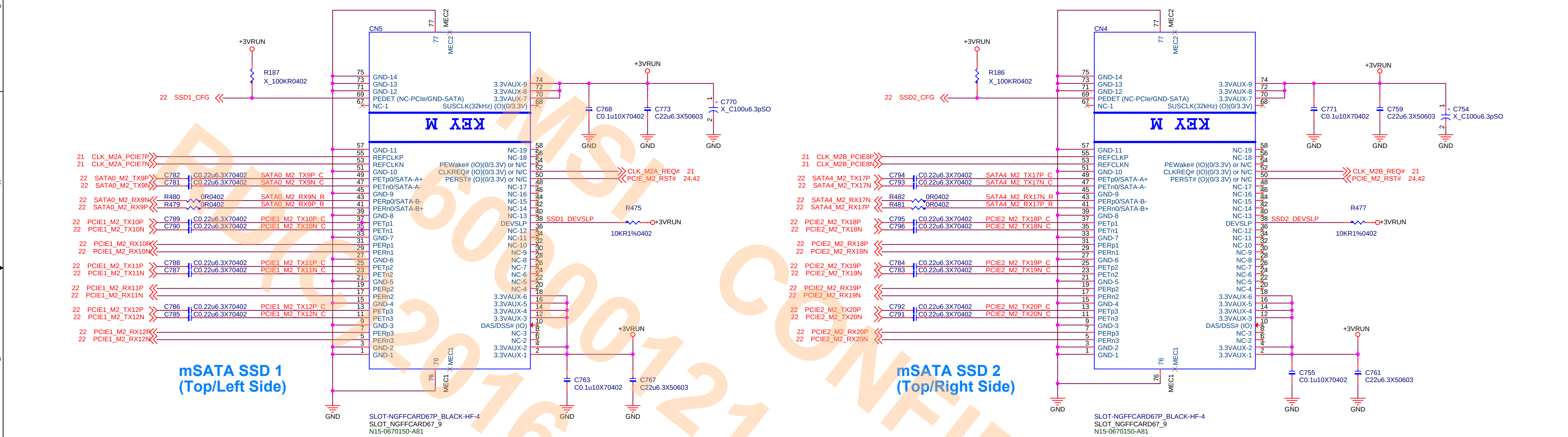
SSD



MICRO-STAR INT'L CO.,LTD.

Title	SSD	
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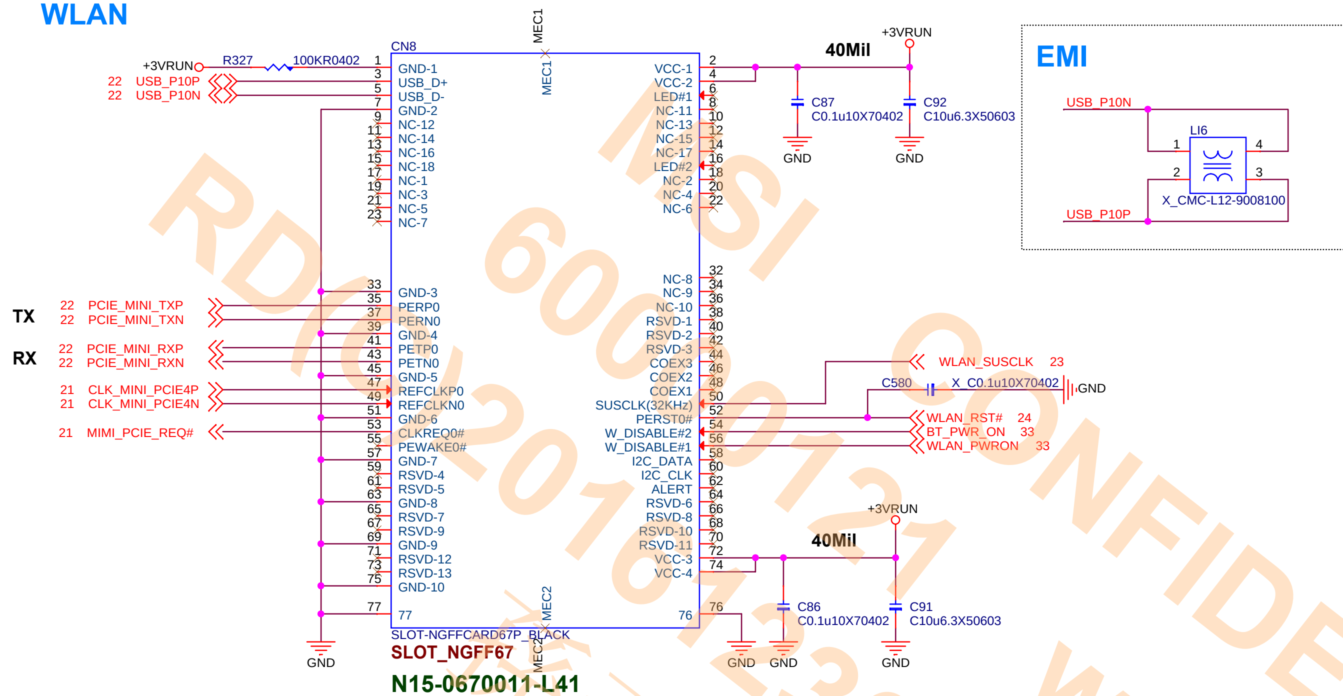
WLAN /Camera/ClickPad/FP

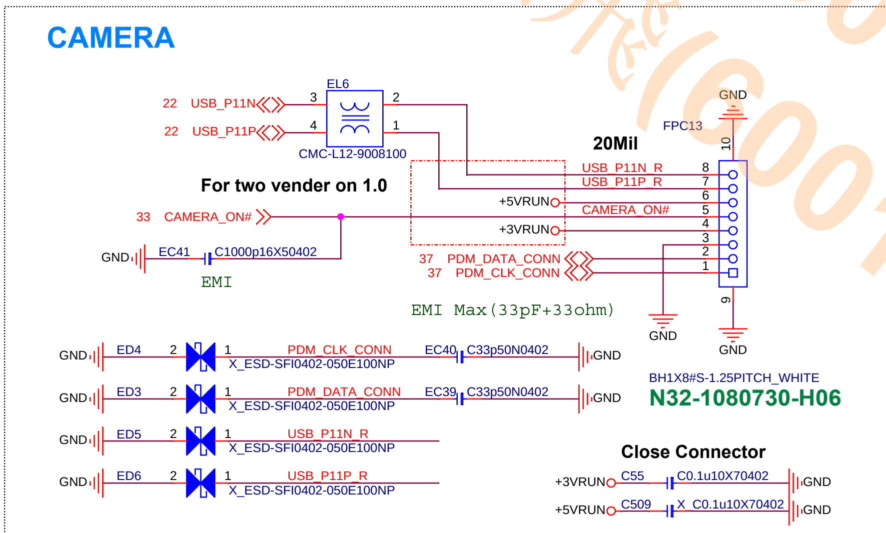
WLAN



CN8
+3VRUN
R327 100KR0402
22 USB_P10P
22 USB_P10N
TX
22 PCIE_MINI_TXP
22 PCIE_MINI_TXN
RX
22 PCIE_MINI_RXP
22 PCIE_MINI_RXN
21 CLK_MINI_PCIE4P
21 CLK_MINI_PCIE4N
21 MIMI_PCIE_REQ#
40Mil
C87 C0.1u10X70402
C92 C10u6.3X50603
WLAN_SUSCLK 23
C580 X_C0.1u10X70402
WLAN_RST# 24
BT_PWR_ON 33
WLAN_PWRON 33
C86 C0.1u10X70402
C91 C10u6.3X50603
SLOT-NGFFCARD67P_BLACK
SLOT_NGFF67
N15-0670011-L41
EMI
USB_P10N
USB_P10P
LI6
X_CMC-L12-9008100
GND

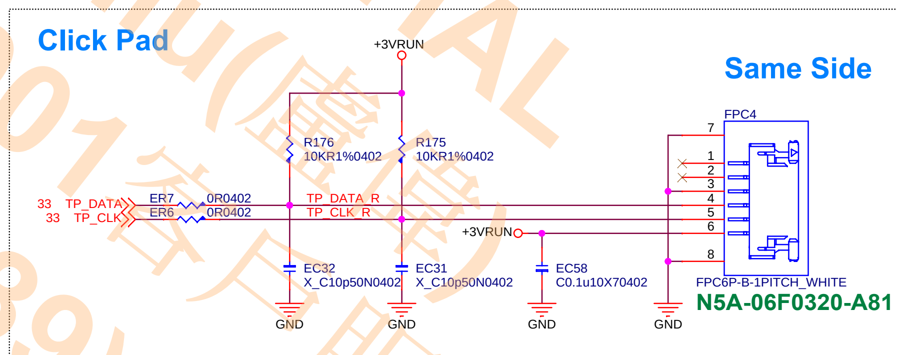
Pin 1	GND		
Pin 3	USB_D+	Pin 2	3.3V
Pin 5	USB_D-	Pin 4	3.3V
Pin 7	GND	Pin 6	LED1#
Pin 9	Module Key	Pin 8	Module Key
Pin 11	Module Key	Pin 10	Module Key
Pin 13	Module Key	Pin 12	Module Key
Pin 15	Module Key	Pin 14	Module Key
Pin 17	N/C	Pin 16	LED2#
Pin 19	N/C	Pin 18	GND
Pin 21	N/C	Pin 20	N/C
Pin 23	N/C	Pin 22	N/C
Pin 25	Module Key	Pin 24	Module Key
Pin 27	Module Key	Pin 26	Module Key
Pin 29	Module Key	Pin 28	Module Key
Pin 31	Module Key	Pin 30	Module Key
Pin 33	GND	Pin 32	N/C
Pin 35	PERP0	Pin 34	N/C
Pin 37	PERN0	Pin 36	N/C
Pin 39	GND	Pin 38	Clink Reset (I 3.3V)
Pin 41	PETP0	Pin 40	N/C
Pin 43	PETN0	Pin 42	N/C
Pin 45	GND	Pin 44	N/C
Pin 47	REFCLKP0	Pin 46	N/C
Pin 49	REFCLKN0	Pin 48	N/C
Pin 51	GND	Pin 50	N/C (SUSCLK (32kHz) for DSx)
Pin 53	CLKREQ0#	Pin 52	PERST0#
Pin 55	PEWAKE0#	Pin 54	BT_EN (W_DISABLE2#)
Pin 57	GND	Pin 56	WLAN_EN (W_DISABLE2#)
Pin 59	N/C	Pin 58	N/C
Pin 61	N/C	Pin 60	N/C
Pin 63	GND	Pin 62	N/C
Pin 65	N/C	Pin 64	Resever
Pin 67	N/C	Pin 66	N/C
Pin 69	GND	Pin 68	N/C
Pin 71	N/C	Pin 70	N/C
Pin 73	N/C	Pin 72	3.3V
Pin 75	GND	Pin 74	3.3V

CAMERA



EL6
22 USB_P11N
22 USB_P11P
CMC-L12-9008100
20Mil
FPC13
For two vender on 1.0
33 CAMERA_ON#
EC41 C1000p16X50402
EMI
37 PDM_DATA_CONN
37 PDM_CLK_CONN
EMI Max(33pF+33ohm)
ED4 X_ESD-SFI0402-050E100NP
ED3 X_ESD-SFI0402-050E100NP
ED5 X_ESD-SFI0402-050E100NP
ED6 X_ESD-SFI0402-050E100NP
EC40 C33p50N0402
EC39 C33p50N0402
BH1X8#S-1.25PITCH_WHITE
N32-1080730-H06
Close Connector
C55 C0.1u10X70402
C509 X_C0.1u10X70402

Click Pad



MICRO-STAR INT'L CO.,LTD.

Title: WLAN /Camera/ClickPad/FP

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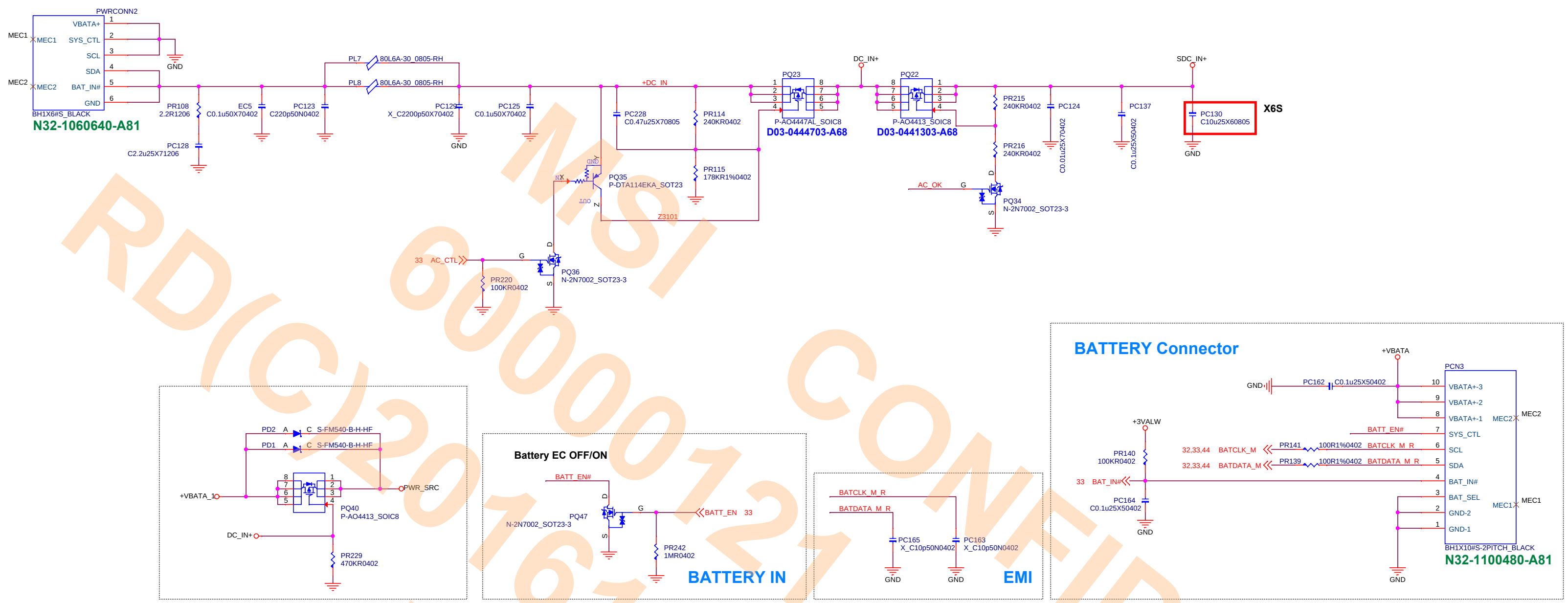
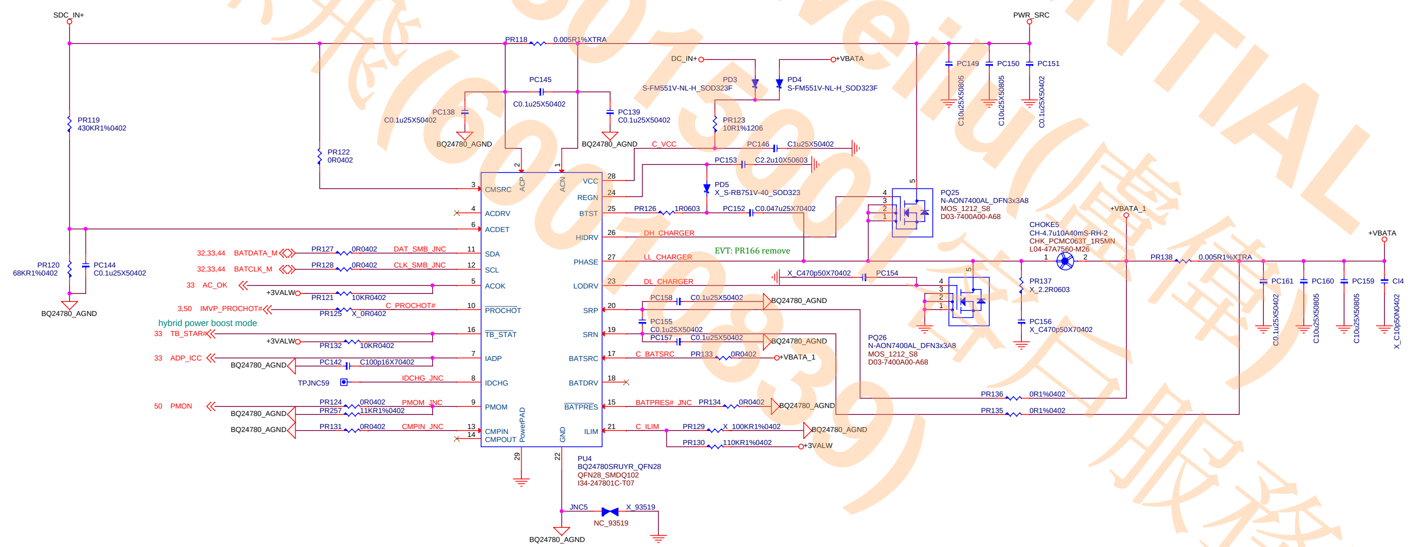
Battery Select/Charger

Battery Select


PWRCONN2
VBATA+
SYS_CTL
SCL
SDA
BAT_IN#
GND
MEC1
MEC2
BH1X6#S_BLACK
N32-1060640-A81
PL7 80L6A-30_0805-RH
PL8 80L6A-30_0805-RH
+DC_IN
DC_IN+
SDC_IN+
PQ23 P-AO4447AL_SOIC8
D03-0444703-A68
PQ22 P-AO4413_SOIC8
D03-0441303-A68
PC130 C10u25X60805
X6S
PQ35 P-DTA114EKA_SOT23
PQ36 N-2N7002_SOT23-3
PQ34 N-2N7002_SOT23-3
AC_CTL
AC_OK
PD2 S-FM540-B-H-HF
PD1 S-FM540-B-H-HF
+VBATA_1
PWR_SRC
PQ40 P-AO4413_SOIC8
PR229 470KR0402
Battery EC OFF/ON
BATT_EN#
PQ47 N-2N7002_SOT23-3
BATT_EN
PR242 1MR0402
BATTERY IN
BATCLK_M_R
BATDATA_M_R
PC165 X_C10p50N0402
PC163 X_C10p50N0402
EMI
BATTERY Connector
+VBATA
+3VALW
PCN3
VBATA+-3
VBATA+-2
VBATA+-1
SYS_CTL
SCL
SDA
BAT_IN#
BAT_SEL
GND-2
GND-1
BH1X10#S-2PITCH_BLACK
N32-1100480-A81

Battery Charger


SDC_IN+
PWR_SRC
PR118 0.005R1%XTRA
PU4 BQ24780SRUYR_QFN28
QFN28_SMDQ102
I34-247801C-T07
CMSRC
ACDRV
ACDET
SDA
SCL
ACOK
PROCHOT
TB_STAT
IADP
IDCHG
PMOM
CMPIN
CMPOUT
VCC
REGN
BTST
HIDRV
PHASE
LODRV
SRP
SRN
BATSRC
BATDRV
BATPRES
ILIM
BQ24780_AGND
PQ25 N-AON7400AL_DFN3x3A8
PQ26 N-AON7400AL_DFN3x3A8
CHOKE5 CH-4.7u10A40mS-RH-2
hybrid power boost mode
EVT: PR166 remove
+VBATA_1
+VBATA
PD3 S-FM551V-NL-H_SOD323F
PD4 S-FM551V-NL-H_SOD323F
PD5 X_S-RB751V-40_SOD323
PR138 0.005R1%XTRA
NC_93519

MICRO-STAR INT'L CO.,LTD.

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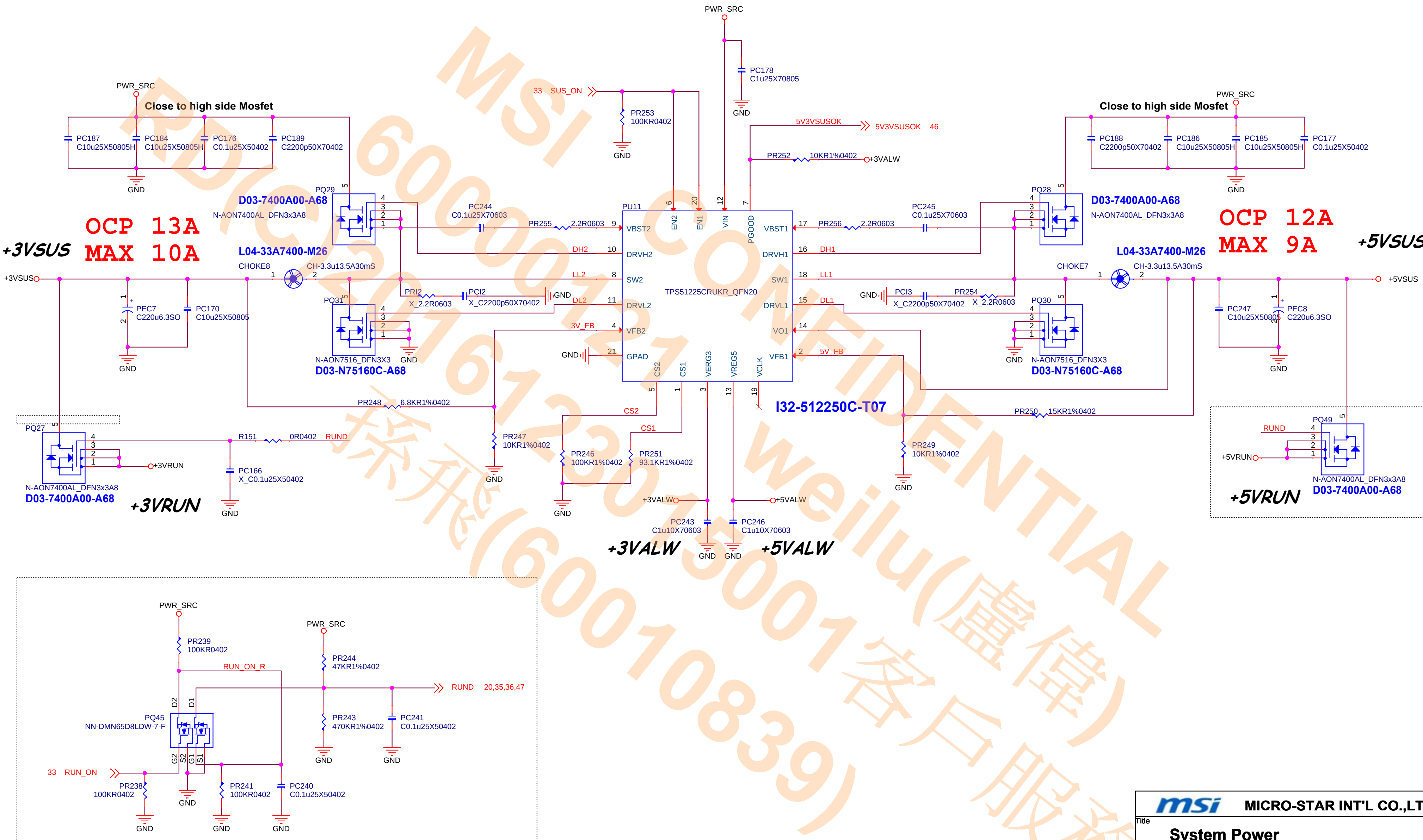
System Power



PWR_SRC
Close to high side Mosfet
PC187 C10u25X50805H
PC184 C10u25X50805H
PC176 C0.1u25X50402
PC189 C2200p50X70402
GND
PQ29
D03-7400A00-A68
N-AON7400AL_DFN3x3A8
OCP 13A
MAX 10A
+3VSUS
L04-33A7400-M26
CHOKE8
CH-3.3u13.5A30mS
PC244 C0.1u25X70603
PR255 2.2R0603
PEC7 C220u6.3SO
PC170 C10u25X50805
PRI2 X_2.2R0603
PCI2 X_C2200p50X70402
PQ31
N-AON7516_DFN3X3
D03-N75160C-A68
PR248 6.8KR1%0402
PQ27
N-AON7400AL_DFN3x3A8
D03-7400A00-A68
R151 0R0402
RUND
+3VRUN
PC166 X_C0.1u25X50402
PR247 10KR1%0402
PR246 100KR1%0402
PR251 93.1KR1%0402
CS2
CS1
33 SUS_ON
PR253 100KR0402
PC178 C1u25X70805
5V3VSUSOK
5V3VSUSOK 46
PR252 10KR1%0402
+3VALW
PU11
TPS51225CRUKR_QFN20
EN2 EN1 VIN PGOOD
VBST2 DRVH2 SW2 DRVL2 VFB2 GPAD
VBST1 DRVH1 SW1 DRVL1 VO1 VFB1
CS2 CS1 VERG3 VREG5 VCLK
DH2 LL2 DL2 3V_FB
DH1 LL1 DL1 5V_FB
I32-512250C-T07
PC243 C1u10X70603
PC246 C1u10X70603
+3VALW
+5VALW
PC245 C0.1u25X70603
PR256 2.2R0603
PCI3 X_C2200p50X70402
PR254 X_2.2R0603
PQ28
D03-7400A00-A68
N-AON7400AL_DFN3x3A8
PQ30
N-AON7516_DFN3X3
D03-N75160C-A68
PC188 C2200p50X70402
PC186 C10u25X50805H
PC185 C10u25X50805H
PC177 C0.1u25X50402
OCP 12A
MAX 9A
+5VSUS
L04-33A7400-M26
CHOKE7
CH-3.3u13.5A30mS
PC247 C10u25X50805
PEC8 C220u6.3SO
PR250 15KR1%0402
PR249 10KR1%0402
PQ49
N-AON7400AL_DFN3x3A8
D03-7400A00-A68
+5VRUN
PR239 100KR0402
RUN_ON_R
PR244 47KR1%0402
RUND 20,35,36,47
PQ45
NN-DMN65D8LDW-7-F
PR243 470KR1%0402
PC241 C0.1u25X50402
33 RUN_ON
PR238 100KR0402
PR241 100KR0402
PC240 C0.1u25X50402

MICRO-STAR INT'L CO.,LTD.

Title: System Power		
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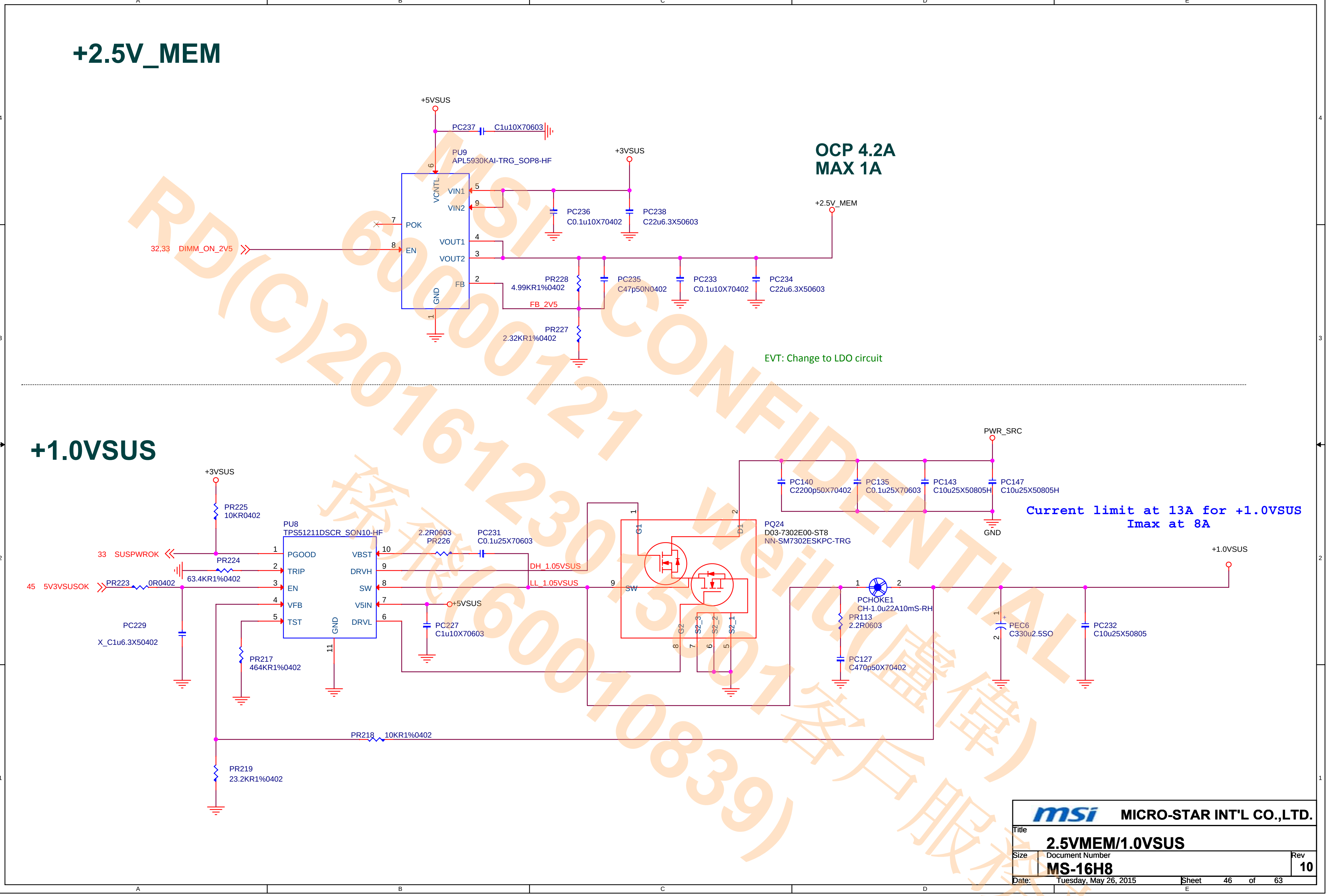
+2.5V_MEM
+5VSUS
PC237 C1u10X70603
PU9
APL5930KAI-TRG_SOP8-HF
+3VSUS
OCP 4.2A
MAX 1A
VCNTL
VIN1
VIN2
POK
EN
VOUT1
VOUT2
FB
GND
32,33 DIMM_ON_2V5
PC236 C0.1u10X70402
PC238 C22u6.3X50603
+2.5V_MEM
PR228 4.99KR1%0402
PC235 C47p50N0402
PC233 C0.1u10X70402
PC234 C22u6.3X50603
FB_2V5
PR227 2.32KR1%0402
EVT: Change to LDO circuit
+1.0VSUS
PWR_SRC
+3VSUS
PR225 10KR0402
PU8
TPS51211DSCR_SON10-HF
PGOOD
TRIP
EN
VFB
TST
VBST
DRVH
SW
V5IN
DRVL
GND
33 SUSPWROK
PR224 63.4KR1%0402
45 5V3VSUSOK
PR223 0R0402
PC229 X_C1u6.3X50402
PR217 464KR1%0402
2.2R0603 PR226
PC231 C0.1u25X70603
DH_1.05VSUS
LL_1.05VSUS
+5VSUS
PC227 C1u10X70603
PQ24
D03-7302E00-ST8
NN-SM7302ESKPC-TRG
G1
D1
SW
G2
S2_3
S2_2
S2_1
PC140 C2200p50X70402
PC135 C0.1u25X70603
PC143 C10u25X50805H
PC147 C10u25X50805H
GND
Current limit at 13A for +1.0VSUS
Imax at 8A
+1.0VSUS
PCHOKE1
CH-1.0u22A10mS-RH
PR113 2.2R0603
PC127 C470p50X70402
PEC6 C330u2.5SO
PC232 C10u25X50805
PR218 10KR1%0402
PR219 23.2KR1%0402
MICRO-STAR INT'L CO.,LTD.
Title
2.5VMEM/1.0VSUS
Size
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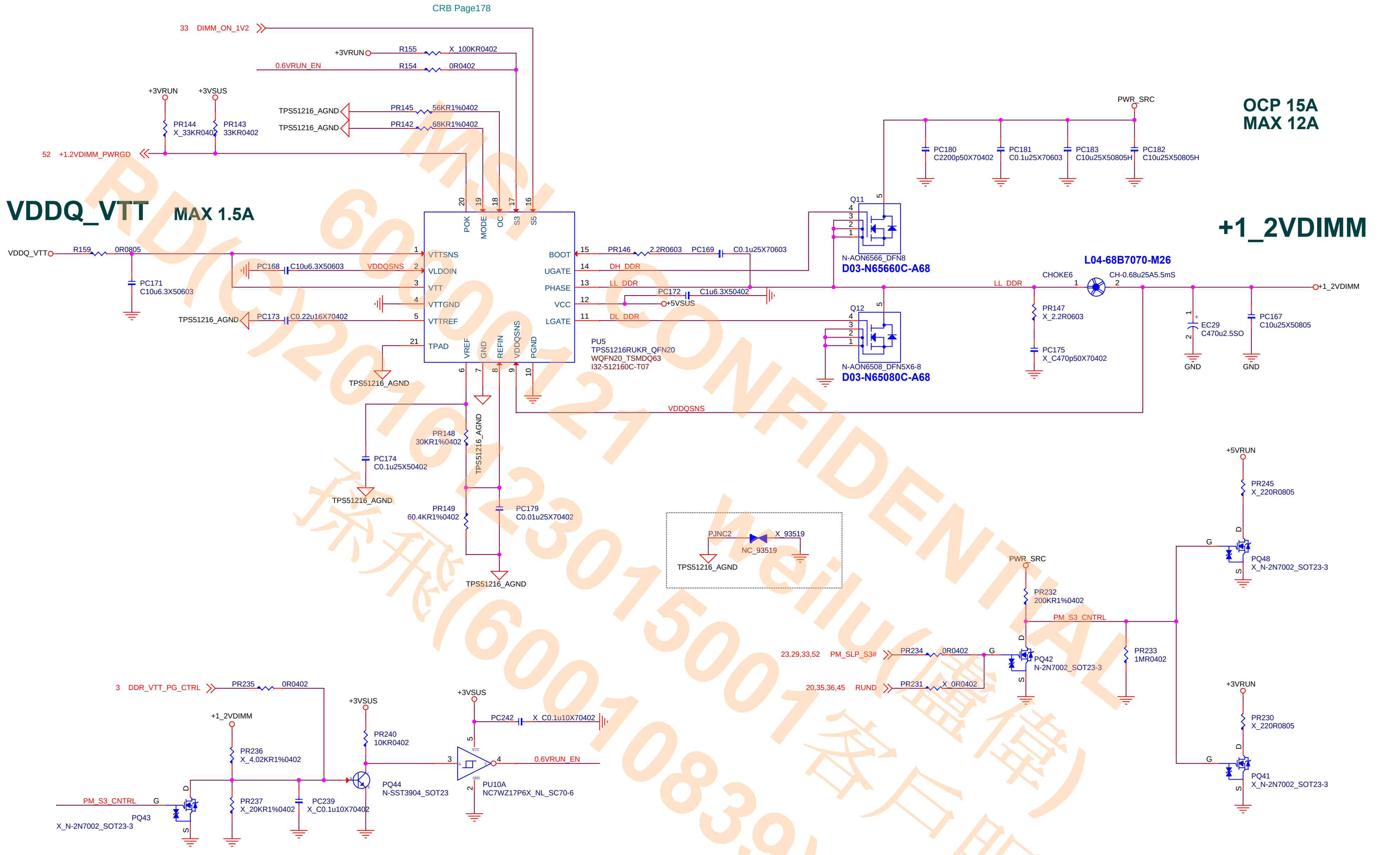
CRB Page178
33 DIMM_ON_1V2
+3VRUN
R155 X_100KR0402
0.6VRUN_EN
R154 0R0402
+3VRUN +3VSUS
PR144 X_33KR0402
PR143 33KR0402
52 +1.2VDIMM_PWRGD
TPS51216_AGND
PR145 56KR1%0402
PR142 68KR1%0402
VDDQ_VTT
MAX 1.5A
VDDQ_VTT
R159 0R0805
PC171 C10u6.3X50603
PC168 C10u6.3X50603
VDDQSNS
PC173 C0.22u16X70402
TPS51216_AGND
POK MODE OC S3 S5
VTTSNS VLDOIN VTT VTTGND VTTREF TPAD
VREF GND REFIN VDDQSNS PGND
BOOT UGATE PHASE VCC LGATE
PR146 2.2R0603
PC169 C0.1u25X70603
DH_DDR
LL_DDR
PC172 C1u6.3X50402
+5VSUS
DL_DDR
PU5
TPS51216RUKR_QFN20
WQFN20_TSMDQ63
I32-512160C-T07
PR148 30KR1%0402
PC174 C0.1u25X50402
PR149 60.4KR1%0402
PC179 C0.01u25X70402
TPS51216_AGND
VDDQSNS
PWR_SRC
PC180 C2200p50X70402
PC181 C0.1u25X70603
PC183 C10u25X50805H
PC182 C10u25X50805H
OCP 15A
MAX 12A
+1_2VDIMM
Q11
N-AON6566_DFN8
D03-N65660C-A68
Q12
N-AON6508_DFN5X6-8
D03-N65080C-A68
L04-68B7070-M26
CHOKE6
CH-0.68u25A5.5mS
LL_DDR
PR147 X_2.2R0603
PC175 X_C470p50X70402
EC29 C470u2.5SO
PC167 C10u25X50805
GND GND
+1_2VDIMM
PJNC2 X_93519
NC_93519
TPS51216_AGND
+5VRUN
PR245 X_220R0805
PQ48 X_N-2N7002_SOT23-3
PWR_SRC
PR232 200KR1%0402
PM_S3_CNTRL
23,29,33,52 PM_SLP_S3#
PR234 0R0402
PQ42 N-2N7002_SOT23-3
PR233 1MR0402
20,35,36,45 RUND
PR231 X_0R0402
+3VRUN
PR230 X_220R0805
PQ41 X_N-2N7002_SOT23-3
3 DDR_VTT_PG_CTRL
PR235 0R0402
+1_2VDIMM
PR236 X_4.02KR1%0402
PR237 X_20KR1%0402
PC239 X_C0.1u10X70402
PM_S3_CNTRL
PQ43 X_N-2N7002_SOT23-3
+3VSUS
PR240 10KR0402
PQ44 N-SST3904_SOT23
+3VSUS
PC242 X_C0.1u10X70402
0.6VRUN_EN
PU10A NC7WZ17P6X_NL_SC70-6

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Title: +1_2VDIMM/VDDQ_VTT

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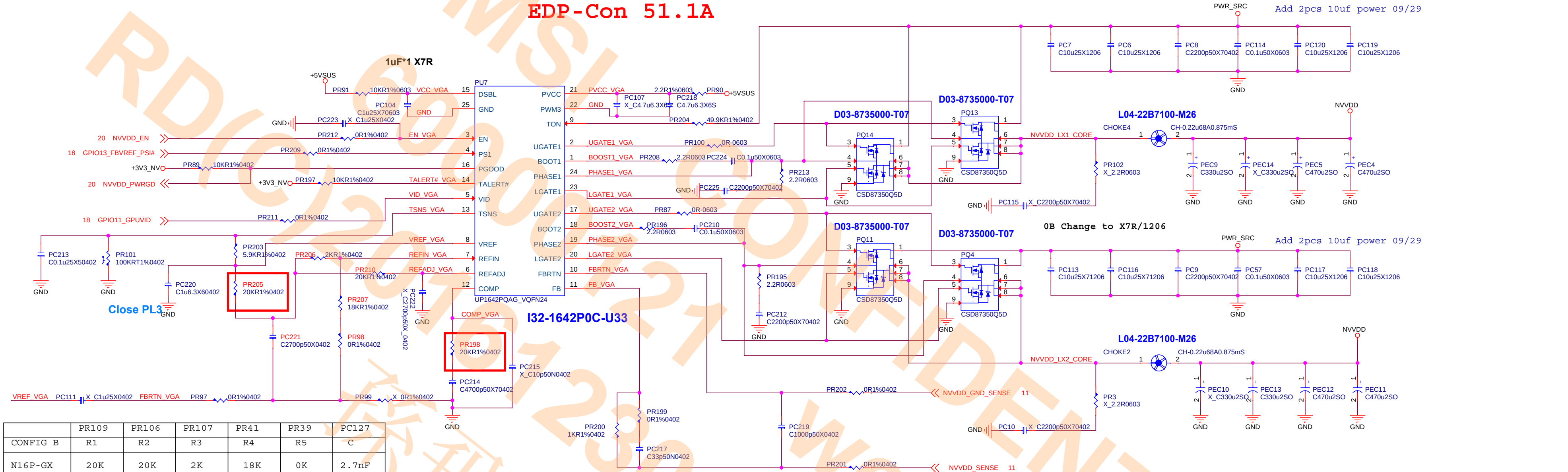
DGPU POWER / UP1642PQAG

DGPU POWER NVVDD

CONFIG B
VBoot:0.9V
Vmin:0.6V / Vmax:1.2V

EDP-Peak 87A
EDP-Con 51.1A

0B Change to X7R/1206
1.0 Change to X5R/1206 high



	PR109	PR106	PR107	PR41	PR39	PC127
CONFIG B	R1	R2	R3	R4	R5	C
N16P-GX	20K	20K	2K	18K	0K	2.7nF

MICRO-STAR INT'L CO.,LTD.

Title: DGPU Power(NVDD)

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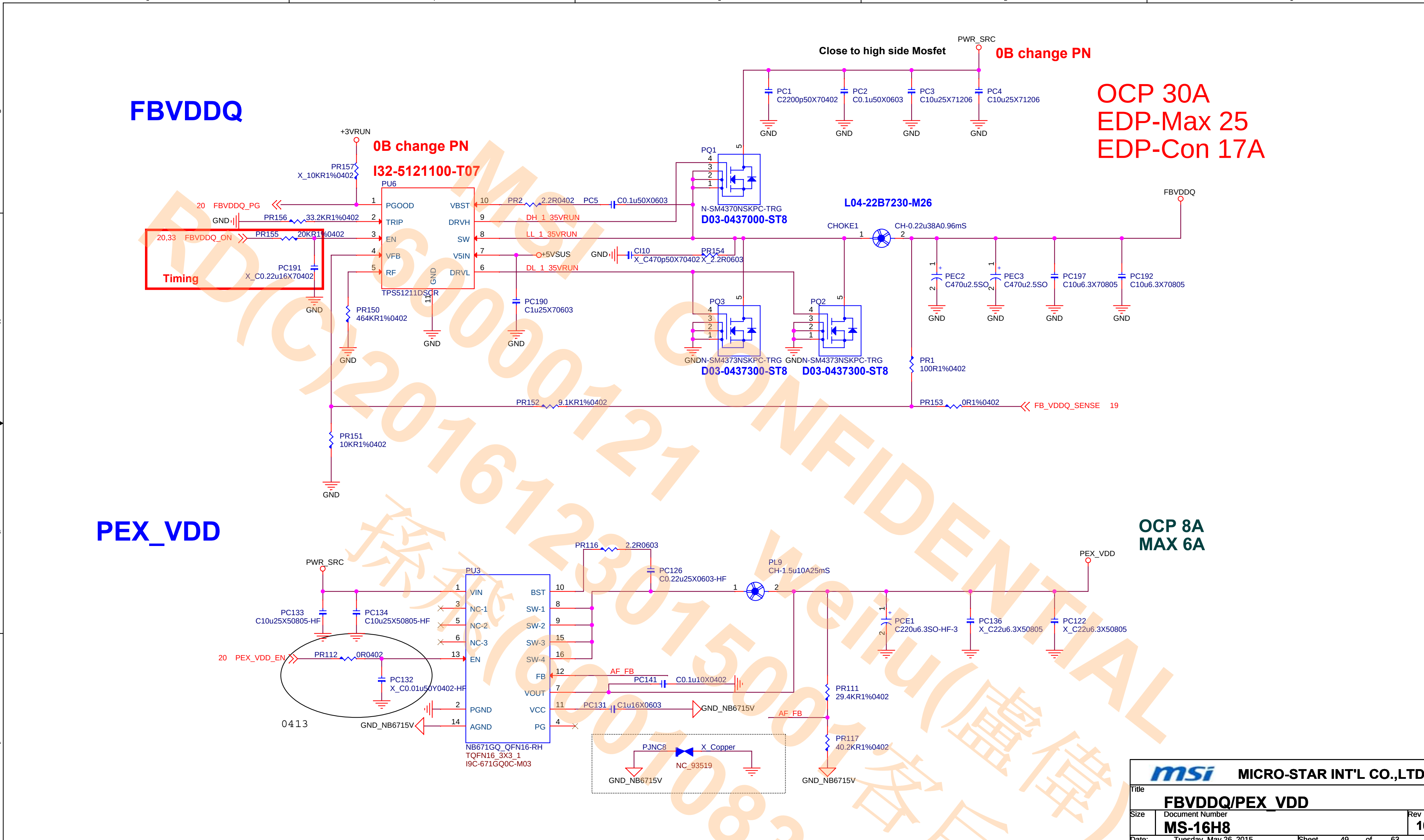
FBVDDQ
0B change PN
I32-5121100-T07
+3VRUN
PR157
X_10KR1%0402
PU6
20 FBVDDQ_PG
PGOOD
VBST
PR2
2.2R0402
PC5
C0.1u50X0603
PR156
33.2KR1%0402
TRIP
DRVH
DH_1_35VRUN
20,33 FBVDDQ_ON
PR155
20KR1%0402
EN
SW
LL_1_35VRUN
VFB
V5IN
+5VSUS
RF
DRVL
DL_1_35VRUN
Timing
PC191
X_C0.22u16X70402
TPS51211DSCR
PR150
464KR1%0402
PC190
C1u25X70603
PC1
C2200p50X70402
PC2
C0.1u50X0603
PC3
C10u25X71206
PC4
C10u25X71206
Close to high side Mosfet
PWR_SRC
PQ1
N-SM4370NSKPC-TRG
D03-0437000-ST8
CI10
X_C470p50X70402
PR154
X_2.2R0603
L04-22B7230-M26
CHOKE1
CH-0.22u38A0.96mS
FBVDDQ
PEC2
C470u2.5SO
PEC3
C470u2.5SO
PC197
C10u6.3X70805
PC192
C10u6.3X70805
PQ3
PQ2
GNDN-SM4373NSKPC-TRG
D03-0437300-ST8
PR1
100R1%0402
PR152
9.1KR1%0402
PR153
0R1%0402
FB_VDDQ_SENSE 19
PR151
10KR1%0402
GND
OCP 30A
EDP-Max 25
EDP-Con 17A
PEX_VDD
OCP 8A
MAX 6A
PR116
2.2R0603
PC126
C0.22u25X0603-HF
PU3
PWR_SRC
VIN
BST
NC-1
SW-1
NC-2
SW-2
NC-3
SW-3
EN
SW-4
FB
VOUT
PGND
VCC
AGND
PG
PC133
C10u25X50805-HF
PC134
C10u25X50805-HF
20 PEX_VDD_EN
PR112
0R0402
PC132
X_C0.01u50Y0402-HF
0413
GND_NB6715V
NB671GQ_QFN16-RH
TQFN16_3X3_1
I9C-671GQ0C-M03
AF_FB
PC141
C0.1u10X0402
PC131
C1u16X0603
PL9
CH-1.5u10A25mS
PEX_VDD
PCE1
C220u6.3SO-HF-3
PC136
X_C22u6.3X50805
PC122
X_C22u6.3X50805
PR111
29.4KR1%0402
PR117
40.2KR1%0402
PJNC8
X_Copper
NC_93519

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Title: FBVDDQ/PEX_VDD

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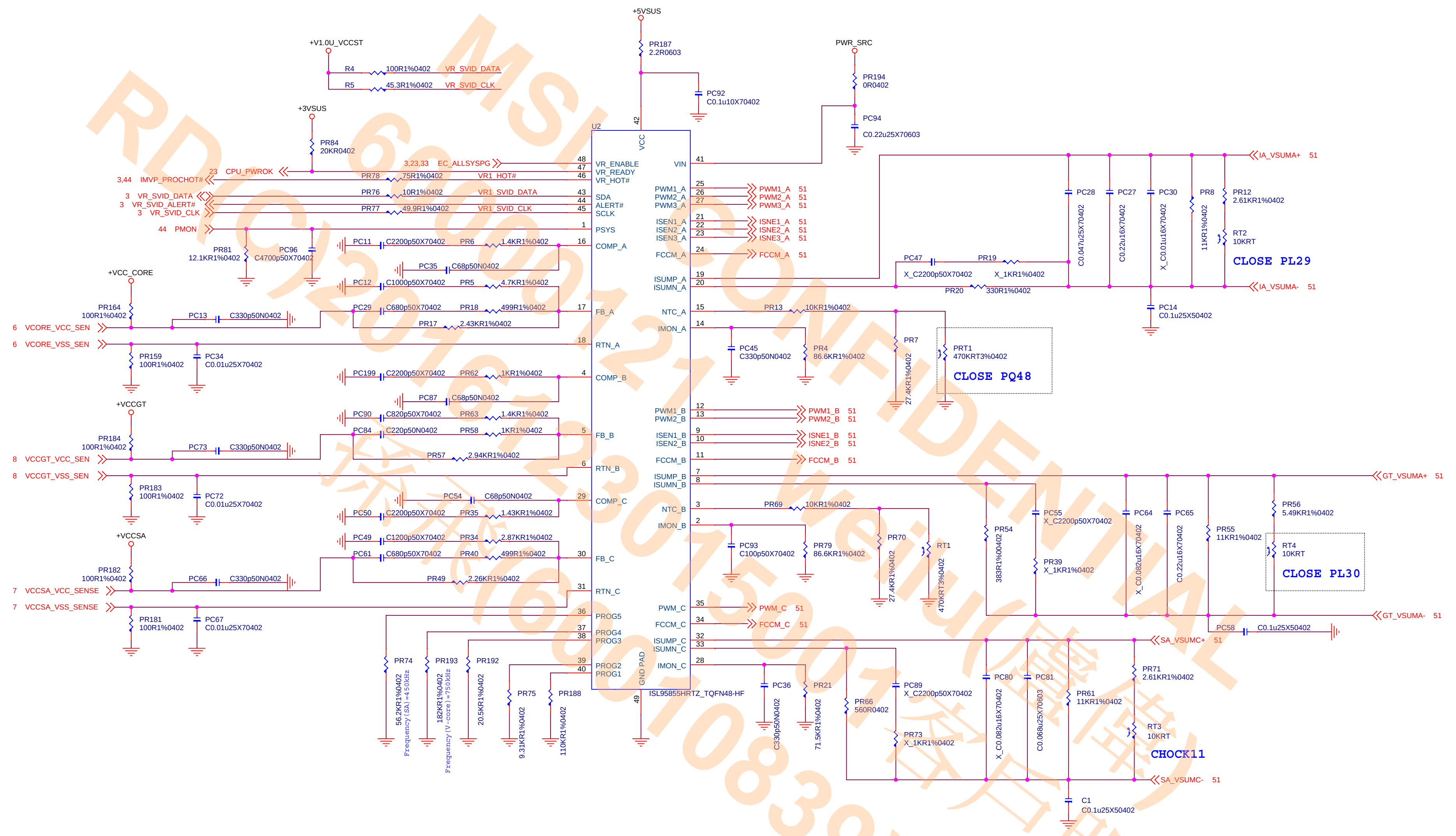
CPU Power IC (ISL95855)



+5VSUS
PR187
2.2R0603
PC92
C0.1u10X70402
+V1.0U_VCCST
R4 100R1%0402 VR_SVID_DATA
R5 45.3R1%0402 VR_SVID_CLK
PWR_SRC
PR194
0R0402
PC94
C0.22u25X70603
+3VSUS
PR84
20KR0402
U2
VCC
3,23,33 EC_ALLSYSPG
23 CPU_PWROK
3,44 IMVP_PROCHOT#
PR78 75R1%0402 VR1_HOT#
3 VR_SVID_DATA
3 VR_SVID_ALERT#
3 VR_SVID_CLK
PR76 10R1%0402 VR1_SVID_DATA
PR77 49.9R1%0402 VR1_SVID_CLK
44 PMON
PR81
12.1KR1%0402
PC96
C4700p50X70402
VR_ENABLE
VR_READY
VR_HOT#
SDA
ALERT#
SCLK
PSYS
COMP_A
FB_A
RTN_A
COMP_B
FB_B
RTN_B
COMP_C
FB_C
RTN_C
PROG5
PROG4
PROG3
PROG2
PROG1
GND PAD
ISL95855HRTZ_TQFN48-HF
VIN
PWM1_A
PWM2_A
PWM3_A
ISEN1_A
ISEN2_A
ISEN3_A
FCCM_A
ISUMP_A
ISUMN_A
NTC_A
IMON_A
PWM1_B
PWM2_B
ISEN1_B
ISEN2_B
FCCM_B
ISUMP_B
ISUMN_B
NTC_B
IMON_B
PWM_C
FCCM_C
ISUMP_C
ISUMN_C
IMON_C
PWM1_A 51
PWM2_A 51
PWM3_A 51
ISNE1_A 51
ISNE2_A 51
ISNE3_A 51
FCCM_A 51
PWM1_B 51
PWM2_B 51
ISNE1_B 51
ISNE2_B 51
FCCM_B 51
PWM_C 51
FCCM_C 51
IA_VSUMA+ 51
IA_VSUMA- 51
GT_VSUMA+ 51
GT_VSUMA- 51
SA_VSUMC+ 51
SA_VSUMC- 51
PC11 C2200p50X70402 PR6 1.4KR1%0402
PC35 C68p50N0402
PC12 C1000p50X70402 PR5 4.7KR1%0402
PC29 C680p50X70402 PR18 499R1%0402
PR17 2.43KR1%0402
+VCC_CORE
PR164
100R1%0402
PC13 C330p50N0402
6 VCORE_VCC_SEN
6 VCORE_VSS_SEN
PR159
100R1%0402
PC34
C0.01u25X70402
PC199 C2200p50X70402 PR62 1KR1%0402
PC87 C68p50N0402
PC90 C820p50X70402 PR63 1.4KR1%0402
PC84 C220p50N0402 PR58 1KR1%0402
PR57 2.94KR1%0402
+VCCGT
PR184
100R1%0402
PC73 C330p50N0402
8 VCCGT_VCC_SEN
8 VCCGT_VSS_SEN
PR183
100R1%0402
PC72
C0.01u25X70402
PC54 C68p50N0402
PC50 C2200p50X70402 PR35 1.43KR1%0402
PC49 C1200p50X70402 PR34 2.87KR1%0402
PC61 C680p50X70402 PR40 499R1%0402
PR49 2.26KR1%0402
+VCCSA
PR182
100R1%0402
PC66 C330p50N0402
7 VCCSA_VCC_SENSE
7 VCCSA_VSS_SENSE
PR181
100R1%0402
PC67
C0.01u25X70402
PR74
56.2KR1%0402
Frequency(SA)=450kHz
PR193
182KR1%0402
Frequency(V-core)=750kHz
PR192
20.5KR1%0402
PR75
9.31KR1%0402
PR188
110KR1%0402
PC28
C0.047u25X70402
PC27
C0.22u16X70402
PC30
X_C0.01u16X70402
PR8
11KR1%0402
PR12
2.61KR1%0402
RT2
10KRT
CLOSE PL29
PC47
X_C2200p50X70402
PR19
X_1KR1%0402
PR20
330R1%0402
PC14
C0.1u25X50402
PR13 10KR1%0402
PC45
C330p50N0402
PR4
86.6KR1%0402
PR7
27.4KR1%0402
PRT1
470KRT3%0402
CLOSE PQ48
PR69 10KR1%0402
PC93
C100p50X70402
PR79
86.6KR1%0402
PR70
27.4KR1%0402
RT1
470KRT3%0402
PR54
383R1%0402
PC55
X_C2200p50X70402
PR39
X_1KR1%0402
PC64
X_C0.082u16X70402
PC65
C0.22u16X70402
PR55
11KR1%0402
PR56
5.49KR1%0402
RT4
10KRT
CLOSE PL30
PC58 C0.1u25X50402
PC36
C330p50N0402
PR21
71.5KR1%0402
PR66
560R0402
PC89
X_C2200p50X70402
PR73
X_1KR1%0402
PC80
X_C0.082u16X70402
PC81
C0.068u25X70603
PR61
11KR1%0402
PR71
2.61KR1%0402
RT3
10KRT
CHOCK11
C1
C0.1u25X50402

MICRO-STAR INT'L CO.,LTD.

Title	CPU Power IC (ISL95855)	
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MICRO-STAR INT'L CO.,LTD.

Title: CPU Power(VCore/VCCGT/VCCSA)

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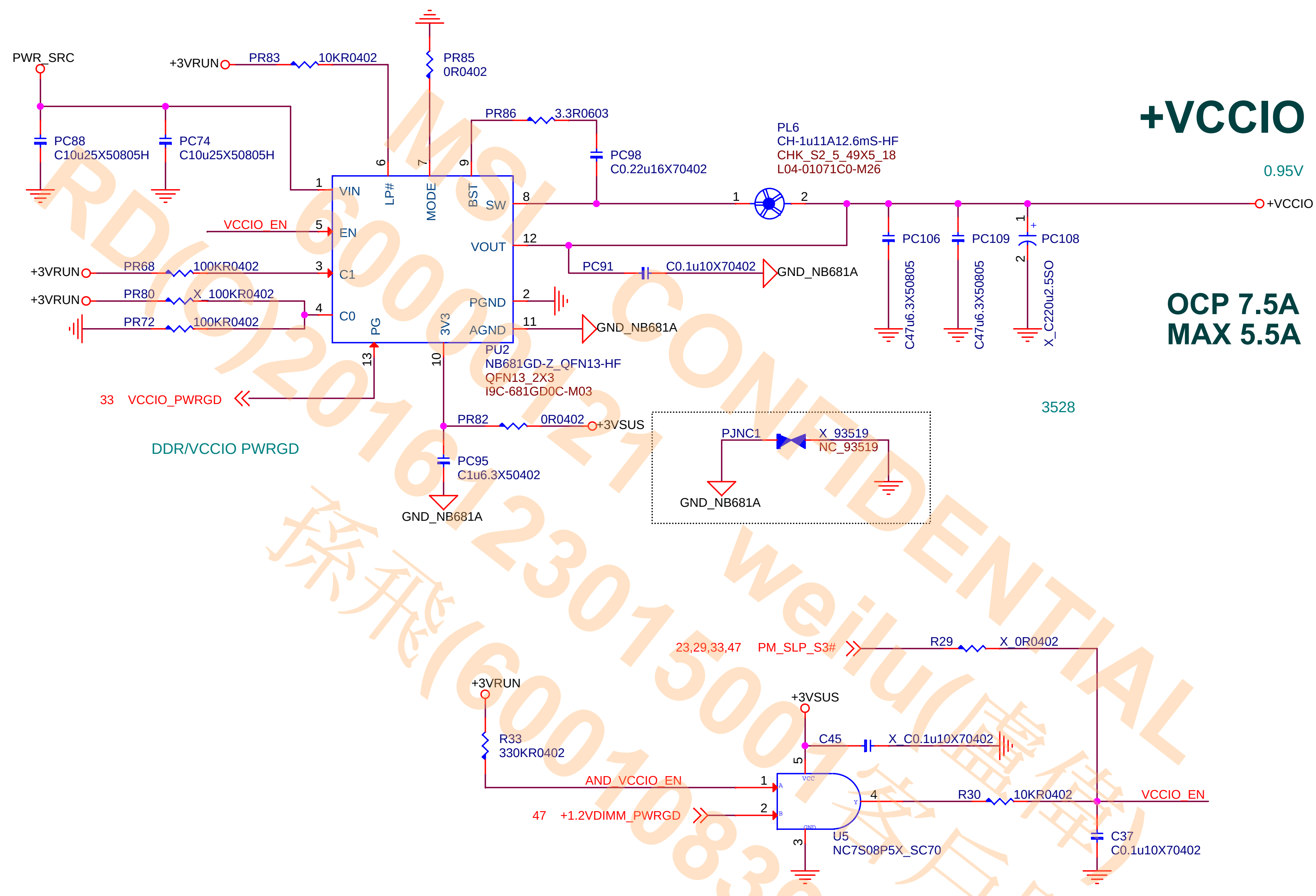
+VCCIO
0.95V
OCP 7.5A
MAX 5.5A
PWR_SRC
+3VRUN
PR83
10KR0402
PR85
0R0402
PR86
3.3R0603
PC98
C0.22u16X70402
PL6
CH-1u11A12.6mS-HF
CHK_S2_5_49X5_18
L04-01071C0-M26
PC88
C10u25X50805H
PC74
C10u25X50805H
VIN
LP#
MODE
BST
SW
EN
VOUT
C1
PGND
C0
PG
3V3
AGND
VCCIO_EN
PR68
100KR0402
PR80
X_100KR0402
PR72
100KR0402
PC91
C0.1u10X70402
GND_NB681A
PC106
PC109
PC108
C47u6.3X50805
C47u6.3X50805
X_C220u2.5SO
PU2
NB681GD-Z_QFN13-HF
QFN13_2X3
I9C-681GD0C-M03
33 VCCIO_PWRGD
DDR/VCCIO PWRGD
PR82
0R0402
+3VSUS
PC95
C1u6.3X50402
PJNC1
X_93519
NC_93519
3528
23,29,33,47 PM_SLP_S3#
R29
X_0R0402
R33
330KR0402
C45
X_C0.1u10X70402
AND_VCCIO_EN
47 +1.2VDIMM_PWRGD
U5
NC7S08P5X_SC70
R30
10KR0402
C37
C0.1u10X70402

MICRO-STAR INT'L CO.,LTD.

Title: CPU Power(VCCIO)

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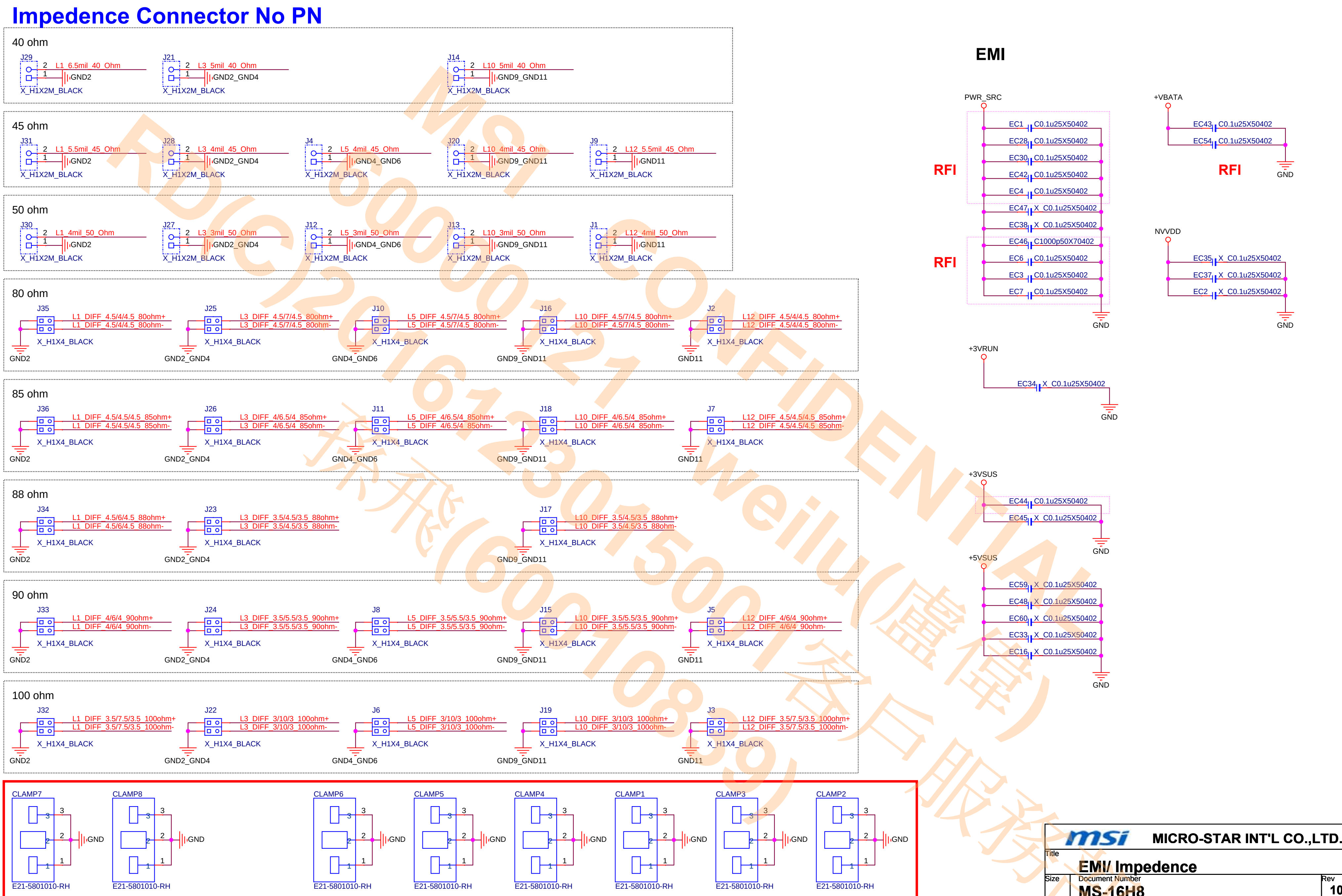
EMI/ Impedence



MICRO-STAR INT'L CO.,LTD.

Title: EMI/ Impedence

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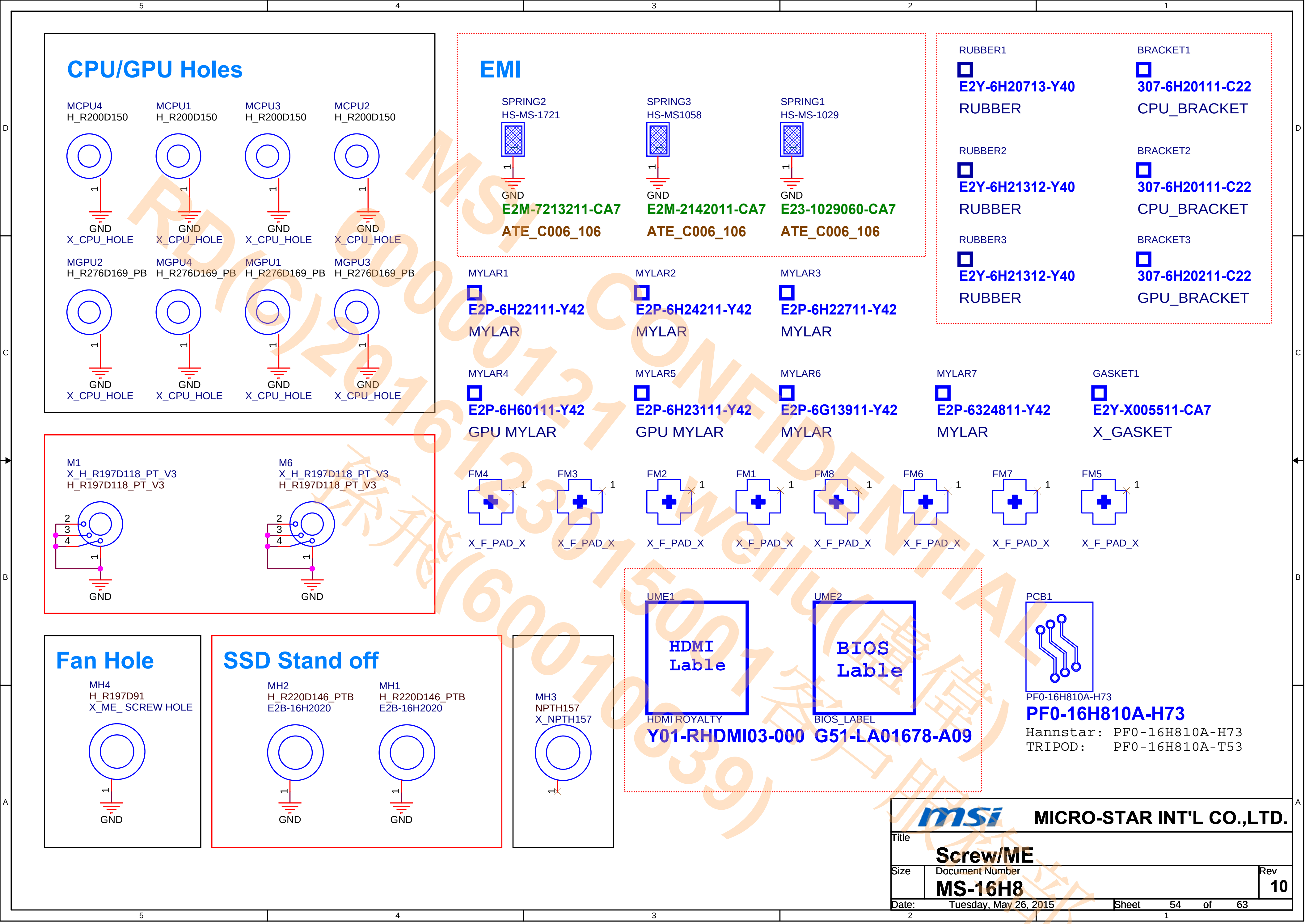

MICRO-STAR INT'L CO.,LTD.

Title: Screw/ME

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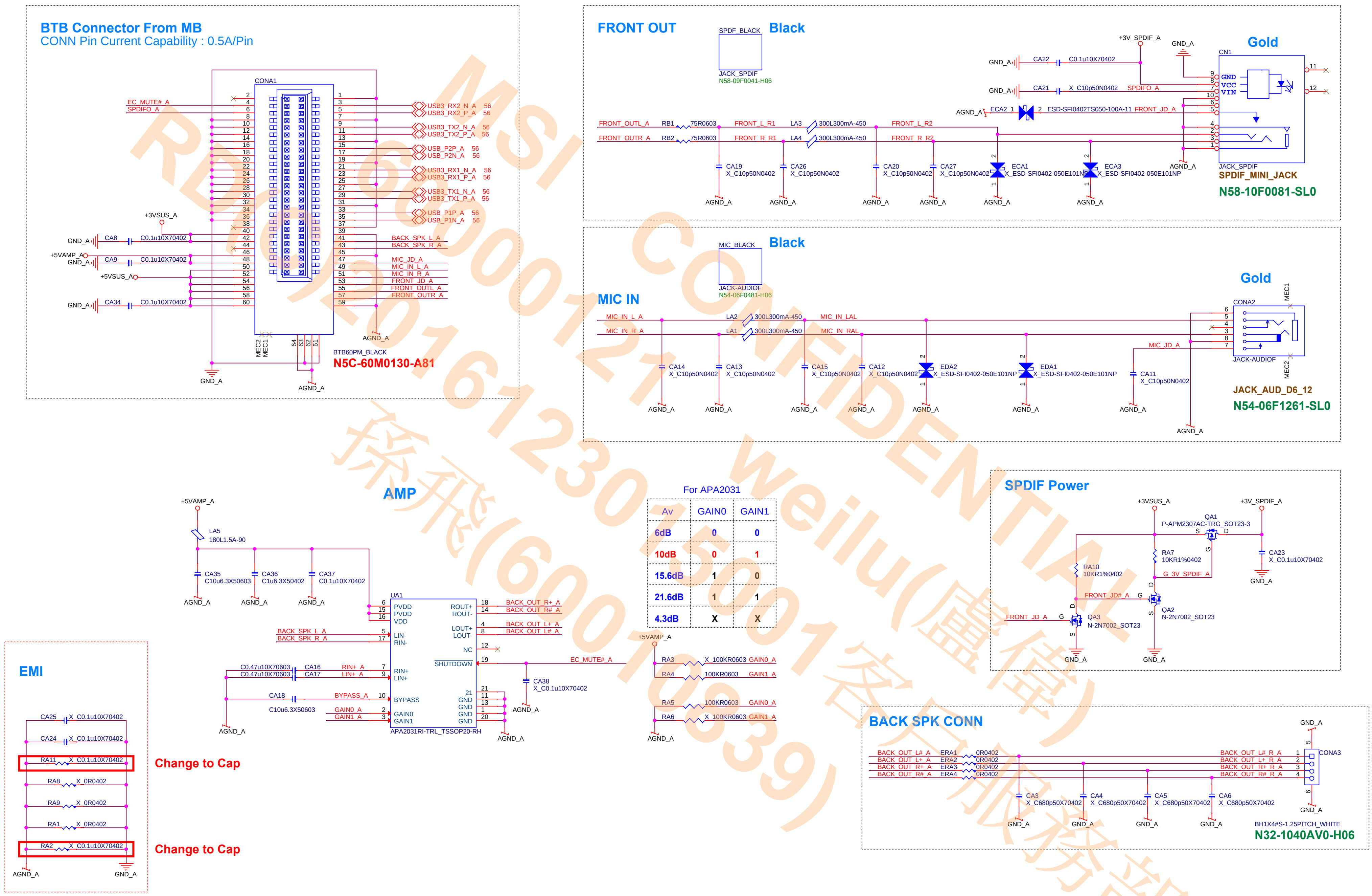
16H8A Board (Audio CONN)


BTB Connector From MB
CONN Pin Current Capability : 0.5A/Pin
CONA1
BTB60PM_BLACK
N5C-60M0130-A81
EC_MUTE#_A
SPDIFO_A
USB3_RX2_N_A
USB3_RX2_P_A
USB3_TX2_N_A
USB3_TX2_P_A
USB_P2P_A
USB_P2N_A
USB3_RX1_N_A
USB3_RX1_P_A
USB3_TX1_N_A
USB3_TX1_P_A
USB_P1P_A
USB_P1N_A
BACK_SPK_L_A
BACK_SPK_R_A
MIC_JD_A
MIC_IN_L_A
MIC_IN_R_A
FRONT_JD_A
FRONT_OUTL_A
FRONT_OUTR_A
+3VSUS_A
+5VAMP_A
+5VSUS_A
GND_A
AGND_A
CA8 C0.1u10X70402
CA9 C0.1u10X70402
CA34 C0.1u10X70402
FRONT OUT
SPDF_BLACK
JACK_SPDIF
N58-09F0041-H06
Black
Gold
+3V_SPDIF_A
CA22 C0.1u10X70402
CA21 X_C10p50N0402
SPDIFO_A
ECA2 ESD-SFI0402TS050-100A-11
FRONT_JD_A
CN1
GND
VCC
VIN
JACK_SPDIF
SPDIF_MINI_JACK
N58-10F0081-SL0
RB1 75R0603
RB2 75R0603
FRONT_L_R1
FRONT_R_R1
LA3 300L300mA-450
LA4 300L300mA-450
FRONT_L_R2
FRONT_R_R2
CA19 X_C10p50N0402
CA26 X_C10p50N0402
CA20 X_C10p50N0402
CA27 X_C10p50N0402
ECA1 X_ESD-SFI0402-050E101NP
ECA3 X_ESD-SFI0402-050E101NP
MIC_BLACK
JACK-AUDIOF
N54-06F0481-H06
MIC IN
LA2 300L300mA-450
LA1 300L300mA-450
MIC_IN_LAL
MIC_IN_RAL
CA14 X_C10p50N0402
CA13 X_C10p50N0402
CA15 X_C10p50N0402
CA12 X_C10p50N0402
EDA2 X_ESD-SFI0402-050E101NP
EDA1 X_ESD-SFI0402-050E101NP
CA11 X_C10p50N0402
CONA2
MEC1
MEC2
JACK-AUDIOF
JACK_AUD_D6_12
N54-06F1261-SL0
AMP
LA5 180L1.5A-90
CA35 C10u6.3X50603
CA36 C1u6.3X50402
CA37 C0.1u10X70402
UA1
APA2031RI-TRL_TSSOP20-RH
PVDD
VDD
LIN-
RIN-
RIN+
LIN+
BYPASS
GAIN0
GAIN1
ROUT+
ROUT-
LOUT+
LOUT-
NC
SHUTDOWN
GND
BACK_OUT_R+_A
BACK_OUT_R#_A
BACK_OUT_L+_A
BACK_OUT_L#_A
CA16 C0.47u10X70603
CA17 C0.47u10X70603
RIN+_A
LIN+_A
CA18 C10u6.3X50603
BYPASS_A
GAIN0_A
GAIN1_A
CA38 X_C0.1u10X70402
RA3 X_100KR0603
RA4 100KR0603
RA5 100KR0603
RA6 X_100KR0603
SPDIF Power
+3VSUS_A
+3V_SPDIF_A
QA1 P-APM2307AC-TRG_SOT23-3
RA7 10KR1%0402
RA10 10KR1%0402
G_3V_SPDIF_A
CA23 X_C0.1u10X70402
QA2 N-2N7002_SOT23
QA3 N-2N7002_SOT23
FRONT_JD#_A
BACK SPK CONN
ERA1 0R0402
ERA2 0R0402
ERA3 0R0402
ERA4 0R0402
BACK_OUT_L#_R_A
BACK_OUT_L+_R_A
BACK_OUT_R+_R_A
BACK_OUT_R#_R_A
CA3 X_C680p50X70402
CA4 X_C680p50X70402
CA5 X_C680p50X70402
CA6 X_C680p50X70402
CONA3
BH1X4#S-1.25PITCH_WHITE
N32-1040AV0-H06
EMI
CA25 X_C0.1u10X70402
CA24 X_C0.1u10X70402
RA11 X_C0.1u10X70402
RA8 X_0R0402
RA9 X_0R0402
RA1 X_0R0402
RA2 X_C0.1u10X70402
Change to Cap
Change to Cap

For APA2031

Av	GAIN0	GAIN1
6dB	0	0
10dB	0	1
15.6dB	1	0
21.6dB	1	1
4.3dB	X	X

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Title: [A] Audio

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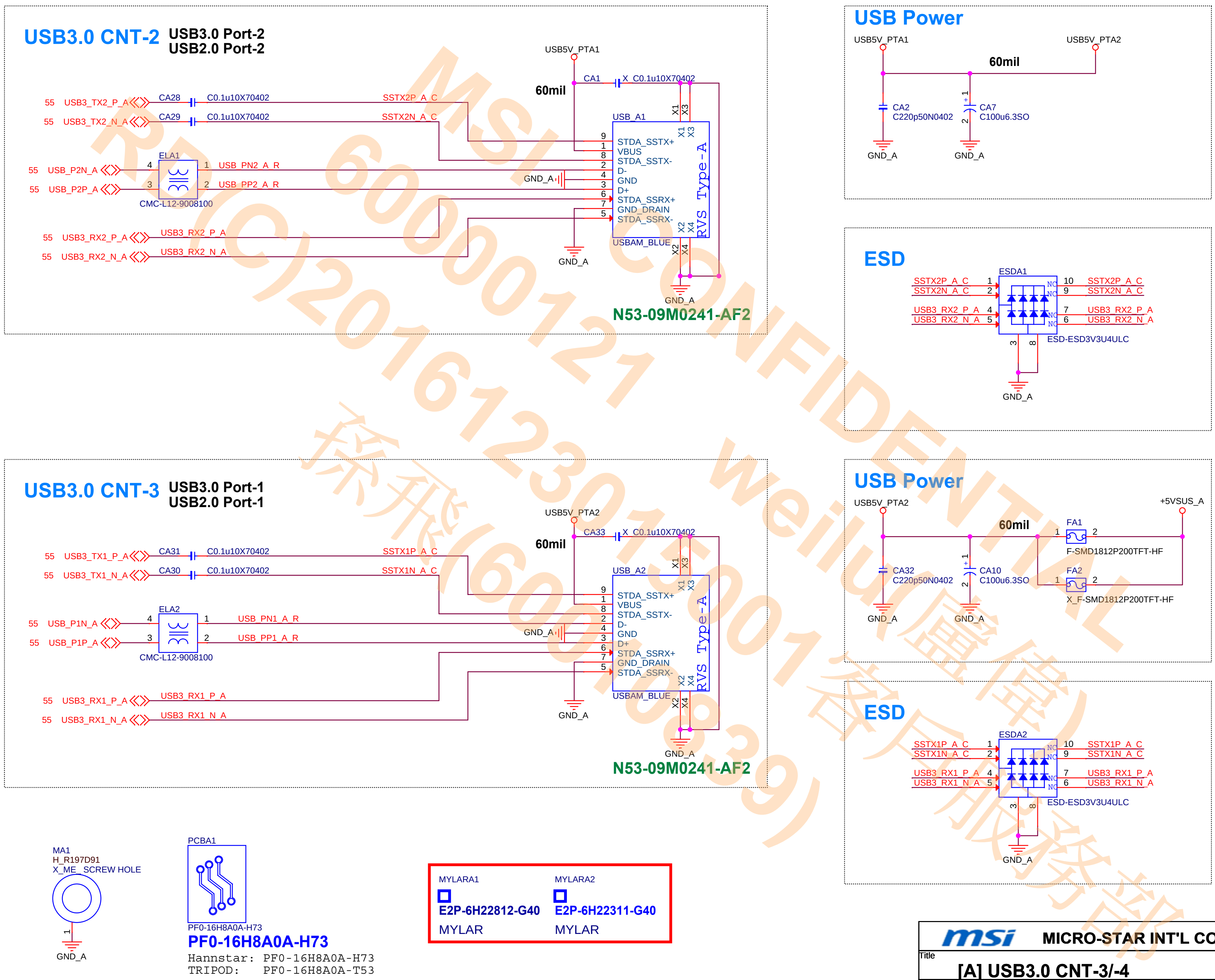
16H8C USB3.0 CNT-2/3


USB3.0 CNT-2
USB3.0 Port-2
USB2.0 Port-2
USB5V_PTA1
60mil
CA1
X_C0.1u10X70402
55 USB3_TX2_P_A
55 USB3_TX2_N_A
CA28
CA29
C0.1u10X70402
SSTX2P_A_C
SSTX2N_A_C
USB_A1
ELA1
55 USB_P2N_A
55 USB_P2P_A
USB_PN2_A_R
USB_PP2_A_R
CMC-L12-9008100
GND_A
STDA_SSTX+
VBUS
STDA_SSTX-
D-
GND
D+
STDA_SSRX+
GND_DRAIN
STDA_SSRX-
RVS Type-A
USBAM_BLUE
55 USB3_RX2_P_A
55 USB3_RX2_N_A
USB3_RX2_P_A
USB3_RX2_N_A
N53-09M0241-AF2
USB Power
USB5V_PTA1
USB5V_PTA2
60mil
CA2
C220p50N0402
CA7
C100u6.3SO
GND_A
ESD
ESDA1
SSTX2P_A_C
SSTX2N_A_C
USB3_RX2_P_A
USB3_RX2_N_A
ESD-ESD3V3U4ULC
GND_A
USB3.0 CNT-3
USB3.0 Port-1
USB2.0 Port-1
USB5V_PTA2
60mil
CA33
X_C0.1u10X70402
55 USB3_TX1_P_A
55 USB3_TX1_N_A
CA31
CA30
C0.1u10X70402
SSTX1P_A_C
SSTX1N_A_C
USB_A2
ELA2
55 USB_P1N_A
55 USB_P1P_A
USB_PN1_A_R
USB_PP1_A_R
CMC-L12-9008100
55 USB3_RX1_P_A
55 USB3_RX1_N_A
USB3_RX1_P_A
USB3_RX1_N_A
N53-09M0241-AF2
USB Power
USB5V_PTA2
+5VSUS_A
60mil
FA1
F-SMD1812P200TFT-HF
FA2
X_F-SMD1812P200TFT-HF
CA32
C220p50N0402
CA10
C100u6.3SO
GND_A
ESD
ESDA2
SSTX1P_A_C
SSTX1N_A_C
USB3_RX1_P_A
USB3_RX1_N_A
ESD-ESD3V3U4ULC
GND_A
MA1
H_R197D91
X_ME_SCREW HOLE
GND_A
PCBA1
PF0-16H8A0A-H73
PF0-16H8A0A-H73
Hannstar: PF0-16H8A0A-H73
TRIPOD: PF0-16H8A0A-T53
MYLARA1
E2P-6H22812-G40
MYLAR
MYLARA2
E2P-6H22311-G40
MYLAR

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Title: [A] USB3.0 CNT-3/-4		
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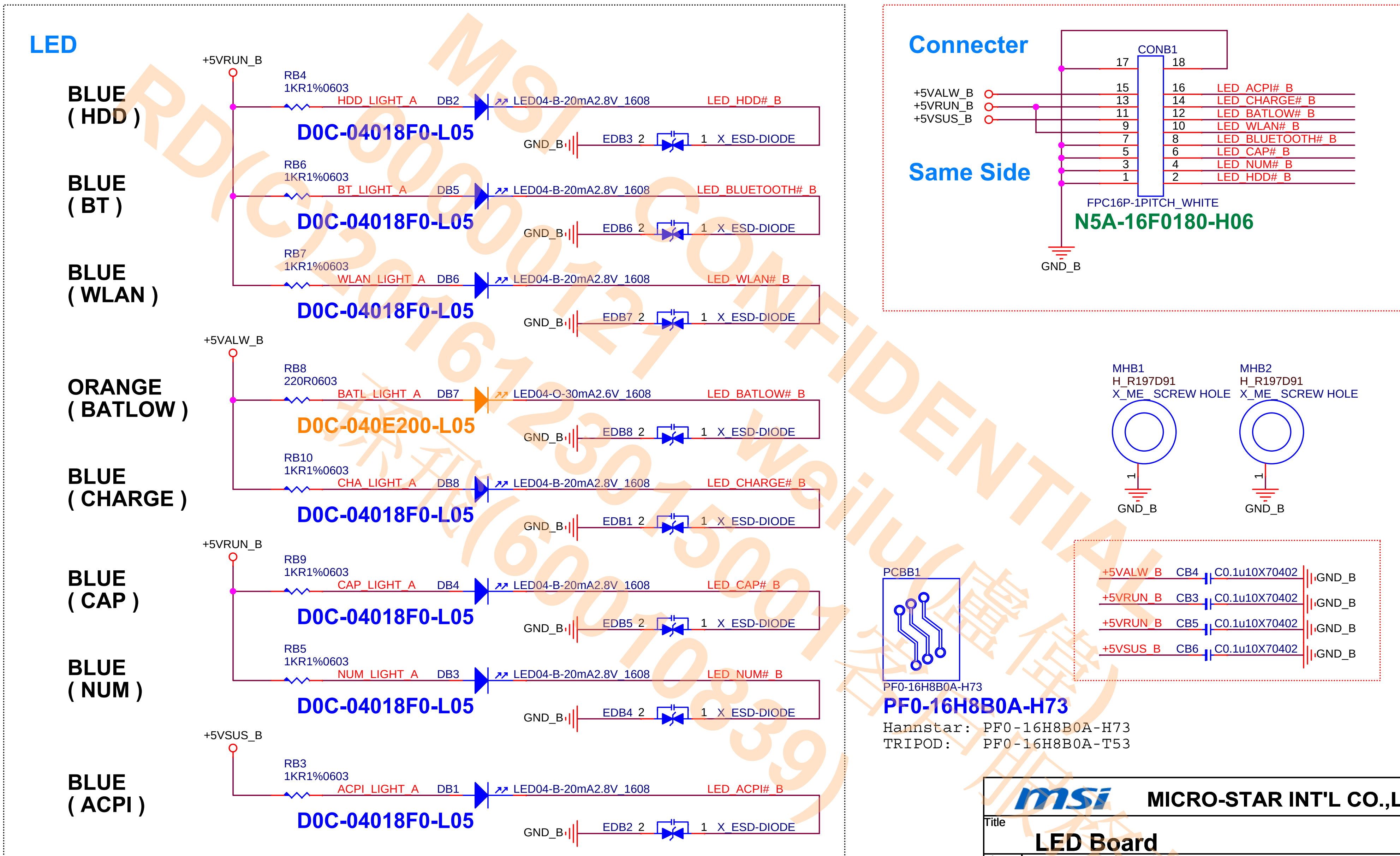
16H8B Board (LED Board)



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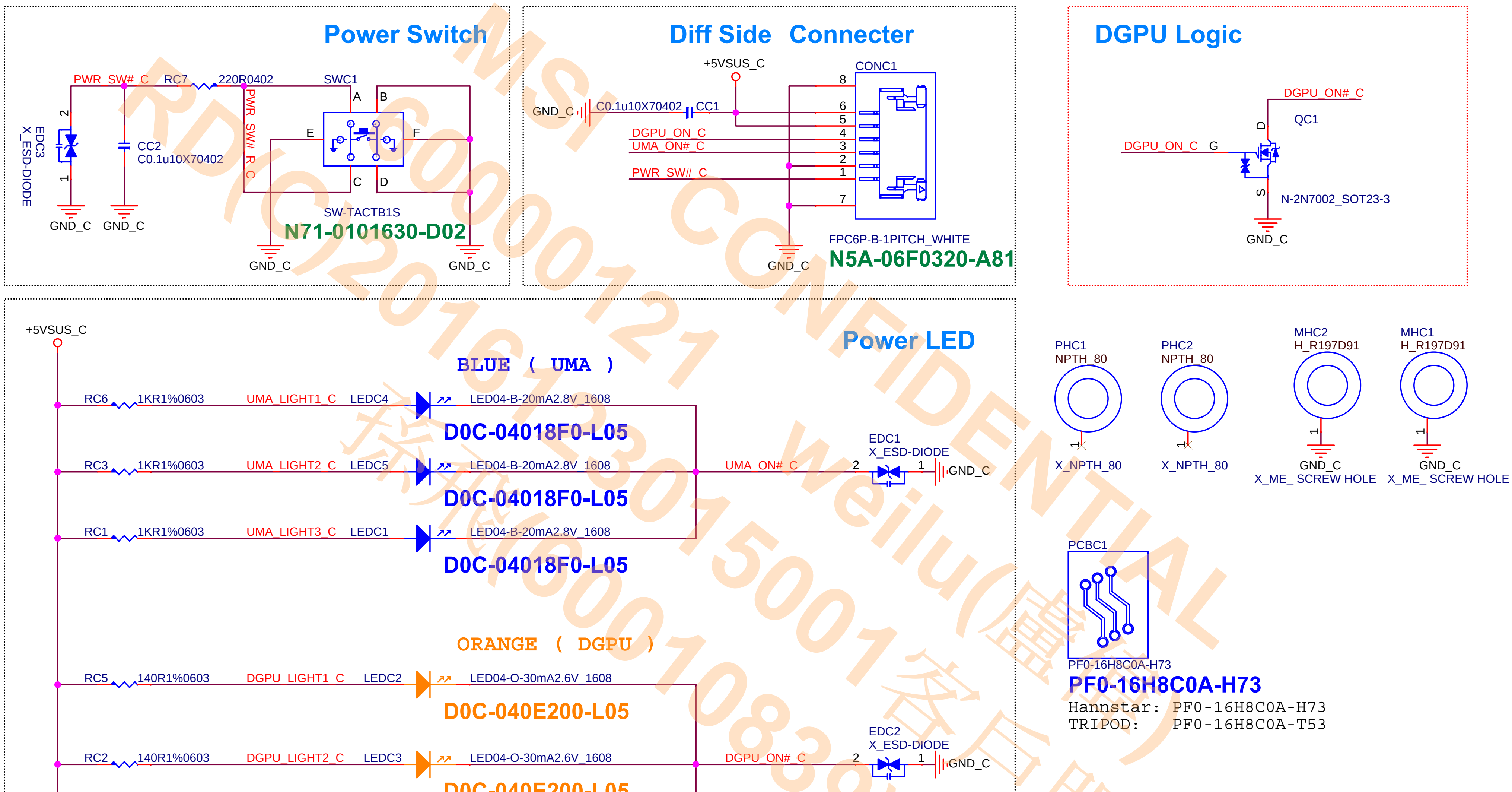
16H8C Board (Power SW Board)



Power Switch
PWR_SW#_C
RC7
220R0402
SWC1
PWR_SW#_R_C
A
B
E
F
C
D
EDC3
X_ESD-DIODE
CC2
C0.1u10X70402
GND_C
SW-TACTB1S
N71-0101630-D02
Diff Side Connecter
+5VSUS_C
CONC1
GND_C
C0.1u10X70402
CC1
DGPU_ON_C
UMA_ON#_C
PWR_SW#_C
FPC6P-B-1PITCH_WHITE
N5A-06F0320-A81
DGPU Logic
DGPU_ON#_C
QC1
DGPU_ON_C
N-2N7002_SOT23-3
GND_C
Power LED
+5VSUS_C
BLUE (UMA)
RC6
1KR1%0603
UMA_LIGHT1_C
LEDC4
LED04-B-20mA2.8V_1608
D0C-04018F0-L05
RC3
1KR1%0603
UMA_LIGHT2_C
LEDC5
LED04-B-20mA2.8V_1608
D0C-04018F0-L05
UMA_ON#_C
EDC1
X_ESD-DIODE
GND_C
RC1
1KR1%0603
UMA_LIGHT3_C
LEDC1
LED04-B-20mA2.8V_1608
D0C-04018F0-L05
ORANGE (DGPU)
RC5
140R1%0603
DGPU_LIGHT1_C
LEDC2
LED04-O-30mA2.6V_1608
D0C-040E200-L05
RC2
140R1%0603
DGPU_LIGHT2_C
LEDC3
LED04-O-30mA2.6V_1608
D0C-040E200-L05
DGPU_ON#_C
EDC2
X_ESD-DIODE
GND_C
RC4
140R1%0603
DGPU_LIGHT3_C
LEDC6
LED04-O-30mA2.6V_1608
D0C-040E200-L05
PHC1
NPTH_80
X_NPTH_80
PHC2
NPTH_80
X_NPTH_80
MHC2
H_R197D91
GND_C
X_ME_ SCREW HOLE
MHC1
H_R197D91
GND_C
X_ME_ SCREW HOLE
PCBC1
PF0-16H8C0A-H73
PF0-16H8C0A-H73
Hannstar: PF0-16H8C0A-H73
TRIPOD: PF0-16H8C0A-T53

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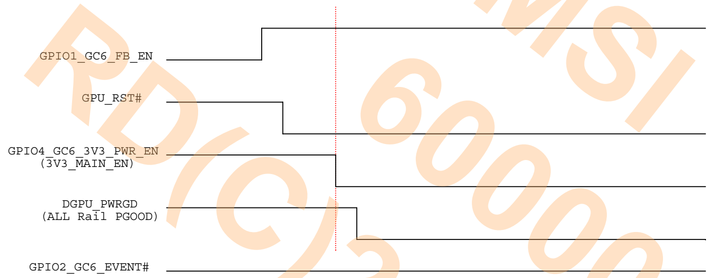
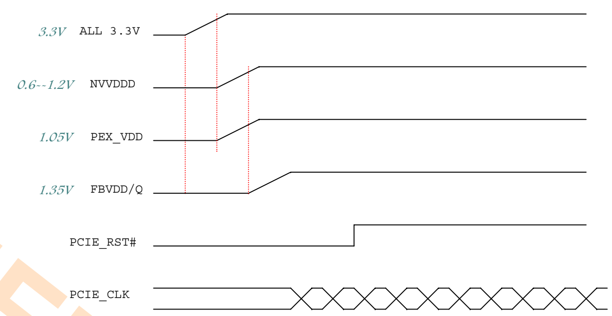
MS-16H8 DGPU POWER SEQUENCE

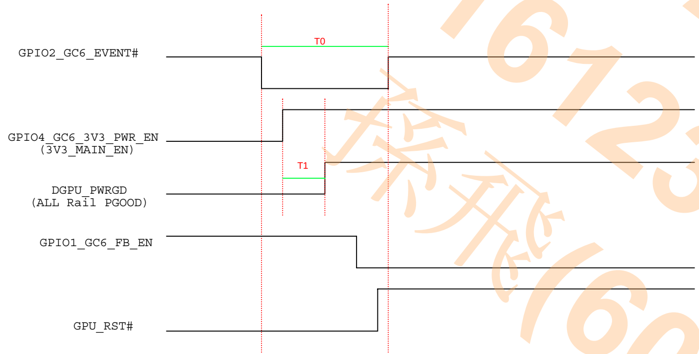
GC6 2.0 ENTRY SEQUENCE



GPU POWER ON SEQUENCE



GC6 2.0 EXIT SEQUENCE



NOTES:

1. The ramp time for any rail must be more than 40 us and is recommended to be less than 2ms.
2. The ramp up overshoot should not exceed the silicon reliability limit voltagr.
3. A VDD33 must ramp up to 90% before NVVDD and PEX_VDD in sequence can ramping up.
   NVVDD must ramp up to 90% before FBVDD/Q in sequence can ramping up.
3. No signal should be applied to the GPU before the power rails are fully ramped.
4. Refer to JEDEC Memory Specification for memory related power sequencing.

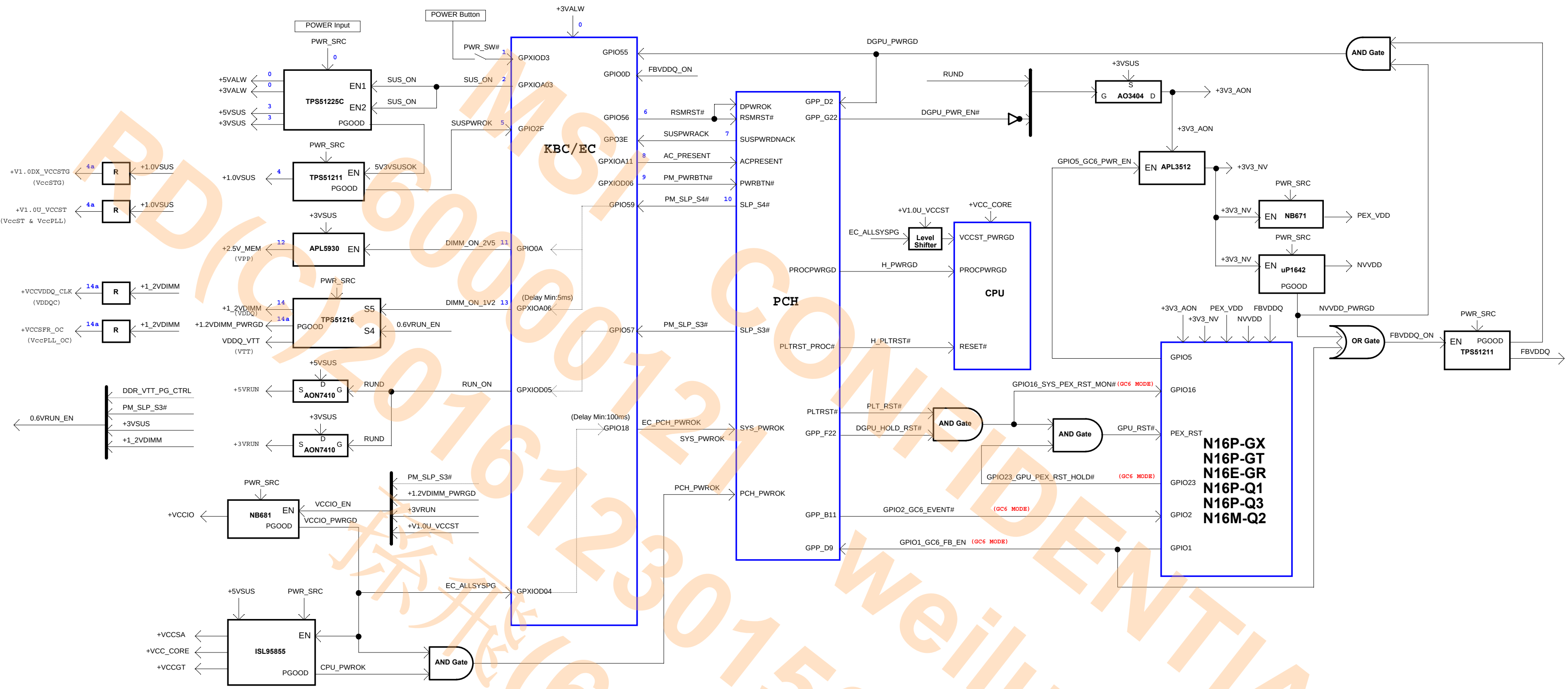
GC6 2.0 TIMING

	Min	Max	Unit	Description
T0	0.001	N/A	mS	GPU_EVENT# assertion
T1	0.04	4	mS	3V3_MAIN_EN assertion to all power rails up and stable

NOTES:

1. ALL RailPGOOD=1 represents all GPU power rails are ramped up and in regulation.
   If any GPU power rail cannot ge guaranteed in regulation this state should equal to 0.
2. During GC6 exit, the order of power rail ramp-up must follow the Power up sequence described in Chapter 3 with the exception that FBVDD/Q stays on.
3. All delays should be minimized to increase time spent in GC6 for maximum power saving.
4. The entire entry and exit sequence must complete within 200 ms.

MS-16H8 Power On Block Diagram



POWER Input
PWR_SRC
POWER Button
+3VALW
PWR_SW#
TPS51225C
EN1
EN2
PGOOD
+5VALW
+3VALW
+5VSUS
+3VSUS
SUS_ON
SUSPWROK
TPS51211
5V3VSUSOK
+1.0VSUS
+V1.0DX_VCCSTG (VccSTG)
+V1.0U_VCCST (VccST & VccPLL)
APL5930
+2.5V_MEM (VPP)
DIMM_ON_2V5
TPS51216
S5
S4
+1_2VDIMM (VDDQ)
+1.2VDIMM_PWRGD
VDDQ_VTT (VTT)
0.6VRUN_EN
DIMM_ON_1V2
+VCCVDDQ_CLK (VDDQC)
+VCCSFR_OC (VccPLL_OC)
+1_2VDIMM
AON7410
+5VRUN
+3VRUN
RUND
RUN_ON
DDR_VTT_PG_CTRL
PM_SLP_S3#
NB681
+VCCIO
VCCIO_EN
VCCIO_PWRGD
+1.2VDIMM_PWRGD
+V1.0U_VCCST
ISL95855
+VCCSA
+VCC_CORE
+VCCGT
CPU_PWROK
EC_ALLSYSPG
AND Gate
KBC/EC
GPXIOD3
GPXIOA03
GPIO2F
GPIO0A
GPXIOA06
GPXIOD05
GPXIOD04
GPIO55
GPIO0D
GPIO56
GPIO3E
GPXIOA11
GPXIOD06
GPIO59
GPIO57
GPIO18
(Delay Min:5ms)
(Delay Min:100ms)
DGPU_PWRGD
FBVDDQ_ON
RSMRST#
SUSPWRACK
AC_PRESENT
PM_PWRBTN#
PM_SLP_S4#
PM_SLP_S3#
EC_PCH_PWROK
SYS_PWROK
PCH_PWROK
PCH
DPWROK
RSMRST#
SUSPWRDNACK
ACPRESENT
PWRBTN#
SLP_S4#
SLP_S3#
PROCPWRGD
PLTRST_PROC#
PLTRST#
GPP_D2
GPP_G22
GPP_F22
GPP_B11
GPP_D9
CPU
VCCST_PWRGD
PROCPWRGD
RESET#
H_PWRGD
H_PLTRST#
Level Shifter
+V1.0U_VCCST
+VCC_CORE
RUND
DGPU_PWR_EN#
AO3404
+3V3_AON
APL3512
GPIO5_GC6_PWR_EN
+3V3_NV
NB671
PEX_VDD
uP1642
NVVDD
NVVDD_PWRGD
OR Gate
FBVDDQ
TPS51211
PLT_RST#
DGPU_HOLD_RST#
GPU_RST#
GPIO16_SYS_PEX_RST_MON# (GC6 MODE)
GPIO23_GPU_PEX_RST_HOLD# (GC6 MODE)
GPIO2_GC6_EVENT# (GC6 MODE)
GPIO1_GC6_FB_EN (GC6 MODE)
GPIO5
GPIO16
PEX_RST
GPIO23
GPIO2
GPIO1
N16P-GX
N16P-GT
N16E-GR
N16P-Q1
N16P-Q3
N16M-Q2

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Title: Power On Block Diagram

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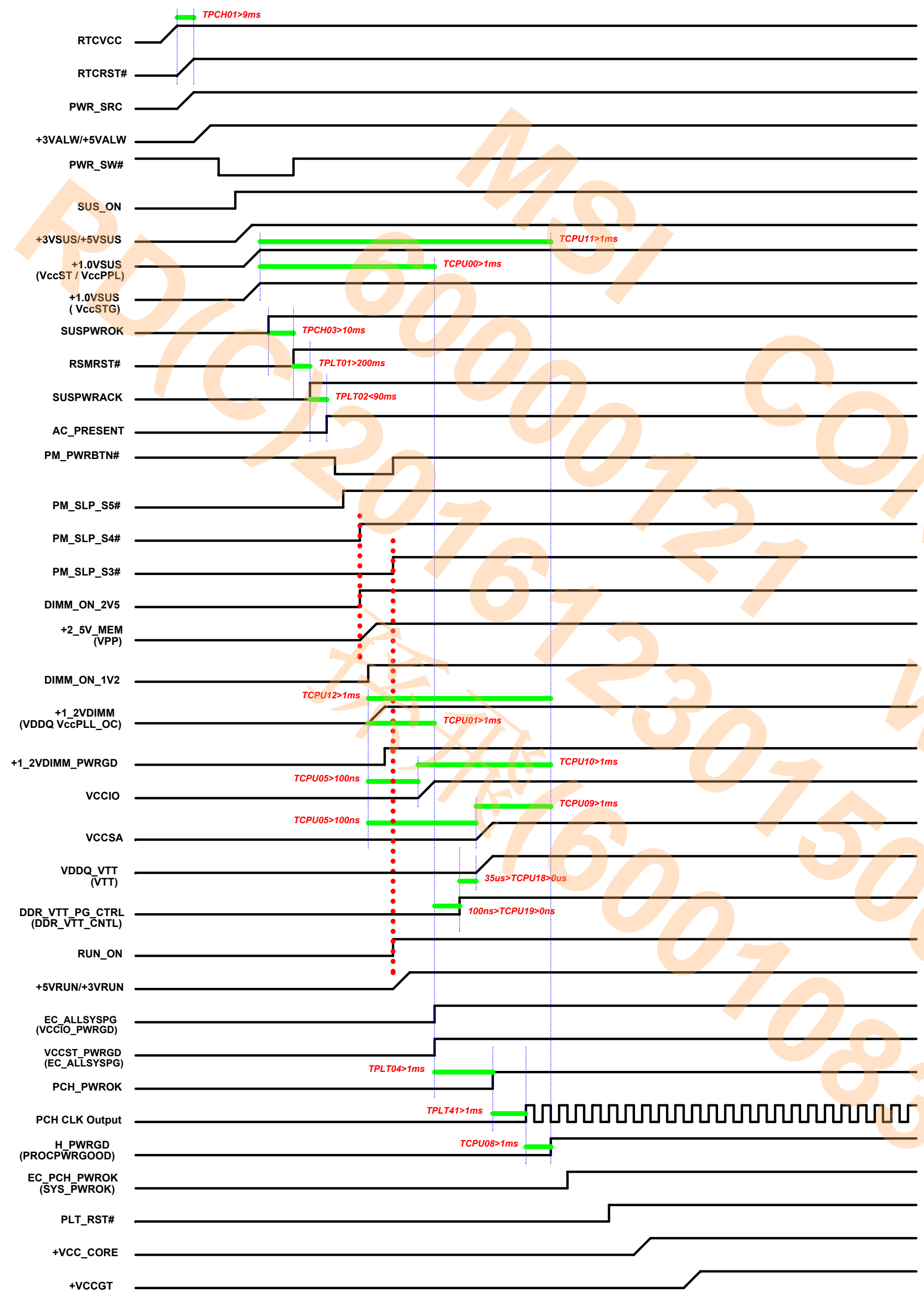
Power On Sequence

G3 -> S0



RTCVCC
TPCH01>9ms
RTCRST#
PWR_SRC
+3VALW/+5VALW
PWR_SW#
SUS_ON
+3VSUS/+5VSUS
TCPU11>1ms
+1.0VSUS (VccST / VccPPL)
TCPU00>1ms
+1.0VSUS (VccSTG)
SUSPWROK
TPCH03>10ms
RSMRST#
TPLT01>200ms
SUSPWRACK
TPLT02<90ms
AC_PRESENT
PM_PWRBTN#
PM_SLP_S5#
PM_SLP_S4#
PM_SLP_S3#
DIMM_ON_2V5
+2_5V_MEM (VPP)
DIMM_ON_1V2
TCPU12>1ms
+1_2VDIMM (VDDQ VccPLL_OC)
TCPU01>1ms
+1_2VDIMM_PWRGD
TCPU10>1ms
TCPU05>100ns
VCCIO
TCPU09>1ms
TCPU05>100ns
VCCSA
VDDQ_VTT (VTT)
35us>TCPU18>0us
DDR_VTT_PG_CTRL (DDR_VTT_CNTL)
100ns>TCPU19>0ns
RUN_ON
+5VRUN/+3VRUN
EC_ALLSYSPG (VCCIO_PWRGD)
VCCST_PWRGD (EC_ALLSYSPG)
TPLT04>1ms
PCH_PWROK
TPLT41>1ms
PCH CLK Output
TCPU08>1ms
H_PWRGD (PROCPWRGOOD)
EC_PCH_PWROK (SYS_PWROK)
PLT_RST#
+VCC_CORE
+VCCGT

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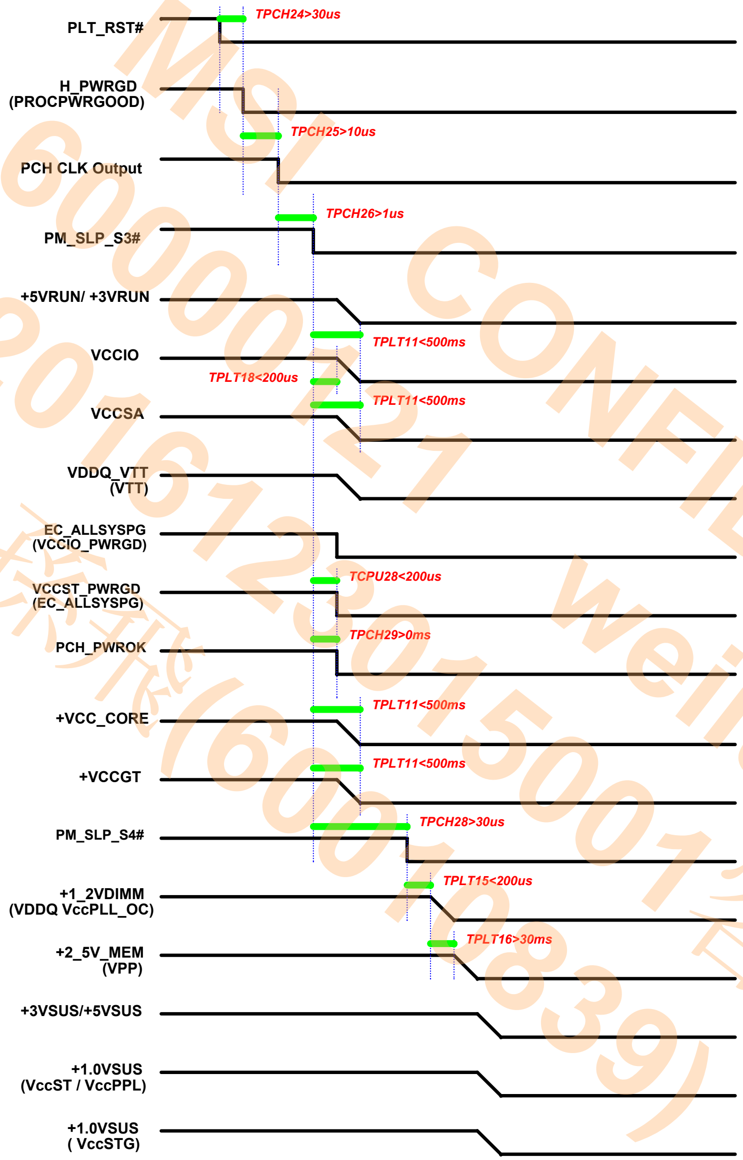
Power Down Sequence

S0 -> G3



msi	MICRO-STAR INT'L CO.,LTD.		
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History

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