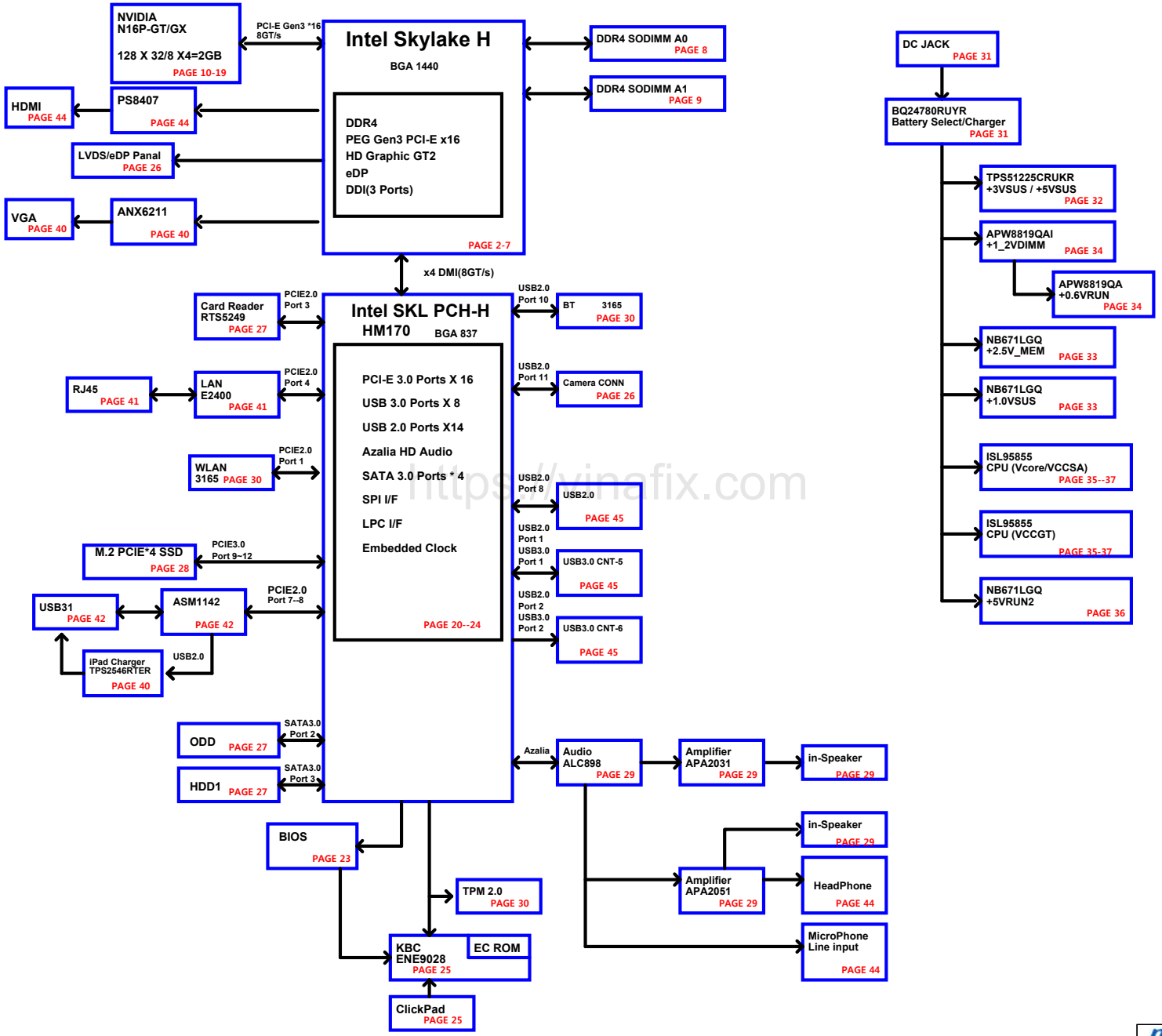
MS-16GJ1 Ver: 10

Intel Skylake platform

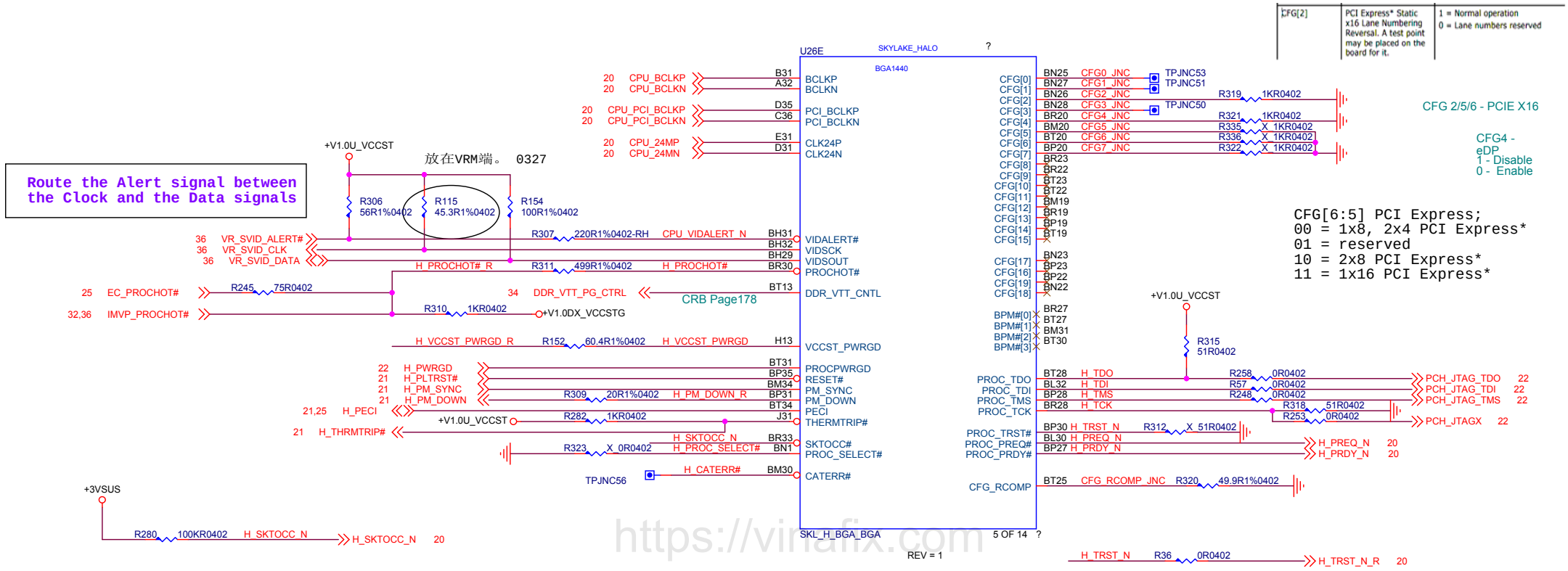


MICRO-STAR INT'L CO.,LTD.

Block Diagram

MS-16GJ

10



CFG[2]	PCI Express* Static x16 Lane Numbering Reversal. A test point may be placed on the board for it.	1 = Normal operation 0 = Lane numbers reserved

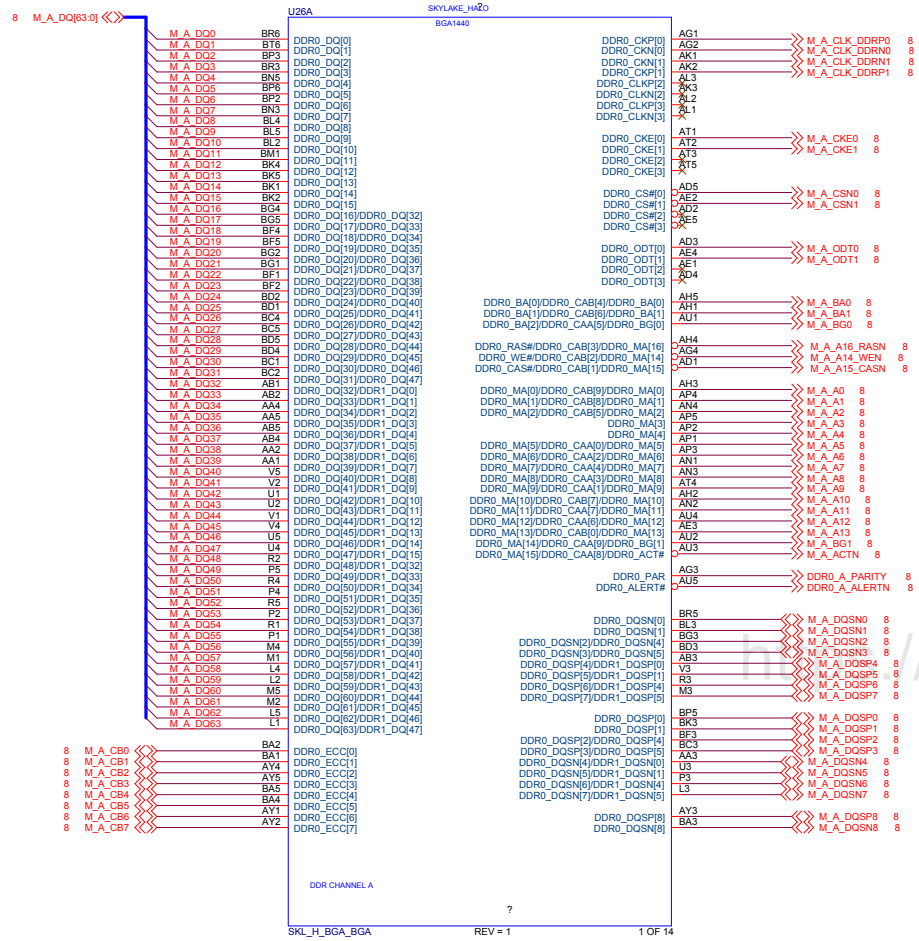
MSR Privacy Bit Feature	
CFG3	1 = Debug capability is determined by IA32_Debug_Interface_MSR (0xC80) bit[0] setting 0 = IA32_Debug_Interface_MSR (0xC80) bit[0] default setting overridden

eDP Enable	
CFG4	1 = Disabled 0 = Enabled

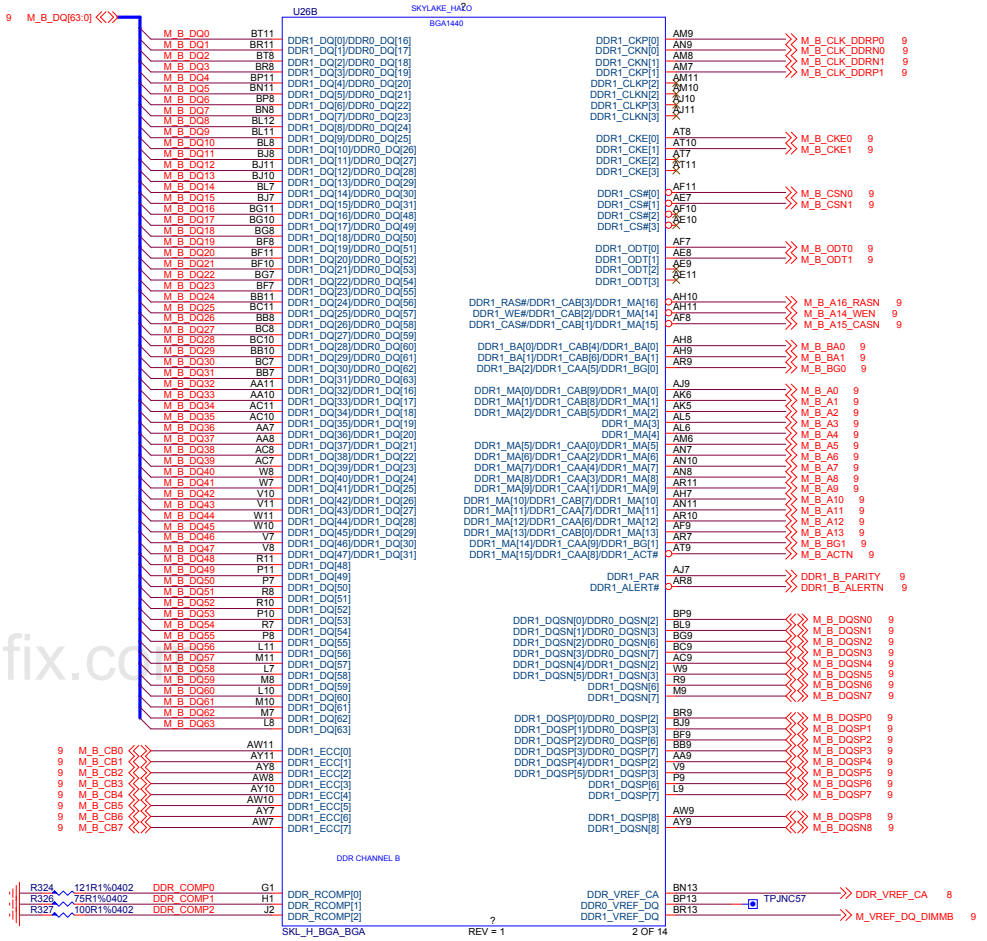
PEG DEFER TRAINING	
CFG7	1: (Default) PEG Train immediately following xxRESETB de assertion 0: PEG Wait for BIOS for training

Title	Skylake(HOST)
Size / Document Number	Custom / MS-16GJ
Rev	10
Date:	Monday, August 03, 2015
Sheet	2 of 56

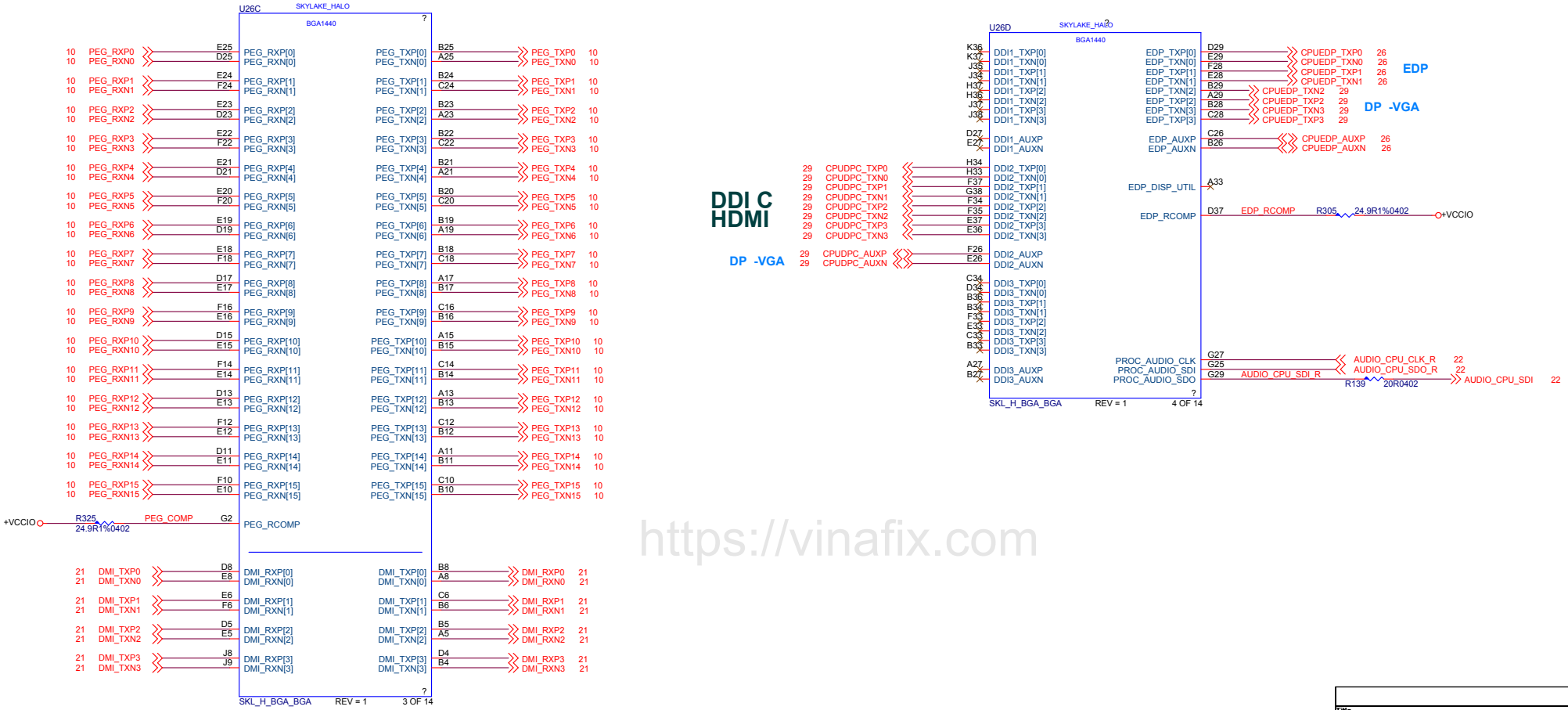
DDR Channel A



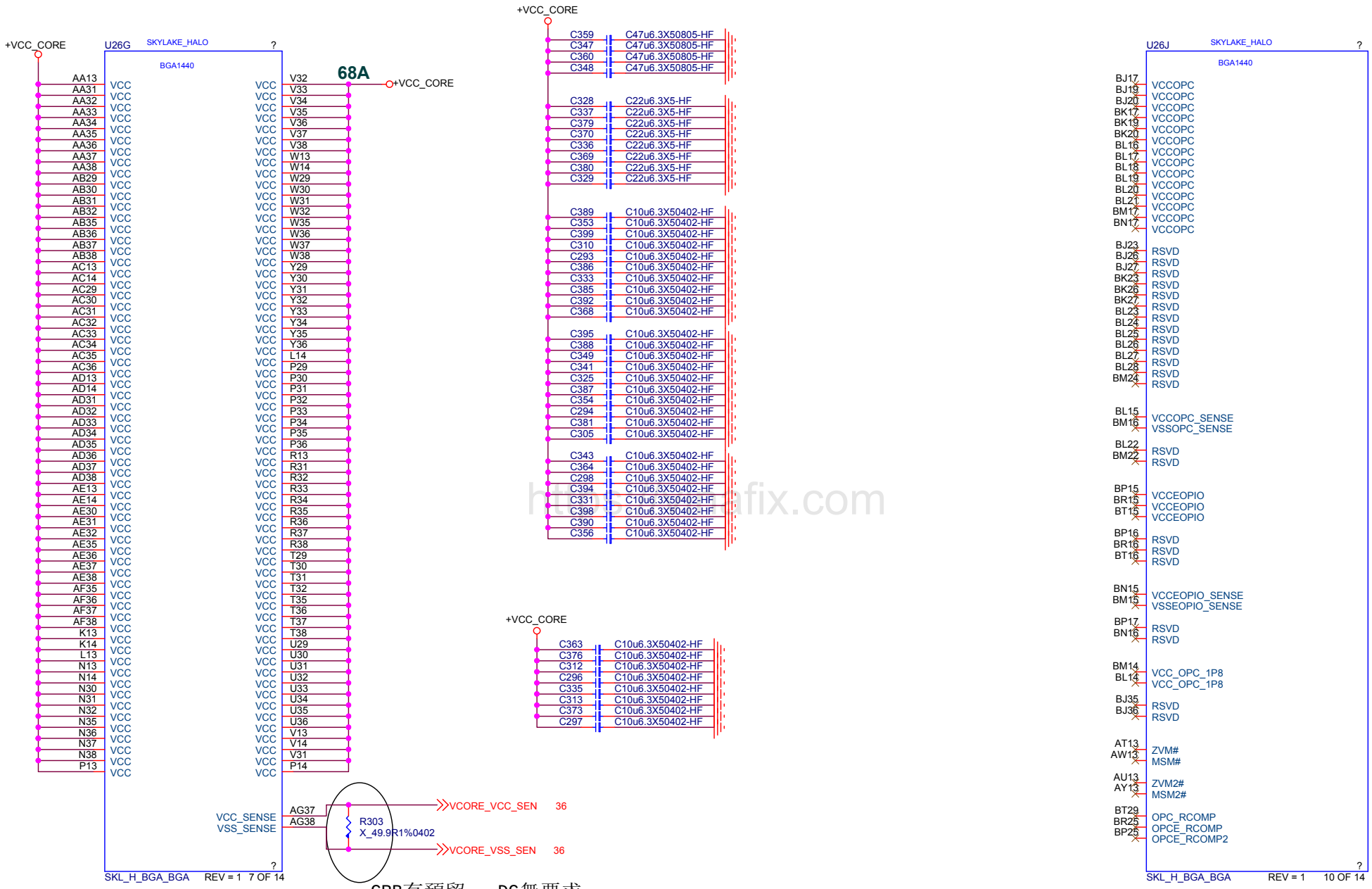
DDR Channel B



Title	Skylake(DDR4)		
Size	Custom	Document Number MS-16GJ	Rev 10
Date:	Wednesday, July 29, 2015	Sheet 3 of 56	

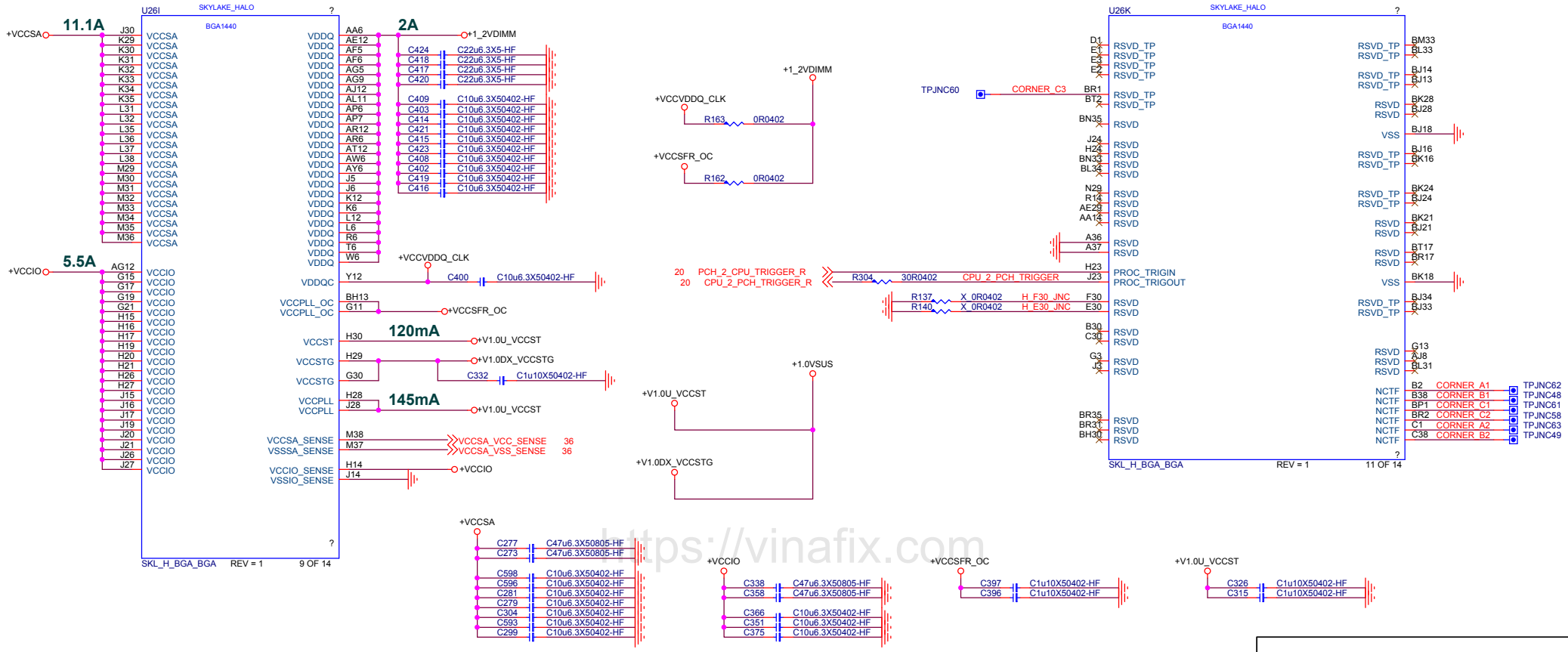


Title: Skylake(DDI)		
Size: Custom	Document Number: MS-16GJ	Rev: 10
Date: Wednesday, July 29, 2015	Sheet 4 of 56	

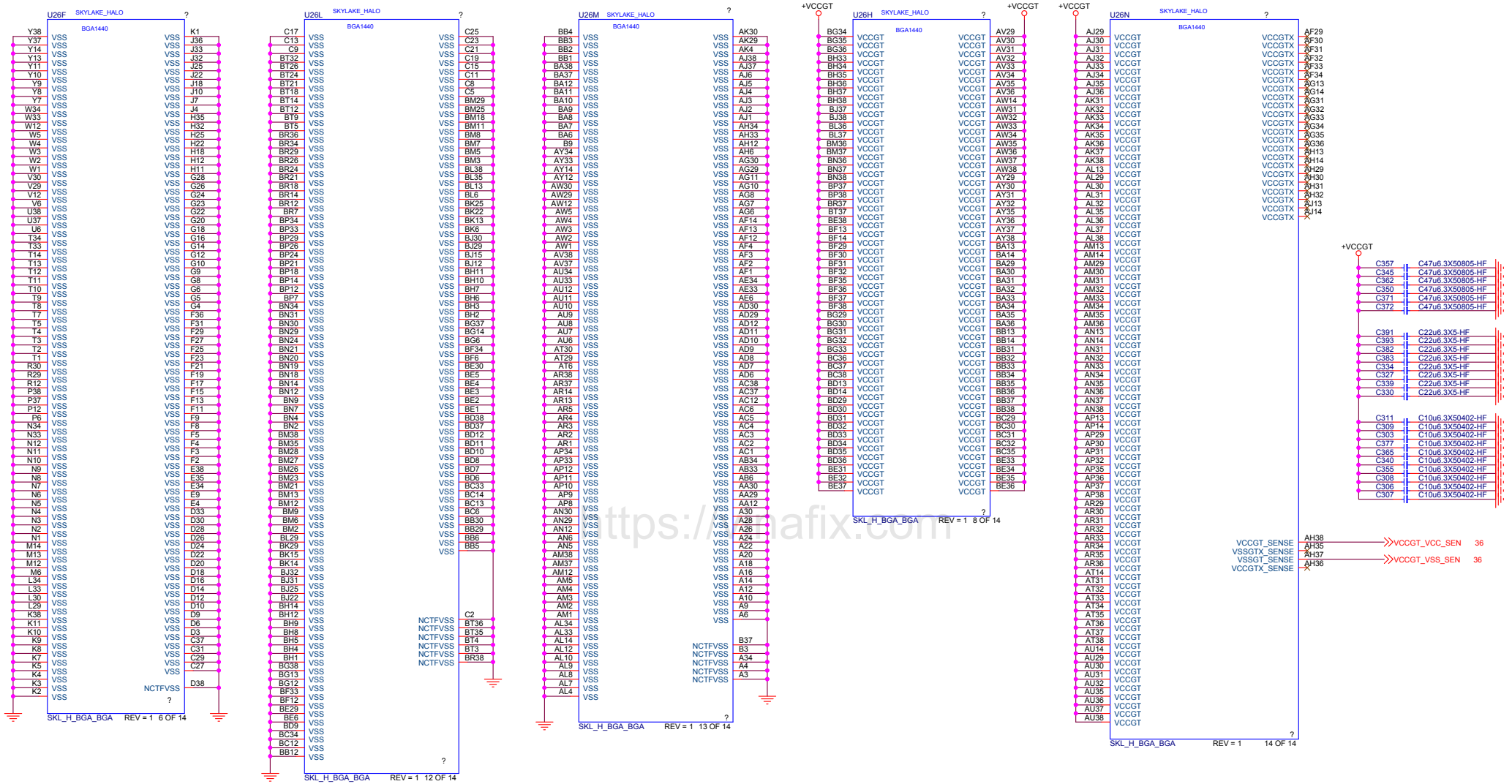


CRB有預留， DG無要求。

Title	Skylake(VCC)		
Size	Document Number		Rev
Custom	MS-16GJ		10
Date:	Wednesday, July 29, 2015	Sheet 5 of 56	

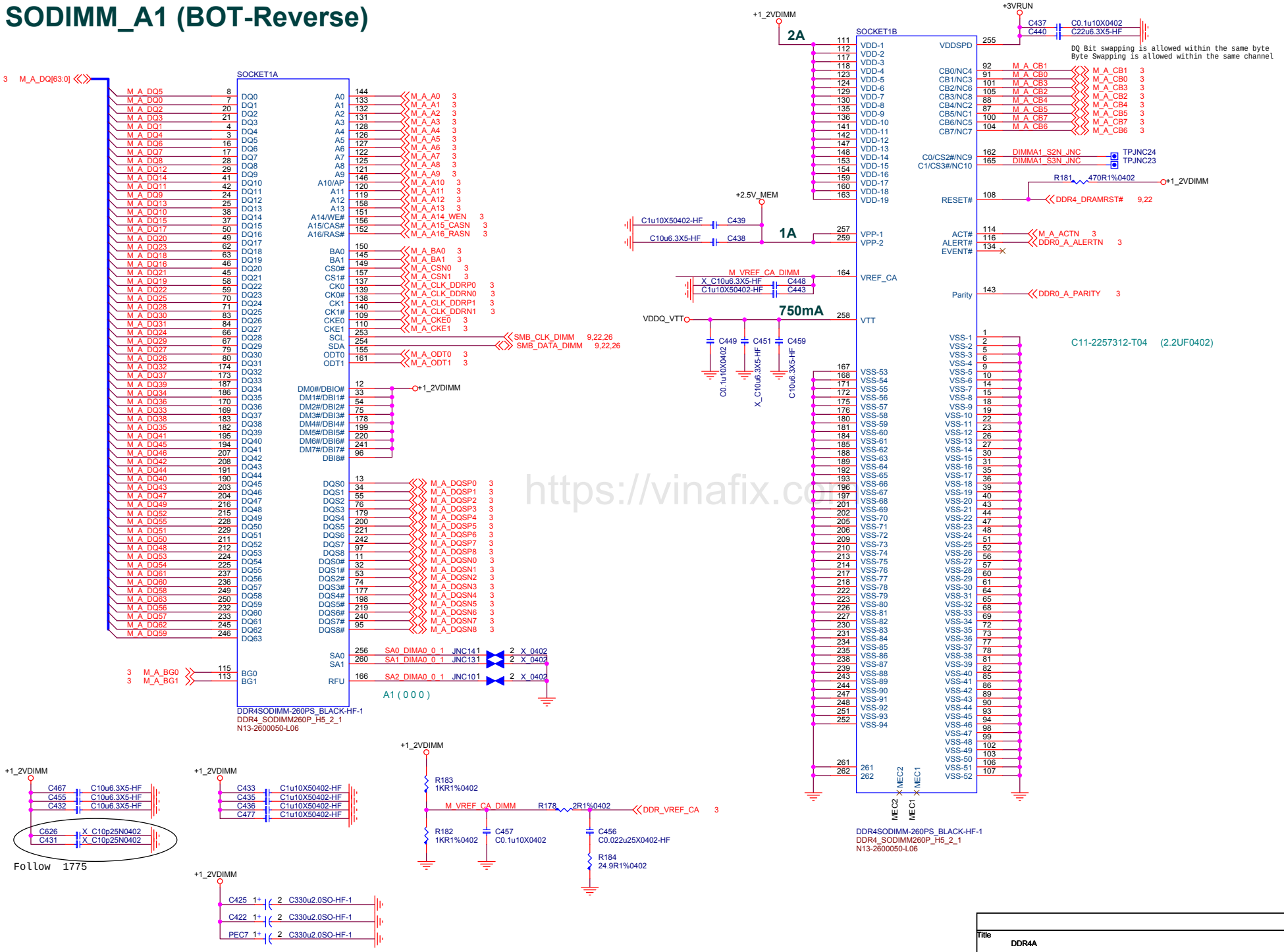


Title	Skylake(VCC2)	
Size: Custom	Document Number: MS-16GJ	Rev: 10
Date: Wednesday, July 29, 2015	Sheet 6 of 56	



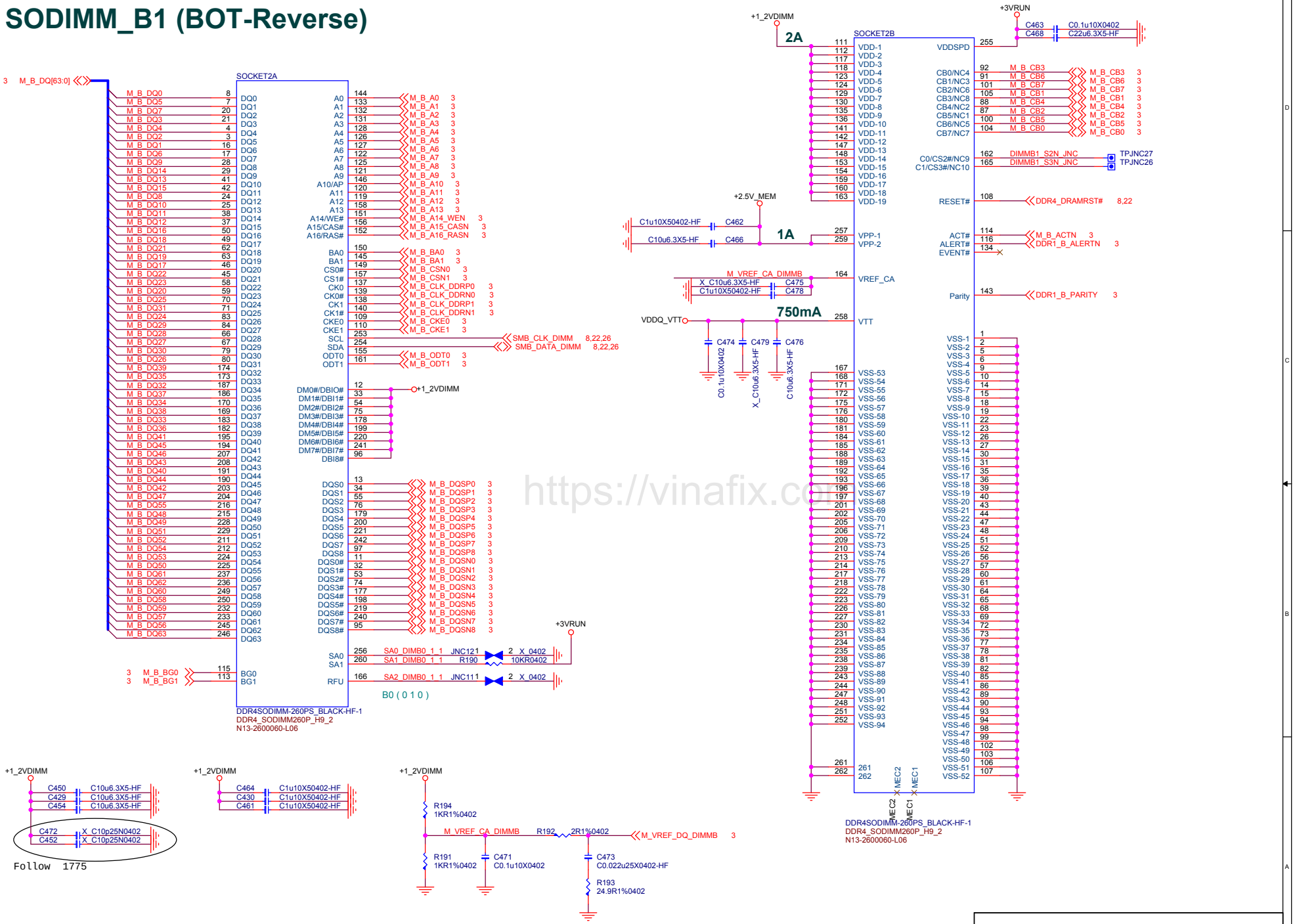
Title	Skylake(VCC/GND)	
Size Custom	Document Number MS-16GJ	Rev 10
Date: Wednesday, July 29, 2015	Sheet 7 of 56	

SODIMM_A1 (BOT-Reverse)



Title	DDR4A
Size	Custom
Document Number	MS-16GJ
Rev	10
Date:	Wednesday, July 29, 2015
Sheet	8 of 56

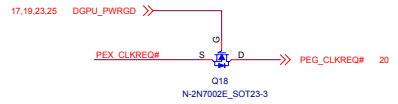
SODIMM_B1 (BOT-Reverse)

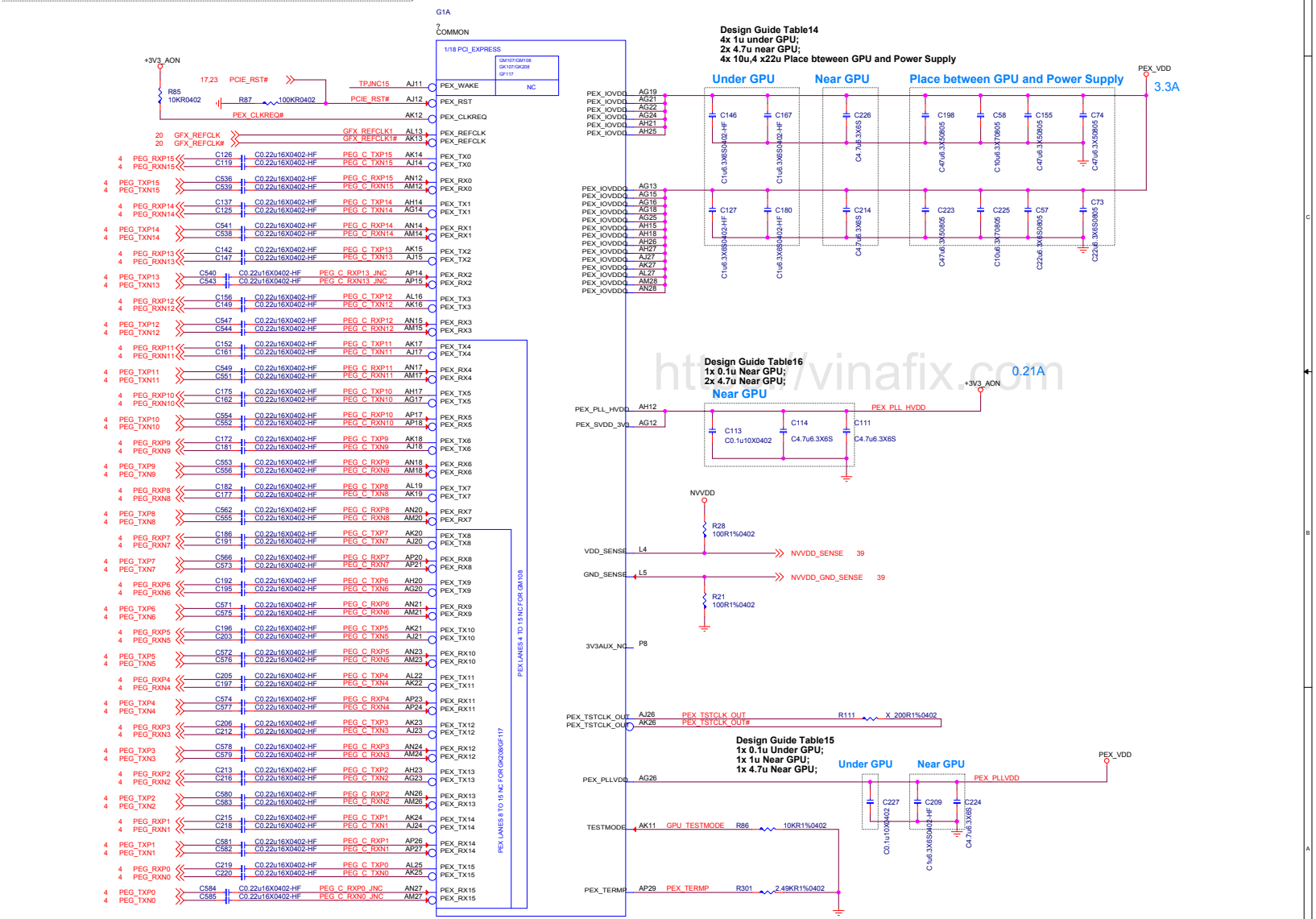


Title	DDR4B
Size	Custom
Document Number	MS-16GJ
Rev	10
Date:	Wednesday, July 29, 2015
Sheet	9 of 56

N16P-GT(PCI-Express Gen3 x16 Interface)

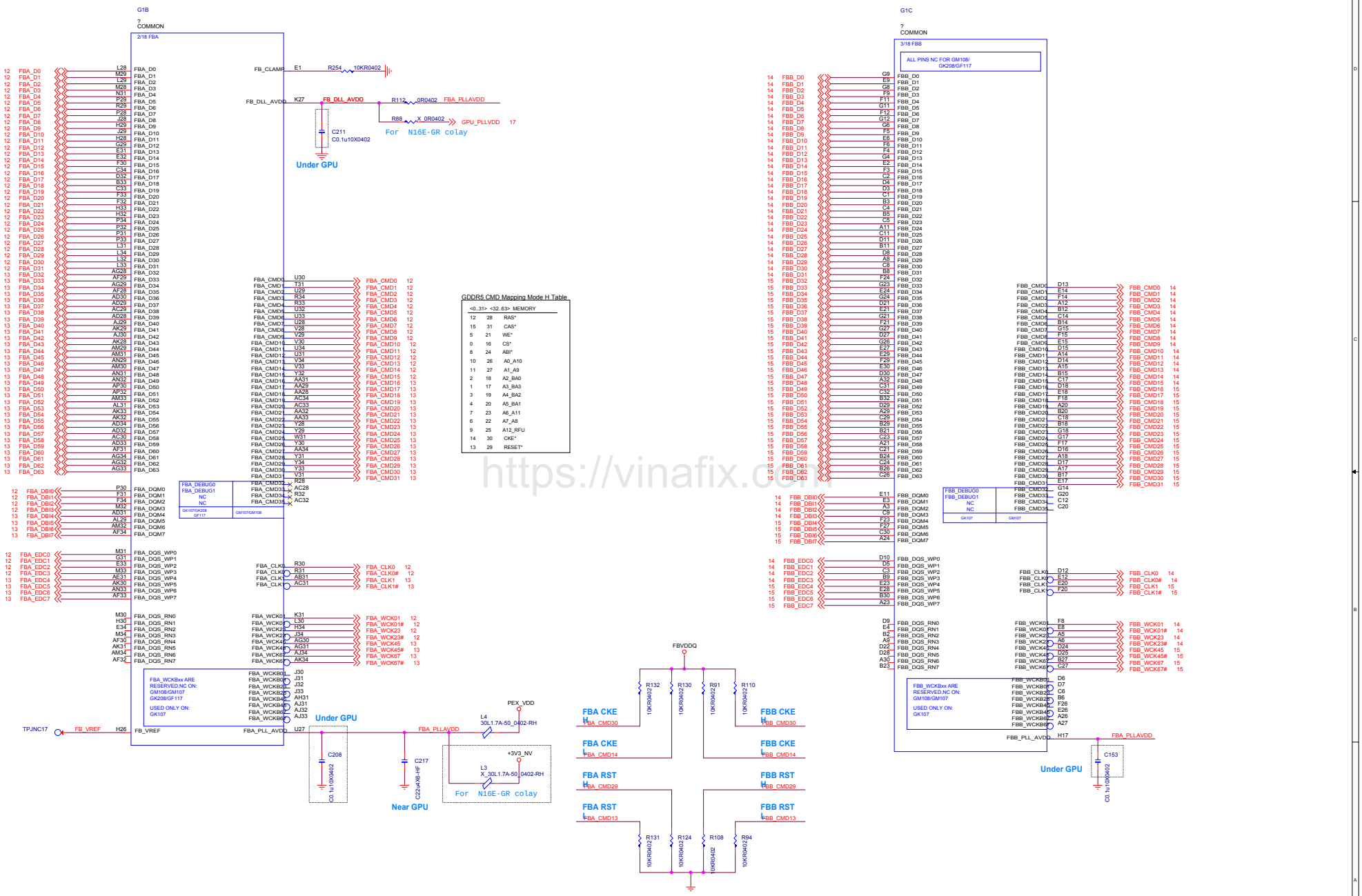
GPU CLK REQ#





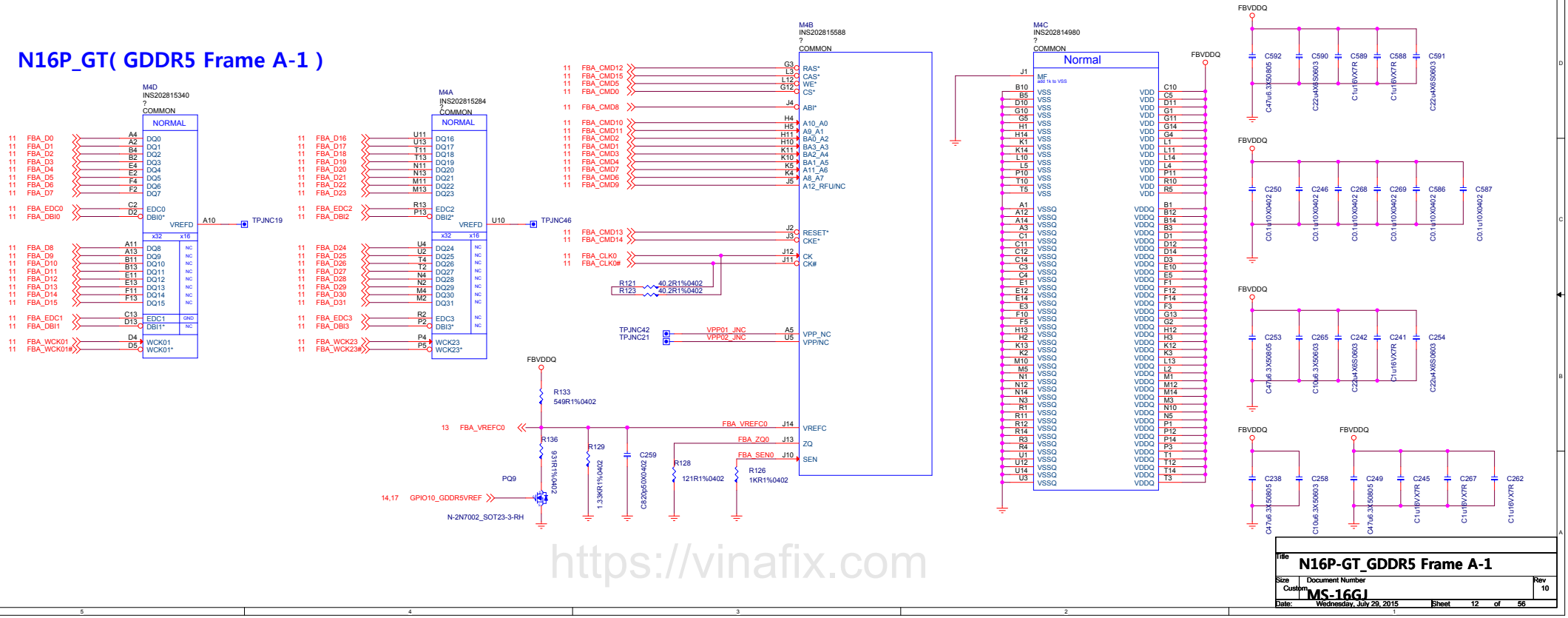
Title	N16P-GT_PCI-E Host		
Size: Custom	Document Number: MS-16GJ		Rev: 10
Date: Wednesday, July 29, 2015	Sheet 10 of 56		

N16P-GT(Frame Buffer Interface)



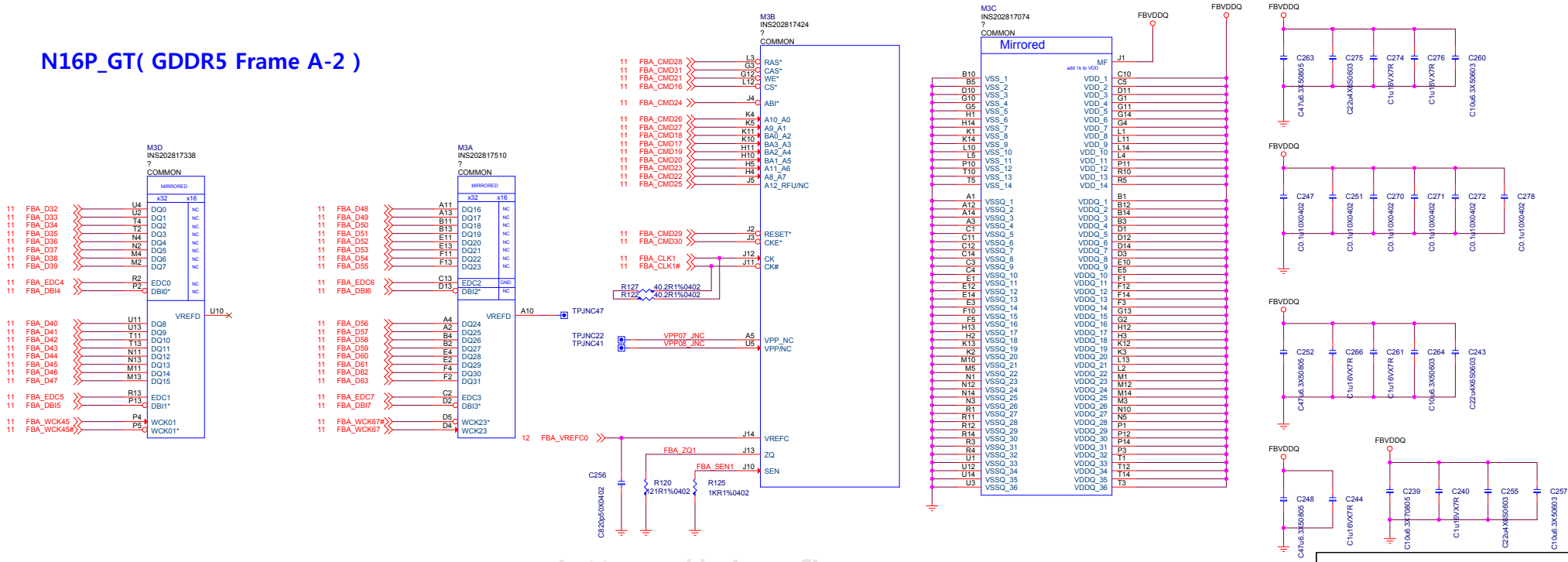
Title	N16P-GT_MEM IF A/B	
Size: Custom	Document Number: MS-16GJ	Rev: 10
Date: Wednesday, July 29, 2015	Sheet 11 of 56	

N16P_GT(GDDR5 Frame A-1)



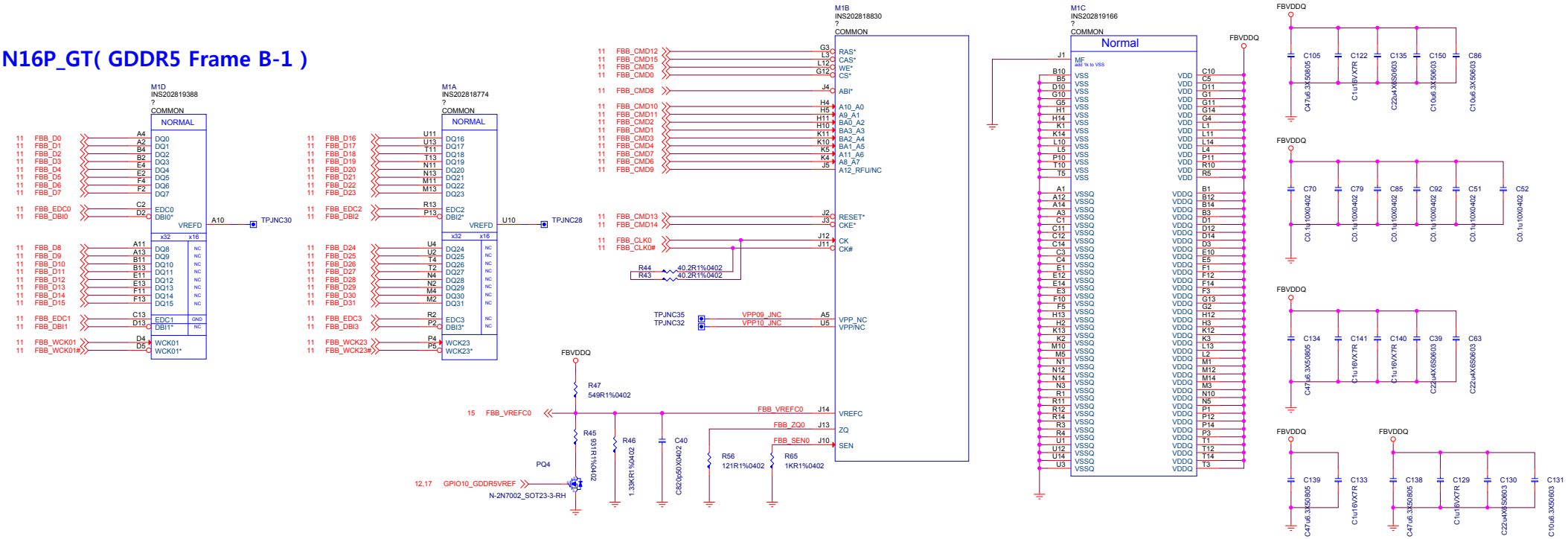
Title	N16P-GT_GDDR5 Frame A-1	
Size: Custom	Document Number: MS-16GJ	Rev: 10
Date: Wednesday, July 29, 2015	Sheet 12 of 56	

N16P_GT(GDDR5 Frame A-2)

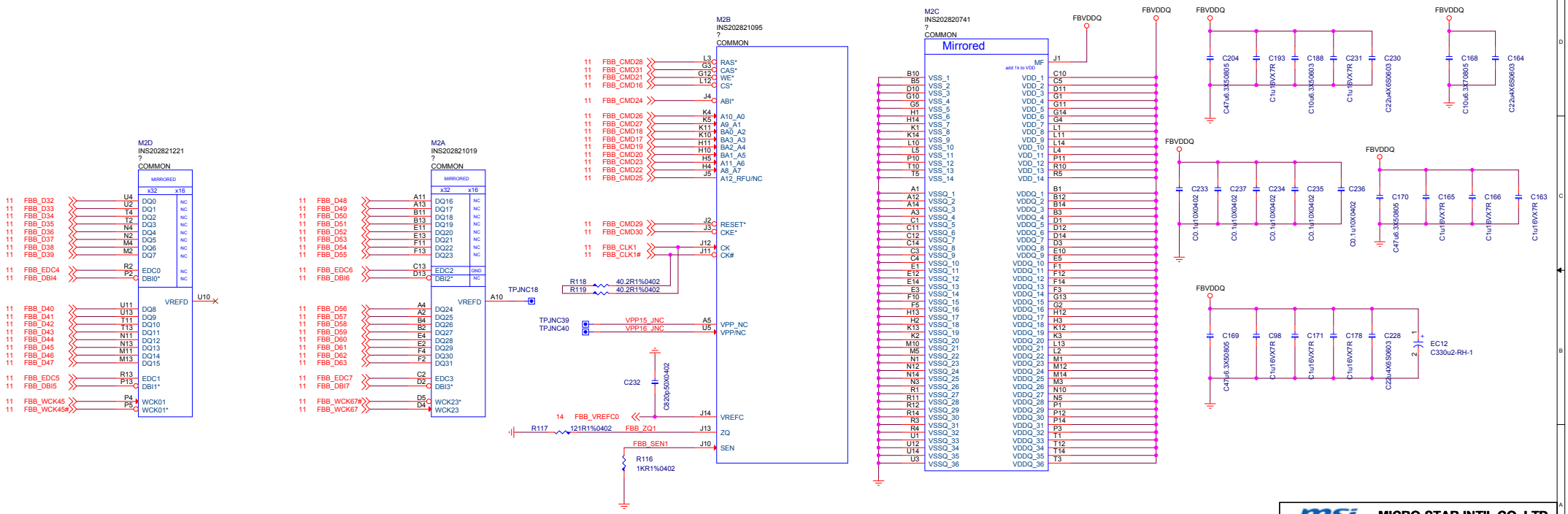


Title	N16P-GT_GDDR5 Frame A-2
Size: Custom	Document Number: MS-16GJ
Rev	10
Date: Wednesday, July 29, 2015	Sheet 13 of 56

N16P_GT(GDDR5 Frame B-1)



Title	N16P-GT_GDDR5 Frame B-1	
Size: Custom	Document Number: MS-16GJ	Rev: 10
Date: Wednesday, July 29, 2015	Sheet 14 of 56	



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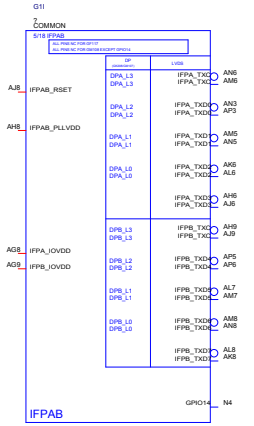
Title: Block Diagram

Size | Document Number: MS-16GJ | Rev: 10

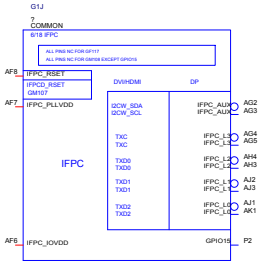
Date: | Sheet 15 of 56

N16P-GT(Display IF)

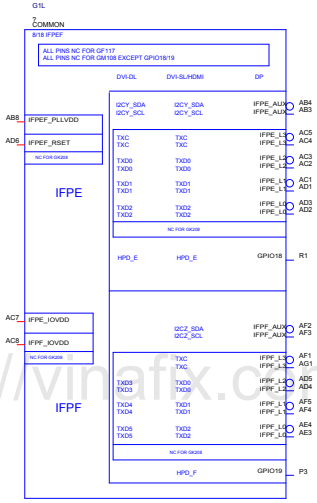
IFP A/B LVDSDual Link



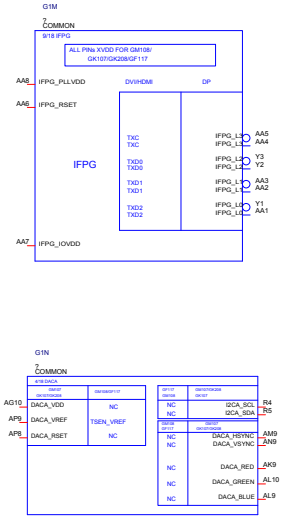
IFP C Native HDMI OR DP

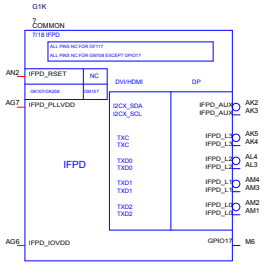


IFP E/F Dual Link TMDS DVI-I

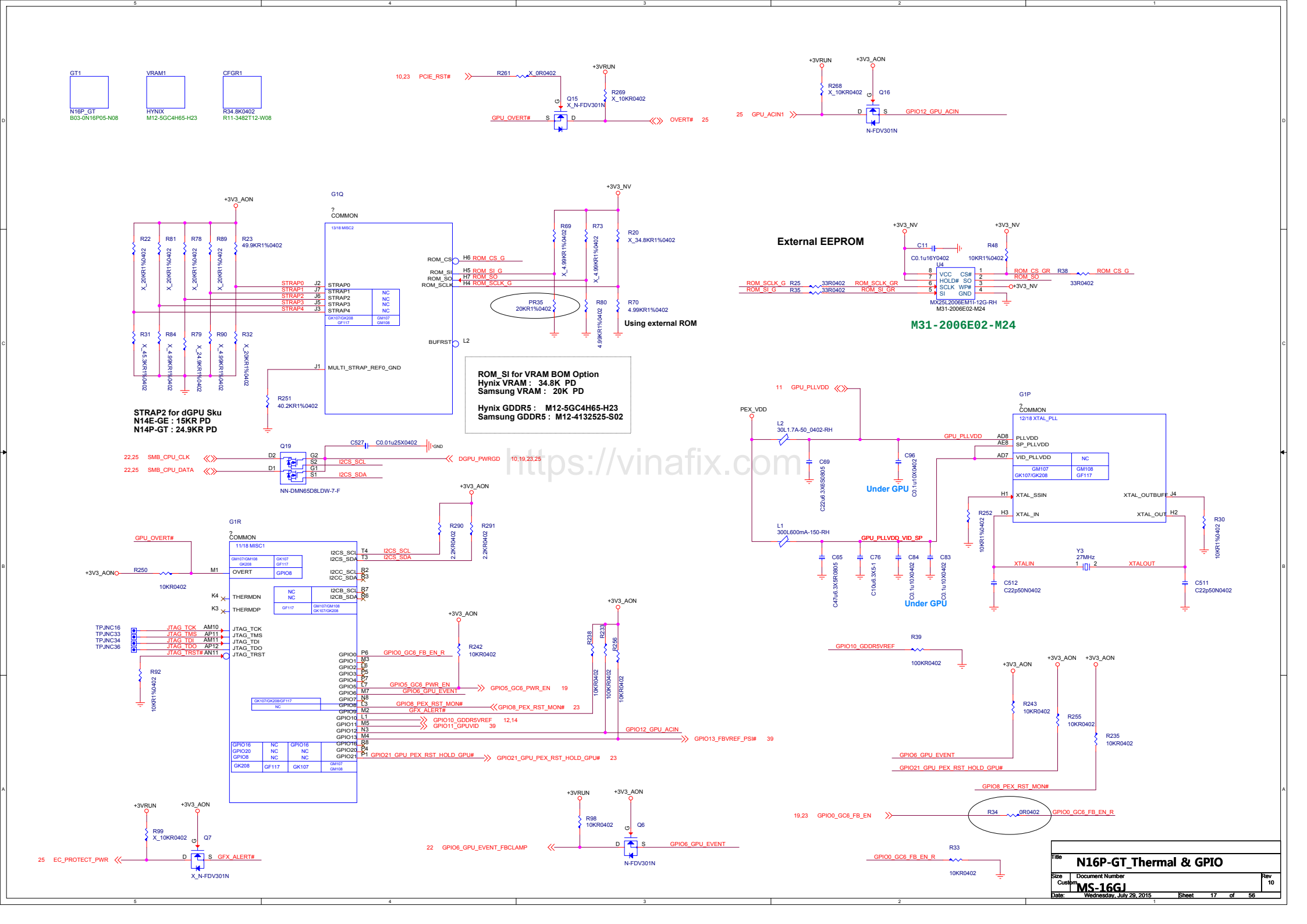


DAC A VGA

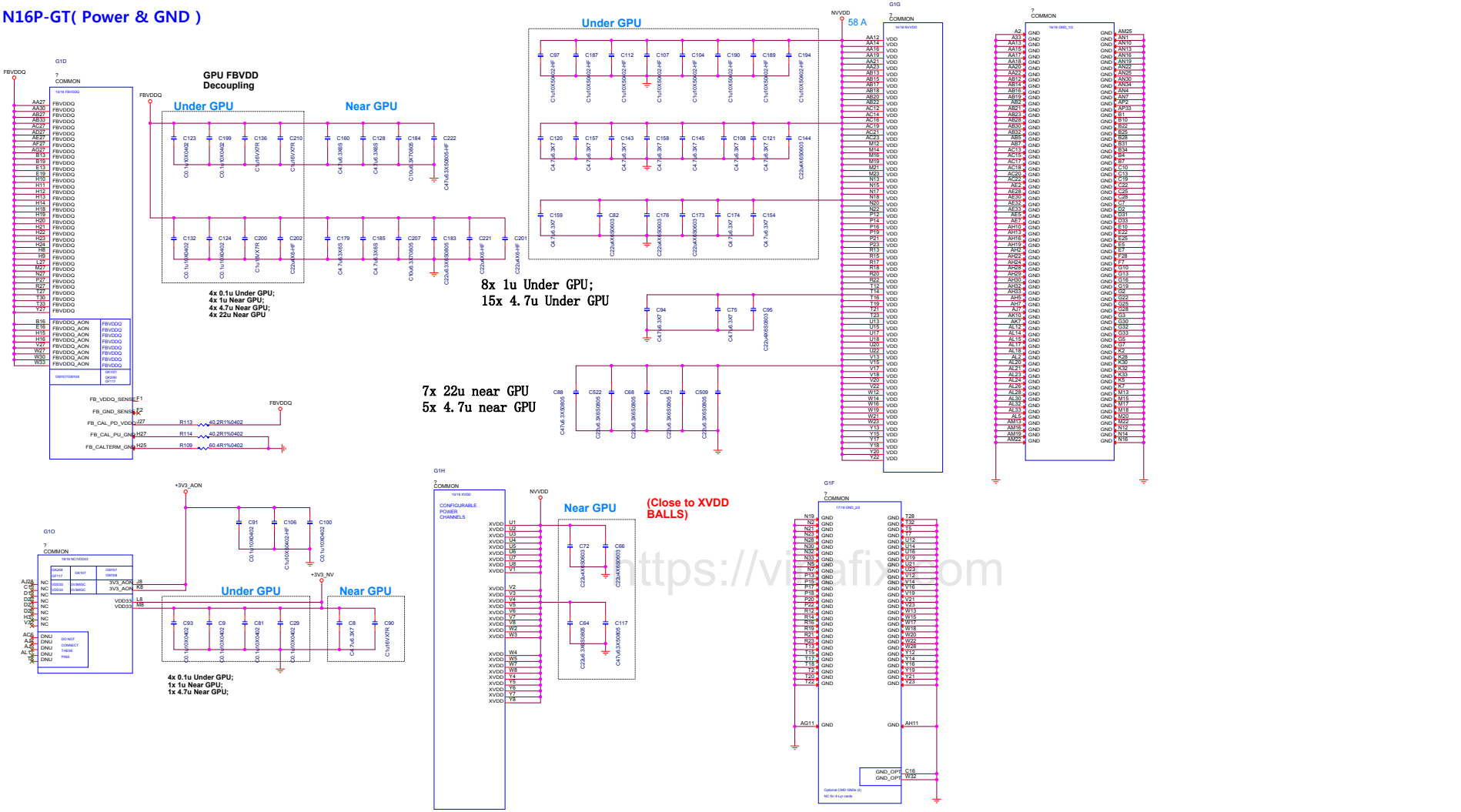




File	N16P-GT_Display IF		
Size	Document Number		Rev
Custom	MS-16GJ		1.0
Date:	Wednesday, July 29, 2015	Sheet 16 of 56	


GT1
N16P_GT
B03-0N16P05-N08
VRAM1
HYNIX
M12-5GC4H65-H23
CFGR1
R34.8K0402
R11-3482T12-W08
10,23 PCIE_RST#
R261 X_0R0402
+3VRUN
R269 X_10KR0402
Q15 X_N-FDV301N
GPU_OVERT#
OVERT# 25
+3VRUN
+3V3_AON
R268 X_10KR0402
Q16
25 GPU_ACIN1
GPIO12_GPU_ACIN
N-FDV301N
+3V3_AON
G1Q
? COMMON
13/18 MISC2
R22 R81 R78 R89 R23 49.9KR1%0402
X_20KR1%0402
STRAP0 J2
STRAP1 J7
STRAP2 J6
STRAP3 J5
STRAP4 J3
STRAP0
STRAP1
STRAP2
STRAP3
STRAP4
NC NC NC NC
GK107/GK208 GF117
GM107 GM108
R31 X_45.3KR1%0402
R84 X_4.99KR1%0402
R79 X_24.9KR1%0402
R90 X_4.99KR1%0402
R32 X_20KR1%0402
J1 MULTI_STRAP_REF0_GND
R251 40.2KR1%0402
STRAP2 for dGPU Sku
N14E-GE : 15KR PD
N14P-GT : 24.9KR PD
+3V3_NV
ROM_CS
ROM_SI
ROM_SO
ROM_SCLK
H6 ROM_CS_G
H5 ROM_SI_G
H7 ROM_SO
H4 ROM_SCLK_G
R69 X_4.99KR1%0402
R73 X_4.99KR1%0402
R20 X_34.8KR1%0402
PR35 20KR1%0402
R80 4.99KR1%0402
R70 4.99KR1%0402
Using external ROM
BUFRST
L2
ROM_SI for VRAM BOM Option
Hynix VRAM : 34.8K PD
Samsung VRAM : 20K PD
Hynix GDDR5 : M12-5GC4H65-H23
Samsung GDDR5 : M12-4132525-S02
External EEPROM
+3V3_NV
C11 C0.1u16Y0402
R48 10KR1%0402
U4
VCC CS#
HOLD# SO
SCLK WP#
SI GND
ROM_SCLK_G R25 33R0402
ROM_SI_G R35 33R0402
ROM_SCLK_GR
ROM_SI_GR
ROM_CS_GR R38 33R0402
ROM_CS_G
ROM_SO
+3V3_NV
MX25L2006EM1I-12G-RH
M31-2006E02-M24
M31-2006E02-M24
22,25 SMB_CPU_CLK
22,25 SMB_CPU_DATA
Q19
D2 D1 G2 S2 G1 S1
NN-DMN65D8LDW-7-F
C527 C0.01u25X0402
GND
I2CS_SCL
I2CS_SDA
DGPU_PWRGD 10,19,23,25
https://vinafix.com
+3V3_AON
R290 2.2KR042
R291 2.2KR042
G1R
? COMMON
11/18 MISC1
GPU_OVERT#
+3V3_AON
R250 10KR0402
M1 OVERT GPIO8
K4 THERMDN
K3 THERMDP
NC NC I2CB_SCL I2CB_SDA
GF117 GM107/GM108 GK107/GK208
I2CS_SCL T4
I2CS_SDA T3
I2CC_SCL B2
I2CC_SDA B3
I2CB_SCL B7
I2CB_SDA B6
TPJNC16 TPJNC33 TPJNC34 TPJNC36
JTAG_TCK AM10
JTAG_TMS AP11
JTAG_TDI AM11
JTAG_TDO AP12
JTAG_TRST# AN11
JTAG_TCK JTAG_TMS JTAG_TDI JTAG_TDO JTAG_TRST
R92 10KR1%0402
GK107/GK208/GF117 NC
GPIO0 P6 GPIO0_GC6_FB_EN_R
GPIO1 M3
GPIO2 L6
GPIO3 P5
GPIO4 P7
GPIO5 L7 GPIO5_GC6_PWR_EN
GPIO6 M7 GPIO6_GPU_EVENT
GPIO7 N8
GPIO8 L3 GPIO8_PEX_RST_MON#
GPIO9 M2 GFX_ALERT#
GPIO10 L1 GPIO10_GDDR5VREF 12,14
GPIO11 M5 GPIO11_GPUVID 39
GPIO12 N3 GPIO12_GPU_ACIN
GPIO13 M4 GPIO13_FBVREF_PSI# 39
GPIO16 R8
GPIO20 P4
GPIO21 P1 GPIO21_GPU_PEX_RST_HOLD_GPU#
GPIO16 NC GPIO16 NC
GPIO20 NC NC
GPIO8 NC NC
GK208 GF117 GK107 GM107 GM108
GPIO21_GPU_PEX_RST_HOLD_GPU# 23
+3V3_AON
R242 10KR0402
R228 10KR0402
R233 100KR0402
R256 10KR0402
GPIO5_GC6_PWR_EN 19
GPIO8_PEX_RST_MON# 23
+3VRUN
+3V3_AON
R99 X_10KR0402
Q7
25 EC_PROTECT_PWR
GFX_ALERT#
X_N-FDV301N
+3VRUN
+3V3_AON
R98 10KR0402
Q6
22 GPIO6_GPU_EVENT_FBCLAMP
GPIO6_GPU_EVENT
N-FDV301N
11 GPU_PLLVDD
PEX_VDD
L2 30L1.7A-50_0402-RH
C69 C22u6.3X6S0805
C96 C0.1u10X0402
Under GPU
G1P
? COMMON
12/18 XTAL_PLL
PLLVDD
SP_PLLVDD
VID_PLLVDD NC
GM107 GM108
GK107/GK208 GF117
AD8 AE8 AD7
H1 XTAL_SSIN
H3 XTAL_IN
XTAL_OUTBUFF J4
XTAL_OUT H2
R252 10KR1%0402
R30 10KR1%0402
L1 300L600mA-150-RH
GPU_PLLVDD_VID_SP
C65 C47u6.3X5R0805
C76 C10u6.3X5-1
C84 C0.1u10X0402
C83 C0.1u10X0402
Under GPU
Y3 27MHz
XTALIN XTALOUT
C512 C22p50N0402
C511 C22p50N0402
GPIO10_GDDR5VREF
R39 100KR0402
+3V3_AON
+3V3_AON
+3V3_AON
R243 10KR0402
R255 10KR0402
R235 10KR0402
GPIO6_GPU_EVENT
GPIO21_GPU_PEX_RST_HOLD_GPU#
GPIO8_PEX_RST_MON#
19,23 GPIO0_GC6_FB_EN
R34 0R0402
GPIO0_GC6_FB_EN_R
R33 10KR0402
Title
N16P-GT_Thermal & GPIO
Size Custom
Document Number MS-16GJ
Rev 10
Date: Wednesday, July 29, 2015
Sheet 17 of 56

N16P-GT(Power & GND)

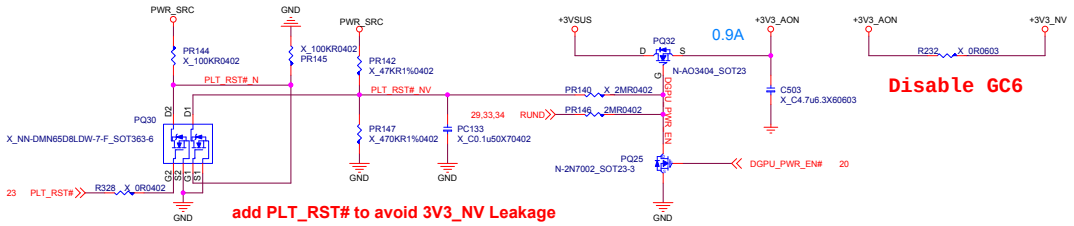


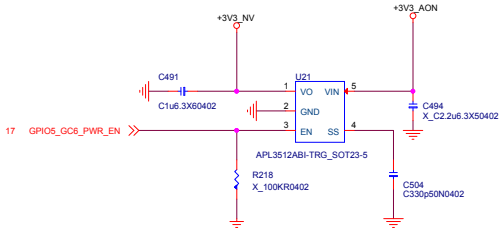
Title	N16P-GT_Power & GND		
Size	Document Number		Rev
Custom	MS-16GJ		10
Date:	Wednesday, July 29, 2015	Sheet 18 of 56	

N16P-GT(Power Control)

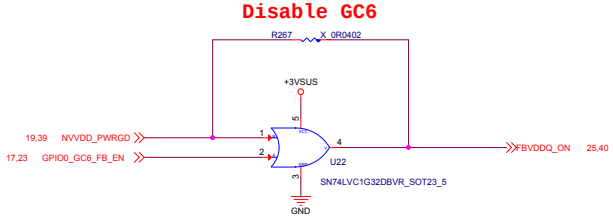
+3V3_AON -> +3V3_NV -> NVVDD ->PEX_VDD -> FBVDDQ -> DGPUPWRGD

3.3V

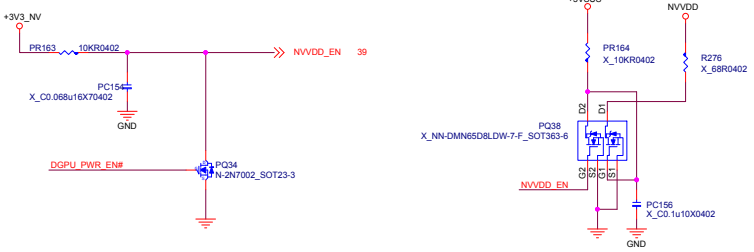




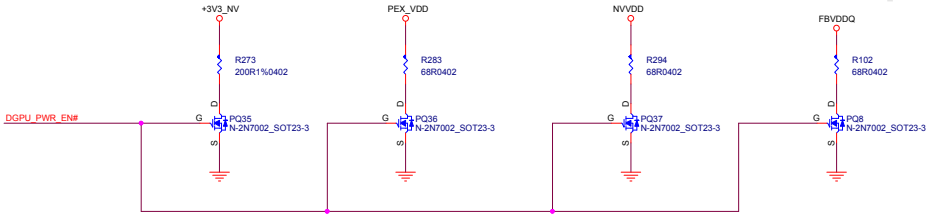
FBVDDQ



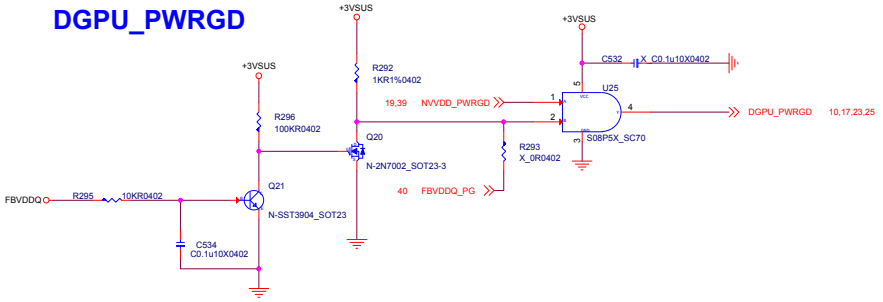
NVVDD



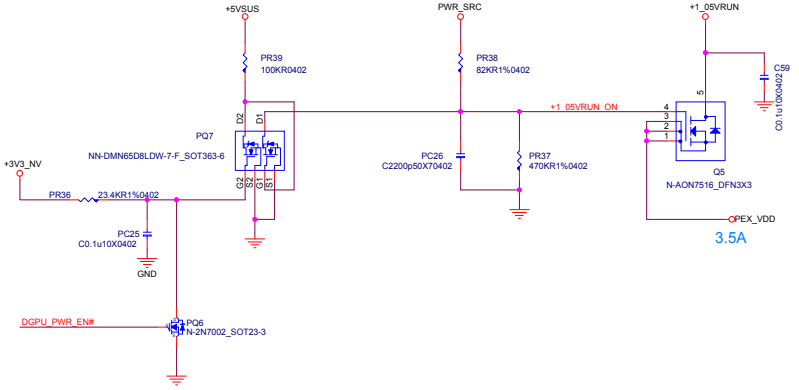
Discharge Circuit



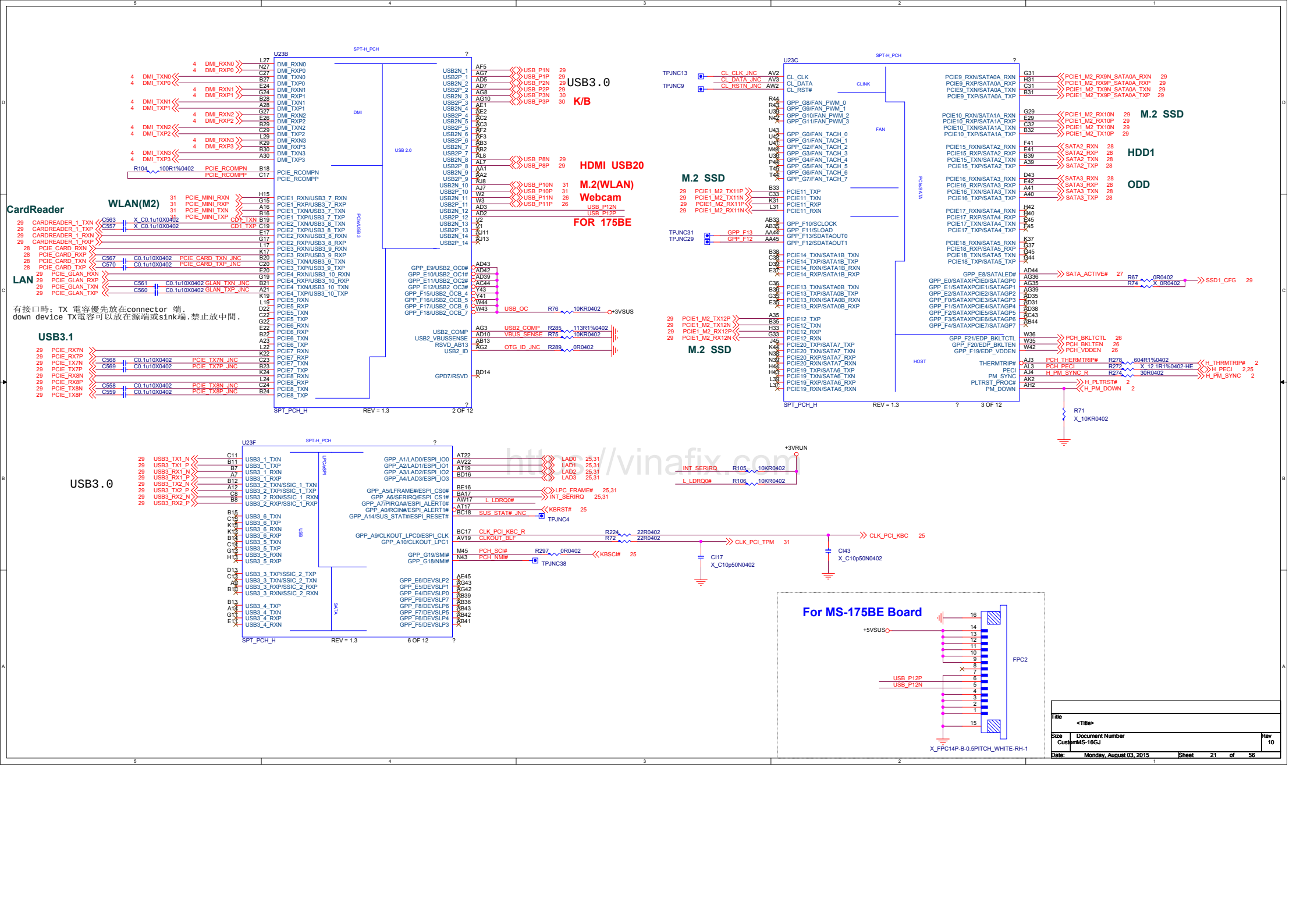
DGPU_PWRGD

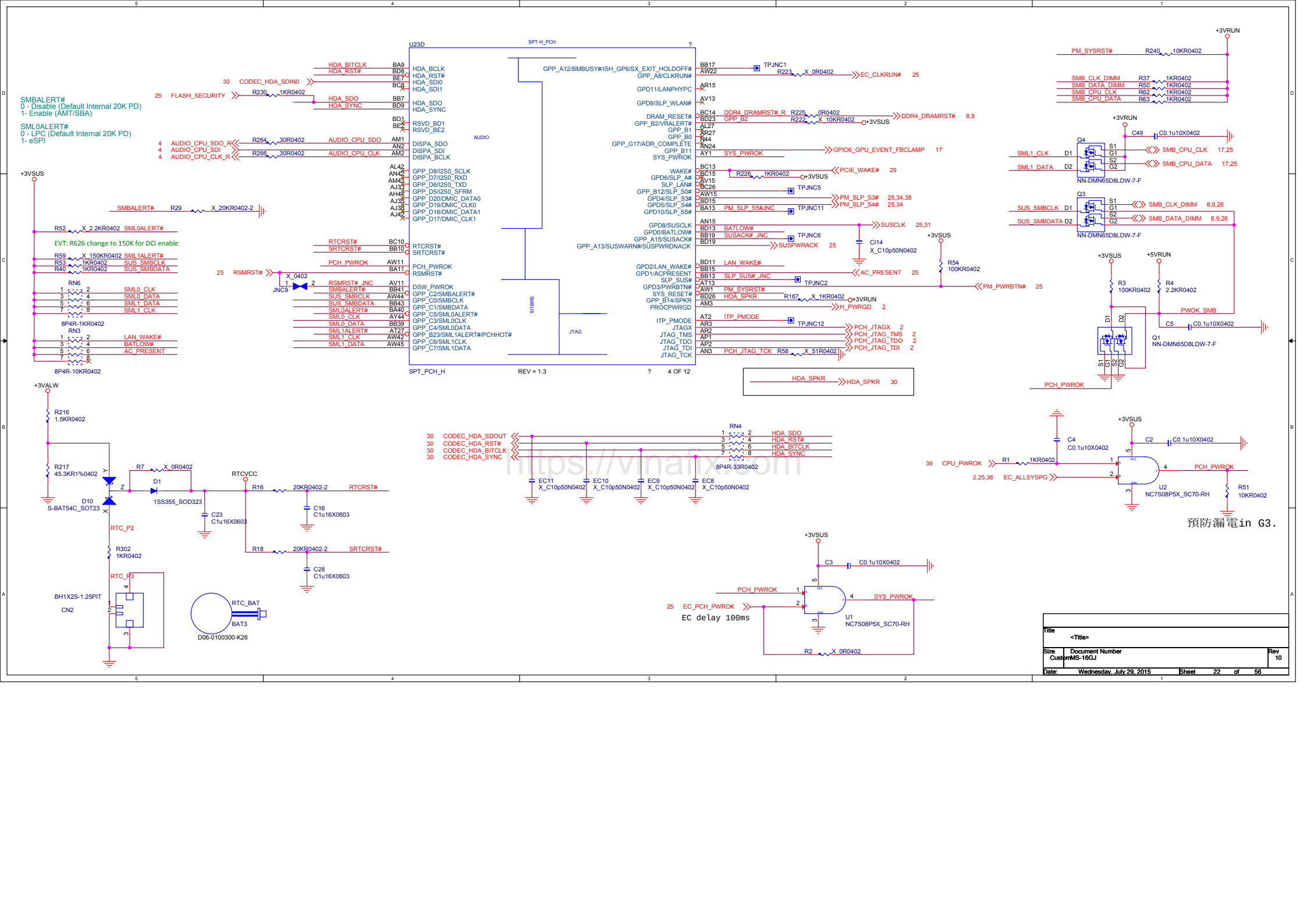


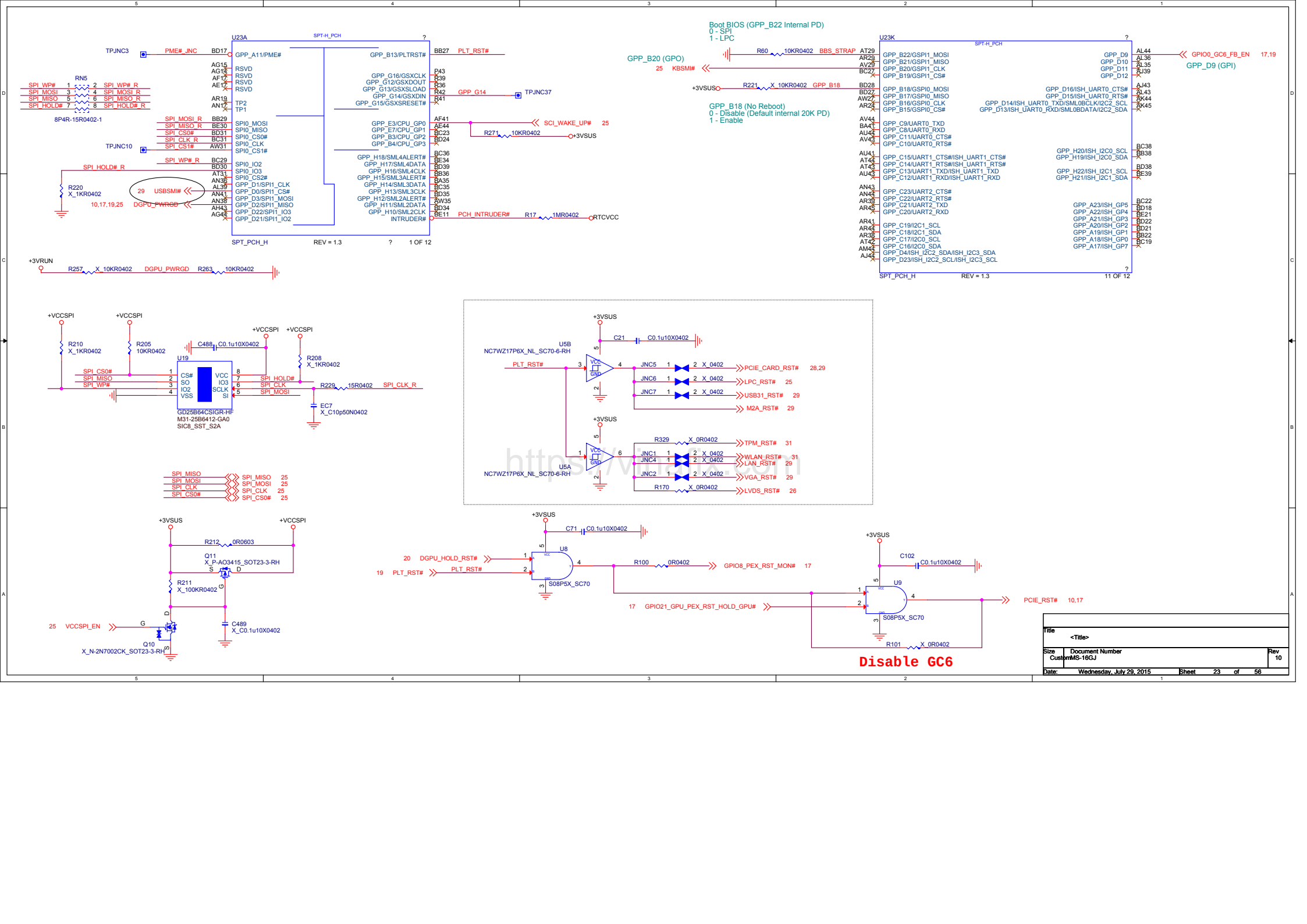
PEX_VDD



Title	N16P-GT_Power Control	
Size: Custom	Document Number: MS-16GJ	Rev: 10
Date: Wednesday, July 29, 2015	Sheet 19 of 56	


USB3.0
K/B
HDMI USB20
M.2(WLAN)
Webcam
FOR 175BE
M.2 SSD
HDD1
ODD
CardReader
WLAN(M2)
LAN
USB3.1
有接口时：TX 电容優先放在connector 端。
down device TX电容可以放在源端或sink端.禁止放中間.
M.2 SSD
USB3.0
https://vinafix.com
For MS-175BE Board
+5VSUS
USB_P12P
USB_P12N
FPC2
X_FPC14P-B-0.5PITCH_WHITE-RH-1
Title
<Title>
Size
Custom
Document Number
MS-16GJ
Rev
10
Date:
Monday, August 03, 2015
Sheet
21
of
56


SMBALERT#
0 - Disable (Default Internal 20K PD)
1- Enable (AMT/SBA)
SML0ALERT#
0 - LPC (Default Internal 20K PD)
1- eSPI
U23D
SPT-H_PCH
SPT_PCH_H
REV = 1.3
4 OF 12
AUDIO
SMBUS
JTAG
HDA_BITCLK
HDA_RST#
CODEC_HDA_SDIN0
FLASH_SECURITY
R230 1KR0402
HDA_SDO
HDA_SYNC
AUDIO_CPU_SDO_R
AUDIO_CPU_SDI
AUDIO_CPU_CLK_R
R264 30R0402
R266 30R0402
AUDIO_CPU_SDO
AUDIO_CPU_CLK
HDA_BCLK
HDA_SDI0
HDA_SDI1
RSVD_BD1
RSVD_BE2
DISPA_SDO
DISPA_SDI
DISPA_BCLK
GPP_D8/I2S0_SCLK
GPP_D7/I2S0_RXD
GPP_D6/I2S0_TXD
GPP_D5/I2S0_SFRM
GPP_D20/DMIC_DATA0
GPP_D19/DMIC_CLK0
GPP_D18/DMIC_DATA1
GPP_D17/DMIC_CLK1
GPP_A12/BMBUSY#/ISH_GP6/SX_EXIT_HOLDOFF#
GPP_A8/CLKRUN#
GPD11/LANPHYPC
GPD9/SLP_WLAN#
DRAM_RESET#
GPP_B2/VRALERT#
GPP_B1
GPP_B0
GPP_G17/ADR_COMPLETE
GPP_B11
SYS_PWROK
WAKE#
GPD6/SLP_A#
SLP_LAN#
GPP_B12/SLP_S0#
GPD4/SLP_S3#
GPD5/SLP_S4#
GPD10/SLP_S5#
GPD8/SUSCLK
GPD0/BATLOW#
GPP_A15/SUSACK#
GPP_A13/SUSWARN#/SUSPWRDNACK
GPD2/LAN_WAKE#
GPD1/ACPRESENT
SLP_SUS#
GPD3/PWRBTN#
SYS_RESET#
GPP_B14/SPKR
PROCPWRGD
ITP_PMODE
JTAGX
JTAG_TMS
JTAG_TDO
JTAG_TDI
JTAG_TCK
TPJNC1
R223 X_0R0402
EC_CLKRUN# 25
DDR4_DRAMRST# R225 0R0402
R222 X_10KR0402
DDR4_DRAMRST# 8,9
GPIO6_GPU_EVENT_FBCLAMP 17
PCIE_WAKE# 29
R226 1KR0402
TPJNC5
PM_SLP_S3# 25,34,38
PM_SLP_S4# 25,34
TPJNC11
SUSCLK 25,31
CI14 X_C10p50N0402
TPJNC6
SUSPWRACK 25
AC_PRESENT 25
TPJNC2
PM_SYSRST#
HDA_SPKR R167 X_1KR0402
H_PWRGD 2
TPJNC12
PCH_JTAGX 2
PCH_JTAG_TMS 2
PCH_JTAG_TDO 2
PCH_JTAG_TDI 2
PCH_JTAG_TCK R58 X_51R0402
HDA_SPKR
HDA_SPKR 30
+3VRUN
PM_SYSRST# R240 10KR0402
SMB_CLK_DIMM R37 1KR0402
SMB_DATA_DIMM R50 1KR0402
SMB_CPU_CLK R62 1KR0402
SMB_CPU_DATA R63 1KR0402
Q4
C49 C0.1u10X0402
SML1_CLK
SML1_DATA
SMB_CPU_CLK 17,25
SMB_CPU_DATA 17,25
NN-DMN65D8LDW-7-F
Q3
SUS_SMBCLK
SUS_SMBDATA
SMB_CLK_DIMM 8,9,26
SMB_DATA_DIMM 8,9,26
NN-DMN65D8LDW-7-F
+3VSUS
+5VRUN
R3 100KR0402
R4 2.2KR0402
PWOK_SMB
C5 C0.1u10X0402
Q1
NN-DMN65D8LDW-7-F
R54 100KR0402
PM_PWRBTN# 25
PCH_PWROK
SMBALERT# R29 X_20KR0402-2
R52 X_2.2KR0402 SML0ALERT#
EVT: R626 change to 150K for DCI enable
R59 X_150KR0402 SML1ALERT#
R53 1KR0402 SUS_SMBCLK
R40 1KR0402 SUS_SMBDATA
RN6
SML0_CLK
SML0_DATA
SML1_DATA
SML1_CLK
8P4R-1KR0402
RN3
LAN_WAKE#
BATLOW#
AC_PRESENT
8P4R-10KR0402
RTCRST#
SRTCRST#
PCH_PWROK
RSMRST#
25 RSMRST#
X_0402
JNC9
RSMRST# JNC
SMBALERT#
SUS_SMBCLK
SUS_SMBDATA
SML0ALERT#
SML0_CLK
SML0_DATA
SML1ALERT#
SML1_CLK
SML1_DATA
+3VALW
R216 1.5KR0402
R217 45.3KR1%0402
D10 S-BAT54C_SOT23
R7 X_0R0402
D1 1SS355_SOD323
RTCVCC
R16 20KR0402-2 RTCRST#
C23 C1u16X0603
C16 C1u16X0603
RTC_P2
R302 1KR0402
RTC_P3
BH1X2S-1.25PIT
CN2
R18 20KR0402-2 SRTCRST#
C28 C1u16X0603
RTC_BAT
BAT3
D06-0100300-K26
30 CODEC_HDA_SDOUT
30 CODEC_HDA_RST#
30 CODEC_HDA_BITCLK
30 CODEC_HDA_SYNC
RN4
HDA_SDO
HDA_RST#
HDA_BITCLK
HDA_SYNC
8P4R-33R0402
EC11 X_C10p50N0402
EC10 X_C10p50N0402
EC9 X_C10p50N0402
EC8 X_C10p50N0402
+3VSUS
C4 C0.1u10X0402
C2 C0.1u10X0402
36 CPU_PWROK
R1 1KR0402
2,25,36 EC_ALLSYSPG
U2
NC7S08P5X_SC70-RH
R51 10KR0402
PCH_PWROK
預防漏電in G3.
C3 C0.1u10X0402
PCH_PWROK
25 EC_PCH_PWROK
EC delay 100ms
SYS_PWROK
U1
NC7S08P5X_SC70-RH
R2 X_0R0402
Title
<Title>
Size Custom
Document Number MS-16GJ
Rev 10
Date: Wednesday, July 29, 2015
Sheet 22 of 56


U23A
SPT-H_PCH
SPT_PCH_H
REV = 1.3
1 OF 12
TPJNC3
PME#_JNC
GPP_A11/PME#
RSVD
SPI_WP#
SPI_MOSI
SPI_MISO
SPI_HOLD#
RN5
8P4R-15R0402-1
SPI_WP#_R
SPI_MOSI_R
SPI_MISO_R
SPI_HOLD#_R
SPI_CS0#
SPI_CLK_R
SPI_CS1#
TPJNC10
SPI0_MOSI
SPI0_MISO
SPI0_CS0#
SPI0_CLK
SPI0_CS1#
SPI0_IO2
SPI0_IO3
SPI0_CS2#
GPP_D1/SPI1_CLK
GPP_D0/SPI1_CS#
GPP_D3/SPI1_MOSI
GPP_D2/SPI1_MISO
GPP_D22/SPI1_IO3
GPP_D21/SPI1_IO2
R220
X_1KR0402
USBSMI#
DGPU_PWRGD
GPP_B13/PLTRST#
PLT_RST#
GPP_G16/GSXCLK
GPP_G12/GSXDOUT
GPP_G13/GSXSLOAD
GPP_G14/GSXDIN
GPP_G15/GSXSRESET#
GPP_G14
TPJNC37
GPP_E3/CPU_GP0
GPP_E7/CPU_GP1
GPP_B3/CPU_GP2
GPP_B4/CPU_GP3
SCI_WAKE_UP#
R271
10KR0402
+3VSUS
GPP_H18/SML4ALERT#
GPP_H17/SML4DATA
GPP_H16/SML4CLK
GPP_H15/SML3ALERT#
GPP_H14/SML3DATA
GPP_H13/SML3CLK
GPP_H12/SML2ALERT#
GPP_H11/SML2DATA
GPP_H10/SML2CLK
INTRUDER#
PCH_INTRUDER#
R17
1MR0402
RTCVCC
+3VRUN
R257
X_10KR0402
DGPU_PWRGD
R263
10KR0402
Boot BIOS (GPP_B22 Internal PD)
0 - SPI
1 - LPC
GPP_B20 (GPO)
KBSMI#
R60
10KR0402
BBS_STRAP
+3VSUS
R221
X_10KR0402
GPP_B18
GPP_B18 (No Reboot)
0 - Disable (Default internal 20K PD)
1 - Enable
U23K
SPT-H_PCH
SPT_PCH_H
REV = 1.3
11 OF 12
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#
GPP_C9/UART0_TXD
GPP_C8/UART0_RXD
GPP_C11/UART0_CTS#
GPP_C10/UART0_RTS#
GPP_C15/UART1_CTS#/ISH_UART1_CTS#
GPP_C14/UART1_RTS#/ISH_UART1_RTS#
GPP_C13/UART1_TXD/ISH_UART1_TXD
GPP_C12/UART1_RXD/ISH_UART1_RXD
GPP_C23/UART2_CTS#
GPP_C22/UART2_RTS#
GPP_C21/UART2_TXD
GPP_C20/UART2_RXD
GPP_C19/I2C1_SCL
GPP_C18/I2C1_SDA
GPP_C17/I2C0_SCL
GPP_C16/I2C0_SDA
GPP_D4/ISH_I2C2_SDA/ISH_I2C3_SDA
GPP_D23/ISH_I2C2_SCL/ISH_I2C3_SCL
GPP_D9
GPP_D10
GPP_D11
GPP_D12
GPP_D16/ISH_UART0_CTS#
GPP_D15/ISH_UART0_RTS#
GPP_D14/ISH_UART0_TXD/SML0BCLK/I2C2_SCL
GPP_D13/ISH_UART0_RXD/SML0BDATA/I2C2_SDA
GPP_H20/ISH_I2C0_SCL
GPP_H19/ISH_I2C0_SDA
GPP_H22/ISH_I2C1_SCL
GPP_H21/ISH_I2C1_SDA
GPP_A23/ISH_GP5
GPP_A22/ISH_GP4
GPP_A21/ISH_GP3
GPP_A20/ISH_GP2
GPP_A19/ISH_GP1
GPP_A18/ISH_GP0
GPP_A17/ISH_GP7
GPIO0_GC6_FB_EN
GPP_D9 (GPI)
+VCCSPI
R210
X_1KR0402
R205
10KR0402
C488
C0.1u10X0402
R208
X_1KR0402
U19
CS#
SO
IO2
VSS
VCC
IO3
SCLK
SI
GD25B64CSIGR-HF
M31-25B6412-GA0
SIC8_SST_S2A
R229
15R0402
SPI_CLK_R
EC7
X_C10p50N0402
SPI_MISO
SPI_MOSI
SPI_CLK
SPI_CS0#
U5B
NC7WZ17P6X_NL_SC70-6-RH
U5A
C21
JNC5
JNC6
JNC7
JNC1
JNC4
JNC2
X_0402
PCIE_CARD_RST#
LPC_RST#
USB31_RST#
M2A_RST#
R329
X_0R0402
TPM_RST#
WLAN_RST#
LAN_RST#
VGA_RST#
R170
LVDS_RST#
+3VSUS
+VCCSPI
R212
0R0603
Q11
X_P-AO3415_SOT23-3-RH
R211
X_100KR0402
Q10
X_N-2N7002CK_SOT23-3-RH
VCCSPI_EN
C489
X_C0.1u10X0402
C71
U8
S08P5X_SC70
DGPU_HOLD_RST#
PLT_RST#
R100
0R0402
GPIO8_PEX_RST_MON#
GPIO21_GPU_PEX_RST_HOLD_GPU#
C102
U9
R101
X_0R0402
PCIE_RST#
Disable GC6
Title
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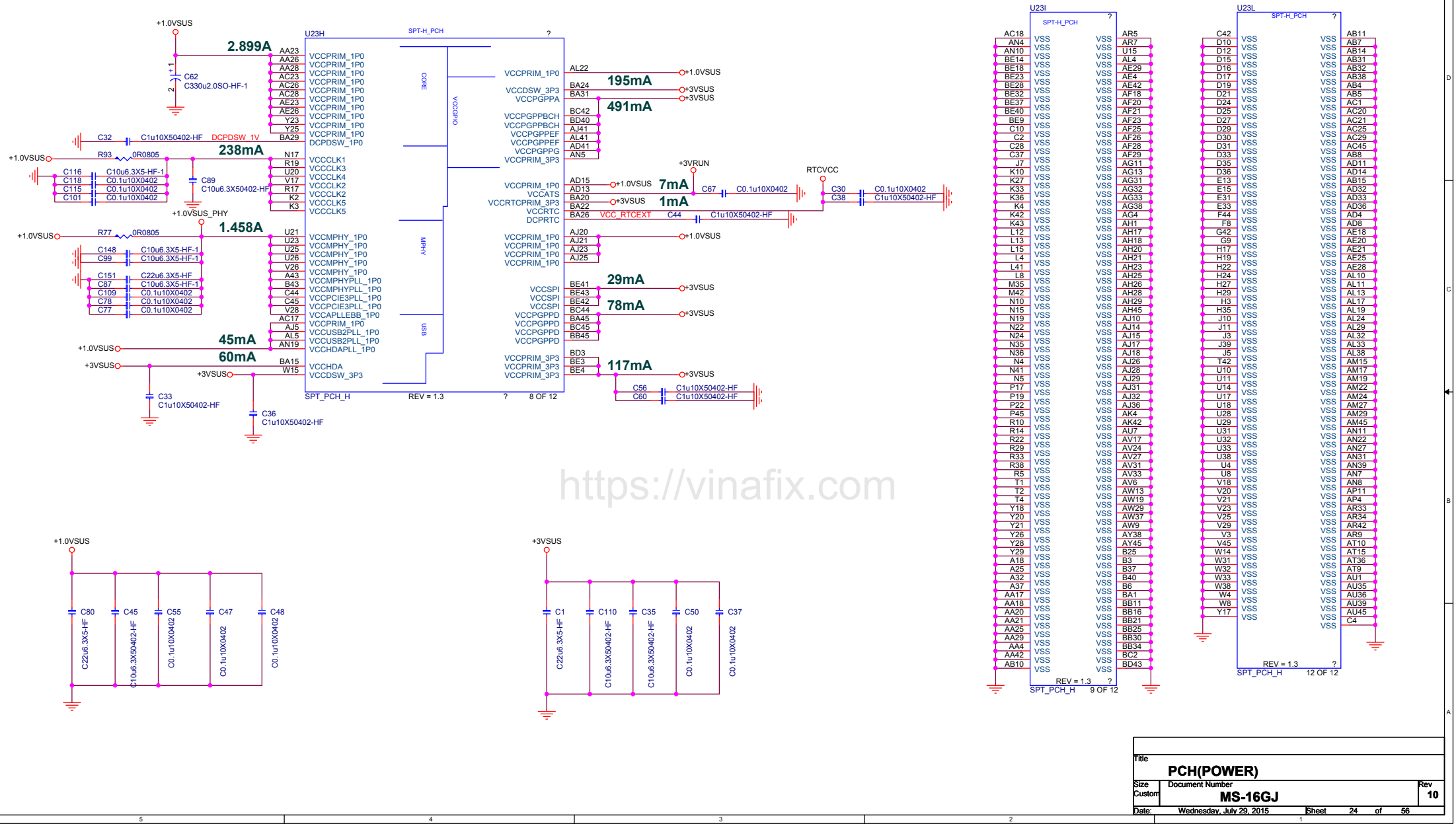
Size
Custom
Document Number
MS-16GJ
Rev
10
Date:
Wednesday, July 29, 2015
Sheet
23
of
56



Title	PCH(POWER)	
Size: Custom	Document Number: MS-16GJ	Rev: 10
Date: Wednesday, July 29, 2015	Sheet 24 of 56	

RSMRST# follow DG modify to 10K

KBC/EC/uP (ENE9028)

PU/PD

+3VRUN

R12 X_10KR0402 KBSMI#
R11 X_10KR0402 KBSCI#
R15 X_10KR0402 EC_GA20
R13 X_10KR0402 KBRST#

R27 100KR0402 EC_CLKRUN#

R95 10KR0402 RSMRST#
R14 100KR0402 KBRST#

LID pull hi 10K

+3VSUS

R265 10KR0402 LID#

U7

LPC I/F
SERIRQ
LFARAME#
PCICLK
CLKRUN#/GPIO1D
LAD0
LAD1
LAD2
LAD3

FAN&PWM
ECRST#
KBRST#/GPIO01
SCI#/GPIO0E
GA20/GPIO00
PCIRST#/GPIO05

PWM0/GPIO0F
PWM1/GPIO10
PWM2/GPIO11
PWM3/GPIO19
FANPWM0/GPIO12
FANPWM1/GPIO13
FANFB0/GPIO14
FANFB1/GPIO15

IKB
KSO0/GPIO20
KSO1/GPIO21
KSO2/GPIO22
KSO3/GPIO23
KSO4/GPIO24
KSO5/GPIO25/UART_SOUT
KSO6/GPIO26
KSO7/GPIO27/SERIRQ(LPC_Bypass)/UART_RTS
KSO8/GPIO28
KSO9/GPIO29
KSO10/GPIO2A
KSO11/GPIO2B/LAD3(LPC_Bypass)
KSO12/GPIO2C/LAD2(LPC_Bypass)UART_DTR
KSO13/GPIO2D/LAD1(LPC_Bypass)
KSO14/GPIO2E/LAD0(LPC_Bypass)
KSO15/GPIO2F
KSO16/GPI048/UART_SOUT2
KSO17/GPIO49

KSI0/GPIO30/E51TXD
KSI1/GPIO31
KSI2/GPIO32
KSI3/GPIO33
KSI4/GPIO34
KSI5/GPIO35
KSI6/GPIO36
KSI7/GPIO37/EDI_DO

ESB
GPIO0B/ESB_CLK
GPIO0C/ESB_DAT_O

CIR
GPIO40/AD6
GPIO41/CIR_RLC_TX/AD7
GPIO0A/OWM
GPIO0D/RLC_TX2

SPI FLASH
MISO/GPIO5B
MOSI/GPIO5C
SPICLK/GPIO58
SPICS#/GPIO5A

PS2 I/F
PSCLK3/GPIO4E
PSDAT3/GPIO4F
PSCLK2/GPIO4C/SCL3
PSDAT2/GPIO4D/SDA3
PSCLK1/GPIO4A/SCL2/SMBD_CLK
PSDAT1/GPIO4B/SDA2/SMBD_DAT

UART
E51TXD/GPIO16
E51CLK/GPIO17

GPIO5D
GPIO5E

KB9028Q-C-RH

POWER/GROUND
VCC_LPC
VCC
VCC-1
VCC-2
VCC-3
VCC0
VCC_IO2
AVCC
AGND
GND
GND-1
GND-2
GND-3
GND-4

SMBUS
SDA0/GPIO45
SCL0/GPIO44
IEDI_SDA/SDA1/GPIO47
IEDI_SCL/SCL1/GPIO46

AD/DA
DA0/GPO3C
DA1/GPO3D
DA2/GPO3E
DA3/GPO3F
AD0/GPI38
AD1/GPI39
AD2/GPI3A
AD3/GPI3B
AD4/GPI42
AD5/GPI43

SDI
GPXIOA00/GPIO60/SHICS#
GPXIOA01/GPIO61/SHICLK
GPXIOA02/GPIO62/SHIDO

POWER_FAIL0/GPIO63/GPXIOA03
GPIO64/GPXIOA04
GPIO65/GPXIOA05
VCOUT1/GPIO66/GPXIOA06
VCOUT0/GPIO67/GPXIOA07
GPIO68/GPXIOA08
GPIO69/GPXIOA09
GPIO6A/GPXIOA10
GWG/GPIO6B/GPXIOA11
SDIDO/GPIO78/GPXIOD00
GPIO79/GPXIOD01
EC_EN#/GPIO7A/GPXIOD02
GPIO7B/GPXIOD03
GPIO7C/GPXIOD04
GPIO7D/GPXIOD05
GPIO7E/GPXIOD06
GPIO7F/PECI

GPIO04
i_clk_8051/GPIO07
PROCHOT#/i_clk_peri/GPIO08
POWER_FAIL1/GPIO18
GPIO50
GPIO52
WDT_LED#/GPIO54
GPIO56
XCLK32K/GPIO57
GPIO59

LED
GPIO1A/NUMLED#
GPIO53/CAPSLED#
GPIO55/SCROLED#

KBSMI# 23
SCI_WAKE_UP# 23
KBSCI# 23
KBRST# 23
EC_GA20 23
EC_CLKRUN# 23
RSMRST# 22
KBRST# 22
EC_RST# 37
PANEL_ON 26
TB_STAR# 32
AC_CTL 32
FLASH_SECURITY 22
BT_PWRON 31
CAMERA_ON 26
CPUFAN_FB 28
EC_PROTECT_PWR 17
CTL1_EC 29
COOLER_BOOST_SW# 29
BAT_IN# 32
LID# 26,29
SUSPWROK 35
EC_SDA 81
EC_SCL 82
LED_BLUETOOTH# 27
COOLER_LED# 29
DIMM_ON_2V5 35
FBVDDQ_ON 19,40
SPI_MISO 23
SPI_MOSI 23
SPI_CLK 23
SPI_CS0# 23
TP_CLK 87
TP_DATA 88
WLAN_PWRON 31
CTL3_EC 29
BATCLK_M 30,32
BATDATA_M 30,32
LEDKB_EN2 29
LEDKB_EN 29
SUSCLK 22,31
EC_XIN_JNC 122
EC_XOUT_JNC 123
INT_SERIRQ 21,31
LPC_FRAME# 21,31
CLK_PCI_KBC 21
EC_CLKRUN# 22
LAD0 21,31
LAD1 21,31
LAD2 21,31
LAD3 21,31
KBOUT0 39
KBOUT1 40
KBOUT2 41
KBOUT3 42
KBOUT4 43
KBOUT5 44
KBOUT6 45
KBOUT7 46
KBOUT16 47
KBOUT17 48
KBOUT8 55
KBOUT9 56
KBOUT10 57
KBOUT11 58
KBOUT12 59
KBOUT13 60
KBOUT14 61
KBOUT15 62
KBIN6 73
KBIN7 74

C54 C0.1u10X0402
C13 C0.1u10X0402
C508 C0.1u10X0402
C12 C0.1u10X0402
C103 C0.1u10X0402
C19 X_C0.1u10X0402
R19 X_10KR0402
SMB_CPU_DATA 17,22
SMB_CPU_CLK 17,22
EC_SDA 29
EC_SCL 29
CPUFAN_PWM
OVERT# 17
SUSPWRACK 22
GPU_ACIN1 17
KBIN0
KBIN1
KBIN2
KBIN3
KBIN4
KBIN5
EAPD 30
EC_MUTE# 30
TBT_HDMI_HPD 29
VCCSPI_EN
MB_ID
SUS_ON 33
VCCSPI_EN 23
DIMM_ON_1V2 34
EC_PROCHOT# 2
LED_WLAN# 27
LED_CHARGE# 27
LED_BATLOW# 27
AC_PRESENT 22
ADP_ICC 32
AC_OK 32
R334 100R1%0402
PWR_SW# 29
EC_ALLSYSPG
RUN_ON 33,40
H_PECI_R R49 33R0402
PM_PWRBTN# 22
H_PECI 2,21
DGPU_PWRGD_LED 29
KBSMI# 23
EC_PCH_PWROK 22
KBLED_BACKLIGHT_SW# 29
USB_ENABLE 29
LED_ACPI# 27,29
RSMRST# 22
PM_SLP_S3# 22,34,38
PM_SLP_S4# 22,34
LED_NUM# 27
LED_CAP# 27
DGPU_PWRGD 10,17,19,23

+3VALW
+3VRUN
+5VRUN
+3VSUS

Keyboard conn

KBOUT17 1
KBOUT16 2
KBIN0 3
KBIN1 4
KBIN2 5
KBIN3 6
KBIN4 7
KBIN5 8
KBIN6 9
KBIN7 10
KBOUT15 11
KBOUT14 12
KBOUT13 13
KBOUT12 14
KBOUT11 15
KBOUT10 16
KBOUT9 17
KBOUT8 18
KBOUT7 19
KBOUT6 20
KBOUT5 21
KBOUT4 22
KBOUT3 23
KBOUT2 24
KBOUT1 25
KBOUT0 26

28 27

N5A-26F0400-H06
FPC_26_C1470903
FPC26P-T-1PITCH_WHITE-RH-1 J1

For EMI

KBOUT17 EC4 C100p50N0402
KBOUT16 EC3 C100p50N0402

EC2: KBOUT7 KBOUT6 KBOUT5 KBOUT4
EC1: KBOUT3 KBOUT2 KBOUT1 KBOUT0
EC5: KBOUT11 KBOUT10 KBOUT9 KBOUT8
EC6: KBOUT15 KBOUT14 KBOUT13 KBOUT12

8p4C-100p50N0402-RH

MotherBoard ID

+3VALW
R64 10KR0402
MB_ID
R68 X_10KR0402

Click Pad

+3VRUN
R134 10KR0402
R135 10KR0402
FPC3
TP_DATA
TP_CLK
+3VRUN
CI22 X_C10p50N0402
CI21 X_C10p50N0402
FPC6P-B-1PITCH_WHITE-RH-3

TP_DATA
TP_CLK
TPJNC20
ESD2
X_ESD-STSU0504F-HF
SOT26
D0G-0200529-A68

CPU FAN

+3VRUN
R10 10KR0402
CPUFAN_FB
J2
VCCFAN1
BH1X3#_white-1.25pitch
N32-1030720-A81
53398_03
C280 C10u10Y0805

+5VRUN
C283 C1u6.3Y0402-RH
U11
FSM# VIN VOUT VSET
GND GND GND GND
VCCFAN1
CPUFAN_PWM
APL5606KI-TRL_SOP8-RH

作用：防止多鍵衝突。

RN1: KBIN3 KBIN2 KBIN0 KBIN1
8P4R-10KR0402

RN2: KBIN5 KBIN4 KBIN7 KBIN6
8P4R-10KR0402

EVT: KBIN add 10K pull high to +3VALW for EC request

R61 / R55 / C405

+3VRUN
R61 10KR0402
38 VCCIO_PWRGD
R55 0R0402
EC_ALLSYSPG 2,22,36
C405 X_C0.1u10X0402

R96 / R97

+3VALW
R96 4.7KR0402 BATCLK_M
R97 4.7KR0402 BATDATA_M

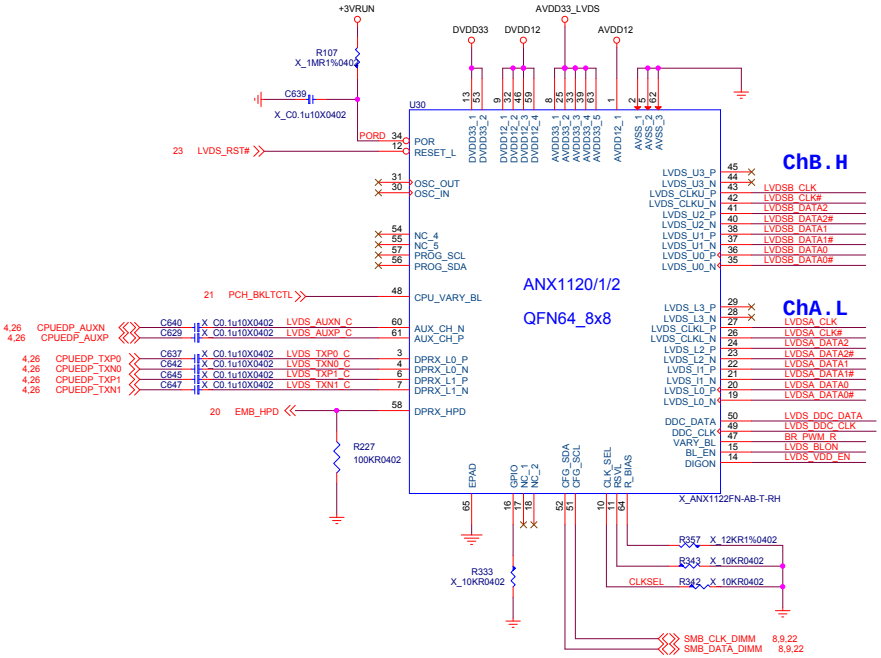
R9 / ER1 / Y1 / C7 / C26 / C25 / R6

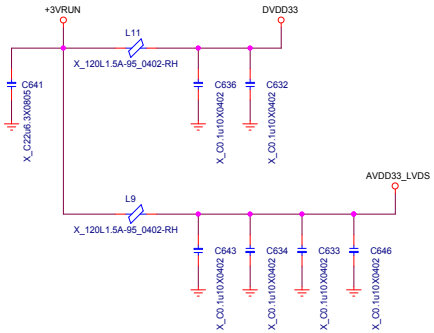
R9 0R0402
ER1 X_22R0402
Y1 X_32.768KHZ12.5p_S-RH-21
C7 X_C22p50N0402
C26 X_C16p50N0402-RH
C25 X_C16p50N0402-RH
R6 680KR0402-HE

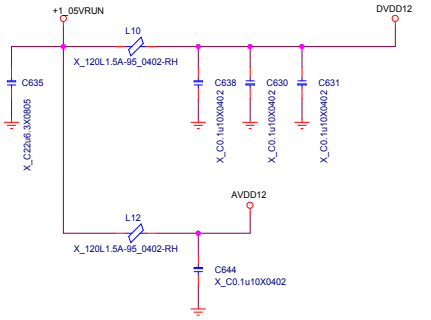
Title	EC (ENE9028)
Size	Document Number: MS-16GJ
Rev	10
Date:	Monday, August 03, 2015
Sheet	25 of 56

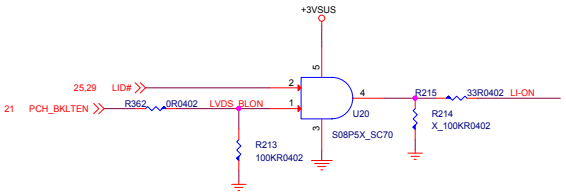
MICRO-STAR INT'L CO.,LTD.

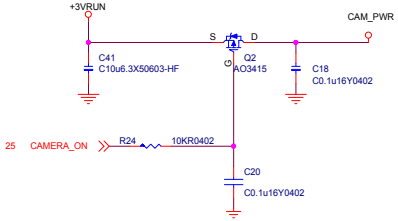
eDP to LVDS

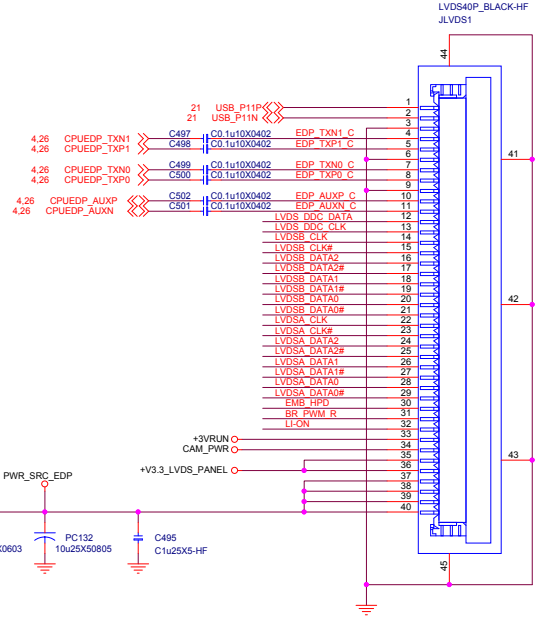


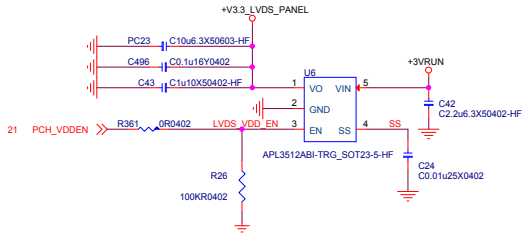


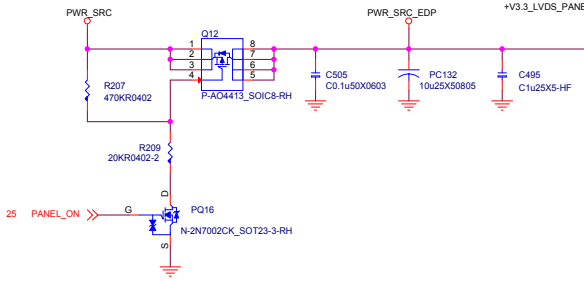


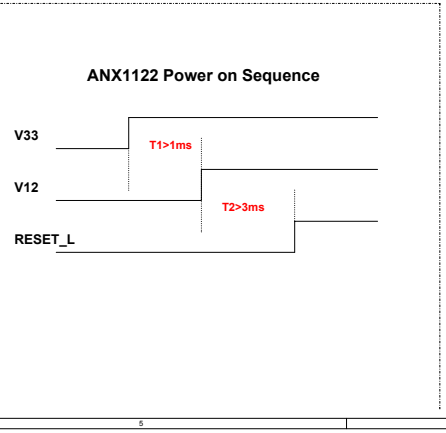










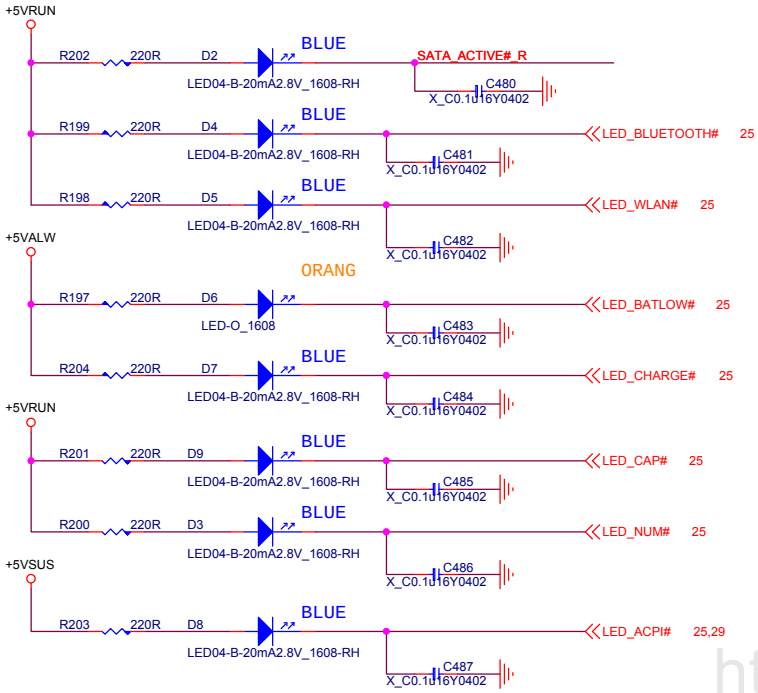


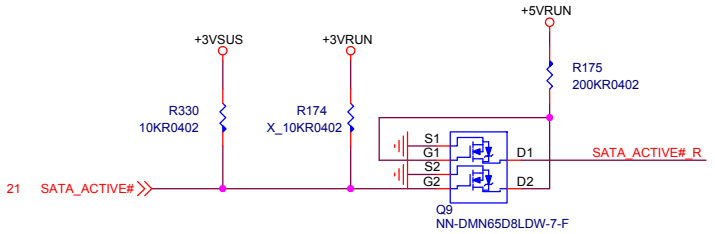
MICRO-STAR INT'L CO.,LTD.

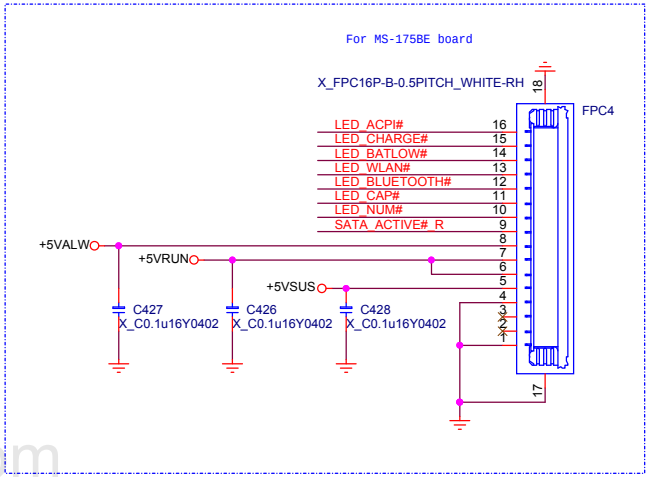
Title: ANX1122

Size | Document Number: MS-16GJ | Rev: 10

Date: | Sheet 26 of 56





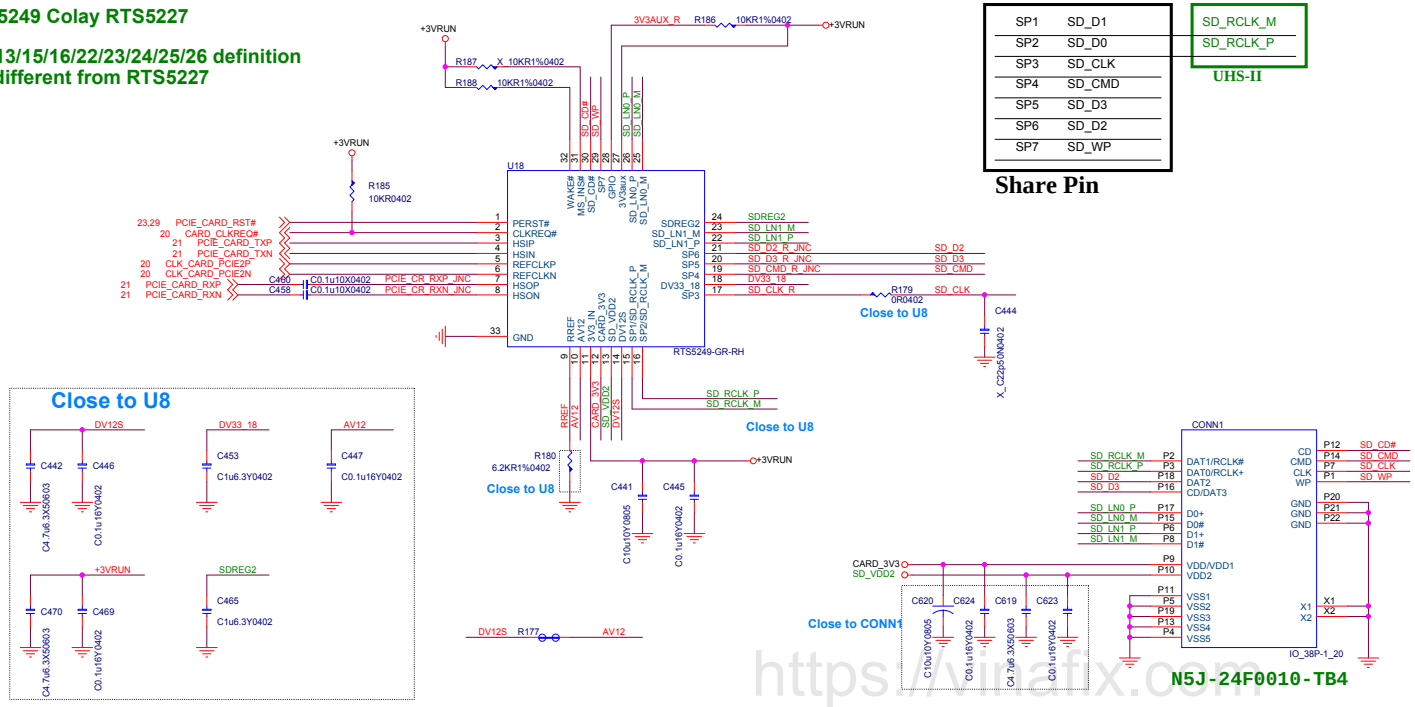


Title: LED		
Size: Custom	Document Number: MS-16GJ	Rev: 10
Date: Wednesday, July 29, 2015	Sheet 27 of 56	

CardReader

RTS5249 Colay RTS5227

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

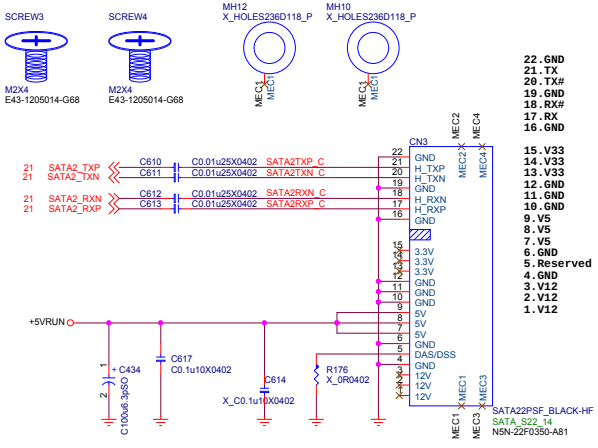


SP1	SD_D1	SD_RCLK_M
SP2	SD_D0	SD_RCLK_P
SP3	SD_CLK	
SP4	SD_CMD	
SP5	SD_D3	
SP6	SD_D2	
SP7	SD_WP	

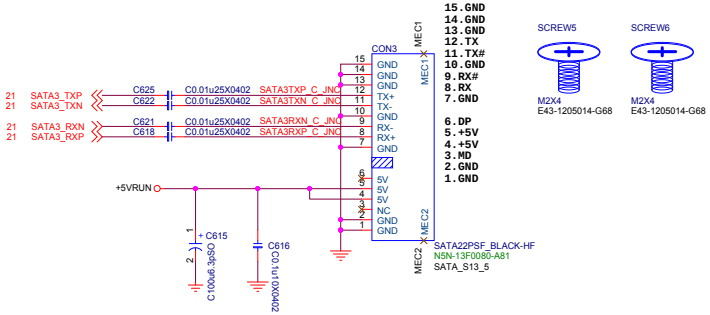
UHS-II

Share Pin

SATA HDD



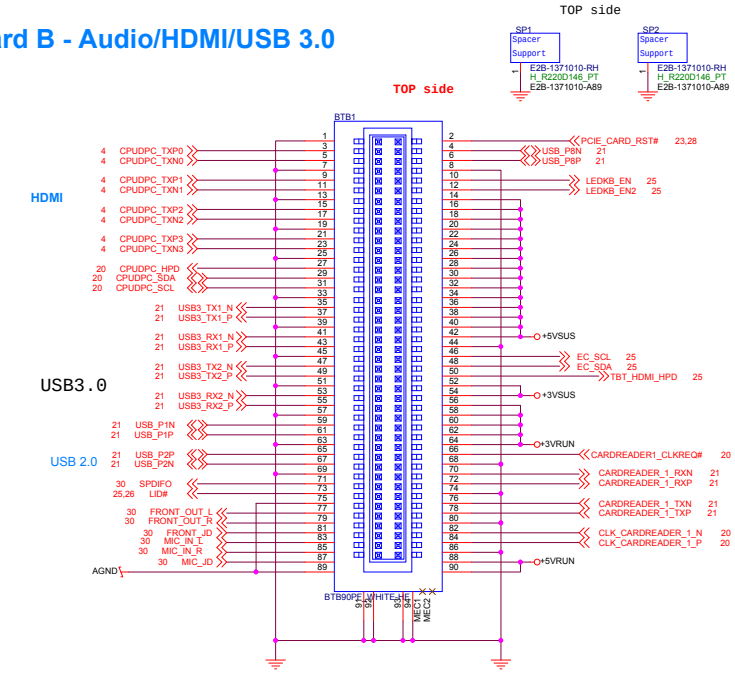
SATA ODD

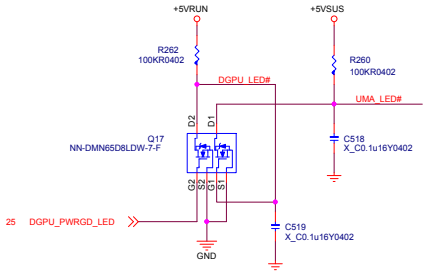


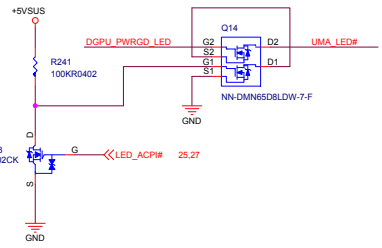
Title	Card Reader/HDD/SSD/ODD
Size	Custom
Document Number	MS-16GJ
Rev	10
Date:	Wednesday, July 29, 2015
Sheet	28 of 56

Board B - Audio/HDMI/USB 3.0

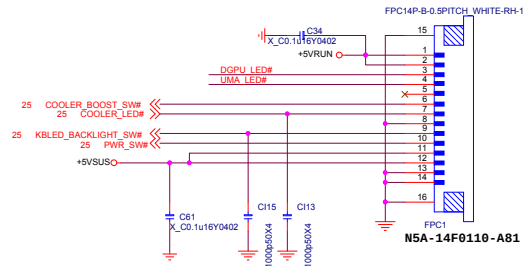
TOP side



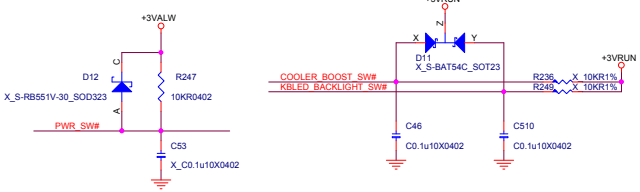




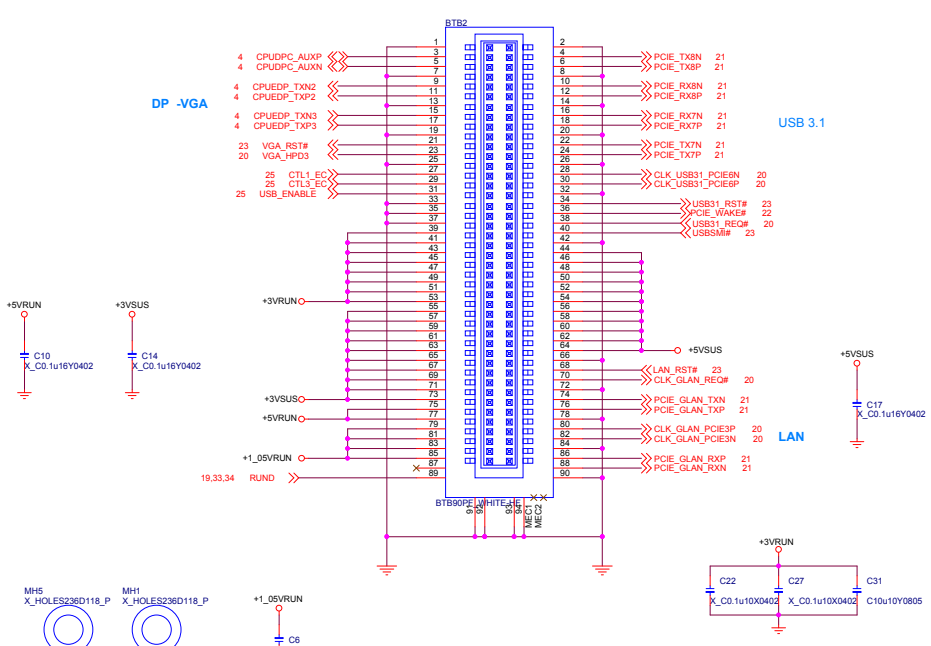
For MS-175B CardReader



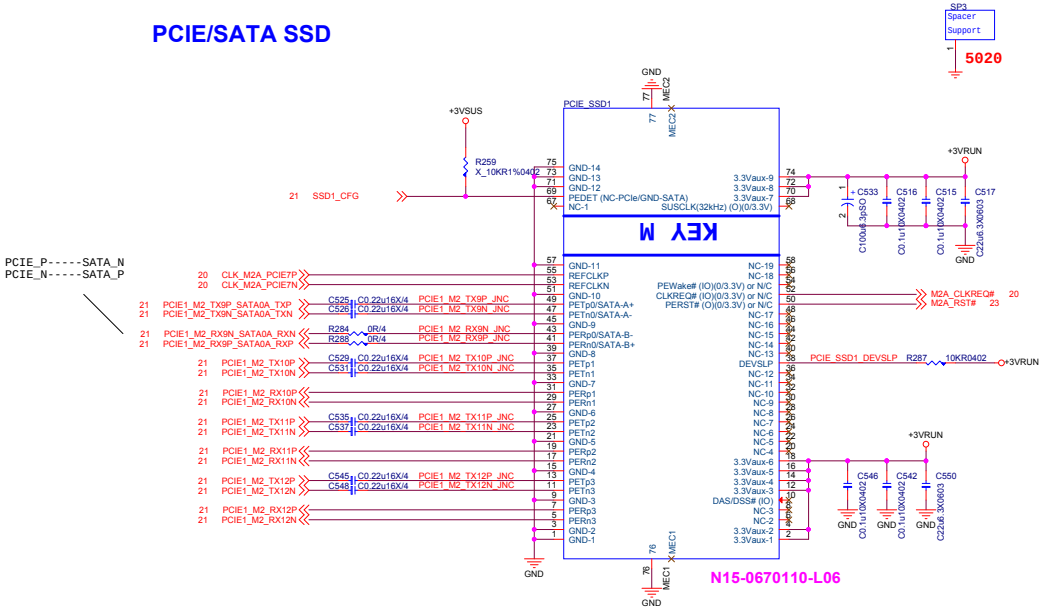
	LED_ACPI#	DGPU_PWRGD_LED	DGPU_LED#	UMA_LED#
S0	1	1	0	1
	1	0	1	0
S3	0	0	無電壓 燈滅	1
	1	0	無電壓 燈滅	1
S5	0	1	無電壓 燈滅	0
	1	1	無電壓 燈滅	1



Board A - CRT/USB3.1/USB2.0/LAN

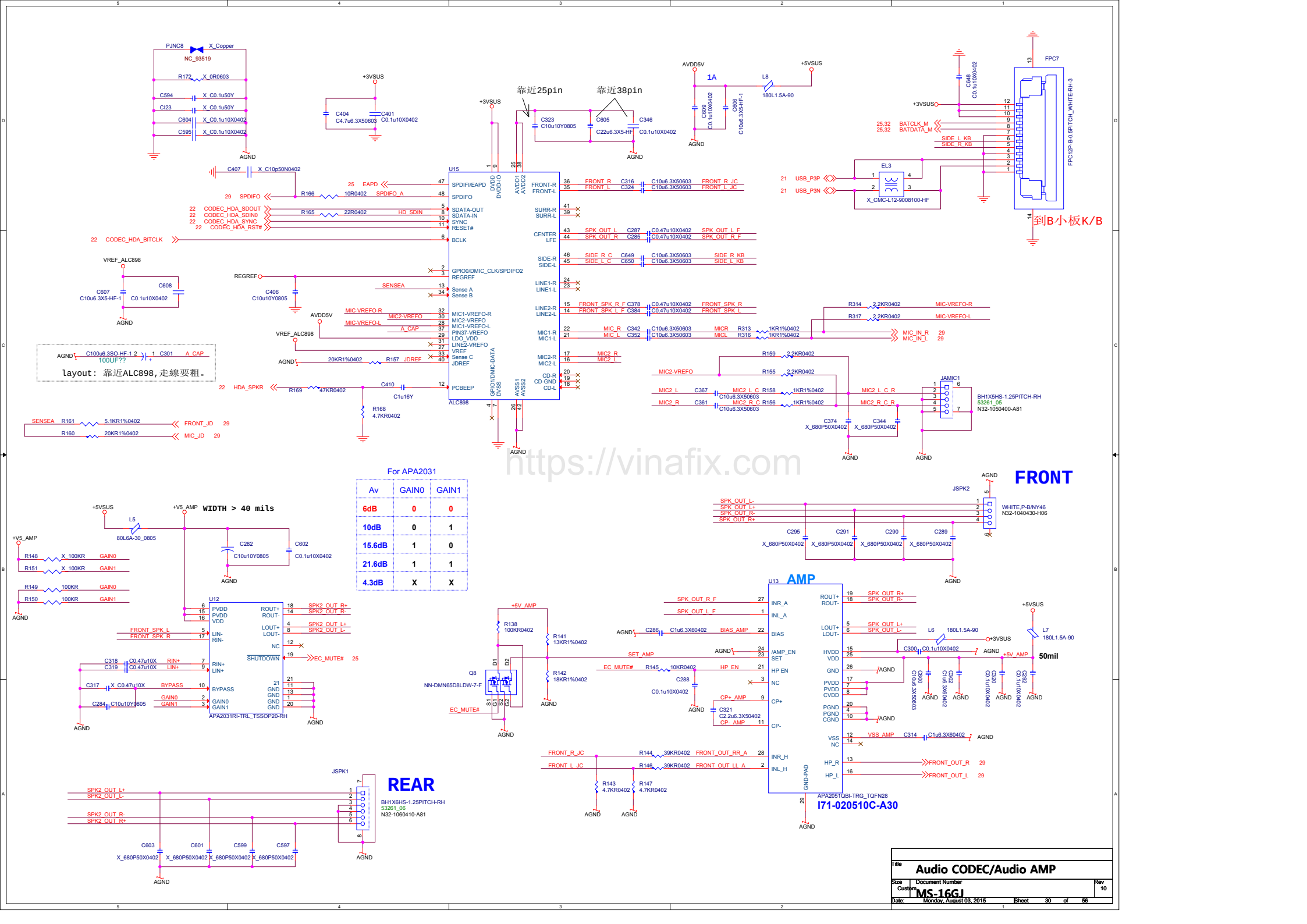


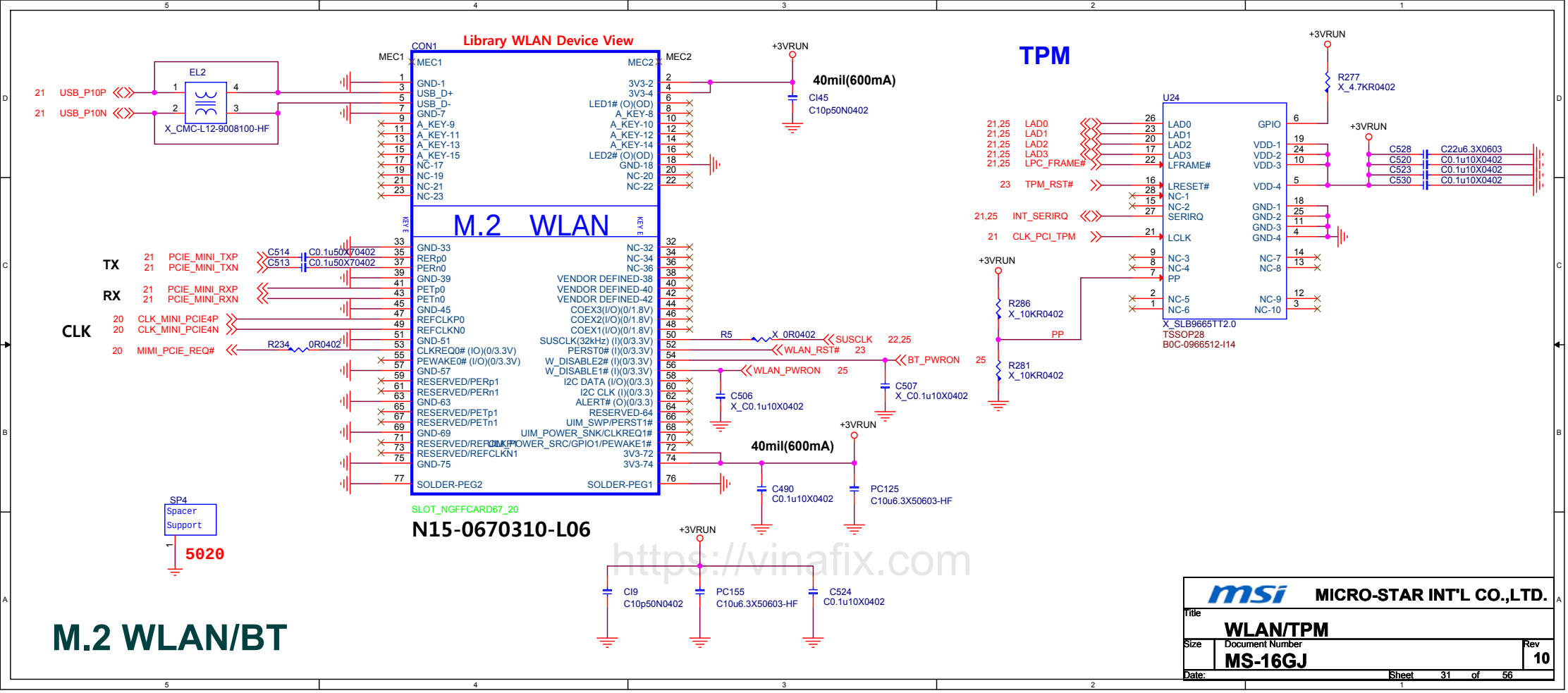
PCIE/SATA SSD



Condition	PCI Express* Gen 2 Only	PCI Express* Gen 3 Only	SATA Only	PCI Express* Gen 2/ SATA	PCI Express* Gen 3/ SATA
Processor Tx	100 nF	220 nF	10 nF	100 nF	220 nF
Processor Rx	None	None	10 nF[2]	None	None[3]

Title: BTB Connector/SSD
Size: Custom | Document Number: MS-16GJ | Rev: 10
Date: Tuesday, August 04, 2015 | Sheet 29 of 56


FRONT
REAR
AMP
靠近25pin
靠近38pin
到B小板K/B
layout：靠近ALC898,走線要粗。
WIDTH > 40 mils
50mil
For APA2031
Av | GAIN0 | GAIN1
6dB | 0 | 0
10dB | 0 | 1
15.6dB | 1 | 0
21.6dB | 1 | 1
4.3dB | X | X
ALC898
APA2031RI-TRL_TSSOP20-RH
APA2051QBI-TRG_TQFN28
I71-020510C-A30
MS-16GJ
Audio CODEC/Audio AMP
Monday, August 03, 2015
https://vinafix.com

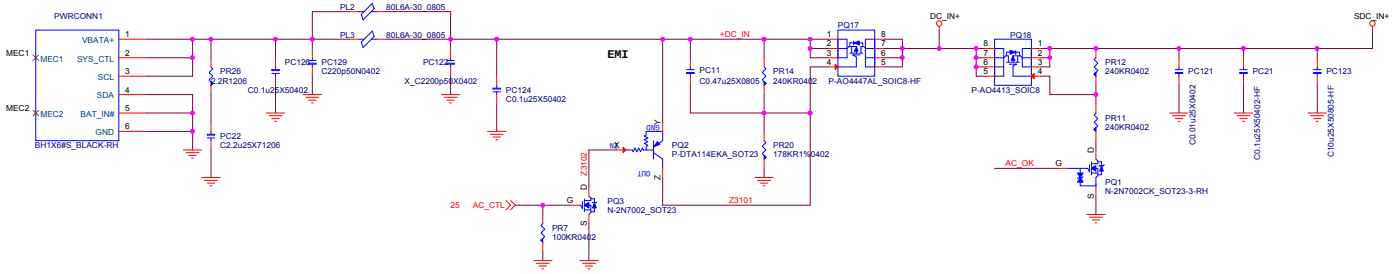


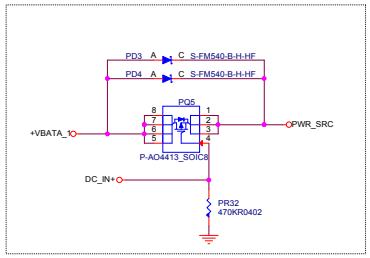
M.2 WLAN/BT

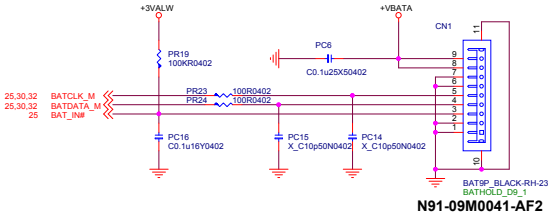
MICRO-STAR INT'L CO.,LTD.

Title	WLAN/TPM	
Size	Document Number: MS-16GJ	Rev: 10
Date:	Sheet 31 of 56	

Battery Select





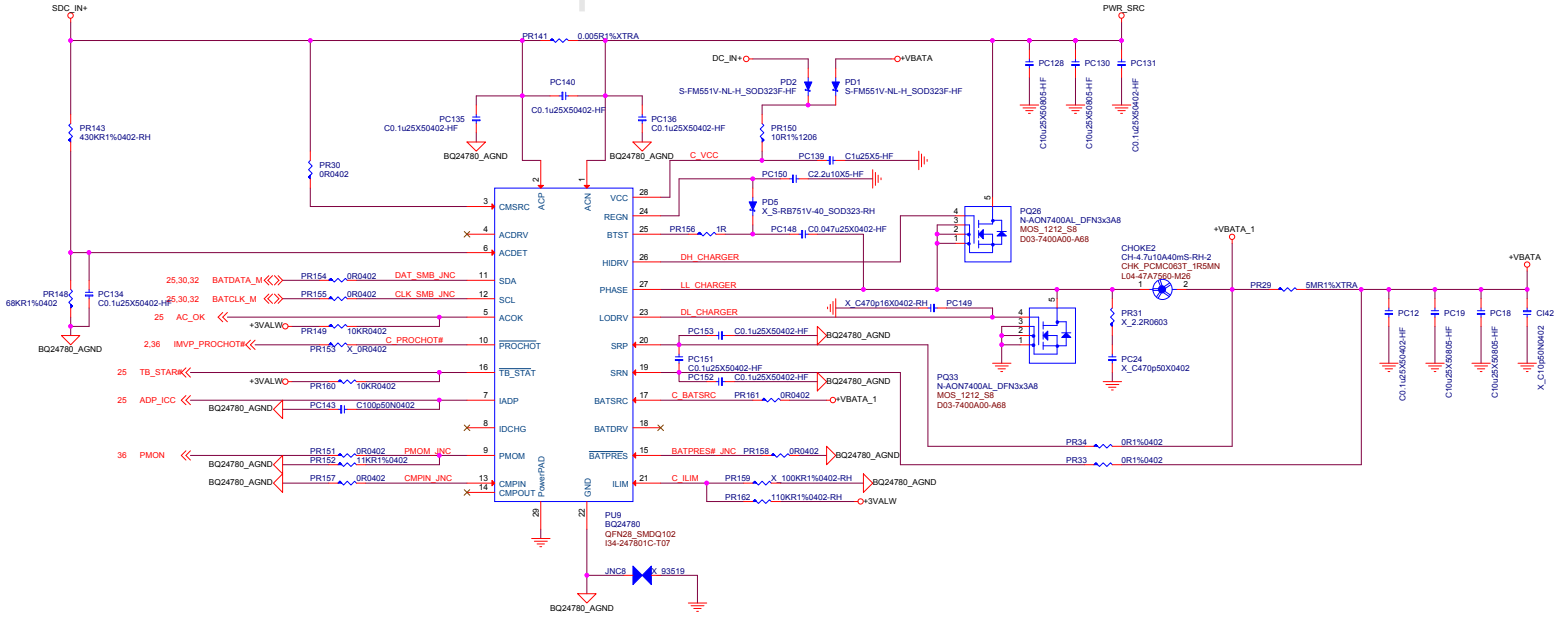


JBAT1 Pin Definition

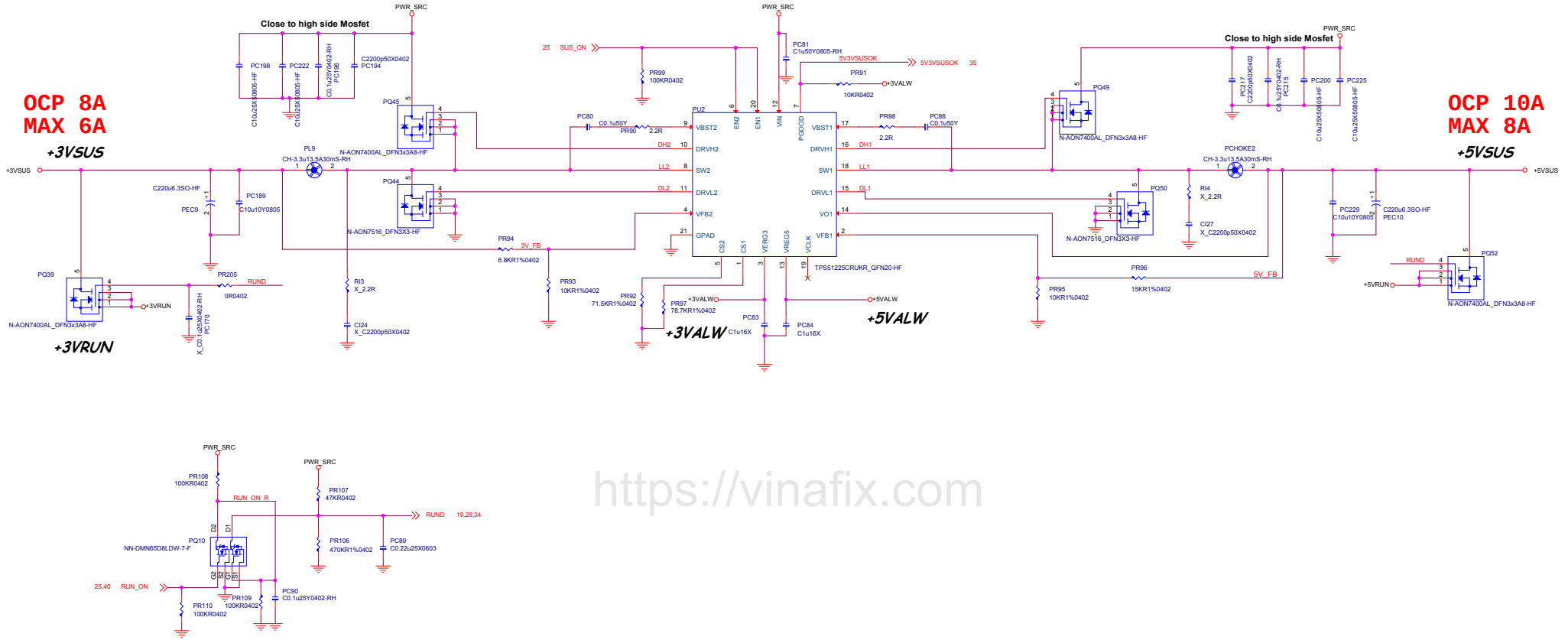
1: GND
2: GND
3: BAT_IN#
4: SMBDATA
5: SMBCLK
6: NC
7: NC
8: VBATA+
9: VBATA+

N91-09M0041-AF2

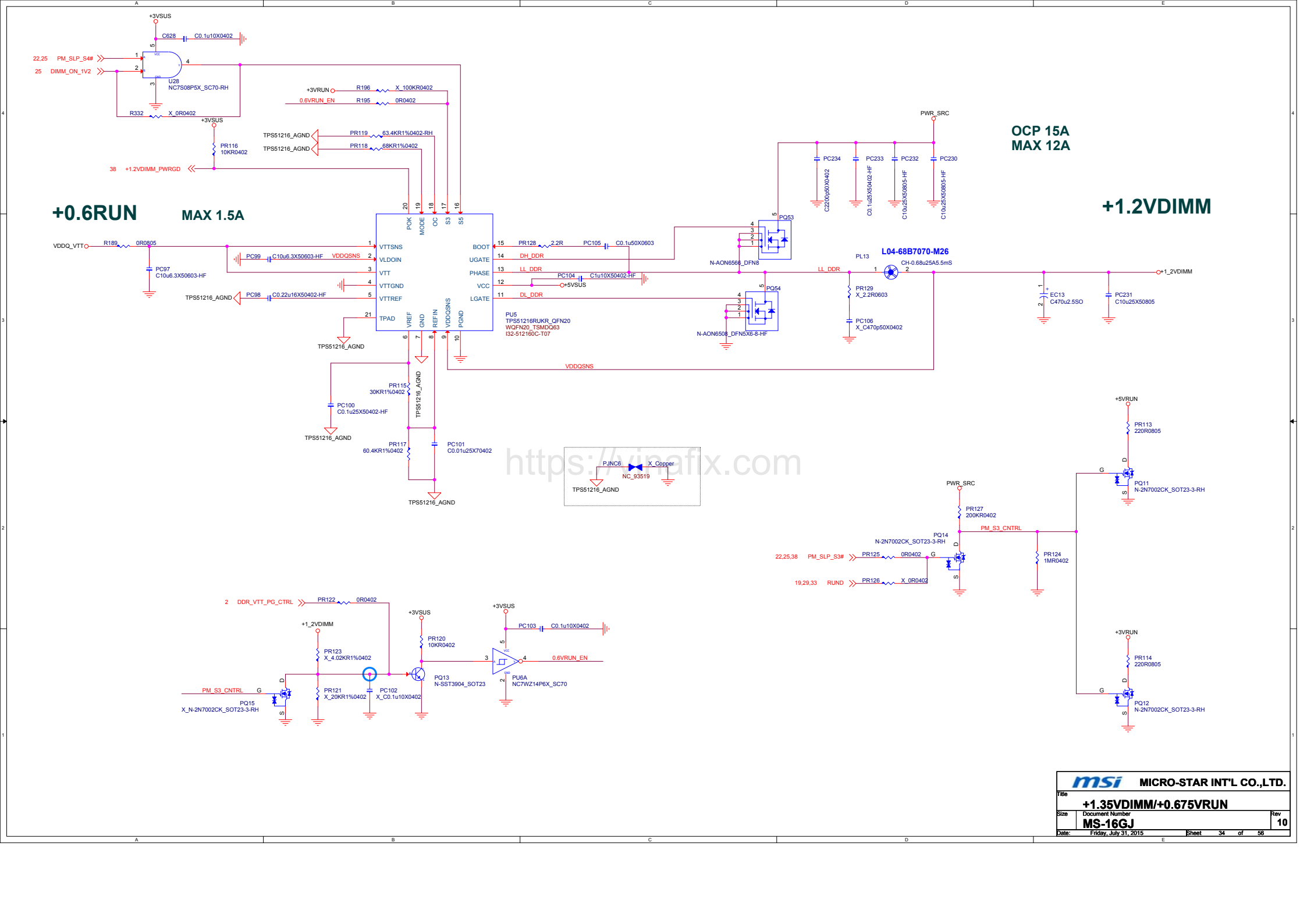
Battery Charger



System Power



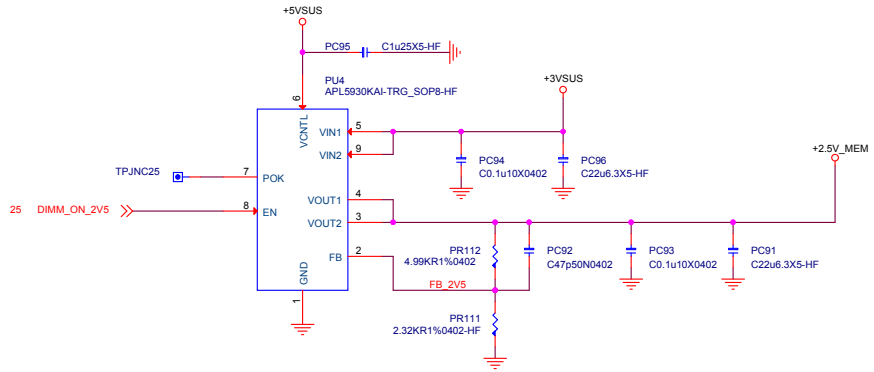
Title	System Power		
Size: Custom	Document Number: MS-16GJ		Rev: 10
Date: Wednesday, July 29, 2015	Sheet 33 of 56		



MICRO-STAR INT'L CO.,LTD.	
Title	+1.35VDIMM/+0.675VRUN
Size	Document Number: MS-16GJ
Rev	10
Date:	Friday, July 31, 2015
Sheet	34 of 56

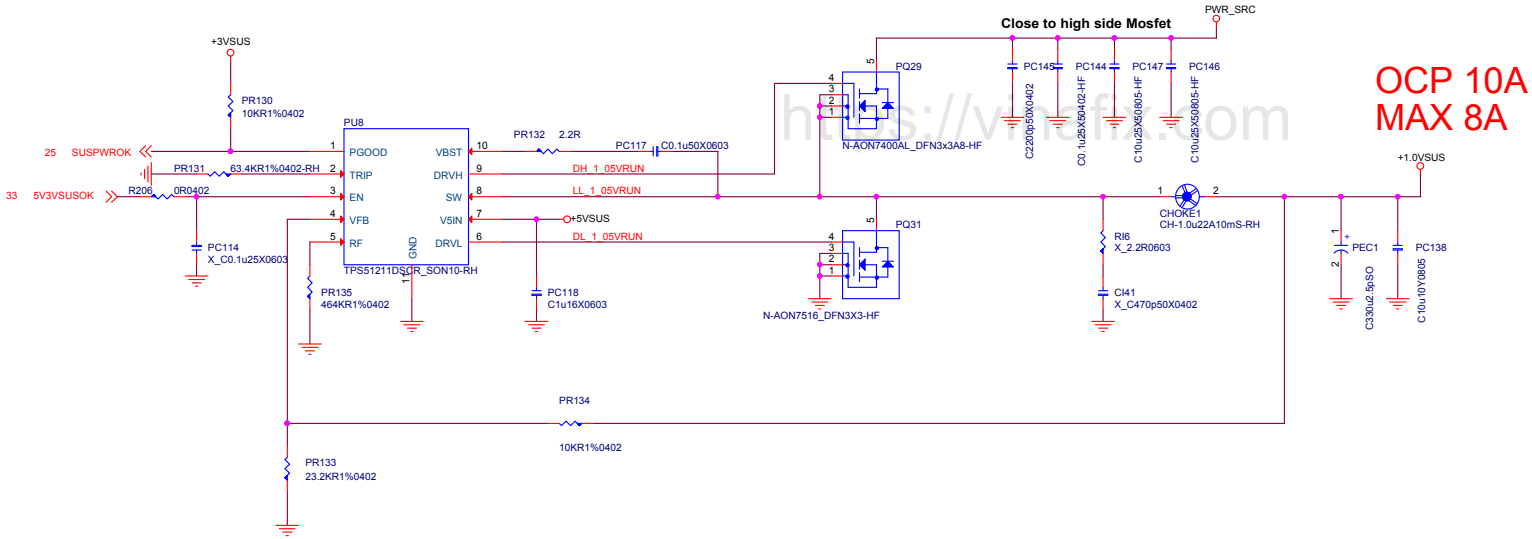
+2.5V_MEM

OCP 4.2A
MAX 1A



+1.0VSUS

OCP 10A
MAX 8A



msi MICRO-STAR INT'L CO.,LTD.		
Title: 2.5VMEM/1.0VSUS		
Size	Document Number: MS-16GJ	Rev: 10
Date: Monday, August 03, 2015	Sheet 35 of 56	

Skylake H-line 42e 45W ISL95855

EVT: power change list (H4+2)
CPU-core
PR157 ≥2.2R (0603 R11-022A013-W08)
PR613 ≥2.43K (R11-2431T12-W08)
PC199 ≥1000P (C11-1027612-M09)
PR608 ≥4.7K (R11-0472T12-W08)
PR615 ≥86.6K (R11-8662T12-W08)
PC194 ≥0.22uF (C11-2242312-W08)
PC193 ≥47nF (C11-4732012-W08)
Add PC288 10nF (C11-1032052-T34)

EVT: power change list (H4+2)
GT-core
PR667 ≥383R (0603 PN:R11-3830T13-W08)
PR662 ≥2.94K (R11-2941T12-W08)
PC227 ≥820P (C11-8212822-Y01)
PR664 ≥1.4K (R11-0142T12-W08)
PC287 ≥220P (C11-2212812-W08)
PR663 ≥ 1K (-R11-0102T12-W08)
PR671 ≥86.6K (R11-8662T12-W08)
PC234 ≥100P (C11-1012812-W08)
PC232 ≥0.22u (C11-2242312-T04)
PR668 ≥5.49K (R11-5491T22-W08)

EVT: power change list (H4+2)
SA-core
PR621≥2.26K (R11-2261T12-W08)
PC207≥1.2nF (C11-1222832-W08)
PR618≥2.87K (R11-2871T12-W08)
PR626≥71.5K (R11-7152T22-W08)

+V1.0U_VCCST
R308 100R1%0402 0327
VR_SVID_DATA

+3VSUS
PR41 20KR0402-2
+5VSUS
PR170 2.2R
PC29 C0.1u50X0402-HF
PWR_SRC
PR185 0R0402
PC28 C0.22u25X-HF

U10
VCC
GND PAD
ISL95855HRTZ_TQFN48-HF

CPU_PWROK 22
IMVP_PROCHOT# 2,32
VR_SVID_DATA 2
VR_SVID_ALERT# 2
VR_SVID_CLK 2
PMON 32
EC_ALLSYSPG 2,22,25
PR42 75R0402 VR1_HOT#
PR44 10R1%0402 VR1_SVID_DATA
PR43 49.9R1%0402 VR1_SVID_CLK

VR_ENABLE 48
VR_READY 47
VR_HOT# 46
SDA 43
ALERT# 44
SCLK 45
PSYS 1
COMP_A 16
FB_A 17
RTN_A 18
COMP_B 4
FB_B 5
RTN_B 6
COMP_C 29
FB_C 30
RTN_C 31
PROG5 36
PROG4 37
PROG3 38
PROG2 39
PROG1 40

VIN 41
PWM1_A 25
PWM2_A 26
PWM3_A 27
ISEN1_A 21
ISEN2_A 22
ISEN3_A 23
FCCM_A 24
ISUMP_A 19
ISUMN_A 20
NTC_A 15
IMON_A 14
PWM1_B 12
PWM2_B 13
ISEN1_B 9
ISEN2_B 10
FCCM_B 11
ISUMP_B 7
ISUMN_B 8
NTC_B 3
IMON_B 2
PWM_C 35
FCCM_C 34
ISUMP_C 33
ISUMN_C 32
IMON_C 28

+VCC_CORE
PR192 100R1%0402
PR40 12.1KR1%0402
PC27 C4700p50X0402
PC63 C2200p50X0402-HF
PR88 1.4KR1%0402
PC53 C68p50N0402-RH
PC61 C820p50X0402
PR85 3.24KR1%0402
PC56 C680p50X0402-RH
PR72 499R1%0402
PR73 2.32KR1%0402
PC62 C330p50N0402
VCORE_VCC_SEN 5
VCORE_VSS_SEN 5
PR198 100R1%0402
PC54 C0.01u25X0402-HF
PC167 C2200p50X0402-HF
PR167 2.32KR1%0402
PR53
PC32 C68p50N0402-RH
PC31 C820p50X0402-HF
PR62 1.8KR1%0402
PC34 C2200p50X0402-RH
PR56 1KR1%0402
PR57 3.01KR1%0402
PC37 C330p50N0402

+VCCGT
PR173 100R1%0402
VCCGT_VCC_SEN 7
VCCGT_VSS_SEN 7
PR174 100R1%0402
PC38 C0.01u25X0402-HF
PC46 C68p50N0402-RH
PC49 C2200p50X0402-HF
PR65 1.43KR1%0402-RH
PC50 C1000p50N0402-HF-2
PR66 2.87KR1%0402
PC43 C680p50X0402-RH
PR82 499R1%0402
PR61 2.26KR1%0402
PC40 C330p50N0402

+VCCSA
PR176 100R1%0402
VCCSA_VCC_SENSE 6
VCCSA_VSS_SENSE 6
PR175 100R1%0402
PC39 C0.01u25X0402-HF

PR46 56.2KR1%0402 Frequency(1.04) =600kHz
PR166 182KR1%0402-RH Frequency(1.04) =1.75MHz
PR167 20.5KR1%0402-RH
PR47 9.31KR1%0402-RH
PR171 110KR1%0402-HF

PR80 10KR1%0402
PC48 C330p50N0402
PR89 86.6KR1%0402-RH
PR87 27.4KR1%0402-RH
PRT1 470KRT3%0402-HF
CLOSE PQ48

PC51 X_C2200p50X0402-HF
PR74 X_1KR1%0402
PR76 330R1%0402
PC57 C0.047u25X0402
PC58 C0.22u16X0402-HF
PC59 C0.033u16X0402-RH-1
PR86 11KR1%0402
PR83 2.61KR1%0402
RT2 10KRT
CLOSE PL29
IA_VSUMA+ 37
IA_VSUMA- 37
PC60 C0.1u25X50402-HF

PR51 10KR1%0402
PC30 C100p50N0402-HF
PR45 88.7KR1%0402-RH
PR50 27.4KR1%0402-RH
PRT1 470KRT3%0402-HF
CLOSE PQ49
PR60 412R1%
PC45 X_C2200p50X0402-HF
PR63 X_1KR1%0402
PC41 X_C0.082u16X0402-HF
PC42 C0.22u16X7R0402-HF
PR59 11KR1%0402
PR58 5.49KR1%0402-1
RT4 10KRT
CLOSE PL30
GT_VSUMA+ 37
GT_VSUMA- 37
PC44 C0.1u25X50402-HF

PC55 C330p50N0402
PR75 73.2KR1%0402-RH
PR54 560R0402
PC33 X_C2200p50X0402-HF
PR48 X_1KR1%0402
PC36
PC35 C0.068u25X
X_C0.082u16X0402-HF
PR55 11KR1%0402
PR49 2.61KR1%0402
RT3 10KRT
CHOCK11
SA_VSUMC+ 37
SA_VSUMC- 37
C229 C0.1u25X50402-HF

TABLE 4. PROG1 PROGRAMMING TABLE

TYPICAL PROG1 RESISTOR (±1%, kΩ)	VR A + VR B + VR C (GTUS), Vboot (V)	SLEW RATE ALL VRs (mV/µs)	ADDRESS SELECTION		
			VR A	VR B	VR C
1.87	1.05	30	GT[01h]	GTUS [03h]	SA [02h]
5.62	1.05	30	GT[01h]	IA [00h]	GTUS [03h]
9.31	1.05	30	GT[01h]	IA [00h]	SA [02h]
13.3	1.05	30	IA [00h]	GTUS [03h]	SA [02h]
16.9	1.05	30	IA [00h]	GT[01h]	GTUS [03h]
20.5	1.05	30	IA [00h]	GT[01h]	SA [02h]
24.3	1.05	10	GT[01h]	GTUS [03h]	SA [02h]
28.0	1.05	10	GT[01h]	IA [00h]	GTUS [03h]
34.0	1.05	10	GT[01h]	IA [00h]	SA [02h]
41.2	1.05	10	IA [00h]	GTUS [03h]	SA [02h]
48.7	1.05	10	IA [00h]	GT[01h]	GTUS [03h]
56.2	1.05	10	IA [00h]	GT[01h]	SA [02h]
63.4	0	30	GT[01h]	GTUS [03h]	SA [02h]
71.5	0	30	GT[01h]	IA [00h]	GTUS [03h]
78.7	0	30	GT[01h]	IA [00h]	SA [02h]
88.7	0	30	IA [00h]	GTUS [03h]	SA [02h]
100	0	30	IA [00h]	GT[01h]	GTUS [03h]
110	0	30	IA [00h]	GT[01h]	SA [02h]
121	0	10	GT[01h]	GTUS [03h]	SA [02h]
137	0	10	GT[01h]	IA [00h]	GTUS [03h]
150	0	10	GT[01h]	IA [00h]	SA [02h]
165	0	10	IA [00h]	GTUS [03h]	SA [02h]
182	0	10	IA [00h]	GT[01h]	GTUS [03h]
215	0	10	IA [00h]	GT[01h]	SA [02h]

TABLE 5. PROG2 PROGRAMMING TABLE

TYPICAL PROG2 RESISTOR (±1%, kΩ)	IMAX VR A			VR A PSI1 PHASE REDUCTION
	3-PH (A)	2-PH (A)	1-PH (A)	
1.87	67	35	7	2-Phase
5.62	70	40	10	2-Phase
9.31	75	45	15	2-Phase
13.3	80	50	18	2-Phase
16.9	85	55	20	2-Phase
20.5	91	60	25	2-Phase
24.3	95	65	27	2-Phase
28.0	100	67	30	2-Phase
34.0	105	70	33	2-Phase
41.2	110	75	35	2-Phase
48.7	115	80	40	2-Phase
56.2	120	85	45	2-Phase
63.4	67	35	7	1-Phase
71.5	70	40	10	1-Phase
78.7	75	45	15	1-Phase
88.7	80	50	18	1-Phase
100	85	55	20	1-Phase
110	91	60	25	1-Phase
121	95	65	27	1-Phase
137	100	67	30	1-Phase
150	105	70	33	1-Phase
165	110	75	35	1-Phase
182	115	80	40	1-Phase
215	120	85	45	1-Phase

TABLE 6. PROG3 PROGRAMMING TABLE

TYPICAL PROG3 RESISTOR (±1%, kΩ)	IMAX VR B		DROOP VR B
	2-PH (A)	1-PH (A)	
1.87	35	7	Active
5.62	40	10	Active
9.31	45	15	Active
13.3	50	18	Active
16.9	55	20	Active
20.5	60	25	Active
24.3	65	27	Active
28.0	67	30	Active
34.0	70	33	Active
41.2	75	35	Active
48.7	80	40	Active
56.2	85	45	Active
63.4	35	7	Disabled
71.5	40	10	Disabled
78.7	45	15	Disabled
88.7	50	18	Disabled
100	55	20	Disabled
110	60	25	Disabled
121	65	27	Disabled
137	67	30	Disabled
150	70	33	Disabled
165	75	35	Disabled
182	80	40	Disabled
215	85	45	Disabled

TABLE 7. PROG4 PROGRAMMING TABLE

TYPICAL PROG4 RESISTOR (±1%, kΩ)	DROOP VR A	DROOP VR C	VR A and VR B SWITCHING FREQUENCY (kHz)
1.87	Disabled	Disabled	300
5.62	Disabled	Disabled	350
9.31	Disabled	Disabled	450
13.3	Disabled	Disabled	583
16.9	Disabled	Disabled	750
20.5	Disabled	Disabled	1000
24.3	Disabled	Active	300
28.0	Disabled	Active	350
34.0	Disabled	Active	450
41.2	Disabled	Active	583
48.7	Disabled	Active	750
56.2	Disabled	Active	1000
63.4	Active	Disabled	300
71.5	Active	Disabled	350
78.7	Active	Disabled	450
88.7	Active	Disabled	583
100	Active	Disabled	750
110	Active	Disabled	1000
121	Active	Active	300
137	Active	Active	350
150	Active	Active	450
165	Active	Active	583
182	Active	Active	750
215	Active	Active	1000

TABLE 8. PROG5 PIN

TYPICAL PROG5 RESISTOR (±1%, kΩ)	VR C IMAX (A)		VR C SWITCHING FREQUENCY (kHz)
	SA	GTUS	
1.87	7	17	300
5.62	9	20	300
9.31	12	25	300
13.3	15	27	300
16.9	7	17	350
20.5	9	20	350
24.3	12	25	350
28.0	15	27	350
34.0	7	17	450
41.2	9	20	450
48.7	12	25	450
56.2	15	27	450
63.4	7	17	583
71.5	9	20	583
78.7	12	25	583
88.7	15	27	583
100	7	17	750
110	9	20	750
121	12	25	750
137	15	27	750
150	7	17	1000
165	9	20	1000
182	12	25	1000
215	15	27	1000

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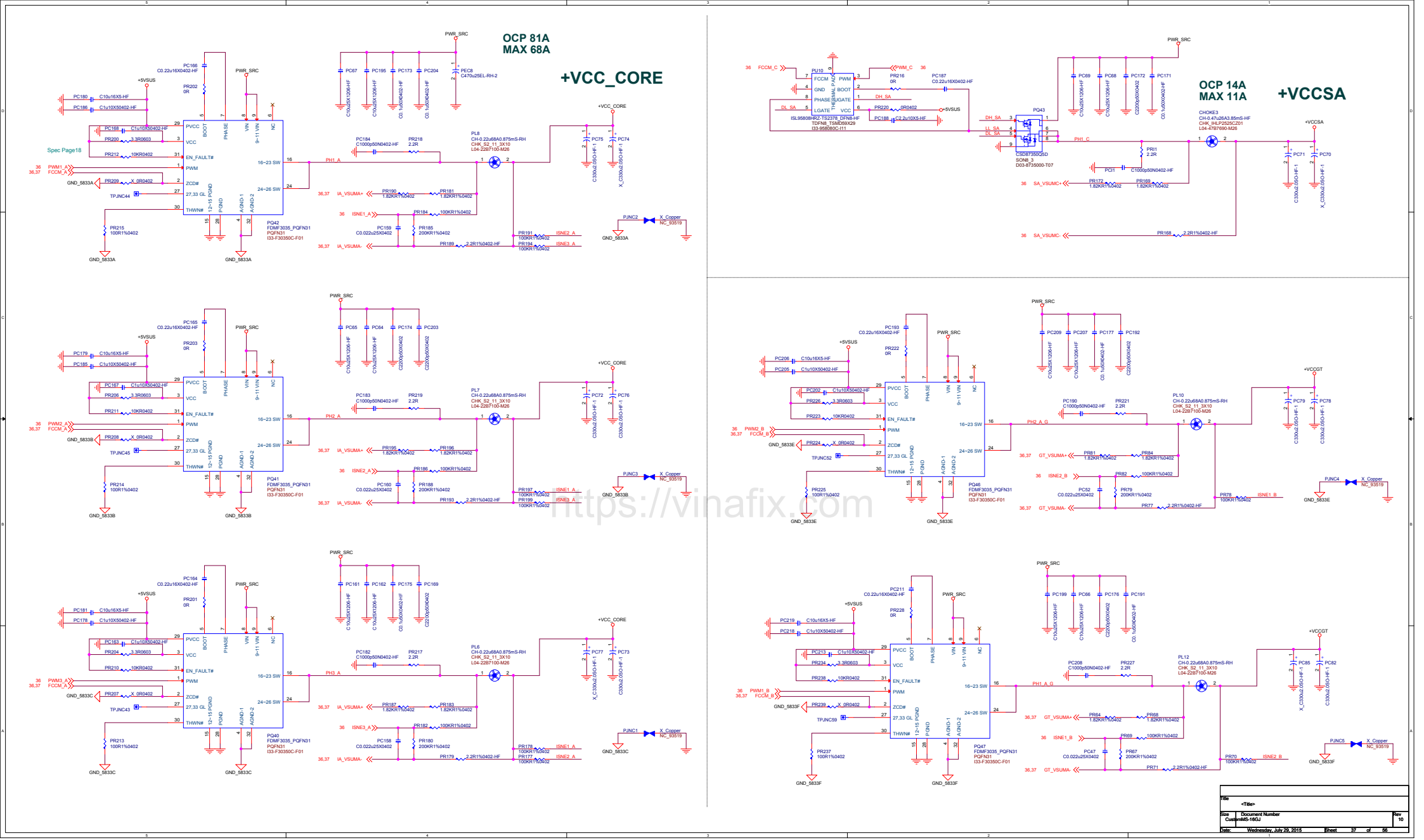
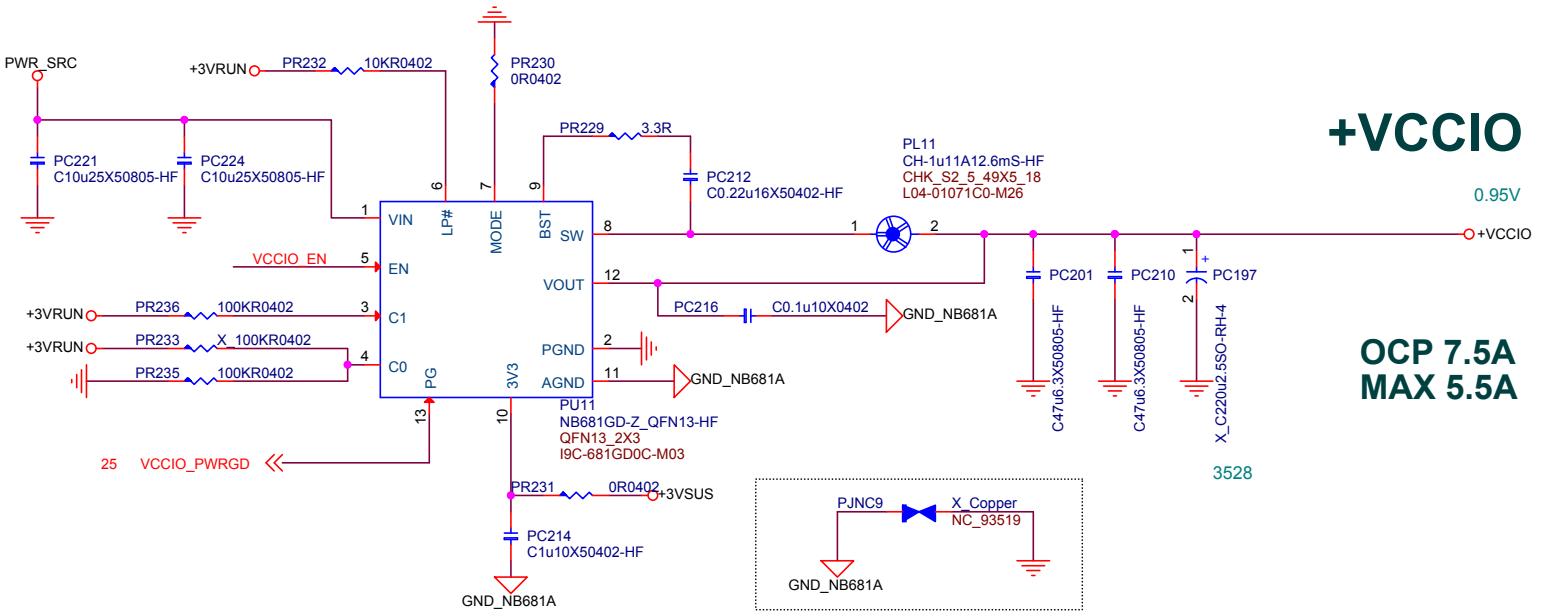
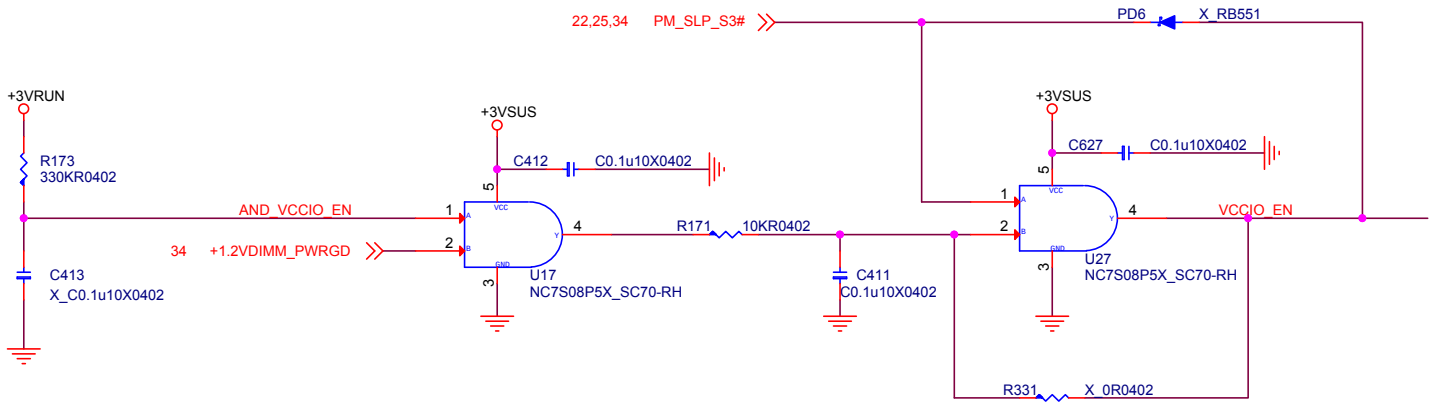
Size	Document Number: CustomMS-16GJ
Rev	10
Date:	Wednesday, July 29, 2015
Sheet	36 of 56


OCP 81A
MAX 68A
+VCC_CORE
OCP 14A
MAX 11A
+VCCSA
Spec Page18
PQ42 FDMF3035_PQFN31 PQFN31 I33-F30350C-F01
PQ41 FDMF3035_PQFN31 PQFN31 I33-F30350C-F01
PQ40 FDMF3035_PQFN31 PQFN31 I33-F30350C-F01
PQ46 FDMF3035_PQFN31 PQFN31 I33-F30350C-F01
PQ47 FDMF3035_PQFN31 PQFN31 I33-F30350C-F01
PU10 ISL9580BHRZ-T52378_DFN8-HF T0FN8_TSMD69X29 I33-9580B0C-I11
PQ43 CSD87350Q5D SON8_3 D03-873500-T07
PL8 CH-0.22u68A0.875mS-RH CHK_S2_11_3X10 L04-226T100-M26
PL7 CH-0.22u68A0.875mS-RH CHK_S2_11_3X10 L04-226T100-M26
PL6 CH-0.22u68A0.875mS-RH CHK_S2_11_3X10 L04-226T100-M26
PL10 CH-0.22u68A0.875mS-RH CHK_S2_11_3X10 L04-226T100-M26
PL12 CH-0.22u68A0.875mS-RH CHK_S2_11_3X10 L04-226T100-M26
CHOKE3 CH-0.47u26A3.85mS-HF CHK_IHLP2525CZ01 L04-47B7690-M26
PWR_SRC
+5VSUS
+VCCGT
GND_5833A
GND_5833B
GND_5833C
GND_5833E
GND_5833F
PJNC1
PJNC2
PJNC3
PJNC4
PJNC5
X_Copper
NC_93519
https://vinafix.com





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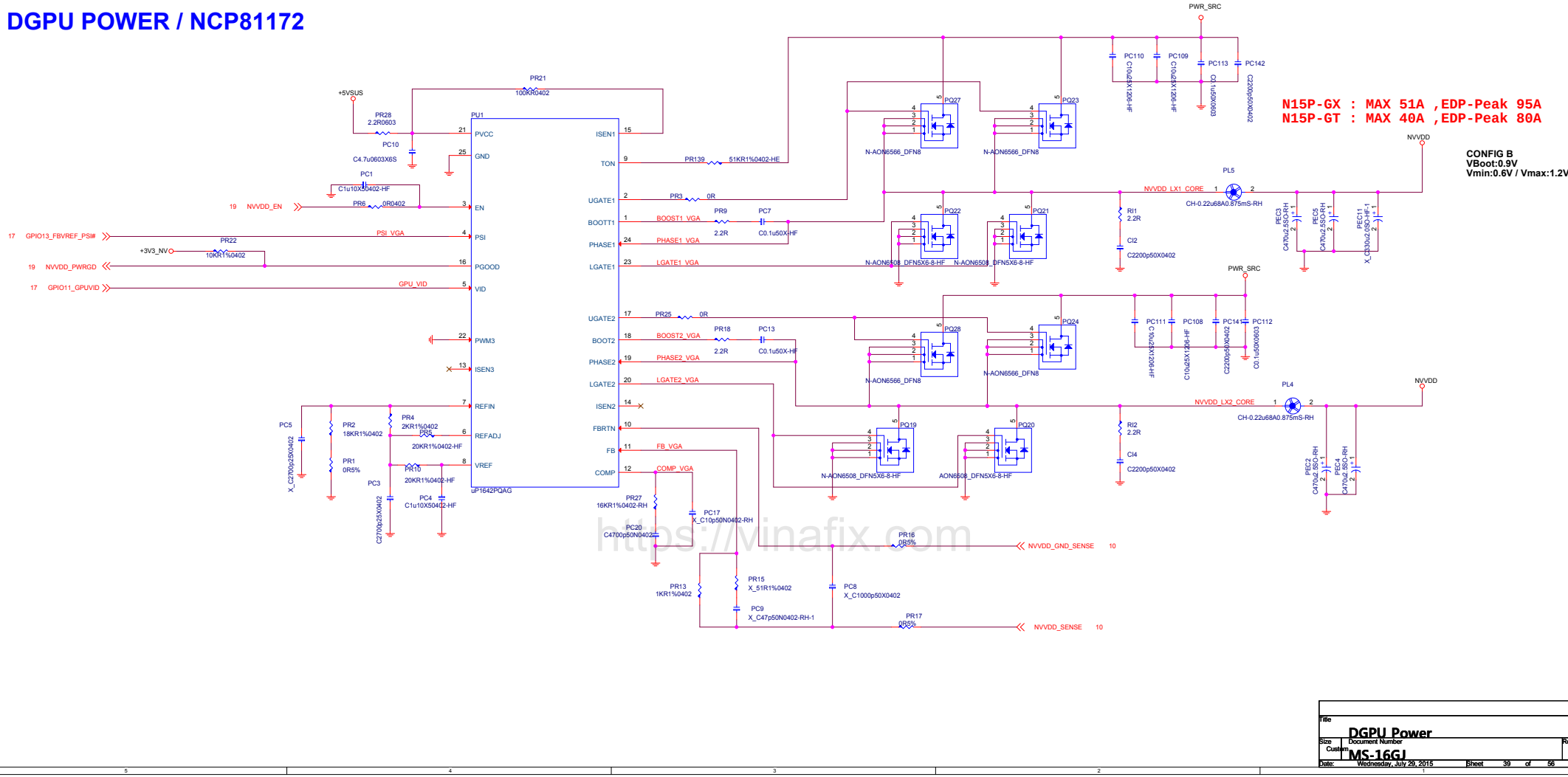
Size: Custom	Document Number: MS-16GJ	Rev: 10
Date: Wednesday, July 29, 2015	Sheet 38 of 56	

DGPU POWER / NCP81172



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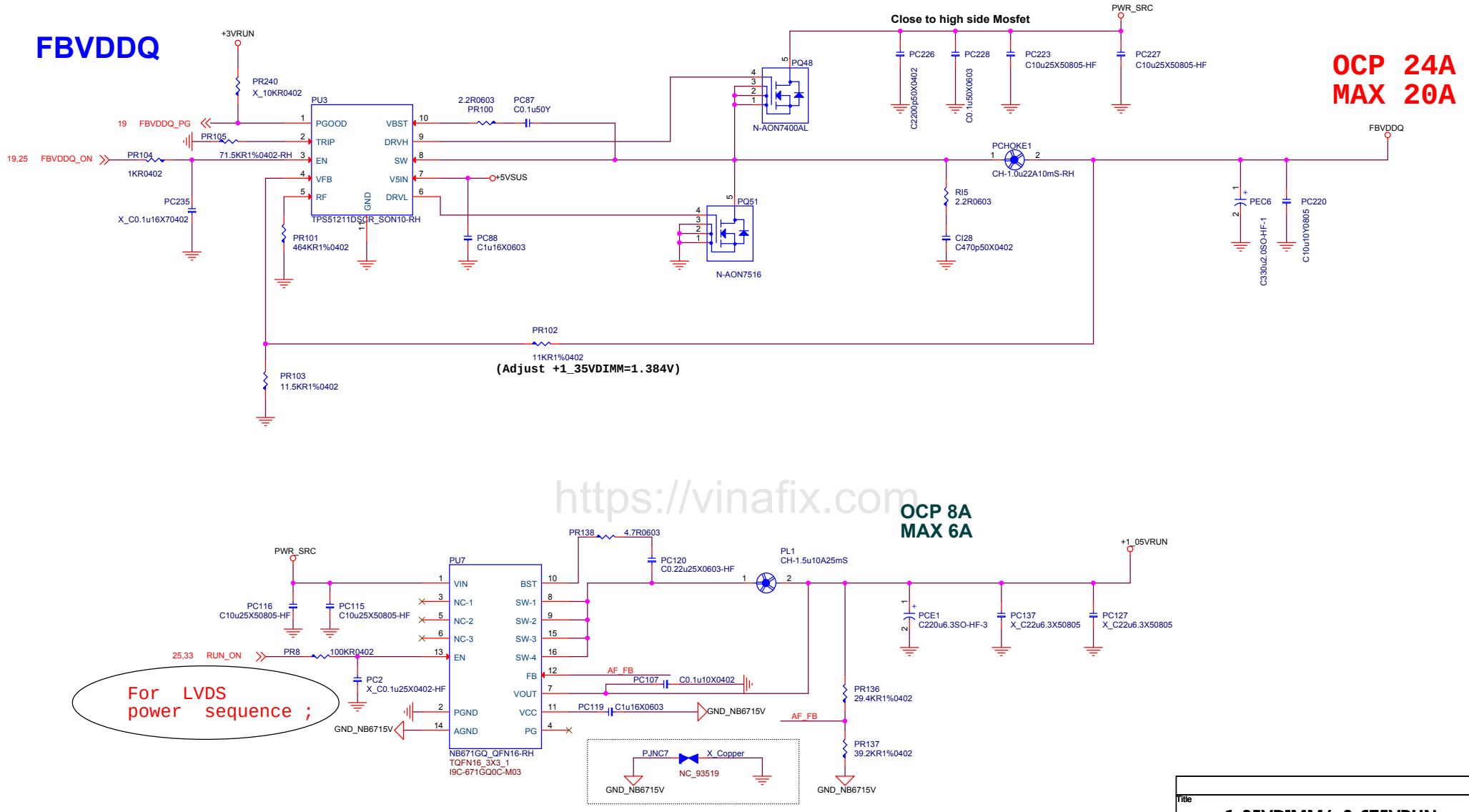
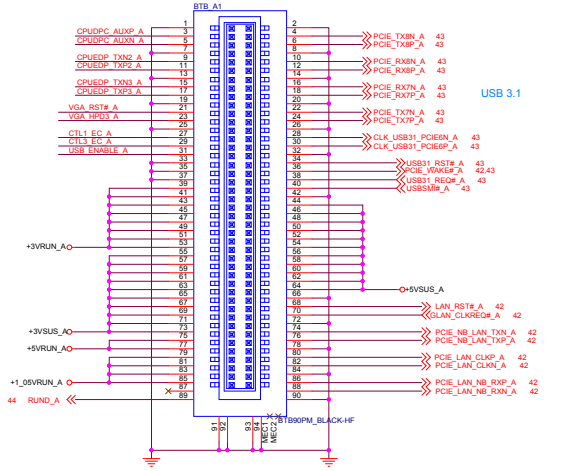
Size: Custom	Document Number: MS-16GJ		Rev: 10
Date: Wednesday, July 29, 2015	Sheet 39 of 56		

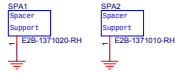


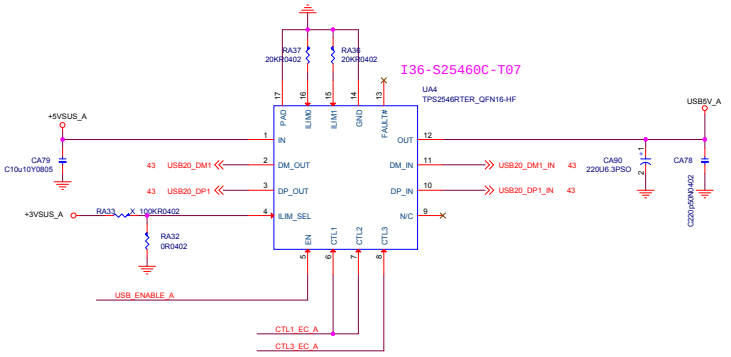
Title	+1_35VDIMM/+0_675VRUN		
Size: Custom	Document Number: MS-16GJ		Rev: 10
Date: Friday, July 31, 2015	Sheet 40 of 56		

Board A - CRT/USB3.1/USB2.0/LAN

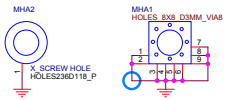


BTB STANDOFF

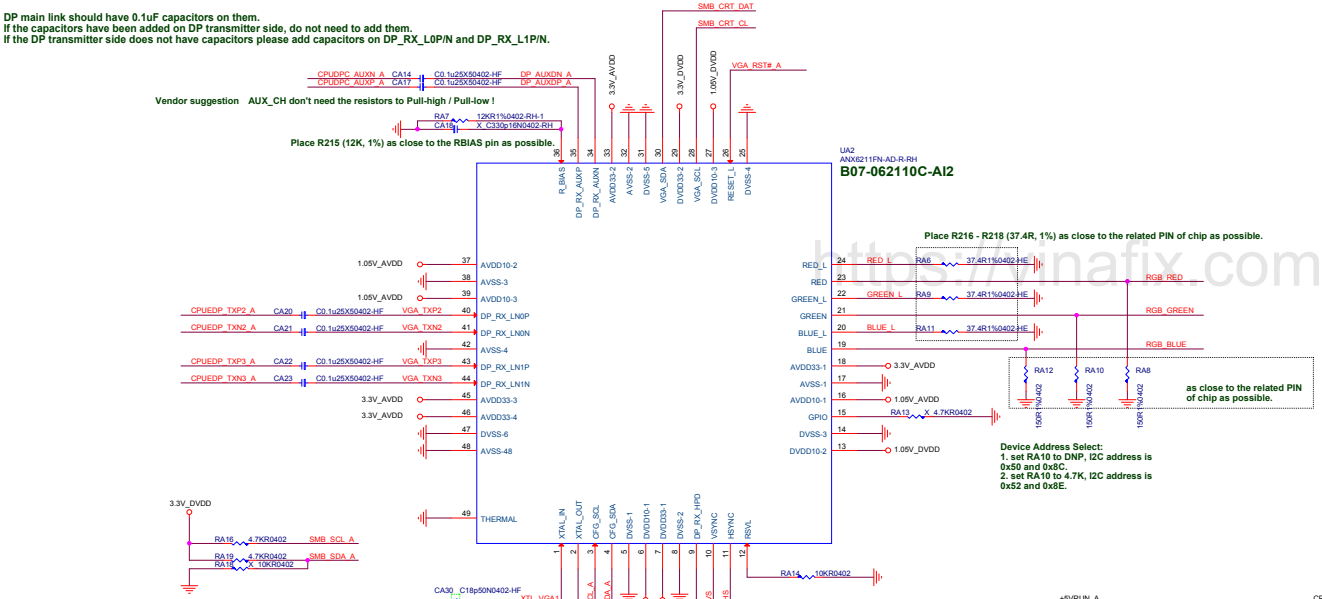


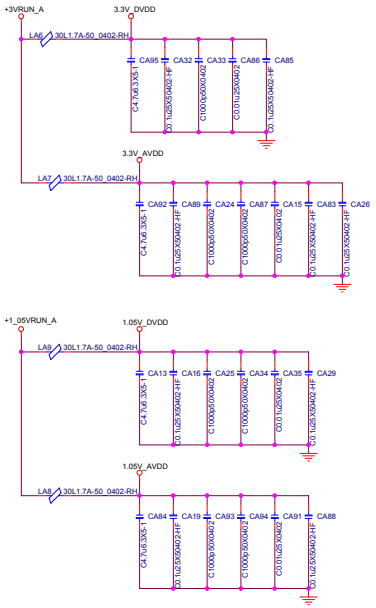


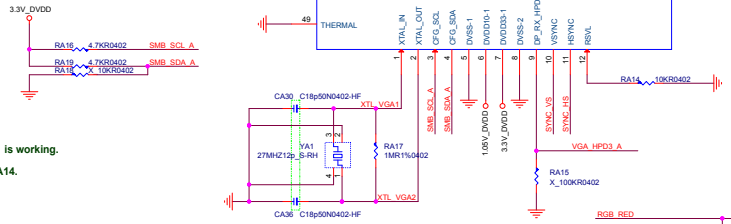
SCREW HOLE



DP main link should have 0.1uF capacitors on them.
If the capacitors have been added on DP transmitter side, do not need to add them.
If the DP transmitter side does not have capacitors please add capacitors on DP_RX_L0P/N and DP_RX_L1P/N.



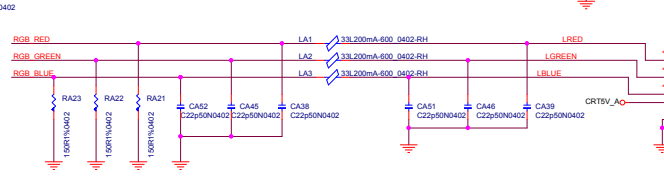




CFG_SCL pull-up to high when ANX6211 is working.
A) Pure Hardware Case:
HPD mode: DNP the RA13, put on the RA14.
IRQ mode: Put on the R14, DNP RA13.

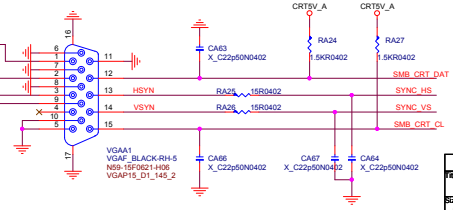
B) With EC control, DNP RA14.
HPD mode: No change.
IRQ mode: Two means to enter IRQ mode.
1st, EC pull-down CNG_SDA during ANX6211 reset.
2nd, set ANX6211 work in IRQ mode by register setting after reset.

6/10 Yangtec vendor suggest Cap value is changed form 18p to 20p



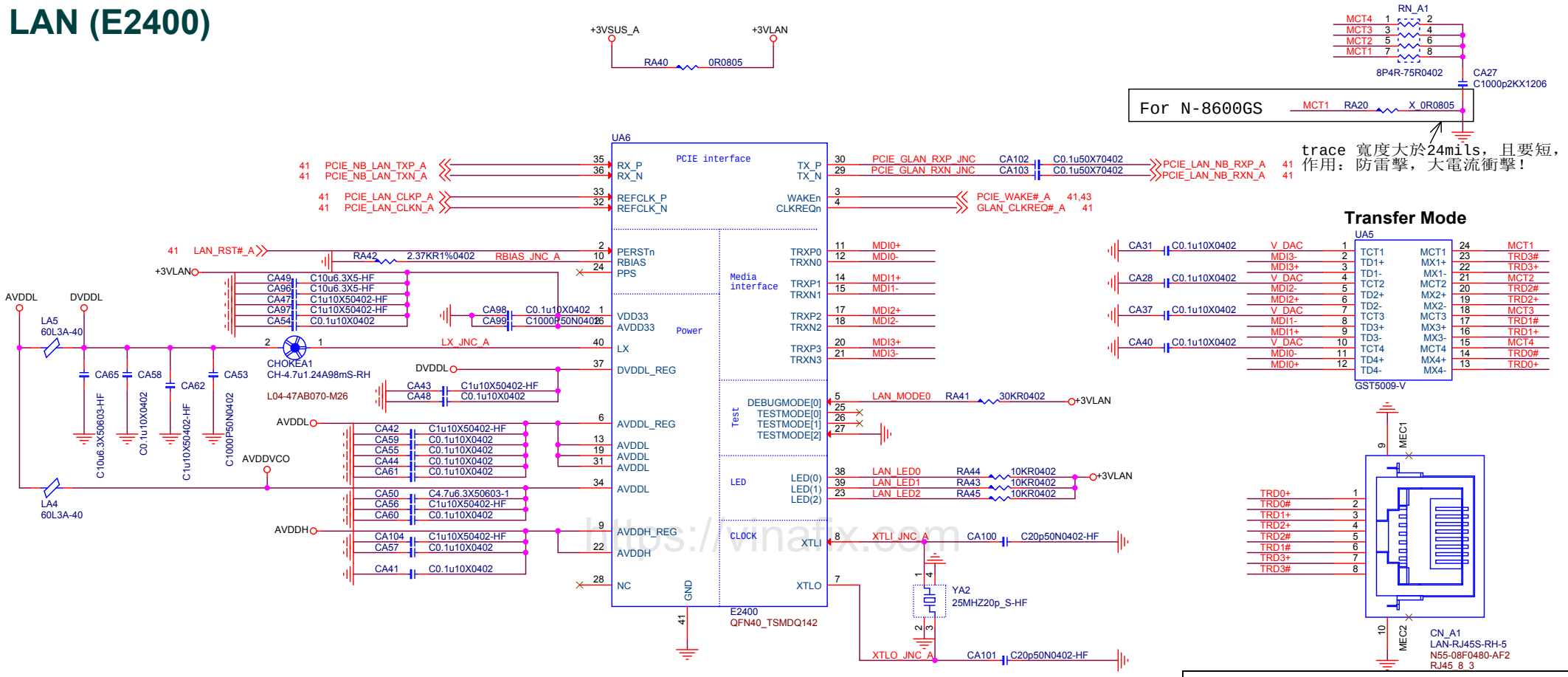
CRT

Vendor suggestion The DDC bus can be directly connected with output connector, don't need the level shifting part



Title	[A] BTB_CNT/CRT/USB/WLAN/BT		
Size	Document Number		Rev
Custom	MS-16GJ		10
Date:	Tuesday, August 04, 2015	Sheet 41 of 56	

LAN (E2400)



Title	[A] GIGA LAN(BFN2205B)		
Size: Custom	Document Number: MS-16GJ		Rev: 10
Date: Wednesday, July 29, 2015	Sheet 42 of 56		

PCIE to USB 3.1

For 0A Consumption measure

+3VRUN_A — RA3 0R0805 — +3VRUN_USB

+3VSUS_A — RA30 0R0603 — +3VSUS_USB

PCB 1.1 эCrystal CL=12P

20MHZ12p_S-HF YAA1 CA76 C10p50N0402

U_XO_JNC U_XI_JNC

ASM1142

UA3 ASM1142-RH

PE_CLKN XO XI VDDP PRX0P PRX0N VCCP PTX0P PTX0N VDDP REXT PTX1P PTX1N VCCP PRXP1 PRXN1 GND

VCC TEST_EN PE_RST# OCI_B# OCI_A# PRON_B PRON_A PE_WAKE# VCCSUS U2DP_A U2DM_A VDDSUS VCCSUS U2DP_B U2DM_B VCCSUS_O

VDD SMI# PE_CLKREQ# VCC SPI_CLK SPI_DO SPI_CS# SPI_DI PORST# UART_RX UART_TX VDD VCC_IN TEST FSTL VCCSUS_IN

QFN64_TSMDQ205

B02-011422C-AD0

RA29 10KR0402 USBSMI#_A

PBC 1.1 modify

41 USB31_REQ#_A

PORST# RA28 80.6KR1%0402 DA2 S-RB551V-30_SOD323 CA69 C1u10X50402-HF

USBA1 USB5V_A

VBUS D- D+ GND SSTX+ SSTX- GND_DRAIN SSRX+ SSRX- RSV

USBAM_BLACK-HF-4 USB_AT_9_USB3_1

USB 3.1 CNT1

N53-09M0431-TB4

SPI ROM For FW (stuff first)

UA1 GD25D10BTIGR SOIC8

CE# SO WP# GND VCC HOLD# SCK SIO

RA2 4.7KR0402 RA1 4.7KR0402 CA7 C0.1u10X0402

M31-25D1002-GA0

Aviod same wtih EC ROM modidy PN

RA5 4.7KR0402 RA4 X 4.7KR0402

CA73 CA72 C0.1u10X0402

0.1uF*2

0.1uF*7

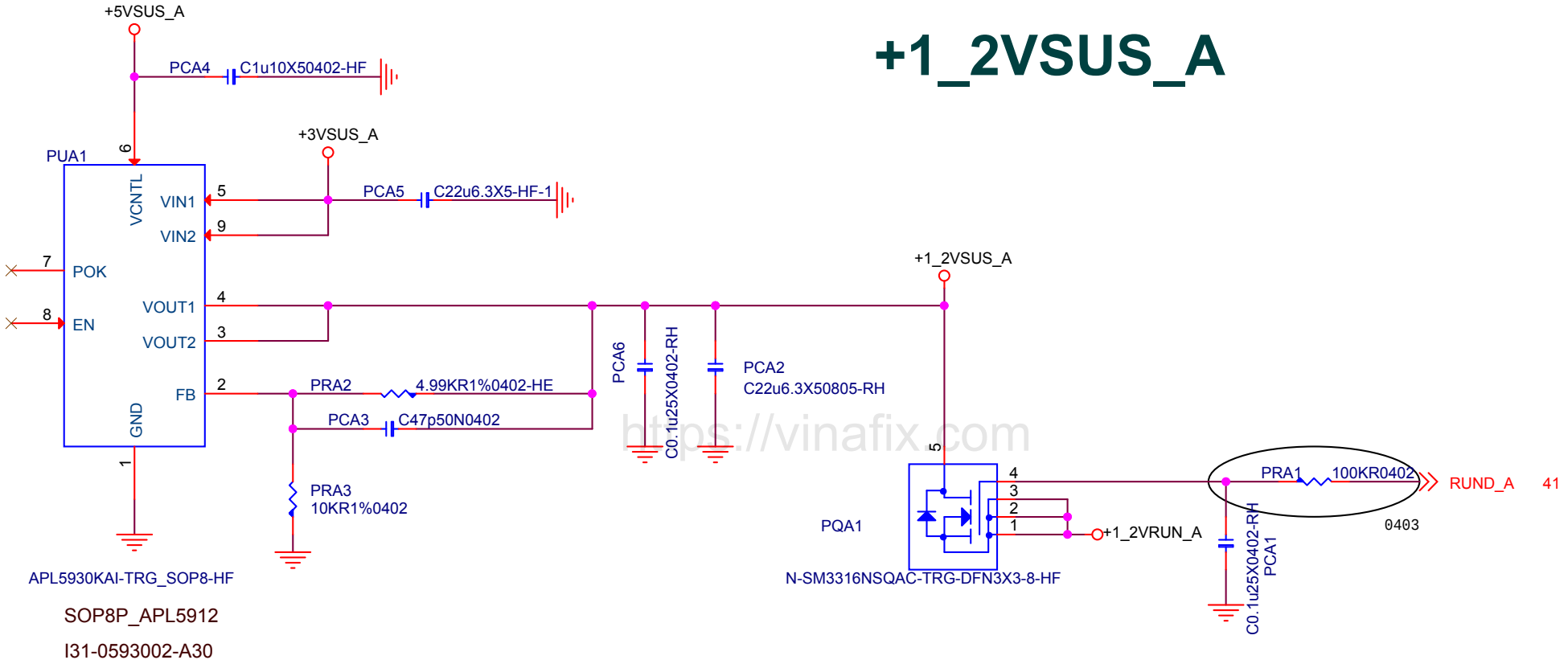
CA5 CA9 CA11 CA8 CA10 CA2 CA4 C0.1u10X0402

0.1uF*4

CA80 CA3 CA77 CA12 C0.1u10X0402 CA1 C10u6.3X50603-HF

Title	[B] USB3.0x2/USB2.0x1/LED KB	
Size: Custom	Document Number: MS-16GJ	Rev: 10
Date: Monday, August 03, 2015	Sheet 43 of 56	

+1_2VSUS_A



Title	+1_2VSUS_A/+1_2VRUN_A	
Size A	Document Number MS-16GJ	Rev 10
Date: Friday, July 31, 2015	Sheet 44 of 56	

16GCB board to board CONN1: HDMI,Audio, LED,LID

175B cardreader RESET 從USB31_RST分出!

Hall Switch

BTB STANDOFF

HDMI Level Shifter

HPD Level Shift 5V to 3V

(BLACK)
MIC Jack
N54-06F0481-A10

3 Level Input:
L: LOW, internal pull down
H: HIGH, external pull up
M: VDD33/2, both external pull-up and pull-down

Configuration pin, 3.3V IO, internal pull down at ~150k Ohm. 3.3V I/O.
L: HDMI ID disable
H: HDMI ID enable

Receiver equalization setting; Internal pull down at ~150k Ohm, 3.3V I/O.
L: programmable EQ for channel loss up to 12.4dB
H: programmable EQ for channel loss up to 4.3dB
M: programmable EQ for channel loss up to 8.6dB

TMDS output swing adjustment; Internal pull down at ~150k Ohm, 3.3V I/O.
L: default
H: increase +13%
M: reduce -13%

DC couping enable; Internal pull down at ~150k Ohm, 3.3V I/O.
L: default, AC coupling input
H: DC coupling input

Enable active DDC buffer; Internal pull down at ~150K Ohm, 3.3V I/O
L: default, passive DDC pass-through
H: active DDC buffer with default threshold
M: active DDC buffer without internal pull up resistor

Output pre-emphasis setting; Internal pull down at ~150k Ohm, 3.3V I/O.
L: no pre-emphasis
H: 1.6dB pre-emphasis
M: 2.5dB pre-emphasis

Mylar for EMI

ASM CFG = 60

MYLAR_B For EMI Audio connector 裝膠紙右貼圖 mylar
MYLAR_B2 For EMI Audio connector 裝膠紙倒及膠個
MYLAR_B3 For EMI USB & HDMI Connector 裝, 膠紙倒及 5*50mm

EMI PAD

SCREW HOLE

Power

QB27 VGS_ON : -1V~-2V

FRONT_JD=1.89V

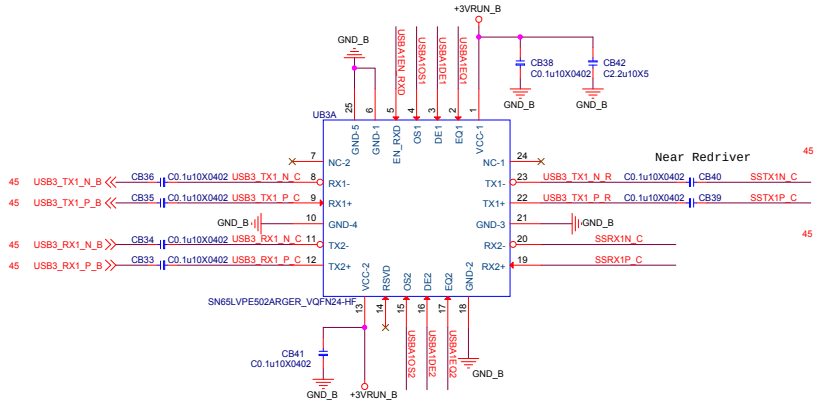
注意預防noise 串到DGND,
DGND再串到AGND----0402

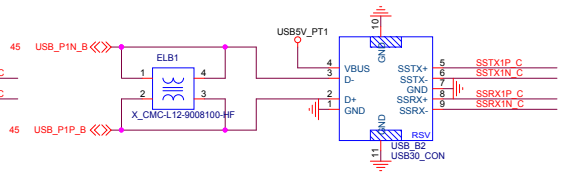
EMI Cap

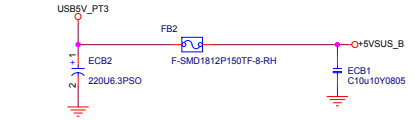
Title	[B] BTB CNT/Audio/HDMI
Size	Custom
Document Number	MS-16GJ
Rev	10
Date:	Tuesday, August 04, 2015
Sheet	45 of 56

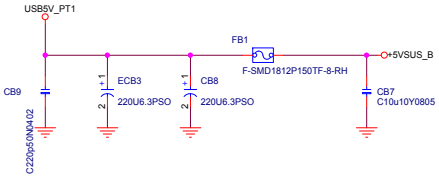
USB 3.0 CNT1

(USB3.0 Left Side - UP)

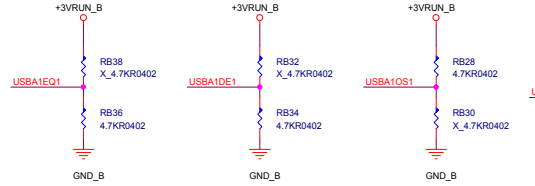


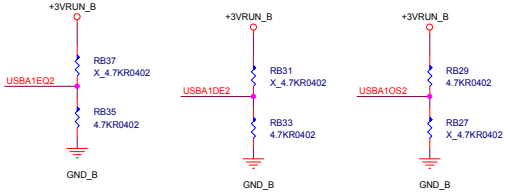






USB 2.0 CNT





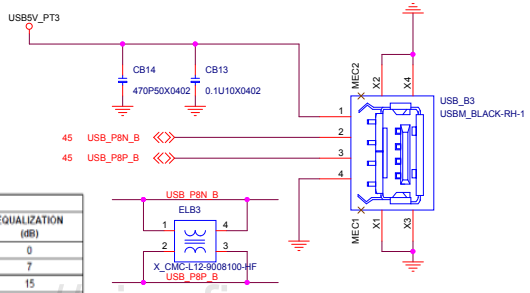


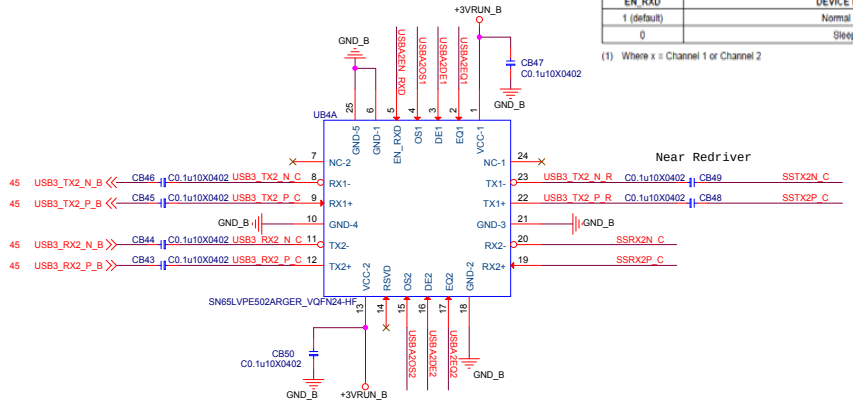
Table 2. Signal Control Pin Setting

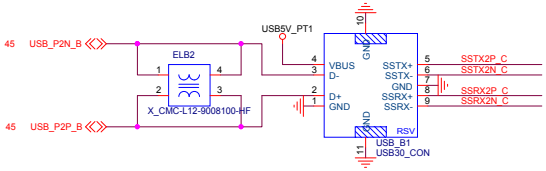
OUTPUT SWING AND EQ CONTROL (at 2.5 GHz)			
OSx(1)	TRANSISTION BIT AMPLITUDE (TYP mVpp)	EQx(1)	EQUALIZATION (dB)
NC (default)	1042	NC (default)	0
0	908	0	7
1	1127	1	15
OUTPUT DE CONTROL (at 2.5 GHz)			
DEx(1)	OSx(1) = NC	OSx(1) = 0	OSx(1) = 1
NC (default)	0 dB	0 dB	0 dB
0	−3.5 dB	−2.2 dB	−4.4 dB
1	−6.0 dB	−5.2 dB	−6.0 dB
CONTROL PINS SETTINGS			
EN_RXD	DEVICE FUNCTION		
1 (default)	Normal Operation		
0	Sleep Mode		

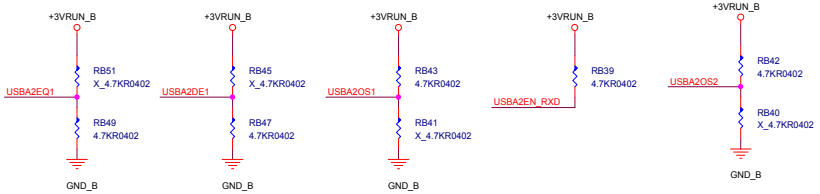
(1) Where x = Channel 1 or Channel 2

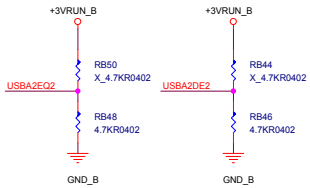
USB 3.0 CNT 2

(USB3.0 Left Side - Down)

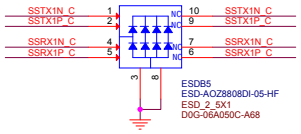


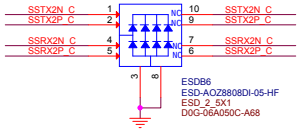


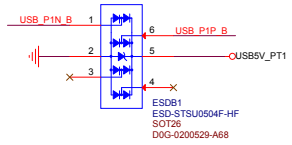


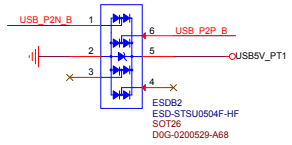


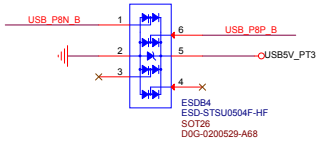
ESD







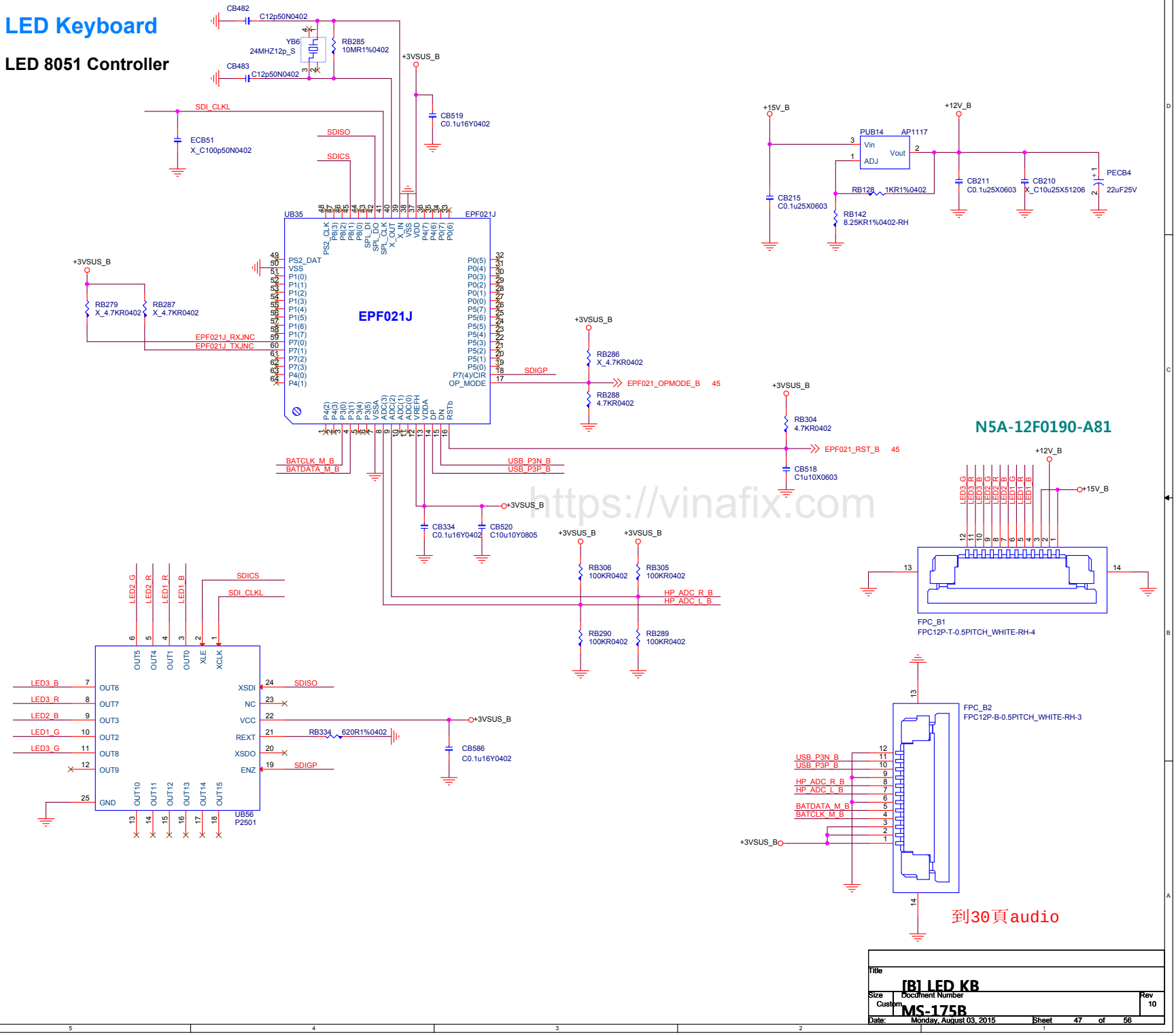




Title	[B] USB3.0x2/USB2.0x1		
Size C	Document Number MS-16GJ		Rev 10
Date: Wednesday, July 29, 2015	Sheet 46 of 56		

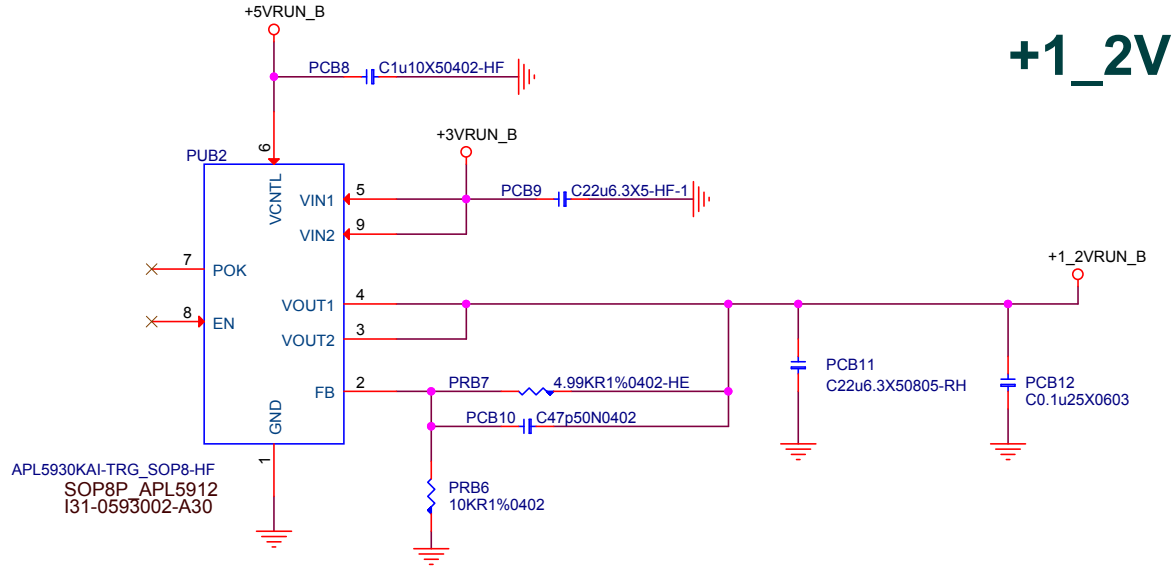
LED Keyboard

LED 8051 Controller



Title	[B] LED_KB	
Size: Custom	Document Number: MS-175B	Rev: 10
Date: Monday, August 03, 2015	Sheet 47 of 56	

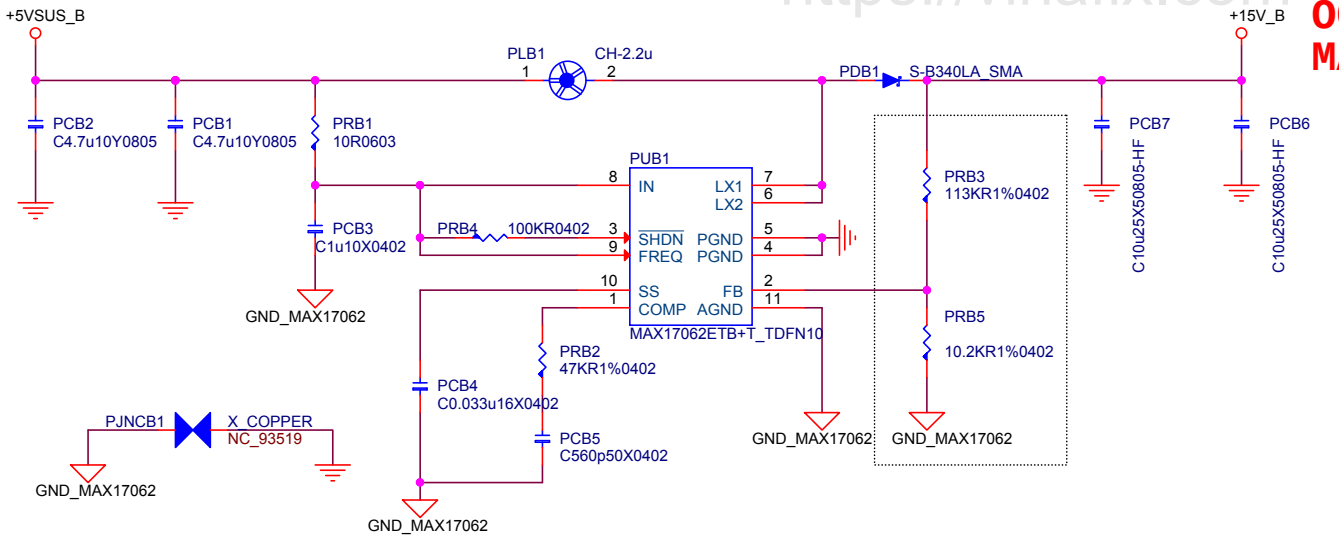
+1_2VRUN_B



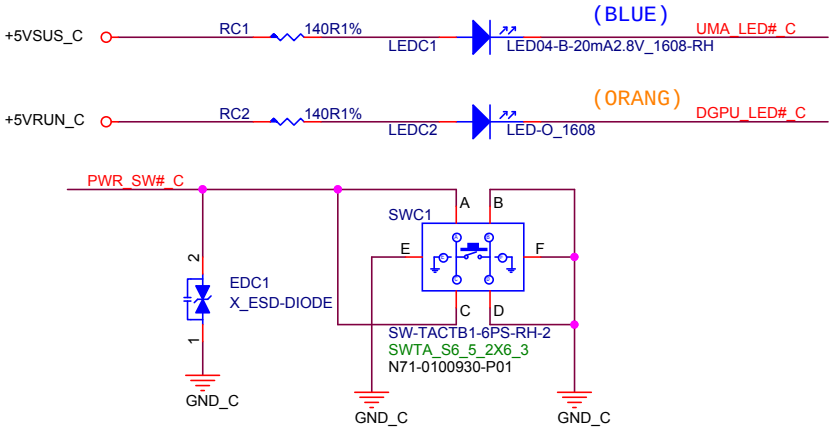
+15V

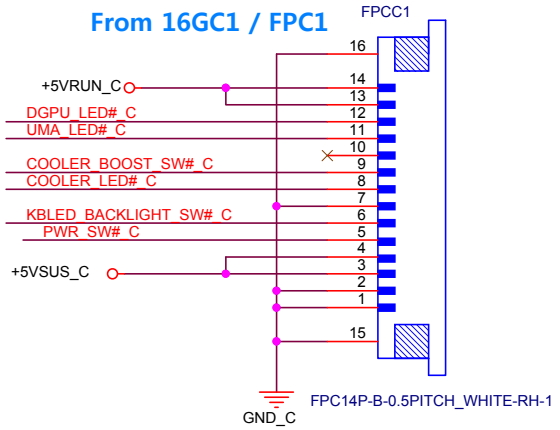
OCP 0.6A

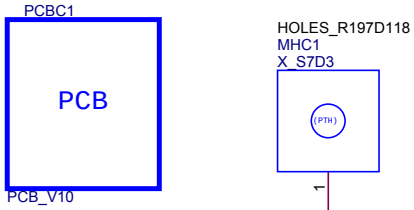
MAX 0.5A

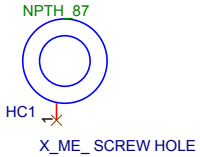


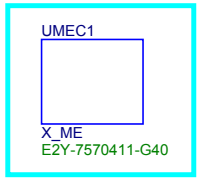
Title	[B]+1_2VRUN_B/_15V_B		
Size: Custom	Document Number: MS-16GJ		Rev: 10
Date: Monday, August 03, 2015	Sheet 48 of 56		

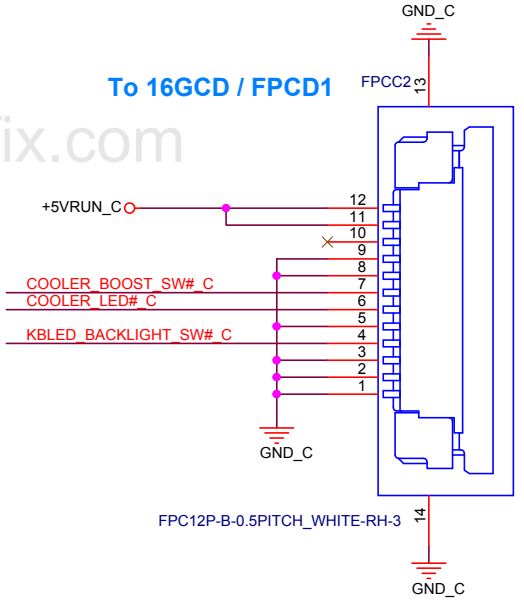




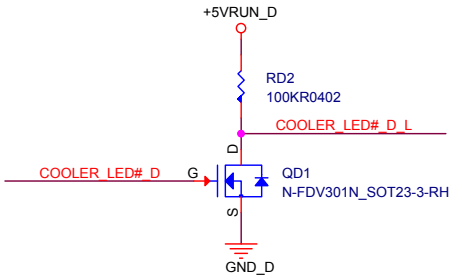


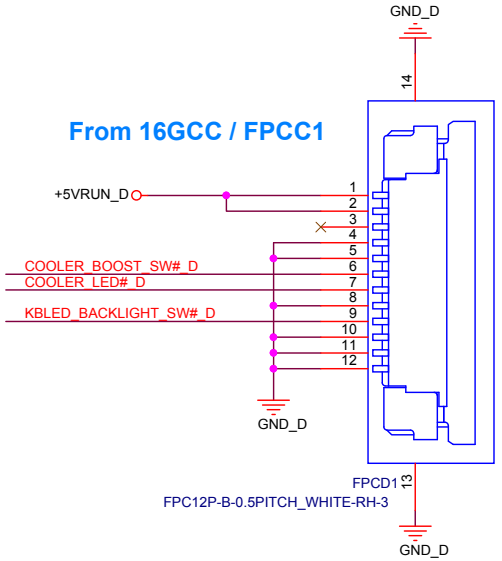


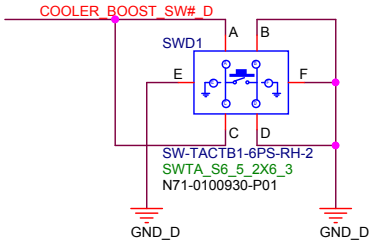


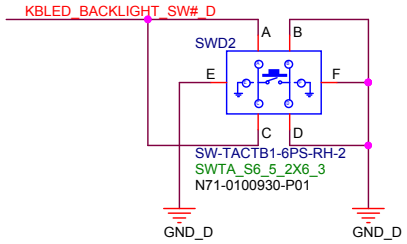


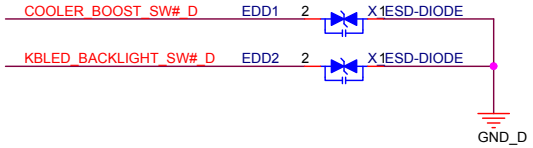
Title	[C] Power SW Board		
Size: Custom	Document Number: MS-16GJ		Rev: 10
Date: Tuesday, August 04, 2015	Sheet 49 of 56		

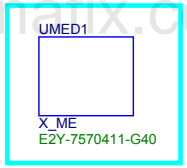


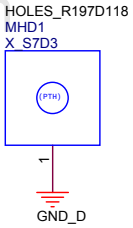


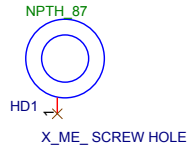




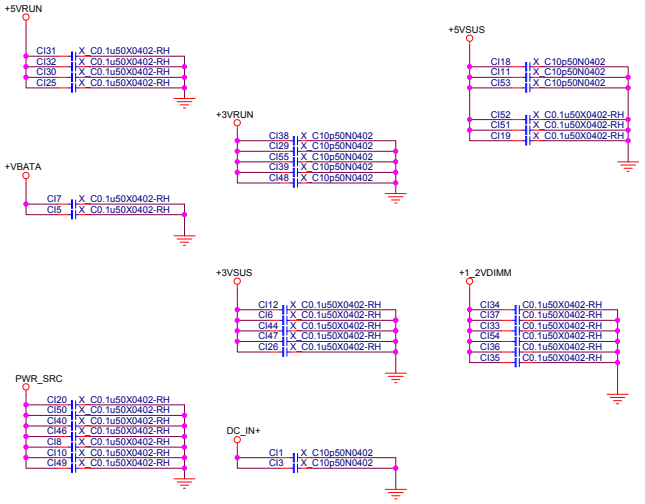




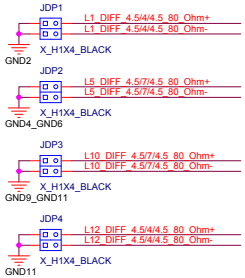




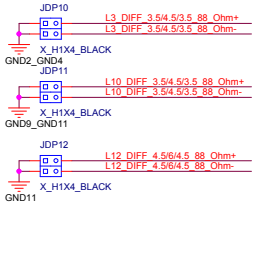
Title	[D] Launch Board		
Size: Custom	Document Number: MS-16GJ		Rev: 10
Date: Tuesday, August 04, 2015		Sheet 50 of 56	



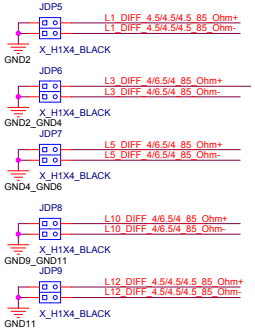
80 OHM



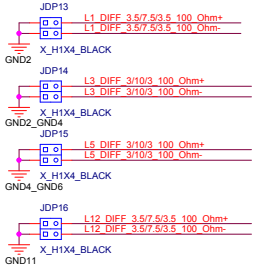
88 OHM



85 OHM

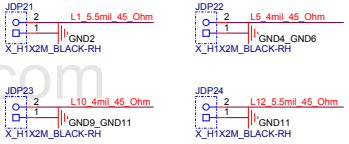


100 OHM

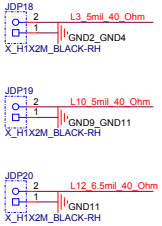


37.5 OHM

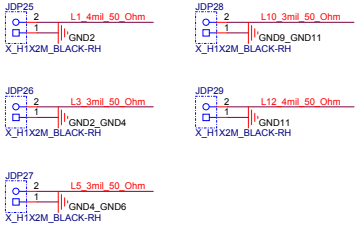
45 OHM



40 OHM



50 OHM



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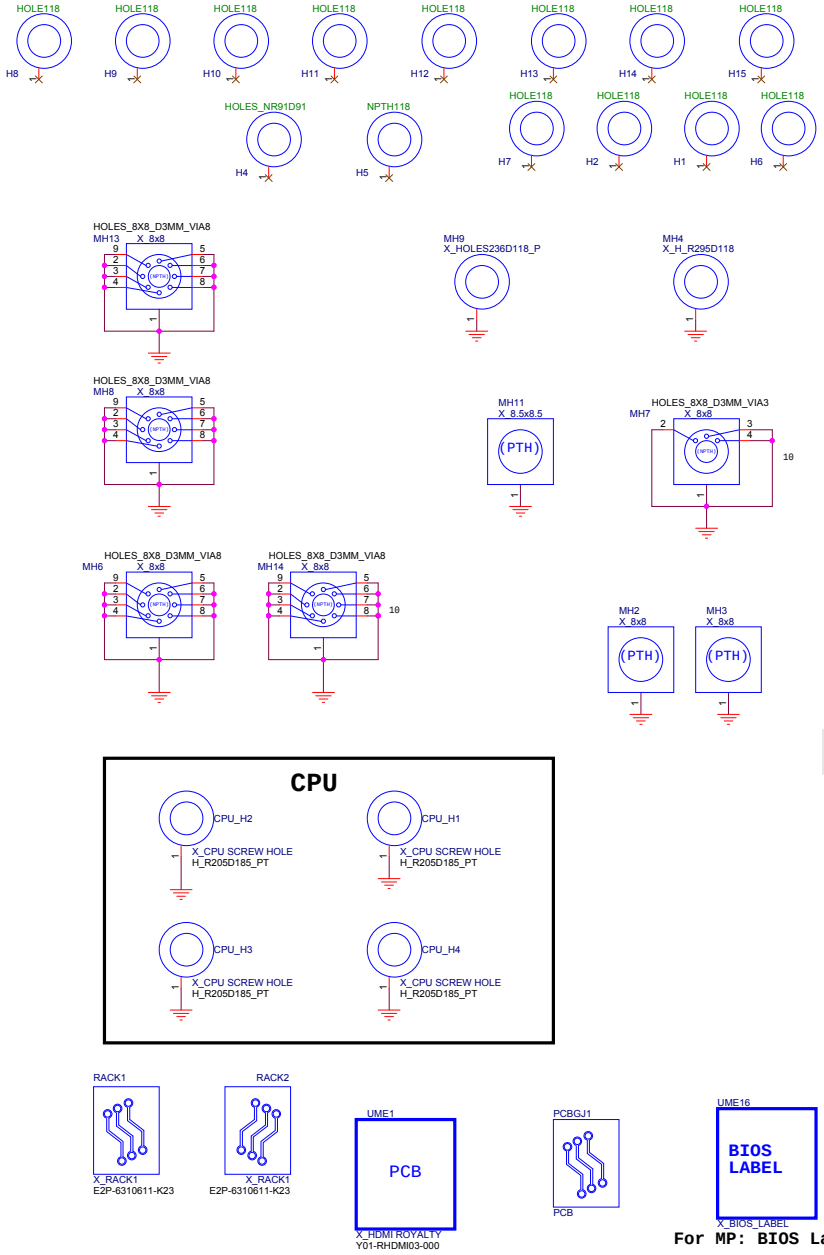
Title: EMI

Size | Document Number: MS-16GJ | Rev: 10

Date: Wednesday, July 29, 2015 | Sheet 51 of 56



5/14 updated michael

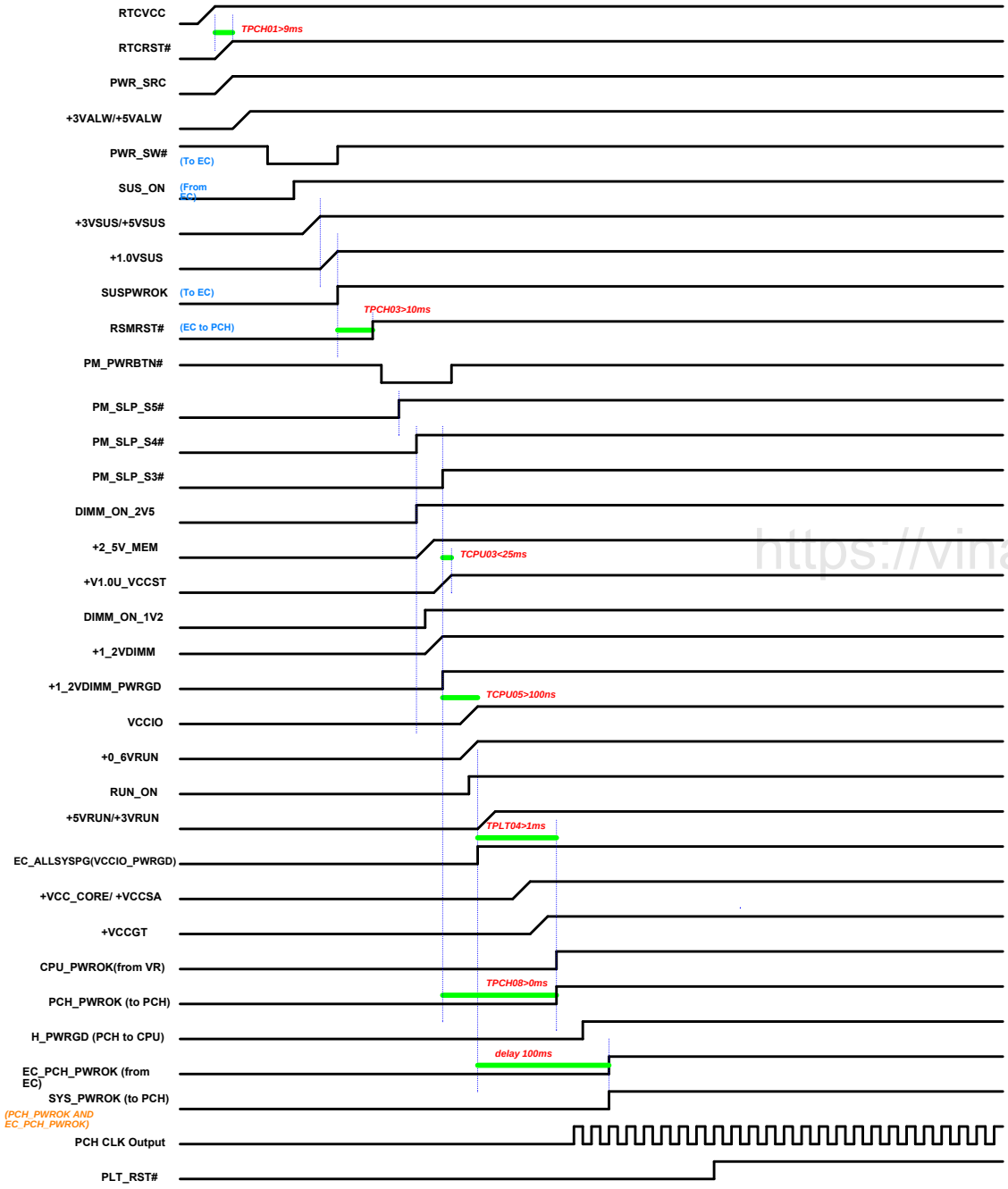
04/20
ADD SB Heatsink and Screw x2

For MP: BIOS Label

Title	Screw/ME	
Size: Custom	Document Number: MS-16GJ	Rev: 10
Date: Tuesday, August 04, 2015	Sheet 52 of 56	

Power on Sequence

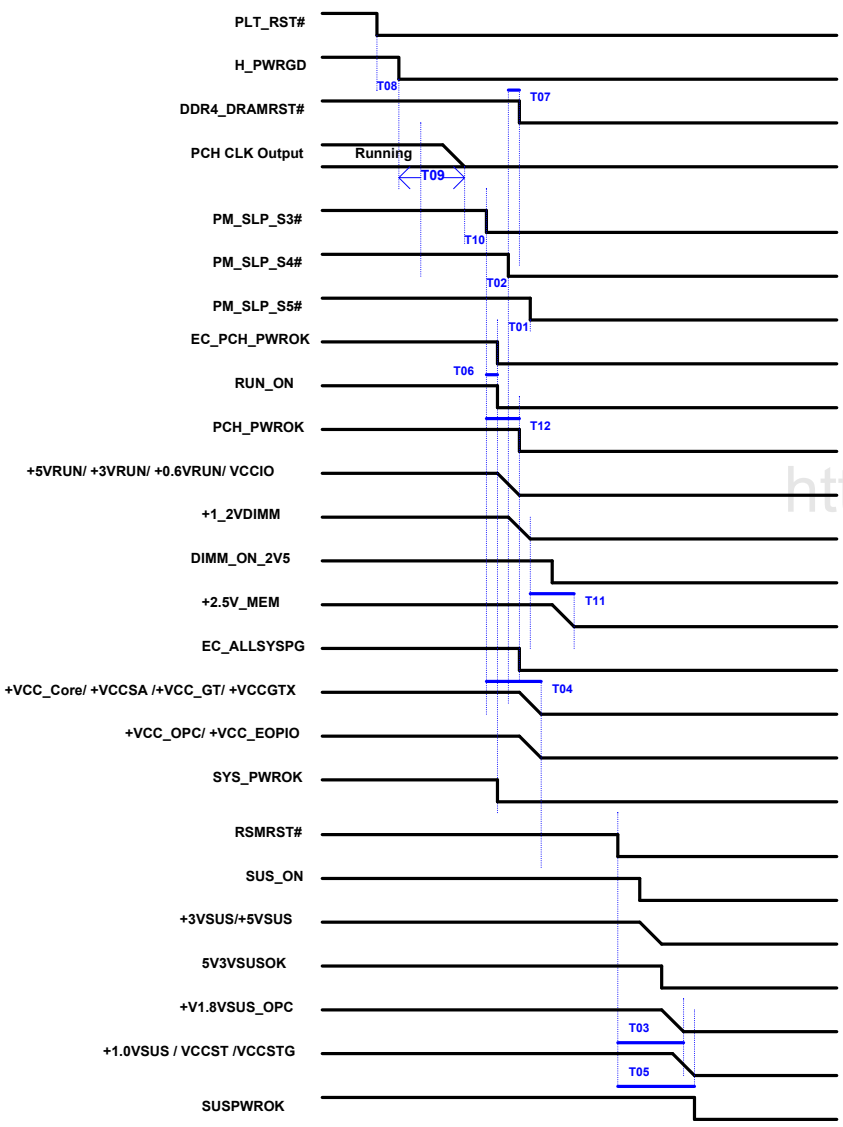
G3 -> S0



MICRO-STAR INT'L CO.,LTD.		
Title: Power on Sequence		
Size	Document Number: MS-16GJ	Rev: 10
Date: Wednesday, July 29, 2015	Sheet 53 of 56	

Power down Sequence

S0 -> G3



	MIN	MAX	Units	Description
T01	30		us	SLP_S5# assertion to SLP_S4#
T02	30		us	SLP_S4# assertion to SLP_S3#
T03	1		us	RSMRST# asserting to VccPRIM dropping 5% of nominal value
T04		500	ms	SLP_S3# assertion to VCC, VCCGT, VCCIO and VCCSA rails completely off.
T05	1		us	RSMRST# asserting to VccPRIM dropping 5% of nominal value
T06		1	us	SLP_S3# assertion to VCCIO VR disabled
T07	-100		ns	DDR_RESET# assertion to SLP_S4# assertion
T08	30		us	PLTRST# assertion to PROCPWRGD deassertion
T09	10		us	PROCPWRGD de-assertion to CLKOUT_BCLK turning OFF.
T10	1		us	CLKOUT_BCLK turning OFF to SLP_S3# assertion
T11	30		ms	VDDQ ramped down to VPP ramp down
T12	0		ms	SLP_S3# assertion to PCH_PWROK deassertion

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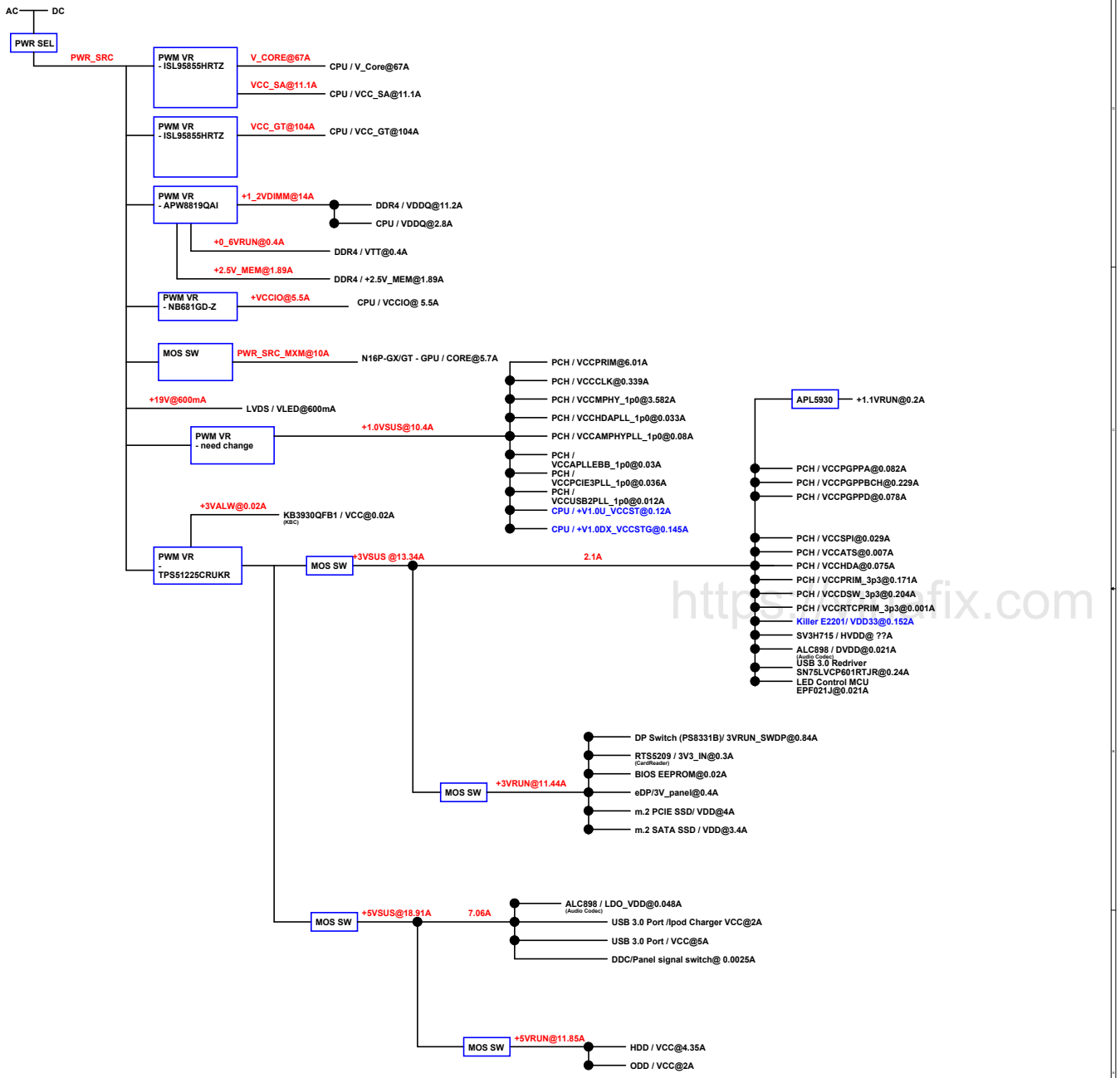
Title: Power down Sequence

Size | Document Number: MS-16GJ | Rev: 10

Date: Wednesday, July 29, 2015 | Sheet 54 of 56

MS-1782 Power Delivery Chart



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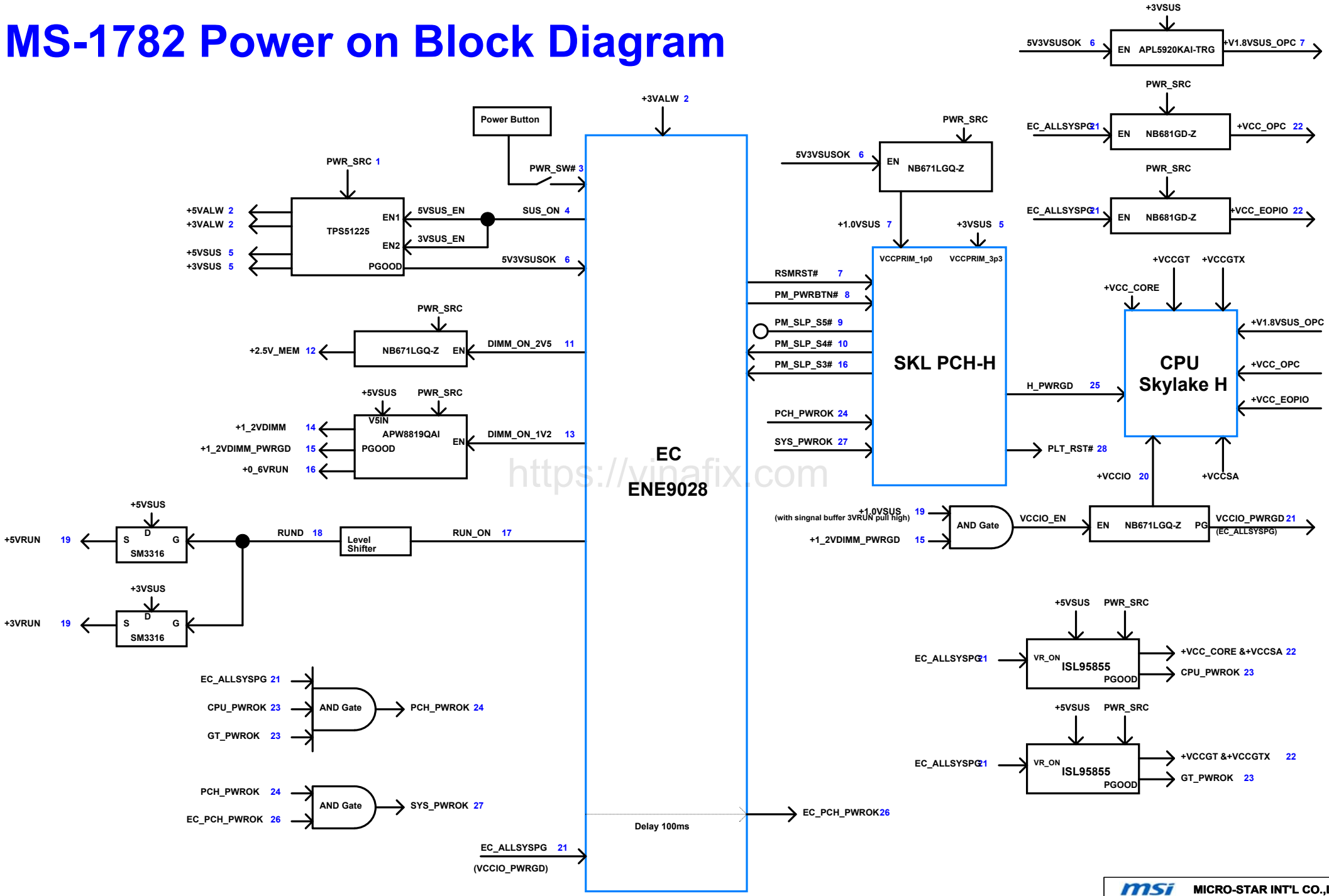
Power Delivery Map

MS-16GJ

10

MS-1782 Power on Block Diagram



msi MICRO-STAR INT'L CO.,LTD.		
Title: Power on Block Diagram		
Size	Document Number: MS-16GJ	Rev: 10
Date: Wednesday, July 29, 2015	Sheet 56 of 56	