MS-16P3 Ver: 0A Intel Kabylake Platform

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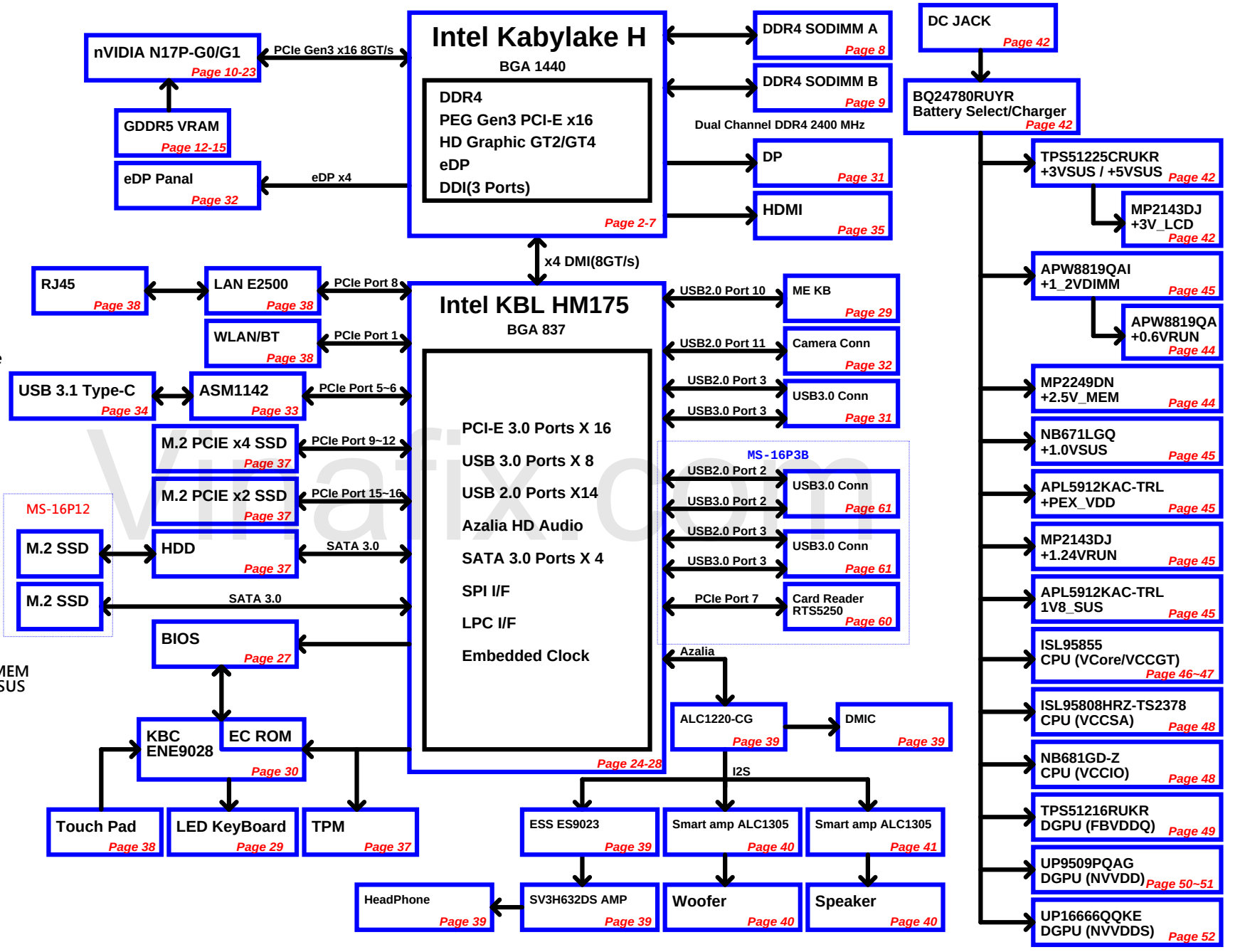

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Title: Block Diagram

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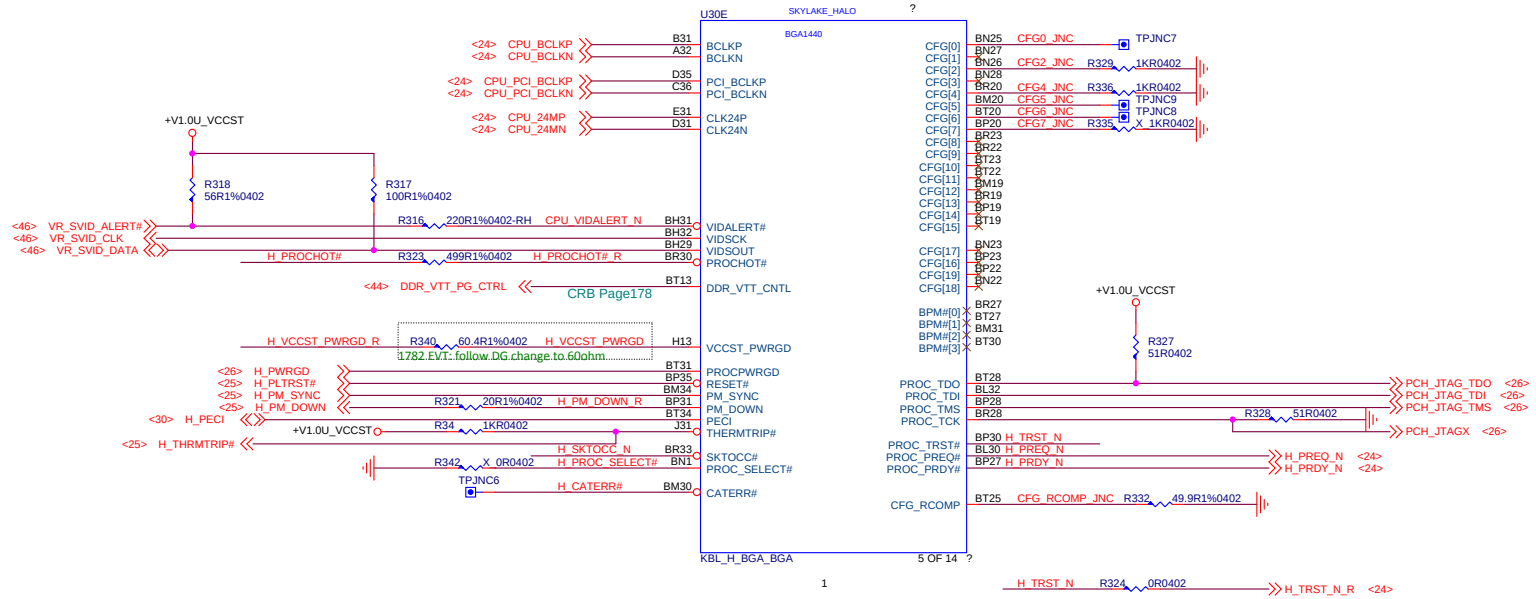
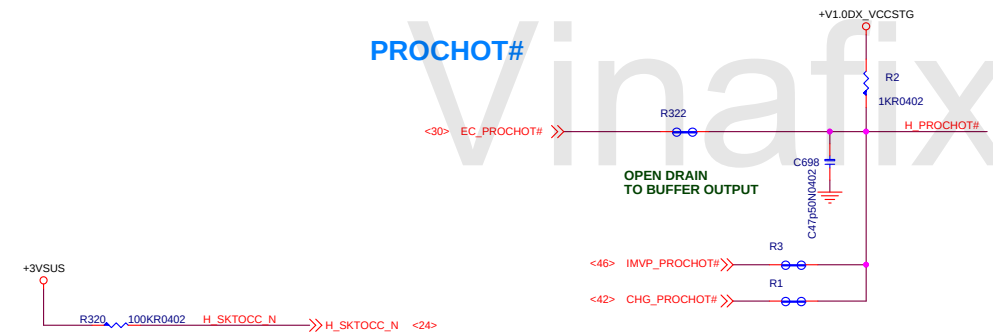
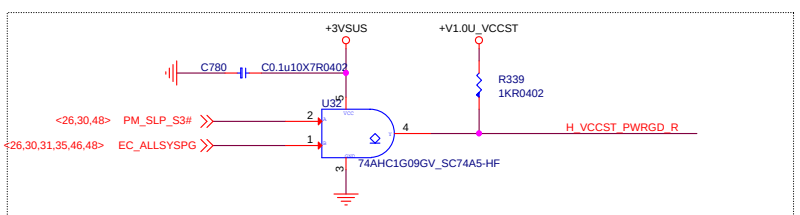


PROCHOT#





Modify U83 74AHC1G09GV and connect PM_SLP_S3# control . page 2. 5/22

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

PCIE Express * Static X16 Lane Numbering Reversal	
CFG2	CFG[2]: PCI Express* Static x16 Lane Numbering Reversal. 1 = Normal operation 0 = Lane numbers reversed.

PCI Express* Bifurcation	
CFG[6:5]	00 = 1 x8, 2 x4 PCI Express* 01 = reserved 10 = 2 x8 PCI Express* 11 = 1 x16 PCI Express*

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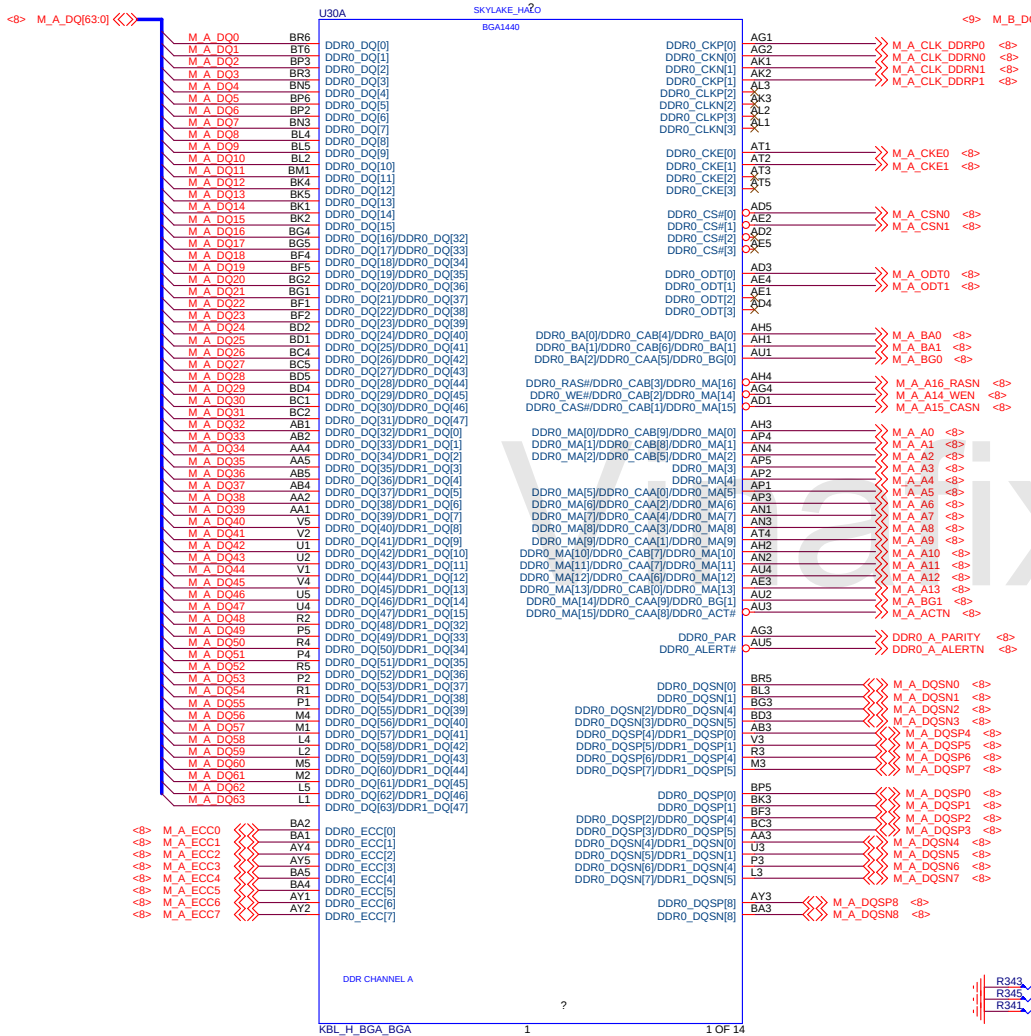
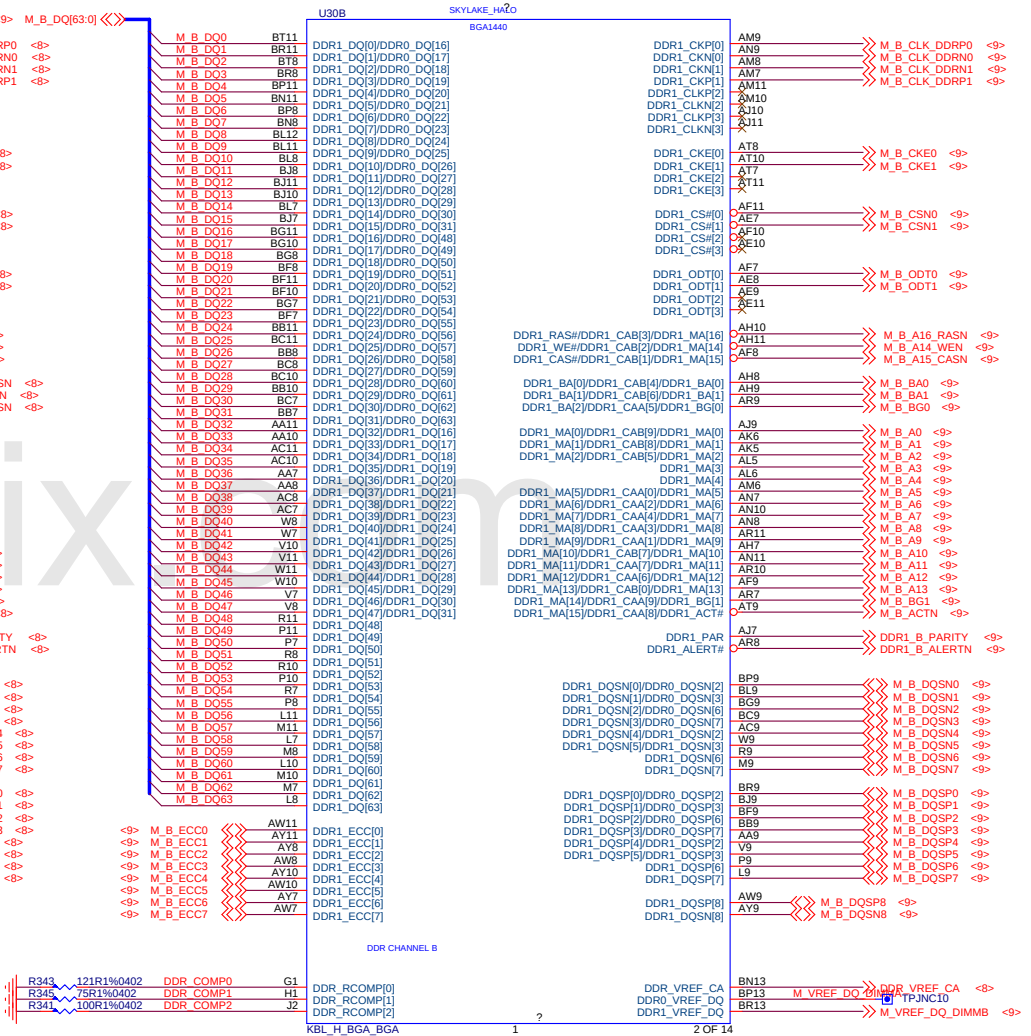
DDR Channel A



DDR Channel B



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Title: Kabylake(DDR4)			
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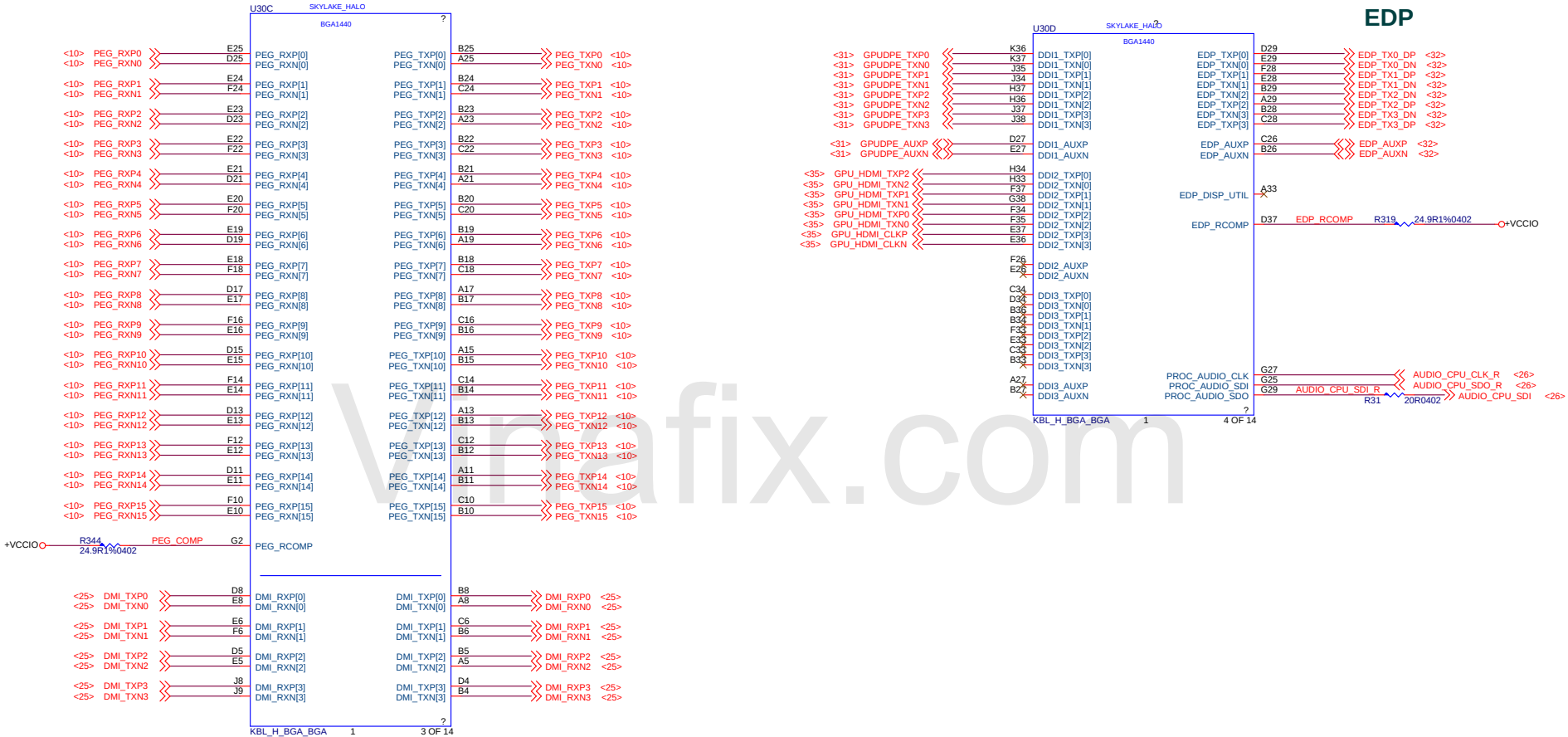

MSI	MICRO-STAR INT'L CO.,LTD.	
Title	Kabylake(DMI/DISPLAY)	
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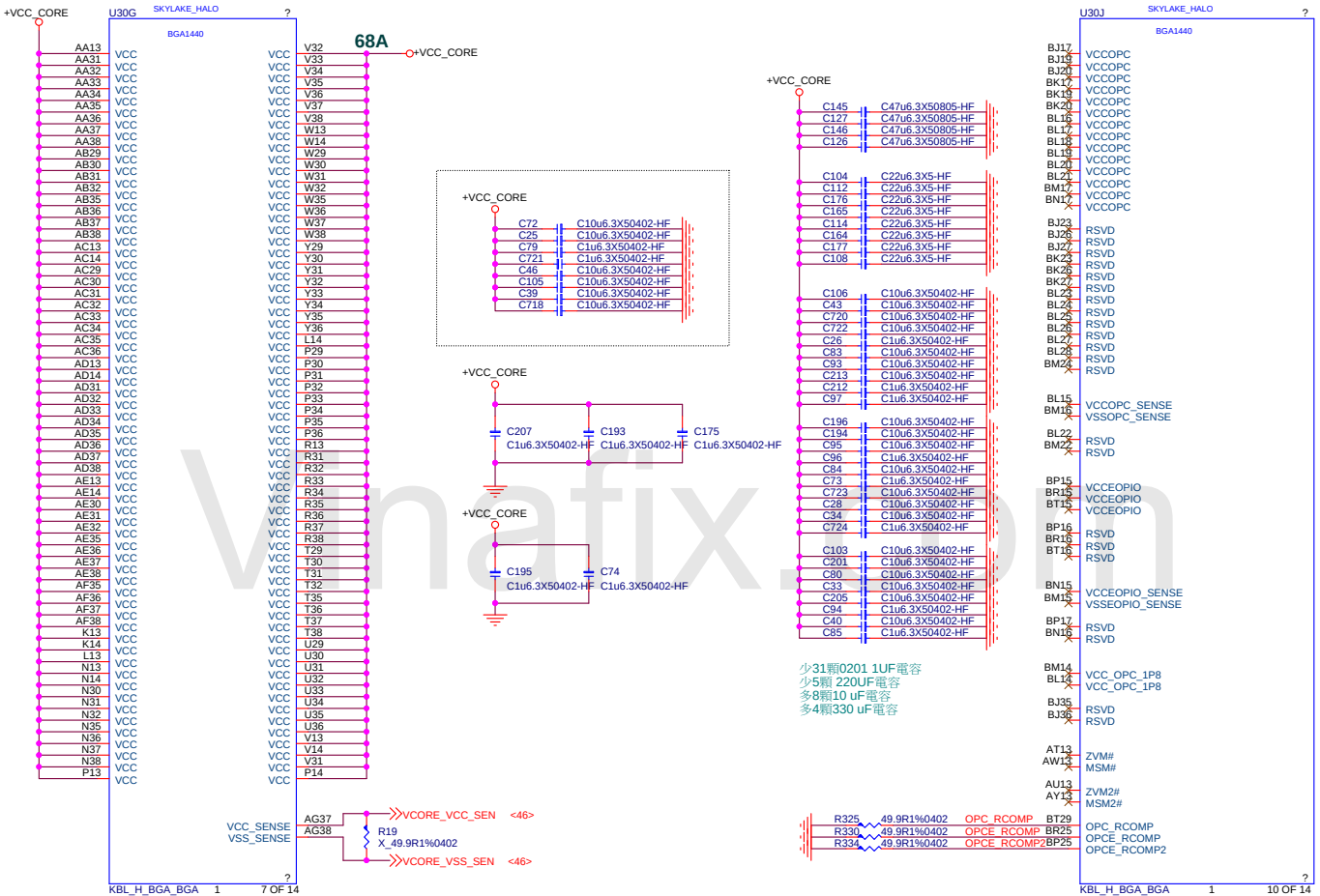

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Title: Kabylake(Power)

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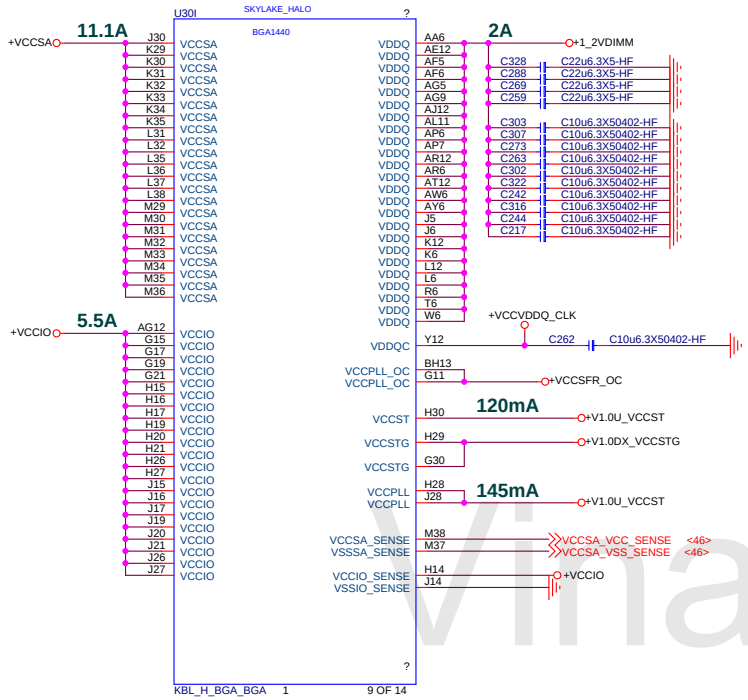
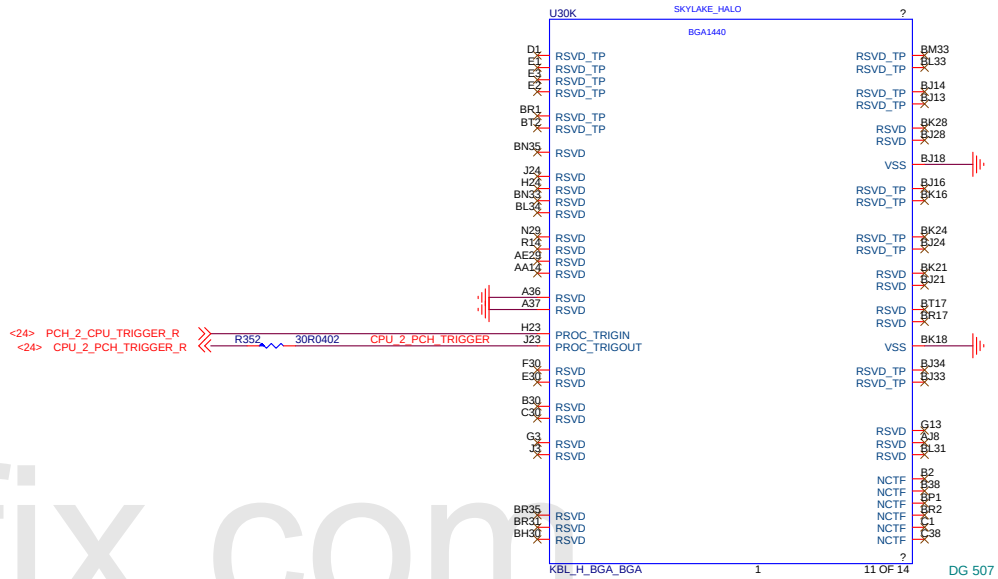
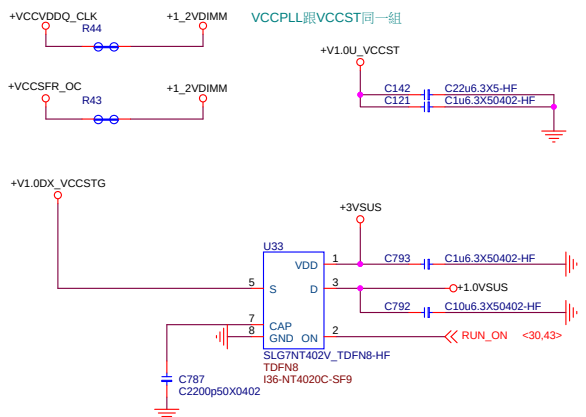
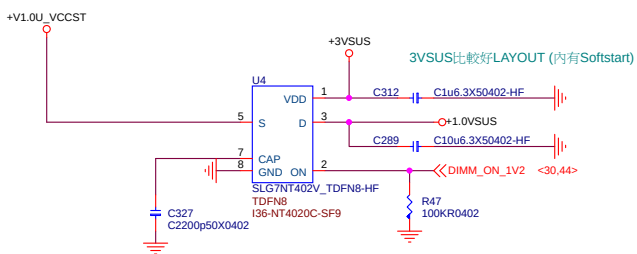
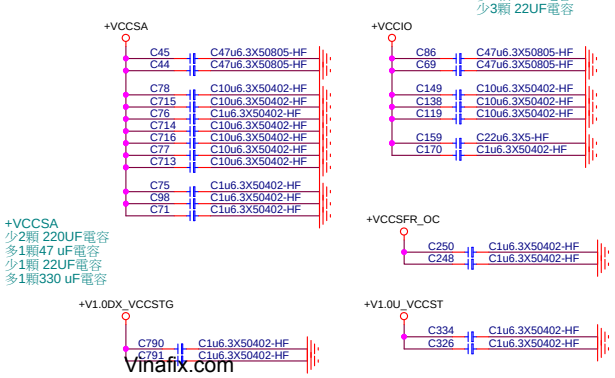


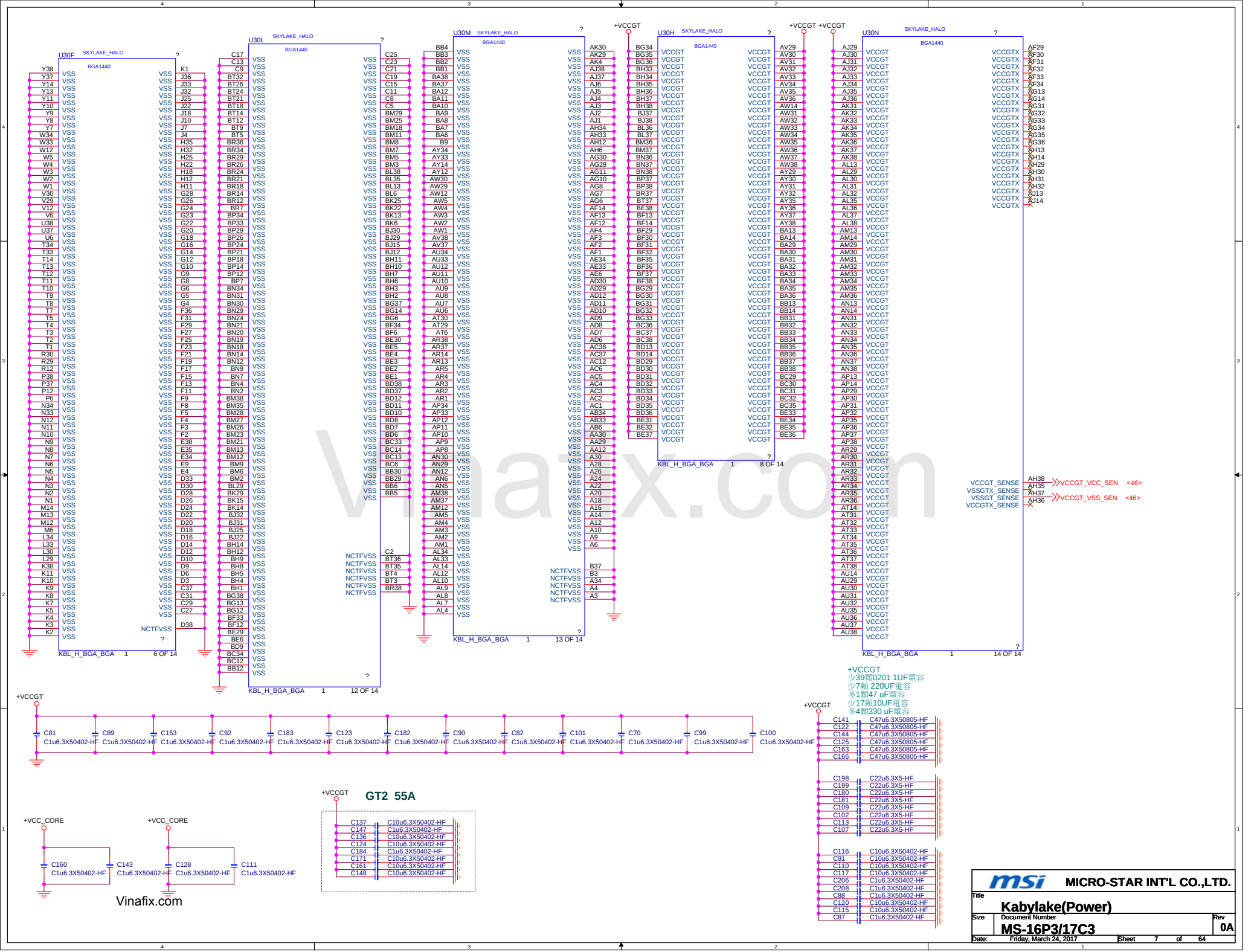








msi	MICRO-STAR INT'L CO.,LTD.	
Title	Kabylake(Power)	
Size	Document Number MS-16P3/17C3	Rev 0A
Date: Wednesday, March 29, 2017	Sheet 6 of 64	



Title	Kabylake(Power)
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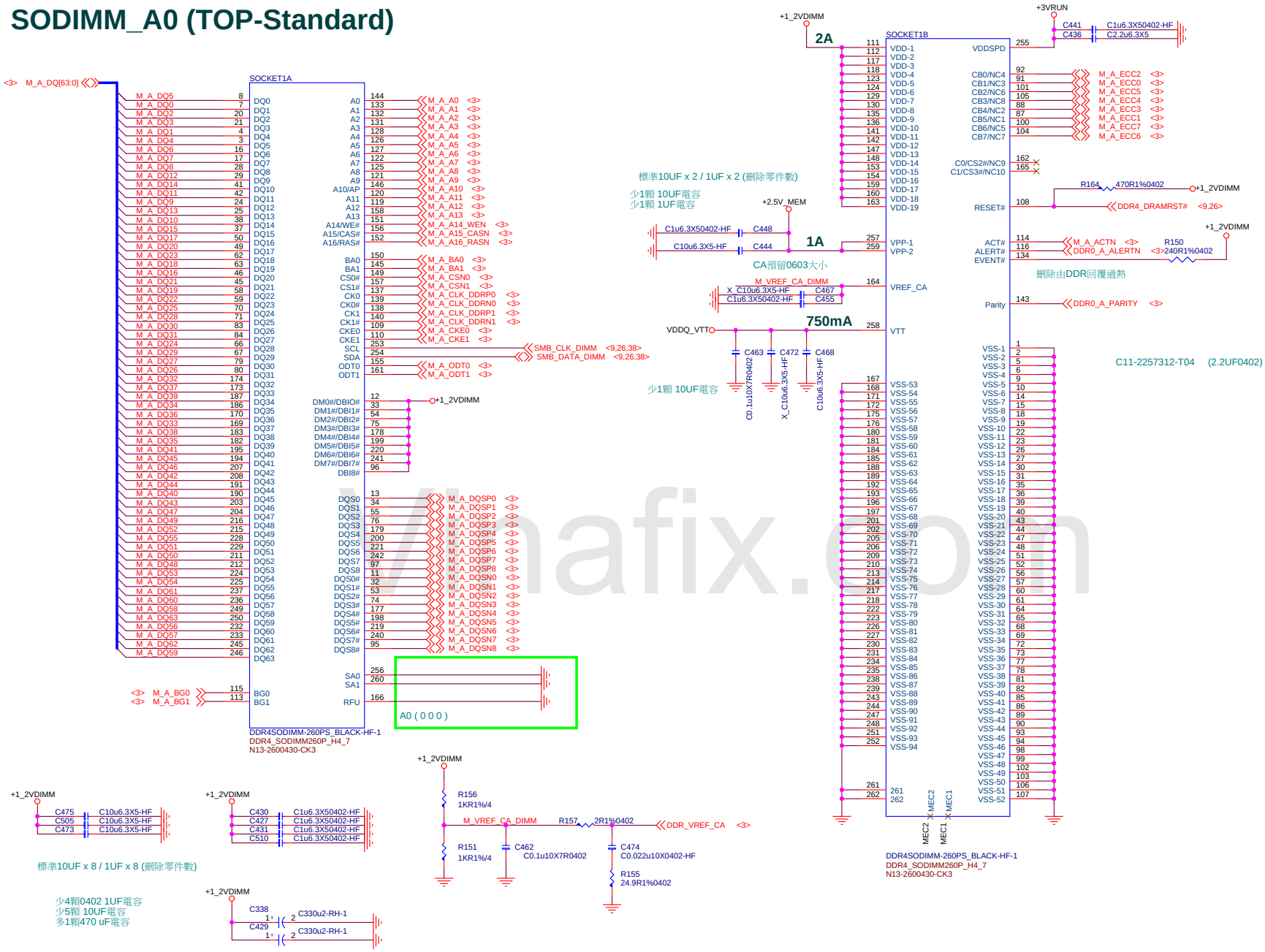
SODIMM_A0 (TOP-Standard)



MSI	MICRO-STAR INT'L CO.,LTD.	
Title	DDR4 SODIMM A0	
Size	Document Number MS-16P3/17C3	Rev 0A
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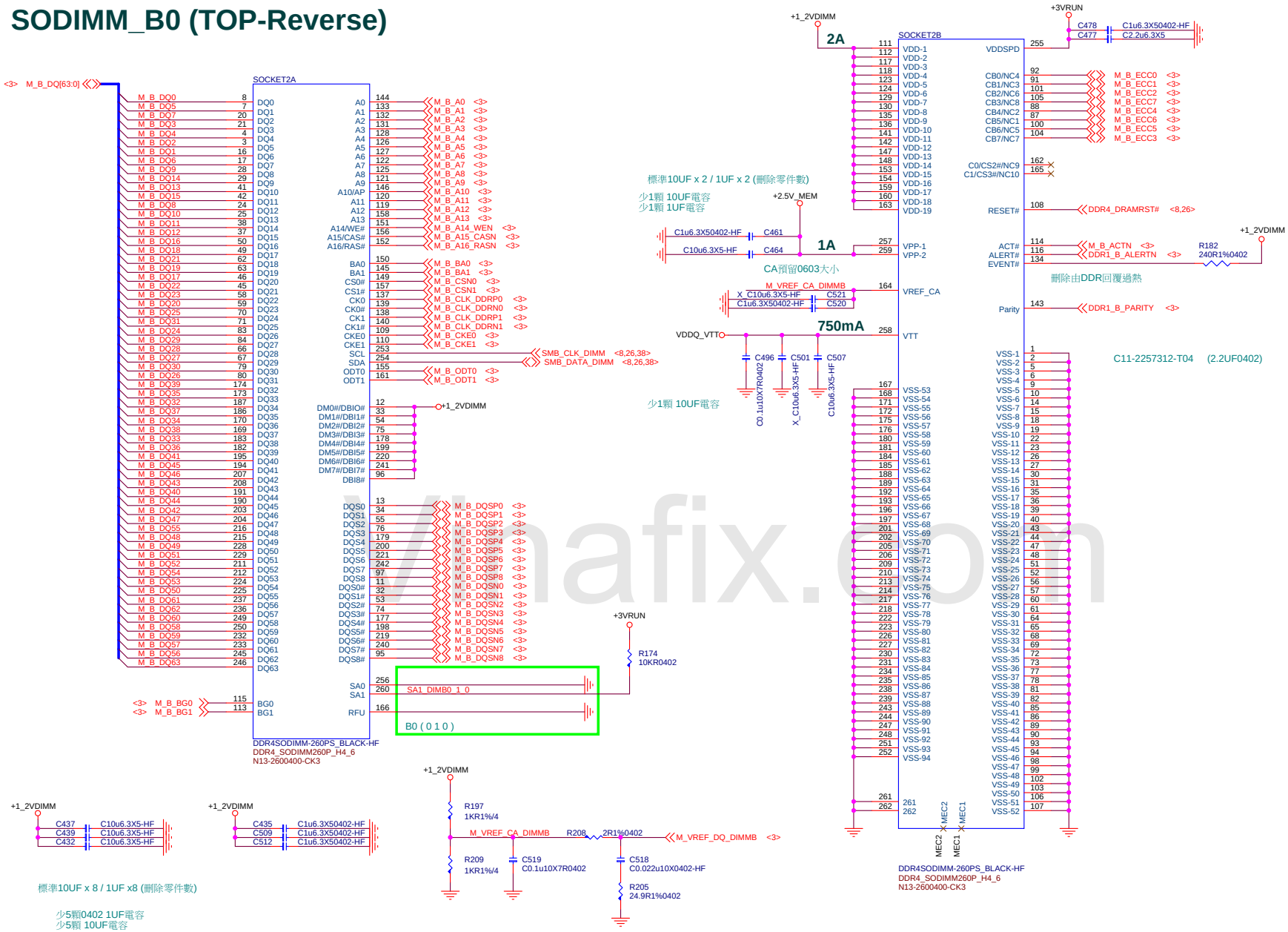
SODIMM_B0 (TOP-Reverse)



msi	MICRO-STAR INT'L CO.,LTD.		
Title	DDR4 SODIMM B0		
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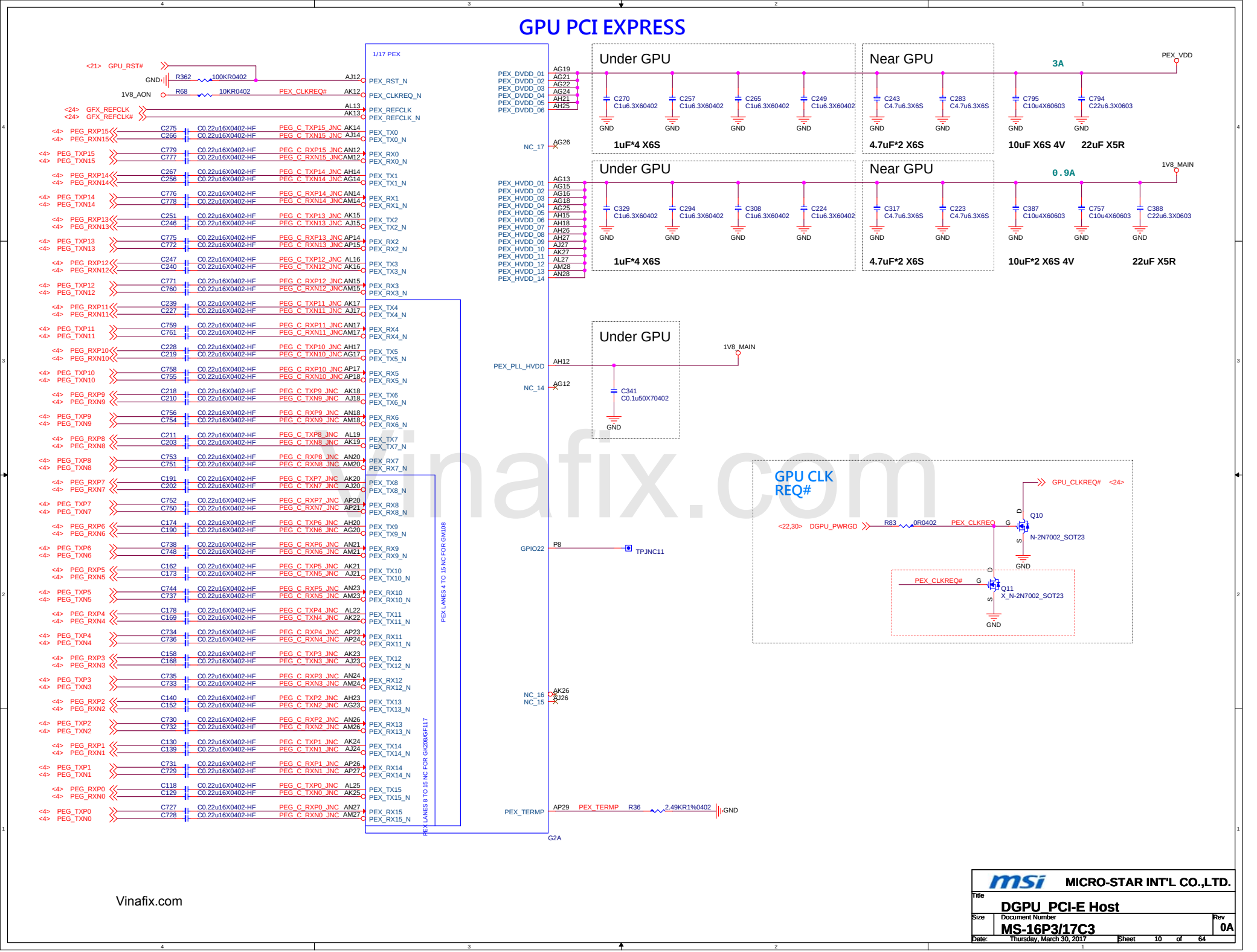
GPU PCI EXPRESS



MICRO-STAR INT'L CO.,LTD.			
Title: DGPU_PCI-E Host			
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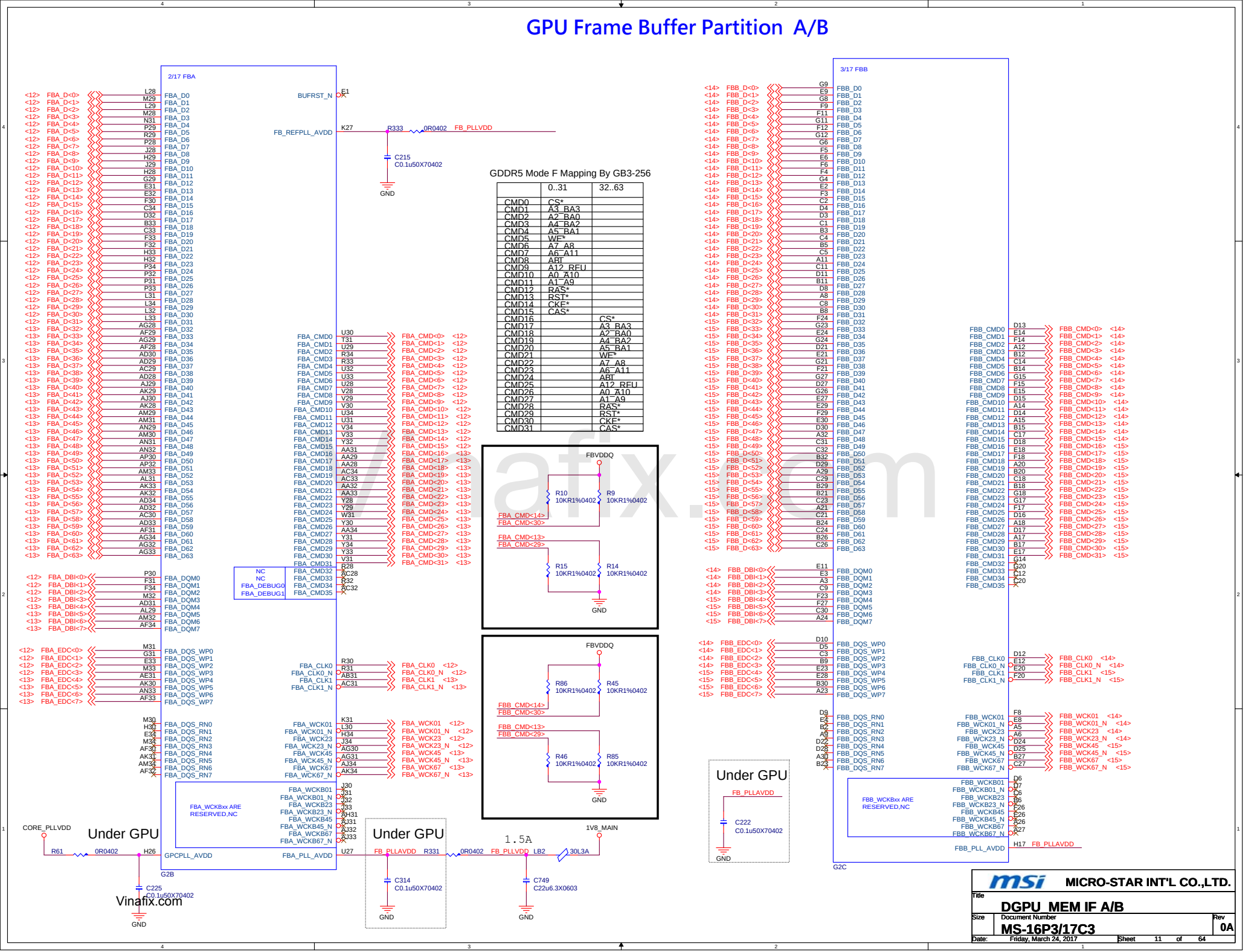
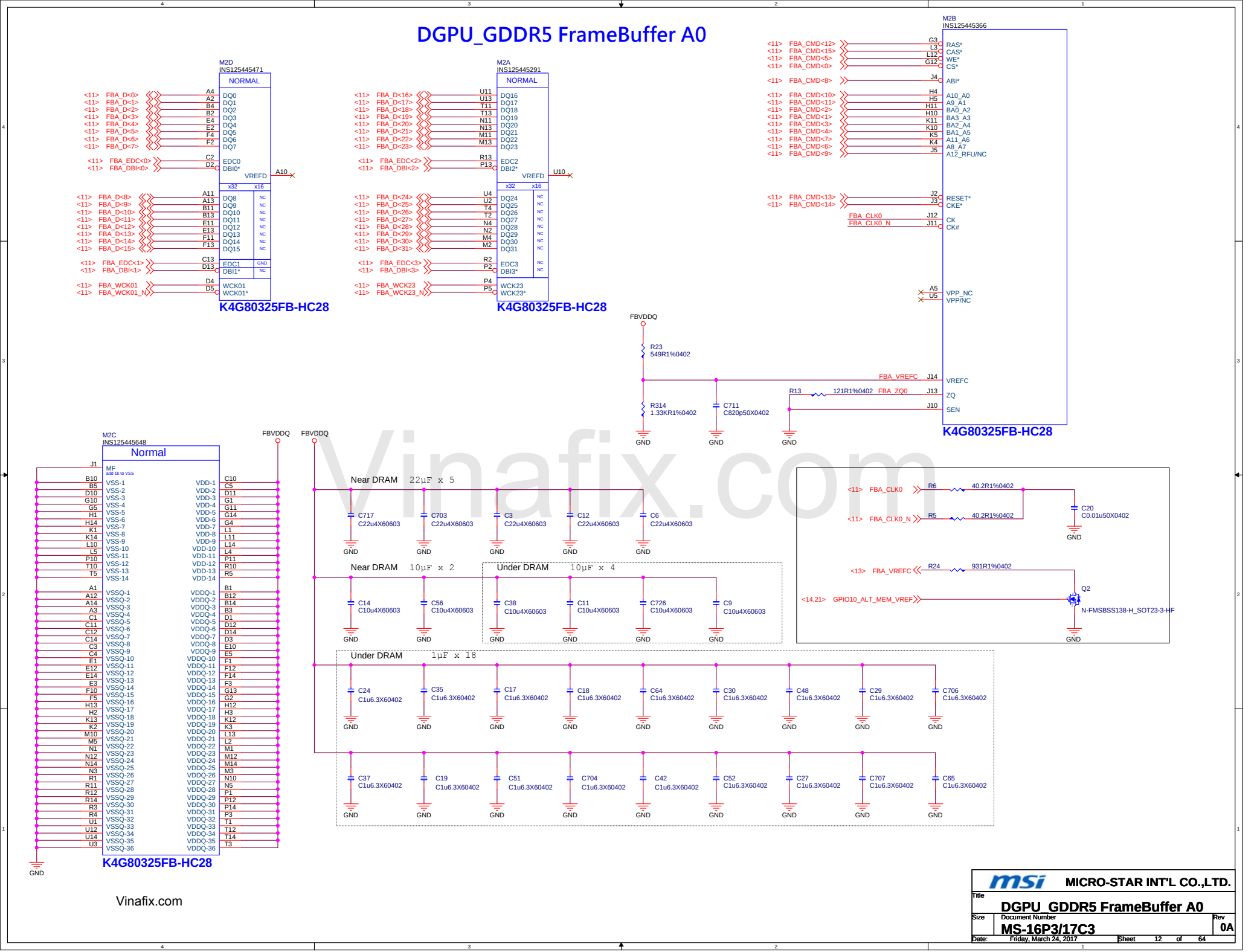
GPU Frame Buffer Partition A/B



DGPU_GDDR5 FrameBuffer A0



MICRO-STAR INT'L CO.,LTD.	
Title	DGPU_GDDR5 FrameBuffer A0
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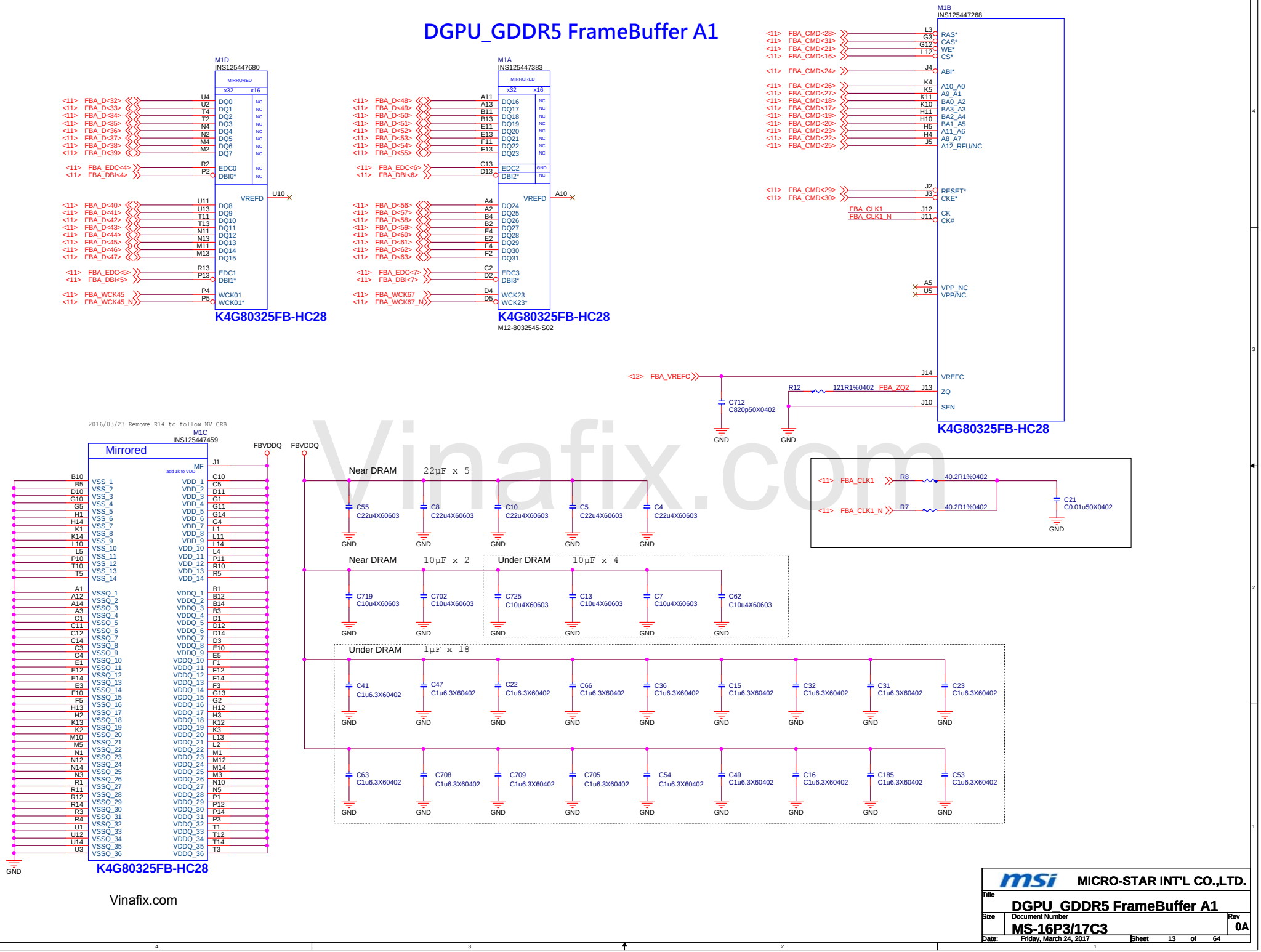
DGPU_GDDR5 FrameBuffer A1



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MICRO-STAR INT'L CO.,LTD.		
Title: DGPU_GDDR5 FrameBuffer A1		
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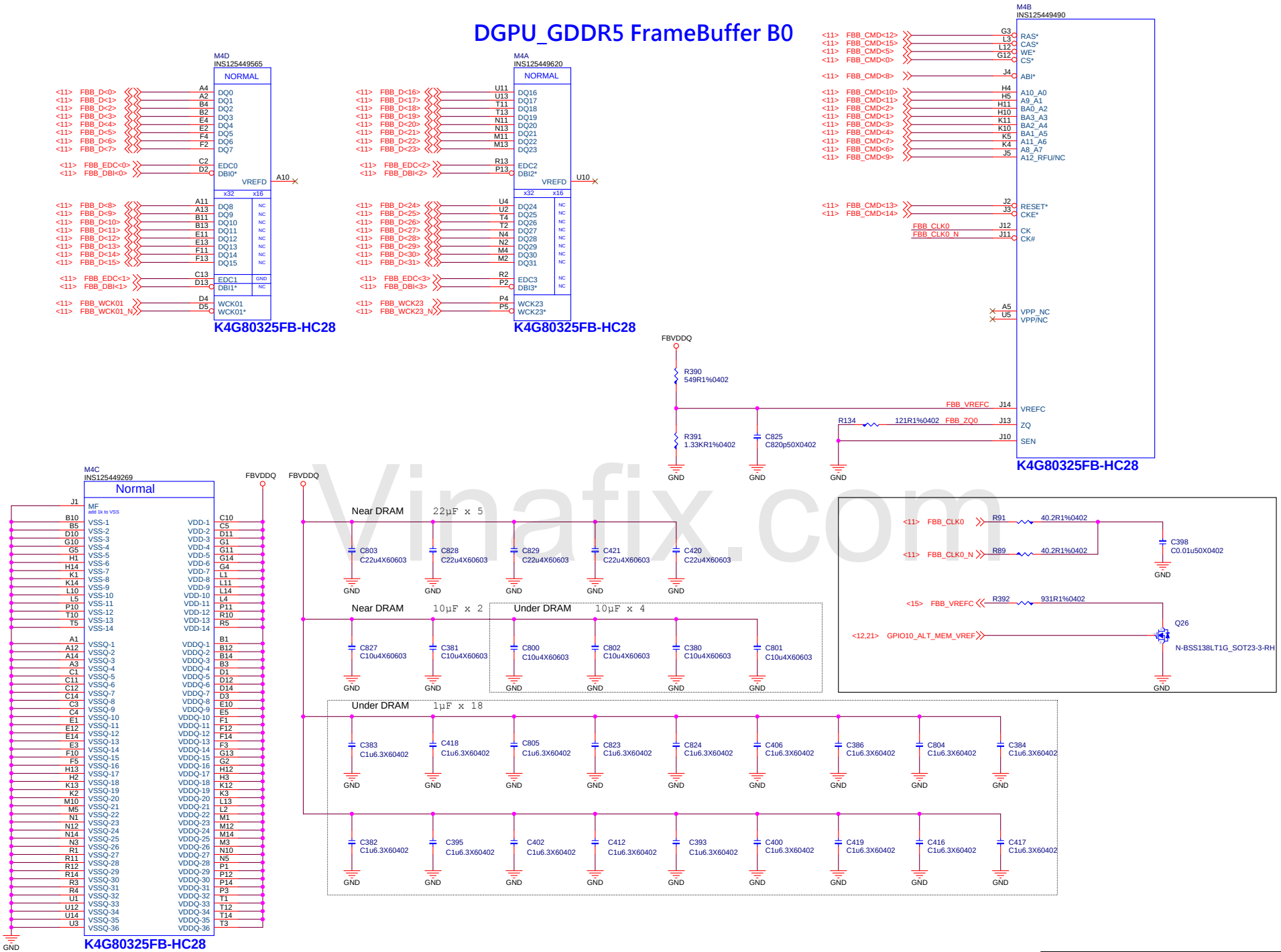
DGPU_GDDR5 FrameBuffer B0



Company	MICRO-STAR INT'L CO.,LTD.
Title	DGPU_GDDR5 FrameBuffer B0
Size	
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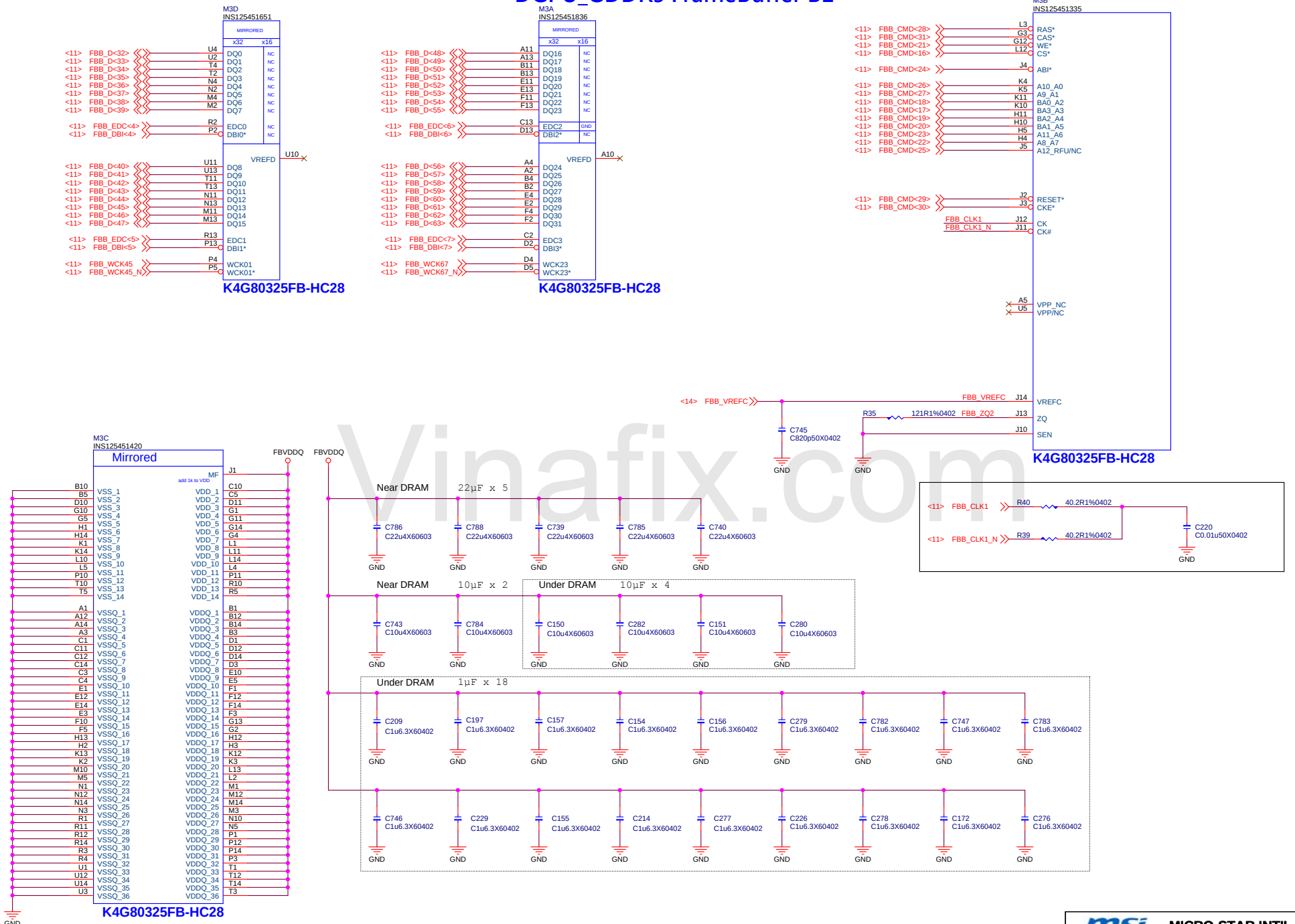
DGPU_GDDR5 FrameBuffer B1



MICRO-STAR INT'L CO.,LTD.			
Title: DGPU_GDDR5 FrameBuffer B1			
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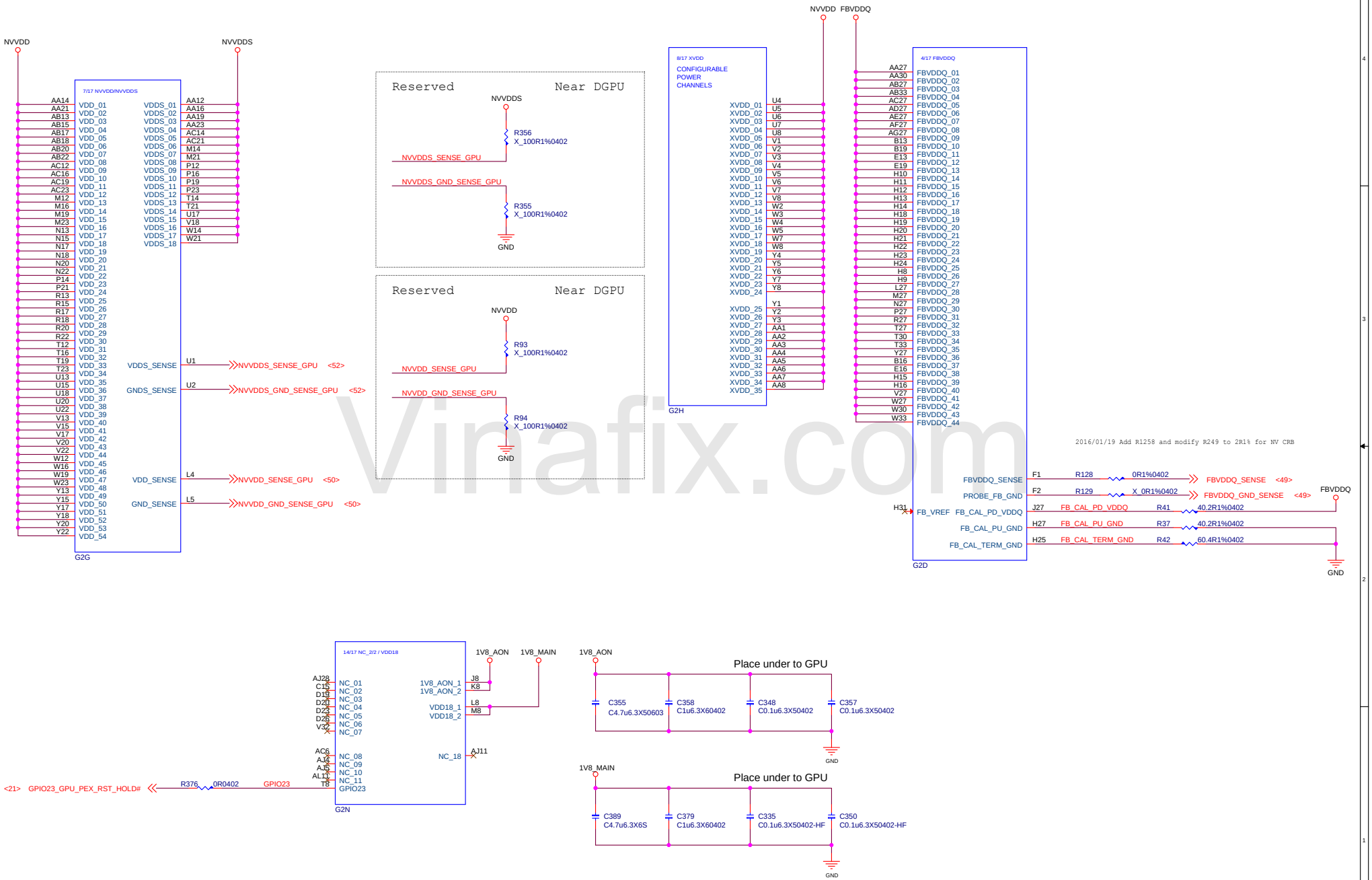
GPU NVVDD, FBVDDQ



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Title: DGPU_POWER

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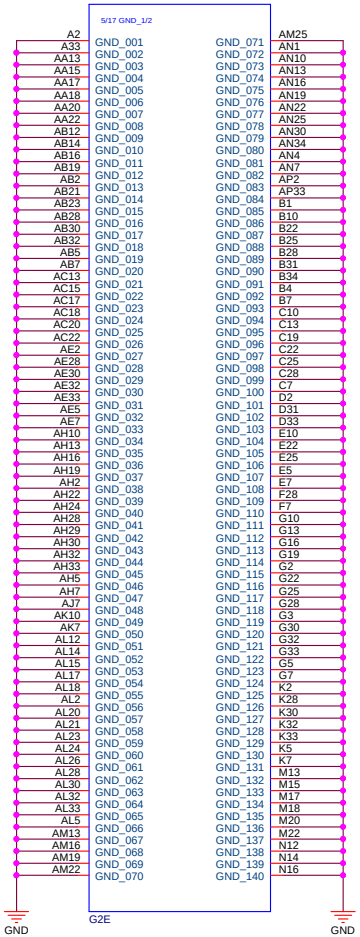
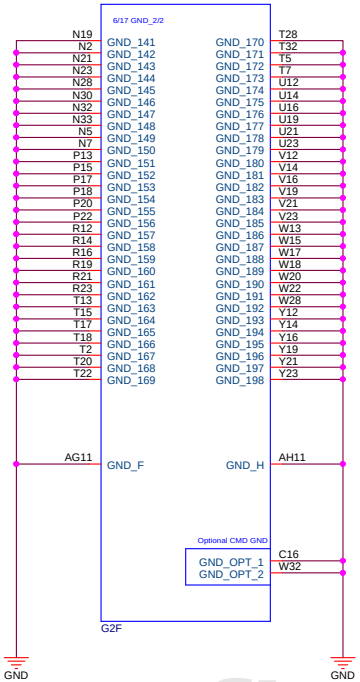
DGPU GND





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Title	DGPU_GND	
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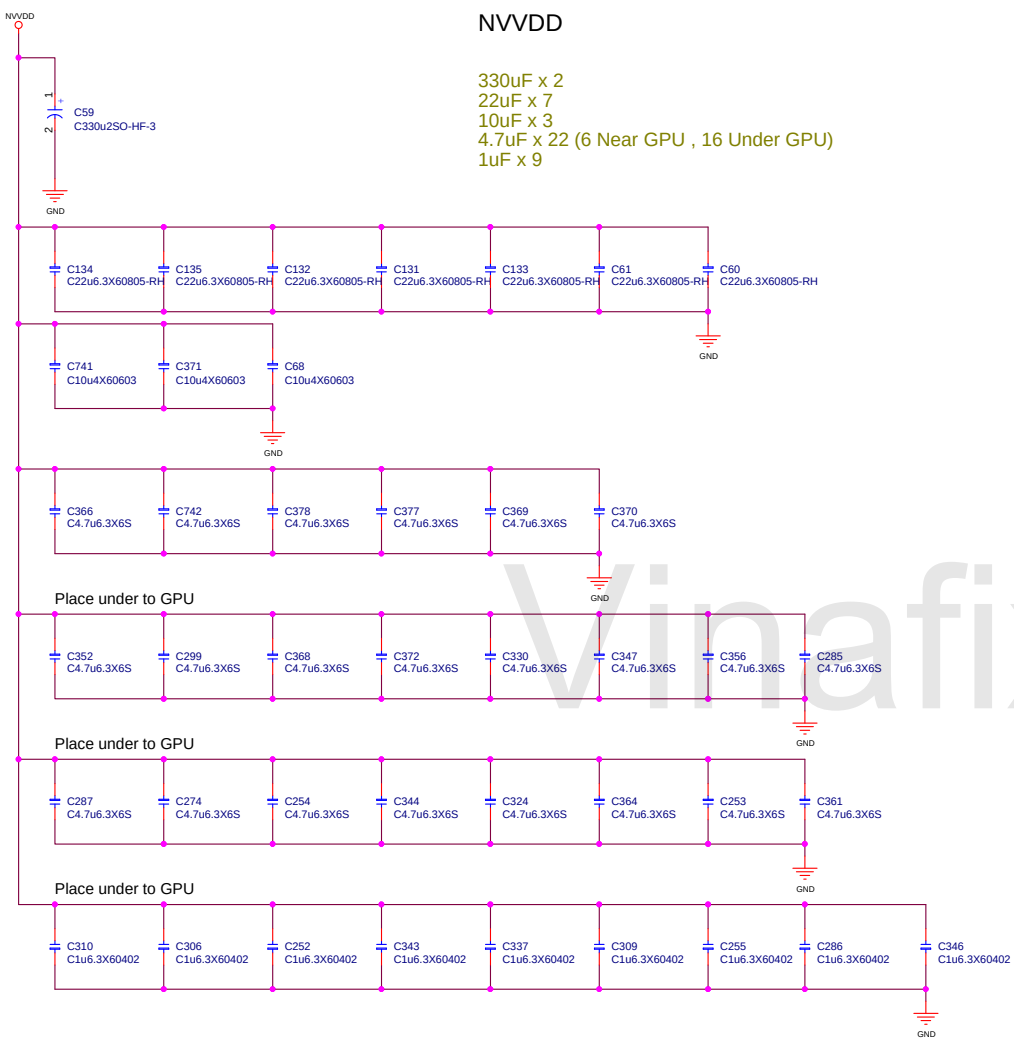
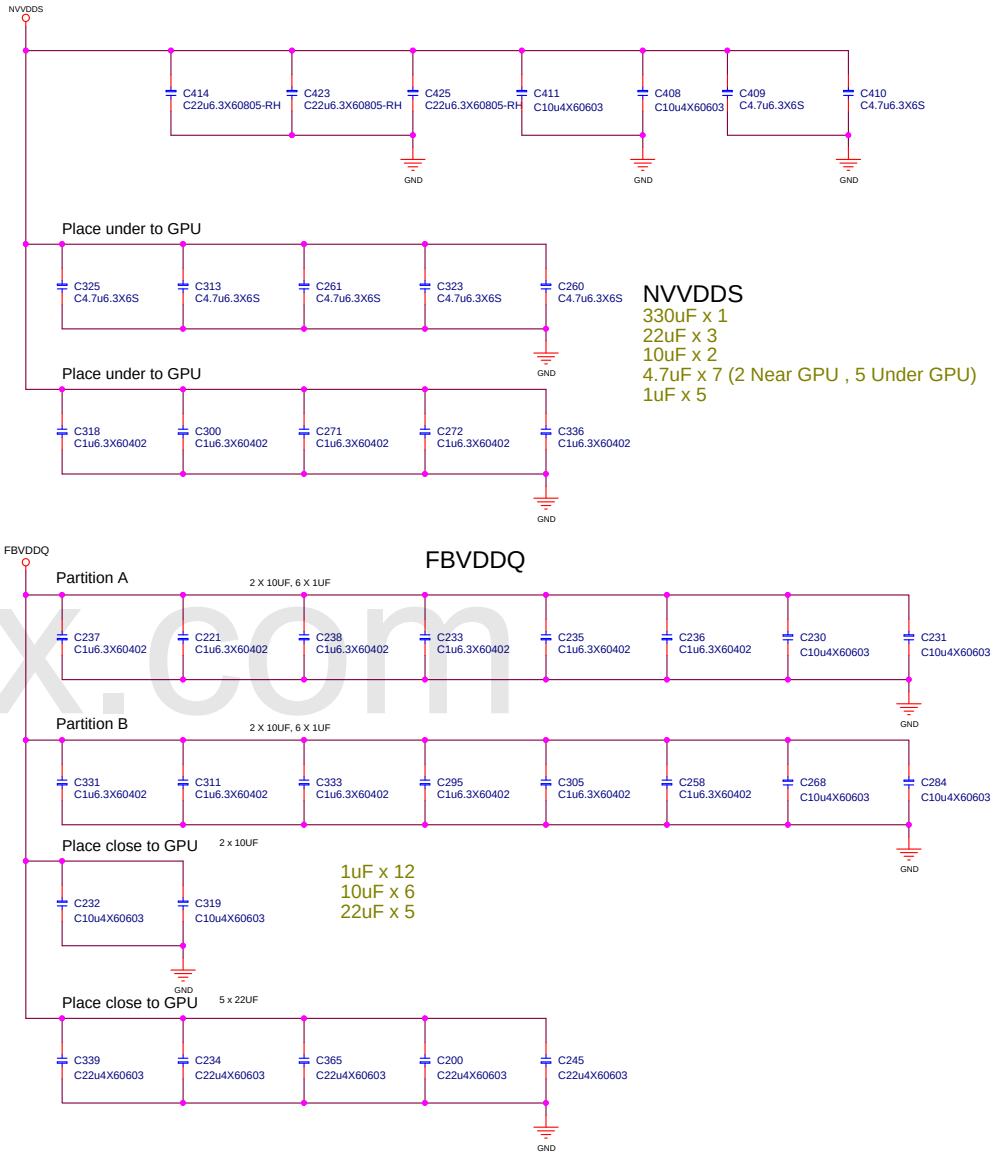
GPU DECOUPLING



NVVDD

330uF x 2
22uF x 7
10uF x 3
4.7uF x 22 (6 Near GPU , 16 Under GPU)
1uF x 9



NVVDDS

330uF x 1
22uF x 3
10uF x 2
4.7uF x 7 (2 Near GPU , 5 Under GPU)
1uF x 5

FBVDDQ

1uF x 12
10uF x 6
22uF x 5

MICRO-STAR INT'L CO.,LTD.	
Title	DGPU_GPU DECOUPLING
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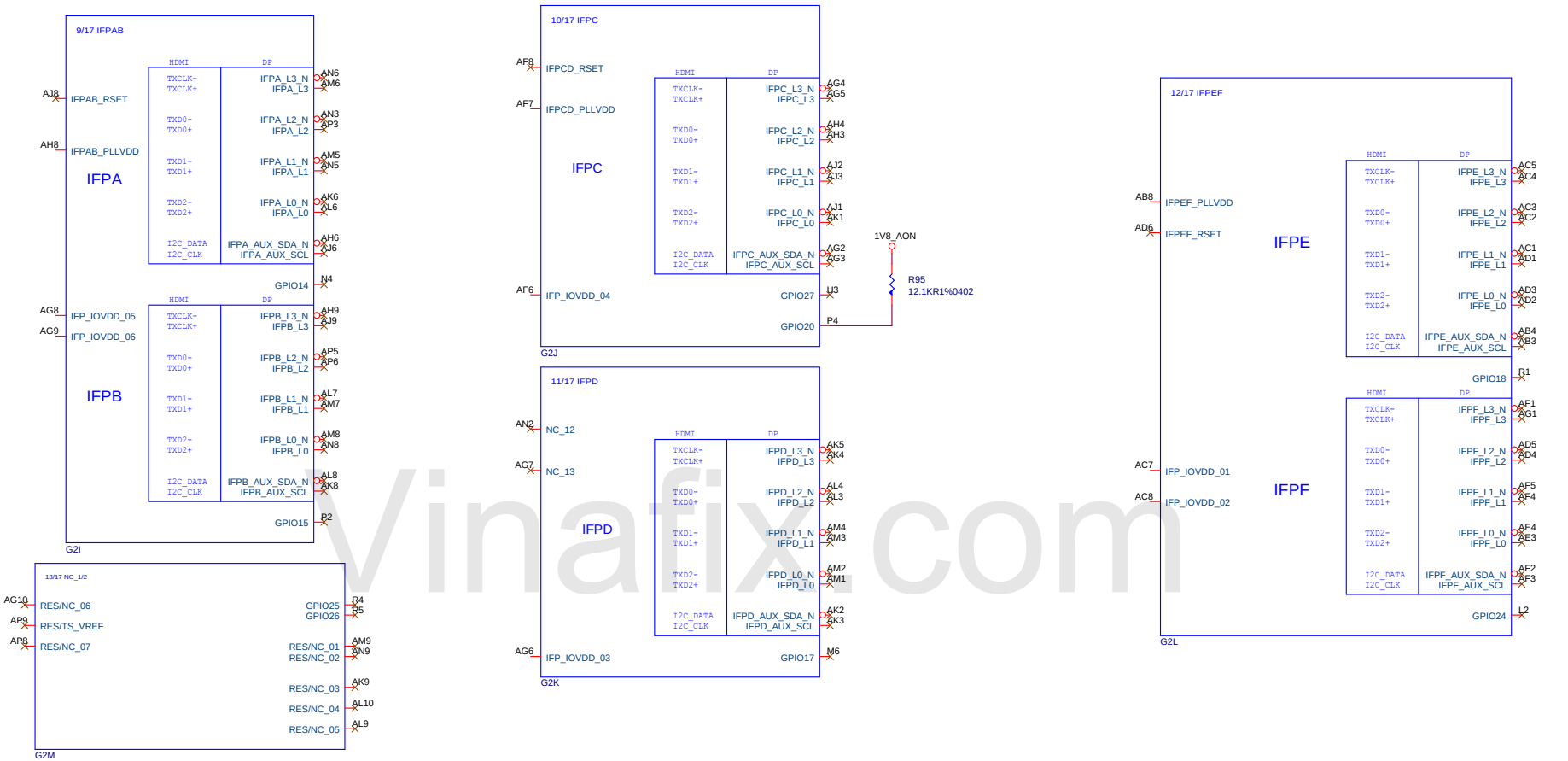
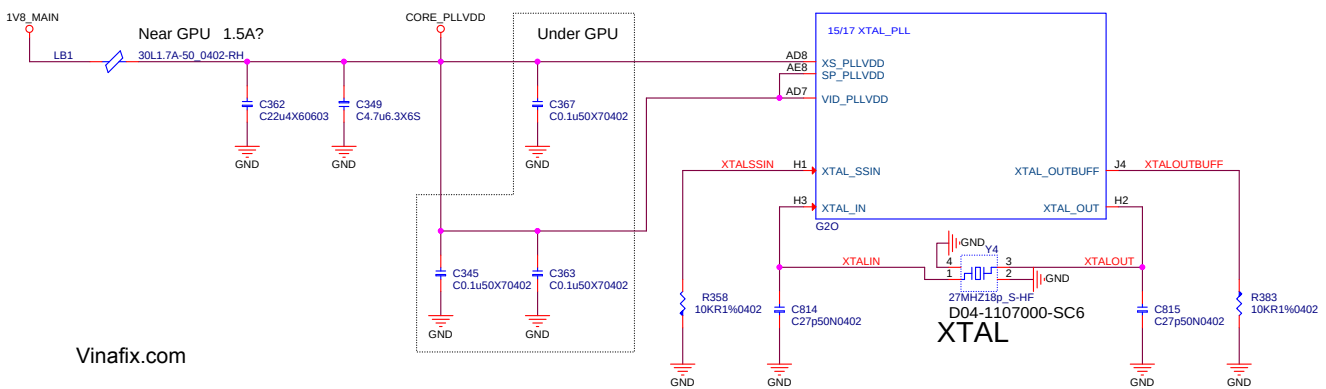
DACA,Display IF



DGPU XTAL



MICRO-STAR INT'L CO.,LTD.	
Title	DGPU_DACA,Display IF,XTAL
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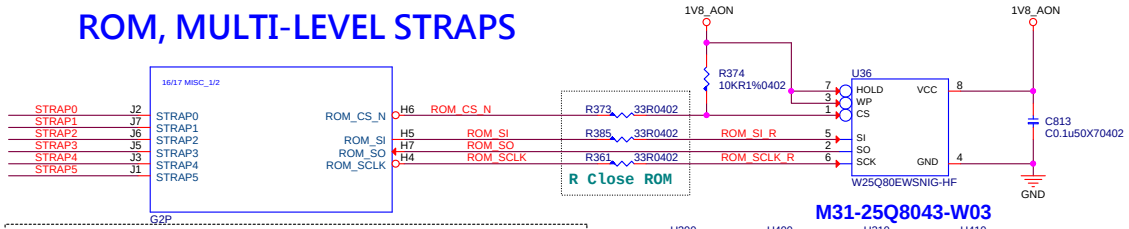
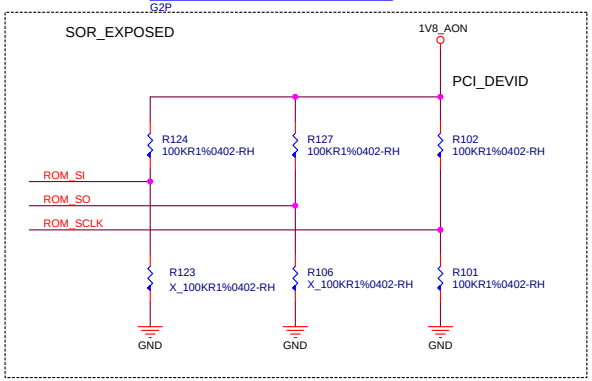
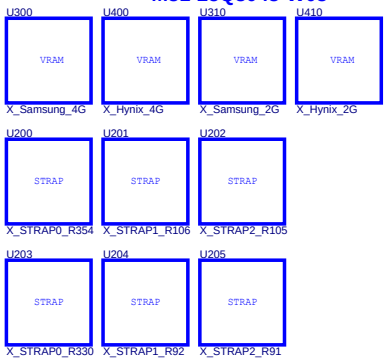
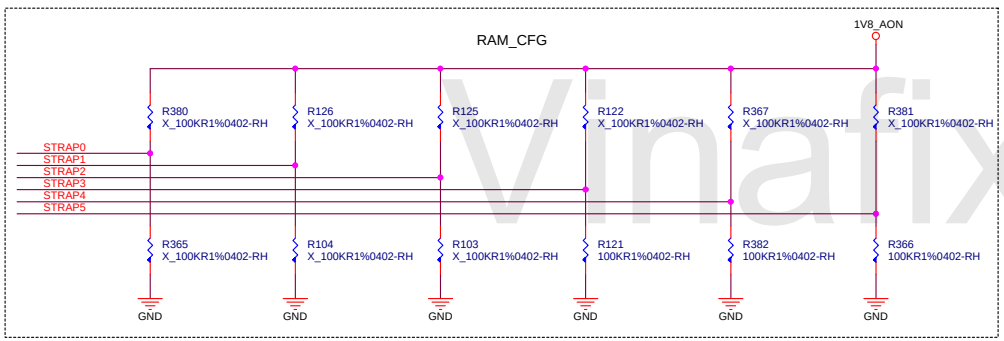
ROM, MULTI-LEVEL STRAPS





M31-25Q8043-W03





ROM_SO	ROM_SI	ROM_SCLK	SOR_EXPOSED[3:0]	1:ENABLE 0:DISABLE
L	L	L	1111 DEFAULT	SOR0/1/2/3 ENABLE
L	L	H	1110	
L	H	L	1101	
L	H	H	1100	
H	L	L	1011	
H	L	H	1010	
H	H	L	1001	
H	H	H	1000	
L	L	M	0111	
L	M	L	0110	
L	M	H	0101	
L	H	M	0100	
H	L	M	0011	
H	M	L	0010	
H	M	H	0001	
H	H	M	0000	V

STRAP5	STRAP4	STRAP3	SMB_ALT_ADDR	DEVID_SEL	PCIE_CFG	VGA_DEVICE
M	H	H	1	1	1	1
M	H	L	1	1	1	0
M	L	H	1	1	0	1
M	L	L	1	1	0	0
L	H	M	1	0	1	1
L	M	H	1	0	1	0
L	M	L	1	0	0	1
L	L	M	1	0	0	0
H	H	H	0	1	1	1
H	H	L	0	1	1	0
H	L	H	0	1	0	1
H	L	L	0	1	0	0
L	H	H	0	0	1	1
L	H	L	0	0	1	0
L	L	H	0	0	0	1 DEFAULT
L	L	L	0	0	0	0 V

STRAP2	STRAP1	STRAP0	RAMCFG[4:0]	STRAP Set
L	L	L	0x0 Samsung: M12-8032545-S02 / K4G80325FB-HC28	R330.R92.R91
L	L	H	0x1 Micron: MT51J256M32HF-70:A	R354.R92.R91
L	H	L	0x2 Hynix: M12-5GC8H05-H23 / H5GC8H24MJR-R0C	R330.R106.R91
L	H	H		
H	L	L		
H	L	H		
H	H	L	0x6 Hynix: M12-5GC4HG5-H23 / H5GC4H24AJR-R0C	R330.R106.R105
H	H	H	0x7 Samsung: M12-41325A5-S02 / K4G41325FE-HC28	R354.R106.R105
L	L	M	0x8 Micron: EDW032BABG-70-F:A	R330.R354.R92.R91
L	M	L		

H=High :Tied to 1.8V
M=Middle:Tied to 0.9V
L=Low :Tied to 0V

1:SMB_ALT_ADDR ENABLE
0:SMB_ALT_ADDR DISABLE

1:DEVID_SEL REBRAND
0:DEVID_SEL ORIGNAL

1:PCIE_CFG LOW POWER
0:PCIE_CFG HIGH POWER

1:VGA_DEVICE ENABLE
0:VGA_DEVICE DISABLE

H=High :Tied to 1.8V
M=Middle:Tied to 0.9V
L=Low :Tied to 0V

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Title: DGPU_ROM,HW Straps

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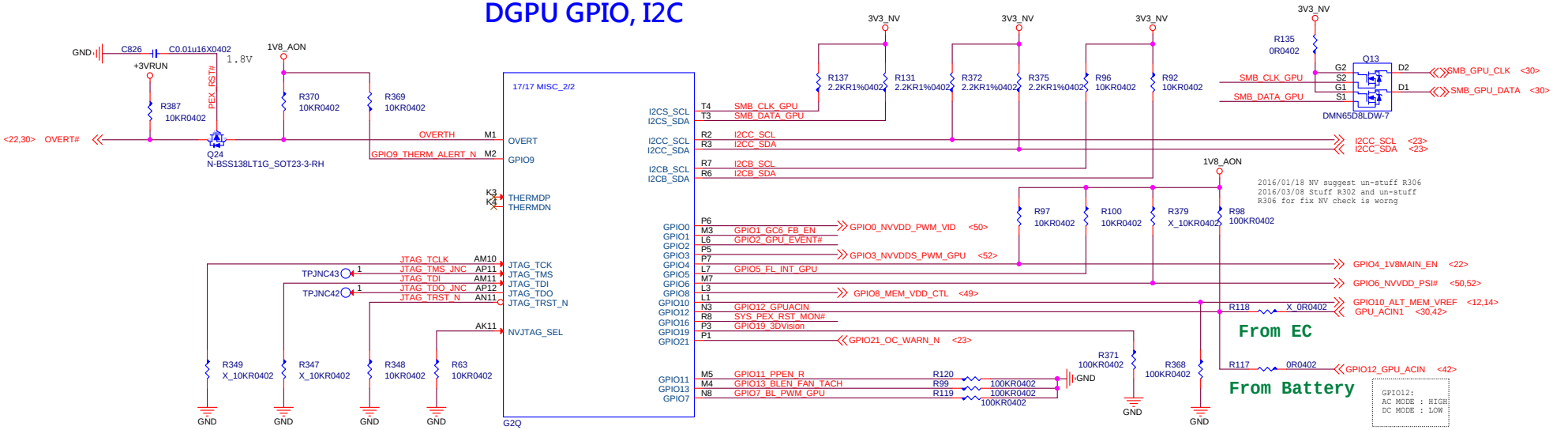
DGPU GPIO, I2C



Pin Name	Normal function	I/O	Functional Description	Recommended Default Pull-up or Pull-down
GPIO0	PWR_VID	O	GPU Core VDD PWM control signal	0 to 1V8 PWM output
GPIO1	GC6_FB_EN	O	FB Enable for GC6 2.1	OD, 10K pull-down
GPIO2	GPU_EVENT#	I	GPU wake signal for GC6 2.1	10K pull-up to 1V8 _AON
GPIO3	NVVDD_SRAM_PWM	O	PWM output to control the SRAM power supply	0 to 1V8 output
GPIO4	1V8_MAIN_EN	O	GPU POWER Sequencing for GC6 2.1	OD, 10K pull-up to 1V8 _AON
GPIO5	FRM_LCK#	I	Active low Frame Lock	OD, 1V8 pull-up to 1V8 _AON
GPIO6	NVVDD_PSI	O	Phase shedding	10K pull-up to 1V8 _AON
GPIO7	LCD_BL_PWM	O	Panel Backlight PWM Brighteness Control	100K pull-down
GPIO8	MEM_VDD_CTL	O	Memory Voltage Control	pull-up/pull-down to set the FBVDD/Q power-on voltage
GPIO9	THERM_ALERT	I/O	Active Low Thermal Alert	OD, 10K pull-up to 1V8_AON
GPIO10	MEM_VREF_CTL	O	Memory VREF Control	100K pull-down
GPIO11	LCD_VCC	O	Panel Power Enable	100K pull-down
GPIO12	PWR_LEVEL	I	AC power detect or power supply overdraw input	100K pull-up to 1V8_AON
GPIO13	LCD_BLEN	O	Panel Backlight Enable	100K pull-down
GPIO14	HPD_A	I	Hot Plug Detect for IFPA	
GPIO15	HPD_B	I	Hot Plug Detect for IFPB	
GPIO16	SYS_PEX_RST_MON#	O	System side PCIe reset monitor	10K pull-up to 1V8 _AON
GPIO17	HPD_D	I	Hot Plug Detect for IFPD	
GPIO18	HPD_E	I	Hot Plug Detect for IFPE	
GPIO19	3DVision	O	3D Vision L/R signal	100K pull-down
GPIO20	GC5_MODE			
GPIO21	UNUSED	I/O		
GPIO22	UNUSED	I/O		
GPIO23	GPU_PEX_RST_HOLD#	O	GPU PCIe self-reset control	OD, 10K pull-up to a gated 3V3
GPIO24	HPD_F	I		
GPIO25	UNUSED			
GPIO26	UNUSED			
GPIO27	HPD_C	I	Hot Plug Detect for IFPC	

MICRO-STAR INT'L CO.,LTD.

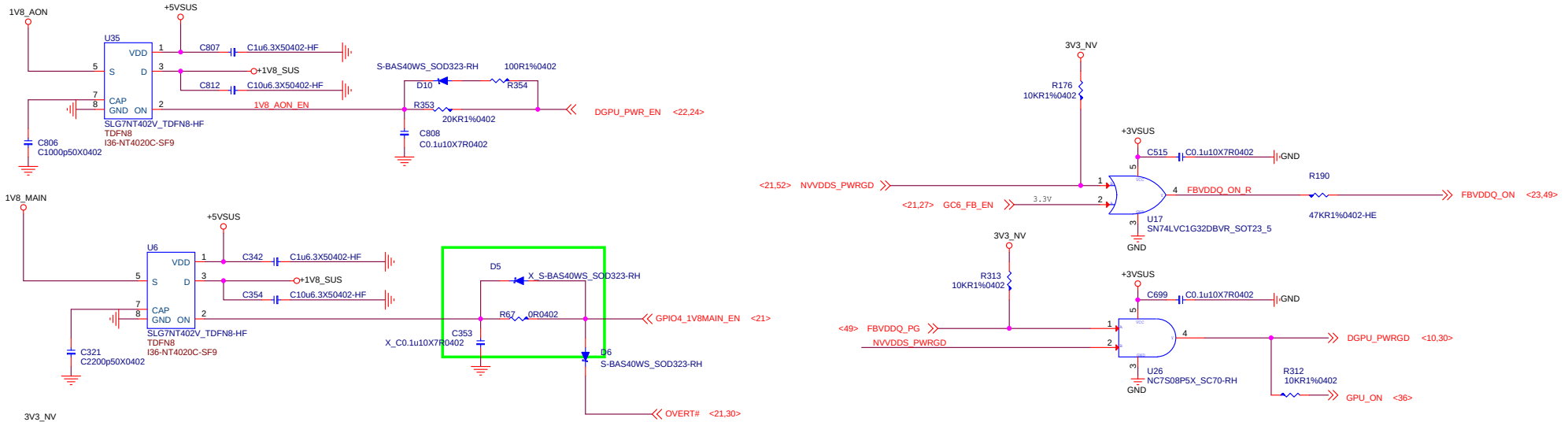
Title: DGPU_GPIO,I2C

Size | Document Number: MS-16P3/17C3 | Rev: 0A

Date: Thursday, March 30, 2017 | Sheet 21 of 64

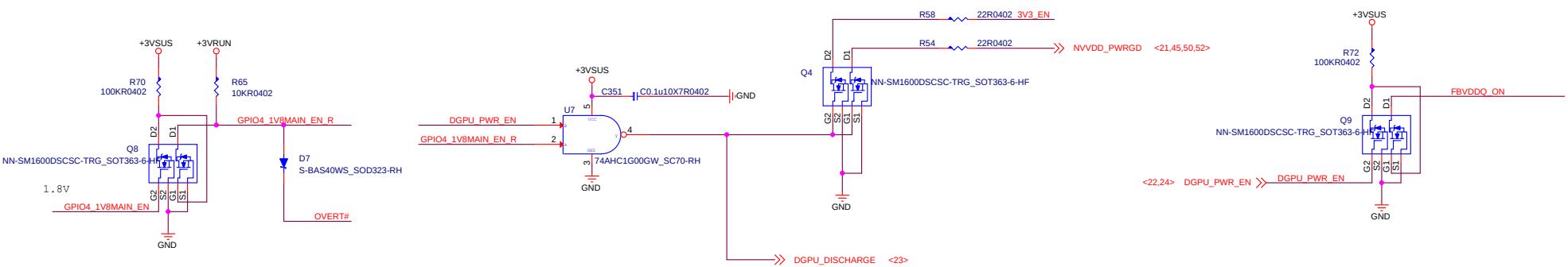
nVIDIA Power Sequence Control

Power on = 1V8_AON -> 1V8_MAIN -> 3V3_NV -> NVVDD -> NVDDS/PEX_VDD -> FBVDDQ -> DGPUPWRGD



nVIDIA Power Sequence Power Down

Power down = FBVDDQ -> NVDDS/PEX_VDD -> 3V3_NV -> 1V8_AON -> 1V8_MAIN



MICRO-STAR INT'L CO.,LTD.

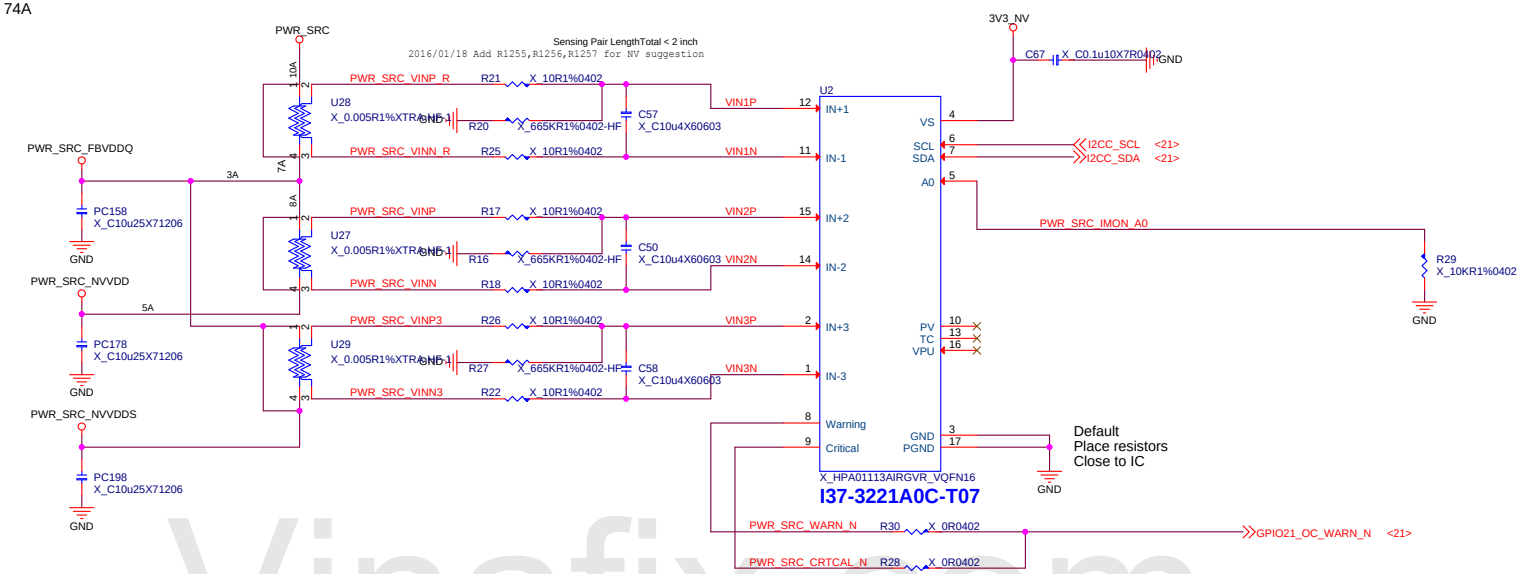
Title: DGPU_Power Sequence

Size | Document Number: MS-16P3/17C3 | Rev: 0A

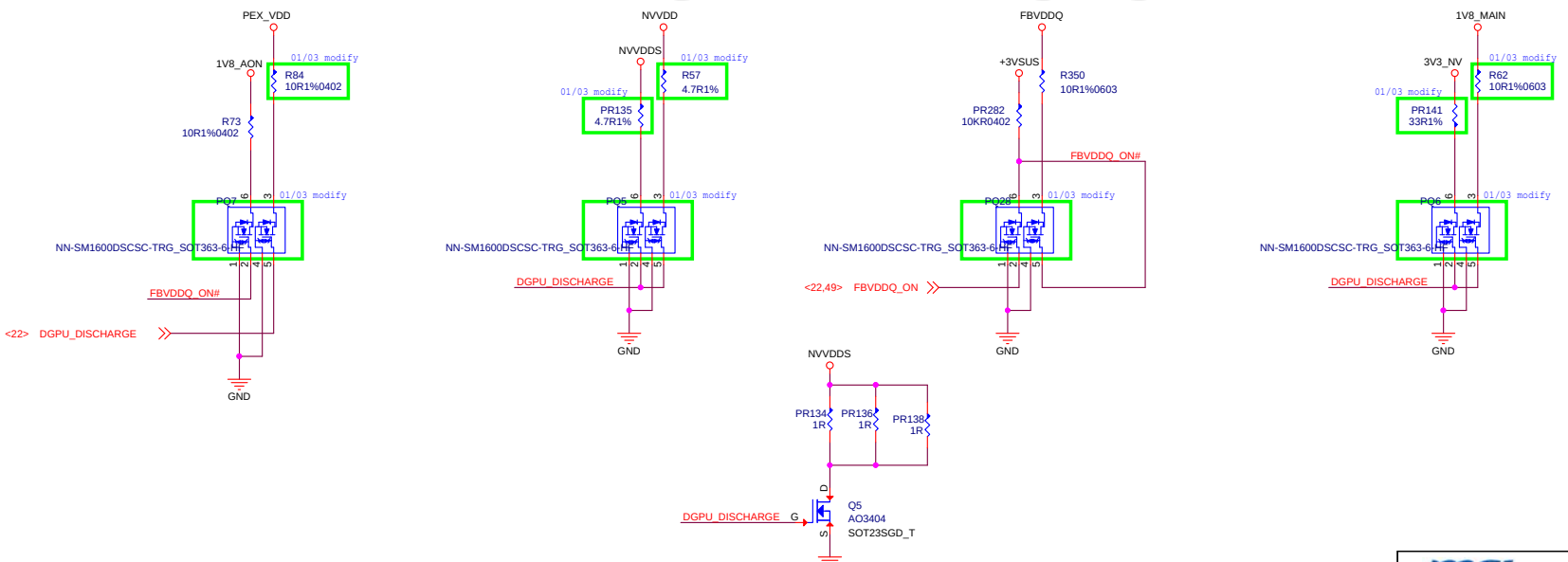
Date: Thursday, March 30, 2017 | Sheet 22 of 64

DGPU_Power Control

EDP Design Guide:
N17E-G1(90W)
NVVDD : 58A ; Peak 136A
NVVDDS : 28A ; Peak 74A
1.8V : 0.9A
PEX_VDD : 3A
FBVDDQ : 16A

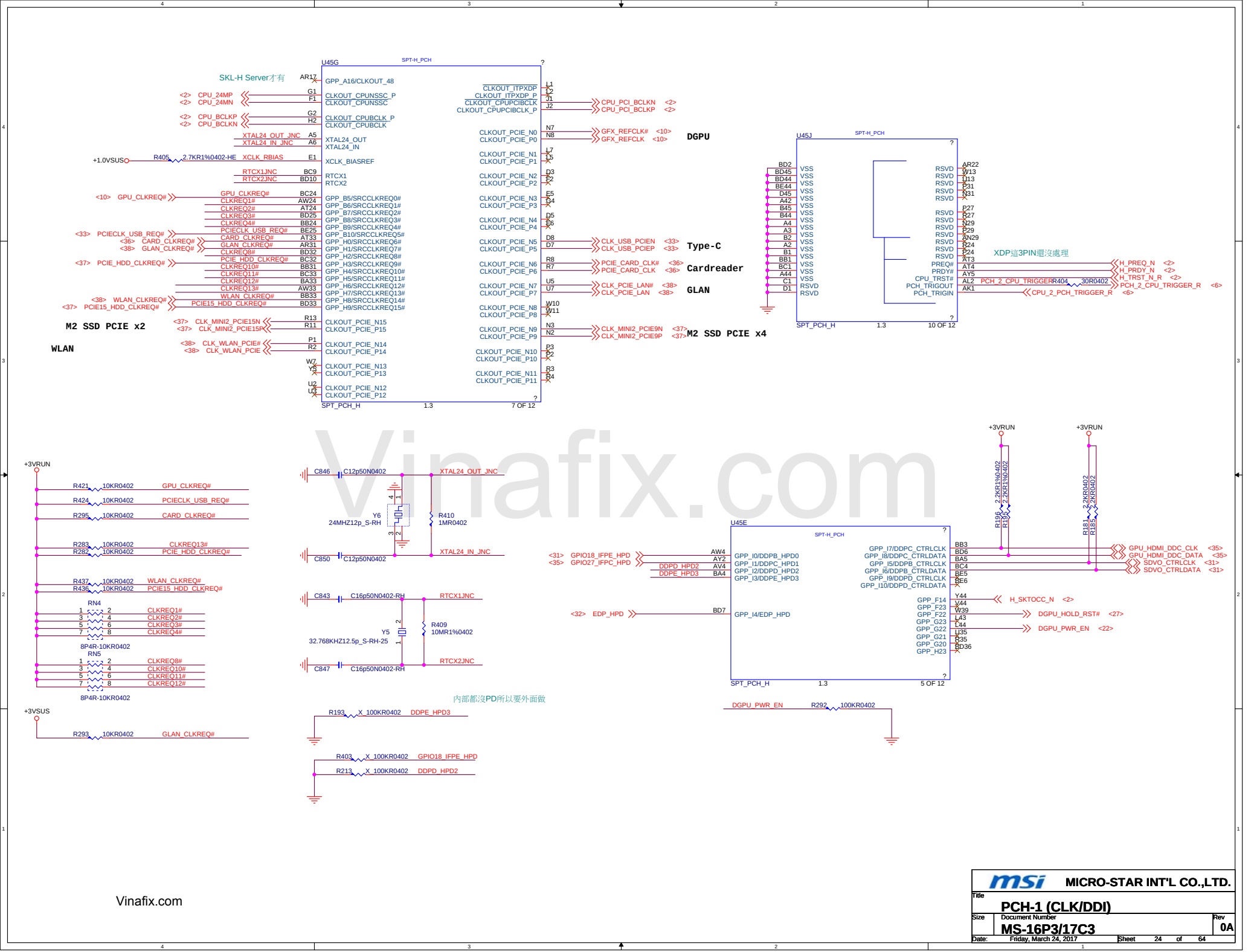


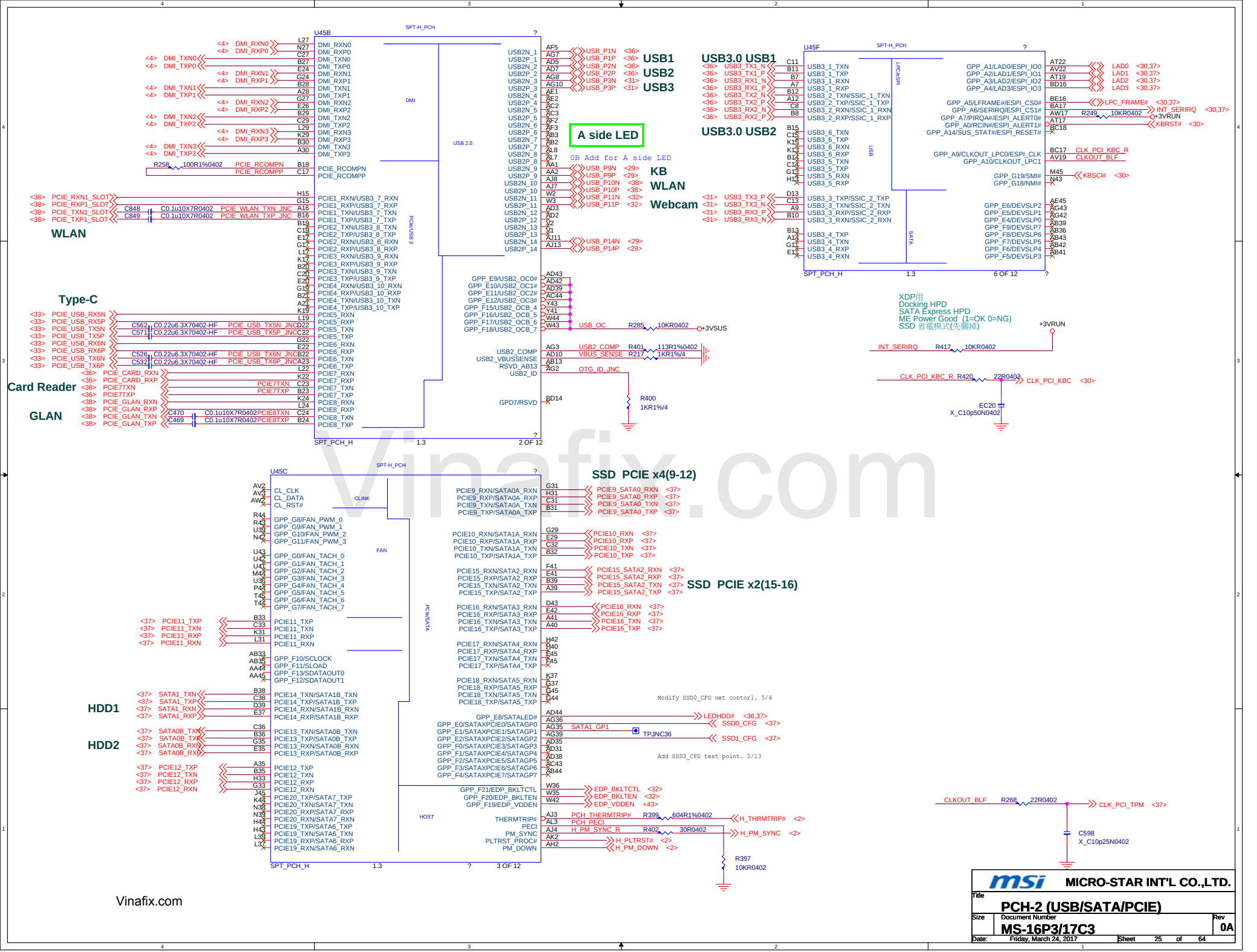
Discharge



MICRO-STAR INT'L CO.,LTD.

Title	DGPU_Power Control/Discharge	
Size	Document Number: MS-16P3/17C3	Rev: 0A
Date: Friday, March 24, 2017	Sheet 23 of 64	


U45G
SPT-H_PCH
SKL-H Server才有
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
SPT_PCH_H
1.3
7 OF 12
CPU_24MP
CPU_24MN
CPU_BCLKP
CPU_BCLKN
CPU_PCI_BCLKN
CPU_PCI_BCLKP
GFX_REFCLK#
GFX_REFCLK
DGPU
GPU_CLKREQ#
PCIECLK_USB_REQ#
CARD_CLKREQ#
GLAN_CLKREQ#
PCIE_HDD_CLKREQ#
WLAN_CLKREQ#
PCIE15_HDD_CLKREQ#
M2 SSD PCIE x2
WLAN
CLK_MINI2_PCIE15N
CLK_MINI2_PCIE15P
CLK_WLAN_PCIE#
CLK_WLAN_PCIE
CLK_USB_PCIEN
CLK_USB_PCIEP
Type-C
PCIE_CARD_CLK#
PCIE_CARD_CLK
Cardreader
CLK_PCIE_LAN#
CLK_PCIE_LAN
GLAN
CLK_MINI2_PCIE9N
CLK_MINI2_PCIE9P
M2 SSD PCIE x4
R405
2.7KR1%0402-HE
+1.0VSUS
U45J
SPT-H_PCH
VSS
RSVD
PREQ#
PRDY#
CPU_TRST#
PCH_TRIGOUT
PCH_TRIGIN
XDP這3PIN還沒處理
H_PREQ_N
H_PRDY_N
H_TRST_N_R
PCH_2_CPU_TRIGGER
PCH_2_CPU_TRIGGER_R
CPU_2_PCH_TRIGGER_R
SPT_PCH_H
1.3
10 OF 12
+3VRUN
R421
10KR0402
R424
R295
R283
R282
R437
R436
RN4
8P4R-10KR0402
RN5
CLKREQ1#
CLKREQ2#
CLKREQ3#
CLKREQ4#
CLKREQ8#
CLKREQ10#
CLKREQ11#
CLKREQ12#
CLKREQ13#
+3VSUS
R293
GLAN_CLKREQ#
C846
C12p50N0402
C850
Y6
24MHZ12p_S-RH
R410
1MR0402
XTAL24_OUT_JNC
XTAL24_IN_JNC
C843
C16p50N0402-RH
C847
Y5
32.768KHZ12.5p_S-RH-25
R409
10MR1%0402
RTCX1JNC
RTCX2JNC
內部都沒PD所以要外面做
R193
X_100KR0402
DDPE_HPD3
R403
GPIO18_IFPE_HPD
R213
DDPD_HPD2
U45E
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
SPT_PCH_H
1.3
5 OF 12
GPIO18_IFPE_HPD
GPIO27_IFPC_HPD
EDP_HPD
GPU_HDMI_DDC_CLK
GPU_HDMI_DDC_DATA
SDVO_CTRLCLK
SDVO_CTRLDATA
H_SKTOCC_N
DGPU_HOLD_RST#
DGPU_PWR_EN
R292
100KR0402
R196
2.2KR1%0402
R197
R181
2.2KR0402
R185
Vinafix.com
MICRO-STAR INT'L CO.,LTD.
PCH-1 (CLK/DDI)
MS-16P3/17C3
0A
Friday, March 24, 2017
Sheet 24 of 64


U45B
SPT-H_PCH
DMI
USB 2.0
PCIe/USB 3
SPT_PCH_H
1.3
2 OF 12
USB1
USB2
USB3
A side LED
0B Add for A side LED
KB
WLAN
Webcam
WLAN
Type-C
Card Reader
GLAN
USB3.0 USB1
USB3.0 USB2
U45F
6 OF 12
XDP用
Docking HPD
SATA Express HPD
ME Power Good (1=OK 0=NG)
SSD 省電模式(先關掉)
U45C
CLINK
FAN
PCIe/SATA
HOST
3 OF 12
SSD PCIE x4(9-12)
SSD PCIE x2(15-16)
HDD1
HDD2
Modify SSD0_CFG net contorl. 5/4
Add SSD3_CFG test point. 5/13
Vinafix.com
MICRO-STAR INT'L CO.,LTD.
PCH-2 (USB/SATA/PCIE)
MS-16P3/17C3
0A
Friday, March 24, 2017
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SMBALERT#
0 - Disable (Default Internal 20K PD)
1- Enable (AMT/SBA)

SML0ALERT#
0 - LPC (Default Internal 20K PD)
1- eSPI

PCH EDS Page 52

U45D SPT-H_PCH

HDA_BITCLK BA9 HDA_BCLK
HDA_RST# BD8 HDA_RST#
<39> CODEC_HDA_SDIN0 BE7 HDA_SDI0
BC8 HDA_SDI1
<30> FLASH_SECURITY R398 1KR0402
HDA_SDO BB7 HDA_SDO
HDA_SYNC BD9 HDA_SYNC
BD1 RSVD_BD1
BE2 RSVD_BE2
<4> AUDIO_CPU_SDO_R R32 30R0402 AUDIO_CPU_SDO AM1 DISPA_SDO
<4> AUDIO_CPU_SDI AN2 DISPA_SDI
<4> AUDIO_CPU_CLK_R R33 30R0402 AUDIO_CPU_CLK AM2 DISPA_BCLK
AUDIO

AL42 GPP_D8/I2S0_SCLK
AN42 GPP_D7/I2S0_RXD
AM43 GPP_D6/I2S0_TXD
AJ33 GPP_D5/I2S0_SFRM
AH43 GPP_D20/DMIC_DATA0
AJ35 GPP_D19/DMIC_CLK0
AJ36 GPP_D18/DMIC_DATA1
AJ42 GPP_D17/DMIC_CLK1

RTCRST# BC10 RTCRST#
SRTCRST# BB10 SRTCRST#
PCH_PWROK AW11 PCH_PWROK
BA11 RSMRST#
<30> RSMRST#
AV11 DSW_PWROK
SMBALERT# BB41 GPP_C2/SMBALERT#
SUS_SMBCLK AW44 GPP_C0/SMBCLK
SUS_SMBDATA BB43 GPP_C1/SMBDATA
SML0ALERT# BA40 GPP_C5/SML0ALERT#
TPJNC37 SML0_CLK AY44 GPP_C3/SML0CLK
SML0_DATA BB39 GPP_C4/SML0DATA
TPJNC35 SML1ALERT# AT27 GPP_B23/SML1ALERT#/PCHHOT#
AW42 GPP_C6/SML1CLK
AW45 GPP_C7/SML1DATA
SMBUS

JTAG

GPP_A12/BMBUSY#/ISH_GP6/SX_EXIT_HOLDOFF# BB17
GPP_A8/CLKRUN# AW22 EC_CLKRUN# <30>
GPD11/LANPHYPC AR15
GPD9/SLP_WLAN# AV13
新的DDR由PCH做RESET
DRAM_RESET# BC14 DDR4_DRAMRST# <8,9>
GPP_B2/VRALERT# BD23
GPP_B1 AL27
GPP_B0 AR27
GPP_G17/ADR_COMPLETE N44
GPP_B11 AN24 GPU_EVENT# <21>
SYS_PWROK AY1 SYS_PWROK
用原本等CPU PWM OK再發也行
由EC過來或多用個AND要想一下 GPP_B11(GPO)
WAKE# BC13
GPD6/SLP_A# BC15 R416 1KR0402 +3VSUS
SLP_LAN# AV15
GPP_B12/SLP_S0# BC26
GPD4/SLP_S3# AW15 PM_SLP_S3# <2,30,48>
GPD5/SLP_S4# BD15 PM_SLP_S4# <30,44>
GPD10/SLP_S5# BA13 PM_SLP_S5#JNC TPJNC34
GPD8/SUSCLK AN15 SUSCLK <30>
GPD0/BATLOW# BD13 BATLOW#
GPP_A15/SUSACK# BB19
GPP_A13/SUSWARN#/SUSPWRDNACK BD19
GPD2/LAN_WAKE# BD11 LAN_WAKE#
GPD1/ACPRESENT BB15 AC_PRESENT <30>
SLP_SUS# BB13
GPD3/PWRBTN# AT13 PM_PWRBTN# <30>
SYS_RESET# AW1 PM_SYSRST#
GPP_B14/SPKR BD26
PROCPWRGD AM3 H_PWRGD <2>
ITP_PMODE AT2
JTAGX AR3 PCH_JTAGX <2>
JTAG_TMS AR2 PCH_JTAG_TMS <2>
JTAG_TDO AP1 PCH_JTAG_TDO <2>
JTAG_TDI AP2 PCH_JTAG_TDI <2>
JTAG_TCK AN3

SPT_PCH_H 1.3 ? 4 OF 12

連EC
0 - Enable TCO

+3VSUS
R298 2.2KR0402 SMBALERT#
R291 2.2KR0402 SUS_SMBCLK
R288 2.2KR0402 SUS_SMBDATA
R297 1KR0402 SML0_CLK
R299 1KR0402 SML0_DATA
RN7 1 2 LAN_WAKE# 3 4 BATLOW# 5 6 AC_PRESENT 7 8
8P4R-10KR0402

+3VALW
Change R276 TO OR . 9/24
R438 1KR0402
Change R279 NC 9/24
Q28 NN-DMN65D8LDW-7_SOT363-6-HF
EC_RTC_RST <30>
R435 100KR0402
PQ40 P-AO3415_SOT23-3-RH
R447 X_C1u10X50405-HF
R442 22R0402
D14 1SS355VMTE_SOD323
D15 S-BAT54C_SOT23
RTCVCC
R216 20KR0402-2 RTCRST#
C529 C1u10X0603
C866 C1u10X0603
G1
Change D7 9/24
Change R277 TO 1uF . 9/24
RTC_P2
R444 1KR0402
RTC_P3
R234 20KR0402-2 SRTCRST#
C556 C1u10X0603
CN12 BH1X2#S-1.25PITCH_BLACK-HF
N32-10200Q0-A81

60階
BAT2
BCR1220H2.8AM1KB
D06-0105701-K26

<39> CODEC_HDA_BIT_CLK
<39> CODEC_HDA_SDOUT
<39> CODEC_HDA_RST#
<39> CODEC_HDA_SYNC
RN6 1 2 HDA_BITCLK 3 4 HDA_SDO 5 6 HDA_RST# 7 8 HDA_SYNC
8P4R-33R0402
EC48 X_C10p50N0402
EC47 X_C10p50N0402
EC46 X_C10p50N0402
EC45 X_C10p50N0402

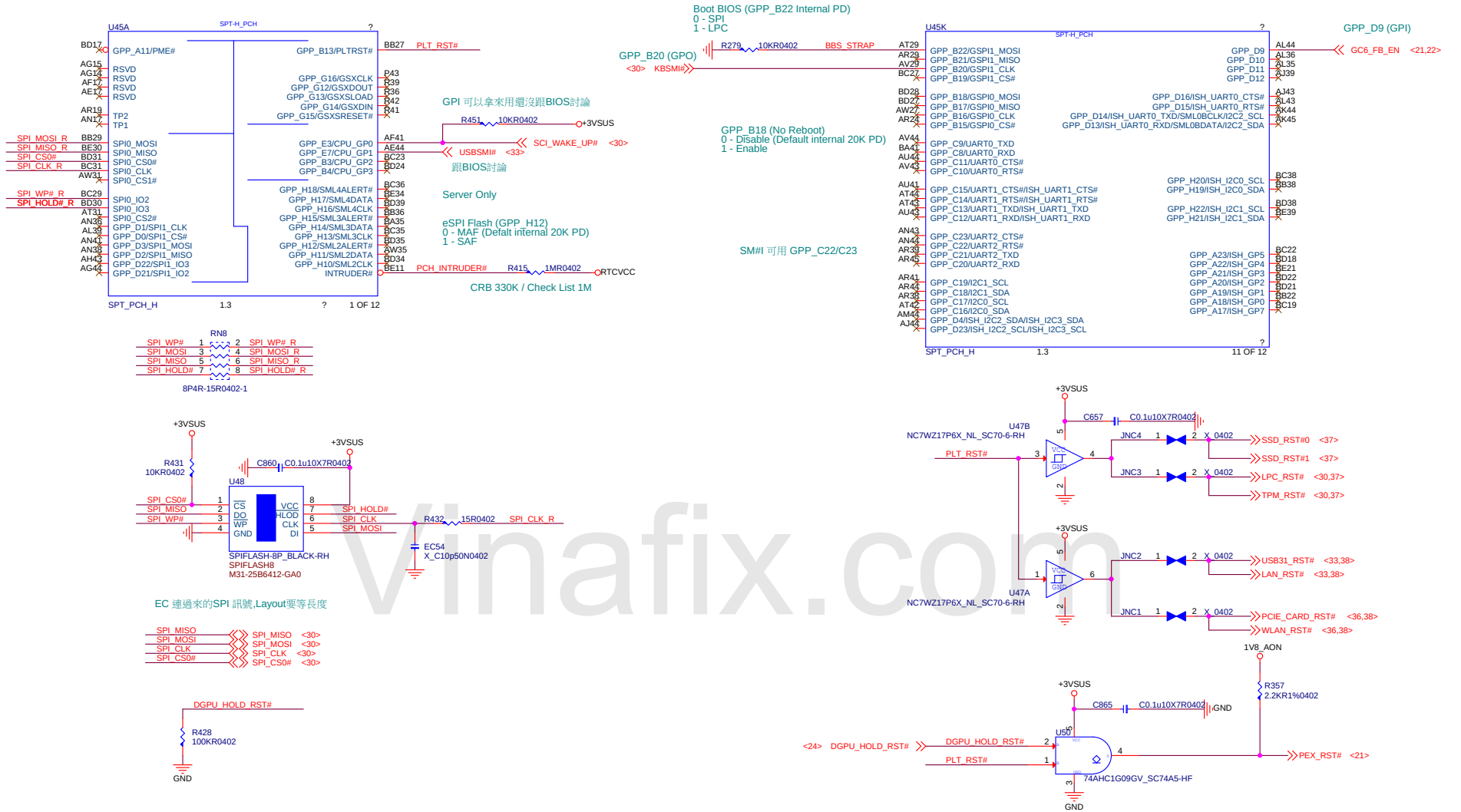
+3VSUS
C841 C0.1u10X7R0402
<46> CPU_PWROK
<2,30,31,35,46,48> EC_ALLSYSPG
PCH_PWROK
U14 NC7S08P5X_SC70-RH

+3VRUN
PM_SYSRST# R396 10KR0402
SMB_CLK_DIMM R458 2.2KR0402
SMB_DATA_DIMM R453 2.2KR0402
EC_CLKRUN# R423 8.2KR1%0402
Modify R139,R141, R149,R151 2.2K page33.5/25

+3VSUS
C499 C0.1u10X7R0402
PCH_PWROK
<30> EC_PCH_PWROK
EC delay 100ms
SYS_PWROK
U44 NC7S08P5X_SC70-RH

+5VRUN
Q29
SUS_SMBCLK
SUS_SMBDATA
SMB_CLK_DIMM <8,9,38>
SMB_DATA_DIMM <8,9,38>
NN-DMN65D8LDW-7_SOT363-6-HF

MICRO-STAR INT'L CO.,LTD.
Title: PCH-3 (HDA/RTC/SMBUS)
Size: Document Number: MS-16P3/17C3 Rev: 0A
Date: Friday, March 24, 2017 Sheet 26 of 64

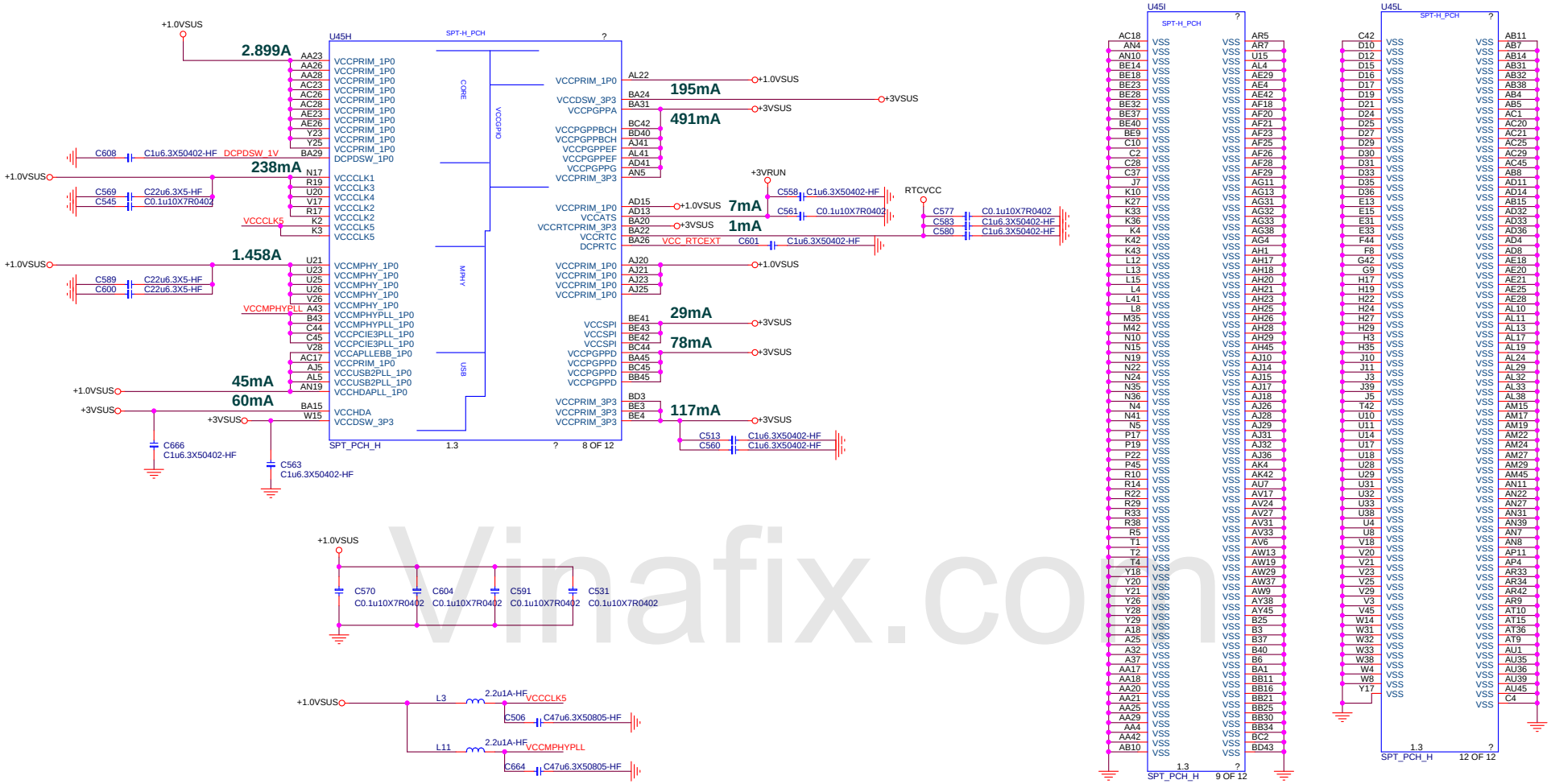


MICRO-STAR INT'L CO.,LTD.

Title: PCH-4 (SPI/GPIO)

Size | Document Number: MS-16P3/17C3 | Rev: 0A

Date: Friday, March 24, 2017 | Sheet 27 of 64



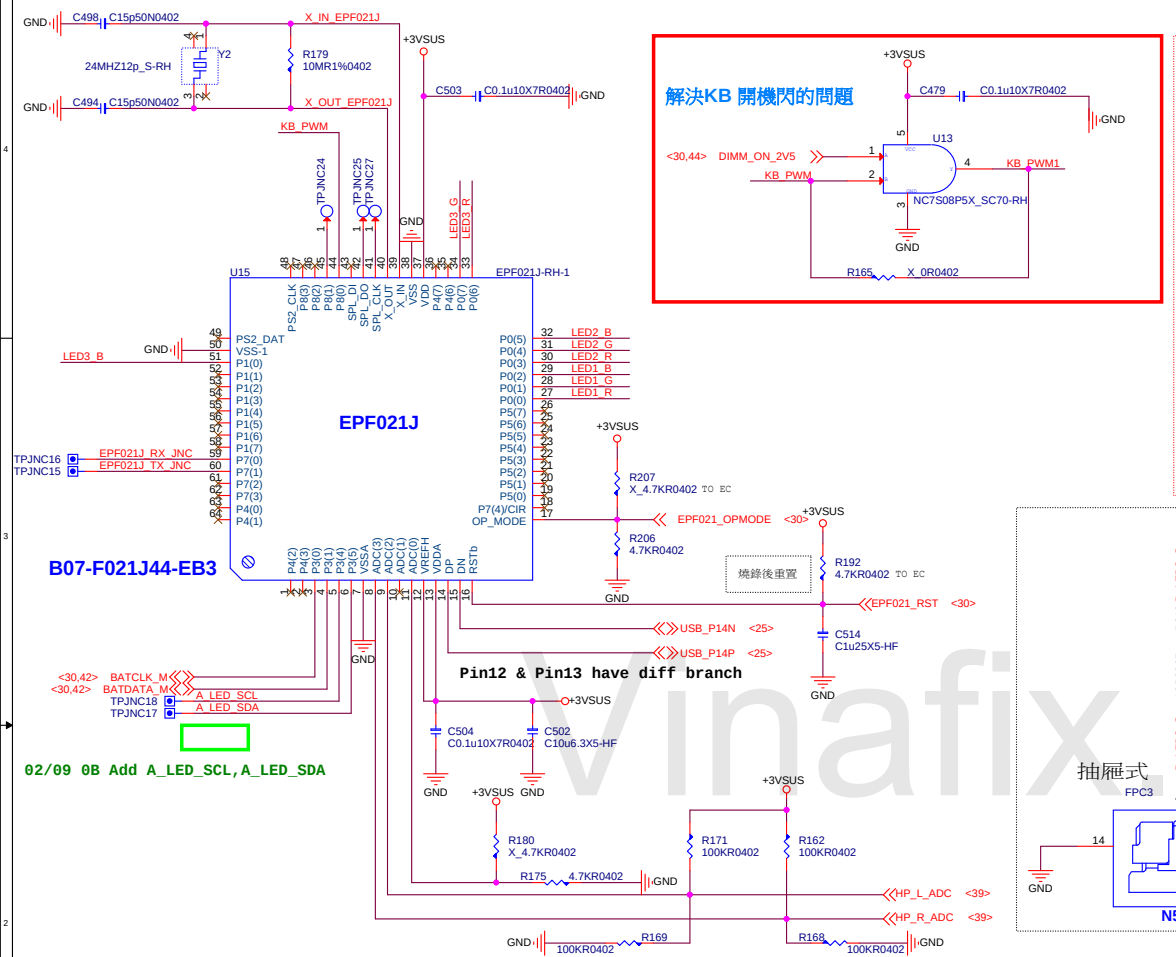
MICRO-STAR INT'L CO.,LTD.

Title: PCH-5 (Power)

Size | Document Number: MS-16P3/17C3 | Rev: 0A

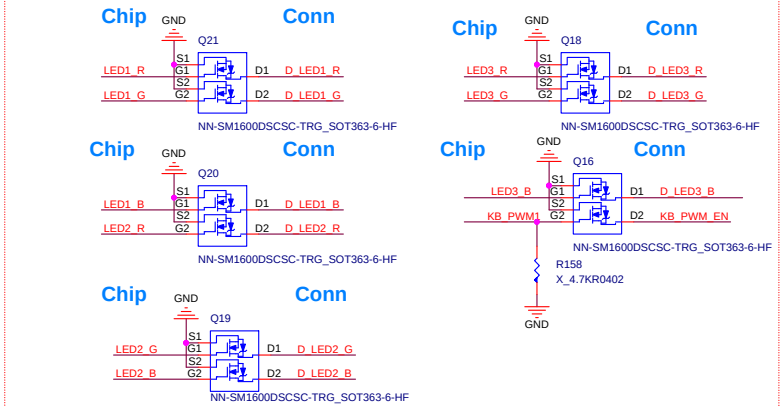
Date: Friday, March 24, 2017 | Sheet 28 of 64

LED 8051 Controller

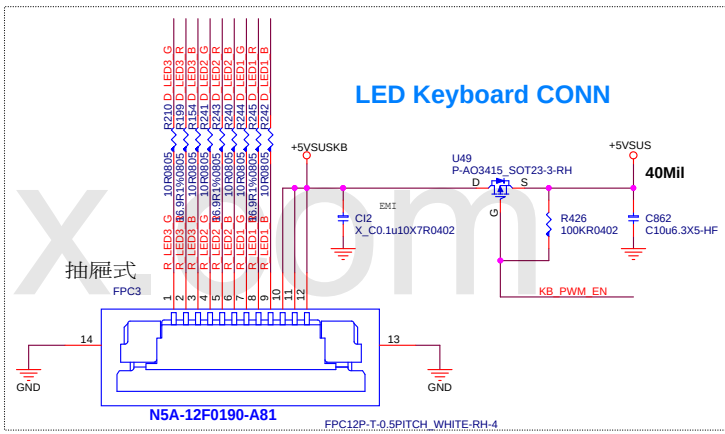


解決KB 開機閃的問題

EPF021J Sink current not enough, only using BSS138 (0.22A)

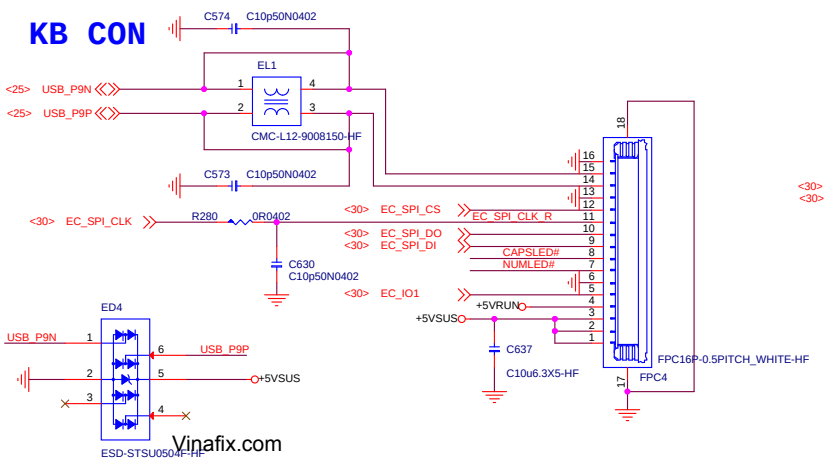


LED Keyboard CONN

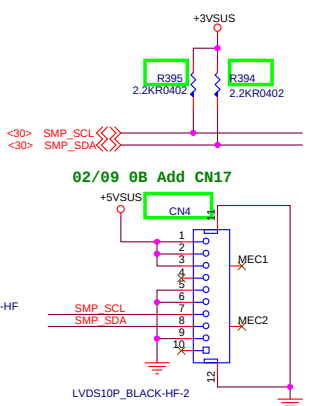


LED Keyboard Pin Define	
Pin 1	VCC_G
Pin 2	VCC_R
Pin 3	VCC_B
Pin 4	LED1_B
Pin 5	LED1_R
Pin 6	LED1_G
Pin 7	LED2_B
Pin 8	LED2_R
Pin 9	LED2_G
Pin 10	LED3_B
Pin 11	LED3_R
Pin 12	LED3_G

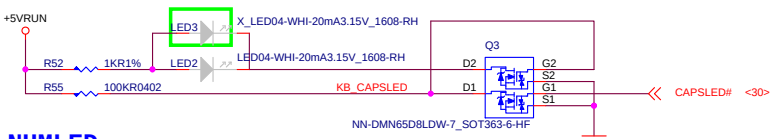
KB CON



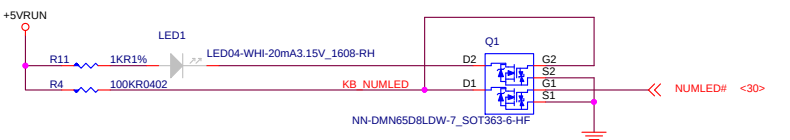
A side LED



CAPSLED 02/06 0B Add LED7 for17"



NUMLED



msi	MICRO-STAR INT'L CO.,LTD.		
Title	LED 8051/KB CON		
Size	Document Number		Rev
	MS-16P3/17C3		0A
Date:	Friday, March 24, 2017	Sheet 29 of 64	

KBC/EC/uP (ENE9028)

RSMRST# follow DG modify to 10K

Hardware Reset

SW1 SW-TACTB1S-HF

RST_SW# R445 100R1%0402 ECRST#

C868 C0.1u10X7R0402

GND

N71-0101630-D02 D17
ESD-SFI0402-050E101NP-LF-RH

PU/PD

R419 47KR0402 RSMRST#
R418 100KR0402 KBRST#

KB pull Hi 10k

+3VALW

RN2 8P4R-10KR0402
KBIN3 KBIN2 KBIN1 KBIN0

RN3 8P4R-10KR0402
KBIN7 KBIN6 KBIN5 KBIN4

LID pull hi 10K

+3VALW R446 X_10KR0402 LID#

U46 KB9028Q-C-RH

SERIRQ, LFARAME#, PCICLK, CLKRUN#/GPIO1D, LAD0, LAD1, LAD2, LAD3	LPC I/F	
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	FAN&PWM	
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/GPIO48/UART_SOUT2, KSO17/GPIO49	IKB	
KSI0/GPIO30/E51TXD, KSI1/GPIO31, KSI2/GPIO32, KSI3/GPIO33, KSI4/GPIO34, KSI5/GPIO35, KSI6/GPIO36, KSI7/GPIO37/EDI_DO		
GPIO0B/ESB_CLK, GPIO0C/ESB_DAT_O	ESB	
GPIO40/AD6, GPIO41/CIR_RLC_TX/AD7, GPIO0A/OWM, GPIO0D/RLC_TX2	CIR	
MISO/GPIO5B, MOSI/GPIO5C, SPICLK/GPIO58, SPICS#/GPIO5A	SPI FLASH	
PSCLK3/GPIO4E, PSDAT3/GPIO4F, PSCLK2/GPIO4C/SCL3, PSDAT2/GPIO4D/SDA3, PSCLK1/GPIO4A/SCL2/SMBD_CLK, PSDAT1/GPIO4B/SDA2/SMBD_DAT	PS2 I/F	
E51TXD/GPIO16, E51CLK/GPIO17	UART	
GPIO5D, GPIO5E		

VCC_LPC, VCC, VCC-1, VCC-2, VCC-3, VCC0, VCC_IO2	POWER/GROUND	
AVCC, AGND		
GND, GND-1, GND-2, GND-3, GND-4		
SDA0/GPIO45, SCL0/GPIO44, IEDI_SDA/SDA1/GPIO47, IEDI_SCL/SCL1/GPIO46	SMBUS	
DA0/GPO3C, DA1/GPO3D, DA2/GPO3E, DA3/GPO3F, AD0/GPI38, AD1/GPI39, AD2/GPI3A, AD3/GPI3B, AD4/GPI42, AD5/GPI43	AD/DA	
GPXIOA00/GPIO60/SHICS#, GPXIOA01/GPIO61/SHICLK, GPXIOA02/GPIO62/SHIDO	SDI	
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, GPIO0A/OWM, GPIO52, WDT_LED#/GPIO54, GPIO56, XCLK32K/GPIO57, GPIO59		
GPIO1A/NUMLED#, GPIO53/CAPSLED#, GPIO55/SCROLED#	LED	

+3VALW

C869 C0.1u10X7R0402, C861 C0.1u10X7R0402, C863 C0.1u10X7R0402, C859 C0.1u10X7R0402, C864 C0.1u10X7R0402

SMB_GPU_DATA <21>
SMB_GPU_CLK <21>
EC_SDA <35>
EC_SCL <35>
BT_PWR_ON <38>
CAMERA_ON <32>
DGPU_PWRGD <10,22>
PANEL_OD <32>
KBIN0 KBIN1 KBIN2 KBIN3 KBIN4 KBIN5
EC_SPI_CS <29>
EC_SPI_CLK <29>
EC_SPI_DO <29>
SUS_ON <43>
WLAN_PWRON <38>
ADP_ICC <42>
DIMM_ON_1V2 <6,44>
EC_PROCHOT# <2>
TB_STAR# <42>
LED_CHARGE <36>
LED_BATLOW <36>
AC_PRESENT <26>
EC_SPI_DI <29>
AC_OK <42>
GPU_ACIN1 <21,42>
PWR_SW# <36>
EC_ALLSYSPG
RUN_ON <6,43>
PM_PWRBTN# <26>
H_PECI <2>
H_PECI_R R411 33R0402
KBSMI# <27>
SCI_WAKE_UP# <27>
EC_PCH_PWROK <26>
WLAN_LED <36>
USB_ENABLE <31,34,36>
PWR_LED# <36>
RSMRST# <26>
PM_SLP_S3# <2,26,48>
PM_SLP_S4# <26,44>
NUMLED# <29>
CAPSLED# <29>
HDMI_HPD_DET <35>

+3VRUN
SMB_GPU_CLK R429 2.2KR0402
SMB_GPU_DATA R427 2.2KR0402

N5A-26F0270-A81 FPC2 FPC26P-T-1PITCH_WHITE-RH-1

KBOUT17 KBOUT16 KBIN0 KBIN1 KBIN2 KBIN3 KBIN4 KBIN5 KBIN6 KBIN7 KBOUT15 KBOUT14 KBOUT13 KBOUT12 KBOUT11 KBOUT10 KBOUT9 KBOUT8 KBOUT7 KBOUT6 KBOUT5 KBOUT4 KBOUT3 KBOUT2 KBOUT1 KBOUT0

For EMI

EC21 ESD-SFI0508-050S500NP-A4-LF-HF
KBOUT7 KBOUT6 KBOUT5 KBOUT4

EC25 ESD-SFI0508-050S500NP-A4-LF-HF
KBOUT3 KBOUT2 KBOUT1 KBOUT0

EC23 ESD-SFI0508-050S500NP-A4-LF-HF
KBOUT11 KBOUT10 KBOUT9 KBOUT8

EC24 ESD-SFI0508-050S500NP-A4-LF-HF
KBOUT15 KBOUT14 KBOUT13 KBOUT12

D16 KBOUT16 ESD-SFI0402-050E101NP-LF-RH

D8 KBOUT17 ESD-SFI0402-050E101NP-LF-RH

<29> EPF021_RST
<29> EPF021_OPMODE
JNC7 JNC8 X_0402 UART_TX UART_RX

<26> SUSCLK
R414 0R0402 MB_ID EC_XOUT_JNC
R408 680KR0402-HE

MotherBoard ID

+3VALW R413 10KR0402
MB_ID
R412 X_10KR0402

+3VALW
R425 4.7KR0402 BATCLK_M
R422 4.7KR0402 BATDATA_M

+3VRUN
R178 2.2KR0402
EC_ALLSYSPG <2,26,31,35,46,48>
C852 X_C2200p50X0402

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MICRO-STAR INT'L CO.,LTD.	
Title	EC(ENE9028)
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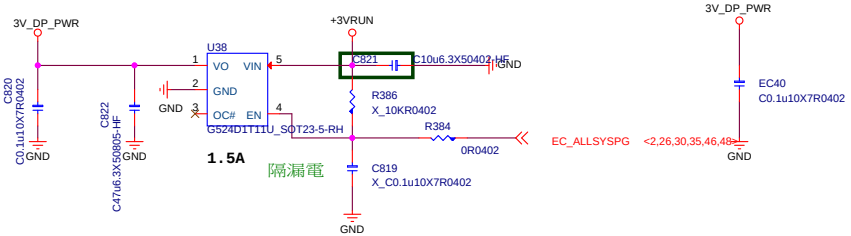
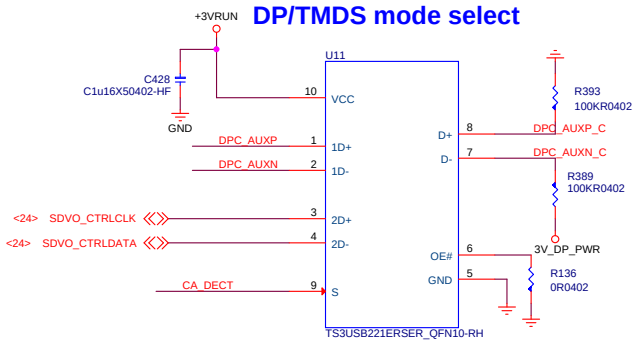
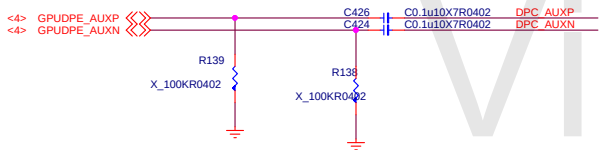
Display Port

The preset trip limit must not exceed 3A at the Upstream device connector DP_PWR pin and 1.5A at the Downstream device connector DP_PWR pin.

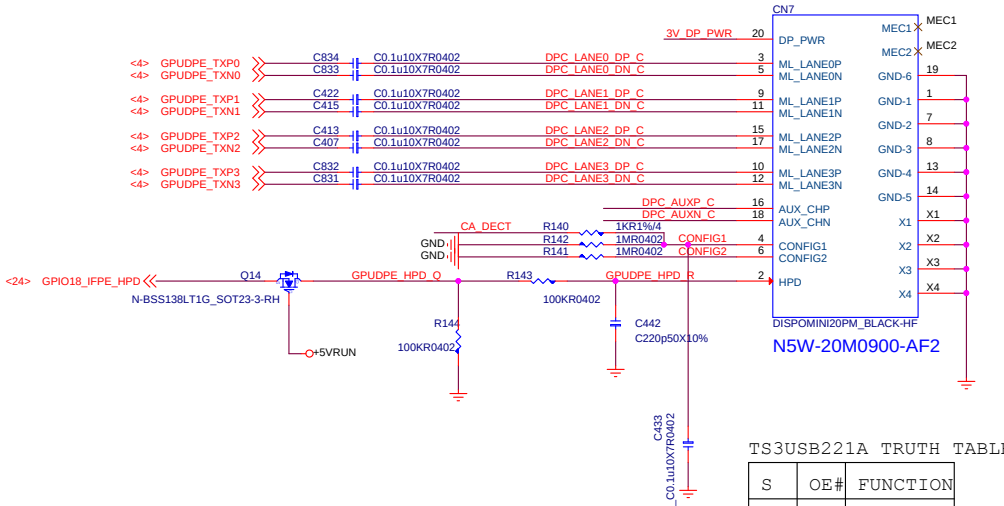


DP/TMDS mode select





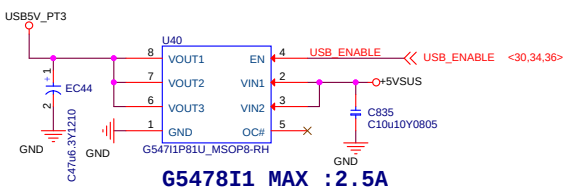
Display Port

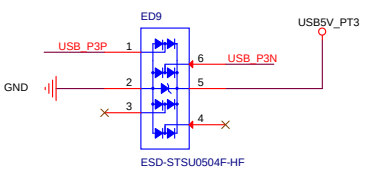


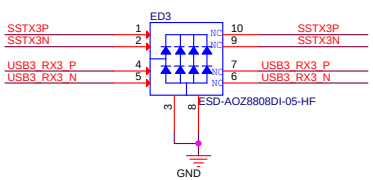
TS3USB221A TRUTH TABLE

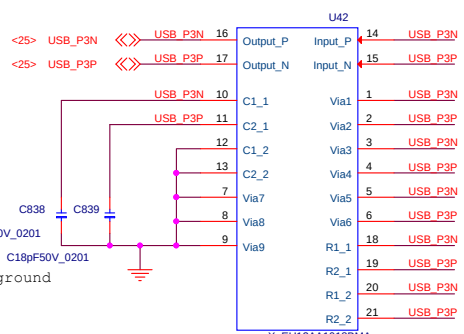
S	OE#	FUNCTION
X	H	Disconnect
L	L	D = 1D
H	L	D = 2D

USB 3.0 CNT 3



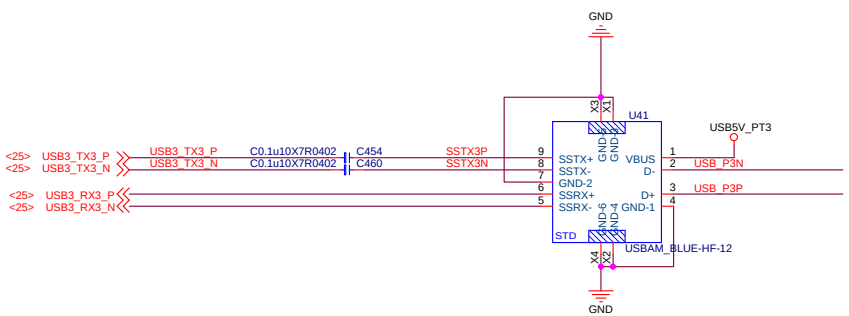






Replaced with 18pF 0201 capacitors

Connect to system ground



02/02 modify CN12 footprint.

USB3.0	N53-09M0681-AF2
USB3.0_LED	N53-13M0031-L06

MICRO-STAR INT'L CO.,LTD.

Title: DP/USB3.0

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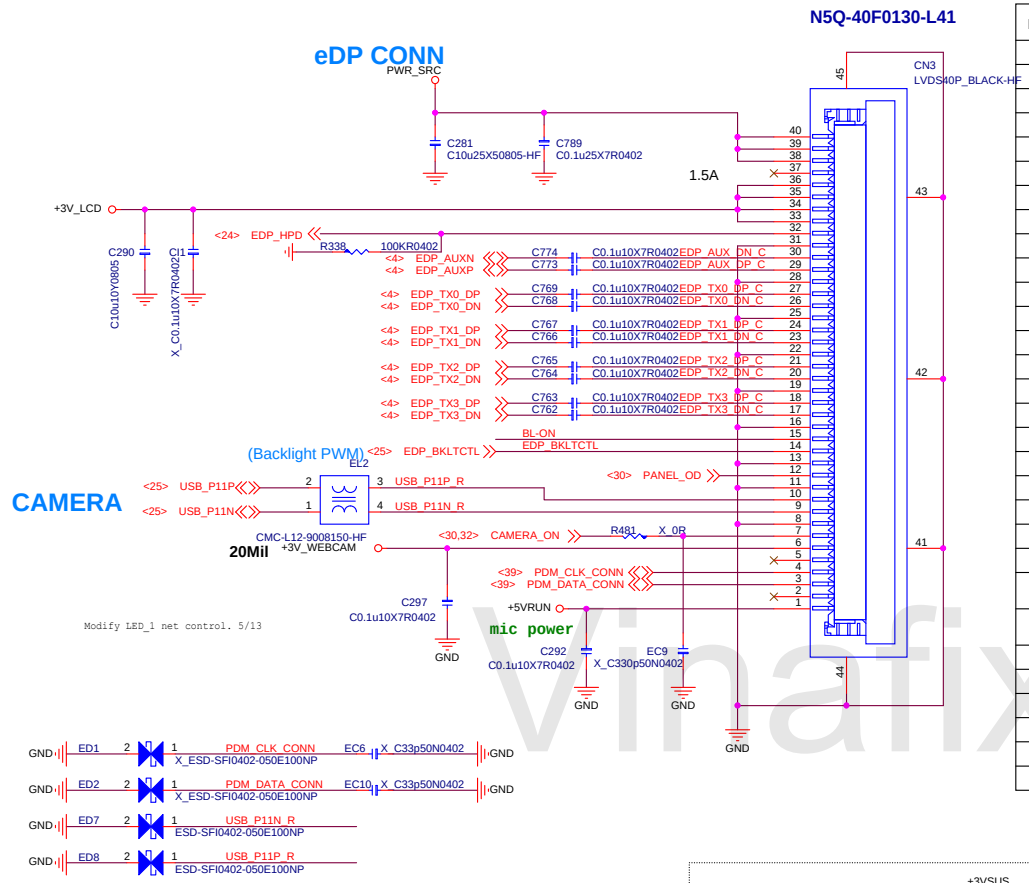
eDP/Camera



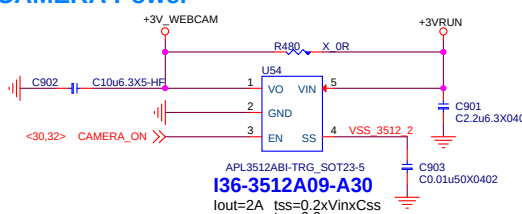
LCD Module Pin Define FOR FULL HD PANEL

Pin No	Symbol	Description
1	Vcom SDA	Vcom IIC SDA
2	H_GND	High Speed Ground
3	LAN1_N	Complement Signal-Lane 1
4	LAN1_P	True Signal-Main Lane 1
5	H_GND	High Speed Ground
6	LAN0_N	Complement Signal-Lane 0
7	LAN0_P	True Signal-Main Lane 0
8	H_GND	High Speed Ground
9	AUX+	True Signal-Auxiliary Channel
10	AUX-	Complement Signal-Auxiliary Channel
11	H_GND	High Speed Ground
12	LCD_VCC	Power Supply +3.3 V (typical)
13	LCD_VCC	Power Supply +3.3 V (typical)
14	NC	No Connection (Reserved for CMI test)
15	H_GND	Ground
16	H_GND	Ground
17	HPD	Hot Plug Detect
18	BL_GND	BL Ground
19	BL_GND	BL Ground
20	BL_GND	BL Ground
21	BL_GND	BL Ground
22	BL_EN	BL_Enable Signal of LED Converter
23	BL_PWM	PWM Dimming Control Signal of LED Converter
24	Vcom SCL	Vcom IIC SCL
25	NC	No Connection (Reserved)
26	LED_VCCS	BL Power
27	LED_VCCS	BL Power
28	LED_VCCS	BL Power
29	LED_VCCS	BL Power
30	**OE_EN**	**OD_Enable Signal of TCON**

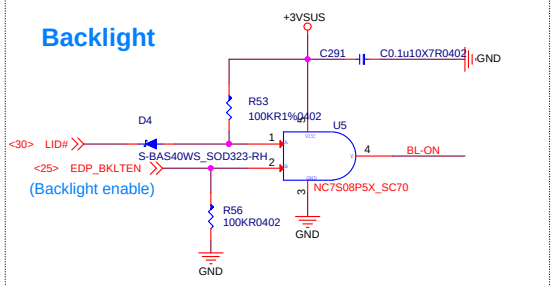
LCD Module Pin Define FOR WQHD PANEL

Pin No	Symbol	Description
1	NC	Reserved for LCD manufactureer's use
2	H_GND	High Speed Ground
3	Lane3_N	Complement Signal Link Lane 3
4	Lane3_P	True Signal Link Lane 3
5	H_GND	High Speed Ground
6	Lane2_N	Complement Signal Link Lane 2
7	Lane2_P	True Signal Link Lane 2
8	H_GND	High Speed Ground
9	Lane1_N	Complement Signal Link Lane 1
10	Lane1_P	True Signal Link Lane 1
11	H_GND	High Speed Ground
12	Lane0_N	Complement Signal Link Lane 0
13	Lane0_P	True Signal Link Lane 0
14	H_GND	High Speed Ground
15	AUX_CH_P	True Signal Auxiliary Channel
16	AUX_CH_N	Complement Signal Auxiliary Channel
17	H_GND	High Speed Ground
18	VDD	LCD logic and driver power(3.3V)
19	VDD	LCD logic and driver power(3.3V)
20	VDD	LCD logic and driver power(3.3V)
21	VDD	LCD logic and driver power(3.3V)
22	BIST	BIST patterns selection L : Disable [default] , H : Enable
23	LCD_GND	LCD logic and driver ground
24	LCD_GND	LCD logic and driver ground
25	LCD_GND	LCD logic and driver ground
26	LCD_GND	LCD logic and driver ground
27	HPD	HPD signal pin
28	BL_GND	Backlight ground
29	BL_GND	Backlight ground
30	BL_GND	Backlight ground
31	BL_GND	Backlight ground
32	BL_ENABLE	Backlight On/0ff
33	BL_PWM_DIM	System PWM
34	NC	Reserved for LCD manufacturer's use
35	NC	Reserved for LCD manufacturer's use
36	VBL	Backlight power
37	VBL	Backlight power
38	VBL	Backlight power
39	VBL	Backlight power
40	**OE_EN**	**OD_Enable Signal of TCON**

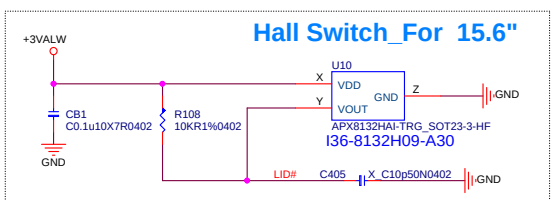
CAMERA Power



Backlight



Hall Switch_For 15.6"



MICRO-STAR INT'L CO.,LTD.

Title: eDP/Camera

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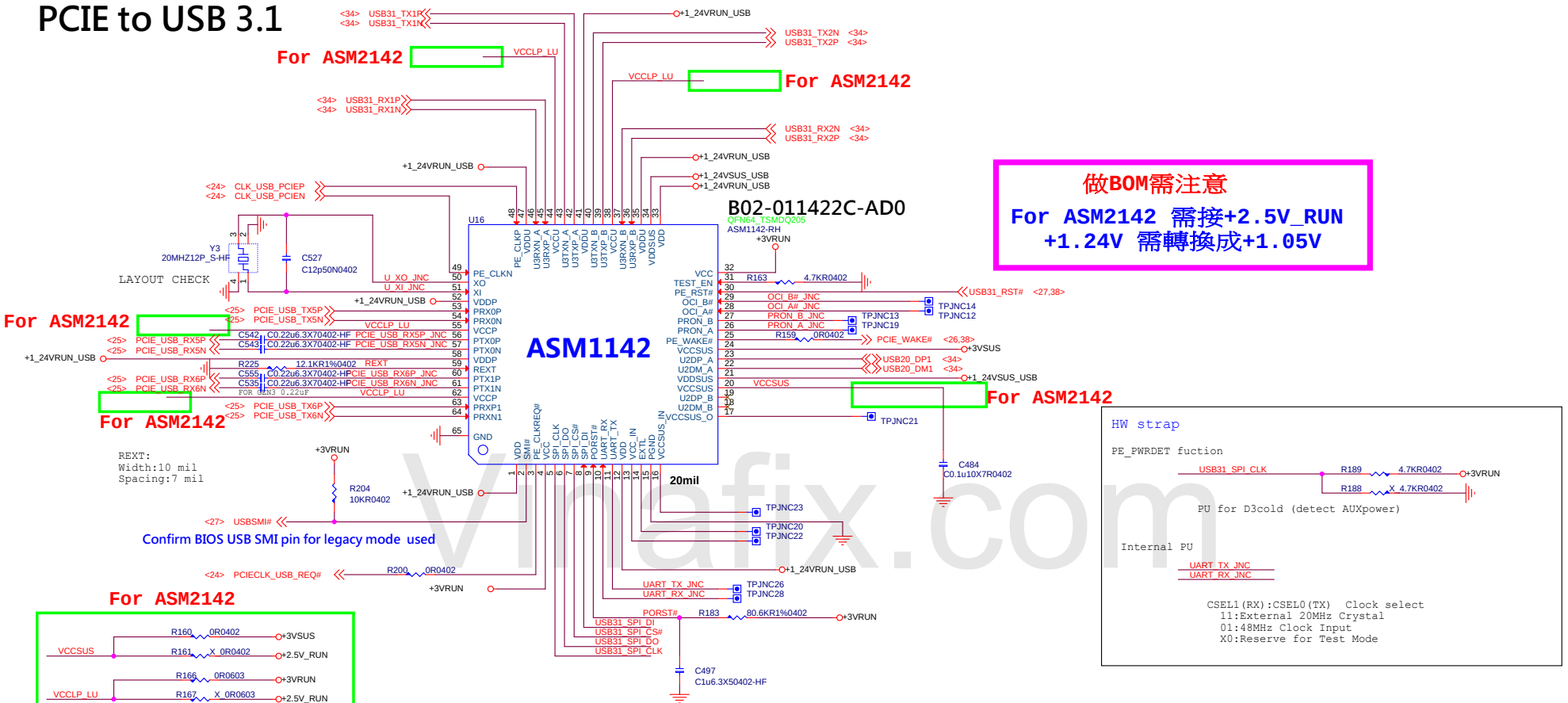
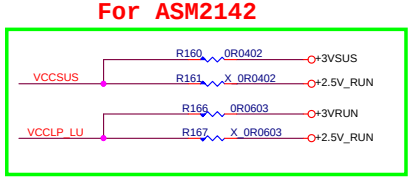
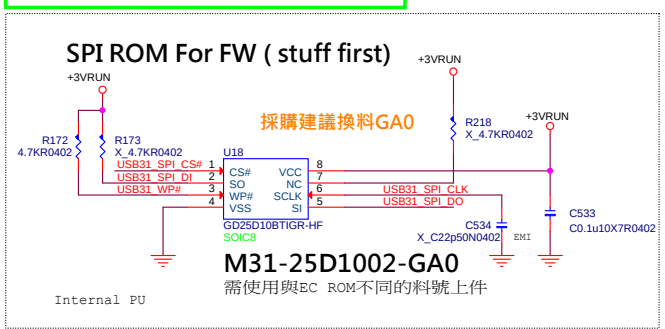
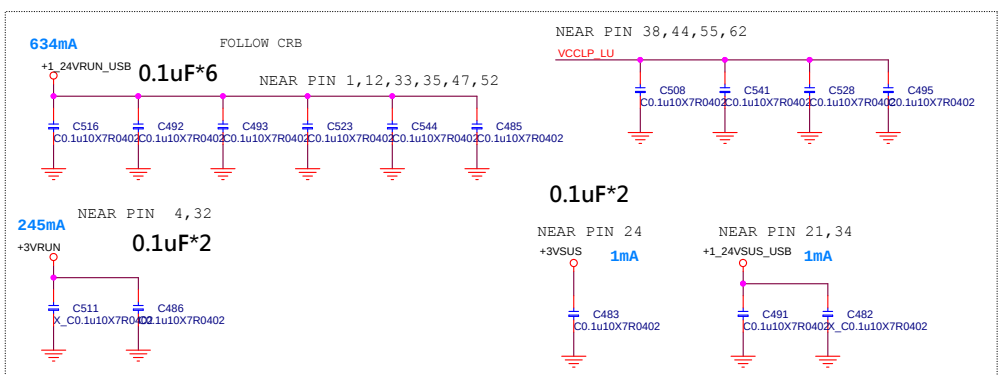
USB 3.0/ USB.3.1

PCIE to USB 3.1









MICRO-STAR INT'L CO.,LTD.		
Title: ASM1142		
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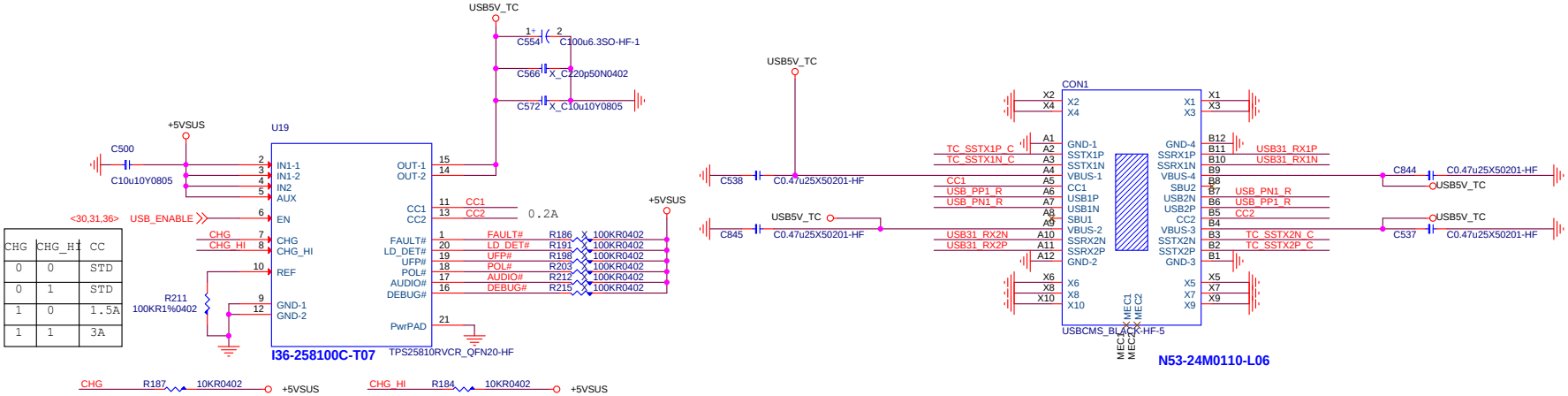
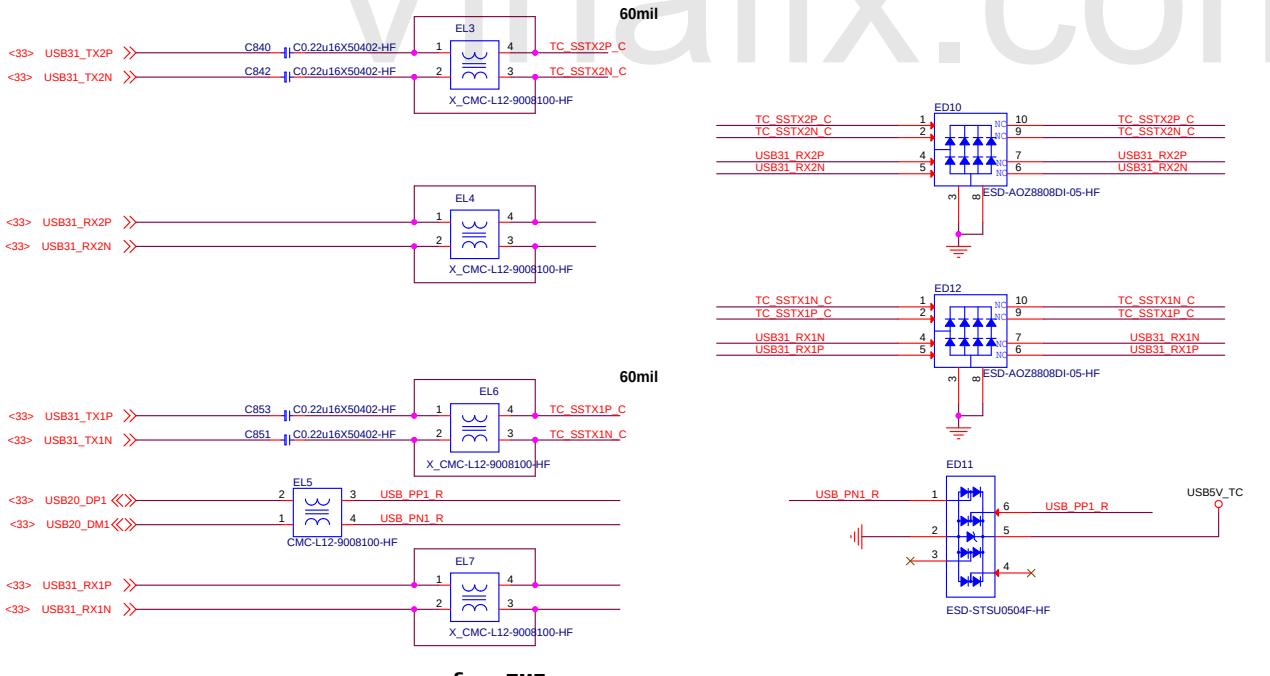
Type C



USB3.1 TYPE C



for EMI

MICRO-STAR INT'L CO.,LTD.

Title: USB3.1 Type-C

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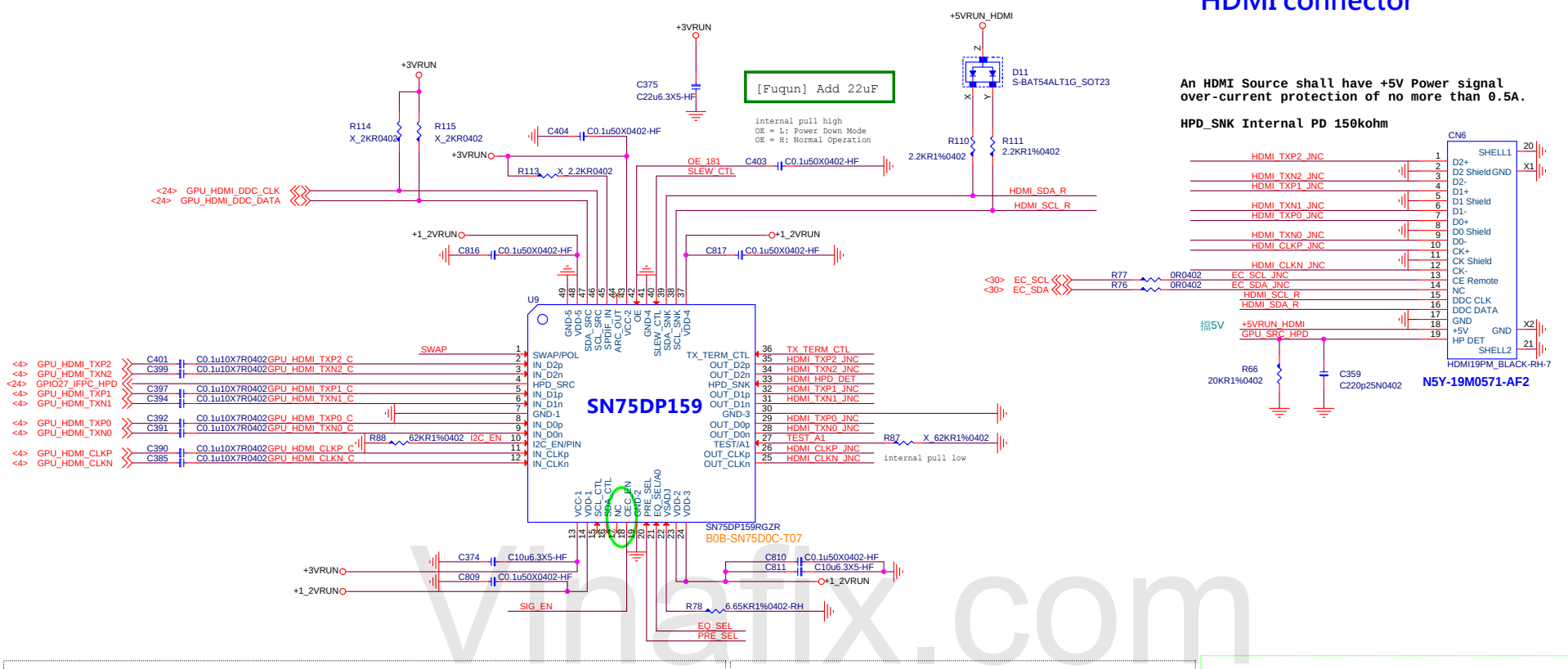
HDMI connector



SWAP
R116 X_62KR1%0402 +3VRUN VCC/2 Normal operation
R107 X_62KR1%0402

TX_TERM_CTL R90 X_62KR1%0402 +3VRUN
R105 X_62KR1%0402
TX_TERM_CTL = H, No transmit Termination
TX_TERM_CTL = L, Transmit Termination impedance in 75~150Ω
TX_TERM_CTL = Vcc/2, Automaticly selects the termination

PRE_SEL R82 X_62KR1%0402 +3VRUN
R80 62KR1%0402
PRE_SEL = L: -2.5dB
PRE_SEL = Vcc/2: 0dB
PRE_SEL = H: -5dB

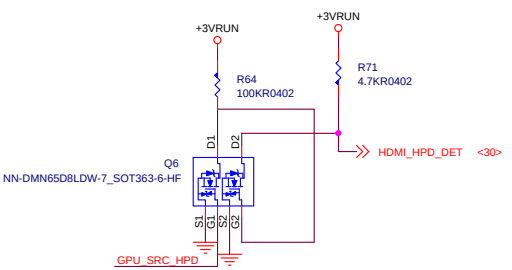
EQ_SEL R79 X_62KR1%0402 +3VRUN
R74 X_62KR1%0402
EQ_SEL = L: Fixed EQ at 7.5dB @ 3GHz
EQ_SEL = Vcc/2: Adaptive EQ
EQ_SEL = H: Fixed at 14B @ 3GHz

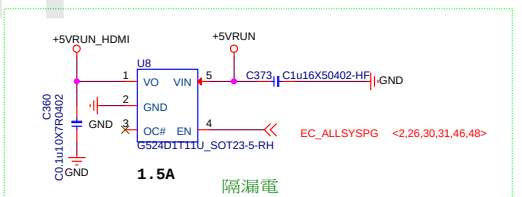
SLEW_CTL R109 62KR1%0402 +3VRUN
R112 X_62KR1%0402
SLEW_CTL = H, Fastest data rate(Default)
SLEW_CTL = L, 20ps slow
SLEW_CTL = Vcc/2, 40ps slow

SIG_EN R81 X_62KR1%0402
SIG_EN = L: Signal Detect Circuit Disabled (Default)
SIG_EN = H: Signal Detect Circuit Enabled:
When no valid clock device enters Standby Mode
internal pull low

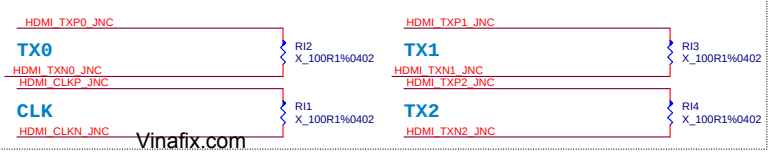
20160901 Vendor suggest R597,R592 stuff

HPD Level Shift 5V to 3V





EMI



MSI MICRO-STAR INT'L CO.,LTD.			
Title: HDMI			
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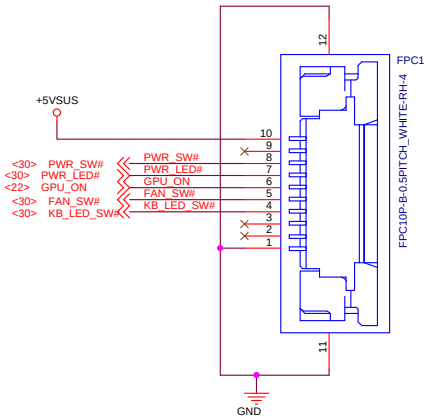
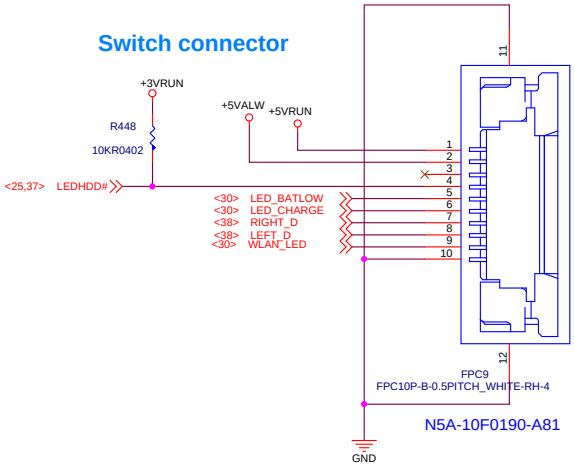
CPU FAN/CPU FAN/POWER CONN/ LED CONN

Power Switch Connector



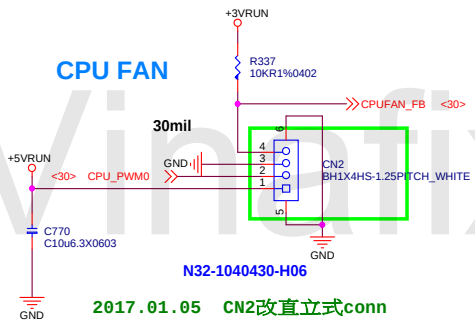
N5A-10F0190-A81

Switch connector



N5A-10F0190-A81

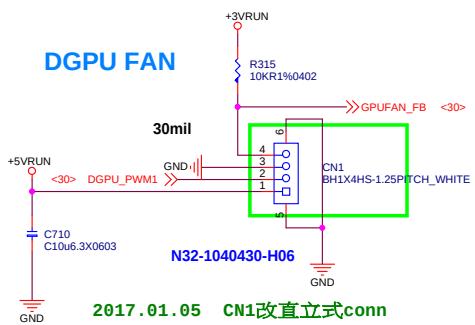
CPU FAN



N32-1040430-H06

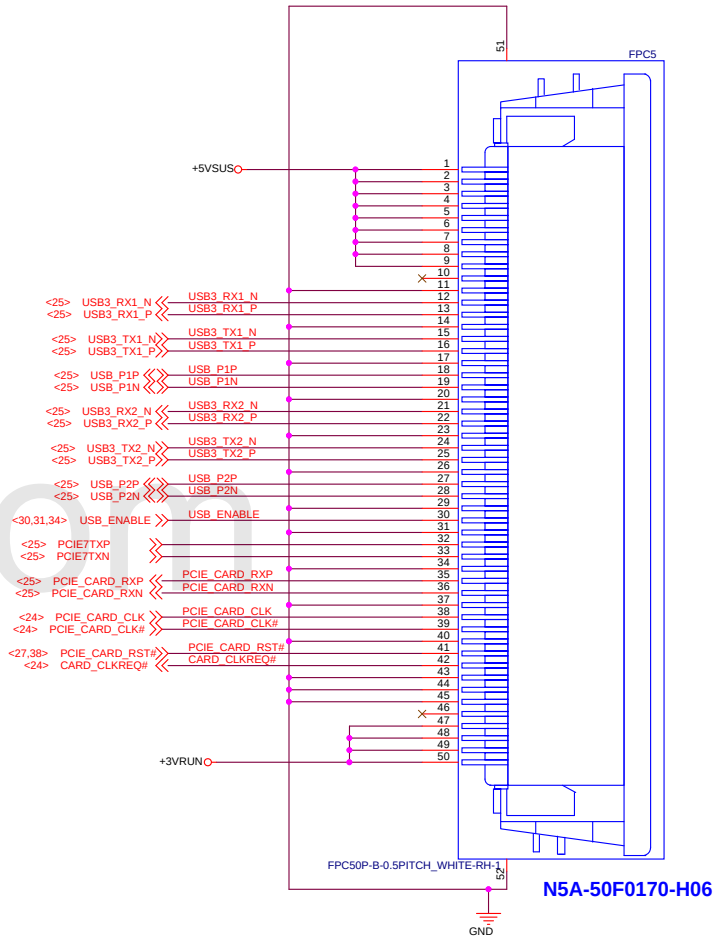
2017.01.05 CN2改直立式conn

DGPU FAN



N32-1040430-H06

2017.01.05 CN1改直立式conn



N5A-50F0170-H06

MICRO-STAR INT'L CO.,LTD.	
Title	FAN/BTB,PWR,LED CONN
Size	Document Number: MS-16P3/17C3
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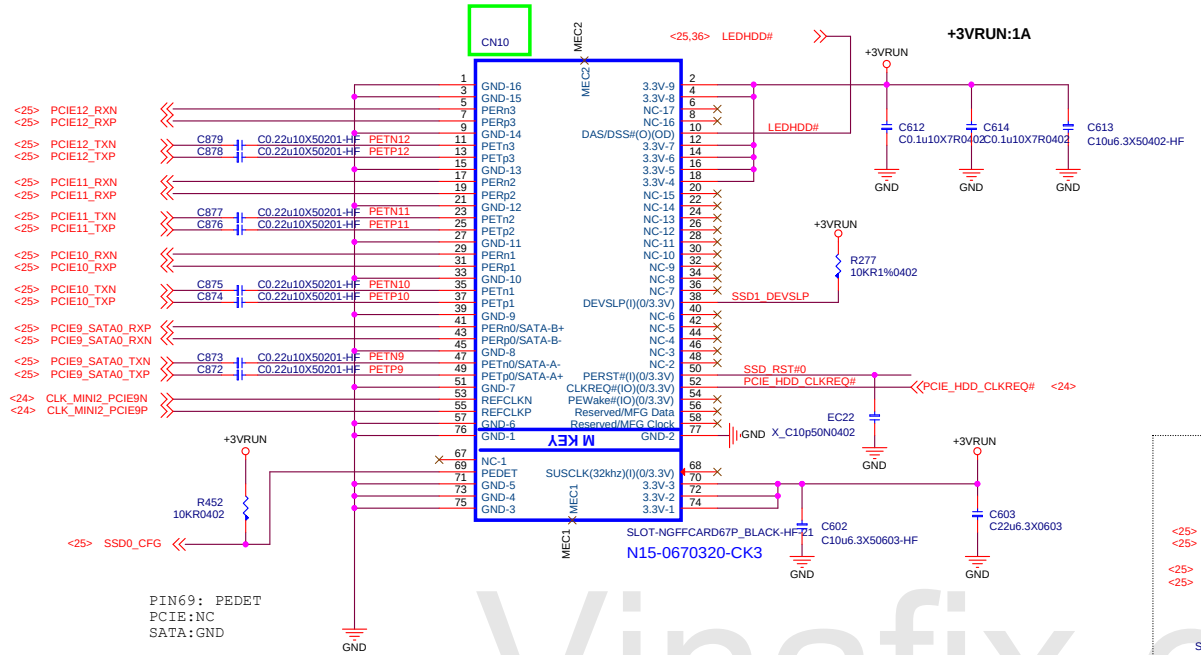
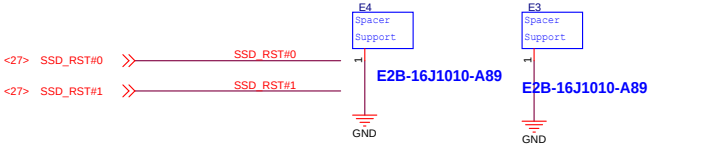
M2 SSD

PCIEx4 /SATA SSD

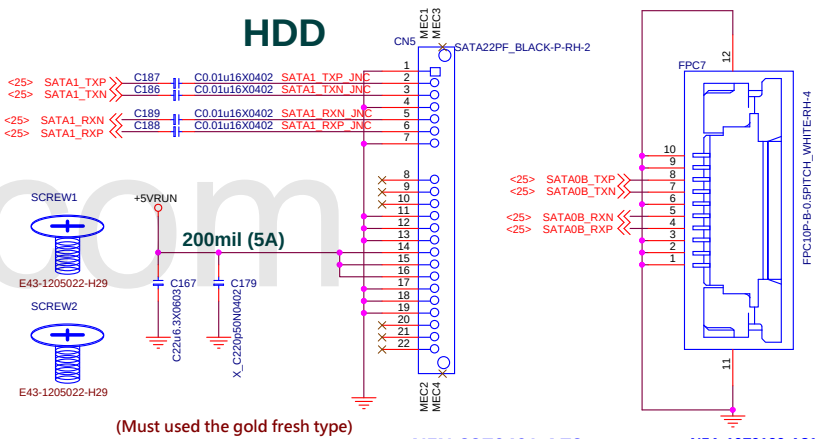


PIN69: PEDET
PCIE:NC
SATA:GND

40	NC	No Connect
41	SATA-B+/PERn0	Host receiver differential signal pair
42	NC	No Connect
43	SATA-B-/PERp0	Host receiver differential signal pair
44	NC	No Connect
45	GND	Ground
46	NC	No Connect
47	SATA-A-/PETn0	Host Transmitter differential signal pair
48	NC	No Connect
49	SATA-A+/PETp0	Host transmitter differential signal pair



HDD



(Must used the gold fresh type)

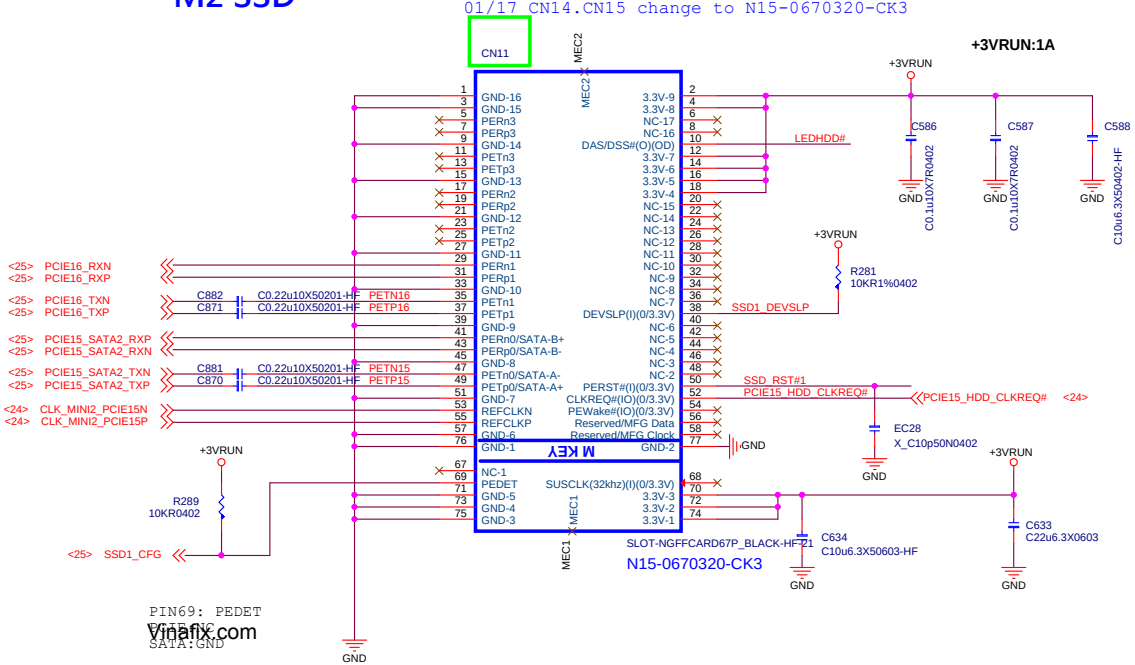
N5N-22F0401-AF2

N5A-10F0190-A81

M2 SSD

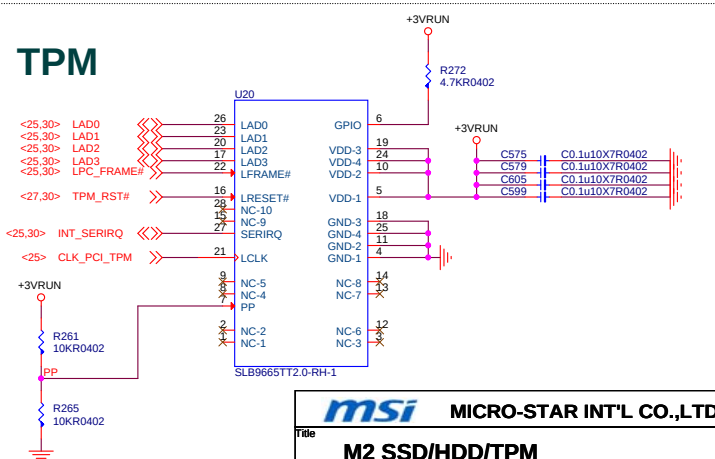
PCIEx2 /SATA SSD

01/17 CN14.CN15 change to N15-0670320-CK3



PIN69: PEDET
SATA:GND

TPM



MSI	MICRO-STAR INT'L CO.,LTD.	
Title	M2 SSD/HDD/TPM	
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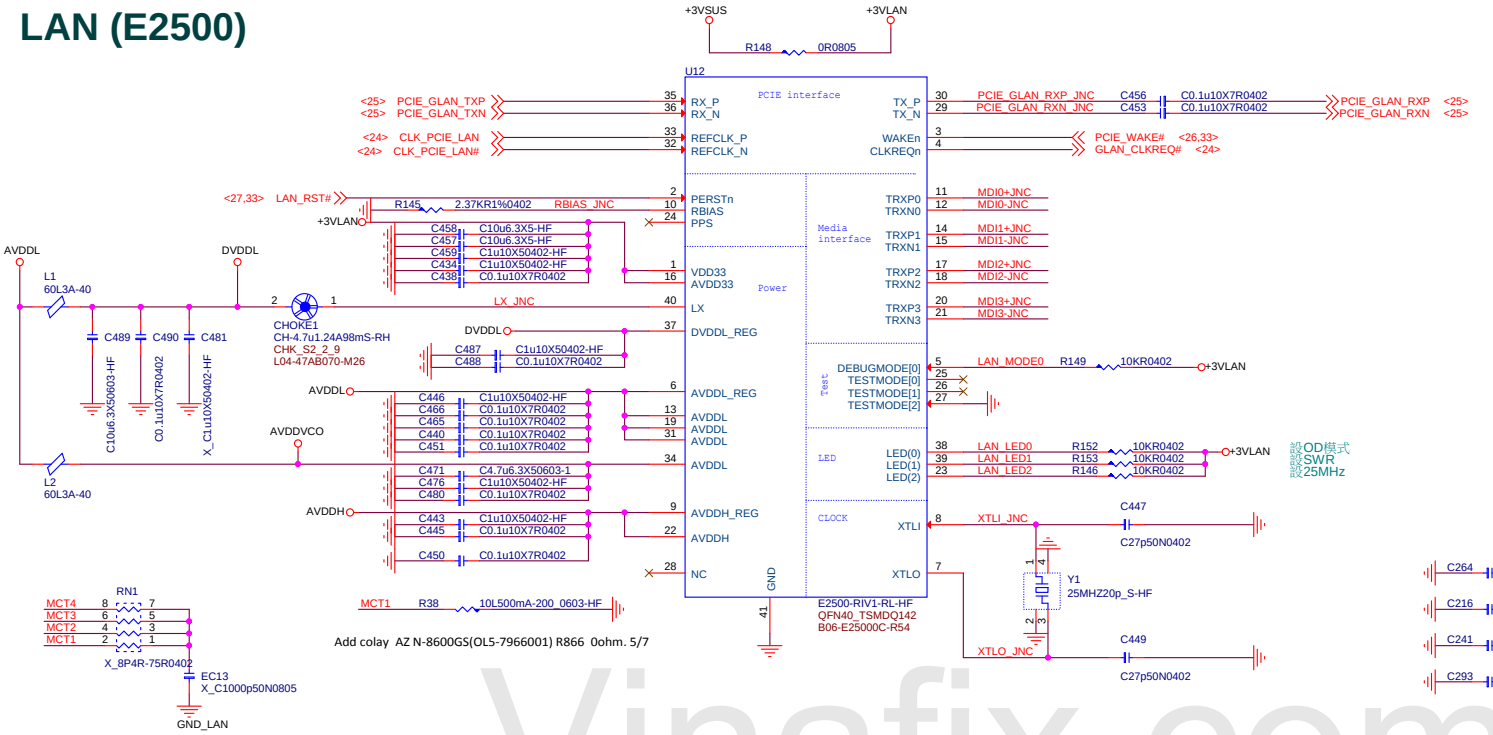
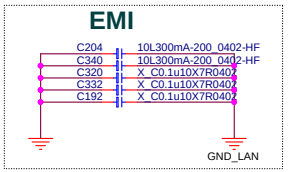
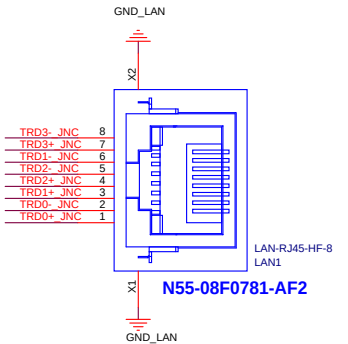
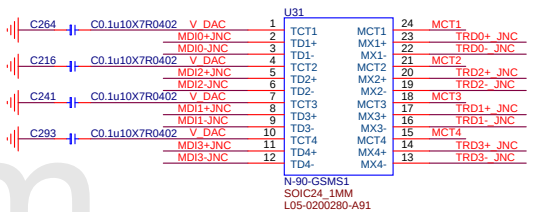
LAN (E2500)



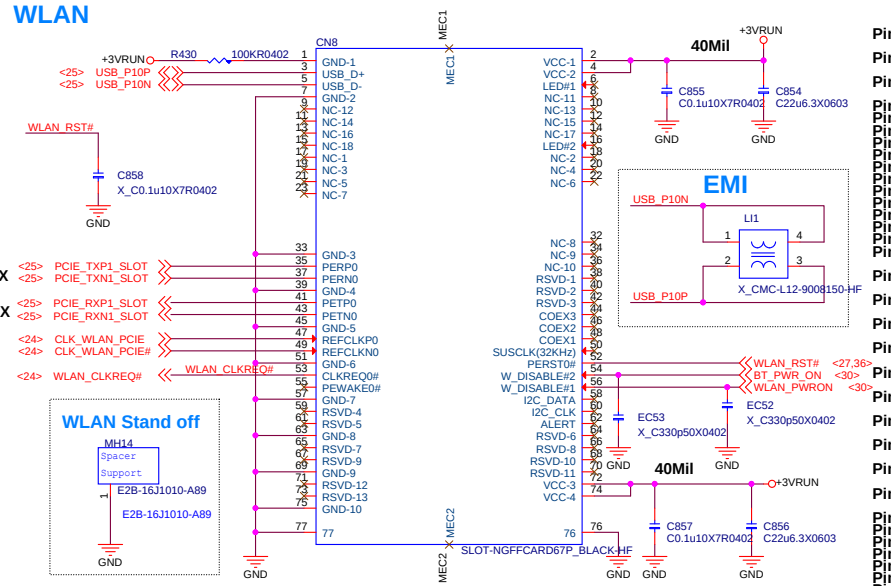






WLAN /Touch Pad

WLAN

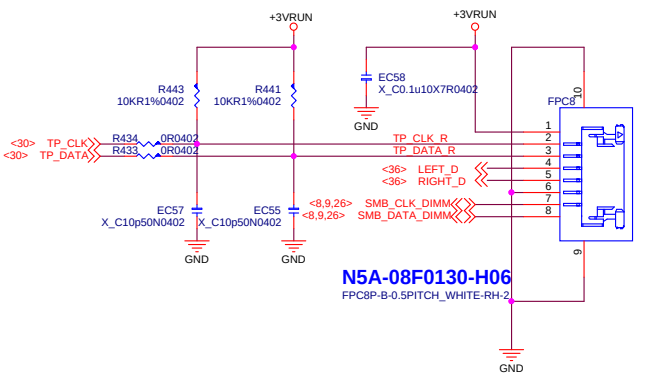


Vinafix.com N15-0670260-L06

SLOT_NGFFCARD67_15

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

Touch Pad



MICRO-STAR INT'L CO.,LTD.		
Title	GIGA_LAN/WLAN/Touch Pad	
Size	Document Number	Rev
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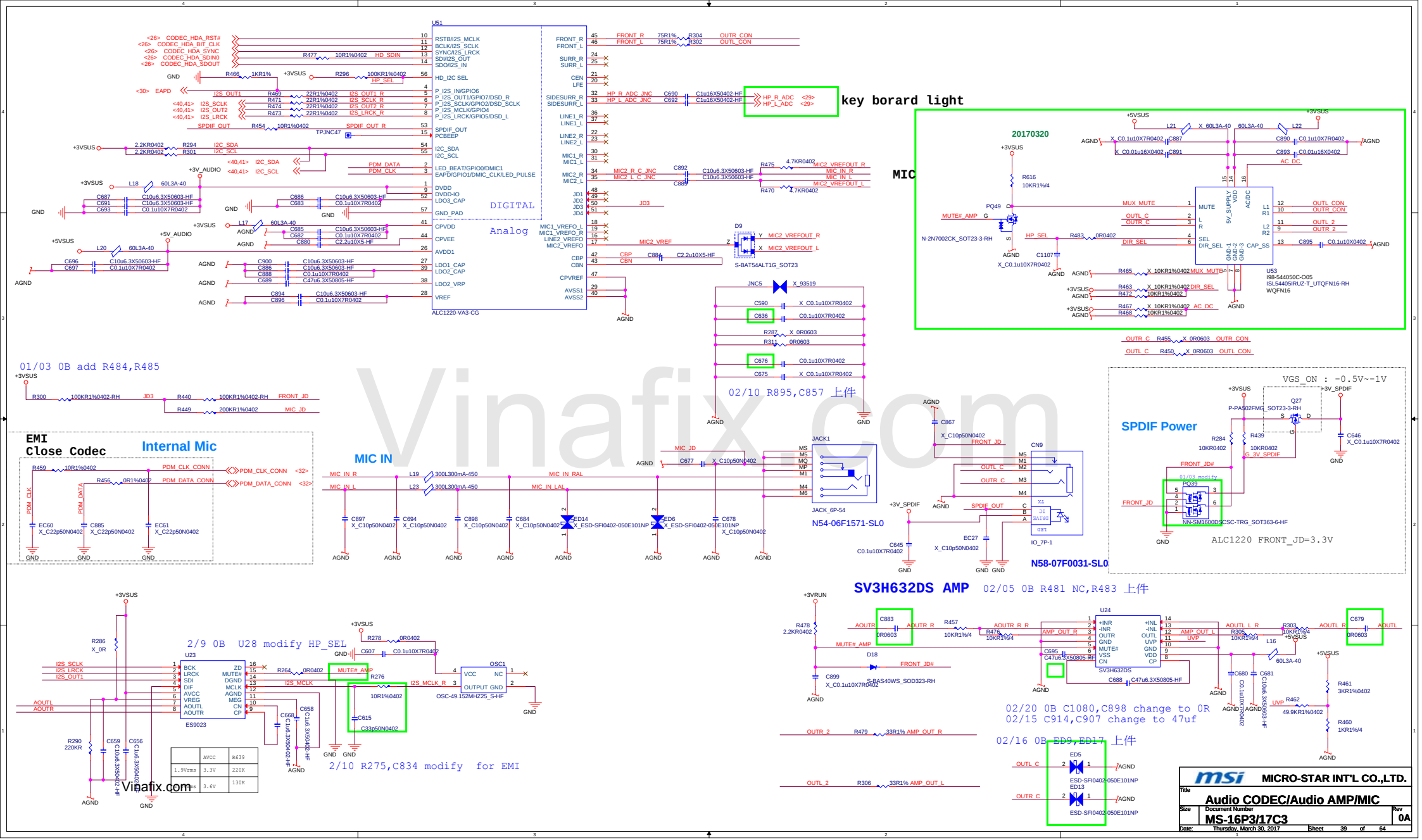
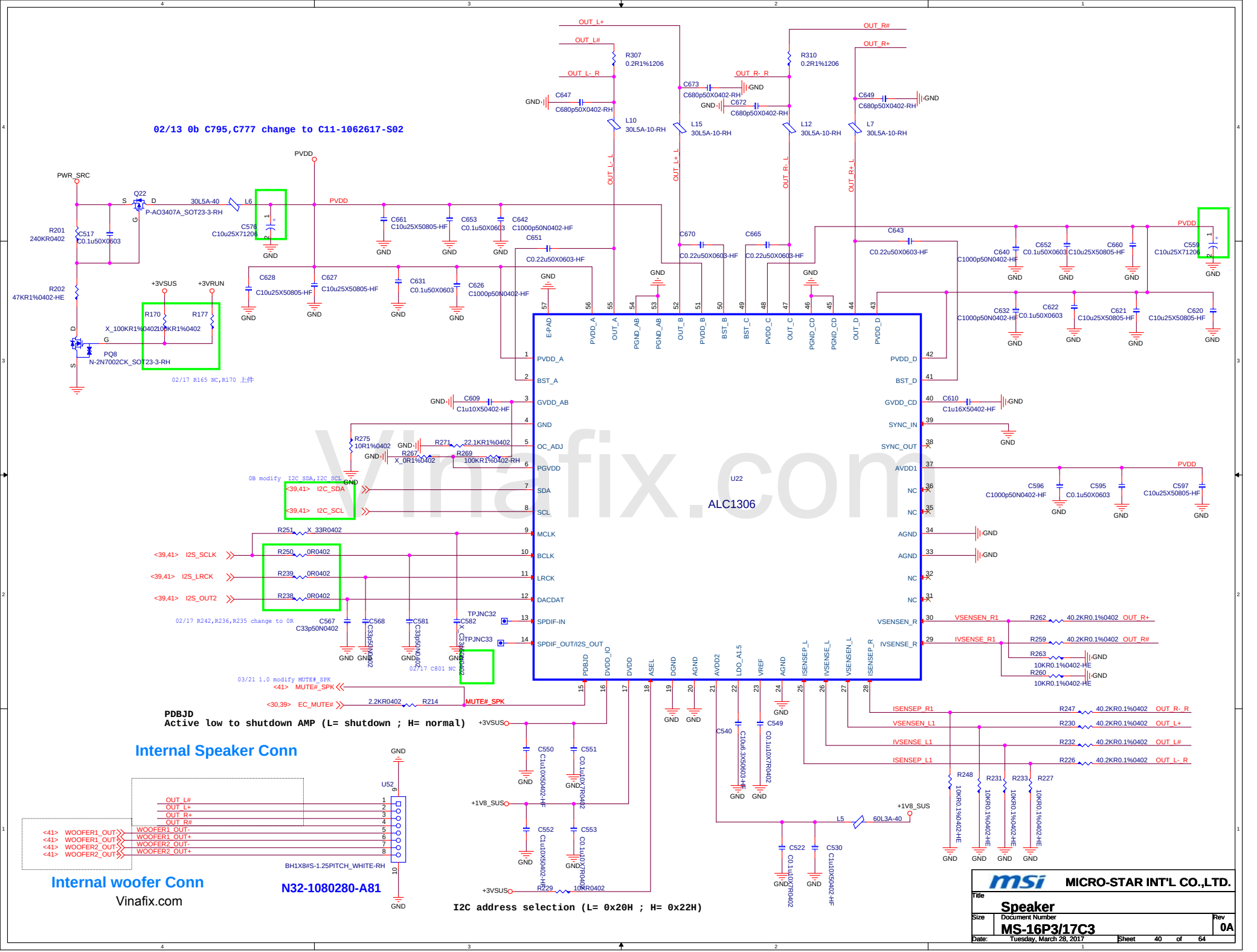

key borard light
MIC
20170320
01/03 0B add R484,R485
02/10 R895,C857 上件
EMI
Close Codec
Internal Mic
MIC IN
SPDIF Power
VGS_ON : -0.5V~-1V
ALC1220 FRONT_JD=3.3V
SV3H632DS AMP
02/05 0B R481 NC,R483 上件
2/9 0B U28 modify HP_SEL
2/10 R275,C834 modify for EMI
02/20 0B C1080,C898 change to 0R
02/15 C914,C907 change to 47uf
02/16 0B ED9,ED17 上件
N54-06F1571-SL0
N58-07F0031-SL0
MICRO-STAR INT'L CO.,LTD.
Audio CODEC/Audio AMP/MIC
MS-16P3/17C3
Vinafix.com


02/13 0b C795,C777 change to C11-1062617-S02
ALC1306
U22
PDBJD
Active low to shutdown AMP (L= shutdown ; H= normal)
I2C address selection (L= 0x20H ; H= 0x22H)
Internal Speaker Conn
Internal woofer Conn
N32-1080280-A81
Vinafix.com
MICRO-STAR INT'L CO.,LTD.
Title
Speaker
Size
Document Number
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0A
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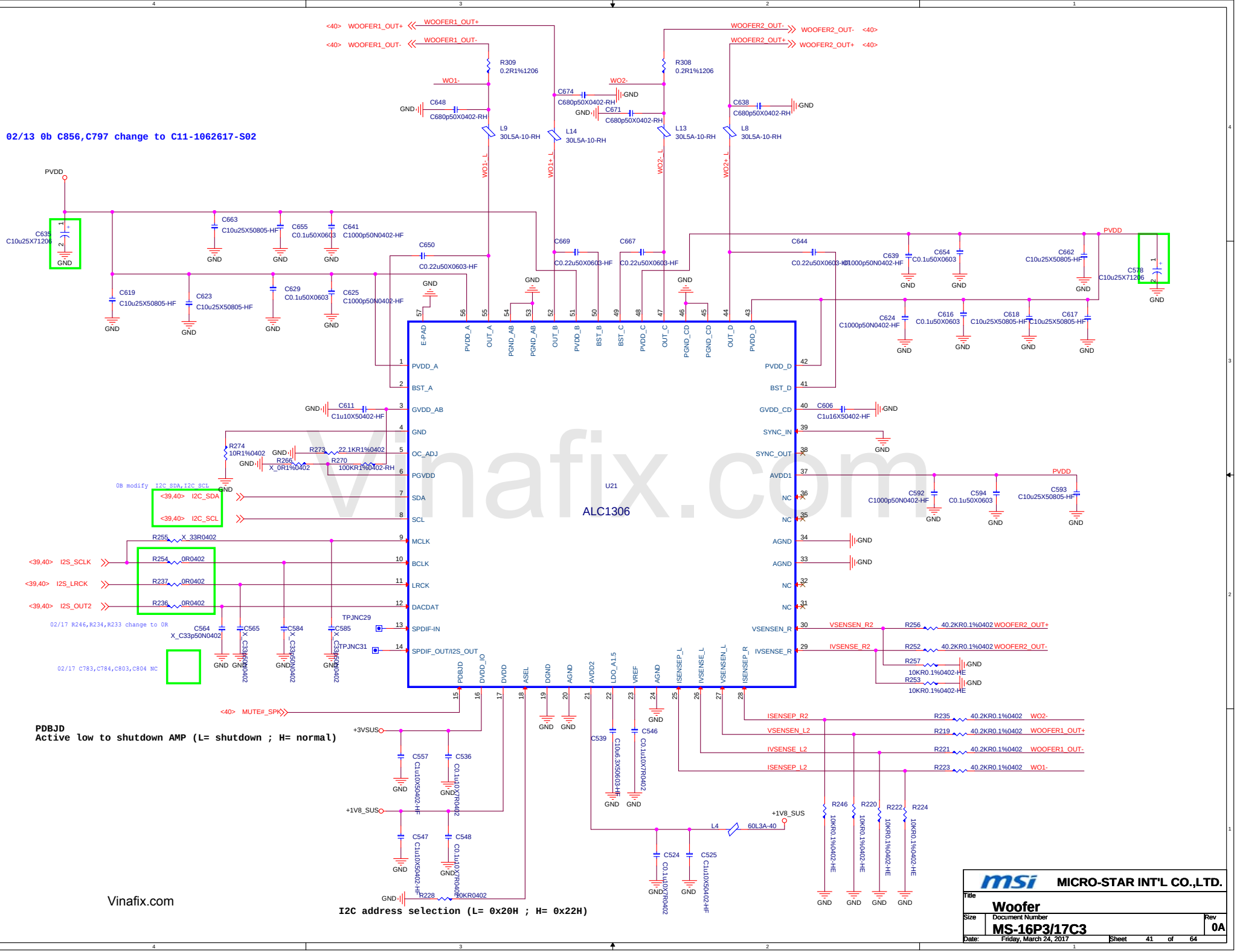
02/13 0b C856,C797 change to C11-1062617-S02
ALC1306
U21
PDBJD
Active low to shutdown AMP (L= shutdown ; H= normal)
I2C address selection (L= 0x20H ; H= 0x22H)
Vinafix.com
MICRO-STAR INT'L CO.,LTD.
Title
Woofer
Size
Document Number
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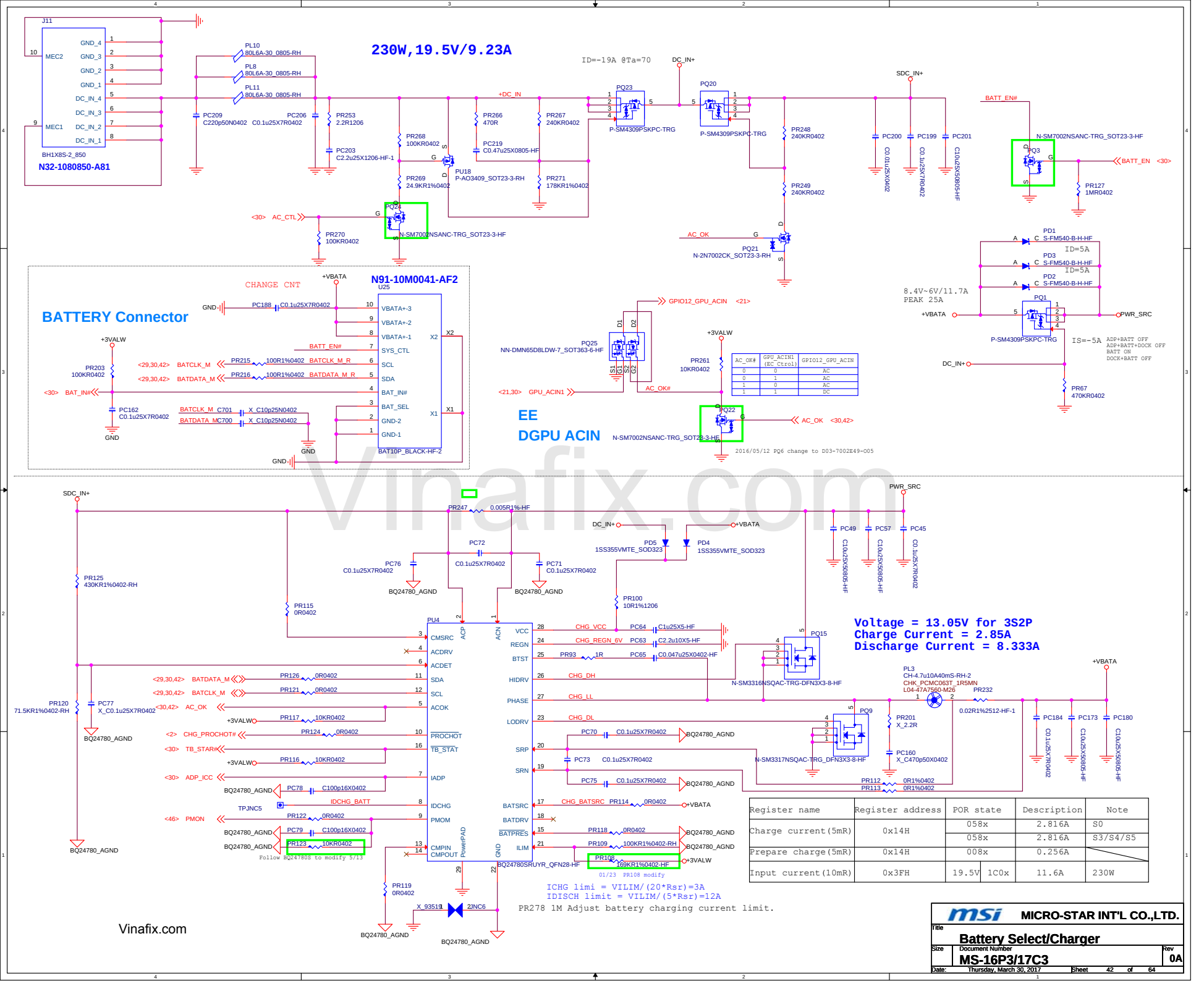

AC_OK#	GPU_ACIN1 (EC Ctrol)	GPIO12_GPU_ACIN
0	0	AC
0	1	AC
1	0	AC
1	1	DC

Register name	Register address	POR state	Description	Note
Charge current(5mR)	0x14H	058x	2.816A	S0
		058x	2.816A	S3/S4/S5
Prepare charge(5mR)	0x14H	008x	0.256A	
Input current(10mR)	0x3FH	19.5V 1C0x	11.6A	230W

Title	Battery Select/Charger
Size	Document Number: MS-16P3/17C3
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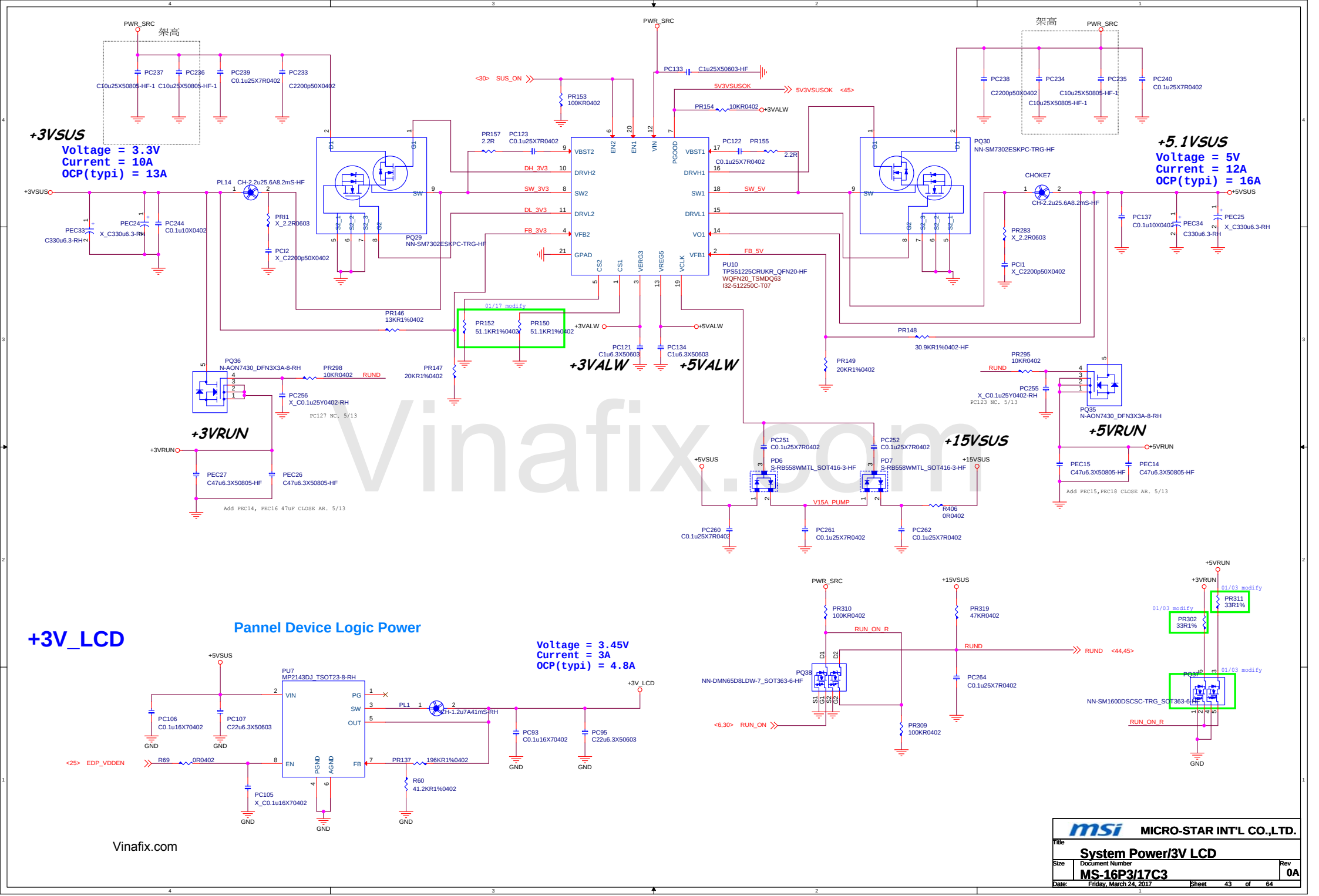
MICRO-STAR INT'L CO.,LTD.



MICRO-STAR INT'L CO.,LTD.			
Title: System Power/3V LCD			
Size	Document Number: MS-16P3/17C3		Rev: 0A
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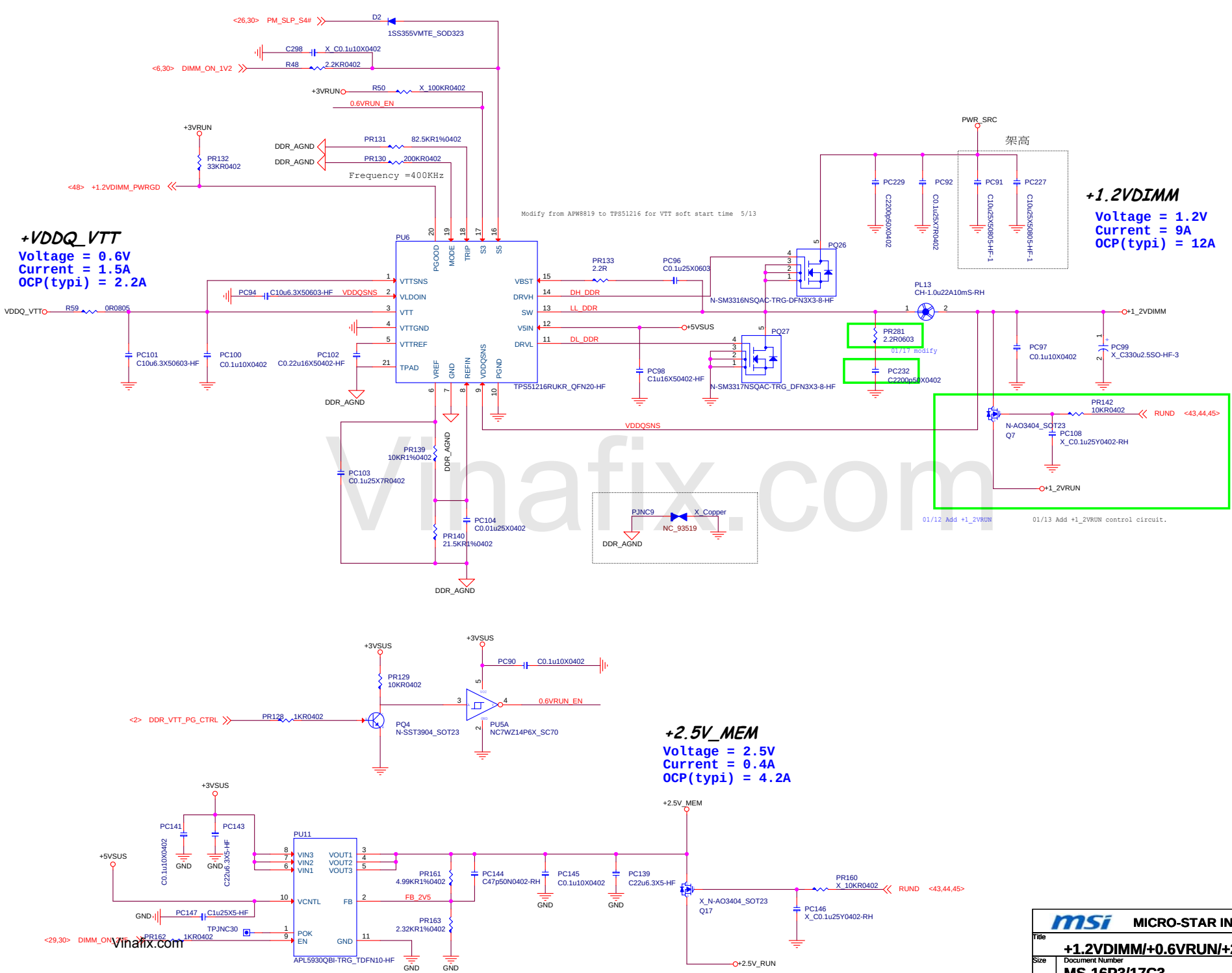

Title	+1.2VDIMM/+0.6VRUN/+2.5VMEM
Size	Document Number: MS-16P3/17C3
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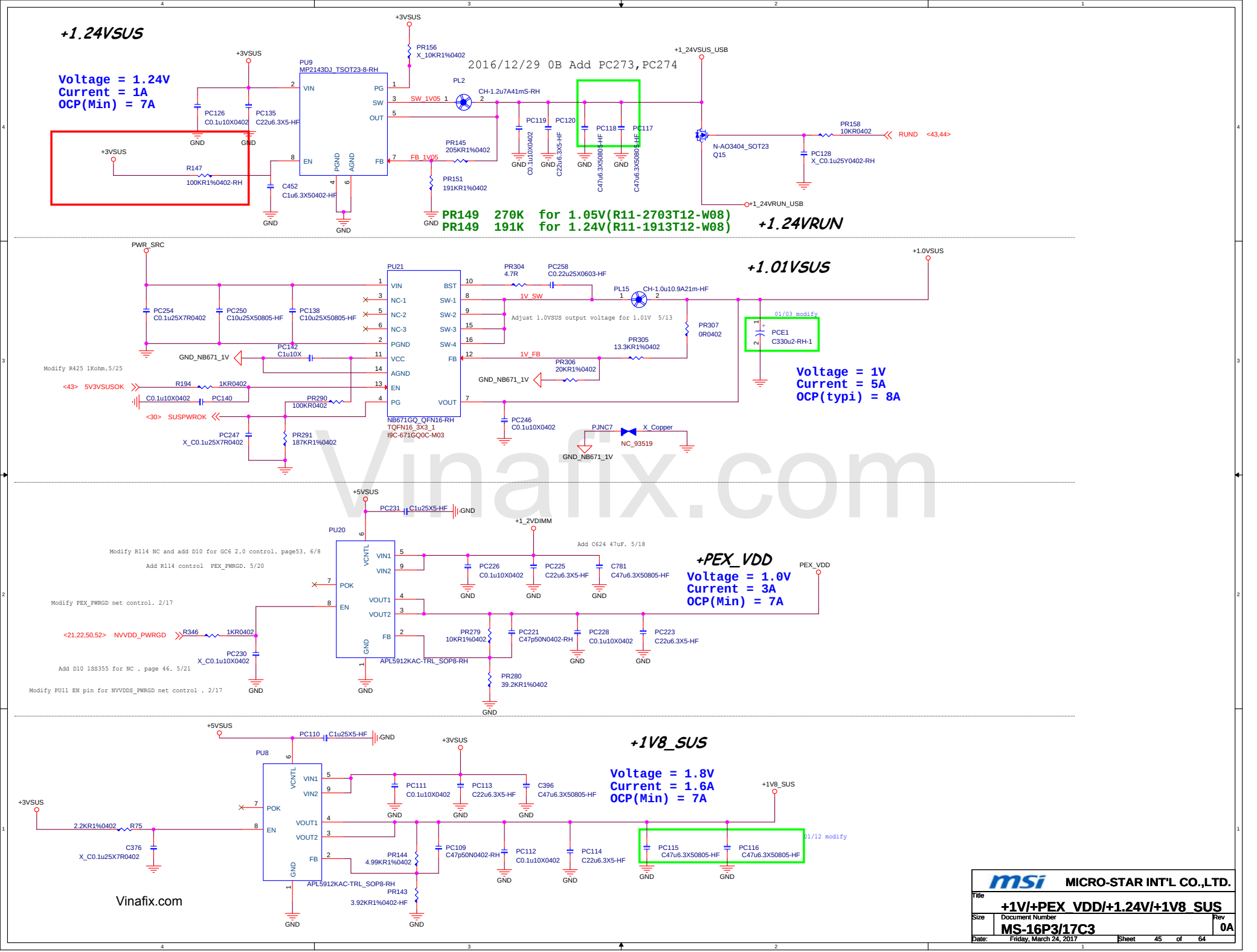
MICRO-STAR INT'L CO.,LTD.


+1.24VSUS
Voltage = 1.24V
Current = 1A
OCP(Min) = 7A
+3VSUS
PU9
MP2143DJ_TSOT23-8-RH
VIN
PG
SW
OUT
EN
PGND
AGND
FB
PR156
X_10KR1%0402
2016/12/29 0B Add PC273,PC274
PL2
CH-1.2u7A41mS-RH
SW_1V05
FB_1V05
PR145
205KR1%0402
PR151
191KR1%0402
PC126
C0.1u10X0402
PC135
C22u6.3X5-HF
R147
100KR1%0402-RH
C452
C1u6.3X50402-HF
PC119
PC120
PC118
PC117
C47u6.3X50805-HF
+1_24VSUS_USB
N-AO3404_SOT23
Q15
PR158
10KR0402
RUND
<43,44>
PC128
X_C0.1u25Y0402-RH
+1_24VRUN_USB
PR149 270K for 1.05V(R11-2703T12-W08)
PR149 191K for 1.24V(R11-1913T12-W08)
+1.24VRUN
+1.01VSUS
PWR_SRC
PU21
VIN
BST
NC-1
SW-1
NC-2
SW-2
NC-3
SW-3
PGND
SW-4
VCC
FB
AGND
EN
PG
VOUT
NB671GQ_QFN16-RH
TQFN16_3X3_1
I9C-671GQ0C-M03
PR304
4.7R
PC258
C0.22u25X0603-HF
1V_SW
PL15
CH-1.0u10.9A21m-HF
Adjust 1.0VSUS output voltage for 1.01V 5/13
PR307
0R0402
PR305
13.3KR1%0402
1V_FB
PR306
20KR1%0402
01/03 modify
PCE1
C330u2-RH-1
+1.0VSUS
Voltage = 1V
Current = 5A
OCP(typi) = 8A
PC254
C0.1u25X7R0402
PC250
C10u25X50805-HF
PC138
C10u25X50805-HF
PC142
C1u10X
GND_NB671_1V
Modify R425 1Kohm.5/25
<43> 5V3VSUSOK
R194
1KR0402
C0.1u10X0402
PC140
PR290
100KR0402
<30> SUSPWROK
PC247
X_C0.1u25X7R0402
PR291
187KR1%0402
PC246
C0.1u10X0402
PJNC7
X_Copper
NC_93519
+5VSUS
PC231
C1u25X5-HF
PU20
VCNTL
VIN1
VIN2
POK
EN
VOUT1
VOUT2
FB
GND
APL5912KAC-TRL_SOP8-RH
+1_2VDIMM
Add C624 47uF. 5/18
PC226
C0.1u10X0402
PC225
C22u6.3X5-HF
C781
C47u6.3X50805-HF
+PEX_VDD
Voltage = 1.0V
Current = 3A
OCP(Min) = 7A
PEX_VDD
Modify R114 NC and add D10 for GC6 2.0 control. page53. 6/8
Add R114 control PEX_PWRGD. 5/20
Modify PEX_PWRGD net control. 2/17
<21,22,50,52> NVVDD_PWRGD
R346
1KR0402
PC230
X_C0.1u10X0402
Add D10 1SS355 for NC . page 46. 5/21
Modify PU11 EN pin for NVVDDS_PWRGD net control . 2/17
PR279
10KR1%0402
PC221
C47p50N0402-RH
PC228
C0.1u10X0402
PC223
C22u6.3X5-HF
PR280
39.2KR1%0402
+1V8_SUS
Voltage = 1.8V
Current = 1.6A
OCP(Min) = 7A
+1V8_SUS
PC110
C1u25X5-HF
PU8
PC111
C0.1u10X0402
PC113
C22u6.3X5-HF
C396
C47u6.3X50805-HF
2.2KR1%0402
R75
C376
X_C0.1u25X7R0402
PR144
4.99KR1%0402
PR143
3.92KR1%0402-HF
PC109
C47p50N0402-RH
PC112
C0.1u10X0402
PC114
C22u6.3X5-HF
PC115
C47u6.3X50805-HF
PC116
C47u6.3X50805-HF
01/12 modify
Vinafix.com
MICRO-STAR INT'L CO.,LTD.
Title
+1V/+PEX_VDD/+1.24V/+1V8_SUS
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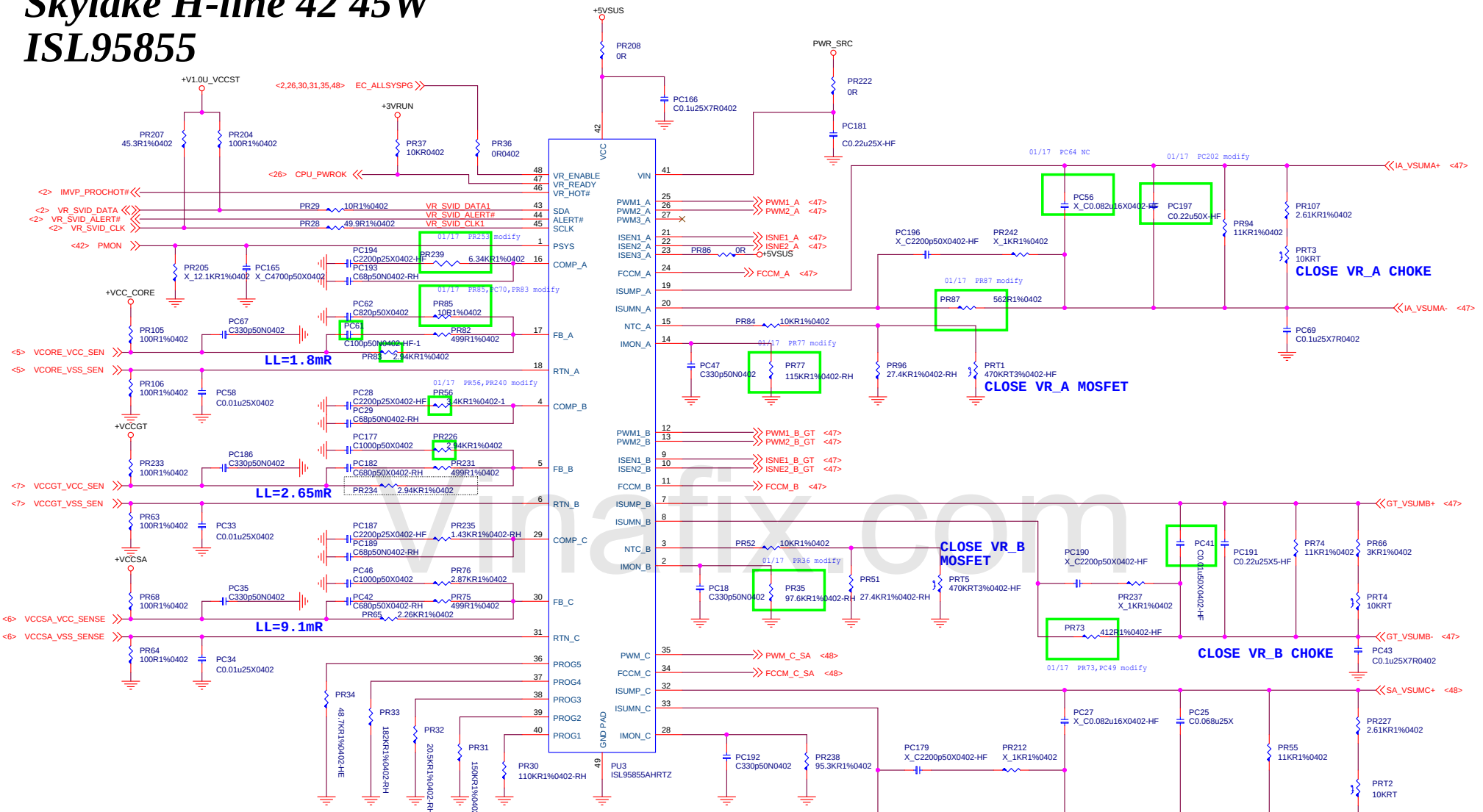
Skylake H-line 42 45W
ISL95855



SKL-H(4+2)

PROG1	110KR	Vboot=0V, Selw rate=30mV/us, VR_A=IA, VR_B=GT, VR_C=SA
PROG2	150KR	IMAX VR_A=70A, VR_A PSI1=1PH
PROG3	20.5KR	IMAX VR_B=60A, DROOP VR_B Active
PROG4	182KR	DROOP VR_A Active, DROOP VR_C Active, VR_A VR_B Frequency=750kHz
PROG5	48.7KR	IMAX VR_C=12A, Frequency=450kHz

MICRO-STAR INT'L CO.,LTD.

Title: CPU Power (ISL95855)

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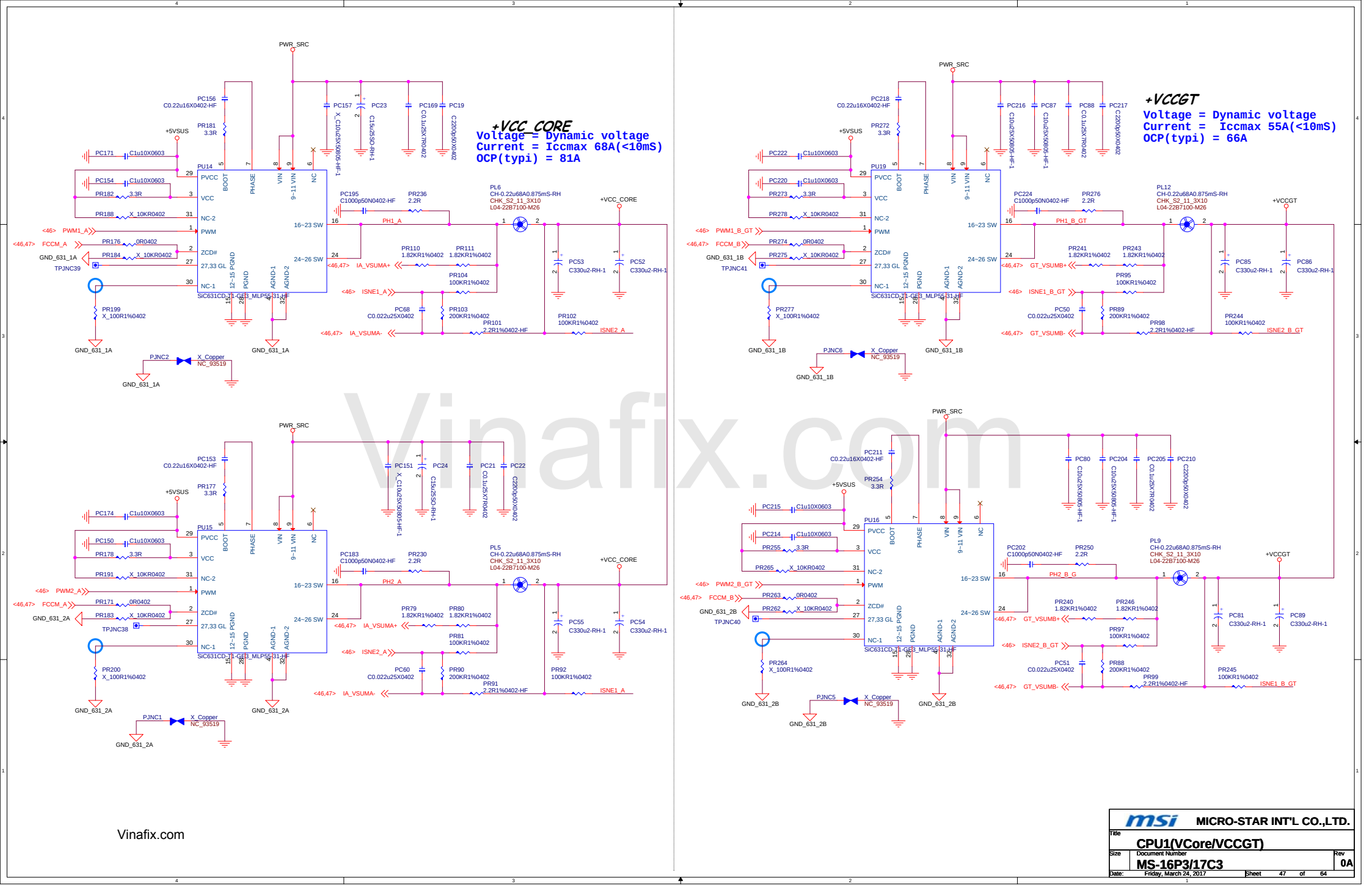
+VCC_CORE
Voltage = Dynamic voltage
Current = Iccmax 68A(<10mS)
OCP(typi) = 81A
+VCCGT
Voltage = Dynamic voltage
Current = Iccmax 55A(<10mS)
OCP(typi) = 66A
PWR_SRC
+5VSUS
PU14
PU19
PU15
PU16
SiC631CD-T1-GE3_MLP55-31-HF
PL6
PL12
PL5
PL9
+VCC_CORE
+VCCGT
GND_631_1A
GND_631_1B
GND_631_2A
GND_631_2B
Vinafix.com
MICRO-STAR INT'L CO.,LTD.
CPU1(VCore/VCCGT)
MS-16P3/17C3
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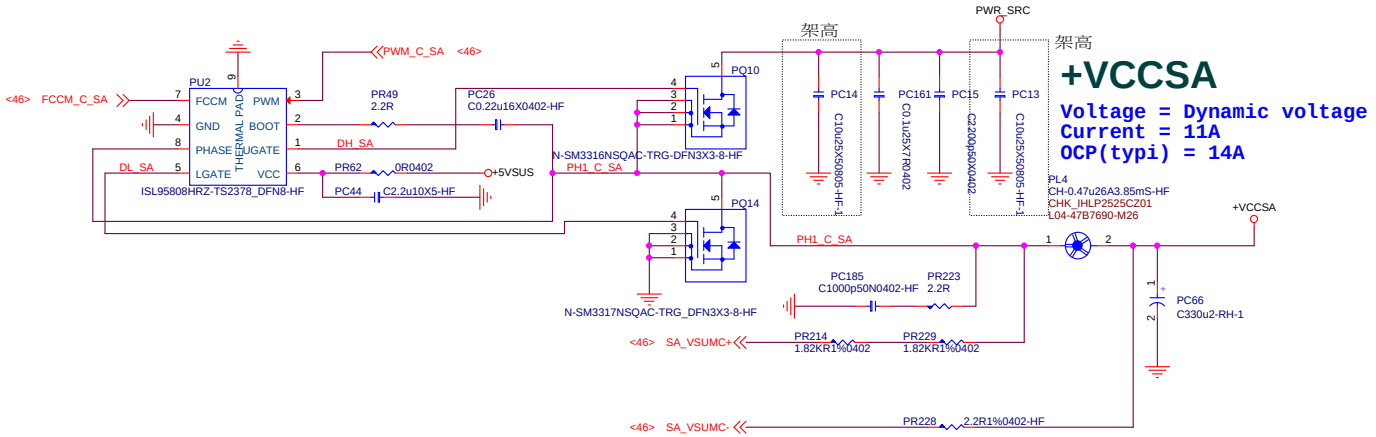

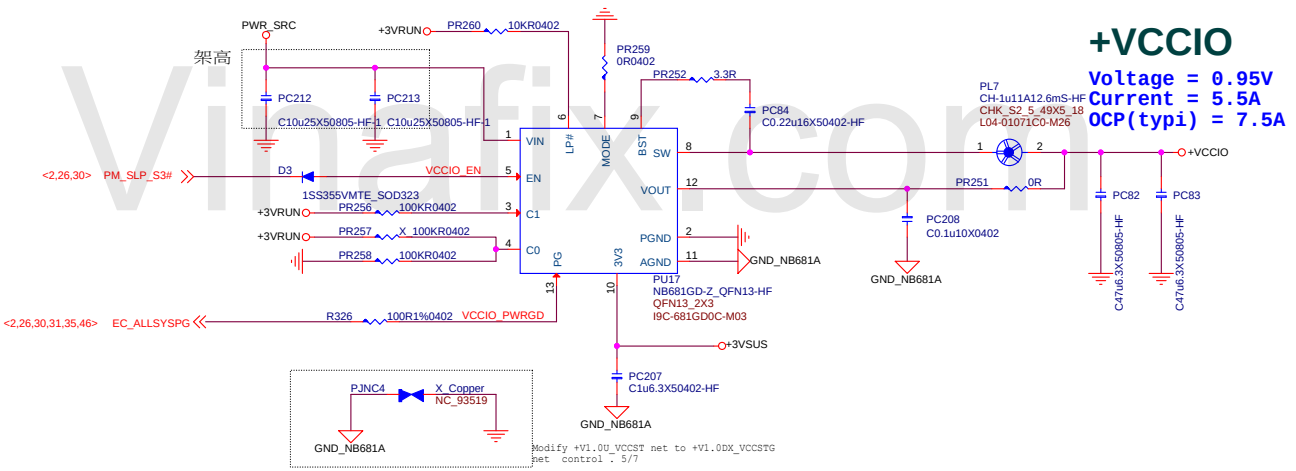

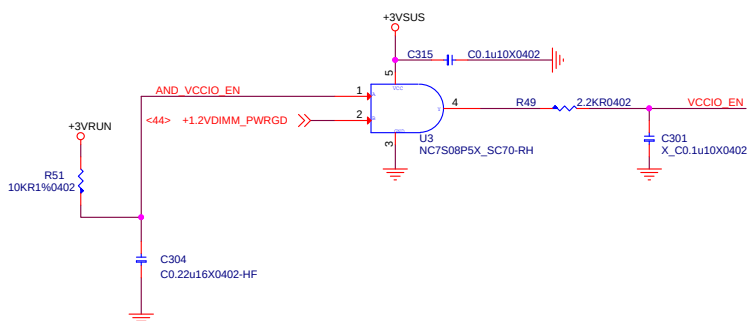

MICRO-STAR INT'L CO.,LTD.		
Title: CPU2(VCCSA/VCCIO)		
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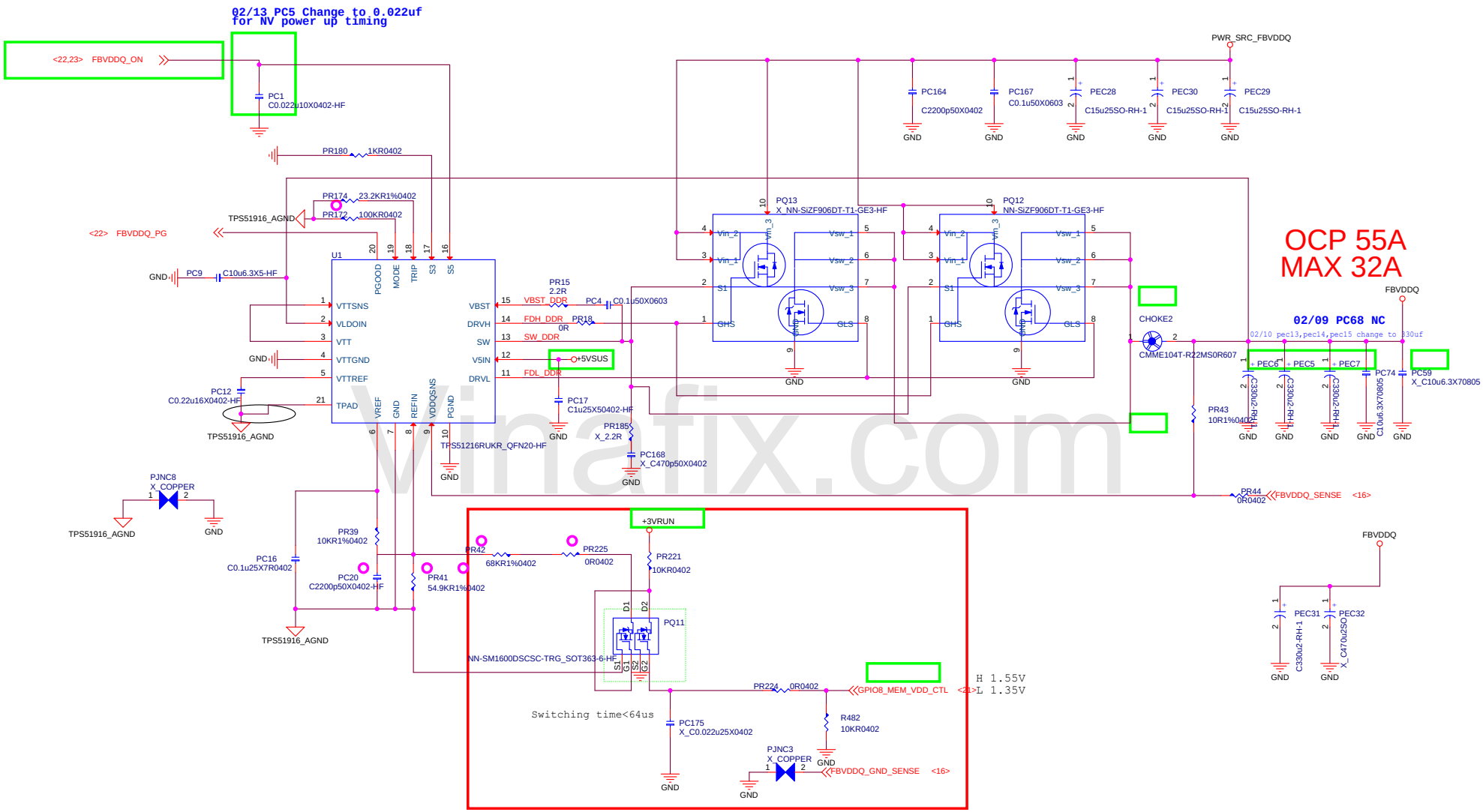
PAGE53: FBVDDQ



MICRO-STAR INT'L CO.,LTD.	
Title	DGPU POWER FBVDDQ
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DGPU POWER / UP9511P

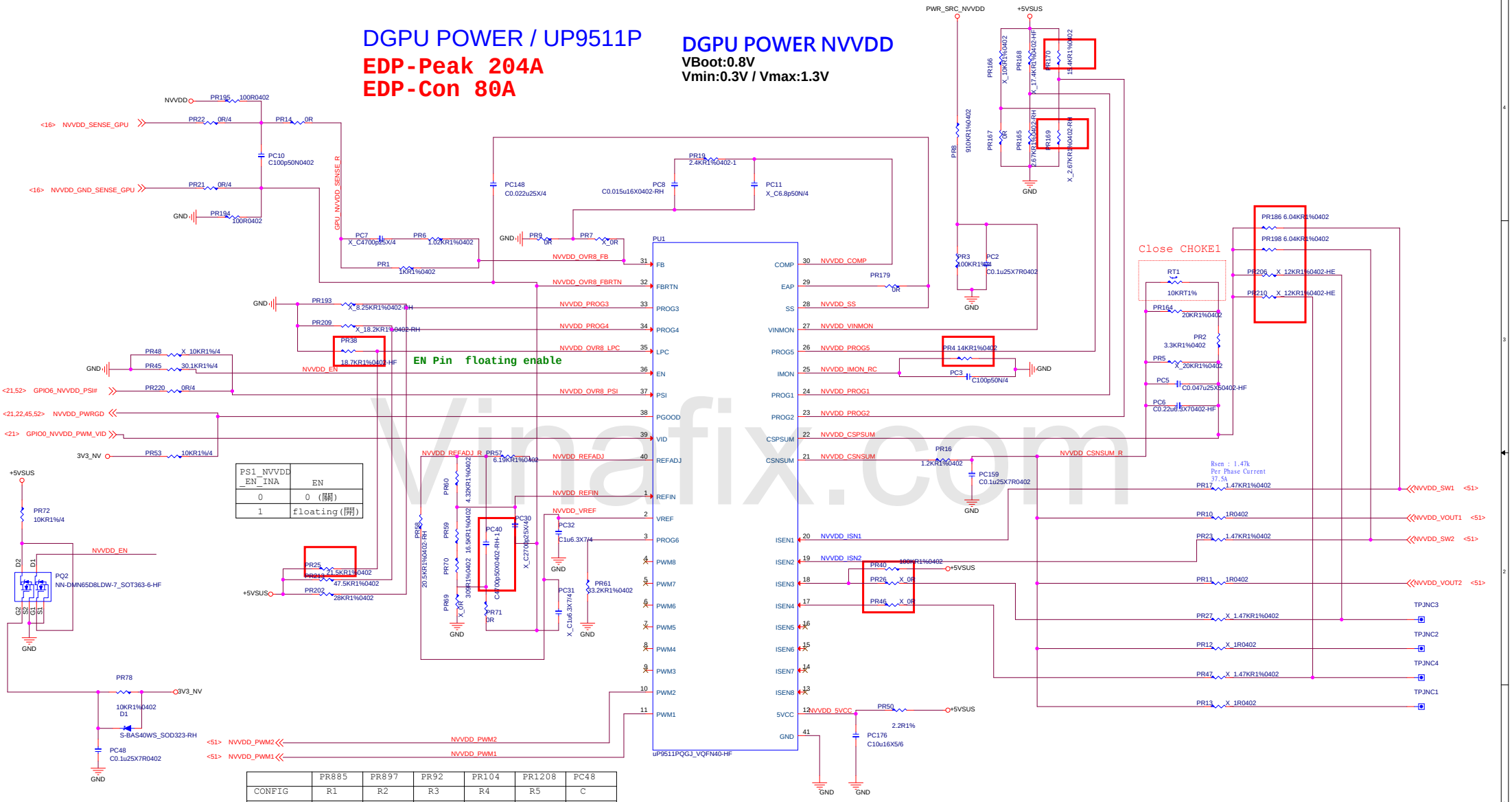
EDP-Peak 204A

EDP-Con 80A

DGPU POWER NVVDD

VBoot:0.8V

Vmin:0.3V / Vmax:1.3V



	PR885	PR897	PR92	PR104	PR1208	PC48
CONFIG	R1	R2	R3	R4	R5	C
N17E-G1	6.19K	20.5K	4.32K	16.5K	309R	4.7nF

MICRO-STAR INT'L CO.,LTD.

Title: DGPU POWER NVVDD1

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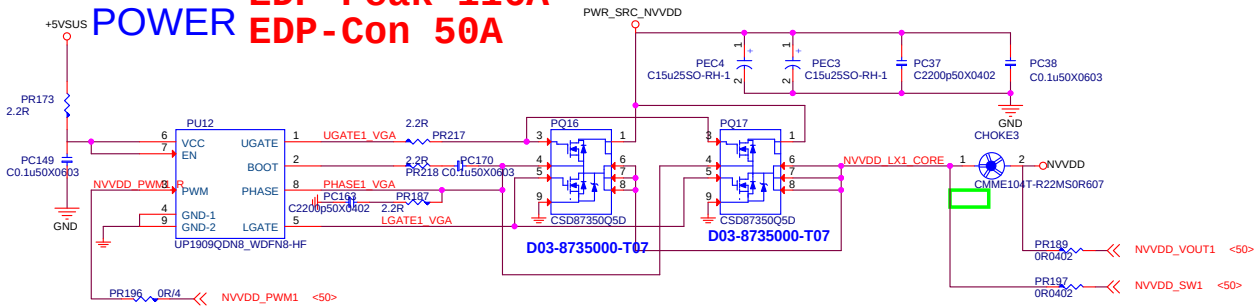
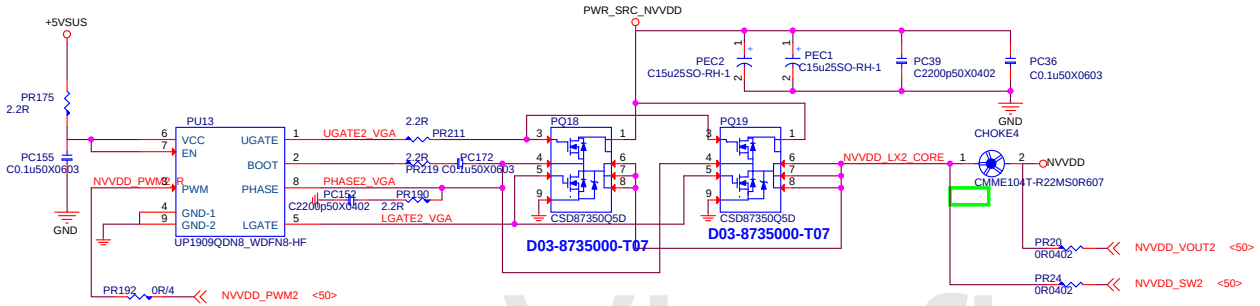
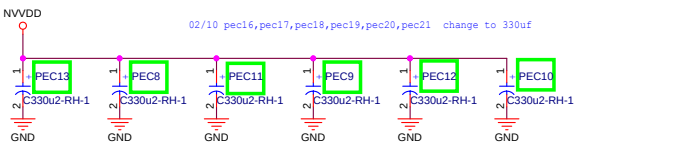
DGPU POWER

EDP-Peak 116A
EDP-Con 50A







02/22 PEC18,PEC20,PEC44,PEC45 NC

MICRO-STAR INT'L CO.,LTD.

Title	DGPU POWER NVVDD2	
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DGPU POWER / UP1666P

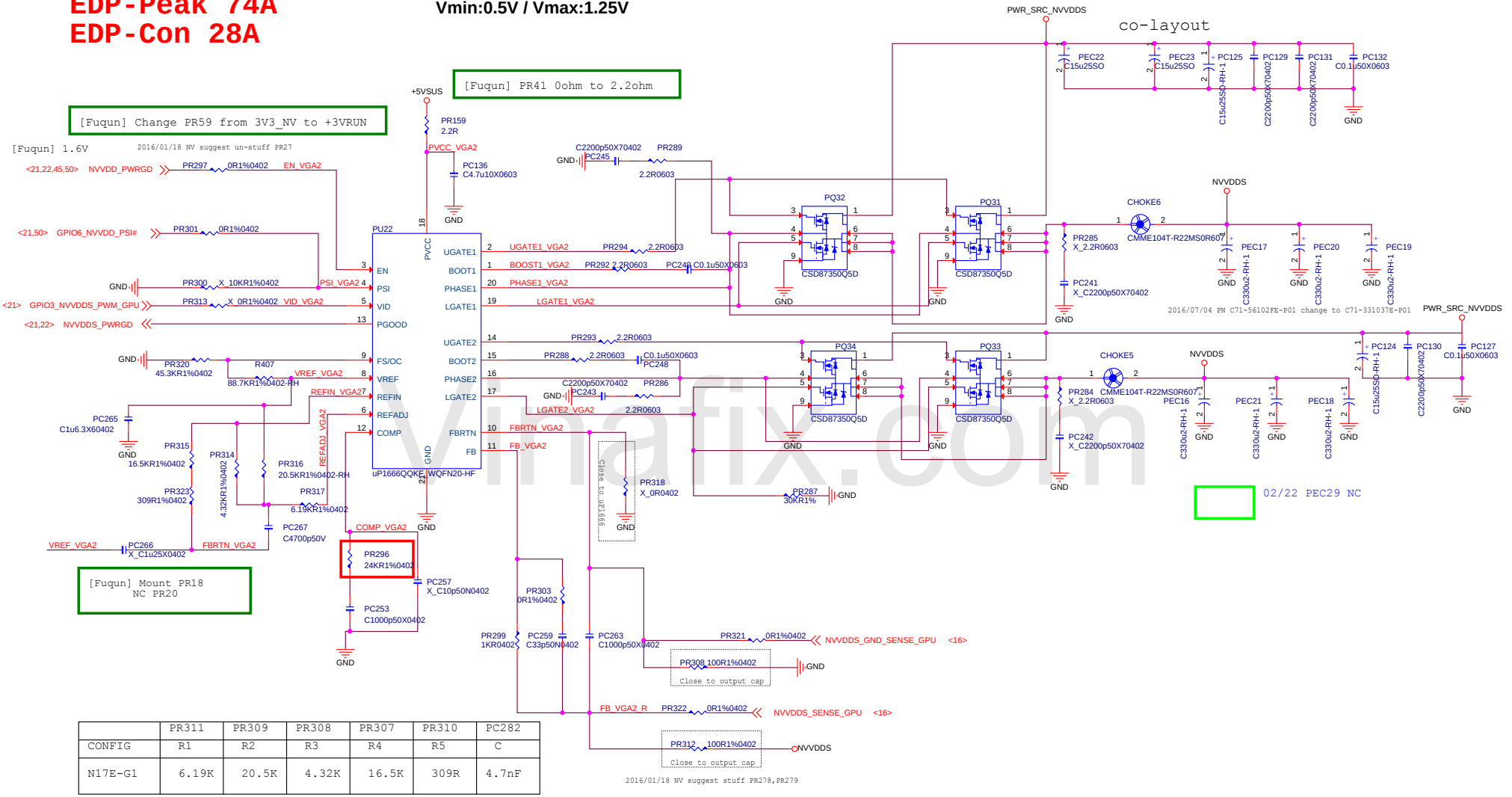
EDP-Peak 74A

EDP-Con 28A

DGPU POWER NVVDDS

VBoot:0.8V

Vmin:0.5V / Vmax:1.25V



	PR311	PR309	PR308	PR307	PR310	PC282
CONFIG	R1	R2	R3	R4	R5	C
N17E-G1	6.19K	20.5K	4.32K	16.5K	309R	4.7nF

MICRO-STAR INT'L CO.,LTD.

Title: DGPU POWER NVVDDS

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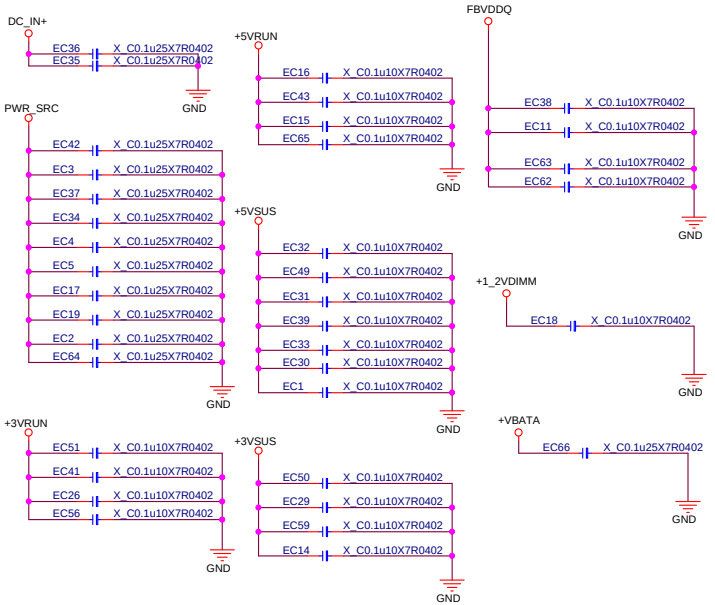
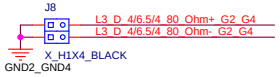


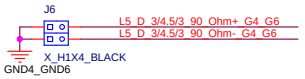
E4 E2Y-X022911-CA7 X_GASKET
E10 E2Y-X022911-CA7 X_GASKET
E11 E2Y-X022911-CA7 X_GASKET
E12 E2Y-X022911-CA7 X_GASKET
E13 E2Y-X022911-CA7 X_GASKET
E14 E2Y-X022911-CA7 X_GASKET

Add E4,E5,E6,E7,E8,E9for EMI.5/22

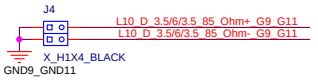
80 OHM / CLK/WCK



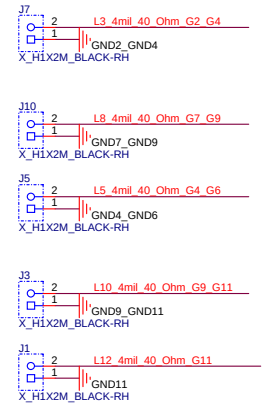
90 AR type-C



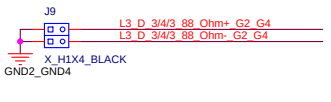
85 OHM /SATA /PCH PCIE/ EDP USB /HDMI/DP/DMI/CLK/PEG



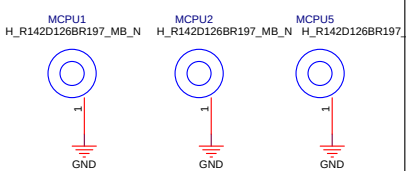
40 OHM / DDR4 CTRL



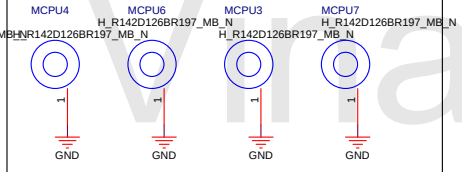
88 OHM /Alpine Ridge/DDR4 CLK

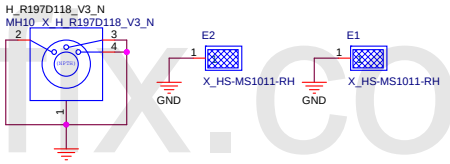


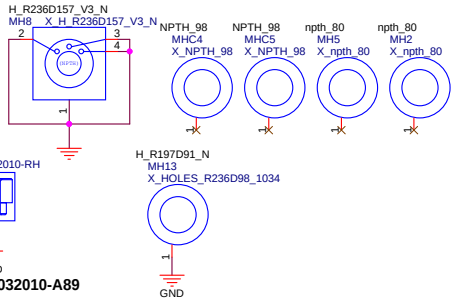
CPU Holes



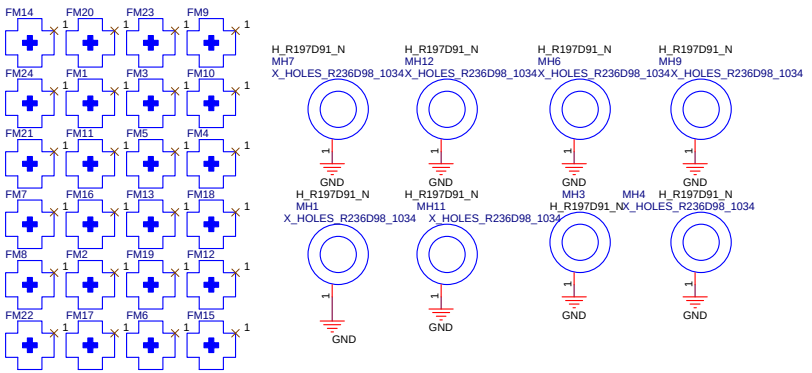
DGPU Holes







E2B-1032010-A89



RU1 E2Y-4A10711-Y40 RUBBER
RU6 E2Y-4A10711-Y40 RUBBER
RU10 E2Y-4A10711-Y40 RUBBER
RU14 E2Y-4A10711-Y40 RUBBER
RU2 E2Y-4A10711-Y40 RUBBER
RU5 E2Y-4A10711-Y40 RUBBER
RU9 E2Y-4A10711-Y40 RUBBER
RU13 E2Y-4A10711-Y40 RUBBER
RU3 E2Y-4A10711-Y40 RUBBER
RU8 E2Y-4A10711-Y40 RUBBER
RU12 E2Y-4A10711-Y40 RUBBER
RU16 E2Y-4A10711-Y40 RUBBER
RU4 E2Y-4A10711-Y40 RUBBER
RU7 E2Y-4A10711-Y40 RUBBER
RU11 E2Y-4A10711-Y40 RUBBER
RU15 E2Y-4A10711-Y40 RUBBER

For MP

UME1 HDMI Lable HDMI ROYALTY
UME2 BIOS Lable BIOS_LABEL

Y01-RHDMI03-000 G51-N1CO041-A09

RU17 E2Y-4A10811-Y40 RUBBER
RU18 E2Y-4A10811-Y40 RUBBER
RU19 E2Y-4A10911-Y40 RUBBER

NPTH118 MHC1 X_NPTH118
NPTH118 MHC6 X_NPTH118
NPTH118 MHC7 X_NPTH118
NPTH118 MHC2 X_NPTH118

UME5 CPU BKT — CPU BKT 307-6P10111-HG0
UME6 GPU BKT — GPU BKT 307-6P10211-HG0

UME3 COMPLIANCE MYLAR — COMPLIANCE_mylar E2P-4A11411-Y42
UME11 COMPLIANCE MYLAR — COMPLIANCE_mylar E2Y-4A11011-Y42

PCB1 PD0-16P110B-H73
PD0-16P110B-H73
Hannstar:PD0-16P110B-H73
TRIPOD: PD0-16P110B-T53

UME4 MB MYLAR — MB_mylar E2P-4A30111-Y42
UME7 DDR MYLAR — MB_mylar E2P-0112911-Y42
UME8 DDR MYLAR — MB_mylar E2P-0112911-Y42
UME10 COMPLIANCE MYLAR — COMPLIANCE_mylar E2Y-4A11011-Y42

MICRO-STAR INT'L CO.,LTD.

Title: EMI/Screw/ME
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MS-16P1 Power Delivery Chart

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Title	Power Delivery Chart	
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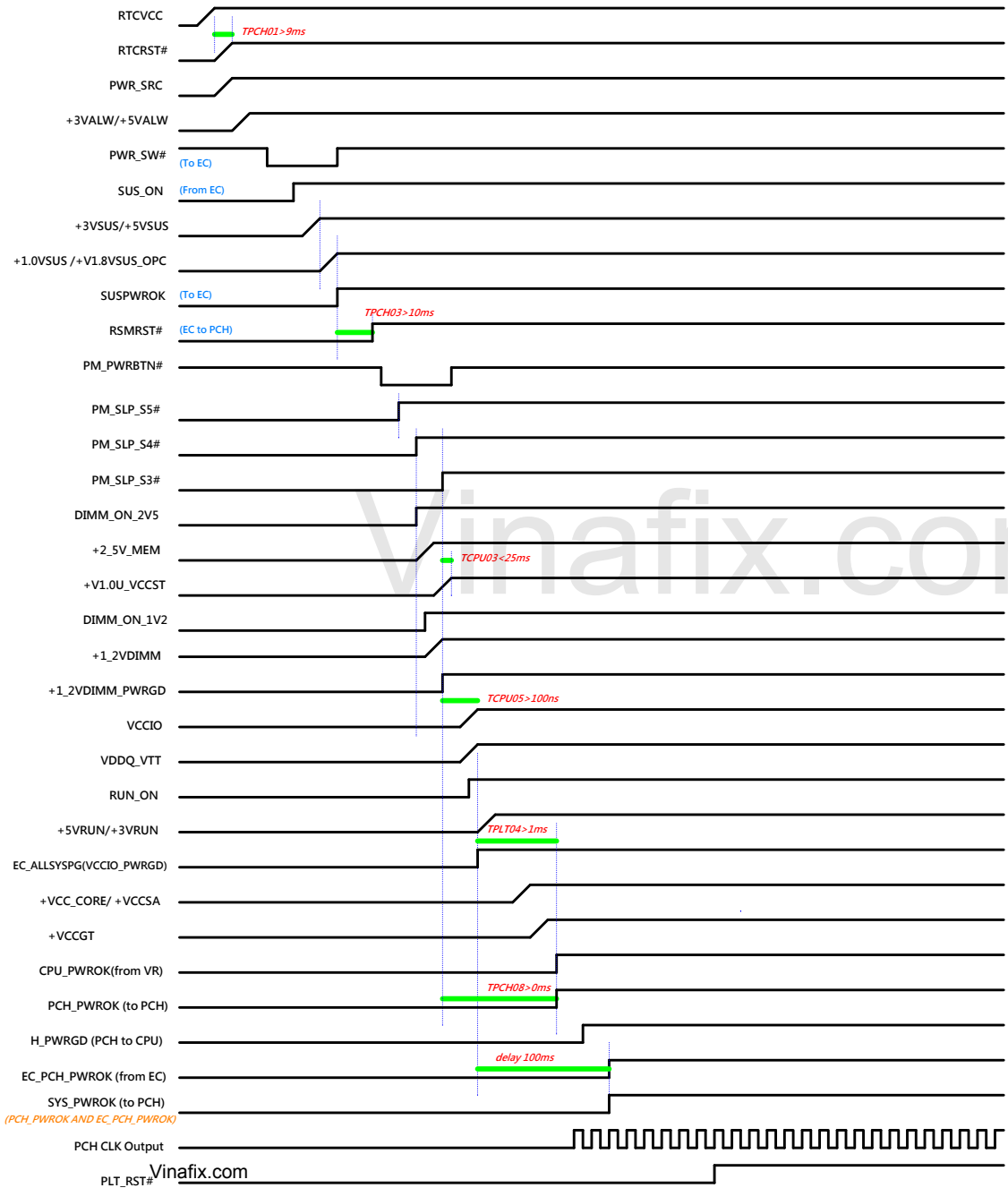
Power on Sequence

G3 -> S0



msi	MICRO-STAR INT'L CO.,LTD.	
Title	Power on Sequence	
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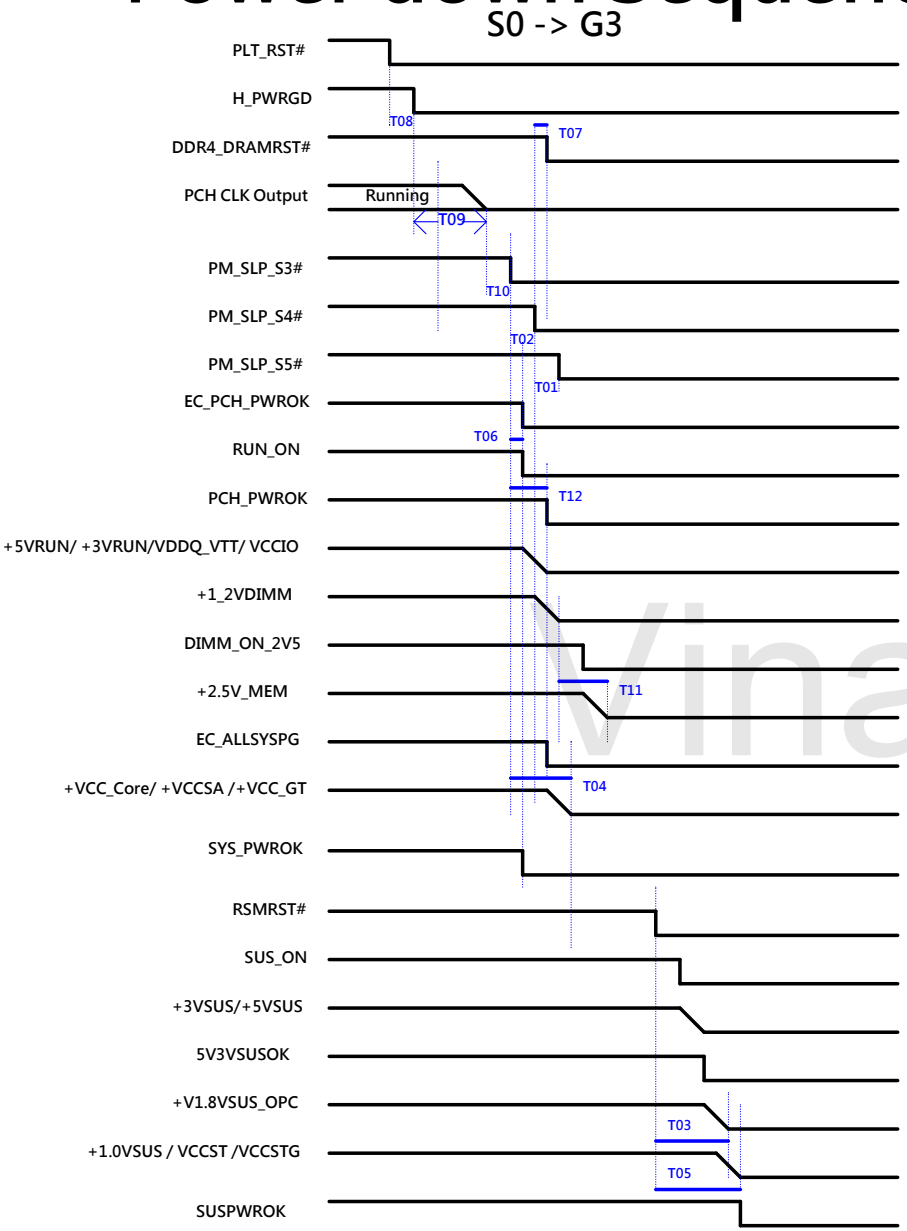
Power down Sequence



	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

MICRO-STAR INT'L CO.,LTD.

Title: Power down Sequence

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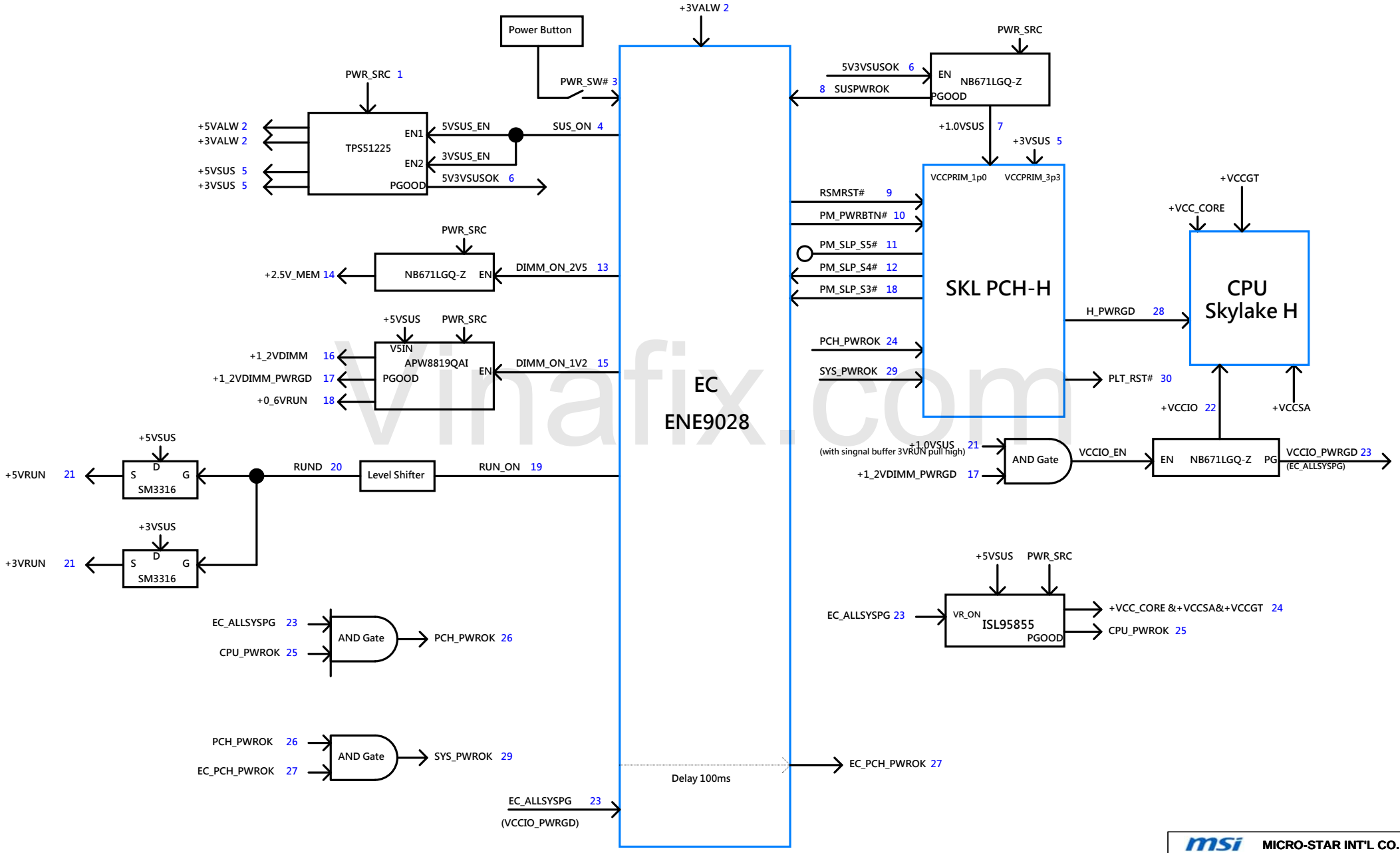
MS-16P1 Power on Block Diagram



msi	MICRO-STAR INT'L CO.,LTD.	
Title	Power on Block Diagram	
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History

0B:

2017/01/03

1. PCE5 P/N change to C71-33102AE-P01 on page59.
2. PQ47, PQ11, PQ9, PQ36, PQ10, PQ45 P/N change to D03-138DW19-D07 on page33, 52, 57..
3. R88, PR135, R64, PR140, R70, PR314, PR326 modify resistor value on page33, 57

2017/01/12

1. C175,C176,C177,C180,C181,C260,C285 P/N change to C11-4767314-M09 on page25.
2. Add PC275,PC276 on page 59
3. C370,C373 Change to 47uf/0805 on page10,27
4. Add +1_2VRUN page58
5. Add HDMI Retimer page46

2017/01/16

1. CN12 change to N53-09M0681-AF2

2017/01/17

1.PR150,PR148 改51.1K R11-5112T12-Y01
2.PR295上件
3.PC237 改2.2nF C11-2222022-Y01
4.PR253 改3K R11-0302T12-Y01
5.PR85 改 10R R11-0100T12-Y01
6.PC70 改 100p C11-1011042-M09
7.PR83 改 2.94K R11-2941T12-Y01
8.PR56 改 3.4K R11-0342T12-Y01
9.PR240 改 2.94K R11-2941T12-Y01
10.PC64 改 NC不上件
11.PC202 改 0.22uF C11-2242813-Y01
12.PR87 改 562R R11-5620T12-Y01
13.PR77 改115K R11-1153T12-Y01
14.PR36 改 97.6K R11-9762T12-Y01
15.PR73 改412R R11-4120T12-Y01
16.PC49 改0.01uF C11-1032B22-Y01

17.CN14.CN15 change to N15-0670320-CK3

2017/01/20

1. CN12 change to N53-13M0031-L06
2. Add Q40 for USB3.0LED

2017/01/23

1. PR108 change to 169K
2. Modify U64 pin17,18 Pin defin

2017/01/25

1. Modify CN12 pin define

2017/02/06

1. R481 NC,R483 上件
2. Add LED7 for17"

2017/02/08

1. R86,R93 change to 0603

2017/02/09

1. Add CN17,add A_LED_SCL,A_LED_SDA net
2. U28 modify HP_SEL

2017/02/10

1. Add SW5,SW7 for 17"
2. Delete E7
3. C438,C340,C944,PEC13,PEC14,PEC15,PEC16,PEC17,PEC18,PEC19,PEC20,PEC21 change to 330uf
4. R895,C857 上件
5. R275,C834 modify for EMI
6. Add R614,R615

2017/02/13

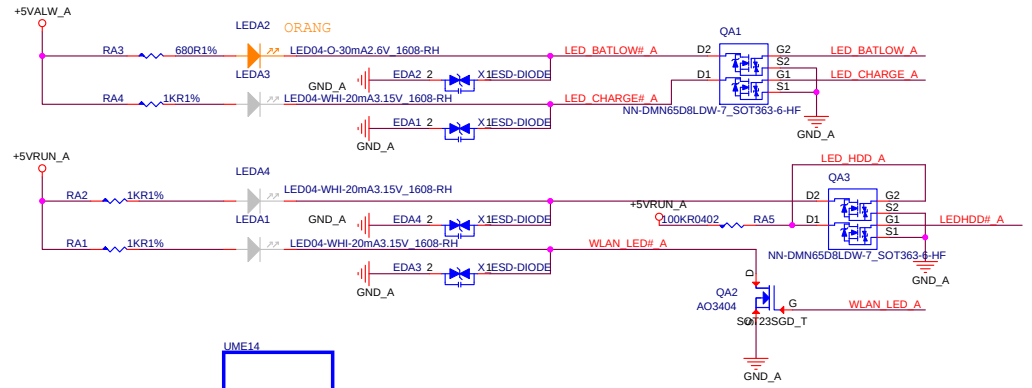
1. C856,C797,C777,C795 change to C11-1062617-S02
2. PC5 Change to 0.022uf

2017/02/14

1. Add Q43,Q45,Q46 for audio impedance sense

2017/02/17

1. R242,R236,R235,R246,R234,R233 change to 0R
2. R165 NC,R170 上件

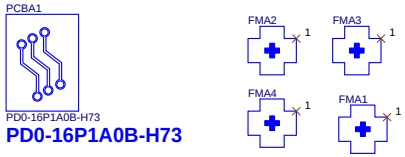


UME14

MB MYLAR

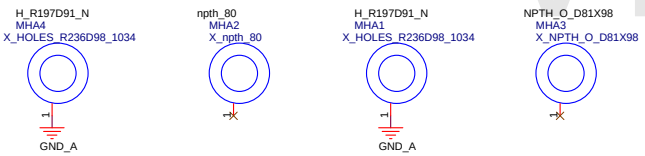
POWER_ADHESIVE

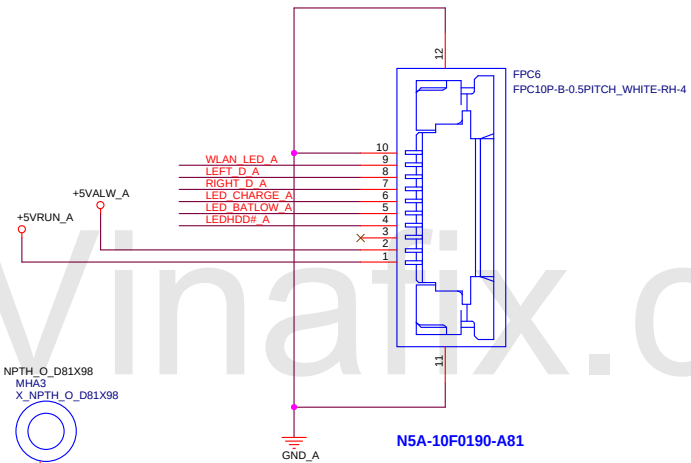
E2Y-6P11111-Y42



PD0-16P1A0B-H73

Hannstar:PD0-16P1A0B-H73
TRIPOD: PD0-16P1A0B-T53

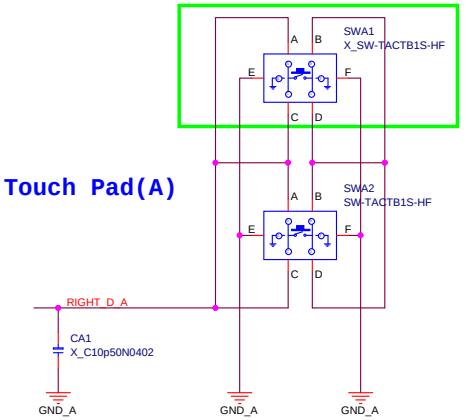




N5A-10F0190-A81

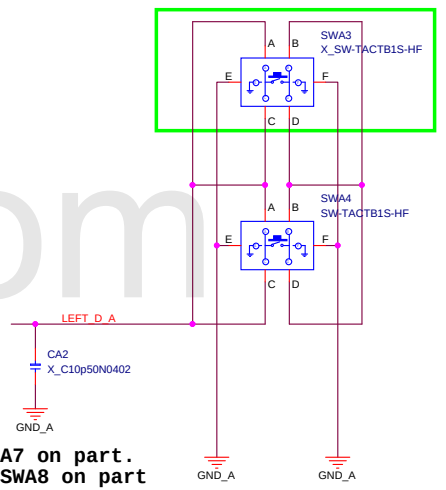
02/10 0B Add SWA5 for17"

Touch Pad(A)



17" SWA5 on part.
15.6" SWA6 on part

02/10 0B Add SWA7 for17"



17" SWA7 on part.
15.6" SWA8 on part

MICRO-STAR INT'L CO.,LTD.

Title: [A]LED/Touch Pad

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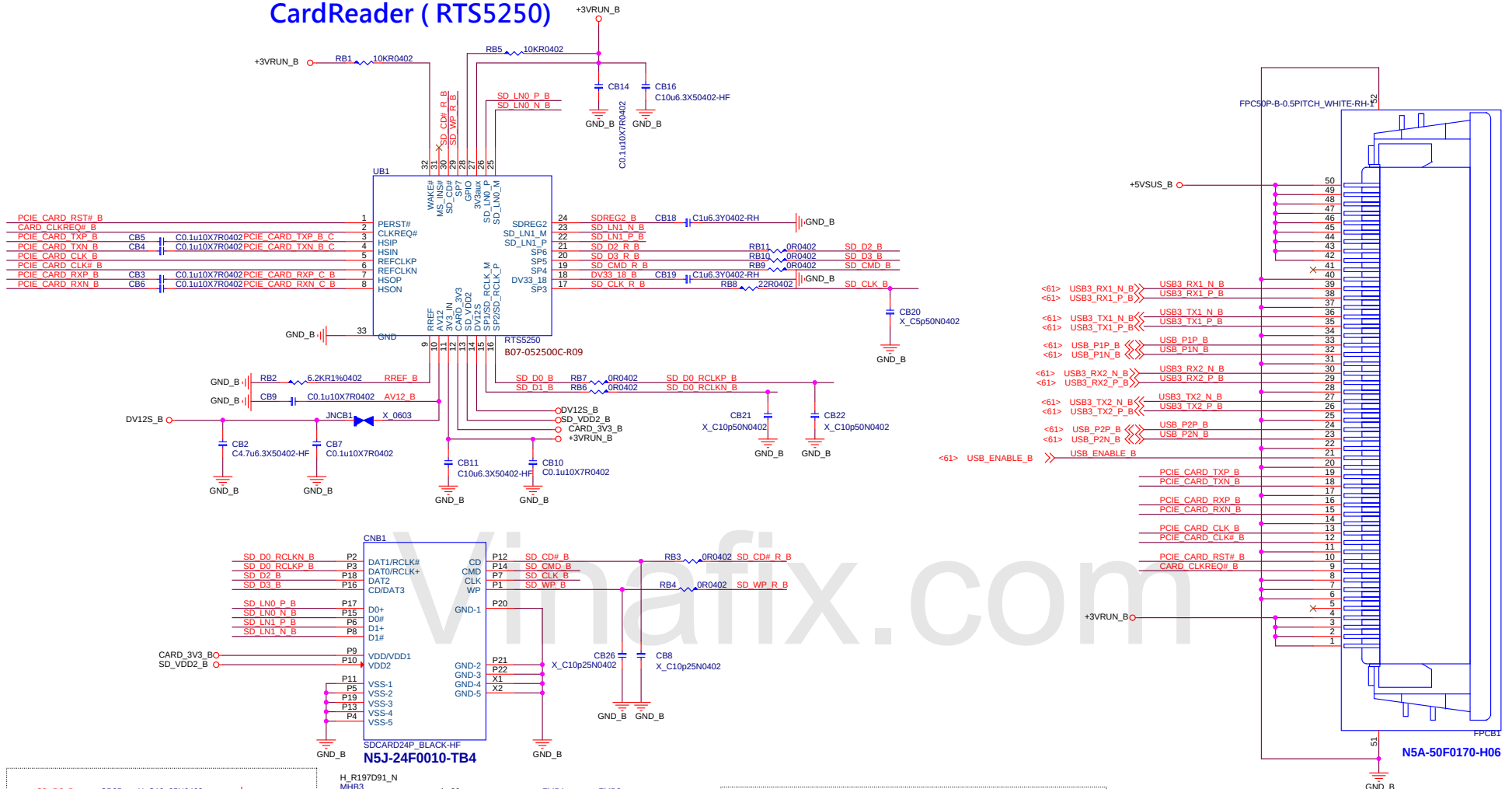
CardReader (RTS5250)



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MSI	MICRO-STAR INT'L CO.,LTD.
Title	[B]Card reader/BTB CONN
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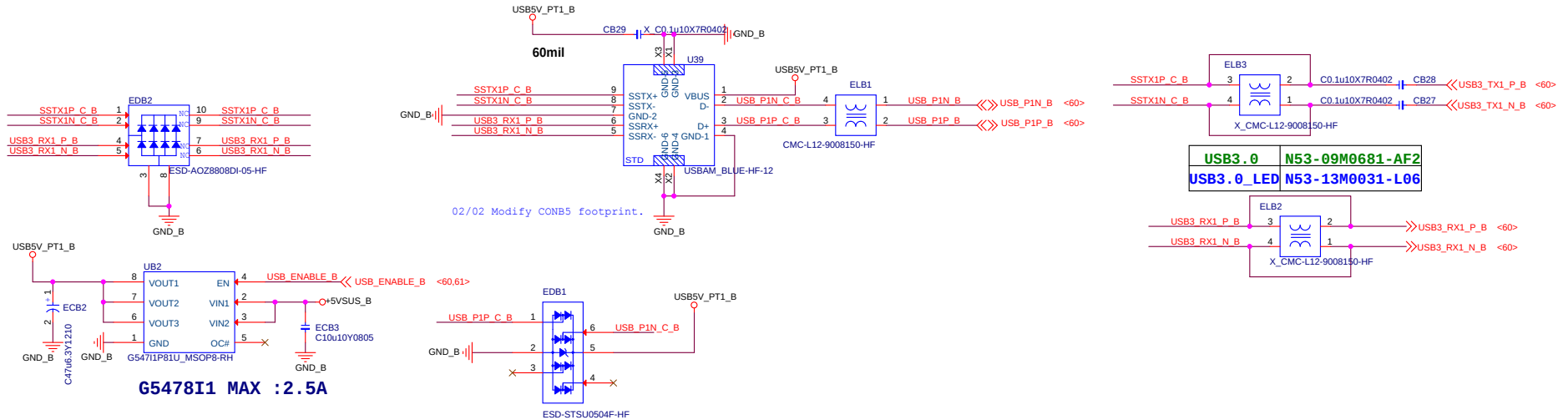
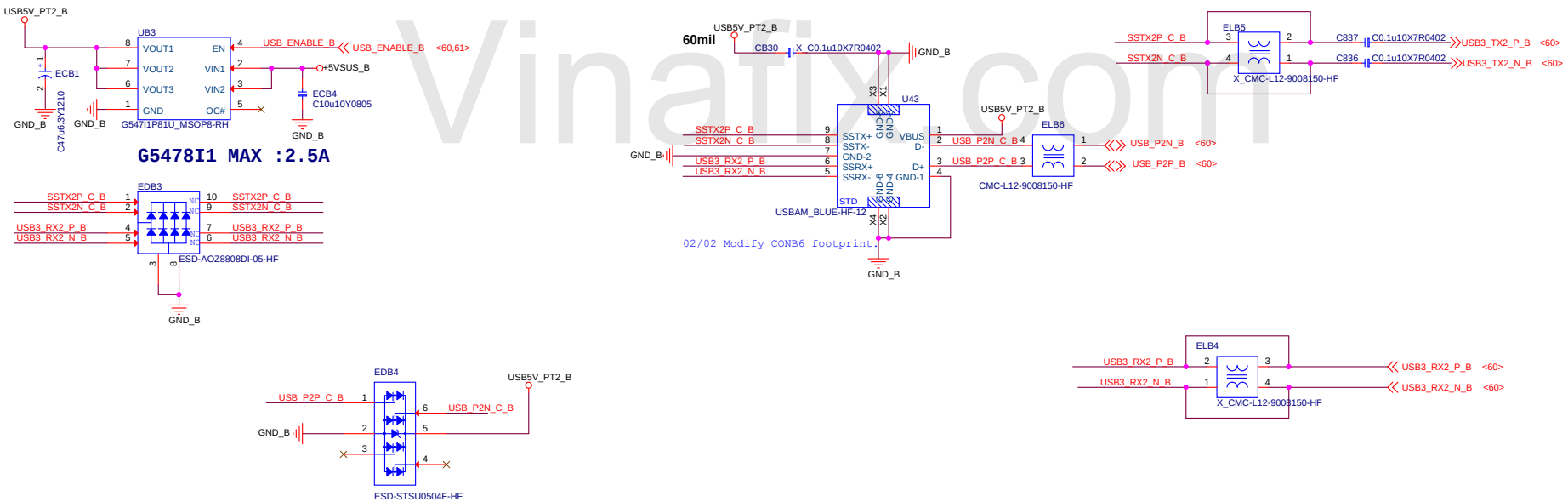
USB2.0/USB 3.0



USB 3.0 CNT 2



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Title	[B]USB3.0
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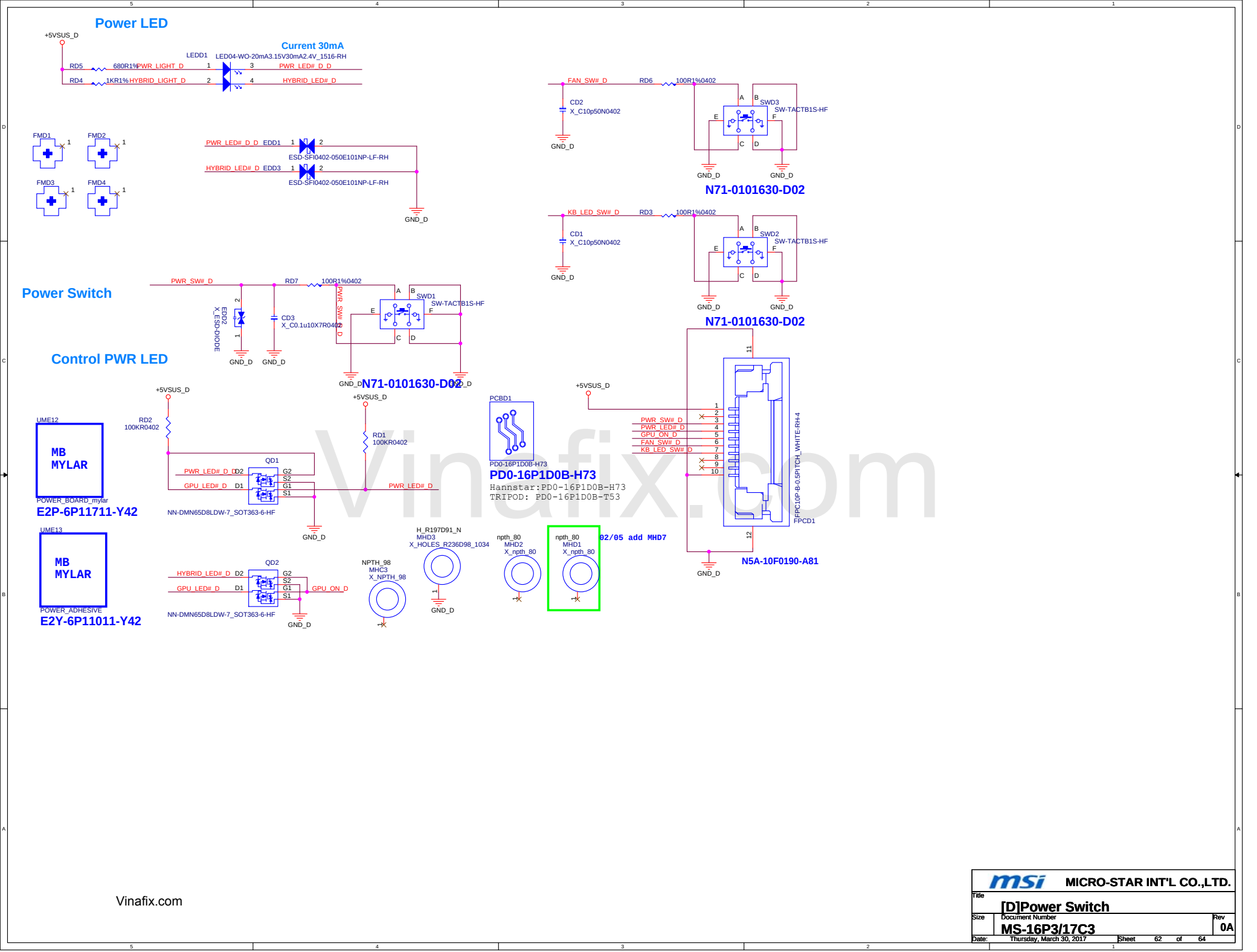

MICRO-STAR INT'L CO.,LTD.		
Title: [D]Power Switch		
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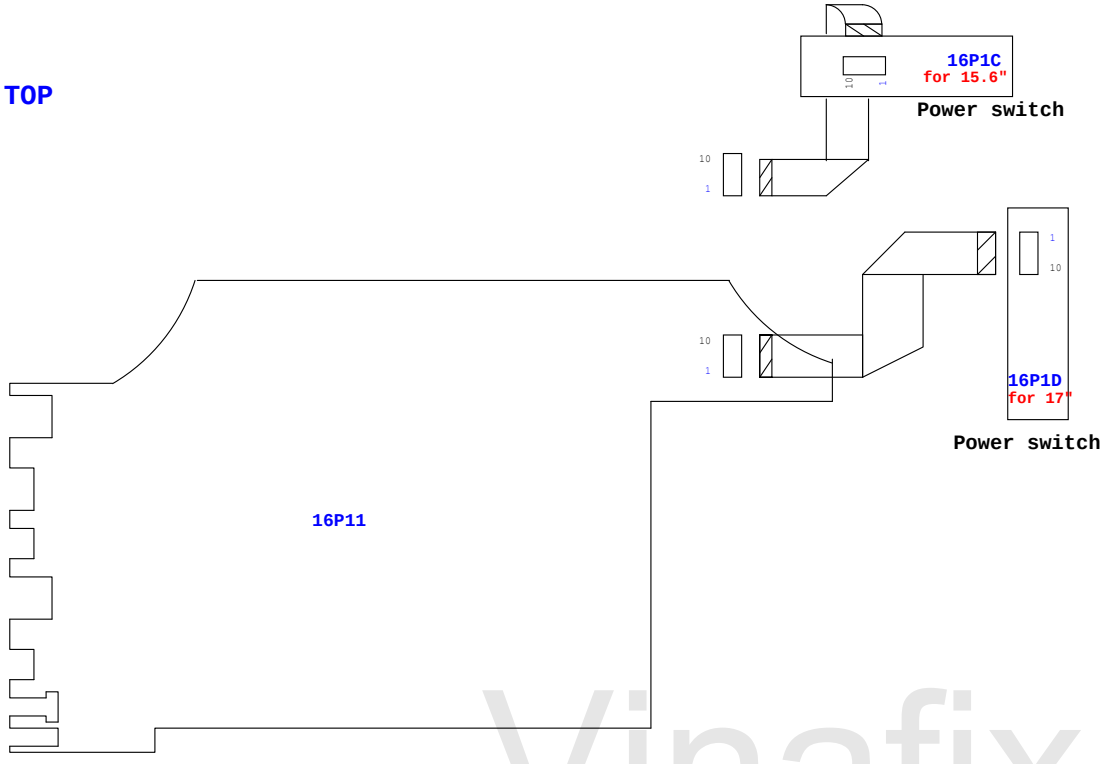
TOP



msi MICRO-STAR INT'L CO.,LTD.		
Title: TOP		
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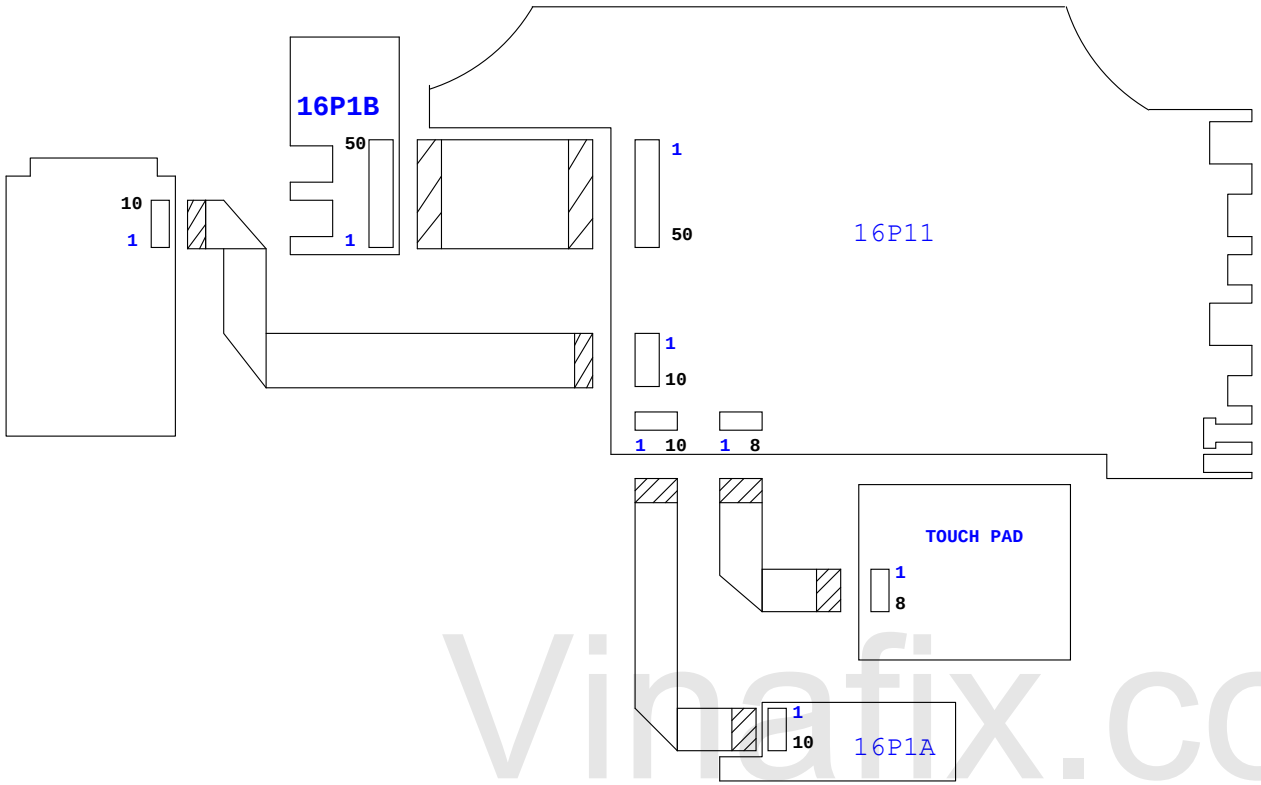
Bottom VIEW



msi MICRO-STAR INT'L CO.,LTD.		
Title: BOTTOM		
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