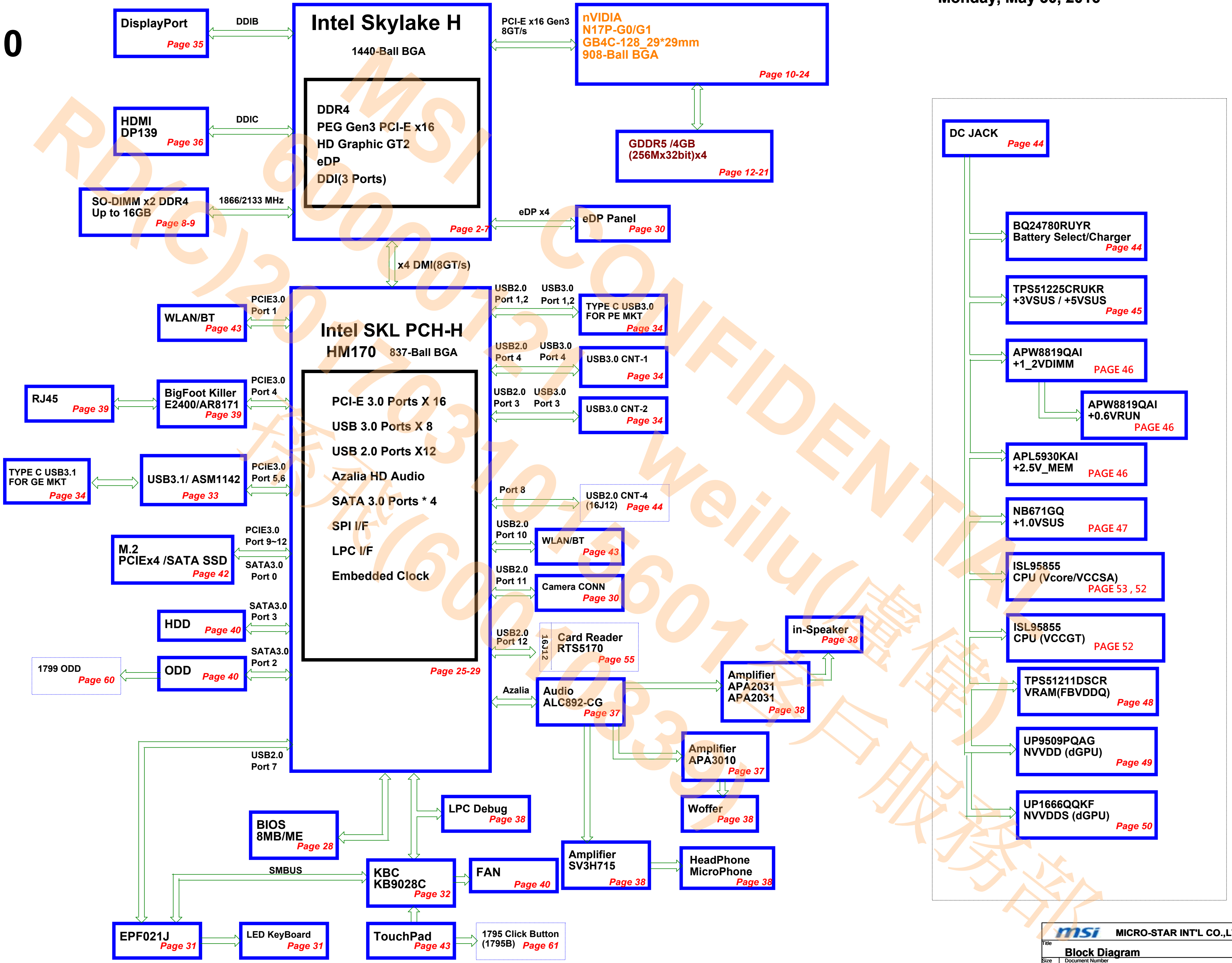
MS-16J9/MS-1799

Intel Skylake Mobile

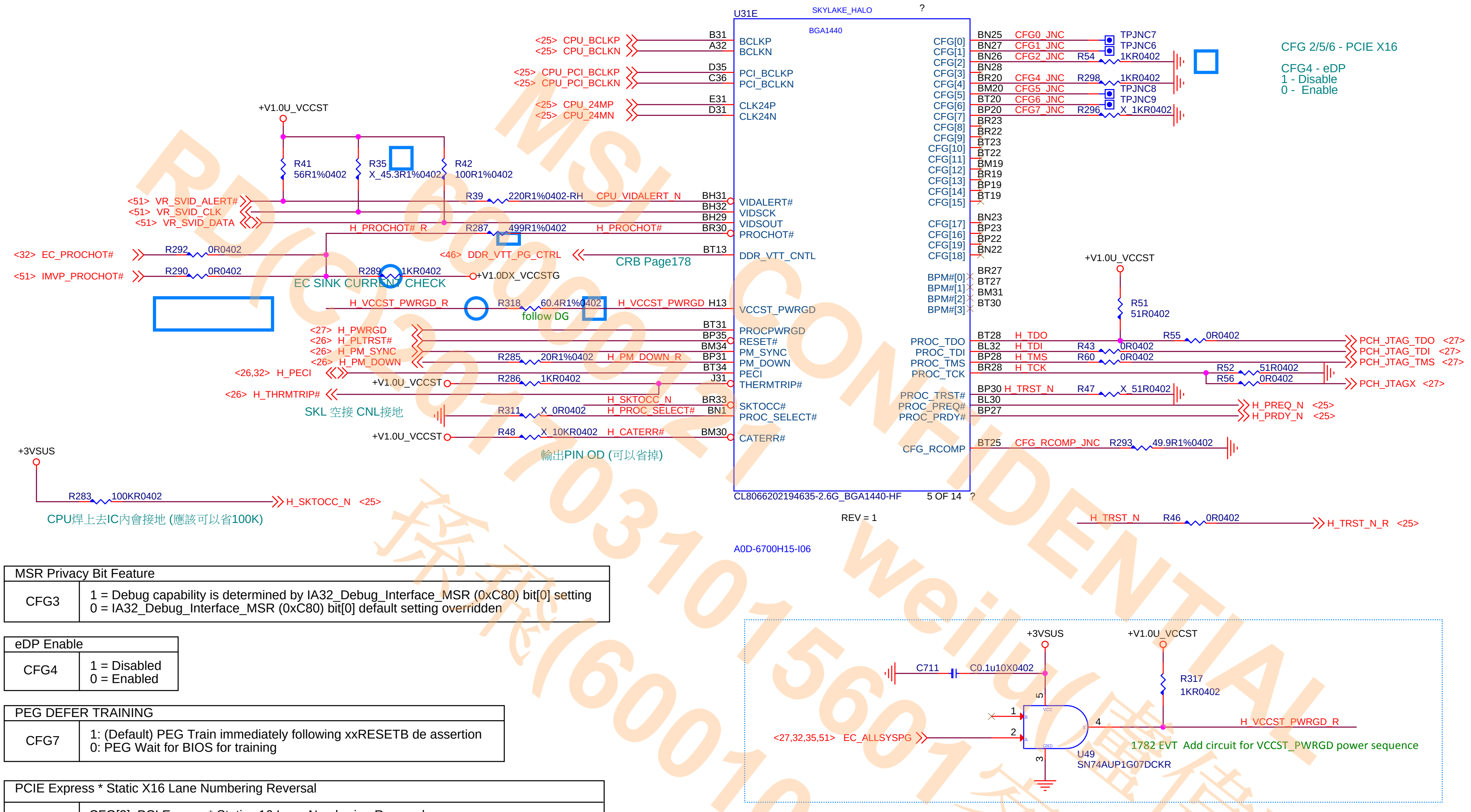
Ver:10

Monday, May 30, 2016



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

Title	Block Diagram	
Size	Document Number MS-16J9	Rev 0A
Date:	Sheet 1 of 62	



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.

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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*

MICRO-STAR INT'L CO.,LTD.		
Title: Skylake(HOST)		
Size: A3	Document Number: MS-16J9	Rev: 0A
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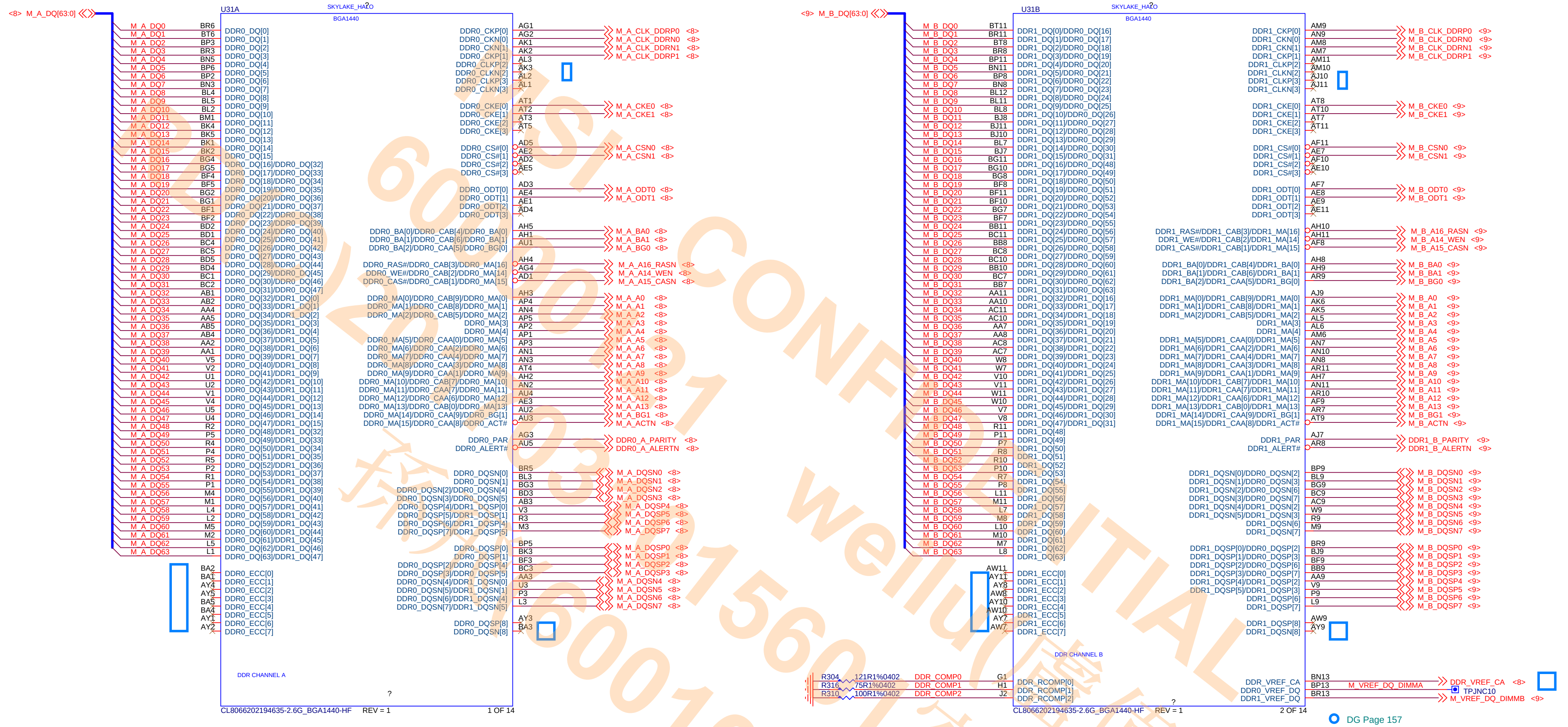
DDR Channel A

DDR Channel B



MICRO-STAR INT'L CO.,LTD.

Title	Skylake(DDR4)	
Size: Custom	Document Number: MS-16J9	Rev: 0A
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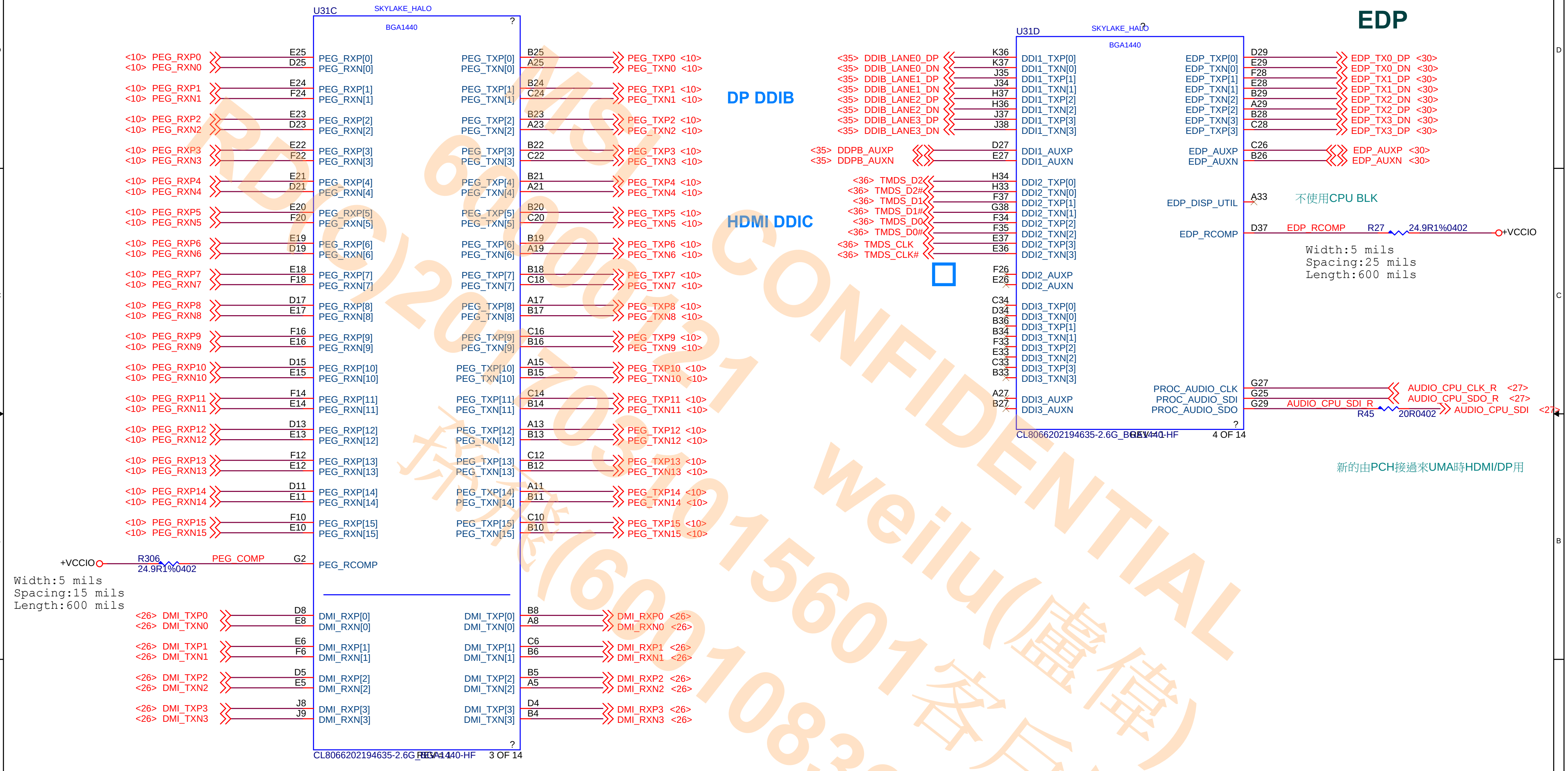

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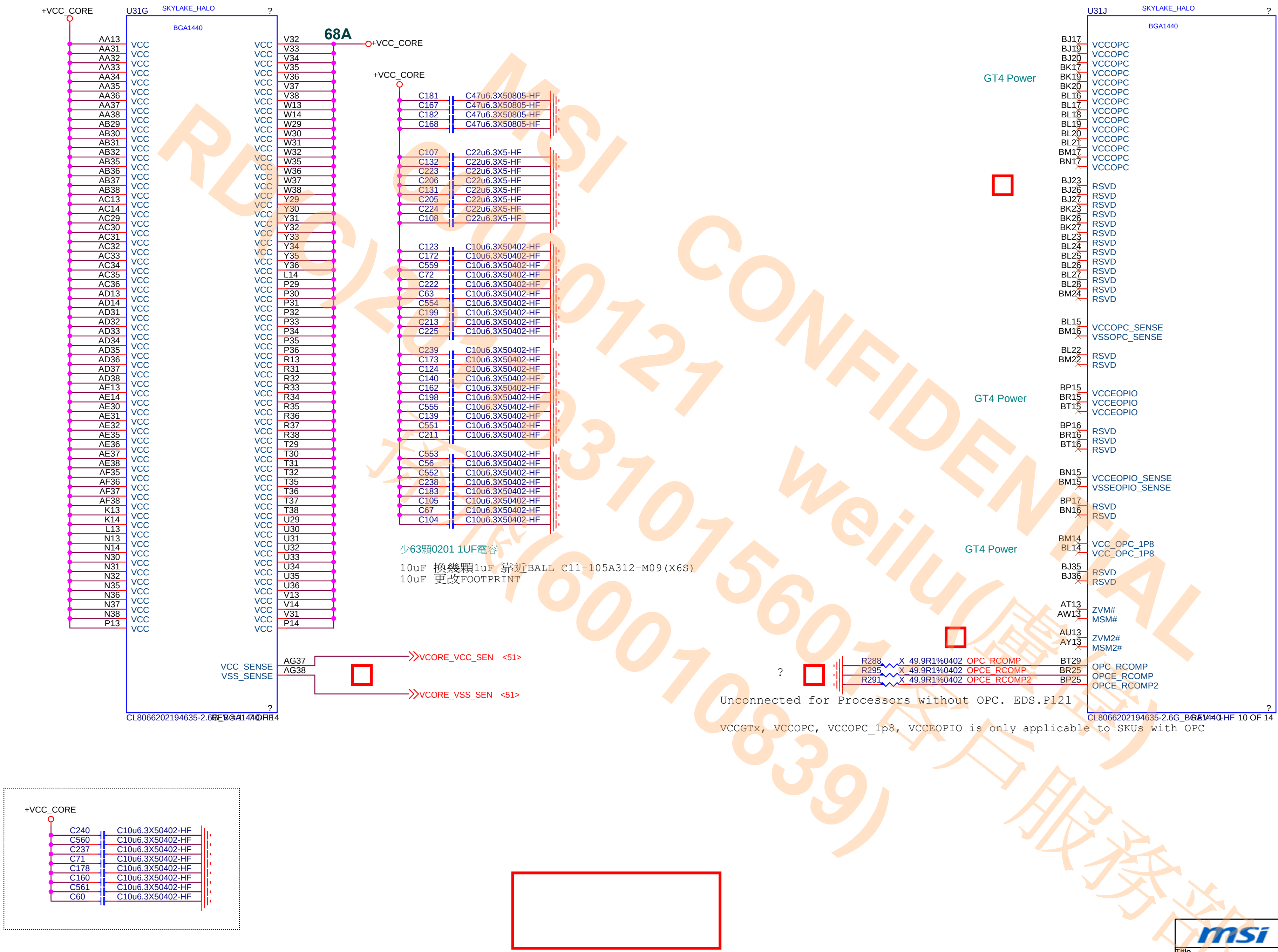
Title: **Skylake(DMI/Display)**

Size: B | Document Number: **MS-16J9** | Rev: **0A**

Date: Wednesday, July 27, 2016 | Sheet 4 of 62



MICRO-STAR INT'L CO.,LTD.

Title: **Skylake(Power1)**

Size	Document Number	Rev
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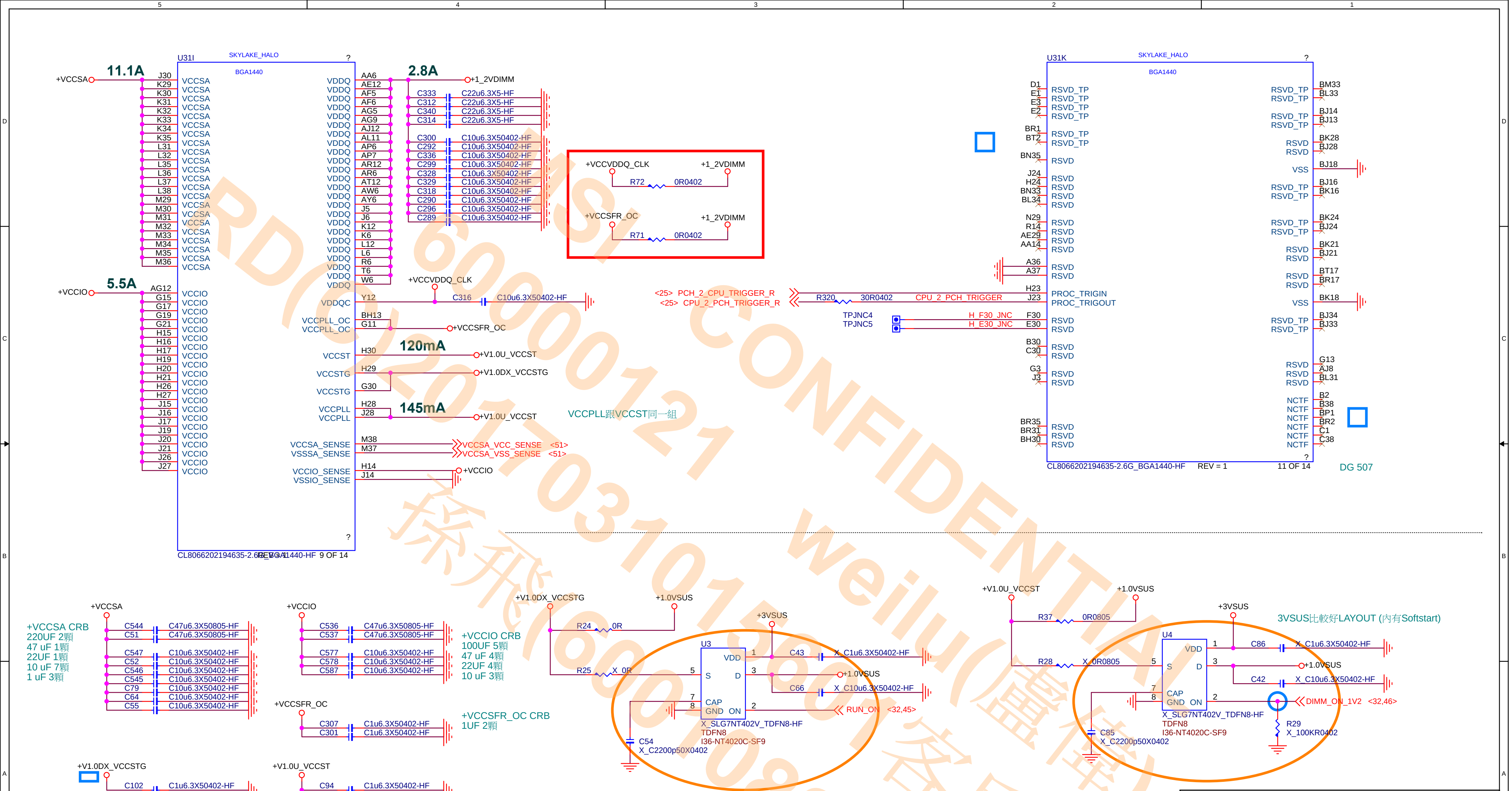
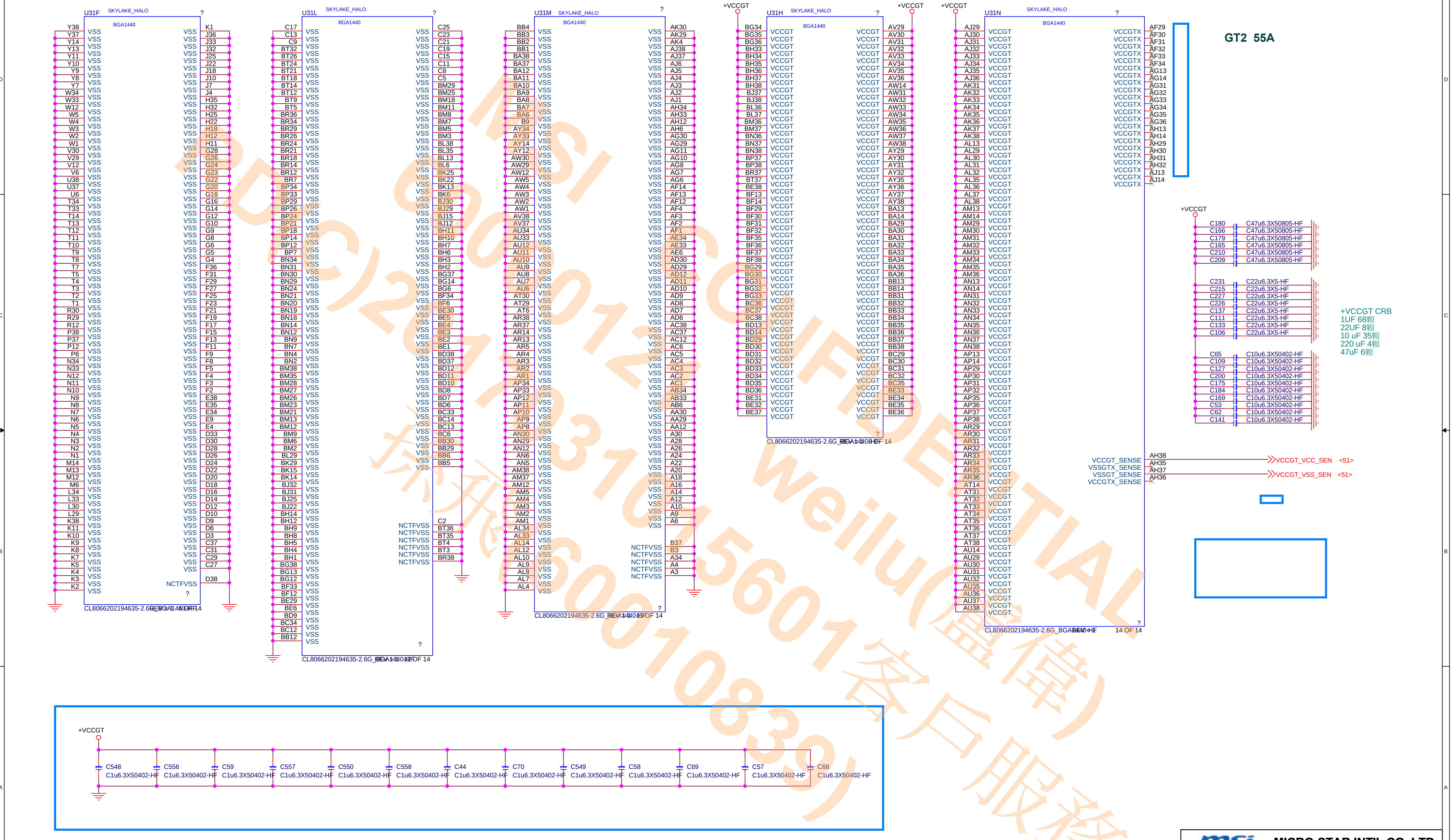


MICRO-STAR INT'L CO.,LTD.

Title: **Skylake(Power2)**

Size	Document Number	Rev
Custom	MS-16J9	0A

Date: Wednesday, July 27, 2016 Sheet 6 of 62



MICRO-STAR INT'L CO.,LTD.

Title	Skylake(Power3)	
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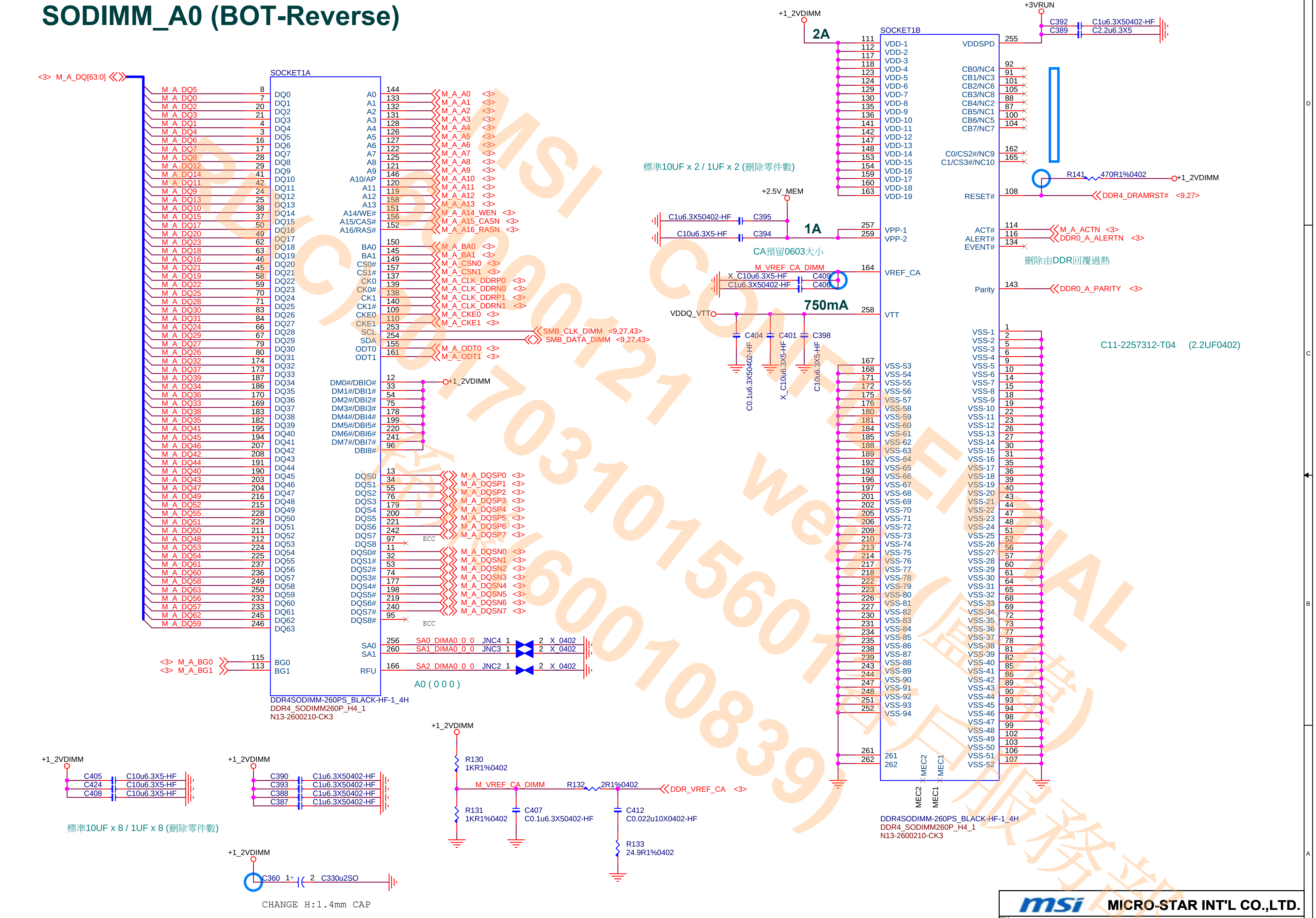
SODIMM_A0 (BOT-Reverse)



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Title	DDR4_SODIMM_A0
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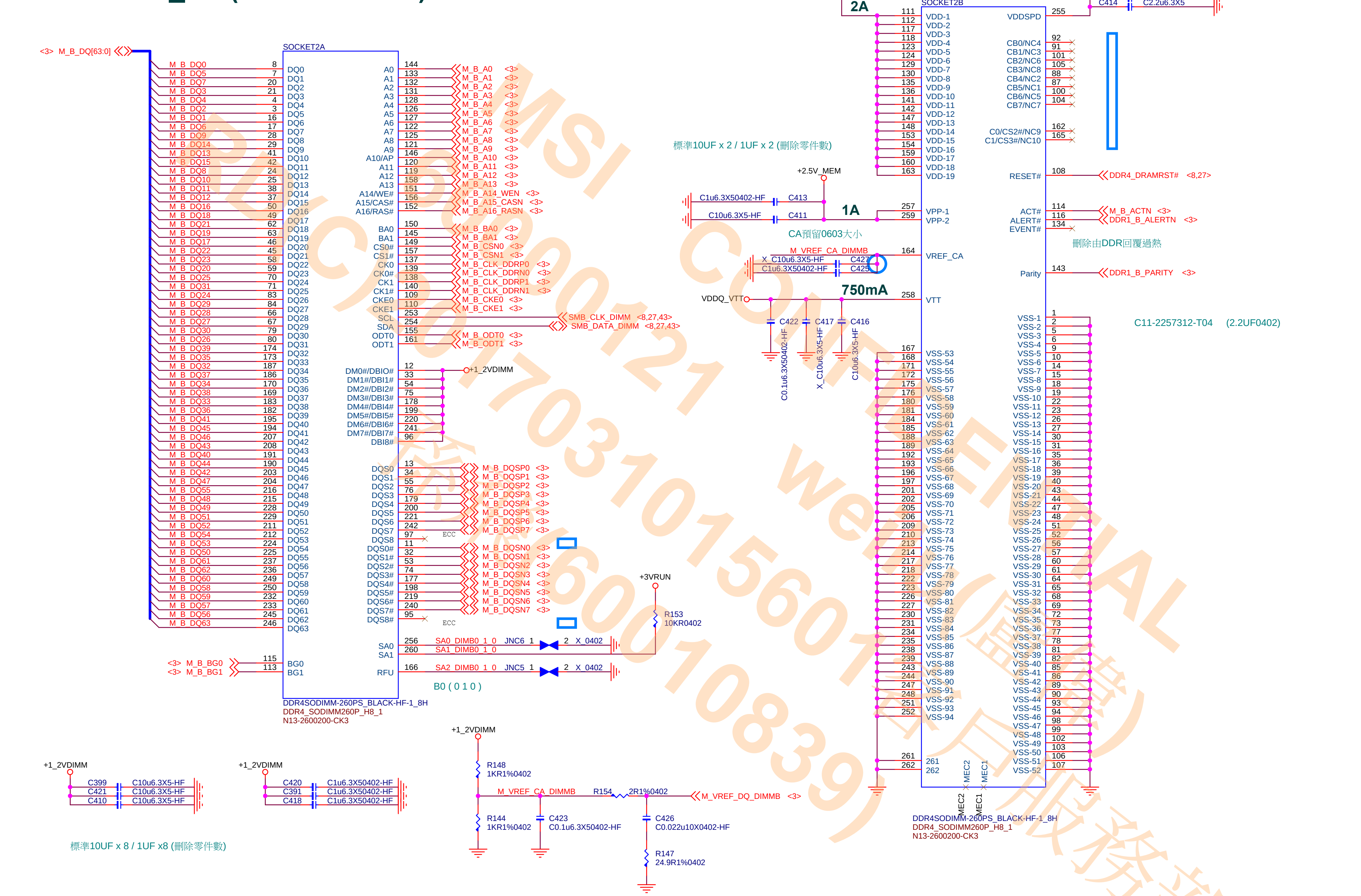
SODIMM_B0 (BOT-Reverse)



MICRO-STAR INT'L CO.,LTD.

Title	DDR4_SODIMM_B0
Size	Custom
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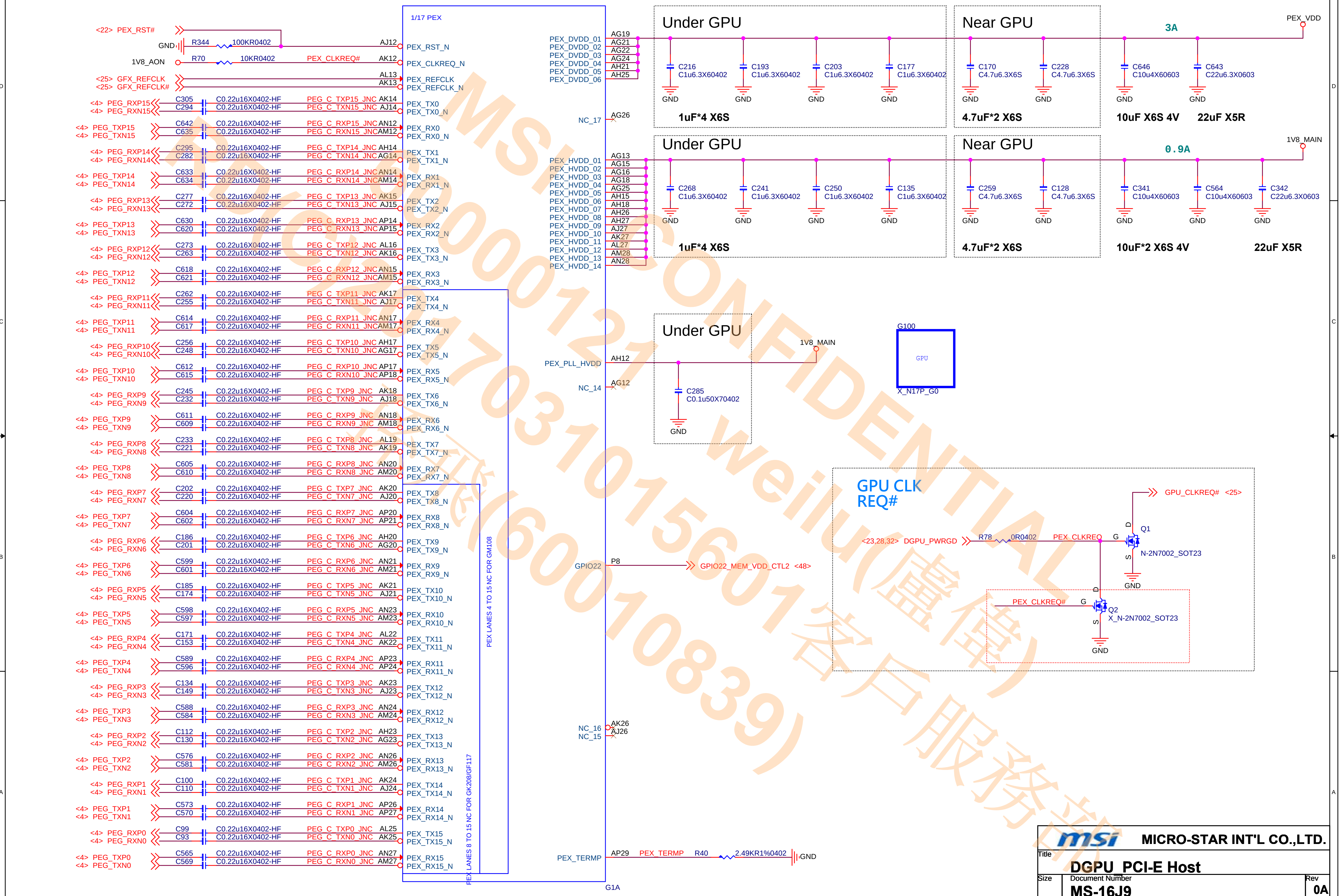
GPU PCI EXPRESS



MICRO-STAR INT'L CO.,LTD.

Title	DGPU_PCI-E Host	
Size	Document Number MS-16J9	Rev 0A
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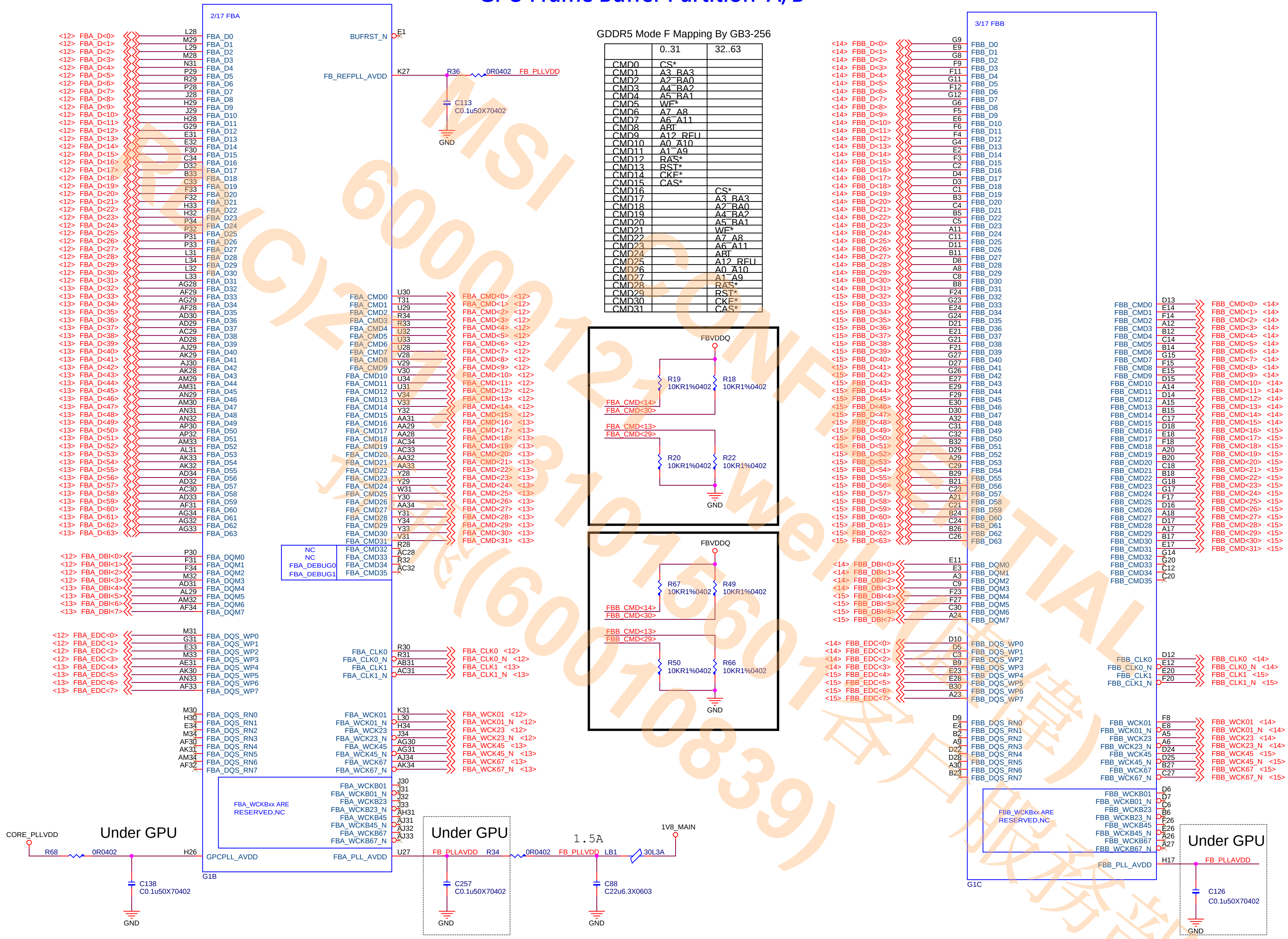
GPU Frame Buffer Partition A/B



GDDR5 Mode F Mapping By GB3-256

	0..31	32..63
CMD0	CS*	
CMD1	A3_BA3	
CMD2	A2_BA0	
CMD3	A4_BA2	
CMD4	A5_BA1	
CMD5	WE*	
CMD6	A7_A8	
CMD7	A6_A11	
CMD8	ABI	
CMD9	A12_RFU	
CMD10	A0_A10	
CMD11	A1_A9	
CMD12	RAS*	
CMD13	RST*	
CMD14	CKE*	
CMD15	CAS*	
CMD16		CS*
CMD17		A3_BA3
CMD18		A2_BA0
CMD19		A4_BA2
CMD20		A5_BA1
CMD21		WE*
CMD22		A7_A8
CMD23		A6_A11
CMD24		ABI
CMD25		A12_RFU
CMD26		A0_A10
CMD27		A1_A9
CMD28		RAS*
CMD29		RST*
CMD30		CKE*
CMD31		CAS*

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Title: DGPU_MEM IF A/B

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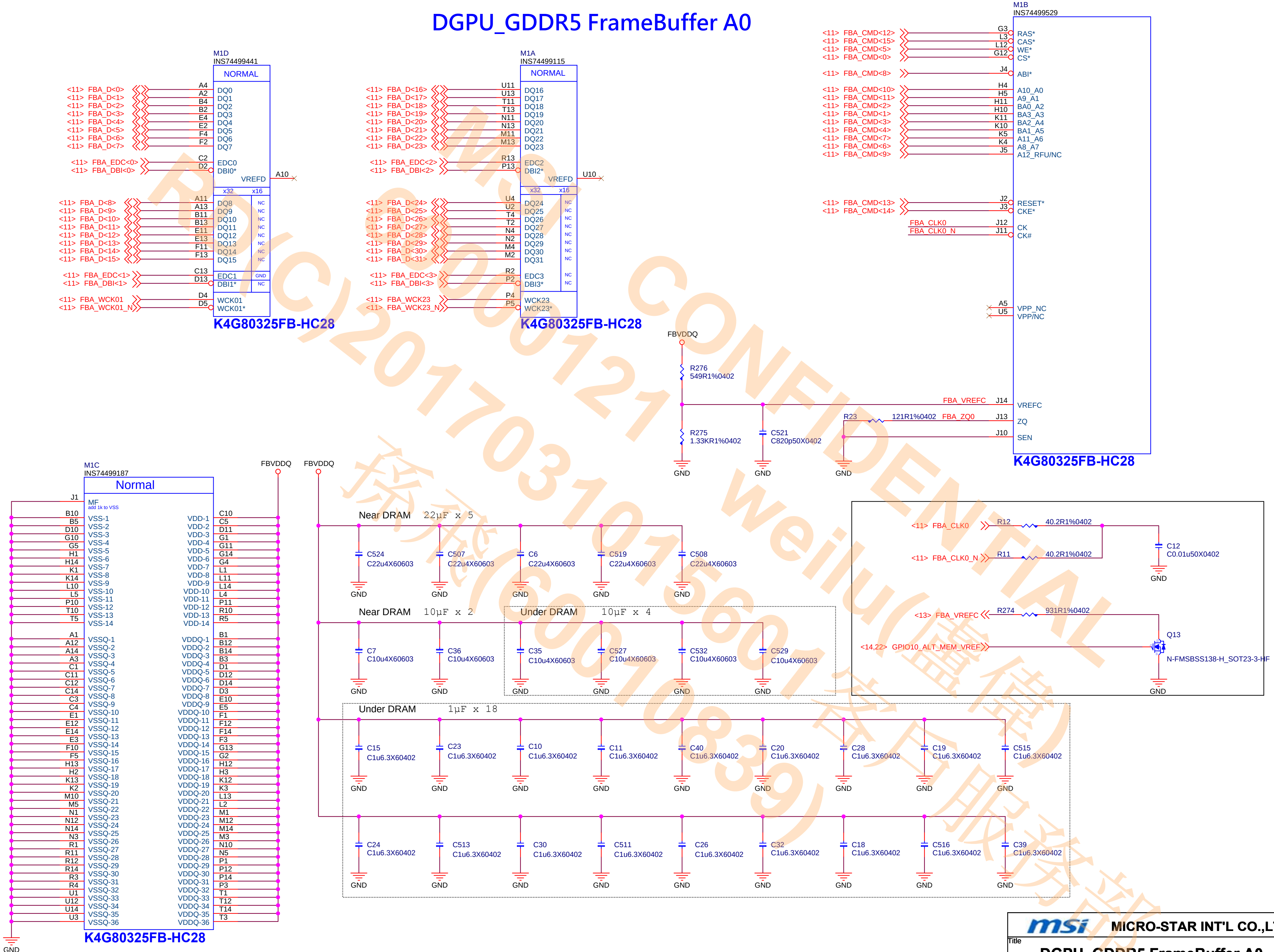
DGPU_GDDR5 FrameBuffer A0



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Title	DGPU_GDDR5 FrameBuffer A0	
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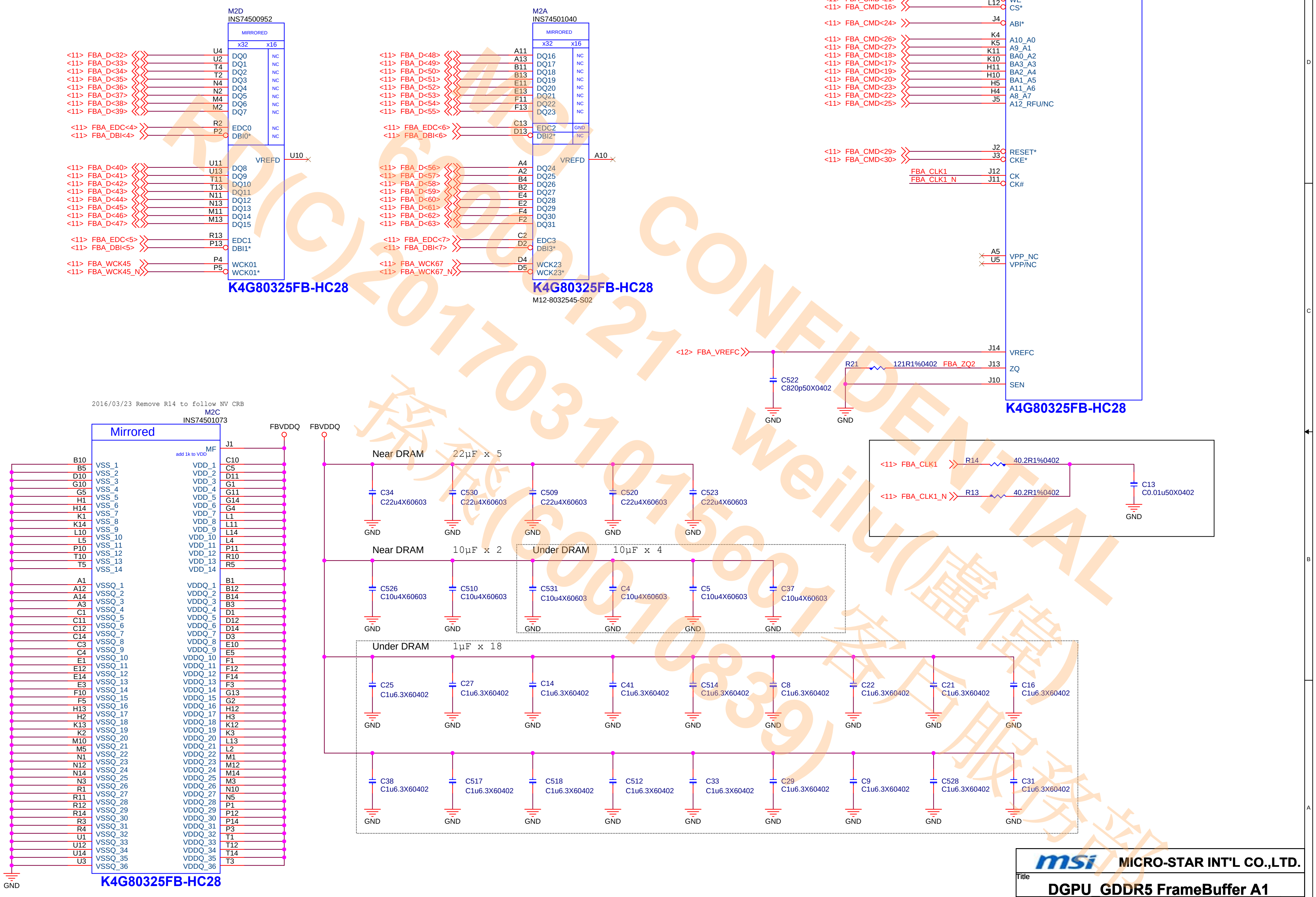
DGPU_GDDR5 FrameBuffer A1



MICRO-STAR INT'L CO.,LTD.

Title: DGPU_GDDR5 FrameBuffer A1

Size	Document Number	Rev
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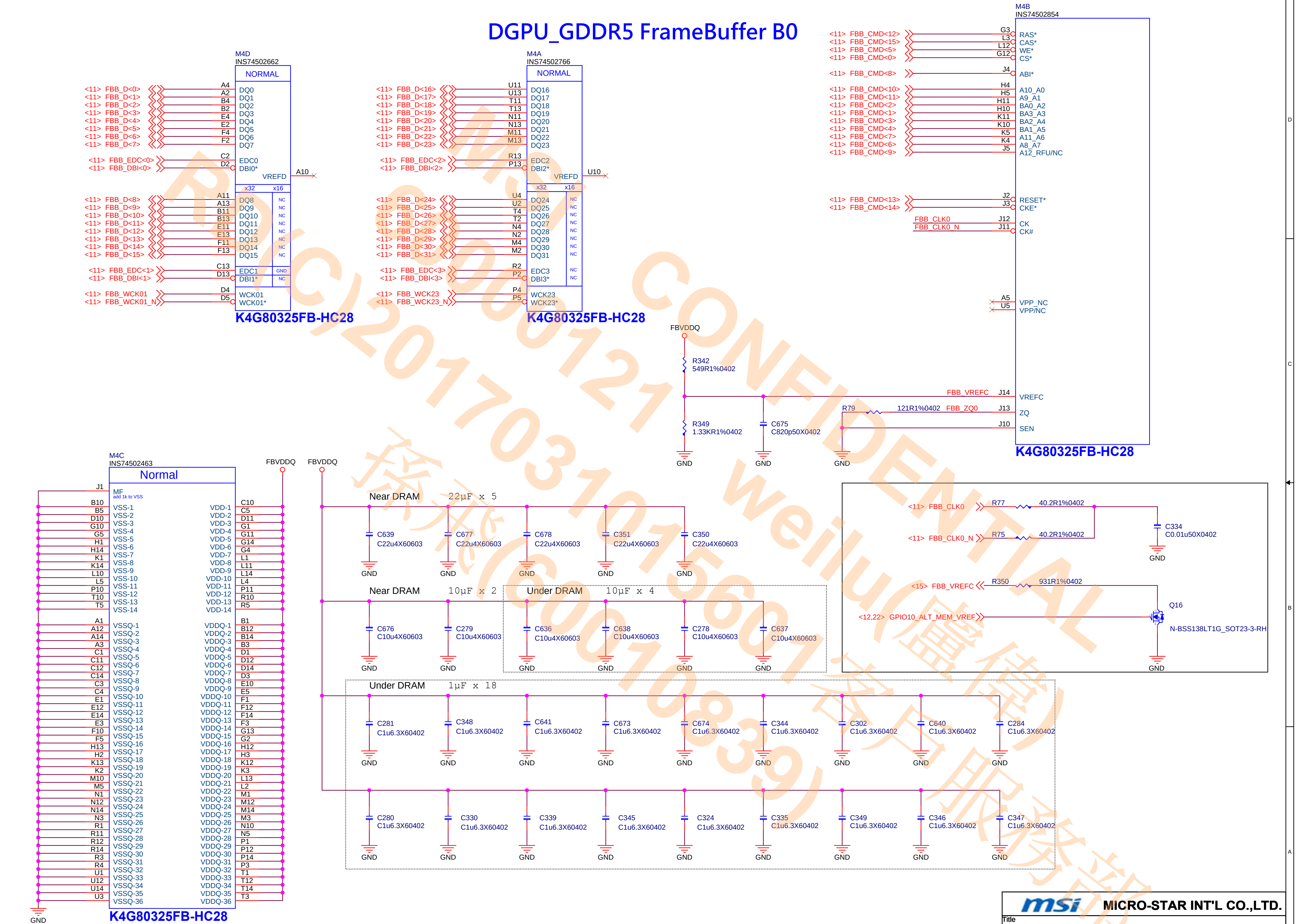
DGPU_GDDR5 FrameBuffer B0



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Title	DGPU_GDDR5 FrameBuffer B0	
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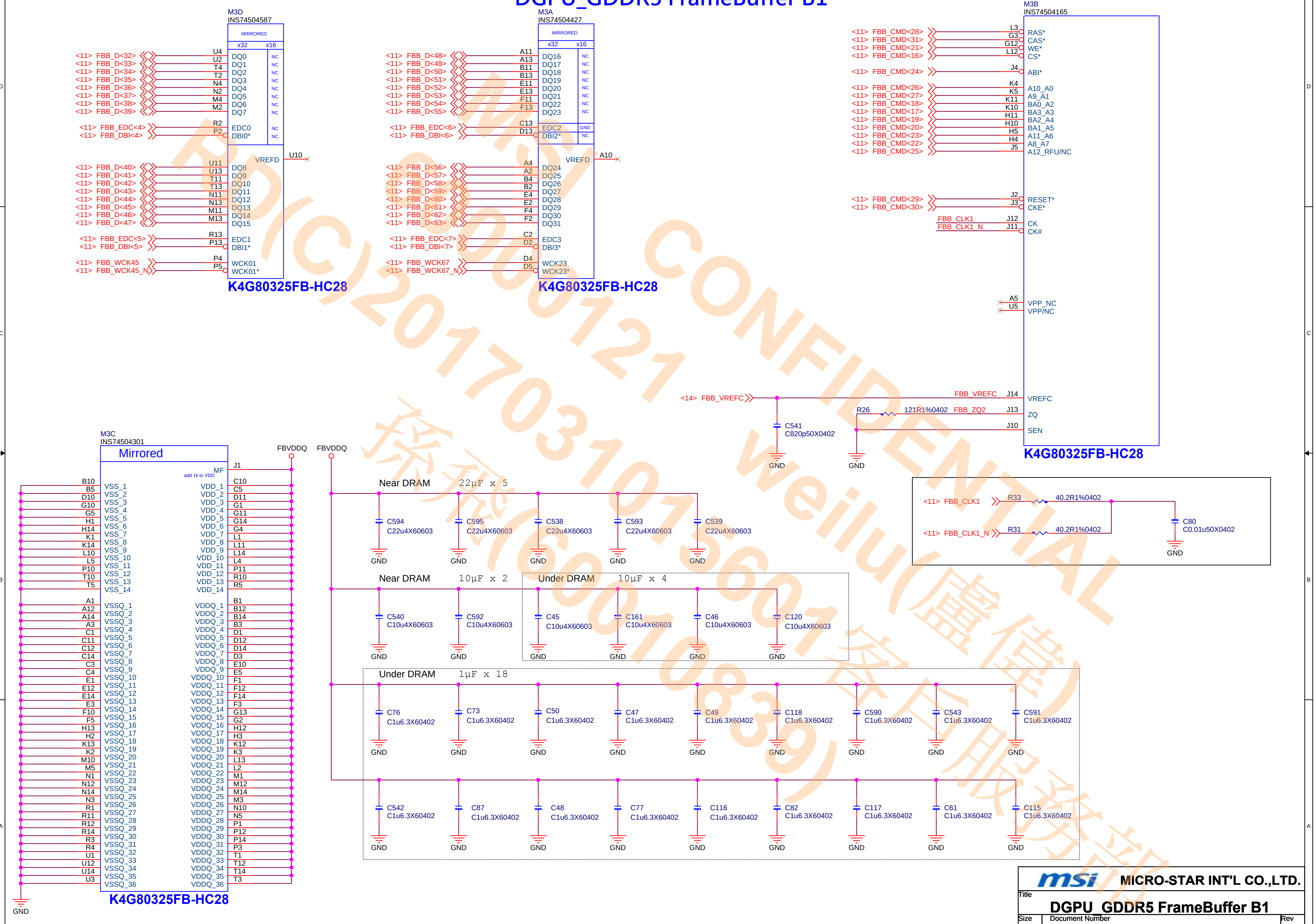
DGPU_GDDR5 FrameBuffer B1



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Title	DGPU_GDDR5 FrameBuffer B1
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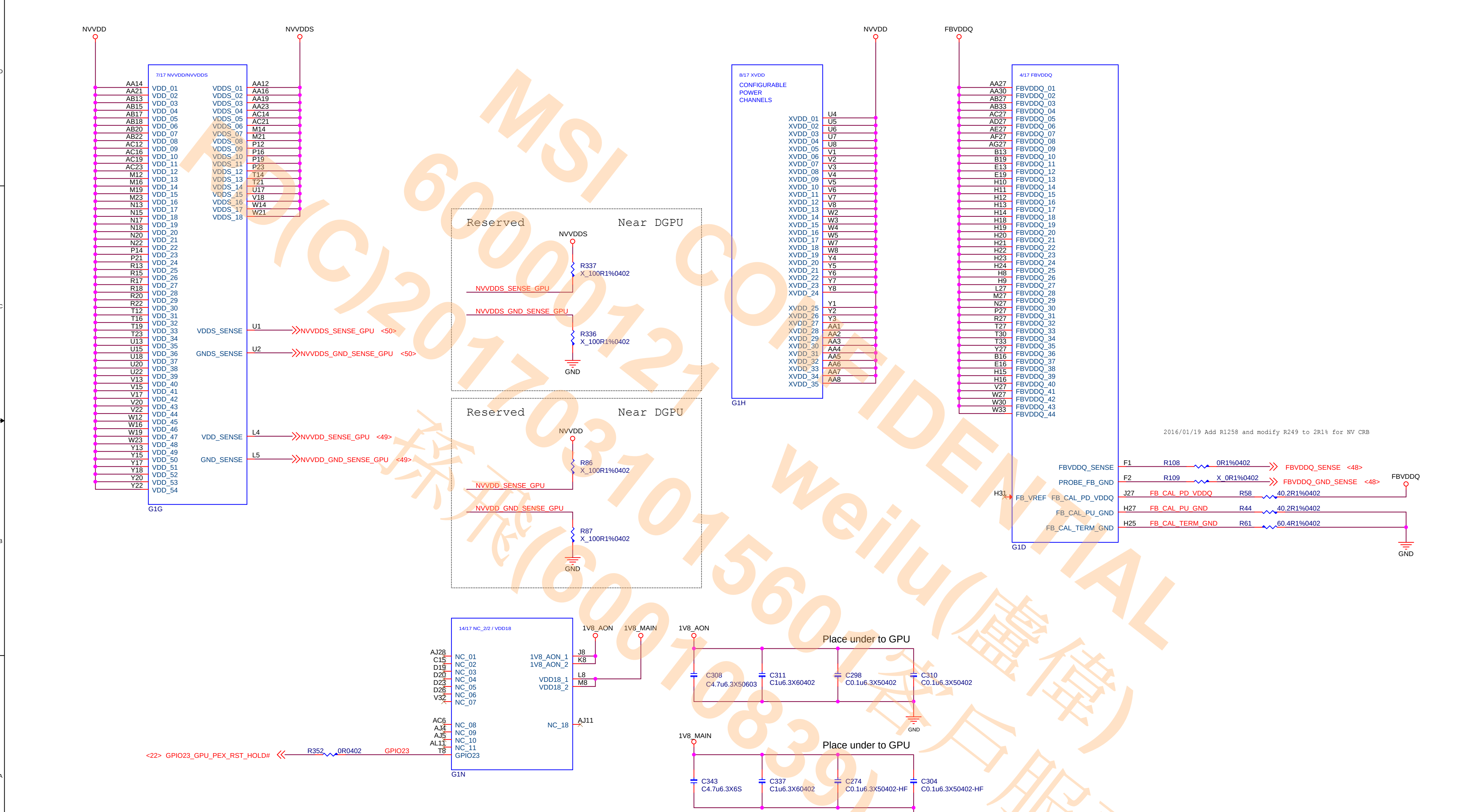
GPU NVVDD, FBVDDQ



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Title	DGPU NVVDD, FBVDDQ	
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DGPU GND

5/17 GND_1/2 (G1E)

Pin	Net	Net	Pin
A2	GND_001	GND_071	AM25
A33	GND_002	GND_072	AN1
AA13	GND_003	GND_073	AN10
AA15	GND_004	GND_074	AN13
AA17	GND_005	GND_075	AN16
AA18	GND_006	GND_076	AN19
AA20	GND_007	GND_077	AN22
AA22	GND_008	GND_078	AN25
AB12	GND_009	GND_079	AN30
AB14	GND_010	GND_080	AN34
AB16	GND_011	GND_081	AN4
AB19	GND_012	GND_082	AN7
AB2	GND_013	GND_083	AP2
AB21	GND_014	GND_084	AP33
AB23	GND_015	GND_085	B1
AB28	GND_016	GND_086	B10
AB30	GND_017	GND_087	B22
AB32	GND_018	GND_088	B25
AB5	GND_019	GND_089	B28
AB7	GND_020	GND_090	B31
AC13	GND_021	GND_091	B34
AC15	GND_022	GND_092	B4
AC17	GND_023	GND_093	B7
AC18	GND_024	GND_094	C10
AC20	GND_025	GND_095	C13
AC22	GND_026	GND_096	C19
AE2	GND_027	GND_097	C22
AE28	GND_028	GND_098	C25
AE30	GND_029	GND_099	C28
AE32	GND_030	GND_100	C7
AE33	GND_031	GND_101	D2
AE5	GND_032	GND_102	D31
AE7	GND_033	GND_103	D33
AH10	GND_034	GND_104	E10
AH13	GND_035	GND_105	E22
AH16	GND_036	GND_106	E25
AH19	GND_037	GND_107	E5
AH2	GND_038	GND_108	E7
AH22	GND_039	GND_109	F28
AH24	GND_040	GND_110	F7
AH28	GND_041	GND_111	G10
AH29	GND_042	GND_112	G13
AH30	GND_043	GND_113	G16
AH32	GND_044	GND_114	G19
AH33	GND_045	GND_115	G2
AH5	GND_046	GND_116	G22
AH7	GND_047	GND_117	G25
AJ7	GND_048	GND_118	G28
AK10	GND_049	GND_119	G3
AK7	GND_050	GND_120	G30
AL12	GND_051	GND_121	G32
AL14	GND_052	GND_122	G33
AL15	GND_053	GND_123	G5
AL17	GND_054	GND_124	G7
AL18	GND_055	GND_125	K2
AL2	GND_056	GND_126	K28
AL20	GND_057	GND_127	K30
AL21	GND_058	GND_128	K32
AL23	GND_059	GND_129	K33
AL24	GND_060	GND_130	K5
AL26	GND_061	GND_131	K7
AL28	GND_062	GND_132	M13
AL30	GND_063	GND_133	M15
AL32	GND_064	GND_134	M17
AL33	GND_065	GND_135	M18
AL5	GND_066	GND_136	M20
AM13	GND_067	GND_137	M22
AM16	GND_068	GND_138	N12
AM19	GND_069	GND_139	N14
AM22	GND_070	GND_140	N16

GND GND

6/17 GND_2/2 (G1F)

Pin	Net	Net	Pin
N19	GND_141	GND_170	T28
N2	GND_142	GND_171	T32
N21	GND_143	GND_172	T5
N23	GND_144	GND_173	T7
N28	GND_145	GND_174	U12
N30	GND_146	GND_175	U14
N32	GND_147	GND_176	U16
N33	GND_148	GND_177	U19
N5	GND_149	GND_178	U21
N7	GND_150	GND_179	U23
P13	GND_151	GND_180	V12
P15	GND_152	GND_181	V14
P17	GND_153	GND_182	V16
P18	GND_154	GND_183	V19
P20	GND_155	GND_184	V21
P22	GND_156	GND_185	V23
R12	GND_157	GND_186	W13
R14	GND_158	GND_187	W15
R16	GND_159	GND_188	W17
R19	GND_160	GND_189	W18
R21	GND_161	GND_190	W20
R23	GND_162	GND_191	W22
T13	GND_163	GND_192	W28
T15	GND_164	GND_193	Y12
T17	GND_165	GND_194	Y14
T18	GND_166	GND_195	Y16
T2	GND_167	GND_196	Y19
T20	GND_168	GND_197	Y21
T22	GND_169	GND_198	Y23
AG11	GND_F	GND_H	AH11

Optional CMD GND

Net	Pin
GND_OPT_1	C16
GND_OPT_2	W32

GND GND

MICRO-STAR INT'L CO.,LTD.

Title	DGPU_GND
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GPU DECOUPLING

MICRO-STAR INT'L CO.,LTD.

Title	DGPU_GPU DECOUPLING	
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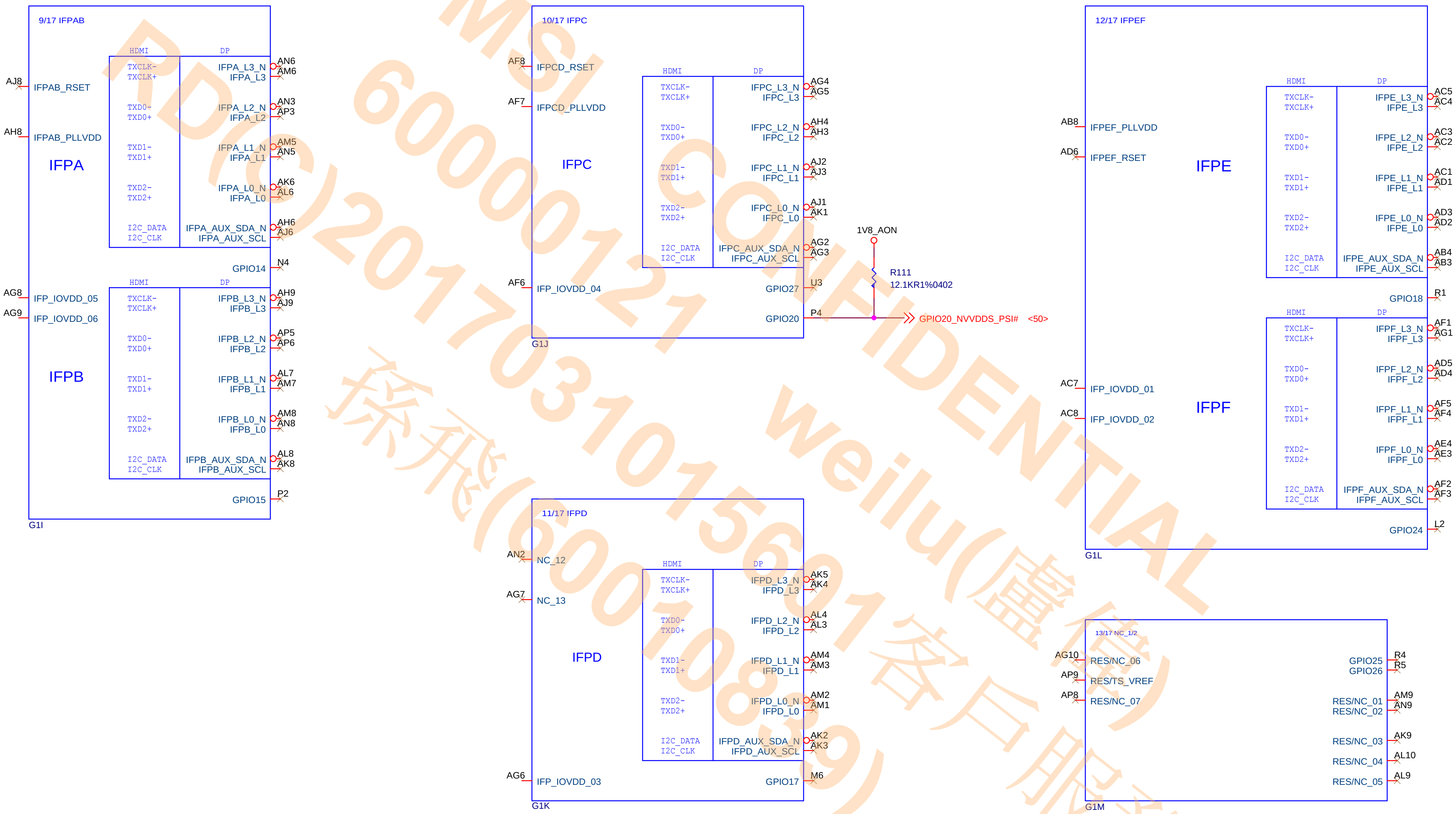
DACA,Display IF



MICRO-STAR INT'L CO.,LTD.

Title: DGPU_DACA,Display IF

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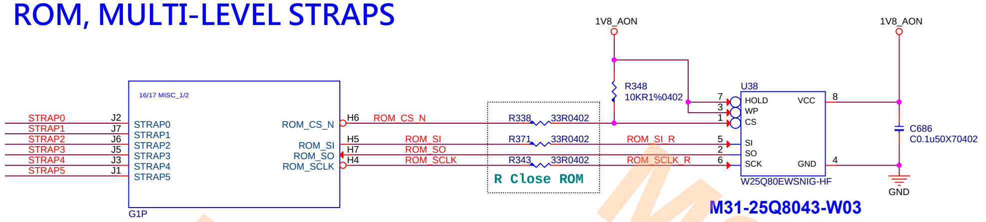
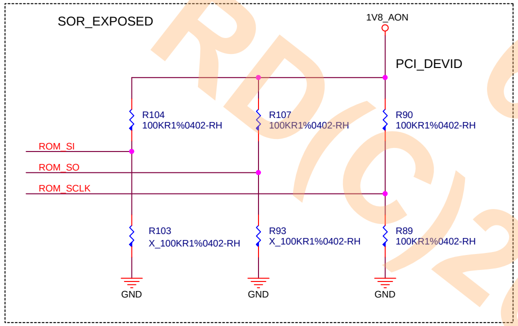
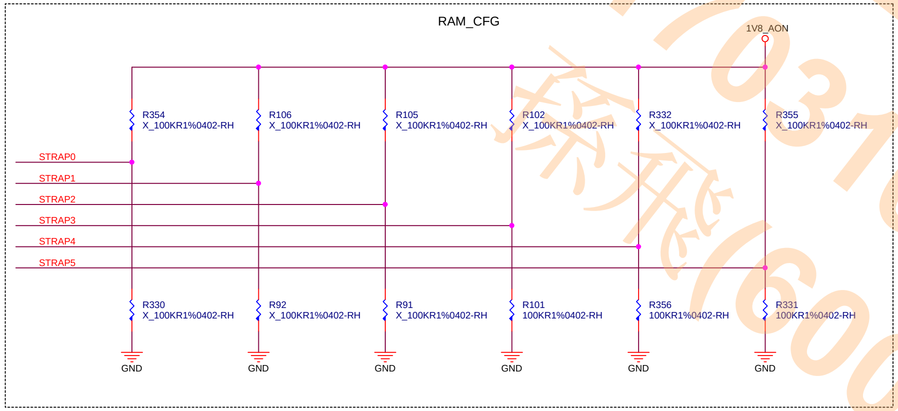
ROM, MULTI-LEVEL STRAPS







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

1:SMB_ALT_ADDR ENABLE
0:SMB_ALT_ADDR DISABLE

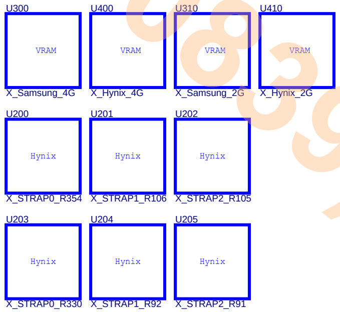
1:DEVID_SEL REBRAND
0:DEVID_SEL ORIGNAL

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

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	R354.R106.R91
H	H	H	0x7 Samsung: M12-41325A5-S02 / K4G41325FE-HC28	R354.R106.R105
L	L	M	0x8 Micron: EDW032BABG-70-F:A	R330.R92.R105.R91
L	M	L		



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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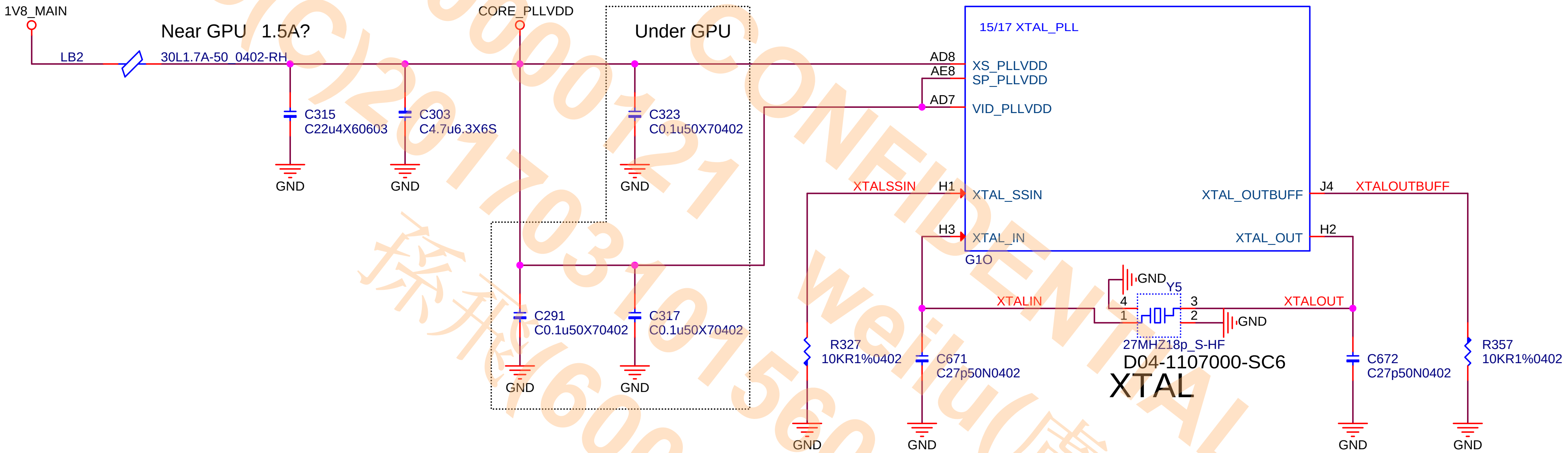
DGPU XTAL



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Title: DGPU_XTAL

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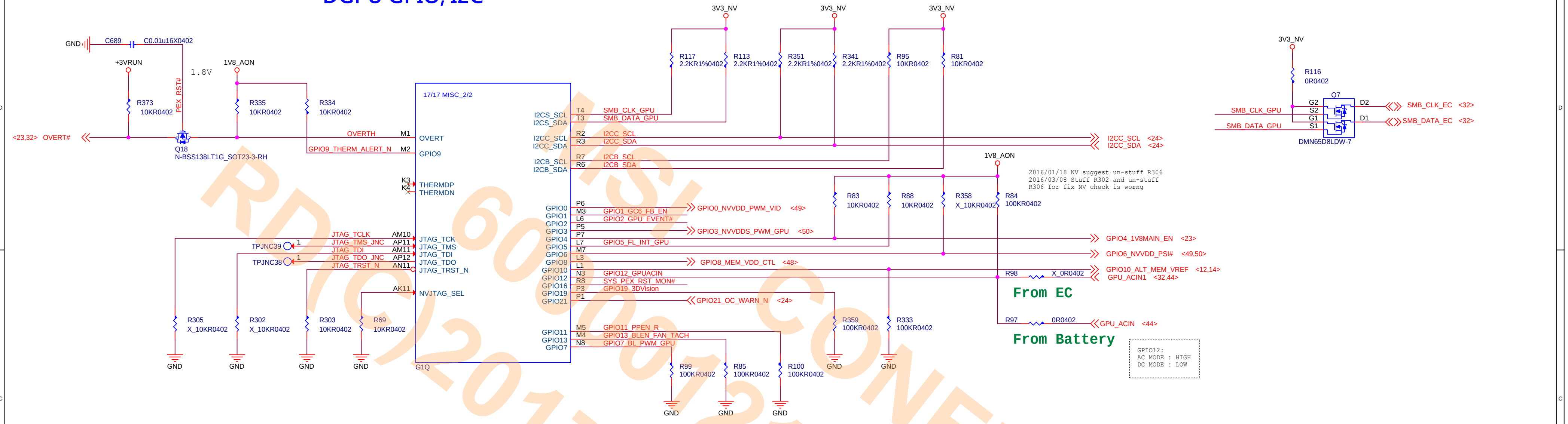
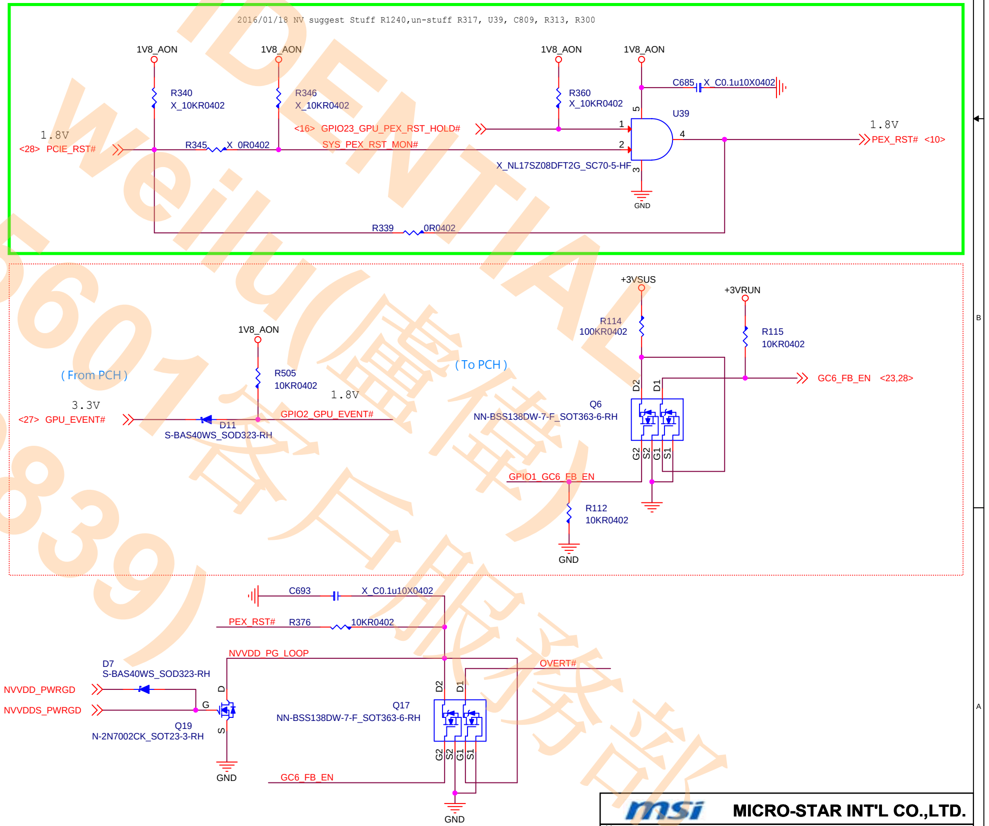
DGPU GPIO, I2C



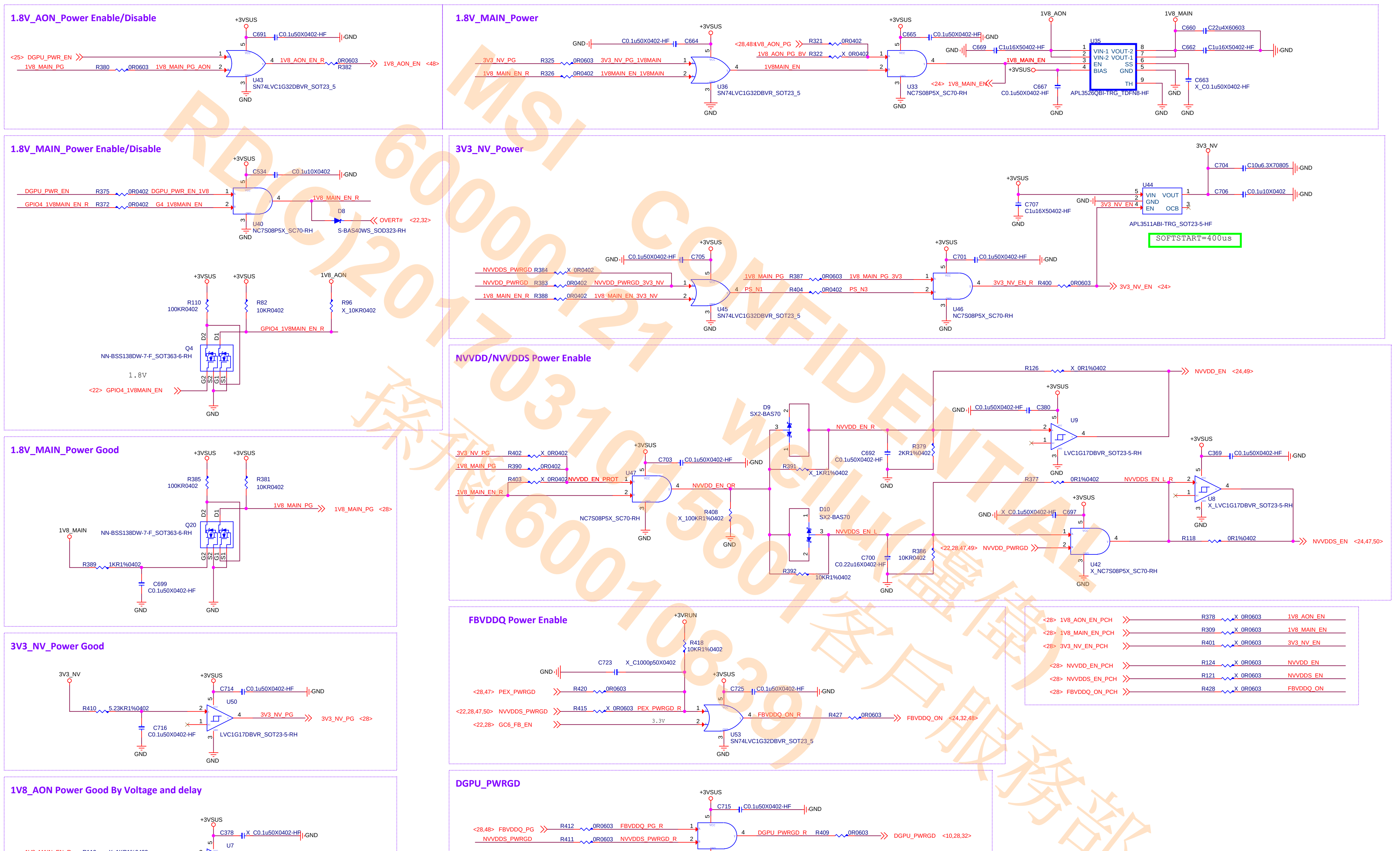
Pin Name	Normal function	I/O	Functional Description	Recommended Default Pull-up or Pull-down
GPIO0	PWR_VID	O	GPU Core VDD PWM control signal	0 to 1V8 PWM output
GPIO1	GC6_FB_EN	O	FB Enable for GC6 2.1	OD, 10K pull-down
GPIO2	GPU_EVENT#	I	GPU wake signal for GC6 2.1	10K pull-up to 1V8 _AON
GPIO3	NVVDD_SRAM_PWM	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	10K 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	O	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	



nVIDIA Power Sequence Control

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

Power Off=NVVDDS/PEX_VDD/FBVDDQ(無先後順序)->NVVDD/NV3V3(可同時掉)->1V8_MAIN->1V8_AON

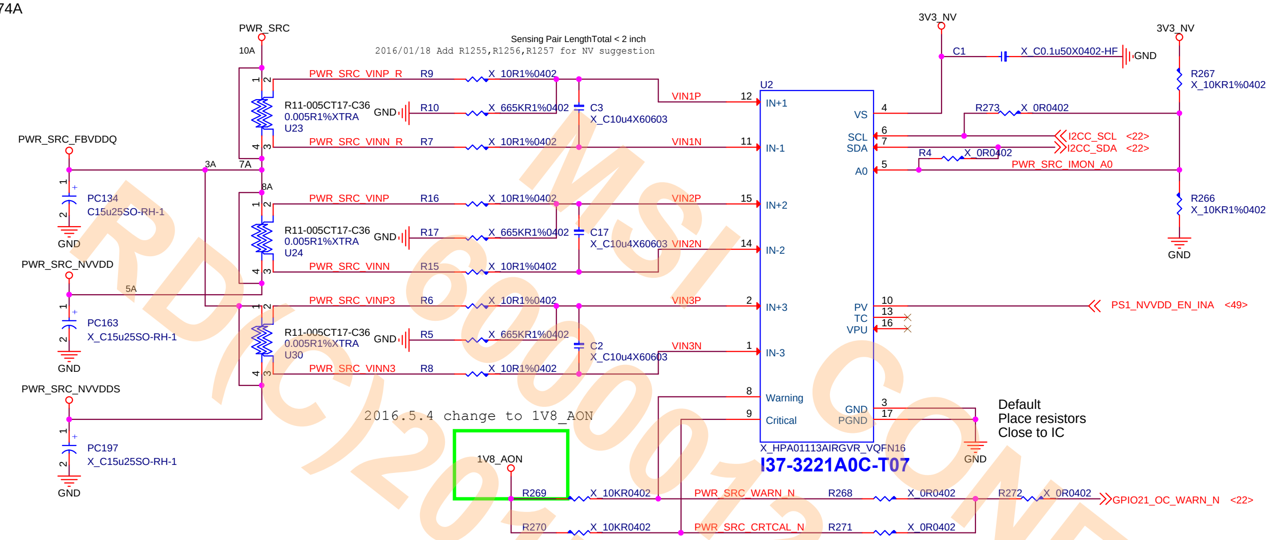


MICRO-STAR INT'L CO.,LTD.

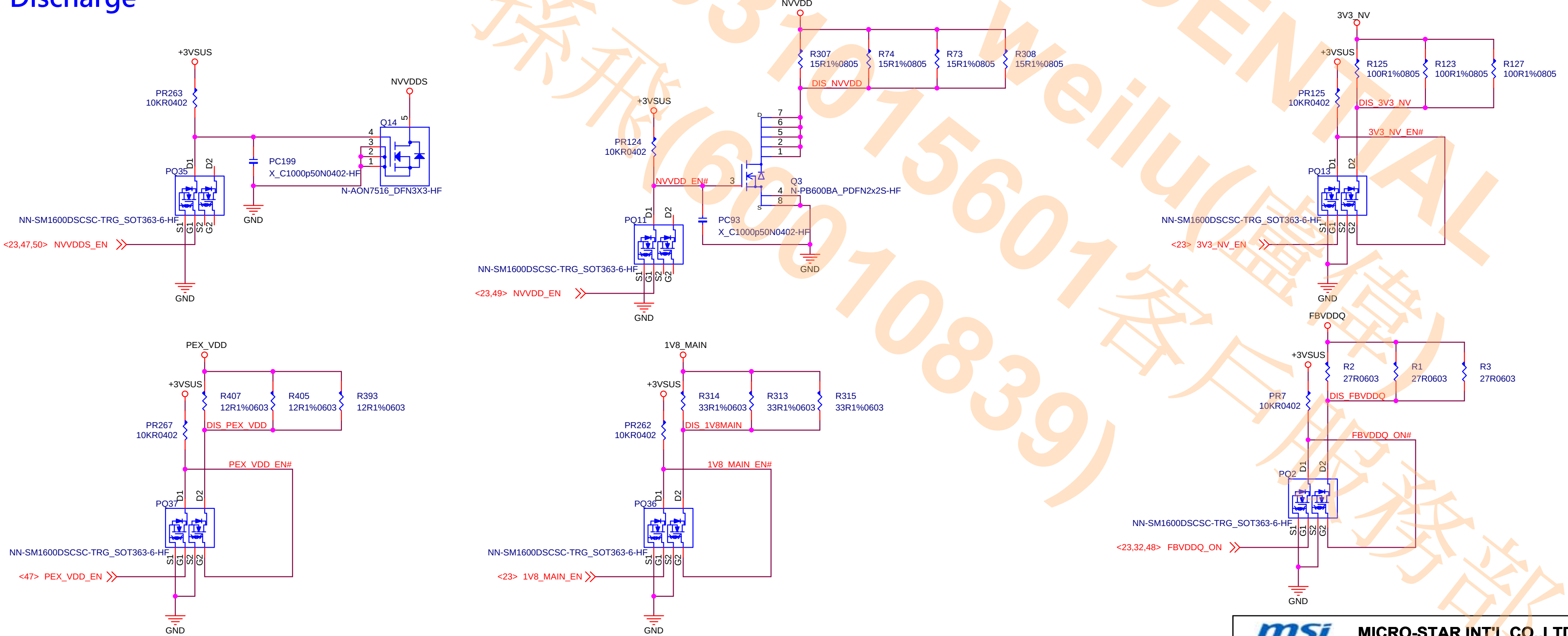
Title	DGPU_Power Sequence
Size / Document Number	MS-16J9
Rev	0A
Sheet	23 of 62

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

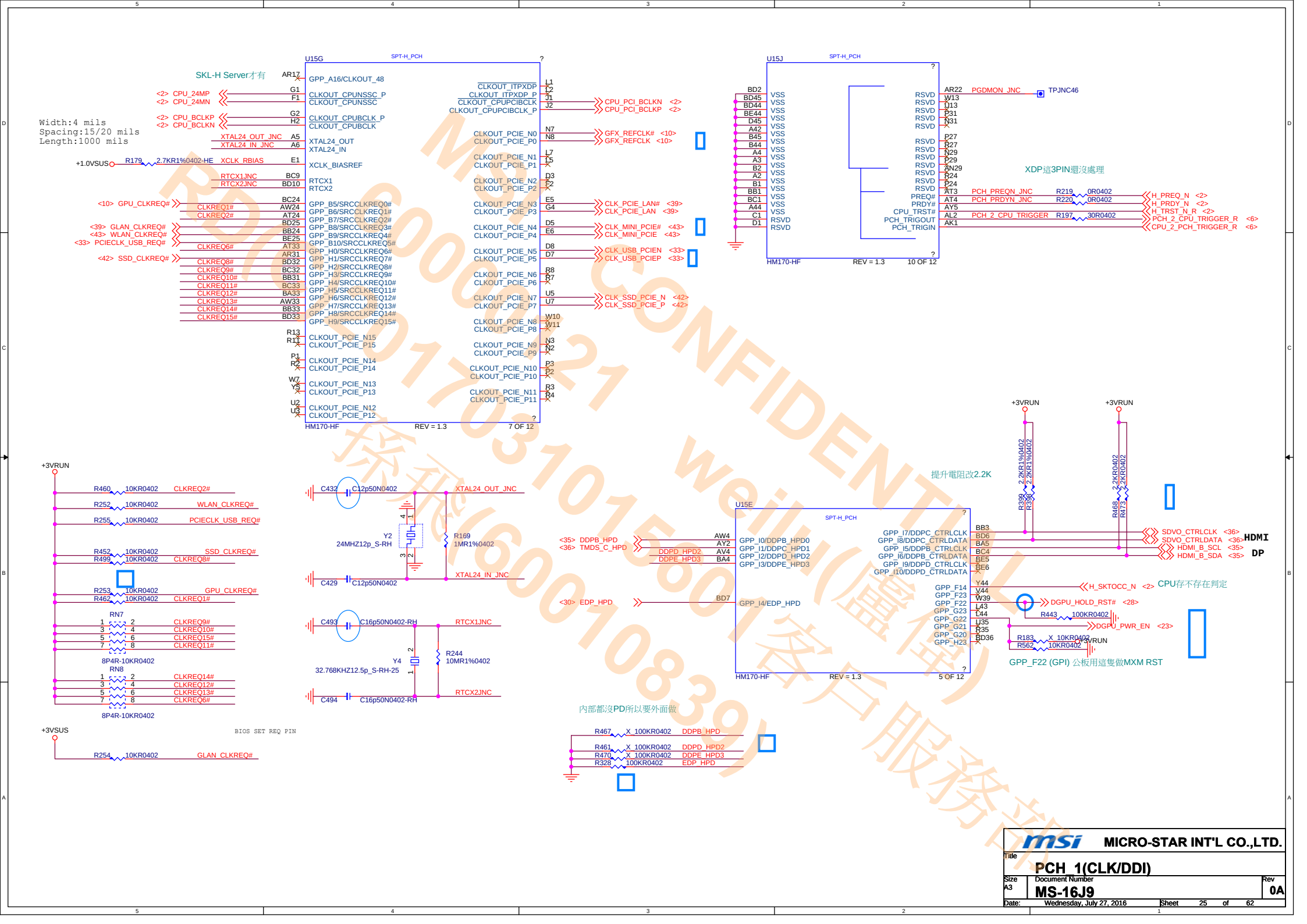
DGPU_Power Control/Discharge

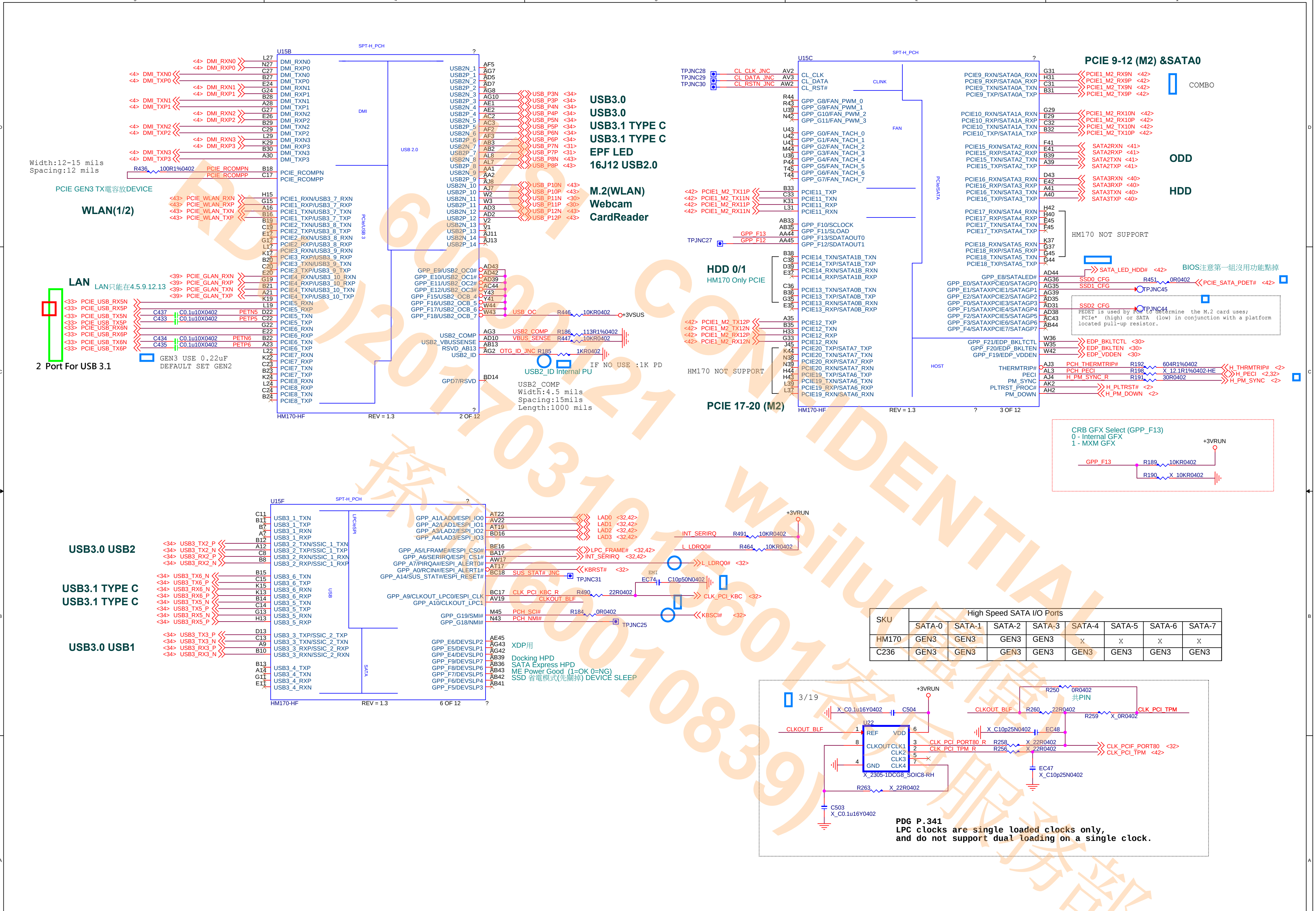


Discharge



msi	MICRO-STAR INT'L CO.,LTD.
Title	DGPU_Discharge
Size / Document Number	MS-16J9
Rev	0A
Date:	Sheet 24 of 62


SKL-H Server才有
Width:4 mils
Spacing:15/20 mils
Length:1000 mils
U15G
SPT-H_PCH
HM170-HF
REV = 1.3
7 OF 12
U15J
10 OF 12
U15E
5 OF 12
XDP這3PIN還沒處理
提升電阻改2.2K
內部都沒PD所以要外面做
CPU存不存在判定
GPP_F22 (GPI) 公板用這隻做MXM RST
BIOS SET REQ PIN
HDMI
DP
MICRO-STAR INT'L CO.,LTD.
PCH_1(CLK/DDI)
MS-16J9
0A
Wednesday, July 27, 2016
Sheet 25 of 62

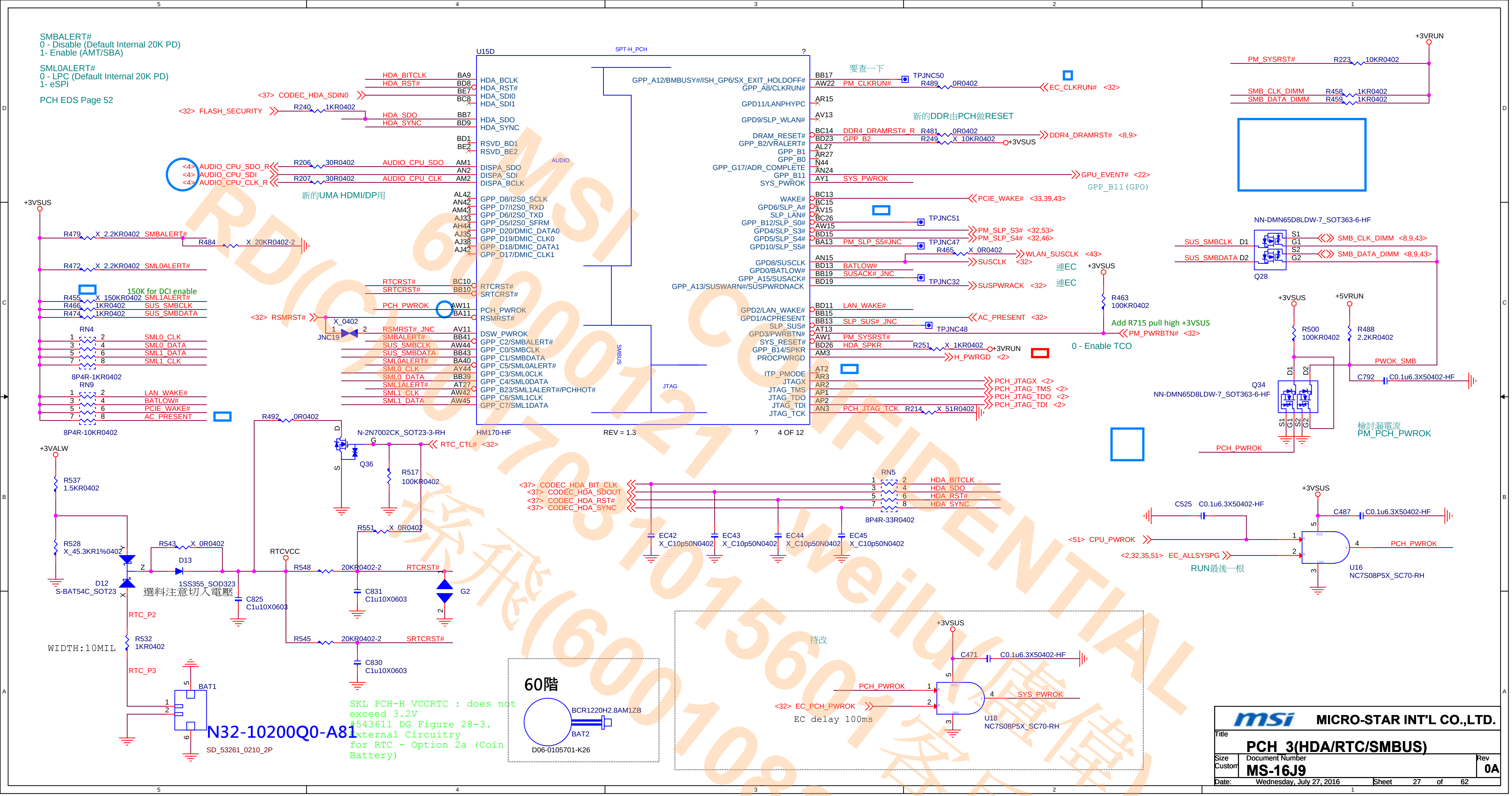


SKU	High Speed SATA I/O Ports							
	SATA-0	SATA-1	SATA-2	SATA-3	SATA-4	SATA-5	SATA-6	SATA-7
HM170	GEN3	GEN3	GEN3	GEN3	X	X	X	X
C236	GEN3	GEN3	GEN3	GEN3	GEN3	GEN3	GEN3	GEN3

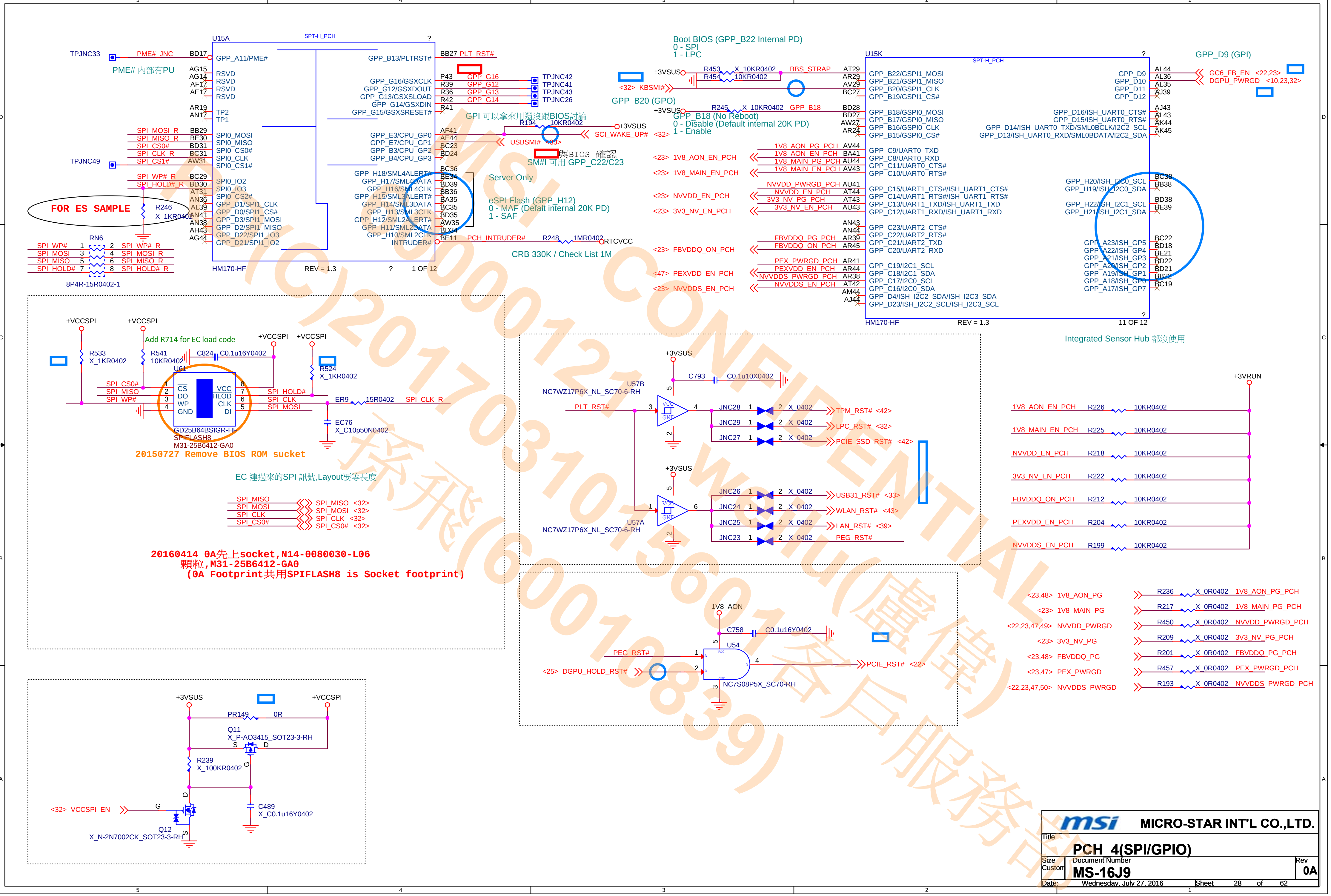
Title: PCH_2(USB/SATA/PCIE)

Size: C — Document Number: MS-16J9 — Rev: 0A

Date: Wednesday, July 27, 2016 — Sheet 26 of 62



SMBALERT#
0 - Disable (Default Internal 20K PD)
1- Enable (AMT/SBA)
SML0ALERT#
0 - LPC (Default Internal 20K PD)
1- eSPI
PCH EDS Page 52
U15D
SPT-H_PCH
HDA_BCLK
HDA_RST#
HDA_SDI0
HDA_SDI1
HDA_SDO
HDA_SYNC
RSVD_BD1
RSVD_BE2
DISPA_SDO
DISPA_SDI
DISPA_BCLK
新的UMA HDMI/DP用
RTCRST#
SRTCRST#
PCH_PWROK
RSMRST#
DSW_PWROK
150K for DCI enable
HM170-HF
REV = 1.3
4 OF 12
要查一下
新的DDR由PCH做RESET
連EC
Add R715 pull high +3VSUS
0 - Enable TCO
檢討漏電流
PM_PCH_PWROK
RUN最後一根
待改
EC delay 100ms
選料注意切入電壓
WIDTH:10MIL
N32-10200Q0-A81
SD_53261_0210_2P
60階
BCR1220H2.8AM1ZB
BAT2
D06-0105701-K26
SKL PCH-H VCCRTC : does not exceed 3.2V
#543611 DG Figure 28-3. External Circuitry for RTC - Option 2a (Coin Battery)
MICRO-STAR INT'L CO.,LTD.
Title
PCH_3(HDA/RTC/SMBUS)
Size Custom
Document Number
MS-16J9
Rev
0A
Date: Wednesday, July 27, 2016
Sheet 27 of 62



U15A
SPT-H_PCH
HM170-HF
REV = 1.3
1 OF 12
PME# 內部有PU
FOR ES SAMPLE
8P4R-15R0402-1
Boot BIOS (GPP_B22 Internal PD)
0 - SPI
1 - LPC
GPP_B20 (GPO)
GPP_B18 (No Reboot)
0 - Disable (Default internal 20K PD)
1 - Enable
GPI 可以拿來用還沒跟BIOS討論
與BIOS 確認
SM#I 可用 GPP_C22/C23
Server Only
eSPI Flash (GPP_H12)
0 - MAF (Defalt internal 20K PD)
1 - SAF
CRB 330K / Check List 1M
U15K
GPP_D9 (GPI)
11 OF 12
Integrated Sensor Hub 都沒使用
Add R714 for EC load code
GD25B64BSIGR-HF
SPIFLASH8
M31-25B6412-GA0
20150727 Remove BIOS ROM sucket
EC 連過來的SPI 訊號,Layout要等長度
20160414 0A先上socket,N14-0080030-L06
顆粒,M31-25B6412-GA0
(0A Footprint共用SPIFLASH8 is Socket footprint)
NC7WZ17P6X_NL_SC70-6-RH
NC7S08P5X_SC70-RH
Q11
X_P-AO3415_SOT23-3-RH
Q12
X_N-2N7002CK_SOT23-3-RH
<32> VCCSPI_EN
MICRO-STAR INT'L CO.,LTD.
Title
PCH_4(SPI/GPIO)
Size Custom
Document Number
MS-16J9
Rev 0A
Date: Wednesday, July 27, 2016
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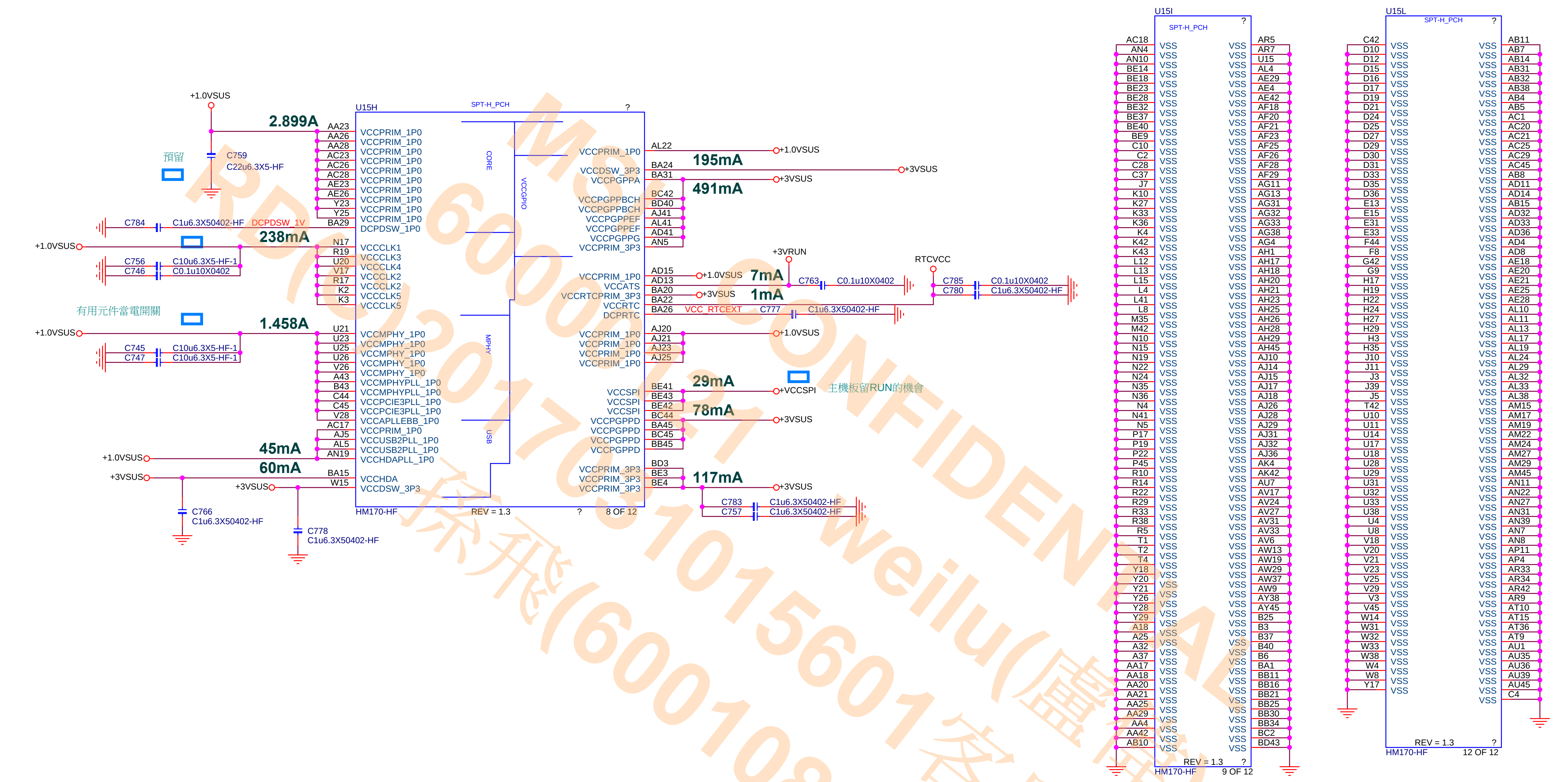
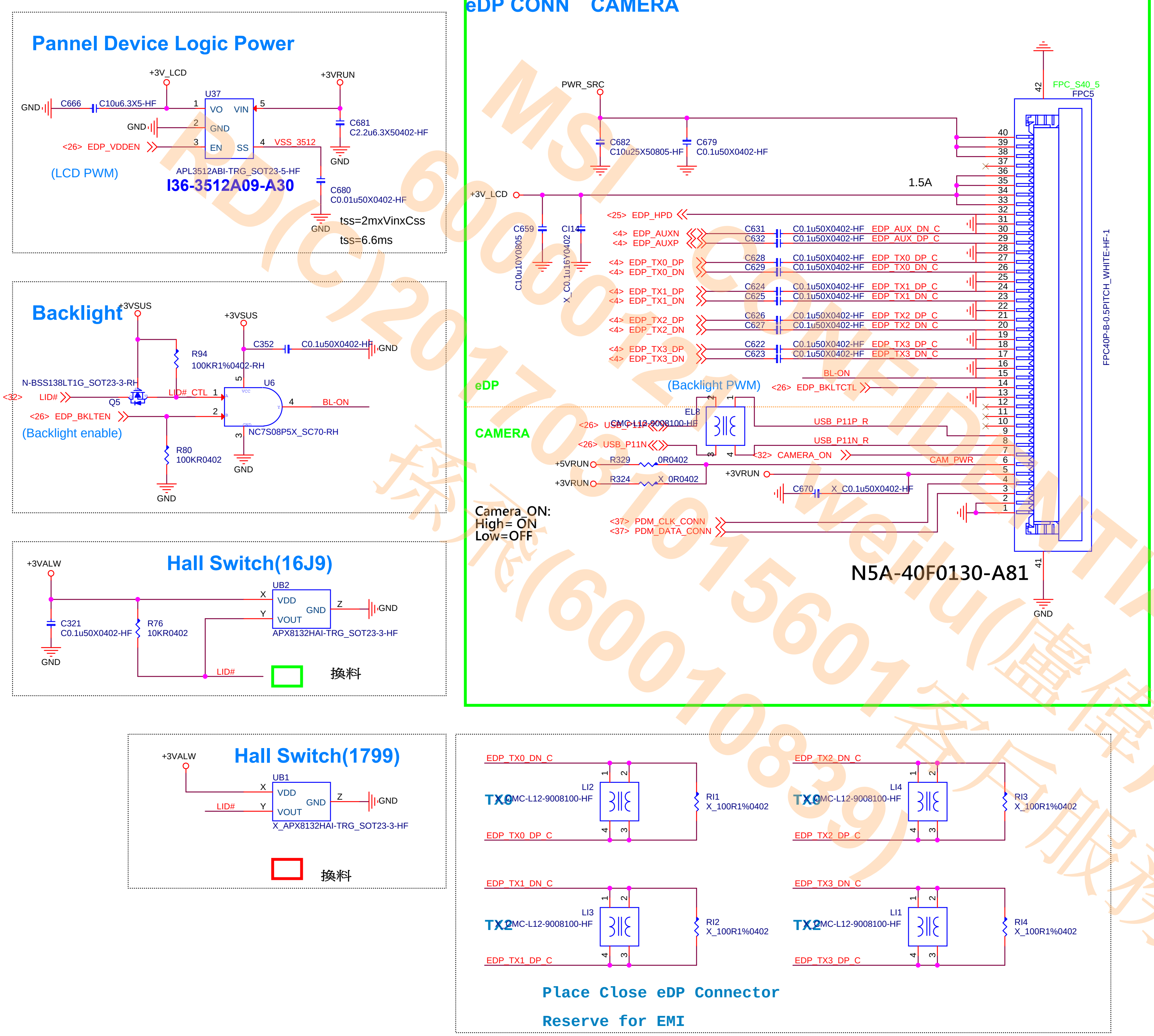


msi	MICRO-STAR INT'L CO.,LTD.
Title	PCH_5(Power1)
Size: Custom	Document Number: MS-16J9	Rev: 0A
Date: Wednesday, July 27, 2016	Sheet 29 of 62

eDP

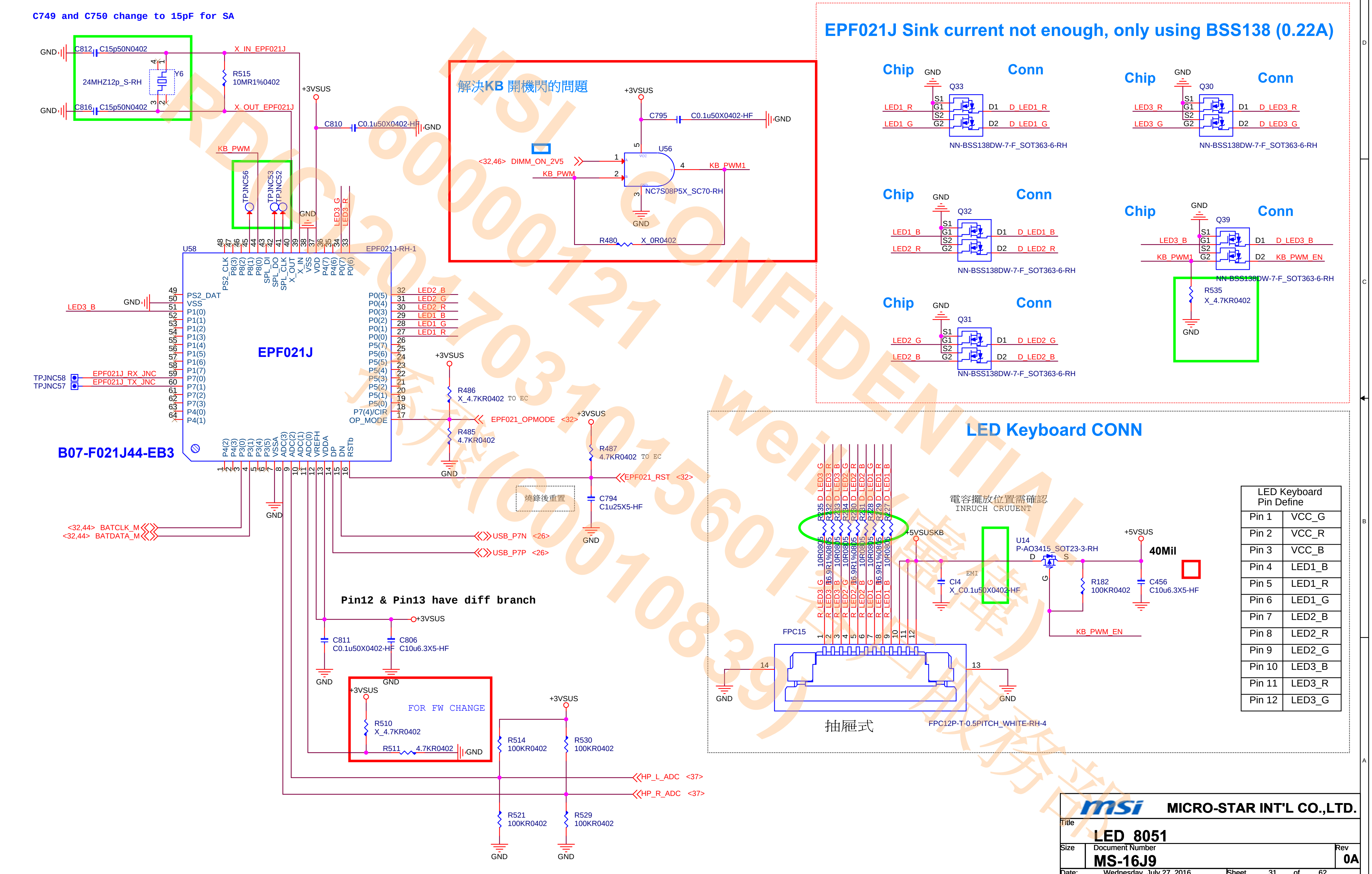


LCD Module Pin Define

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

MICRO-STAR INT'L CO.,LTD.
Title: eDP /Camera
Size | Document Number: MS-16J9 | Rev: 0A
Date: Wednesday, July 27, 2016 | Sheet 30 of 62

LED 8051 Controller



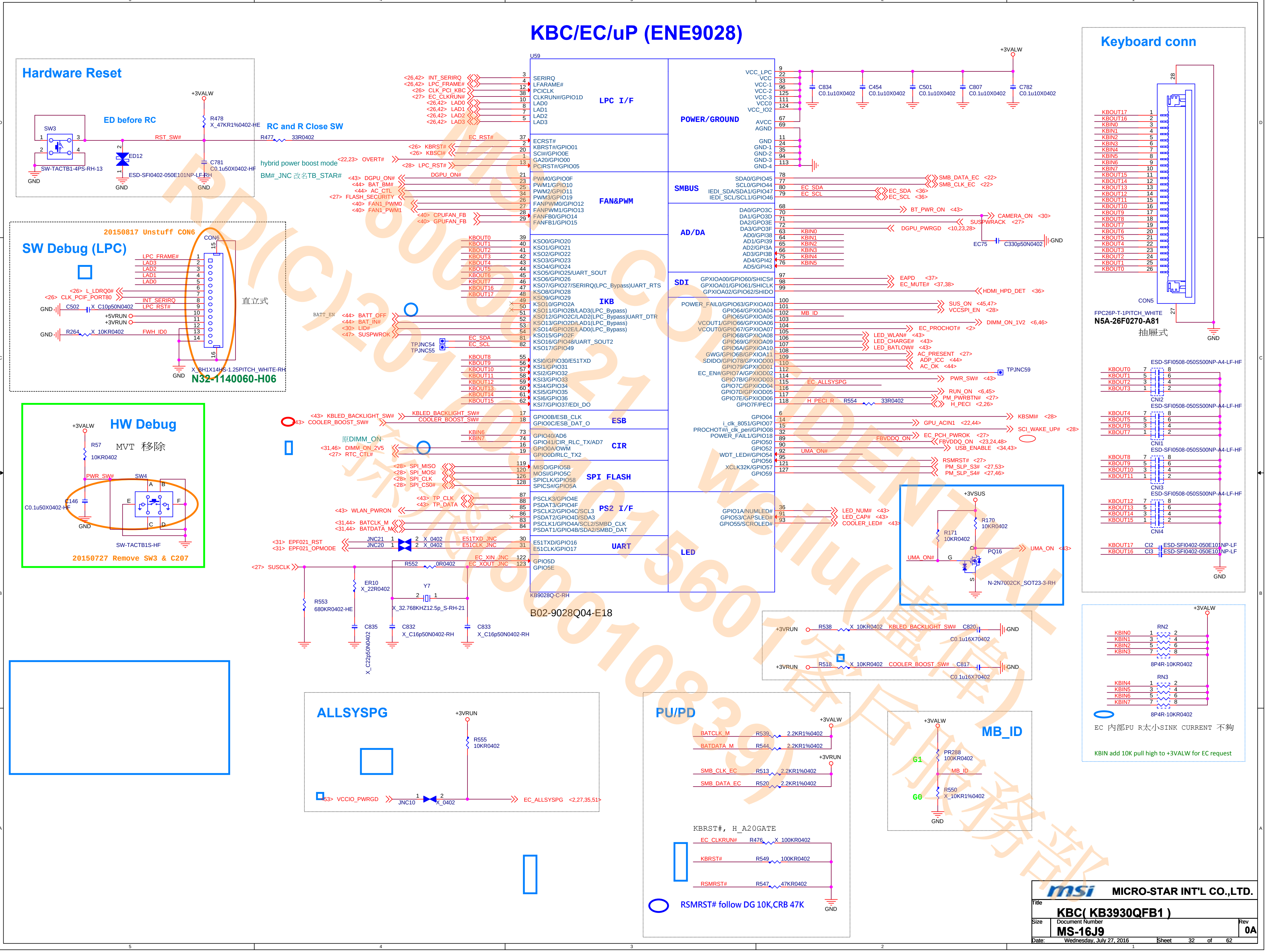
LED Keyboard Pin Define	
Pin 1	VCC_G
Pin 2	VCC_R
Pin 3	VCC_B
Pin 4	LED1_B
Pin 5	LED1_R
Pin 6	LED1_G
Pin 7	LED2_B
Pin 8	LED2_R
Pin 9	LED2_G
Pin 10	LED3_B
Pin 11	LED3_R
Pin 12	LED3_G

MICRO-STAR INT'L CO.,LTD.

Title: LED_8051

Size | Document Number: MS-16J9 | Rev: 0A

Date: Wednesday, July 27, 2016 | Sheet 31 of 62



MICRO-STAR INT'L CO.,LTD.

Title: KBC(KB3930QFB1)

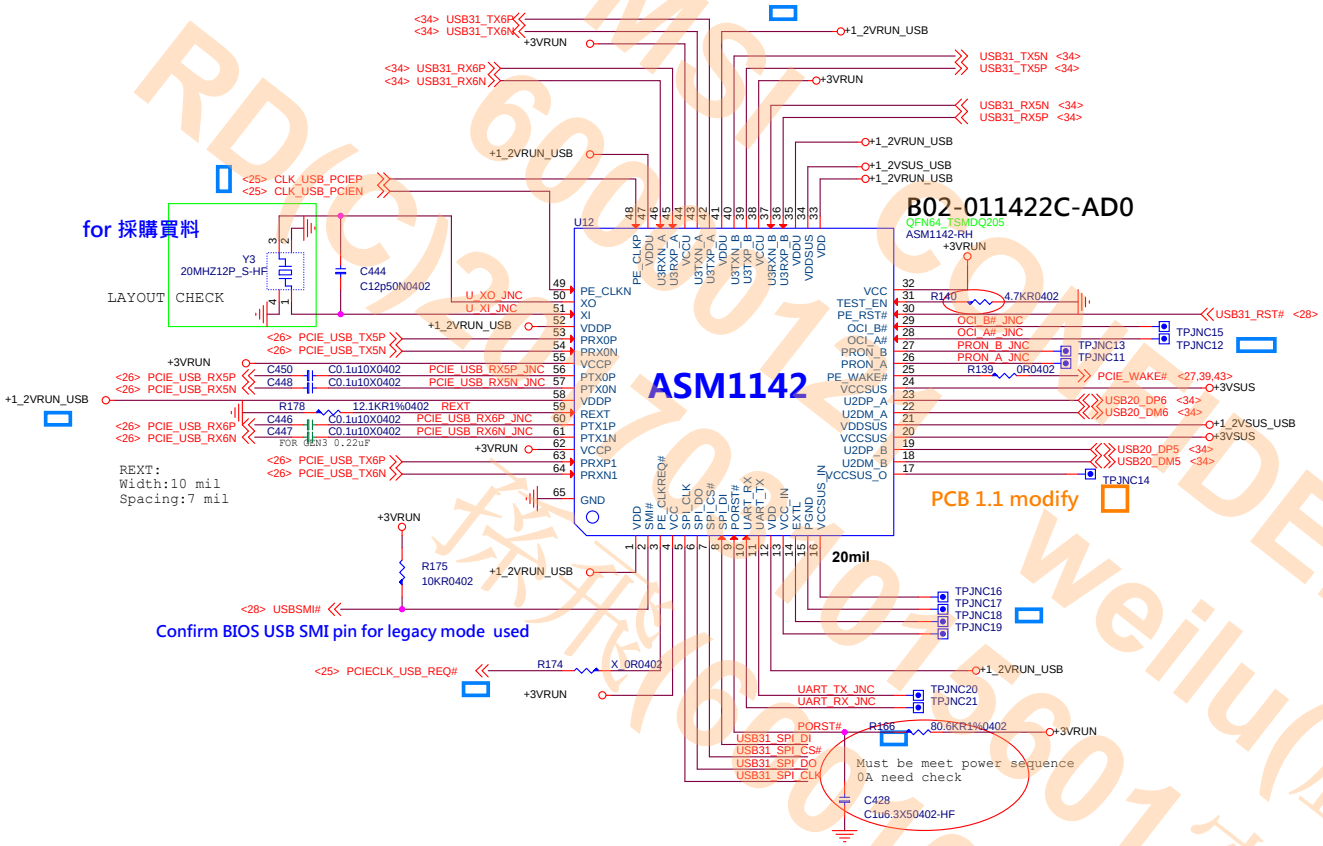
Document Number: MS-16J9

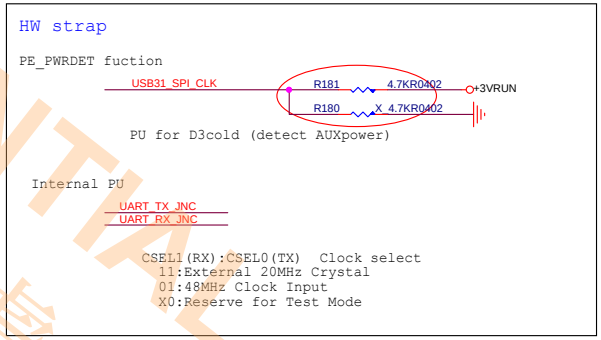
Rev: 0A

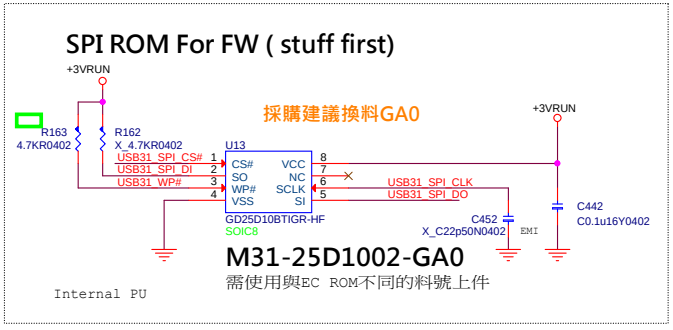
Date: Wednesday, July 27, 2016 — Sheet 32 of 62

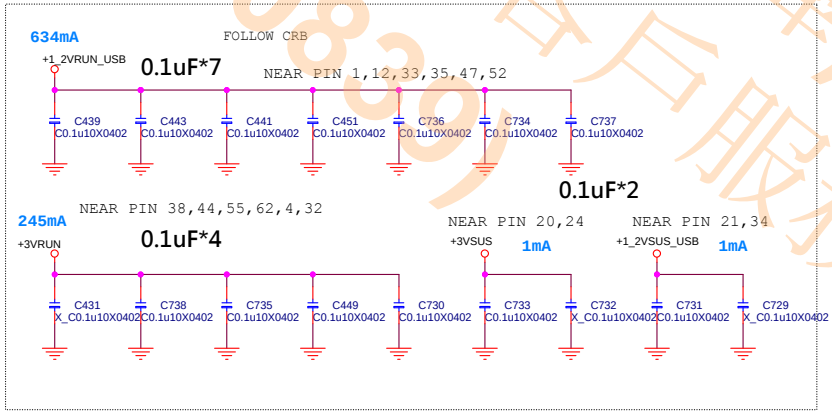
USB 3.0/ USB.3.1

PCIE to USB 3.1

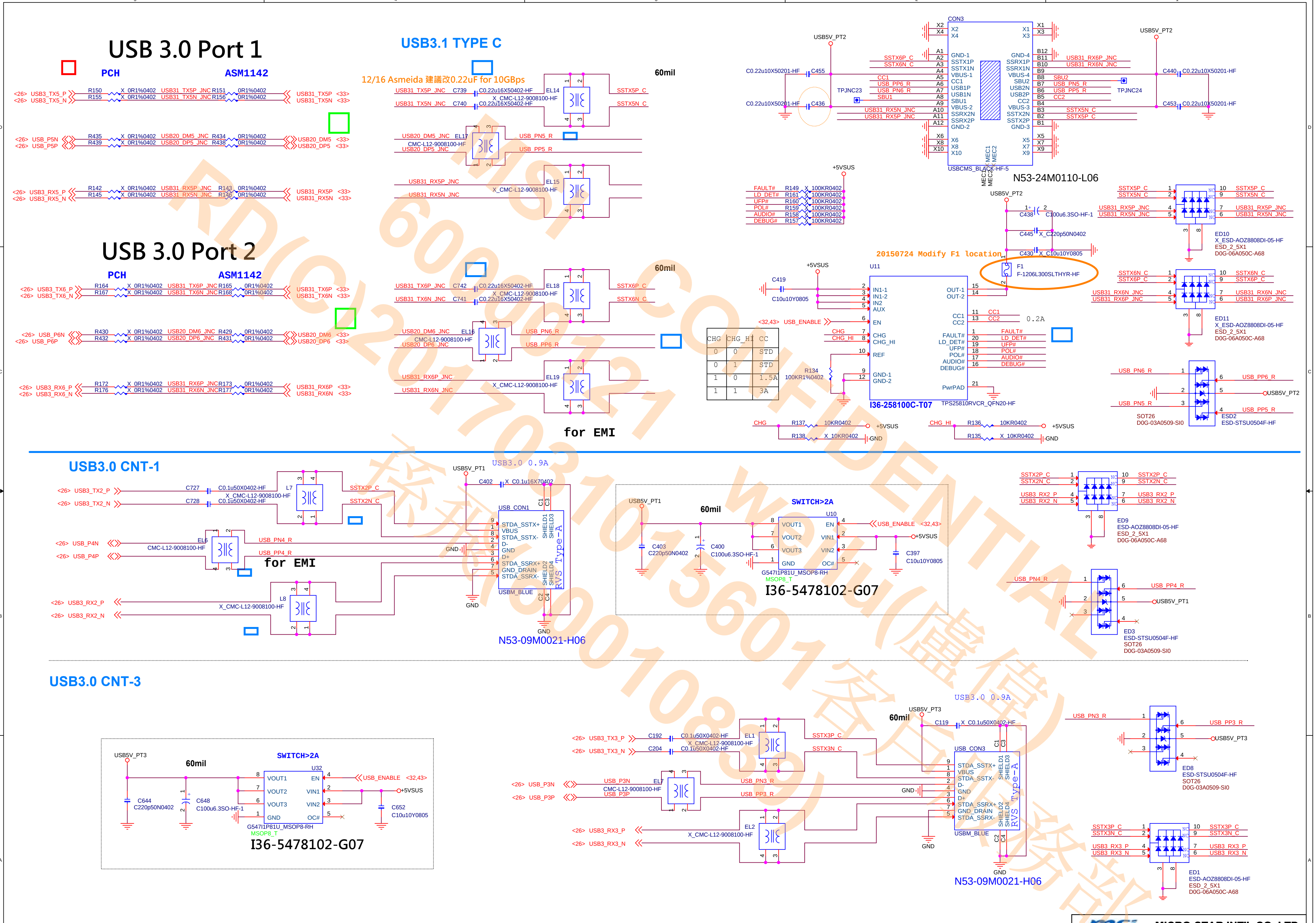








MICRO-STAR INT'L CO.,LTD.			
Title: USB 3.0 / USB 3.1			
Size	Document Number: MS-16J9		Rev: 0A
Date: Wednesday, July 27, 2016	Sheet 33 of 62		



USB 3.0 Port 1
PCH
ASM1142
USB3.1 TYPE C
12/16 Asmeida 建議改0.22uF for 10GBps
60mil
CON3
USBCMS_BLACK-HF-5
N53-24M0110-L06
USB 3.0 Port 2
PCH
ASM1142
60mil
for EMI
20150724 Modify F1 location
F1
F-1206L300SLTHYR-HF
U11
I36-258100C-T07
TPS2581ORVCR_QFN20-HF
0.2A
CHG CHG_HI CC
0 0 STD
0 1 STD
1 0 1.5A
1 1 3A
USB3.0 CNT-1
USB3.0 0.9A
USB_CON1
USBM_BLUE
N53-09M0021-H06
for EMI
60mil
SWITCH>2A
U10
G547I1P81U_MSOP8-RH
MSOP8_T
I36-5478102-G07
USB3.0 CNT-3
USB5V_PT3
60mil
SWITCH>2A
U32
G547I1P81U_MSOP8-RH
MSOP8_T
I36-5478102-G07
USB3.0 0.9A
60mil
USB_CON3
USBM_BLUE
N53-09M0021-H06

MICRO-STAR INT'L CO.,LTD.

Title: USB 3.0 /iCharger

Size | Document Number: MS-16J9 | Rev: 0A

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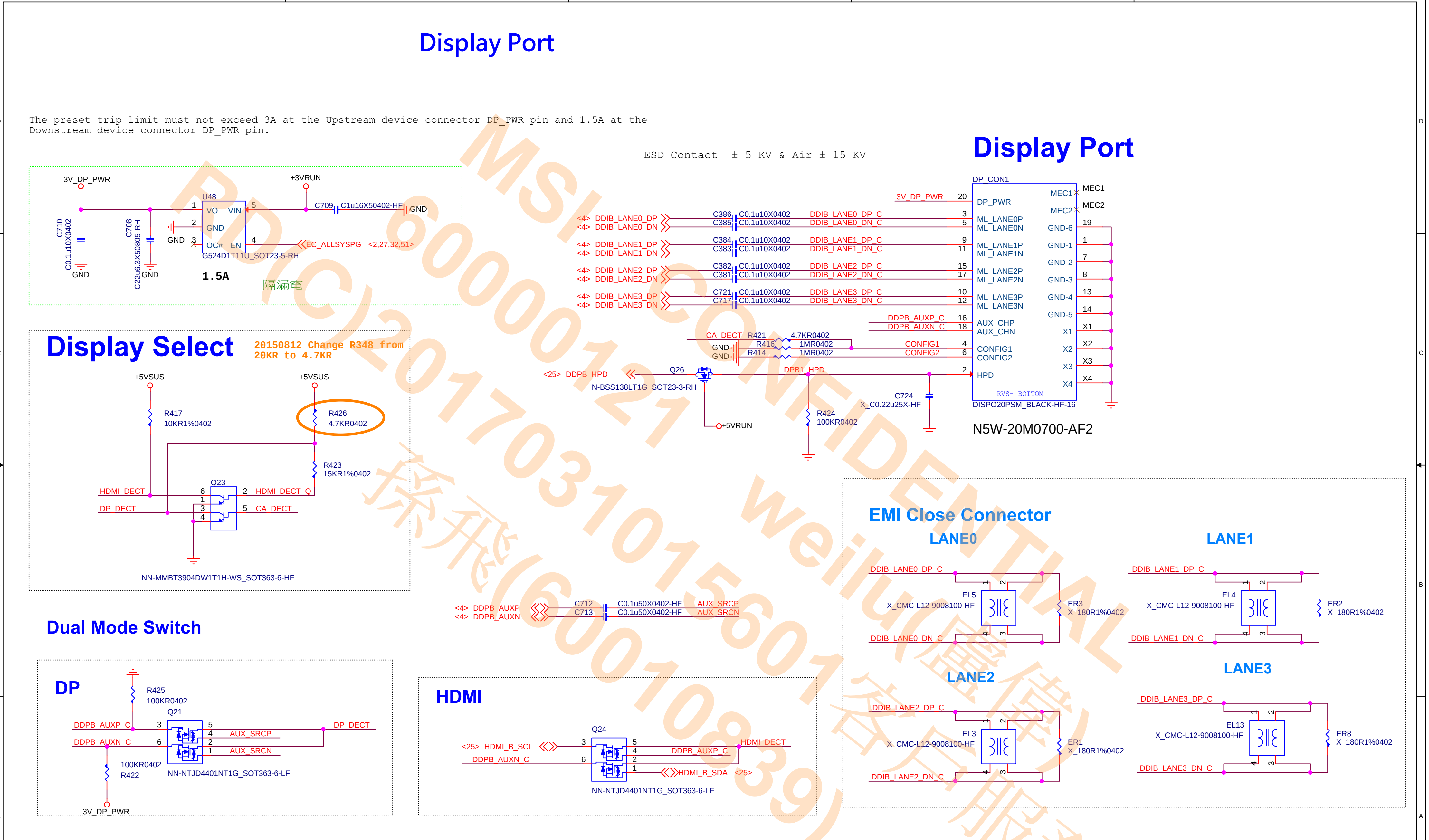
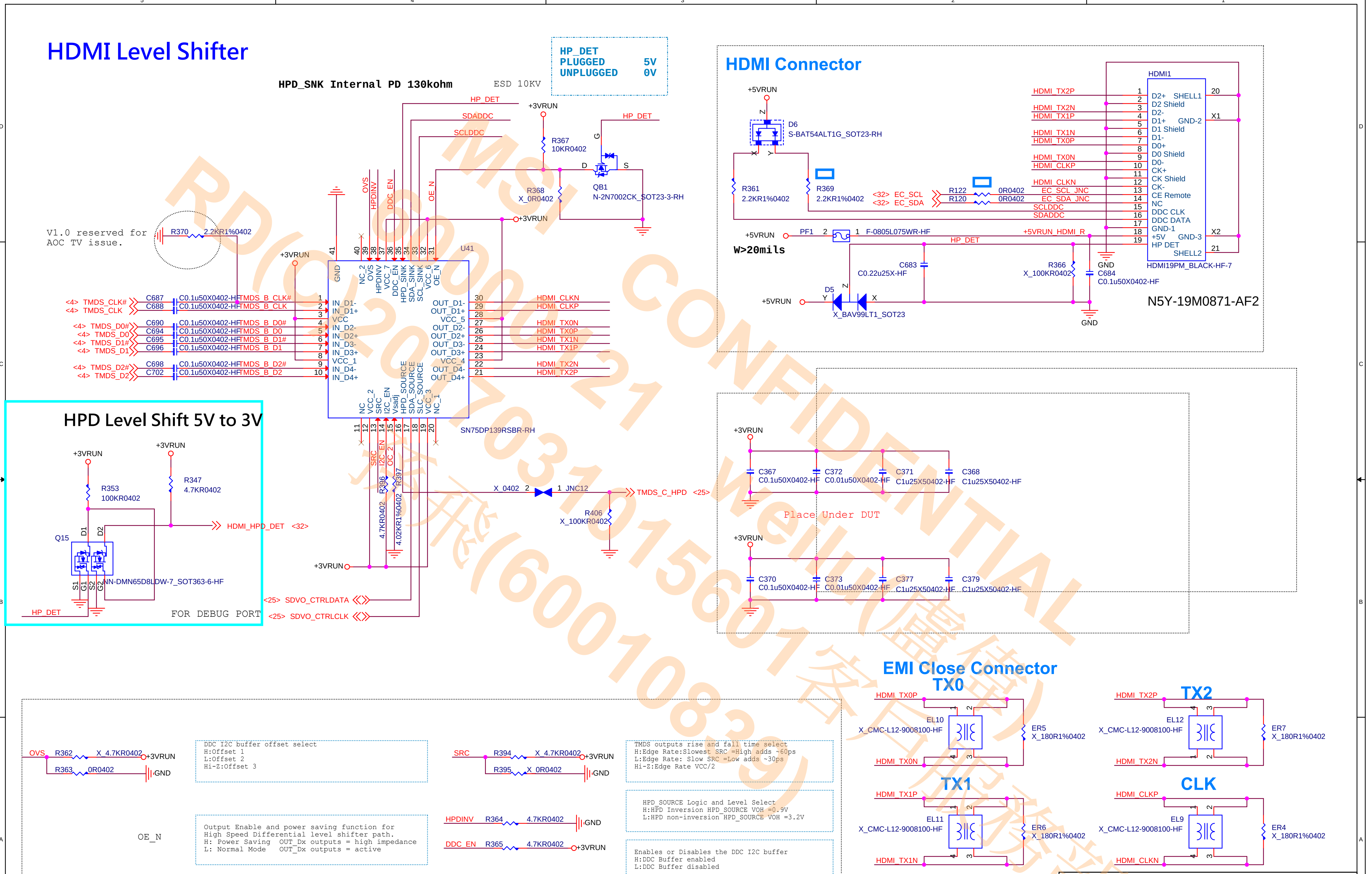

Display Port
The preset trip limit must not exceed 3A at the Upstream device connector DP_PWR pin and 1.5A at the Downstream device connector DP_PWR pin.
ESD Contact ± 5 KV & Air ± 15 KV
Display Port
3V_DP_PWR
+3VRUN
U48
VO
VIN
GND
OC#
EN
C709
C1u16X50402-HF
C710
C0.1u10X0402
C708
C22u6.3X50805-RH
EC_ALLSYSPG
<2,27,32,51>
G524D1T11U_SOT23-5-RH
1.5A
隔漏電
DP_CON1
DP_PWR
ML_LANE0P
ML_LANE0N
ML_LANE1P
ML_LANE1N
ML_LANE2P
ML_LANE2N
ML_LANE3P
ML_LANE3N
AUX_CHP
AUX_CHN
CONFIG1
CONFIG2
HPD
MEC1
MEC2
RVS- BOTTOM
DISPO20PSM_BLACK-HF-16
N5W-20M0700-AF2
<4> DDIB_LANE0_DP
<4> DDIB_LANE0_DN
<4> DDIB_LANE1_DP
<4> DDIB_LANE1_DN
<4> DDIB_LANE2_DP
<4> DDIB_LANE2_DN
<4> DDIB_LANE3_DP
<4> DDIB_LANE3_DN
C386 C385 C384 C383 C382 C381 C721 C717
C0.1u10X0402
DDPB_AUXP_C
DDPB_AUXN_C
CA_DECT
R421 4.7KR0402
R416 1MR0402
R414 1MR0402
<25> DDPB_HPD
Q26
N-BSS138LT1G_SOT23-3-RH
DPB1_HPD
C724 X_C0.22u25X-HF
R424 100KR0402
+5VRUN
Display Select
20150812 Change R348 from 20KR to 4.7KR
+5VSUS
R417 10KR1%0402
R426 4.7KR0402
R423 15KR1%0402
Q23
HDMI_DECT
DP_DECT
HDMI_DECT_Q
CA_DECT
NN-MMBT3904DW1T1H-WS_SOT363-6-HF
<4> DDPB_AUXP
<4> DDPB_AUXN
C712 C713
C0.1u50X0402-HF
AUX_SRCP
AUX_SRCN
Dual Mode Switch
DP
R425 100KR0402
Q21
R422 100KR0402
NN-NTJD4401NT1G_SOT363-6-LF
HDMI
Q24
<25> HDMI_B_SCL
HDMI_B_SDA <25>
NN-NTJD4401NT1G_SOT363-6-LF
EMI Close Connector
LANE0
LANE1
LANE2
LANE3
EL5 EL4 EL3 EL13
X_CMC-L12-9008100-HF
ER3 ER2 ER1 ER8
X_180R1%0402

MICRO-STAR INT'L CO.,LTD.

Title	DP	
Size	Document Number MS-16J9	Rev 0A
Date: Wednesday, July 27, 2016	Sheet 35 of 62	



HDMI Level Shifter
HPD_SNK Internal PD 130kohm
ESD 10KV
HP_DET
PLUGGED 5V
UNPLUGGED 0V
V1.0 reserved for AOC TV issue.
R370 2.2KR1%0402
R367 10KR0402
R368 X_0R0402
QB1 N-2N7002CK_SOT23-3-RH
U41
SN75DP139RSBR-RH
GND NC_2 OVS HPDINV VCC_7 DDC_EN HPD_SINK SDA_SINK SCL_SINK VCC_6 OE_N
IN_D1- IN_D1+ VCC IN_D2- IN_D2+ IN_D3- IN_D3+ VCC_1 IN_D4- IN_D4+
OUT_D1- OUT_D1+ VCC_5 OUT_D2- OUT_D2+ OUT_D3- OUT_D3+ VCC_4 OUT_D4- OUT_D4+
NC VCC_2 SRC I2C_EN Vsadj HPD_SOURCE SDA_SOURCE SLC_SOURCE VCC_3 NC_1
<4> TMDS_CLK#
<4> TMDS_CLK
<4> TMDS_D0#
<4> TMDS_D0
<4> TMDS_D1#
<4> TMDS_D1
<4> TMDS_D2#
<4> TMDS_D2
C687 C688 C690 C694 C695 C696 C698 C702 C0.1u50X0402-HF
HDMI_CLKN HDMI_CLKP HDMI_TX0N HDMI_TX0P HDMI_TX1N HDMI_TX1P HDMI_TX2N HDMI_TX2P
R396 4.7KR0402
R397 4.02KR1%0402
X_0402 JNC12
TMDS_C_HPD <25>
R406 X_100KR0402
<25> SDVO_CTRLDATA
<25> SDVO_CTRLCLK
HPD Level Shift 5V to 3V
R353 100KR0402
R347 4.7KR0402
Q15
N-DMN65D8LDW-7_SOT363-6-HF
HDMI_HPD_DET <32>
HP_DET
FOR DEBUG PORT
HDMI Connector
D6 S-BAT54ALT1G_SOT23-RH
R361 2.2KR1%0402
R369 2.2KR1%0402
<32> EC_SCL
<32> EC_SDA
R122 0R0402
R120 0R0402
PF1 F-0805L075WR-HF
W>20mils
C683 C0.22u25X-HF
D5 X_BAV99LT1_SOT23
R366 X_100KR0402
C684 C0.1u50X0402-HF
HDMI1
HDMI19PM_BLACK-HF-7
D2+ D2 Shield D2- D1+ D1 Shield D1- D0+ D0 Shield D0- CK+ CK Shield CK- CE Remote NC DDC CLK DDC DATA GND-1 +5V HP DET
SHELL1 GND-2 GND-3 SHELL2
N5Y-19M0871-AF2
C367 C0.1u50X0402-HF
C372 C0.01u50X0402-HF
C371 C1u25X50402-HF
C368 C1u25X50402-HF
Place Under DUT
C370 C0.1u50X0402-HF
C373 C0.01u50X0402-HF
C377 C1u25X50402-HF
C379 C1u25X50402-HF
EMI Close Connector
TX0
TX2
TX1
CLK
EL10 EL11 EL12 EL9 X_CMC-L12-9008100-HF
ER5 ER6 ER7 ER4 X_180R1%0402
OVS R362 X_4.7KR0402 +3VRUN
R363 0R0402 GND
DDC I2C buffer offset select
H:Offset 1
L:Offset 2
Hi-Z:Offset 3
SRC R394 X_4.7KR0402 +3VRUN
R395 X_0R0402 GND
TMDS outputs rise and fall time select
H:Edge Rate:Slowest SRC =High adds ~60ps
L:Edge Rate: Slow SRC =Low adds ~30ps
Hi-Z:Edge Rate VCC/2
HPD_SOURCE Logic and Level Select
H:HPD Inversion HPD_SOURCE VOH =0.9V
L:HPD non-inversion HPD_SOURCE VOH =3.2V
OE_N
Output Enable and power saving function for
High Speed Differential level shifter path.
H: Power Saving OUT_Dx outputs = high impedance
L: Normal Mode OUT_Dx outputs = active
HPDINV R364 4.7KR0402 GND
DDC_EN R365 4.7KR0402 +3VRUN
Enables or Disables the DDC I2C buffer
H:DDC Buffer enabled
L:DDC Buffer disabled

MICRO-STAR INT'L CO.,LTD.

Title	HDMI DP139	
Size	Document Number: MS-16J9	Rev: 0A
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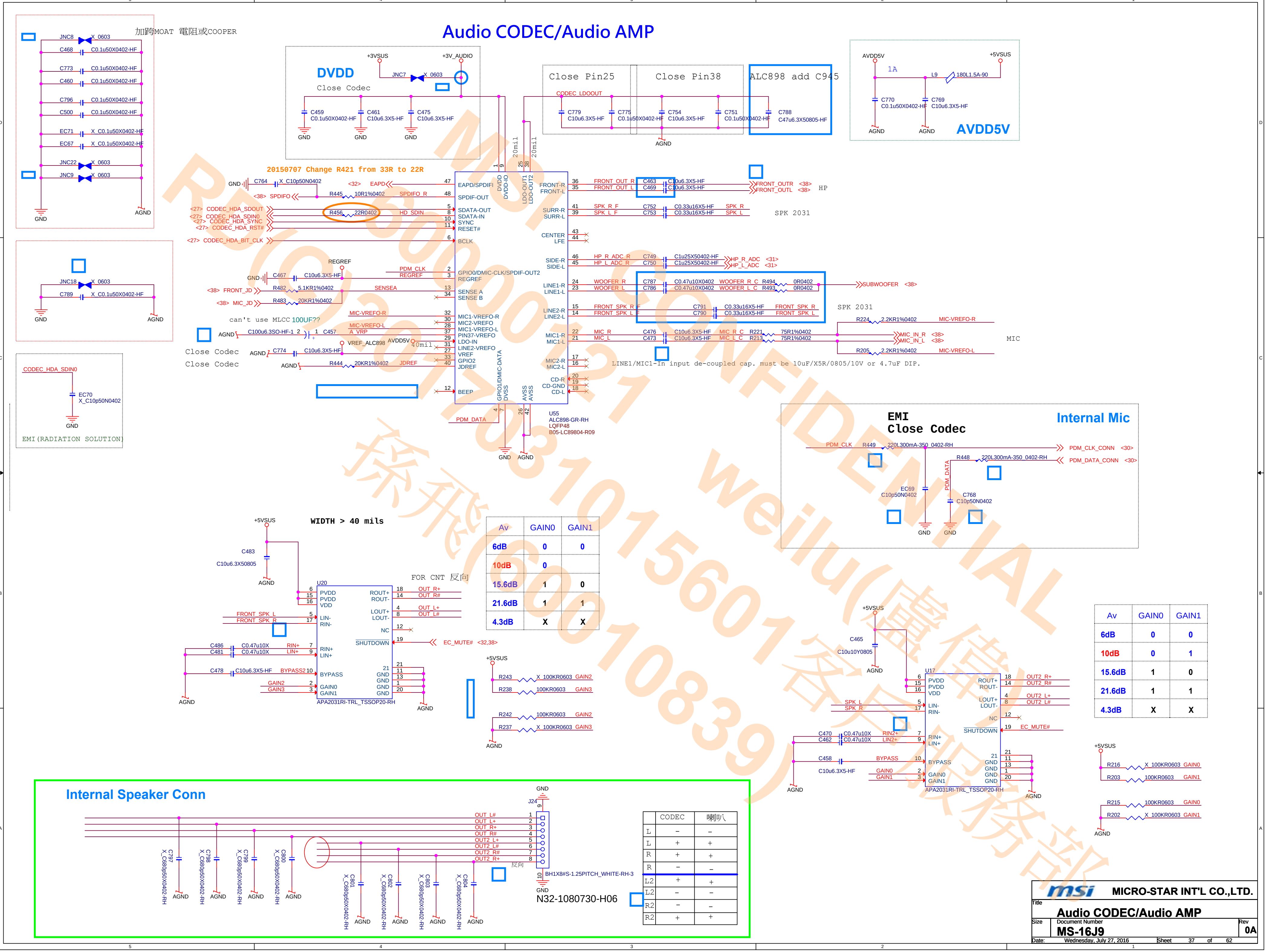
Audio CODEC/Audio AMP



加跨MOAT 電阻或COOPER
DVDD
Close Codec
+3VSUS
+3V_AUDIO
Close Pin25
Close Pin38
ALC898 add C945
AVDD5V
+5VSUS
20150707 Change R421 from 33R to 22R
can't use MLCC 100UF??
Close Codec
Close Codec
EMI(RADIATION SOLUTION)
LINE1/MIC1-In input de-coupled cap. must be 10uF/X5R/0805/10V or 4.7uF DIP.
HP
SPK 2031
SPK 2031
MIC
U55
ALC898-GR-RH
LQFP48
B05-LC89804-R09
EMI
Close Codec
Internal Mic
PDM_CLK_CONN
PDM_DATA_CONN
WIDTH > 40 mils
FOR CNT 反向
U20
APA2031RI-TRL_TSSOP20-RH
U17
APA2031RI-TRL_TSSOP20-RH
EC_MUTE#
Internal Speaker Conn
J24
BH1X8#S-1.25PITCH_WHITE-RH-3
N32-1080730-H06

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

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

	CODEC	喇叭
L	−	−
L	+	+
R	+	+
R	−	−
L2	+	+
L2	−	−
R2	−	−
R2	+	+

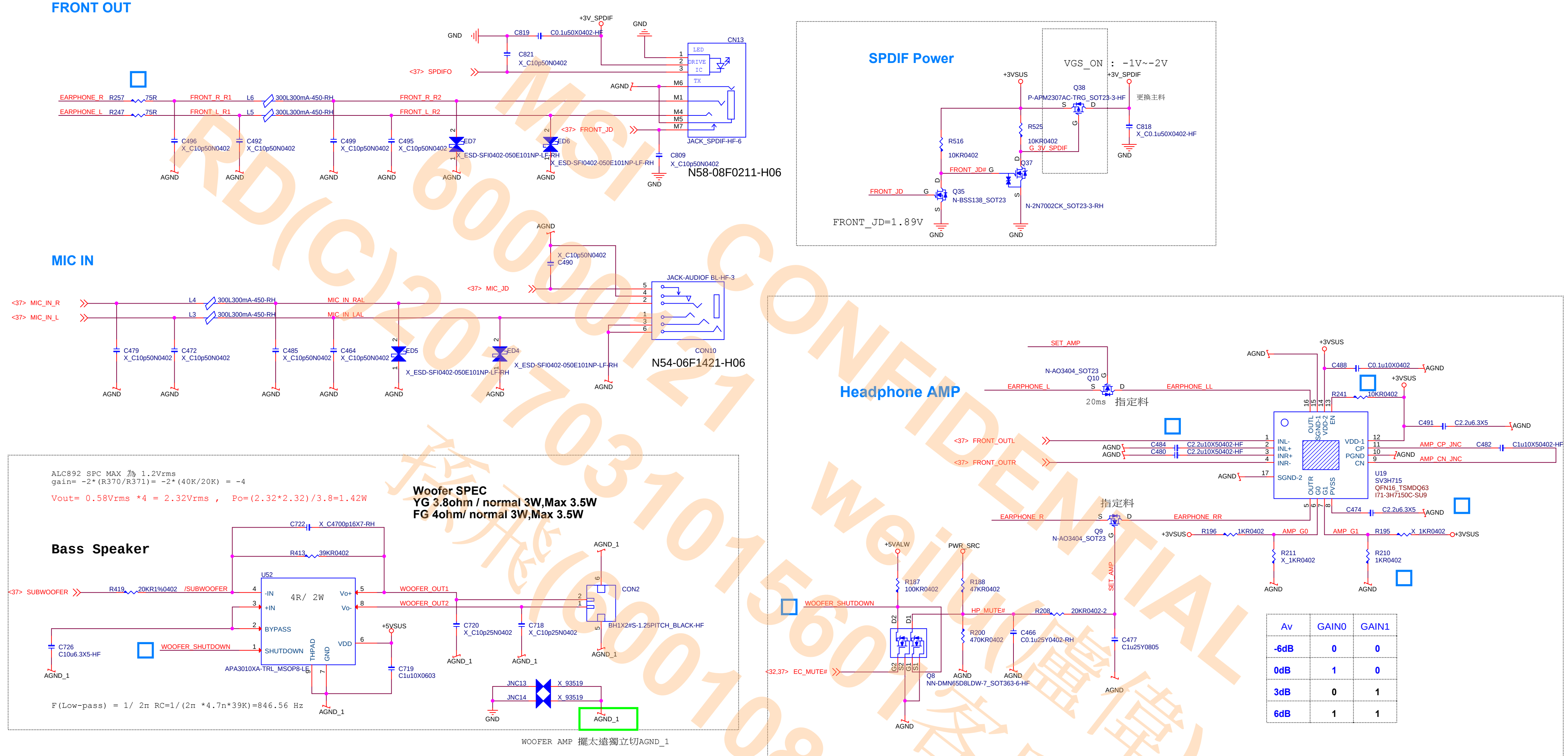
MICRO-STAR INT'L CO.,LTD.

Title: Audio CODEC/Audio AMP

Size | Document Number: MS-16J9 | Rev: 0A

Date: Wednesday, July 27, 2016 | Sheet 37 of 62

Audio CONN /Woffer



Av	GAIN0	GAIN1
-6dB	0	0
0dB	1	0
3dB	0	1
6dB	1	1

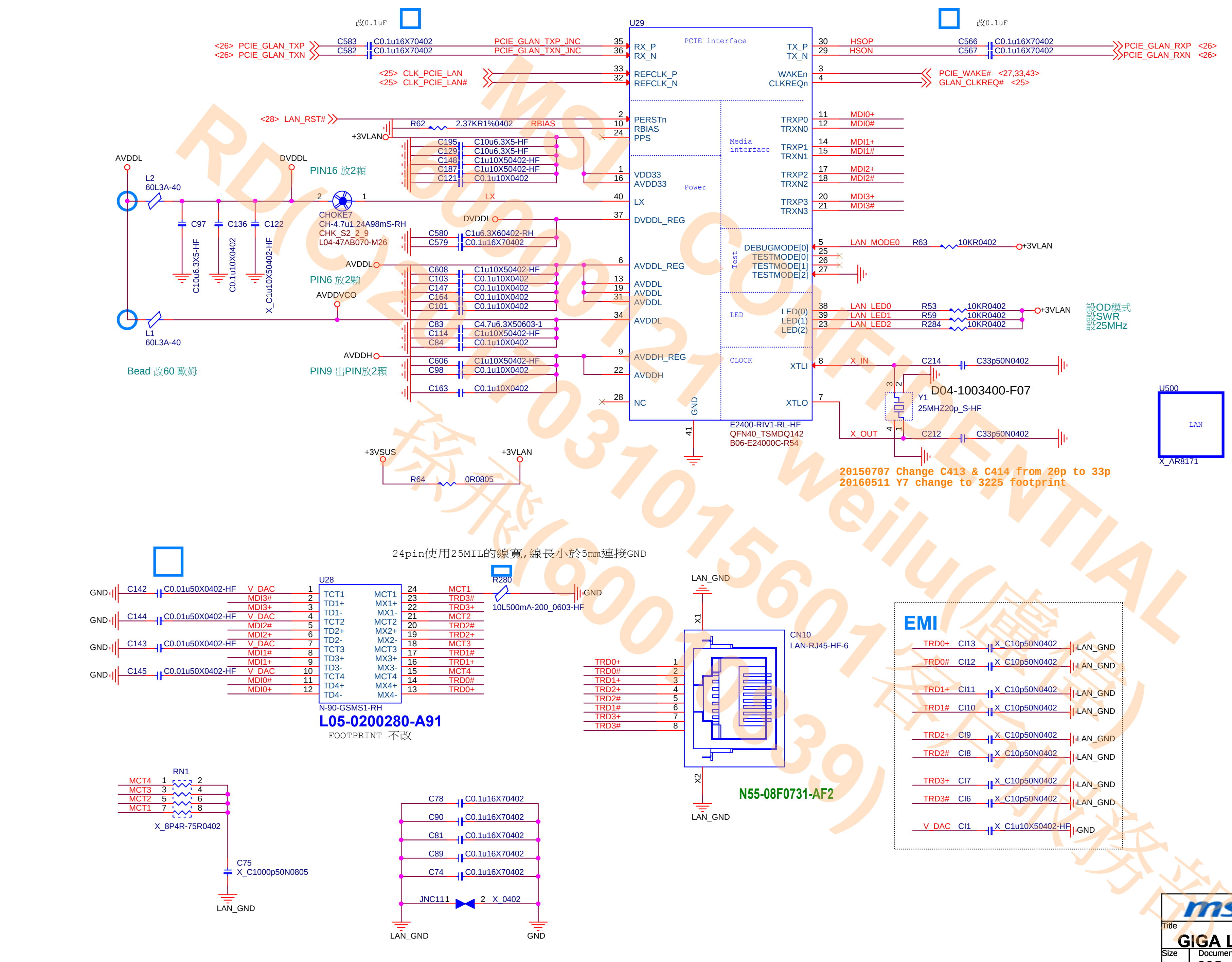
MICRO-STAR INT'L CO.,LTD.

Title: Audio / Woffer

Size | Document Number: MS-16J9 | Rev: 0A

Date: Wednesday, July 27, 2016 | Sheet 38 of 62

GIGA LAN(BigFoot BFN2400B)

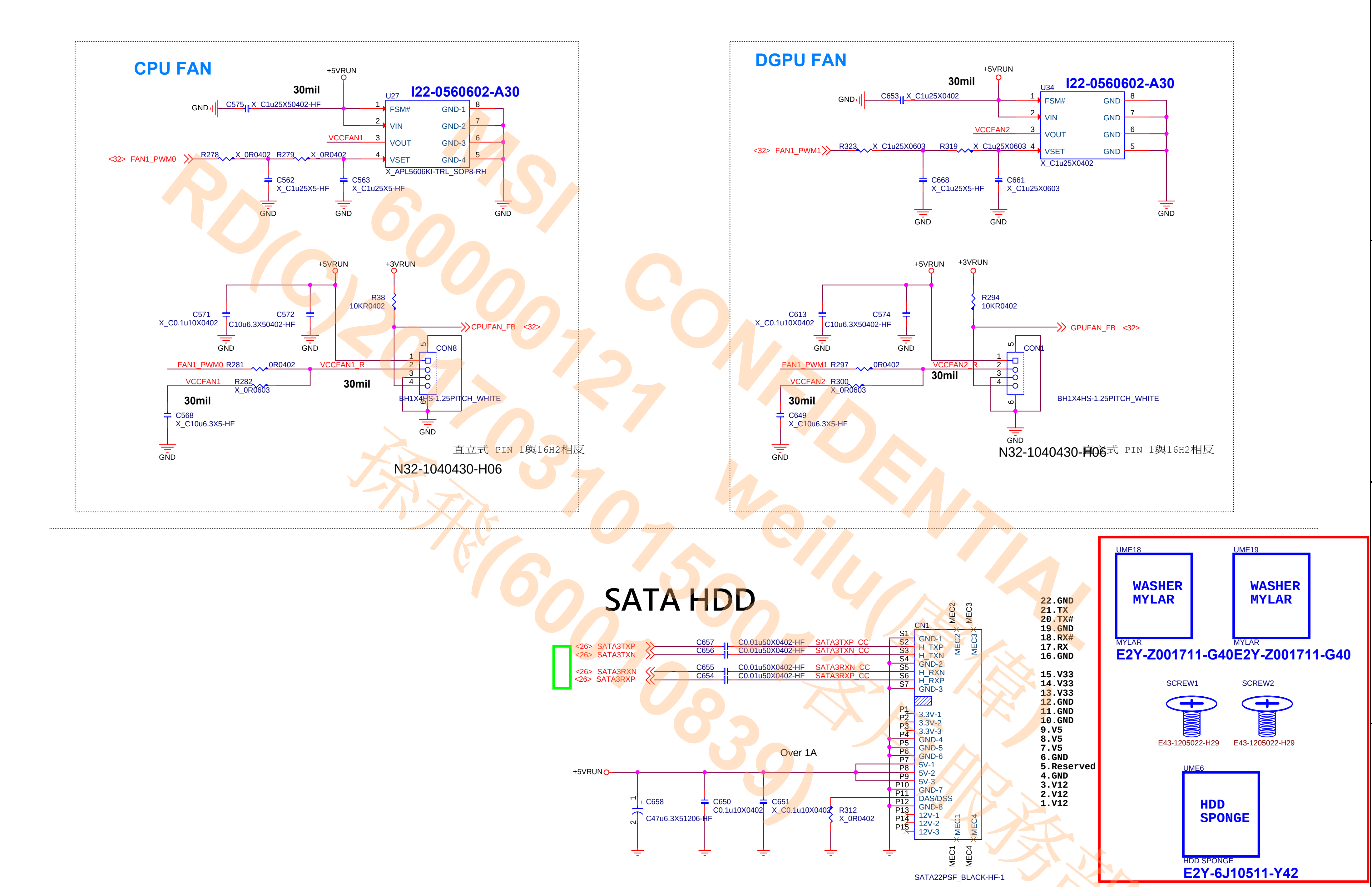


MICRO-STAR INT'L CO.,LTD.

Title: GIGA LAN(BigFoot BFN2400/AR8171)

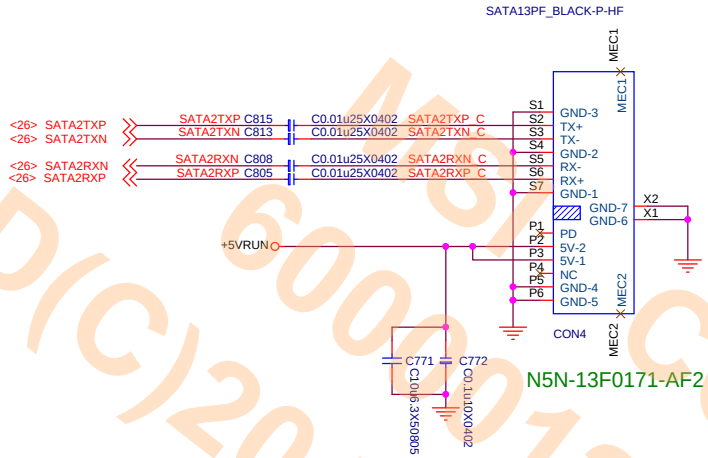
Size	Document Number	Rev
	MS-16J9	0A

Date: Wednesday, July 27, 2016 Sheet 39 of 62

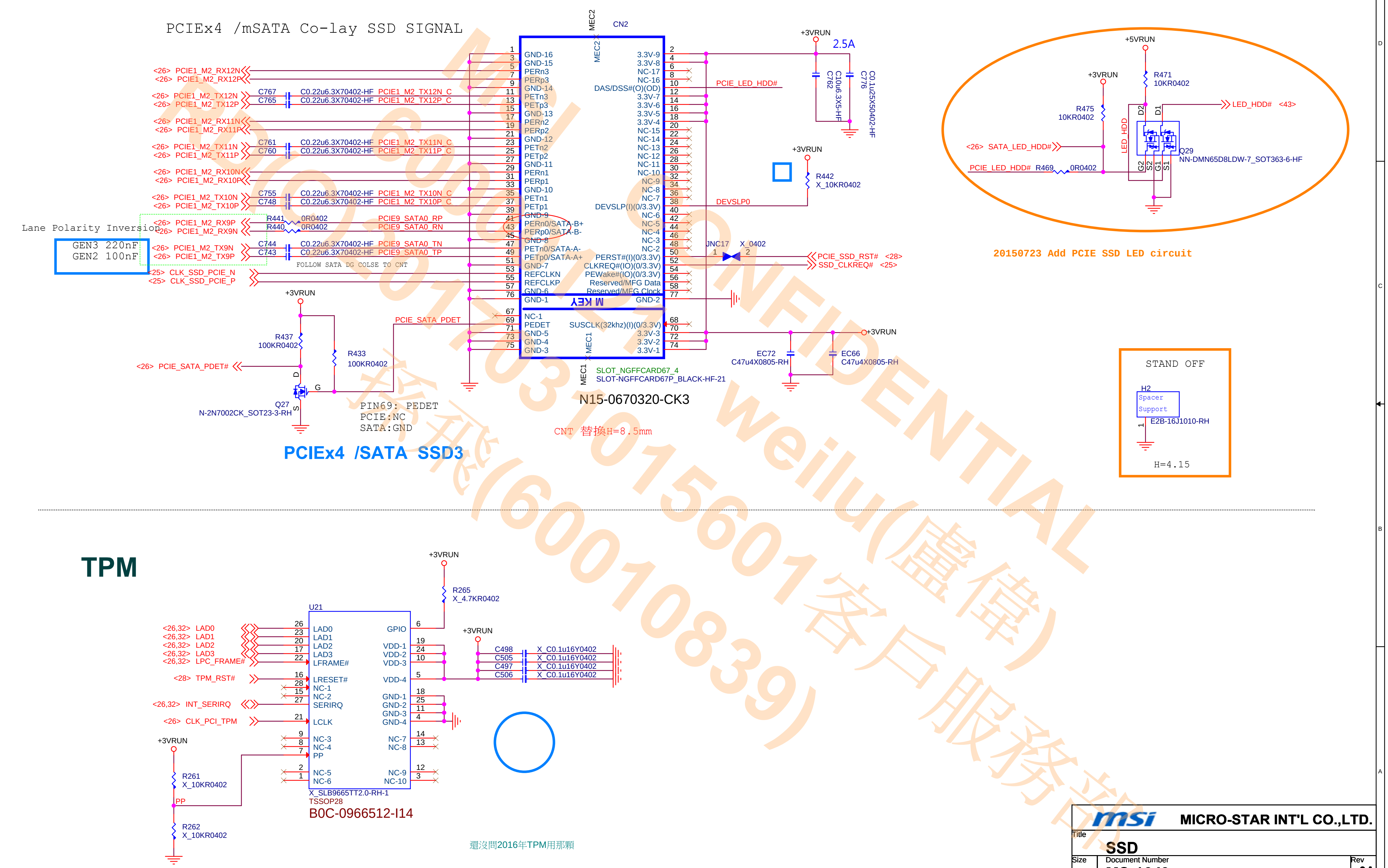


Title	ODD/HDD/FAN	
Size A3	Document Number MS-16J9	Rev 0A
Date: Wednesday, July 27, 2016	Sheet 40 of 62	

SATA ODD

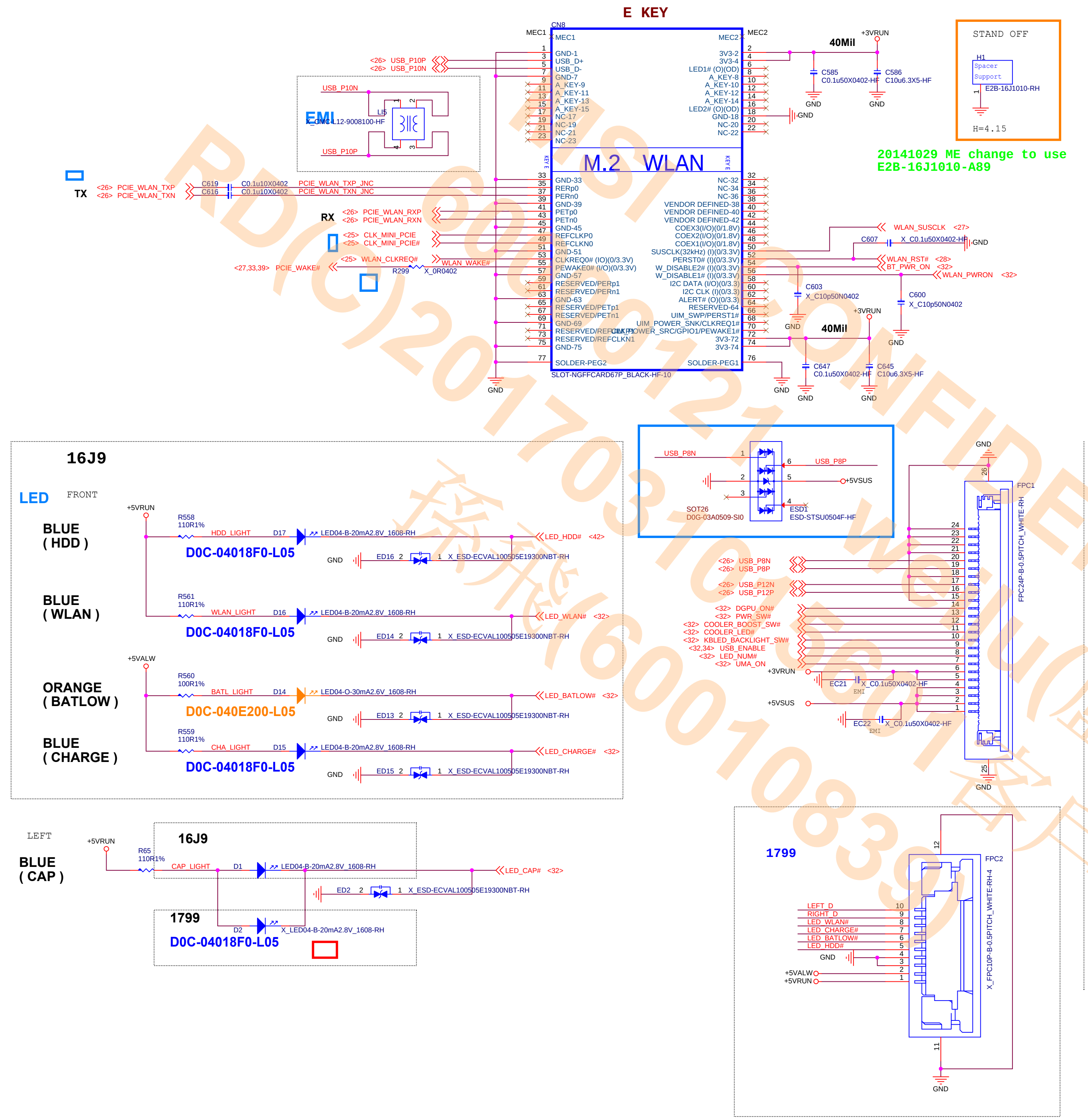


msi MICRO-STAR INT'L CO.,LTD.		
Title: FBA_CMD18		
Size	Document Number: MS-16J9	Rev: 0A
Date: Wednesday, July 27, 2016	Sheet 41 of 62	



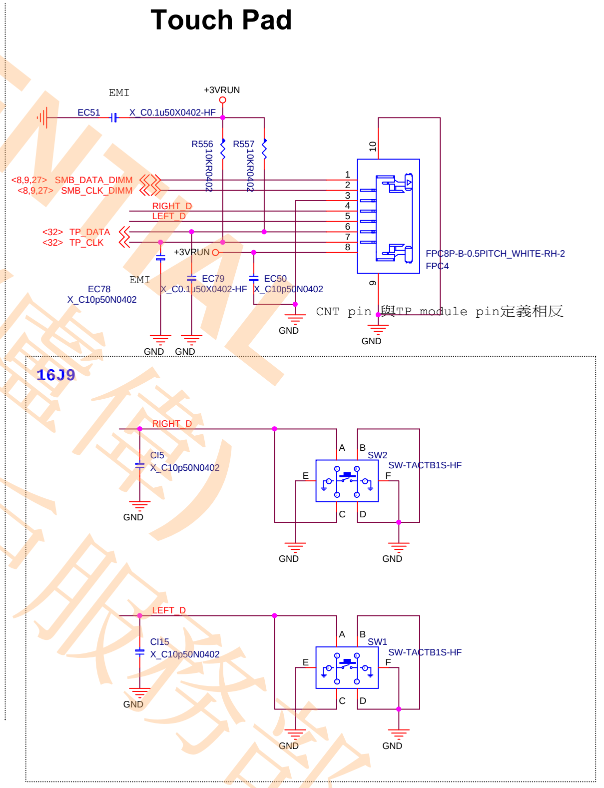
msi	MICRO-STAR INT'L CO.,LTD.
Title	SSD
Size / Document Number	MS-16J9
Rev	0A
Date:	Wednesday, July 27, 2016
Sheet	42 of 62

WLAN/LED



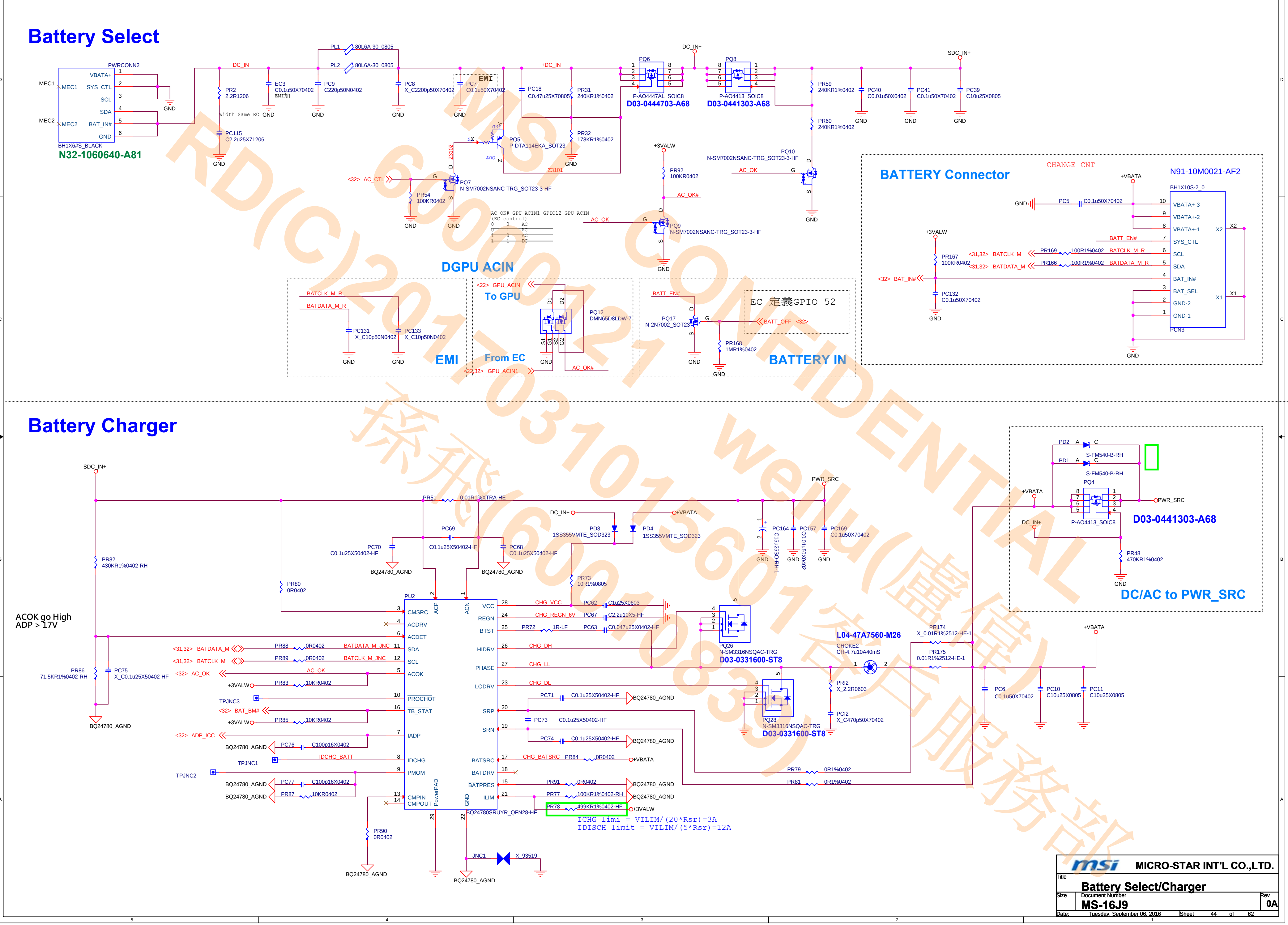
Pin 1	GND		
Pin 3	USB_D+	Pin 2	3.3V
Pin 5	USB_D-	Pin 4	3.3V
Pin 7	GND	Pin 6	LED1#
Pin 9	Module Key	Pin 8	Module Key
Pin 11	Module Key	Pin 10	Module Key
Pin 13	Module Key	Pin 12	Module Key
Pin 15	Module Key	Pin 14	Module Key
Pin 17	N/C	Pin 16	LED2#
Pin 19	N/C	Pin 18	GND
Pin 21	N/C	Pin 20	N/C
Pin 23	N/C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

Touch Pad



msi	MICRO-STAR INT'L CO.,LTD.
Title	WLAN /LED/TP
Size / Document Number	MS-16J9
Rev	0A
Date:	Friday, August 12, 2016
Sheet	43 of 62

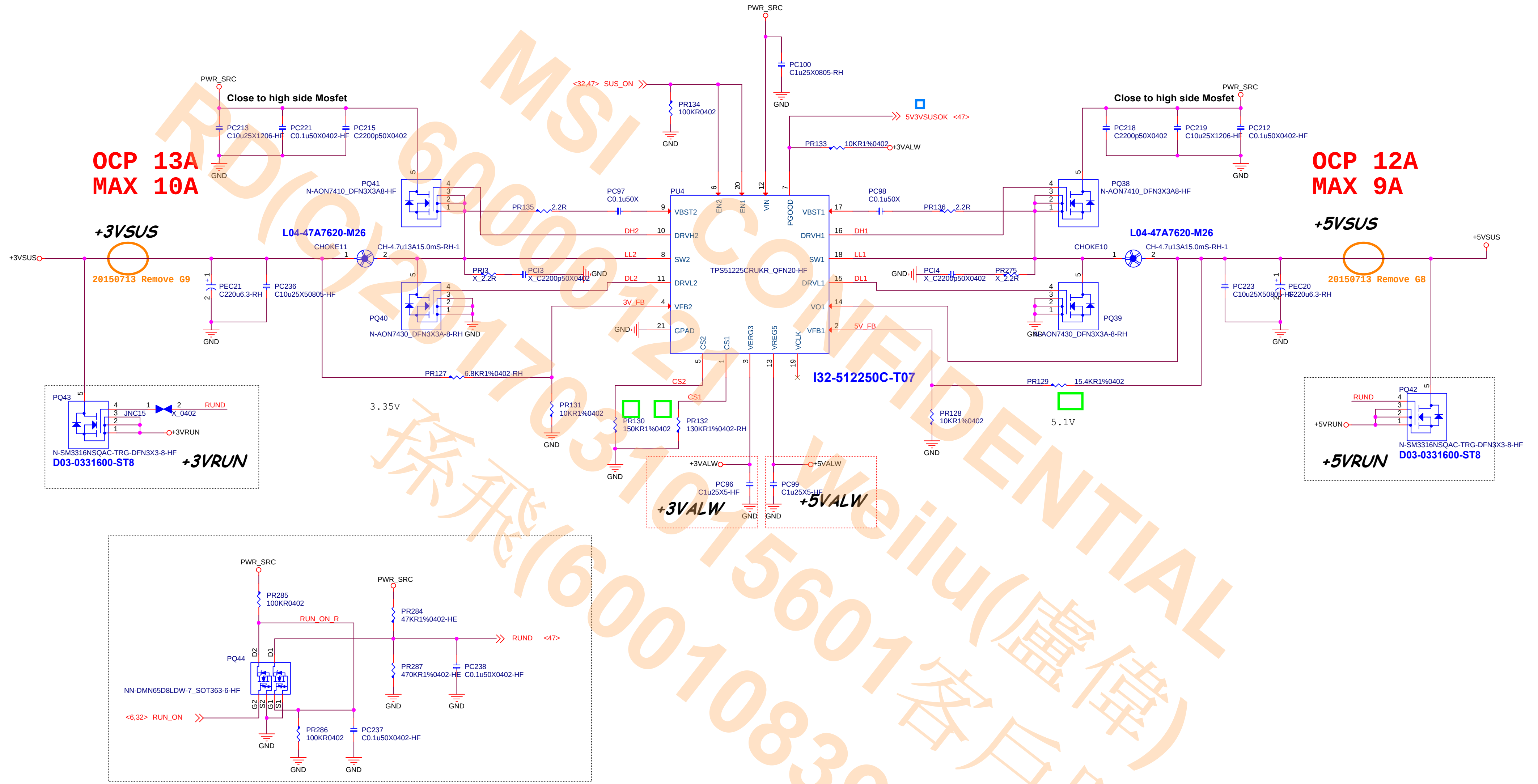
Battery Select/Charger



MICRO-STAR INT'L CO.,LTD.

Title	Battery Select/Charger	
Size	Document Number: MS-16J9	Rev: 0A
Date: Tuesday, September 06, 2016	Sheet 44 of 62	

System Power



MICRO-STAR INT'L CO.,LTD.	
Title	System Power
Size / Document Number	MS-16J9
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Date:	Wednesday, July 27, 2016
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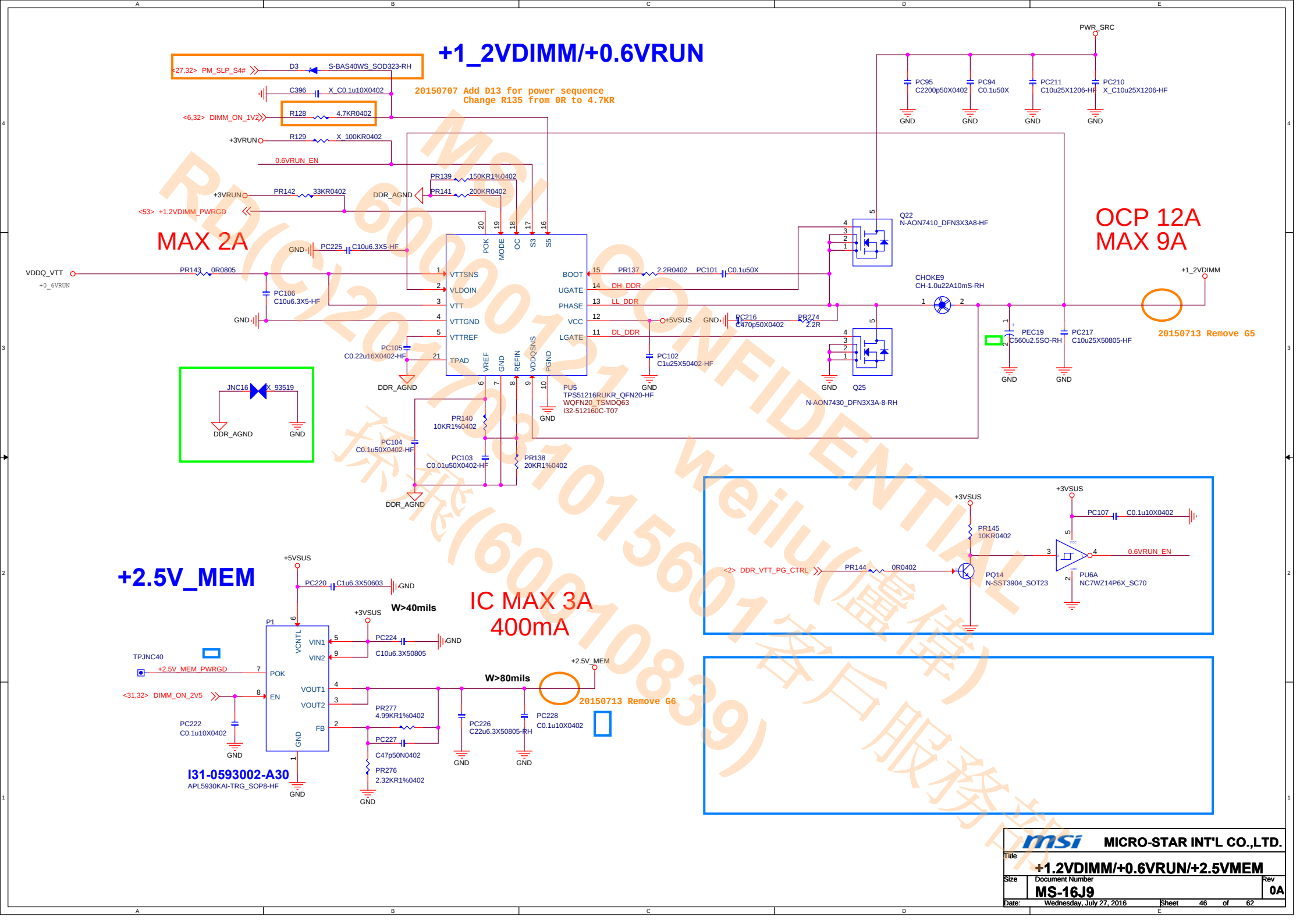
+1_2VDIMM/+0.6VRUN
20150707 Add D13 for power sequence
Change R135 from 0R to 4.7KR
MAX 2A
OCP 12A
MAX 9A
20150713 Remove G5
+2.5V_MEM
IC MAX 3A
400mA
W>40mils
W>80mils
20150713 Remove G6
I31-0593002-A30
APL5930KAI-TRG_SOP8-HF
TPS51216RUKR_QFN20-HF
WQFN20_TSMDQ63
I32-512160C-T07
N-AON7430_DFN3X3A-8-RH
N-AON7410_DFN3X3A8-HF
CH-1.0u22A10mS-RH
C560u2.5SO-RH
NC7WZ14P6X_SC70
N-SST3904_SOT23
MICRO-STAR INT'L CO.,LTD.
+1.2VDIMM/+0.6VRUN/+2.5VMEM
MS-16J9
0A
Wednesday, July 27, 2016
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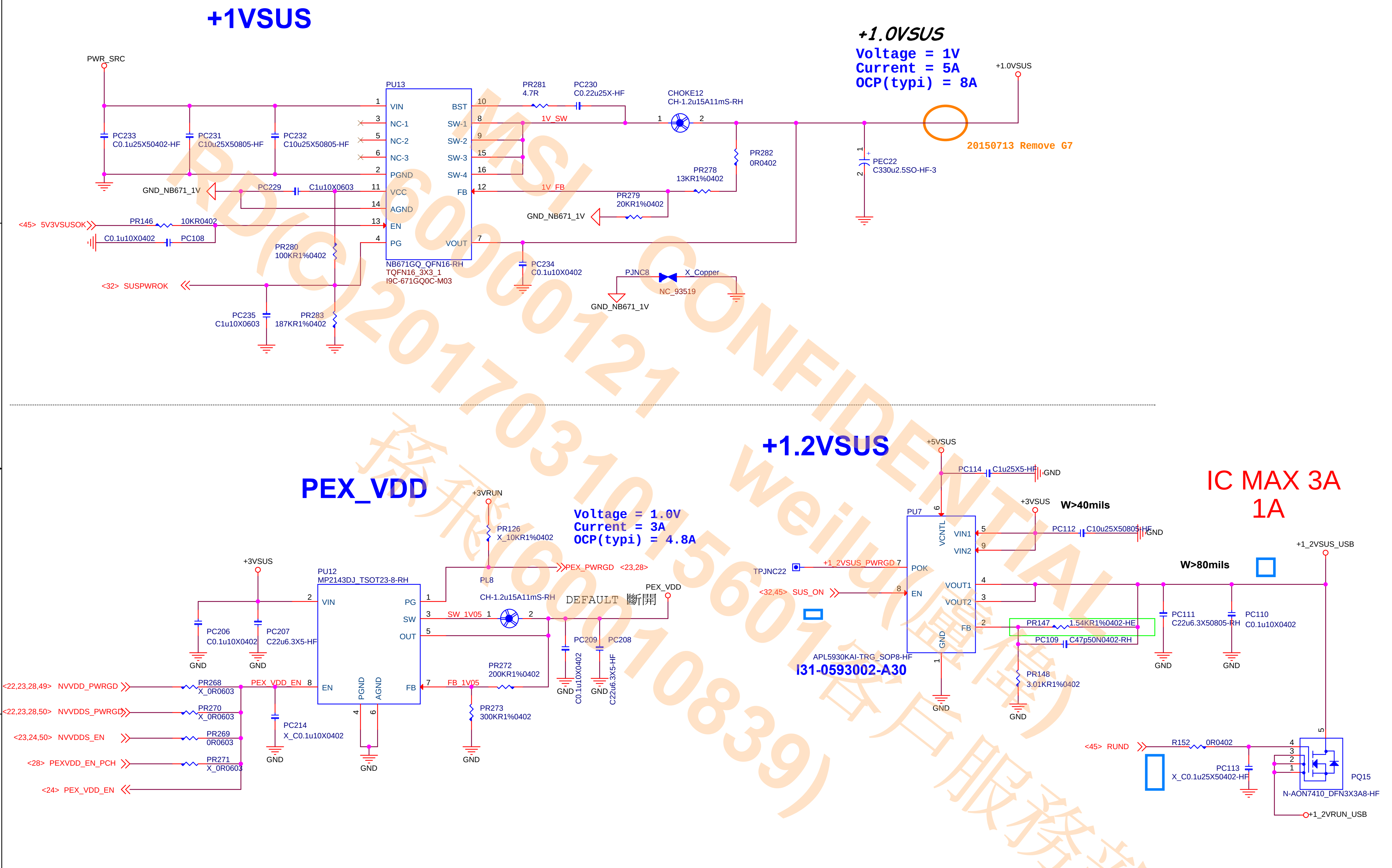


MICRO-STAR INT'L CO.,LTD.

Title: 1VSUS /PEX_VDD/1.2VSUS

Size | Document Number: MS-16J9 | Rev: 0A

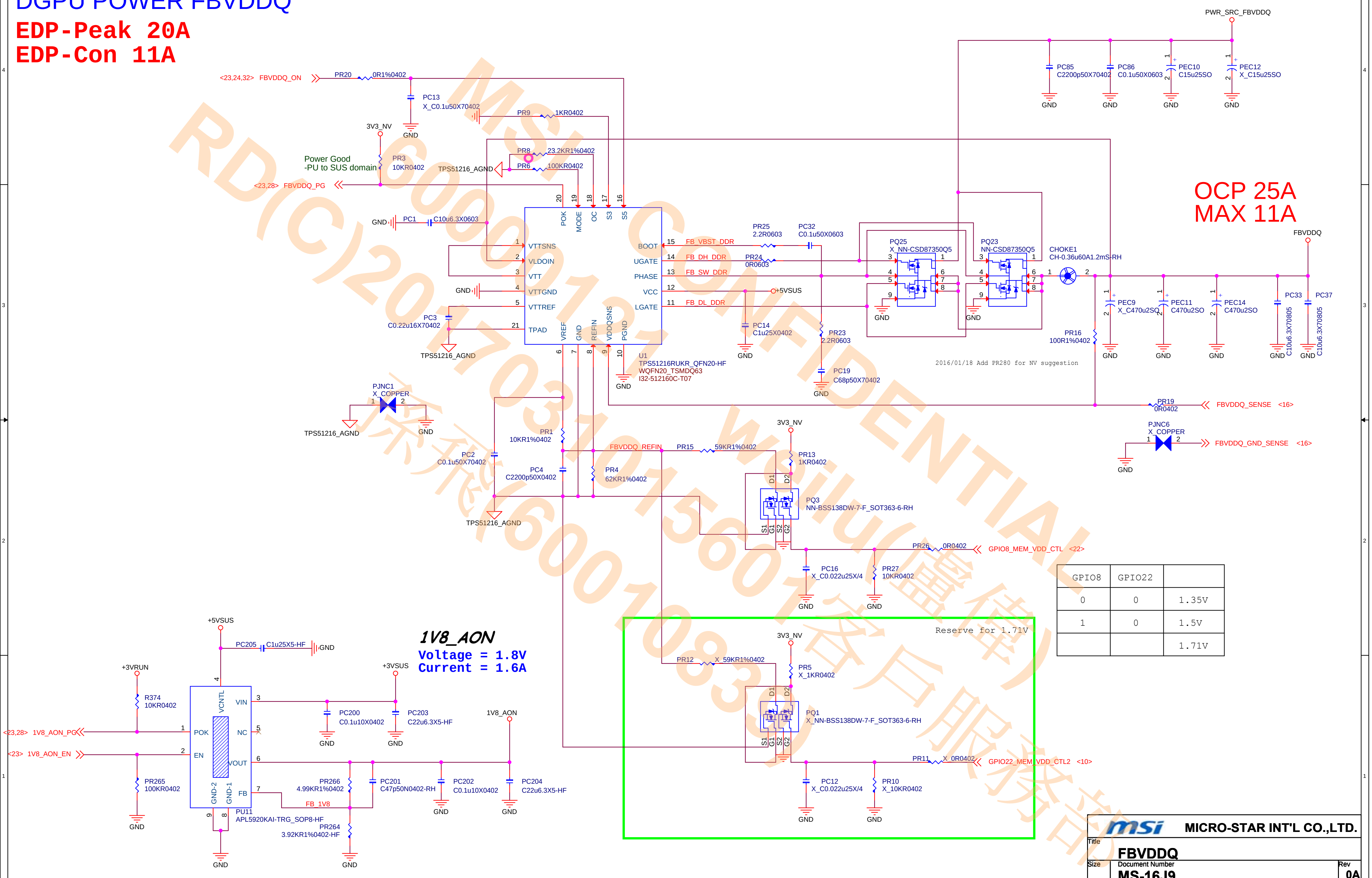
Date: Wednesday, July 27, 2016 | Sheet 47 of 62

PAGE53: FBVDDQ

DGPU POWER FBVDDQ

EDP-Peak 20A

EDP-Con 11A



GPIO8	GPIO22	
0	0	1.35V
1	0	1.5V
		1.71V

MICRO-STAR INT'L CO.,LTD.

Title: FBVDDQ

Size | Document Number: MS-16J9 | Rev: 0A

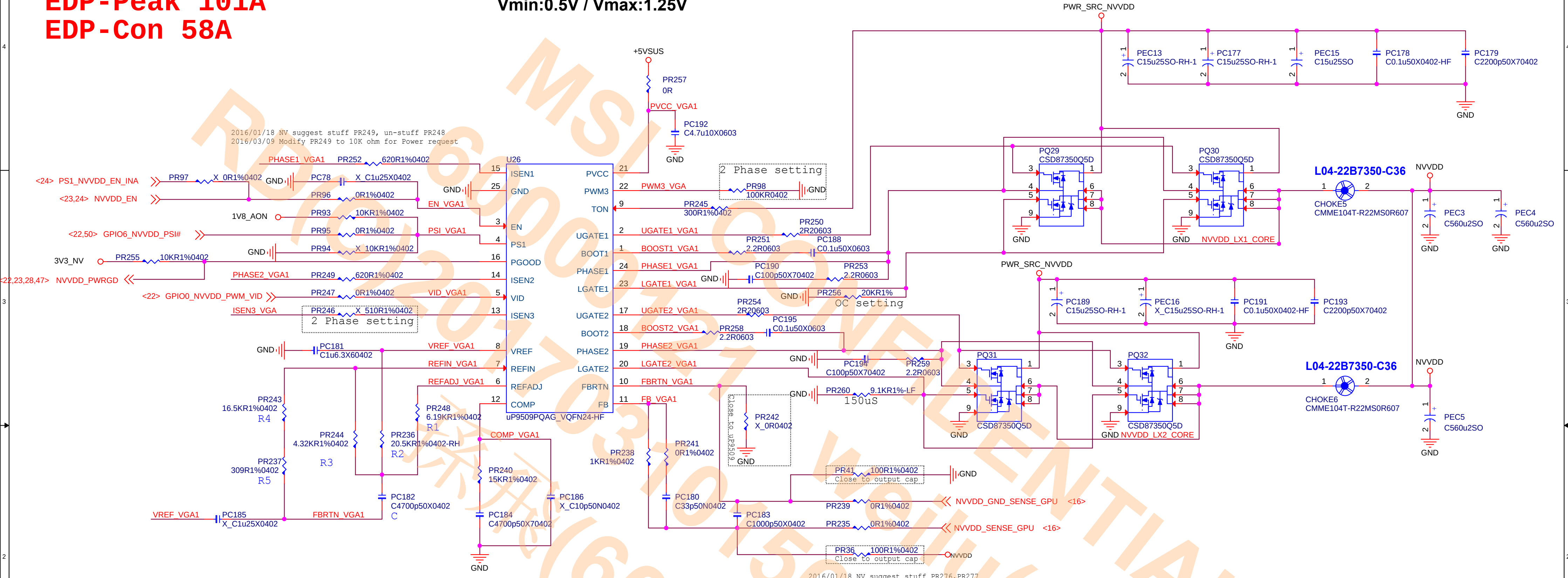
Date: | Sheet 48 of 62

DGPU POWER / UP9509P

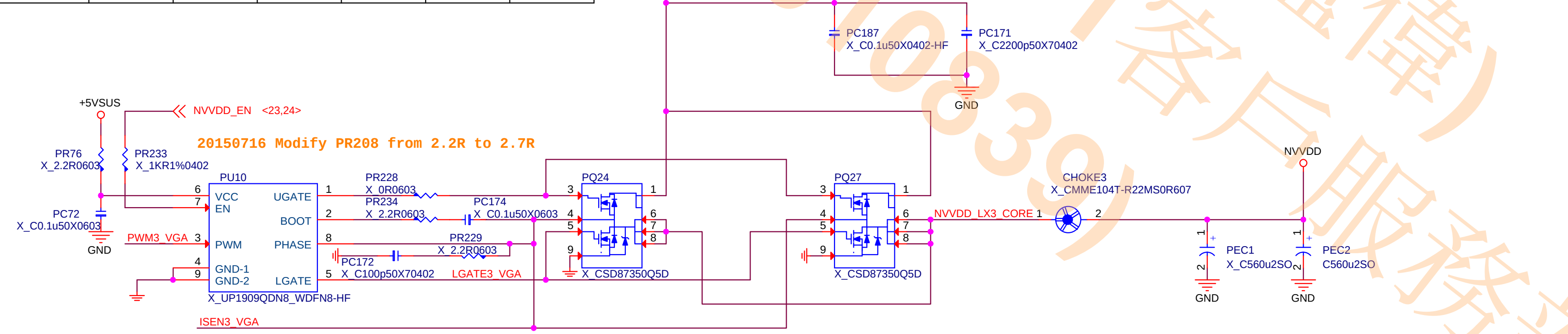
EDP-Peak 101A
EDP-Con 58A

DGPU POWER NVVDD

VBoot:0.8V
Vmin:0.5V / Vmax:1.25V



CONFIG	R1	R2	R3	R4	R5	C
N17P-G1	6.19K	20.5K	4.32K	16.5K	309R	1.5nF



MICRO-STAR INT'L CO.,LTD.

Title: NVVDD PWM IC (UP1633)

Size	Document Number	Rev
	MS-16J9	0A

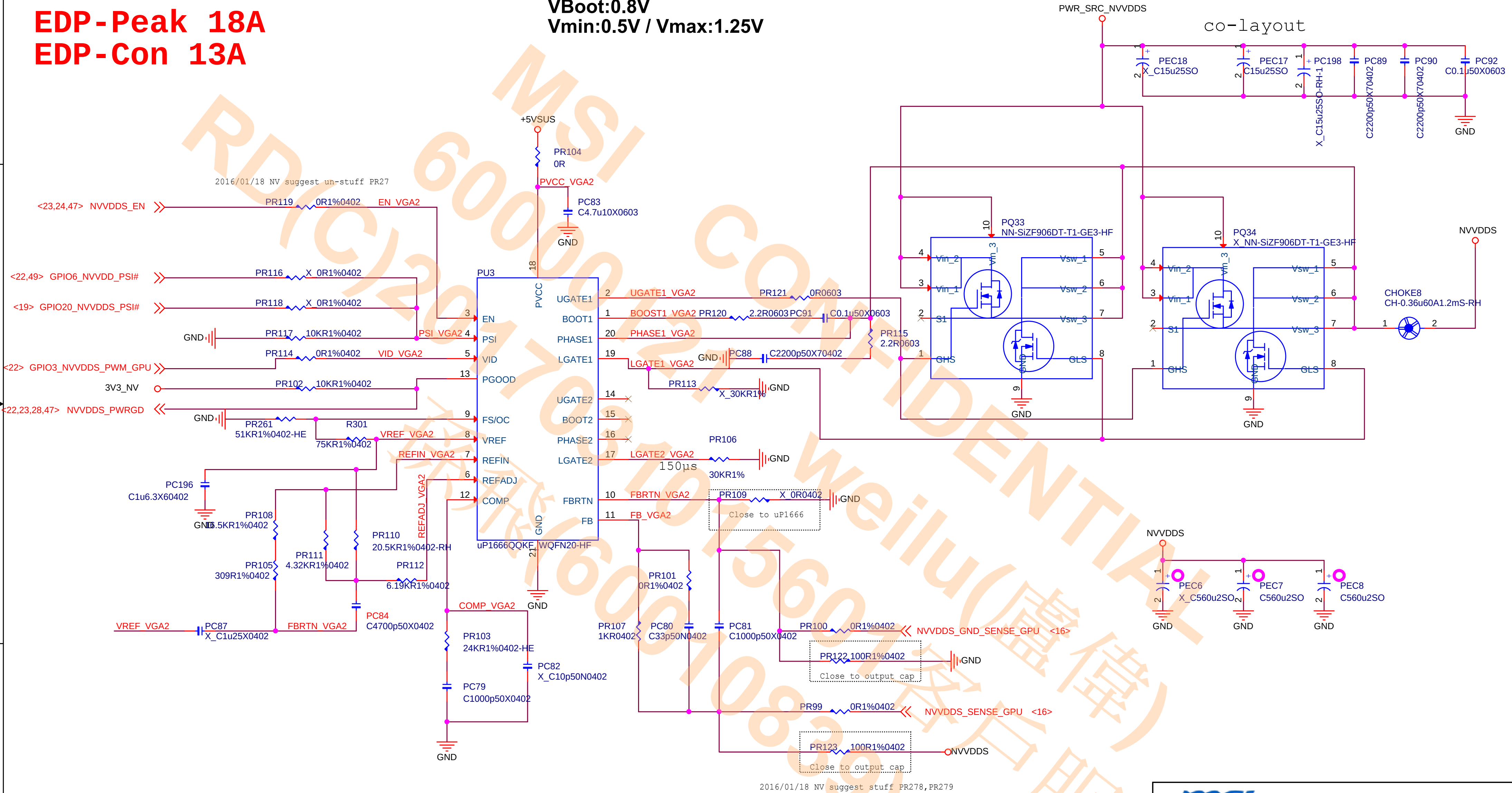
Date: Sheet 49 of 62

DGPU POWER / UP1666P

EDP-Peak 18A
EDP-Con 13A

DGPU POWER NVVDDS

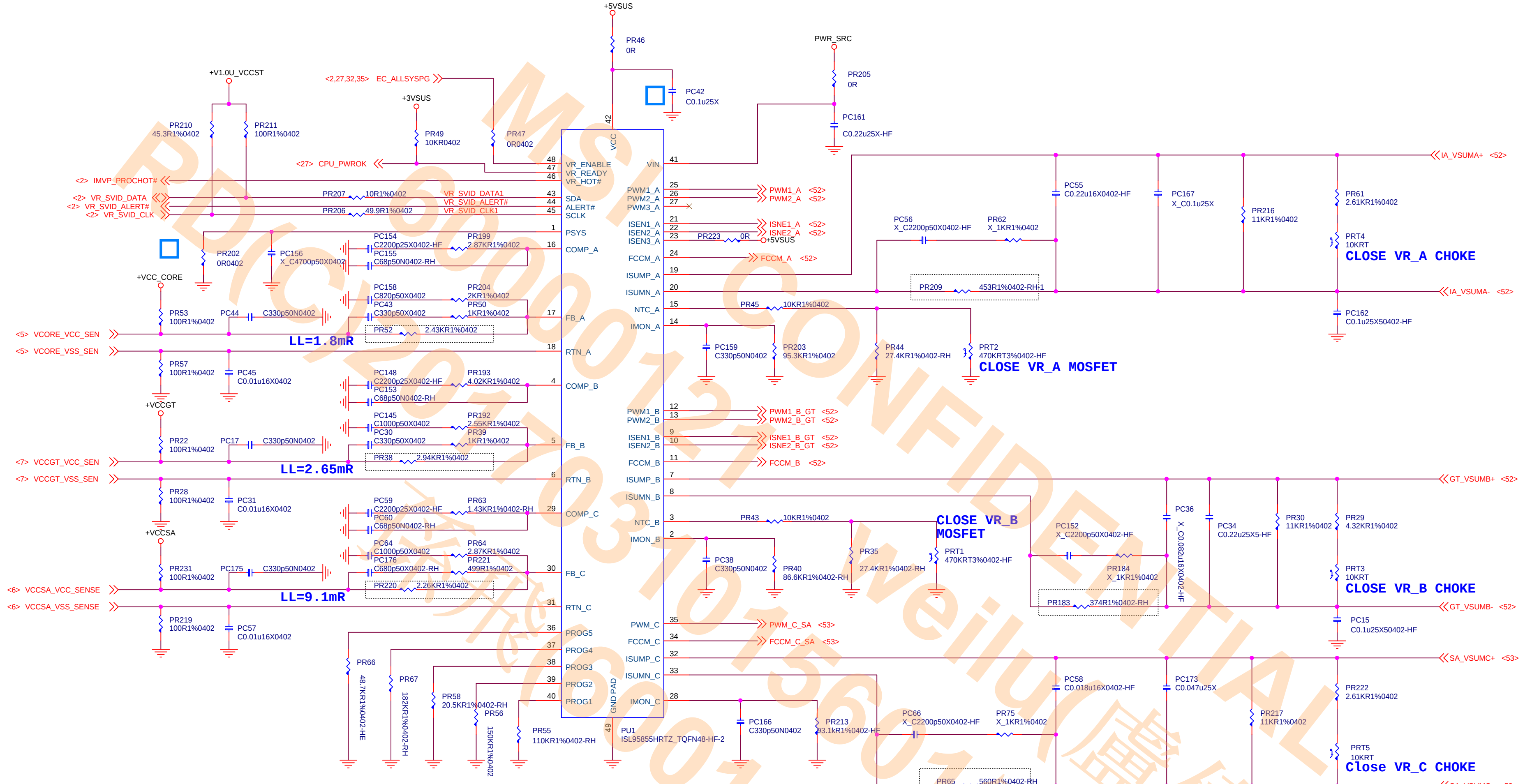
VBoot:0.8V
Vmin:0.5V / Vmax:1.25V



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

Title	NVVDD PHASE 1~4	
Size	Document Number: MS-16J9	Rev: 0A
Date:	Sheet 50 of 62	

Skylake H-line 42 45W ISL95855



SKL-H(4+2)

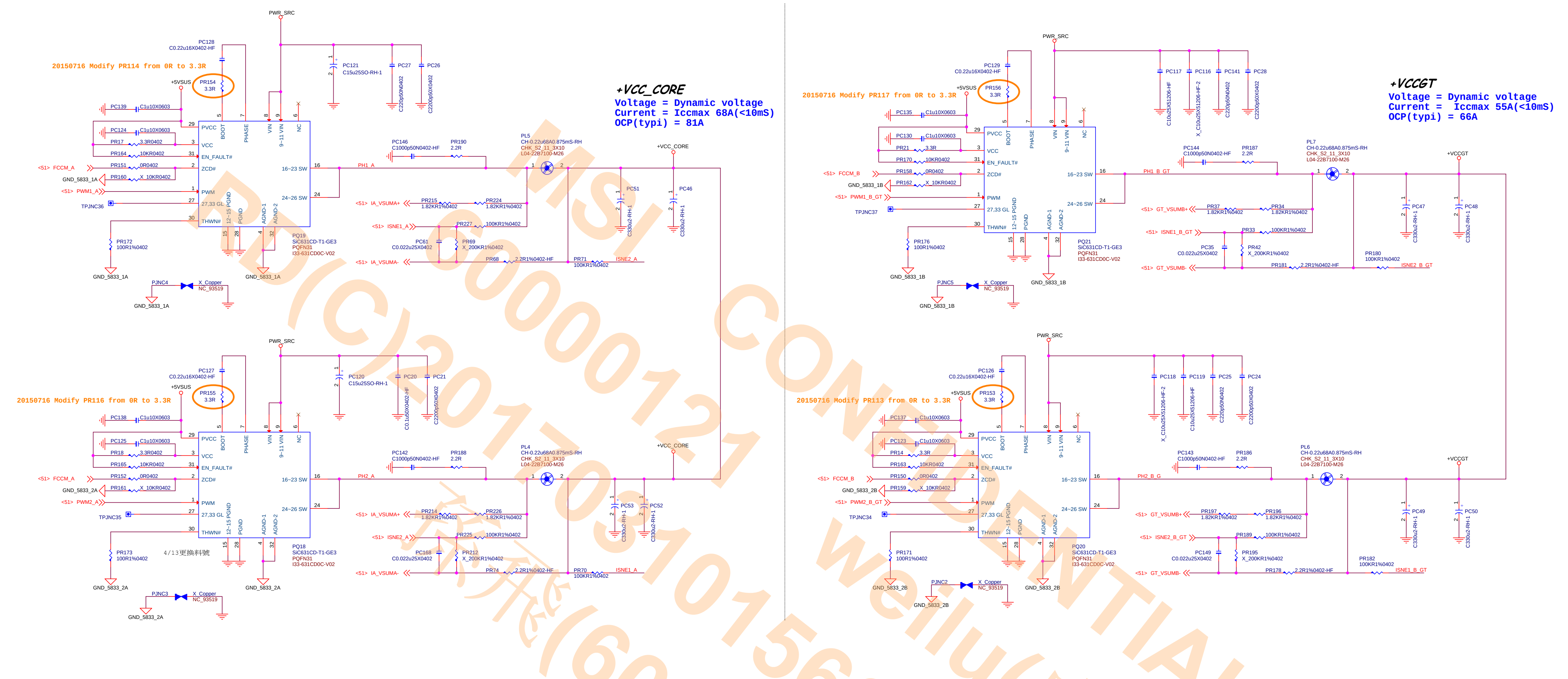
PROG1	110KR	Vboot=0V, Selw rate=30mV/us, VR_A=IA, VR_B=GT, VR_C=SA
PROG2	150KR	IMAX VR_A=70A, VR_A PSI1=1PH
PROG3	20.5KR	IMAX VR_B=60A, DROOP VR_B Active
PROG4	182KR	DROOP VR_A Active, DROOP VR_C Active, VR_A VR_B Frequency=750kHz
PROG5	48.7KR	IMAX VR_C=12A, Frequency=450kHz

MICRO-STAR INT'L CO.,LTD.

Title: Skylake CPU Power

Size | Document Number: MS-16J9 | Rev: 0A

Date: Wednesday, July 27, 2016



msi	MICRO-STAR INT'L CO.,LTD.
Title	Skylake VCore/VCCGT
Document Number	MS-16J9
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Date:	Wednesday, July 27, 2016
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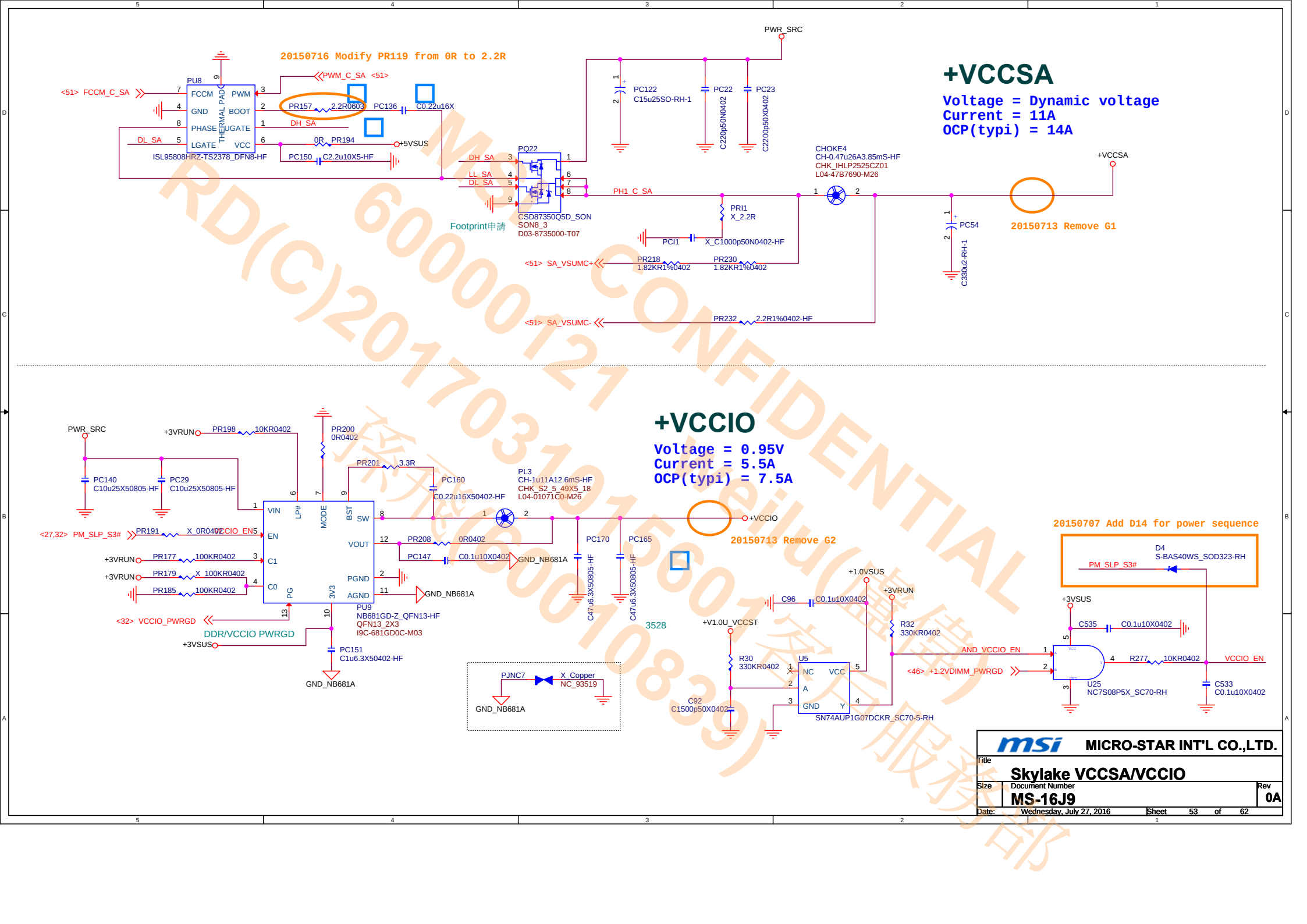
20150716 Modify PR119 from 0R to 2.2R
PWR_SRC
PU8
ISL95808HRZ-TS2378_DFN8-HF
PR157 2.2R0603
PC136 C0.22u16X
PR194 0R
PC150 C2.2u10X5-HF
+5VSUS
PQ22
CSD87350Q5D_SON SON8_3 D03-8735000-T07
Footprint申請
PC122 C15u25SO-RH-1
PC22 C220p50N0402
PC23 C2200p50X0402
PH1_C_SA
CHOKE4 CH-0.47u26A3.85mS-HF CHK_IHLP2525CZ01 L04-47B7690-M26
PRI1 X_2.2R
PCI1 X_C1000p50N0402-HF
PR218 1.82KR1%0402
PR230 1.82KR1%0402
PC54 C330u2-RH-1
20150713 Remove G1
+VCCSA
PR232 2.2R1%0402-HF
+VCCSA
Voltage = Dynamic voltage
Current = 11A
OCP(typi) = 14A
+VCCIO
Voltage = 0.95V
Current = 5.5A
OCP(typi) = 7.5A
PR198 10KR0402
PR200 0R0402
PR201 3.3R
PC160 C0.22u16X50402-HF
PL3 CH-1u11A12.6mS-HF CHK_S2_5_49X5_18 L04-01071C0-M26
PC140 C10u25X50805-HF
PC29 C10u25X50805-HF
PR191 X_0R0402
PR177 100KR0402
PR179 X_100KR0402
PR185 100KR0402
PR208 0R0402
PC147 C0.1u10X0402
PC170 C47u6.3X50805-HF
PC165 C47u6.3X50805-HF
PU9 NB681GD-Z_QFN13-HF QFN13_2X3 I9C-681GD0C-M03
PC151 C1u6.3X50402-HF
DDR/VCCIO PWRGD
20150713 Remove G2
20150707 Add D14 for power sequence
D4 S-BAS40WS_SOD323-RH
PJNC7 X_Copper NC_93519
3528
C96 C0.1u10X0402
R30 330KR0402
R32 330KR0402
C92 C1500p50X0402
U5 SN74AUP1G07DCKR_SC70-5-RH
C535 C0.1u10X0402
R277 10KR0402
U25 NC7S08P5X_SC70-RH
C533 C0.1u10X0402
MICRO-STAR INT'L CO.,LTD.
Skylake VCCSA/VCCIO
MS-16J9
0A
Wednesday, July 27, 2016
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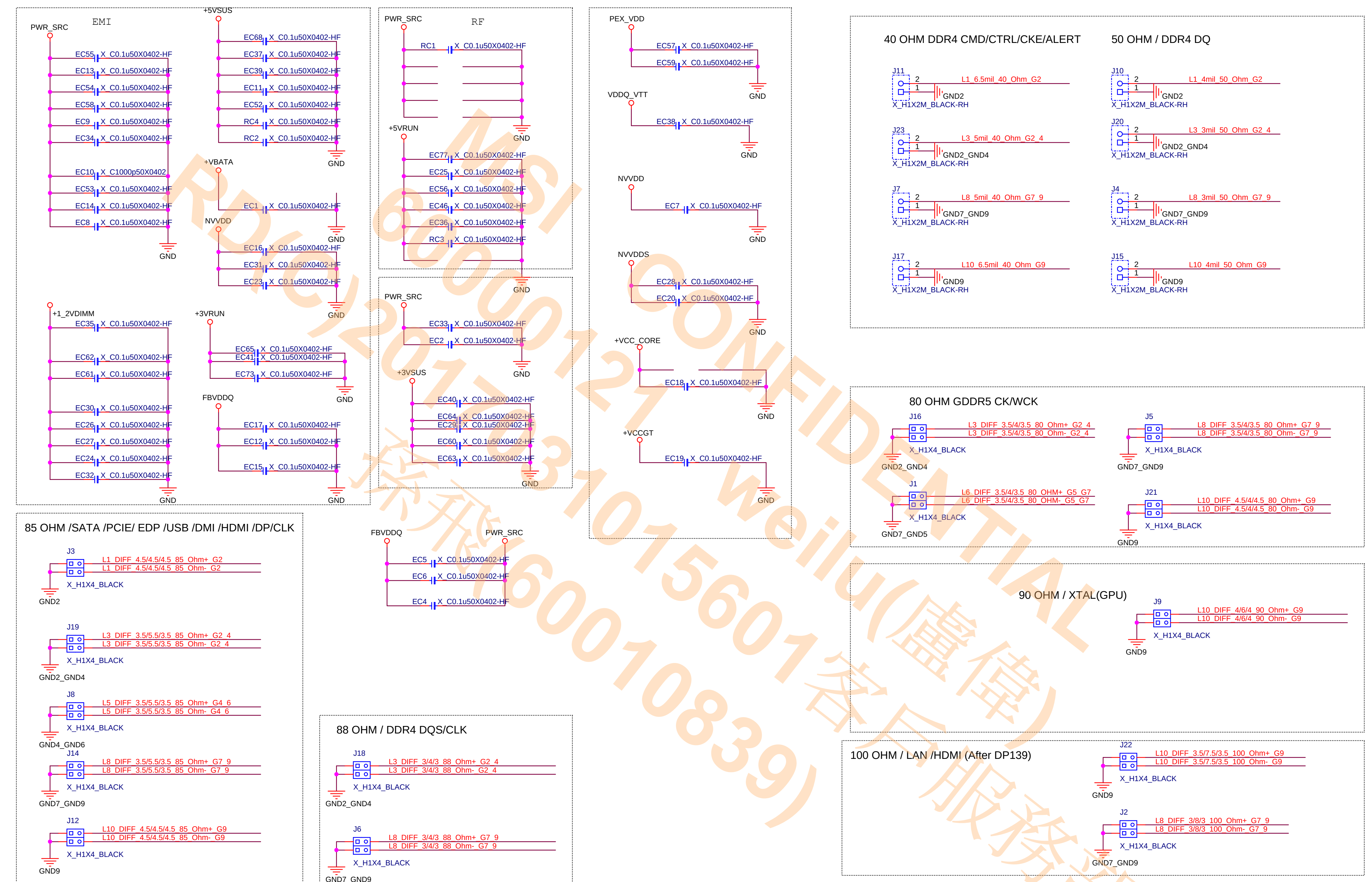


MICRO-STAR INT'L CO.,LTD.

Title: EMI/ Impedance

Size | Document Number: MS-16J9 | Rev: 0A

Date: Wednesday, July 27, 2016 | Sheet 54 of 62

CPU/GPU Holes

MCPU4 H_R276D169_PB_NH — MCPU2 H_R276D169_PB_NH — MCPU3 H_R276D169_PB_NH — MCPU1 H_R276D169_PB_N
MGPU2 H_R276D169_PB_NH — MGPU4 H_R276D169_PB_NH — MGPU1 H_R276D169_PB_NH — MGPU3 H_R276D169_PB_N
GND X_CPU_HOLE

OD 2.3

MH7 H_R197D118_PT_N X_ME_SCREW HOLE
MH4 H_R197D118_PT_N X_ME_SCREW HOLE
修改內徑3mm
MH9 H_R197D91_N X_ME_SCREW HOLE
MH5 H_R197D91_N X_ME_SCREW HOLE
MH6 H_R197D91_N X_ME_SCREW HOLE

版邊 內3 / 外8

MH1 H_R197D118_PT_N X_ME_SCREW HOLE
HOLES_8X8_D3MM_VIA8_N
MH8 X_8x8
MH3 X_H_R197D118_PT_V3 H_R197D118_PT_V3
MH2 X_H_R197D118_PT_V3 H_R197D118_PT_V3
GND
LAN_GND

FM12 FM34 FM49 FM6 FM33 FM20 FM25 FM26
FM48 FM11 FM16 FM43 FM35 FM37 FM19 FM47
FM4 FM10 FM28 FM2 FM1 FM21 FM30 FM9
FM40 FM41 FM38 FM13 FM15 FM14
FM39 FM36 FM42 FM24
X_FM

4/13 新增

20150908 Un-stuff TP mylar UME16 for ME request
20150713 Add TP mylar UME16 for 16J4

Only 16J4

UME3	UME4	UME5	UME7	UME8	UME17	UME11	UME16
CPU BKT	GPU BKT	CPU MYLAR	LED SPONGE	LED SPONGE	ME_MYLAR	HIDE_GAP_ MYLAR	TP MYLAR
CPU BKT	GPU BKT	X_CPU MYLAR	LED SPONGE	LED SPONGE	Hide Caps Lock LED_MYLAR	X_HIDE_GAP_MYLAR	X_TP_MYLAR
E2M-7810111-A89	307-6H20211-C22	E2P-6J11211-Y42	E2Y-6J10611-Y42	E2Y-6J10611-Y42	E2Y-6324111-Y42	E2P-6J11411-Y42	E2Y-6J11811-G40

Only 1794

UME1	UME12	UME14	UME13	UME15	UME21
HDMI Lable	USB3_CON_ MYLAR	HDMI/DP MYLAR	MB MYLAR	SPONGE	MB MYLAR
HDMI ROYALTY	MYLAR	MYLAR	MB MYLAR	SPONGE	MB MYLAR
Y01-RHDMI03-000	E2M-3570611-Y42	E2M-3570611-Y42	E2P-7910311-G40	E2Y-7910211-G40	E2P-7910312-G40

HOLE10 HOLE11 HOLE7 HOLE6 HOLE2 HOLE13 HOLE12 HOLE1
HOLE15 HOLE4 HOLE3 HOLE8 HOLE5 HOLE14 HOLE9
NPTH_80 X_NPTH_80 X_npth_98 npth_98

PCB1
PD0-16J910B-H73
PD0-16J910B-H73

UME2
BIOS Lable
BIOS_LABEL
G51-N1CO041-A09
For MP

UME20
ME_MYLAR
MYLAR
E2P-6J90111-G40

Top Spring

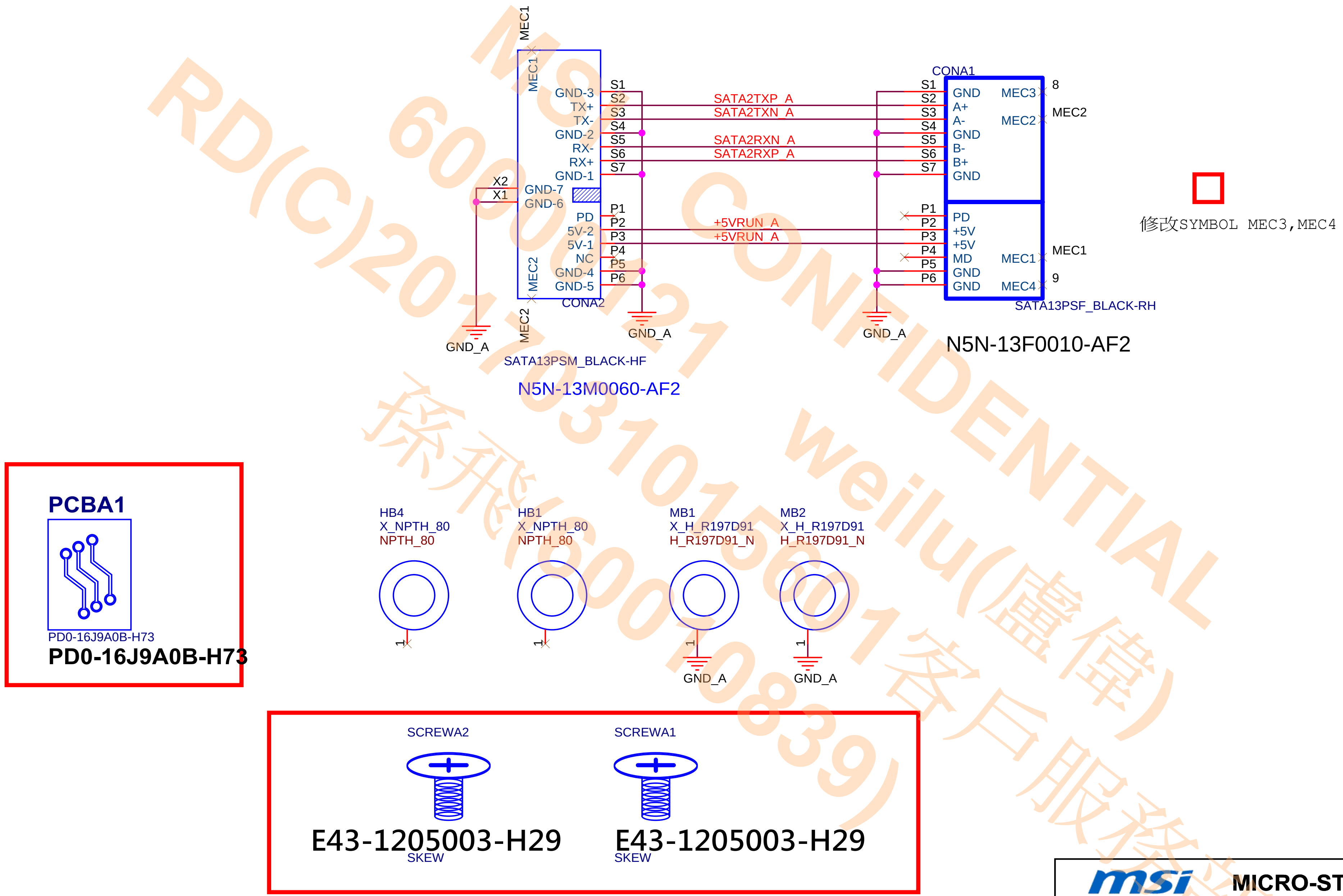
PAD6 X_HS-MS1011-RH ATE_C006_106
E23-1011040-CA7
PAD2 PAD3 PAD4 X_HS-MS1011-RH ATE_C006_106
E23-1011040-CA7 E23-1011040-CA7 E23-1011040-CA7

BOT Spring

PAD1 PAD5 X_HS-MS1011-RH ATE_C006_106
E23-1011040-CA7 E23-1011040-CA7

FM31 FM45 FM17 FM7 FM29 FM44 FM23 FM5
X_FM_NB2

MICRO-STAR INT'L CO.,LTD.
Title: Screw/ME
Size: Document Number: MS-16J9 Rev: 0A
Date: Wednesday, August 24, 2016 Sheet 55 of 62

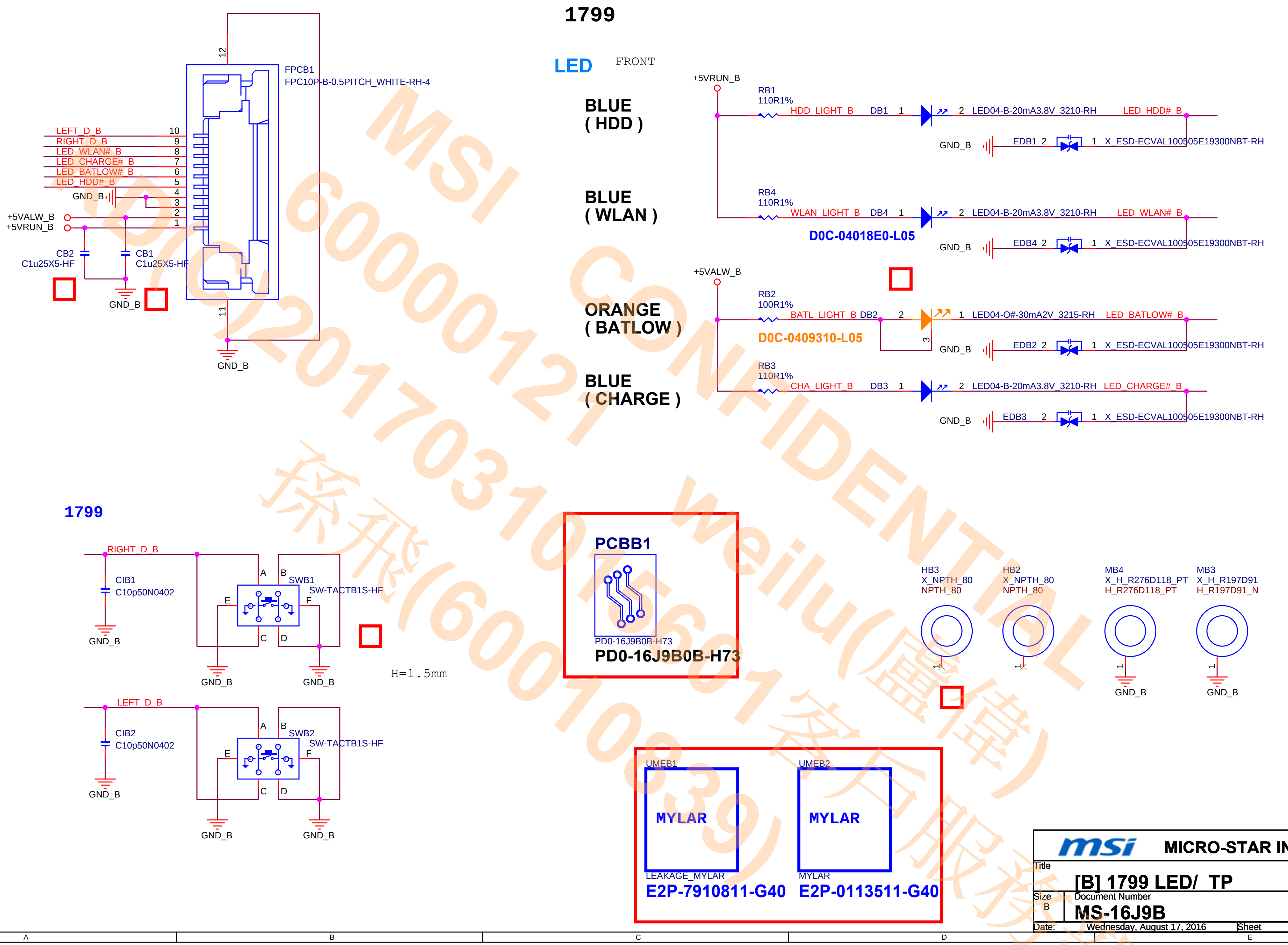

MEC1
CONA2
GND-3
TX+
TX-
GND-2
RX-
RX+
GND-1
GND-7
GND-6
PD
5V-2
5V-1
NC
GND-4
GND-5
X2
X1
S1 S2 S3 S4 S5 S6 S7
P1 P2 P3 P4 P5 P6
SATA2TXP_A
SATA2TXN_A
SATA2RXN_A
SATA2RXP_A
+5VRUN_A
+5VRUN_A
GND_A
MEC2
SATA13PSM_BLACK-HF
N5N-13M0060-AF2
CONA1
GND
A+
A-
GND
B-
B+
GND
PD
+5V
+5V
MD
GND
GND
MEC3
MEC2
MEC1
MEC4
8
9
SATA13PSF_BLACK-RH
N5N-13F0010-AF2
修改SYMBOL MEC3,MEC4
PCBA1
PD0-16J9A0B-H73
PD0-16J9A0B-H73
HB4
X_NPTH_80
NPTH_80
HB1
X_NPTH_80
NPTH_80
MB1
X_H_R197D91
H_R197D91_N
MB2
X_H_R197D91
H_R197D91_N
GND_A
GND_A
SCREWA2
SCREWA1
E43-1205003-H29
SKEW
E43-1205003-H29
SKEW

MICRO-STAR INT'L CO.,LTD.

Title: [A] 1799 ODD

Size: A4
Document Number: MS-16J9A
Rev: 0A

Date: Wednesday, August 17, 2016
Sheet 56 of 62



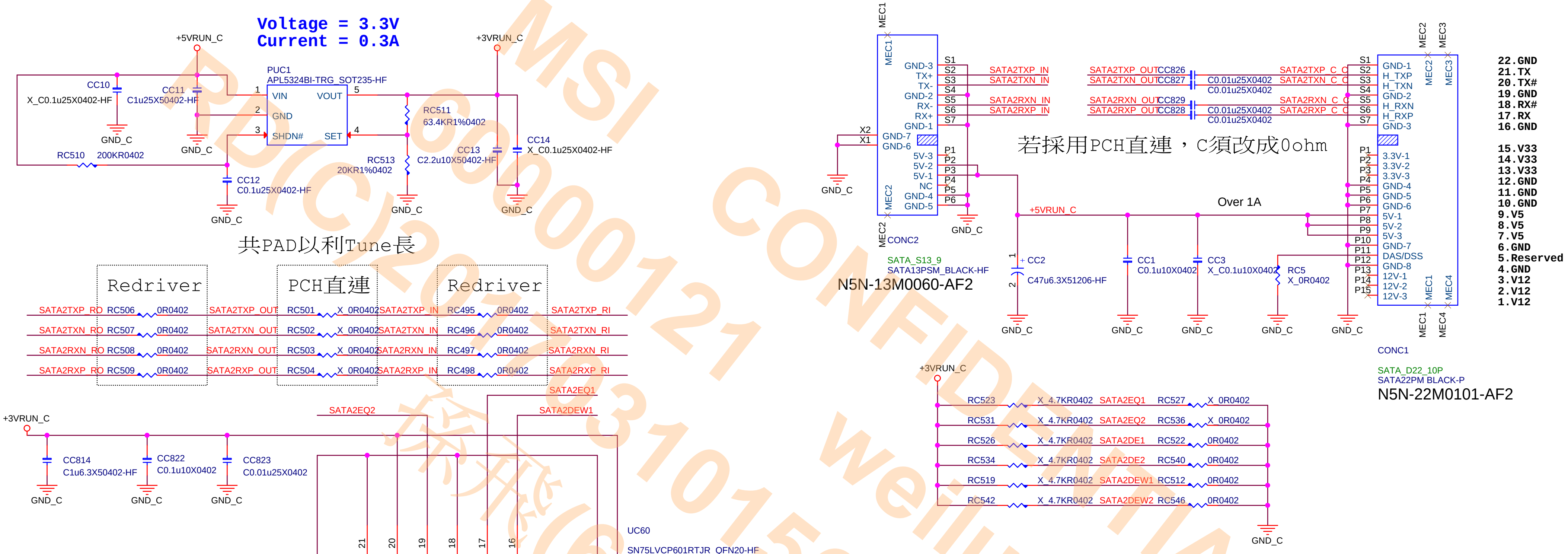
MICRO-STAR INT'L CO.,LTD.

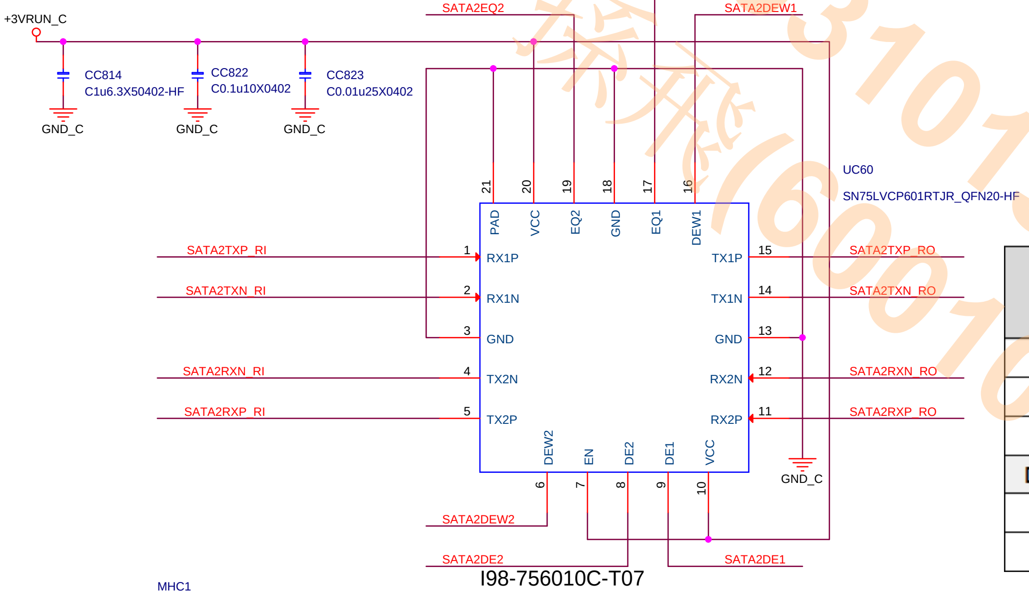
Title: [B] 1799 LED/ TP

Size	Document Number	Rev
B	MS-16J9B	0A

Date: Wednesday, August 17, 2016 | Sheet 57 of 62

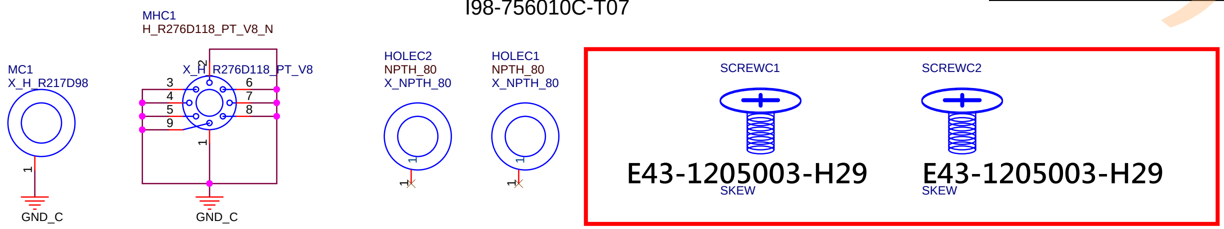
ODD SATA HDD

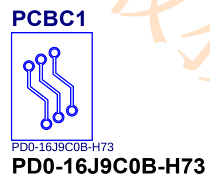




TX and RX EQ and DE Pulse-Duration Settings

DE1 OR DE2	CH1 OR CH2 DE-EMPHASIS dB (at 6 Gbps)	EQ1 OR EQ2	CH1 OR CH2 Equalization dB (at 6 Gbps)
NC (*default*)	–4	NC (*default*)	0
0	0	0	7
1	–2	1	14
DEW1 OR DEW2	**DEVICE FUNCTION → DE WIDTH FOR CH1/CH2**		
0	De-emphasis pulse duration, short		
1 (*default*)	De-emphasis pulse duration, long		





MICRO-STAR INT'L CO.,LTD.

Title: SATA ODD to HDD

Size: A3 | Document Number: MS-16J9C | Rev: 0A

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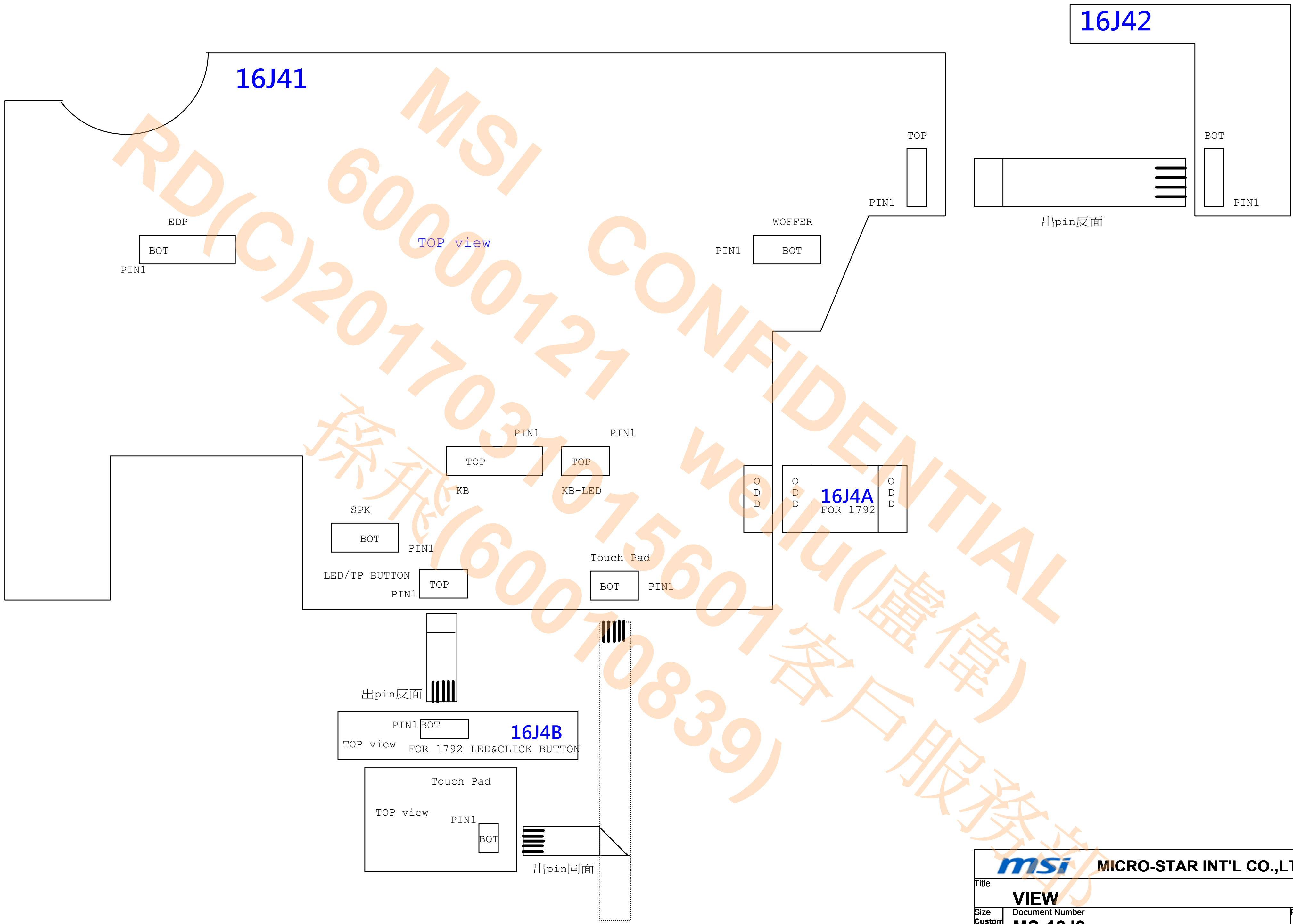

MSI MICRO-STAR INT'L CO.,LTD.

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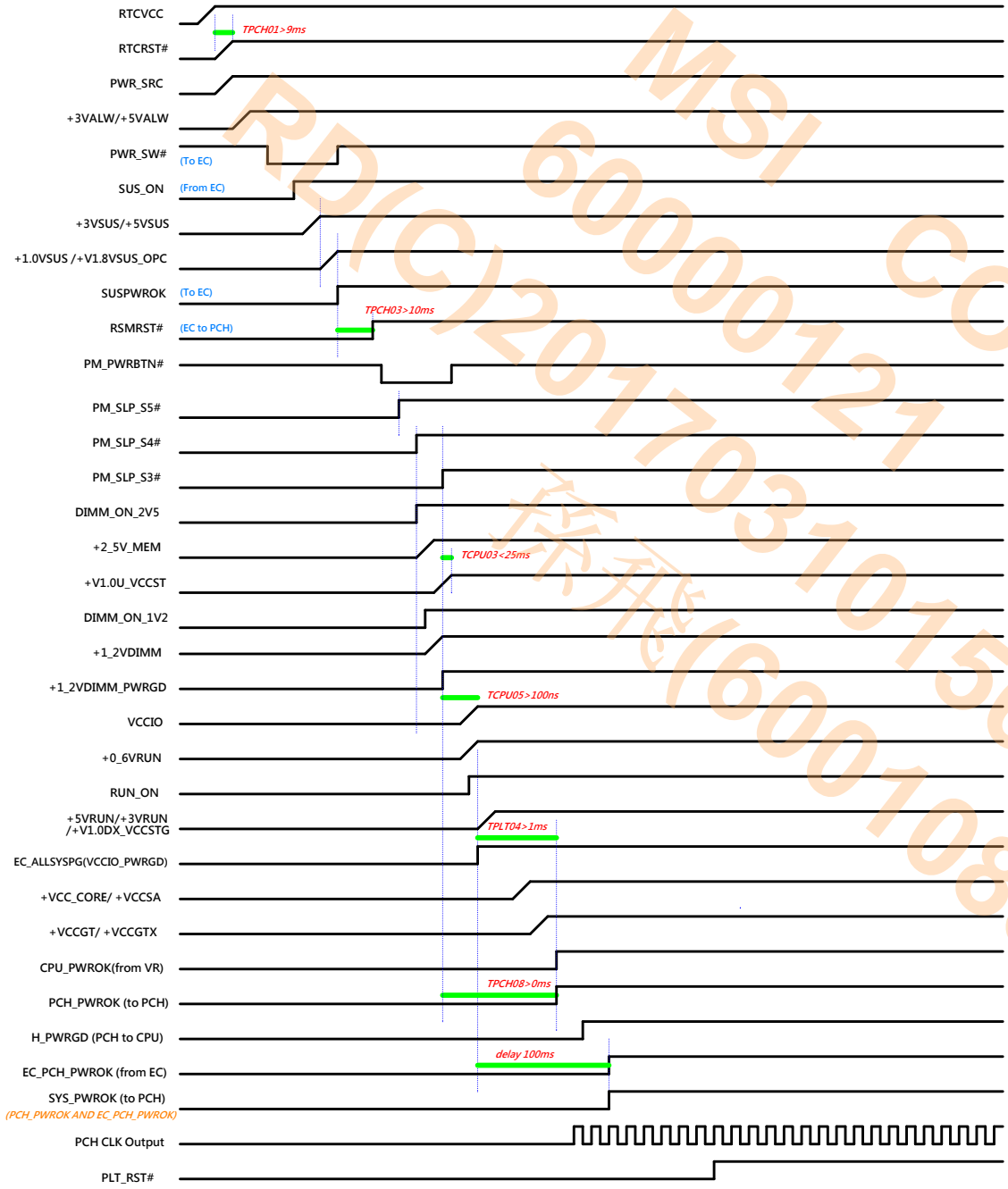
Power on Sequence

G3 -> S0



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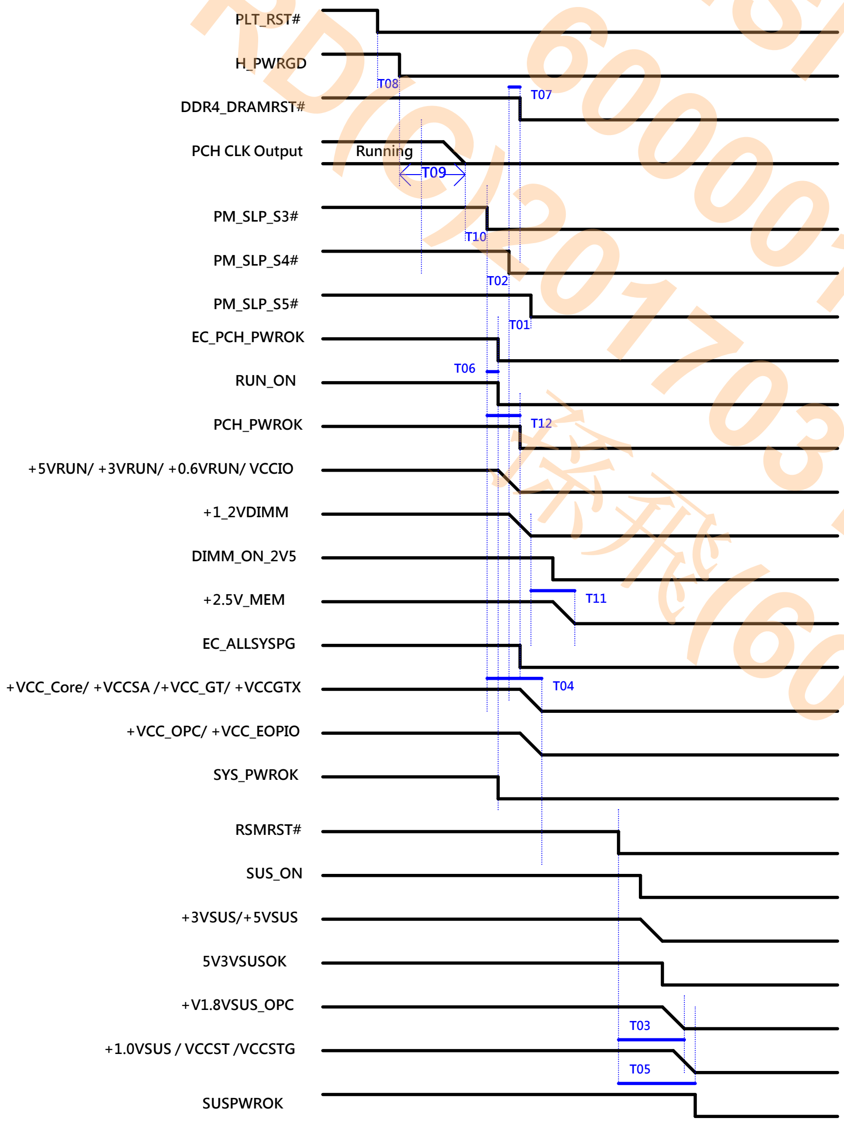
Power down Sequence

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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Page	Description
28	REMOVE PU R164,R172,R151,R149
33	JNC13 CHANGE FOOTPRINT
	R176,R412 CHANGE TO JNC29,JNC30
30	ED10,ED11 PIN4,5 CHANGE NET
42	REMOVE G2
38	ADD ESD2
30	ADD TPS25810 U34 ED11 P/N SWAP
28	R144 PU TO 3VSUS
5	REMOVE R67
6	ADD C597
3	REMOVE R74,R72 ,C262
8	REMOVE C597
25	C646 CHANGE FOOTPRINT
	REMOVE R380 ,R376
31	DP REMOVE U8 ,ADD Q22,Q23,Q24
21	ADD R448 ,R380
30	ADD C725,C726
39	PR54,PC57 CHANGE FOOTPRINT
41	PC197 0805 CHANGE 0402 FOOTPRINT
42	PC91 0805 CHANGE 0402 FOOTPRINT
05	REMOVE R31
30	U34 CHANGE FOOTPRINT
29	REMOVE R139,R163
33	REMOVE C665 ADD JNC31
48	REMOVE J24 ,J17,J12,J18
49	REMOVE PAD1,PAD5,PAD9,PAD10
43	REMOVE G3,G4
48	ADD +1_2VDIMM EMI CAP
	REMOVE J19,J22
42	ADD PC666

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Page	Description	
12~17 19~21	memory change RC料號統一	5/12
27	Change R111 reference 4.99K to 20K	5/13
30	D3 +3VRUN change to 3V_NV	
49	PR61 :1ohm 0402 >0603 (R11-0010023-W08) PC64 :1u 0402>0603 (C11-1057613-W08) PR74 :205Kohm>187Kohm(R11-1873T12-W08)	5/14
52	+1VSUS VCC分壓	
33	U17 CPU_POWOK add C to ground	5/15
49	PR33換料	
44	CON10 Change to N54-06F1371-SL0 CN13 Change to N58-08F0191-SL0	5/18
39	Y4 change to D04-0901000-SC6	
	R190 改不上件	
37	LED限流電阻改值	
54	PC62 change to C11-4722812-M09	
	1VSUS PR223 : 12.4K?13K(R11-0133T12-W08) DIMM PU5 : APW8819?TPS51216 (I32-512160C-T07) PR91 : 110K?150K(R11-0154T12-W08) PR219,PC200 : NC?上件 FBVDDQ PR7,CI1 : NC?上件 VCORE PR174 : 499R?470R(R11-0471T12-W08) PR164 : 95.3K?82K(R11-0823T12-W08) PR34 : 2.43K?2.15K(R11-2151T12-W08) PR32 : 499R?1K(R11-0102T12-W08) PR160 : 1.4K?2.87K(R11-2871T12-W08) PR109,PR110 : NC?0R(R11-0000012-W08) PR123,PR122 : 10K?NC PR51,PR175 : 200k?NC PC163 : 0.22u?0.1u(C11-1042023-Y01) PC48 : 0.082u?0.1u(C11-1042812-Y01) PC154 : 680p?820P(C11-8212012-W08) PC36 : 680p?330P(C11-3312012-W08) VGT PR144 : 412R?340R(R11-0341T12-W08) PR14 : 2.61K?4.32K(R11-4321T12-W08) PR24 : 97.6K?86.6K(R11-8662T12-W08) PR154 : 2K?2.55K(R11-2551T12-W08) PR23 : 499R?1K(R11-0102T12-W08) PR155 : 1K?4.02K(R11-4021T12-W08) PR120,PR108 : NC?0R(R11-0000012-W08) PR124,PR121 : 10K?NC PR25,PR157 : 200k?NC PC22 : 680p?330P(C11-3312012-W08) PC139 : 680p?1000P(C11-1022012-W08) VCCSA PR45 : 619R?560R(R11-0561T12-W08) PR182 : 2.15K?2.26K(R11-2261T12-W08) PR176 : 100K?91K(R11-0913T12-W08) PR44 : 2K?2.87K(R11-2871T12-W08) PC168 : 0.068u?0.047u(C11-4732043-Y01) PC51 : 0.082u?6800P(C11-6822612-W08) PC56 : 680p?1000P(C11-1022012-W08)	5/20
26	Y6 change to D04-1103510-F07 PC24,38,50 : 0.01uF change to C11-1032012-W08	5/25
54	Add UMEB1 , UMEB2	5/29
	PU2 change to I32-958552C-I11	
	CPU change to OAD-14A1001	
	PCH change to OB1-14A1001	
	U12 change to I36-258100C-T07	

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Page	Description	
	R247 ,R441,D8stuff R147,R464,R448上件 U39 change to B07-F021J44-EB3 U43 change to M31-25B6412-GA0 U13 change to B02-011422C-AD0	6/12
	VCORE: PR174 : 470R'453R(R11-4530T22-W08) PR34 : 2.15K'2.43K(R11-2431T12-W08) PC163 : 0.1u?NC PC48 : 0.1u'0.22u(C11-2242512-M09) PR164 : 82K'95.3K(R11-9532T12-W08) FBVDDQ PR11 : 33.2K?27K(R11-2702T12-W08) VGT: PR144 : 340R'374R(R11-3740T12-W08) VCCSA: PC51 : 6800P'0.018u (C11-1832512-M09) PR176 : 91K'93.1K(R11-9312T12-W08)	6/16
	PR147,PR150,PR151,PR152 PC135,PC136,PC137,PC138 上件 R72 change to L02-1008023-T19	6/17
	U29 change to N-90-GSMS1-RH	6/22
	ED10, ED11 stuff	6/23
	E207不上 R219上件	
	CPU PC105,PC106,PC107,PC108,PC109,PC110,PC112,PC113, DGPU : PC167,PC169,PC170,PC178,PC183,PC184,PC185,PC187 Change to C11-1067610-M09	6/24
	E2P-6J11211-Y42移除	6/25
	Add E2Y-Z001711-G40*2	
	Add BIOS Socket	

Page	Description	
43	**Change R421 from 33R to 22R**	7/7
43	**Change C413 & C414 from 20p to 33p**	
51	**Change R135 from 0R to 4.7KR**	
	Add D13 circuit for power sequence	
57	**Add D14 circuit for power sequence**	
59	**Stuff UME2**	
	Remove all gate	7/13
59	**Add UME16 for 16J4 TP Mylar**	
54	**Modify PR79 & PR194 from 2.2R to 2.7R**	7/16
56	**Modify PR114 & PR116 & PR113 & PR117 from 0R to 3.3R**	
57	**Modify PR119 from 0R to 2.2R**	
60	**Unstuff A board component for 16J4**	
61	**Unstuff B board component for 16J4**	
36	**Stuff UB1 & unstuff UB2 for 1794**	7/24
40	**20150724 Modify F1 location**	
34	**20150727 Remove BIOS ROM sucket**	7/27
38	**20150727 Remove SW3 & C207**	
	Modify to 1.0 BOM	8/6
	Change CPU PN to A0D-6700H15-I06 **PCH PN to B01-HM17005-I06**	8/12
	Change R348 from 20KR to 4.7KR	
38	**Unstuff CON6**	8/17
	Change BIOS label to G51-N1C0041-A09 for AMI	8/18
	Change 2N7002 dual PN to D03-65D8L09-D07 for Safety	
	Change UME11 to un-stuff for ME request	8/24
	Modify DGPU VRAM size from 3G to 6G and strap value	9/03
	Change UME16 to un-stuff for ME request	9/08
	Modify GPU HW strap value to correct	11/30

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