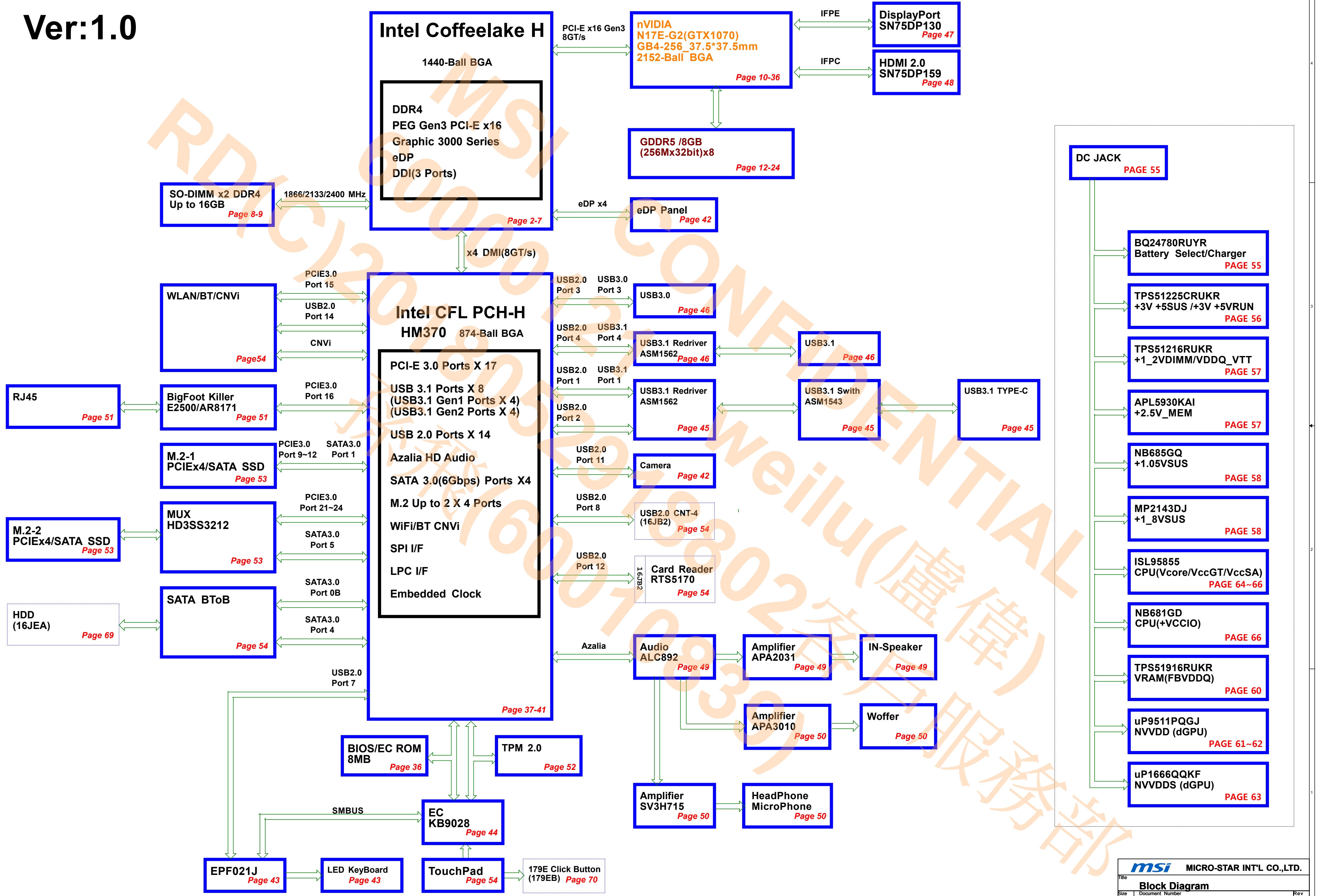
MS-16JE/MS-179E

Intel CoffeeLake Mobile

Thursday, December 14, 2017

Ver:1.0



msi	MICRO-STAR INT'L CO.,LTD.
Title	Block Diagram
Size / Document Number	MS-16JE
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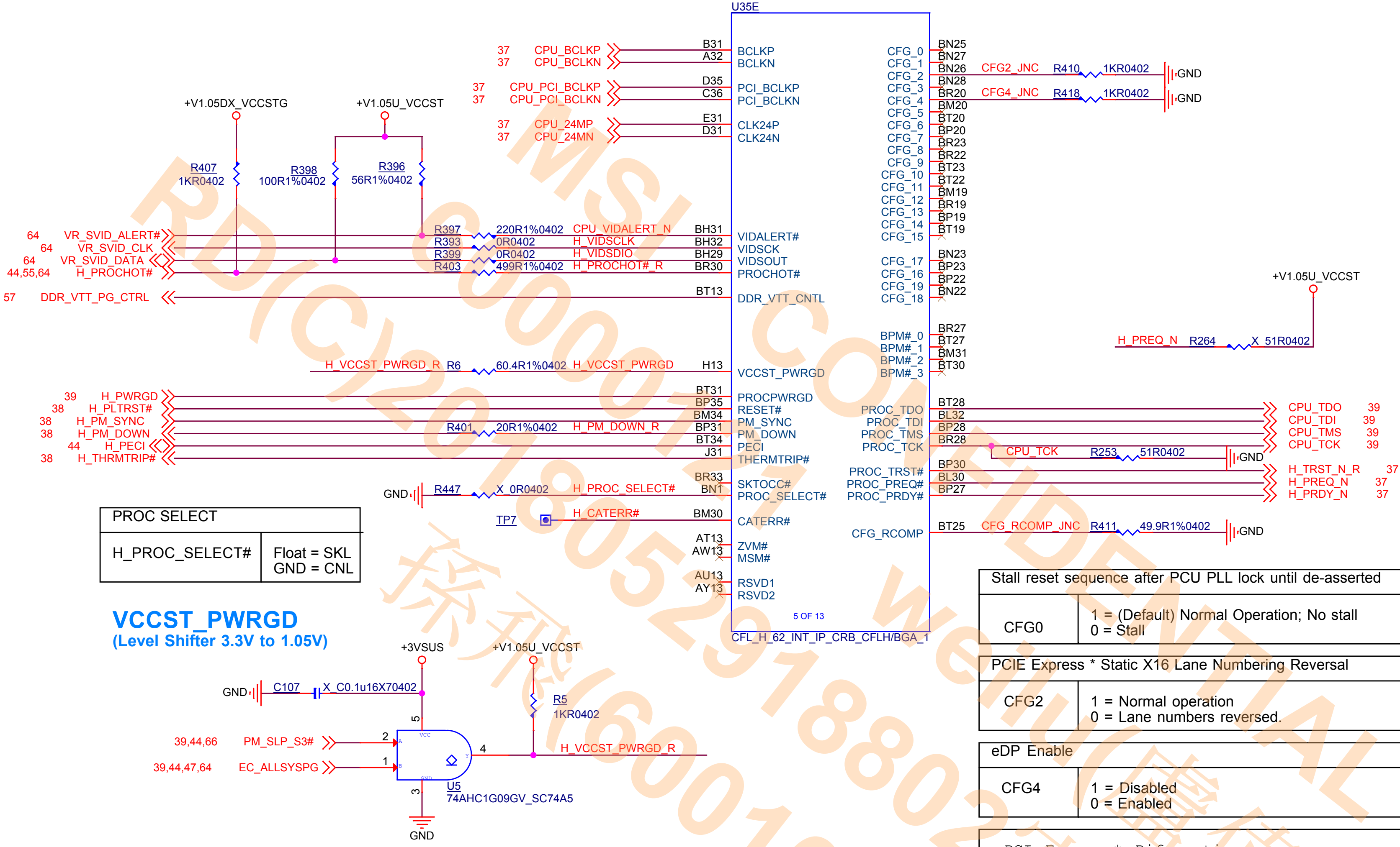

PROC SELECT	
H_PROC_SELECT#	Float = SKL GND = CNL

Stall reset sequence after PCU PLL lock until de-asserted	
CFG0	1 = (Default) Normal Operation; No stall 0 = Stall

PCIE Express * Static X16 Lane Numbering Reversal	
CFG2	1 = Normal operation 0 = Lane numbers reversed.

eDP Enable	
CFG4	1 = Disabled 0 = Enabled

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*

PEG DEFER TRAINING	
CFG7	1: (default) PEG Train immediately following RESET# de assertion. 0: PEG Wait for BIOS for training

I7-8750H

I7_8750
OAD-16K5004-I06
X_I7-8750

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

Title	Coffeelake(HOST)	
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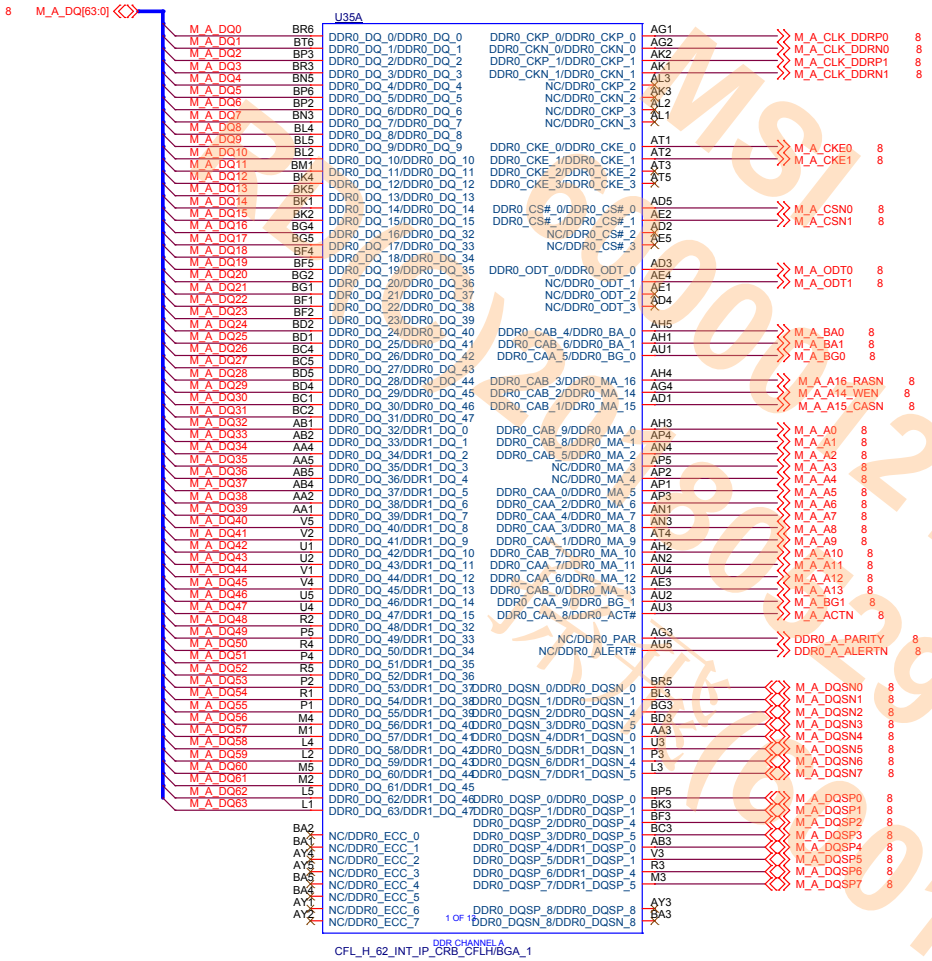
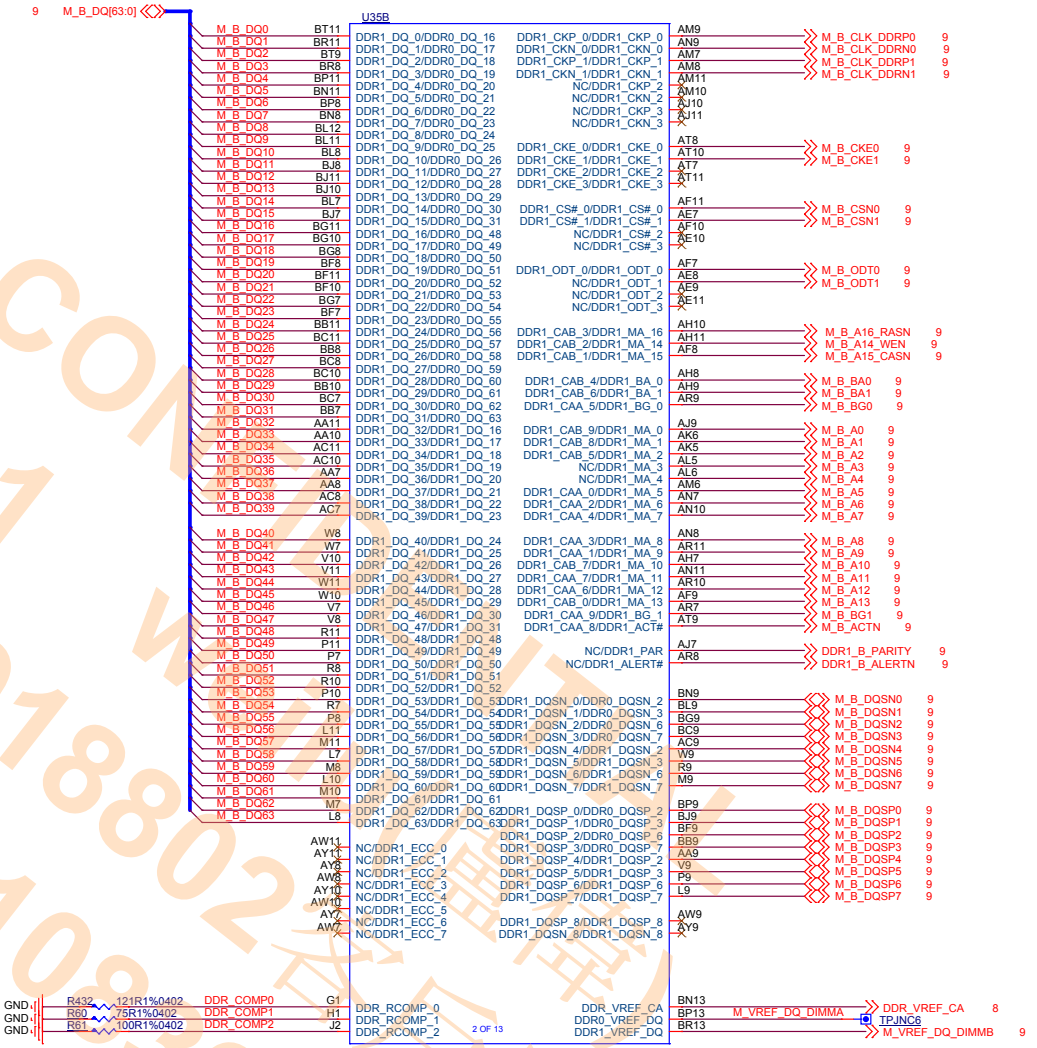
DDR Channel A



DDR Channel B



MSI	MICRO-STAR INT'L CO.,LTD.	
Title	Coffeelake(DDR4)	
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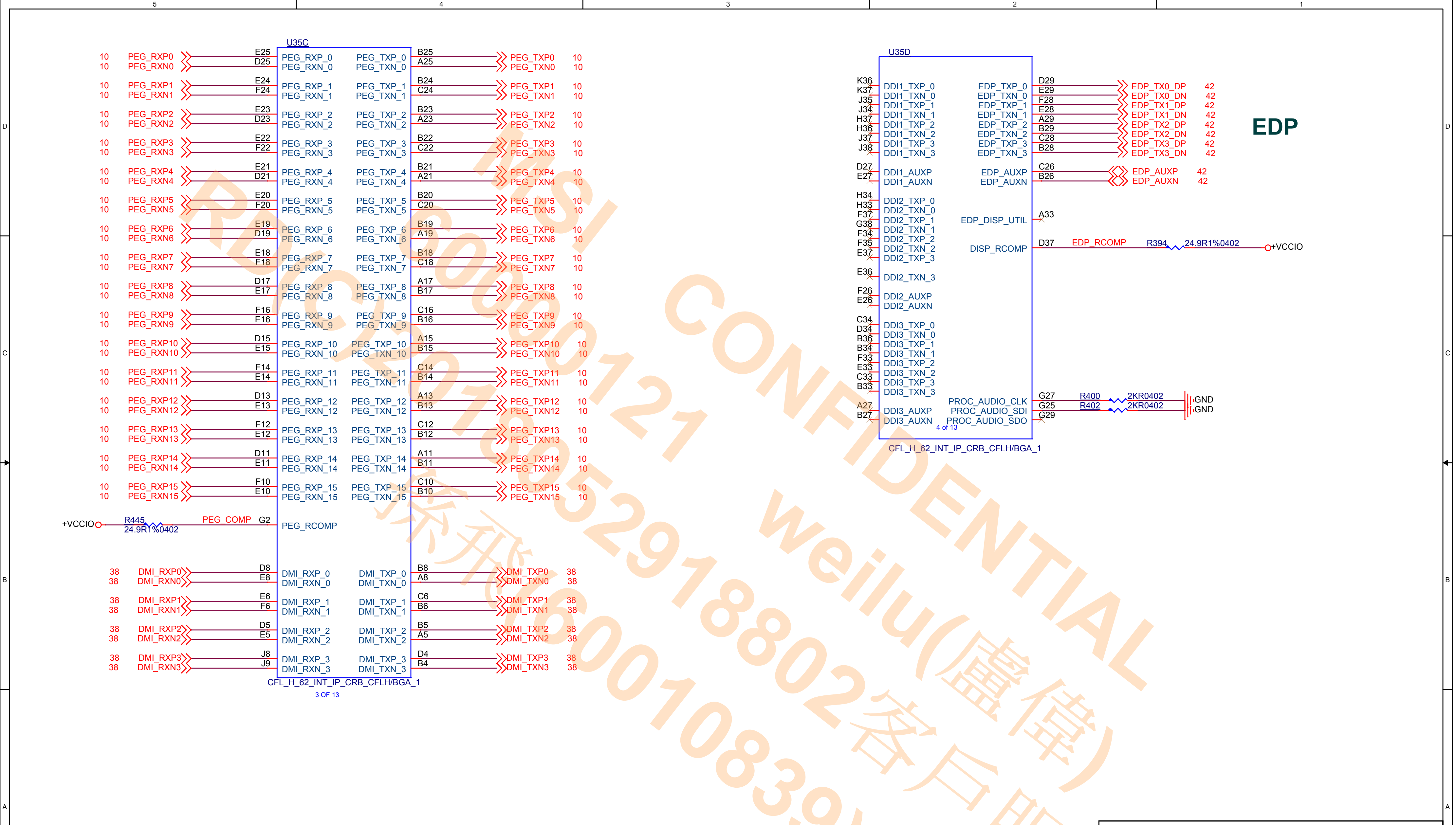

MICRO-STAR INT'L CO.,LTD.

Title: Coffeelake(DMI/Display)

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B	MS-16JE	1.0

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MICRO-STAR INT'L CO.,LTD.

Title: **Coffeelake(Power1)**

Size	Document Number	Rev
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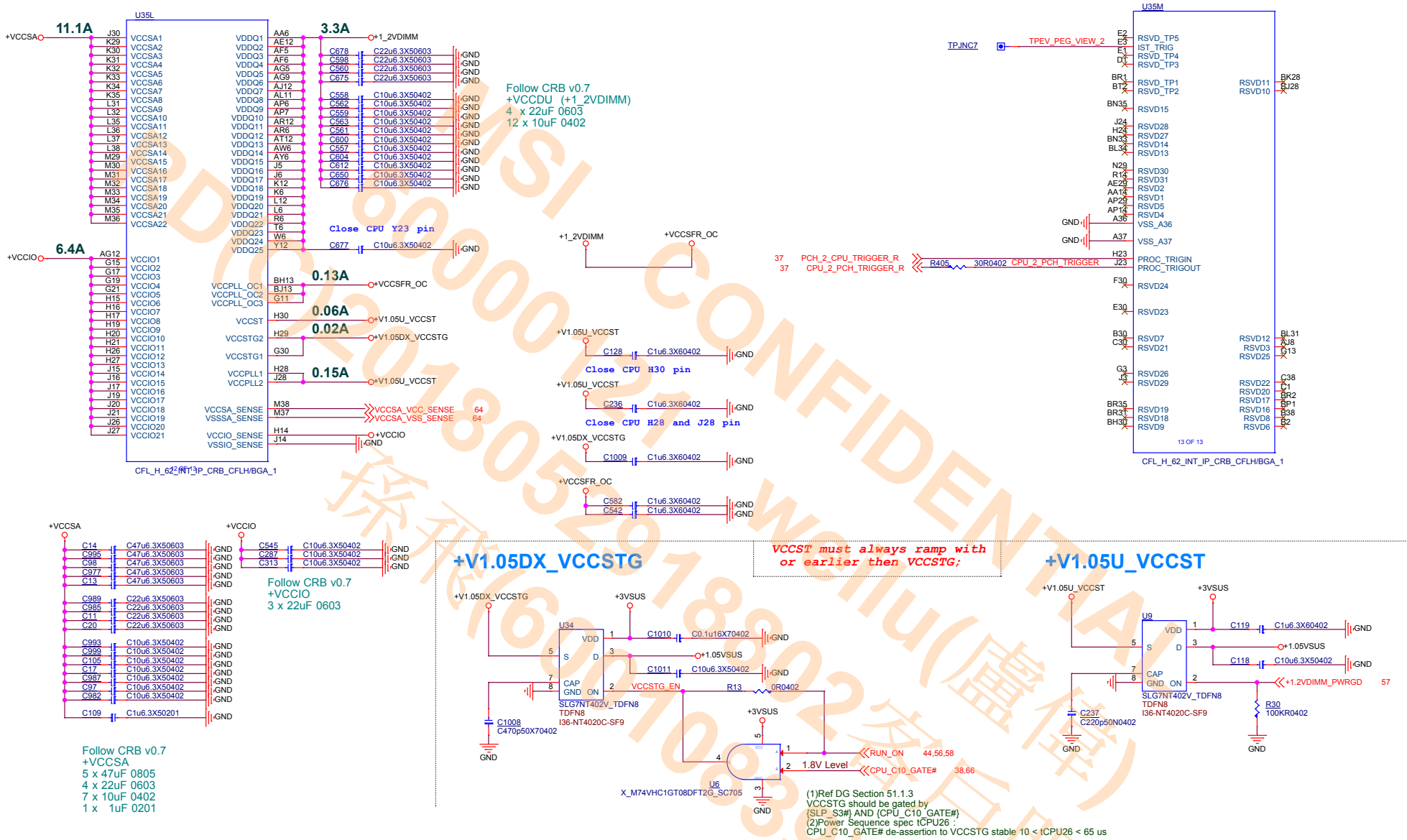
U35L
11.1A
+VCCSA
VCCSA1
VCCSA2
VCCSA3
VCCSA4
VCCSA5
VCCSA6
VCCSA7
VCCSA8
VCCSA9
VCCSA10
VCCSA11
VCCSA12
VCCSA13
VCCSA14
VCCSA15
VCCSA16
VCCSA17
VCCSA18
VCCSA19
VCCSA20
VCCSA21
VCCSA22
6.4A
+VCCIO
VCCIO1
VCCIO2
VCCIO3
VCCIO4
VCCIO5
VCCIO6
VCCIO7
VCCIO8
VCCIO9
VCCIO10
VCCIO11
VCCIO12
VCCIO13
VCCIO14
VCCIO15
VCCIO16
VCCIO17
VCCIO18
VCCIO19
VCCIO20
VCCIO21
CFL_H_62_INT_IP_CRB_CFLH/BGA_1
3.3A
+1_2VDIMM
VDDQ1
VDDQ2
VDDQ3
VDDQ4
VDDQ5
VDDQ6
VDDQ7
VDDQ8
VDDQ9
VDDQ10
VDDQ11
VDDQ12
VDDQ13
VDDQ14
VDDQ15
VDDQ16
VDDQ17
VDDQ18
VDDQ19
VDDQ20
VDDQ21
VDDQ22
VDDQ23
VDDQ24
VDDQ25
C678 C22u6.3X50603
C598 C22u6.3X50603
C560 C22u6.3X50603
C675 C22u6.3X50603
C558 C10u6.3X50402
C562 C10u6.3X50402
C559 C10u6.3X50402
C563 C10u6.3X50402
C561 C10u6.3X50402
C600 C10u6.3X50402
C557 C10u6.3X50402
C604 C10u6.3X50402
C612 C10u6.3X50402
C650 C10u6.3X50402
C676 C10u6.3X50402
Close CPU Y23 pin
C677 C10u6.3X50402
0.13A
+VCCSFR_OC
VCCPLL_OC1
VCCPLL_OC2
VCCPLL_OC3
0.06A
+V1.05U_VCCST
VCCST
0.02A
+V1.05DX_VCCSTG
VCCSTG2
VCCSTG1
0.15A
+V1.05U_VCCST
VCCPLL1
VCCPLL2
VCCSA_SENSE
VSSSA_SENSE
VCCSA_VCC_SENSE 64
VCCSA_VSS_SENSE 64
VCCIO_SENSE
VSSIO_SENSE
+VCCIO
Follow CRB v0.7
+VCCDU (+1_2VDIMM)
4 x 22uF 0603
12 x 10uF 0402
+1_2VDIMM
+VCCSFR_OC
C128 C1u6.3X60402
Close CPU H30 pin
C236 C1u6.3X60402
Close CPU H28 and J28 pin
C1009 C1u6.3X60402
C582 C1u6.3X60402
C542 C1u6.3X60402
U35M
TPJNC7
TPEV_PEG_VIEW_2
RSVD_TP5
IST_TRIG
RSVD_TP4
RSVD_TP3
RSVD_TP1
RSVD_TP2
RSVD11
RSVD10
RSVD15
RSVD28
RSVD27
RSVD14
RSVD13
RSVD30
RSVD31
RSVD2
RSVD1
RSVD5
RSVD4
VSS_A36
VSS_A37
PROC_TRIGIN
PROC_TRIGOUT
RSVD24
RSVD23
RSVD7
RSVD21
RSVD12
RSVD3
RSVD25
RSVD26
RSVD29
RSVD22
RSVD20
RSVD17
RSVD16
RSVD8
RSVD6
RSVD19
RSVD18
RSVD9
13 OF 13
CFL_H_62_INT_IP_CRB_CFLH/BGA_1
37 PCH_2_CPU_TRIGGER_R
37 CPU_2_PCH_TRIGGER_R
R405 30R0402 CPU_2_PCH_TRIGGER
+VCCSA
+VCCIO
C14 C47u6.3X50603
C995 C47u6.3X50603
C98 C47u6.3X50603
C977 C47u6.3X50603
C13 C47u6.3X50603
C989 C22u6.3X50603
C985 C22u6.3X50603
C11 C22u6.3X50603
C20 C22u6.3X50603
C993 C10u6.3X50402
C999 C10u6.3X50402
C105 C10u6.3X50402
C17 C10u6.3X50402
C987 C10u6.3X50402
C97 C10u6.3X50402
C982 C10u6.3X50402
C109 C1u6.3X50201
C545 C10u6.3X50402
C287 C10u6.3X50402
C313 C10u6.3X50402
Follow CRB v0.7
+VCCSA
5 x 47uF 0805
4 x 22uF 0603
7 x 10uF 0402
1 x 1uF 0201
Follow CRB v0.7
+VCCIO
3 x 22uF 0603
+V1.05DX_VCCSTG
VCCST must always ramp with or earlier then VCCSTG;
+V1.05U_VCCST
U34
VDD
S
D
CAP
GND ON
SLG7NT402V_TDFN8
TDFN8
I36-NT4020C-SF9
C1010 C0.1u16X70402
C1011 C10u6.3X50402
VCCSTG_EN
R13 0R0402
+3VSUS
+1.05VSUS
C1008 C470p50X70402
U6
X_M74VHC1GT08DFT2G_SC705
1.8V Level
RUN_ON 44,56,58
CPU_C10_GATE# 38,66
U9
C119 C1u6.3X60402
C118 C10u6.3X50402
+1.2VDIMM_PWRGD 57
C237 C220p50N0402
R30 100KR0402
(1)Ref DG Section 51.1.3
VCCSTG should be gated by
{SLP_S3#} AND {CPU_C10_GATE#}
(2)Power Sequence spec tCPU26 :
CPU_C10_GATE# de-assertion to VCCSTG stable 10 < tCPU26 < 65 us
MICRO-STAR INT'L CO.,LTD.
Title
Coffeelake(Power2)
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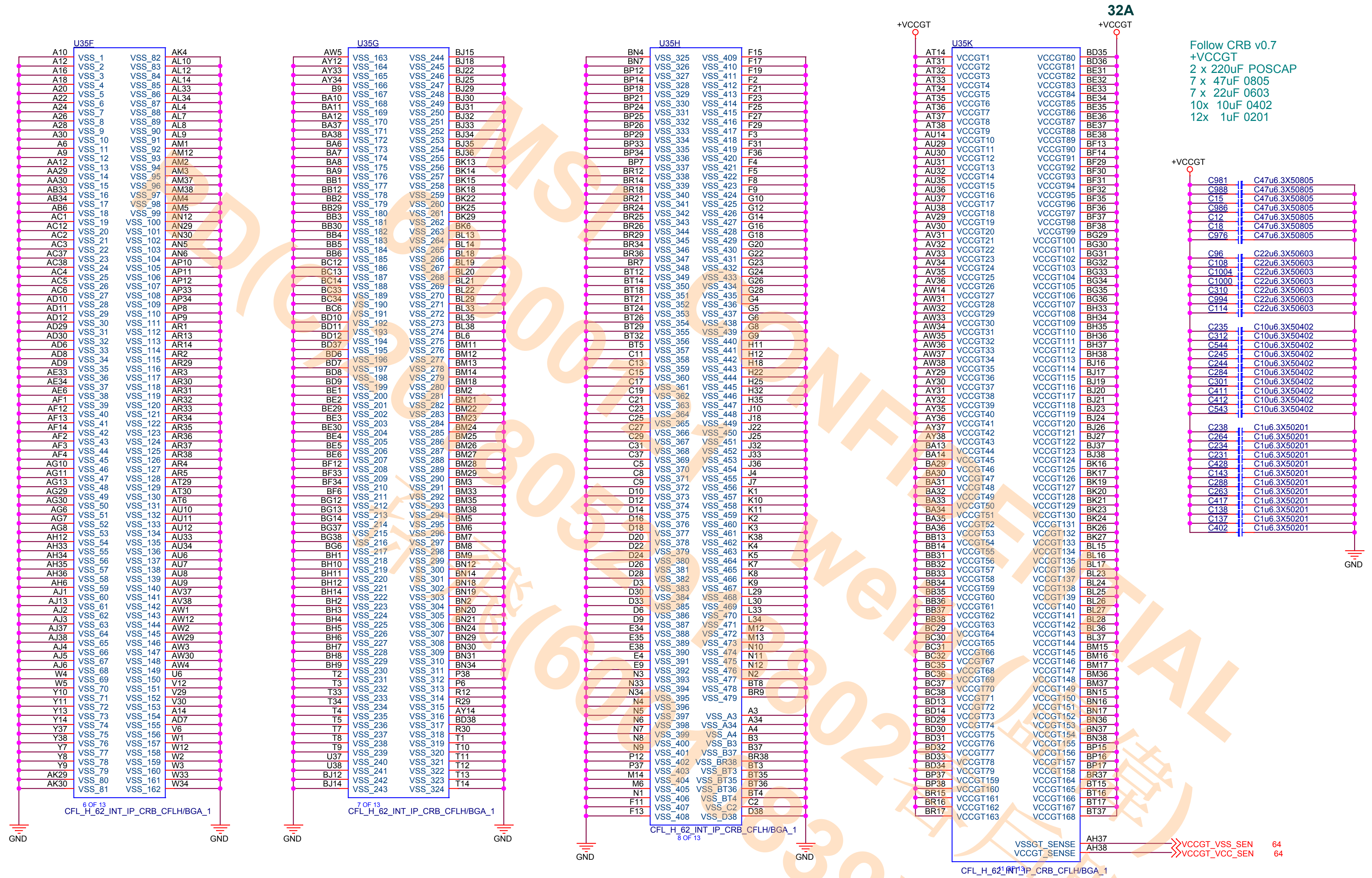

MICRO-STAR INT'L CO.,LTD.

Title: Coffeelake(Power3)

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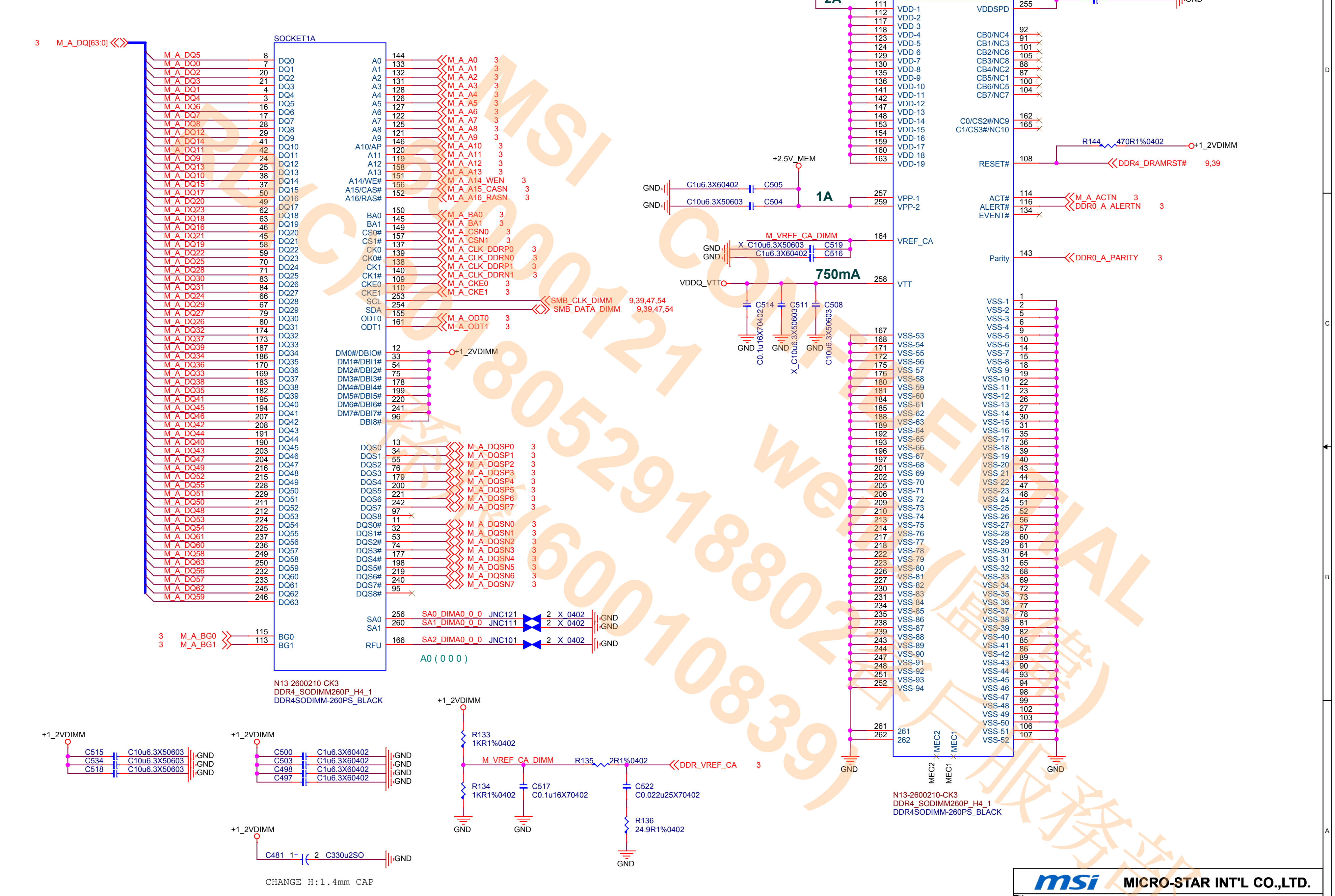
SODIMM_A0 (BOT-Reverse)



MICRO-STAR INT'L CO.,LTD.

Title	DDR4_SODIMM_A0	
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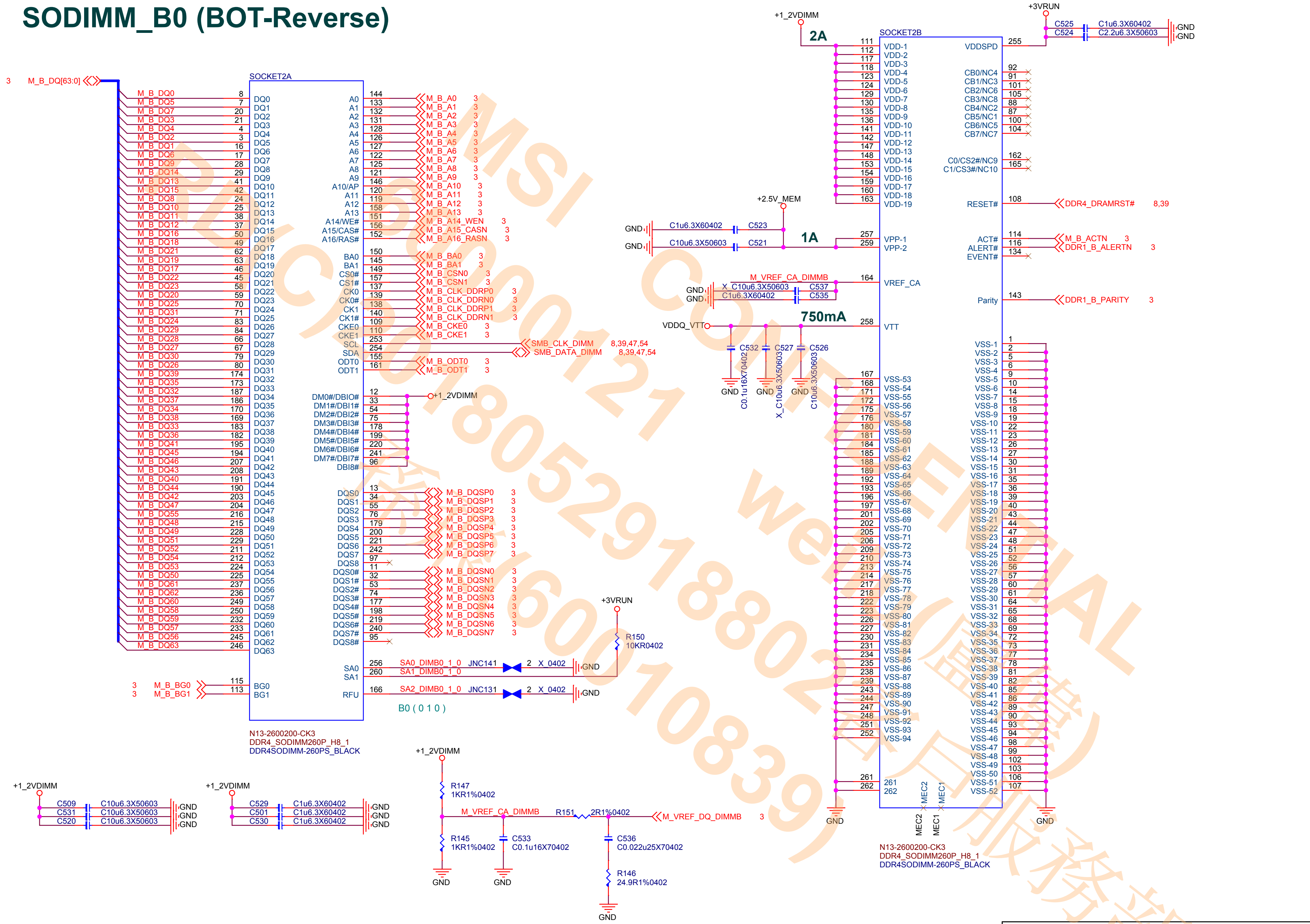
SODIMM_B0 (BOT-Reverse)



MICRO-STAR INT'L CO.,LTD.

Title	DDR4_SODIMM_B0	
Size: Custom	Document Number: MS-16JE	Rev: 1.0
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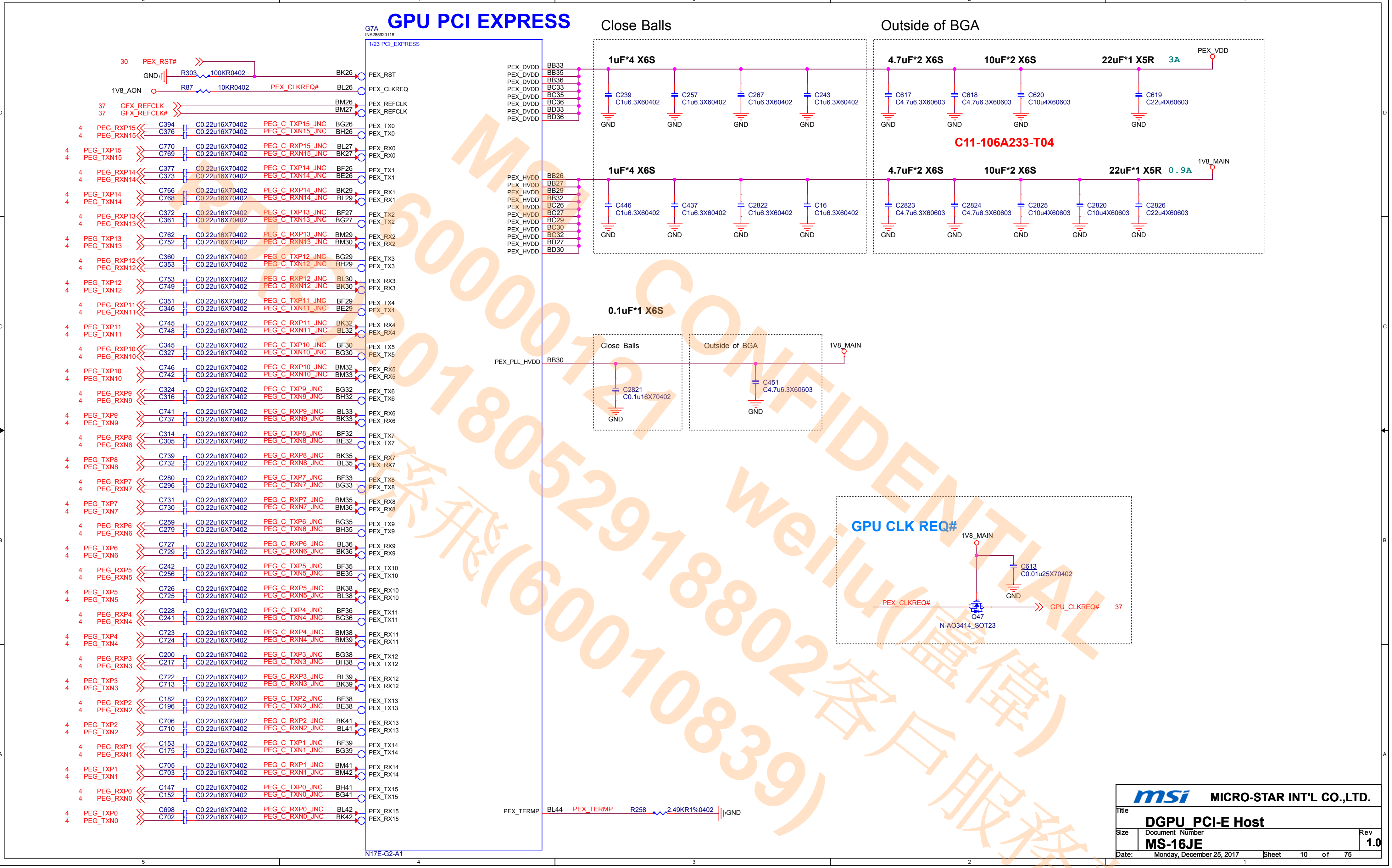
GPU PCI EXPRESS
G7A
1/23 PCI_EXPRESS
N17E-G2-A1
Close Balls
Outside of BGA
PEX_VDD
1uF*4 X6S
4.7uF*2 X6S
10uF*2 X6S
22uF*1 X5R
3A
C239 C1u6.3X60402
C257 C1u6.3X60402
C267 C1u6.3X60402
C243 C1u6.3X60402
C617 C4.7u6.3X60603
C618 C4.7u6.3X60603
C620 C10u4X60603
C619 C22u4X60603
C11-106A233-T04
1V8_MAIN
0.9A
C446 C1u6.3X60402
C437 C1u6.3X60402
C2822 C1u6.3X60402
C16 C1u6.3X60402
C2823 C4.7u6.3X60603
C2824 C4.7u6.3X60603
C2825 C10u4X60603
C2820 C10u4X60603
C2826 C22u4X60603
PEX_DVDD
PEX_HVDD
0.1uF*1 X6S
PEX_PLL_HVDD BB30
C2821 C0.1u16X70402
C451 C4.7u6.3X60603
GND
30 PEX_RST#
R303 100KR0402
R87 10KR0402
1V8_AON
PEX_CLKREQ#
37 GFX_REFCLK
37 GFX_REFCLK#
PEX_RST
PEX_CLKREQ
PEX_REFCLK
PEX_REFCLK#
PEG_RXP15 … PEG_RXP0 / PEG_RXN15 … PEG_RXN0
PEG_TXP15 … PEG_TXP0 / PEG_TXN15 … PEG_TXN0
C0.22u16X70402
PEX_TX0 … PEX_TX15
PEX_RX0 … PEX_RX15
GPU CLK REQ#
C613 C0.01u25X70402
PEX_CLKREQ#
Q47
N-AO3414_SOT23
GPU_CLKREQ# 37
PEX_TERMP BL44
R258 2.49KR1%0402
MICRO-STAR INT'L CO.,LTD.
Title
DGPU_PCI-E Host
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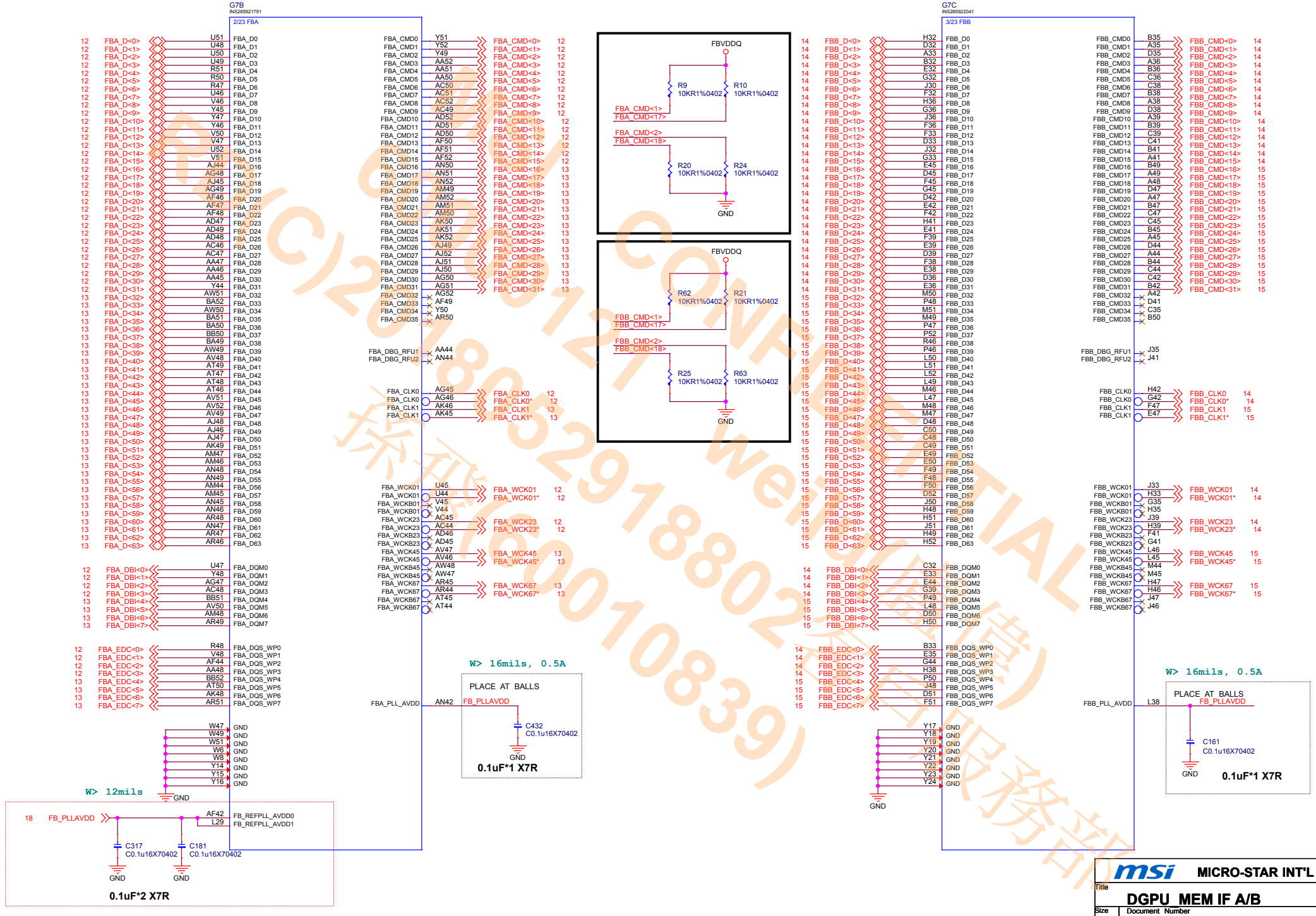
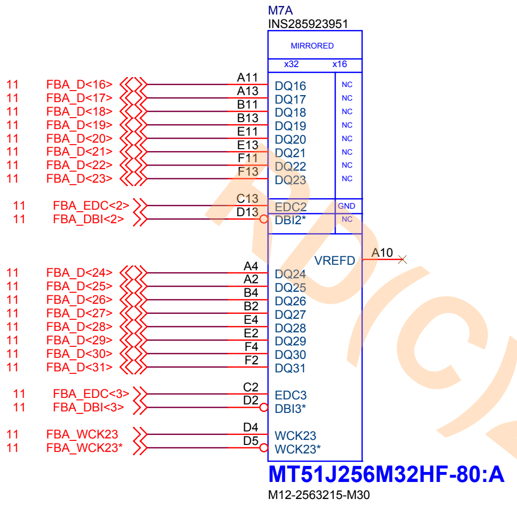
GPU Frame Buffer Partition A/B

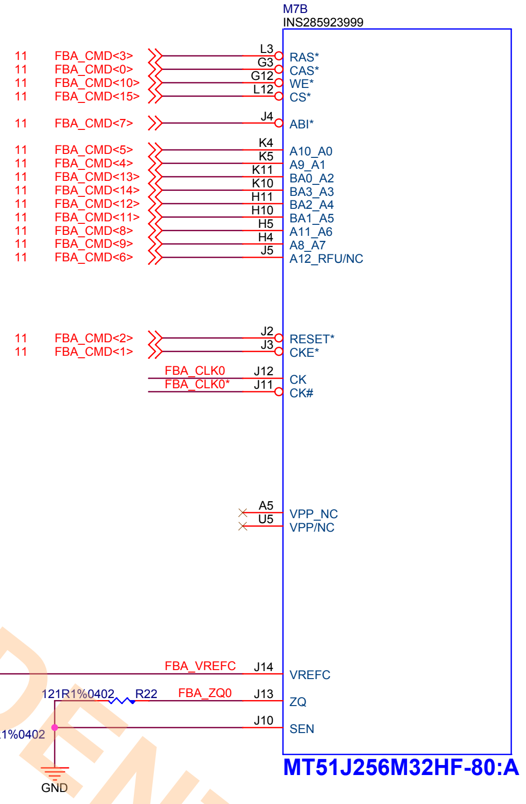


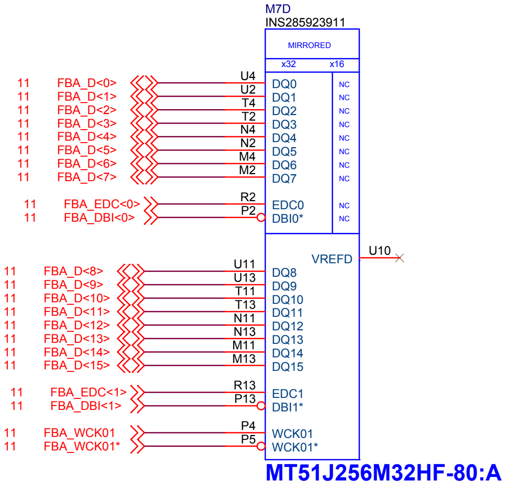
DGPU_GDDR5 FrameBuffer A0

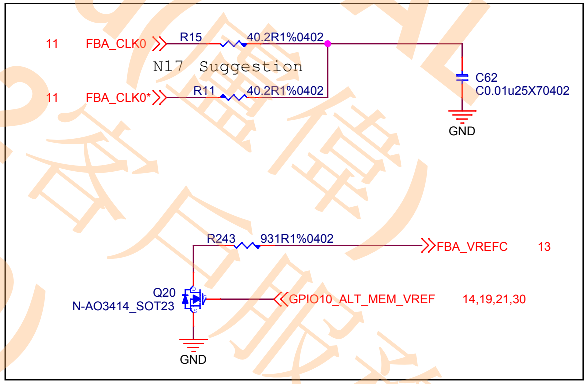


GDD5 Command Mapping GB4-256

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







MICRO-STAR INT'L CO.,LTD.

Title: DGPU_GDDR5 FrameBuffer A0

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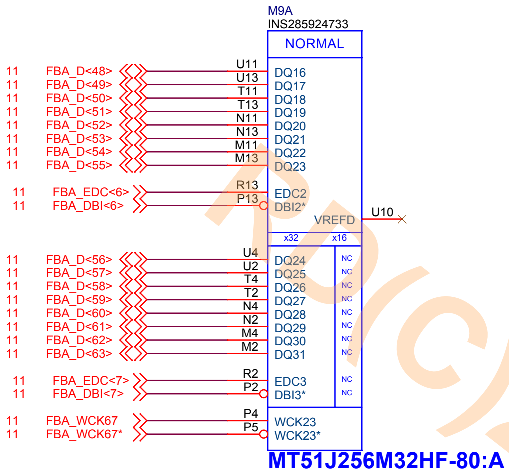
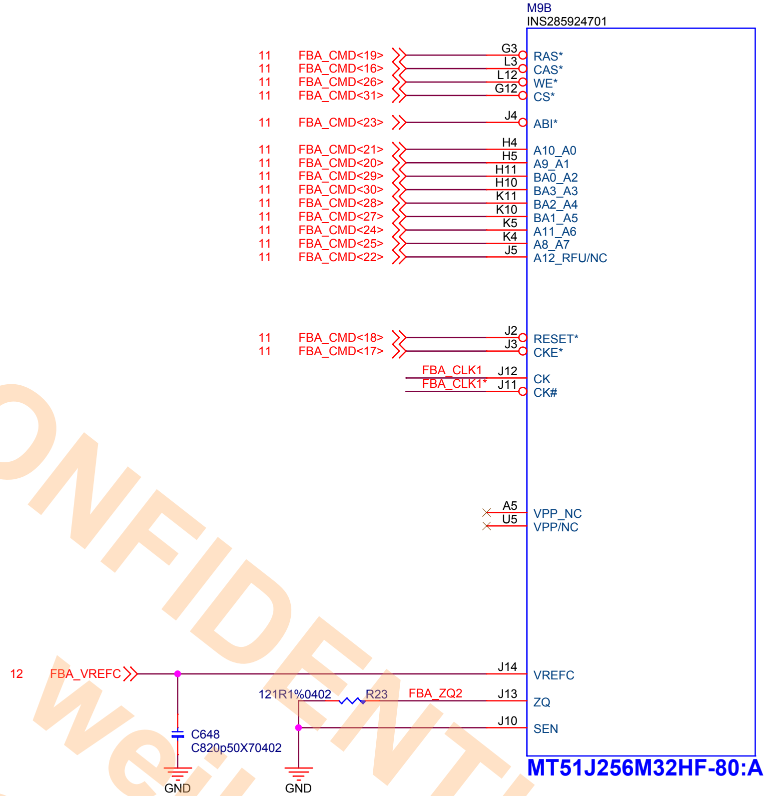
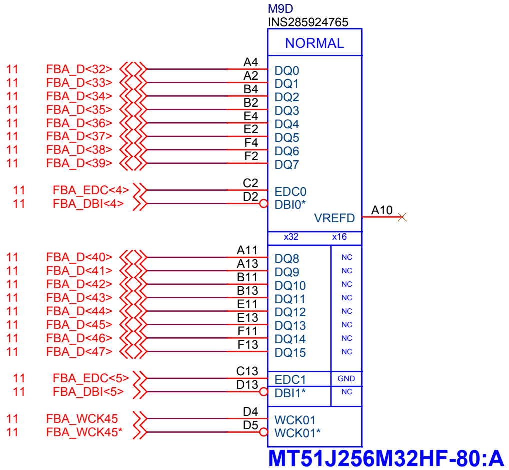
DGPU_GDDR5 FrameBuffer A1

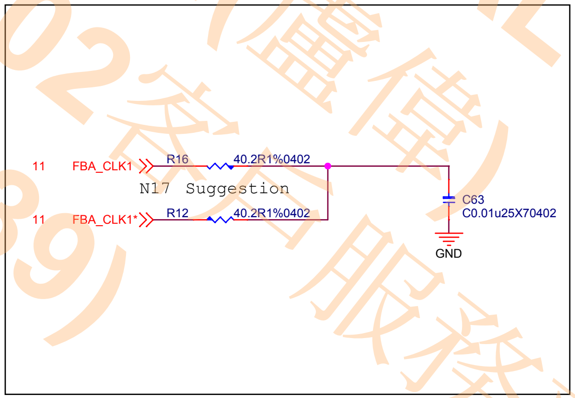


GDD5 Command Mapping GB4-256

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







MICRO-STAR INT'L CO.,LTD.

Title: DGPU_GDDR5 FrameBuffer A1

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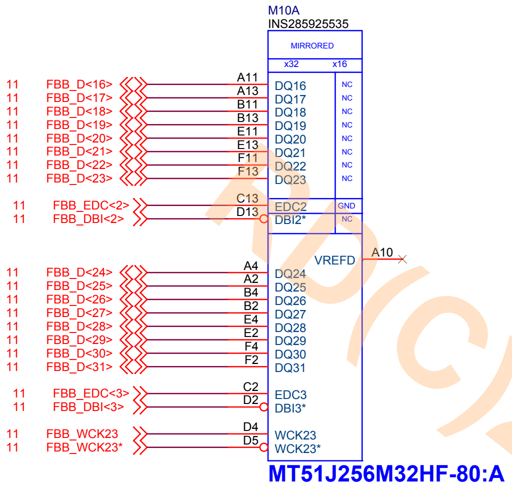
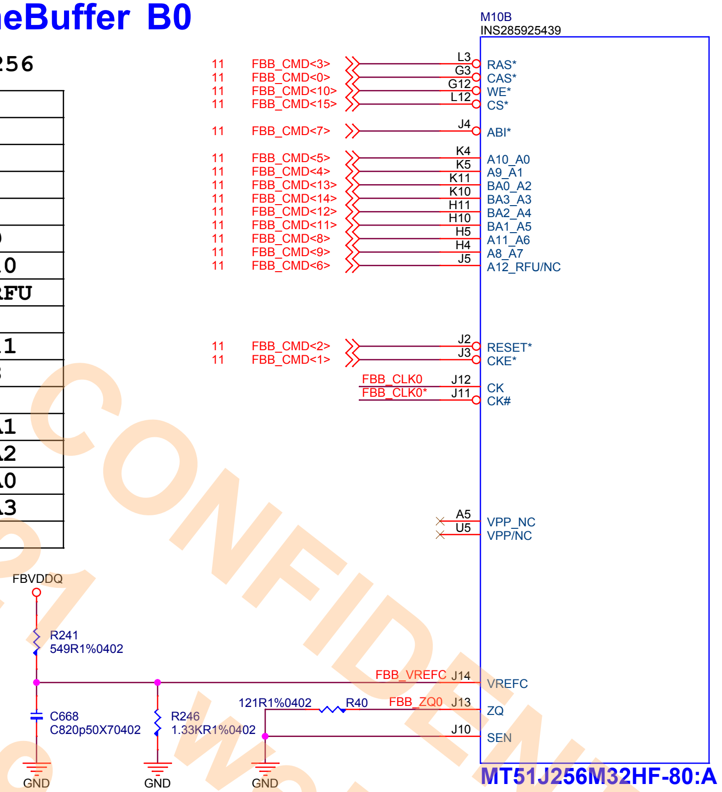
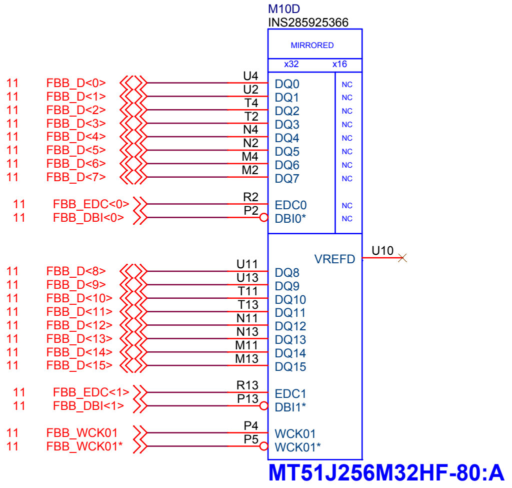
DGPU_GDDR5 FrameBuffer B0

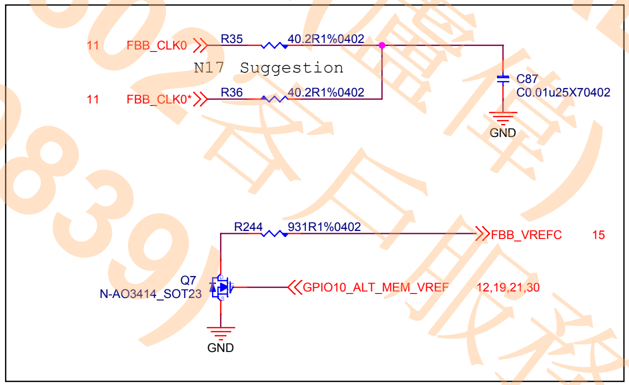


GDD5 Command Mapping GB4-256

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







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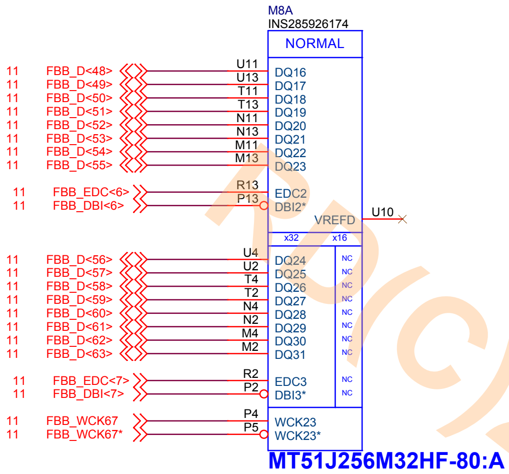
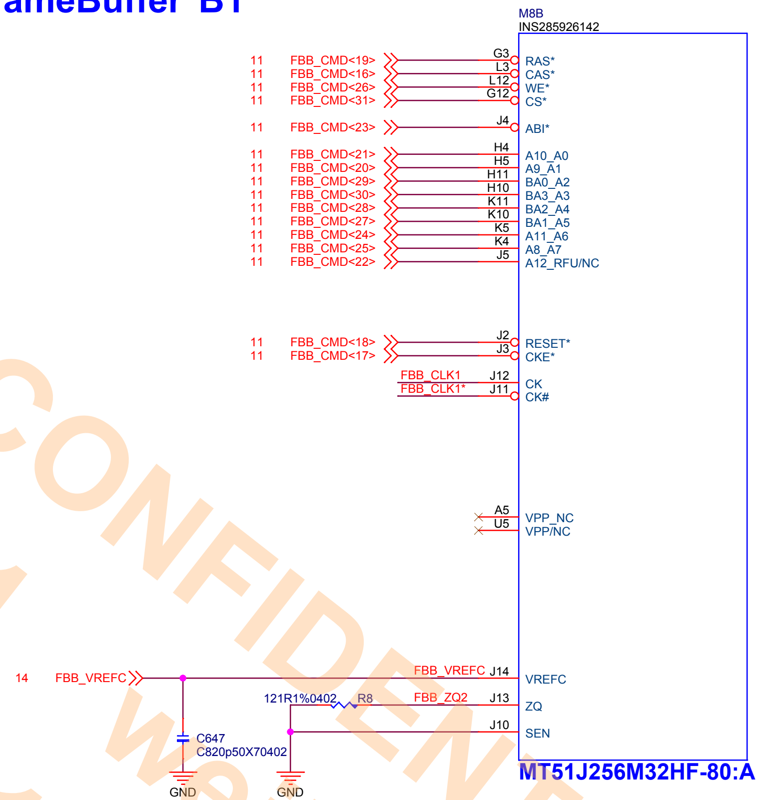
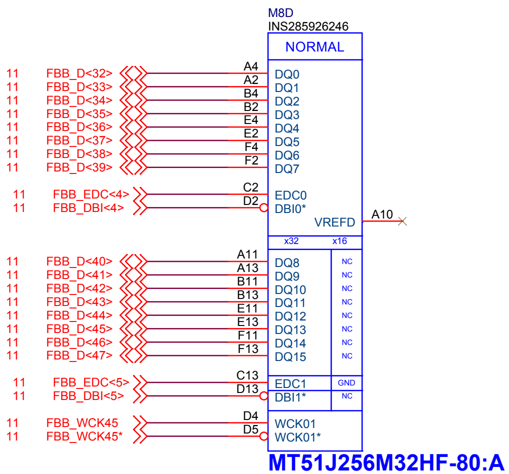
DGPU_GDDR5 FrameBuffer B1

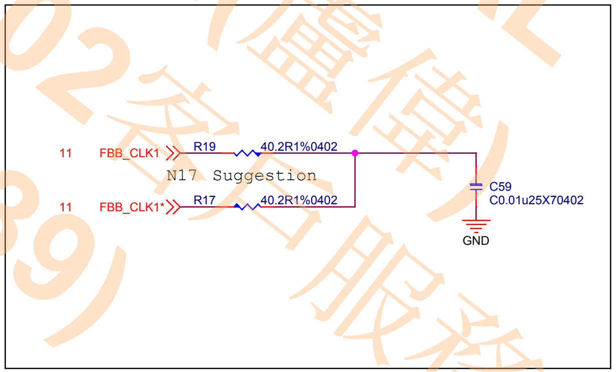


GDD5 Command Mapping GB4-256

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







MICRO-STAR INT'L CO.,LTD.

Title	DGPU_GDDR5 FrameBuffer B1	
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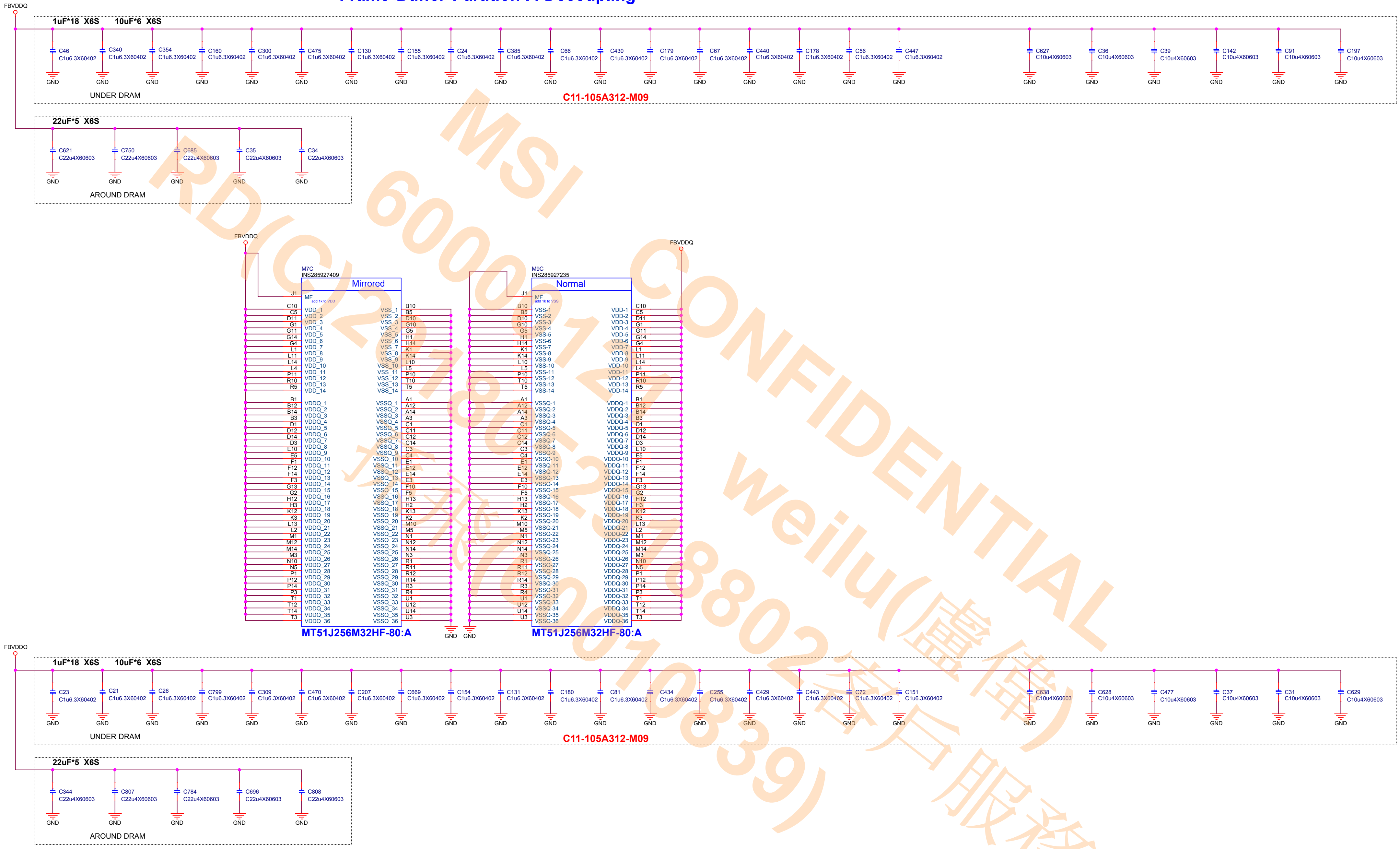
Frame Buffer Partition A Decoupling



MICRO-STAR INT'L CO.,LTD.

Title: DGPU_GDDR5 FB-A_DECOUPLING

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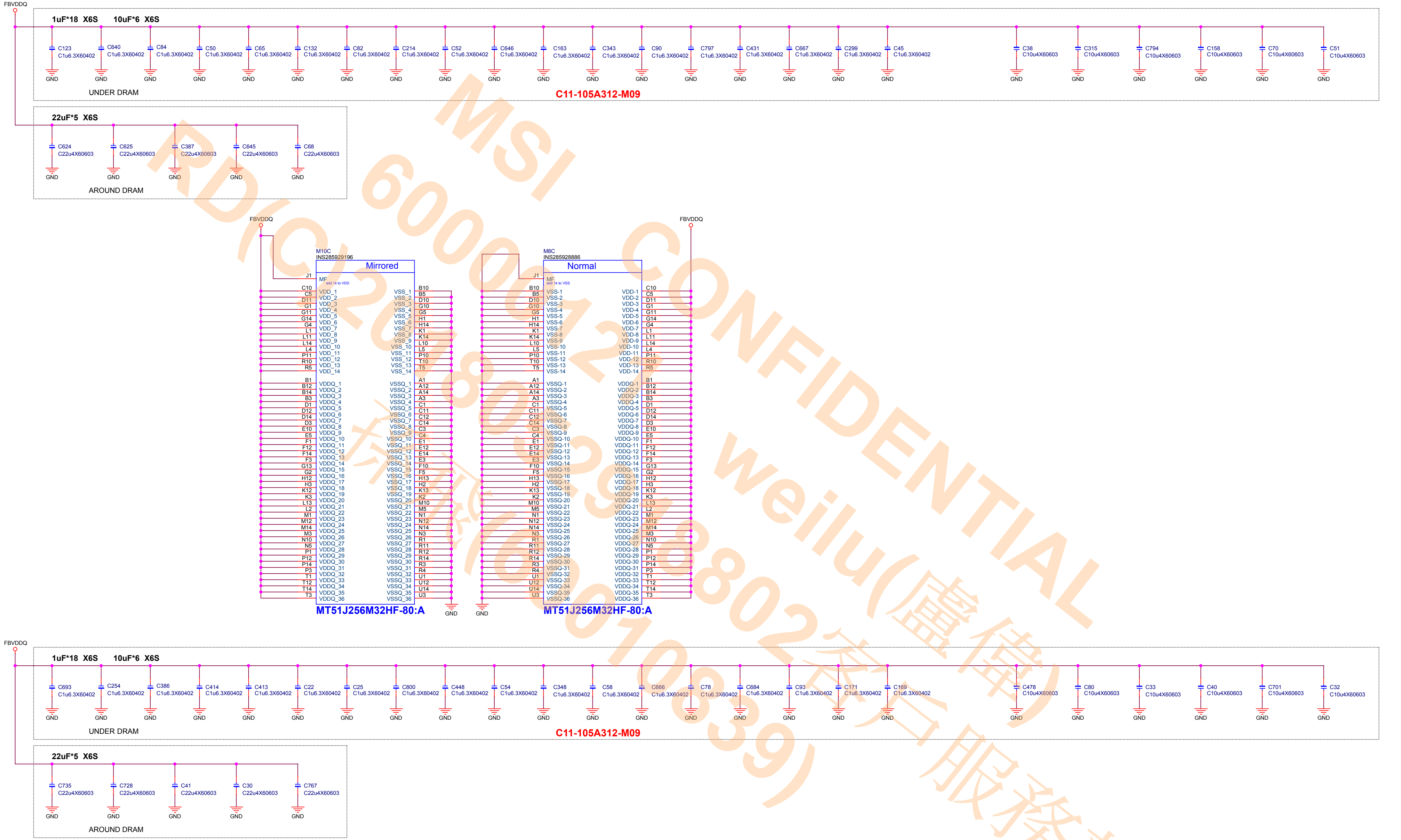
Frame Buffer Partition B Decoupling



MICRO-STAR INT'L CO.,LTD.

Title	DGPU_GDDR5 FB-B_DECOUPLING	
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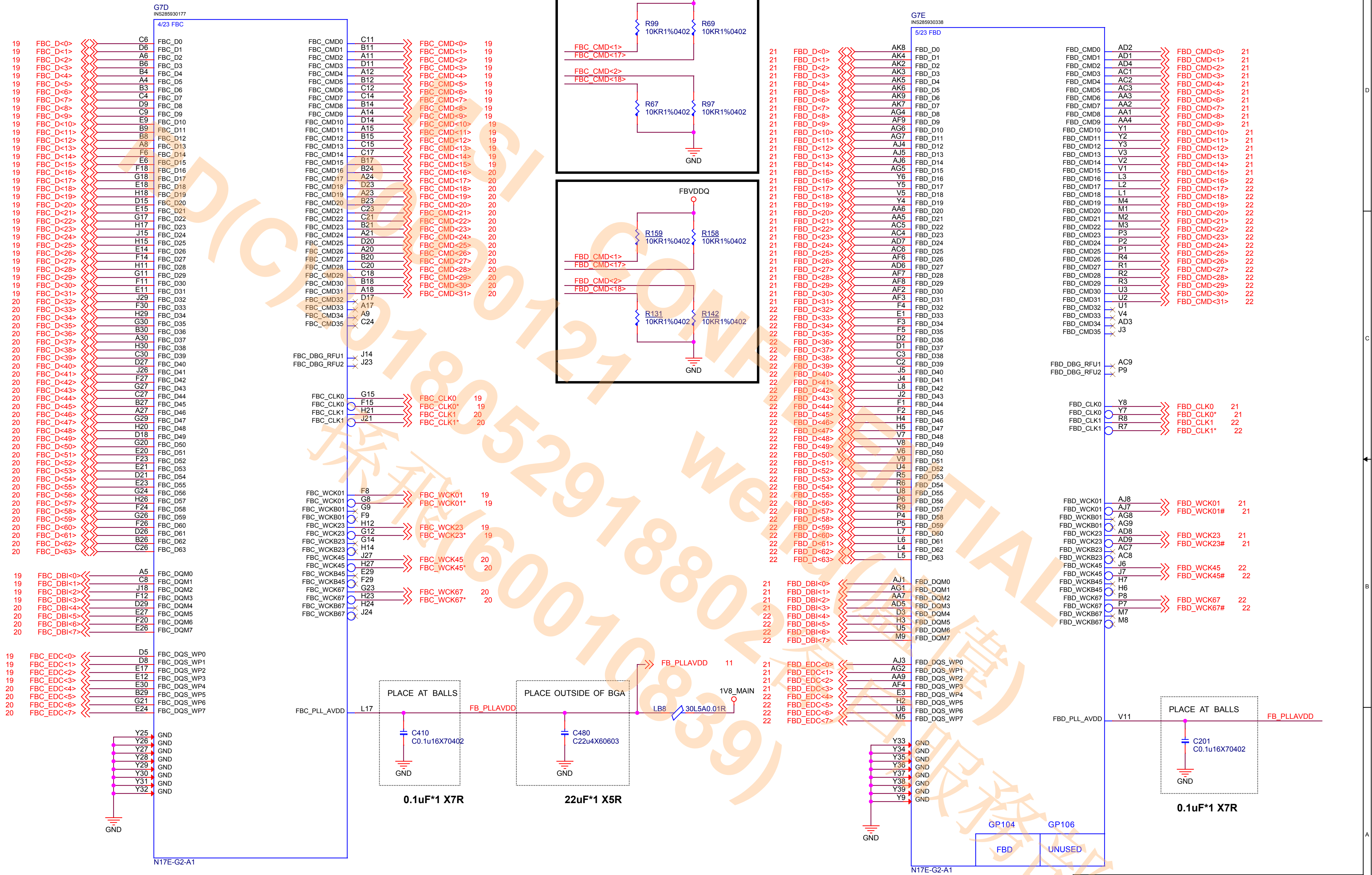
GPU Frame Buffer Partition C/D



MICRO-STAR INT'L CO.,LTD.

Title: DGPU_MEM IF C/D

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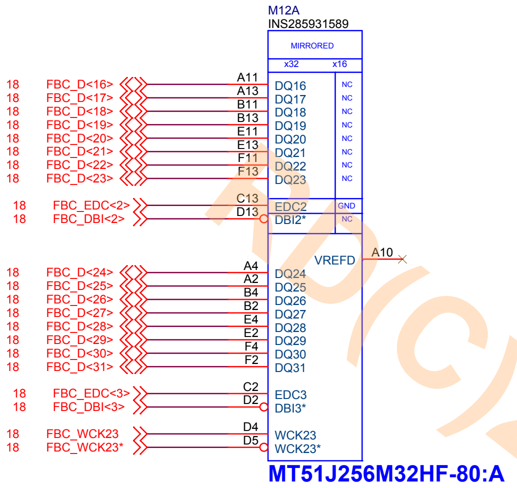
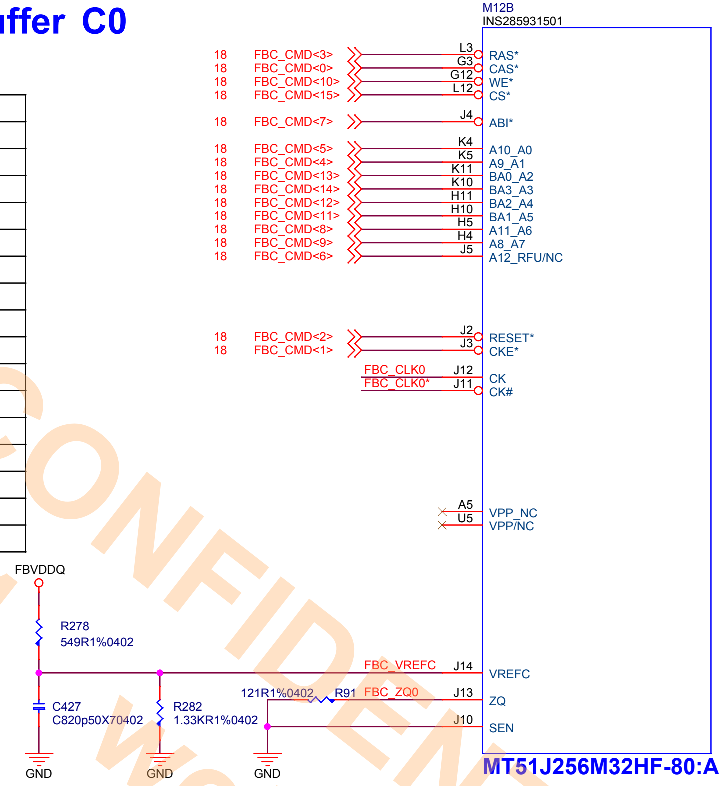
DGPU_GDDR5 FrameBuffer C0

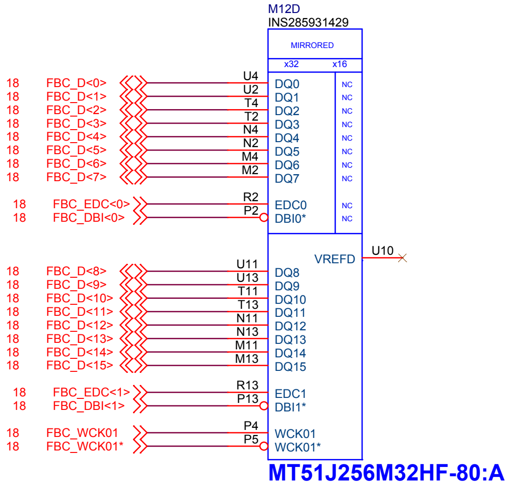


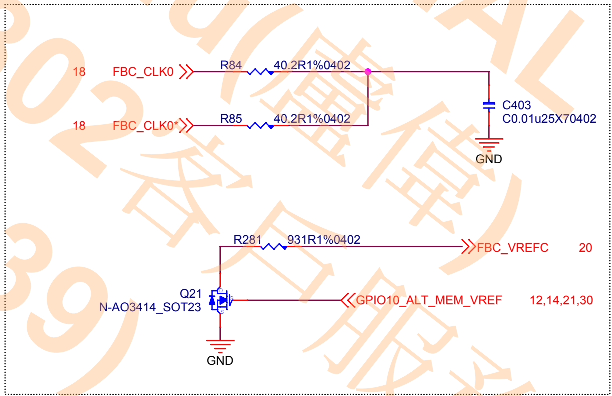
GDD5 Command Mapping GB4-256

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



A12_RFU





MICRO-STAR INT'L CO.,LTD.

Title	DGPU_GDDR5 FrameBuffer C	
Size	Document Number MS-16JE	Rev 1.0
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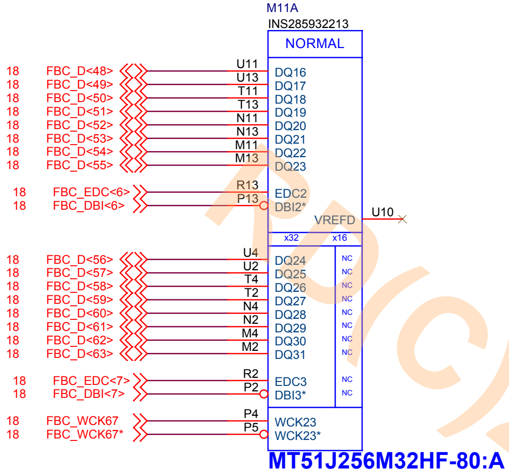
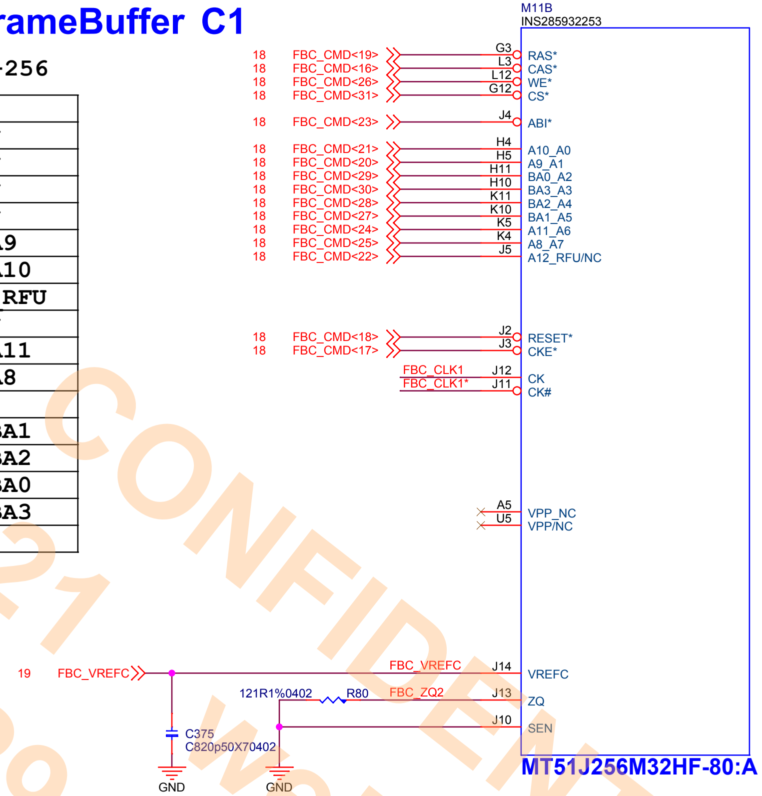
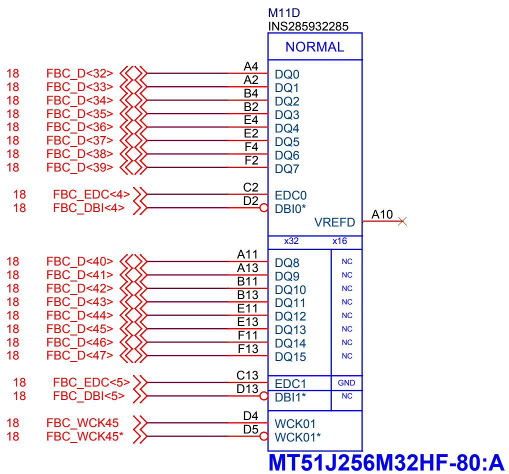
DGPU_GDDR5 FrameBuffer C1

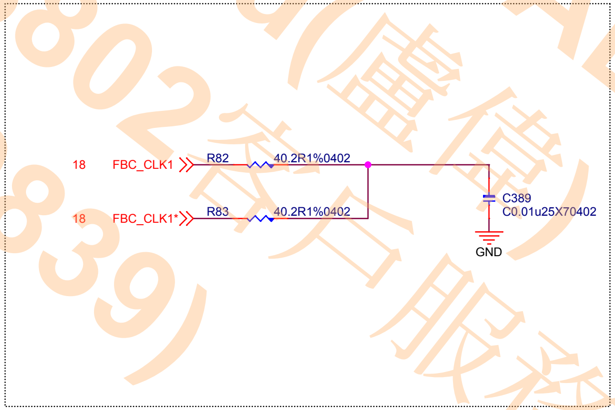
GDD5 Command Mapping GB4-256

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









MICRO-STAR INT'L CO.,LTD.

Title: DGPU_GDDR5 FrameBuffer C

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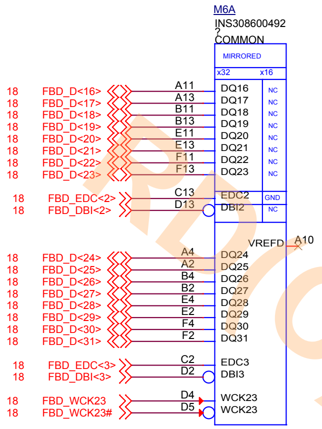
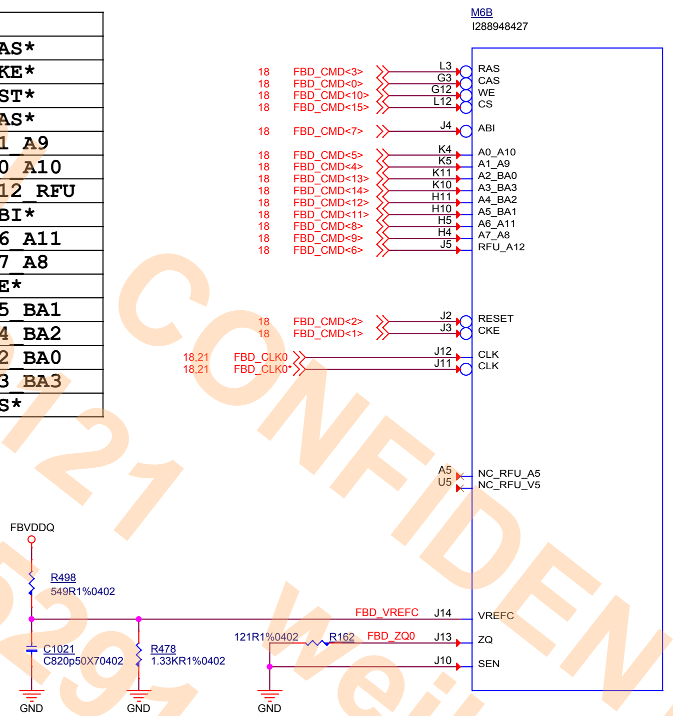
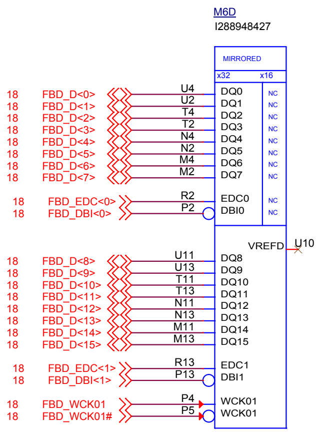
DGPU_GDDR5 FrameBuffer D0

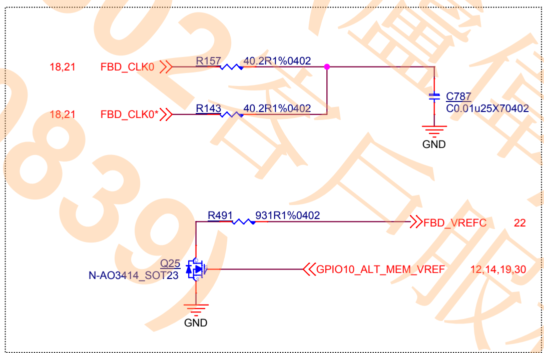


GDD5 Command Mapping GB4-256

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







msi	MICRO-STAR INT'L CO.,LTD.	
Title	DGPU_GDDR5 FrameBuffer D0	
Size	Document Number MS-16JE	Rev 1.0
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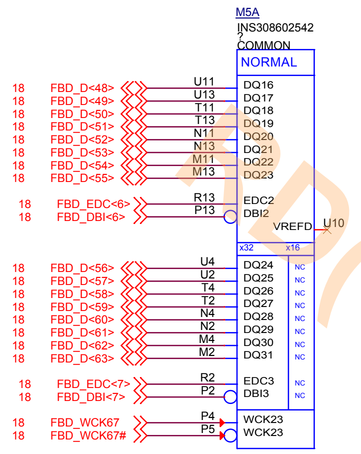
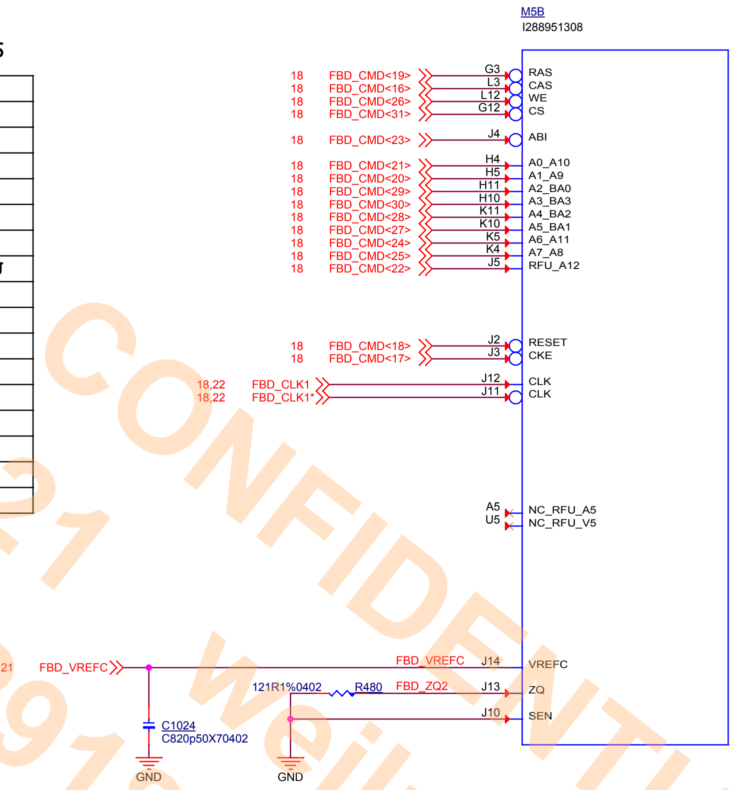
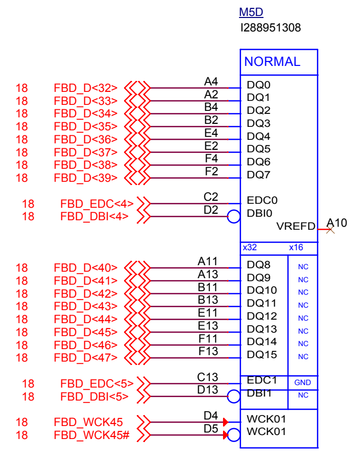
DGPU_GDDR5 FrameBuffer D1

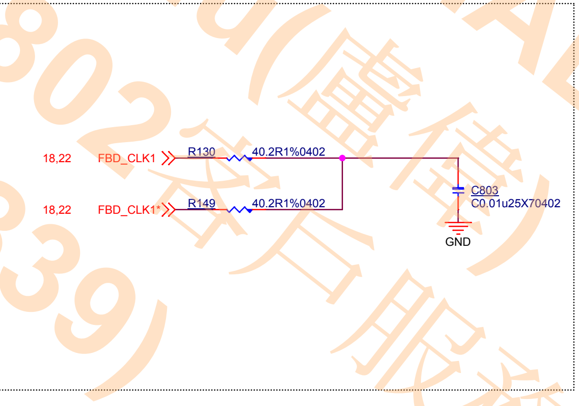


GDD5 Command Mapping GB4-256

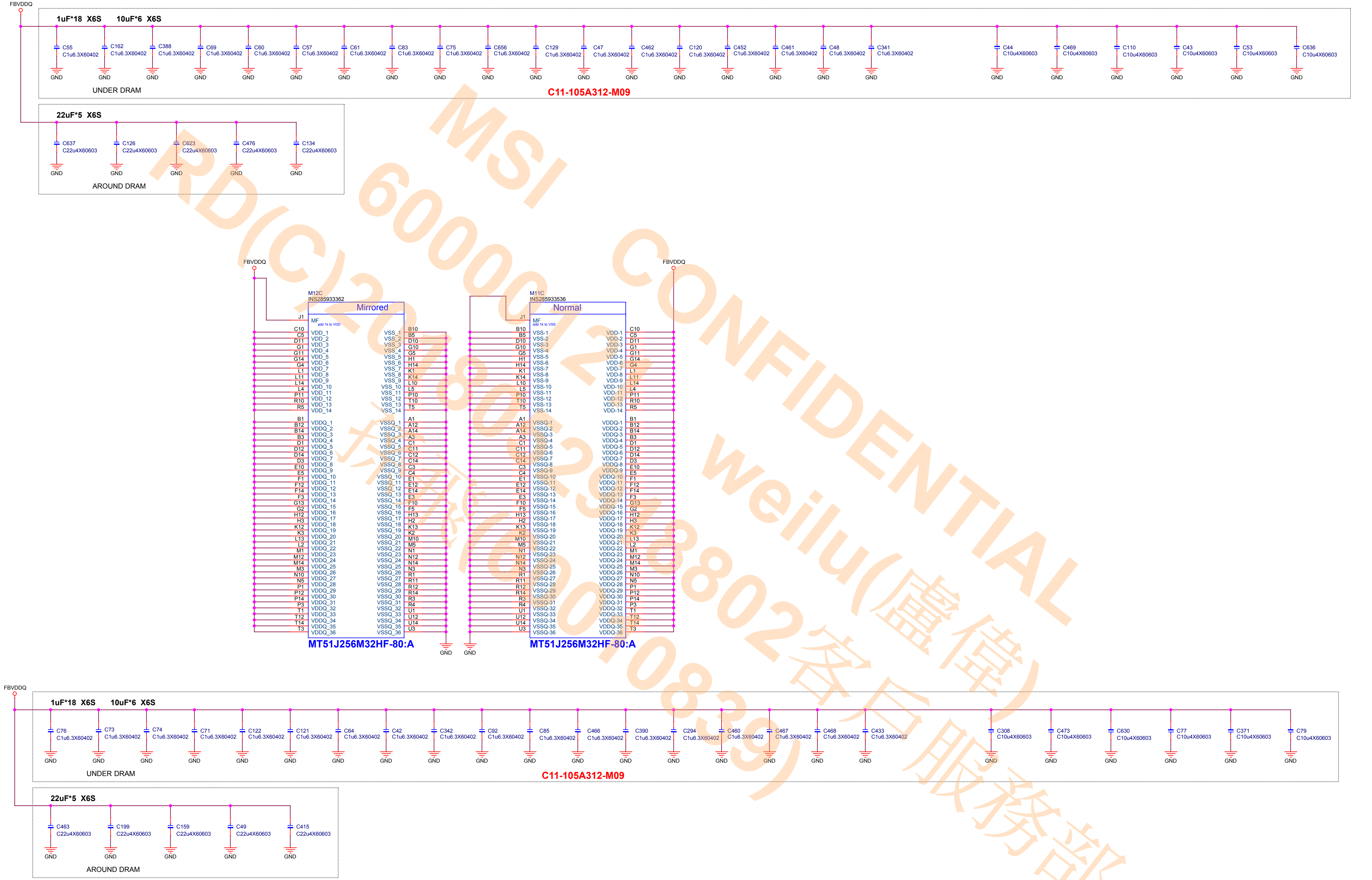
DQ[31:0]	DQ[63:32]	
CMD0	CMD16	CAS*
CMD1	CMD17	CKE*
CMD2	CMD18	RST*
CMD3	CMD19	RAS*
CMD4	CMD20	A1_A9
CMD5	CMD21	A0_A10
CMD6	CMD22	A12_RFU
CMD7	CMD23	ABI*
CMD8	CMD24	A6_A11
CMD9	CMD25	A7_A8
CMD10	CMD26	WE*
CMD11	CMD27	A5_BA1
CMD12	CMD28	A4_BA2
CMD13	CMD29	A2_BA0
CMD14	CMD30	A3_BA3
CMD15	CMD31	CS*







Frame Buffer Partition C Decoupling



MICRO-STAR INT'L CO.,LTD.

Title: DGPU_GDDR5 FB-C_DECOUPLING

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Frame Buffer Partition D Decoupling

MICRO-STAR INT'L CO.,LTD.

Title: DGPU_GDDR5 FB-D_DECOUPLING

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GPU DECOUPLING A

msi	MICRO-STAR INT'L CO.,LTD.	
Title	DGPU_GPU DECOUPLING A	
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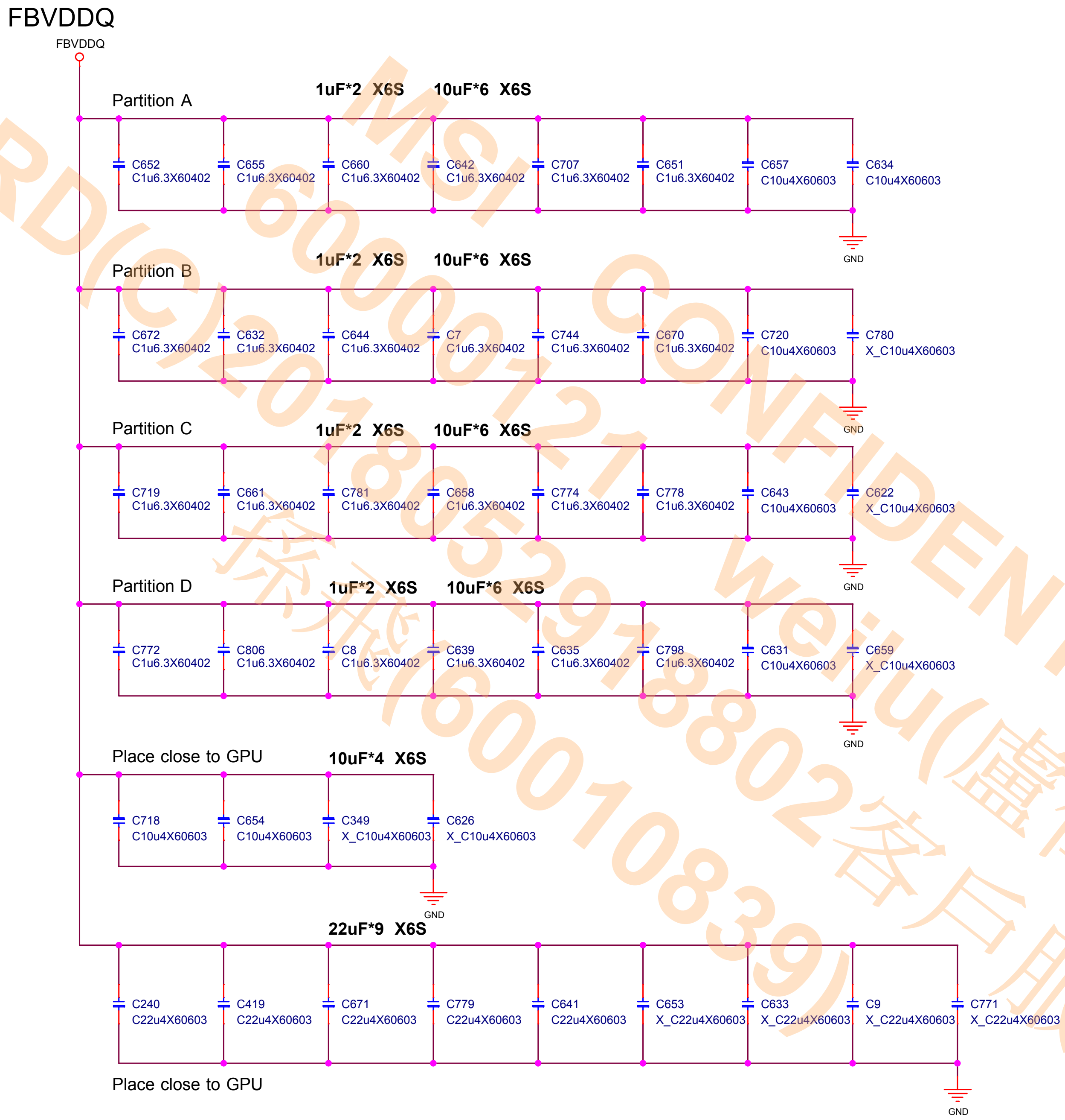
GPU DECOUPLING B



msi	MICRO-STAR INT'L CO.,LTD.	
Title	DGPU_GPU DECOUPLING B	
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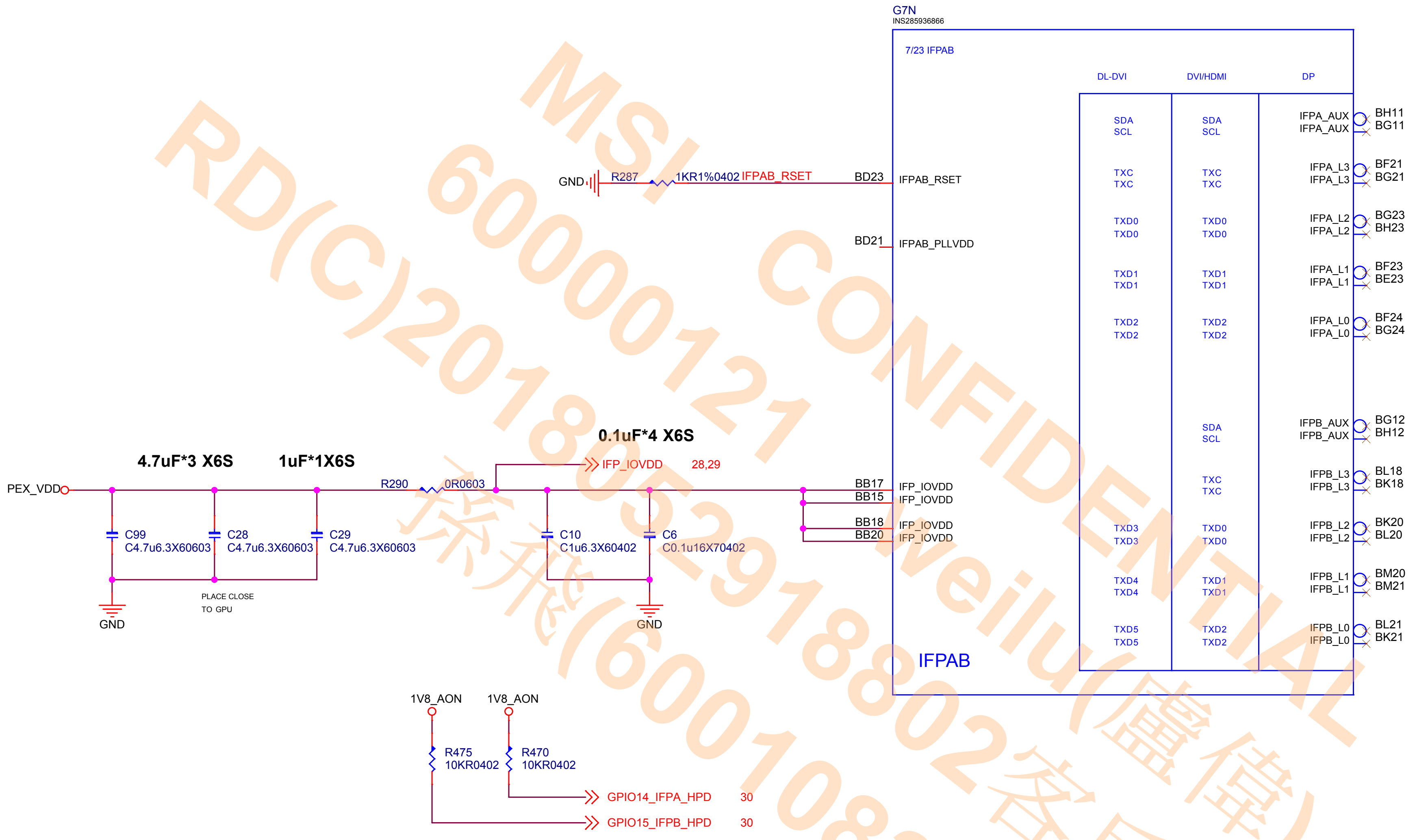
IFPCD



MICRO-STAR INT'L CO.,LTD.

Title: DGPU_DACA,Display IF

Size | Document Number: MS-16JE | Rev: 1.0

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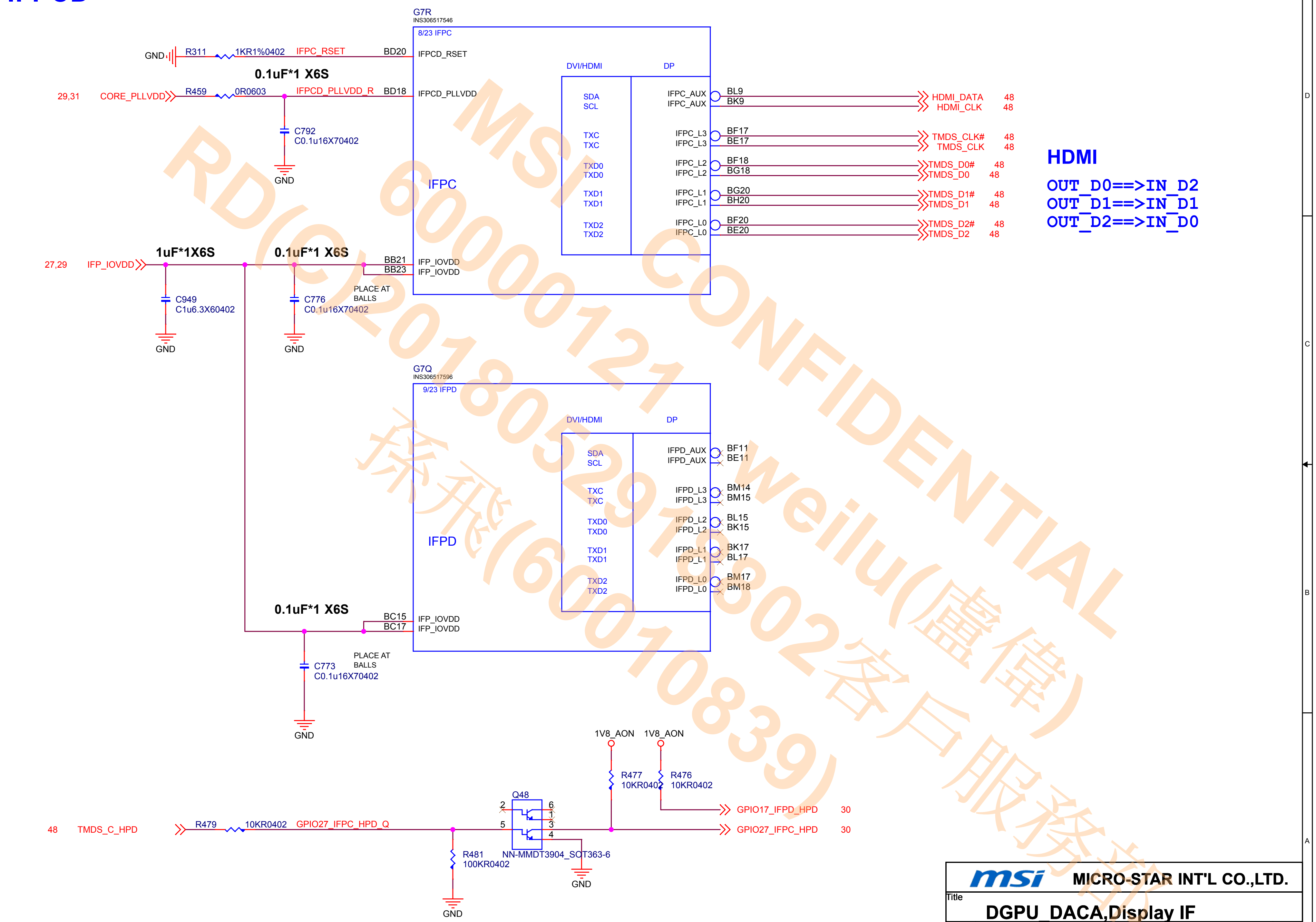
IFPCD



MICRO-STAR INT'L CO.,LTD.

Title: DGPU_DACA,Display IF

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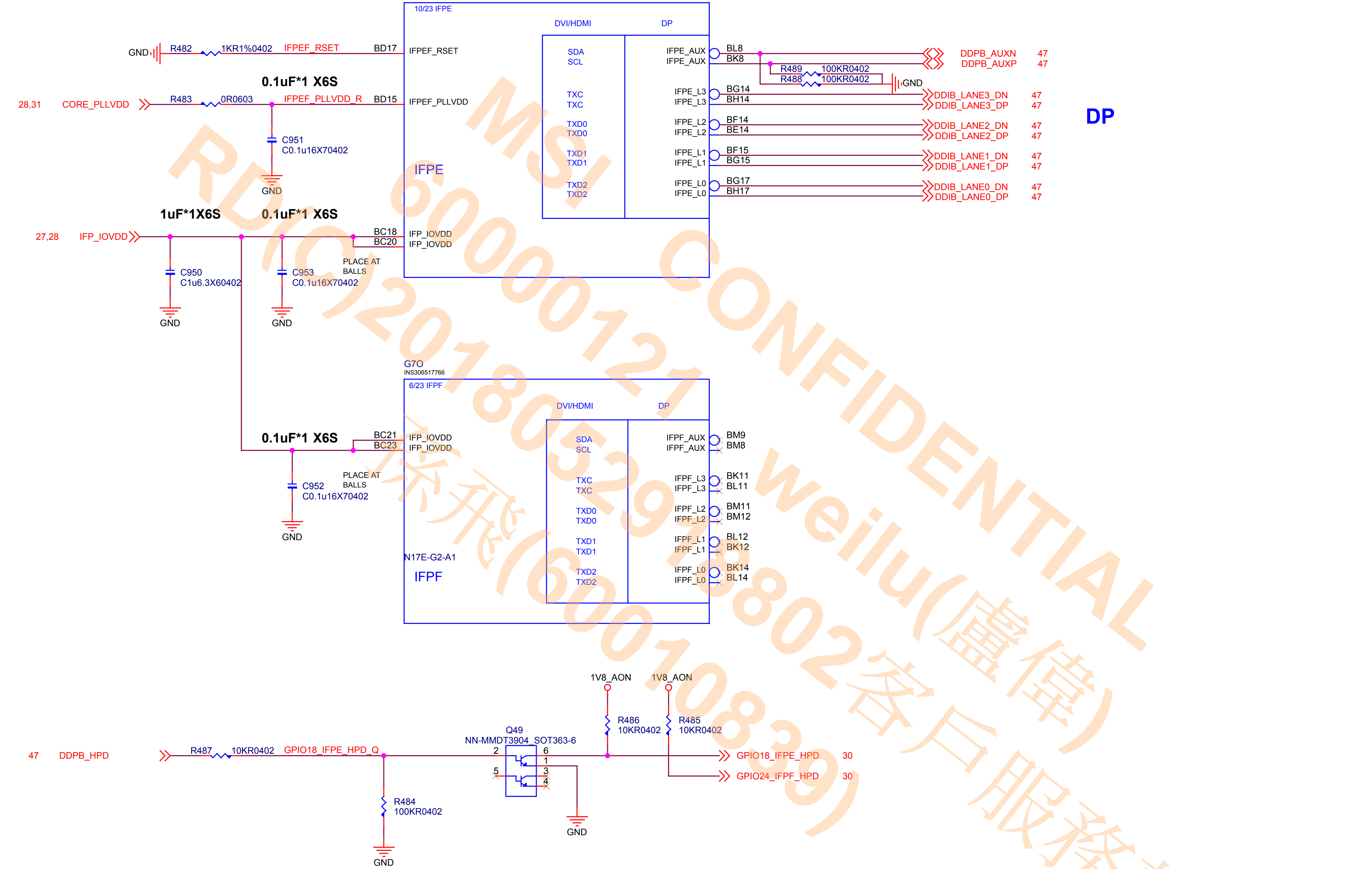
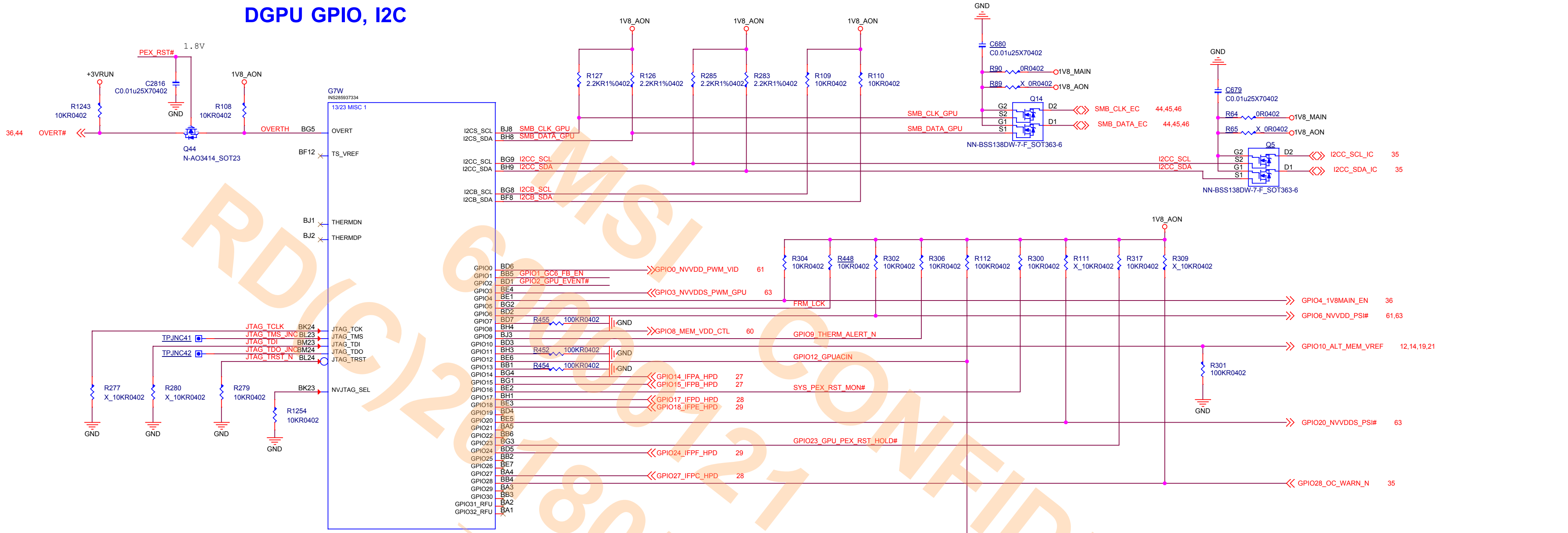
IFPEF

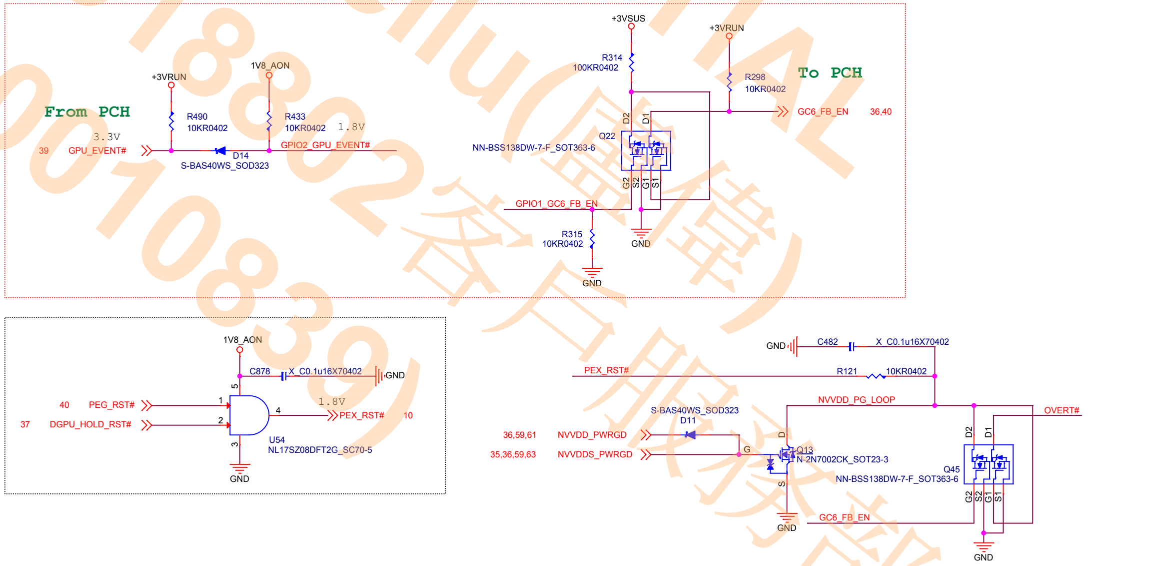


msi	MICRO-STAR INT'L CO.,LTD.
Title	DGPU_IFPEF
Size	Document Number: MS-16JE — Rev 1.0
Date: Monday, December 25, 2017	Sheet 29 of 75

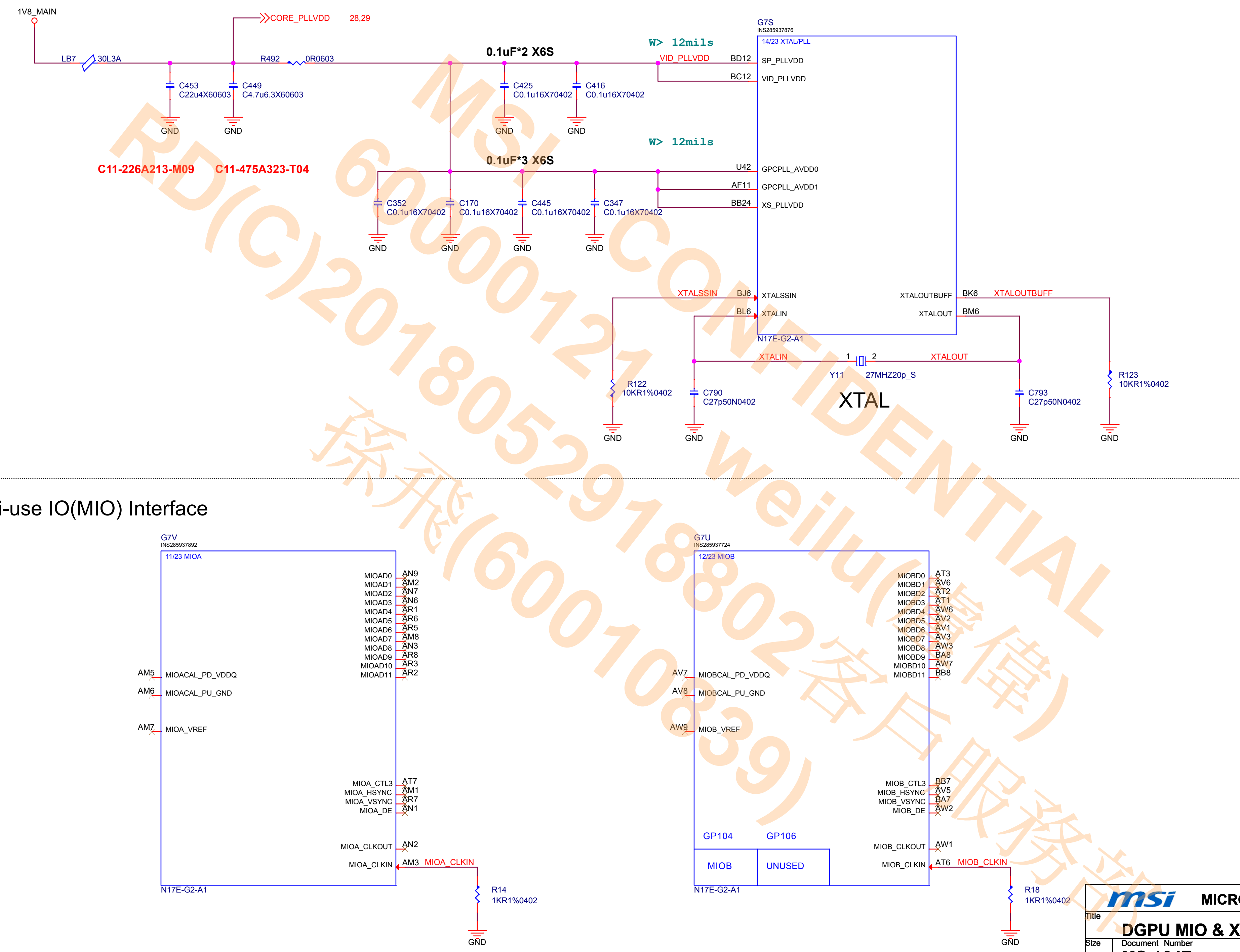
DGPU GPIO, I2C



Pin Name	Normal function	I/O	Functional Description	Recommended Default Pull-up or Pull-down
GPIO0	PWR_VID	O	PWM Output to Control NVVD	0 to 1V8 PWM output
GPIO1	GC6_FB_EN	O	FB Enable for GC6 2.1	10K pull-down
GPIO2	GPU_EVENT#	I	GPU wake signal for GC6 2.1	10K pull-up to 1V8 _AON
GPIO3	**NVVDDS_PWM**	O	PWM output to control the NVVDDS power supply	0 to 1V8 PWM output
GPIO4	**1V8_MAIN_EN**	O	GPU POWER Sequencing for GC6 2.1	10K pull-up to 1V8 _AON
GPIO5	**FRM_LCK**	I	Active low Fram Lock	10K 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 Brightness 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	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	10K pull-up to 1V8_AON
GPIO15	**HPD_B**	I	Hot Plug Detect for IFPB	10K pull-up to 1V8_AON
GPIO16	SYS_PEX_RST_MON#	I	System side PCI reset Monitor	10K pull-up to 1V8_AON
GPIO17	HPD_D	I	Hot Plug Detect for IFPD	10K pull-up to 1V8_AON
GPIO18	HPD_E	I	Hot Plug Detect for IFPE	10K pull-up to 1V8_AON
GPIO19	3DVision	O	3D Vision L/R signal	100K pull-down
GPIO20	**NVVDDS_PSI**	O	Phase shedding	10K pull-up to 1V8 _AON
GPIO21	SLI_RASTER_SYNC	I	SLI Raster Sync	100K pull-down
GPIO22	SLI_SWAP_DRY	I	SLI Swap Ready	
GPIO23	GPU_PEX_RST_HOLD	O	GPU PCIE self-reset control	10K pull-up to 1V8 _AON
GPIO24	HPD_F	I	Hot Plug Detect for IFPDF	10K pull-up to 1V8_AON
GPIO25	RESERVED			
GPIO26	RESERVED			
GPIO27	HPD_C	I	Hot Plug Detect for IFPC	10K pull-up to 1V8_AON
GPIO28	OC_WARN	I	Over current throttling	10K pull-up to 1V8 _AON
GPIO29	EDPc_OUTPUT_CAP	I	Input from power supply	0 to 1V8
GPIO30	RESERVED			



DGPU MIO & XTAL



MICRO-STAR INT'L CO.,LTD.

Title: DGPU MIO & XTAL

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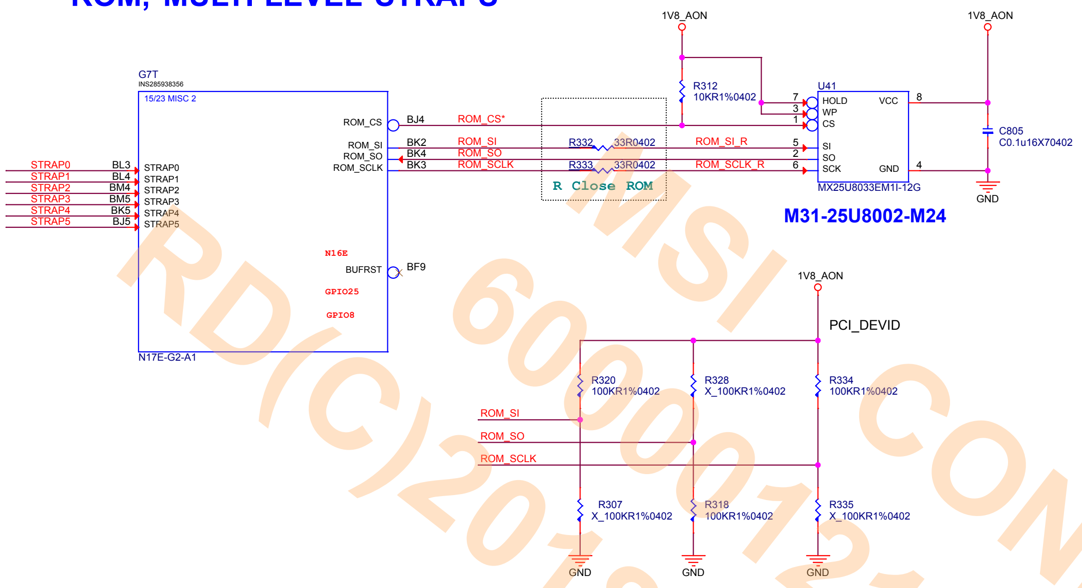
ROM, MULTI-LEVEL STRAPS



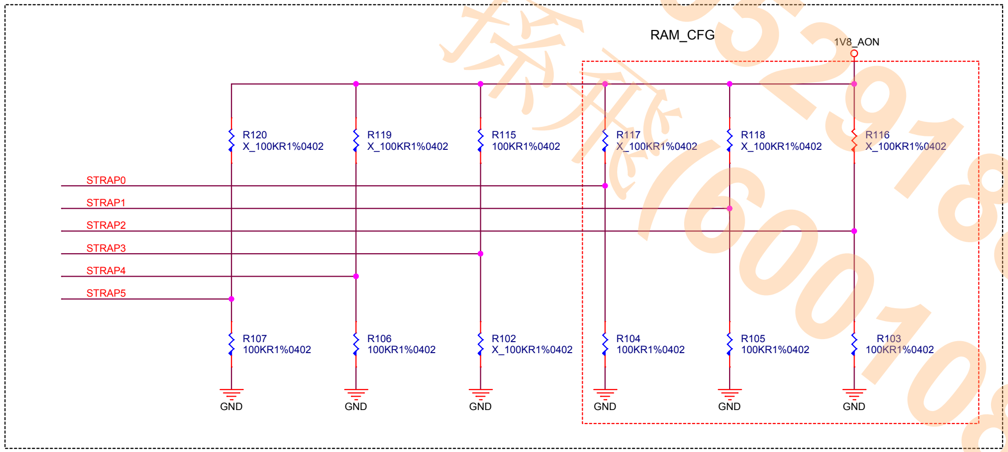
ROM_SO	ROM_SI	ROM_SCLK	SOR_EXPOSED3	SOR_EXPOSED2	SOR_EXPOSED1	SOR_EXPOSED0
L	L	L	1:ENABLE	1:ENABLE	1:ENABLE	1:ENABLE
L	L	H	1:ENABLE	1:ENABLE	1:ENABLE	0:DISABLE
L	H	L	1:ENABLE	1:ENABLE	0:DISABLE	1:ENABLE
L	H	H	1:ENABLE	1:ENABLE	0:DISABLE	0:DISABLE
H	H	H	1:ENABLE	0:DISABLE	0:DISABLE	0:DISABLE
H	H	M	0:DISABLE	0:DISABLE	0:DISABLE	0:DISABLE

STRAP 5	STRAP 4	STRAP 3	
L	L	L	Optimus
L	L	H	Discrete
H	L	H	Discrete with Gsync

STRAP 2	STRAP 1	STRAP 0			
L	L	L	0x0	Samsung K4G80325FB-HC25	256M*32
L	L	H	0x1	Microm MT51J2256M32HF-80:A	
L	H	L	0x2	Hynix H5GC8H24MJR-R4C	
H	H	L	0x6	Hynix H5GQ4H24AJR-R4C	
H	H	H	0x7	Samsung K4G41325FE-HC25	128M*32

V_BOT1 — Samsung 256Mx32bit
M12-8032535-S02
X_K4G80325FB-HC25

V_BOT2 — Samsung 128Mx32bit
M12-41325D5-S02
X_K4G41325FE-HC25



N17E-G2 (GTX1070)
N17E_G2
B03-0N17E05-N08
X_N17E-G2-A1

N17E-G1 (GTX1060)
N17E_G1
B03-0N17E25-N08
X_N17E-G1-A1

MICRO-STAR INT'L CO.,LTD.
Title: DGPU_ROM,HW Straps
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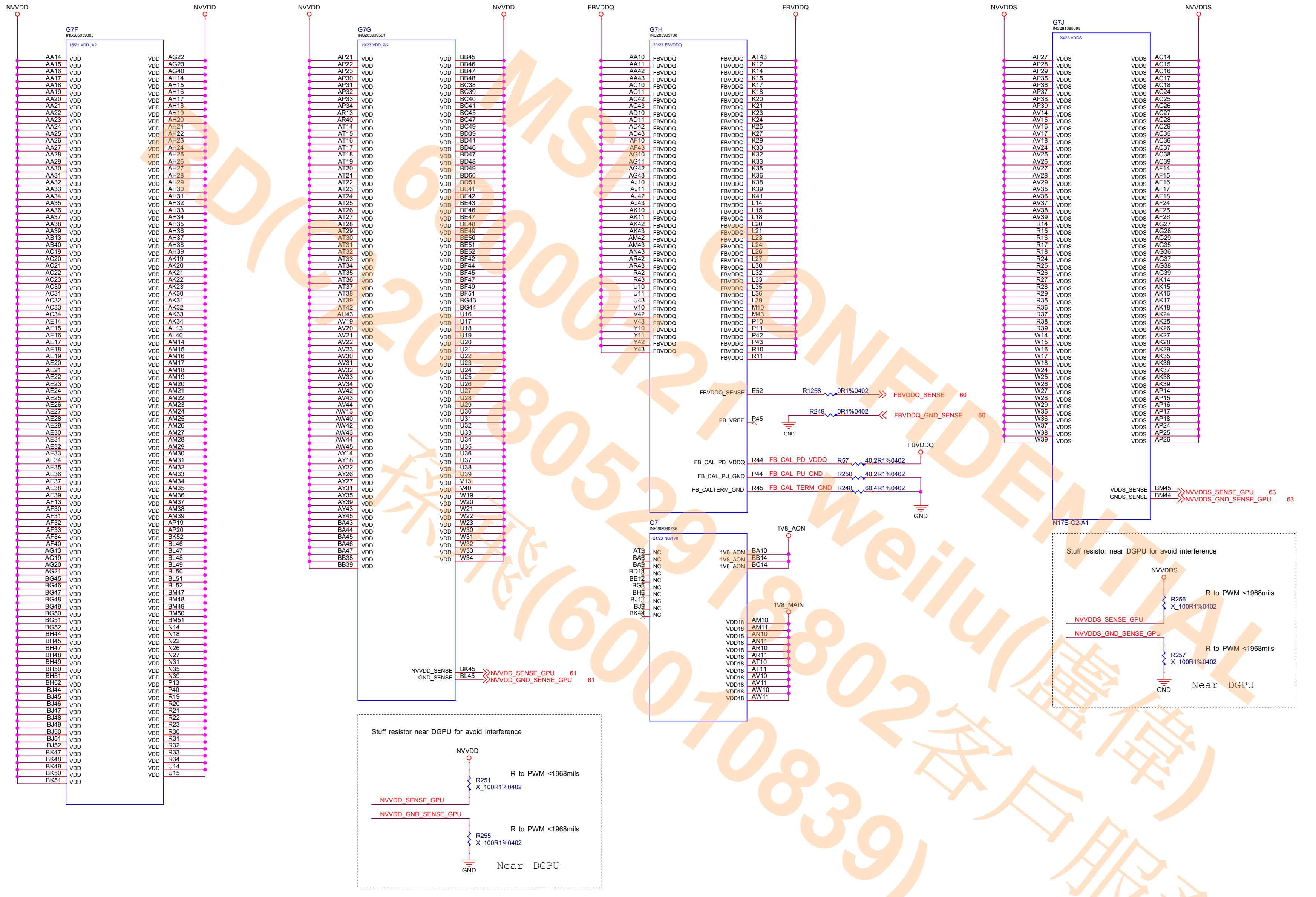
GPU NVVDD, FBVDDQ



MICRO-STAR INT'L CO.,LTD.

Title	DGPU NVVDD, FBVDDQ	
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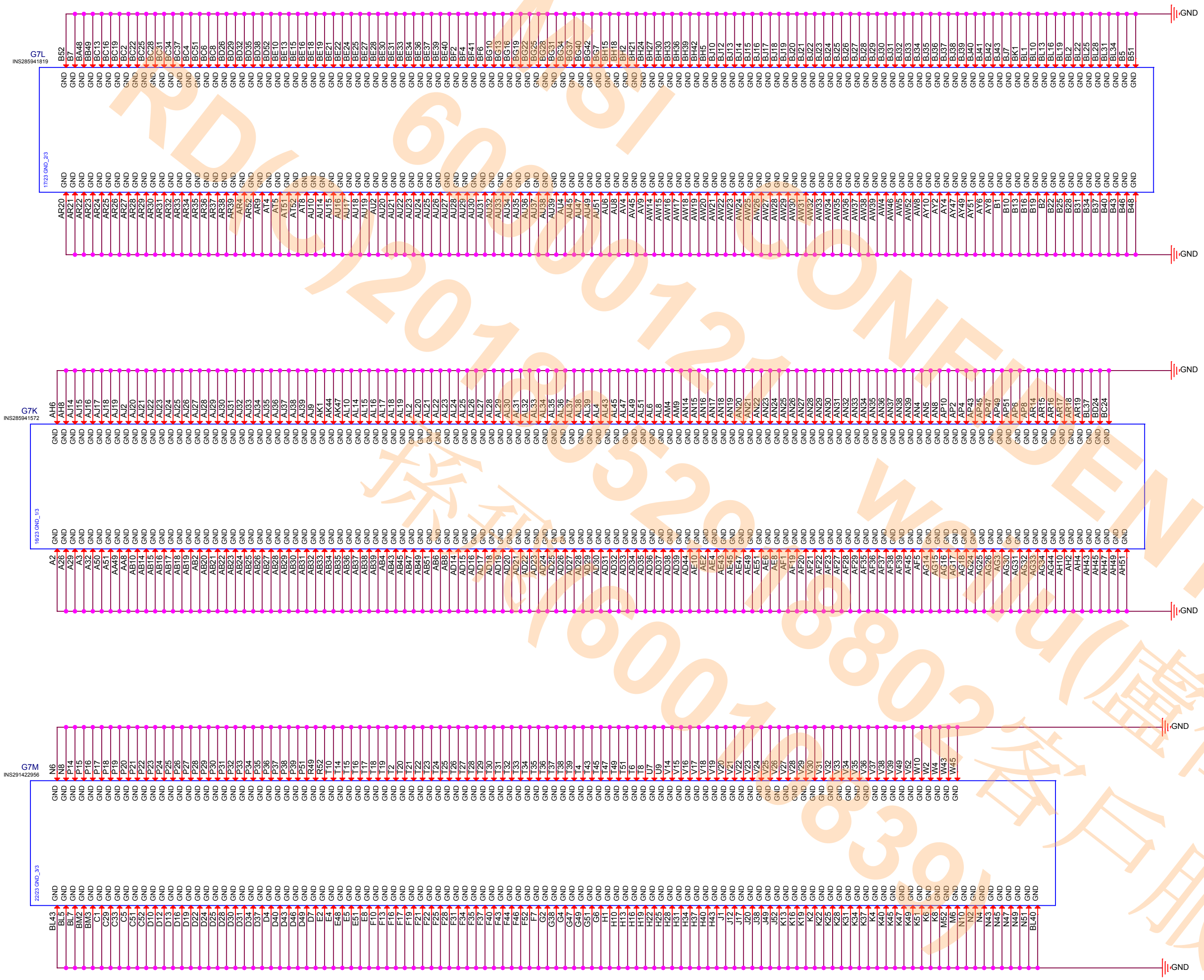
DGPU GND



MICRO-STAR INT'L CO.,LTD.		
Title: DGPU GND		
Size	Document Number: MS-16JE	Rev: 1.0
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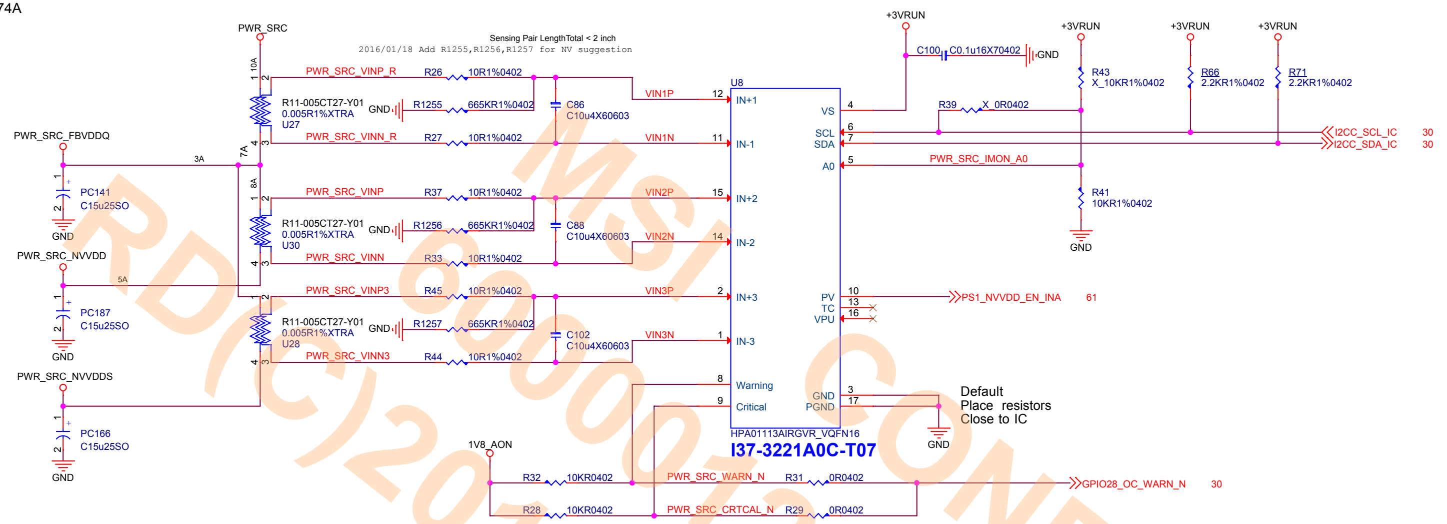
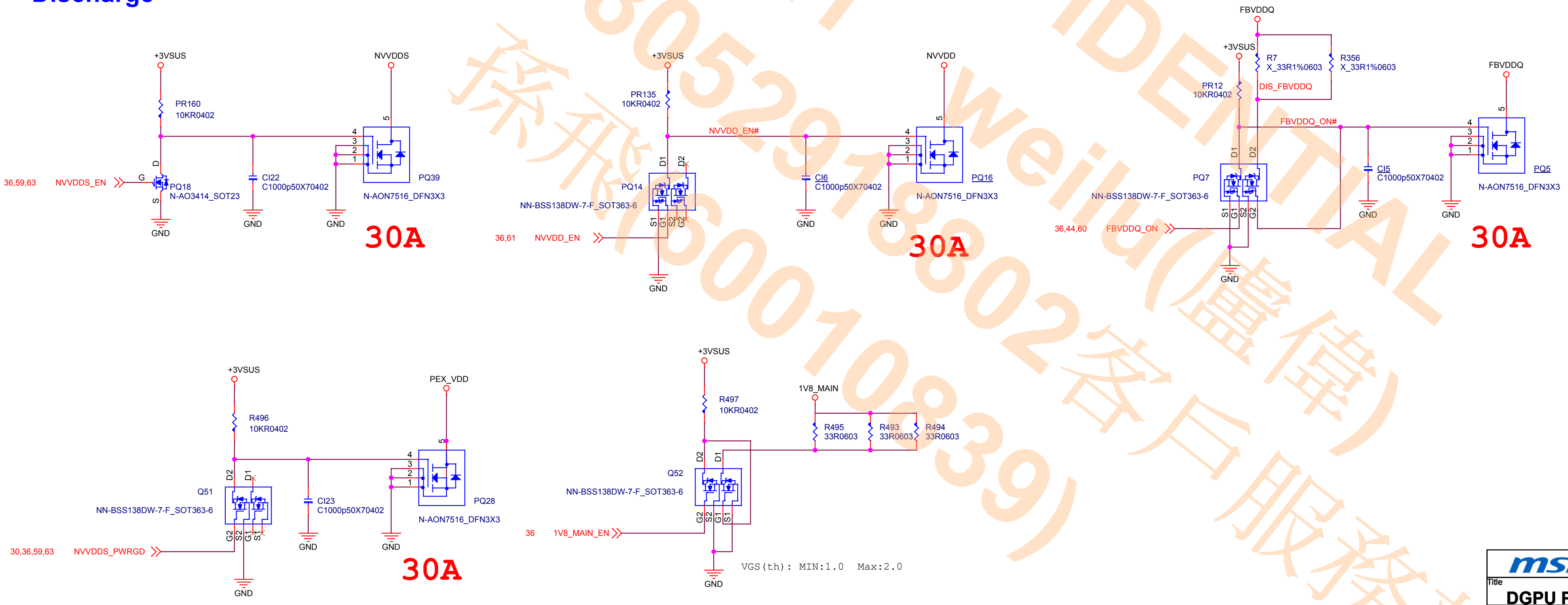
DGPU Power Measurement

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 Measurement

Size | Document Number: MS-16JE | Rev: 1.0

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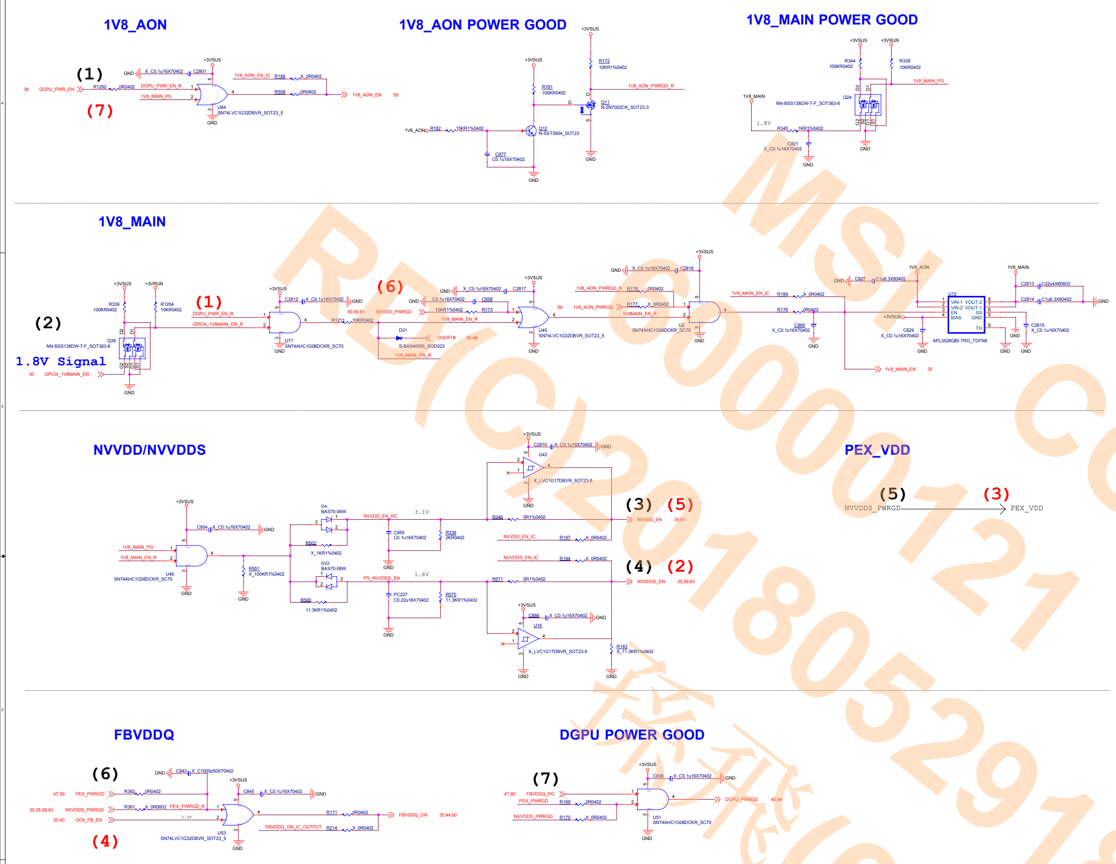
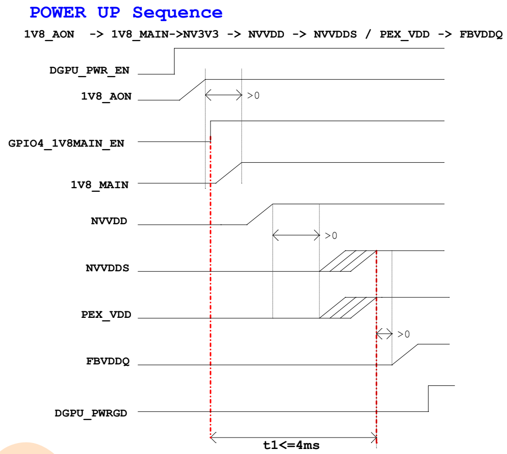
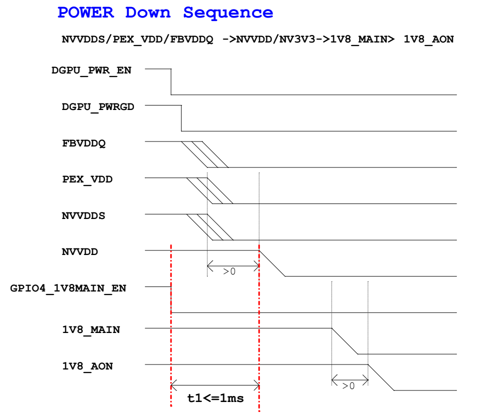
nVIDIA Power Sequence Control

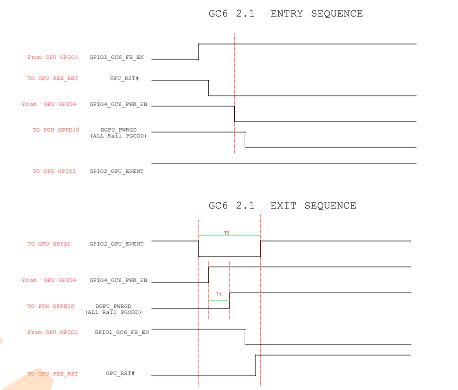
Power on = 1V8_AON -> 1V8_MAIN -> 3V3_NV/NVVDD -> NVDDS/PEX_VDD -> FBVDDQ -> DGPUPWRGD

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

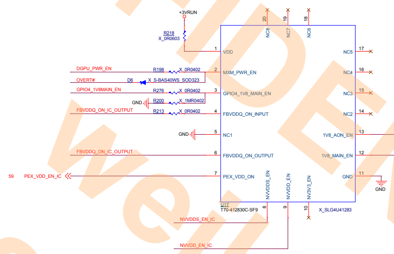








SLG4U41283 Power Sequence Control IC



PIN2: MXM_PWR_EN is 3.3V INPUT
PIN3: GPIO4_GC6_PWR_EN is 1.8V INPUT
PIN4: FBVDDQ_ON_INPUT 3.3V INPUT
PIN6: FBVDDQ_ON_OUTPUT 3.3V OUTPUT
PIN7: PEX_VDD_EN_IC 3.3V OUTPUT
PIN9: NVVDD_EN_IC 3.3V OUTPUT
PIN12:1V8_MAIN_EN_IC 3.3V OUTPUT
PIN13:1V8_AON_EN_IC 3.3V OUTPUT
(PIN13:PULL DOWN 100K)

GC6 2.1 TIMING

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

NOTES:

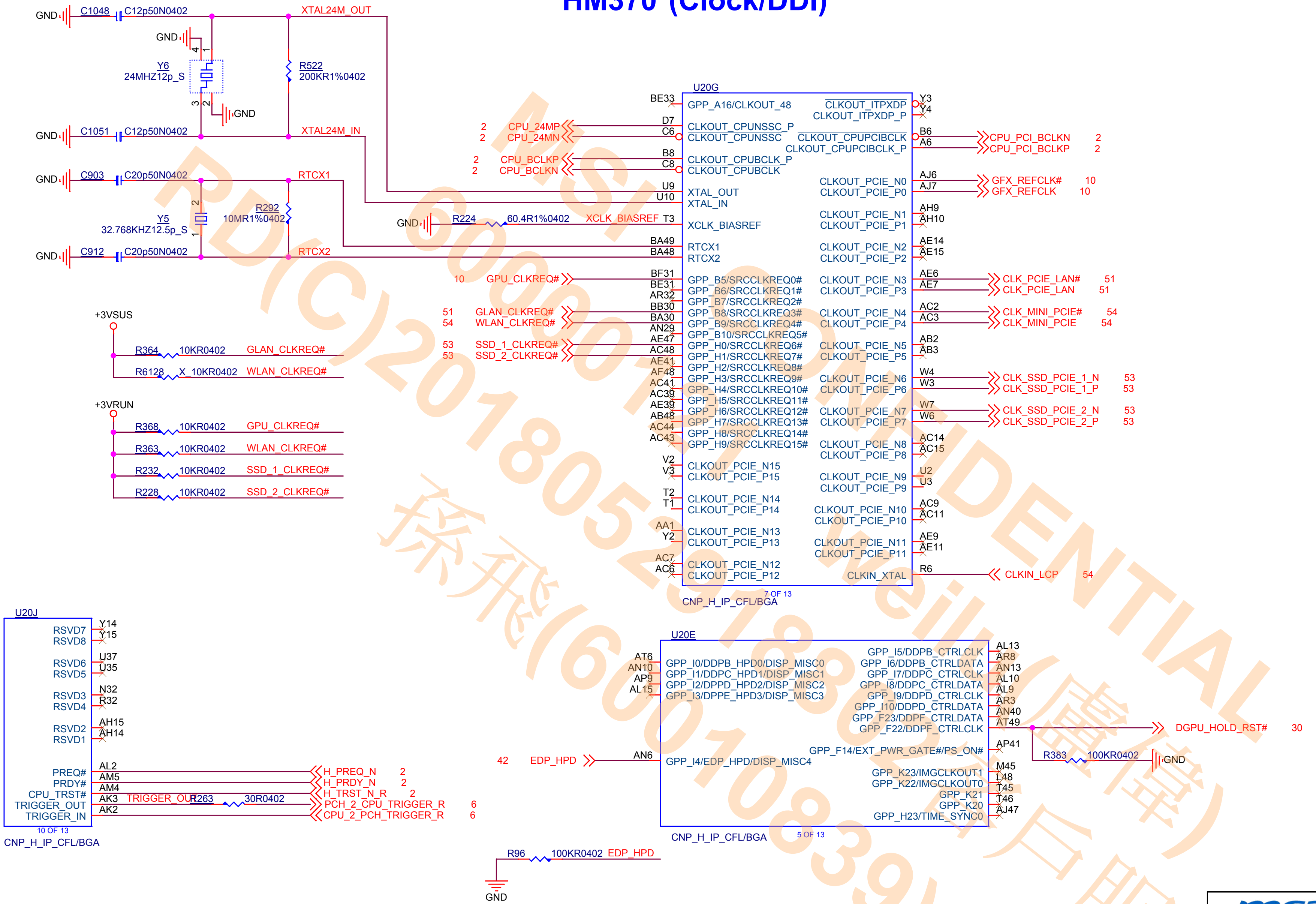
1. ALL RailPGOOD=1 represents all GPU power rails are ramped up and in regulation. If any GPU power rail cannot ge guaranteed in regulation this state should equal to 0.

2. During GC6 exit, the order of power rail ramp-up must follow the Power up sequence described in Chapter 3 with the exception that FBVDD/Q stays on.

3. All delays should be minimized to increase time spent in GC6 for maximum power saving.

4. The entire entry and exit sequence must complete within 200 ms.

HM370 (Clock/DDI)



Functional Strap Definitions

DDPB_CTRLDATA / GPP_I6

This signal has a weak internal pull-down.
0 = Port B is not detected. (Default)
1 = Port B is detected.

DDPC_CTRLDATA / GPP_I8

This signal has a weak internal pull-down.
0 = Port B is not detected. (Default)
1 = Port B is detected.

DDPD_CTRLDATA / GPP_I10

This signal has a weak internal pull-down.
0 = Port B is not detected. (Default)
1 = Port B is detected.

GPP_F23

This signal has a weak internal pull-down.
0 = Port F is not detected. (Default)
1 = Port F is detected.

MICRO-STAR INT'L CO.,LTD.

Title	PCH_1(CLK/DDI)	
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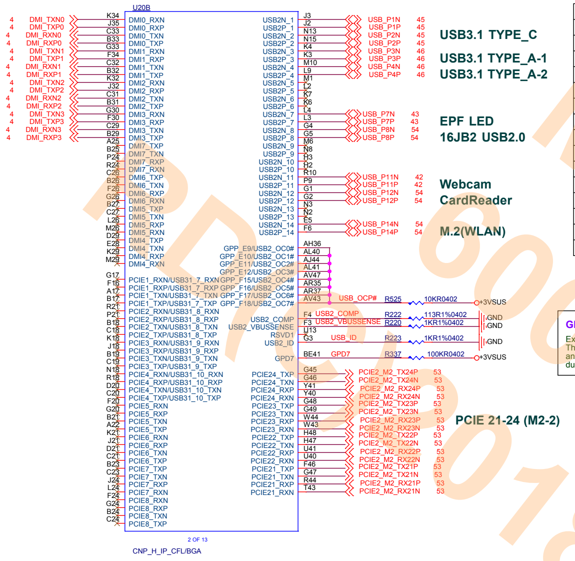
HM370 (DMI/PCIE/USB/CNVi)



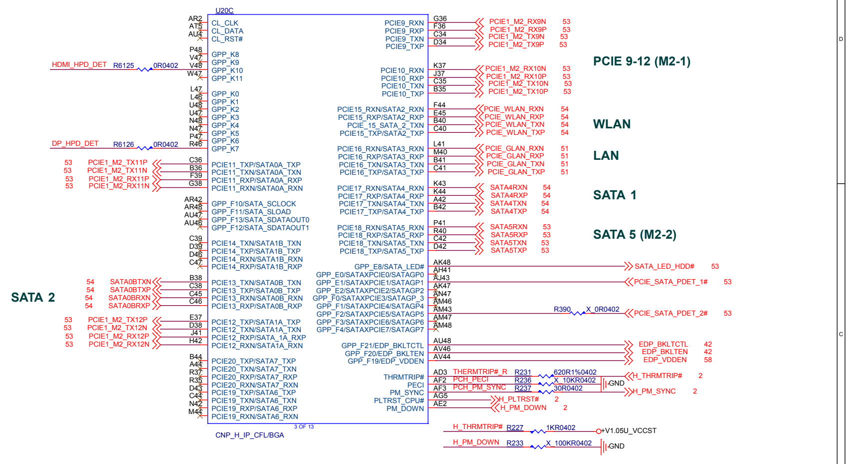
USB			
USB 2.0	USB 3.1	Device	Note
1	1	USB TYPE_C-1	
2		USB TYPE_C-2	
3	3	USB TYPE_A-1	
4	4	USB TYPE_A-2	
5			
6			
7		EPF021	
8		USB 2.0	16JB2
9			
10			
11		WebCam	
12		CARDREADER	16JB2
13			
14		WLAN	

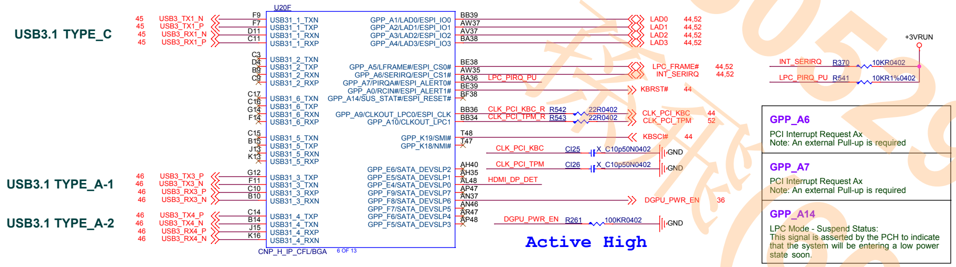
GPD7

External pull-up is required. Recommend 100K.
This strap should sample HIGH. There should NOT be any on-board device driving it to opposite direction during strap sampling

High Speed I/O Ports			
	HM370		Device
1	USB3.1 Gen 1		USB TYPE_A-1
2	USB3.1 Gen 1		USB TYPE_A-2
3	N/A		NC
4	N/A		NC
5	INTEL LAN Only		NC
6	N/A		NC
7	N/A		NC
8	N/A		NC
9	PCIE/LAN	PICE Configurable M.2	M.2 SSD-1
10	PCIE		
11	PCIE/SATA0A		
12	PCIE/LAN/SATA1A		
13	PCIE/LAN/SATA0B		SATA 2
14	PCIE/SATA1B		NC
15	PCIE		WLAN
16	PCIE		LAN
17	PCIE/SATA4		SATA 1
18	PCIE/SATA5		M.2 SSD-2
19	PCIE		NC
20	PCIE		NC
21	PCIE	PICE Configurable M.2	M.2 SSD-2
22	PCIE		
23	PCIE		
24	PCIE		

SATA Lane 0 has the flexibility to be mapped to PCIE 11 or 13
SATA Lane 1 has the flexibility to be mapped to PCIE 12 or 14





GPP_A6

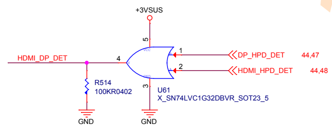
PCI Interrupt Request Ax
Note: An external Pull-up is required

GPP_A7

PCI Interrupt Request Ax
Note: An external Pull-up is required

GPP_A14

LPC Mode - Suspend Status:
This signal is asserted by the PCH to indicate that the system will be entering a low power state soon.



GPP_J4 / CNV_BRI_DT

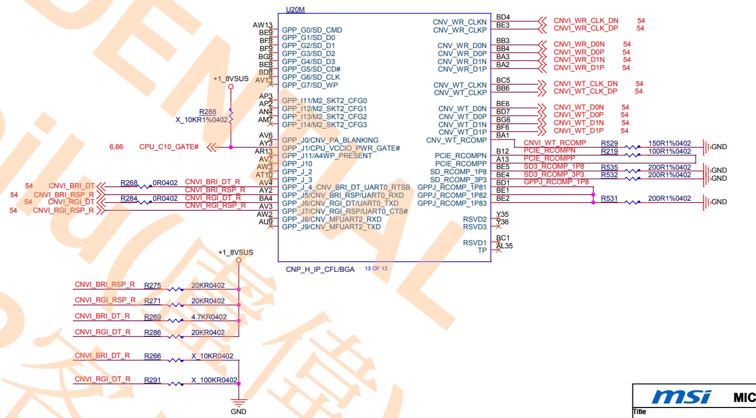
This signal has a weak internal pull-down.
An external pull-up is required on this strap since 38.4 MHz XTAL is not supported on the PCH.
0 = 38.4 XTAL frequency selected. (Default)
1 = 24MHz XTAL frequency selected.

GPP_J6 / CNV_RGI_DT

An external pull-up or pull-down is required.
0 = Integrated CNVi enable.
1 = Integrated CNVi disable.

GPP_J9

The signal has a weak internal pull-down
0 = VCCSPI is connected to 3.3V rail
1 = VCCSPI is connected to 1.8V rail



MICRO-STAR INT'L CO.,LTD.	
Title	PCH_2(DMI/PCIE/USB/CNVi)
Size: Custom / Document Number	MS-16JE
Rev	1.0
Date	Monday, December 25, 2017
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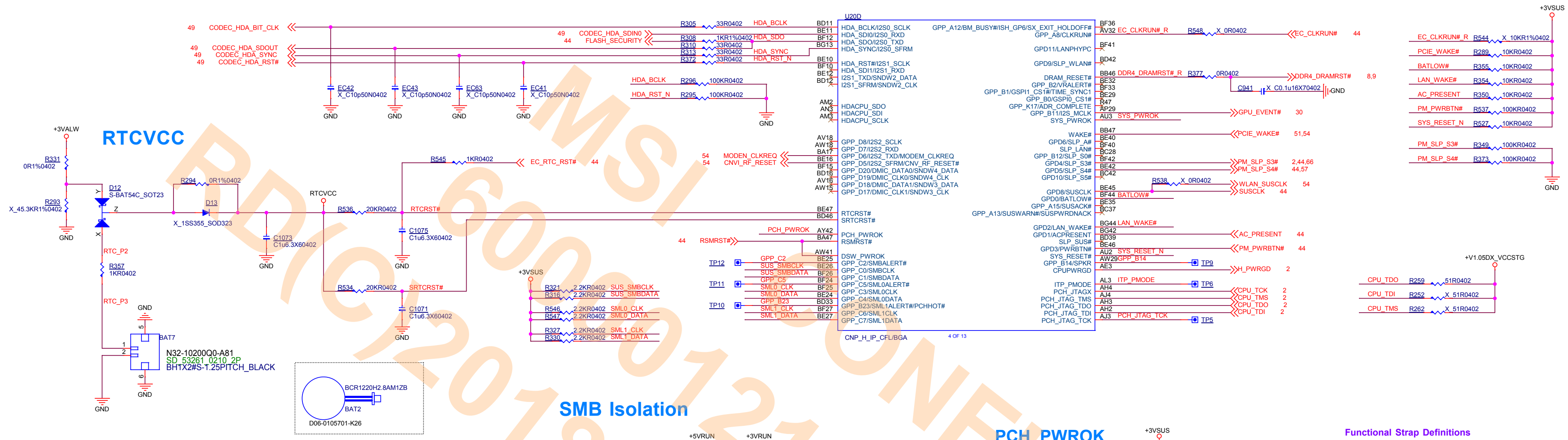
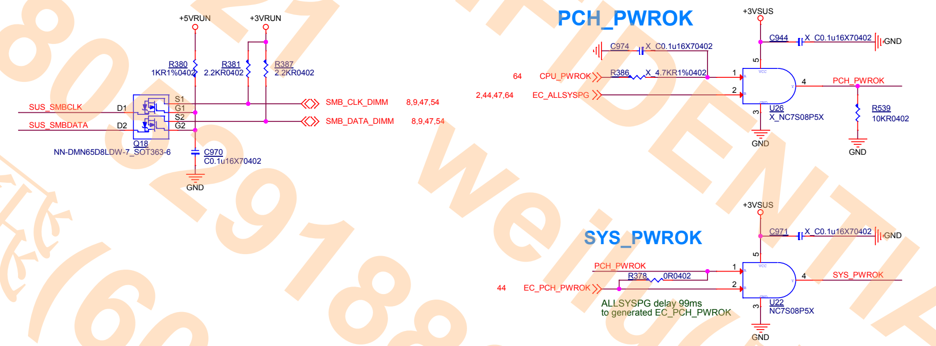
HM370 (HDA/RTC/SMBUS)





Functional Strap Definitions

HDA_SDO / I2S0_TXD

This signal has a weak internal pull-down.
0 = Enable security measures defined in the Flash Descriptor. (Default)
1 = Disable Flash Descriptor Security (override).

SMBALERT# / GPP_C2

This signal has a weak internal pull-down.
0 = Disable Intel ME Crypto Transport Layer Security (TLS) cipher suite (no confidentiality). (Default)
1 = Enable Intel ME Crypto Transport Layer Security (TLS) cipher suite (with confidentiality). Must be pulled up to support Intel AMT with TLS.

SML0ALERT# / GPP_C5

This signal has a weak internal pull-down.
0 = LPC is selected (for EC). (Default)
1 = eSPI is selected (for EC).

SML1ALERT# / PCHHOT# / GPP_B23

This signal has an internal pull-down.
0 = Disable Intel DCI-OOB (Default)
1 = Enable Intel DCI-OOB

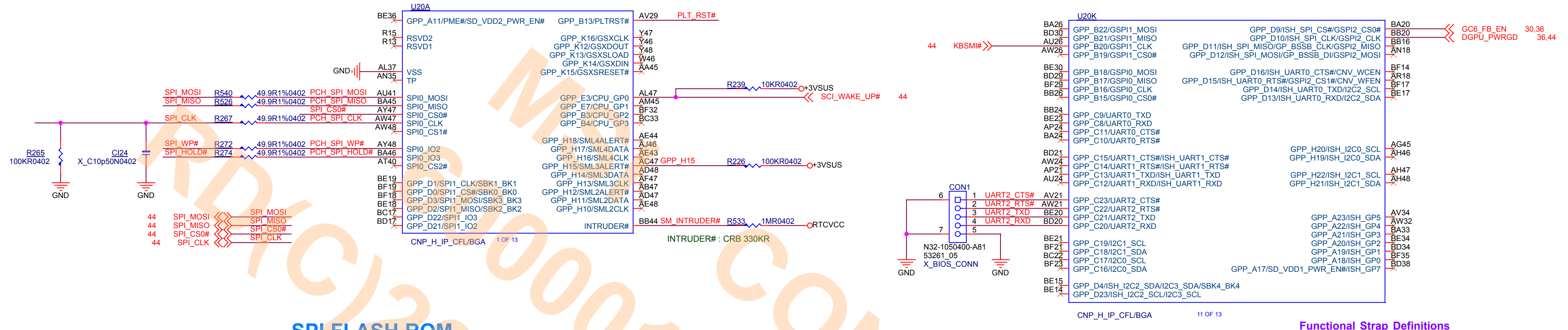
SPKR / GPP_B14

The signal has a weak internal pull-down.
0 = Disable Top Swap mode. (Default)
1 = Enable Top Swap mode.

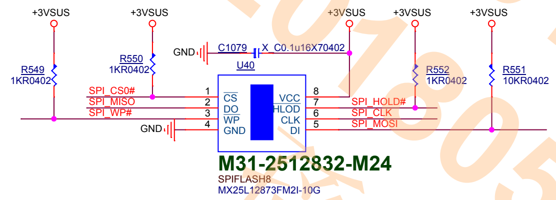
DG/ RTC Well Input Strap

RSMRST# & DSW_PWROK, PCH_PWROK : PD
RTCRST#, SRTCRST#, INTRUDER# : PU

HM370 (SPI/GPIO)

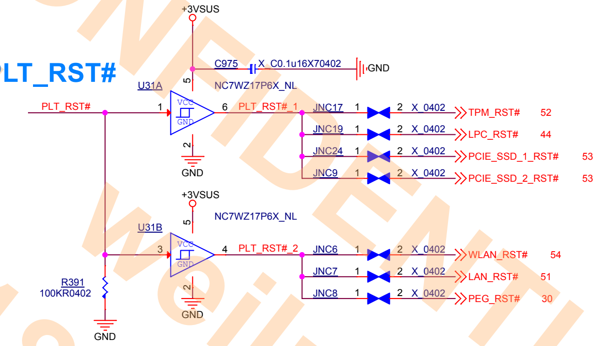


SPI FLASH ROM



Supported types of Flash Memory
Command:0x03 & 0x0B & 0xBB

PLT_RST#



Functional Strap Definitions

SML3ALERT# / GPP_H15

External pull-up is required.
Recommend 100K if pulled
up to 3.3V or 75K if pulled up to 1.8V.

GSPI1_MOSI / GPP_B22

This Signal has a weak internal pull-down.
Bit 6 Boot BIOS Destination
0 SPI (Default)
1 LPC

GSPI0_MOSI / GPP_B18

The signal has a weak internal pull-down.
0 = Disable No Reboot mode. (Default)
1 = Enable No Reboot mode

DG / Single Flash Topology Table 29-3
(1) R use 50 Ohm for 3.3V
(2) SPIO_IO2/IO3 PU 1KR when using quad mode

SPI0_IO2

External pull-up is required. Recommend 100K if pulled up to 3.3V or 75K if pulled up to 1.8V.

SPI0_IO3

External pull-up is required. Recommend 100K if pulled up to 3.3V or 75K if pulled up to 1.8V.

SPI0_MOSI

External pull-up is required. Recommend 100K if pulled up to 3.3V or 75K if pulled up to 1.8V.

MICRO-STAR INT'L CO.,LTD.

Title	PCH_4(SPI/GPIO)
Size: Custom	Document Number: MS-16JE
Rev	1.0
Date:	Monday, December 25, 2017
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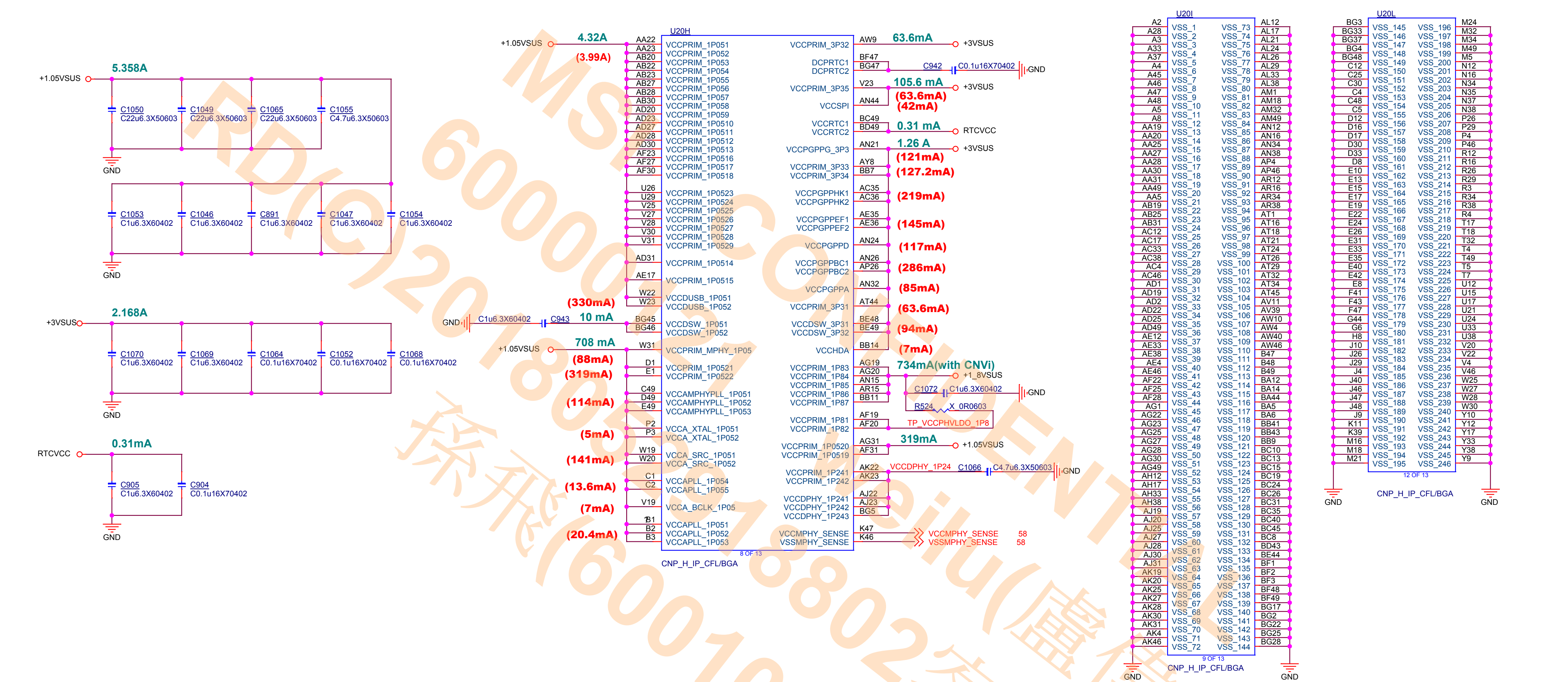
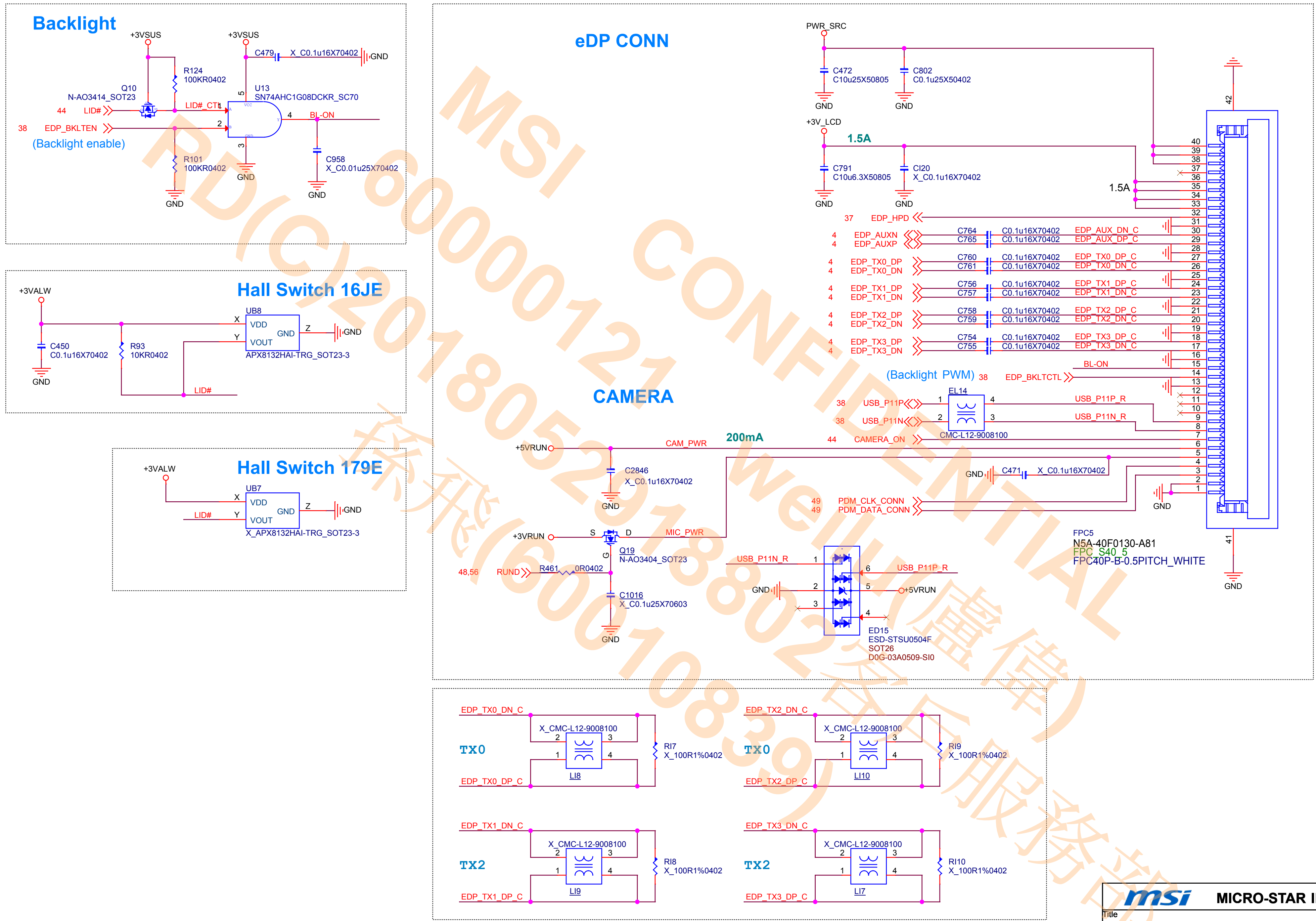
HM370 (Power & GND)



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

Title	PCH_5(Power)	
Size Custom	Document Number MS-16JE	Rev 1.0
Date: Monday, December 25, 2017	Sheet 41 of 75	

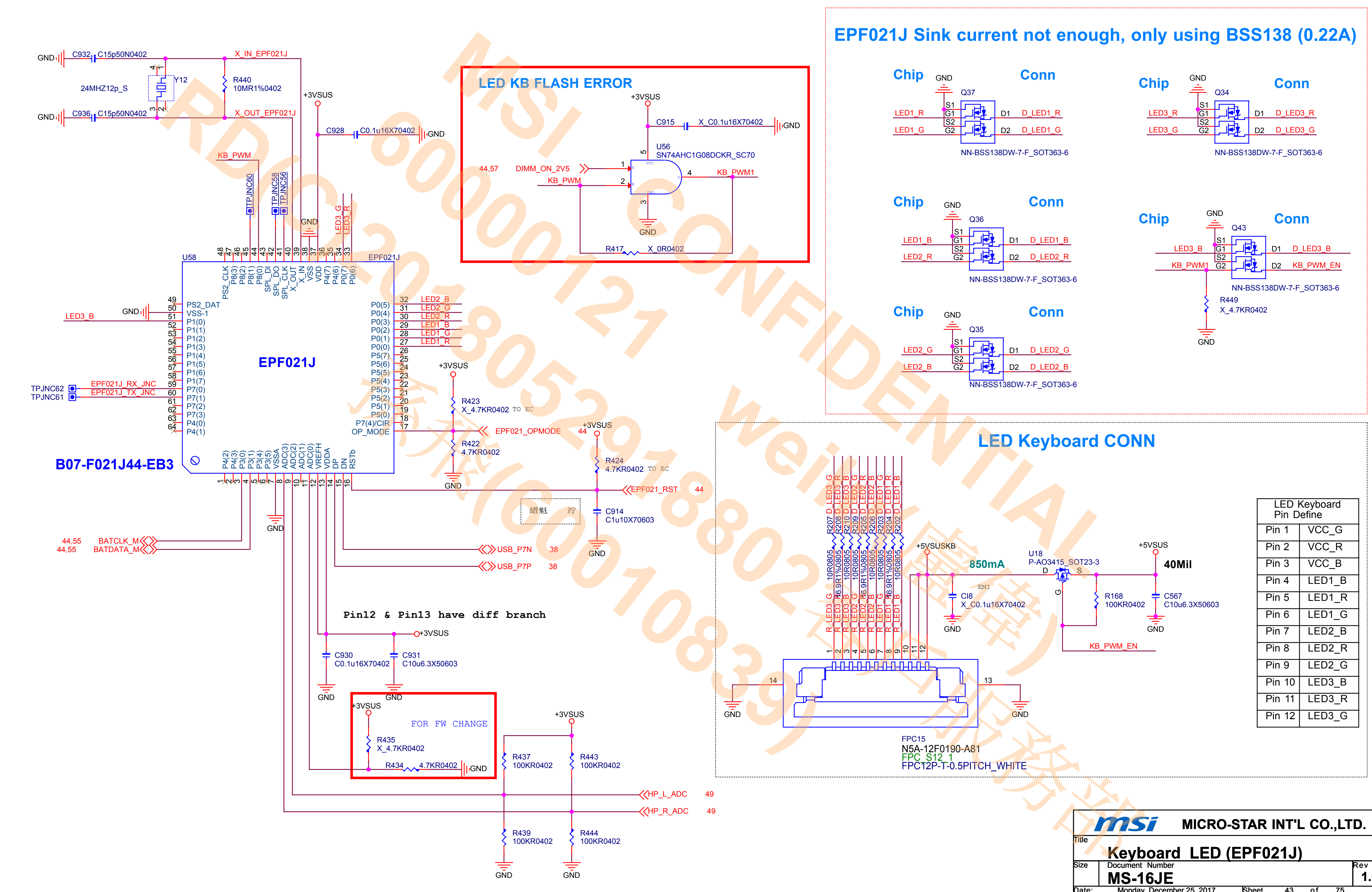
eDP / Camera



MICRO-STAR INT'L CO.,LTD.

Title	eDP /Camera
Size / Document Number	MS-16JE
Rev	1.0
Date:	Monday, December 25, 2017
Sheet	42 of 75

Keyboard LED (EPF021J)



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

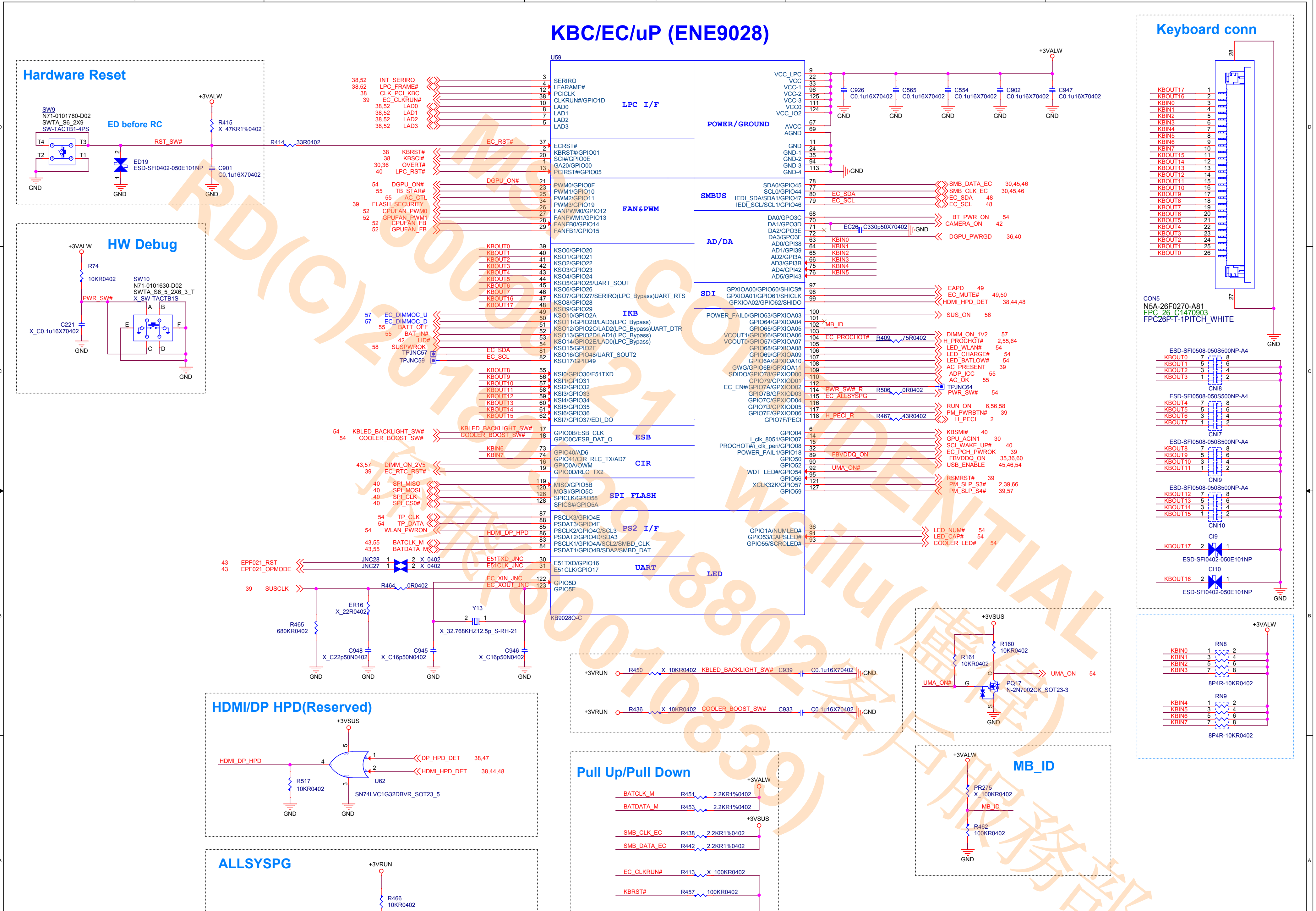
MICRO-STAR INT'L CO.,LTD.

Title: Keyboard LED (EPF021J)

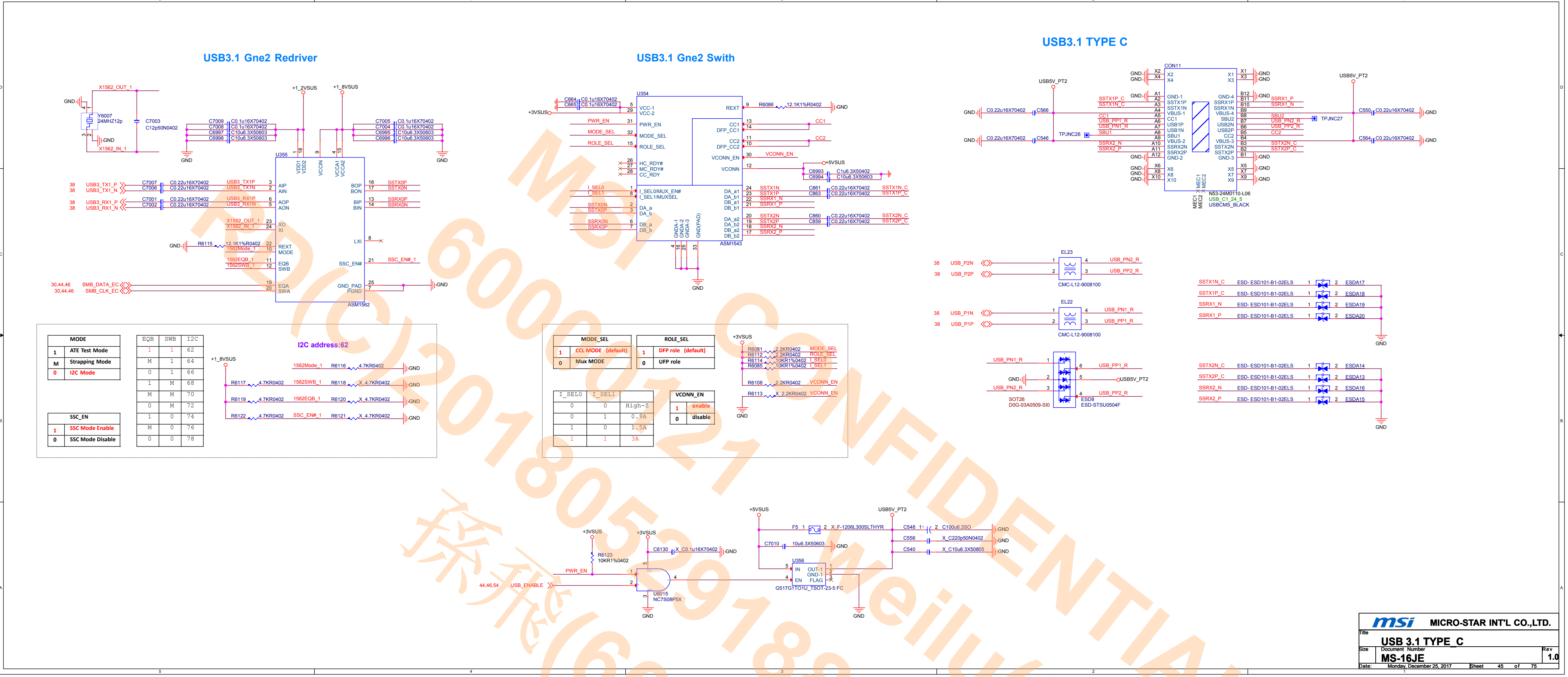
Size | Document Number: MS-16JE | Rev: 1.0

Date: Monday, December 25, 2017 | Sheet 43 of 75

KBC/EC/uP (ENE9028)



msi	MICRO-STAR INT'L CO.,LTD.		
Title	KBC(KB3930QFB1)		
Size	Document Number: MS-16JE		Rev 1.0
Date:	Monday, December 25, 2017	Sheet 44 of 75	



MODE	
1	ATE Test Mode
M	Strapping Mode
0	I2C Mode

EQB	SWB	I2C
1	1	62
M	1	64
0	1	66
1	M	68
M	M	70
0	M	72
1	0	74
M	0	76
0	0	78

SSC_EN	
1	SSC Mode Enable
0	SSC Mode Disable

MODE_SEL	
1	CCL MODE (default)
0	Mux MODE

ROLE_SEL	
1	DFP role (default)
0	UFP role

I_SEL0	I_SEL1	
0	0	High-Z
0	1	0.9A
1	0	1.5A
1	1	3A

VCONN_EN	
1	enable
0	disable

MICRO-STAR INT'L CO.,LTD.

Title: USB 3.1 TYPE_C

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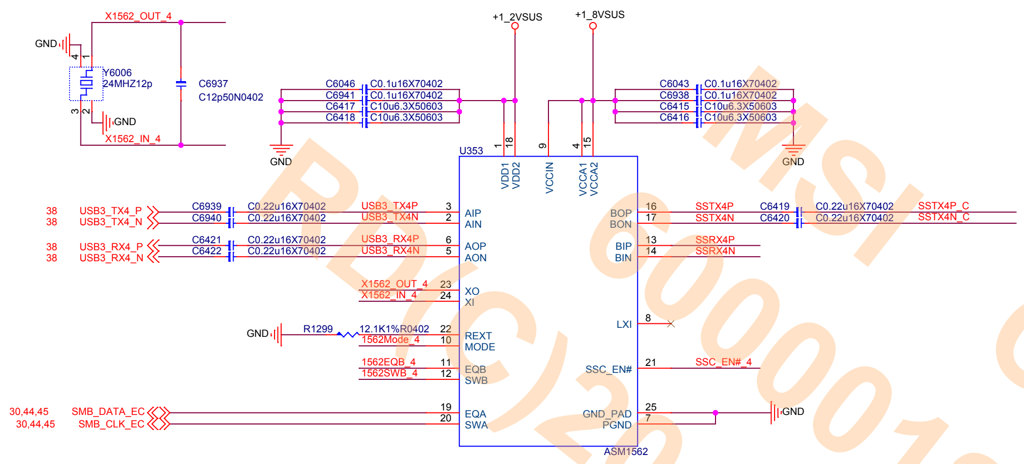
Date: Monday, December 25, 2017 | Sheet 45 of 75

USB3.1 Gne2 Redriver

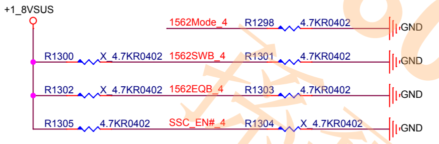


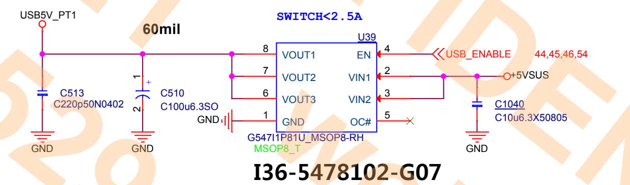
MODE	
1	ATE Test Mode
M	Strapping Mode
0	I2C Mode

SSC_EN	
1	SSC Mode Enable
0	SSC Mode Disable

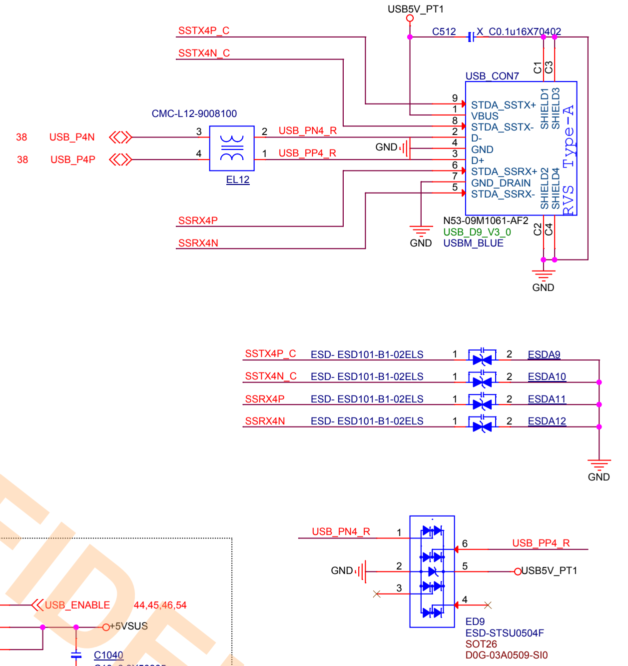
EQB	SWB	I2C
1	1	62
M	1	64
0	1	66
1	M	68
M	M	70
0	M	72
1	0	74
M	0	76
0	0	78

I2C address:78

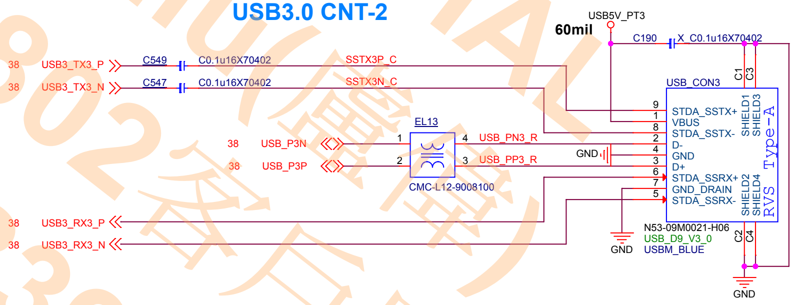


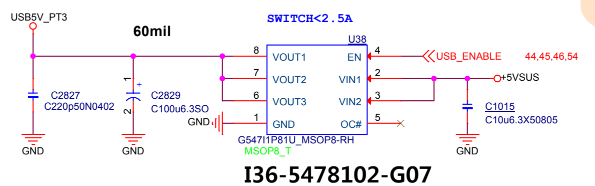


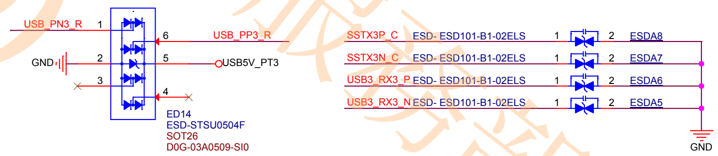
USB3.1 CNT-1



USB3.0 CNT-2







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Title: USB3.1 TYPE_A

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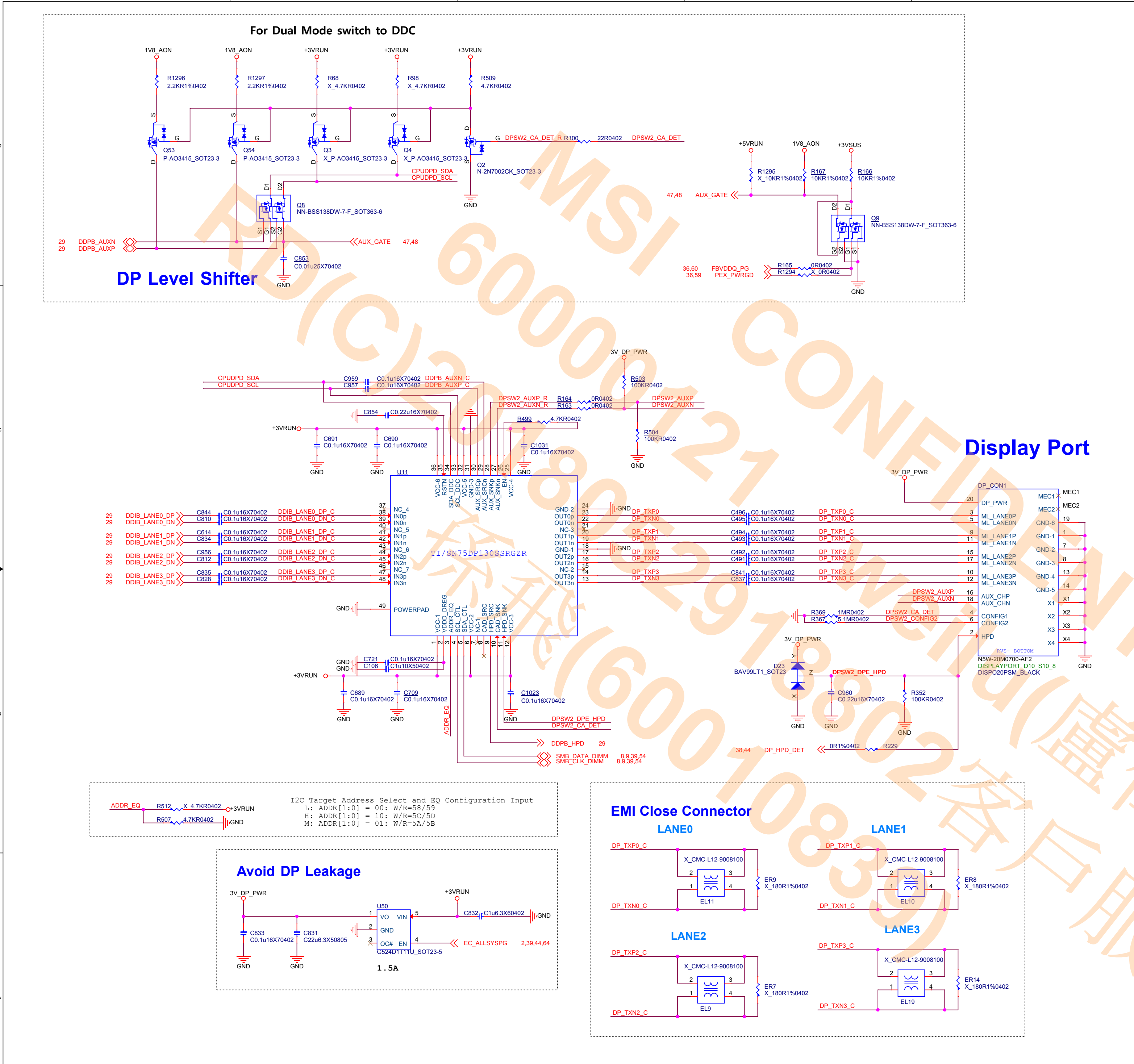
Date: Monday, December 25, 2017 | Sheet 46 of 75



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

Title	DP	
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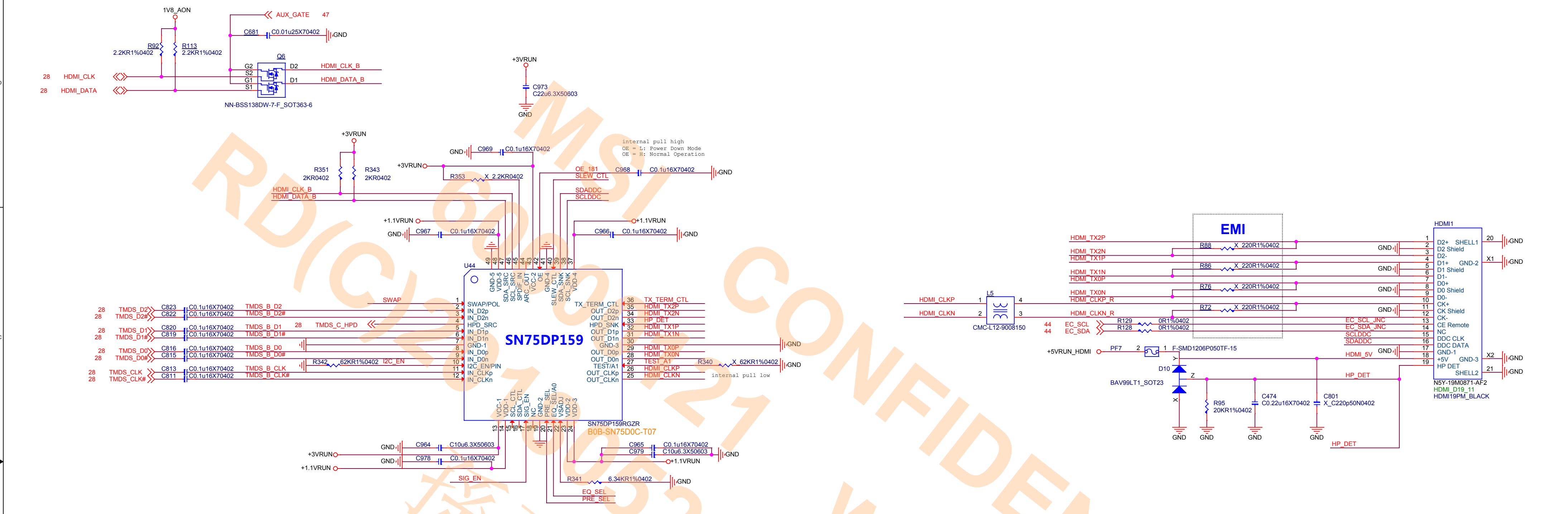
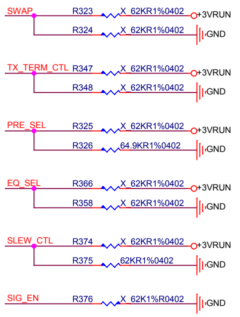
HDMI Level Shifter





VCC/2 Normal operation

TX_TERM_CTL = H, No transmit Termination
TX_TERM_CTL = L, Transmit Termination impedance in 75~150
TX_TERM_CTL = Vcc/2, Automaticly selects the termination

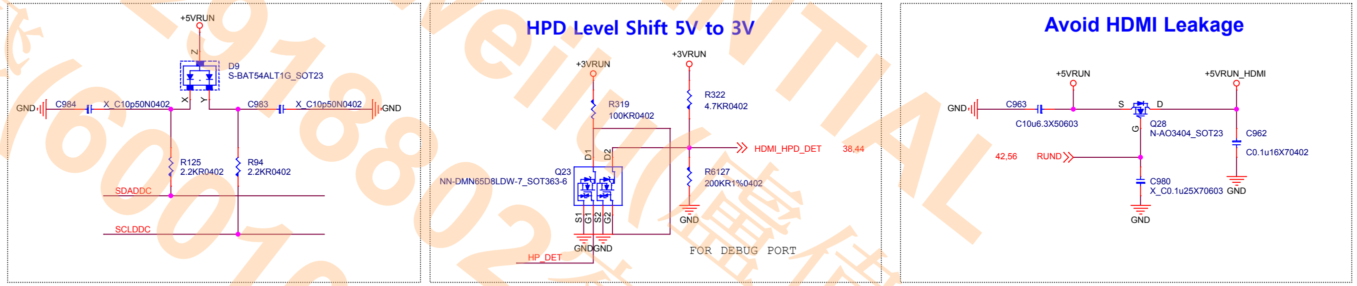
PRE_SEL = L: -2.5dB
PRE_SEL = Vcc/2: 0dB
PRE_SEL = H: -5dB

EQ_SEL = L: Fixed EQ at 7.5dB @ 3GHz
EQ_SEL = Vcc/2: Adaptive EQ
EQ_SEL = H: Fixed at 14B @ 3GHz

SLEW_CTL = H, Fastest data rate(Default)
SLEW_CTL = L, 20ps slow
SLEW_CTL = Vcc/2, 40ps slow

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



msi	MICRO-STAR INT'L CO.,LTD.		
Title	HDMI DP139		
Size	Document Number: MS-16JE		Rev 1.0
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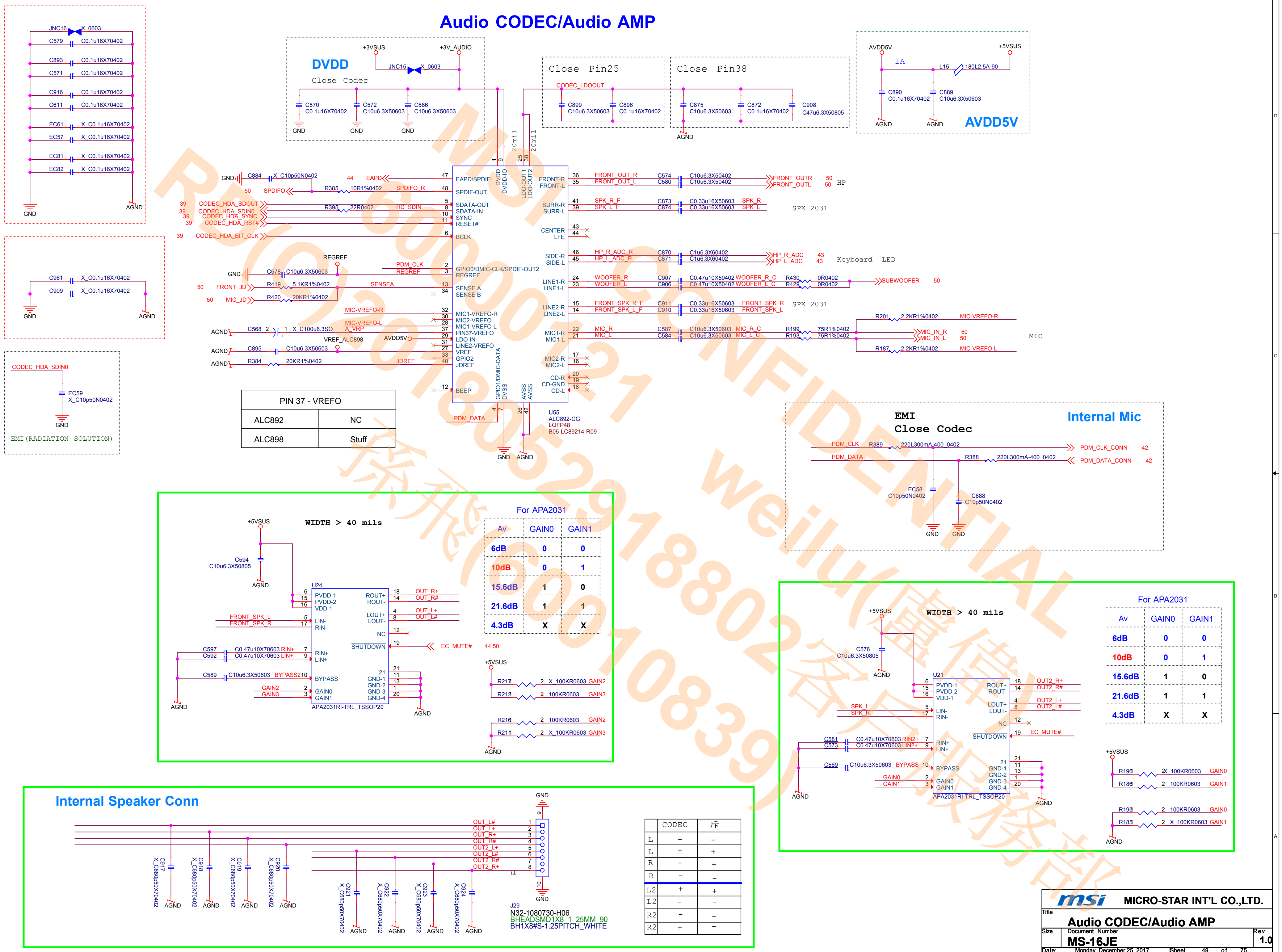
Audio CODEC/Audio AMP



PIN 37 - VREFO	
ALC892	NC
ALC898	Stuff

For APA2031

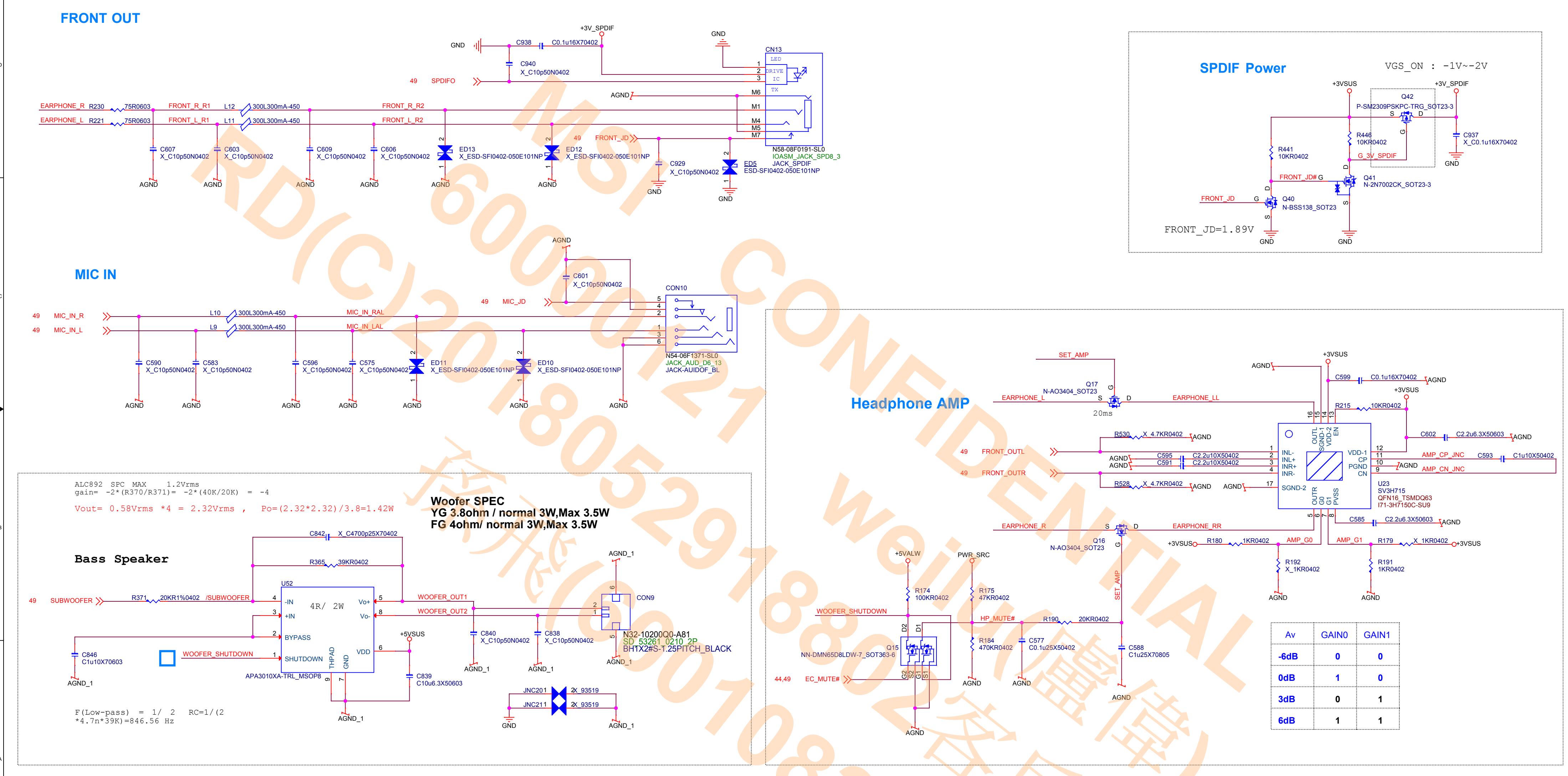
Av	GAIN0	GAIN1
6dB	0	0
10dB	0	1
15.6dB	1	0
21.6dB	1	1
4.3dB	X	X

For APA2031

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

	CODEC	斥
L	−	−
L	+	+
R	+	+
R	−	−
L2	+	+
L2	−	−
R2	−	−
R2	+	+

Audio CONN / Woffer



FRONT OUT
+3V_SPDIF
GND
C938 C0.1u16X70402
C940 X_C10p50N0402
49 SPDIFO
CN13
LED
DRIVE IC
TX
AGND
M6 M1 M4 M5 M7
EARPHONE_R R230 75R0603 FRONT_R_R1 L12 300L300mA-450 FRONT_R_R2
EARPHONE_L R221 75R0603 FRONT_L_R1 L11 300L300mA-450 FRONT_L_R2
C607 X_C10p50N0402
C603 X_C10p50N0402
C609 X_C10p50N0402
C606 X_C10p50N0402
ED13 X_ESD-SFI0402-050E101NP
ED12 X_ESD-SFI0402-050E101NP
49 FRONT_JD
C929 X_C10p50N0402
ED5 ESD-SFI0402-050E101NP
N58-08F0191-SL0
IOASM_JACK_SPD8_3
JACK_SPDIF
SPDIF Power
VGS_ON : -1V~-2V
+3VSUS
+3V_SPDIF
Q42 P-SM2309PSKPC-TRG_SOT23-3
R446 10KR0402
C937 X_C0.1u16X70402
R441 10KR0402
G_3V_SPDIF
FRONT_JD# G
Q41 N-2N7002CK_SOT23-3
FRONT_JD
Q40 N-BSS138_SOT23
FRONT_JD=1.89V
MIC IN
C601 X_C10p50N0402
49 MIC_JD
CON10
49 MIC_IN_R L10 300L300mA-450 MIC_IN_RAL
49 MIC_IN_L L9 300L300mA-450 MIC_IN_LAL
C590 X_C10p50N0402
C583 X_C10p50N0402
C596 X_C10p50N0402
C575 X_C10p50N0402
ED11 X_ESD-SFI0402-050E101NP
ED10 X_ESD-SFI0402-050E101NP
N54-06F1371-SL0
JACK_AUD_D6_13
JACK-AUIDOF_BL
Headphone AMP
SET_AMP
Q17 N-AO3404_SOT23
EARPHONE_L
EARPHONE_LL
20ms
+3VSUS
C599 C0.1u16X70402
R215 10KR0402
R530 X_4.7KR0402
49 FRONT_OUTL
49 FRONT_OUTR
C595 C2.2u10X50402
C591 C2.2u10X50402
R528 X_4.7KR0402
C602 C2.2u6.3X50603
AMP_CP_JNC
C593 C1u10X50402
AMP_CN_JNC
U23 SV3H715 QFN16_TSMDQ63 I71-3H7150C-SU9
EARPHONE_R
EARPHONE_RR
Q16 N-AO3404_SOT23
C585 C2.2u6.3X50603
R180 1KR0402 AMP_G0
AMP_G1 R179 X_1KR0402
R192 X_1KR0402
R191 1KR0402
+5VALW
PWR_SRC
R174 100KR0402
R175 47KR0402
WOOFER_SHUTDOWN
HP_MUTE#
R190 20KR0402
R184 470KR0402
C577 C0.1u25X50402
C588 C1u25X70805
NN-DMN65D8LDW-7_SOT363-6
Q15
44,49 EC_MUTE#
ALC892 SPC MAX 1.2Vrms
gain= -2*(R370/R371)= -2*(40K/20K) = -4
Vout= 0.58Vrms *4 = 2.32Vrms , Po=(2.32*2.32)/3.8=1.42W
Woofer SPEC
YG 3.8ohm / normal 3W,Max 3.5W
FG 4ohm/ normal 3W,Max 3.5W
Bass Speaker
C842 X_C4700p25X70402
R365 39KR0402
U52
49 SUBWOOFER R371 20KR1%0402 /SUBWOOFER
4R/ 2W
WOOFER_OUT1
WOOFER_OUT2
CON9
BYPASS
SHUTDOWN
THPAD
VDD
C846 C1u10X70603
WOOFER_SHUTDOWN
APA3010XA-TRL_MSOP8
+5VSUS
C839 C10u6.3X50603
C840 X_C10p50N0402
C838 X_C10p50N0402
N32-10200Q0-A81
SD_53261_0210_2P
BHTX2#S-1.25PITCH_BLACK
JNC201 2X_93519
JNC211 2X_93519
F(Low-pass) = 1/ 2 RC=1/(2 *4.7n*39K)=846.56 Hz

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

MICRO-STAR INT'L CO.,LTD.

Title: Audio CONN / Woffer

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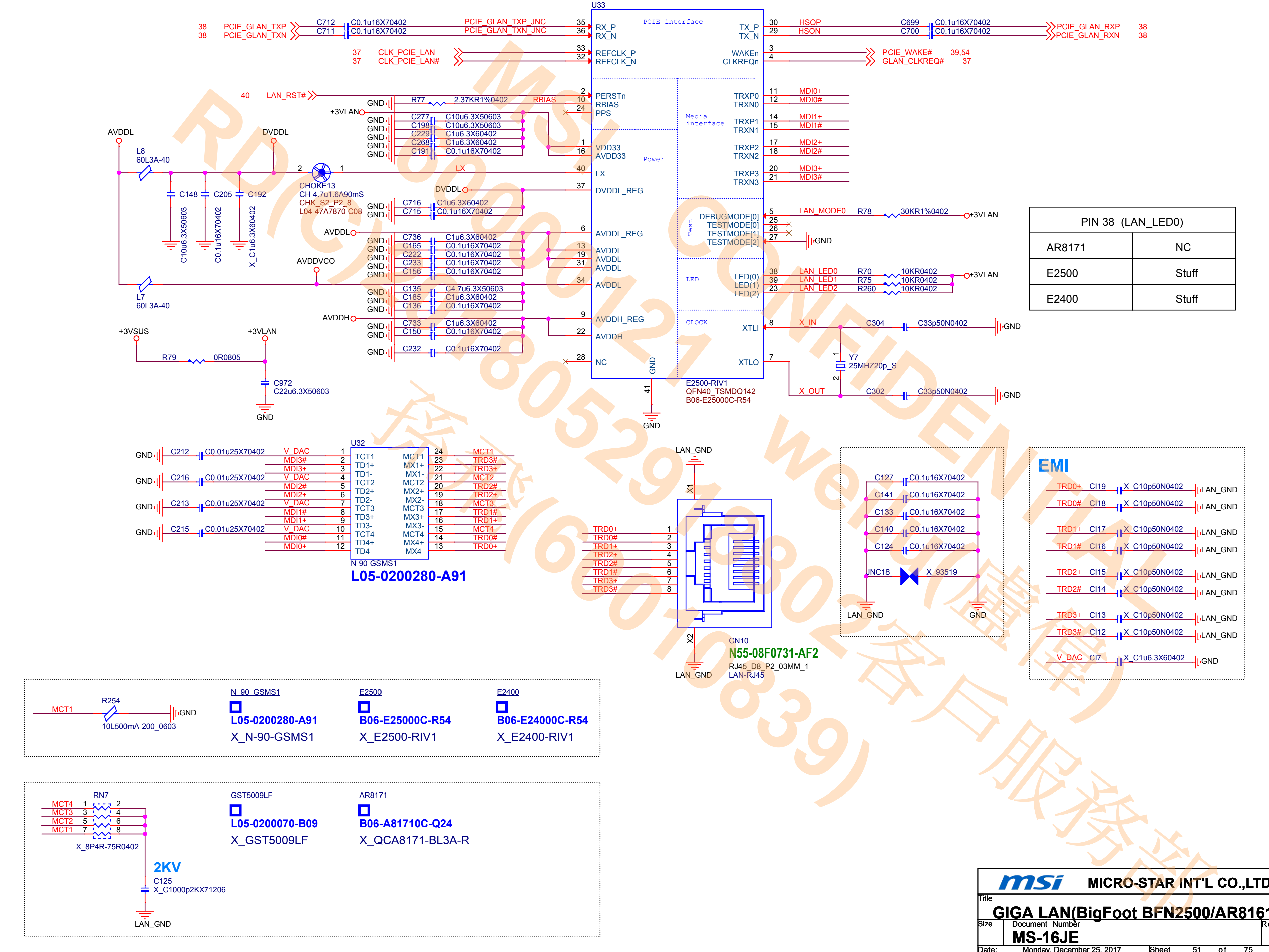
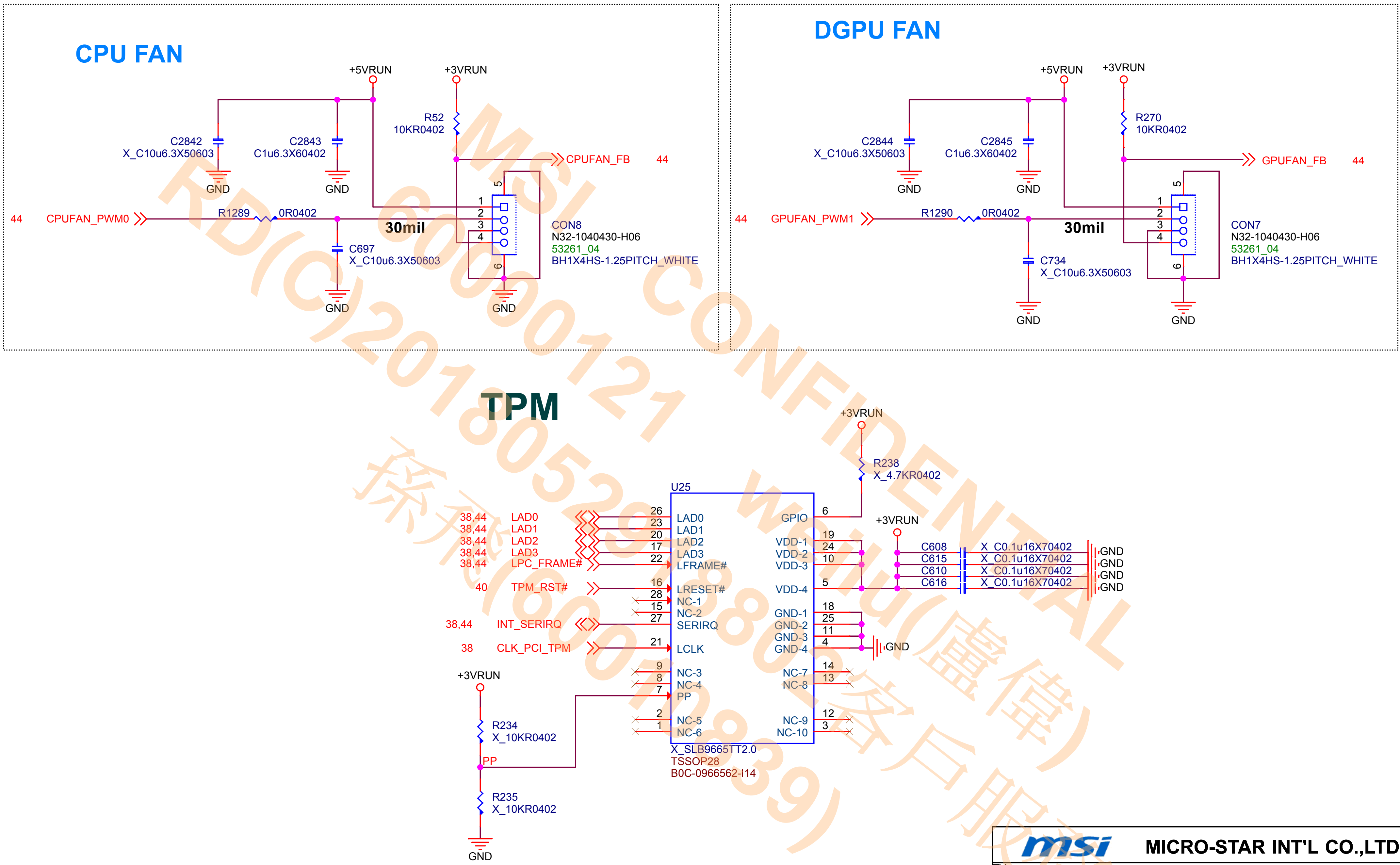
GIGA LAN(BigFoot BFN2500)



PIN 38 (LAN_LED0)	
AR8171	NC
E2500	Stuff
E2400	Stuff

MICRO-STAR INT'L CO.,LTD.

Title	GIGA LAN(BigFoot BFN2500/AR8161)	
Size	Document Number: MS-16JE	Rev 1.0
Date: Monday, December 25, 2017	Sheet 51 of 75	



MICRO-STAR INT'L CO.,LTD.

Title: FAN/TPM

Size | Document Number: MS-16JE | Rev 1.0

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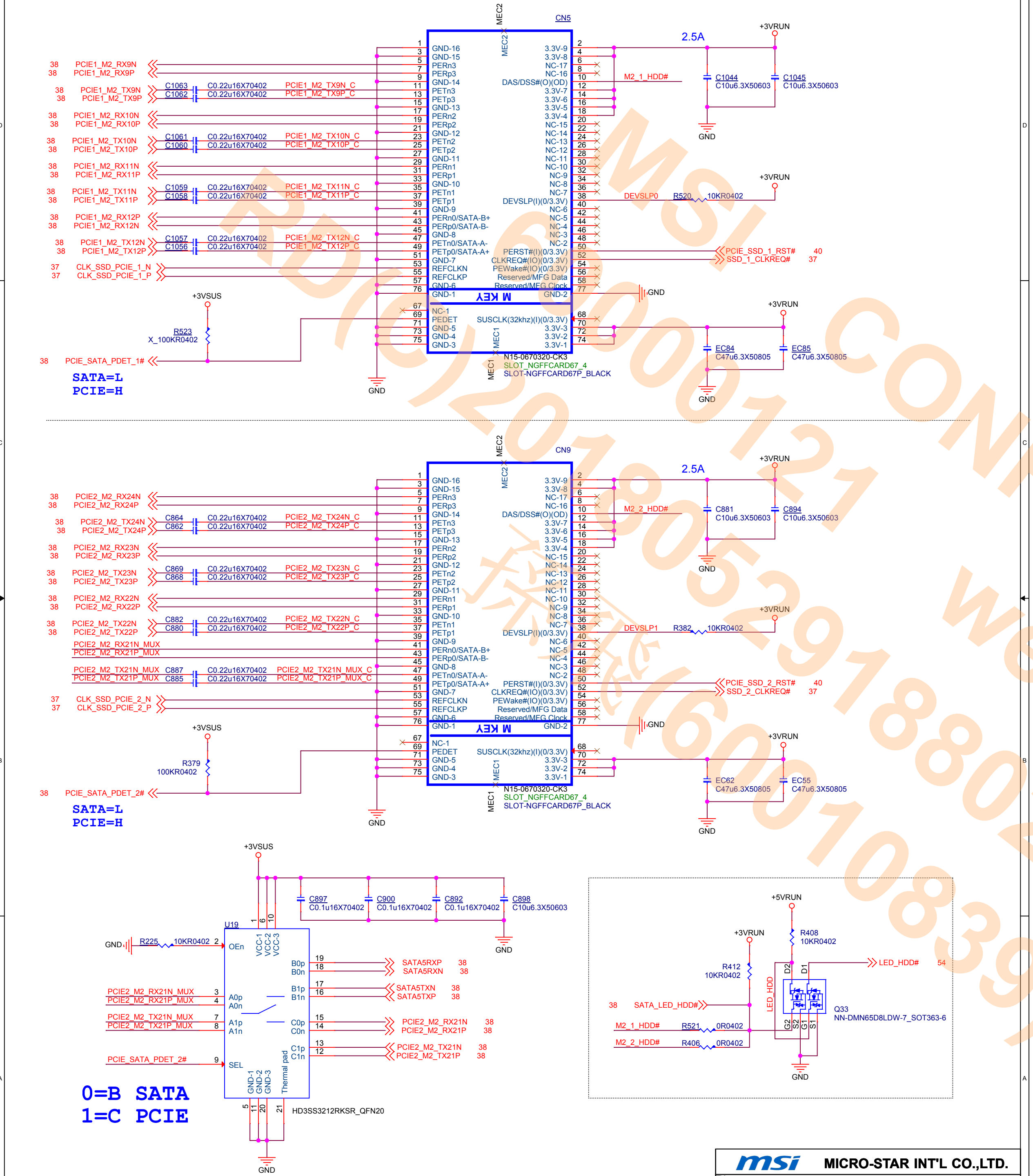
PCIEx4 / SATA M.2 SSD

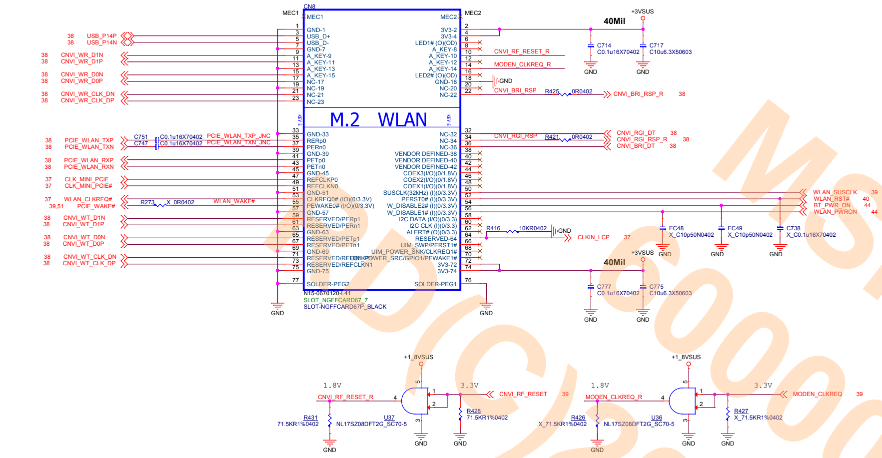


MICRO-STAR INT'L CO.,LTD.

Title	M.2 SSD	
Size	Document Number: MS-16JE	Rev 1.0
Date: Monday, December 25, 2017	Sheet 53 of 75	

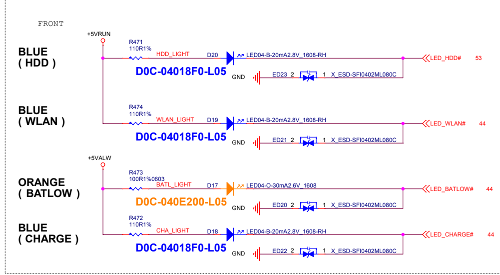
WLAN / LED / TP / BTB

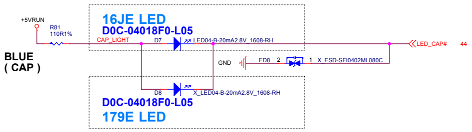
WLAN



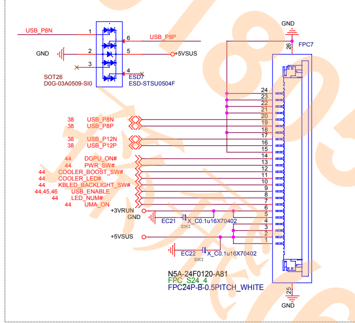
Pin #	M.2 WLAN	INTEL CNVi WLAN	Pin #	M.2 WLAN	INTEL CNVi WLAN
Pin 1	GND	GND	Pin 2	3.3V	3.3V
Pin 3	USB_D+	N/C	Pin 4	3.3V	3.3V
Pin 5	USB_D-	N/C	Pin 6	LED1#	LED1#
Pin 7	GND	GND	Pin 8	Module Key	N/C
Pin 9	Module Key	WGR_D1N	Pin 10	Module Key	RF_RESET_B(1.8V)
Pin 11	Module Key	WGR_D1P	Pin 12	Module Key	N/C
Pin 13	Module Key	GND	Pin 14	Module Key	CLKREQ0(1.8V)
Pin 15	Module Key	WGR_D0N	Pin 16	LED2#	LED2#
Pin 17	N/C	WGR_D0P	Pin 18	GND	GND
Pin 19	N/C	GND	Pin 20	N/C	N/C
Pin 21	N/C	WGR_CLKN	Pin 22	N/C	BRI_RSP(1.8V)
Pin 23	N/C	WGR_CLKP	Pin 24	Module Key	Module Key
Pin 25	Module Key	Module Key	Pin 26	Module Key	Module Key
Pin 27	Module Key	Module Key	Pin 28	Module Key	Module Key
Pin 29	Module Key	Module Key	Pin 30	Module Key	Module Key
Pin 31	Module Key	Module Key	Pin 32	N/C	RGI_DT(1.8V)
Pin 33	GND	GND	Pin 34	N/C	RGI_RSP(1.8V)
Pin 35	PERP0	N/C	Pin 36	N/C	BGI_DT(1.8V)
Pin 37	PERN0	N/C	Pin 38	N/C	N/C
Pin 39	GND	GND	Pin 40	N/C	N/C
Pin 41	PETP0	N/C	Pin 42	N/C	N/C
Pin 43	PETN0	N/C	Pin 44	N/C	N/C
Pin 45	GND	GND	Pin 46	N/C	N/C
Pin 47	REFCLKP0	N/C	Pin 48	N/C	N/C
Pin 49	REFCLKN0	N/C	Pin 50	SUSCLK (32KHz)	SUSCLK (32KHz)
Pin 51	GND	GND	Pin 52	PERST0#	N/C
Pin 53	CLKREQ0#	N/C	Pin 54	BT_EN (W_DISABLE2#)	BT_EN (W_DISABLE2#)
Pin 55	PEWAKE0#	N/C	Pin 56	WLAN_EN (W_DISABLE2#)	WLAN_EN (W_DISABLE2#)
Pin 57	GND	GND	Pin 58	N/C	N/C
Pin 59	N/C	WT_D1N	Pin 60	N/C	N/C
Pin 61	N/C	WT_D1P	Pin 62	N/C	N/C
Pin 63	GND	GND	Pin 64	Resever	REFCLK0(38.4MKz)
Pin 65	N/C	WT_D0N	Pin 66	N/C	N/C
Pin 67	N/C	WT_D0P	Pin 68	N/C	N/C
Pin 69	GND	GND	Pin 70	N/C	N/C
Pin 71	N/C	WT_CLKN	Pin 72	3.3V	3.3V
Pin 73	N/C	WT_CLKP	Pin 74	3.3V	3.3V
Pin 75	GND	GND			

16JE LED

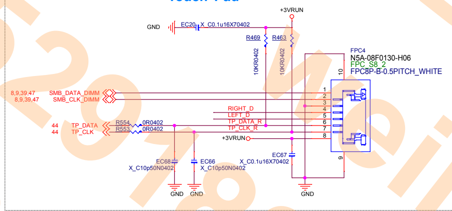




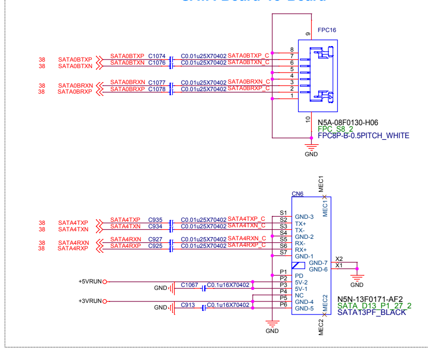
To 16JB2 (Power Board/USB2.0/Card Reader Board)



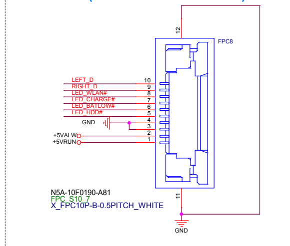
Touch Pad



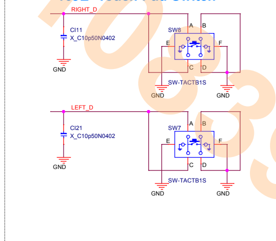
SATA Board To Board



To 179EB (LED / TP Switch Board)



16JE Touch Pad Switch



MICRO-STAR INT'L CO.,LTD.

Title: WLAN /LED/TP/BTB

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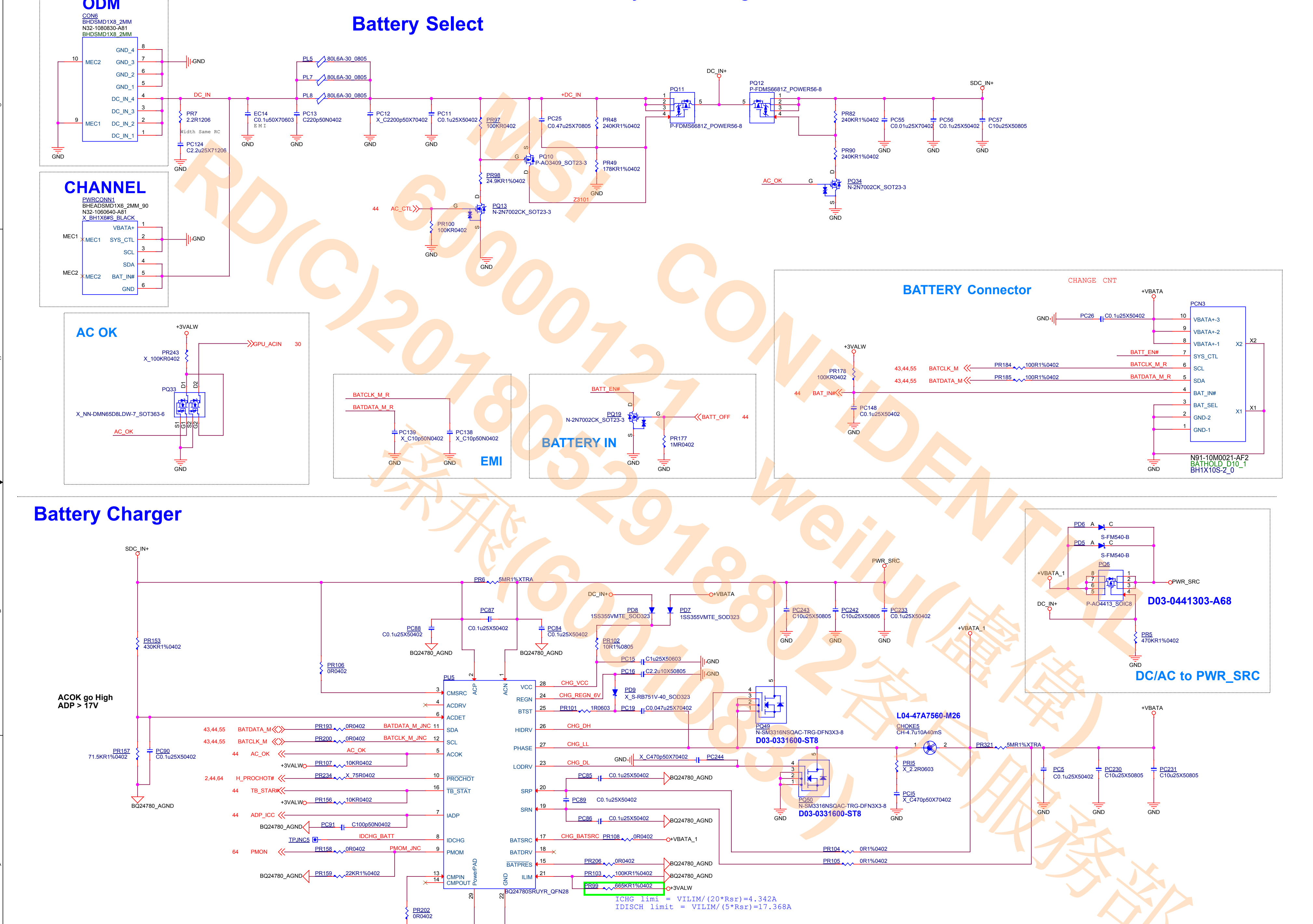
Battery Select/Charger



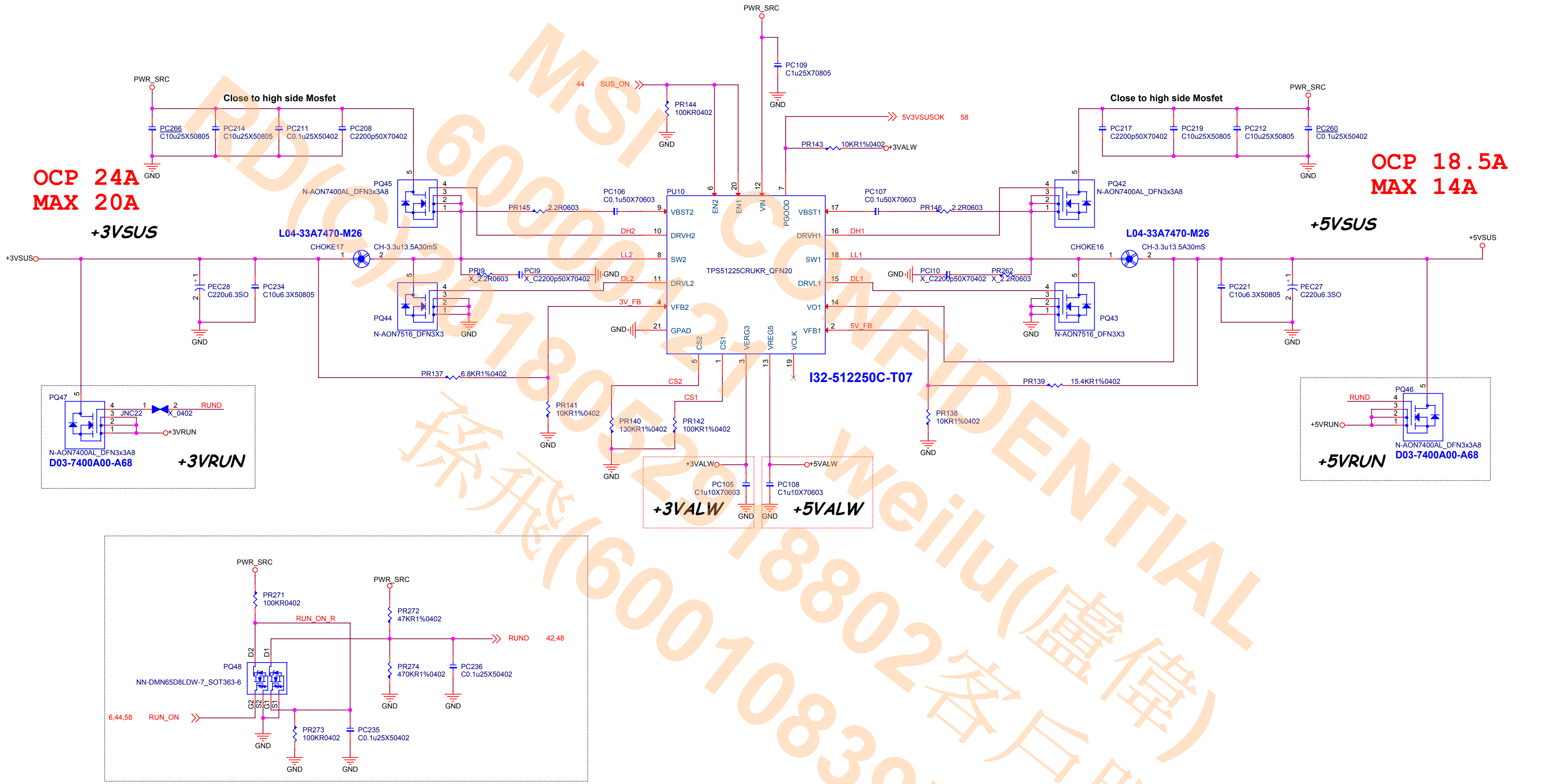
MICRO-STAR INT'L CO.,LTD.

Title: Battery Select/Charger

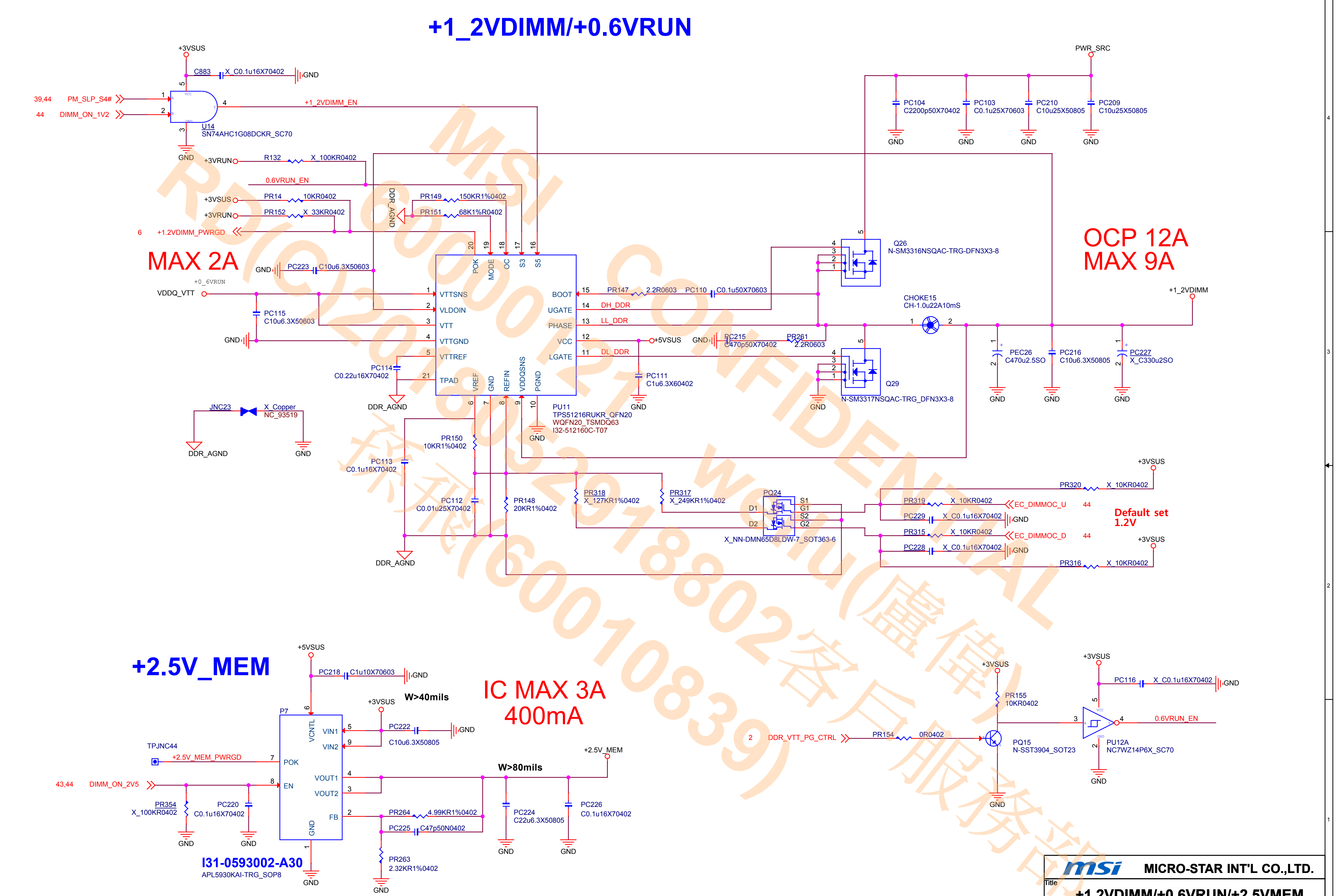
Size | Document Number: MS-16JE | Rev: 1.0

Date: Monday, December 25, 2017 | Sheet 55 of 75

System Power



MICRO-STAR INT'L CO.,LTD.		
Title: System Power		
Size	Document Number: MS-16JE	Rev 1.0
Date: Monday, December 25, 2017	Sheet 56 of 75	



MICRO-STAR INT'L CO.,LTD.

Title	+1.2VDIMM/+0.6VRUN/+2.5VMEM
Size / Document Number	MS-16JE
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Date:	Monday, December 25, 2017
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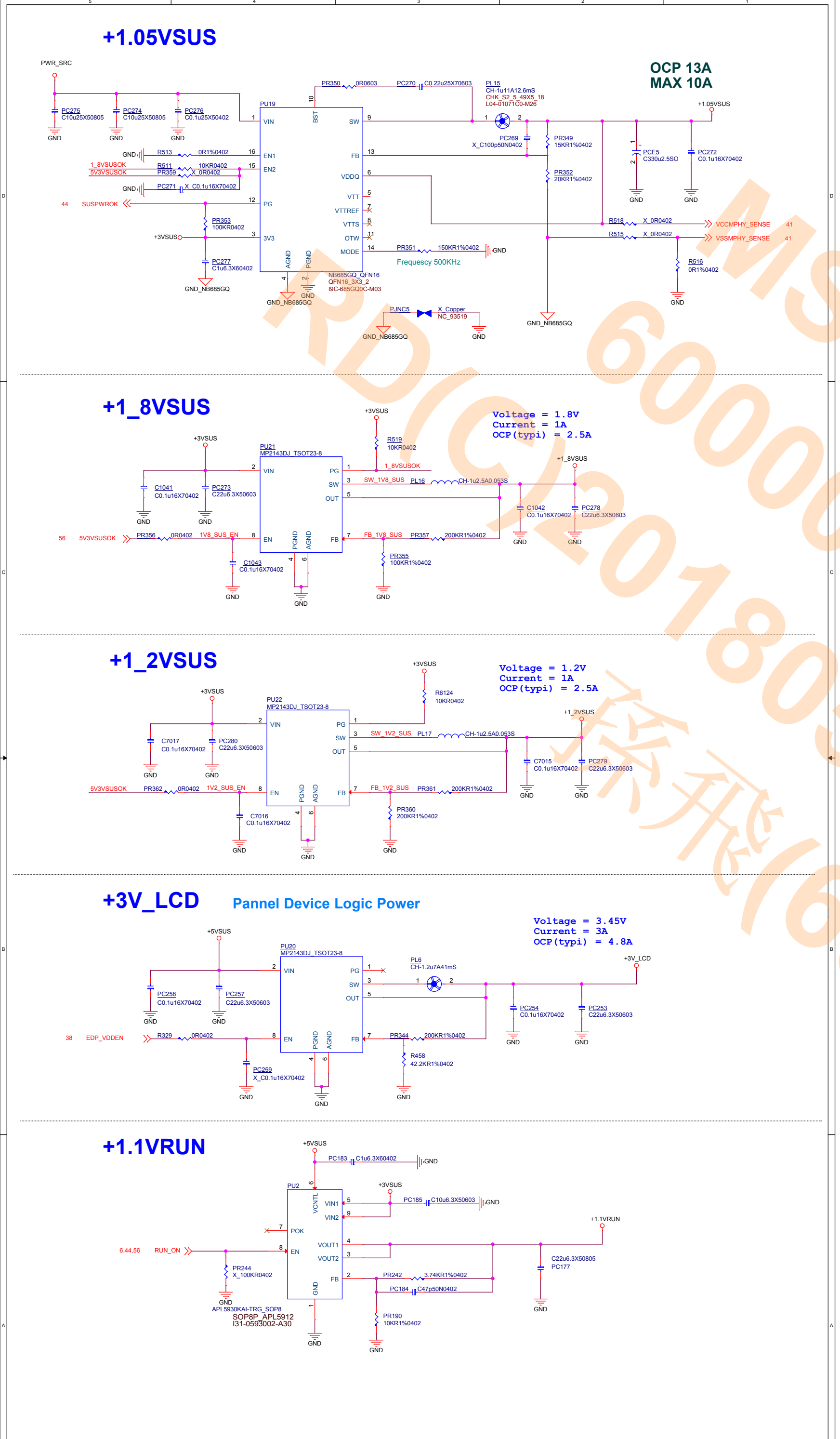
+1.05VSUS
OCP 13A
MAX 10A
PWR_SRC
PU19
NB685GQ_QFN16
QFN16_3X3_2
I9C-685GQ0C-M03
Frequency 500KHz
VCCMPHY_SENSE
VSSMPHY_SENSE
SUSPWROK
GND_NB685GQ
+1_8VSUS
Voltage = 1.8V
Current = 1A
OCP(typi) = 2.5A
PU21
MP2143DJ_TSOT23-8
1_8VSUSOK
SW_1V8_SUS
FB_1V8_SUS
1V8_SUS_EN
5V3VSUSOK
+1_2VSUS
Voltage = 1.2V
Current = 1A
OCP(typi) = 2.5A
PU22
MP2143DJ_TSOT23-8
SW_1V2_SUS
FB_1V2_SUS
1V2_SUS_EN
+3V_LCD
Pannel Device Logic Power
Voltage = 3.45V
Current = 3A
OCP(typi) = 4.8A
PU20
MP2143DJ_TSOT23-8
EDP_VDDEN
+1.1VRUN
PU2
APL5930KAI-TRG_SOP8
SOP8P_APL5912
I31-0593002-A30
RUN_ON

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

Title: +1.05V/+1.8V/+3V_LCD/+1.1V/+1.2V

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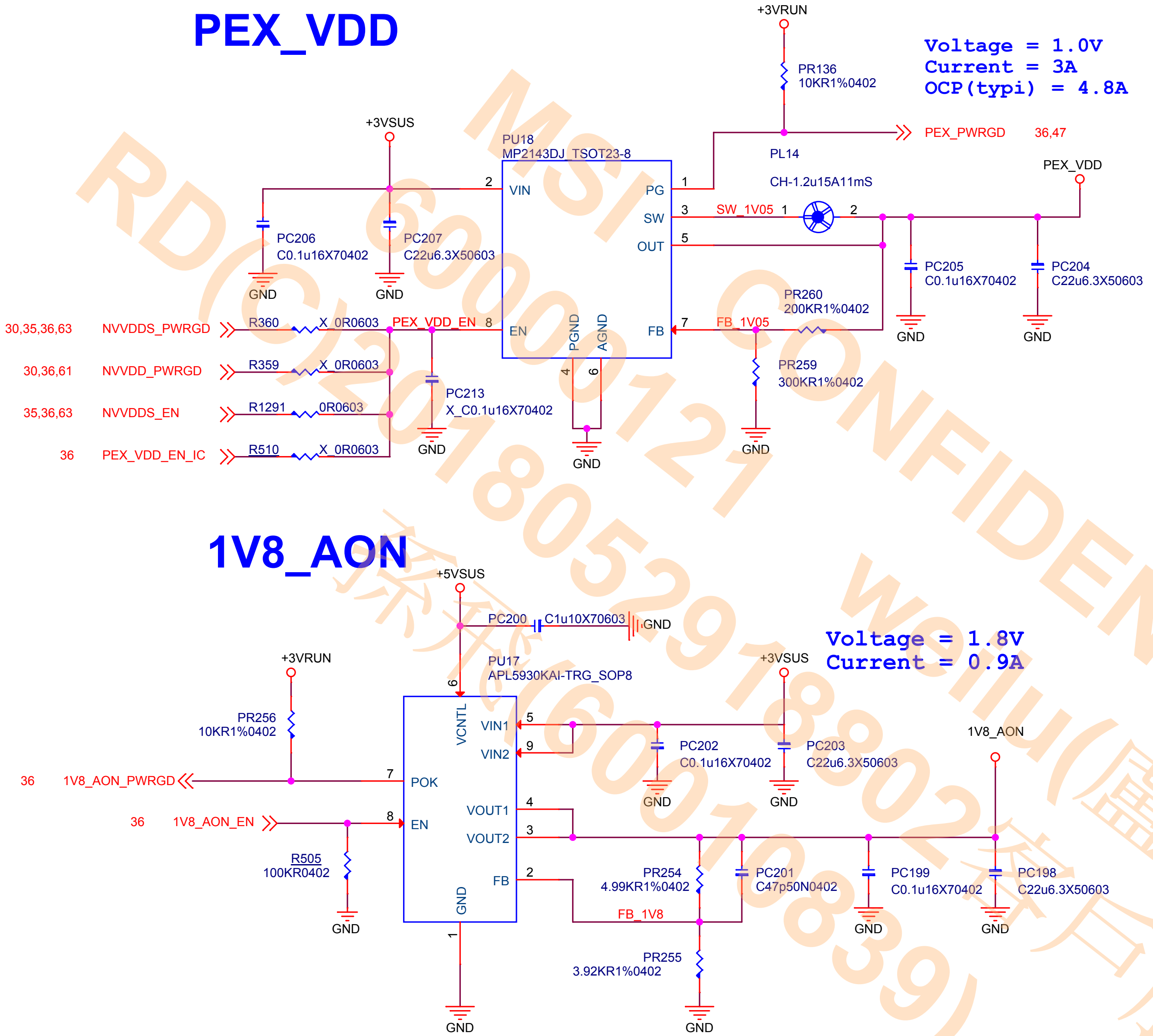
Date: Monday, December 25, 2017 | Sheet 58 of 75

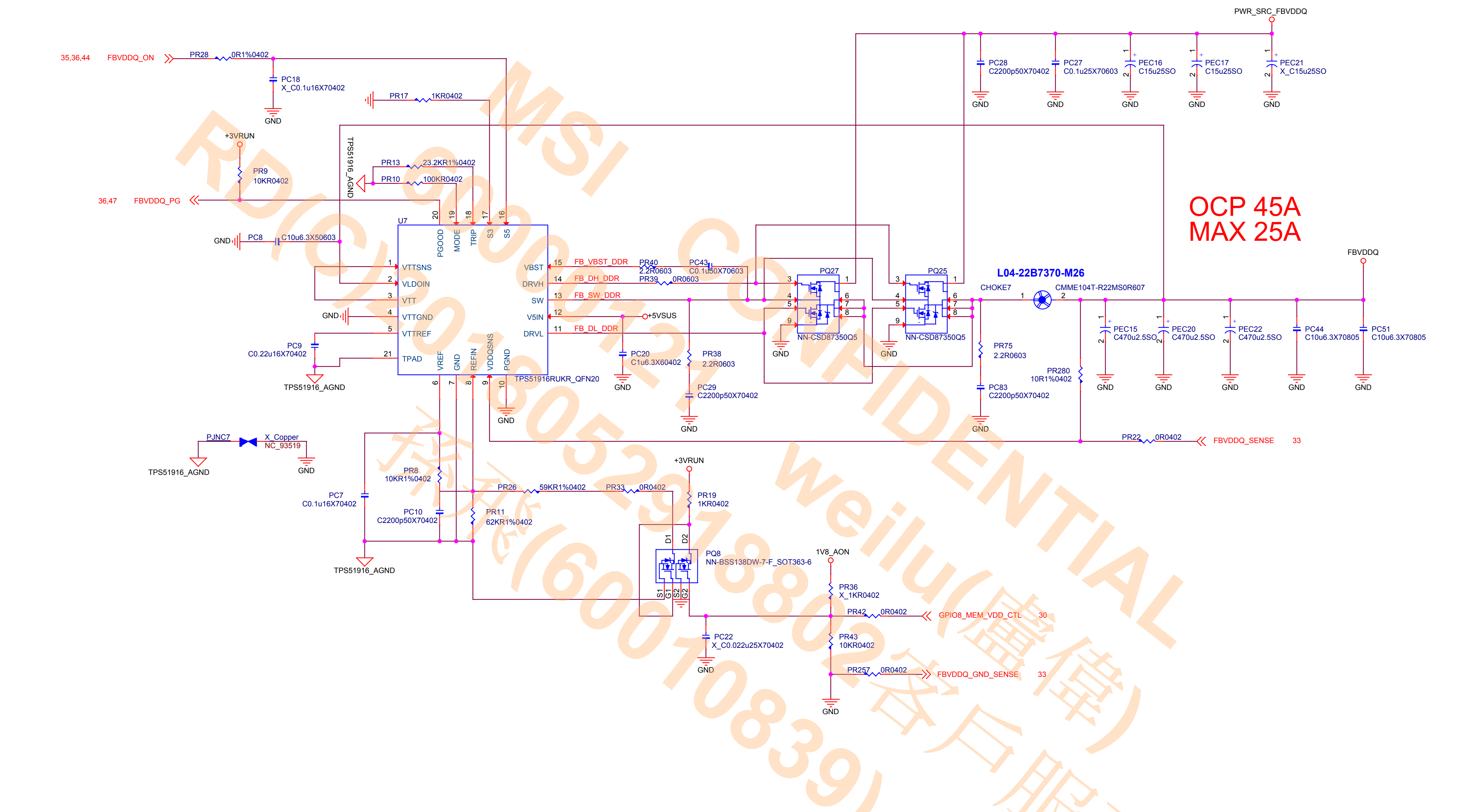


MICRO-STAR INT'L CO.,LTD.

Title: **PEX_VDD / 1V8_AON**

Size | Document Number: **MS-16JE** | Rev **1.0**

Date: Monday, December 25, 2017 | Sheet 59 of 75



MICRO-STAR INT'L CO.,LTD.

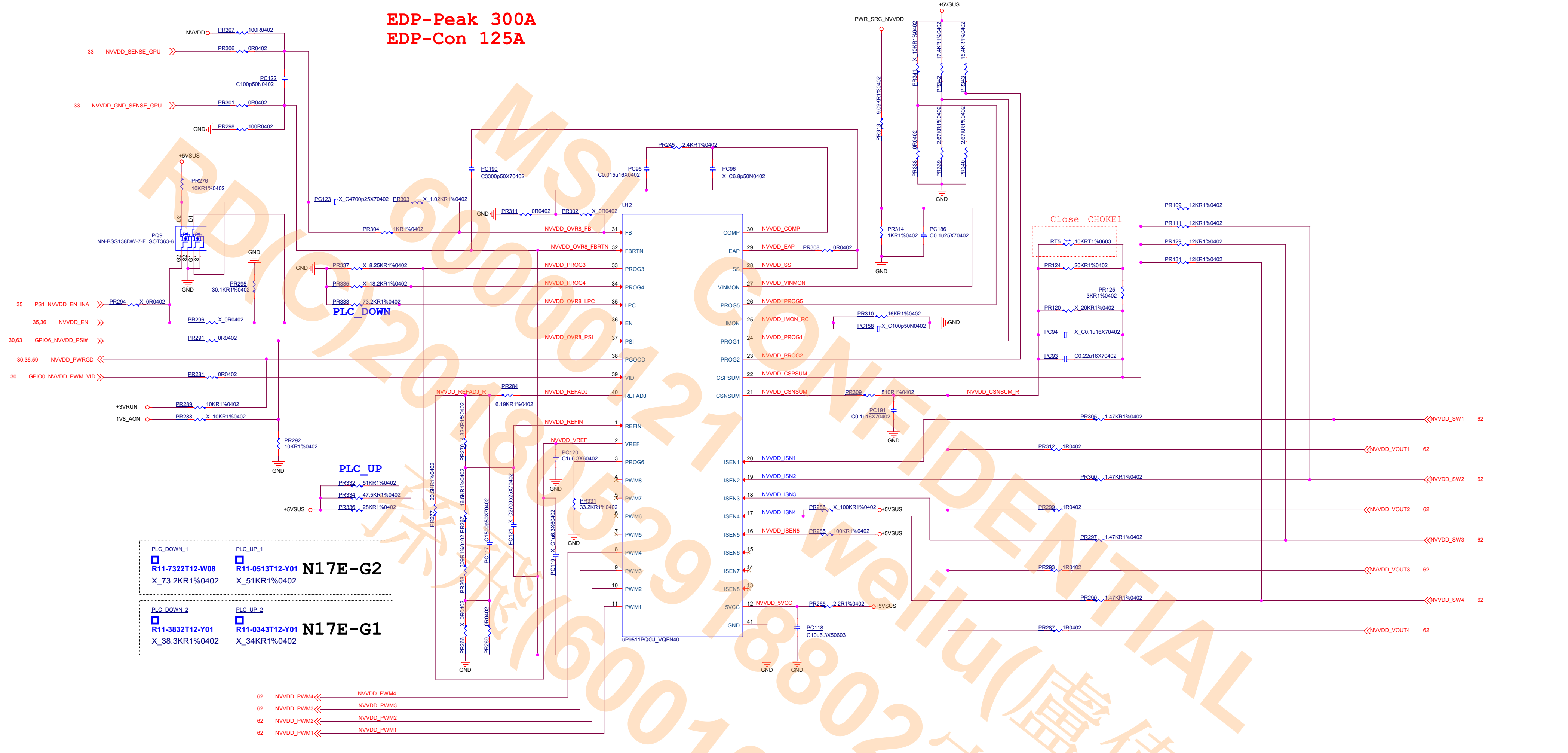
Title: FBVDDQ

Size | Document Number: MS-16JE | Rev 1.0

Date: | Sheet 60 of 75

NVVDD Power Controller UP9511

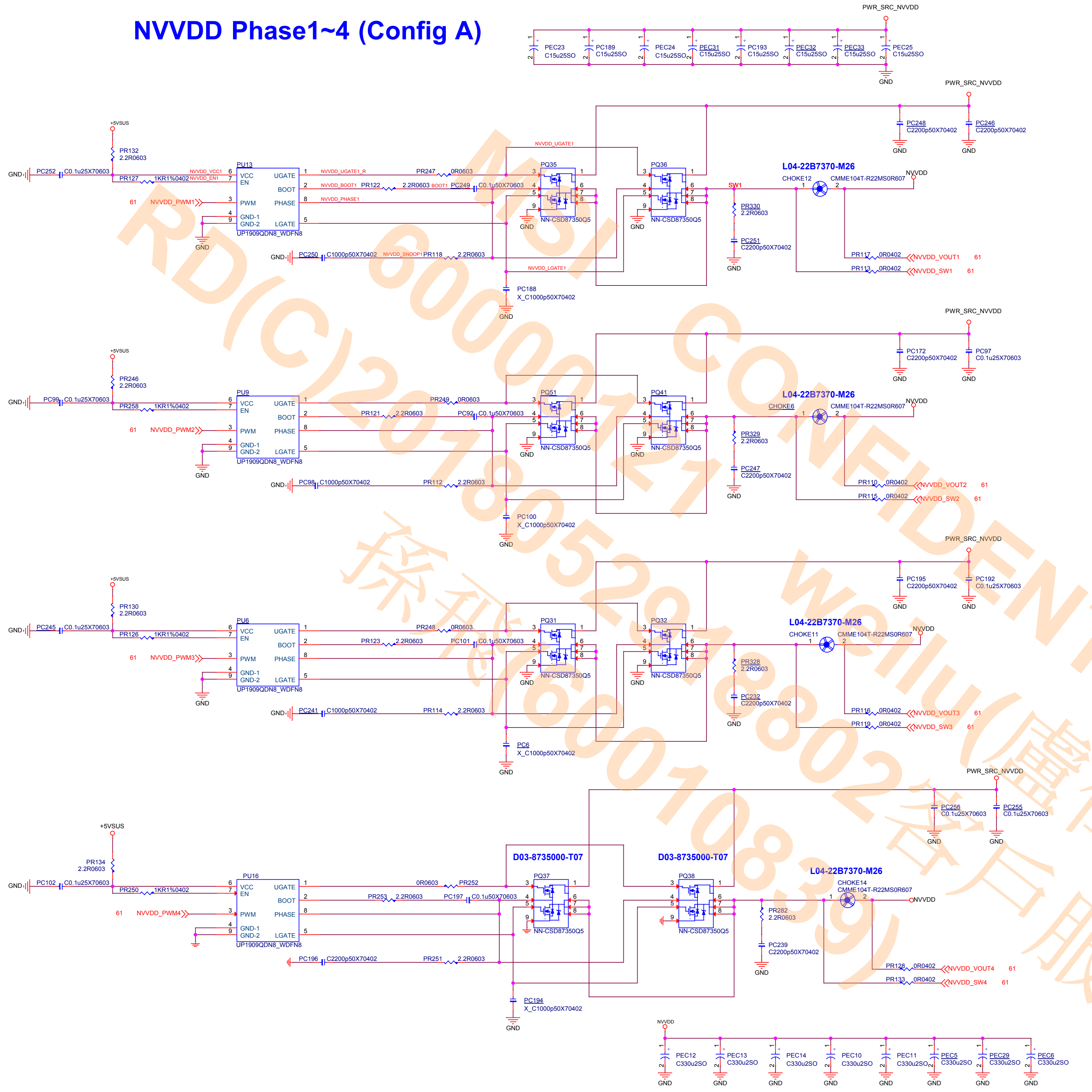
EDP-Peak 300A
EDP-Con 125A



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

Title	NVVDD PWM IC (UP9511)	
Size	Document Number: MS-16JE	Rev: 1.0
Date:	Sheet 61 of 75	

NVVDD Phase1~4 (Config A)



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

Title: NVVDD phase1~4

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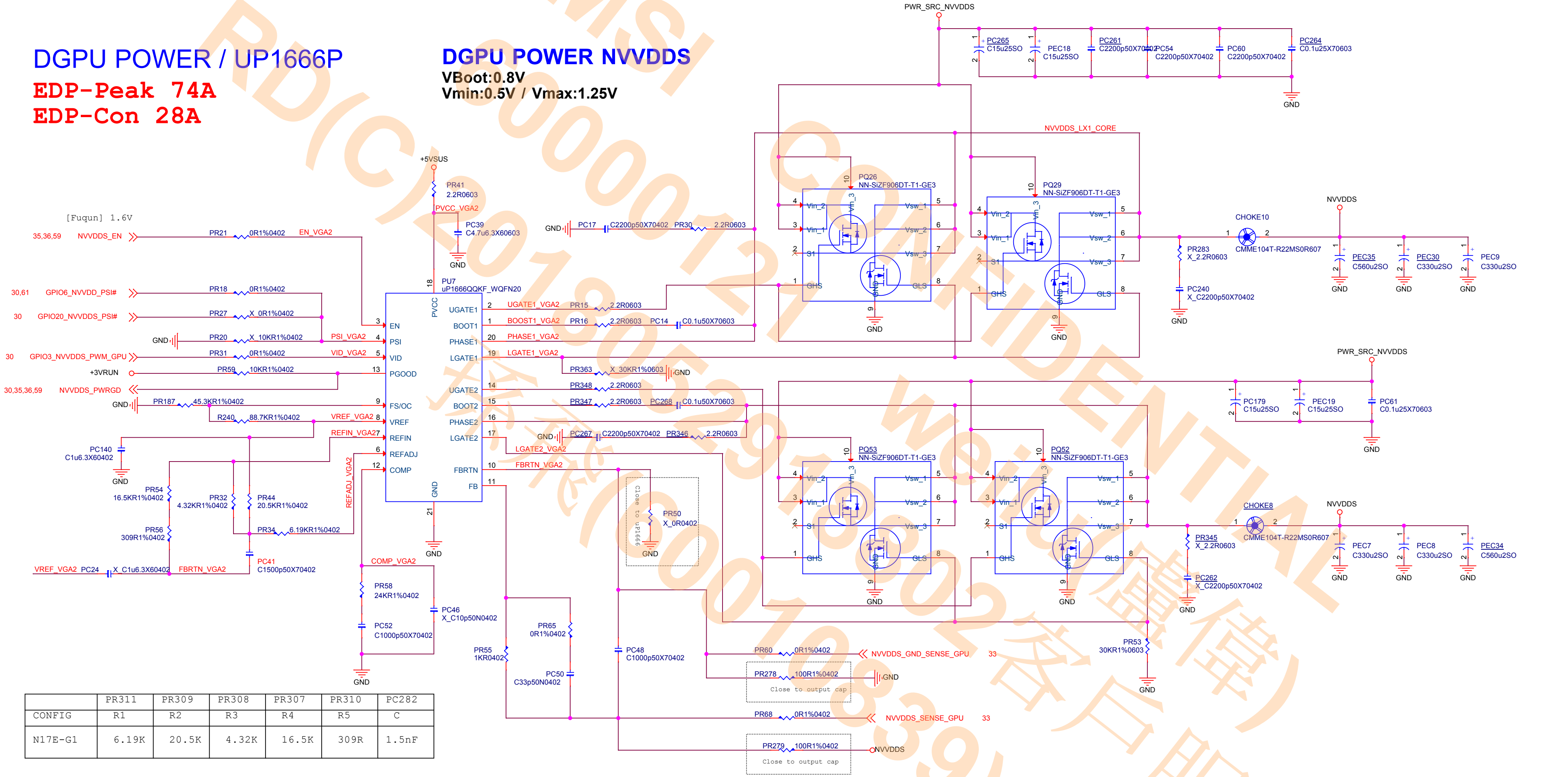
Date: | Sheet 62 of 75

DGPU POWER / UP1666P

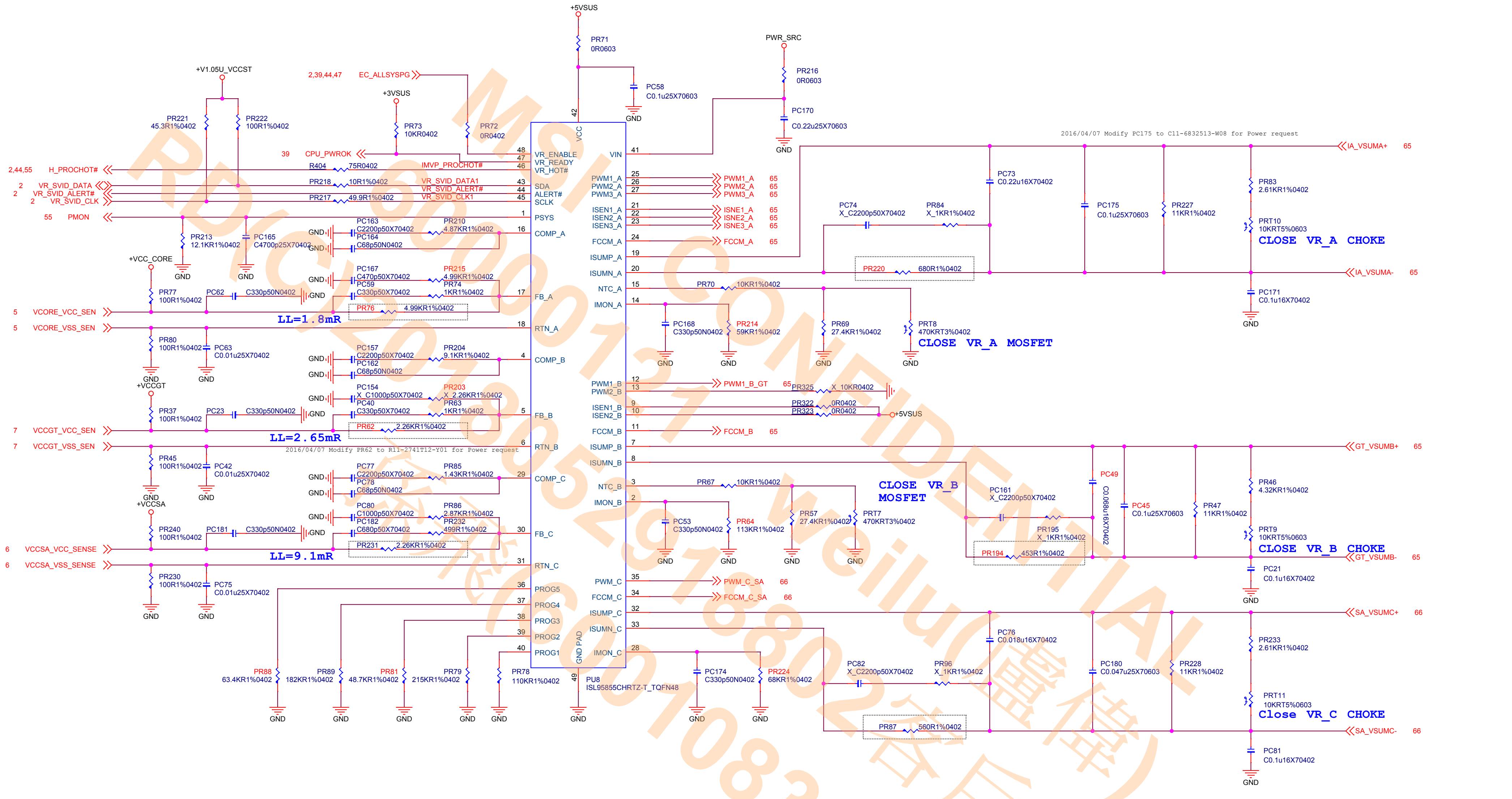
EDP-Peak 74A
EDP-Con 28A

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	1.5nF

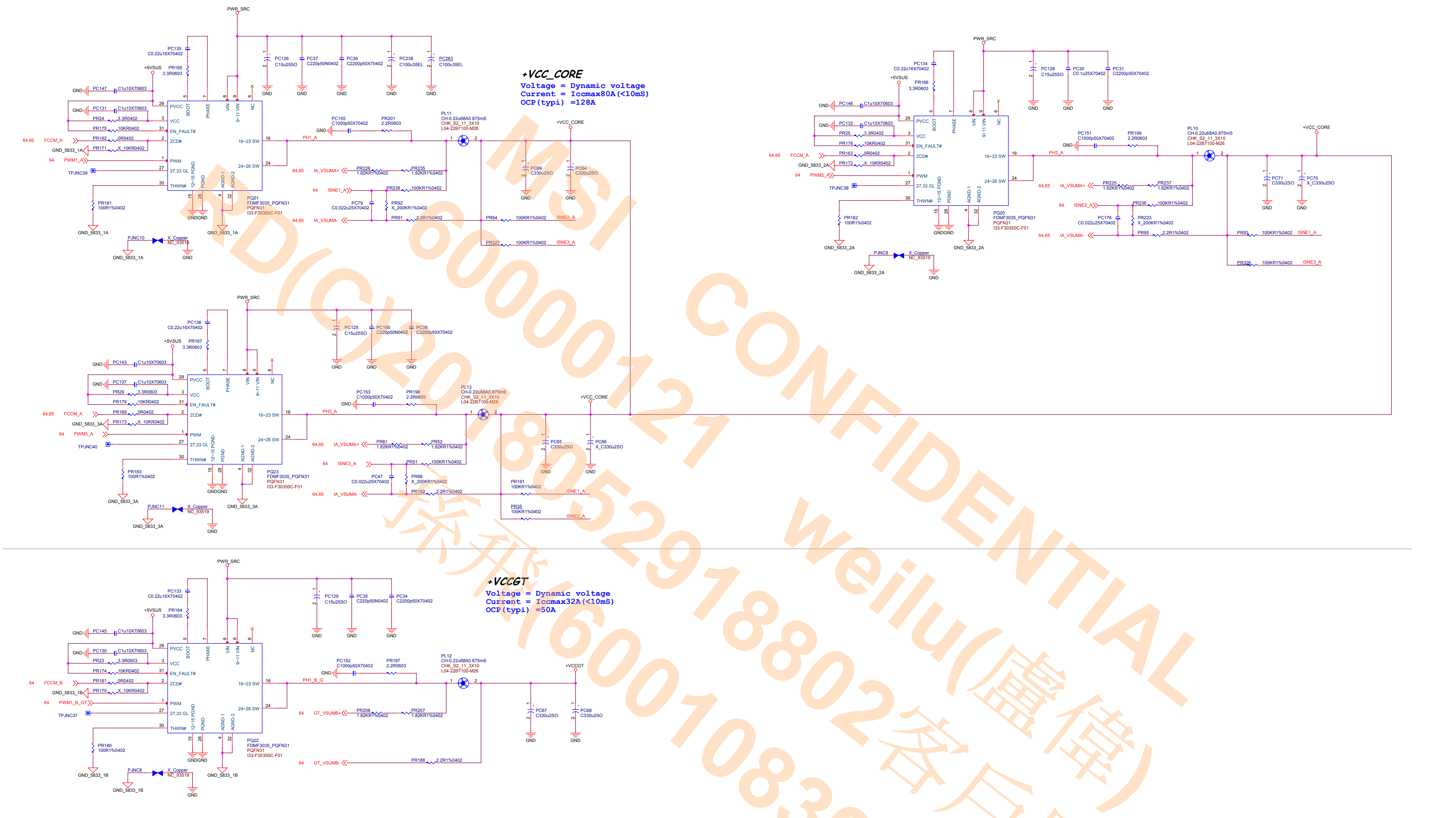


MICRO-STAR INT'L CO.,LTD.

Title: CPU Power_1(ISL95855)

Size | Document Number: MS-16JE | Rev 1.0

Date: Tuesday, December 26, 2017 | Sheet 64 of 75

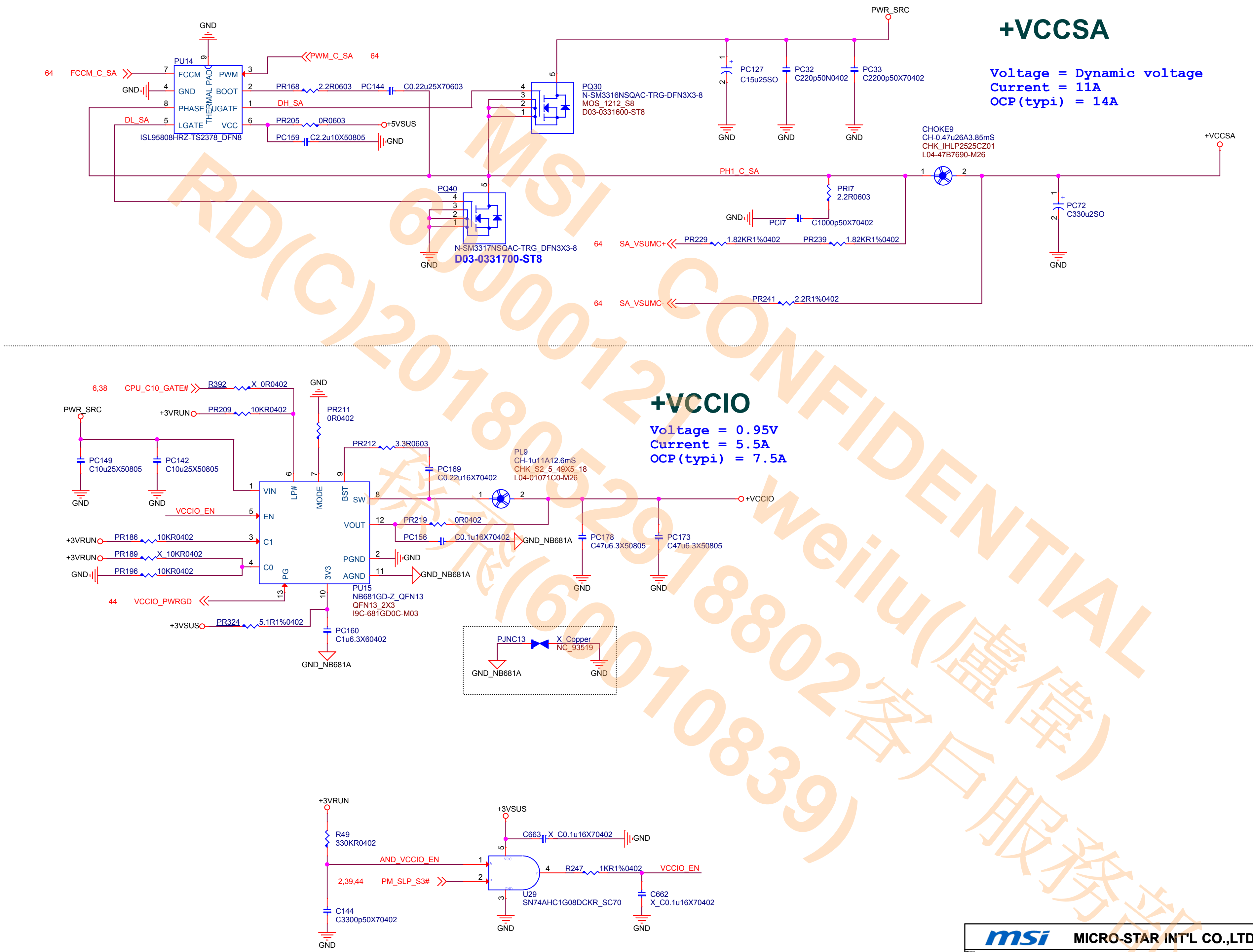


msi MICRO-STAR INT'L CO.,LTD.

Title: CPU Power_2(VCore/VCCGT)

Size | Document Number: MS-16JE | Rev 1.0

Date: Monday, December 25, 2017 | Sheet 65 of 75

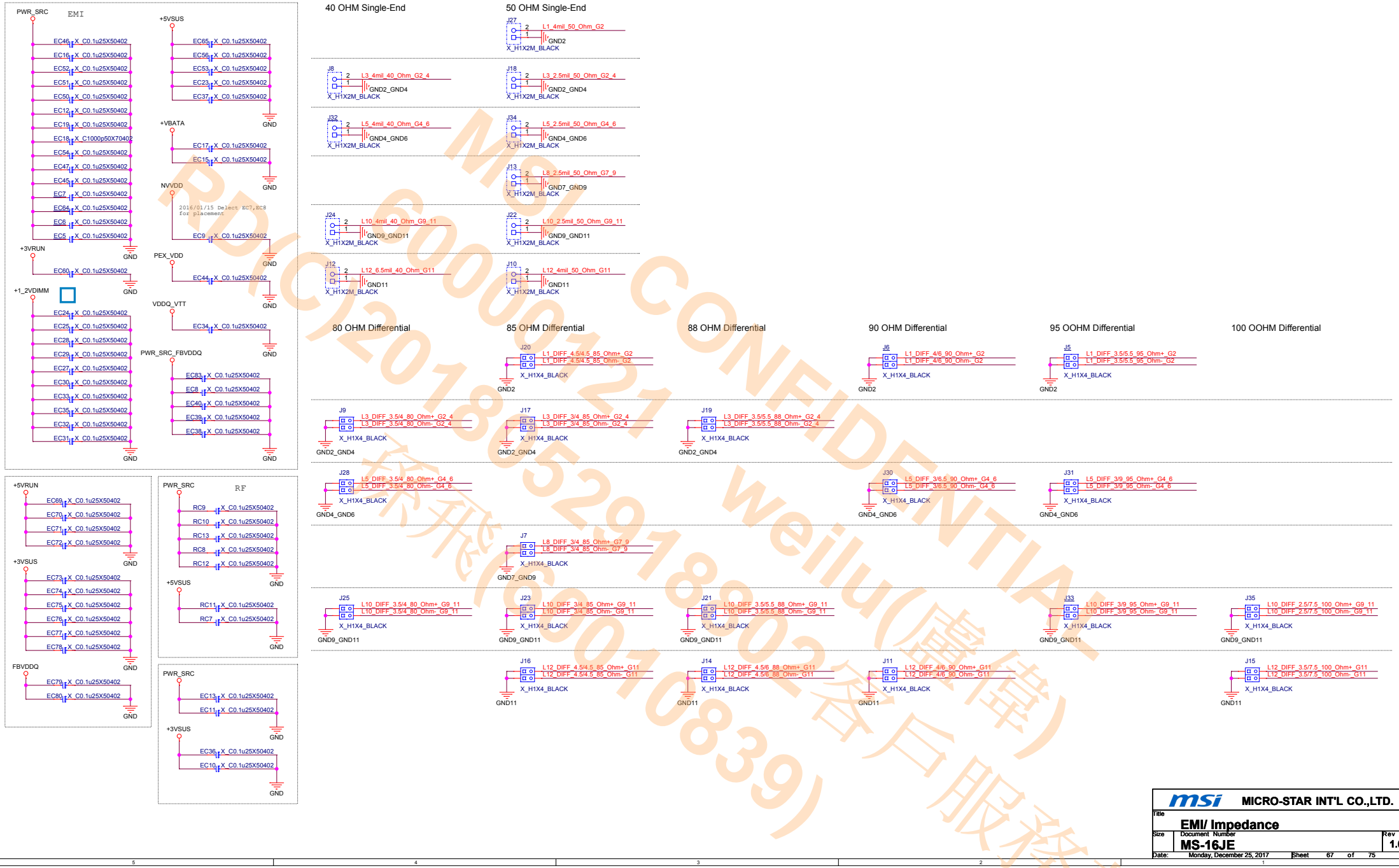


MICRO-STAR INT'L CO.,LTD.

Title: CPU Power_3(VCCSA/VCCIO)

Size	Document Number	Rev
	MS-16JE	1.0

Date: Monday, December 25, 2017 | Sheet 66 of 75


EMI
PWR_SRC
+5VSUS
+VBATA
NVVDD
2016/01/15 Delect EC7,EC8 for placement
+3VRUN
PEX_VDD
+1_2VDIMM
VDDQ_VTT
PWR_SRC_FBVDDQ
GND
RF
+5VRUN
+3VSUS
FBVDDQ
40 OHM Single-End
50 OHM Single-End
80 OHM Differential
85 OHM Differential
88 OHM Differential
90 OHM Differential
95 OOHM Differential
100 OOHM Differential
MICRO-STAR INT'L CO.,LTD.
EMI/ Impedance
MS-16JE
1.0
Monday, December 25, 2017
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CPU/GPU Holes

MCPU10 H_R276D169_PB_N — GND X_CPU_HOLE
MCPU8 H_R276D169_PB_N — GND X_CPU_HOLE
MCPU9 H_R276D169_PB_N — GND X_CPU_HOLE
MCPU7 H_R276D169_PB_N — GND X_CPU_HOLE
MGPU8 H_R185D169BR276_PB_N — GND X_GPU_HOLE
MGPU7 H_R185D169BR276_PB_N — GND X_GPU_HOLE
MGPU9 H_R185D169BR276_PB_N — GND X_GPU_HOLE
MGPU10 H_R185D169BR276_PB_N — GND X_GPU_HOLE

FM7 FM8 FM9 FM10 FM11 FM12 FM13 FM14 FM15 FM16 FM17 FM18 FM19 FM20 FM21 FM22 FM23
FM24 FM25 FM26 FM27 FM28 FM29 FM30 FM31 FM32 FM33 FM34 FM35 FM36 FM37 FM38 FM39 FM40
FM49 FM50 FM51 FM52 FM53 FM54 FM55 FM56
X_FM / X_F_PAD_NB

MH7 X_H_R197D118_PT_V3 H_R197D118_PT_V3_N — GND
MH8 X_H_R197D118_PT_V3 H_R197D118_PT_V3_N — LAN_GND
MH10 X_H_R197D118_PT_V3 H_R197D118_PT_V3_N — GND
MH13 X_H_R197D118_PT_V3 H_R197D118_PT_V3_N — GND

MH11 X_ME_SCREW HOLE H_R197D91_V8_N — GND
MH12 X_ME_SCREW HOLE H_R197D91_V8_N — GND
MH15 X_ME_SCREW HOLE H_R197D91_V8_N — GND

MH14 X_8x8 HOLES_8X8_D3MM_VIA8_N — GND
MH9 X_H_R315D118_V3_N H_R315D118_V3_N — GND

XX1 X_NPTH_80 NPTH_80
XX2 X_NPTH_80 NPTH_80
XX3 X_NPTH_80 NPTH_80
XX4 X_NPTH_80 NPTH_80
XX5 X_NPTH_80 NPTH_80
XX9 X_NPTH_80 NPTH_80
XX6 X_npth_98 npth_98
XX7 X_npth_98 npth_98
XX8 X_npth_98 npth_98
XX10 X_npth_98 npth_98

HOLE16 X_NPTH_80 NPTH_80
HOLE17 X_NPTH_80 NPTH_80
HOLE14 X_H_NR118D118_1 H_NR118D118_1
HOLE12 X_H_NR118D118_1 H_NR118D118_1
HOLE13 X_H_R197D79_PT H_R197D79_PT_N

PCB1 — PD0-16JE110-H73
PD0-16JE110-H73
Hannstar:PD0-16JE110-H73
TRIPOD: PD0-16JE110-T53

CPU/GPU BRACKET

UME3 CPU BKT — CPU BKT — **307-6JE0111-A89**
UME4 GPU BKT — GPU BKT — **307-6H20211-C22**

Only 16JE

UME7 LED SPONGE — LED SPONGE — **E2Y-6J10611-Y42**
UME8 LED SPONGE — LED SPONGE — **E2Y-6J10611-Y42**
UME17 MB MYLAR — Hide Caps Lock LED_MYLAR — **E2Y-6324111-Y42**
UME22 KB RUBBER — KeyBoard_RUBBER — **E2Y-6JE0111-Y40**
UME23 KB RUBBER — KeyBoard_RUBBER — **E2Y-6JE0211-Y40**

M.2 SSD-1 STAND OFF

H5 Spacer Support — GND — E2B-16J1010-A89 H_R201D118_PTB_N — E2B-16J1010

M.2 SSD-2 STAND OFF

H8 Spacer Support — GND — E2B-16J1010-A89 H_R201D118_PTB_N — E2B-16J1010

Only 179E

UME13 MB MYLAR — X_MB MYLAR — **E2P-7910312-G40**
UME15 SPONGE — X_SPONGE — **E2Y-7910211-G40**

Only ODM

UME24 POWER_CONN MYLAR — Power Conn_MYLAR — **E2P-0C12011-G40**

THERMAL STAND OFF

H6 Spacer Support — GND — E2B-16JC010-A89 H_R201D118_PT_N — E2B-16JC010

WLAN STAND OFF

H7 Spacer Support — GND — E2B-16J1010-A89 H_R201D118_PTB_N — E2B-16J1010

UME20 Audio_JACK SPONGE — Audio_JACK_SPONGE — **E2Y-X047411-CA7**
UME21 Audio_JACK SPONGE — Audio_JACK_SPONGE — **E2Y-X047411-CA7**
UME12 USB_CON MYLAR — MYLAR — **E2M-3570611-Y42**
UME14 HDMI/DP MYLAR — MYLAR — **E2M-3570611-Y42**

Top Spring

PAD8 X_HS-MS1011 ATE_C006_106 — GND — **E23-1011040-CA7**
PAD9 X_HS-MS1011 ATE_C006_106 — GND — **E23-1011040-CA7**
PAD10 X_HS-MS1011 ATE_C006_106 — GND — **E23-1011040-CA7**
PAD12 X_HS-MS1011 ATE_C006_106 — GND — **E23-1011040-CA7**

BOT Spring

PAD7 X_HS-MS1011 ATE_C006_106 — GND — **E23-1011040-CA7**
PAD13 X_HS-MS1011 ATE_C006_106 — GND — **E23-1011040-CA7**

UME1 HDMI Lable — HDMI ROYALTY — **Y01-RHDMI03-000**
UME2 BIOS Lable — BIOS_LABEL — **G51-N1CO041-A09**

MICRO-STAR INT'L CO.,LTD.

Title	Screw/ME	
Size	Document Number: MS-16JE	Rev: 1.0
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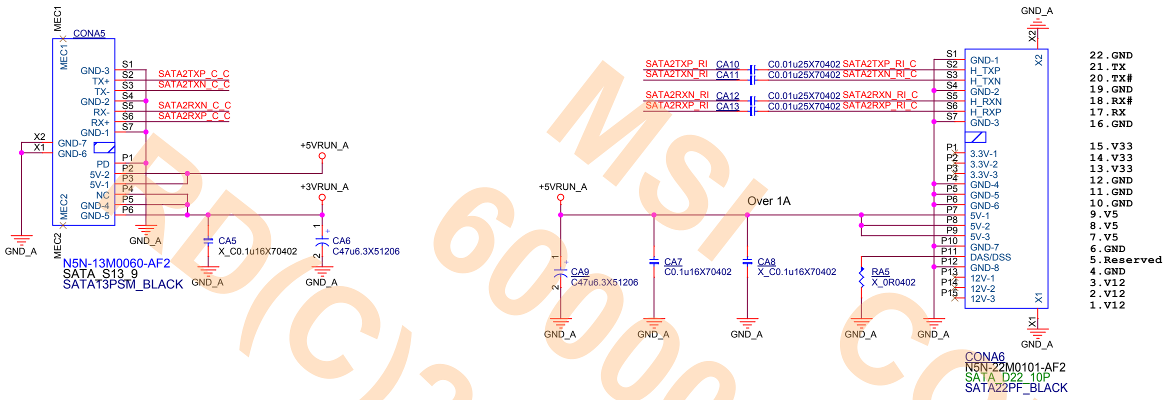
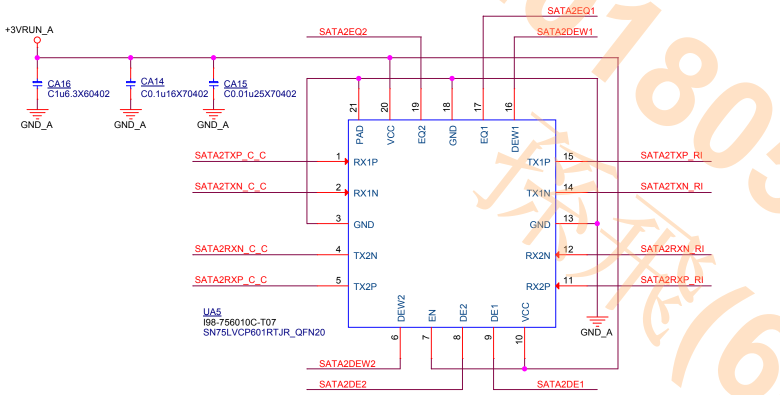
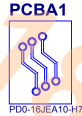
16JE-A Board (SATA HDD)



SATA ReDriver



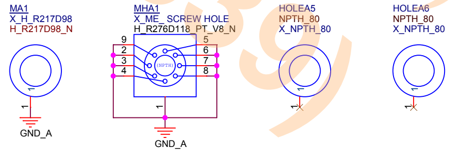


Hannstar: PD0-16JEA10-H73
TRIPOD: PD0-16JEA10-T53

TI SN75LVCP601RTJR HW Setting

DE1/DE2	CH1/CH2De-Emphasis dB(at 6Gbps)	EQ1/EQ2	CH1/CH2De-Emphasis dB(at 6Gbps)
NC(default)	-4	NC(default)	0
0	0	0	7
1	-2	1	14

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



MICRO-STAR INT'L CO.,LTD.

Title	[A] 16JE HDD BOARD	
Size Custom	Document Number MS-16JE	Rev 1.0
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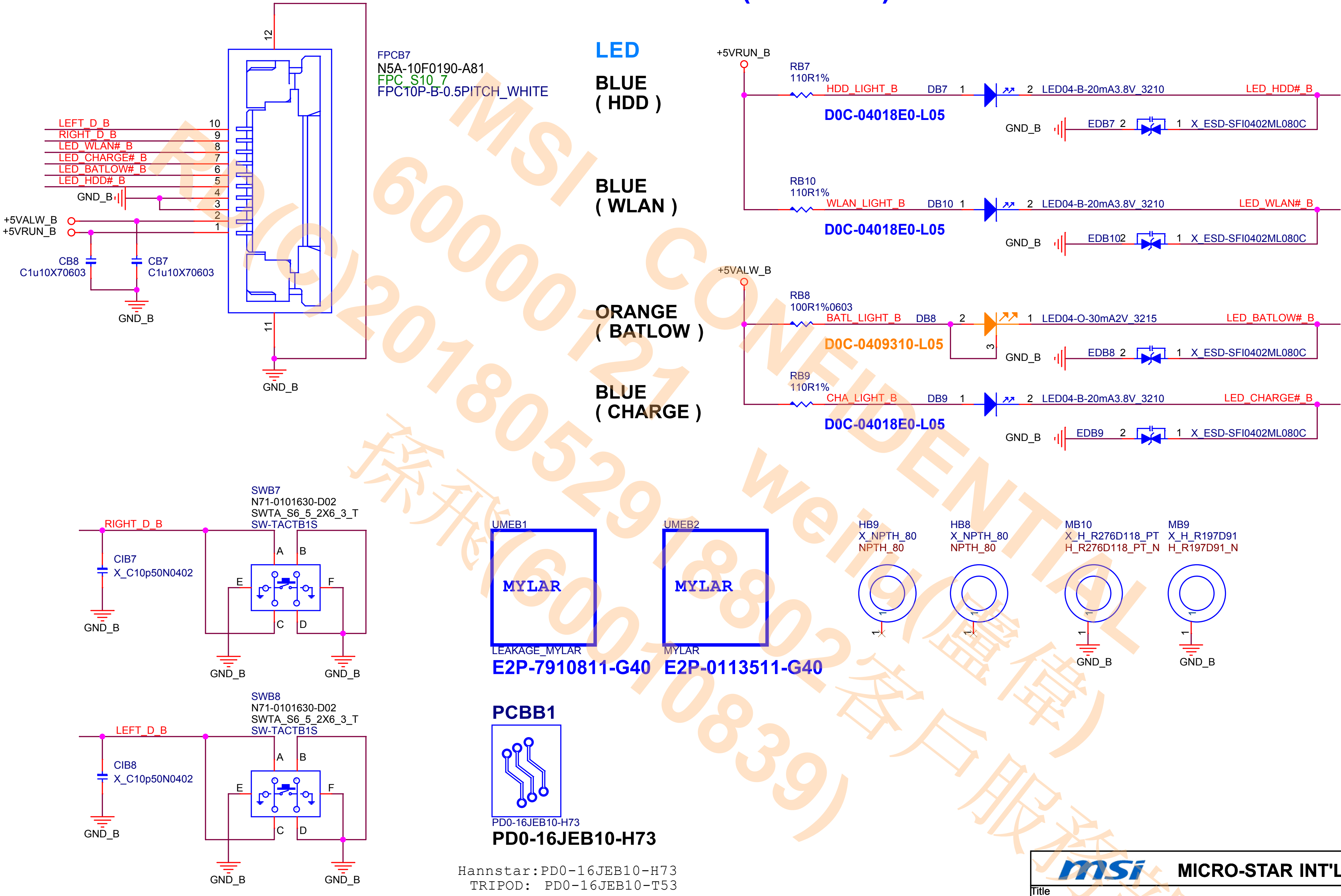
179E-B Board (LED / TP)



FPCB7
N5A-10F0190-A81
FPC_S10_7
FPC10P-B-0.5PITCH_WHITE
LEFT_D_B 10
RIGHT_D_B 9
LED_WLAN#_B 8
LED_CHARGE#_B 7
LED_BATLOW#_B 6
LED_HDD#_B 5
GND_B 4 3
+5VALW_B 2
+5VRUN_B 1
12
11
CB8
C1u10X70603
CB7
C1u10X70603
GND_B
LED
BLUE
(HDD)
BLUE
(WLAN)
ORANGE
(BATLOW)
BLUE
(CHARGE)
+5VRUN_B
RB7
110R1%
HDD_LIGHT_B
DB7 1 2 LED04-B-20mA3.8V_3210
LED_HDD#_B
D0C-04018E0-L05
EDB7 2 1 X_ESD-SFI0402ML080C
RB10
110R1%
WLAN_LIGHT_B
DB10 1 2 LED04-B-20mA3.8V_3210
LED_WLAN#_B
D0C-04018E0-L05
EDB102 1 X_ESD-SFI0402ML080C
+5VALW_B
RB8
100R1%0603
BATL_LIGHT_B
DB8 2 1 LED04-O-30mA2V_3215
LED_BATLOW#_B
D0C-0409310-L05
3
EDB8 2 1 X_ESD-SFI0402ML080C
RB9
110R1%
CHA_LIGHT_B
DB9 1 2 LED04-B-20mA3.8V_3210
LED_CHARGE#_B
D0C-04018E0-L05
EDB9 2 1 X_ESD-SFI0402ML080C
SWB7
N71-0101630-D02
SWTA_S6_5_2X6_3_T
SW-TACTB1S
RIGHT_D_B
CIB7
X_C10p50N0402
A B E F C D
SWB8
N71-0101630-D02
SWTA_S6_5_2X6_3_T
SW-TACTB1S
LEFT_D_B
CIB8
X_C10p50N0402
UMEB1
MYLAR
LEAKAGE_MYLAR
E2P-7910811-G40
UMEB2
MYLAR
MYLAR
E2P-0113511-G40
HB9
X_NPTH_80
NPTH_80
HB8
X_NPTH_80
NPTH_80
MB10
X_H_R276D118_PT
H_R276D118_PT_N
MB9
X_H_R197D91
H_R197D91_N
PCBB1
PD0-16JEB10-H73
PD0-16JEB10-H73
Hannstar:PD0-16JEB10-H73
TRIPOD: PD0-16JEB10-T53

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Title: [B] 179E LED/ TP		
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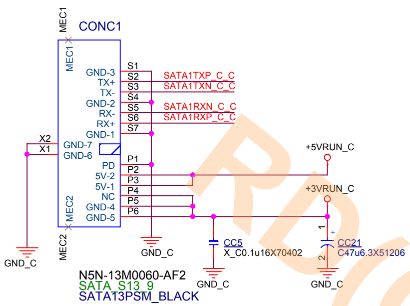
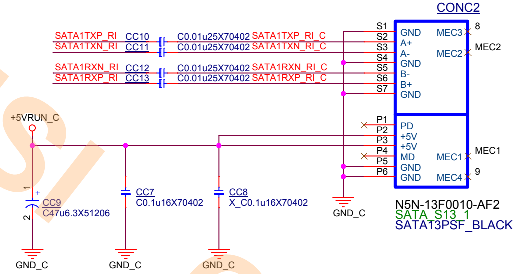
179E-C Board (ODD)

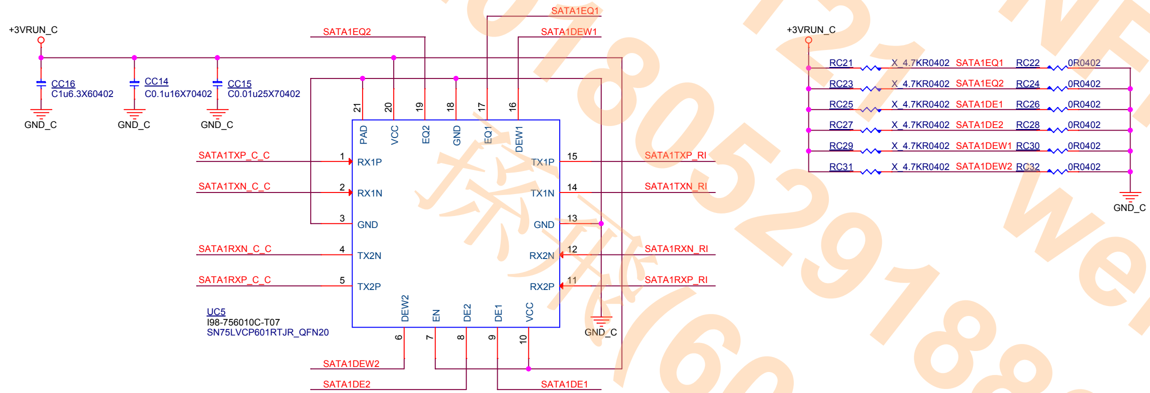
MB Side



Device Side



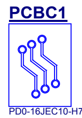
SATA ReDriver



TI SN75LVCP601RTJR HW Setting

DE1/DE2	CH1/CH2De-Emphasis dB(at 6Gbps)	EQ1/EQ2	CH1/CH2De-Emphasis dB(at 6Gbps)
NC(default)	-4	NC(default)	0
0	0	0	7
1	-2	1	14

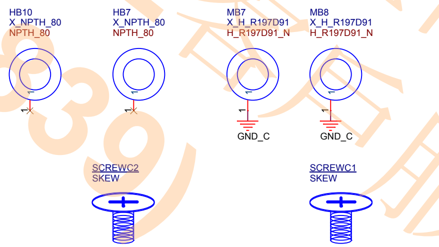
DEW1/DEW2	Device Function --> De Width for CH1/CH2
0	De-emphasis Pulse duration, short(recommended setting when linkoperates at SATA 1.5/3/6 Gbps)
1(default)	De-emphasis Pulse duration, long(recommended setting when linkoperates at SATA 1.5/3/6 Gbps)



PD0-16JEC10-H73

Hannstar:PD0-16JEC10-H73

TRIPOD: PD0-16JEC10-T53



E43-1205003-H29 E43-1205003-H29

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Title	[C]179E ODD	
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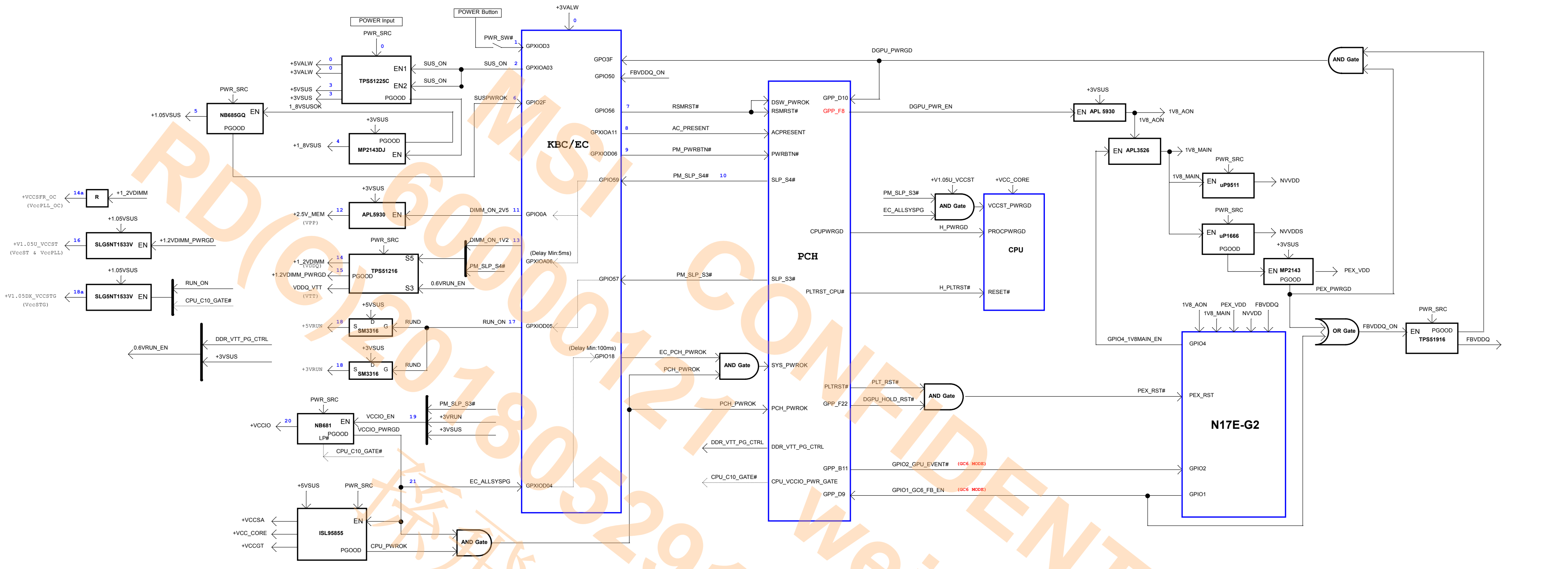
MS-16JE Power on Block Diagram



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

Title: Power on Block Diagram

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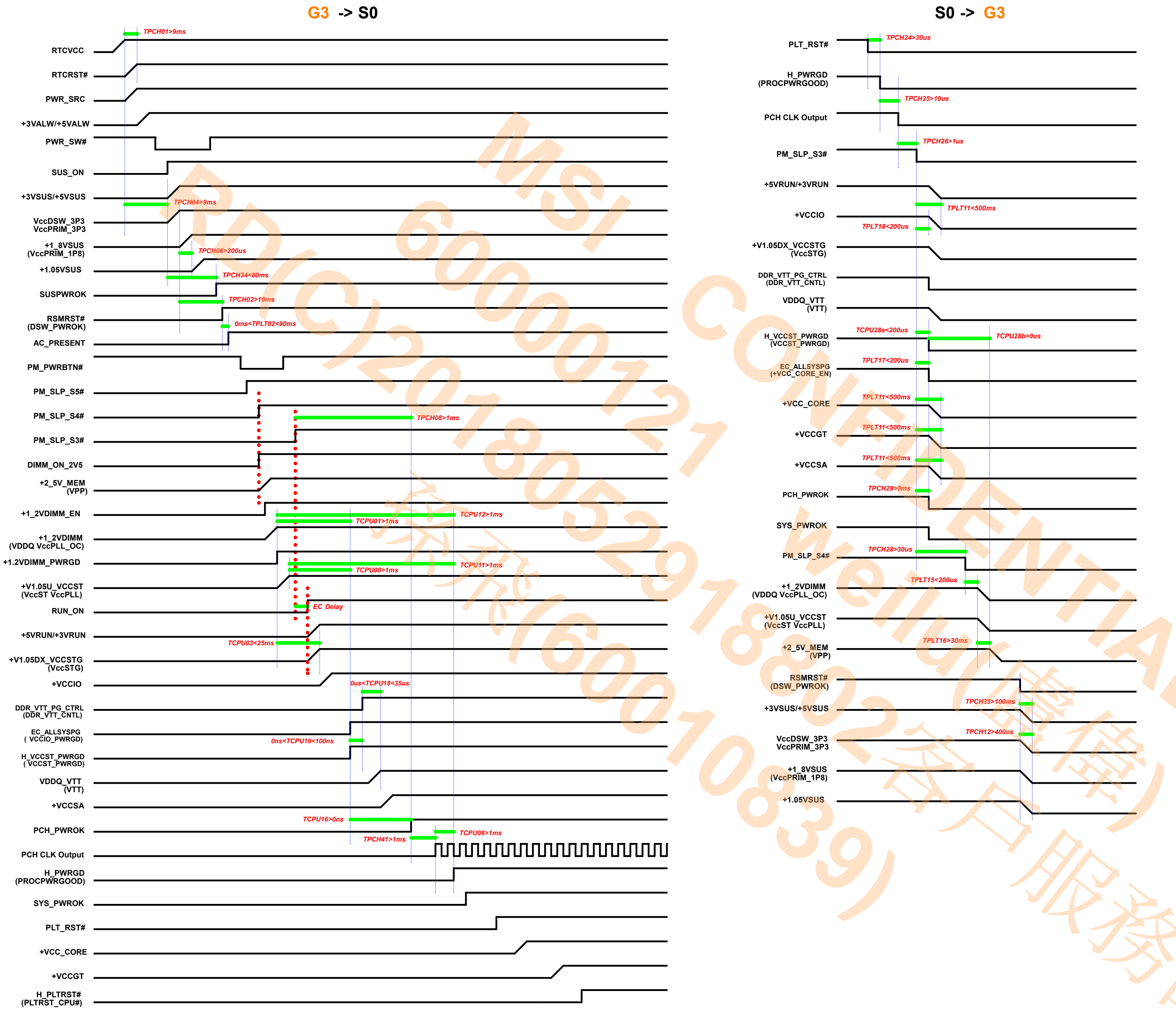

MSI MICRO-STAR INT'L CO.,LTD.

Title		
Power On/Off Sequence		
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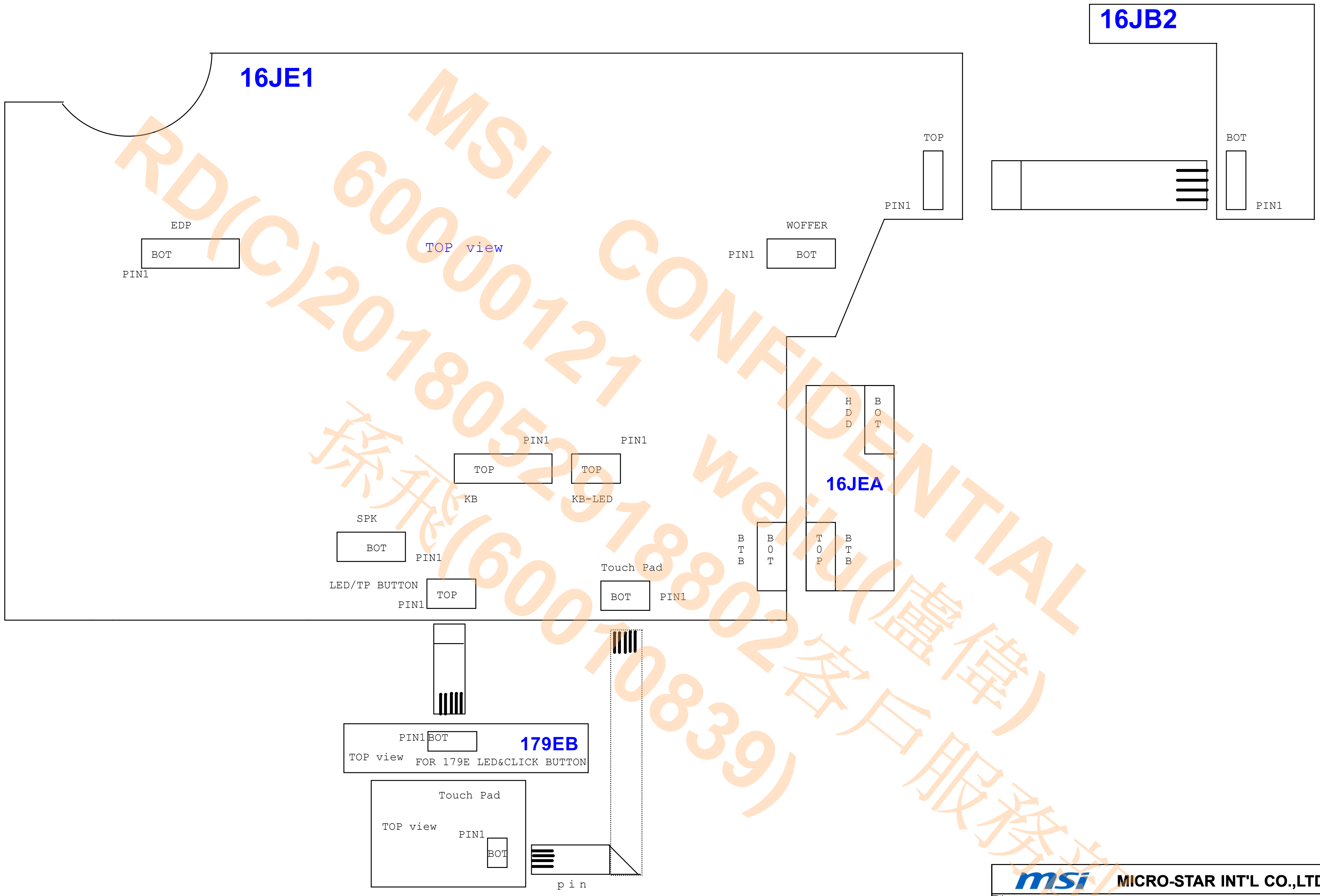

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Title	VIEW	
Size Custom	Document Number MS-16JE	Rev 1.0
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