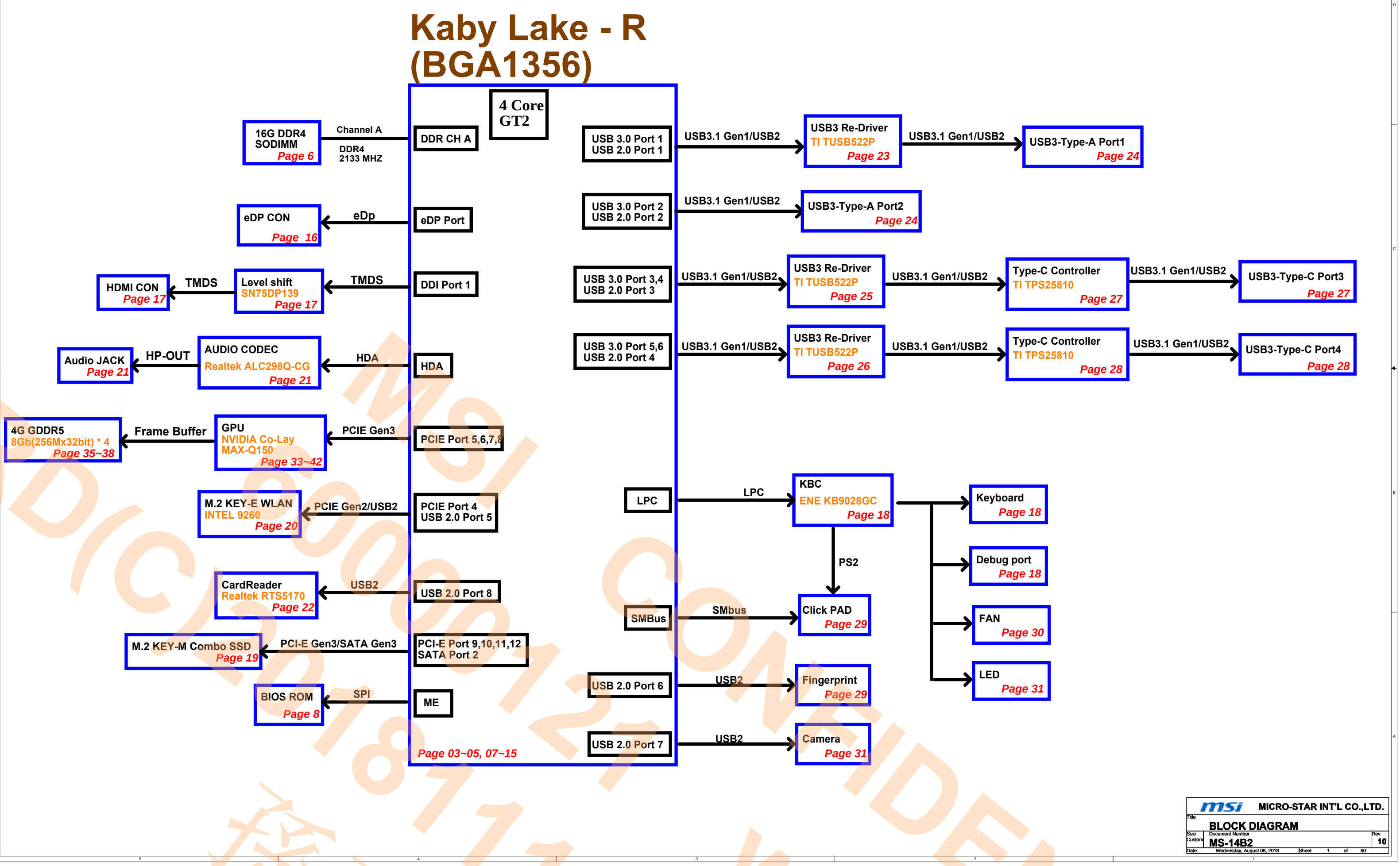
KabyLake Processor-R Platform MS-14B2 VER : 10



SCHEMATIC ANNOTATIONS AND BOARD INFORMATION

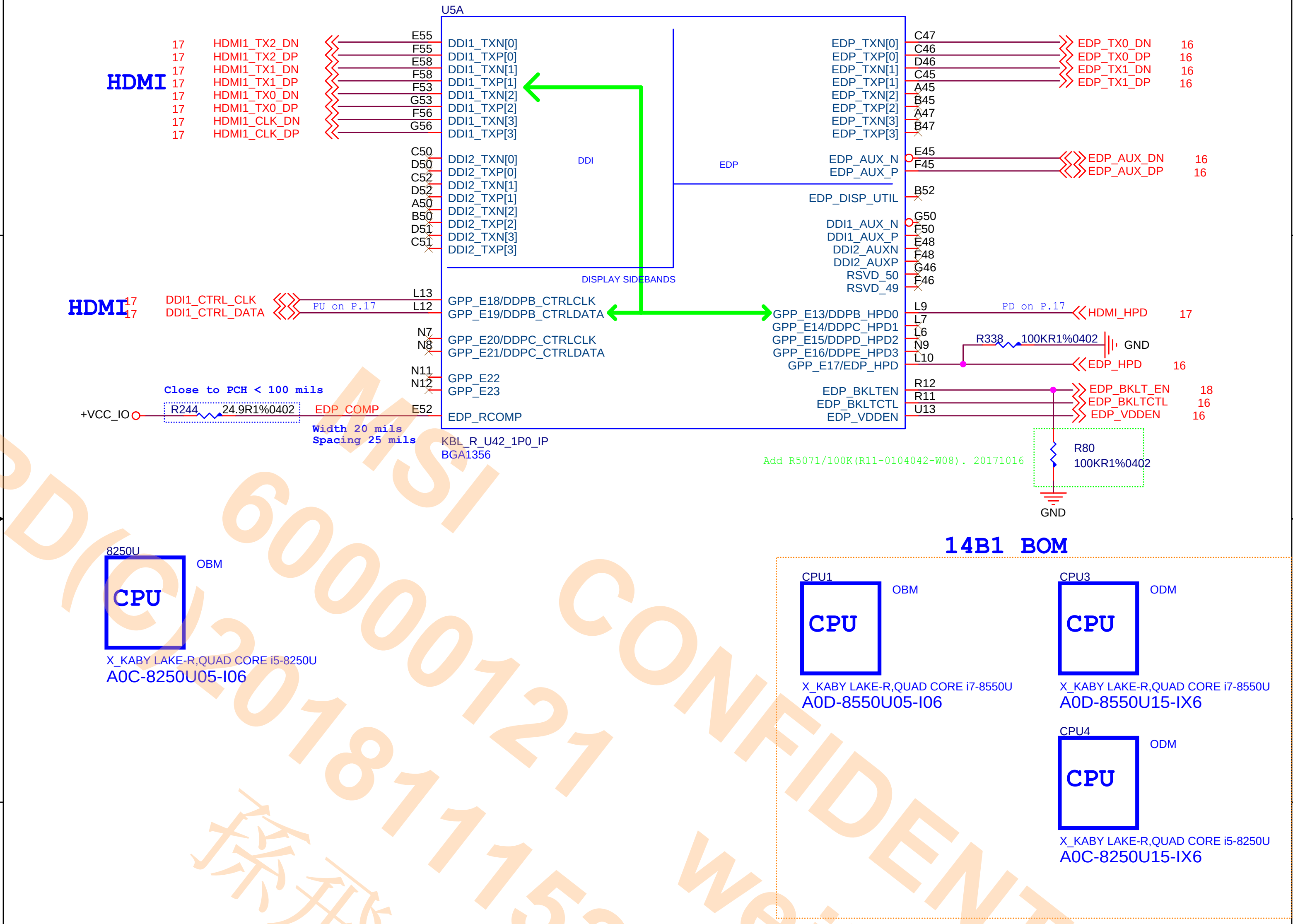
Voltage Rails

POWER STATES

Voltage	Description	Control Signal	SLP_S5#	SLP_S4#	SLP_S3#
PWR_SRC	AC ADAPTER OR BATTERY IN		HIGH	HIGH	HIGH
+5VALW	5.0V always on power rail	PWR_SRC	ON	ON	ON
+3VALW	3.3V always on power rail	PWR_SRC	ON	ON	ON
+5VSUS	5.0V power rail	SUS_ON	ON	ON	ON
+3VSUS	3.3V power rail	SUS_ON	ON	ON	ON
+1_8VSUS	1.8V power rail	3V5VSUSPWRGD	ON	ON	ON
+1VSUS	1.0V power rail	1_8VSUSPWRGD	ON	ON	ON
+2_5VMEM_VPP	2.5V power rail DDR (off in S4-S5)	DIMM_ON_VPP	OFF	ON	ON
+VCCST	1.0V power rail CPU (off in S4-S5)	DIMM_ON_VPP	OFF	ON	ON
+VCCPLL	1.0V power rail CPU (off in S4-S5)	+VCCST	OFF	ON	ON
+1_2VDIMM	1.2V power rail DDR (off in S4-S5)	DIMM_ON_VDDQ	OFF	ON	ON
+VDDQC	1.2V power rail CPU DRAM (off in S4-S5)	+1_2VDIMM	OFF	ON	ON
+VCCPLL_OC	1.2V power rail CPU (off in S4-S5)	+1_2VDIMM	OFF	ON	ON
+5VRUN	5.0V switched power rail (off in S3-S5)	RUND	OFF	OFF	ON
+3VRUN	3.3V switched power rail (off in S3-S5 / M0)	RUND	OFF	OFF	ON
+1_8VRUN	1.8V power rail AUDIO (off in S3-S5)	RUND	OFF	OFF	ON
+VCC_IO	1.0V rail for Processor & PCH (off in S3-S5)	RUND	OFF	OFF	ON
+VCCSTG	1.0V power rail CPU (off in S3-S5)	+VCC_IO	OFF	OFF	ON
+0_6VTT_RUN	0.6V DDR Termination voltage (off in S3-S5)	DDR_VTT_CTRL	OFF	OFF	ON
+VCC_SA	0.55V to 1.15V Voltage for Processor	VR_ON	OFF	OFF	ON
+VCC_CORE	0.55V to 1.5V Voltage for Processor	VR_ON	OFF	OFF	ON
+VCC_GT	0.55V to 1.52V Core Voltage for Processor	VR_ON	OFF	OFF	ON

Note: WHEN AC MODE, System turn on then +*VSUS will always keep high

S4(Suspend to Disk)
S3(Suspend to RAM)
S0(Full ON)

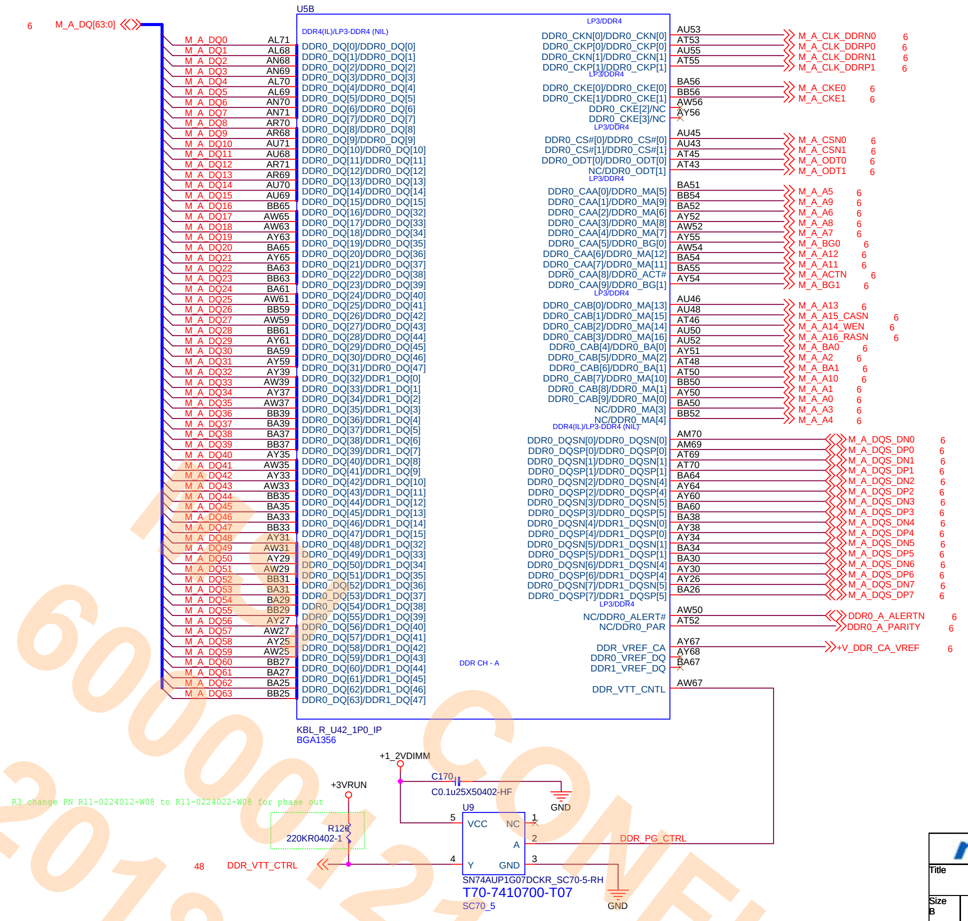


MICRO-STAR INT'L CO.,LTD.

Title: **Kabylake-R (EDP & HDMI)**

Size	Document Number	Rev
Custom	MS-14B2	10

Date: Thursday, August 02, 2018 Sheet 3 of 60



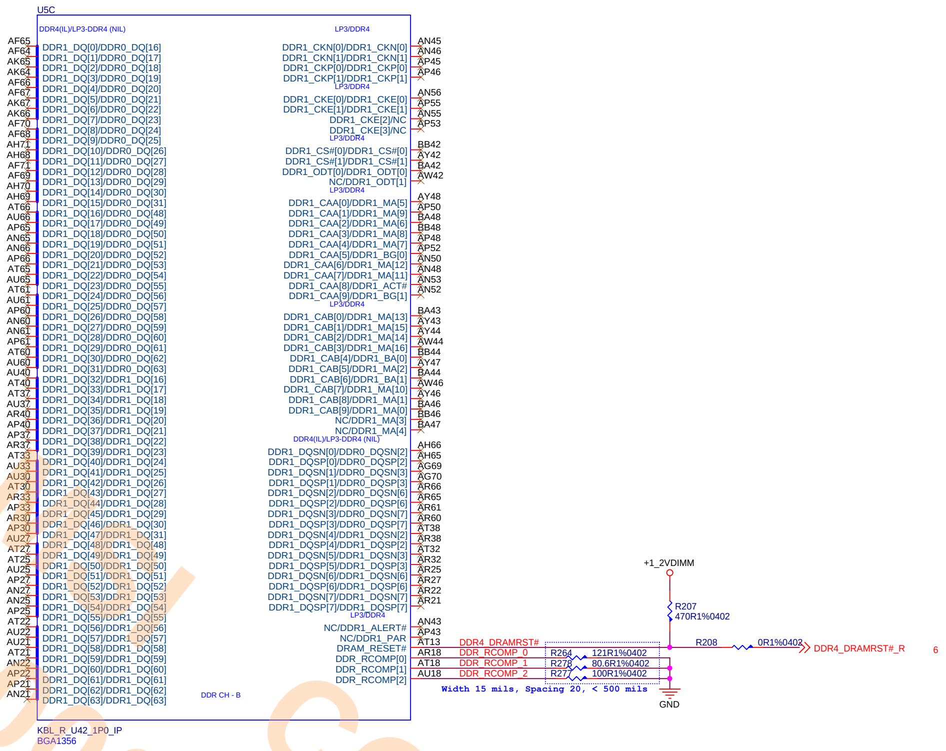
COMPRESSED IMAGE

MICRO-STAR INT'L CO.,LTD.

Title: Kabylake-R (DDR4)CHA

Size: B | Document Number: MS-14B2 | Rev: 10

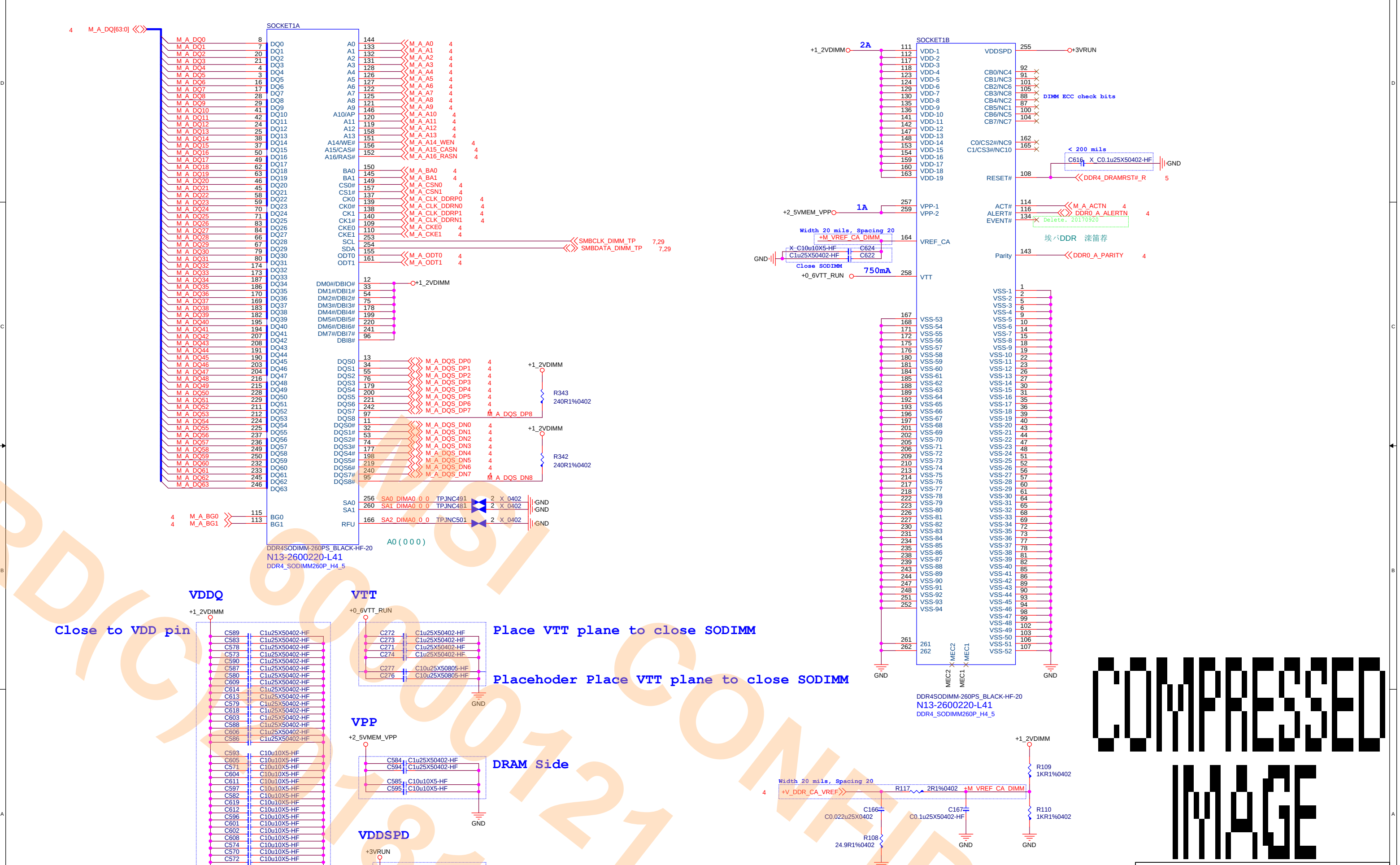
Date: Thursday, August 02, 2018 | Sheet 4 of 60



MICRO-STAR INT'L CO.,LTD.

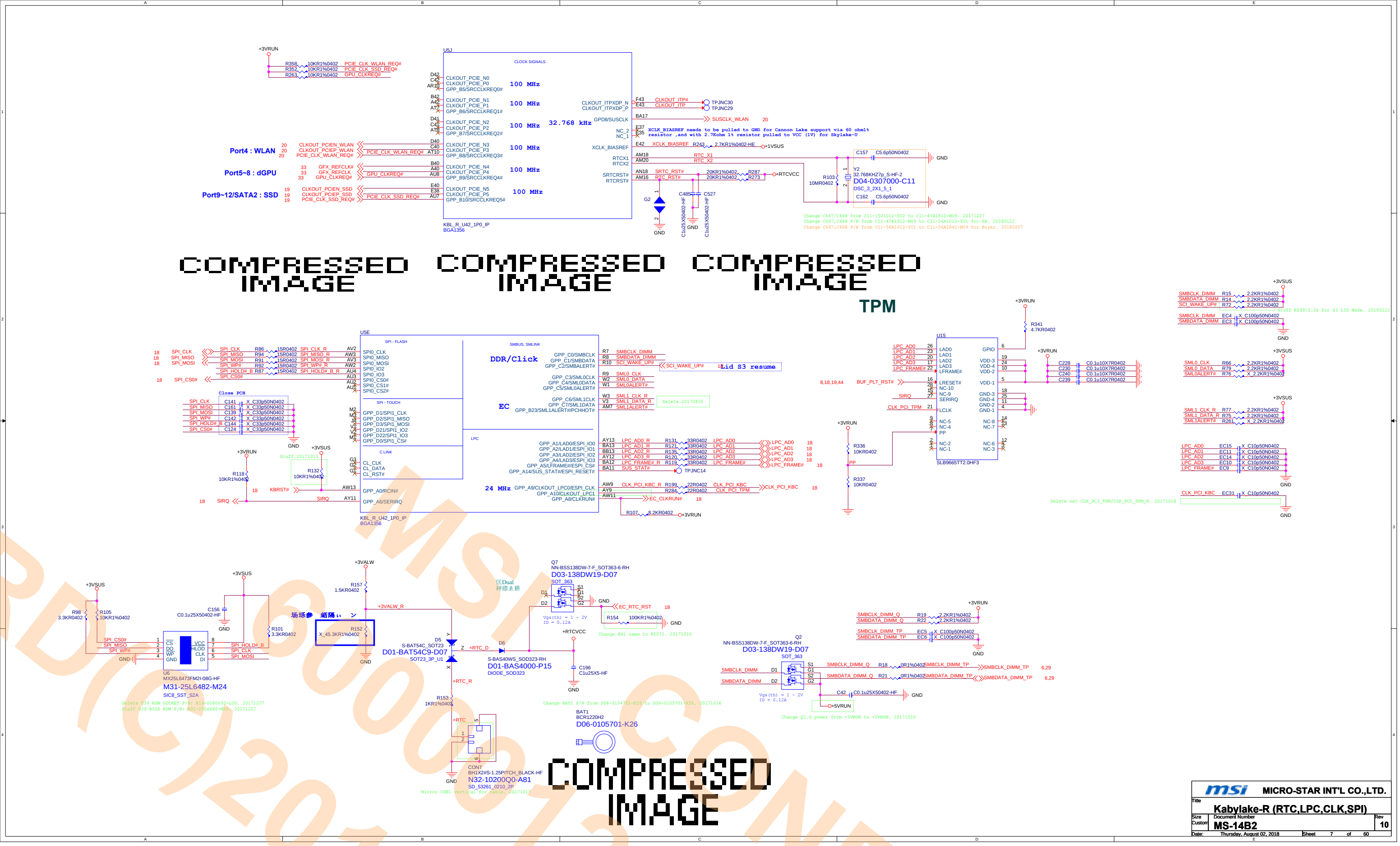
Title	Kabylake-R (DDR4)CHB	
Size B	Document Number MS-14B2	Rev 10
Date: Thursday, August 02, 2018	Sheet 5 of 60	

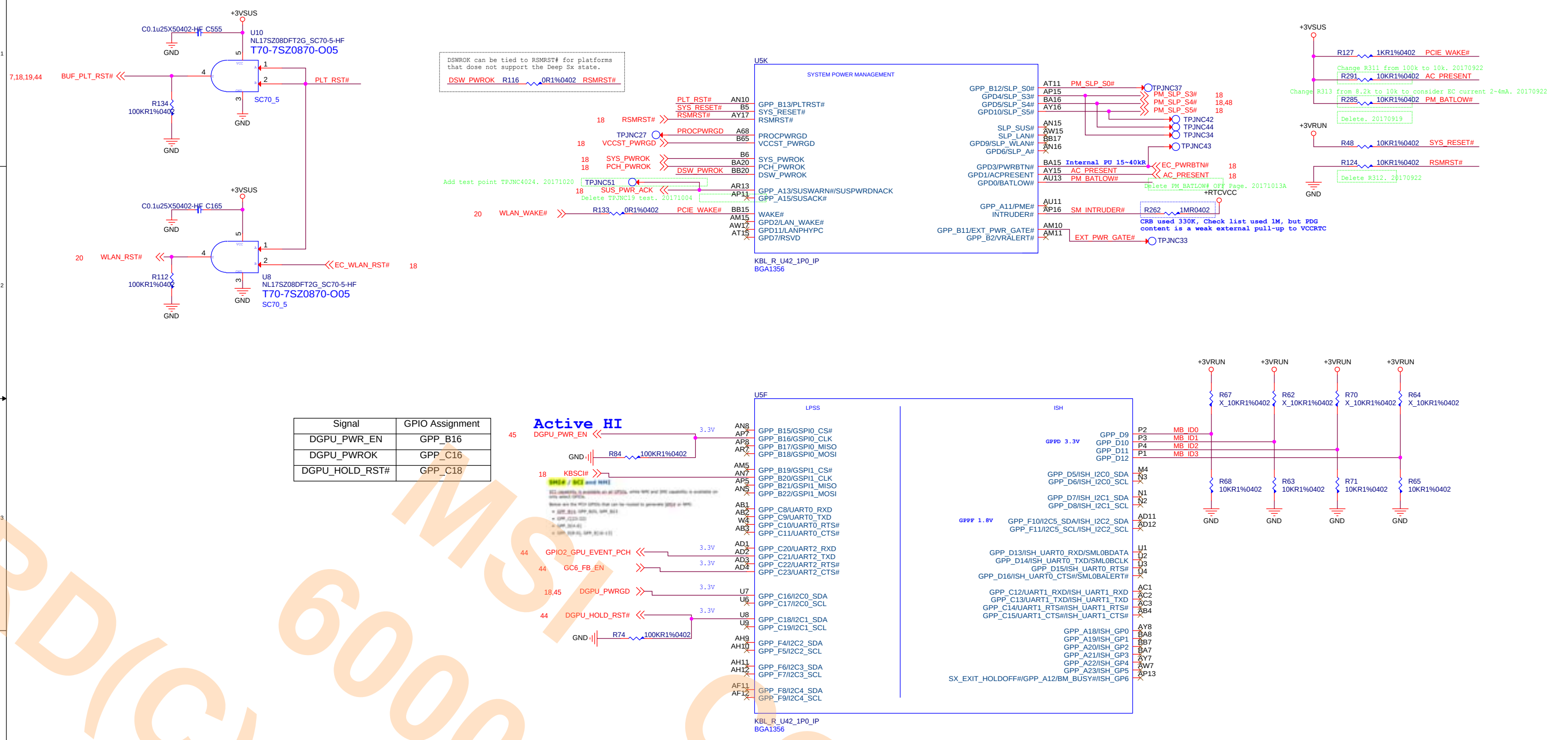
SODIMM_A (Bottom)



MICRO-STAR INT'L CO.,LTD.

Title	DDR4_SODIMM_A	
Size: Custom	Document Number: MS-14B2	Rev: 10
Date: Thursday, August 02, 2018	Sheet 6 of 60	


CLOCK SIGNALS
Port4 : WLAN
Port5~8 : dGPU
Port9~12/SATA2 : SSD
100 MHz
32.768 kHz
XCLK_BIASREF needs to be pulled to GND for Cannon Lake support via 60 ohm1% resistor, and with 2.7Kohm 1% resistor pulled to VCC (1V) for Skylake-U
KBL_R_U42_1P0_IP
BGA1356
D04-0307000-C11
TPM
SPI - FLASH
SMBUS, SMLINK
DDR/Click
EC
Lid S3 resume
SPI - TOUCH
C LINK
LPC
24 MHz
SLB9665TT2.0HF3
M31-25L6482-M24
D01-BAT54C9-D07
D01-BAS4000-P15
D03-138DW19-D07
N32-10200Q0-A81
D00-0105701-K26
MICRO-STAR INT'L CO.,LTD.
Title
Kabylake-R (RTC,LPC,CLK,SPI)
Size Custom
Document Number
MS-14B2
Rev
10
Date: Thursday, August 02, 2018
Sheet 7 of 60



Signal	GPIO Assignment
DGPU_PWR_EN	GPP_B16
DGPU_PWROK	GPP_C16
DGPU_HOLD_RST#	GPP_C18

MICRO-STAR INT'L CO.,LTD.

Title: Kabylake-R (LPSS,ISH,I2C)

Size: Custom | Document Number: MS-14B2 | Rev: 10

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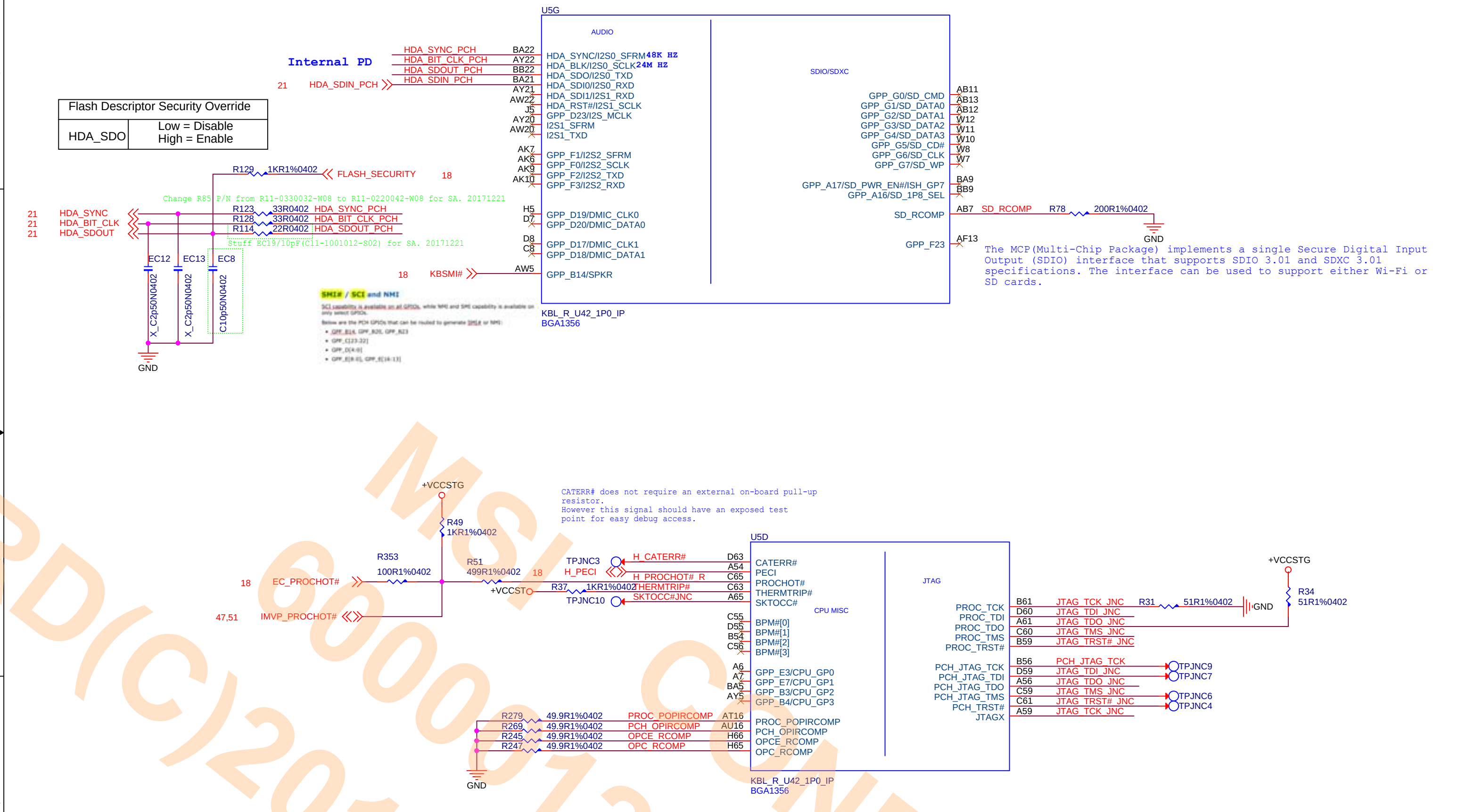

MICRO-STAR INT'L CO.,LTD.

Title: Kabylake-R (HDA,MISC,JTAG)

Size	Document Number	Rev
Custom	MS-14B2	10

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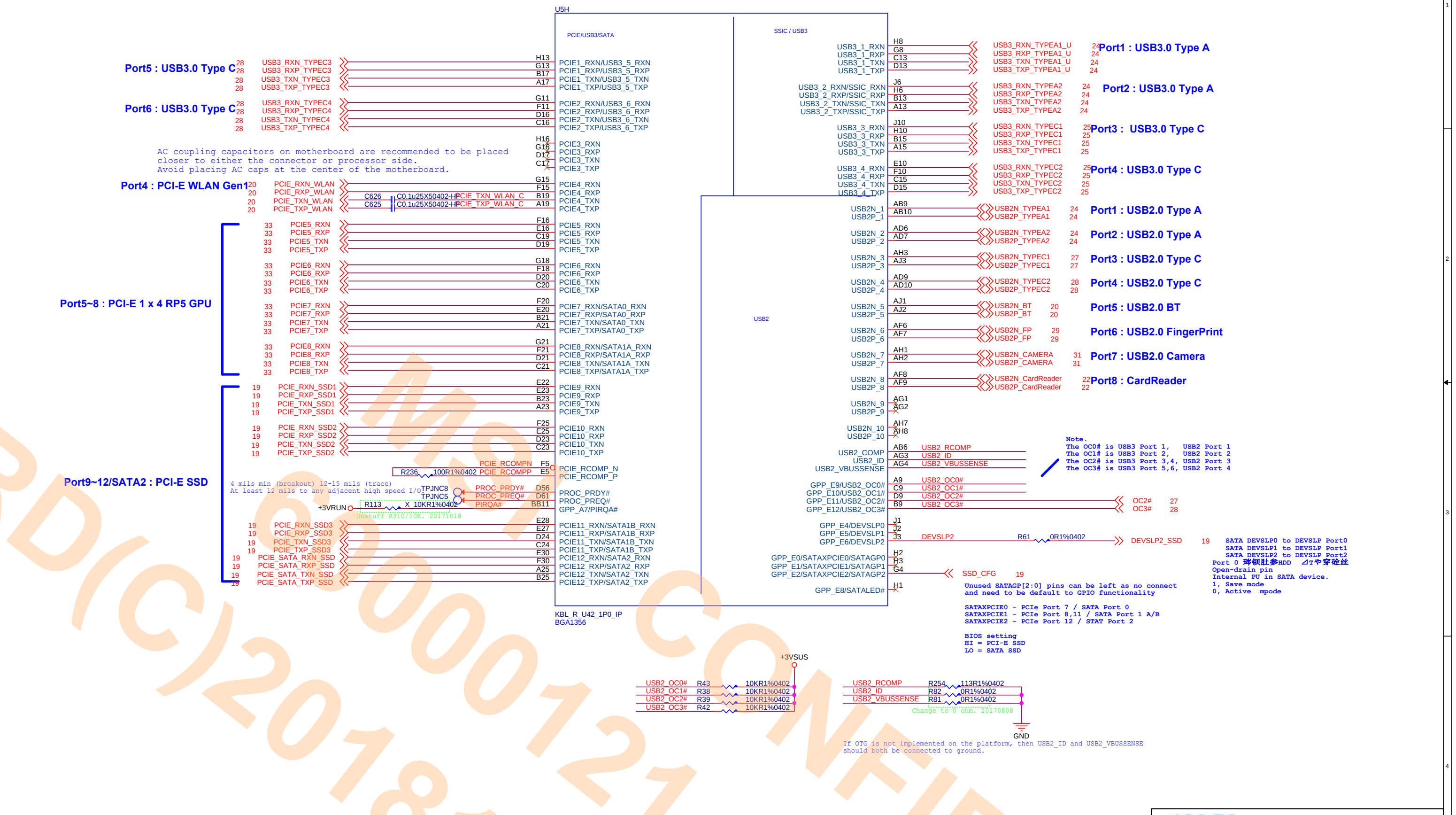
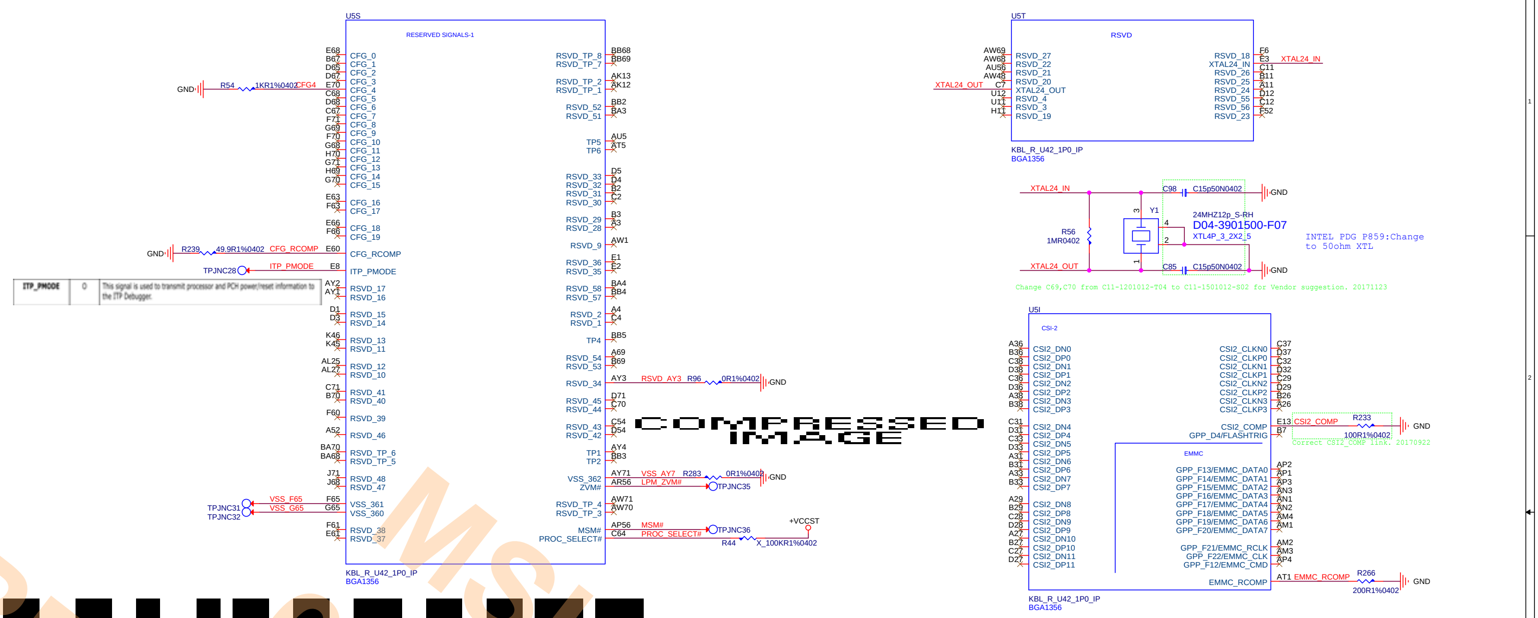


MICRO-STAR INT'L CO.,LTD.

Title	Kabylake-R (PCIE,SATA,USB)	
Size: Custom	Document Number: MS-14B2	Rev: 10
Date: Thursday, August 02, 2018	Sheet 10 of 60	



PROC_SELECT#	**Processor Select:** This pin is for compatibility with future platforms. It should be unconnected for the processor.

RSVD		All the RSVD pins should be left unconnected (floating) on the board.

Name	Type	Description
CSI2_DP[11:0] CSI2_DN[11:0]	I	MIPI CSI-2 Data
CSI2_CLKP[3:0] CSI2_CLKN[3:0]	I	MIPI CSI-2 Clock
CSI2_COMP	I	External Reference (100 Ohm+/- 1% pull down to ground)

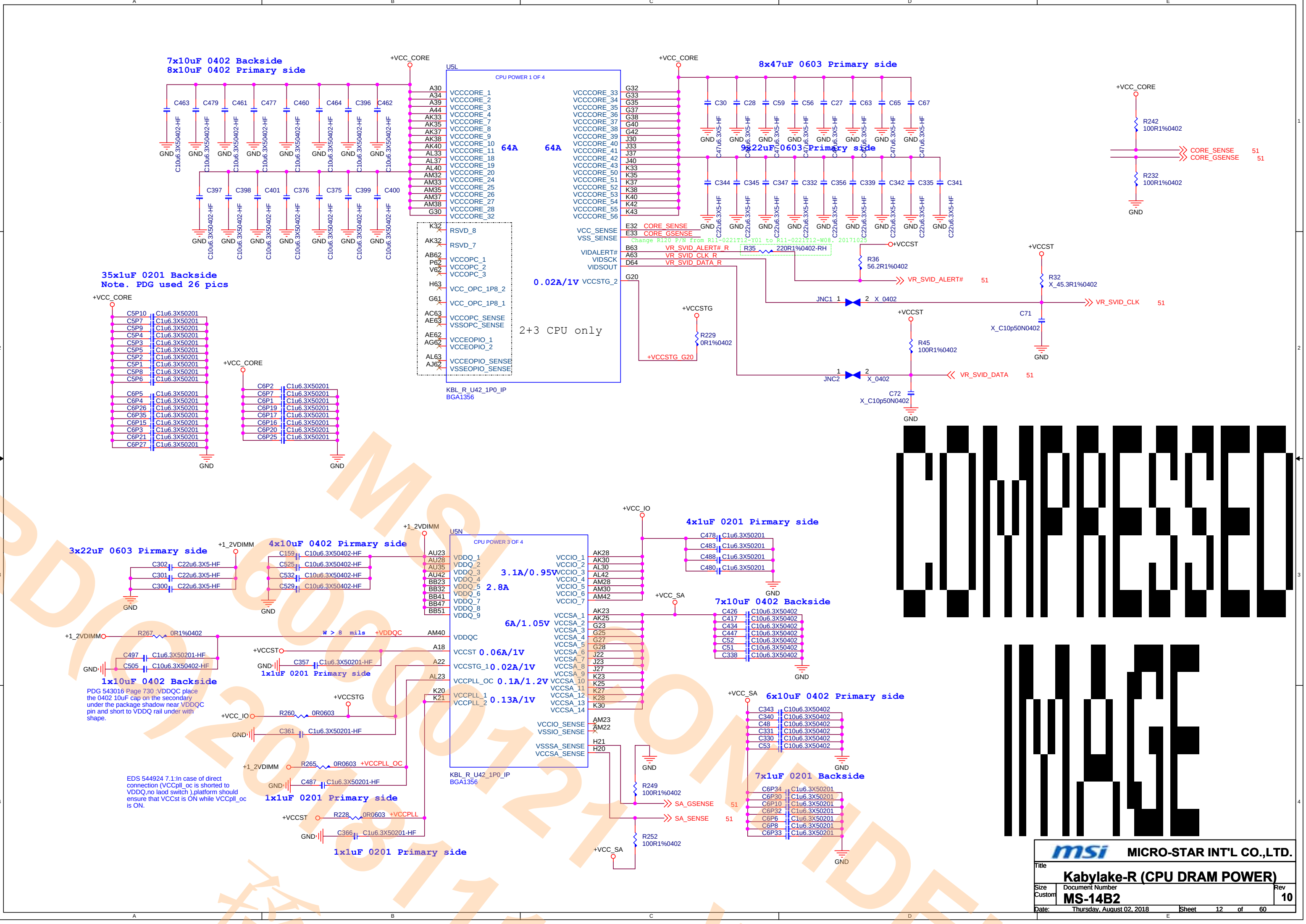
Name	Type	Description
EMMC_CMD	I/O	eMMC Command/Response
EMMC_DATA0	I/O	eMMC Data
EMMC_DATA1	I/O	eMMC Data
EMMC_DATA2	I/O	eMMC Data
EMMC_DATA3	I/O	eMMC Data
EMMC_DATA4	I/O	eMMC Data
EMMC_DATA5	I/O	eMMC Data
EMMC_DATA6	I/O	eMMC Data
EMMC_DATA7	I/O	eMMC Data
EMMC_RCLK	I	eMMC Receive Clock
EMMC_CLK	O	eMMC Clock
EMMC_RCOMP	I/O	External reference (200 Ohm+/- 1% pull down to ground)

MICRO-STAR INT'L CO.,LTD.

Title: Kabylake-R (CFG,CSI,RSVD)

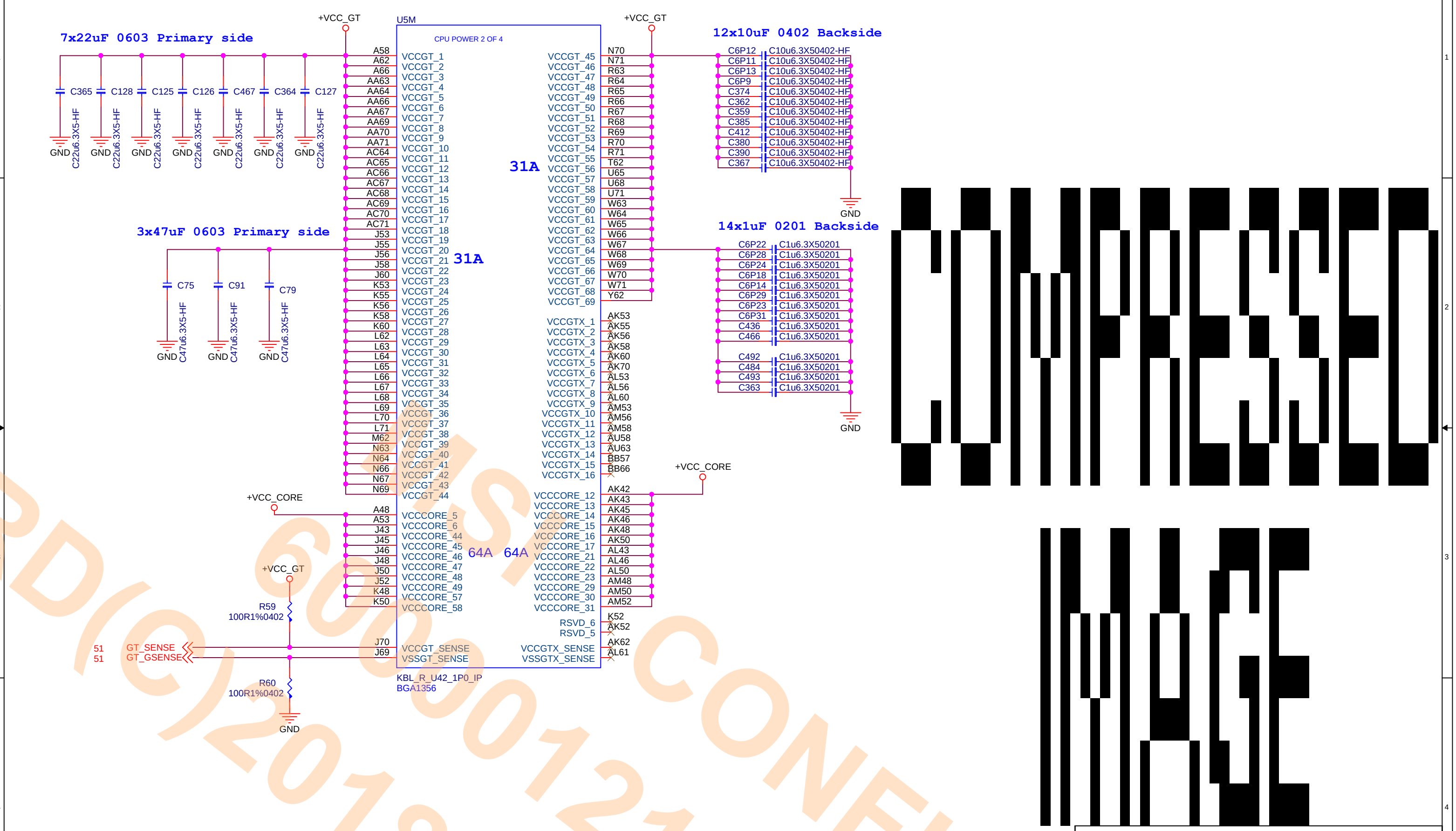
Size: Custom | Document Number: MS-14B2 | Rev: 10

Date: Thursday, August 02, 2018 | Sheet 11 of 60

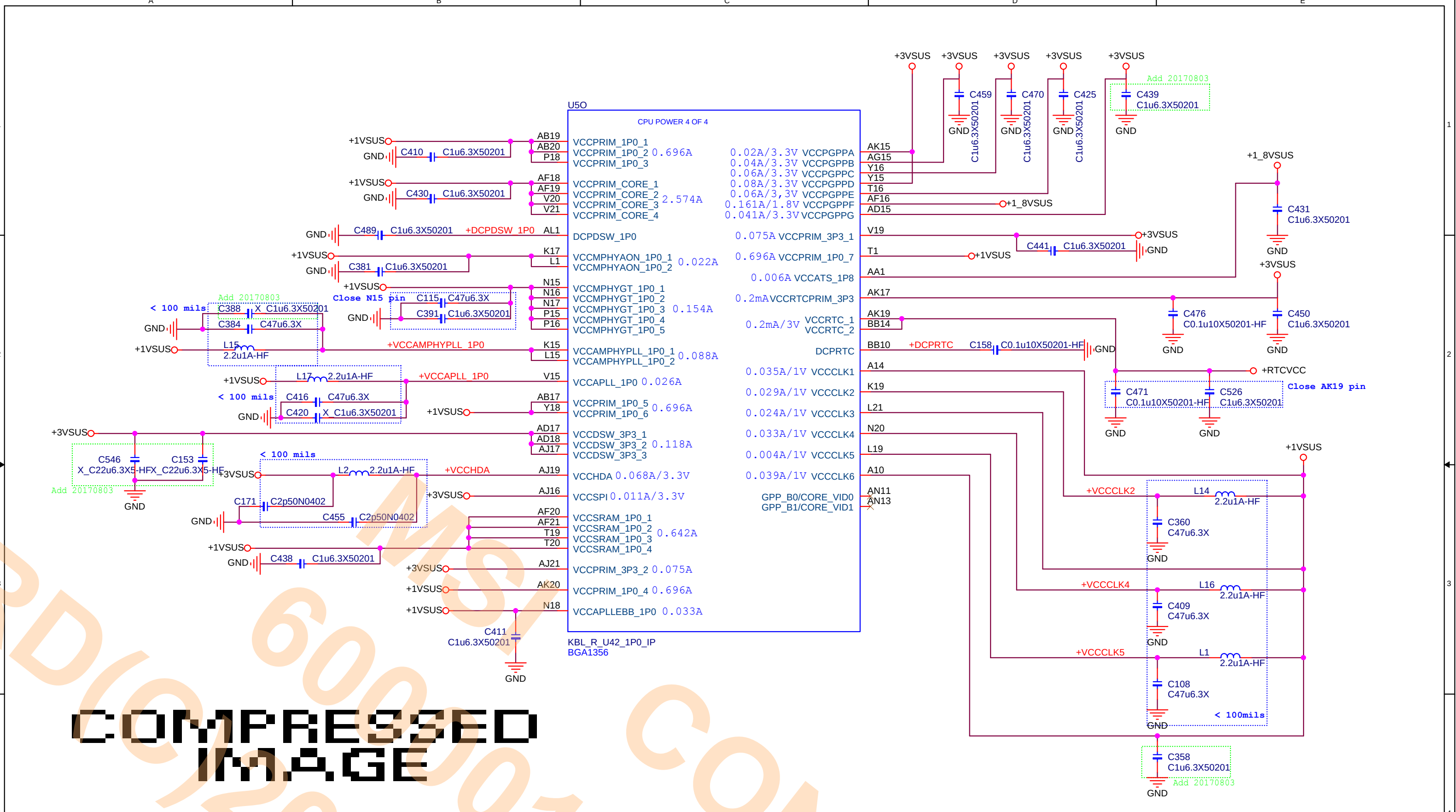


MICRO-STAR INT'L CO.,LTD.

Title	Kabylake-R (CPU DRAM POWER)	
Size Custom	Document Number MS-14B2	Rev 10
Date: Thursday, August 02, 2018	Sheet 12 of 60	



MICRO-STAR INT'L CO.,LTD.			
Title	Kabylake-R (GT POWER)		
Size: Custom	Document Number: MS-14B2		Rev: 10
Date: Thursday, August 02, 2018	Sheet 13 of 60		

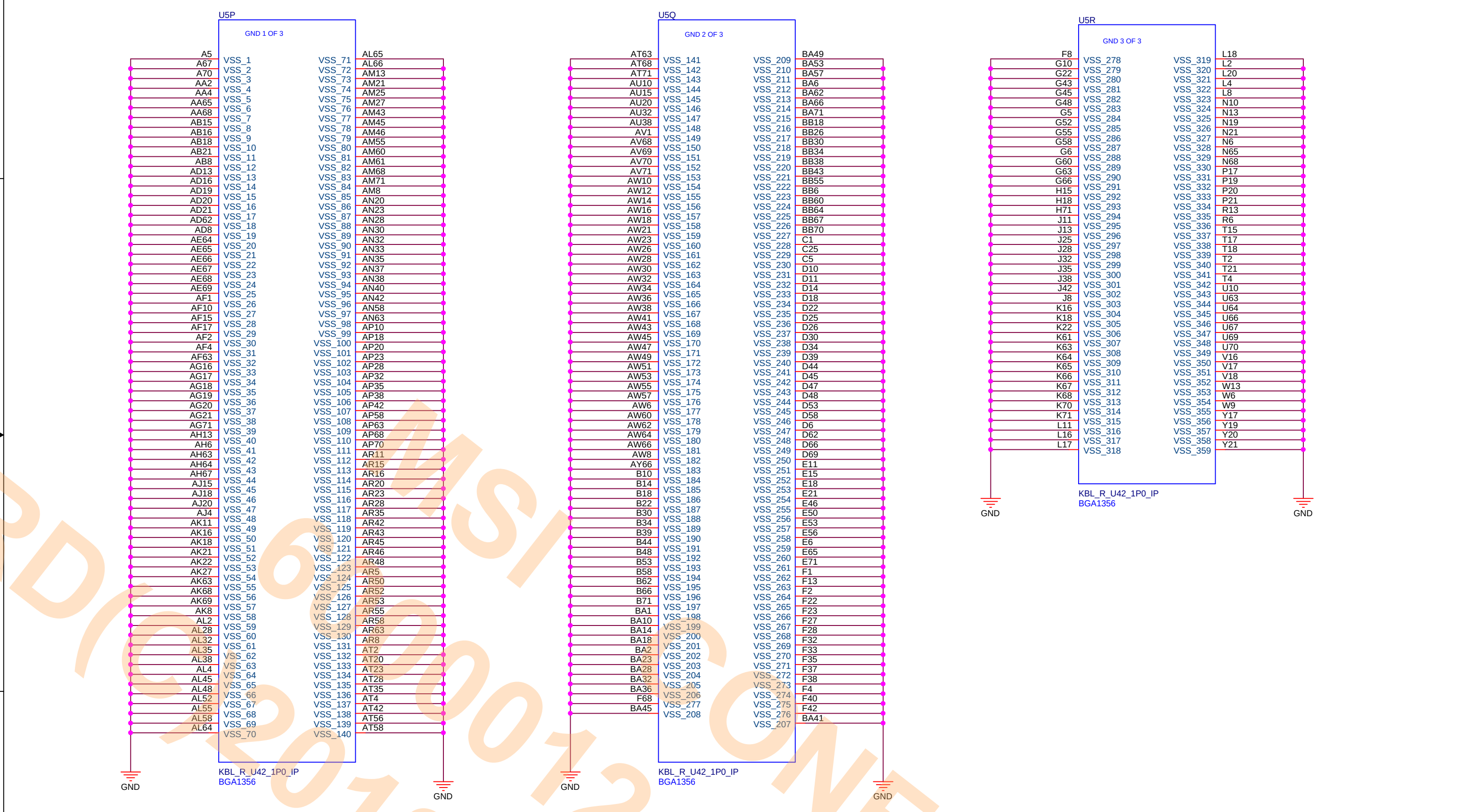


MICRO-STAR INT'L CO.,LTD.

Title: **Kabylake-R (PCH POWER)**

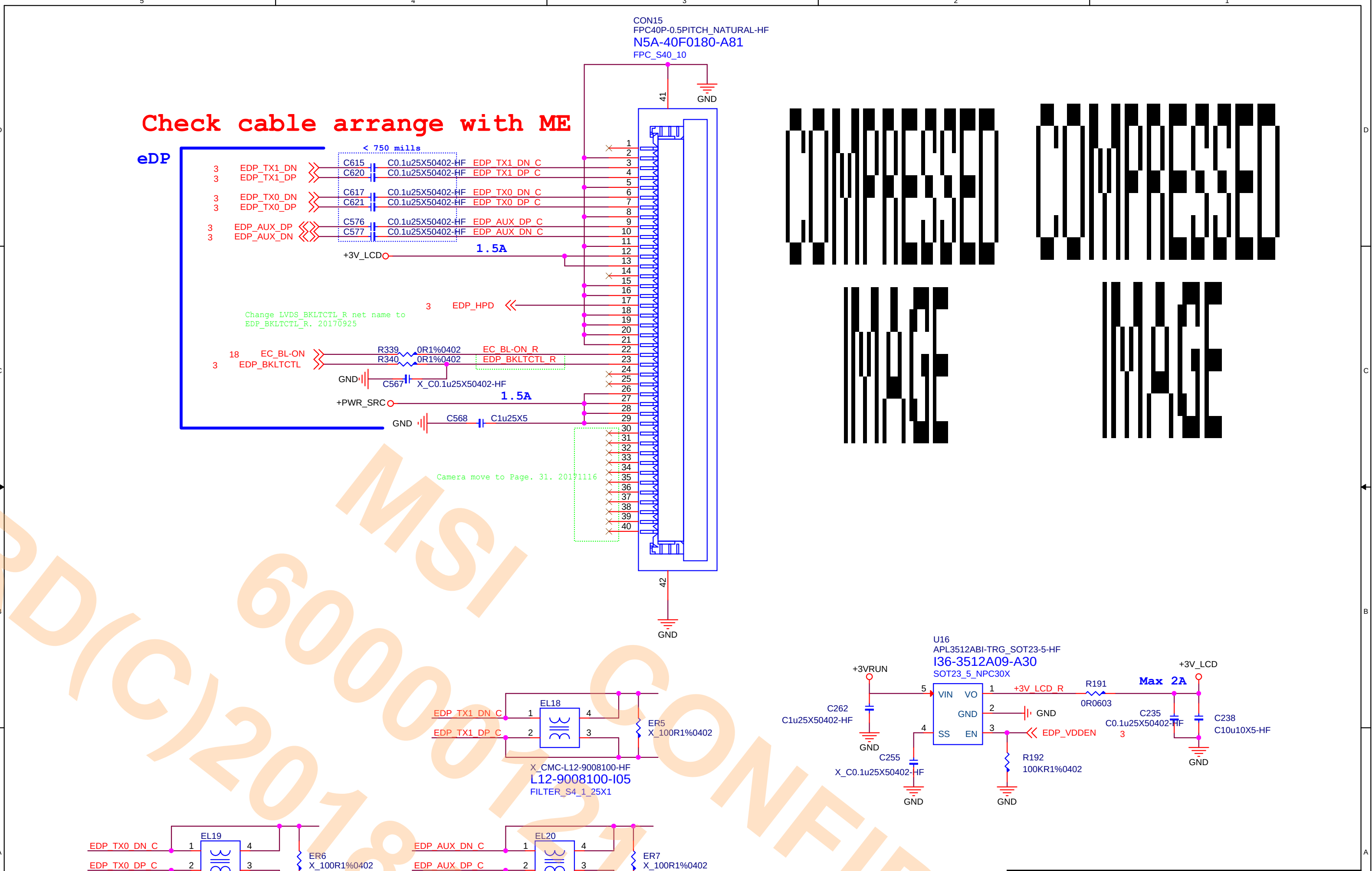
Size	Document Number	Rev
Custom	MS-14B2	10

Date: Thursday, August 02, 2018 Sheet 14 of 60



MICRO-STAR INT'L CO.,LTD.

Title	Kabylake-R (GND)	
Size Custom	Document Number MS-14B2	Rev 10
Date: Thursday, August 02, 2018	Sheet 15 of 60	



MICRO-STAR INT'L CO.,LTD.

Title: **eDP Pannel**

Size	Document Number	Rev
Custom	MS-14B2	10

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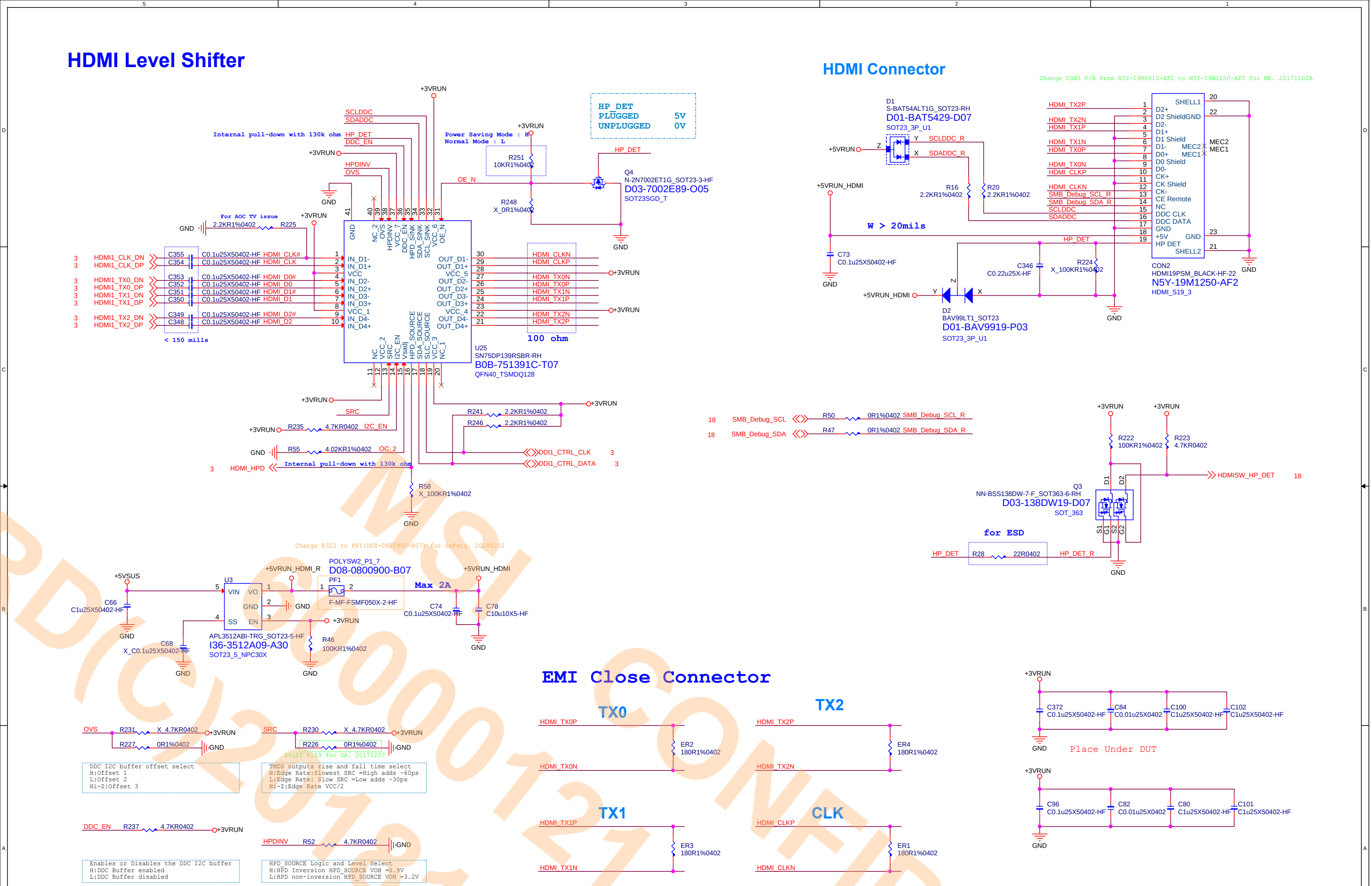
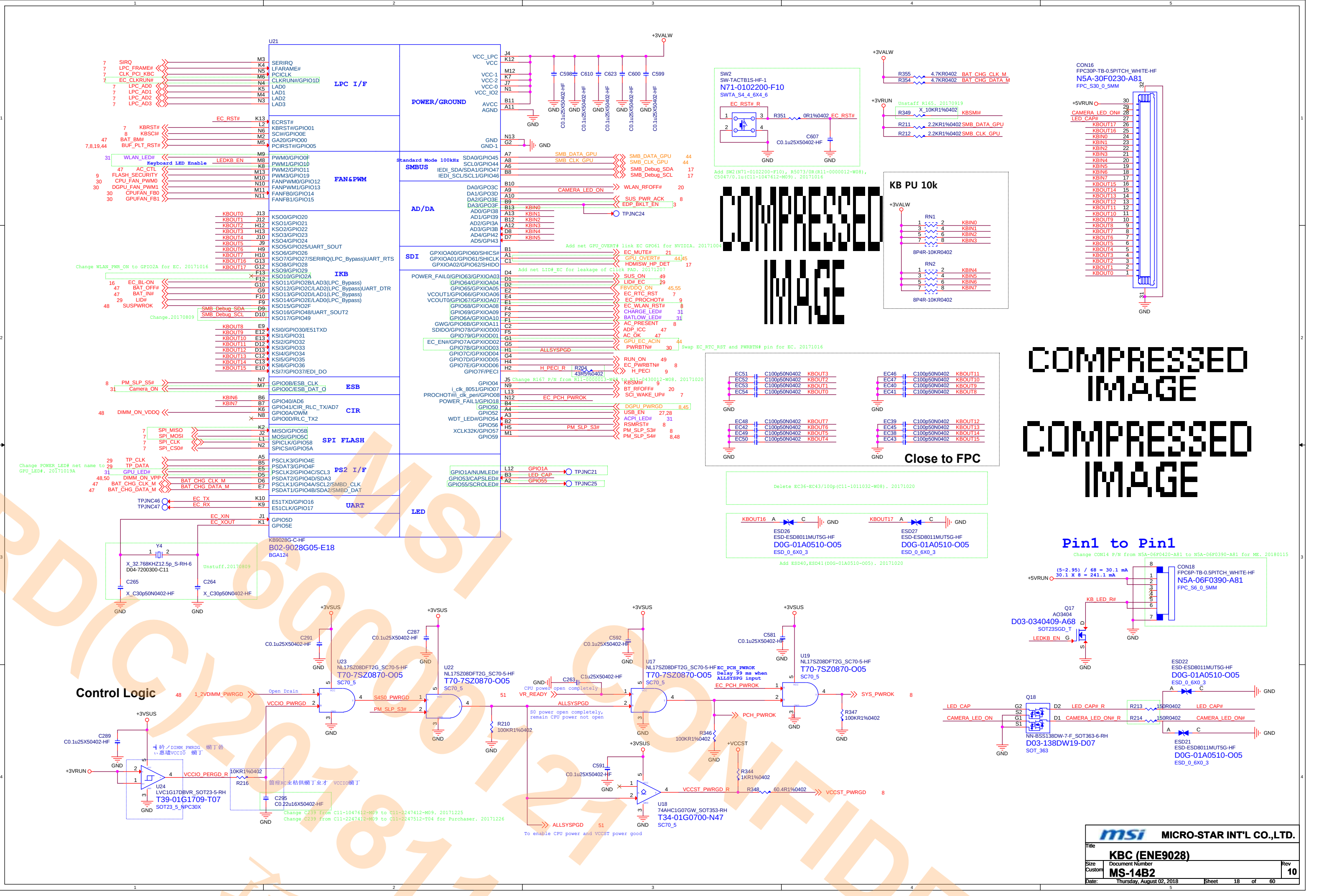


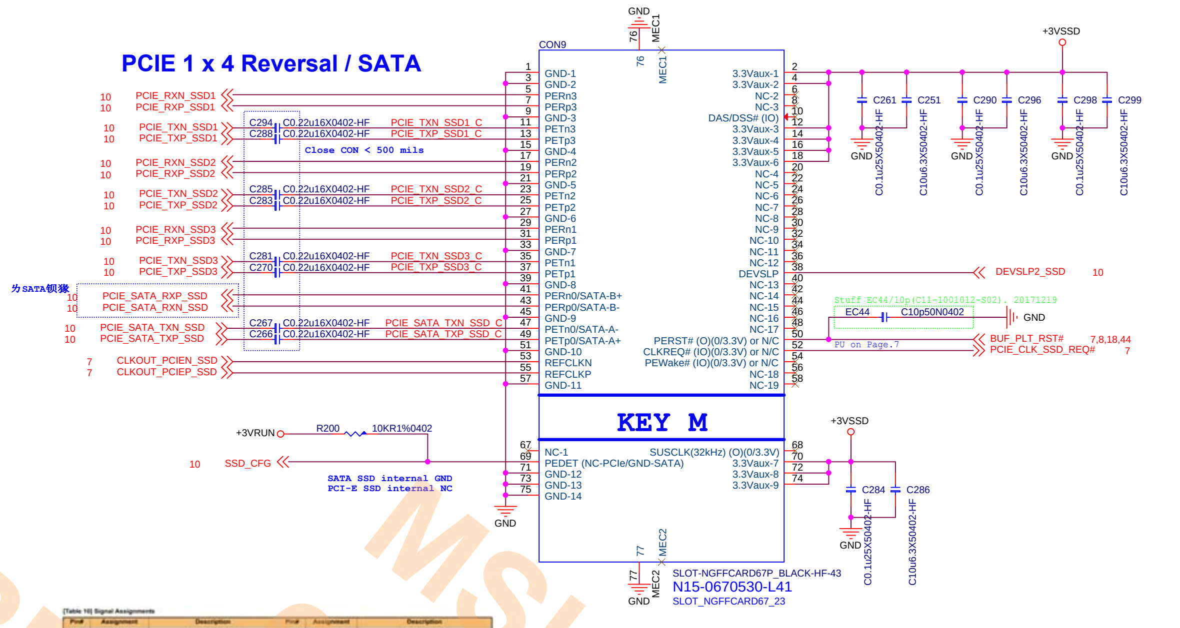
msi MICRO-STAR INT'L CO.,LTD.

Title: HDMI Level Shifter_SN75DP139

Size	Document Number	Rev
Custom	MS-14B2	10

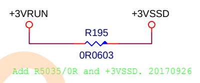
Date: Thursday, August 02, 2018 — Sheet 17 of 60





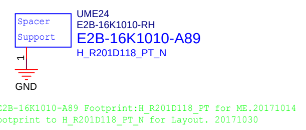
[Table 10] Signal Assignments

Pin#	Assignment	Description	Pin#	Assignment	Description
1	GND	Return current path	2	3.3V	3.3V source
3	GND	Return current path	4	3.3V	3.3V source
5	PETn3	PCIe TX	6	N/C	N/C
7	PETp3	PCIe TX	8	N/C	N/C
9	GND	Return current path	10	LED1#	Device Active Signal (Refer to [Table 11])
11	PERn3	PCIe Rx	12	3.3V	3.3V source
13	PERp3	PCIe Rx	14	3.3V	3.3V source
15	GND	Return current path	16	3.3V	3.3V source
17	PETn2	PCIe TX	18	3.3V	3.3V source
19	PETp2	PCIe TX	20	N/C	N/C
21	GND	Return current path	22	N/C	N/C
23	PERn2	PCIe Rx	24	N/C	N/C
25	PERp2	PCIe Rx	26	N/C	N/C
27	GND	Return current path	28	N/C	N/C
29	PETn1	PCIe TX	30	N/C	N/C
31	PETp1	PCIe TX	32	N/C	N/C
33	GND	Return current path	34	N/C	N/C
35	PERn1	PCIe Rx	36	N/C	N/C
37	PERp1	PCIe Rx	38	N/C	N/C
39	GND	Return current path	40	N/C	N/C
41	PETn0	PCIe TX	42	N/C	N/C
43	PETp0	PCIe TX	44	N/C	N/C
45	GND	Return current path	46	N/C	N/C
47	PERn0	PCIe Rx	48	N/C	N/C
49	PERp0	PCIe Rx	50	PERST#	PCIe Reset
51	GND	Return current path	52	CLKREQ#	PCIe Device Clock Request
53	REFCLKN	PCIe Reference Clock	54	PEWake#	N/C
55	REFCLKP	PCIe Reference Clock	56	Reserved for MFG_Data	N/C
57	GND	Return current path	58	Reserved for MFG_CLOCK	N/C
67	N/C	N/C	68	SUSCLK	N/C
69	PEDET	N/C	70	3.3V	3.3V source
71	GND	Return current path	72	3.3V	3.3V source
73	GND	Return current path	74	3.3V	3.3V source
75	GND	Return current path			



PCIe	PERp0, PERn0/ PETp0, PETn0 PERp1, PERn1/ PETp1, PETn1 PERp2, PERn2/ PETp2, PETn2 PERp3, PERn3/ PETp3, PETn3	I/O	PCIe TX/RX Differential signals defined by the PCIe 3.0 specification	
	REFCLK+/ REFCLK-	I	PCIe Reference Clock signals (100 MHz) defined by the PCIe 3.0 specification	
	PERST#	O	PE-Reset is a functional reset to the card as defined by the PCIe Mini Card CEM specification	3.3V
	CLKREQ#	I/O	Clock Request is a reference clock request signal as defined by the PCIe Mini Card CEM specification; Also used by L1 PM Substates	3.3V
	WAKE#/OBFF	I/O	PCIe PME Wake. Open Drain with pull up on platform; Active Low	3.3V

SSD STAND OFF



MICRO-STAR INT'L CO.,LTD.

Title: M.2 KEY-M Combo SSD

Size: Custom | Document Number: MS-14B2 | Rev: 10

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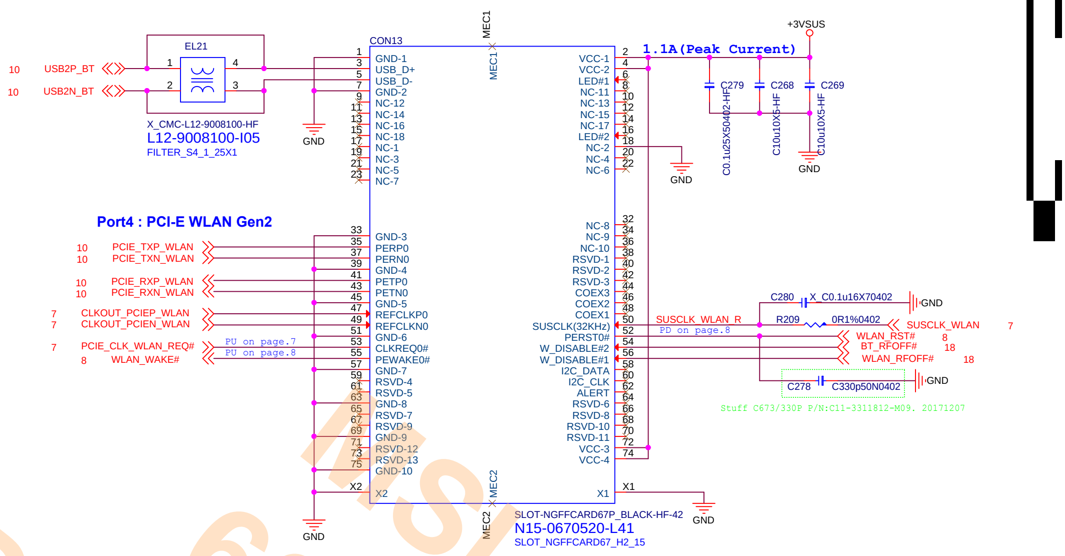

COMPRESSED IMAGE

MICRO-STAR INT'L CO.,LTD.

Title: M.2 KEY-E WLAM(9260)

Size	Document Number	Rev
Custom	MS-14B2	10

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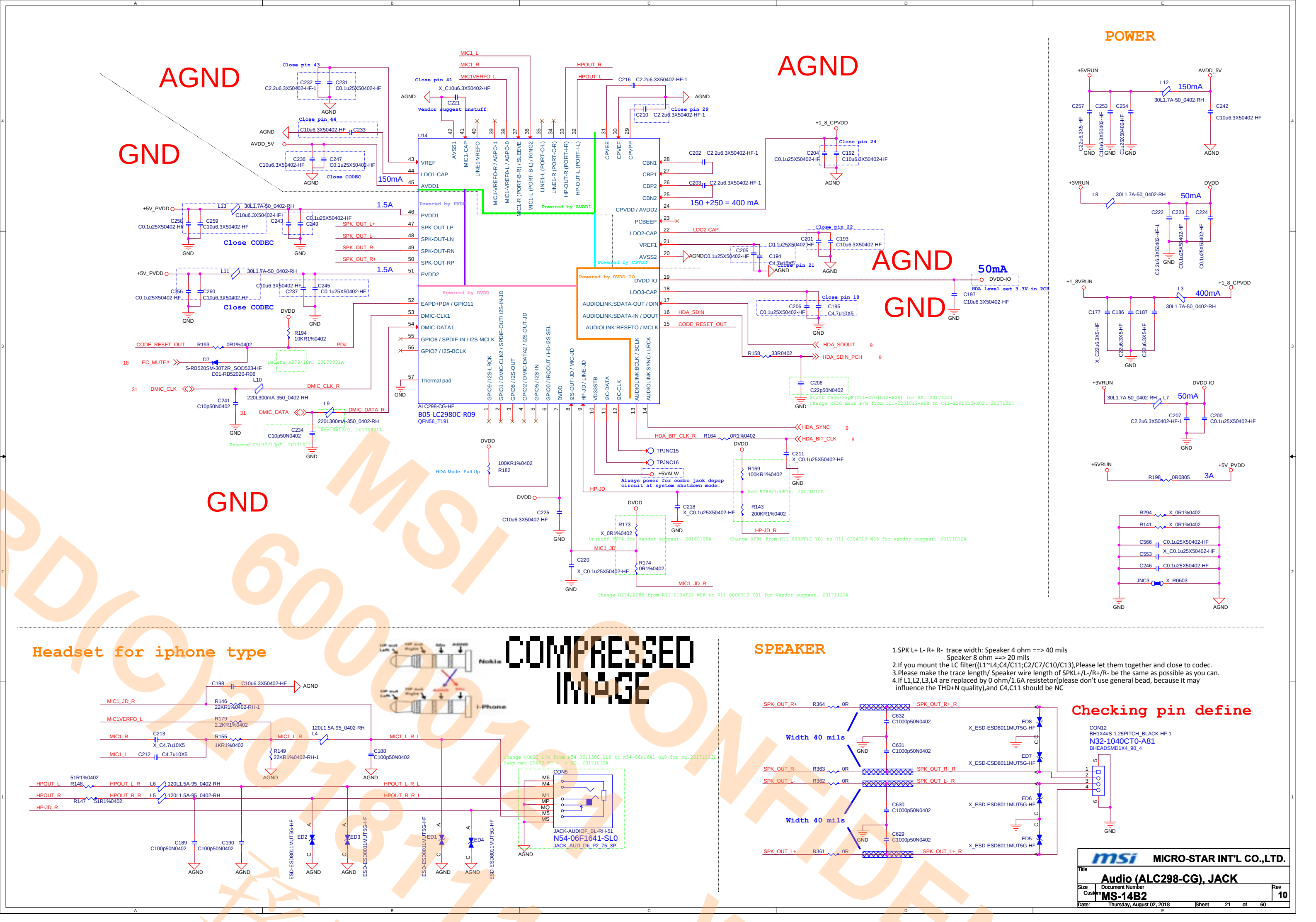
AGND
GND
AGND
AGND
GND
GND
POWER
150mA
50mA
400mA
3A
U14
ALC298-CG-HF
B05-LC2980C-R09
QFN56_T191
150 +250 = 400 mA
1.5A
Close CODEC
Headset for iphone type
COMPRESSED IMAGE
SPEAKER
Width 40 mils
Checking pin define
CON12
N32-1040CT0-A81
CON5
JACK-AUDIOF_BL-RH-51
N54-06F1641-SL0
1.SPK L+ L- R+ R- trace width: Speaker 4 ohm ==> 40 mils
Speaker 8 ohm ==> 20 mils
2.If you mount the LC filter((L1~L4;C4/C11;C2/C7/C10/C13),Please let them together and close to codec.
3.Please make the trace length/ Speaker wire length of SPKL+/L-/R+/R- be the same as possible as you can.
4.If L1,L2,L3,L4 are replaced by 0 ohm/1.6A resistetor(please don't use general bead, because it may influence the THD+N quality),and C4,C11 should be NC

MICRO-STAR INT'L CO.,LTD.

Title: Audio (ALC298-CG), JACK

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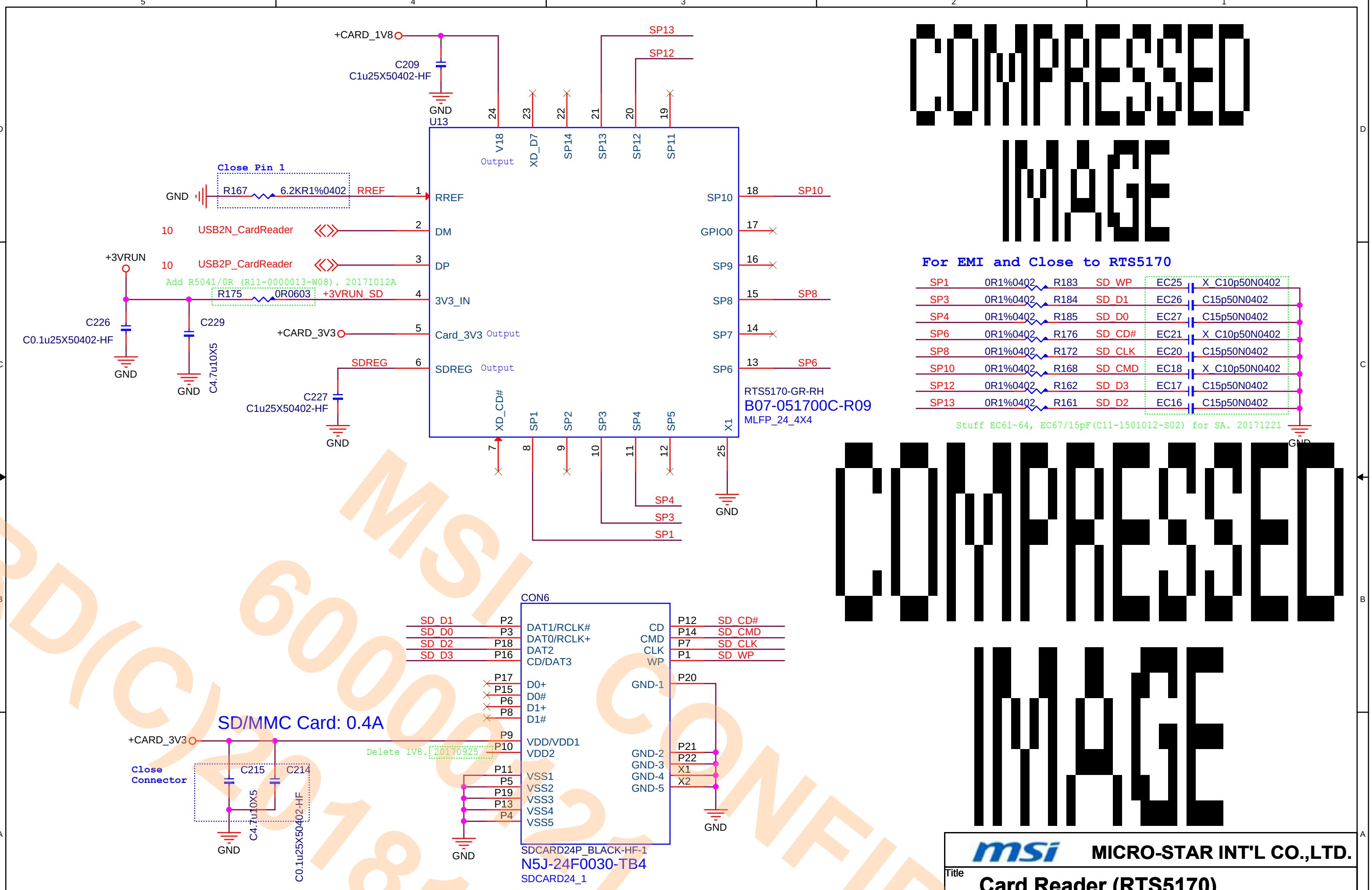

MICRO-STAR INT'L CO.,LTD.

Title: **Card Reader (RTS5170)**

Size	Document Number	Rev
Custom	MS-14B2	10

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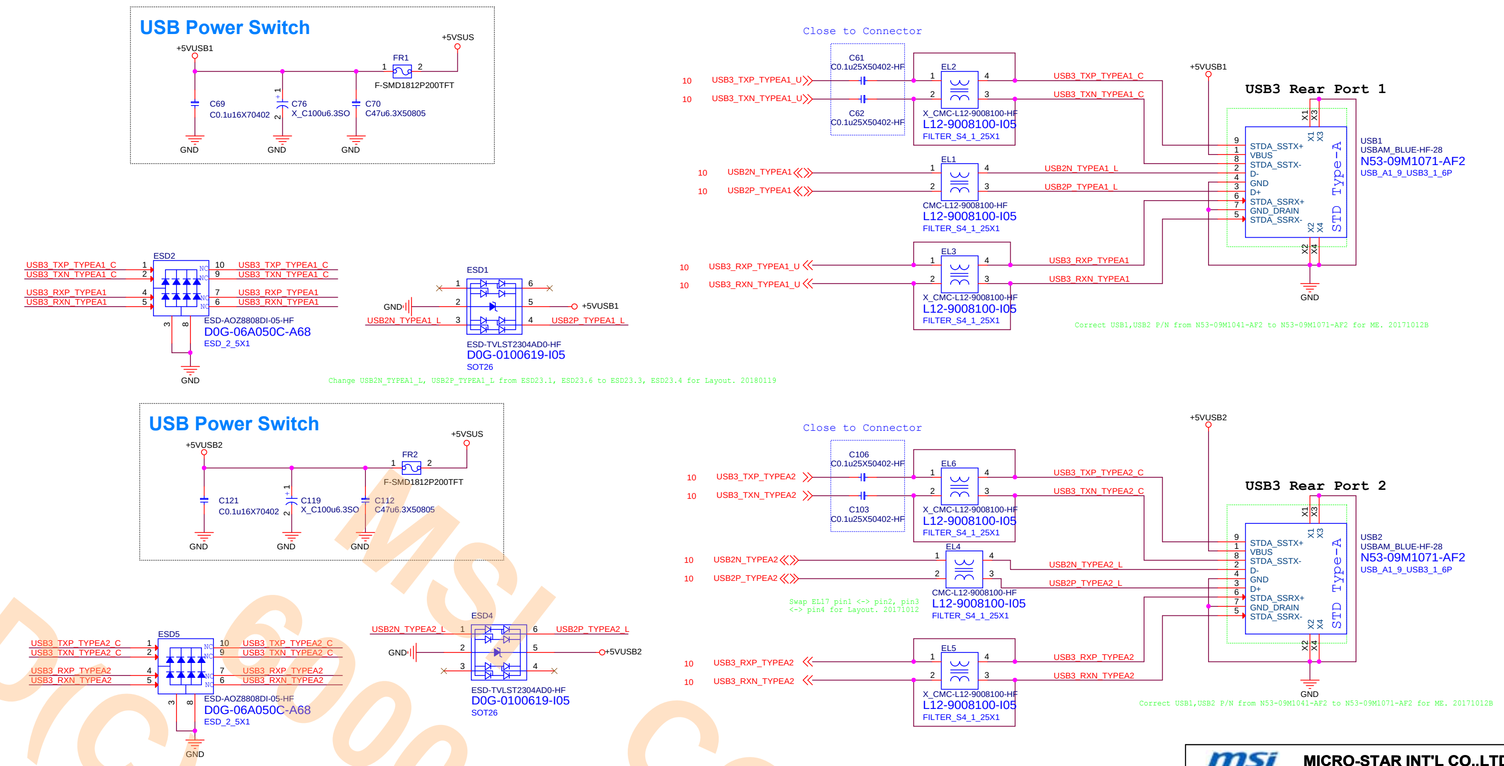
MICRO-STAR INT'L CO.,LTD.

Title: U3 Re-driver TYPE-A Port1,2

Size: Custom | Document Number: MS-14B2 | Rev: 1.0

Date: Wednesday, July 25, 2018 | Sheet 23 of 60


USB Power Switch
+5VUSB1
+5VSUS
FR1
F-SMD1812P200TFT
C69
C0.1u16X70402
C76
X_C100u6.3SO
C70
C47u6.3X50805
GND
Close to Connector
C61
C0.1u25X50402-HF
C62
C0.1u25X50402-HF
USB3_TXP_TYPEA1_U
USB3_TXN_TYPEA1_U
EL2
X_CMC-L12-9008100-HF
L12-9008100-I05
FILTER_S4_1_25X1
USB3_TXP_TYPEA1_C
USB3_TXN_TYPEA1_C
USB3 Rear Port 1
USB1
USBAM_BLUE-HF-28
N53-09M1071-AF2
USB_A1_9_USB3_1_6P
STDA_SSTX+
VBUS
STDA_SSTX-
D-
GND
D+
STDA_SSRX+
GND_DRAIN
STDA_SSRX-
STD Type-A
USB2N_TYPEA1
USB2P_TYPEA1
EL1
CMC-L12-9008100-HF
USB2N_TYPEA1_L
USB2P_TYPEA1_L
USB3_RXP_TYPEA1_U
USB3_RXN_TYPEA1_U
EL3
USB3_RXP_TYPEA1
USB3_RXN_TYPEA1
Correct USB1,USB2 P/N from N53-09M1041-AF2 to N53-09M1071-AF2 for ME. 20171012B
ESD2
ESD-AOZ8808DI-05-HF
D0G-06A050C-A68
ESD_2_5X1
ESD1
ESD-TVLST2304AD0-HF
D0G-0100619-I05
SOT26
Change USB2N_TYPEA1_L, USB2P_TYPEA1_L from ESD23.1, ESD23.6 to ESD23.3, ESD23.4 for Layout. 20180119
USB Power Switch
+5VUSB2
FR2
C121
C0.1u16X70402
C119
X_C100u6.3SO
C112
C47u6.3X50805
C106
C103
USB3_TXP_TYPEA2
USB3_TXN_TYPEA2
EL6
USB3_TXP_TYPEA2_C
USB3_TXN_TYPEA2_C
USB3 Rear Port 2
USB2
USB2N_TYPEA2
USB2P_TYPEA2
EL4
USB2N_TYPEA2_L
USB2P_TYPEA2_L
Swap EL1? pin1 <-> pin2, pin3 <-> pin4 for Layout. 20171012
USB3_RXP_TYPEA2
USB3_RXN_TYPEA2
EL5
ESD5
ESD4

MICRO-STAR INT'L CO.,LTD.

Title: USB3 Type-A Port1,2

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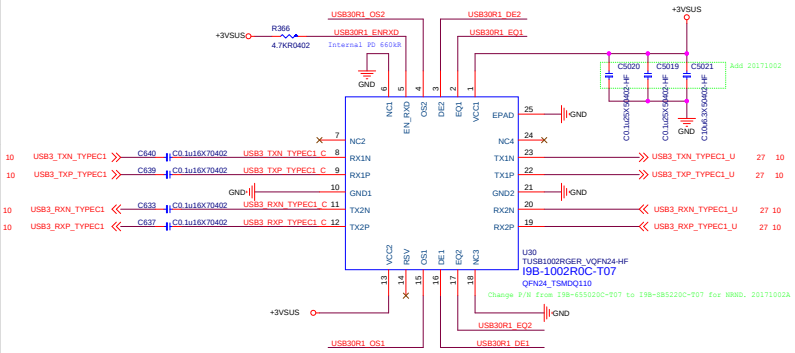
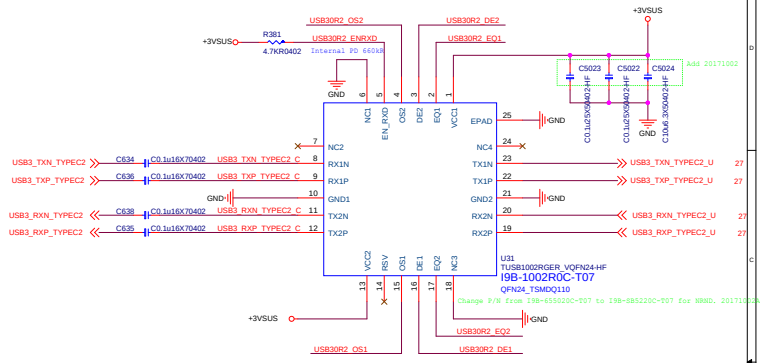
USB3.0 TYPE-C Port 3 Redriver TOP



USB3.0 TYPE-C Port 3 Redriver BOT



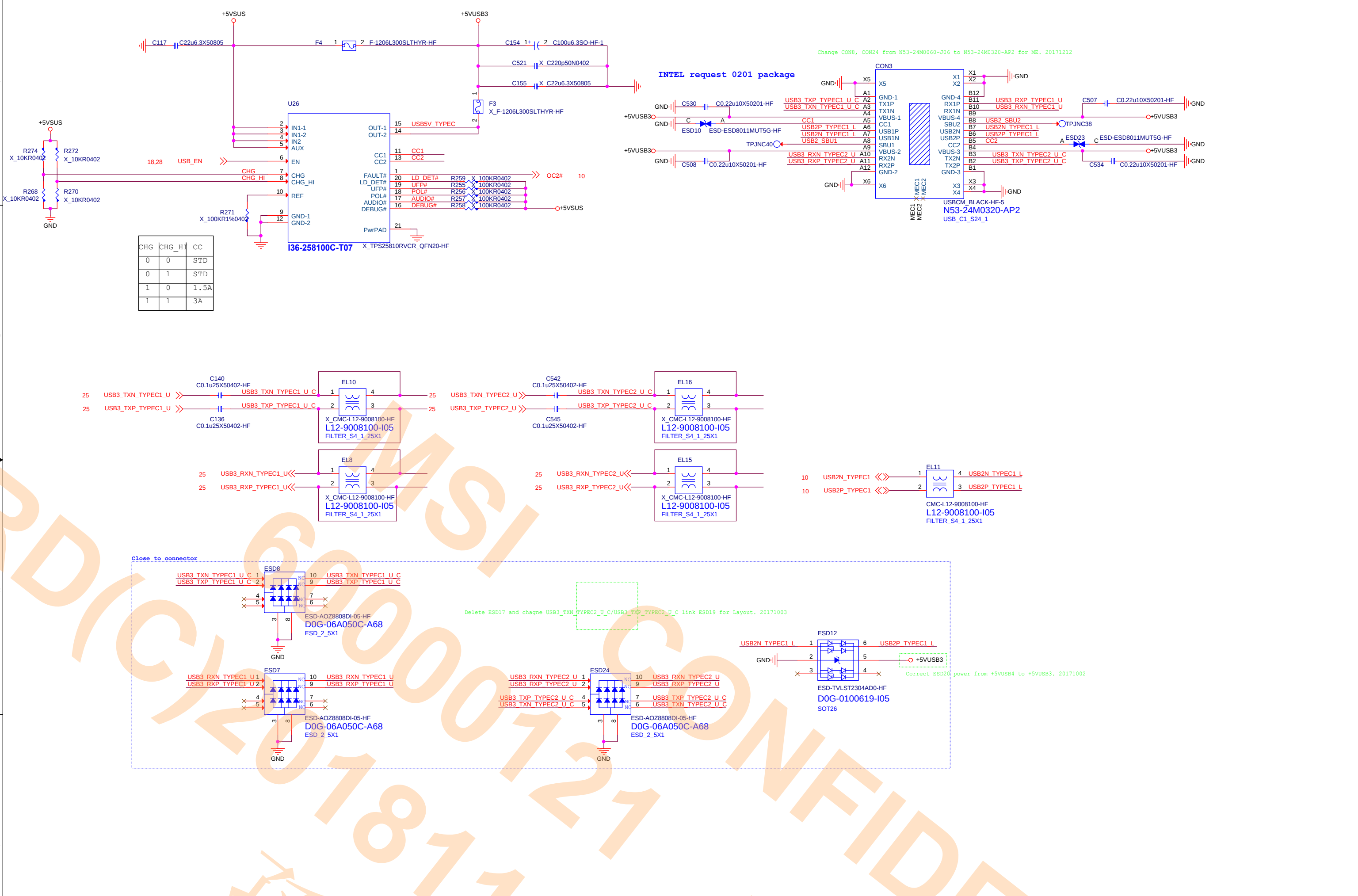
msi	MICRO-STAR INT'L CO.,LTD.		
Title	U3 Re-driver TYPE-C Port3		
Size: Custom	Document Number: MS-14B2		Rev: 1.0
Date: Wednesday, August 08, 2018	Sheet 25 of 60		

MICRO-STAR INT'L CO.,LTD.

Title: U3 Re-driver TYPE-C Port4

Size: Custom | Document Number: MS-14B2 | Rev: 1.0

Date: Wednesday, July 25, 2018 | Sheet 26 of 60



CHG	CHG_HI	CC
0	0	STD
0	1	STD
1	0	1.5A
1	1	3A

MICRO-STAR INT'L CO.,LTD.

Title: **USB Type-C (TPS25810) Port3**

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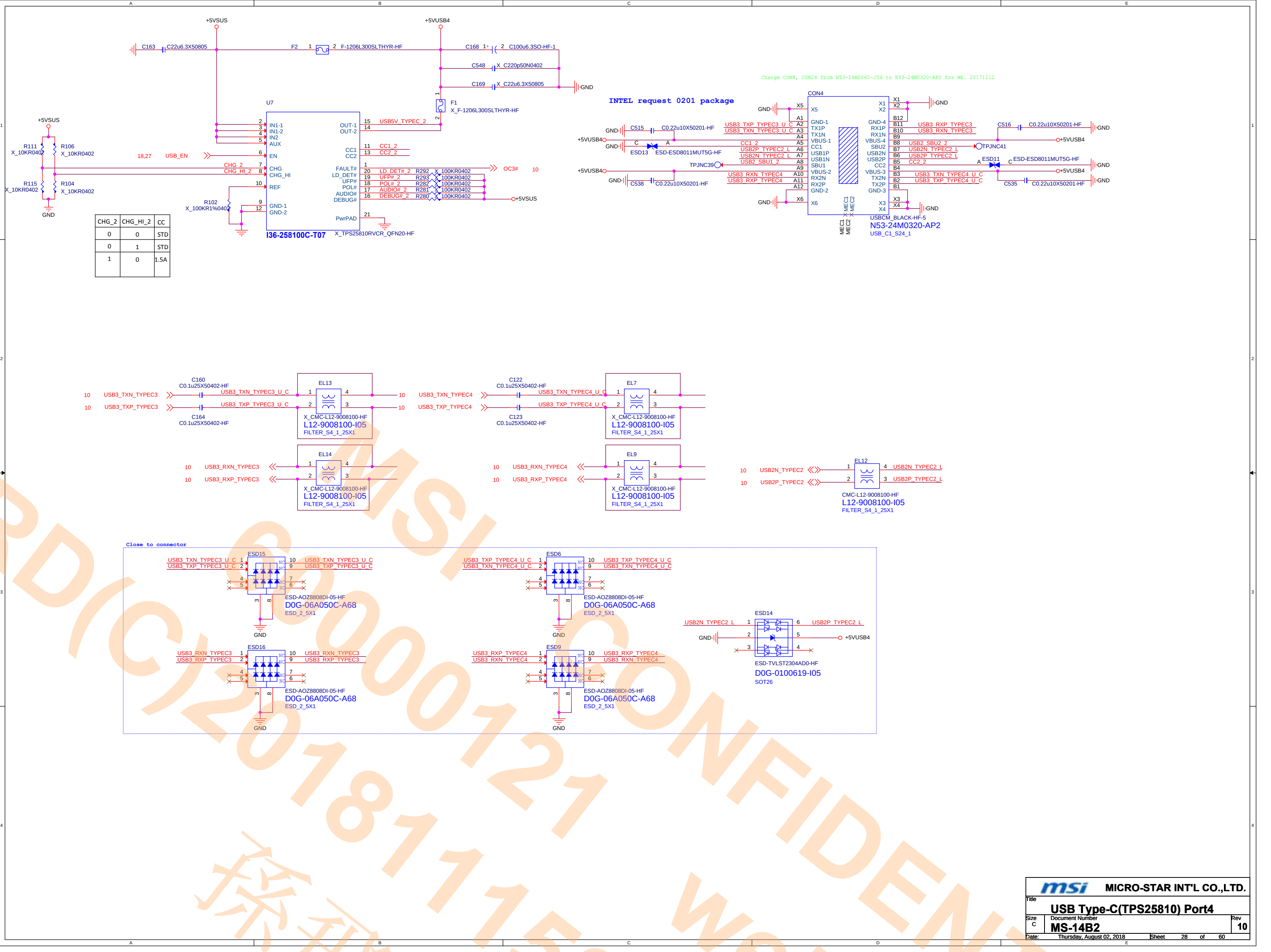

+5VSUS
+5VUSB4
C163 C22u6.3X50805
F2 F-1206L300SLTHYR-HF
C168 C100u6.3SO-HF-1
C548 X_C220p50N0402
C169 X_C22u6.3X50805
F1 X_F-1206L300SLTHYR-HF
INTEL request 0201 package
U7
IN1-1 IN1-2 IN2 AUX EN CHG CHG_HI REF GND-1 GND-2
OUT-1 OUT-2 CC1 CC2 FAULT# LD_DET# UFP# POL# AUDIO# DEBUG# PwrPAD
USB5V_TYPEC_2
CC1_2 CC2_2
LD_DET#_2 UFP#_2 POL#_2 AUDIO#_2 DEBUG#_2
R292 X_100KR0402 R293 100KR0402 R282 100KR0402 R281 100KR0402 R280 100KR0402
OC3#
I36-258100C-T07
X_TPS25810RVCR_QFN20-HF
R111 X_10KR0402 R106 X_10KR0402 R115 X_10KR0402 R104 X_10KR0402
R102 X_100KR1%0402
USB_EN
CHG_2 CHG_HI_2
CON4
N53-24M0320-AP2
USB_C1_S24_1
USBCM_BLACK-HF-5
C515 C0.22u10X50201-HF
C538 C0.22u10X50201-HF
C516 C0.22u10X50201-HF
C535 C0.22u10X50201-HF
ESD13 ESD-ESD8011MUT5G-HF
ESD11 ESD-ESD8011MUT5G-HF
TPJNC39 TPJNC41
USB3_TXP_TYPEC3_U_C USB3_TXN_TYPEC3_U_C
USB3_RXP_TYPEC3 USB3_RXN_TYPEC3
USB2P_TYPEC2_L USB2N_TYPEC2_L
USB2_SBU1_2 USB2_SBU2_2
USB3_RXN_TYPEC4 USB3_RXP_TYPEC4
USB3_TXN_TYPEC4_U_C USB3_TXP_TYPEC4_U_C
C160 C0.1u25X50402-HF
C164 C0.1u25X50402-HF
C122 C0.1u25X50402-HF
C123 C0.1u25X50402-HF
EL13 X_CMC-L12-9008100-HF L12-9008100-I05 FILTER_S4_1_25X1
EL14 X_CMC-L12-9008100-HF L12-9008100-I05 FILTER_S4_1_25X1
EL7 X_CMC-L12-9008100-HF L12-9008100-I05 FILTER_S4_1_25X1
EL9 X_CMC-L12-9008100-HF L12-9008100-I05 FILTER_S4_1_25X1
EL12 CMC-L12-9008100-HF L12-9008100-I05 FILTER_S4_1_25X1
Close to connector
ESD15 ESD16 ESD6 ESD9
ESD-AOZ8808DI-05-HF D0G-06A050C-A68 ESD_2_5X1
ESD14 ESD-TVLST2304AD0-HF D0G-0100619-I05 SOT26
MICRO-STAR INT'L CO.,LTD.
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USB Type-C(TPS25810) Port4
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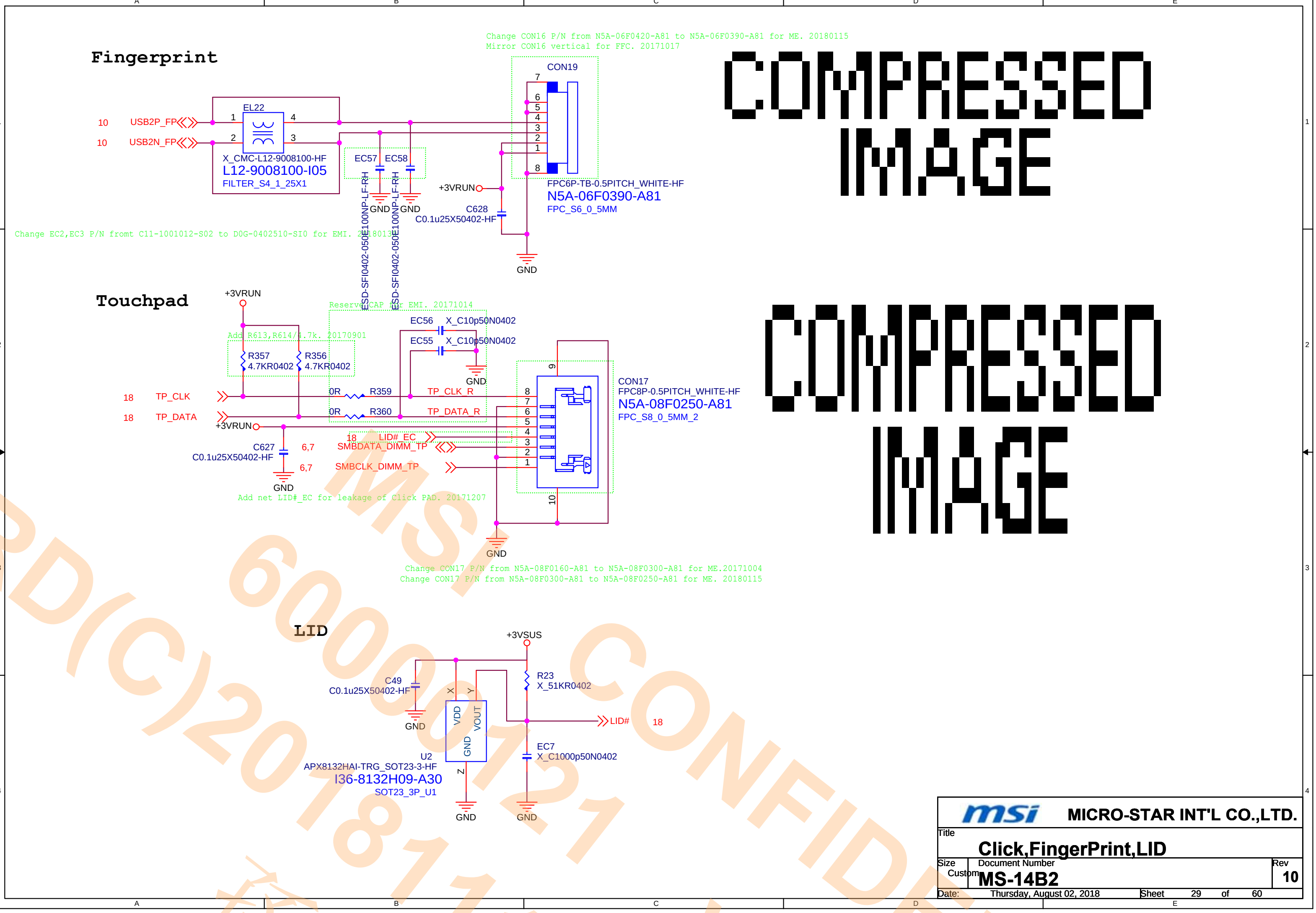
CHG_2	CHG_HI_2	CC
0	0	STD
0	1	STD
1	0	1.5A



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Title	Click,FingerPrint,LID	
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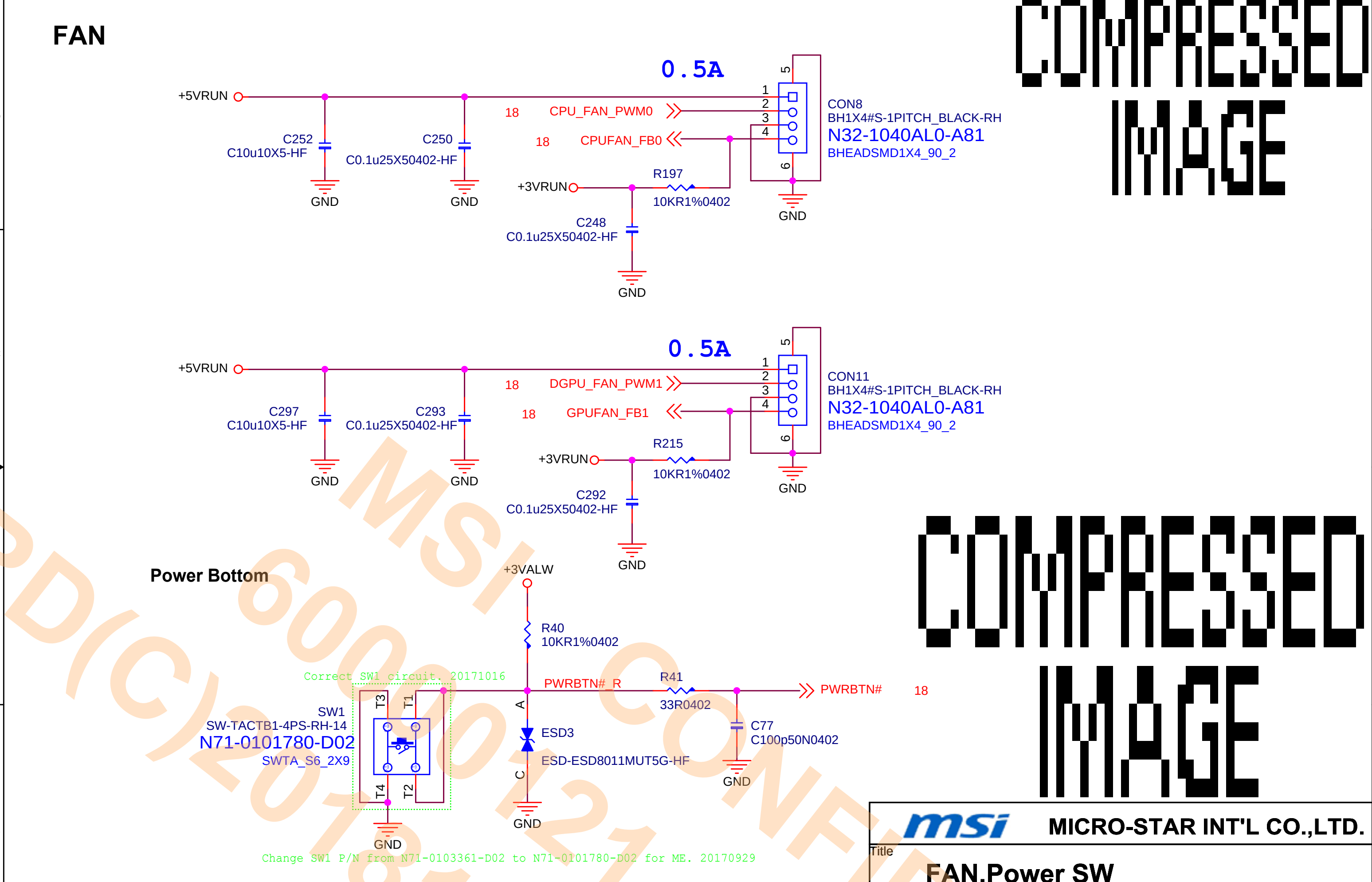

MICRO-STAR INT'L CO.,LTD.

Title: FAN,Power SW

Size	Document Number	Rev
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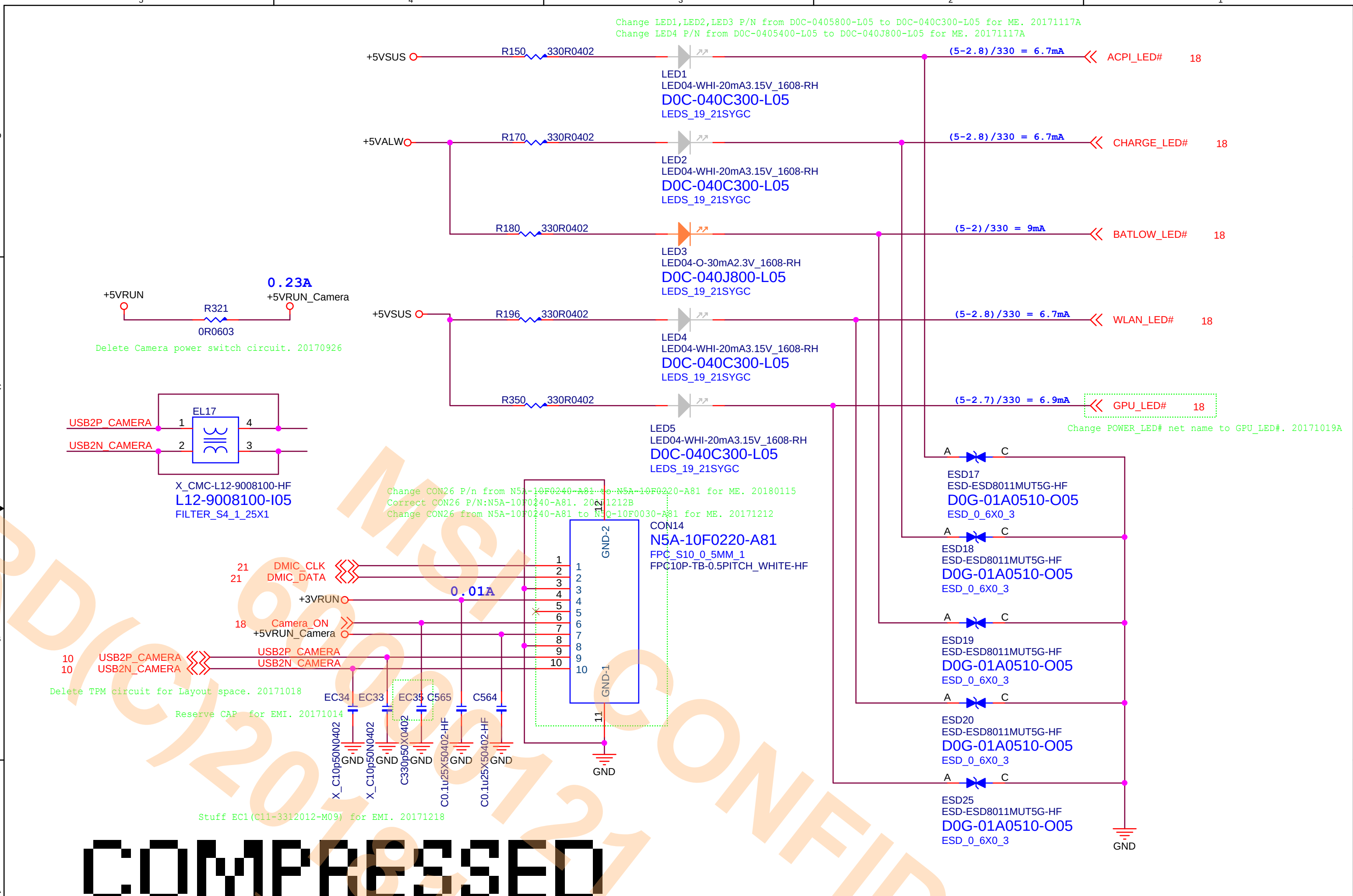

MICRO-STAR INT'L CO.,LTD.

Title: **LED / Camera**

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CPU STAND OFF

UME7 E2B_1P-5 E2B-13D2010-A89 H_R236D142_PB_N
UME16 E2B_1P-5 E2B-13D2010-A89 H_R236D142_PB_N
UME15 E2B_1P-5 E2B-13D2010-A89 H_R236D142_PB_N
UME6 E2B_1P-5 E2B-13D2010-A89 H_R236D142_PB_N

GPU STAND OFF

UME12 E2B_1P-5 E2B-13D2010-A89 H_R236D142_PB_N
UME9 E2B_1P-5 E2B-13D2010-A89 H_R236D142_PB_N
UME13 E2B_1P-5 E2B-13D2010-A89 H_R236D142_PB_N
UME10 E2B_1P-5 E2B-13D2010-A89 H_R236D142_PB_N

MYL2 Mylar MYLAR,FR283,64*25.5*0.15mm E2P-0112911-G40

LABEL1 HDMI ROYALTY Certificated HDMI_ROYALTY_0.04 Y01-RHDMI03-000

MYL3 RUBBER E2Y-6K21111-Y40
MYL4 RUBBER E2Y-6K21111-Y40
MYL5 RUBBER E2Y-6K21111-Y40
MYL6 RUBBER E2Y-6K21111-Y40
MYL7 GASKET E2Y-X007111-CA7
MYL8 GASKET E2Y-X007111-CA7
MYL9 FOIL E2M-4B10711-G40
MYL10 FOIL E23-1047010-G40

Add E2Y-6K21111-Y40 *4, E2Y-X007111-CA7 *2, E2M-4B10711-Y42, E23-1047010-G40 for ME. 20180306

MYL11 TAPE CONDUCTION_TAPE,5*5*0.13mm E2Y-X043011-G40
MYL12 TAPE PC+ADHESIVE,6*3*1.25mm E2P-4B11711-G40
MYL13 TAPE PC+ADHESIVE,6*3*1.25mm E2P-4B11711-G40
MYL14 TAPE PC+ADHESIVE,6*3*1.25mm E2P-4B11711-G40
MYL15 TAPE PC+ADHESIVE,6*3*1.25mm E2P-4B11711-G40

Add E2Y-X043011-G40 *1, E2P-4B11711-G40 *3 for PM. 20180316

UME25 H_R276D118_N
UME4 H_R276D118_N
UME5 H_R276D118_NH_R276D118_N
UME3 H_R276D118_NH_R276D118_N
UME8 H_R276D118_N
UME2 H_R276D118_N
UME14 H_R276D118_N
UME11 H_R276D118_N
UME20 H_R276D118_N
SPRING1 X_E23-1004060-CA7
SPRING2 X_E23-1004060-CA7
UME18 NPTH_98
UME1 NPTH_98
UME21 NPTH_98
X1 H_NR118D118
X2 H_NR118D118
X4 H_NR118D118
X3 H_NR118D118

Change UME23, UME14, UME15 footprint to H_R276D118_V5_N for Layout. 20171030

UME22 H_R276D118_V5_N
UME26 H_R276D118_V5_N
UME19 H_R276D118_V5_N
UME17 H_R276D118_V8_N
UME23 H_R276D118_V8_N

Add LABEL1(Y01-RHDMI03-000), LABEL2(G51-N1CO041-A09). 20180130

LABEL2 BIOS LABEL BIOS_LABEL G51-N1CO041-A09

PCB1 PD0-14B2110-H73

+1_2VDIMM
EC59 X_C0.1u25X50402-HF
EC60 X_C0.1u25X50402-HF
EC61 X_C0.1u25X50402-HF

+VBATA_1
EC32 X_C0.1u25X50402-HF

+PWR_SRC
EC24 X_C0.1u25X50402-HF
EC2 X_C0.1u25X50402-HF
EC29 X_C0.1u25X50402-HF
EC28 X_C0.1u25X50402-HF
EC23 X_C0.1u25X50402-HF
EC19 X_C0.1u25X50402-HF
EC22 X_C0.1u25X50402-HF
EC1 X_C0.1u25X50402-HF

+5VSUS
EC62 X_C0.1u25X50402-HF
EC63 X_C0.1u25X50402-HF
EC64 X_C0.1u25X50402-HF

+5VRUN
EC30 X_C0.1u25X50402-HF

Differential 80 ohm

J12 L1_DIFF_5/4.5/5_80_Ohm+ / L1_DIFF_5/4.5/5_80_Ohm- GND2 GND2 X_H1X2_black
J5 L3_DIFF_4/4.5/4_80_Ohm+ / L3_DIFF_4/4.5/4_80_Ohm- GND2GND4 GND2GND4 X_H1X2_black
J21 L8_DIFF_4/4.5/4_80_Ohm+ / L8_DIFF_4/4.5/4_80_Ohm- GND7GND9 GND7GND9 X_H1X2_black
J9 L10_DIFF_4/4.5/4_80_Ohm+ / L10_DIFF_4/4.5/4_80_Ohm- GND9GND11 GND9GND11 X_H1X2_black
J30 L12_DIFF_5/4.5/5_80_Ohm+ / L12_DIFF_5/4.5/5_80_Ohm- GND11 GND11 X_H1X2_black

Differential 90 ohm

J11 L1_DIFF_4/4.5/4_90_Ohm+ / L1_DIFF_4/4.5/4_90_Ohm- GND2 GND2 X_H1X2_black
J4 L3_DIFF_3.5/5.5/3.5_90_Ohm+ / L3_DIFF_3.5/5.5/3.5_90_Ohm- GND2GND4 GND2GND4 X_H1X2_black
J3 L8_DIFF_3.5/5.5/3.5_90_Ohm+ / L8_DIFF_3.5/5.5/3.5_90_Ohm- GND7GND9 GND7GND9 X_H1X2_black
J8 L10_DIFF_3.5/5.5/3.5_90_Ohm+ / L10_DIFF_3.5/5.5/3.5_90_Ohm- GND9GND11 GND9GND11 X_H1X2_black
J28 L12_DIFF_4/4.5/4_90_Ohm+ / L12_DIFF_4/4.5/4_90_Ohm- GND11 GND11 X_H1X2_black

FM3 FM13 FM11 FM4 FM18 FM25 FM26 FM23 FM14 FM7 FM19 FM22 FM24 FM6 FM20 FM8 FM17 FM27 FM5 FM21 FM9 FM1 FM22 FM10 FM2 FM12 FM16 X_F_PAD_X F_PAD_X

Single 40 Ohm

J24 L1_7mil_40_Ohm GND2
J14 L3_4.5mil_40_Ohm GND2GND4
J20 L8_4.5mil_40_Ohm GND7GND9
J34 L10_4.5mil_40_Ohm GND9GND11
J35 L12_7mil_40_Ohm GND11

Single 50 Ohm

J25 L1_4.5mil_50_Ohm GND2
J13 L3_3mil_50_Ohm GND2GND4
J22 L8_3mil_50_Ohm GND7GND9
J18 L10_3mil_50_Ohm GND9GND11
J33 L12_4.5mil_50_Ohm GND11

X_PIN1*2

Differential 83 ohm

J26 L1_DIFF_4.5/4/4.5_83_Ohm+ / L1_DIFF_4.5/4/4.5_83_Ohm- GND2 GND2 X_H1X2_black
J15 L3_DIFF_4/5/4_83_Ohm+ / L3_DIFF_4/5/4_83_Ohm- GND2GND4 GND2GND4 X_H1X2_black
J1 L8_DIFF_4/5/4_83_Ohm+ / L8_DIFF_4/5/4_83_Ohm- GND7GND9 GND7GND9 X_H1X2_black
J17 L10_DIFF_4/5/4_83_Ohm+ / L10_DIFF_4/5/4_83_Ohm- GND9GND11 GND9GND11 X_H1X2_black
J32 L12_DIFF_4.5/4/4.5_83_Ohm+ / L12_DIFF_4.5/4/4.5_83_Ohm- GND11 GND11 X_H1X2_black

Differential 85 ohm

J27 L1_DIFF_4.5/4.5/4.5_85_Ohm+ / L1_DIFF_4.5/4.5/4.5_85_Ohm- GND2 GND2 X_H1X2_black
J16 L3_DIFF_3.5/5/3.5_85_Ohm+ / L3_DIFF_3.5/5/3.5_85_Ohm- GND2GND4 GND2GND4 X_H1X2_black
J2 L8_DIFF_3.5/5/3.5_85_Ohm+ / L8_DIFF_3.5/5/3.5_85_Ohm- GND7GND9 GND7GND9 X_H1X2_black
J19 L10_DIFF_3.5/5/3.5_85_Ohm+ / L10_DIFF_3.5/5/3.5_85_Ohm- GND9GND11 GND9GND11 X_H1X2_black
J31 L12_DIFF_4.5/4.5/4.5_85_Ohm+ / L12_DIFF_4.5/4.5/4.5_85_Ohm- GND11 GND11 X_H1X2_black

Differential 100 ohm

J10 L1_DIFF_3.5/6.5/3.5_100_Ohm+ / L1_DIFF_3.5/6.5/3.5_100_Ohm- GND2 GND2 X_H1X2_black
J6 L3_DIFF_3/6/3_100_Ohm+ / L3_DIFF_3/6/3_100_Ohm- GND2GND4 GND2GND4 X_H1X2_black
J23 L8_DIFF_3/6/3_100_Ohm+ / L8_DIFF_3/6/3_100_Ohm- GND7GND9 GND7GND9 X_H1X2_black
J7 L10_DIFF_3/6/3_100_Ohm+ / L10_DIFF_3/6/3_100_Ohm- GND9GND11 GND9GND11 X_H1X2_black
J29 L12_DIFF_3.5/6.5/3.5_100_Ohm+ / L12_DIFF_3.5/6.5/3.5_100_Ohm- GND11 GND11 X_H1X2_black

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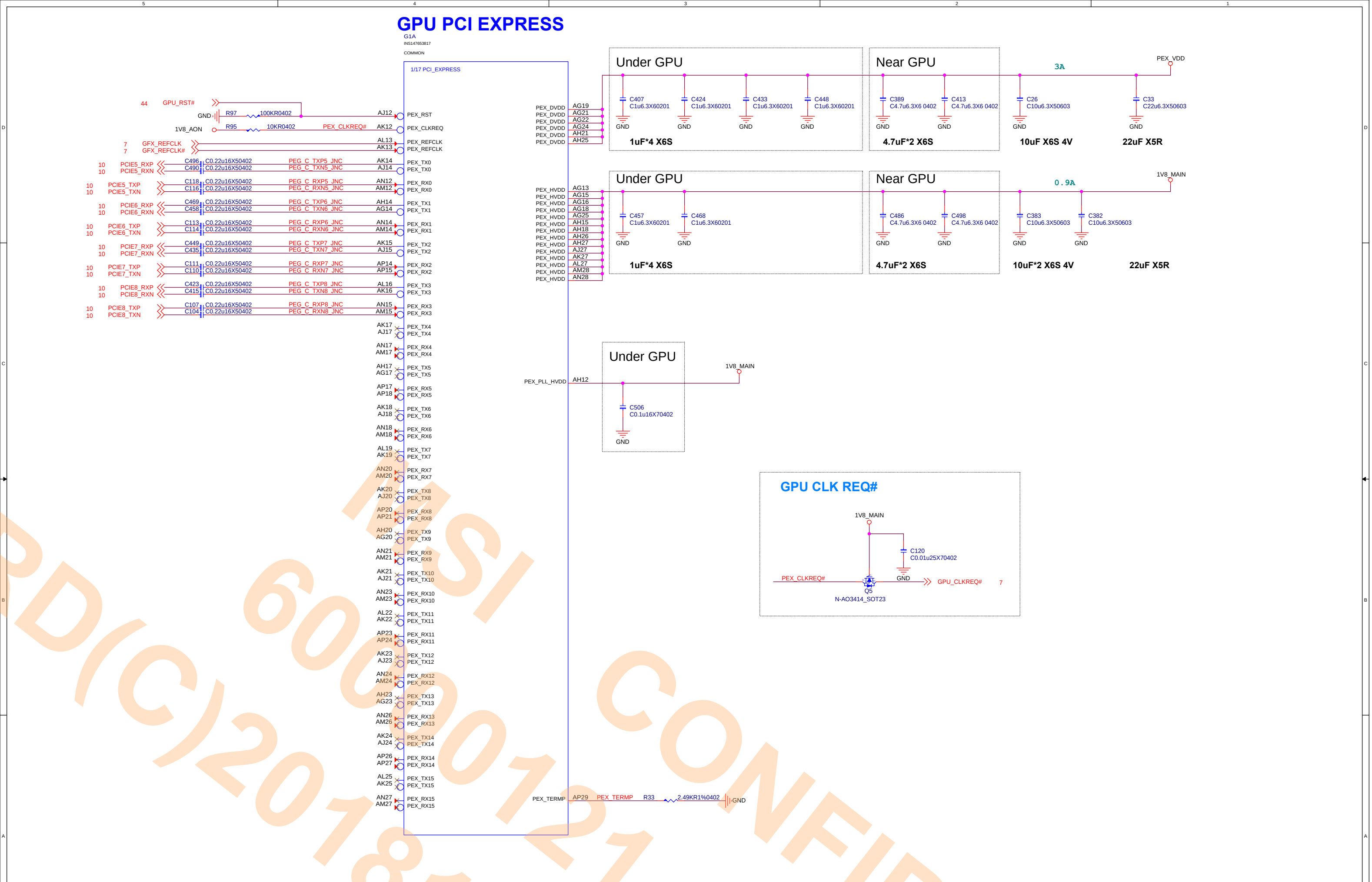
GPU PCI EXPRESS



MICRO-STAR INT'L CO.,LTD.

Title	DGPU_PCI-E Host
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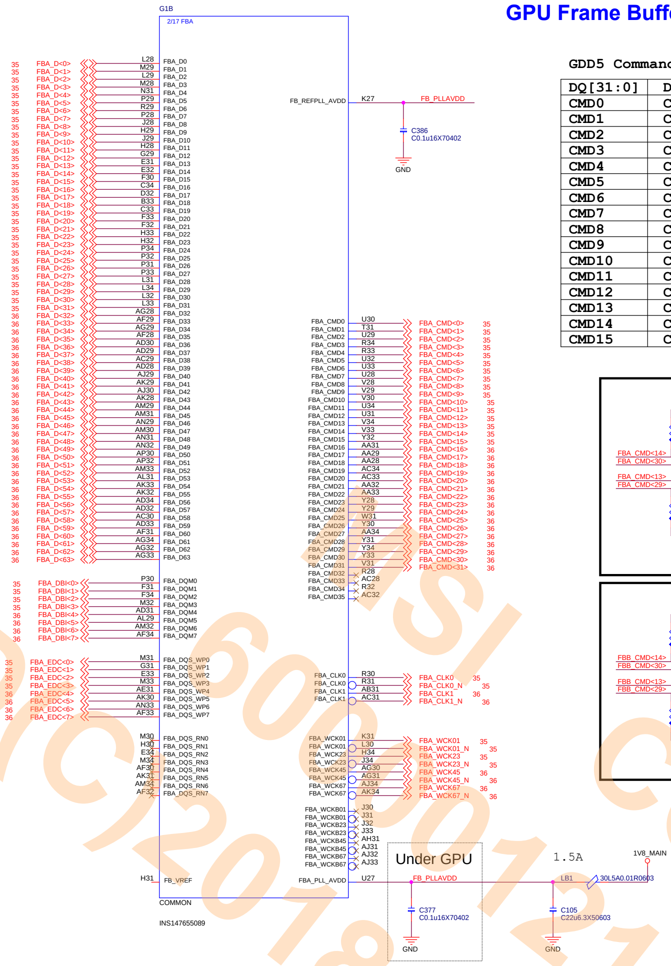
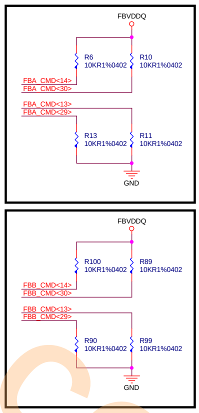
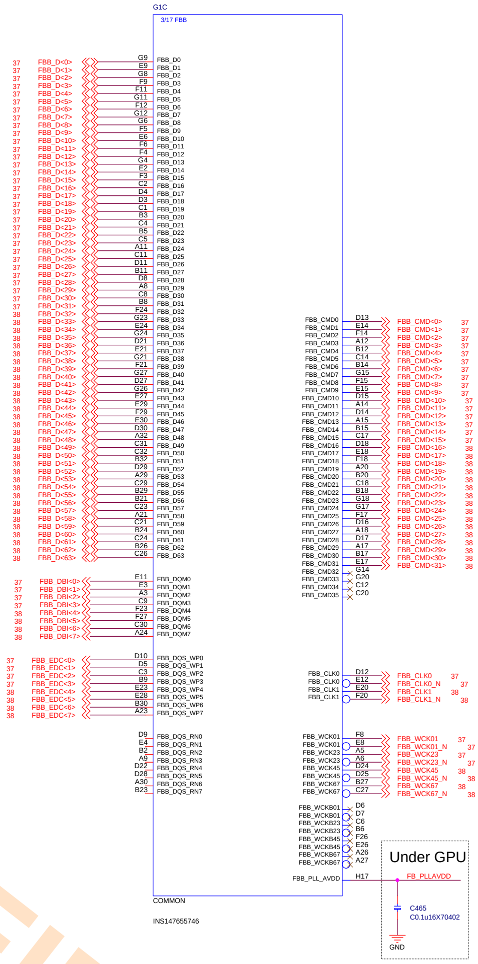
GPU Frame Buffer Partition A/B



GDD5 Command Mapping GB4C-128

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





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Title	DGPU_MEM IF A/B	
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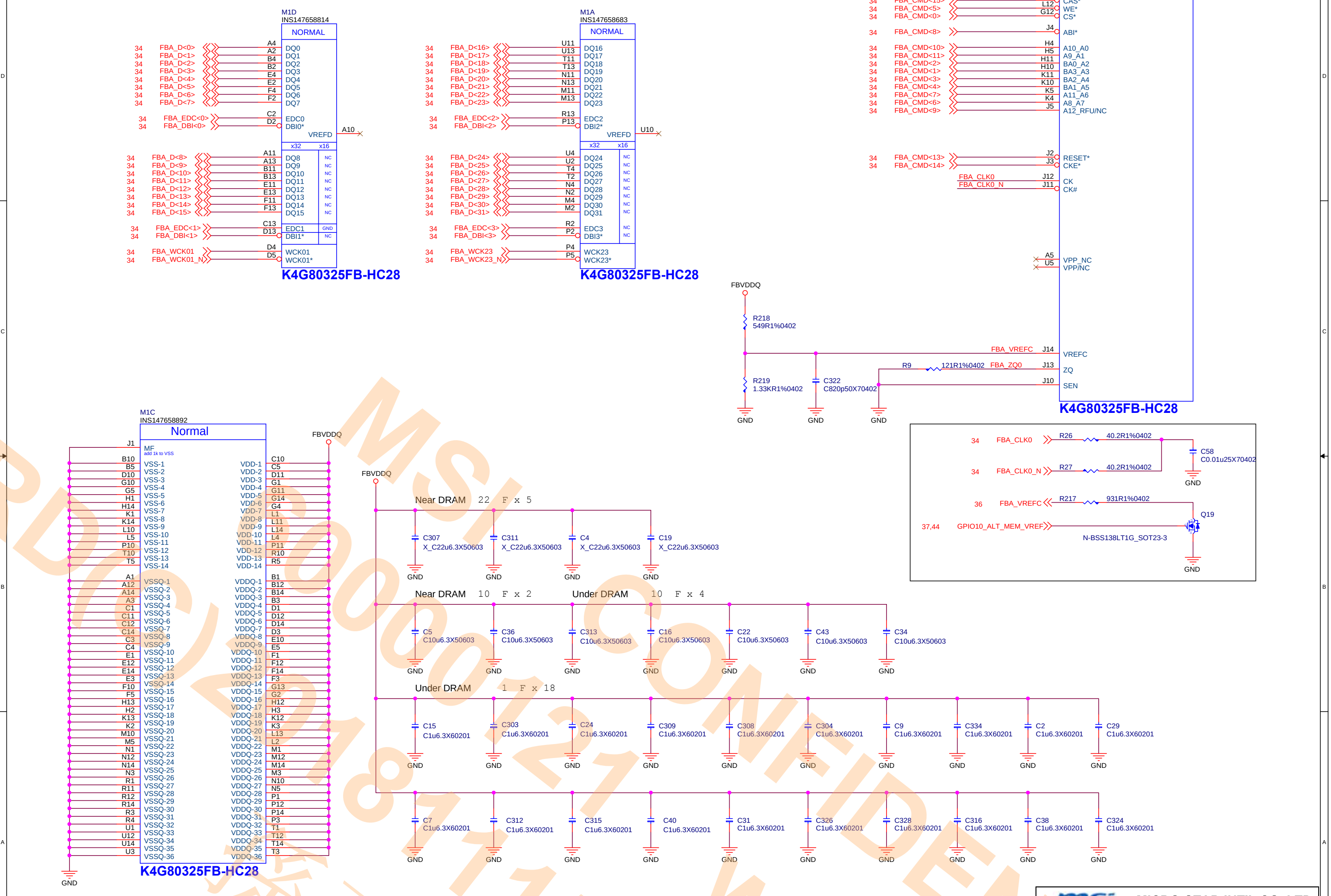
DGPU_GDDR5 FrameBuffer A0



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Title	DGPU_GDDR5 FrameBuffer A0	
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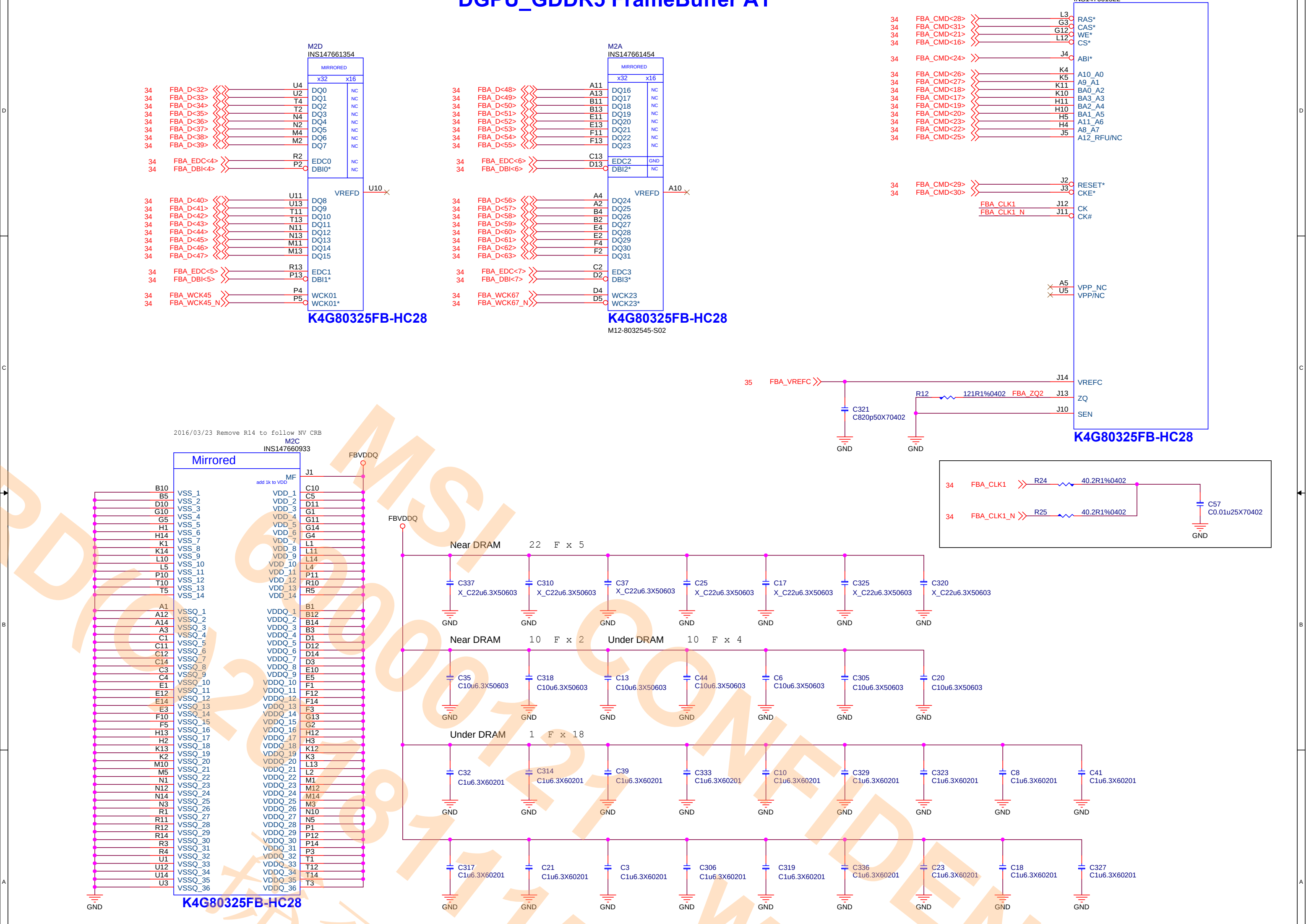
DGPU_GDDR5 FrameBuffer A1



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Title: DGPU_GDDR5 FrameBuffer A1

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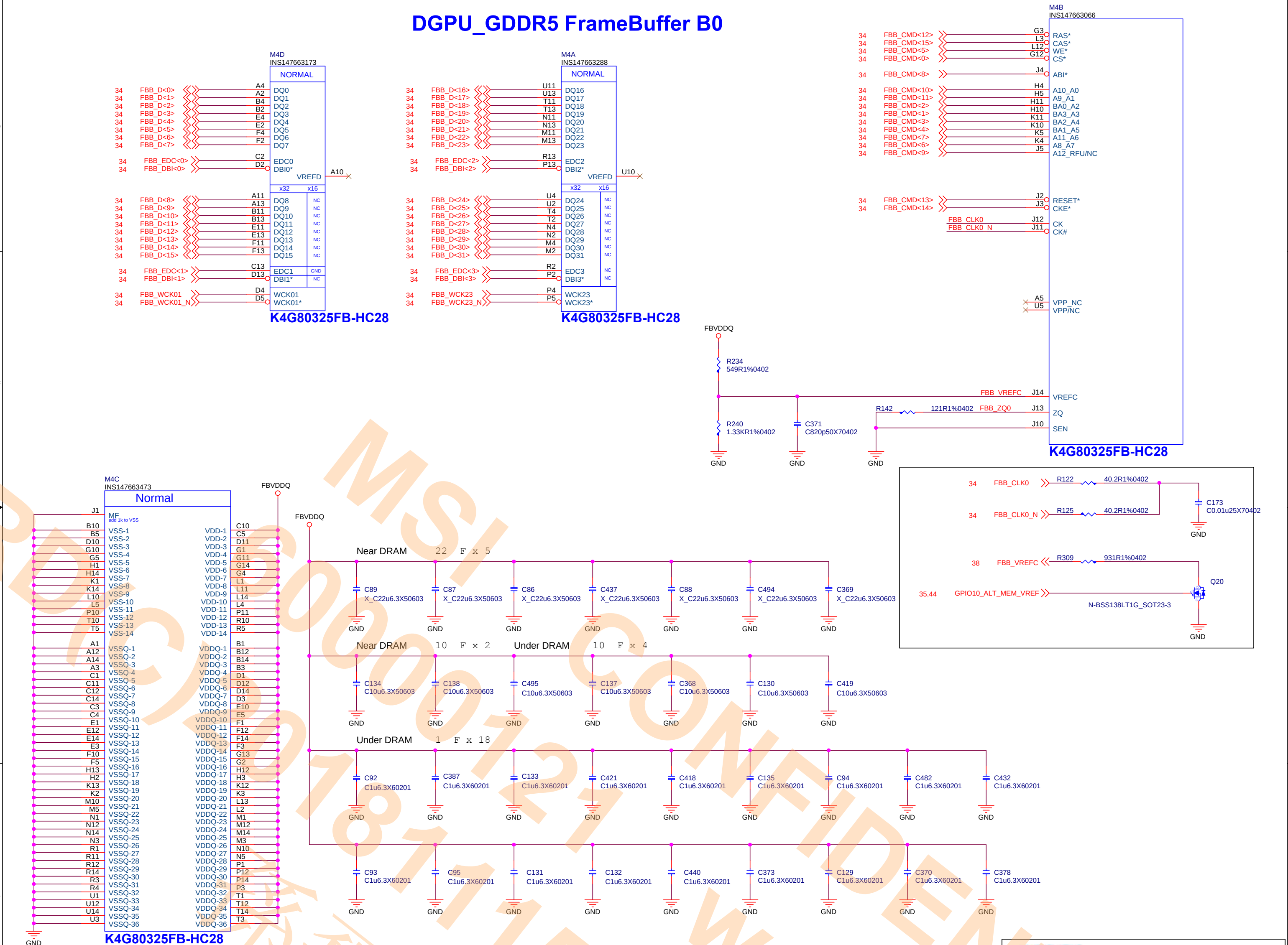
DGPU_GDDR5 FrameBuffer B0



MICRO-STAR INT'L CO.,LTD.

Title	DGPU_GDDR5 FrameBuffer B0
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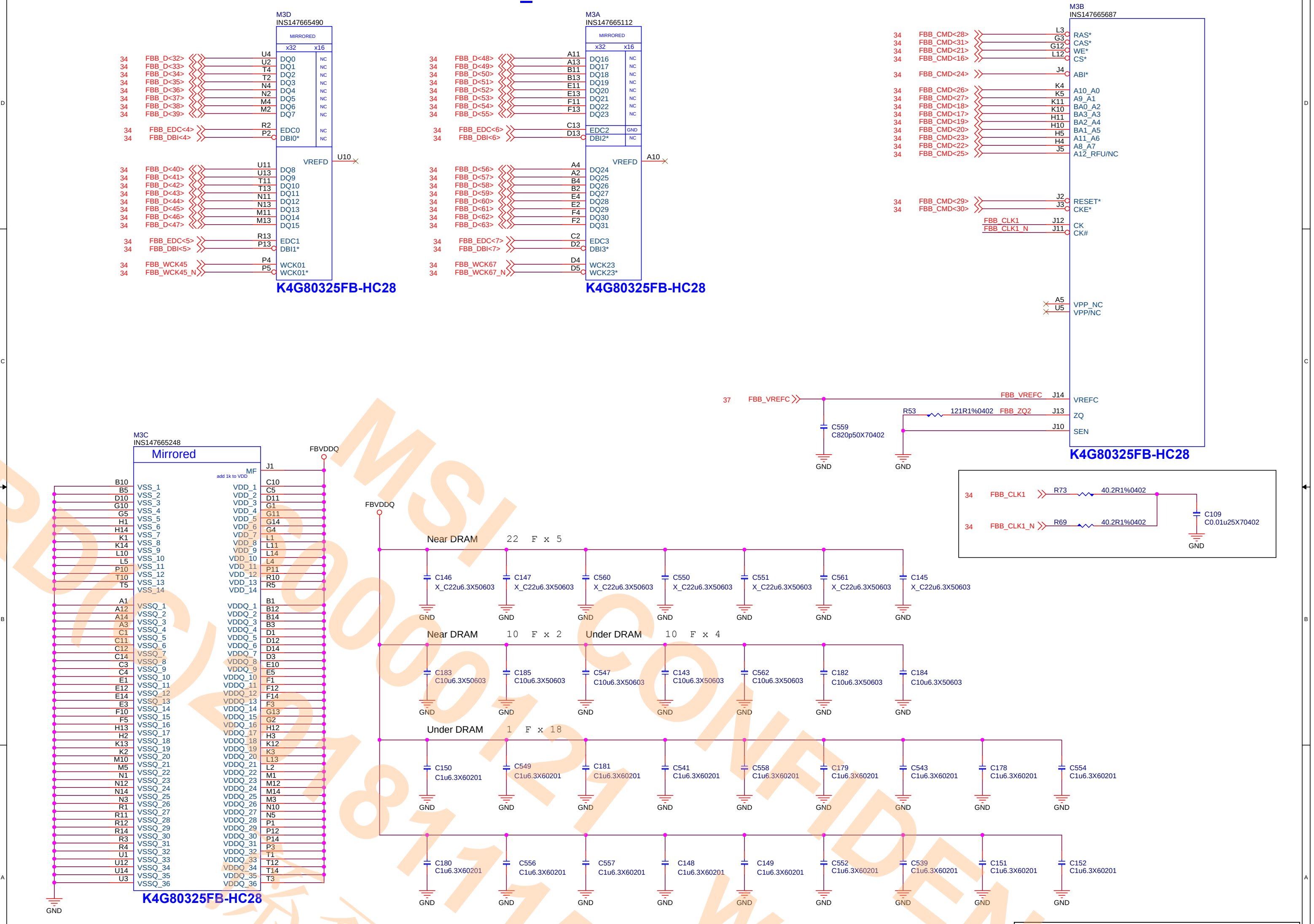
DGPU_GDDR5 FrameBuffer B1



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Title	DGPU_GDDR5 FrameBuffer B1	
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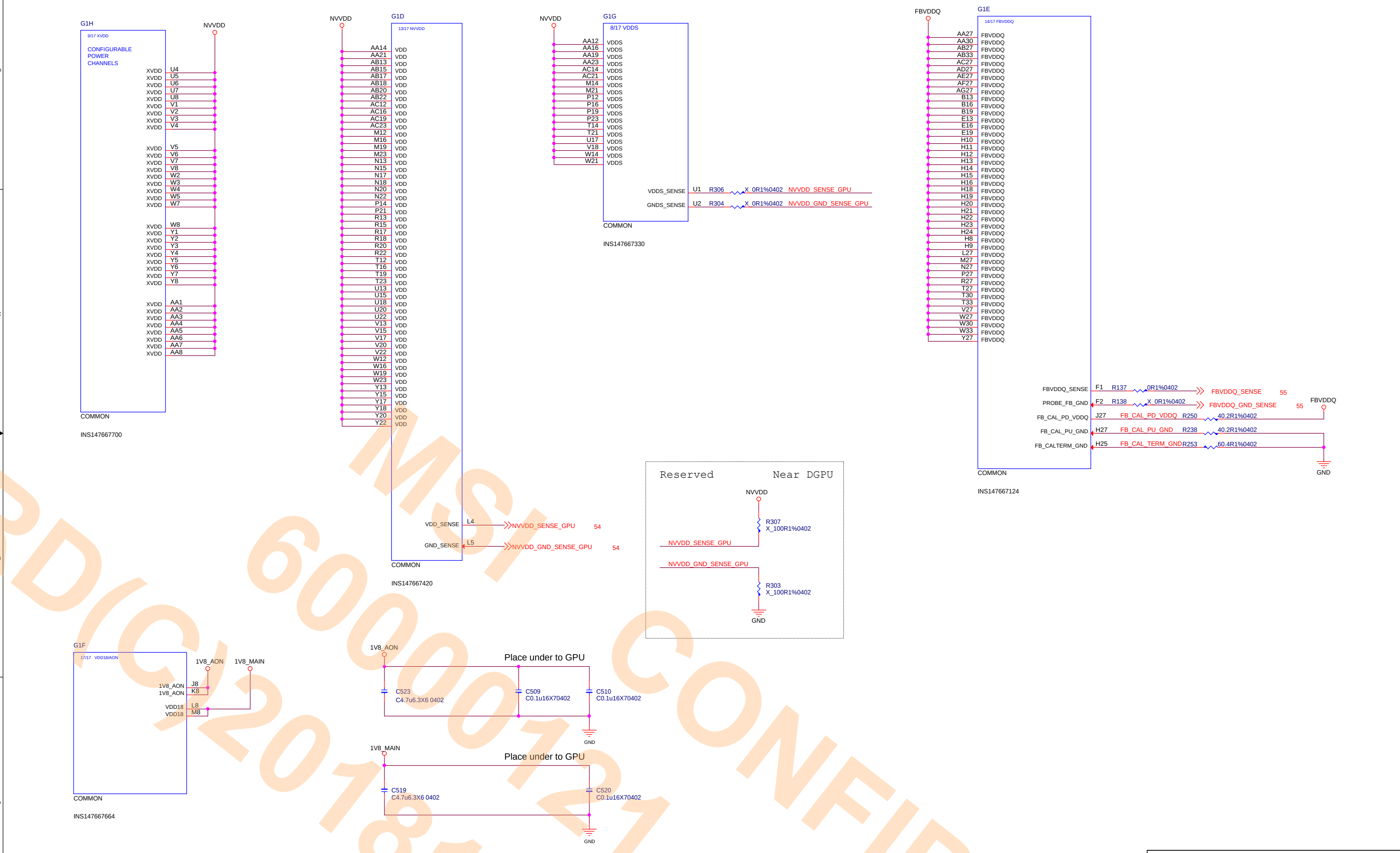
GPU NVVDD, FBVDDQ



MICRO-STAR INT'L CO.,LTD.

Title: DGPU_POWER

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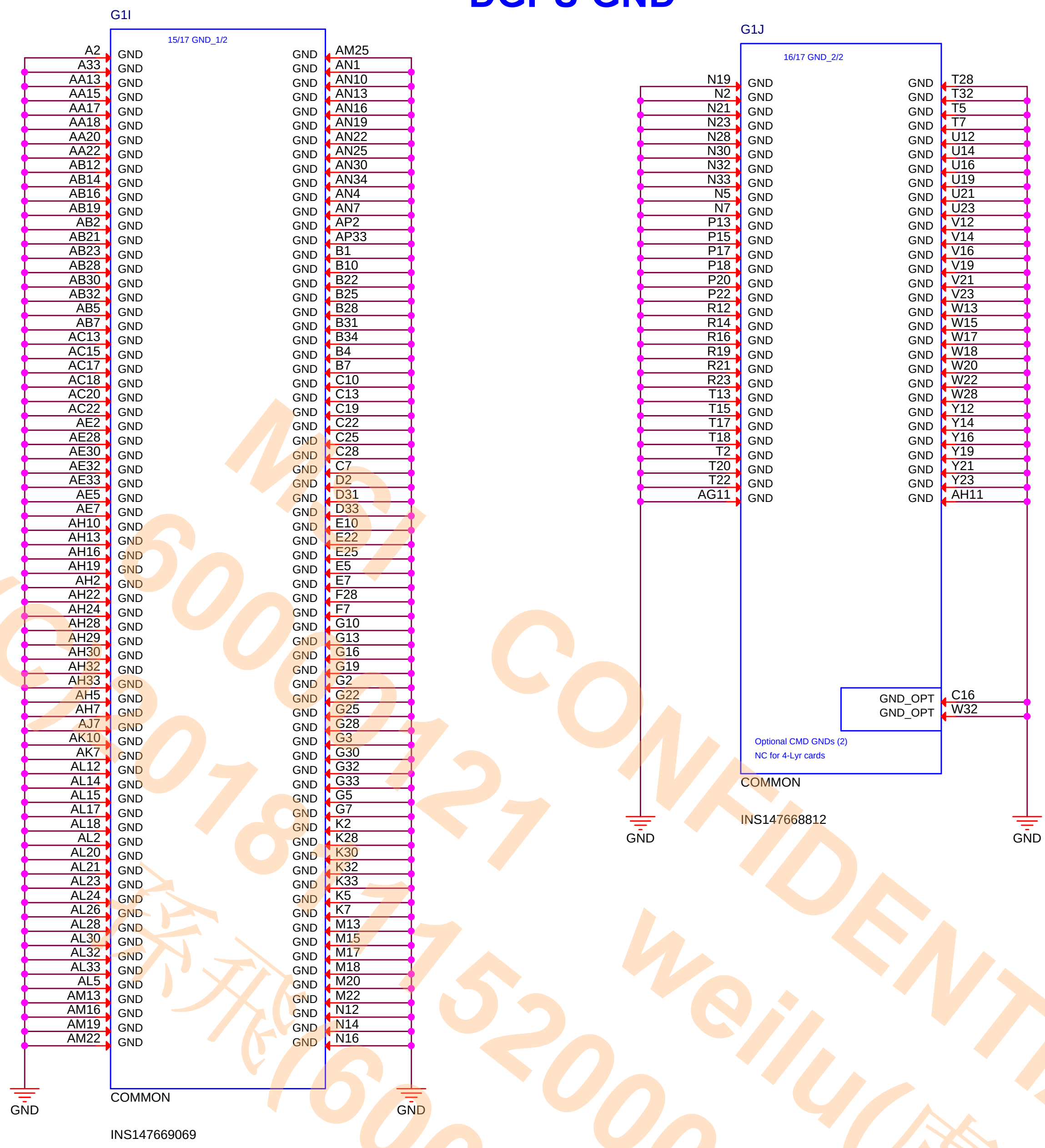
DGPU GND



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Title	DGPU_GND	
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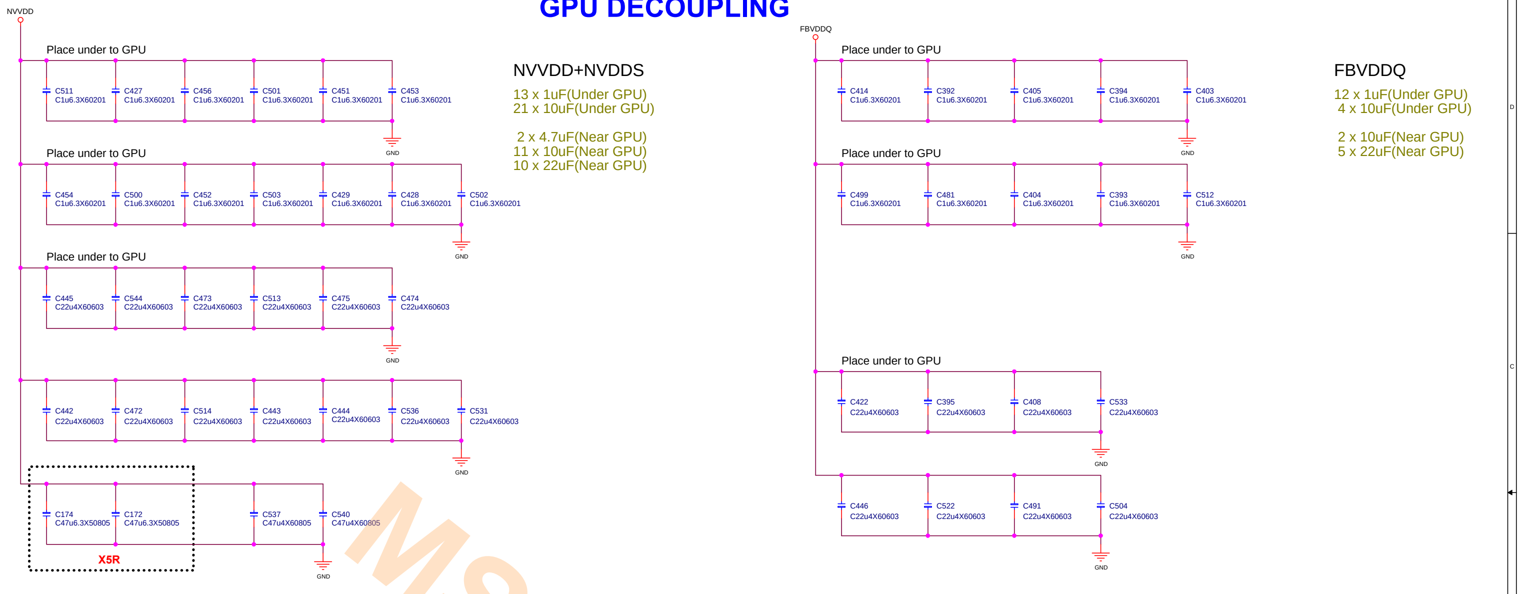
GPU DECOUPLING


NVVDD
Place under to GPU
C511 C1u6.3X60201
C427 C1u6.3X60201
C456 C1u6.3X60201
C501 C1u6.3X60201
C451 C1u6.3X60201
C453 C1u6.3X60201
GND
Place under to GPU
C454 C1u6.3X60201
C500 C1u6.3X60201
C452 C1u6.3X60201
C503 C1u6.3X60201
C429 C1u6.3X60201
C428 C1u6.3X60201
C502 C1u6.3X60201
GND
Place under to GPU
C445 C22u4X60603
C544 C22u4X60603
C473 C22u4X60603
C513 C22u4X60603
C475 C22u4X60603
C474 C22u4X60603
GND
C442 C22u4X60603
C472 C22u4X60603
C514 C22u4X60603
C443 C22u4X60603
C444 C22u4X60603
C536 C22u4X60603
C531 C22u4X60603
GND
C174 C47u6.3X50805
C172 C47u6.3X50805
X5R
C537 C47u4X60805
C540 C47u4X60805
GND
NVVDD+NVDDS
13 x 1uF(Under GPU)
21 x 10uF(Under GPU)
2 x 4.7uF(Near GPU)
11 x 10uF(Near GPU)
10 x 22uF(Near GPU)
FBVDDQ
Place under to GPU
C414 C1u6.3X60201
C392 C1u6.3X60201
C405 C1u6.3X60201
C394 C1u6.3X60201
C403 C1u6.3X60201
GND
Place under to GPU
C499 C1u6.3X60201
C481 C1u6.3X60201
C404 C1u6.3X60201
C393 C1u6.3X60201
C512 C1u6.3X60201
GND
Place under to GPU
C422 C22u4X60603
C395 C22u4X60603
C408 C22u4X60603
C533 C22u4X60603
GND
C446 C22u4X60603
C522 C22u4X60603
C491 C22u4X60603
C504 C22u4X60603
GND
FBVDDQ
12 x 1uF(Under GPU)
4 x 10uF(Under GPU)
2 x 10uF(Near GPU)
5 x 22uF(Near GPU)

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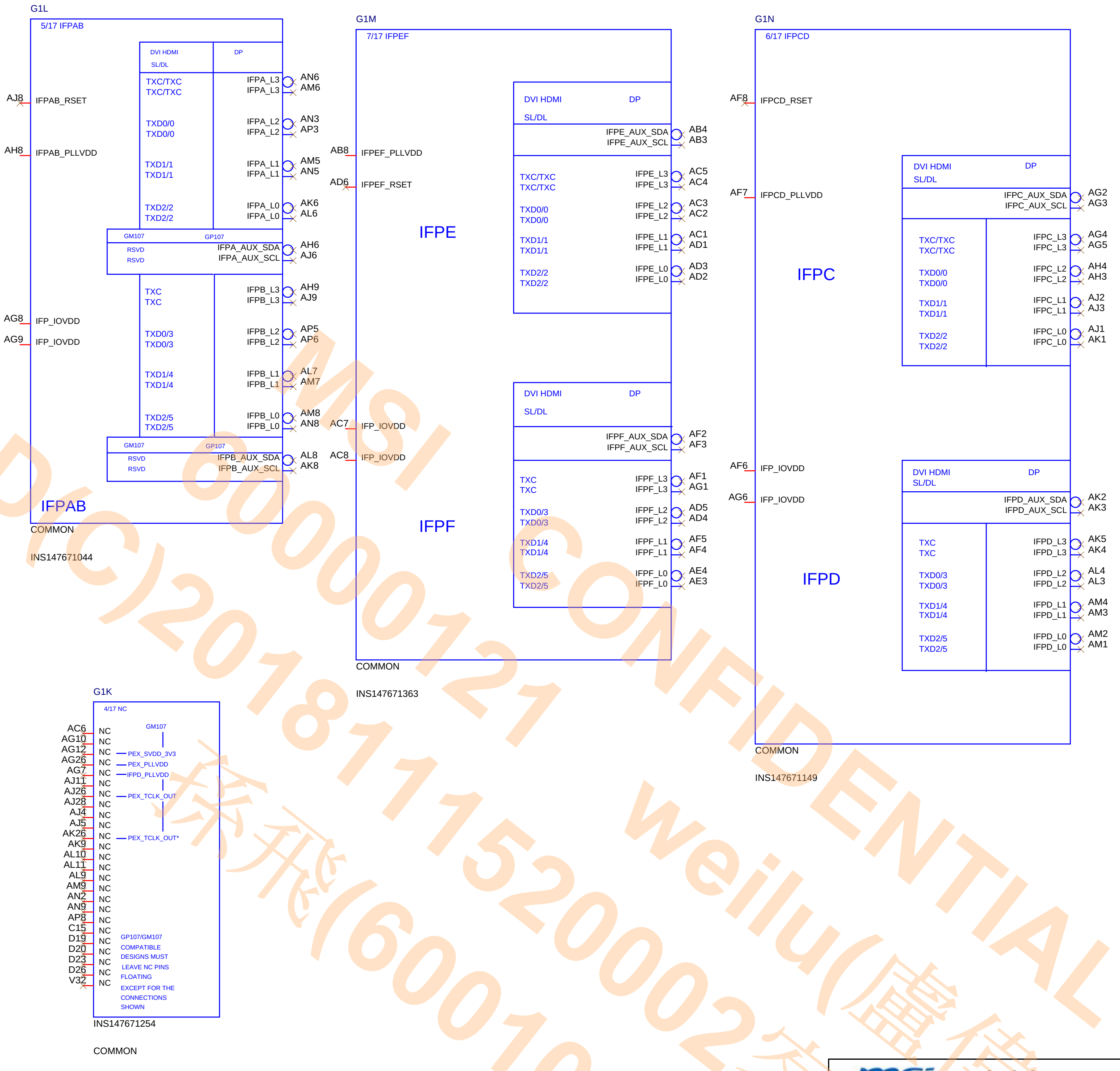
DACA,Display IF



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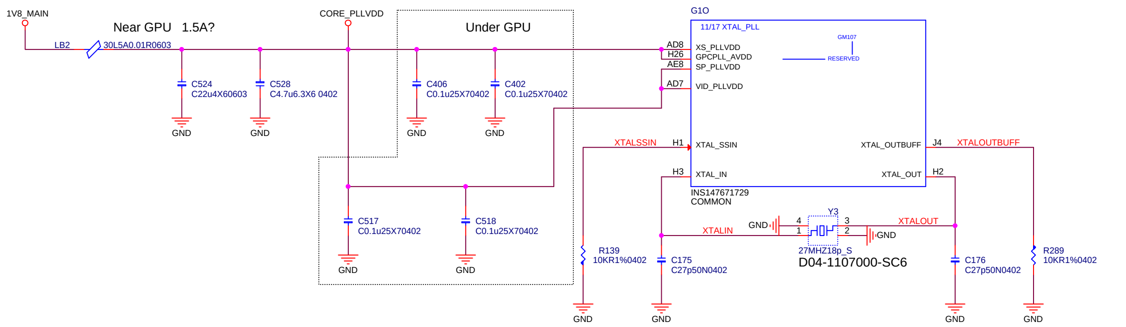
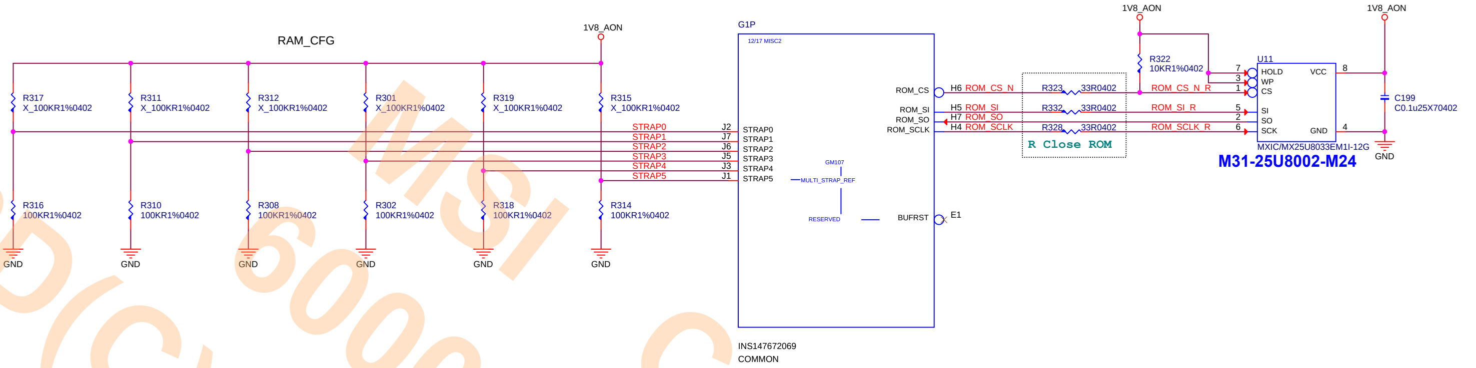
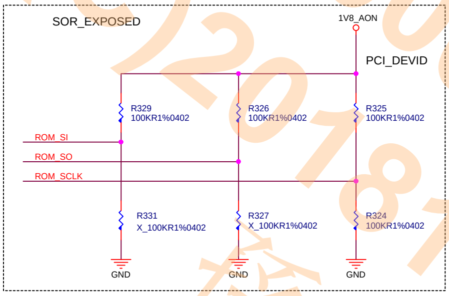
ROM, MULTI-LEVEL STRAPS







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			
8Gbps	L	L	L	0x0	Samsung K4G80325FB-HC25	
7Gbps	L	L	L	0x0	Samsung K4G80325FB-HC28	256M*32
	L	L	H	0x1	Micron MT51J2256M32HF-80:A	
	L	H	L	0x2	Hynix H5GC8H24MJR-R4C	
	H	H	L	0x6	Hynix H5GQ4H24AJR-R4C	128M*32
	H	H	H	0x7	Samsung K4G41325FE-HC25	

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

MICRO-STAR INT'L CO.,LTD.

Title: ROM/HW Straps/XTAL

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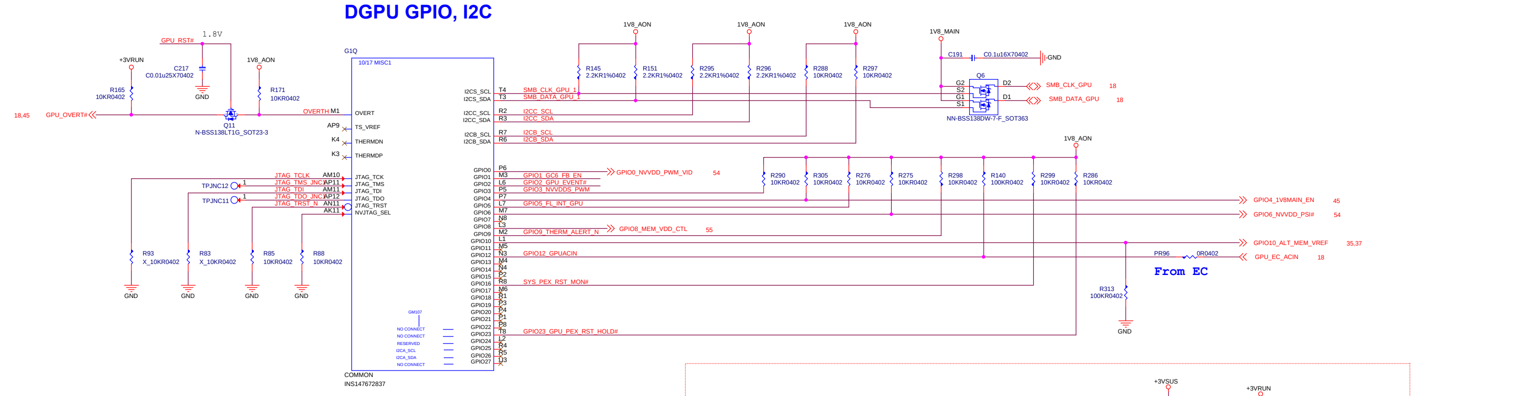
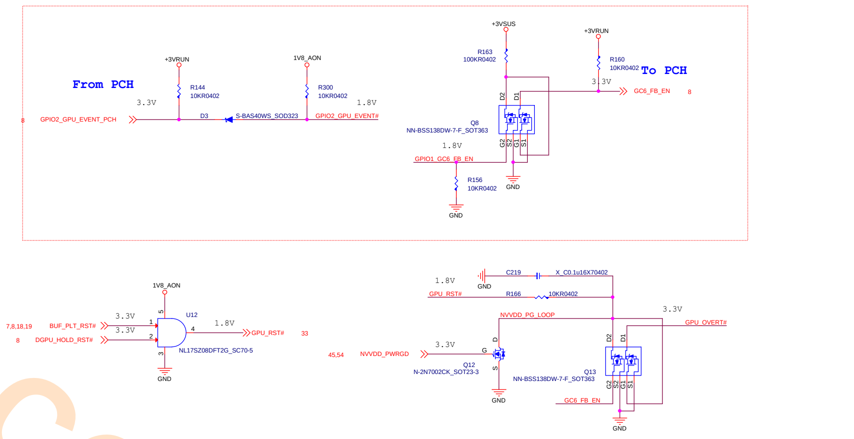
DGPU GPIO, I2C



Pin Name	Normal function	I/O	Functional Description	Recommended Default Pull-up or Pull-down
GPIO0	NVVDD_PWM	O	PWM Output to control NVVDD	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	NVVDDS_PWM	O	PWM output to control the NVVDDS 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, 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 Brighteness Control	100K pull-down
GPIO8	MEM_VDD_CTL	O	Memory Voltage Control	pull-up/pull-down to set the FBVDD/Q power-on voltage
GPIO9	THERM_ALERT	I/O	Active Low Thermal Alert	OD, 10K pull-up to 1V8_AON
GPIO10	MEM_VREF_CTL	O	Memory VREF Control	100K pull-down
GPIO11	LCD_VCC	O	Panel Power Enable	100K pull-down
GPIO12	PWR_LEVEL	I	AC power detect or power supply overdraw input	100K pull-up to 1V8_AON
GPIO13	LCD_BLEN	O	Panel Backlight Enable	100K pull-down
GPIO14	HPD_A	I	Hot Plug Detect for IFPA	
GPIO15	HPD_B	I	Hot Plug Detect for IFPB	
GPIO16	SYS_PEX_RST_MON#	O	System side PCIe reset monitor	10K pull-up to 1V8 _AON
GPIO17	HPD_D	I	Hot Plug Detect for IFPD	
GPIO18	HPD_E	I	Hot Plug Detect for IFPE	
GPIO19	3DVision	O	3D Vision L/R signal	100K pull-down
GPIO20	GC5_MODE			
GPIO21	UNUSED	I/O		
GPIO22	UNUSED	I/O		
GPIO23	GPU_PEX_RST_HOLD#	O	GPU PCIe self-reset control	OD, 10K pull-up to a gated 3V3
GPIO24	HPD_F	I		
GPIO25	UNUSED			
GPIO26	UNUSED			
GPIO27	HPD_C	I	Hot Plug Detect for IFPC	



MICRO-STAR INT'L CO.,LTD.

Title	DGPU_GPIO/I2C	
Size Custom	Document Number MS-14B2	Rev 1.0
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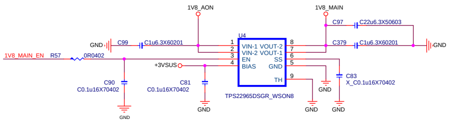
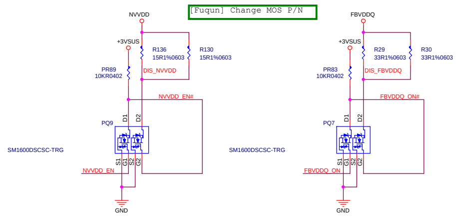
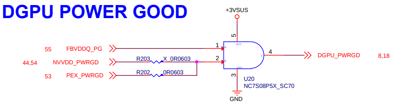
1V8_MAIN

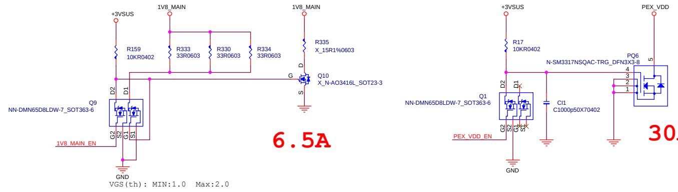


Discharge

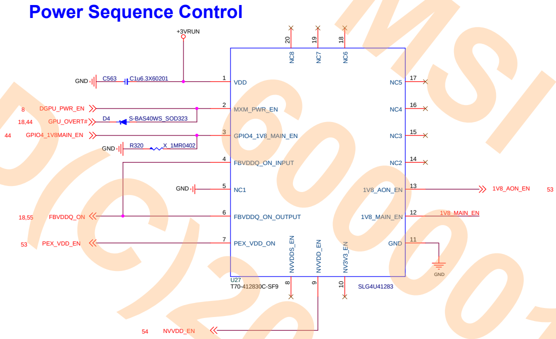


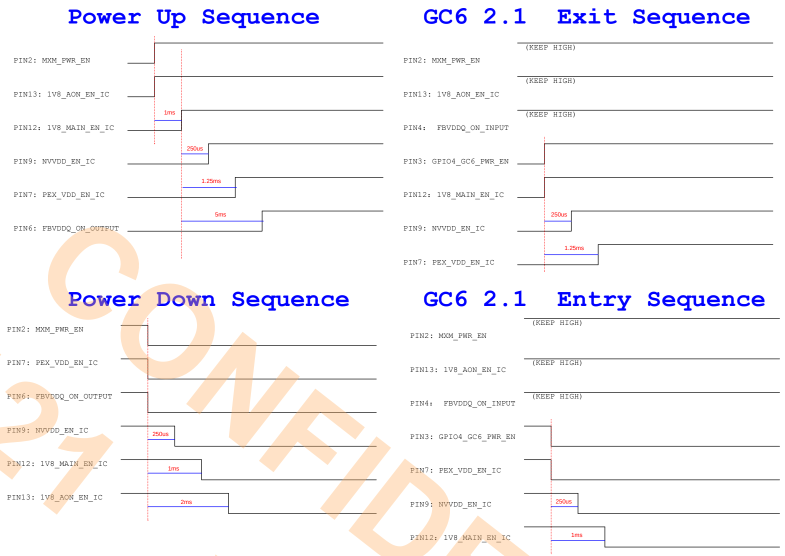
DGPU POWER GOOD





Power Sequence Control






```
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
```

msi	MICRO-STAR INT'L CO.,LTD.
Title	DGPU_Power Control
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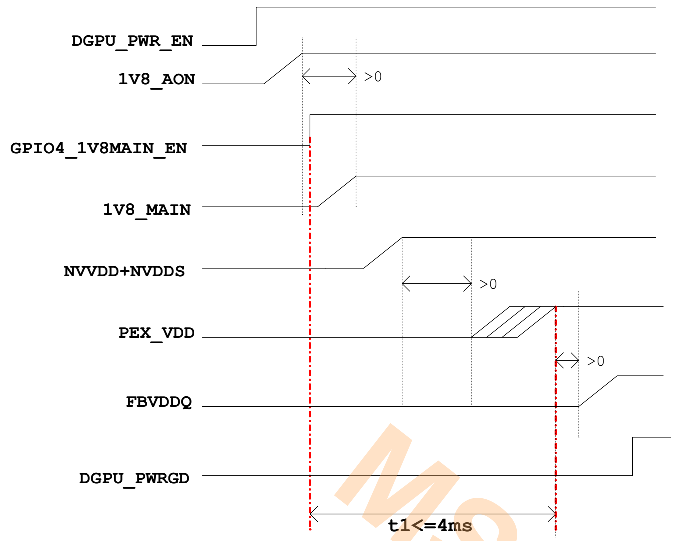
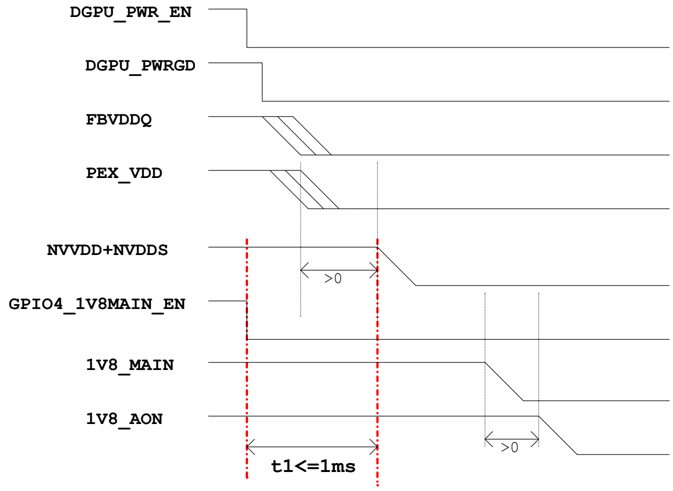
POWER UP Sequence

1V8_AON -> 1V8_MAIN->NV3V3 -> NVVDD -> NVVDDS / PEX_VDD -> FBVDDQ

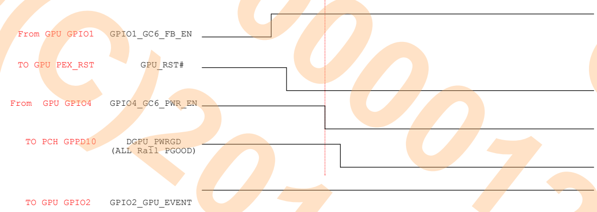


POWER Down Sequence

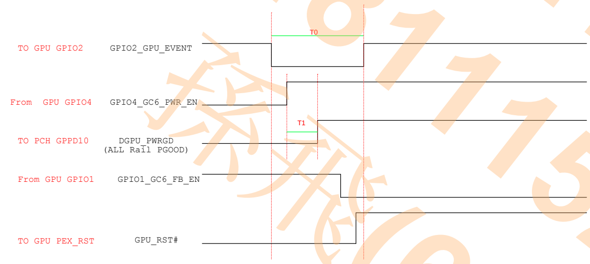
NVVDDS/PEX_VDD/FBVDDQ ->NVVDD/NV3V3->1V8_MAIN> 1V8_AON



GC6 2.1 ENTRY SEQUENCE



GC6 2.1 EXIT SEQUENCE

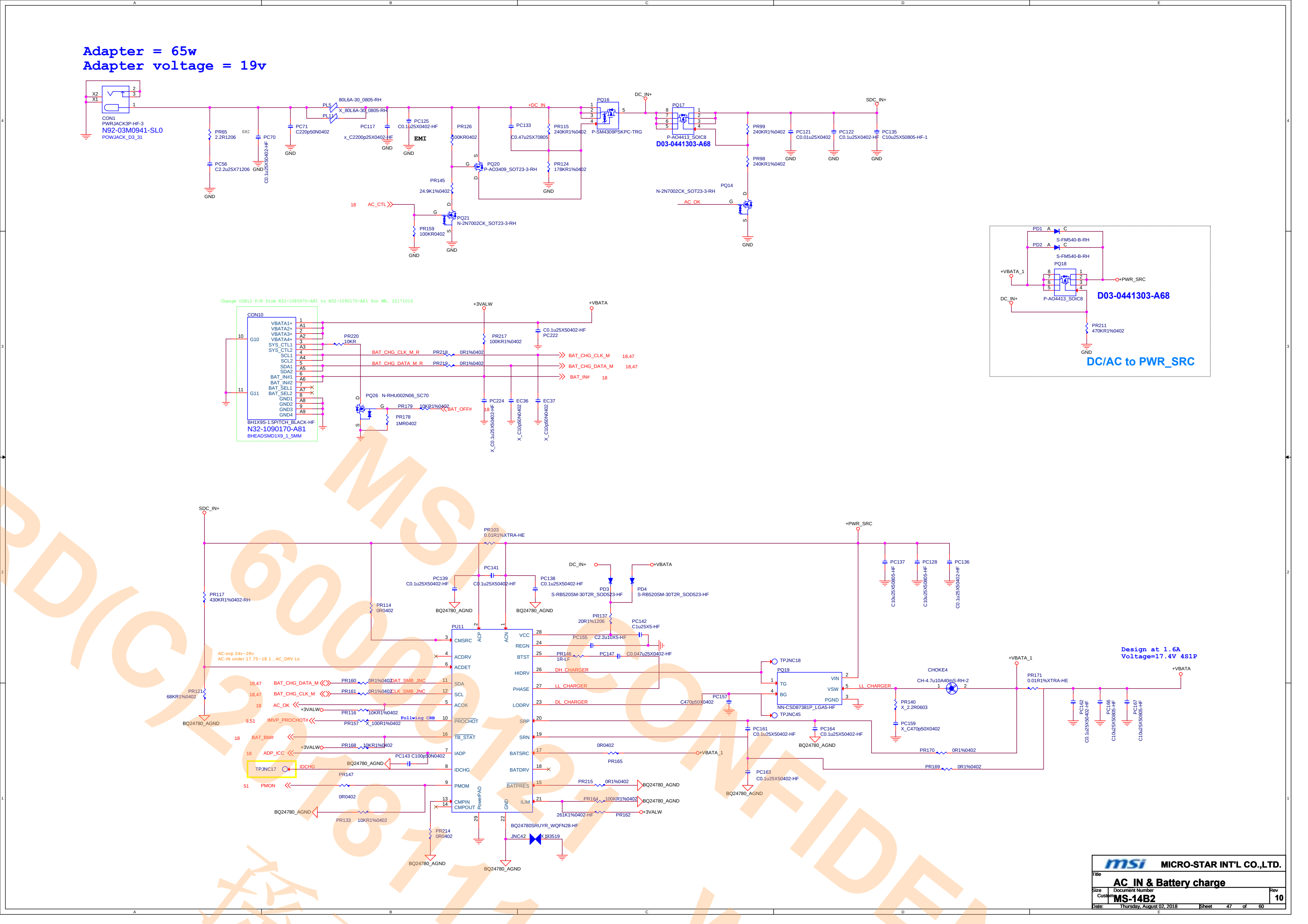


GC6 2.1 TIMING

	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 guarateed 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.



MICRO-STAR INT'L CO.,LTD.

Title: AC_IN & Battery charge

Size	Document Number	Rev
Custom	MS-14B2	10

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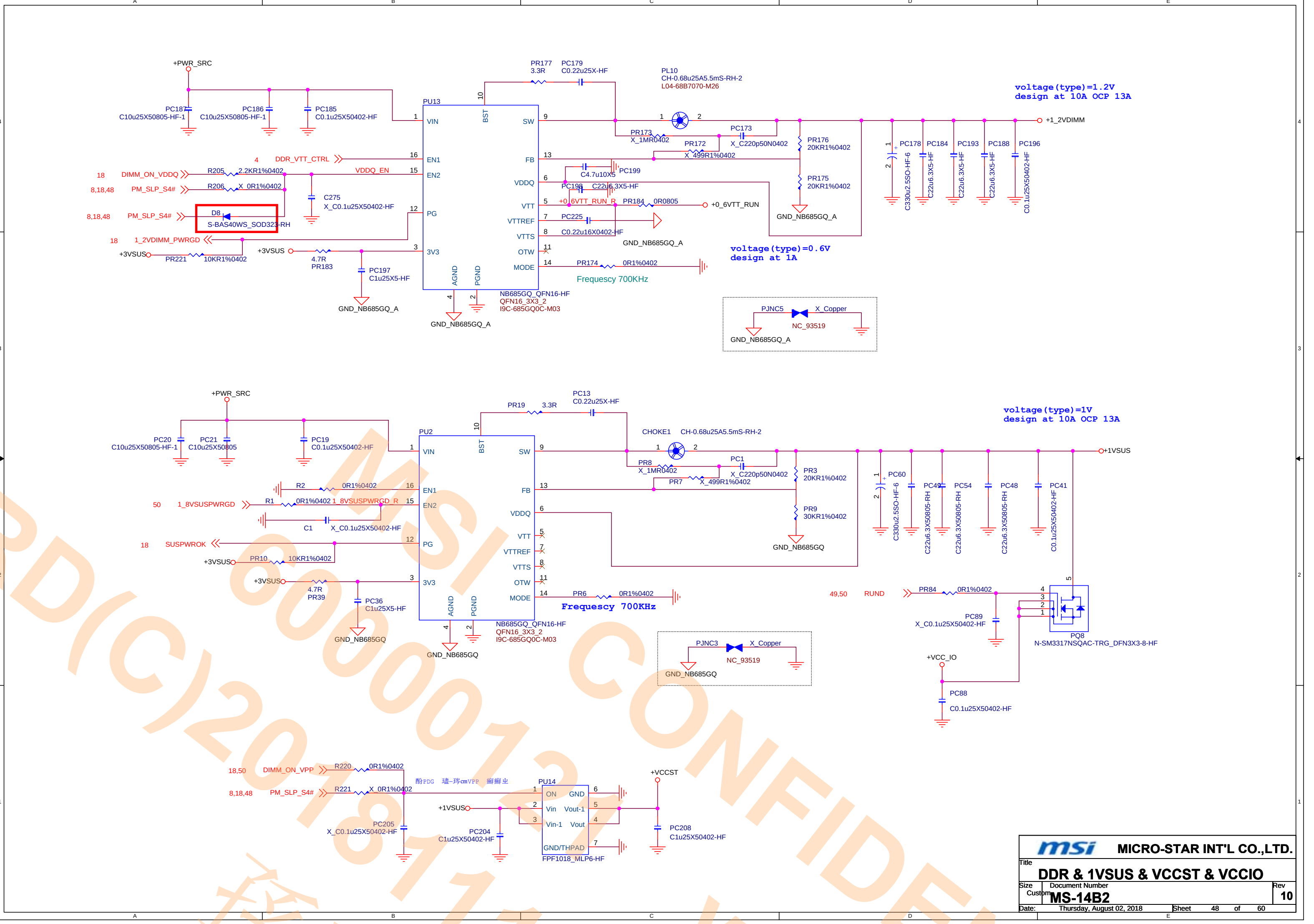

MICRO-STAR INT'L CO.,LTD.

Title: DDR & 1VSUS & VCCST & VCCIO

Size	Document Number	Rev
Custom	MS-14B2	10

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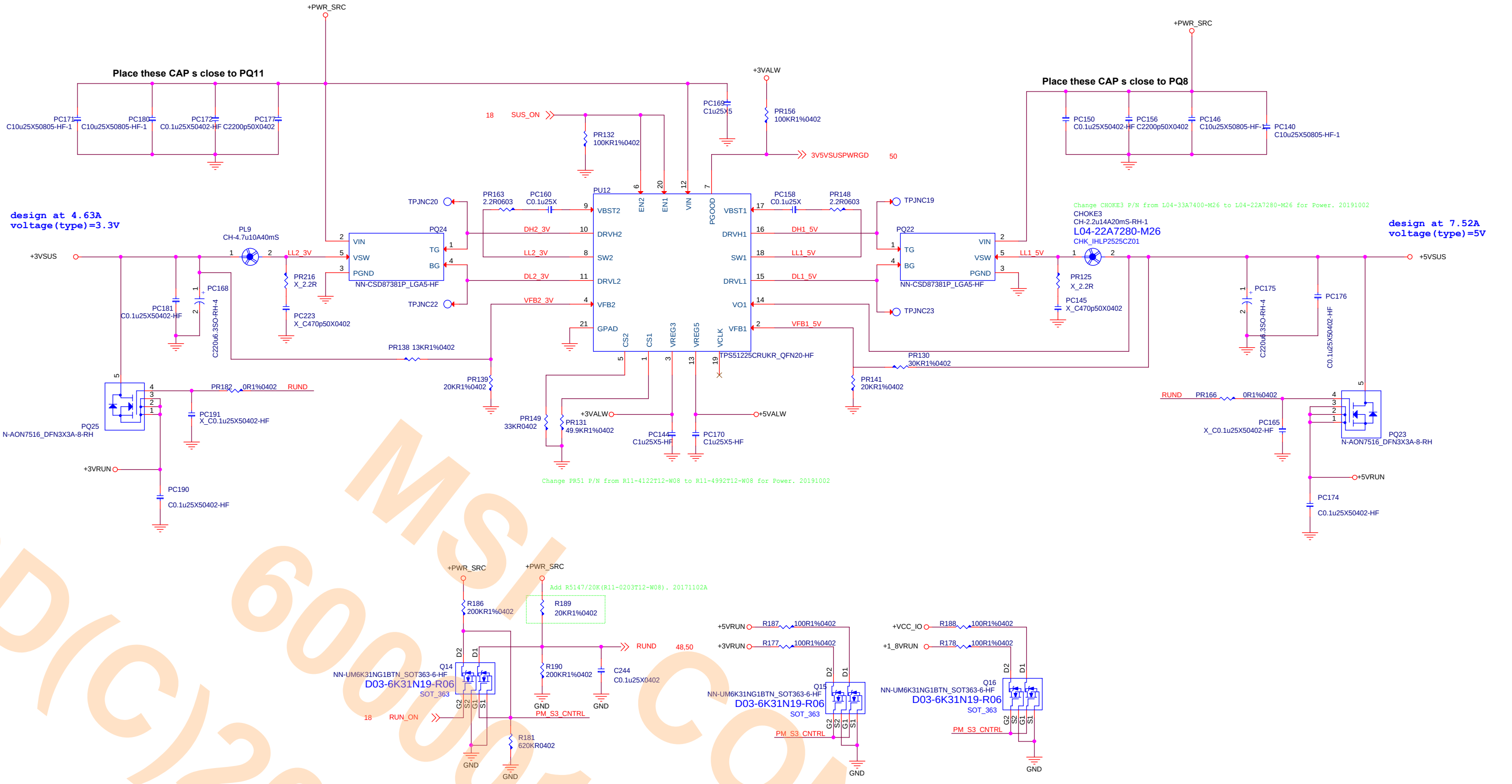

+PWR_SRC
Place these CAP s close to PQ11
PC171
C10u25X50805-HF-1
PC180
C10u25X50805-HF-1
PC172
C0.1u25X50402-HF
PC177
C2200p50X0402
+3VALW
PC169
C1u25X5
PR156
100KR1%0402
18
SUS_ON
PR132
100KR1%0402
3V5VSUSPWRGD
50
Place these CAP s close to PQ8
PC150
C0.1u25X50402-HF
PC156
C2200p50X0402
PC146
C10u25X50805-HF-1
PC140
C10u25X50805-HF-1
design at 4.63A
voltage(type)=3.3V
design at 7.52A
voltage(type)=5V
+3VSUS
+5VSUS
PL9
CH-4.7u10A40mS
LL2_3V
PR216
X_2.2R
PC223
X_C470p50X0402
PC181
C0.1u25X50402-HF
PC168
C220u6.3SO-RH-4
PQ24
NN-CSD87381P_LGA5-HF
VIN
VSW
PGND
TG
BG
TPJNC20
TPJNC22
PR163
2.2R0603
PC160
C0.1u25X
DH2_3V
LL2_3V
DL2_3V
VFB2_3V
PU12
VBST2
DRVH2
SW2
DRVL2
VFB2
GPAD
CS2
CS1
VREG3
VREG5
VCLK
EN2
EN1
VIN
PGOOD
VBST1
DRVH1
SW1
DRVL1
VO1
VFB1
TPS51225CRUKR_QFN20-HF
PC158
C0.1u25X
PR148
2.2R0603
DH1_5V
LL1_5V
DL1_5V
VFB1_5V
TPJNC19
TPJNC23
PQ22
NN-CSD87381P_LGA5-HF
Change CHOKE3 P/N from L04-33A7400-M26 to L04-22A7280-M26 for Power, 20191002
CHOKE3
CH-2.2u14A20mS-RH-1
L04-22A7280-M26
CHK_IHLP2525CZ01
LL1_5V
PR125
X_2.2R
PC145
X_C470p50X0402
PC175
C220u6.3SO-RH-4
PC176
C0.1u25X50402-HF
PR138 13KR1%0402
PR139
20KR1%0402
PR149
33KR0402
PR131
49.9KR1%0402
+3VALW
PC144
C1u25X5-HF
PC170
C1u25X5-HF
+5VALW
PR130
30KR1%0402
PR141
20KR1%0402
Change PR51 P/N from R11-4122T12-M08 to R11-4992T12-M08 for Power, 20191002
PQ25
N-AON7516_DFN3X3A-8-RH
PR182
0R1%0402
RUND
PC191
X_C0.1u25X50402-HF
+3VRUN
PC190
C0.1u25X50402-HF
RUND
PR166
0R1%0402
PC165
X_C0.1u25X50402-HF
PQ23
N-AON7516_DFN3X3A-8-RH
+5VRUN
PC174
C0.1u25X50402-HF
+PWR_SRC
R186
200KR1%0402
Add R5147/20KR(R11-2003T12-M08), 20171102A
R189
20KR1%0402
RUND
48.50
Q14
NN-UM6K31NG1BTN_SOT363-6-HF
D03-6K31N19-R06
SOT_363
18
RUN_ON
PM_S3_CNTRL
R190
200KR1%0402
C244
C0.1u25X0402
R181
620KR0402
GND
+5VRUN
R187
100R1%0402
+3VRUN
R177
100R1%0402
Q15
NN-UM6K31NG1BTN_SOT363-6-HF
D03-6K31N19-R06
SOT_363
PM_S3_CNTRL
+VCC_IO
R188
100R1%0402
+1_8VRUN
R178
100R1%0402
Q16
NN-UM6K31NG1BTN_SOT363-6-HF
D03-6K31N19-R06
SOT_363
PM_S3_CNTRL
GND

MICRO-STAR INT'L CO.,LTD.

Title: **System Power**

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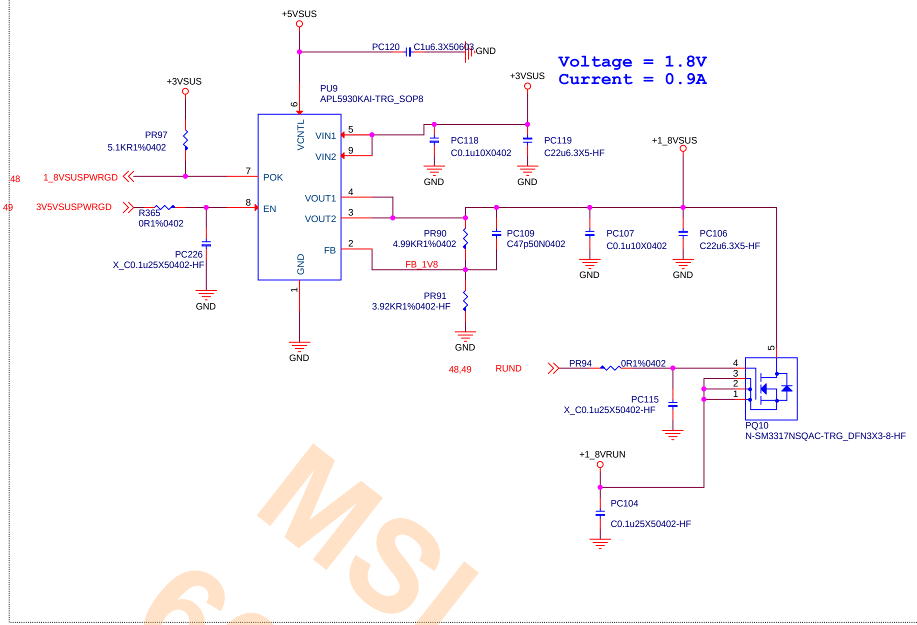
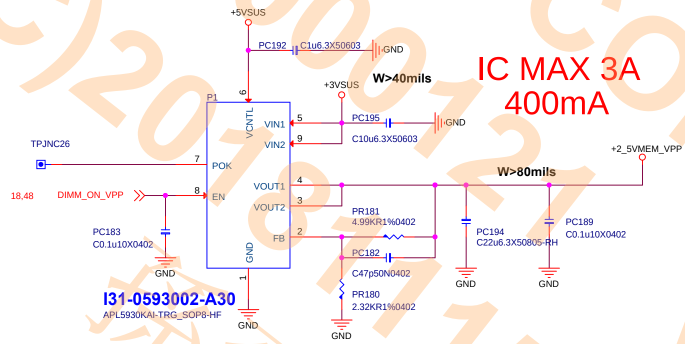
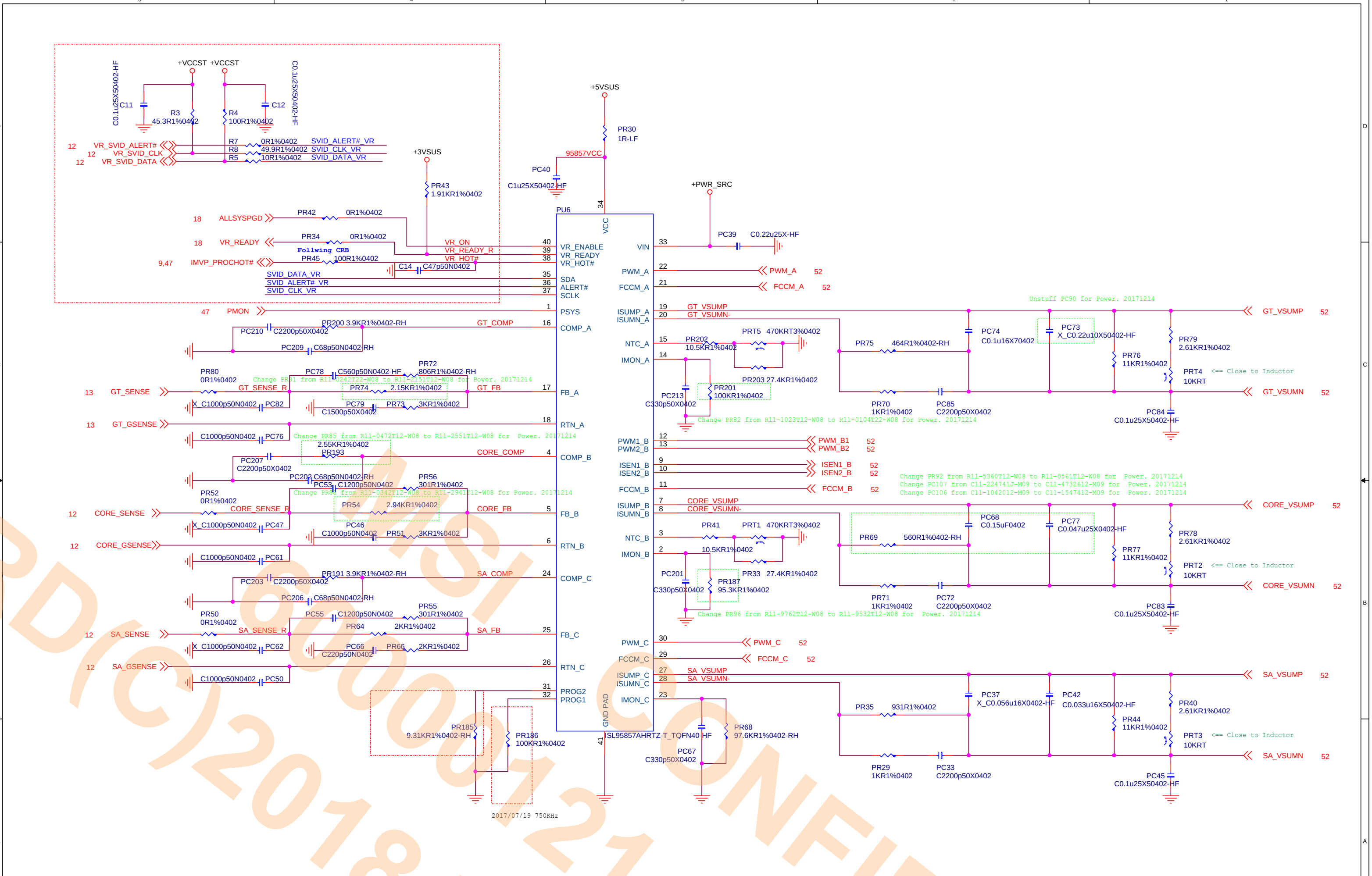
+1.8VRUN



+2.5V_MEM



msi	MICRO-STAR INT'L CO.,LTD.	
Title	2V5 & 1.8VSUS	
Size: Custom	Document Number: MS-14B2	Rev: 10
Date: Thursday, August 02, 2018	Sheet 50 of 60	



MICRO-STAR INT'L CO.,LTD.

Title: +VCC_CORE(1)

Size	Document Number	Rev
Custom	MS-14B2	10

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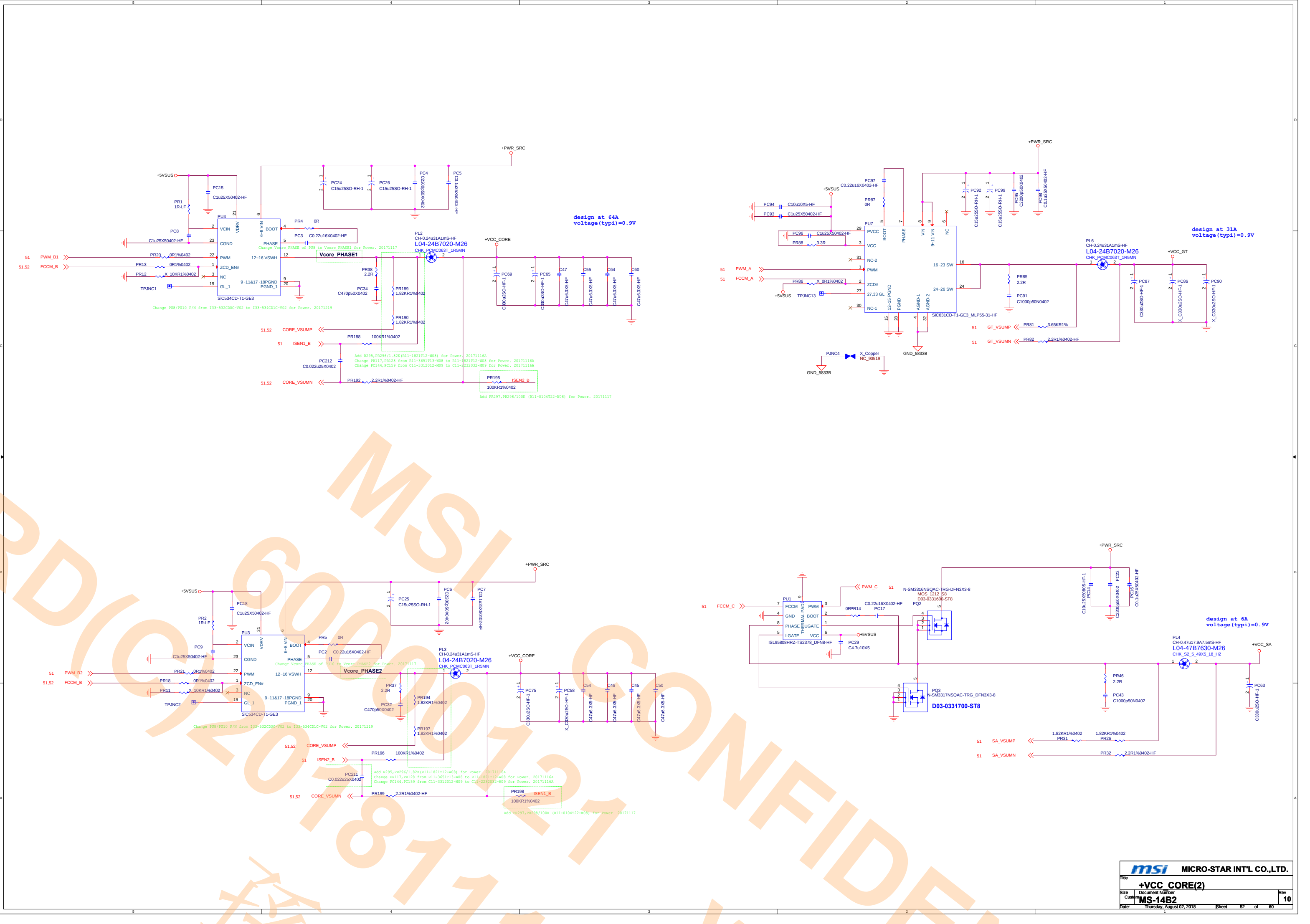

MICRO-STAR INT'L CO.,LTD.

Title: +VCC_CORE(2)

Size: Custom | Document Number: MS-14B2 | Rev: 10

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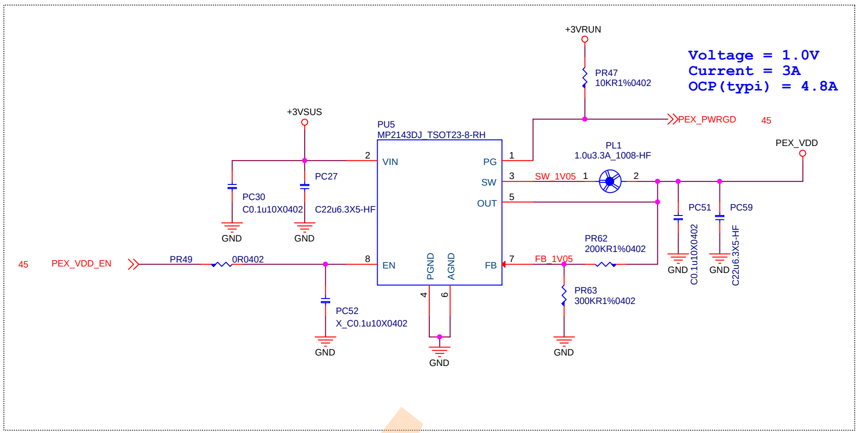
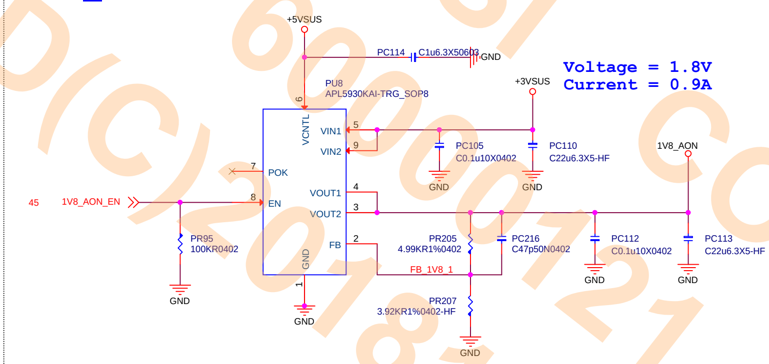
PEX_VDD



1V8_AON



MICRO-STAR INT'L CO.,LTD.

Title	DGPU POWER PEX_VDD/1V8_AON	
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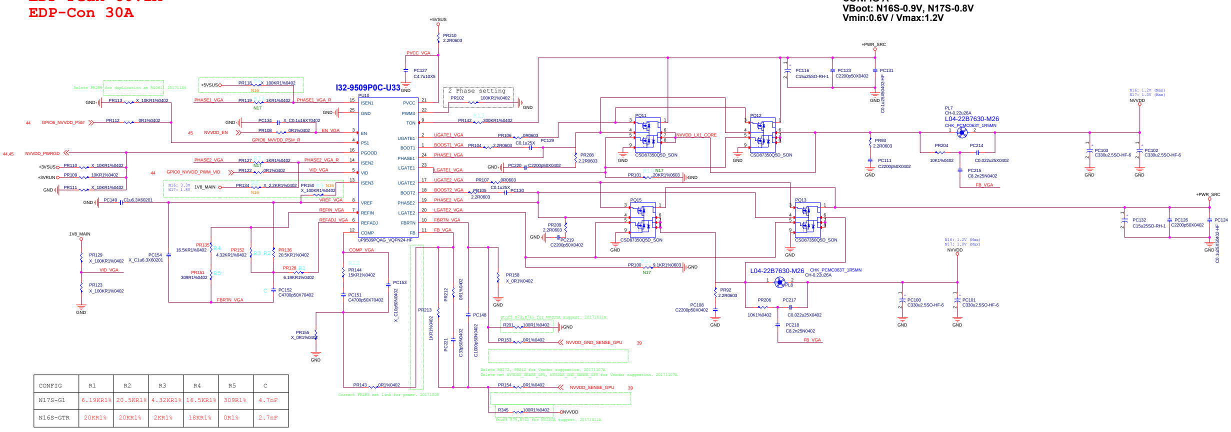
EDP-Peak 60.1A
EDP-Con 30A

DGPU POWER NVVDD

CONFIG A
VBoot: N16S-0.9V, N17S-0.8V
Vmin:0.6V / Vmax:1.2V



CONFIG	R1	R2	R3	R4	R5	C
N17S-G1	6.19KR1%	20.5KR1%	4.32KR1%	16.5KR1%	309R1%	4.7nF
N16S-GTR	20KR1%	20KR1%	2KR1%	18KR1%	0R1%	2.7nF

CONFIG	R6	R7	R8	R9	R10	R11	R12	R13	R14
N17S-G1	NC	1KR1%	NC	NC	20KR1%	9.1KR1%	15KR1%	300KR1%	1KR1%
N16S-GTR	100KR1%	NC	2.2KR1%	100KR1%	NC	NC	20KR1%	68KR1%	NC

N17: R1 R11-6191T12-W08, R2 R11-2052T12-W08, R3 R11-4321T12-W08, R4 R11-1652T12-W08, R5 R11-3090T12-R01, C C11-4722812-M09, PWM I32-9509P0C-U33, R12 R11-0153T12-W08, R13 R11-0304T12-W08

N16: R1 R11-0203T12-W08, R2 R11-0203T12-W08, R3 R11-0202T12-W08, R4 R11-0183T12-W08, R5 R11-0000T12-Y01, C C11-2722812-W08, PWM I32-1642P0C-U33, R12 R11-0203T12-W08, R13 R11-0683T12-W08

MICRO-STAR INT'L CO.,LTD.		
Title: DGPU POWER NVVDD		
Size: Custom	Document Number: MS-14B2	Rev: 10
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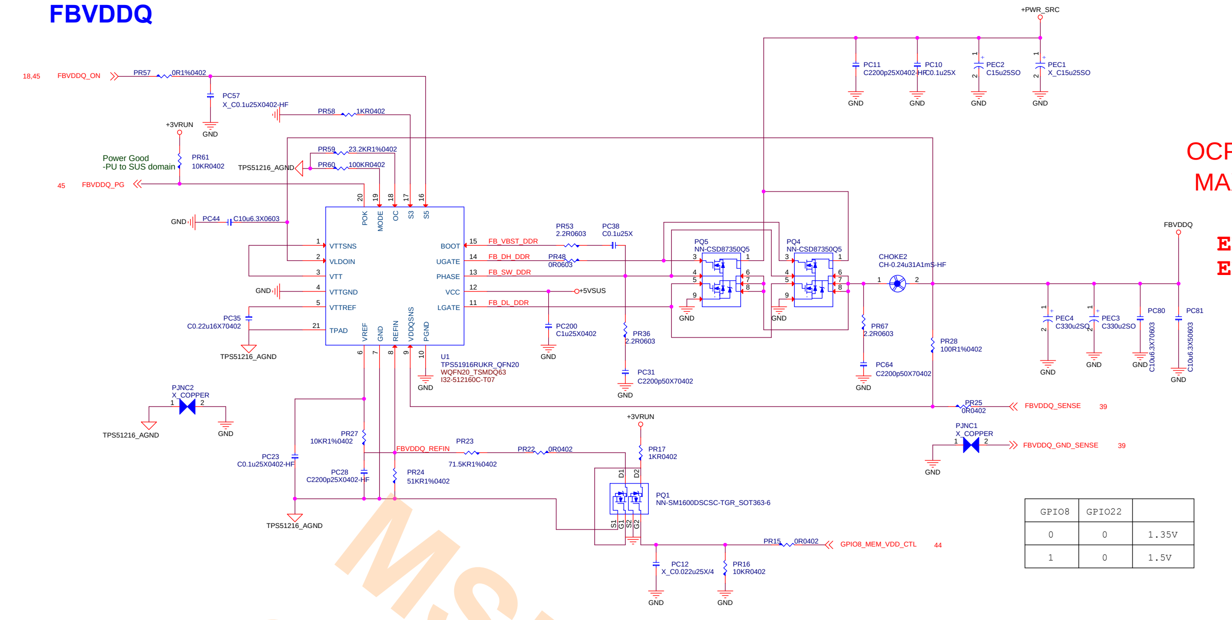
FBVDDQ



OCP 25A
MAX 11A

EDP-Peak 20A
EDP-Con 11A

GPIO8	GPIO22	
0	0	1.35V
1	0	1.5V

MICRO-STAR INT'L CO.,LTD.

Title: DGPU POWER FBVDDQ

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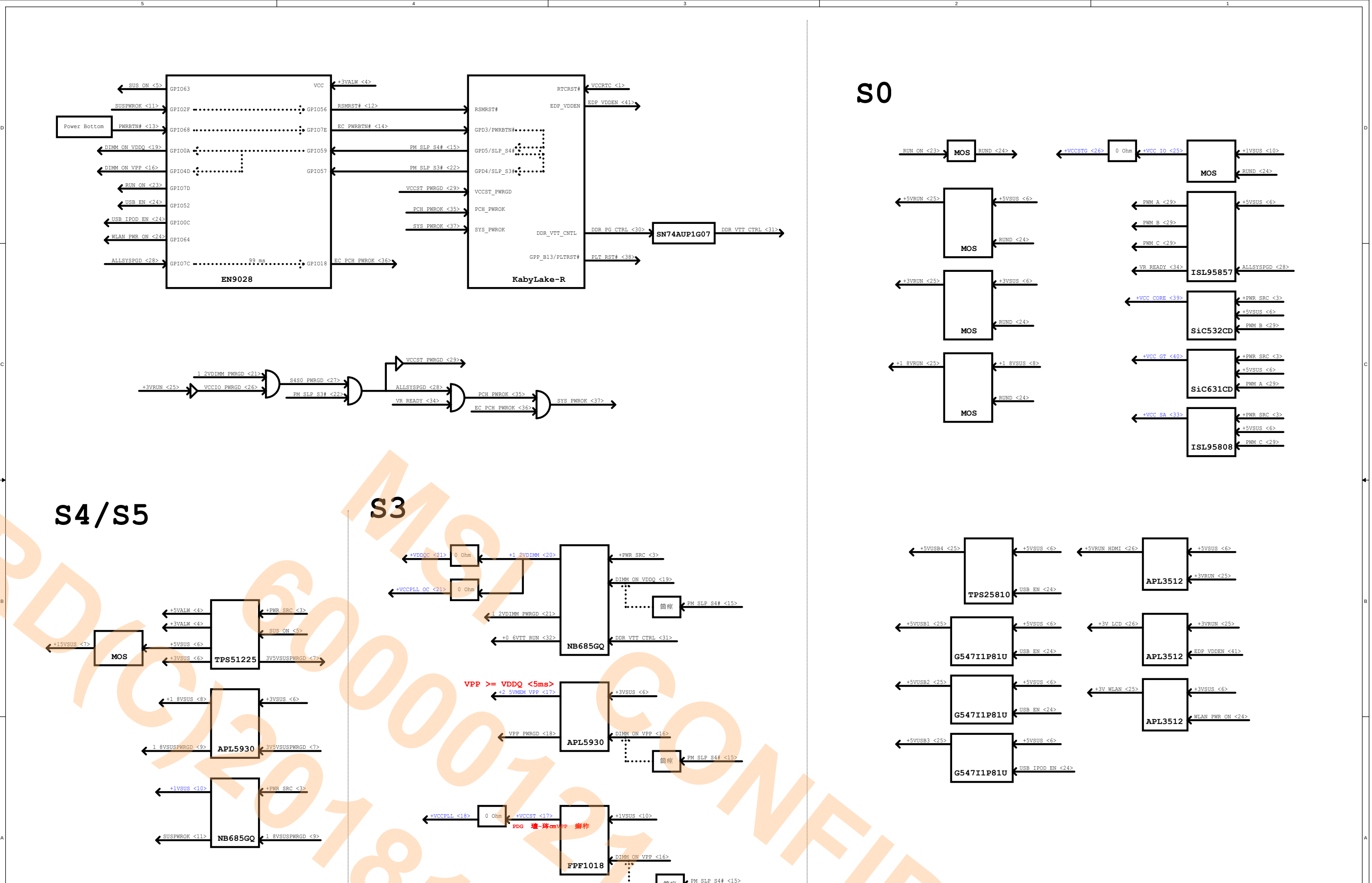

MICRO-STAR INT'L CO.,LTD.

Title: Power on Block Diagram

Size: Custom | Document Number: MS-14B2 | Rev: 10

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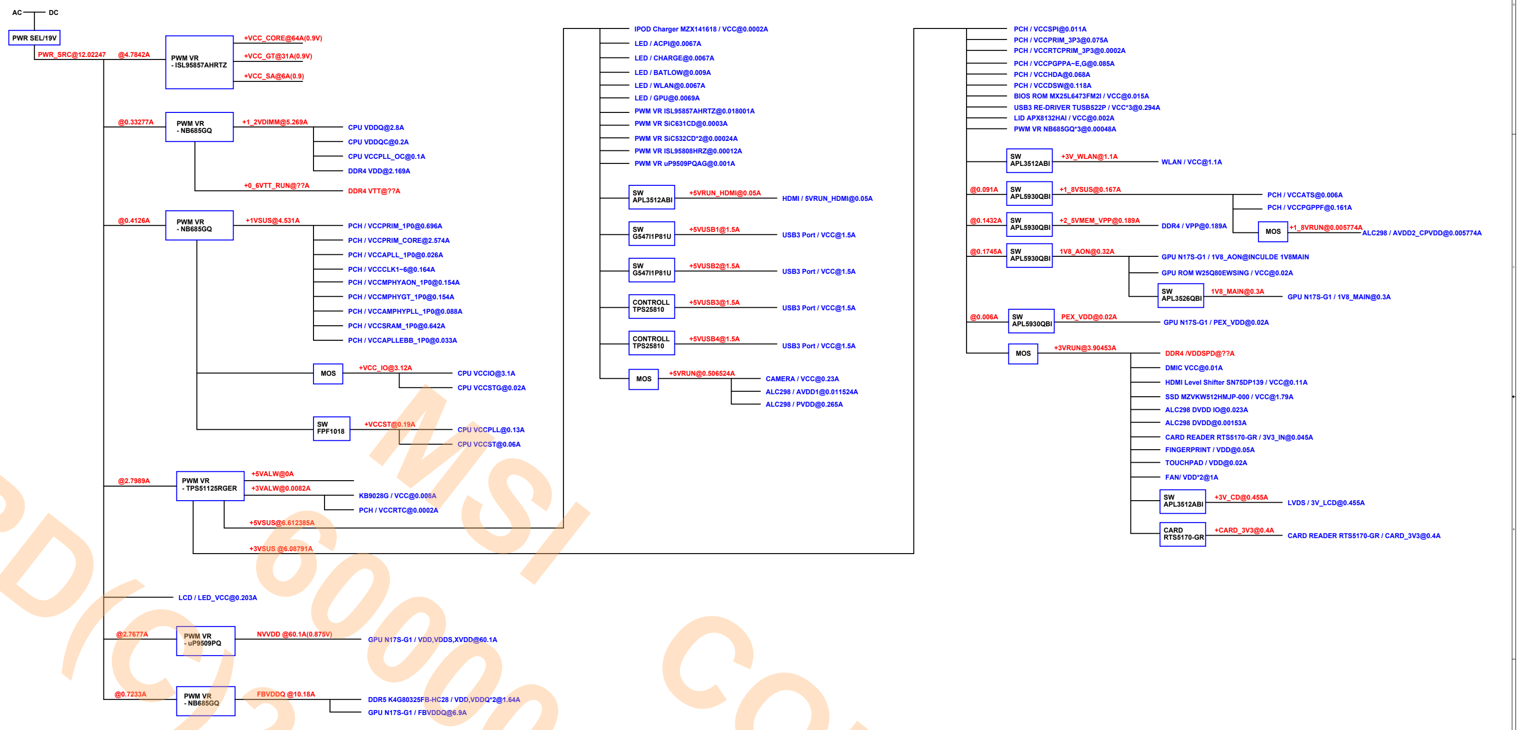
14B1 Power Delivery Chart



MICRO-STAR INT'L CO.,LTD.

Title: Power Delivery Chart

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G3 to S0

msi	MICRO-STAR INT'L CO.,LTD.		
Title	G3 into S0 without M		
Size C	Document Number MS-14B2		Rev 10
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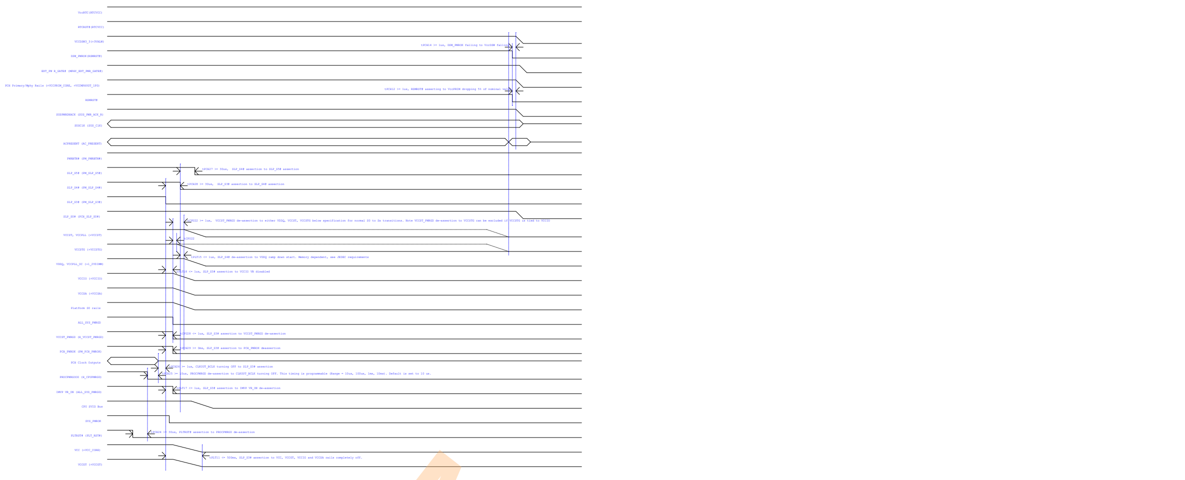
S0 to G3



MICRO-STAR INT'L CO.,LTD.			
Title: S0 into G3 without M			
Size: E	Document Number: MS-14B2		Rev: 10
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1. Change R311 from 100k to 10k. 20170922
2. Delete R312. 20170922
3. Change R313 from 8.2k to 10k to consider EC current 2~4mA. 20170922
4. Correct CSI2_COMP link. 20170922

5. Change LVDS_BKLTCTL_R net name to EDP_BKLTCTL_R. 20170925

6. Delete Camera power switch circuit. 20170926
7. Add R5035/0R and +3VSSD. 20170926

8. Delete DDR Channel B. 20170927
9. Swap EL17 pin1 <-> pin2, pin3 <-> pin4 for Layout. 20170927

10.Delete C4244/C4243 330UF for Layout. 20170929
11.Change SW1 P/N from N71-0103361-D02 to N71-0101780-D02 for ME. 20170929
12.Place Audio connecter P/N, Footprint. 20170929
13.Add LED5(D0C-040C300-L05), R5036/330R(R11-0331012-W08), ESD39(D0G-01A0510-O05) for ME. 20170929
14.Add TPM(B0C-0966002-I14) cirucit for PM. 20170929
15.Add C5017,C5018/0.1uF(C11-1047612-M09). 20170929
16.Modify Page Size. 20170930

17.Change CHOKE3 P/N from L04-33A7400-M26 to L04-22A7280-M26 for Power. 20191002
18.Change PR51 P/N from R11-4122T12-W08 to R11-4992T12-W08 for Power. 20191002
19.Change U30,U31,U4036,U4035 P/N from I9B-655020C-T07 to I9B-SB5220C-T07 for NRND. 20171002A
20.Delete 4.7K/R244,R243,R5026,R5015 for internal PD. 20171002A
21.Stuff 4.7K/R239,R224,R237,R222,R5010,R5000,R5018,R5002. 20171002A
22.Correct ESD20 power from +5VUSB4 to +5VUSB3. 20171002
23.Add 0.1uF(C11-1047612-M09)/C5019 ~ C5023, C5025,C5026,C5028,C5029. 20171002A
24.Add 10uF(C11-1067312-M09)/C5021,C5024,C5027,C5030. 20171002A

25.Change C4420 from C11-106A233-T04 to C11-226A213-M09 for NVIDIA. 20171003
26.Change C4197 P/N from C11-105A312-S02 to C11-1042012-Y01 for NVIDIA. 20171003
27.Add C5031/0.1uF(C11-1042012-Y01) for NVIDIA. 20171003
28.Change C4000,C4004,C4006,C4007 P/N from C11-106A233-T04 to C11-226A213-M09 for NVIDIA. 20171003
29.Delete ESD17 and chagne USB3_TXN_TYPEC2_U_C/USB3_TXP_TYPEC2_U_C link ESD19 for Layout. 20171003
30.Stuff R4052/10K for NVIDIA. 20171003
31.Unstuff R4050/10K for NVIDIA. 20171003

32.Mark EC SMBus standard mode speed 100kHz. 20171004
33.Change R4273,R4269,R4039,R4043 P/N from R11-0222012-W08 to R11-0202T12-W08 for NVIDIA. 20171004
34.Reserve R5039/0R(R11-0000012-W08) to open Q4024 for NVIDIA. 20171004.
35.Add R5040/0R(R11-0000012-W08) for NVIDIA. 20171004.
36.Add net GPU_OVERT# link EC GPO61 for NVIDIA. 20171004
37.Delete TPJNC19 test. 20171004
38.Change USB1,USB2 P/N from N53-09M1041-AF2 to N53-09M1071-AF2 for ME. 20171004
39.Change CON17 P/N from N5A-08F0160-A81 to N5A-08F0300-A81 for ME.20171004

40.Correct PR285 net link for power. 20171005

41.Add PR286/10K PU. 20171009
42.Net FBVDDQ_ON connect to EC/GPIO7A. 20171009

43.Reserve C5032/10pF. 20171011
44.Add H_R276D118_N*14, NPTH98*3. 20171011

45.Change C4060 from C11-475A323-T04 to C11-105A312-S02 for NVIDIA suggest. 20171011A
46.Stuff C4058,C4411,C4057 for NVIDIA suggest. 20171011A
47.Stuff C4078,C4127,C4433,C4120 for NVIDIA suggestion. 20171011A
48.Stuff C4424 for NVIDIA suggest. 20171011A
49.Stuff R79,R741 for NVIDIA suggest. 20171011A
50.Change R4201,R4207 from R11-1210T12-Y01 to R11-0121T12-W08 for NVIDIA suggest. 20171011A
51.Unstuff R4044/10KR for NVIDIA suggest. 20171011A52
52.Change footprint fromt H_R236142_PB to H_R236D142_PB_N for Layout. 20171011A

53.Swap EL17 pin1 <-> pin2, pin3 <-> pin4 for Layout. 20171012

54.Swap net CON22 MP <--> MQ. 20171012A
55.Add R5041/0R (R11-0000013-W08) for vendor suggestion. 20171012A
56.Add R274,R288/100K1% for vendor suggestion. 20171012A
57.Change R281 from R11-0000T12-Y01 to R11-0204T12-W08 for vendor suggestion. 20171012A
58.Change R286 from R11-0000T12-Y01 to R11-0104T22-W08 for vendor suggestion. 20171012A

59.Unstuff R5028,R5029 and stuff U35. 20171012B
60.Correct USB1,USB2 P/N from N53-09M1041-AF2 to N53-09M1071-AF2 for ME. 20171012B
61.Change CON22 P/N from N54-06F1380-SL0 to N54-06F1641-SL0 for ME.20171012B

62.Stuff R48/10K for INTEL suggestion. 20171013
63.Add U3 re-driver for USB3 typeA prot1, port2 for TCL. 20171013

64.Change UME1,2,7,8,9,10,11,12 footprint from H_R236D142_PB to H_R236D142_PB_N. 20171013A
65.Correct UME3,13,14,15,16,17,18,19,20,21,22,23,24,25 footprint from H_R236D142_PB_N to H_R276D118_N. 20171013A
66.Delete AC_DET#, PR9(R11-0103012-W08), PQ5(D03-02N0600-R06), PR8(R11-0104042-W08), PR14(R11-0104042-W08), PC11(C11-4722022-M09). 20171013A
67.Delete PM_BATLOW#. 20171013A
68.Modify GPIO12_ACIN circuit. 20171013A

69.Change CON12 P/N from N32-1090170-A81 to N32-1080670-A81 for ME. 20171014
70.Add UME29(E2B-16K1010-A89) for ME. 20171014
71.Reserve EC77, EC78, EC2, EC3, EC81, EC79, EC80, EC81/10P(C11-1001012-S02) for EMI. 20171014
72.Reserve EC1/330P(C11-3312012-W08) for EMI. 20171014
73.Add net name TP_CLK_R, TP_DATA_R. 20171014

74.Update Properties CGF. 20171016
75.Change Q1.G power from +3VRUN to +5VRUN. 20171016
76.Correct SW1 circuit. 20171016
77.Add GPIO64 test point. 20171016
78.Change WLAN_PWR_ON to GPIO2A for EC. 20171016
79.Swap EC_RTC_RST and PWRBTN# pin for EC. 20171016
80.Add R5071/100K(R11-0104042-W08). 20171016
81.Change BAT1 P/N from D06-0104701-K26 to D06-0105701-K26. 20171016
82.Change RX1 name to R5072. 20171016
83.Change CON12 P/N from N32-1080670-A81 to N32-1090170-A81 for ME. 20171016
84.Add SW2(N71-0102200-F10), R5073/0R(R11-0000012-W08), C5047/0.1u(C11-1047612-M09). 20171016
85.Delete TPJNC30. 20171016

86.Change C4436 from C11-106A233-T04 to C11-475A323-T04 for NVIDIA suggestion. 20171017
87.Stuff C4123, C4124, C4017 for NVIDIA suggestion. 20171017
88.Mirror CON16 vertical for FFC. 20171017
89.Mirror CON1 vertical for cable. 20171017

90.Delete USB3 TYPE-A2 Re-driver circuit. 20171017A

91.Unstuff R310/10K. 20171018
92.Delete net CLK_PCI_TPM/CLK_PCI_TPM_R and TPM circuit for Layout space. 20171018

93.Delete J40/L5_3.5mil_50_Ohm, J6/L6_3.5mil_50_Ohm. 20171019
94.Change UME14, UME15, UME23 footprint to H_R276D118_V5 for EMI. 20171019
95.Change UME13, UME16 footprint to H_R276D118_V8_N for EMI. 20171019
96.Add X1~4 footprint H_NR118D118. 20171019

97.Change POWER_LED# net name to GPU_LED#. 20171019A
98.Change C0402/F_C0402 footprint to C0402_MXM_1. 20171019A
99.Change R0402/F_R0402 footprint to R0402_MXM_1. 20171019A
100.Change L0402 footprint to L0402_MXM_1. 20171019A

101.Change CPU2 P/N from A0C-8250U05-I06 to OAC-14B1001-I06 for PM. 20171020
102.Add test point TPJNC4024. 20171020
103.Change R167 P/N from R11-0000013-W08 to R11-0430012-W08. 20171020
104.Unstuff R299. 20171020
105.Delete R4047. 20171020
106.Delete EC36~EC43/100p(C11-1011032-W08). 20171020
107.Add ESD40,ESD41(D0G-01A0510-O05). 20171020

108.Correct UME13,UME14,UME15,UME16,UME23 library. 20171020A

109.Change P/N from C11-4764223-M09 to C11-4767313-M09. 20171023
110.Stuff C4492, C4207, C4204 for vendor suggestion. 20171023A

111.Reserve EC82~89/0.1uF for EMI. 20171024
112.Update R,C main P/N. 20171024

113.Delete EL4~7(L12-9008100-I05) for Layout. 20171024A
112.Add SPRING1,2 P/N:E23-1004060-CA7 for EMI. 20171024A
113.Delete FM1 for Layout. 20171024A
114.Add FM29~34(F_PAD_NB_2) for Layout. 20171024A

115.Unstuff Q7,Q11(D03-5121N09-O05), R215,R627(R11-0104T22-W08), R216,R628(R11-0102T12-W08). 20171024B

116.Delete FM33,FM34 for Layout. 20171025
117.Change R120 P/N from R11-0221T12-Y01 to R11-0221T12-W08. 20171025

118.Delete FM24, FM26, FM29, FM32 for Layout. 20171026

119.Update D,T component main P/N. 20171026A

120.Change PC132,PC127,PC152,PC148,PC209,PC236,PC194,PC188,PC111,PC122,PC91,PC102,PC112,PC97,PC36,PC38,PC3 P/N to C11-2222022-T04. 20171027
121.Change PC113,PC92,PC103 P/Nto C11-6801812-T04. 20171027
122.Change PC401,PC500,PC503,PC502,PC501,PC400 P/N to C71-331024G-P01. 20171027
123.Change D4 P/N to D01-BAV9919-P03. 20171027
124.Change R121 P/N to R11-562AT12-W08. 20171027

125.Change UME23, UME14, UME15 footprint to H_R276D118_V5_N for Layout. 20171030
126.Change UME29 footprint to H_R201D118_PT_N for Layout. 20171030

127.Update Power Delivery Chart. 20171030A

128.Modify GPU Strap pin. 20171031
129.Modify GPU PCI EXPRESS. 20171031
130.Note N16 ROM P/N:M31-25X2023-W03,2Mb(256Kx8bit). 20171031

131.Modify GPU POWER RAIL DECOUPLING AND FILTERING. 20171101
132.Modify GPIO DIFFERNCES. 20171101

133.Add N16 Power Sequence 3V3_AON, 3V3_MAIN. 20171101A

134.Add C5049(C11-106A233-T04). 20171102
135.Delete C4488, 4486. 20171102

136.Add PR288,PR291,PR293,PR294/100K(R11-0104T22-W08), PR289,PR290,PR292/10K(R11-0103T12-W08). 20171102A
137.Add R5147/20K(R11-0203T12-W08). 20171102A
138.Add N16 Power Sequence NVVDD, PEX_VDD, FBVDDQ. 20171102A
139.Change CON3 P/N from N5Y-19M0910-AF2 to N5Y-19M1250-AF2 for ME. 20171102A

140.Change R5096 stuff on N17 and N16. 20171103
141.Change L4000 only stuff on N17. 20171103
142.Add R5148 only stuff on N17. 20171103
143.Move R5094 to link Pin.F6. 20171103
144.Unstuff R5092/30.1KR(R11-3012T12-W08) and R5150/200R(R11-0201T12-W08). 20171103
145.Add R5149/4.99K(R11-4991T12-W08). 20171103

146.Add DDR1, DDR2 P/N option. 20171103A

147.Delete DDR1, DDR2 and update N16S DDR5 RVL. 20171103B

148.Delete C5058/4.7uF(C11-475A323-M09) for Vendor suggestion. 20171106
149.Move C4216 on XS_PLLVDD for Vendor suggestion. 20171106
150.Stuff C4194, C4173, C4189, C4195 for Vendor suggestion. 20171106
151.Add C5070/47u(C11-4767313-M09) for N16S. 20171106
152.Delete PR289 for duplication as R4061. 20171106
151.Stuff C4094 for Vendor suggestion. 20171106
152.Stuff C4096/10uF. 20171106
153.Stuff C4156, C4157, C4067 for N17S, C4157 for N16S. 20171106
154.Stuff C4016, C4011, C4009, C4002. 20171106
155.Stuff C4023, C4020, C4021. 20171106
156.Stuff C4004, C4006, C4007, C4022, C4000. 20171106
157.Delete R5117, R5118, R4287 for Vendor suggestion. 20171106
158.Delete R5121, R5122, R4044 for Vendor suggestion. 20171106
159.Delete R5125 and net GPIO16_N17 for Vendor suggestion. 20171106
160.Delete R5127 and net GPIO23_N17 for Vendor suggestion. 20171106

161.Unstuff R4301,R4302 for Vendor suggextion. 20171107

162.Delete R4997, R4996 for Vendor suggextion. 20171107A
163.Change VDDS_SENSE/GNDS_SENSE link to VDD_SENSE/GND_SENSE for Vendor suggestion. 20171107A
164.Delete PR272, PR242 for Vendor suggestion. 20171107A
165.Delete net NVVDDS_SENSE_GPU, NVVDDS_GND_SENSE_GPU for Vendor suggestion. 20171107A

166.Moidfy Power NVVDD configuration. 20171108
167.Unstuff 1V8_AON on N16S. 20171108

168.Stuff PR247 on N17 only. 20171109

169.Add CFG_N17S_i7, CFG_N17S_i5, CFG_N16S_i7, CFG_N16S_i5 configuration. 20171114

170.Camera move to Page. 31 for ME. 20171116
171.Add Camera CON26 for ME. 20171116

172.Add R295,PR296/1.82K(R11-1821T12-W08) for Power. 20171116A
173.Change PR117,PR128 from R11-3651T13-W08 to R11-1821T12-W08 for Power. 20171116A
174.Change PC144,PC159 from C11-3312012-M09 to C11-2232032-M09 for Power. 20171116A

174.Shange PR117,PR295,PR128,PR296 footprint R0402 to R0402_MXM_1 for Layout. 20171116B

179.Change LED1,LED2,LED3 P/N from D0C-0405800-L05 to D0C-040C300-L05 for ME. 20171117A
180.Change LED4 P/N from D0C-0405400-L05 to D0C-040J800-L05 for ME. 20171117A

181.Add GPU2 P/N B03-0N16S45-N08. 20171117B

182.Change PR167 from R11-2612T12-W08 to R11-2552T12-W08 for Power. 20171121
183.Change PCB1 from PD0-14B110A-H73 to PD0-14B110B-H73. 20171121

184.Change R274,R286 from R11-0104T22-W08 to R11-0000T12-Y01 for Vendor suggestion. 20171121A

185.Update component SMT ASM for Layout. 20171122

186.Change R4013 from R11-422AT12-W08 to R11-402AT12-W08 for Vendor suggestion. 20171123
187.Change C69,C70 from C11-1201012-T04 to C11-1501012-S02 for Vendor suggestion. 20171123

188.Correct PR291 Value. 20171125
189.Unstuff R5142 in N16S. 20171125

190.Change R1A name to N17R1 for BOM. 20171127.
191.Change R1B name to N16R1 for BOM. 20171127.
192.Change R2A name to N17R2 for BOM. 20171127.
193.Change R2B name to N16R2 for BOM. 20171127.
194.Change R3A name to N17R3 for BOM. 20171127.
195.Change R3B name to N16R3 for BOM. 20171127.
190.Change R4A name to N17R4 for BOM. 20171127.
191.Change R4B name to N16R4 for BOM. 20171127.
192.Change R5A name to N17R5 for BOM. 20171127.
193.Change R5B name to N16R5 for BOM. 20171127.
194.Change R12A name to N17R12 for BOM. 20171127.
195.Change R12B name to N16R12 for BOM. 20171127.
194.Change R13A name to N17R13 for BOM. 20171127.
195.Change R13B name to N16R13 for BOM. 20171127.

196.Stuff C673/330P P/N:C11-3311812-M09. 20171207
197.Add net LID#_EC for leakage of Click PAD. 20171207
198.Change NV ROM P/N:M31-2006E02-M24 in N16S. 20171207
199.Delete U39 ROM SOCKET P/N: N14-0080030-L06. 20171207
200.Stuff U39 BIOS ROM P/N: M31-25L6482-M24. 20171207
201.Change C667/C668 from C11-1501012-S02 to C11-47A1812-M09. 20171207
202.Stuff R159 for SA. 20171207
203.Add MYL1(E2P-4B10911-G40), MYL2(E2P-0112911-G40) for ME. 20171207

204.Change CON26 from N5A-10F0240-A81 to N5Q-10F0030-A81 for ME. 20171212
205.Change CON8, CON24 from N53-24M0060-J06 to N53-24M0320-AP2 for ME. 20171212

206.Modify CON26 Library pin number. 20171212A
207.Correct CON26 P/N:N5A-10F0240-A81. 20171212B

208.Change PR81 from R11-0242T22-W08 to R11-2151T12-W08 for Power. 20171214
209.Change PR82 from R11-1023T12-W08 to R11-0104T22-W08 for Power. 20171214
210.Unstuff PC90 for Power. 20171214
211.Change PR88 from R11-0342T12-W08 to R11-2941T12-W08 for Power. 20171214
212.Change PR96 from R11-9762T12-W08 to R11-9532T12-W08 for Power. 20171214
213.Change PC106 from C11-1042012-M09 to C11-1547412-M09 for Power. 20171214
214.Change PC107 from C11-224741J-M09 to C11-4732612-M09 for Power. 20171214
215.Change PR92 from R11-5360T12-W08 to R11-0561T12-W08 for Power. 20171214
216.Change PR85 from R11-0472T12-W08 to R11-2551T12-W08 for Power. 20171214
217.Change PQ2,PQ3 from D03-7422E0C-A68 to D03-3324N0C-ST8 for Power. 20171214

218.Add R5151 and unstuff R5093 for MX130 ID. 20171218
219.Stuff EC1(C11-3312012-M09) for EMI. 20171218

220.Stuff EC44/10p(C11-1001012-S02). 20171219
221.Change PU8/PU10 P/N from I33-532CD0C-V02 to I33-534CD1C-V02 for Power. 20171219
222.Correct LED configuration. 20171219

223.Stuff C636/22pF(C11-2201012-W08) for SA. 20171221
224.Stuff EC19/10pF(C11-1001012-S02) for SA. 20171221
225.Change R85 P/N from R11-0330032-W08 to R11-0220042-W08 for SA. 20171221
226.Stuff EC61~64, EC67/15pF(C11-1501012-S02) for SA. 20171221
227.Change PCB1 from PD0-14B110B-H73 to PD0-14B110C-H73. 20171222

228.Change C239 from C11-1047612-M09 to C11-2247412-M09. 20171225
229.Change C636 main P/N from C11-2201012-W08 to C11-2201012-S02. 20171225

230.Change C239 from C11-2247412-M09 to C11-2247512-T04 for Purchaser. 20171226

231.Change MYL1, MYL2 ASM level to 60. 20171229

232.Delete MYL1(E2P-4B10911-G40) for ME. 20171229A

233.Unstuff R274 for Vendor suggest. 20180109A
234.Change N16R13 P/N from R11-0913T12-W08 to R11-0683T12-W08 for Power. 20180109A

235.Change CON26 P/N from N5A-10F0240-A81 to N5A-10F0220-A81 for ME. 20180115
236.Change CON17 P/N from N5A-08F0300-A81 to N5A-08F0250-A81 for ME. 20180115
237.Change CON14,CON16 P/N from N5A-06F0420-A81 to N5A-06F0390-A81 for ME. 20180115

238.Change USB2N_TYPEA1_L, USB2P_TYPEA1_L from ESD23.1, ESD23.6 to ESD23.3, ESD23.4 for Layout. 20180119

239.Change C4450,C4464 P/N from C11-3001812-W08 to C11-3301012-T04 for SA. 20180122
240.Change C667,C668 P/N from C11-47A1812-M09 to C11-56A1012-Y01 for SA. 20180122
241.Change CPU2 P/N from OAC-14B1001-I06 to A0C-8250U05-I06 for PM. 20180122
242.Stuff R299/2.2k for S3 LID Wake. 20180122

243.Change CPU2 P/N from A0C-8250U05-I06 to OAC-14B1001-I06 for PM. 20180124

244.Change PCB1 P/N from PD0-14B110C-H73 to PD0-14B1110-H73. 20180130
245.Change EC2,EC3 P/N fromt C11-1001012-S02 to D0G-0402510-SI0 for EMI. 20180130
246.Add LABEL1(Y01-RHDMI03-000), LABEL2(G51-N1C0041-A09). 20180130

247.Add P/N CPU3(A0D-8550U15-IX6), CPU4(A0C-8250U15-IX6) for OBM. 20180131
248.Add CFG_N17S_i7_OBM and CFG_N17S_i5_OBM. 20180131

249.Change R322 to PF1(D08-0800900-B07) for Safety. 20180202

250.Change C667,C668 P/N from C11-56A1012-Y01 to C11-56A1842-M09 for Buyer. 20180207
251.Add GPU3 P/N B03-0N17S15-NX8 for ODM. 20180207
252.Modify CFG_N17S_i7_OBM to CFG_N17S_i7_ODM and CFG_N17S_i5_OBM to CFG_N17S_i5_ODM. 20180207

253.Add E2Y-6K21111-Y40 *4, E2Y-X007111-CA7 *2, E2M-4B10711-Y42, E23-1047010-G40 for ME. 20180306
254.Change CPU2 P/N from OAC-14B1001-I06 to A0C-8250U05-I06 for PM. 20180306
255.Add E2Y-X043011-G40 *1, E2P-4B11711-G40 *3 for PM. 20180316

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