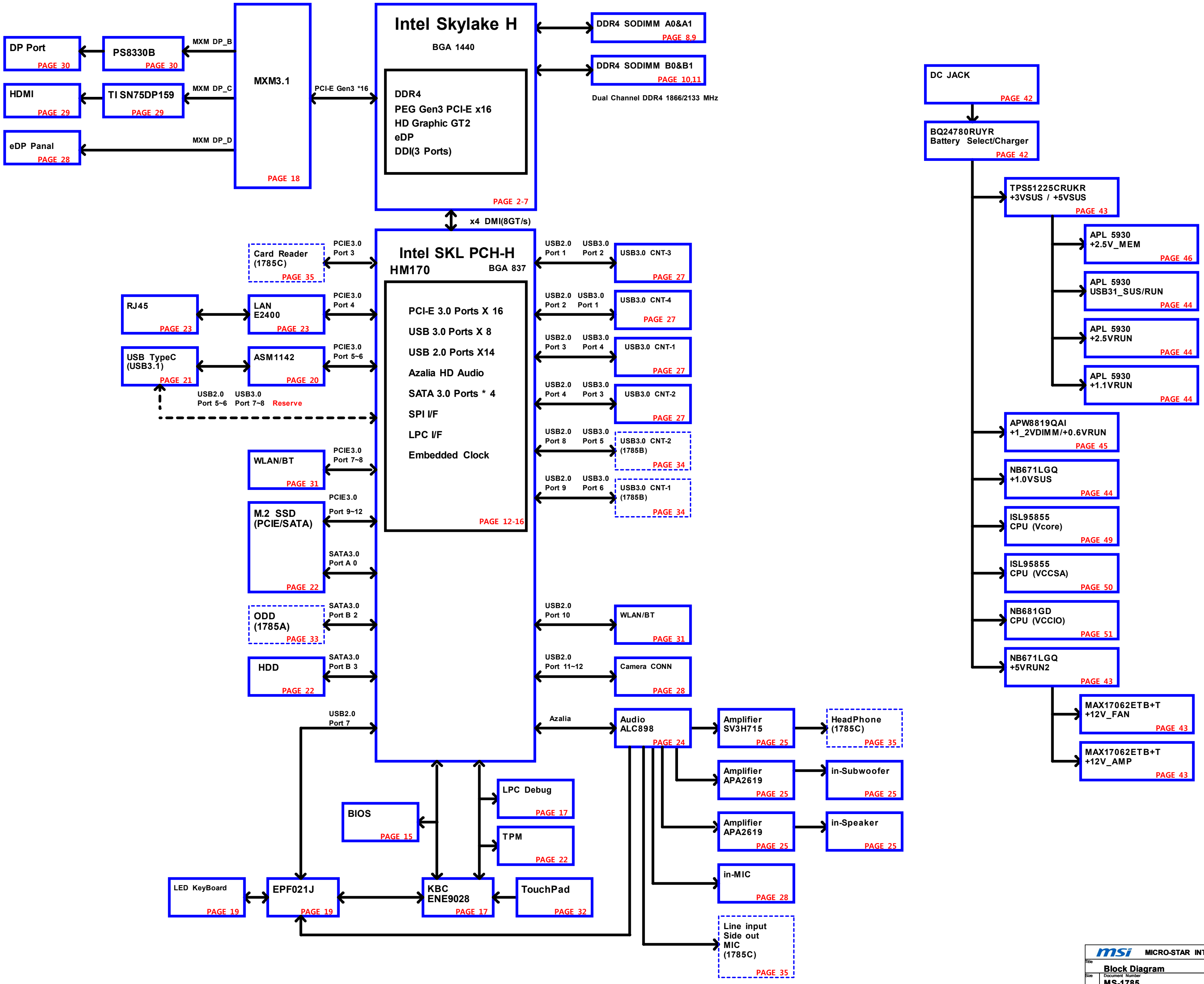
MS-1785 Ver: 0A Intel Skylake platform



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

Title	Block Diagram
Document Number	MS-1785
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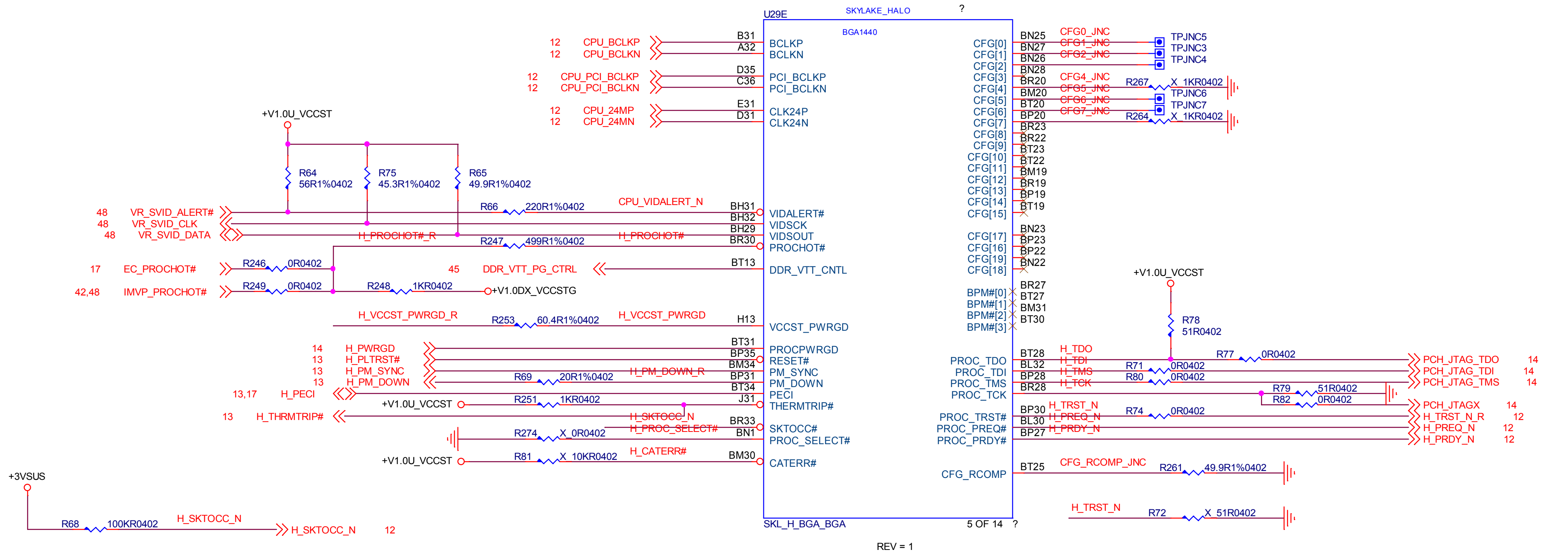
Sheet	1 of 59



PCI Express* Static x16 Lane Numbering Reversal

CFG2	1 = Normal operation 0 = Lane numbers reserved

Display Port Presence strap

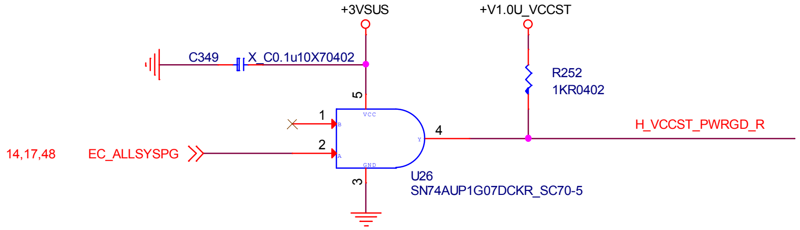
CFG4	1:Disabled - No Physical Display Port attached to Embedded DisplayPort*. No connect for disable. 0:Enabled - A Display Port device is connected to the Embedded Display Port. Pull-down to GND through a 1 KΩ ± 5% resistor to enable port

PCI Express* Bifurcation

CFG[6:5]	00 = 1x8, 2x4 PCI Express* 01 = reserved 10 = 2x8 PCI Express* 11 = 1x16 PCI Express* Recommend 1K Ω ± 5% pull-down resistor to GND

PEG Training

CFG7	1 = (default) PEG train immediately following RESET# de assertion. 0 = PEG wait BIOS for training.



I7-6700HQ

I7_6700
A0D-6700H15-I06
X_I7-6700HQ

MICRO-STAR INT'L CO.,LTD.

Title	Skylake(HOST)	
Size	Document Number: MS-1785	Rev 0A
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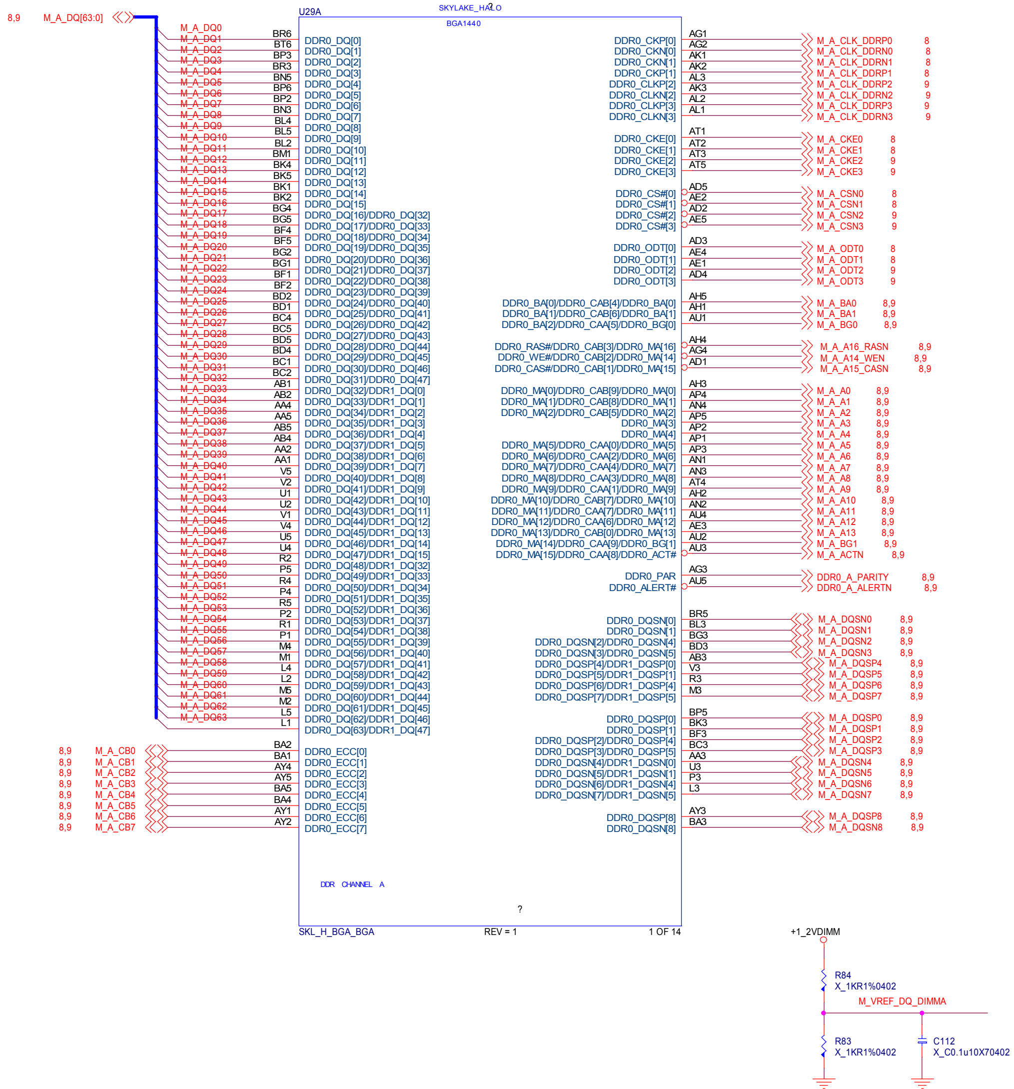
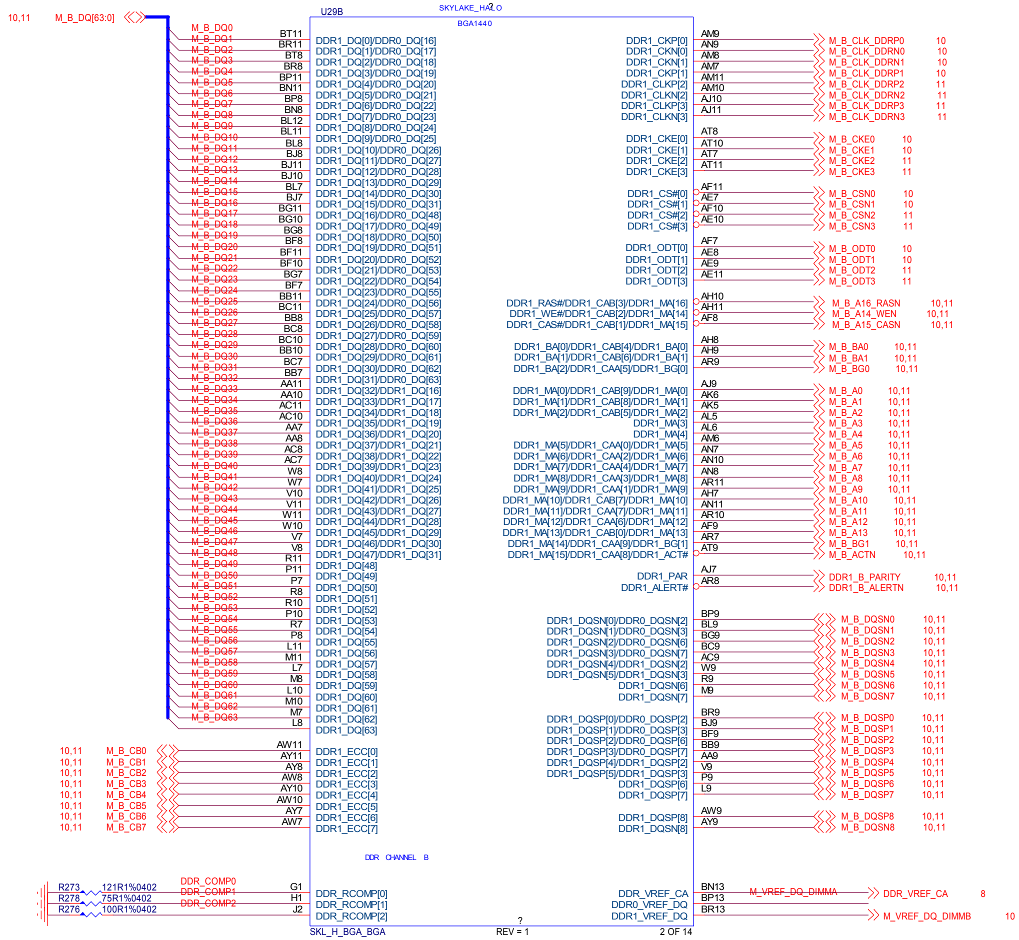
DDR Channel A

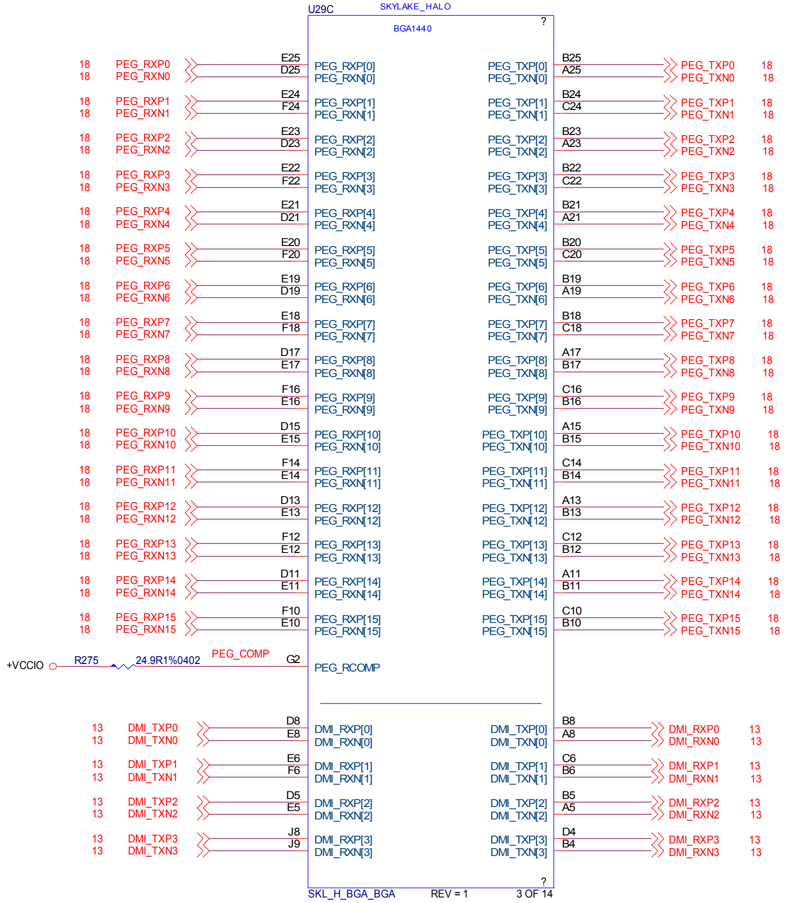


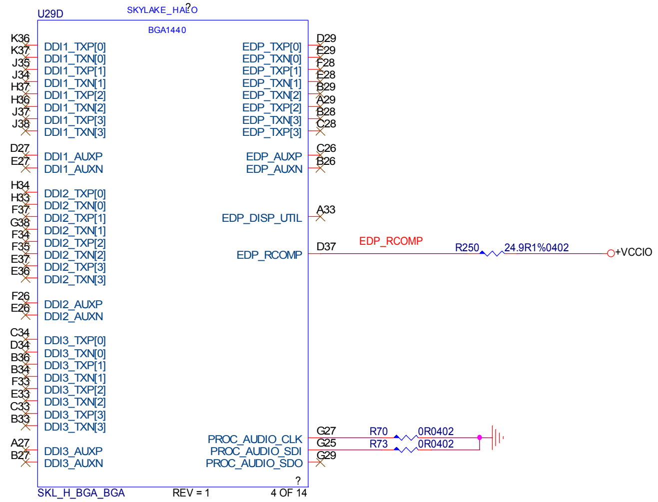
DDR Channel B



MICRO-STAR INT'L CO.,LTD.

Title	Skylake(DDR4)	
Size	Document Number MS-1785	Rev 0A
Date: Thursday, February 18, 2016	Sheet 3 of 59	

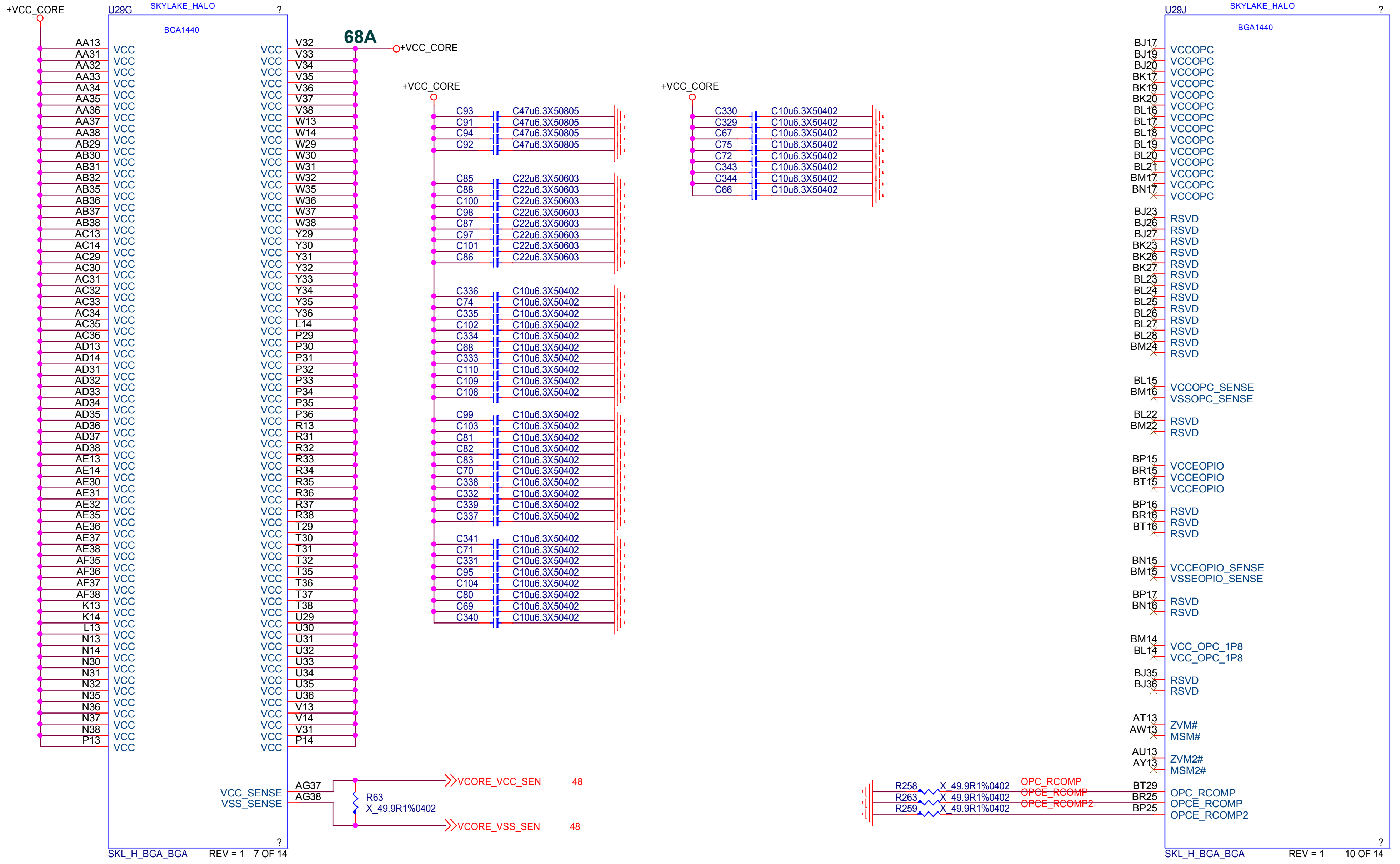




Disabling and Termination Guidelines for the High Definition Audio Interface

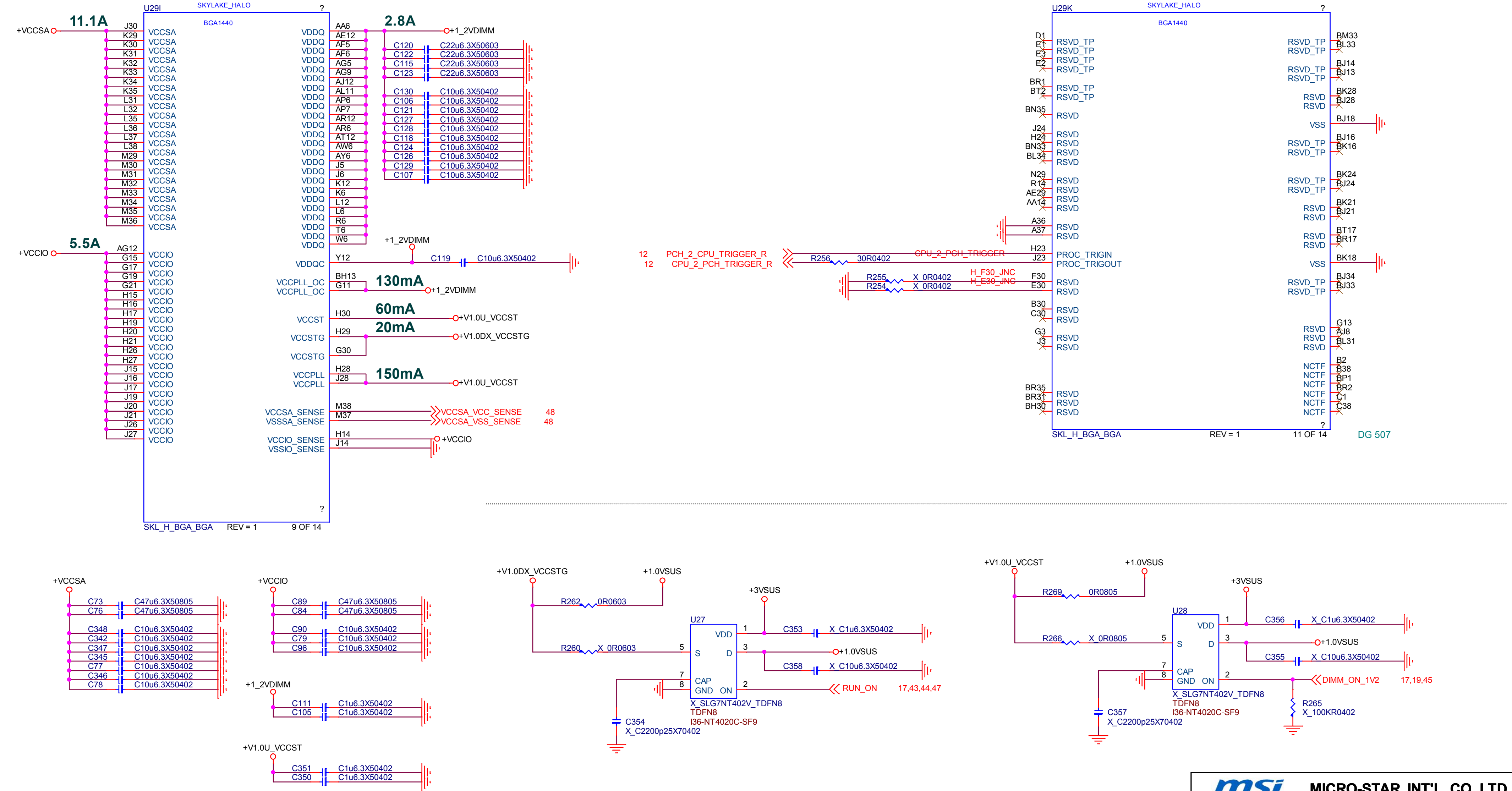
When HDA_SDIN[1:0], DISPA_SDIN interface is not implemented on the platform the signal pin(s) may be left unconnected.

When embedded display audio is not implemented, PROC_AUDIO_CLK and PROC_AUDIO_SDI need to be terminated to GND, PROC_AUDIO_SDO can be left unconnected.



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

Title	Skylake(Power1)	
Size	Document Number: MS-1785	Rev: 0A
Date:	Thursday, February 18, 2016	Sheet 5 of 59

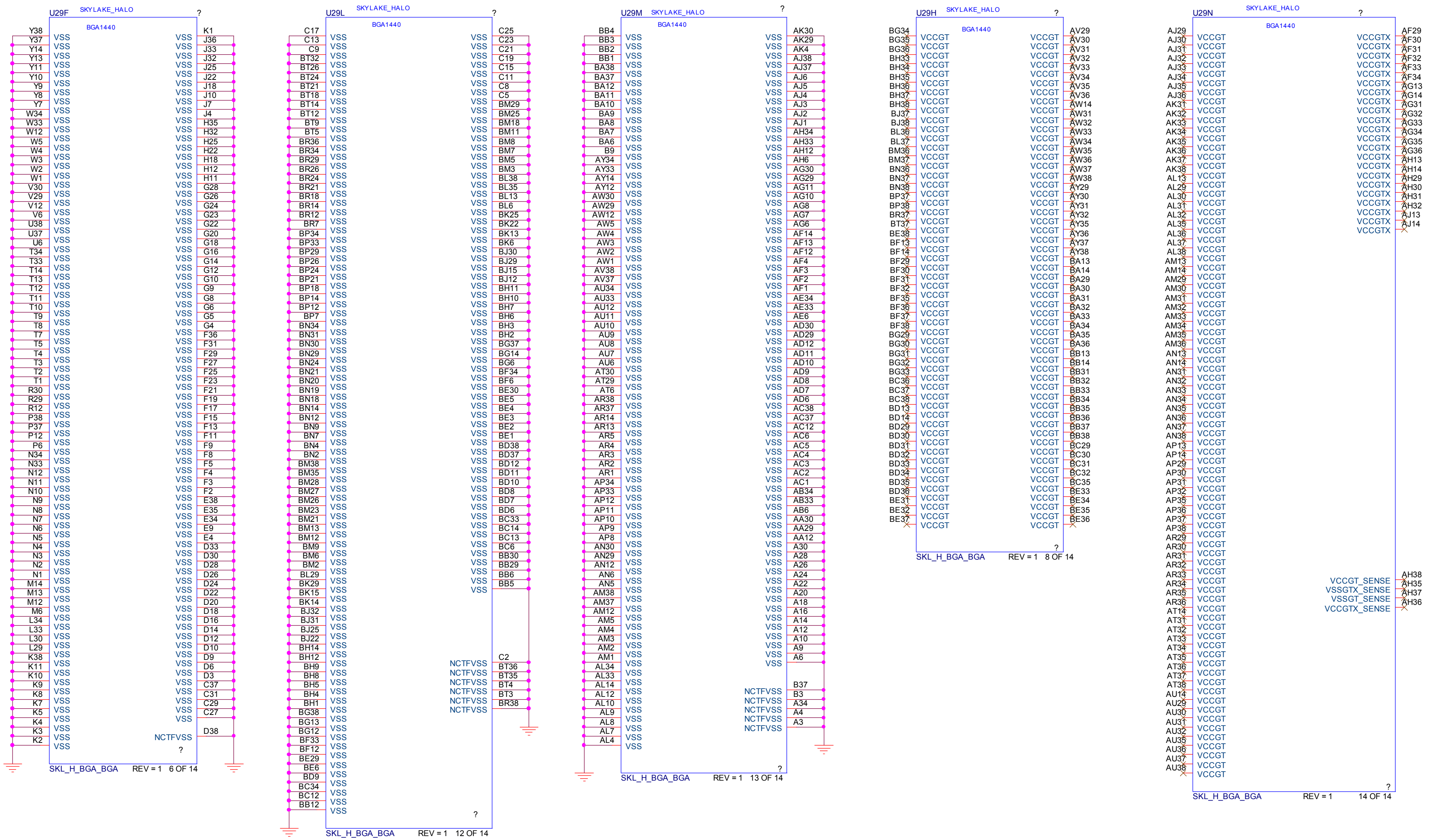


msi MICRO-STAR INT'L CO.,LTD.

Title: **Skylake(Power2)**

Size | Document Number: **MS-1785** | Rev 0A

Date: Thursday, February 18, 2016 | Sheet 6 of 59



MICRO-STAR INT'L CO.,LTD.

Title: **Skylake(Power3)**		
Size	Document Number: **MS-1785**	Rev: 0A
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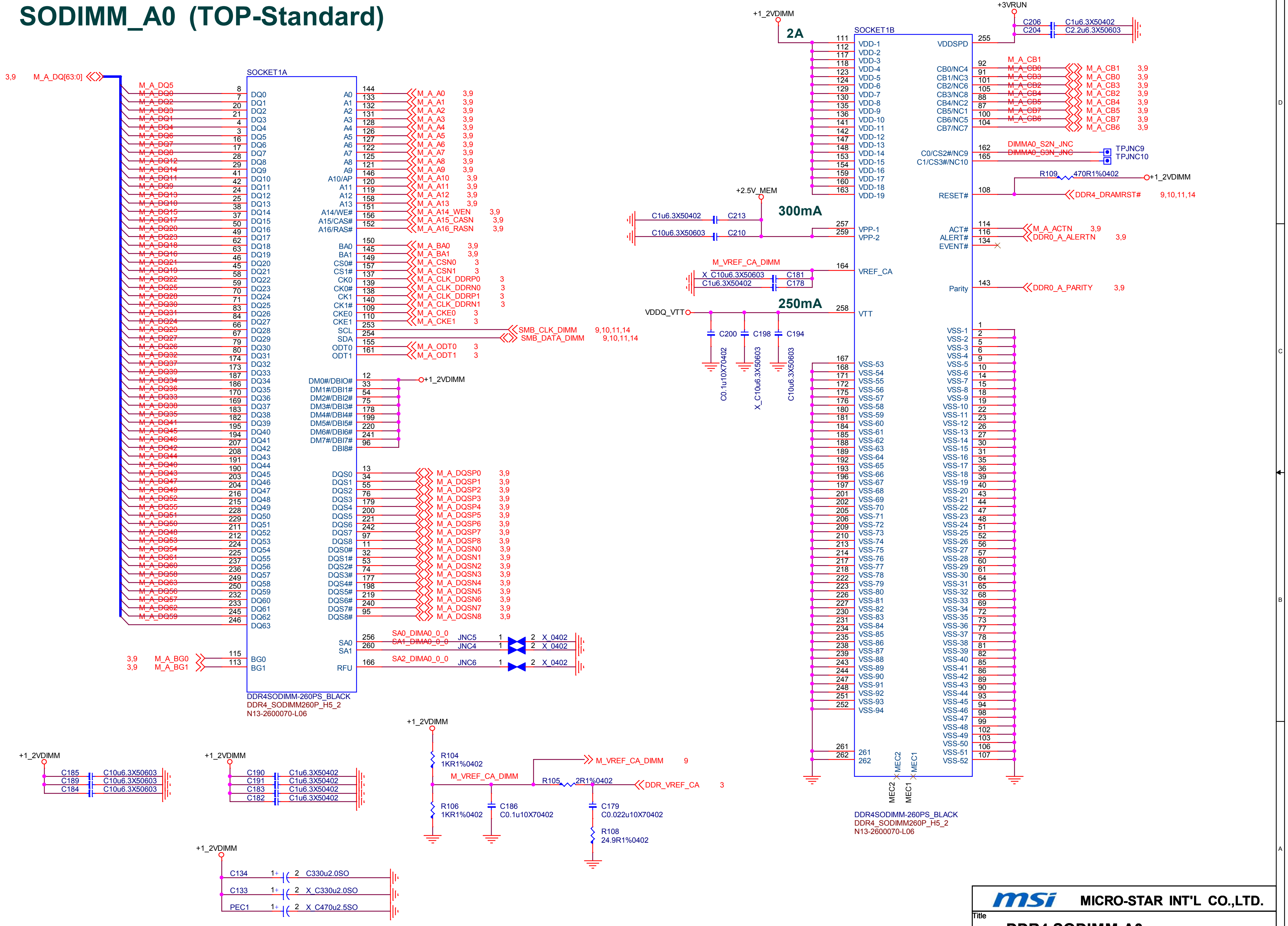
SODIMM_A0 (TOP-Standard)



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

Title: DDR4 SODIMM A0

Size | Document Number: MS-1785 | Rev: 0A

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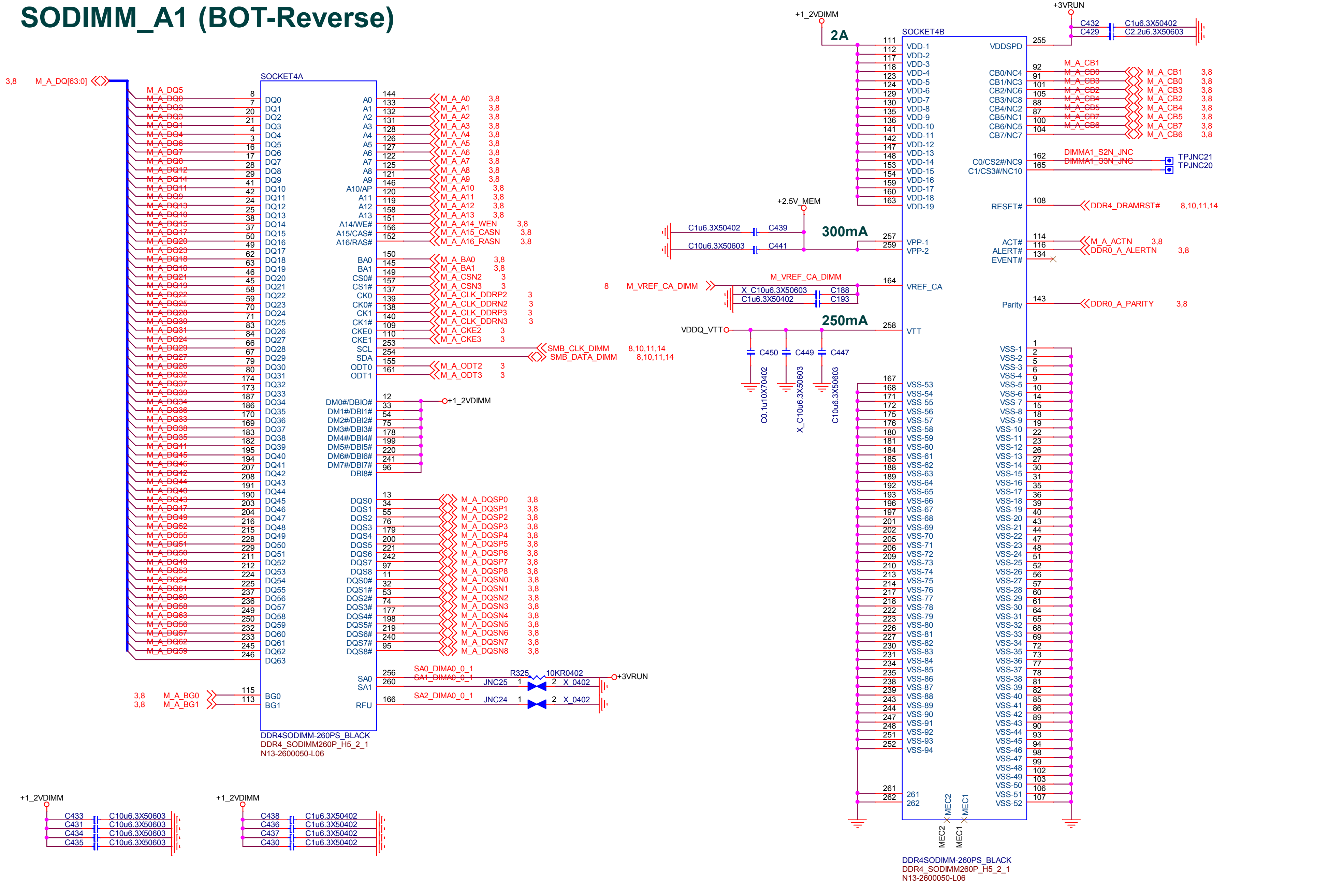
SODIMM_A1 (BOT-Reverse)



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

Title: **DDR4 SODIMM A1**

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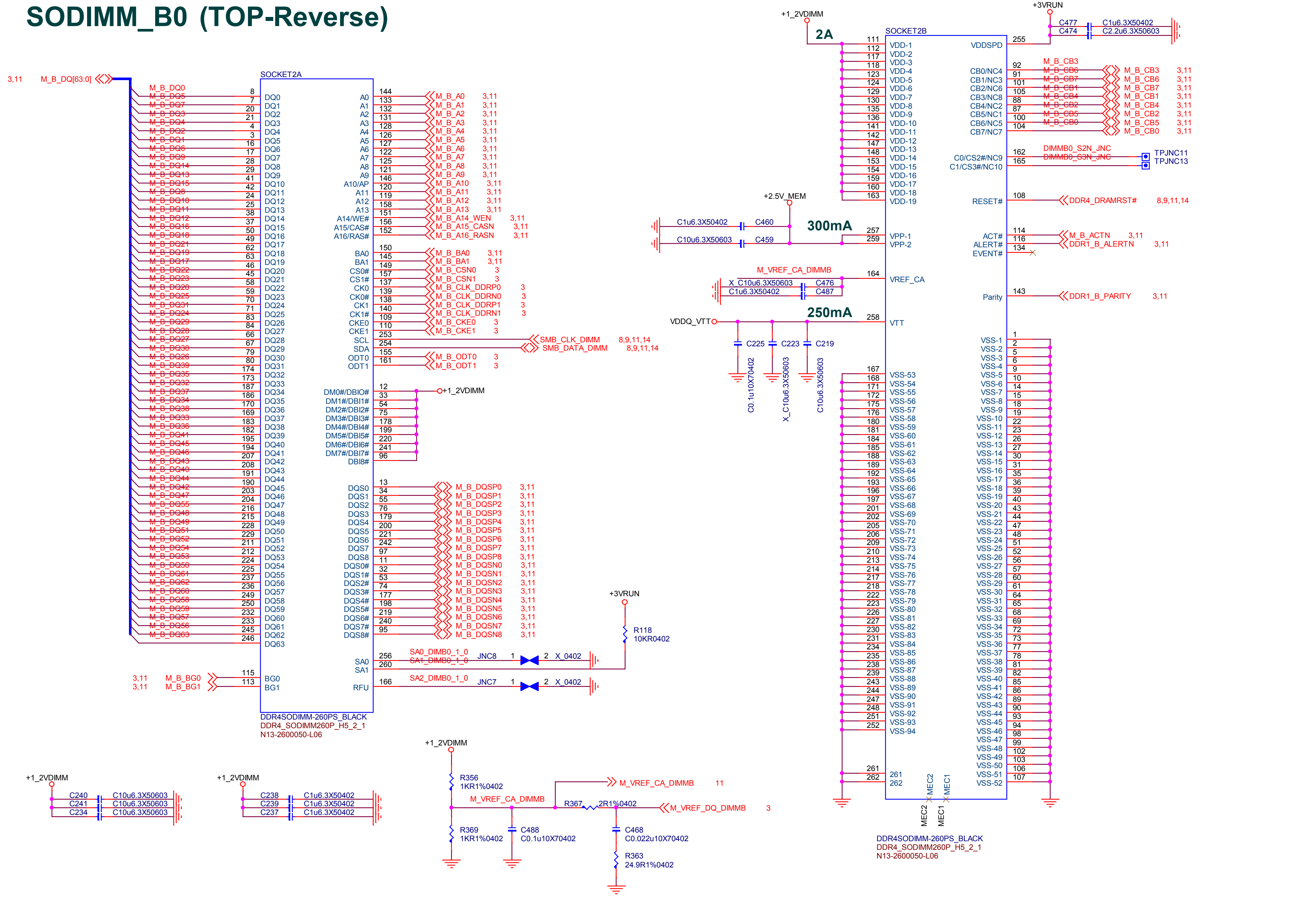
SODIMM_B0 (TOP-Reverse)



MICRO-STAR INT'L CO.,LTD.		
Title	DDR4 SODIMM B0	
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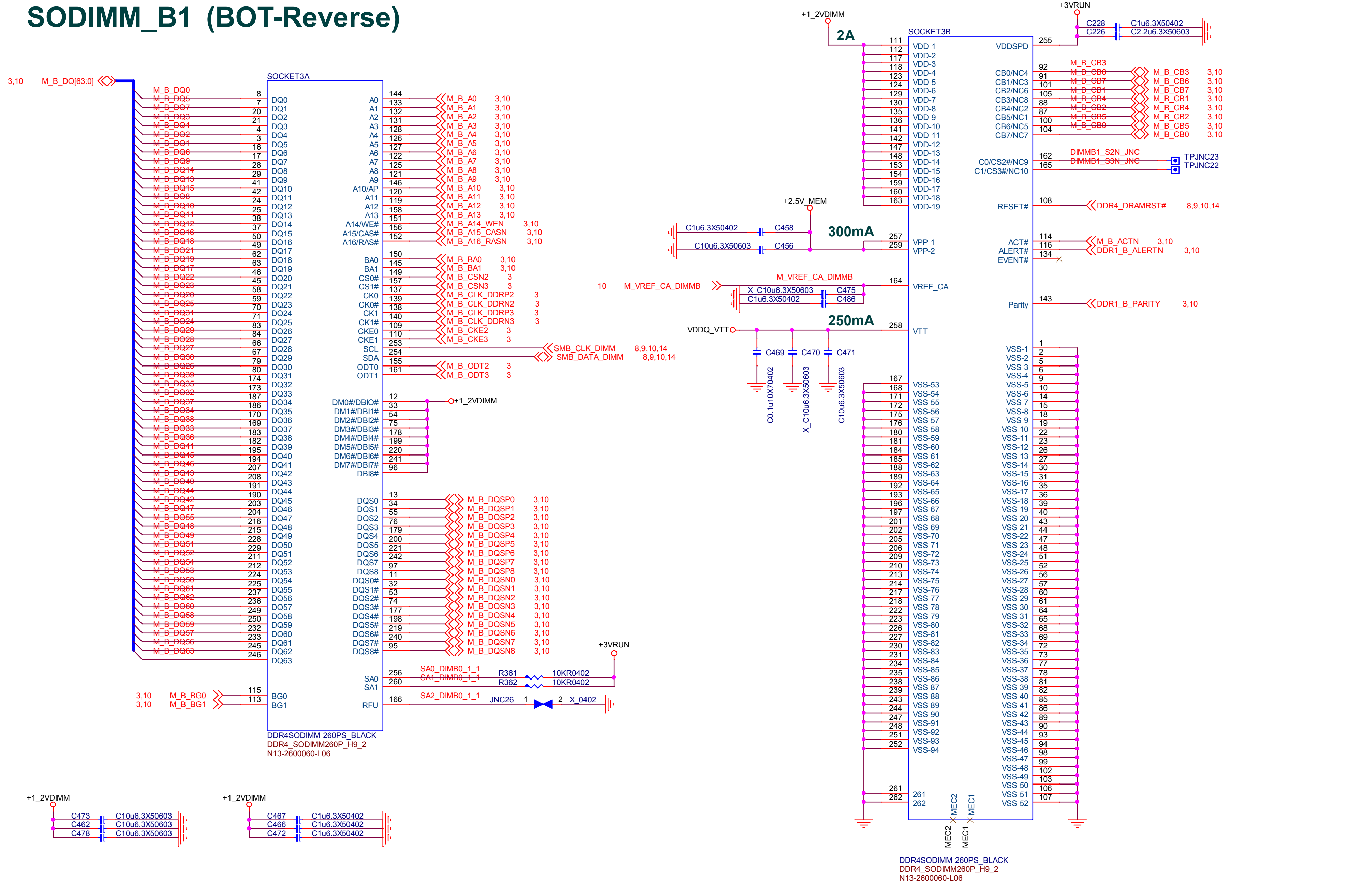
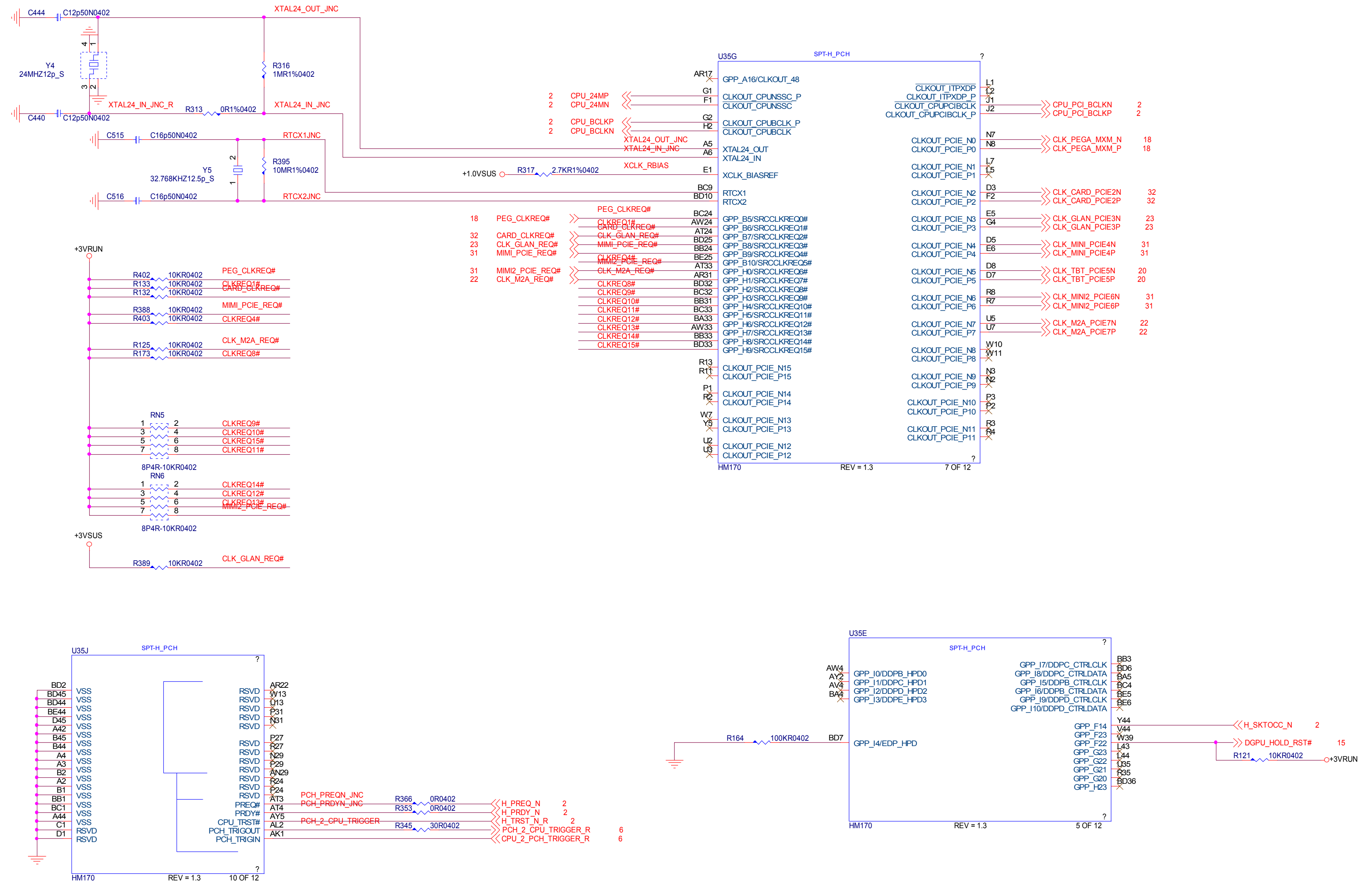
SODIMM_B1 (BOT-Reverse)



msi	MICRO-STAR INT'L CO.,LTD.	
Title	DDR4 SODIMM B1	
Size	Document Number: MS-1785	Rev: 0A
Date: Thursday, February 18, 2016	Sheet 11 of 59	

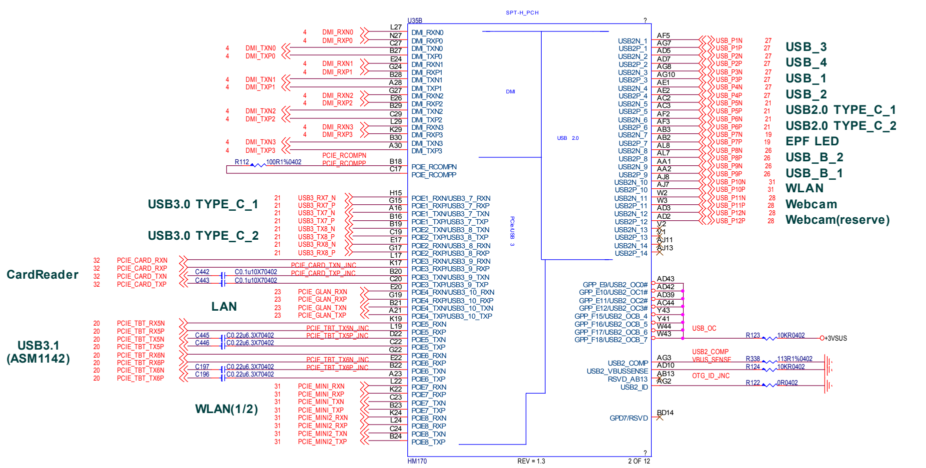


MICRO-STAR INT'L CO.,LTD.

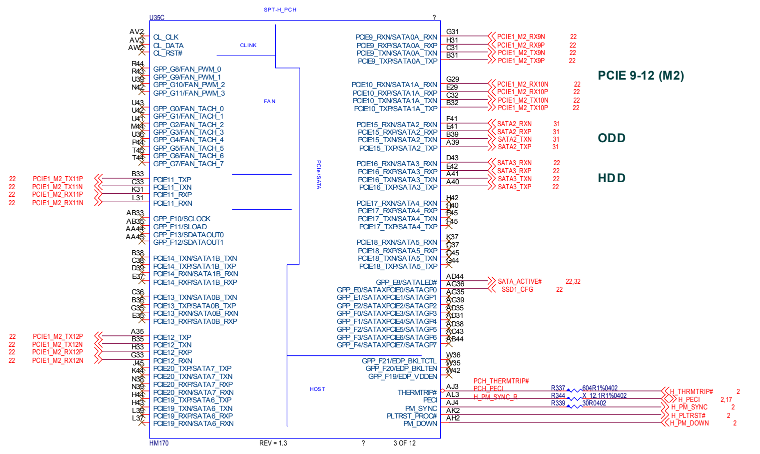
Title
PCH-1 (CLK/DDI)

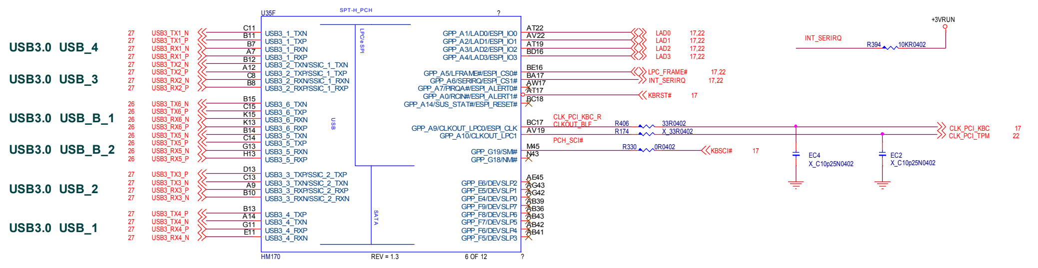
Size	Document Number	Rev
	MS-1785	0A

Date: Thursday, February 18, 2016 Sheet 12 of 59



USB 2.0	USB 3.0	Device	Note
1	2	USB 3.0 Port 3	
2	1	USB 3.0 Port 4	
3	4	USB 3.0 Port 1	
4	3	USB 3.0 Port 2	
5	7	TYPE_C_1	
6	8	TYPE_C_2	
7		EPF021	
8	5	USB 3.0 Port 2	1785B
9	6	USB 3.0 Port 1	1785B
10		WLAN	
11		WebCam	
12		WebCam	Reserve
13			NC
14			NC

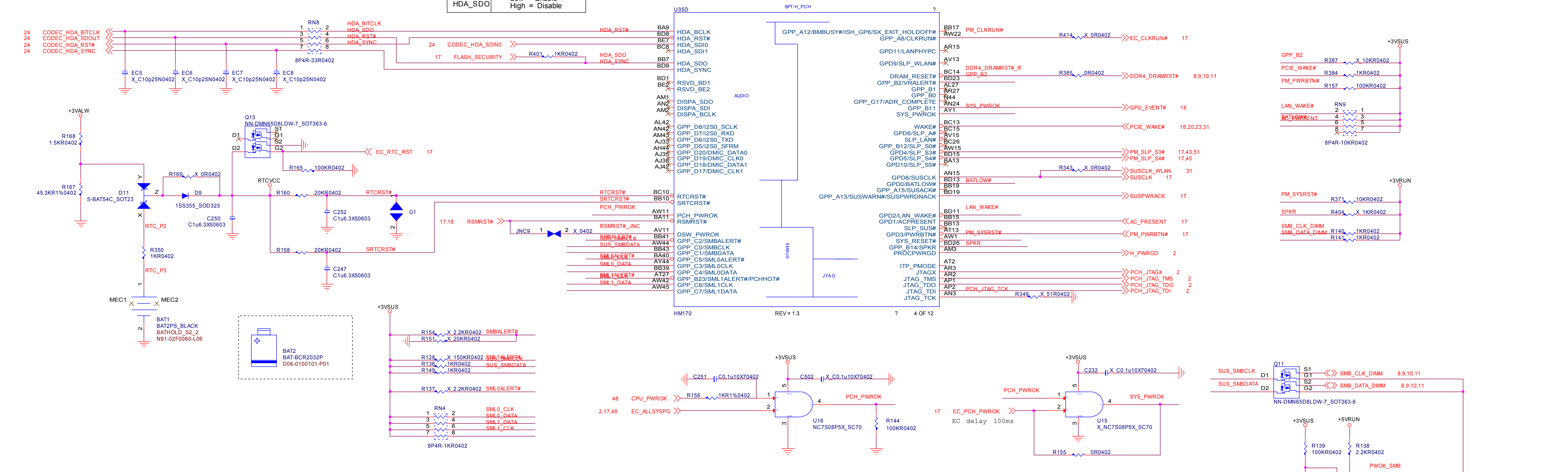




High Speed I/O Ports

	HM170	C236	Device
1	USB3.0/PCIE	USB3.0/PCIE	TYPE_C
2	USB3.0/PCIE	USB3.0/PCIE	
3	PCIE	USB3.0/PCIE	CardReader
4	PCIE	USB3.0/PCIE	LAN
5	PCIE	PCIE	USB 3.1 (ASM1142)
6	PCIE	PCIE	
7	PCIE	PCIE	WLAN
8	PCIE	PCIE	
9	SATA/PCIE	SATA/PCIE	M.2 SSD 1
10	SATA/PCIE	SATA/PCIE	
11	PCIE	PCIE	
12	PCIE	PCIE	
13	PCIE	SATA/PCIE	NC
14	PCIE	SATA/PCIE	
15	SATA/PCIE	SATA/PCIE	ODD
16	SATA/PCIE	SATA/PCIE	HDD
17	N/A	SATA/PCIE	NC
18	N/A	SATA/PCIE	
19	N/A	SATA/PCIE	
20	N/A	SATA/PCIE	

Flash Descriptor Security Protect	
HDA_SDO	Low = Enable High = Disable



TLS Confidentiality	
SMBALERT#	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).

eSPI or LPC	
SML0ALERT#	This signal has a weak internal pull-down(20K OHM). 0 = LPC is selected for EC. (Default) 1 = eSPI is selected for EC.

SML1ALERT# / PCHHOT# / GPP_B23	
SML1ALERT#	When used as PCHHOT#, a 150k weak board pull-up is recommended to ensure it does not override the internal pull-down strap sampling.

msi	MICRO-STAR INT'L CO.,LTD.	
Title	PCH-3 (HDA/RTC/SMBUS)	
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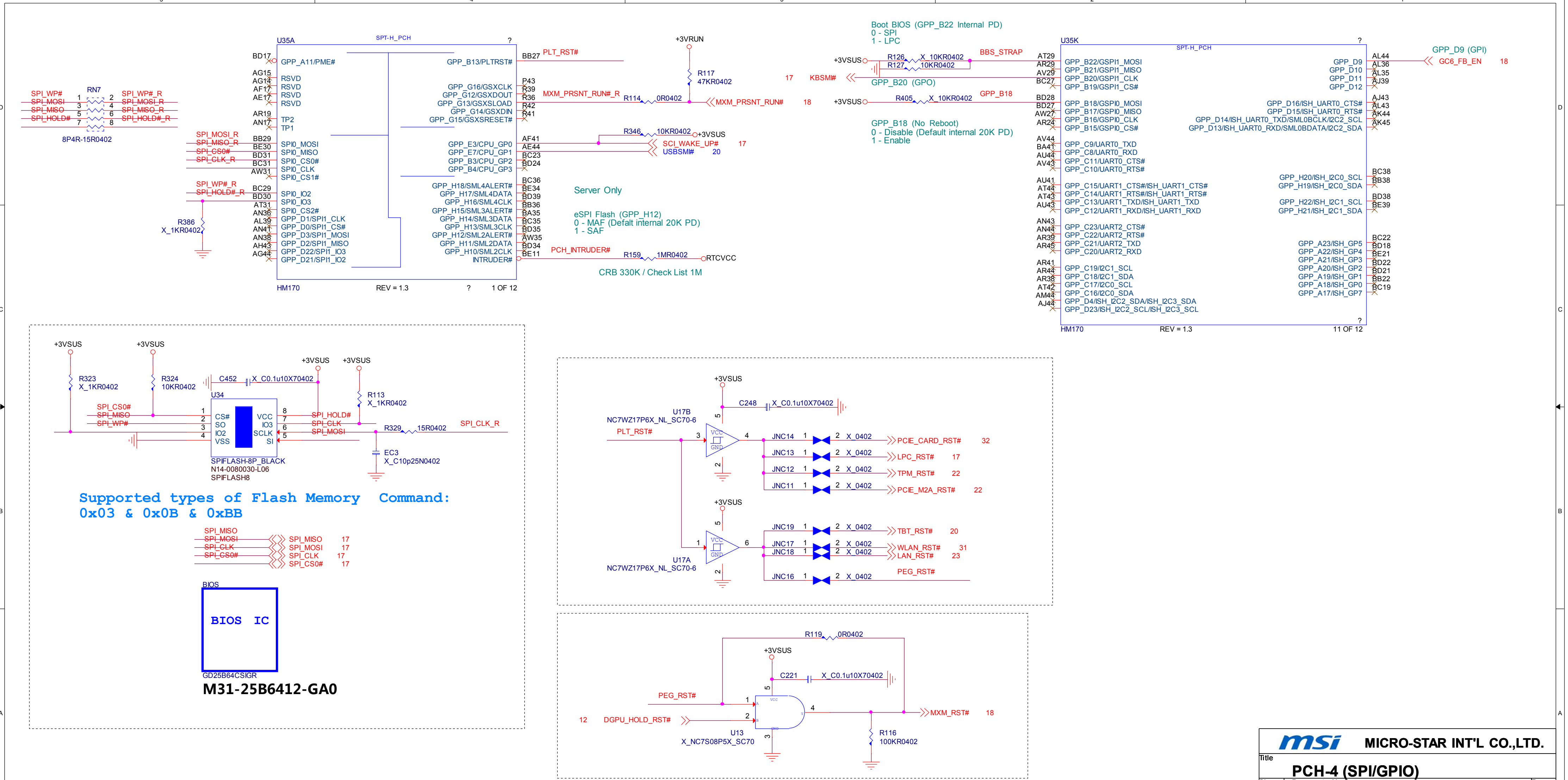

MICRO-STAR INT'L CO.,LTD.

Title: PCH-4 (SPI/GPIO)

Size	Document Number	Rev
	MS-1785	0A

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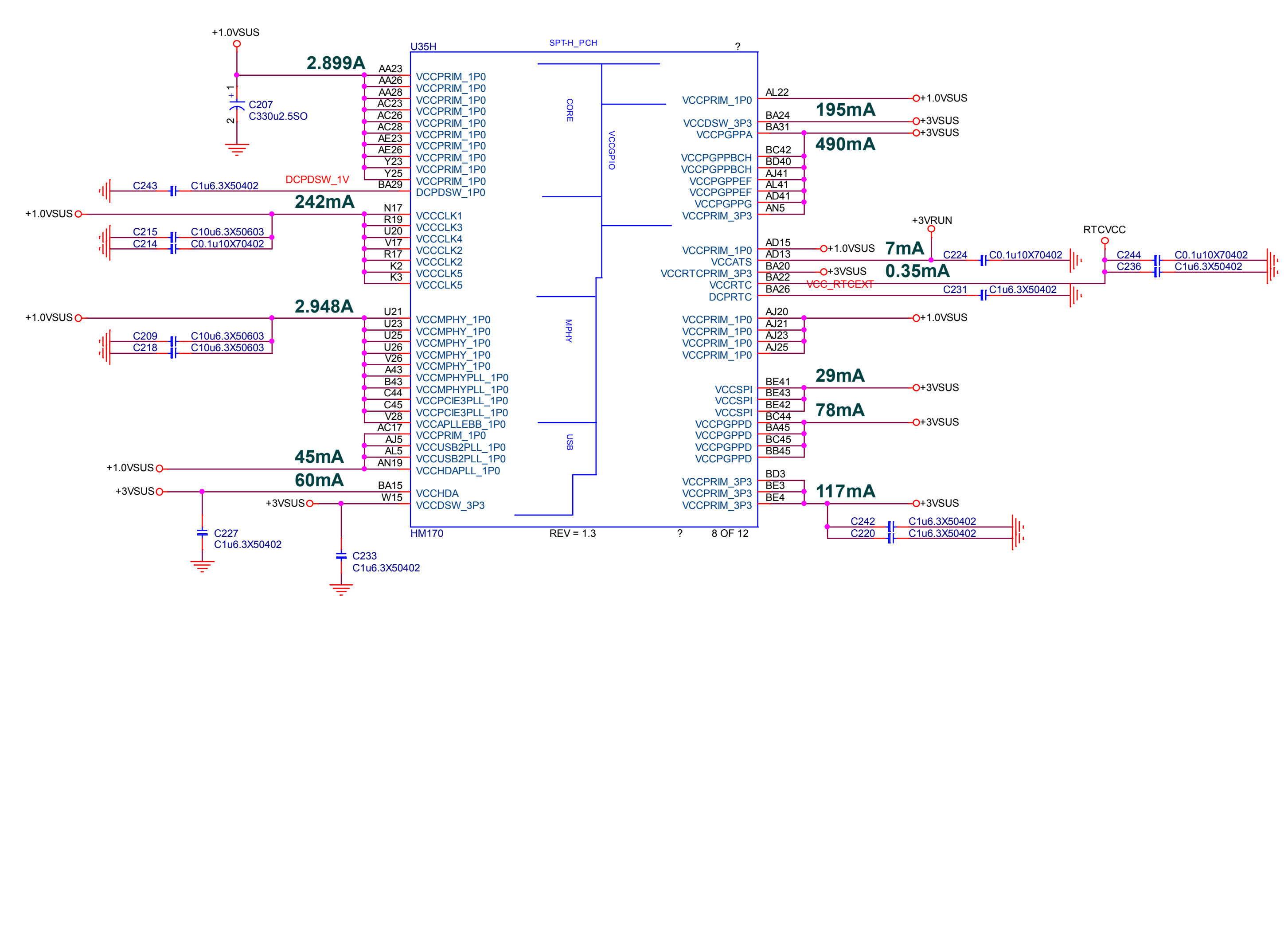

msi MICRO-STAR INT'L CO.,LTD.

Title	PCH_5(Power/GND)	
Size	Document Number: MS-1785	Rev: 0A
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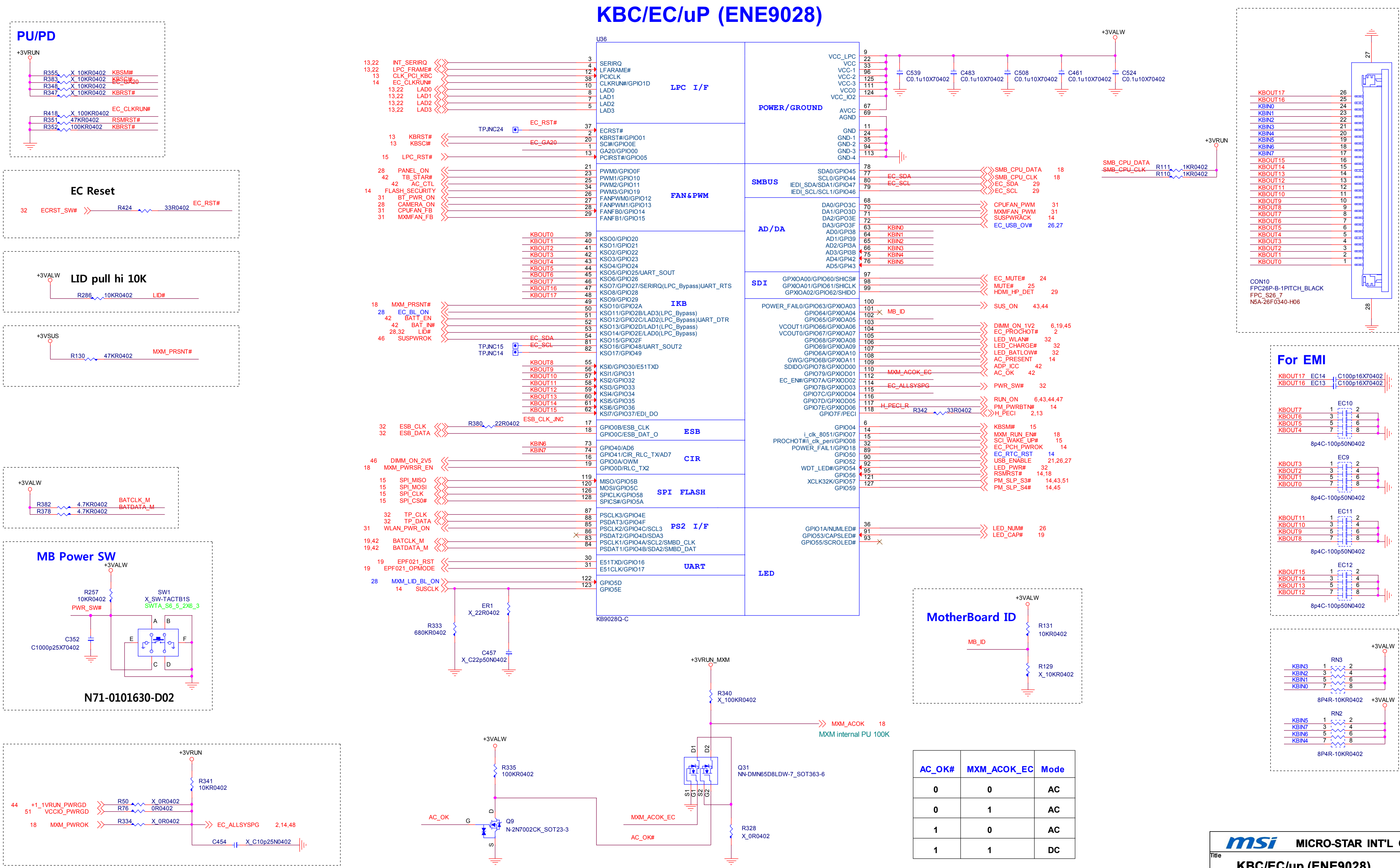
KBC/EC/uP (ENE9028)



AC_OK#	MXM_ACOK_EC	Mode
0	0	AC
0	1	AC
1	0	AC
1	1	DC

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

Title: KBC/EC/up (ENE9028)

Size | Document Number: MS-1785 | Rev: 0A

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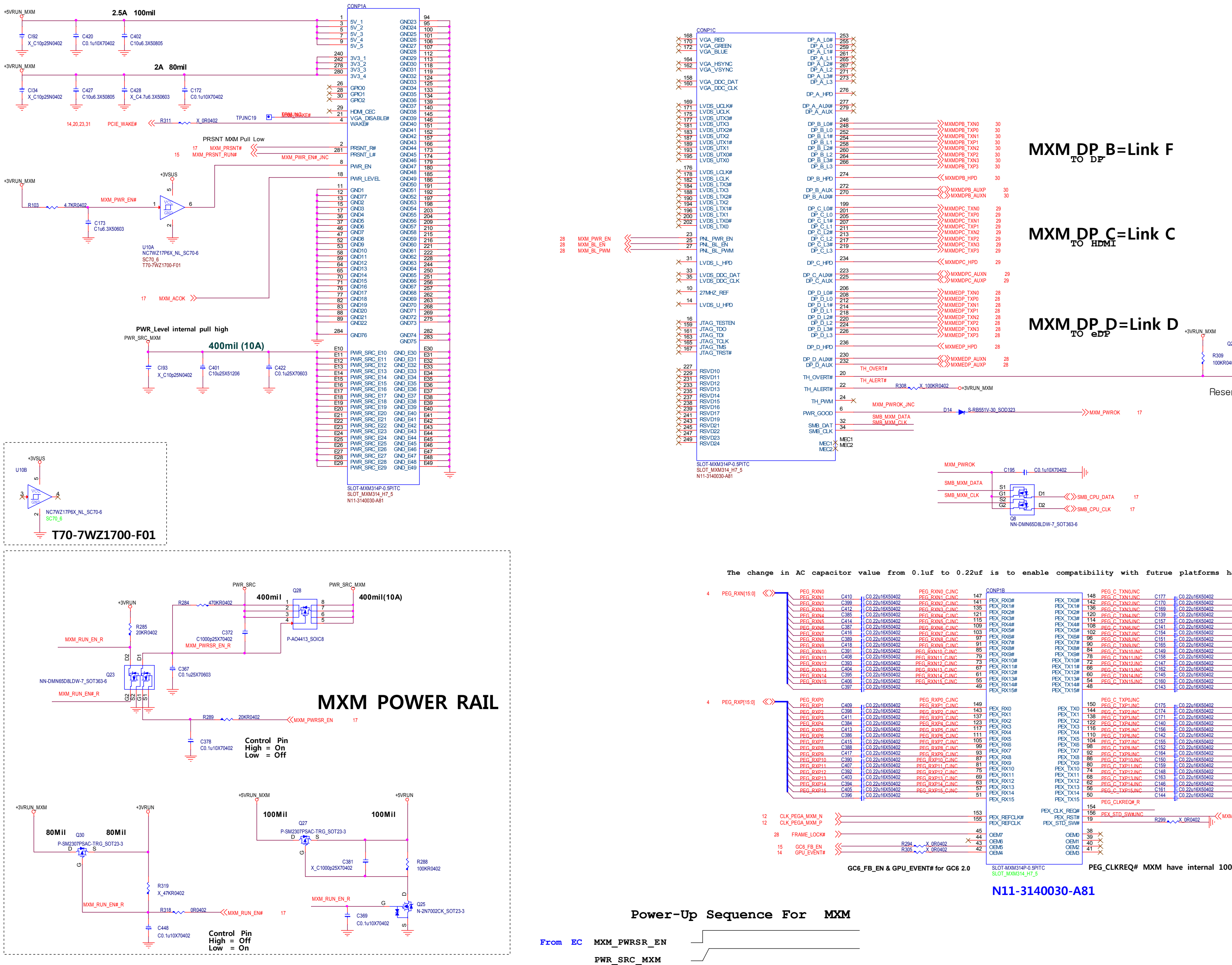
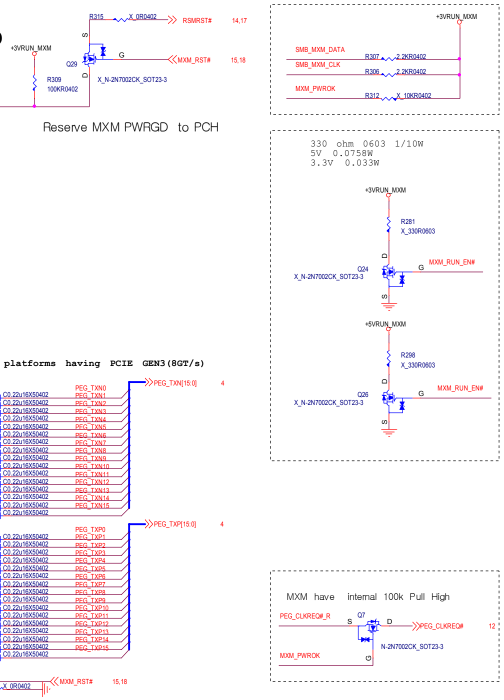
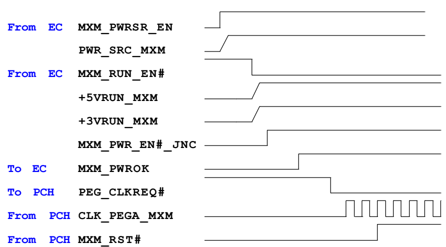
MXM 3.1 (x16 PEG Gen 3)



GB4-256(N17E-G1/G2/G3)	
Link AB	DVI (Dual Link)
Link C	DP / HDMI
Link D	DP / eDP
Link E	DP / HDMI / DVI
Link F	DP / eDP / DVI

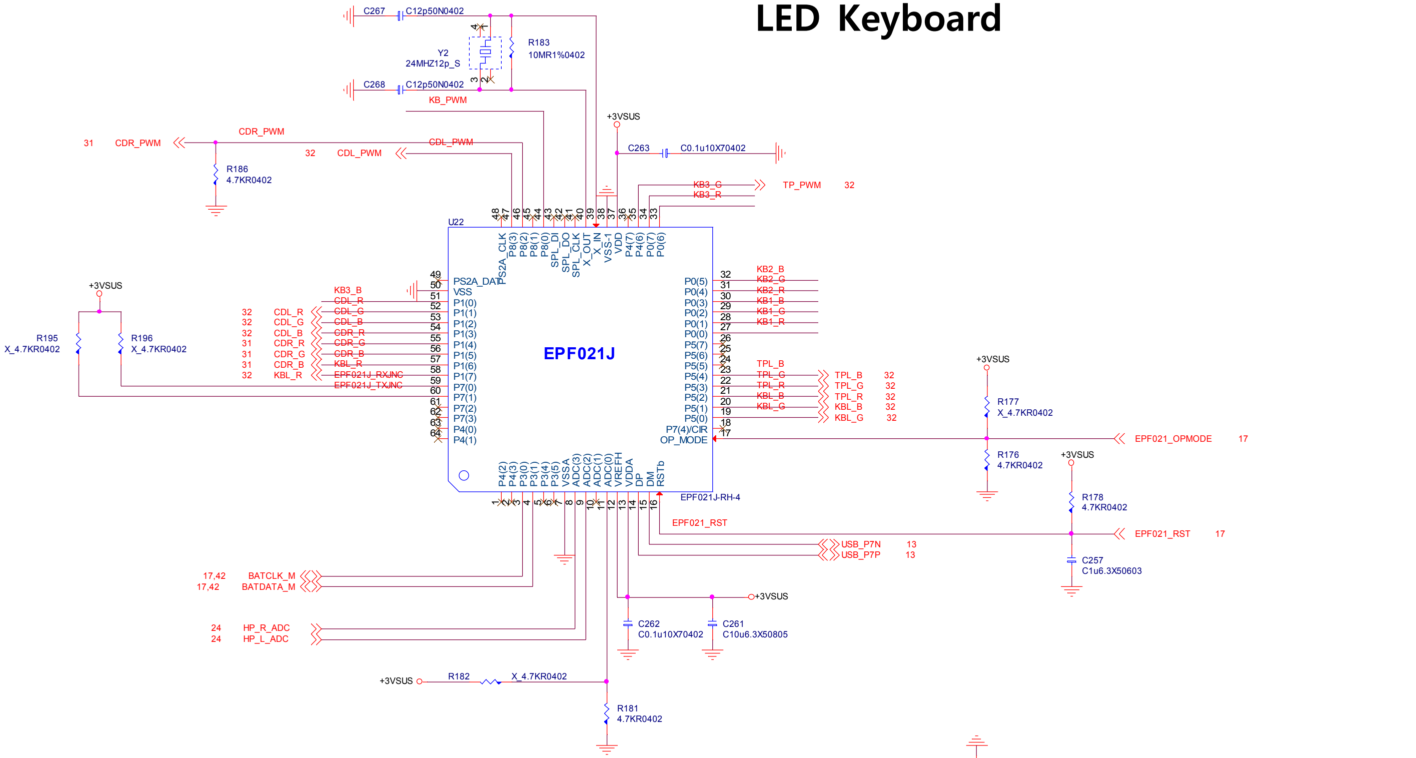


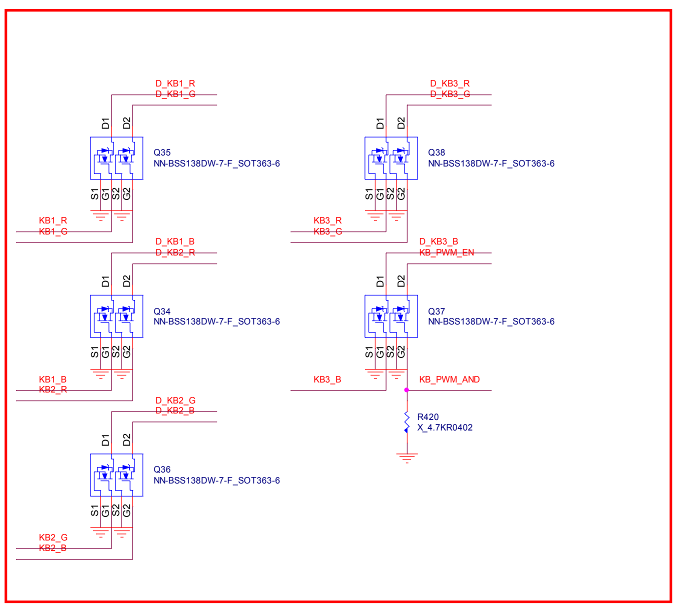
Power-Up Sequence For MXM



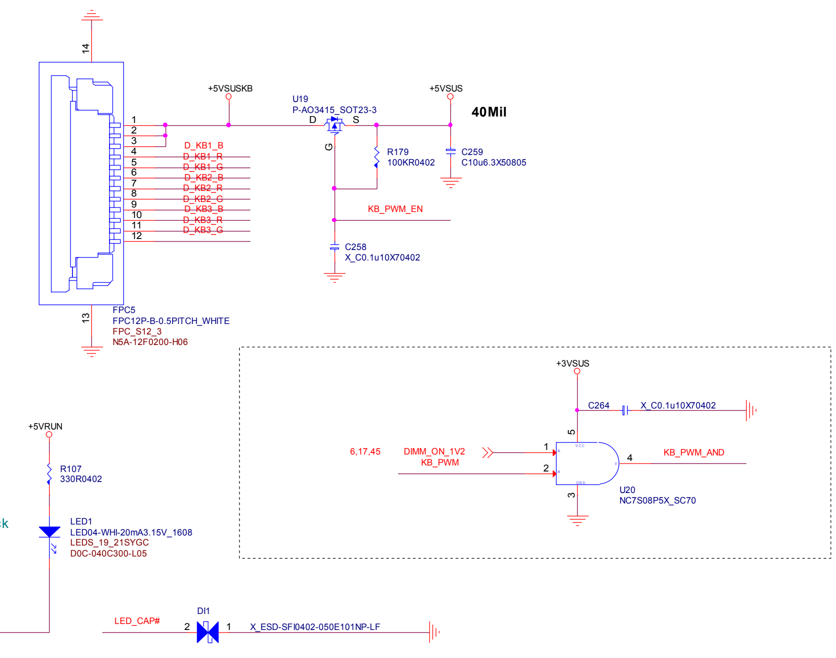
LED 8051 Controller

LED Keyboard





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



MICRO-STAR INT'L CO.,LTD.

Title: LED Driver IC/ LED 8051

Size | Document Number: MS-1785 | Rev: 0A

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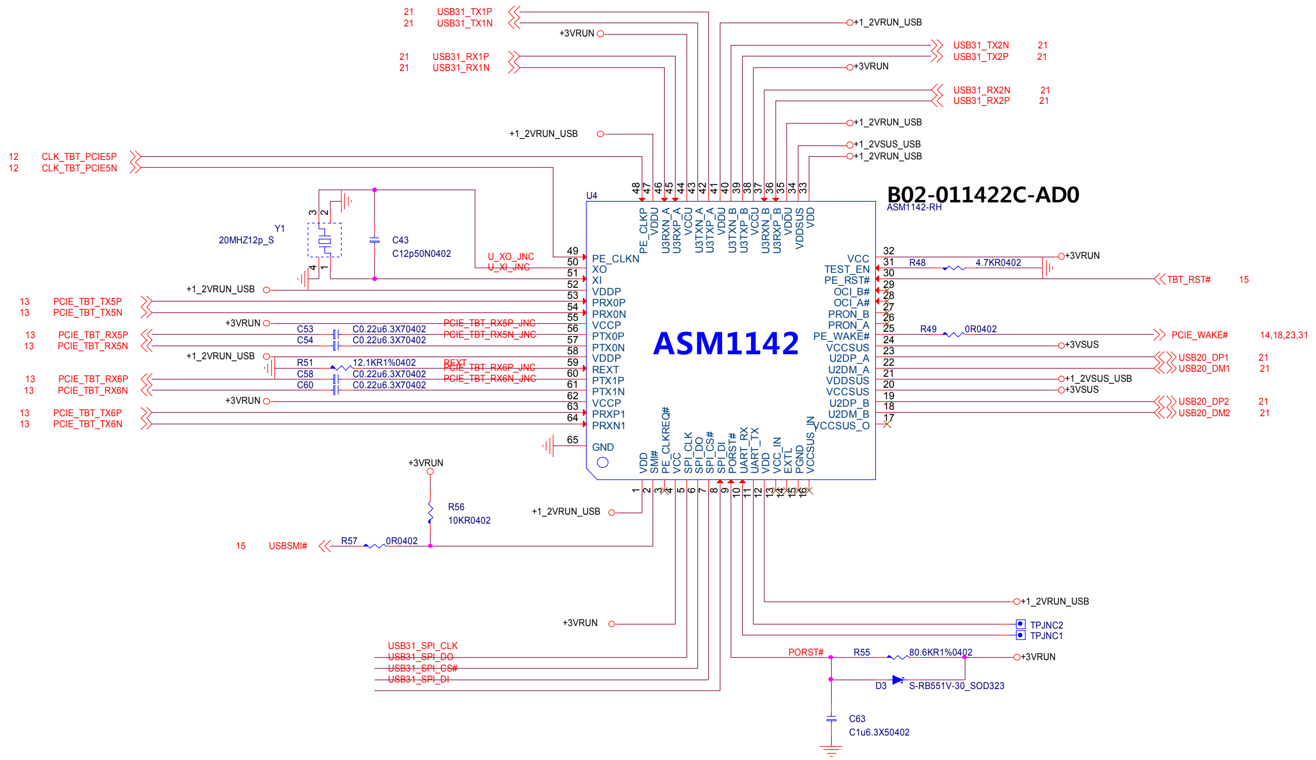
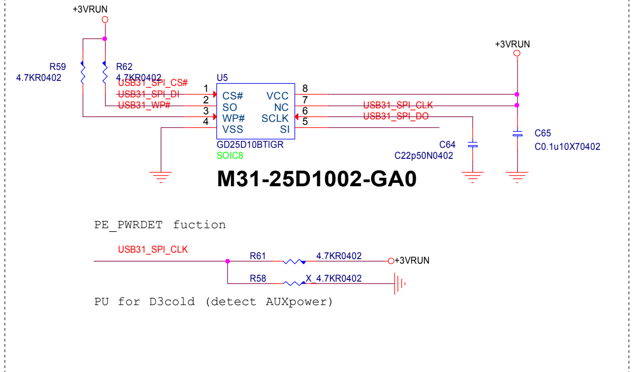
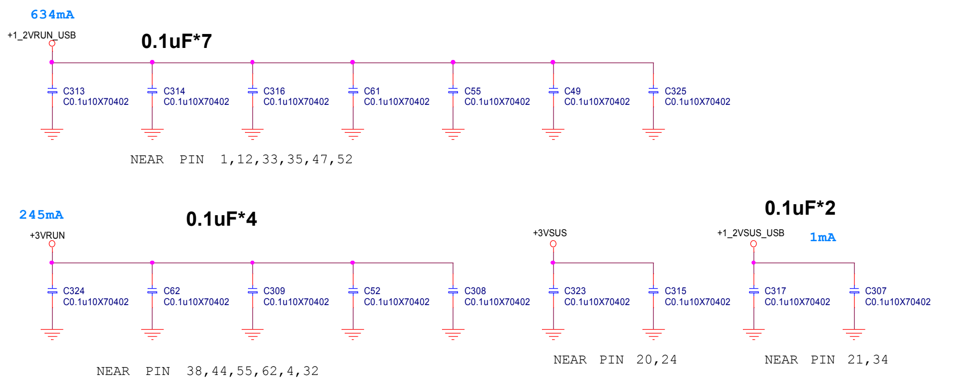
USB3.1(ASM1142)

PCIE to USB 3.1



SPI ROM For FW (stuff first)





msi	MICRO-STAR INT'L CO.,LTD.	
Title	USB3.1(ASM1142)	
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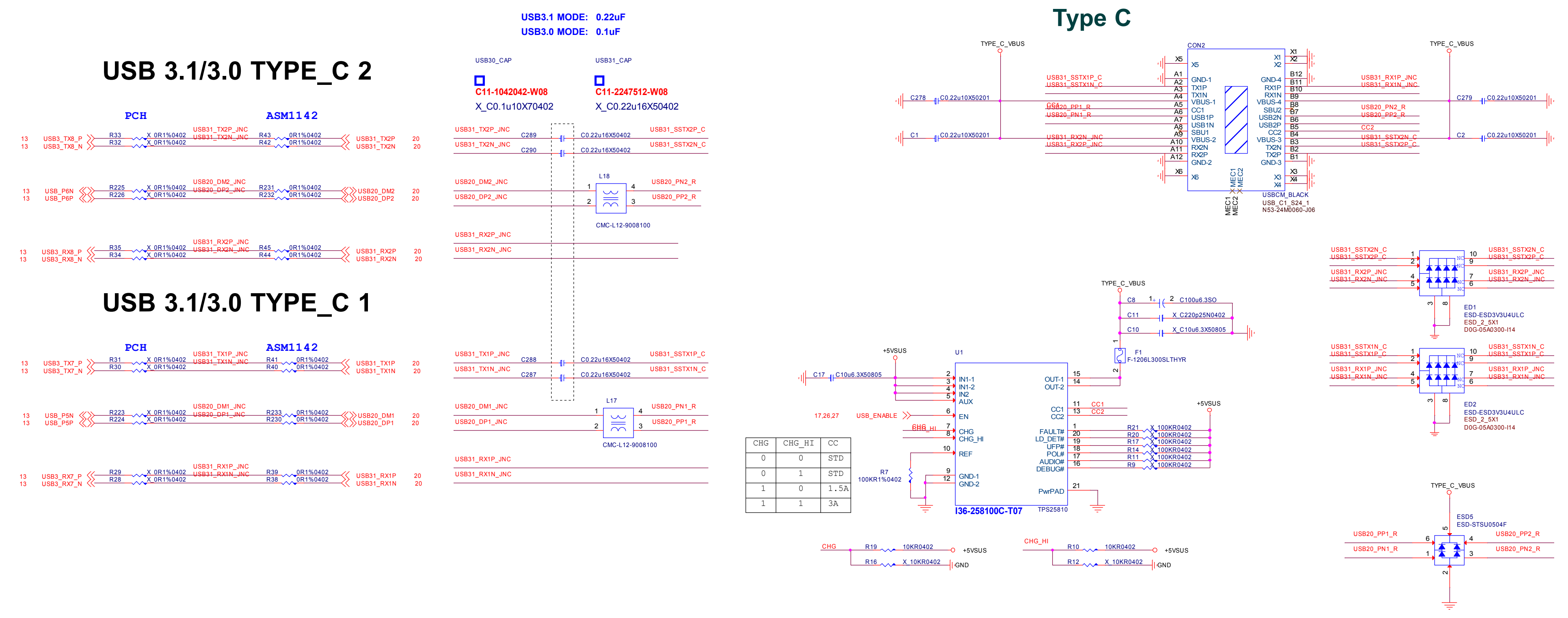

CHG	CHG_HI	CC
0	0	STD
0	1	STD
1	0	1.5A
1	1	3A

MICRO-STAR INT'L CO.,LTD.

Title: TYPE_C Conn

Size / Document Number: MS-1785

Rev: 0A

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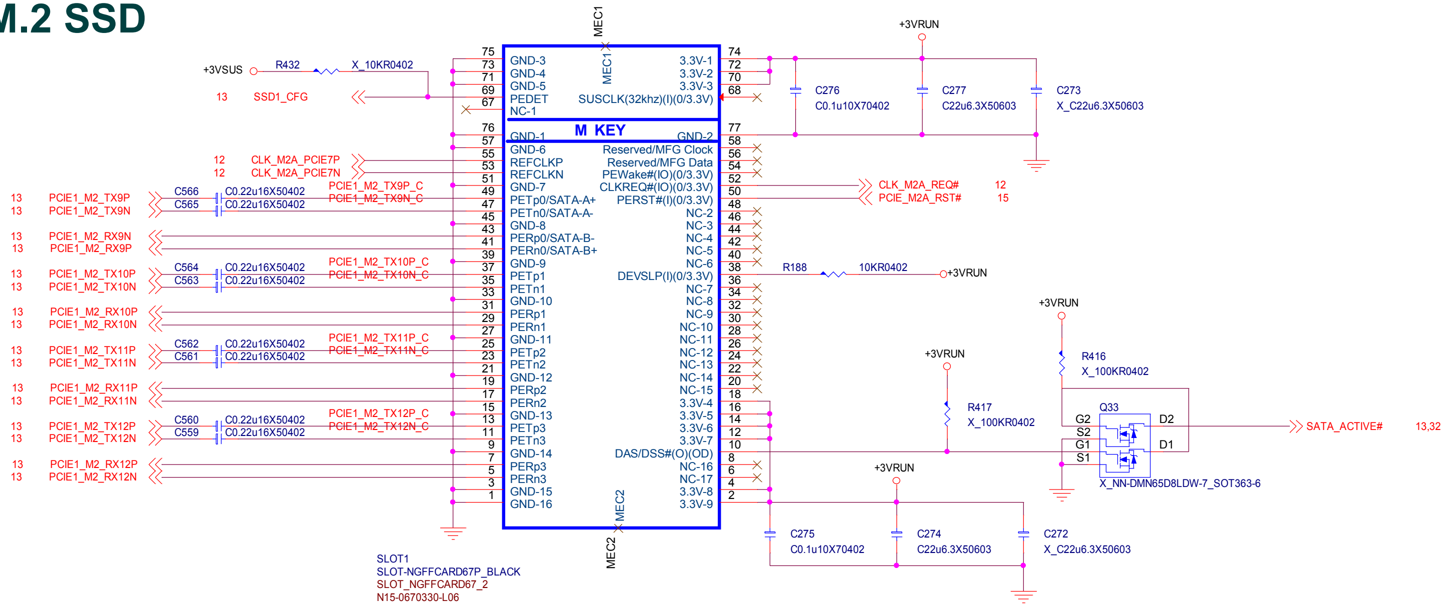
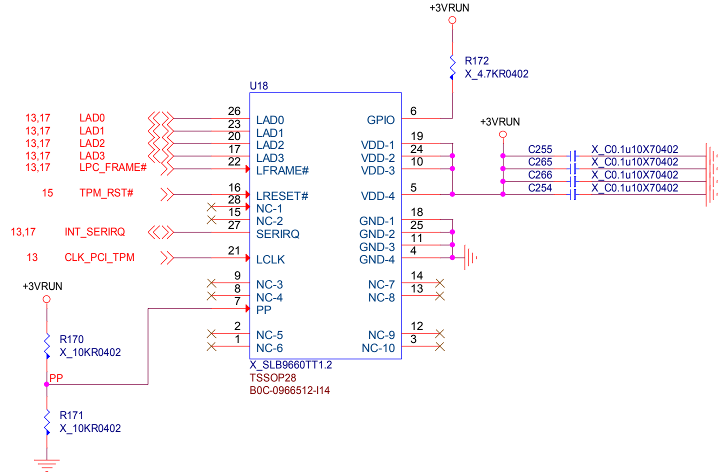
M.2 SSD

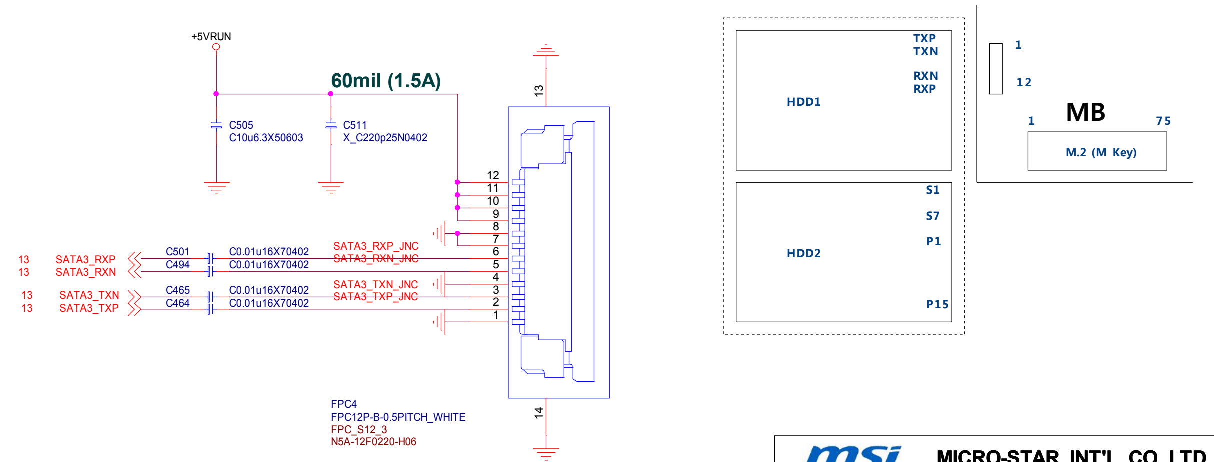
PCIE 9-12 (M2)



TPM



HDD



(Must used the gold fresh type)

MICRO-STAR INT'L CO.,LTD.

Title	TPM/M.2 SSD/HDD Conn.	
Size: Custom	Document Number: MS-1785	Rev: 0A
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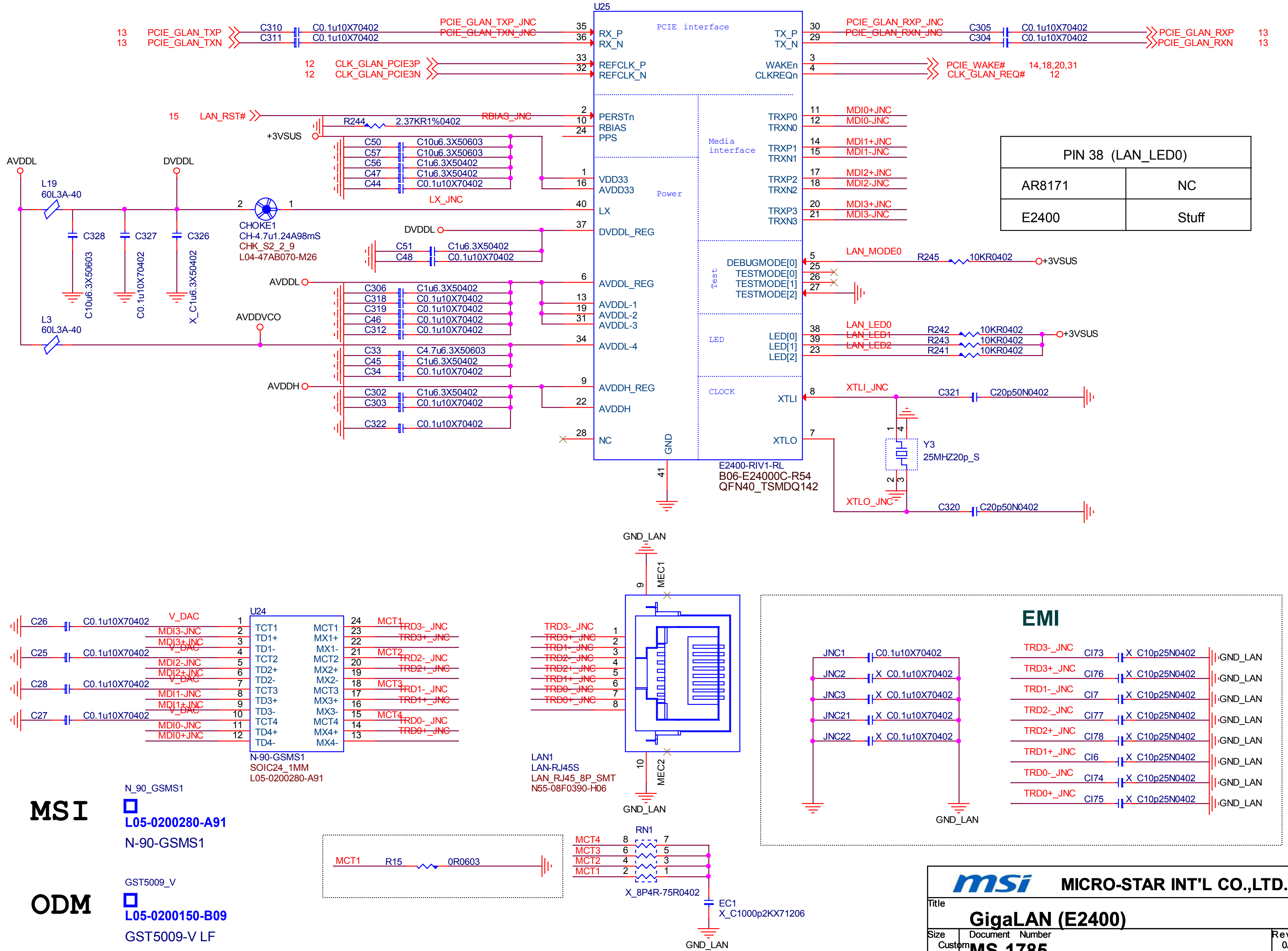
LAN (E2400)



PIN 38 (LAN_LED0)	
AR8171	NC
E2400	Stuff

MSI

N_90_GSMS1

L05-0200280-A91

N-90-GSMS1

ODM

GST5009_V

L05-0200150-B09

GST5009-V LF

MICRO-STAR INT'L CO.,LTD.

Title: **GigaLAN (E2400)**

Size: Custom | Document Number: **MS-1785** | Rev: 0A

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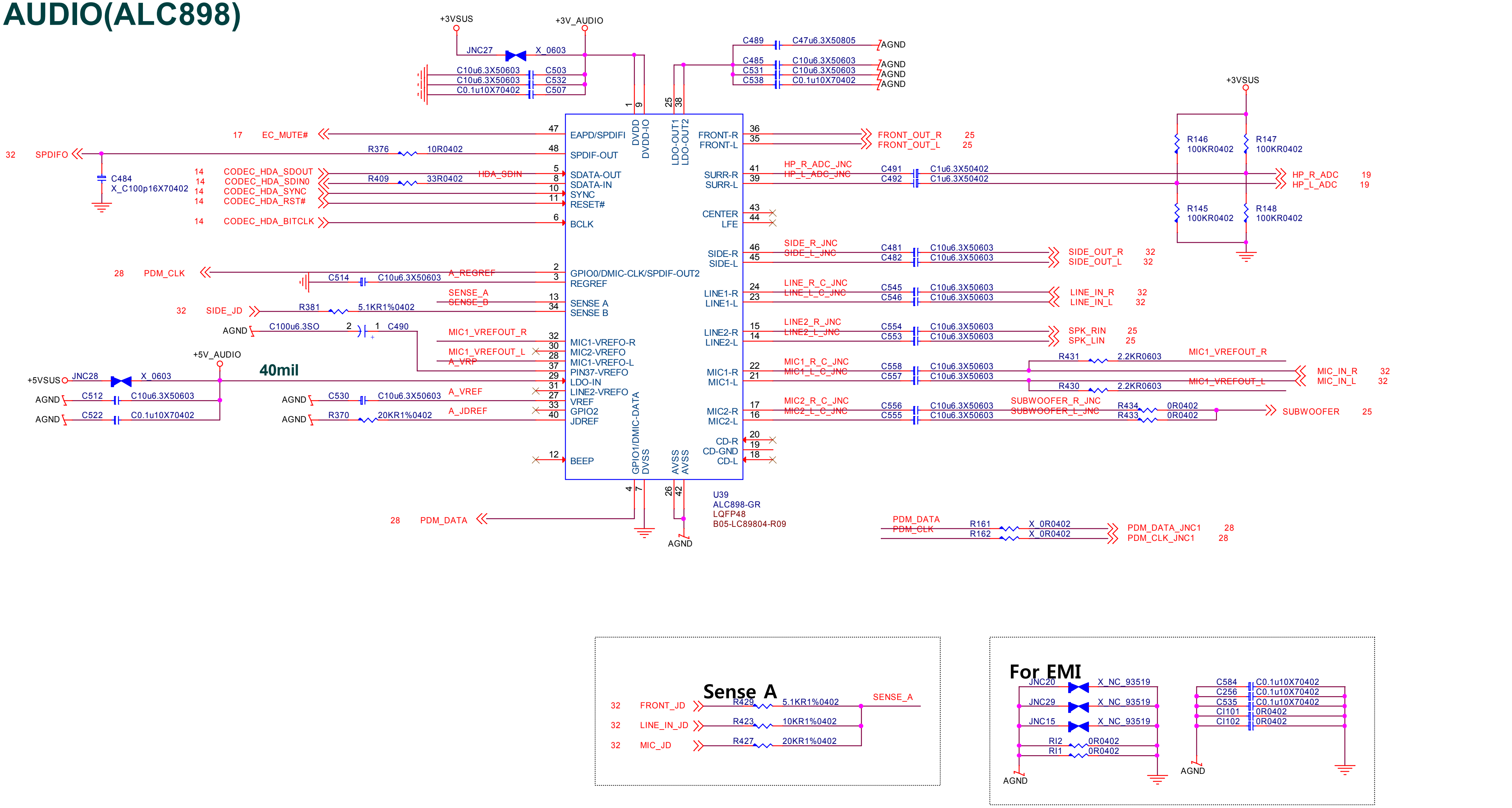
AUDIO(ALC898)



MICRO-STAR INT'L CO.,LTD.

Title	Audio(ALC898)	
Size: Custom	Document Number: MS-1785	Rev: 0A
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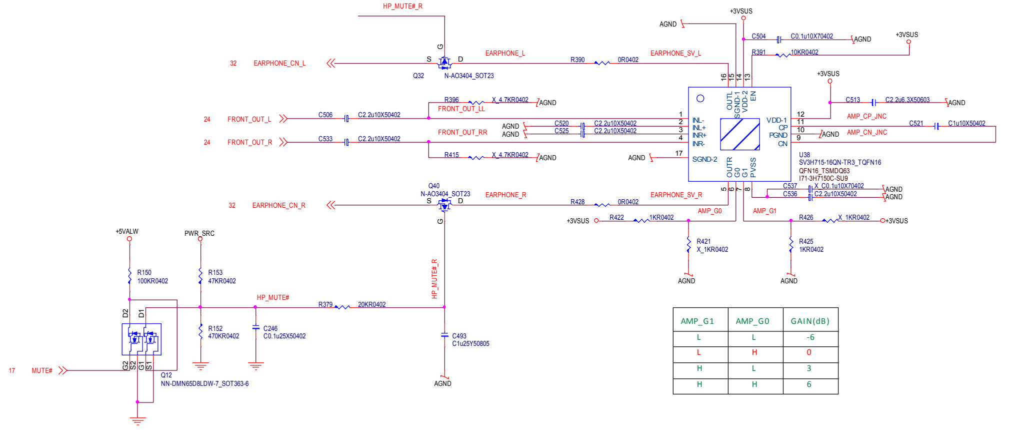
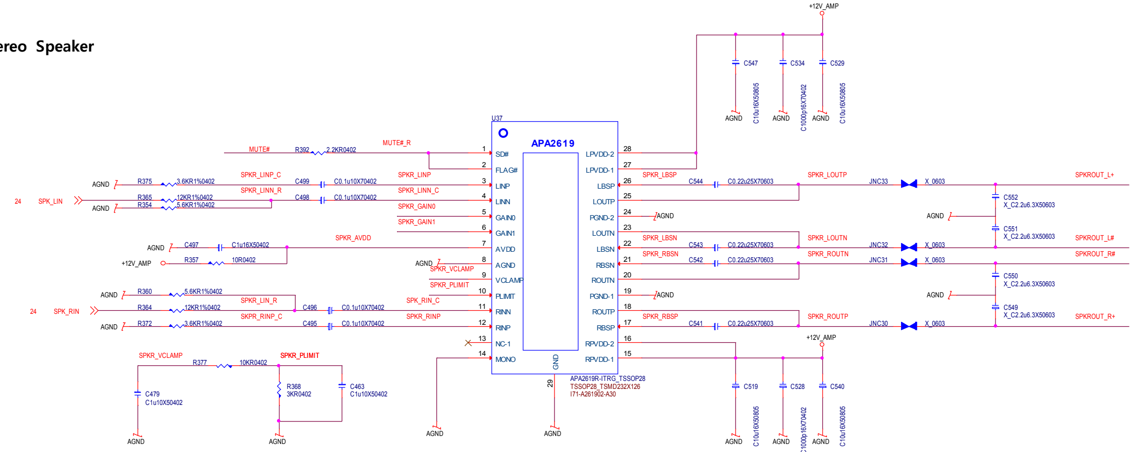
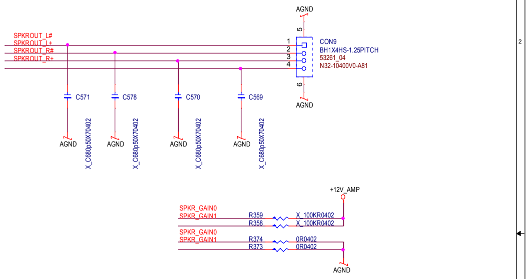


AMP_G1	AMP_G0	GAIN(dB)
L	L	-6
L	H	0
H	L	3
H	H	6

Stereo Speaker

Speaker

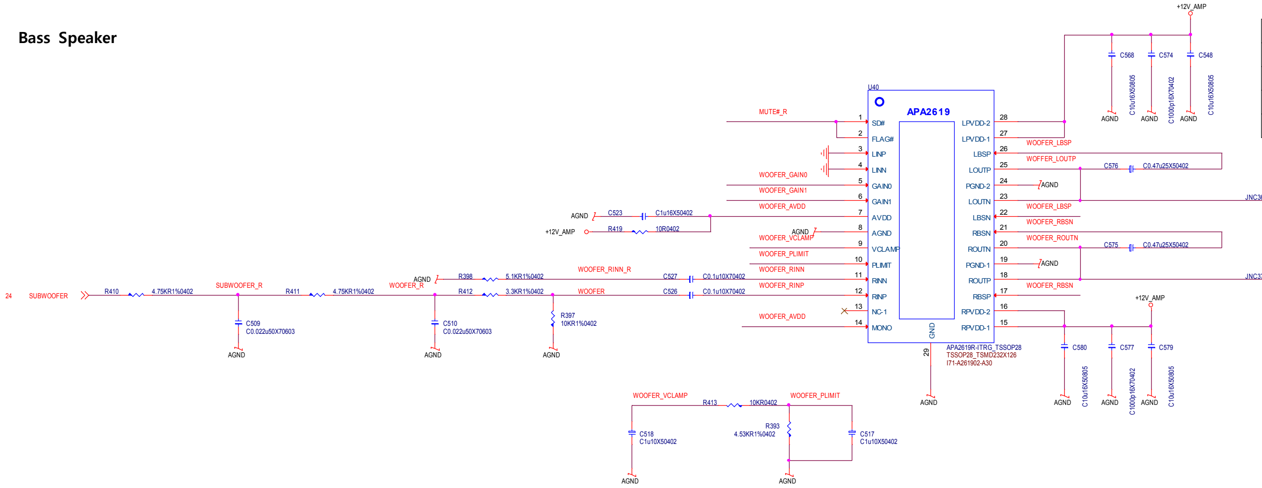




For APA2619

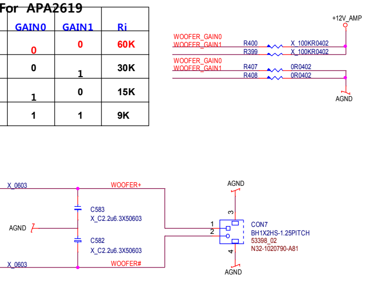
Gain	GAIN0	GAIN1	Ri
20dB	0	0	60K
26dB	0	1	30K
32dB	1	0	15K
36dB	1	1	9K

Bass Speaker

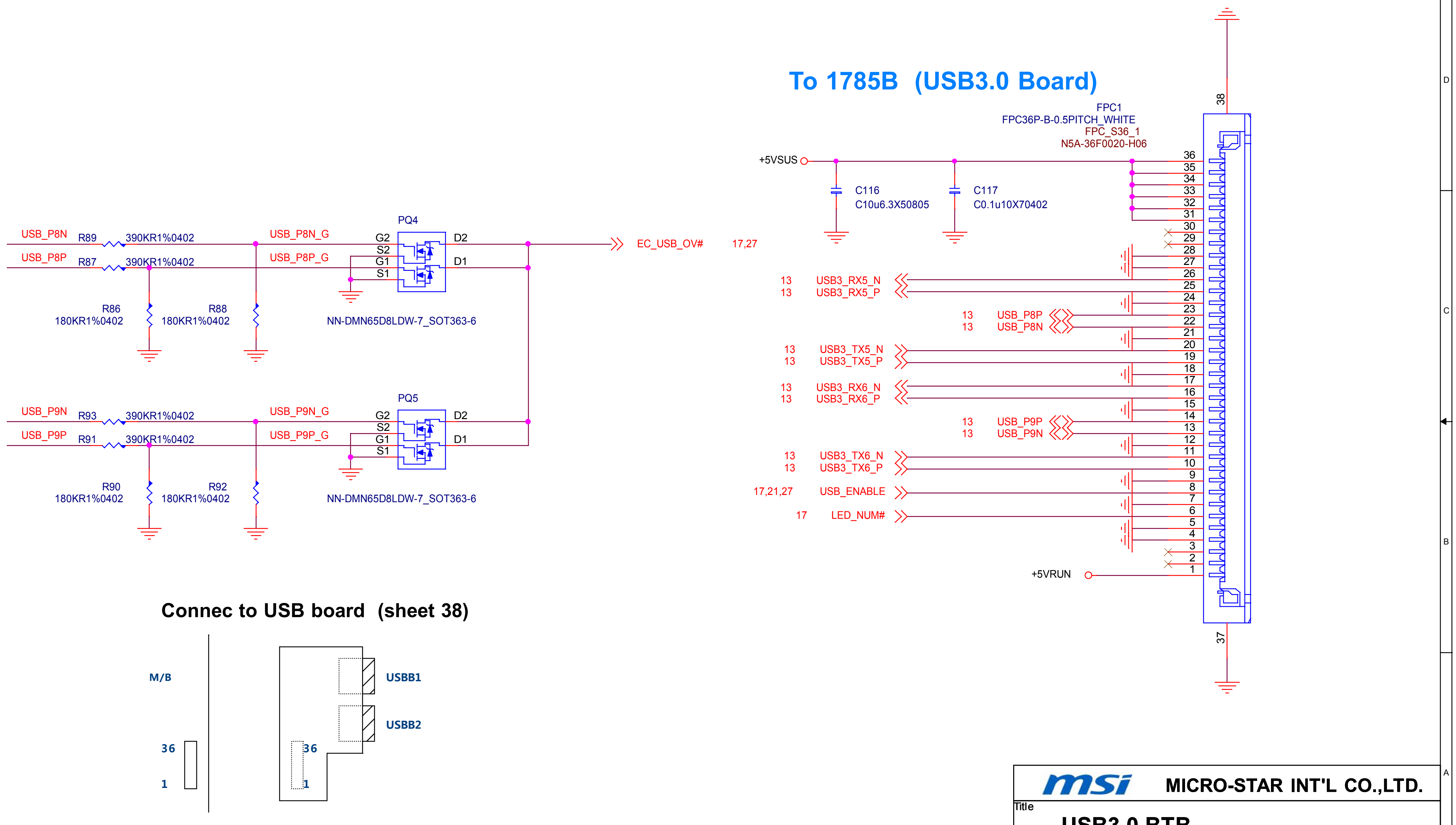


For APA2619

Gain	GAIN0	GAIN1	Ri
20dB	0	0	60K
26dB	0	1	30K
32dB	1	0	15K
36dB	1	1	9K



Woofer



MICRO-STAR INT'L CO.,LTD.

Title	USB3.0 BTB
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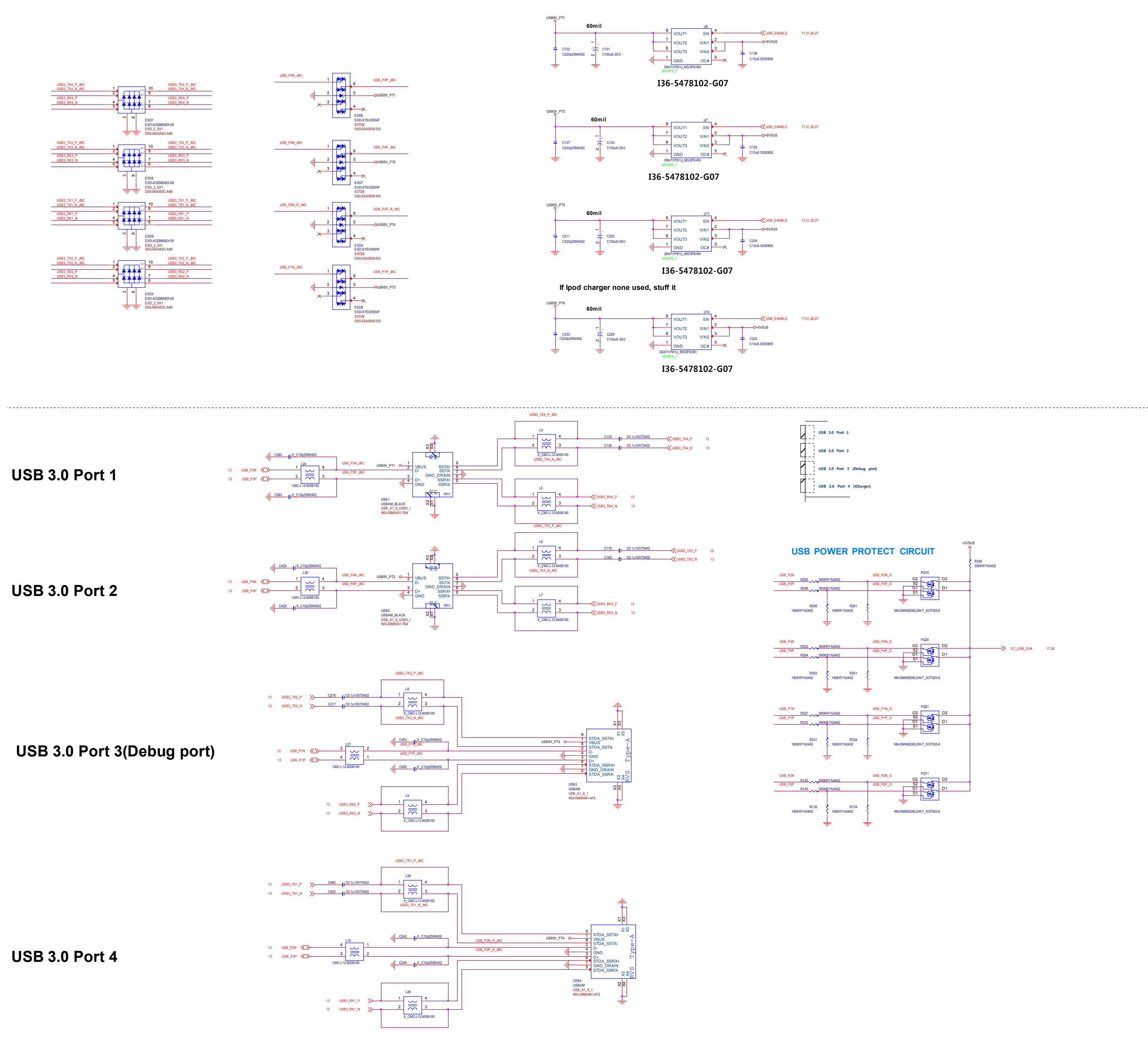
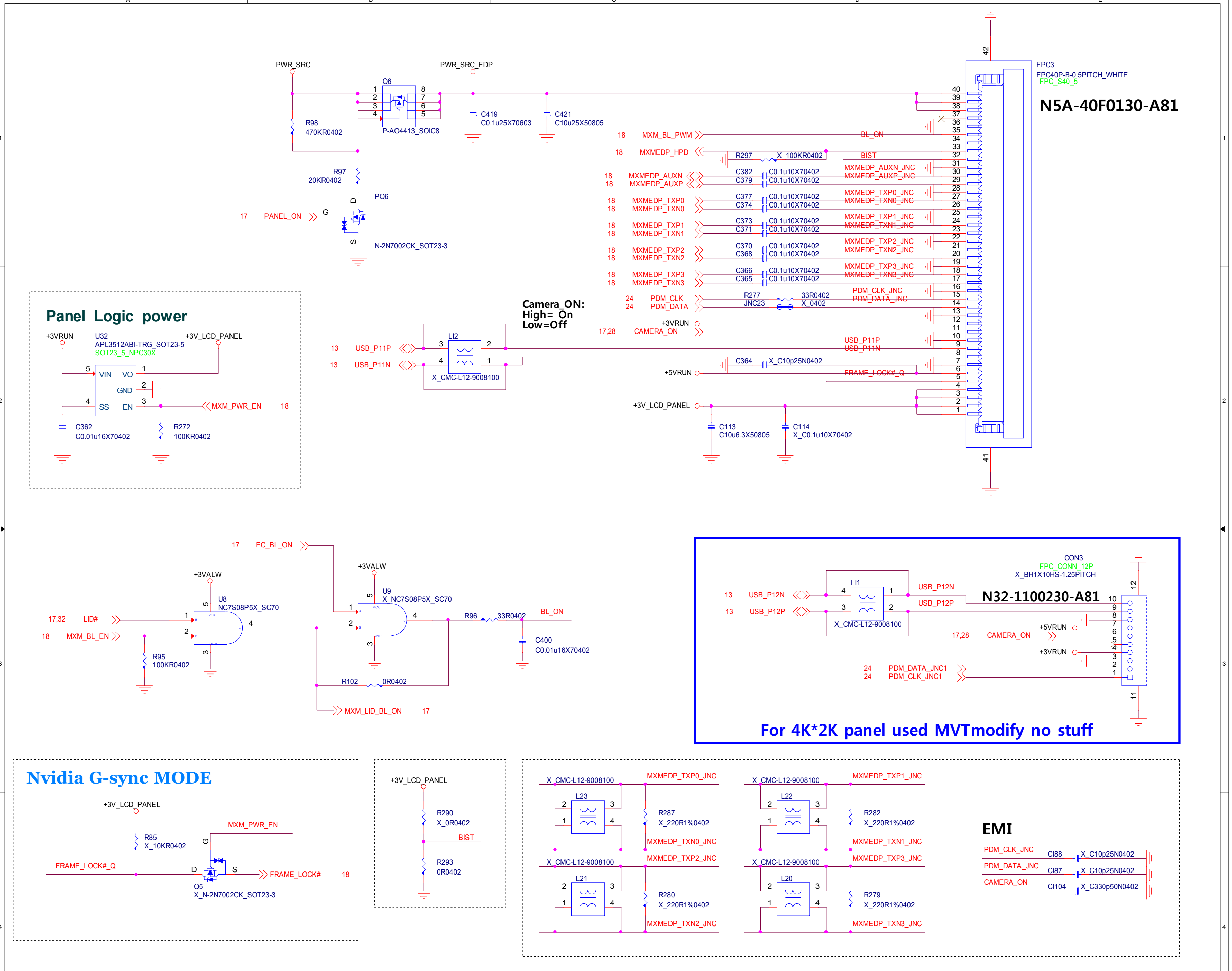


MICRO-STAR INT'L CO.,LTD.

Title	USB3.0/USB3.1 Conn/iCharger	
Size	Document Number: MS-1785	Rev: 0A
Date: Thursday, February 18, 2016	Sheet 27 of 59	



MICRO-STAR INT'L CO.,LTD.

Title: eDP Conn/CAM/Lid

Size	Document Number	Rev
Custom	MS-1785	0A

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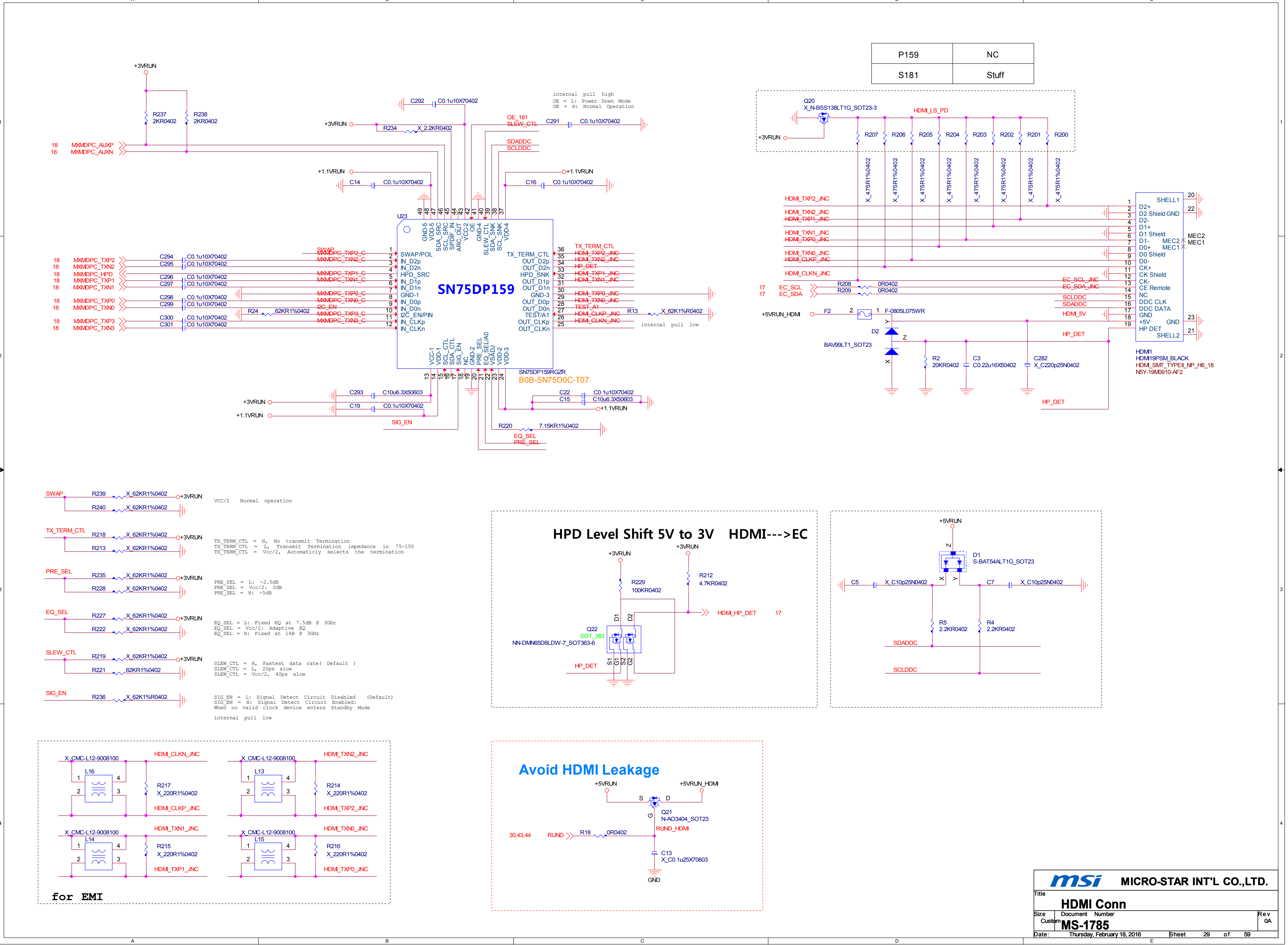
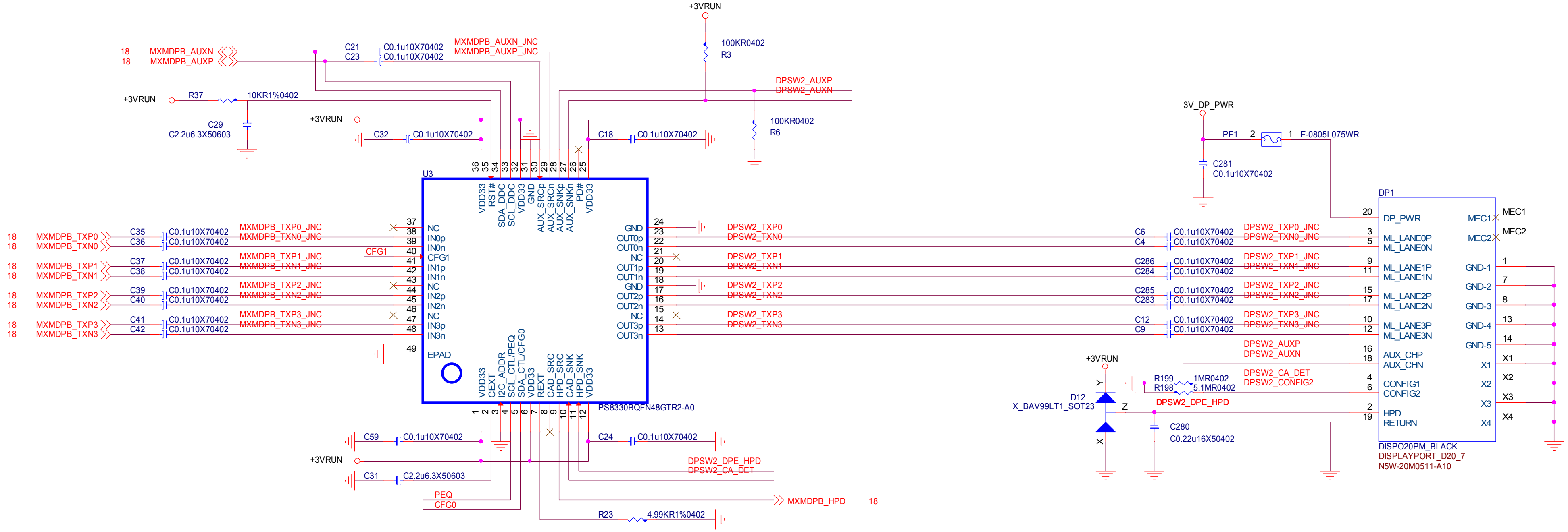
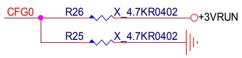
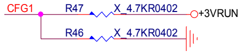


P159	NC
S181	Stuff

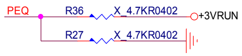




Configuration pin for automatic EQ and AUX interception; Internal pull down at ~150k Ohm, 3.3V I/O.
L: default, automatic EQ enable & AUX interception enable
H: automatic EQ disable & AUX interception enable
M: automatic EQ disable & AUX interception disable, no pre-emphasis, 600mVpp swing

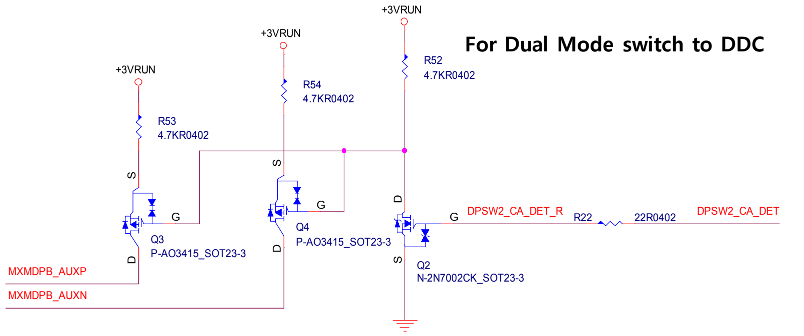


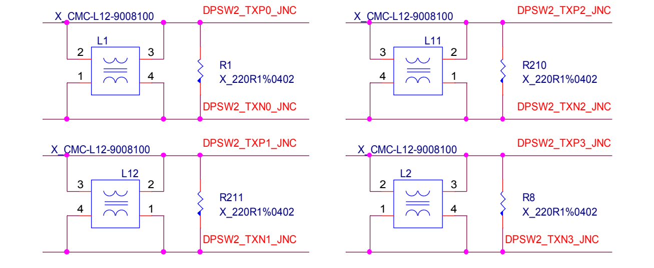
Configuration pin for auto test and input offset cancellation, 3.3V IO, internal pull up at ~150K Ohm
H: default, auto test disable & input offset cancellation enable
L: auto test enable & input offset cancellation enable
M: auto test disable & input offset cancellation disable



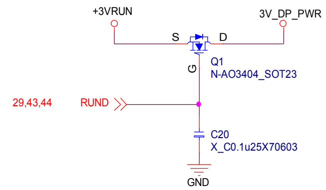
Programmable input equalization levels; Internal pull down at ~150k Ohm, 3.3V I/O.
L: default, LEQ, compensate channel loss up to 12dB @ HBR2
H: HEQ, compensate channel loss up to 15dB @ HBR2
M: LLEQ, compensate channel loss up to 5dB @ HBR2

For Dual Mode switch to DDC





Avoid DP Leakage



msi	MICRO-STAR INT'L CO.,LTD.
Title	DP Switch
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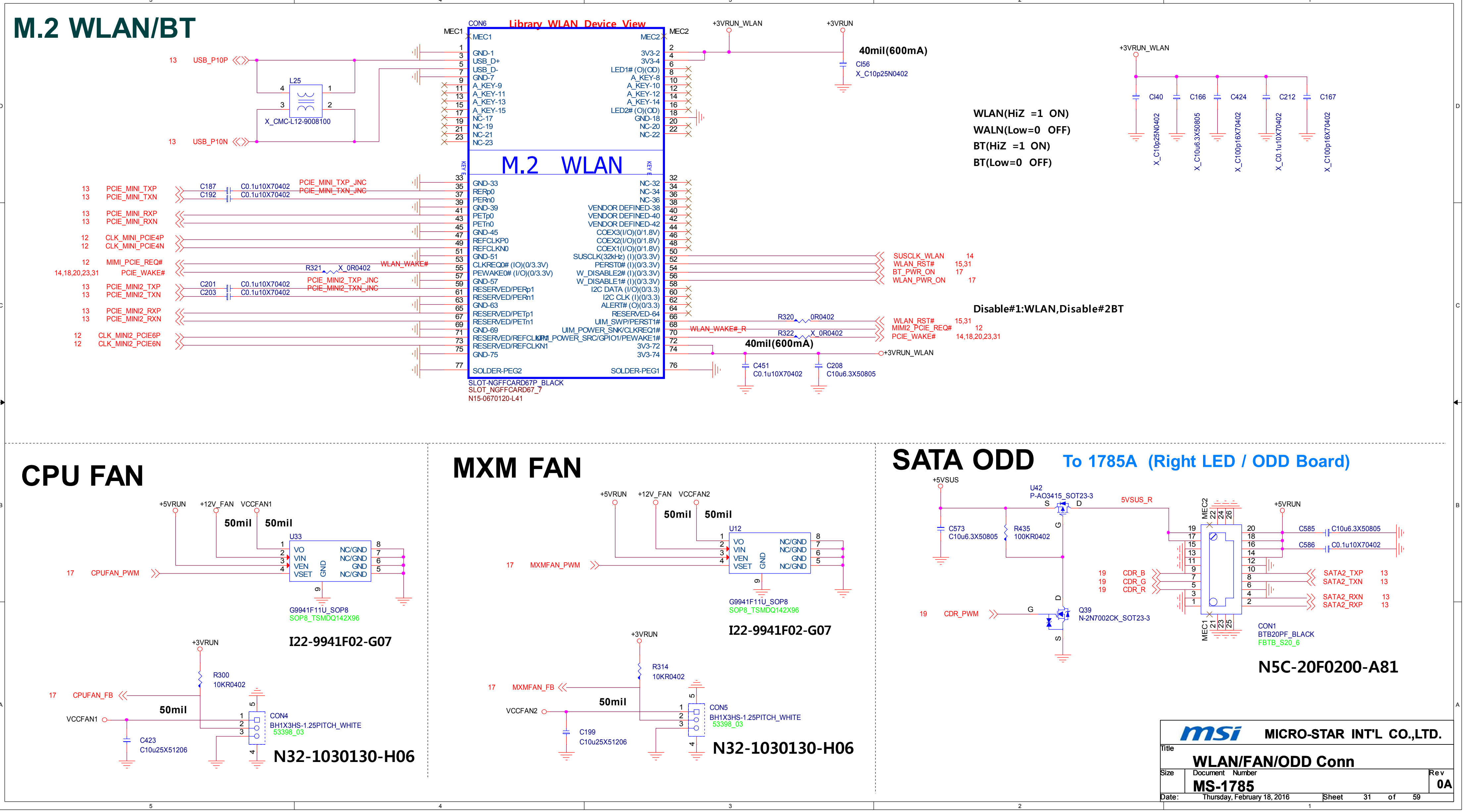

MICRO-STAR INT'L CO.,LTD.

Title	WLAN/FAN/ODD Conn
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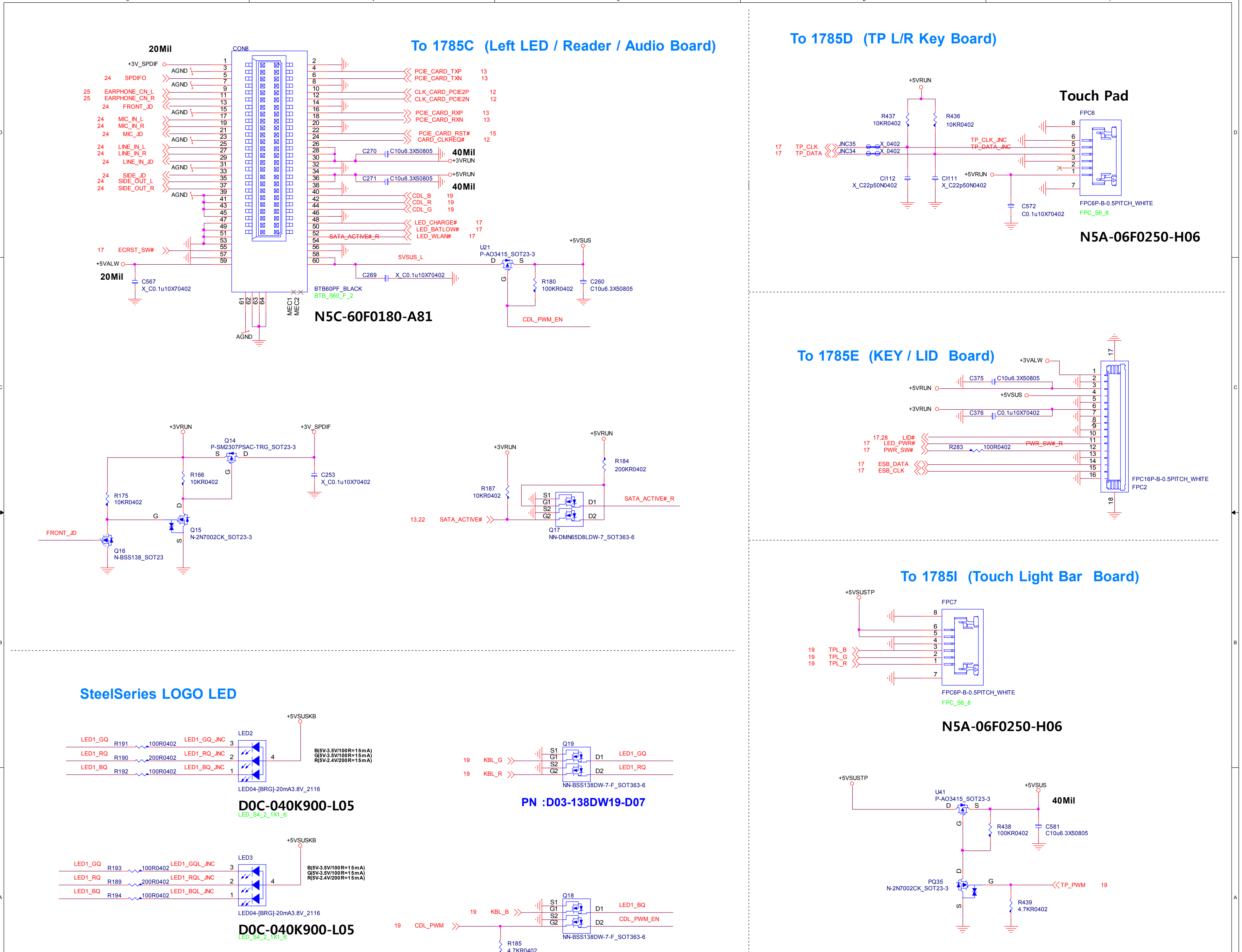

MICRO-STAR INT'L CO.,LTD.

Title: **Audio BTB/TP Conn**

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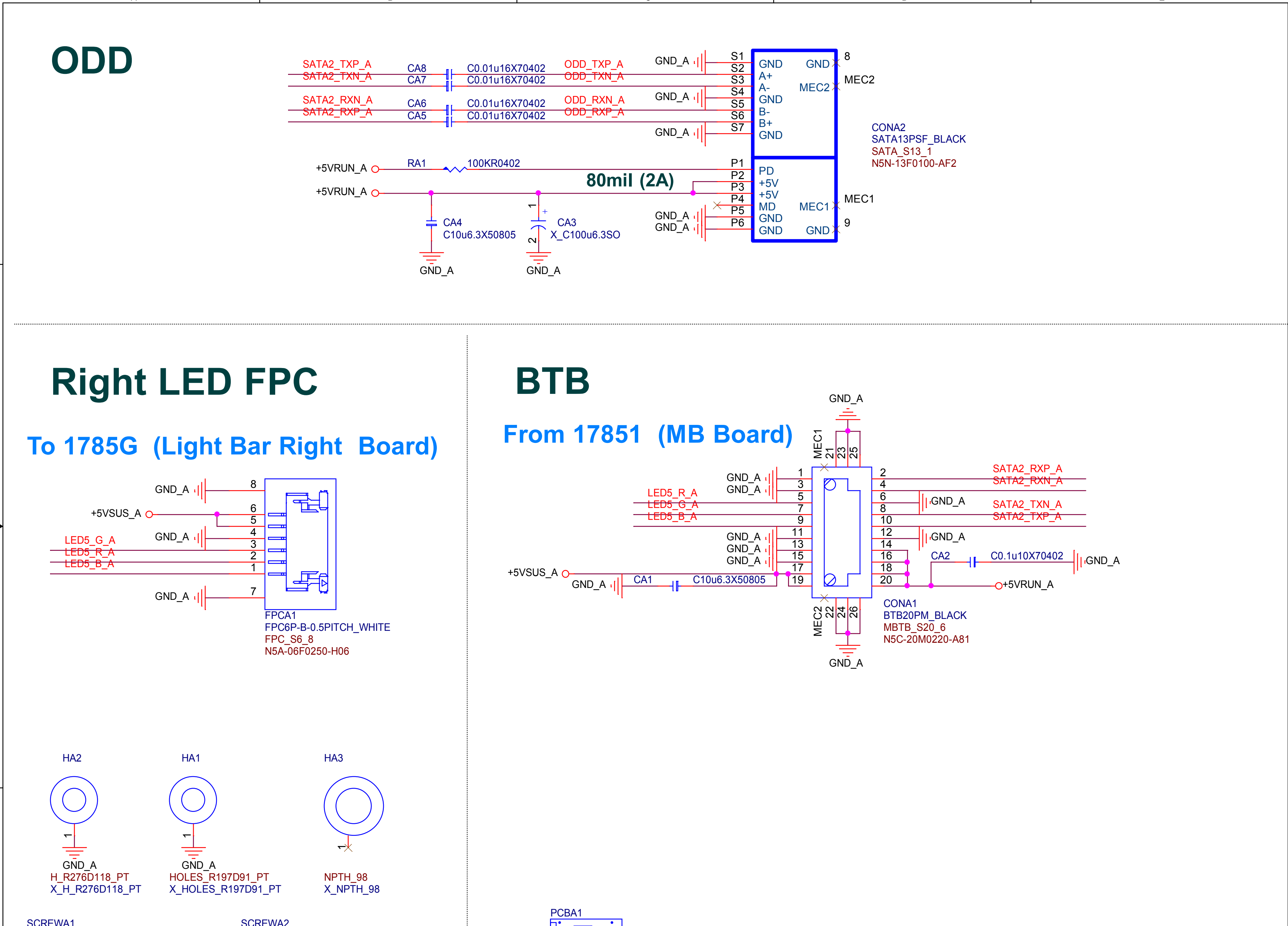

MICRO-STAR INT'L CO.,LTD.

Title

[A]ODD Board

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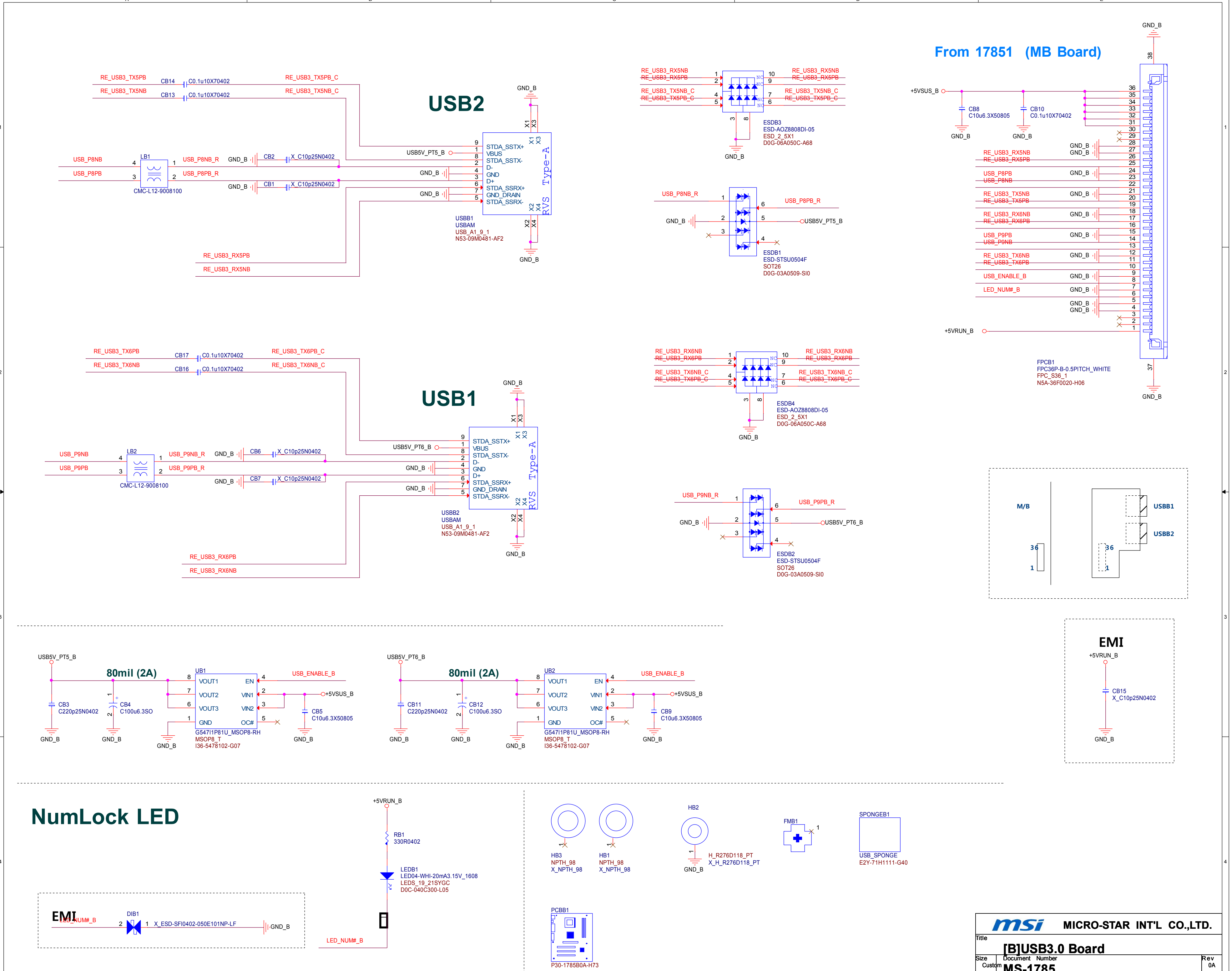

msi MICRO-STAR INT'L CO.,LTD.

Title	[B]USB3.0 Board	
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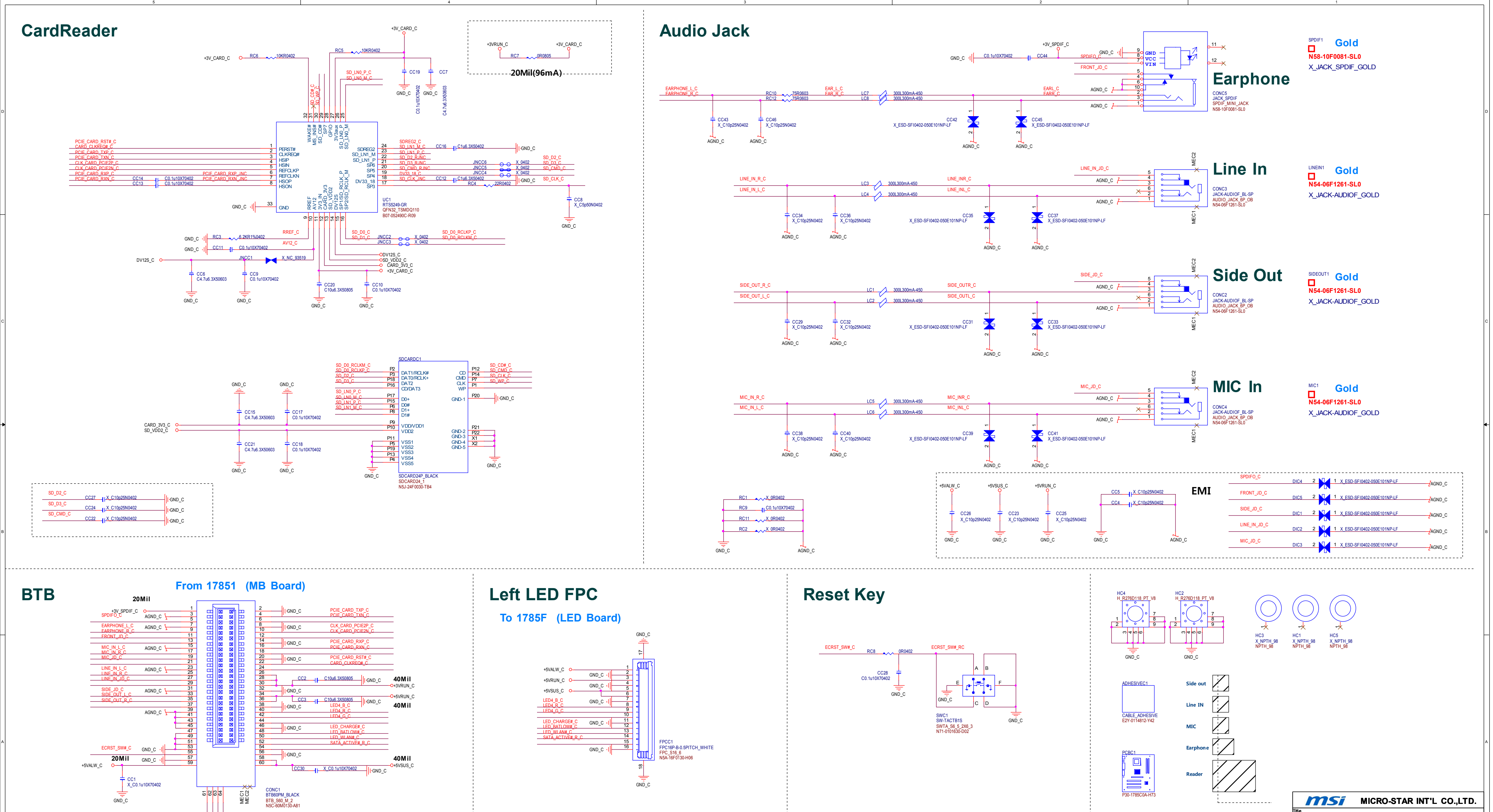

MICRO-STAR INT'L CO.,LTD.

Title: [C]Card Readre /Audo Jack

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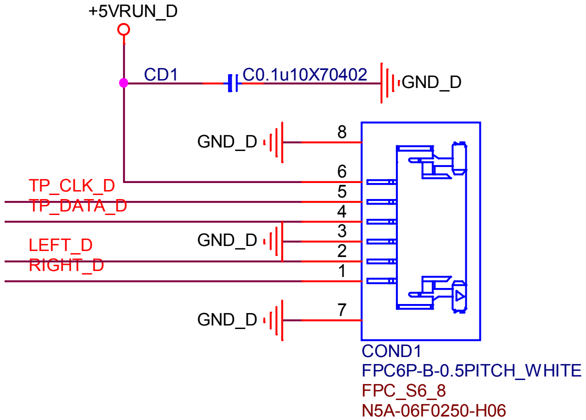
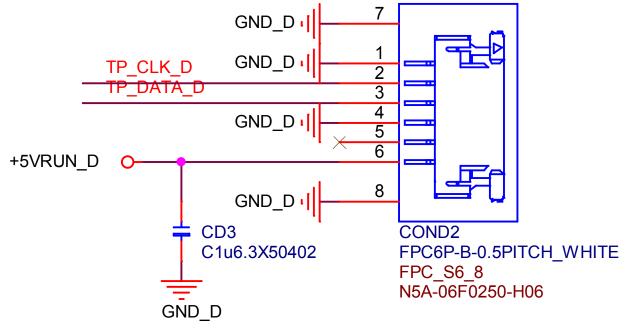
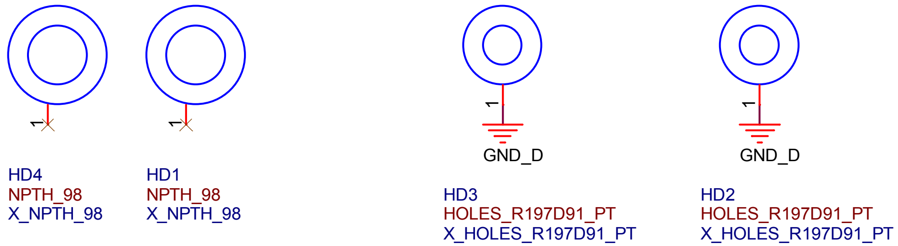
TP Pad FPC

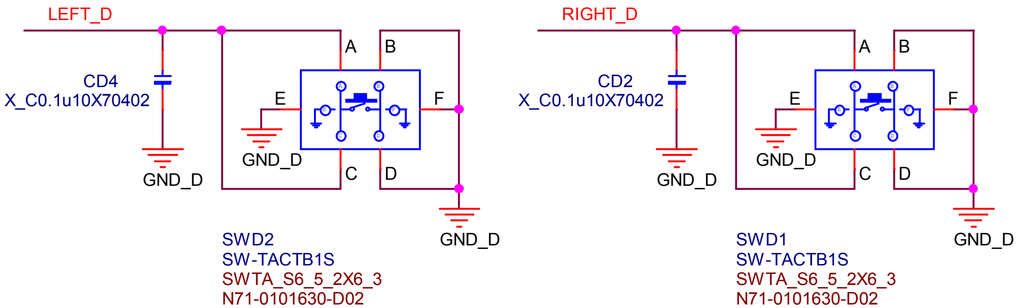


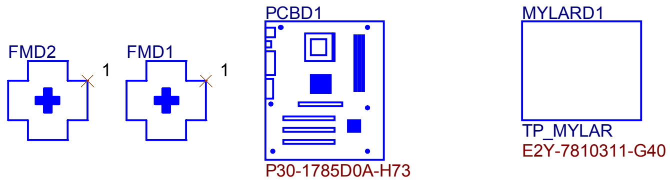
MB FPC From 17851 (MB Board)





TP L/R Key





MICRO-STAR INT'L CO.,LTD.

Title: [D]TP/LED BOARD

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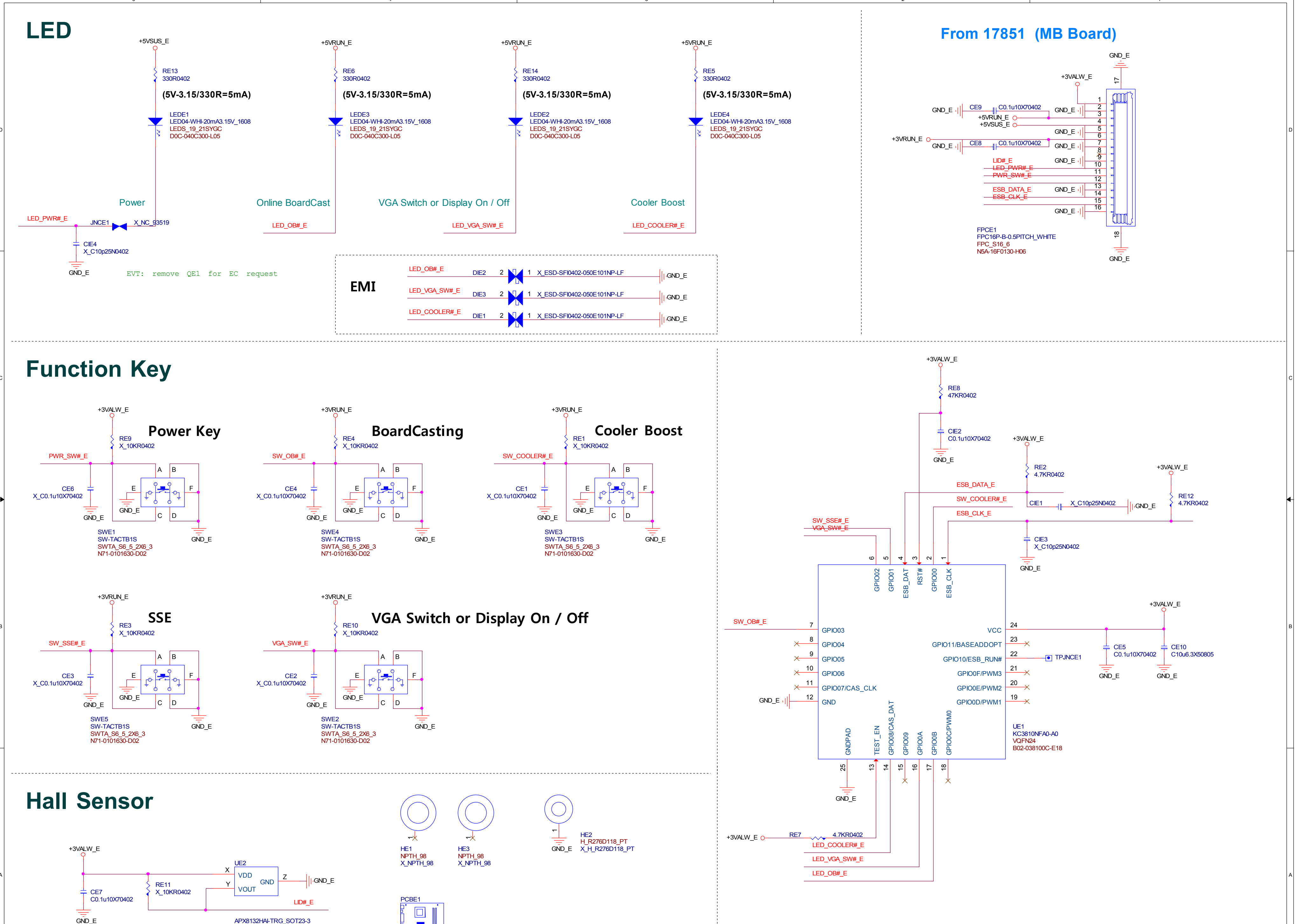

MICRO-STAR INT'L CO.,LTD.

Title	[E]KEY/ LID Board	
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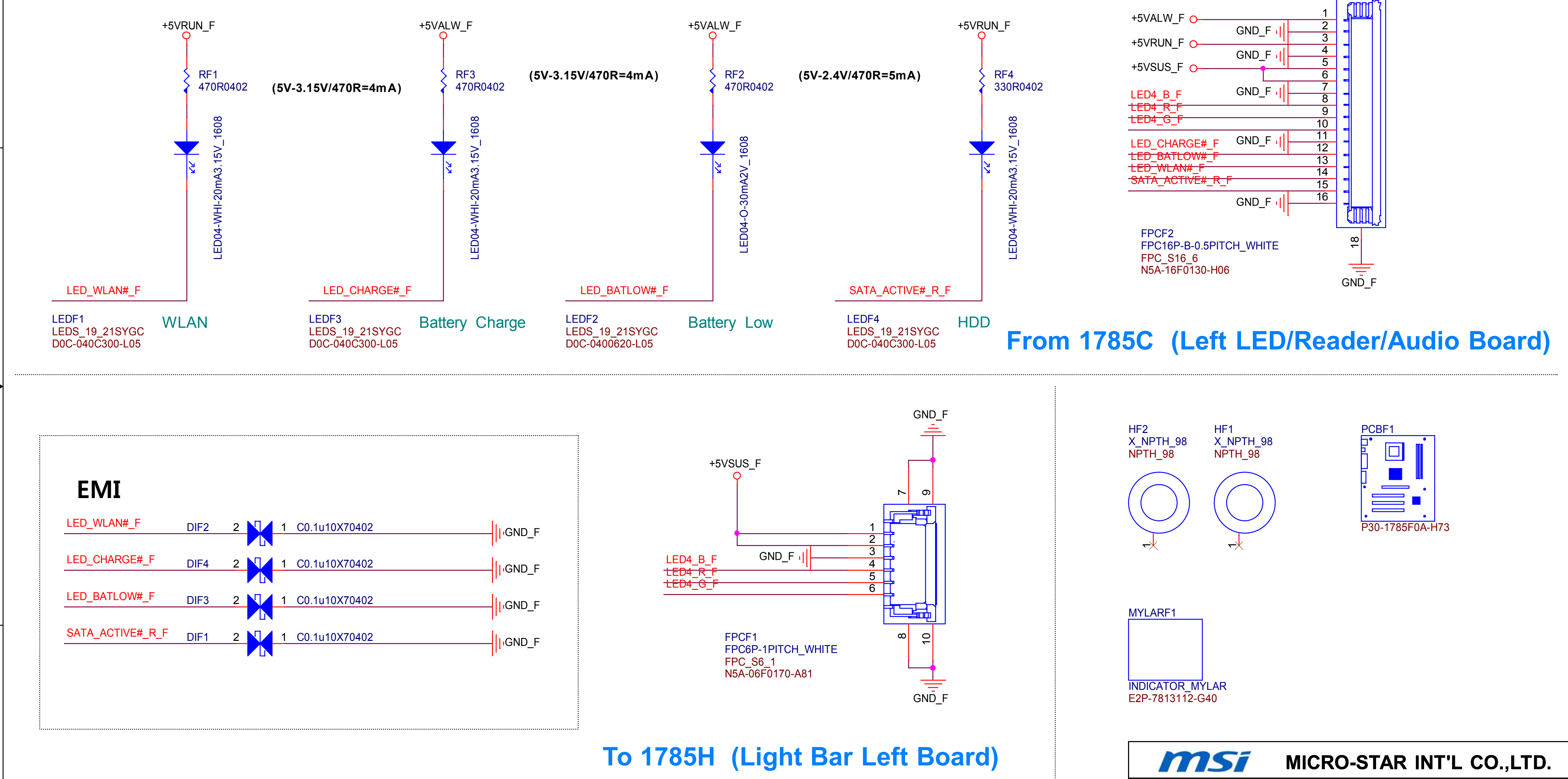
LED Board



MICRO-STAR INT'L CO.,LTD.

Title	[F]LED Board	
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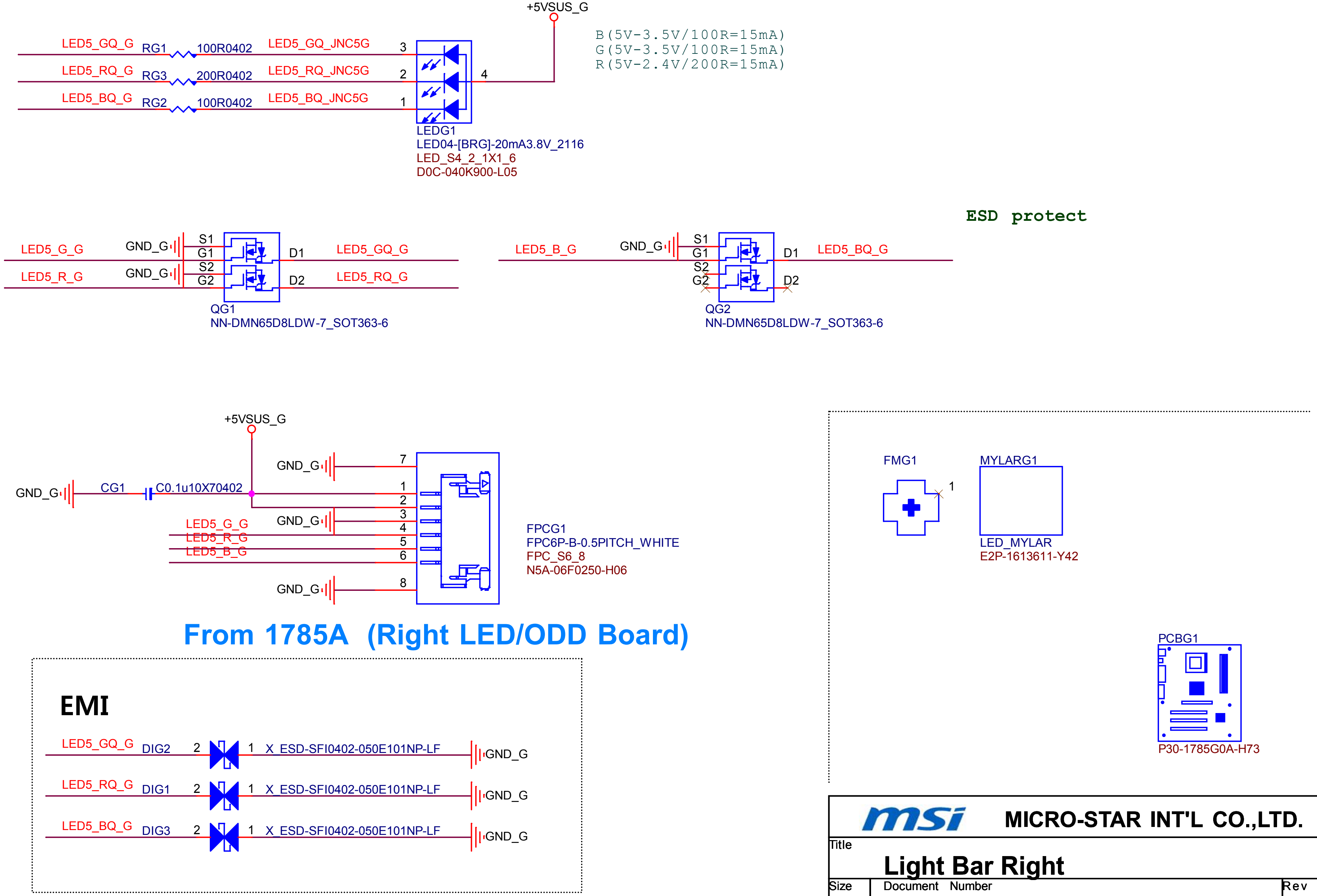
LED Light Bar (Right)



MICRO-STAR INT'L CO.,LTD.

Title: **Light Bar Right**

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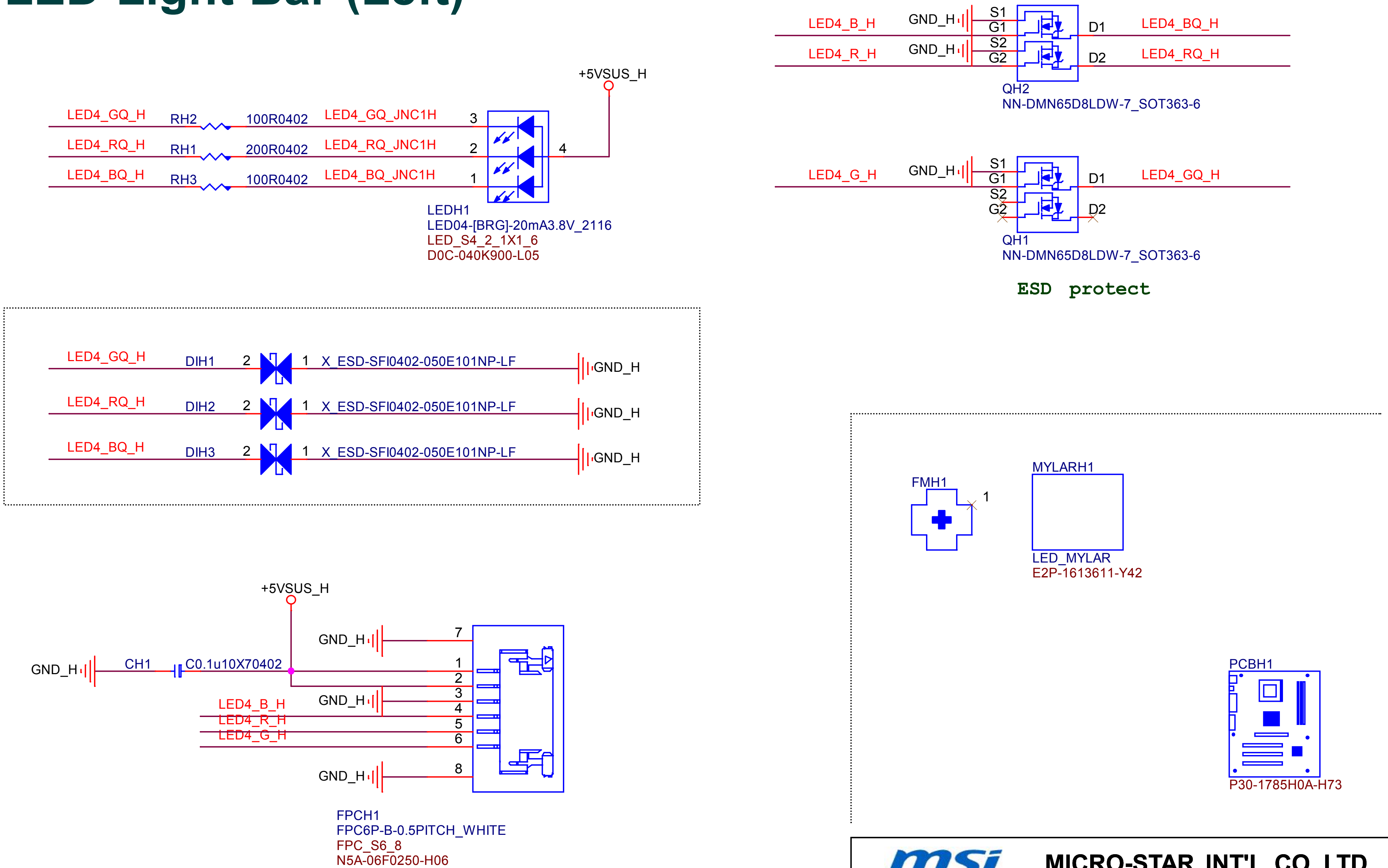
LED Light Bar (Left)



MICRO-STAR INT'L CO.,LTD.

Title	[H]Light Bar Left	
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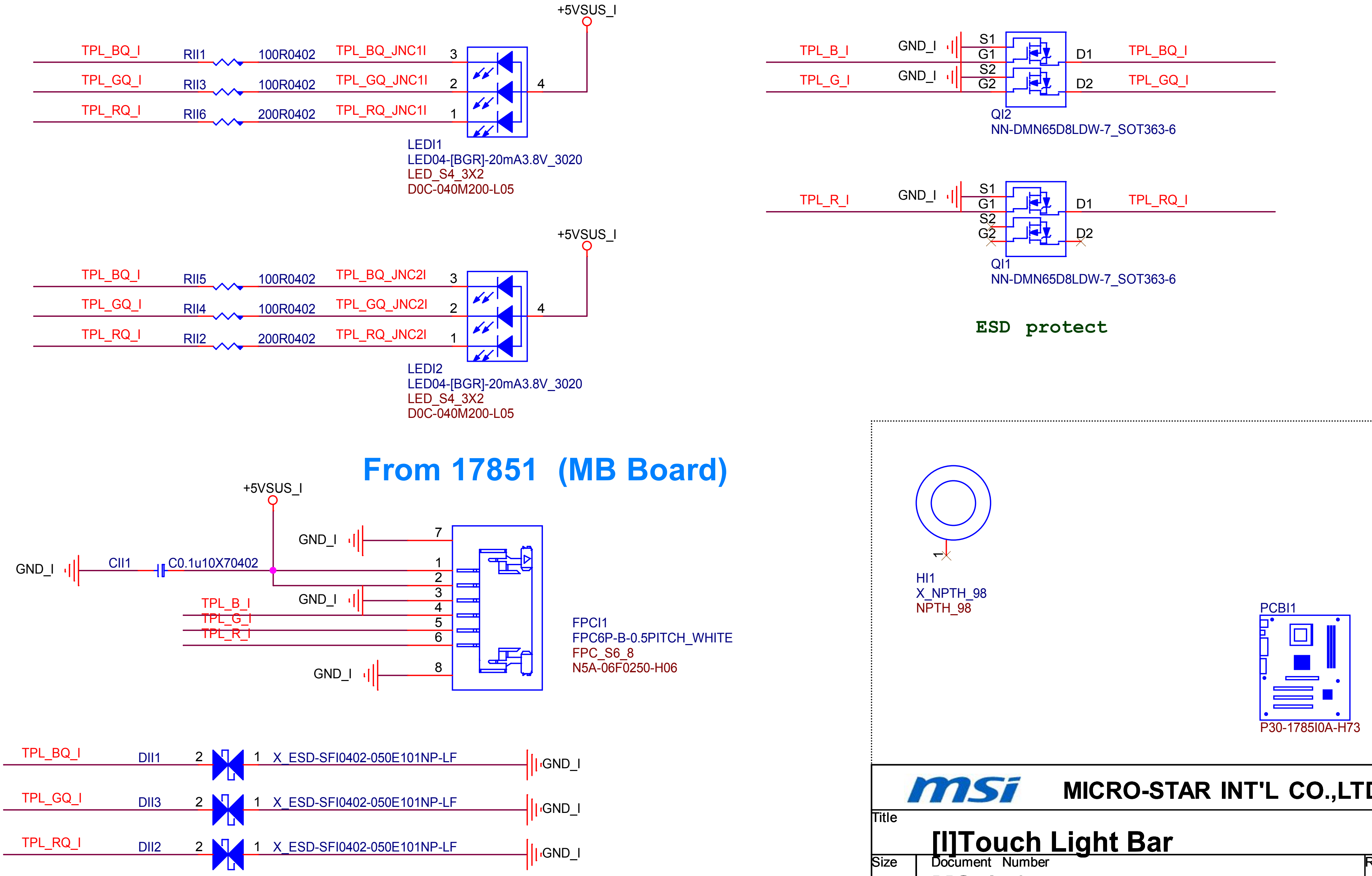
Touch Light Bar



MICRO-STAR INT'L CO.,LTD.

Title	[I]Touch Light Bar
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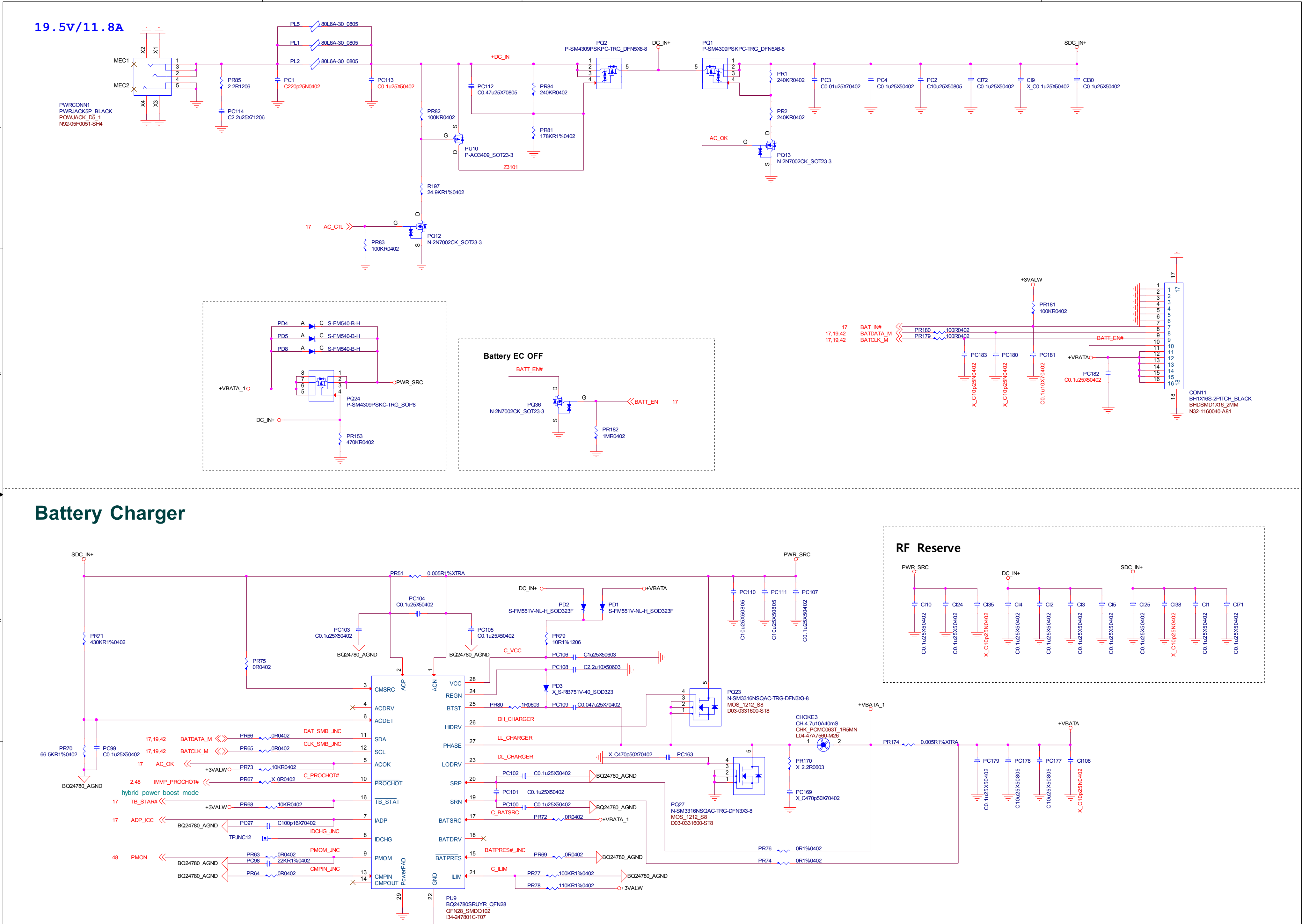

MICRO-STAR INT'L CO.,LTD.

Title: Battery select/Charger

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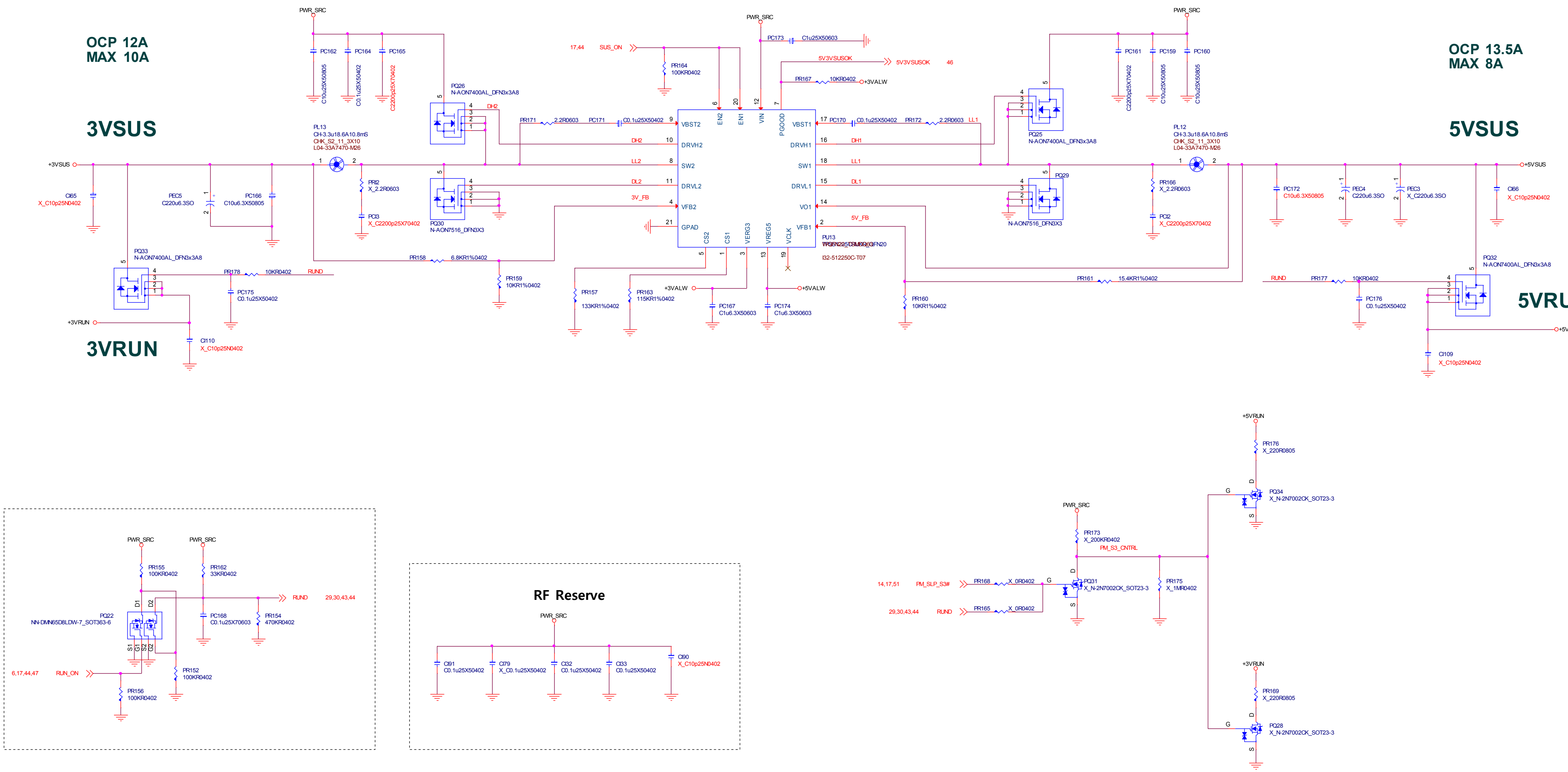
System Power



MICRO-STAR INT'L CO.,LTD.

Title: System Power

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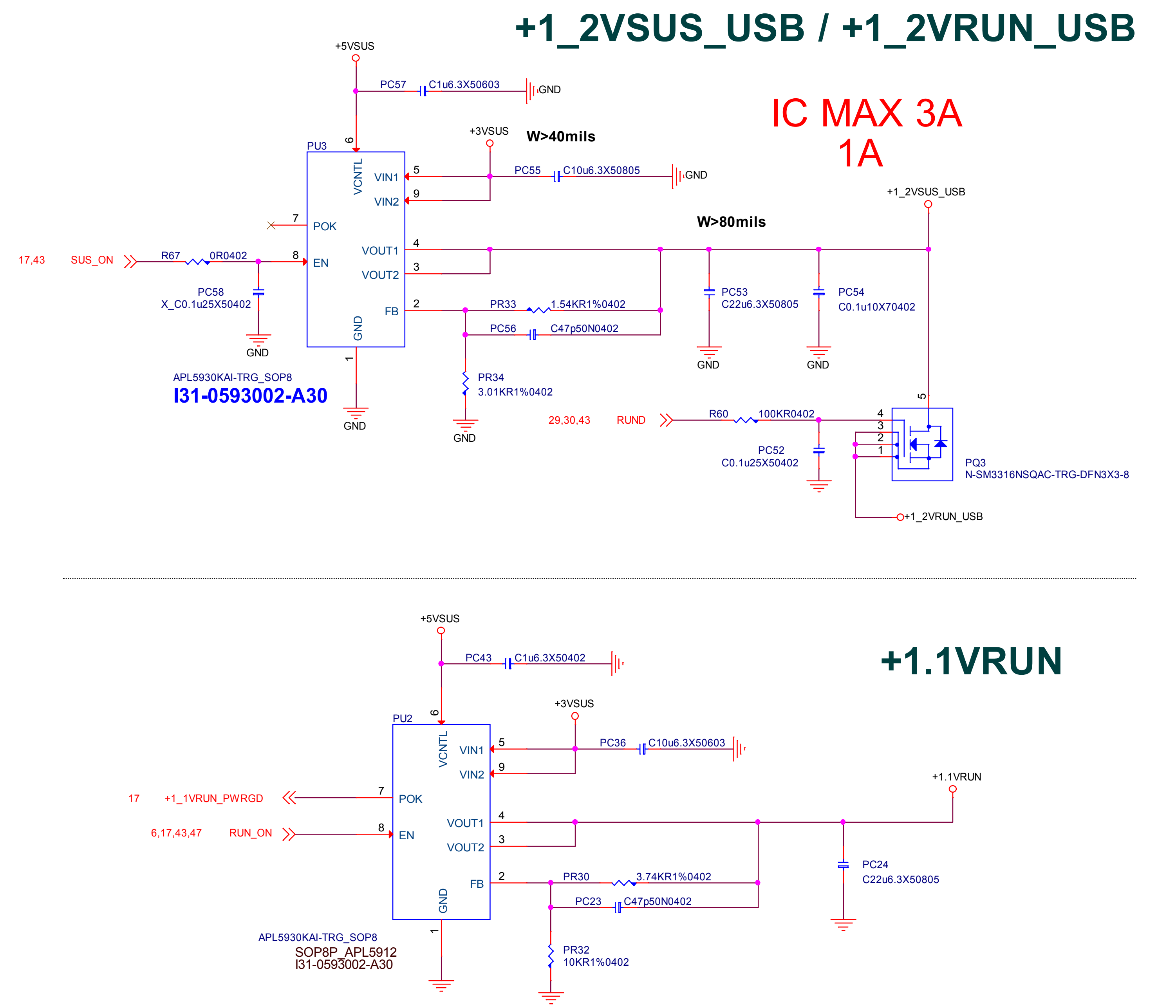

MICRO-STAR INT'L CO.,LTD.

Title: **USB31_POWER/+1.1VRUN**

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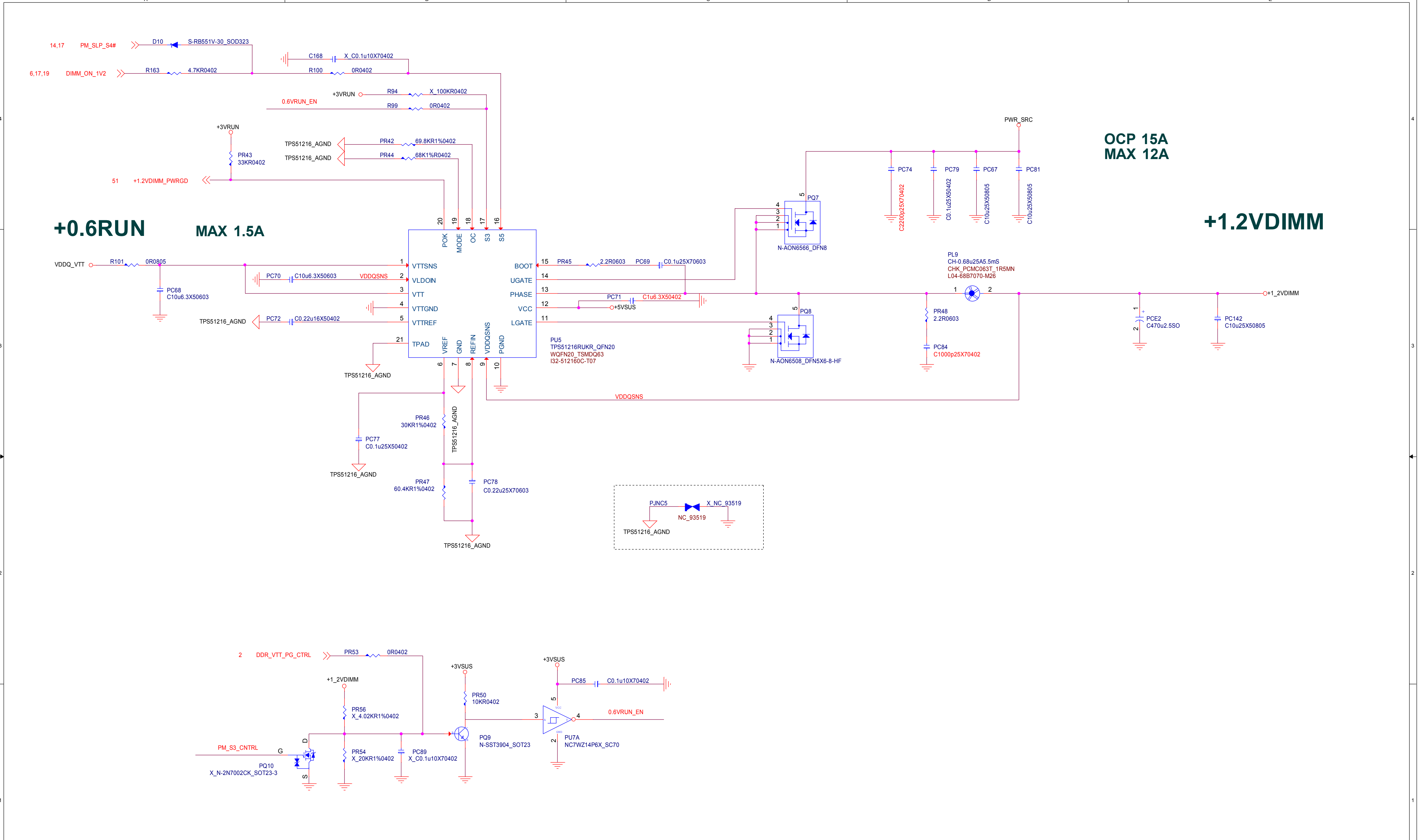

MICRO-STAR INT'L CO.,LTD.

Title: +1.35VDIMM/+0.675VRUN

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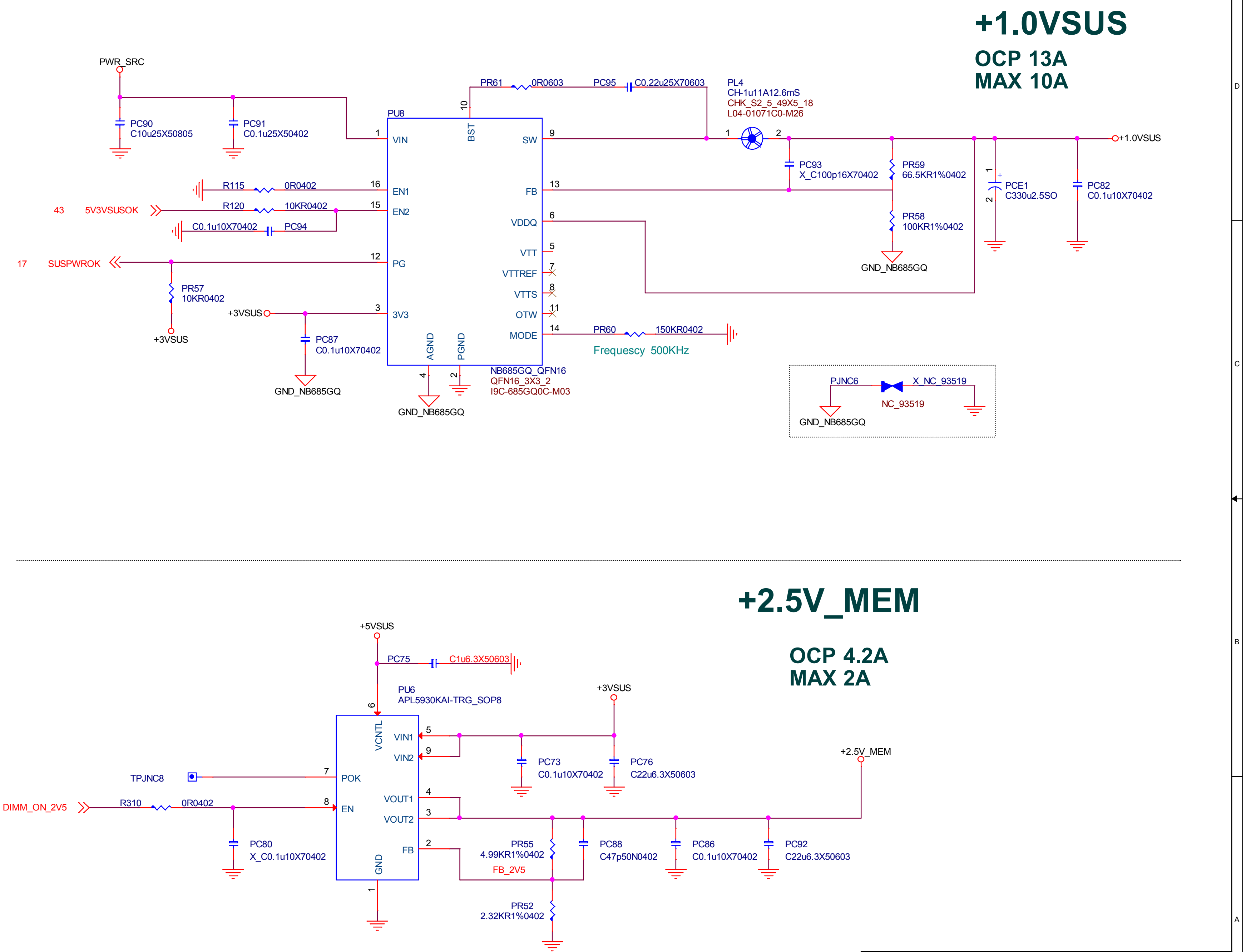

MICRO-STAR INT'L CO.,LTD.

Title: +2.5V_MEM/+1.0VSUS

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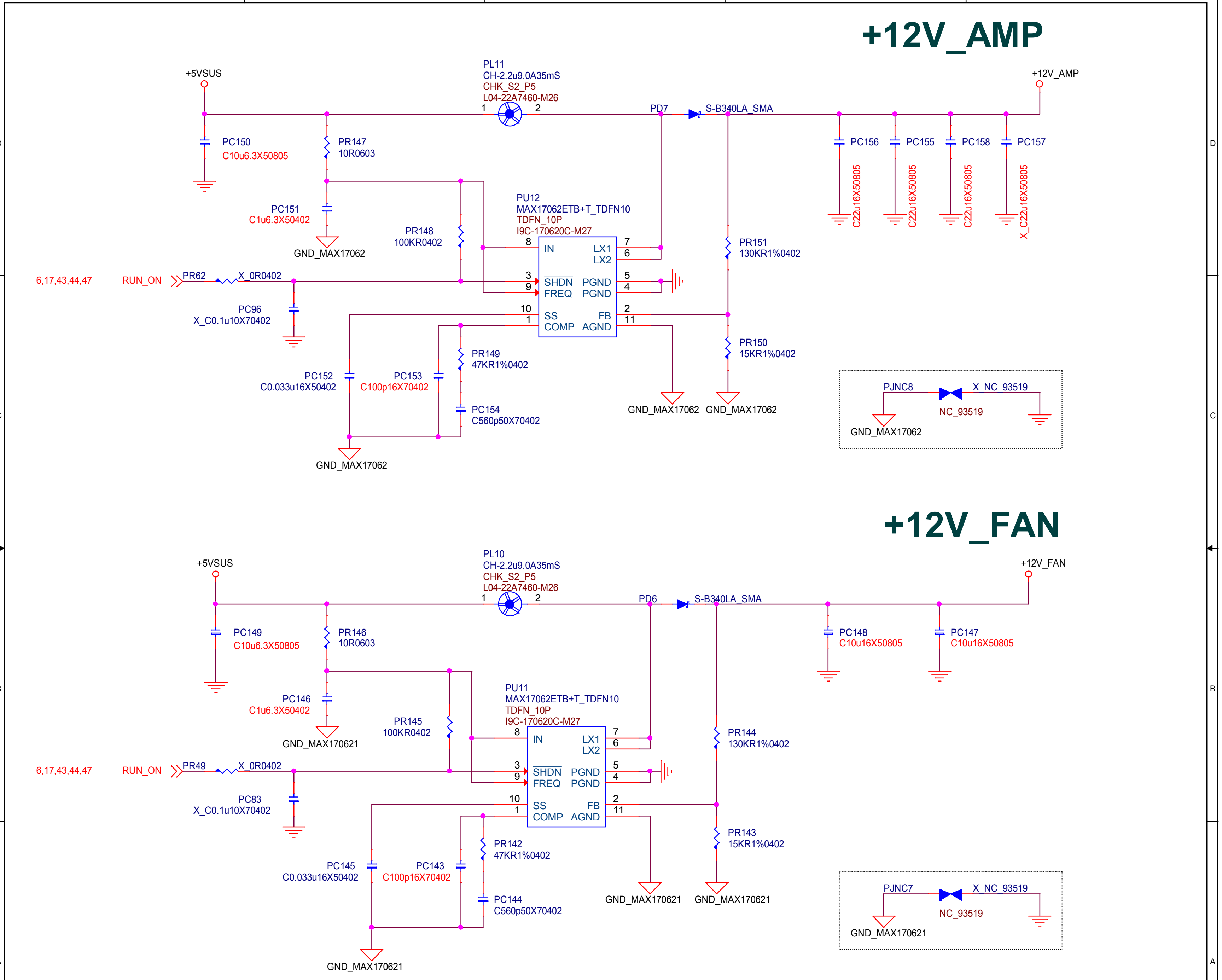

MICRO-STAR INT'L CO.,LTD.

Title

+12V_AMP/+12V_FAN

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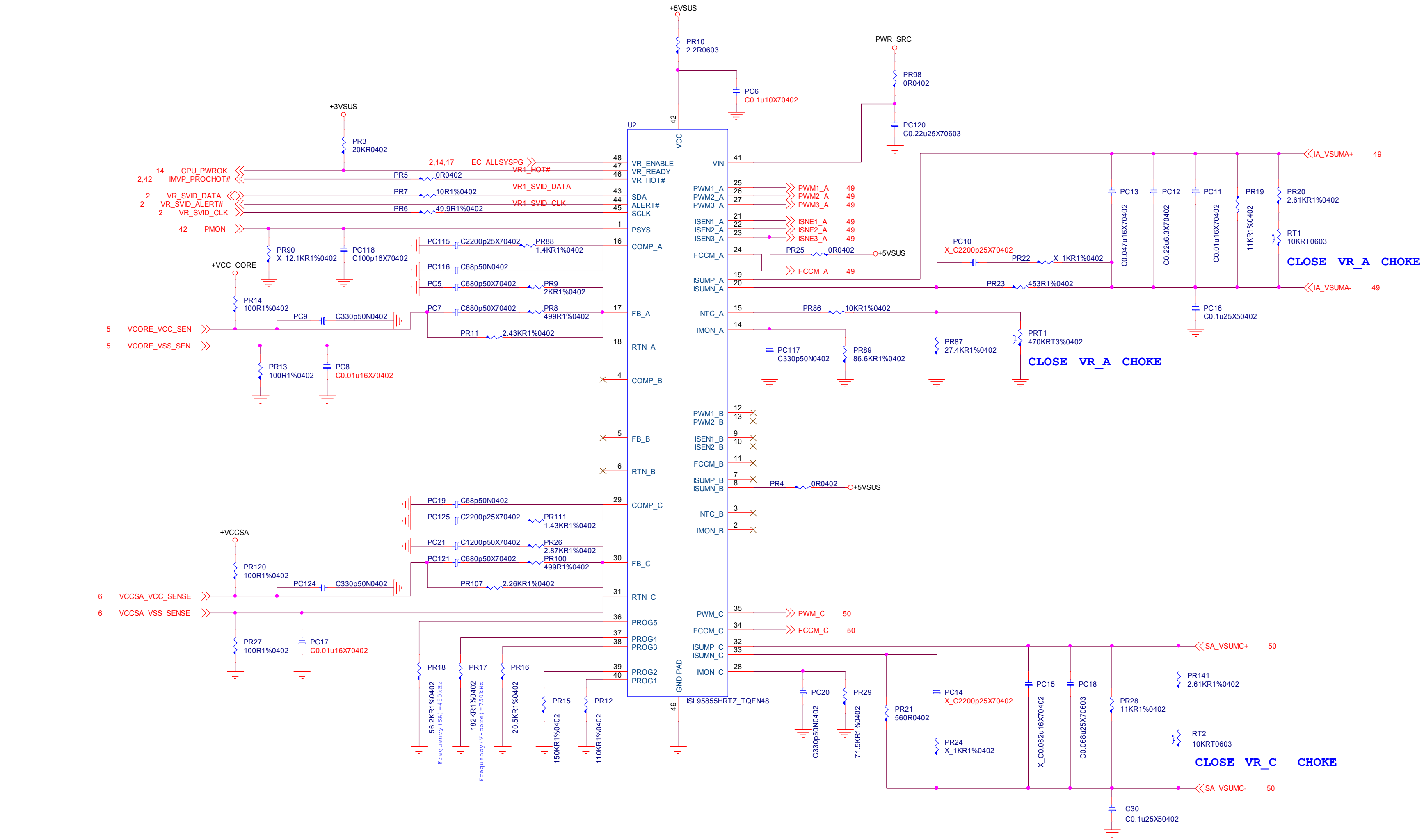
Skylake H-line 4+2 ISL95855



MICRO-STAR INT'L CO.,LTD.

Title	CPU Power(ISL95855)_1	
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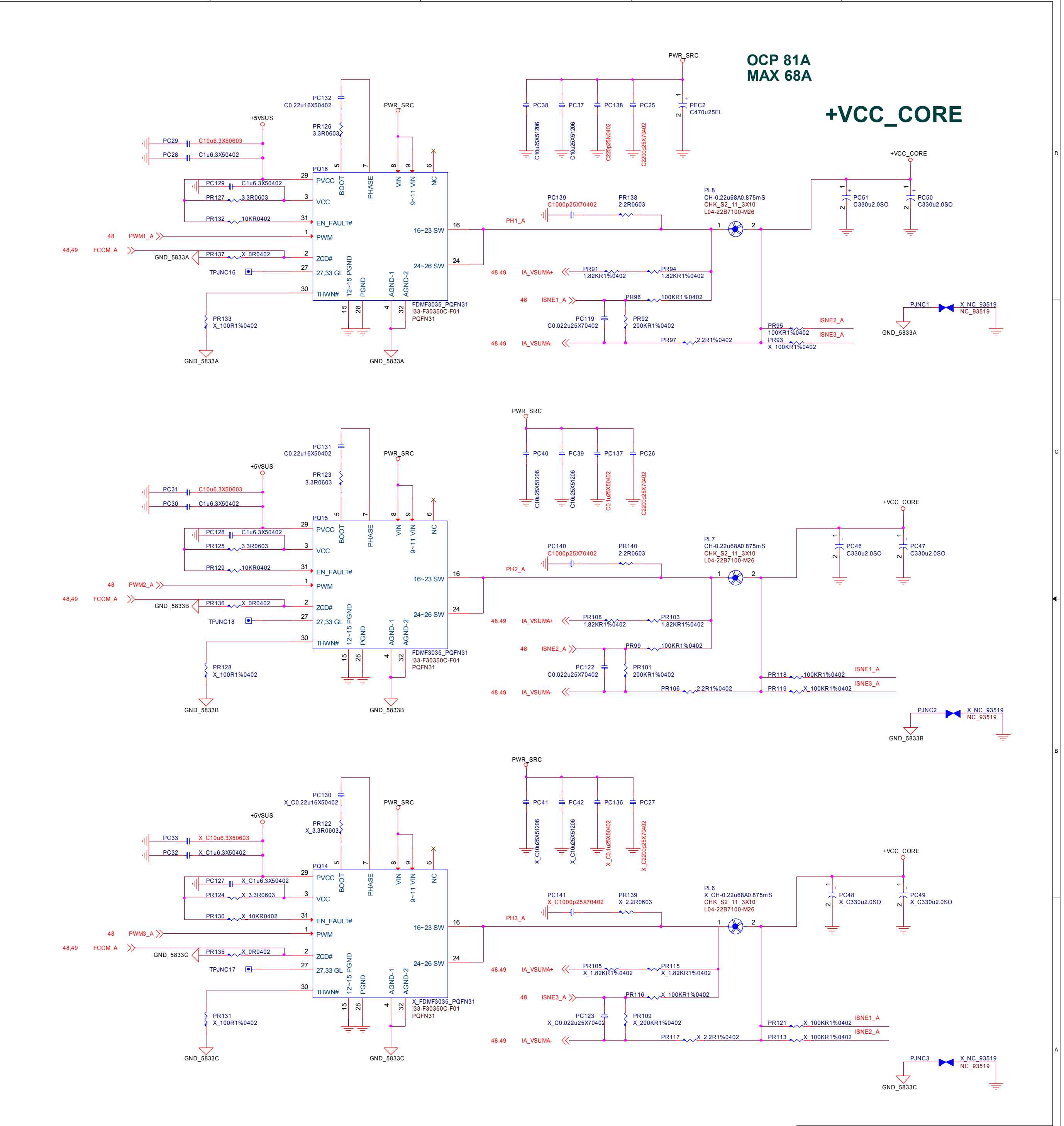

MICRO-STAR INT'L CO.,LTD.

Title: CPU Power(VCore)

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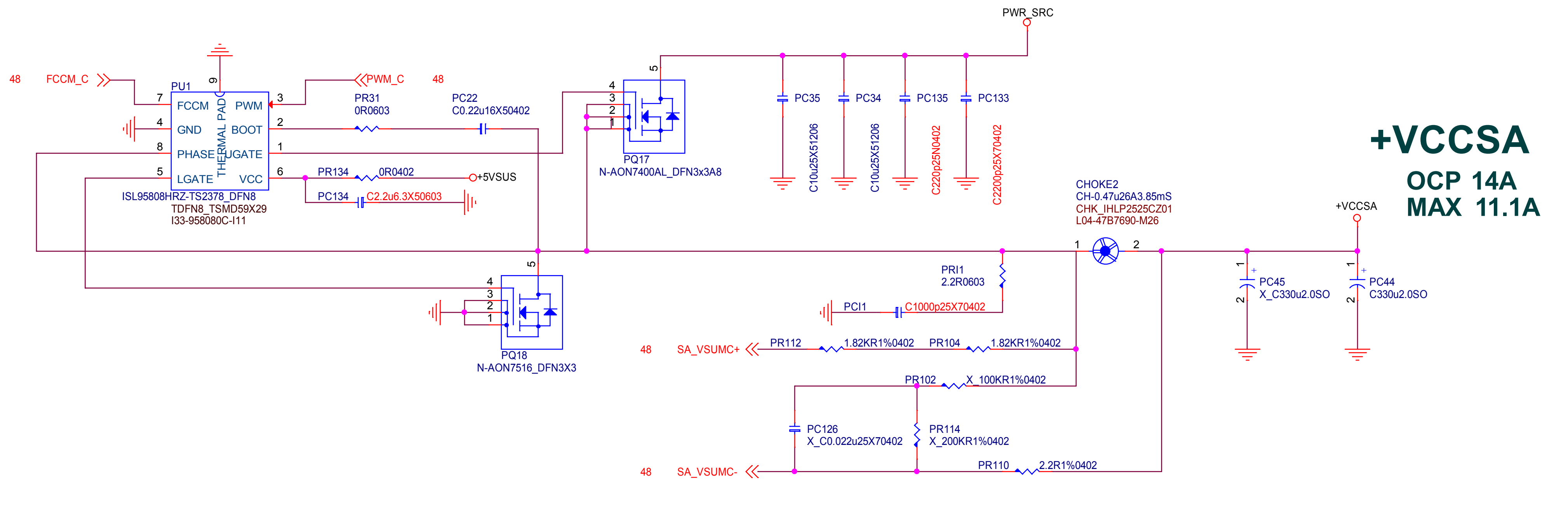

MICRO-STAR INT'L CO.,LTD.

Title	CPU Power(VCCSA)
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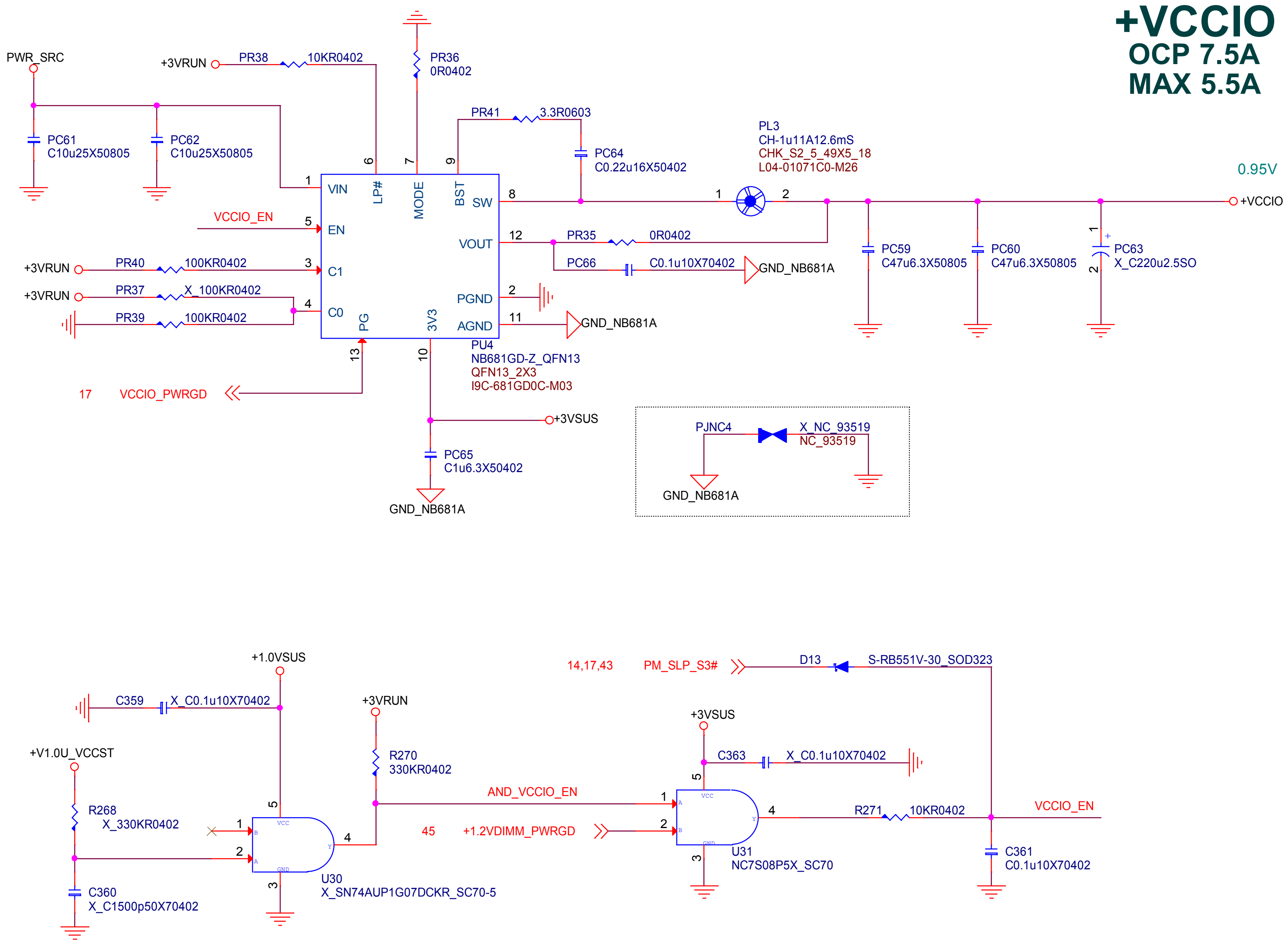

MICRO-STAR INT'L CO.,LTD.

Title
CPU Power(VCCIO)

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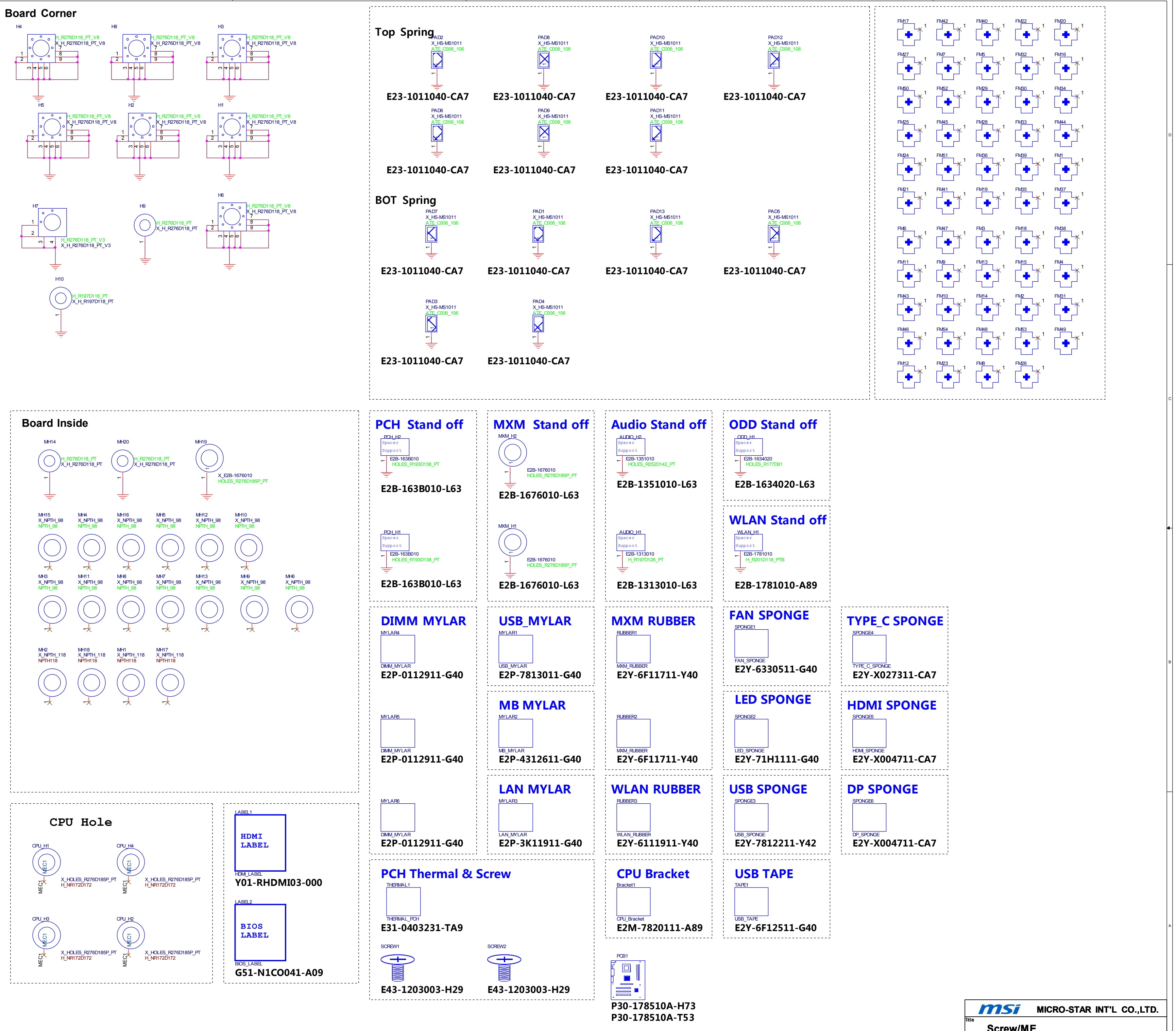

MSI MICRO-STAR INT'L CO.,LTD.

Title: Screw/ME

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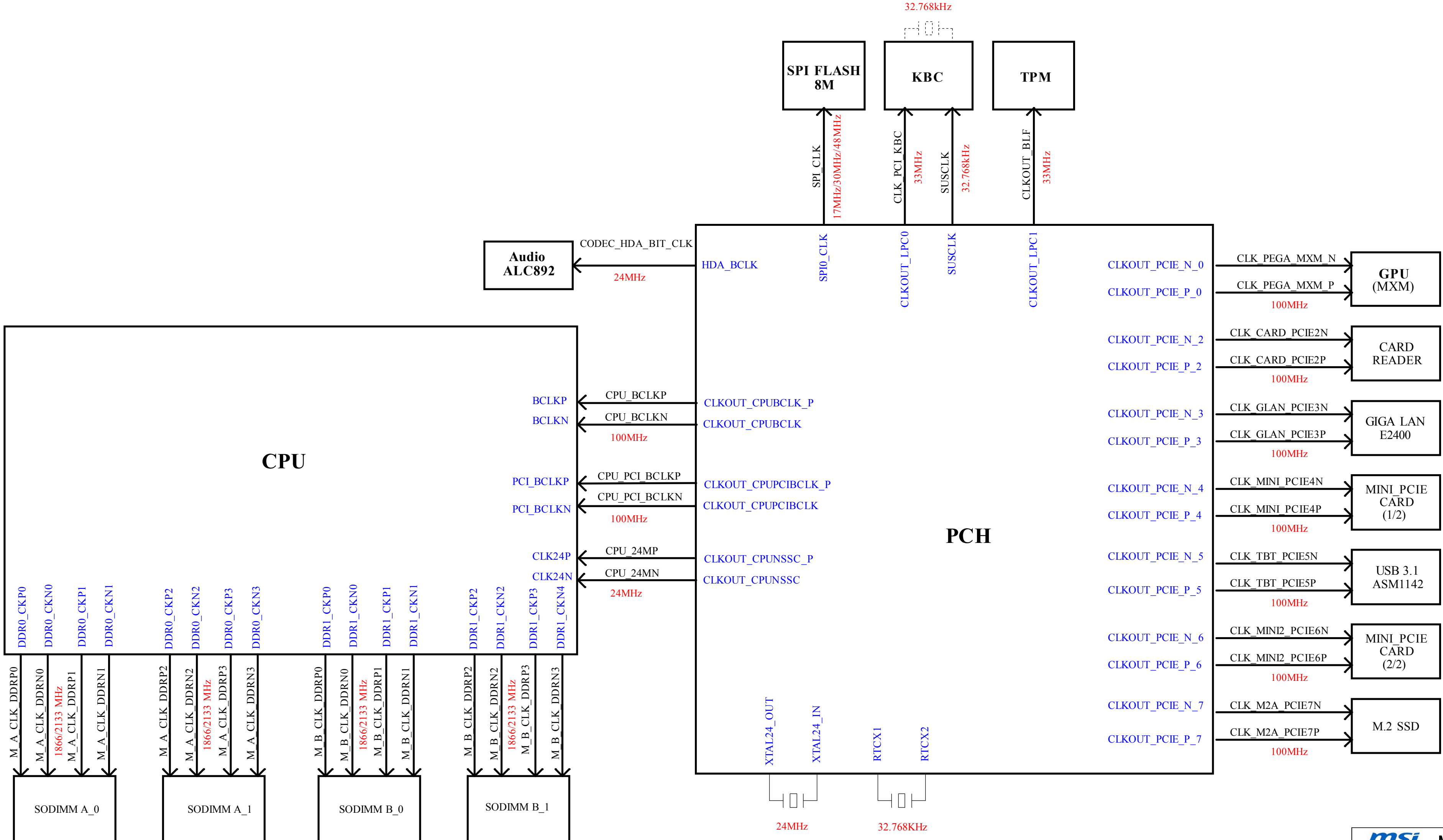

MSI MICRO-STAR INT'L CO.,LTD.

Title: CLock Delivery chart

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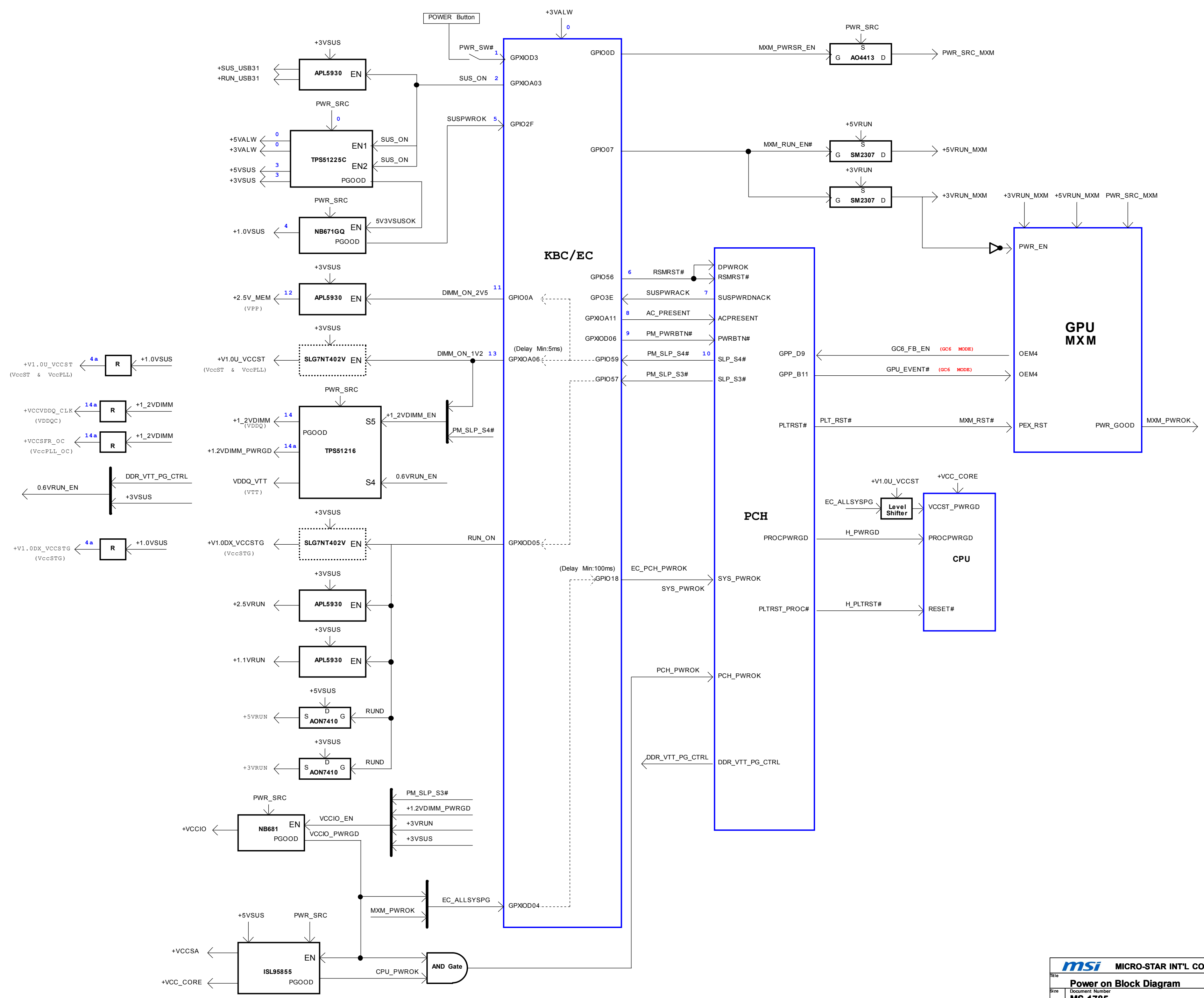
MS-1785 Power on Block Diagram



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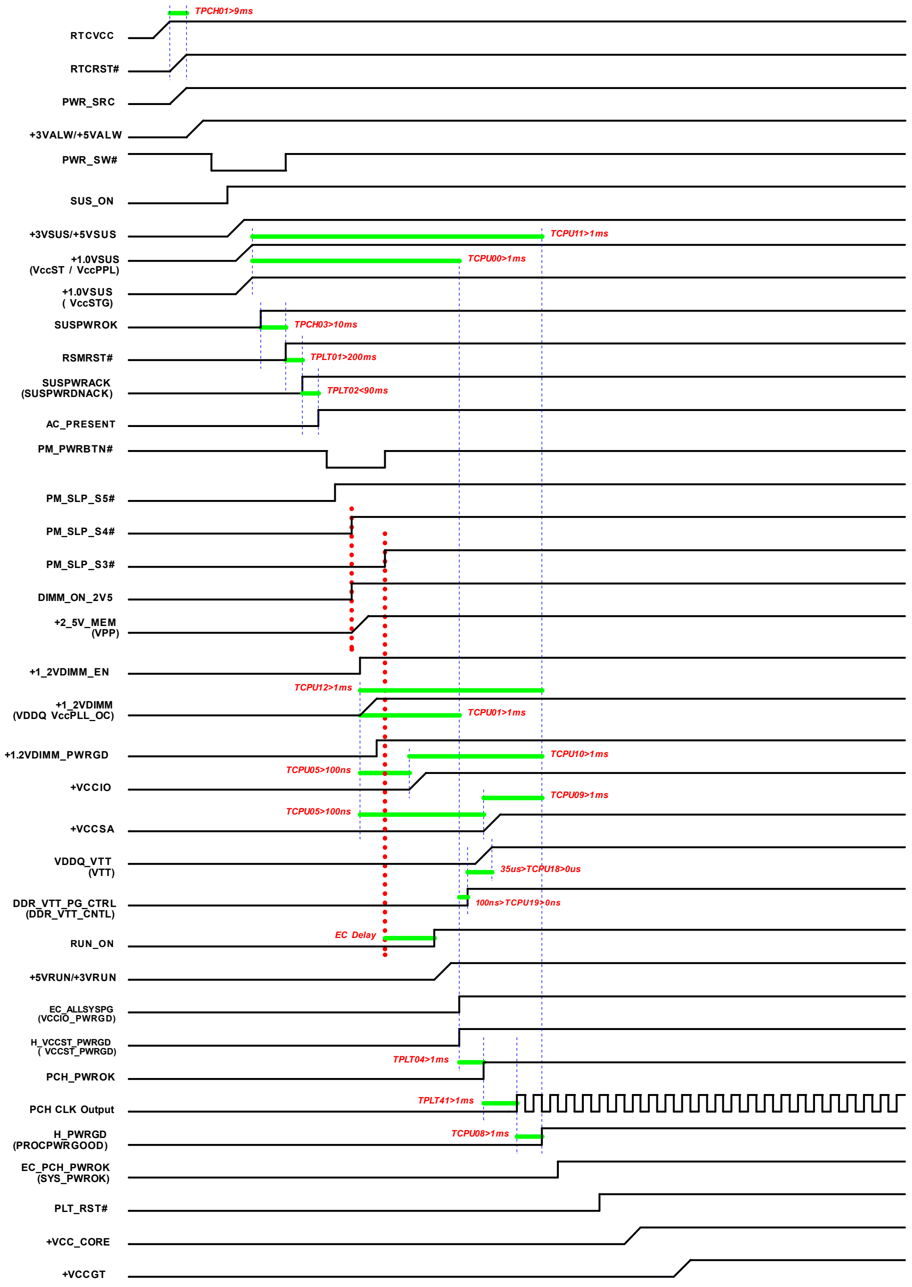
Power on Sequence

G3 -> S0



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Title	Power on Sequence	
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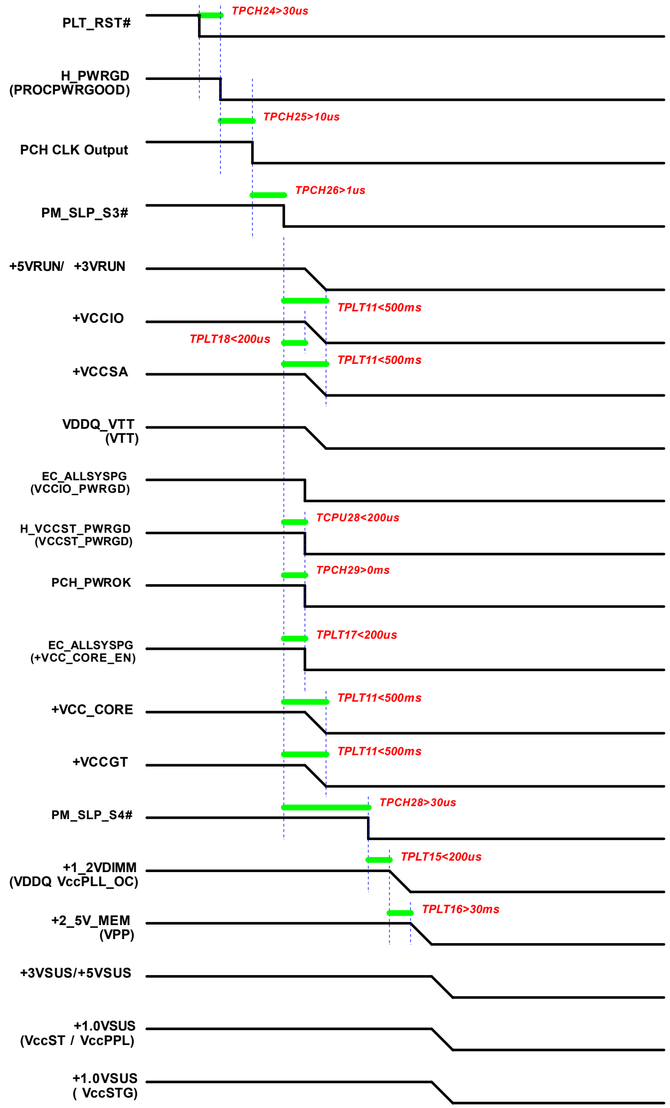
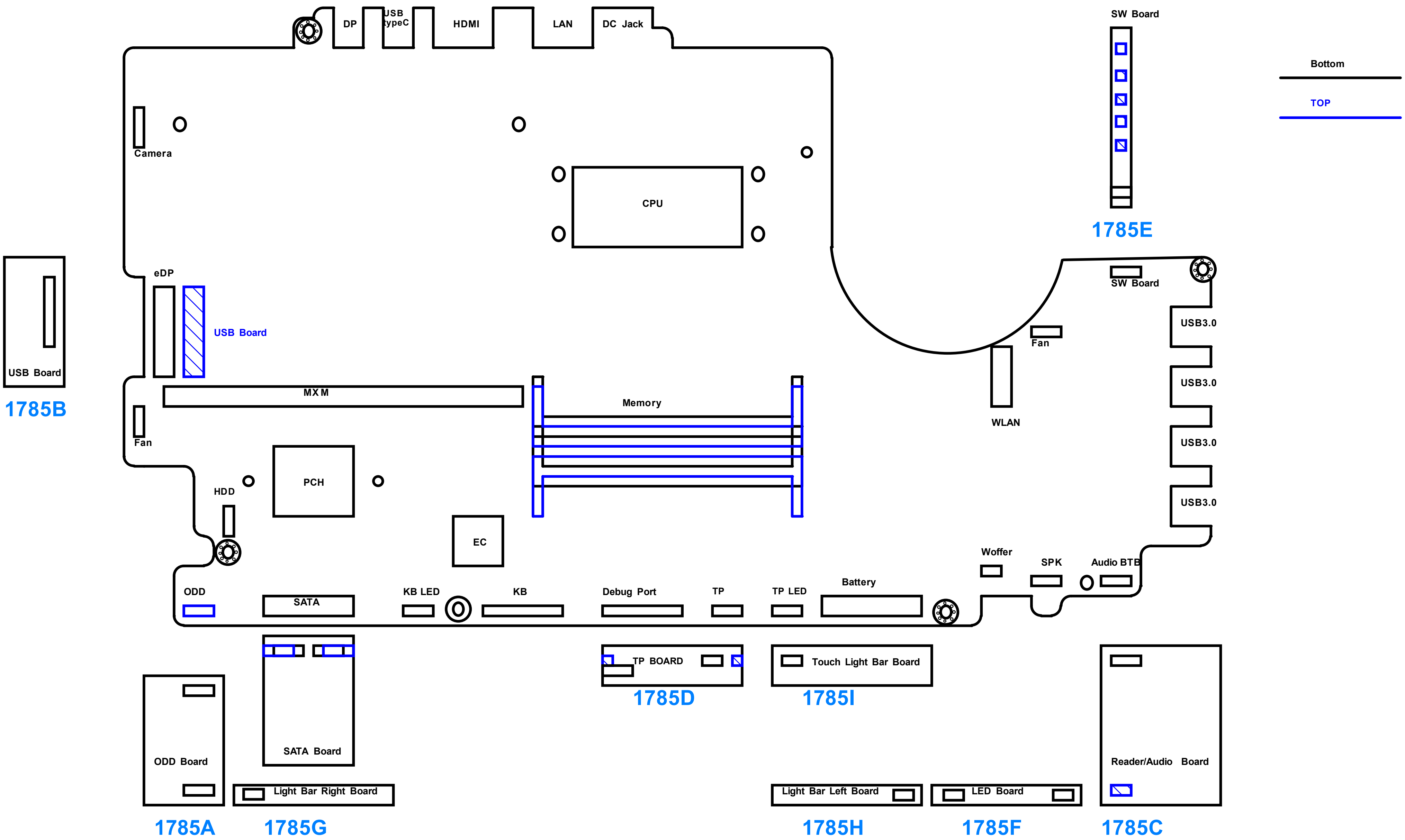
Power down Sequence

S0 -> G3



MS-1785 Board View



MICRO-STAR INT'L CO.,LTD.

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