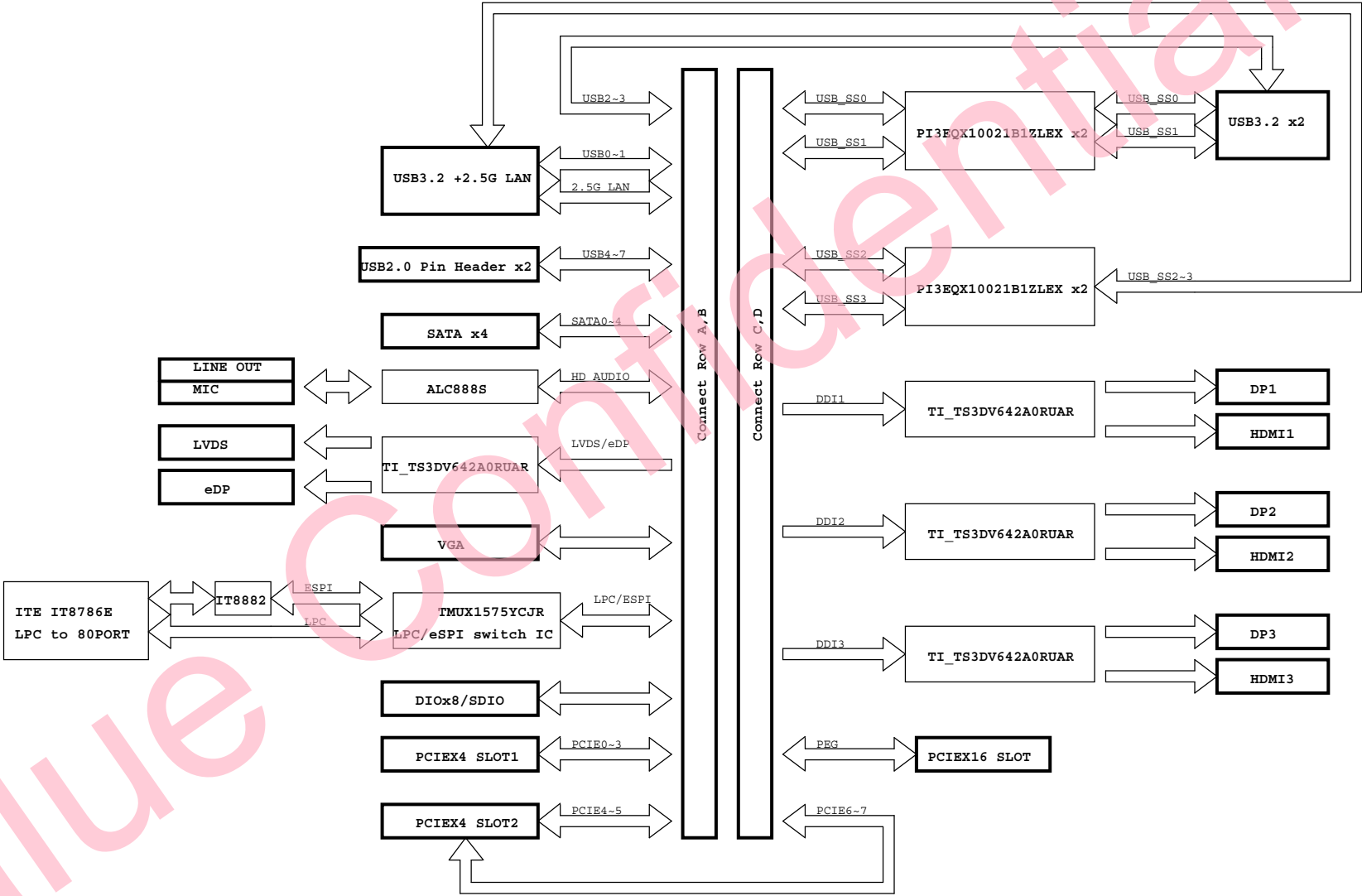
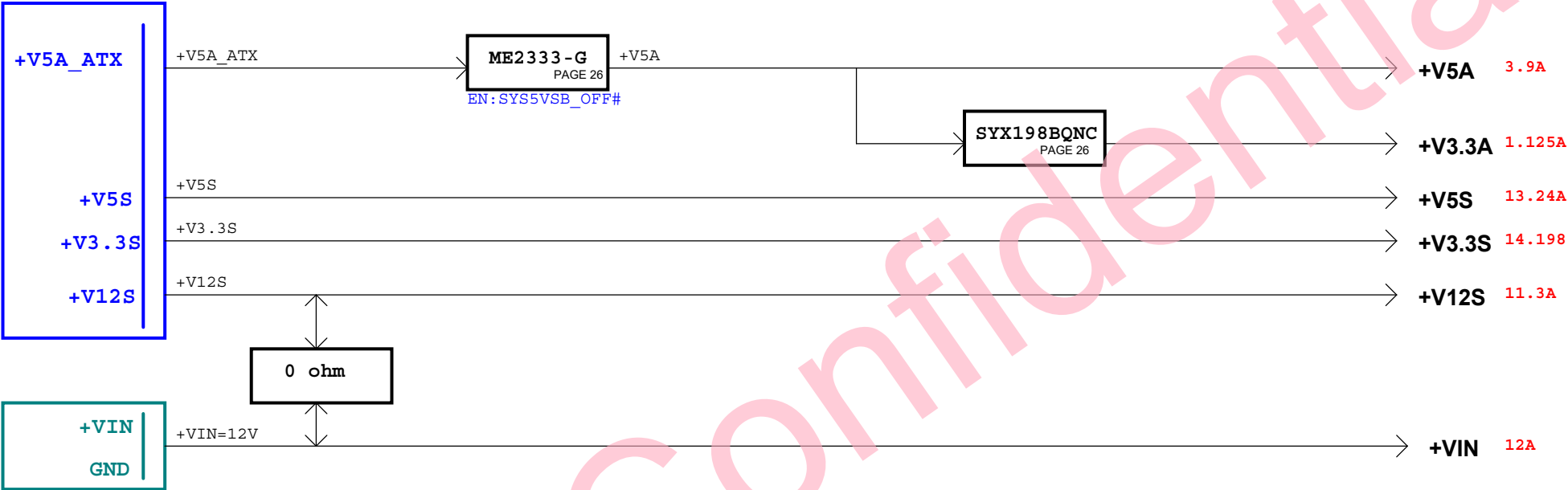


Page	Function
01	BLOCK DIAGRAM
02	Power Delivery Map
03	Clock Distribution
04	Power Sequence
05	Board information
06	COM EXPRESS CONNECTOR
07	DDI1 switch & DP1
08	HDMI1
09	DDI2 switch & DP2
10	HDMI2
11	DDI3 switch & DP3
12	HDMI3
13	LVDS & EDP
14	VGA
15	PCIEX16 TX Redriver
16	PCIEX16 RX Redriver
17	PCIEX16,CLOCK BUFFER
18	PCIEX4 Redriver
19	PCIEX4
20	USB3.2
21	USB3.2
22	USB2.0
23	SATA、LAN、SD、DIO
24	SPI、RTC、FAN
25	AUDIO_2CH(ALC892)
26	ESPI to LPC(IT8882FN)
27	IET & 80 port(LPC)
28	CONTROL,SETTING,TEST
29	POWER IN & CONTROL
30	MODIFY HISTORY

BLOCK DIAGRAM



Power Delivery Map



COMexpress	
+VIN	12A
+VCC_5VSB	2A

CPU FAN	
+V12S	1A

System FAN	
+V12S	1A

SDIO	
+V5S	1A

DIO	
+V5S	1A

DDI1 HDMI/DP SWITCH	
+V3.3S	0.05A

DDI2 HDMI/DP SWITCH	
+V3.3S	0.05A

DDI3 HDMI/DP SWITCH	
+V3.3S	0.05A

LVDS/eDP SWITCH	
+V3.3S	0.05A

HDMI1	
+V3.3S	0.1A
+V5S	0.05A

HDMI2	
+V3.3S	0.1A
+V5S	0.05A

HDMI3	
+V3.3S	0.1A
+V5S	0.05A

LVDS/eDP	
+V12S	3A
+V5S	2A
+V3.3S	2A

DP1	
+V3.3S	0.5A

DP2	
+V3.3S	0.5A

DP3	
+V3.3S	0.5A

VGA	
+V3.3S	0.25A

PCIE x16	
+V12S	2.1A
+V3.3S	3A
+V3.3A	0.375A

PCIE x4_1	
+V12S	2.1A
+V3.3S	3A
+V3.3A	0.375A

PCIE x4_2	
+V12S	2.1A
+V3.3S	3A
+V3.3A	0.375A

BUZZER	
+V5S	0.044A

USB 3.2 x4	
+V5S	3.6A

USB 2.0x2	
+V5S	1A

ALC892	
+V5S	0.046A
+V3.3S	0.012A

IET	
+V12S	2A
+V5S	3A

LAN	
+V3.3A	0.02A

USB Redriver	
+V3.3A	0.688A

HDMI Redriver	
+V3.3S	1.4A

HDMI Level shift	
+V5S	0.008A

PCIe Buffer	
+V3.3S	0.068A

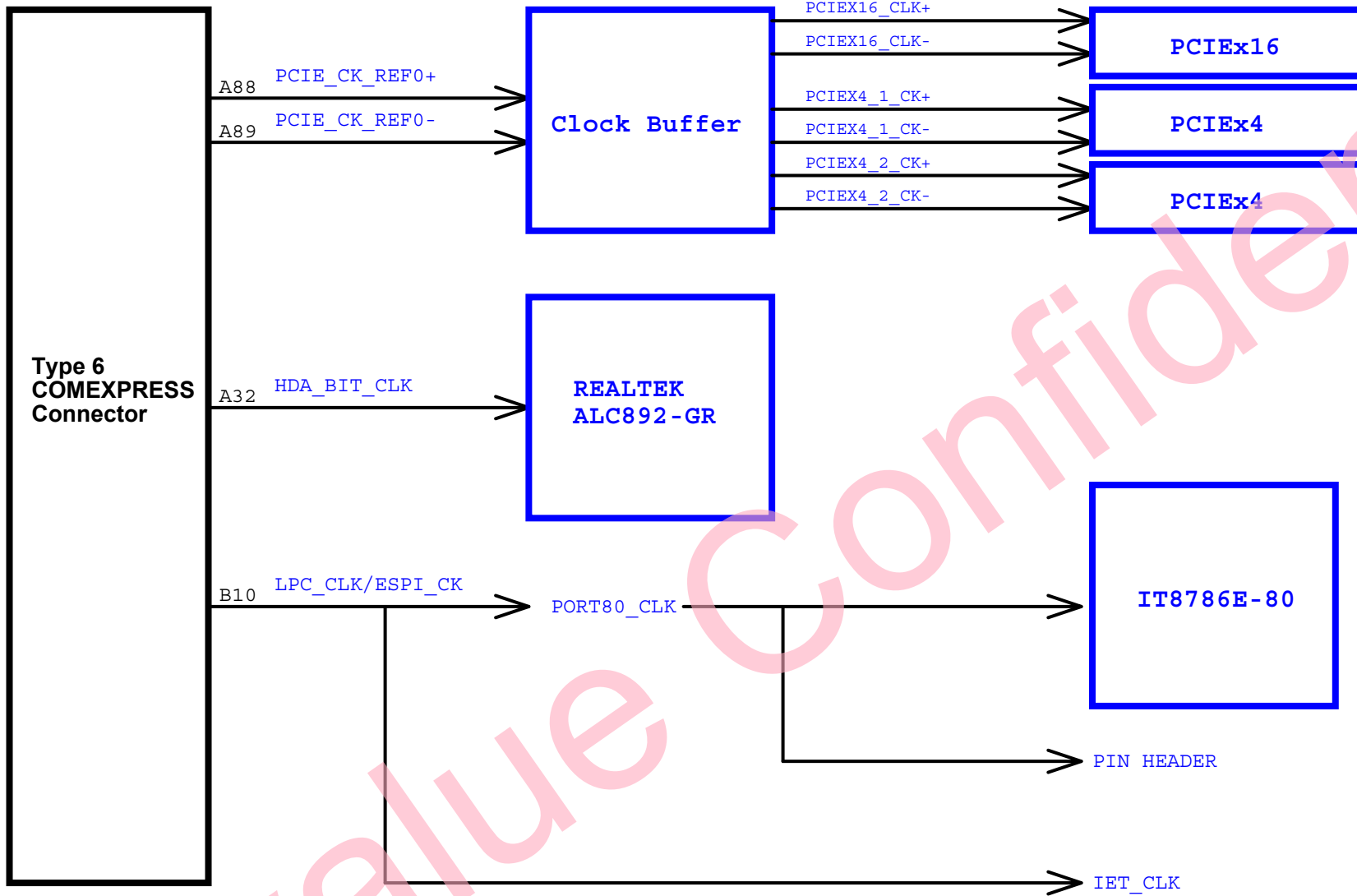
USB 2.0x2	
+V5A	1A

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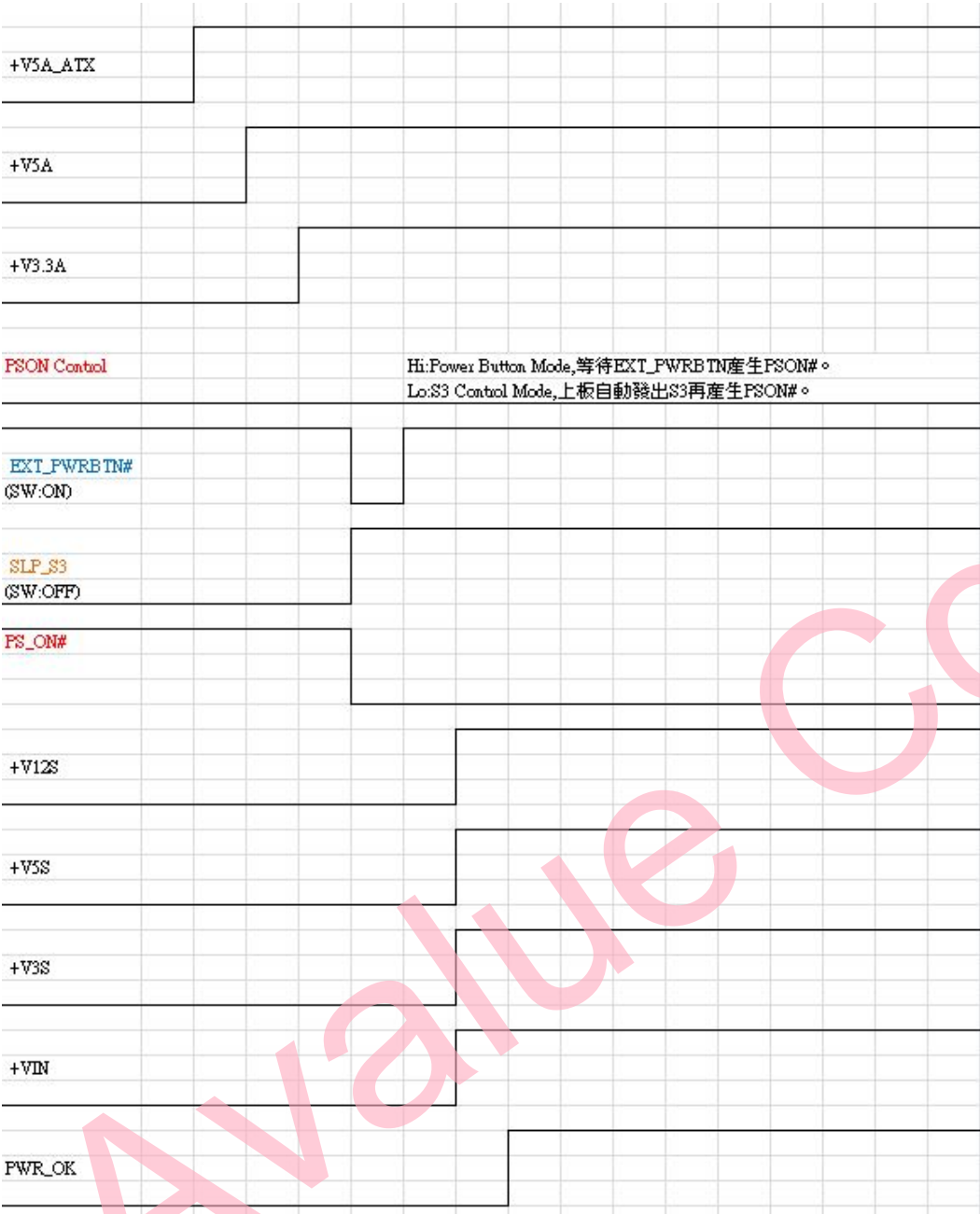
Project Name EEV-EX16		Module Number EEV-EX16	Rev ?
Size A3	Title Power Delivery Map		Rev B1
Date: Wednesday, September 21, 2022		Sheet 2 of 30	

B0

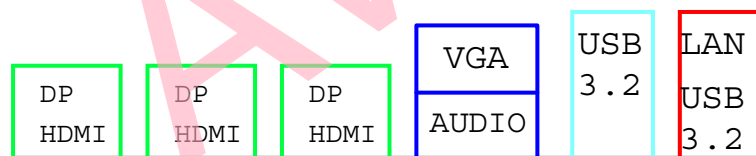
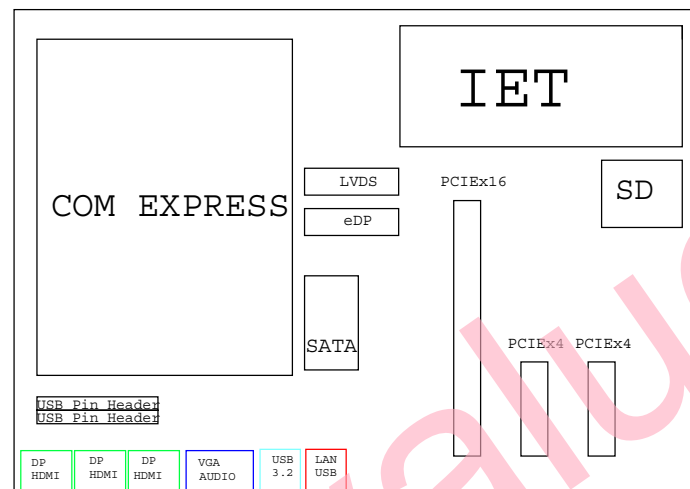
Clock Distribution



Power Sequence



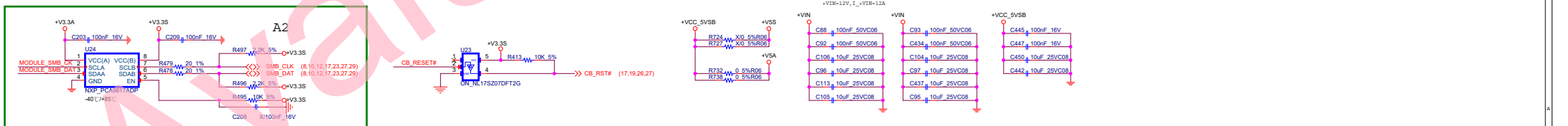
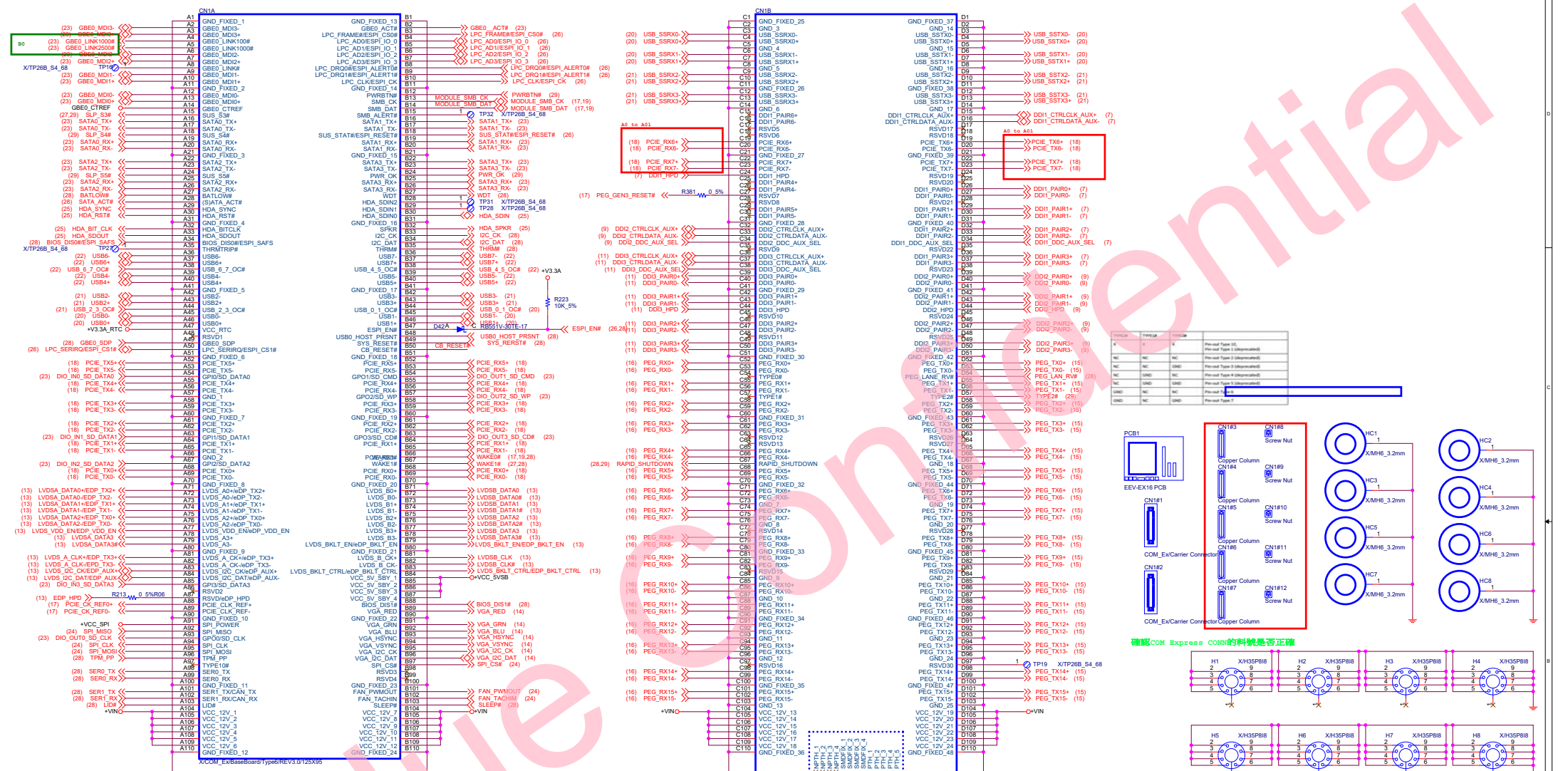
Reference document	
SPEC.	Com ExpressR Module Base Specification PICMG COM.0 R3.0
Sch check list	COM Express Carrier Board Schematic Check List 20190620



COM EXPRESS CONNECTOR			
PIN(D57)	PIN(C57)	PIN(C54)	
TYPE2#	TYPE1#	TYPE0#	
X	X	X	Pin-out Type 1
NC	NC	NC	Pin-out Type 2
NC	NC	GND	Pin-out Type 3 (no IDE)
NC	GND	NC	Pin-out Type 4 (no PCI)
NC	GND	GND	Pin-out Type 5 (no IDE, no PCI)
GND	NC	NC	Pin-out Type 6 (no IDE, no PCI)

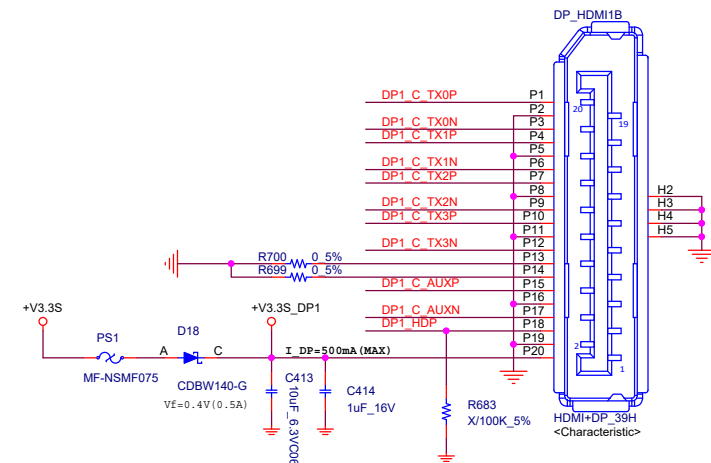
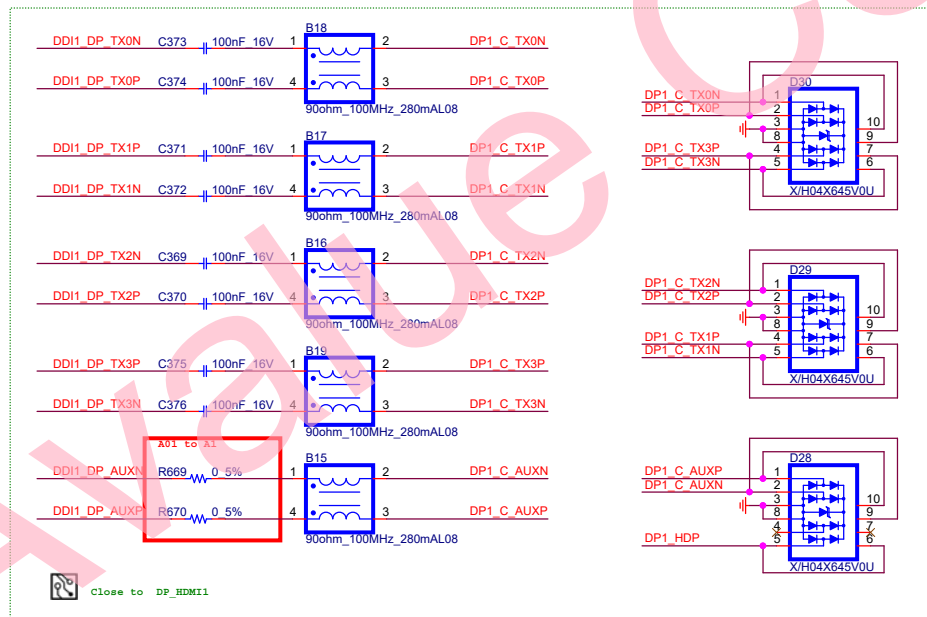
Module板對 TYPE2# 接GND~~ 以示為TYPE 6 PIN DEFINE
Carrier板 用此PIN來控制12V的輸出

COM EXPRESS CONNECTOR	
PIN(A97)	
TYPE10#	
NC	Pin-out R2.0
PD	Pin-out Type 10 pull down to ground with 4.7K resistor
12V	Pin-out R1.0

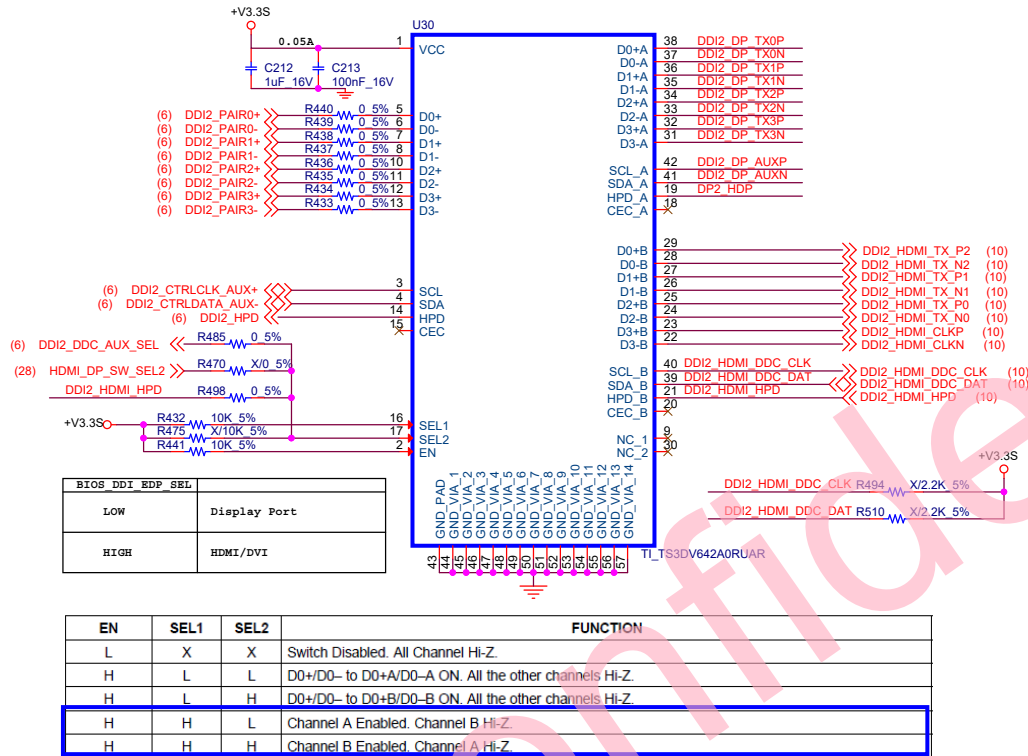


請確認COM Express CONN的料號是否正確

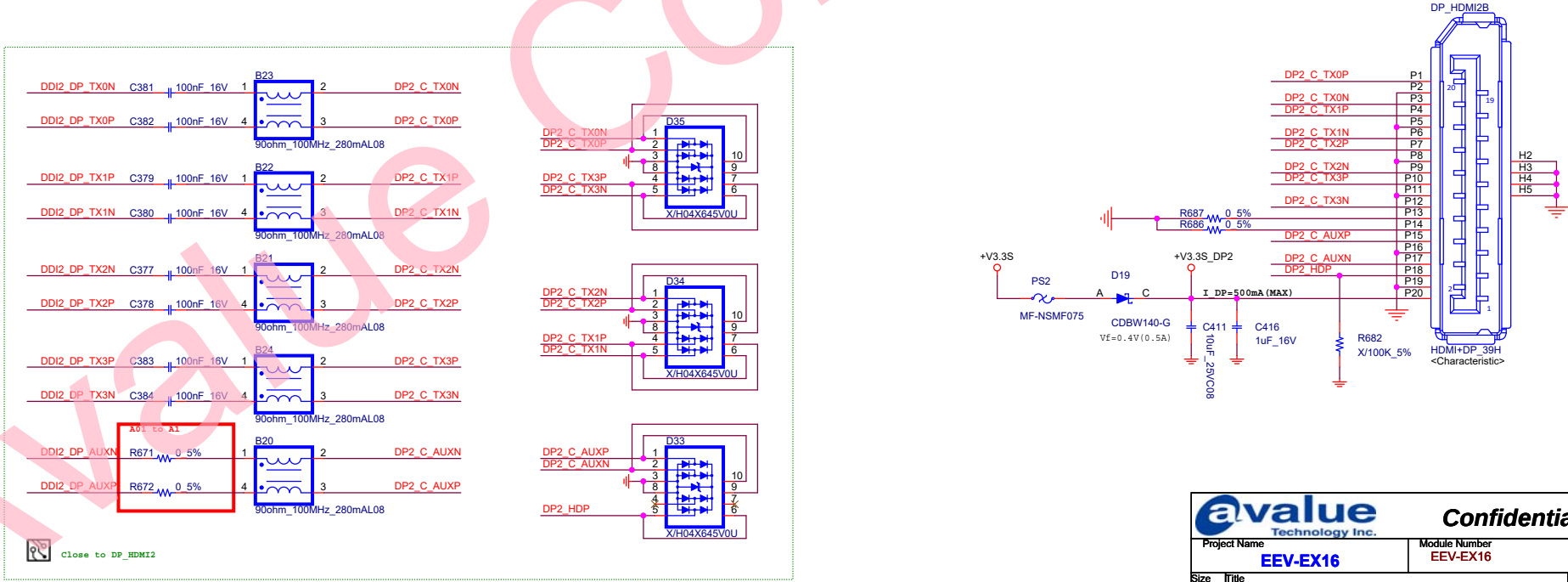
DP1

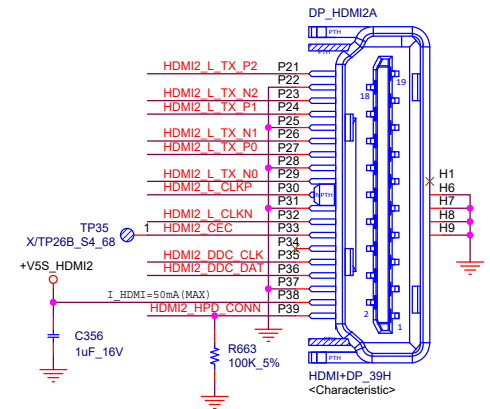
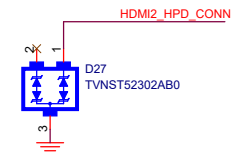
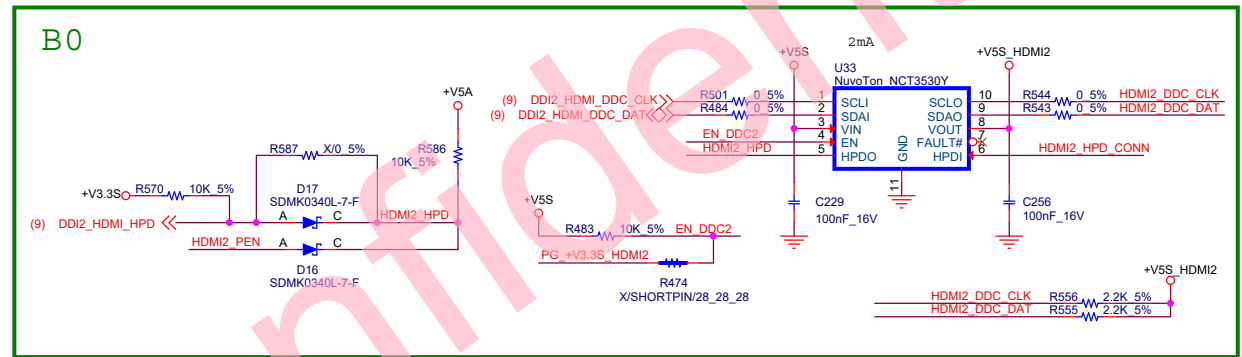
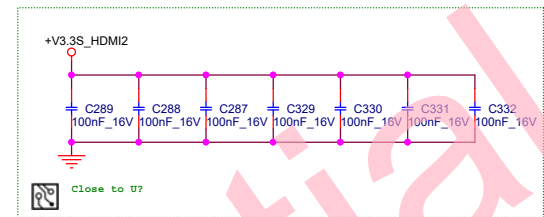


DDI2 switch

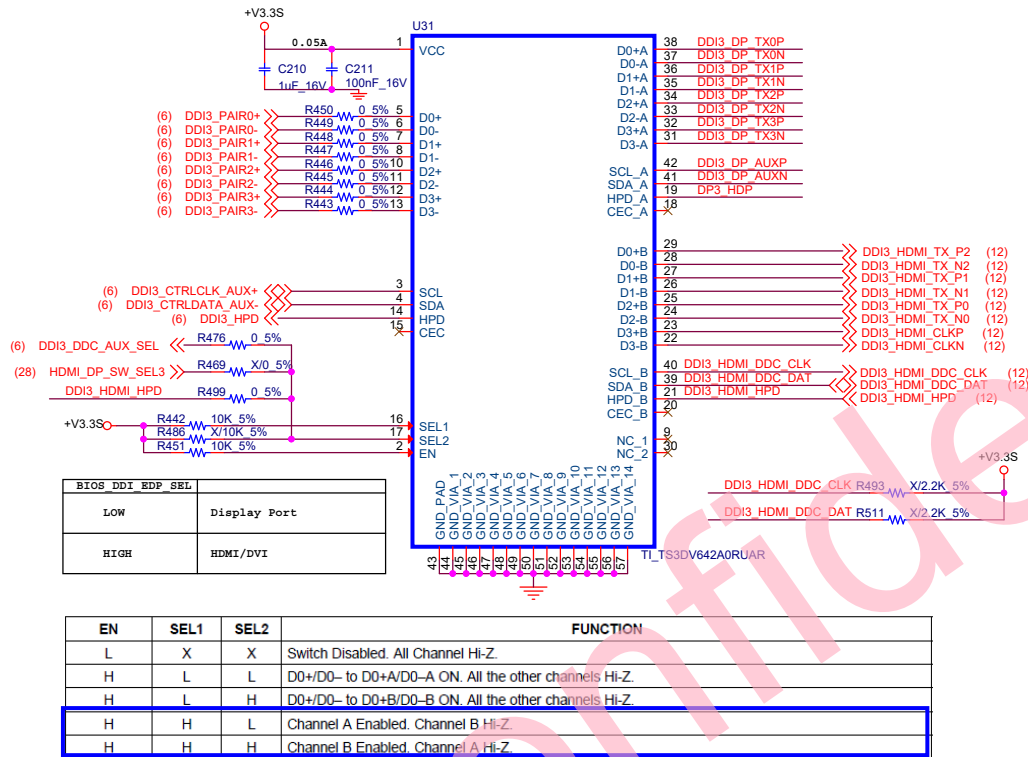


DP2

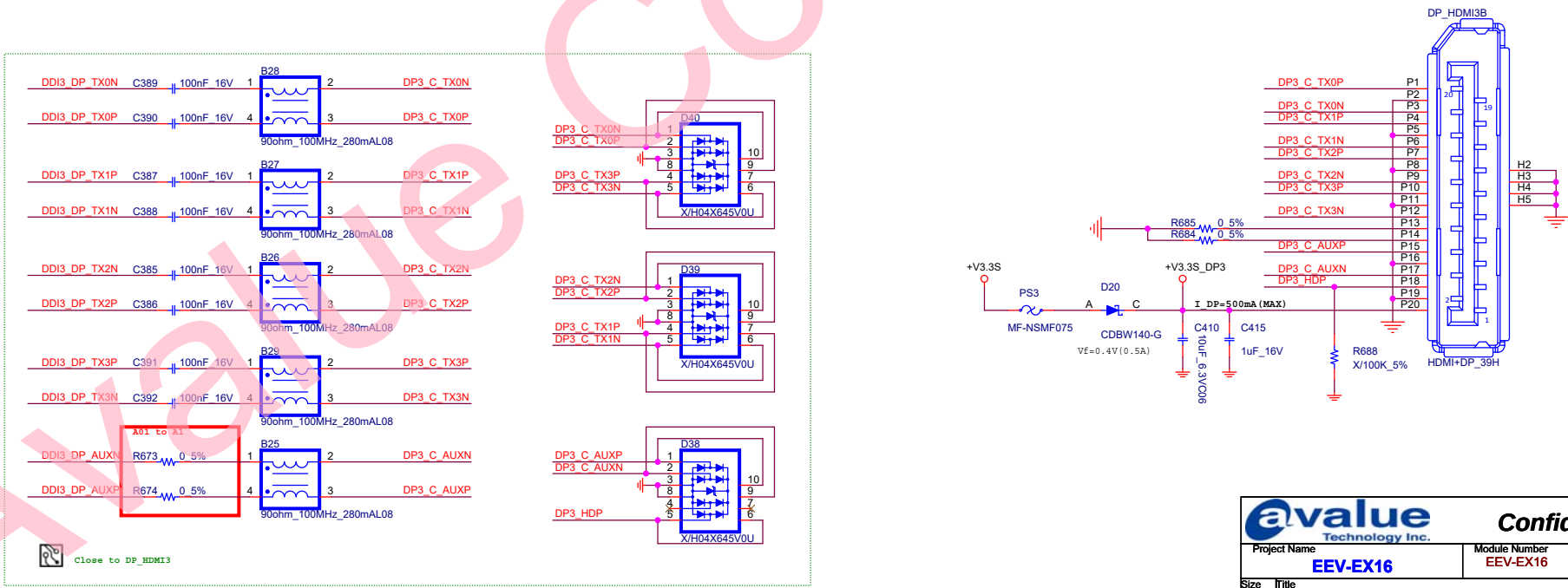




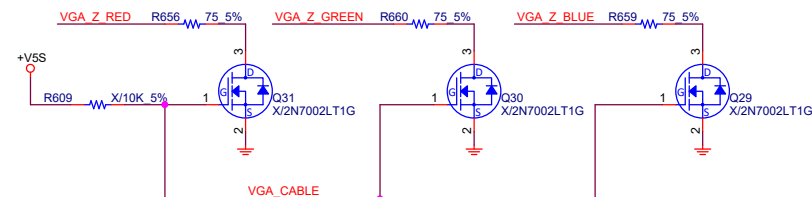
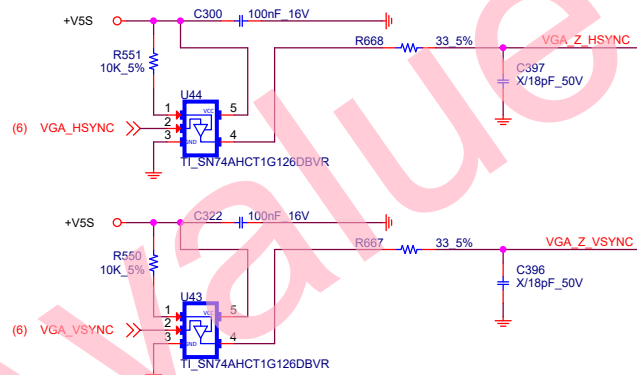
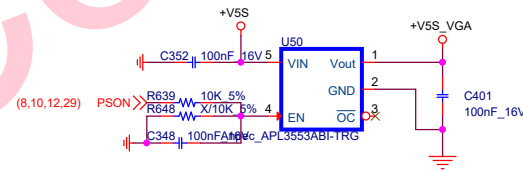
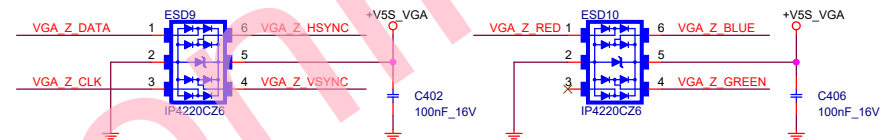
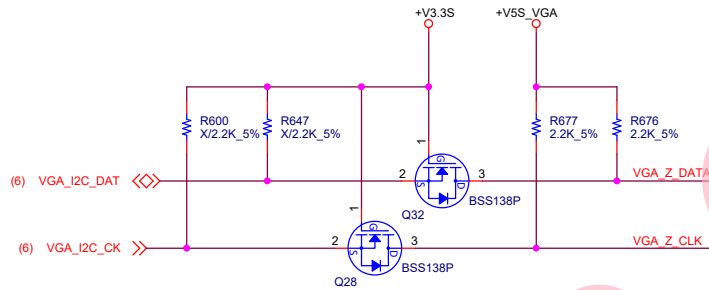
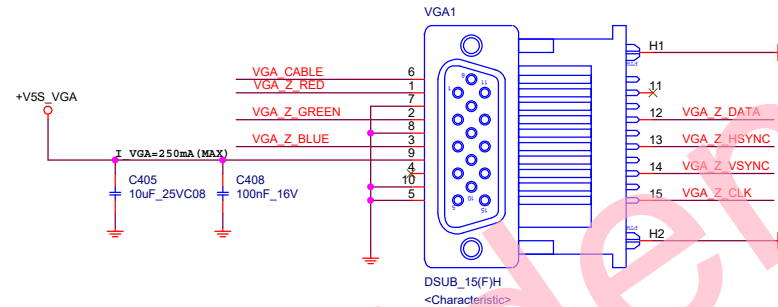
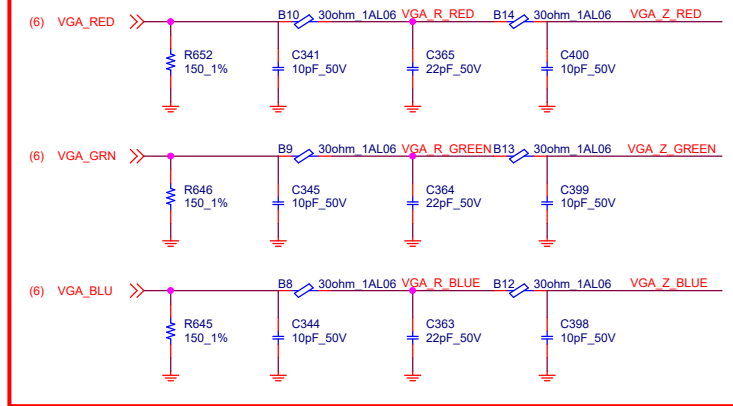
DDI3 switch



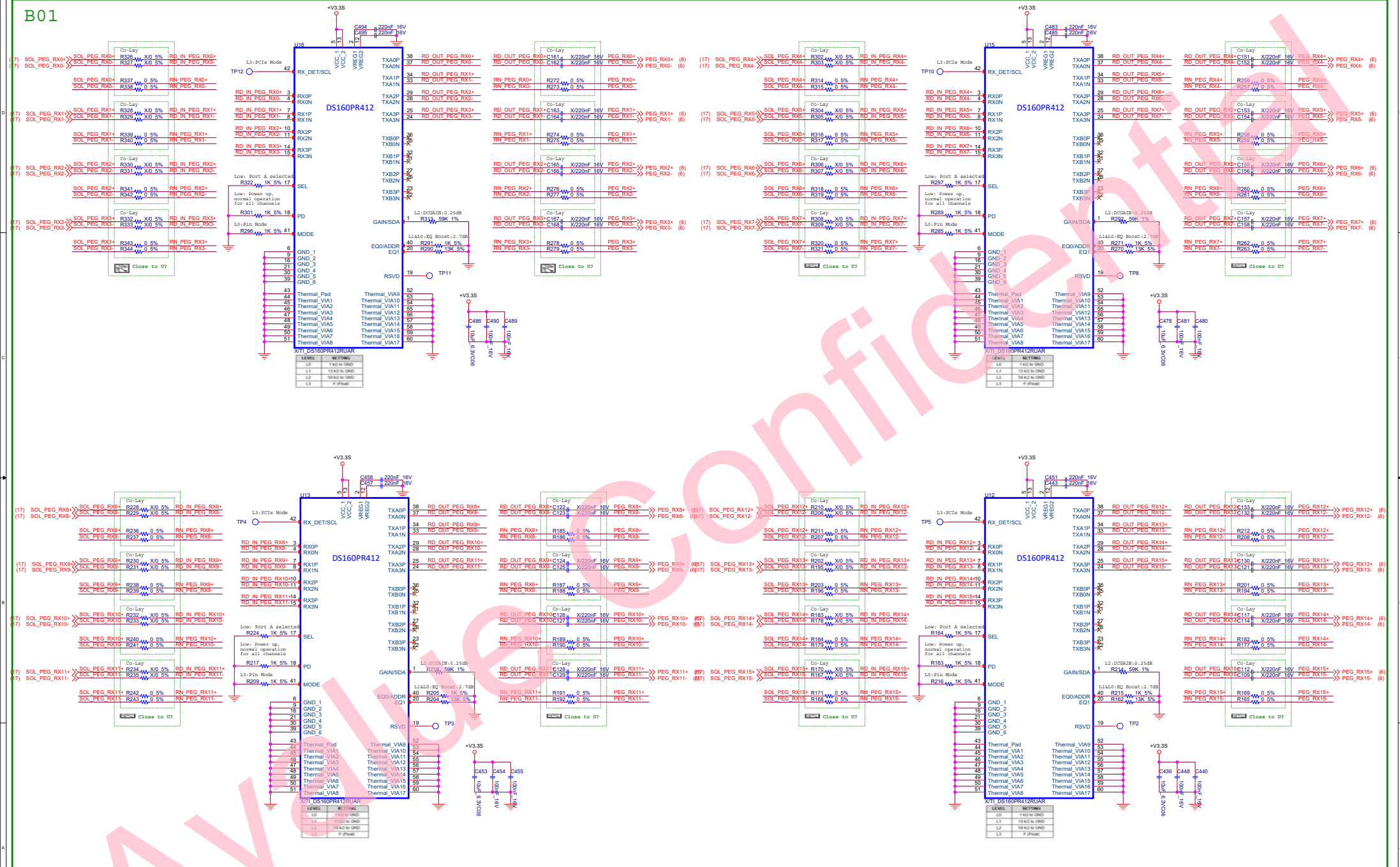
DP3

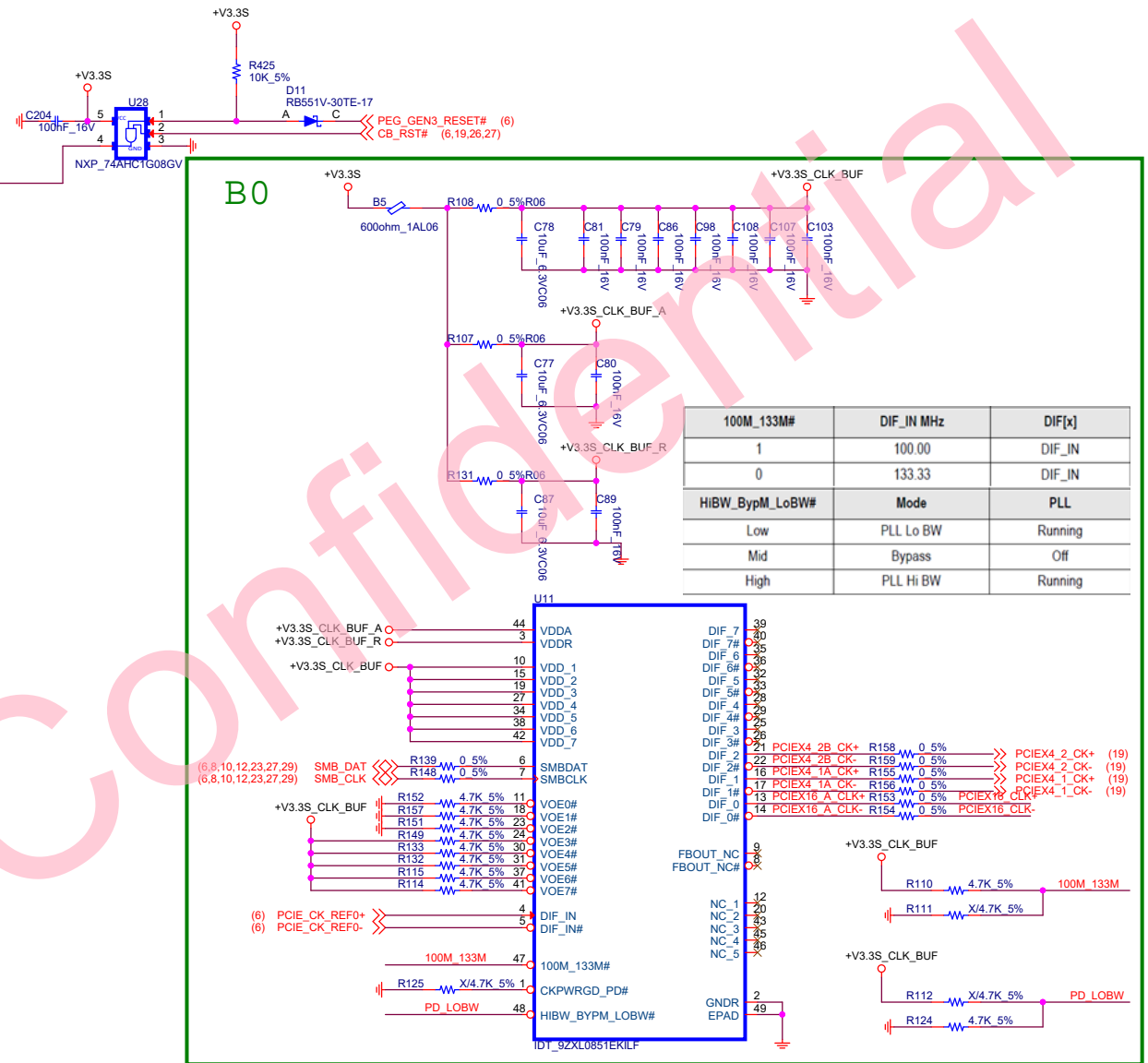
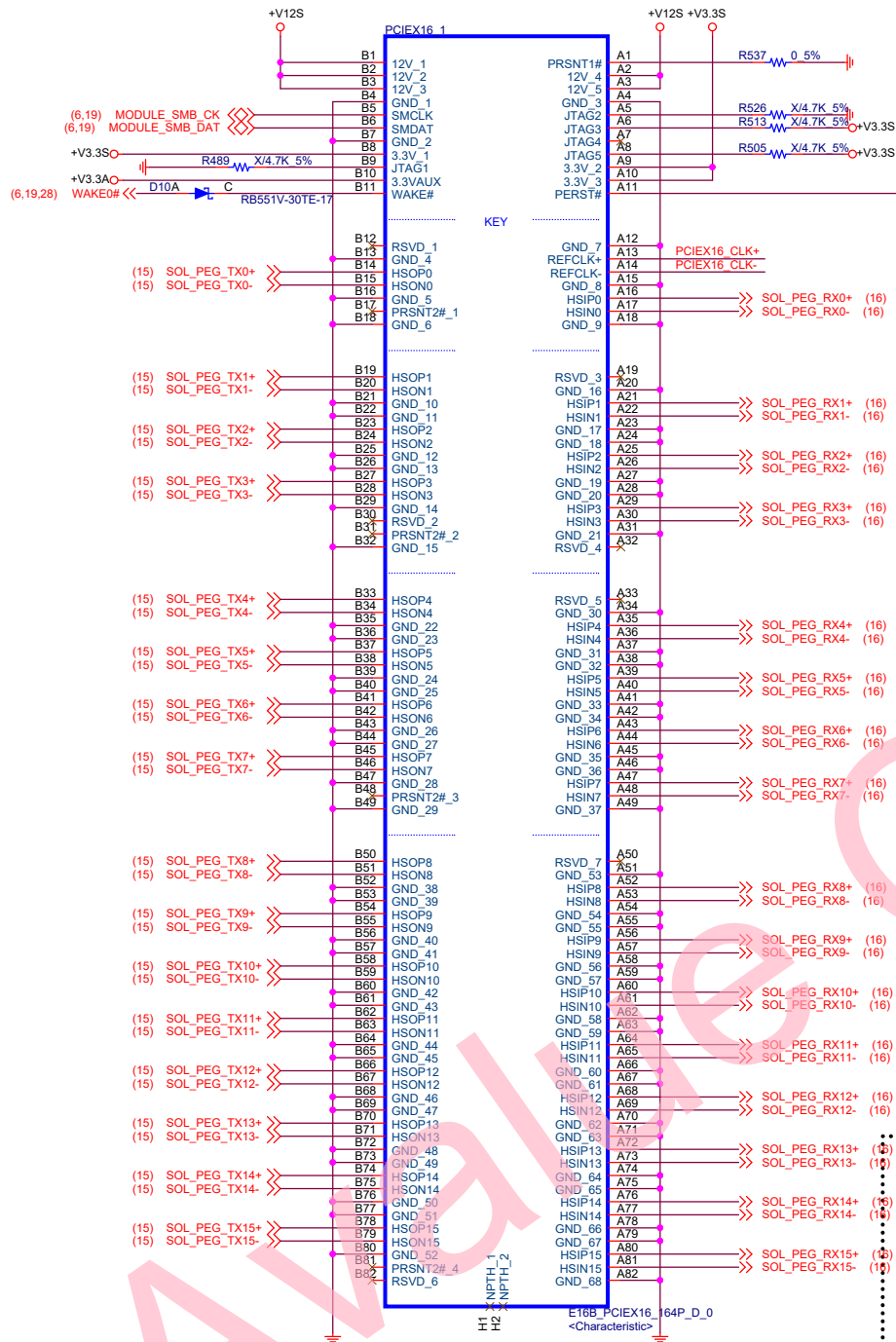


A0 to A01

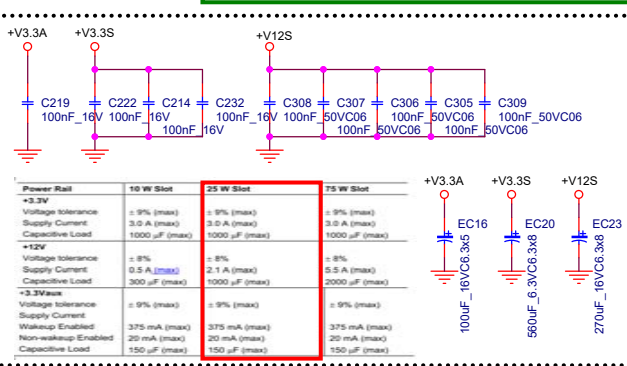


B01



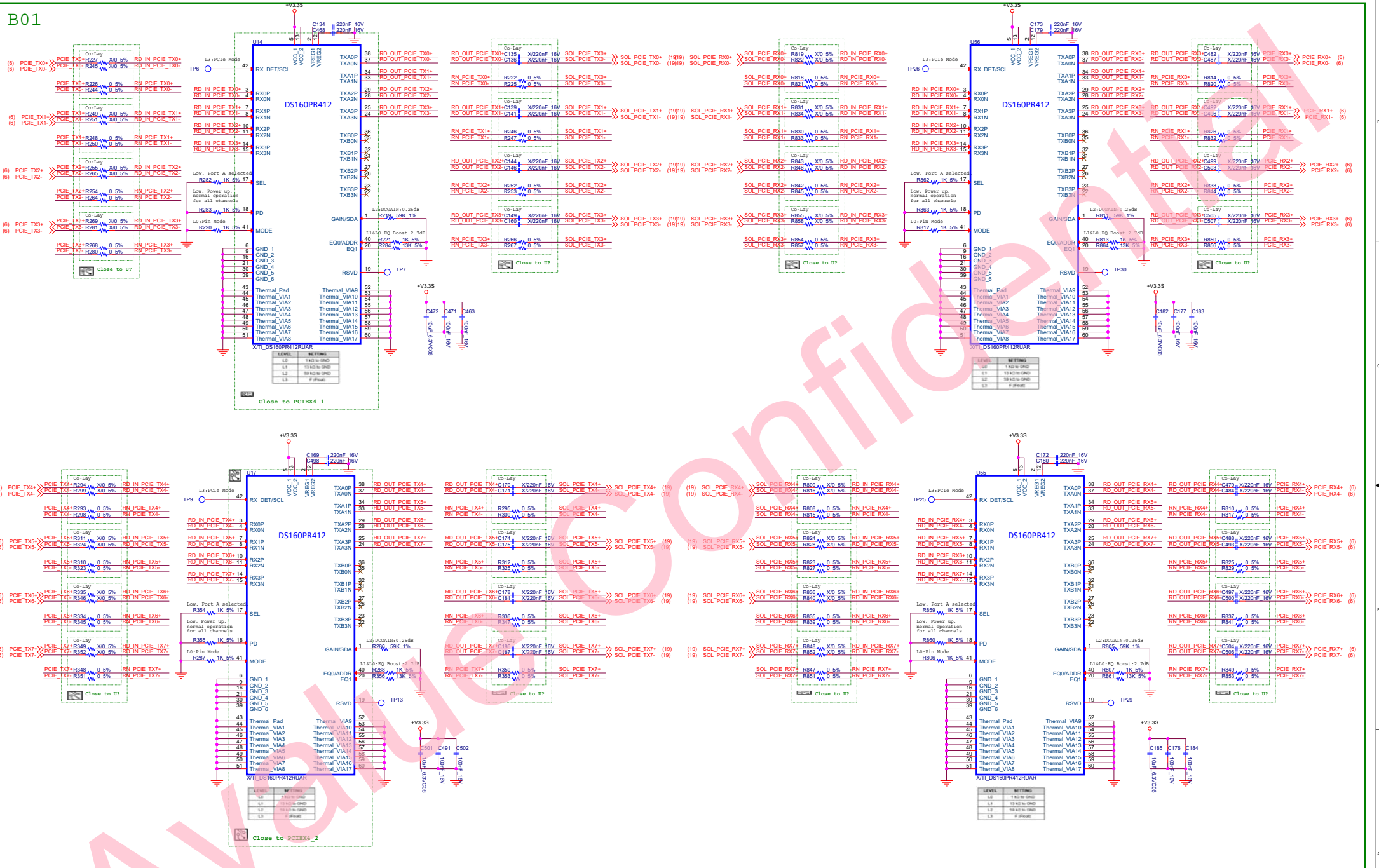


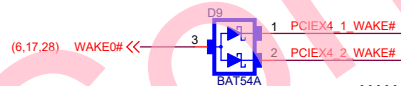
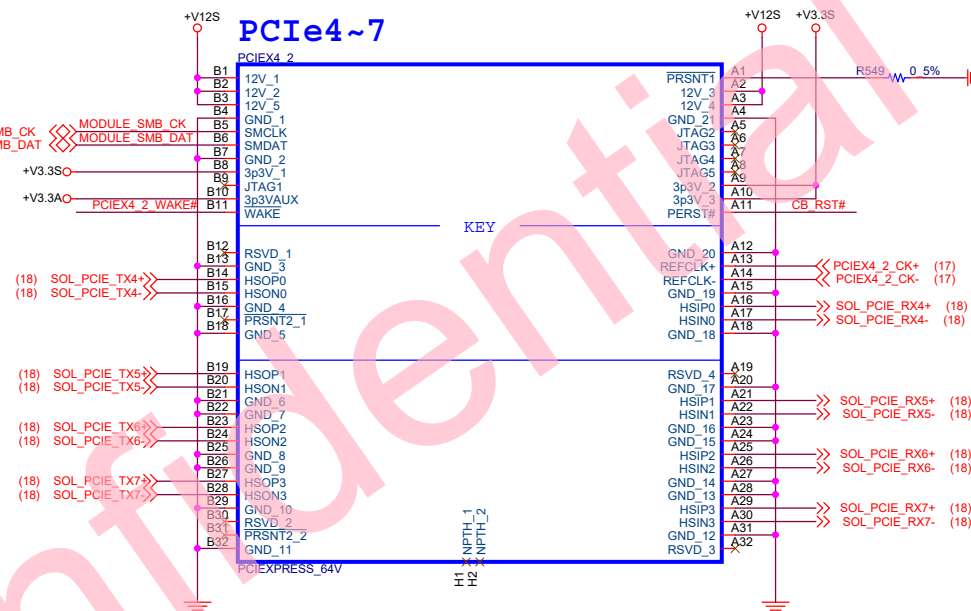
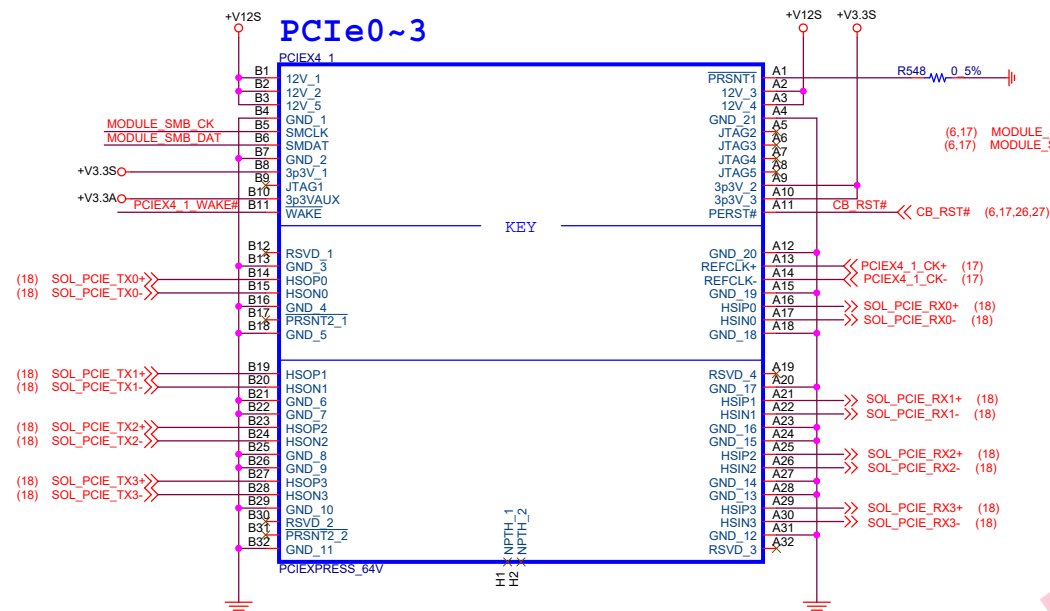
100M_133M#	DIF_IN MHz	DIF[x]
1	100.00	DIF_IN
0	133.33	DIF_IN
HiBW_ByPM_LoBW#	Mode	PLL
Low	PLL Lo BW	Running
Mid	Bypass	Off
High	PLL Hi BW	Running



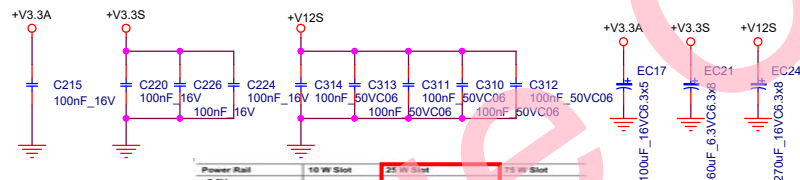
Please choose suitable cap. for individual design needed.
and Capacitors next to the connector.

avalue Technology Inc.		Confidential	
Project Name EEV-EX16		Module Number EEV-EX16	Rev ?
Size A3	Title PCIEX16,CLOCK BUFFER	Rev B1	
Date: Wednesday, September 21, 2022		Sheet 17	of 30



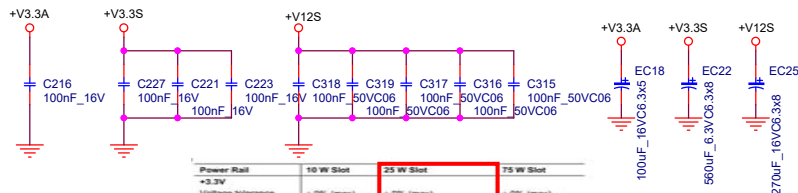


Please choose suitable cap. for individual design needed. and Capacitors next to the connector.



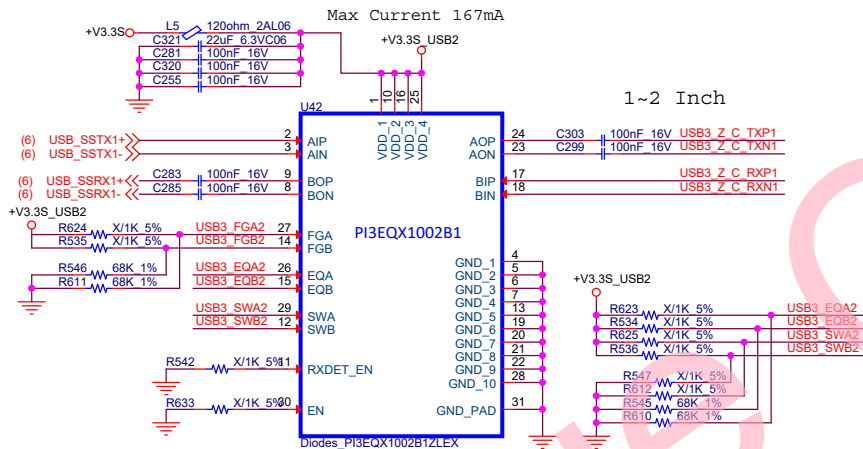
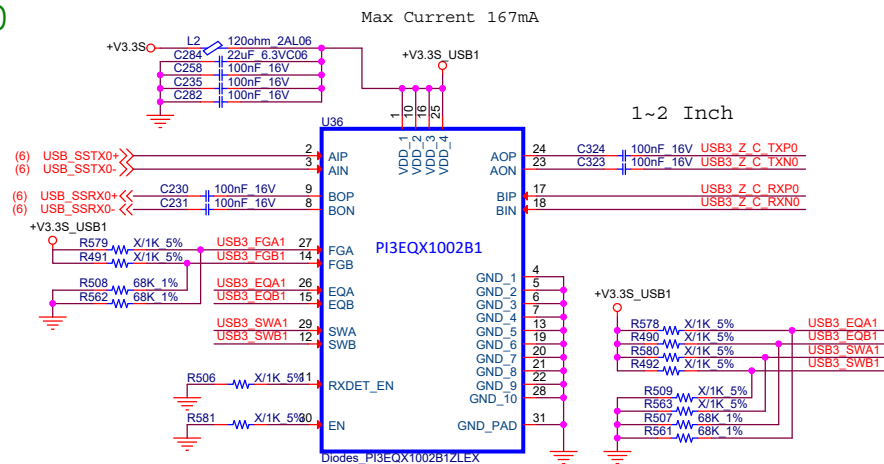
Power Rail	10 W Slot	25 W Slot	75 W Slot
+3.3V			
Voltage Tolerance	± 9% (max)	± 9% (max)	± 9% (max)
Supply Current	3.0 A (max)	3.0 A (max)	3.0 A (max)
Capacitive Load	1000 µF (max)	1000 µF (max)	1000 µF (max)
+12V			
Voltage Tolerance	± 8%	± 8%	± 8%
Supply Current	0.5 A (max)	2.1 A (max)	0.5 A (max)
Capacitive Load	300 µF (max)	1000 µF (max)	2000 µF (max)
+3.3Vaux			
Voltage Tolerance	± 9% (max)	± 9% (max)	± 9% (max)
Supply Current	375 mA (max)	375 mA (max)	375 mA (max)
Non-wakeup Enabled	20 mA (max)	20 mA (max)	20 mA (max)
Capacitive Load	150 µF (max)	150 µF (max)	150 µF (max)

Please choose suitable cap. for individual design needed. and Capacitors next to the connector.



Power Rail	10 W Slot	25 W Slot	75 W Slot
+3.3V			
Voltage Tolerance	± 9% (max)	± 9% (max)	± 9% (max)
Supply Current	3.0 A (max)	3.0 A (max)	3.0 A (max)
Capacitive Load	1000 µF (max)	1000 µF (max)	1000 µF (max)
+12V			
Voltage Tolerance	± 8%	± 8%	± 8%
Supply Current	0.5 A (max)	2.1 A (max)	0.5 A (max)
Capacitive Load	300 µF (max)	1000 µF (max)	2000 µF (max)
+3.3Vaux			
Voltage Tolerance	± 9% (max)	± 9% (max)	± 9% (max)
Supply Current	375 mA (max)	375 mA (max)	375 mA (max)
Non-wakeup Enabled	20 mA (max)	20 mA (max)	20 mA (max)
Capacitive Load	150 µF (max)	150 µF (max)	150 µF (max)

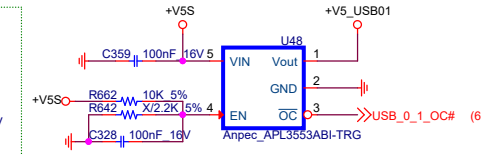
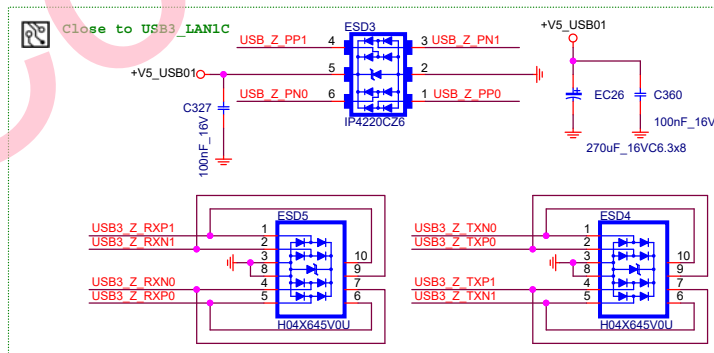
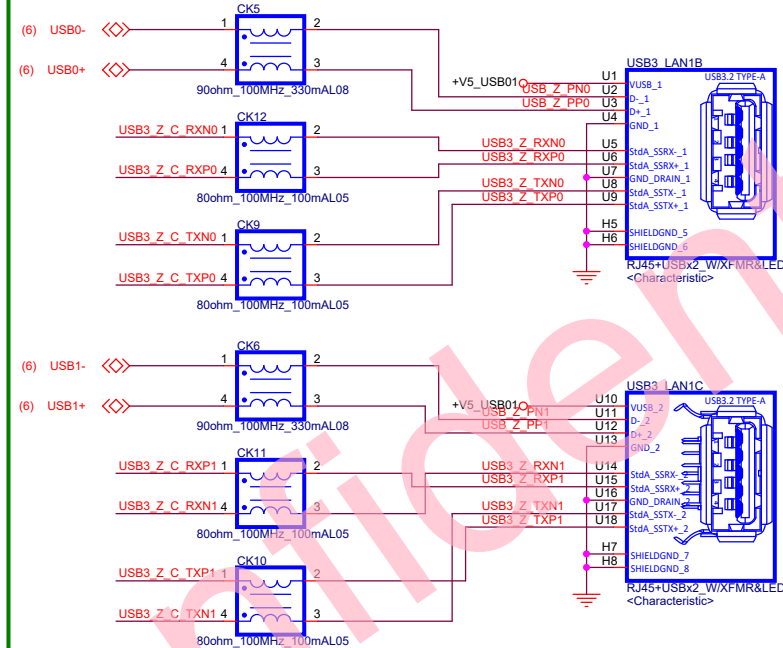
B0



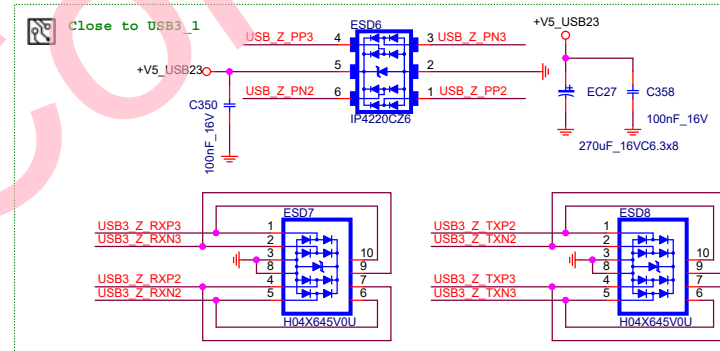
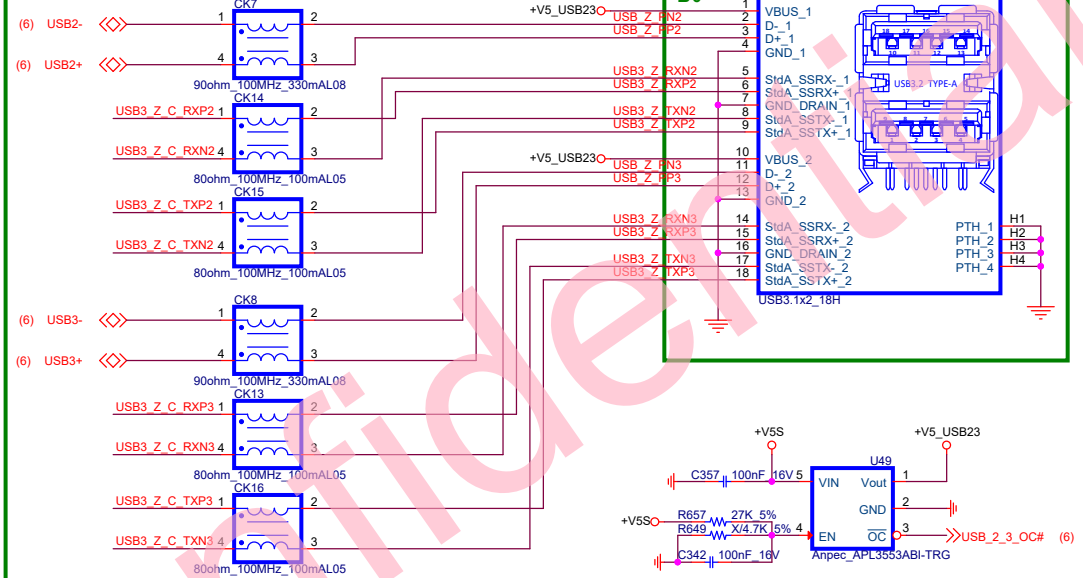
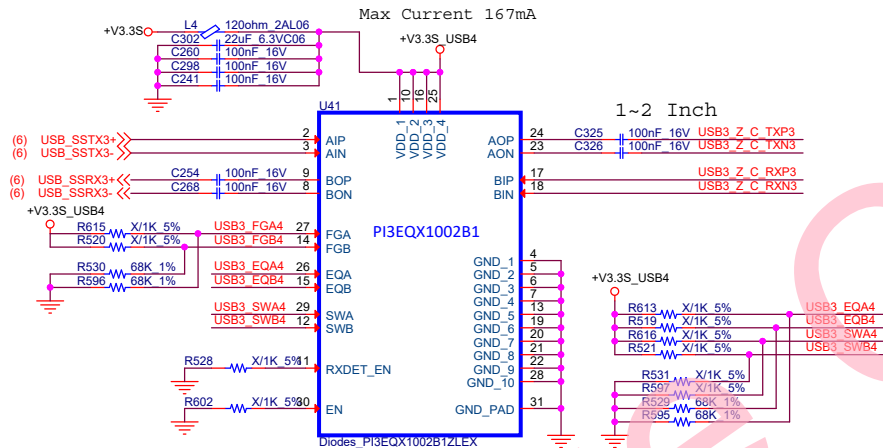
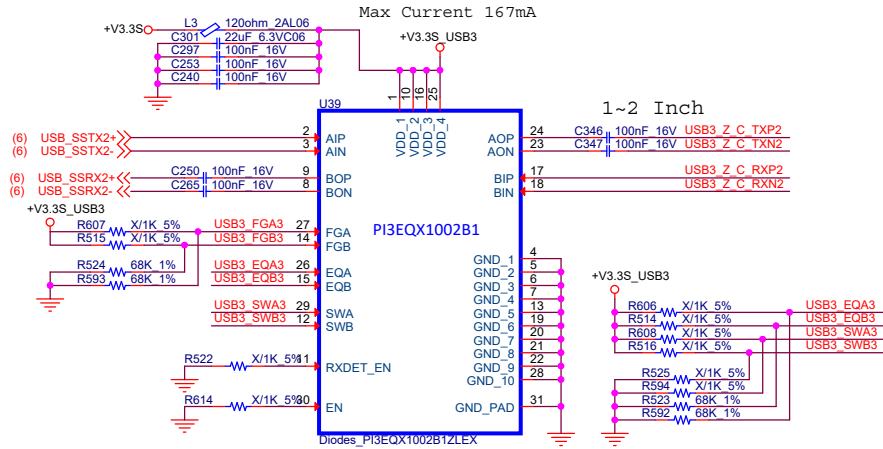
Post-channel	less than 2inch		2inch to 4inch		up to 4inch	
Pre-channel	TX		RX		TX	
For PI3EQX1002B1	TX		RX		TX	
under 7inch	EQA=68kohm to GND FGA=Pull low to 68kohm SWA=Floating	EQB=68kohm to GND FGB=Pull low to GND SWB=Floating	EQA=68kohm to GND FGA=Pull low to 68kohm SWA=Floating	EQB=68kohm to GND FGB=Pull low to GND SWB=Floating	EQA=68kohm to GND FGA=Floating SWA=Floating	EQB=68kohm to GND FGB=Pull low to GND SWB=Floating
7inch to 9inch	EQA=Floating FGA=Pull low to 68kohm SWA=Floating	EQB=68kohm to GND FGB=Floating SWB=Floating	EQA=Floating FGA=Pull low to 68kohm SWA=Floating	EQB=68kohm to GND FGB=Floating SWB=Floating	EQA=Floating FGA=Floating SWA=Floating	EQB=Floating FGB=Floating SWB=Floating
up to 12inch	EQA=1kohm to VDD FGA=Pull low to 68kohm SWA=Floating	EQB=68kohm to GND FGB=1kohm to VDD SWB=Floating	EQA=1kohm to VDD FGA=Pull low to 68kohm SWA=Floating	EQB=68kohm to GND FGB=1kohm to VDD SWB=Floating	EQA=1kohm to VDD FGA=Floating SWA=Floating	EQB=Floating FGB=1kohm to VDD SWB=Floating

Table2: PCB Trace vs PI3EQX1002B/B1 ReDriver Setting

B0

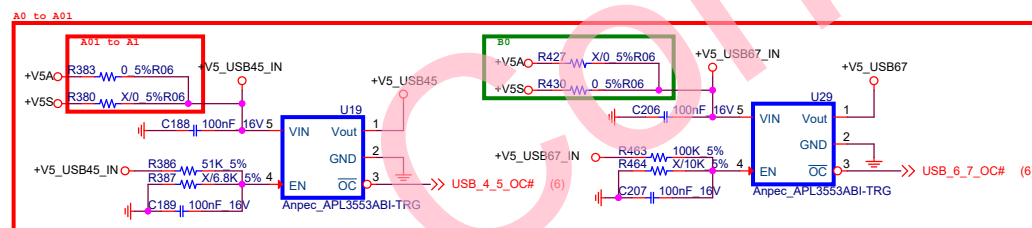
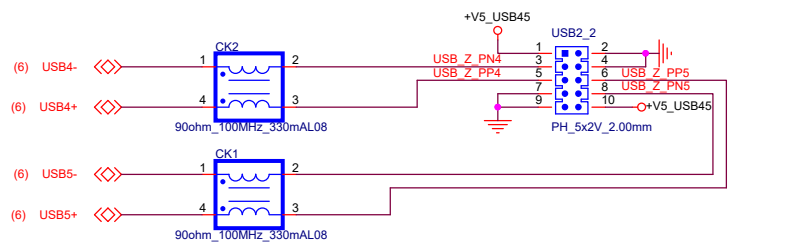
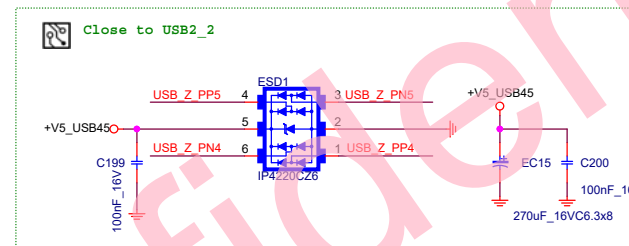


B0

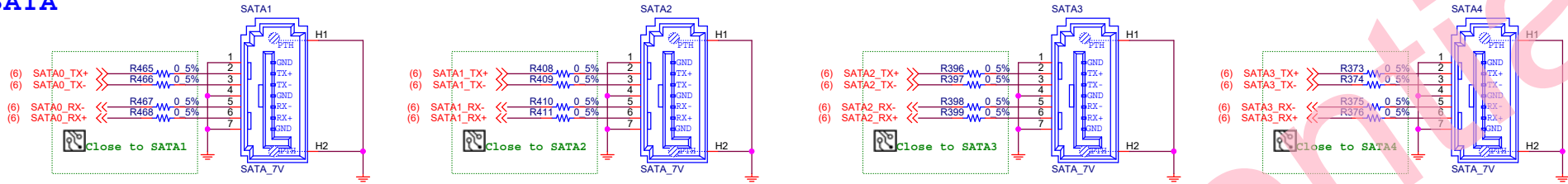


Post-channel	less than 2inch	2inch to 4inch	up to 4inch
Pre-channel			
For PI3EQX1002B1			
TX	EQA=68kohm to GND FGA=Pull low to 68kohm SWA=Floating	EQA=68kohm to GND FGA=Pull low to 68kohm SWA=Floating	EQA=68kohm to GND FGA=Pull low to 68kohm SWA=Floating
RX	EQB=68kohm to GND FGB=Pull low to 68kohm SWB=Floating	EQB=68kohm to GND FGB=Pull low to 68kohm SWB=Floating	EQB=68kohm to GND FGB=Pull low to 68kohm SWB=Floating
7inch to 9inch	EQA=Floating FGA=Pull low to 68kohm SWA=Floating	EQA=Floating FGA=Pull low to 68kohm SWA=Floating	EQA=Floating FGA=Pull low to 68kohm SWA=Floating
up to 12inch	EQA=1kohm to VDD FGA=Pull low to 68kohm SWA=Floating	EQA=1kohm to VDD FGA=Pull low to 68kohm SWA=Floating	EQA=1kohm to VDD FGA=Pull low to 68kohm SWA=Floating

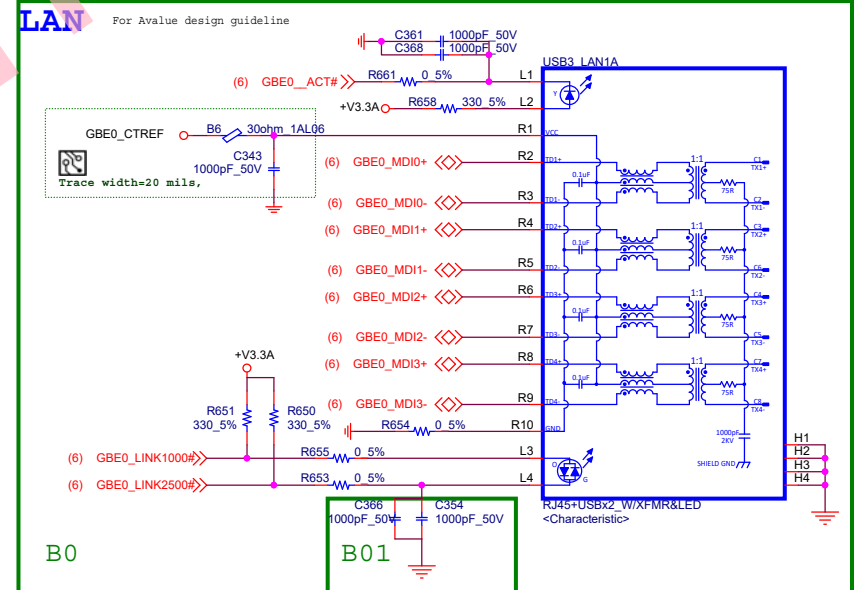
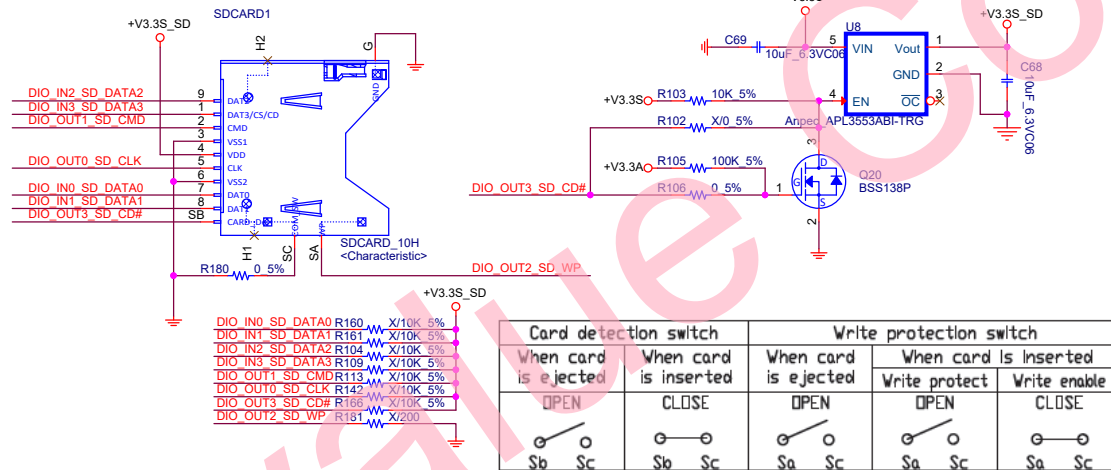
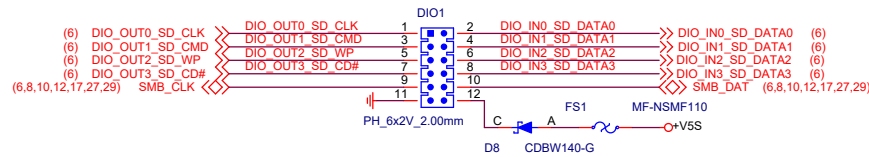
Table2: PCB Trace vs PI3EQX1002B1 ReDriver Setting



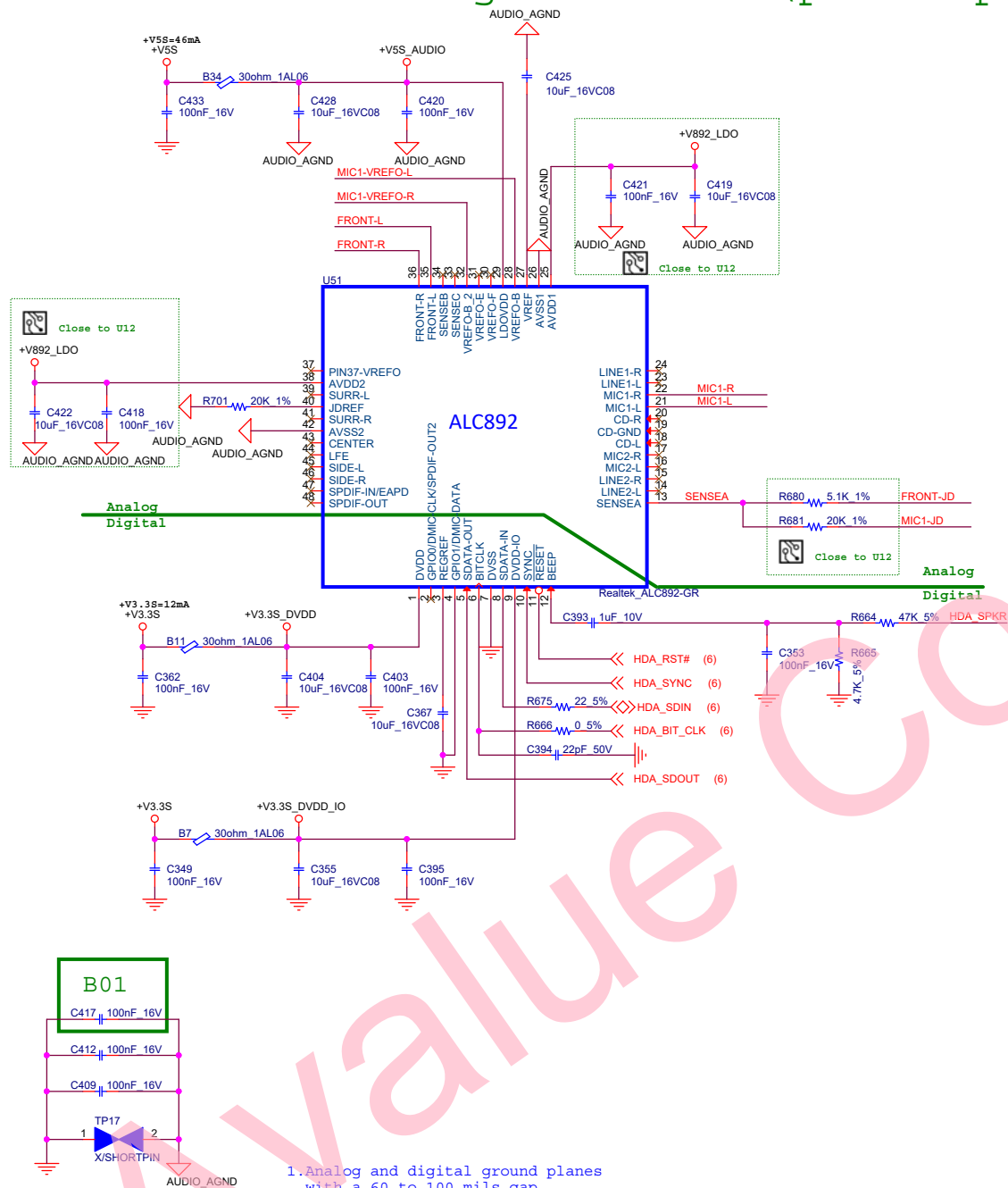
SATA



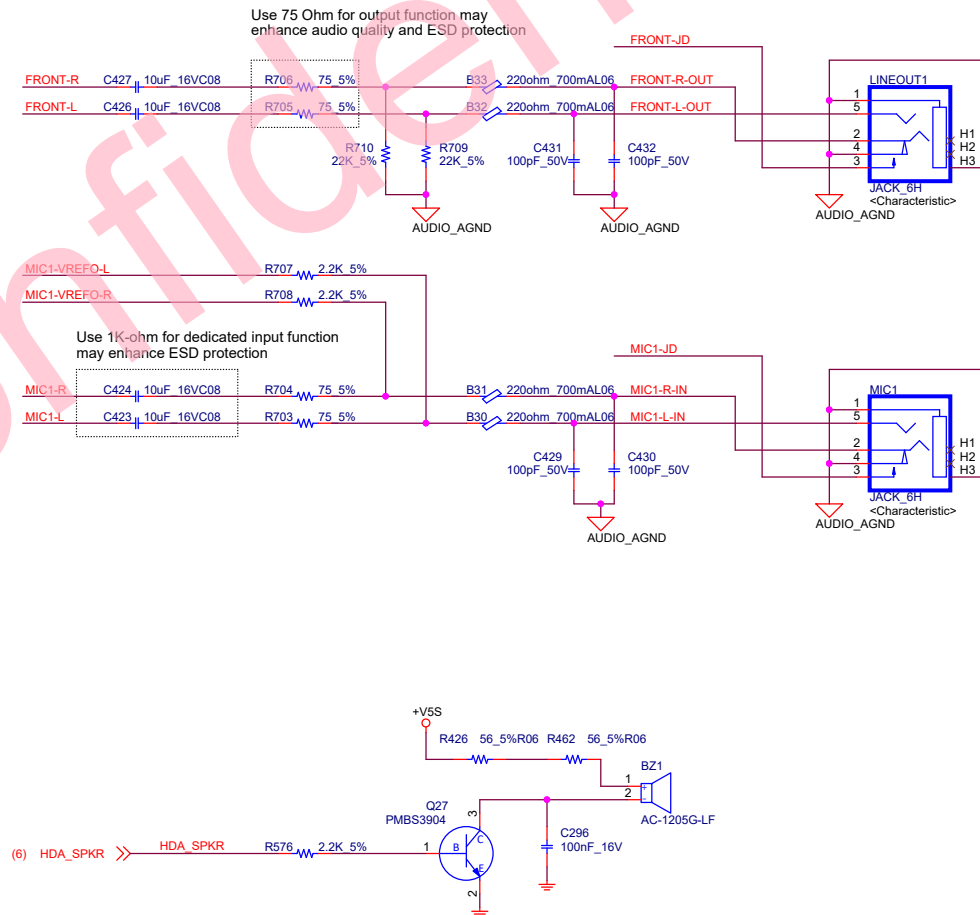
DIO/SDIO



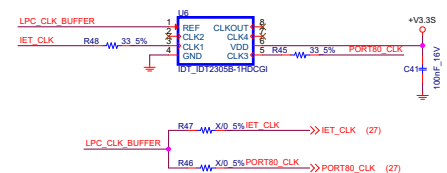
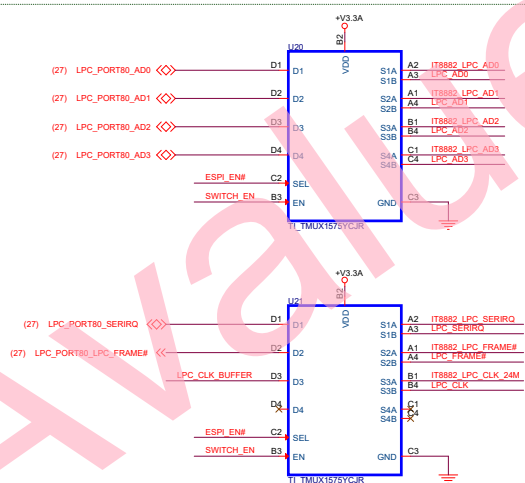
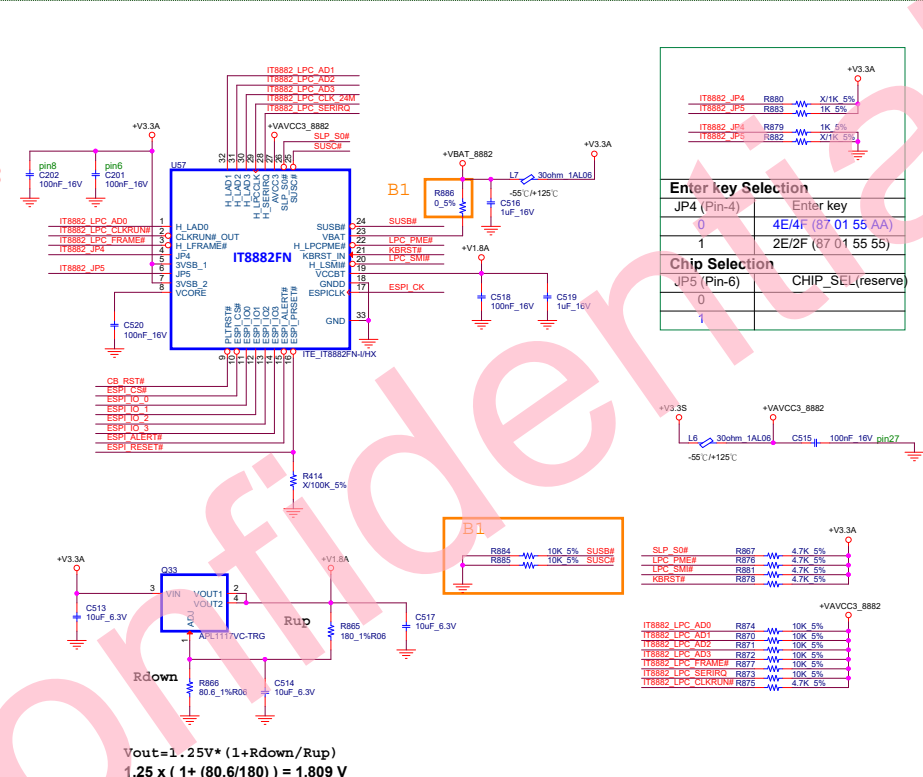
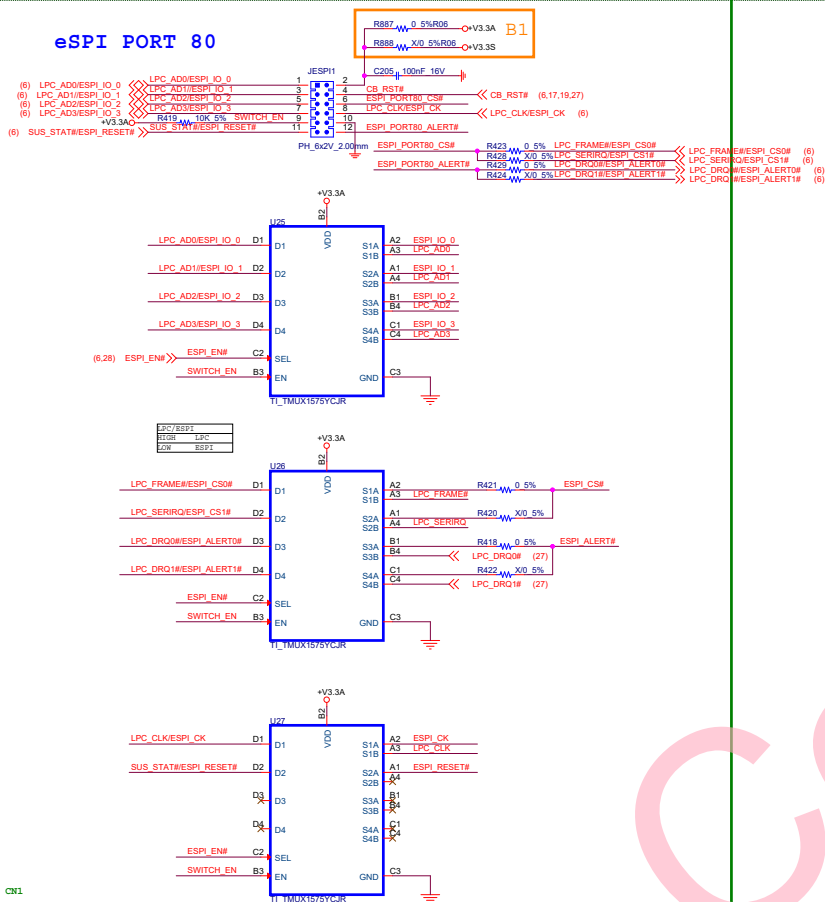
ALC892 EOL Change to ALC888 (pin to pin)

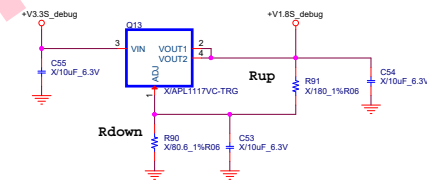
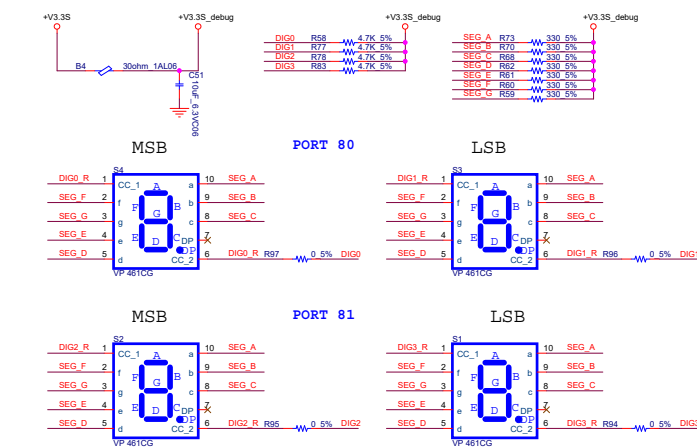
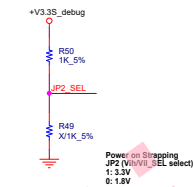
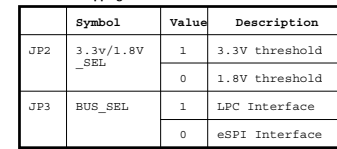


1. Analog and digital ground planes with a 60 to 100 mils gap
2. The digital and analog ground planes are tied together by a wide link, about 50mils



eSPI PORT 80



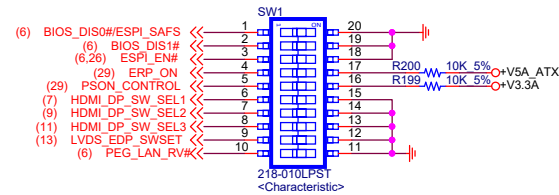


$$V_{out} = 1.25V * (1 + R_{down}/R_{up})$$

$$1.25 \times (1 + (80.6/180)) = 1.809 V$$

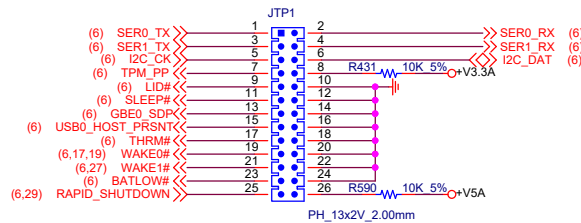
SW1 Setting

	Function	OFF	ON
1	BIOS ROM select	Default	
2	BIOS ROM select	Default	
3	LPC/eSPI select	LPC	eSPI
4	ERP setting	ERP OFF	ERP ON
5	PSON control	S3	Power button
6	DP/HDMI select1 (optional)	HDMI1	DP1
7	DP/HDMI select2 (optional)	HDMI2	DP2
8	DP/HDMI select3 (optional)	HDMI3	DP3
9	LVDS/eDP select (optional)	eDP	LVDS
10	PCIe16 reverse select	Normal	Reverse



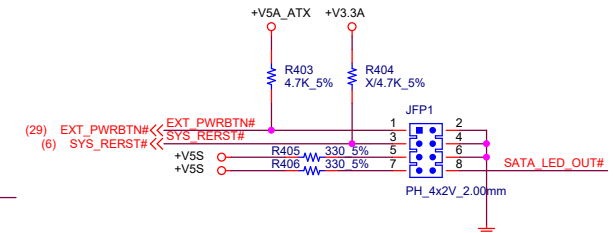
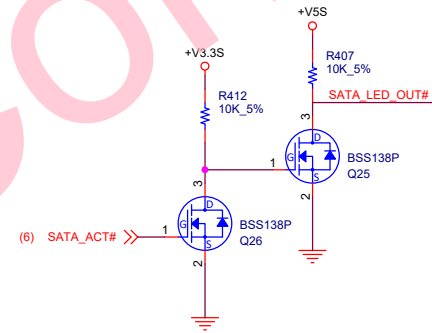
ESPI_EN#	BIOS_DIS0#	BIOS_DIS1#	Boot Bus	BBS	Chipset ESPI_CS0# Destination	Carrier ESPI_CS0# Pin	Chipset SPI_CS# Destination	Module SPI_CS#	Carrier SPI_CS# Pin	SPI Descriptor	Ref to Images Above	Notes
1	0	0	SPI	0	-	-	Carrier	Module	SPI1	Module	A	MAFS on Module LPC bus enabled
1	0	1	SPI	0	-	-	Module	Carrier	SPI0	Carrier	B	MAFS on Carrier LPC bus enabled
1	1	0	-	0	-	-	-	-	High	-	-	Not used - was FWH
1	1	1	SPI	0	-	-	Module	Module	High	Module	A	MAFS on Module LPC bus enabled
0	0	0	SPI	0	-	-	Carrier	Module	SPI1	Module	C	MAFS on Module ESPI bus enabled
0	0	1	SPI	0	-	-	Module	Carrier	SPI0	Carrier	D	MAFS on Carrier ESPI bus enabled
0	1	0	eSPI	1	Module	-	-	-	SPI0	Module	E	SAFS and BMC on Module ESPI bus enabled
0	1	1	eSPI	1	Carrier	Chipset ESPI_CS0#	-	-	SPI0	Carrier	F	SAFS and BMC on Carrier ESPI bus enabled

Test position



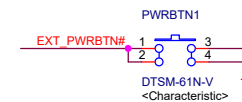
Function	Pin define
Serial port0	1 SER0_TX 2 SER0_RX
Serial port1	3 SER1_TX 4 SER1_RX
I2C	5 I2C_CK 6 I2C_DAT
TPM_PP	7 TPM_PP 8 +V3.3A
LID switch	9 LID# 10 GND
Sleep button	11 SLEEP# 12 GND
IEEE 1588 SDP	13 GBEO_SDP 14 GND
USB0_HOST_PRSENT	15 USB0_HOST_PRSENT 16 GND
Over-temp	17 THRM# 18 GND
PCI Express wake up	19 WAKE0# 20 GND
General wake up	21 WAKE1# 22 GND
Battery low	23 BATLOW# 24 GND
Rapid Shutdown	25 RAPID_SHUTDOWN 26 +V5A

Front panel

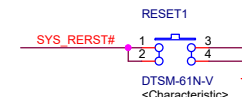


Function	Pin define
Power button	1 PWRBTN# 2 GND
Reset button	3 RERST# 4 GND
Power LED	5 +V5S 6 GND
SATA LED	7 +V5S 8 SATA_LED#

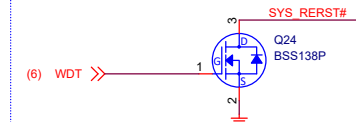
Power button



Reset button



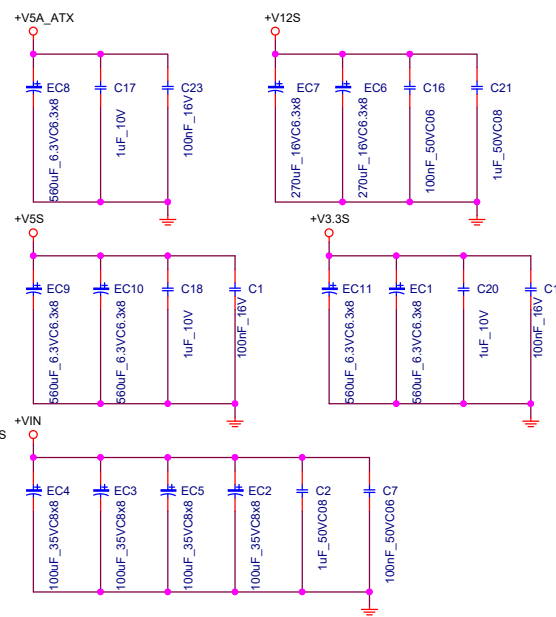
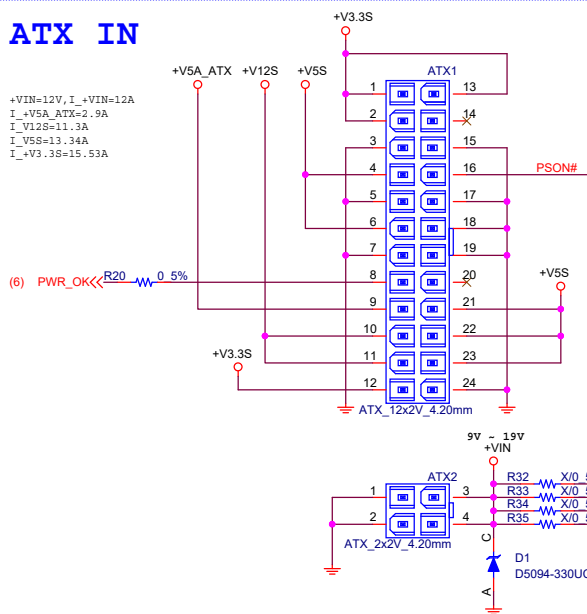
WDT



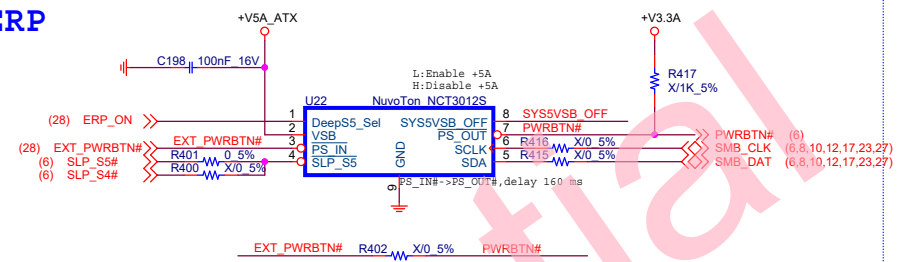
avalue Technology Inc.		Confidential	
Project Name	Module Number	Rev	?
EEV-EX16	EEV-EX16		
Size	Title	Rev	
A3	CONTROL, SETTING, TEST	B1	
Date:	Wednesday, September 21, 2022	Sheet	28 of 30

ATX IN

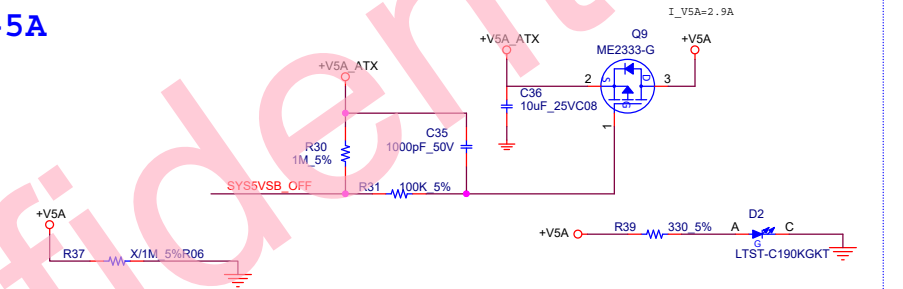
+VIN=12V, I_{VIN}=12A
I_{V5A_ATX}=2.9A
I_{V12S}=11.3A
I_{V5S}=13.34A
I_{V3.3S}=15.53A



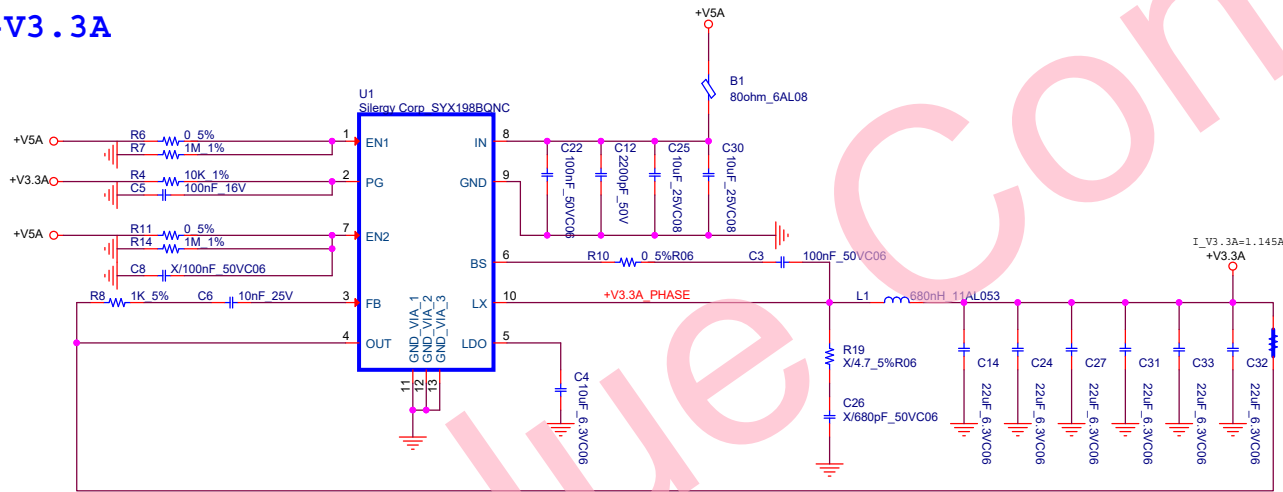
ERP



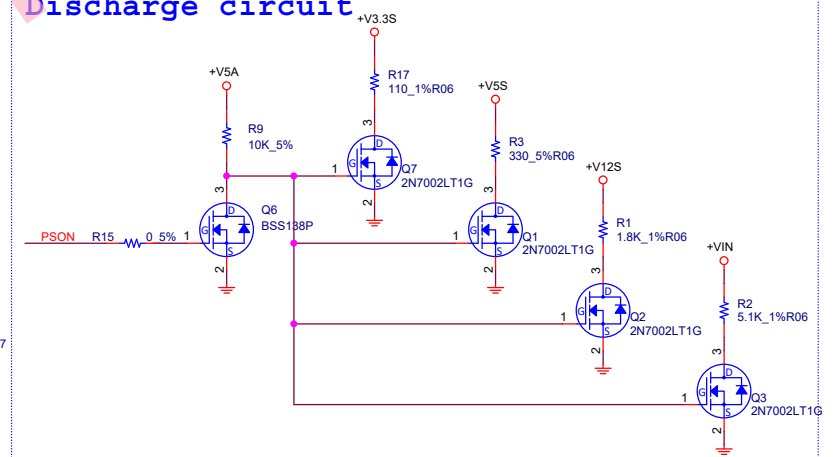
+5A



+V3.3A

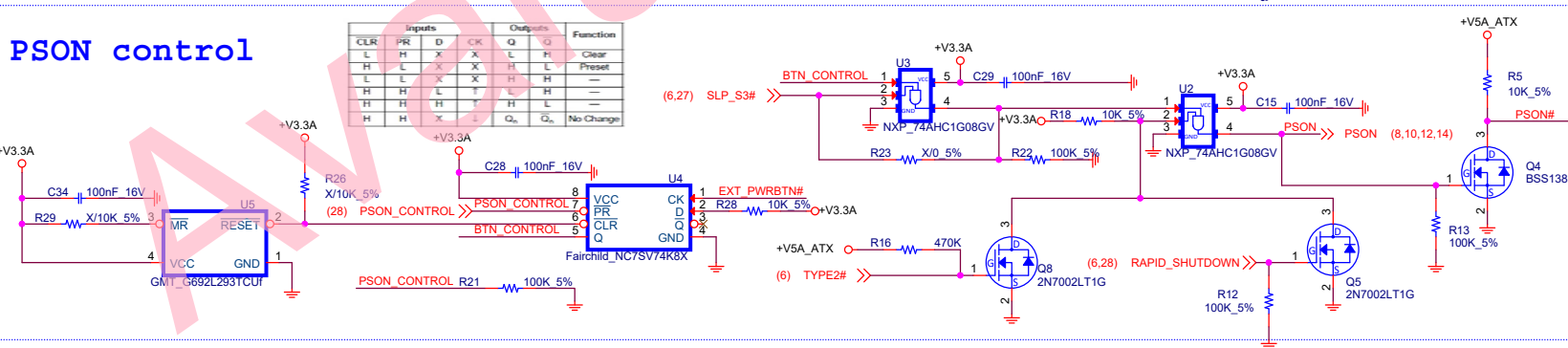


Discharge circuit



PSON control

Inputs				Outputs				Function
CLR	PR	D	CK	Q	L	H	Q	
L	H	X	X	X	L	H	L	Clear
H	L	X	X	X	L	H	H	Preset
L	L	X	X	X	H	H	L	---
H	H	X	X	X	H	H	H	---
H	H	X	X	X	L	H	L	---
H	H	X	X	X	L	H	H	---
H	H	X	X	X	L	L	L	No Change



Modify History

EEV-EX16 Rev:B0

EE:Tony

Item	Description	Track or reason	Page	Date
1.	Remove U27 U43 U25 U38 U26 U39 Q34 Q39 Q35,Add U94 U93 U97	HDMI Level Shift.	08 、 10 、 12	2020/11/04
2.	PCie X4 X16 Conn Gen4	Gen3 Update to Gen4	15 、 16	2020/11/04
3.	Remove U17 , Add U107	PCie Clock bUFFER Gen3 Update to Gen4	15	2020/11/04
4.	ADD U99 U100 U101 U102	USB Redriver	17 、 18	2020/11/04
5.	Change USB LAN1A 、 USB LAN1B 、 USB LAN1C	Update to LAN2.5G USB3.2	18 、 20	2020/11/04
6.	ADD USB2 2	USB Pin Header	19	2020/11/04
7.	Change USB3_1	4 Port To 2 Port	17	2020/11/04
8.	Remove U10 U8 U9 U11 U12 U13 Q12 Q19 , Add U92	For eSPI	23 、 24	2020/11/04

EEV-EX16 Rev:B01

EE:Tony

Item	Description	Track or reason	Page	Date
1.	Add C1459 C1460 C1461	For EMI,ESD Solution	19 、 20 、 22	2021/08/19
2.	Remove R382 R426 R366 R365 R378 R422 R355 R354 R379 R423 R360 R359	Adjust HDMI dB	08 、 10 、 12	2021/08/19
3.	Add U108 U109 U110 U111 U112 U113 U114 U115 U116 U117 U118 U119	PCie Redirver	15 、 16 、 18	2021/11/07
4.	Add U120	eSPI to LPC	26	2021/11/07

EEV-EX16 Rev:B1

EE:Tony

Item	Description	Track or reason	Page	Date
1.	Remove R868,R869	SUSC#,SUSB# need pull down	26	2022/08/03
2.	Remove R72	Remove eSPI_RESET	27	2022/08/03
3.	Add R884,R885,R886	SUSC#,SUSB# pull down	26	2022/08/03
4.	JESPI1 Pin2 contact +V3.3A	eSPI need contact standby power	26	2022/08/03