M.2 SSD adapter board (Ava)

PCB REV: A
PCBA REV: A2A
SCH Rev: 0.10
LAST UPDATE: 20170712

Cover Page

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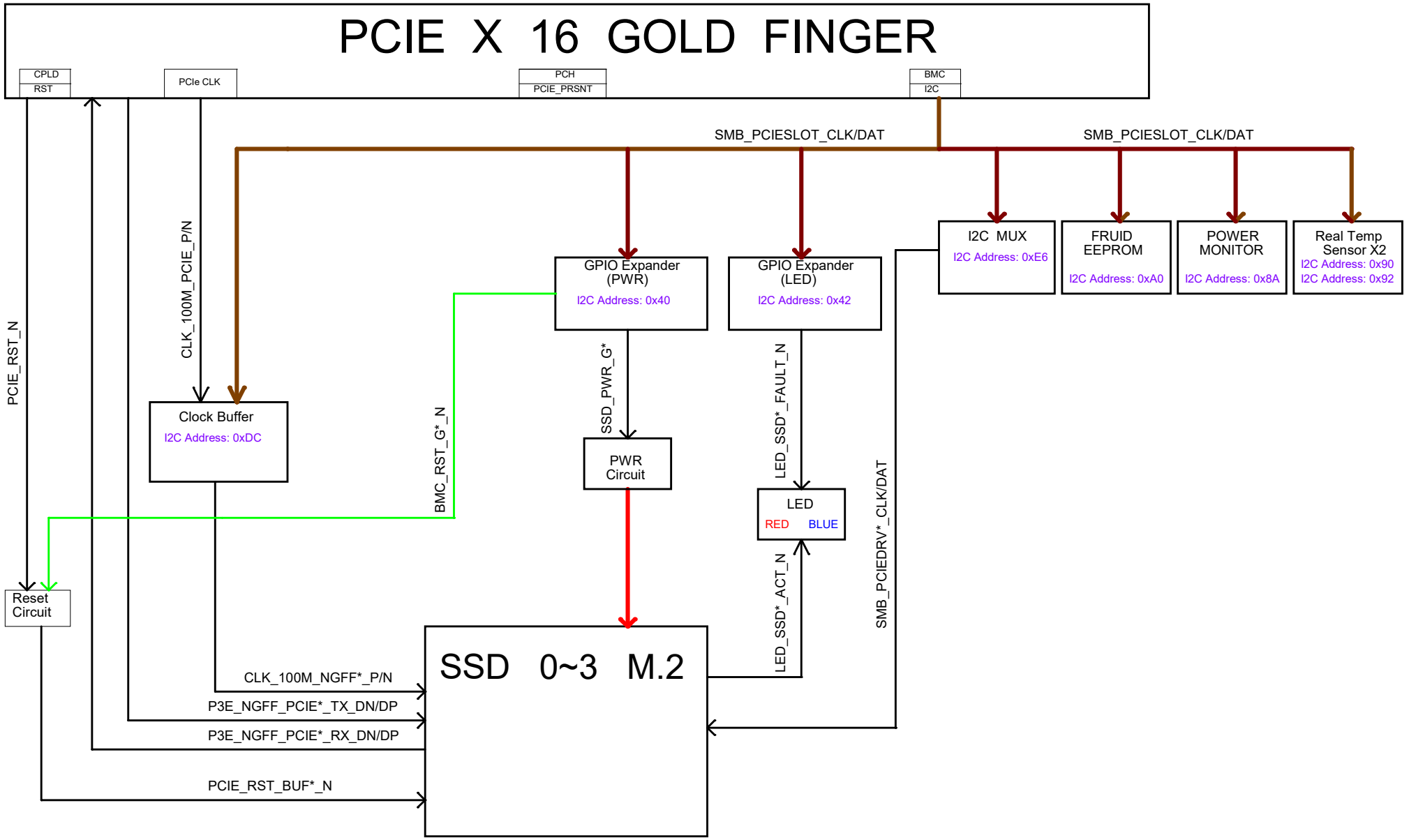

Block Diagram

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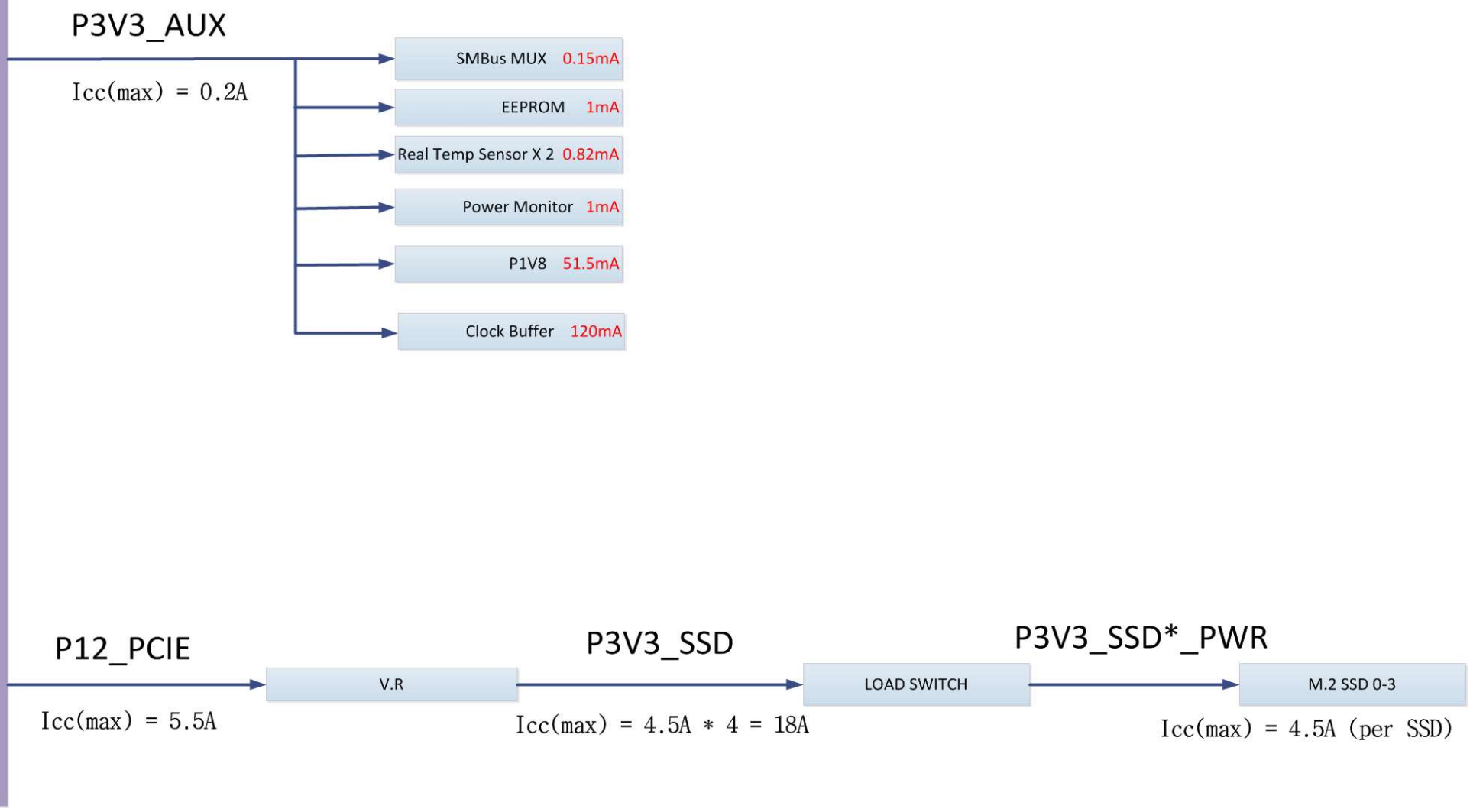
PCIE X 16 GOLD FINGER



Power Map

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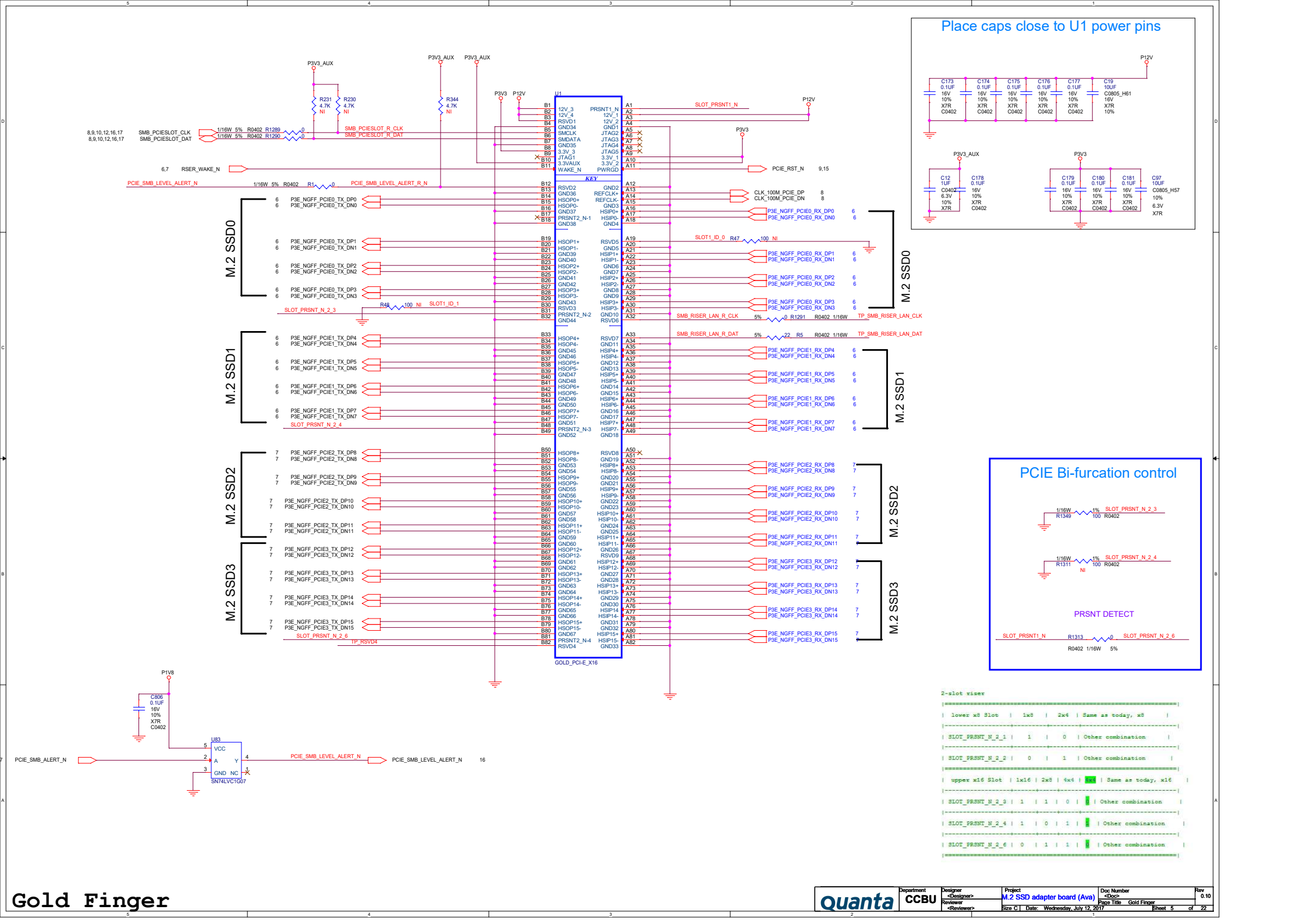
Place caps close to U1 power pins
P12V
C173 0.1UF 16V 10% X7R C0402
C174 0.1UF 16V 10% X7R C0402
C175 0.1UF 16V 10% X7R C0402
C176 0.1UF 16V 10% X7R C0402
C177 0.1UF 16V 10% X7R C0402
C19 10UF C0805_H61 16V 10% X7R
P3V3_AUX
C12 1UF C0402 6.3V 10% X7R
C178 0.1UF 16V 10% X7R C0402
P3V3
C179 0.1UF 16V 10% X7R C0402
C180 0.1UF 16V 10% X7R C0402
C181 0.1UF 16V 10% X7R C0402
C97 10UF C0805_H57 10% 6.3V X7R
U1
GOLD_PCI-E_X16
KEY
M.2 SSD0
M.2 SSD1
M.2 SSD2
M.2 SSD3
PCIE Bi-furcation control
PRSNT DETECT
2-slot riser
lower x8 Slot | 1x8 | 2x4 | Same as today, x8
SLOT_PRSNT_N_2_1 | 1 | 0 | Other combination
SLOT_PRSNT_N_2_2 | 0 | 1 | Other combination
upper x16 Slot | 1x16 | 2x8 | 4x4 | 1x4 | Same as today, x16
SLOT_PRSNT_N_2_3 | 1 | 1 | 0 | 0 | Other combination
SLOT_PRSNT_N_2_4 | 1 | 0 | 1 | 0 | Other combination
SLOT_PRSNT_N_2_6 | 0 | 1 | 1 | 0 | Other combination
U83
SN74LVC1G07
P1V8
C806 0.1UF 16V 10% X7R C0402
PCIE_SMB_ALERT_N
PCIE_SMB_LEVEL_ALERT_N
Gold Finger
Quanta
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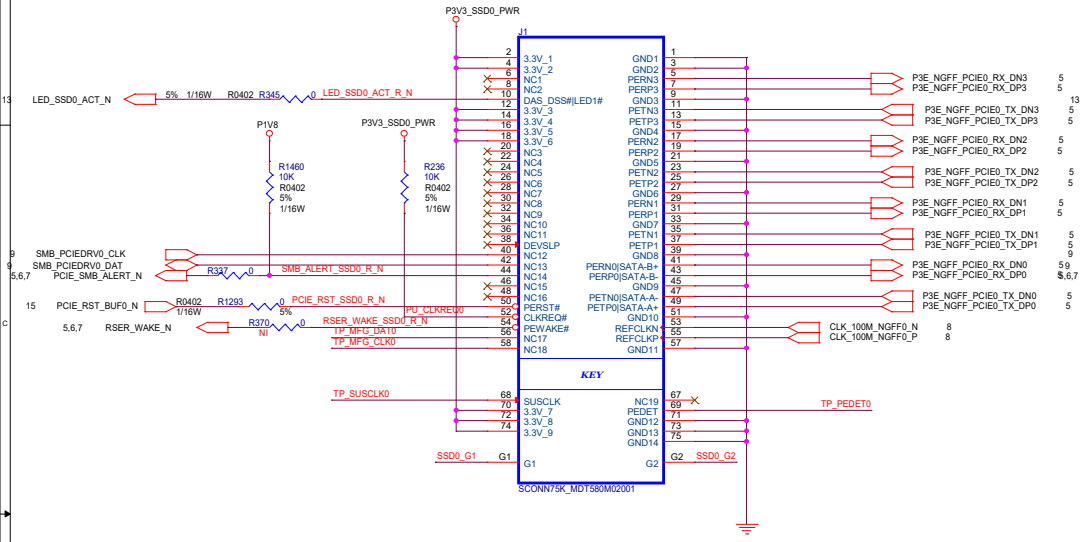
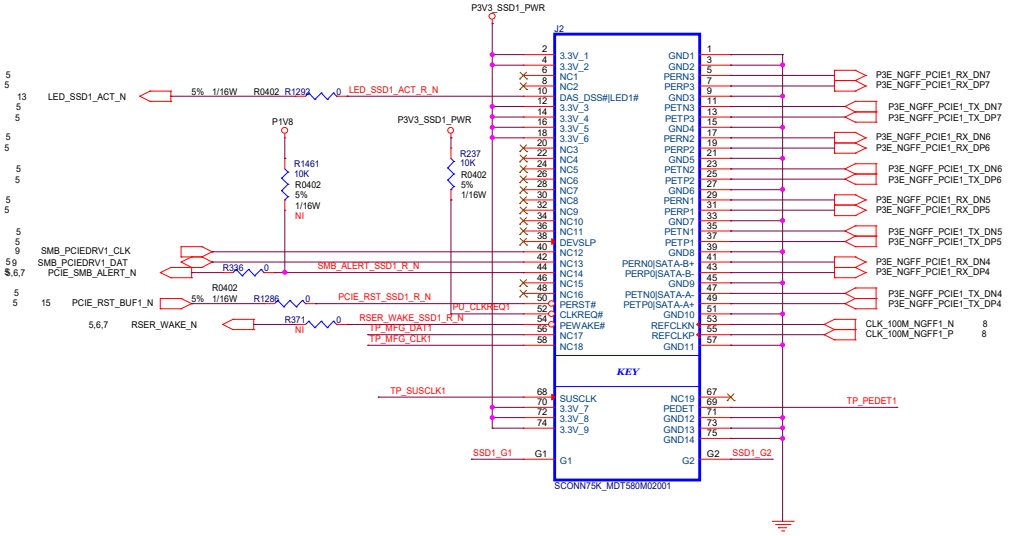
SSD0 M.2

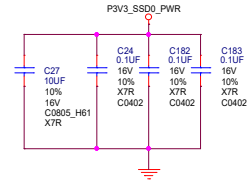


SSD1 M.2

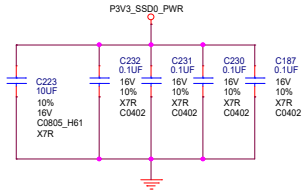


Place caps close to J1 power pins

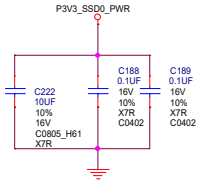
PLACE CLOSE TO PINS 70,72,74



PLACE CLOSE TO PINS 12,14,16,18

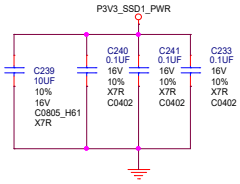


PLACE CLOSE TO PINS 2&4

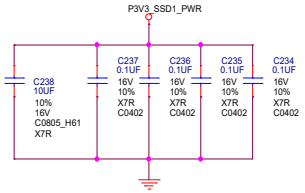


Place caps close to J2 power pins

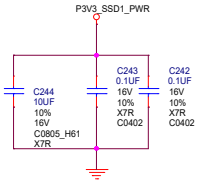
PLACE CLOSE TO PINS 70,72,74



PLACE CLOSE TO PINS 12,14,16,18



PLACE CLOSE TO PINS 2&4



M.2 SSD Slot0/1

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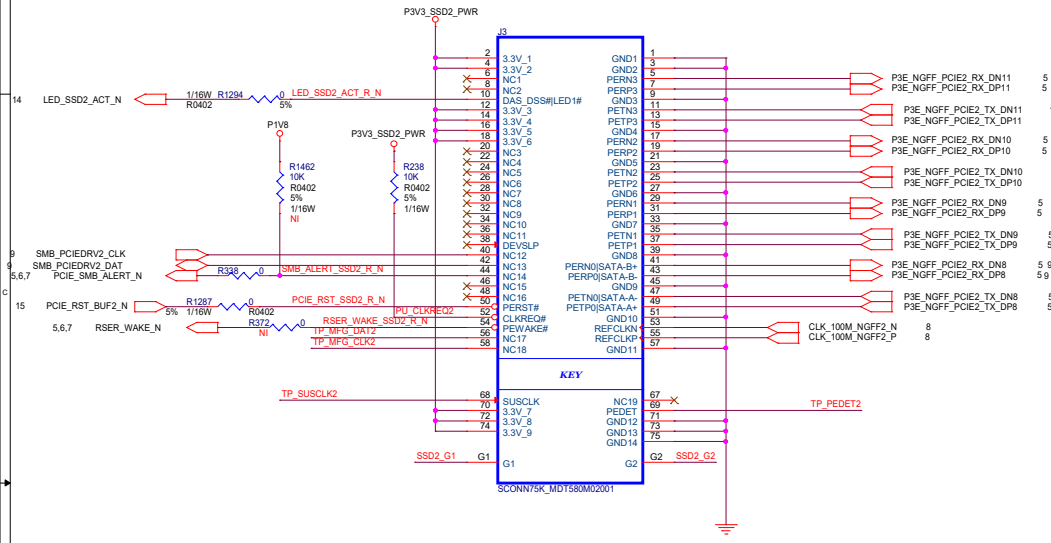
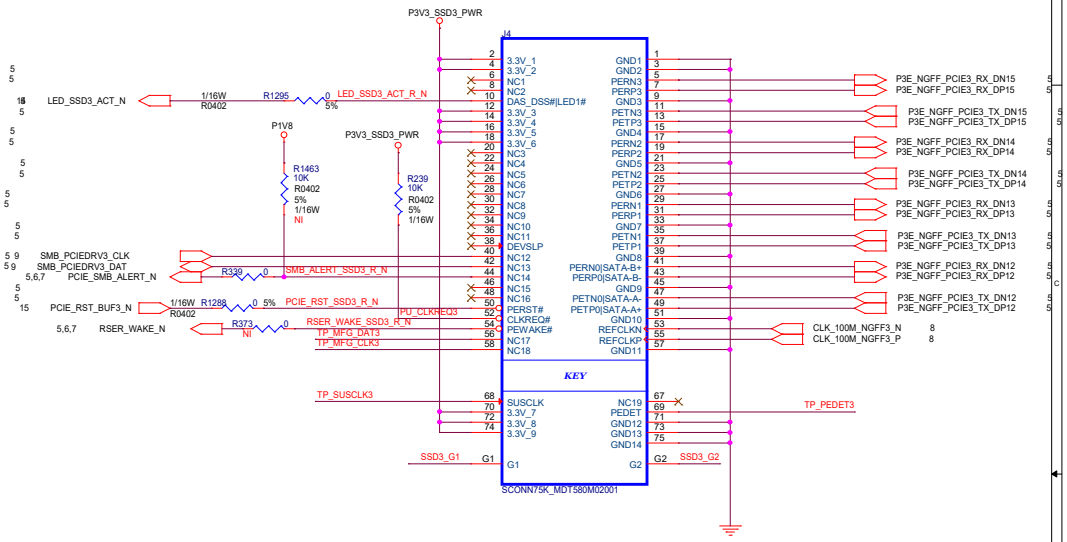
SSD2 M.2

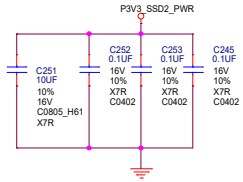


SSD3 M.2

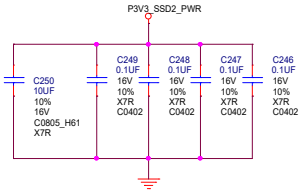


Place caps close to J3 power pins

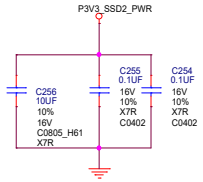
PLACE CLOSE TO PINS 70,72,74



PLACE CLOSE TO PINS 12,14,16,18

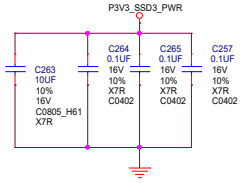


PLACE CLOSE TO PINS 2&4

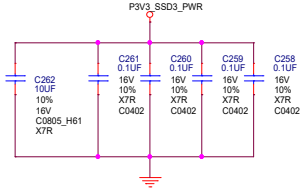


Place caps close to J4 power pins

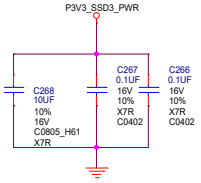
PLACE CLOSE TO PINS 70,72,74



PLACE CLOSE TO PINS 12,14,16,18



PLACE CLOSE TO PINS 2&4



M.2 SSD Slot2/3

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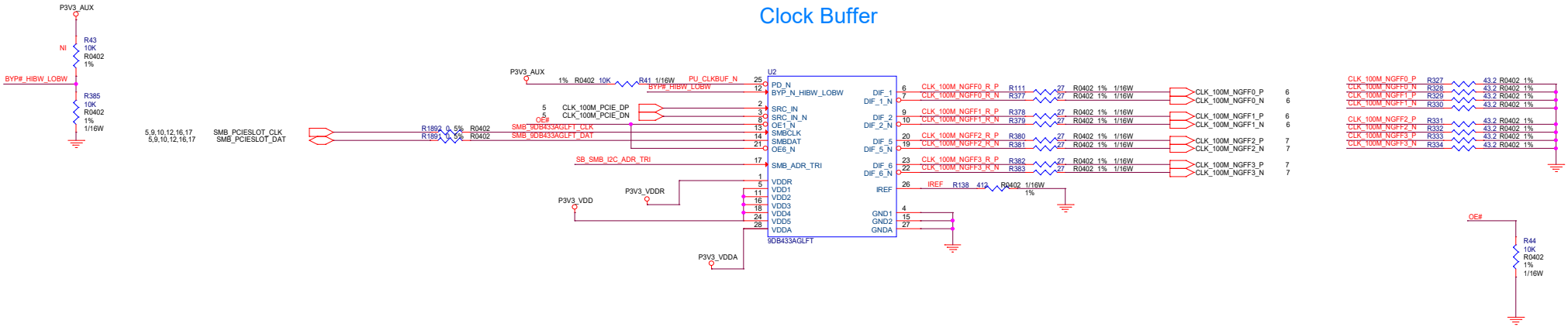
PLL Operating Mode Readback Table

BYP#_LOBW_HIBW	MODE	Byte0, bit 3	Byte 0 bit 1
Low	Bypass	0	0
Mid	PLL 100M Hi BW	1	0
High	PLL 100M Low BW	0	1

Clock Buffer



SMBus Address Selection and Readback

SMB_ADR_tri	Address
Low	DA/DB
Mid	DC/DD
High	D8/D9

Tri-Level Input Logic Pins

State of Pin	Voltage
Low	<0.8V
Mid	1.2<Vin<1.8V
High	Vin > 2.0V

Clock Buffer

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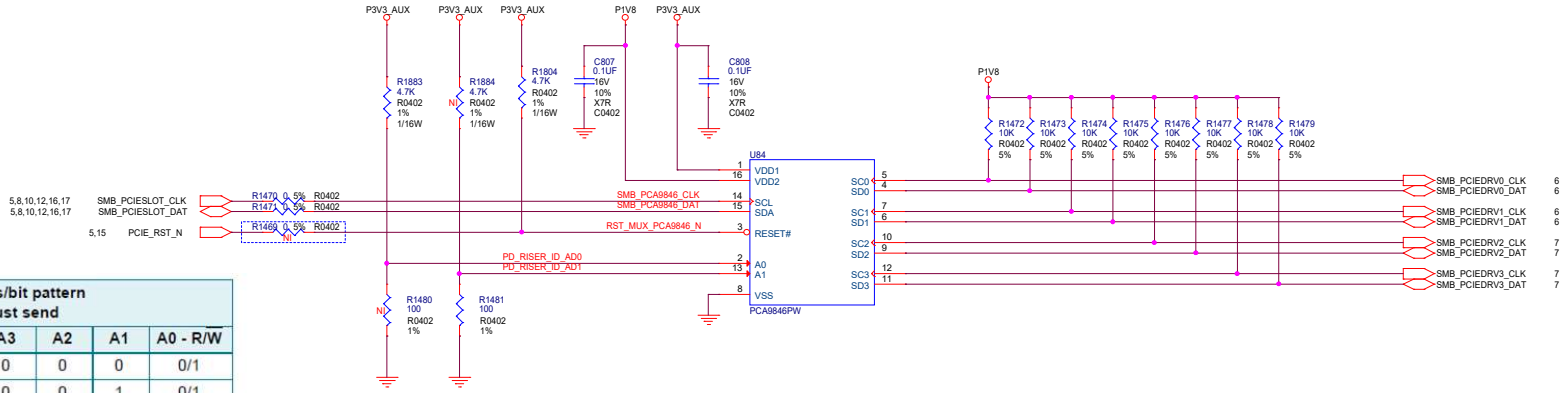
PCA9846 Address Define

1	X	1	X	X	X	X	R/W

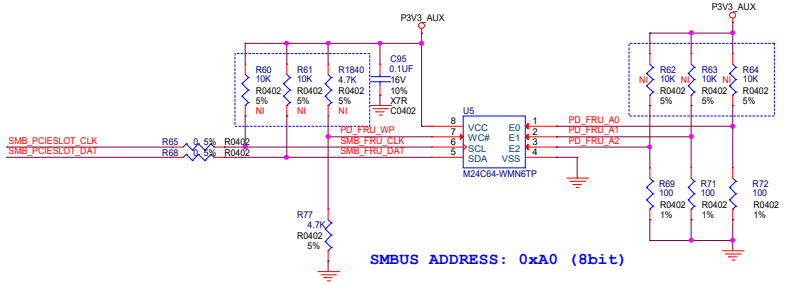
X = programmable by hardware



SMBUS ADDRESS: 0xE6 (8bit)

PCA9846 address pins		8-bit I²C-bus address	Slave address/bit pattern master must send							
A1	A0		A7	A6	A5	A4	A3	A2	A1	A0 - R/W
0	SCL	0xE0h	1	1	1	0	0	0	0	0/1
0	0	0xE2h	1	1	1	0	0	0	1	0/1
0	SDA	0xE4h	1	1	1	0	0	1	0	0/1
0	1	0xE6h	1	1	1	0	0	1	1	0/1
1	SCL	0xE8h	1	1	1	0	1	0	0	0/1
1	0	0xEAh	1	1	1	0	1	0	1	0/1
1	SDA	0xECh	1	1	1	0	1	1	0	0/1
1	1	0xEEh	1	1	1	0	1	1	1	0/1
SCL	SCL	0xB0h	1	0	1	1	0	0	0	0/1
SCL	0	0xB2h	1	0	1	1	0	0	1	0/1
SCL	SDA	0xB4h	1	0	1	1	0	1	0	0/1
SCL	1	0xB6h	1	0	1	1	0	1	1	0/1
SDA	SCL	0xB8h	1	0	1	1	1	0	0	0/1
SDA	0	0xBAh	1	0	1	1	1	0	1	0/1
SDA	SDA	0xBCh	1	0	1	1	1	1	0	0/1
SDA	1	0xBEh	1	0	1	1	1	1	1	0/1

FRU



SMBUS ADDRESS: 0xA0 (8bit)

M24C64 Address Setting

1	0	1	0	A2	A1	A0

Fixed — hardware selectable

SMBus MUX

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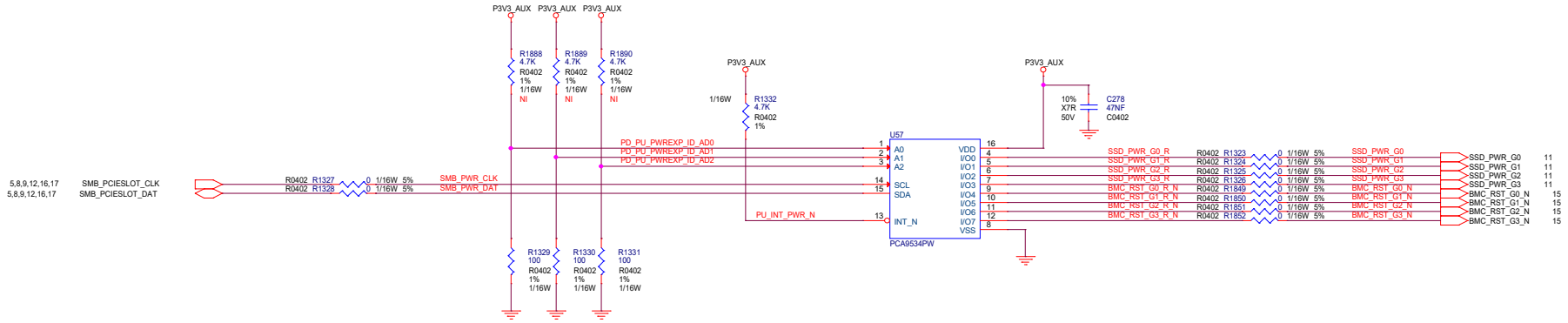
PCA9534PW Address Define

0	1	0	0	A2	A1	A0
Fixed						

Riser Address Setting

0	1	0	0	0	0	0

Fix on riser card



I2C Address: 0x40 (8bit)

GPIO Expander for PWR

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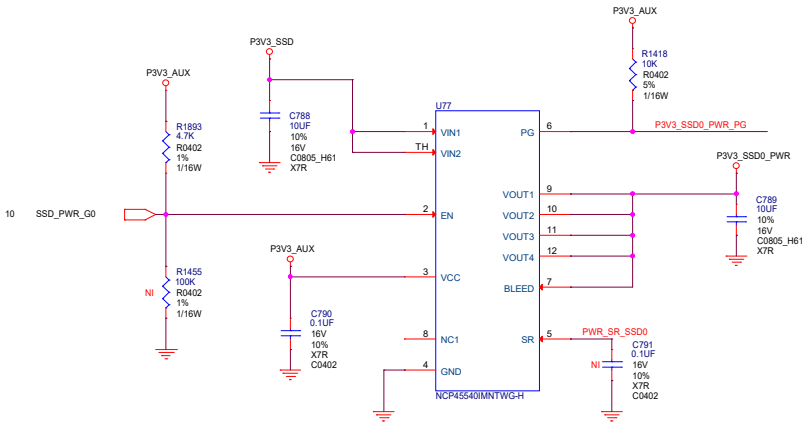
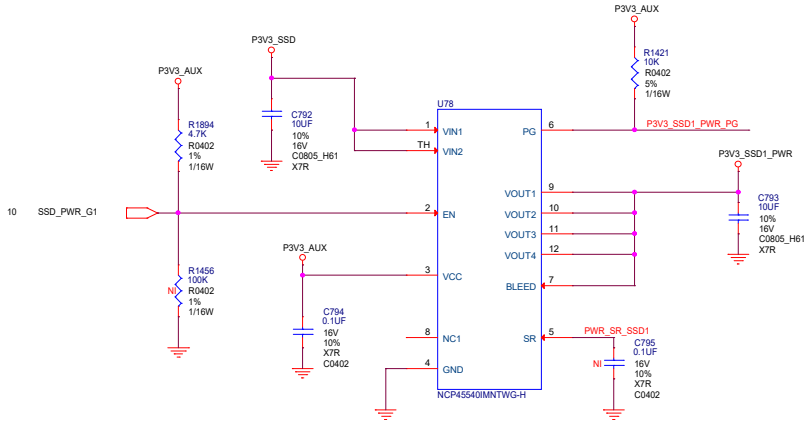
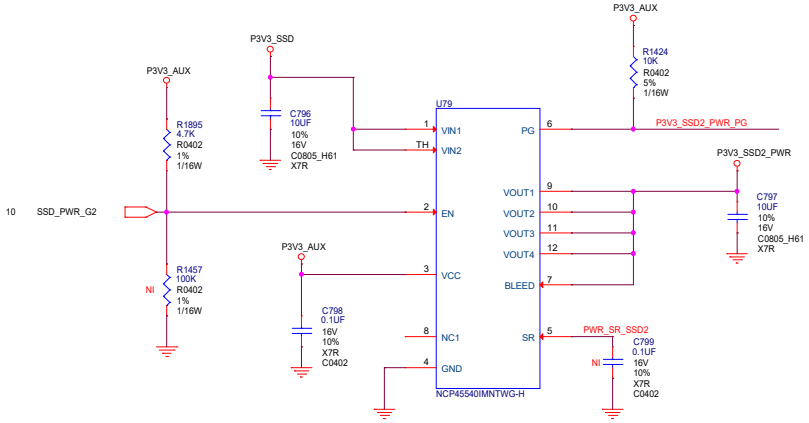
PWR for SSD0



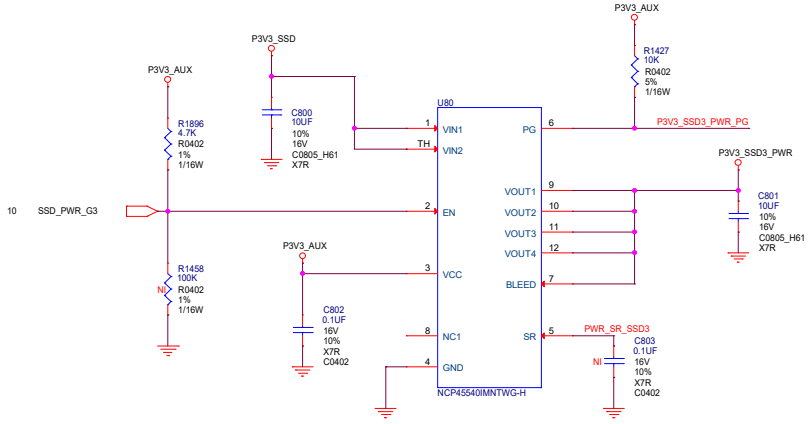
PWR for SSD1



PWR for SSD2



PWR for SSD3



PWR_G0_G3

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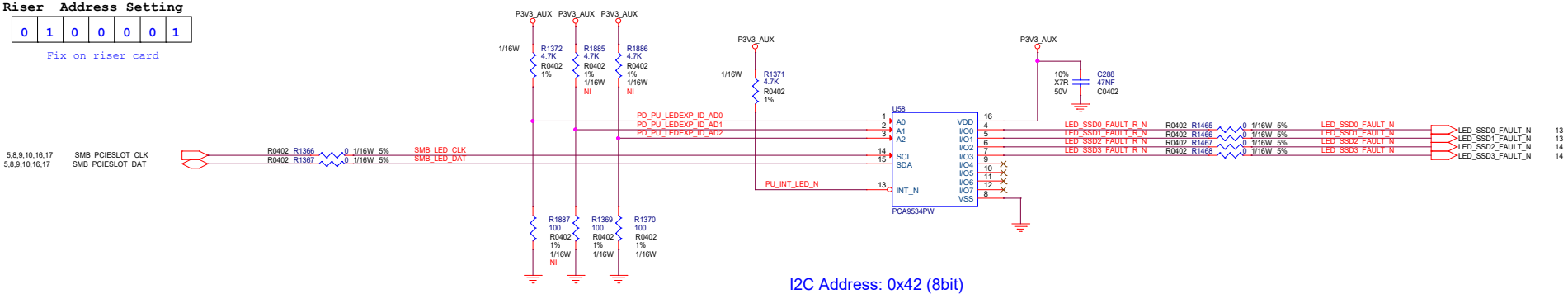
PCA9534PW Address Define

0	1	0	0	A2	A1	A0
Fixed						

Riser Address Setting

0	1	0	0	0	0	1

Fix on riser card



I2C Address: 0x42 (8bit)

GPIO Expander for LED

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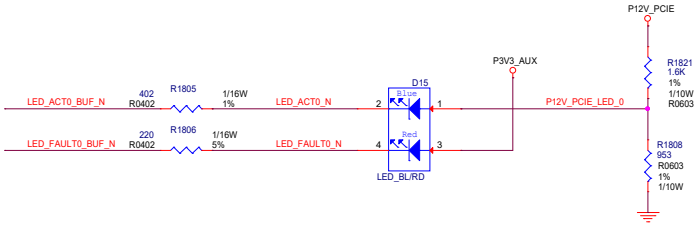
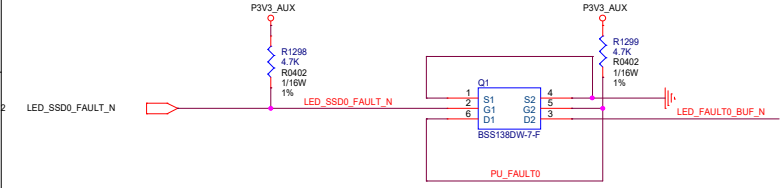
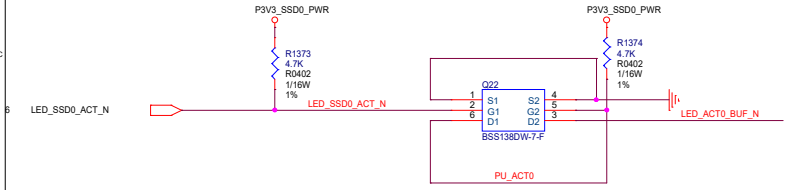
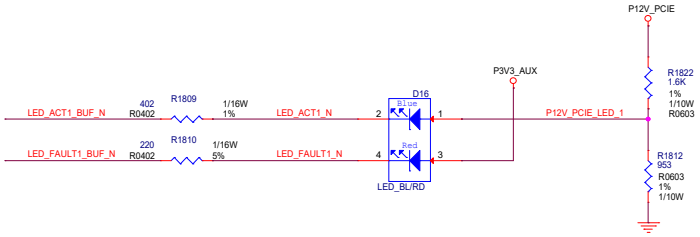
LED for SSD0

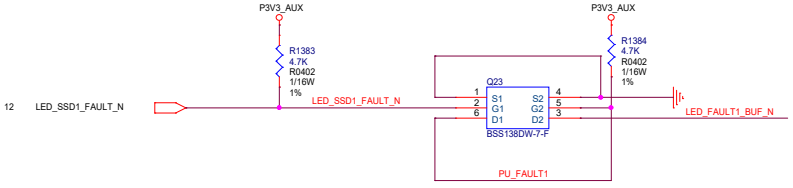


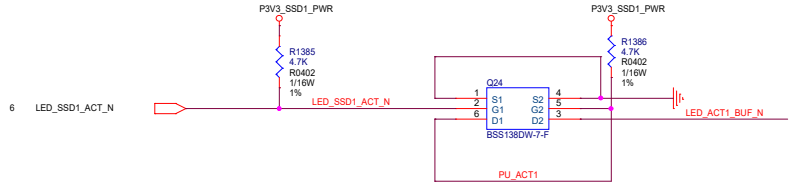




LED for SSD1







LED Circuit1

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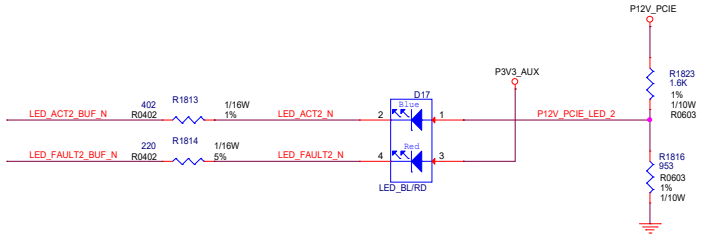
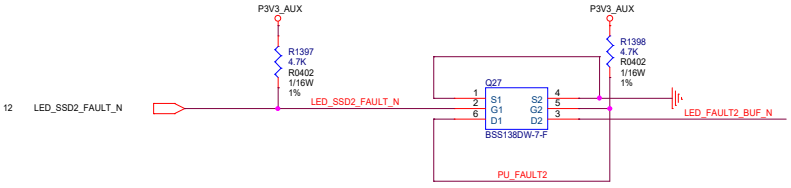
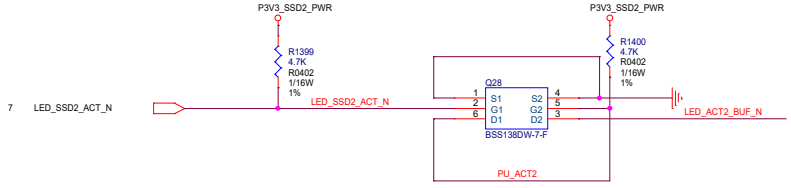
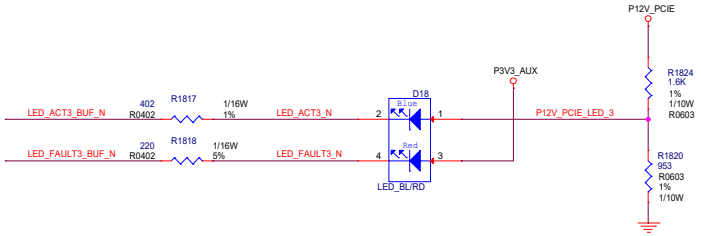
LED for SSD2

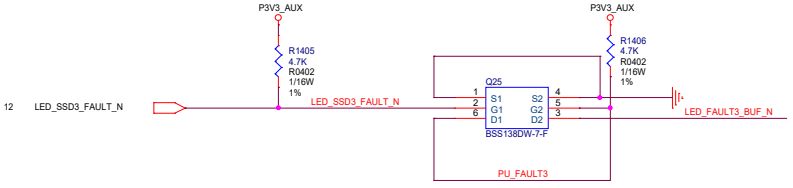


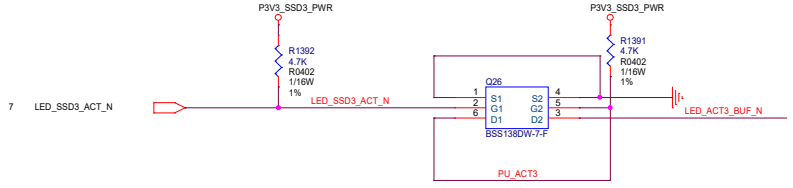




LED for SSD3







LED Circuit2

Quanta	Department: CCBU	Designer: <Designer>	Project: M.2 SSD adapter board (Ava)	Doc Number: <Doc>	Rev: 0.10
		Reviewer: <Reviewer>		Page Title: LED Circuit2	
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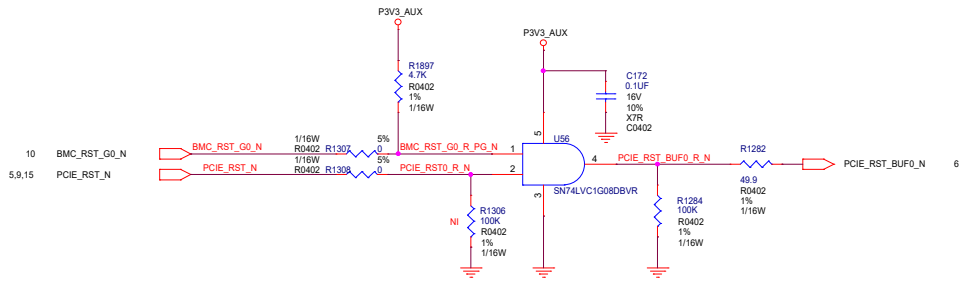
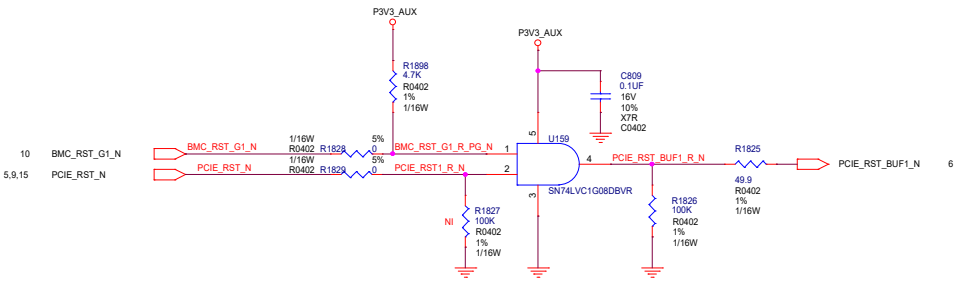
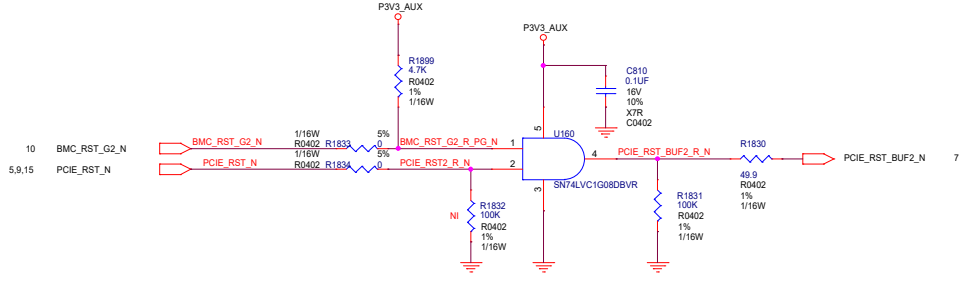
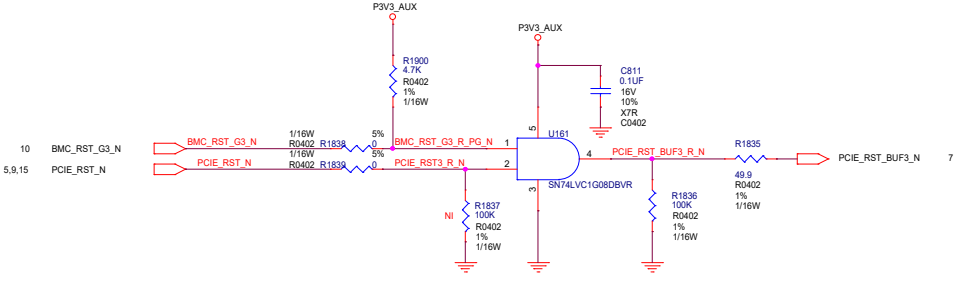
PCIE SSD RESET CIRCUIT









PCIE SSD RESET CIRCUIT

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		Reviewer: <Reviewer>	Page Title: PCIE SSD RESET CIRCUIT	
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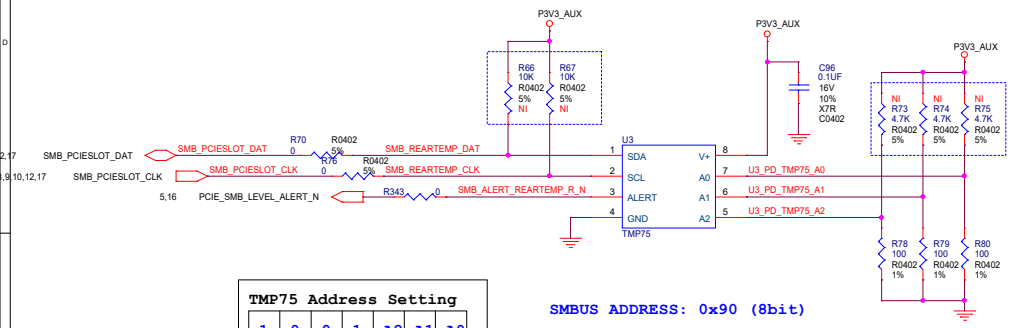
Rear Temp Sensor

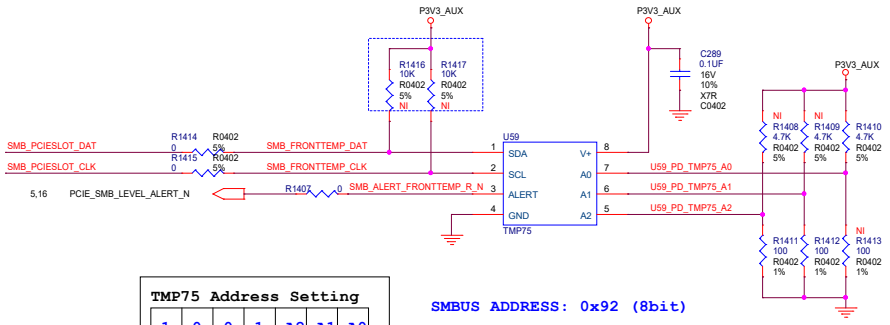


TMP75 Address Setting

1	0	0	1	A2	A1	A0
Fixed				hardware selectable		

SMBUS ADDRESS: 0x90 (8bit)

Front Temp Sensor



TMP75 Address Setting

1	0	0	1	A2	A1	A0
Fixed				hardware selectable		

SMBUS ADDRESS: 0x92 (8bit)

Thermal Sensor

Quanta	Department: CCBU	Designer: <Designer>	Project: M.2 SSD adapter board (Ava)	Doc Number: <Doc>	Rev: 0.10
		Reviewer: <Reviewer>		Page Title: Thermal Sensor	
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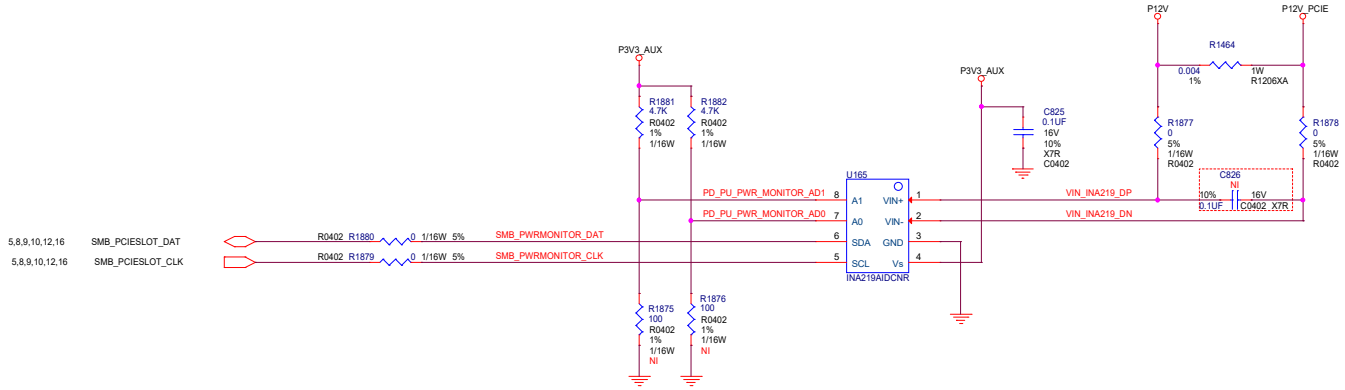
A1	A0	SLAVE ADDRESS
GND	GND	1000000
GND	V_{S+}	1000001
GND	SDA	1000010
GND	SCL	1000011
V_{S+}	GND	1000100
V_{S+}	V_{S+}	1000101
V_{S+}	SDA	1000110
V_{S+}	SCL	1000111
SDA	GND	1001000
SDA	V_{S+}	1001001
SDA	SDA	1001010
SDA	SCL	1001011
SCL	GND	1001100
SCL	V_{S+}	1001101
SCL	SDA	1001110
SCL	SCL	1001111

SMBUS ADDRESS: 0x8A (8bit)



POWER MONITOR

Quanta	Department: CCBU	Designer: <Designer>	Project: M.2 SSD adapter board (Ava)	Doc Number: <Doc> Rev: 0.10
		Reviewer: <Reviewer>	Page Title: POWER MONITOR	
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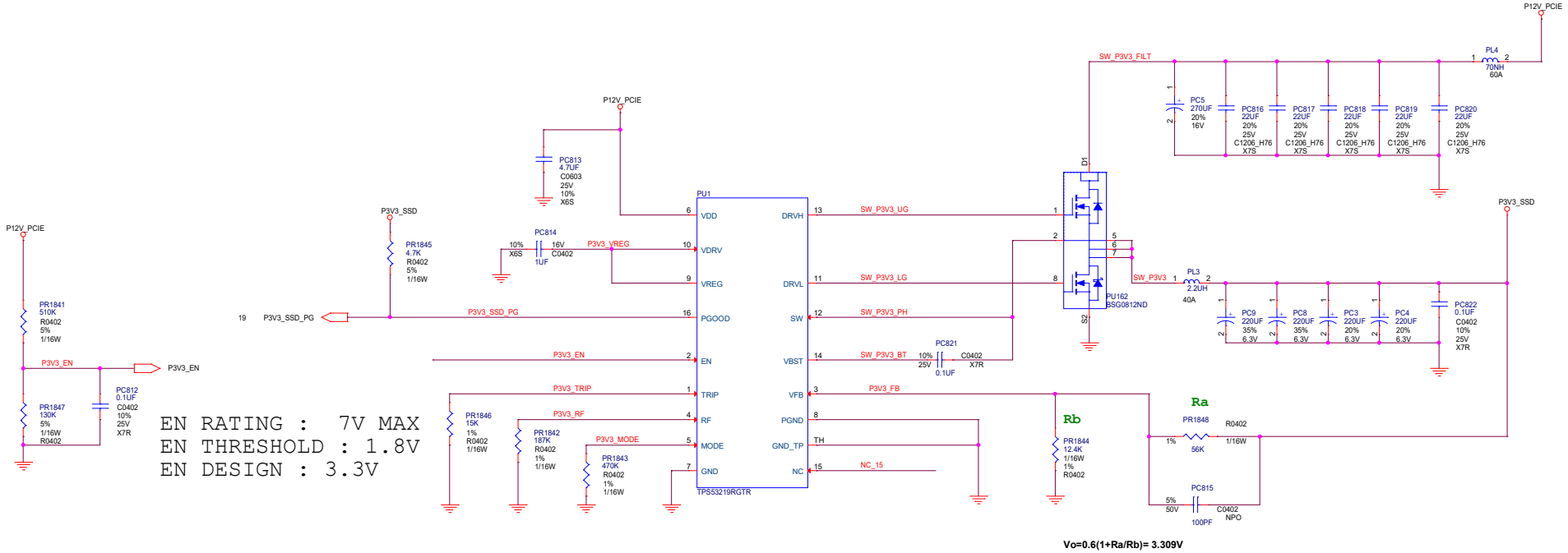
DESIGN NOTE:
OUTPUT VOLTAGE = 3.3V+/-5%
OUTPUT RIPPLE&NOISE< 50MV
TRANSIENT TOLERANCE=330MV
TDC = 5A
MAX. CURRENT = 18A
OVER-CURRENT PROTECTION (MAX RATING*1.3)=25A
CURRENT STEP = 0.5A
SLEW RATE = 0.5A/US
WORK FREQUENCY = 300KHZ
EFFICIENCY > 90% @ TDC



EN RATING : 7V MAX
EN THRESHOLD : 1.8V
EN DESIGN : 3.3V

Vo=0.6(1+Ra/Rb)= 3.309V

VR P3V3 SSD

Quanta	Department CCBU	Designer <Designer>	Project M.2 SSD adapter board (Ava)	Doc Number <Doc>	Rev 0.10
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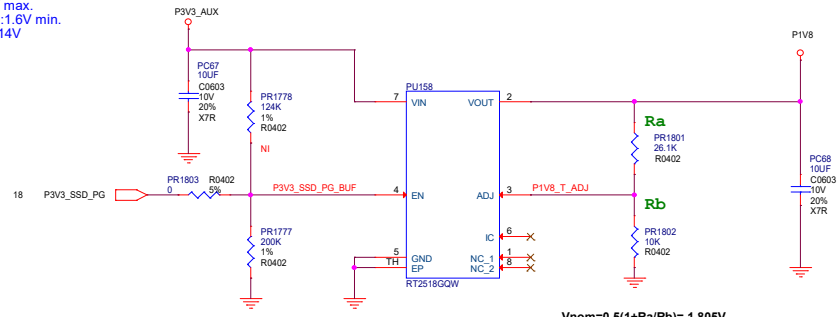
P1V8

P1V8 max. current=50mA

EN Rating:7V max.
EN Threshold:1.6V min.
EN Design:3.14V



CAD NOTE: Need more GND shapes by every L

Vnom=0.5(1+Ra/Rb)= 1.805V

PCBA_LABEL

WEEE

PB-E1

BARCODE

BARCODE

QUANTA_LOGO_LABEL

Laser LABEL

Dummy Symbol

Quanta	Department: CCBU	Designer: <Designer>	Project: M.2 SSD adapter board (Ava)	Doc Number: <Doc>	Rev: 0.10
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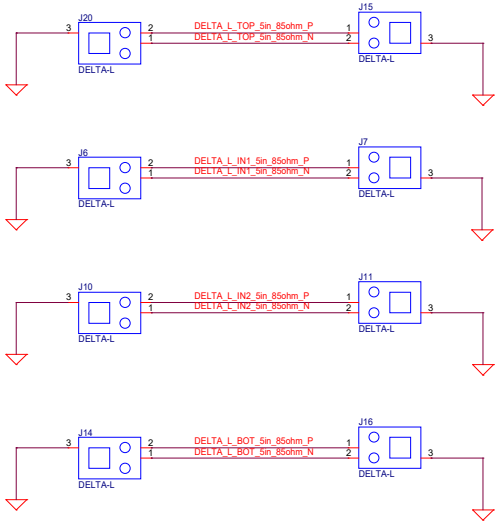
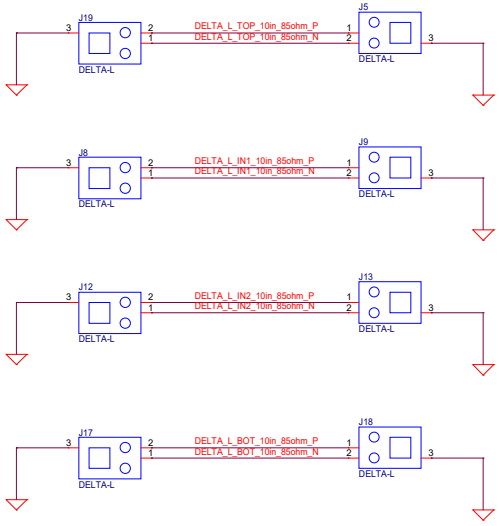
5 inch trace



10 inch trace



Loss Coupon

Quanta	Department: CCBU	Designer: <Designer>	Project: M.2 SSD adapter board (Ava)	Doc Number: <Doc>	Rev: 0.10
		Reviewer: <Reviewer>		Page Title: Loss Coupon	
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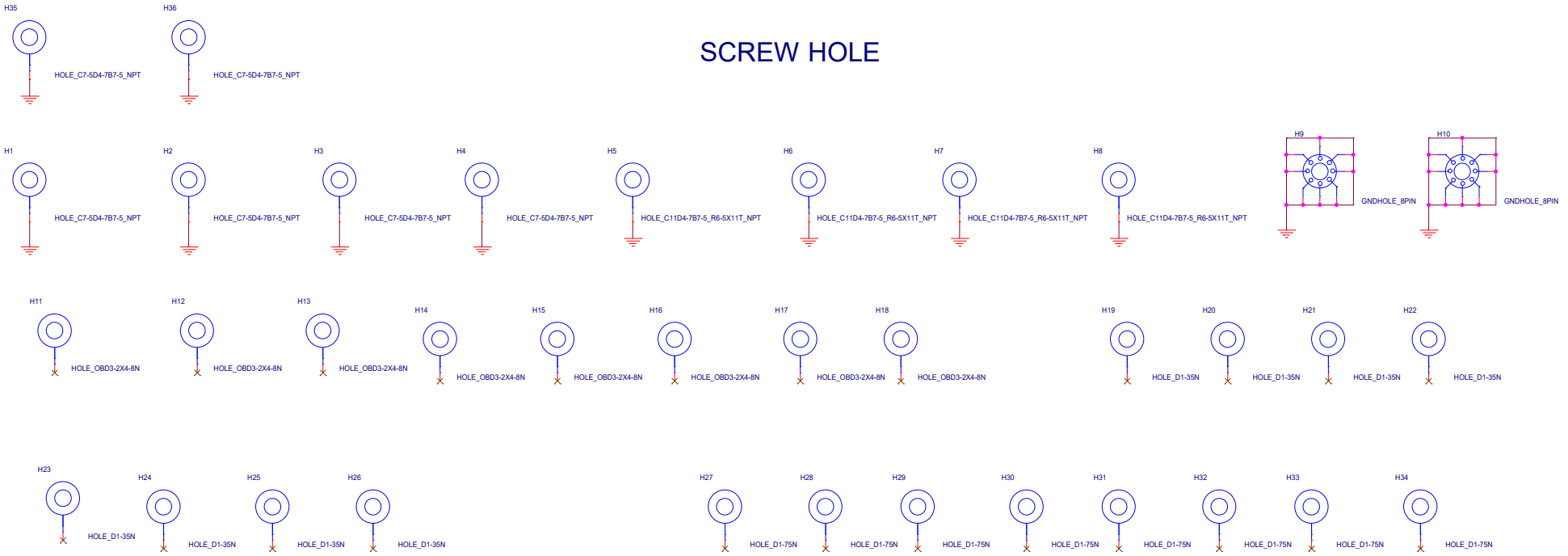
SCREW HOLE



SCREW HOLE

Quanta	Department: CCBU	Designer: <Designer>	Project: M.2 SSD adapter board (Ava)	Doc Number: <Doc>	Rev: 0.10
		Reviewer: <Reviewer>		Page Title: SCREW HOLE	
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