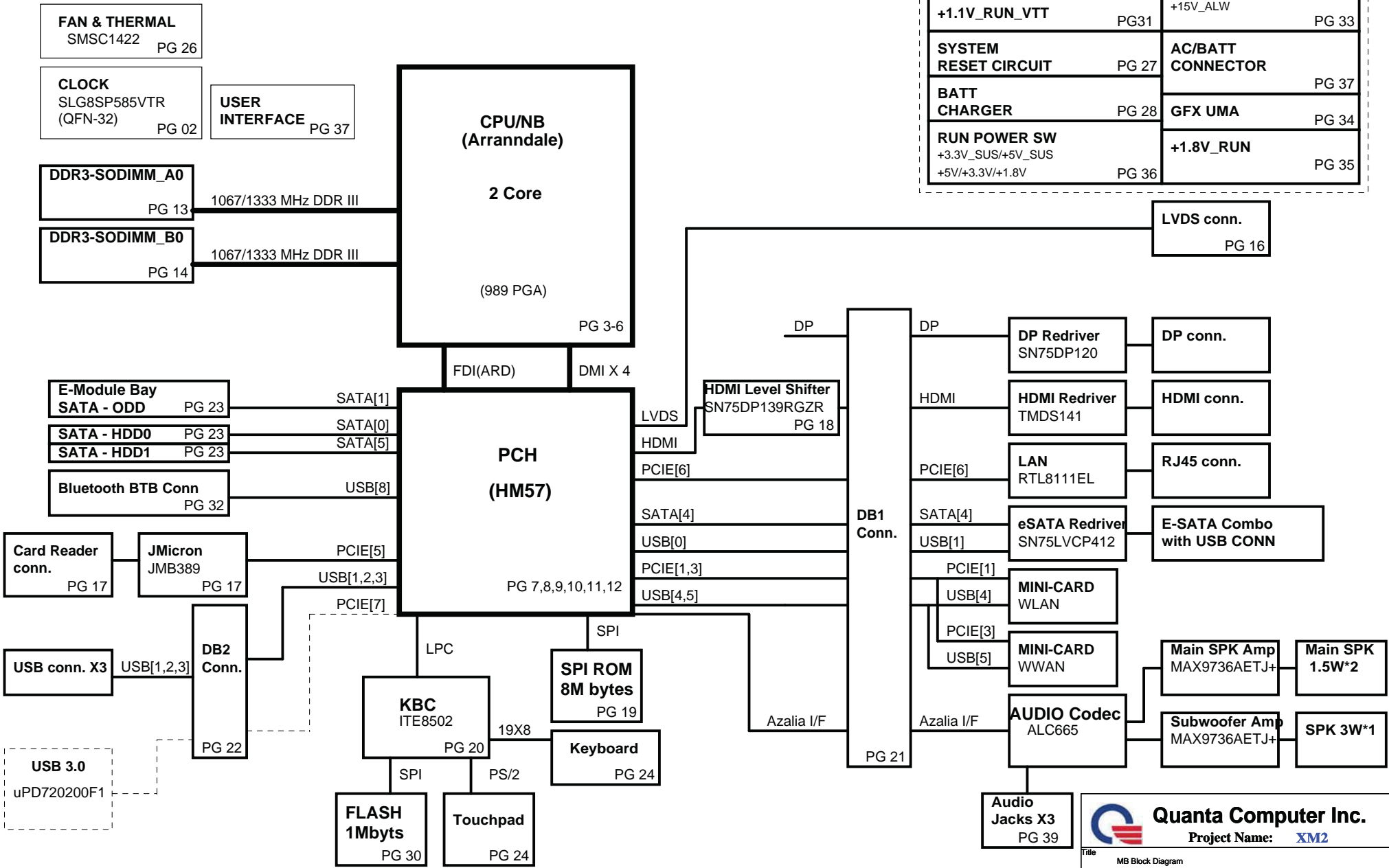


# System Block Diagram of GM7



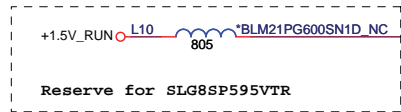
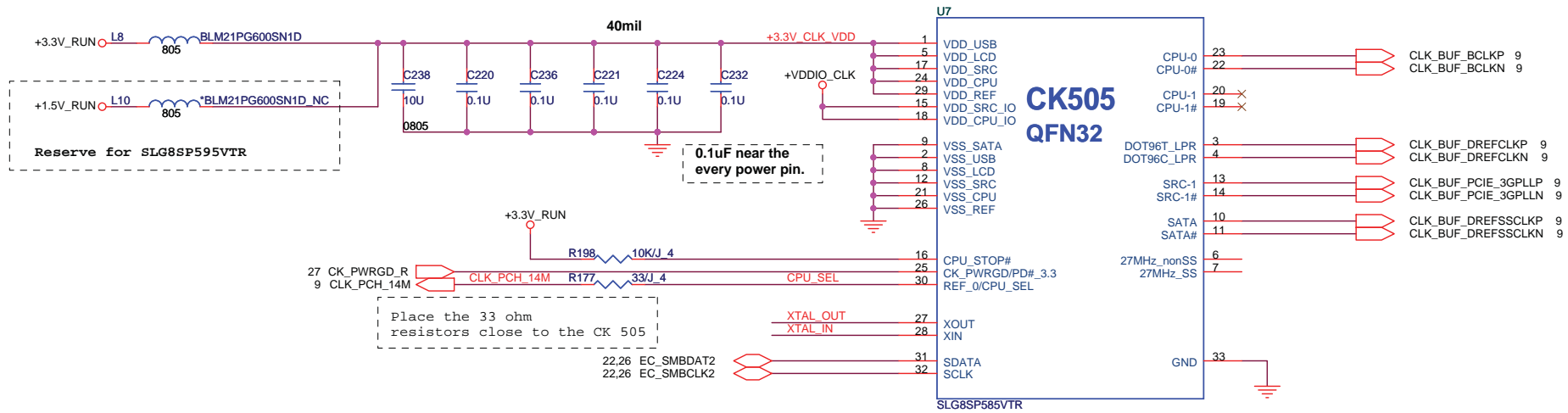
POWER	
<b>REGULATOR</b> +1.5V_SUS/+0.75V_DDR_VTT	PG 30
<b>+1.05V_RUN</b>	PG 32
<b>+1.1V_RUN_VTT</b>	PG31
<b>SYSTEM RESET CIRCUIT</b>	PG 27
<b>BATT CHARGER</b>	PG 28
<b>RUN POWER SW</b> +3.3V_SUS/+5V_SUS +5V/+3.3V/+1.8V	PG 36
<b>CPU VCORE</b>	PG 29
<b>DC/DC</b> +3.3V_ALW/+5V_ALW/ +15V_ALW	PG 33
<b>AC/BATT CONNECTOR</b>	PG 37
<b>GFX UMA</b>	PG 34
<b>+1.8V_RUN</b>	PG 35

**Quanta Computer Inc.**  
Project Name: XM2

Title: MB Block Diagram

Size: Document Number XM2\_MB Rev D

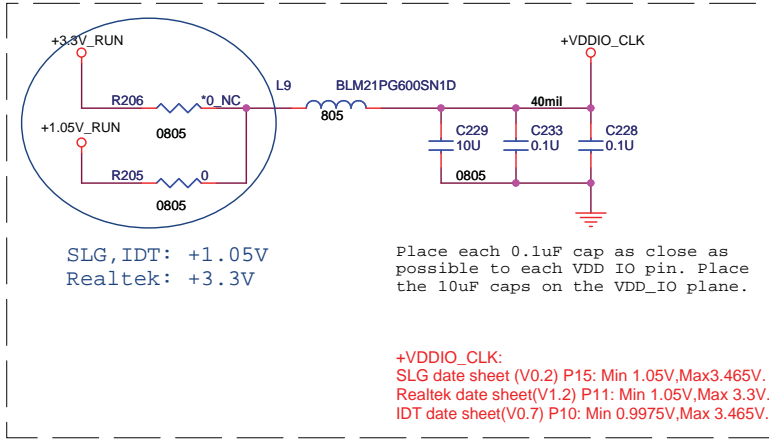
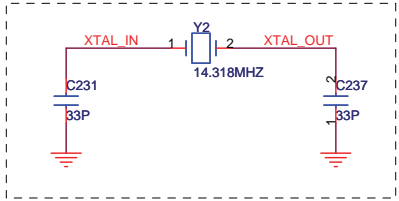
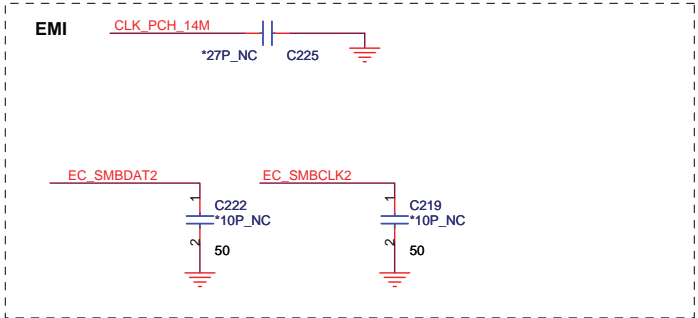
Date: Friday, January 15, 2010 Sheet 1 of 40



0.1uF near the every power pin.

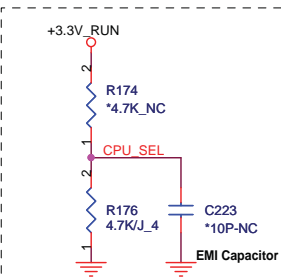
Place the 33 ohm resistors close to the CK 505

Realtek: 0.1uFx3pcs, 22uFx1pcs  
IDT: 0.1uFx2pcs, 10uFx1pcs



SLG, IDT: +1.05V  
Realtek: +3.3V

+VDDIO\_CLK:  
SLG date sheet (V0.2) P15: Min 1.05V, Max 3.465V.  
Realtek date sheet (V1.2) P11: Min 1.05V, Max 3.3V.  
IDT date sheet (V0.7) P10: Min 0.9975V, Max 3.465V.

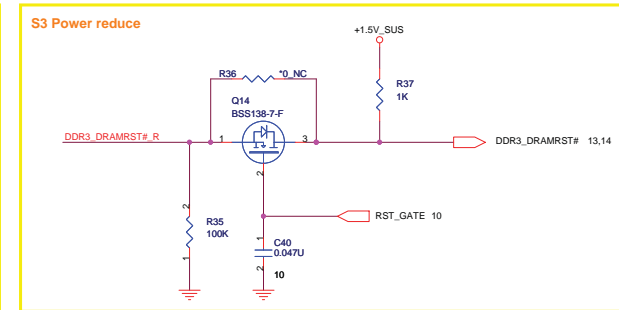
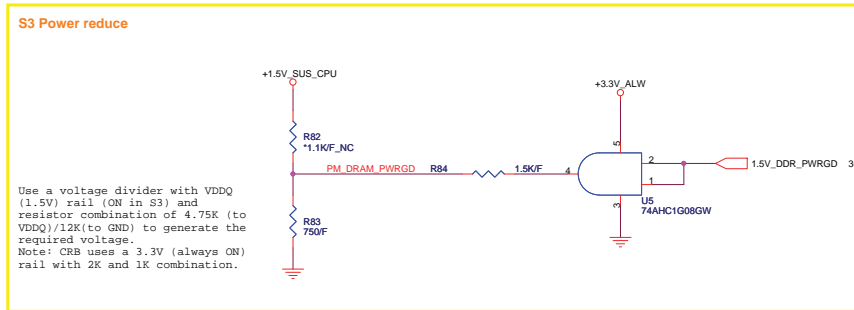
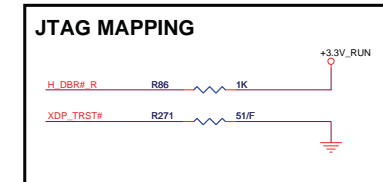
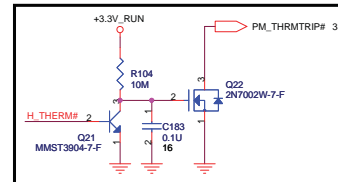
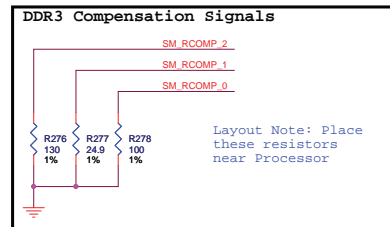
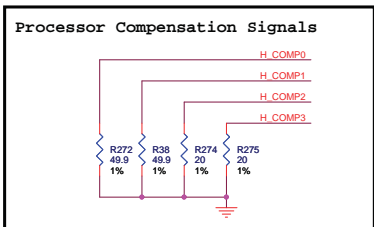
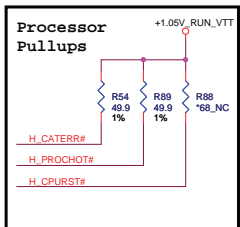
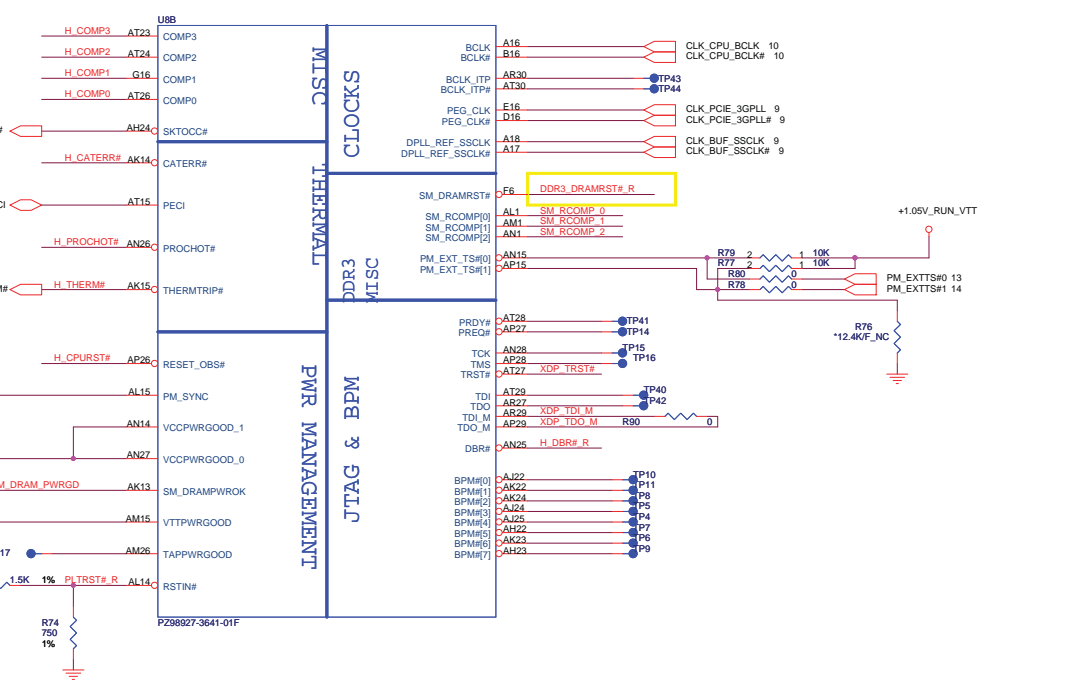
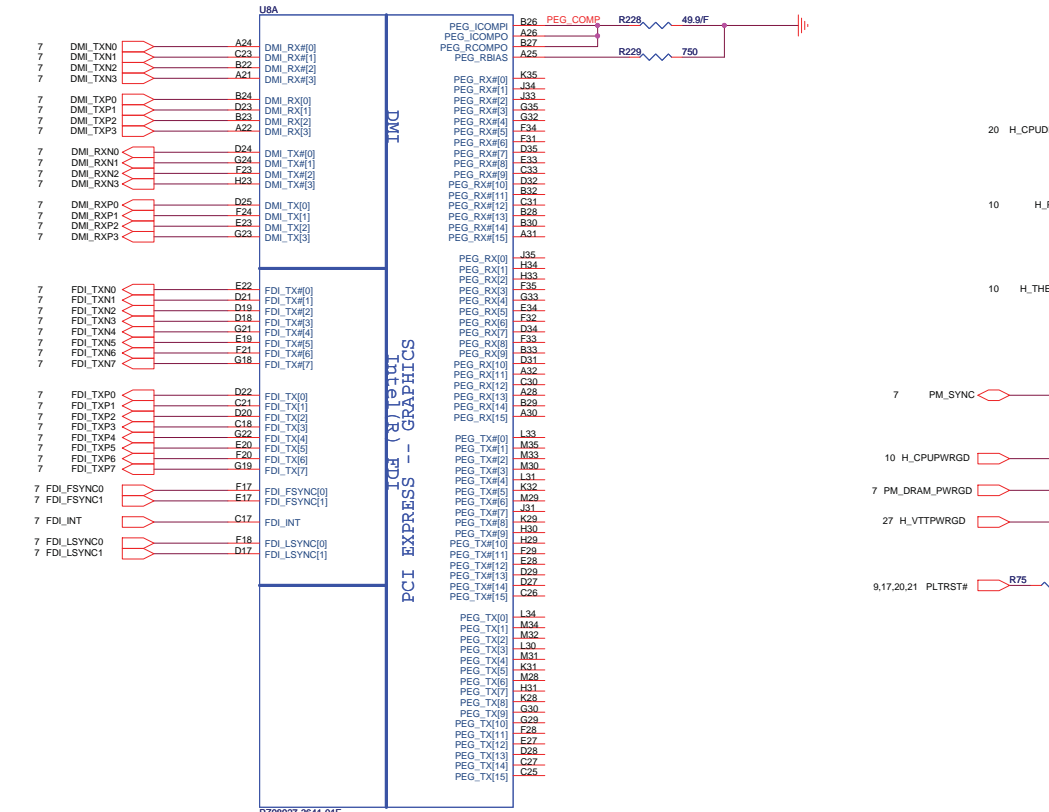


PIN 30	CPU_0	CPU_1
0 (default)	133MHz	133MHz
1 (0.7V-1.5V)	100MHz	100MHz

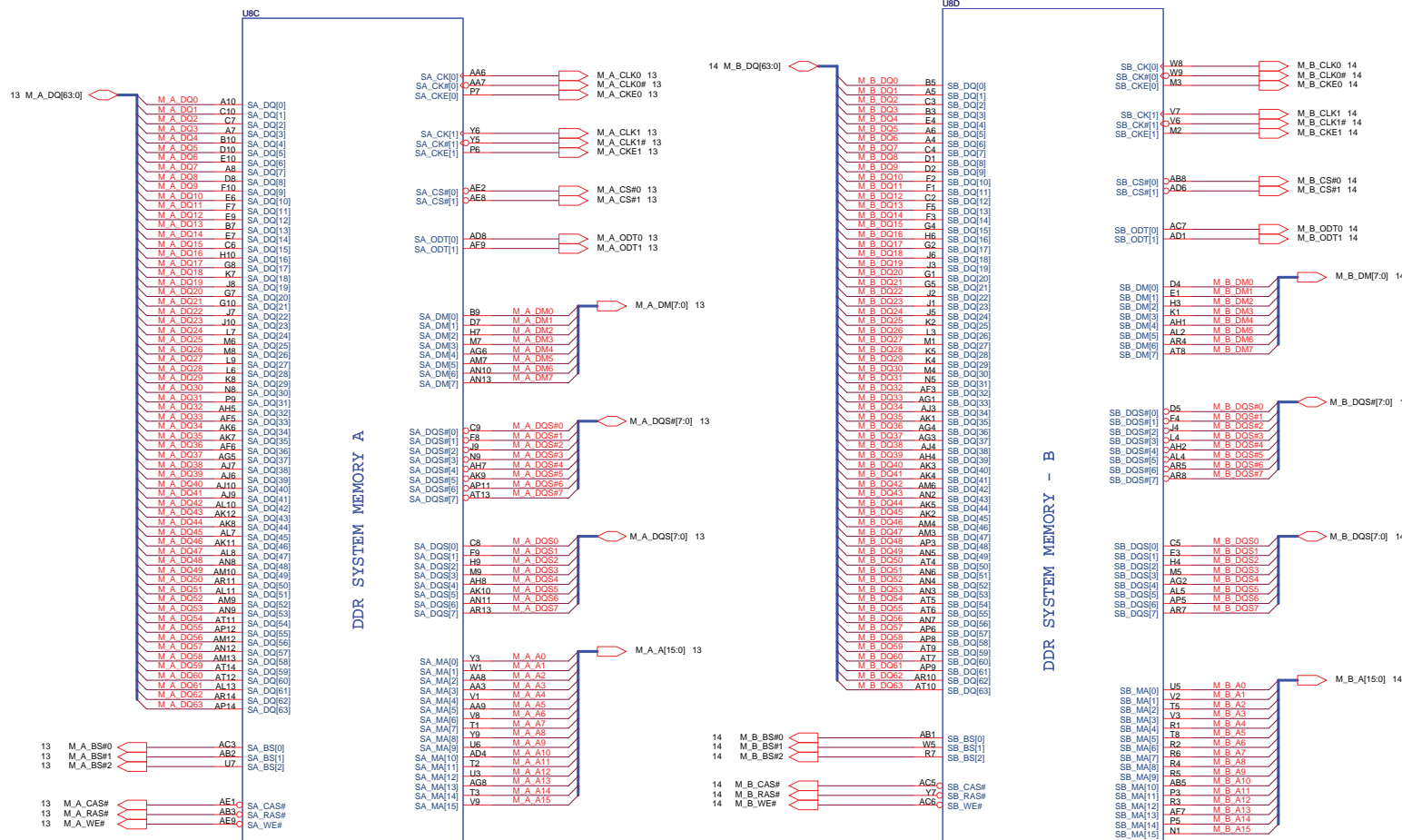
**CPU\_SEL:**  
SLG date sheet (V0.2) P15:  
High Voltage: Min 0.7V, Max 1.5V.  
Low Voltage: Min Vss-0.3V, Max 0.35V.  
Realtek date sheet (V1.2) P11:  
High Voltage: Min 0.7V, Max 1.5V.  
Low Voltage: Min Vss-0.3V, Max 0.35V.  
IDT date sheet (V0.7) P10:  
High Voltage: Min 0.7V, Max 1.5V.  
Low Voltage: Min Vss-0.3V, Max 0.35V.

**Quanta Computer Inc.**  
Project Name: **GM7B**

Title: Clock Gen		Rev: D
Size: Document Number	GM7B	
Date: Friday, January 15, 2010	Sheet: 2 of 40	




# AUBURNDALE/CLARKSFIELD PROCESSOR (DDR3)



P298927-3641-01F

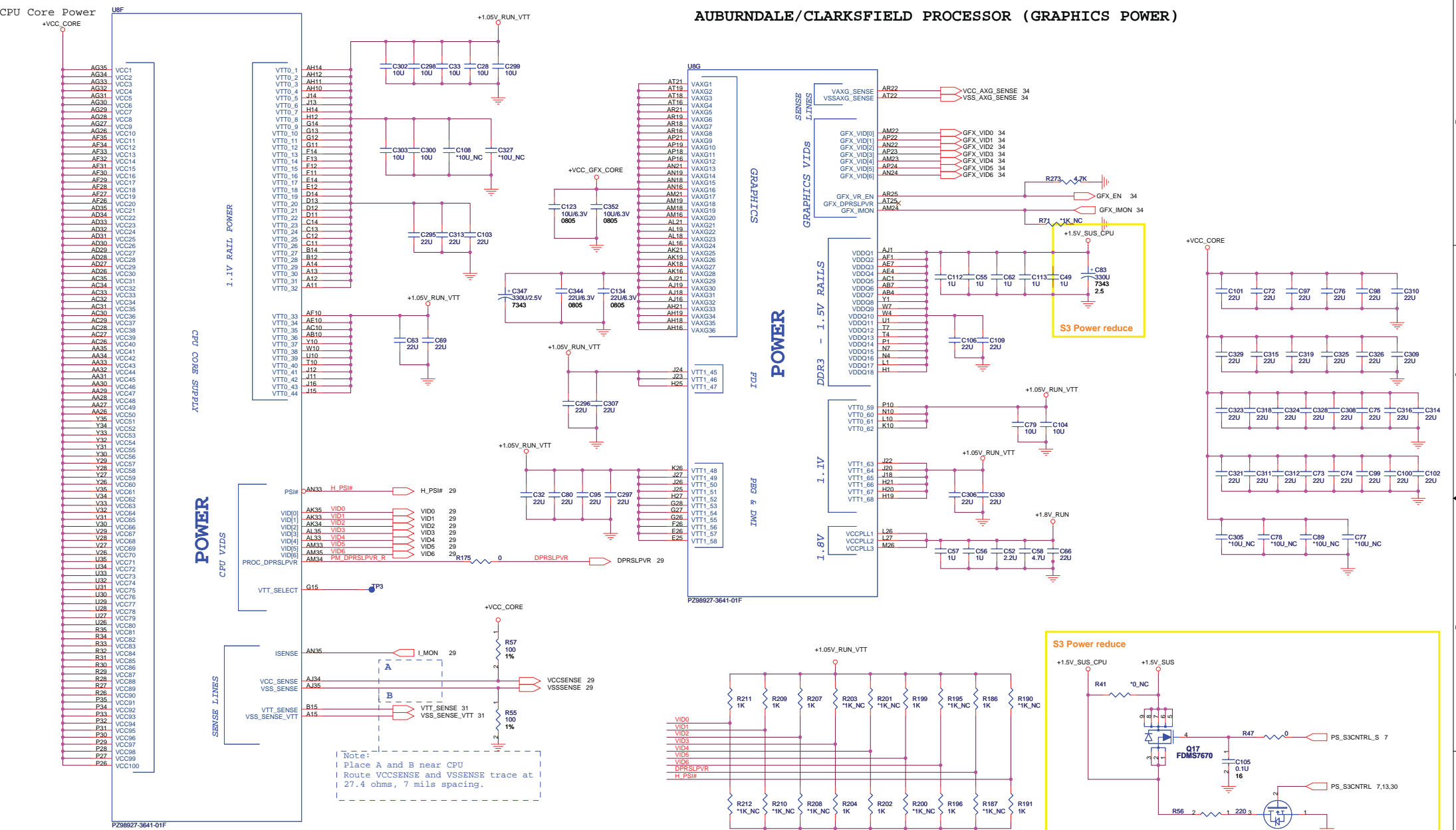
P298927-3641-01F



**Quanta Computer Inc.**  
Project Name: **XM2**

Title	CPU 24(DDR)		
Size	Document Number	XM2_MB	Rev D
Date:	Friday, January 15, 2010	Sheet	4 of 40

AUBURNDALE/CLARKSFIELD PROCESSOR (GRAPHICS POWER)



- CPU Core Power**
- AG35 VCC1
  - AG34 VCC2
  - AG33 VCC3
  - AG32 VCC4
  - AG31 VCC5
  - AG29 VCC6
  - AG28 VCC7
  - AG27 VCC8
  - AG26 VCC9
  - AG25 VCC10
  - AF35 VCC11
  - AF34 VCC12
  - AF33 VCC13
  - AF32 VCC14
  - AF31 VCC15
  - AF30 VCC16
  - AF29 VCC17
  - AF28 VCC18
  - AF27 VCC19
  - AD35 VCC20
  - AD34 VCC21
  - AD33 VCC22
  - AD32 VCC23
  - AD31 VCC24
  - AD30 VCC25
  - AD29 VCC26
  - AD28 VCC27
  - AD27 VCC28
  - AD26 VCC29
  - AD25 VCC30
  - AC35 VCC31
  - AC34 VCC32
  - AC33 VCC33
  - AC32 VCC34
  - AC31 VCC35
  - AC30 VCC36
  - AC29 VCC37
  - AC28 VCC38
  - AC27 VCC39
  - AC26 VCC40
  - AA35 VCC41
  - AA34 VCC42
  - AA33 VCC43
  - AA32 VCC44
  - AA31 VCC45
  - AA30 VCC46
  - AA29 VCC47
  - AA28 VCC48
  - AA27 VCC49
  - AA26 VCC50
  - VCC51
  - VCC52
  - VCC53
  - VCC54
  - VCC55
  - VCC56
  - VCC57
  - VCC58
  - VCC59
  - VCC60
  - VCC61
  - VCC62
  - VCC63
  - VCC64
  - VCC65
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  - VCC68
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  - VCC70
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  - VCC76
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  - VCC79
  - VCC80
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  - VCC82
  - VCC83
  - VCC84
  - VCC85
  - VCC86
  - VCC87
  - VCC88
  - VCC89
  - VCC90
  - VCC91
  - VCC92
  - VCC93
  - VCC94
  - VCC95
  - VCC96
  - VCC97
  - VCC98
  - VCC99
  - VCC100

**POWER**

**CPU CORE SUPPLY**

**1.1V RAILS POWER**

**1.5V RAILS**

**1.8V RAILS**

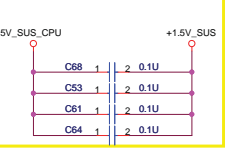
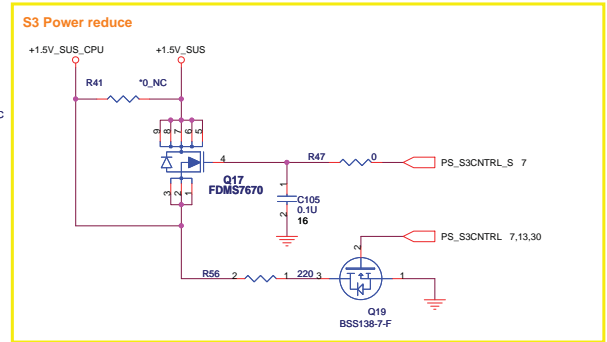
**POWER**

**CPU VIDS**

**SENSE LINES**

Note:  
Place A and B near CPU  
Route VCCSENSE and VSSSENSE trace at  
27.4 ohms, 7 mils spacing.

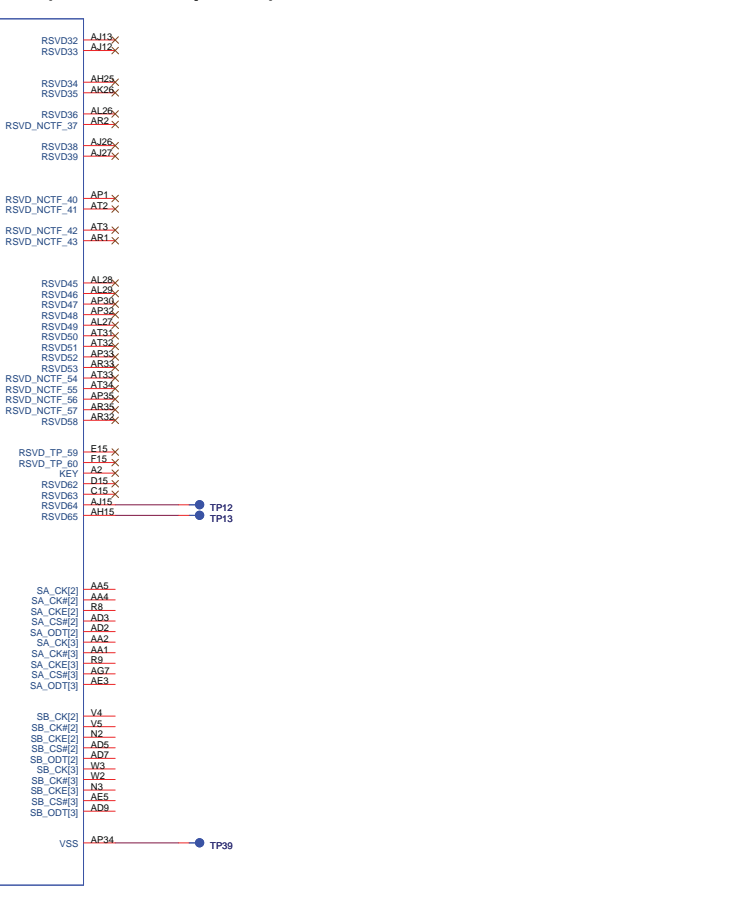
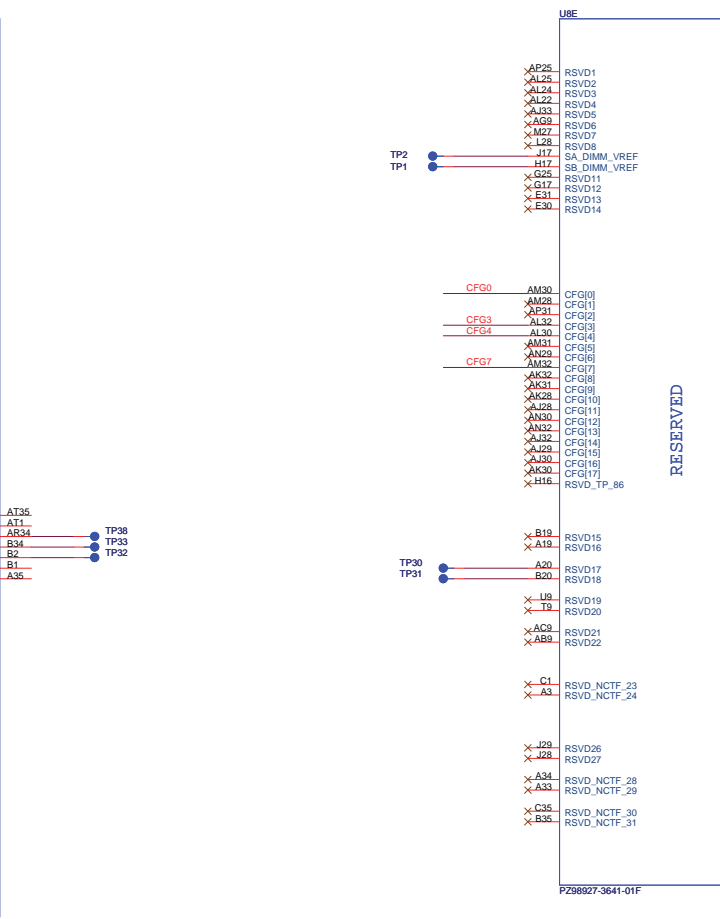
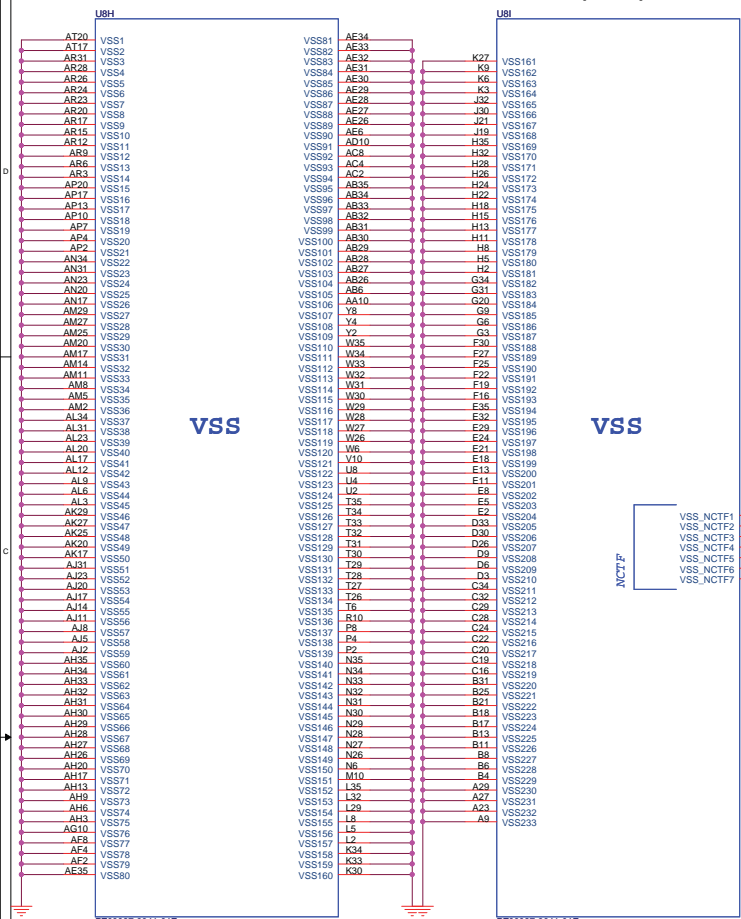
Note:  
For Validating IMVP VR R483 should be STUFF  
and R2N1\_NO\_STUFF



AUBURNDALE PROCESSOR (POWER)

AUBURNDALE/CLARKSFIELD PROCESSOR (GND)

AUBURNDALE/CLARKSFIELD PROCESSOR ( RESERVED, CFG)



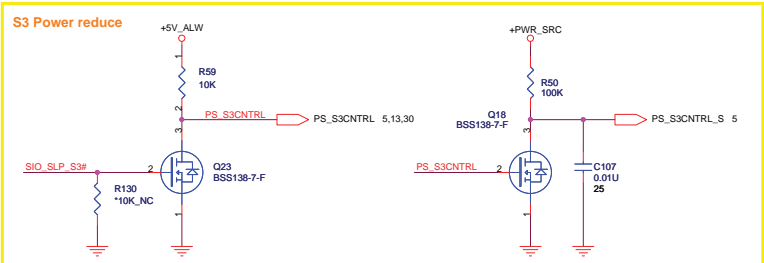
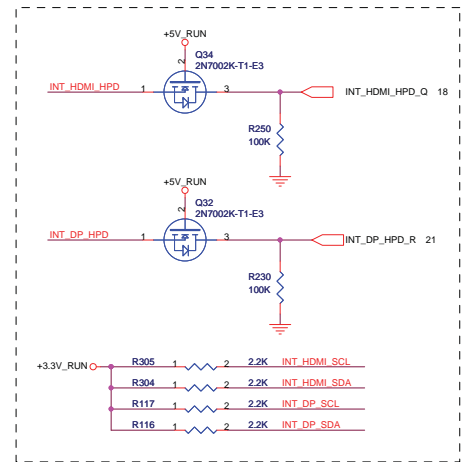
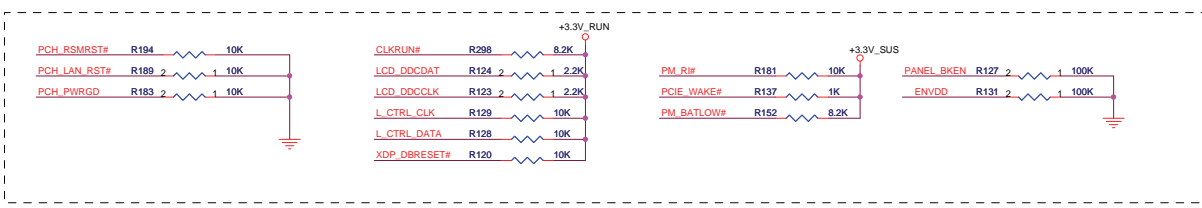
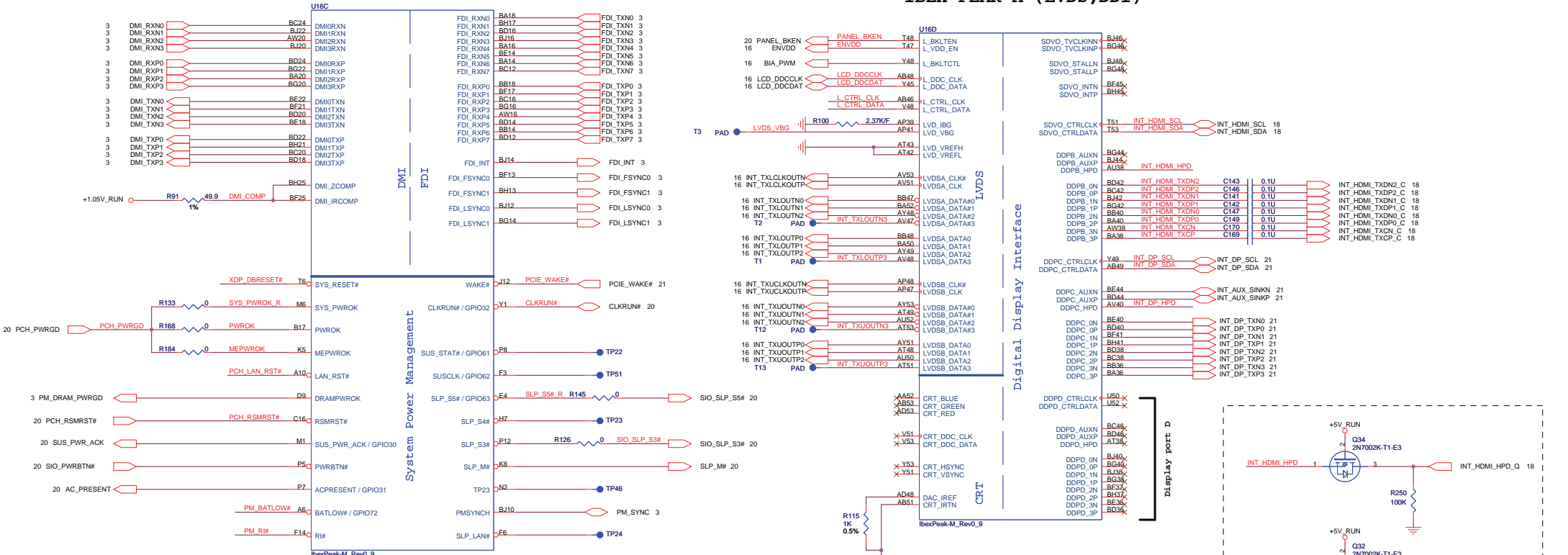
The Clarkfield processor's PCI Express 2.0 jitter specifications. Intel recommends placing a 3.0k +/- 5% pull down resistor to VSS on CFG[7] pin for both rPGA and BGA components. This pull down resistor should be removed when this issue is fixed.



	1	0
CFG4 (Display Port Presence)	Disabled; No Physical Display Port attached to Embedded Display Port	Enabled; An external Display port device is connected to the Embedded Display port
CFG0 (PCI-Epress Configuration Select)	Single PEG	Bifurcation enabled
CFG3 (PCI-Epress Static Lane Reversal)	Normal Operation	Lane Numbers Reversed
CFG7 (Clarkfield (only for early samples pre-ES1)	Common motherboard design	For early samples pre-ES1 CFD

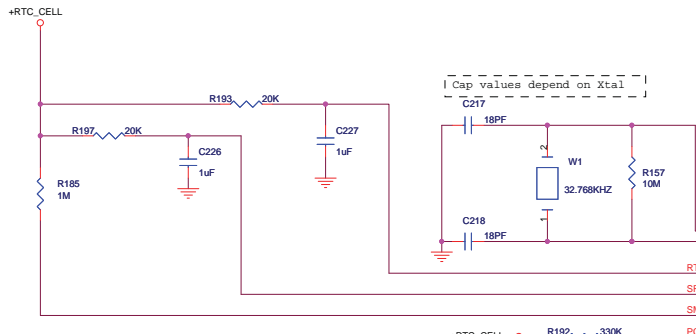
# IBEX PEAK-M (DMI, FDI, GPIO)

# IBEX PEAK-M (LVDS, DDI)

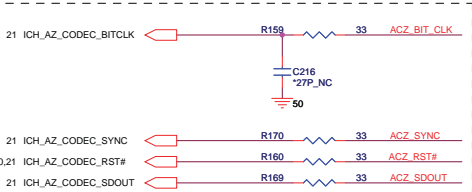




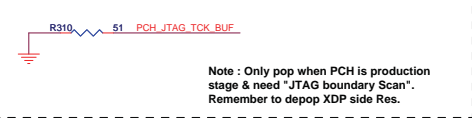
# IBEX PEAK-M (HDA, JTAG, SATA)



No Reboot Strap	
SPKR	Low=Default
	High=No Reboot

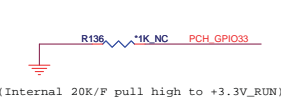


Place all series terms close to PCH except for SDIN input lines, which should be close to source. Placement of R773, R775, R776 & R777 should equal distance from T split trace point. Basically, keep the same distance from T for all series termination resistors.



Note: Only pop when PCH is production stage & need "JTAG boundary Scan". Remember to depop XDP side Res.

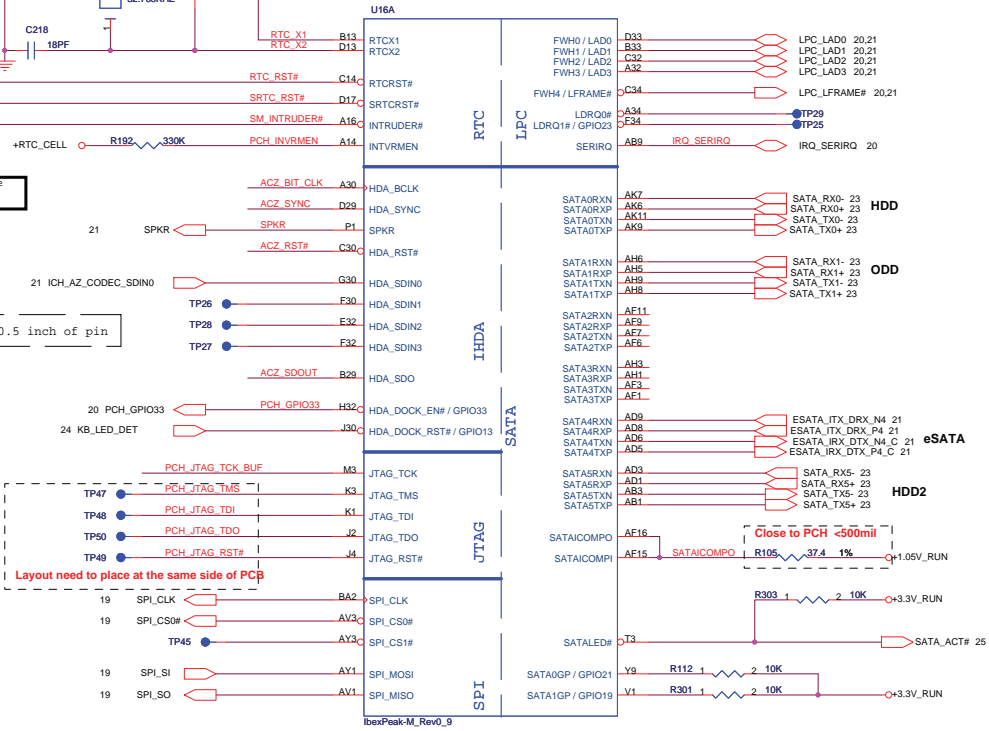
Flash Descriptor Security Override	
GPIO33	Low = Enabled High = Disabled



Note: GPIO33 is a signal used for Flash Descriptor Security Override/ME Debug Mode. This signal should be only asserted low through an external pull-down in manufacturing or debug environments ONLY.

INVRMEN - Integrated SUS 1.1V VRM Enable  
High - Enable Internal VRs

0 ohm resistor within 0.5 inch of pin

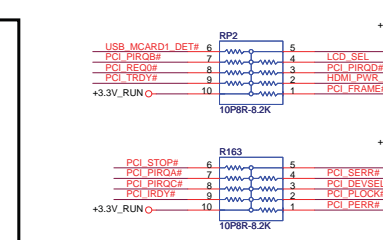
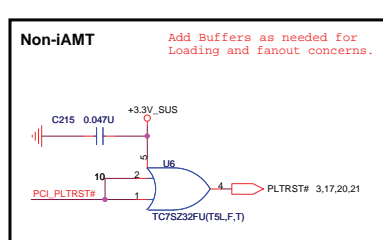
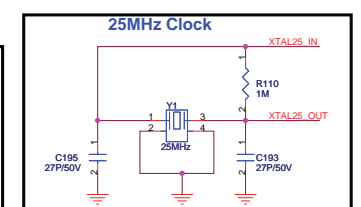
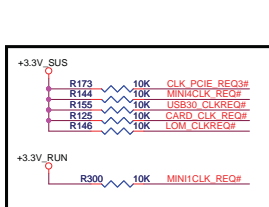
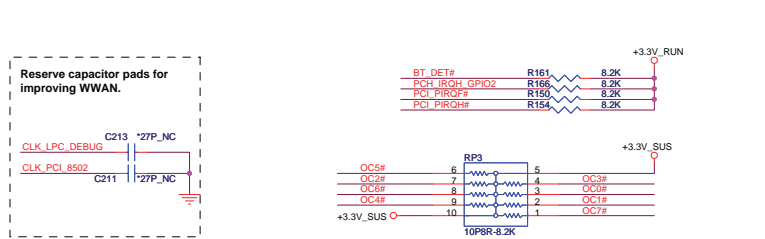
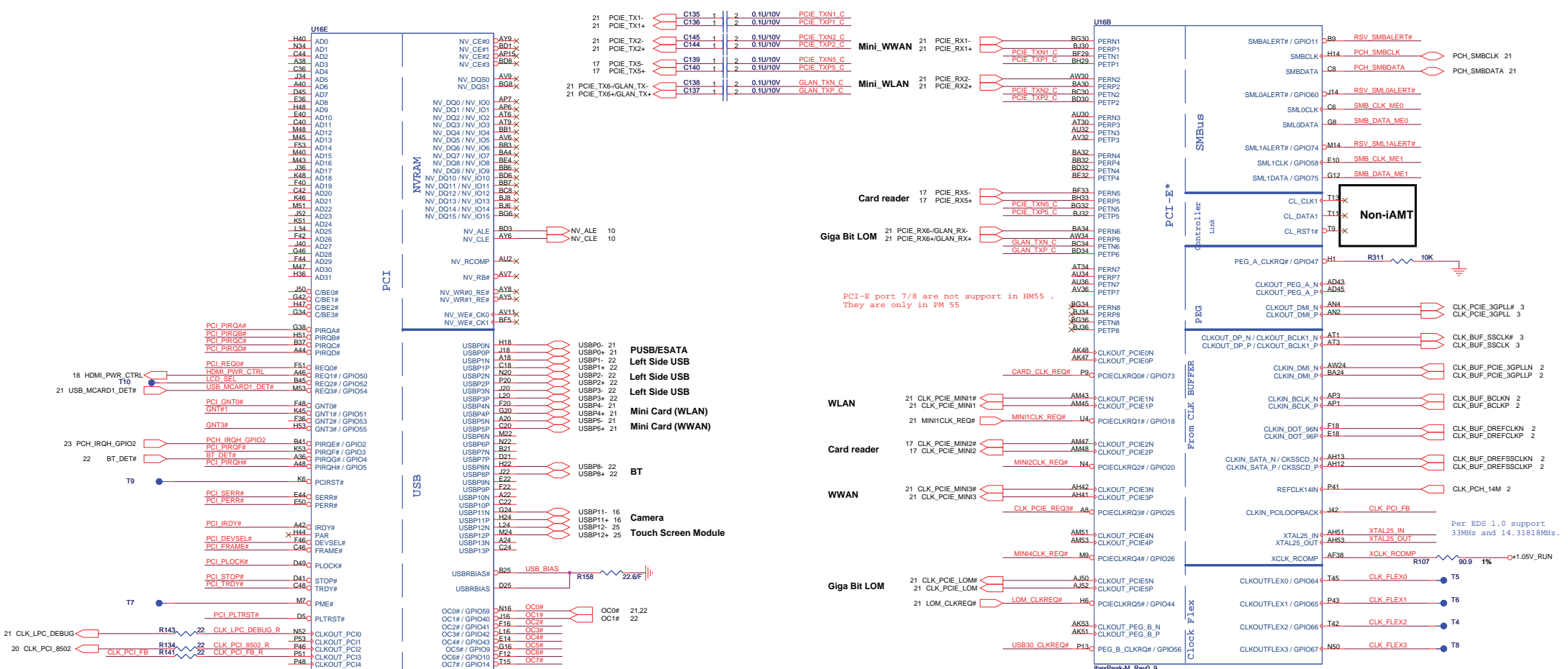


ibexPeak-M\_Rev0\_9



IBEX PEAK-M (PCI,USB,NVRAM)

IBEX PEAK-M (PCI-E,SMBUS,CLK)



Boot BIOS Strap

PCI_GNT0#	GNT#1	Boot BIOS Location
0	0	LPC
0	1	Reserved (NAND)
1	0	PCI
1	1	SPI

A16 swap override Strap/Top-Block Swap Override Jumper

GNT3#	Low = A16 swap override/Top-Block Swap Override enabled	High = Default
0	High	Low
1	Low	High

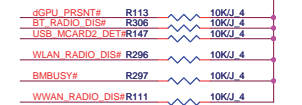
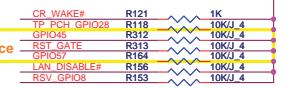
Quanta Computer Inc.  
Project Name: XM2

1160 PCH 3/6 (PCI,SMBUS,CLK)  
Size: Document Number XM2\_MB  
Date: Friday, January 15, 2010 Sheet 9 of 40

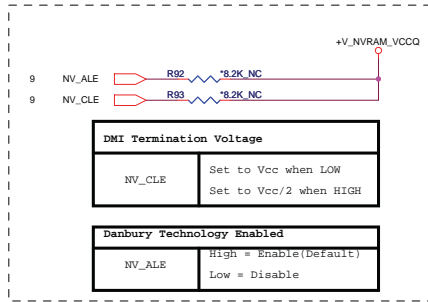
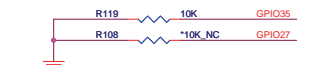
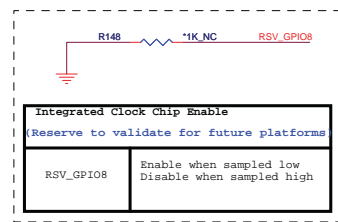
# IBEX PEAK-M (GPIO,VSS\_NCTF,RSVD)

## GPIO

### Pull-up/Pull-down

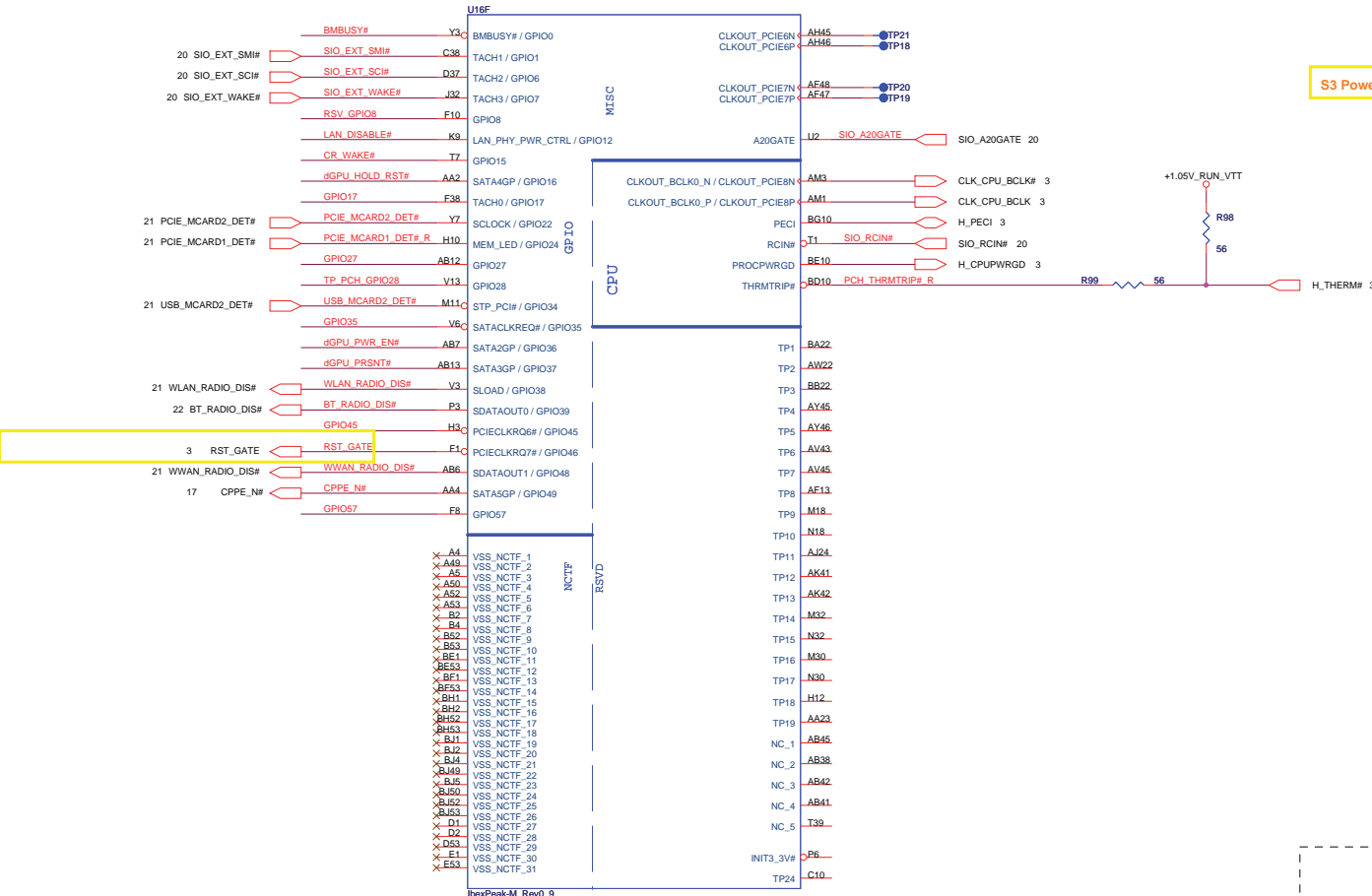


SV\_SET\_UP | 1-X High = Strong (Default)



**DMI Termination Voltage**  
 NV\_CLE | Set to Vcc when LOW  
 | Set to Vcc/2 when HIGH

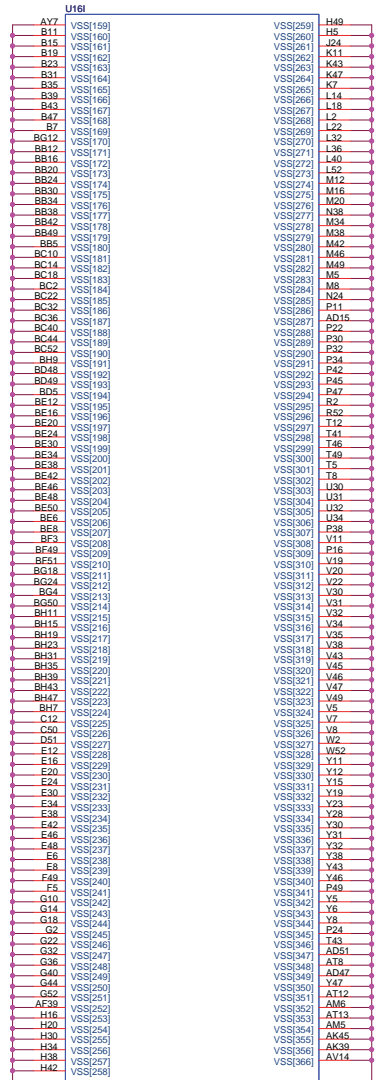
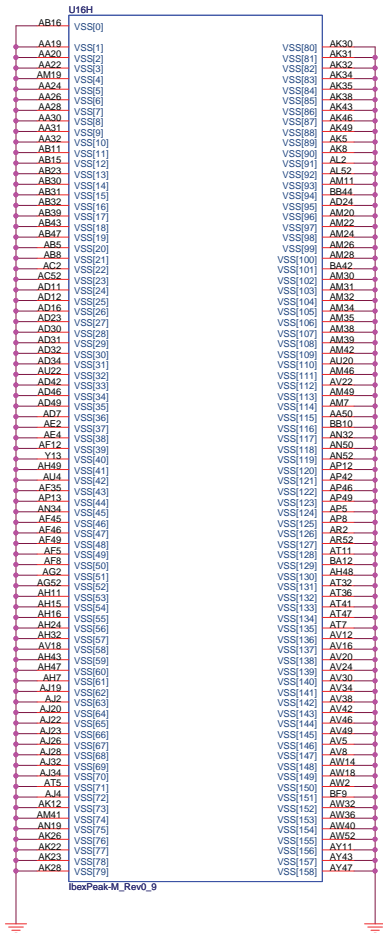
**Danbury Technology Enabled**  
 NV\_ALE | High = Enable(Default)  
 | Low = Disable

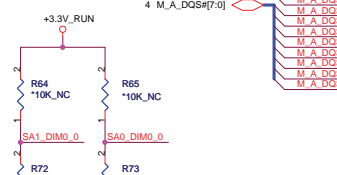
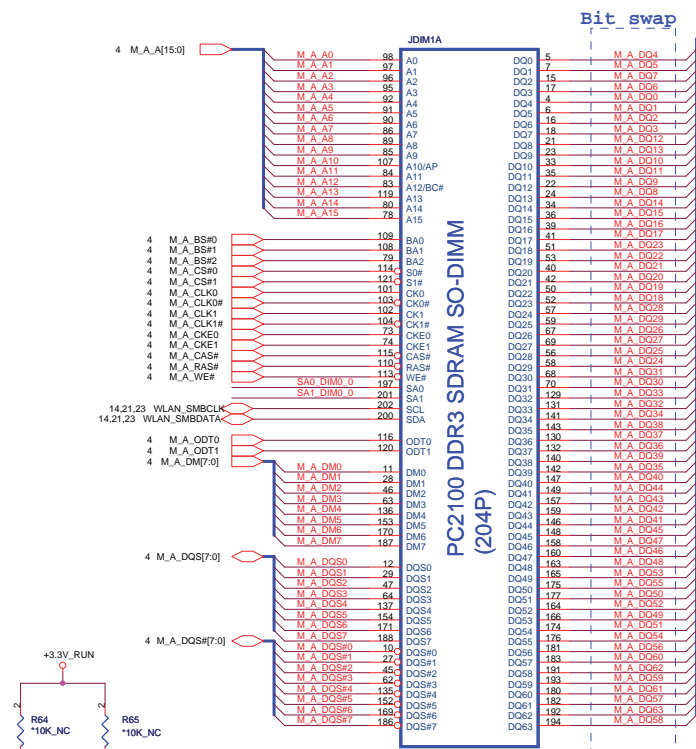


ibexPeak-M\_Rev0\_9



**IBEX PEAK-M (GND)**

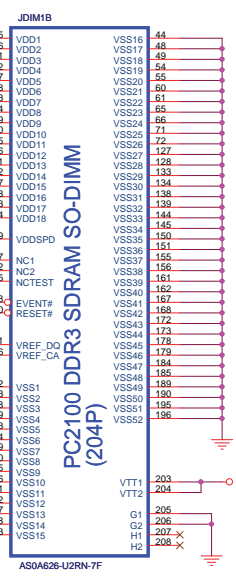
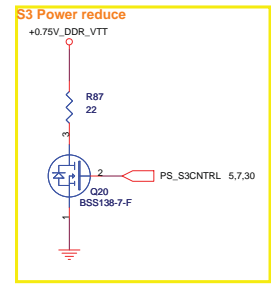
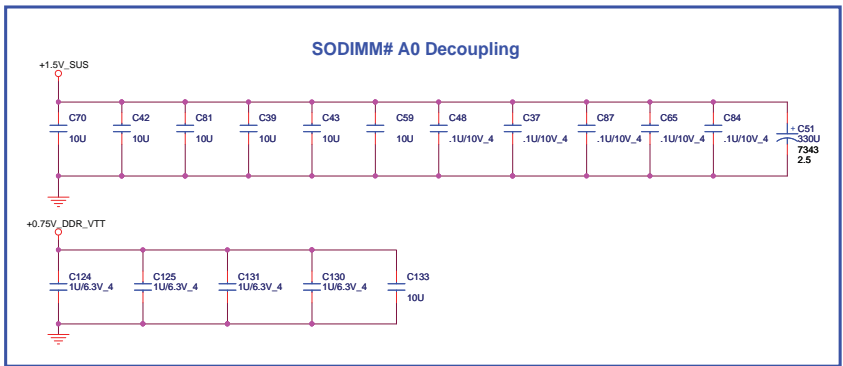
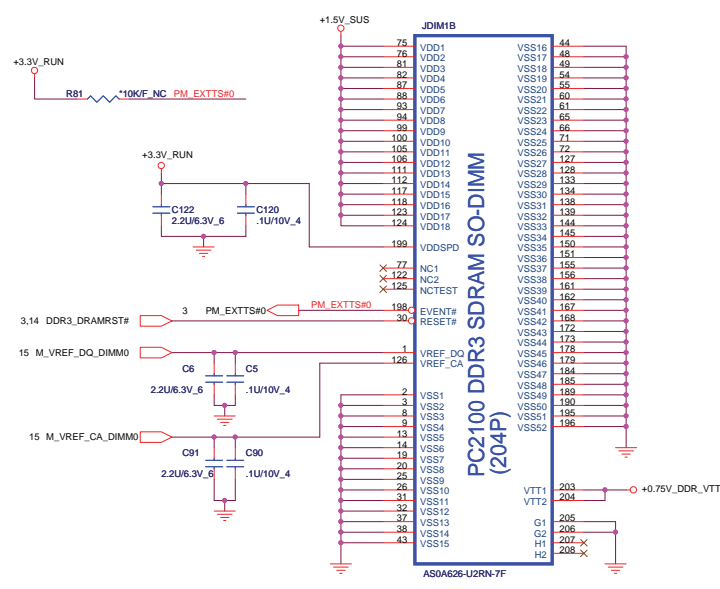




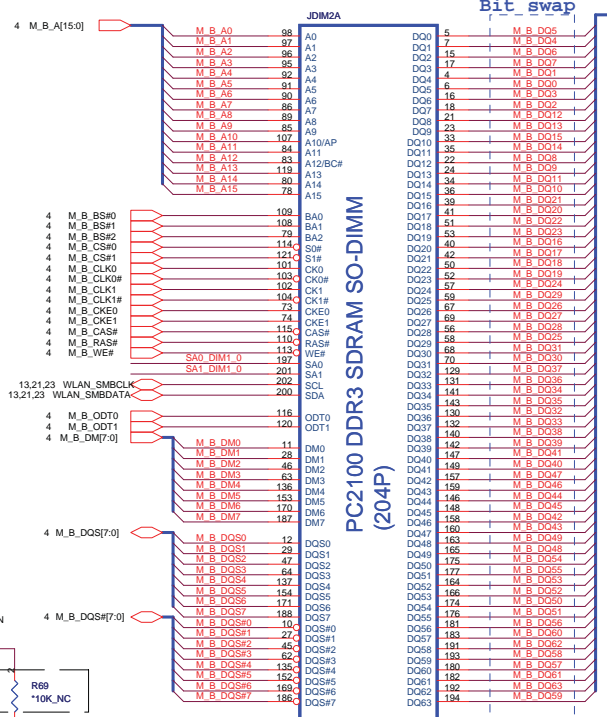
	SA1	SA0
CHA0	0	0
CHA1	0	1
CHB0	1	0
CHB1	1	1

Note:  
 If SA0\_DIM0 = 0, SA1\_DIM0 = 0  
 SO-DIMMA SPD Address is 0xA0  
 SO-DIMMA TS Address is 0x30  
 If SA0\_DIM0 = 1, SA1\_DIM0 = 0  
 SO-DIMMA SPD Address is 0xA2  
 SO-DIMMA TS Address is 0x32

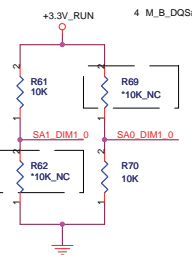
### CHA\_DIMM0\_BOT\_SIDE



0105CT: Update JDIM4 footprint 5.2mm, STD type.

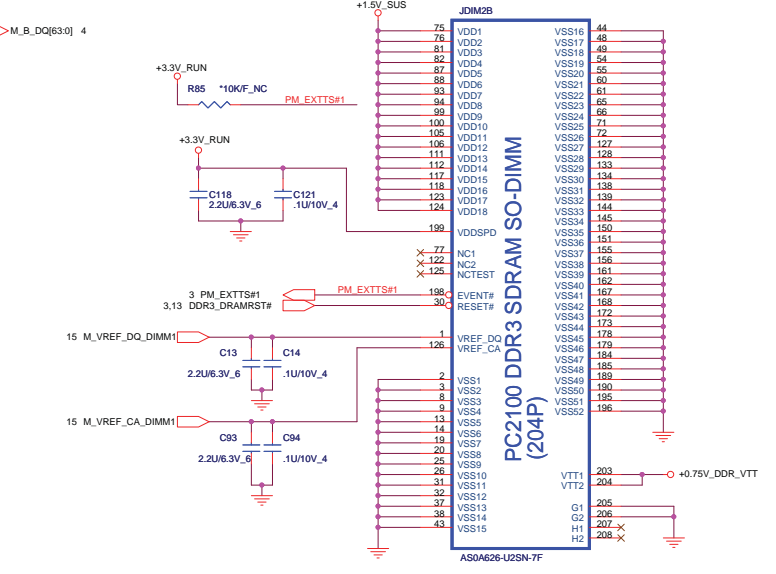
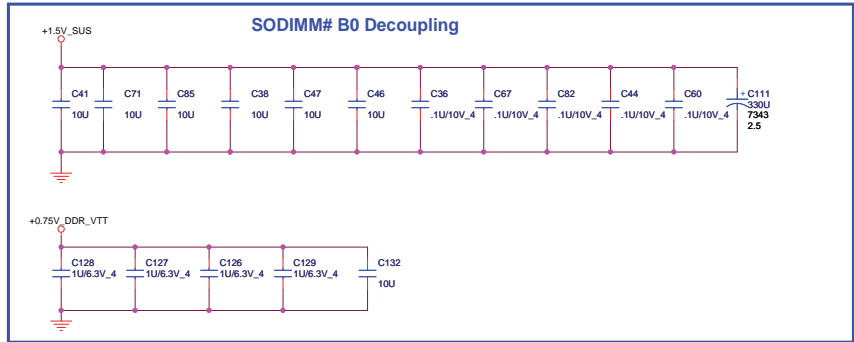
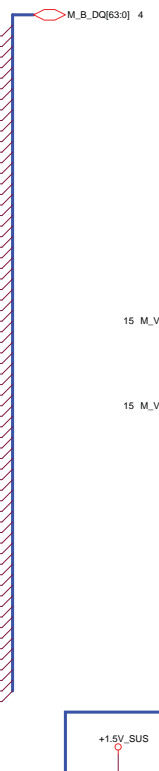


PC2100 DDR3 SDRAM SO-DIMM (204P)

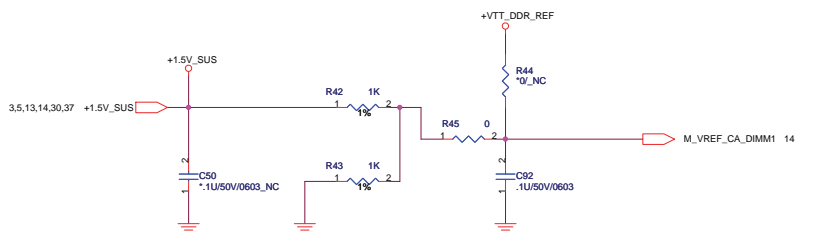
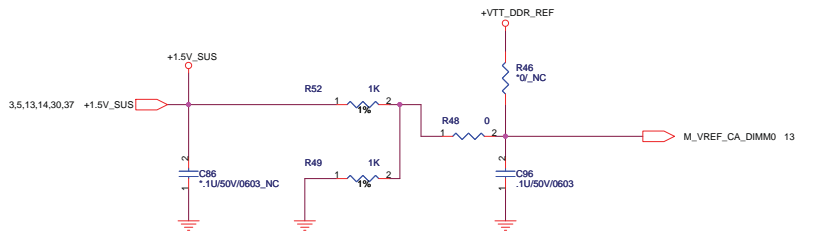
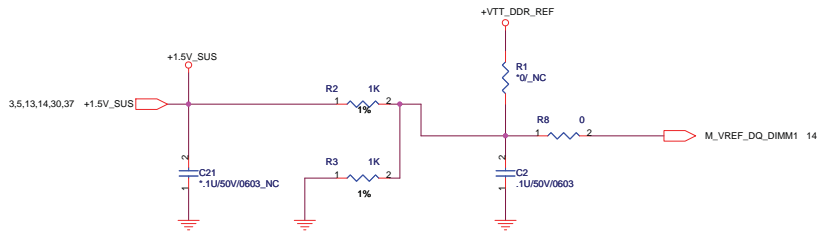
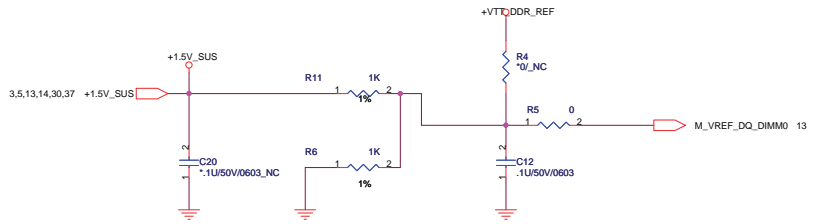


	SA1	SA0
CHA0	0	0
CHA1	0	1
CHB0	1	0
CHB1	1	1

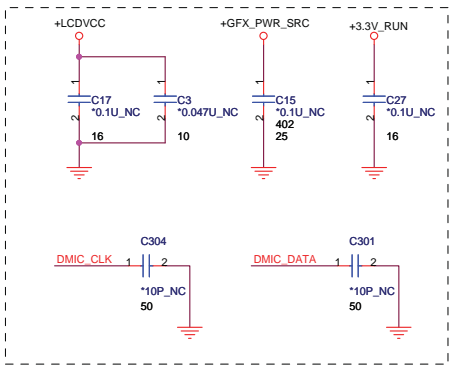
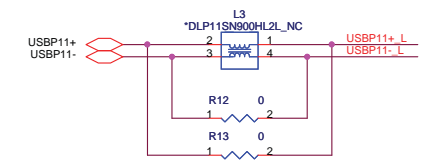
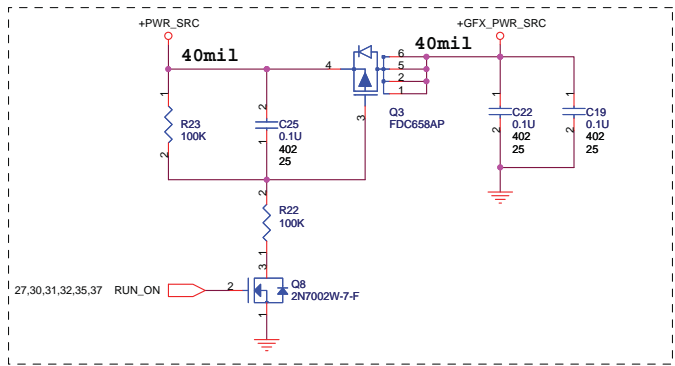
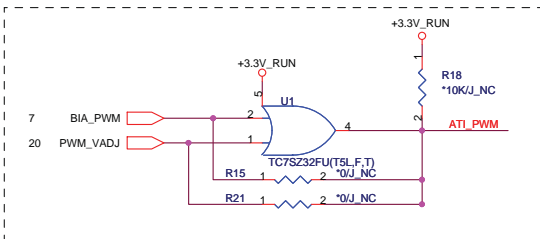
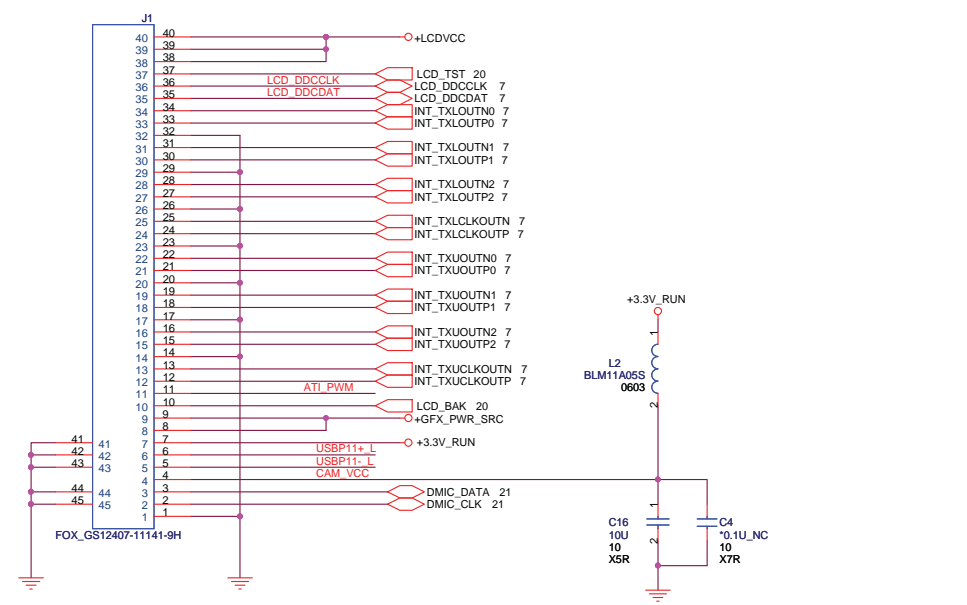
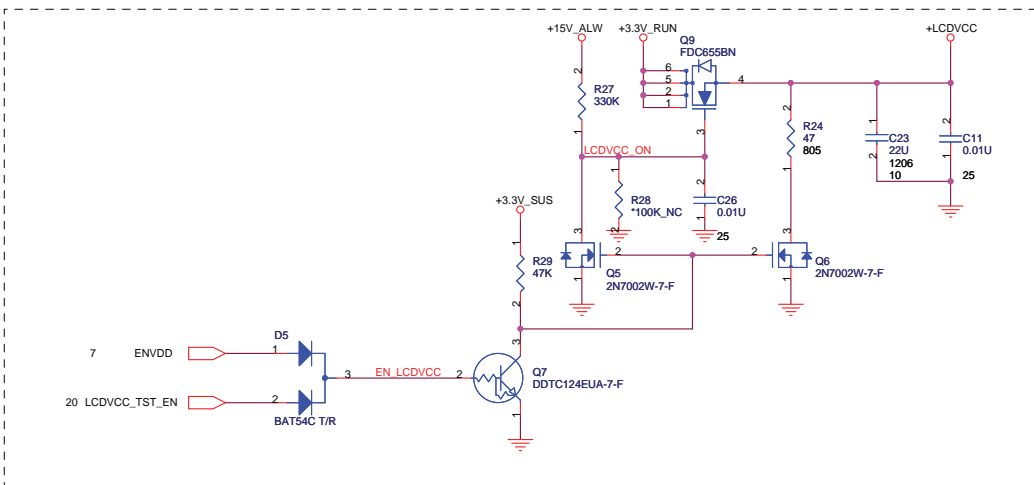
Note:  
SO-DIMMA SPD Address is 0xA4  
SO-DIMMA TS Address is 0x34



# Fixed SO-DIMM VREF\_DQ (M1): Default

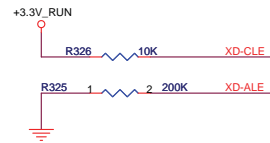
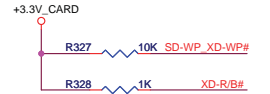
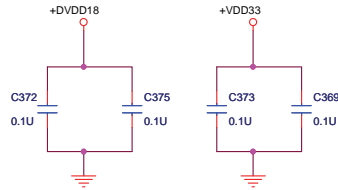
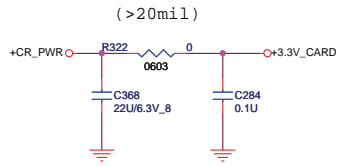
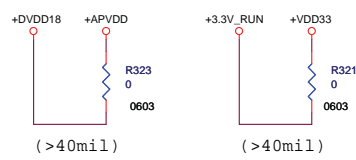




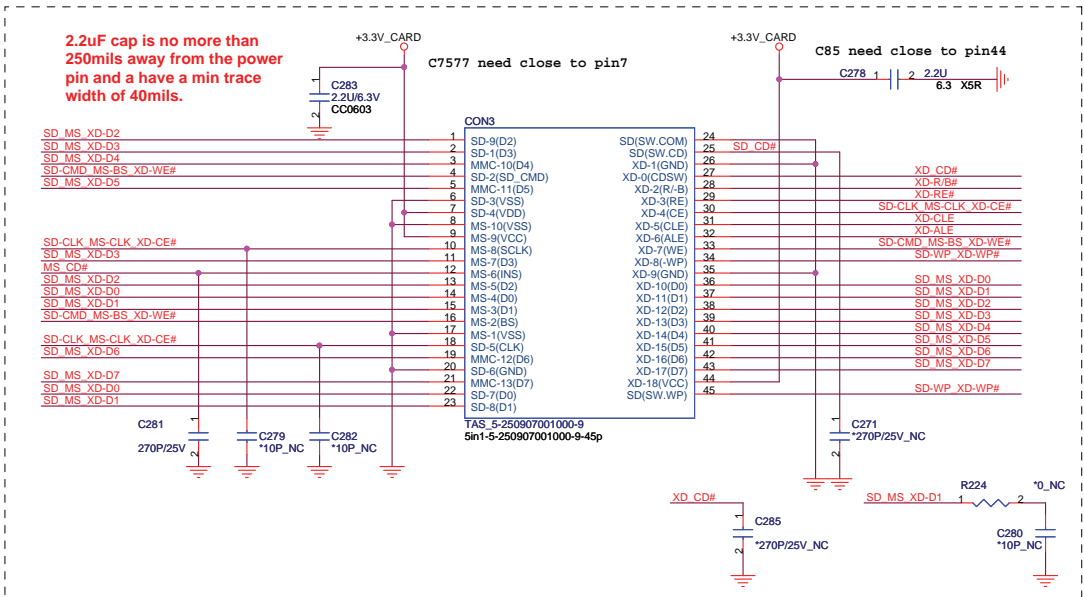
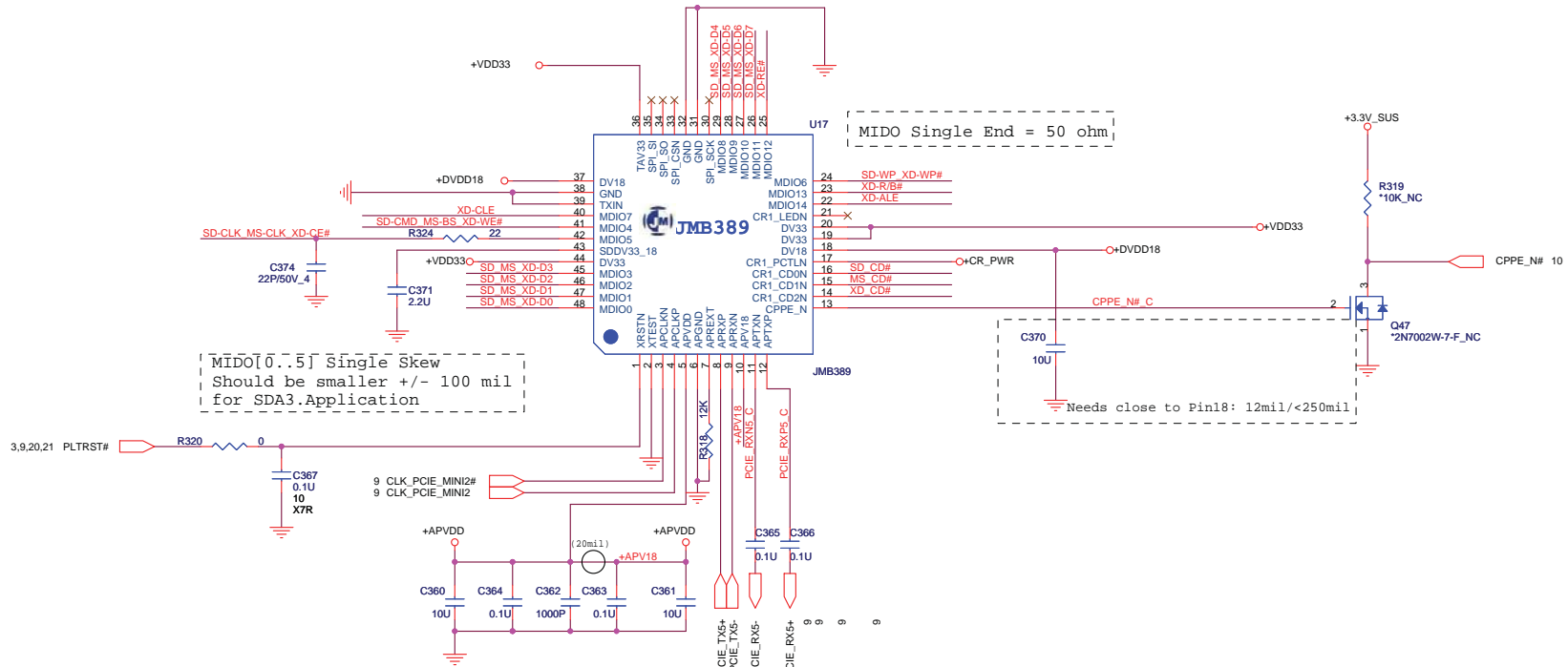


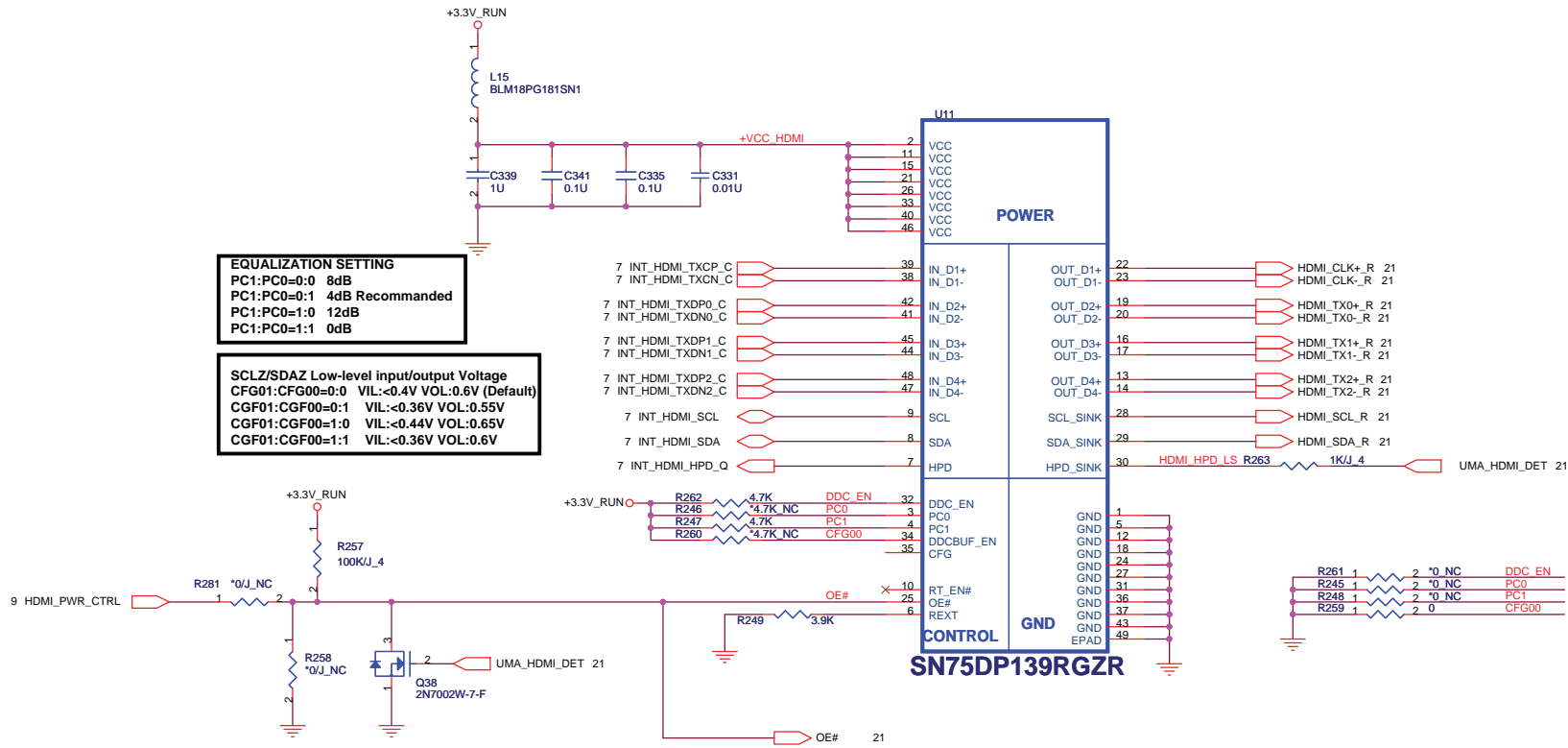
**Card Reader interface signal mapping**

PIN	Default	SD / MMC	MS	XD
MDIO00	SD/MMC/MS/XD	SD_D0	MS_D0	XD_D0
MDIO01		SD_D1	MS_D1	XD_D1
MDIO02		SD_D2	MS_D2	XD_D2
MDIO03		SD_D3	MS_D3	XD_D3
MDIO04		SD_CMD	MS_BS	XD_WF#
MDIO05		SD_CLK	MS_CLK	XD_CE#
MDIO06		SD_WP		XD_WF#
MDIO07				XD_CLE
MDIO08		MMC_D4	MS_D4	XD_D4
MDIO09		MMC_D5	MS_D5	XD_D5
MDIO10		MMC_D6	MS_D6	XD_D6
MDIO11		MMC_D7	MS_D7	XD_D7
MDIO12				XD_RE#
MDIO13				XD_R/#
MDIO14				XD_AL#
CR1_LEDN		SD_LED#	MS_LED#	XD_LED#
CR1_PCTLN		SD_PWR#	MS_PWR#	XD_PWR#
CR1_CD0		SD_CD#		
CR1_CD1			MS_CD#	
CR1_CD2				XD_CD#

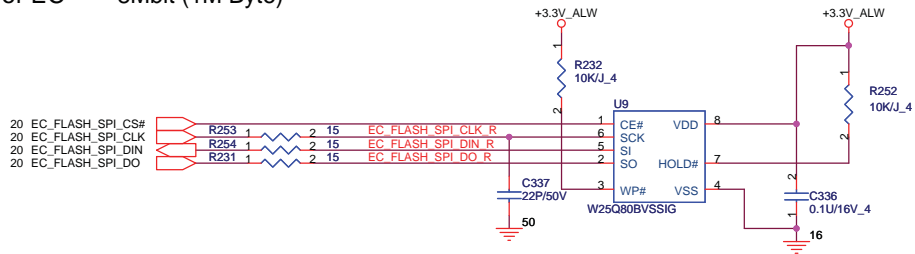


MIDO[0..5] Single Skew  
Should be smaller +/- 100 mil  
for SDA3.Application

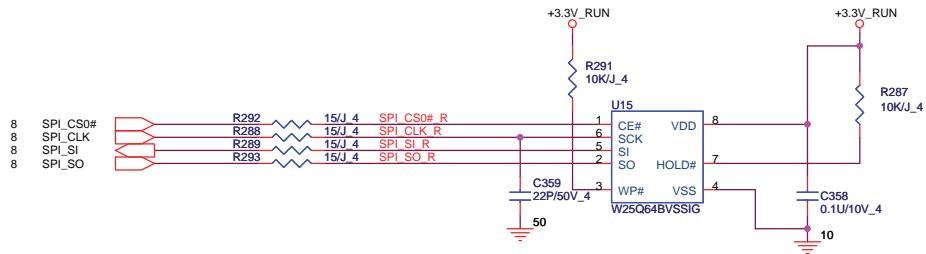




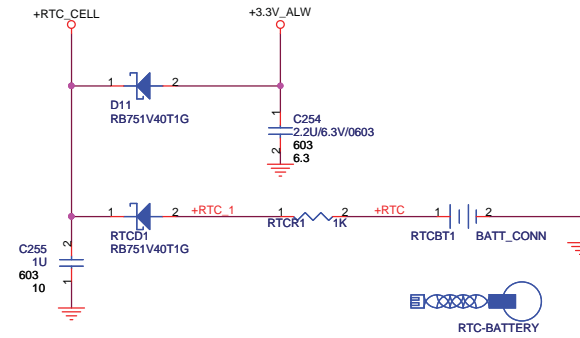
For EC 8Mbit (1M Byte)



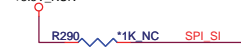
For PCH 64Mbit (8M Byte), SPI



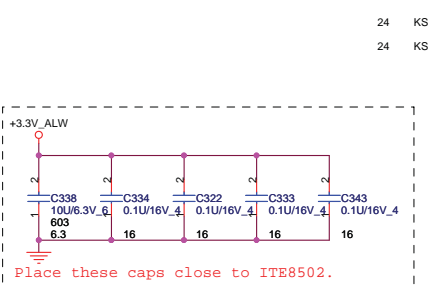
RTC BATTERY



iTPM ENABLE/DISABLE

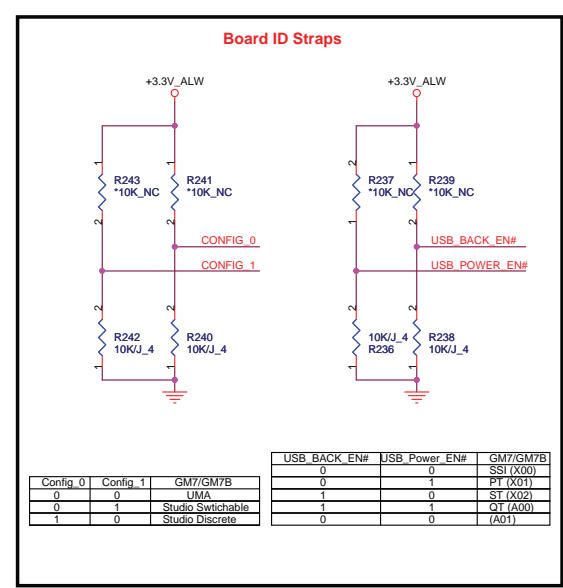
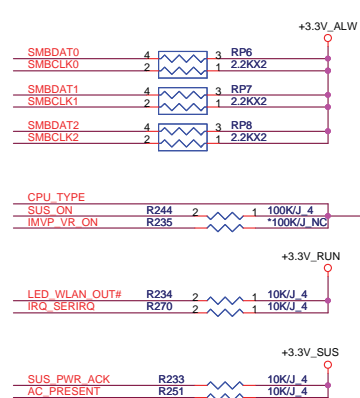
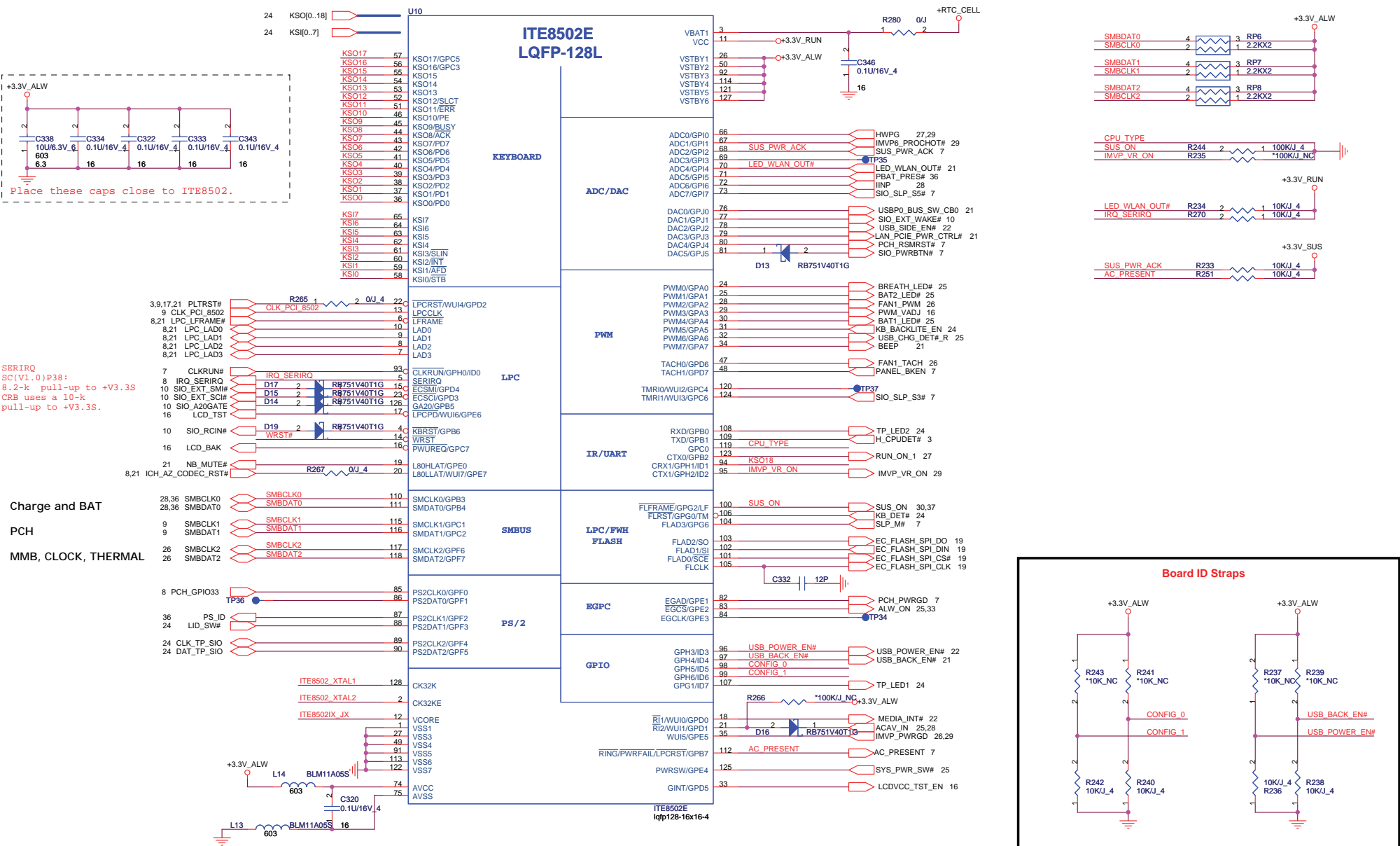
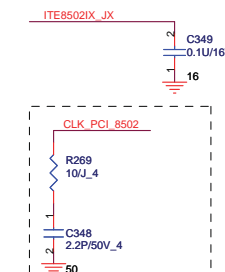
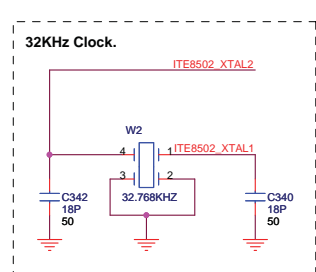
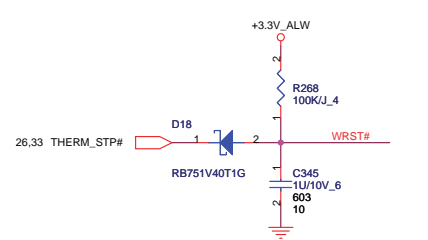


TPM Function	R712
Enable	Mount
Disable	NC (Default)



SERIRQ  
 SC(V1.0)P38:  
 8.2-k pull-up to +V3.3S  
 CRB uses a 10-k  
 pull-up to +V3.3S.

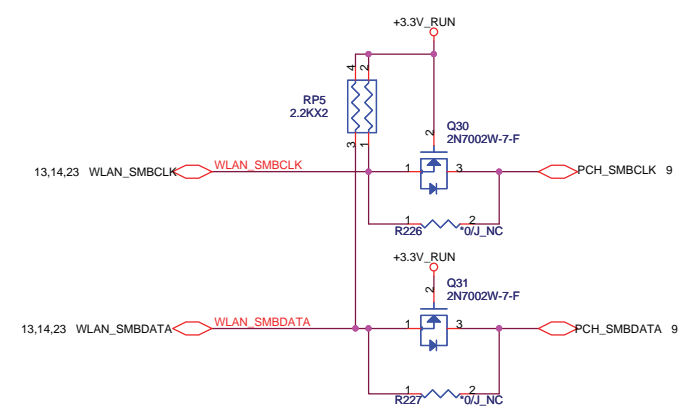
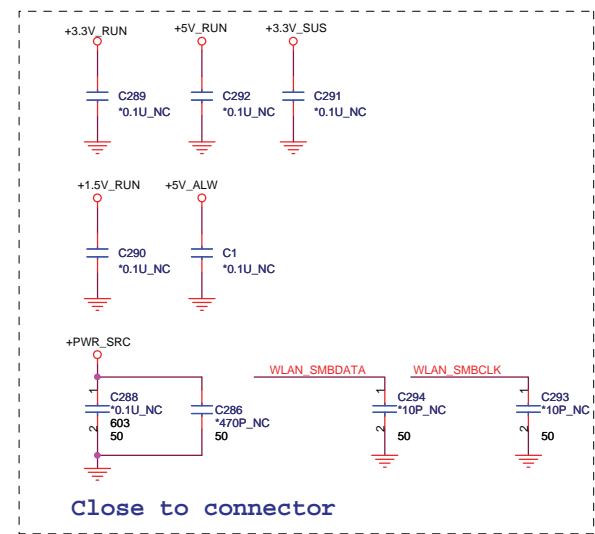
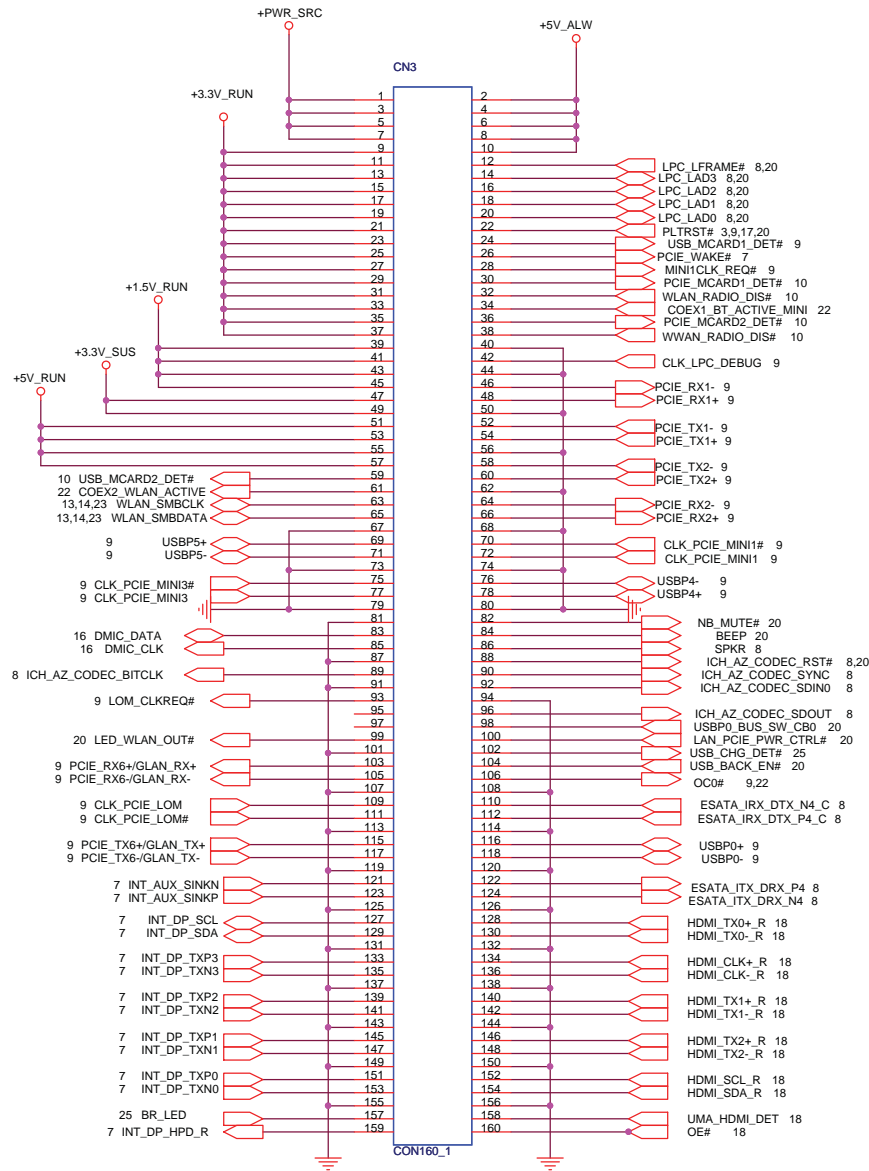
Charge and BAT  
 PCH  
 MMB, CLOCK, THERMAL



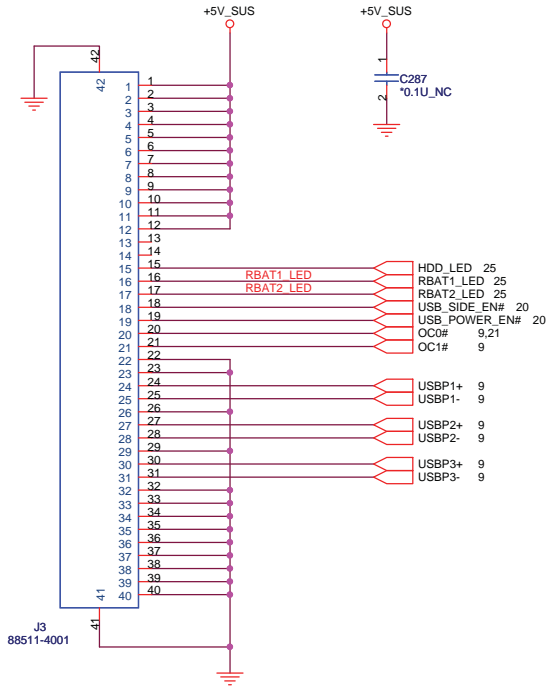
Config 0	Config 1	GM7/GM7B	USB_BACK_EN#	USB Power EN#	GM7/GM7B
0	0	UMA	0	0	SSI (X00)
0	1	Studio Switchable	1	1	PT (X01)
1	0	Studio Discrete	0	0	ST (X02)
			0	1	QT (X00)
			0	0	(A01)

**Quanta Computer Inc.**  
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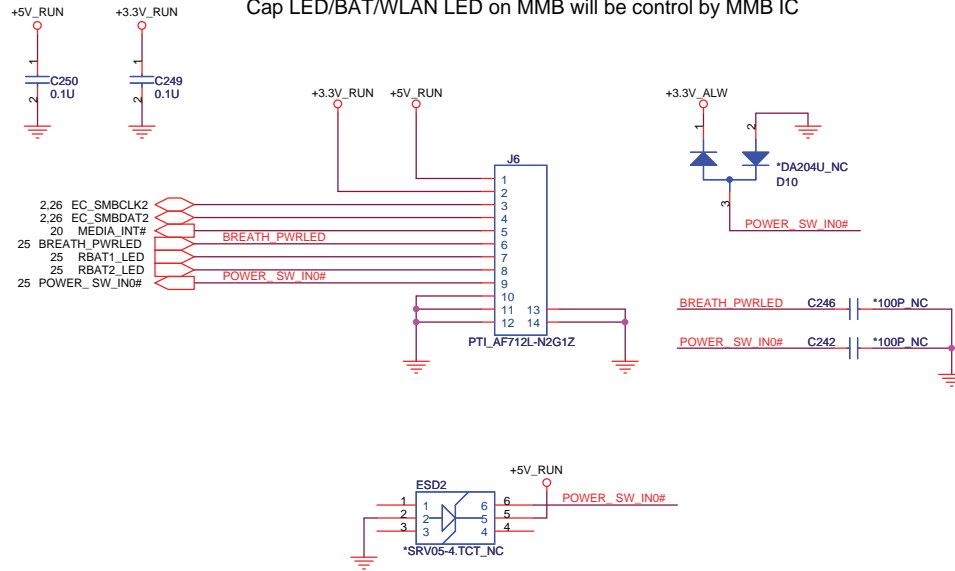


### USB IO 40 pins

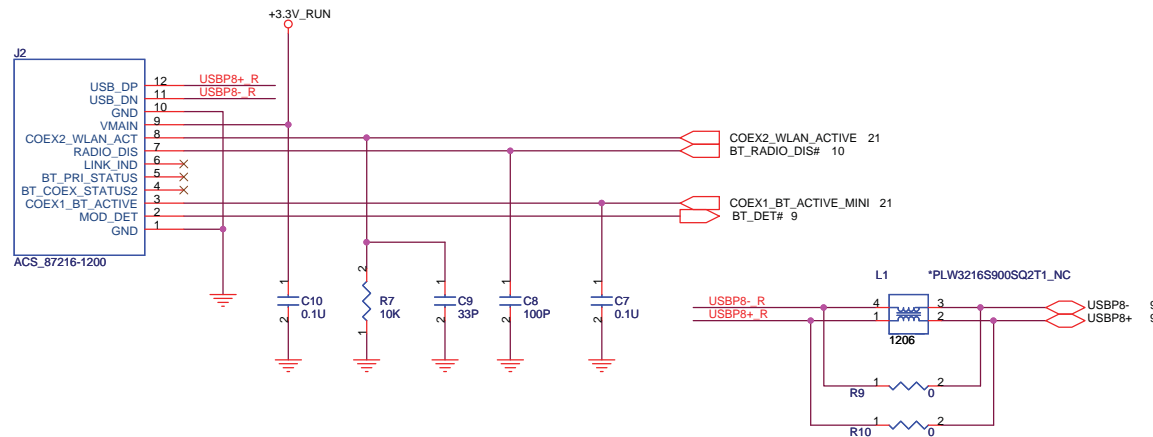


### MMB & Power Board 12pins

Cap LED/BAT/WLAN LED on MMB will be control by MMB IC

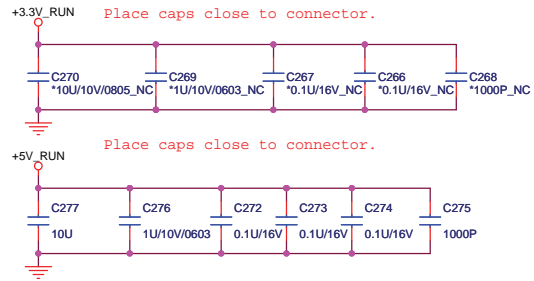
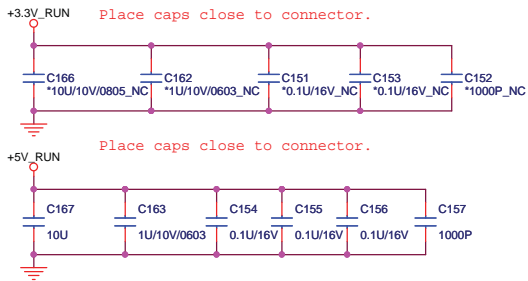
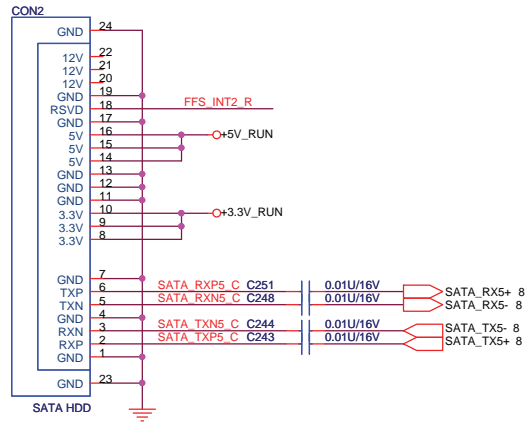
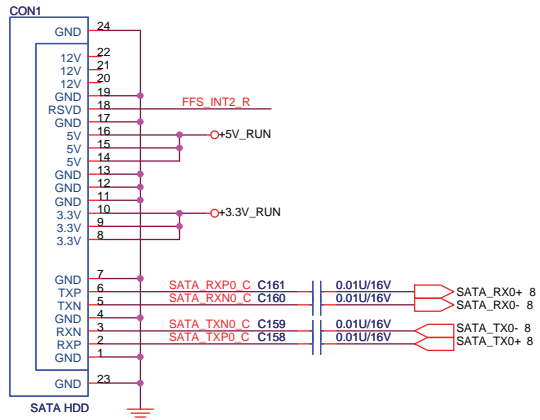


### Support Dell BT3xx series module Bluetooth WTB Conn

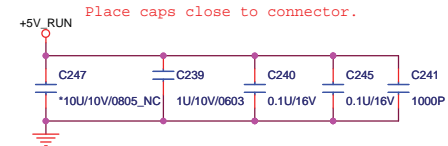
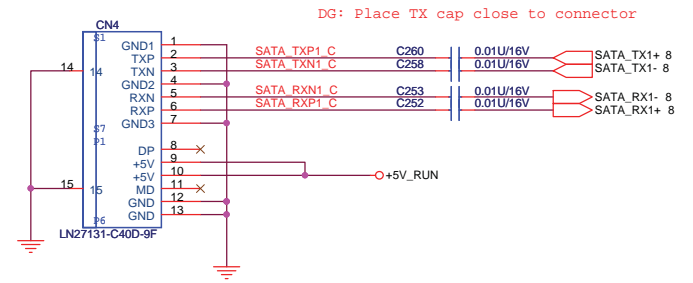




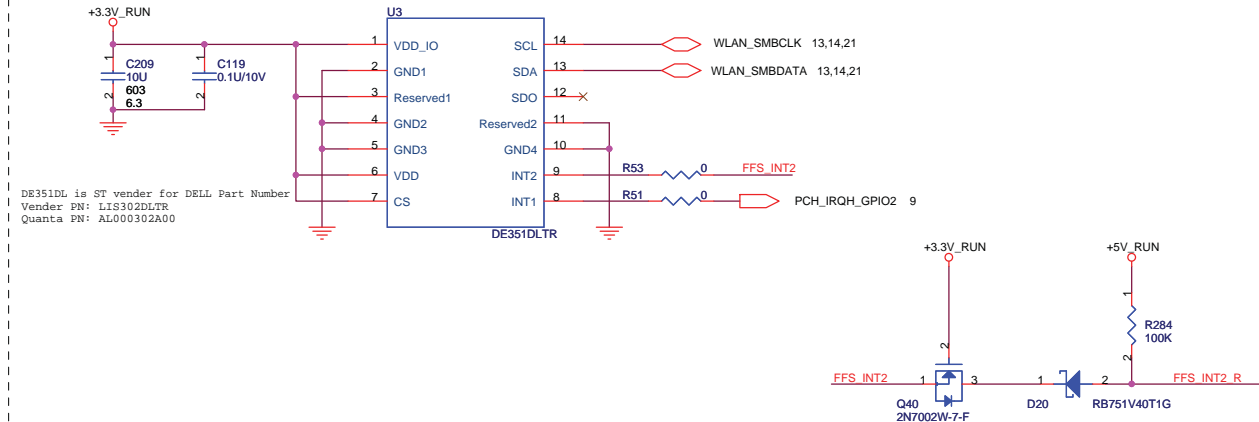
### SATA Connector.



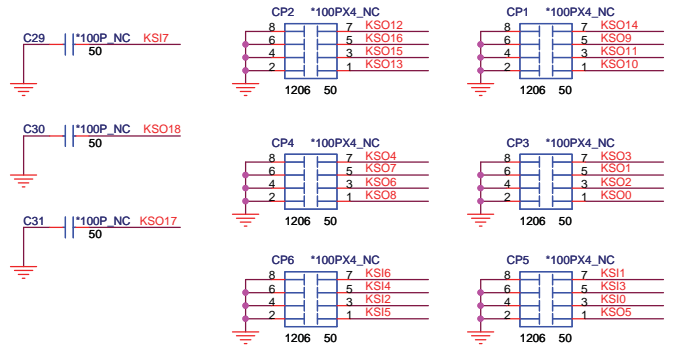
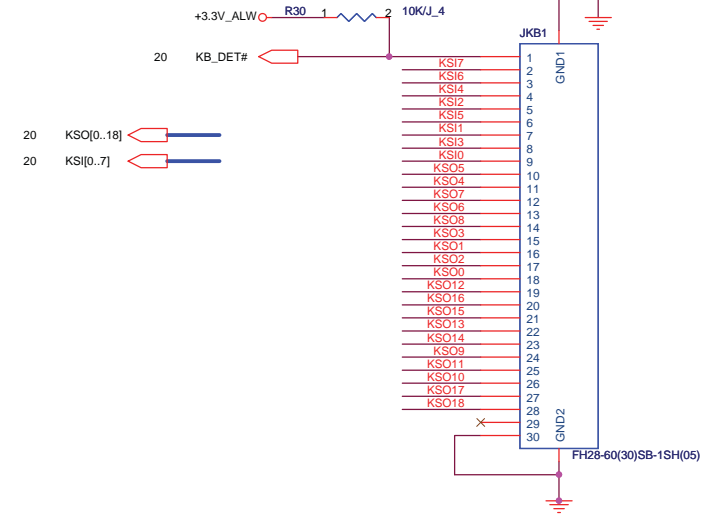
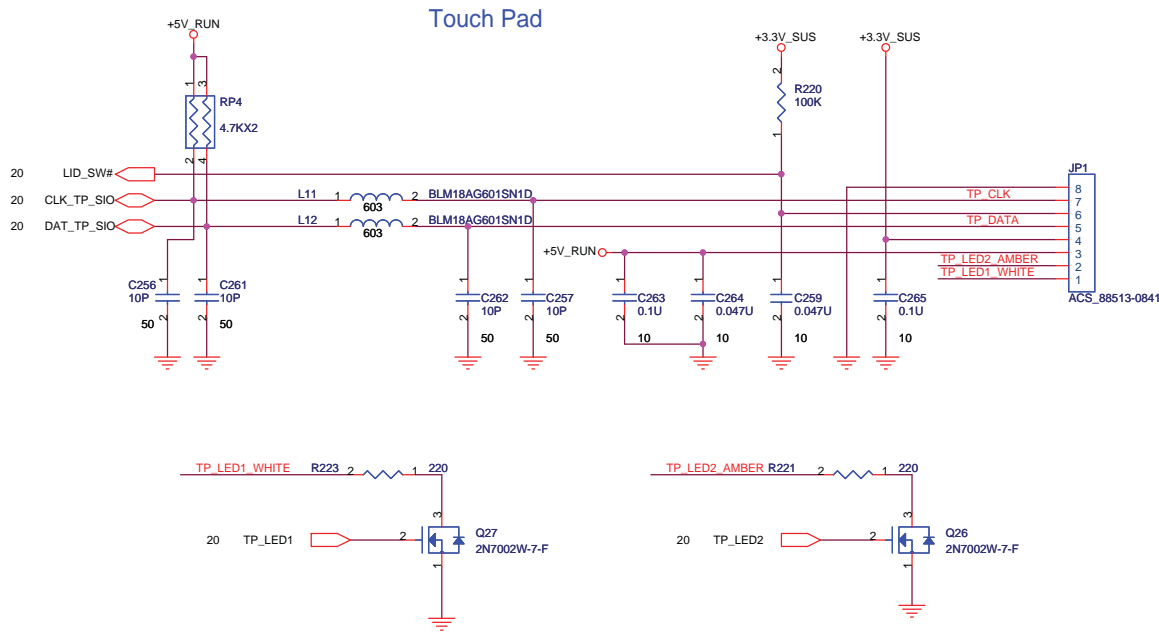
### ODD Connector



### 3-axis Fall Sensor (HDD data protector)



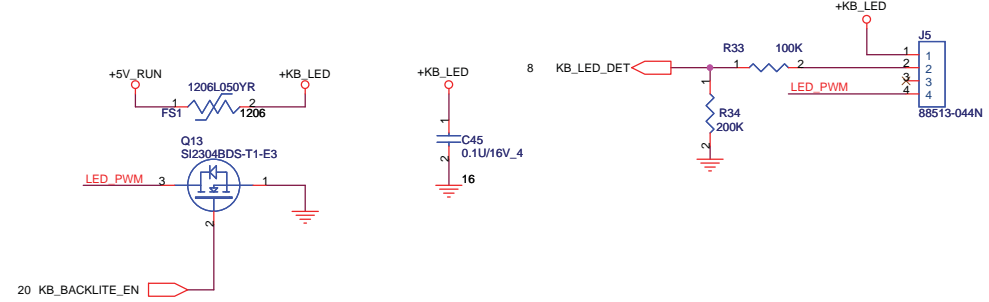
# KEYBOARD CONNECTOR



100P CAPS CLOSE TO JKB1

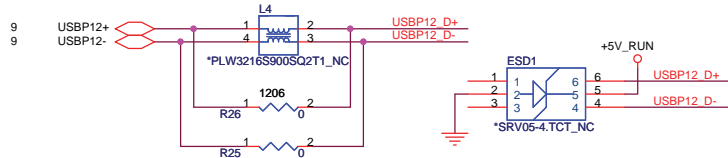
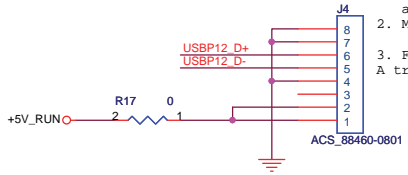
## Key board illumination

+KB\_LED power trace width >10 mil

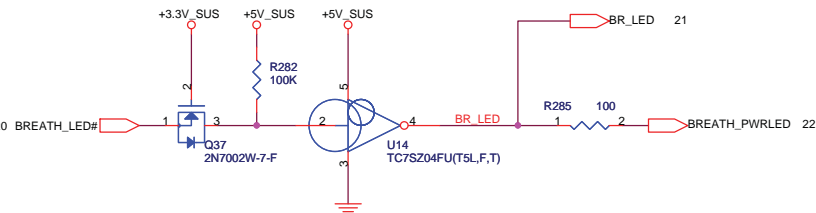
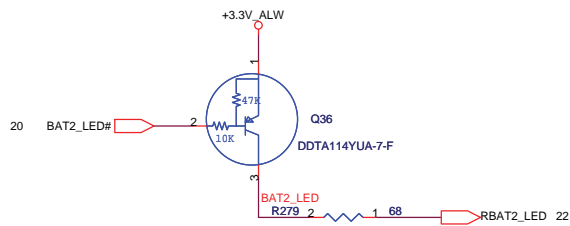
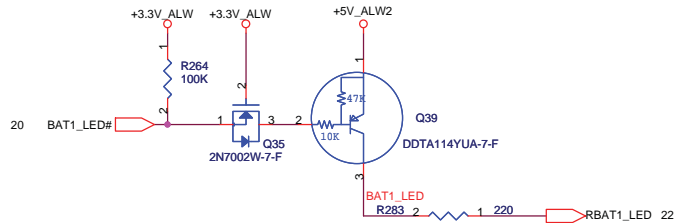


# Touch Screen Module

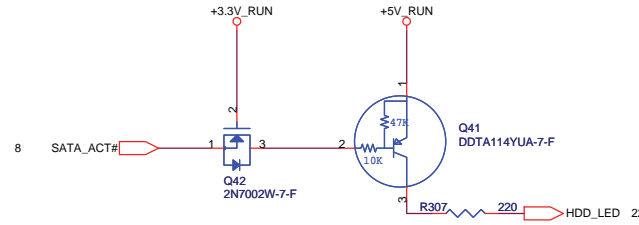
- Note:
- VBUS IND:VBUS indication should be supplied to single the DuoSense to connect According to the USB 2.0 specification. A GND voltage from the host should indicate a connection.
  - Maximum cable resistance on VCC, GND should be 150m ohm.
  - FPC cable should support 12MHz USB singles. A tri-state should indicate no connection.



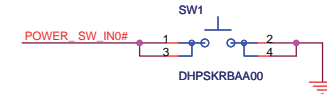
## Battery status.



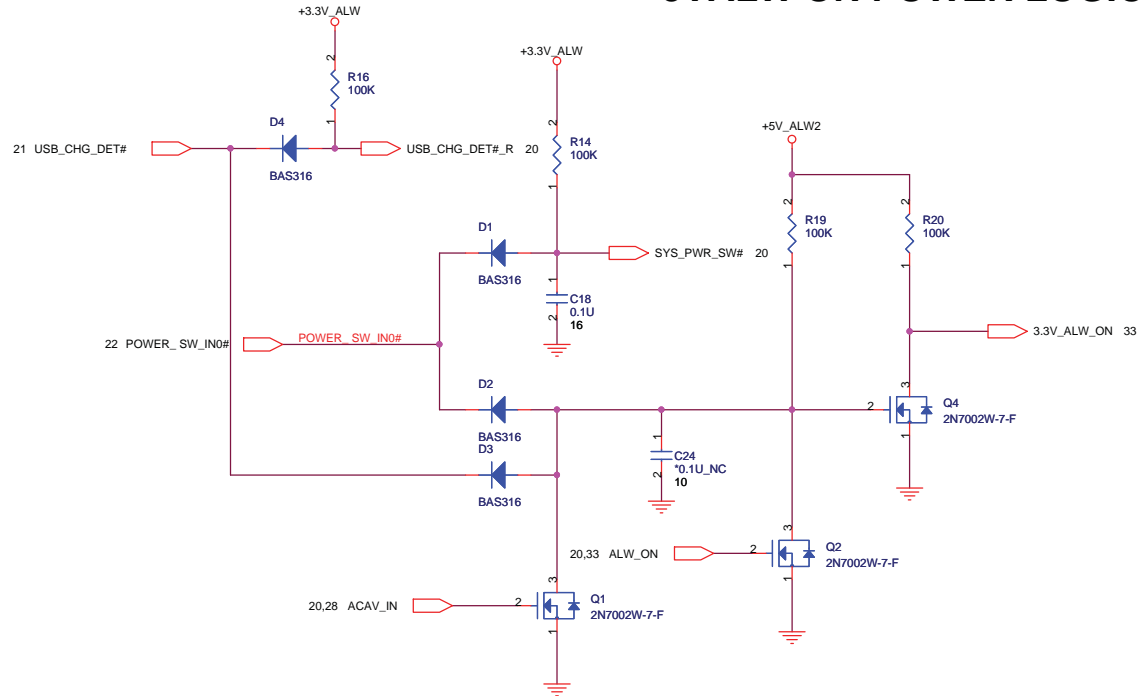
## HDD activity LED.

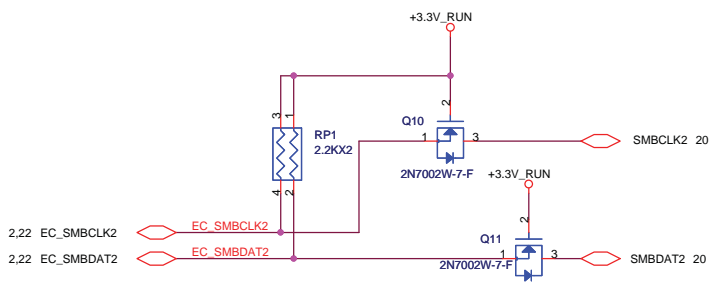
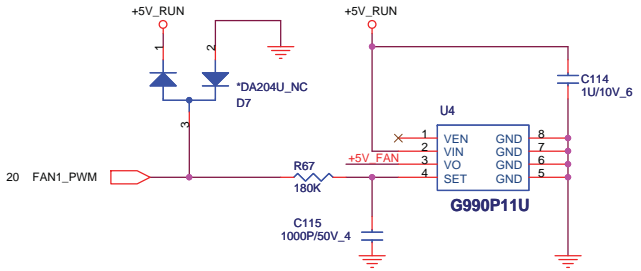
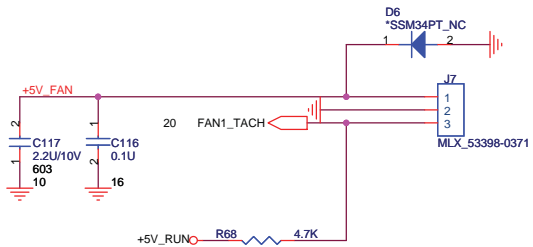


## Power button for Engineer

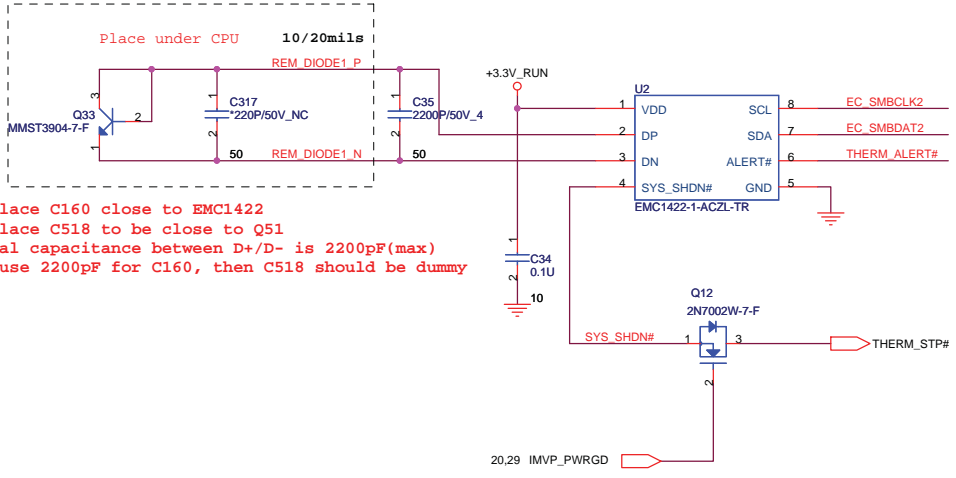


## 3VALW ON POWER LOGIC

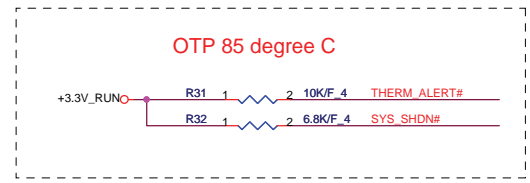


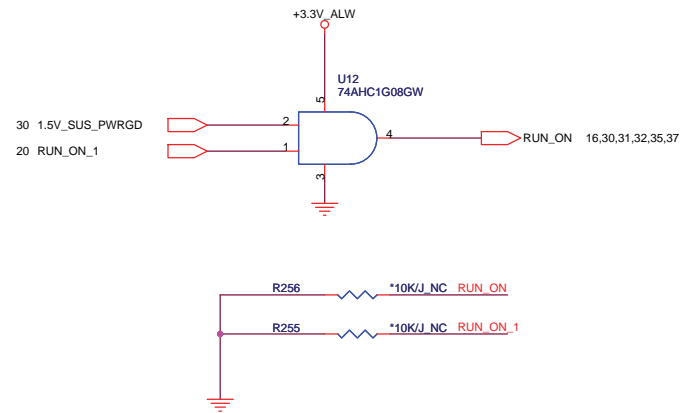
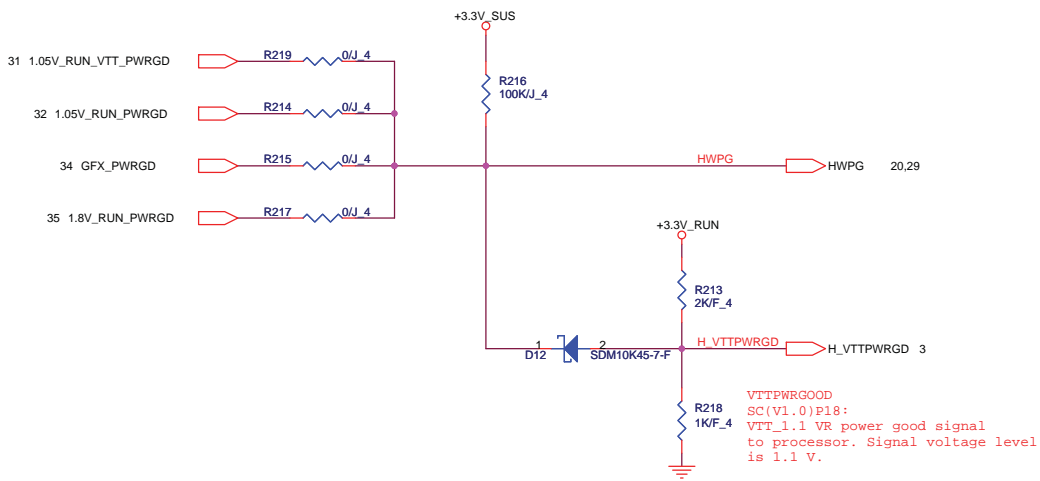
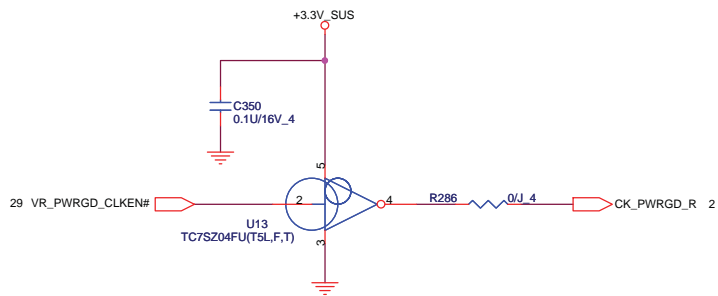


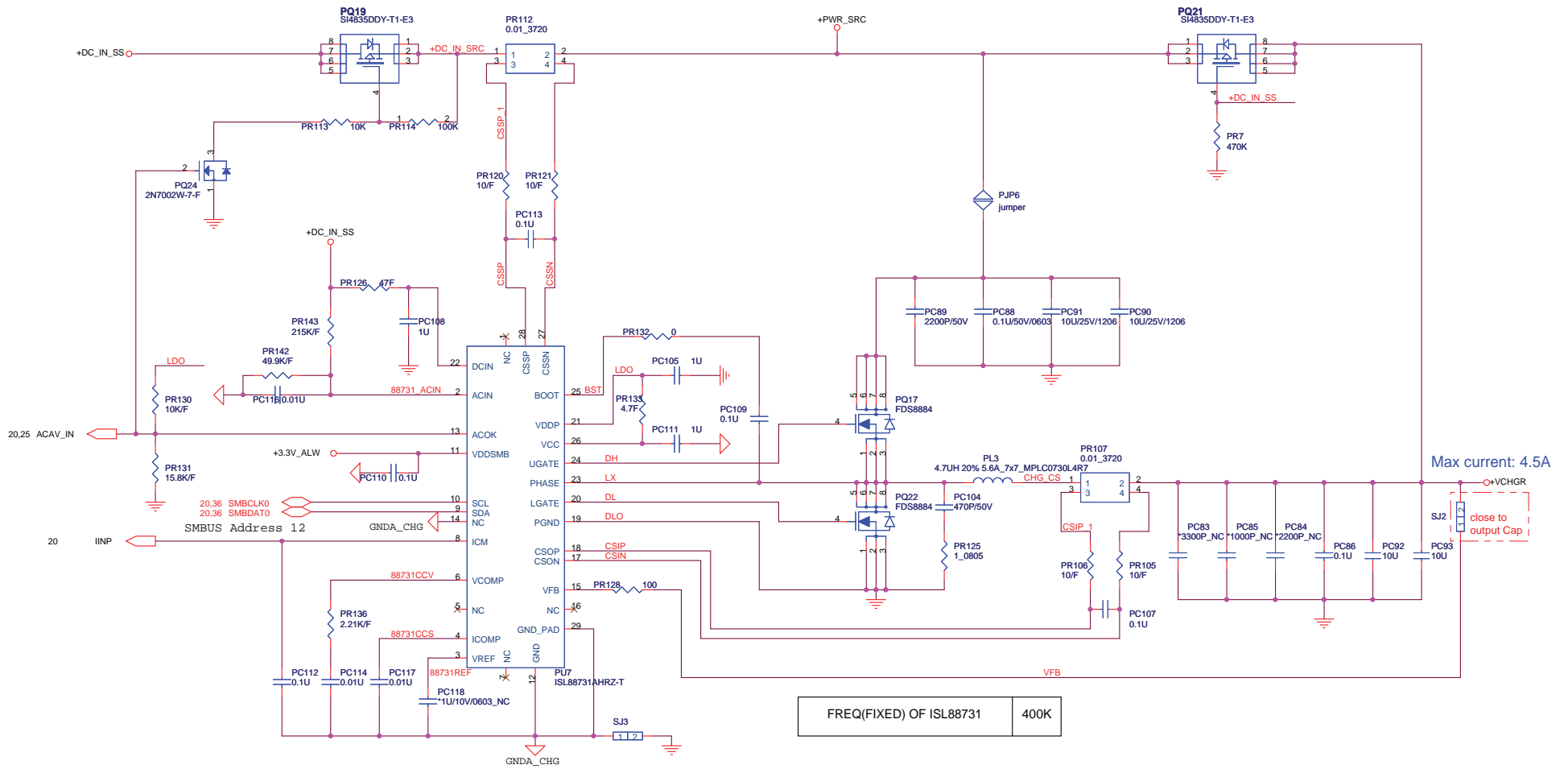
0907 Steg: Need to check C484 if needed

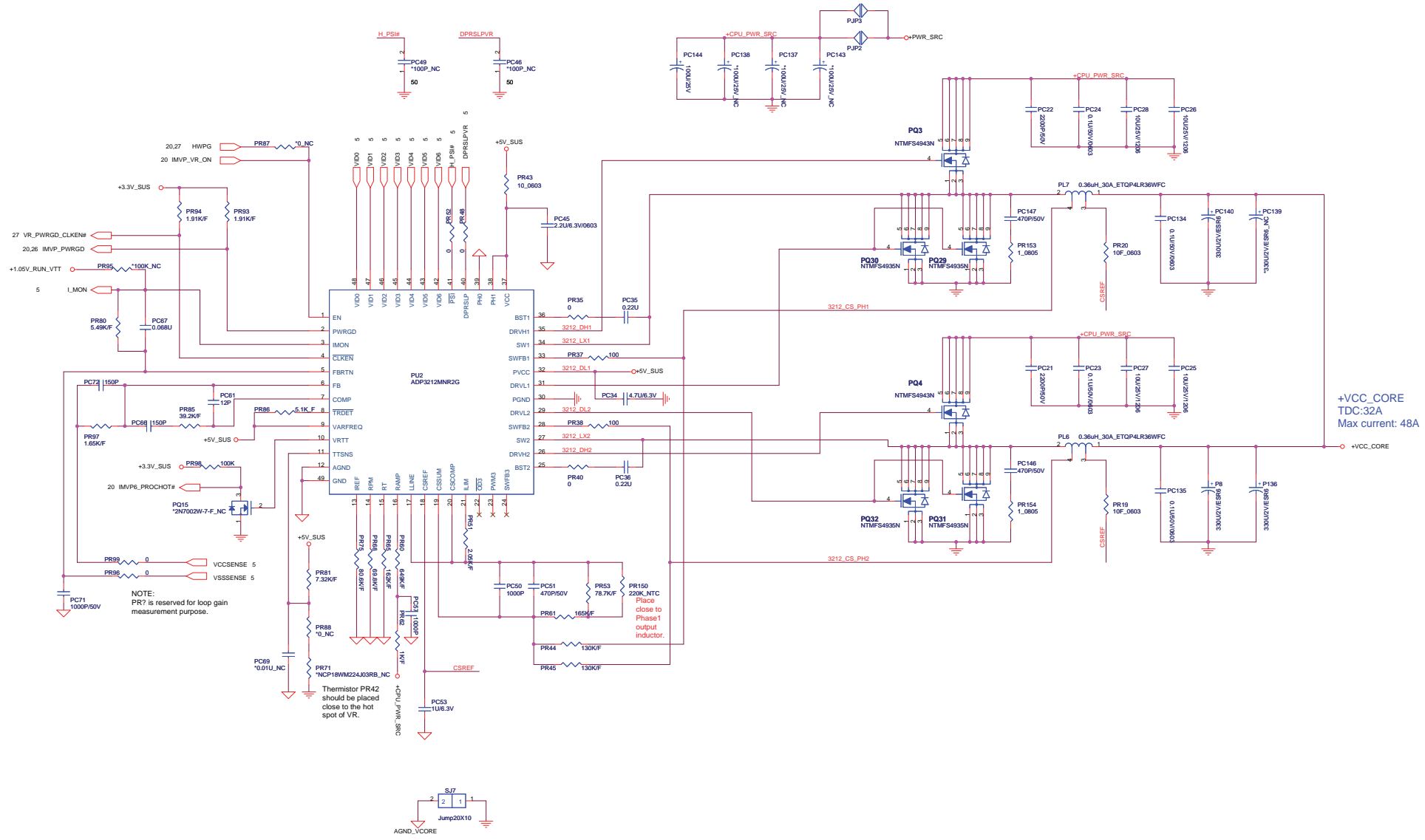


1. Place C160 close to EMC1422
  2. Place C518 to be close to Q51
- Total capacitance between D+/D- is 2200pF(max)  
if use 2200pF for C160, then C518 should be dummy



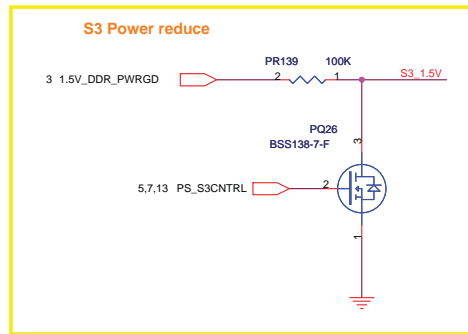








TON	PR67 = 620K
FREQ	400K



**VDDQ and VTT discharge control**

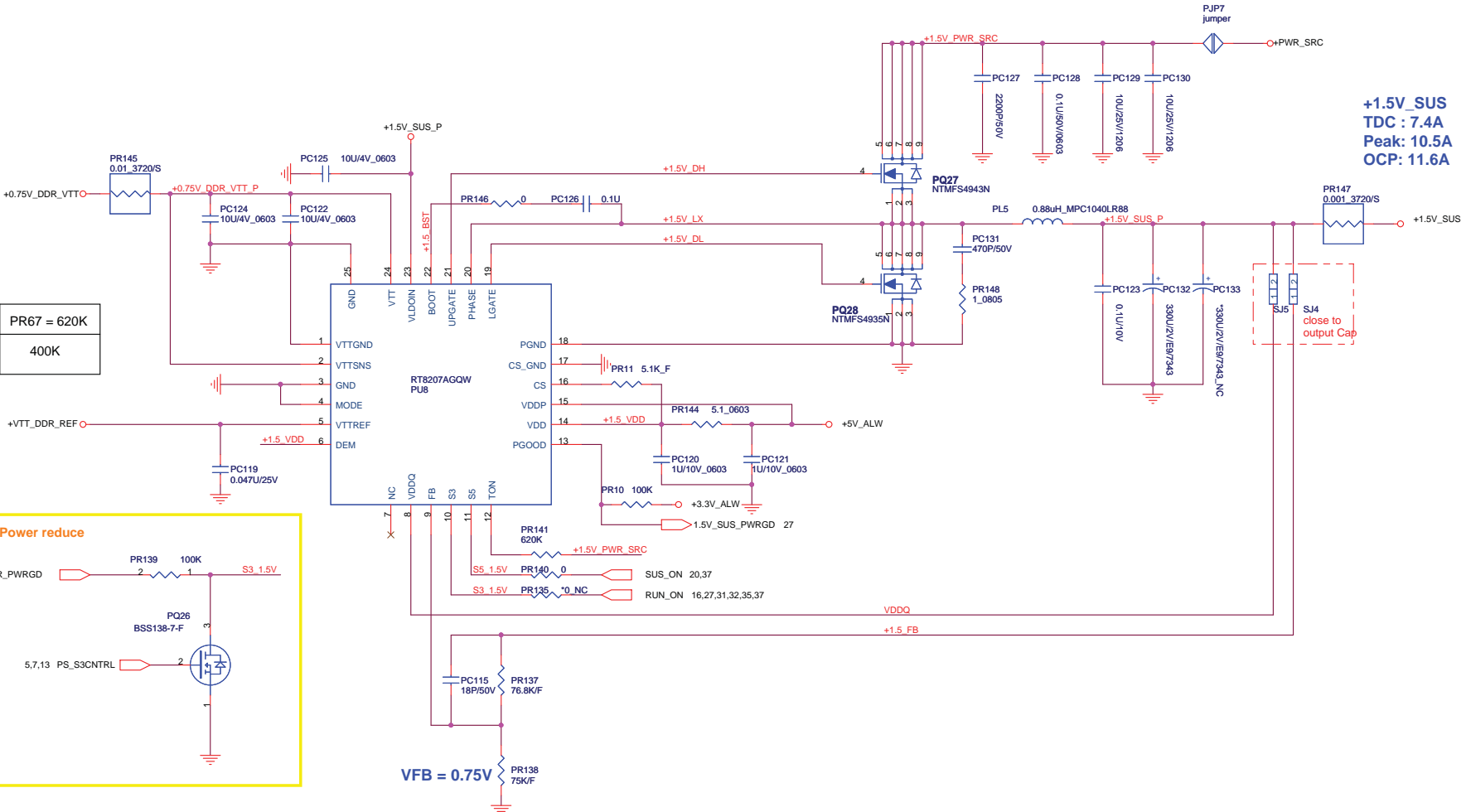
MODE pin	Discharge mode
V5IN	No discharge
VDDQ	Tracking discharge
GND	Non-tracking discharge

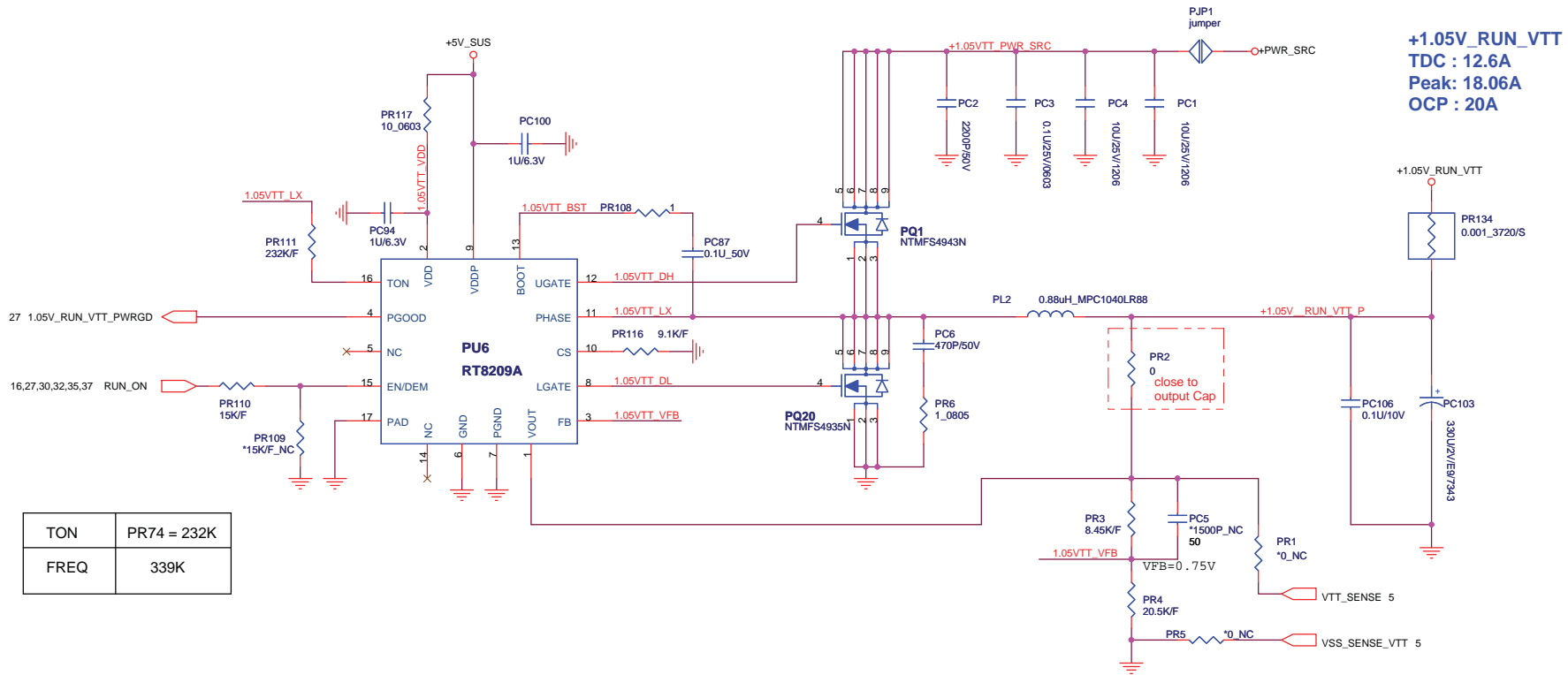
**VDDQ output voltage selection**

FB	VDDQ (V)	VTTREF and VIT	NOTE
GND	1.5V	VDDQSNS/2	DDR3
V5IN	1.8V	VDDQSNS/2	DDR2
FB Resistors	Adjusting	VDDQSNS/2	0.75V < VDDQ < 3.3V

**Outputs Management by S3, S5 control**


State	S3	S5	VDDQ	VTTREF	VTT
S0	HI	HI	On	On	On
S3	LO	HI	On	On	Off (Hi-Z)
S4/S5	LO	LO	Off (discharge)	Off (discharge)	Off (discharge)



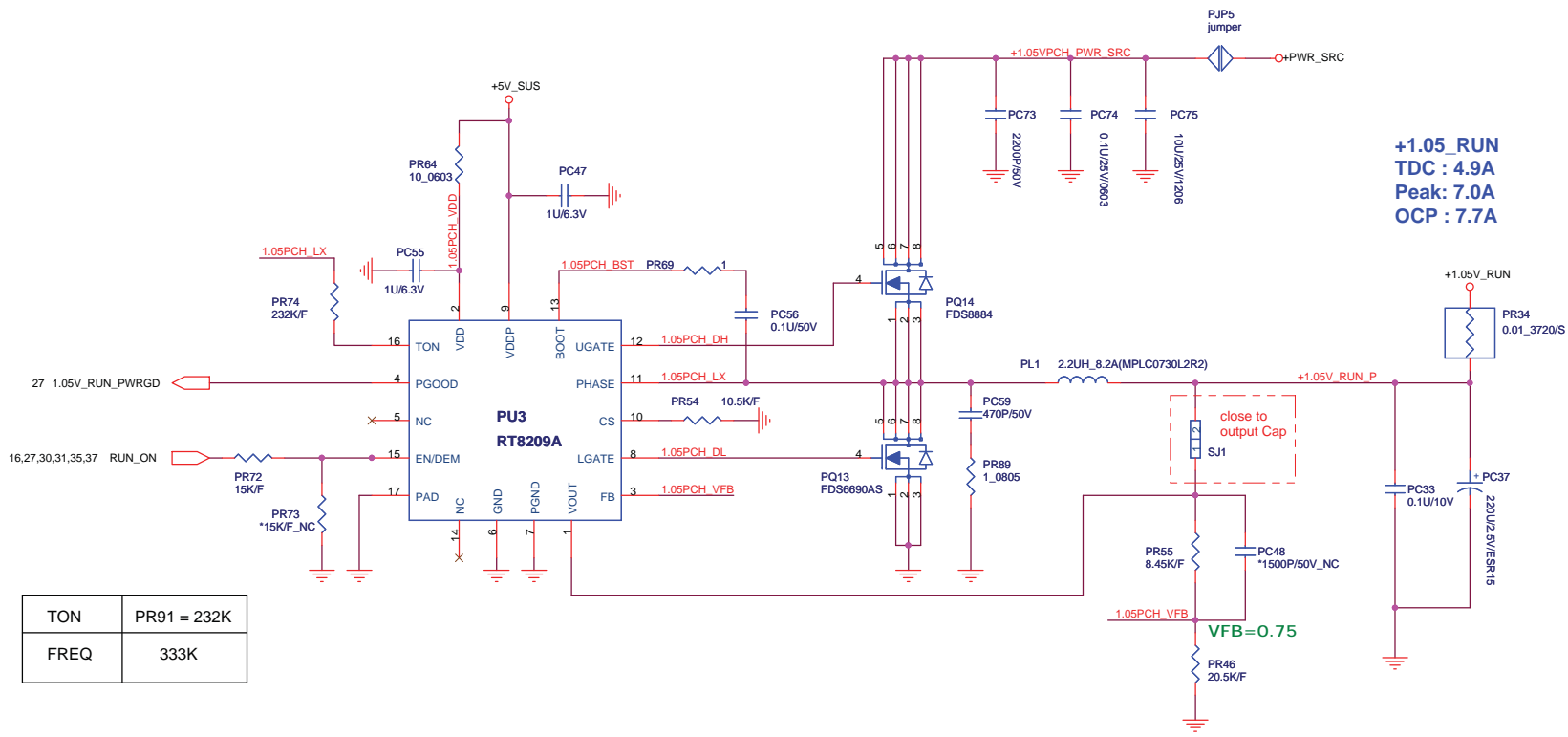


**+1.05V\_RUN\_VTT**  
**TDC : 12.6A**  
**Peak: 18.06A**  
**OCP : 20A**

TON	PR74 = 232K
FREQ	339K

 **Quanta Computer Inc.**  
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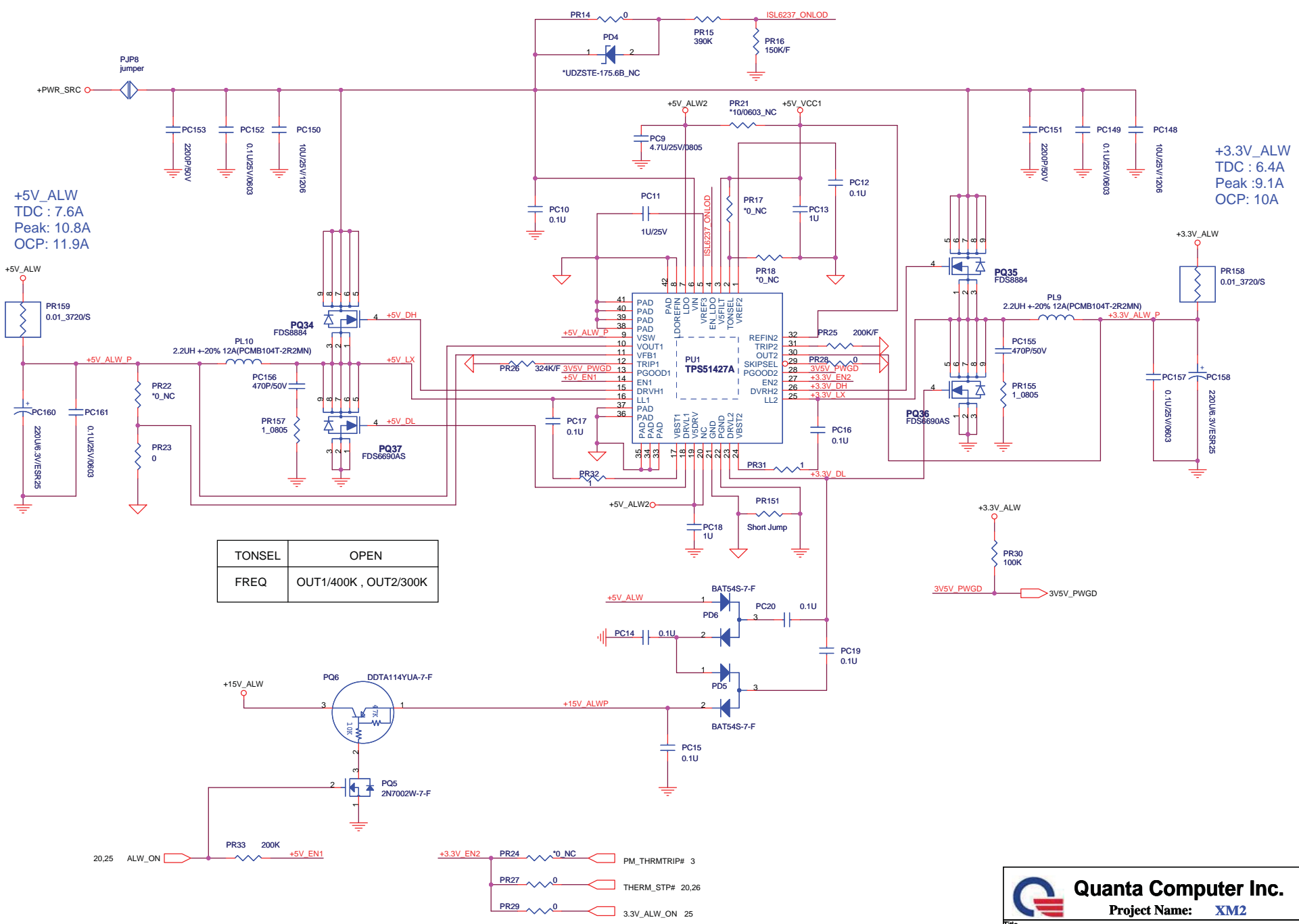
TON	PR91 = 232K
FREQ	333K

**Quanta Computer Inc.**  
 Project Name: **XM2**

Title: CoverPage

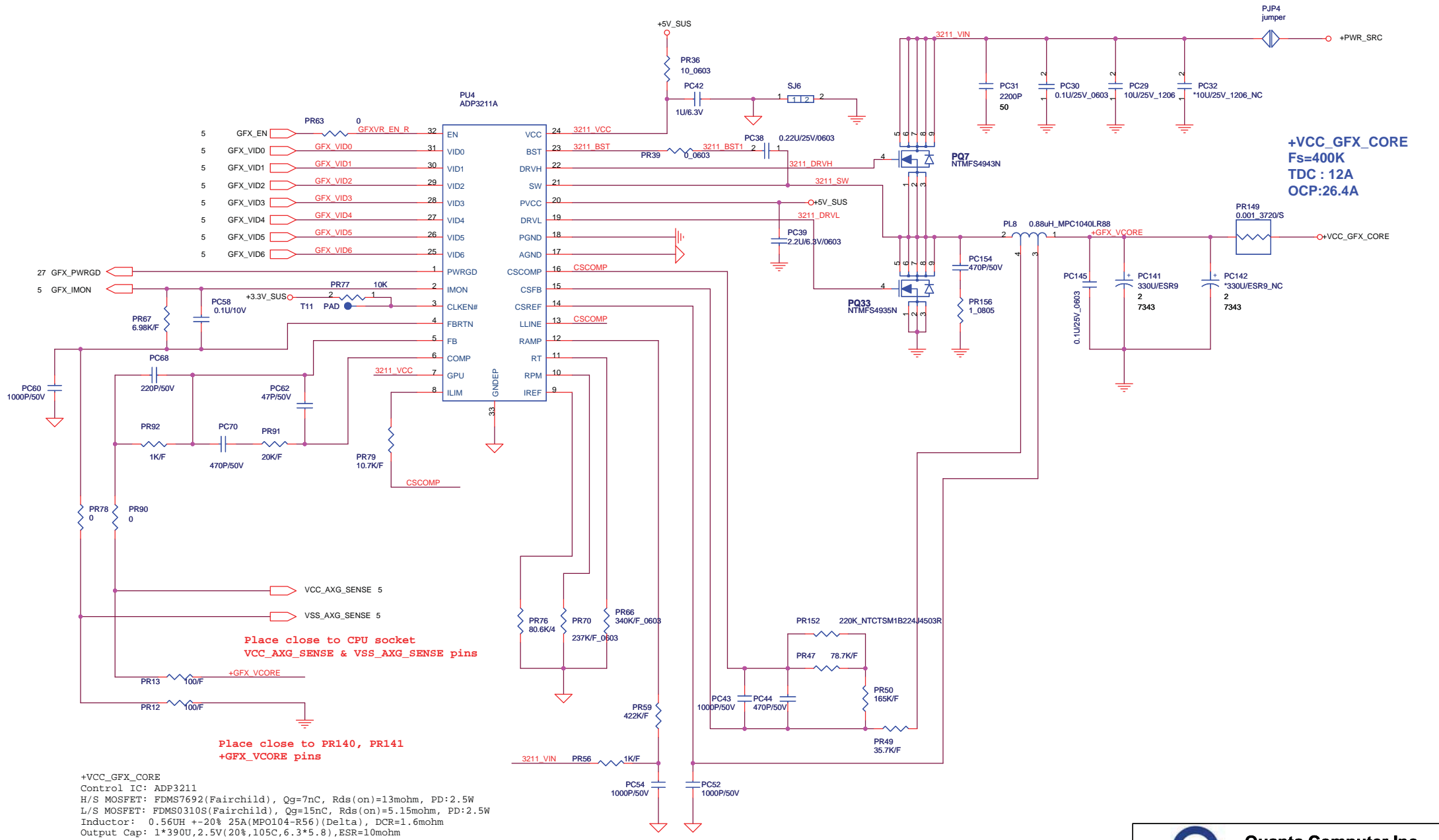
Size: Document Number XM2\_MB Rev D

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**Quanta Computer Inc.**  
Project Name: **XM2**

Title CoverPage		
Size	Document Number XM2_MB	Rev D
Date: Friday, January 15, 2010	Sheet 33	of 39




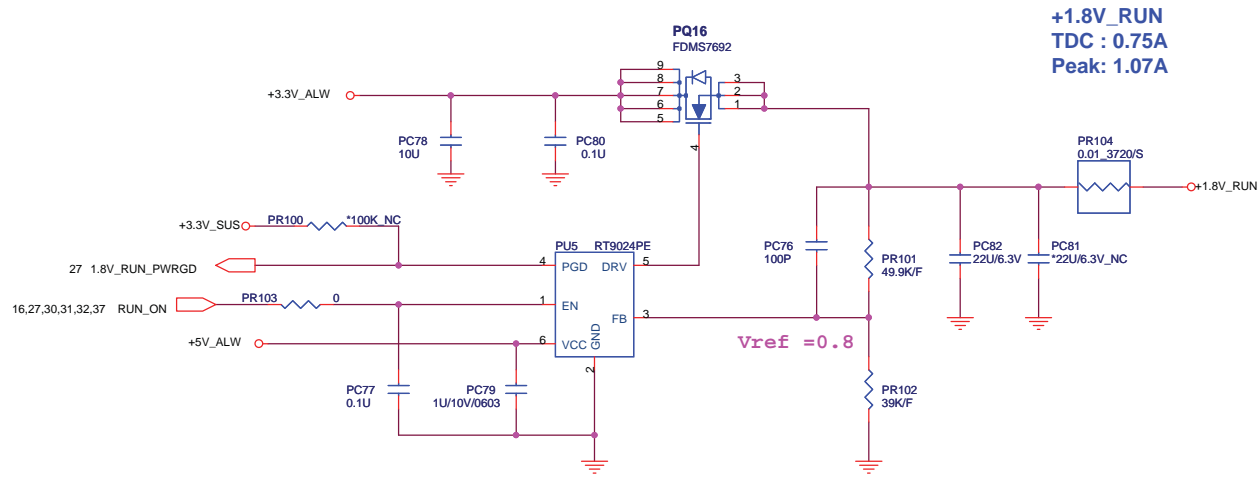
**+VCC\_GFX\_CORE**  
**Fs=400K**  
**TDC : 12A**  
**OCP:26.4A**

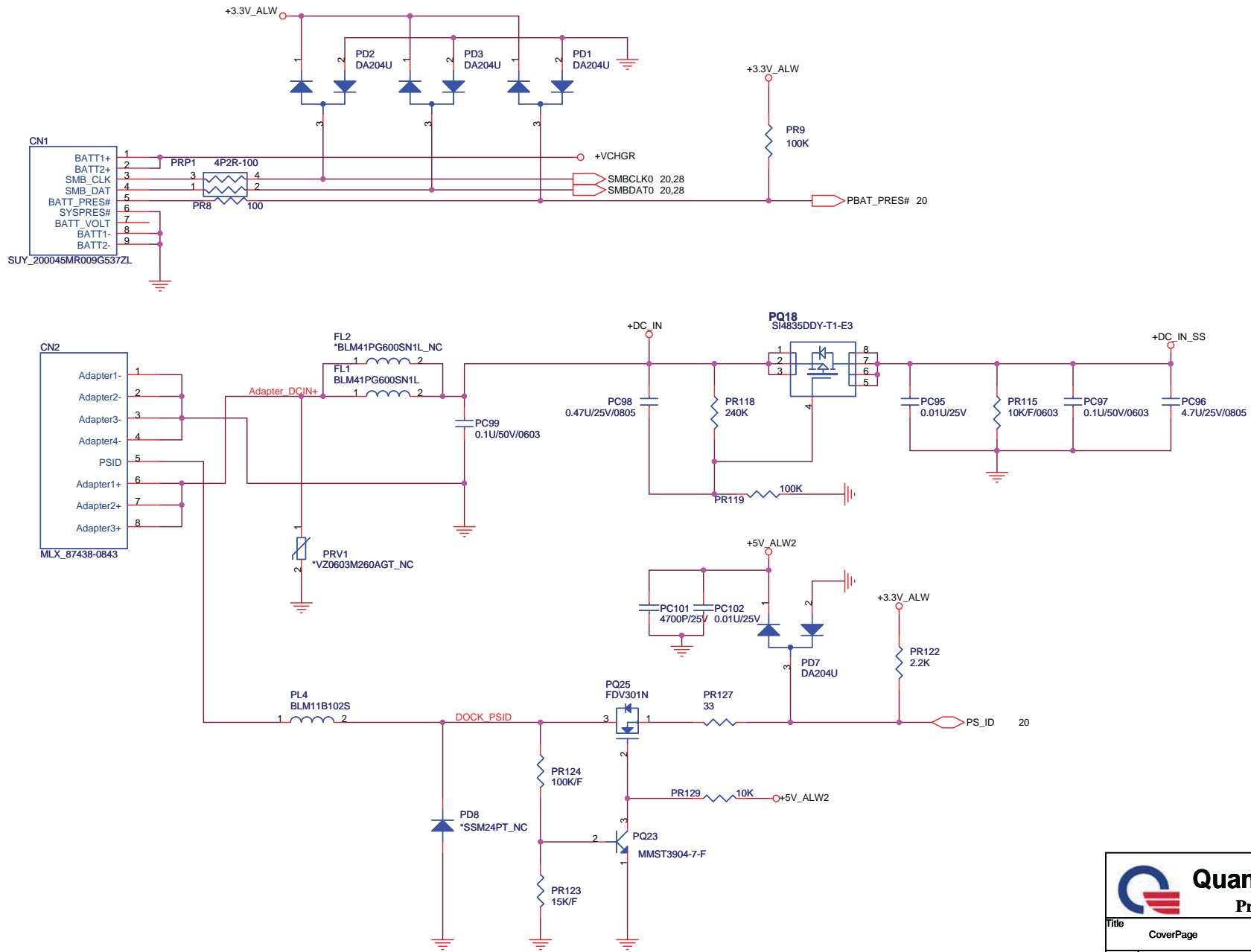
Place close to CPU socket  
**VCC\_AXG\_SENSE & VSS\_AXG\_SENSE pins**

Place close to PR140, PR141  
**+GFX\_VCORE pins**

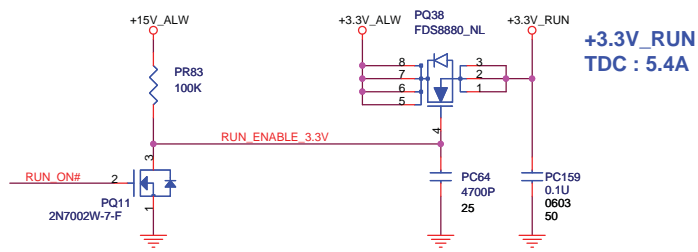
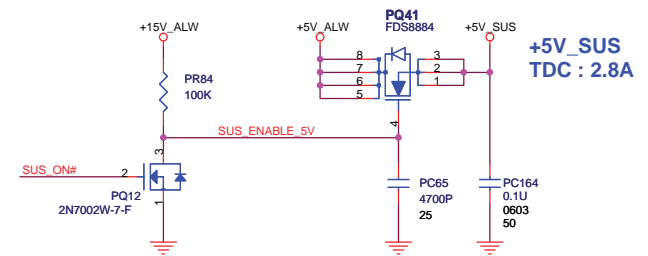
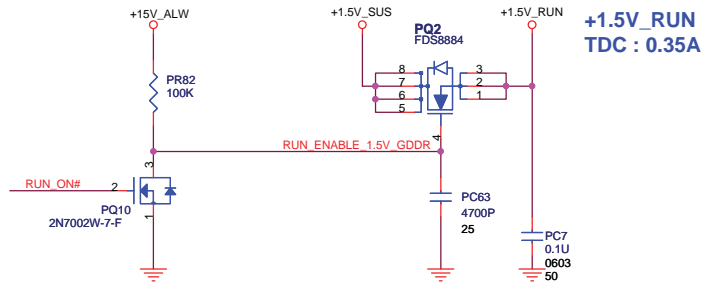
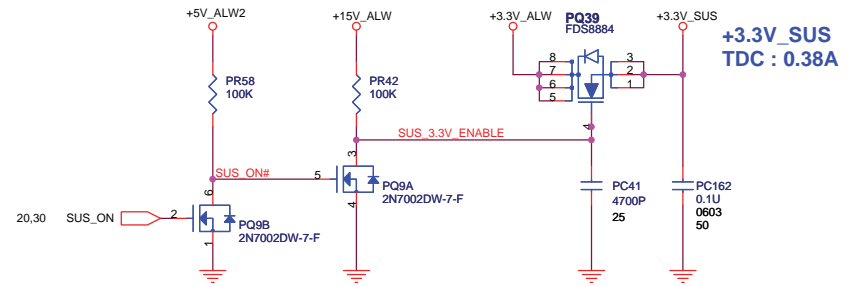
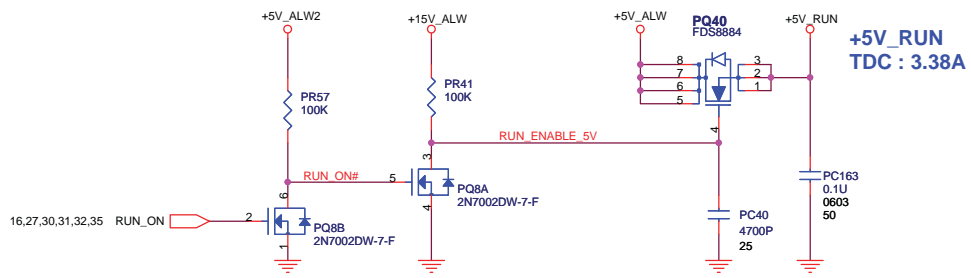
+VCC\_GFX\_CORE  
 Control IC: ADP3211  
 H/S MOSFET: FDMS7692(Fairchild), Qg=7nC, Rds(on)=13mohm, PD=2.5W  
 L/S MOSFET: FDMS0310S(Fairchild), Qg=15nC, Rds(on)=5.15mohm, PD=2.5W  
 Inductor: 0.56UH +-20% 25A(MPO104-R56)(Delta), DCR=1.6mohm  
 Output Cap: 1\*390U, 2.5V(20%, 105C, 6.3\*5.8), ESR=10mohm

 <b>Quanta Computer Inc.</b> <b>PROJECT : GM6 UMA MB</b>		Rev 1A
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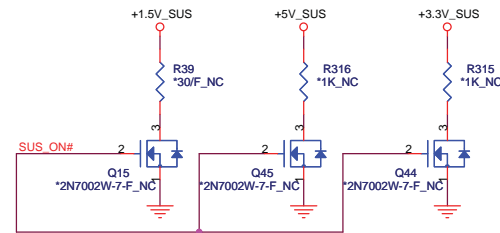
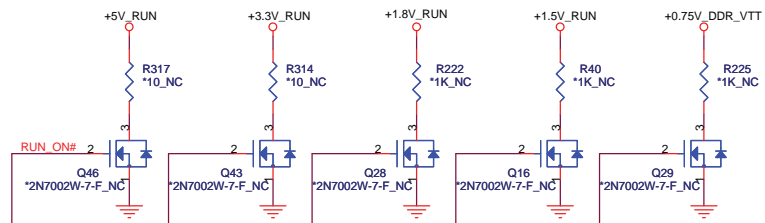





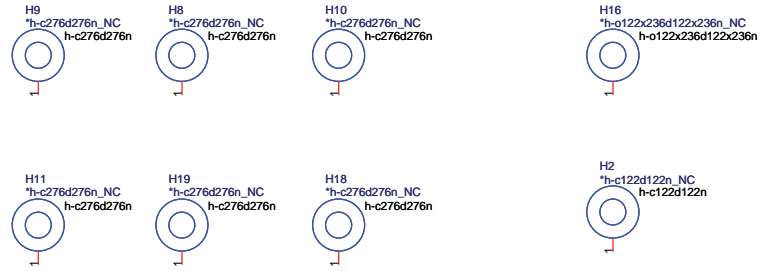
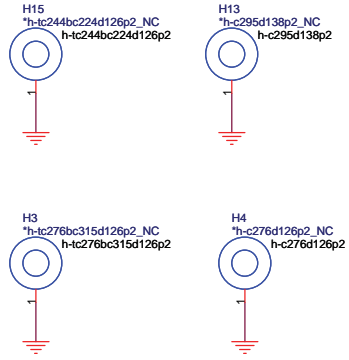
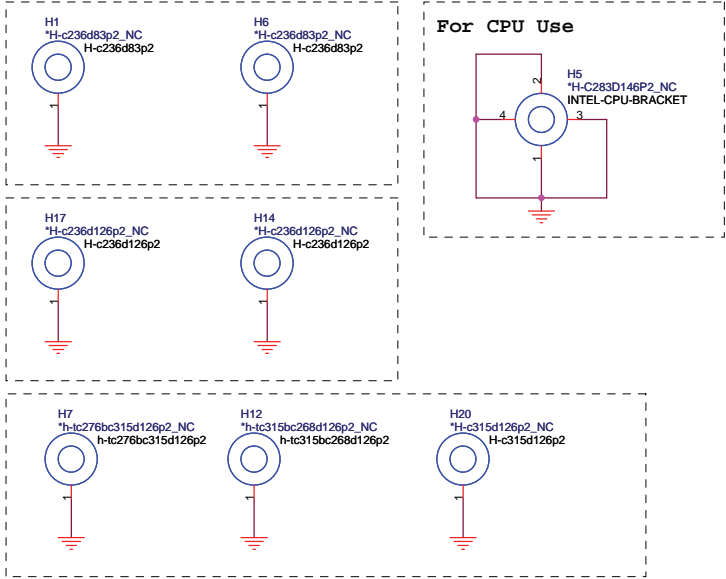





**Reserve discharge path**

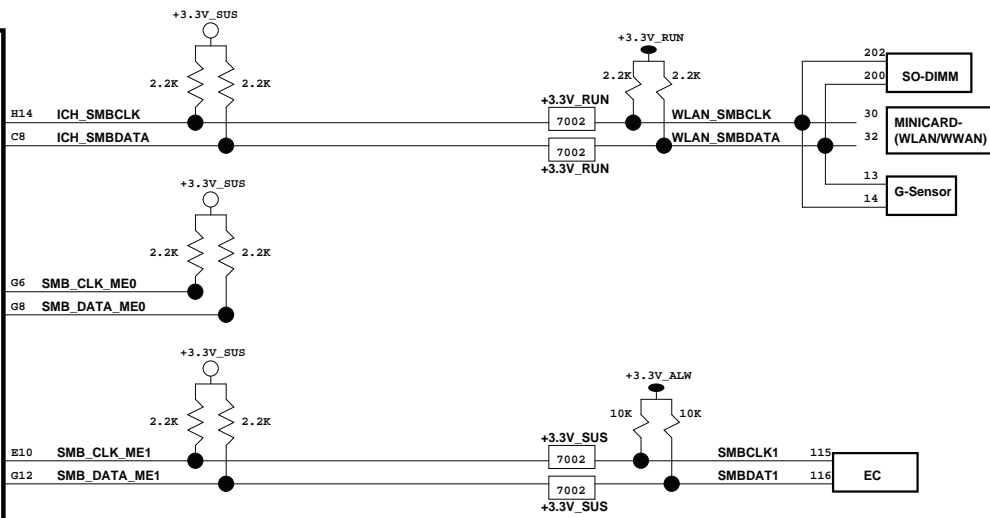


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