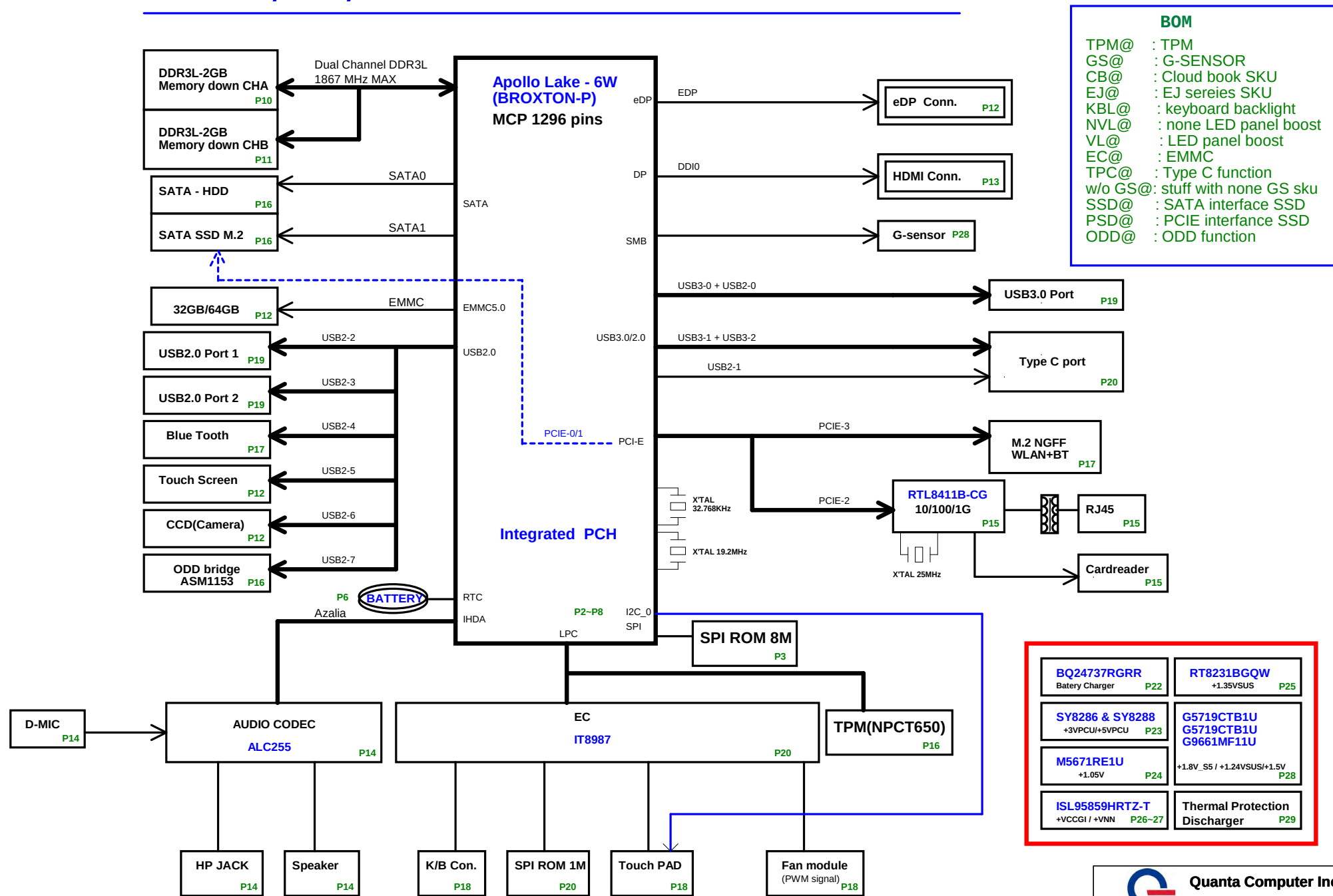
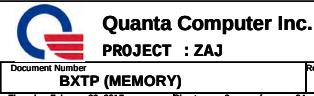


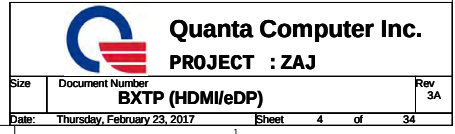
ZAJ/Z8P/Z8PA SYSTEM BLOCK DIAGRAM





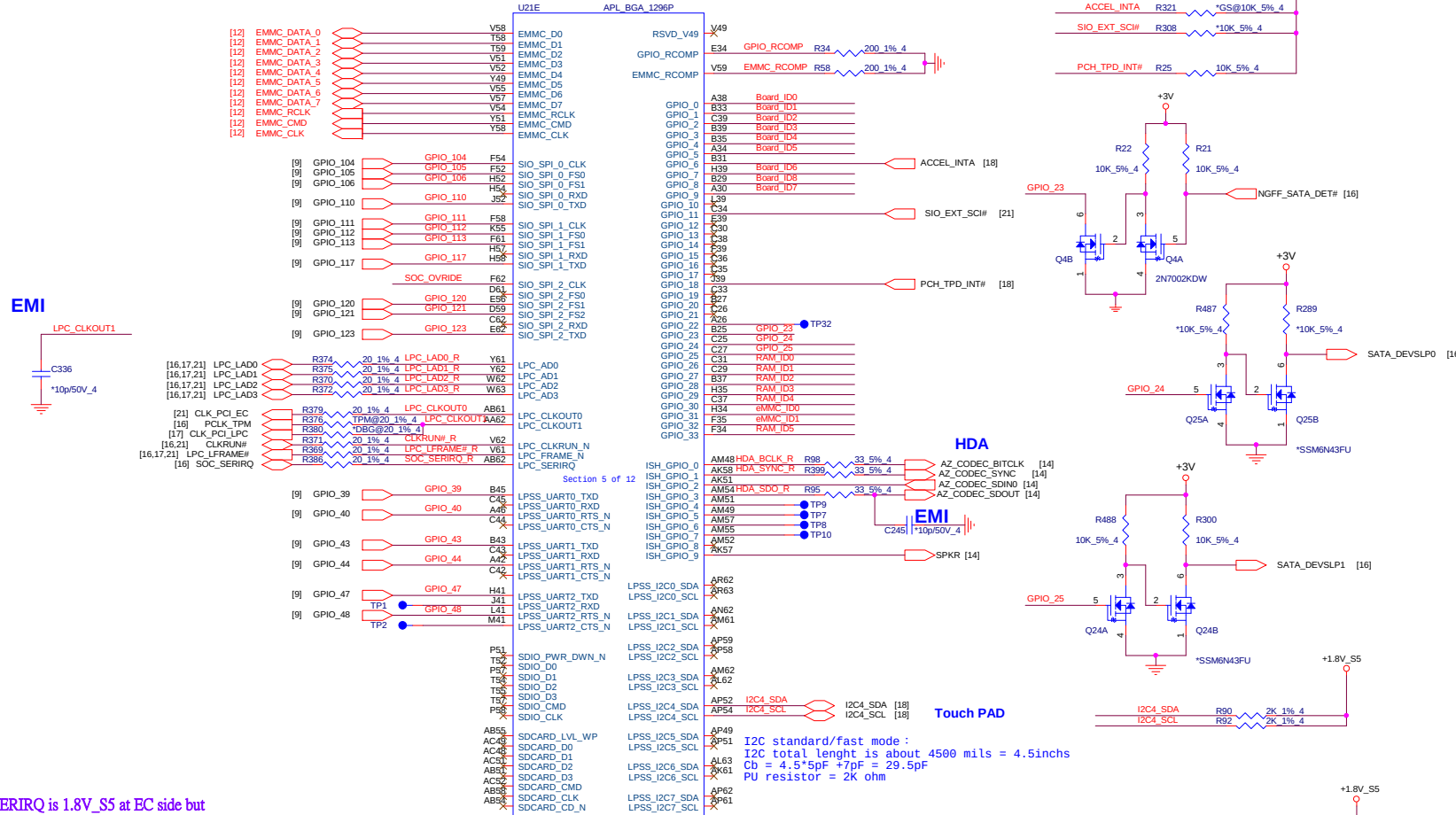


 Quanta Computer Inc. PROJECT : ZAJ		Rev. 3
Size	Document Number	
BXTP (PCIe/USB/SATA/SPI)		
Date:	Thursday, February 23, 2017	Sheet 3 of 34

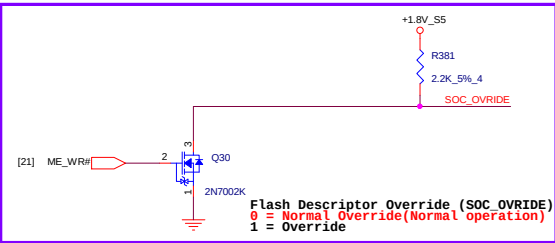
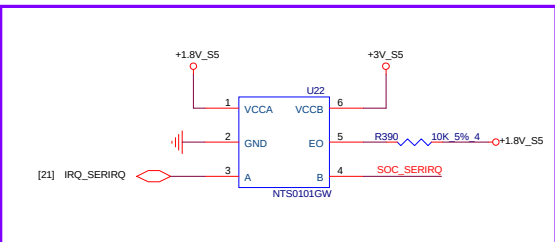


ApolloLake (EMMC/LPC/I2C)

05



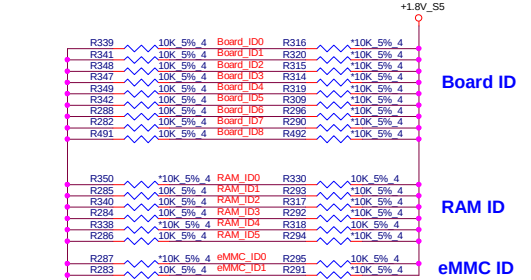
SERIRQ is 1.8V_S5 at EC side but 3V_S5 at CPU/TPM side



Flash Descriptor Override (SOC OVRIDE)
0 = Normal Operation (Normal operation)
1 = Override

HW strap ID	Strap pin Description
Board_ID0	0 = w/o type C 1 = w/ type C
Board_ID1	0 = with EMMC 1 = without EMMC <HDD only>
Board_ID2	0 = SATA SSD 1 = PCIe SSD
Board_ID3	0 = none G sensor 1 = G sensor
Board_ID4	0 = none TPM 1 = TPM
Board_ID5	0 = EJ HDD 1 = Cloud book SSD
Board_ID6	0 = EJ SSD 1 = Cloud book N/A
Board_ID7	0 = EJ series 1 = Cloud book
Board_ID8	0 = UMA 1 = GPU
RAM_ID0	0 = Single channel (A only) 1 = Dual channel (A & B)
RAM_ID1	0 = Channel A 2GB 1 = Channel A 4GB
RAM_ID2	0 = Channel B 2GB 1 = Channel B 4GB

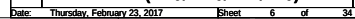
I2C standard/fast mode:
I2C total length is about 4500 mils = 4.5inches
Cb = 4.5*5pF *7pF = 29.5pF
PU resistor = 2K ohm

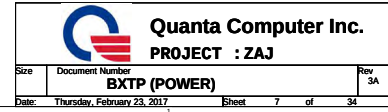


RAM_ID5	RAM_ID4	RAM_ID3	Vender	Quanta PN	Description
0	0	0	Miron-2GB	AKD5J6STL08	IC SDRAM(96P)MT41K256M16HA-125:E STNBSQ
0	0	1	Miron-2GB	AKD596STL12	IC SDRAM(96P)MT41K256M16TW-107:P STNBSQ
0	1	0	Hynix-2GB	AKD5PGSTW29	IC SDRAM(96P)H5TC4663EFR-PBA(FBGA)STNBSQ
0	1	1	Samsung-2GB	AKD5J0T5B4	IC SDRAM(96P)K4B4G1646E-BYK0(FBGA)STNBSQ

eMMC_ID1	eMMC_ID0	Vender
0	0	Samsung 32/64GB
0	1	Hynix 32/64GB
1	0	Kingston 32/64GB

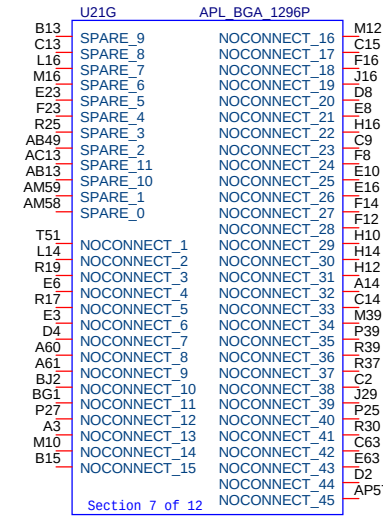
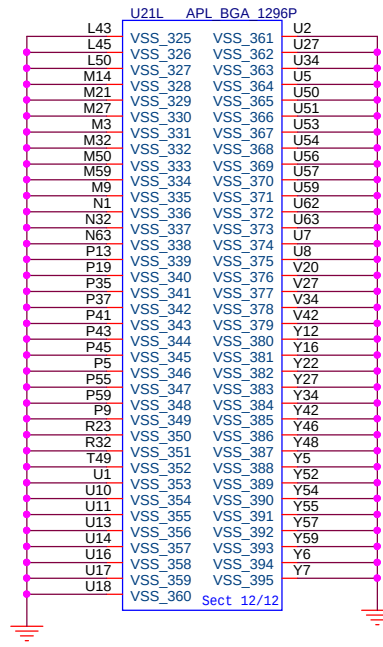
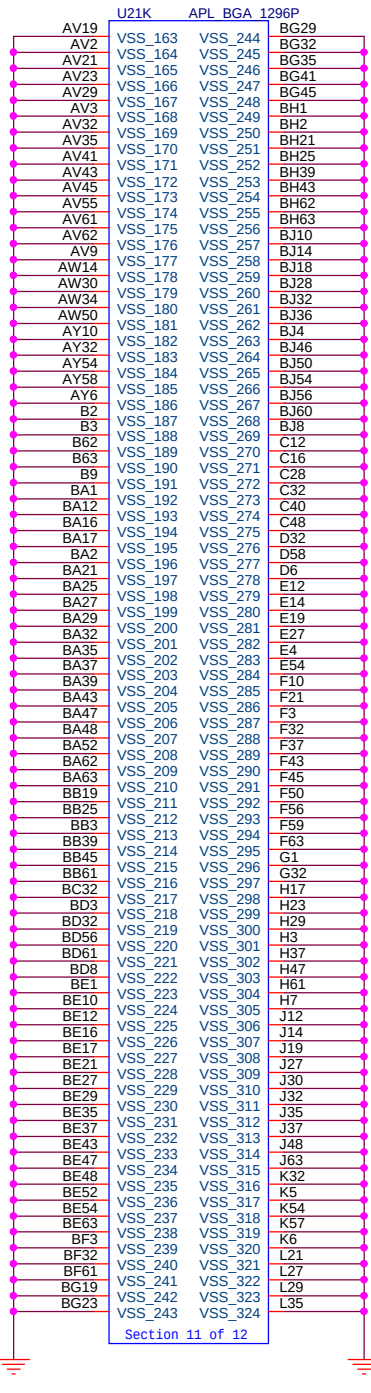
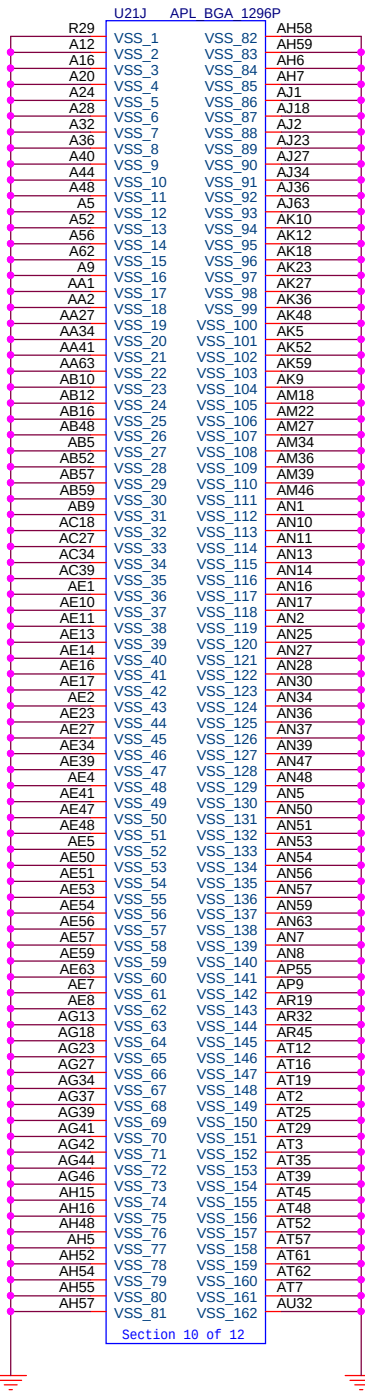
Quanta Computer Inc.
PROJECT : ZAJ
BXTP (EMMC/LPC/SMB/ISH)
 Date: Thursday, February 23, 2017 Sheet 5 of 34





Apollolake ULT (GND)

08

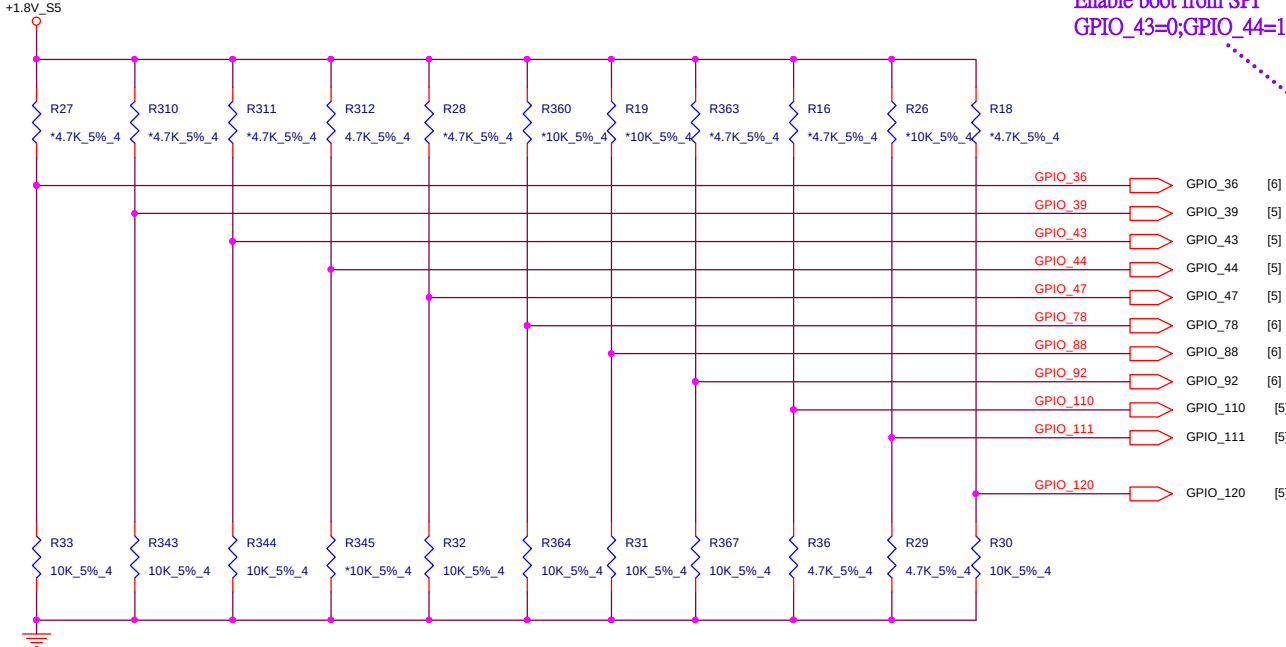




Quanta Computer Inc.
PROJECT : ZAJ

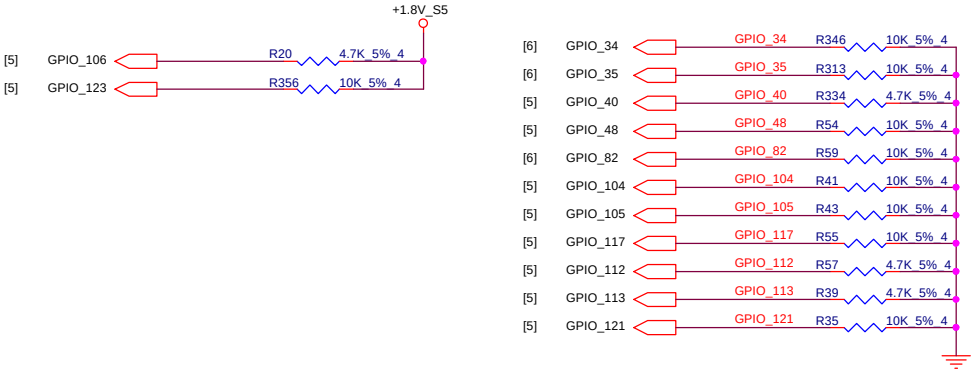
Size	Document Number	Rev 3A
BXTP (GND)		
Date:	Thursday, February 23, 2017	Sheet 8 of 34

HARDWARE STRAPS



Follw APL WoW36 :
Enable boot from SPI
GPIO_43=0;GPIO_44=1

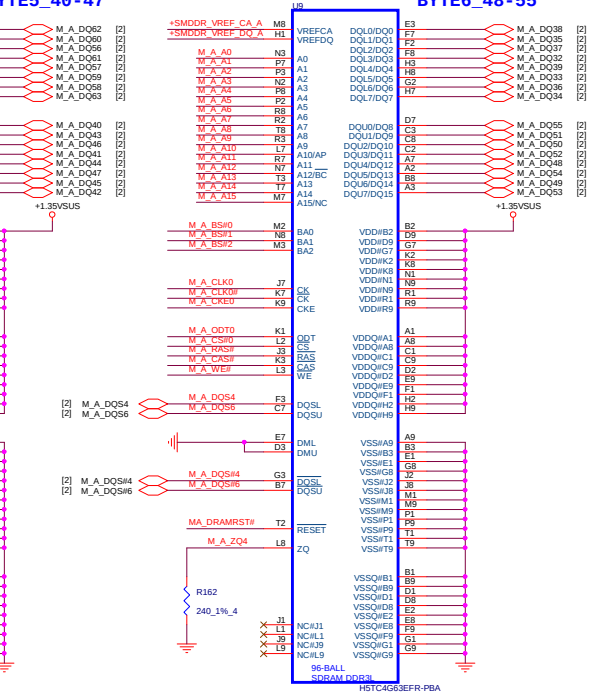
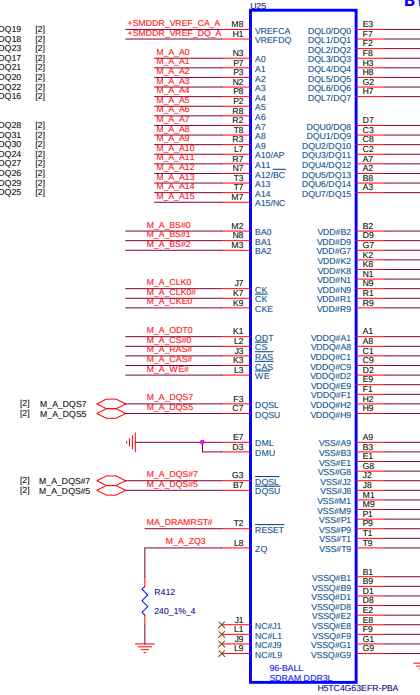
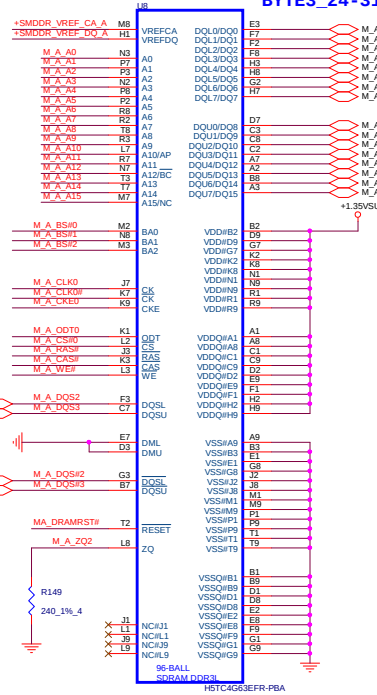
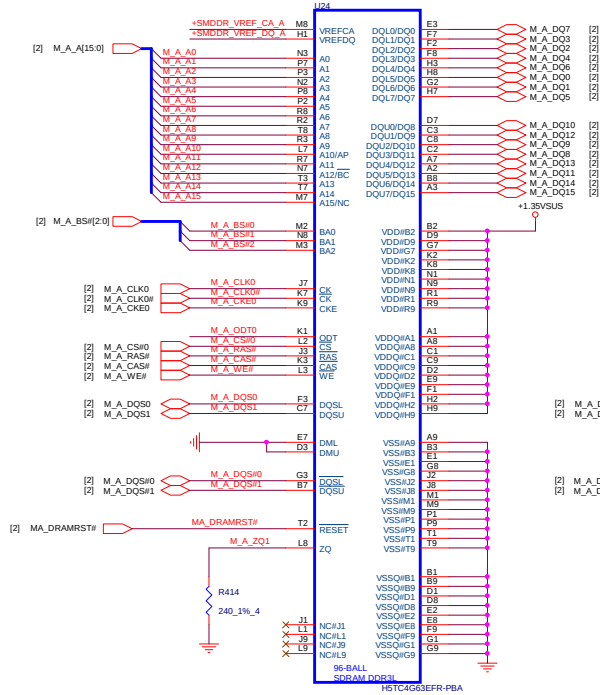
Hardware Strap	Strap Description
GPIO_36	VCC_1P24V_1P35V_A voltage select 0 = 1.24V 1 = 1.35V
GPIO_39	Enable CSE(TXE3.0) ROM Bypass 0 = Disable bypass 1 = Enable Bypass
GPIO_43	Allow eMMC as a boot source 0 = Disable 1 = Enable
GPIO_44	Allow SPI as a boot source 0 = Disable 1 = Enable
GPIO_47	Force DNX FW Load 0 = Do not force 1 = Force
GPIO_78	SMBus 1.8V/3.3V mode select 0=buffers set to 3.3V 1=buffers set to 1.8V
GPIO_88	PMU 1.8V/3.3V mode select 0=buffers set to 3.3V mode 1=buffers set to 1.8V mode
GPIO_92	SMBus No Re-Boot 0 = Disable (default) 1 = Enable
GPIO_110	LPC 1.8V/3.3V mode select 0=buffers set to 3.3V mode 1=buffers set to 1.8V mode
GPIO_111	Boot BIOS Strap 0 = Boot from SPI 1 = Do not boot from SPI
GPIO_120	Top swap override 0 = Disable 1 = Enable



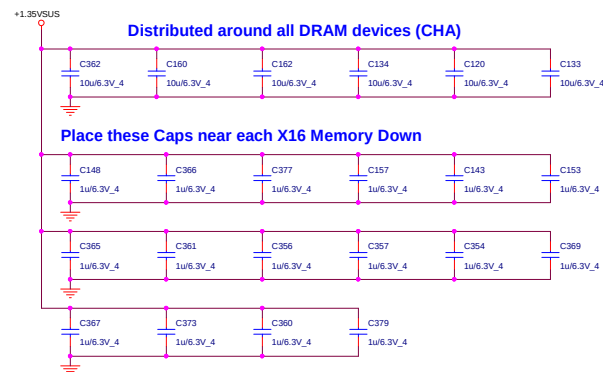


Quanta Computer Inc.
PROJECT : ZAJ

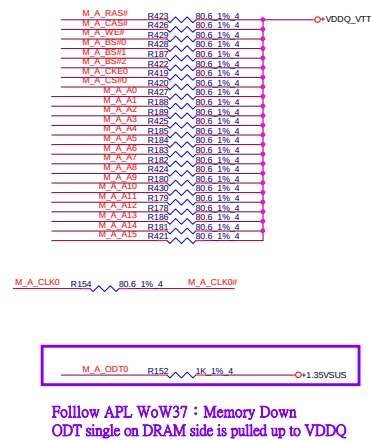
Size	Document Number	Rev
	HARDWARE STRAPS	3A
Date:	Thursday, February 23, 2017	Sheet 9 of 34

BYTE0_0-7
BYTE1_8-15BYTE2_16-23
BYTE3_24-31BYTE7_56-63
BYTE5_40-47BYTE4_32-39
BYTE6_48-55

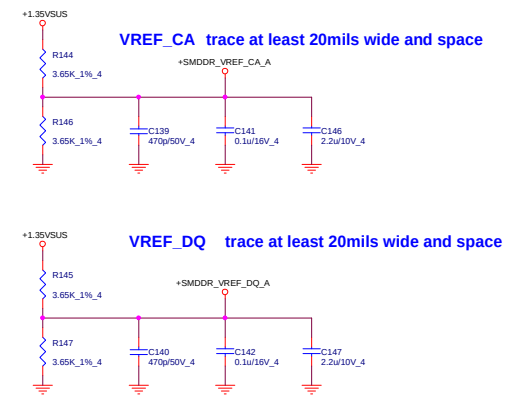
DE-CAPS FOR MEMORY CHANNEL A



VTT TERMINATIONS



VREF_CA-DQ CIRCUIT



BYTE0_0-7

BYTE2_16-23

BYTE1_8-15

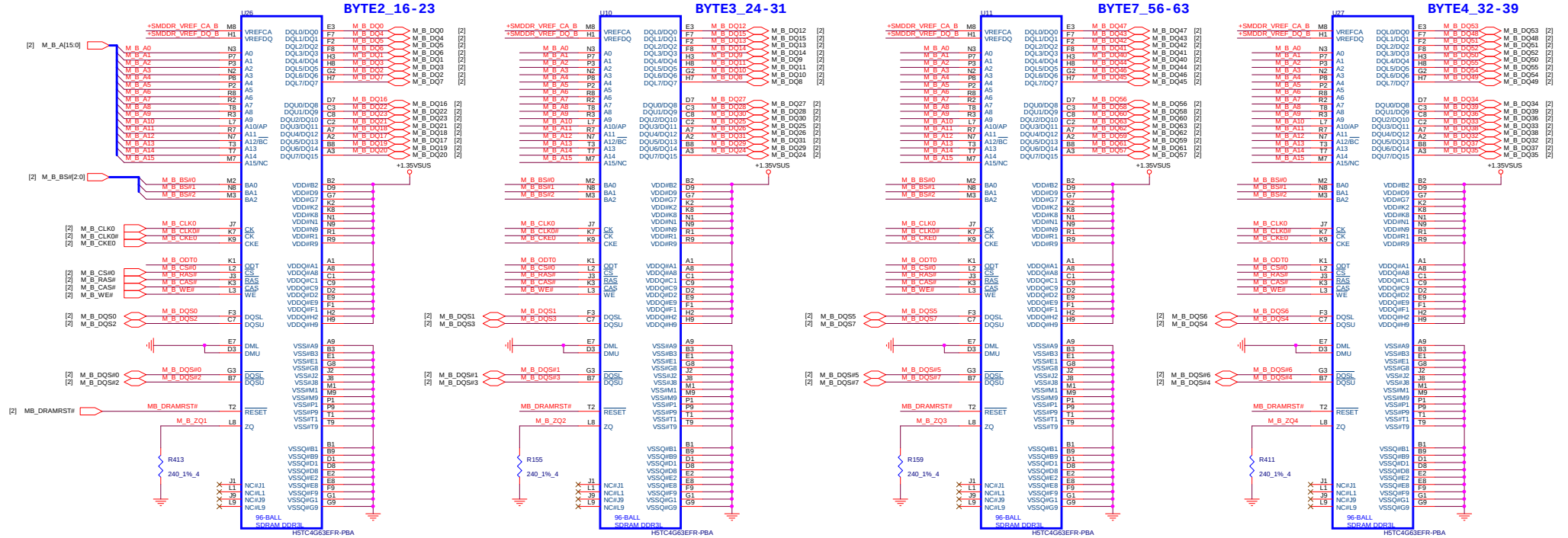
BYTE3_24-31

BYTE5_40-47

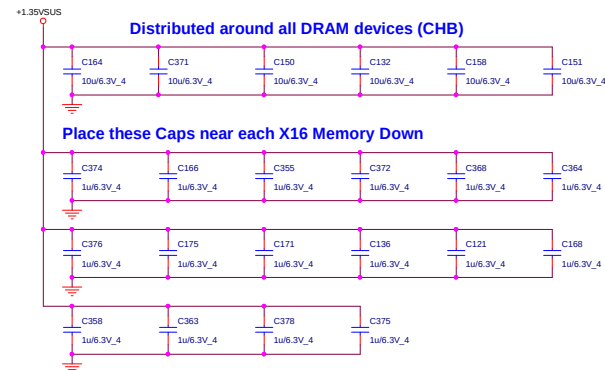
BYTE7_56-63

BYTE6_48-55

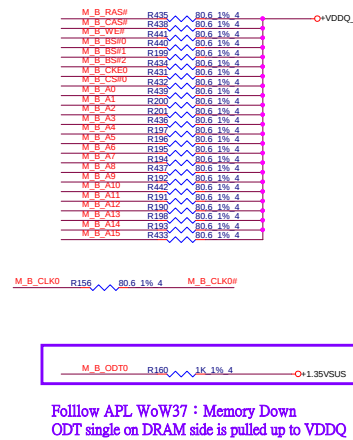
BYTE4_32-39



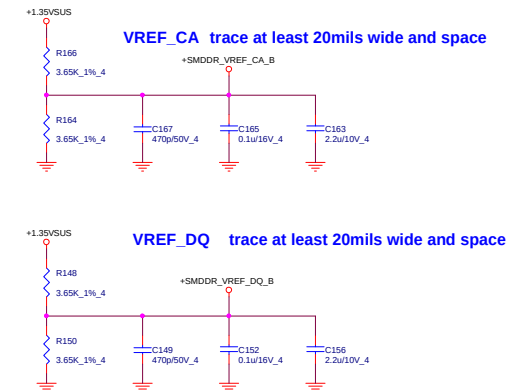
DE-CAPS FOR MEMORY CHANNEL B

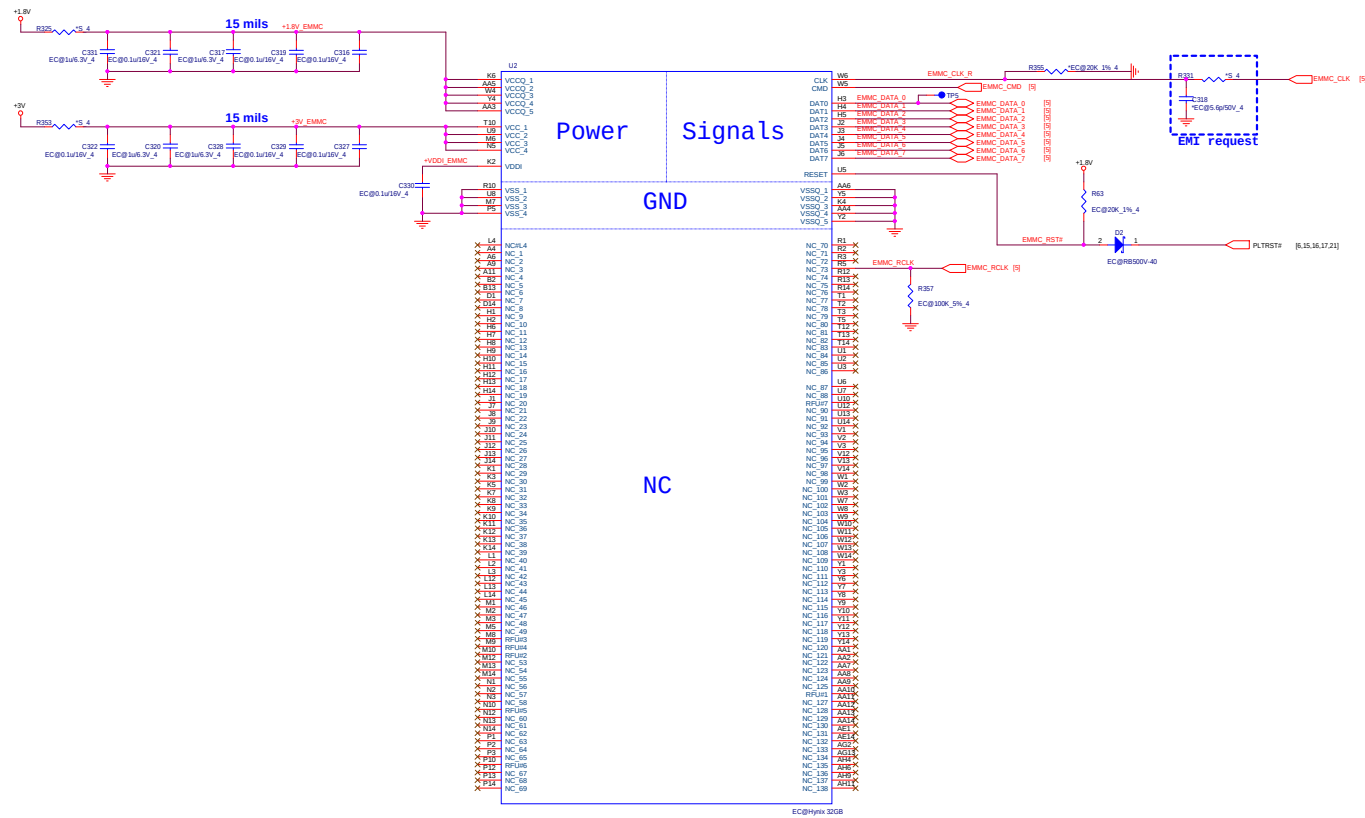


VTT TERMINATIONS

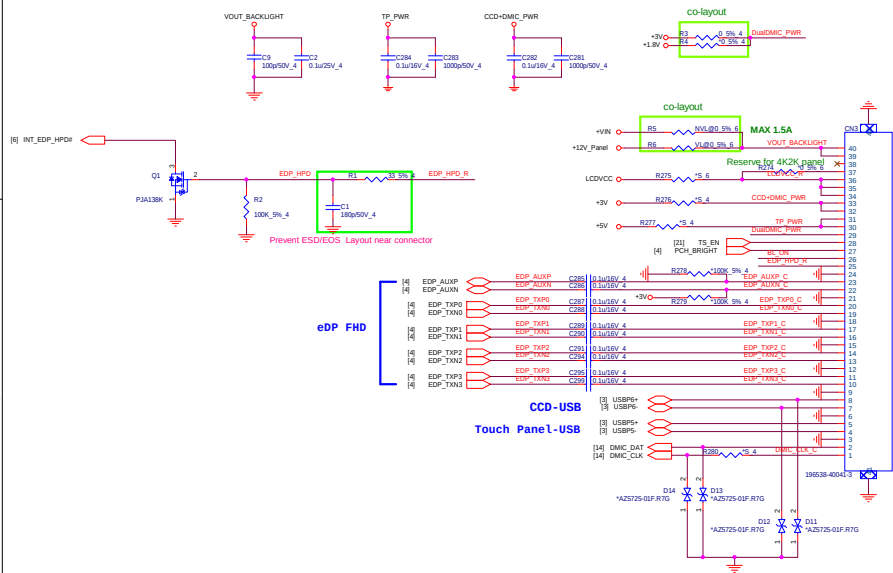


VREF_CA-DQ CIRCUIT

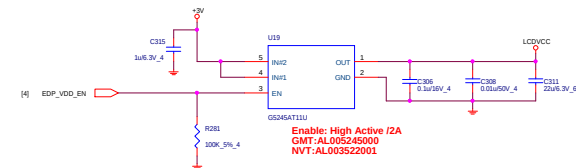




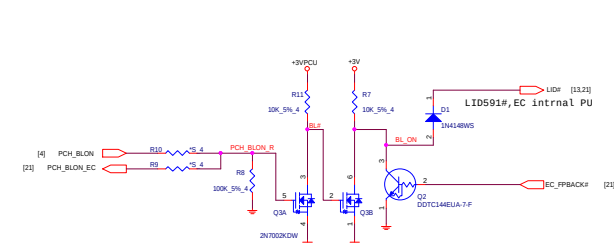
eDP CONNECTOR (LDS)



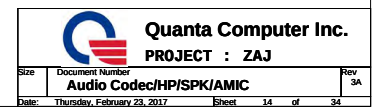
eDP Power (LDS)



eDP Backlight (LDS)

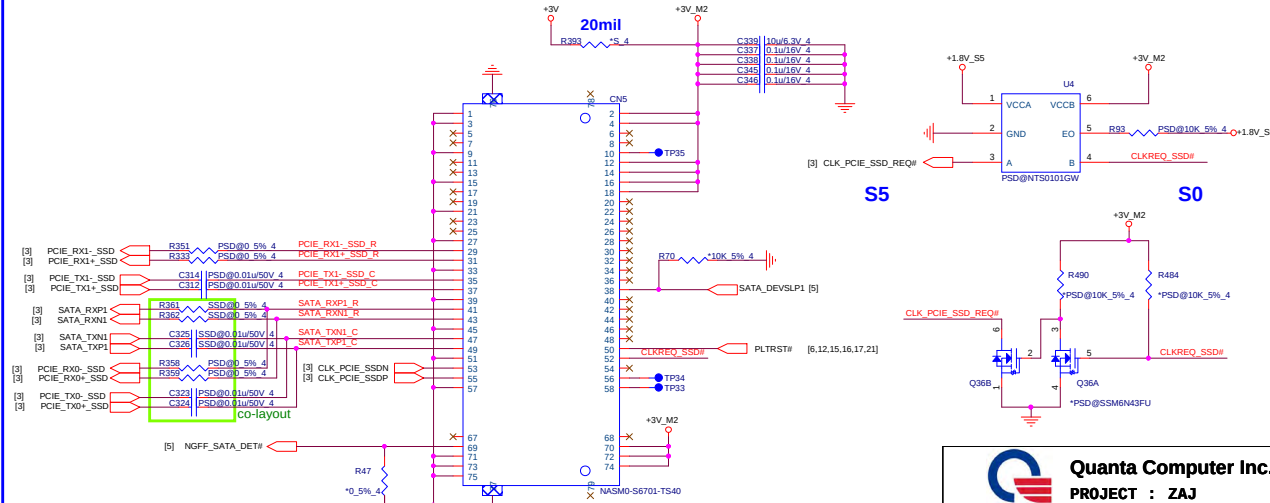


Hall Sensor (HSR)



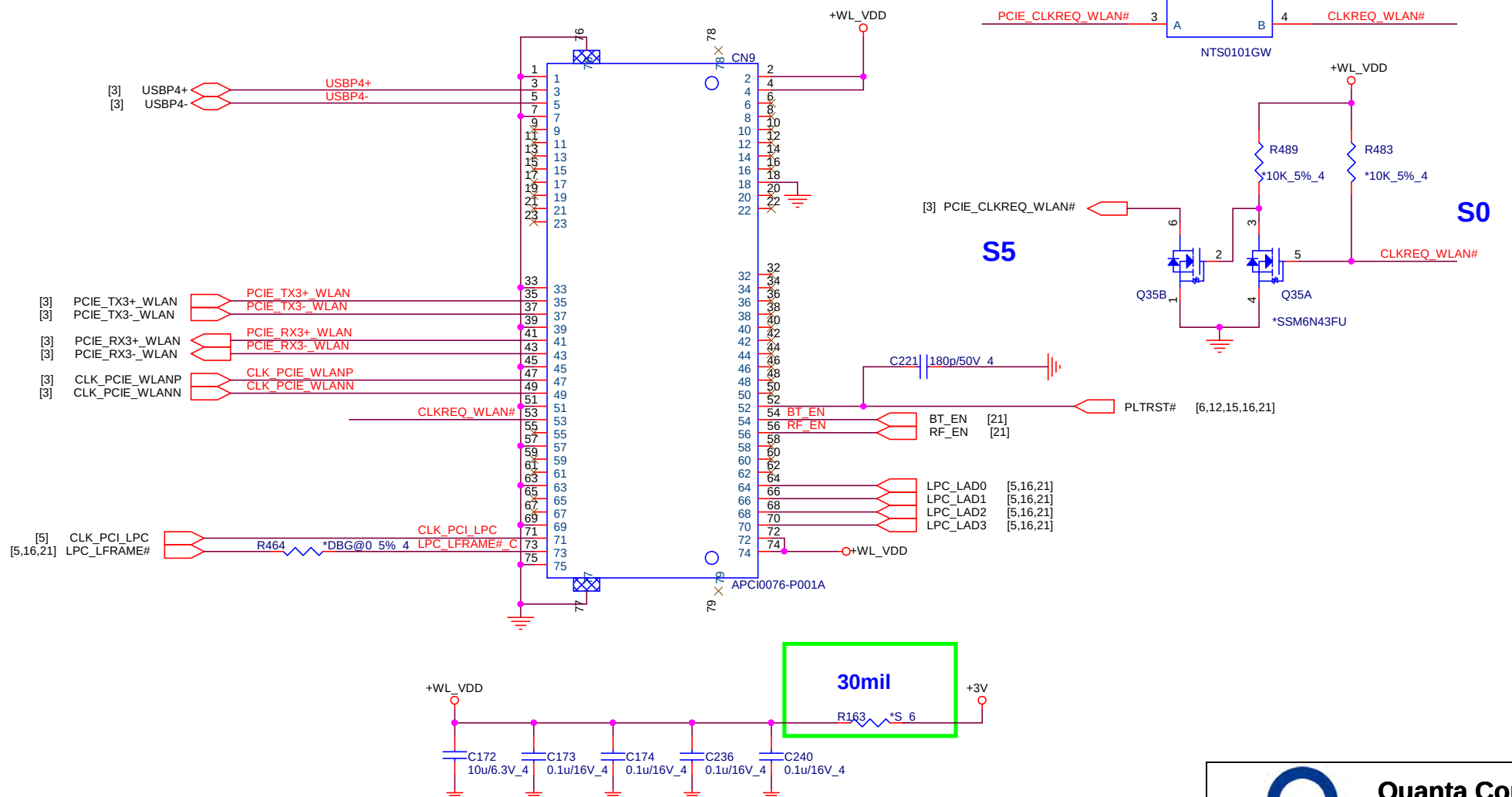


Quanta Computer Inc. PROJECT : ZAJ		Rev
Size	Document Number	3
LAN/CRD COMBO - RTL8411B		
Date:	Thursday, February 23, 2017	Sheet 15 of 34

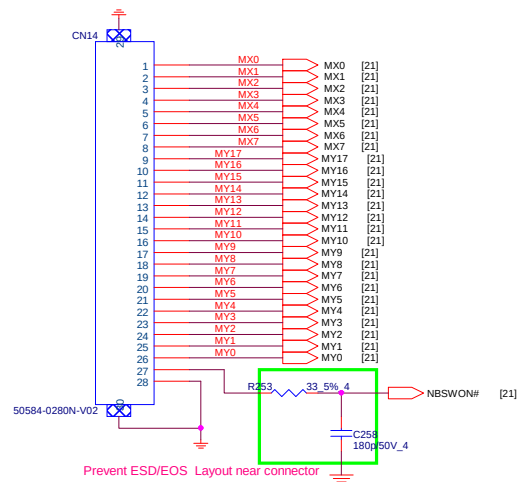


NGFF_M.2 WiFi & BT (NGF)

17

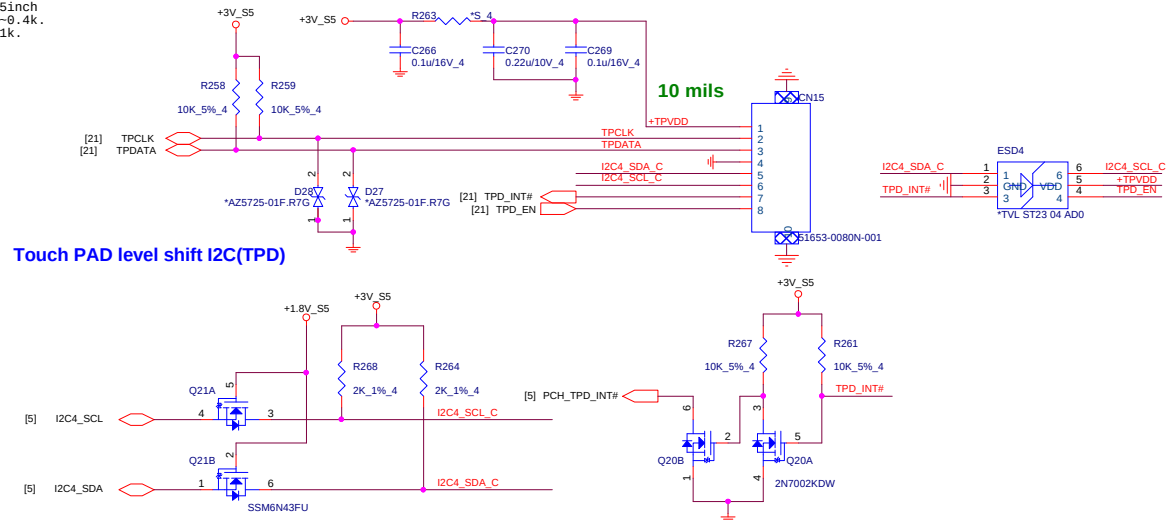


KEYBOARD (KBC)

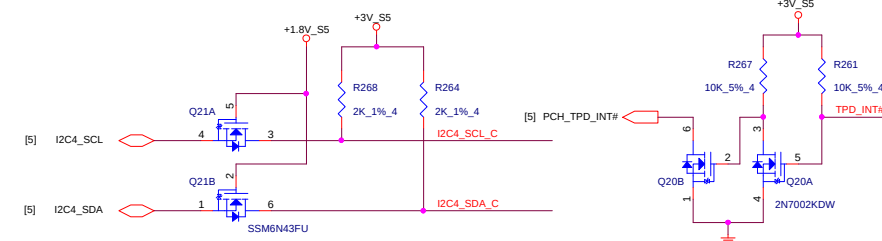


TOUCHPAD (TPD I2C/PS2 co-lay)

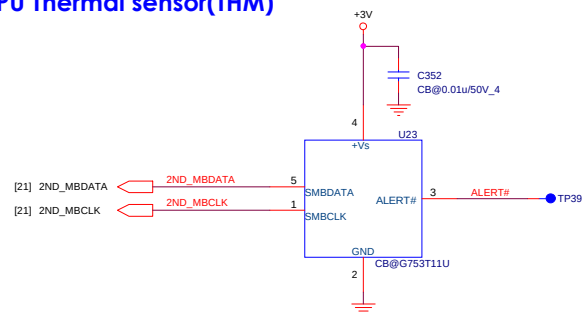
TPD->100kHz, TS=400KHz
Intel design guide suggestion
MCP PIN 10u.
Per inch 3u TS=3x5inch
400kHz10-100u =2.4-0.4k.
100KHz 10-100u=9k-1k.



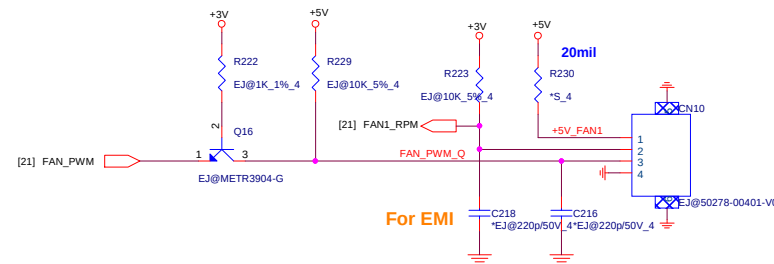
Touch PAD level shift I2C(TPD)



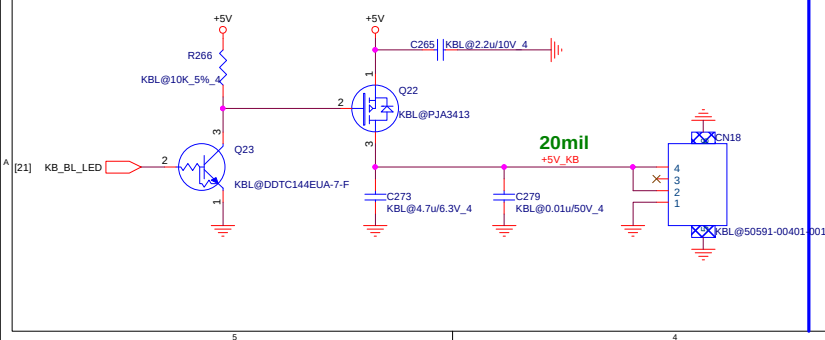
CPU Thermal sensor(THM)



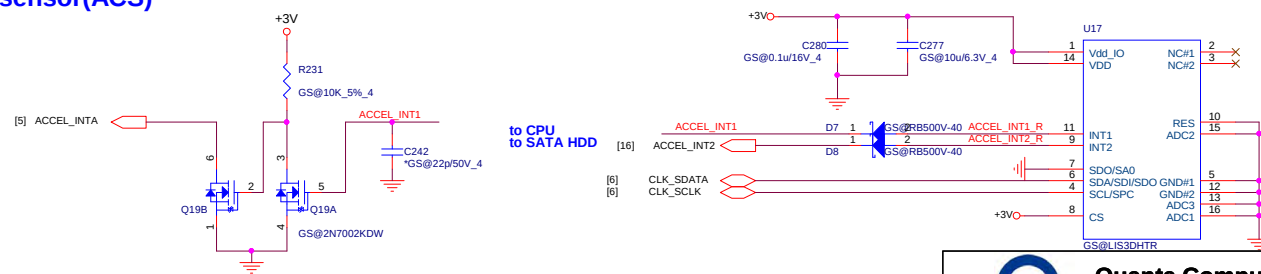
CPU FAN (THM)



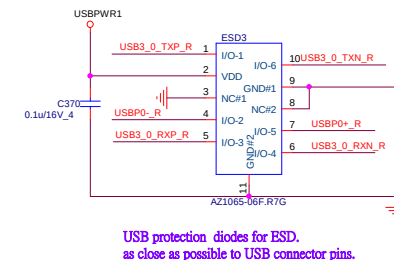
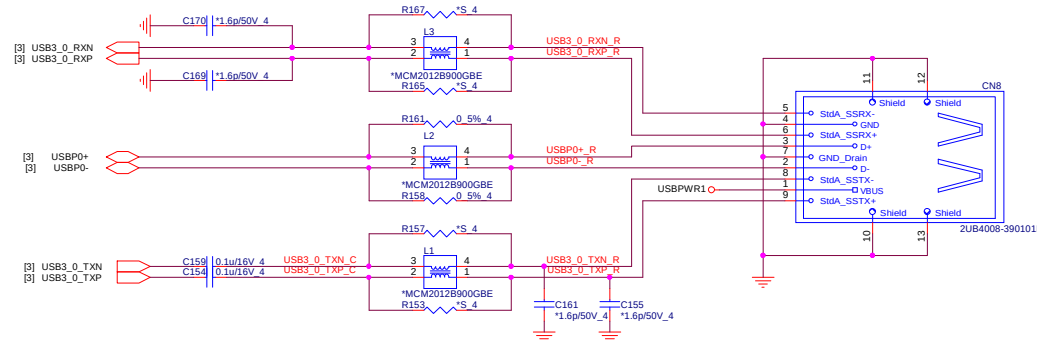
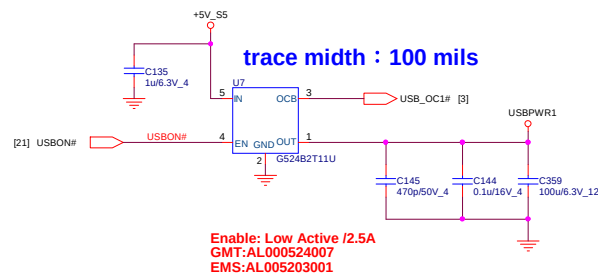
Keyboard backlight (KBL)



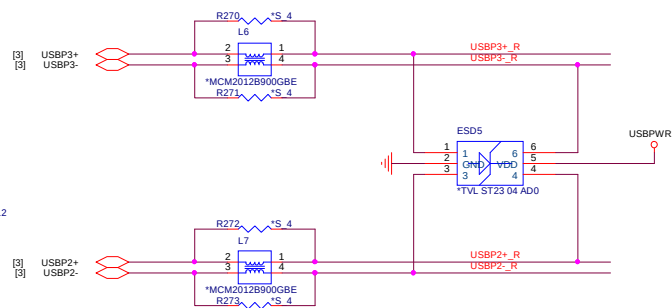
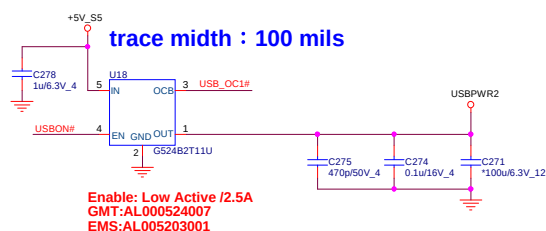
G-sensor(ACS)



USB 3.0 (UB3)

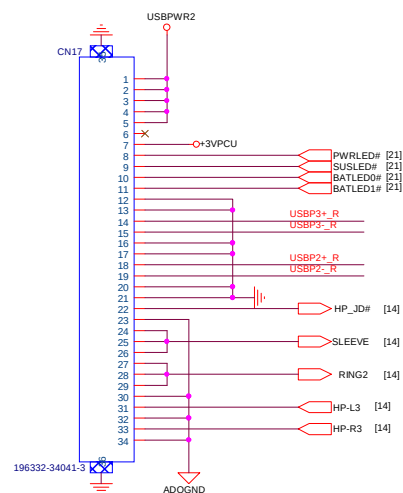


USB 2.0 (UB2)

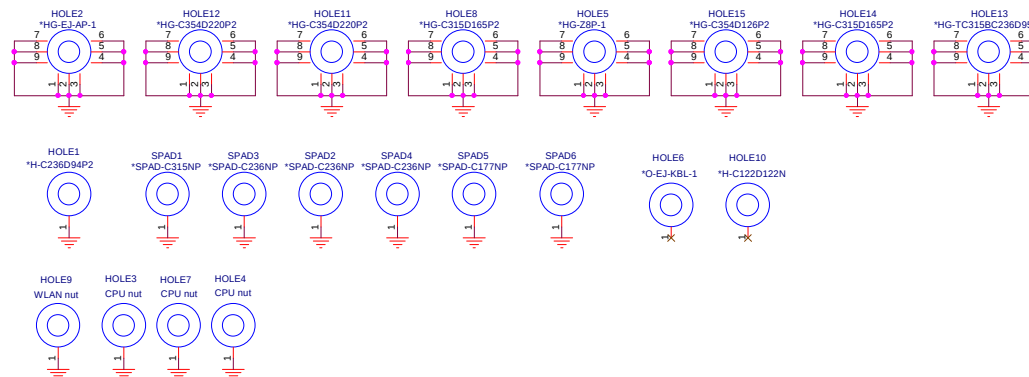


Stitch cap (EMC)

USB 2.0/LED/AUDIO JACK DB (UB2)

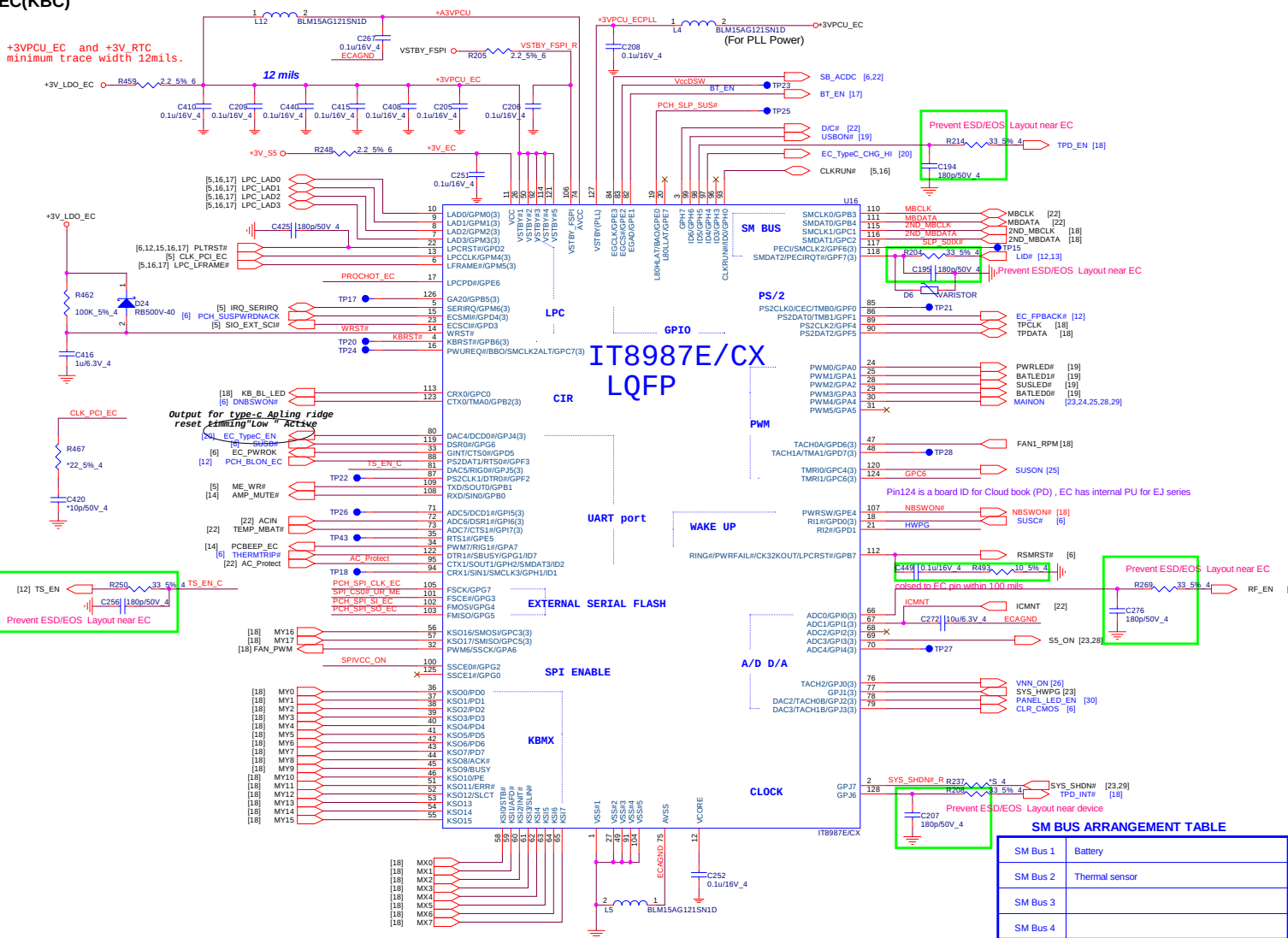


HOLE(OTH)



EC(KBC)

+3VPCU_EC and +3V_RTC
minimum trace width 12mils.

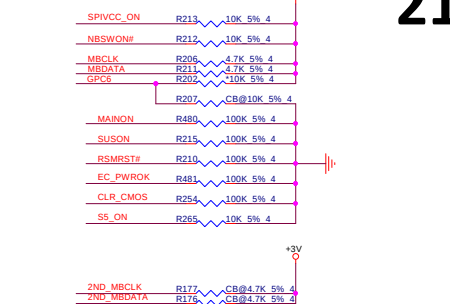


IT8987E/CX
LQFP

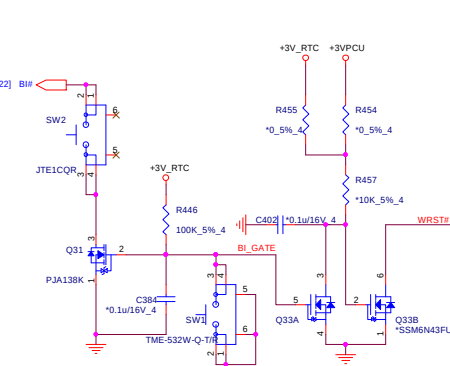
SM BUS ARRANGEMENT TABLE

SM Bus 1	Battery
SM Bus 2	Thermal sensor
SM Bus 3	
SM Bus 4	

PU/PD (KBC)

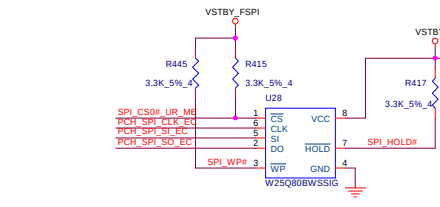
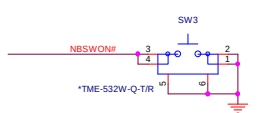


Battery Disable (FSW)



SPI ROM(KBC)

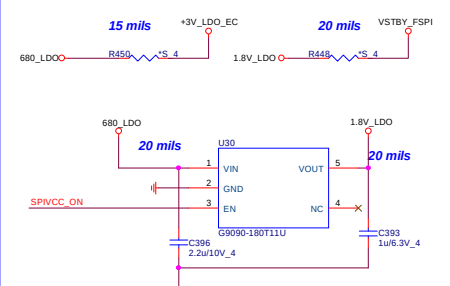
Reserve power on switch for test
(MP remove)



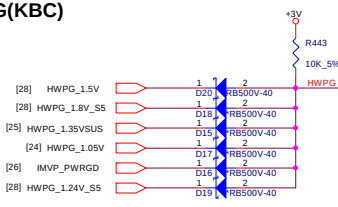
SP@ socket P/N: DFHS08FS023 only for A-TEST

SPI ROM	Vender	Size	Quanta P/N	Vender P/N
1.8V	WND	1M	AKE5GGN0N00	W25Q80EWSSIG
	GGD	1M	AKE5GZNOQ00	GD25LQ80BSIGR

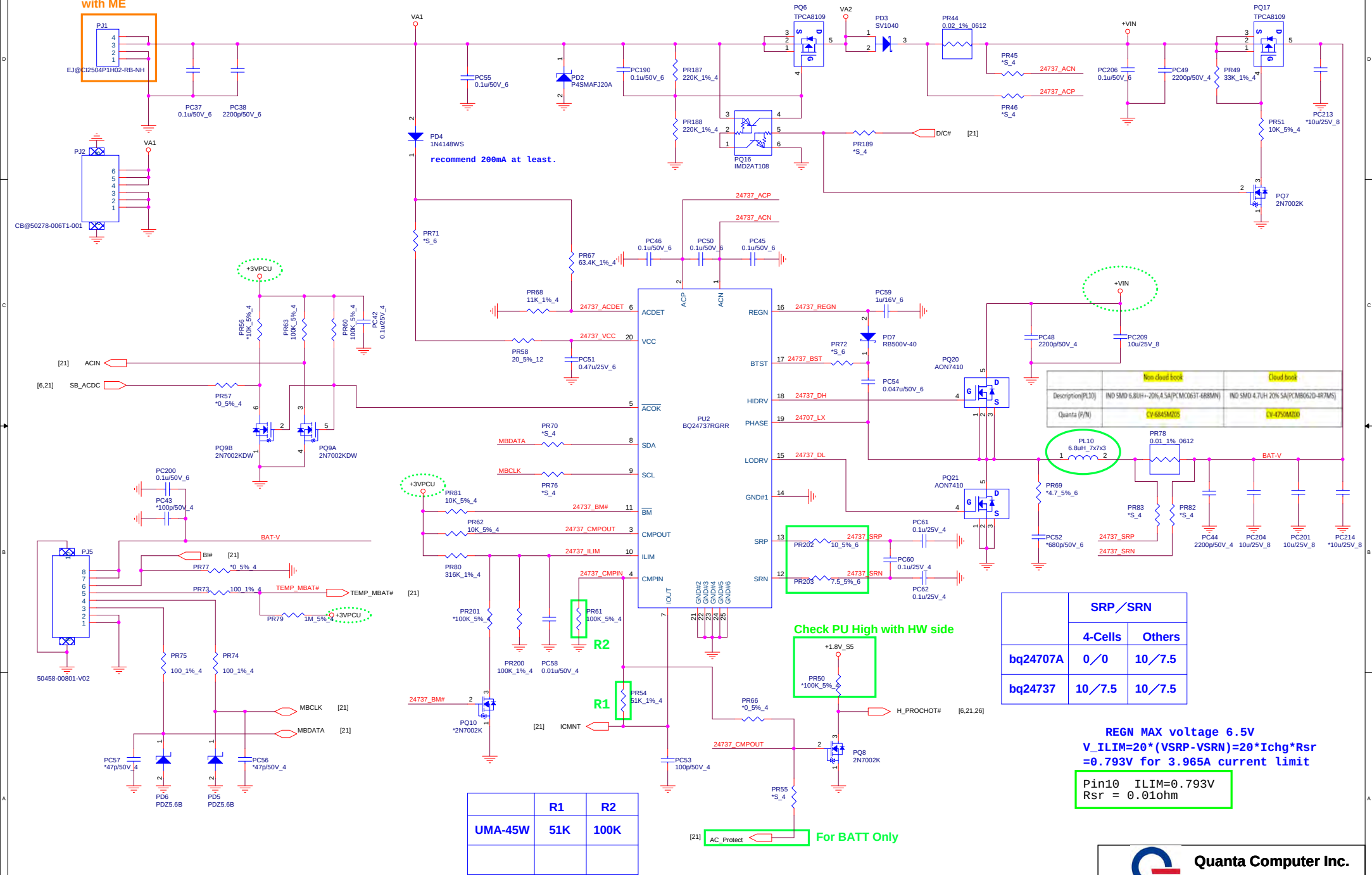
Power Auto Recovery



HWPG(KBC)



Double Check ADP-IN Connector with ME



	Non cloud book	Cloud book
Description(PL10)	IND SMD 6.8uH ±20% 4.5A(PCM0637-688MN)	IND SMD 4.7uH 20% 5A(PCM0652D-487MS)
Quanta (P/N)	CY 6843M025	CY 4750M020

	SRP / SRN	
	4-Cells	Others
bq24707A	0 / 0	10 / 7.5
bq24737	10 / 7.5	10 / 7.5

REGN MAX voltage 6.5V
 $V_{ILIM} = 20 * (VSRP - VSRN) = 20 * I_{chg} * R_{sr}$
= 0.793V for 3.965A current limit

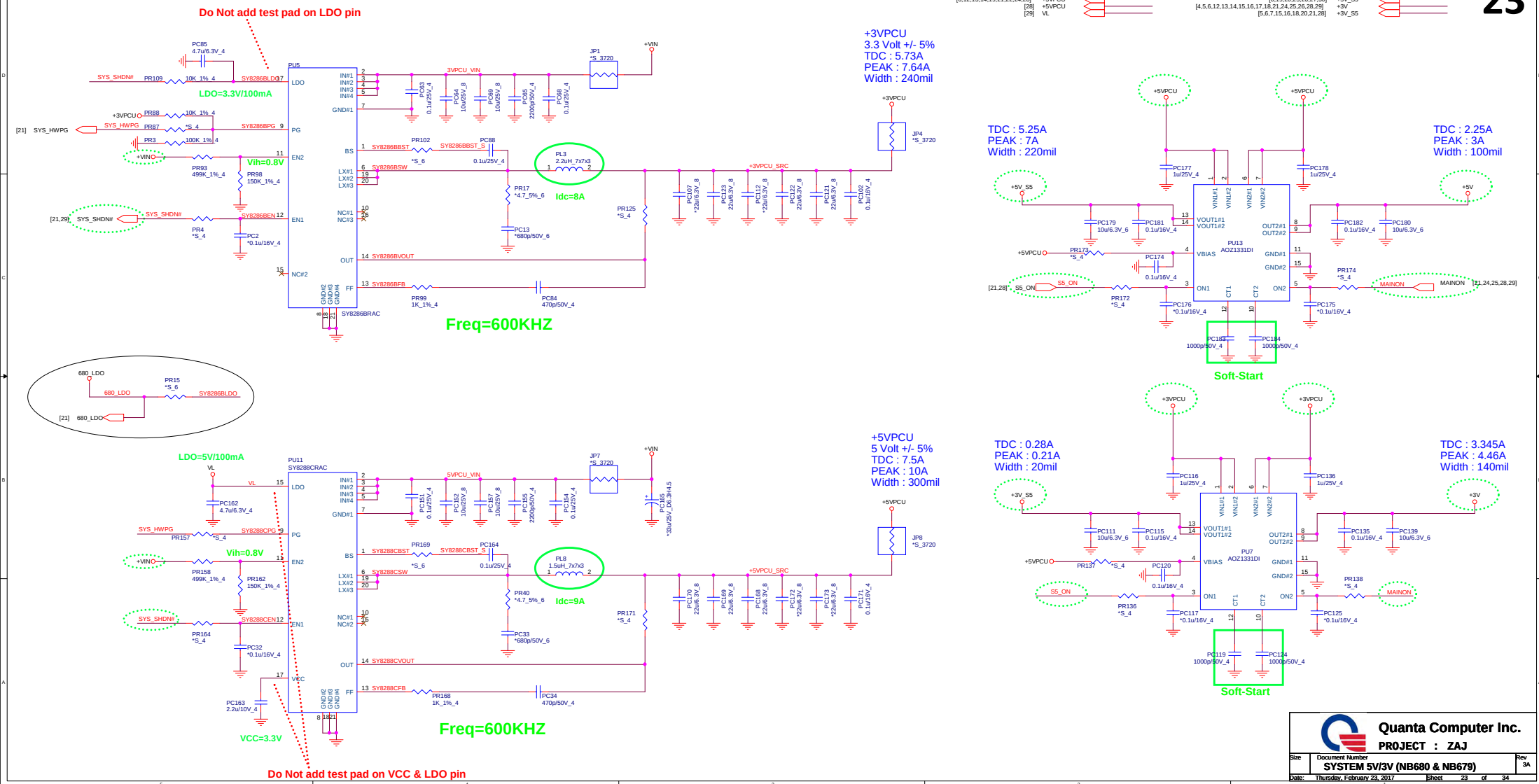
Pin10 ILIM=0.793V
 $R_{sr} = 0.010\Omega$

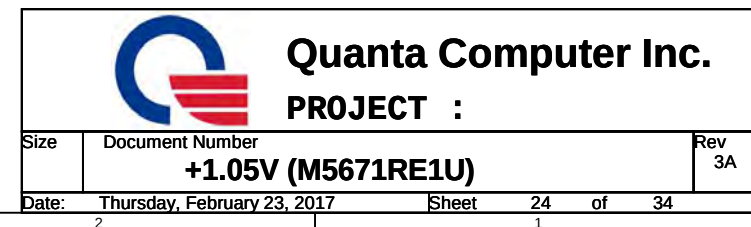
	R1	R2
UMA-45W	51K	100K

Check PU High with HW side

+1.8V_S5
PR50 *100K_5%_4

For BATT Only







VID	Ref. Voltage
High	0.675V
Low	0.75V

OCP=13A
L ripple current
= $(19-1.35)*1.35/(1u*500k*19)$
=2.508A
Vtrip=13-(2.508/2)*14.5mohm
=170.317mV
Rlimit=170.317mV/5uA*10=340.63Kohm

DDR=1.35V
R1=10K/F_4
R2=10K/F_4

	S3	S5	VDDQ	VTTREF	VTT
S0	1	1	ON	ON	ON
S3 (mainon off)	0	1	ON	ON	OFF
S4/S5	0	0	OFF	OFF	OFF

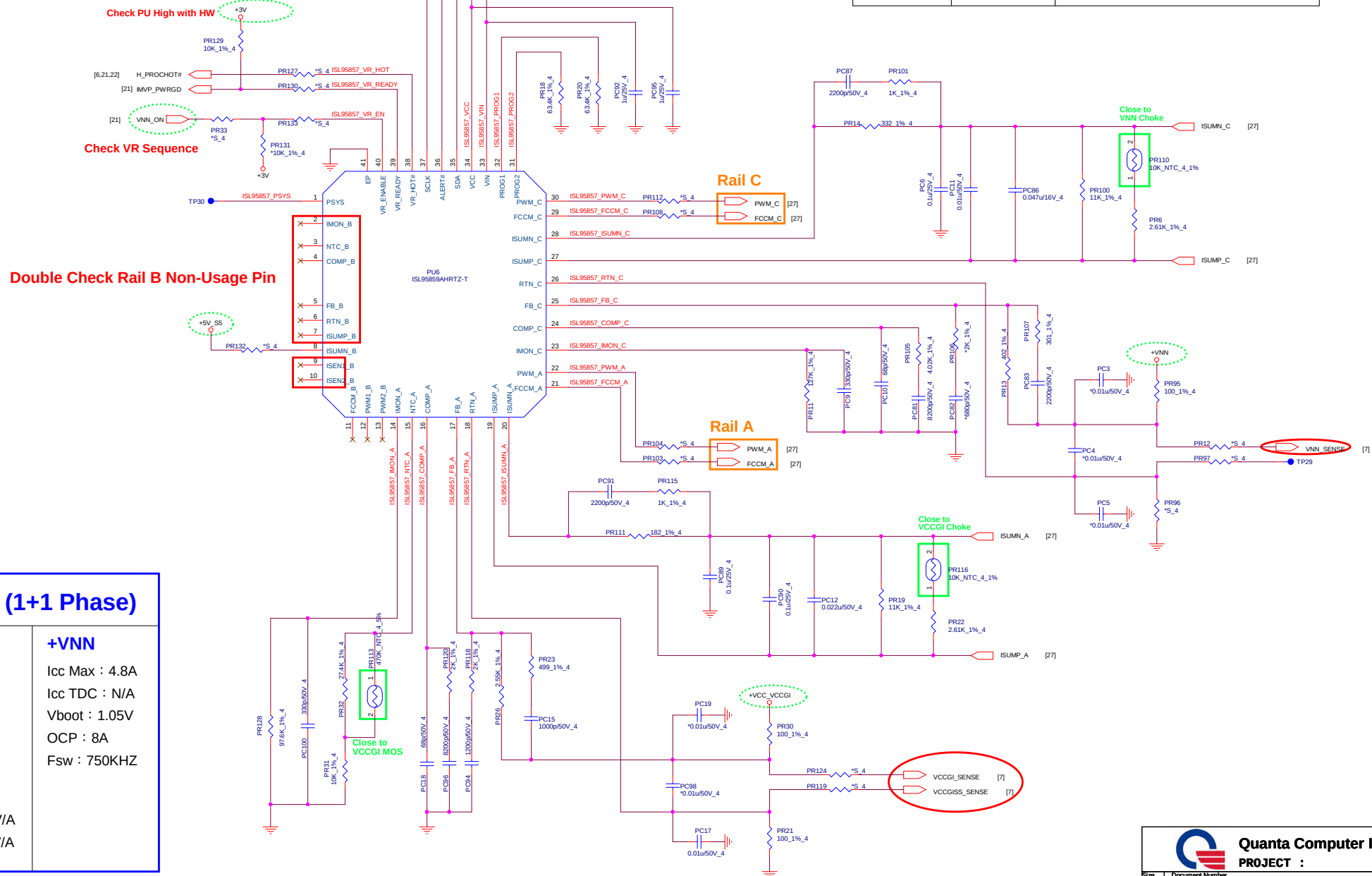
```
SVID_CLK      : UP:85 ohm   Series:95 ohm
SVID_ALERT    : UP:68 ohm   Series:220 ohm
SVID_DATA     : UP:170 ohm  Series:20 ohm
```

IMVP8 VR Controller

Rail A (1 phase) : +VCCGI

Rail C (1 phase) : +VNN

Cloud book	P/N	Description
PR14	CS16342FB17	RES CHIP 634 (1/16W +-1%0402)
PC86	CH3226K1B00	CAP CHIP 0.022U 50V(+/-10%,X7R,0402)
PR111	CS12322FB09	RES CHIP 232 1/16W +-1%(0402)
PC90	CH3683K9B00	CAP CHIP 0.068U 16V(+/-10%,X5R,0402)



APL VR (1+1 Phase)

+VCCGI

Icc Max : 21A
Icc TDC : 18A
Vboot : 0V
OCP : 25A
Fsw : 750KHZ

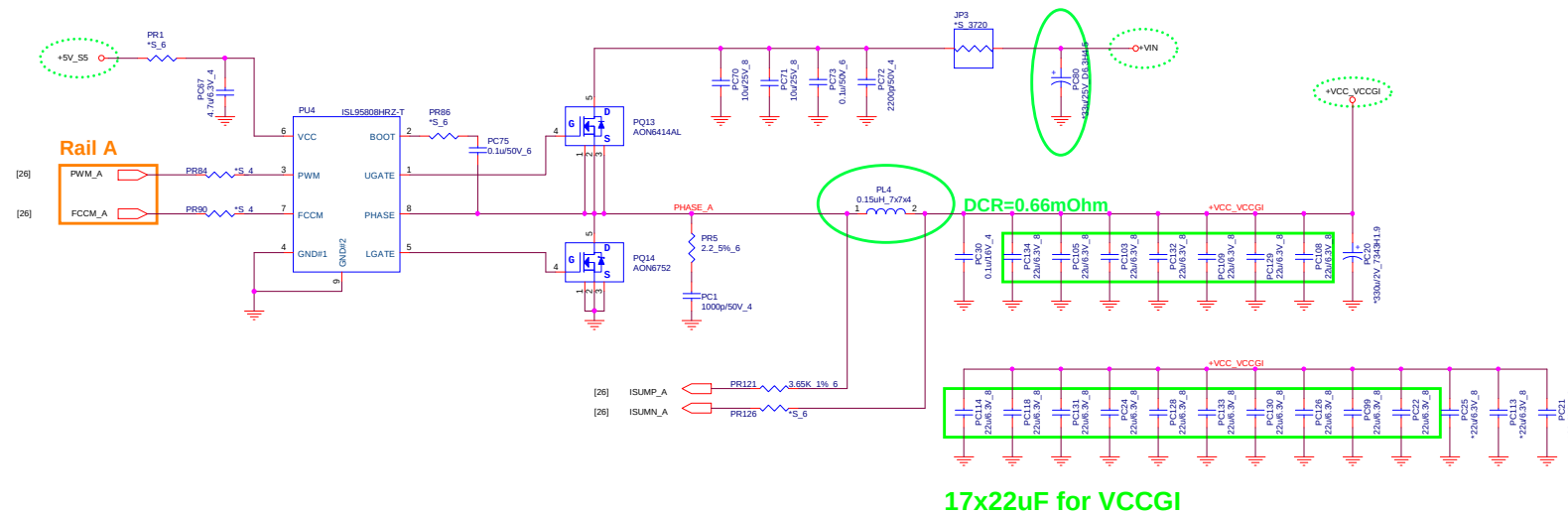
VCCGI L/L :

R_DC_LL : 6mV/A
R_AC_LL : 6mV/A

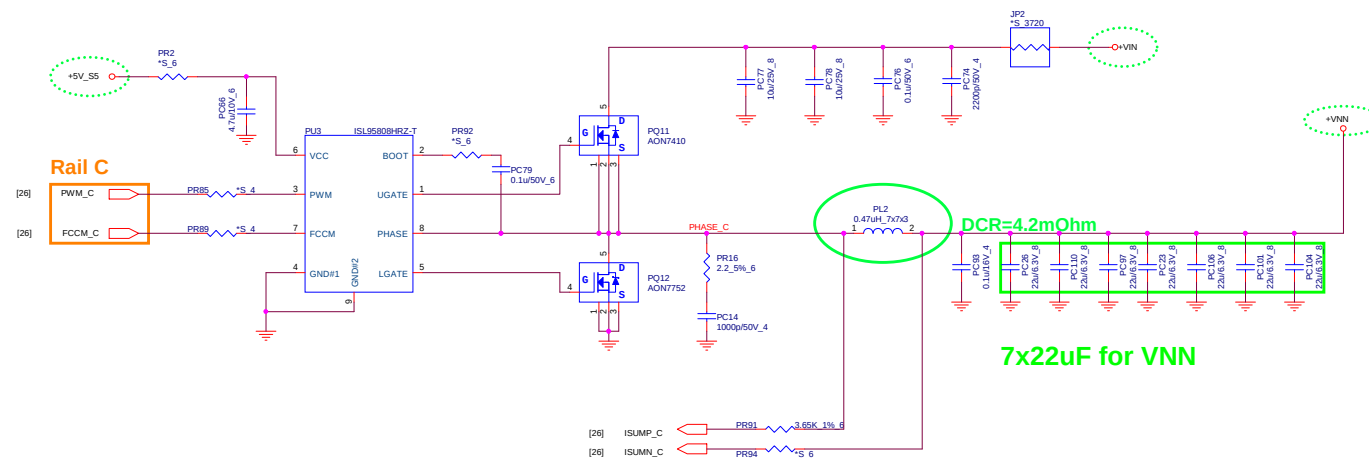
+VNN

Icc Max : 4.8A
Icc TDC : N/A
Vboot : 1.05V
OCP : 8A
Fsw : 750KHZ

VCCGI

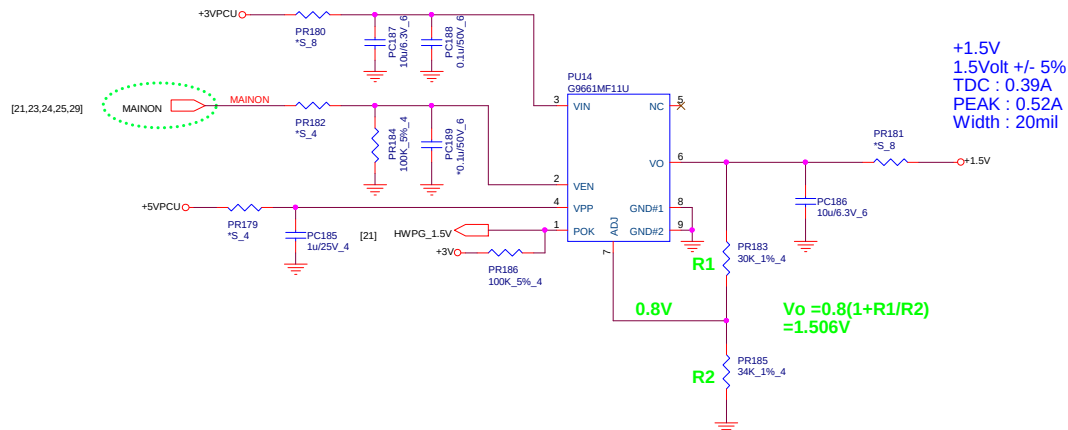
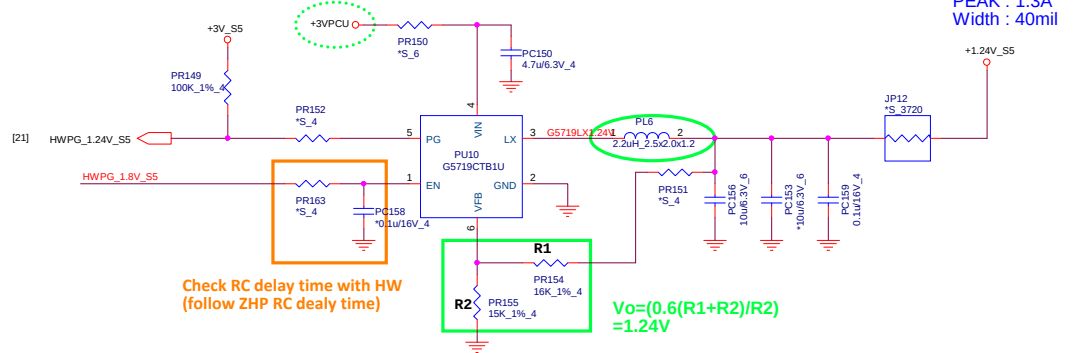
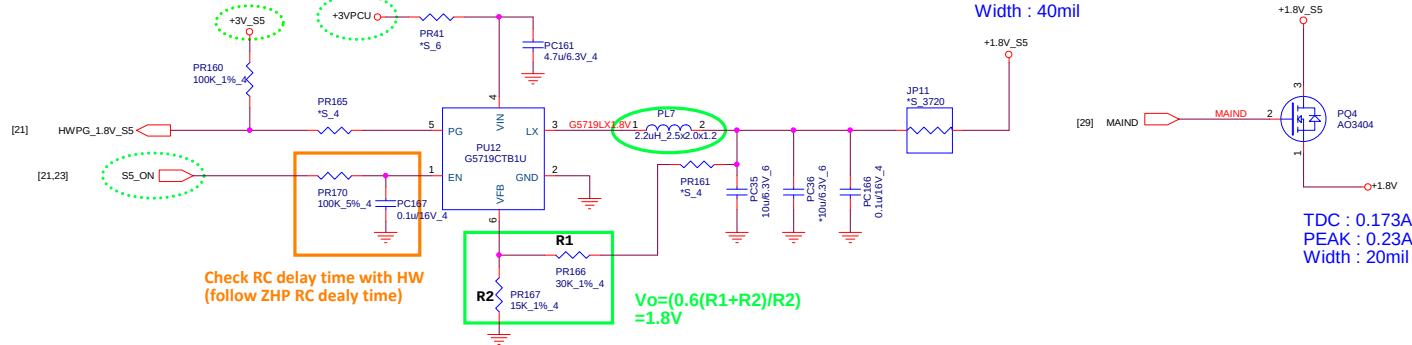


VNN





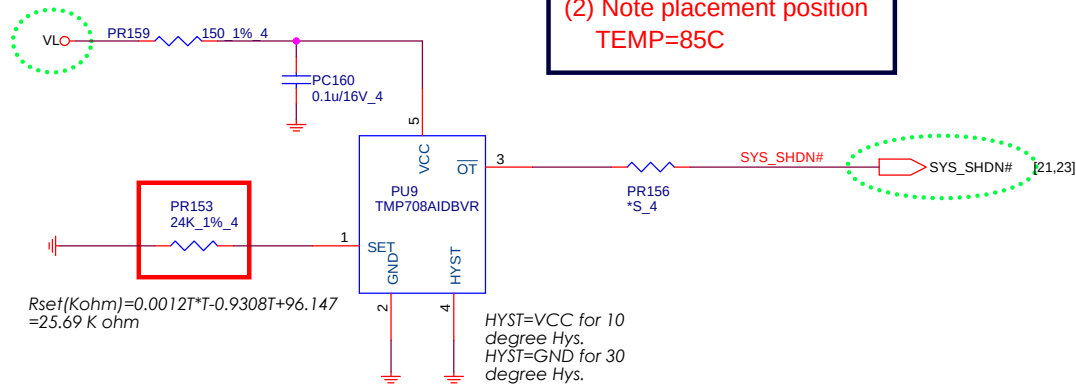
ZHP change +1.8V_S5 PG pull up to +3V_S5



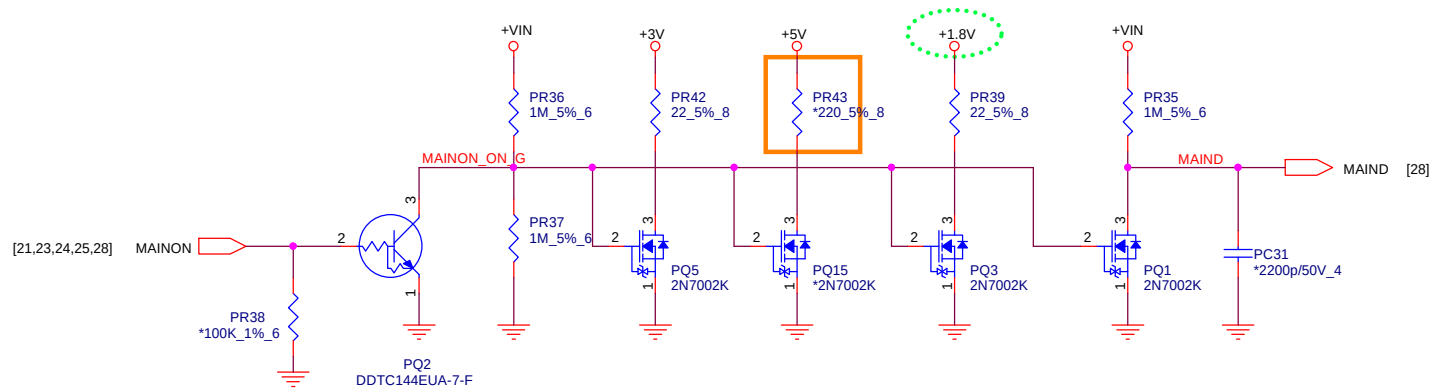
[23] VL
 [12,22,23,25,26,27,30] +VIN
 [4,5,6,12,13,14,15,16,17,18,21,23,24,25,26,28] +3V
 [12,13,14,16,18,23] +5V
 [12,13,28] +1.8V

Thermal Protection

- (1) Need fine tune for thermal protect point
- (2) Note placement position TEMP=85C

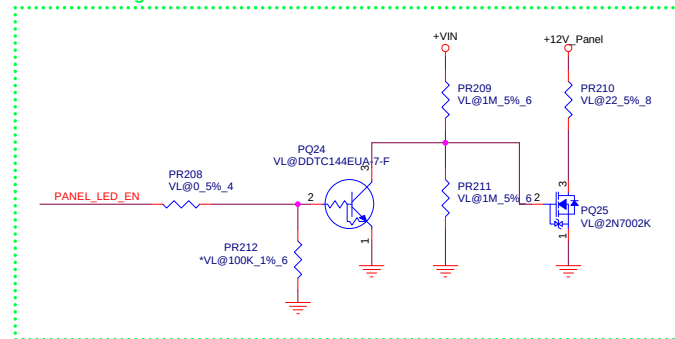


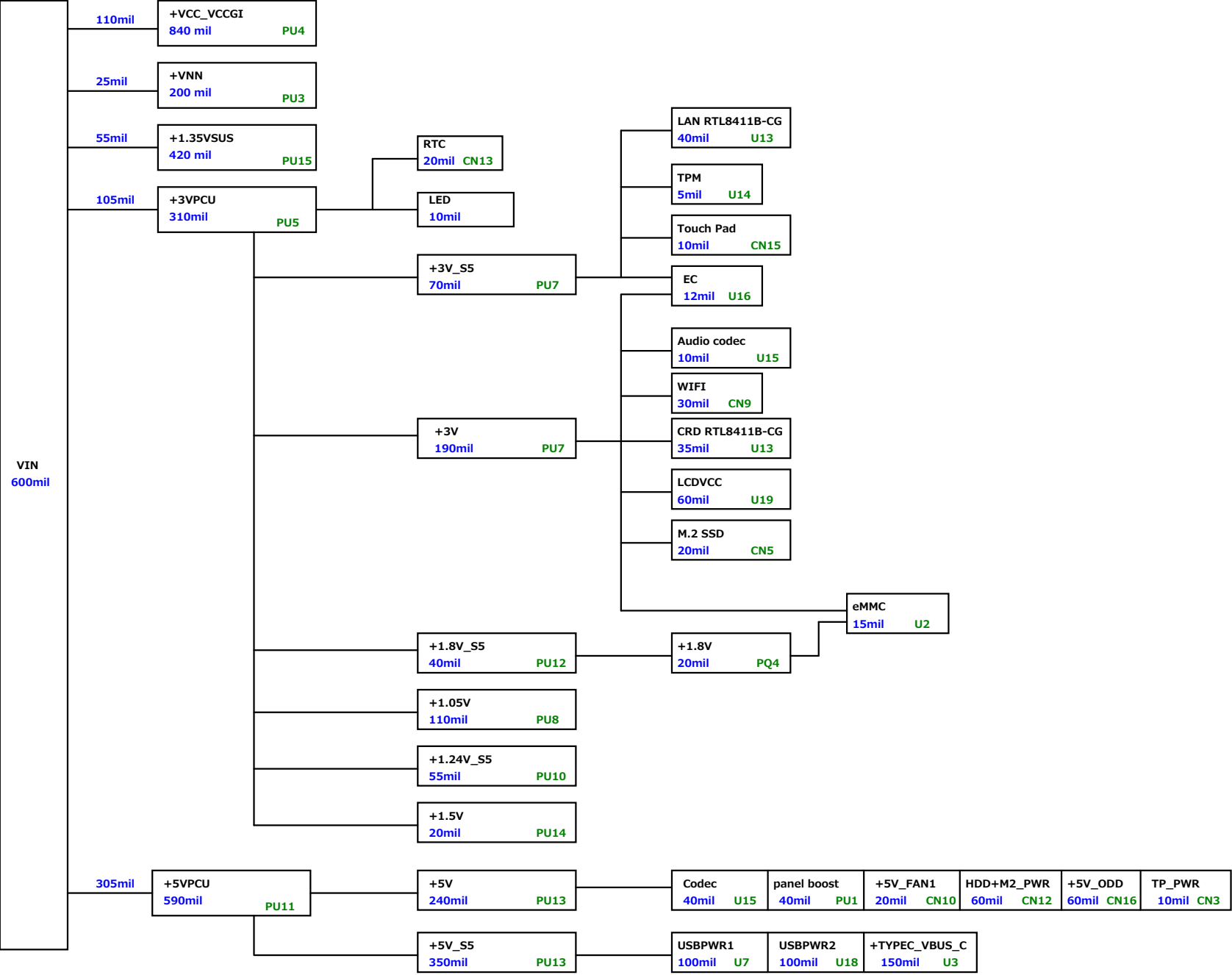
+5V PU High R= 220 ohm for Bo-Bo sound issue.

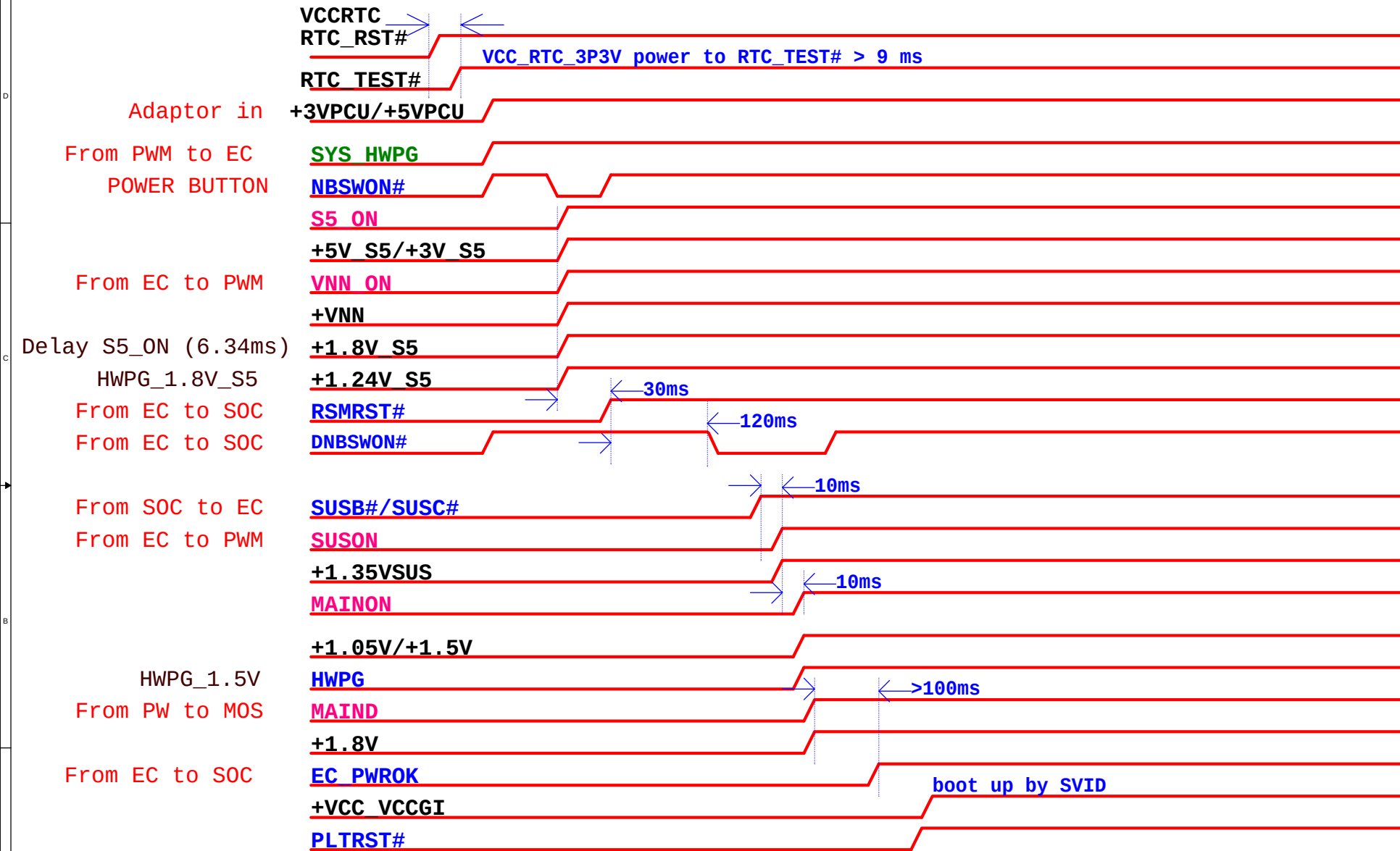


Quanta Computer Inc.

PROJECT :







Quanta Computer Inc.
PROJECT : ZAJ

Size	Document Number	Rev
	Power on Sequence	3A

Date: Thursday, February 23, 2017 Sheet 32 of 34

Power plane	Description	S0	S3	S5
+VIN	Adaptor power supply	ON	ON	ON
+VCC_VCCGI	Variable voltage supply to CPU and Graphics Core and ISP logic	ON	OFF	OFF
+VNN	Variable voltage supply to other (non core) logic	ON	OFF	OFF
+1.05V	Fixed voltage rail for SRAM,I/O,internal Logic	ON	OFF	OFF
+1.24V_S5	Fixed voltage rail for SoC L2/ Audio & ISH I/O Logic and PLLs MPHY Logic/ USB2-I/O/MIPI I/Os	ON	ON	ON
+1.8V_S5	Fixed voltage rail for all GPIOs	ON	ON	ON
+1.35VSUS	Fixed voltage rail for DDR3L IO	ON	ON	OFF
+3V_RTC	Fixed Voltage rail for RTC (Real Time Clock)	ON	ON	ON
+1.8V	1.8V S0 power rail	ON	OFF	OFF
+1.5V	1.5V S0 power rail	ON	OFF	OFF
+5VPCU	5V always on power rail	ON	ON	ON
+5V_S5	5V S5 power rail	ON	ON	ON
+5V	5V S0 power rail	ON	OFF	OFF
+3VPCU	3V always on power rail	ON	ON	ON
+3V_S5	3V S5 power rail	ON	ON	ON
+3V	3V S0 power rail	ON	OFF	OFF

Model	Date	CHANGE LIST												
ZAJ REV.D	02/10	1.Remove U33/R482 2.Change 0 ohm to shortpad : R403,R404,R405,R406,R407,R408,R409,R410,R104,R113,R108,R115,R99,R402,R167,R165,R161,R158,R157,R153,R270,R271,R272,R273 3.Change C34 from 18pF to 15pF 4.Un-stuff R380/R464 (debug card circuit) 5.Change PR5/PR16 from 1% to 5%												
	02/16	1.Remove HDMI EMI resistor -R131/R136/R141/R124												
	02/18	1.Unstuff SW3 2.Update SW2 FP to "sw-ds-a40e-4p-smt" by SMT request 3.Update CN2 FP to "sdcard-156-1001902602-11p-smt" by SMT request 4.Update CN9 FP to "ngff-apci0076-p001a-75p-ke-smt" by SMT request												
	02/20	1.Un stuff PC211&PC212 then stuff PC203&PC194 by power team request 2.Un stuff PC107&PC112 then stuff PC121&PC122 by power team request 3.Change R158/R161 from shortpad to 0 ohm 4.Add C449&R493 for RSMRST#												
	02/23	1.Modify Q31/Q33 from 2N7002 (Vgs=2.5V) to PJA138K (Vgs=1.5V) 2.Change CN14 QPN and FP to DFFC28FR029 -- "50584-0280n-v02-28p-I" by PDC request 3.Change CN17 QPN and FP to DFFC34FR026 -- "196332-34041-3-34p-I" by PDC request												
<table><tr><td rowspan="2">Quanta Computer Inc. PROJECT : ZAJ</td><td rowspan="2">DOC NO.</td><td>PROJECT MODEL :</td><td>ZAJ</td><td>APPROVED BY:</td><td></td><td>DATE:</td></tr><tr><td>PART NUMBER:</td><td></td><td>DRAWING BY:</td><td></td><td>REVISION:</td></tr></table>			 Quanta Computer Inc. PROJECT : ZAJ	DOC NO.	PROJECT MODEL :	ZAJ	APPROVED BY:		DATE:	PART NUMBER:		DRAWING BY:		REVISION:
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		PART NUMBER:		DRAWING BY:		REVISION:								