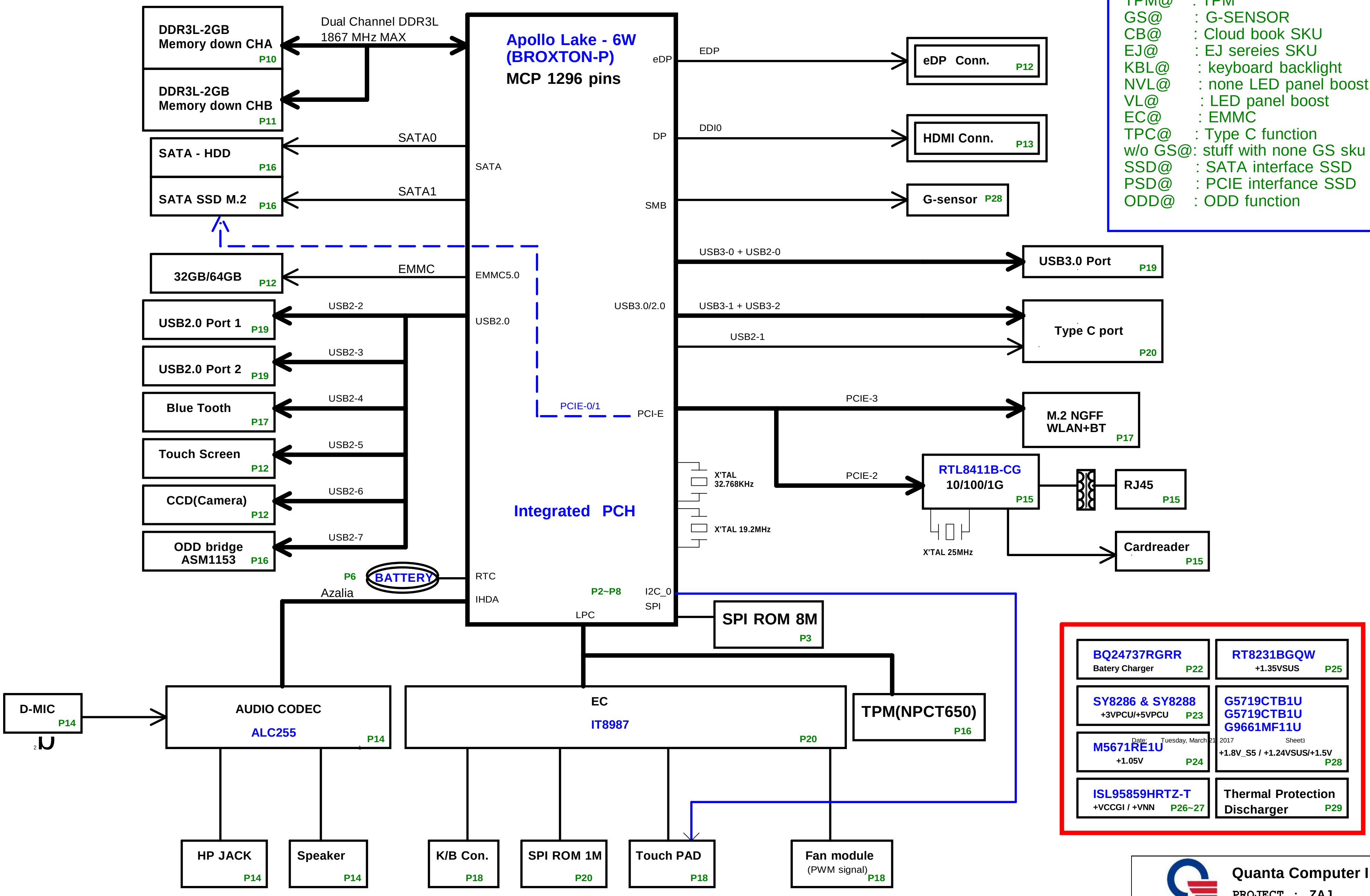
ZAJ/Z8P/Z8PA SYSTEM BLOCK DIAGRAM



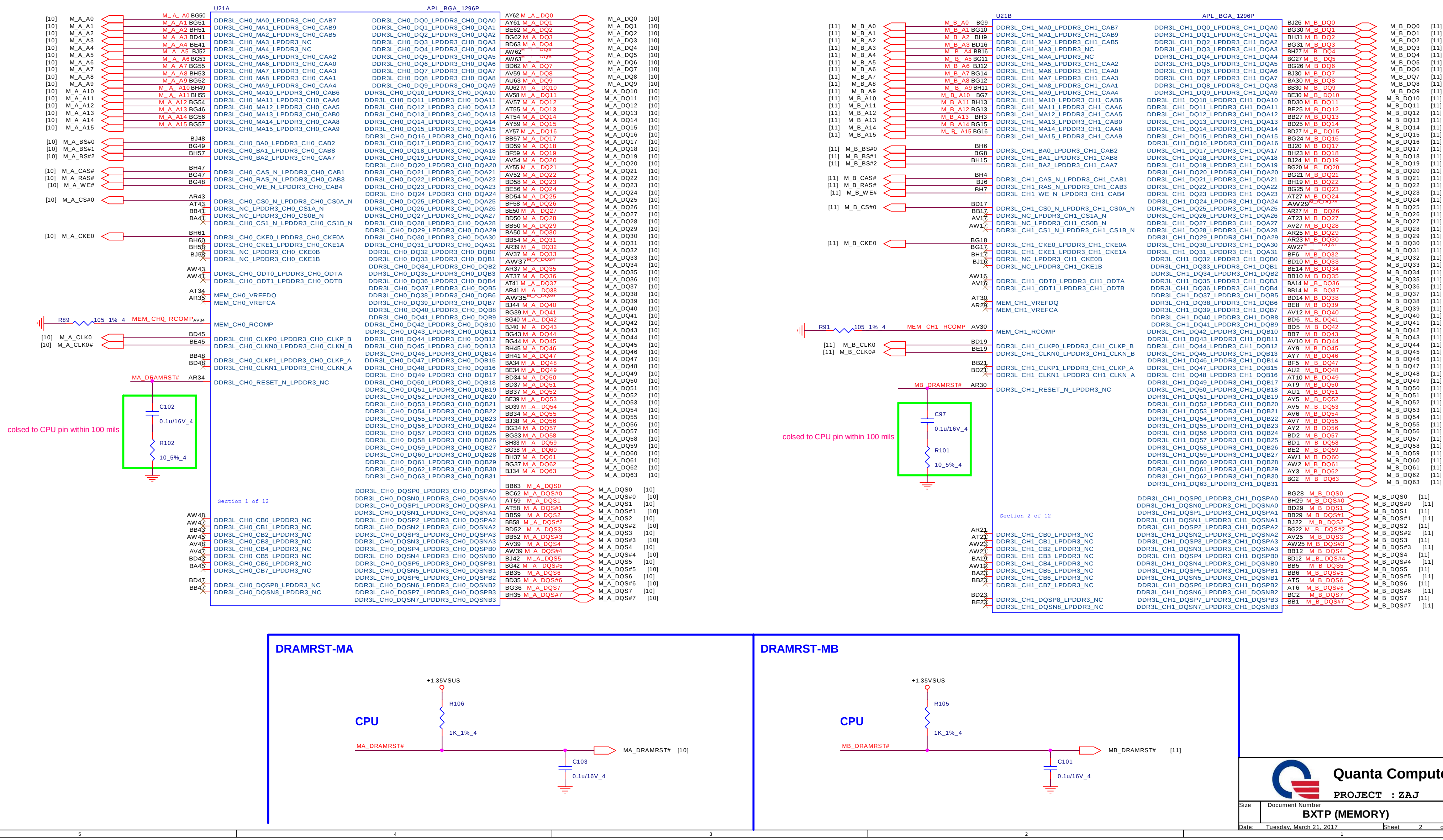
BOM

TPM@ : TPM
GS@ : G-SENSOR
CB@ : Cloud book SKU
EJ@ : EJ sereies SKU
KBL@ : keyboard backlight
NVL@ : none LED panel boost
VL@ : LED panel boost
EC@ : EMMC
TPC@ : Type C function
w/o GS@: stuff with none GS sku
SSD@ : SATA interface SSD
PSD@ : PCIE interfance SSD
ODD@ : ODD function

Quanta Computer Inc.
PROJECT : ZAJ
Date: Tuesday, March 21, 2017 Sheet 1
Size | Document Number: Block Diagram | Rev 3A

APL ULT (DDR3L)

02



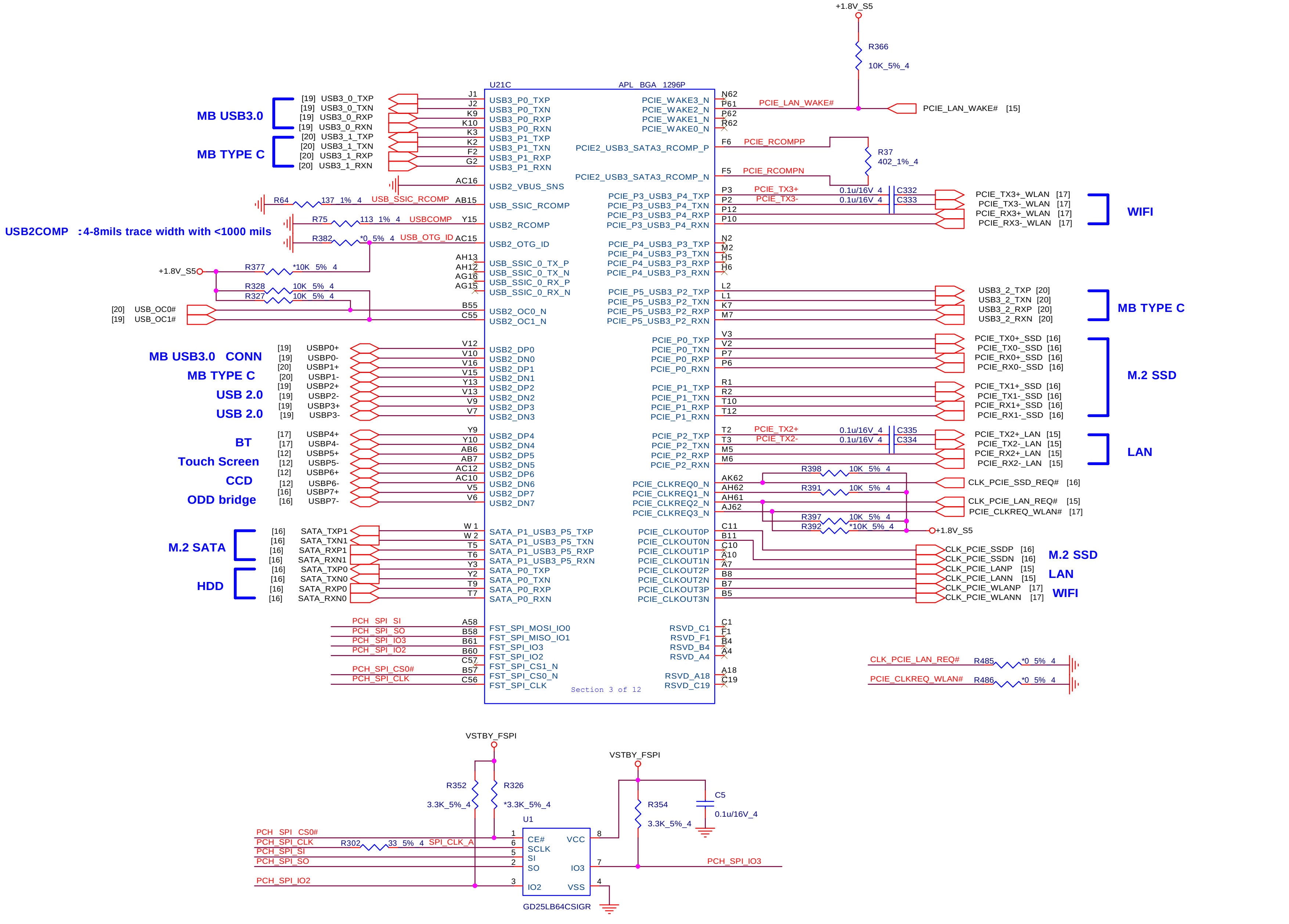
Quanta Computer Inc.

PROJECT : ZAJ

Size	Document Number	Rev
	BXTP (MEMORY)	3A

Date: Tuesday, March 21, 2017 Sheet 2 of 34

Apollo lake (SATA , ODD, CLK ,USB,PCIE)



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

SPI ROM	Vender	Size	Quanta P/N	Vender P/N
1.8V	WND	8M	AKE5EZN0N01	W25Q64FWSSIQ
	GGD	8M	AKE5EG-0Q01	GD25LB64CSIGR

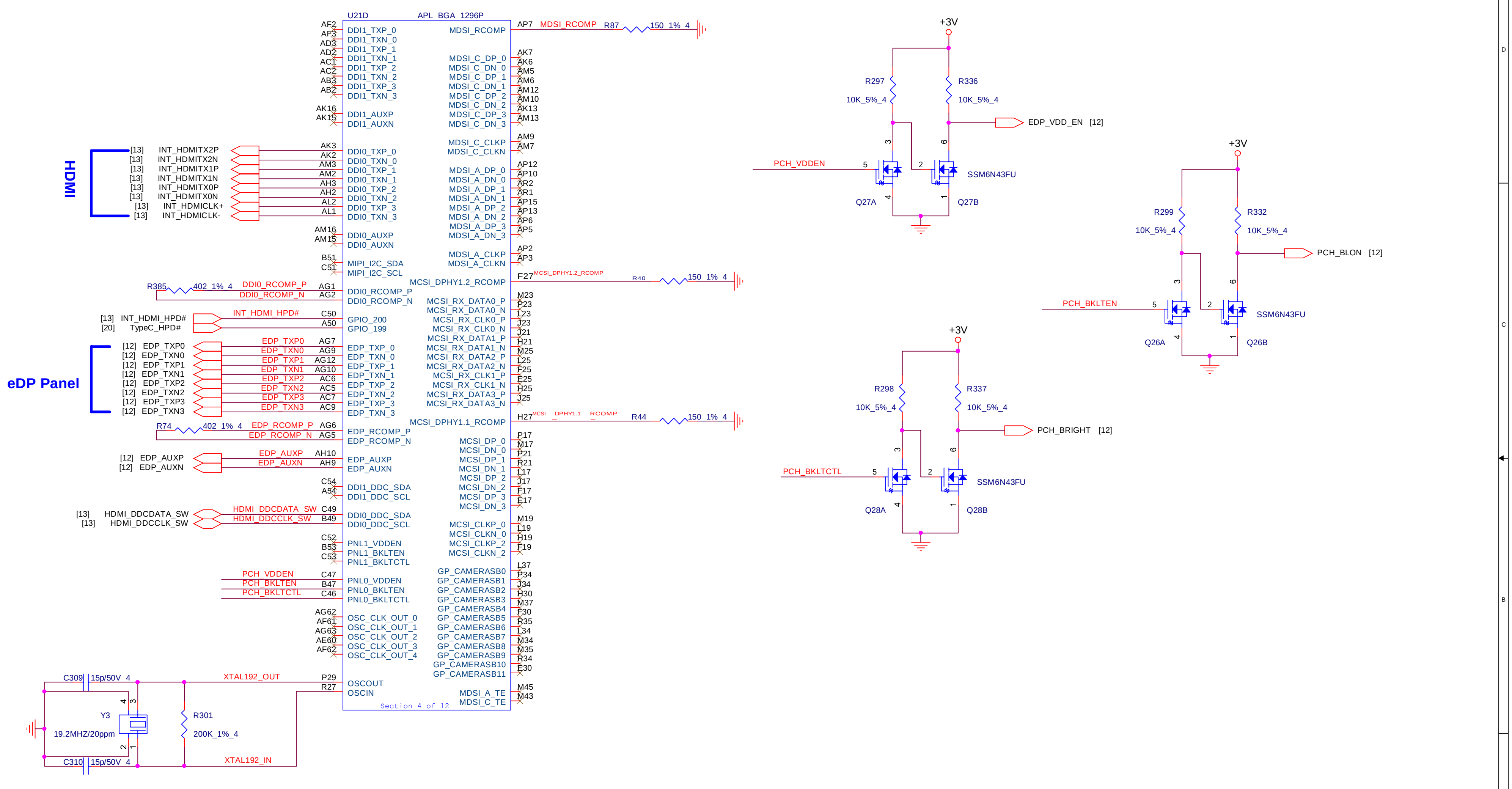
Quanta Computer Inc.

PROJECT :ZAJ

Size	Document Number	Rev
	BXTP (PCIE/USB/SATA/SPI)	3A

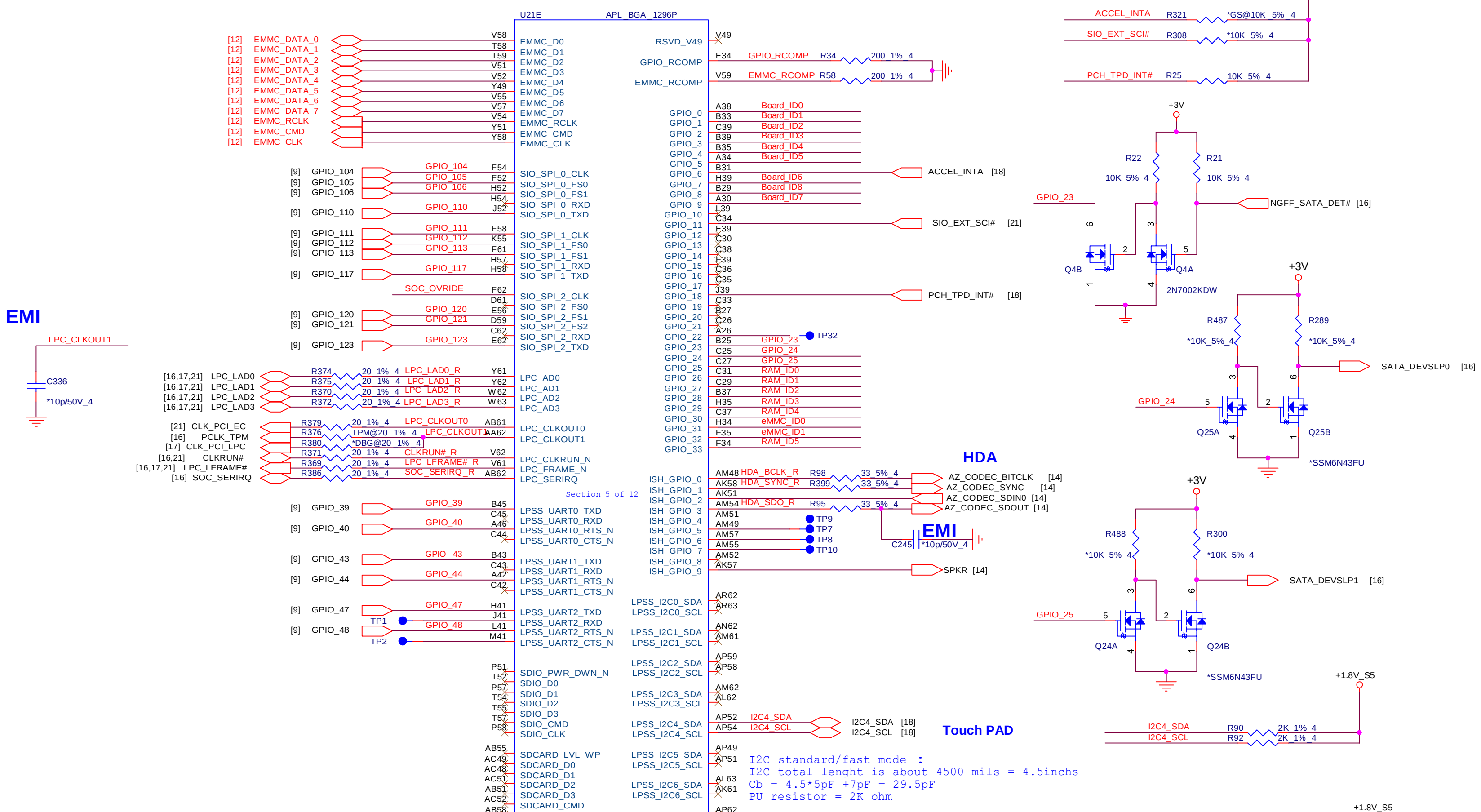
Date: Tuesday, March 21, 2017 Sheet 3 of 34

Apollolake (DISPLAY,eDP)

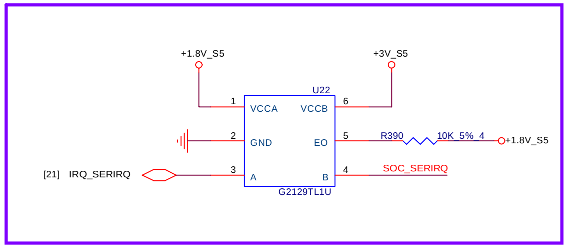


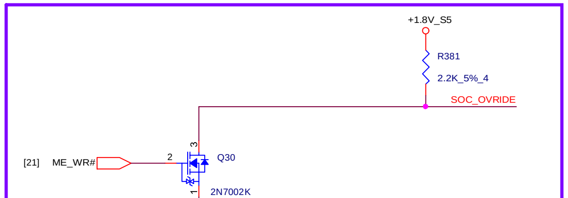
Quanta Computer Inc.		
PROJECT : ZAJ		
Size	Document Number: BXTP (HDMI/eDP)	Rev 3A
Date: Tuesday, March 21, 2017	Sheet 4 of 34	

Apollolake (EMMC/LPC/I2C)



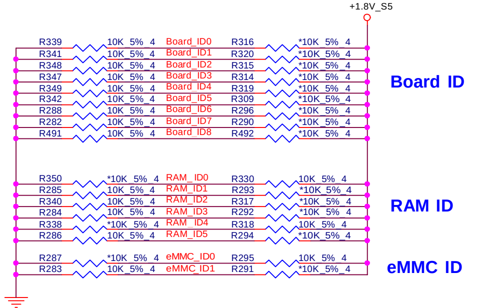
SERIRQ IS 1.8V_S5 AT EC SIDE BUT
3V_S5 AT CPU/TPM SIDE





Flash Descriptor Override (SOC_OVRIDE)
0 = Normal Override(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



RAM_ID5	RAM_ID4	RAM_ID3	Vender	Quanta PN	Description
0	0	0	Miron-2GB	AKD5JGSTL08	IC SDRAM(96P)MT41K256M16HA-125:E STNBSQ
0	0	1	Miron-2GB	AKD59GSTL12	IC SDRAM(96P)MT41K256M16TW-107:P STNBSQ
0	1	0	Hynix-2GB	AKD5PGSTW29	IC SDRAM(96P)H5TC4G63EFR-PBA(FBGA)STNBSQ
0	1	1	Samsung-2GB	AKD5JG0T504	IC SDRAM(96P)K4B4G1646E-BYK0(FBGA)STNBSQ

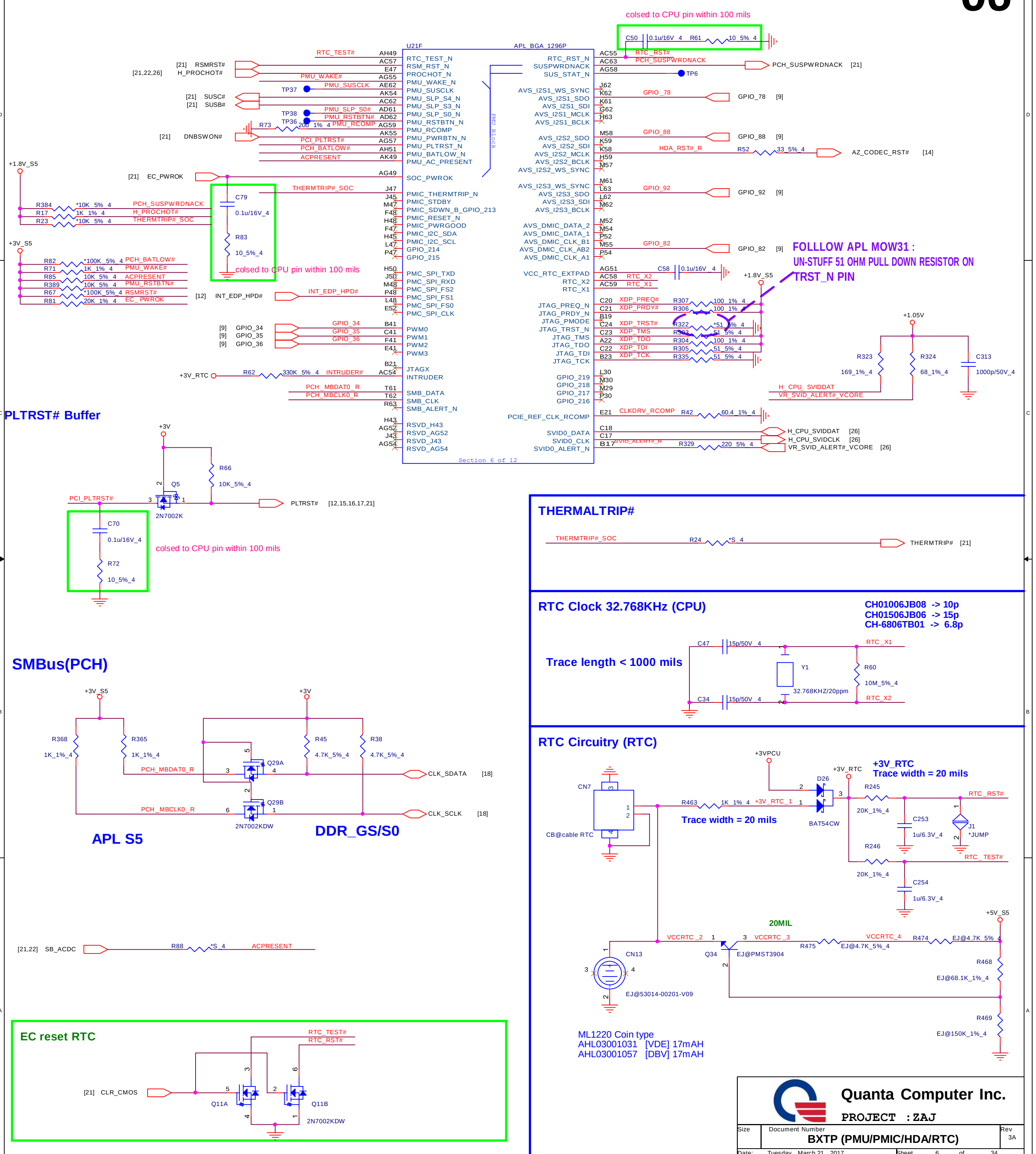
eMMC_ID1	eMMC_ID0	Vender
0	0	Samsung 32/64GB
0	1	Hynix 32/64GB
1	0	Kingston 32/64GB

Quanta Computer Inc.
PROJECT : ZAJ

Size	Document Number	Rev
	BXTP (EMMC/LPC/SMB/ISH)	3A

Date: Tuesday, March 21, 2017 Sheet 5 of 34

Apollolake (PMU/PMIC/HDA)



Quanta Computer Inc.

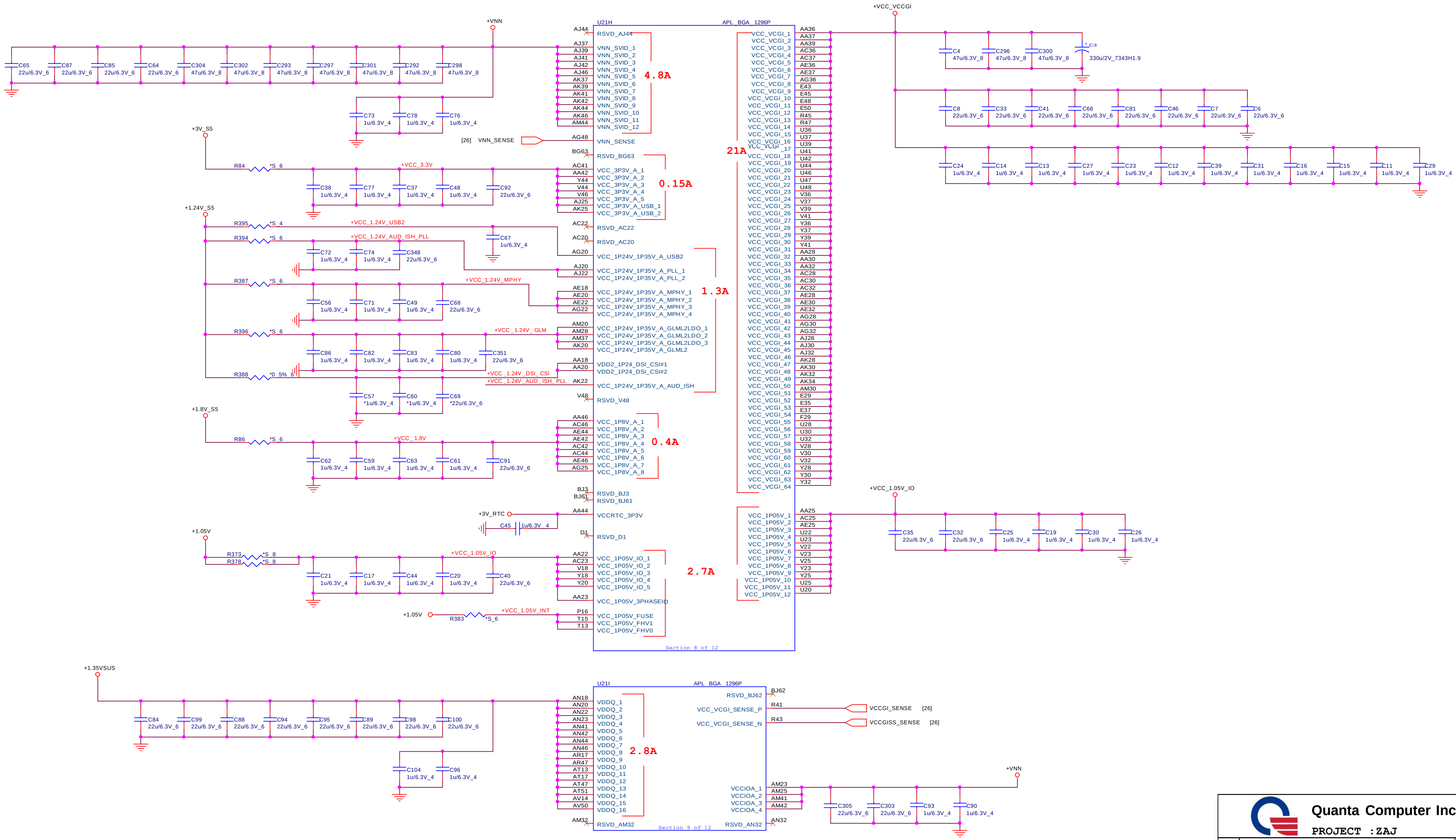
PROJECT : ZAJ

Size	Document Number	Rev
	BXTP (PMU/PMIC/HDA/RTC)	3A

Date: Tuesday, March 21, 2017 Sheet 6 of 34

Apollolake (POWER)

07



Quanta Computer Inc.

PROJECT : ZAJ

Size	Document Number	Rev
	BXTP (POWER)	3A

Date: Tuesday, March 21, 2017 Sheet 7 of 34

Apollolake ULT (GND)

U21J APL_BGA_1296P (Section 10 of 12)

Pin	Net	Net	Pin
R29	VSS_1	VSS_82	AH58
A12	VSS_2	VSS_83	AH59
A16	VSS_3	VSS_84	AH6
A20	VSS_4	VSS_85	AH7
A24	VSS_5	VSS_86	AJ1
A28	VSS_6	VSS_87	AJ18
A32	VSS_7	VSS_88	AJ2
A36	VSS_8	VSS_89	AJ23
A40	VSS_9	VSS_90	AJ27
A44	VSS_10	VSS_91	AJ34
A48	VSS_11	VSS_92	AJ36
A5	VSS_12	VSS_93	AJ63
A52	VSS_13	VSS_94	AK10
A56	VSS_14	VSS_95	AK12
A62	VSS_15	VSS_96	AK18
A9	VSS_16	VSS_97	AK23
AA1	VSS_17	VSS_98	AK27
AA2	VSS_18	VSS_99	AK36
AA27	VSS_19	VSS_100	AK48
AA34	VSS_20	VSS_101	AK5
AA41	VSS_21	VSS_102	AK52
AA63	VSS_22	VSS_103	AK59
AB10	VSS_23	VSS_104	AK9
AB12	VSS_24	VSS_105	AM18
AB16	VSS_25	VSS_106	AM22
AB48	VSS_26	VSS_107	AM27
AB5	VSS_27	VSS_108	AM34
AB52	VSS_28	VSS_109	AM36
AB57	VSS_29	VSS_110	AM39
AB59	VSS_30	VSS_111	AM46
AB9	VSS_31	VSS_112	AN1
AC18	VSS_32	VSS_113	AN10
AC27	VSS_33	VSS_114	AN11
AC34	VSS_34	VSS_115	AN13
AC39	VSS_35	VSS_116	AN14
AE1	VSS_36	VSS_117	AN16
AE10	VSS_37	VSS_118	AN17
AE11	VSS_38	VSS_119	AN2
AE13	VSS_39	VSS_120	AN25
AE14	VSS_40	VSS_121	AN27
AE16	VSS_41	VSS_122	AN28
AE17	VSS_42	VSS_123	AN30
AE2	VSS_43	VSS_124	AN34
AE23	VSS_44	VSS_125	AN36
AE27	VSS_45	VSS_126	AN37
AE34	VSS_46	VSS_127	AN39
AE39	VSS_47	VSS_128	AN47
AE4	VSS_48	VSS_129	AN48
AE41	VSS_49	VSS_130	AN5
AE47	VSS_50	VSS_131	AN50
AE48	VSS_51	VSS_132	AN51
AE5	VSS_52	VSS_133	AN53
AE50	VSS_53	VSS_134	AN54
AE51	VSS_54	VSS_135	AN56
AE53	VSS_55	VSS_136	AN57
AE54	VSS_56	VSS_137	AN59
AE56	VSS_57	VSS_138	AN63
AE57	VSS_58	VSS_139	AN7
AE59	VSS_59	VSS_140	AN8
AE63	VSS_60	VSS_141	AP55
AE7	VSS_61	VSS_142	AP9
AE8	VSS_62	VSS_143	AR19
AG13	VSS_63	VSS_144	AR32
AG18	VSS_64	VSS_145	AR45
AG23	VSS_65	VSS_146	AT12
AG27	VSS_66	VSS_147	AT16
AG34	VSS_67	VSS_148	AT19
AG37	VSS_68	VSS_149	AT2
AG39	VSS_69	VSS_150	AT25
AG41	VSS_70	VSS_151	AT29
AG42	VSS_71	VSS_152	AT3
AG44	VSS_72	VSS_153	AT35
AG46	VSS_73	VSS_154	AT39
AH15	VSS_74	VSS_155	AT45
AH16	VSS_75	VSS_156	AT48
AH48	VSS_76	VSS_157	AT52
AH5	VSS_77	VSS_158	AT57
AH52	VSS_78	VSS_159	AT61
AH54	VSS_79	VSS_160	AT62
AH55	VSS_80	VSS_161	AT7
AH57	VSS_81	VSS_162	AU32

U21K APL_BGA_1296P (Section 11 of 12)

Pin	Net	Net	Pin
AV19	VSS_163	VSS_244	BG29
AV2	VSS_164	VSS_245	BG32
AV21	VSS_165	VSS_246	BG35
AV23	VSS_166	VSS_247	BG41
AV29	VSS_167	VSS_248	BG45
AV3	VSS_168	VSS_249	BH1
AV32	VSS_169	VSS_250	BH2
AV35	VSS_170	VSS_251	BH21
AV41	VSS_171	VSS_252	BH25
AV43	VSS_172	VSS_253	BH39
AV45	VSS_173	VSS_254	BH43
AV55	VSS_174	VSS_255	BH62
AV61	VSS_175	VSS_256	BH63
AV62	VSS_176	VSS_257	BJ10
AV9	VSS_177	VSS_258	BJ14
AW14	VSS_178	VSS_259	BJ18
AW30	VSS_179	VSS_260	BJ28
AW34	VSS_180	VSS_261	BJ32
AW50	VSS_181	VSS_262	BJ36
AY10	VSS_182	VSS_263	BJ4
AY32	VSS_183	VSS_264	BJ46
AY54	VSS_184	VSS_265	BJ50
AY58	VSS_185	VSS_266	BJ54
AY6	VSS_186	VSS_267	BJ56
B2	VSS_187	VSS_268	BJ60
B3	VSS_188	VSS_269	BJ8
B62	VSS_189	VSS_270	C12
B63	VSS_190	VSS_271	C16
B9	VSS_191	VSS_272	C28
BA1	VSS_192	VSS_273	C32
BA12	VSS_193	VSS_274	C40
BA16	VSS_194	VSS_275	C48
BA17	VSS_195	VSS_276	D32
BA2	VSS_196	VSS_277	D58
BA21	VSS_197	VSS_278	D6
BA25	VSS_198	VSS_279	E12
BA27	VSS_199	VSS_280	E14
BA29	VSS_200	VSS_281	E19
BA32	VSS_201	VSS_282	E27
BA35	VSS_202	VSS_283	E4
BA37	VSS_203	VSS_284	E54
BA39	VSS_204	VSS_285	F10
BA43	VSS_205	VSS_286	F21
BA47	VSS_206	VSS_287	F3
BA48	VSS_207	VSS_288	F32
BA52	VSS_208	VSS_289	F37
BA62	VSS_209	VSS_290	F43
BA63	VSS_210	VSS_291	F45
BB19	VSS_211	VSS_292	F50
BB25	VSS_212	VSS_293	F56
BB3	VSS_213	VSS_294	F59
BB39	VSS_214	VSS_295	F63
BB45	VSS_215	VSS_296	G1
BB61	VSS_216	VSS_297	G32
BC32	VSS_217	VSS_298	H17
BD3	VSS_218	VSS_299	H23
BD32	VSS_219	VSS_300	H29
BD56	VSS_220	VSS_301	H3
BD61	VSS_221	VSS_302	H37
BD8	VSS_222	VSS_303	H47
BE1	VSS_223	VSS_304	H61
BE10	VSS_224	VSS_305	H7
BE12	VSS_225	VSS_306	J12
BE16	VSS_226	VSS_307	J14
BE17	VSS_227	VSS_308	J19
BE21	VSS_228	VSS_309	J27
BE27	VSS_229	VSS_310	J30
BE29	VSS_230	VSS_311	J32
BE35	VSS_231	VSS_312	J35
BE37	VSS_232	VSS_313	J37
BE43	VSS_233	VSS_314	J48
BE47	VSS_234	VSS_315	J63
BE48	VSS_235	VSS_316	K32
BE52	VSS_236	VSS_317	K5
BE54	VSS_237	VSS_318	K54
BE63	VSS_238	VSS_319	K57
BF3	VSS_239	VSS_320	K6
BF32	VSS_240	VSS_321	L21
BF61	VSS_241	VSS_322	L27
BG19	VSS_242	VSS_323	L29
BG23	VSS_243	VSS_324	L35

U21L APL_BGA_1296P (Sect 12/12)

Pin	Net	Net	Pin
L43	VSS_325	VSS_361	U2
L45	VSS_326	VSS_362	U27
L50	VSS_327	VSS_363	U34
M14	VSS_328	VSS_364	U5
M21	VSS_329	VSS_365	U50
M27	VSS_330	VSS_366	U51
M3	VSS_331	VSS_367	U53
M32	VSS_332	VSS_368	U54
M50	VSS_333	VSS_369	U56
M59	VSS_334	VSS_370	U57
M9	VSS_335	VSS_371	U59
N1	VSS_336	VSS_372	U62
N32	VSS_337	VSS_373	U63
N63	VSS_338	VSS_374	U7
P13	VSS_339	VSS_375	U8
P19	VSS_340	VSS_376	V20
P35	VSS_341	VSS_377	V27
P37	VSS_342	VSS_378	V34
P41	VSS_343	VSS_379	V42
P43	VSS_344	VSS_380	Y12
P45	VSS_345	VSS_381	Y16
P5	VSS_346	VSS_382	Y22
P55	VSS_347	VSS_383	Y27
P59	VSS_348	VSS_384	Y34
P9	VSS_349	VSS_385	Y42
R23	VSS_350	VSS_386	Y46
R32	VSS_351	VSS_387	Y48
T49	VSS_352	VSS_388	Y5
U1	VSS_353	VSS_389	Y52
U10	VSS_354	VSS_390	Y54
U11	VSS_355	VSS_391	Y55
U13	VSS_356	VSS_392	Y57
U14	VSS_357	VSS_393	Y59
U16	VSS_358	VSS_394	Y6
U17	VSS_359	VSS_395	Y7
U18	VSS_360		

U21G APL_BGA_1296P (Section 7 of 12)

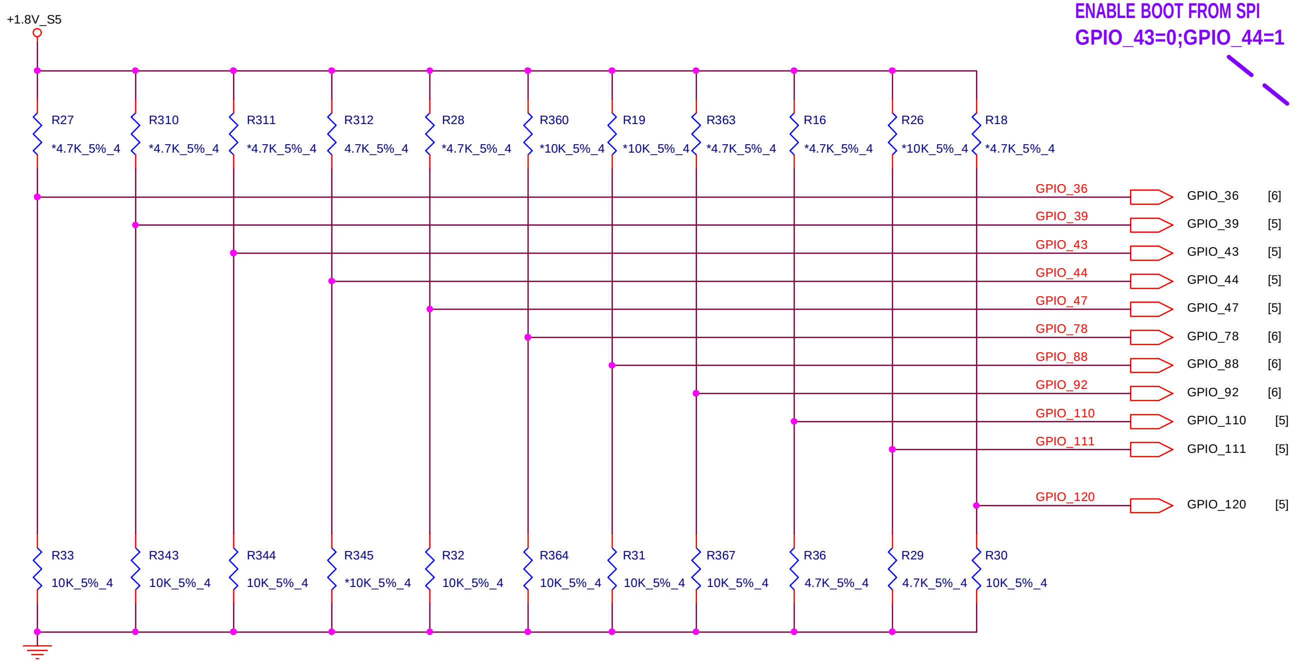
Pin	Net	Net	Pin
B13	SPARE_9	NOCONNECT_16	M12
C13	SPARE_8	NOCONNECT_17	C15
L16	SPARE_7	NOCONNECT_18	F16
M16	SPARE_6	NOCONNECT_19	J16
E23	SPARE_5	NOCONNECT_20	D8
F23	SPARE_4	NOCONNECT_21	E8
R25	SPARE_3	NOCONNECT_22	H16
AB49	SPARE_2	NOCONNECT_23	C9
AC13	SPARE_11	NOCONNECT_24	F8
AB13	SPARE_10	NOCONNECT_25	E10
AM59	SPARE_1	NOCONNECT_26	E16
AM58	SPARE_0	NOCONNECT_27	F14
		NOCONNECT_28	F12
T51	NOCONNECT_1	NOCONNECT_29	H10
L14	NOCONNECT_2	NOCONNECT_30	H14
R19	NOCONNECT_3	NOCONNECT_31	H12
E6	NOCONNECT_4	NOCONNECT_32	A14
R17	NOCONNECT_5	NOCONNECT_33	C14
E3	NOCONNECT_6	NOCONNECT_34	M39
D4	NOCONNECT_7	NOCONNECT_35	P39
A60	NOCONNECT_8	NOCONNECT_36	R39
A61	NOCONNECT_9	NOCONNECT_37	R37
BJ2	NOCONNECT_10	NOCONNECT_38	C2
BG1	NOCONNECT_11	NOCONNECT_39	J29
P27	NOCONNECT_12	NOCONNECT_40	P25
A3	NOCONNECT_13	NOCONNECT_41	R30
M10	NOCONNECT_14	NOCONNECT_42	C63
B15	NOCONNECT_15	NOCONNECT_43	E63
		NOCONNECT_44	D2
		NOCONNECT_45	AP57

Quanta Computer Inc.

PROJECT : ZAJ

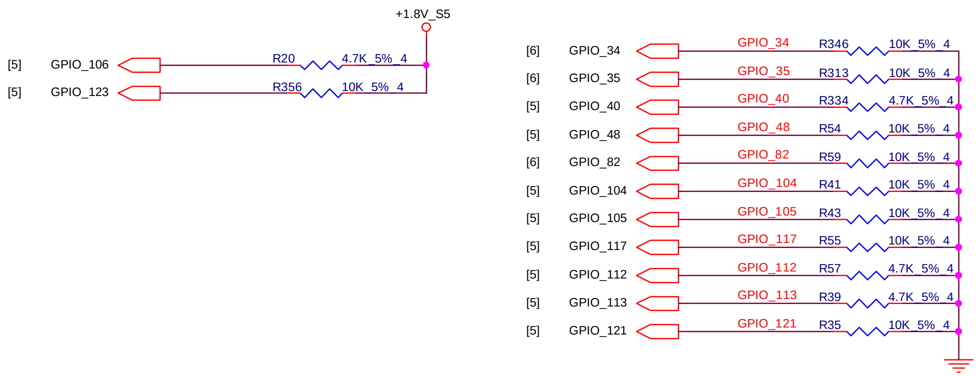
Size	Document Number	Rev
	BXTP (GND)	3A

HARDWARE STRAPS



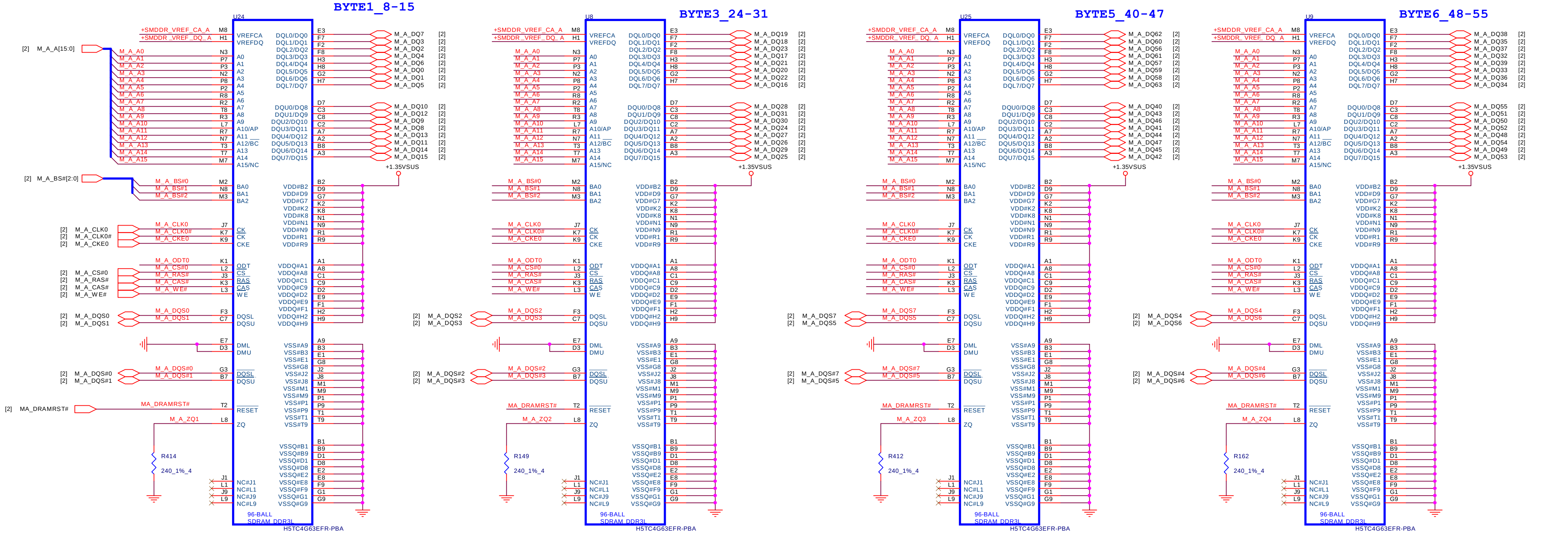
FOLLLOW APL WOW36 :
ENABLE BOOT FROM SPI
GPIO_43=0;GPIO_44=1

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

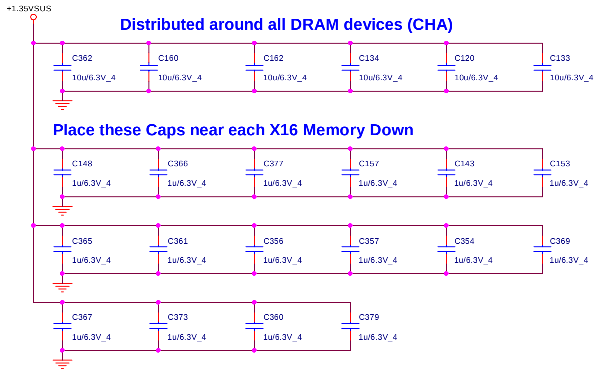


On board memory(OBM)

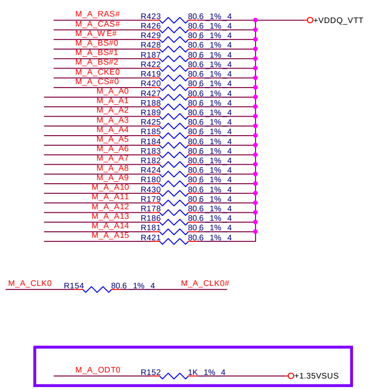
DDR3L MEMORY CHANNEL A



DE-CAPS FOR MEMORY CHANNEL A

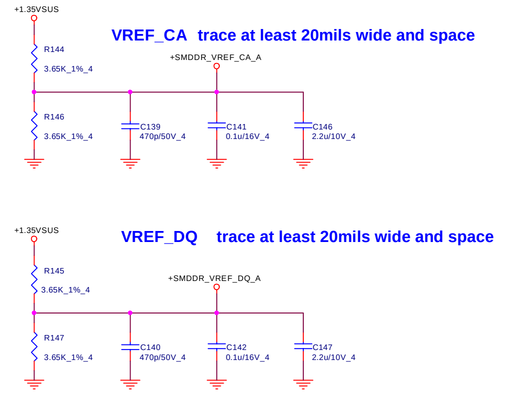


VTT TERMINATIONS



FOLLLOW APL WOW37 : MEMORY DOWN
ODT SINGLE ON DRAM SIDE IS PULLED UP TO VDDQ

VREF_CA-DQ CIRCUIT

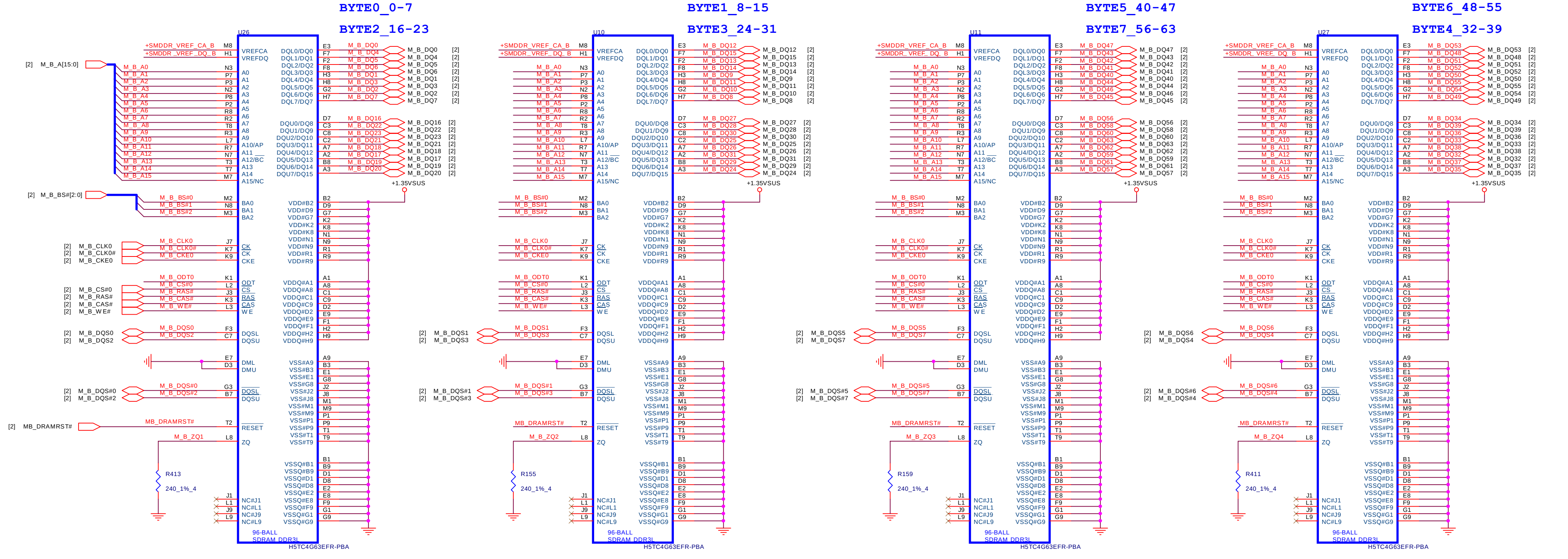


Quanta Computer Inc.
PROJECT : ZAJ

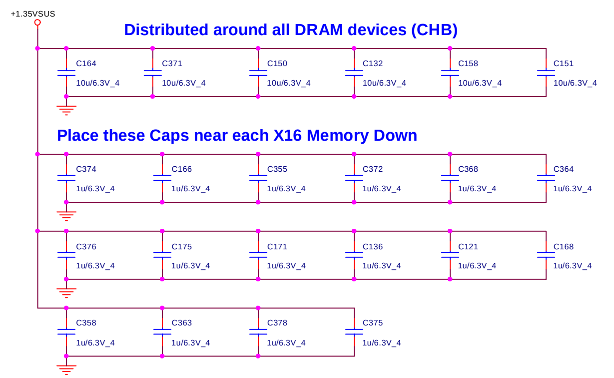
Size	Document Number	Rev
	DDR3L SODIMM-STD CHA	3A
Date: Tuesday, March 21, 2017	Sheet 10 of 34	

DDR3L MEMORY CHANNEL B

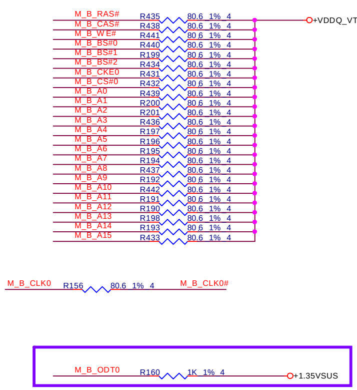
On board memory(OBM)



DE-CAPS FOR MEMORY CHANNEL B

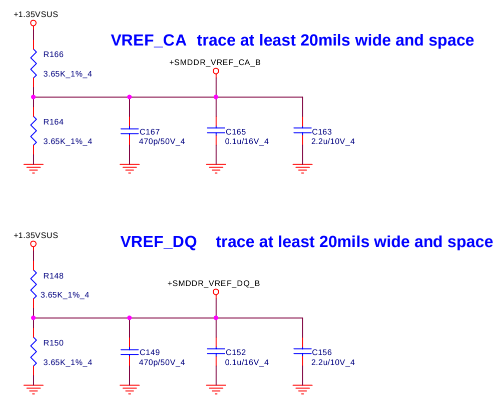


VTT TERMINATIONS



FOLLLOW APL WOW37 :MEMORY DOWN
ODT SINGLE ON DRAM SIDE IS PULLED UP TO VDDQ

VREF_CA-DQ CIRCUIT

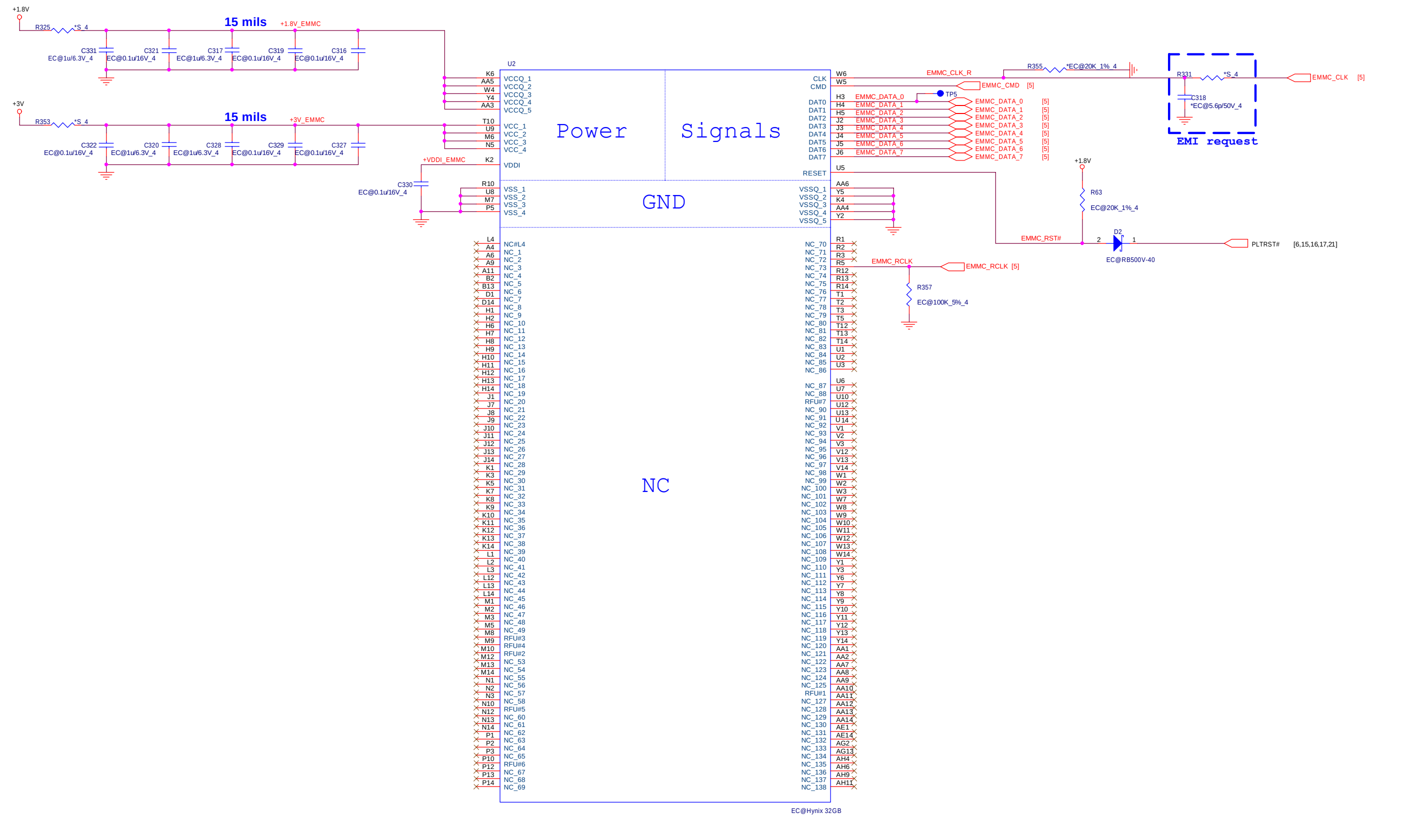


Quanta Computer Inc.

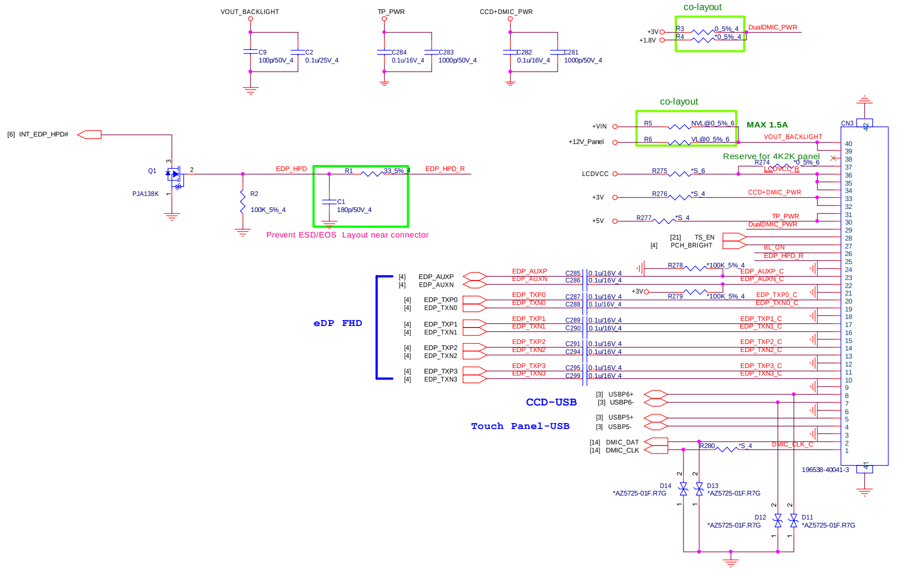
PROJECT : ZAJ

Size	Document Number	Rev
	DDR3L MEMORY DOWNx16 CHB	3A

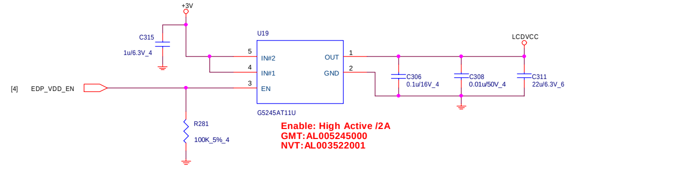
eMMC (MMC)



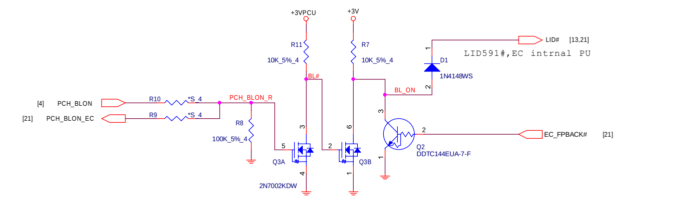
eDP CONNECTOR (LDS)



eDP Power (LDS)



eDP Backlight (LDS)



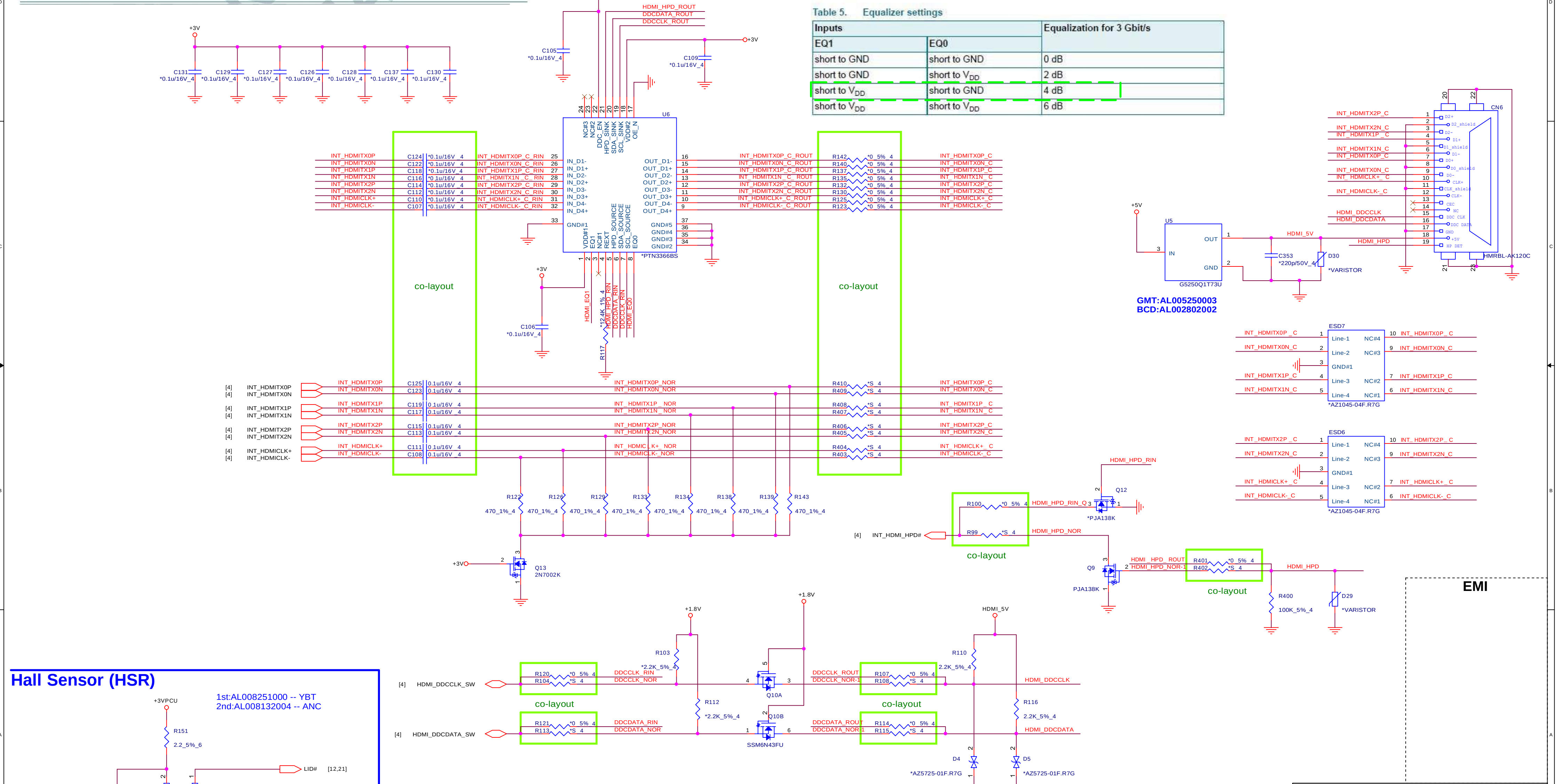
HDMI (HDM)

OE_N	DDC_EN	HPD_SINK	Source output	PTN3366 power mode
LOW	HIGH	HIGH	source active	Active mode; DDC active
LOW	LOW	LOW	don't care	Standby mode
HIGH	LOW	don't care	don't care	Ultra low-power mode

The PTN3366 supports four level equalization settings based on binary input pins EQ0 and EQ1.

Table 5. Equalizer settings

Inputs		Equalization for 3 Gbit/s
EQ1	EQ0	
short to GND	short to GND	0 dB
short to GND	short to V_{DD}	2 dB
short to V_{DD}	short to GND	4 dB
short to V_{DD}	short to V_{DD}	6 dB



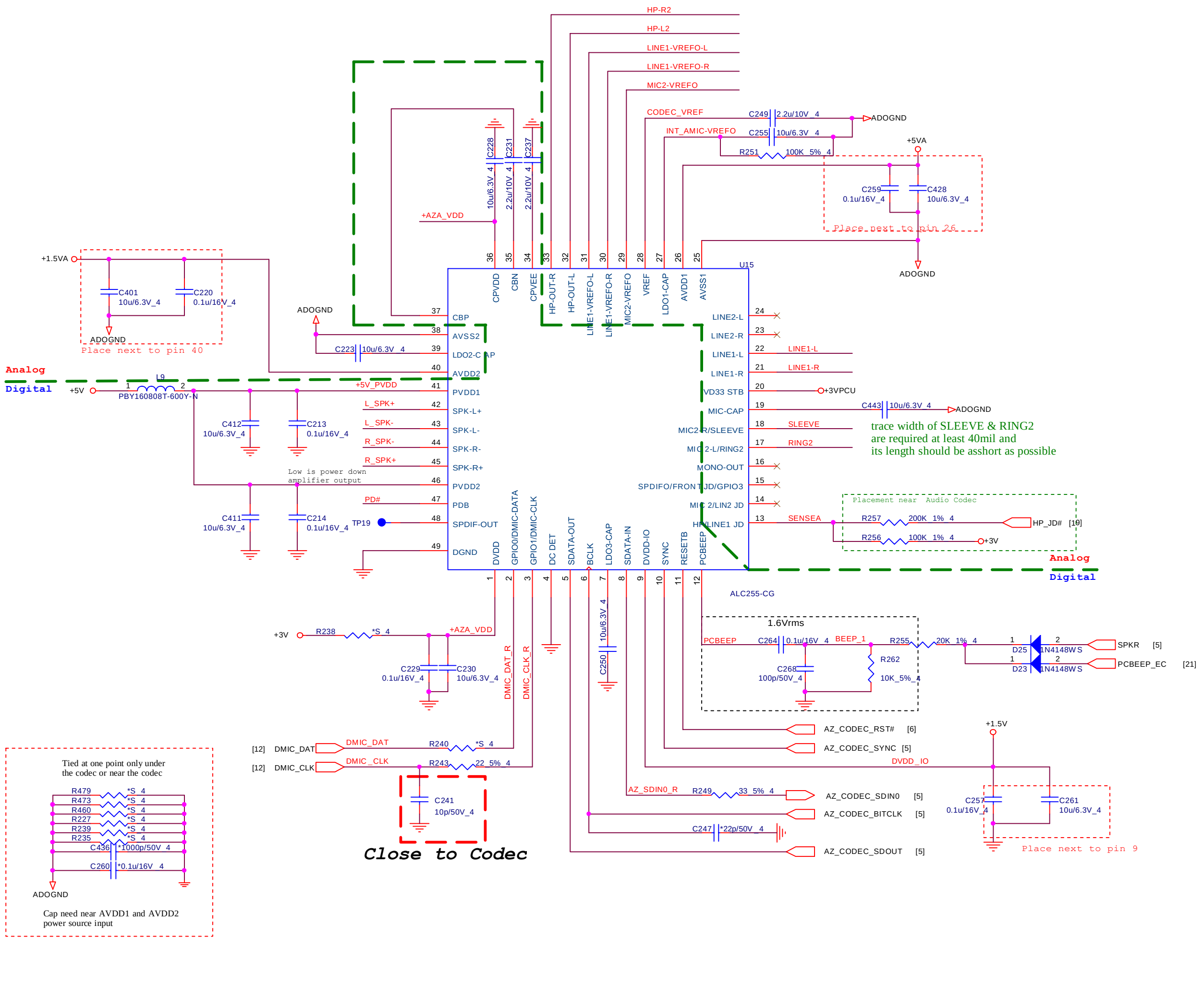
Quanta Computer Inc.

PROJECT : ZAJ

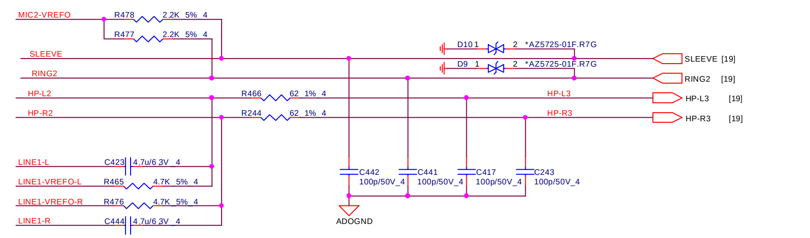
Size	Document Number	Rev
	HDMI/Hall sensor	3A

Date: Tuesday, March 21, 2017 Sheet 13 of 34

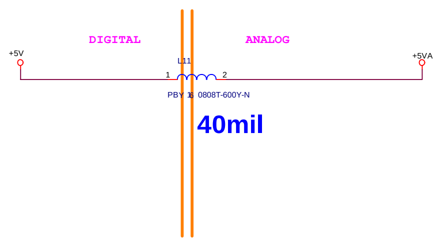
Codec(ADO)



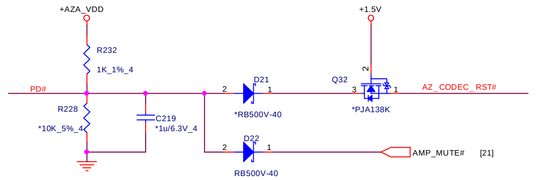
Universal Audio Jack HEADPHONE/MIC/LINE combo (ADO)



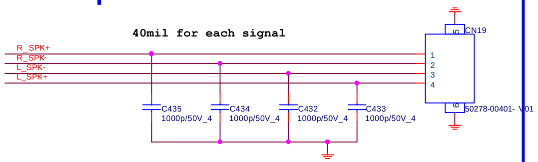
Codec PWR 5V(ADO)



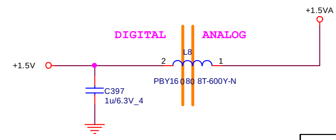
Mute(ADO)



Internal Speaker

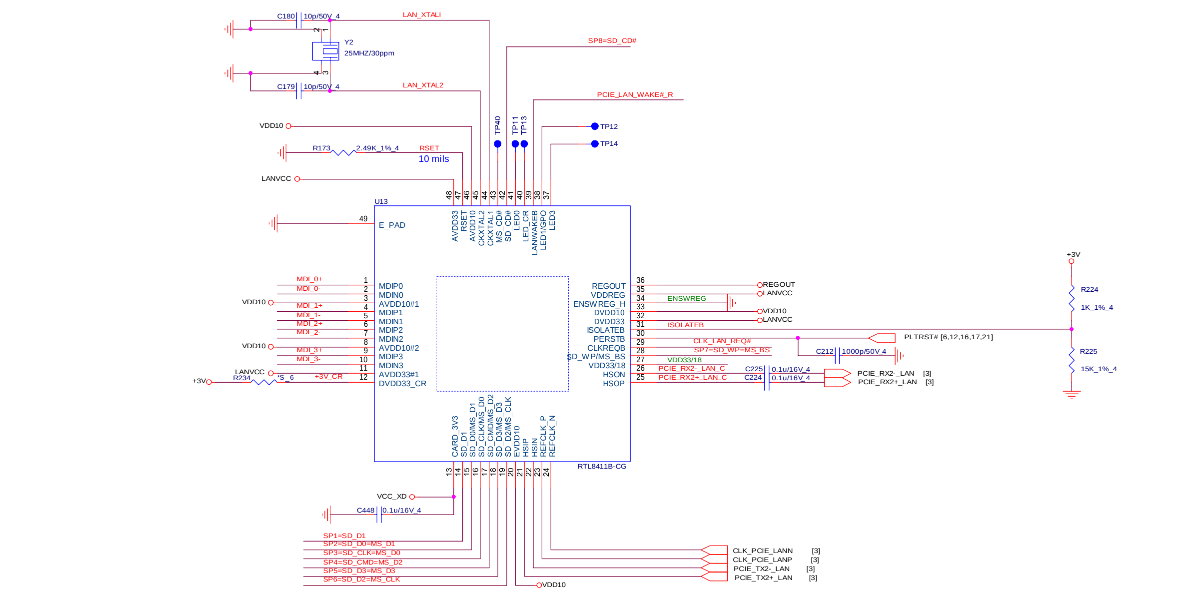


Codec PWR 1.5V(ADO)

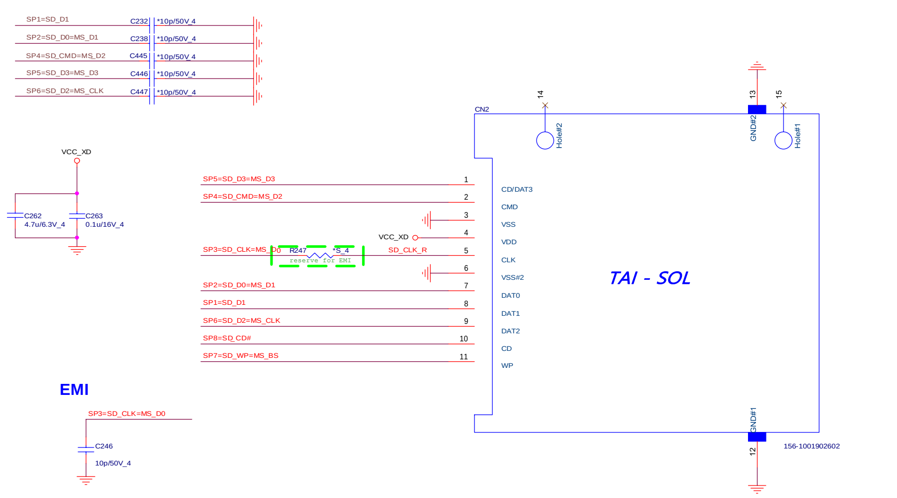


Quanta Computer Inc.	
PROJECT : ZAJ	
Size	Document Number: Audio Codec/HP/SPK/AMIC — Rev 3A
Date: Tuesday , March 21, 2017	Sheet 14 of 34

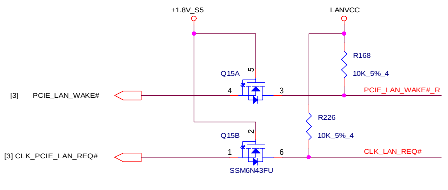
LAN & Card reader Combo (LAN)

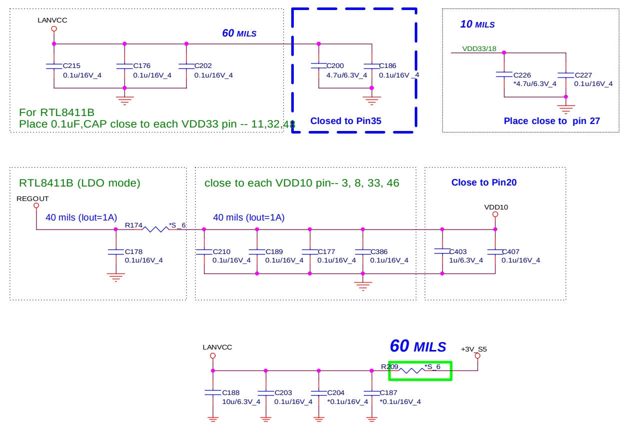


CARD READER (CRD)

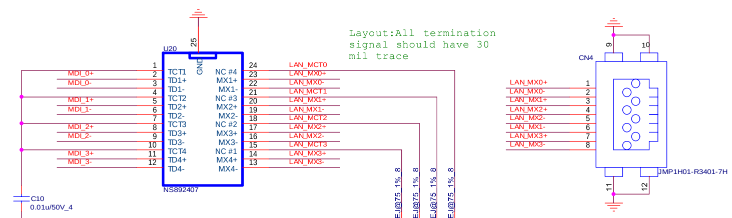


WAKE#/REQ# circuit(LAN)





Tramsformer



TF height limit = 4mm

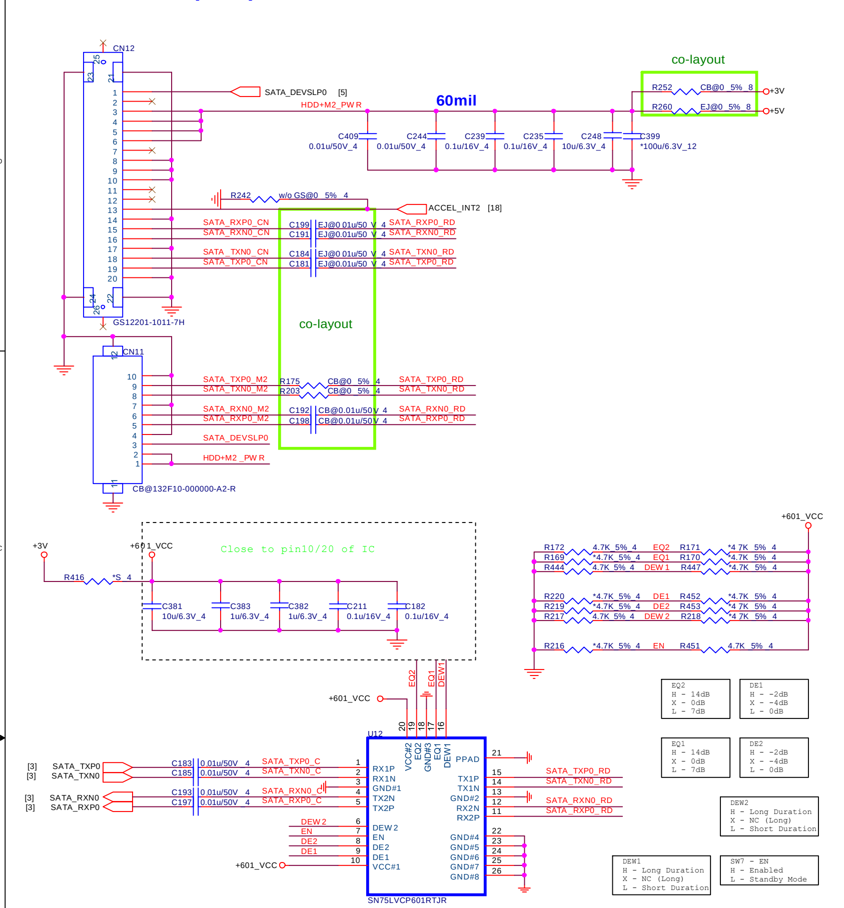
EJ series	Vender	Descripiton
DB0LL1LAN00	FCE	TRANSFORMER LL1 LAN 24P(NS892407)
DB0X81LAN01	PSK	TRANSFORMER X81 GIGA LAN (A-8300G)
DB0Z06LAN00	BOT	TRANSFORMER Z06 LAN 24P(GST5009B LF)

TF height limit = 2.4mm

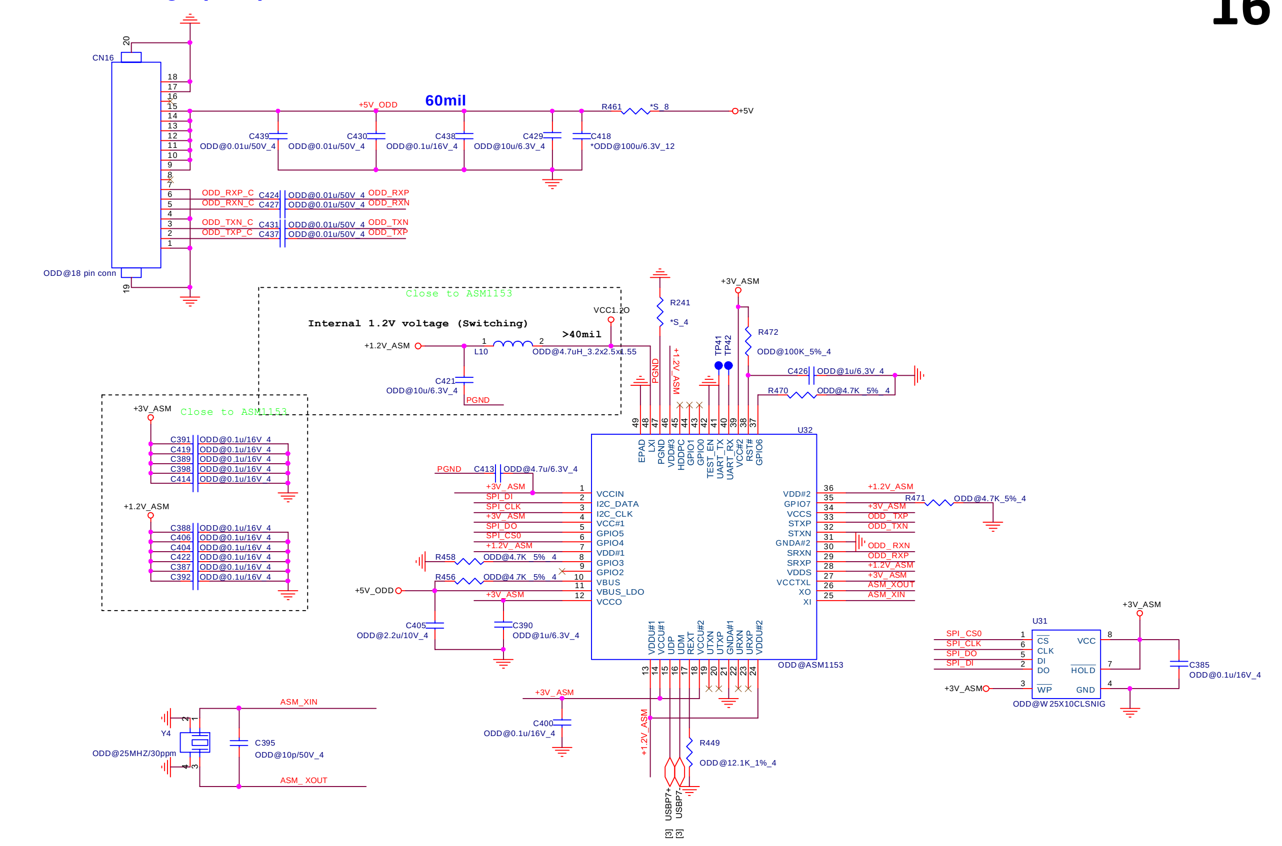
Cloudbook	Vender	Descripiton
DB0Z8PLAN00	PSK	TRANSFORMER Z8P LAN (A-8300G-SLIM)

Quanta Computer Inc.		
PROJECT : ZAJ		
Size	Document Number: LAN/CRD COMBO - RTL8411B	Rev: 3A
Date: Tuesday, March 21, 2017	Sheet 15 of 34	

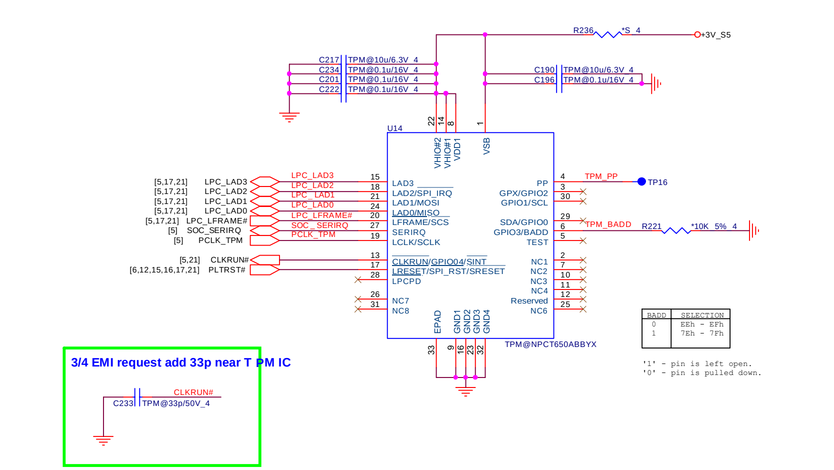
2.5" SATA HDD (HDD)



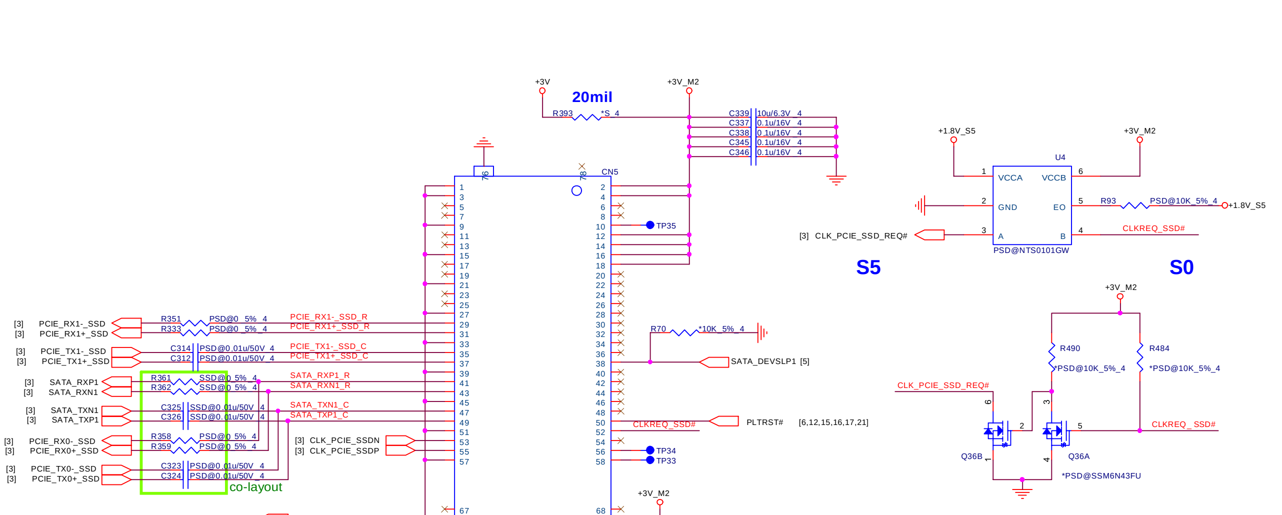
USB ODD Bridge (ODD)



TPM NPCT650 (TPM)

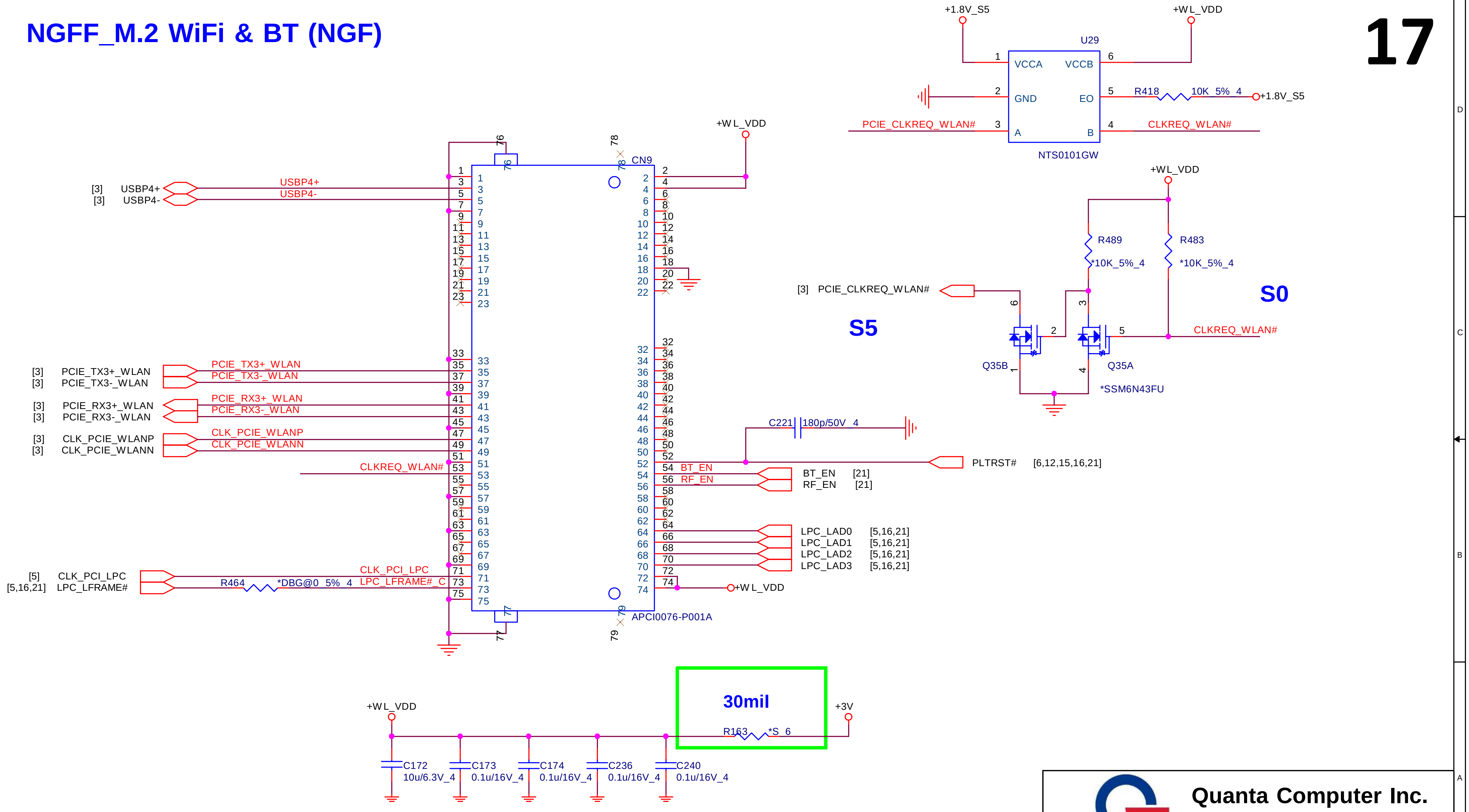


M.2 PCPIE & SATA SSD (NGF)

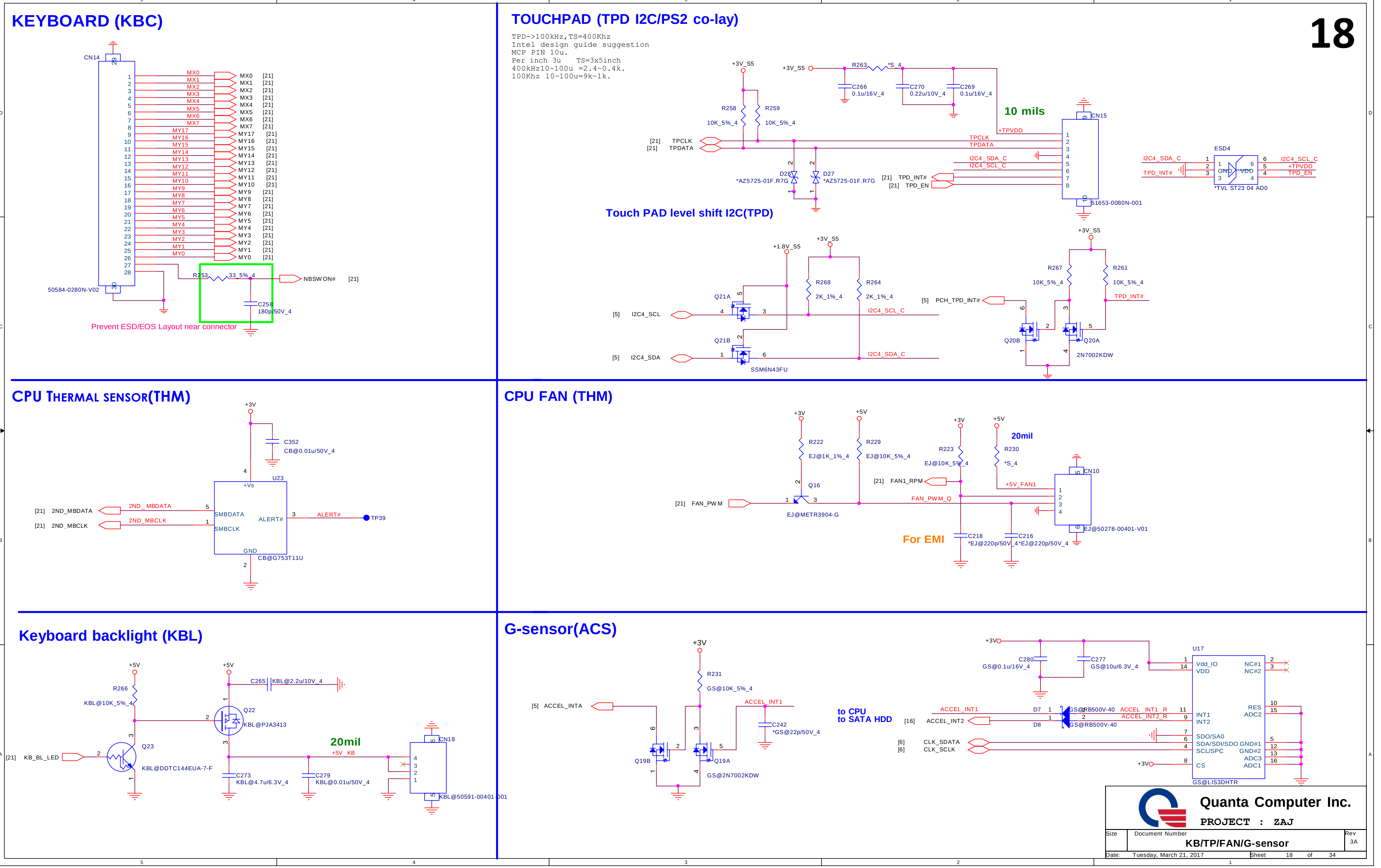


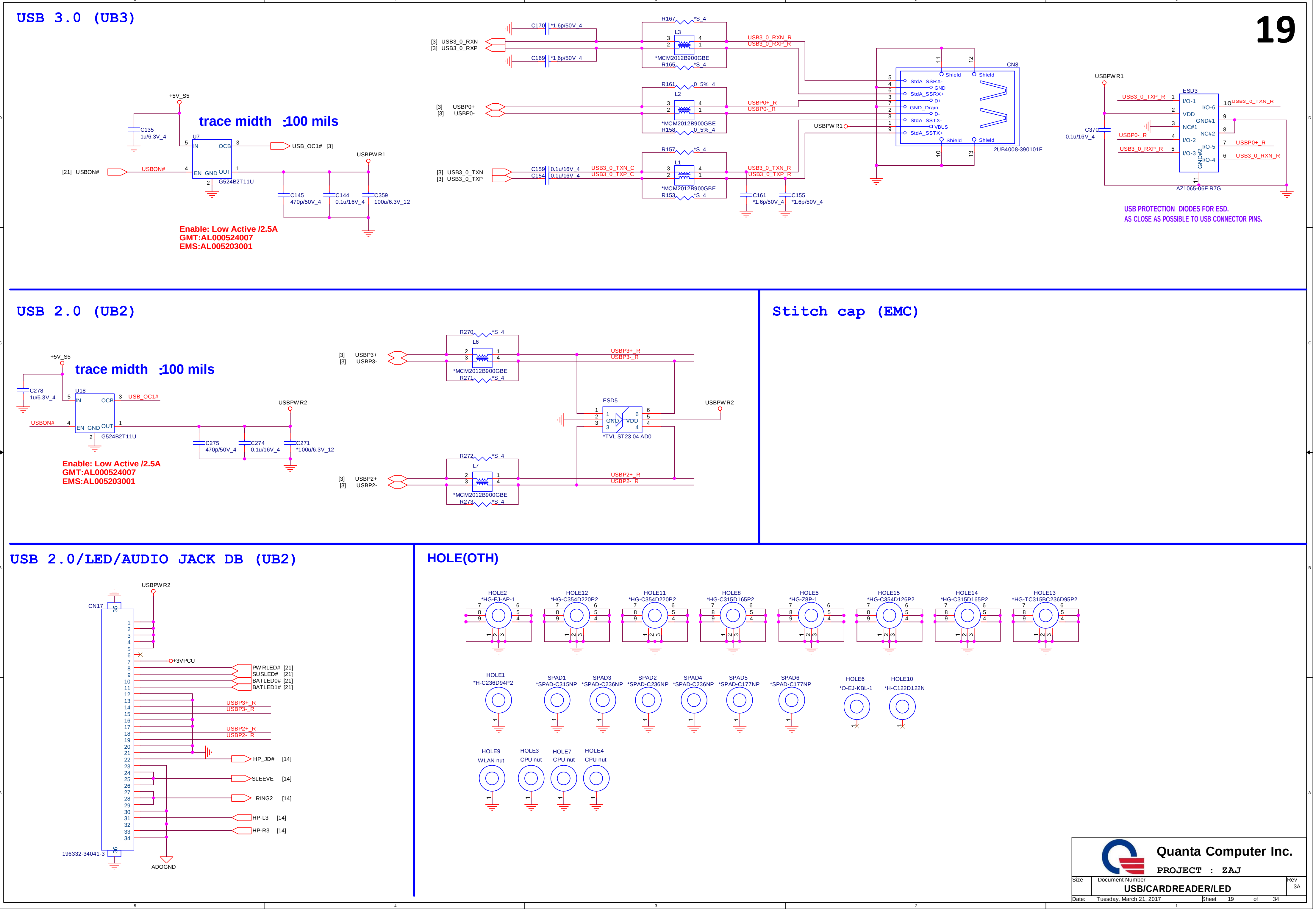
Quanta Computer Inc.	
PROJECT : ZAJ	
Size / Document Number: HDD/ODD/TPM NPCT650/Hole	Rev 3A
Date: Tuesday , March 21, 2017	Sheet 16 of 34

NGFF_M.2 WiFi & BT (NGF)



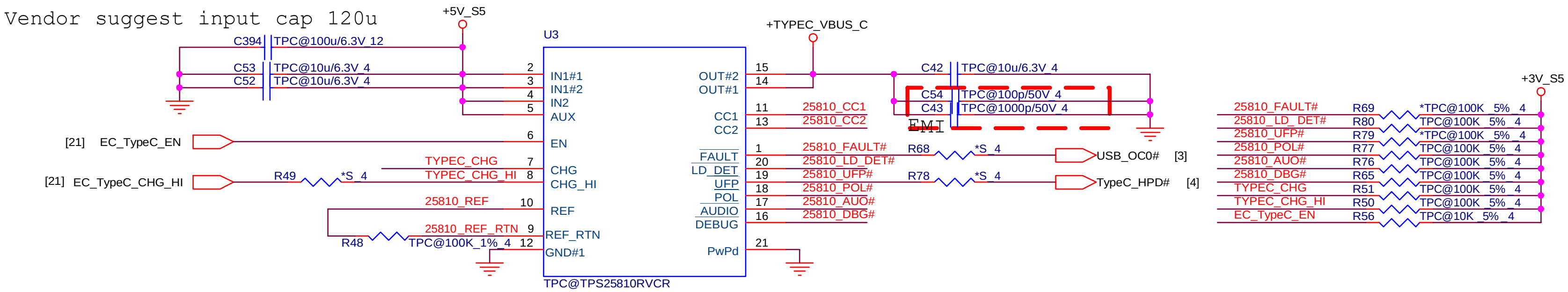
Quanta Computer Inc.		
PROJECT : ZAJ		
Size	Document Number: NGFF WiFi & BT	Rev 3A
Date: Tuesday, March 21, 2017	Sheet 17 of 34	


18
KEYBOARD (KBC)
CN14
MX0 MX1 MX2 MX3 MX4 MX5 MX6 MX7 [21]
MY17 MY16 MY15 MY14 MY13 MY12 MY11 MY10 MY9 MY8 MY7 MY6 MY5 MY4 MY3 MY2 MY1 MY0 [21]
50584-0280N-V02
R253 33_5%_4
NBSWON# [21]
C258 180p/50V_4
Prevent ESD/EOS Layout near connector
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.
+3V_S5
R263 *S_4
C266 0.1u/16V_4
C270 0.22u/10V_4
C269 0.1u/16V_4
R258 10K_5%_4
R259 10K_5%_4
10 mils
+TPVDD
CN15
[21] TPCLK
[21] TPDATA
I2C4_SDA_C
I2C4_SCL_C
D28 *AZ5725-01F.R7G
D27 *AZ5725-01F.R7G
[21] TPD_INT#
[21] TPD_EN
51653-0080N-001
ESD4
*TVL ST23 04 AD0
Touch PAD level shift I2C(TPD)
+1.8V_S5
R268 2K_1%_4
R264 2K_1%_4
Q21A
Q21B
SSM6N43FU
[5] I2C4_SCL
[5] I2C4_SDA
R267 10K_5%_4
R261 10K_5%_4
[5] PCH_TPD_INT#
Q20B
Q20A
2N7002KDW
CPU THERMAL SENSOR(THM)
+3V
C352 CB@0.01u/50V_4
U23
+Vs
SMBDATA
SMBCLK
ALERT#
GND
CB@G753T11U
[21] 2ND_MBDATA
[21] 2ND_MBCLK
TP39
CPU FAN (THM)
+5V
R222 EJ@1K_1%_4
R229 EJ@10K_5%_4
R223 EJ@10K_5%_4
R230 *S_4
20mil
+5V_FAN1
[21] FAN1_RPM
FAN_PWM_Q
[21] FAN_PWM
Q16 EJ@METR3904-G
CN10
EJ@50278-00401-V01
C218 *EJ@220p/50V_4
C216 *EJ@220p/50V_4
For EMI
Keyboard backlight (KBL)
R266 KBL@10K_5%_4
Q22 KBL@PJA3413
C265 KBL@2.2u/10V_4
Q23 KBL@DDTC144EUA-7-F
[21] KB_BL_LED
20mil
+5V_KB
C273 KBL@4.7u/6.3V_4
C279 KBL@0.01u/50V_4
CN18
KBL@50591-00401-001
G-sensor(ACS)
R231 GS@10K_5%_4
[5] ACCEL_INTA
ACCEL_INT1
C242 *GS@22p/50V_4
Q19B
Q19A
GS@2N7002KDW
to CPU
to SATA HDD
C280 GS@0.1u/16V_4
C277 GS@10u/6.3V_4
U17
Vdd_IO
VDD
NC#1
NC#2
INT1
INT2
RES
ADC2
SDO/SA0
SDA/SDI/SDO
SCL/SPC
CS
GND#1
GND#2
ADC3
ADC1
GS@LIS3DHTR
D7 GS@RB500V-40
D8 GS@RB500V-40
ACCEL_INT1_R
ACCEL_INT2_R
[16] ACCEL_INT2
[6] CLK_SDATA
[6] CLK_SCLK
Quanta Computer Inc.
PROJECT : ZAJ
Size
Document Number
KB/TP/FAN/G-sensor
Rev
3A
Date: Tuesday, March 21, 2017
Sheet 18 of 34


USB 3.0 (UB3)
trace midth :100 mils
+5V_S5
C135
1u/6.3V_4
U7
IN
OCB
EN GND OUT
G524B2T11U
USB_OC1# [3]
[21] USBON#
USBON#
USBPWR1
C145
470p/50V_4
C144
0.1u/16V_4
C359
100u/6.3V_12
Enable: Low Active /2.5A
GMT:AL000524007
EMS:AL005203001
[3] USB3_0_RXN
[3] USB3_0_RXP
C170 *1.6p/50V_4
C169 *1.6p/50V_4
R167 *S_4
L3
*MCM2012B900GBE
R165 *S_4
USB3_0_RXN_R
USB3_0_RXP_R
[3] USBP0+
[3] USBP0-
R161 0_5%_4
L2
*MCM2012B900GBE
R158 0_5%_4
USBP0+_R
USBP0-_R
USBPWR1
[3] USB3_0_TXN
[3] USB3_0_TXP
C159 0.1u/16V_4
C154 0.1u/16V_4
USB3_0_TXN_C
USB3_0_TXP_C
R157 *S_4
L1
*MCM2012B900GBE
R153 *S_4
USB3_0_TXN_R
USB3_0_TXP_R
C161
*1.6p/50V_4
C155
*1.6p/50V_4
CN8
Shield
StdA_SSRX-
GND
StdA_SSRX+
D+
GND_Drain
D-
StdA_SSTX-
VBUS
StdA_SSTX+
2UB4008-390101F
USBPWR1
ESD3
USB3_0_TXP_R
I/O-1
I/O-6
USB3_0_TXN_R
VDD
GND#1
NC#1
NC#2
C370
0.1u/16V_4
USBP0-_R
I/O-2
I/O-5
USBP0+_R
USB3_0_RXP_R
I/O-3
GND#2
I/O-4
USB3_0_RXN_R
AZ1065-06F.R7G
USB PROTECTION DIODES FOR ESD.
AS CLOSE AS POSSIBLE TO USB CONNECTOR PINS.
USB 2.0 (UB2)
+5V_S5
trace midth :100 mils
C278
1u/6.3V_4
U18
IN
OCB
USB_OC1#
USBON#
EN GND OUT
G524B2T11U
USBPWR2
C275
470p/50V_4
C274
0.1u/16V_4
C271
*100u/6.3V_12
Enable: Low Active /2.5A
GMT:AL000524007
EMS:AL005203001
[3] USBP3+
[3] USBP3-
R270 *S_4
L6
*MCM2012B900GBE
R271 *S_4
USBP3+_R
USBP3-_R
ESD5
GND
VDD
*TVL ST23 04 AD0
USBPWR2
[3] USBP2+
[3] USBP2-
R272 *S_4
L7
*MCM2012B900GBE
R273 *S_4
USBP2+_R
USBP2-_R
Stitch cap (EMC)
USB 2.0/LED/AUDIO JACK DB (UB2)
USBPWR2
CN17
+3VPCU
PWRLED# [21]
SUSLED# [21]
BATLED0# [21]
BATLED1# [21]
USBP3+_R
USBP3-_R
USBP2+_R
USBP2-_R
HP_JD# [14]
SLEEVE [14]
RING2 [14]
HP-L3 [14]
HP-R3 [14]
196332-34041-3
ADOGND
HOLE(OTH)
HOLE2 *HG-EJ-AP-1
HOLE12 *HG-C354D220P2
HOLE11 *HG-C354D220P2
HOLE8 *HG-C315D165P2
HOLE5 *HG-Z8P-1
HOLE15 *HG-C354D126P2
HOLE14 *HG-C315D165P2
HOLE13 *HG-TC315BC236D95P2
HOLE1 *H-C236D94P2
SPAD1 *SPAD-C315NP
SPAD3 *SPAD-C236NP
SPAD2 *SPAD-C236NP
SPAD4 *SPAD-C236NP
SPAD5 *SPAD-C177NP
SPAD6 *SPAD-C177NP
HOLE6 *O-EJ-KBL-1
HOLE10 *H-C122D122N
HOLE9 WLAN nut
HOLE3 CPU nut
HOLE7 CPU nut
HOLE4 CPU nut
Quanta Computer Inc.
PROJECT : ZAJ
Size
Document Number
USB/CARDREADER/LED
Rev
3A
Date: Tuesday, March 21, 2017
Sheet 19 of 34

USB TYPE-C (UB3)

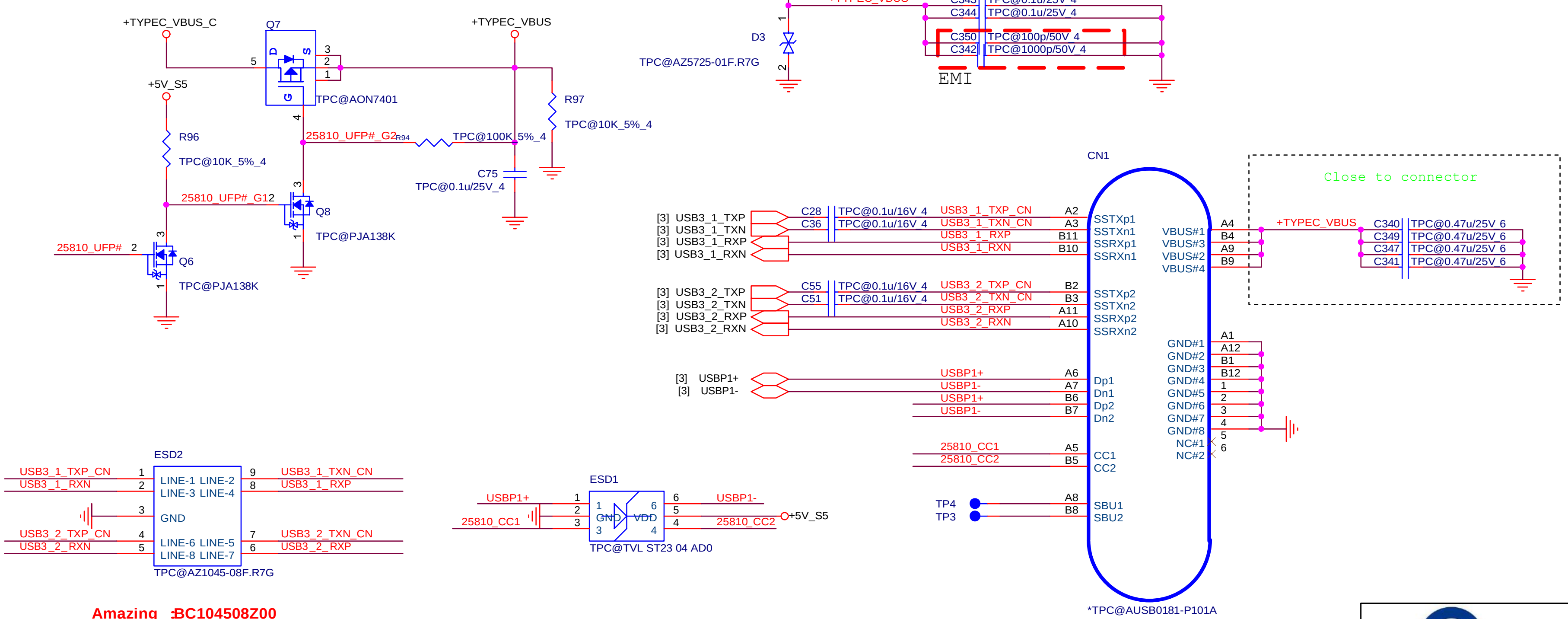
trace midth :150 mils



TPS25810 Port	CC1	CC2	TPS25810 Response					
			OUT	VCONN On CC1 or CC2	POLb	UFPb	AUDIOb	DEBUGb
Nothing Attached	OPEN	OPEN	OPEN	NO	Hi-Z	Hi-Z	Hi-Z	Hi-Z
UFP Connected	Rd	OPEN	IN1	NO	Hi-Z	LOW	Hi-Z	Hi-Z
UFP Connected	OPEN	Rd	IN1	NO	LOW	LOW	Hi-Z	Hi-Z
Powered Cable/No UFP Connected	OPEN	Ra	OPEN	NO	Hi-Z	Hi-Z	Hi-Z	Hi-Z
Powered Cable/No UFP Connected	Ra	OPEN	OPEN	NO	Hi-Z	Hi-Z	Hi-Z	Hi-Z
Powered Cable/UFP Connected	Rd	Ra	IN1	CC2	Hi-Z	LOW	Hi-Z	Hi-Z
Powered Cable/UFP Connected	Ra	Rd	IN1	CC1	LOW	LOW	Hi-Z	Hi-Z
Debug Accessory Connected	Rd	Rd	OPEN	NO	Hi-Z	Hi-Z	Hi-Z	LOW
Audio Adapter Accessory Connected	Ra	Ra	OPEN	NO	Hi-Z	Hi-Z	LOW	Hi-Z

CHG	CHG_HI	CC Capability Broadcast	Current Limit	Load Detect Threshold
0	0	STD	1.67 A	NA
0	1	STD	1.67 A	NA
1	0	1.5 A	1.67 A	NA
1	1	3.0 A	3.34 A	1.77 A

trace midth :150 mils



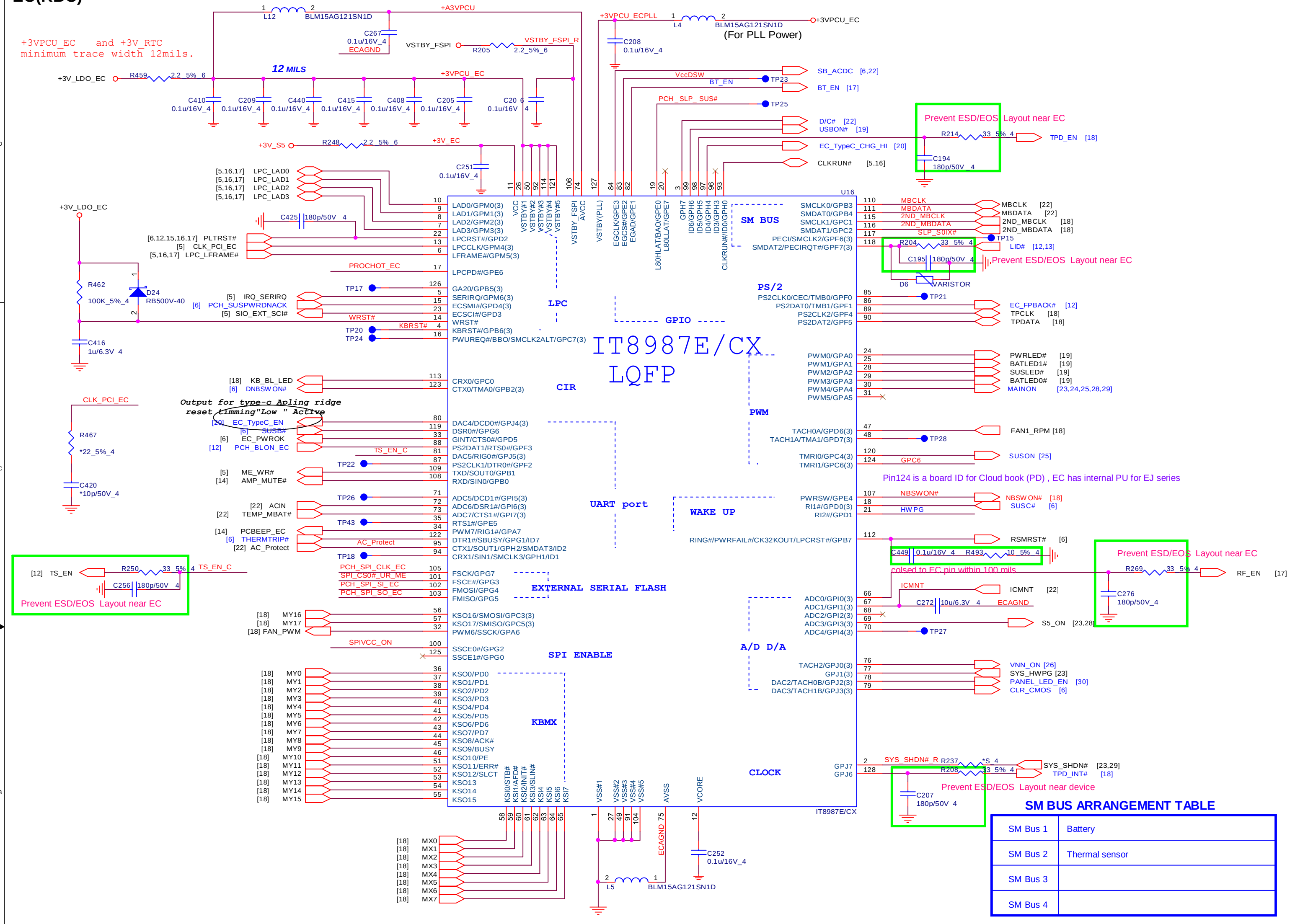
Amazing :BC104508Z00
PJT :BC605S8QZ00
INPAQ :BC38109LZ00

Quanta Computer Inc.

PROJECT :ZAJ

Size	Document Number	Rev
	USB_Type C_25810	3A
Date: Tuesday, March 21, 2017	Sheet 20 of 34	

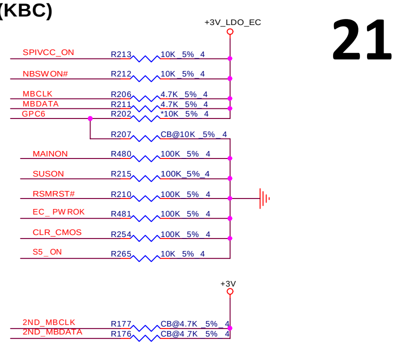
EC(KBC)

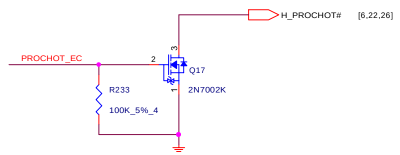


SM BUS ARRANGEMENT TABLE

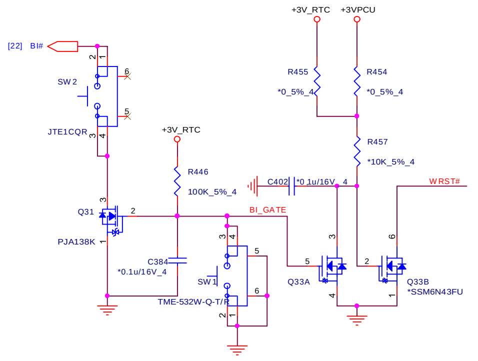
SM Bus 1	Battery
SM Bus 2	Thermal sensor
SM Bus 3	
SM Bus 4	

PU/PD (KBC)



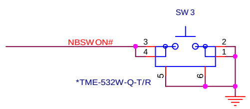


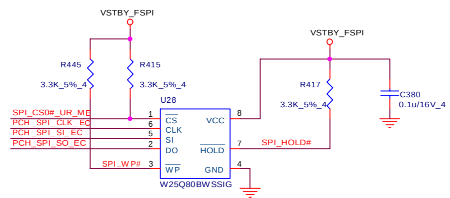
Battery Disable (FSW)



SPI ROM(KBC)

Reserve power on switch for test (MP remove)

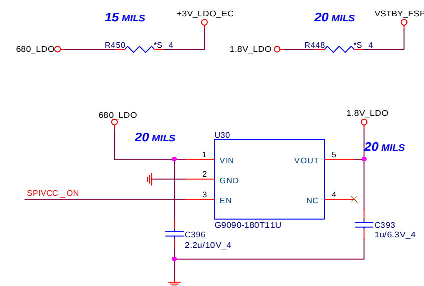




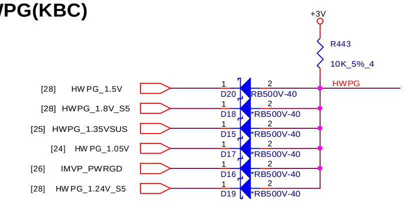
SP@ socket P/N: DFHS08FS023 only for A-TEST

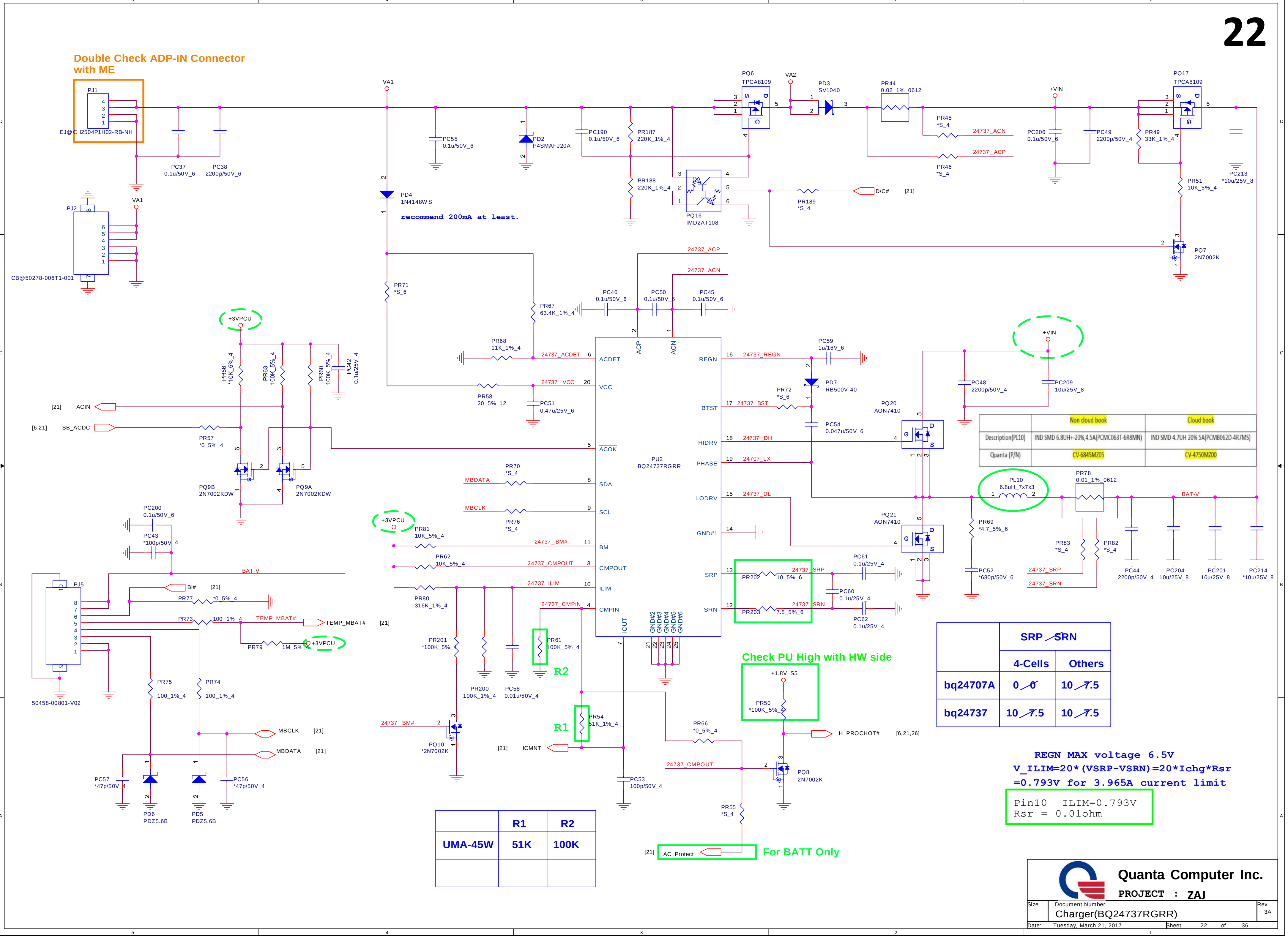
SPI ROM	Vender	Size	Quanta P/N	Vender P/N
1.8V	WND	1M	AKE5GGN0N00	W25Q80EWSSIG
	GGD	1M	AKE5GZN0Q00	GD25LQ80BSIGR

Power_Auto_Recovery



HWPG(KBC)





	Non cloud book	Cloud book
Description(PL10)	IND SMD 6.8UH+-20%,4.5A(PCMC063T-6R8MN)	IND SMD 4.7UH 20% 5A(PCMB062D-4R7MS)
Quanta (P/N)	CV-6845MZ05	CV-4750MZ00

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

	R1	R2
UMA-45W	51K	100K

REGN MAX voltage 6.5V

V_ILIM=20*(VSRP-VSRN)=20*Ichg*Rsr

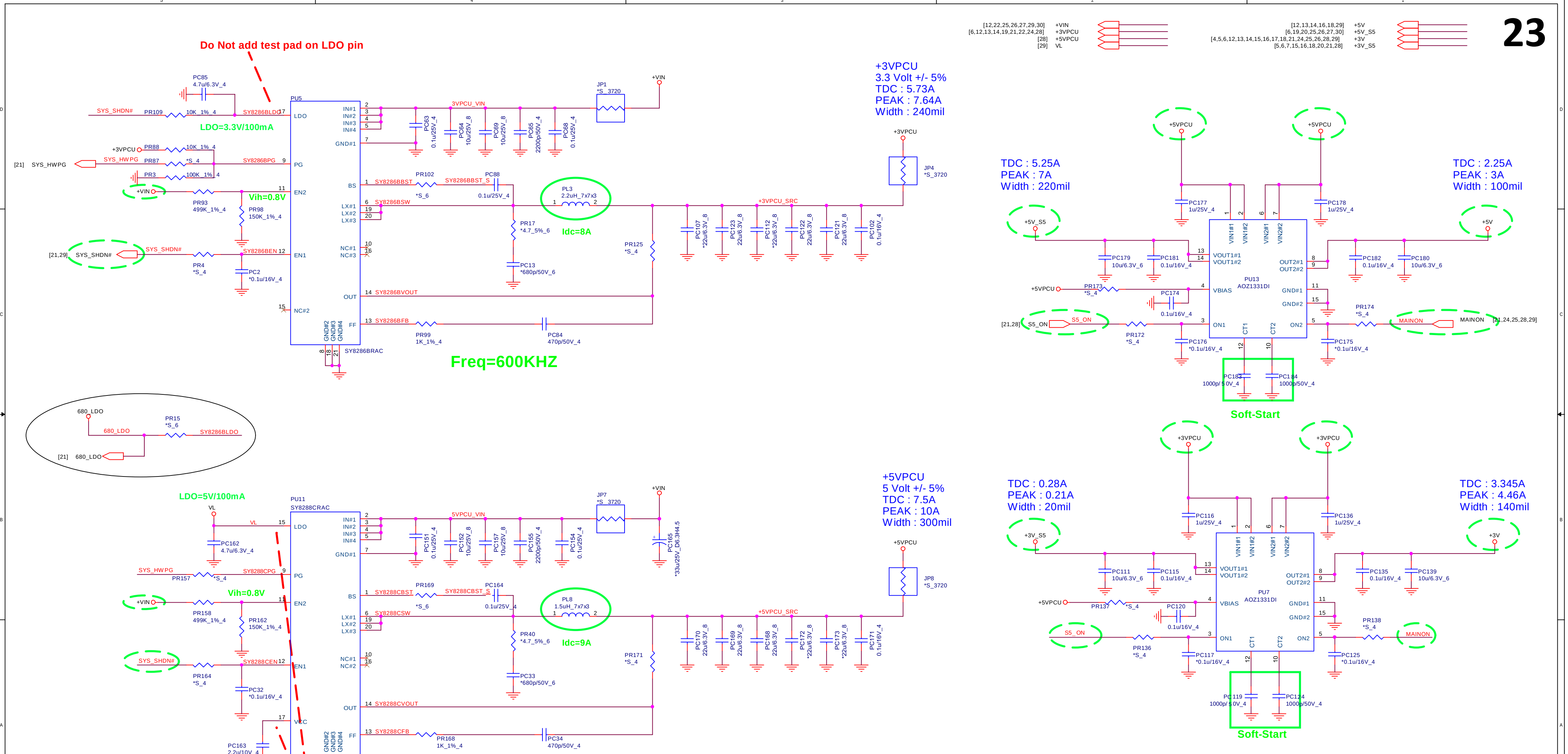
=0.793V for 3.965A current limit

Pin10 ILIM=0.793V
Rsr = 0.01ohm

Quanta Computer Inc.

PROJECT : ZAJ

Size	Document Number	Rev
	Charger(BQ24737RGRR)	3A
Date: Tuesday, March 21, 2017	Sheet 22 of 36	

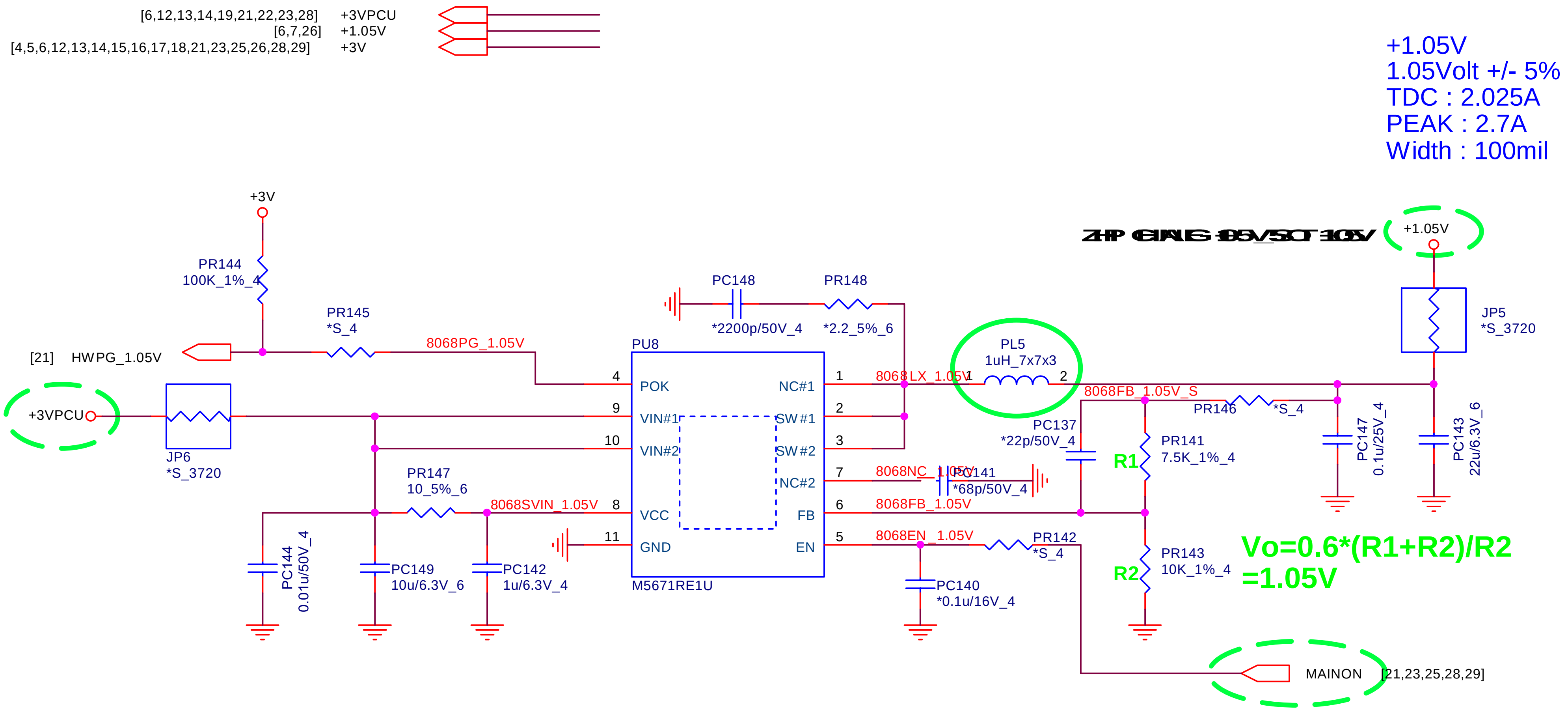


Quanta Computer Inc.

PROJECT : ZAJ

Size	Document Number	Rev
	SYSTEM 5V/3V (NB680 & NB679)	3A

Date: Tuesday, March 21, 2017 Sheet 23 of 34

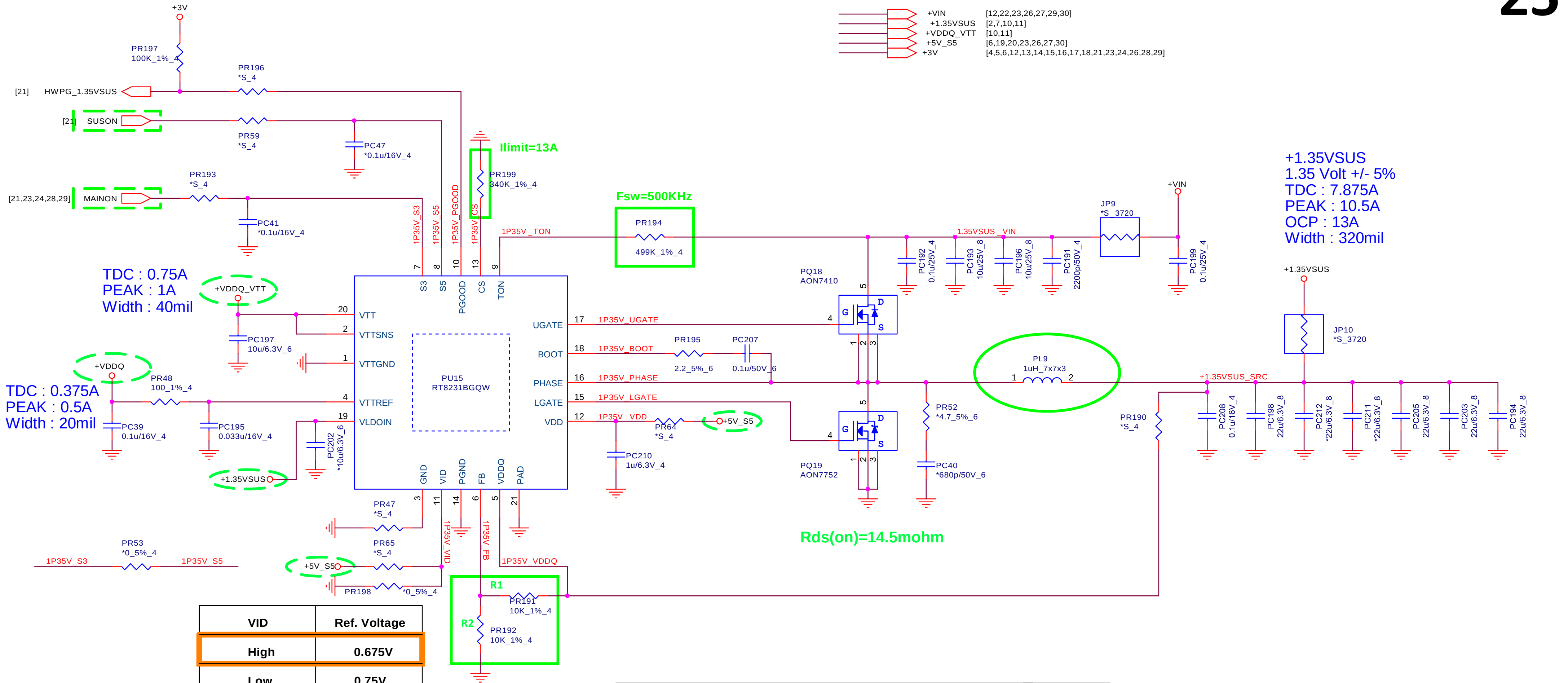


Quanta Computer Inc.

PROJECT :

Size	Document Number	Rev
	+1.05V (M5671RE1U)	3A

Date: Tuesday, March 21, 2017 | Sheet 24 of 34



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

Quanta Computer Inc.
PROJECT :

Size	Document Number	Rev
	DDR3L (RT8231BGQW)	3A

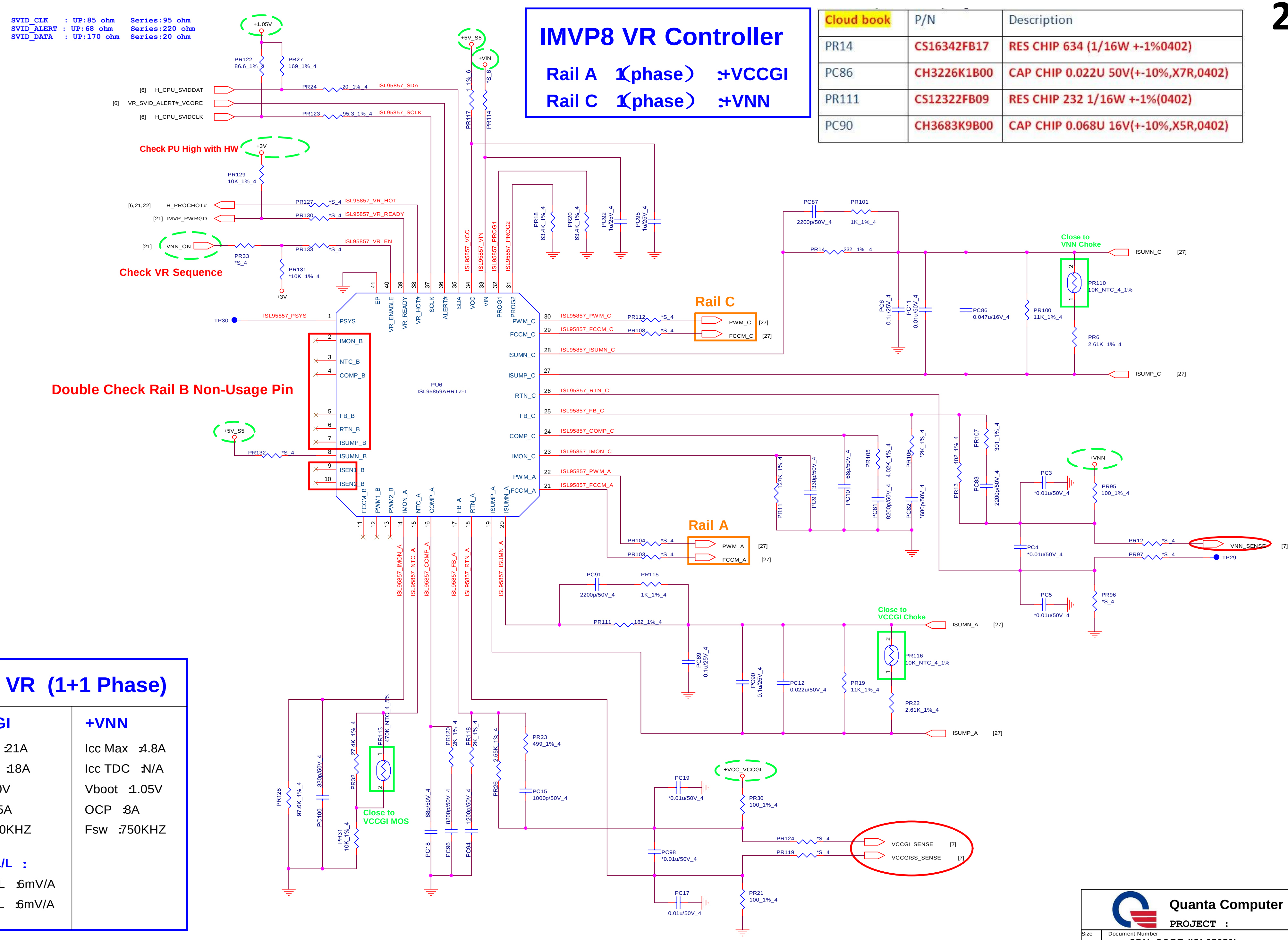
Date: Tuesday , March 21 , 2017 Sheet 25 of 34

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	+VNN
Icc Max :21A	Icc Max :4.8A
Icc TDC :18A	Icc TDC :N/A
Vboot :0V	Vboot :1.05V
OCP :25A	OCP :8A
Fsw :750KHZ	Fsw :750KHZ

VCCGI L/L :

R_DC_LL :6mV/A

R_AC_LL :6mV/A

Quanta Computer Inc.

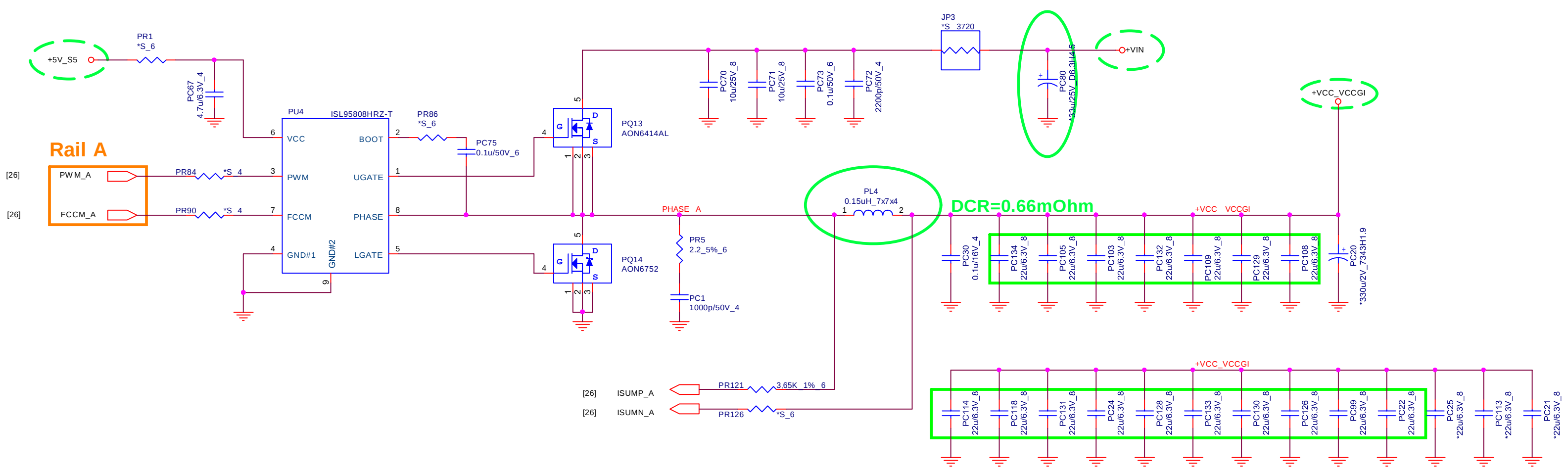
PROJECT :

Size	Document Number	Rev
	CPU_CORE (ISL95859)	3A

Date: Tuesday, March 21, 2017 Sheet 26 of 34

+VIN [12,22,23,25,26,29,30]
+VCC_VCCGI [7,26]
+VNN [7,26]
+5V_S5 [6,19,20,23,25,26,30]

VCCGI



17x22uF for VCCGI

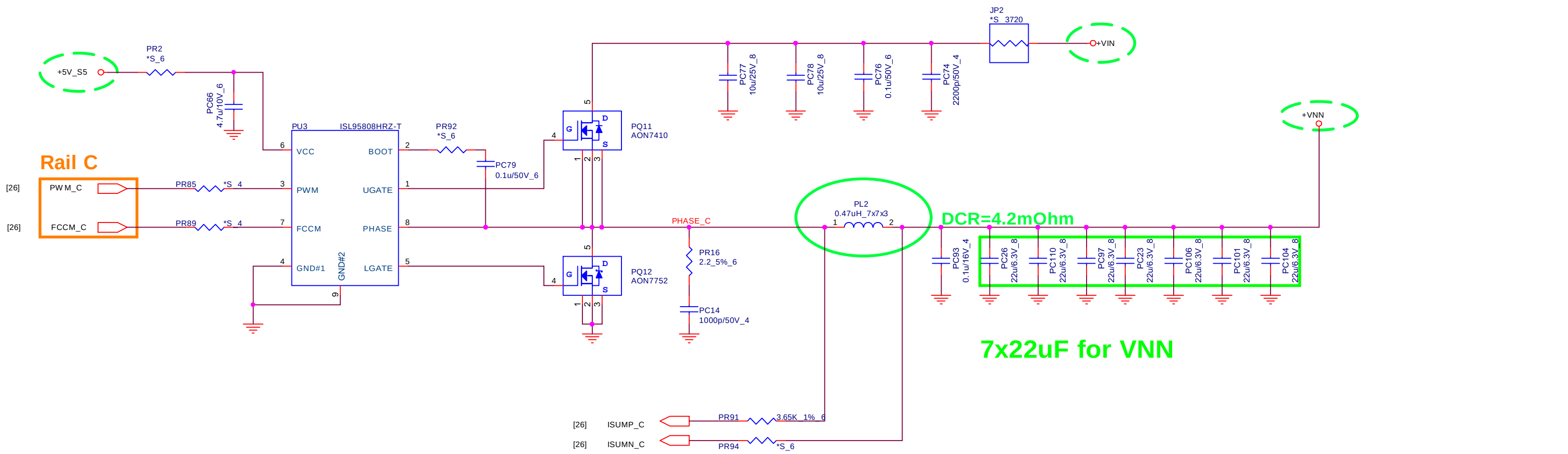
+VCCGI

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

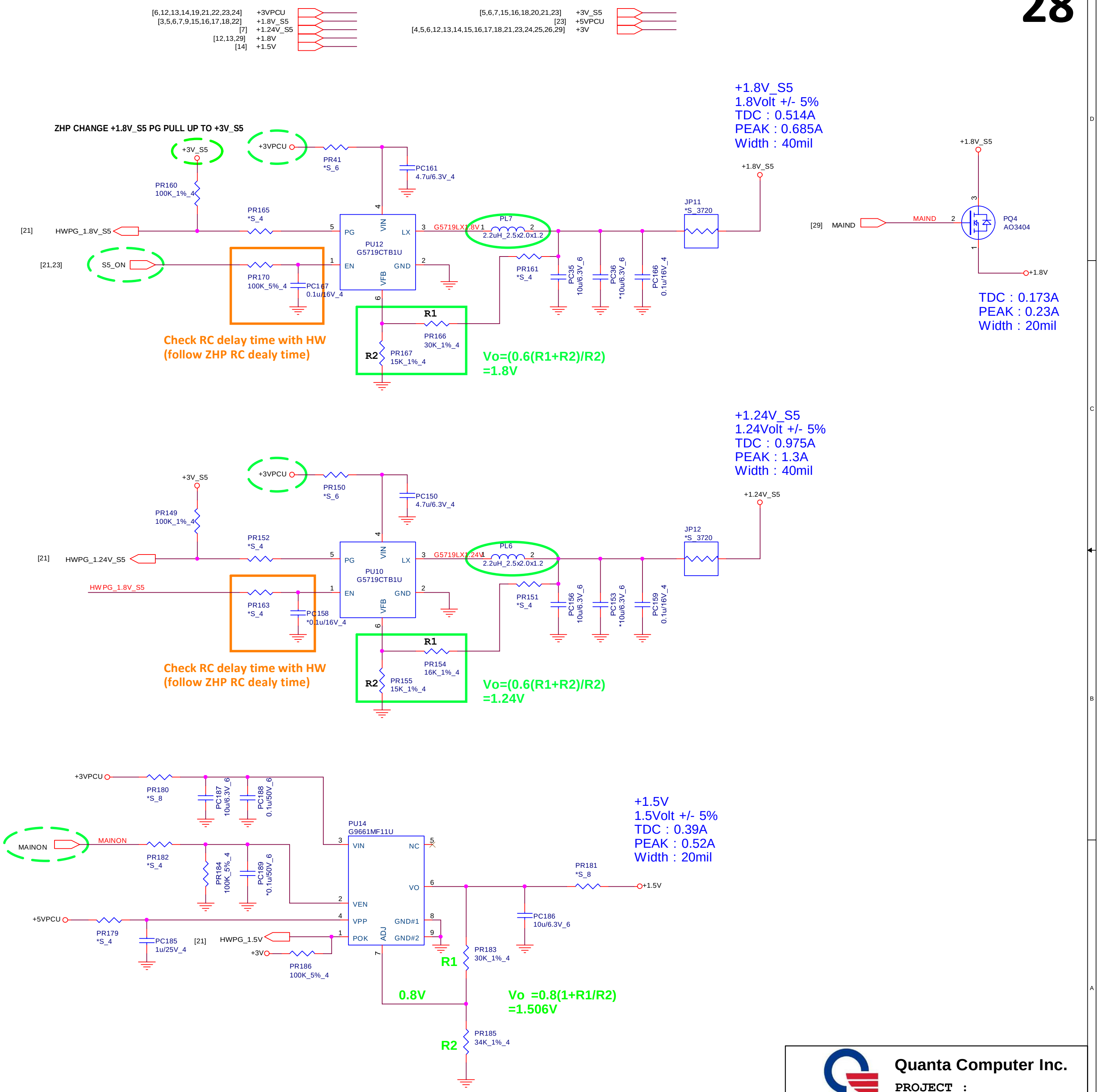
VNN



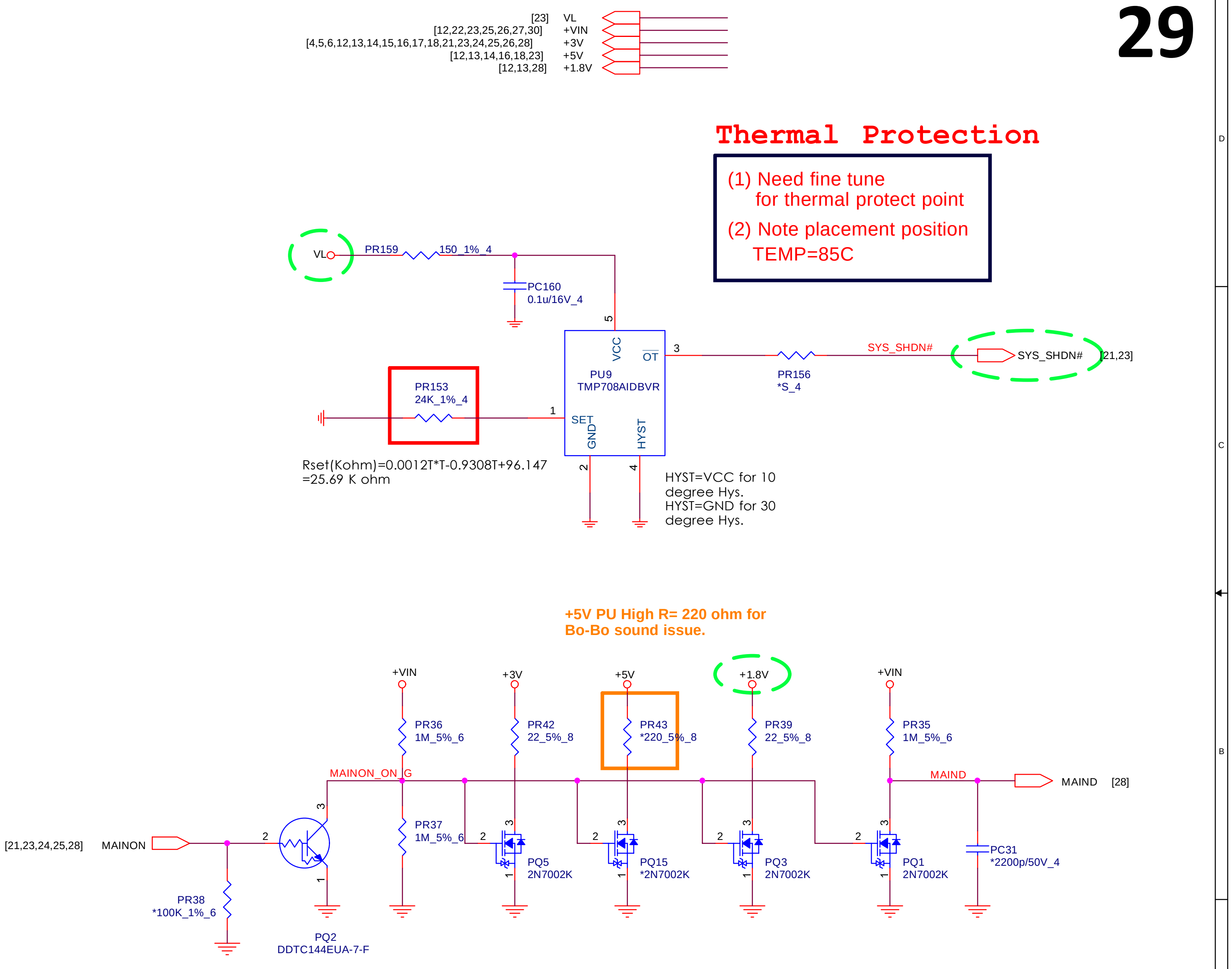
7x22uF for VNN

+VNN

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



Quanta Computer Inc.		
PROJECT :		
Size	Document Number +1.8V_S5 / +1.24V_S5 / +1.5V	Rev 3A
Date: Tuesday, March 21, 2017	Sheet 28 of 34	



Quanta Computer Inc.

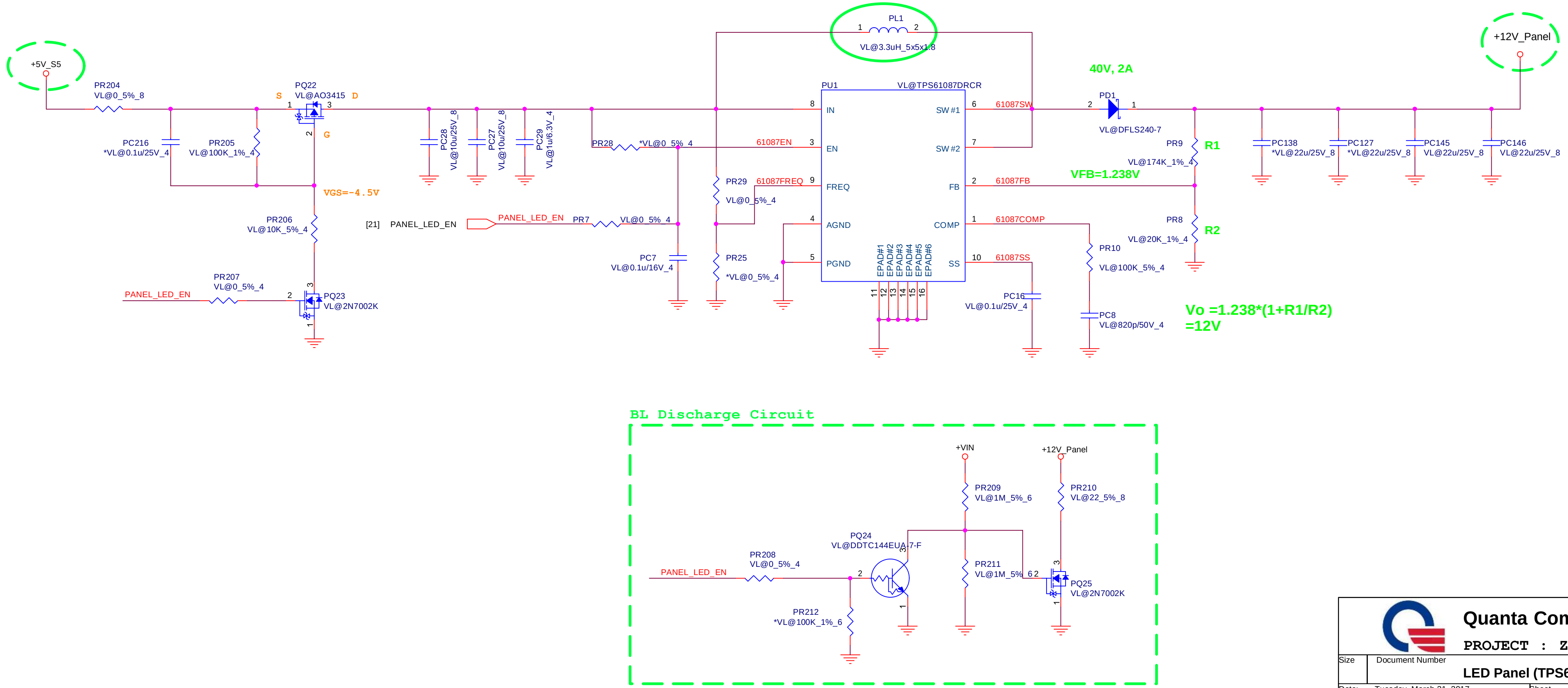
PROJECT :

Size	Document Number	Rev
	Thermal / Discharge	3A

Date: Tuesday, March 21, 2017 Sheet 29 of 34

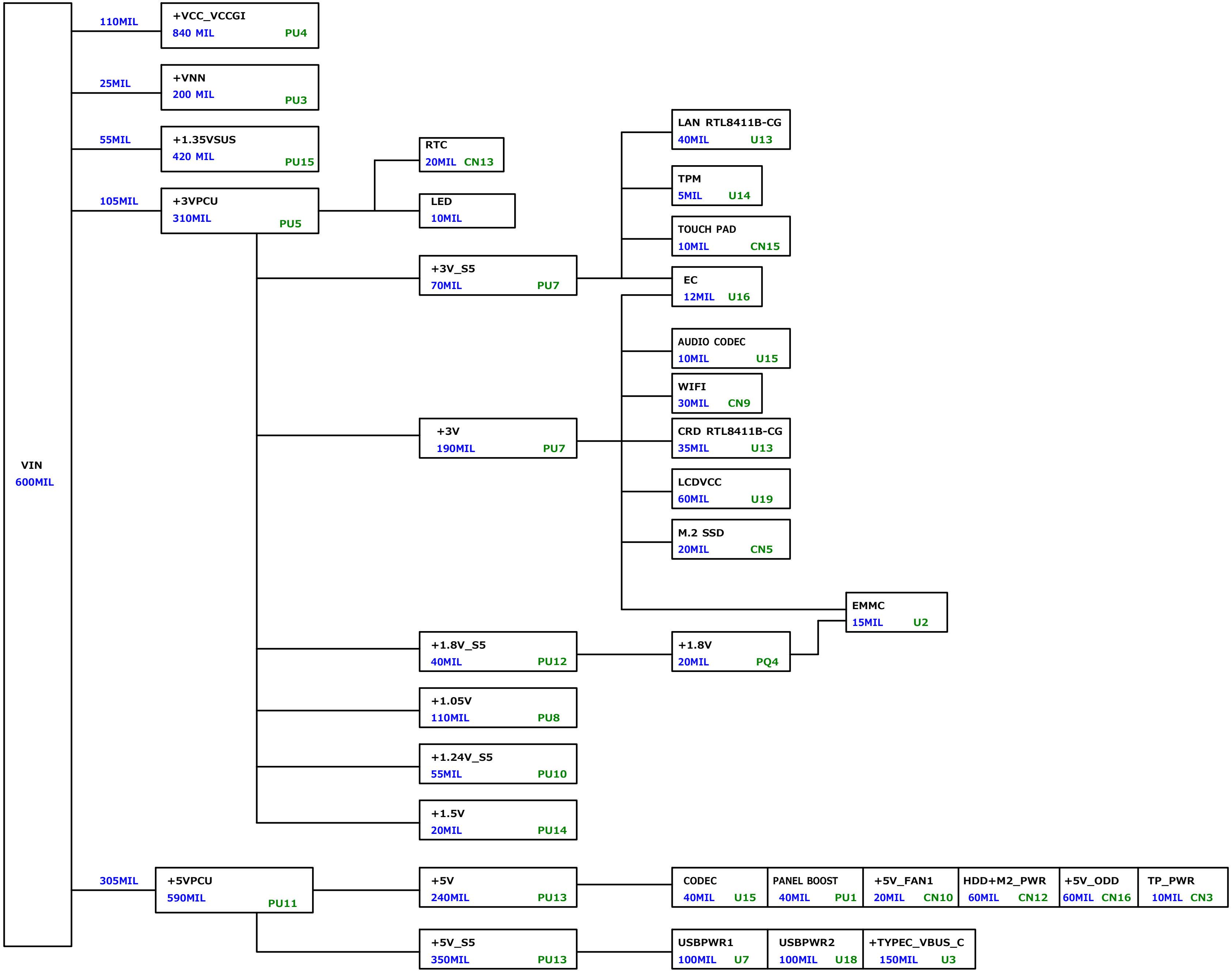
Panel Spec (TFT-LCD 14")
VLED : 6V~21V (Tpy:12V)
Power Consumption : 3W (MAX)

+12V_Panel
12 Volt +/- 5%
PEAK : 0.35A
Width : 20mil



Quanta Computer Inc.		
PROJECT : ZAJ		
Size	Document Number: LED Panel (TPS61087)	Rev 3A
Date: Tuesday, March 21, 2017	Sheet 30 of 34	

Apollo Power Tree

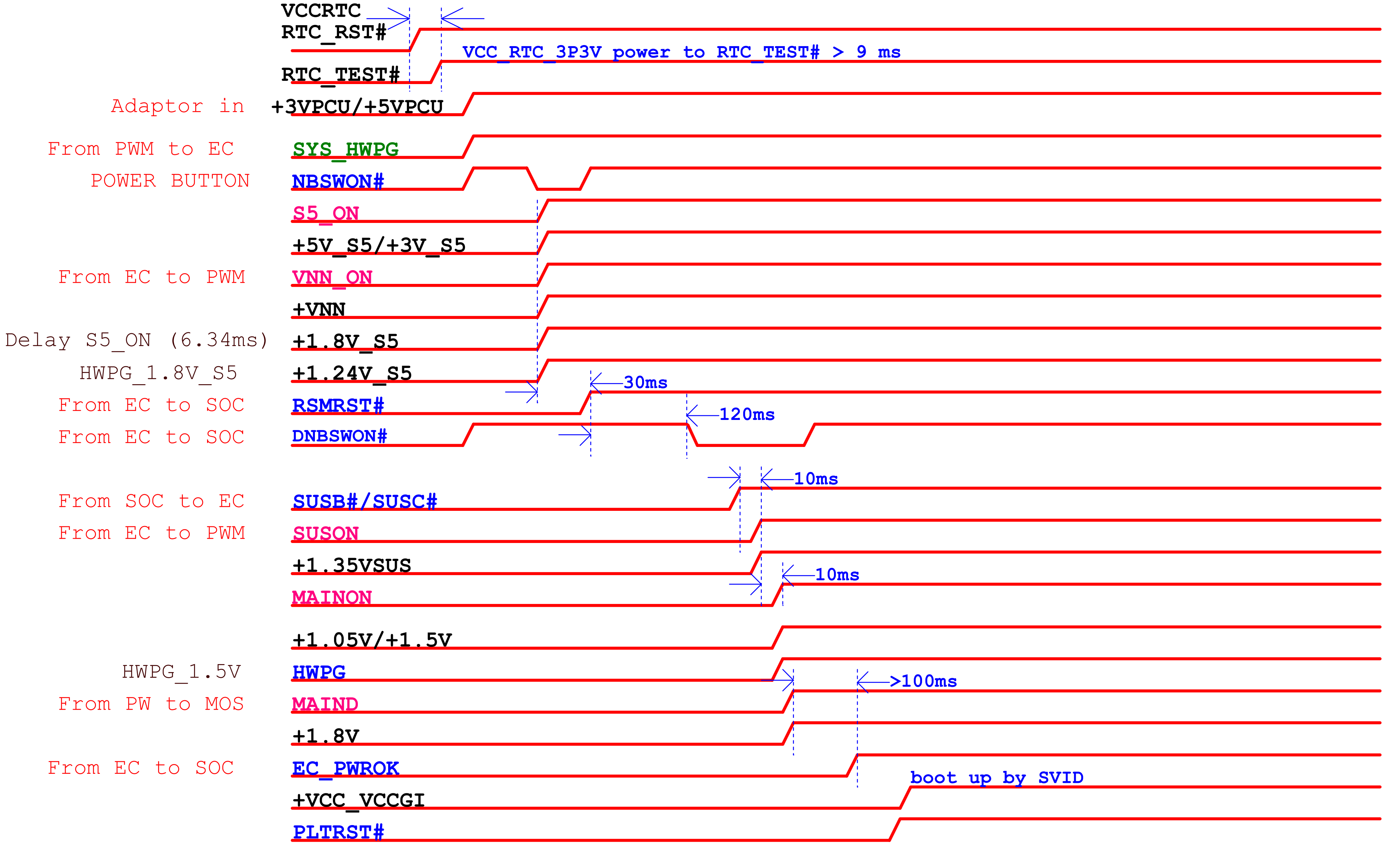


Quanta Computer Inc.
PROJECT : ZAJ

Size	Document Number	Rev
	POWER TREE	3A

Date: Tuesday, March 21, 2017 Sheet 31 of 34

31



Quanta Computer Inc.

PROJECT : ZAJ

Size	Document Number	Rev
	Power on Sequence	3A

Date: Tuesday, March 21, 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.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,R247 2.Un-stuff R380/R464 (debug card circuit)
	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