Page	Title of schematic page	Rev.	Date
01	Page List	1A	
02	Block Diagram	1A	
03	Change List	1A	
04	KBL MCP(DISPLAY/JTAG)	1A	
05	KBL MCP(MEMORY/CHA/CHB)	1A	
06	KBL MCP(CFG/RSVD)	1A	
07	KBL MCP(POWER-1)	1A	
08	KBL MCP(POWER-2)	1A	
09	KBL PCH(RTC/CLK)	1A	
10	KBL PCH(PCIE/USB/SPM)	1A	
11	KBL PCH(HDA/LPC/SPI/SMB)	1A	
12	KBL PCH(GPIO/UART/I2C)	1A	
13	KBL PCH(POWER)	1A	
14	KBL PCH(GND)	1A	
15	DDR4 DIMM0-RVS (4H)	1A	
16	DDR4 DIMM1-STD (4H)	1A	
17	LVDS/NFC	1A	
18	HDMI	1A	
19	HDMI2.0A	1A	
20	HOLE/EMI/KB	1A	
21	EC(IT8528/HX)/FLASH	1A	
22	MB TO USB/B/LED	1A	
23	USB3.0/USB CHARGER	1A	
24	PSW/DMIC/CAMERA/TS	1A	
25	Asmedia_ASM1142	1A	
26	EJ179S(MUX)\EJ898C(PD)	1A	
27	Audio ALC286S	1A	
28	AMP(YDA148)	1A	
29	LAN (RTL8111HS)	1A	
30	WLAN	1A	
31	CR RTS5250S/RTS5227S(SD4/SD3)	1A	
32	HDD/ODD/TP/FAN	1A	
33	SSD M2 CON	1A	
34	POWER +VCCCORE (ISL95859)	1A	
35	POWER +VCCCORE (ISL95859-1)	1A	
36	POWER VCC3&VCC5(RT6575C)	1A	
37	POWER 1.2VSUS/VTT/2.5VSUS	1A	
38	POWER 1.0V_S5/1.8_S5(G5335)	1A	
39	POWER +1.0V_VCCEDRAM / +12V	1A	

Page	Title of schematic page	Rev.	Date
40	POWER CHARGE (BQ24780S)	1A	
41	PWR AD IN/BAT IN/Thermal	1A	
42	PowerMAP	1A	
43	SMBUS	1A	
44	Power Sequence	1A	
45	POWER DIAGRAM_V	1A	

* : No mount
E@ : For GT3 CPU

FFx SKL ULT BLOCK DIAGRAM

Sonata FO SKU is red line
Sonata-L FO and Sonata-L SKU is black line


DDR4-1600 : 1.2V
Dual Channel
P15~P16
DDR SYSTEM MEMORY


PCIE Port 9/10/11/12
PCIE

intel
Kaby Lake U Dual Core processor
15W GT2
28W GT3e

TOUCH SCREEN
USB2_3
P28


HDD SATA0
6Gb/s
P27
SATA Gen3


ODD SATA1
3Gb/s
P27
SATA Gen1


Camera USB2_5
P28


WiMax/BT USB2_4
P24
USB 2.0


PORT4 USB3.0 CON USB3_3 USB2_7


PORT3 USB3.0 CON USB3_2 USB2_6
USB3_1 for L-SKU(BC1.2) USB2_1

PCI-Express Gen2 5GT/s
PCIE6
PCIE5

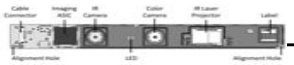

PORT2
With BC1.2
USB3.1 CON U3_B U2D_B

USB3.1 Type C CON
PORT1
C_1
C_2

Asmedia(USB3.1 HOST) ASM1142
QFN64
9x9mm

Erton(MUX) EJ179S
QFN24
4x4mm
U3_A U2D_A

Erton(PD) EJ898C
5Vx2A
CC1/CC2


USB 3.0 USB3_4

BGA1356
(42mm X 24X1.27mm)
P4~P14

HDA
SPI

NFC
P17
I2C

LPC

EC
ITE8528
P20

SMBUS


Touch Pad
P27


Keyboard
P19

Power LED
Status LED
Battery LED
SATA LED
SD Slot LED
NUMLED
CAPSLED
WLAN LED

Button
Power SW
Soft
My Choice
Volume Up SW
Volume Down SW
Display Off SW


eDP
4 Lanes support 4K2K display
P17
USB2_8
For AIT LG Touch screen to LVDS CON

DDI2
HDMI2 converter
PS175

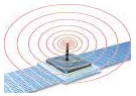
DDI1
4K2K Redriver
PS8201A
P18


P18

5GT/s
PCI-Express Gen2
PCIE1
PCIE3
PCIE4 GEN2

Giga-LAN
RTL8111HS
P23
RJ45


P23


WLAN/BT P24

Card Reader
RTS5227S
RTS5250S P25
Control by BOM

SD-XC
UHS1 or UHS2


Control SD3.0/SD4.0 CONNECTOR by BOM

Azalia
SPI

SPI ROM
8MB P11

SPI ROM
1MB P20

Woofer AMP IC
YDA148 P30
Line out

Audio CODEC
ALC286S-VC1
P26

Combo Jack
SPK BOX
DMIC


P24


P24


P24

YAMAHA Speakers

Change List

FFG_SOLEIL-PP_0419A

Page 12-- assemble R822 to avoid mis-setting of GPIO termination.
Page 21-- Add KC41 and KC42 10P for SMBUS signal.
Page 21-- KR11, KR12 change from 4.7K to 2.2K for SMBUS signal.
Page 41-- PR300, PR301 change from 0 ohm to 15 ohm from PP stage for serge consideration.
Page 41-- PC243, PC244 change from 47P to 10P.
Page 37-- PR367 from 0 ohm to 4.7K. PC286 from un-mount to mount 0.047UF for MCDP2800-BC timing.
Page 26-- Add U45 for VCNN power and Reserved R823 0 ohm and D42 no mount for support new version IC and Drop issue.
Page 21-- KR68 change to 91K for PP ID.

0 ohm to Short Pad: R569, R222, R798, RP22, RP32, RP15, RP16, RP17, RP18, R810, R662, R664, R669, R671, R677, R751, R724, R815, AR184, PR142, PR151, PR357, PR200, PR353, PR372, PR373, PR364, PR378, R792

FFG_SOLEIL-PP_0420A

Page 18-- Un-mount D50 and F24, mount C1014 and U7 for Voltage drop issue.
Page 19-- Un-mount D51 and F25, mount C1012 and U27 for Voltage drop issue.
Page 22-- Change LED resistor R415, R416, R417, R418, R419, R536, R537 to 180 ohm.
Page 20-- Mount ESDC7,ESD10,ESD12,ESD13,ESDC11,ESDC15,ESDC16,ESDC8 for ESD improvement.
Page 15-- Add ESDC17 and ESDC18 0.1uF for ESD improvement.
Page 16-- Add ESDC19 and ESDC20 0.1uF for ESD improvement.

FFG_SOLEIL-PP_0421A

Page 25-- Remove R763, add R831 and Q32 to meet wake event.
Page 19-- HDMI2.0 Change to MegaChips MCDP2800-BC solution
Page 17-- EC52 change to mount for EMI. R793 change from 0 ohm to bead BLM15BB221SN1D for EMI
Page 20-- C417, C419, C421, C424, C426, C428, C430 and C432 add 220pF for EMI

FFG_SOLEIL-PP_0421B

Page 15-- Reserve ESDC21, ESDC22 PCB land for ESD
Page 16-- Reserve ESDC23 PCB land for ESD

FFG_SOLEIL-PP_0425B

Page 19-- Change MCDP2800 power rail and add capacitor
Page 26-- U45 change to G517AL1TB1U for VCONN drop issue.

FFG_SOLEIL-PP_0426A

Page 18-- chenage to PS8201A pin define and description
Page 43-- modify SMBus connection image
Page 19-- modify Assemble mark and correct power rail.
Page 40-- PR240 change to 75ohm. follow intel KBL design guide.
Page 36-- PR133 change to 88.7kohm for fine tune OCP.
Page 34-- PR30 change to I@120kohm, E@115kohm
PR31 change to I@82.5kohm, E@105kohm
PR34 change to I@137kohm, E@113kohm
PR58 change to 34kohm
for meet VRTT test and ICCMAX change
Page 34-- PC39 add 0.01uF for 28W Iout row test.
Page 34-- PR11 change to I@1.91/E@3.32kohm for meet 28W LL test
Page 34-- Add PC288 0.1uF for EMI.

FFG_SOLEIL-PP_0427C

Page 39-- PR377 remove.
Page 18-- Remove D50 and F24 PCB land.
Page 19-- Remove D51 and F25 PCB land.
Page 26-- Remove D42 and R823 PCB land.
Page 19-- Change R644 and R645 to 175@ and un-mount.

FFG_SOLEIL-PP_0428A

Page 34-- PR17 change from short pad to 75 ohm.
Page 28-- Remove LC on L-SKU.

FFG_SOLEIL-PP_0428B

Page 4-- Add R833 75 ohm. Follow PROCHOT# DG topology.

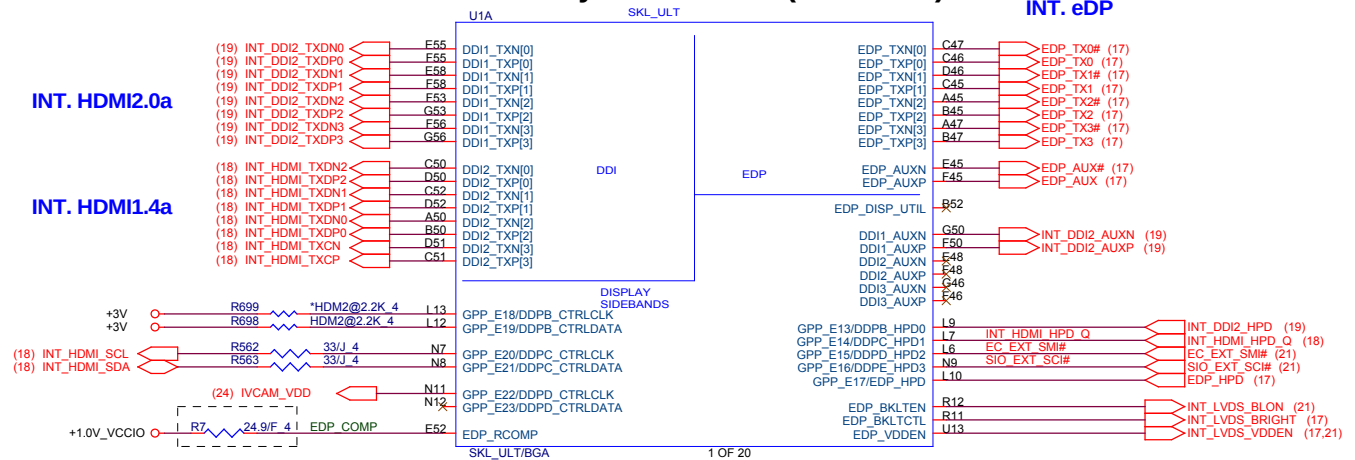
Quanta Computer Inc.
PROJECT : FFG
Size | Document Number | Rev 1A
Change List
Date: Thursday, April 28, 2016 | Sheet 3 of 45

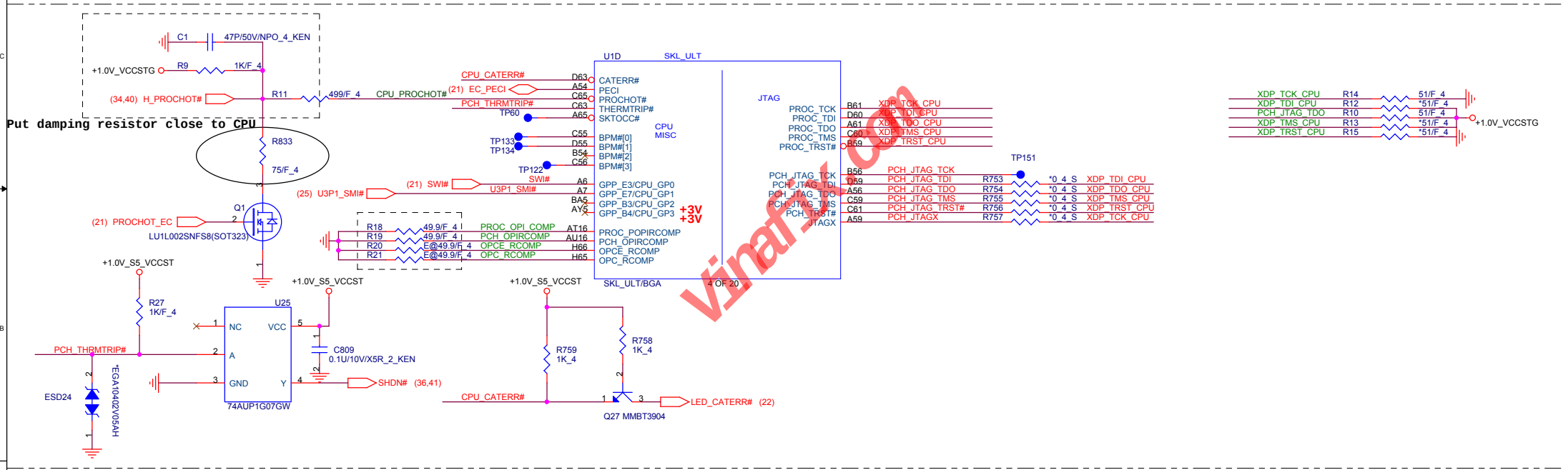
Kaby Lake ULT (DISPLAY)

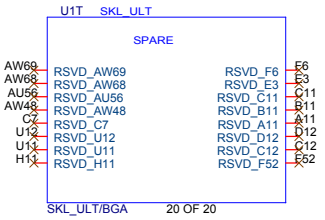
INT. HDMI2.0a

INT. HDMI1.4a

INT. eDP

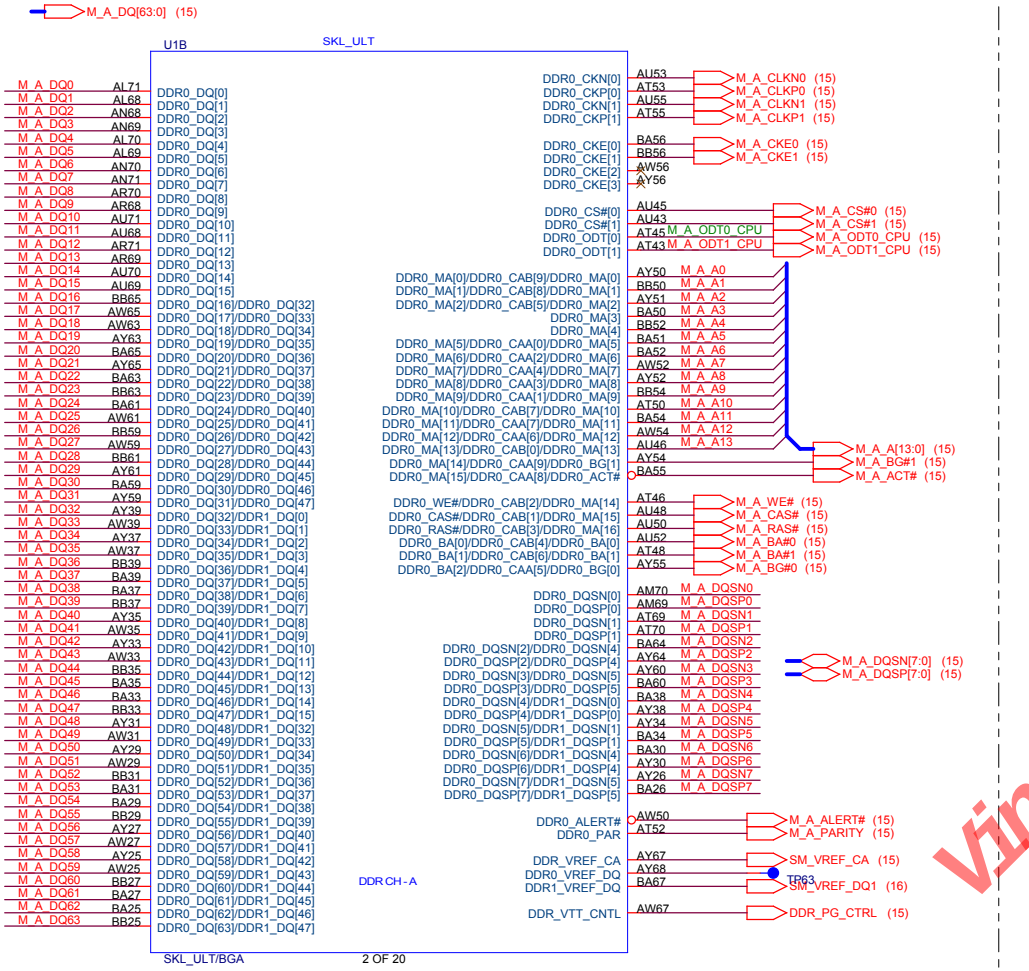




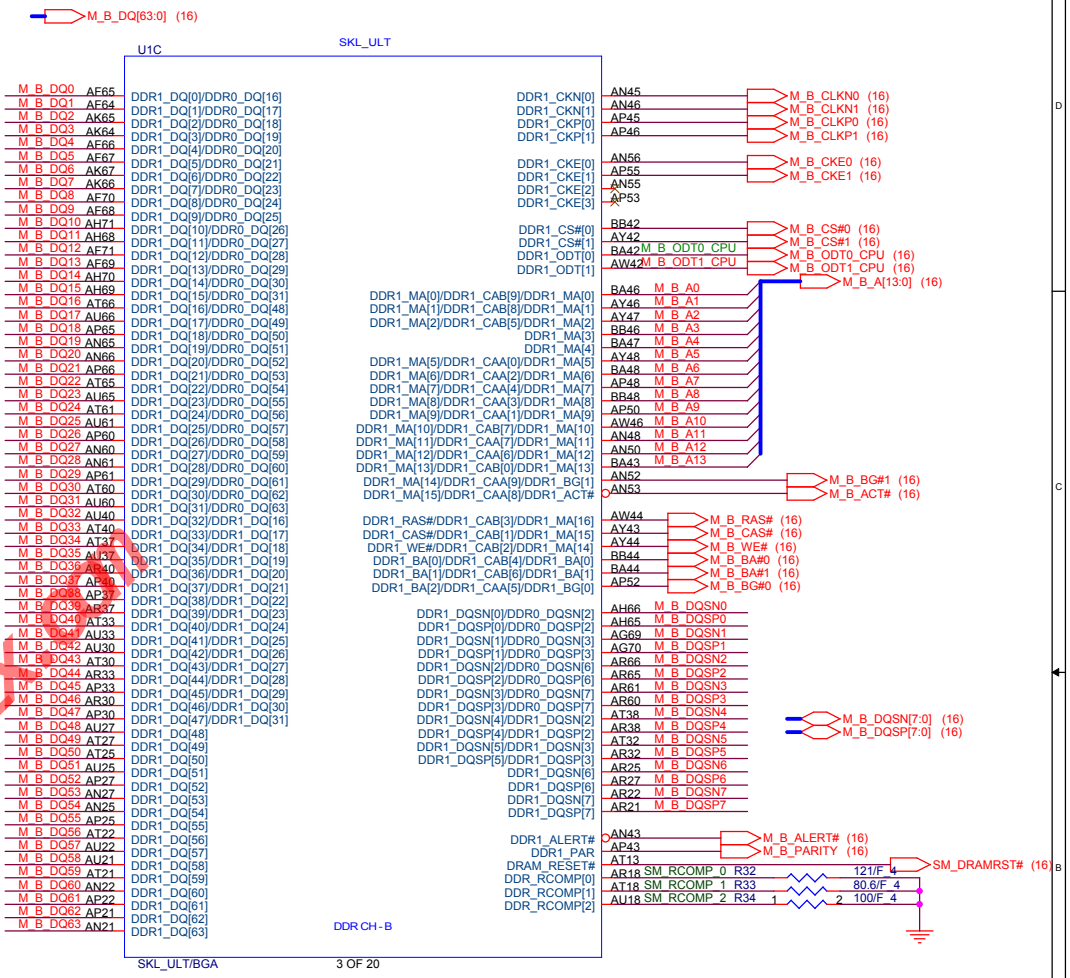


Quanta Computer Inc.		
PROJECT : FFG		
Size	Document Number	Rev
	KBL MCP(Display/eDP)	1A
Date: Thursday, April 28, 2016	Sheet 4 of 45	

Kaby Lake ULT (DDR4)



Kaby Lake ULT (DDR4)

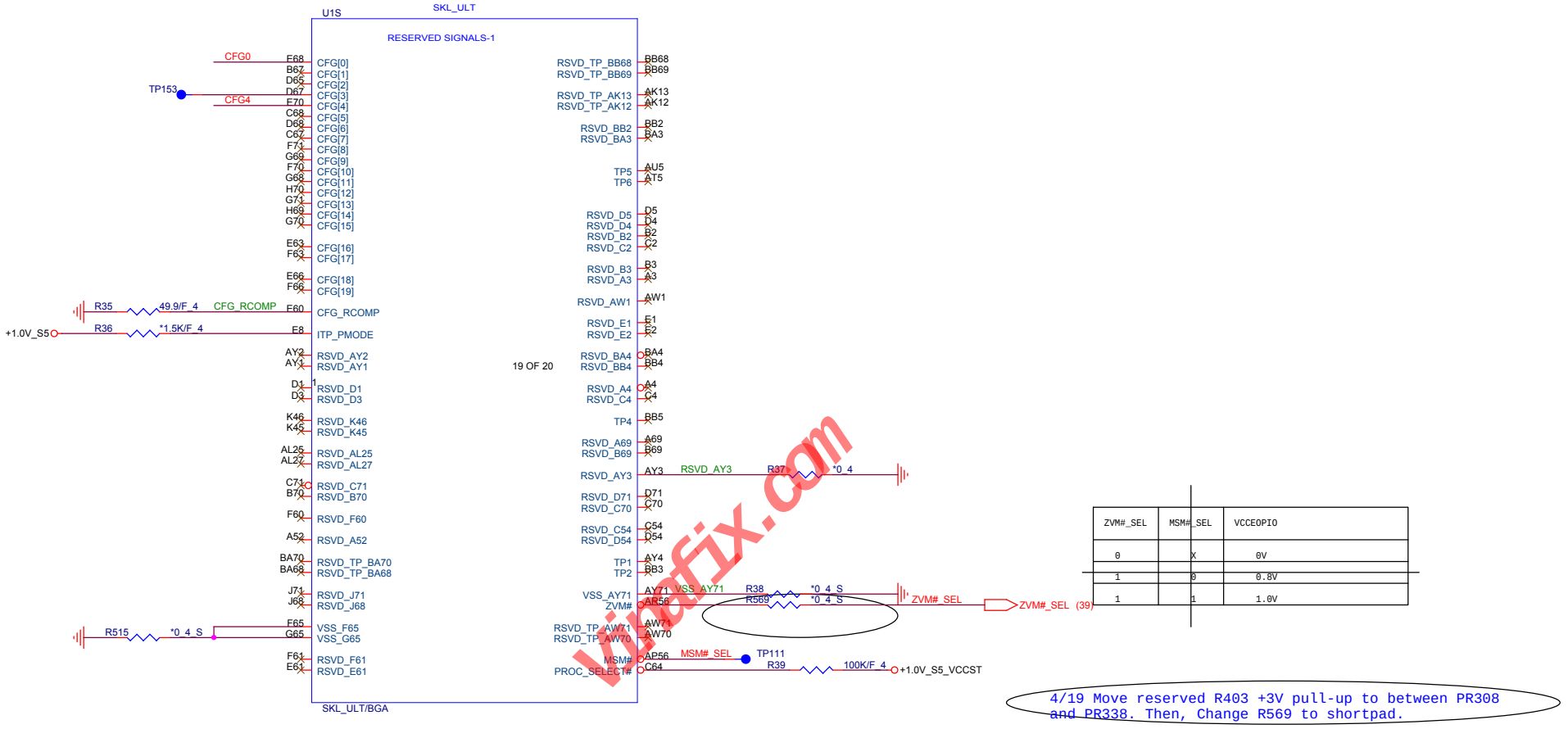


Quanta Computer Inc.

PROJECT : FFG

Size	Document Number	Rev
	KBL MCP(Memory)	1A

Date: Thursday, April 28, 2016 Sheet 5 of 45



ZVM#_SEL	MSM#_SEL	VCCEOPIO
0	X	0V
1	0	0.8V
1	1	1.0V

Processor Strapping

	1	0	
CFG0 EAR-STALL/NOT STALL RESET SEQUENCE AFTER PCU PLL IS LOCKED	(DEFAULT) NORMAL OPERATION; NO STALL	STALL	CFG0 R40 *1K/F_4
CFG4 eDP enable:	DISABLED	ENABLED	CFG4 R41 1K/F_4

Quanta Computer Inc.
PROJECT : FFG

Size	Document Number	Rev
	KBL MCP(CFG)	1A
Date: Thursday, April 28, 2016	Sheet 6 of 45	

Kaby Lake ULT MCP(POWER-1)

SkyLake ULT:22 15W IccMax :28A
23e 15W IccMax: 28A
23e 28W IccMax: 29A

+VCC_GFX : 22 15W IccMax :31A
23e 28W IccMax: 64A

U1L SKL_ULT
CPU POWER 1 OF 4
SKL_ULT/BGA 12 OF 20

U1M SKL_ULT
CPU POWER 2 OF 4
SKL_ULT/BGA 13 OF 20

Backside Cap(TOP side)
Primary Cap(BOT side)

SVID ALERT

close to CPU
+1.0V_S5_VCCST
R54 56_4
C131 1U/6.3V/X5R_2_KEN
H_CPU_SVIDALRT_N
R56 220_4
VR_SVID_ALERT# (34)

SVID DATA

close to CPU
close to VR
+1.0V_S5_VCCST
R60 100/F_4
C132 1U/6.3V/X5R_2_KEN
R61 100/F_4
C133 1U/6.3V/X5R_2_KEN
VR_SVID_DATA_R
R423 *0_4_S
VR_SVID_DATA (34)

SVID CLK

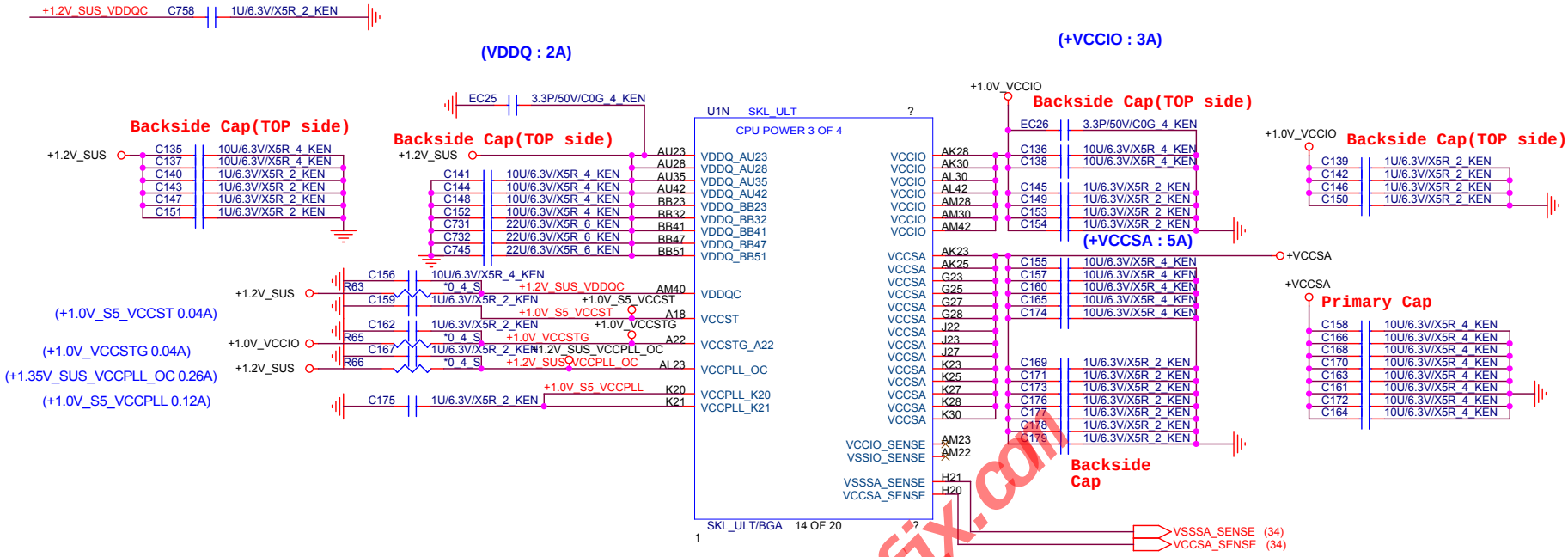
close to CPU
close to VR
+1.0V_S5_VCCST
R471 *54.9_4
R62 45.3_4
C134 1U/6.3V/X5R_2_KEN
VR_SVID_CLK_R
R424 *0_4_S
VR_SVID_CLK
VR_SVID_CLK (34)

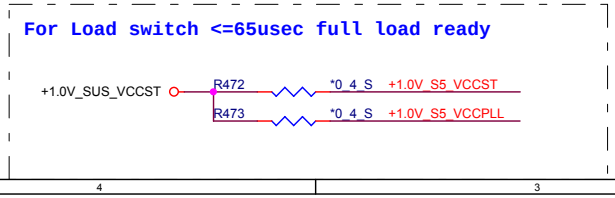
H1 *H-TC394IC197BC197D150P2
H2 *H-TC394IC197BC197D150P2
H3 *H-TC394IC197BC197D150P2
H4 *H-TC394IC197BC197D150P2
*bkt-Hole

Additional components needed when supporting 23e

Quanta Computer Inc.
PROJECT : FFG
Size | Document Number: KBL MCP(Power-1) | Rev 1A
Date: Thursday, April 28, 2016 Sheet 7 of 45

SkyLake ULT MCP(POWER-2)





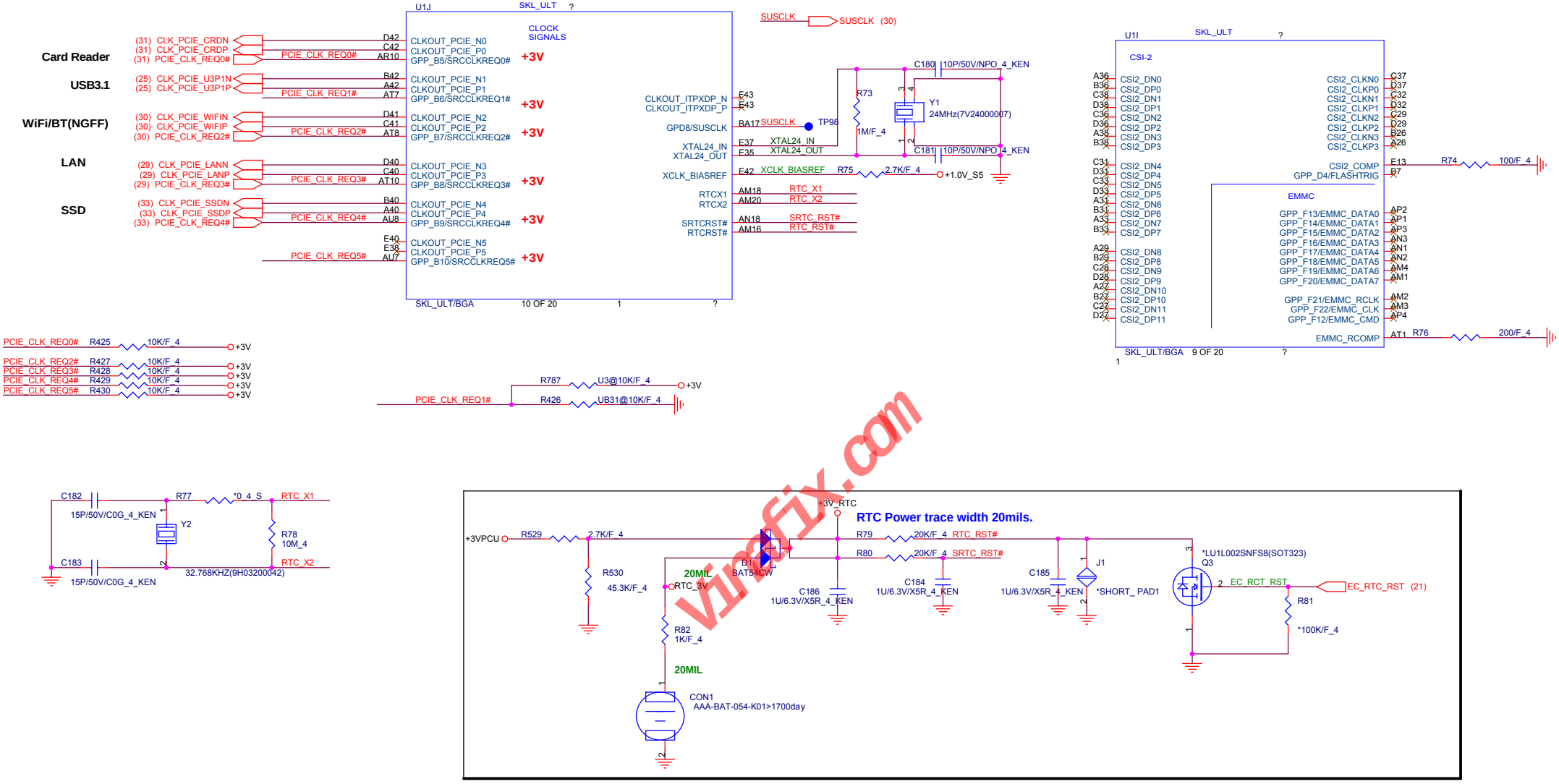
Quanta Computer Inc.

PROJECT : FFG

Size	Document Number	Rev
	KBL PCH(Power-2)	1A

Date: Thursday, April 28, 2016 Sheet 8 of 45

SkyLake ULT (RTC/CLK)

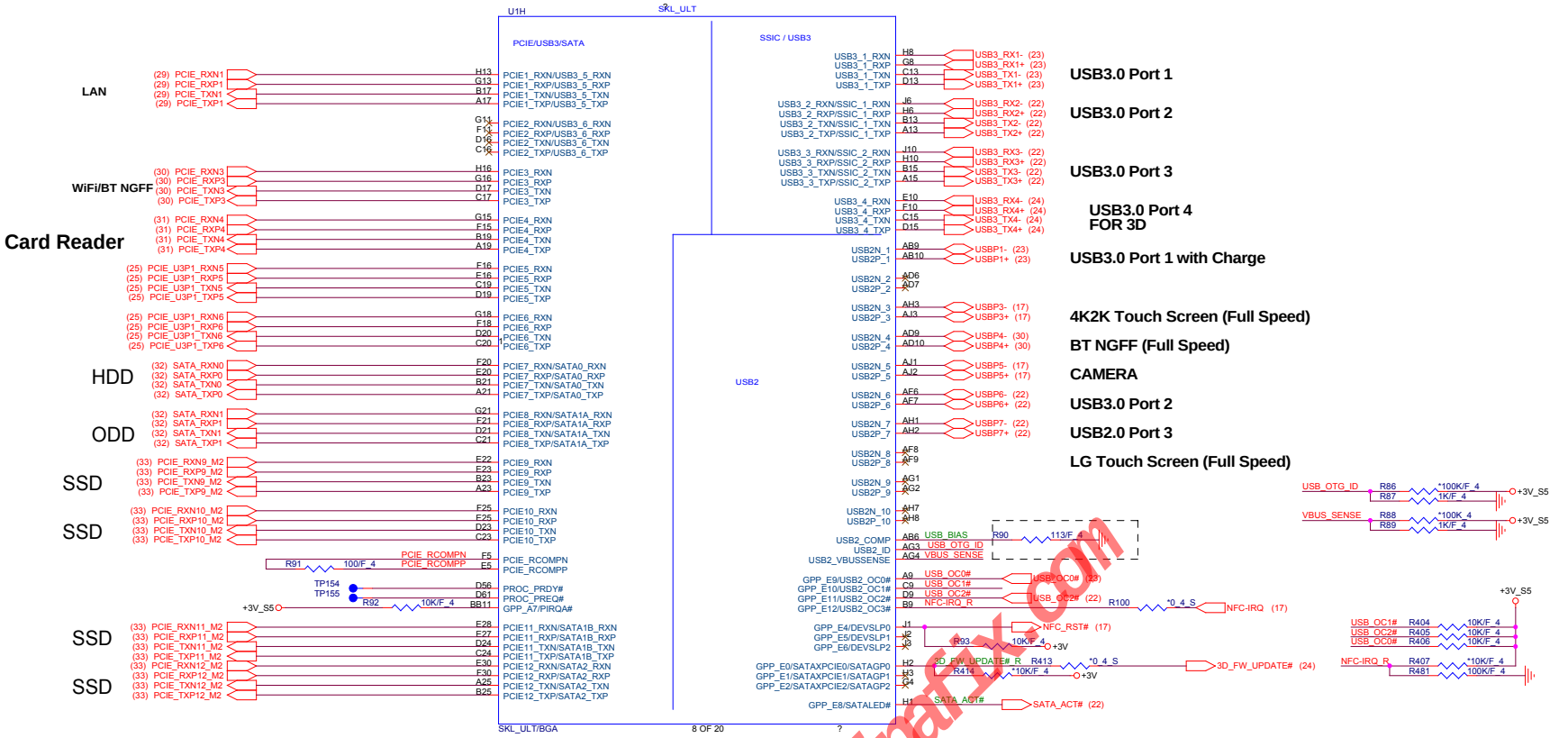


PCH Strap Table

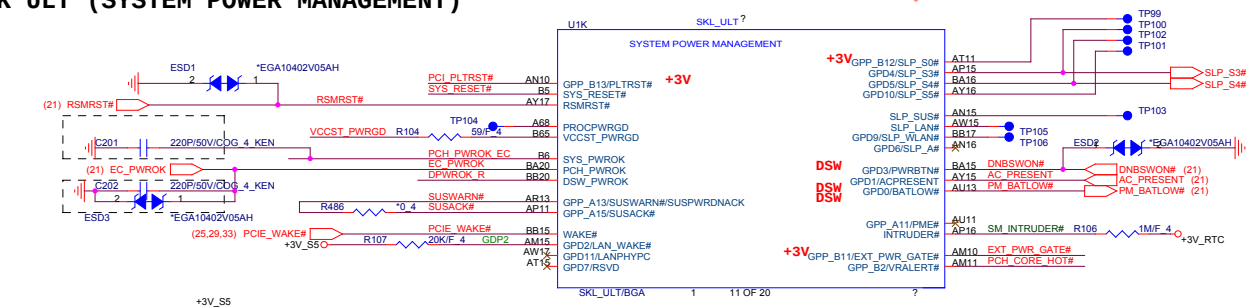
Pin Name	Strap description	Sampled	Configuration	note
HDA_SDO	Flash Descriptor Security Override / Intel ME Debug Mode	PWROK	0 = Security Effect (Int PD) 1 = Can be Override	+3V_S5 R84 *1K/F_4 ACZ_SDOUT_R ACZ_SDOUT_R (11,21)

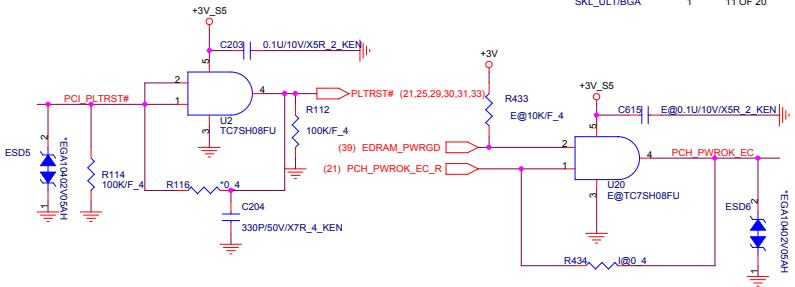
Quanta Computer Inc.			
PROJECT : FFG			
Size	Document Number		Rev
	KBL PCH(RTC/CLK)		1A
Date: Thursday, April 28, 2016	Sheet 9	of	45

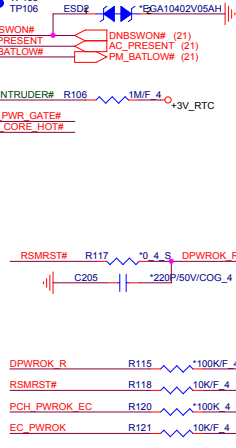
SkyLake ULT (PCIE,USB)



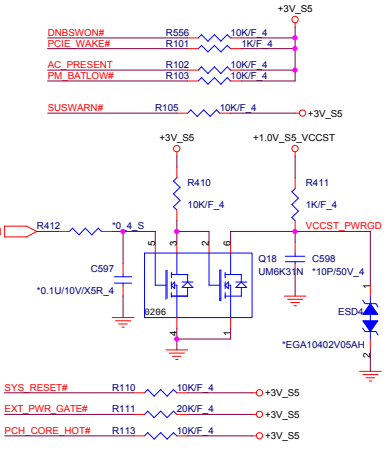
SLK ULT (SYSTEM POWER MANAGEMENT)

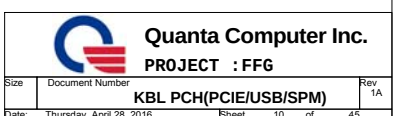






PCH Pull-high/low(CLG)





Quanta Computer Inc.

PROJECT : FFG

Size	Document Number	Rev
	KBL PCH(PCIE/USB/SPM)	1A
Date: Thursday, April 28, 2016	Sheet 10 of 45	

SkyLake ULT (HDA/SDXC)

GPPC5: ESPI or LPC SEL
HIGH: ESPI interface
LOW: LPC interface(default)INT DN

Put damping resistor close to CPU

U1G SKL_ULT

AUDIO

(27) ACZ_SYNC — R122 33_4 — HDA_SYNC_C — BA22 HDA_SYNC/I2S0_SFRM
(27) ACZ_BITCLK — R123 33_4 — HDA_BITCLK_C — AY22 HDA_BLK/I2S0_SCLK
(9,21) ACZ_SDOUT_R — R124 33_4 — ACZ_SDOUT_R — BB22 HDA_SDO/I2S0_TXD
(27) ACZ_SDOUT — BA21 HDA_SDI0/I2S0_RXD
(27) ACZ_SDIN0 — AY21 HDA_SDI1/I2S1_RXD
(21,27) ACZ_RST# — R127 33_4 — HDA_RST# C — AW22 HDA_RST#/I2S1_SCLK
J5 GPD_D23/I2S_MCLK
AY20 I2S1_SFRM
AW20 I2S1_TXD

AK7 GPP_F1/I2S2_SFRM 1.8V
AK6 GPP_F0/I2S2_SCLK 1.8V
AK9 GPP_F2/I2S2_TXD 1.8V
AK10 GPP_F3/I2S2_RXD 1.8V

H5 GPP_D19/DMIC_CLK0 3.3V/1.8V
D7 GPP_D20/DMIC_DATA0 3.3V/1.8V
D8 GPP_D17/DMIC_CLK1 3.3V/1.8V
C8 GPP_D18/DMIC_DATA1 3.3V/1.8V

SPKR — AW5 GPP_B14/SPKR 3.3V/1.8V — C206 *100P/50V/X7R_4

SKL_ULT/BGA 7 OF 20

SDIO/SDXC

3.3V/1.8V
GPP_G0/SD_CMD AB11
GPP_G1/SD_DATA0 AB13
GPP_G2/SD_DATA1 AB12
GPP_G3/SD_DATA2 W12
GPP_G4/SD_DATA3 W11
GPP_G5/SD_CD# W10
GPP_G6/SD_CLK W8
GPP_G7/SD_WP W7

GPP_A17/SD_PWR_EN#/ISH_GP7 BA9
GPP_A16/SD_1P8_SEL BB9

3.3V/1.8V
SD_RCOMP AB7 — SD_RCOMP — R129 200/F_4

1.8V
GPP_F23 AF13

R125 20K/F_4 GPPC5 R126 *10K/F_4 +3V_S5

EC_RCIN# R134 10K/F_4
CLKRUN# R136 8.2K_4
GPPB23 R133 150K_4
SERIRQ# R135 10K/F_4 +3V

SkyLake ULT (LPC/SPI/SMB/CLINK)

U1E SKL_ULT

SPI - FLASH

PCH_SPI_CLK AV2 SPI0_CLK
PCH_SPI_SO AW3 SPI0_MISO
PCH_SPI_SI AV3 SPI0_MOSI
PCH_SPI_IO2 AW2 SPI0_IO2
PCH_SPI_IO3 AU4 SPI0_IO3
PCH_SPI_CS0# AU3 SPI0_CS0#
AU2 SPI0_CS1#
AU1 SPI0_CS2#

SPI - TOUCH

M2 GPP_D1/SPI1_CLK
M3 GPP_D2/SPI1_MISO
J4 GPP_D3/SPI1_MOSI
V1 GPP_D21/SPI1_IO2
V2 GPP_D22/SPI1_IO3
M1 GPP_D0/SPI1_CS#

3.3V/1.8V

C LINK

G3 CL_CLK
G2 CL_DATA
G1 CL_RST#

SMBUS, SMLINK

3.3V/1.8V
GPP_C0/SMBCLK
GPP_C1/SMBDATA
GPP_C2/SMBALERT#
GPP_C3/SML0CLK
GPP_C4/SML0DATA
GPP_C5/SML0ALERT#
GPP_C6/SML1CLK
GPP_C7/SML1DATA
3.3V/1.8V
GPP_B23/SML1ALERT#/PCHHOT#

R7 SMB_PCH_CLK
R8 SMB_PCH_DAT
R10 GPPC2 — SPD

R9 SMB_ME0_CLK
W2 SMB_ME0_DAT
W1 GPPC5 — NFC

W3 SMB_ME1_CLK
V3 SMB_ME1_DAT
AM7 GPPB23 — No Used

LPC 3.3V/1.8V
GPP_A1/LAD0/ESPI_IO0
GPP_A2/LAD1/ESPI_IO1
GPP_A3/LAD2/ESPI_IO2
GPP_A4/LAD3/ESPI_IO3
GPP_A5/LFRAME#/ESPI_CS#
GPP_A14/SUS_STAT#/ESPI_RESET#

AY13 LPC_AD0-0 — R140 33/J_4 — LPC_AD0 (21,30)
BA13 LPC_AD0-1 — R141 33/J_4 — LPC_AD1 (21,30)
BB13 LPC_AD0-2 — R143 33/J_4 — LPC_AD2 (21,30)
AY12 LPC_AD0-3 — R144 33/J_4 — LPC_AD3 (21,30)
BA12 — R421 33/J_4 — LPC_FRAME# (21,30)
BA11

Put damping resistor close to CPU

(21) EC_RCIN# — EC_RCIN# AW13 GPP_A0/RCIN# 3.3V/1.8V
(21) SERIRQ# — SERIRQ# AY11 GPP_A6/SERIRQ 3.3V/1.8V

3.3V/1.8V
GPP_A9/CLKOUT_LPC0/ESPI_CLK
GPP_A10/CLKOUT_LPC1
GPP_A8/CLKRUN#

AW9 LPC_CLK_0 — R146 1 2 22/F_4 — CLK_PCI_EC (21)
AY9 LPC_CLK_1 — R147 1 2 22/F_4 — CLK_PCI_LPC (30)
AW11 CLKRUN#

C212 *10P/50V/C0G_4
C213 *10P/50V/C0G_4

SKL_ULT/BGA 5 OF 20

SMBus/Pull-up(CLG)

C207 22P/50V/NPO_4
+3V_S5 R138 2.2K_4 SMB_PCH_CLK
R142 2.2K_4 SMB_PCH_DAT
C209 22P/50V/NPO_4

Q4
+3V 5
3 SMB_PCH_CLK
+3V 2
6 SMB_PCH_DAT
4
1
UM6K31N

R137 4.7K_4 +3V
SMB_RUN_CLK (15)
C208 22P/50V/NPO_4
R139 4.7K_4 +3V
SMB_RUN_DAT (15)
C210 22P/50V/NPO_4

R729 *NFC@0_4
Q5
+3V 5
3 SMB_ME0_CLK
+3V 2
6 SMB_ME0_DAT
4
1
NFC@UM6K31N
+3V_S5 R149 1K/F_4 SMB_ME0_CLK
R151 1K/F_4 SMB_ME0_DAT

R148 NFC@499/F_4 +3V
SMB_NFC_CLK (17)
C211 *NFC@220P/50V/COG_4
R150 NFC@499/F_4 +3V
SMB_NFC_DAT (17)
C214 *NFC@220P/50V/COG_4
R730 *NFC@0_4

SMB_ME1_CLK R154 2.2K_4 +3V_S5
SMB_ME1_DAT R155 2.2K_4 +3V_S5

PCH_SPI_CS0# TP156
PCH_SPI_SI_R TP157
PCH_SPI_SO_R TP158
PCH_SPI_CLK_R TP159

4/19 Add Test Point

SPI FLASH

+3V_S5 R156 *10K/F_4

U3 W25Q64FVSSIQ
PCH_SPI_CS0# 1 CE#
PCH_SPI_CLK R158 15_4 PCH_SPI_CLK_R 6 SCK
PCH_SPI_SI R160 15_4 PCH_SPI_SI_R 5 SI
PCH_SPI_SO R161 15_4 PCH_SPI_SO_R 2 SO
PCH_SPI_IO2 R163 15_4 PCH_SPI_WP# 3 WP#
+3V_S5 R164 1K/F_4
(21) SPI_WP_PCH# R165 *0_4
8 VDD
7 HOLD#
4 VSS
+3V_S5 C220 0.1U/10V/X5R_2 KEN
R159 1K/F_4 +3V_S5
R162 15_4 PCH_SPI_IO3

Put damping resistor close to CPU

PCH_SPI_SI R516 *1K/F_4 +3V_S5

GPPC2 R157 10K/F_4

TLS CONFIDENTIALITY STRAP(GPP_C2)	
NC	Default
PU	EN

SPKR R166 *10K/F_4 +3V_S5

SPKR/GPP_B14 Top-Block Swap	
PU	Enable
PD	Disable(Default) internal week pull-dpwn

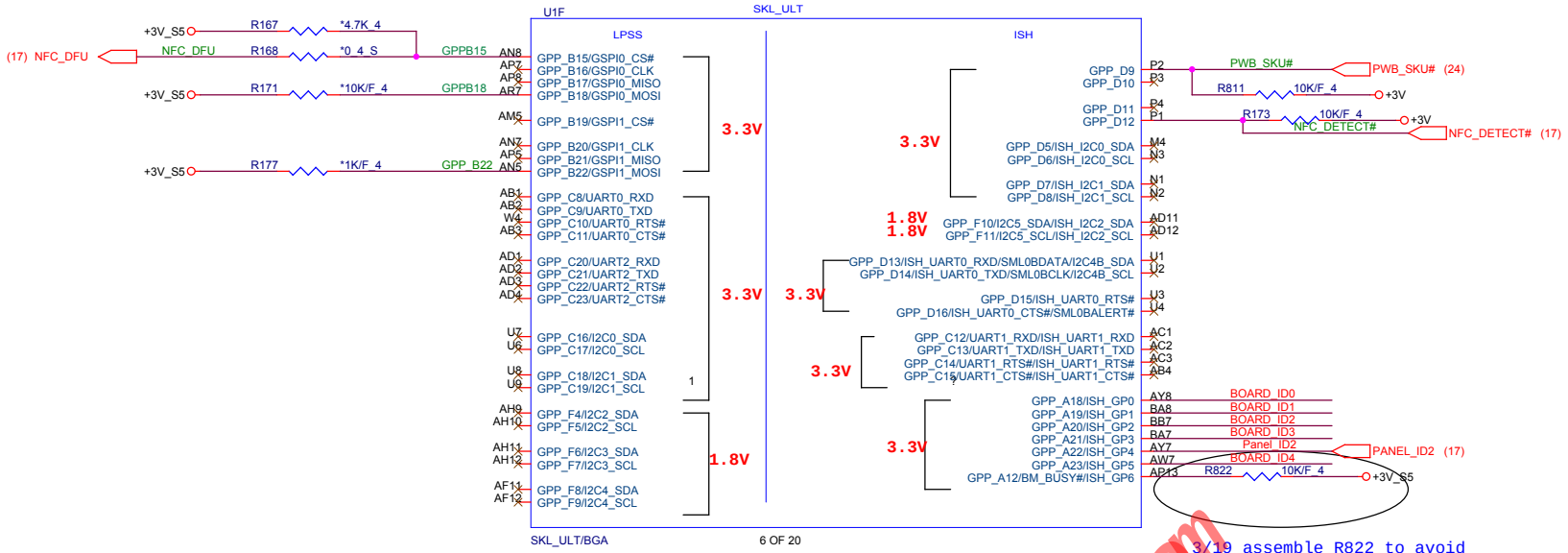
Quanta Computer Inc.
PROJECT : FFG

Size	Document Number	Rev
	KBL PCH(HDA/LPC/SPI/SMB)	1A
Date: Thursday, April 28, 2016	Sheet 11 of 45	

SLK ULT(GPIO,LPIO,MISC)

GPIO Pull-up/Pull-down(CLG)

12



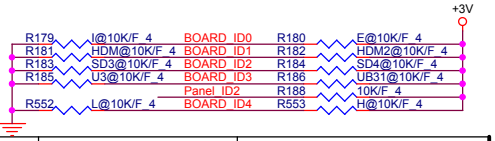
3/19 assemble R822 to avoid mis-setting of GPIO termination.

PANEL ID2

PANEL_ID2	
H	4K2K
L	FHD and HD

GPP_B22(Boot BIOS)	
PU	LPC
PD	SPI (Default IPD)

No Reboot Strap(GPP_B18)	
NC	Default
PU	EN



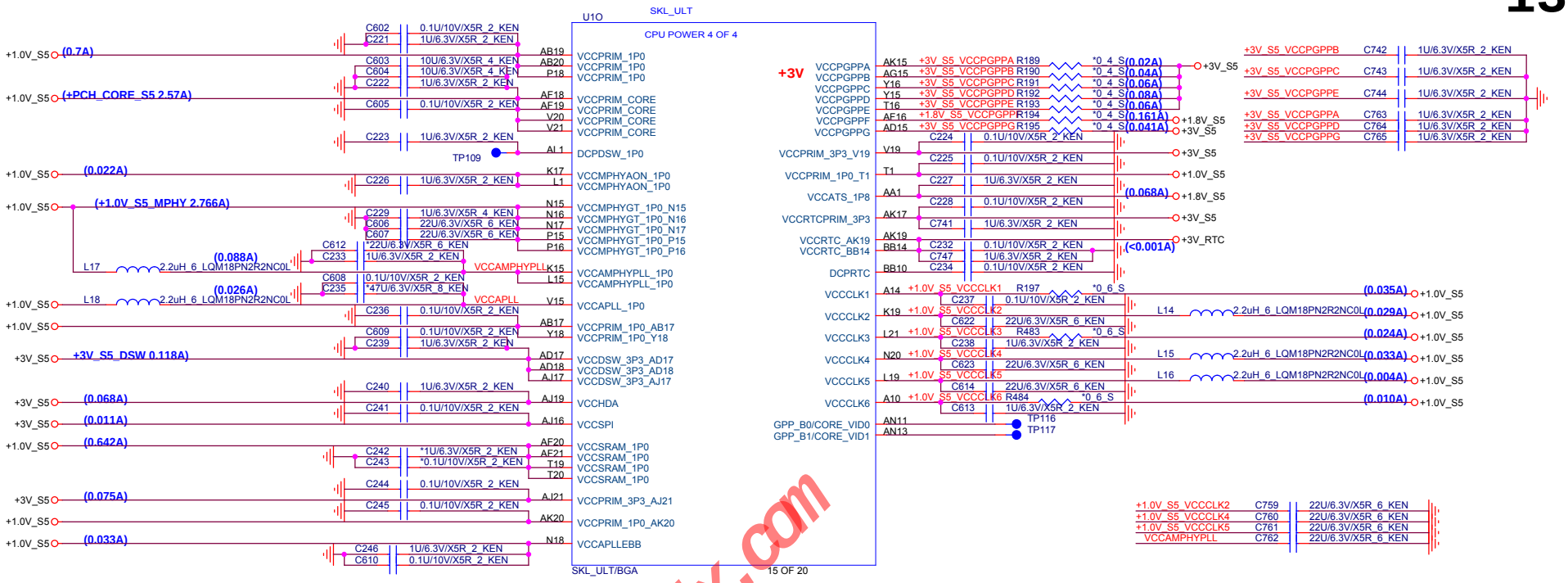
	0	1
Board ID0	KBL GFX GT2	KBL GFX GT3
Board ID1	HDMI1.4a	HDMI2.0a
Board ID2	SD3.0	SD4.0
Board ID3	USB3.0	USB3.1
Panel ID2	Other LCD	4K2K Panel
Board ID4	L-SKU for No Bland speaker	H-SKU for YAMAHA speaker

Quanta Computer Inc.

PROJECT :FFG

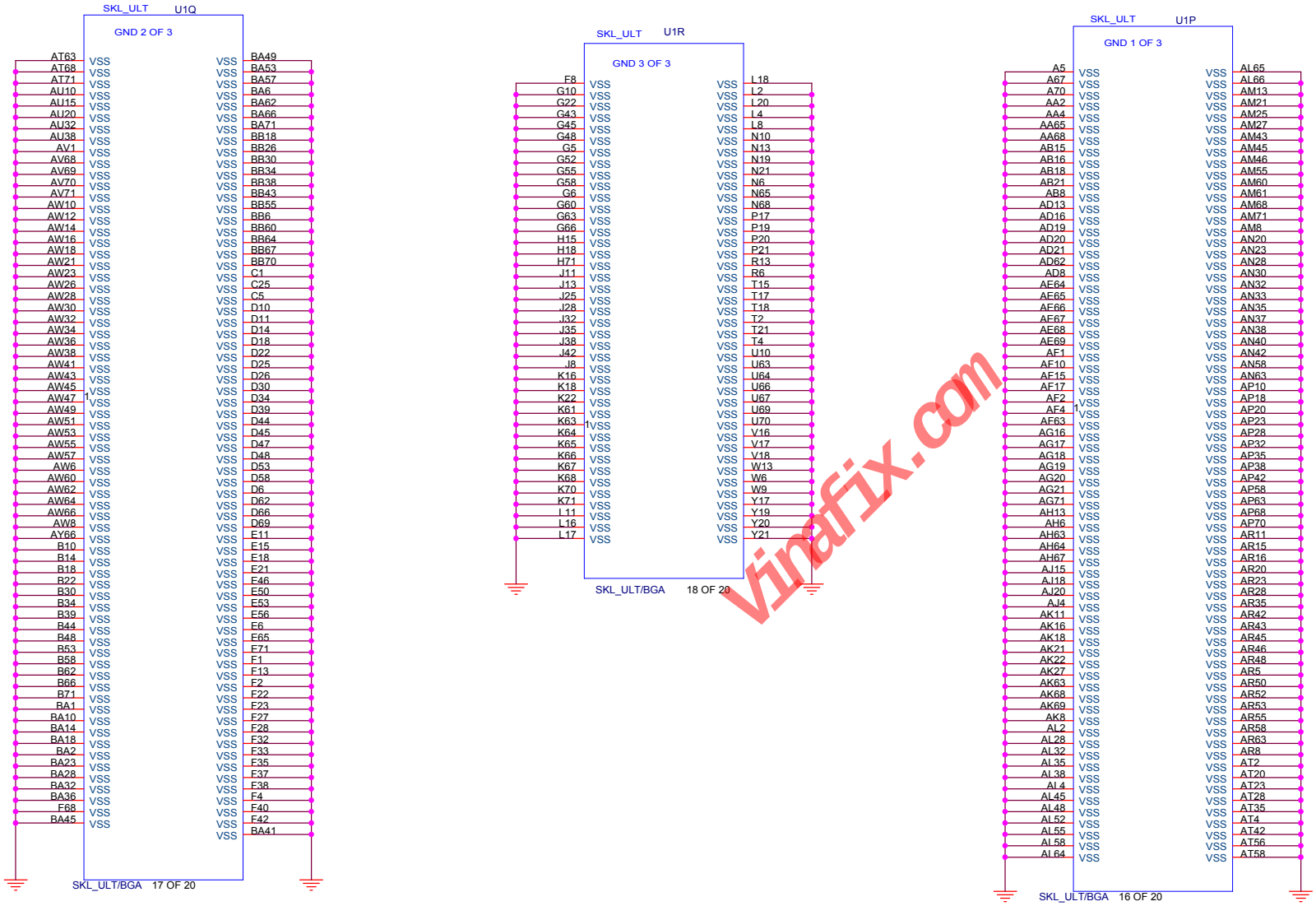
Size	Document Number	Rev
	KBL PCH(GPIO/UART/I2S)	1A

Date: Thursday, April 28, 2016 Sheet 12 of 45



Quanta Computer Inc.
PROJECT : FFG

Size	Document Number	Rev
	KBL PCH(Power)	1A
Date: Thursday, April 28, 2016	Sheet 13 of 45	

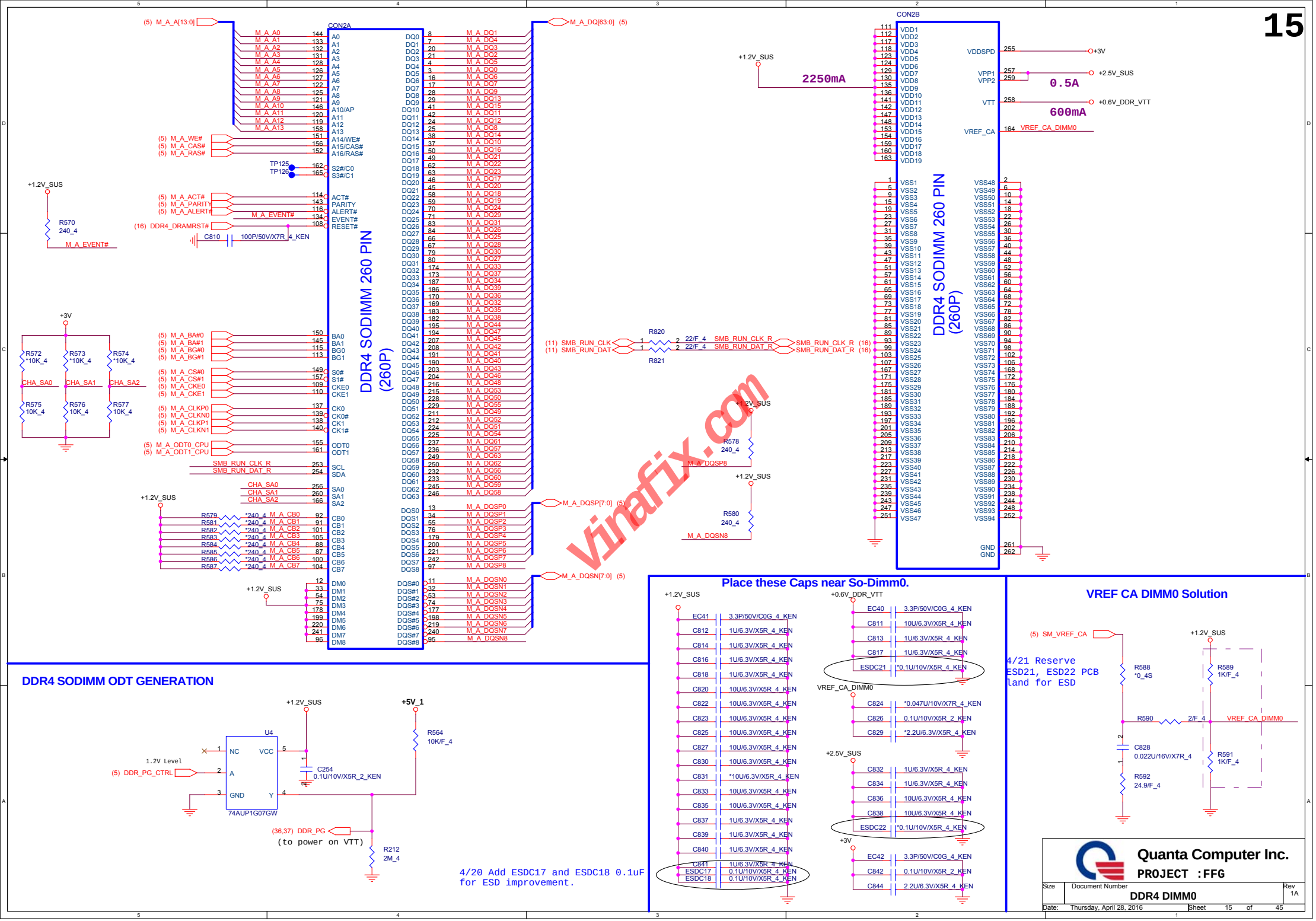


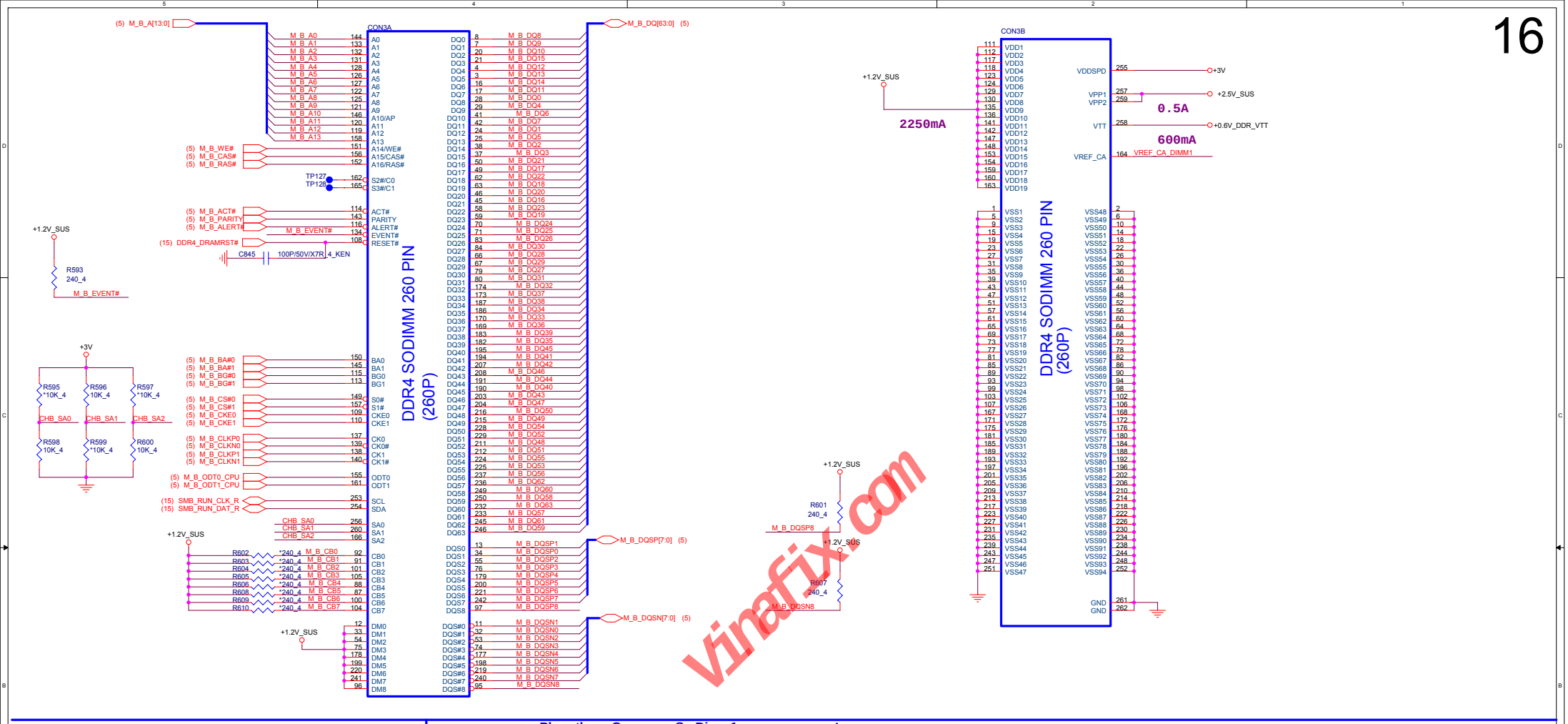
Quanta Computer Inc.

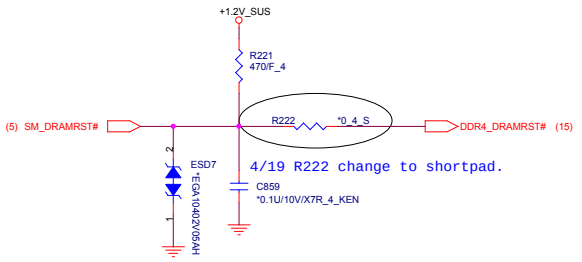
PROJECT : FFG

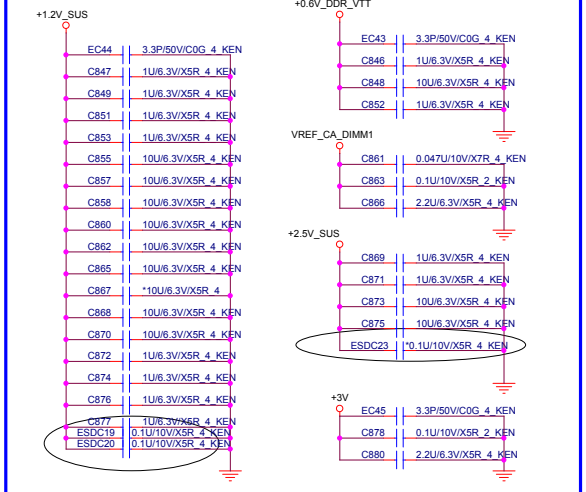
Size	Document Number	Rev
	KBL PCH(GND)	1A

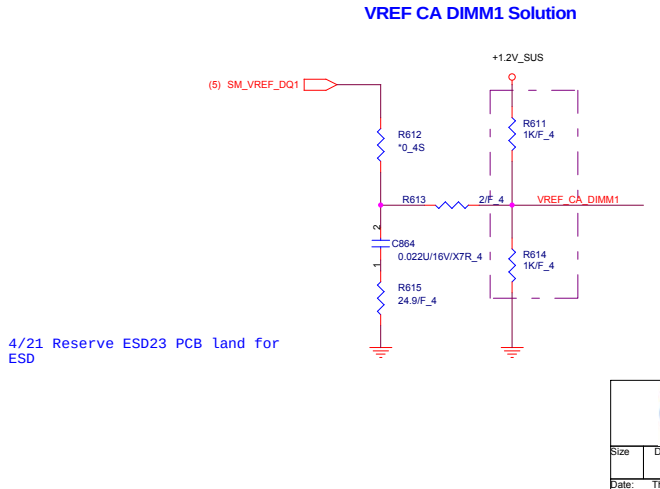
Date: Thursday, April 28, 2016 Sheet 14 of 45


CON2A
DDR4 SODIMM 260 PIN (260P)
CON2B
DDR4 SODIMM 260 PIN (260P)
2250mA
0.5A
600mA
+1.2V_SUS
+3V
+2.5V_SUS
+0.6V_DDR_VTT
VREF_CA_DIMM0
M_A_EVENT#
SMB_RUN_CLK_R
SMB_RUN_DAT_R
M_A_DQSP8
M_A_DQSN8
Place these Caps near So-Dimm0.
VREF CA DIMM0 Solution
4/21 Reserve ESD21, ESD22 PCB land for ESD
DDR4 SODIMM ODT GENERATION
(to power on VTT)
4/20 Add ESDC17 and ESDC18 0.1uF for ESD improvement.
Quanta Computer Inc.
PROJECT :FFG
DDR4 DIMM0
Thursday, April 28, 2016
Sheet 15 of 45







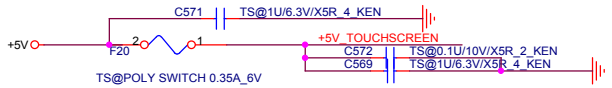


Quanta Computer Inc.
PROJECT : FFG

Size	Document Number	Rev
	DDR4 DIMM1	1A

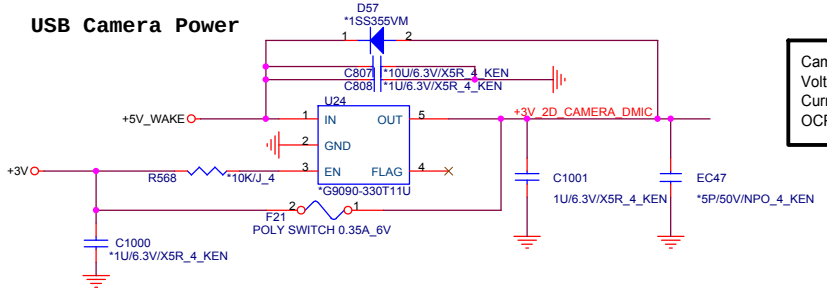
Date: Thursday, April 28, 2016 Sheet 16 of 45

Touch Screen Power for 4K2K&LG FHD



Limit Current: 220mA~700mA
Typ:200mA

USB Camera Power



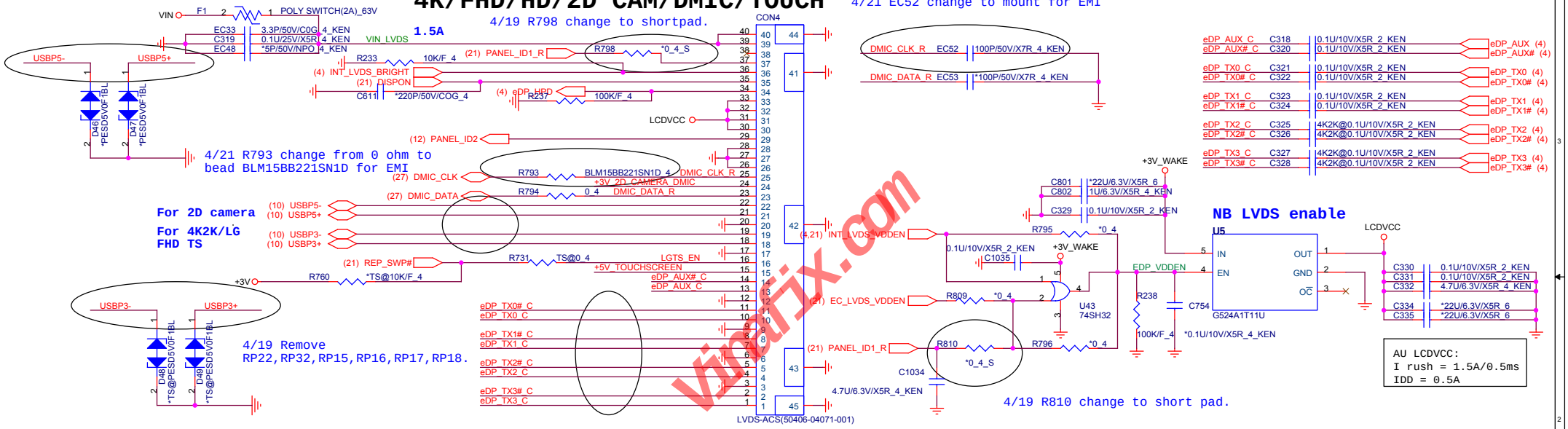
Camera HD specification
Voltage: Max. 3.6V
Current : Max. 200mA
OCP: 200mA ~ 300mA

4K/FHD/HD/2D CAM/DMIC/TOUCH

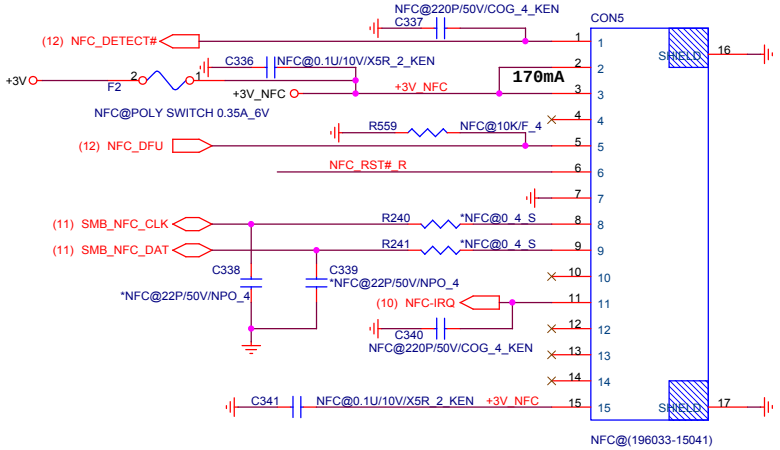
FAST,UL/CSA

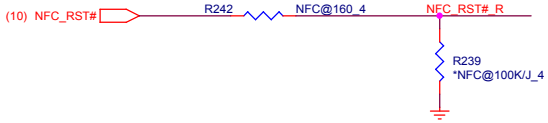
4/21 EC52 change to mount for EMI

4/19 R798 change to shortpad.



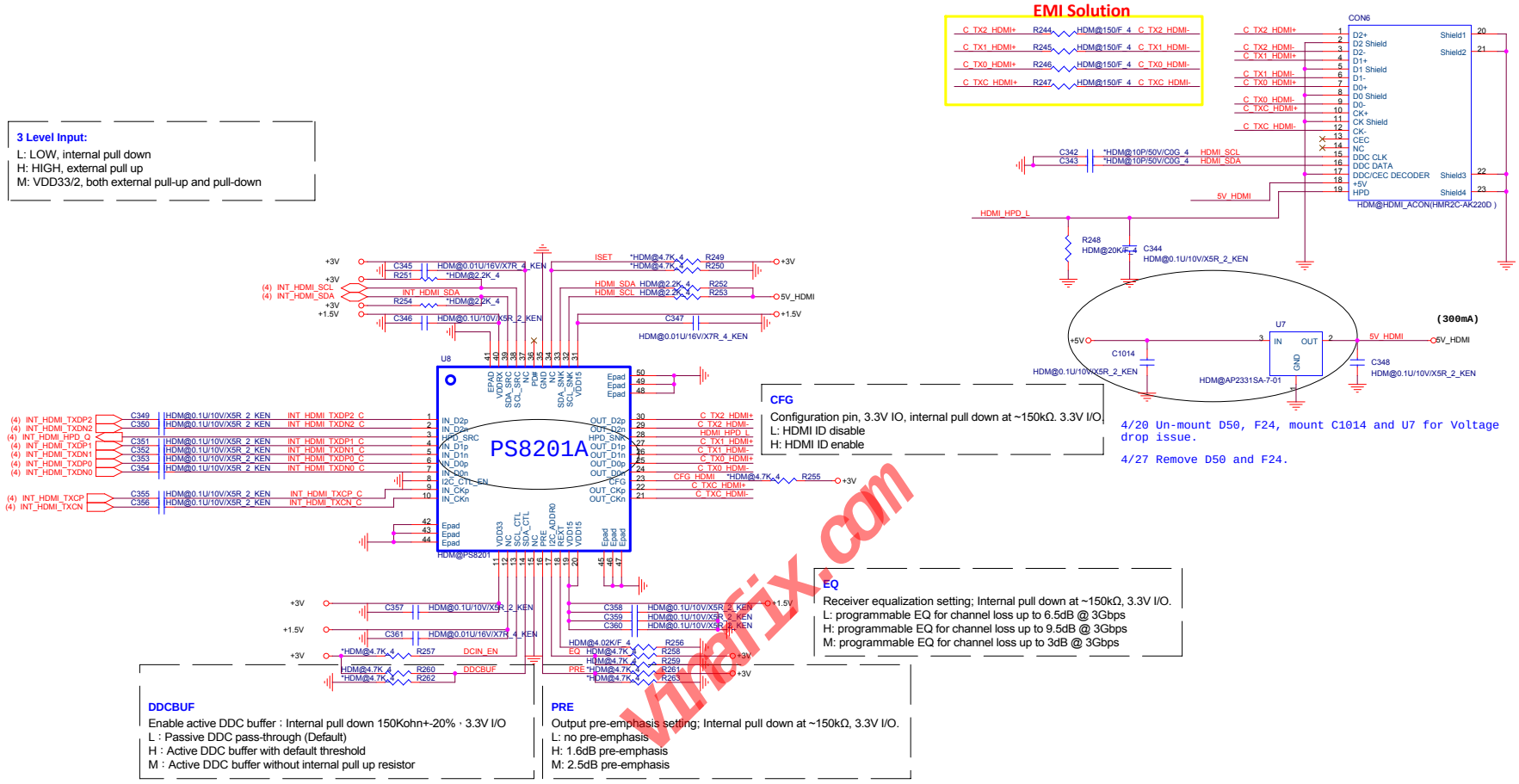
NFC





Quanta Computer Inc.
PROJECT : FFG

Size	Document Number	Rev
	eDP/NFC	1A
Date: Thursday, April 28, 2016	Sheet 17 of 45	



CFG

Configuration pin, 3.3V IO, internal pull down at ~150kΩ. 3.3V I/O
L: HDMI ID disable
H: HDMI ID enable

4/20 Un-mount D50, F24, mount C1014 and U7 for Voltage drop issue.

4/27 Remove D50 and F24.

EQ

Receiver equalization setting; Internal pull down at ~150kΩ, 3.3V I/O.
L: programmable EQ for channel loss up to 6.5dB @ 3Gbps
H: programmable EQ for channel loss up to 9.5dB @ 3Gbps
M: programmable EQ for channel loss up to 3dB @ 3Gbps

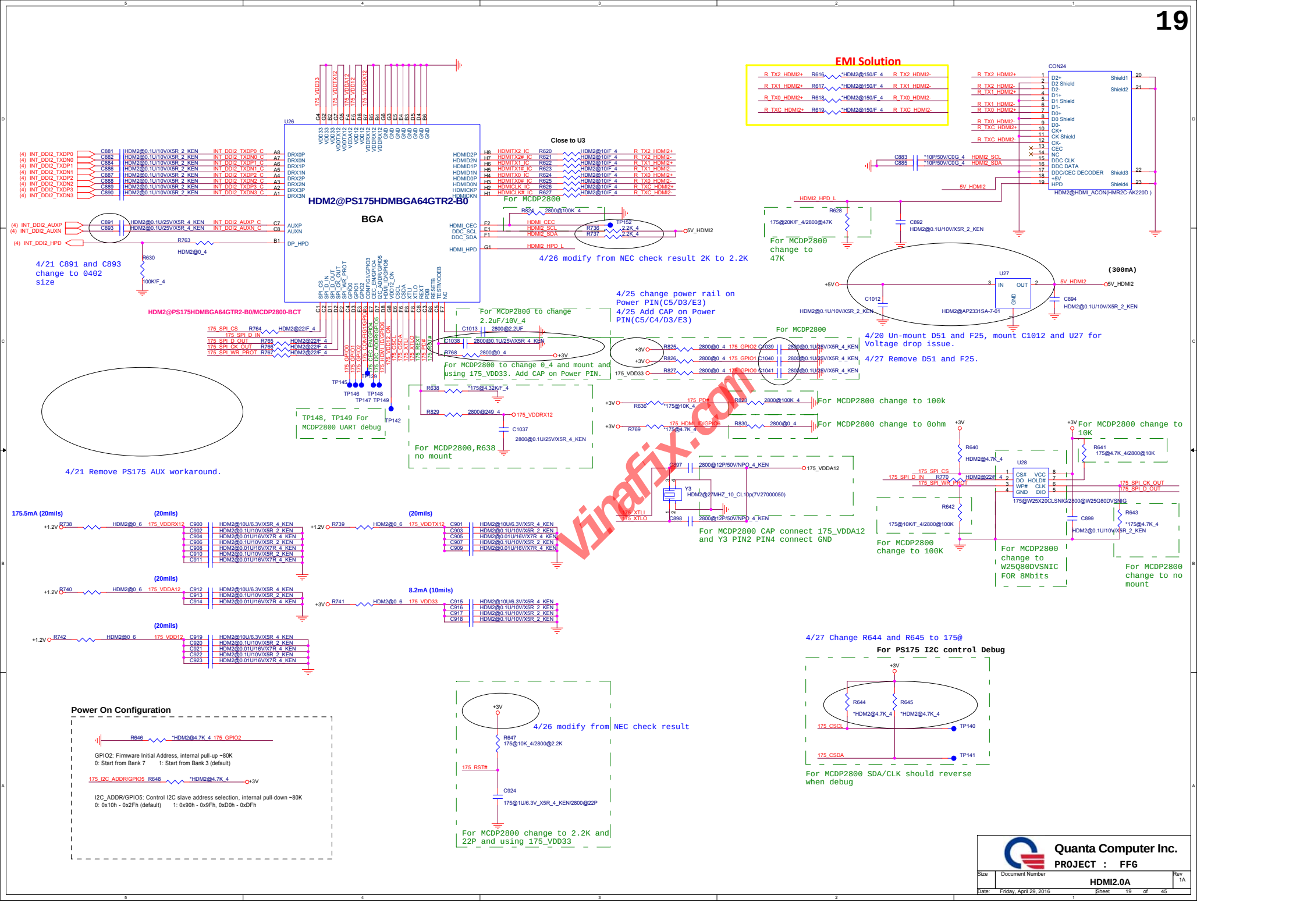
DDCBUF

Enable active DDC buffer : Internal pull down 150Kohn+-20% , 3.3V I/O
L : Passive DDC pass-through (Default)
H : Active DDC buffer with default threshold
M : Active DDC buffer without internal pull up resistor

PRE

Output pre-emphasis setting; Internal pull down at ~150kΩ, 3.3V I/O.
L: no pre-emphasis
H: 1.6dB pre-emphasis
M: 2.5dB pre-emphasis

Quanta Computer Inc.		
PROJECT : FFG		
Size	Document Number: HDMI	Rev 1A
Date: Thursday, April 28, 2016	Sheet 18 of 45	



Quanta Computer Inc.			
PROJECT : FFG			
Size	Document Number		Rev
	HDMI2.0A		1A
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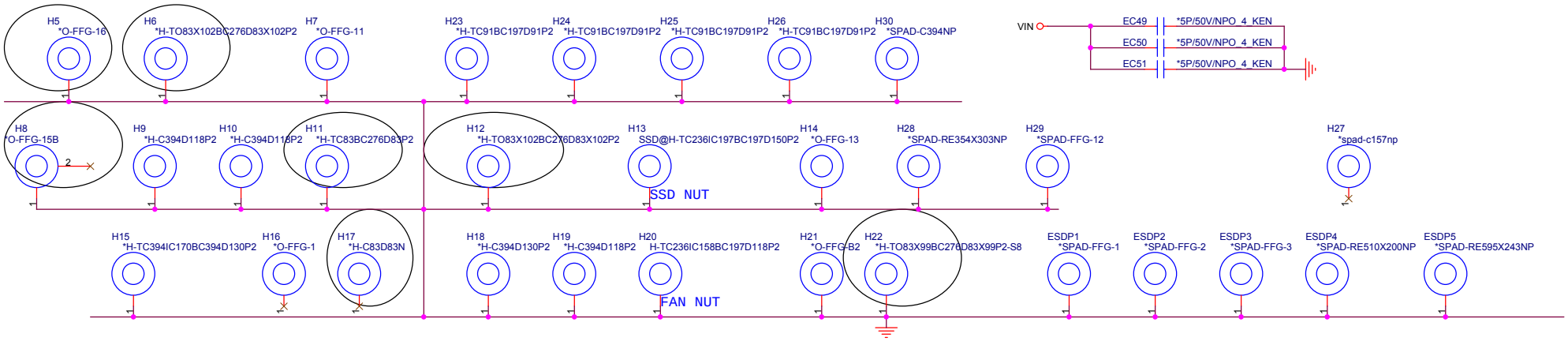
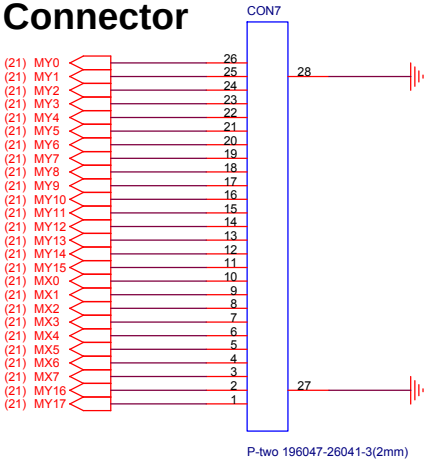
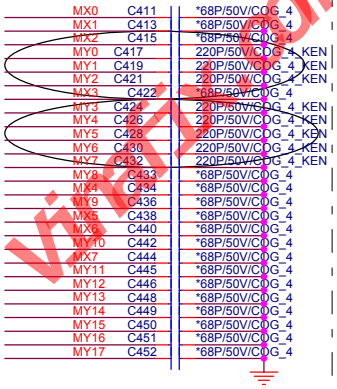
HOLE

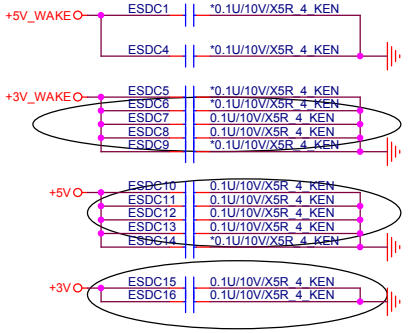


KEY BOARD Connector

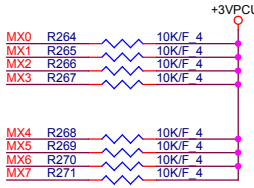


P-two 196047-26041-3(2mm)





4/20 Mount
ESDC7,ESD10,ESD12,ESD13,ESDC11,ESDC15,ESDC16,ESDC8
for ESD improvement.



4/21 C417, C419, C421, C424, C426, C428, C430 and
C432 add 220pF for EMI

Quanta Computer Inc.
PROJECT : FFG

Size	Document Number	Rev
	HOLE/EMI/KB	1A

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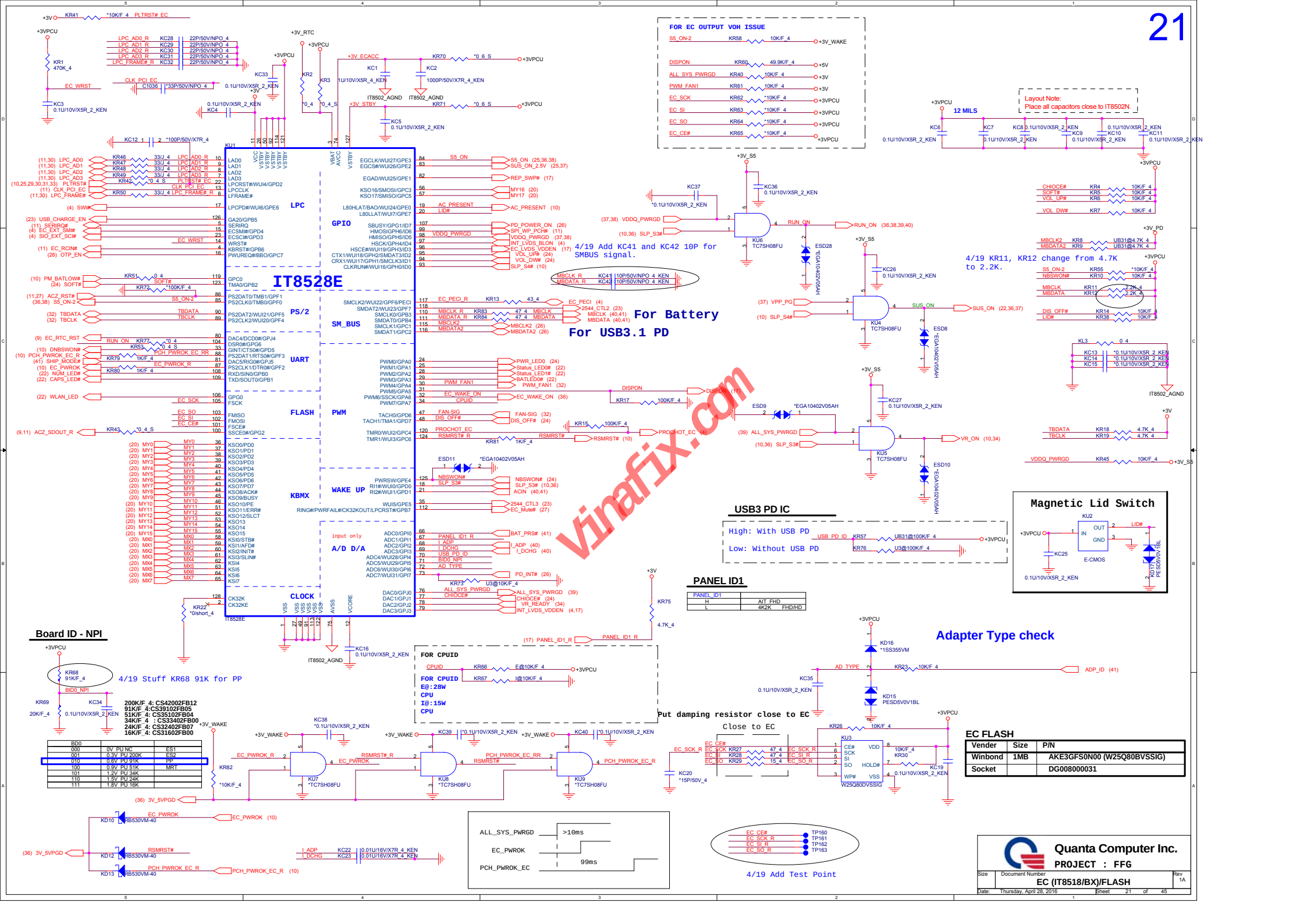
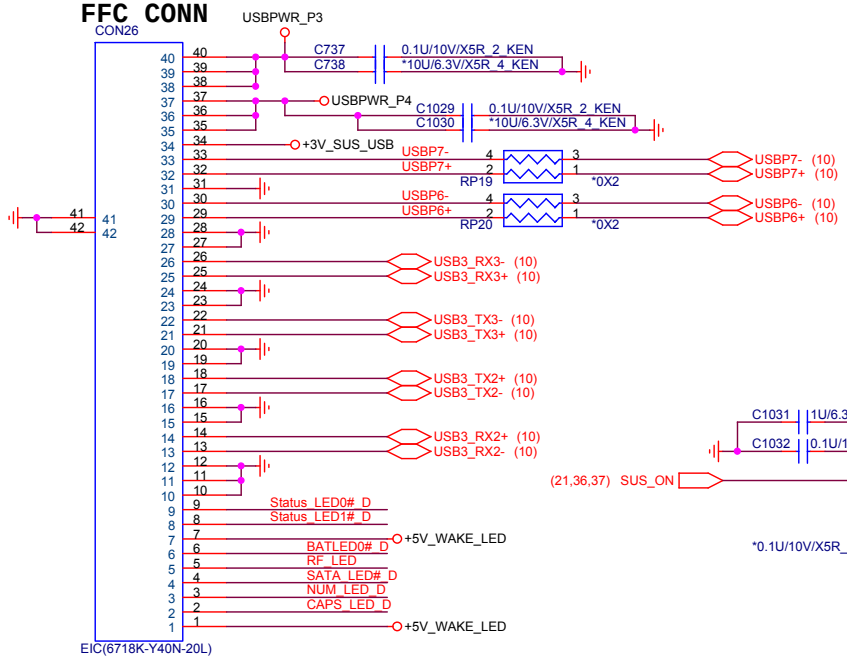
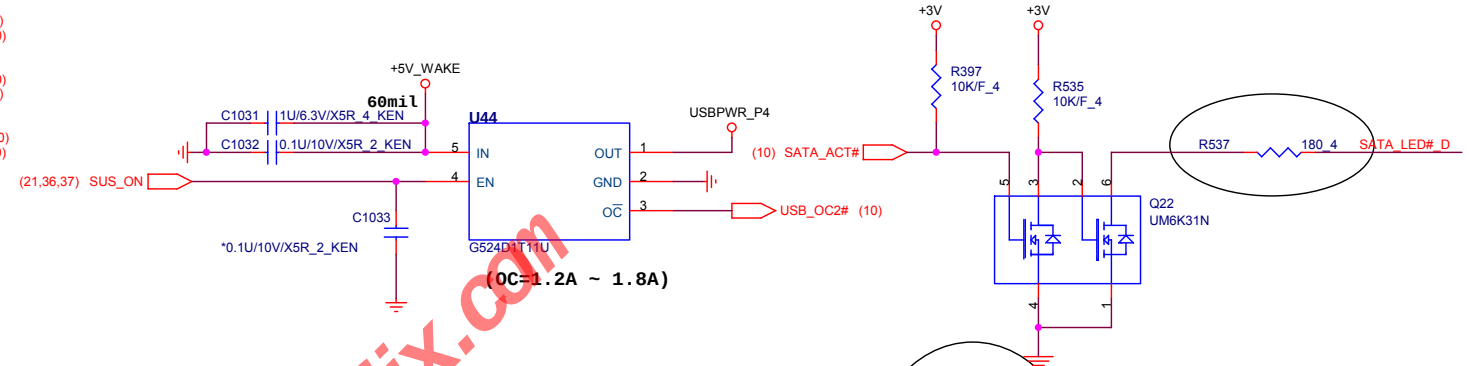

IT8528E
LPC
GPIO
PS/2
SM_BUS
UART
FLASH
PWM
WAKE UP
KBMX
A/D D/A
CLOCK
FOR EC OUTPUT VOH ISSUE
4/19 Add KC41 and KC42 10P for SMBUS signal.
4/19 KR11, KR12 change from 4.7K to 2.2K.
For Battery
For USB3.1 PD
Layout Note: Place all capacitors close to IT8502N.
12 MILS
Magnetic Lid Switch
USB3 PD IC
High: With USB PD
Low: Without USB PD
PANEL ID1
Board ID - NPI
4/19 Stuff KR68 91K for PP
200K/F_4: CS42002FB12
91K/F_4:CS39102FB05
51K/F_4: CS35102FB04
34K/F_4 : CS33402FB00
24K/F_4: CS32402FB07
16K/F_4: CS31602FB00
FOR CPUID
CPU
E@:28W
I@:15W
Put damping resistor close to EC
Close to EC
Adapter Type check
EC FLASH
Vender | Size | P/N
Winbond | 1MB | AKE3GFS0N00 (W25Q80BVSSIG)
Socket | | DG008000031
4/19 Add Test Point
Quanta Computer Inc.
PROJECT : FFG
EC (IT8518/BX)/FLASH
Date: Thursday, April 28, 2016
Sheet 21 of 45

MB to USB board

FFC CONN



SATA LED

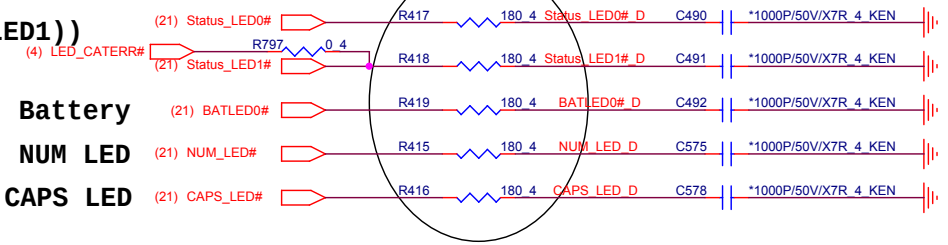


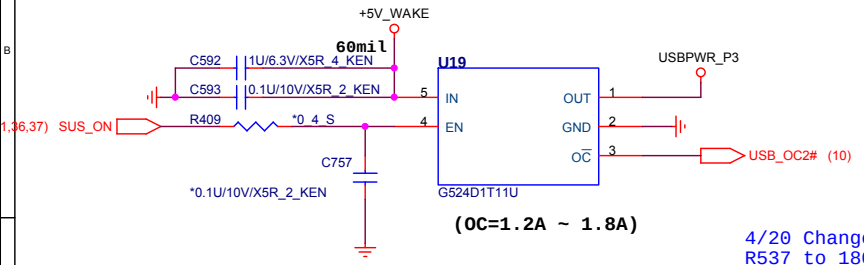
Status LED (White(LED0)/Amber(LED1))

Battery

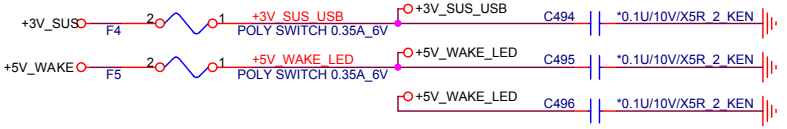
NUM LED

CAPS LED

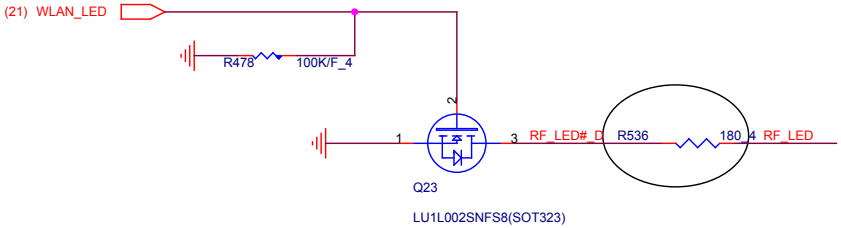




4/20 Change LED resistor R415, R416, R417, R418, R419, R536, R537 to 180 ohm.



WLAN LED



Quanta Computer Inc.

PROJECT : FFG

Size	Document Number	Rev
	MB TO USB	1A

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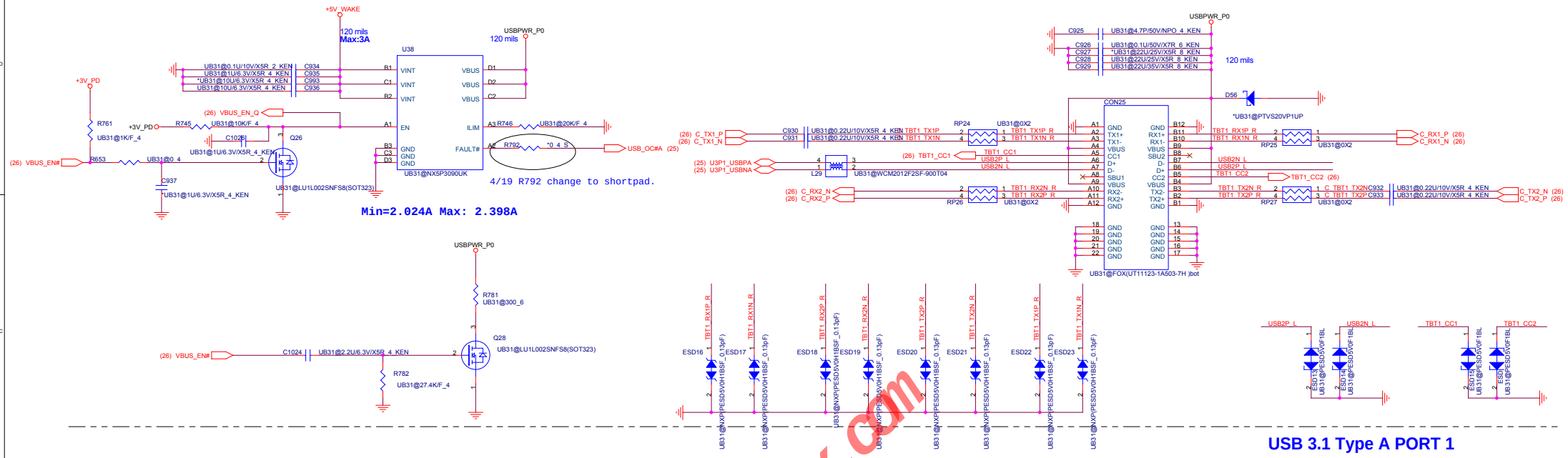
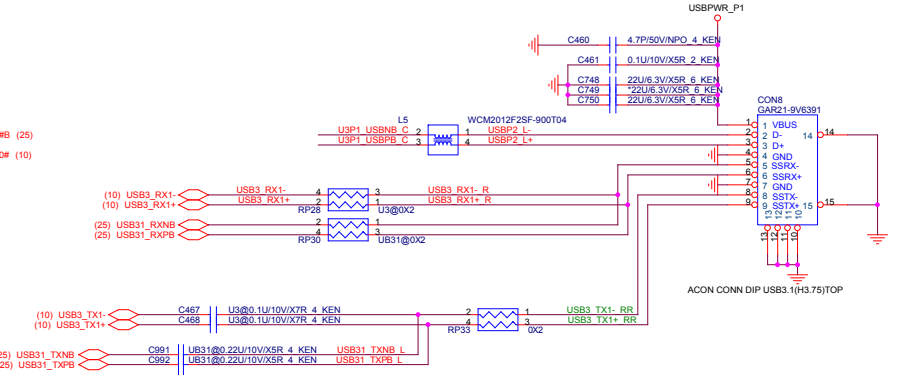
USB 3.1 Type C PORT 0 with PD

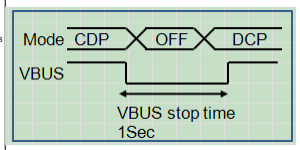


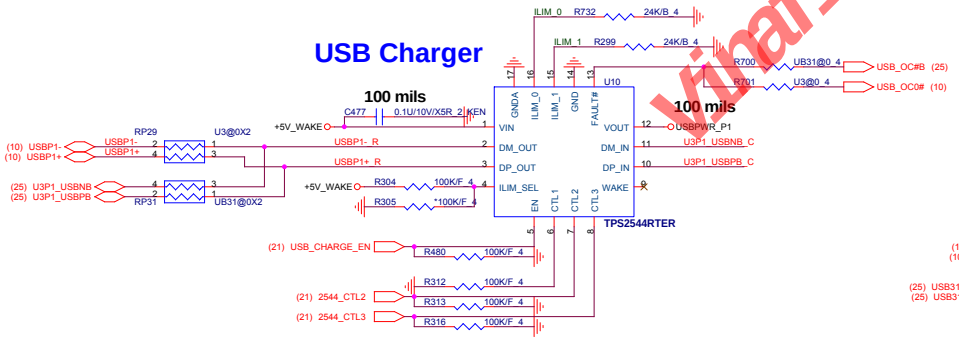
USB 3.1 Type A PORT 1



USB Charger

SDP : Standard Downstream Port
CDP : Charging downstream port
DCP : Dedicated Charging Port
Enable/Disable : setting by EC





ILIM_SEL	(I LIMIT(A)= 50250/R)	
HI	I_LIM_HI	50250/24K=2.093A
LO	I_LIM_LO	50250/24K=2.093A

	TPS2541		TPS2544	
ILIM_SEL	Pin15	Pin16	Pin15	Pin16
High	V			V
Low		V	V	

USB_CHARGE_EN	CTL_1	CTL_2	CTL_3	TPS 2544 Truth Table
1	0	X	1	DCP,Auto-detect(S3/S4/S5, 1.5A)
1	1	0	0	DCP, BC SPEC1.2 only(S3/Deep standby/S4/S5, 1.5A)
1	1	0	1	DCP, Divider mode only(S3/S4/S5, 1.5A)
1	0	1	0	SDP, USB2.0 mode(S0, 0.5A)
1	1	1	1	CDP (S0, 1.5A)
0	0	0	0	OUT discharge, power switch OFF

System State	USB Battery Charging Setting		
	Disable(AC and DC mode)(EN1 2 3)	Enable(AC mode)(EN1 2 3)	Enable(DC mode)(EN1 2 3)
S0	SDP (1 0 1 0)	SDP (1 0 1 0)	SDP (1 0 1 0)
S3	SDP (1 0 1 0)	DCP Auto (1 0 X 1)	Charger OFF (0 0 0 0)
S4	Charger OFF (0 0 0 0)	DCP Auto (1 0 X 1)	Charger OFF (0 0 0 0)
S5	Charger OFF (0 0 0 0)	DCP Auto (1 0 X 1)	Charger OFF (0 0 0 0)

Quanta Computer Inc.
PROJECT : FFG
Size | Document Number | Rev 1A
USB/USB Charger
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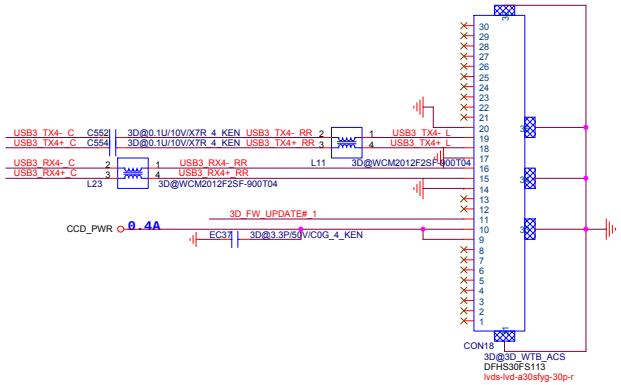
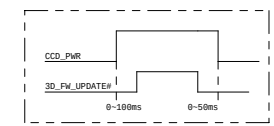
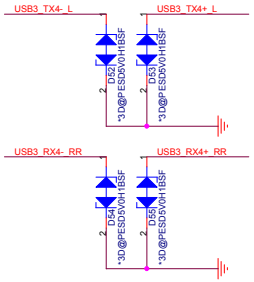
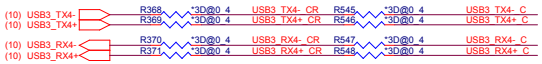
3D Camera For H-SKU

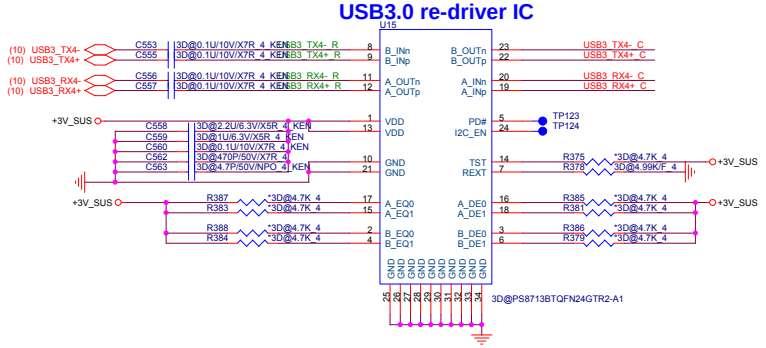




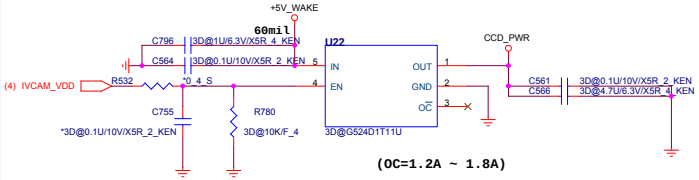


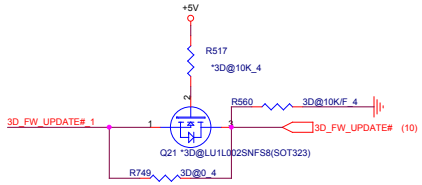


USB3.0 re-driver IC



3D Camera Power





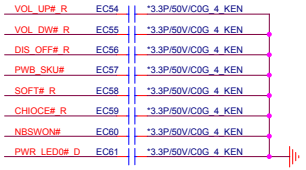
Programmable output pre-emphasis level
setting for channel A/B
3.3V tolerant. Internally pulled down
at ~150K
[A/B_DE1, A/B_DE0] ==
LL: 3.5dB de-emphasis(defaul)
LH: NO de-emphasis
HL: 2.7dB de-emphasis
HH: 5dB de-emphasis

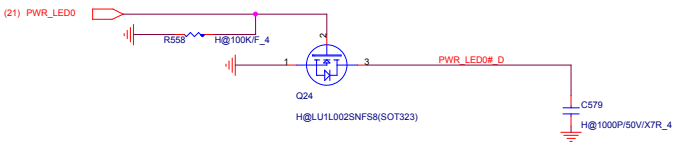
LFPS swing adjust. 3.3V tolerant. Internally
pulled down at
~150K.
TEST ==
L: Normal LFPS swing(default)
H: Tune down LFPS swing

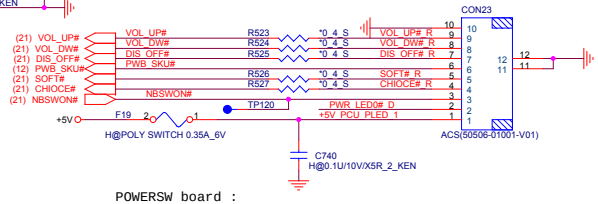
Equalizer control and program for channel A/B
3.3V tolerant. Internally pulled down at ~150K.
[A/B_EQ1, A/B_EQ0] ==
LL: Program EQ for channel loss up to 9.5dB(default)
LH: Program EQ for channel loss up to 13dB
HL: Program EQ for channel loss up to 4.5dB
HH: Program EQ for channel loss up to 7.5dB

Note:
REXT can be left open to get default swing
setting
The programmable values from 2.5K to 10K

Power SW Board Connector







POWERSW board :
L SKU:High
H SKU:Low

Quanta Computer Inc.
PROJECT : FFG

Size	Document Number	Rev
	PSW/DMIC/Camera/TS	1A

Date: Thursday, April 28, 2016 Sheet 24 of 45

SPI FLASH

U33 UB31@W25X10CLSNIG (SOP8)1M

PCIE Gen2*2

U34 UB31@ASM1142

USB3.1 < 2"

For USB3.1 Type C

For USB3.1 Type A

4/19 R677 change to short pad. From Source side

4/19 R662 change to shortpad.

4/19 R664 change to shortpad.

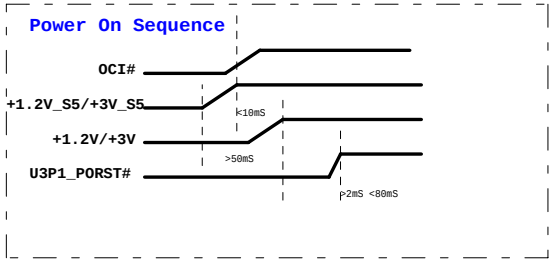
4/19 R669, R671 change to shortpad.

4/21 Remove R763, add R831 and Q32 to meet wake event

4/19 R751 change to shortpad.

+1.2_S5 for ASM1142 0.033A

Power On Sequence



H/W Strapping

UR_TX	UR_RX	Function
1	1	Asynchronous Mode with External 20Mhz Crystal

USP1_SPI_CLK	Function
1	1:D3cold (default)
0	0:D3Hot

UART_RX R683 *UB31@4.7K_4 R682 *UB31@4.7K_4

UART_TX R687 *UB31@4.7K_4 R686 *UB31@4.7K_4

R684 UB31@4.7K_4 U3P1_SPI_CLK

R685 *UB31@4.7K_4

Quanta Computer Inc.

PROJECT : FFG

Size | Document Number: USB3.1 HOST IC | Rev 1A

Date: Thursday, April 28, 2016 | Sheet 25 of 45

	5V	0V
VA ID2	0	1
VA ID1	0	0
VA ID0	0	0

CHANNEL_SEL	Descriptions
0	(TX/RX) to (TX_0/RX_0)
1	(TX/RX) to (TX_1/RX_1)

4/19 R724 change to shortpad.

4/19 R815 change to shortpad.

11/27 modify from Tommy

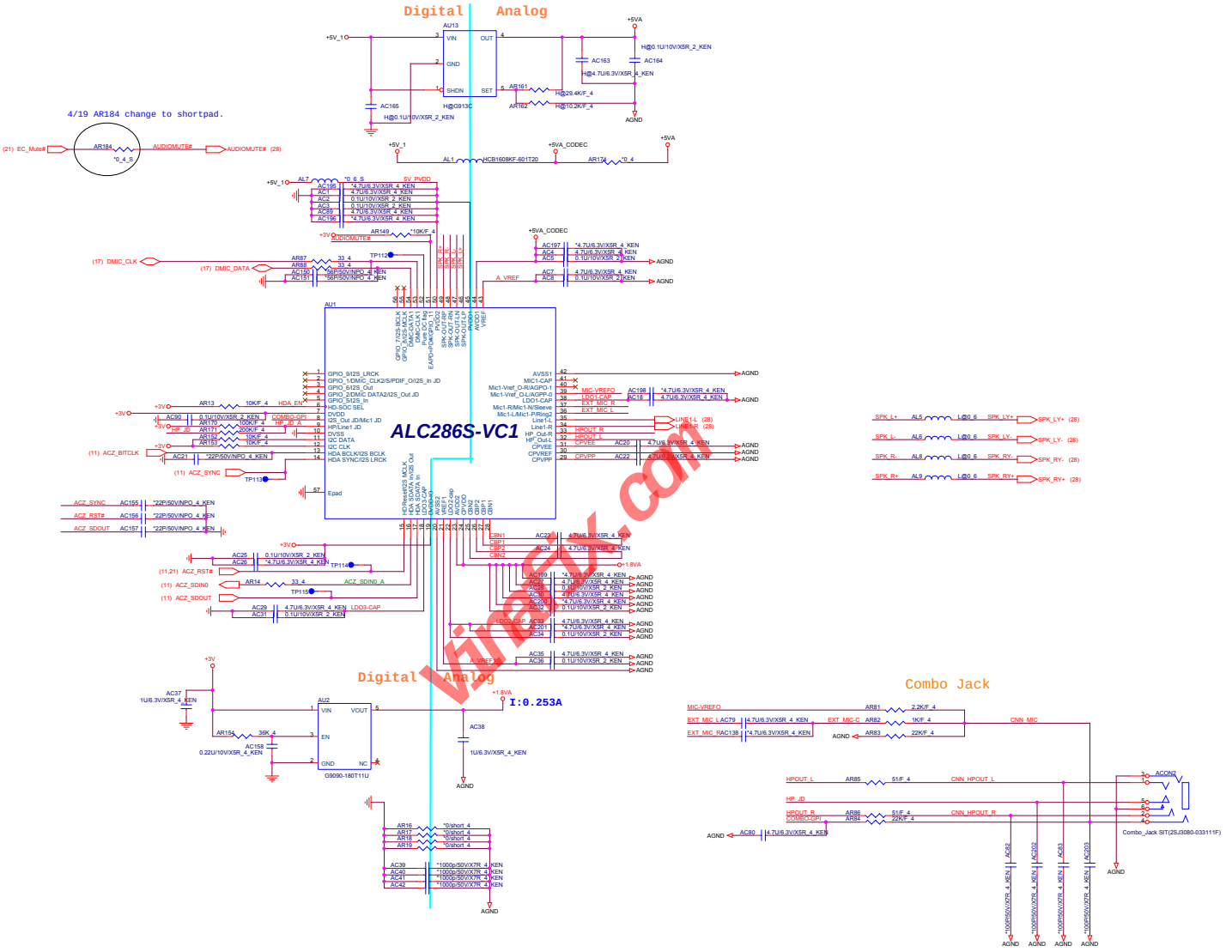
4/27 Remove D42 and R823.

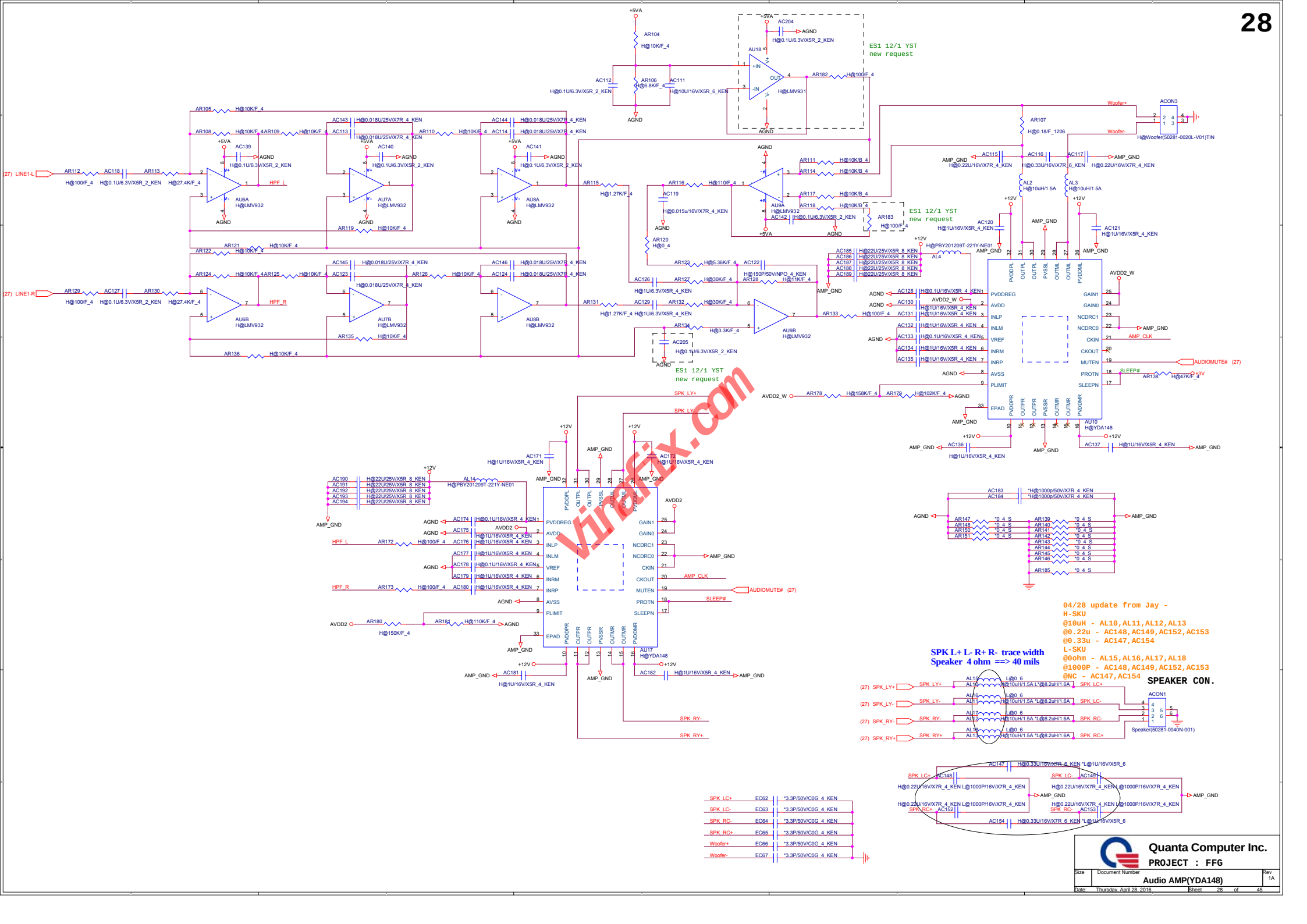
4/25 Add U45 and Rset=88.7k, OCP(min)=0.203A, OCP(max)=0.353A

H= Program Code to PD
L= disable Program

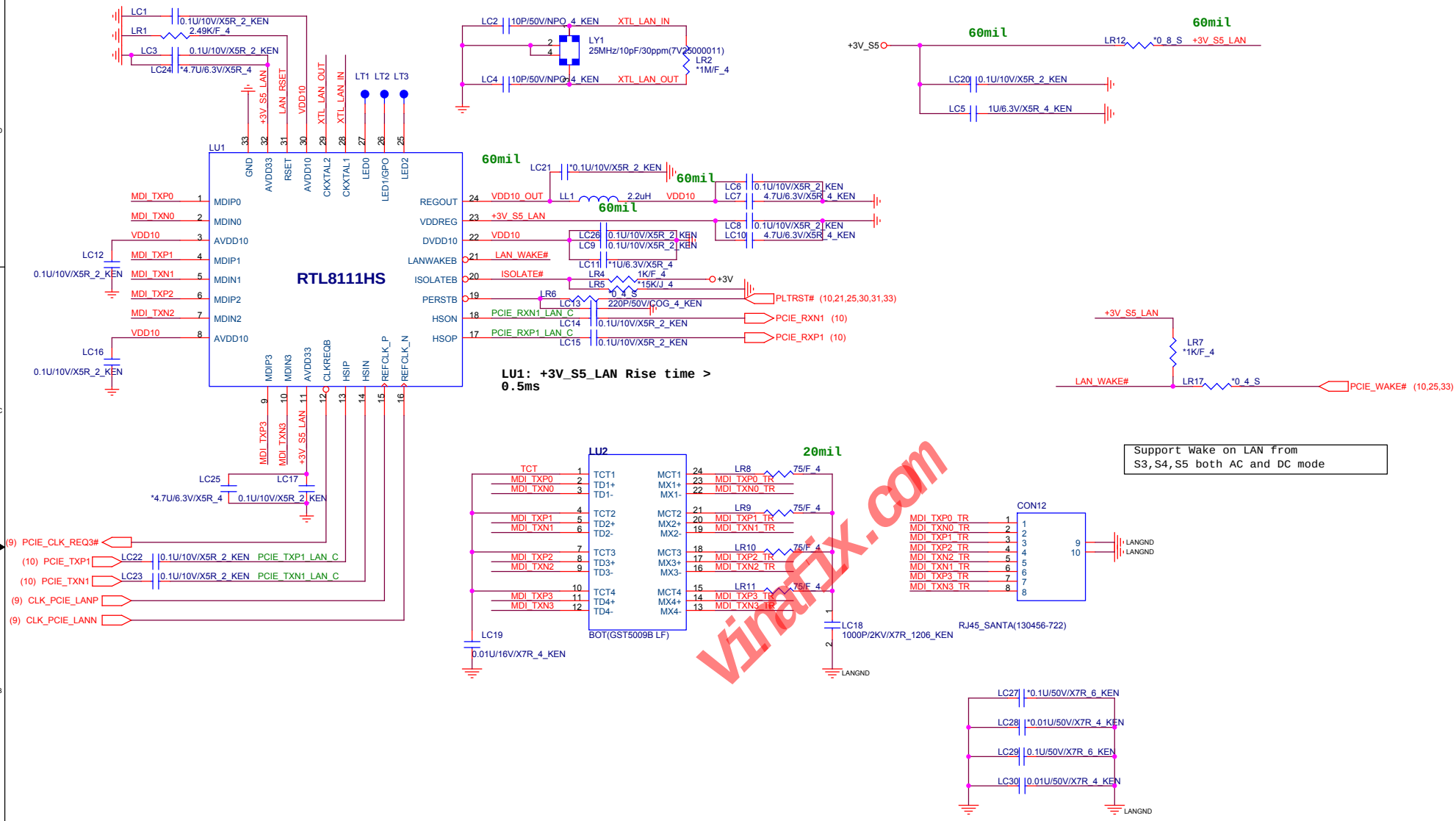
Need to 1%

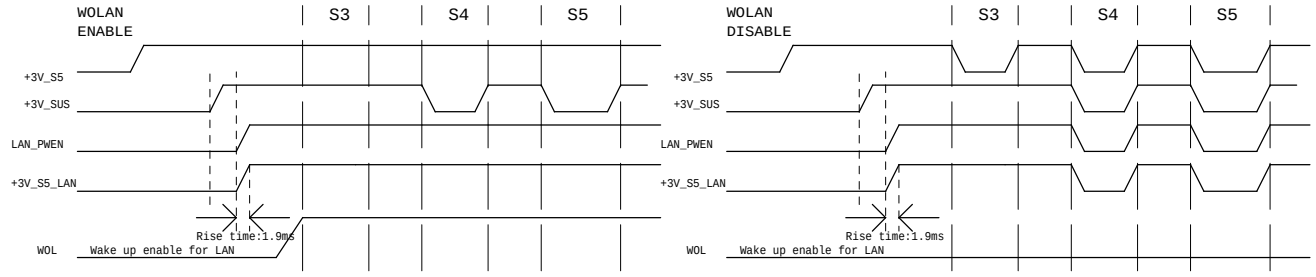
Quanta Computer Inc.
PROJECT : FFG
Size | Document Number: ASM1543 | Rev 1A
Date: Thursday, April 28, 2016 | Sheet 26 of 45


Digital
Analog
4/19 AR184 change to shortpad.
ALC286S-VC1
Digital
Analog
I:0.253A
Combo Jack
Quanta Computer Inc.
PROJECT : FFG
Audio Codec ALC286S-CG
Rev 1A
Date: Thursday, April 28, 2016
Sheet 27 of 45



Quanta Computer Inc.	
PROJECT : FFG	
Size	Document Number: Audio AMP(YDA148) — Rev 1A
Date: Thursday, April 28, 2016	Sheet 28 of 45





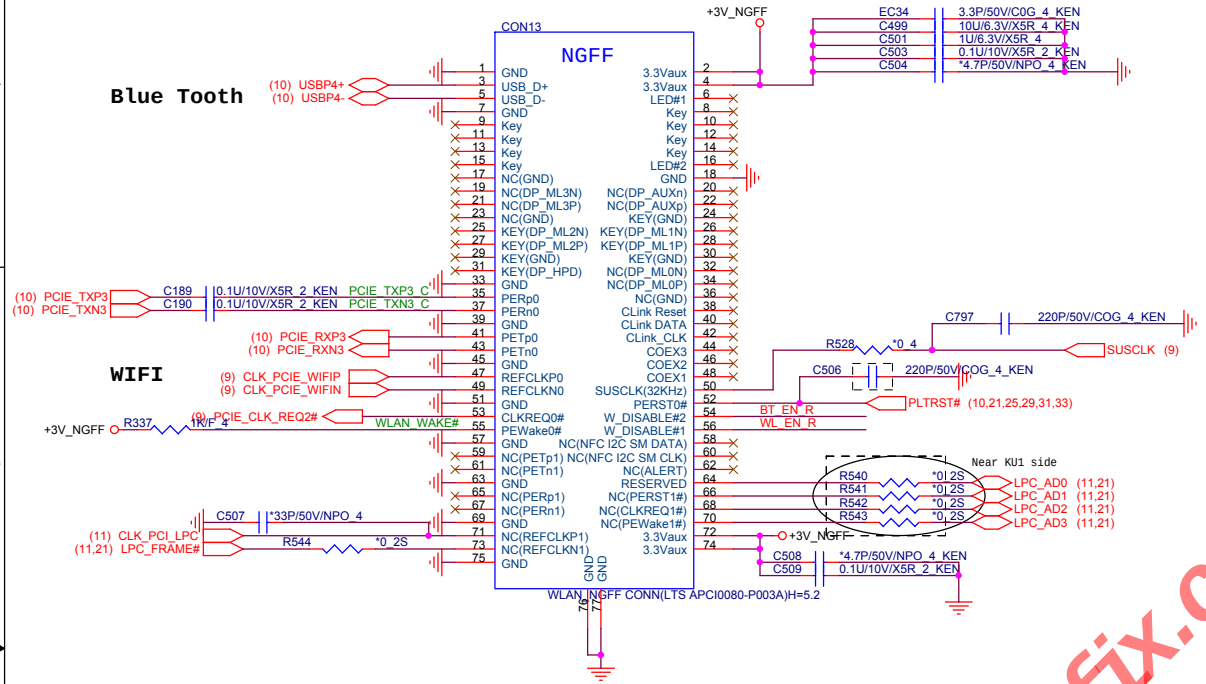
BIOS Setup	WOLAN DISABLE		WOLAN ENABLE	
	LAN_PWEN	WOL	LAN_PWEN	WOL
S3	H	H	H	H
S4	L	L	H	H
S5	L	L	H	H

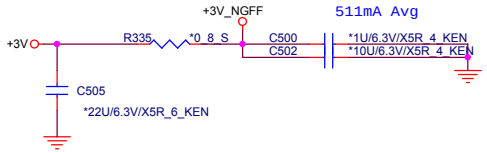
Quanta Computer Inc.
PROJECT : FFG

Size	Document Number	Rev
	Giga LAN RTL8111HS	1A
Date: Thursday, April 28, 2016	Sheet 29 of 45	

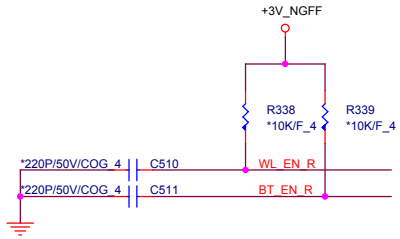
NGFF Wifi/BT

+3.3V_NGFF_WLAN Max Current : 1000mA



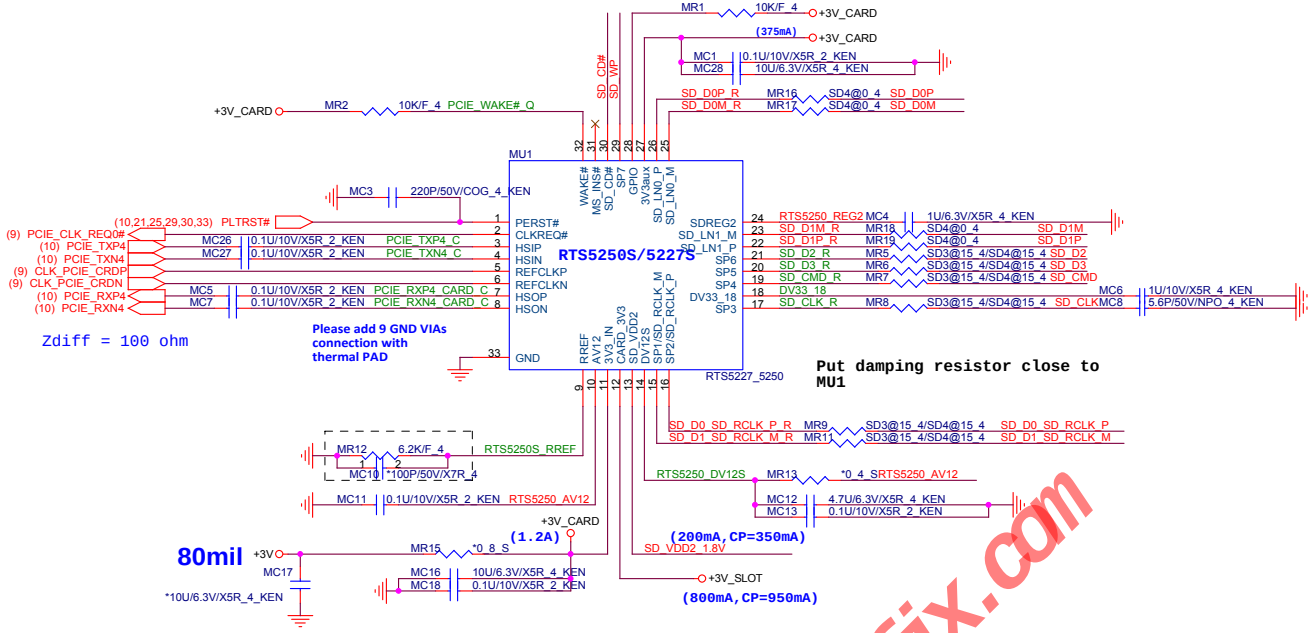


Don't support wake on WLAN from S3,S4,S5

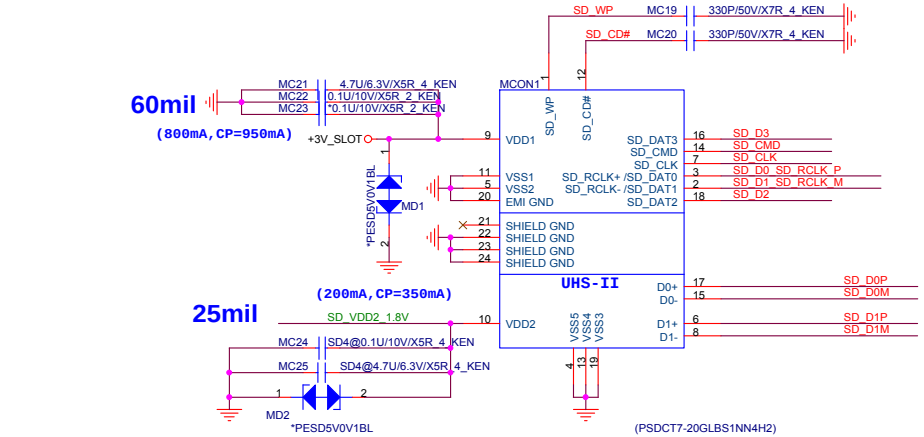


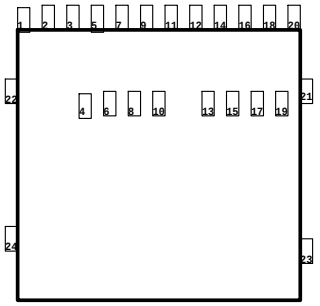
Quanta Computer Inc.
PROJECT : FFG

Size	Document Number	Rev
	WLAN	1A
Date: Thursday, April 28, 2016	Sheet 30 of 45	



SD 4.0 Connector





Quanta Computer Inc.		
PROJECT : FFG		
Size	Document Number	Rev
	CR RTS5250S & CR SOCKET	1A
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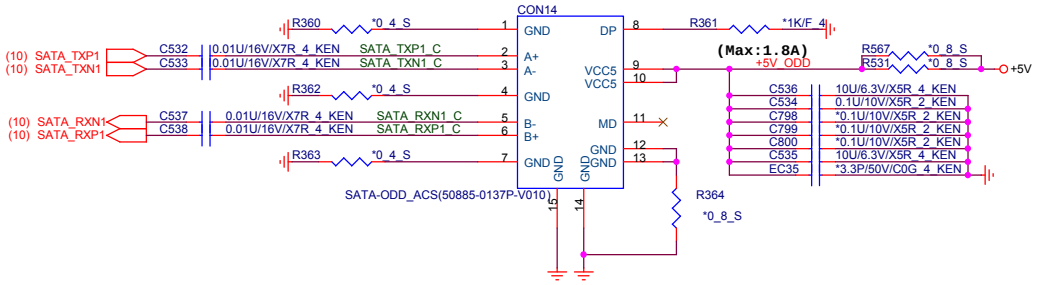
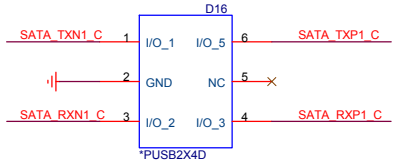
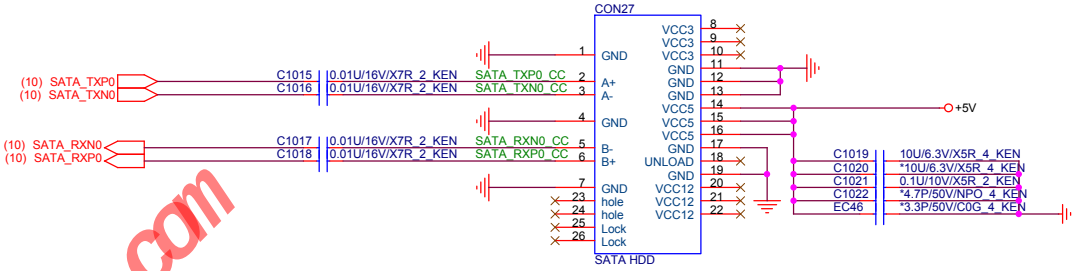
ODD CONNECTOR

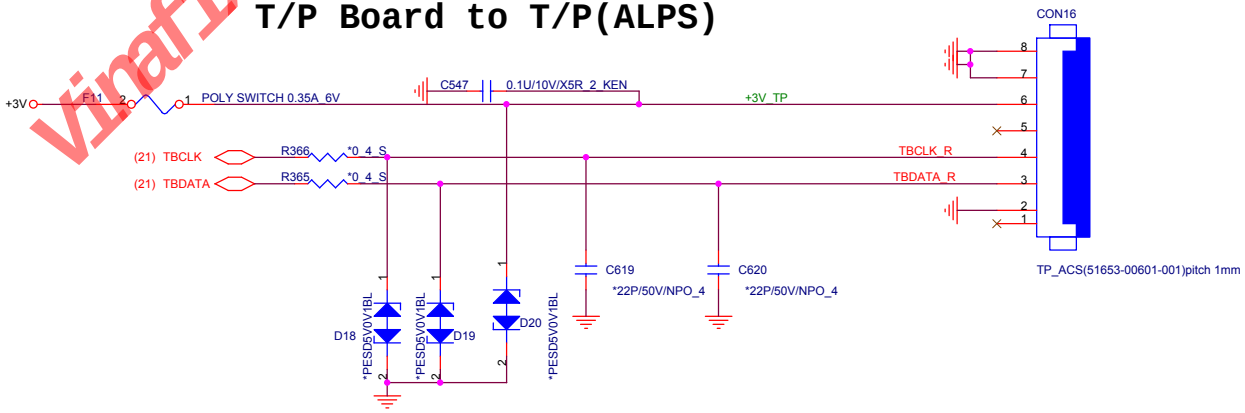




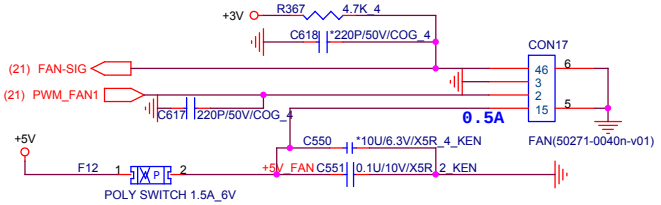
HDD CONNECTOR



T/P Board to T/P(ALPS)



FAN



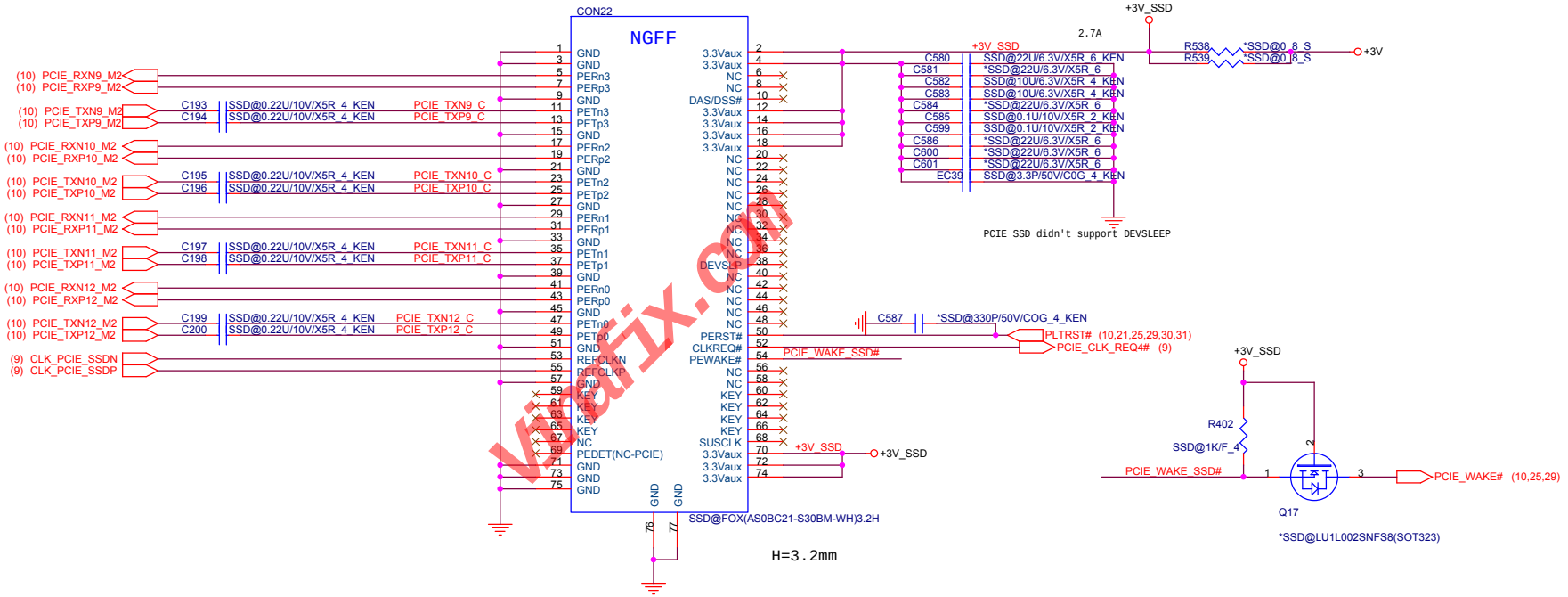
Quanta Computer Inc.
PROJECT : FFG

Size	Document Number	Rev
	HDD/ODD/TP/FAN	1A

Date: Thursday, April 28, 2016 Sheet 32 of 45

Peak
Current : 2.0A,120mil

SSD CONNECTOR (Type M)



Quanta Computer Inc.		
PROJECT : FFG		
Size	Document Number: SSD CON	Rev: 1A
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I@ is for U22
E@ is for U23e

Location	U22	U23	Note
PR9	4.02kohm	1.82kohm	GFX compensate
PC10	0.015uF	0.022uF	GFX Current sense nework
PC9	0.068uF	0.15uF	
PR43	2.87kohm		CORE compensate
PR30	120kohm	115kohm	CORE ICCMAX
PR31	82.5kohm	105kohm	GFX ICCMAX
PC39	N.I	0.01uF	VCCSA IOUT

Location	U22	U23	Note
3/2 update SPEC	Fsw=583kHz		
	CORE TDC=21A, MAX=32A OCP= Min:39.7A Max:54.7A Loadline=2.4mv/A	CORE TDC=23A, MAX=32A OCP= Min:39.7A Max:54.7A Loadline=2.4mv/A	
	GFX TDC=18A, MAX=31A OCP= Min:37.84A Max:46.77A Loadline=3.1mv/A	GFX TDC=40A, MAX=64A OCP= Min:71.76A Max:85.64A Loadline=2.0mv/A	
	VCCSA TDC=4A, MAX=5.1A OCP= Min:6.89A Max:10.83A Loadline=10.3mv/A	VCCSA TDC=5A, MAX=6A OCP= Min:6.89A Max:10.83A Loadline=10.3mv/A	
PR42	1.65kohm		CORE OCP and Loadline
PR49	316ohm		
PR11	1.91kohm	3.32kohm	GFX OCP and Loadline
PR5	316ohm	374ohm	
PR32	1.5kohm		VCCSA OCP and Loadline
PR24	348ohm		
PR58	34kohm	41.2kohm	PROG1
PR60	56.2kohm		PROG2
PR321 PR322	0ohm	N.I	1 Phase
PC2 PC5	N.I	0.022uF	1 Phase
PR34	137kohm	113kohm	VCCSA ICCMAX

4/26 PR11 change to I@1.91/E@3.32kohm
for meet 28W VRTT test

4/28 PR17 change from short pad
to 75 ohm.

Typ Setting= 105'C

Place NTC close to the VCORE Hot-Spot.

Place NTC close to the GFX_VCORE Hot-Spot.

Place NTC close to the GFX_CORE inductor

Place NTC close to the VCCSA inductor

Place NTC close to the VCORE inductor of phase 1

4/26 PC39 add 0.01uF for 28W Iout row test.

4/26 PR30 change to I@120kohm, E@115kohm
PR31 change to I@82.5kohm, E@105kohm
PR34 change to I@137kohm, E@113kohm
PR58 change to 34kohm
for meet VRTT test and ICCMAX change

PROG1
PR58 I@34K/F_4 / E@41.2K/F_4 95859-PROG1

PROG2
PR60 56.2K/F_4 95859-PROG2

Fsw Setting=583KHz
U22
VR_A: VCORE, Imax=33A
VR_B: GFXCORE, Imax=35A
VR_C: VCCSA, Imax=6A
U23
VR_A: VCORE, Imax=34A
VR_B: GFXCORE, Imax=67A
VR_C: VCCSA, Imax=7A

VCORE LL: -2.4mV/A

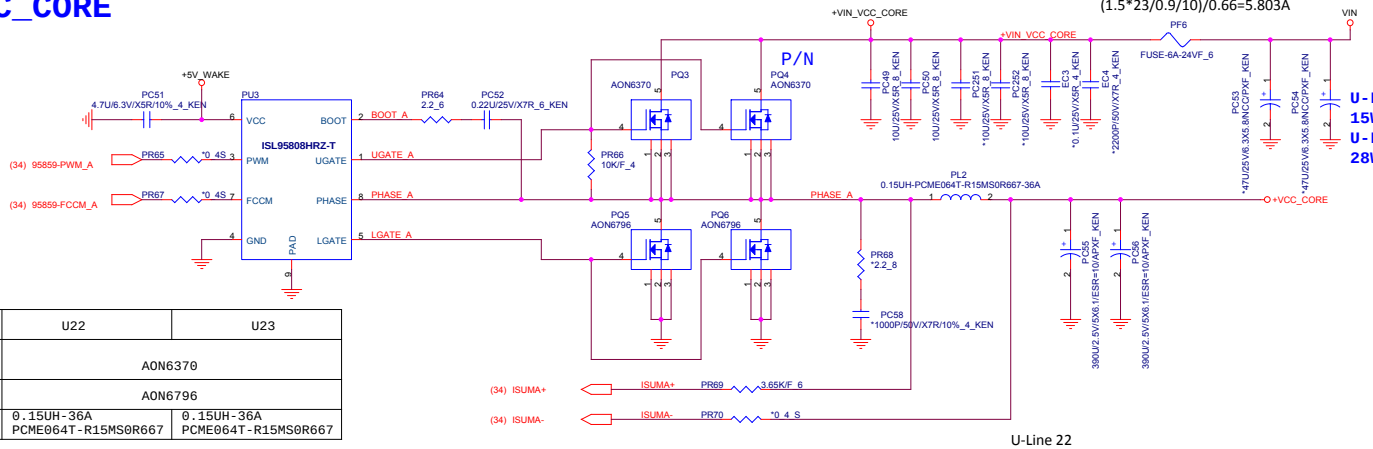
Fuse Rating=
IR(max)/(0.75*0.88)=
(1.15*6/0.9/10)/0.66=11.62A

U-Line 22
15W: TDC=4A, Max=5.1A
U-Line 23e
28w: TDC=5A, Max=6A

Quanta Computer Inc.
PROJECT : FFG
Size | Document Number: VCCORE/GTCORE/VCCSA (ISL95859) | Rev 1A
Date: Thursday, April 28, 2016 | Sheet 34 of 45

VCC_CORE

Fuse Rating=
IR(max)/(0.75*0.88)=
(1.5*23/0.9/10)/0.66=5.803A

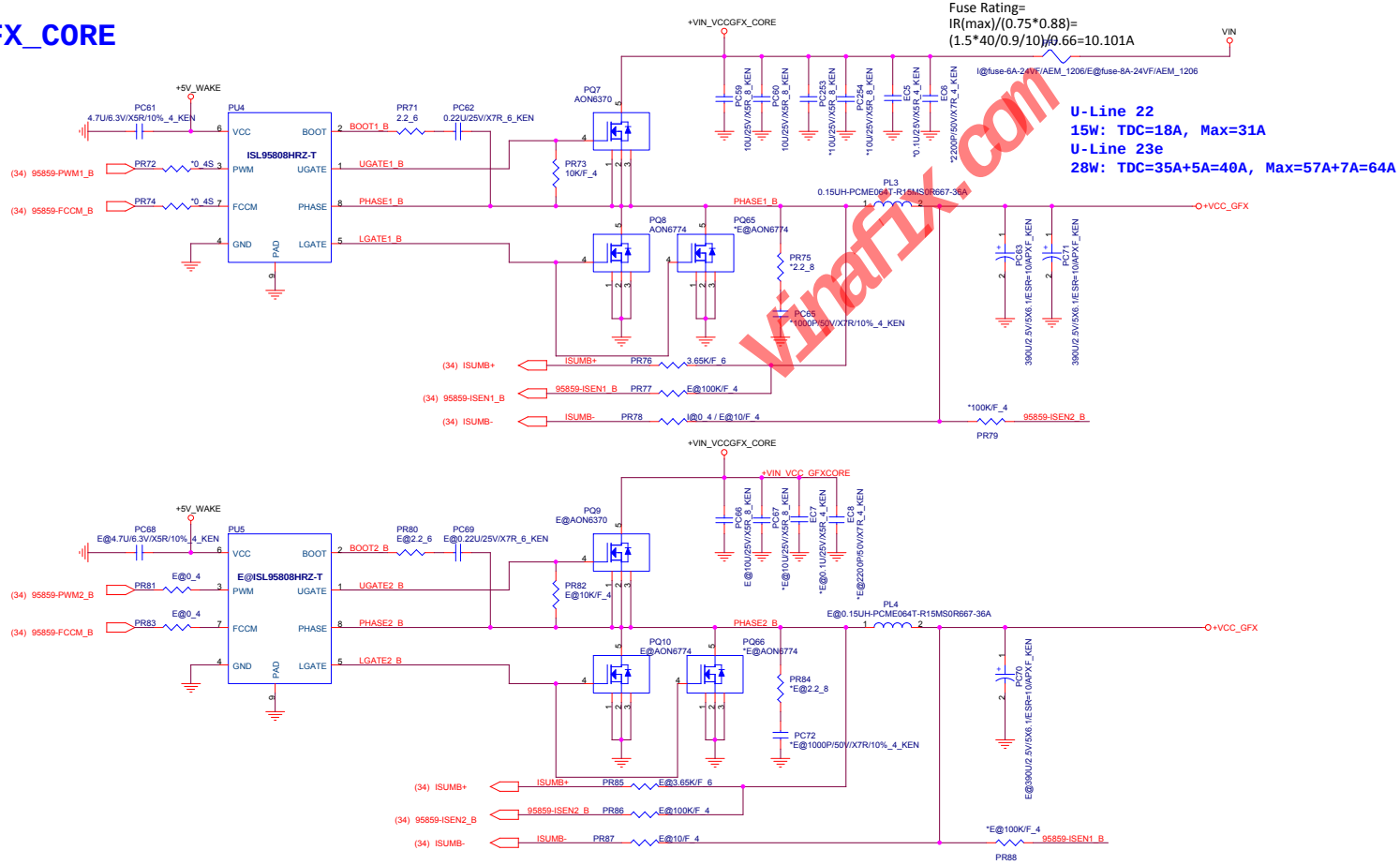


U-Line 22
15W: TDC=21A, Max=32A
U-Line 23e
28W: TDC=23A, Max=32A

Location	U22	U23
PQ3 PQ4	AON6370	
PQ5 PQ6	AON6796	
PL2	0.15UH-36A PCME064T-R15MS0R667	0.15UH-36A PCME064T-R15MS0R667

GFX_CORE

U-Line 22
Fuse Rating=
IR(max)/(0.75*0.88)=
(1.5*18/0.9/10)/0.66=4.545A
U-Line 23e
Fuse Rating=
IR(max)/(0.75*0.88)=
(1.5*40/0.9/10)/0.66=10.101A

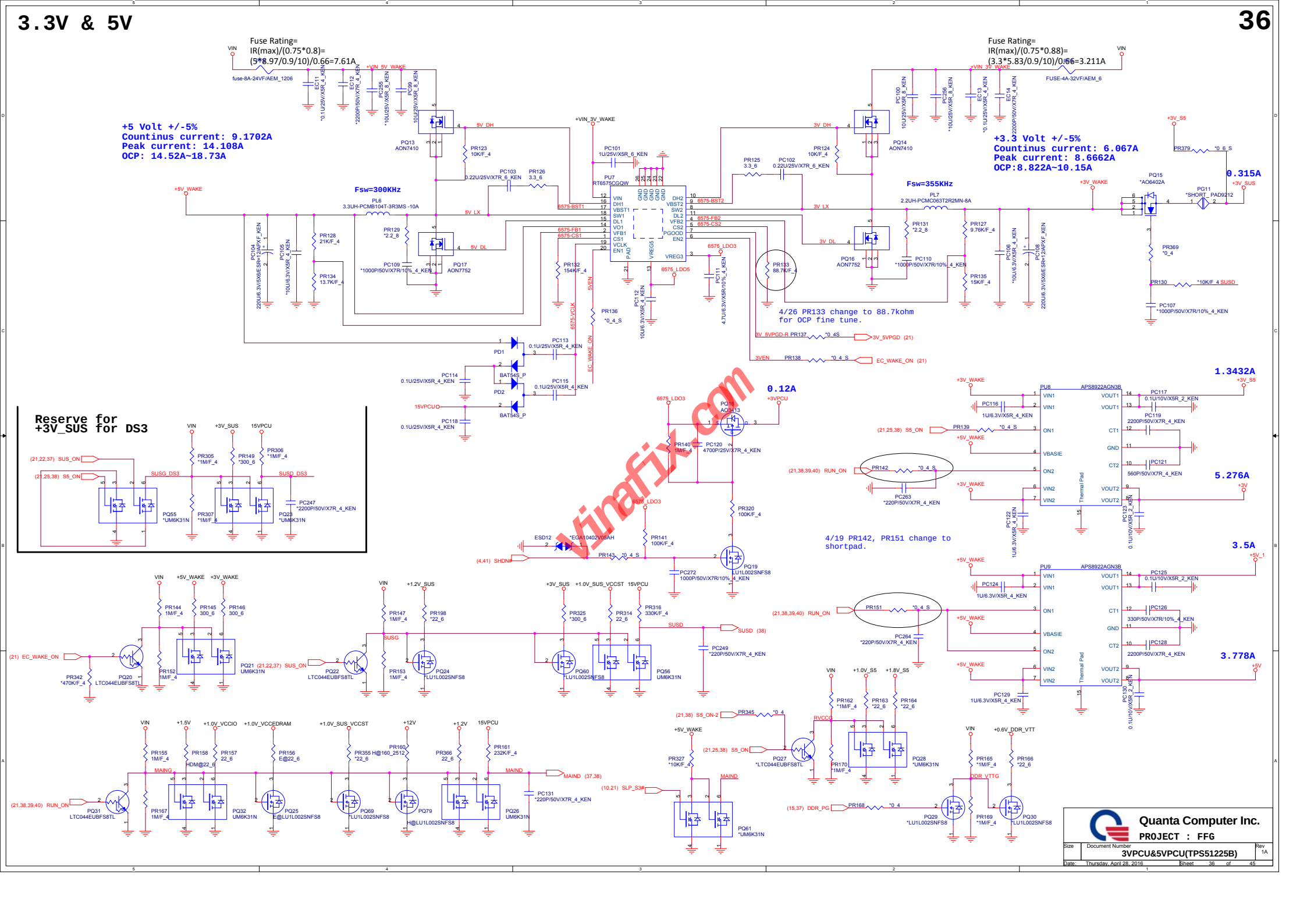


U-Line 22
15W: TDC=18A, Max=31A
U-Line 23e
28W: TDC=35A+5A=40A, Max=57A+7A=64A

1/11 update PC72,PR84,PQ65,PQ66,PF7 information

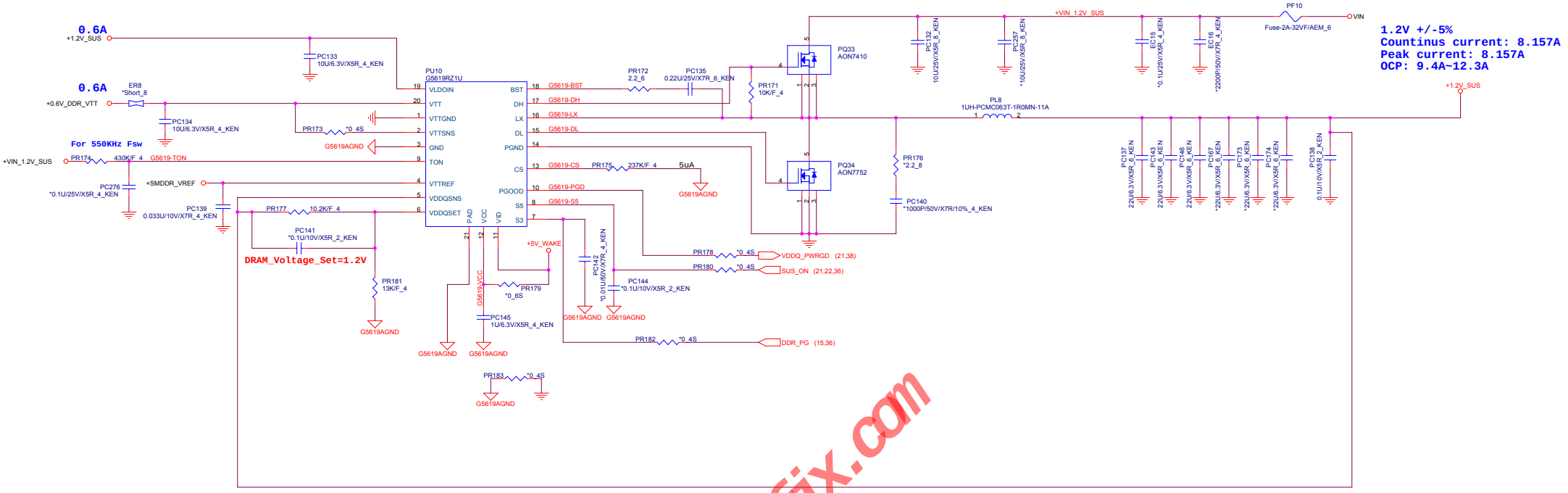
Location	U22	U23
PL3	0.15UH-36A PCME064T-R15MS0R667	0.15UH-36A PCME064T-R15MS0R667
PR77	Resere	100kohm
PR78	0ohm	10ohm
PL4	Resere	0.15UH-36A PCME064T-R15MS0R667
PC69	Resere	0.22U/25V/X5R_6_KEN
PR81,PR83	Resere	0_4
PR87	Resere	10/F_4
PC72	Resere	Resere
PR86	Resere	100K/F_4
PR82	Resere	10K/F_4
PC66	Resere	10U/25V/X5R_8_KEN
PC67	Resere	*10U/25V/X5R_8_KEN
PR80	Resere	2.2_6
PR84	Resere	Resere
PR85	Resere	3.65K/F_6
PC70,PC64	Resere	390U/2.5V/5X6.1/ ESR=10/APXF_KEN
PC68	Resere	4.7U/6.3V/X5R_4_KEN
PU5	Resere	ISL95808HRZ-T
PQ9	Resere	AON6370
PQ10	Resere	AON6774
PQ65,PQ66	Resere	Resere
PR88	Resere	*100K/F_4
EC7	Resere	*0.1U/25V/X5R_4_KEN
EC8	Resere	*2200P/50V/X7R_4_KEN
PF7	fuse-6A-24V	fuse-8A-24V

Quanta Computer Inc.
PROJECT : FFG
Size | Document Number: VCCORE/GTCORE/VCCSA (ISL95859) | Rev 1A
Date: Thursday, April 28, 2016 | Sheet 35 of 45


Fuse Rating=
IR(max)/(0.75*0.8)=
(5*8.97/0.9/10)/0.66=7.61A
fuse-8A-24VF/AEM_1206
+5 Volt +/-5%
Countinus current: 9.1702A
Peak current: 14.108A
OCP: 14.52A~18.73A
Fsw=300KHz
PL6
3.3UH-PCMB104T-3R3MS -10A
PQ13
AON7410
PQ17
AON7752
PU7
RT6575CGQW
6575-BST1
6575-FB1
6575-CS1
5V_DH
5V_LX
5V_DL
6575_LDO3
6575_LDO5
5VEN
6575_VCLK
EC_WAKE_ON
PD1
PD2
BAT54S_P
Fuse Rating=
IR(max)/(0.75*0.88)=
(3.3*5.83/0.9/10)/0.66=3.211A
FUSE-4A-32VF/AEM_6
+3.3 Volt +/-5%
Countinus current: 6.067A
Peak current: 8.6662A
OCP:8.822A~10.15A
Fsw=355KHz
PL7
2.2UH-PCMC063T2R2MN-8A
PQ14
AON7410
PQ16
AON7752
3V_DH
3V_LX
3V_DL
0.315A
PQ15
*AO6402A
PG11
*SHORT_PAD9212
4/26 PR133 change to 88.7kohm
for OCP fine tune.
3V_5VPGD-R PR137
3V_5VPGD (21)
3VEN
PR138
EC_WAKE_ON (21)
0.12A
PQ18
AO3413
PR140
1M/F_4
PC120
4700P/25V/X7R_4_KEN
PR320
100K/F_4
PR141
100K/F_4
PQ19
LU1L002SNFS8
PC272
1000P/50V/X7R/10%_4_KEN
ESD12
*EGA10402V05AH
PR143
*0_4_S
(4,41) SHDN#
1.3432A
PU8
APS8922AGN3B
PC116
1U/6.3V/X5R_4_KEN
PC117
0.1U/10V/X5R_2_KEN
PC119
2200P/50V/X7R_4_KEN
PC121
560P/50V/X7R_4_KEN
PR139
*0_4_S
(21,25,38) S5_ON
PR142
*0_4_S
(21,38,39,40) RUN_ON
PC263
*220P/50V/X7R_4_KEN
PC122
1U/6.3V/X5R_4_KEN
PC123
0.1U/10V/X5R_2_KEN
5.276A
4/19 PR142, PR151 change to
shortpad.
PU9
APS8922AGN3B
PR151
*0_4_S
PC264
*220P/50V/X7R_4_KEN
PC124
1U/6.3V/X5R_4_KEN
PC125
0.1U/10V/X5R_2_KEN
PC126
330P/50V/X7R/10%_4_KEN
PC128
2200P/50V/X7R_4_KEN
PC129
1U/6.3V/X5R_4_KEN
PC130
0.1U/10V/X5R_2_KEN
3.5A
3.778A
Reserve for
+3V_SUS for DS3
PQ55
*UM6K31N
PQ23
*UM6K31N
PC247
*2200P/50V/X7R_4_KEN
PQ21 (21,22,37) SUS_ON
UM6K31N
PQ20
LTC044EUBFS8TL
PQ22
LTC044EUBFS8TL
PQ24
*LU1L002SNFS8
PQ60
*LU1L002SNFS8
PQ56
UM6K31N
PQ31
LTC044EUBFS8TL
PQ32
UM6K31N
PQ25
E@LU1L002SNFS8
PQ69
*LU1L002SNFS8
PQ79
H@LU1L002SNFS8
PQ26
UM6K31N
PQ61
*UM6K31N
PQ27
*LTC044EUBFS8TL
PQ28
*UM6K31N
PQ29
*LU1L002SNFS8
PQ30
*LU1L002SNFS8
MAIN (37,38)
(10,21) SLP_S3#
(15,37) DDR_PG
Quanta Computer Inc.
PROJECT : FFG
Size
Document Number
3VPCU&5VPCU(TPS51225B)
Rev
1A
Date: Thursday, April 28, 2016
Sheet 36 of 45

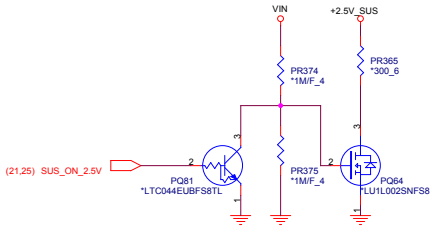
1.2VSUS & VTT_MEM

Fuse Rating=
IR(max)/(0.75*0.88)=
(1.2*8.062/0.9/10)/0.66=1.684A



STATE	S3	S5	1.35VSUS	VTTREF	VTT
S0	1	1	On	On	On
S3	0	1	On	On	Off/High Z
S4/S5	0	0	Off	Off	Off

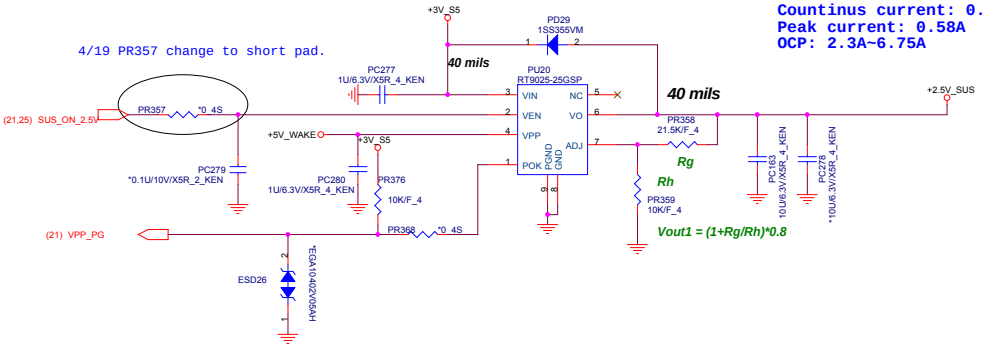
12/11 Change 2.5V_SUS discharge circuit



+2.5V_SUS

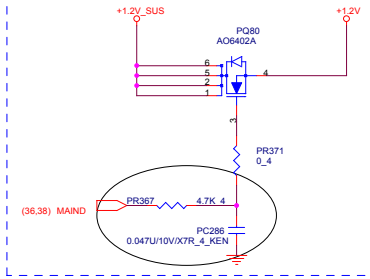
2.5V +/- 5%
Countinus current: 0.58A
Peak current: 0.58A
OCP: 2.3A~6.75A

4/19 PR357 change to short pad.



+1.2V

Max: 1.137A



4/19 PR367 from 0 ohm to 4.7K. PC286 from un-mount to mount 0.047UF for MCDP2800-BC timing.

Quanta Computer Inc.
PROJECT : FFG

Size	Document Number	Rev
	1.35VSUS/VTT_MEM	1A

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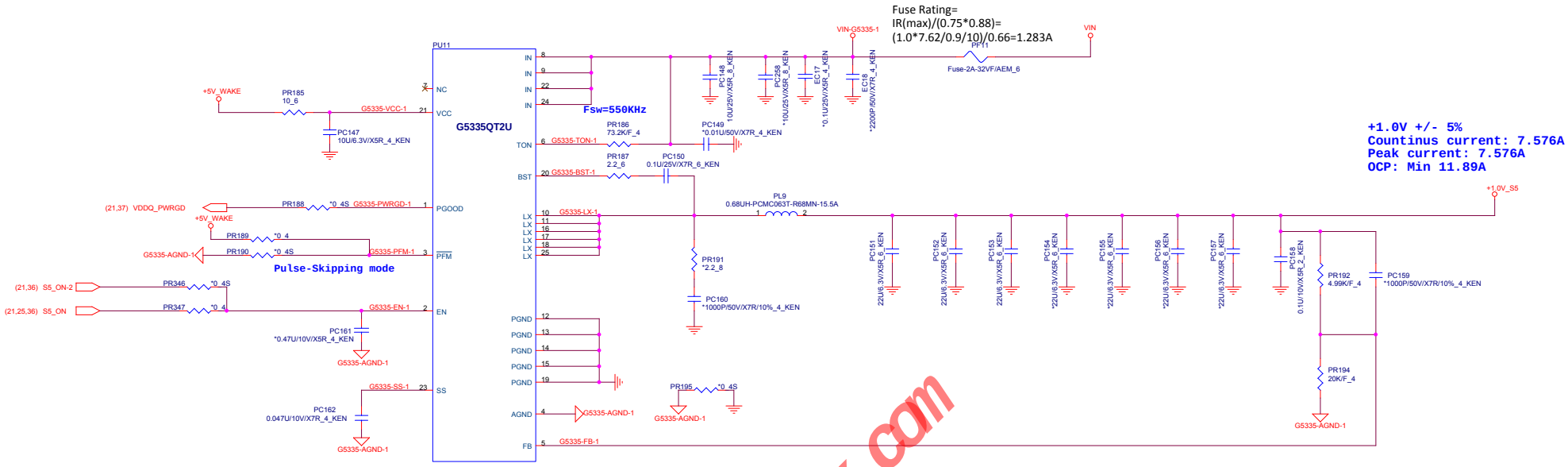
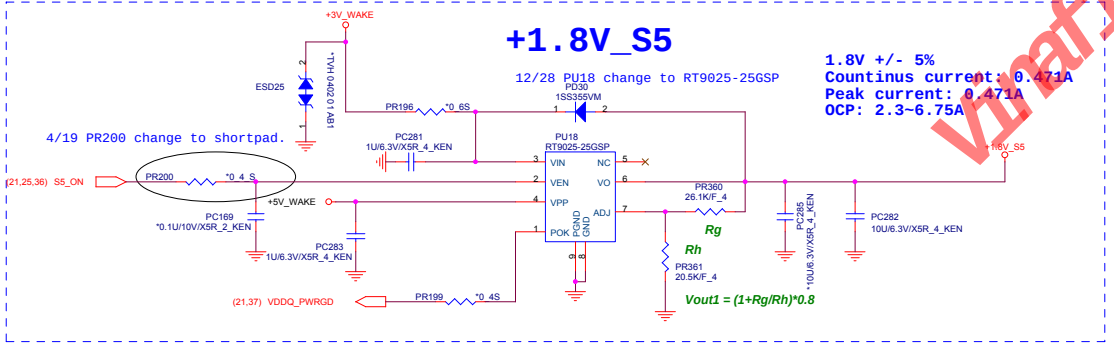
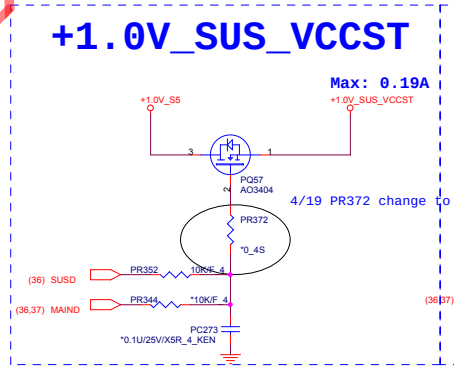
+1.0V_S5



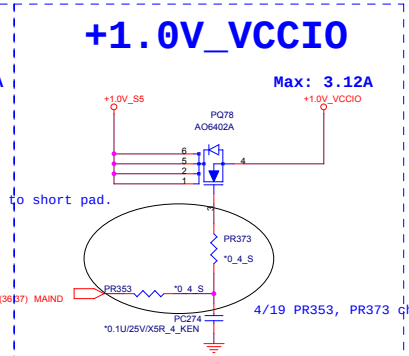
+1.8V_S5



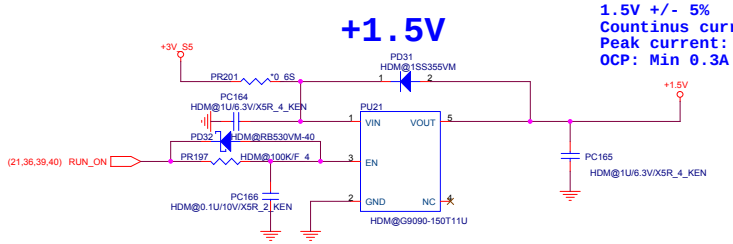
+1.0V_SUS_VCCST



+1.0V_VCCIO

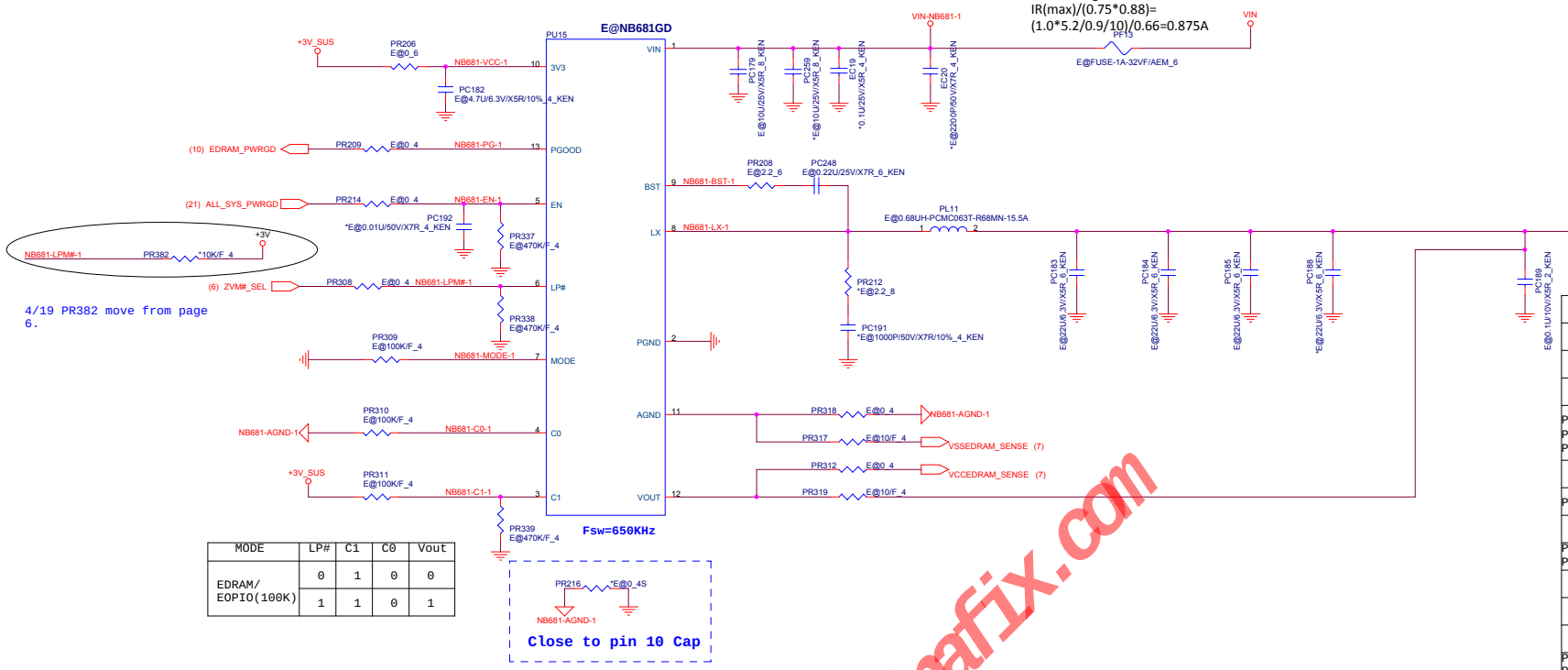


+1.5V



Quanta Computer Inc.		
PROJECT : FFG		
Size	Document Number: +1.0V_S5 / +1.8V_S5 / +1.8V / +1.5V	Rev: 1A
Date: Thursday, April 28, 2016	Sheet 38 of 45	

+1.0V_VCCEDRAM



+1.0V +/- 5%
Countinus current: 5.2A
Peak current: 5.2A
OCP: Min 7.78A, Max 9.6A

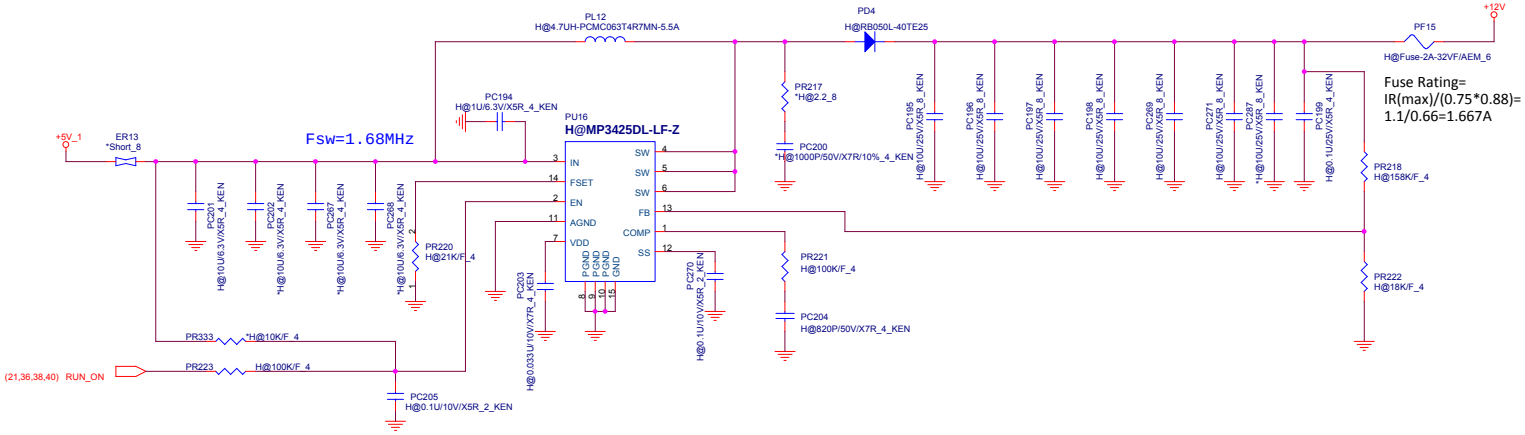
4/19 PR382 move from page 6.

4/27 PR377 remove.

MODE	LP#	C1	C0	Vout
EDRAM/ EOPIO(100K)	0	1	0	0
	1	1	0	1

Location	U22	U23
PC189	Resere	0.1U/10V/X5R_4_KEN
PC248	Resere	0.22U/25V/X5R_6_KEN
PL11	Resere	0.68UH-15.5A PCMC063T-R68MN
PR209,PR214 PR308,PR312 PR318	Resere	0_4
PR206	Resere	0_6
PR317,PR319	Resere	10/F_4
PC191	Resere	Resere
PR309,PR310 PR311	Resere	100K/F_4
PC179	Resere	10U/25V/X5R_8_KEN
PR208	Resere	2.2_6
PR212	Resere	Resere
PC183,PC184 PC185	Resere	22U/6.3V/X5R_6_KEN
PC182	Resere	4.7U/6.3V/X5R_4_KEN
PF13	Resere	FUSE-1A-32VF/AEM_6
PU15	Resere	NB681GD
EC20	Resere	Resere
EC19	Resere	Resere
PC259	Resere	*10U/25V/X5R_8_KEN
PC192	Resere	*0.01U/25V/X7R_4_KEN
PC188	Resere	*22U/6.3V/X5R_6_KEN
PR337,PR338 PR339	Resere	470k/F_4

+12V for Audio AMP



12V +/- 5%
Countinus current: 1.1A
Peak current: 1.1A
OCP:1.124~2.038A

Fuse Rating=
IR(max)/(0.75*0.88)=
1.1/0.66=1.667A

Quanta Computer Inc.
PROJECT : FFG

Size	Document Number	Rev
	+1.0V_VCCEDRAM / +12V	1A

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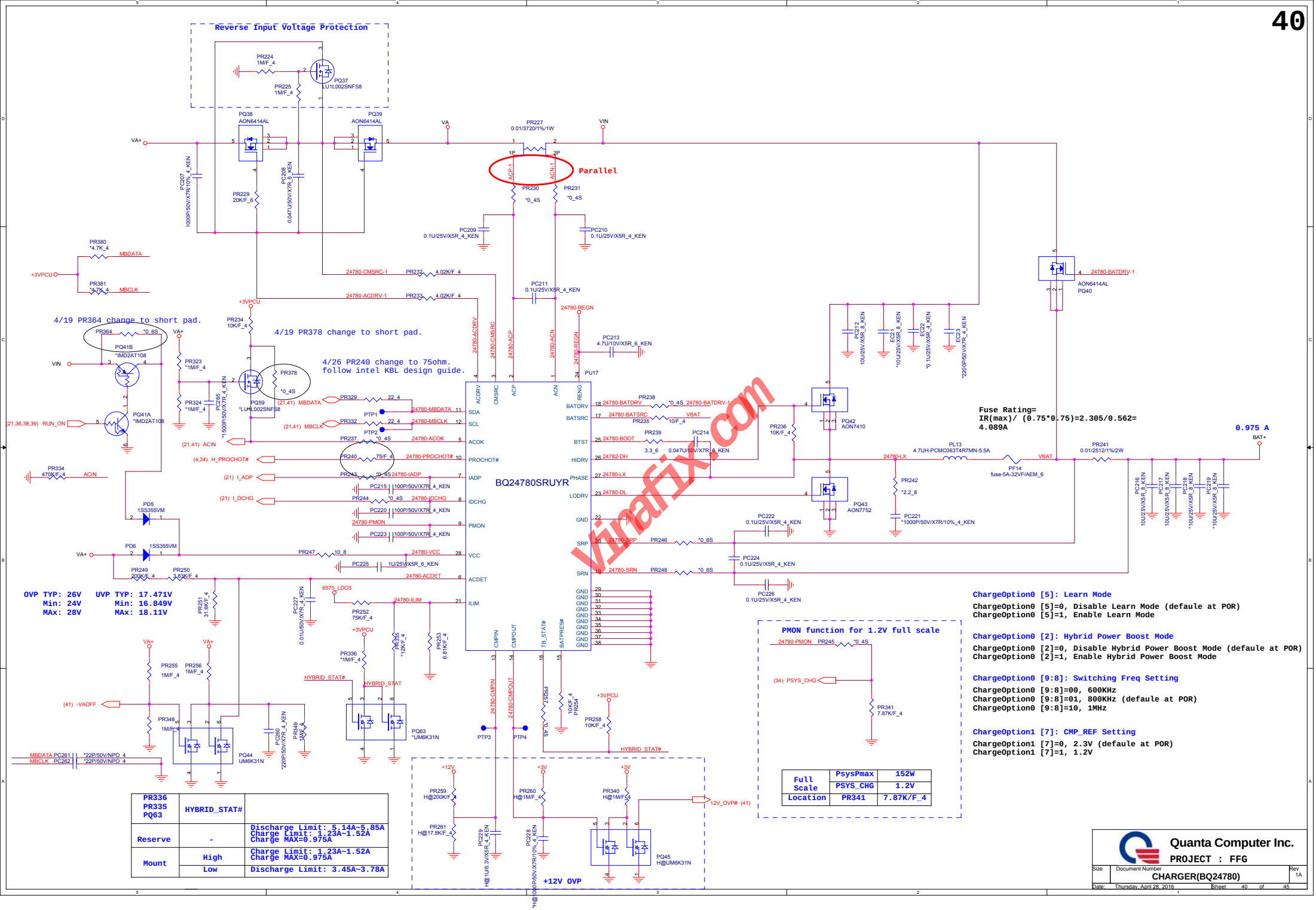
Reverse Input Voltage Protection
PR224 1M/F_4
PR225 1M/F_4
PQ37 LU1L002SNFS8
PQ38 AON6414AL
PQ39 AON6414AL
VA+
VA
VIN
PR227 0.01/3720/1%/1W
1P
2P
ACP-1
ACN-1
Parallel
PR230 *0_4S
PR231 *0_4S
PC209 0.1U/25V/X5R_4_KEN
PC210 0.1U/25V/X5R_4_KEN
PC207 1000P/50V/X7R/10%_4_KEN
PC208 0.047U/50V/X7R_6_KEN
PR229 20K/F_6
PR380 *4.7K_4
PR381 *4.7K_4
MBDATA
MBCLK
+3VPCU
24780-CMSRC-1
PR232 4.02K/F_4
24780-ACDRV-1
PR233 4.02K/F_4
PC211 0.1U/25V/X5R_4_KEN
24780-REGN
PC213 4.7U/10V/X5R_6_KEN
4/19 PR364 change to short pad.
PR364 *0_6S
PQ41B *IMD2AT108
PQ41A *IMD2AT108
(21,36,38,39) RUN_ON
PR234 10K/F_4
4/19 PR378 change to short pad.
4/26 PR240 change to 75ohm.
follow intel KBL design guide.
PR378 *0_4S
PQ59 *LUHL002SNFS8
PR323 *1M/F_4
PR324 *1M/F_4
PC205 *1500P/50V/X7R_4_KEN
PR334 470K/F_4
ACIN
PD5 1SS355VM
PD6 1SS355VM
PR249 200K/F_4
PR250 3.83K/F_4
PR251 31.6K/F_4
PC227 0.01U/50V/X7R_4_KEN
6575_LDO3
PR252 75K/F_4
24780-ILIM
PR253 6.81K/F_4
PR335 *12K/F_4
PR336 *1M/F_4
HYBRID_STAT#
HYBRID_STAT
PQ63 *UM6K31N
PR255 1M/F_4
PR256 1M/F_4
(41) -VAOFF
PR348 1M/F_4
PR349 10K/F_4
PC260 *220P/50V/X7R_4_KEN
PQ44 UM6K31N
MBDATA PC261 *22P/50V/NPO_4
MBCLK PC262 *22P/50V/NPO_4
(21,41) MBDATA
(21,41) MBCLK
(21,41) ACIN
(4,34) H_PROCHOT#
(21) I_ADP
(21) I_DCHG
PR329 22_4
PR332 22_4
PR237 *0_4S
PR240 75/F_4
PR243 *0_4S
PR244 *0_4S
PTP1
PTP2
24780-MBDATA
24780-MBCLK
24780-ACOK
24780-PROCHOT#
24780-IADP
24780-IDCHG
24780-PMON
24780-VCC
24780-ACDET
PC215 100P/50V/X7R_4_KEN
PC220 100P/50V/X7R_4_KEN
PC223 100P/50V/X7R_4_KEN
PR247 10_8
PC225 1U/25V/X5R_6_KEN
ACDRV
CMSRC
ACP
ACN
REGN
SDA
SCL
ACOK
PROCHOT#
IADP
IDCHG
PMON
VCC
ACDET
ILIM
CMPIN
CMPOUT
TB_STAT#
BATPRES#
BQ24780SRUYR
PU17
BATDRV
BATSRC
BTST
HIDRV
PHASE
LODRV
GND
SRP
SRN
24780-BATDRV
24780-BATSRC
24780-BOOT
24782-DH
24780-LX
24780-DL
24780-SRP
24780-SRN
PR238 *0_4S
PR235 10/F_4
VBAT
PR239 3.3_6
PC214 0.047U/50V/X7R_6_KEN
PR246 *0_6S
PR248 *0_6S
PC222 0.1U/25V/X5R_4_KEN
PC224 0.1U/25V/X5R_4_KEN
PC226 0.1U/25V/X5R_4_KEN
PQ42 AON7410
PQ43 AON7752
PR236 10K/F_4
PR242 *2.2_8
PC221 *1000P/50V/X7R/10%_4_KEN
PC212 10U/25V/X5R_8_KEN
EC21 *10U/25V/X5R_8_KEN
EC22 *0.1U/25V/X5R_4_KEN
EC23 *220P/50V/X7R_4_KEN
PQ40 AON6414AL
24780-BATDRV-1
Fuse Rating=
IR(max)/ (0.75*0.75)=2.305/0.562=
4.089A
0.975 A
PL13 4.7UH-PCMC063T4R7MN-5.5A
PF14 fuse-5A-32VF/AEM_6
PR241 0.01/2512/1%/2W
BAT+
PC216 10U/25V/X5R_8_KEN
PC217 10U/25V/X5R_8_KEN
PC218 *10U/25V/X5R_8_KEN
PC219 *10U/25V/X5R_8_KEN
OVP TYP: 26V
Min: 24V
MAx: 28V
UVP TYP: 17.471V
Min: 16.849V
MAx: 18.11V
PMON function for 1.2V full scale
24780-PMON PR245 *0_4S
(34) PSYS_CHG
PR341 7.87K/F_4
Full Scale
PsysPmax 152W
PSYS_CHG 1.2V
Location PR341 7.87K/F_4
ChargeOption0 [5]: Learn Mode
ChargeOption0 [5]=0, Disable Learn Mode (defaule at POR)
ChargeOption0 [5]=1, Enable Learn Mode
ChargeOption0 [2]: Hybrid Power Boost Mode
ChargeOption0 [2]=0, Disable Hybrid Power Boost Mode (defaule at POR)
ChargeOption0 [2]=1, Enable Hybrid Power Boost Mode
ChargeOption0 [9:8]: Switching Freq Setting
ChargeOption0 [9:8]=00, 600KHz
ChargeOption0 [9:8]=01, 800KHz (defaule at POR)
ChargeOption0 [9:8]=10, 1MHz
ChargeOption1 [7]: CMP_REF Setting
ChargeOption1 [7]=0, 2.3V (defaule at POR)
ChargeOption1 [7]=1, 1.2V
PR336 PR335 PQ63 HYBRID_STAT#
Reserve - Discharge Limit: 5.14A~5.85A Charge Limit: 1.23A~1.52A Charge MAX=0.975A
Mount High Charge Limit: 1.23A~1.52A Charge MAX=0.975A
Low Discharge Limit: 3.45A~3.78A
+12V
+3V
PR259 H@200K/F_4
PR261 H@17.8K/F_4
PR260 H@1M/F_4
PR340 H@1M/F_4
PC229 H@1U/6.3V/X5R_4_KEN
PC228 H@1000P/50V/X7R/10%_4_KEN
PQ45 H@UM6K31N
12V_OVP# (41)
+12V OVP
Quanta Computer Inc.
PROJECT : FFG
Size
Document Number
CHARGER(BQ24780)
Rev 1A
Date: Thursday, April 28, 2016
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AC IN

AC ADAPTOR IN CONN

Fuse Rating=
IR(max)/ (0.75*0.88)=3.47/0.66= 5.258A

50320-0060N-001

PCN1

VAIN+

VAIN-

PF1

FUSE-6A-24VF_6

PC238 0.1U/50V/X7R_6_KEN

PC239 0.1U/50V/X7R_6_KEN

PL14 *Short_8

PL15 *Short_8

PL16 *Short_8

PL17 *Short_8

240mil

PC240 0.1U/50V/X7R_6_KEN

PD14 PTVS22VP1UP

PD16 PTVS22VP1UP

VA+

4/26 Add 0.1uF for EMI.

+3VPCU

PR276 750/F_4

ADP_ID

ADP_ID (21)

PC235 *0.01U/50V/X7R_4_KEN

Close to PCN1

Thermal Protection

VA+

BAT+

PD8 1SS355VM

PD12 1SS355VM

PR263 100K/F_4

PD9 1SS355VM

PD11 1SS355VM

PD10 1SS355VM

PD13 1SS355VM

SHDN# (4,36)

VAOFF (40)

PQ47 PMBT3906

PC232 0.1U/25V/X7R_6_KEN

PR265 2K/F_4

PR274 10K/F_6

PR326 4.87K/F_4

PR264 4.87K/F_4

PR267 12K_6

PR268 12K_6

PR269 12K_6

PR270 12K_6

PR271 12K_6

PD18 UDZVTE-175.1B

PR272 390K/F_4

PD17 1SS355VM

PR273 100K/F_4

PC233 10U/6.3V/X5R_4_KEN

PC234 22U/6.3V/X5R_6_KEN

PQ48 LU1L002SNFS8

PR281~PR291 are PRF15BB102RB6RC for FET OTP
PR292 is PRF15BB102RB6RC for CPU OTP

2/24 Reserve ESD27 for 6575_LDO3

PD19 H@1SS355VM

(40) 12V_OVP#

6575_LDO3

ESD27

*EGA10402V05AH

PR278 16.9K/F_4

PR279 16.9K/F_4

PR280 16.9K/F_4

Close PQ7, PQ8 (+VCC_GFX)

Close PQ4, PQ6, PQ9 (+VCC_CORE/+VCC_GFX)

Close PQ1, PQ2 (+VCCSA)

Close PQ3, PQ5, PQ10 (+VCC_CORE/+VCC_GFX)

PR281 1K/PTC_4

PR284 1K/PTC_4

PR287 1K/PTC_4

PR290 1K/PTC_4

PQ49 LU1L002SNFS8

PC236 330P/50V/X7R/10%_4_KEN

Close PQ14, PQ16 (+3V_WAKE)

Close PQ13, PQ17 (+5V_WAKE)

Close PQ33, PQ34 (+1.35V_SUS)

Close PQ42, PQ43 (Charge)

PR282 1K/PTC_4

PR285 1K/PTC_4

PR288 1K/PTC_4

PR291 1K/PTC_4

PQ50 LU1L002SNFS8

PC237 330P/50V/X7R/10%_4_KEN

Close PQ38 (ADP IN)

Close PQ40, PQ39 (BATT IN)

Close CPU

PR283 1K/PTC_4

PR286 1K/PTC_4

PR289 1K/F_4

PR292 1K/PTC_4

PQ51 LU1L002SNFS8

PC238 330P/50V/X7R/10%_4_KEN

Adapter Discharge

VA+

PR295 1M/F_4

PR293 160_2512

PR296 160_2512

PR297 1M/F_4

PC240 4.7U/16V/X5R_6_KEN

PQ53 UM6K31N

(21,40) ACIN

PR351 *0_4_S

Shipping Mode

+3VPCU

PR331 100K/F_4

PR298 1K/F_4

SHIP_MODE# (21)

SYS_PRS#

PR294 *1M/F_4

PC239 1000P/50V/X7R/10%_4_KEN

Shipping Mode(Nornal Open)

SHIPSW1

SPVR110100

PR350 100K/F_4

D35 *PESD5V0F1BL

PQ52 UM6K31N

	SYS_PRS#	Battery output FET
DIMM COVER mount	L	ON
DIMM COVER NO mount	H	OFF

P_MBAT

PCN2

50477-01001-V01

P_DATA

P_CLK

PR302 *0_4_S

PR303 1K/F_4

SYS_PRS#

PR300 15_4

PR301 15_4

PC244 10P/50V/COG_4_KEN

PC243 10P/50V/COG_4_KEN

PC245 0.01U/50V/X7R_4_KEN

PD23 *PDZ5.6B

PD24 *PDZ5.6B

PD25 *PDZ5.6B

Fuse Rating =
IR(max) /(0.75*0.88)
60W/10V / 0.66 =9.091A

PF2

fuse-10A-24VF/AEM_1206

BAT+

MBDATA (21,40)

MBCLK (21,40)

PC241 0.1U/25V/X7R_6_KEN

PC242 0.1U/25V/X7R_6_KEN

PD28 *TDZVTR22(19.8-24.2)

+3VPCU

PR304 220K_4

BAT_PRS# (21)

PC246 0.01U/50V/X7R_4_KEN

Close to EC side

4/19 PR300, PR301 change from 0 ohm to 15 ohm from PP stage for serge consideration.

4/19 PC243, PC244 change from 47P to 10P.

BAT_PRS# = HI	Battery Absent
BAT_PRS# = LOW	Battery Present

Quanta Computer Inc.
PROJECT : FFG

Size | Document Number: ADP IN / BAT IN / Thermal Protection | Rev 1A

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OS status	S0	S3		(Soft OFF)	(Soft OFF)	(Soft OFF)	(Soft OFF)	(Soft OFF)
H/W status	S0	S3		S4 (Win8 off) RTC wake Enable WOLAN Enable	S4 (Win8 off) RTC wake Disable WOLAN Disable	S5 Charge Enable	S5 Charge Disable WoL Disable	S5 WoL Enable
RUN_ON	H	L		L	L	L	L	L
+3V	H	L		L	L	L	L	L
+5V	H	L		L	L	L	L	L
+0.675V_DDR_VTT	H	L		L	L	L	L	L
+12V	H	L		L	L	L	L	L
+1.5V	H	L		L	L	L	L	L
+1.0V_VCCEDRAM	H	L		L	L	L	L	L
+VCCSA	H	L		L	L	L	L	L
+VCC_GFX	H	L		L	L	L	L	L
+VCC_CORE	H	L		L	L	L	L	L
+1.0V_VCCIO(+1.0V_VCCSTG)	H	L		L	L	L	L	L
SUS_ON	H	H		L	L	L	L	L
+5V_SUS	H	H		L	L	L	L	L
+3V_SUS	H	H		L	L	L	L	L
+1.2V_SUS	H	H		L	L	L	L	L
SUS_ON_2.5V	H	H		L	L	L	L	L
+2.5V_SUS	H	H		L	L	L	L	L
S5_ON	H	H		H	L	L	L	H
+1.8V_S5(+1.8V_S5_VEDRAM)	H	H		H	L	L	L	H
+3V_S5	H	H		H	L	L	L	H
+1.0V_S5	H	H		H	L	L	L	H
EC_WAKE_ON	H	H		H	L	H	L	H
+3V_WAKE	H	H		H	L	H	L	H
+5V_WAKE	H	H		H	L	H	L	H

(+1.0V_S5:For VCCPRIM_ CORE/VCCPRIM_1P /VCCMPHYAON_1P /VCCMPHYGT/VCCAMPHYPLL/ VCCAPLL/VCCSRAM/VCCCLK1~6)/VCCST/VCCPLL

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	POWER MAP	1A

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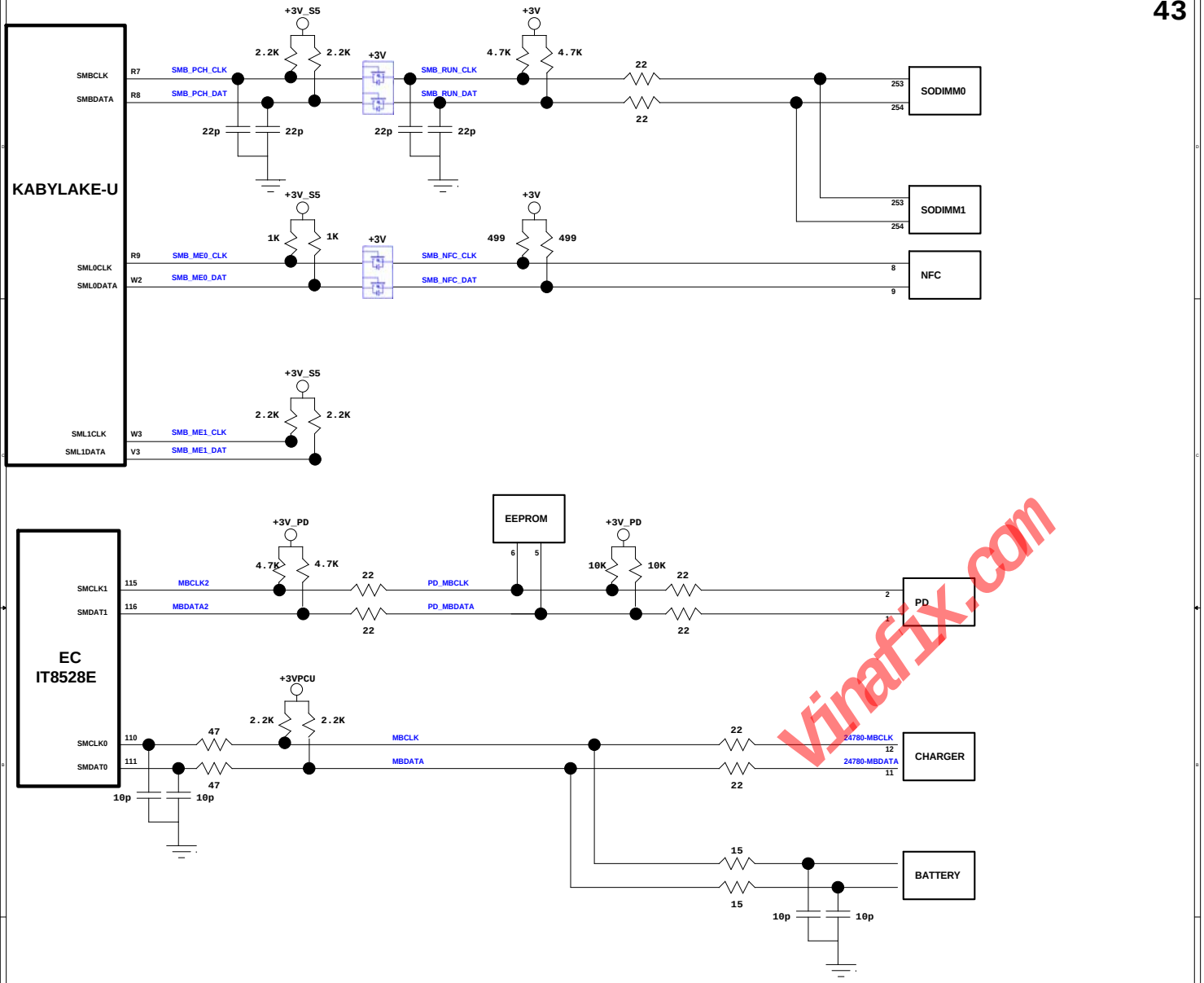

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	SMBUS	1A
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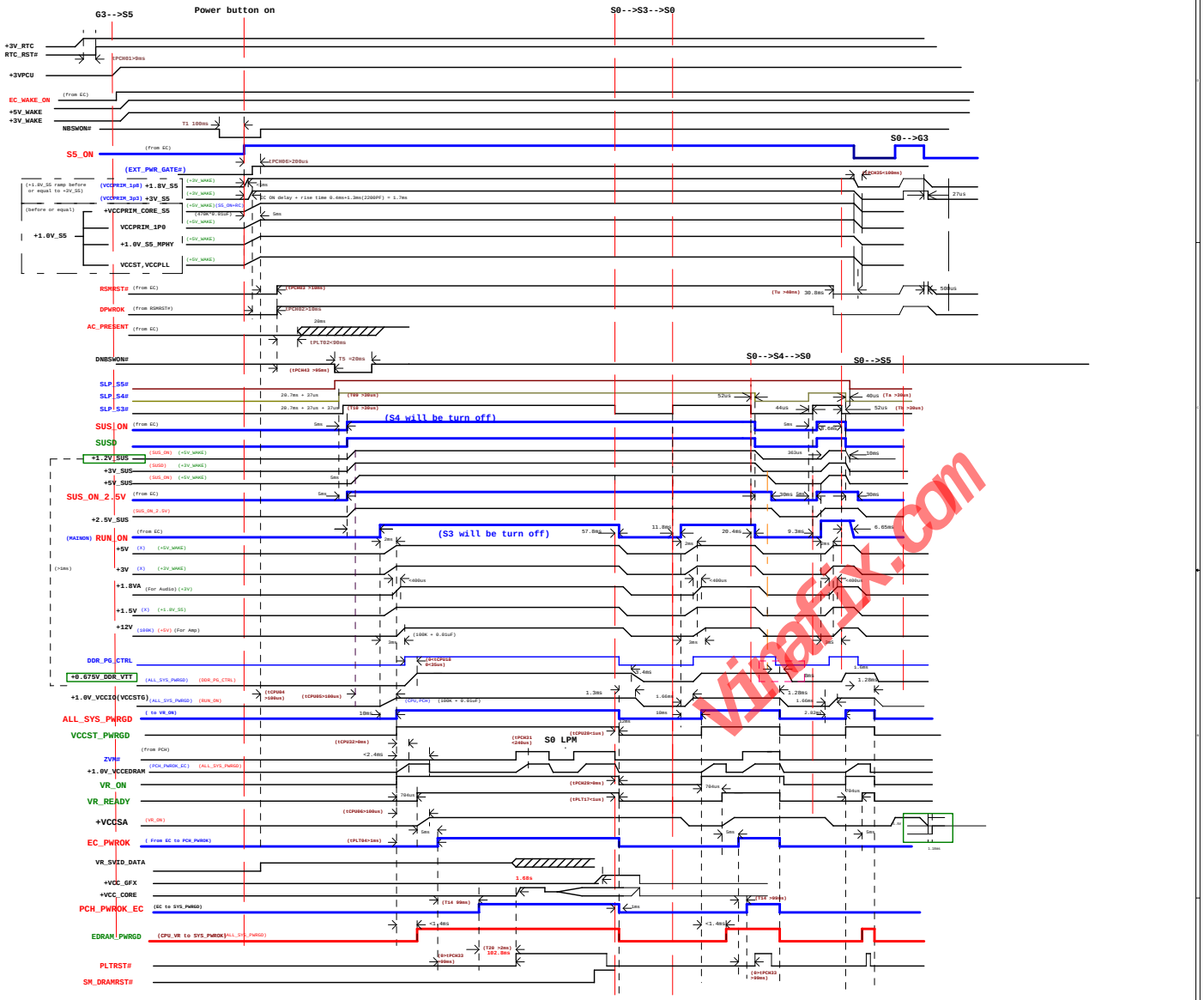
SkyLake ULT Power-Up Sequencing (G3-->S0-->S3-->S4-->S5)



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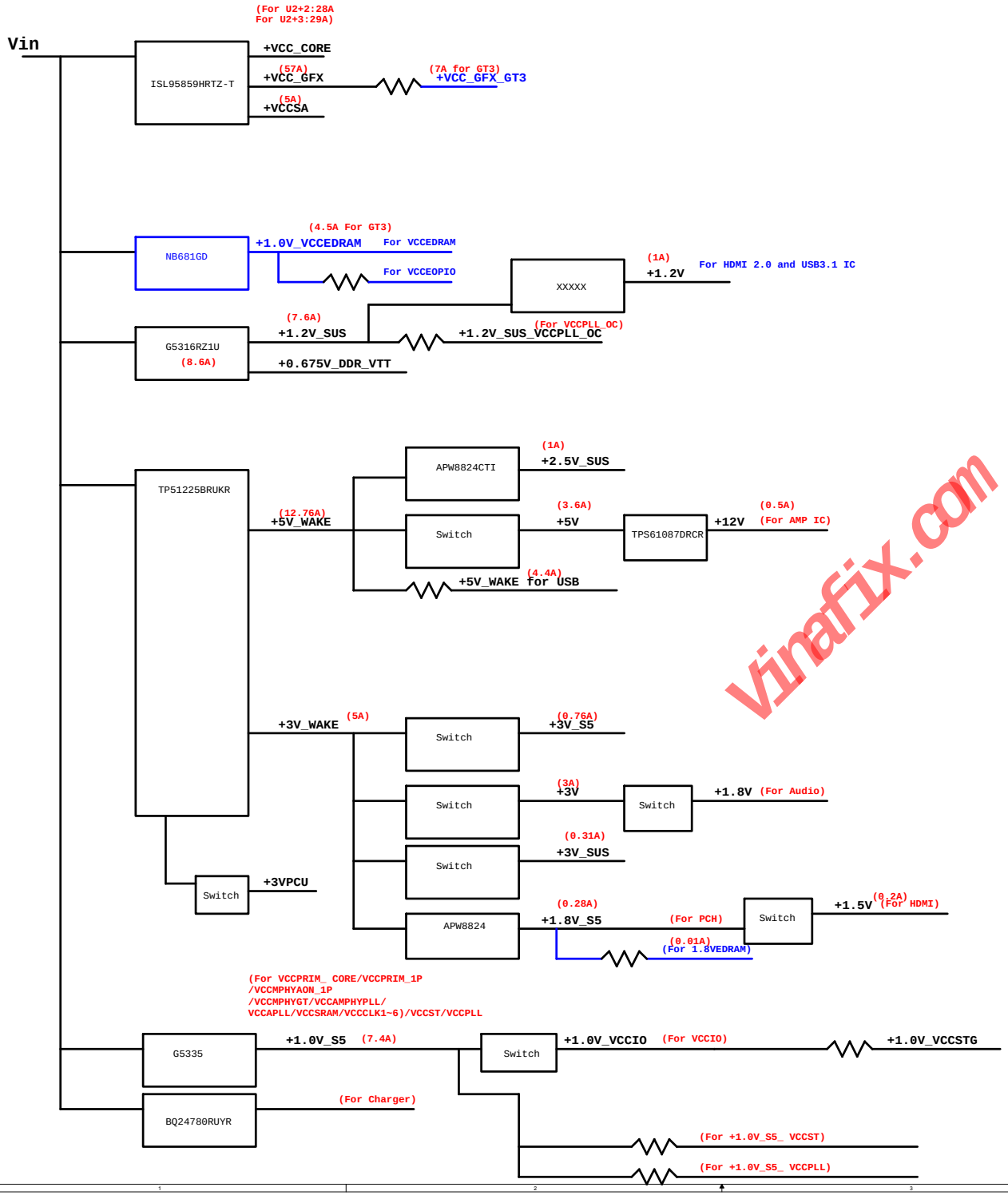
Power Sequence



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