

ZK2 SYSTEM BLOCK DIAGRAM

BOM MARK
I@: INT VGA
E@: STUFF FOR EXT VGA
ND@: STUFF FOR NON-DOCK
D@: DOCK
SP@: SPECIAL FOR EXT/INT VGA

CLOCK GENERATOR
ICS: ICS9LPRS365BGLFT
SELGO: SLG8SP512K05
P2

Penryn 479
uFCPGA
P3, P4

Thermal Sensor
(NS LM95245)
P3

Fan Driver
(G991)
P30

DDR PWR TPS5116 P36	CHARGER ISL6251 P32
THERMAL PROTECTION P37	3/5V SYS PWR ISL6237 P33
2.5V/ 1.5V PWR DISCHARGER P38	CPU CORE PWR ISL6262A P34
POWER TREE P39	+1.05V RT8202 P35

DDRII
SO-DIMM 0
SO-DIMM 1
P16

NB Cantiga
(GM45/ PM45/ GL40)
P5, P6, P7, P8, P9, P10, P11

MXM (n-Vidia) NB9M-GS
VRAM 512MB
P17

SWITCH CIRCUIT
P18

HDMI switch (PS8122)
P19

CRT
P18

LVDS
P18

HDMI
P19

DOCKING/DVI
P19

MP-Stage
31ZK2MB0000: ZK2 MB ASSY(GM/UMA)ASSY W/O CPU
31ZK2MB0010: ZK2 MB ASSY(PM/MXM)ASSY W/O CPU
31ZK2MB0020: ZK2 MB ASSY(PM/MXM) W/O CPU/E-SATA

HDD (SATA) *2
P23

ODD (SATA)
P23

SB ICH9M
P12,P13,P14,P15

eSATA Conn.
USB1
P29

eSATA Buffer
(PI2EQX3021)
P29

USB Port x 3
USB0, 4, 7
P29

Bluetooth
USB5
P21

CCD
USB11
P18

FingerPrint
USB9
P30

Wire Docking
USB10
P30

Audio CODEC (ALC888S)
P24

HDCP ROM (Option)
P13

EC (WPC775LDG)
P31

Media Cardreader (RTS5158E)
USB2
P27

ATHEROS Giga-LAN (AR8121)
P20

New Card
USB6
P26

Mini Card
WLAN / TV
USB2 & 3
P22

Audio Amplifier
P24,P25

Sub-Amplifier (MAX9736B)
P25

Speaker
P25

S/PDIF
P25

SUBWOOFER
P25

Line in
P25

MIC Jack
P25

Int. D-MIC
P18, P24

MDC 1.5
P24

RJ11 WIRE CONN.

SPI ROM
P31

Touch Pad
P30

K/B COON.
P30

MMB
P28

CIR
P31

Card Reader Connector
P27

LAN SWITCH (PI3L500)
P21

DOCK/LAN
P30

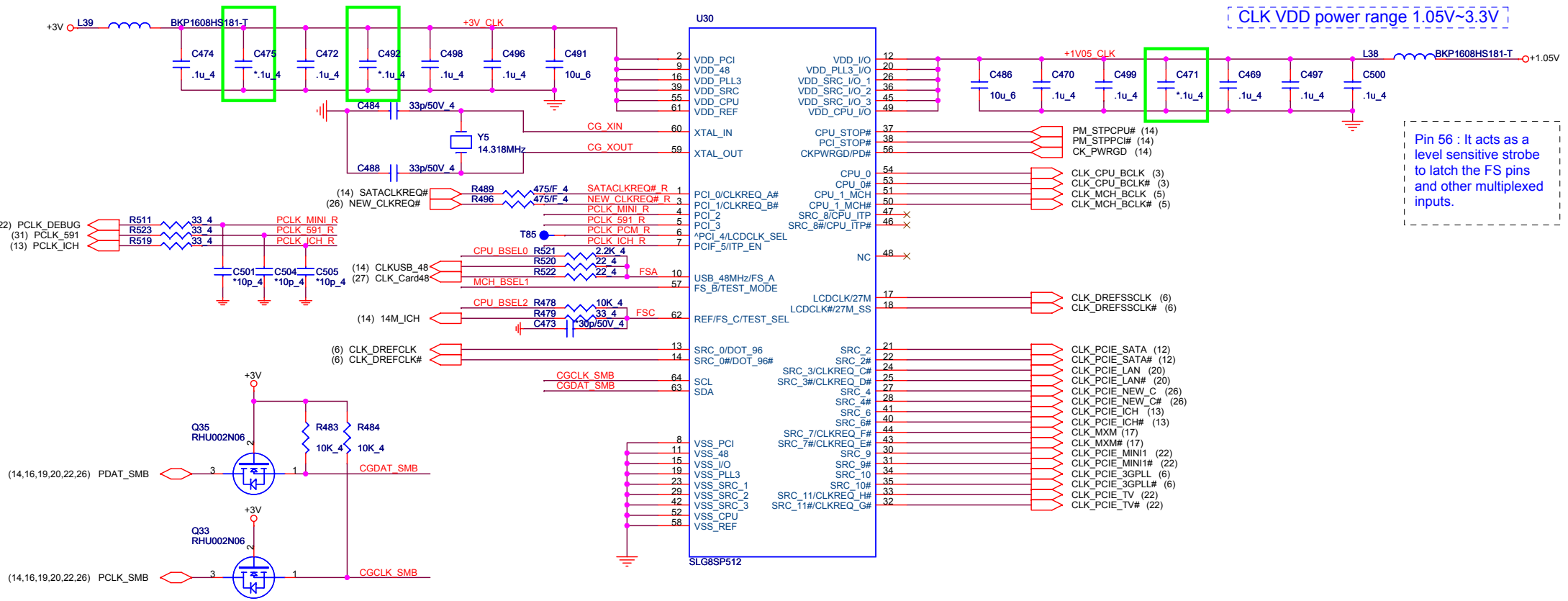
Transformer
P21

RJ45
P21

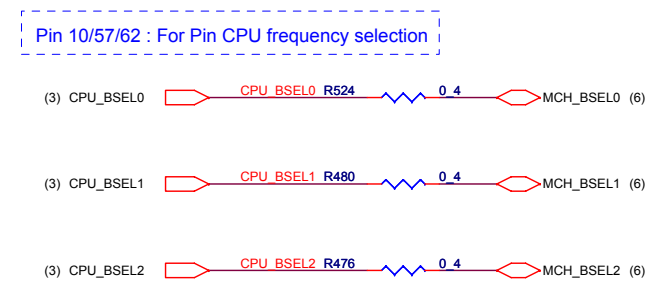
DA0ZK2MB6D0
DA0ZK2MB6C0
DA0ZK2MB6B0
DA0ZK2MB6A0

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PROJECT : ZK2
Block Diagram
Rev 3B
Date: Friday, June 27, 2008
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Clock Generator



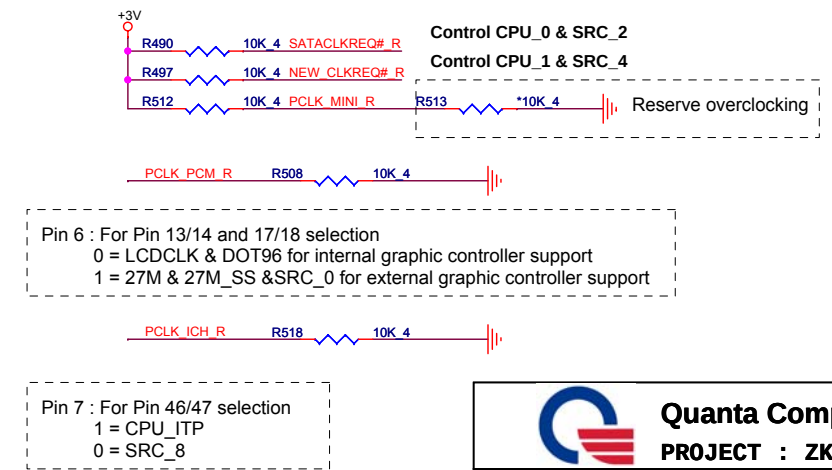
CPU Clock select



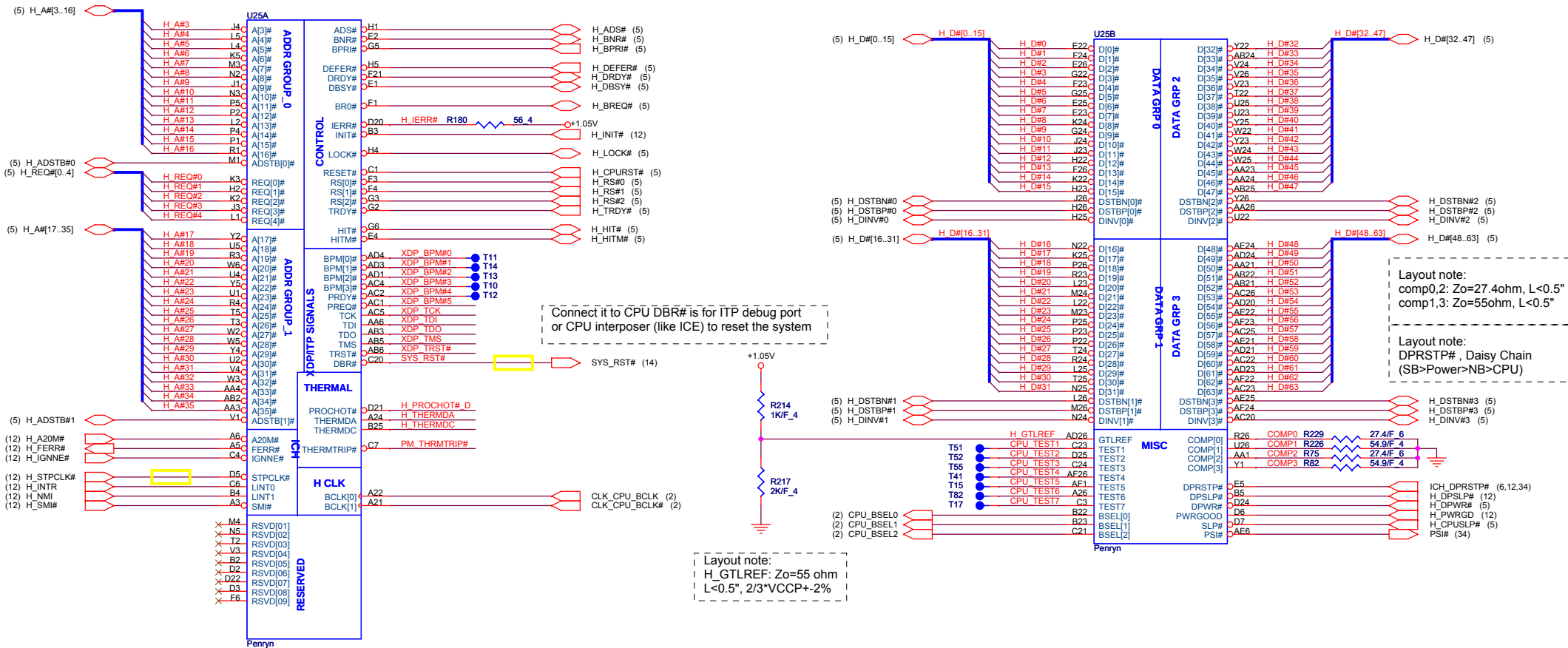
BSEL Frequency Select Table

FSC	FSB	FSA	Frequency
0	0	0	266Mhz
0	0	1	133Mhz
0	1	1	166Mhz
0	1	0	200Mhz
1	1	0	400Mhz
1	1	1	Reserved
1	0	1	100Mhz
1	0	0	333Mhz

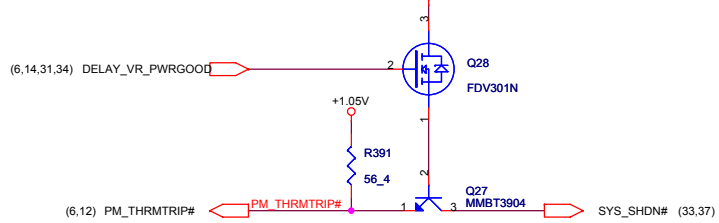
Strap table



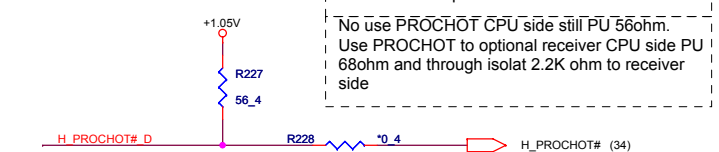
CLOCK GENERATOR



Thermal Trip

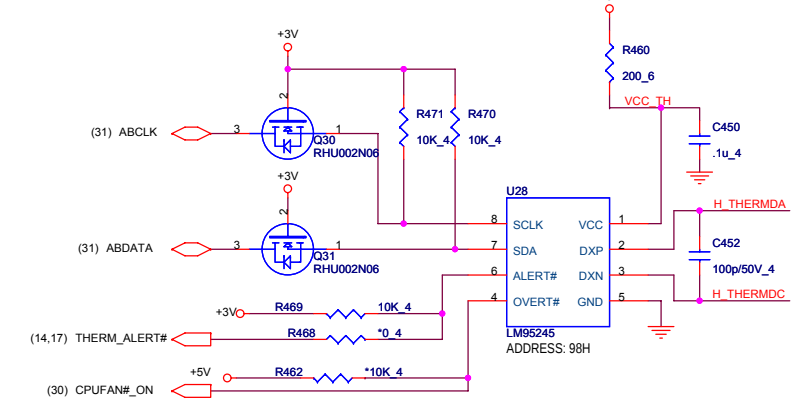


Processor hot

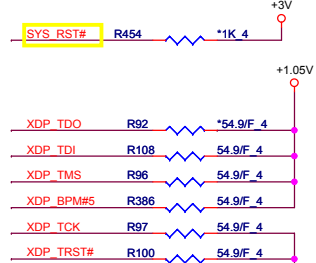


CPU 1/2

CPU Thermal monitor



XDP PU/ID



XDP_DBRESET# and XDP_TDO reserve for XDP

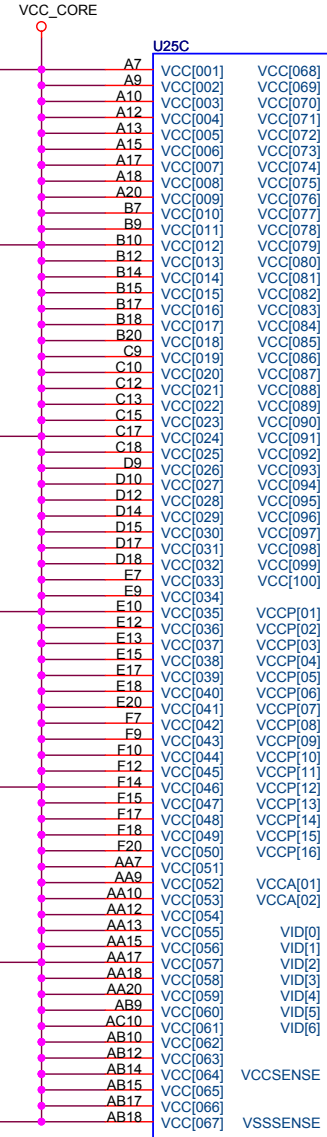
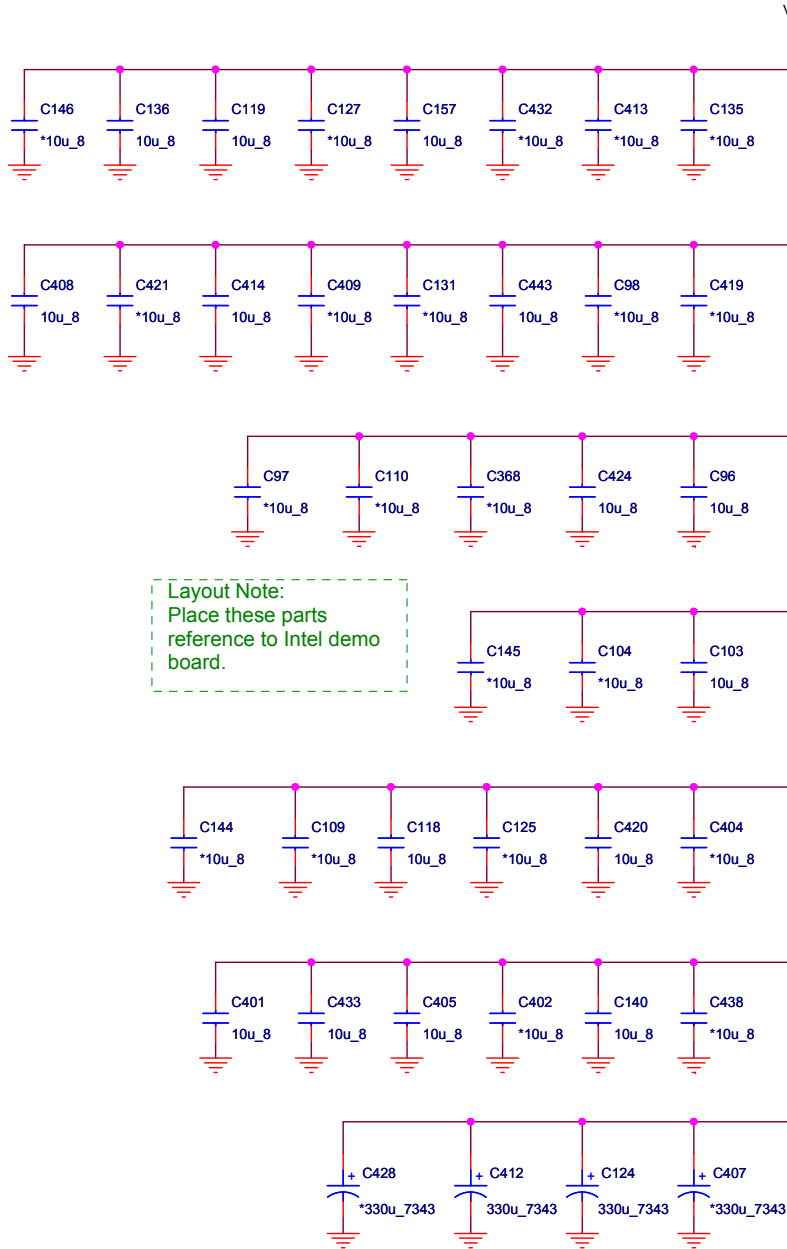


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CPU Host Bus

CPU 2/2

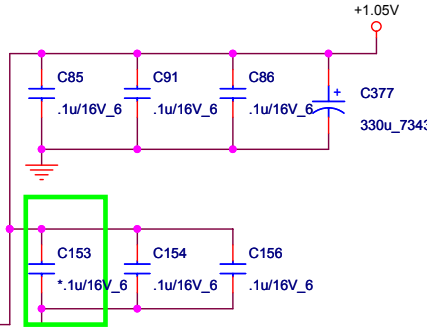
U25D		
A4	VSS[001]	P6
A8	VSS[002]	P21
A11	VSS[003]	P24
A14	VSS[004]	R2
A16	VSS[005]	R5
A19	VSS[006]	R22
A23	VSS[007]	R25
AF2	VSS[008]	T1
B6	VSS[009]	T4
B8	VSS[010]	T23
B11	VSS[011]	T26
B13	VSS[012]	U3
B16	VSS[013]	U6
B19	VSS[014]	U21
B21	VSS[015]	U24
B24	VSS[016]	V2
C5	VSS[017]	V5
C8	VSS[018]	V22
C11	VSS[019]	V25
C14	VSS[020]	W1
C16	VSS[021]	W4
C19	VSS[022]	W23
C2	VSS[023]	W26
C22	VSS[024]	Y3
C25	VSS[025]	Y6
D1	VSS[026]	Y21
D4	VSS[027]	Y24
D8	VSS[028]	AA2
D11	VSS[029]	AA5
D13	VSS[030]	AA8
D16	VSS[031]	AA11
D19	VSS[032]	AA14
D23	VSS[033]	AA16
D26	VSS[034]	AA19
E3	VSS[035]	AA22
E6	VSS[036]	AA25
E8	VSS[037]	AB1
E11	VSS[038]	AB4
E14	VSS[039]	AB8
E16	VSS[040]	AB11
E19	VSS[041]	AB13
E21	VSS[042]	AB16
E24	VSS[043]	AB19
F5	VSS[044]	AB23
F8	VSS[045]	AB26
F11	VSS[046]	AC3
F13	VSS[047]	AC6
F16	VSS[048]	AC8
F19	VSS[049]	AC11
F2	VSS[050]	AC14
F22	VSS[051]	AC16
F25	VSS[052]	AC19
G4	VSS[053]	AC21
G1	VSS[054]	AC24
G23	VSS[055]	AD2
G26	VSS[056]	AD5
H3	VSS[057]	AD8
H6	VSS[058]	AD11
H21	VSS[059]	AD13
H24	VSS[060]	AD16
J2	VSS[061]	AD19
J5	VSS[062]	AD22
J22	VSS[063]	AD25
J25	VSS[064]	AE1
K1	VSS[065]	AE4
K4	VSS[066]	AE8
K23	VSS[067]	AE11
K26	VSS[068]	AE14
L3	VSS[069]	AE16
L6	VSS[070]	AE19
L21	VSS[071]	AE23
L24	VSS[072]	AE26
M2	VSS[073]	A2
M5	VSS[074]	AF6
M22	VSS[075]	AF8
M25	VSS[076]	AF11
N1	VSS[077]	AF13
N4	VSS[078]	AF16
N23	VSS[079]	AF19
N26	VSS[080]	AF21
P3	VSS[081]	A25
		AF25



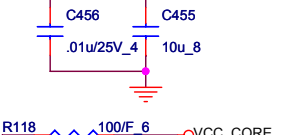
VCC:38A (Low power type)
VCC:47A (Standard type)

Layout Note:
Inside CPU center cavity in 2 rows

VCCP : 2.5A(Supply after VCC Stable)
4.5A(Supply before VCC Stable)



VCCA:130mA



Layout Note:
Z0=27.4,PJ/PD L<1"

Montevina platform : Early Reference Board Schematics Feb 2007. Rev 1.0
stuff 22U*34, NC 22U*2
stuff 330U*2, NC330U*2

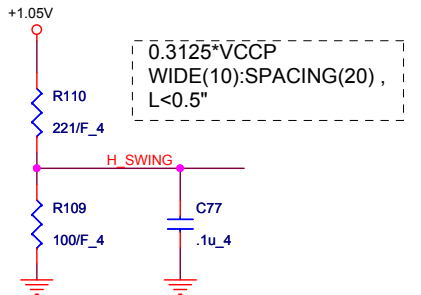


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PROJECT : ZK2

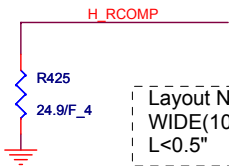
Size	Document Number	Rev
	CPU Power	3B

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	QCI P/N
Intel Cantiga (G)M	AJSLB940T04
Intel Cantiga (P)M	AJSLB970T06

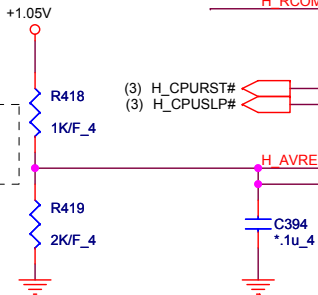


0.3125*VCCP
WIDE(10):SPACING(20) ,
L<0.5"



Layout Note:
WIDE(10):SPACING(20) ,
L<0.5"

2/3*VCCP
WIDE(10):SPACING(20),
L<0.5"



(3) H_D# [0..63]

H_D#0 F2
H_D#1 G8
H_D#2 F8
H_D#3 E6
H_D#4 G2
H_D#5 H6
H_D#6 H2
H_D#7 F6
H_D#8 D4
H_D#9 H3
H_D#10 M9
H_D#11 M11
H_D#12 J1
H_D#13 J2
H_D#14 N12
H_D#15 J6
H_D#16 P2
H_D#17 L2
H_D#18 R2
H_D#19 N9
H_D#20 L6
H_D#21 M5
H_D#22 J3
H_D#23 N2
H_D#24 R1
H_D#25 N5
H_D#26 N6
H_D#27 P13
H_D#28 N8
H_D#29 L7
H_D#30 N10
H_D#31 M3
H_D#32 Y3
H_D#33 AD14
H_D#34 Y6
H_D#35 Y10
H_D#36 Y12
H_D#37 Y14
H_D#38 Y7
H_D#39 W2
H_D#40 AA8
H_D#41 Y9
H_D#42 AA13
H_D#43 AA9
H_D#44 AA11
H_D#45 AD11
H_D#46 AD10
H_D#47 AD13
H_D#48 AE12
H_D#49 AE9
H_D#50 AA2
H_D#51 AD8
H_D#52 AA3
H_D#53 AD3
H_D#54 AD7
H_D#55 AE14
H_D#56 AF3
H_D#57 AC1
H_D#58 AE3
H_D#59 AC3
H_D#60 AE11
H_D#61 AE8
H_D#62 AG2
H_D#63 AD6

U26A

H_D#_0
H_D#_1
H_D#_2
H_D#_3
H_D#_4
H_D#_5
H_D#_6
H_D#_7
H_D#_8
H_D#_9
H_D#_10
H_D#_11
H_D#_12
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H_D#_57
H_D#_58
H_D#_59
H_D#_60
H_D#_61
H_D#_62
H_D#_63

HOST

H_A#_3
H_A#_4
H_A#_5
H_A#_6
H_A#_7
H_A#_8
H_A#_9
H_A#_10
H_A#_11
H_A#_12
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H_A#_33
H_A#_34
H_A#_35

A14
C15
F16
H13
C18
M16
J13
P16
R16
N17
M13
E17
P17
F17
G20
B19
J16
E20
H16
J20
L17
A17
B17
L16
C21
J17
H20
B18
K17
B20
F21
K21
L20

H_A#3
H_A#4
H_A#5
H_A#6
H_A#7
H_A#8
H_A#9
H_A#10
H_A#11
H_A#12
H_A#13
H_A#14
H_A#15
H_A#16
H_A#17
H_A#18
H_A#19
H_A#20
H_A#21
H_A#22
H_A#23
H_A#24
H_A#25
H_A#26
H_A#27
H_A#28
H_A#29
H_A#30
H_A#31
H_A#32
H_A#33
H_A#34
H_A#35

H_A# [3..35] (3)

H_ADS#
H_ADSTB#_0
H_ADSTB#_1
H_BNR#
H_BPR#
H_BREQ#
H_DEFER#
H_DBSY#
HPLL_CLK
HPLL_CLK#
H_DPWR#
H_DRDY#
H_HIT#
H_HITM#
H_LOCK#
H_TRDY#

H12
B16
G17
A9
E11
G12
E9
B10
AH7
AH6
J11
E9
H9
E12
H11
C9

H_ADS# (3)
H_ADSTB#0 (3)
H_ADSTB#1 (3)
H_BNR# (3)
H_BPR# (3)
H_BREQ# (3)
H_DEFER# (3)
H_DBSY# (3)
CLK_MCH_BCLK (2)
CLK_MCH_BCLK# (2)
H_DPWR# (3)
H_DRDY# (3)
H_HIT# (3)
H_HITM# (3)
H_LOCK# (3)
H_TRDY# (3)

H_DINV#_0
H_DINV#_1
H_DINV#_2
H_DINV#_3

J8
L3
Y13
Y1

H_DINV# [3..0] (3)

H_DSTBN#_0
H_DSTBN#_1
H_DSTBN#_2
H_DSTBN#_3

L10
M7
AA5
AE6

H_DSTBN# [3..0] (3)

H_DSTBP#_0
H_DSTBP#_1
H_DSTBP#_2
H_DSTBP#_3

L9
M8
AA6
AE5

H_DSTBP# [3..0] (3)

H_REQ#_0
H_REQ#_1
H_REQ#_2
H_REQ#_3
H_REQ#_4

B15
K13
E13
B13
B14

H_REQ# [0..4] (3)

H_RS#_0
H_RS#_1
H_RS#_2

B6
E12
C8

H_RS# [0..2] (3)

H_SWING
H_RCOMP

H_CPURST#
H_CPUSLP#

H_AVREF
H_DVREF

CANTIGA_PM

GMCH (CANTIGA)



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Size	Document Number	Rev
		3B

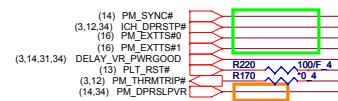
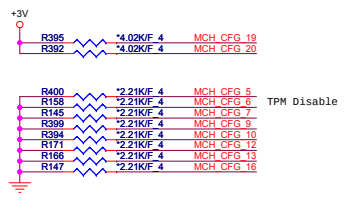
GMCH HOST

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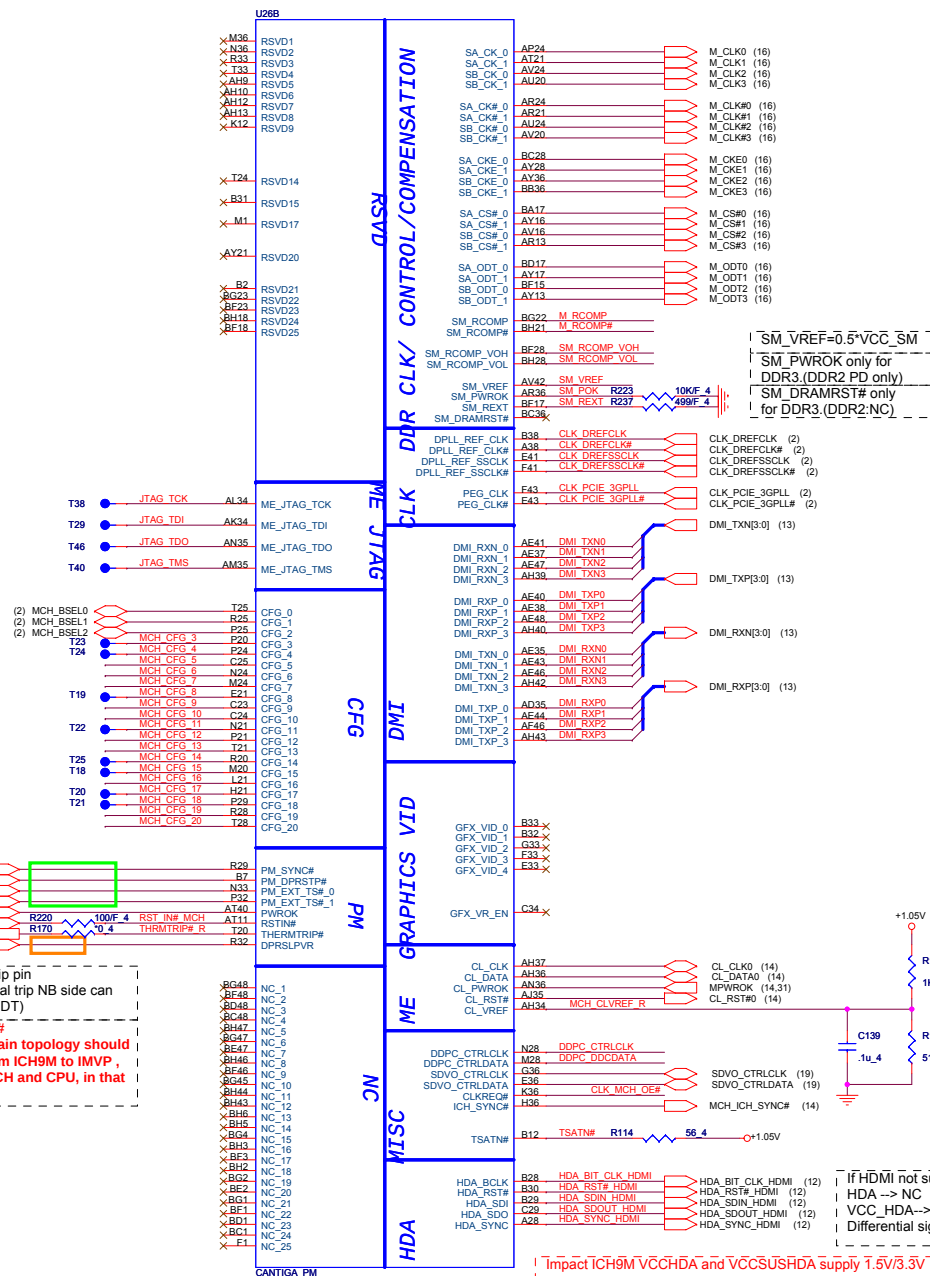
Strap table

Pin Name	Strap description	Configuration
CFG[2:0]	FSB Frequency Select	000 = FSB 1066MHz 010 = FSB 800MHz 011 = FSB 667MHz
CFG[4:3]	Reserved	
CFG5	DMI X2 Select	0 = DMI X2 1 = DMI X4(Default)
CFG6	iTPM Host Interface	0 = iTPM Host Interface is enabled 1 = iTPM Host Interface is disabled(Default)
CFG7	ME TLS Confidentiality	0 = AMT Firmware will use TLS cipher suite with no confidentiality 1 = AMT Firmware will use TLS cipher suite with confidentiality(Default)
CFG8	Reserved	
CFG9	PCIe Graphics Lane Reversal	0 = Reverse Lanes 1 = Normal operation(Default)
CFG10	PCIe Loopback enable	0 = Enabled 1 = Disabled (Default)
CFG11	Reserved	
CFG12	ALLZ	0 = ALLZ mode enable 1 = disable(Default)
CFG13	XOR	0 = XOR mode enable 1 = disable(Default)
CFG[15:14]	Reserved	
CFG16	FSB Dynamic ODT	0 = Dynamic ODT disable 1 = Dynamic ODT Enable(Default)
CFG[18:17]	Reserved	
CFG19	DMI Lane Reversal	0 = Normal (Default) 1 = Lanes Reversed
CFG20	Digital Display Port (SDVO/DP/iHDMI) Concurrent with PCIe	0 = Only Digital Display port (SDVO/DP/iHDMI) or PCIe is operational (Default) 1 = Digital Display port (SDVO/DP/iHDMI) and PCIe are operating simultaneously via PEG port
SDVO_CTRLDATA	SDVO Present	0 = No SDVO/HDMI Device Present(Default) 1 = SDVO/HDMI Device present
DDPC_CTRLDATA	Digital Display Present	0 = Digital display(HDMI/DP) device absent (Default) 1 = Digital display(HDMI/DP) device present

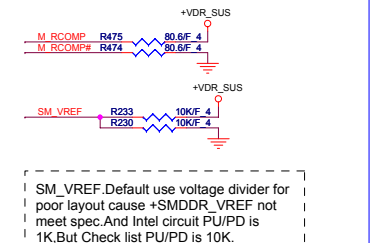
Strap pin



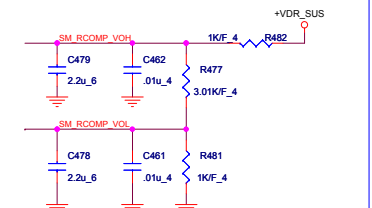
NB Thermal trip pin
 No use Thermal trip NB side can
 NC.(NB has ODT)
PM_DPRSTP#
The Daisy chain topology should
be routed from ICH9M to IMVP ,
then to (G)MCH and CPU, in that
order.



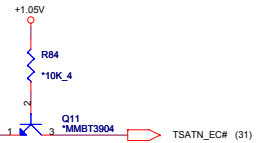
NOTE:
If (G)MCH's HD Audio signals are connected to ICH9M for iHDMM, VCCHDA and VCCSUSHDA on ICH9M should be only on 1.5V. These power pins on ICH9M can be supplied with 3.3V if and only if (G)MCH's HDA is not connected to ICH9M. Consequently, only 1.5V audio/modem codecs can be used on the platform.



INTEL FAE Suggest PD for Ext graphics



NB Thermaltrip



Check list note : CL_VREF=0.35V

DDPC_CTRL for HDMI port C
SDVO_CTRL for HDMI port B

<Checklist ver0.8>
If TSATN# is not used, then it must be terminated with a 56-Ω pull-up resistor to VCCP.

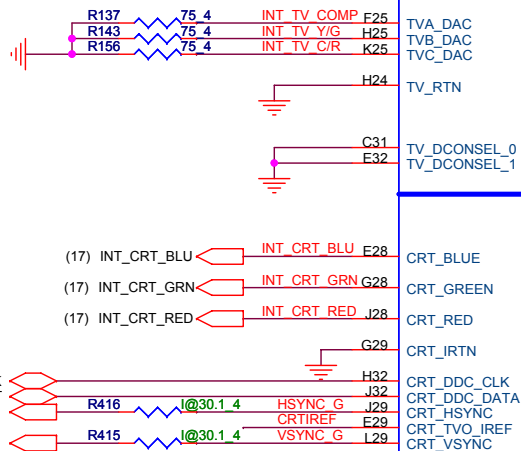
```

- I <Pin out check issue>
- I "P104 TOATN" 5 - TOATN

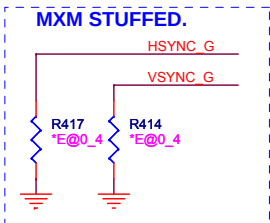
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SP@

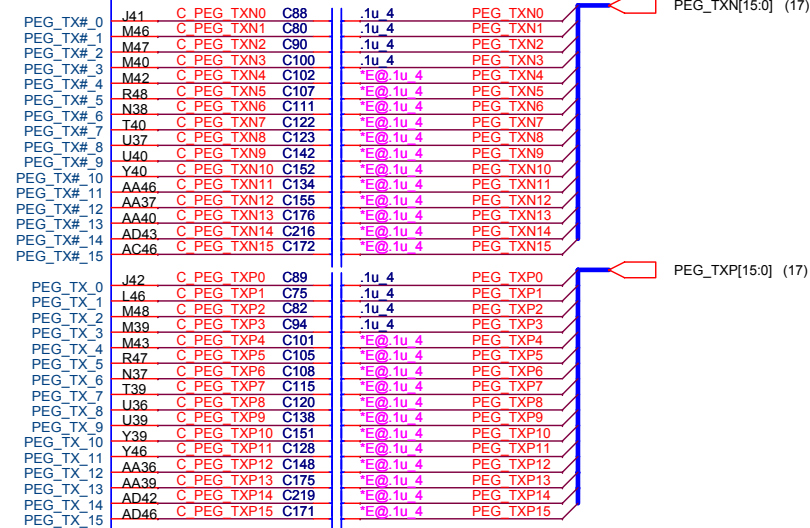
If LVDS no use, all signal can NC



CRTIREF pull down
for IV cantiga 1.02k ohm/F



+1.05V



Can support reversal routing.If CFG9=1, PCI Express is normal operation. If CFG9=0, then PEG_TXP0 becomes PEG_TXP15, PEG_TXP1 becomes PEG_TXP14, PEG_TXP2 becomes PEG_TXP13, etc. similarly for PEG_RXP[15:0] and PEG_RXN[15:0]

<5/31>Montevina_Schematics_Checklist_Rev0_8

<5/31>Montevina_Schematics_Checklist_Rev0_8

a)For TVOUT Disabled, TV_DCONSEL[1:0] Connect to GND. But design guide Rev0.7 show NC.What is correct.

b)For CRT DAC Disable, CRT_DDC_CLK, CRT_DDC_DATA , CRT_HSYNC, CRT_VSYNCThese signals should be connected to GND. But design guide Rev0.7 show NC, Intel suggest follow Design guide.

For EV@	For IV@
CRT R/G/B 0ohm to GND	CRT R/G/B 150ohm to GND
CRTIREF 0ohm to GND	CRTIREF 1.02Kohm to GND

For IV: 1.02Kohm
For EV:0ohm



CRT_R/G/B
For IV: 150ohm
For EV:0ohm



PROJECT : ZK2

GMCH VGA

Size	Document Number
------	-----------------

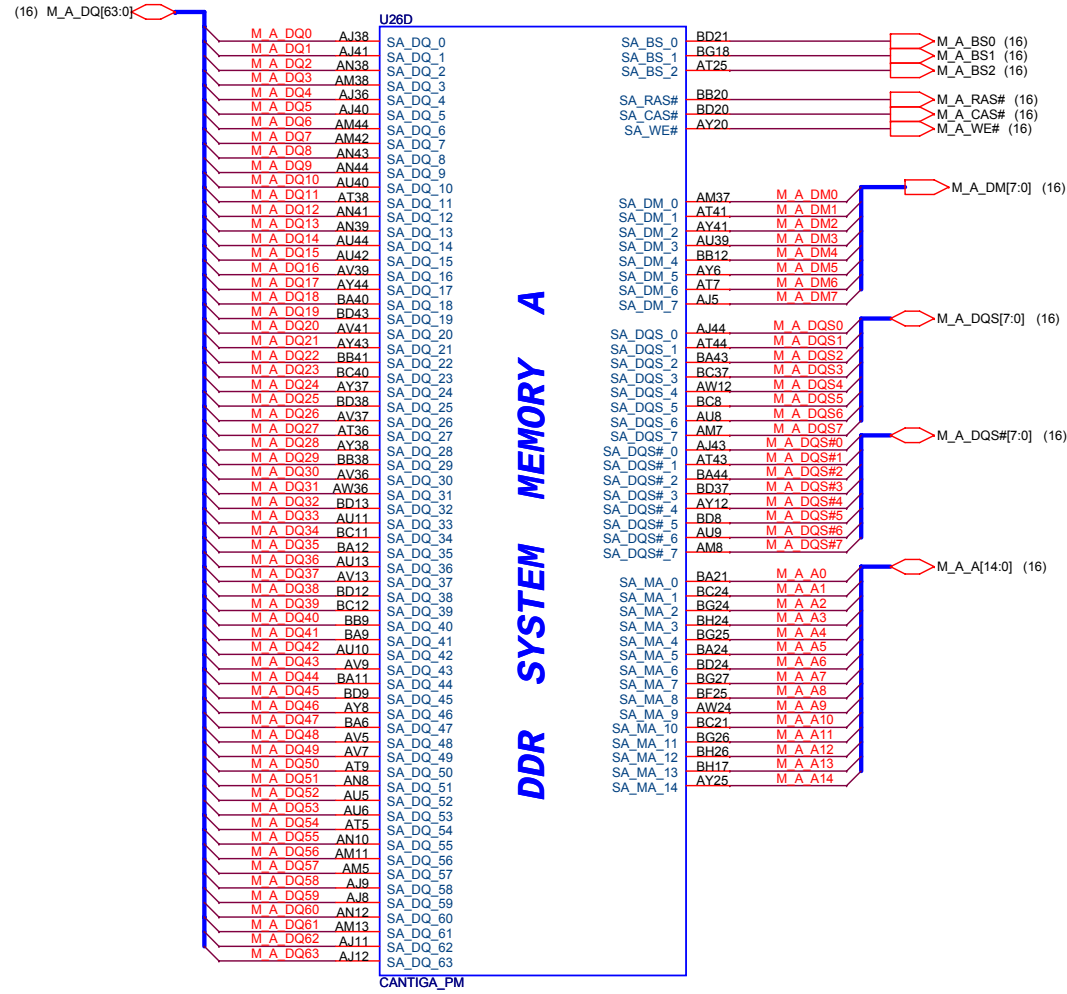
Rev	3B
-----	----

Date: Wednesday, July 09, 2008

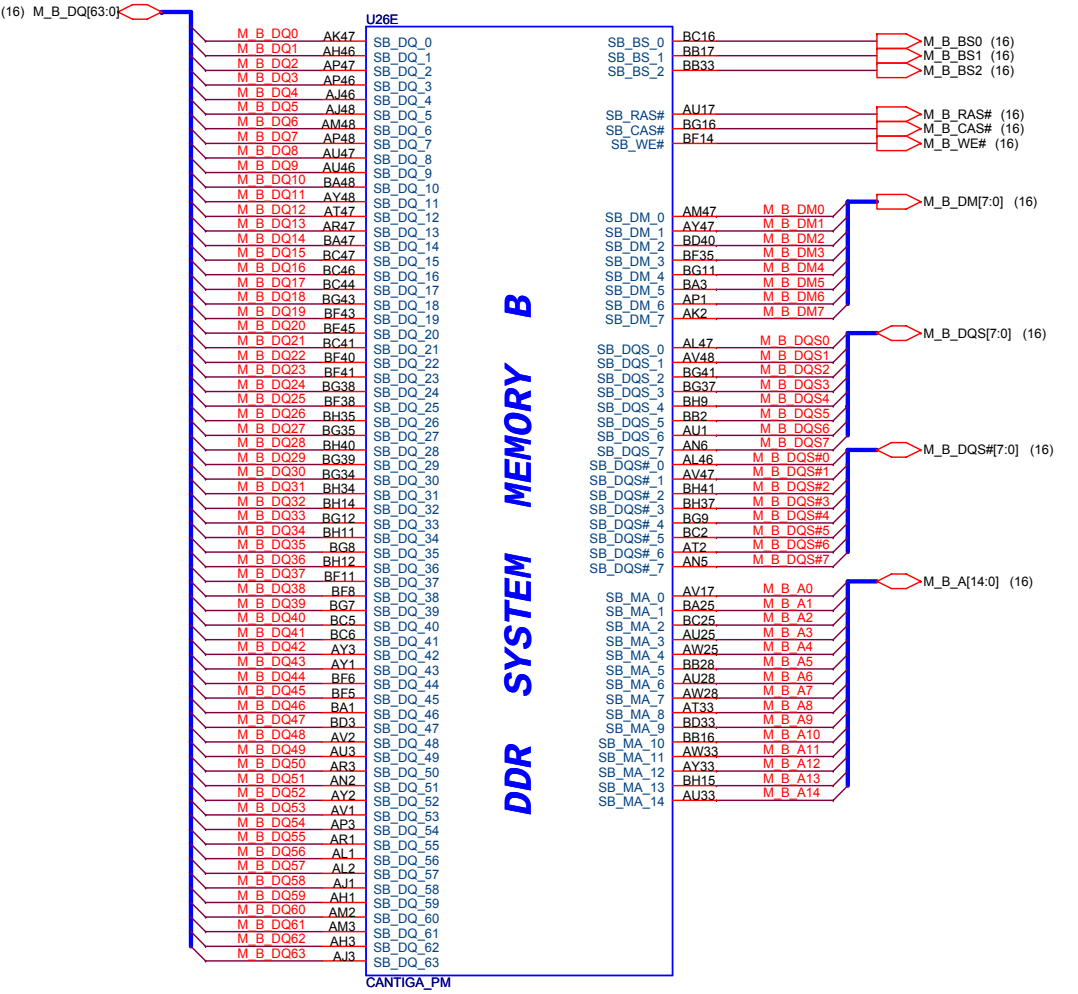
Sheet 7 of 39

GMCH (CANTIGA)

DDR SYSTEM MEMORY A



DDR SYSTEM MEMORY B



Quanta Computer Inc.
PROJECT : ZK2

Size	Document Number	Rev
	GMCH DDRII	3B
Date:	Friday, June 27, 2008	Sheet 8 of 39

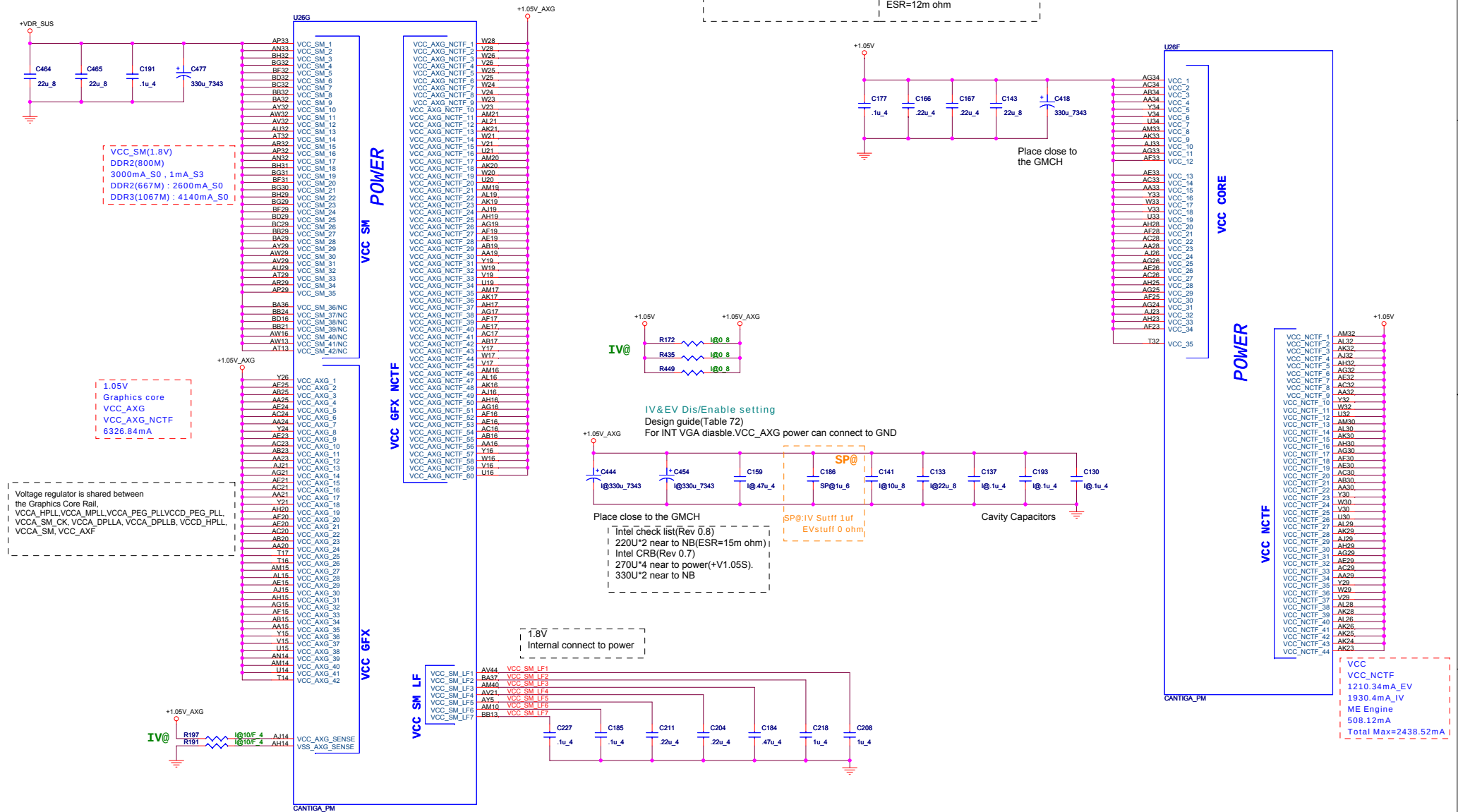
Power consumption reference to Intel
644135 Cantiga chipset EDS Volume1.
Section 10

GM	TDP	10.5~12W
GS	TDP	7~8W
PM	TDP	7W

```

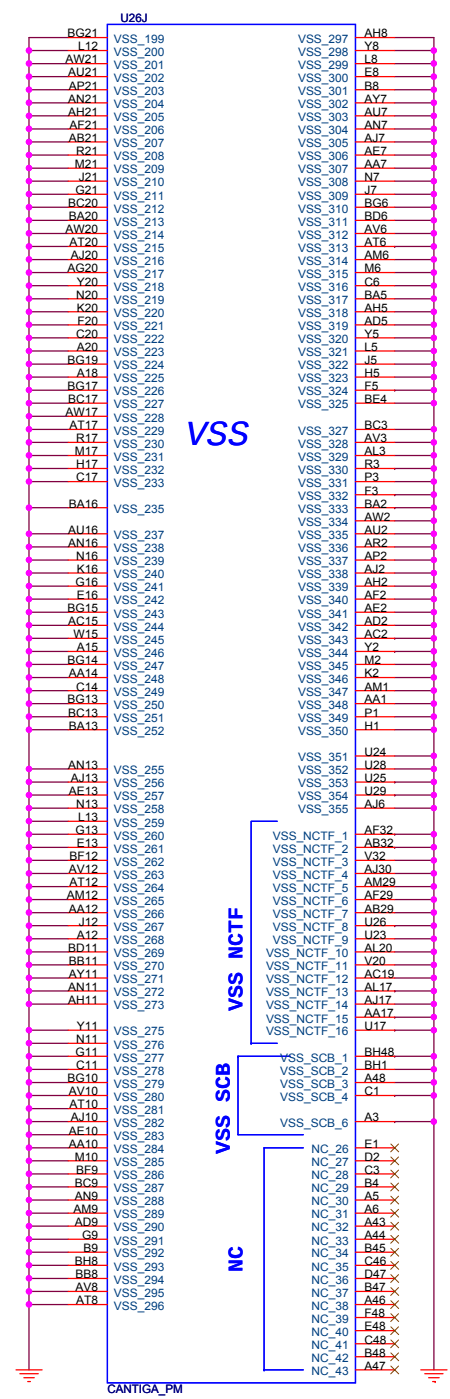
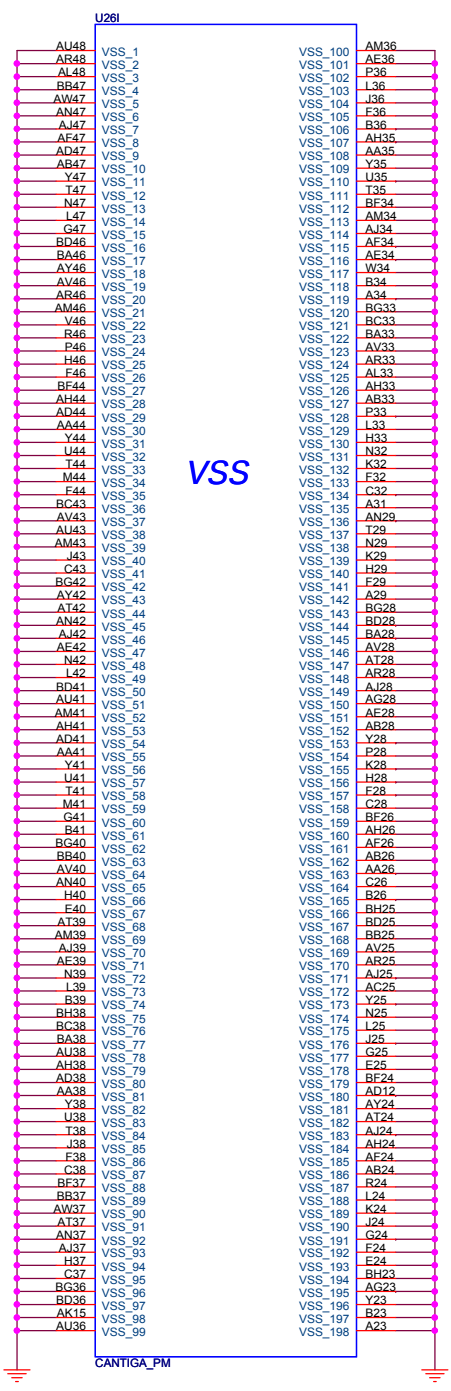
| Intel check list(Rev 0.8)
| 270U*1 near to power(+V1.05M).
| 270U*2 near to NB
| Intel CRB(Rev 0.7)
| 270U*3 near to power(+V1.05M).
| 270U*1 near to NB
| ESR=12m ohm

```



1. Route VCC_AXG_SENSE and VSS_AXG_SENSE differentially
2. VCC_AXG_SENSE PU to +V GFX_CORE_INT with 10ohm and VSS_AXG_SENSE PD with 10ohm for Intel suggest

 Quanta Computer Inc. PROJECT : ZK2		Rev 3B
Size	Document Number	
GMCH VCC,NCTF		
Maker	Friday, June 27, 2008	Sheet 0 of 30

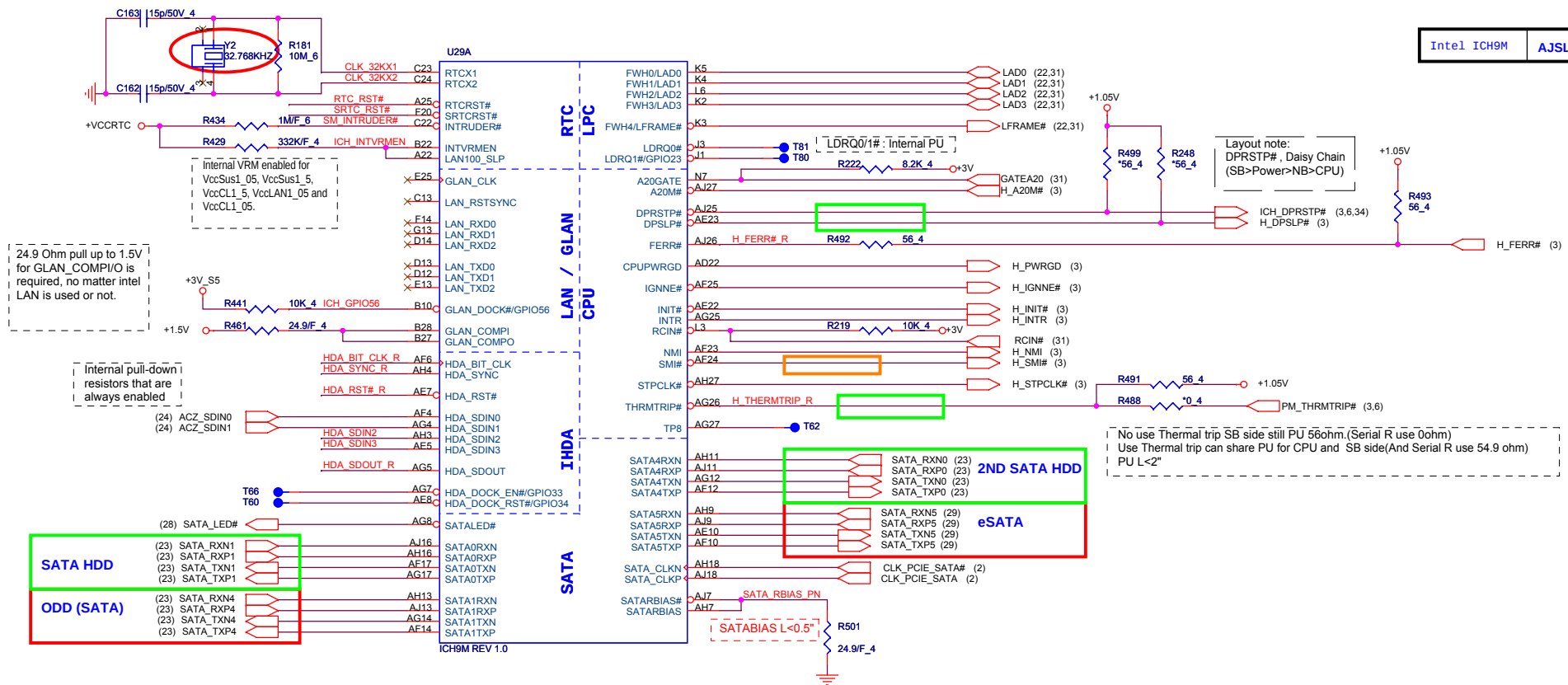


ICH9M

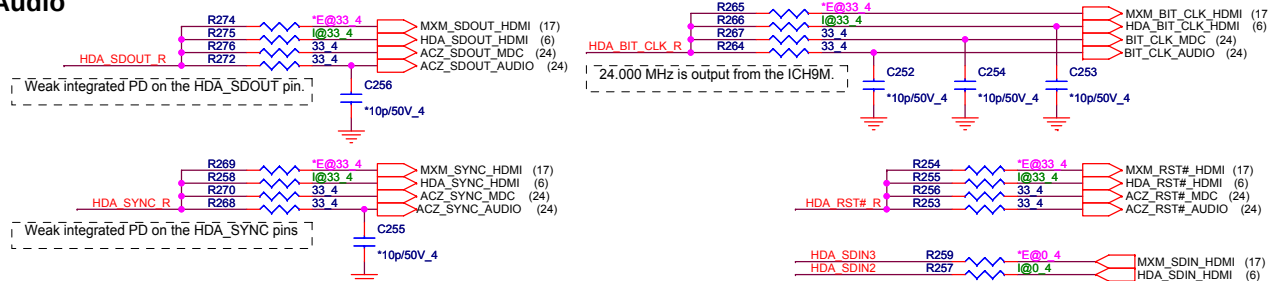
IV@

EV@

Intel ICH9M AJSLB8Q0T03



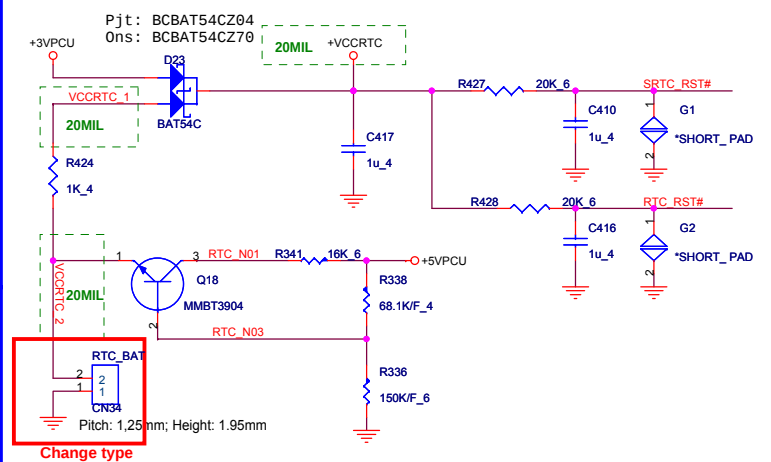
HD Audio

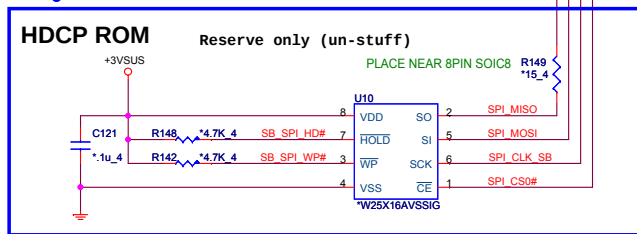


South Bridge Strap Pin (1/3)

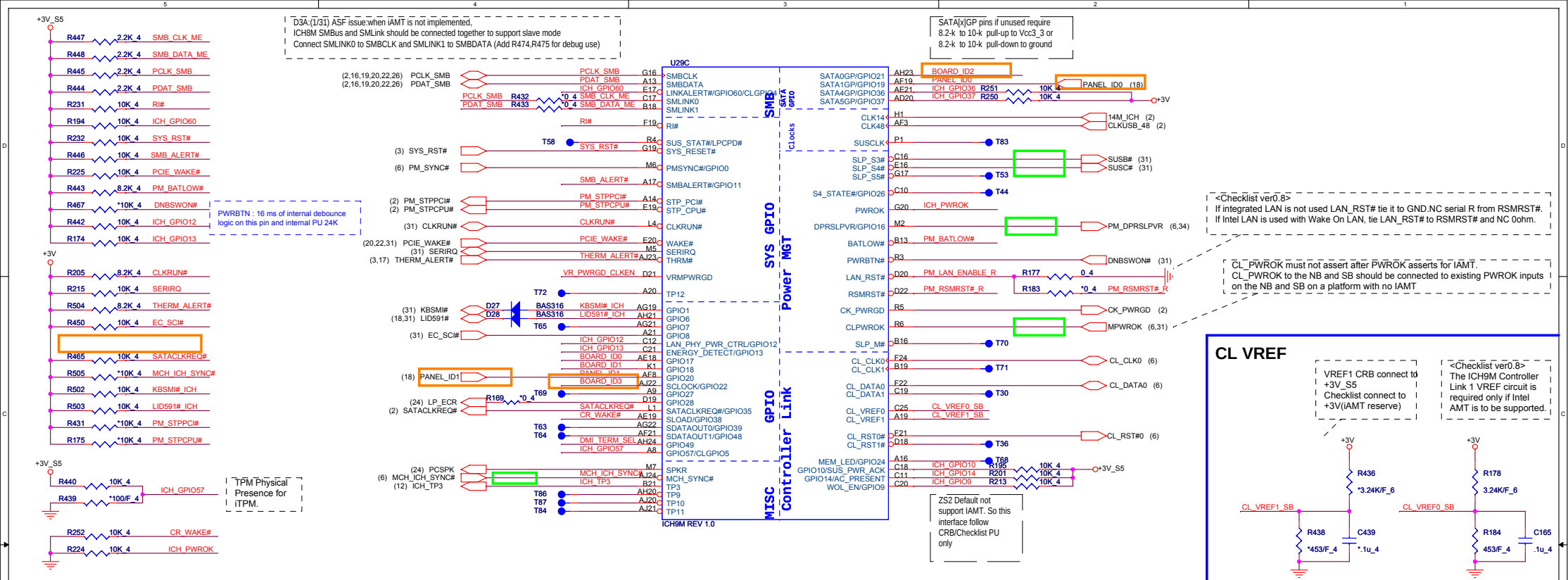
Pin Name	Strap description	Sampled	Configuration			PUI/PD
HDA_DOCK_EN/ GPIO33	Flash Descriptor Security Override Strap	PWROK	0 = The Flash Descriptor Security will be overridden. 1 = The security measures defined in the Flash Descriptor will be in effect			This strap should only be enabled in manufacturing environments using an external pull-up resistor.
SATALED#	PCI Express Lane Reversal (Lanes 1-4)	PWROK	Internal PU			
TP3	XOR Chain Entrance	PWROK	ICH_TP3	HDA_SDOUT	Description	(14) ICH_TP3 ICH_TP3 R451 *1K_4
HDA_SDOUT	XOR Chain Entrance /PCI Express* Port Config 1 bit 1(Port 1-4)	PWROK	0	0	RSVD	
			0	1	Enter XOR Chain	HDA_SDOUT_R R273 *1K_4 +3V
			1	0	Normal operation(Default)	
			1	1	Set PCIe port config bit 1	

RTC





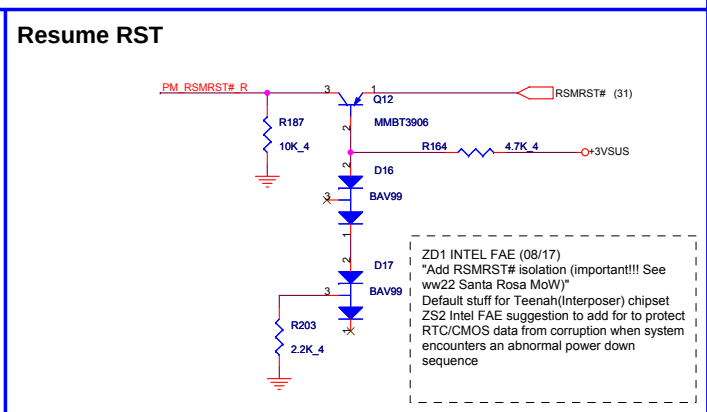
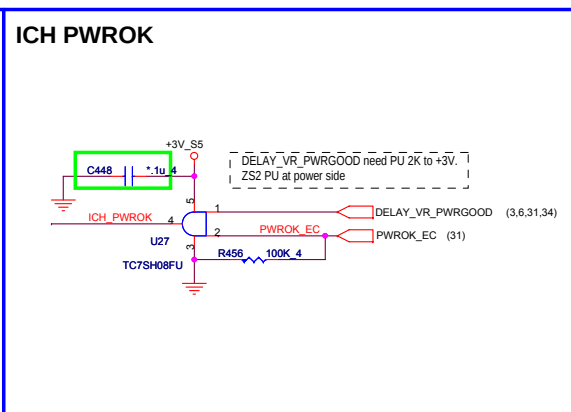
Pin Name	Strap description	Sampled	Configuration			PU/PD
HDA_SYNC	PCI Express Port Config 1 bit 0 (Port 1-4)	PWROK	0 = Default 1 = Setting bit 0			
GNT2# / GPIO53	PCI Express Port Config 2 bit 2 (Port 5-6)	PWROK	0 = Setting bit 2 1 = Default			
GNT1# / GPIO51	ESI Strap(Server Only)	PWROK	0 = DMI for ESI-compatible 1 = Default			
GNT3# / GPIO55	Top-Block Swap Override	PWROK	0 = "top-block swap" mode 1 = Default			
SPI_MOSI	Integrated TPM Enable	CLPWROK	0 = INT TPM disable(Default) 1 = INT TPM enable			
GNT0#	Boot BIOS Selection 0	PWROK	PCI_GNT#0	SPI_CS#1	Boot Location	
			0	1	SPI	
SPI_CS1# / GPIO58 / CLGPIO6	Boot BIOS Selection 1	CLPWROK	1	0	PCI	
			1	1	LPC(Default)	



Panel ID (UMA only)

Close to LCD connector (CN3)

P_ID1 (GPIO20)	P_ID0 (GPIO19)	Resolution
0	0	1366x768
0	1	1920x1080
1	0	Reserved
1	1	Reserved

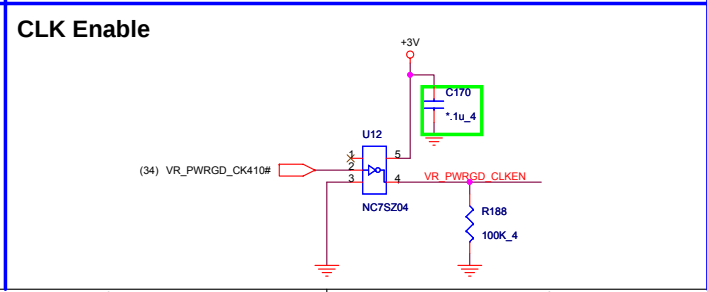


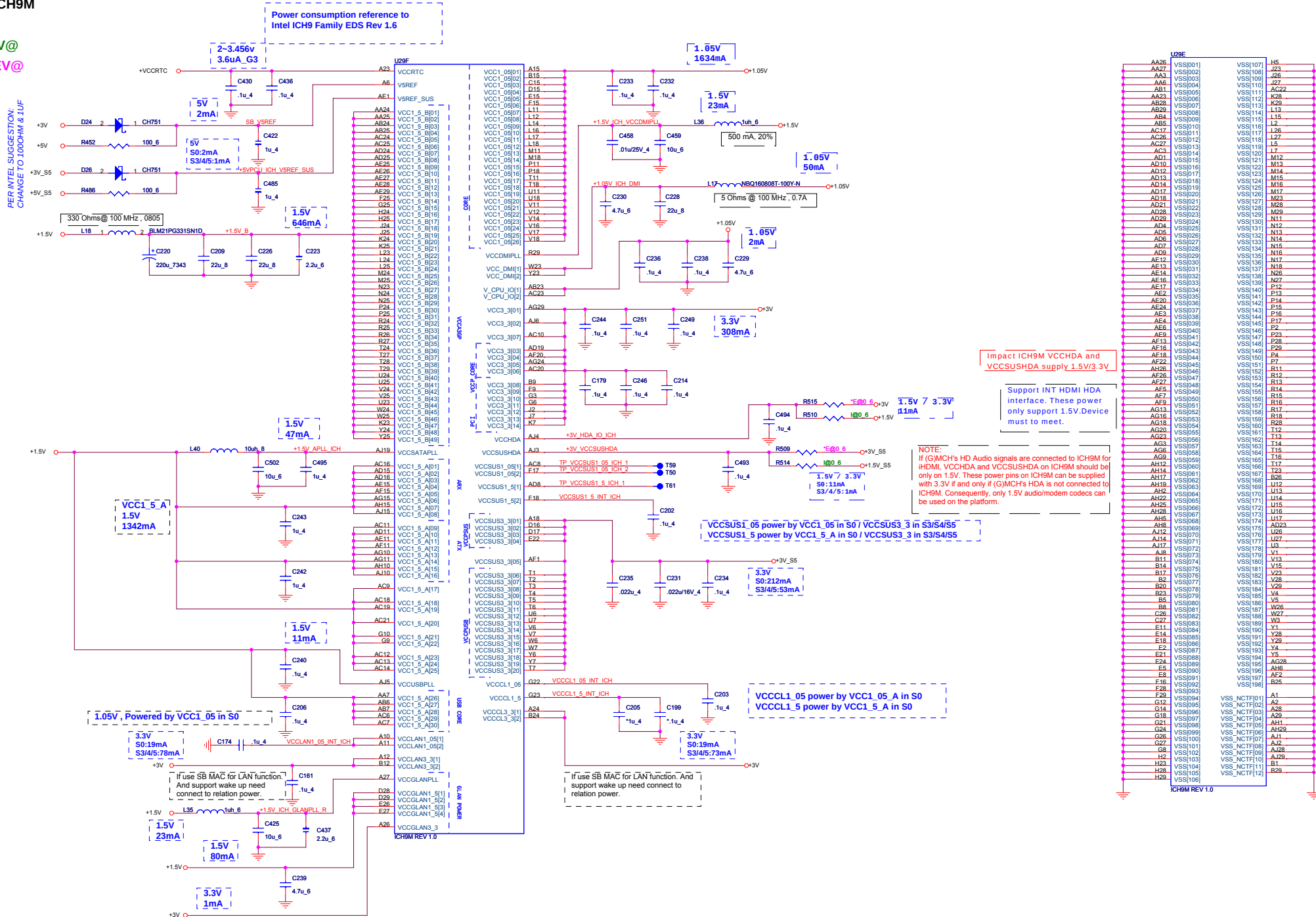
M/B ID

Board ID	ID3	ID2	ID1	ID0
default	0	0	0	0
	0	0	0	1
	0	0	1	0
	0	0	1	1
	0	1	0	0

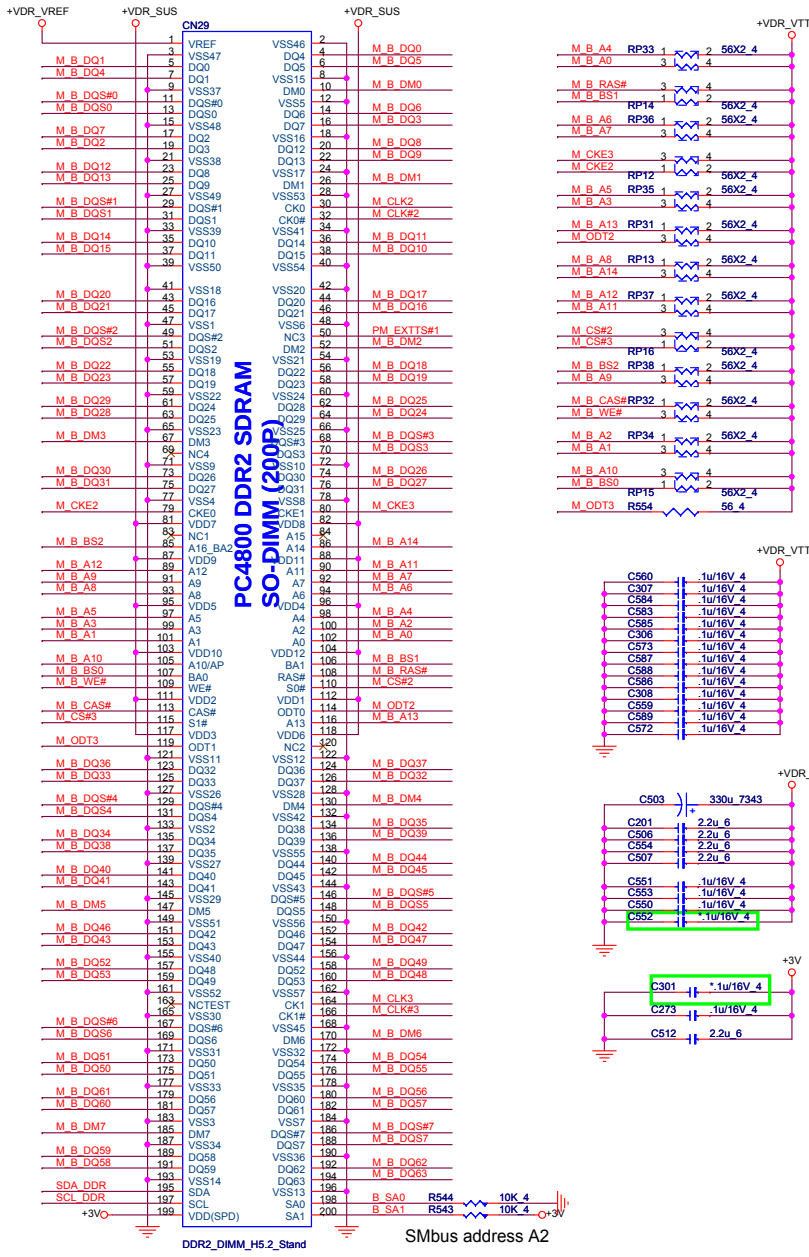
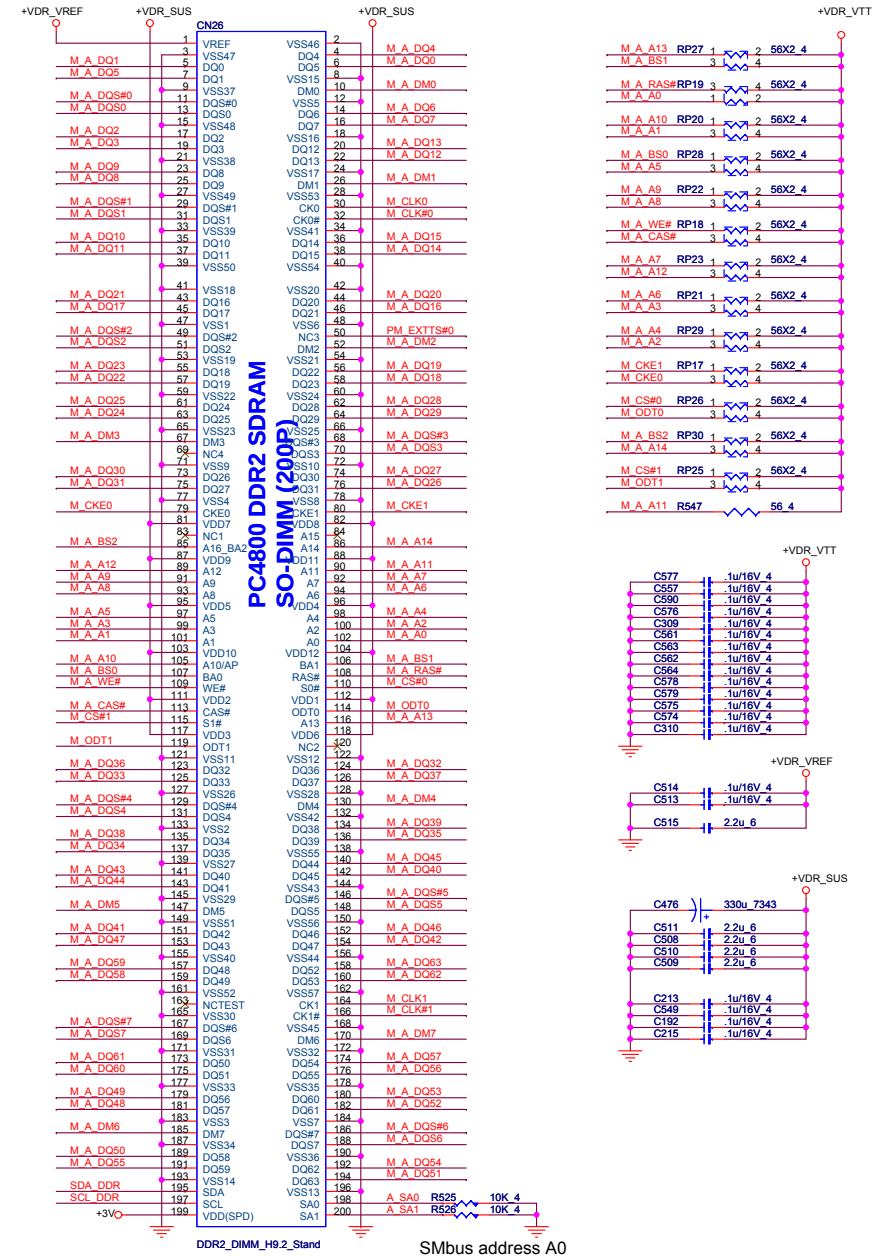
South Bridge Strap Pin (3/3)

Pin Name	Strap description	Sampled	Configuration	PU/PD
GPIO20	Reserved	PWROK		
SPKR	No Reboot	PWROK	0 = Default 1 = No Reboot mode	PCSPK R236 *1K_4 +3V
GPIO49	DMI Termination Voltage	PWROK	0 = for desktop applications 1 = for mobile applications Internal PU	DMI_TERM_SEL R507 *1K_4





DDR2 Module



- (6) PM_EXTTS#1 $\rightarrow$ PM_EXTTS#1
- (6) PM_EXTTS#0 $\rightarrow$ PM_EXTTS#0
- (6) M_CS#3[3:0] $\rightarrow$ M_CS#3[3:0]
- (6) M_ODT#3[0] $\rightarrow$ M_ODT#3[0]
- (6) M_CKE#3[0] $\rightarrow$ M_CKE#3[0]
- (6) M_CLK#3[0] $\rightarrow$ M_CLK#3[0]
- (8) M_A_CS# $\rightarrow$ M_A_CS#
- (8) M_A_RAS# $\rightarrow$ M_A_RAS#
- (8) M_A_WE# $\rightarrow$ M_A_WE#
- (8) M_A_BS2[0] $\rightarrow$ M_A_BS2[0]
- (8) M_A_DM7[0] $\rightarrow$ M_A_DM7[0]
- (8) M_A_DQS#7[0] $\rightarrow$ M_A_DQS#7[0]
- (8) M_A_DQS#7[0] $\rightarrow$ M_A_DQS#7[0]
- (8) M_A_A[14:0] $\rightarrow$ M_A_A[14:0]
- (8) M_A_DQ[63:0] $\rightarrow$ M_A_DQ[63:0]
- (8) M_B_CS# $\rightarrow$ M_B_CS#
- (8) M_B_RAS# $\rightarrow$ M_B_RAS#
- (8) M_B_WE# $\rightarrow$ M_B_WE#
- (8) M_B_BS2[0] $\rightarrow$ M_B_BS2[0]
- (8) M_B_DM7[0] $\rightarrow$ M_B_DM7[0]
- (8) M_B_DQS#7[0] $\rightarrow$ M_B_DQS#7[0]
- (8) M_B_DQS#7[0] $\rightarrow$ M_B_DQS#7[0]
- (8) M_B_A[14:0] $\rightarrow$ M_B_A[14:0]
- (8) M_B_DQ[63:0] $\rightarrow$ M_B_DQ[63:0]

Quanta Computer Inc.
PROJECT : ZK2

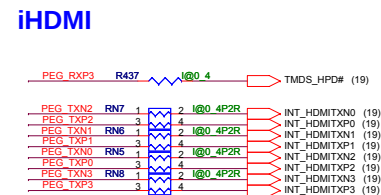
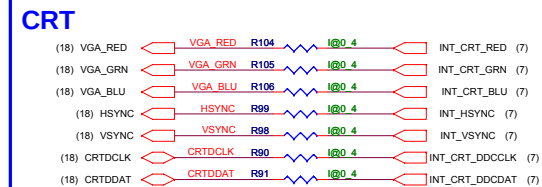
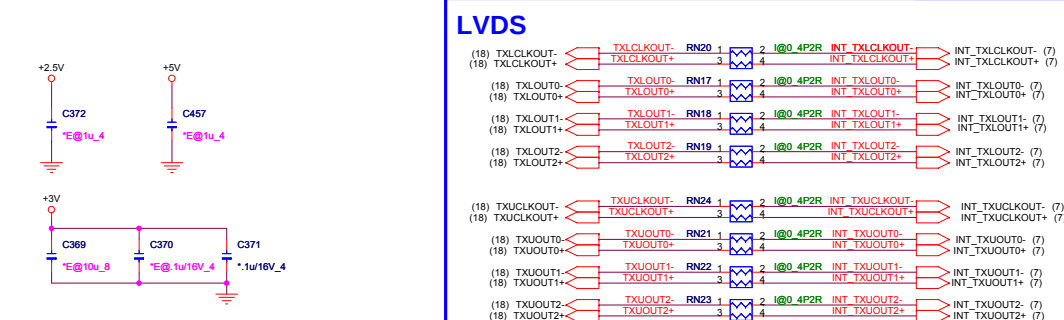
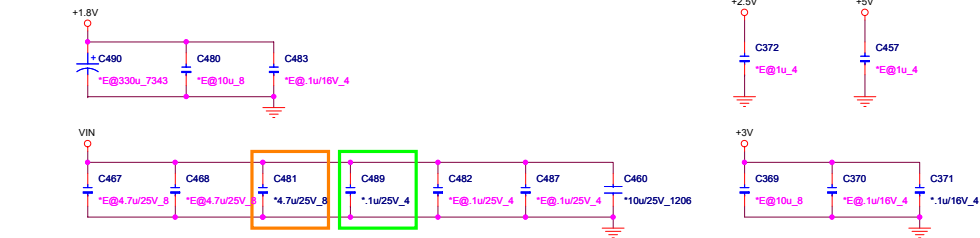
Size Document Number

Rev 38

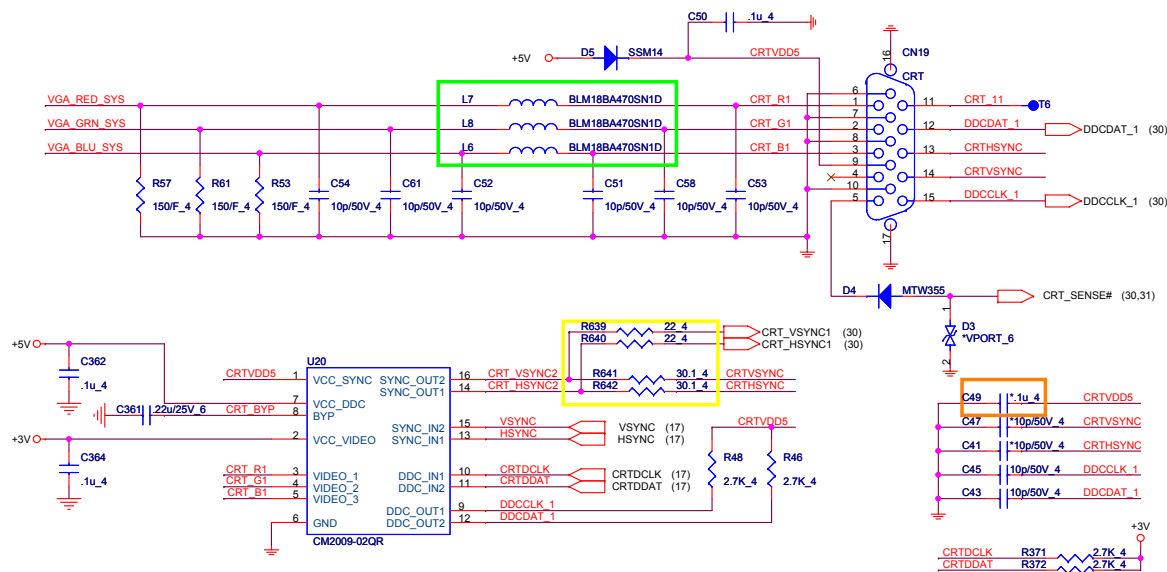
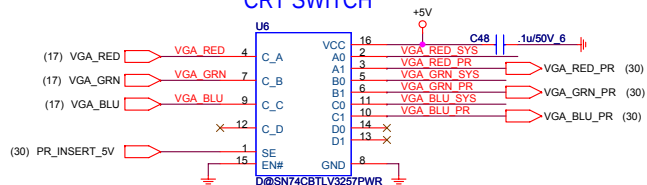
DDR2 SO-DIMM

Date: Friday, June 27, 2008 Sheet 16 of 39

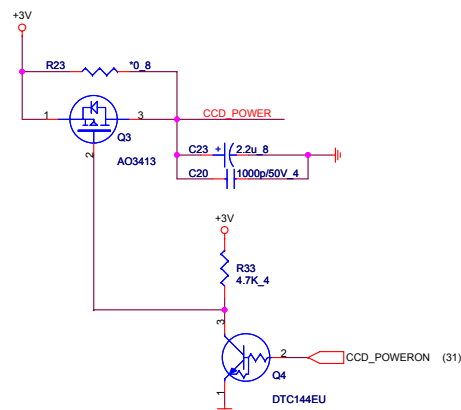
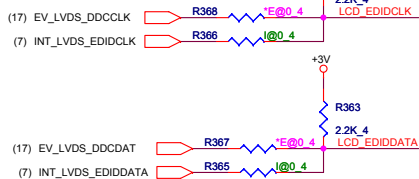
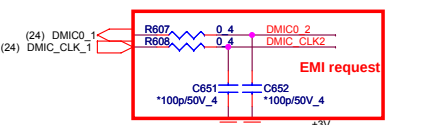
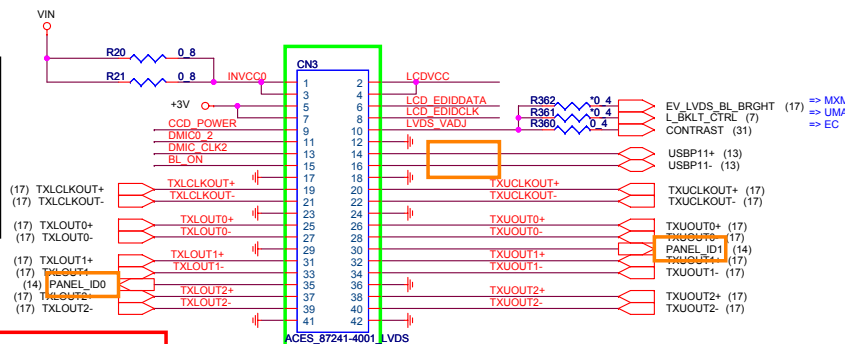
IV@
EV@



IV@
EV@



P_ID1	P_ID0	Resolution
0	0	1366x768
0	1	1920x1080
1	0	Reserved
1	1	Reserved



Lid Switch (Hall sensor)

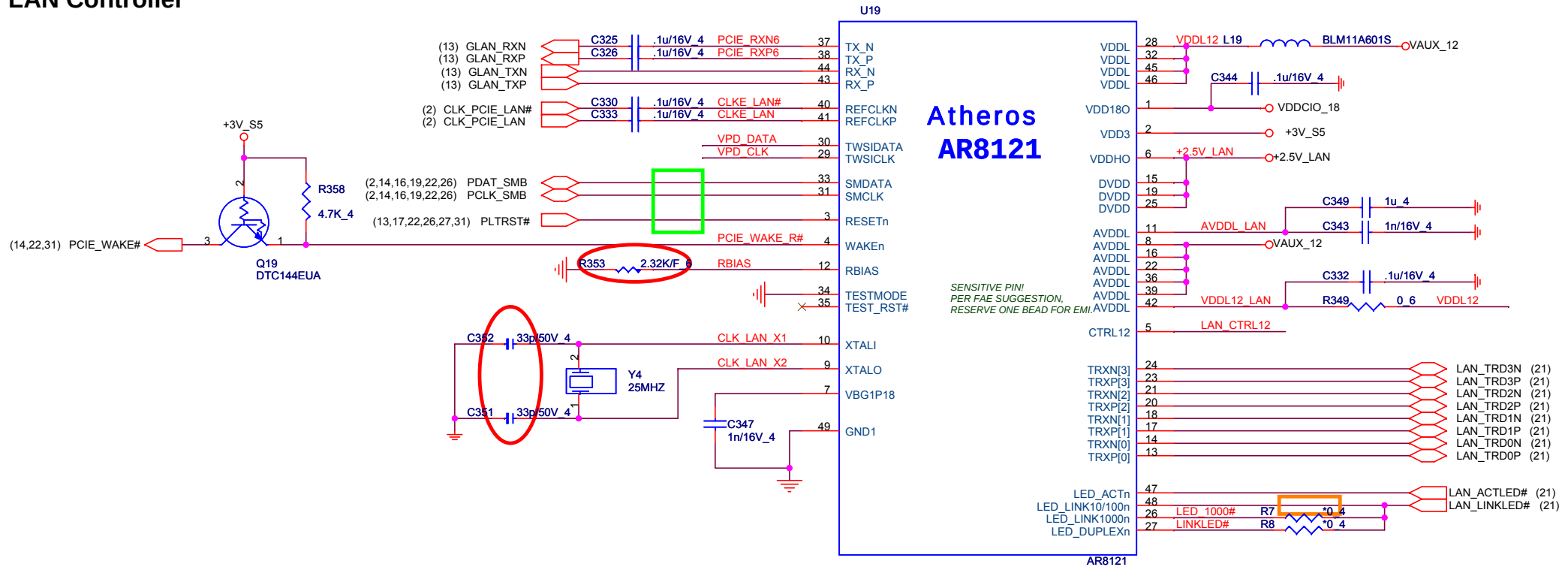
PT3661-BB : AL003661003
EM-6781-T3 : AL006781000

(7) INT_LVDS_BLOn
(17) EV_LVDS_BLOn

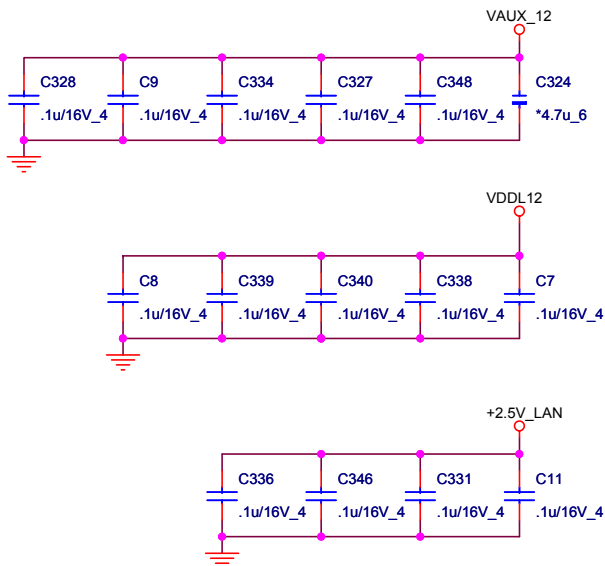
UMA: 100K pull-down to GND

Quanta Computer I
PROJECT : ZK2
CRT/LVDS/CAMERA/LID

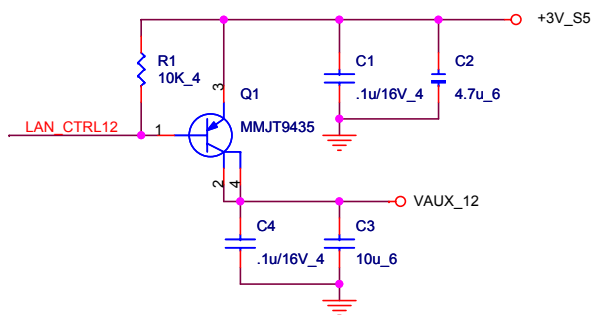
LAN Controller



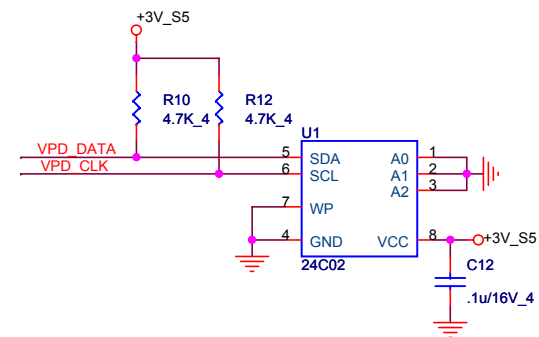
Decoupling CAP



Regulator(1.2V)

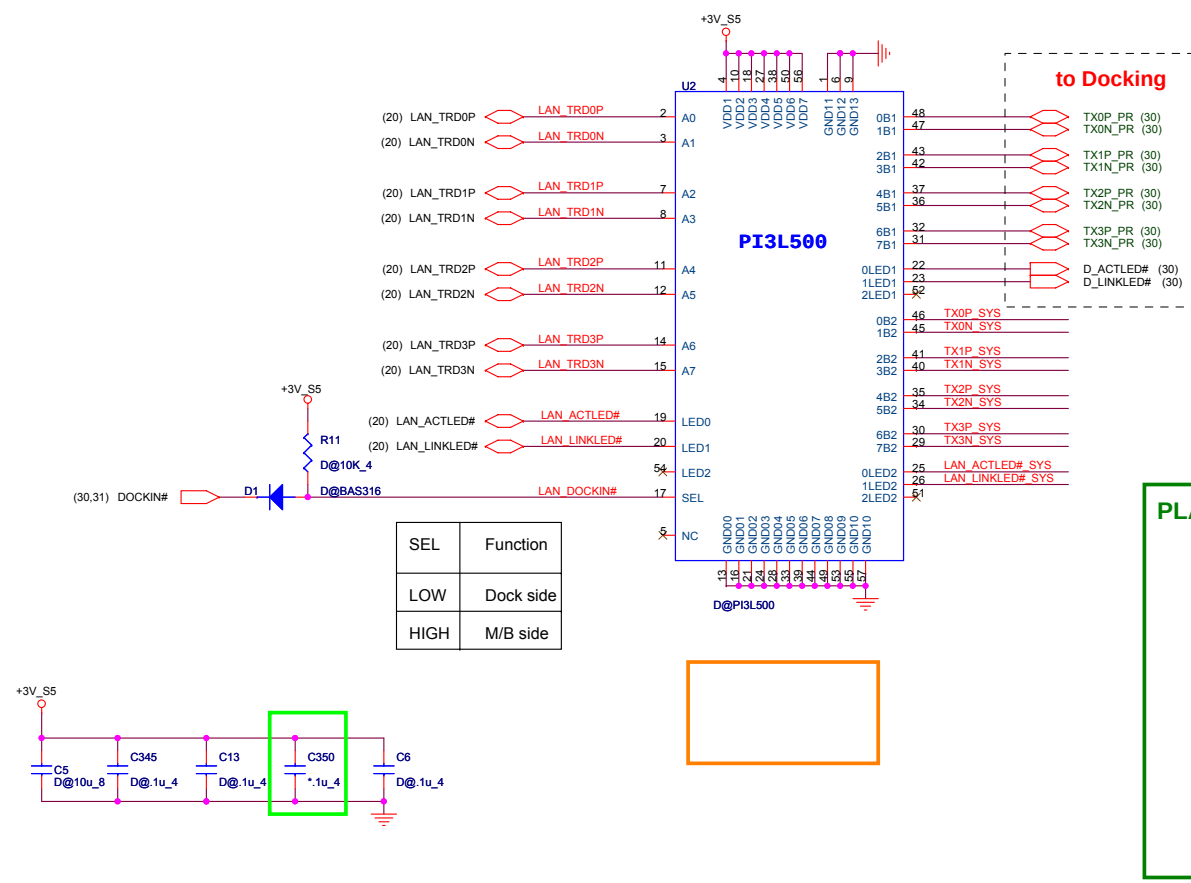


EEPROM

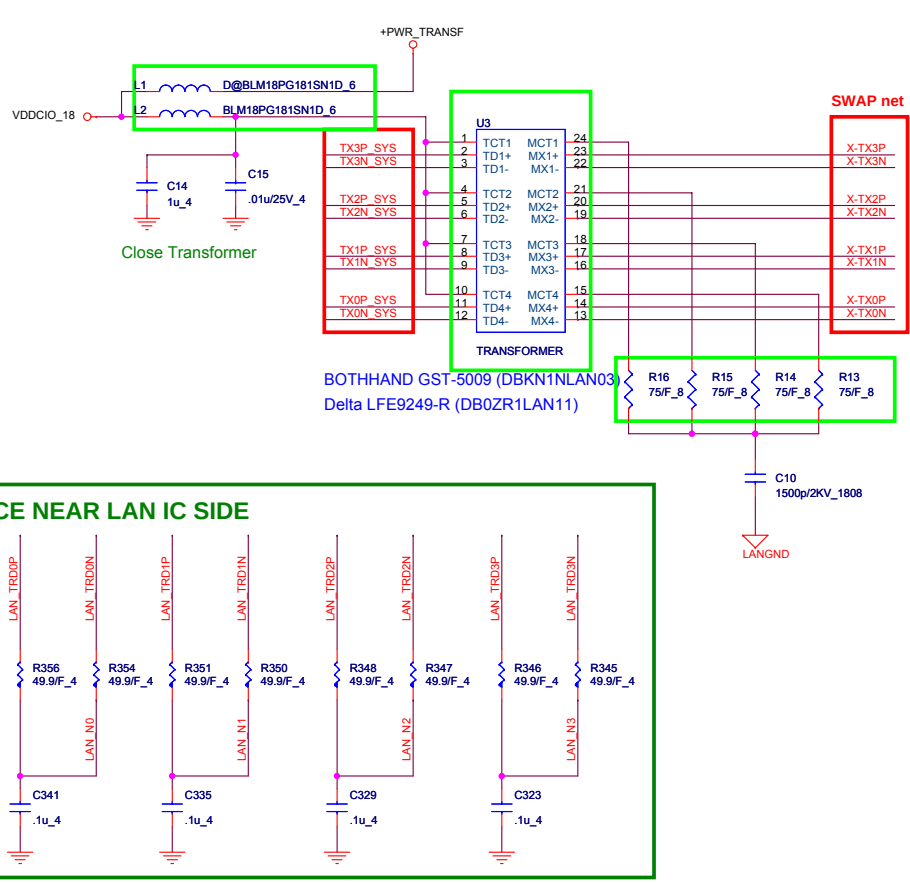


Quanta Computer Inc.
PROJECT : ZK2

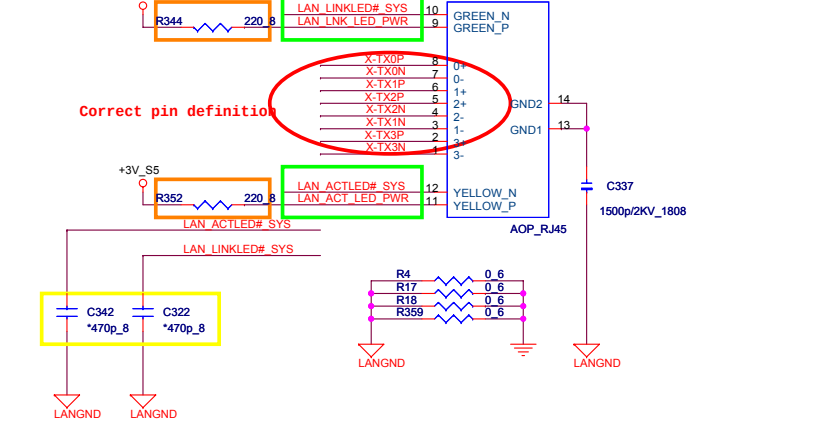
LAN SWITCH



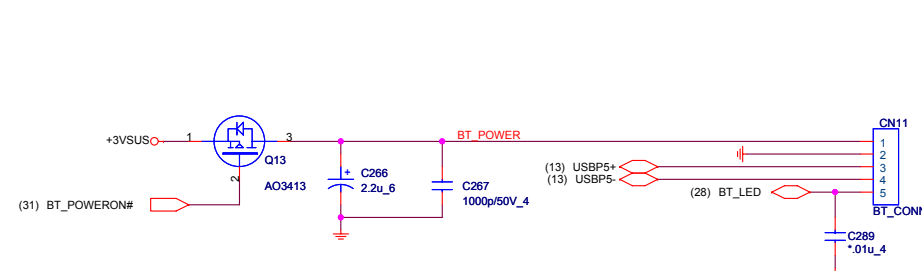
TRANSFORMER



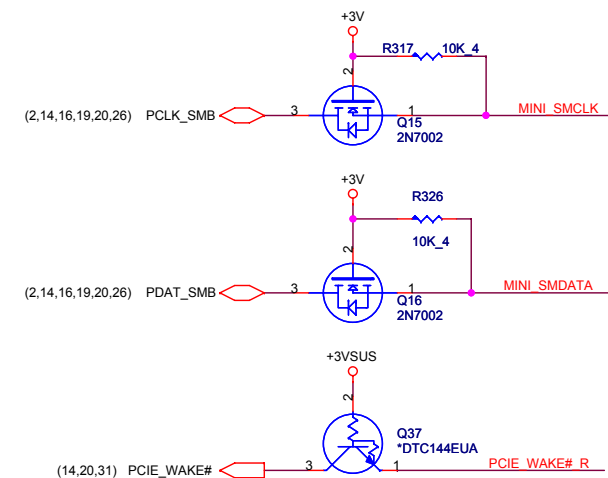
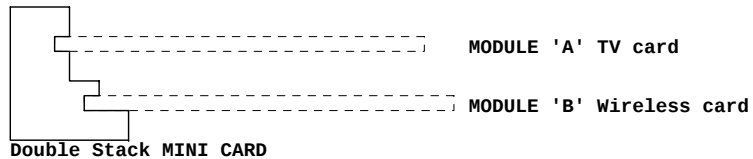
RJ45



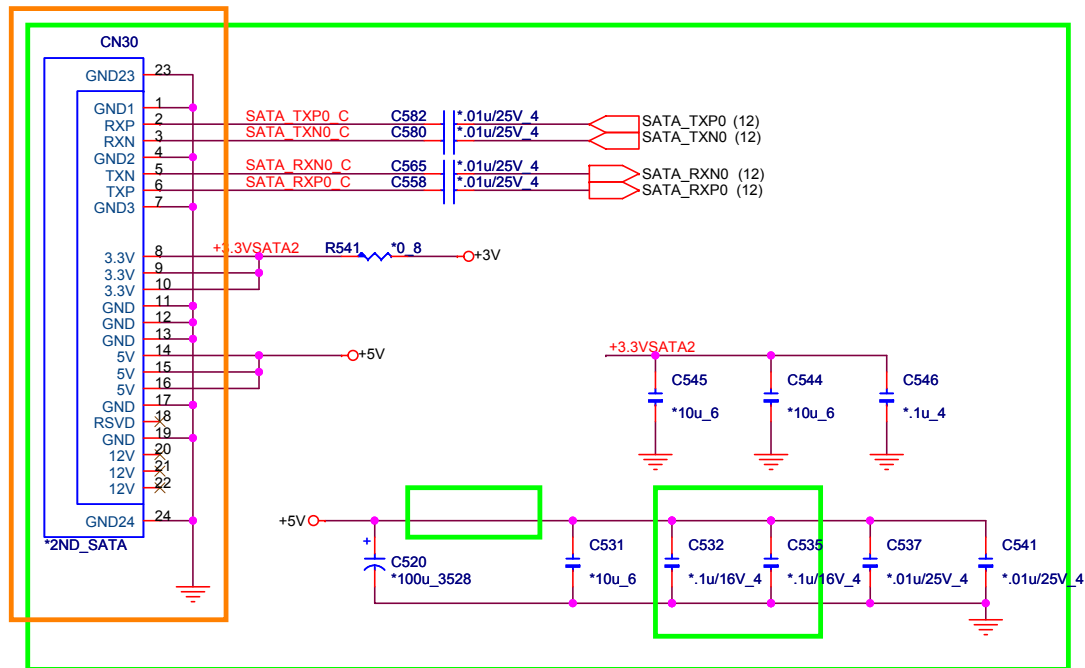
BLUETOOTH CONNECTOR



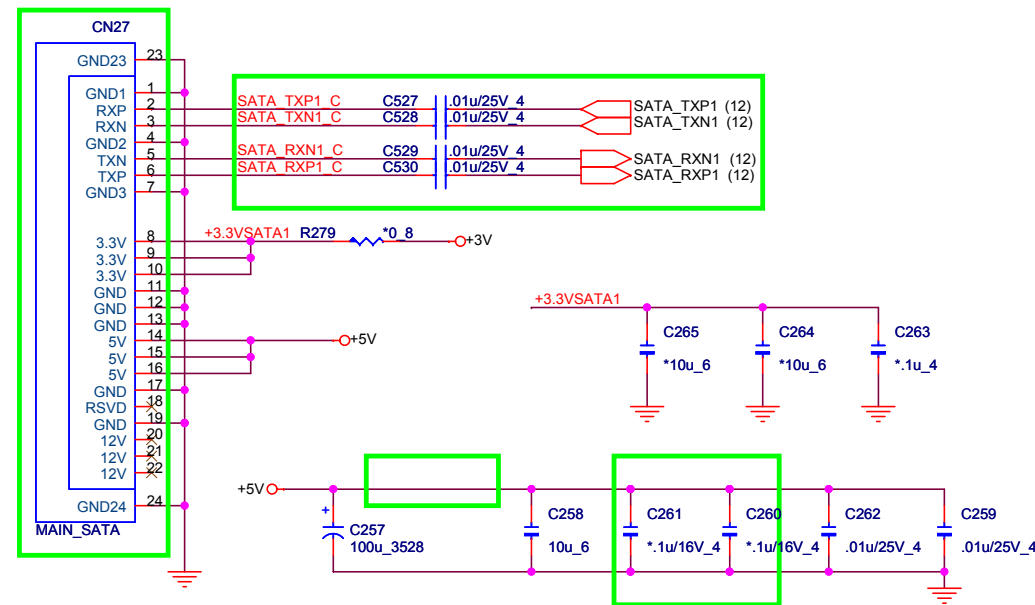
+3.3V: 1000mA
+3.3Vaux:330mA
+1.5V:500mA



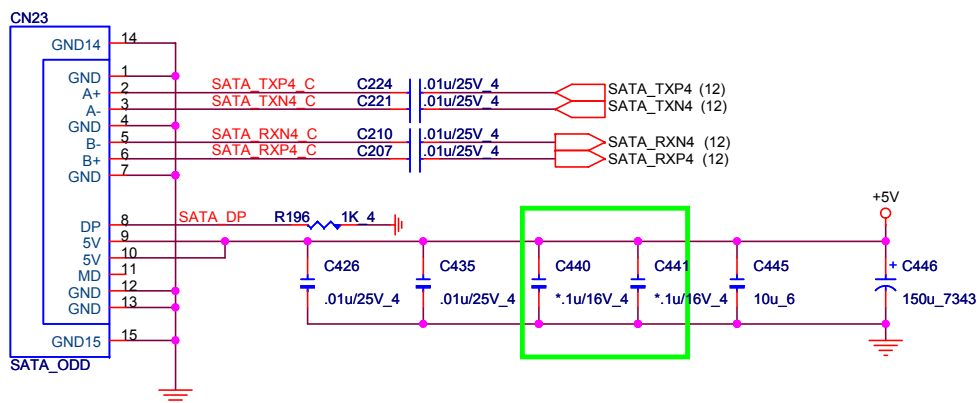
2nd SATA HDD (edge of board)



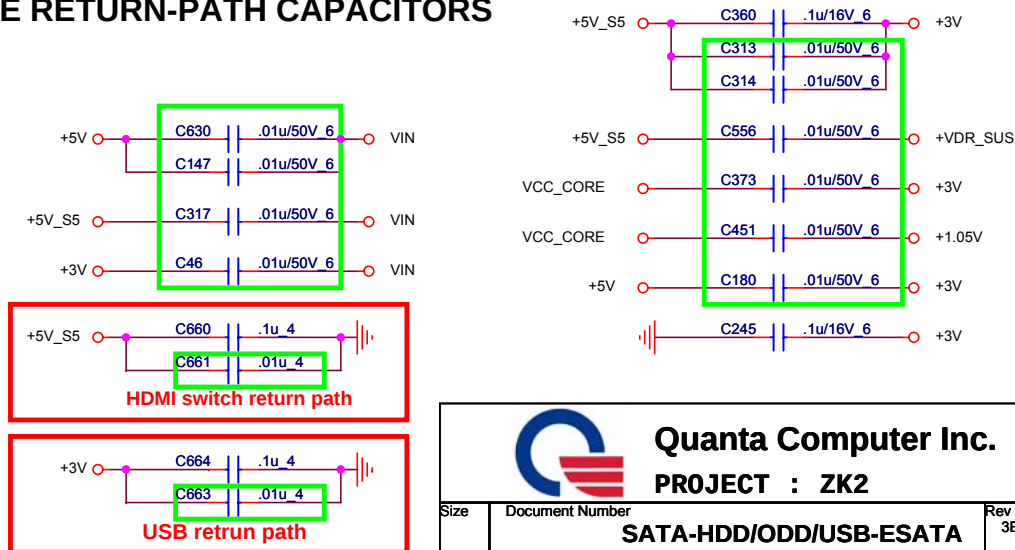
MAIN SATA HDD



ODD (SATA)



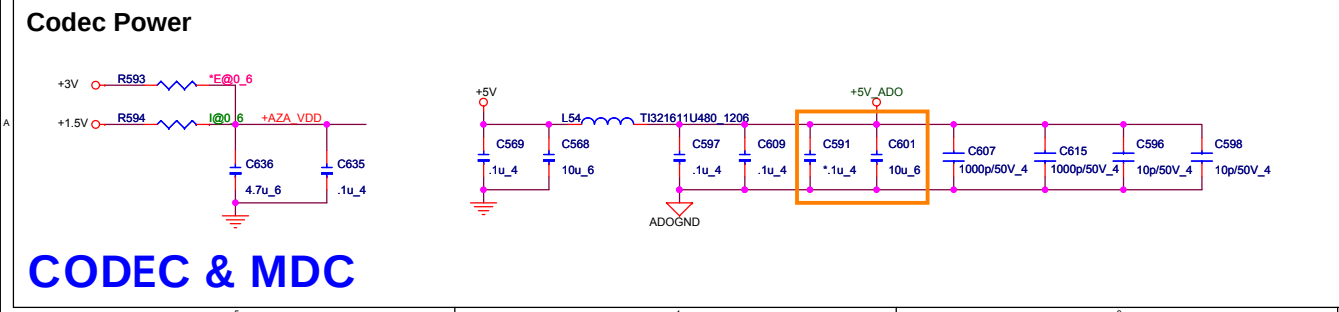
EE RETURN-PATH CAPACITORS



Quanta Computer Inc.
PROJECT : ZK2

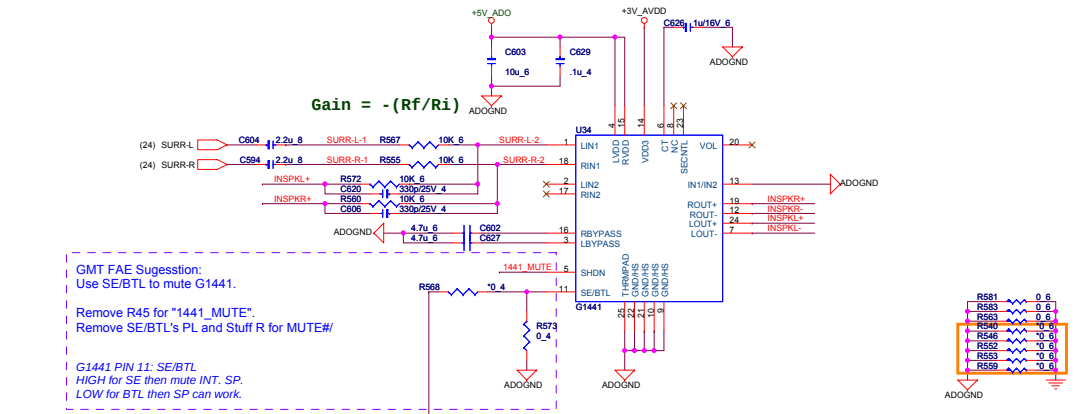
Size	Document Number	Rev
	SATA-HDD/ODD/USB-ESATA	3B
Date:	Friday, June 27, 2008	Sheet 23 of 39

IV@
EV@

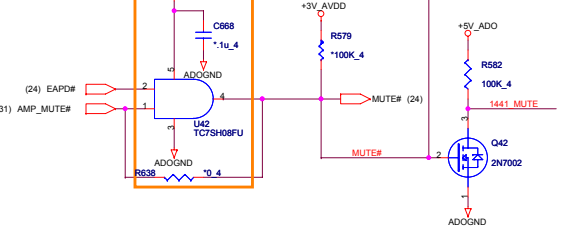
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Size	Document Number	Rev
	REALTEK ALC663&888/MDC	3B
Date:	Friday, June 27, 2008	Sheet 24 of 39

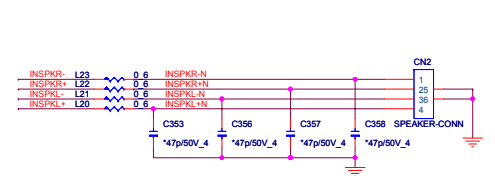
SPEAKER AMP.



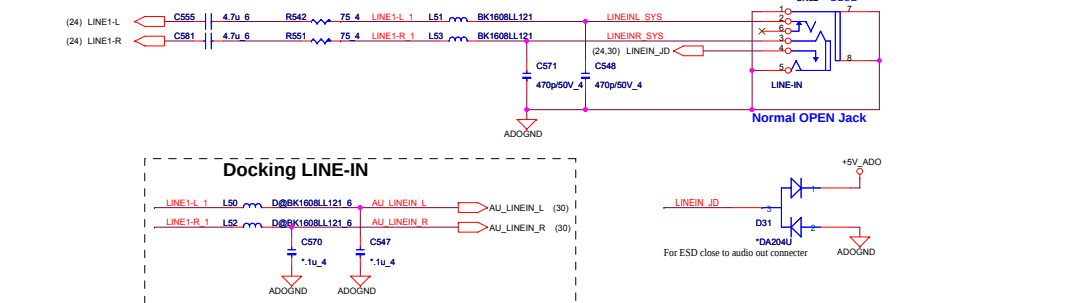
MUTE



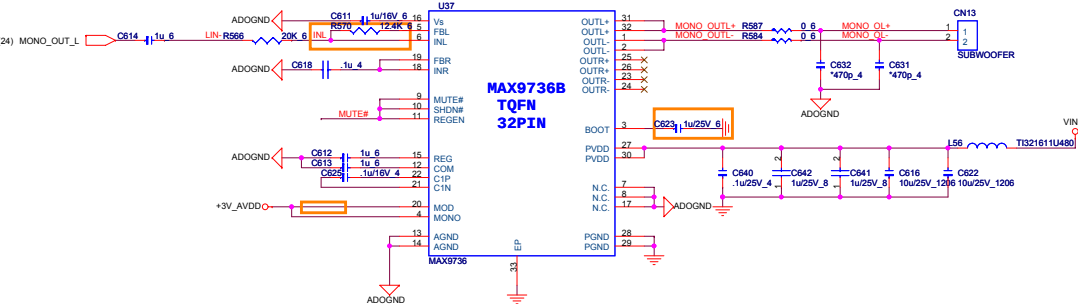
SPEAKER



LINE IN

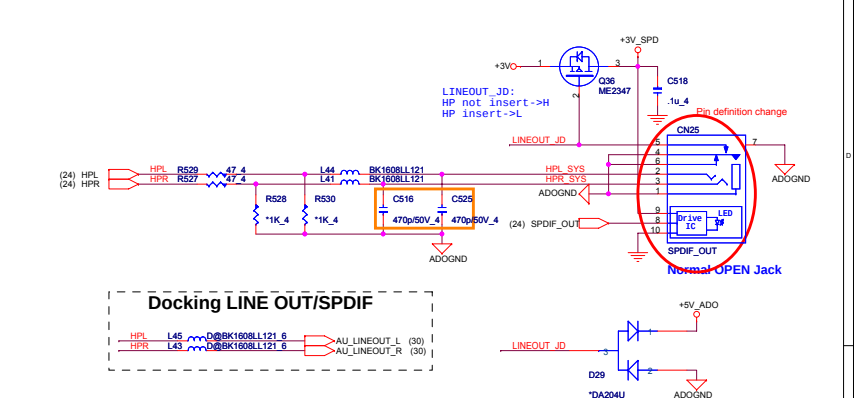


SUBWOOFER

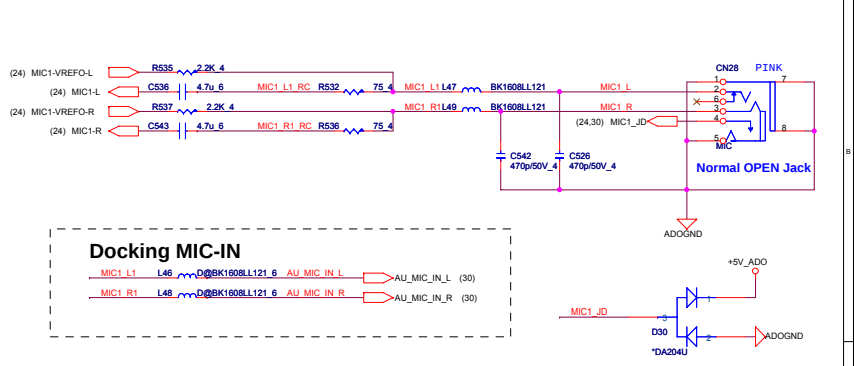


AMP & PHONE JACK & SUBWOOFER

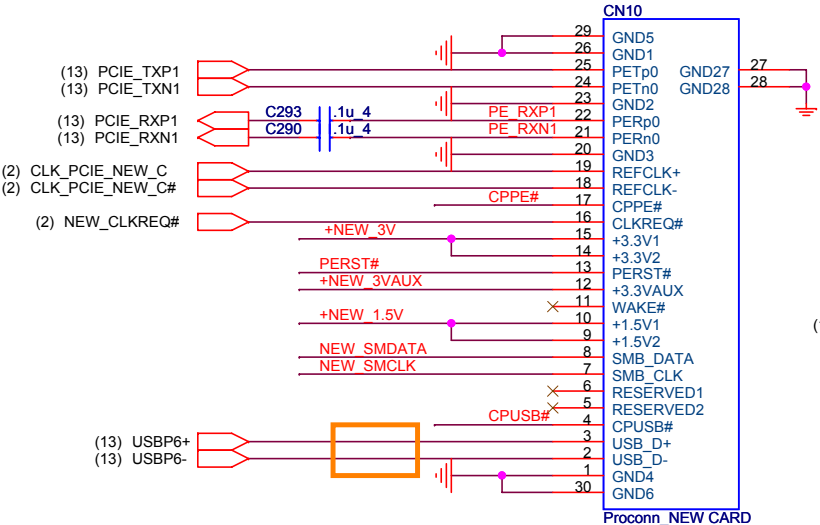
LINE-OUT/SPDIFO



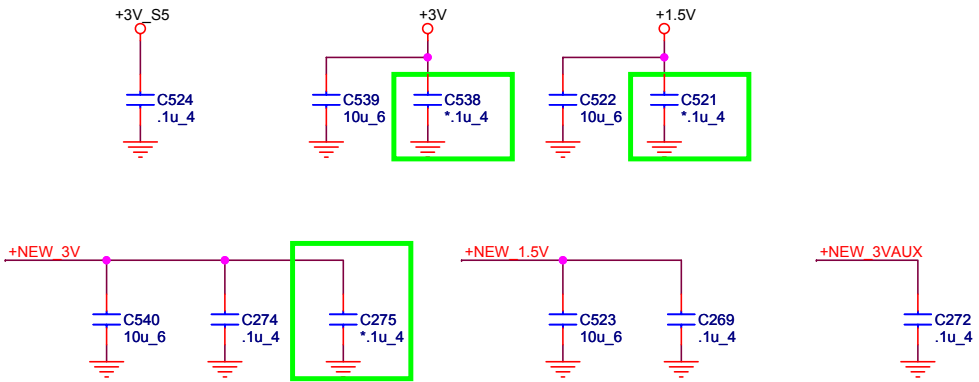
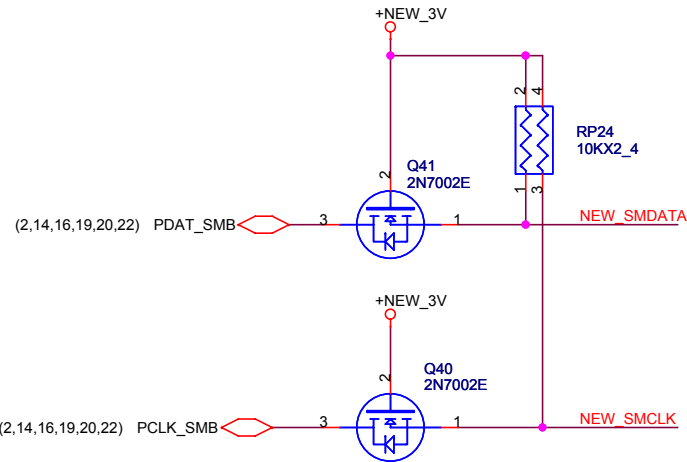
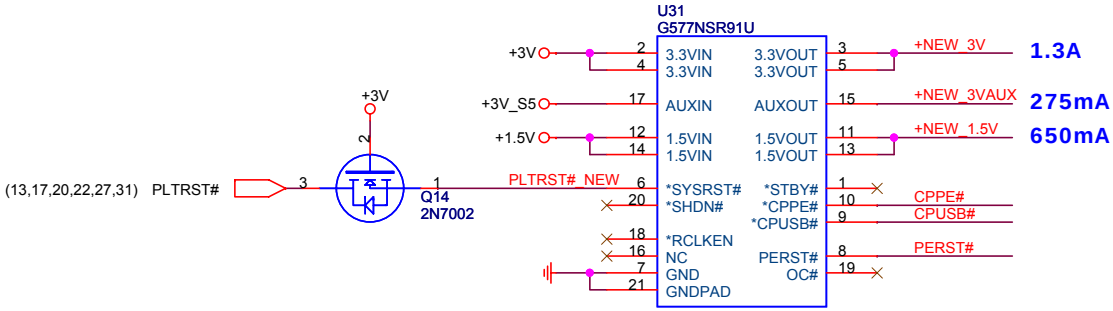
MIC



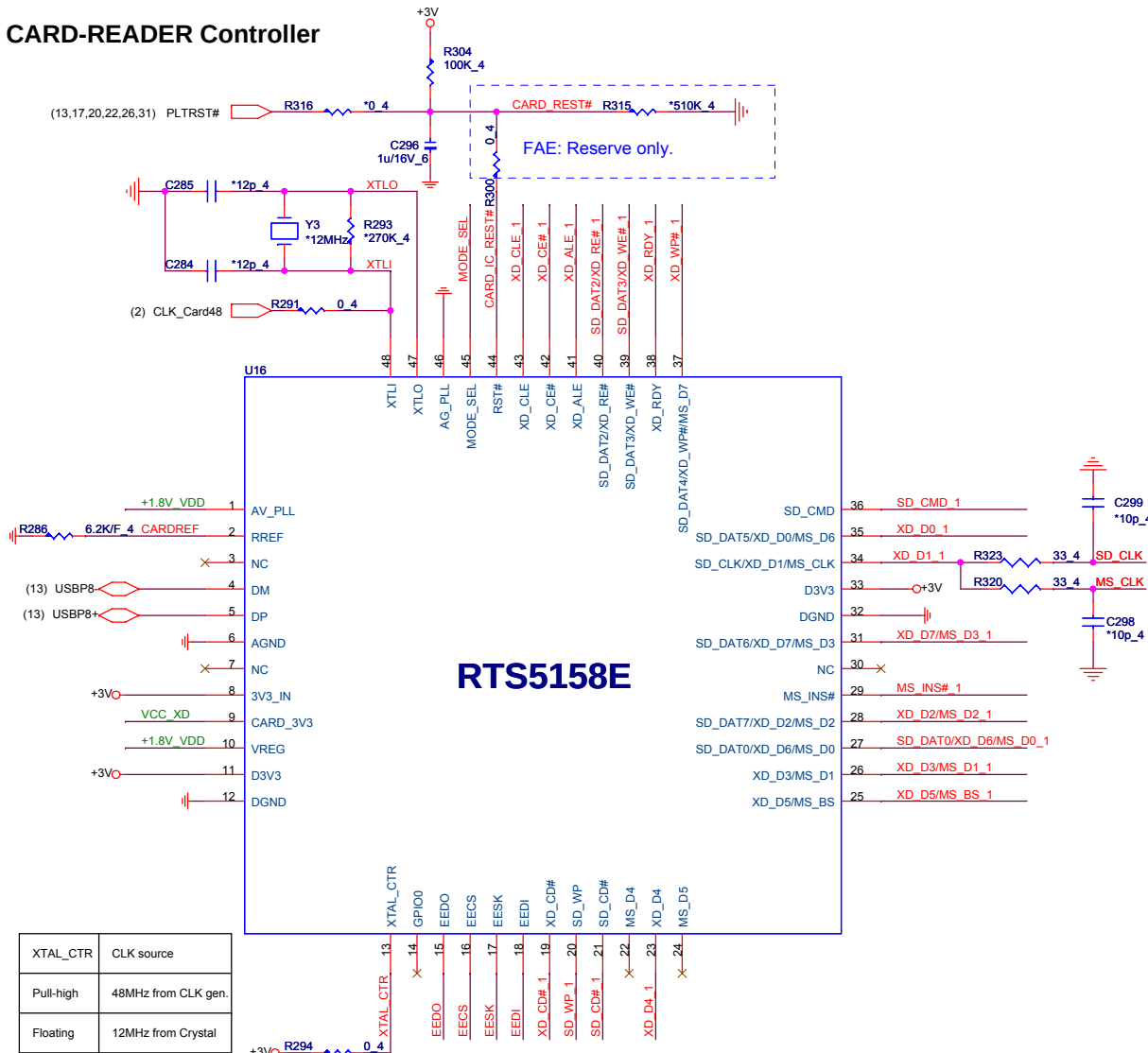
NEW CARD



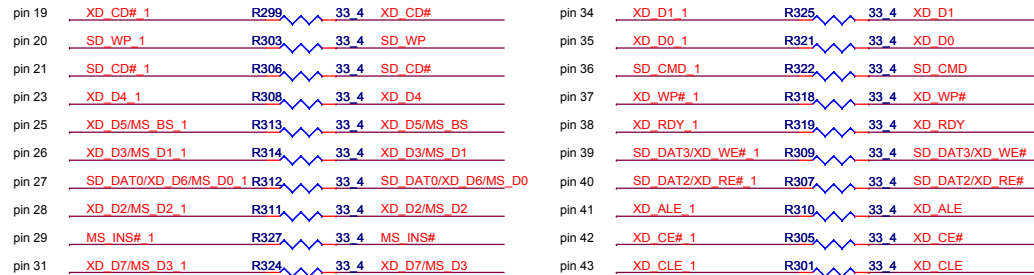
NEW CARD'S POWER SWITCH
TI: AL002231000
GMT: AL000577002



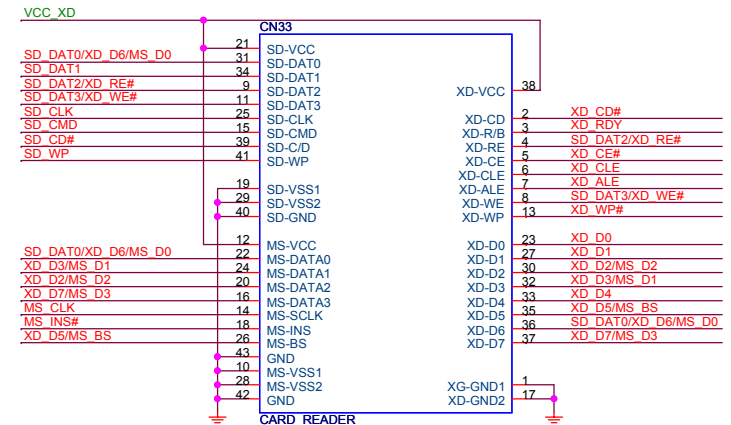
CARD-READER Controller



XTAL_CTR	CLK source
Pull-high	48MHz from CLK gen.
Floating	12MHz from Crystal

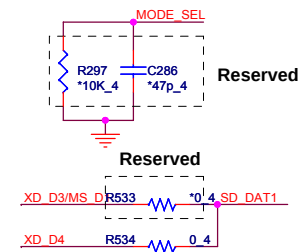


4 IN 1 CARD READER

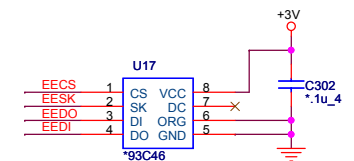


Model_Select

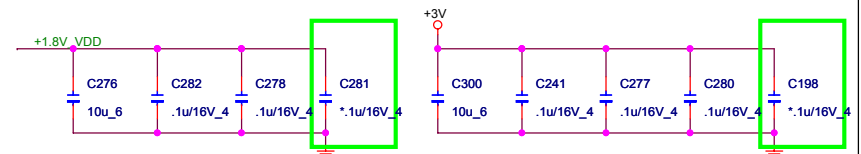
R6256/C860=NC/NC (R6258:ON)=> SD_D1 from pin23
R6256/C860=10K/47pF(R6257:ON)=>SD_D1 from pin26



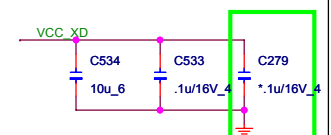
EEPROM(Reserved)



Decoupling CAP



	SD/MMC	MS	XD
SP1		XD CD#	
SP2	SD WP		
SP3	SD CD#		
SP4		XD D4	
SP5		XD D5	MS B5
SP6		XD D3	MS D1
SP7	SD DAT0	XD D6	MS D0
SP8	SD DAT7	XD D2	MS D2
SP9			MS INS#
SP10	SD DAT6	XD D7	MS D3
SP11		XD D1	
SP12	SD DAT5	XD D0	MS D6
SP13	SD DAT4	XD WP#	MS D7
SP14		XD RDY	
SP15	SD DAT3	XD WE#	
SP16	SD DAT2	XD RE#	
SP17		XD ALE	
SP18		XD CE#	
SP19		XD CLE	



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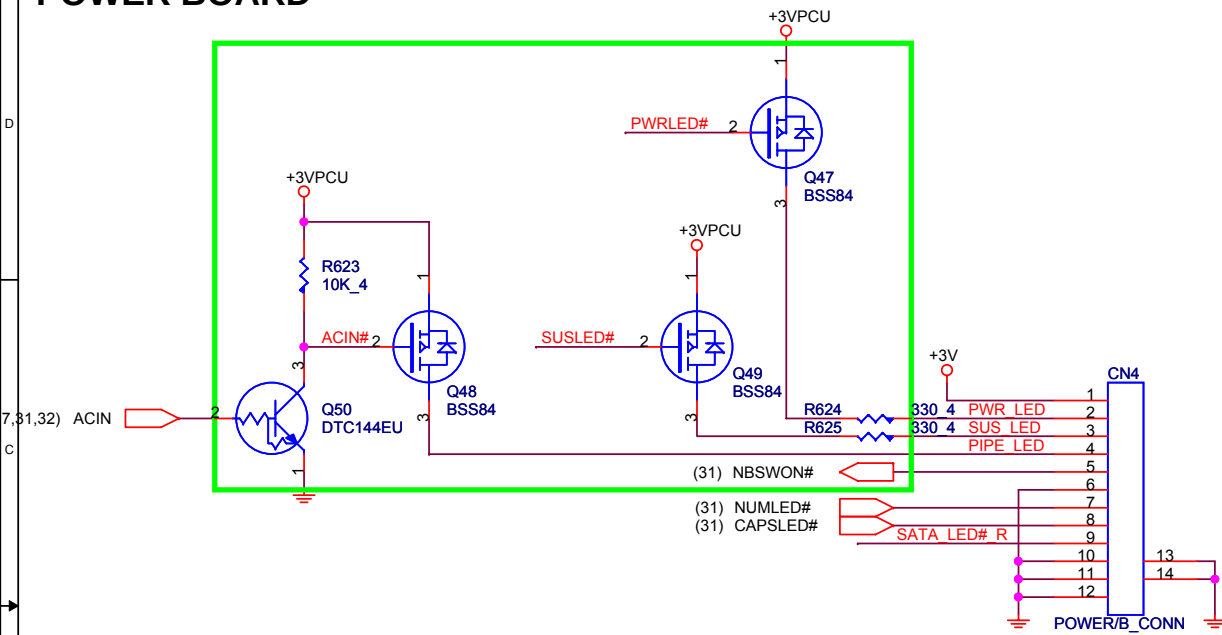
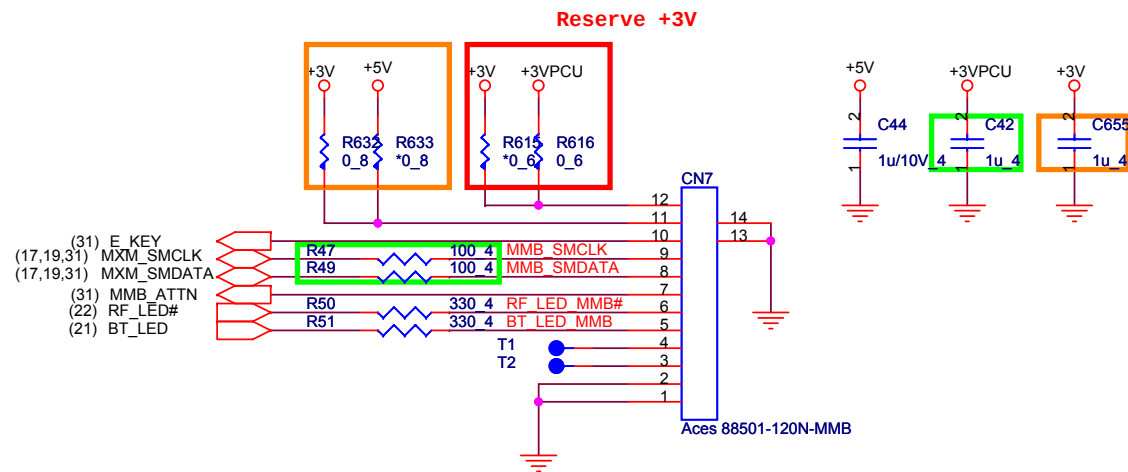
CARD READER RTS5158E

Date: Friday, June 27, 2008

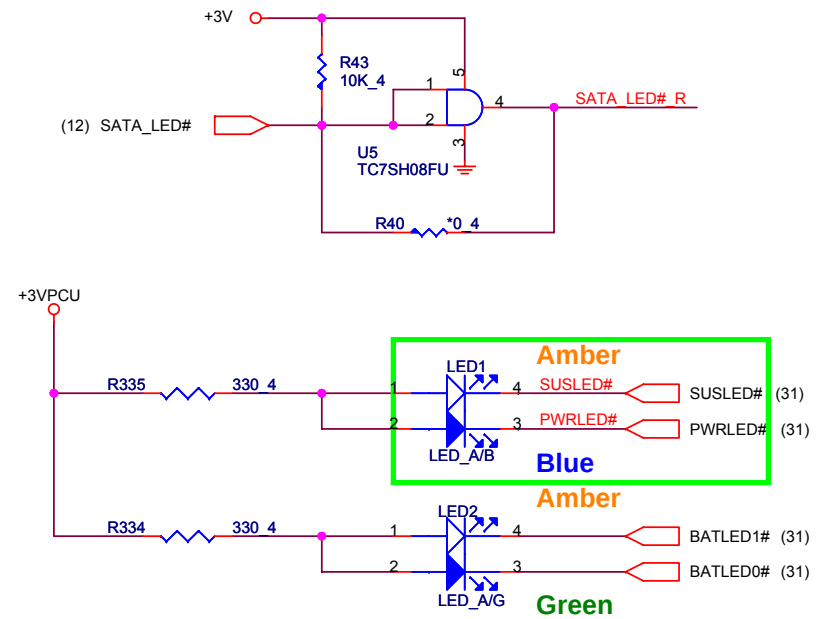
Sheet 27 of 39

Rev
3B

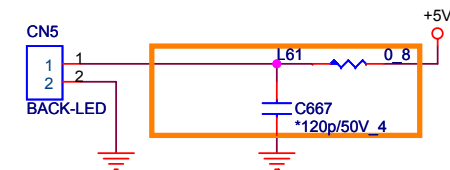
POWER BOARD

**MMB**

LED



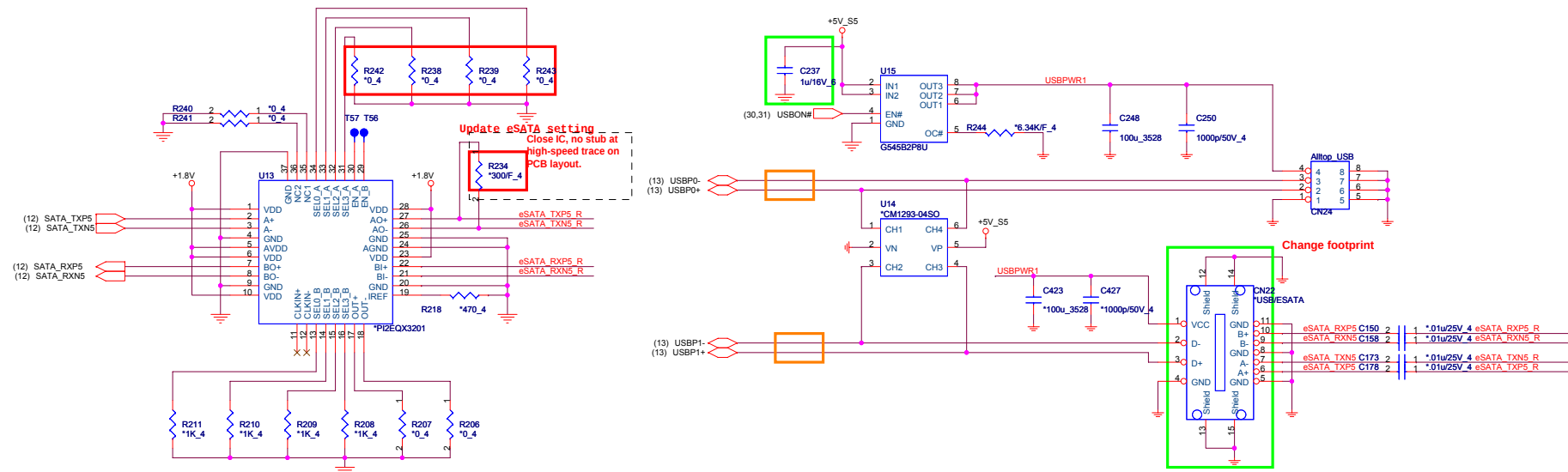
Backlight Logo LED



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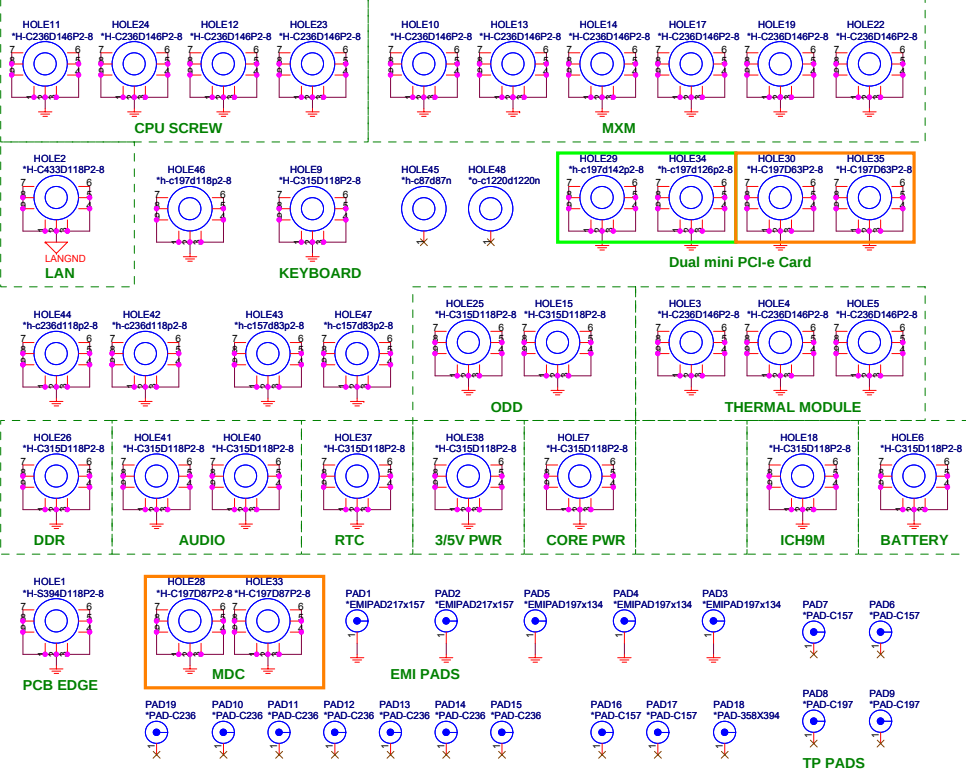
Size	Document Number	Rev
	POWER/MMB/LAUNCH/LED	3B
Date:	Friday, June 27, 2008	Sheet 28 of 39

USB & eSATA

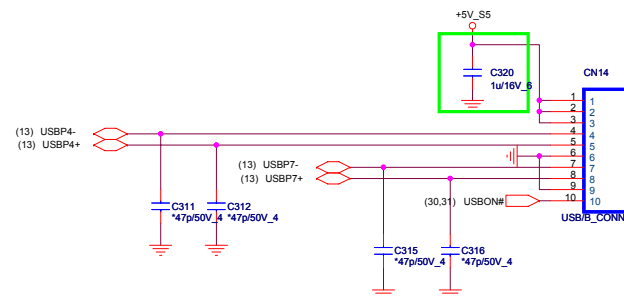


SEL0_X	SEL1_X	E _q	SEL2_X	Swing	SEL3_X	De-Emphasis
0	0	0dB	0	1.0X	0	0dB
0	1	2.5dB	1	1.2X	1	-3.5dB
1	0	4.5dB				
1	1	6.5dB				

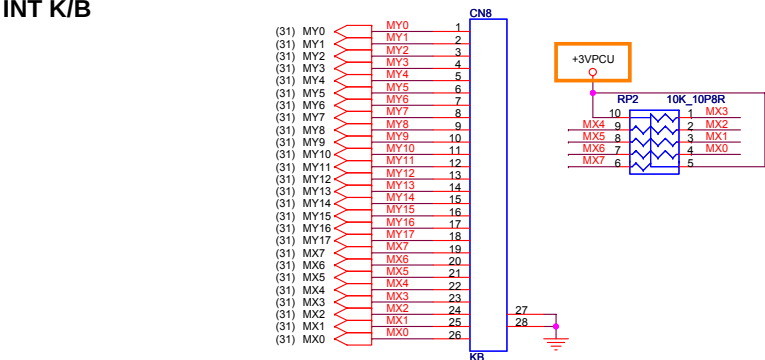
HOLES



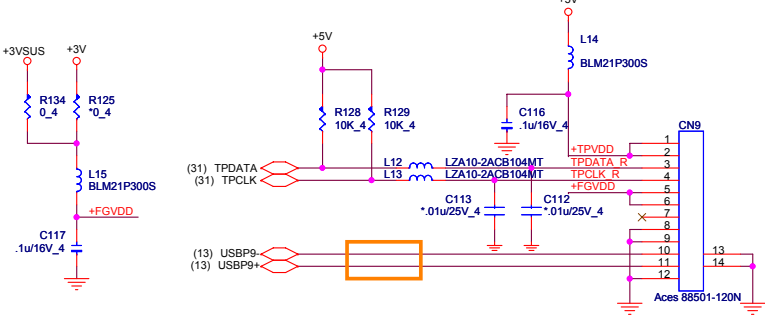
USB/B



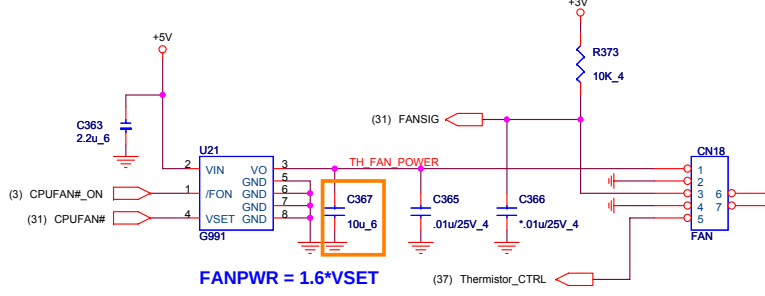
INT K/B



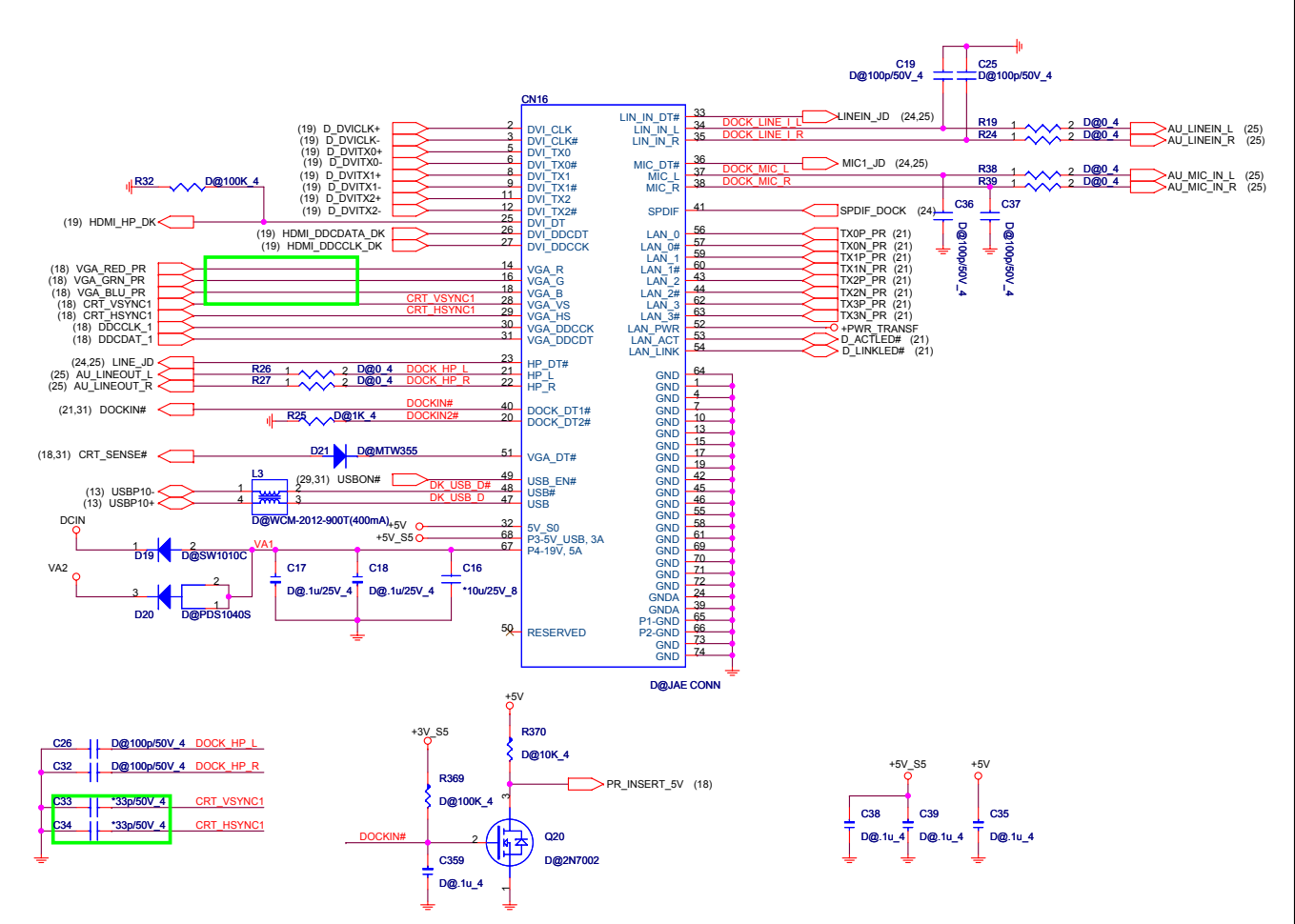
TOUCHPAD & Finger-Printer CONN.



CPU FAN



CABLE DOCK



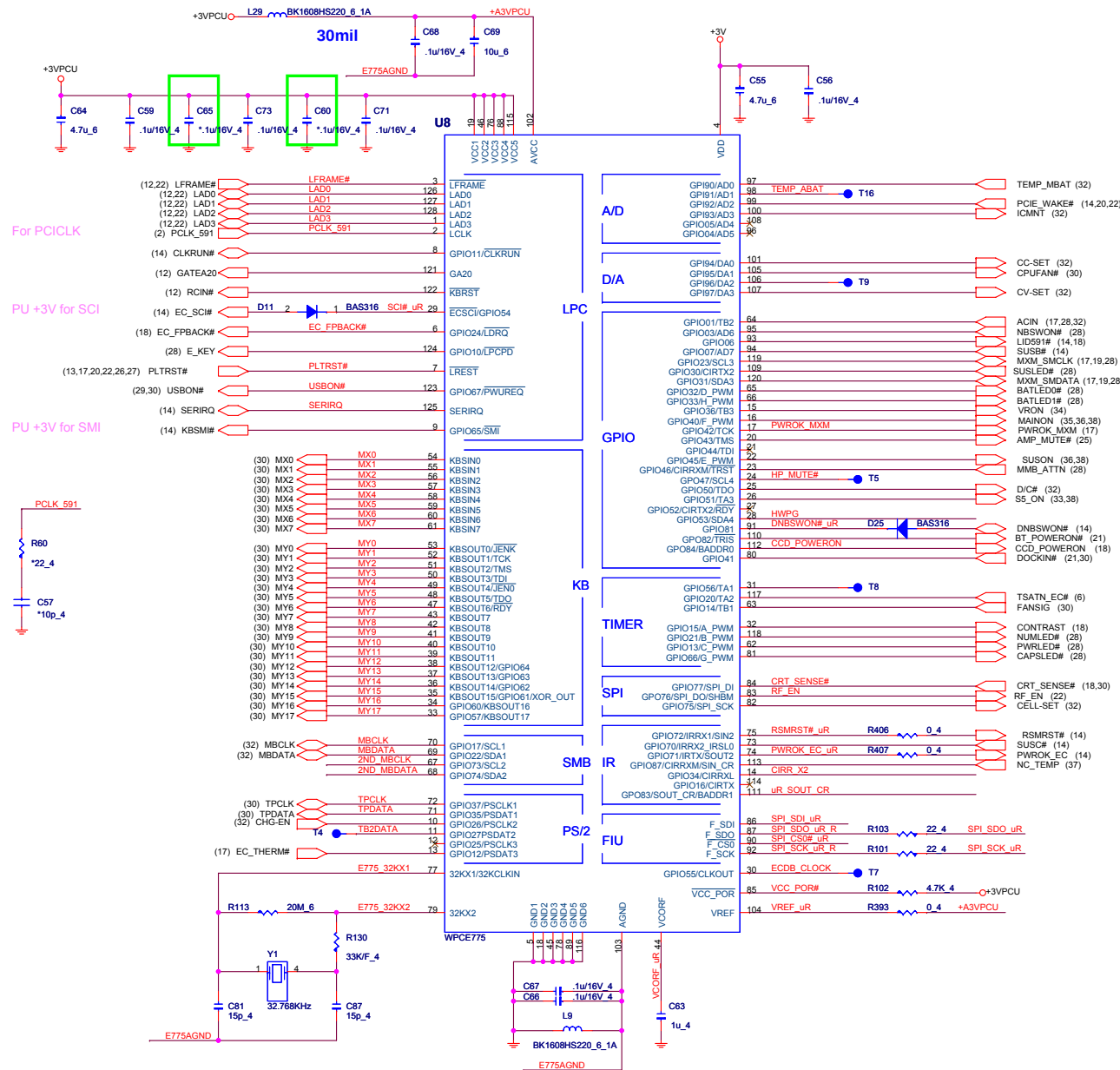


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Size	Document Number	Rev
	KB/FAN/TP+FP/DOCK	3B
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EC



I/O ADDRESS SETTING

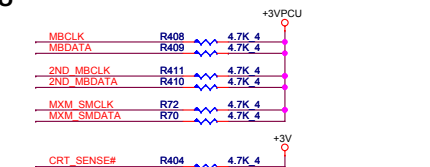
I/O Address	
BADDR1-0	Index Data
0 0	XOR TREE TEST MODE
0 1	CORE DEFINED
1 0	2Eh 2Fh
1 1	164Eh 164Fh

SHBM=0: Enable shared memory with host BIOS

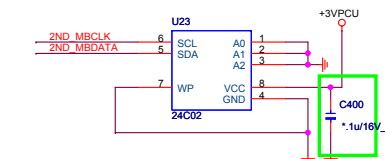


1/13 Confirm by vendor mail :
Disabled ('1') if using FWH device on LPC.
Enabled ('0') if using SPI flash for both system BIOS and EC firmware

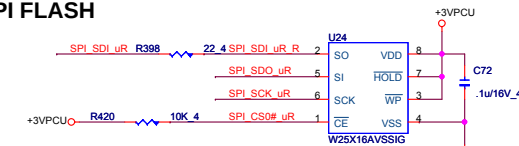
SM BUS PU



ACER ID

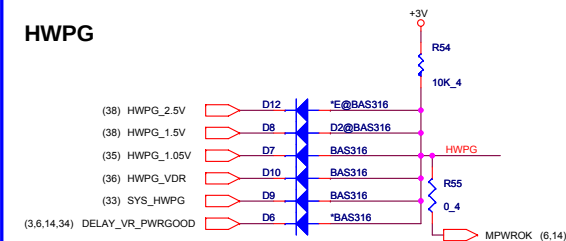


SPI FLASH

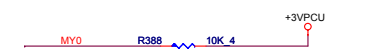


1/13 Confirm by vendor mail :
If the Southbridge enables 'Long Wait Abort' by default, the flash device should be 50MHz (or faster)

HWPG

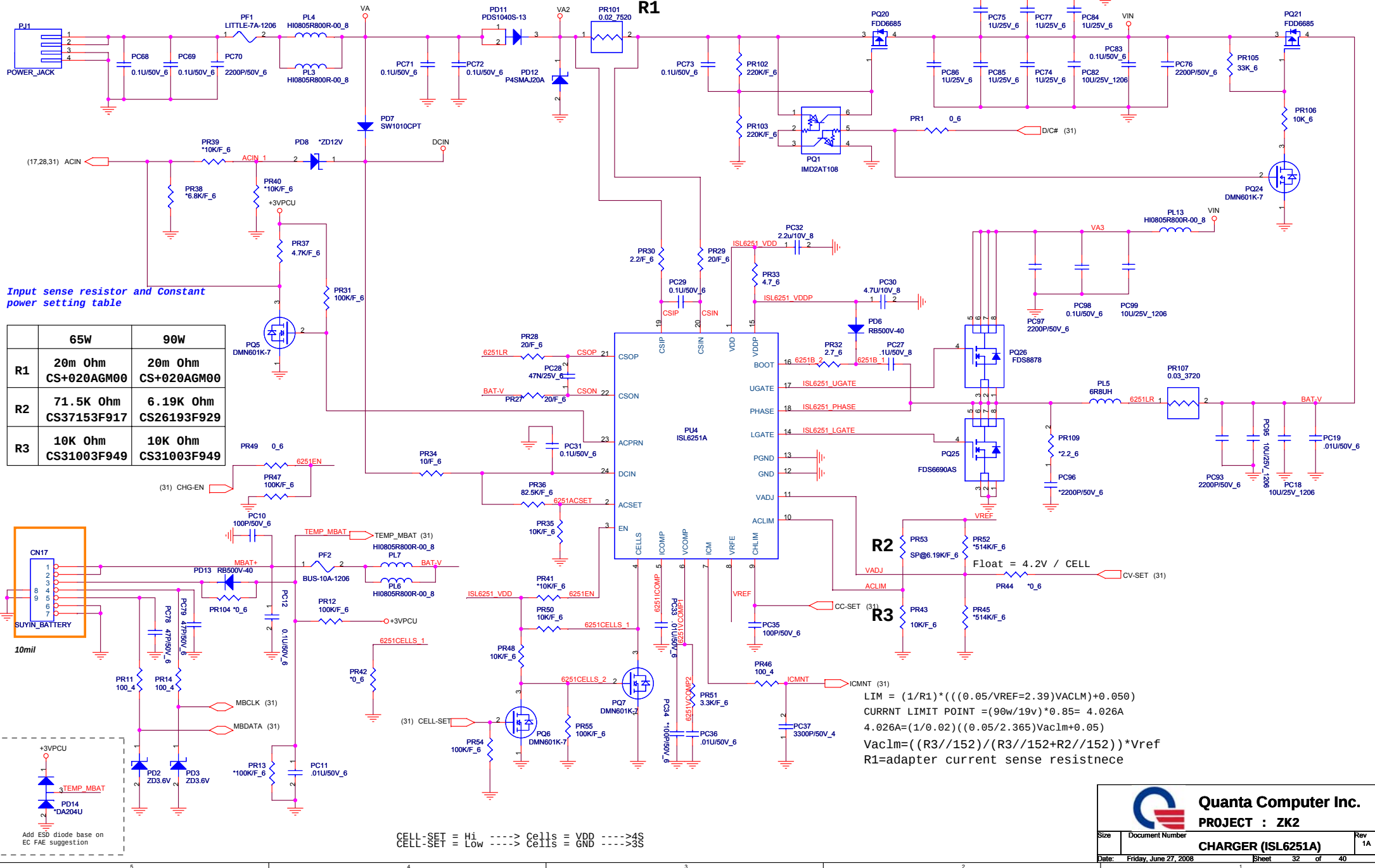


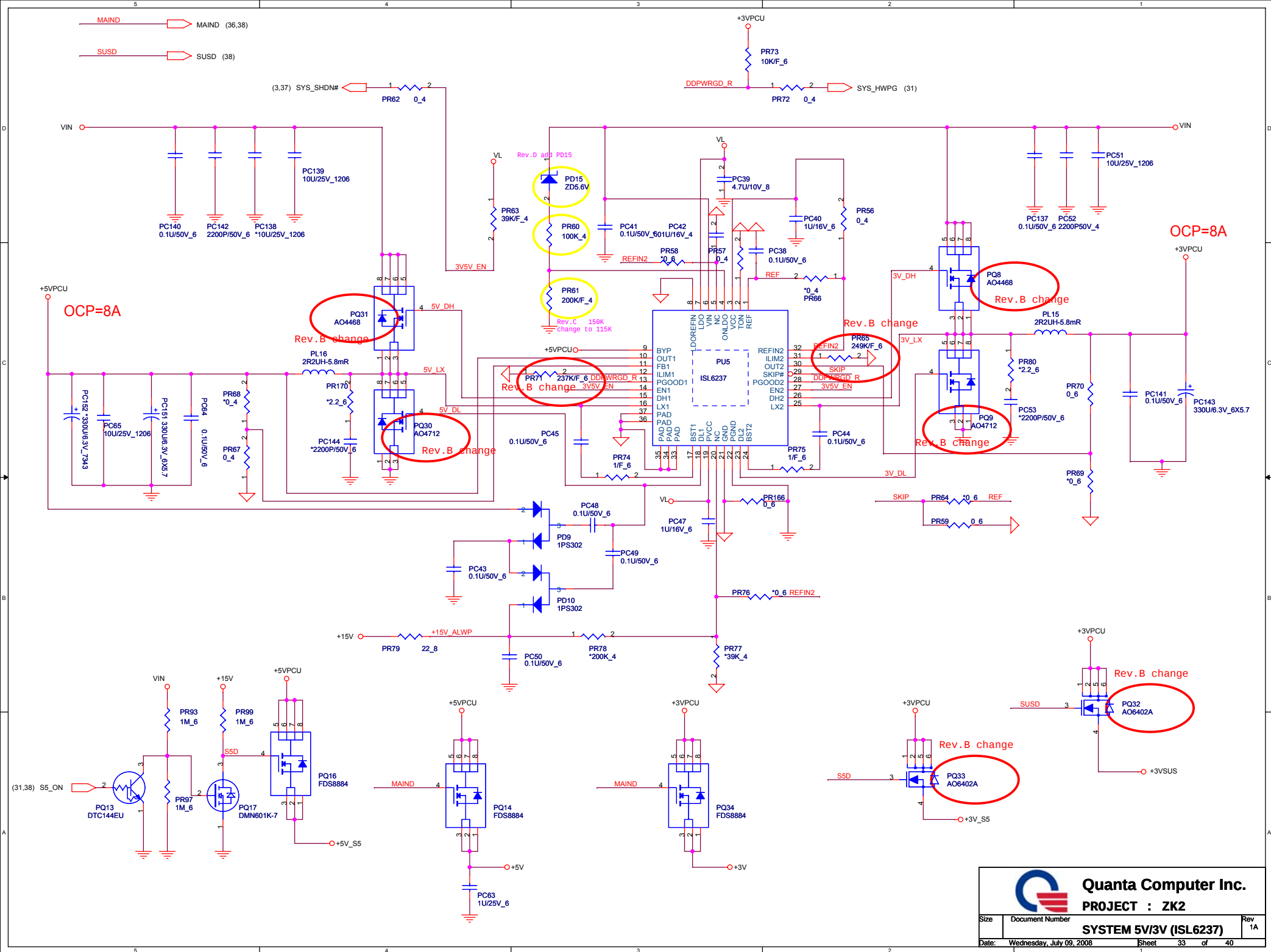
INTERNAL KEYBOARD STRIP SET

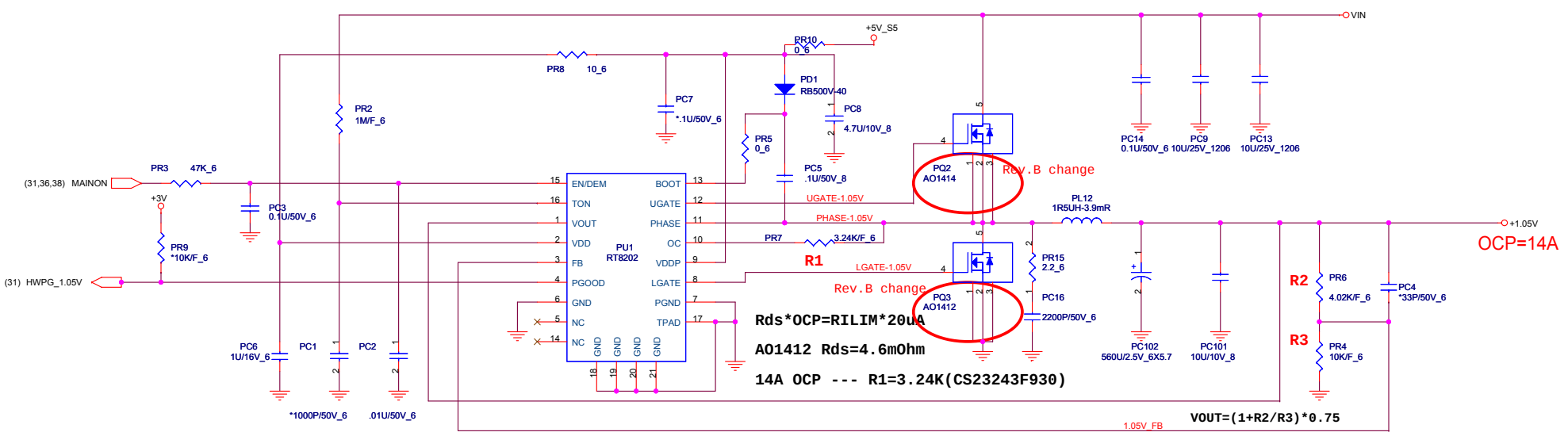


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	WPCE775C_0DG & FLASH	3E
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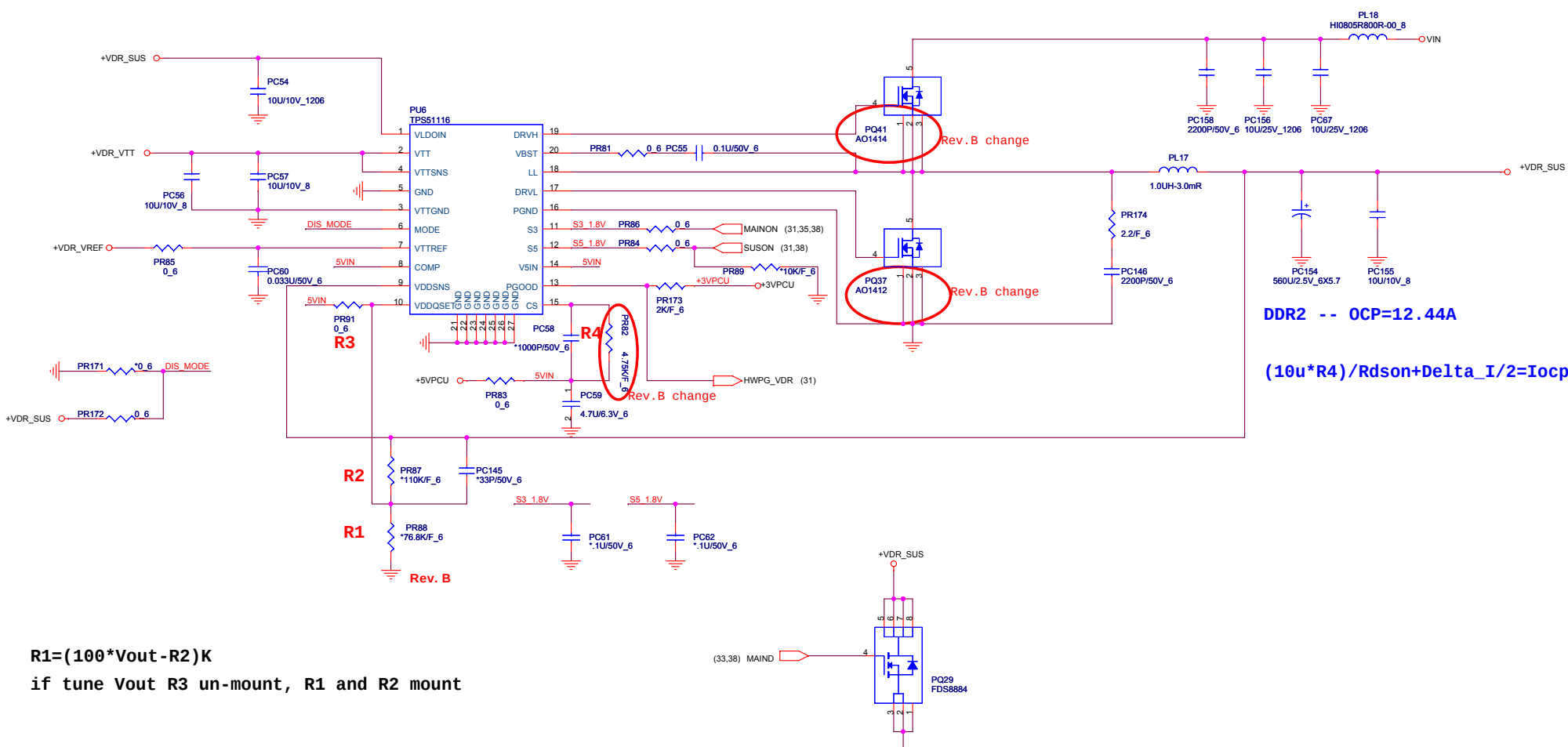


$$TON = 3.85p \cdot RTON \cdot Vout / (Vin - 0.5)$$

$$Frequency = Vout / (Vin \cdot TON)$$

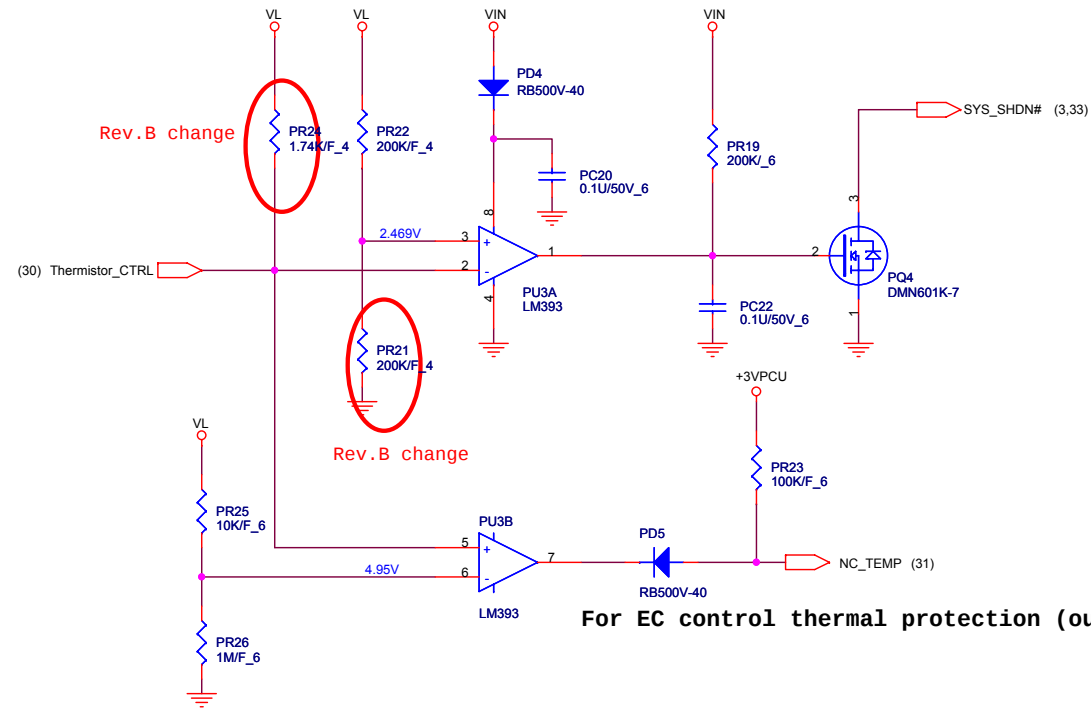
$Rds \cdot OCP = RILIM \cdot 20uA$
A01412 $Rds = 4.6m\Omega$
14A OCP --- R1 = 3.24K (CS23243F930)

$$VOUT = (1 + R2/R3) \cdot 0.75$$



$R1 = (100 * V_{out} - R2)K$
 if tune V_{out} R3 un-mount, R1 and R2 mount

thermal protection



Quanta Computer Inc.

PROJECT : ZK2

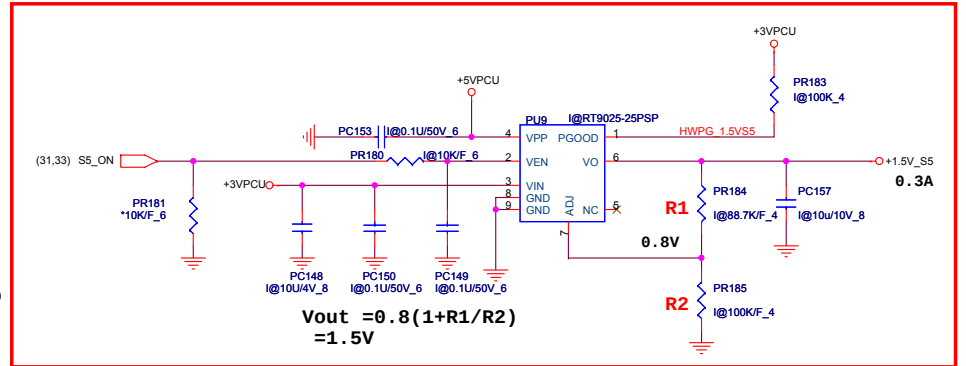
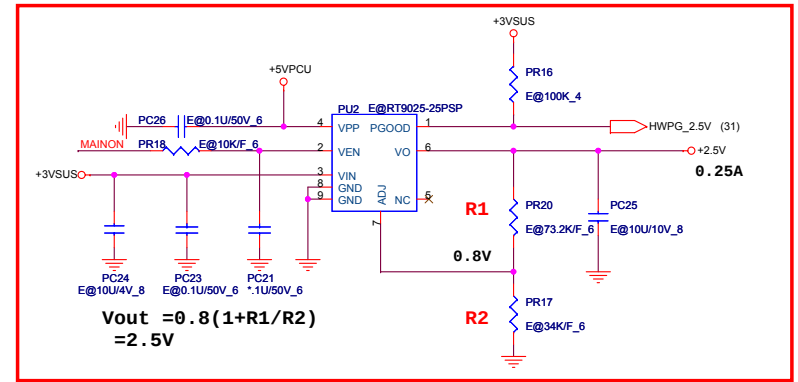
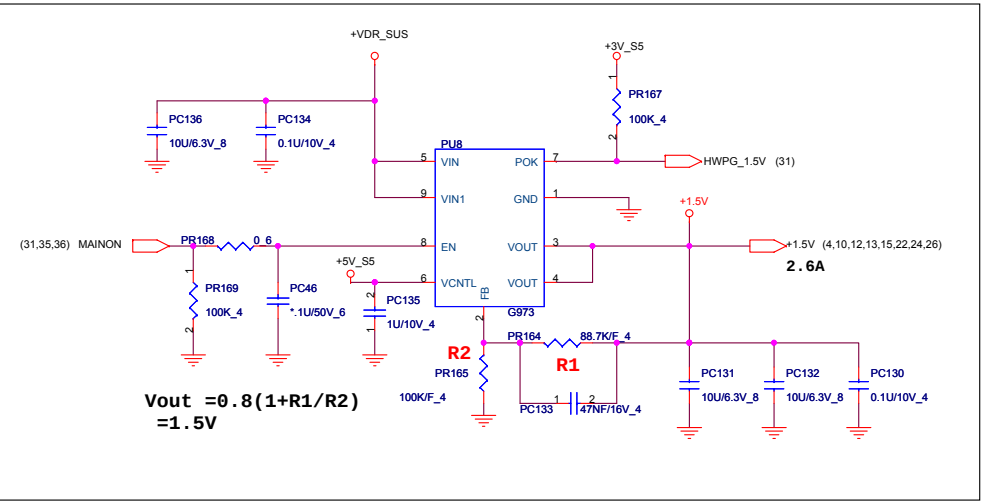
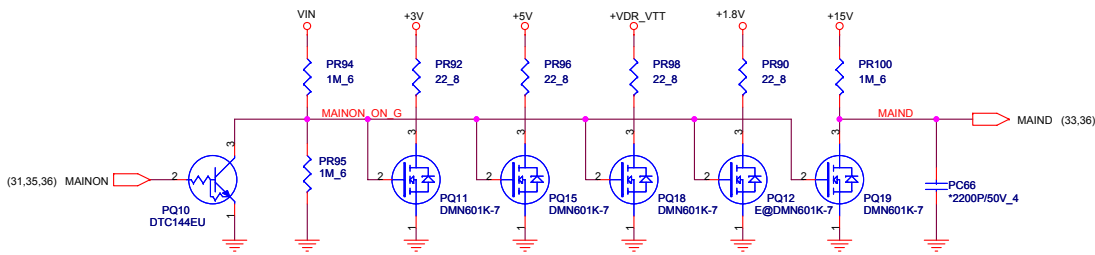
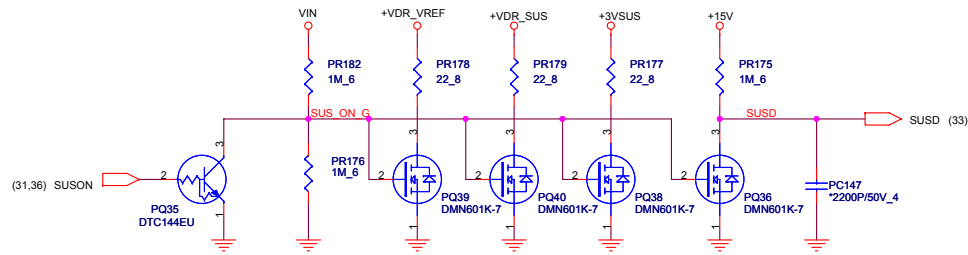
Size Document Number

Thermal protect

Rev
1A

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Model		REV	CHANGE LIST	MODEL	ZK2	
					FROM	To
ZK2 MB	1A	FIRST RELEASED: E200803-5424 (PCB: DA0ZK2MB6A0)			X	1A
					X	1A
					1A	2A
					1A	2A
					1A	2A
					1A	2A
					1A	2A
					1A	2A
					1A	2A
					1A	2A
2A		Power change items			1A	2A
		Page32 : [PMS3] 6.1kOhm(CS26103F020) for MXM(90W ADP)			1A	2A
		71.5kOhm(CS37153F017) for UMA(60W ADP)			1A	2A
		Page33 : 1. Change PQ31/PQ8 from FDS8878(BAM88780020) to A04468(BAM44680003)			1A	2A
		2. Change PQ30/PQ9 from FDS6690AS(BAM66900022) to A04712 (BAM47120000)			1A	2A
		3. Change PQ32/PQ33 from FDC655 (BAMS300203) to A06402A (BAM64020000)			1A	2A
		4. Change PR61 from 150K/F.4(CS41502FB18) to 150K/K.4(CS41502JB10)			1A	2A
		5. Change PR71 from 178K/F.6 (CS41783FB18) to 237K/F.6 (CS42373FB11)			1A	2A
		6. Change PR85 from 196K/F.6 (CS41963FB18) to 249K/F.6 (CS42493FB14)			1A	2A
		Page34 : 1. Change PQ27/PQ22 from TPCAB023-H(BAM80230000) to A01414 (BAM14140001)			1A	2A
		2. Change PQ28/PQ23 from TPCAB019-H (BAM80190000) to A01412 (BAM14120000)			1A	2A
		Page35 : 3. Change PC111 from 0.0220/50V.5 (CH3226K1901) to 0.0330/50V.5 (CH3336J1900)			1A	2A
		1. Change PQ2 from TPCAB023-H (BAM80230000) to A01414 (BAM14140001)			1A	2A
		2. Change PQ3 from TPCAB019-H (BAM80190000) to A01412 (BAM14120000)			1A	2A
		Page36 : 1. Change PQ41 fromTPCAB023-H (BAM80230000) to A01414 (BAM14140001)			1A	2A
		PQ37 from TPCAB019-H (BAM80190000) to A01412 (BAM14120000)			1A	2A
		3. Change PR82 from 5.62K/F.6 (CS2623FB14) to 4.75K/F.6 (CS24753FB19)			1A	2A
		Page37 : 1. Change PR21 from 106K/F.4 (CS41062FB01) to 200K/F.4 (CS42002FB12)			1A	2A
		2. Change PR24 from 1.43K/F.4 (CS21432FB00) to 1.74K/F.4 (CS21742FB00)			1A	2A
					2A	3A
		Page2 : no mount 0.1uF (C475/C492/C471)			2A	3A
		Page4 : no mount 0.1uF (C151)			2A	3A
		Page10 : remove 0 ohm (R188/R189/R402/R189), and connect them directly			2A	3A
		Page12 : remove 0 ohm (R408/R240/R407), and connect them directly			2A	3A
		Swap Main HDD to port-0, and 2nd HDD to port-4			2A	3A
		Page13 : remove 0 ohm (R189), and connect them directly			2A	3A
		Swap USB port2 to external USB, and port-7 to Cardreader			2A	3A
		Page14 : remove 0 ohm (R186/R105/R466/R235/R506), and connect them directly.			2A	3A
		no mount 0.1uF (C170/C448)			2A	3A
		Page16 : no mount 0.1uF (C30/C552)			2A	3A
		Page17 : reserve 0 ohm (R626) from MXM to EC (EC.THERM#)			2A	3A
		no mount 0.1uF (C489)			2A	3A
		Page18 : no mount Q21/Q24 and bypass from 0ohm (R378/R381), pull-up 2K ohm to +3V for MXM sku			2A	3A
		Change L67/7/8 to BLM188A4705N10			2A	3A
		Change U4 to AL904280001 (AA14280-4) part			2A	3A
		Remove 0 ohm (R22), and connect directly			2A	3A
		Change CN3 to DFWF40MR000 for SMT request			2A	3A
		Change R42 from 330 ohm to 180 ohm (CS11802JB15)			2A	3A
		Page19 : Use 10u ohm (R619/R620/R621/R622) and 1uF (C6506/C657/C658/C659) for HDMI EMI request			2A	3A
		Reserve C662/Q43/Q44/R119/R126, and bypass 0ohm (R627/R628)			2A	3A
		Page20 : remove 0ohm (R6/R9/R357) and connect directly			2A	3A
		Page21 : Change L1/L2 (BLM188A4705N10) to increase current rating			2A	3A
		Change transformer to GST-5009			2A	3A
		Change R13-R16 from 75ohm 0402 to 0805 size			2A	3A
		no mount 0.1uF (C356)			2A	3A
		Page22 : Swap LAN LED color connect (green: linking/orange:active)			2A	3A
		Remove R296/R292/R328/L42/R298 and connect directly			2A	3A
		no mount 0.1uF (C247/C270/C268)			2A	3A
		Page23 : Change main (CN27) and 2nd (CN30) HDD footprint for M/E request			2A	3A
		no mount 0.1uF (C532/C535/C260/C261/C440/C441)			2A	3A
		Change 0.1uF to 0.33uF (C630/C347/C317/C46/C661/C663/C313/C314/C556/C373/C451/C100)			2A	3A
		Page24 : remove 0ohm (R574) and connect directly			2A	3A
		Page25 : no mount 0.1uF (C581) and add 10uF (C81)			2A	3A
		Page27 : no mount 0.1uF (C281/C198/C278)			2A	3A
		Page28 : Add AC-IN LED function (Q40/Q50)			2A	3A
		Add PWMLED/SUSLED function on Power/B (Q47/Q49/R624/R625)			2A	3A
		Change R47/R49 from 0ohm to 100ohm for synaptic MMB			2A	3A
		Page29 : Change L53/L500/R180/R105/R106/R107/R108/R109/R110/R111/R112/R113/R114/R115/R116/R117/R118/R119/R120/R121/R122/R123/R124/R125/R126/R127/R128/R129/R130/R131/R132/R133/R134/R135/R136/R137/R138/R139/R140/R141/R142/R143/R144/R145/R146/R147/R148/R149/R150/R151/R152/R153/R154/R155/R156/R157/R158/R159/R160/R161/R162/R163/R164/R165/R166/R167/R168/R169/R170/R171/R172/R173/R174/R175/R176/R177/R178/R179/R180/R181/R182/R183/R184/R185/R186/R187/R188/R189/R190/R191/R192/R193/R194/R195/R196/R197/R198/R199/R200/R201/R202/R203/R204/R205/R206/R207/R208/R209/R210/R211/R212/R213/R214/R215/R216/R217/R218/R219/R220/R221/R222/R223/R224/R225/R226/R227/R228/R229/R230/R231/R232/R233/R234/R235/R236/R237/R238/R239/R240/R241/R242/R243/R244/R245/R246/R247/R248/R249/R250/R251/R252/R253/R254/R255/R256/R257/R258/R259/R260/R261/R262/R263/R264/R265/R266/R267/R268/R269/R270/R271/R272/R273/R274/R275/R276/R277/R278/R279/R280/R281/R282/R283/R284/R285/R286/R287/R288/R289/R290/R291/R292/R293/R294/R295/R296/R297/R298/R299/R300/R301/R302/R303/R304/R305/R306/R307/R308/R309/R310/R311/R312/R313/R314/R315/R316/R317/R318/R319/R320/R321/R322/R323/R324/R325/R326/R327/R328/R329/R330/R331/R332/R333/R334/R335/R336/R337/R338/R339/R340/R341/R342/R343/R344/R345/R346/R347/R348/R349/R350/R351/R352/R353/R354/R355/R356/R357/R358/R359/R360/R361/R362/R363/R364/R365/R366/R367/R368/R369/R370/R371/R372/R373/R374/R375/R376/R377/R378/R379/R380/R381/R382/R383/R384/R385/R386/R387/R388/R389/R390/R391/R392/R393/R394/R395/R396/R397/R398/R399/R400/R401/R402/R403/R404/R405/R406/R407/R408/R409/R410/R411/R412/R413/R414/R415/R416/R417/R418/R419/R420/R421/R422/R423/R424/R425/R426/R427/R428/R429/R430/R431/R432/R433/R434/R435/R436/R437/R438/R439/R440/R441/R442/R443/R444/R445/R446/R447/R448/R449/R450/R451/R452/R453/R454/R455/R456/R457/R458/R459/R460/R461/R462/R463/R464/R465/R466/R467/R468/R469/R470/R471/R472/R473/R474/R475/R476/R477/R478/R479/R480/R481/R482/R483/R484/R485/R486/R487/R488/R489/R490/R491/R492/R493/R494/R495/R496/R497/R498/R499/R500/R501/R502/R503/R504/R505/R506/R507/R508/R509/R510/R511/R512/R513/R514/R515/R516/R517/R518/R519/R520/R521/R522/R523/R524/R525/R526/R527/R528/R529/R530/R531/R532/R533/R534/R535/R536/R537/R538/R539/R540/R541/R542/R543/R544/R545/R546/R547/R548/R549/R550/R551/R552/R553/R554/R555/R556/R557/R558/R559/R560/R561/R562/R563/R564/R565/R566/R567/R568/R569/R570/R571/R572/R573/R574/R575/R576/R577/R578/R579/R580/R581/R582/R583/R584/R585/R586/R587/R588/R589/R590/R591/R592/R593/R594/R595/R596/R597/R598/R599/R600/R601/R602/R603/R604/R605/R606/R607/R608/R609/R610/R611/R612/R613/R614/R615/R616/R617/R618/R619/R620/R621/R622/R623/R624/R625/R626/R627/R628/R629/R630/R631/R632/R633/R634/R635/R636/R637/R638/R639/R640/R641/R642/R643/R644/R645/R646/R647/R648/R649/R650/R651/R652/R653/R654/R655/R656/R657/R658/R659/R660/R661/R662/R663/R664/R665/R666/R667/R668/R669/R670/R671/R672/R673/R674/R675/R676/R677/R678/R679/R680/R681/R682/R683/R684/R685/R686/R687/R688/R689/R690/R691/R692/R693/R694/R695/R696/R697/R698/R699/R700/R701/R702/R703/R704/R705/R706/R707/R708/R709/R710/R711/R712/R713/R714/R715/R716/R717/R718/R719/R720/R721/R722/R723/R724/R725/R726/R727/R728/R729/R730/R731/R732/R733/R734/R735/R736/R737/R738/R739/R740/R741/R742/R743/R744/R745/R746/R747/R748/R749/R750/R751/R752/R753/R754/R755/R756/R757/R758/R759/R760/R761/R762/R763/R764/R765/R766/R767/R768/R769/R770/R771/R772/R773/R774/R775/R776/R777/R778/R779/R780/R781/R782/R783/R784/R785/R786/R787/R788/R789/R790/R791/R792/R793/R794/R795/R796/R797/R798/R799/R800/R801/R802/R803/R804/R805/R806/R807/R808/R809/R810/R811/R812/R813/R814/R815/R816/R817/R818/R819/R820/R821/R822/R823/R824/R825/R826/R827/R828/R829/R830/R831/R832/R833/R834/R835/R836/R837/R838/R839/R840/R841/R842/R843/R844/R845/R846/R847/R848/R849/R850/R851/R852/R853/R854/R855/R856/R857/R858/R859/R860/R861/R862/R863/R864/R865/R866/R867/R868/R869/R870/R871/R872/R873/R874/R875/R876/R877/R878/R879/R880/R881/R882/R883/R884/R885/R886/R887/R888/R889/R890/R891/R892/R893/R894/R895/R896/R897/R898/R899/R900/R901/R902/R903/R904/R905/R906/R907/R908/R909/R910/R911/R912/R913/R914/R915/R916/R917/R918/R919/R920/R921/R922/R923/R924/R925/R926/R927/R928/R929/R930/R931/R932/R933/R934/R935/R936/R937/R938/R939/R940/R941/R942/R943/R944/R945/R946/R947/R948/R949/R950/R951/R952/R953/R954/R955/R956/R957/R958/R959/R960/R961/R962/R963/R964/R965/R966/R967/R968/R969/R970/R971/R972/R973/R974/R975/R976/R977/R978/R979/R980/R981/R982/R983/R984/R985/R986/R987/R988/R989/R990/R991/R992/R993/R994/R995/R996/R997/R998/R999/R1000/R1001/R1002/R1003/R1004/R1005/R1006/R1007/R1008/R1009/R1010/R1011/R1012/R1013/R1014/R1015/R1016/R1017/R1018/R1019/R1020/R1021/R1022/R1023/R1024/R1025/R1026/R1027/R1028/R1029/R1030/R1031/R1032/R1033/R1034/R1035/R1036/R1037/R1038/R1039/R1040/R1041/R1042/R1043/R1044/R1045/R1046/R1047/R1048/R1049/R1050/R1051/R1052/R1053/R1054/R1055/R1056/R1057/R1058/R1059/R1060/R1061/R1062/R1063/R1064/R1065/R1066/R1067/R1068/R1069/R1070/R1071/R1072/R1073/R1074/R1075/R1076/R1077/R1078/R1079/R1080/R1081/R1082/R1083/R1084/R1085/R1086/R1087/R1088/R1089/R1090/R1091/R1092/R1093/R1094/R1095/R1096/R1097/R1098/R1099/R1100/R1101/R1102/R1103/R1104/R1105/R1106/R1107/R1108/R1109/R1110/R1111/R1112/R1113/R1114/R1115/R1116/R1117/R1118/R1119/R1120/R1121/R1122/R1123/R1124/R1125/R1126/R1127/R1128/R1129/R1130/R1131/R1132/R1133/R1134/R1135/R1136/R1137/R1138/R1139/R1140/R1141/R1142/R1143/R1144/R1145/R1146/R1147/R1148/R1149/R1150/R1151/R1152/R1153/R1154/R1155/R1156/R1157/R1158/R1159/R1160/R1161/R1162/R1163/R1164/R1165/R1166/R1167/R1168/R1169/R1170/R1171/R1172/R1173/R1174/R1175/R1176/R1177/R1178/R1179/R1180/R1181/R1182/R1183/R1184/R1185/R1186/R1187/R1188/R1189/R1190/R1191/R1192/R1193/R1194/R1195/R1196/R1197/R1198/R1199/R1200/R1201/R1202/R1203/R1204/R1205/R1206/R1207/R1208/R1209/R1210/R1211/R1212/R1213/R1214/R1215/R1216/R1217/R1218/R1219/R1220/R1221/R1222/R1223/R1224/R1225/R1226/R1227/R1228/R1229/R1230/R1231/R1232/R1233/R1234/R1235/R1236/R1237/R1238/R1239/R1240/R1241/R1242/R1243/R1244/R1245/R1246/R1247/R1248/R1249/R1250/R1251/R1252/R1253/R1254/R1255/R1256/R1257/R1258/R1259/R1260/R1261/R1262/R1263/R1264/R1265/R1266/R1267/R1268/R1269/R1270/R1271/R1272/R1273/R1274/R1275/R1276/R1277/R1278/R1279/R1280/R1281/R1282/R1283/R1284/R1285/R1286/R1287/R1288/R1289/R1290/R1291/R1292/R1293/R1294/R1295/R1296/R1297/R1298/R1299/R1300/R1301/R1302/R1303/R1304/R1305/R1306/R1307/R1308/R1309/R1310/R1311/R1312/R1313/R1314/R1315/R1316/R1317/R1318/R1319/R1320/R1321/R1322/R1323/R1324/R1325/R1326/R1327/R1328/R1329/R1330/R1331/R1332/R1333/R1334/R1335/R1336/R1337/R1338/R1339/R1340/R1341/R1342/R1343/R1344/R1345/R1346/R1347/R1348/R1349/R1350/R1351/R1352/R1353/R1354/R1355/R1356/R1357/R1358/R1359/R1360/R1361/R1362/R1363/R1364/R1365/R1366/R1367/R1368/R1369/R1370/R1371/R1372/R1373/R1374/R1375/R1376/R1377/R1378/R1379/R1380/R1381/R1382/R1383/R1384/R1385/R1386/R1387/R1388/R1389/R1390/R1391/R1392/R1393/R1394/R1395/R1396/R1397/R1398/R1399/R1400/R1401/R1402/R1403/R1404/R1405/R1406/R1407/R1408/R1409/R1410/R1411/R1412/R1413/R1414/R1415/R1416/R1417/R1418/R1419/R1420/R1421/R1422/R1423/R1424/R1425/R1426/R1427/R1428/R1429/R1430/R1431/R1432/R1433/R1434/R1435/R1436/R1437/R1438/R1439/R1440/R1441/R1442/R1443/R1444/R1445/R1446/R1447/R1448/R1449/R1450/R1451/R1452/R1453/R1454/R1455/R1456/R1457/R1458/R1459/R1460/R1461/R1462/R1463/R1464/R1465/R1466/R1467/R1468/R1469/R1470/R1471/R1472/R1473/R1474/R1475/R1476/R1477/R1478/R1479/R1480/R1481/R1482/R1483/R1484/R1485/R1486/R1487/R1488/R1489/R1490/R1491/R1492/R1493/R1494/R1495/R1496/R1497/R1498/R1499/R1500/R1501/R1502/R1503/R1504/R1505/R1506/R1507/R1508/R1509/R1510/R1511/R1512/R1513/R1514/R1515/R1516/R1517/R1518/R1519/R1520/R1521/R1522/R1523/R1524/R1525/R1526/R1527/R1528/R1529/R1530/R1531/R1532/R1533/R1534/R1535/R1536/R1537/R1538/R1539/R1540/R1541/R1542/R1543/R1544/R1545/R1546/R1547/R1548/R1549/R1550/R1551/R1552/R1553/R1554/R1555/R1556/R1557/R1558/R1559/R1560/R1561/R1562/R1563/R1564/R1565/R1566/R1567/R1568/R1569/R1570/R1571/R1572/R1573/R1574/R1575/R1576/R1577/R1578/R1579/R1580/R1581/R1582/R1583/R1584/R1585/R1586/R1587/R1588/R1589/R1590/R1591/R1592/R1593/R1594/R1595/R1596/R1597/R1598/R1599/R1600/R1601/R1602/R1603/R1604/R1605/R1606/R1607/R1608/R1609/R1610/R1611/R1612/R1613/R1614/R1615/R1616/R1617/R1618/R1619/R1620/R1621/R1622/R1623/R1624/R1625/R1626/R1627/R1628/R1629/R1630/R1631/R1632/R1633/R1634/R1635/R1636/R1637/R1638/R1639/R1640/R1641/R1642/R1643/R1644/R1645/R1646/R1647/R1648/R1649/R1650/R1651/R1652/R1653/R1654/R1655/R1656/R1657/R1658/R1659/R1660/R1661/R1662/R1663/R1664/R1665/R1666/R1667/R1668/R1669/R1670/R1671/R1672/R1673/R1674/R1675/R1676/R1677/R1678/R1679/R1680/R1681/R1682/R1683/R1684/R1685/R16				