

COMPAL CONFIDENTIAL

MODEL NAME : JAZ00

PCB NO : LA-4291P

BOM P/N : 46155331L01



MINICOOPER

**uFCBGA Mobile Penryn SFF ULV
Intel Cantiga GS(High Performance)+ ICH9M SFF**

12-07-2007

REV : 0.1(X00)

@ : Nopop Component

1@ : TAA board Used only

2@ : Without TAA board Used only

DELL CONFIDENTIAL/PROPRIETARY

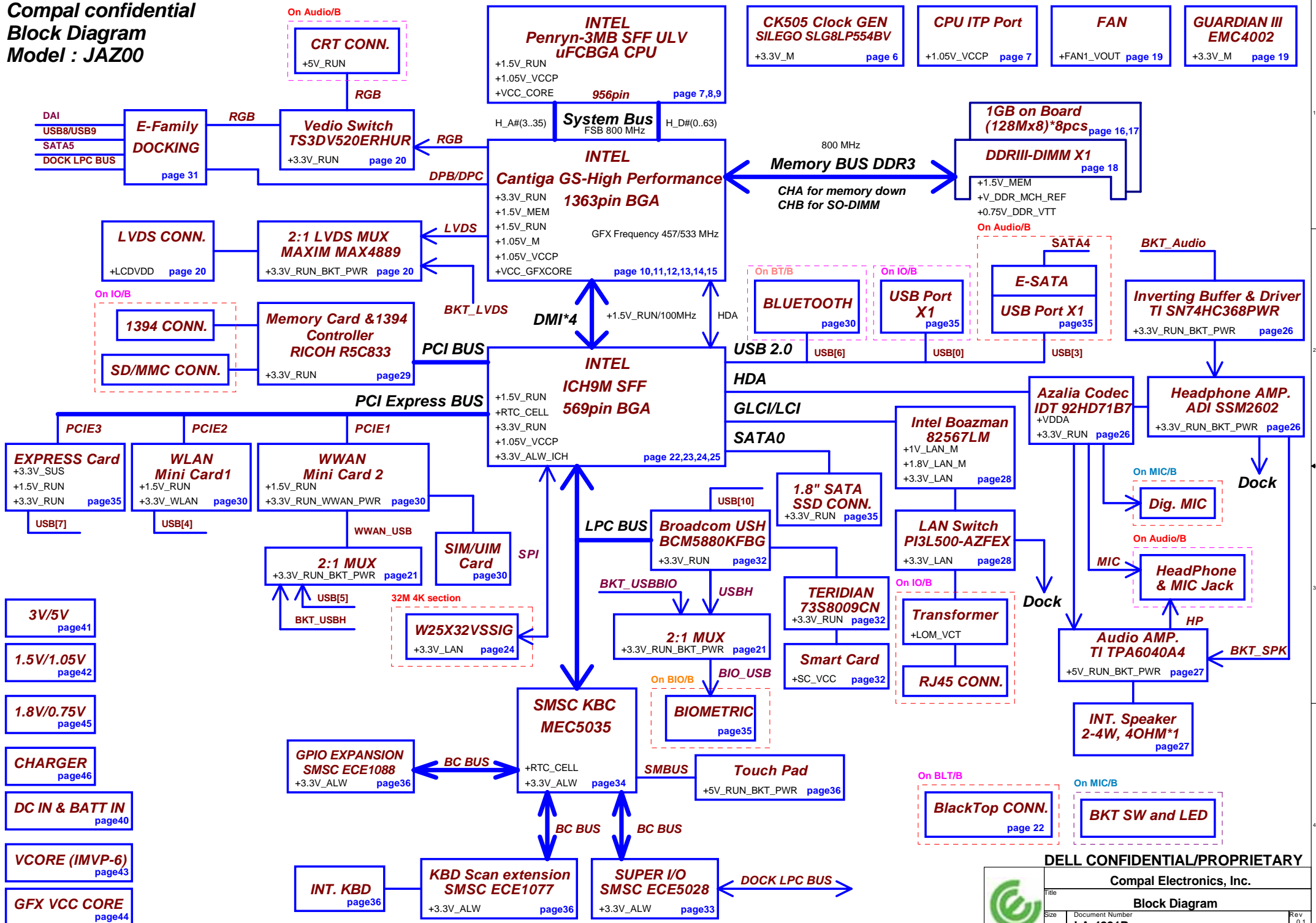
Compal Electronics, Inc.

Title		
Cover sheet		
Size	Document Number	Rev
	LA-4291P	0.1
Date:	Friday, December 07, 2007	Sheet 1 of 49

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL") THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



Compal confidential
Block Diagram
Model : JAZ00



POWER STATES

Signal State	SLP S3#	SLP S4#	SLP S5#	S4 STATE#	SLP M#	ALWAYS PLANE	M PLANE	SUS PLANE	RUN PLANE	CLOCKS
S0 (Full ON) / M0	HIGH	HIGH	HIGH	HIGH	HIGH	ON	ON	ON	ON	ON
S3 (Suspend to RAM) / M1	LOW	HIGH	HIGH	HIGH	HIGH	ON	ON	ON	OFF	ON
S4 (Suspend to DISK) / M1	LOW	HIGH	HIGH	LOW	HIGH	ON	ON	ON	OFF	ON
S5 (SOFT OFF) / M1	LOW	HIGH	LOW	LOW	HIGH	ON	ON	ON	OFF	ON
S3 (Suspend to RAM) / M-OFF	LOW	HIGH	HIGH	HIGH	LOW	ON	OFF	ON	OFF	OFF
S4 (Suspend to DISK) / M-OFF	LOW	LOW	HIGH	LOW	LOW	ON	OFF	OFF	OFF	OFF
S5 (SOFT OFF) / M-OFF	LOW	LOW	LOW	LOW	LOW	ON	OFF	OFF	OFF	OFF

USB PORT#	DESTINATION
0	JUSB (Ext Right Side)
1	NONE
2	NONE
3	JESATA (Ext Left Side)
4	WLAN
5	WWAN
6	BT
7	Express card
8	DOCKING
9	DOCKING
10	USH->BIO
11	NONE

PM TABLE

power plane State	+15V_ALW +5V_ALW +3.3V_ALW +3.3V_ALW_ICH +3.3V_RTC_LDO +1.5V_ALW_HDA	+3.3V_SUS +1.5V_MEM	+5V_RUN +3.3V_RUN +1.8V_RUN +1.5V_RUN +0.75V_DDR_VTT +VCC_GFXCORE +VCC_CORE +1.05V_VCCP	+3.3V_M +1.05V_M	+3.3V_M +1.05V_M (M-OFF)	+3.3V_RUN_BKT_PWR +5V_RUN_BKT_PWR +3.3V_RUN_WWAN_PWR +INV_PWR_SRC +LCDVDD	+3.3V_BKT_PWR
S0	ON	ON	ON	ON	ON	ON	OFF
S3	ON	ON	OFF	ON	OFF	OFF	OFF
S5 S4/AC	ON	OFF	OFF	ON	OFF	OFF	OFF
S5 S4/AC don't exist	OFF	OFF	OFF	OFF	OFF	OFF	OFF
BLT mode	ON	OFF	OFF	OFF	OFF	ON	ON

PCI EXPRESS	DESTINATION
Lane 1	MINI CARD-2 WWAN
Lane 2	MINI CARD-1 WLAN
Lane 3	None
Lane 4	EXPRESS CARD
Lane 5	None
Lane 6	Giga LAN

SATA	DESTINATION
SATA0	SSD
SATA1	None
SATA4	ESATA
SATA5	DOCKING

PCI TABLE

PCI DEVICE	IDSEL	REQ#/GNT#	PIRQ
R5C833	AD17	REQ#1 / GNT#1	PIRQ[C..D]

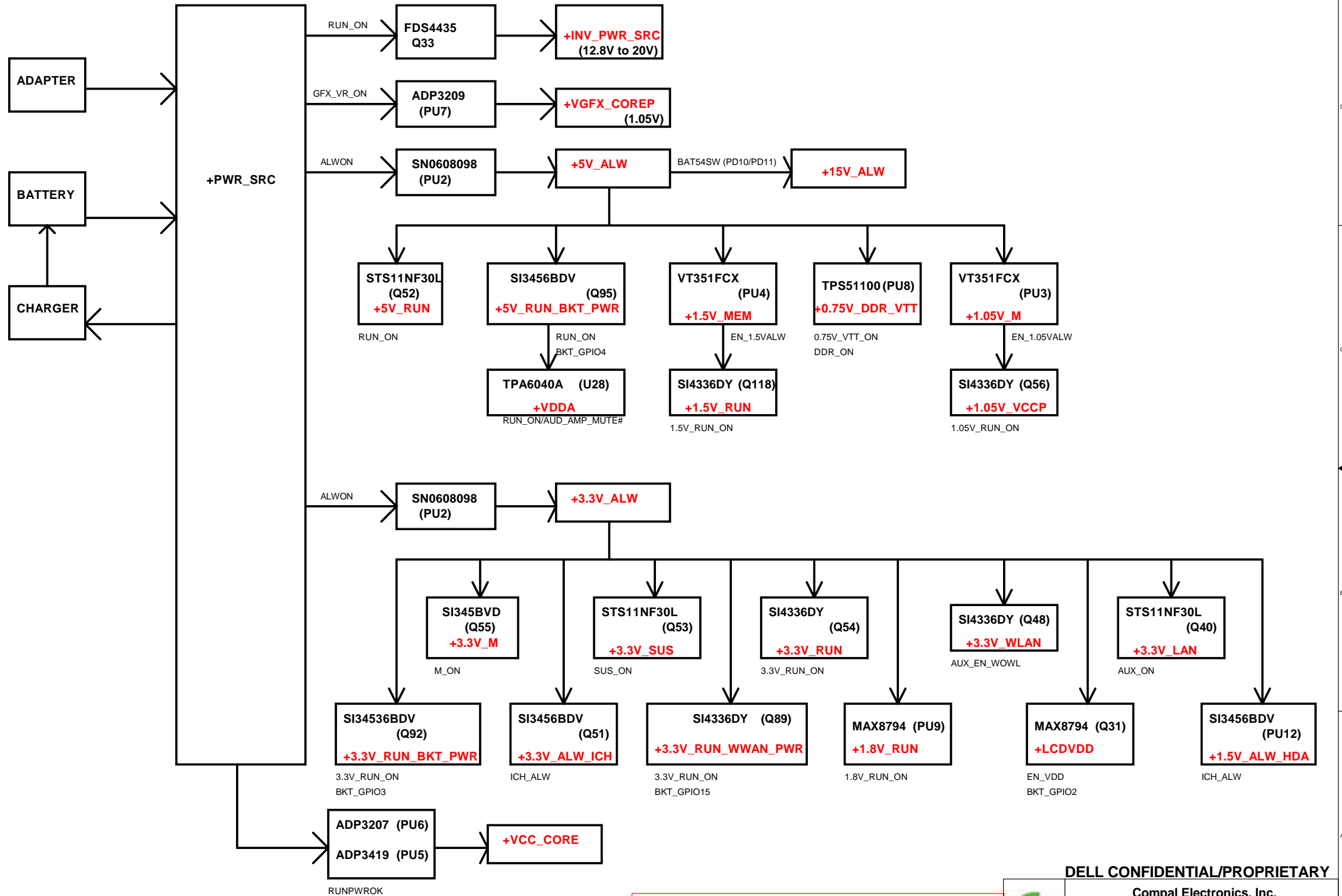
DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

Title		Index and Config.	
Size	Document Number	Rev	0.1
LA-4291P			
Date:	Friday, December 07, 2007	Sheet	3 of 49

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



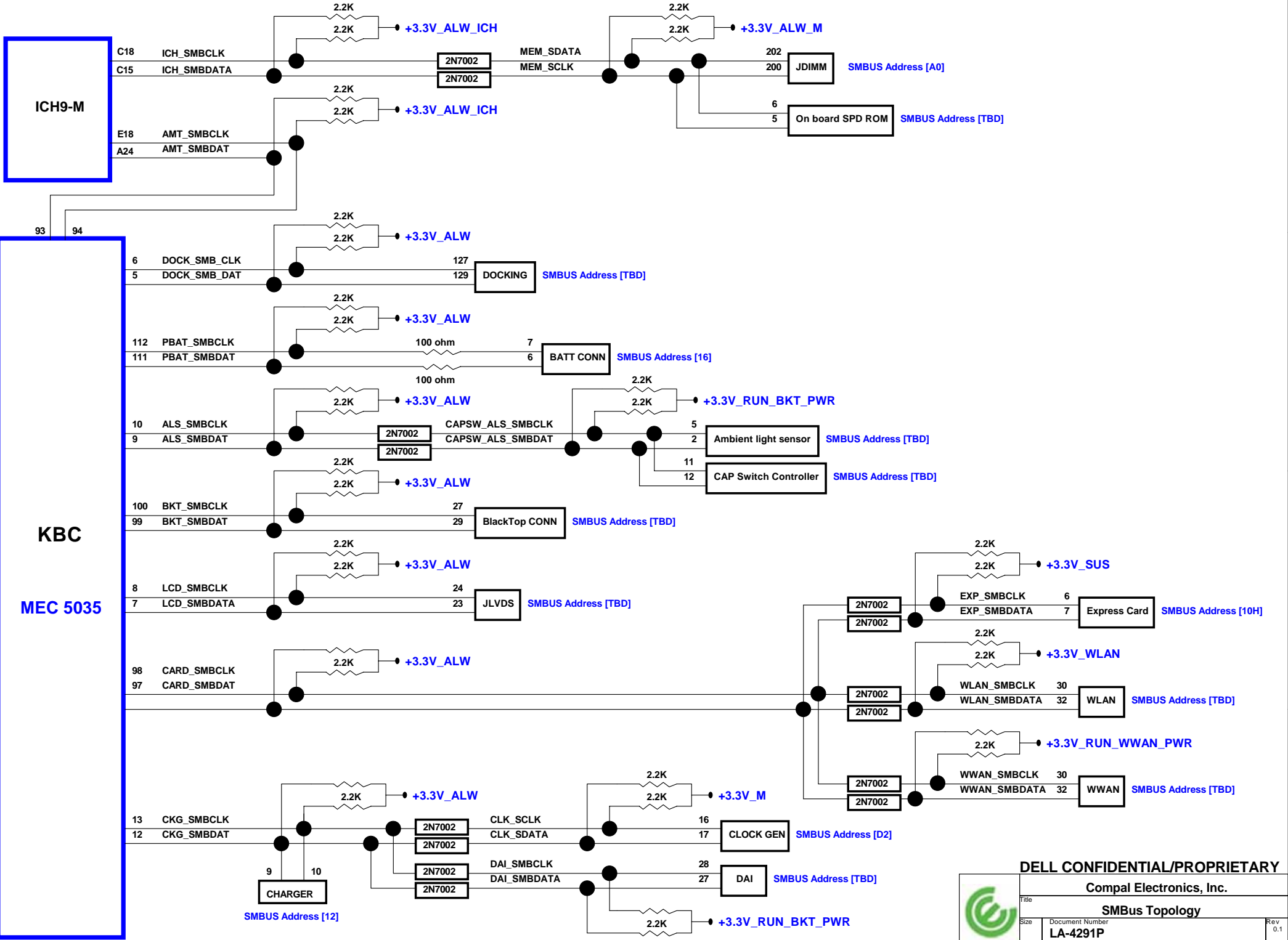


PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL") THIS DOCUMENT MAY NOT BE TRANSMITTED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.


DELL CONFIDENTIAL/PROPRIETARY
Compal Electronics, Inc.

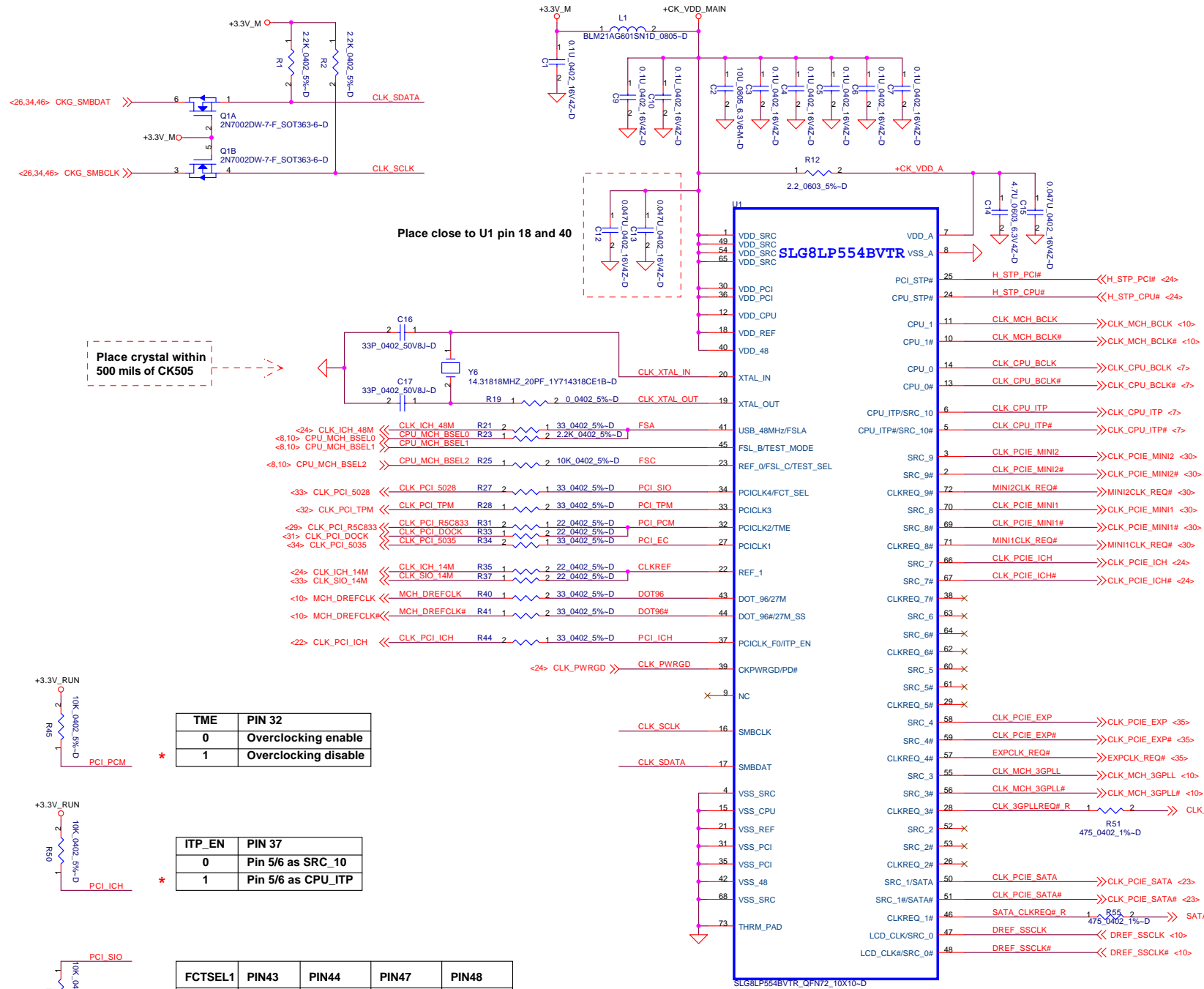
Power Rails

Title: _____
 Size: _____ Document Number: **LA-4291P** Rev: 0.1
 Date: Friday, December 07, 2007 Sheet 4 of 49

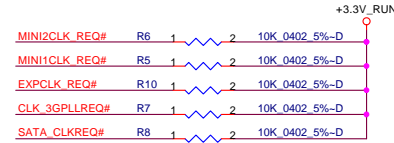


DELL CONFIDENTIAL/PROPRIETARY

 Compal Electronics, Inc.		
SMBus Topology		
Size	Document Number	Rev
	LA-4291P	0.1
Date:	Friday, December 07, 2007	Sheet 5 of 49



FSC CLKSEL2	FSB CLKSEL1	FSA CLKSEL0	CPU MHz	SRC MHz	PCI MHz
0	0	0	266	100	33.3
0	1	0	200	100	33.3
0	1	1	166	100	33.3



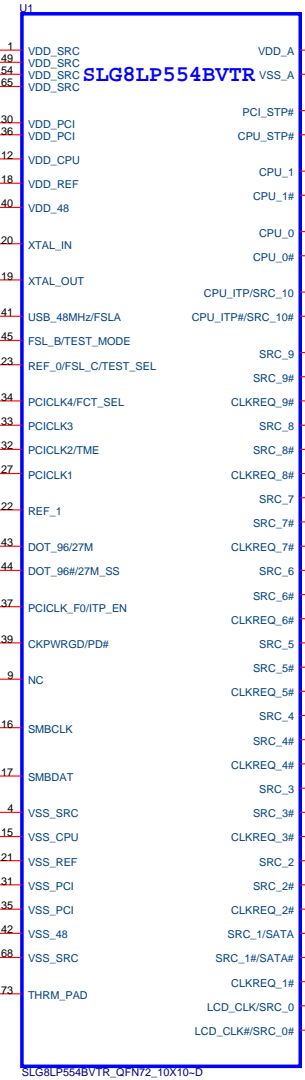
Place crystal within 500 mils of CK505

Place close to U1 pin 18 and 40

TME	PIN 32
0	Overclocking enable
1	Overclocking disable

ITP_EN	PIN 37
0	Pin 5/6 as SRC_10
1	Pin 5/6 as CPU_ITP

FCTSEL1	PIN43	PIN44	PIN47	PIN48
0=UMA	DOT96T	DOT96C	96/100M_T	96/100M_C
1=DIS	27M_out	27M SSout	SRCT0	SRCC0



PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

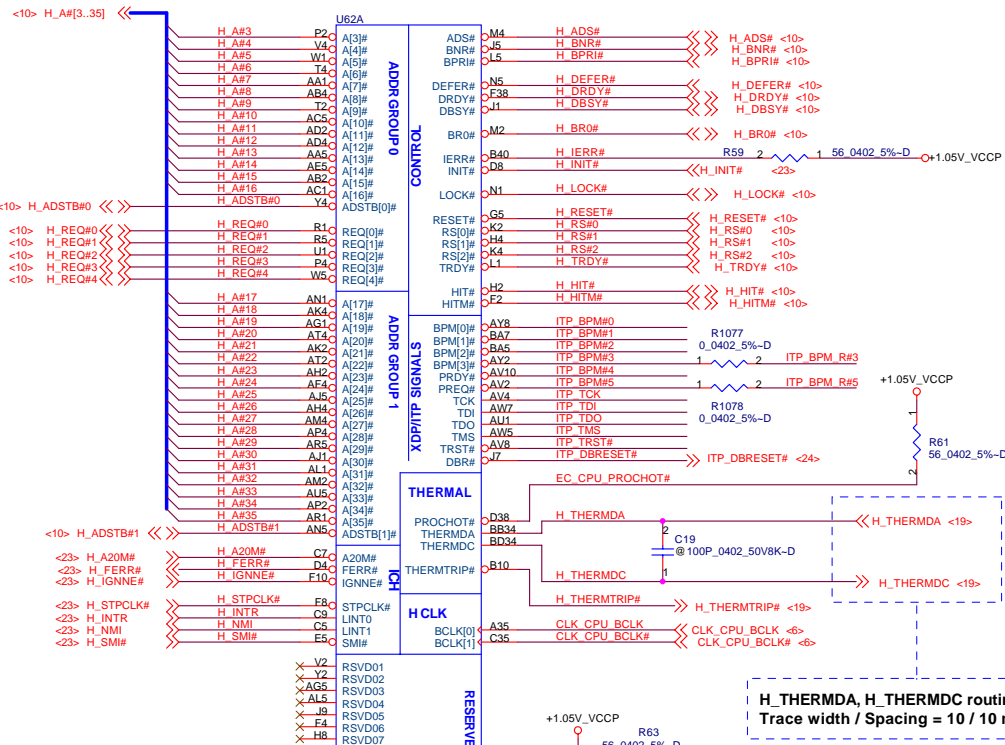


DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

Clock GEN. with internal terminations

LA-4291P

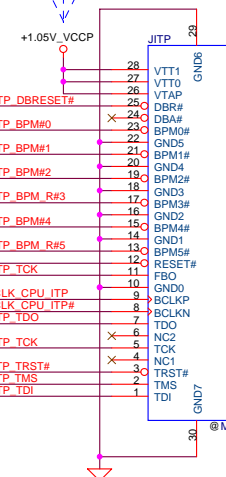


Place close to JITP within 100 mil

Place close to CPU within 200ps = 1000 mil

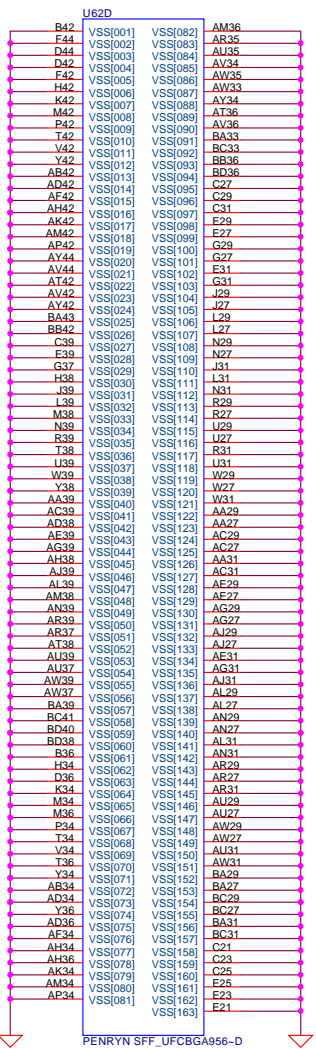
Place close to CPU within 200ps = 1000 mil

Place close to CPU within 200ps = 1000 mil



Place close to JITP within 1ns = 5000 mil

Place close to JITP within 200ps = 1000 mil



Layout Note: for ITP700Flex debug port with a XDP based Run Control Tools

ITP_BPM#[0..5], TCK, and TMS routings must be a maximum of 1.5ns = 7500 mil

ITP_BPM#[0..5], and TCK to FBO routings must be length matched to within 50ps = 250 mil

Place R70 close to JITP pin 5
TCK to FBO routing should refer to debug port design guide
H_RESET# should be routed from GMCH with split to ITP conn. Refer to DG page #56

Depop JITP, C18, R68, R70, R64, R67, R69 when JIP connector is depopulated

H_THERMDA, H_THERMDC routing together, Trace width / Spacing = 10 / 10 mil

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



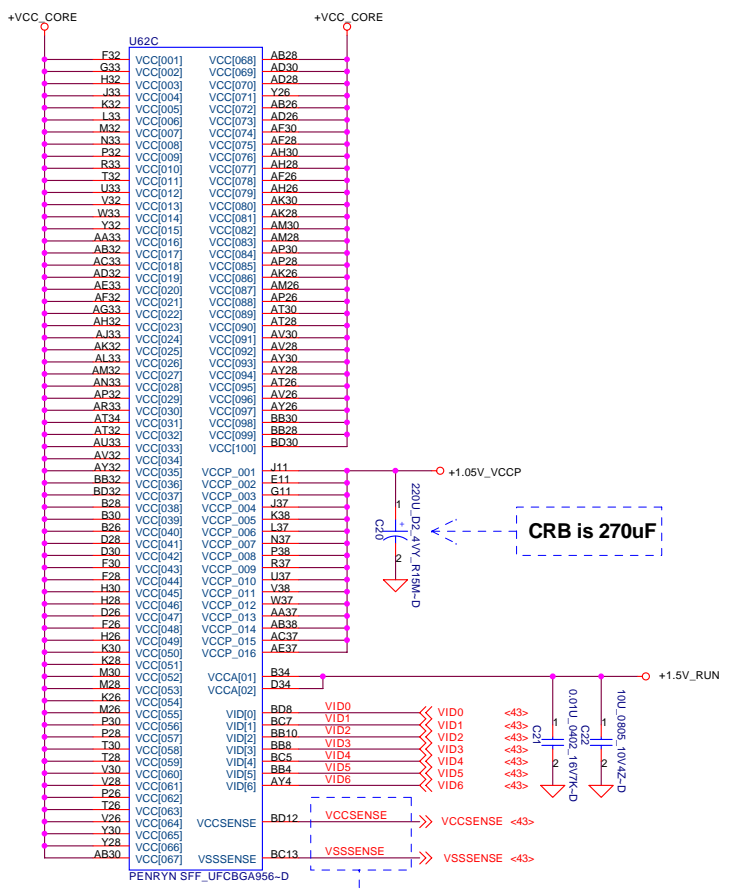
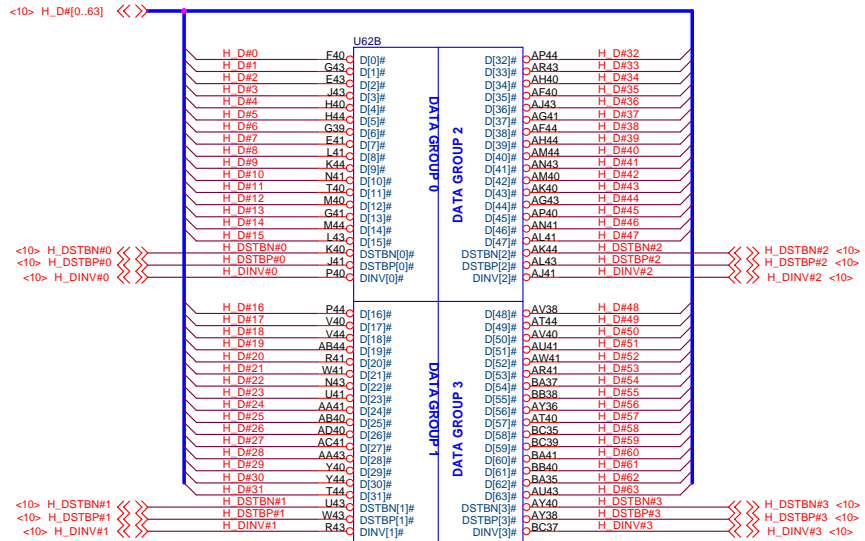
DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

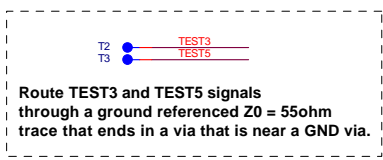
Penryn SFF ULV Processor(1/3)

LA-4291P

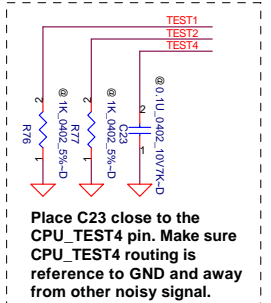
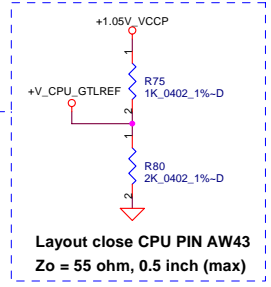
Friday, December 07, 2007 Sheet 7 of 49



FSB	BCLK	BSEL2	BSEL1	BSEL0
667	166	0	1	1
800	200	0	1	0
1067	266	0	0	0

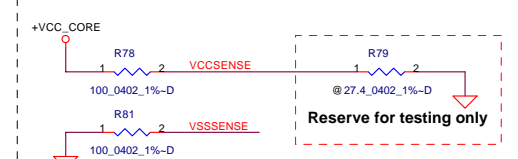


Resistor placed within 0.5" of CPU pin. Trace should be at least 25 mils away from any other toggling signal. COMP0, COMP2 trace should be 27.4 ohm. COMP1, COMP3 should be 55ohm.



Length match within 25 mils, Z0=27.4 ohm

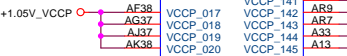
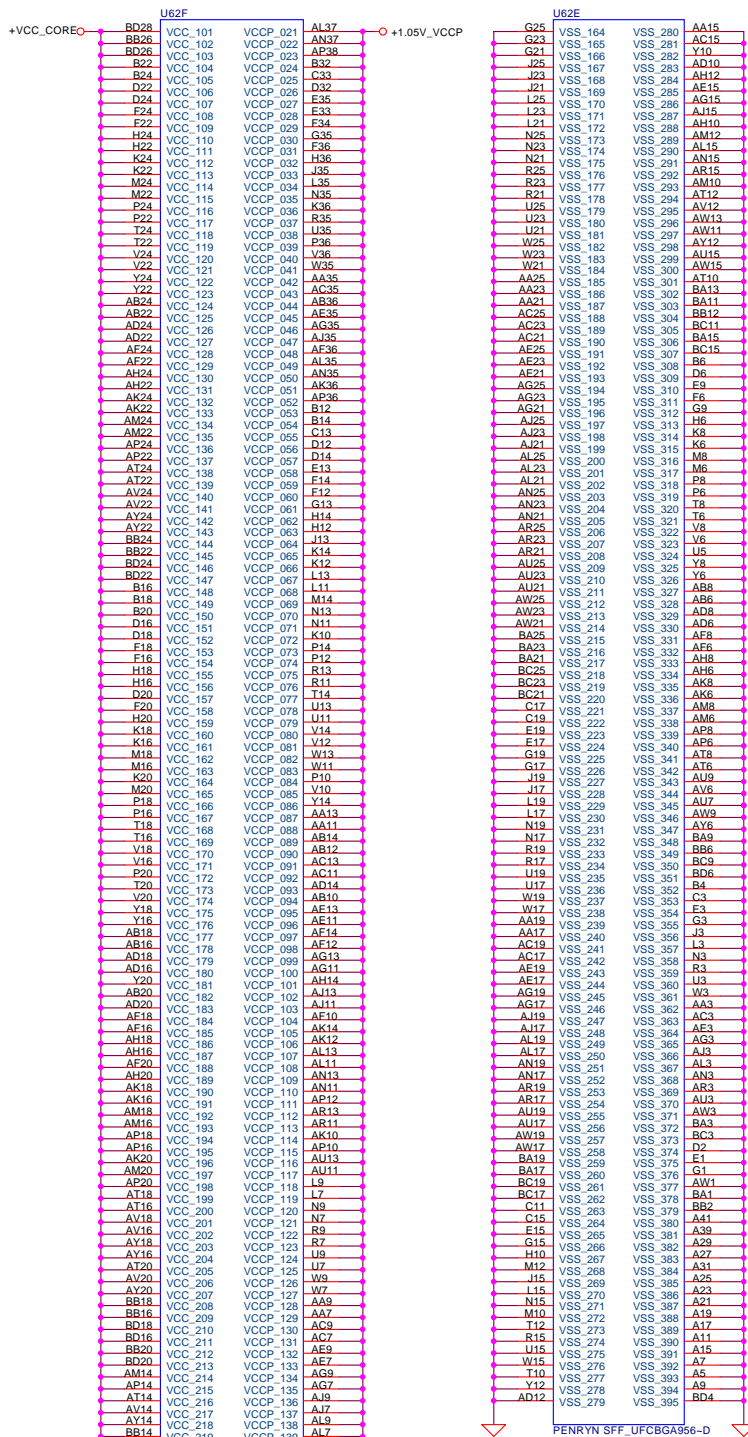
Place R78 and R81 close to CPU within 1000 mil



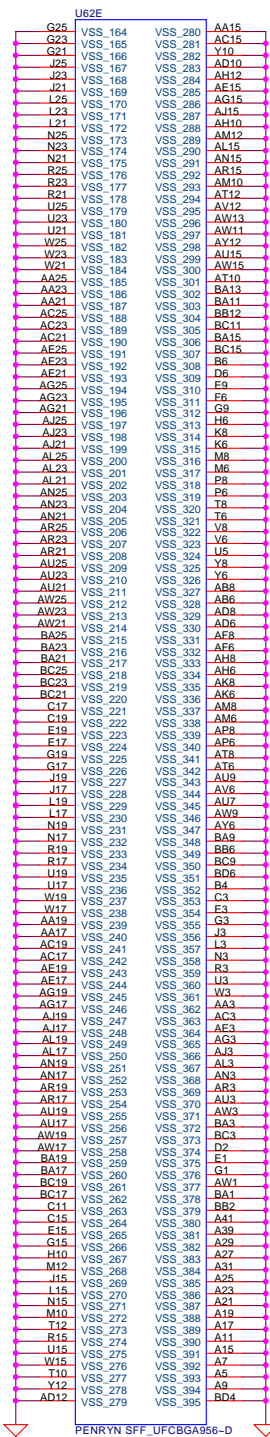
Route VCCSENSE and VSSSENSE trace at 27.4 ohms with 7 mil spacing



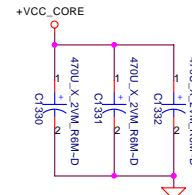
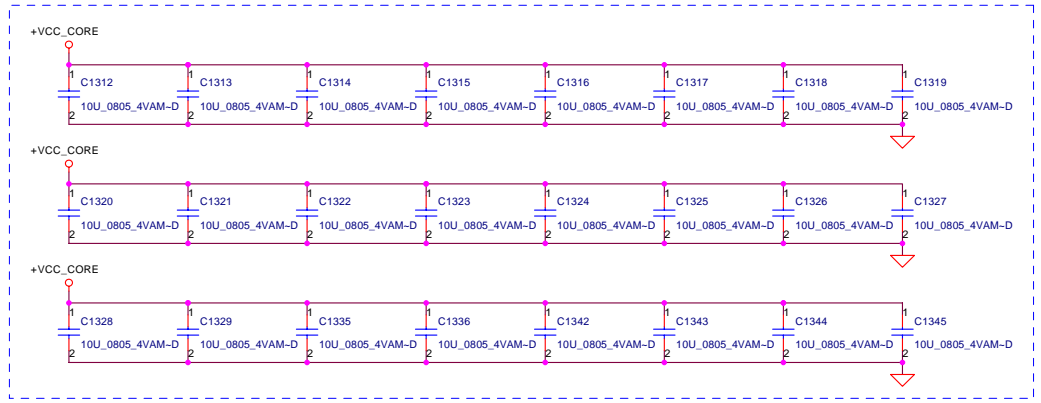
PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



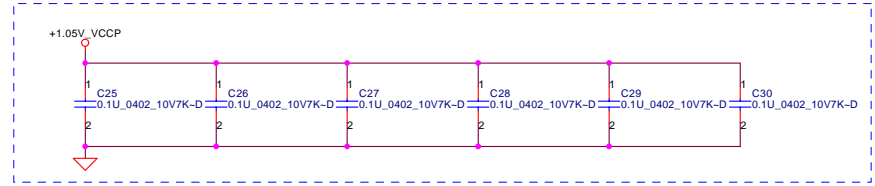
PENRYN SFF_ULFCBGA956-D



PENRYN SFF_ULFCBGA956-D



Place these inside cavity on L8(North side Secondary)



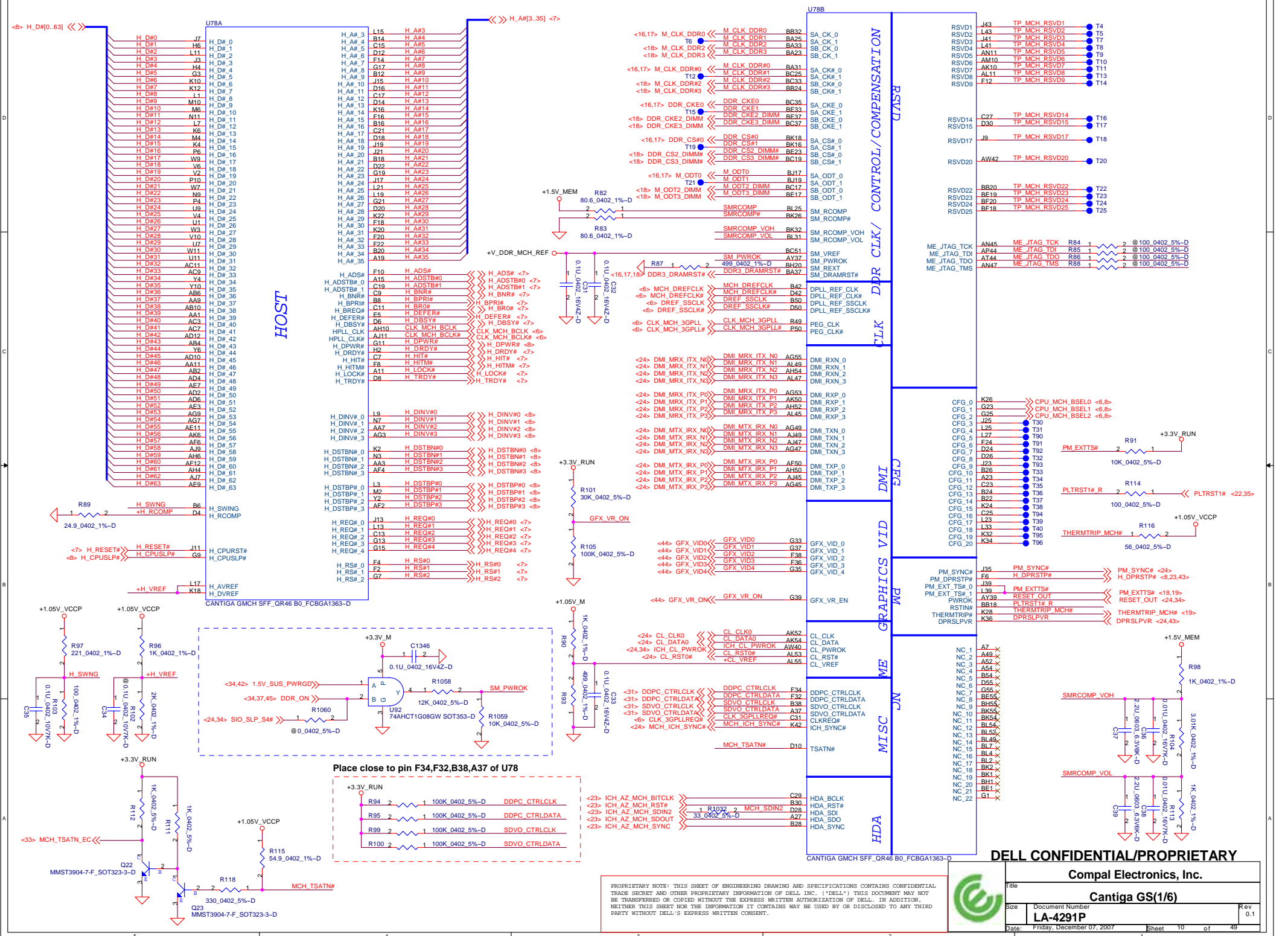
PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ('DELL'). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

Penryn SFF ULV Processor(3/3)
LA-4291P

Date: Friday, December 07, 2007 Sheet 9 of 49



<< H_D# [0.63] <<<

>>> H_A# [3.35] >>

HSOI

CLK DDR CLK/ CONTROL/ COMPENSATION

DMI

GRAPHICS VID

PM

MISC

HDA

R89

+1.05V_VCCP

+3.3V_RUN

<<< MCH_TSATN_EC <<<

MMST3904-7-F_SOT323-3-D

U78A

+1.05V_VCCP

+3.3V_RUN

+1.05V_VCCP

MMST3904-7-F_SOT323-3-D

H_A# 3

+1.05V_M

+3.3V_M

+1.05V_VCCP

MMST3904-7-F_SOT323-3-D

H_A# [3.35] >>

+1.05V_VCCP

+3.3V_RUN

+1.05V_VCCP

MMST3904-7-F_SOT323-3-D

<<< H_A# [3.35] <<<

+1.05V_VCCP

+3.3V_RUN

+1.05V_VCCP

MMST3904-7-F_SOT323-3-D

U78B

+1.05V_VCCP

+3.3V_RUN

+1.05V_VCCP

MMST3904-7-F_SOT323-3-D

Place close to pin F34,F32,B38,A37 of U78

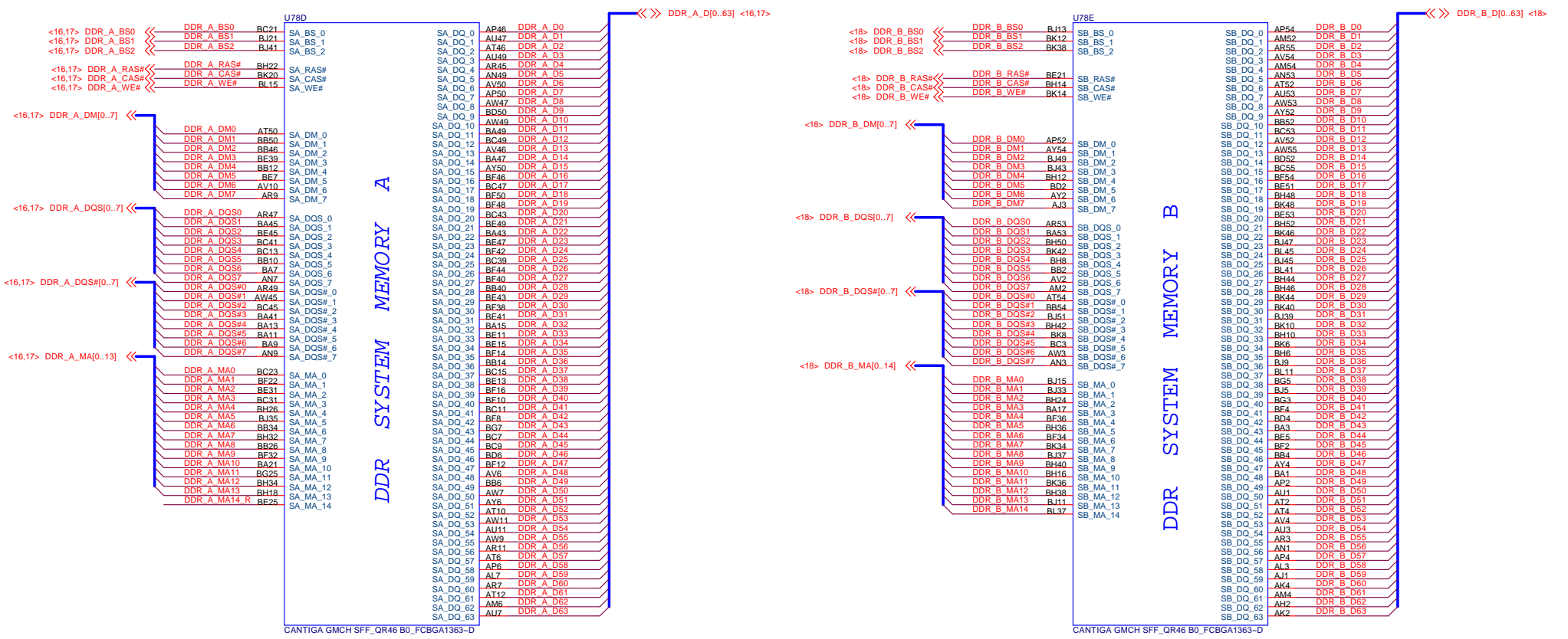
PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL, INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSMITTED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL, INC. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

DELL CONFIDENTIAL/PROPRIETARY

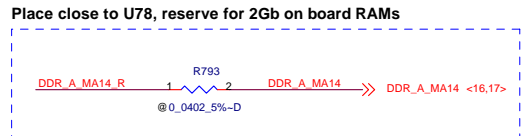
Compal Electronics, Inc.

LA-4291P

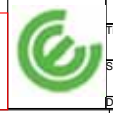
Friday, December 07, 2007 Sheet 10 of 49



CANTIGA GMCH SFF_QR46 B0_FCBGA1363-D



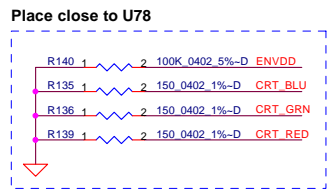
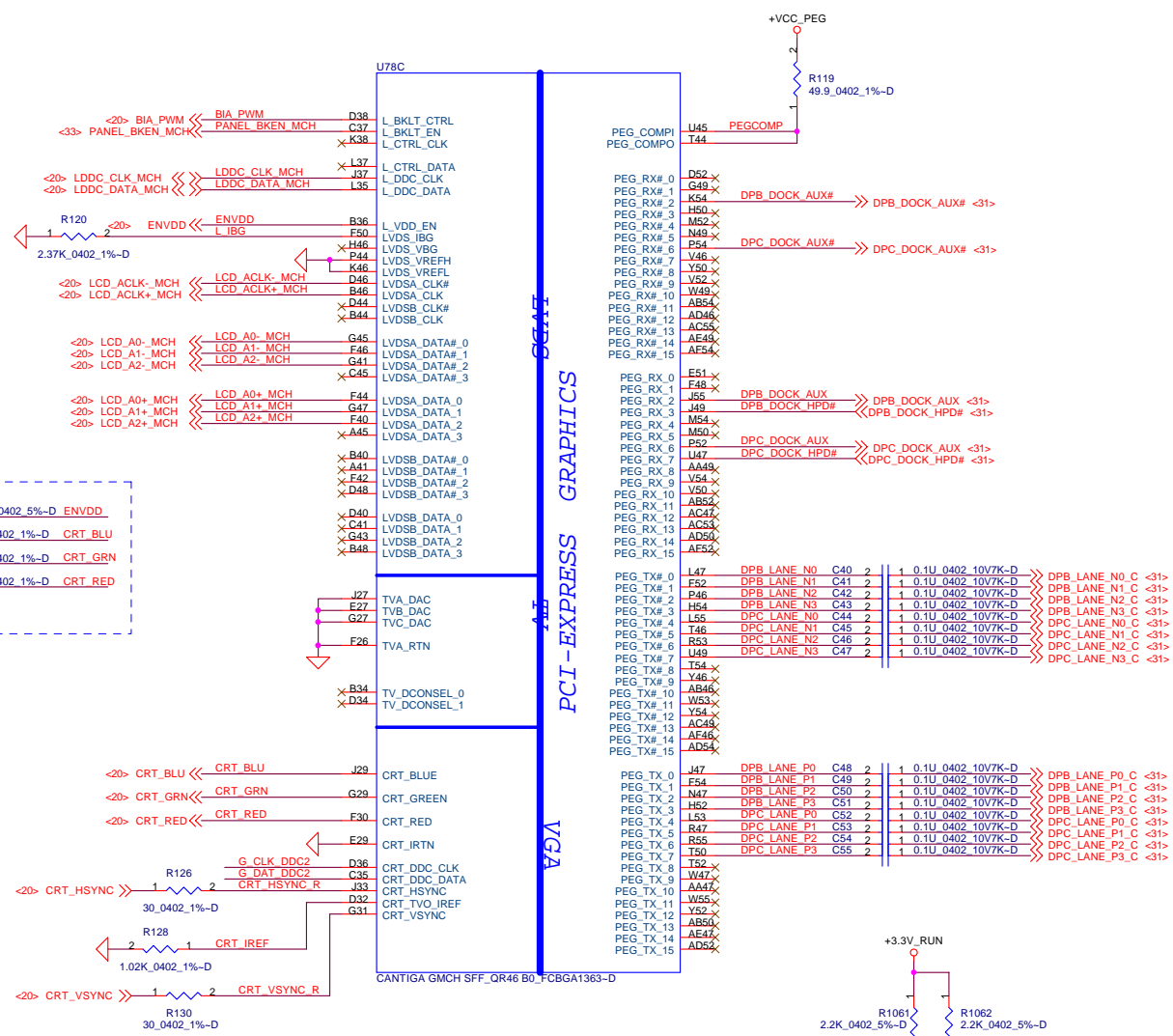
PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



DELL CONFIDENTIAL/PROPRIETARY

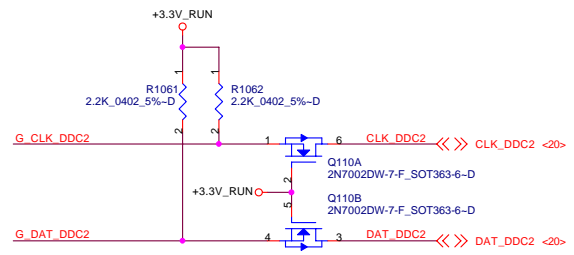
Compal Electronics, Inc.

Title		Cantiga GS(2/6)	
Size	Document Number	LA-4291P	
Date:	Friday, December 07, 2007	Sheet	11 of 49
Rev	0.1		



Strap Pin Table		
CFG5	DMI X2 Select	Low = DMI x 2 High = DMI x 4 (Default)
CFG6	iTPM Host Interface	Low = iTPM enable High = iTPM disable(Default)
CFG7	Management Engine Crypto Strap	Low = TLS cipher suite with no confidentiality High = TLS cipher suite with confidentiality(Default)
CFG9	PCI Express Graphic Lane	Low = Reverse Lane High = Normal Operation(Default)
CFG10	PCI Express Lookpback enable	Low = Enable High = Disable(default)
CFG12	ALLZ	Low = ALLZ mode enable High = Disable(default)
CFG13	XOR	Low = XOR mode enable High = Disable(default)
CFG16	FSB Dynamic ODT	Low=Dynamic ODT Disable High=Dynamic ODT Enable(default)
CFG19	DMI Lane Reversal	Low=Normal (default) High=Lane Reversed
CFG20	SDVO/PCIE Concurrent Operation	Low=Only SDVO or PCIe1 is operational (default) High=SDVO and PCIe1 are operating simultaneously via PEG port
SDVO_CTRL_DATA		Low=No SDVO Device Present (default) High=SDVO Device Present
DDPC_CTRL_DATA		Low=DisplayPort disabled (default) High=DisplayPort device present

CFG[5:16] have internal pullup CFG[19:20] have internal pulldown

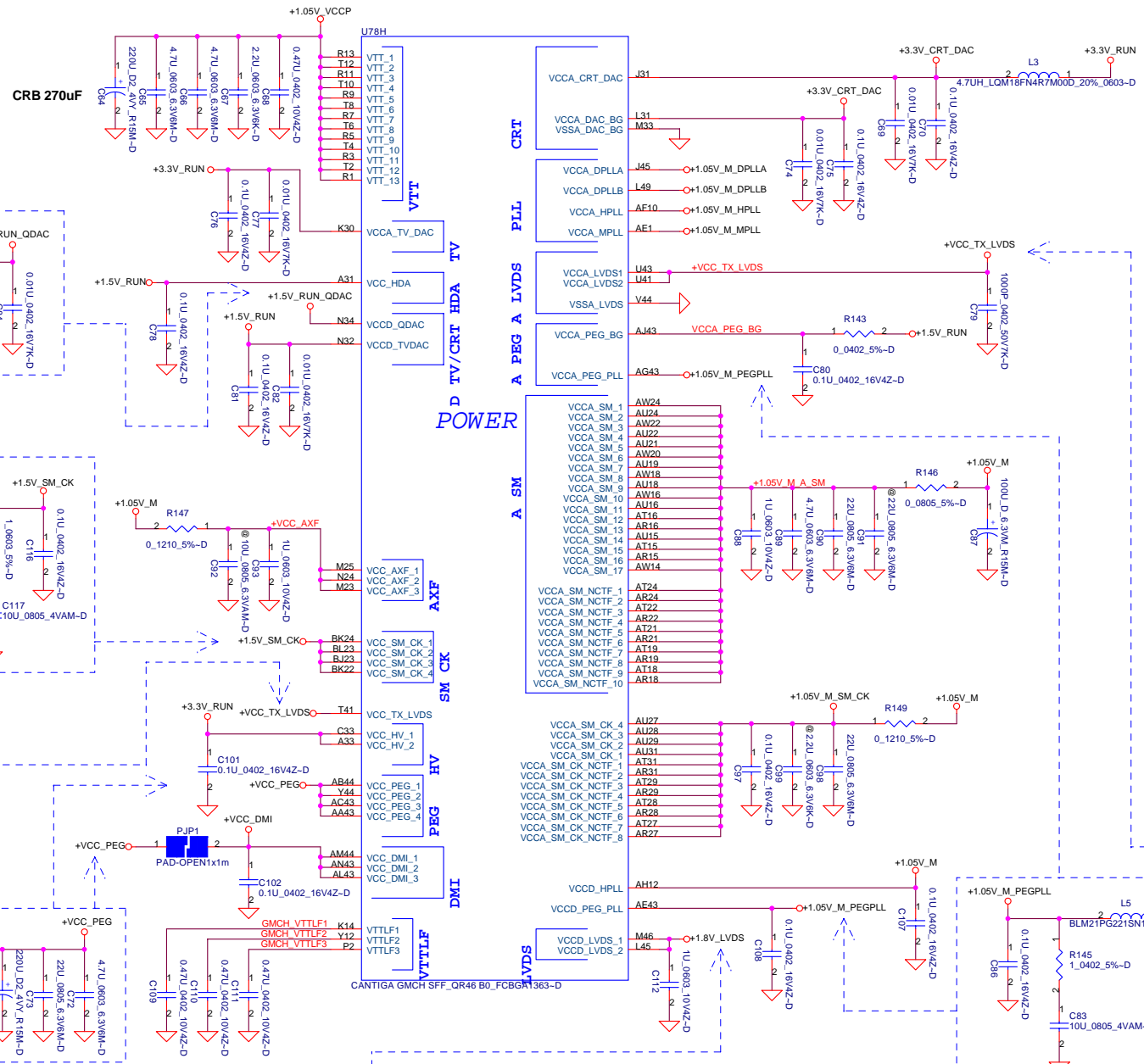


DELL CONFIDENTIAL/PROPRIETARY



Compal Electronics, Inc.		
Title Cantiga GS(3/6)		
Size	Document Number LA-4291P	Rev 0.1
Date	Friday, December 07, 2007	Sheet 12 of 49

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL") THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



CRB 270uF

118.8mA Max.

64.8mA Max.

64.8mA Max.

24mA Max.

139.2mA Max.

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSMITTED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



DELL CONFIDENTIAL/PROPRIETARY

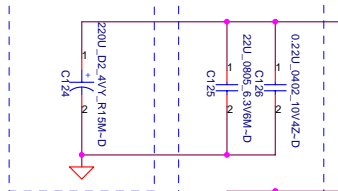
Compal Electronics, Inc.

Cantiga GS(4/6)

Title	Cantiga GS(4/6)		Rev	0.1
Size	Document Number	LA-4291P	Date:	Friday, December 07, 2007
Sheet 13 of 49				

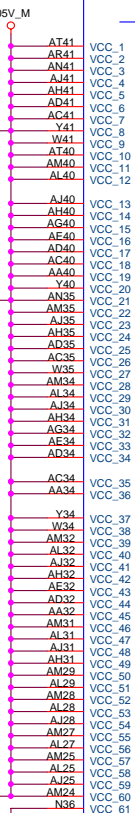
Layout Note:
Place close to U78

Layout Note:
Inside GMCH cavity



CRB 270uF

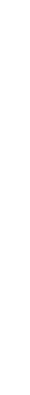
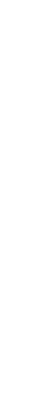
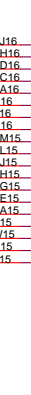
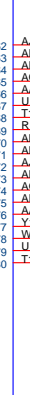
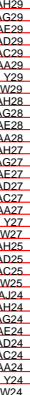
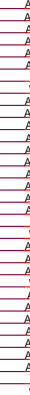
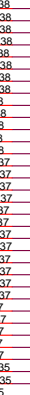
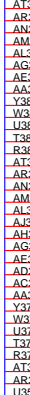
U78F



VCC CORE

POWER

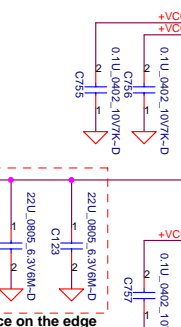
VCC NCTF



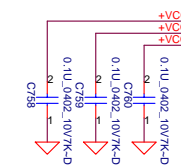
CANTIGA GMCH SFF_QR46 B0_FCBGA1363-D

U78G

+1.5V MEM

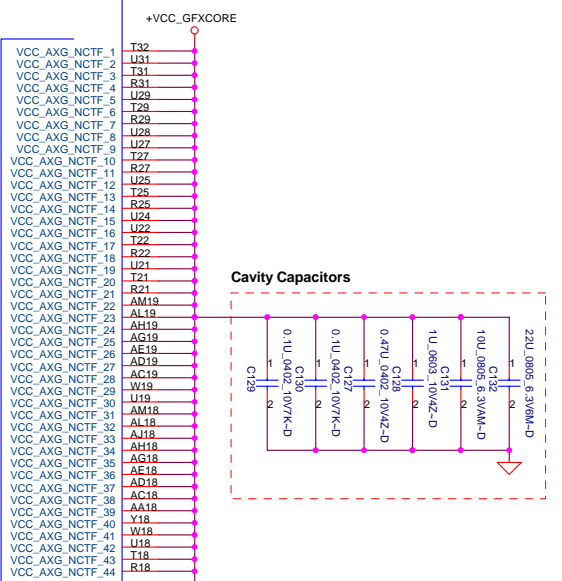


Place close to GMCH Place on the edge



<<< VCC_AXG_SENSE VCC_AXG_SENSE AG13 VCC_AXG_SENSE
<<< VSS_AXG_SENSE VSS_AXG_SENSE AE13 VSS_AXG_SENSE

CANTIGA GMCH SFF_QR46 B0_FCBGA1363-D



POWER

VCC SM

VCC GFX NCTF

VCC GFX

VCC SM LF

VCC SM LF

VCC SM LF

VCC SM LF

VCC SM LF

VCC SM LF

VCC SM LF

VCC SM LF

VCC SM LF

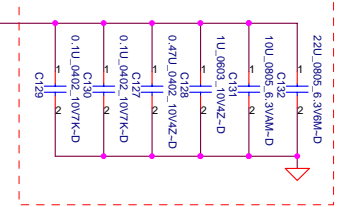
VCC SM LF

VCC SM LF

VCC SM LF

VCC SM LF

Cavity Capacitors



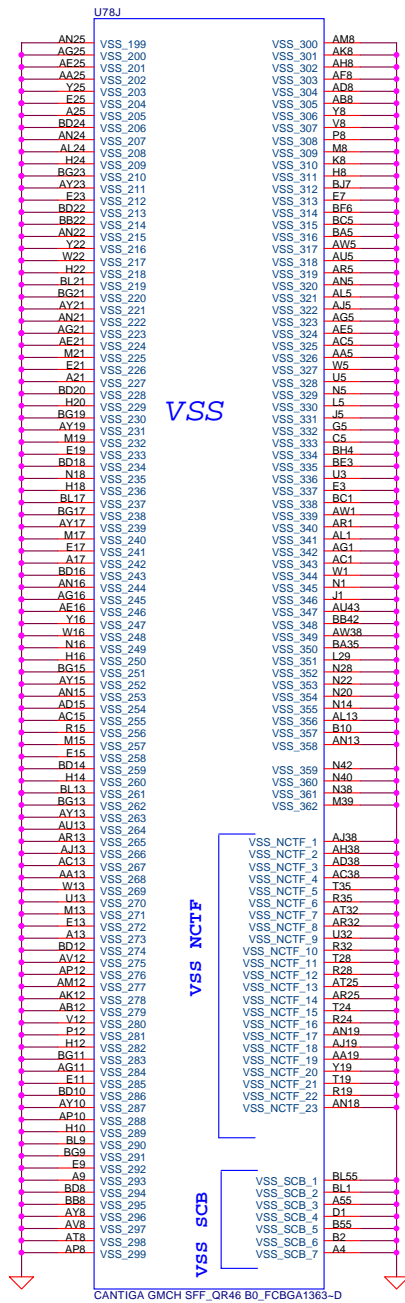
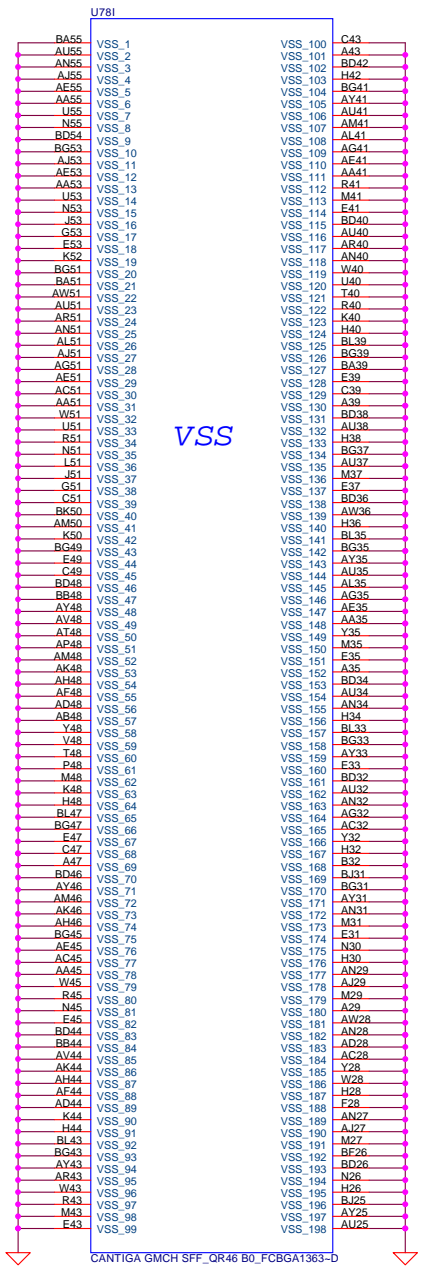
DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

Cantiga GS(5/6)

Title
Document Number
LA-4291P
Date: Friday, December 07, 2007 Sheet 14 of 49

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



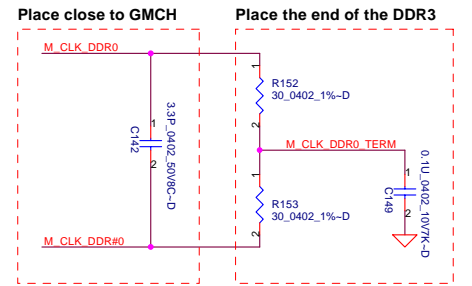
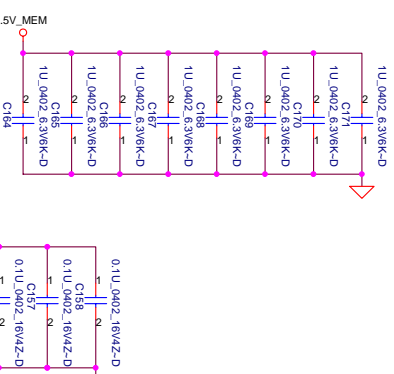
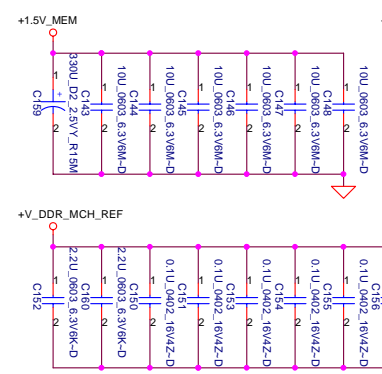
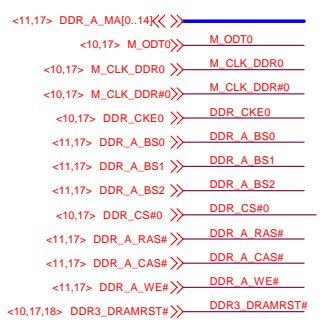
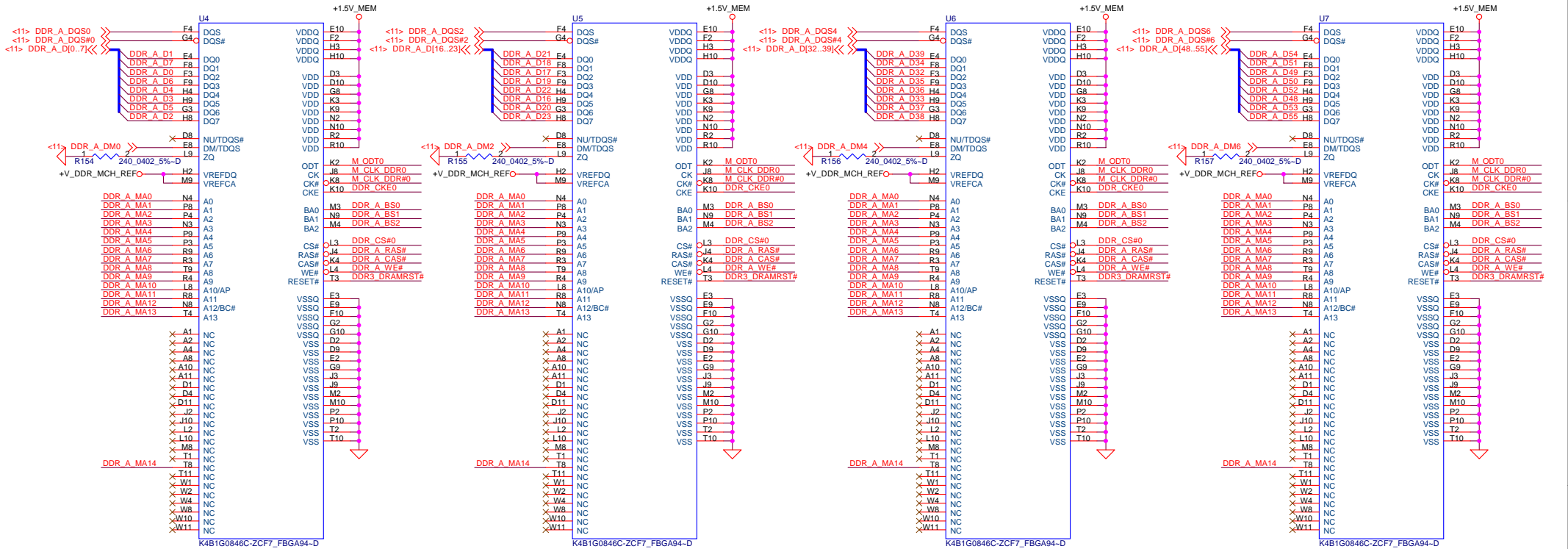
DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

Cantiga GS(6/6)

Title	Cantiga GS(6/6)		
Size	Document Number	Rev	0.1
Date:	Friday, December 07, 2007	Sheet	15 of 49

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



DELL CONFIDENTIAL/PROPRIETARY

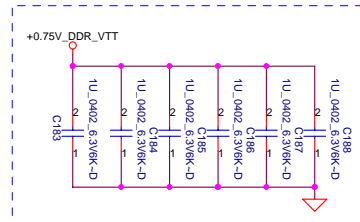
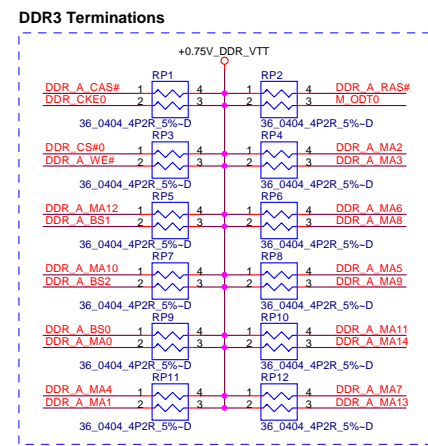
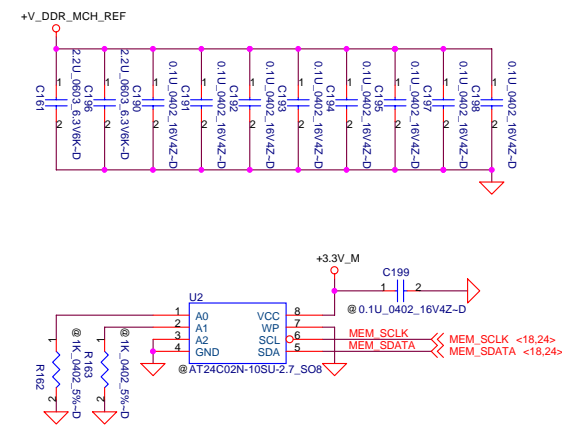
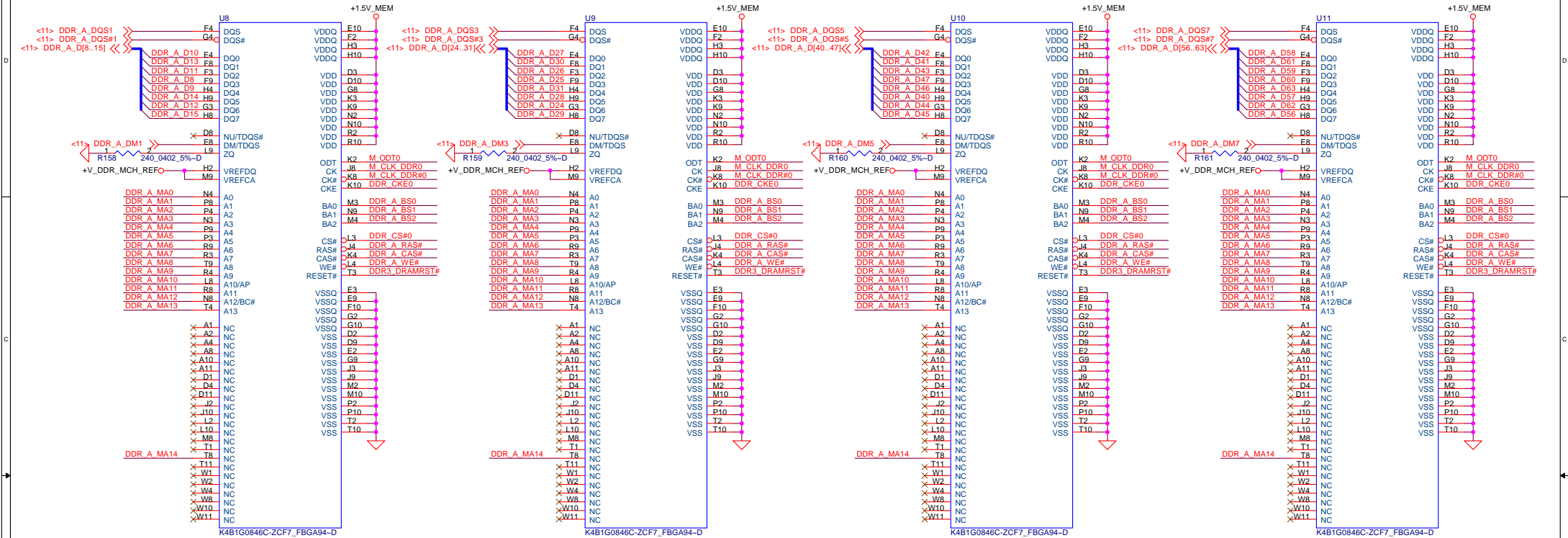
Compal Electronics, Inc.

DDRIII-Memory Down (Top)



Title		LA-4291P	
Size	Document Number	Rev 0.1	
Date	Friday, December 07, 2007	Sheet	16 of 49

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



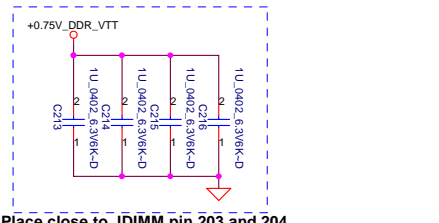
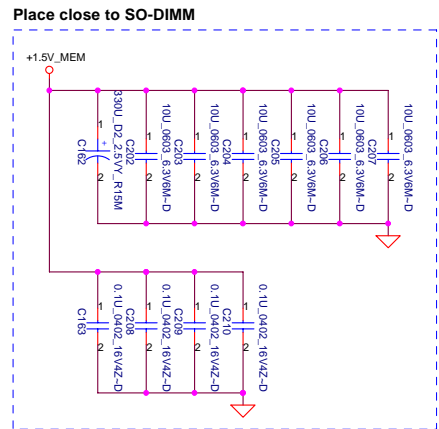
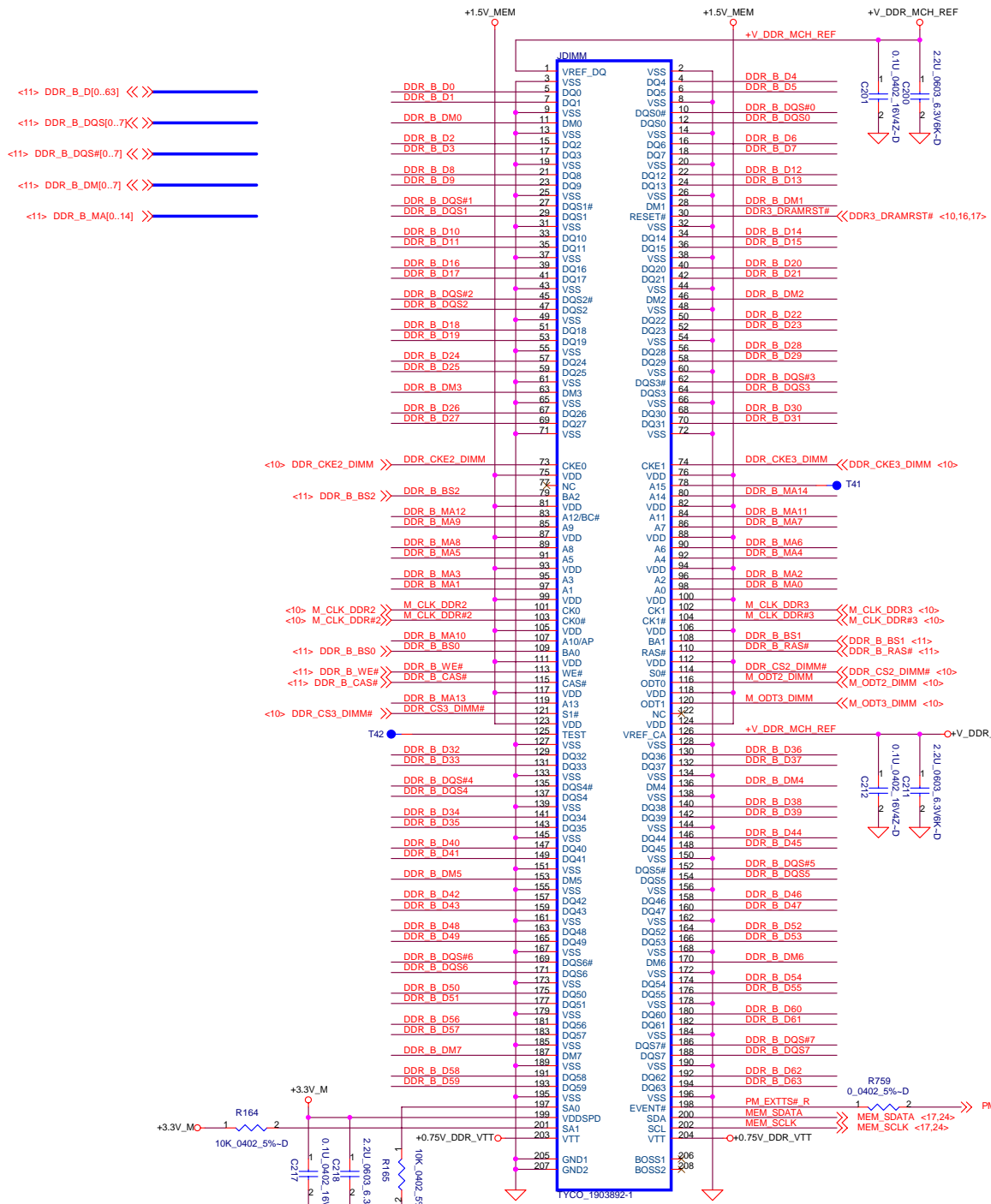
Place decaps close end termination resistors, one decap for 4 resistors

DELL CONFIDENTIAL/PROPRIETARY
Compal Electronics, Inc.

Title		DDR3-III-Memory Down (Bottom)	
Size		Document Number	
Date		LA-4291P	
Friday, December 07, 2007	Sheet 17	of	49

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.





DDR3 SO-DIMM/Standard Type

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL") THIS DOCUMENT MAY NOT BE TRANSMITTED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

DDRIII SO-DIMM SLOT

Title: **LA-4291P**
 Date: Friday, December 07, 2007
 Sheet 18 of 49

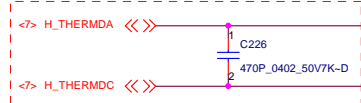
Rev 0.1

Place Q29 under CPU

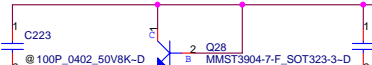


C225 close to Guardian and C224 close to Q29

Place C226 close to Guardian pin as possible

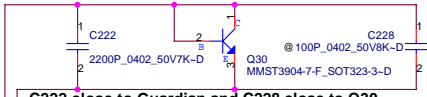


Place Q28 close to SO-DIMM



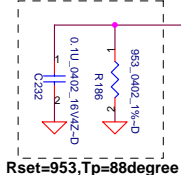
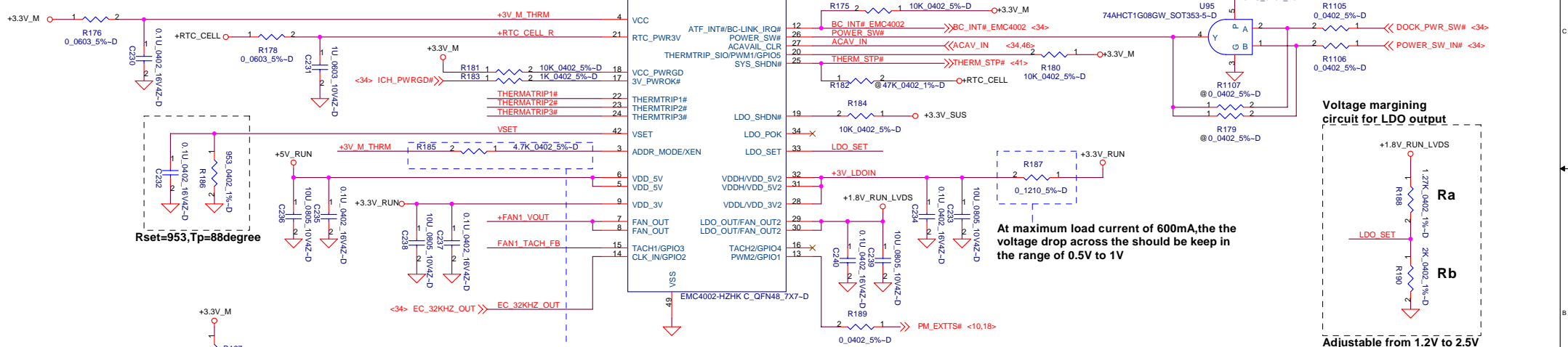
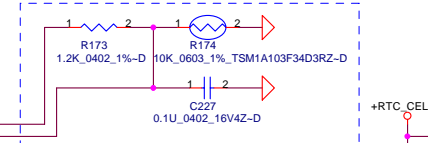
C229 close to Guardian and C223 close to Q28

Diode circuit at DP4/DN4 is used for skin temp sensor (placed Q28 optimally between CPU, MCH and MEM)

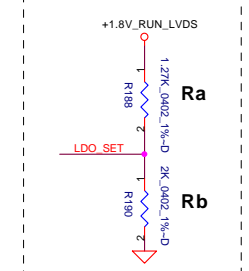


C222 close to Guardian and C228 close to Q30

THERMISTOR OPTION: Single-ended routing to thermistor is permissible (ground return). Place R173 and C227 near EMC4002



Voltage margining circuit for LDO output

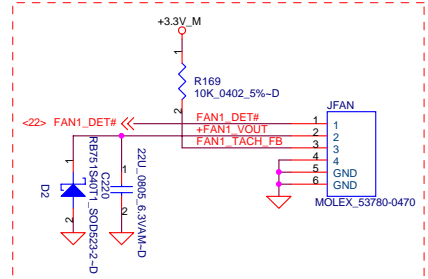


Adjustable from 1.2V to 2.5V
 $R_a = ((LDO_OUT/1.1)-1) \times R_b$

At maximum load current of 600mA, the voltage drop across the should be keep in the range of 0.5V to 1V

Pull-up Resistor on ADDR_MODE/XEN	For Remote1 mode	SMBus Address
<= 4.7K +/- 5%	2N3904	2F(r/w)
10K	2N3904	2F(r/w)
18K	Thermistor	2F(r/w)
>= 33K	Thermistor	2F(r/w)

FAN control and Tachometer



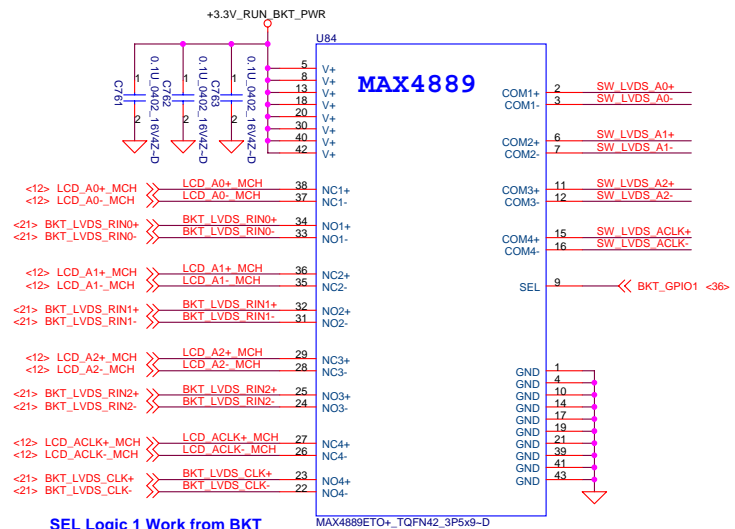
Must confirm we can get C version to solve leakage issue
 Backdrive from RTC PWR to 3VSUS
 B Version need external solution , check Roush I schematic

DELL CONFIDENTIAL/PROPRIETARY



Compal Electronics, Inc.
Thermal Sensor and FAN
 LA-4291P
 Date: Friday, December 07, 2007 Sheet 19 of 49

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

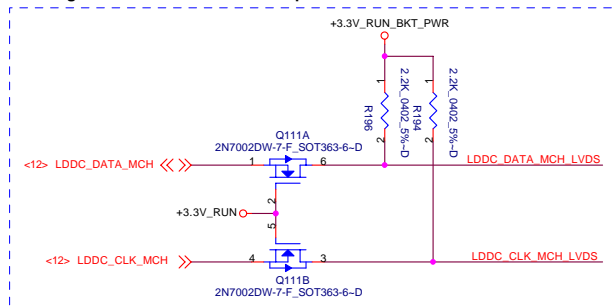


SEL Logic 1 Work from BKT

SEL	NC to COM	NO to COM
0	ON	OFF
1	OFF	ON

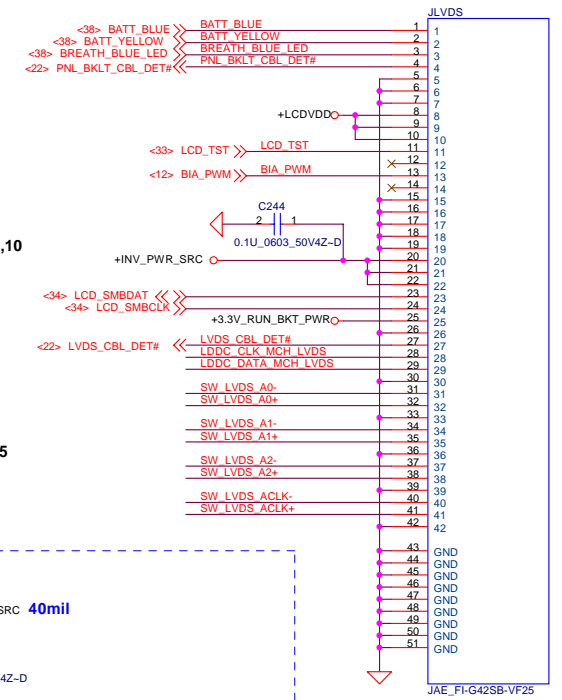
MAX4889ETO+_TQFN42_3P5x9-D

EDID signals drive low when BlackTop mode

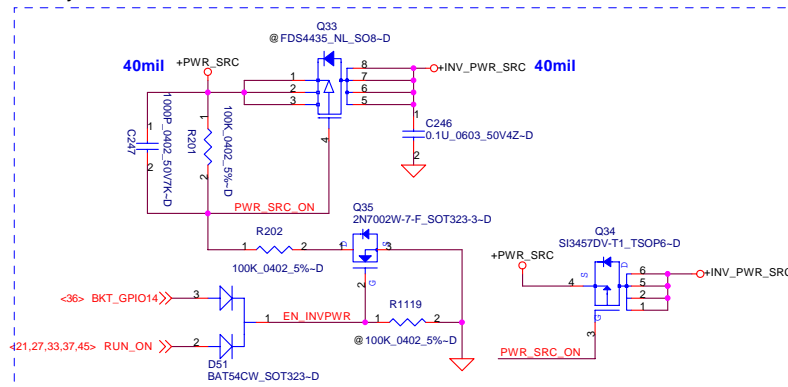


Place close to JLVDS.8,9,10

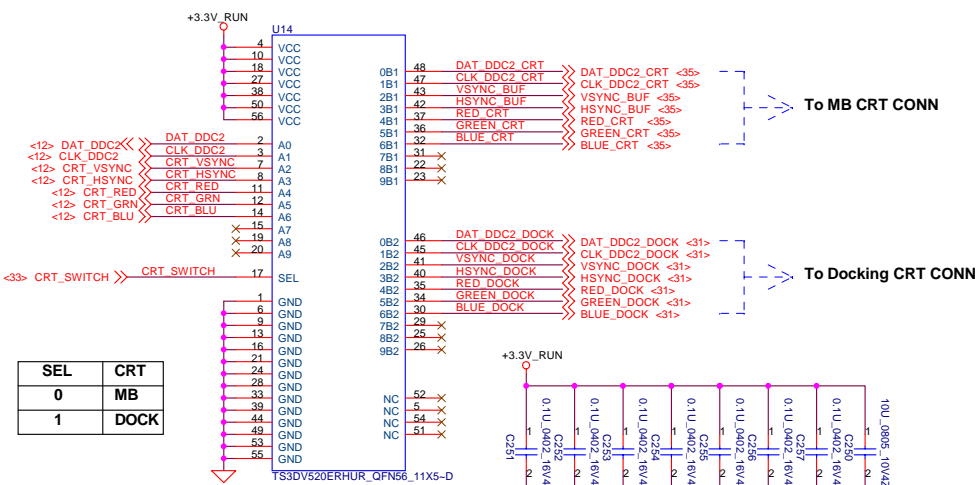
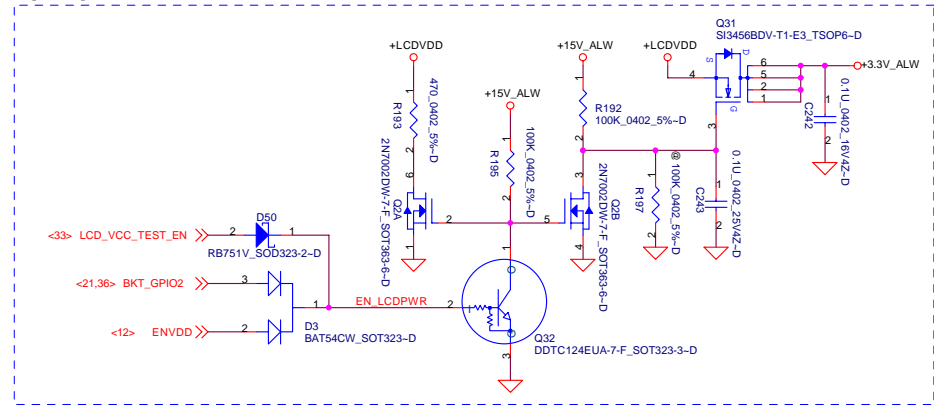
Place close to JLVDS.25



Dual layout for Q33 and Q34



LCD POWER



SEL	CRT
0	MB
1	DOCK

DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

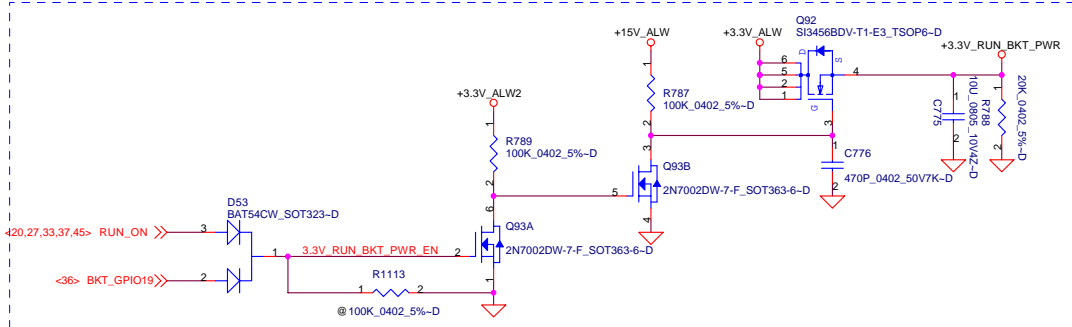
Title: **CRT SWITCH, LVDS MUX, LVDS CONN**

Size: Document Number **LA-4291P** Rev 0.1

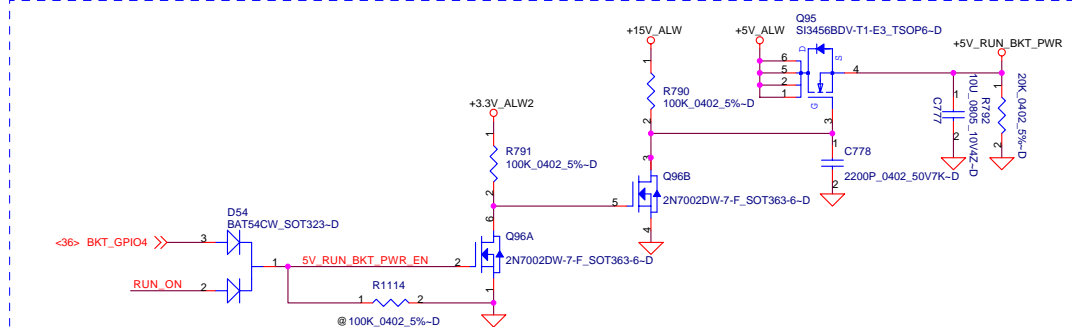
Date: Friday, December 07, 2007 Sheet 20 of 49

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL") THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL, IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

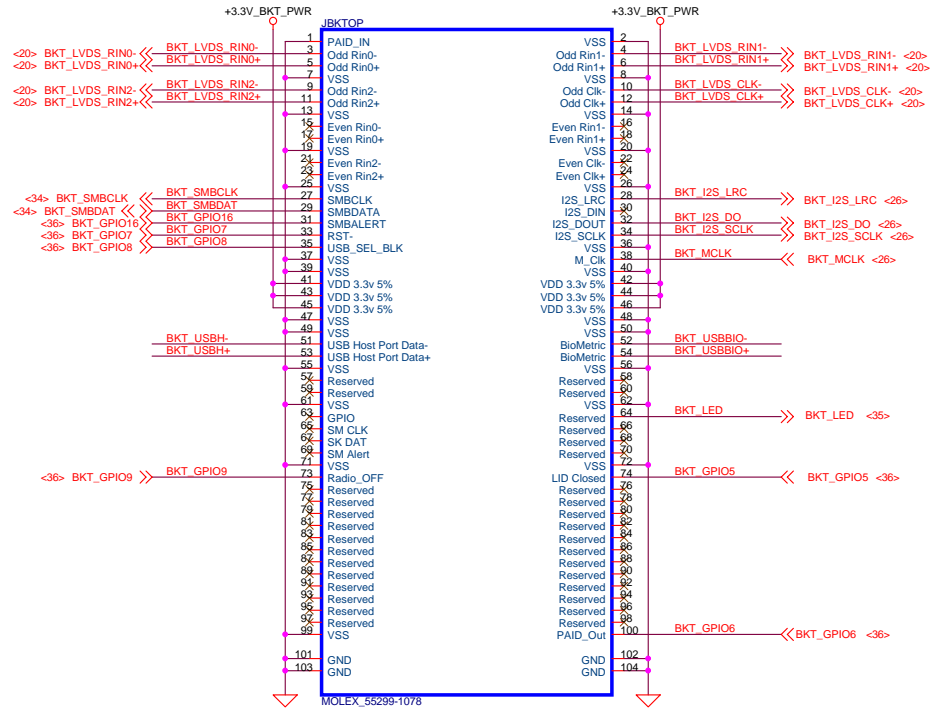
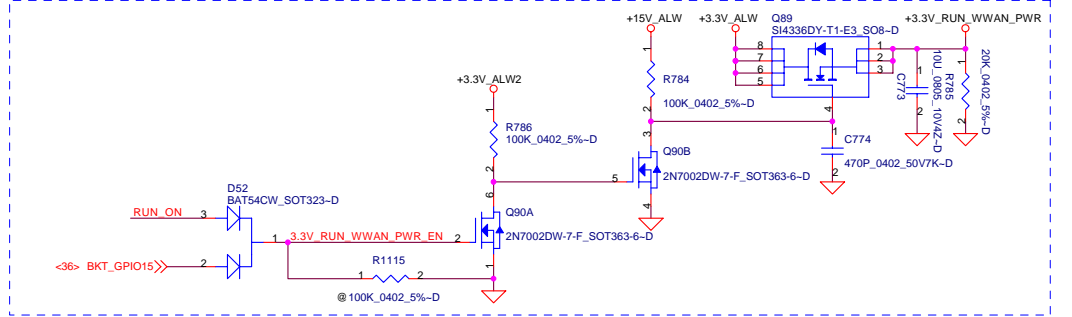
+3.3V_RUN_BKT_PWR Source



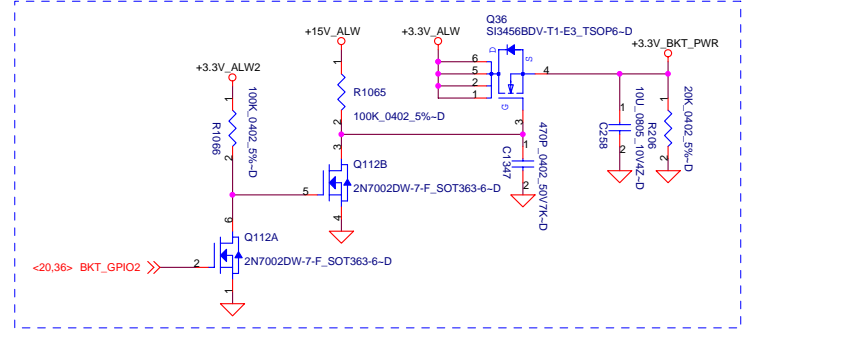
+5V_RUN_BKT_PWR Source, for Touch Pad and Audio Amplifier



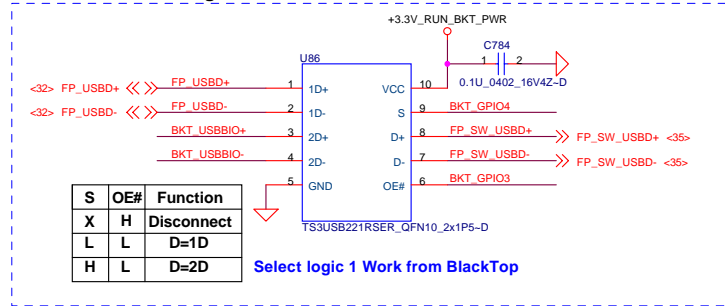
+3.3V_RUN_WWAN_PWR Source, for WWAN



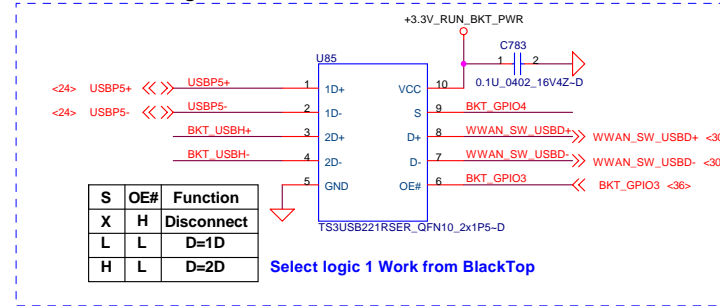
Enable BlackTop POWER



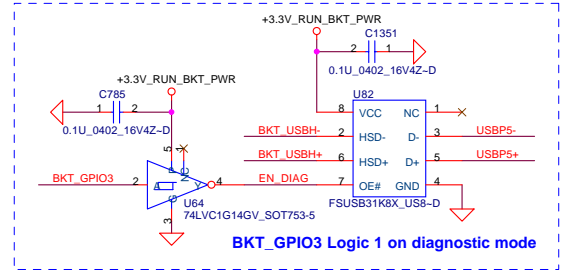
For Biometric USB signals isolation



For WWAN USB signals isolation



Add BlackTop to ICH9M interface by USB signals when diagnostic mode



DELL CONFIDENTIAL/PROPRIETARY

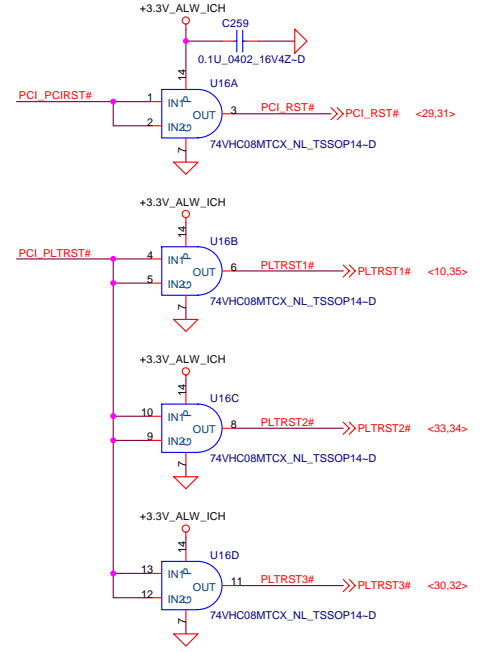
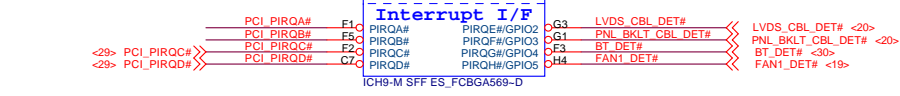
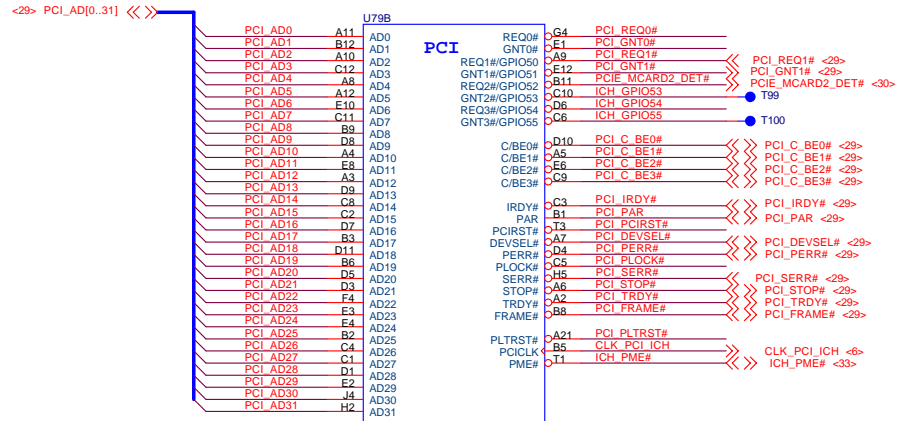
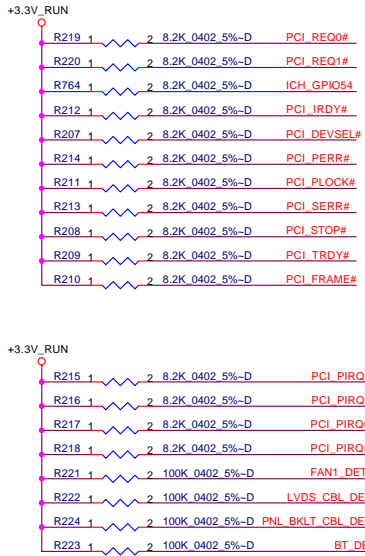
Compal Electronics, Inc.

BlackTop POWER and CONN

LA-4291P

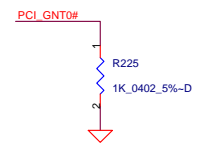
Date: Friday, December 07, 2007 Sheet 21 of 49

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND/OR PROPRIETARY INFORMATION OF DELL INC. ("DELL") THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

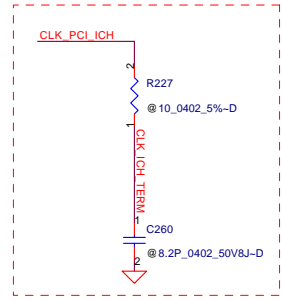


There is a weak integrated pull-up resistor on SPI_CS#1 pin

Boot BIOS Strap		
PCI_GNT0#	SPI_CS#1	Boot BIOS Destination
0	1	SPI
1	0	PCI
1	1	LPC



Place closely pin U79.B5



PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ('DELL'). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

DELL CONFIDENTIAL/PROPRIETARY
Compal Electronics, Inc.

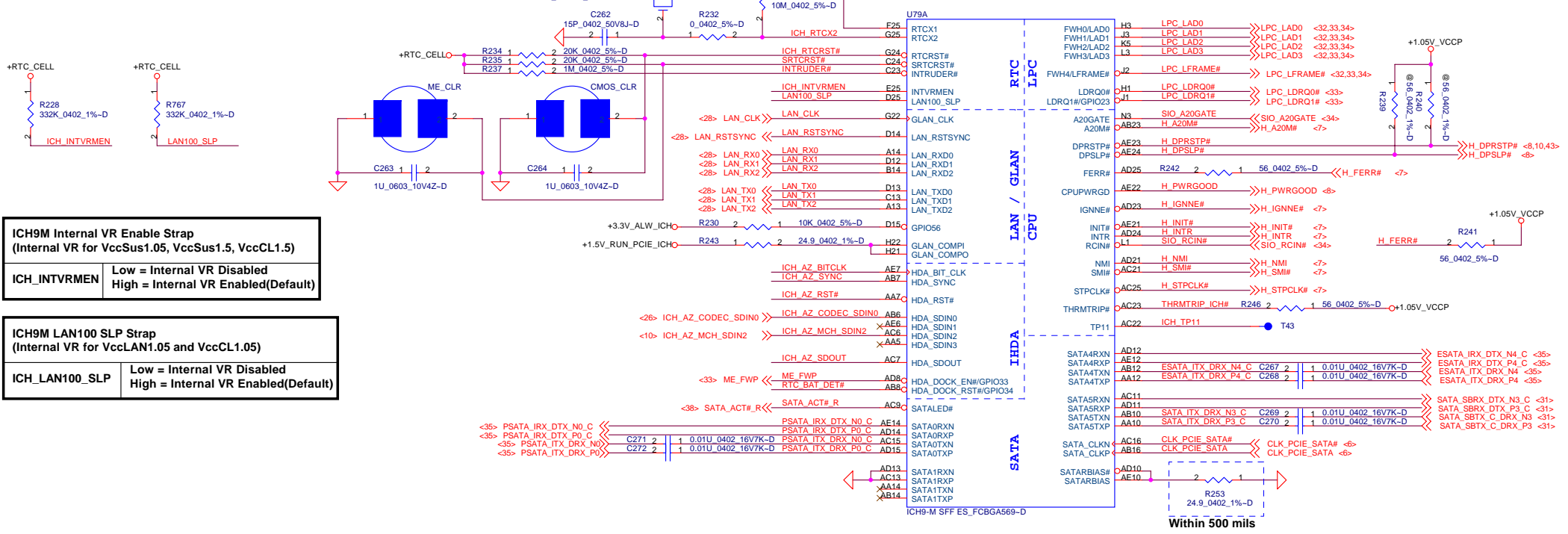
Title: **ICH9M SFF(1/4)**

Size: Document Number **LA-4291P** Rev: 0.1

Date: Friday, December 07, 2007 Sheet 22 of 49

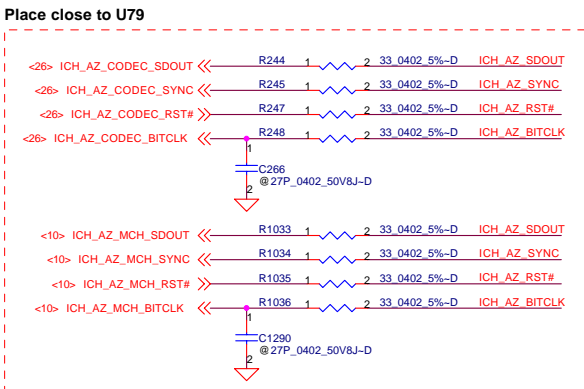
CMOS_CLR	CMOS setting
Short	Clear CMOS
Open	Keep CMOS

ME_CLR	TPM setting
Short	Clear ME RTC Registers
Open	Keep ME RTC Registers



ICH9M Internal VR Enable Strap (Internal VR for VccSus1.05, VccSus1.5, VccCL1.5)	
ICH_INTVRMEN	Low = Internal VR Disabled High = Internal VR Enabled(Default)

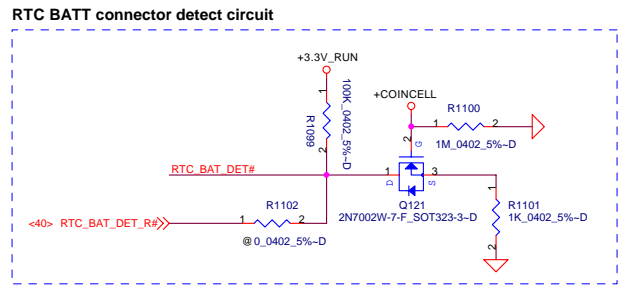
ICH9M LAN100 SLP Strap (Internal VR for VccLAN1.05 and VccCL1.05)	
ICH_LAN100_SLP	Low = Internal VR Disabled High = Internal VR Enabled(Default)



XOR Chain Entrance Strap

ICH_RSVD_TP3	HDA SDOOUT	DESCRIPTION
0	0	RSVD
0	1	Enter XOR Chain
1	0	Normal Operation (Default)
1	1	Set PCIE port config bit 1

There is a weak integrated pull-up resistor on ICH_RSVD_TP3 pin
There is a weak integrated pull-down resistor on HDA_SDOOUT pin

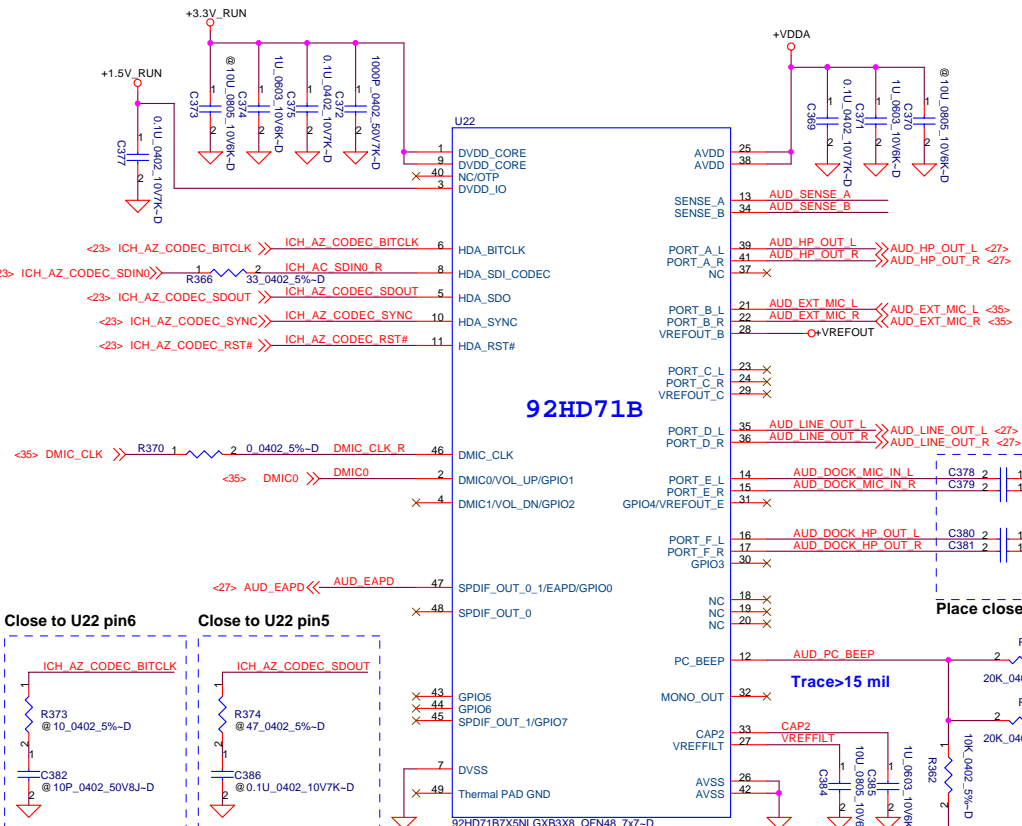


DELL CONFIDENTIAL/PROPRIETARY
Compal Electronics, Inc.

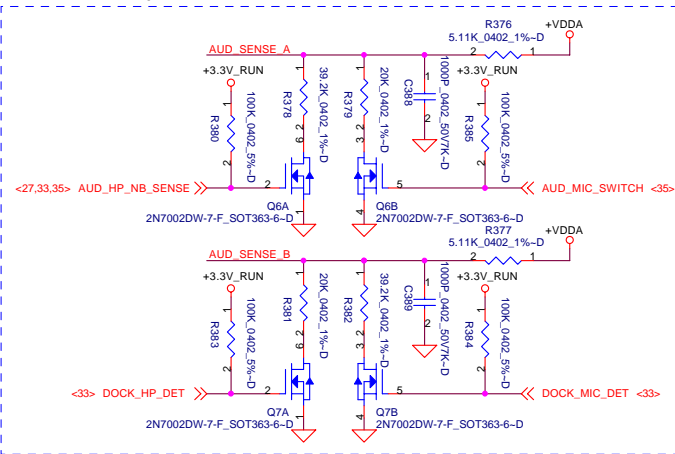
Title: ICH9M SFF(2/4)

Size	Document Number LA-4291P	Rev 0.1
Date:	Friday, December 07, 2007	Sheet 23 of 49

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL") THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



Place close to U22 pin 13 and 34

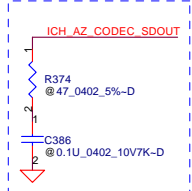
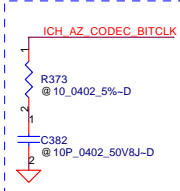


	BKT_GPIO11	EN_I2S_NB_CODEC
Without BKT	H	L
BKT	L	H

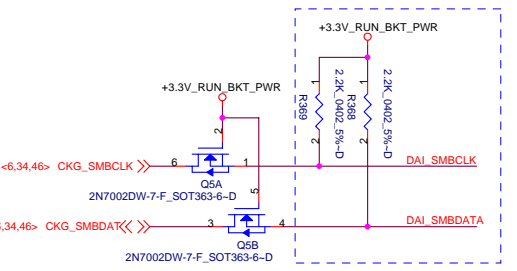
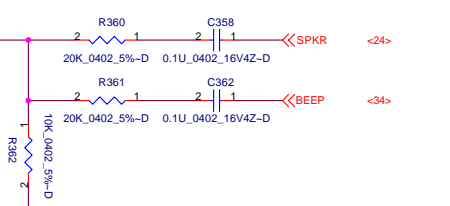
Input	Output	
OE#	A	Y
0	H	L
0	L	H

Close to U22 pin6

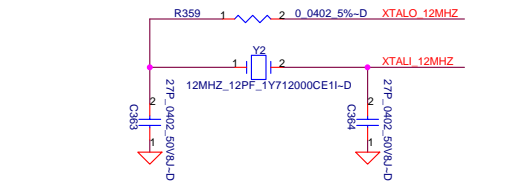
Close to U22 pin5



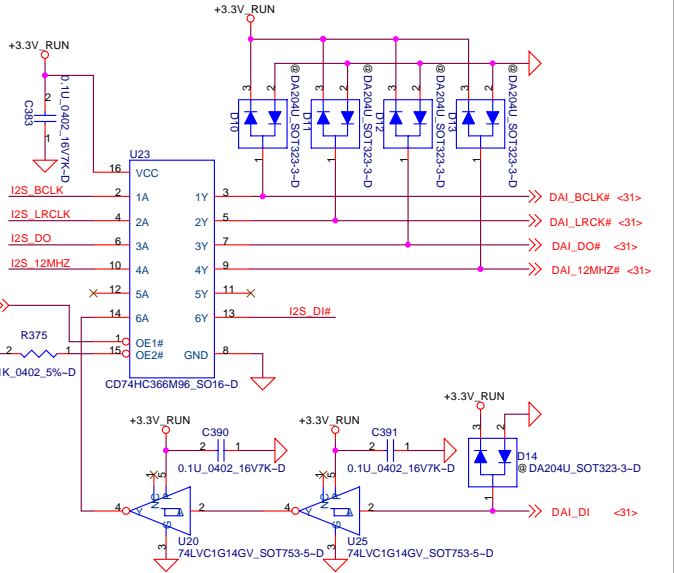
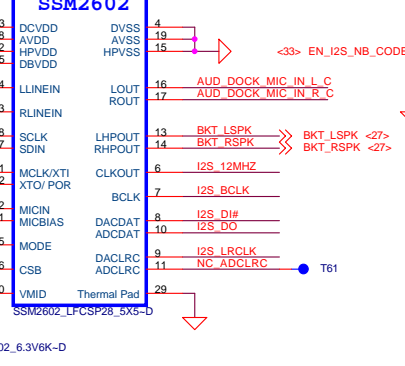
Place close to U22



I2S will disconnect SMBUS and PU for next version. Need to check the PU value.



SSM2602

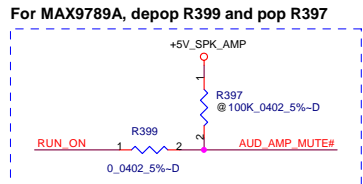
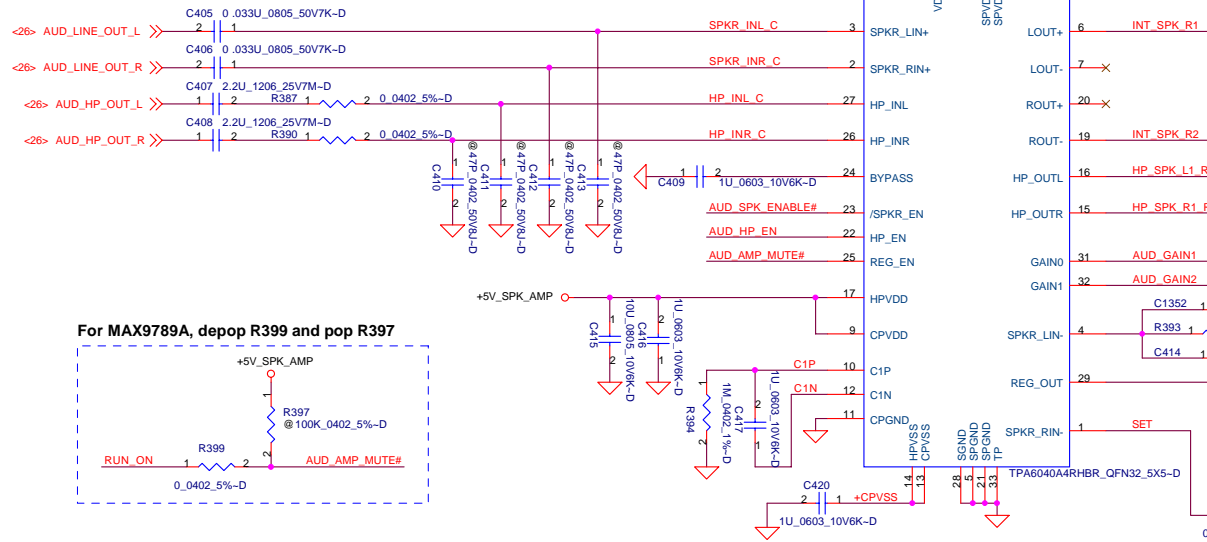
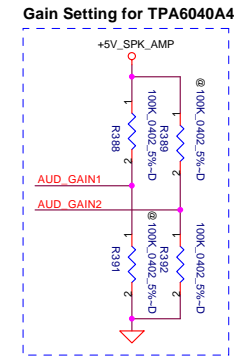
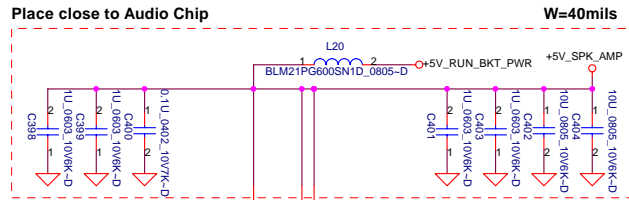
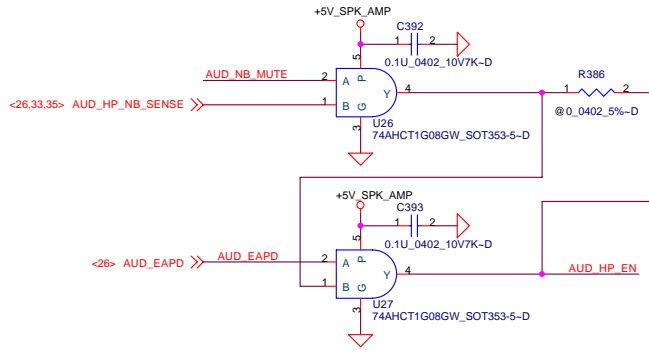


DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

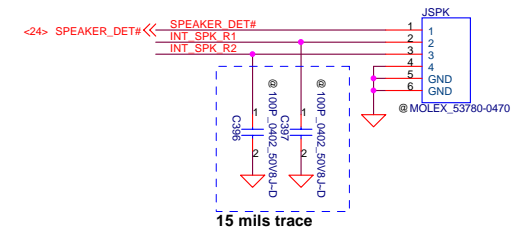
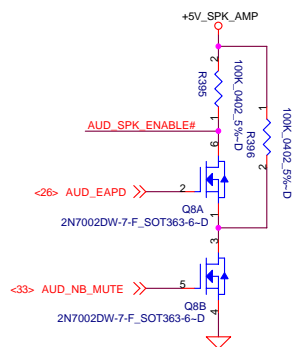
Codec 92HD71B and I2C D/A A/D converters		Rev 0.1
LA-4291P	Document Number	
Date: Friday, December 07, 2007	Sheet 26	of 49

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL") THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



GAIN1	GAIN2	AV(inv)	INPUT IMPEDANCE
0	0	6dB	82K ohm
0	1	10dB	66K ohm
1	0	15.6dB	45K ohm
1	1	21.6dB	26K ohm

Minimam 150 mA



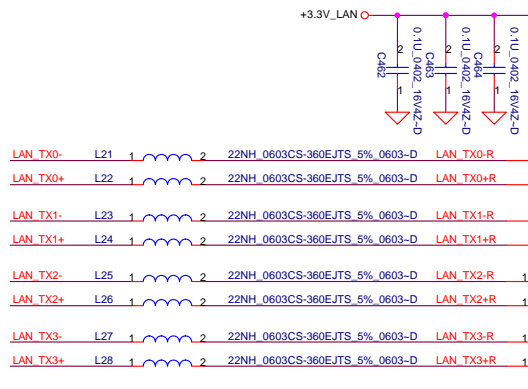
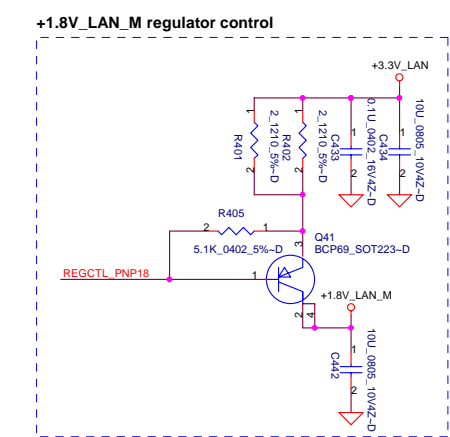
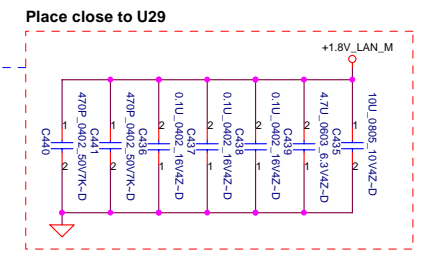
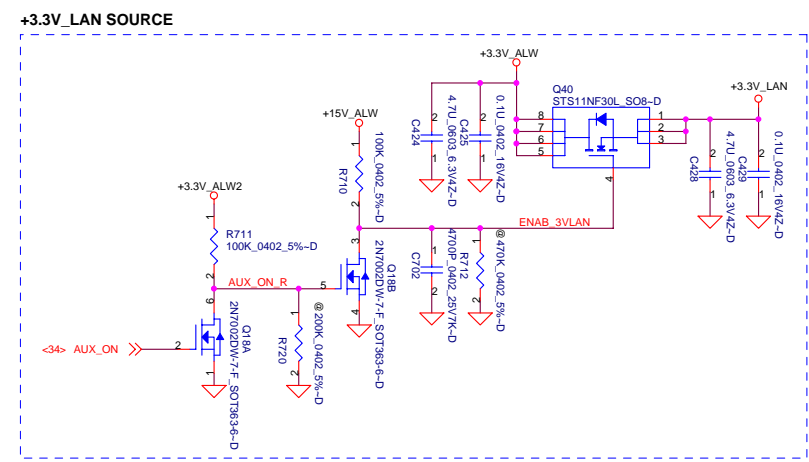
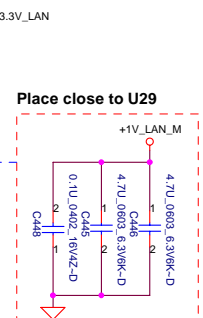
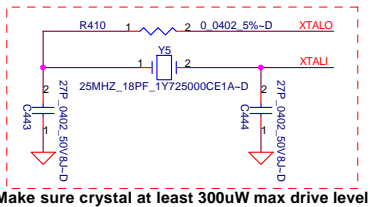
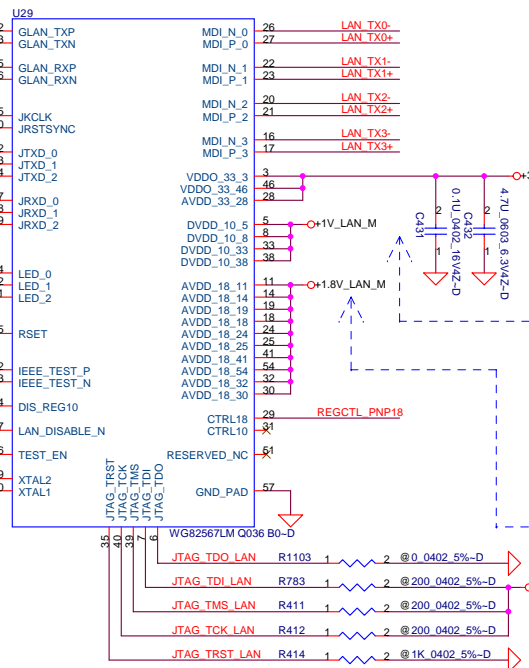
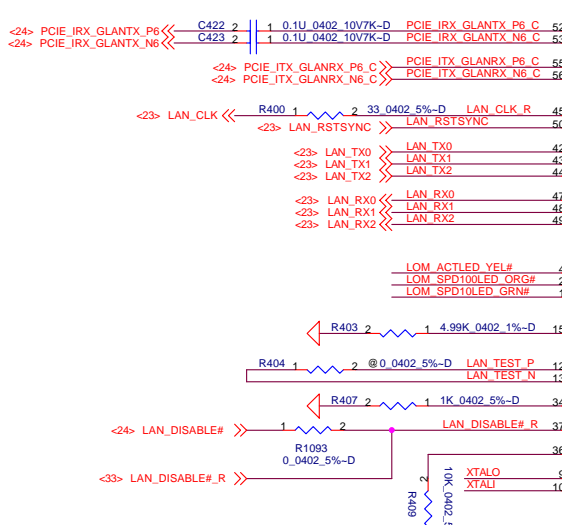
PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL") THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



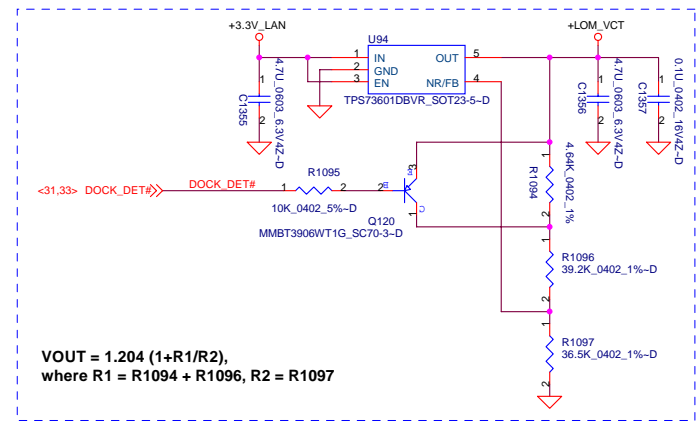
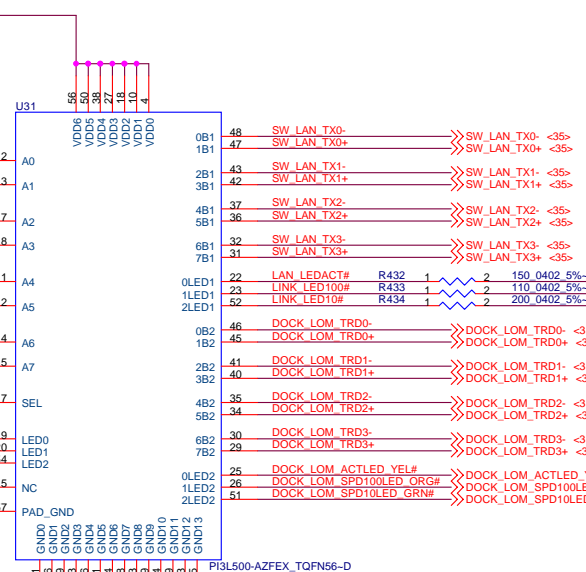
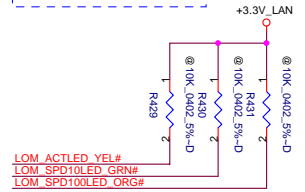
DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

Title			Audio amplifier and speaker CONN		
Size			Document Number		
Date			Rev		
Friday, December 07, 2007			LA-4291P		
Sheet			of		
27			49		



**DOCKED 1: TO DOCK
0: TO RJ45**



DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

Title			Boazman 82567LM and LAN SWITCH		
Size			Document Number		
Date			Rev		
Friday, December 07, 2007			LA-4291P		
Sheet			of		
28			49		

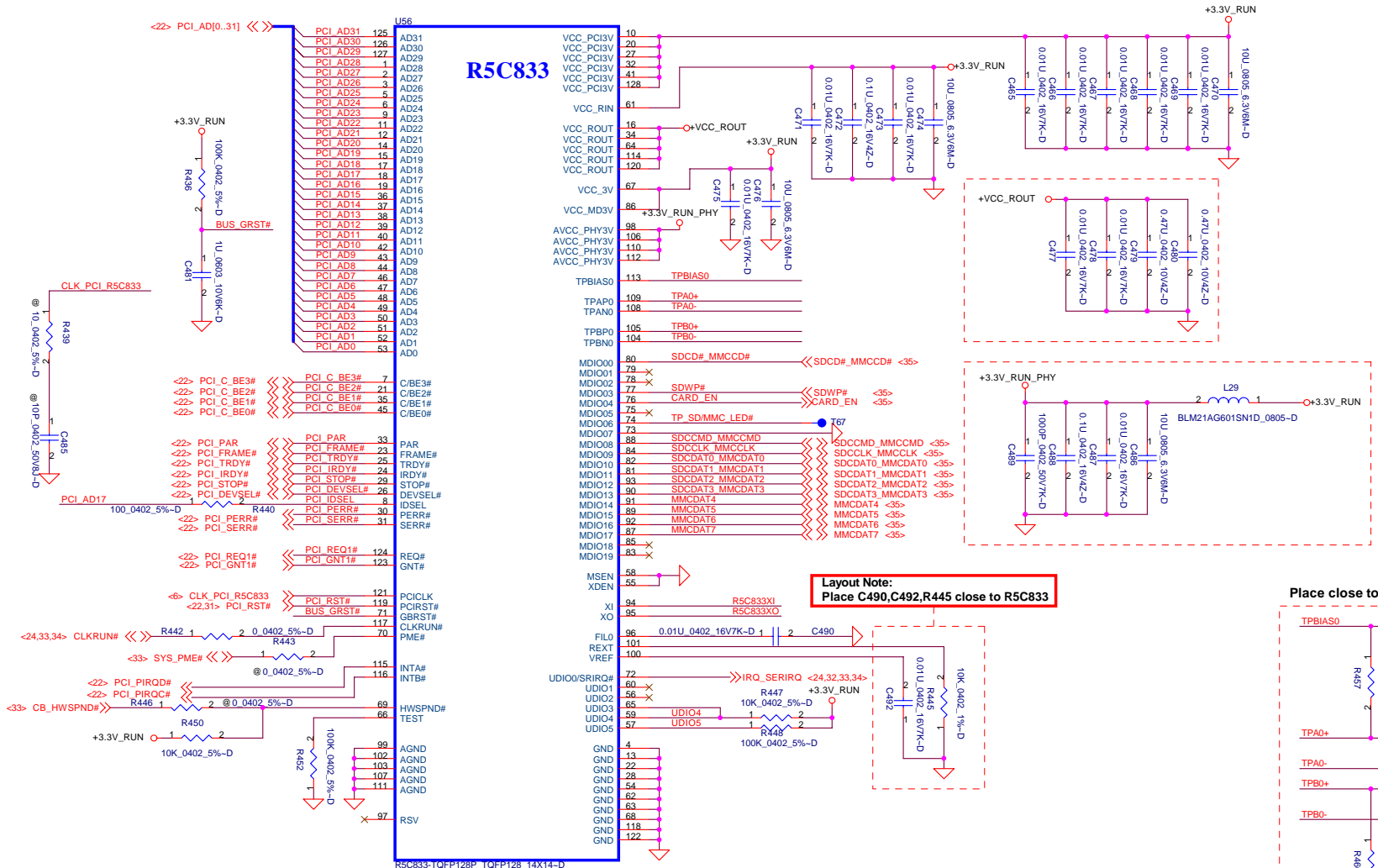
PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSMITTED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

Function set pin define

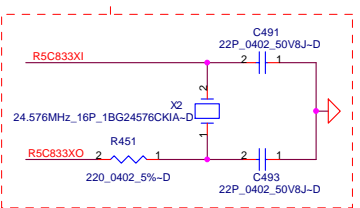
UDIO3	UDIO4	MSEN	XDEN	Function
Pull-up	Pull-up	Pull-down	Pull-down	Enable SD,MMC Card

SD,MMC multi-function pin define

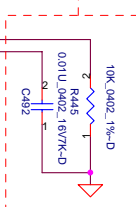
Media I/F	SD Card	MMC Card
MDIO00	SDCD#	MMCCD#
MDIO01		
MDIO02		
MDIO03	SDWP#	
MDIO04	SDPWR#	MMCPWR
MDIO05	SDPWR1	
MDIO06	SDLED#	MMCLD#
MDIO07	SDEXTCK	
MDIO08	SDCCMD	MMCCMD
MDIO09	SDCCLK	MMCCLK
MDIO10	SDCDAT0	MMCDAT0
MDIO11	SDCDAT1	MMCDAT1
MDIO12	SDCDAT2	MMCDAT2
MDIO13	SDCDAT3	MMCDAT3
MDIO14		MMCDAT4
MDIO15		MMCDAT5
MDIO16		MMCDAT6
MDIO17		MMCDAT7
MDIO18		
MDIO19		



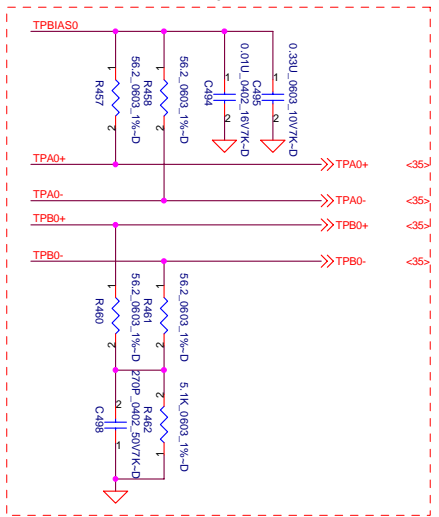
Layout Note: Place close to R5C833 and Shield GND



Layout Note: Place C490,C492,R445 close to R5C833



Place close to R5C833 Chip



PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSMITTED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

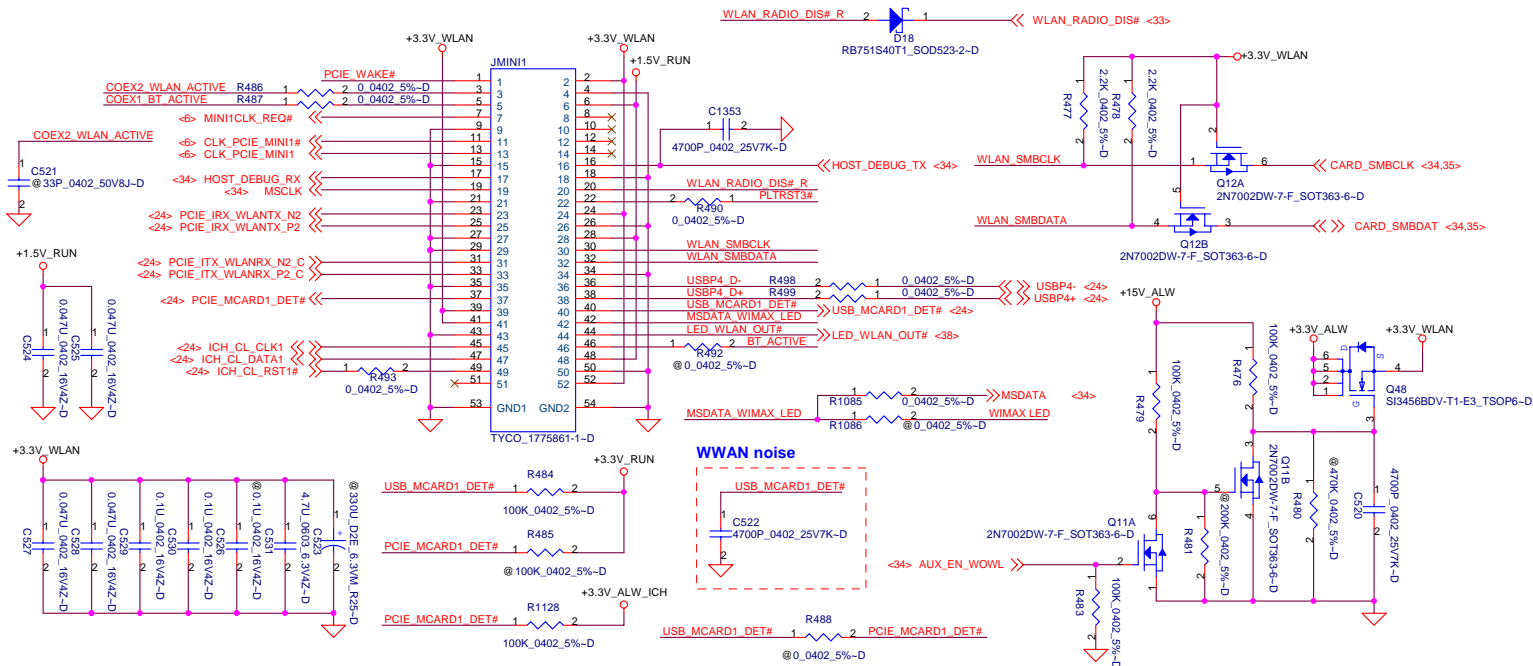


DELL CONFIDENTIAL/PROPRIETARY

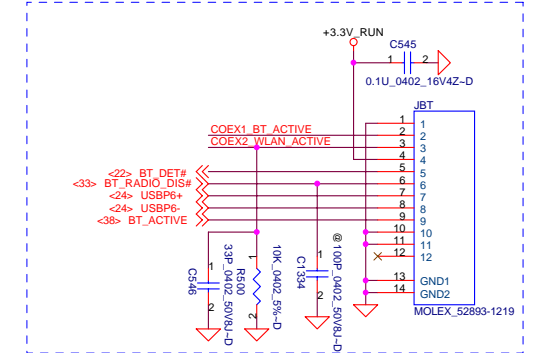
Compal Electronics, Inc.

Title	R5C833-SD/MMC and 1394 Controller		Rev
Size	Document Number	LA-4291P	0.1
Date	Friday, December 07, 2007	Sheet	29 of 49

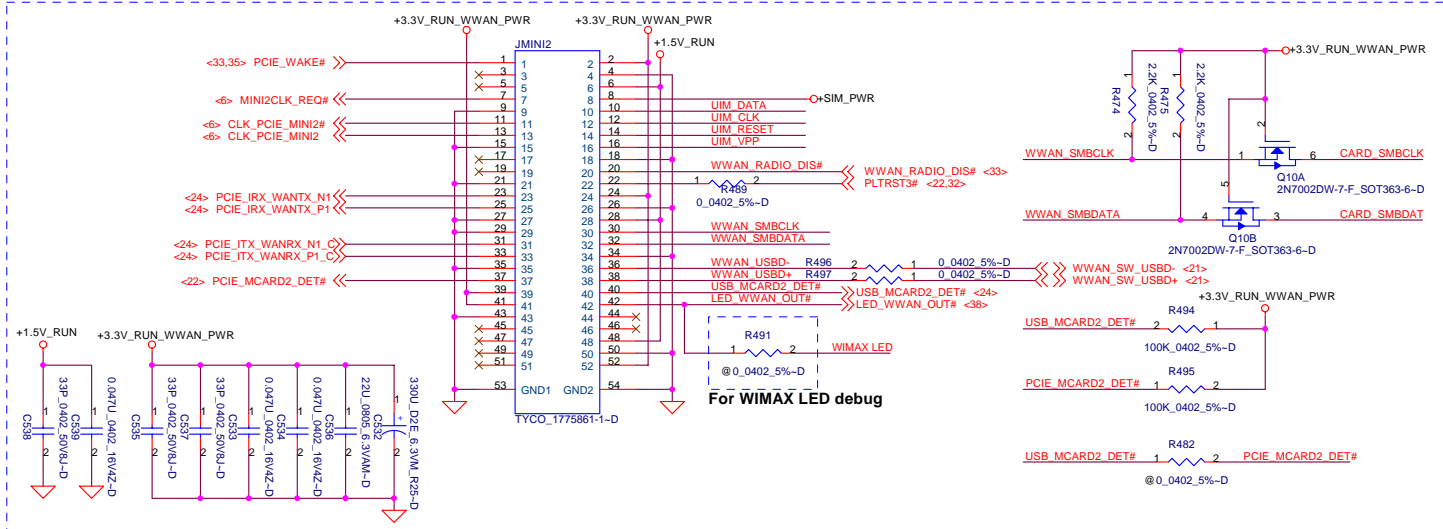
Mini Card 1---WLAN



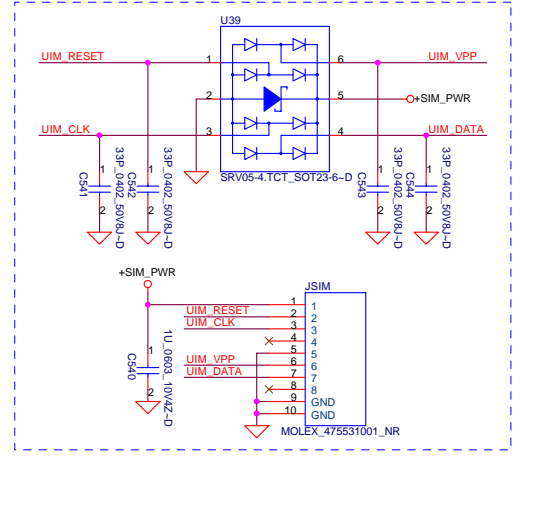
BlueTooth



Mini Card 2---WWAN



SIM Card

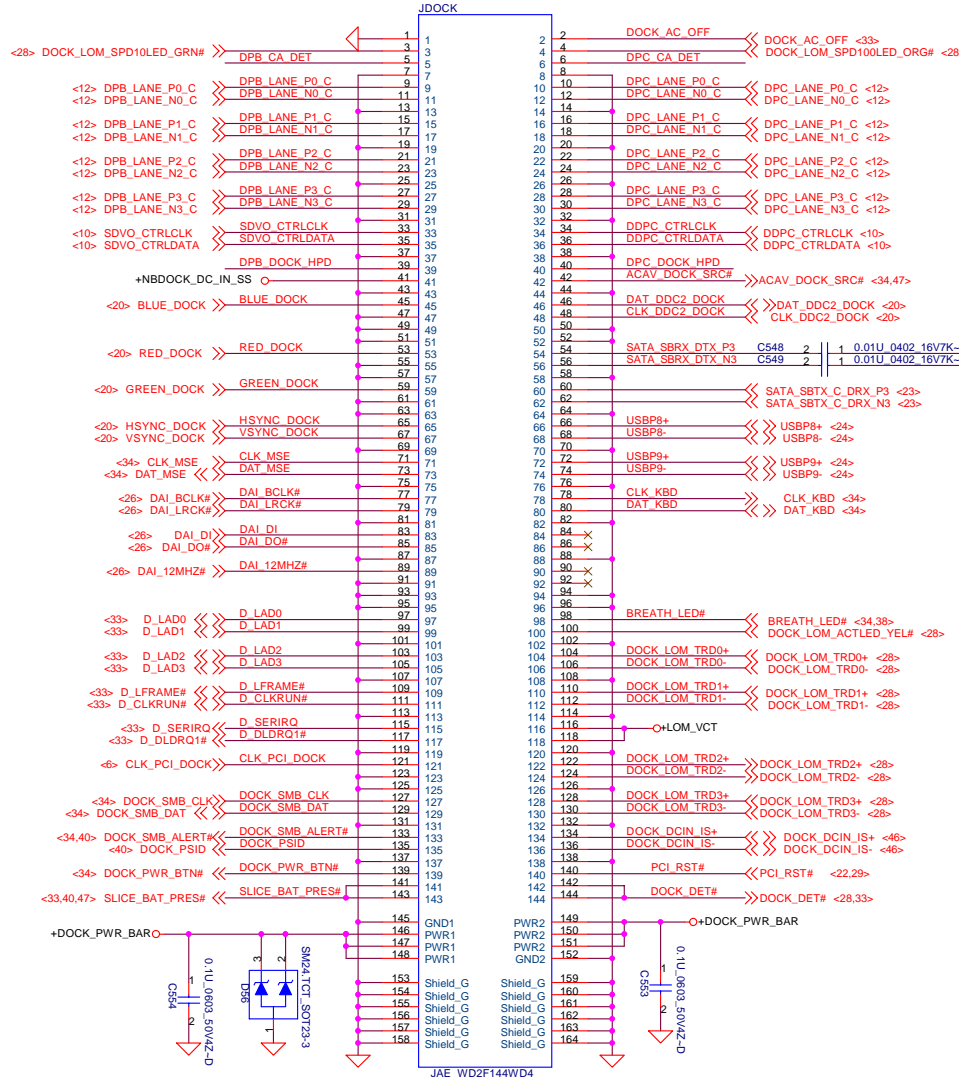
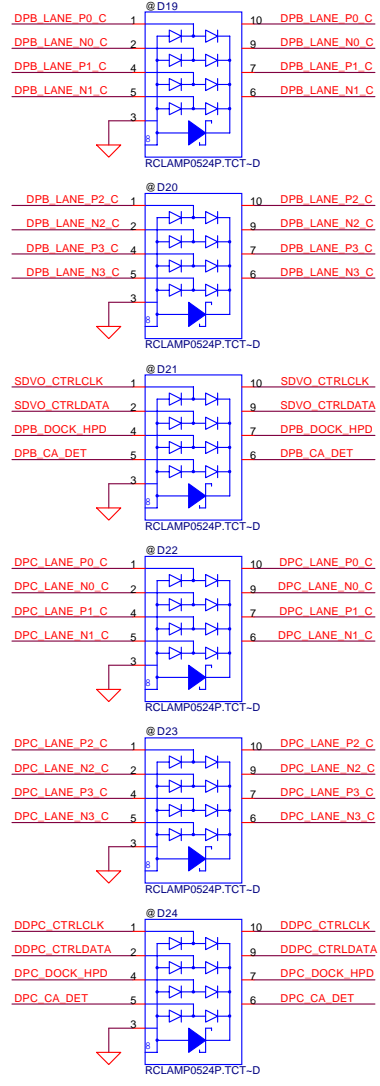


PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

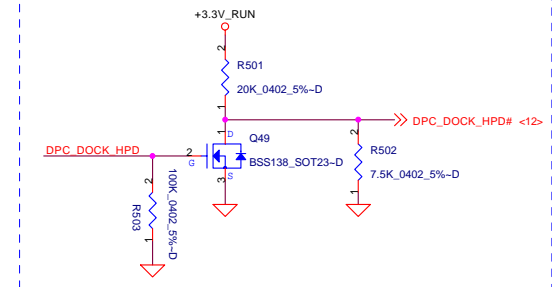
DELL CONFIDENTIAL/PROPRIETARY
Compal Electronics, Inc.

Title	Mini WLAN/WWAN, SIM card and BT		
Size	Document Number	Rev	
	LA-4291P		0.1
Date:	Friday, December 07, 2007	Sheet	30 of 49

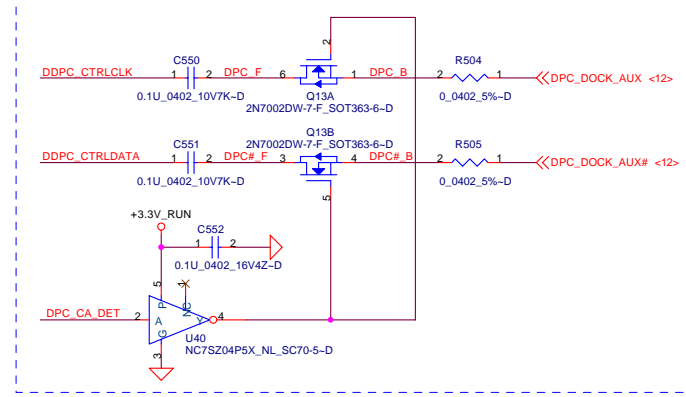
Place close to JDOCK connector



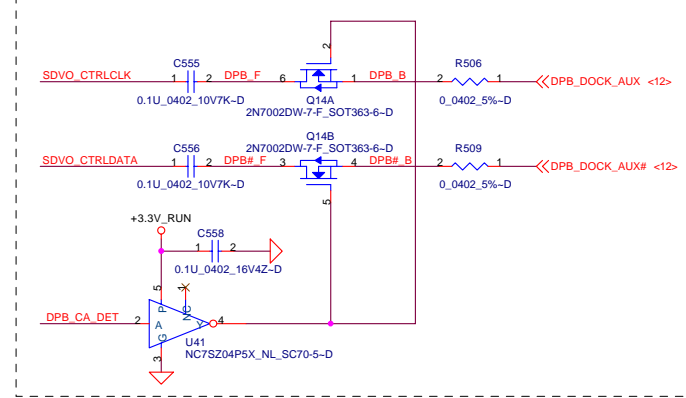
HPD# inverting level shifting circuit for DisplayPort C



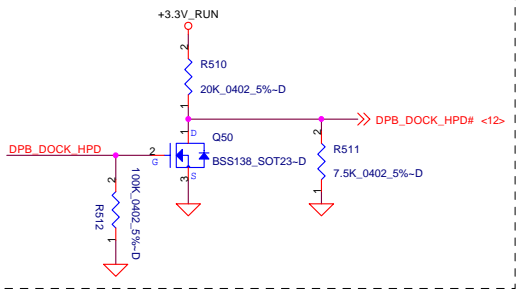
Switch that support both DisplayPort C and DVI/HDMI



Switch that support both DisplayPort B and DVI/HDMI



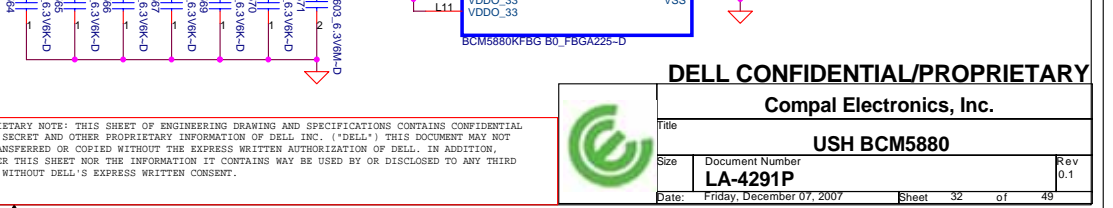
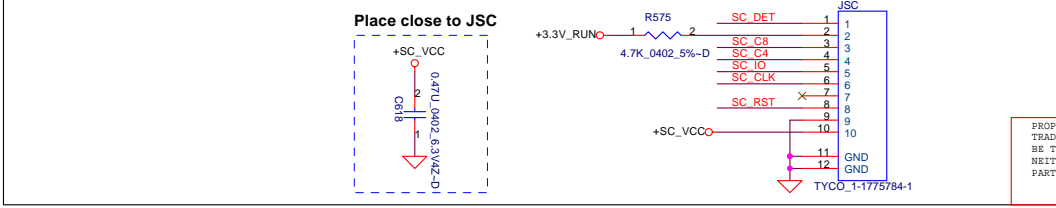
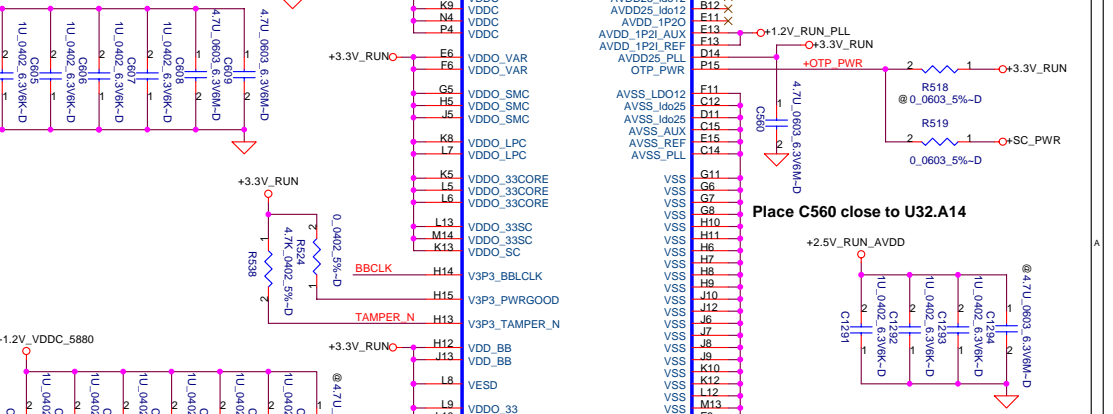
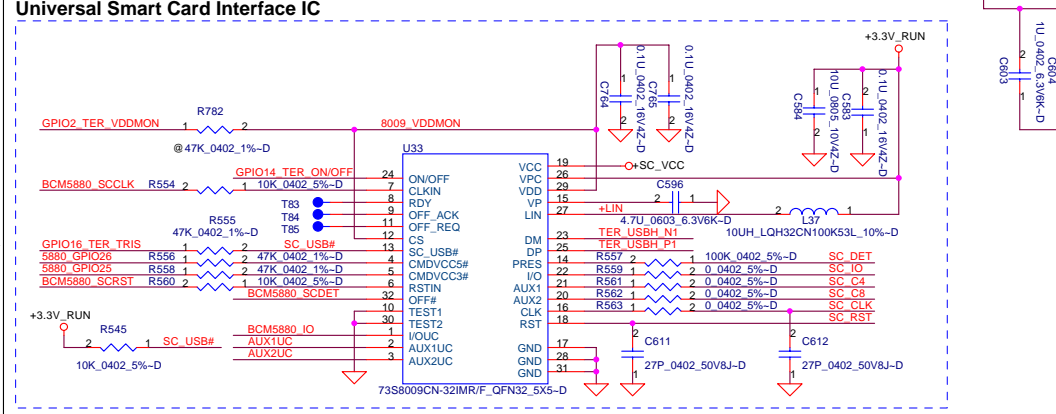
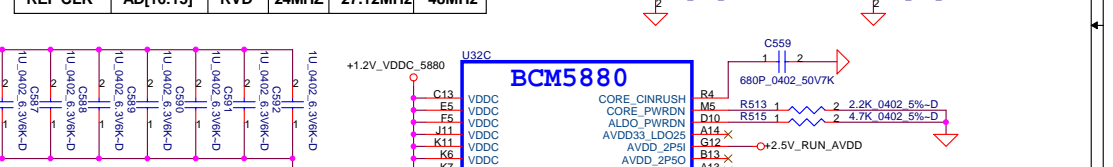
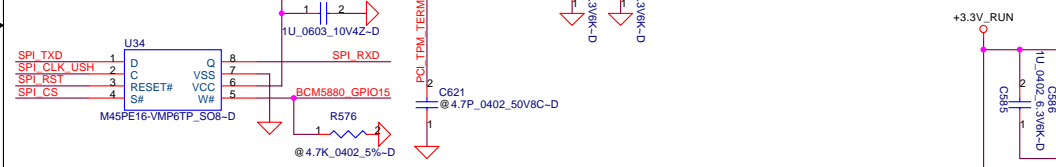
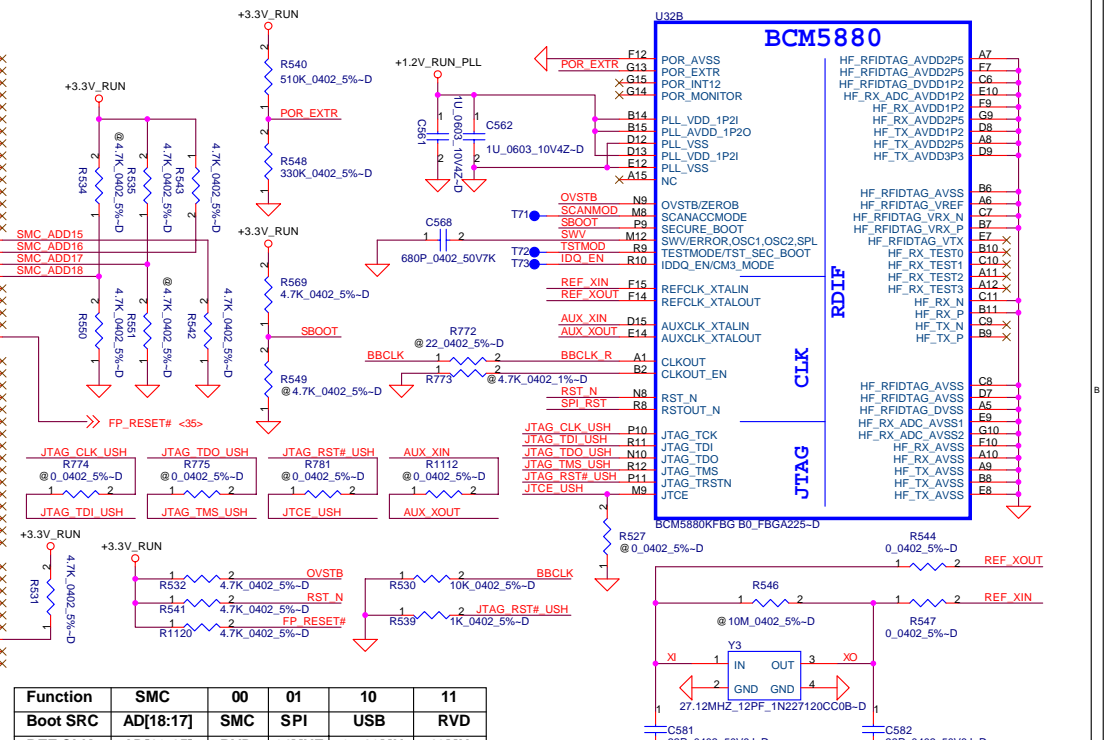
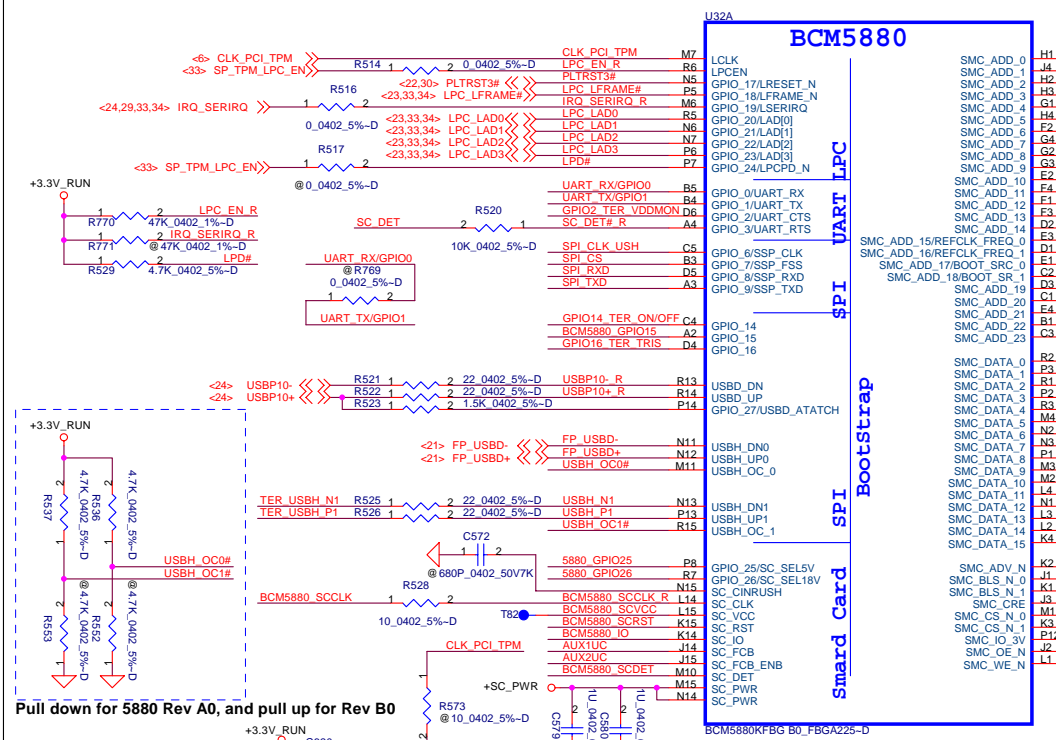
HPD# inverting level shifting circuit for DisplayPort B



PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



DELL CONFIDENTIAL/PROPRIETARY
Compal Electronics, Inc.
DOCKING CONNECTOR
LA-4291P
 Date: Friday, December 07, 2007 Sheet 31 of 49



PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

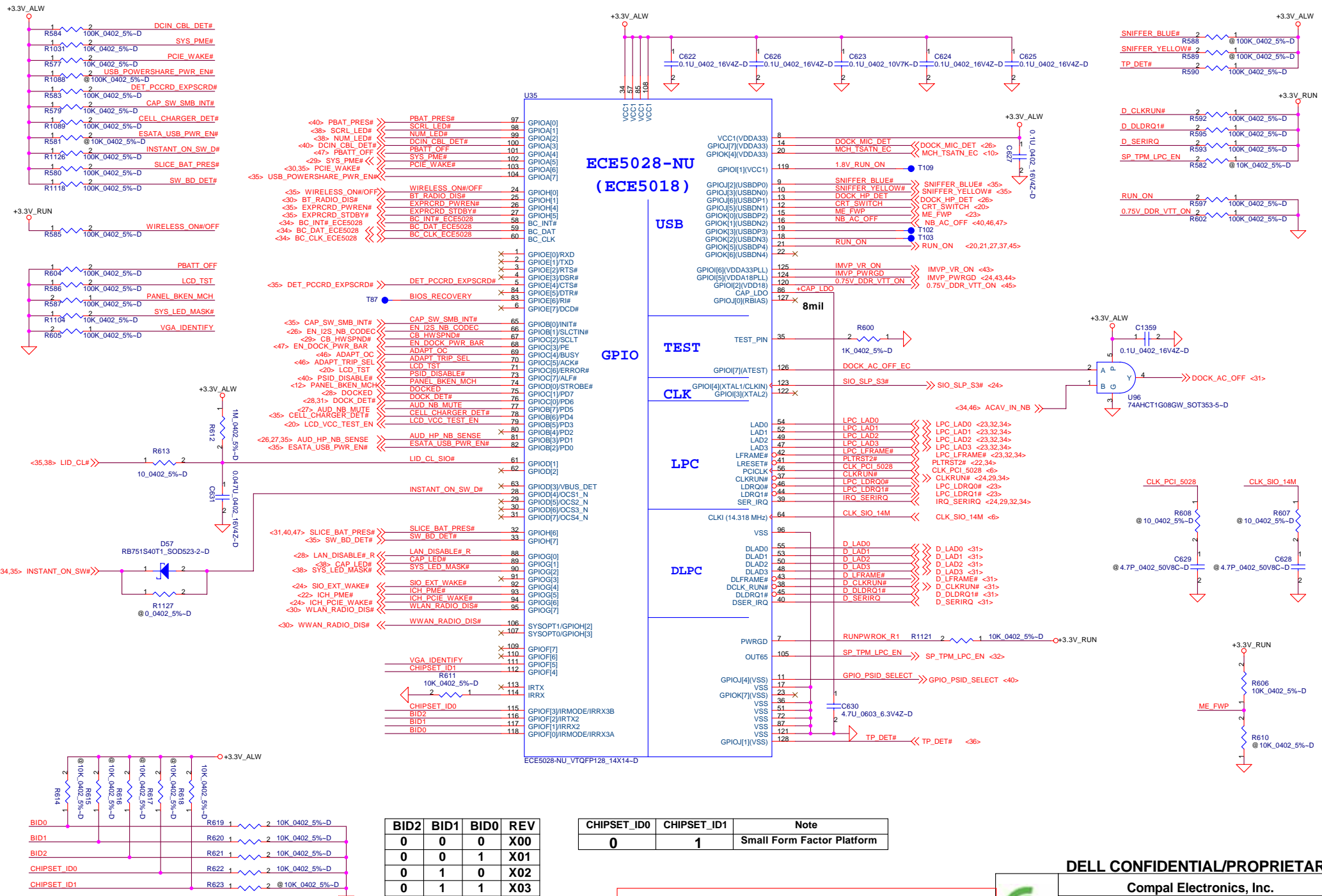
USH BCM5880

LA-4291P

Friday, December 07, 2007

Sheet 32 of 49

Rev 0.1



ECE5028-NU (ECE5018)

USB

TEST

CLK

LPC

DLPC

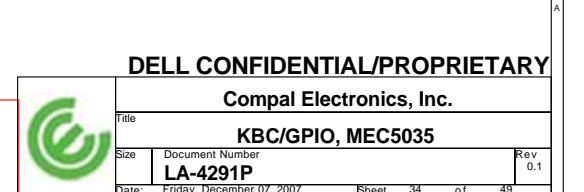
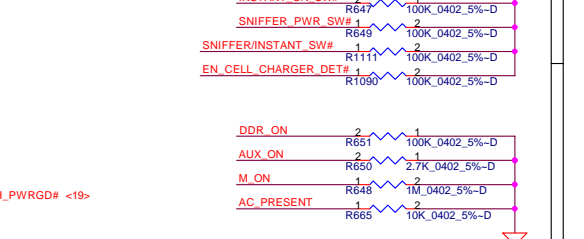
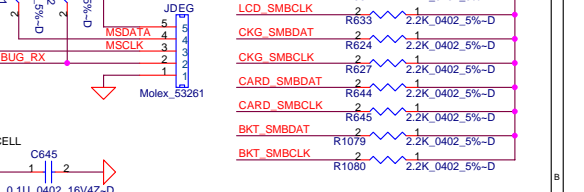
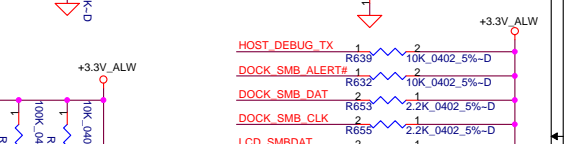
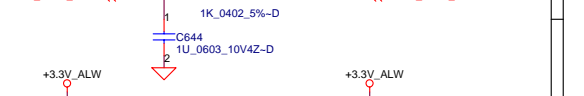
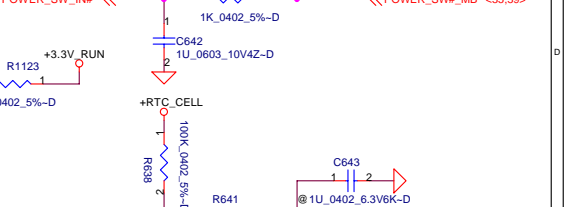
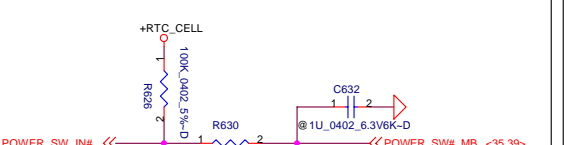
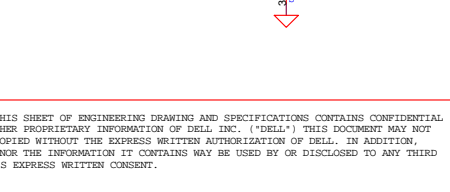
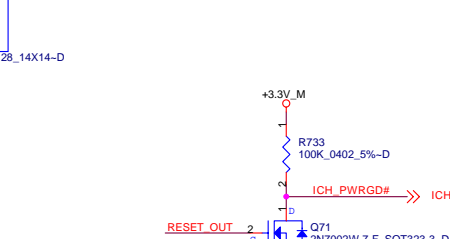
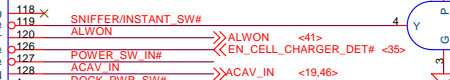
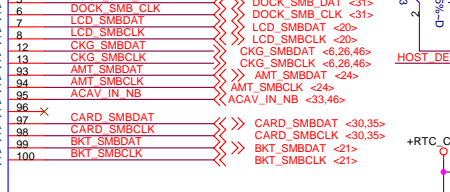
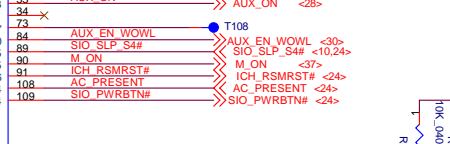
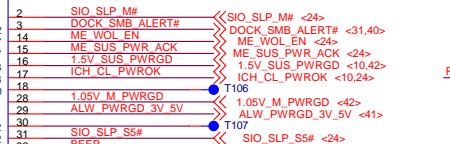
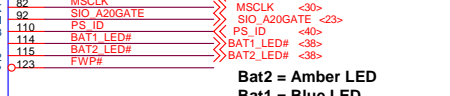
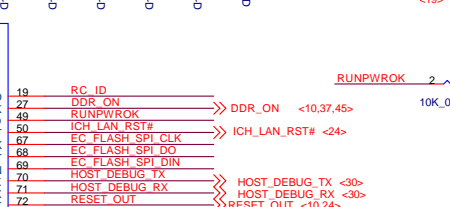
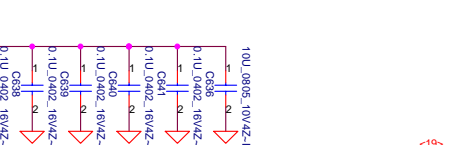
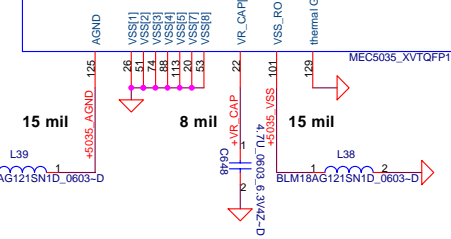
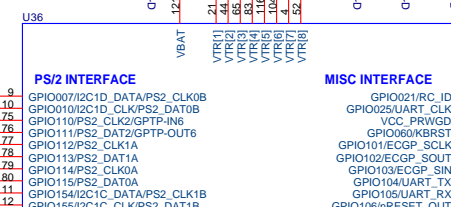
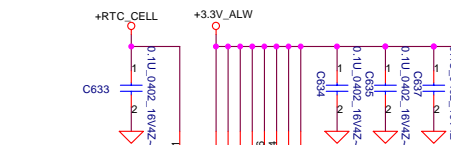
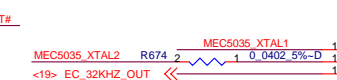
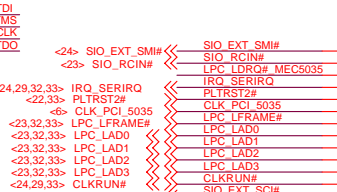
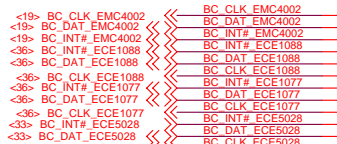
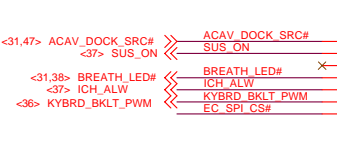
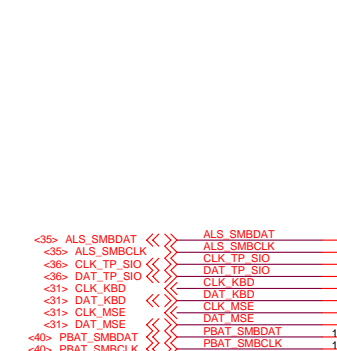
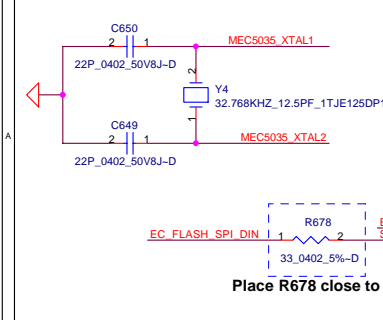
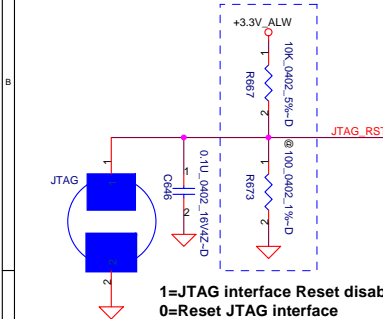
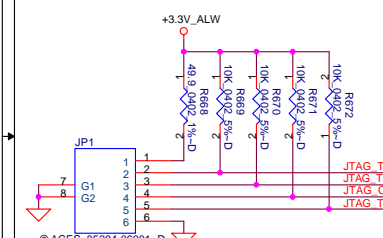
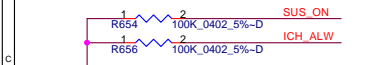
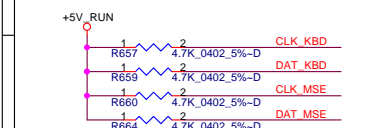
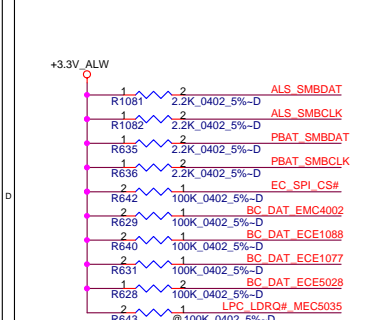
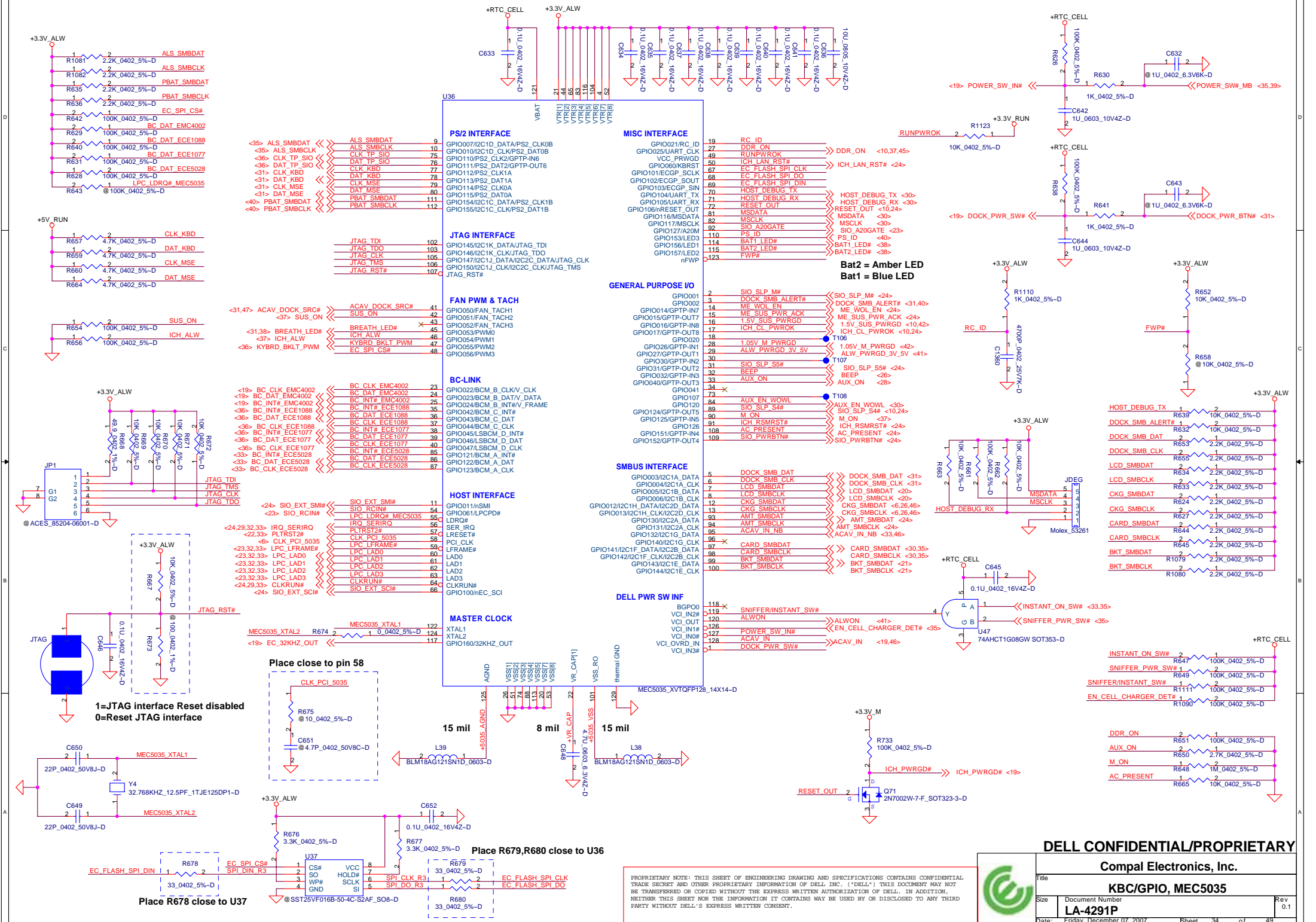
BID2	BID1	BID0	REV
0	0	0	X00
0	0	1	X01
0	1	0	X02
0	1	1	X03

CHIPSET_ID0	CHIPSET_ID1	Note
0	1	Small Form Factor Platform

DELL CONFIDENTIAL/PROPRIETARY

	Compal Electronics, Inc.	
	SIO ECE5028	
Title	Document Number	Rev
Date: Friday, December 07, 2007	LA-4291P	0.1
Sheet	33	of 49

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



DELL CONFIDENTIAL/PROPRIETARY

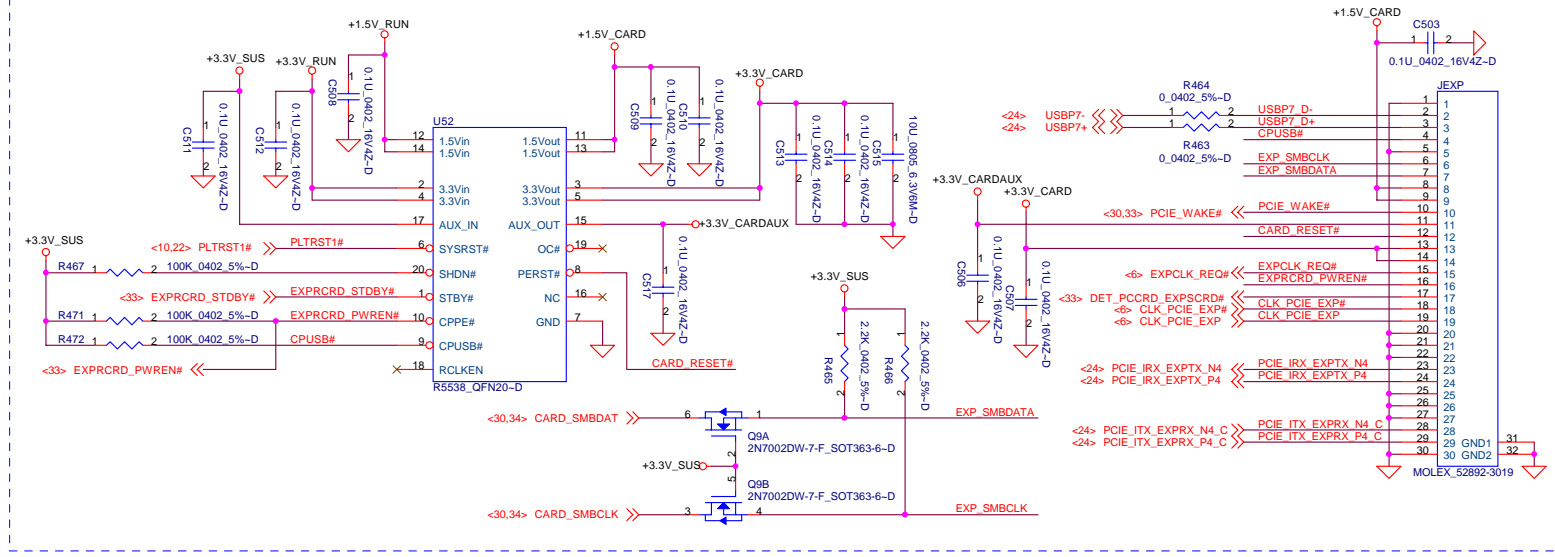
Compal Electronics, Inc.

KBC/GPIO, MEC5035

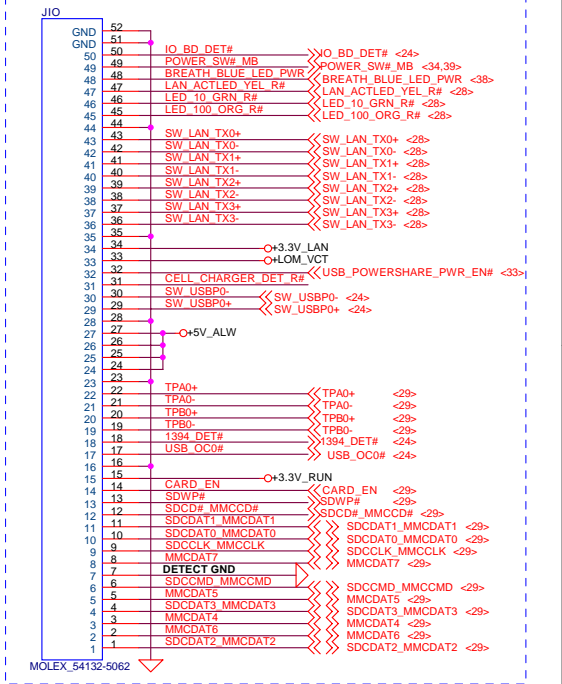
Title: _____
 Date: Friday, December 07, 2007
 Document Number: LA-4291P
 Rev: 0.1
 Sheet 34 of 49

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSMITTED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

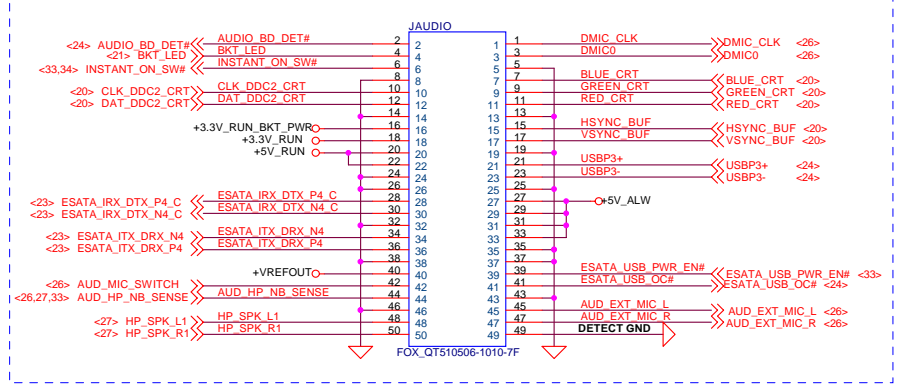
Express Card



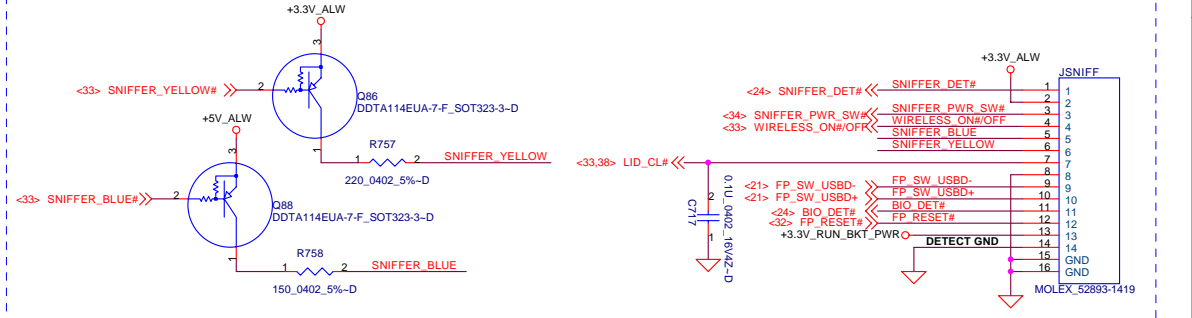
IO/B connector, Right side



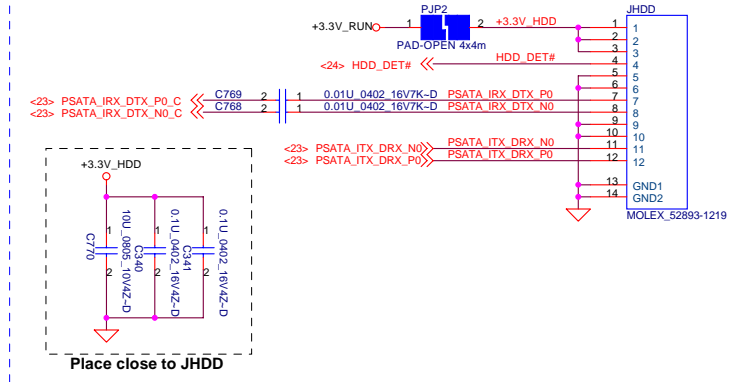
AUDIO/B BTB connector, Left side



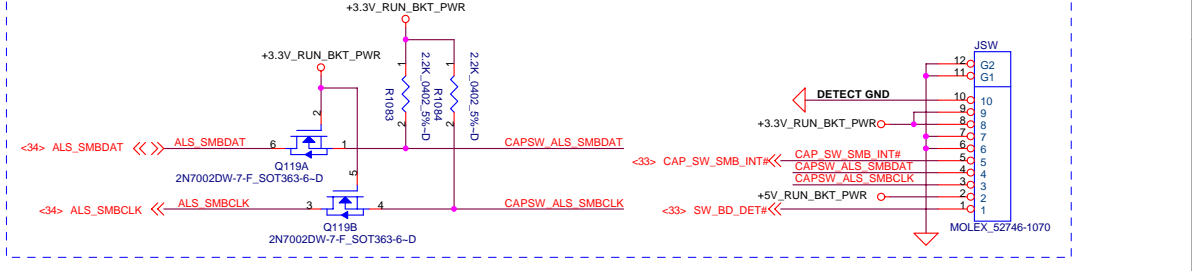
SNIFFER connector and LED



1.8" Micro SATA HDD connector



CAP Switch and ALS connector



DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

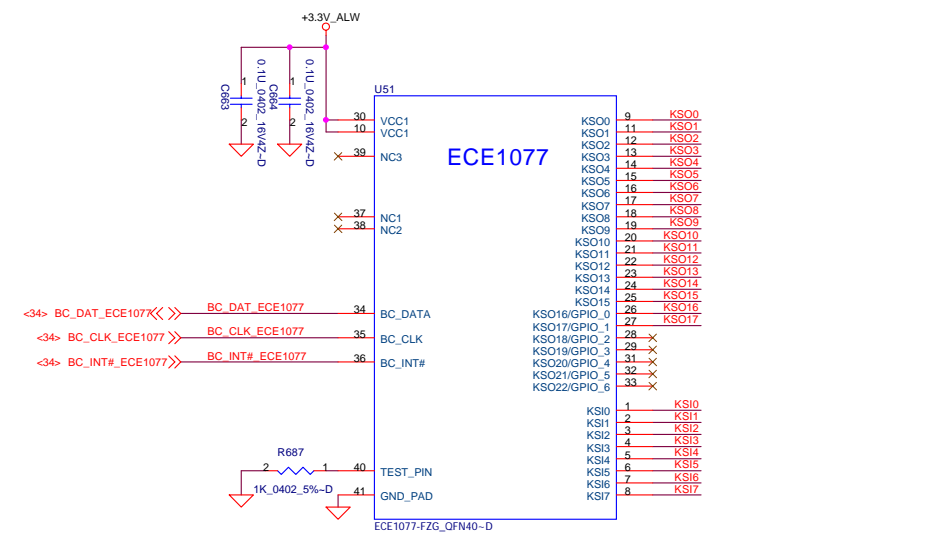
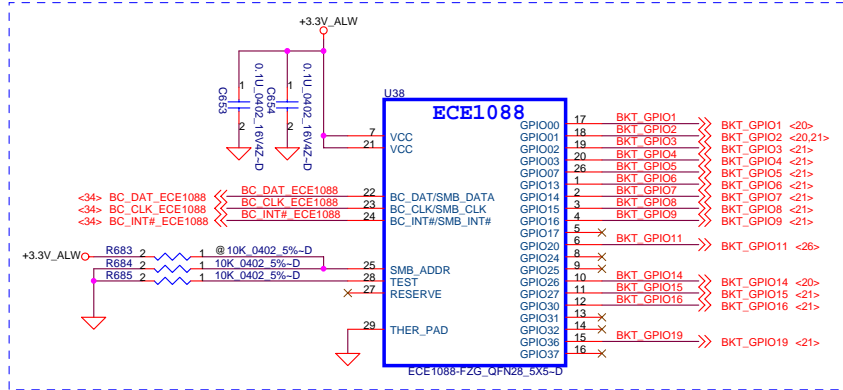
Express Card, HDD, Sniffer, IO CONN

LA-4291P

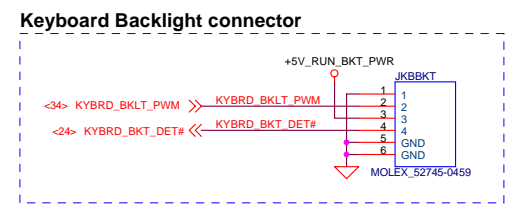
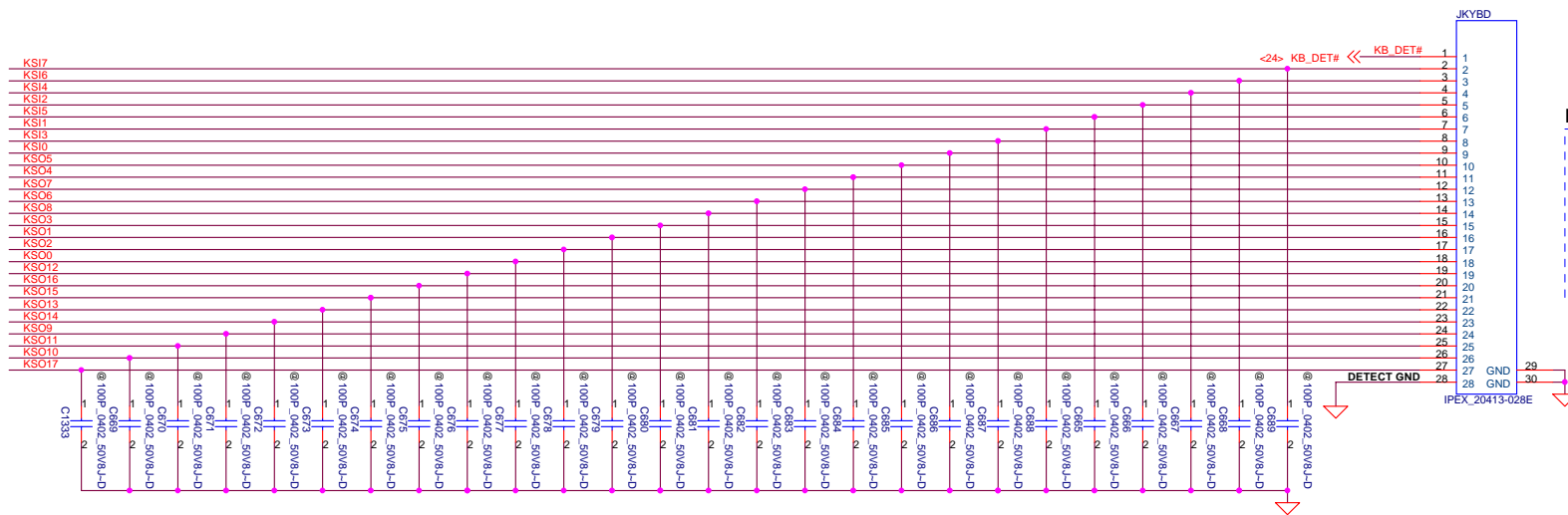
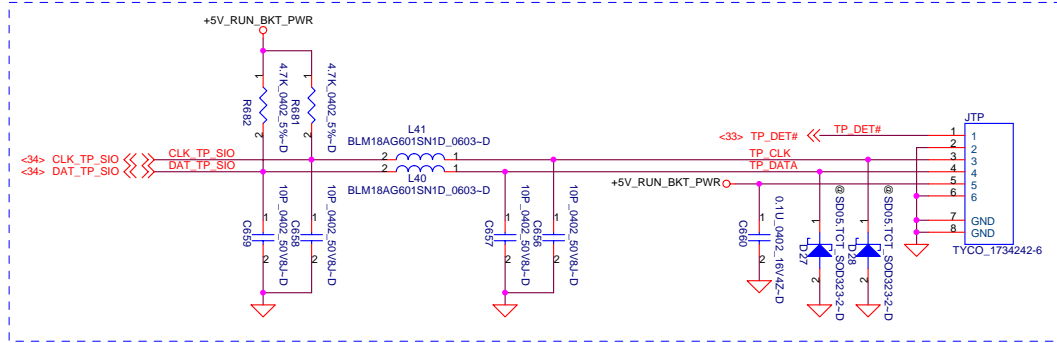
Date: Friday, December 07, 2007 Sheet 35 of 49

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

GPIO Expander for BlackTop



Touch Pad connector



DELL CONFIDENTIAL/PROPRIETARY

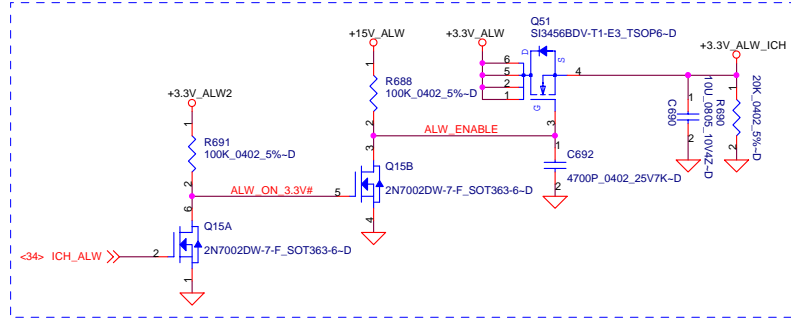
Compal Electronics, Inc.



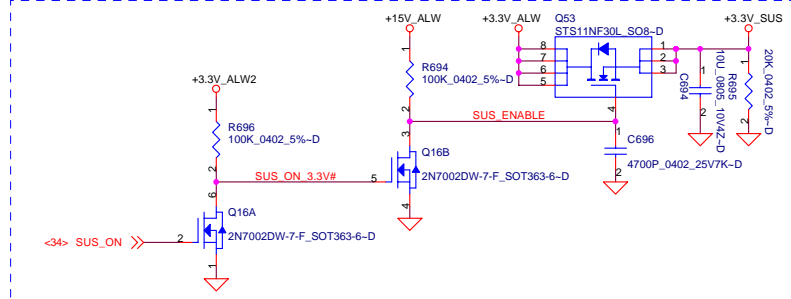
Title		Keyboard, TouchPad and GPIO expander	
Size		Document Number	
Date		Rev	
Friday, December 07, 2007	Sheet 36 of 49	LA-4291P	0.1

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

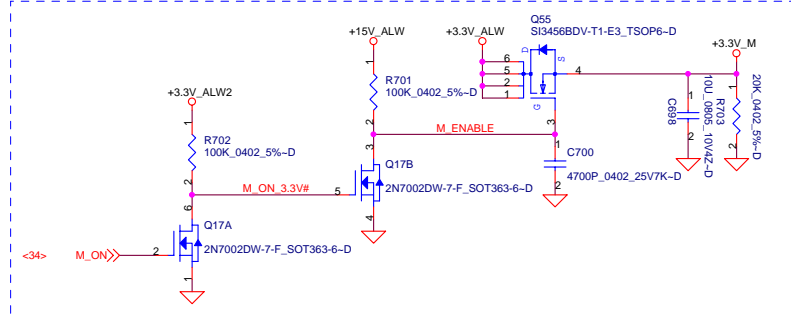
+3.3V_ALW_ICH Source



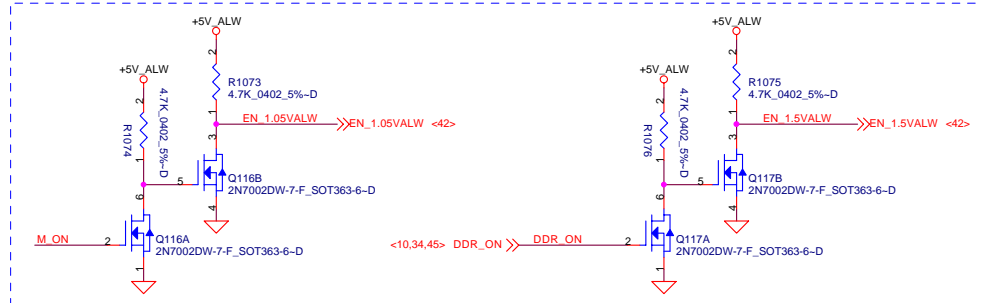
+3.3V_SUS Source



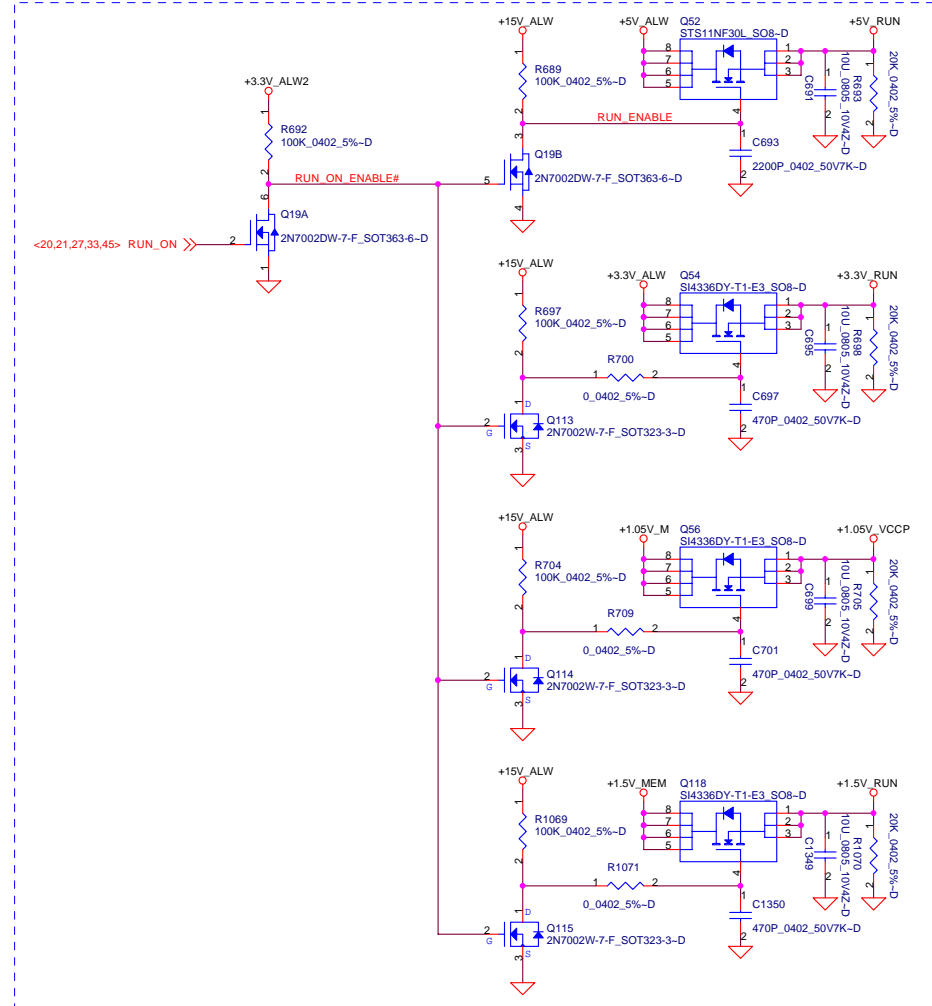
+3.3V_M Source



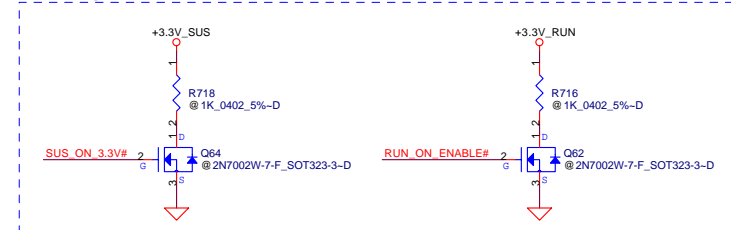
Level shifter for +1.05V_M and +1.5V_MEM PWM IC



+5VRUN/+3.3V_RUN/+1.05V_VCCP/+1.5V_RUN Source



Discharg Circuit

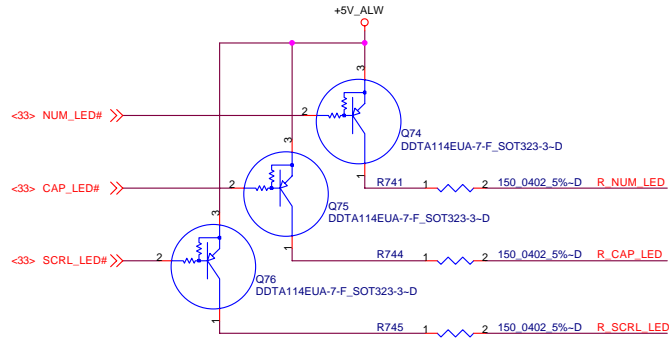


DELL CONFIDENTIAL/PROPRIETARY

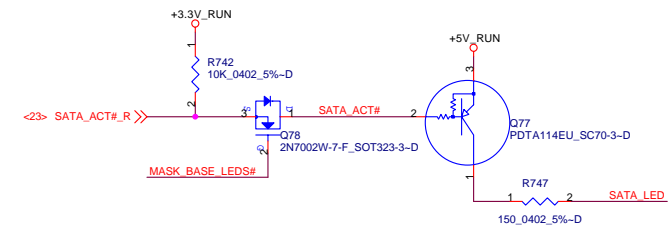
		Compal Electronics, Inc.	
		POWER CONTROL	
Size	Document Number	Rev	
	LA-4291P	0.1	
Date:	Friday, December 07, 2007	Sheet	37 of 49

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL") THIS DOCUMENT MAY NOT BE TRANSMITTED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

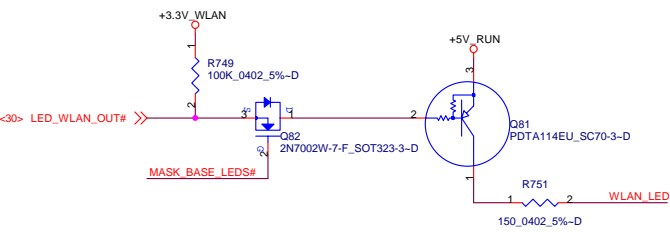
Keyboard Status, Num Lock/Caps Lock/Scroll Lock LEDs



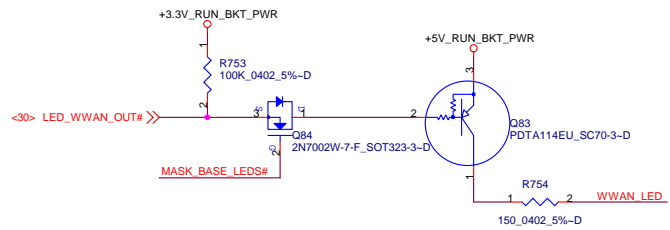
HDD LED



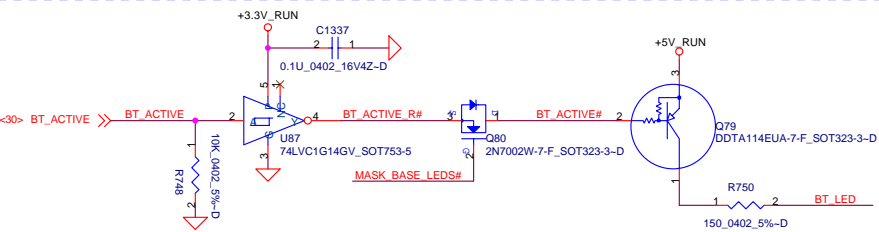
WLAN LED



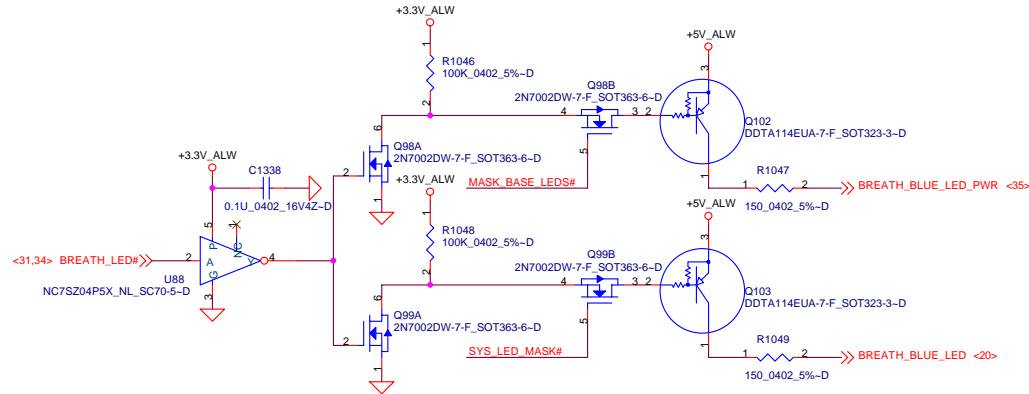
WWAN LED



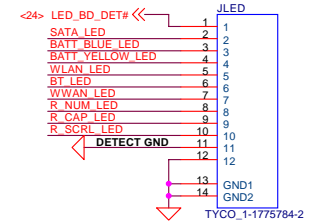
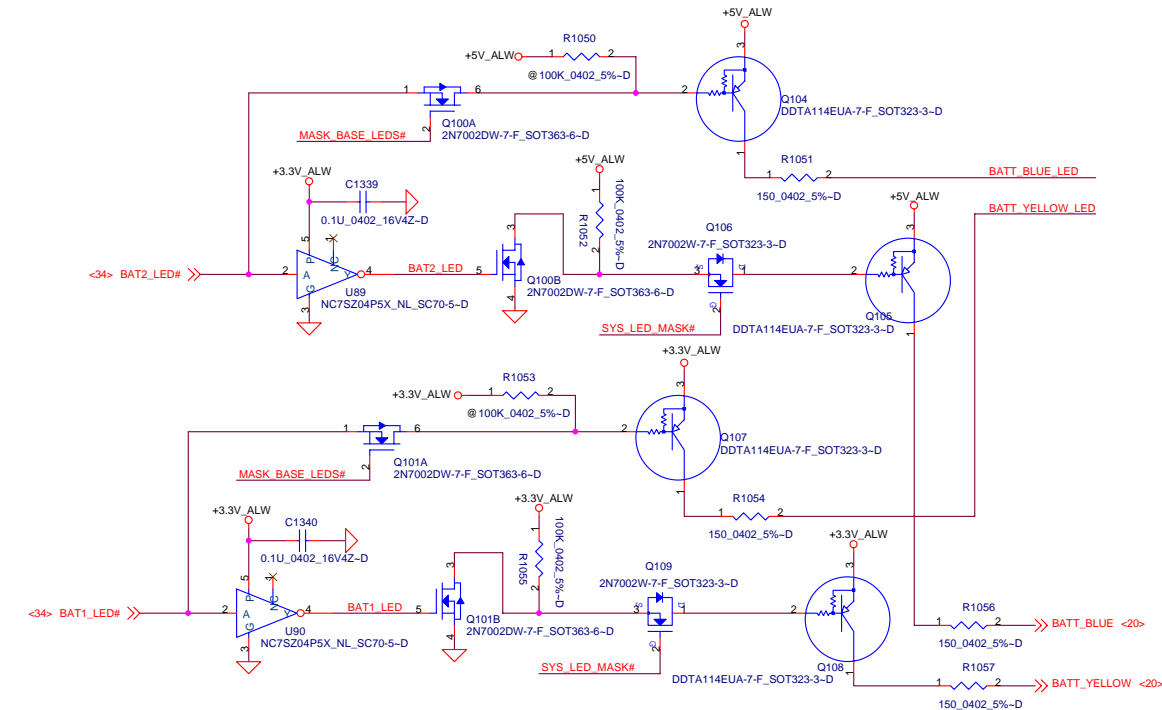
BLUETOOTH LED



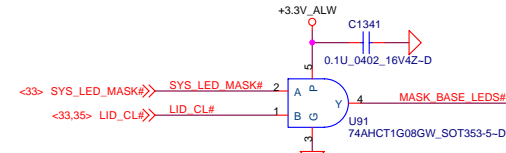
POWER/SUSPEND breathing LED



BATTERY LED



LED Circuit Control Table		
	SYS_LED_MASK#	LID_CL#
Mask All LEDs (Sniffer Function)	0	X
Mask Base MB LEDs (Lid Closed)	1	0
Do not Mask LEDs (Lid Opened)	1	1



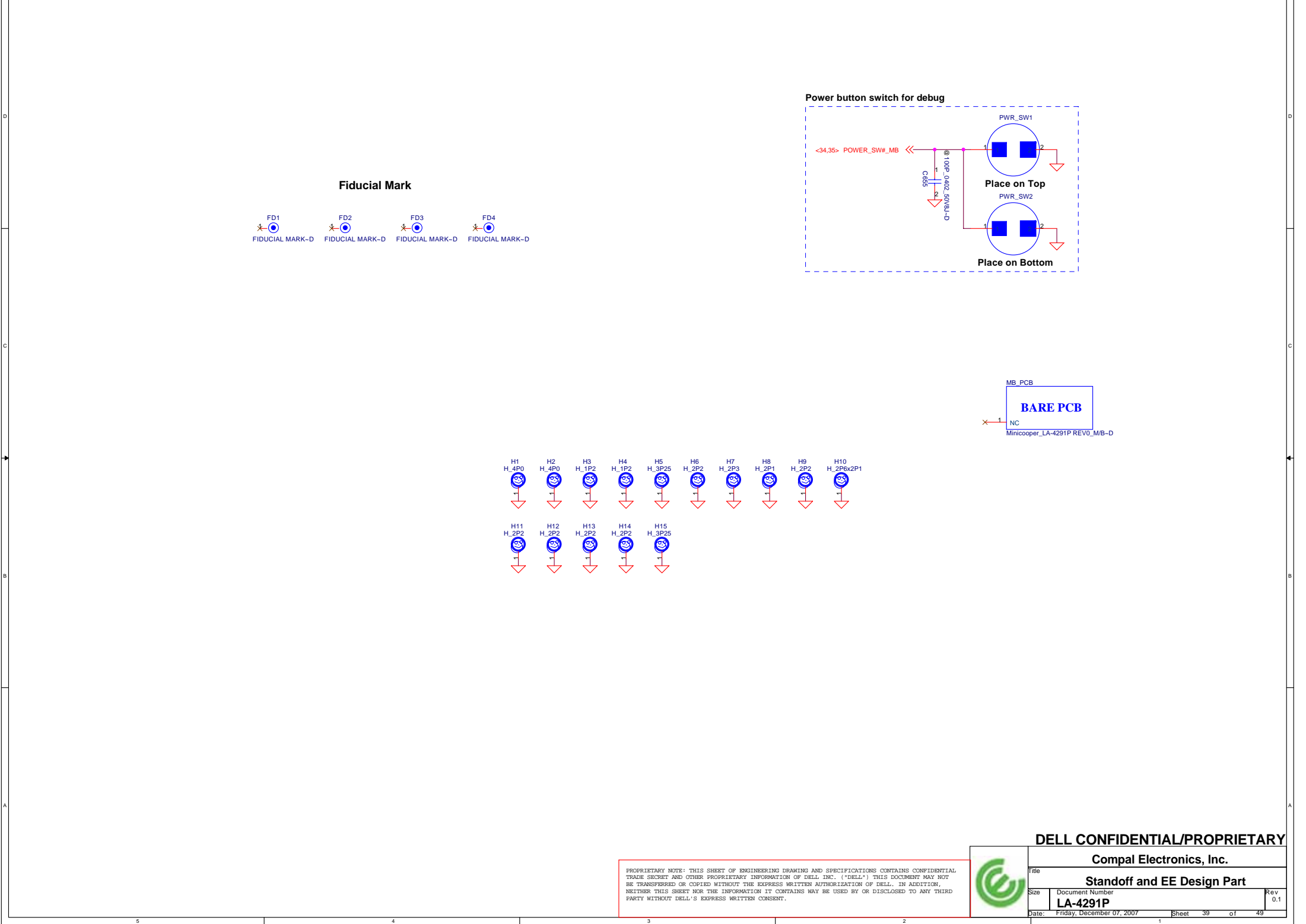
DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

System LEDs Control

Title: LA-4291P
 Date: Friday, December 07, 2007
 Sheet: 38 of 49
 Rev: 0.1

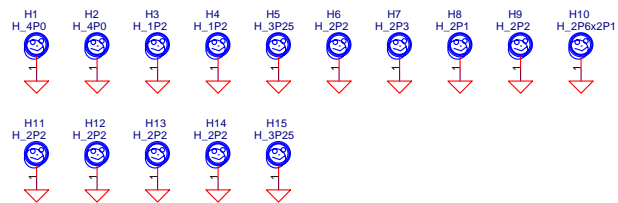
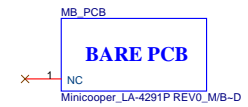
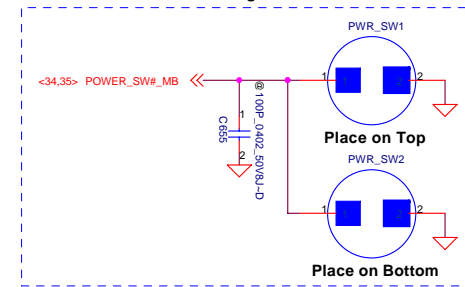
PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWINGS AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



Fiducial Mark



Power button switch for debug



PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL") THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

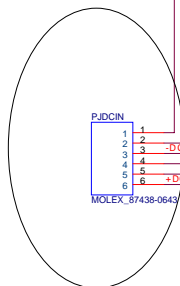
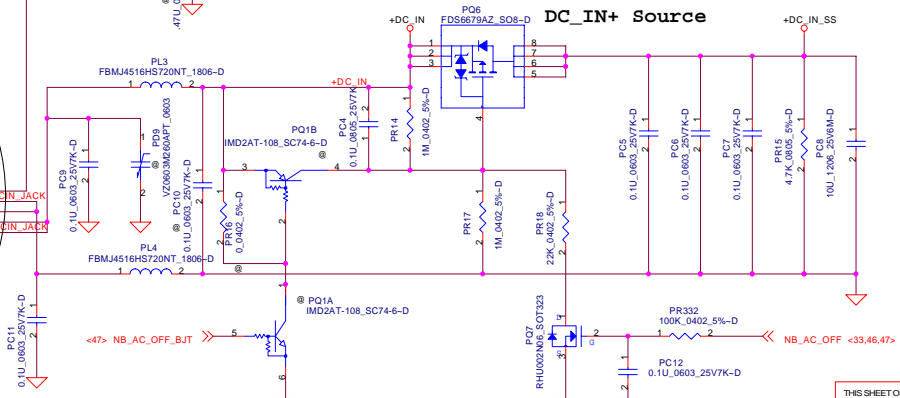
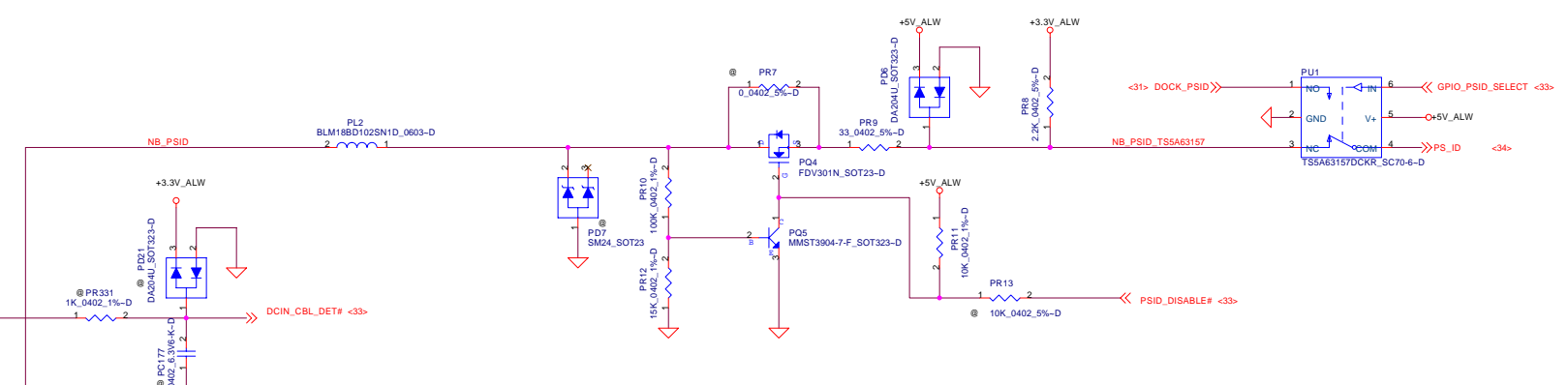
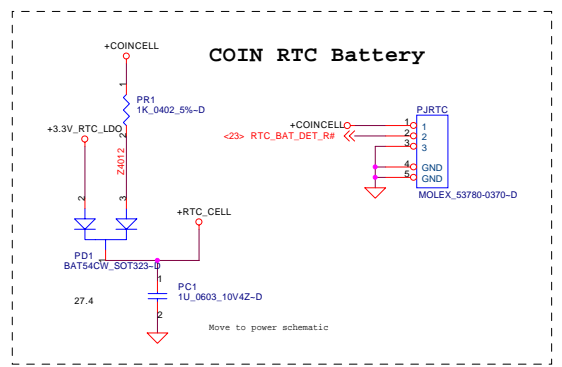
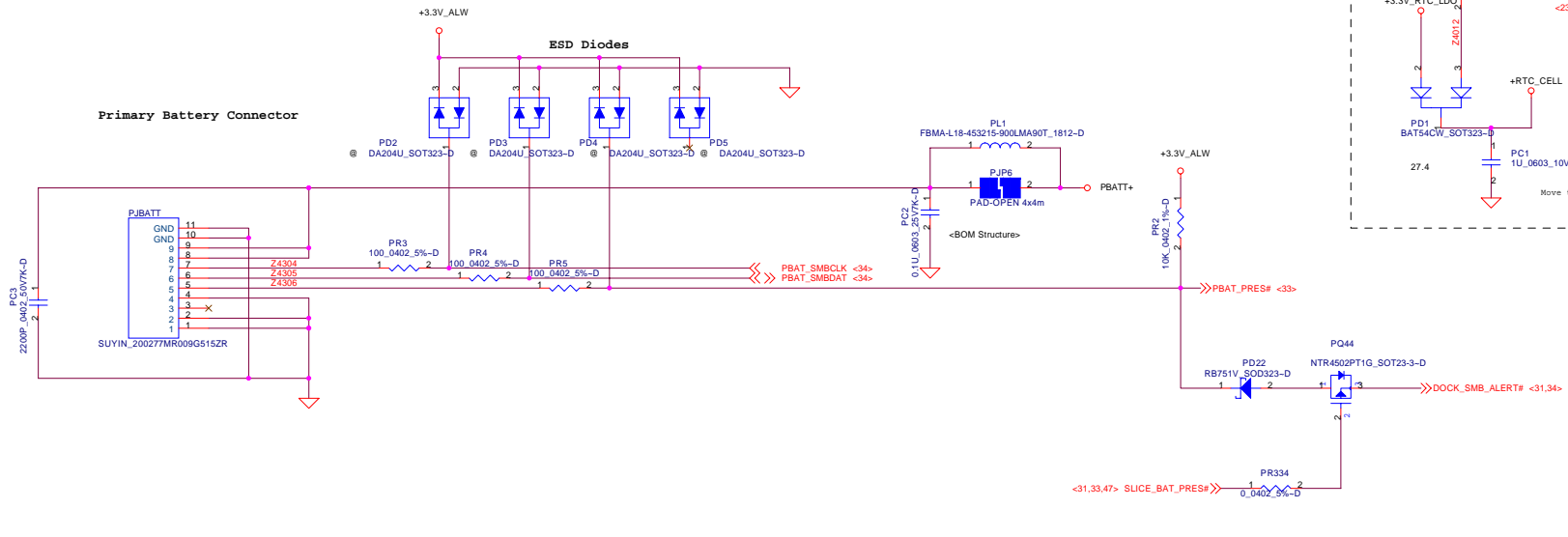


DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

Standoff and EE Design Part

Title	Standoff and EE Design Part		Rev	0.1
Size	Document Number		LA-4291P	
Date:	Friday, December 07, 2007	Sheet	39	of 49



THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF COMPAL ELECTRONICS, INC. AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY COMPAL ELECTRONICS, INC. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF COMPAL ELECTRONICS, INC.

DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

+DCIN

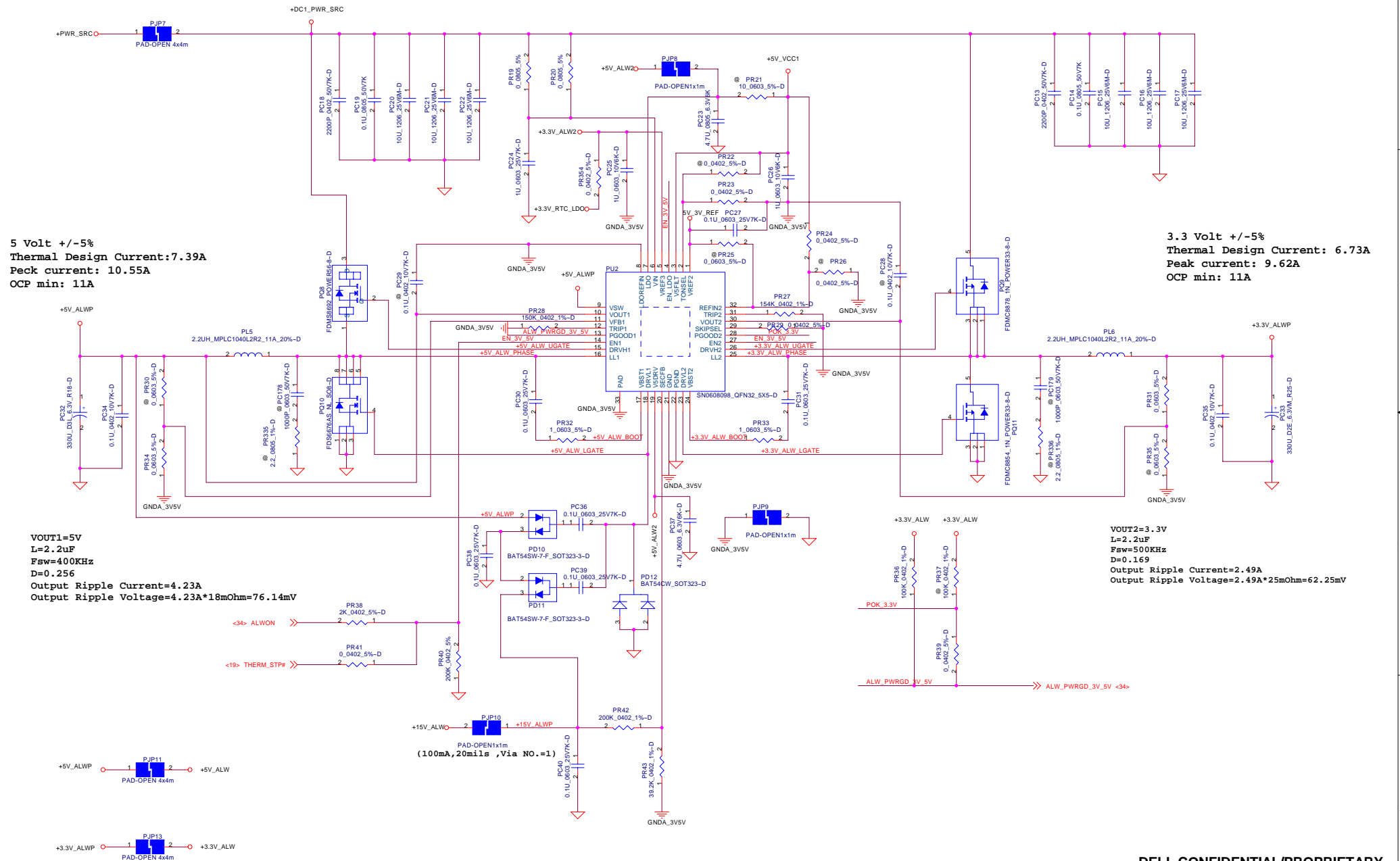
LA-4291P

Rev 0.1

Friday, December 07, 2007

Sheet 40 of 49

+3.3V_ALWP/ +5V_ALWP/ +5V_ALW2 / +15V_ALWP

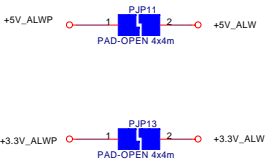


5 Volt +/-5%
 Thermal Design Current: 7.39A
 Peak current: 10.55A
 OCP min: 11A

3.3 Volt +/-5%
 Thermal Design Current: 6.73A
 Peak current: 9.62A
 OCP min: 11A

VOUT1=5V
 L=2.2uF
 Fsw=400KHz
 D=0.256
 Output Ripple Current=4.23A
 Output Ripple Voltage=4.23A*18mOhm=76.14mV

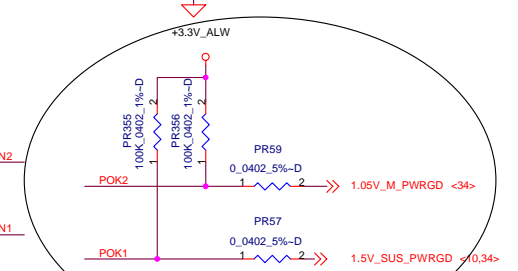
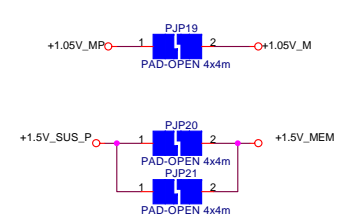
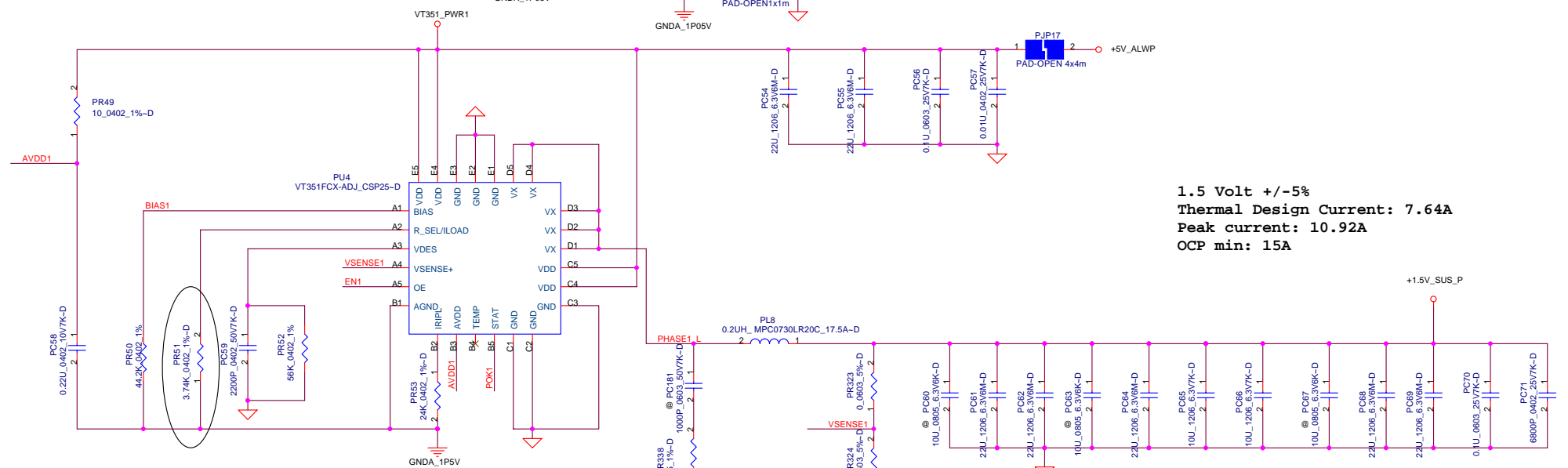
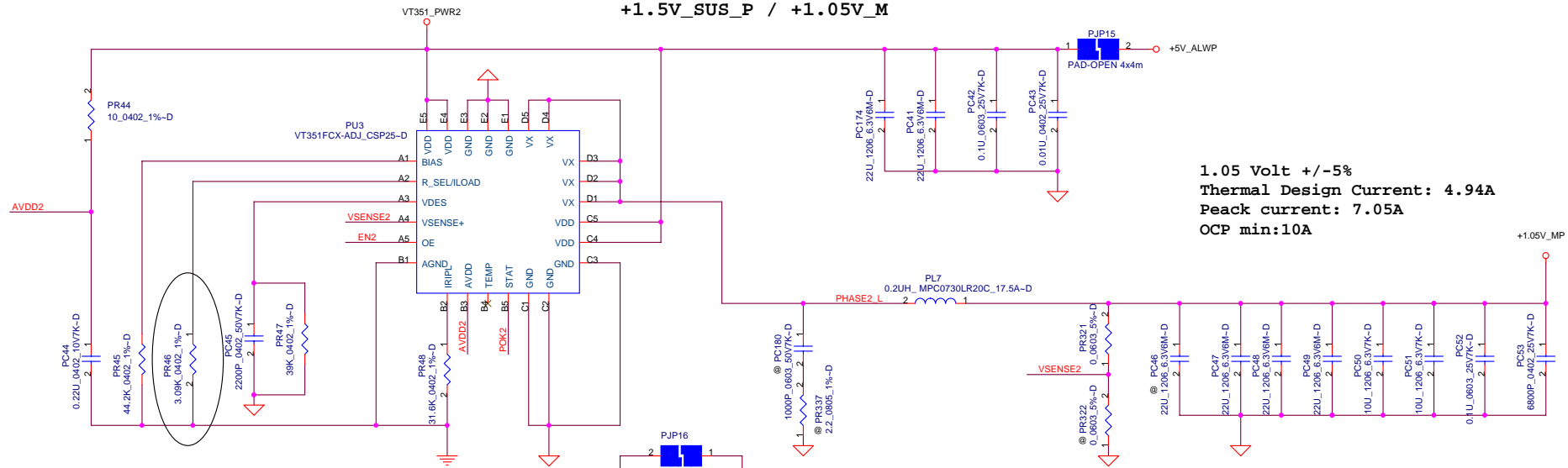
VOUT2=3.3V
 L=2.2uF
 Fsw=500KHz
 D=0.169
 Output Ripple Current=2.49A
 Output Ripple Voltage=2.49A*25mOhm=62.25mV



THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF COMPAL ELECTRONICS, INC. AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY COMPAL ELECTRONICS, INC. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS

DELL CONFIDENTIAL/PROPRIETARY			
Compal Electronics, Inc.			
DC/DC +3V/ +5V			
Title	Document Number		Rev
	LA-4291P		0.1
Date:	Friday, December 07, 2007	Sheet	41 of 49

+1.5V_SUS_P / +1.05V_M



PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL") THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF COMPAQ ELECTRONICS, INC. AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY COMPAQ ELECTRONICS, INC. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS



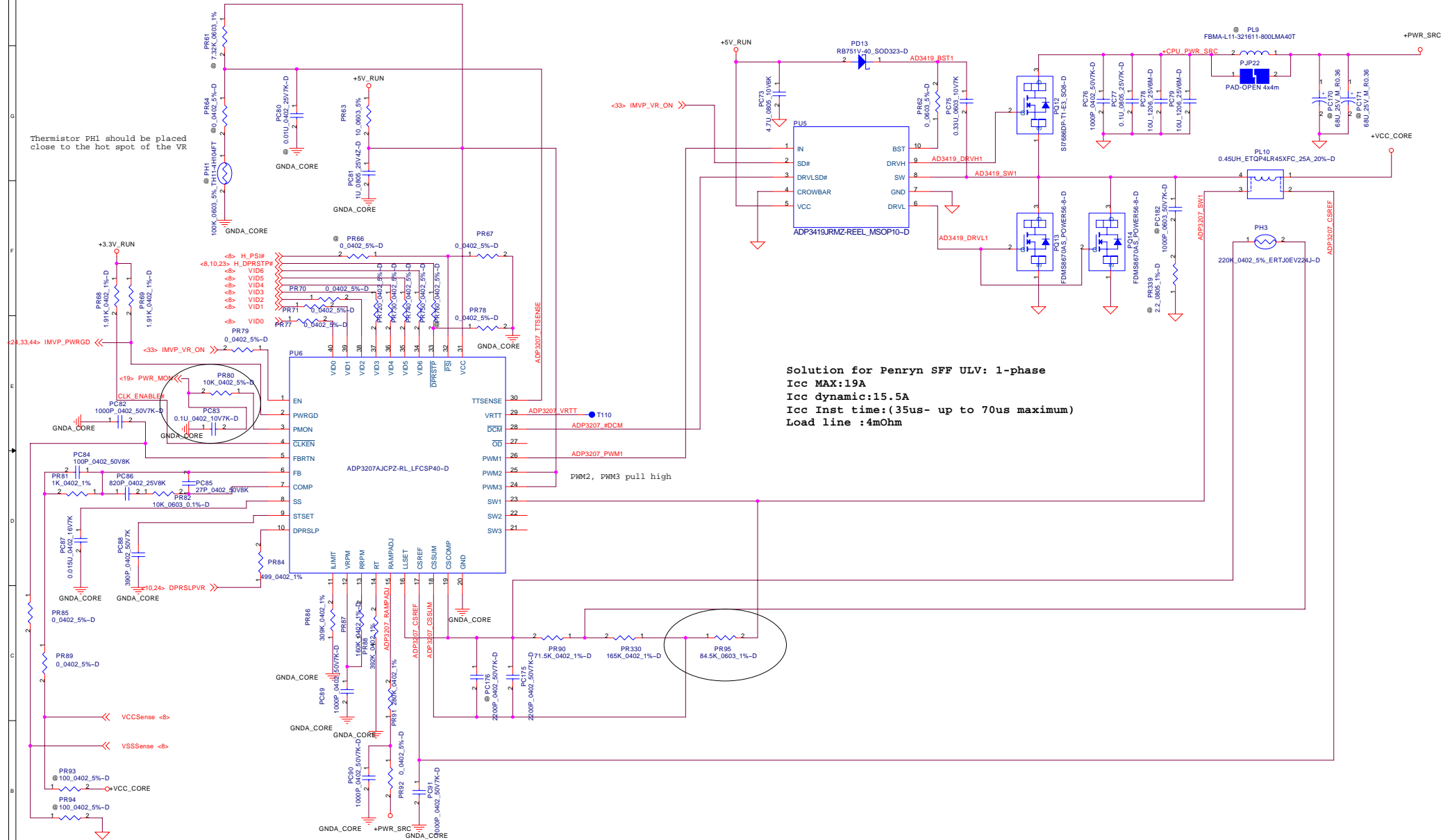
DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

+1.5V SUS P / +1.05V MP

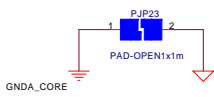
Title: **LA-4291P**
 Size: Document Number
 Date: Friday, December 07, 2007
 Sheet 42 of 49

Thermistor PH1 should be placed close to the hot spot of the VR



Solution for Penryn SFF ULV: 1-phase
Icc MAX:19A
Icc dynamic:15.5A
Icc Inst time:(35us- up to 70us maximum)
Load line :4mOhm

NOTE: (Connection VCORE output Cap GND)
 De-populate PR93 and PR94 when CPU is present



DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.

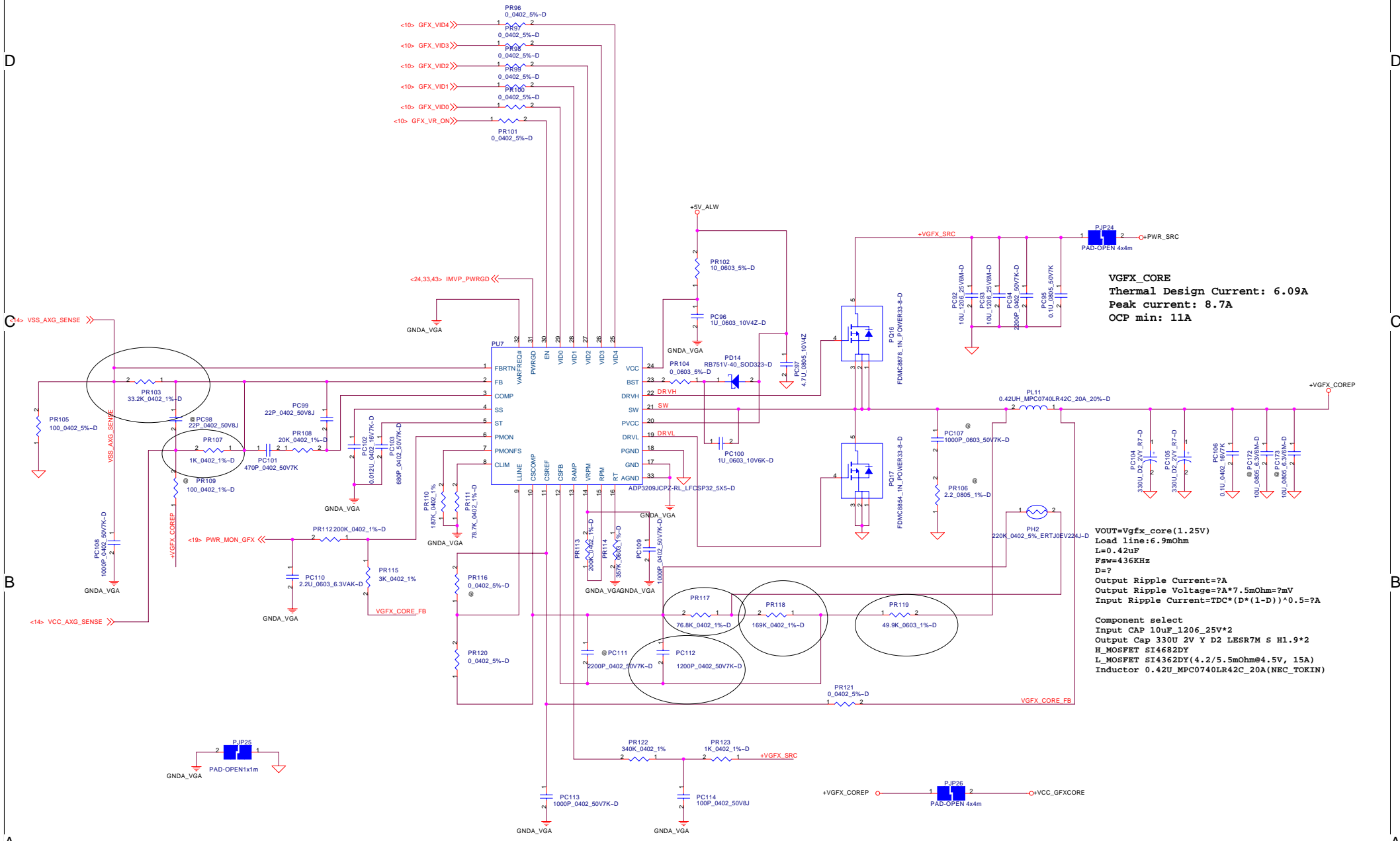
+VCORE

LA-4291P

Rev 0.1

Date: Friday, December 07, 2007 Sheet 43 of 49

THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF COMPAL ELECTRONICS, INC. AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY COMPAL ELECTRONICS, INC. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF COMPAL ELECTRONICS, INC.



VGFX_CORE
 Thermal Design Current: 6.09A
 Peak current: 8.7A
 OCP min: 11A

VOUT=Vgfx_core(1.25V)
 Load line=6.9mOhm
 L=0.42uF
 Fsw=436KHz
 D=?
 Output Ripple Current=?A
 Output Ripple Voltage=?A*7.5mOhm=?mV
 Input Ripple Current=TDC*(D*(1-D))^0.5=?A

Component select
 Input CAP 10uF_1206_25V*2
 Output Cap 330U 2V Y D2 LESR7M s H1.9*2
 L_MOSFET SI4682DY
 L_MOSFET SI4362DY(4.2/5.5mOhm@4.5V, 15A)
 Inductor 0.42U_MPC0740LR42C_20A(NEC_TOKIN)

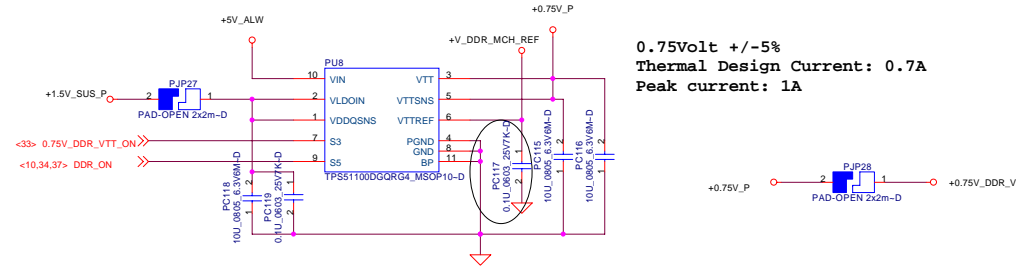
DELL CONFIDENTIAL/PROPRIETARY



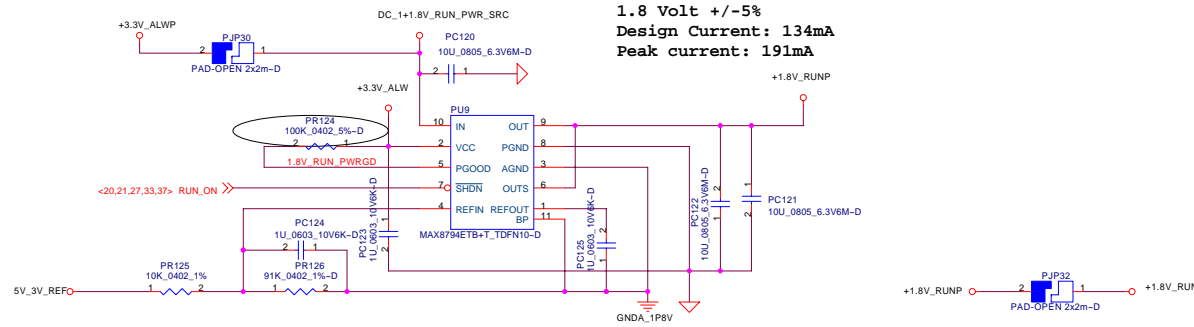
Compal Electronics, Inc.	
Title: ADP3209_NB_core	
Size: Document Number	LA-4291P
Date: Friday, December 07, 2007	Sheet 44 of 49

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL"). THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

+1.8VRUN/ +0.75V_DDR_VTT
DDR3 Termination

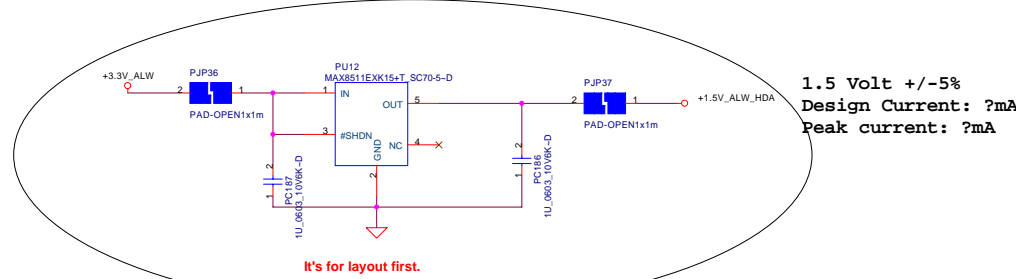


0.75Volt +/-5%
Thermal Design Current: 0.7A
Peak current: 1A



1.8 Volt +/-5%
Design Current: 134mA
Peak current: 191mA

PGND and GND should be tied together at one point near the GND Pin



1.5 Volt +/-5%
Design Current: ?mA
Peak current: ?mA

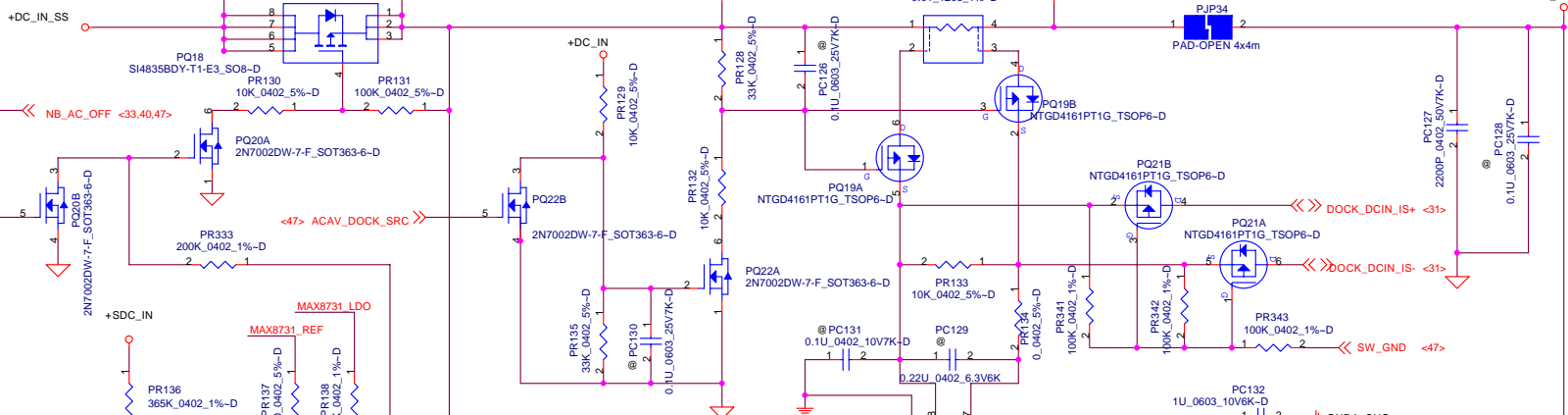
It's for layout first.

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL") THIS DOCUMENT MAY NOT BE TRANSMITTED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL, IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

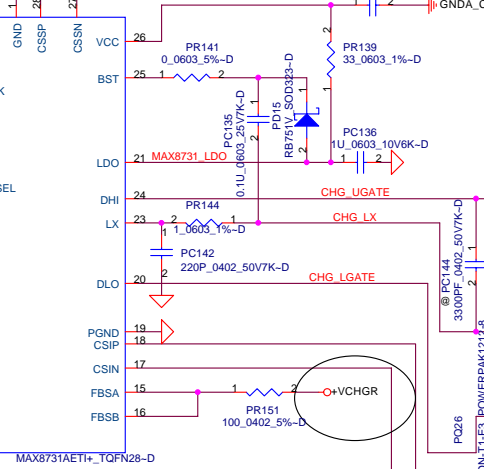
DELL CONFIDENTIAL/PROPRIETARY
Compal Electronics, Inc.

Title		+1.8VRUN/ +0.75V_DDR_VT	
Size	Document Number	Rev	
	LA-4291P	0.1	
Date:	Friday, December 07, 2007	Sheet	45 of 49

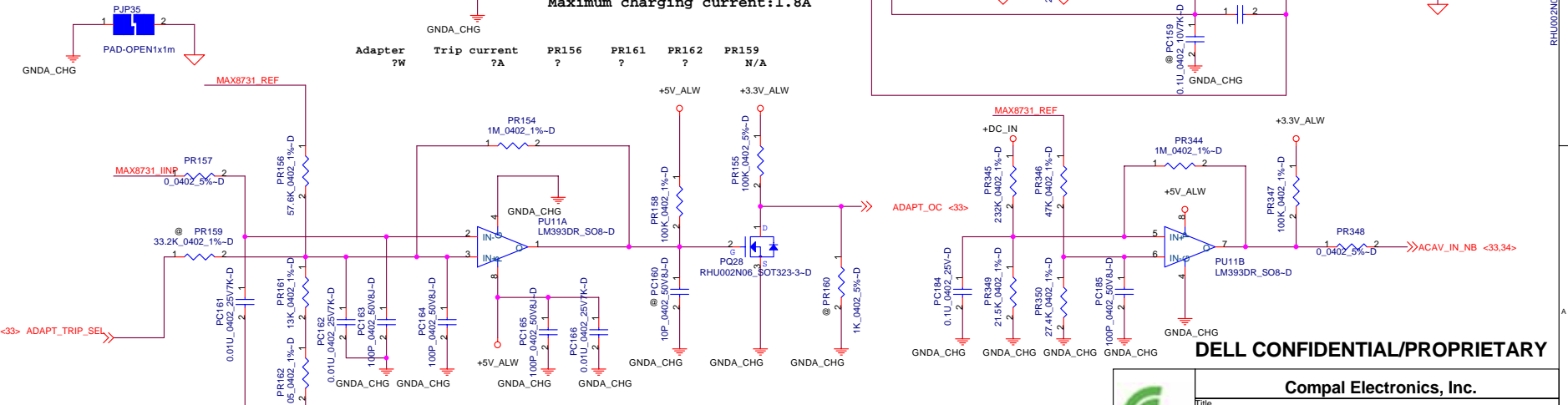
+DC_IN discharge path



Vin Detector
High 17.9 V
Low 17.24 V

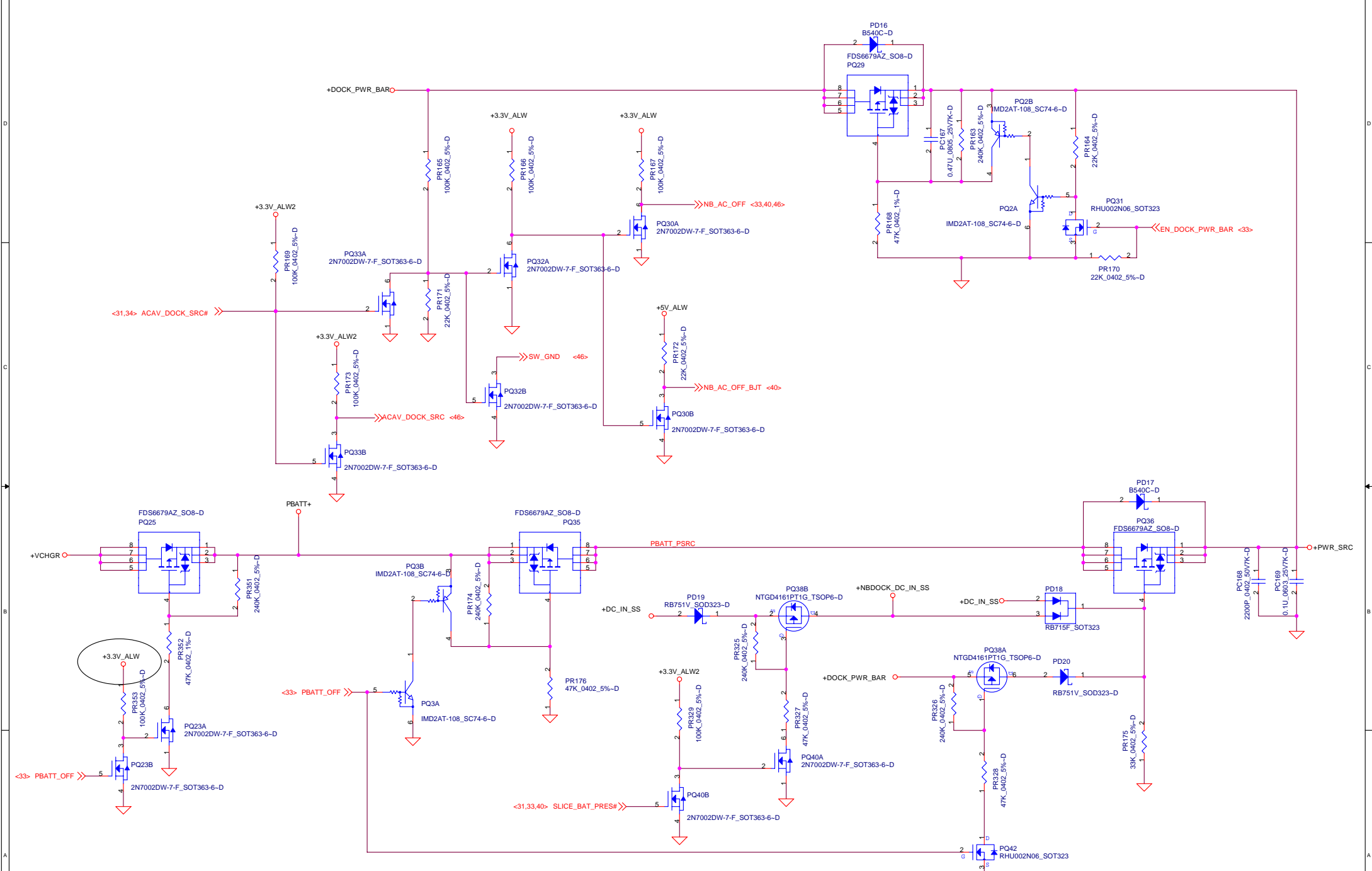


Maximum charging current:1.8A



DELL CONFIDENTIAL/PROPRIETARY

THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF COMPAL ELECTRONICS, INC. AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY COMPAL ELECTRONICS, INC. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF COMPAL ELECTRONICS, INC.



DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.



Title			Selector		
Size			Document Number		
Date: Friday, December 07, 2007			Rev 0.1		
Sheet 47			of 49		

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL") THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.

Version Change List (Power P. I. R. List)

Item	Page#	Title	Date	Request Owner	Issue Description	Solution Description	Rev.
------	-------	-------	------	---------------	-------------------	----------------------	------

1

PROPRIETARY NOTE: THIS SHEET OF ENGINEERING DRAWING AND SPECIFICATIONS CONTAINS CONFIDENTIAL TRADE SECRET AND OTHER PROPRIETARY INFORMATION OF DELL INC. ("DELL") THIS DOCUMENT MAY NOT BE TRANSFERRED OR COPIED WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF DELL. IN ADDITION, NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT DELL'S EXPRESS WRITTEN CONSENT.



DELL CONFIDENTIAL/PROPRIETARY

Compal Electronics, Inc.
Title Power-Change History 1
Size Document Number LA-4291P Rev 0.1
Date: Friday, December 07, 2007 Sheet 49 of 49