Compal Confidential

QBL50 Schematics Document

AMD Sabine

APU Llano / Hudson M2_M3 / Vancouver Whistler

UMA only / PX Muxless with BACO

2010-02-16

LA-7552P REV: 0.03

Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

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Title: Cover Page		
Size: B	Document Number: QBL60 LA-7552P	Rev: 0.03
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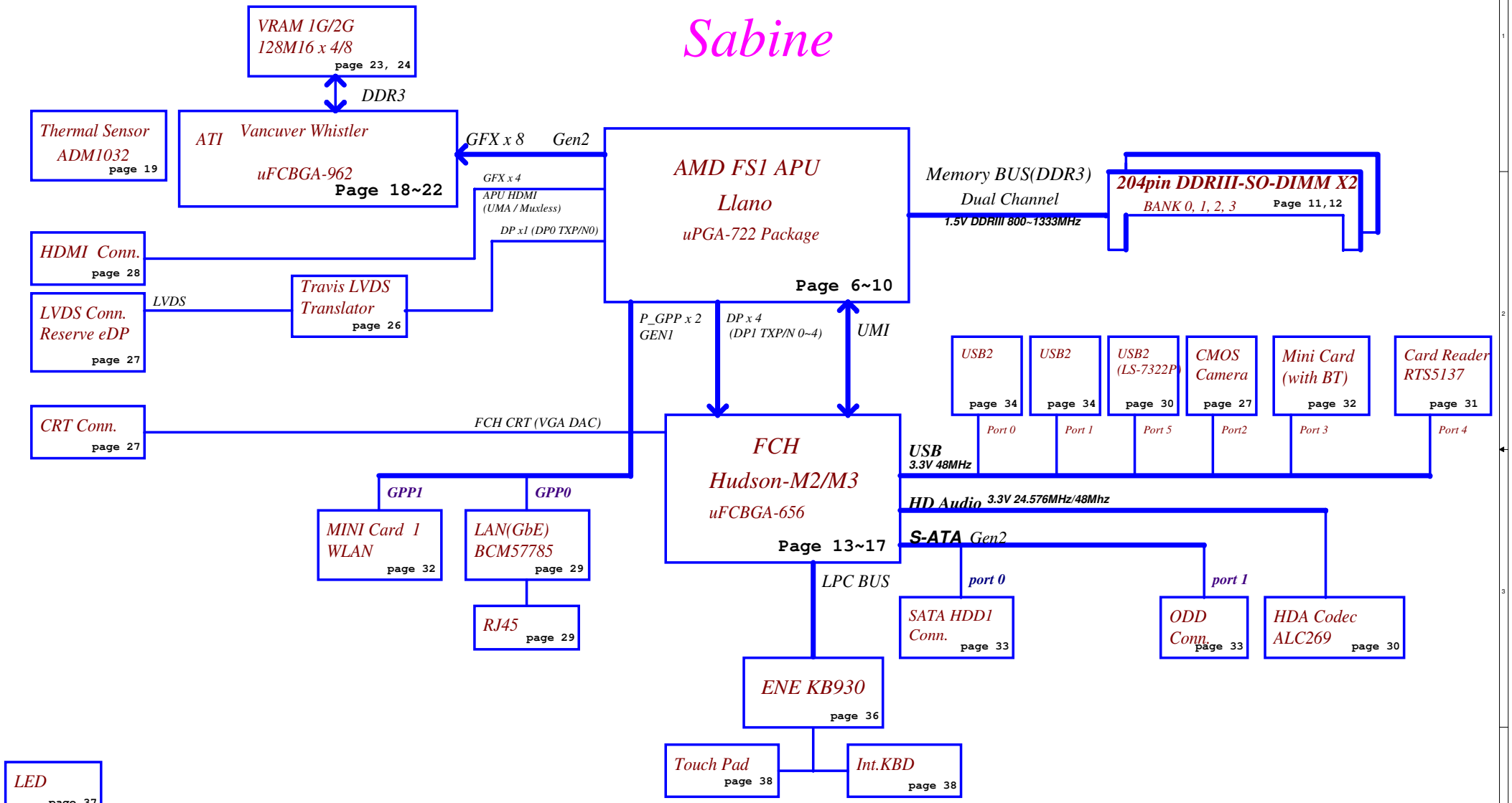
Compal Confidential

Model Name : QBL60



Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

Compal Electronics, Inc.

Title: Block Diagrams

Size	Document Number	Rev
B	QBL60 LA-7552P	0.03

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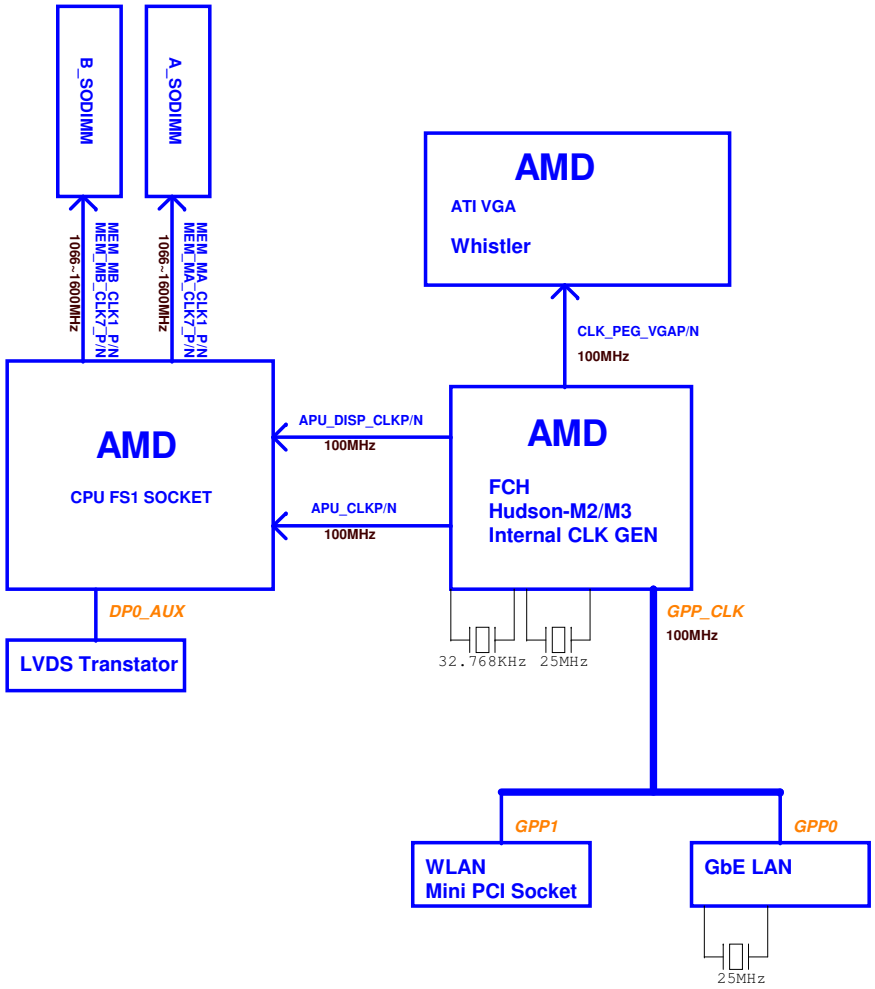
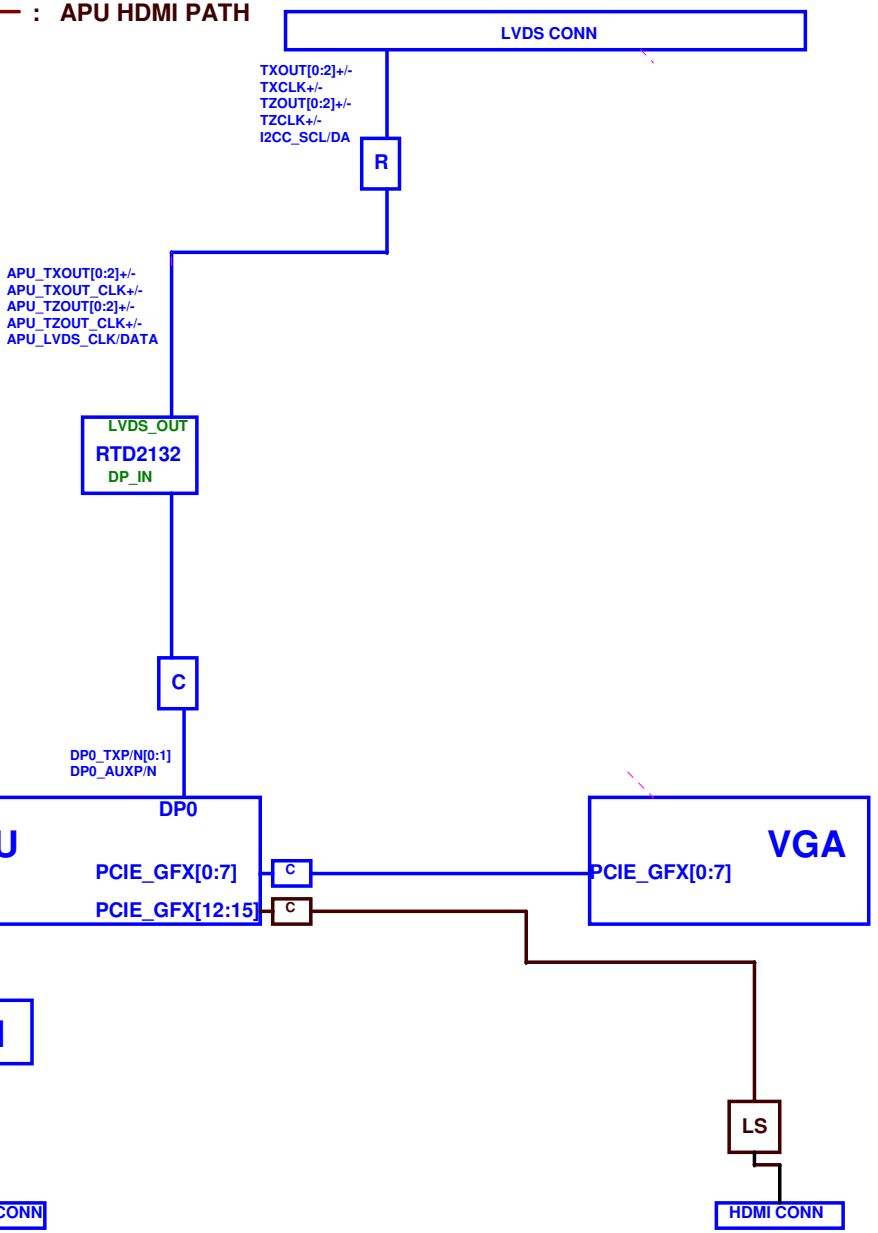
CLOCK DISTRIBUTION



DISPLAY DISTRIBUTION

: LVDS PATH

: APU HDMI PATH



Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

Title	CLOCK / DISPLAY DISTRIBUTION		
Size: Custom	Document Number: QBL60 LA-7552P		Rev: 0.03
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Voltage Rails

Power Plane	Description	S1	S3	S5
VIN	Adapter power supply (19V)	N/A	N/A	N/A
B+	AC or battery power rail for power circuit.	N/A	N/A	N/A
+CPU_CORE	Core voltage for CPU	ON	OFF	OFF
+CPU_CORE_NB	Voltage for On-die VGA of APU	ON	OFF	OFF
+VGA_CORE	0.95-1.2V switched power rail	ON	OFF	OFF
+0.75VS	0.75V switched power rail for DDR terminator	ON	ON	OFF
+1.0VSG	1.0V switched power rail for VGA	ON	OFF	OFF
+1.1ALW	1.1V switched power rail for FCH	ON	ON	ON*
+1.1VS	1.1V switched power rail for FCH	ON	OFF	OFF
+1.2VS	1.2V switched power rail for APU	ON	OFF	OFF
+1.5V	1.5V power rail for CPU VDDIO and DDR	ON	ON	OFF
+1.5VS	1.5V switched power rail	ON	OFF	OFF
+1.8VSG	1.8V switched power rail	ON	OFF	OFF
+2.5VS	2.5V for CPU_VDDA	ON	OFF	OFF
+3VALW	3.3V always on power rail	ON	ON	ON*
+LAN_IO	3.3V power rail for LAN	ON	ON	ON
+3VS	3.3V switched power rail	ON	OFF	OFF
+5VALW	5V always on power rail	ON	ON	ON*
+5VS	5V switched power rail	ON	OFF	OFF
+VSB	VSB always on power rail	ON	ON	ON*
+RTCVCC	RTC power	ON	ON	ON

Note : ON* means that this power plane is ON only with AC power available, otherwise it is OFF.

STATE \ SIGNAL	SLP_S3#	SLP_S4#	SLP_S5#	+VALW	+V	+VS	Clock
Full ON	HIGH	HIGH	HIGH	ON	ON	ON	ON
S1(Power On Suspend)	HIGH	HIGH	HIGH	ON	ON	ON	LOW
S3 (Suspend to RAM)	LOW	HIGH	HIGH	ON	ON	OFF	OFF
S4 (Suspend to Disk)	LOW	LOW	HIGH	ON	OFF	OFF	OFF
S5 (Soft OFF)	LOW	LOW	LOW	ON	OFF	OFF	OFF

BTO Option Table

BOM Structure	BTO Item
VGA@	Use VGA (Mux)
X76@	VRAM ID Table
M2@	Use Hudson-M2
M3@	Use Hudson-M3
USB30@	USB30 on M/B
USB20@	USB20 on M/B

M3@ U25

FCH M3
Part Number = SA000043I90

BOM Config

x = 1 is read cmd, x= 0 is writee cmd.

External PCI Devices

Device	IDSEL#	REQ#/GNT#	Interrupts

EC SM Bus1 address

Device	Address	HEX
Smart Battery	0001 011X b	16H

EC SM Bus2 address

Device	Address	HEX
ADI ADM1032 (VGA)	1001 101X b	9AH
(APU)		
RTD2132S (TL)		

FCH SM Bus 0 address

Device	Address	HEX
DDR DIMM1	1101 000X b	D0
DDR DIMM2	1101 001X b	D2

FCH SM Bus 1 address

Device	Address	HEX

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Title: Notes List

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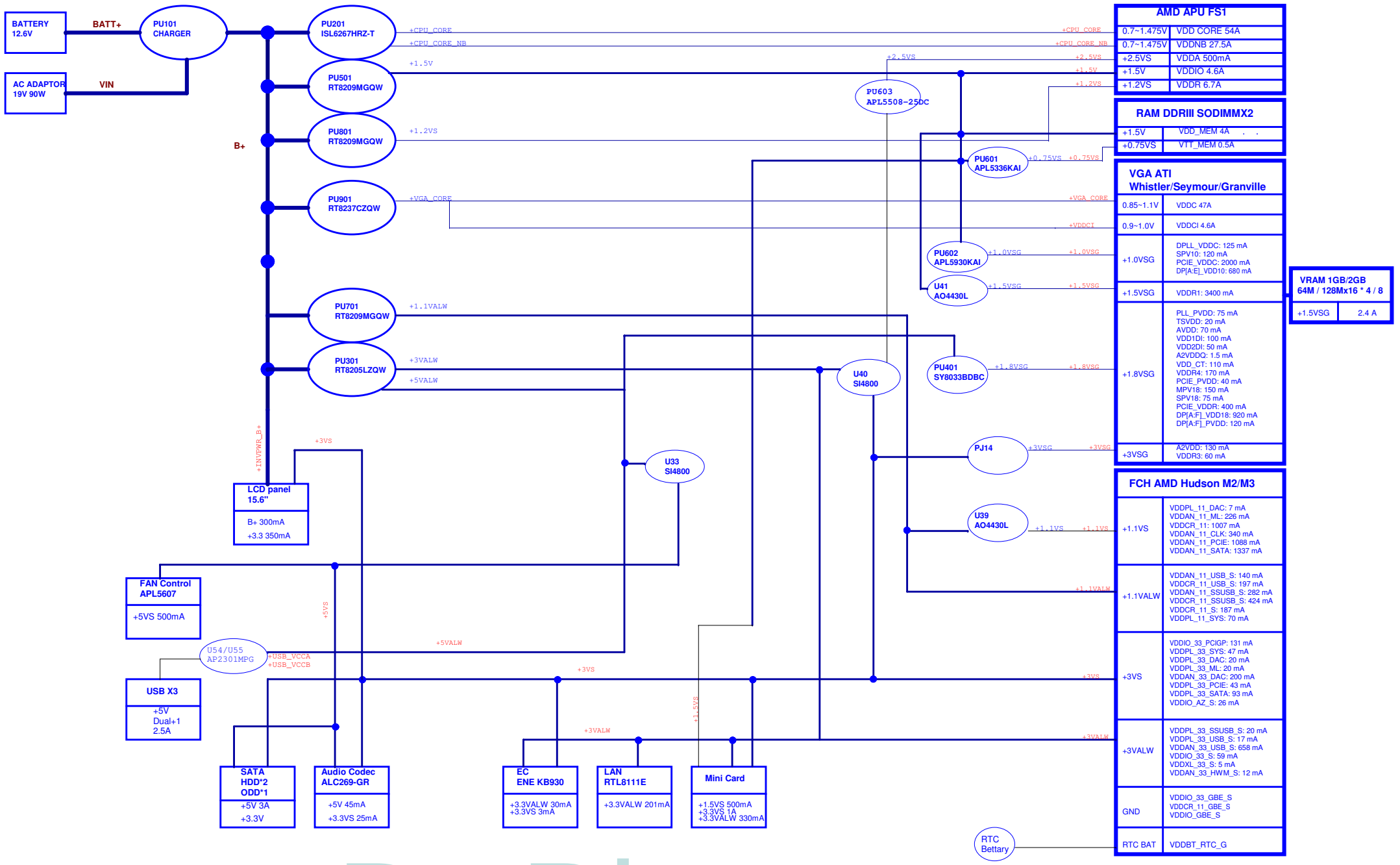

Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

Title	POWER DELIVERY CHART		
Size: Custom	Document Number: QBL60 LA-7552P		Rev: 0.03
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18 PCIE_GTX_C_FRX_P[0..7]
18 PCIE_GTX_C_FRX_N[0..7]

PCIE_FTX_C_GRX_P[0..7] 18
PCIE_FTX_C_GRX_N[0..7] 18

APU To HDMI

PCIE_FTX_GRX_P[12..15] 28
PCIE_FTX_GRX_N[12..15] 28

JCPU1A — CONN@

PCI EXPRESS — GRAPHICS

PCIE_GTX_C_FRX_P0	AA8	P_GFX_RXP0	P_GFX_TXP0	AA2	PCIE_FTX_GRX_P0	C917	VGA@	0.1U_0402_16V7K	PCIE_FTX_C_GRX_P0
PCIE_GTX_C_FRX_N0	AA9	P_GFX_RXN0	P_GFX_TXN0	AA3	PCIE_FTX_GRX_N0	C918	VGA@	0.1U_0402_16V7K	PCIE_FTX_C_GRX_N0
PCIE_GTX_C_FRX_P1	Y7	P_GFX_RXP1	P_GFX_TXP1	Y2	PCIE_FTX_GRX_P1	C919	VGA@	0.1U_0402_16V7K	PCIE_FTX_C_GRX_P1
PCIE_GTX_C_FRX_N1	Y8	P_GFX_RXN1	P_GFX_TXN1	Y1	PCIE_FTX_GRX_N1	C920	VGA@	0.1U_0402_16V7K	PCIE_FTX_C_GRX_N1
PCIE_GTX_C_FRX_P2	W5	P_GFX_RXP2	P_GFX_TXP2	Y4	PCIE_FTX_GRX_P2	C921	VGA@	0.1U_0402_16V7K	PCIE_FTX_C_GRX_P2
PCIE_GTX_C_FRX_N2	W6	P_GFX_RXN2	P_GFX_TXN2	Y5	PCIE_FTX_GRX_N2	C922	VGA@	0.1U_0402_16V7K	PCIE_FTX_C_GRX_N2
PCIE_GTX_C_FRX_P3	W8	P_GFX_RXP3	P_GFX_TXP3	W2	PCIE_FTX_GRX_P3	C923	VGA@	0.1U_0402_16V7K	PCIE_FTX_C_GRX_P3
PCIE_GTX_C_FRX_N3	W9	P_GFX_RXN3	P_GFX_TXN3	W3	PCIE_FTX_GRX_N3	C924	VGA@	0.1U_0402_16V7K	PCIE_FTX_C_GRX_N3
PCIE_GTX_C_FRX_P4	V7	P_GFX_RXP4	P_GFX_TXP4	V2	PCIE_FTX_GRX_P4	C925	VGA@	0.1U_0402_16V7K	PCIE_FTX_C_GRX_P4
PCIE_GTX_C_FRX_N4	V8	P_GFX_RXN4	P_GFX_TXN4	V1	PCIE_FTX_GRX_N4	C926	VGA@	0.1U_0402_16V7K	PCIE_FTX_C_GRX_N4
PCIE_GTX_C_FRX_P5	U5	P_GFX_RXP5	P_GFX_TXP5	V4	PCIE_FTX_GRX_P5	C927	VGA@	0.1U_0402_16V7K	PCIE_FTX_C_GRX_P5
PCIE_GTX_C_FRX_N5	U6	P_GFX_RXN5	P_GFX_TXN5	V5	PCIE_FTX_GRX_N5	C928	VGA@	0.1U_0402_16V7K	PCIE_FTX_C_GRX_N5
PCIE_GTX_C_FRX_P6	U8	P_GFX_RXP6	P_GFX_TXP6	U2	PCIE_FTX_GRX_P6	C929	VGA@	0.1U_0402_16V7K	PCIE_FTX_C_GRX_P6
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PCIE_GTX_C_FRX_N7	T8	P_GFX_RXN7	P_GFX_TXN7	T1	PCIE_FTX_GRX_N7	C932	VGA@	0.1U_0402_16V7K	PCIE_FTX_C_GRX_N7
	R5	P_GFX_RXP8	P_GFX_TXP8	T4					
	R6	P_GFX_RXN8	P_GFX_TXN8	T5					
	R8	P_GFX_RXP9	P_GFX_TXP9	R2					
	R9	P_GFX_RXN9	P_GFX_TXN9	R3					
	P7	P_GFX_RXP10	P_GFX_TXP10	P2					
	P8	P_GFX_RXN10	P_GFX_TXN10	P1					
	N5	P_GFX_RXP11	P_GFX_TXP11	P4					
	N6	P_GFX_RXN11	P_GFX_TXN11	P5					
	N8	P_GFX_RXP12	P_GFX_TXP12	N2	PCIE_FTX_GRX_P12				
	N9	P_GFX_RXN12	P_GFX_TXN12	N3	PCIE_FTX_GRX_N12				
	M7	P_GFX_RXP13	P_GFX_TXP13	M2	PCIE_FTX_GRX_P13				
	M8	P_GFX_RXN13	P_GFX_TXN13	M1	PCIE_FTX_GRX_N13				
	L5	P_GFX_RXP14	P_GFX_TXP14	M4	PCIE_FTX_GRX_P14				
	L6	P_GFX_RXN14	P_GFX_TXN14	M5	PCIE_FTX_GRX_N14				
	L8	P_GFX_RXP15	P_GFX_TXP15	L2	PCIE_FTX_GRX_P15				
	L9	P_GFX_RXN15	P_GFX_TXN15	L3	PCIE_FTX_GRX_N15				

For UMA Mux.

To HDMI

2 / 1 / 0 / CK

GPP

29 PCIE_DTX_C_FRX_P0	AC5	P_GPP_RXP0	P_GPP_TXP0	AD4	PCIE_FTX_DRX_P0	C950	0.1U_0402_16V7K	PCIE_FTX_C_DRX_P0 29	*GLAN*
29 PCIE_DTX_C_FRX_N0	AC6	P_GPP_RXN0	P_GPP_TXN0	AD5	PCIE_FTX_DRX_N0	C951	0.1U_0402_16V7K	PCIE_FTX_C_DRX_N0 29	
32 PCIE_DTX_C_FRX_P1	AC8	P_GPP_RXP1	P_GPP_TXP1	AC2	PCIE_FTX_DRX_P1	C952	0.1U_0402_16V7K	PCIE_FTX_C_DRX_P1 32	*WLAN*
32 PCIE_DTX_C_FRX_N1	AC9	P_GPP_RXN1	P_GPP_TXN1	AC3	PCIE_FTX_DRX_N1	C953	0.1U_0402_16V7K	PCIE_FTX_C_DRX_N1 32	
	AB7	P_GPP_RXP2	P_GPP_TXP2	AB2					
	AB8	P_GPP_RXN2	P_GPP_TXN2	AB1					
	AA5	P_GPP_RXP3	P_GPP_TXP3	AB4					
	AA6	P_GPP_RXN3	P_GPP_TXN3	AB5					

UMI-LINK

13 UMI_MTX_C_FRX_P0	AF8	P_UMI_RXP0	P_UMI_TXP0	AF1	UMI_FTX_MRX_P0	C956	0.1U_0402_16V7K	UMI_FTX_C_MRX_P0 13	
13 UMI_MTX_C_FRX_N0	AF7	P_UMI_RXN0	P_UMI_TXN0	AF2	UMI_FTX_MRX_N0	C957	0.1U_0402_16V7K	UMI_FTX_C_MRX_N0 13	
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13 UMI_MTX_C_FRX_P3	AD8	P_UMI_RXP3	P_UMI_TXP3	AD1	UMI_FTX_MRX_P3	C962	0.1U_0402_16V7K	UMI_FTX_C_MRX_P3 13	
13 UMI_MTX_C_FRX_N3	AD7	P_UMI_RXN3	P_UMI_TXN3	AD2	UMI_FTX_MRX_N3	C963	0.1U_0402_16V7K	UMI_FTX_C_MRX_N3 13	

+1.2VS — R539 196_0402_1%

P_ZVDDP	K5	P_ZVDDP	P_ZVSS
		K4	P_ZVSS — R540 196_0402_1%

AMD_TOPEDO_FS-1

CPU TSI interface level shift

BSH111, the Vgs is:
min = 0.4V
Max = 1.3V

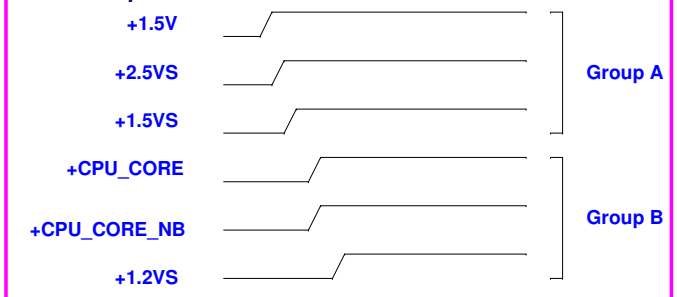
C935 0.1U_0402_16V4Z
+3VS — R535 31.6K_0402_1% — R536 30K_0402_1%

Q9 BSH111 1N_SOT23-3
8,14 APU_SID — APU_SID — EC_SMB_DA — R537 0_0402_5% — EC_SMB_DA2 19,26,36

Q10 BSH111 1N_SOT23-3
8,14 APU_SIC — APU_SIC — EC_SMB_CK — R538 0_0402_5% — EC_SMB_CK2 19,26,36

To EC

Power Sequence of APU



Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

Compal Electronics, Inc.

Title: AMD FS1 PCIE / UMI / TSI

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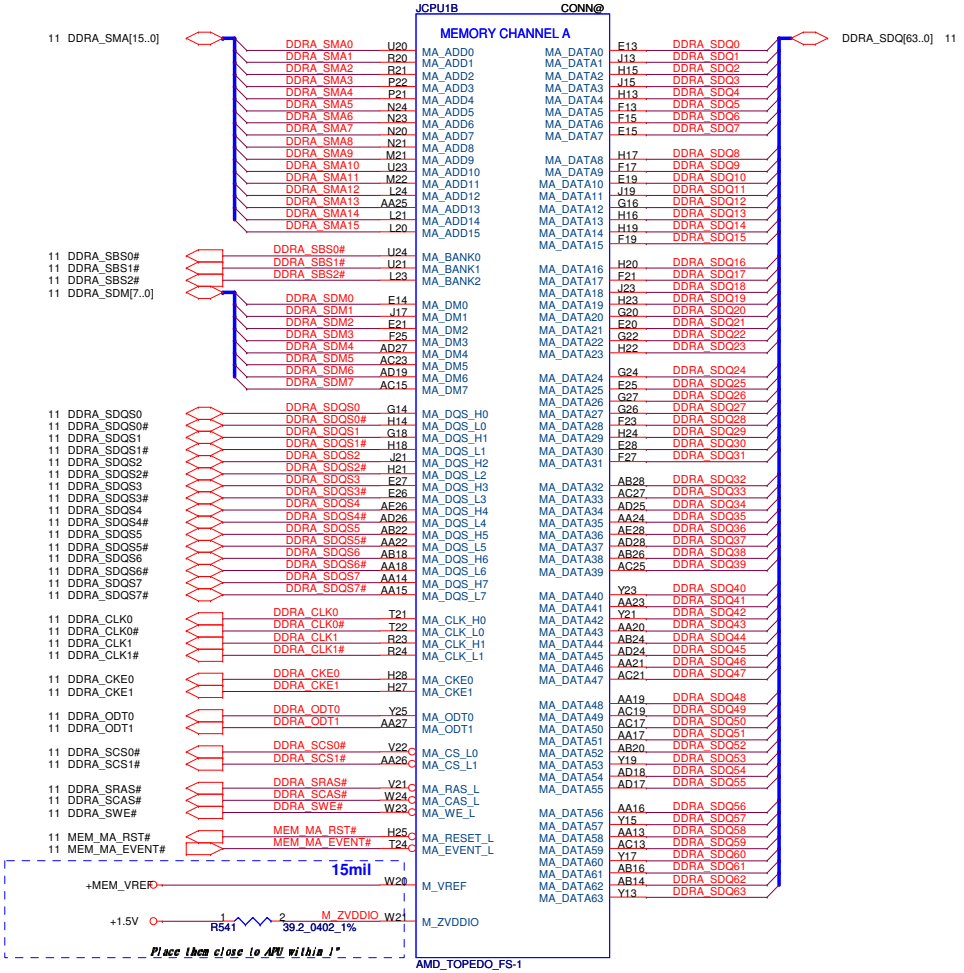
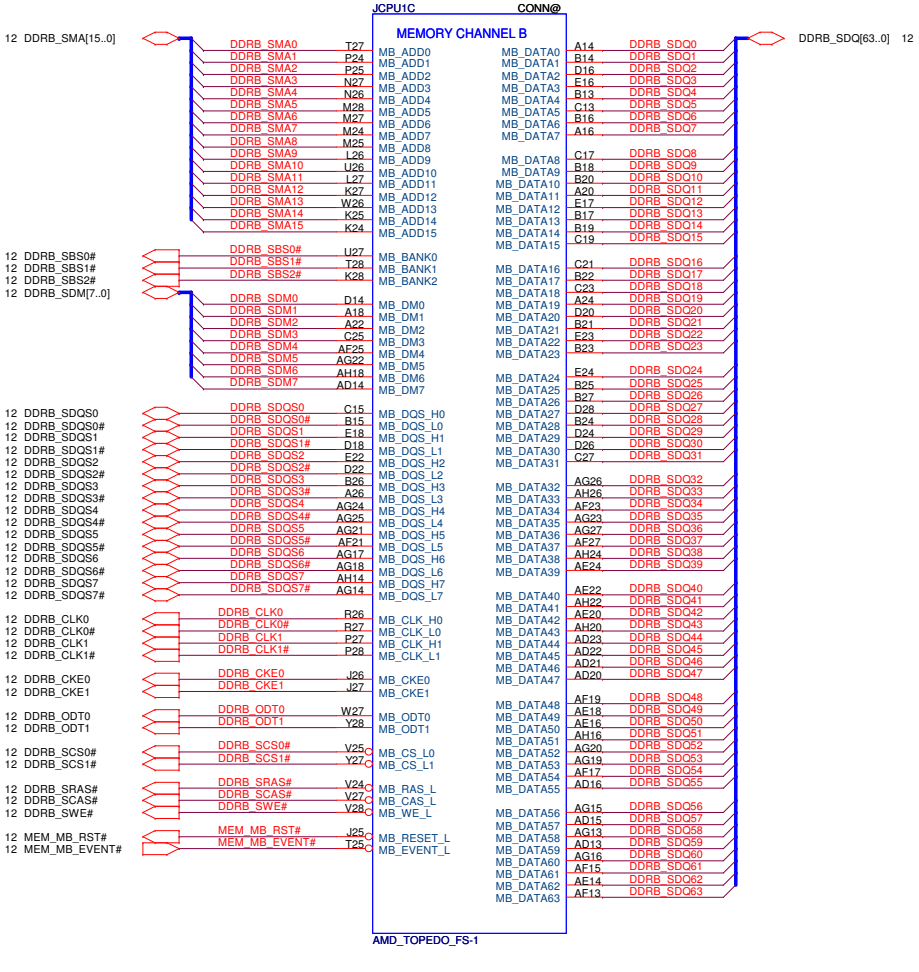
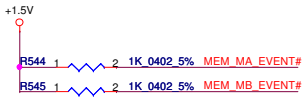
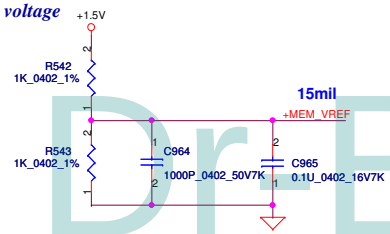




EVENT# pull high



0.75V reference voltage



Security Classification	Compal Secret Data		
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Compal Electronics, Inc.

Title: AMD FS1 DDRIII I/F

Size	Document Number	Rev
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To LVDS Translator

To FCH VGA ML

100MHz

100MHz_NSS

TSI

Serial VID

Close to Header

Route as differential with VSS_SENSE

APU_VDDNB_RUN_FB_L
APU_VDDNB_SEN route as differential

APU_VDD_RUN_FB_L
APU_VDD_SEN route as differential

Place near APU

JCPU1D

DISPLAY PORT 0

DISPLAY PORT 1

System DP

CLK

SER.

CTRL

JTAG

RSVD

SENSE

AMD_TOPEDO_FS-1

CONN@

DISPLAY PORT MISC.

To LVDS Translator

To FCH

AUX 2~5 are for GFX interface use, they could be selected to I2C or AUX logic

VDDIO level
Need Level shift

LVDS

CRT

HDMI

Chang to unpop (DG ref.) 20101111

Llano do not support this thermal die

If not used, pins are left unconnected (DG ref.) 20101111

FS1R1 : Control S5 Dual PWR plane
In laptop, seems no use

MISC

Asserted as an input to force the processor into the HTC-active state

THERMTRIP shutdown temperature: 125 degree

Indicates to the FCH that a thermal trip has occurred. Its assertion will cause the FCH to transition the system to S5 immediately

HDT Debug conn

Cut on CPU side, Debug mount

SAMTE_ASP-136446-07-B
CONN@

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Issued Date	2010/08/04	Deciphered Date	2010/08/04

Compal Electronics, Inc.

Title: AMD FS1 Display / MISC / HDT

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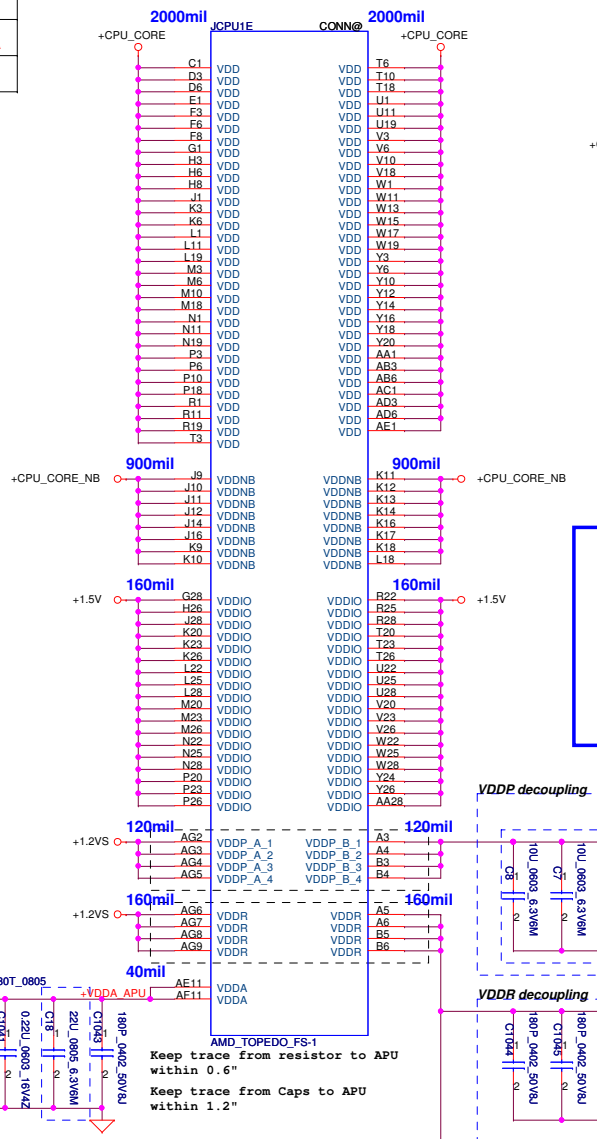
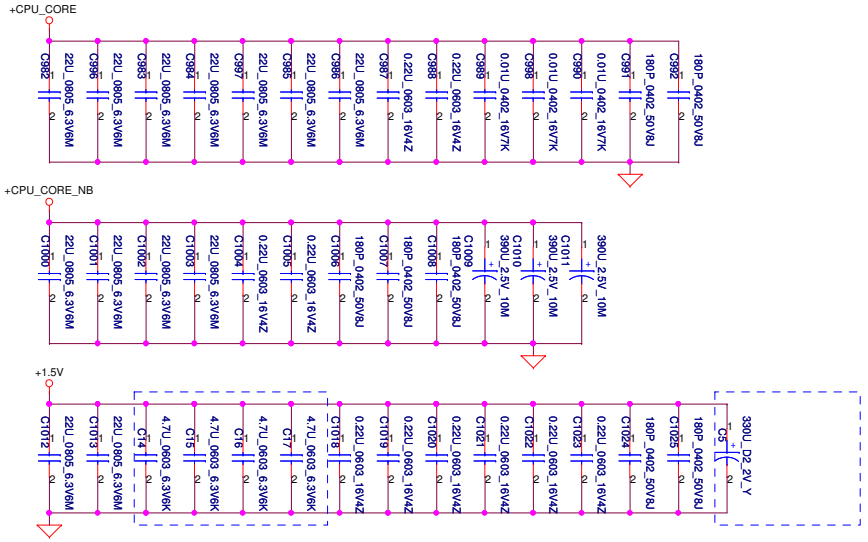
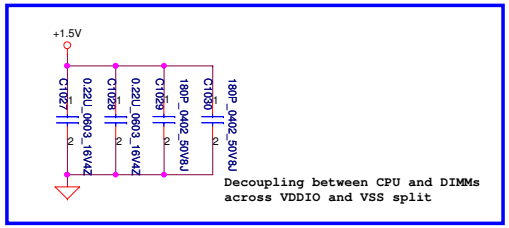
CPU BOTTOM SIDE DECOUPLING

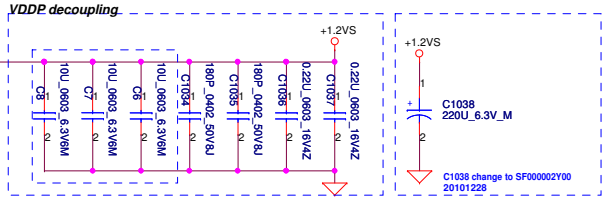
Power Name	Consumption
VDD +CPU_CORE	50A
VDDNB +CPU_CORE_NB	22.5A
VDDIO +1.5V	4A
VDDP / VDDR +1.2VS	3A / 3.5A
VDDA +2.5VS	0.75A

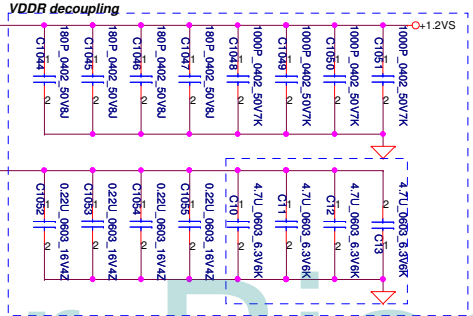
CORE_NB	CPU_CORE
330uF X 2	330uF X 4
22uF X 4	22uF X 11

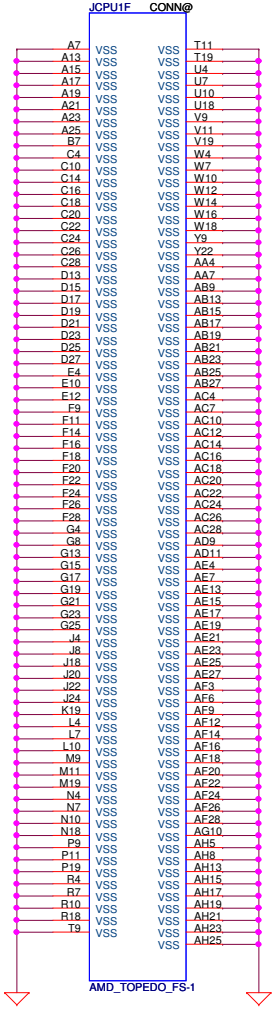












Demo Board Capacitor (include PWM side)

CPU_CORE	CORE_NB	VDDIO_SUS (CPU side)	VDDIO_SUS (DIMM x2)	VDDP/R_PWM	VDDP	VDDR
470uF x 6	470uF x 4	680uF x 1	100uF x 4	470uF x 2	10uF x 3	4.7uF x 4
22uF x 9	22uF x 6	330uF x 1	0.1uF	10uF x 1	0.22uF x 2	0.22uF x 4
0.22uF x 2	0.22uF x 2	22uF x 3			180pF x 2	1nF x 4
180pF x 2	180uF x 3	4.7uF x 4				180pF x 4
10nF x 3		0.22uF x 6				
		180pF x 4				

Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

Compal Electronics, Inc.

Title: AMD FS1 PWR / GND

Size: Custom | Document Number: QBL60 LA-7552P | Rev: 0.02

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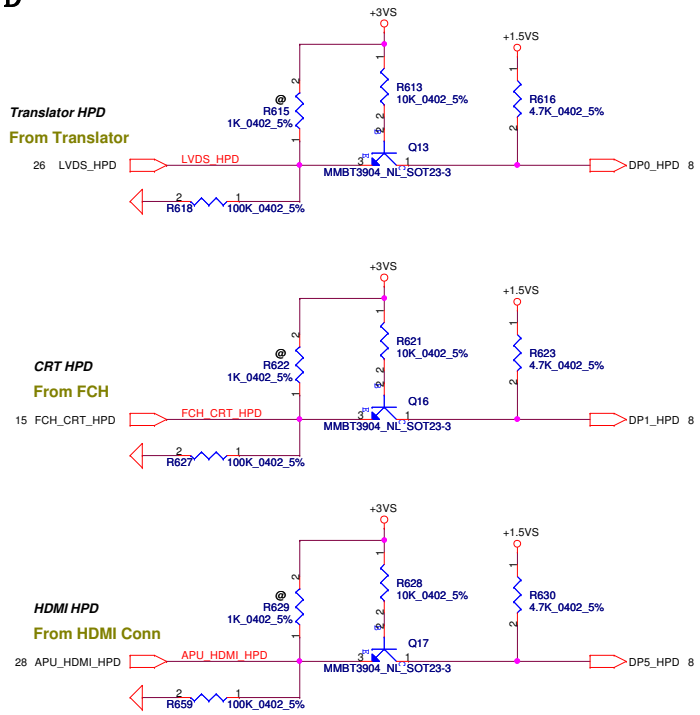
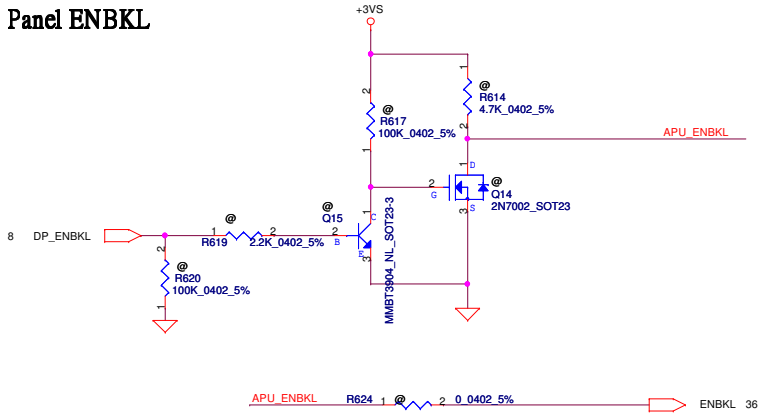
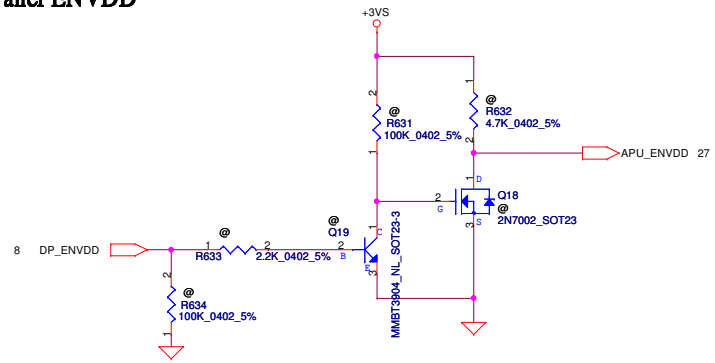
HPD



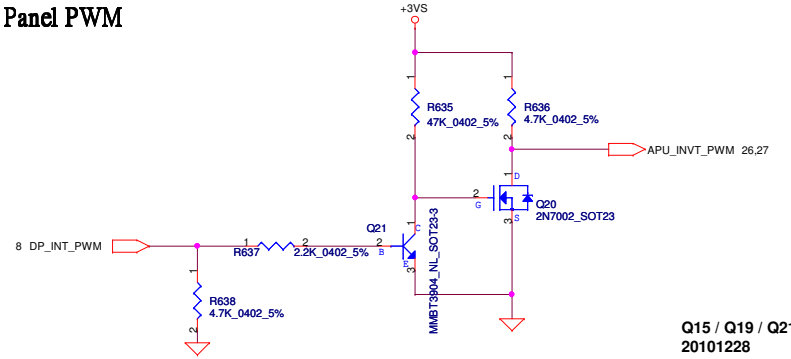
Panel ENBKL



Panel ENVDD



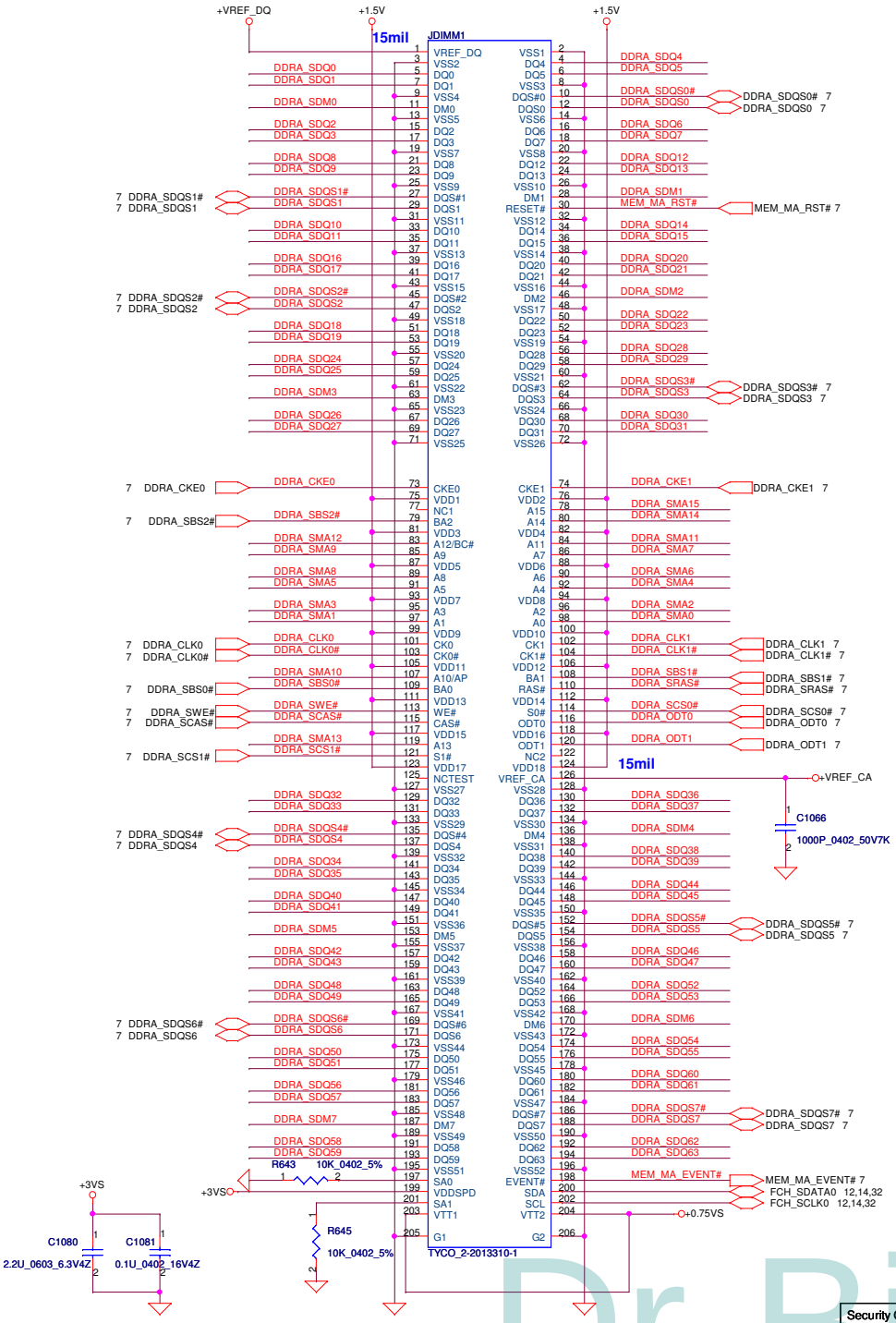
Panel PWM



Q15 / Q19 / Q21 change to SB000006A00
20101228

Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

Title	AMD FS1 Singal Level Shifter		
Size: Custom	Document Number: QBL60 LA-7552P		Rev: 0.03
Date: Tuesday, February 22, 2011	Sheet 10 of 49		



DIMM_A STD H:9.2mm

<Address: 00>

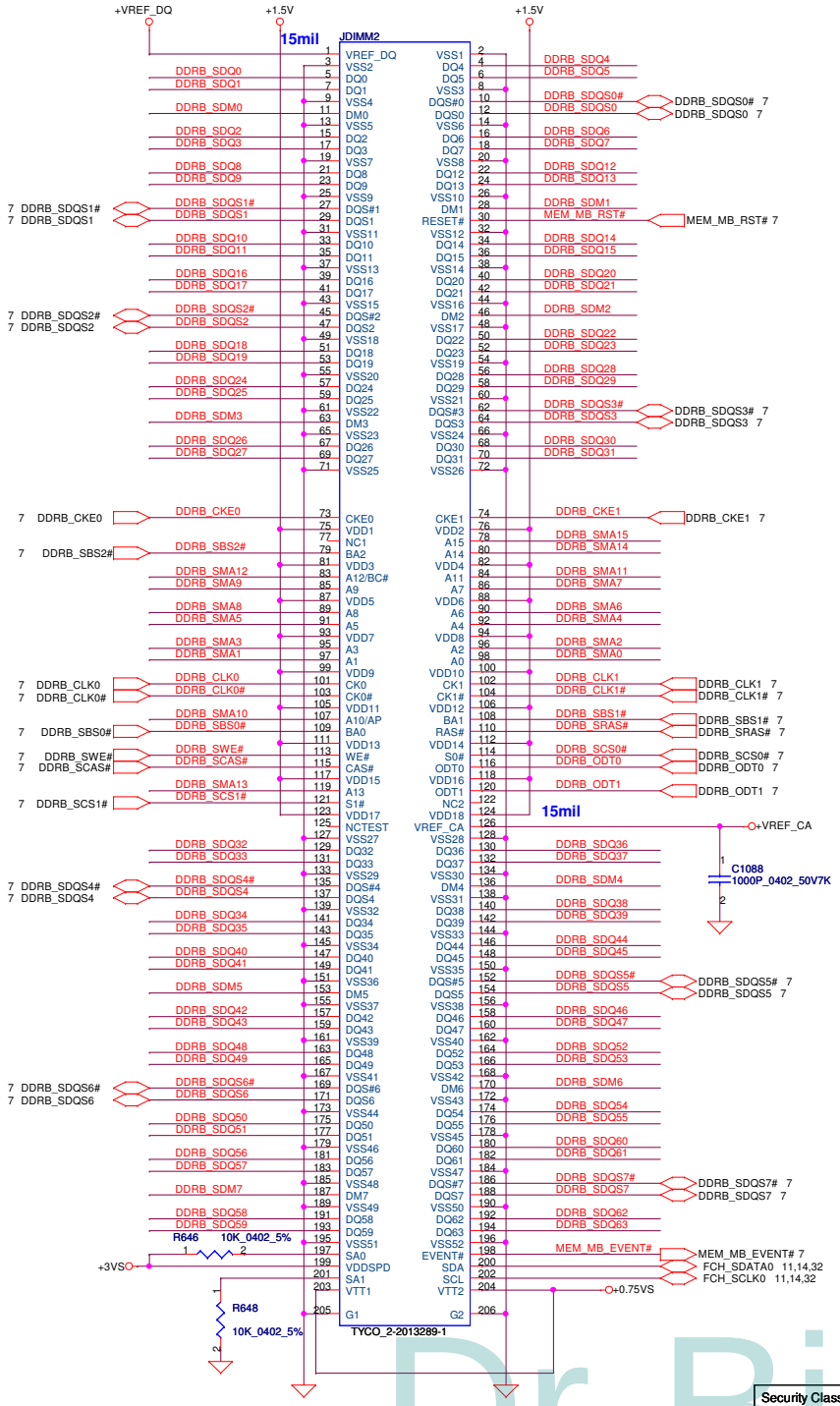
Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

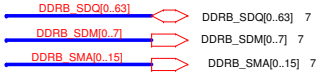
Compal Electronics, Inc.

Title: DDRIII SO-DIMM 1

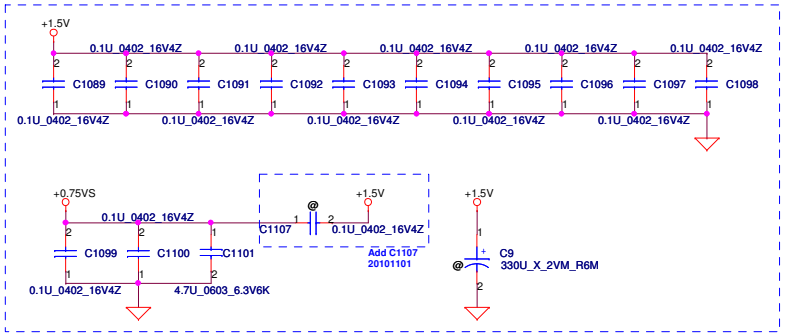
Size	Document Number	Rev
Custom	QBL60 LA-7552P	0.03

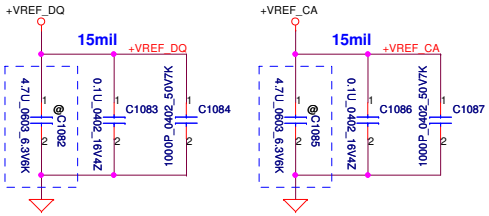
Date: Tuesday, February 22, 2011 Sheet 11 of 49





Place near DIMM2





DIMM_B STD H:5.2mm

<Address: 01>

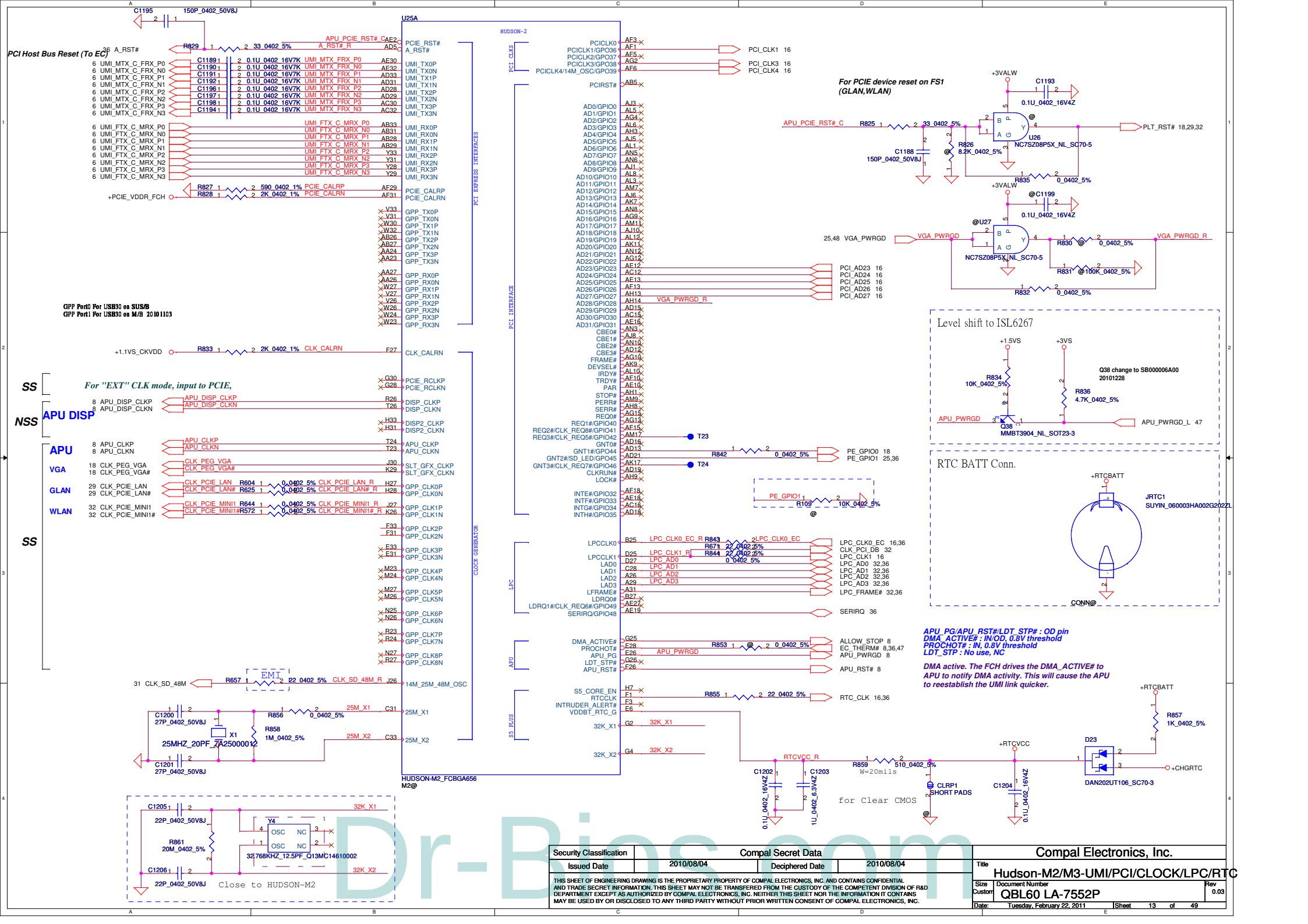
Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

Compal Electronics, Inc.

Title: DDRIII SO-DIMM 2

Size: Custom | Document Number: QBL60 LA-7552P | Rev: 0.03

Date: Tuesday, February 22, 2011 | Sheet 12 of 49



Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

Compal Electronics, Inc.

Title: Hudson-M2/M3-UMI/PCI/CLOCK/LPC/RTC

Size	Document Number	Rev
Custom	QBL60 LA-7552P	0.03

Date: Tuesday, February 22, 2011 Sheet 13 of 49

PCIE_RST2 : Reset PCIE device on Hudson2

THERMTRIP:
Need level shift from +3VALW to +1.5V

SM bus 0-->S0 PWR domain
SM bus 1-->S5 PWR domain
VGA_PD: Support MLDAC power save if connect
0: MLDAC power on
1: MLDAC power off

U25D
HUDSON-2

PCIE_RST2#/PCI_PME#/GEVENT4#
RI#/GEVENT22#
SPI_CS3#/GBE_STAT1/GEVENT21#
SLP_S3#
SLP_S5#
PWR_BTN#
PWR_GOOD
TEST0
TEST1/TMS
TEST2
GA20IN/GEVENT0#
KBRST#/GEVENT1#
LPC_PME#/GEVENT3#
LPC_SMI#/GEVENT23#
LPC_PD#/GEVENT5#
SYS_RESET#/GEVENT19#
WAKE#/GEVENT8#
IR_RX1/GEVENT20#
THRMTRIP#/SMBALERT#/GEVENT2#
WD_PWRGD
RSMRST#
CLK_REQ4#/SATA_IS0#/GPIO64
CLK_REQ3#/SATA_IS1#/GPIO63
SMARTVOLT1/SATA_IS2#/GPIO50
CLK_REQ0#/SATA_IS3#/GPIO60
SATA_IS4#/FANOUT3/GPIO55
SATA_IS5#/FANIN3/GPIO59
SPKR/GPIO66
SCL0/GPIO43
SDA0/GPIO47
SCL1/GPIO227
SDA1/GPIO228
CLK_REQ2#/FANIN4/GPIO62
CLK_REQ1#/FANOUT4/GPIO61
IR_LED#/LLB#/GPIO184
SMARTVOLT2/SHUTDOWN#/GPIO51
DDR3_RST#/GEVENT7#/VGA_PD
GBE_LED0/GPIO183
SPI_HOLD#/GBE_LED1/GEVENT9#
GBE_LED2/GEVENT10#
GBE_STAT0/GEVENT11#
CLK_REQG#/GPIO65/OSCIN/IDLEEXIT#
BLINK/USB_OC7#/GEVENT18#
USB_OC6#/IR_TX1/GEVENT6#
USB_OC5#/IR_TX0/GEVENT17#
USB_OC4#/IR_RX0/GEVENT16#
USB_OC3#/AC_PRES/TDO/GEVENT15#
USB_OC2#/TCK/GEVENT14#
USB_OC1#/TDI/GEVENT13#
USB_OC0#/SPI_TPM_CS#/TRST#/GEVENT12#
AZ_BITCLK
AZ_SDOUT
AZ_SDIN0/GPIO167
AZ_SDIN1/GPIO168
AZ_SDIN2/GPIO169
AZ_SDIN3/GPIO170
AZ_SYNC
AZ_RST#
PS2_DAT/SDA4/GPIO187
PS2_CLK/CEC/SCL4/GPIO188
SPI_CS2#/GBE_STAT2/GPIO166
PS2KB_DAT/GPIO189
PS2KB_CLK/GPIO190
PS2M_DAT/GPIO191
PS2M_CLK/GPIO192
KSO_0/GPIO209
KSO_1/GPIO210
KSO_2/GPIO211
KSO_3/GPIO212
KSO_4/GPIO213
KSO_5/GPIO214
KSO_6/GPIO215
KSO_7/GPIO216
KSO_8/GPIO217
KSO_9/GPIO218
KSO_10/GPIO219
KSO_11/GPIO220
KSO_12/GPIO221
KSO_13/GPIO222
KSO_14/GPIO223
KSO_15/GPIO224
KSO_16/GPIO225
KSO_17/GPIO226

USB_MISC
USBCLK/14M_25M_48M_OSC
USB_RCOMP
USB_FSD1P/GPIO186
USB_FSD1N
USB_FSD0P/GPIO185
USB_FSD0N
USB_HSD13P
USB_HSD13N
USB_HSD12P
USB_HSD12N
USB_HSD11P
USB_HSD11N
USB_HSD10P
USB_HSD10N
USB_HSD9P
USB_HSD9N
USB_HSD8P
USB_HSD8N
USB_HSD7P
USB_HSD7N
USB_HSD6P
USB_HSD6N
USB_HSD5P
USB_HSD5N
USB_HSD4P
USB_HSD4N
USB_HSD3P
USB_HSD3N
USB_HSD2P
USB_HSD2N
USB_HSD1P
USB_HSD1N
USB_HSD0P
USB_HSD0N
USBSS_CALRP
USBSS_CALRN
USB_SS_TX3P
USB_SS_TX3N
USB_SS_RX3P
USB_SS_RX3N
USB_SS_TX2P
USB_SS_TX2N
USB_SS_RX2P
USB_SS_RX2N
USB_SS_TX1P
USB_SS_TX1N
USB_SS_RX1P
USB_SS_RX1N
USB_SS_TX0P
USB_SS_TX0N
USB_SS_RX0P
USB_SS_RX0N
SCL2/GPIO193
SDA2/GPIO194
SCL3_LV/GPIO195
SDA3_LV/GPIO196
EC_PWM0/EC_TIMER0/GPIO197
EC_PWM1/EC_TIMER1/GPIO198
EC_PWM2/EC_TIMER2/WOL_EN/GPIO199
EC_PWM3/EC_TIMER3/GPIO200
KSI_0/GPIO201
KSI_1/GPIO202
KSI_2/GPIO203
KSI_3/GPIO204
KSI_4/GPIO205
KSI_5/GPIO206
KSI_6/GPIO207
KSI_7/GPIO208

USB1
CardReder
WLAN(BT)
CMOS
USB3
USB2

Hudson-M2 EHCI CTL DEV 22, Fn 2 <Disable CTL of M2>
Hudson-M3 xHCI CTL DEV 16, Fn 1 xHCI CTL DEV 16, Fn 0
Hudson-M2/M3 EHCI CTL DEV 19, Fn 2
Hudson-M2/M3 EHCI CTL DEV 18, Fn 2
On board USB Conn

Project SKU ID		
GPIO189 (use VGA)	L(NO) R44	H(YES) R43
GPIO190 (use PX)	L(NO) R46	H(YES) R45
GPIO191	L(15") R48	H(17") R47

Add Project ID Table 201011301600

HUDSON-M2_FCBGA656
M2@

For FCH internal debug use

Modify 2010212-AMD request
Modify 20101111

Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

Compal Electronics, Inc.

Title: Hudson-M2/M3-ACPI/USB/EC

Size	Document Number	Rev
Custom	QBL60 LA-7552P	0.03

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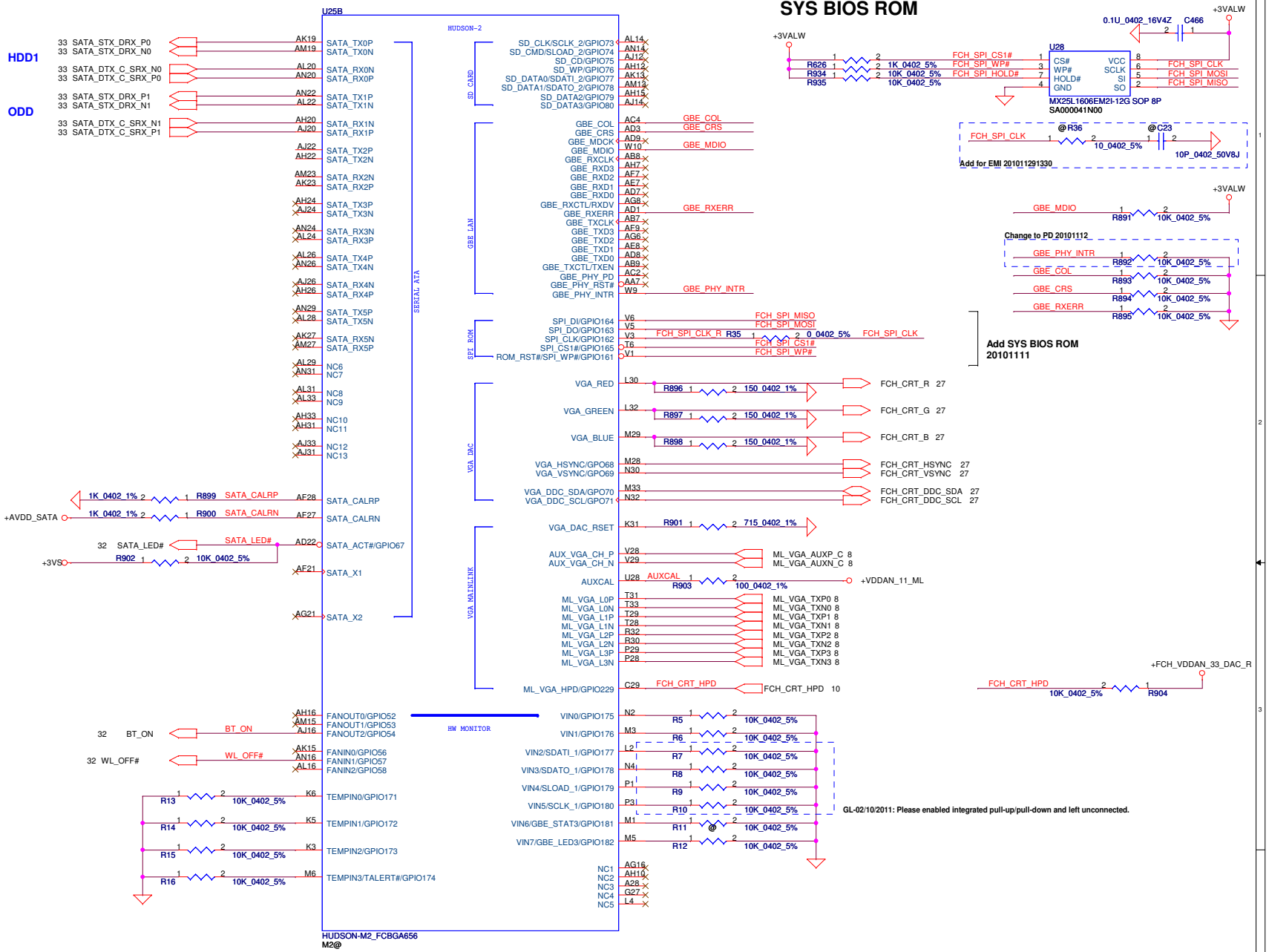
SYS BIOS ROM

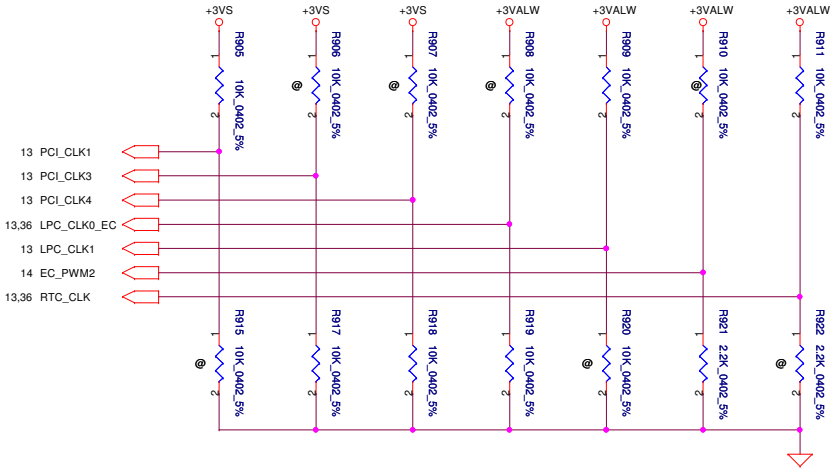


Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

Compal Electronics, Inc.			
Title	Hudson-M2/M3-SATA/GBE/HWM		
Size: Custom	Document Number: QBL60 LA-7552P		Rev: 0.03
Date: Tuesday, February 22, 2011	Sheet 15 of 49		

STRAP PINS

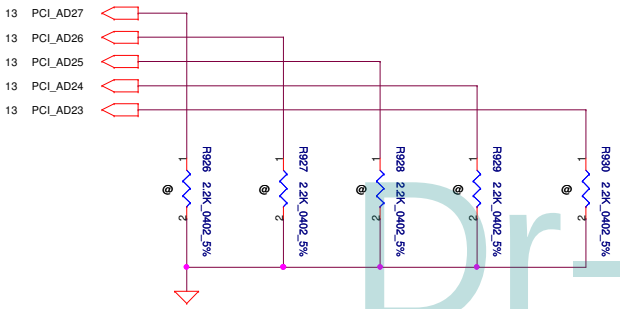
	PCI_CLK1	PCI_CLK3	PCI_CLK4	LPC_CLK0	LPC_CLK1	EC_PWM2	RTC_CLK
PULL HIGH	ALLOW PCIE GEN2 DEFAULT	USE DEBUG STRAPS	NON_FUSION CLOCK MODE	EC ENABLED	CLKGEN ENABLED DEFAULT	LPC ROM	S5 PLUS MODE DISABLED DEFAULT
PULL LOW	FORCE PCIE GEN1	IGNORE DEBUG STRAP DEFAULT	FUSION CLOCK MODE DEFAULT	EC DISABLED DEFAULT	CLKGEN DISABLE	SPI ROM DEFAULT	S5 PLUS MODE ENABLED

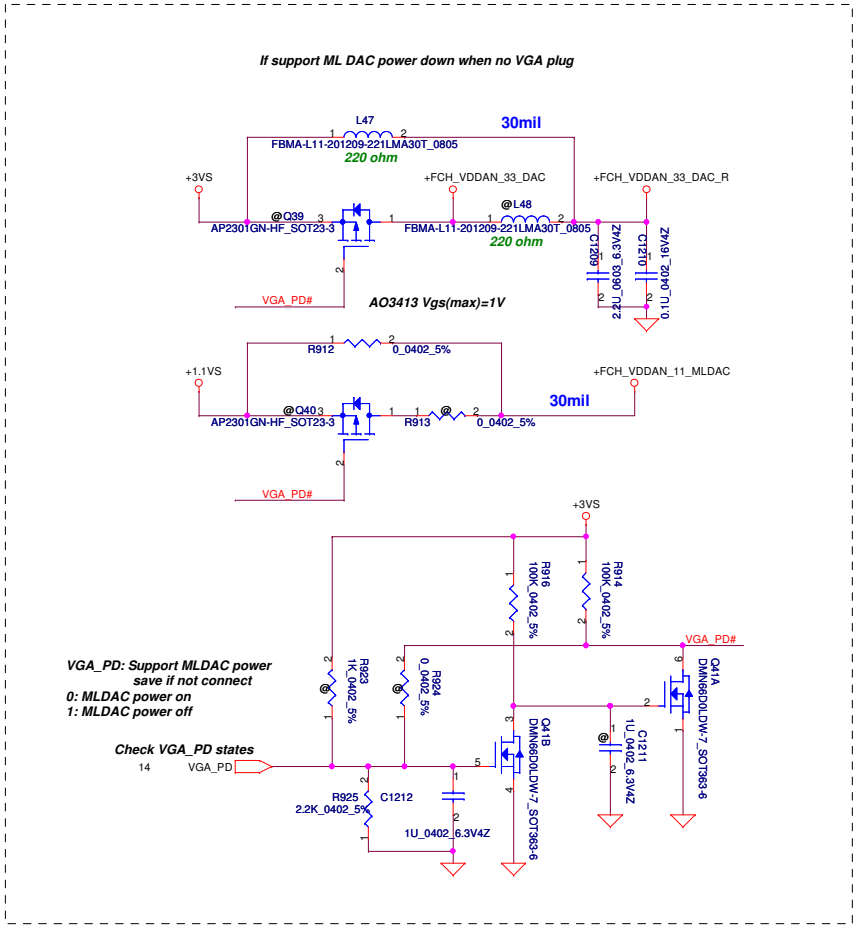


DEBUG STRAPS

FCH HAS 15K INTERNAL PU FOR PCI_AD[27:23]

PCI_AD26	PCI_AD27		PCI_AD25	PCI_AD24	PCI_AD23
PULL HIGH	USE PCI PLL DEFAULT	DISABLE ILA AUTORUN DEFAULT	USE FC PLL DEFAULT	USE DEFAULT PCIE STRAPS DEFAULT	DISABLE PCI MEM BOOT DEFAULT
PULL LOW	BYPASS PCI PLL	ENABLE ILA AUTORUN	BYPASS FC PLL	USE EEPROM PCIE STRAPS	ENABLE PCI MEM BOOT





Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

Compal Electronics, Inc.			
Title	Hudson-M2/M3-STRAP		
Size Custom	Document Number QBL60 LA-7552P		Rev 0.03
Date: Tuesday, February 22, 2011	Sheet 16 of 49		

C1218 / C1219 / C1247 Change to SE00000I10
20101228

VDDPL_33_SSUSB_S
For Hudson3 USB3.0 only
For Hudson2, connect to GND

LDO_CAP: Internally generated 1.8V supply for the RGB outputs

For A11: Cap = 1nF
For A12, Cap = DNI

change to 0ohm-AMD request 20110212

R1242 change to 2.2uf-AMD request 20110212

change to four 1uf-AMD request 20110212

For FCH M2 - BOM option
VDDAN_11_SSUSB_S / VDDAN_11_SSUSB_S Connected to VSS.

AMD reply:
VDDAN_33_HWM_S: Please connect it to +3.3V_S5 directly if HWM is not used.

VDDIO_AZ_S should be tied to +3.3/1.5V_S5 rail if Wake on Ring is supported

Connected to VSS through a dedicated via.

U25C HUDSON-M2_FCBGA656 M2@

U25E HUDSON-M2_FCBGA656 M2@

Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

Compal Electronics, Inc.

Title: Hudson-M2/M3-POWER/GND

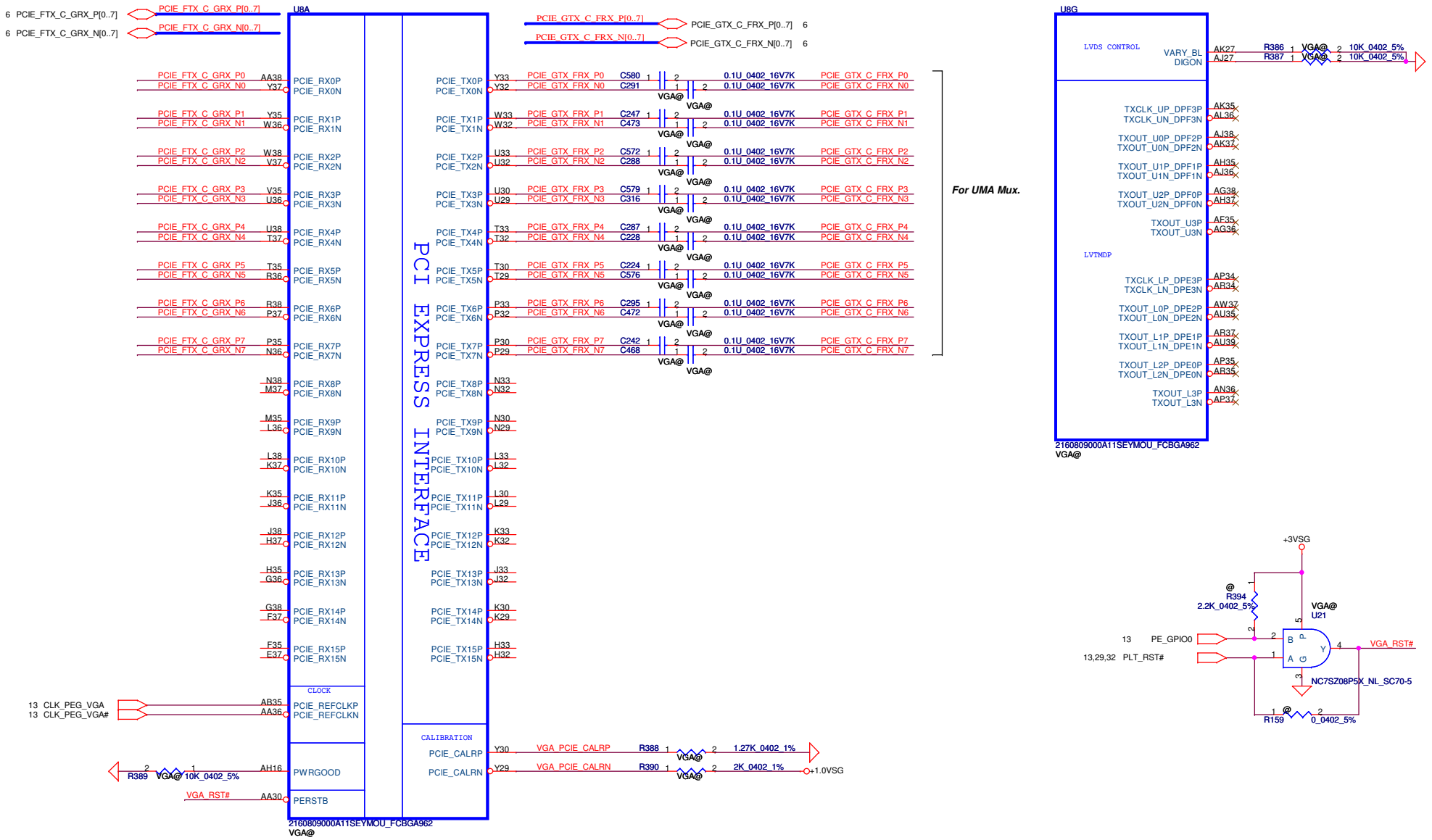
Size: Custom | Document Number: QBL60 LA-7552P | Rev: 0.03

Date: Tuesday, February 22, 2011 | Sheet 17 of 49

GFX PCIE LANE REVERSAL

<DIGON>
Controls panel digital power on/off.
Active High ,external PD need

<VARY_BL>
LCD PWM (pulse width modulated) output to adjust LCD brightness
Active High ,external PD need



For UMA Mux.

Security Classification	Compal Secret Data		
Issued Date	2010/07/12	Deciphered Date	2012/07/12

Compal Electronics, Inc.

Title: Vancouver_ PCIE / LVDS

Size	Document Number	Rev
Custom	QBL60 LA-7552P	0.03

Date: Tuesday, February 22, 2011 | Sheet 18 of 49

Strap Name		Pin Straps description <all internal PD>	Setting
VIP_DEVICE_EN	V2SYNC (GENLK_VSYNC)	VIP Device Strap Enable indicates to the software driver (Internal PD) 0: Driver would ignore the value sampled on VHAD_0 during reset 1: VHAD_0 to determine whether or not a VIP slave device	0
VGA_DIS	GPIO9	VGA Disable determines (Internal PD) 0: VGA Controller capacity enabled 1: The device will not be recognized as the system's VGA controller	0
TX_PWRS_ENB	GPIO0	Transmitter Power Saving Enable (Internal PD) 0: 50%Tx output swing 1: full Tx output swing	1
TX_DEEMPH_EN	GPIO1	PCI Express Transmitter De-emphasis Enable (Internal PD) 0: Tx de-emphasis diabled 1: Tx de-emphasis enabled	1
CONFIG[2] CONFIG[1] CONFIG[0]	GPIO13 GPIO12 GPIO11	GPIO13,12,11 (config 2,1,0) : (Internal PD) memory apertures a) If BIOS_ROM_EN = 1, then Config[2:0] defines CONFIG[3:0] the ROM type. 128 MB 000 b) If BIOS_ROM_EN = 0, then Config[2:0] defines 256 MB 001 * the primary memory aperture size. 64 MB 010	001
BIOS_ROM_EN	GPIO22	Enable external BIOS ROM device (Internal PD) 0: Diable, 1: Enable	0
AUD[1] AUD(0)	HSYNC VSYNC	00: No audio function; 10: Audio for DisplayPort only; 01: Audio for DisplayPort and HDMI if adapter is detected; 11: Audio for both DisplayPort and HDMI	00
BIF_GEN2_EN	GPIO2	0= Advertises the PCI-E device as 2.5 GT/s capable at power-on 1= Advertises the PCI-E device as 5.0 GT/s capable at power-on 5.0 GT/s capability will be controlled by software	1
RESERVED	H2SYNC (GENLK_CLK) GPIO8 GPIO21	Internal use only. THIS PAD HAS AN INTERNAL PULL-DOWN AND MUST BE 0 V AT RESET. The pad may be left unconnected	DNI

Don't have this strap on Whistler and Seymour

NC on Park, Robson and Seymour
NC on Park, Robson

NC on Park, Robson and Seymour

Global Swap Lock on Multiple GPUs

NC on Park, Robson and Seymour

Not share via for other GND

External VGA Thermal Sensor

U9 VGA@ ADM1032ARMZ-2REEL_MSOP8

Q8A DMN66D0LDW-7_SOT363-6

Q8B DMN66D0LDW-7_SOT363-6

VRAM ID

GPIO5 fast-power reduction:
HW control will casue display disturb
should use SW method control
GPIO6 voltage control signal ,No use can NC

Move to DDCCLK_AUX3P,DDCDATA_AUX3N,

GPIO7 Controls backlight on/off.
Active High ,need external PD
If GPIO22 High ,GPIO 11-13->CFG[0:2]
Config ROM type ,GPU has internal PD

ROM

GPIO6,15,16,20
Voltage control signal
GPIO6,15 no use can NC
Thermal monitor interrupt

Critical temperature fault

Reserved

External BIOS device
ON(1)/OFF(0) inter PD

Internal Debug
no use can floating
ON(1)/OFF(0)

Stereo Sync
no use can NC

For ATI Cross fire
no use can NC

70mA
100mA

10mil

AMD ref:120ohm/0.3A

100mA
2mA

NC on Whistler and Seymour

Back compatibility(Manhattan)

Whistler and Seymour
Except A2VSSQ change to TSVSSQ, others are NC

SM010030010
200ma 120ohm@100mhz DCR 0.2

20mil

AMD ref:470ohm/1A

75mA
125mA

Future ASIC call MLPS.
OLD ASIC is Fan PWM

20mA

120ohm/0.3A

NC on Park, Robson and Seymour

NC on Park, Robson and Seymour

2160809000A11SEYMOU_FCBGA962

HSYNC:VSYNC
11: Audio for both DisplayPort and HDMI

AUD Strap

GPIO8 Serial-ROM output from ROM,
GPIO9 Serial-ROM input to ROM.
GPIO10 Serial-ROM clock to ROM.
GPIO22 erternal BIOS-ROM enable

GPIO8,GPIO9,GPIO10 no use can NC
GPIO22
Enable need 3K PH ,no use must NC

if GPIO22 High ,GPIO 11-13->CFG[0:2]
Config ROM type ,GPU has internal PD
if GPIO22 Low ,GPIO 11-13->CFG[0:2]
Config Primary memory-aperture size
CFG[3:0]
128MB 000
256MB 001 *
64MB 010

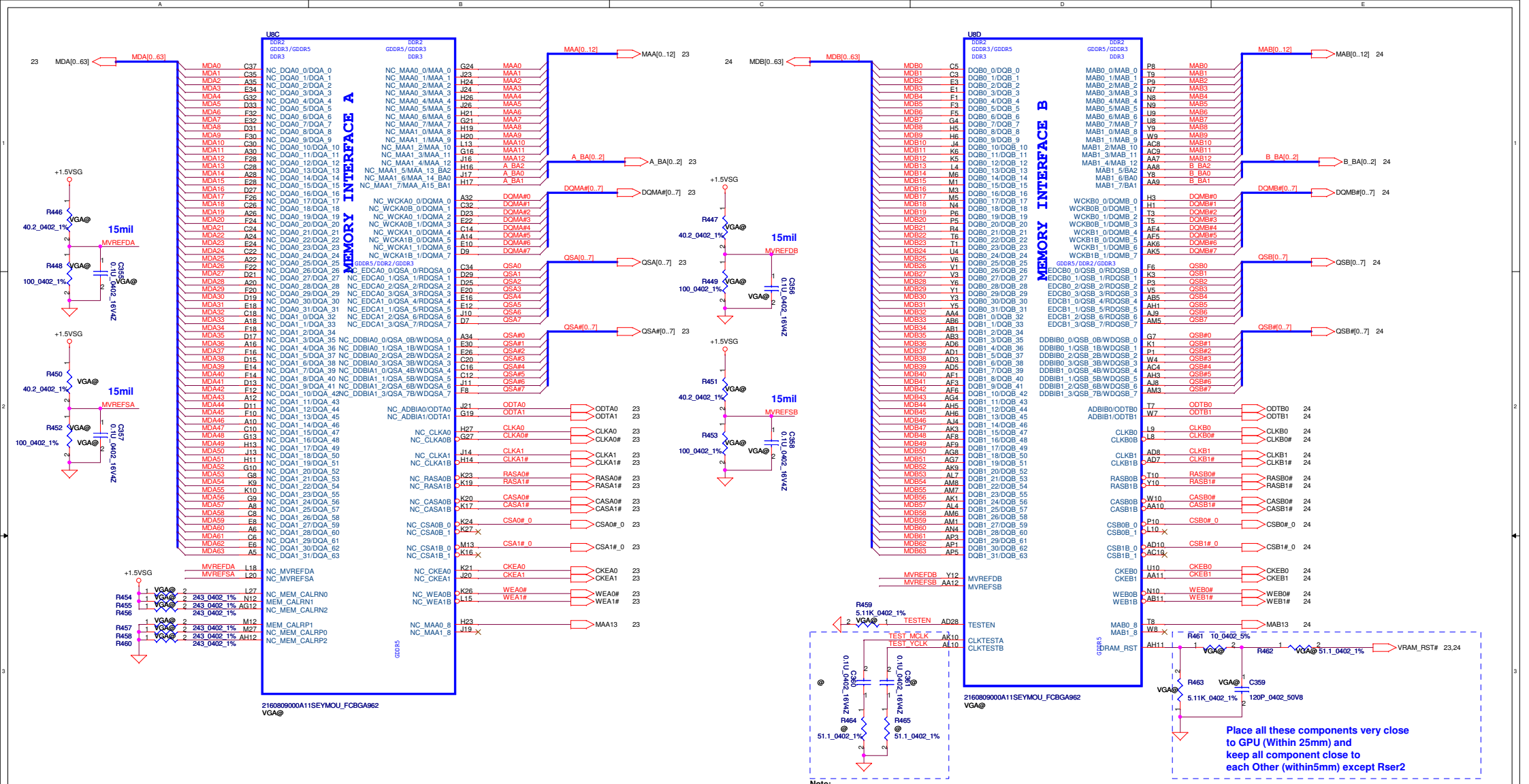
Security Classification	Compal Secret Data		
Issued Date	2010/07/12	Deciphered Date	2012/07/12

Compal Electronics, Inc.

Title: Vancouver_Strape/DP/HDMI//CRT

Size: Custom | Document Number: QBL60 LA-7552P | Rev: 0.03

Date: Tuesday, February 22, 2011 | Sheet 19 of 49



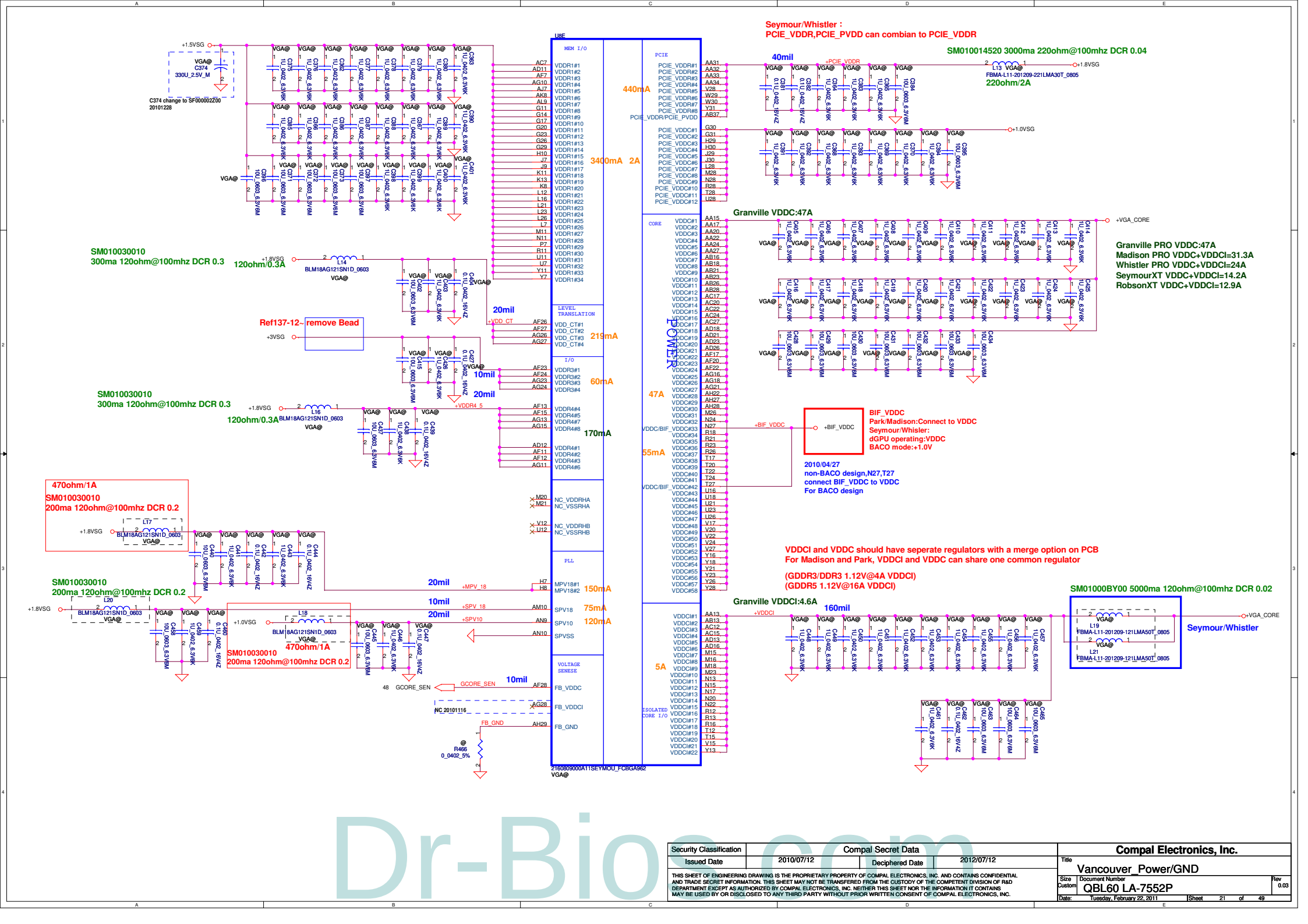
Security Classification	Compal Secret Data		
Issued Date	2010/07/12	Deciphered Date	2012/07/12

Compal Electronics, Inc.

Title: Vancouver_Memory

Size	Document Number	Rev
Custom	QBL60 LA-7552P	0.03

Date: Tuesday, February 22, 2011 | Sheet 20 of 49



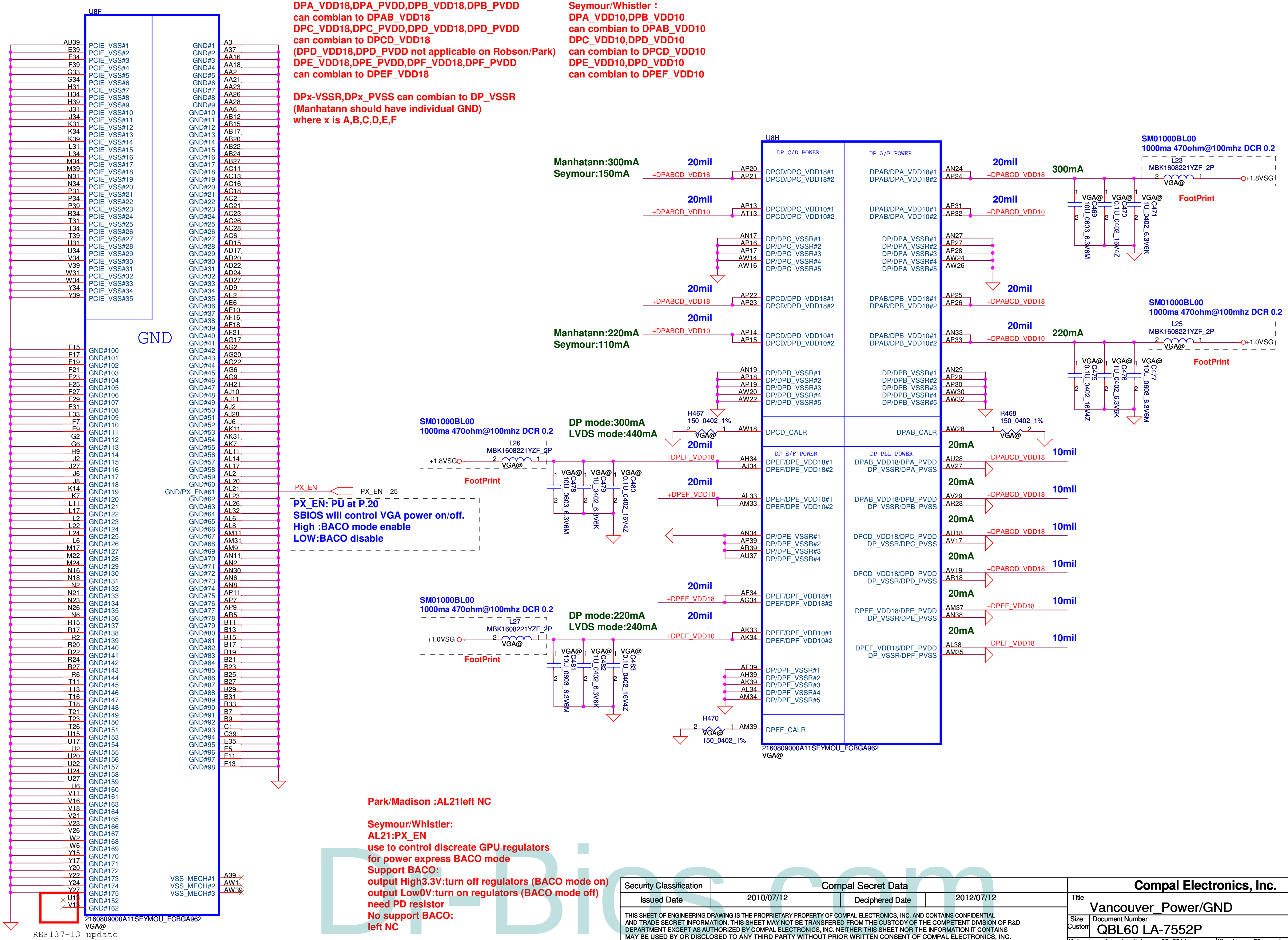
Security Classification	Compal Secret Data		
Issued Date	2010/07/12	Deciphered Date	2012/07/12

Compal Electronics, Inc.

Title: Vancouver_Power/GND

Size	Document Number	Rev
Custom	QBL60 LA-7552P	0.03

Date: Tuesday, February 22, 2011 | Sheet 21 of 49


U8F
GND
2160809000A11SEYMOU_FCBGA962
VGA@
REF137-13 update
PX_EN
PX_EN 25
GND/PX_EN#61
VSS_MECH#1
VSS_MECH#2
VSS_MECH#3
U8H
DP C/D POWER
DP A/B POWER
DP E/F POWER
DP PLL POWER
Manhatann:300mA
Seymour:150mA
Manhatann:220mA
Seymour:110mA
20mil
10mil
20mA
300mA
220mA
+DPABCD_VDD18
+DPABCD_VDD10
+DPEF_VDD18
+DPEF_VDD10
+1.8VSG
+1.0VSG
SM01000BL00
1000ma 470ohm@100mhz DCR 0.2
L23
L25
L26
L27
MBK1608221YZF_2P
FootPrint
DP mode:300mA
LVDS mode:440mA
DP mode:220mA
LVDS mode:240mA
R467
R468
R470
150_0402_1%
C469 10U_0603_6.3V6M
C470 0.1U_0402_16V4Z
C471 1U_0402_6.3V6K
C475 0.1U_0402_16V4Z
C476 1U_0402_6.3V6K
C477 10U_0603_6.3V6M
C478 10U_0603_6.3V6M
C479 1U_0402_6.3V6K
C480 0.1U_0402_16V4Z
C481 10U_0603_6.3V6M
C482 1U_0402_6.3V6K
C483 0.1U_0402_16V4Z
DPCD_CALR
DPAB_CALR
DPEF_CALR

DPA_VDD18,DPA_PVDD,DPB_VDD18,DPB_PVDD
can combian to DPAB_VDD18
DPC_VDD18,DPC_PVDD,DPD_VDD18,DPD_PVDD
can combian to DPCD_VDD18
(DPD_VDD18,DPD_PVDD not applicable on Robson/Park)
DPE_VDD18,DPE_PVDD,DPF_VDD18,DPF_PVDD
can combian to DPEF_VDD18

DPx-VSSR,DPx_PVSS can combian to DP_VSSR
(Manhatann should have individual GND)
where x is A,B,C,D,E,F

Seymour/Whistler：
DPA_VDD10,DPB_VDD10
can combian to DPAB_VDD10
DPC_VDD10,DPD_VDD10
can combian to DPCD_VDD10
DPE_VDD10,DPD_VDD10
can combian to DPEF_VDD10

PX_EN: PU at P.20
SBIOS will control VGA power on/off.
High :BACO mode enable
LOW:BACO disable

Park/Madison :AL21left NC

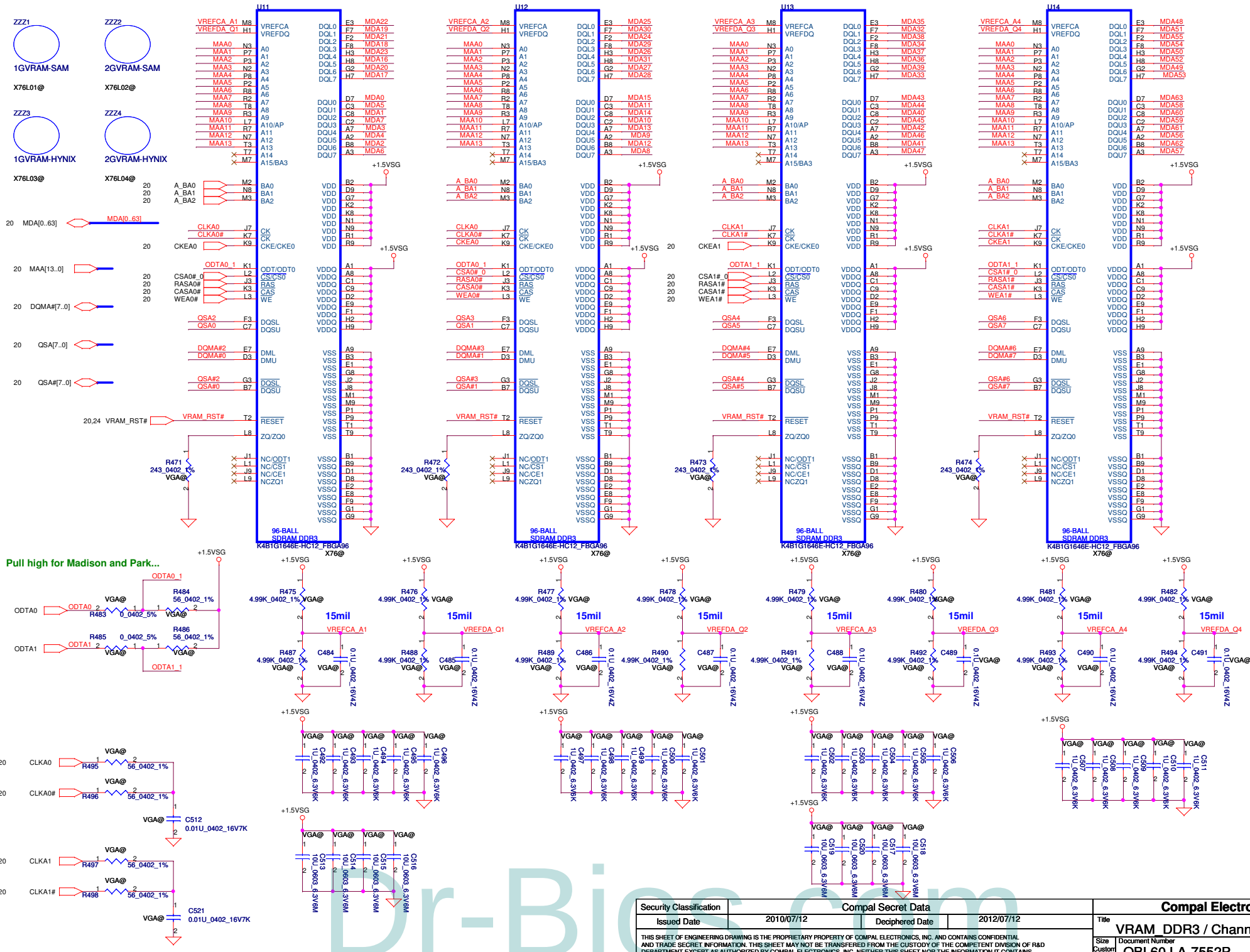
Seymour/Whistler:
AL21:PX_EN
use to control discreate GPU regulators
for power express BACO mode
Support BACO:
output High3.3V:turn off regulators (BACO mode on)
output Low0V:turn on regulators (BACO mode off)
need PD resistor
No support BACO:
left NC

Security Classification	Compal Secret Data		
Issued Date	2010/07/12	Deciphered Date	2012/07/12

Compal Electronics, Inc.

Title: Vancouver_Power/GND

Size: Custom | Document Number: QBL60 LA-7552P | Rev: 0.03



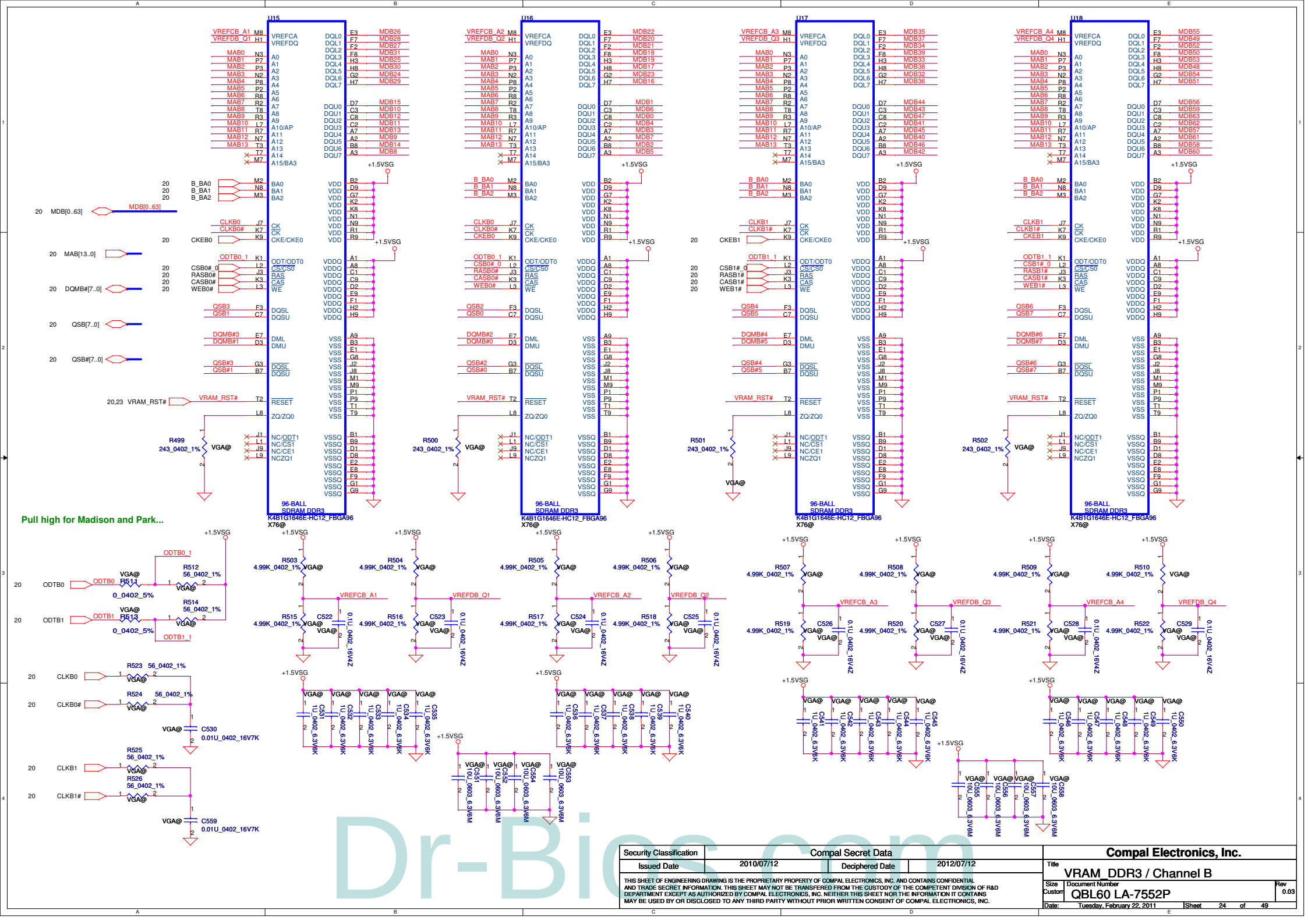
Security Classification	Compal Secret Data		
Issued Date	2010/07/12	Deciphered Date	2012/07/12

Compal Electronics, Inc.

Title: VRAM_DDR3 / Channel A

Size	Document Number	Rev
Custom	QBL60 LA-7552P	0.03

Date: Tuesday, February 22, 2011 | Sheet 23 of 49



Security Classification	Compal Secret Data		
Issued Date	2010/07/12	Deciphered Date	2012/07/12

Compal Electronics, Inc.

Title: VRAM_DDR3 / Channel B

Size	Document Number	Rev
Custom	QBL60 LA-7552P	0.03

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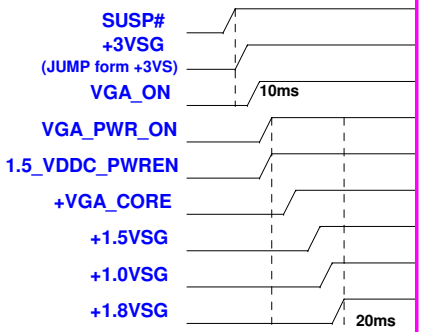
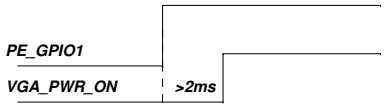
Power Sequence of Whistler and Seymour

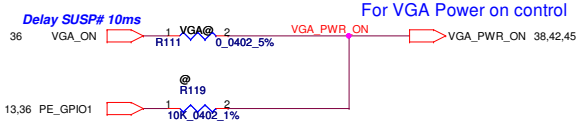


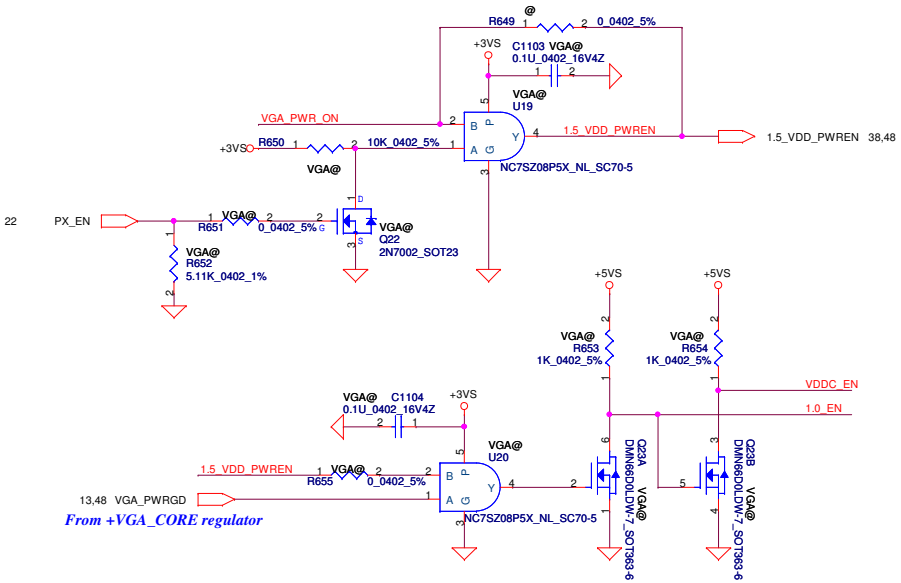
For PX sequence, >2mS delay is required between PE_GPIO1 and VGA_PWR_ON

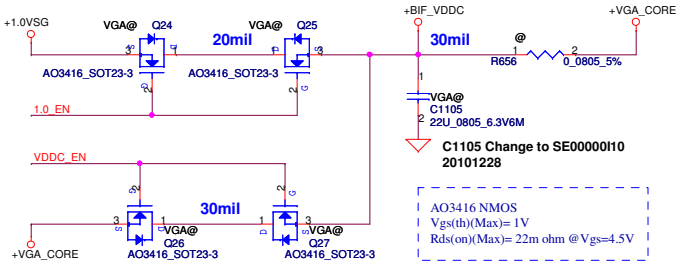


VGA Muxless with BACO Status Mapping table		
	Normal mode	BACO mode
PX_EN	0	1
1.5_VDDC_PWREN	1	0
VDDC_EN	1	0
1.0_EN	0	1
+3.3VSG	ON	ON
+1.8VSG	ON	ON
+1.0VSG	ON	ON
+VGA_CORE	ON	OFF
+1.5VSG	ON	OFF
+BIF_VDDC	+VGA_CORE	+1.0VSG

VGA Power Enable Signal Mapping table	
	Whislter
VGA_PWR_ON source signal	VGA_ON
+3.3VSG	SUSP#
+1.8VSG	VGA_PWR_ON
+1.0VSG	VGA_PWR_ON
+VDDCI	Combine with +VGA_CORE
+VGA_CORE	1.5_VDDC_PWREN
+1.5VSG	1.5_VDDC_PWREN







Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

Compal Electronics, Inc.

Title: VGA power sequence and BACO

Size	Document Number	Rev
Custom	QBL60 LA-7552P	0.03

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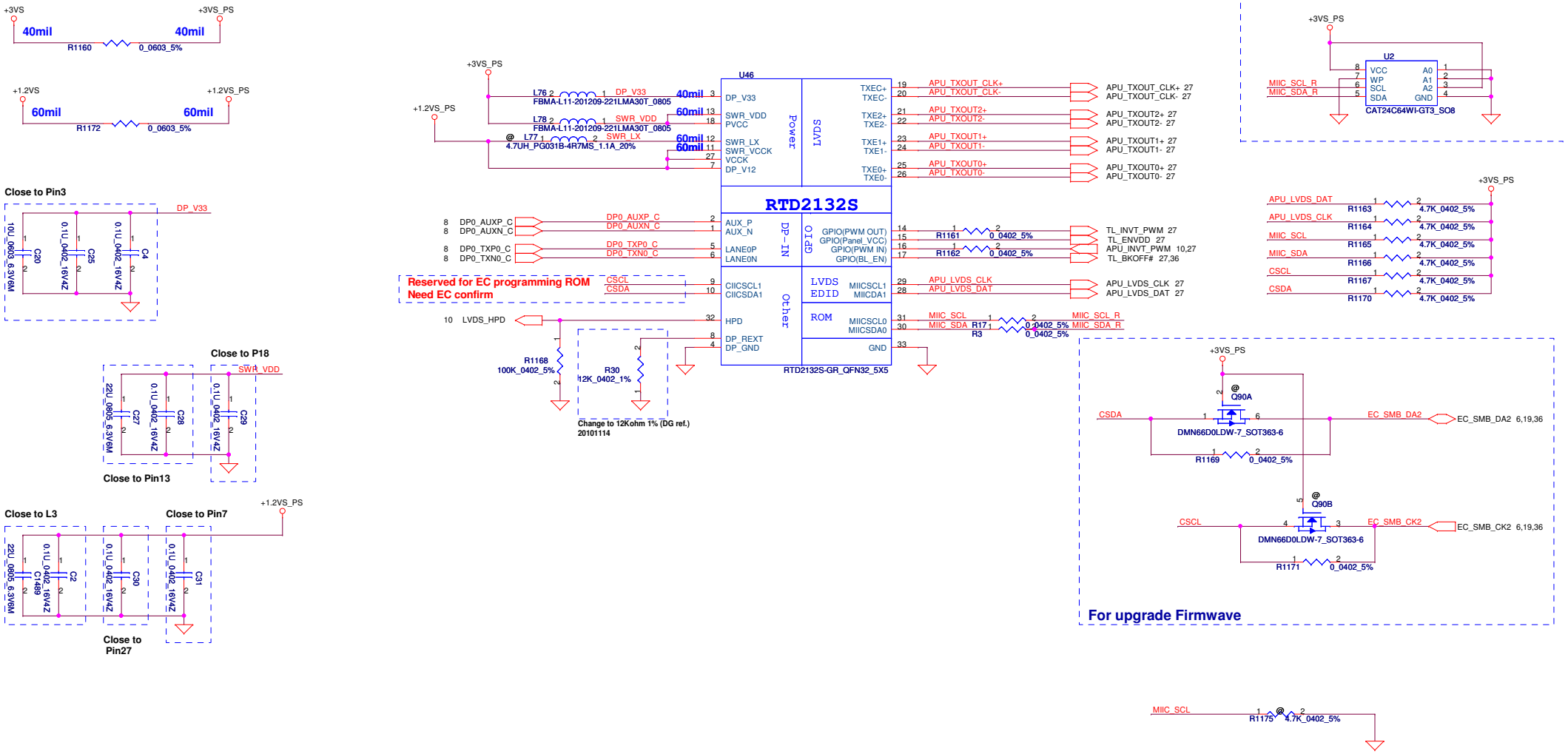
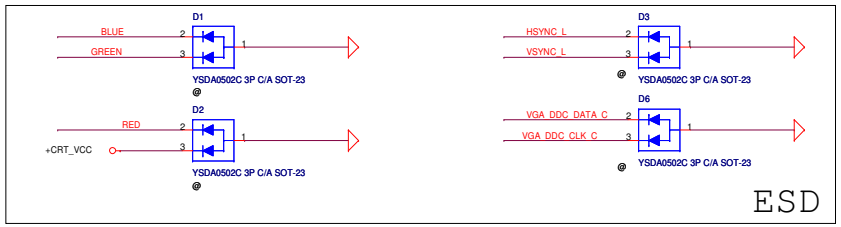
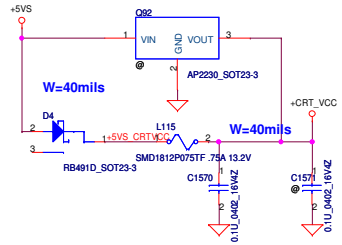


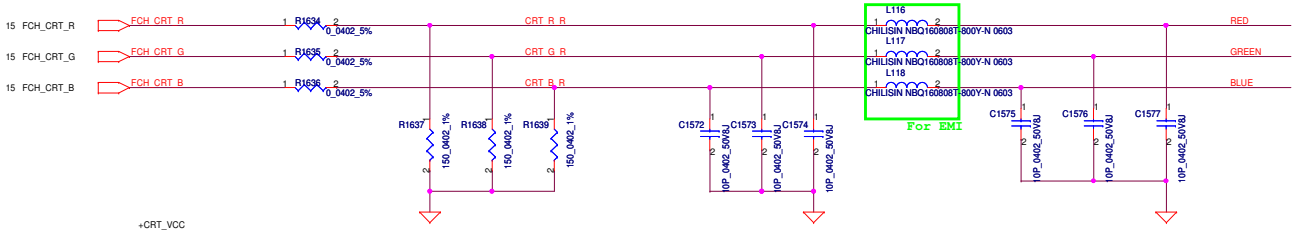
Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

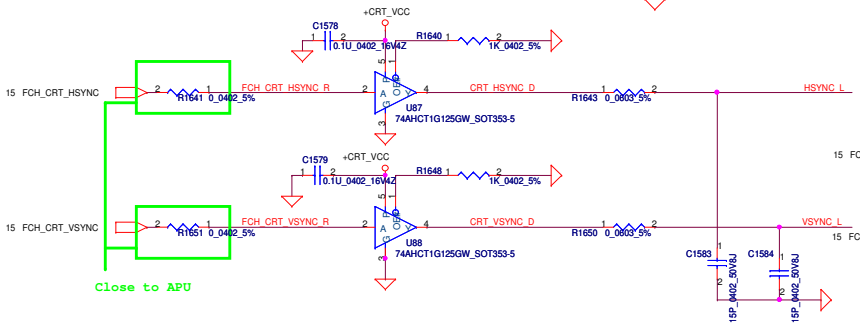
Title	LVDS Translator - RTD2132S		
Size: Custom	Document Number: QBL60 LA-7552P		Rev: 0.03
Date: Tuesday, February 22, 2011	Sheet 26 of 49		

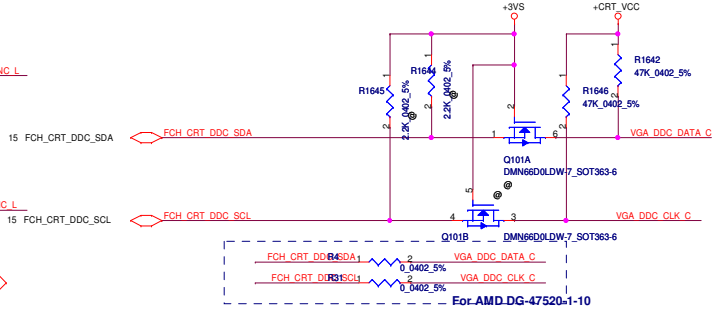
CRT

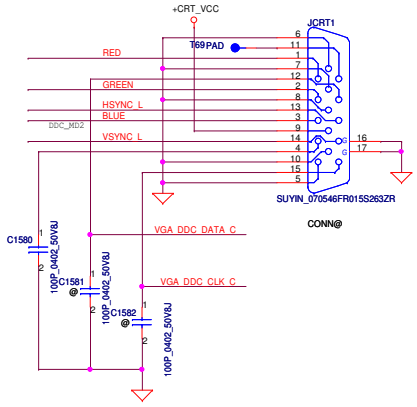




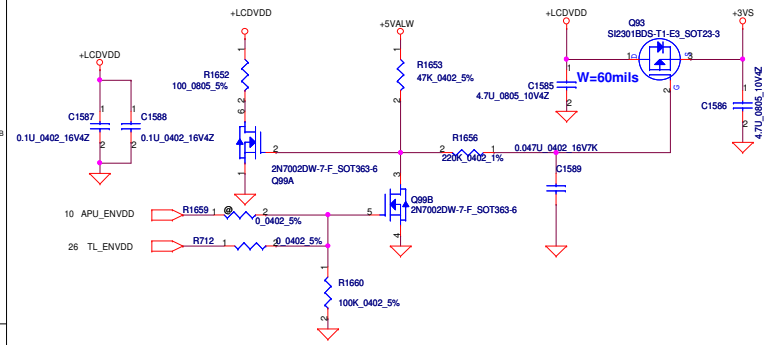


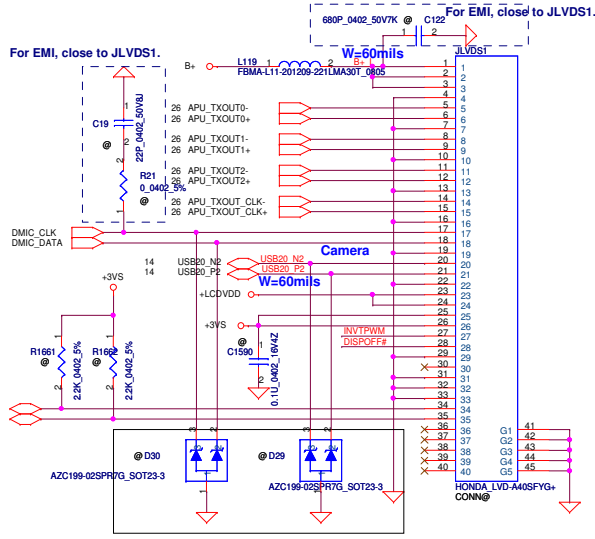




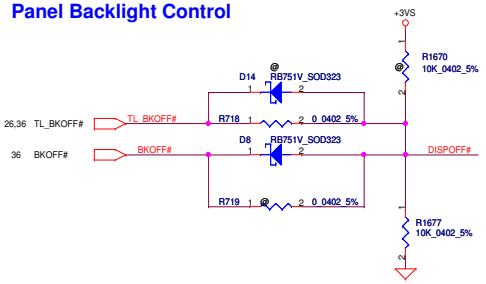


Panel LCDVDD Control

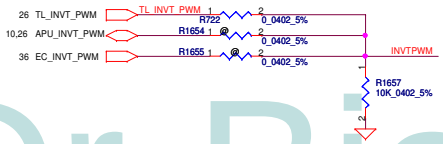




Panel Backlight Control

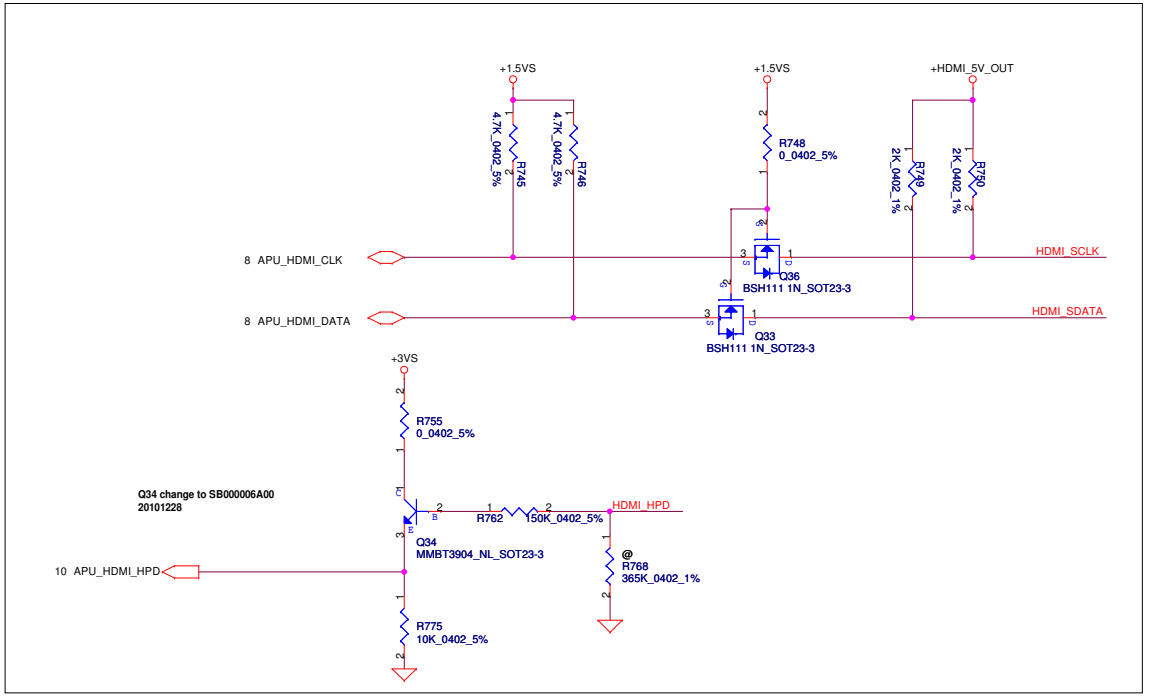


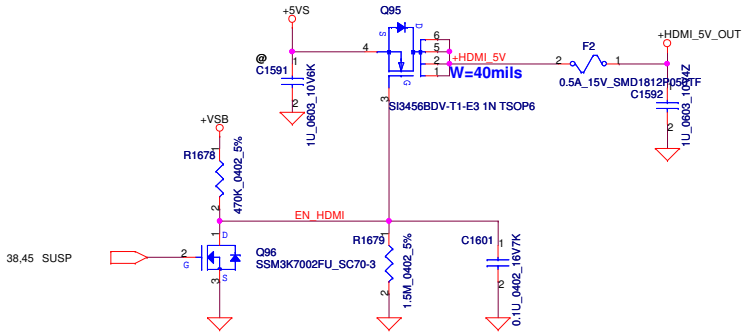
Panel PWM Control

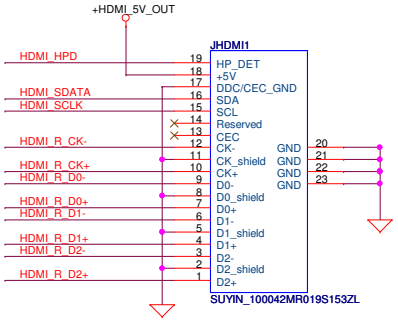


Security Classification	Compal Secret Data		
Issued Date	2010/06/30	Deciphered Date	2012/06/30

Compal Electronics, Inc.			
Title	P10-LVDS/CRT CONN		
Size C	Document Number QBL60 LA-7552P		Rev 0.03
Date: Tuesday, February 22, 2011	Sheet 27 of 49		



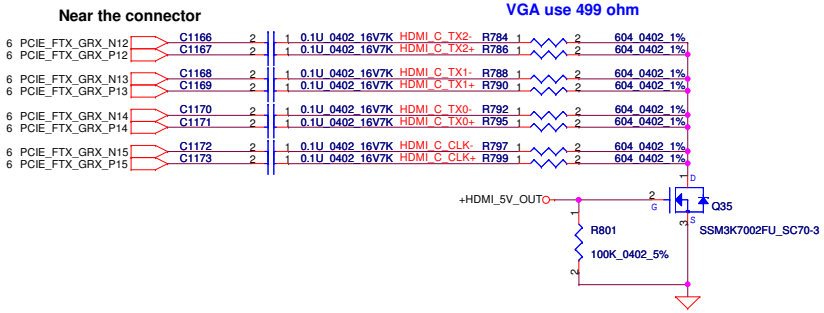


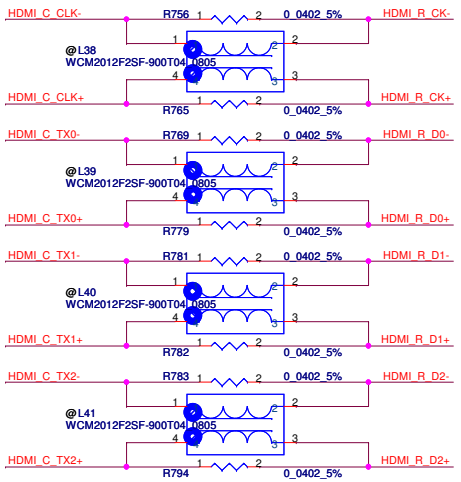


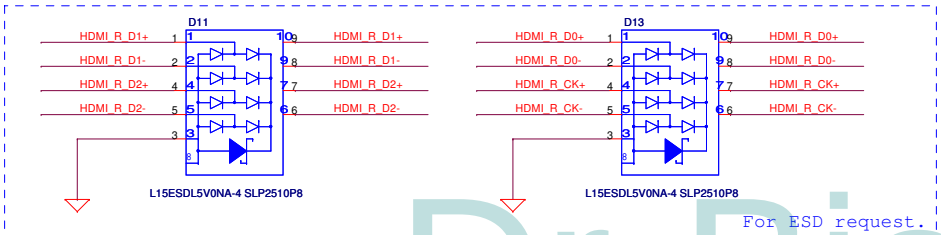
From APU

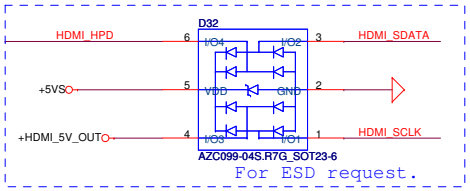
Near the connector

UMA use 604 ohm
VGA use 499 ohm









Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

Compal Electronics, Inc.

Title: HDMI Connector

Size	Document Number	Rev
Custom	QBL60 LA-7552P	0.03

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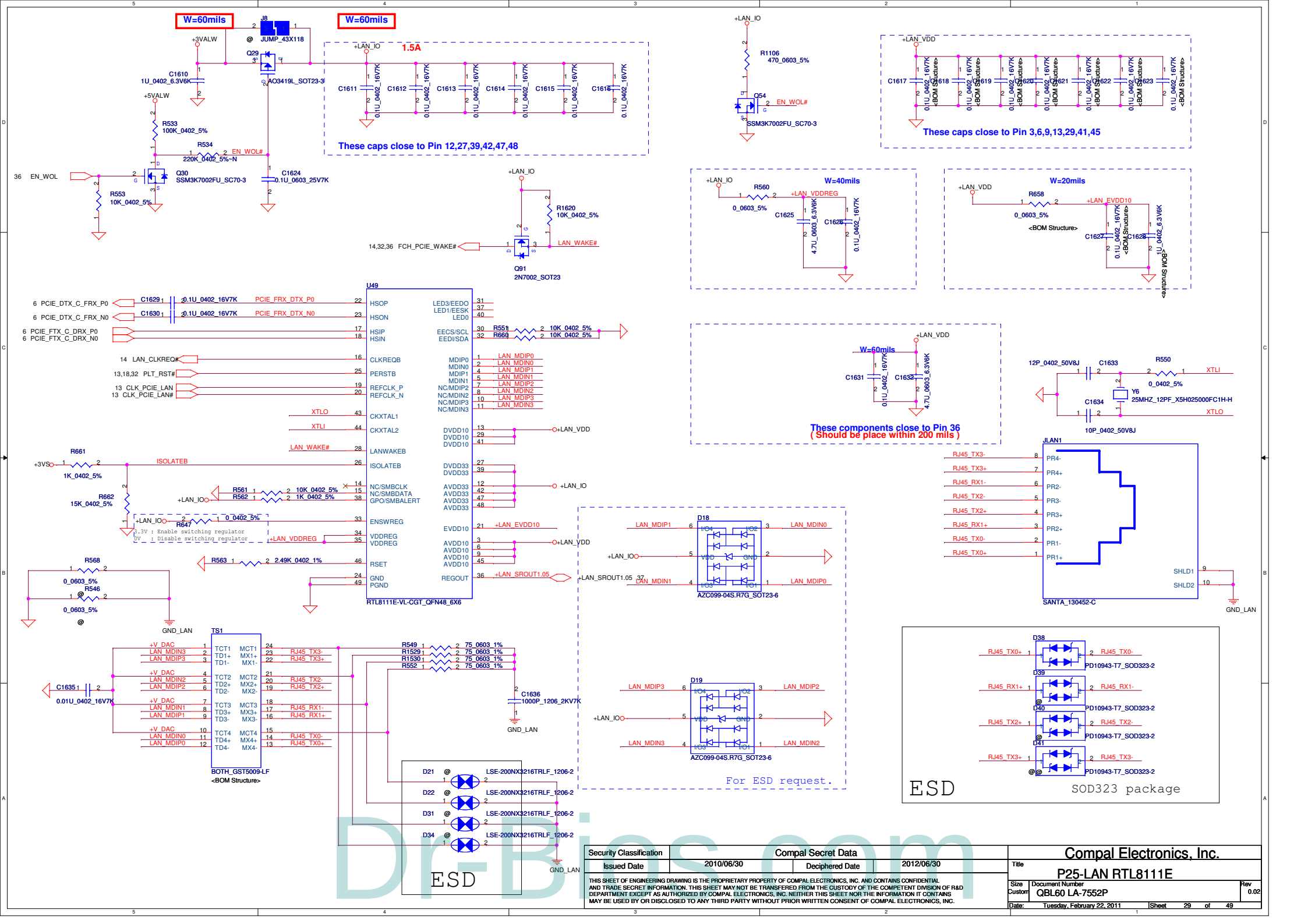
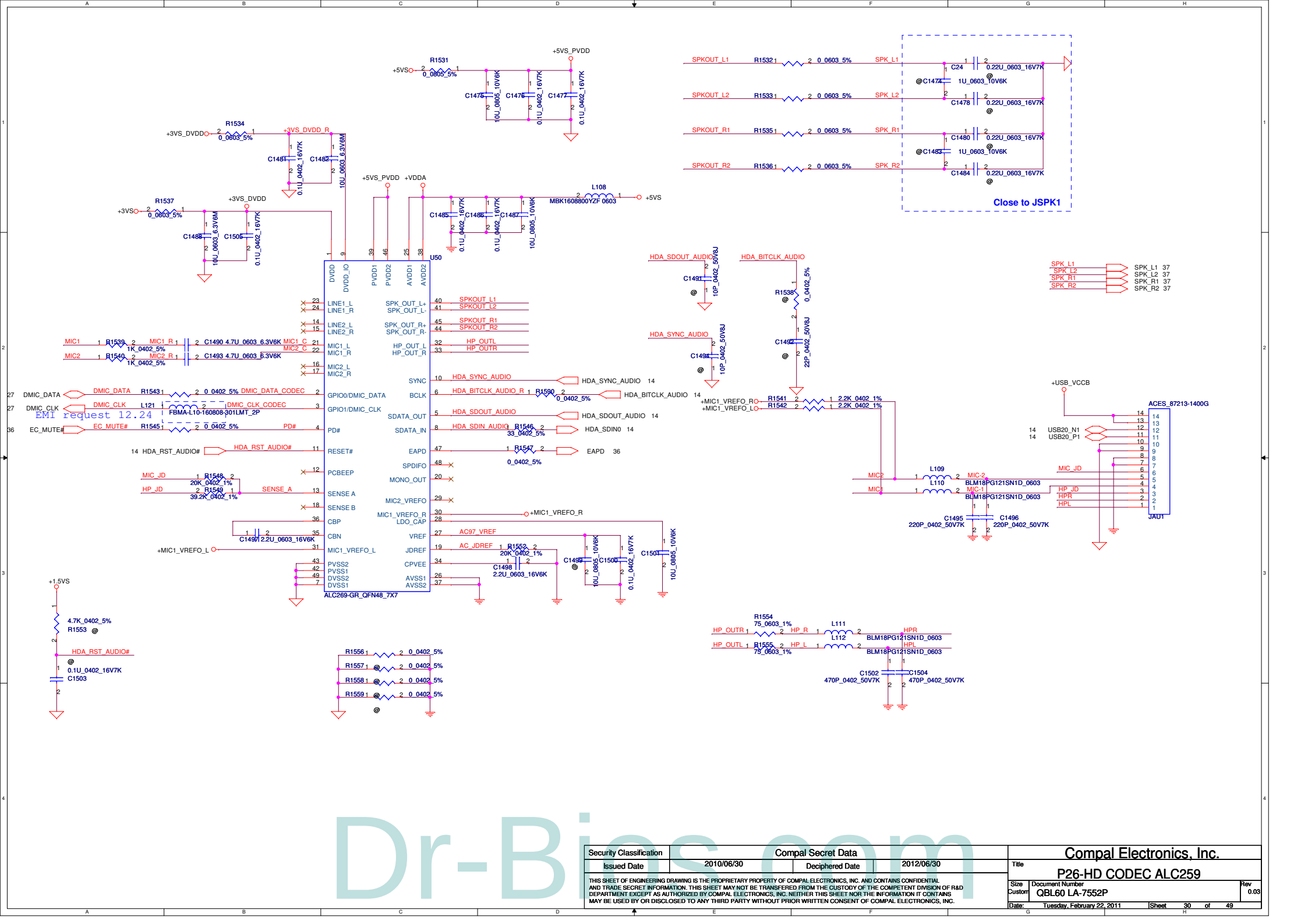


Security Classification	Compal Secret Data		
Issued Date	2010/06/30	Deciphered Date	2012/06/30

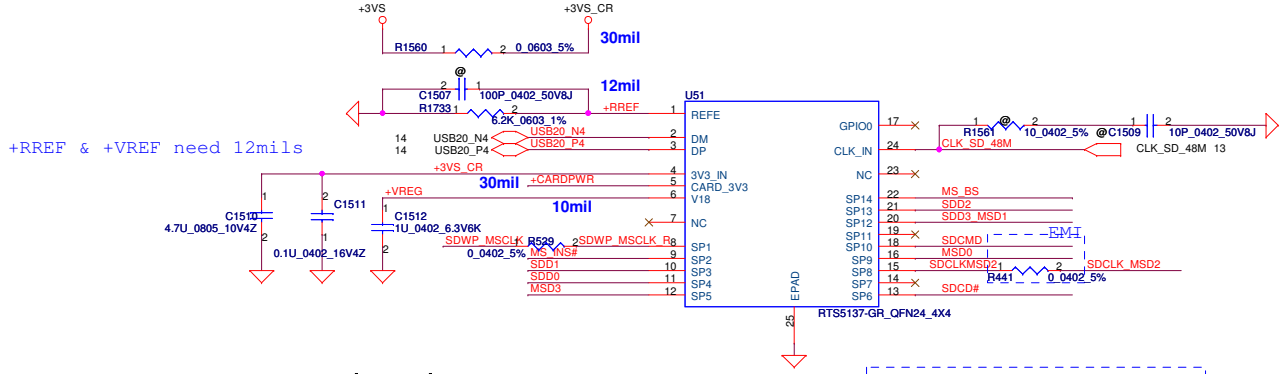
Compal Electronics, Inc.	
Title	P25-LAN RTL8111E
Size: Custom	Document Number: QBL60 LA-7552P
Rev	0.02
Date: Tuesday, February 22, 2011	Sheet 29 of 49



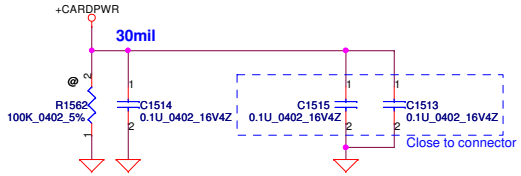
Security Classification	Compal Secret Data		
Issued Date	2010/06/30	Deciphered Date	2012/06/30

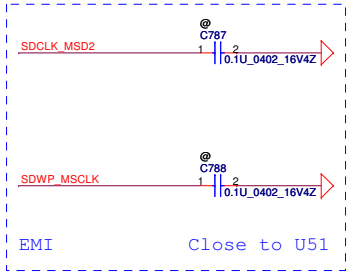
Compal Electronics, Inc.			
Title	P26-HD CODEC ALC259		
Size: Custom	Document Number: QBL60 LA-7552P		Rev: 0.03
Date: Tuesday, February 22, 2011	Sheet 30 of 49		

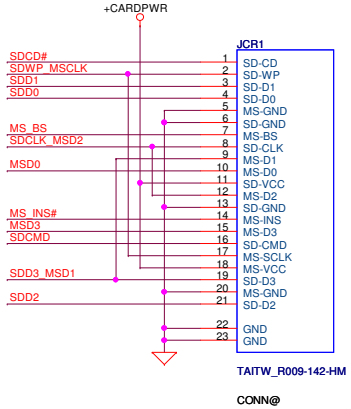
Card Reader RTS5137
(only SD/MMC/MS function)



Card Reader Connector







Security Classification	Compal Secret Data		
Issued Date	2010/06/30	Deciphered Date	2012/06/30

Compal Electronics, Inc.

Title: P27-RTS5137 Media Card Controller

Size	Document Number	Rev
Custom	QBL60 LA-7552P	0.03

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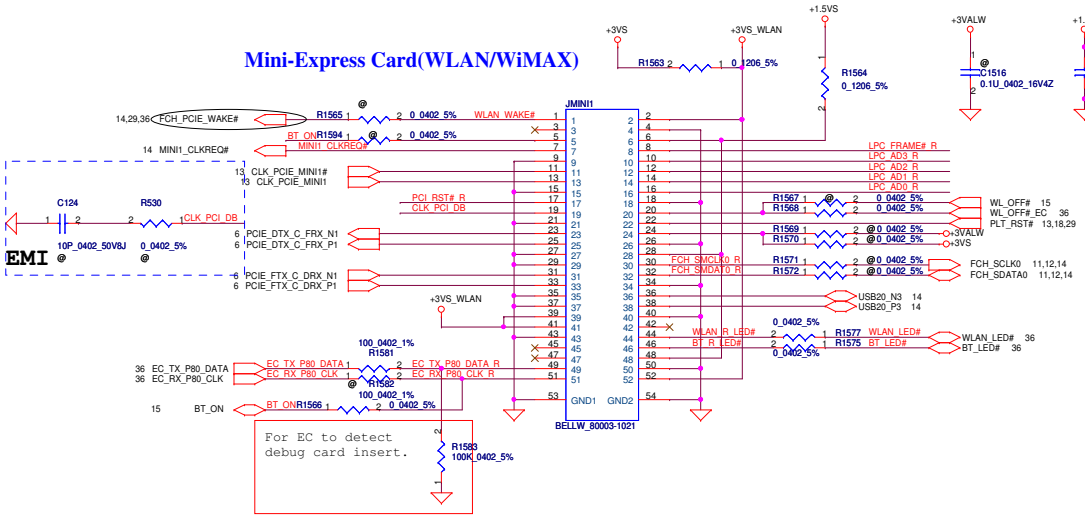
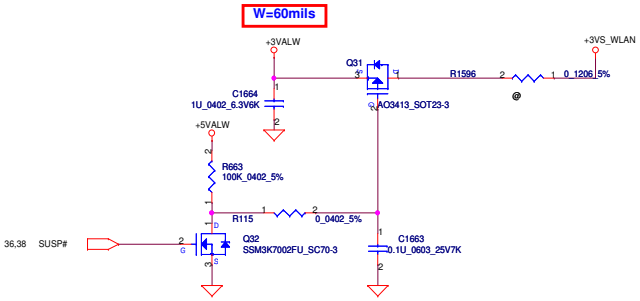
Mini-Express Card for WLAN/WiMAX(Half)

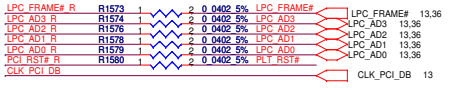
Mini-Express Card(WLAN/WiMAX)



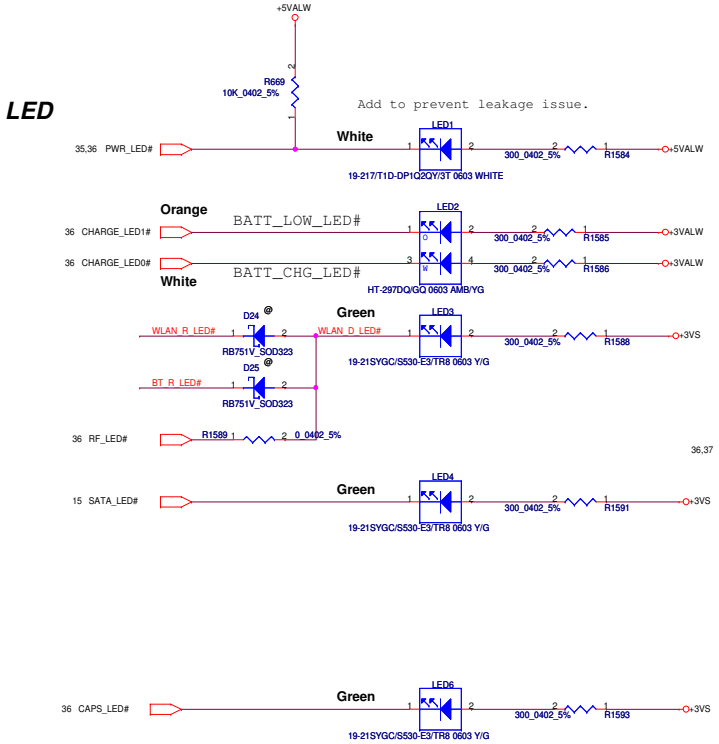
W=60mils

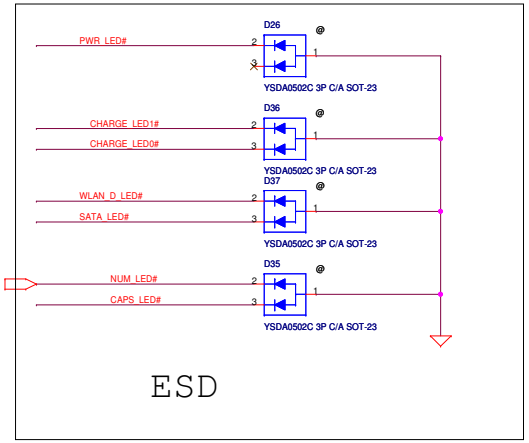


Reserve for SW mini-pcie debug card.
Series resistors closed to KBC side.



LED

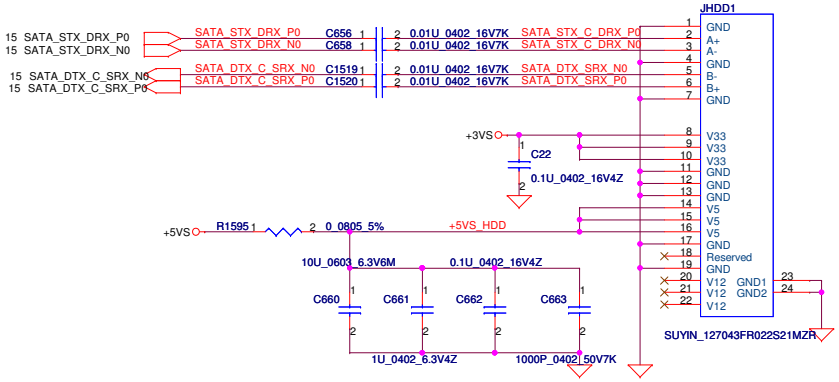




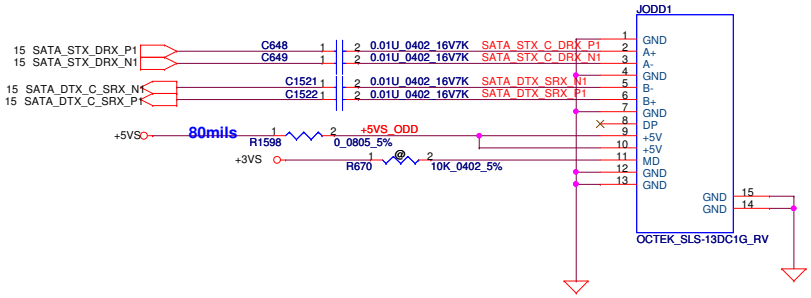
Security Classification	Compal Secret Data		
Issued Date	2010/06/30	Deciphered Date	2012/06/30

Compal Electronics, Inc.			
Title	P28-Mini PCIE/LED		
Size	Document Number		Rev
	QBL60 LA-7552P		0.03
Date:	Tuesday, February 22, 2011	Sheet	32 of 49

SATA HDD Conn.

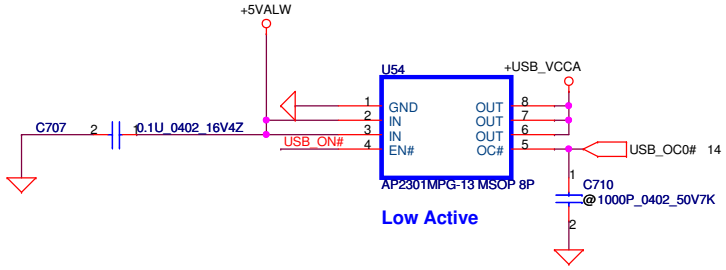


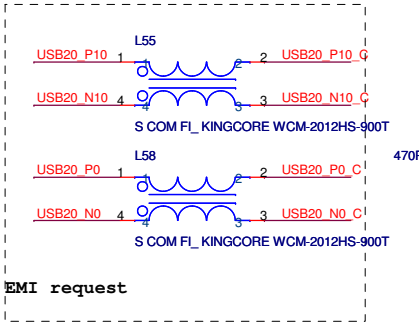
SATA ODD FFC Conn.



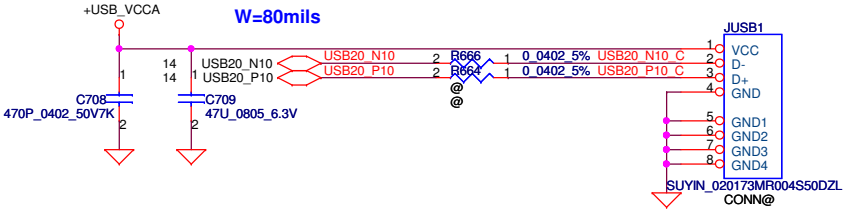
Security Classification	Compal Secret Data		
Issued Date	2010/06/30	Deciphered Date	2012/06/30

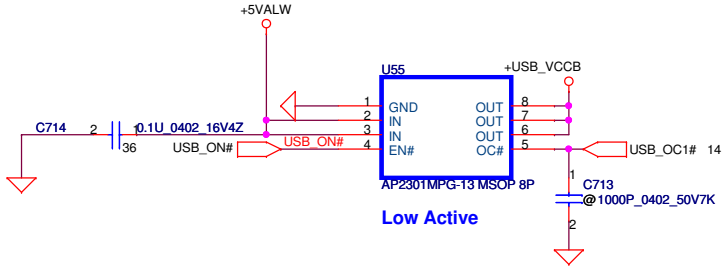
Compal Electronics, Inc.		
Title	P29-HDD & ODD CONN	
Size B	Document Number QBL60 LA-7552P	Rev 0.03
Date: Tuesday, February 22, 2011	Sheet 33 of 49	



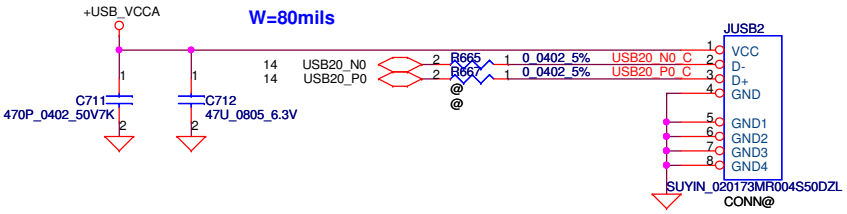


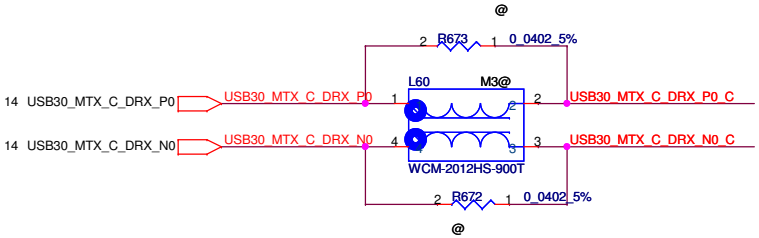
Left USB Conn.

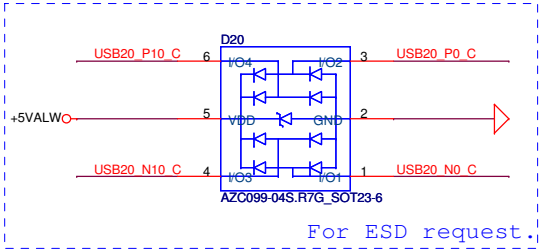


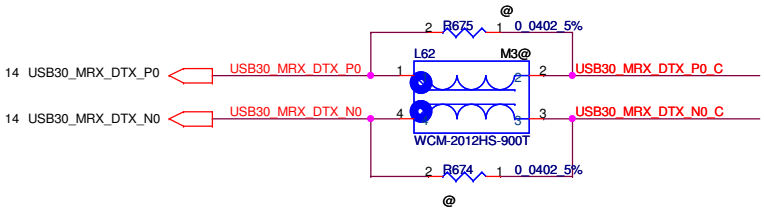


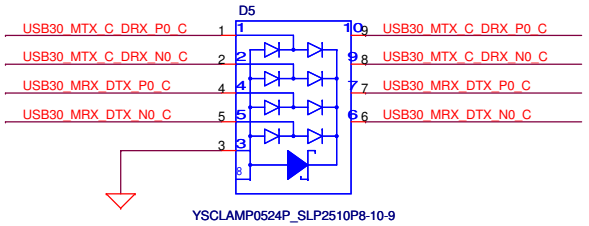
Left USB Conn.







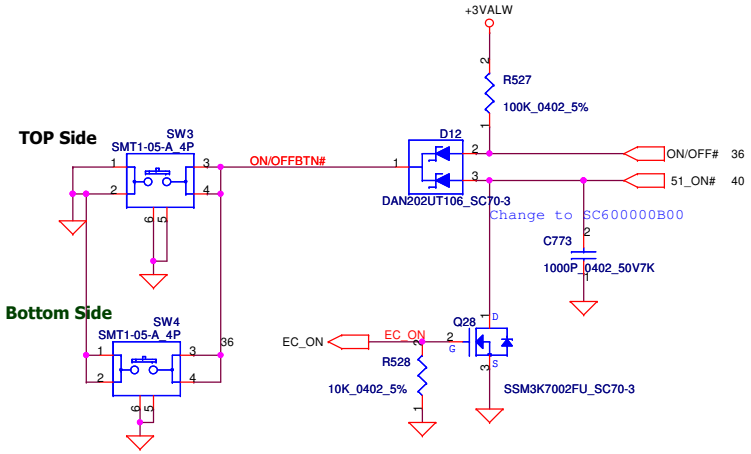


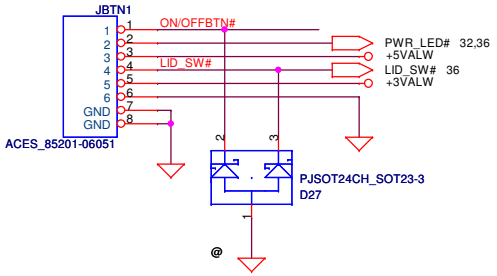


Security Classification	Compal Secret Data		
Issued Date	2010/06/30	Deciphered Date	2012/06/30

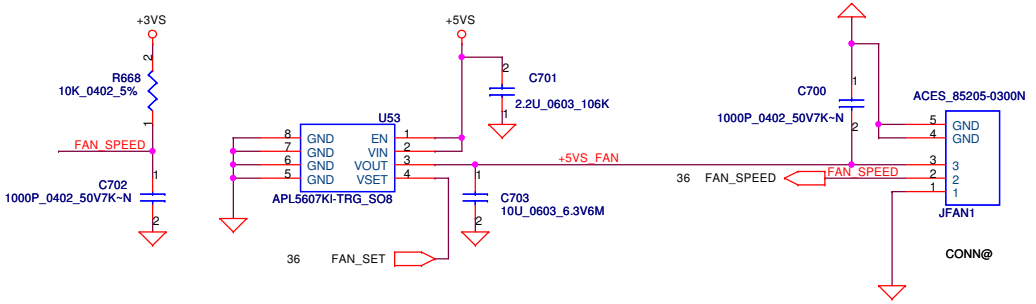
Compal Electronics, Inc.			
Title	P32-USB/BT/USBsub		
Size: Custom	Document Number: QBL60 LA-7552P		Rev: 0.03
Date: Tuesday, February 22, 2011	Sheet 34 of 49		

ON/OFF switch **Power Button**

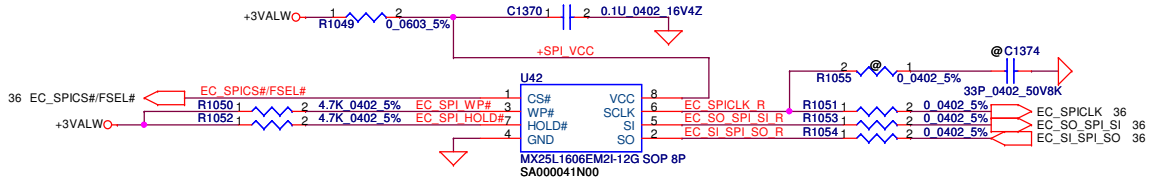




Fan Control Circuit



EC BIOS ROM



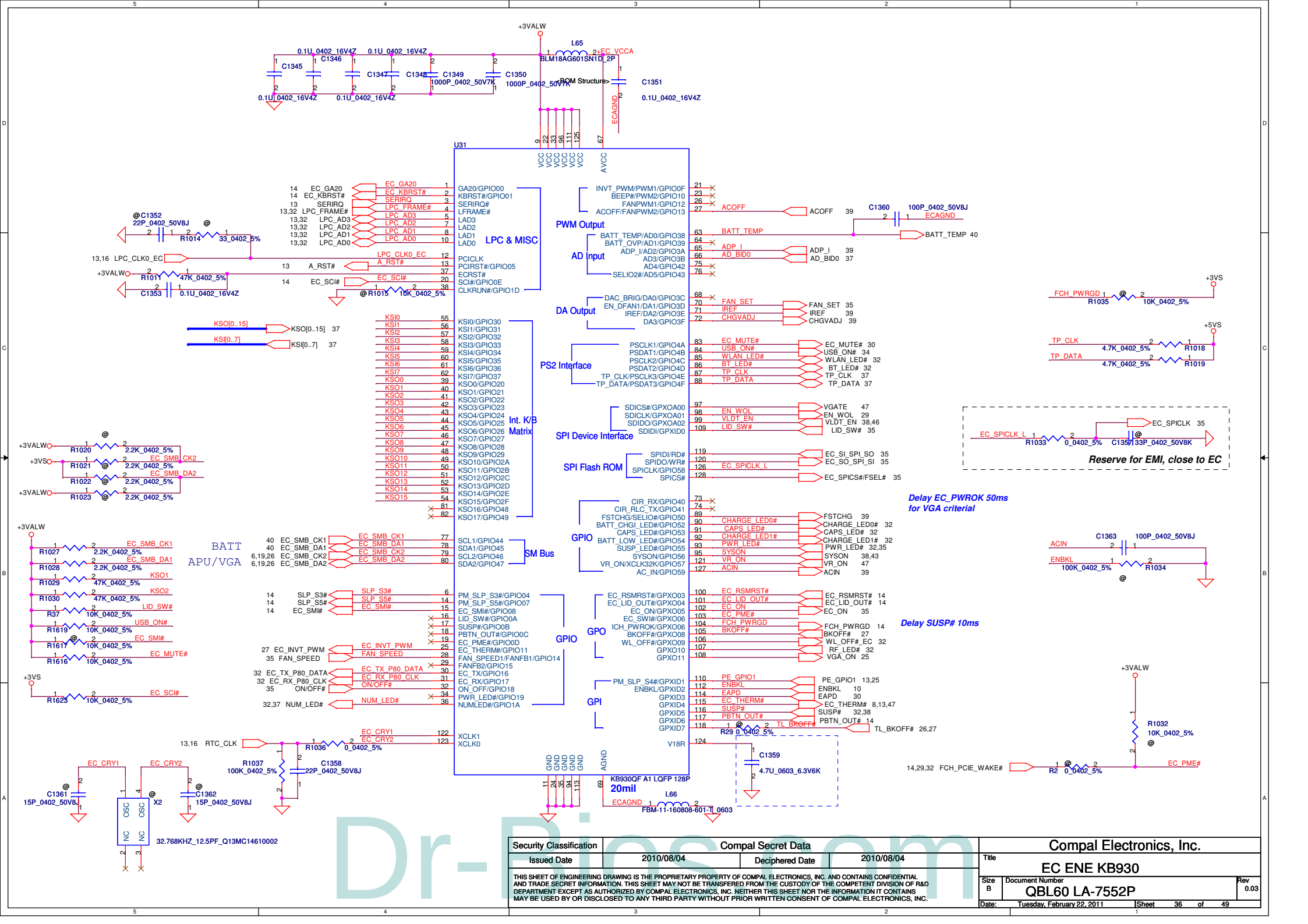
Security Classification	Compal Secret Data		
Issued Date	2010/06/30	Deciphered Date	2012/06/30

Compal Electronics, Inc.

Title: P31-KB /SW/TP/Lid

Size: B | Document Number: QBL60 LA-7552P | Rev: 0.03

Date: Tuesday, February 22, 2011 | Sheet 35 of 49



Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

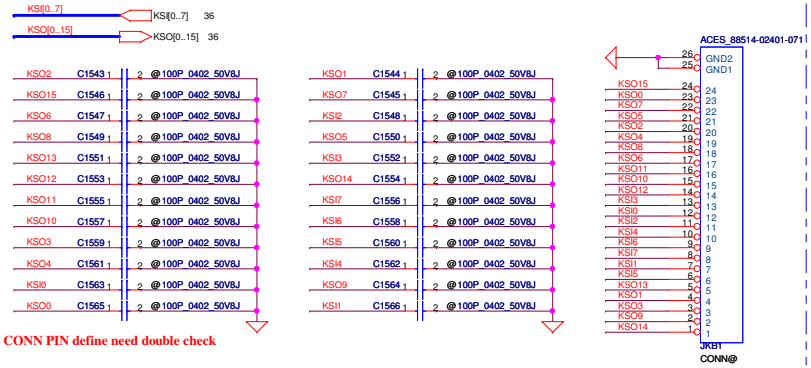
Compal Electronics, Inc.

Title: EC ENE KB930

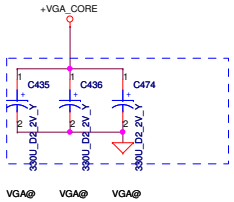
Size	Document Number	Rev
B	QBL60 LA-7552P	0.03

Date: Tuesday, February 22, 2011 Sheet 36 of 49

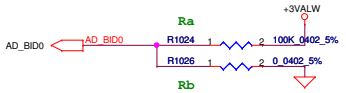
INT_KBD Conn.



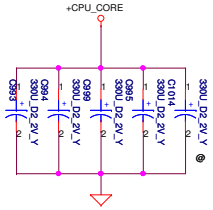
CONN PIN define need double check



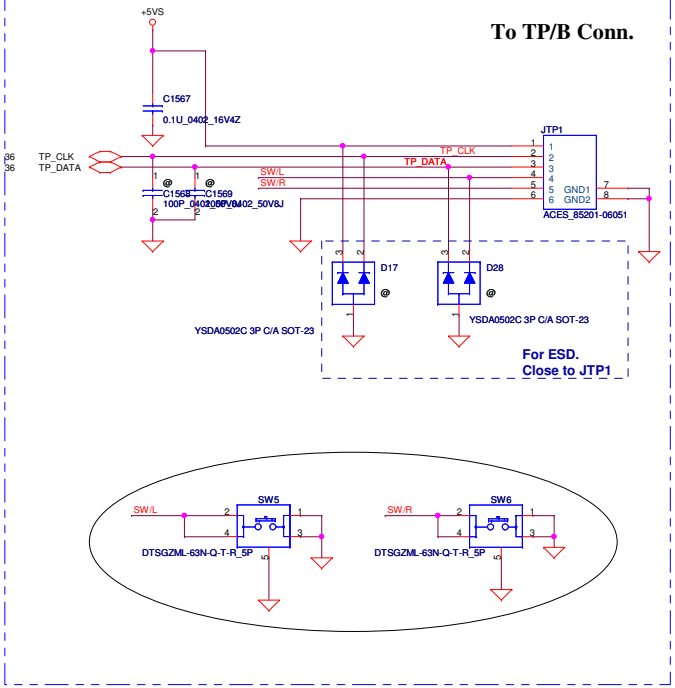
ID	BRD ID	Ra	Rb	Vab
0	R01 SR	100K	0	0V
1	R02 ER	100K	8.2K	0.25V
2	R03 PR	100K	18K	0.5V
3	R10 MP	100K	33K	0.82V

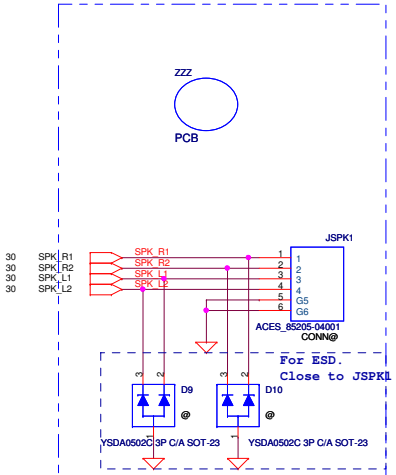


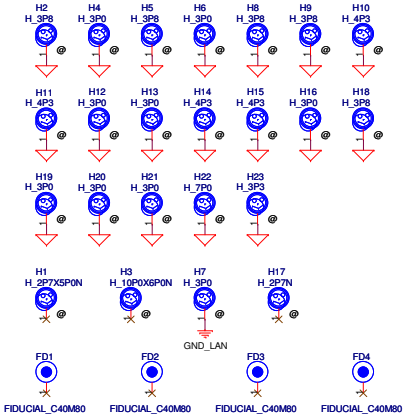
P9 FS1 PWR/GND

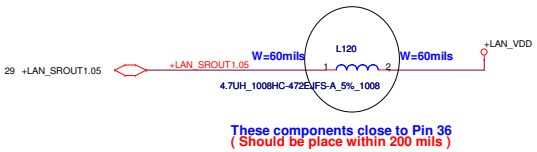


To TP/B Conn.

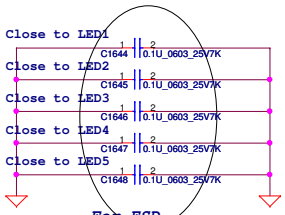








These components close to Pin 36
(Should be place within 200 mils)



For ESD.
Cap to LED gap is 1.2mm.

Security Classification	Compal Secret Data		
Issued Date	2010/11/25	Deciphered Date	2011/12/31

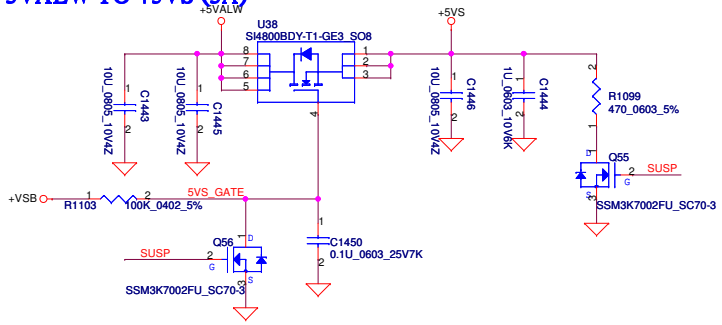
Compal Electronics, Inc.

Title: P33-Other IO/USB (right)

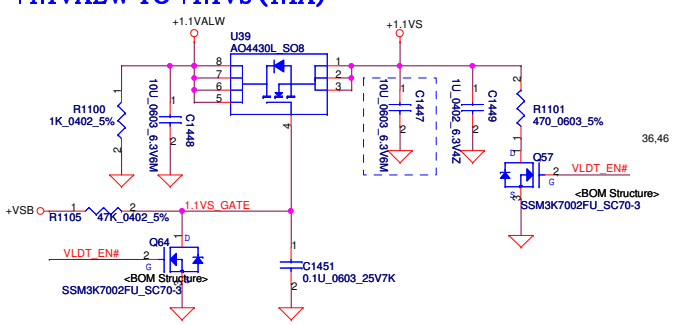
Size: Custom | Document Number: QBL50 LA-7551P | Rev: 0.02

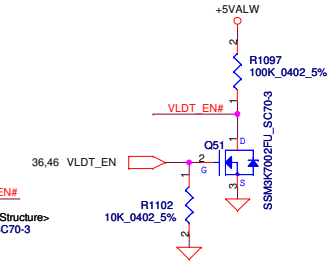
Date: Tuesday, February 22, 2011 | Sheet 37 of 49

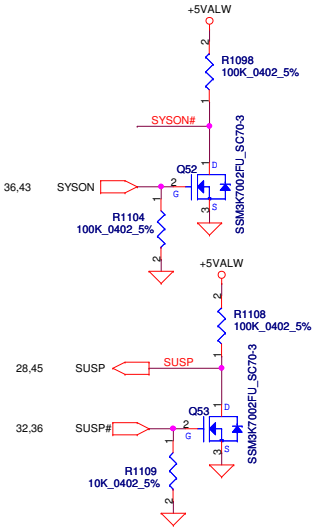
+5VALW TO +5VS (5A)



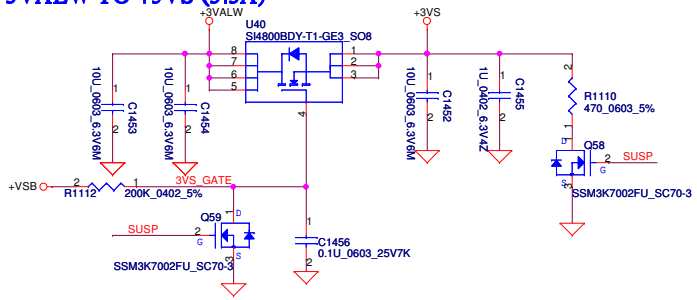
+1.1VALW TO +1.1VS (1.1A)



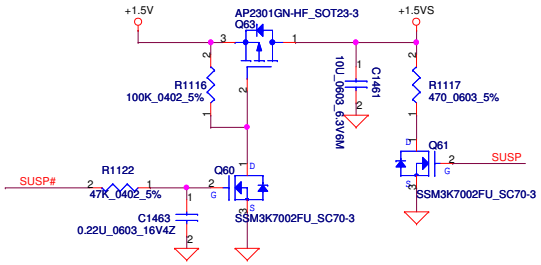




+3VALW TO +3VS (3.3A)

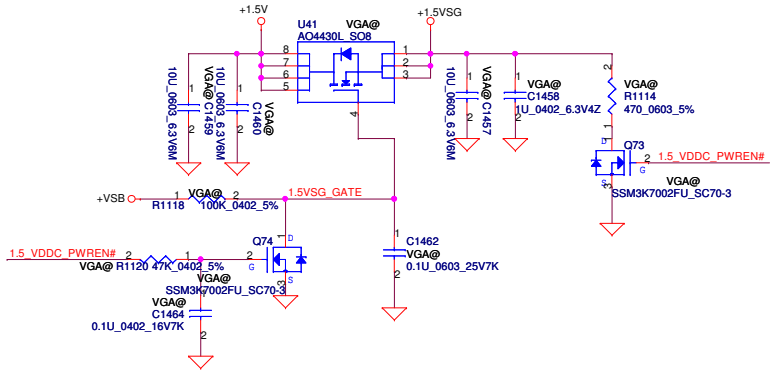


+1.5V TO +1.5VS (1.5A)

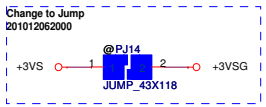


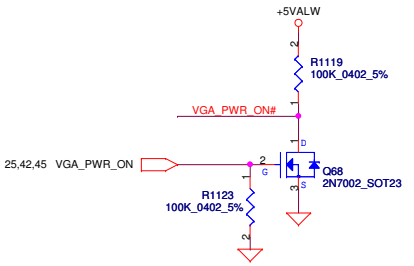
VGA Power

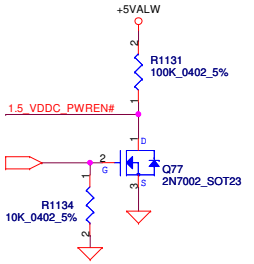
+1.5V to +1.5VSG (1.5A)

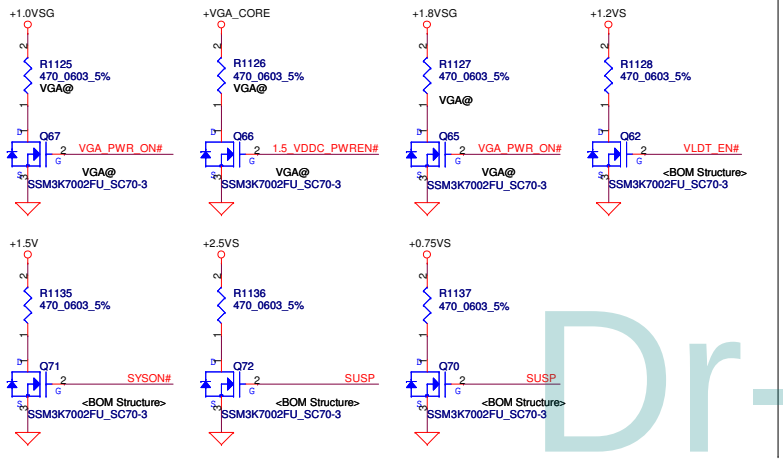


+3VS to +3VSG (3.3A)



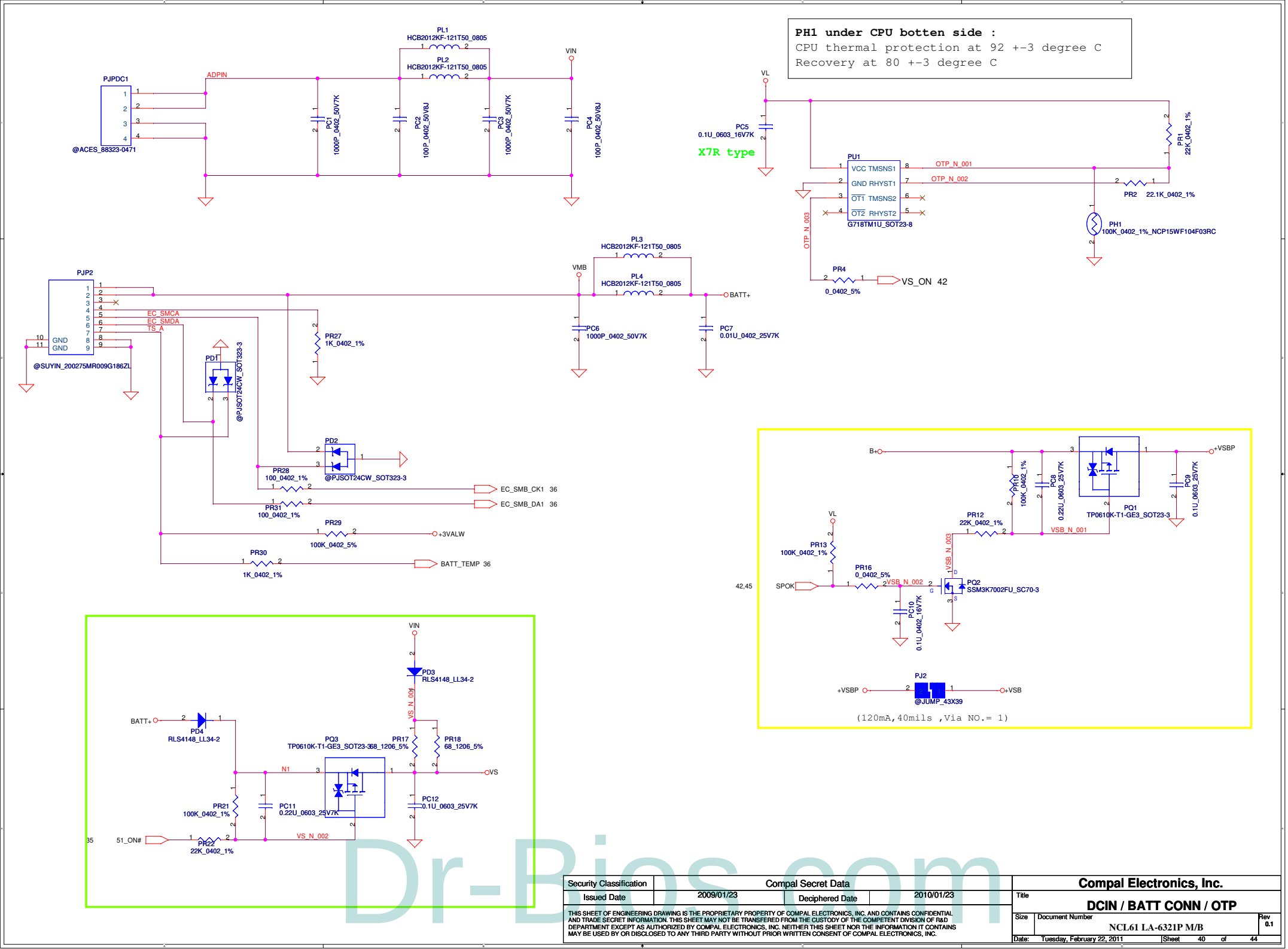






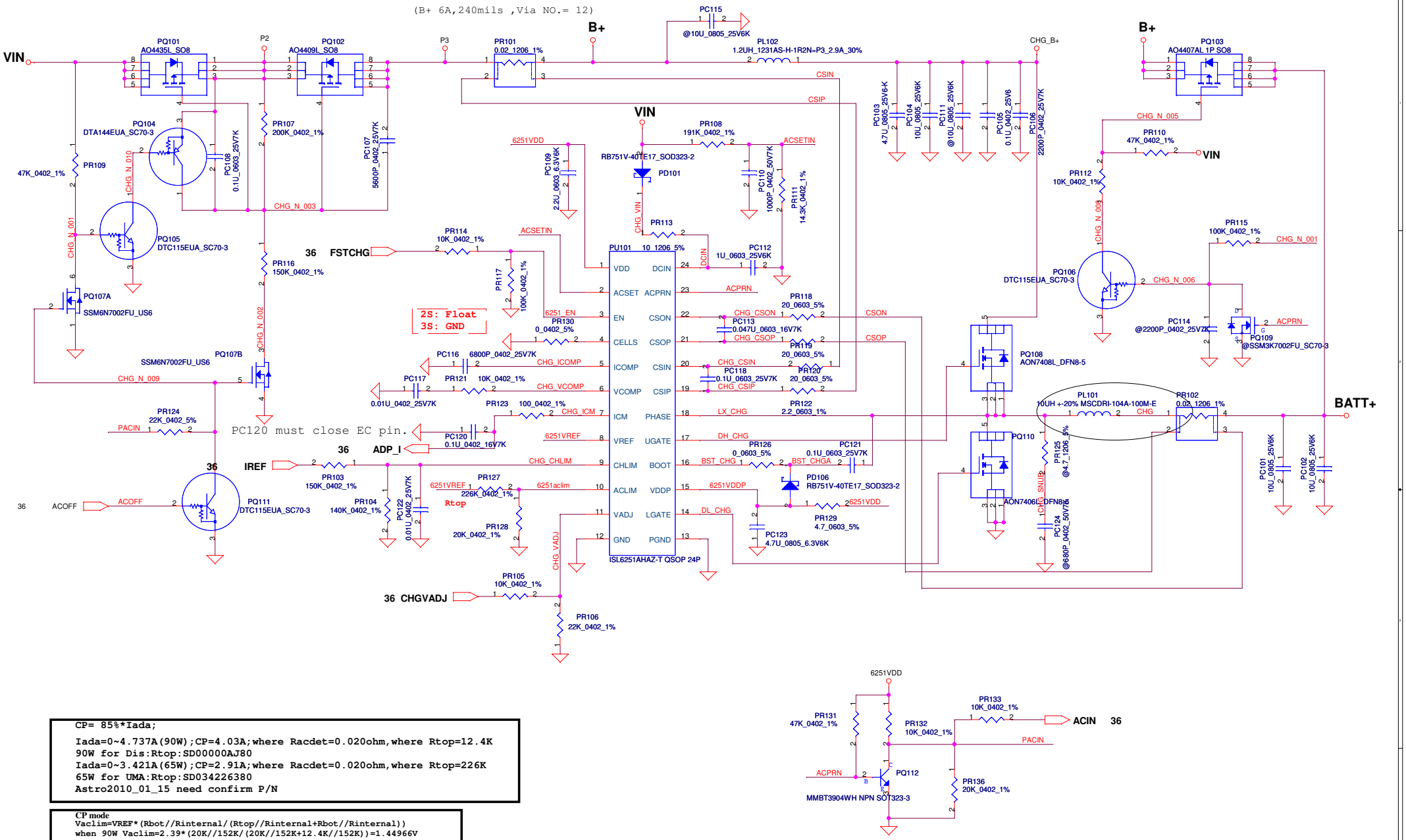
Security Classification	Compal Secret Data		
Issued Date	2010/08/04	Deciphered Date	2010/08/04

Compal Electronics, Inc.			
Title	DC Interface		
Size B	Document Number QBL60 LA-7552P		Rev 0.03
Date: Tuesday, February 22, 2011	Sheet 38 of 49		



Security Classification	Compal Secret Data		
Issued Date	2009/01/23	Deciphered Date	2010/01/23

Compal Electronics, Inc.			
Title	DCIN / BATT CONN / OTP		
Size	Document Number		Rev
	NCL61 LA-6321P M/B		0.1
Date:	Tuesday, February 22, 2011	Sheet	40 of 44



CP= 85%*Iada;

Iada=0~4.737A(90W);CP=4.03A;where Racdet=0.020ohm,where Rtop=12.4K
90W for Dis:Rtop:SD00000AJ80
Iada=0~3.421A(65W);CP=2.91A;where Racdet=0.020ohm,where Rtop=226K
65W for UMA:Rtop:SD034226380
Astro2010_01_15 need confirm P/N

CP mode
Vaclim=VREF*(Rbot//Rinternal/(Rtop//Rinternal+Rbot//Rinternal))
when 90W Vaclim=2.39*(20K//152K/(20K//152K+12.4K//152K))=1.44966V
when 65W Vaclim=2.39*(20K//152K/(20K//152K+226K//152K))=0.38914V
Iinput=(1/Racdet)*((0.05*Vaclim/VREF+0.05))
when 90W,Iinput=(1/0.02)*(0.05*1.44966/2.39+0.05)=4.02A
when 65W,Iinput=(1/0.02)*(0.05*0.38914/2.39+0.05)=2.92A

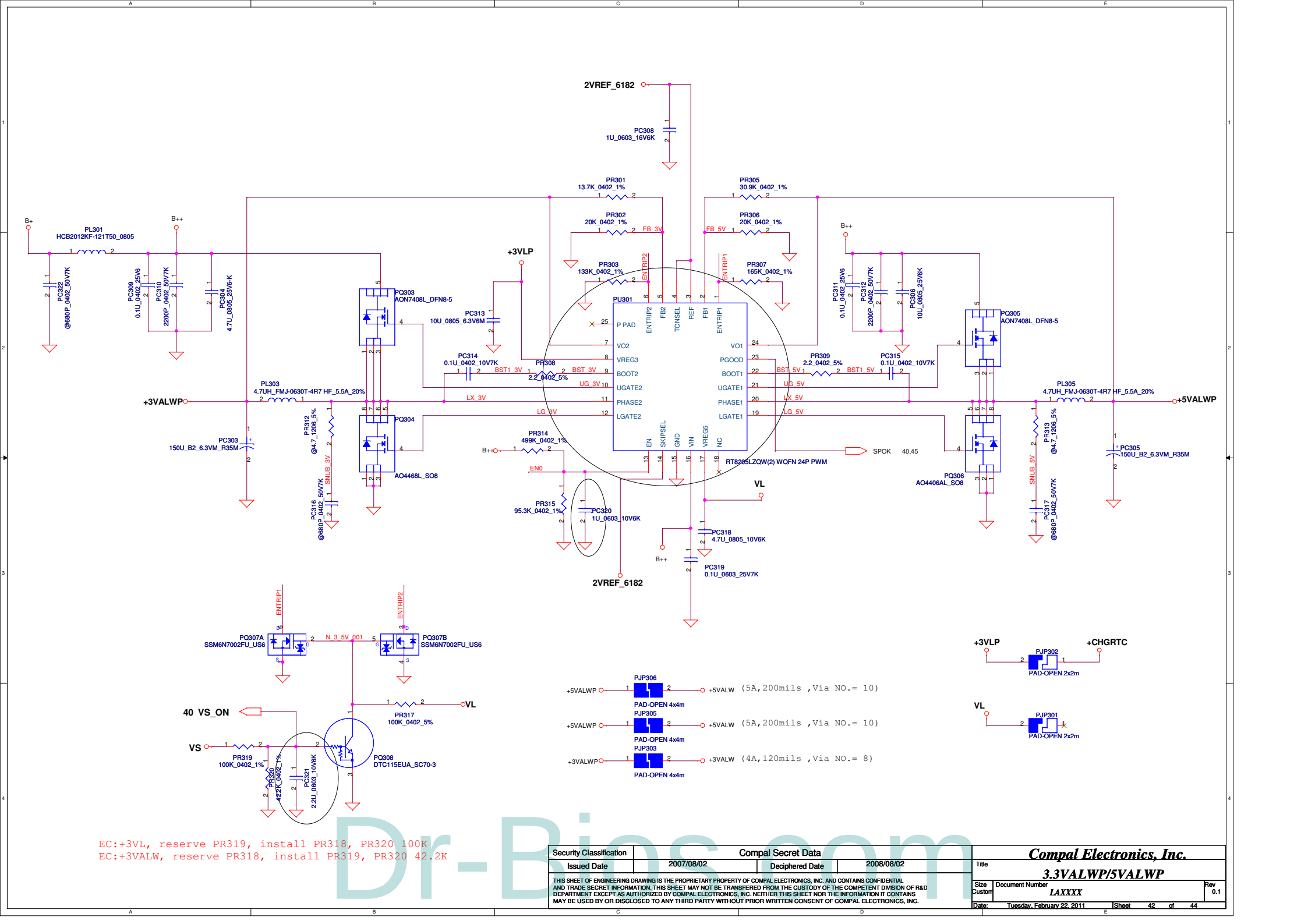
CC=0.25A~3A
IREF=1.016*Icharge
IREF=0.254V~3.048V
VCHLIM need over 95mV

CHGVADJ=(Vcell-4)/0.10627

Vcell	CHGVADJ
4V	0V
4.2V	1.882V

Security Classification	Compal Secret Data		
Issued Date	2009/01/23	Deciphered Date	2010/01/23

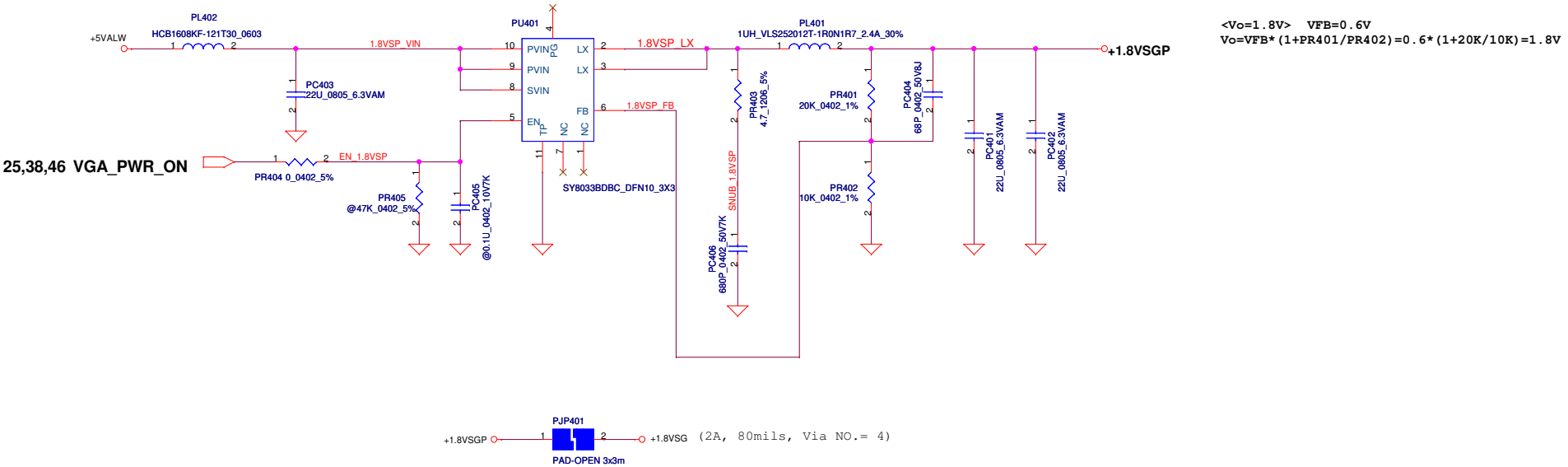
Compal Electronics, Inc.			
Title	CHARGER		
Size	Document Number	NCL61 LA-6321P M/B	Rev 0.1
Date: Tuesday, February 22, 2011	Sheet 41 of 44		



EC:+3VL, reserve PR319, install PR318, PR320 100K
EC:+3VALW, reserve PR318, install PR319, PR320 42.2K

Security Classification	Compal Secret Data		
Issued Date	2007/08/02	Deciphered Date	2008/08/02

Compal Electronics, Inc.			
Title	3.3VALWP/5VALWP		
Size: Custom	Document Number: LAXXXX		Rev: 0.1
Date: Tuesday, February 22, 2011	Sheet 42 of 44		



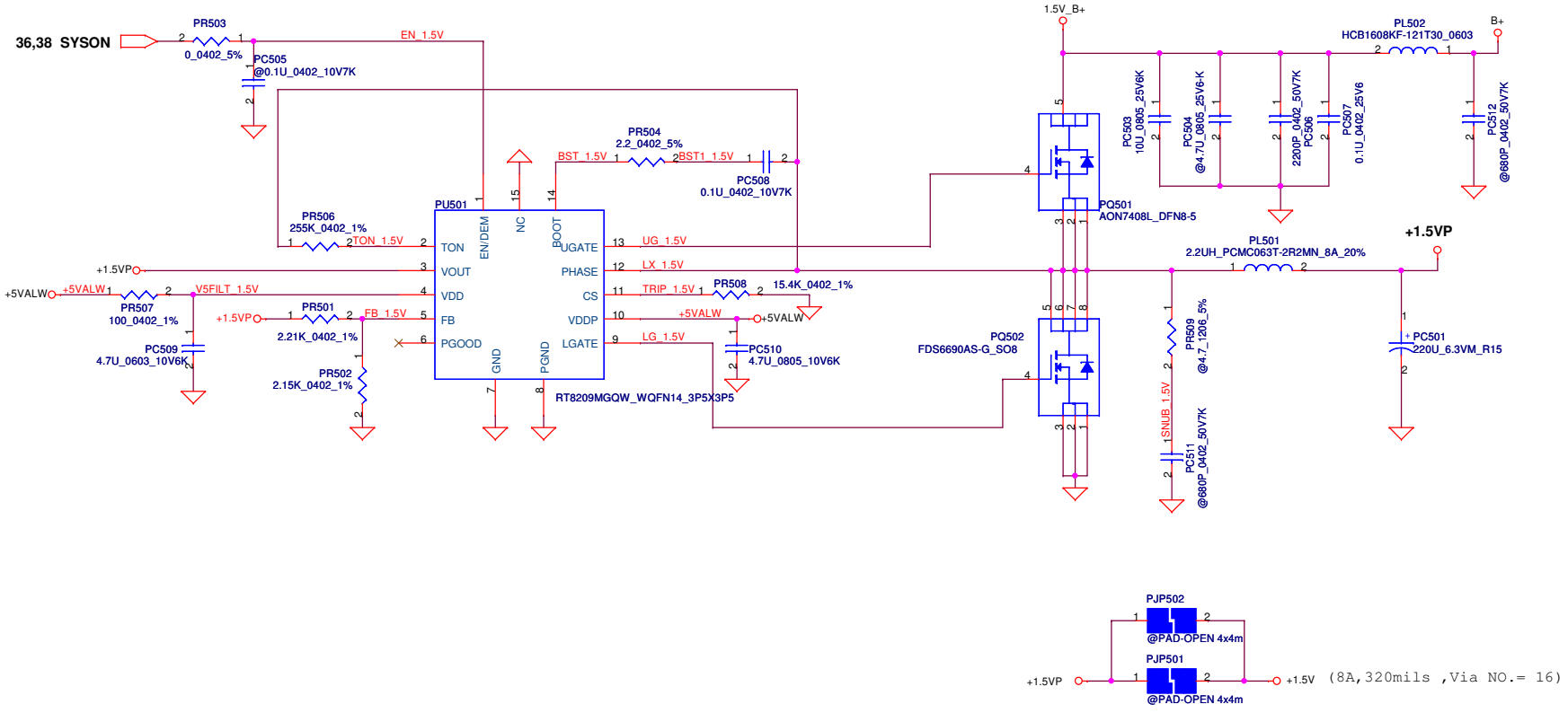
Security Classification	Compal Secret Data		
Issued Date	2009/01/23	Deciphered Date	2010/01/23

Compal Electronics, Inc.

Title: **+1.8VSGP**

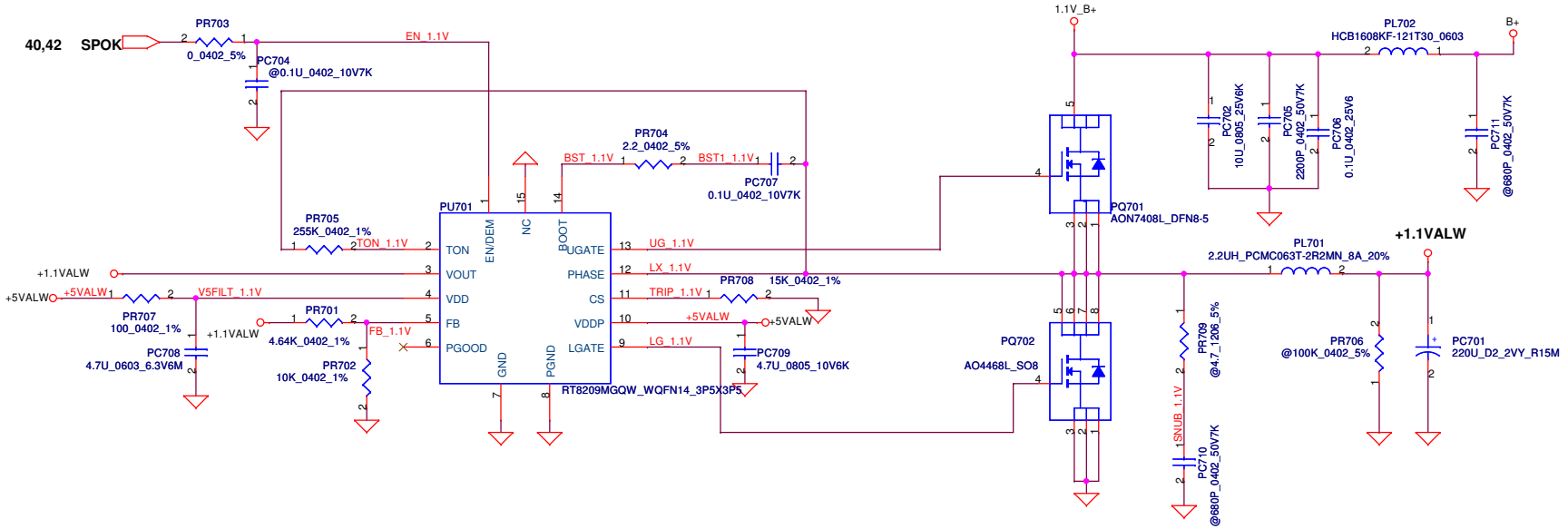
Size	Document Number	Rev
	NCL61 LA-6321P M/B	0.1

Date: Tuesday, February 22, 2011 | Sheet 43 of 44



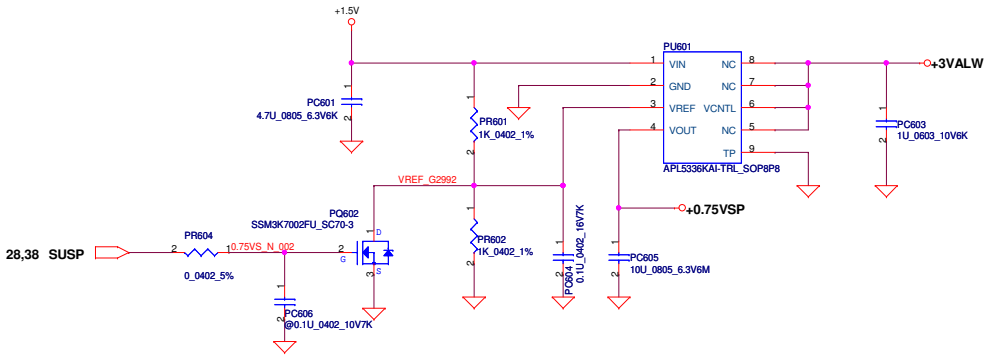
Security Classification	Compal Secret Data		
Issued Date	2007/05/29	Deciphered Date	2008/05/29

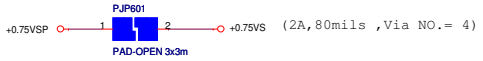
Compal Electronics, Inc.			
Title	+1.5VP		
Size	Document Number		Rev
	LAXXXX		0.1
Date:	Tuesday, February 22, 2011	Sheet	44 of 44

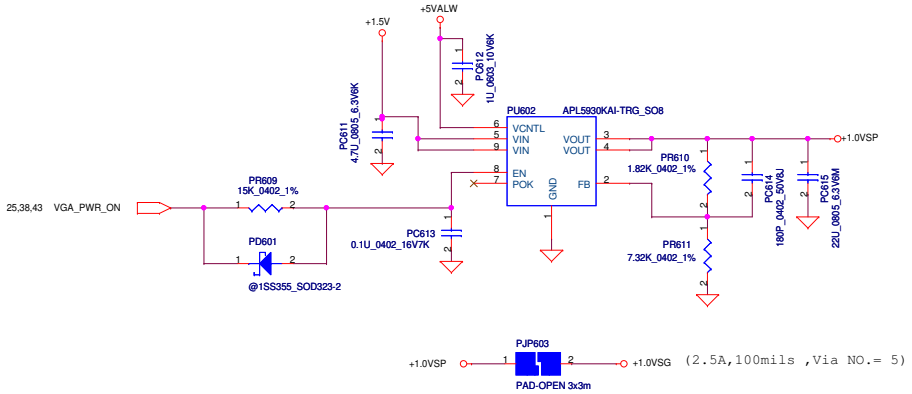


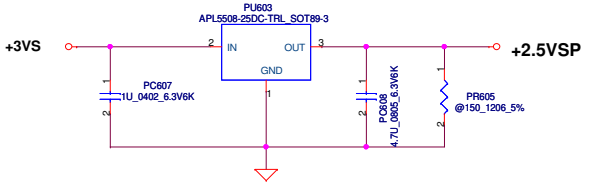
Security Classification	Compal Secret Data		
Issued Date	2009/12/01	Deciphered Date	2010/12/31

Compal Electronics, Inc.			
Title: PWR+1.1VALWP			
Size: Custom	Document Number: LAXXXX		Rev: 0.1
Date: Tuesday, February 22, 2011	Sheet 45 of 44		









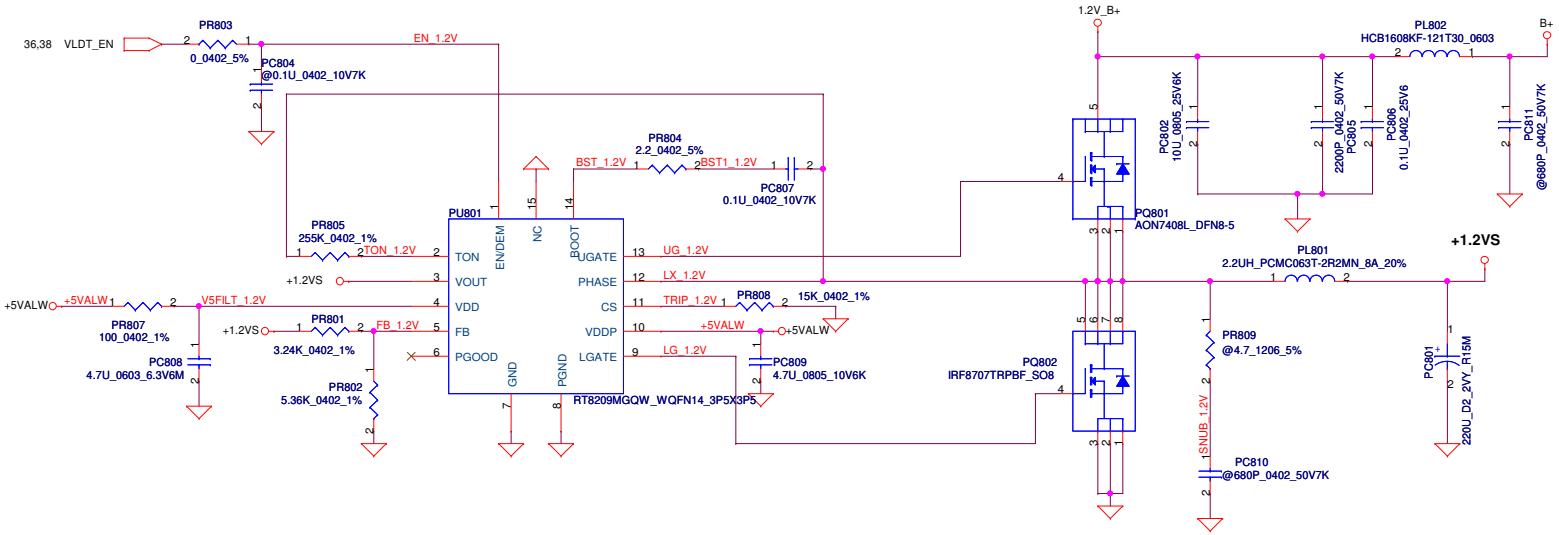
Security Classification	Compal Secret Data		
Issued Date	2006/11/23	Deciphered Date	2007/11/23

Compal Electronics, Inc.

Title: **PWR 0.75VSP/1.0VSP/2.5VSP**

Size	Document Number	Rev
	LAXXXX	0.1

Date: Tuesday, February 22, 2011 | Sheet 46 of 44



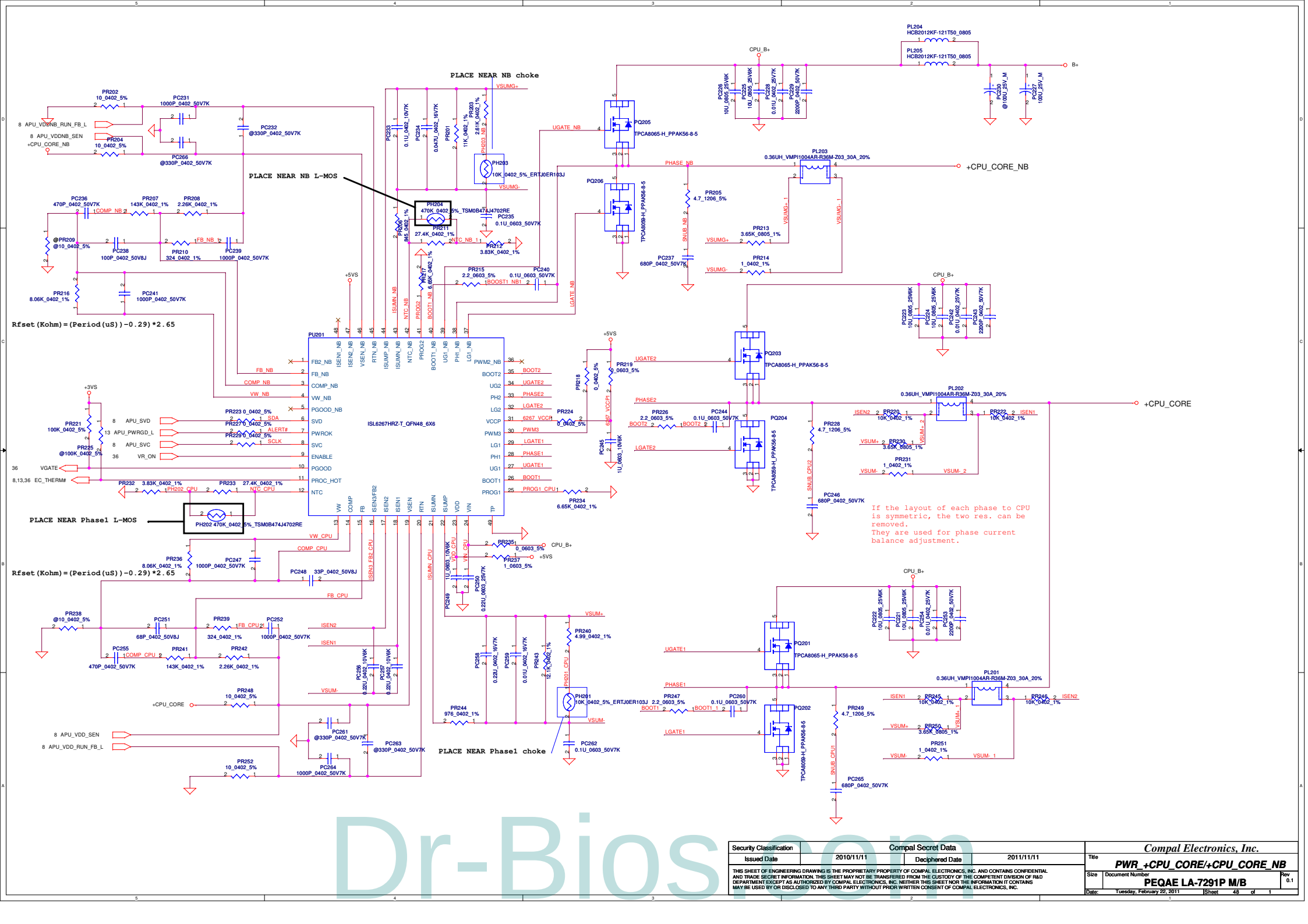
Security Classification	Compal Secret Data		
Issued Date	2009/01/23	Deciphered Date	2010/01/23

Compal Electronics, Inc.

Title: **+1.2VSP**

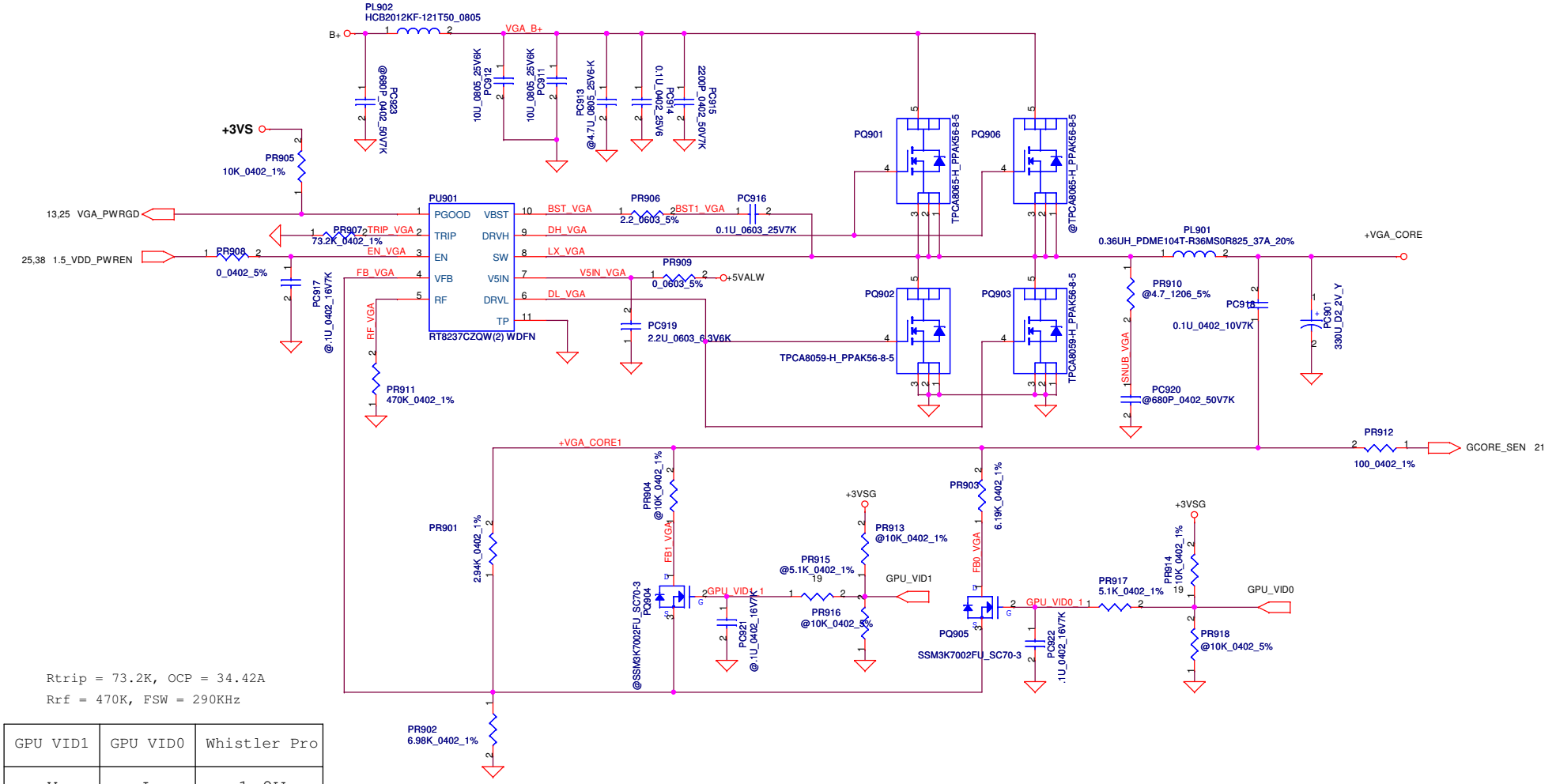
Size	Document Number	Rev
	NCL61 LA-6321P M/B	0.1

Date: Tuesday, February 22, 2011 | Sheet 47 of 44



Security Classification	Compal Secret Data		
Issued Date	2010/11/11	Deciphered Date	2011/11/11

Compal Electronics, Inc.			
Title	PWR_+CPU_CORE/+CPU_CORE_NB		
Size	Document Number	PEQAE LA-7291P M/B	Rev 0.1
Date: Tuesday, February 22, 2011	Sheet 48 of 1		



Rtrip = 73.2K, OCP = 34.42A

Rrf = 470K, FSW = 290KHz

GPU VID1	GPU VID0	Whistler Pro
X	L	1.0V
X	H	0.9V
H	L	
H	H	

Security Classification	Compal Secret Data		
Issued Date	2007/05/29	Deciphered Date	200810/11

Compal Electronics, Inc.		
Title: VGA_CORE		
Size	Document Number: LAXXXX	Rev: 0.1
Date: Tuesday, February 22, 2011	Sheet 49 of 44	

Item	Reason for change	PG#	Modify List	Date	Phase
1					
2					
3					
4					
5					
6					
7					