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Compal Confidential

ISKAE LA-3661P Schematics Document

Intel Yonah/Merom with 945GM/943GML/940GML+ DDRII + ICH7M

2006-12-22

REV: 0.1

Security Classification	Compal Secret Data		
Issued Date	2006/10/31	Deciphered Date	2009/11/13

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Title: Cover Sheet

Size | Document Number: ISKAE M/B LA-3661P | Rev: 0.1

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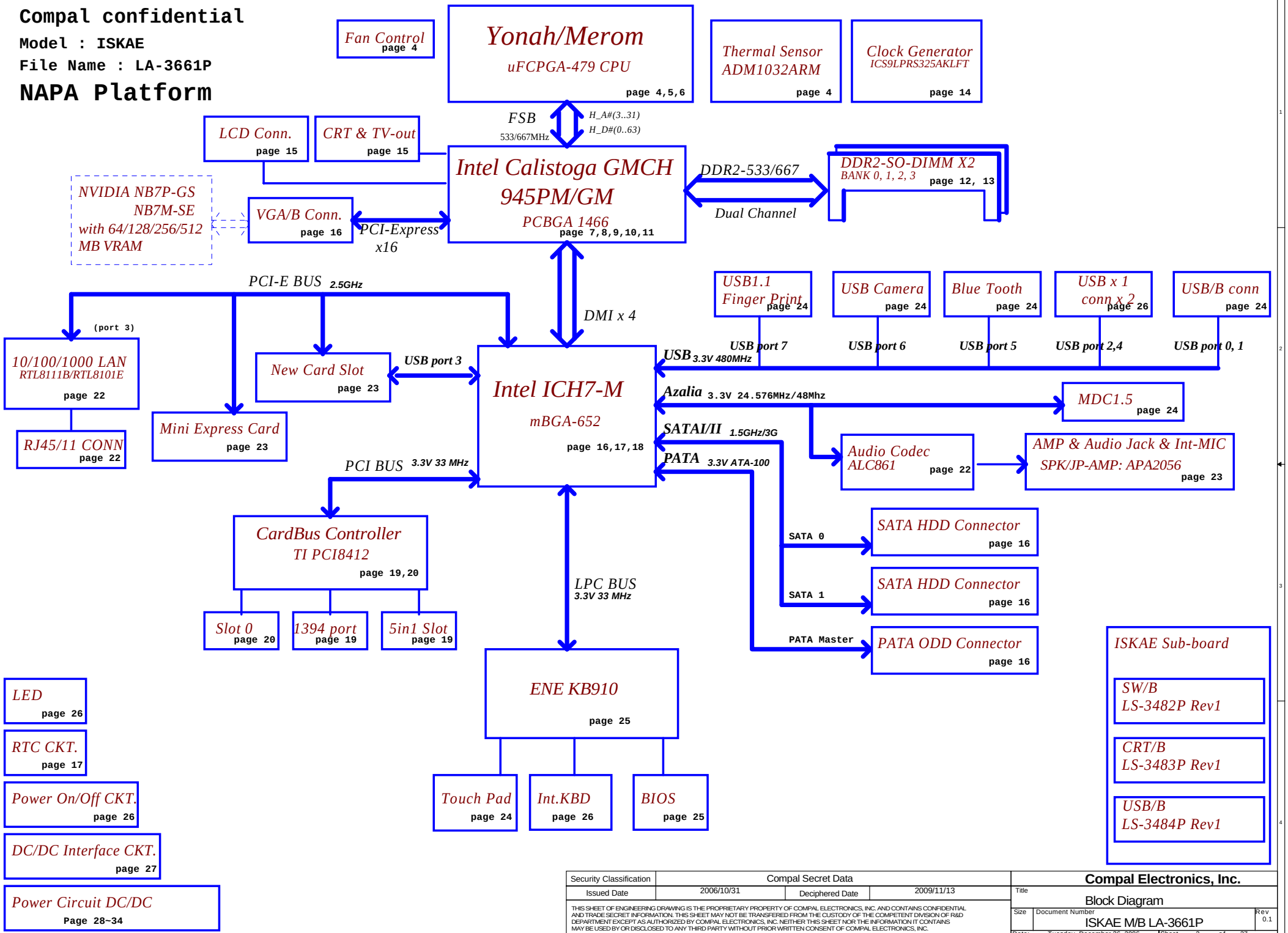
Compal confidential

Model : ISKAE

File Name : LA-3661P

NAPA Platform



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Title	Block Diagram	
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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
+0.9VS	0.9V switched power rail for DDR terminator	ON	OFF	OFF
+VCCP	1.05V switched power rail	ON	OFF	OFF
+1.5VS	1.5V switched power rail	ON	OFF	OFF
+1.8V	1.8V power rail for DDR	ON	ON	OFF
+1.8VS	1.8V switched power rail	ON	OFF	OFF
+2.5VS	2.5V switched power rail	ON	OFF	OFF
+3VALW	3.3V always on power rail	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.

External PCI Devices

DEVICE	PCI Device ID	IDSEL #	REQ/GNT #	PIRQ
1394	D0	AD20	2	A,B,C
CARD BUS	D4	AD20	2	A,B,C
5IN1	D4	AD20	2	A,B,C

KB910 I2C / SMBUS ADDRESSING

DEVICE	HEX	ADDRESS
SM1 24C16	A0H	1 0 1 0 0 0 0 X b
SM1 SMART BATTERY	16H	0 0 0 1 0 1 1 X b
SM2 ADM0132 CPU THERMAL MONITOR	98H	1 0 0 1 1 0 0 X b

ICH7-M SM Bus address

DEVICE	HEX	ADDRESS
DDR SO-DIMM 0	A0	1 0 1 0 0 0 0 0
DDR SO-DIMM 1	A4	1 0 1 0 0 1 0 0
CLOCK GENERATOR (EXT.)	D2	1 1 0 1 0 0 1 0

Board ID / SKU ID Table for AD channel

Vcc	3.3V +/- 5%
Ra	100K +/- 5%

Board ID	Rb	V_{AD_BID} min	V_{AD_BID} typ	V_{AD_BID} max
0	0	0 V	0 V	0 V
1	8.2K +/- 5%	0.216 V	0.250 V	0.289 V
2	18K +/- 5%	0.436 V	0.503 V	0.538 V
3	33K +/- 5%	0.712 V	0.819 V	0.875 V
4	56K +/- 5%	1.036 V	1.185 V	1.264 V
5	100K +/- 5%	1.453 V	1.650 V	1.759 V
6	200K +/- 5%	1.935 V	2.200 V	2.341 V
7	NC	2.500 V	3.300 V	3.300 V

BOARD ID Table

Board ID	PCB Revision
0	0.1
1	
2	
3	
4	
5	
6	
7	

SKU ID Table

SKU ID	SKU
0	10 (10E)
1	10C
2	10G
3	10GC
4	10J (10EJ)
5	10CJ
6	10GJ
7	10GCJ

BTO Option Table

BTO Item	BOM Structure
NEW CARD	NEWCARD@
LAN	100M@ 1000M@
WLAN	KS@
NB	GM@ PM@
BT	BT@
MIC	MIC@
CIR	CIR@
FINGER PRINT	FP@
5IN1	5IN1@
CAMERA	CAMERA@
PCMCIA	PCMCIA@
MDC	MDC@

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Title: Notes

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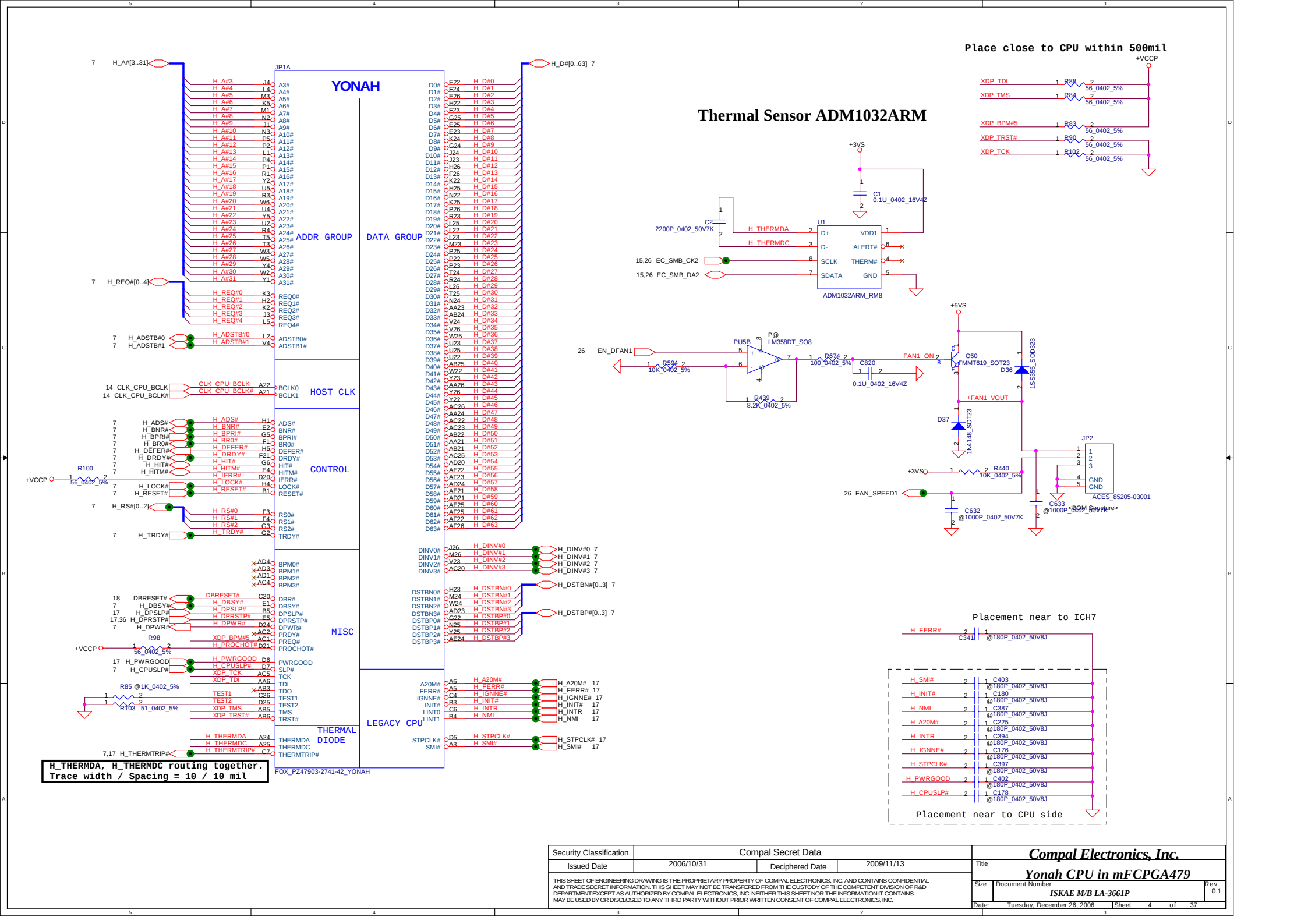
Place close to CPU within 500mil
Thermal Sensor ADM1032ARM
YONAH
JP1A
ADDR GROUP
DATA GROUP
HOST CLK
CONTROL
MISC
THERMAL DIODE
LEGACY CPU
H_THERMDA, H_THERMDC routing together.
Trace width / Spacing = 10 / 10 mil
FOX_PZ47903-2741-42_YONAH
ADM1032ARM_RM8
Placement near to ICH7
Placement near to CPU side
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Compal Secret Data
Issued Date
2006/10/31
Deciphered Date
2009/11/13
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Title
Yonah CPU in mFCPGA479
Size
Document Number
ISKAE M/B LA-3661P
Rev
0.1
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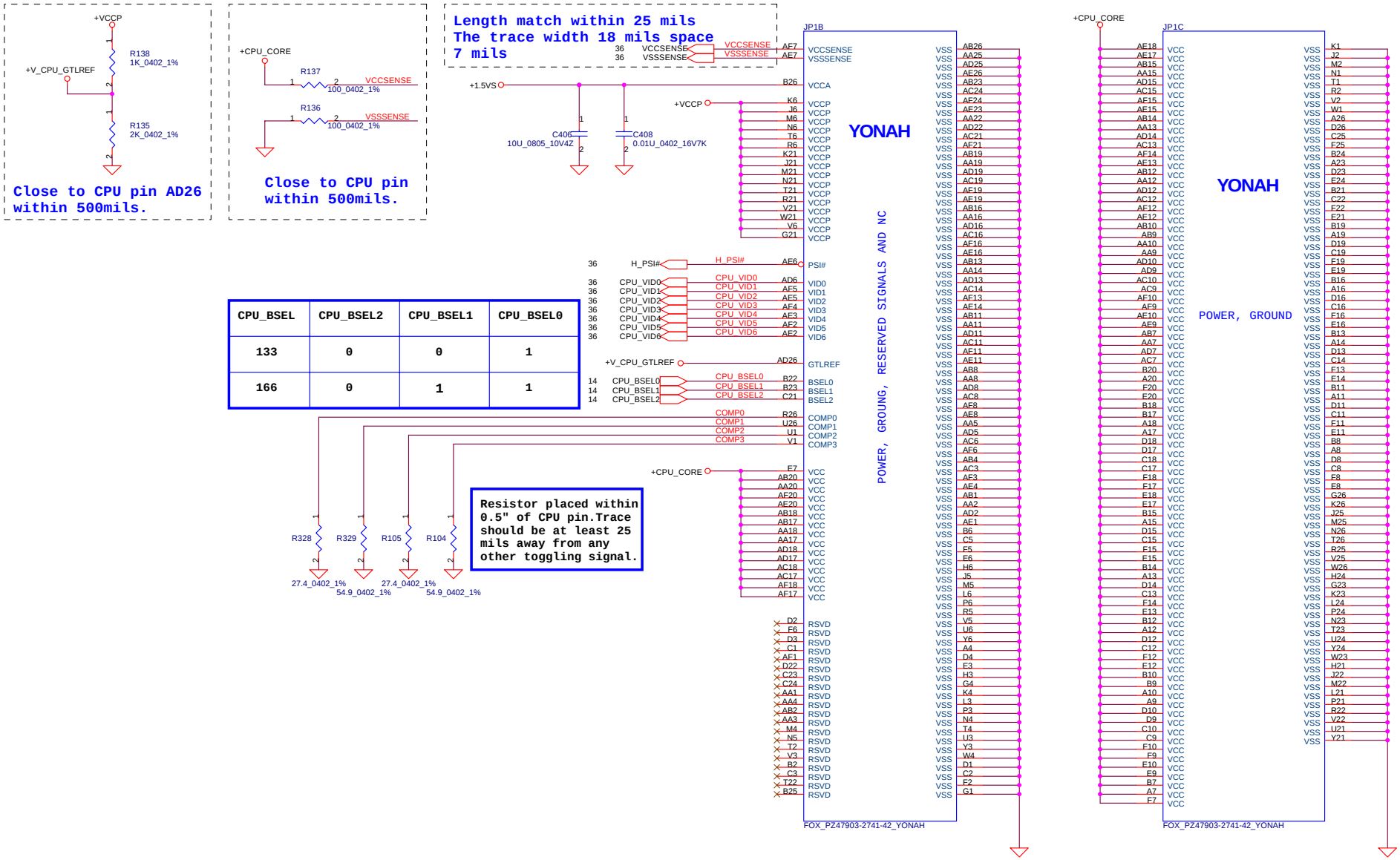

CPU_BSEL	CPU_BSEL2	CPU_BSEL1	CPU_BSEL0
133	0	0	1
166	0	1	1

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Title: Yonah CPU in mFCPGA479

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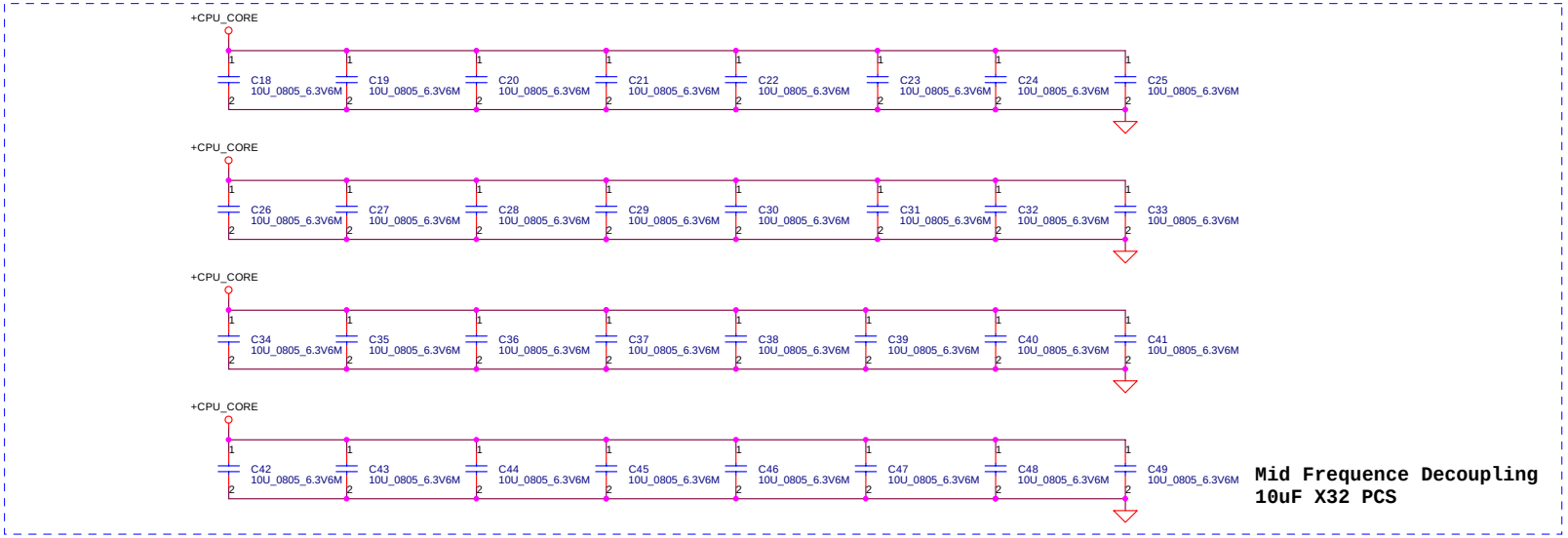
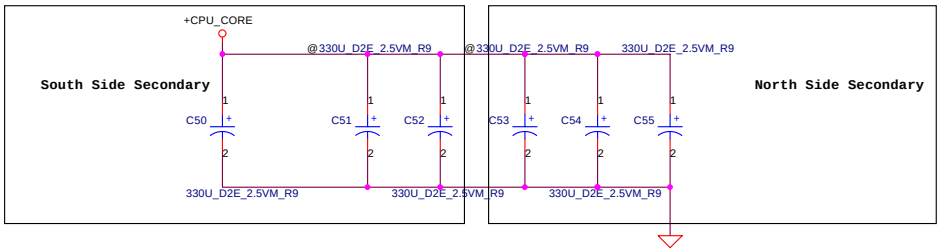
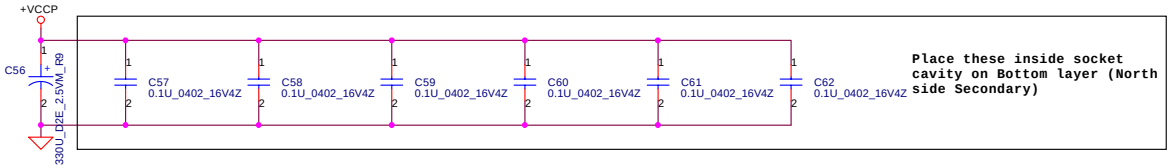




ESR <= 1.5m ohm
Capacitor > 1980uF

330uF ESR 9m ohm X 6 PCS



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Title: CPU Bypass capacitors			
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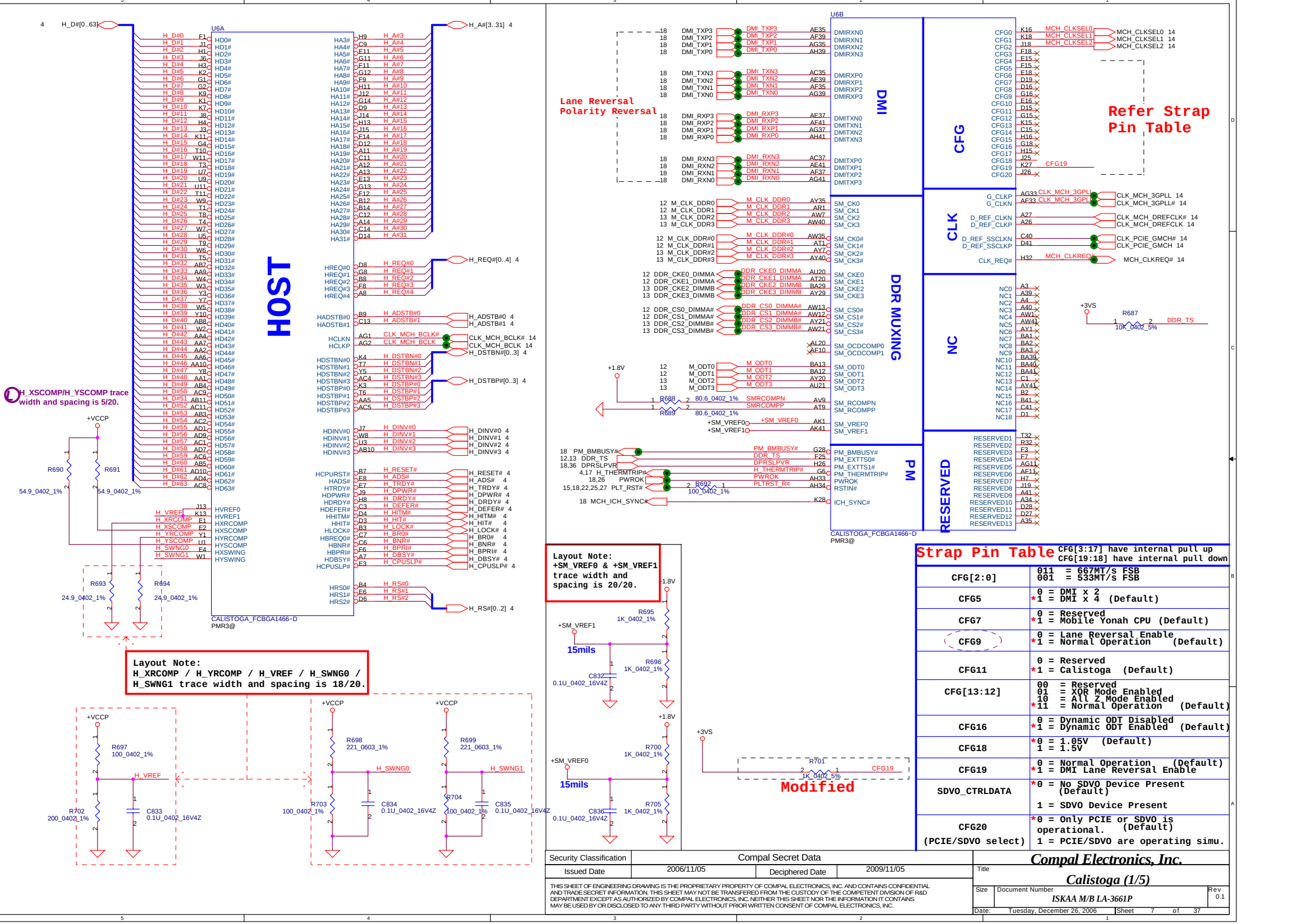

Strap Pin Table

CFG[3:17] have internal pull up
CFG[19:18] have internal pull down

CFG[2:0]	011 = 667MT/s FSB 001 = 533MT/s FSB
CFG5	0 = DMI x 2 *1 = DMI x 4 (Default)
CFG7	0 = Reserved *1 = Mobile Yonah CPU (Default)
CFG9	0 = Lane Reversal Enable *1 = Normal Operation (Default)
CFG11	0 = Reserved *1 = Calistoga (Default)
CFG[13:12]	00 = Reserved 01 = XOR Mode Enabled 10 = All Z Mode Enabled *11 = Normal Operation (Default)
CFG16	0 = Dynamic ODT Disabled *1 = Dynamic ODT Enabled (Default)
CFG18	*0 = 1.05V (Default) 1 = 1.5V
CFG19	0 = Normal Operation (Default) *1 = DMI Lane Reversal Enable
SDVO_CTRLDATA	*0 = No SDVO Device Present (Default) 1 = SDVO Device Present
CFG20 (PCIE/SDVO select)	*0 = Only PCIE or SDVO is operational. (Default) 1 = PCIE/SDVO are operating simu.

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Title: **Calistoga (1/5)**

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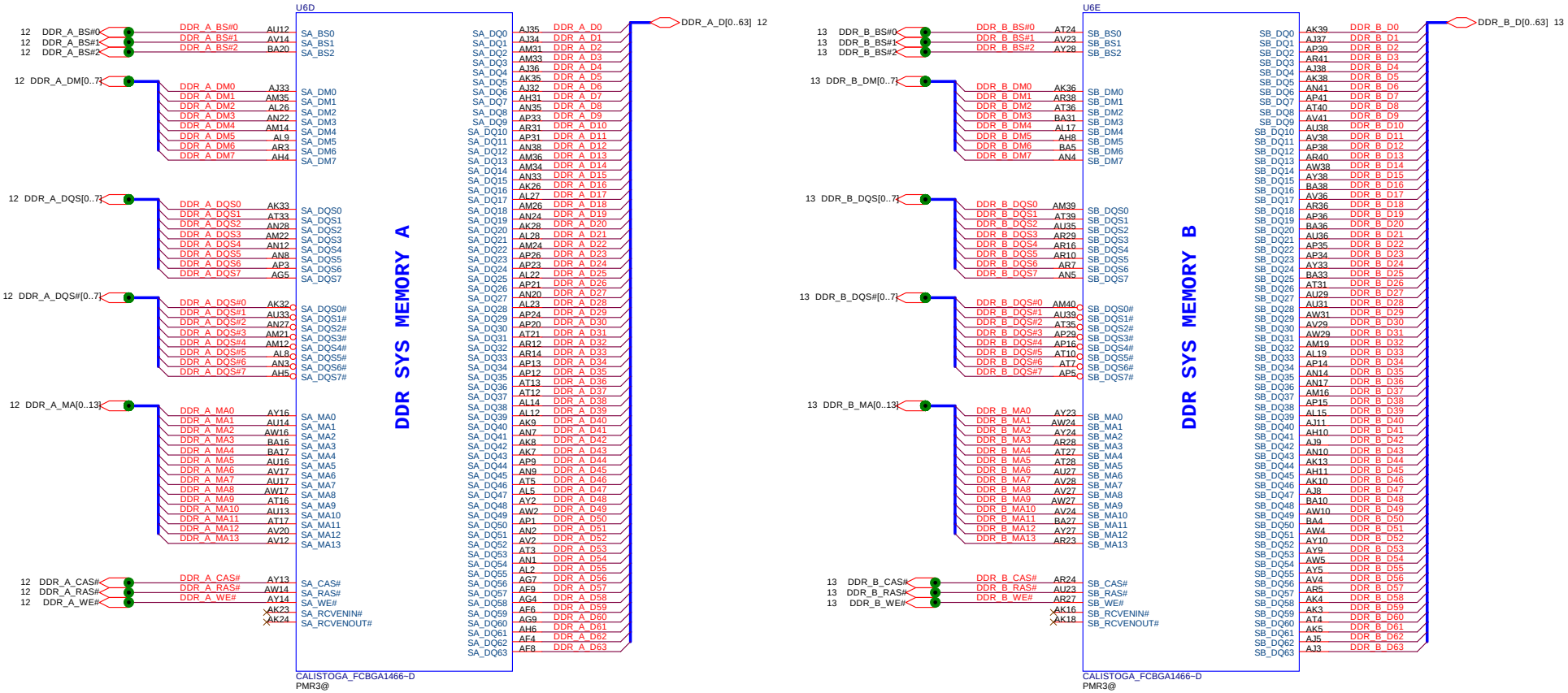

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Issued Date	2006/11/05	Deciphered Date	2009/11/05

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Title: **Calistoga (2/5)**

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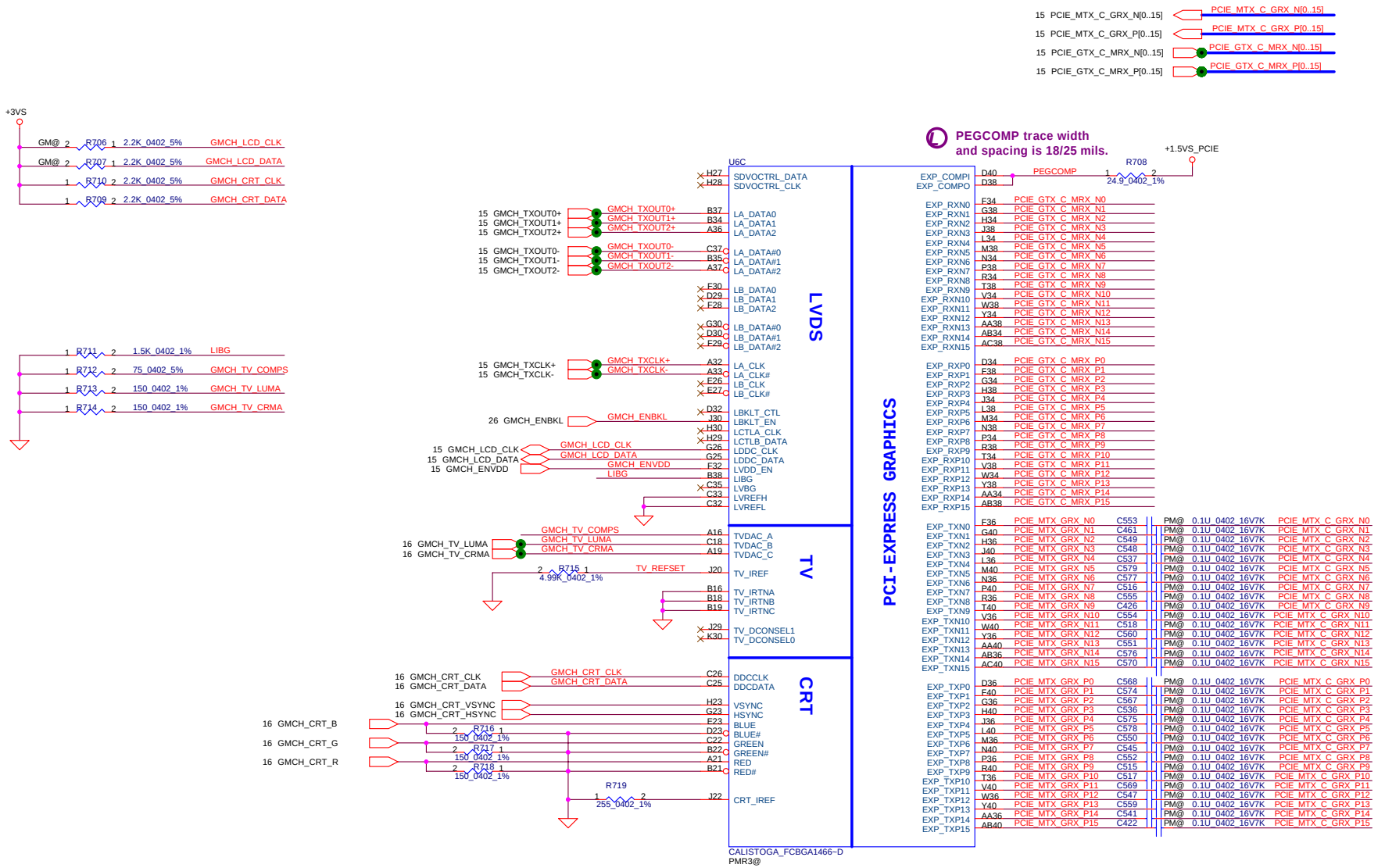

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Title: **Calistoga (3/5)**

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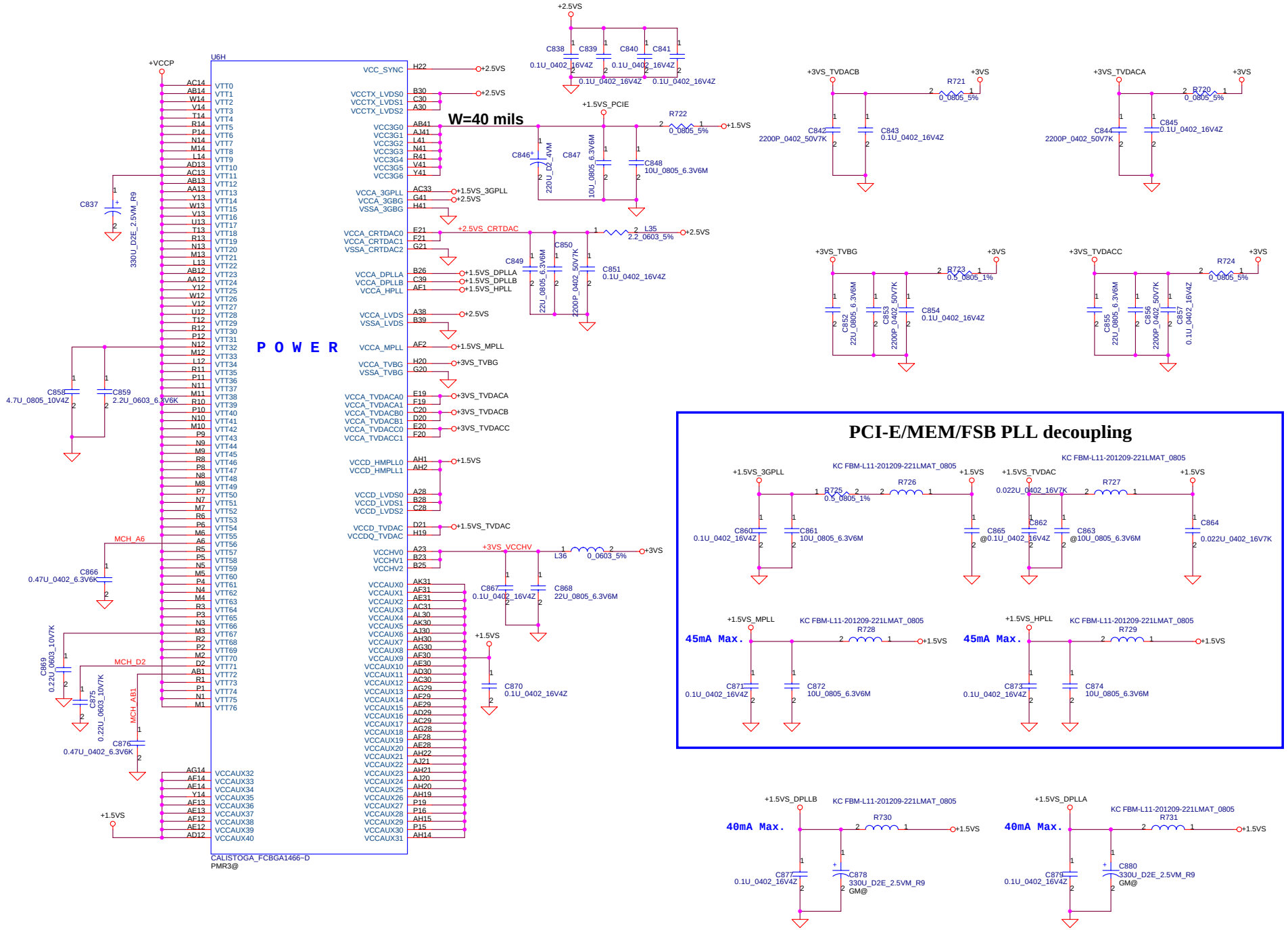

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Title: **Calistoga (4/5)**

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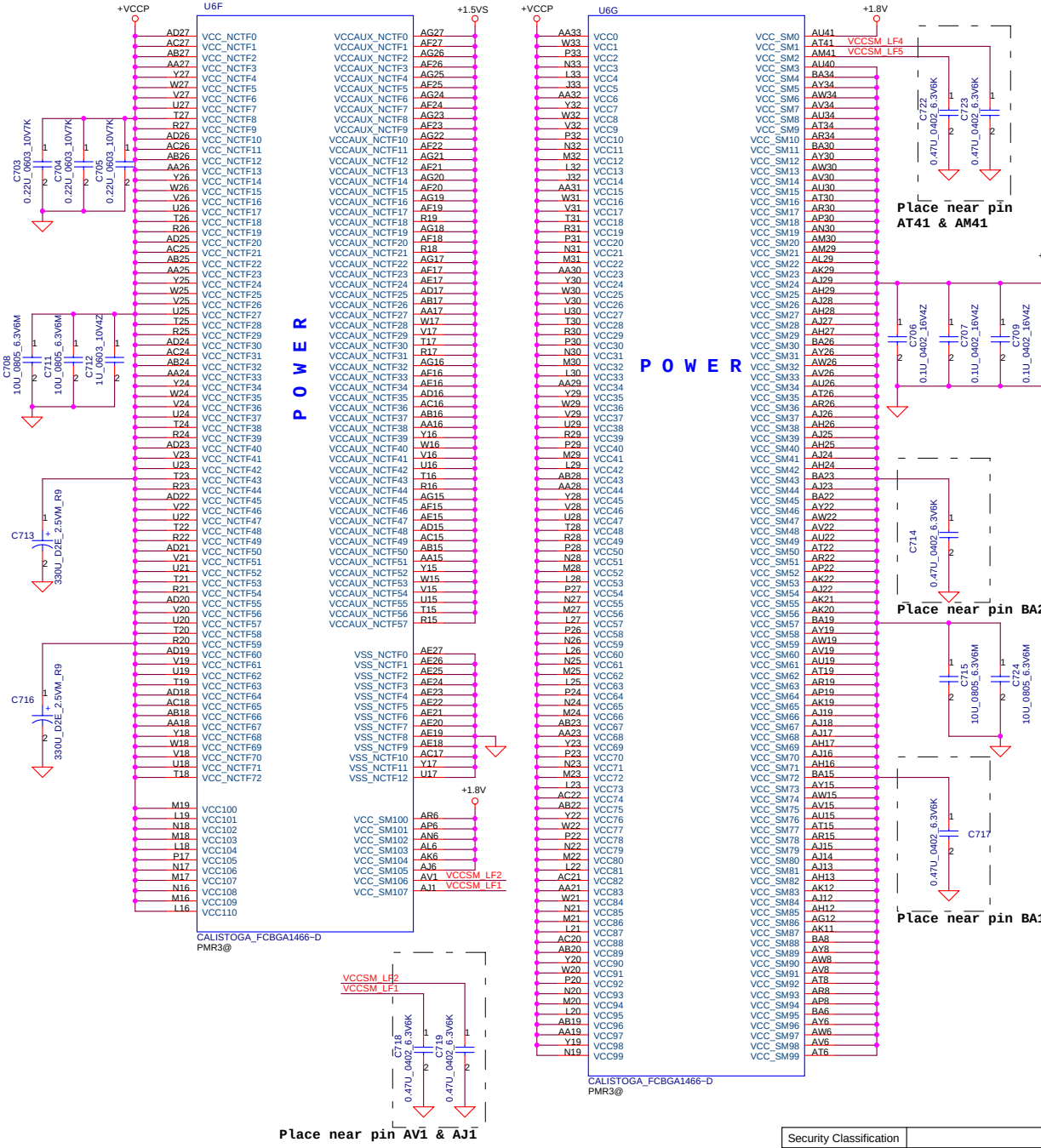
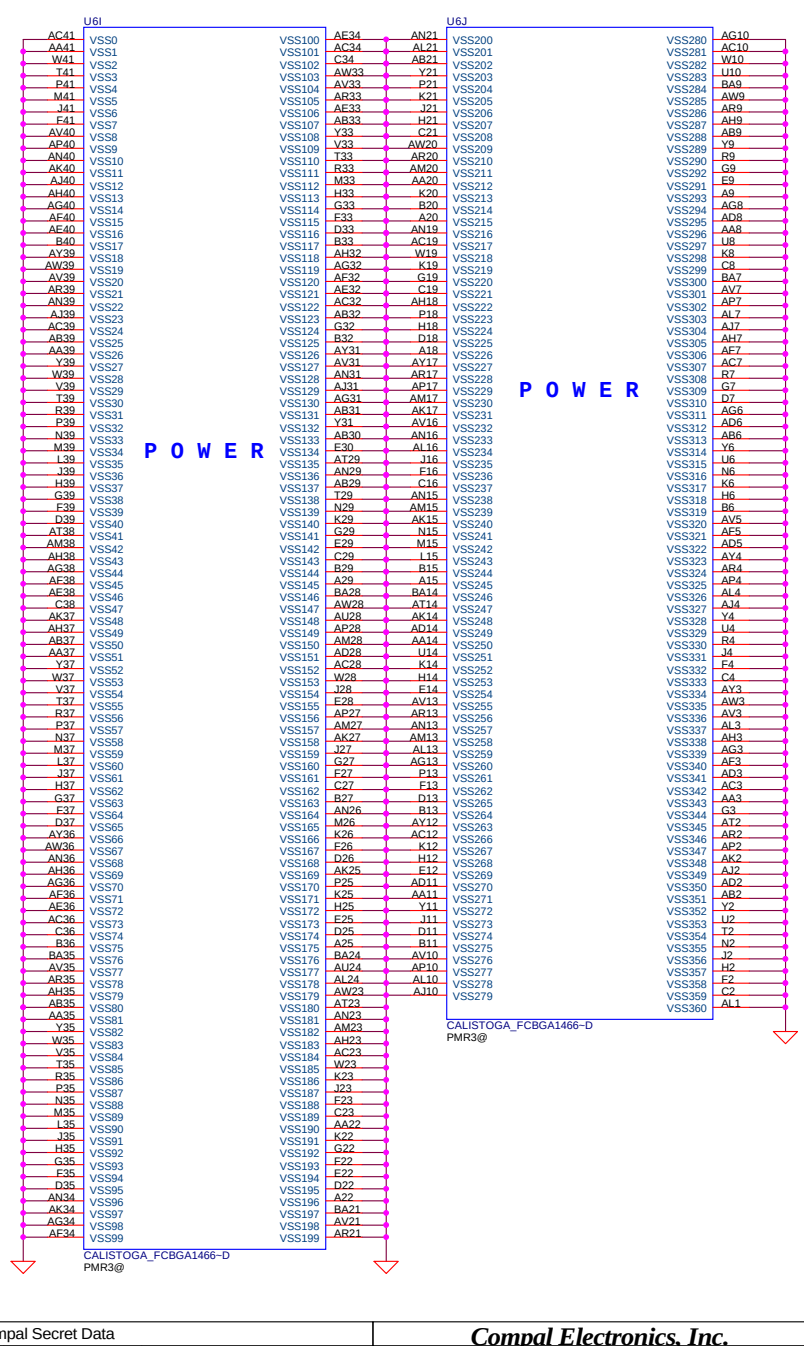
POWER



GND



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Title: **Calistoga (5/5)**

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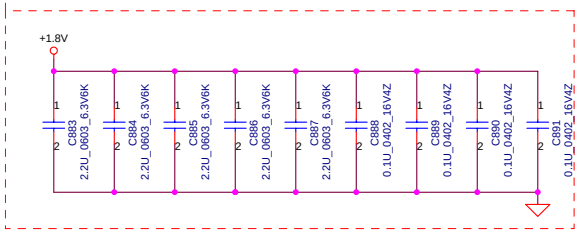
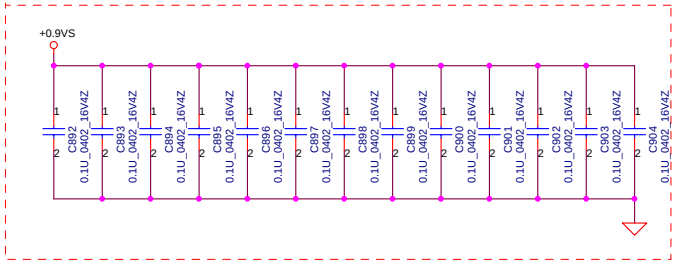
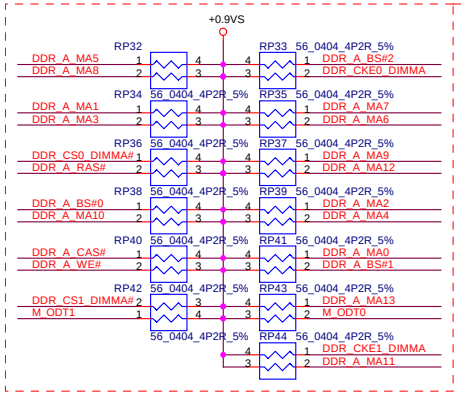
8 DDR_A_DQS#[0..7]
8 DDR_A_D[0..63]
8 DDR_A_DM[0..7]
8 DDR_A_DQS[0..7]
8 DDR_A_MA[0..13]

Layout Note:
Place near JP27

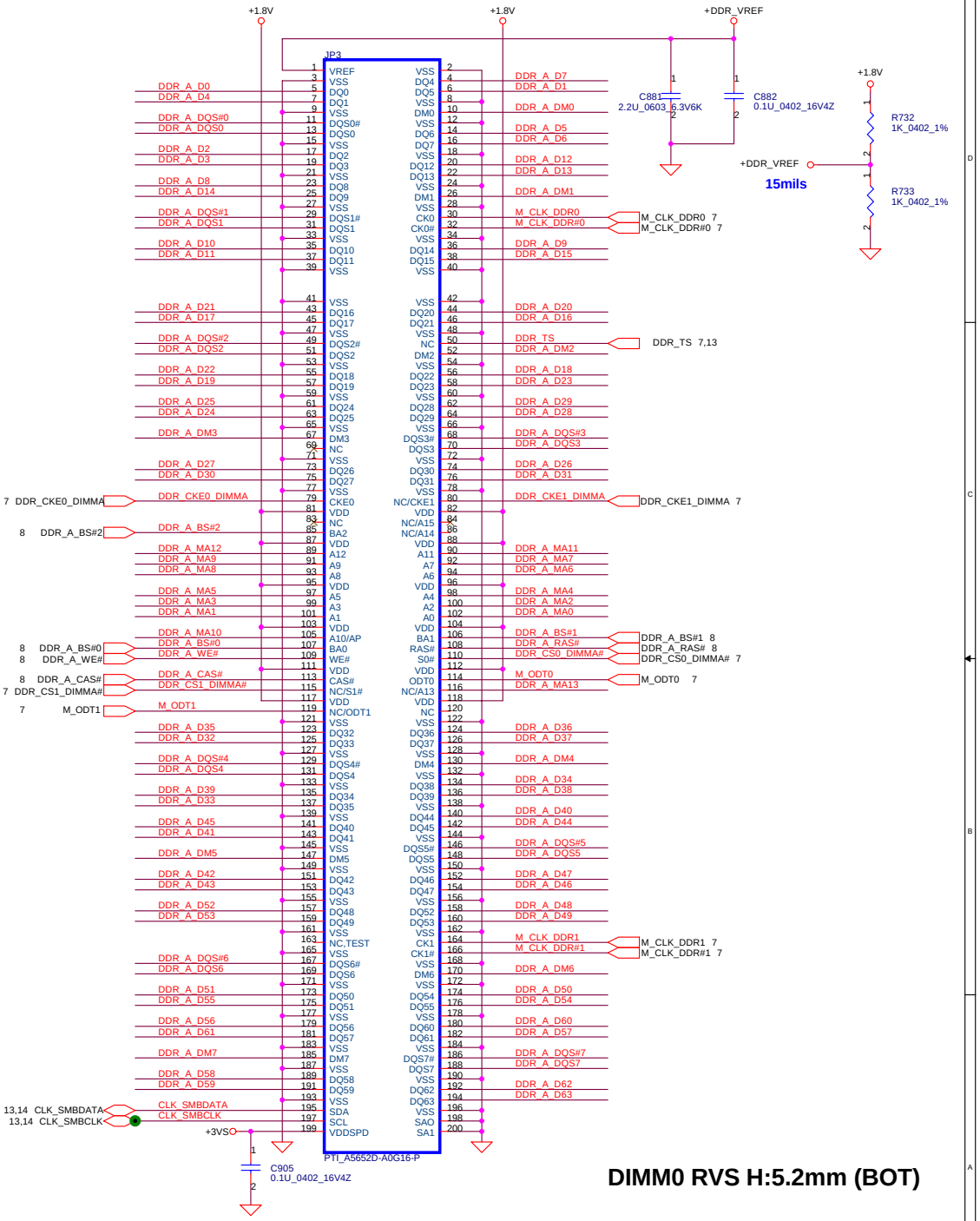


Layout Note:
Place one cap close to every 2 pullup resistors terminated to +0.9VS





Layout Note:
Place these resistor closely JP27,all trace length Max=1.5"



DIMM0 RVS H:5.2mm (BOT)

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Title	DDRII-SODIMM SLOT1
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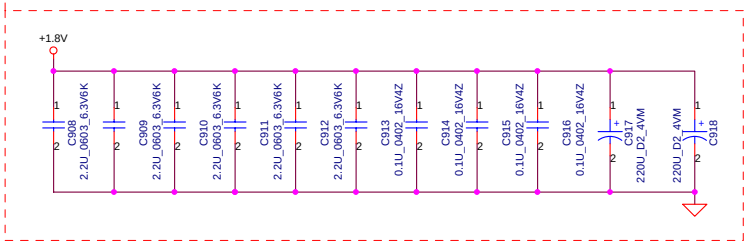
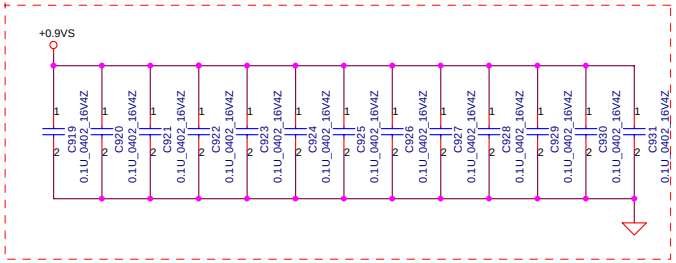
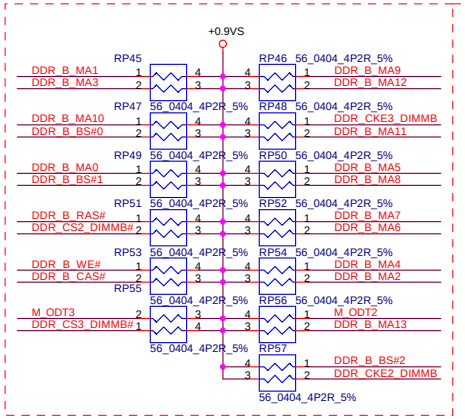
8 DDR_B_DQS#[0..7]
8 DDR_B_D[0..63]
8 DDR_B_DM[0..7]
8 DDR_B_DQS[0..7]
8 DDR_B_MA[0..13]

Layout Note:
Place near JP26

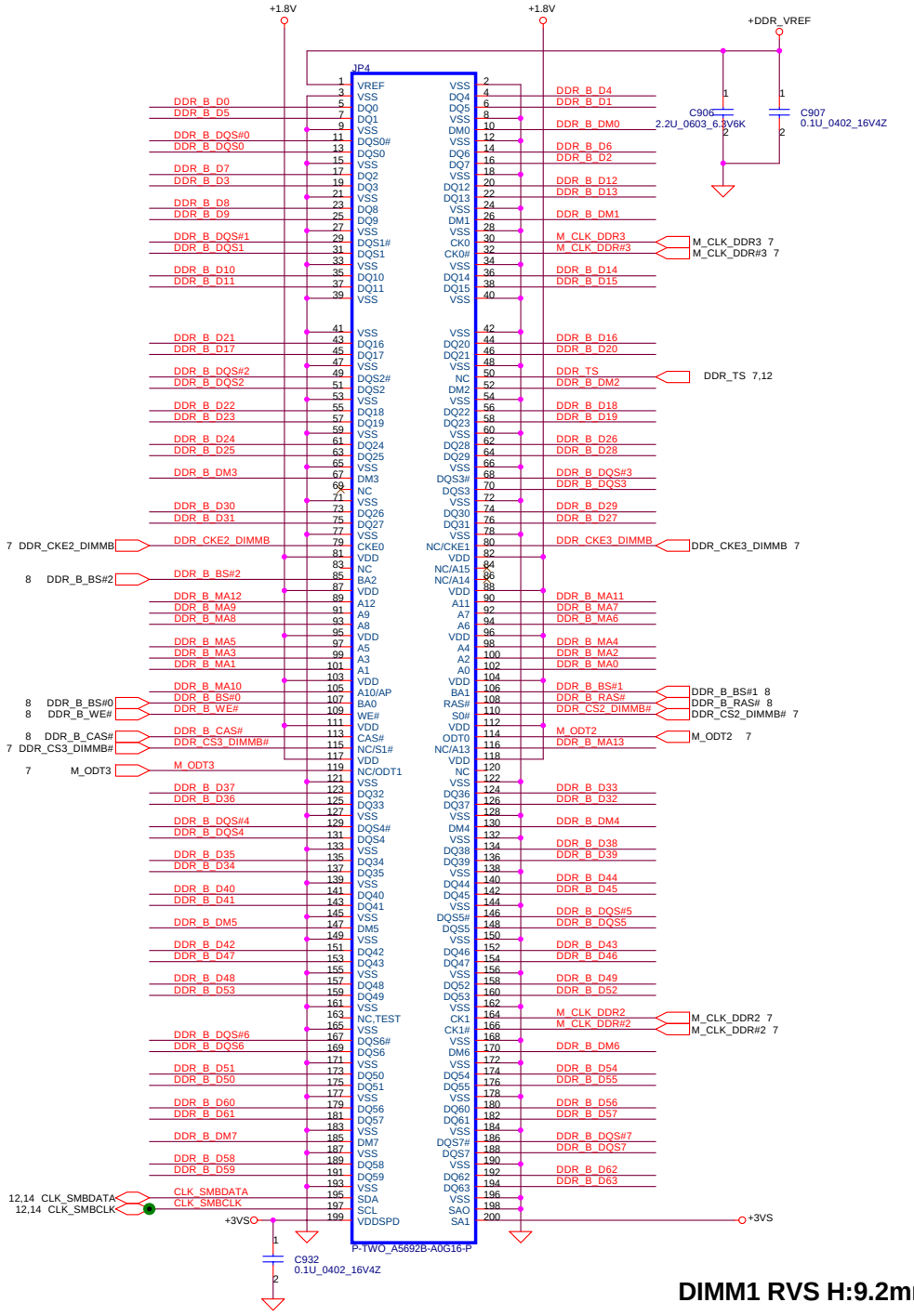


Layout Note:
Place one cap close to every 2 pullup resistors terminated to +0.9VS





Layout Note:
Place these resistor closely JP26,all trace length Max=1.5"



DIMM1 RVS H:9.2mm (BOT)

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Compal Electronics, Inc.			
Title	DDRII-SODIMM SLOT2		
Size	Document Number	ISKAA M/B LA-3661P	Rev 0.1
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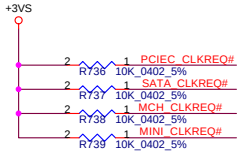
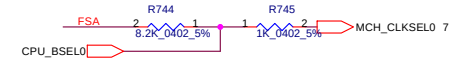
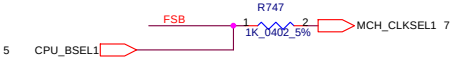


FSLC CLKSEL2	FSLB CLKSEL1	FSLA CLKSEL0	CPU MHz	SRC MHz	PCI MHz
0	0	1	133	100	33.3
0	1	1	166	100	33.3

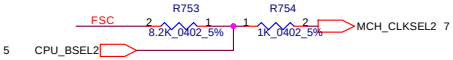
FSA

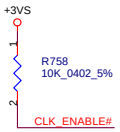


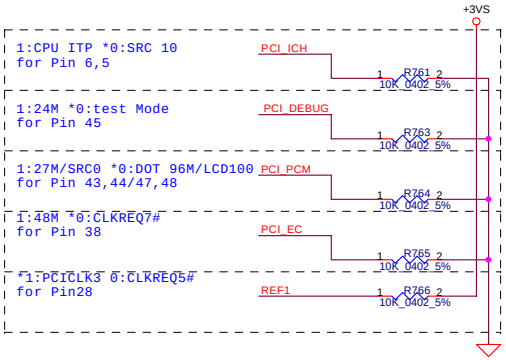
FSB

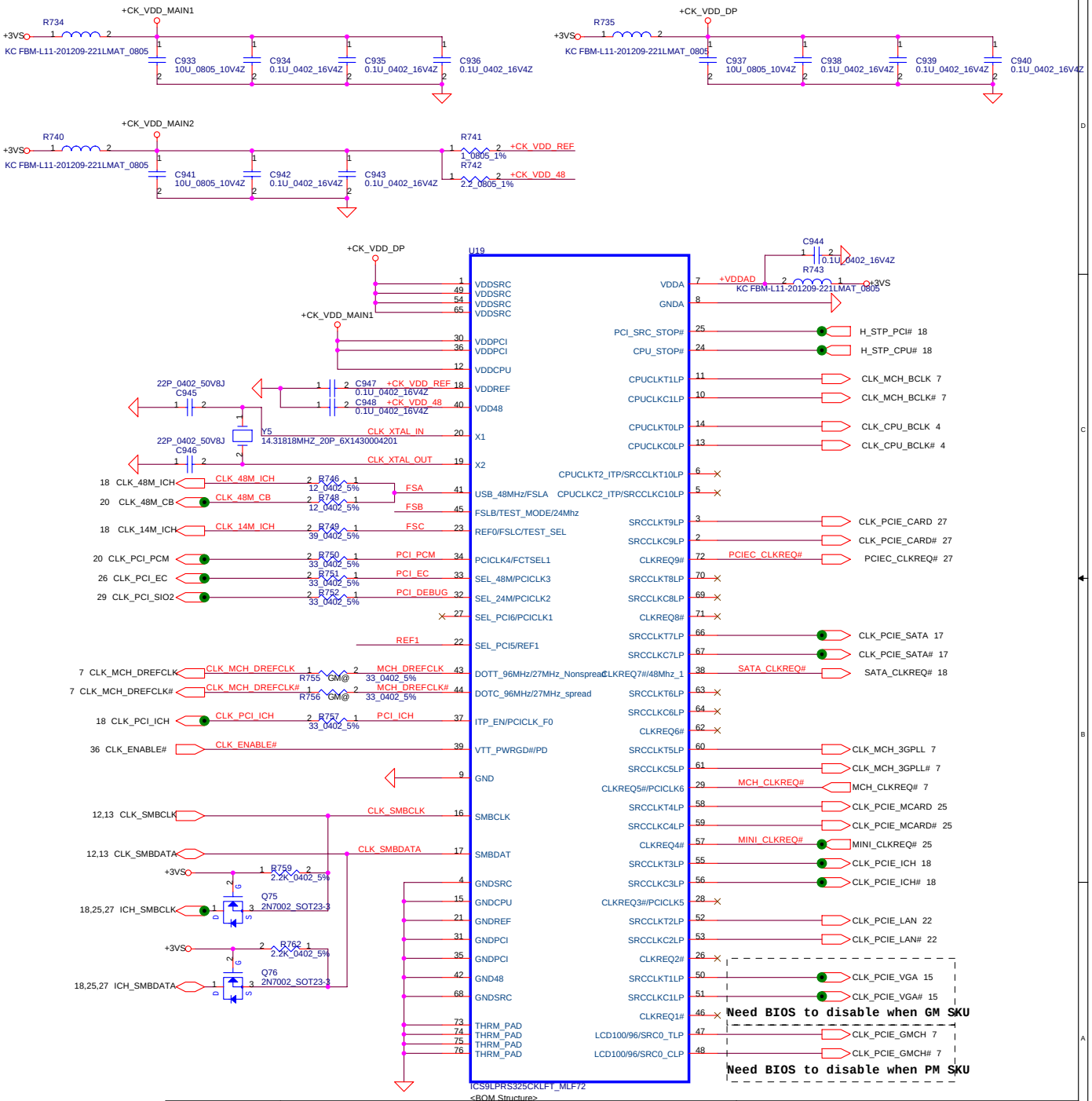


FSC
(Fixed at low)









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Title: **Clock generator**

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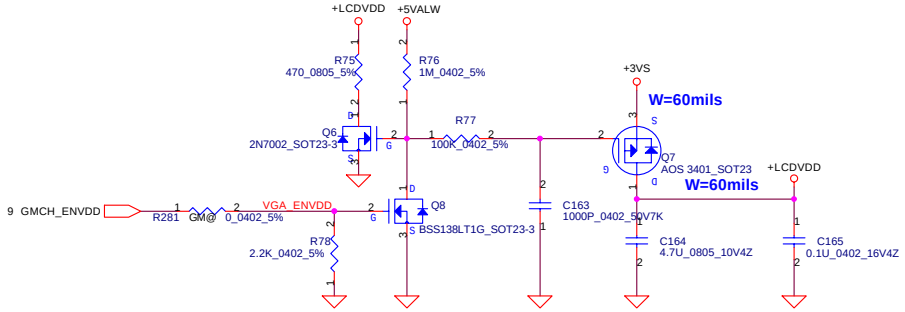
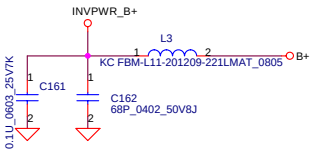
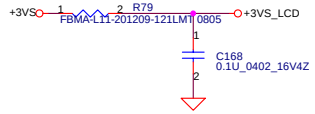
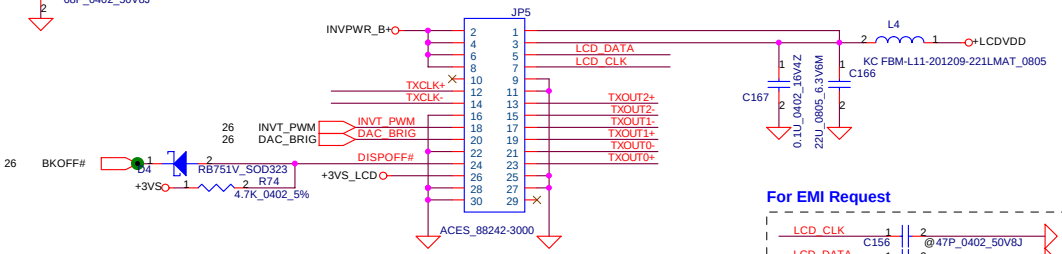
LCD POWER CIRCUIT



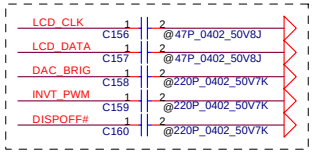




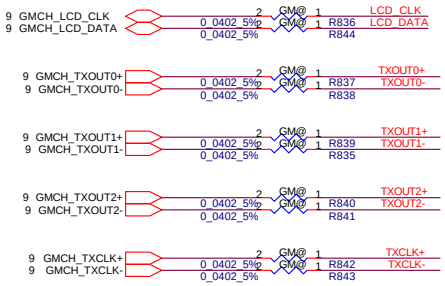
LCD/PANEL BD. Conn.

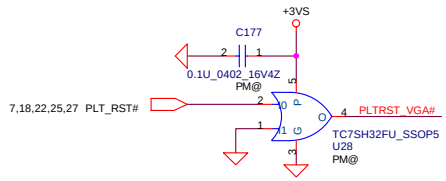


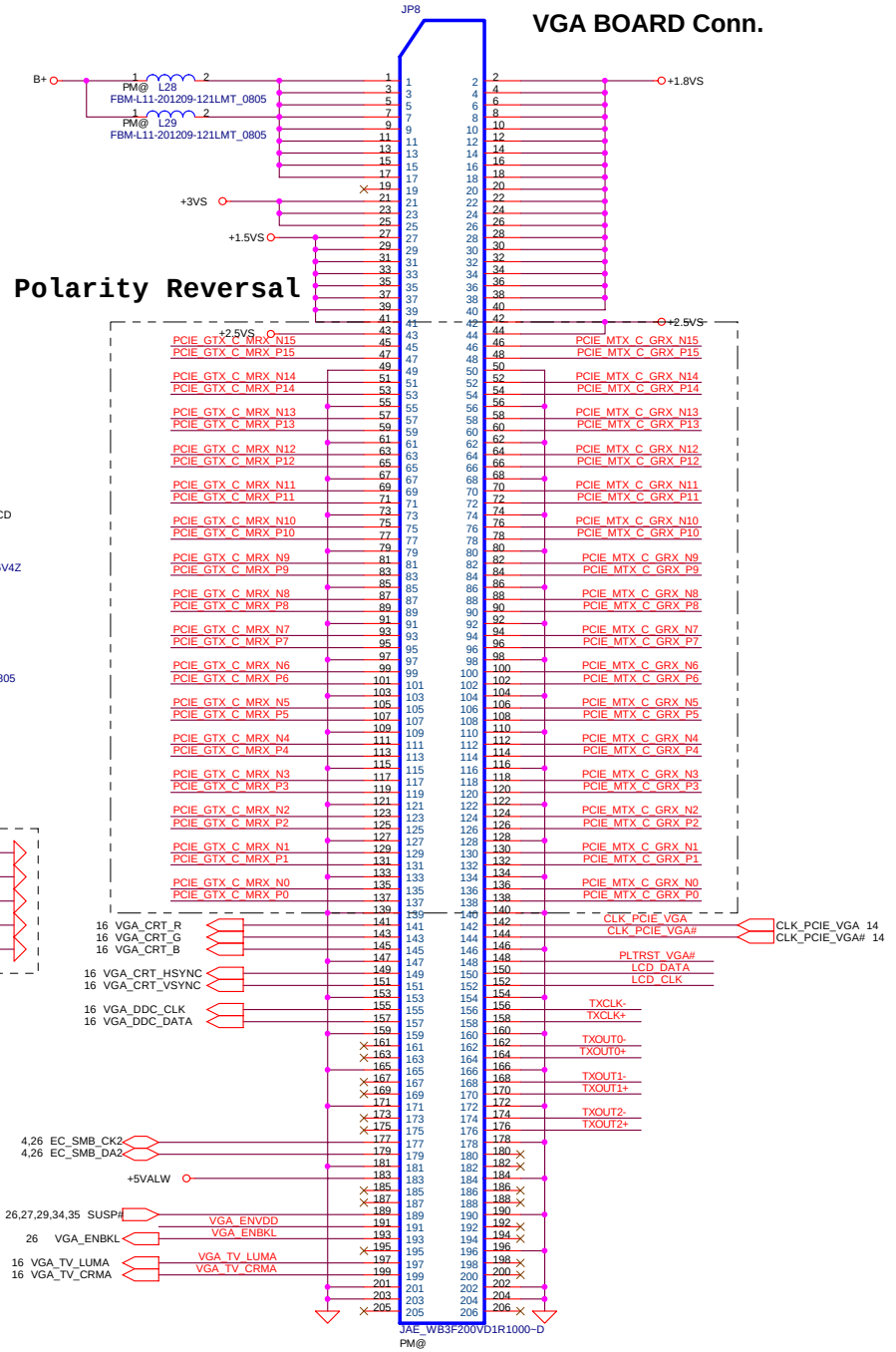
For EMI Request



ALL R CLOSE LVDS CONNECTOR







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Title: VGA CONN

Size	Document Number	Rev
	LA-3481P	0.2

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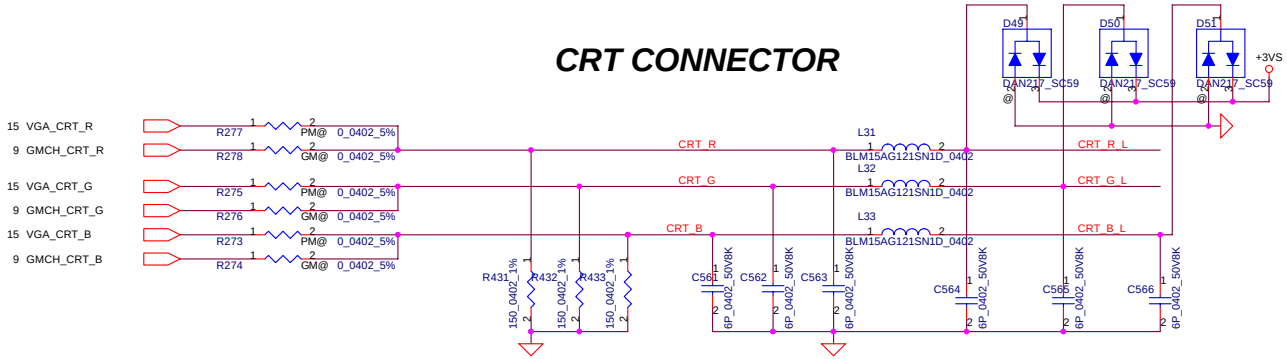
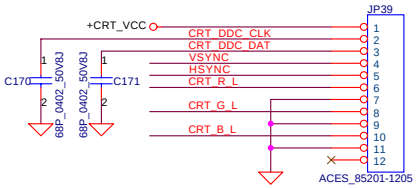
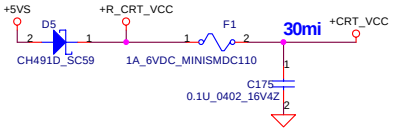
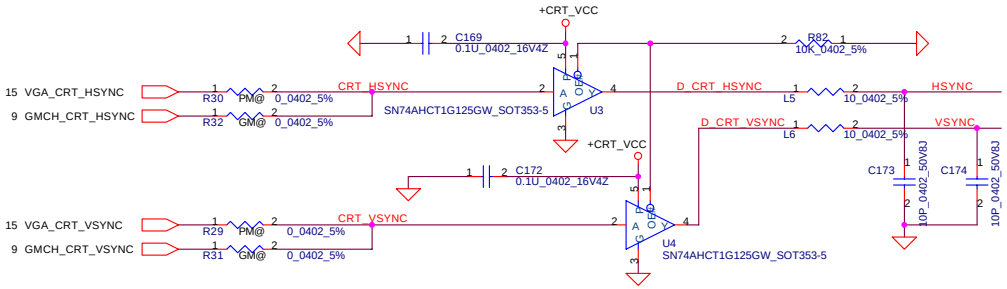
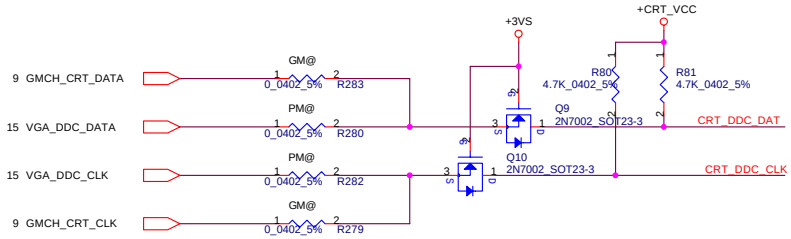
CRT CONNECTOR



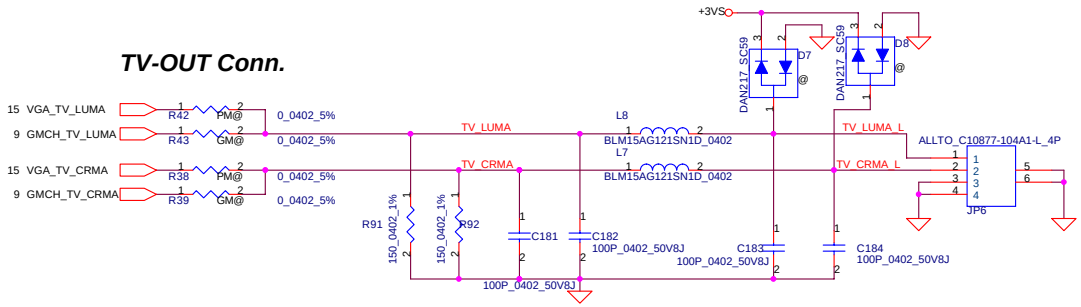








TV-OUT Conn.



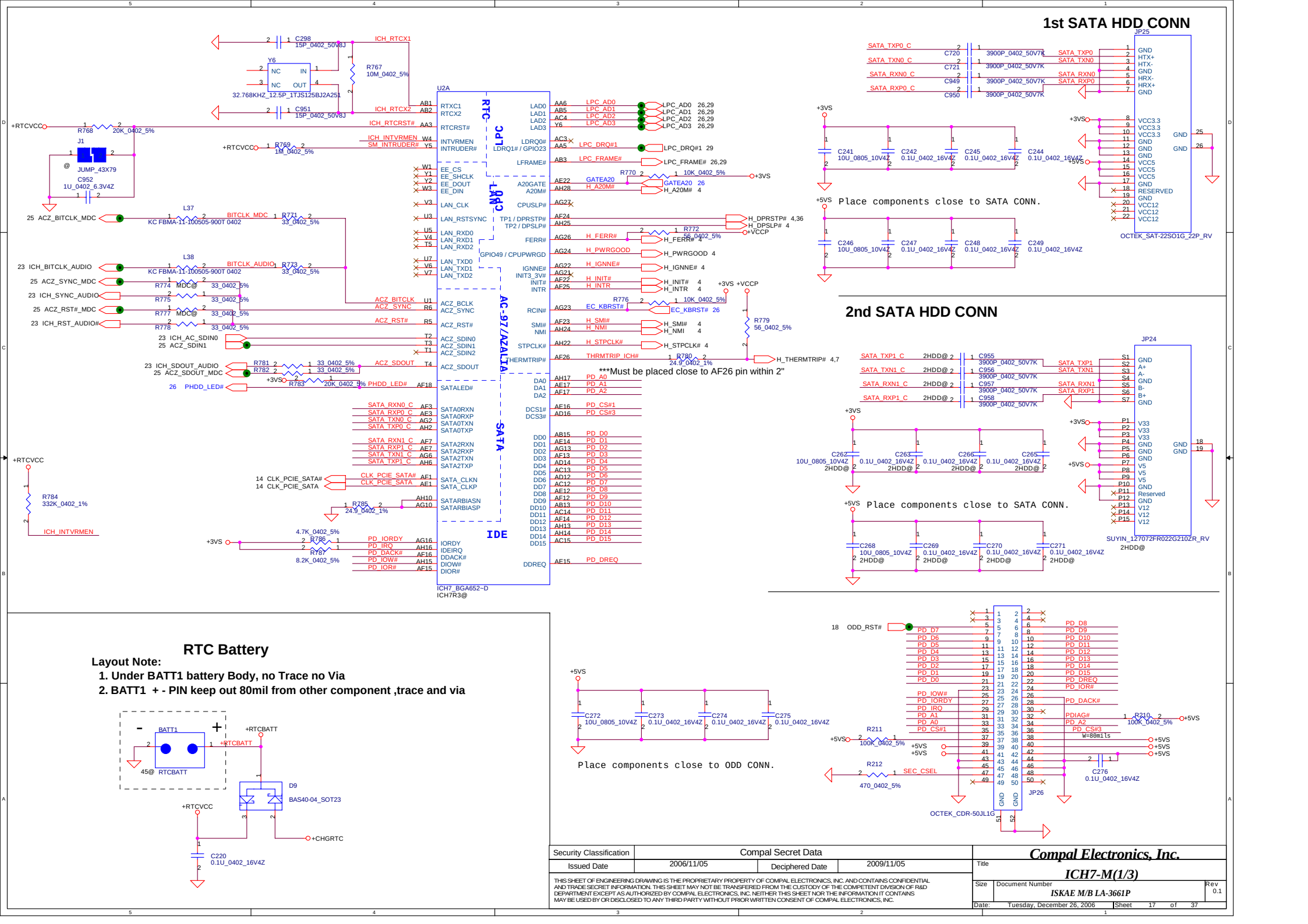
Security Classification	Compal Secret Data		
Issued Date	2006/10/31	Deciphered Date	2009/11/13

Compal Electronics, Inc.

Title: ***Display Interface Connector***

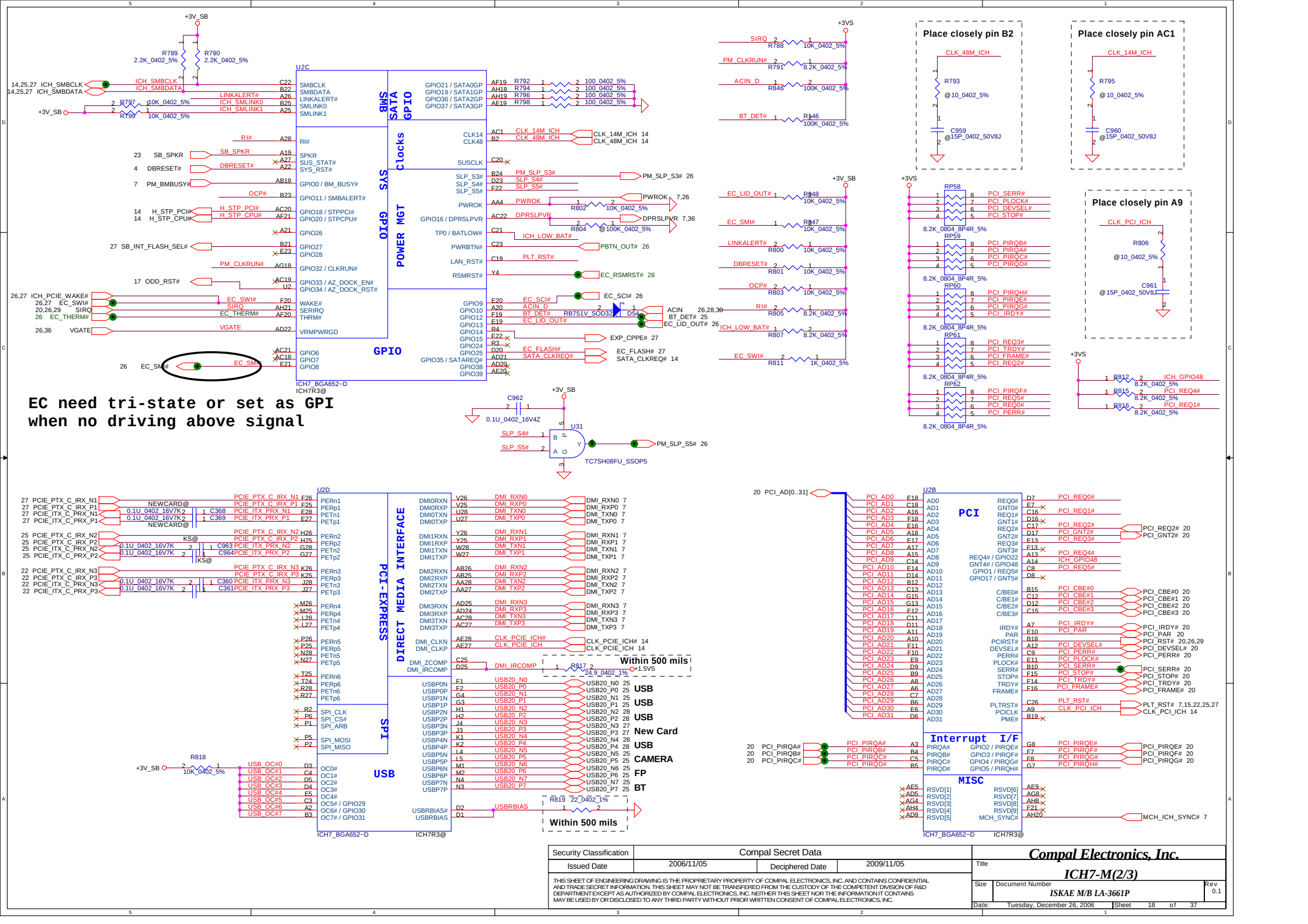
Size	Document Number	Rev
	ISKAE M/B LA-3661P	0.1

Date: Thursday, December 28, 2006 Sheet 16 of 37



Security Classification	Compal Secret Data		
Issued Date	2006/11/05	Deciphered Date	2009/11/05

Compal Electronics, Inc.			
Title: ICH7-M(1/3)			
Size	Document Number: ISKAE M/B LA-3661P		Rev: 0.1
Date: Tuesday, December 26, 2006	Sheet 17 of 37		



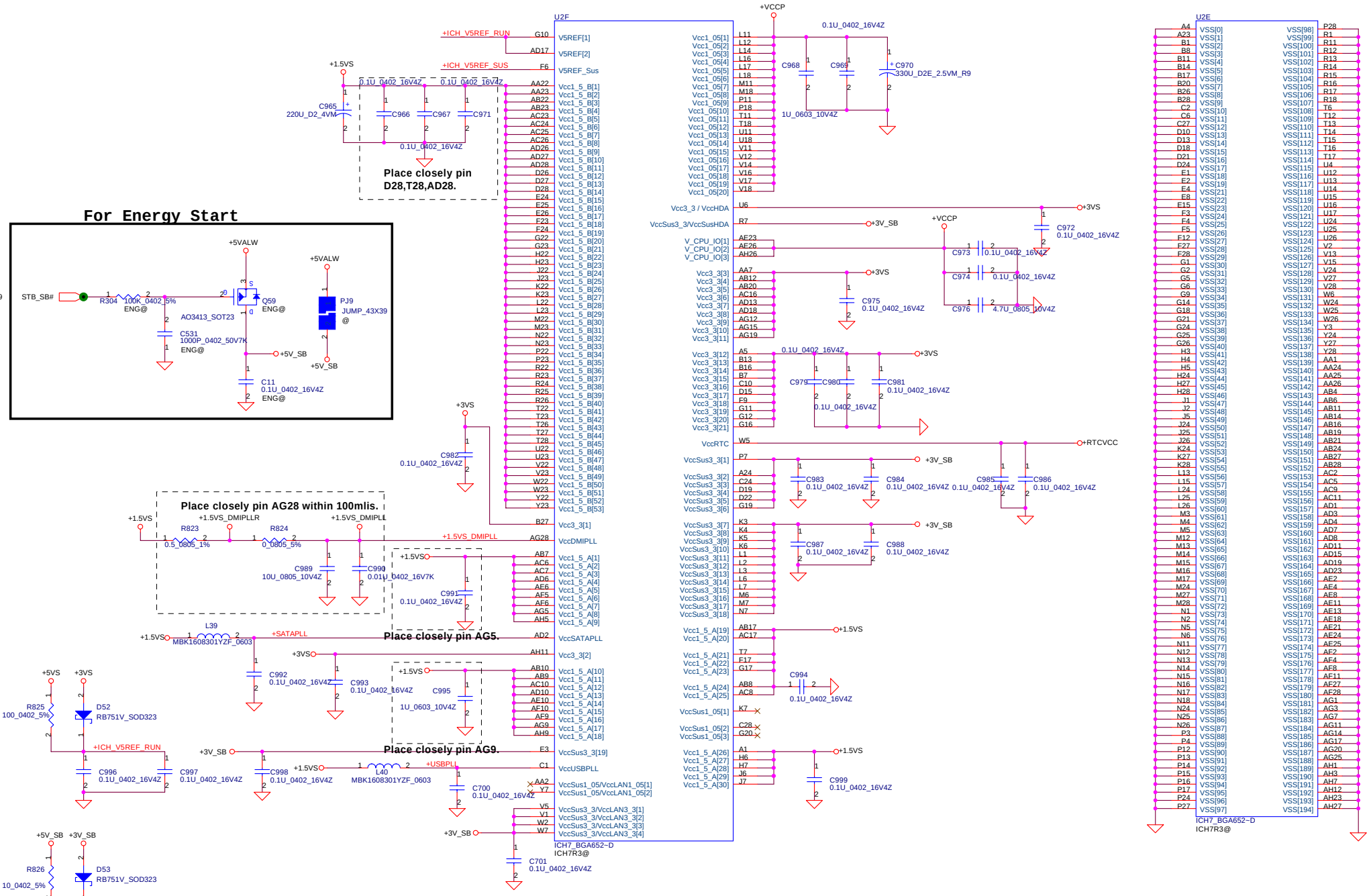
Security Classification	Compal Secret Data		
Issued Date	2006/11/05	Deciphered Date	2009/11/05

Compal Electronics, Inc.

Title: ICH7-M(2/3)

Size | Document Number: ISKAE M/B LA-3661P | Rev: 0.1

Date: Tuesday, December 26, 2006 | Sheet 18 of 37



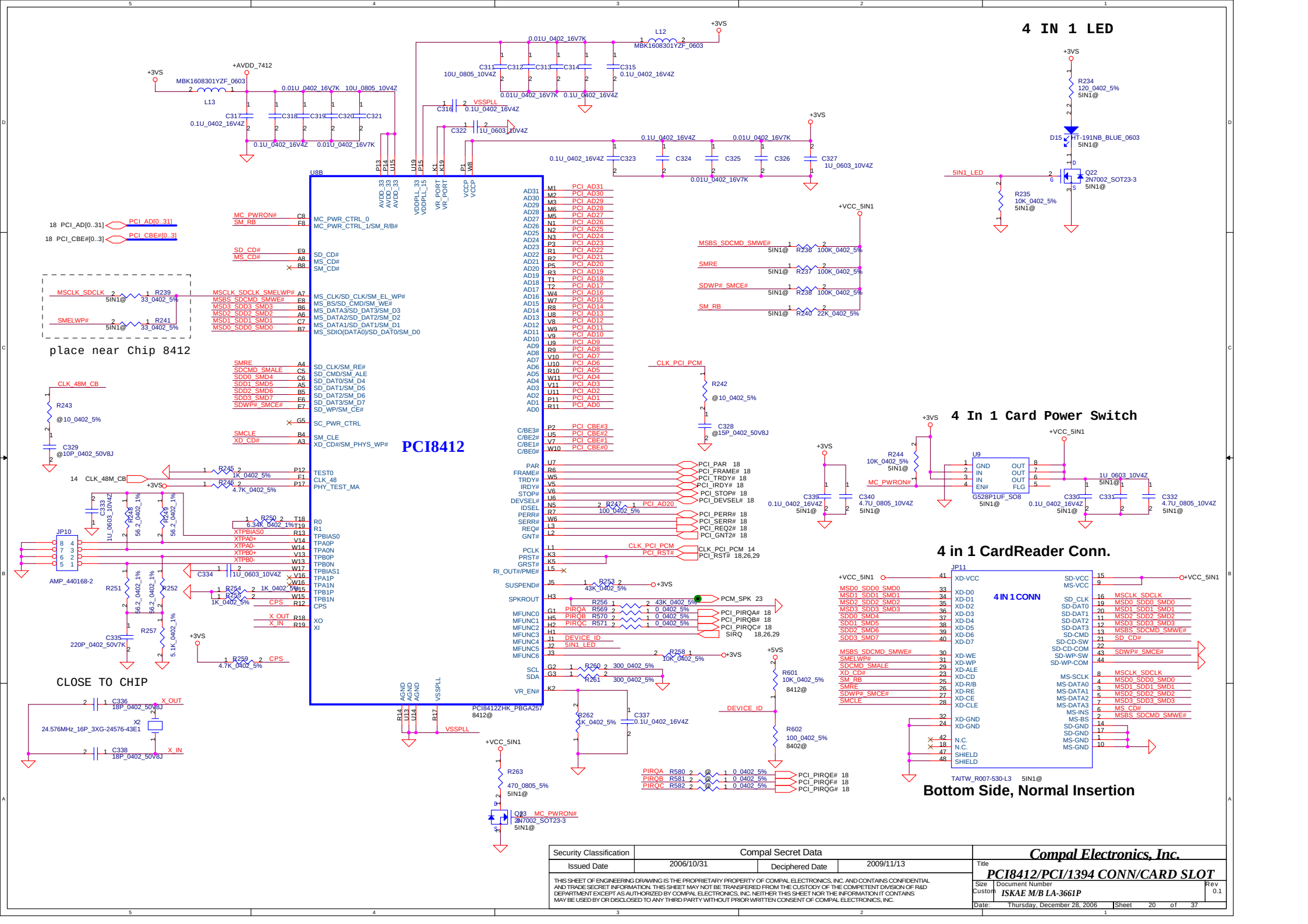
Security Classification	Compal Secret Data		
Issued Date	2006/11/05	Deciphered Date	2009/11/05

Compal Electronics, Inc.

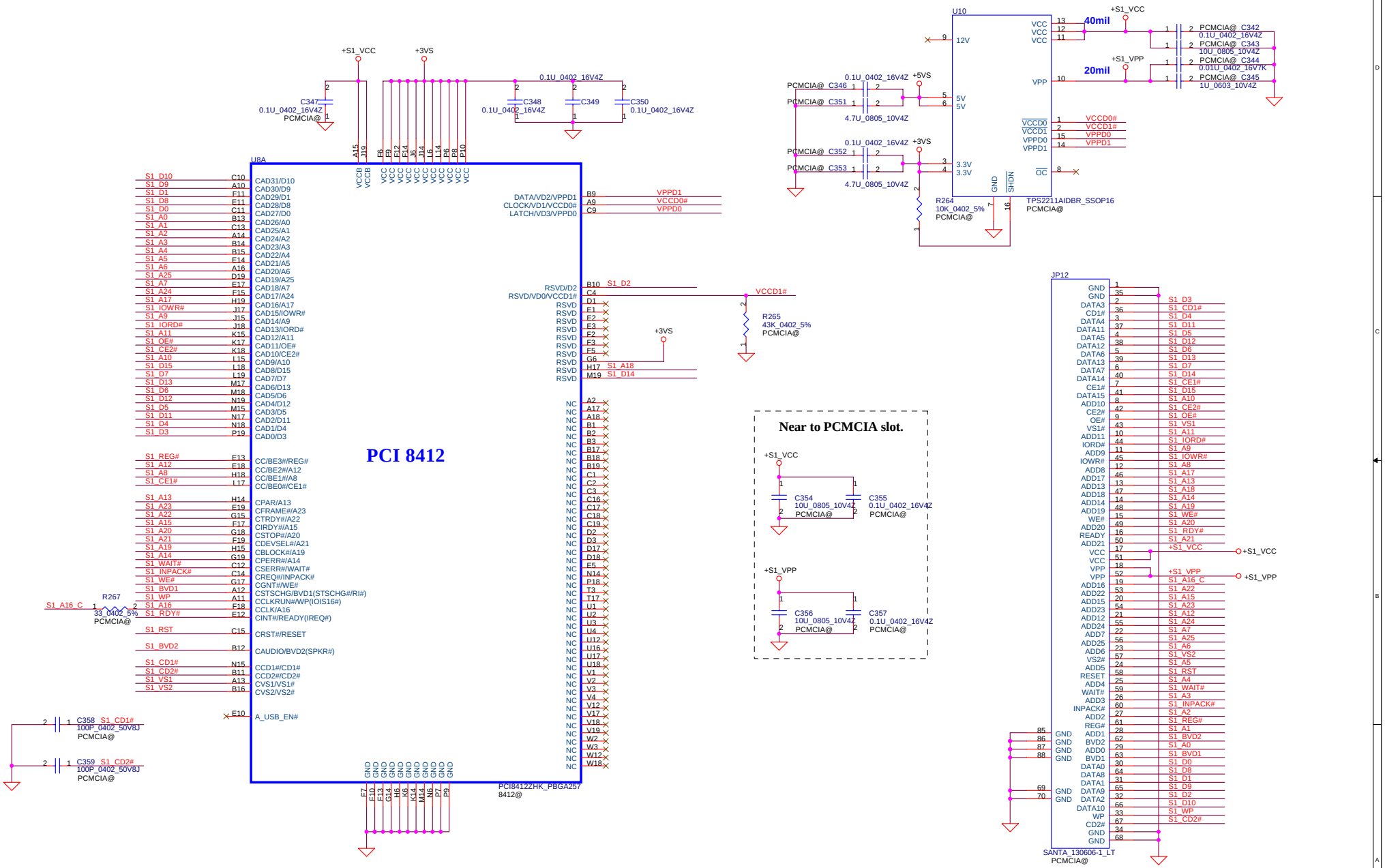
Title: **ICH7-M(3/3)**

Size | Document Number: **ISKAE M/B LA-3661P** | Rev: 0.1

Date: Tuesday, December 26, 2006 | Sheet 19 of 37


4 IN 1 LED
PCI8412
place near Chip 8412
CLOSE TO CHIP
4 In 1 Card Power Switch
4 in 1 CardReader Conn.
4 IN 1 CONN
Bottom Side, Normal Insertion
Compal Electronics, Inc.
PCI8412/PCI/1394 CONN/CARD SLOT
Security Classification
Compal Secret Data
Issued Date
2006/10/31
Deciphered Date
2009/11/13
Size
Custom
Document Number
ISKAE M/B LA-3661P
Rev
0.1
Date:
Thursday, December 28, 2006
Sheet
20
of
37

CardBus Power Switch



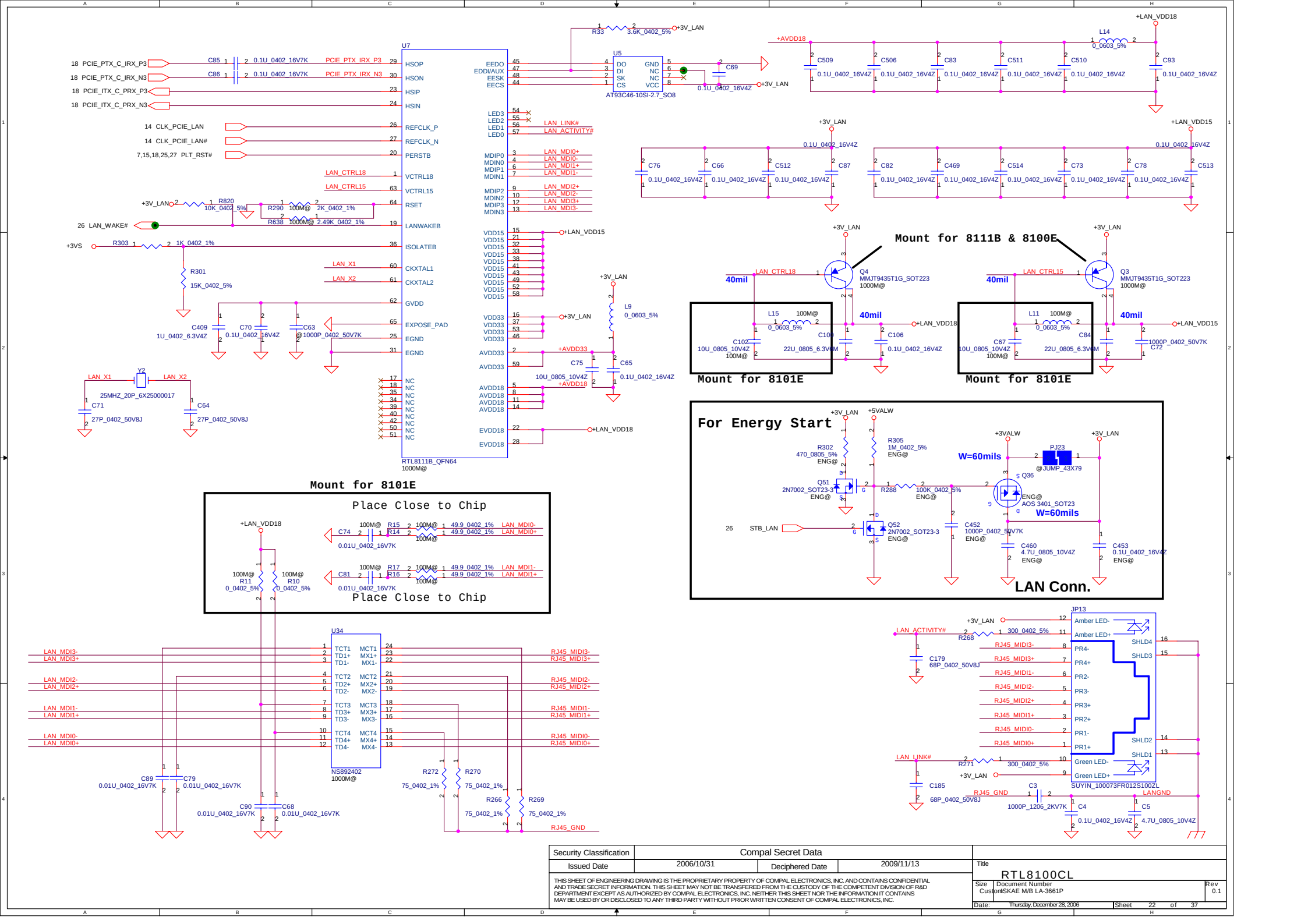
Security Classification	Compal Secret Data		
Issued Date	2006/10/31	Deciphered Date	2009/11/13

Compal Electronics, Inc.

Title: **PCI7412/CB/CB SLOT**

Size	Document Number	Rev
Custom	ISKAE M/B LA-3661P	0.1

Date: Tuesday, December 26, 2006 | Sheet 21 of 37



Security Classification	Compal Secret Data		
Issued Date	2006/10/31	Deciphered Date	2009/11/13

Title: RTL8100CL

Size	Document Number	Rev
Custom	SKAE M/B LA-3661P	0.1

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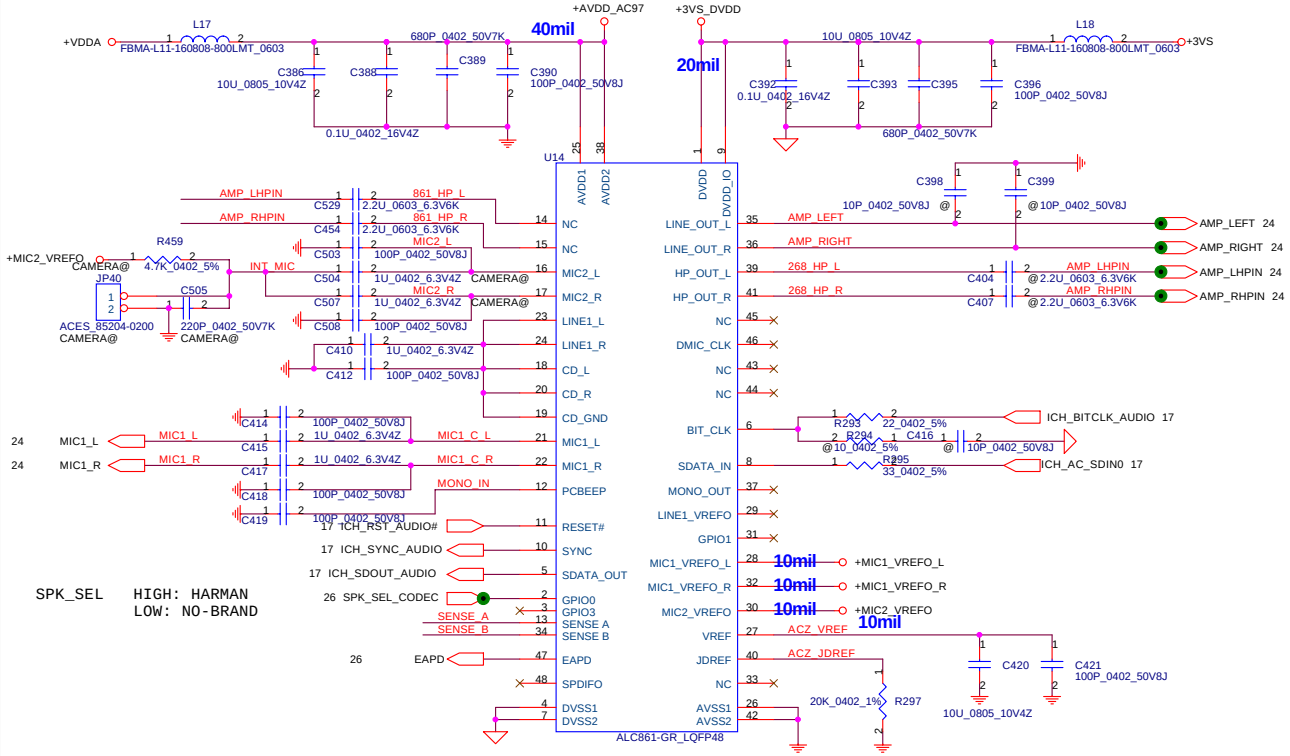
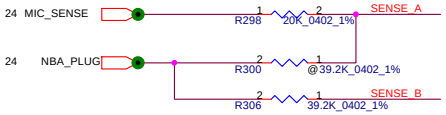
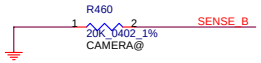
HD Audio Codec



SPK_SEL HIGH: HARMAN
LOW: NO-BRAND

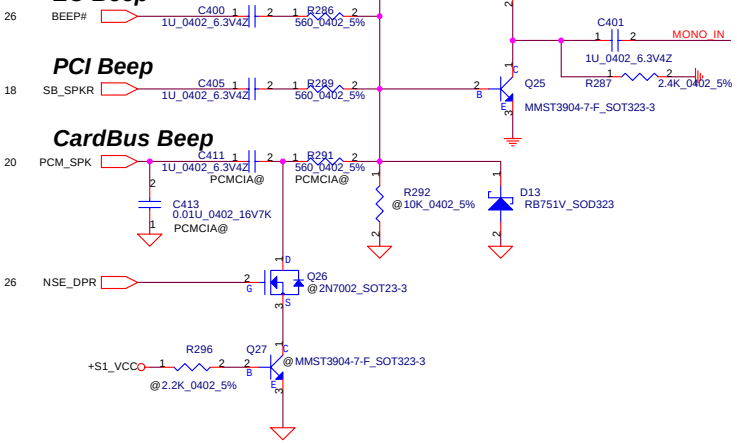


SENSE FOR Int. Mic.



Sense Pin	Impedance	Codec Signals
SENSE A	39.2K	PORT-A (PIN 39, 41)
	20K	PORT-B (PIN 21, 22)
	10K	PORT-C (PIN 23, 24)
	5.1K	PORT-D (PIN 35, 36)
SENSE B	39.2K	PORT-E (PIN 14, 15)
	20K	PORT-F (PIN 16, 17)
	10K	PORT-G (PIN 43, 44)
	5.1K	PORT-H (PIN 45, 46)

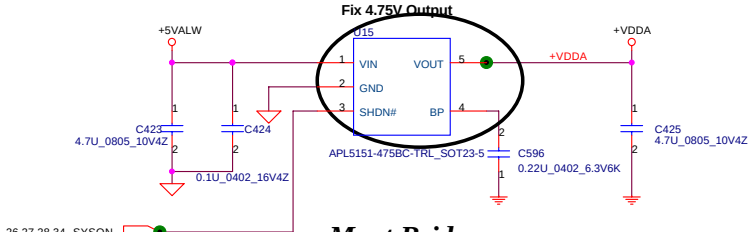
EC Beep



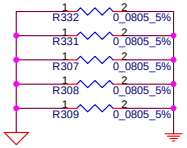
PCI Beep

CardBus Beep

Regulator for CODEC



Moat Bridge



Security Classification	Compal Secret Data		
Issued Date	2006/10/31	Deciphered Date	2009/11/13

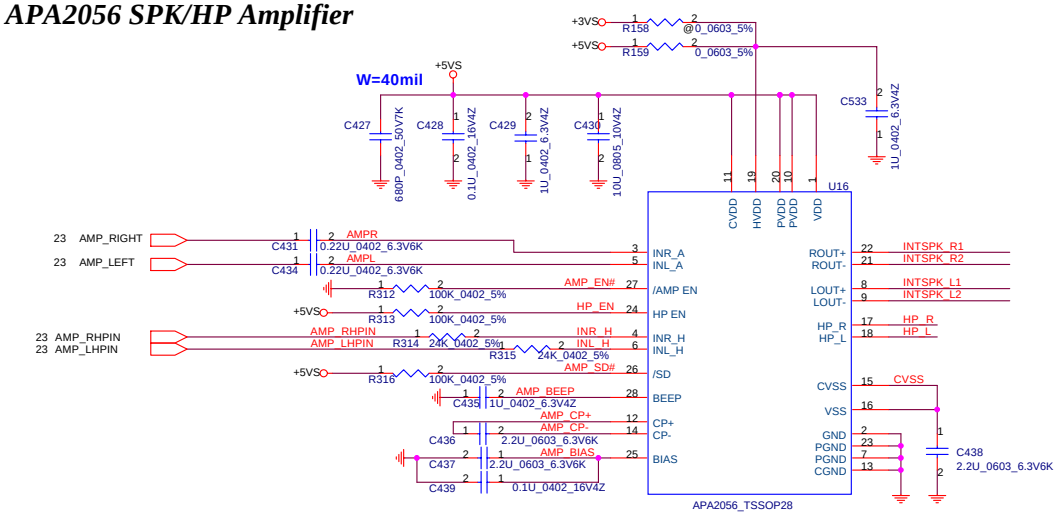
Compal Electronics, Inc.

Title: HD Audio Codec ALC268

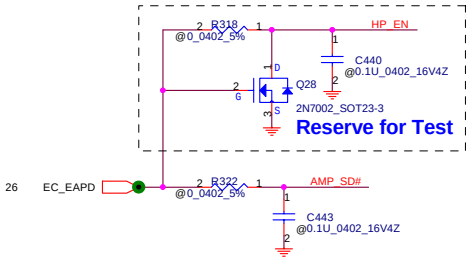
Size: Custom | Document Number: ISKAE M/B LA-3661P | Rev: 0.1

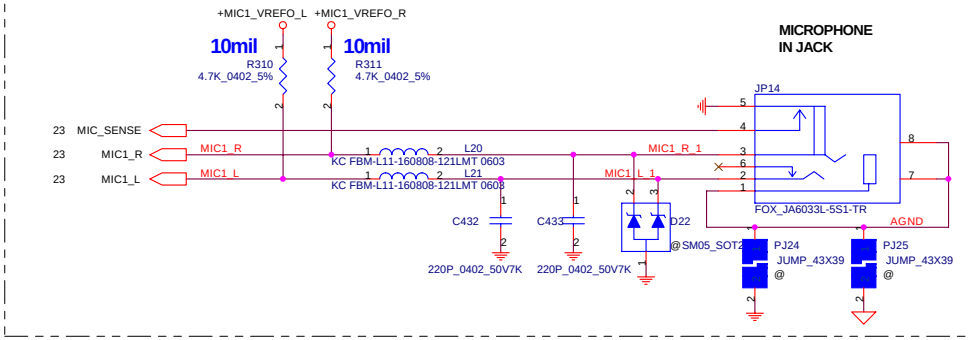
Date: Thursday, December 28, 2006 | Sheet 23 of 37

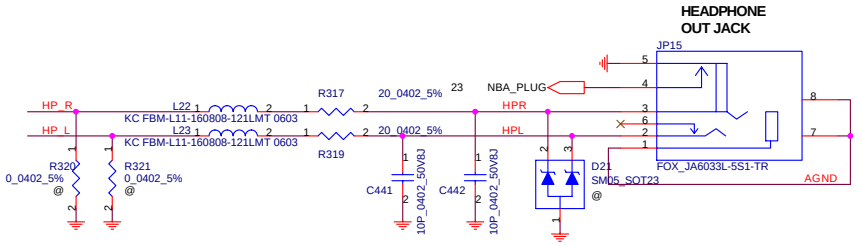
APA2056 SPK/HP Amplifier



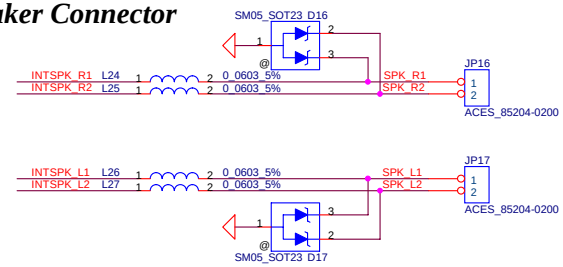
IN_A Gain = 10dB (Internal Speaker)
IN_H Gain = 0dB (Headphone)



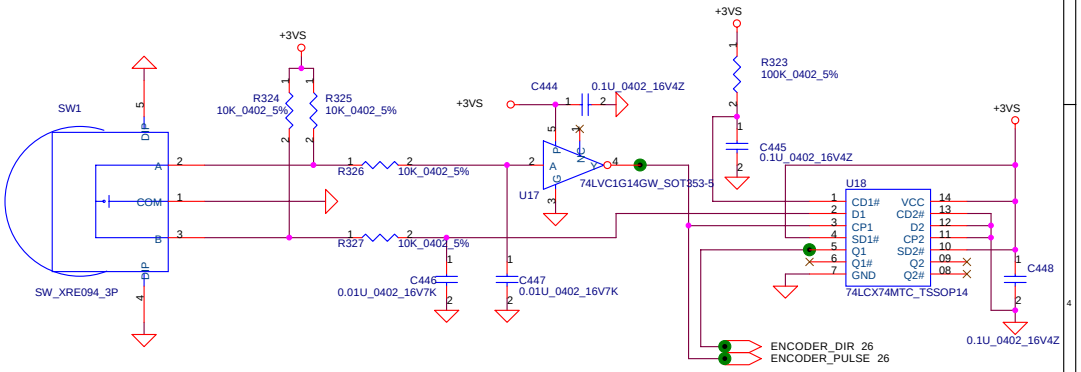




Right Speaker Connector



Volume Control



Security Classification	Compal Secret Data		
Issued Date	2006/10/31	Deciphered Date	2009/11/13

Compal Electronics, Inc.

Title: AMP/Volume Encoder/Audio Jack/MIC

Size	Document Number	Rev
Custom	ISKAE M/B LA-3661P	0.1

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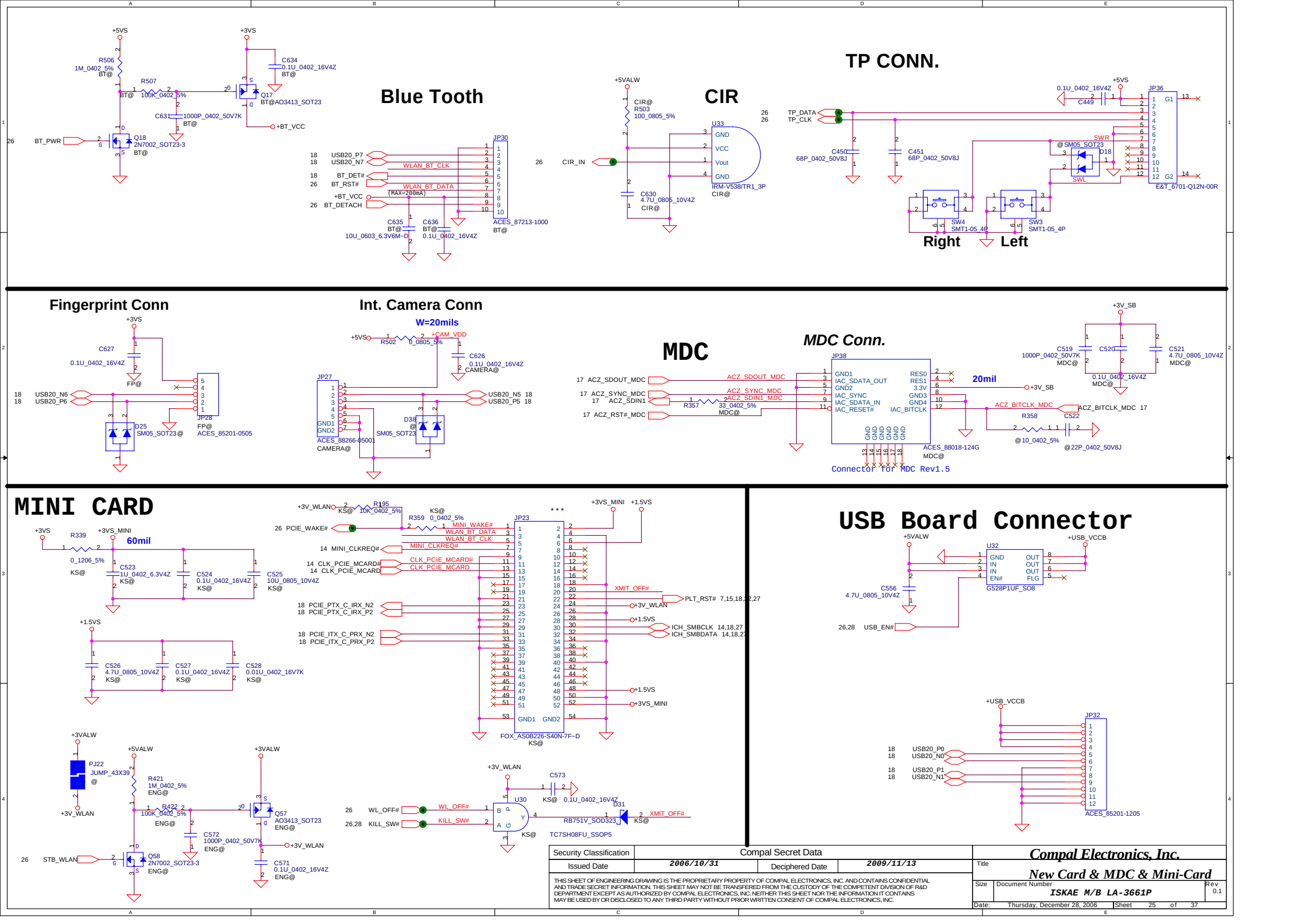
Blue Tooth
CIR
TP CONN.
Right
Left
Fingerprint Conn
Int. Camera Conn
W=20mils
MDC
MDC Conn.
20mil
Connector for MDC Rev1.5
MINI CARD
60mil
USB Board Connector
Security Classification
Compal Secret Data
Issued Date
2006/10/31
Deciphered Date
2009/11/13
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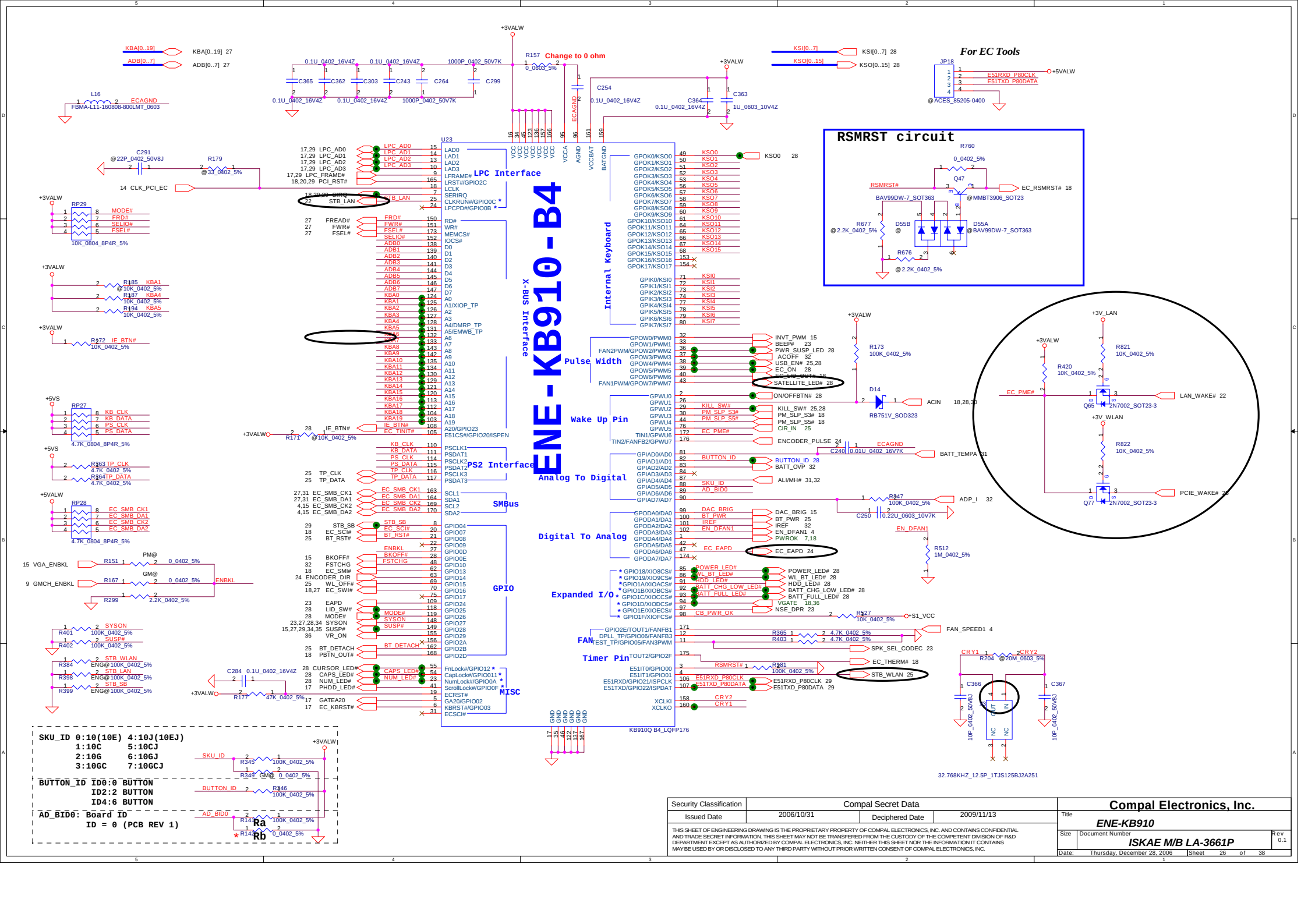
Compal Electronics, Inc.
Title
New Card & MDC & Mini-Card
Size
Document Number
ISKAE M/B LA-3661P
Rev
0.1
Date: Thursday, December 28, 2006
Sheet 25 of 37



Security Classification	Compal Secret Data		
Issued Date	2006/10/31	Deciphered Date	2009/11/13

Compal Electronics, Inc.

Title: *ENE-KB910*

Size: | Document Number: *ISKAE M/B LA-3661P* | Rev: 0.1

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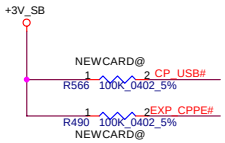
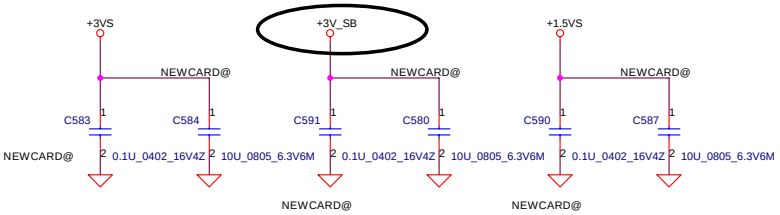
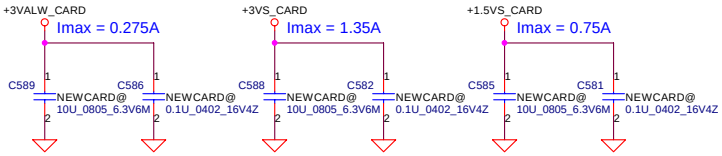
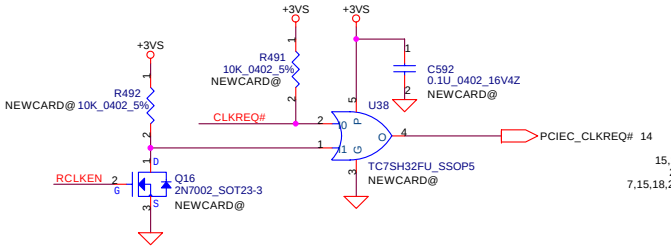
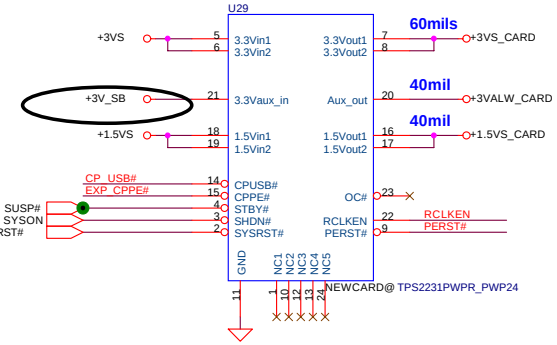
New Card

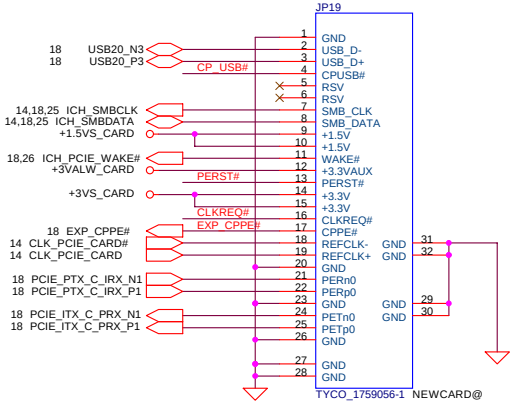


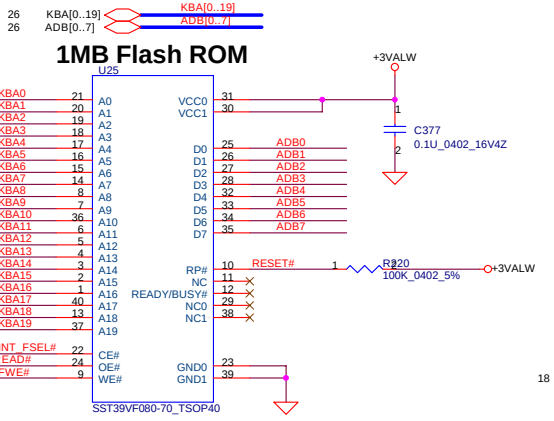


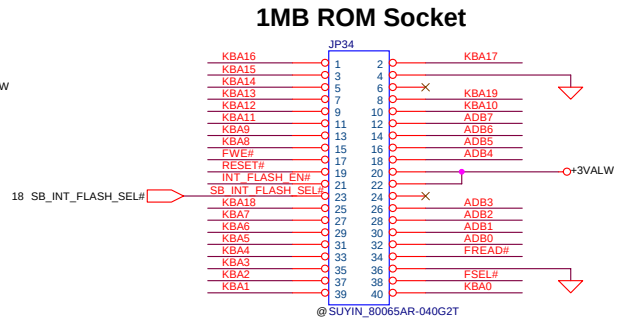


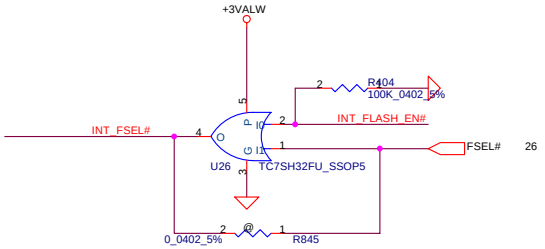


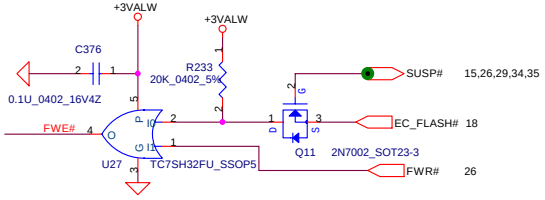


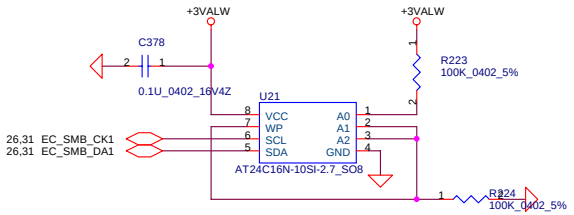












Security Classification	Compal Secret Data		
Issued Date	2006/11/05	Deciphered Date	2009/11/05

Compal Electronics, Inc.

Title: BIOS/TP-PAD/BT

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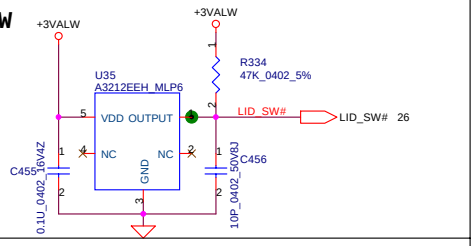
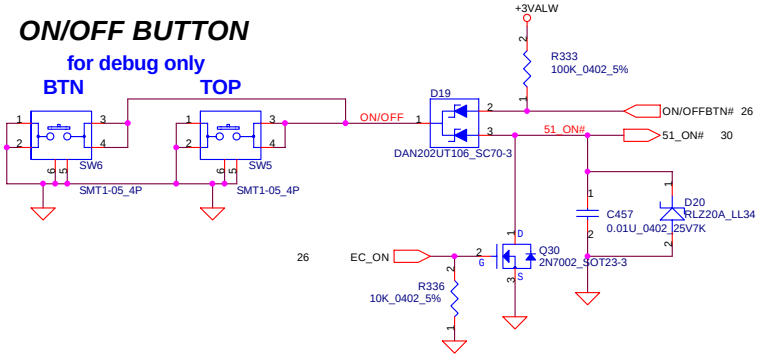
Lid SW



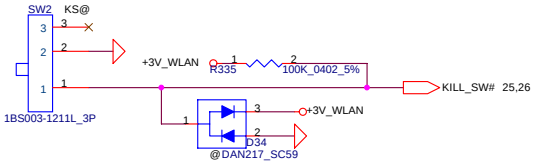
ON/OFF BUTTON

for debug only

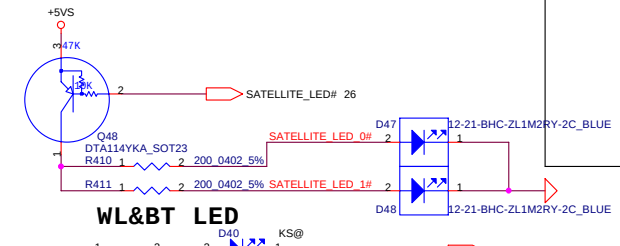
BTN TOP

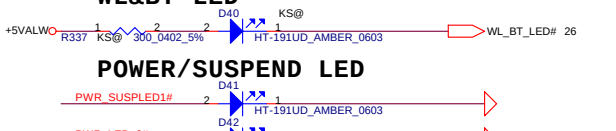


Kill SWITCH

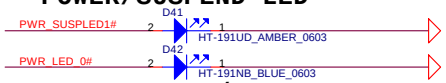


WL&BT LED

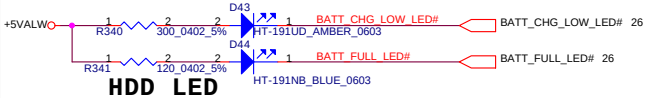




POWER/SUSPEND LED

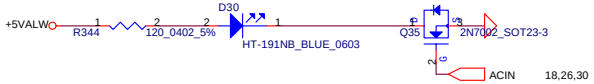


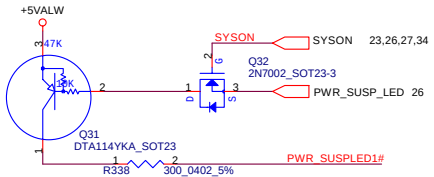
BATT CHARGE/FULL LED

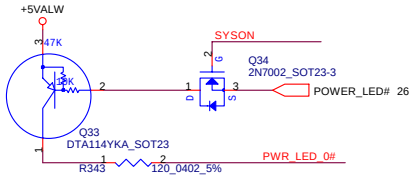


HDD LED

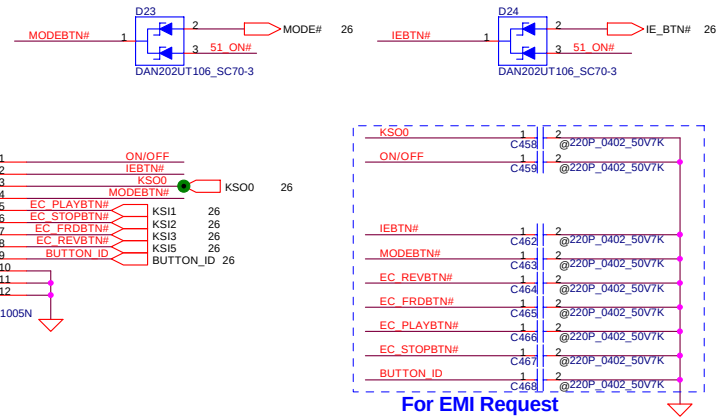
AC IN LED



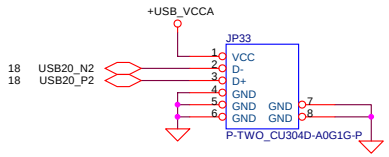




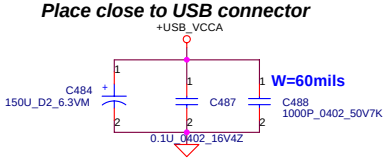
SW/LED Connector

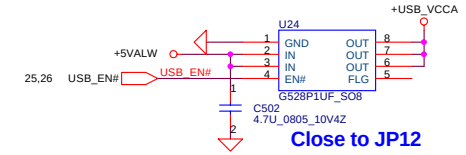


USB CONN. 1 (In Left From Side)

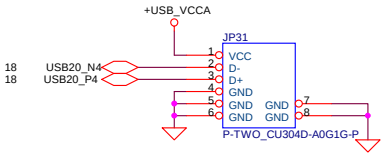


Place close to USB connector

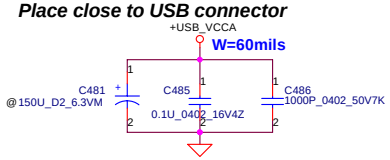




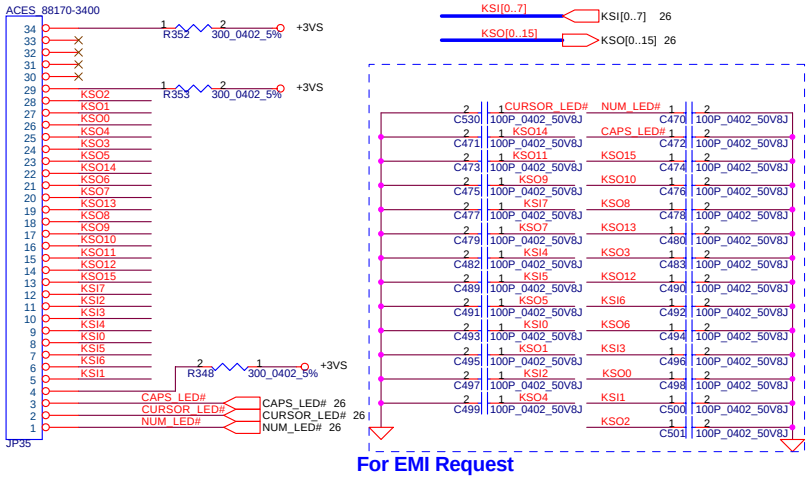
USB CONN. 2 (In Left Back Side)



Place close to USB connector



KEYBOARD CONN.



Security Classification	Compal Secret Data		
Issued Date	2006/10/31	Deciphered Date	2009/11/13

Compal Electronics, Inc.

Title: USB/LID/KS/KB/LED/SW-B Conn

Size	Document Number	Rev
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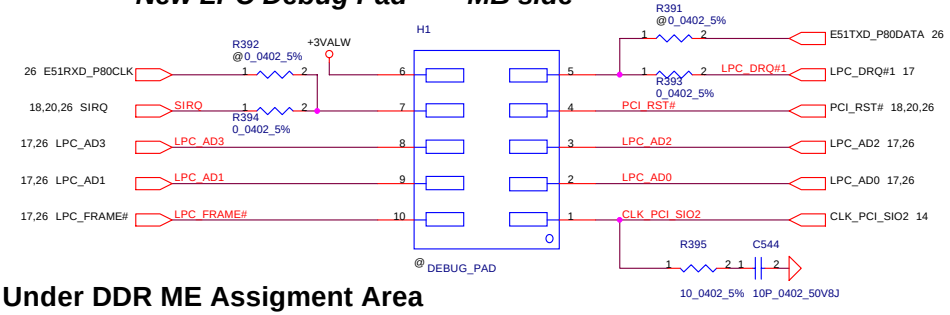
New LPC Debug Pad ---- MB side

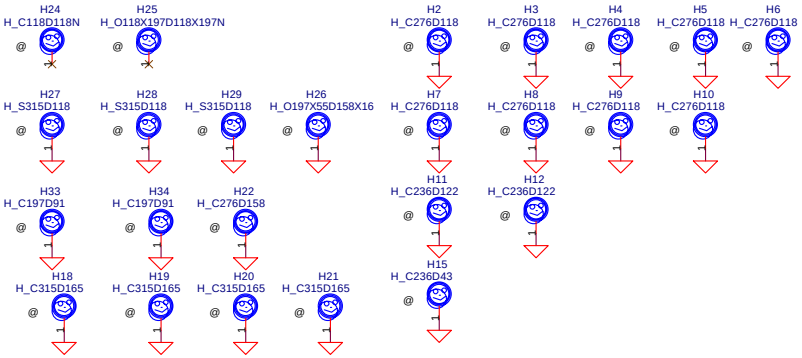


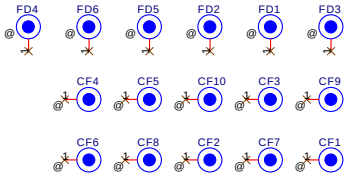
Under DDR ME Assigment Area

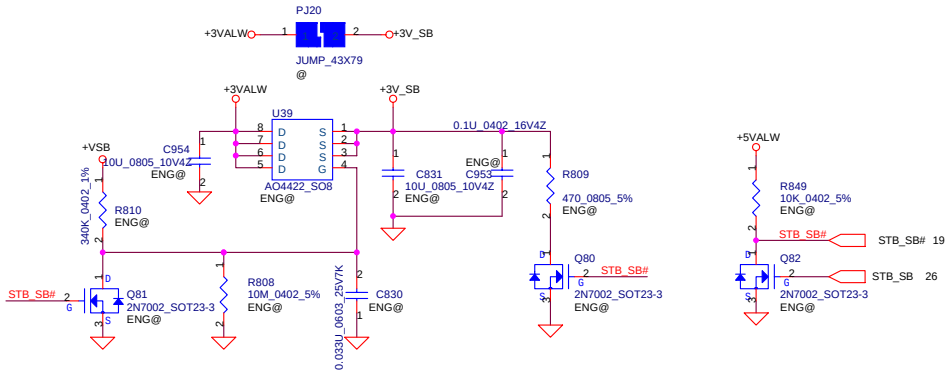
Keep Resistor near Debug Pad and in the same side

Reverse side DIMM ---- Pin 1 keep away DIMM

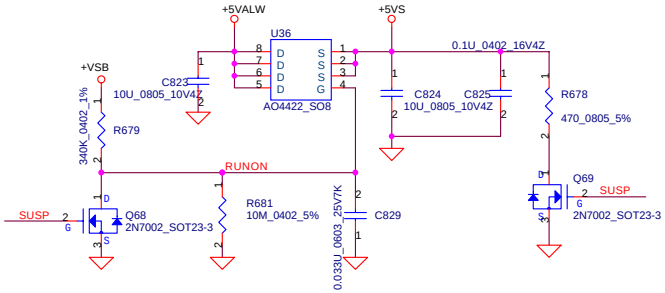
Screw Hole



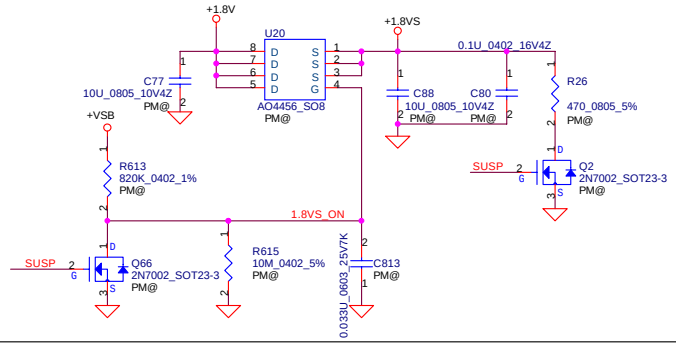




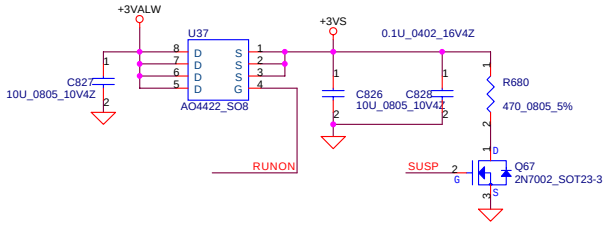
+5VALW to +5VS Transfer



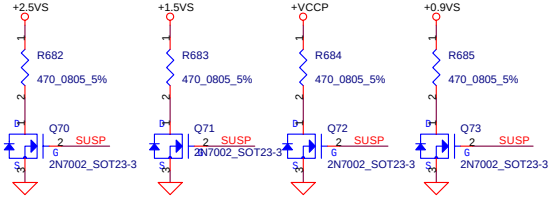
+1.8V to +1.8VS Transfer (Place close to VGA-Connector)

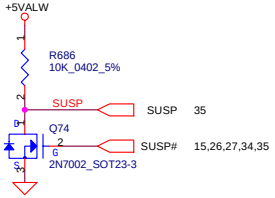


+3VALW to +3VS Transfer



Discharge Circuit





Security Classification	Compal Secret Data		
Issued Date	2006/10/31	Deciphered Date	2009/11/13

Compal Electronics, Inc.

Title: DC/DC I/F_Debug I/F_Screw

Size: | Document Number: ISKAE M/B LA-3661P | Rev: 0.1

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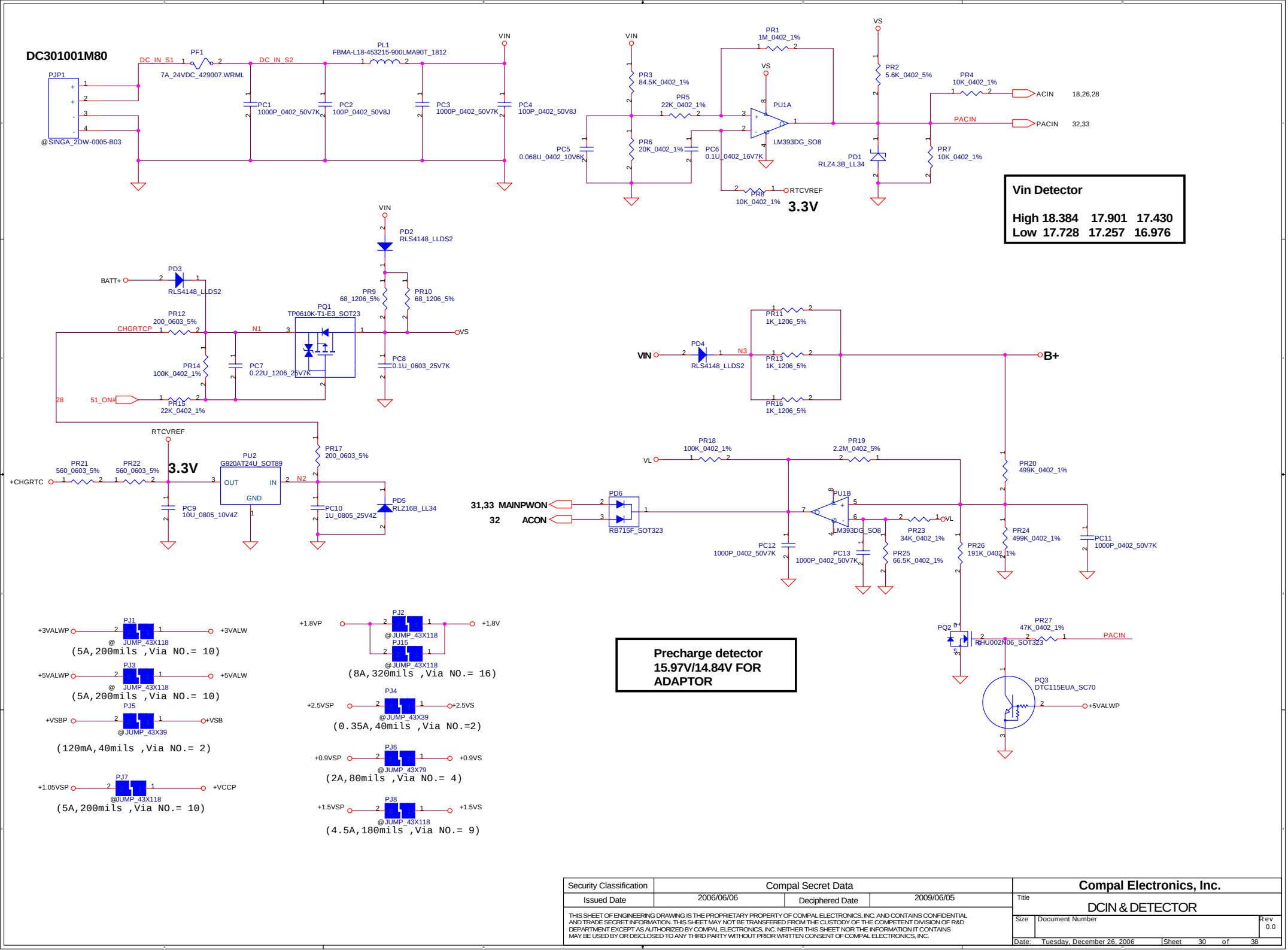

Security Classification	Compal Secret Data		
Issued Date	2006/06/06	Deciphered Date	2009/06/05

Compal Electronics, Inc.

Title: DCIN & DETECTOR

Size	Document Number	Rev
		0.0

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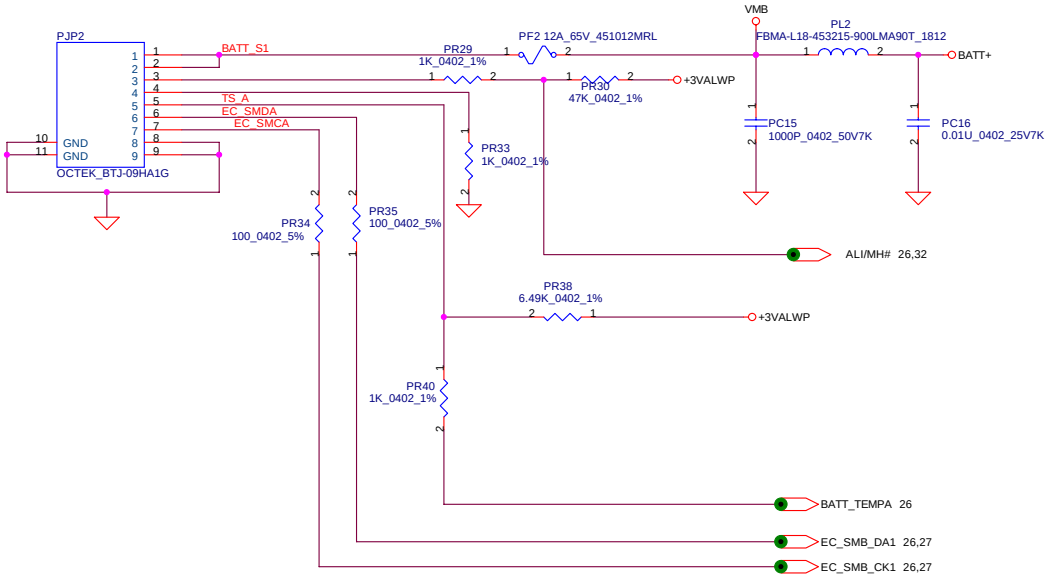
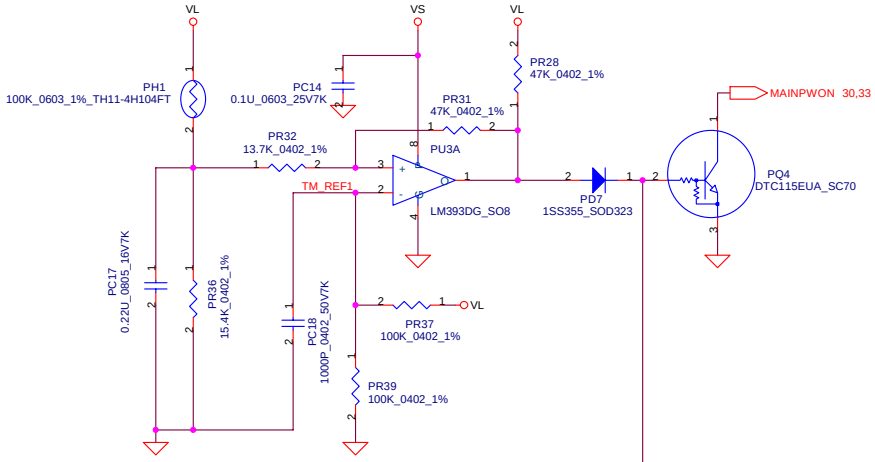
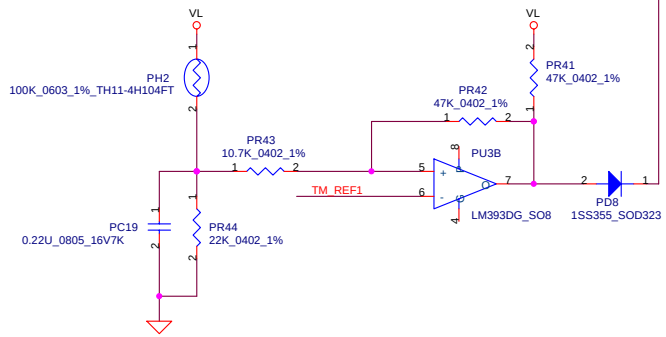
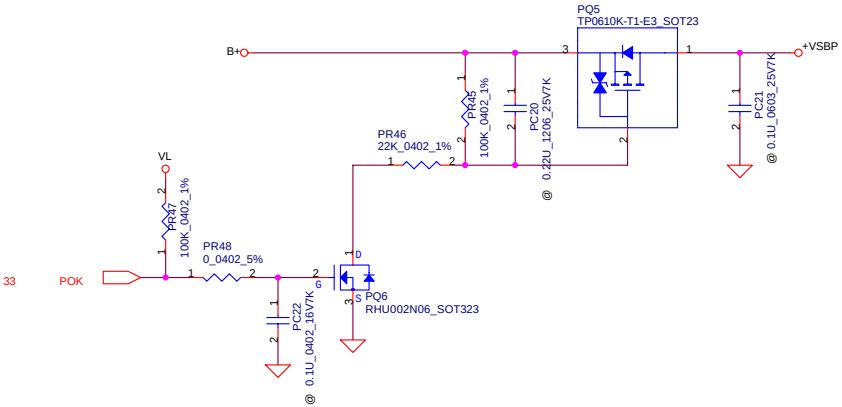
PH1 under CPU botten side :
CPU thermal protection at 87 degree C
Recovery at 48 degree C





PH2 near main Battery CONN :
BAT. thermal protection at 79 degree C
Recovery at 45 degree C





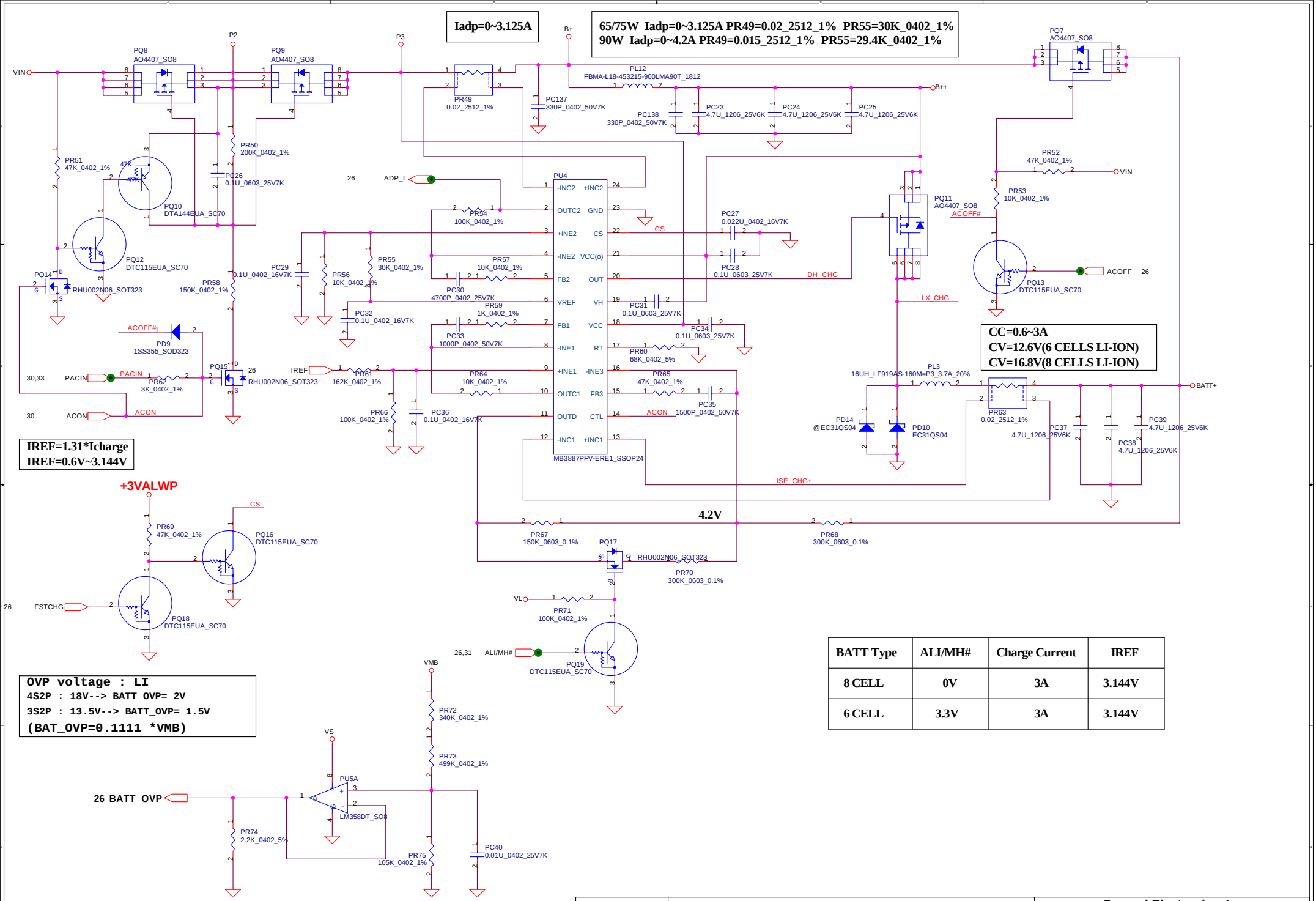
Security Classification	Compal Secret Data		
Issued Date	2006/06/06	Deciphered Date	2009/06/05

Compal Electronics, Inc.

Title: BATTERY CONN / OTP

Size	Document Number	Rev
		0.0

Date: Tuesday, December 26, 2006 | Sheet 31 of 38



BATT Type	ALI/MH#	Charge Current	IREF
8 CELL	0V	3A	3.144V
6 CELL	3.3V	3A	3.144V

Security Classification	Compal Secret Data		
Issued Date	2006/06/06	Deciphered Date	2009/06/05

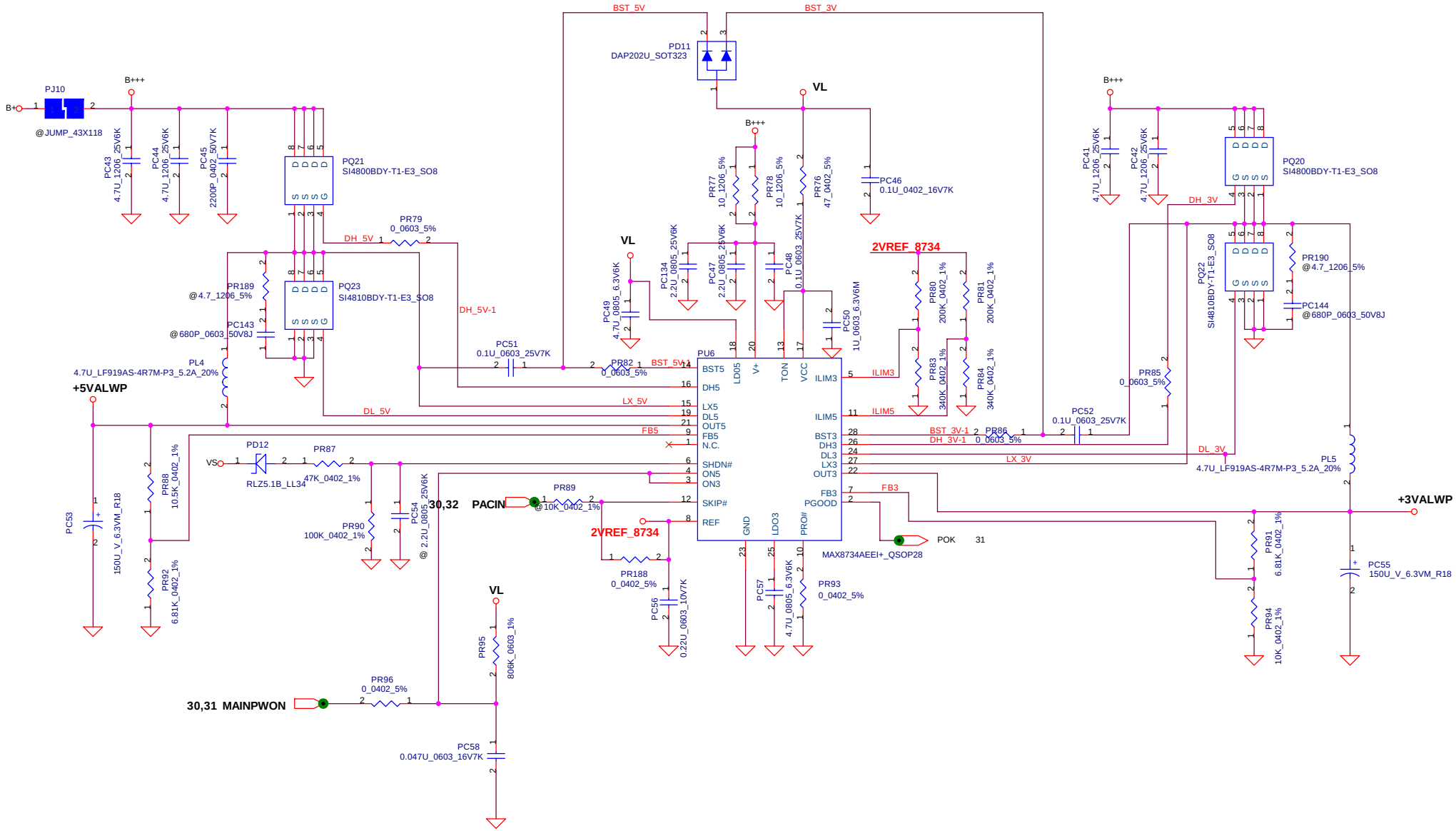
Compal Electronics, Inc.

Title: CHARGER

Size | Document Number | Rev 0.0

Date: Tuesday, December 26, 2006 | Sheet 32 of 38

+3.3VALWP/+5VALWP



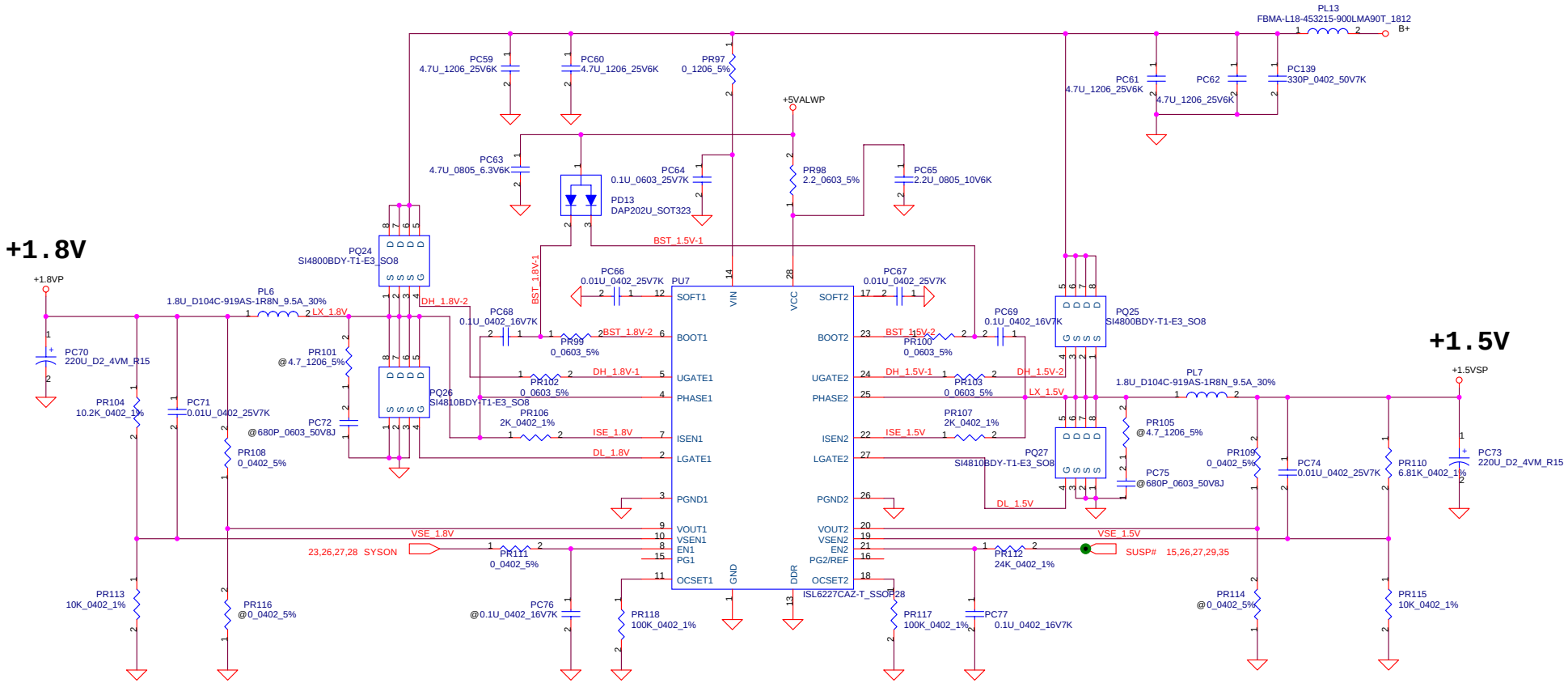
Security Classification	Compal Secret Data		
Issued Date	2006/06/06	Deciphered Date	2009/06/05

Compal Electronics, Inc.

Title: +5V/+3V

Size: Custom | Document Number: IAKAA M/B LA-3401P | Rev: 0.0

Date: Tuesday, December 26, 2006 | Sheet 33 of 38



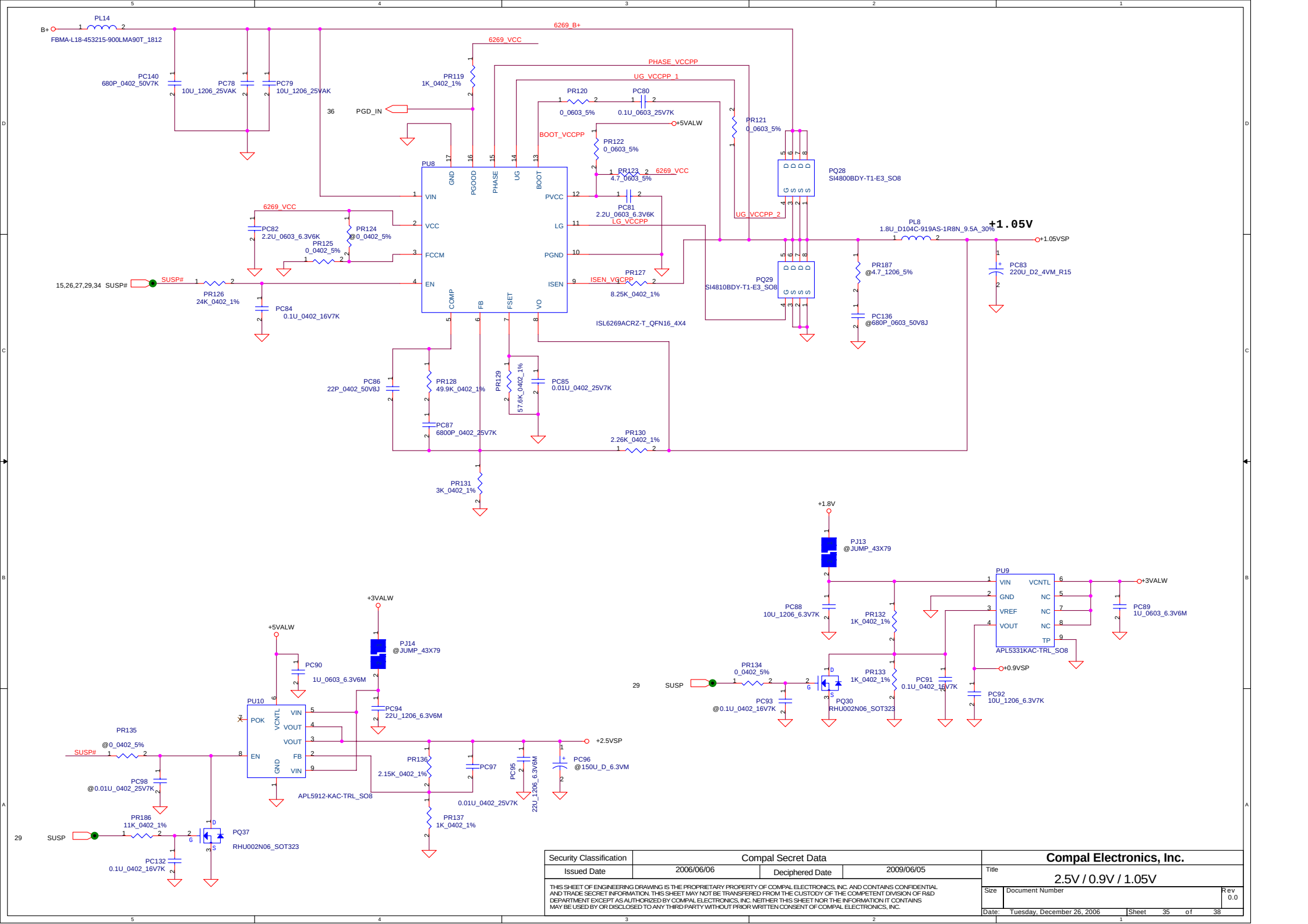
Security Classification	Compal Secret Data		
Issued Date	2006/06/06	Deciphered Date	2009/06/05

Compal Electronics, Inc.

Title: 1.8V / 1.5V

Size | Document Number | Rev 0.0

Date: Tuesday, December 26, 2006 | Sheet 34 of 38



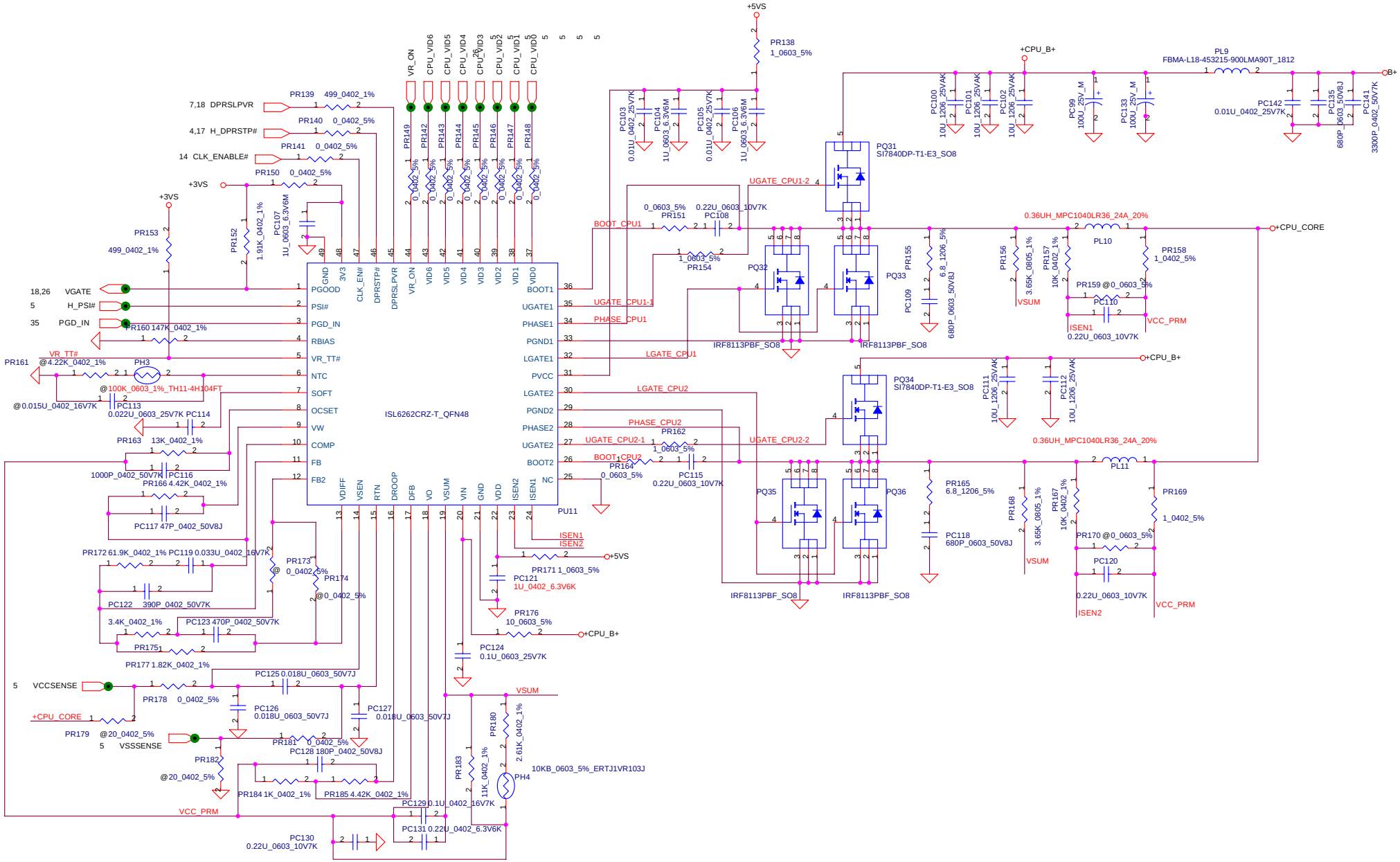
Security Classification	Compal Secret Data		
Issued Date	2006/06/06	Deciphered Date	2009/06/05

Compal Electronics, Inc.

Title: 2.5V / 0.9V / 1.05V

Size	Document Number	Rev
		0.0

Date: Tuesday, December 26, 2006 | Sheet 35 of 38



Security Classification	Compal Secret Data		
Issued Date	2006/06/06	Deciphered Date	2009/06/05

Compal Electronics, Inc.

Title: **+CPU_CORE**

Size	Document Number	Rev
Custom		0.0

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POWER PIR LIST

	page	Reason for change	Modify list
DVT	35	Change +1.05V PWM IC	Change PU8 to ISL6269A(SA00000GU80), add PR122 (0ohm, SD013000080)
	36	For EMI team request to add snubber and gate resistor	Add snuber PR155,PR165(6.8ohm_SD011680B80), PC109,PC118(680p_SE024681J80) and gate resistor PR154,PR162(1ohm_SD013100B80)
		Modify the CUP CORE load line and compensation	Change PC103 to 0.022u(SE076223K80), PC104 to 2.2u(SE107225K80), PR185 to 4.42K(SD000004J80), PC129 to 0.1u(SE076104K80, add PC126 (0.018U_SE025183J80), delete PC105 and PC106
	31	Modify the CPU OTP point from 84 degC to 87 degC for thermal team request	Change PR36 from 22K to 20K(SD034200280)
PVT	32,34, 35,36	For EMI team request to add bead to reduce board band	Add PL12,PL13,PL14(SM010020720);PC137,PC138,PC139(330p_SE074331K80);PC140(680p_SE074681K80);PC141(3300p_SE074332K80)
	33	Reduce the power consumption on S3/S4	Add PR188(0_0402_5%) and unpop PR89
	36	Solve the high frequency noise.	Change PC99 from 100U to 220U(SF22004M210)
Pre-MP	36	For EMI solution	Add PC142 (0.01u_0402)
	36	PC99 was interfere with logic low so change to small size	Change PC99 from 220U to 100U and add PC143,PC144(68U_25V).

PIR (Product Improve Record)

FOR ISPD

LAN

U13
RTL8101E
100M@

TRANSFORMER

U34
NS892404
100M@

PCB

ZZZ1
PCB ZKU LA-3661P REV0

Card BUS

U8
8402
8402@

U8
4512
4512@

SB

U2
ICH7
ICH7R1@

U6
943GML
GMLR3@

U6
943GML
GMLR1@

NB

U6
945GM
GMR3@

U6
945GM
GMR1@

U6
945PM
PMR1@

SKU ID

R349
18K_0402_5%
PM@

DC-JACK

PJP1
SINGA_2DW-0005-B03
45@

Security Classification	Compal Secret Data		
Issued Date	2006/10/03	Deciphered Date	2009/11/13

Compal Electronics, Inc.

Title: *ISPD*

Size | Document Number: *ISKAE M/B LA-3661P* | Rev: 0.1

Date: Tuesday, December 26, 2006 | Sheet 38 of 37