

# Compal Confidential

Model Name :Q5WV1/Q5WS1

Compal Project Name :

File Name : LA-7912P

# Compal Confidential

## Q5WV1 M/B Schematics Document

### Intel Sandy/Ivy Bridge Processor with DDRIII + Panther Point PCH

### Nvidia N13P GS/GL

2011-12-24

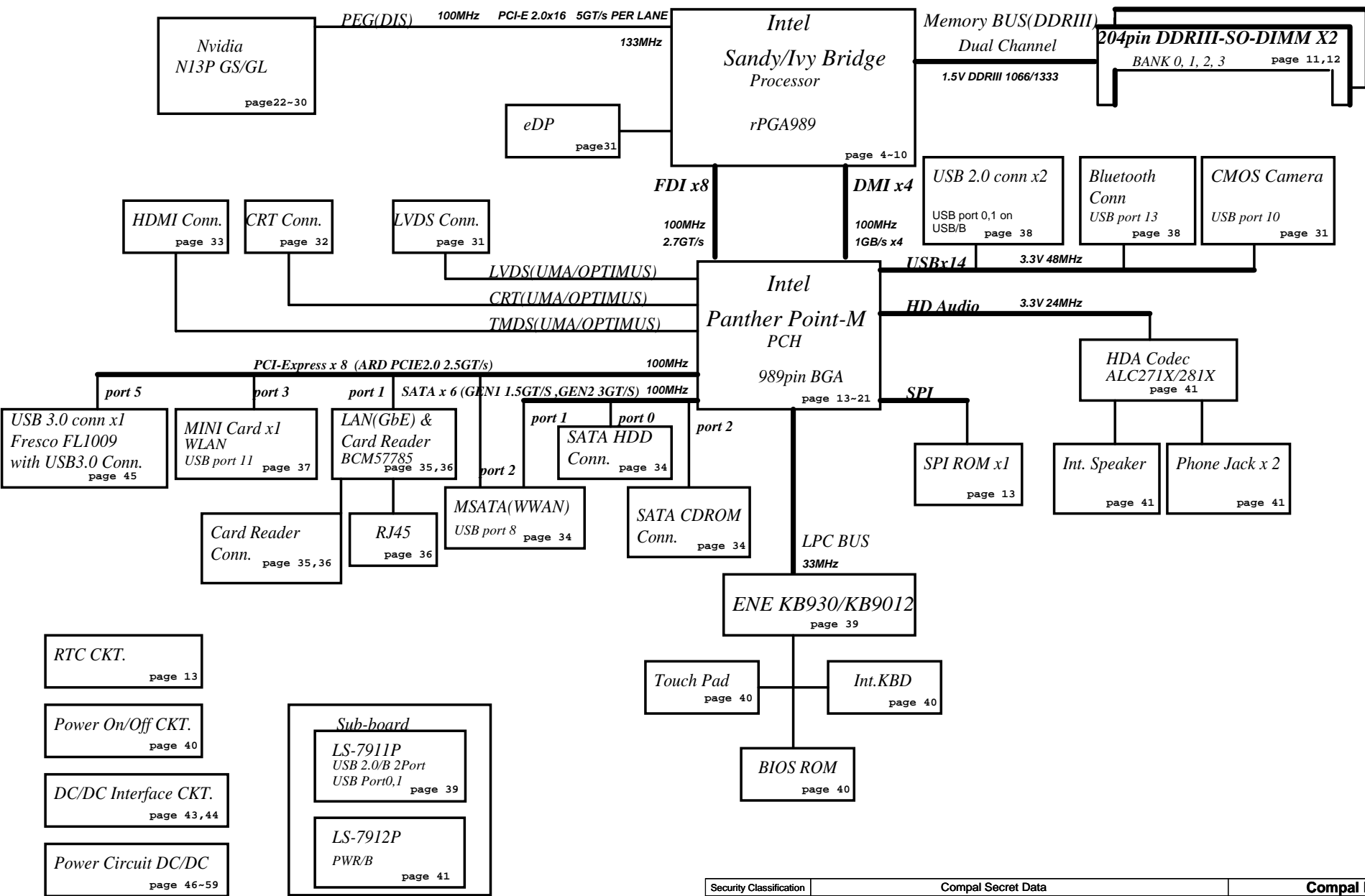
REV:0.2

Part Number	Description
DA60000SV00	PCB 0N4 LA-7912P REV0 M/B



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				Rev B
				Date: Friday, January 06, 2012
				Sheet 1 of 60

Fan Control  
page 42



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				Date:	Friday, January 06, 2012	Sheet 2 of 60
				Custom	4019ID	B

## Voltage Rails

Power Plane	Description	S1	S3	S5
VIN	Adapter power supply (19V)	N/A	N/A	N/A
BATT+	Battery power supply (12.6V)	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
+VGA_CORE	Core voltage for GPU	ON	OFF	OFF
+VGFX_CORE	Core voltage for UMA graphic	ON	OFF	OFF
+0.75VS	+0.75VP to +0.75VS switched power rail for DDR terminator	ON	OFF	OFF
+1.05VSDGPU	+1.0VSPDGPU to +1.0VSDGPU switched power rail for GPU	ON	OFF	OFF
+1.05VS_VTT	+1.05VS_VCCPP to +1.05VS_VCCP switched power rail for CPU	ON	OFF	OFF
+1.05VS_PCH	+1.05VS_VCCP to +1.05VS_PCH power for PCH	ON	OFF	OFF
+1.5V	+1.5VP to +1.5V power rail for DDRIII	ON	ON	OFF
+1.5VS	+1.5V to +1.5VS switched power rail	ON	OFF	OFF
+1.5VSDGPU	+1.5VS to +1.5VSDGPU switched power rail for GPU	ON	OFF	OFF
+1.8VS	(+5VALW or +3VALW) to 1.8V switched power rail to PCH & GPU	ON	OFF	OFF
+1.8VSDGPU	+1.8VS to +1.8VSDGPU switched power rail for GPU	ON	OFF	OFF
+3VALW	+3VALW always on power rail	ON	ON	ON*
+3VALW_EC	+3VALW always to KBC	ON	ON	ON*
+3V_LAN	+3VALW to +3V_LAN power rail for LAN	ON	ON	ON*
+3VALW_PCH	+3VALW to +3VALW_PCH power rail for PCH (Short Jumper)	ON	ON	ON*
+3VS	+3VALW to +3VS power rail	ON	OFF	OFF
+5VALW	+5VALWP to +5VALW power rail	ON	ON	ON*
+5VALW_PCH	+5VALW to +5VALW_PCH power rail for PCH (Short resistor)	ON	ON	ON*
+5VS	+5VALW to +5VS switched power rail	ON	OFF	OFF
+VSB	+VSBP to +VSB always on power rail for sequence control	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.

### EC SM Bus1 address

Device	Address	Device	Address
Smart Battery	0001 011X b		

### EC SM Bus2 address

### PCH SM Bus address

Device	Address
Clock Generator (9LVS3199AKLFT, RTM890N-631-VB-GRT)	1101 0010b
DDR DIMM0	1001 000Xb
DDR DIMM2	1001 010Xb

### BT & USB30 & USB20 Config

OPTMIUS SKU:DIS@ N13P-GL:GL@ N13P-GS:GS@ N13P-GF108\_ES4:GF108@  
 BT SKU:BT@  
 internal USB SKU: PUSB@ DIS USB30 SKU:DUSB@  
 eDP SKU: EDP@  
 LVDS SKU: LVDS@  
 EC 930 SKU: 930@ EC 9012 SKU: 9012@  
 PCH HM65: HM65@ PCH HM76: HM76@  
 Win8: WIN8@

STATE	SIGNAL	SLP_S1#	SLP_S3#	SLP_S4#	SLP_S5#	+VALW	+V	+VS	Clock
Full ON		HIGH	HIGH	HIGH	HIGH	ON	ON	ON	ON
S1 (Power On Suspend)		LOW	HIGH	HIGH	HIGH	ON	ON	ON	LOW
S3 (Suspend to RAM)		LOW	LOW	HIGH	HIGH	ON	ON	OFF	OFF
S4 (Suspend to Disk)		LOW	LOW	LOW	HIGH	ON	OFF	OFF	OFF
S5 (Soft OFF)		LOW	LOW	LOW	LOW	ON	OFF	OFF	OFF

### Board ID / SKU ID Table for AD channel

Vcc	3.3V +/- 5%			
Ra/Rc/Re	100K +/- 5%			
Board ID	Rb / Rd / Rf	VAD_BID min	VAD_BID typ	VAD_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	
1	
2	
3	0.1
4	0.2
5	0.3
6	0.4
7	

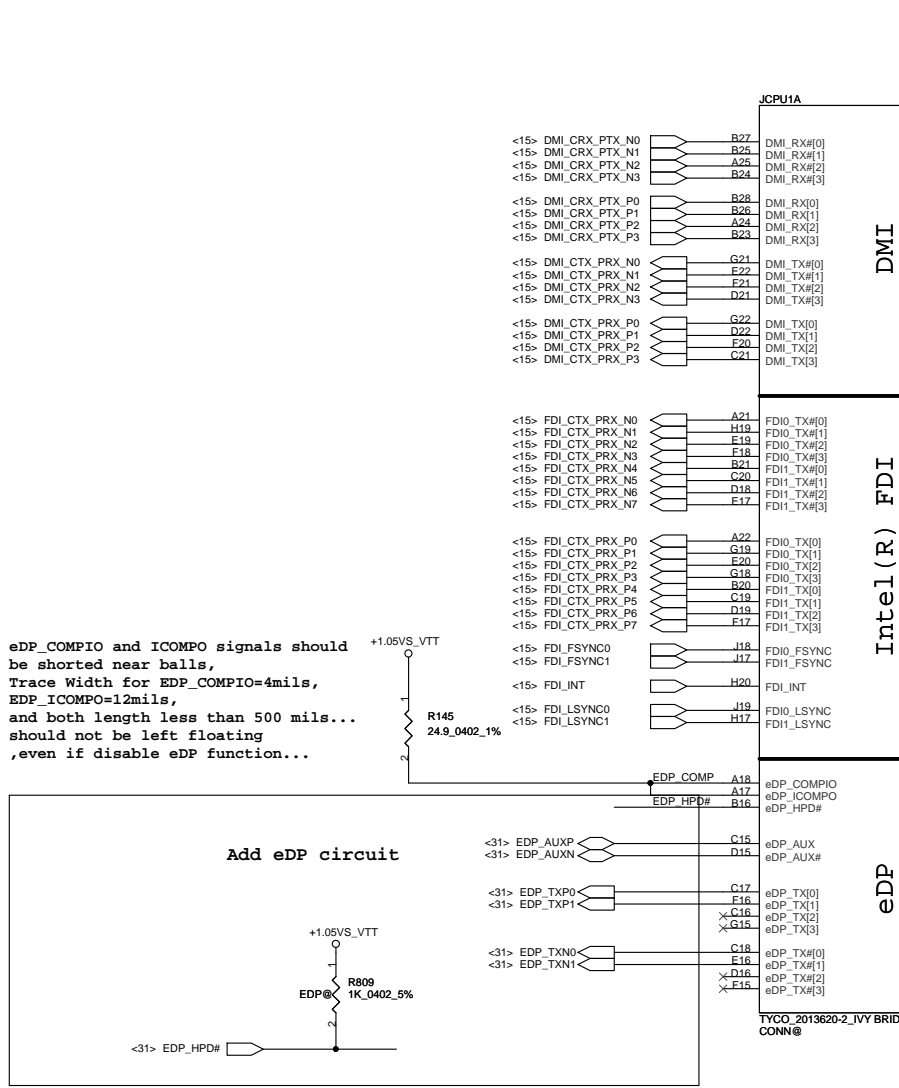
### BTO Option Table

BTO Item	BOM Structure
UMA Only	UMAO@
Dis with OPTIMUS	DIS@
Blue Tooth	BT@
Internal USB 3.0	PUSB@
eDP	eDP@
VRAM	X76@
Connector	CONN@
Unpop	@
N13P-GS	GS@
N13P-GL	GL@
Win8	WIN8@
Audio ALC271X	271X@
Audio ALC281X	281X@
PCH HM65	HM65@
PCH HM76	HM76@

### USB Port Table

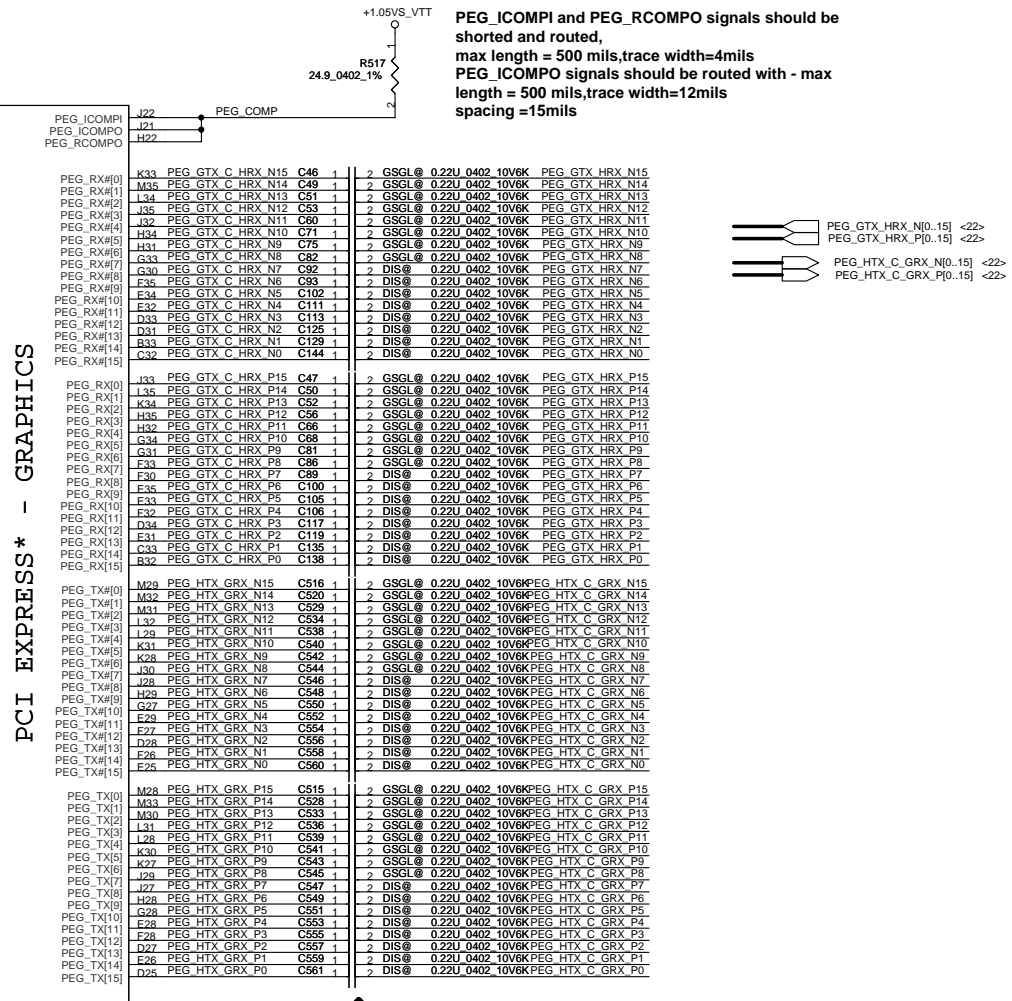
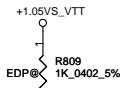
USB 2.0	USB 1.1	Port	3 External USB Port
EHCI1	UHCI0	0	USB3.0 colay USB2.0 Conn
		1	USB/B (Right Side)
	UHCI1	2	USB/B (Right Side)
		3	
		4	
	UHCI2	5	
		6	
7			
EHCI2	UHCI4	8	Mini Card 1(WLAN)
		9	
	UHCI5	10	Camera
		11	BlueTooth
		12	
	UHCI6	13	

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Date: Friday, January 06, 2012				Rev B
Sheet 3 of 60				



eDP\_COMP and ICOMPO signals should be shorted near balls, Trace Width for EDP\_COMP=4mils, EDP\_ICOMPO=12mils, and both length less than 500mils... should not be left floating ,even if disable eDP function...

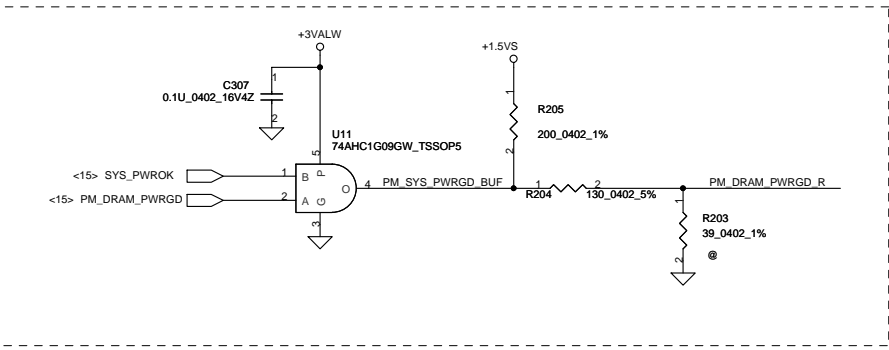
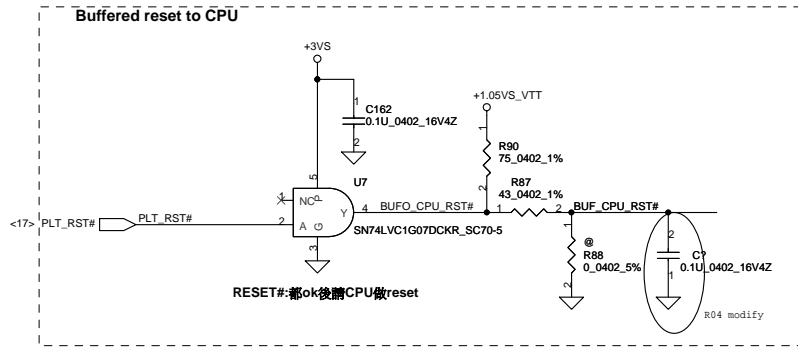
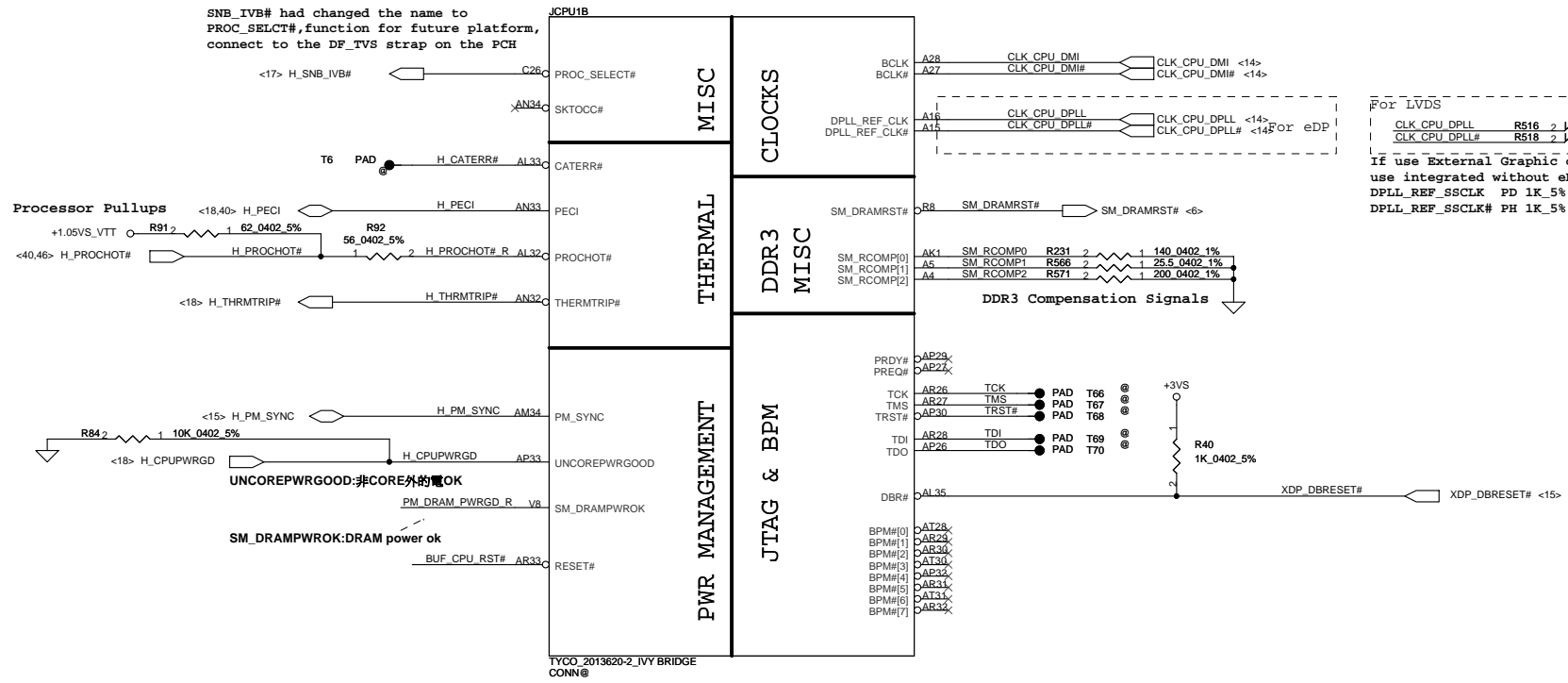
Add eDP circuit



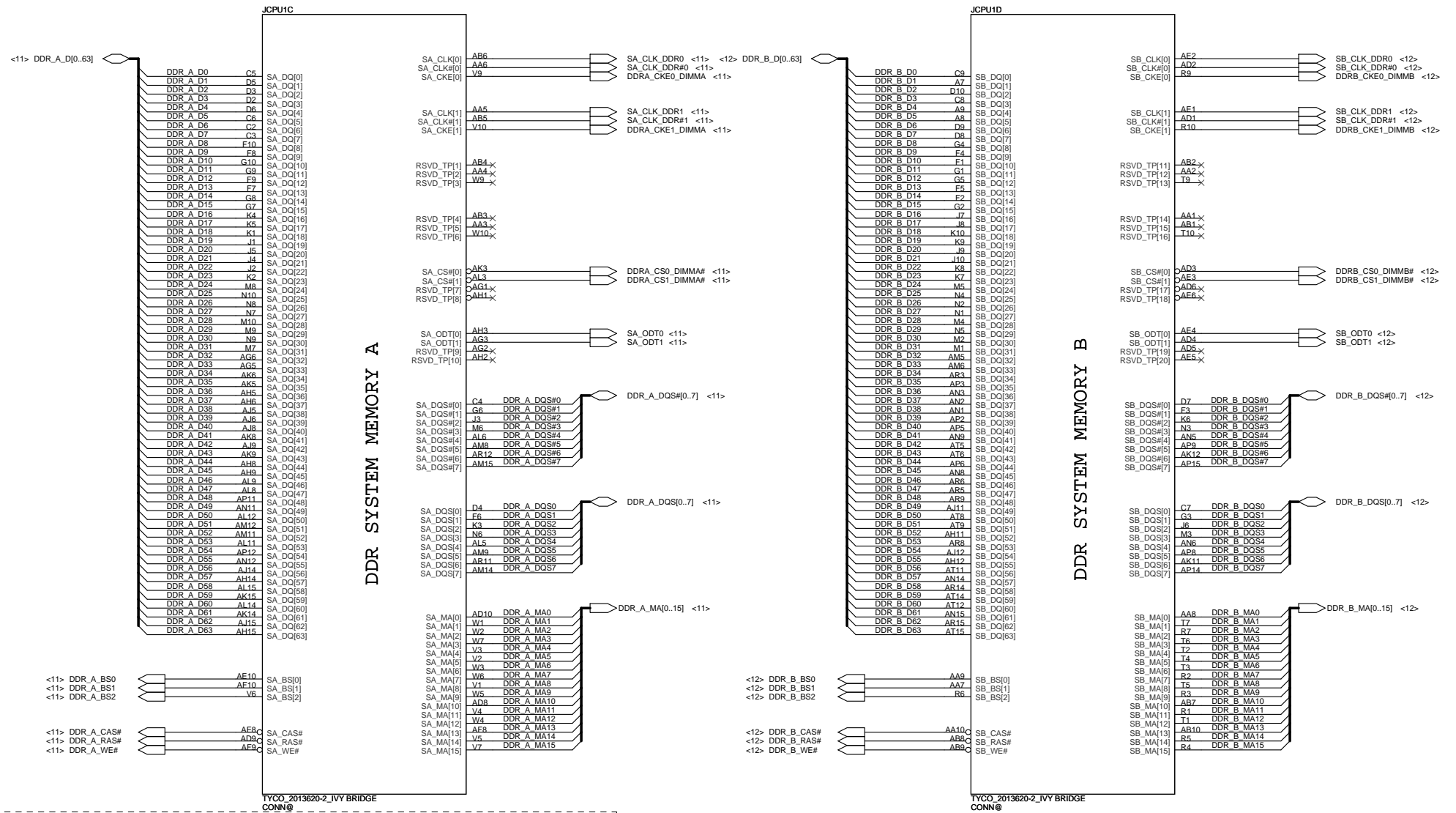
PEG\_ICOMPI and PEG\_RCOMPO signals should be shorted and routed, max length = 500mils, trace width=4mils PEG\_ICOMPO signals should be shorted with - max length = 500mils, trace width=12mils spacing =15mils

Typ- suggest 220nF. The change in AC capacitor value from 100nF to 220nF is to enable compatibility with future platforms having PCIe Gen3 (8GT/s)

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				Rev <b>B</b>
				Sheet 4 of 60



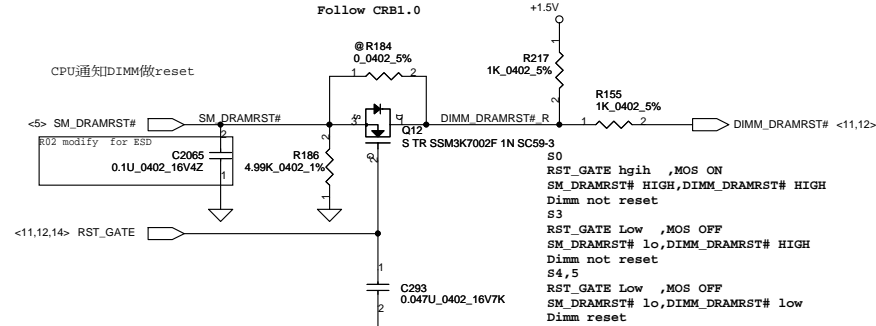
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				4019ID
Date: Friday, January 06, 2012				Rev B
Sheet 5 of 60				



TYCO\_2013620-2\_IVY BRIDGE  
CONN@

TYCO\_2013620-2\_IVY BRIDGE  
CONN@

Follow CRB1.0

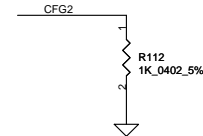
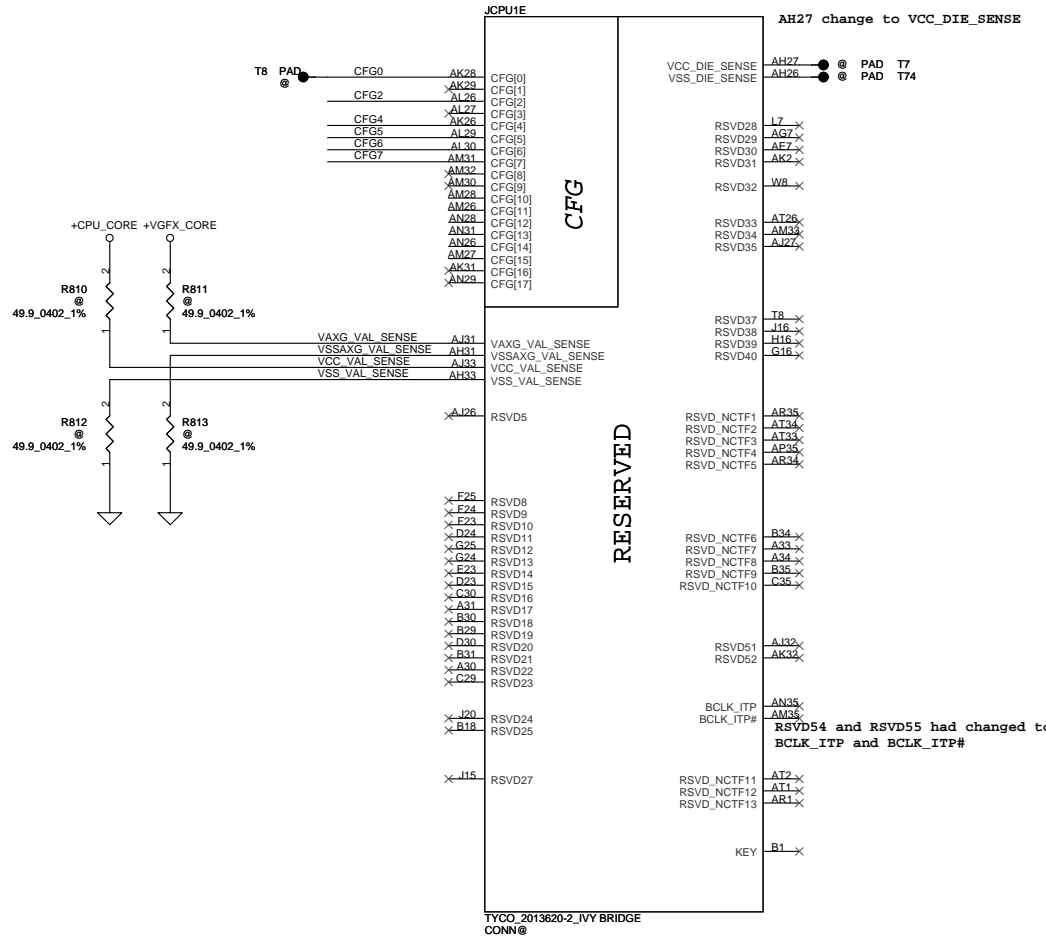


S0  
RST\_GATE hghh ,MOS ON  
SM\_DRAMRST# HIGH, DIMM\_DRAMRST# HIGH  
Dimm not reset  
S3  
RST\_GATE Low ,MOS OFF  
SM\_DRAMRST# lo, DIMM\_DRAMRST# HIGH  
Dimm not reset  
S4,5  
RST\_GATE Low ,MOS OFF  
SM\_DRAMRST# lo, DIMM\_DRAMRST# low  
Dimm reset

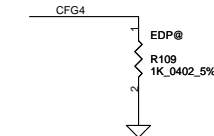
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Doc Number	Customer	Rev	4019ID	
Date:	Friday, January 06, 2012	Sheet	6	of 6

# CFG Straps for Processor

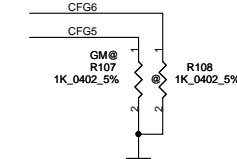
AH26	Sandy	Ivy
	GND	VSS_DIE_SENSE



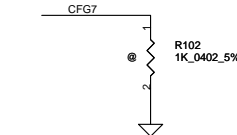
PEG Static Lane Reversal - CFG2 is for the 16x	
CFG2	1: Normal Operation; Lane # definition matches socket pin map definition * 0: Lane Reversed



Display Port Presence Strap	
CFG4	* 1 : Disabled; No Physical Display Port attached to Embedded Display Port 0 : Enabled; An external Display Port device is connected to the Embedded Display Port



PCIe Port Bifurcation Straps	
CFG[6:5]	*11: (Default) x16 - Device 1 functions 1 and 2 disabled 10: x8, x8 - Device 1 function 1 enabled ; function 2 disabled 01: Reserved - (Device 1 function 1 disabled ; function 2 enabled) 00: x8,x4,x4 - Device 1 functions 1 and 2 enabled



PEG DEFER TRAINING	
CFG7	1: (Default) PEG Train immediately following xxRESETB de assertion 0: PEG Wait for BIOS for training

SV type CPU

JCPU1F

**POWER**

+CPU\_CORE  
QC 53A  
DC 53A

- AG35 VCC1
- AG34 VCC2
- AG33 VCC3
- AG32 VCC4
- AG31 VCC5
- AG30 VCC6
- AG29 VCC7
- AG28 VCC8
- AG27 VCC9
- AG26 VCC10
- AF35 VCC11
- AF34 VCC12
- AF33 VCC13
- AF32 VCC14
- AF31 VCC15
- AF30 VCC16
- AF29 VCC17
- AF28 VCC18
- AF27 VCC19
- AF26 VCC20
- AD35 VCC21
- AD34 VCC22
- AD33 VCC23
- AD32 VCC24
- AD31 VCC25
- AD30 VCC26
- AD29 VCC27
- AD28 VCC28
- AD27 VCC29
- AD26 VCC30
- AC35 VCC31
- AC34 VCC32
- AC33 VCC33
- AC32 VCC34
- AC31 VCC35
- AC30 VCC36
- AC29 VCC37
- AC28 VCC38
- AC27 VCC39
- AC26 VCC40
- AA35 VCC41
- AA34 VCC42
- AA33 VCC43
- AA32 VCC44
- AA31 VCC45
- AA30 VCC46
- AA29 VCC47
- AA28 VCC48
- AA27 VCC49
- AA26 VCC50
- Y35 VCC51
- Y34 VCC52
- Y33 VCC53
- Y32 VCC54
- Y31 VCC55
- Y30 VCC56
- Y29 VCC57
- Y28 VCC58
- Y27 VCC59
- Y26 VCC60
- V35 VCC61
- V34 VCC62
- V33 VCC63
- V32 VCC64
- V31 VCC65
- V30 VCC66
- V29 VCC67
- V28 VCC68
- V27 VCC69
- V26 VCC70
- U35 VCC71
- U34 VCC72
- U33 VCC73
- U32 VCC74
- U31 VCC75
- U30 VCC76
- U29 VCC77
- U28 VCC78
- U27 VCC79
- R35 VCC80
- R34 VCC81
- R33 VCC82
- R32 VCC83
- R31 VCC84
- R30 VCC85
- R29 VCC86
- R28 VCC87
- R27 VCC88
- R26 VCC89
- P35 VCC90
- P34 VCC91
- P33 VCC92
- P32 VCC93
- P31 VCC94
- P30 VCC95
- P29 VCC96
- P28 VCC97
- P27 VCC98
- P26 VCC99
- P25 VCC100

**PEG AND DDR**

- VCCIO1 AH13
- VCCIO2 AH10
- VCCIO3 AC10
- VCCIO4 Y10
- VCCIO5 LH10
- VCCIO6 L10
- VCCIO7 J14
- VCCIO8 J13
- VCCIO9 J12
- VCCIO10 H14
- VCCIO11 H12
- VCCIO12 H11
- VCCIO13 G14
- VCCIO14 G13
- VCCIO15 G12
- VCCIO16 F14
- VCCIO17 F13
- VCCIO18 F12
- VCCIO19 F11
- VCCIO20 E14
- VCCIO21 E12
- VCCIO22 E11
- VCCIO23 E10
- VCCIO24 E09
- VCCIO25 F11
- VCCIO26 D14
- VCCIO27 D13
- VCCIO28 D12
- VCCIO29 D11
- VCCIO30 C14
- VCCIO31 C13
- VCCIO32 C12
- VCCIO33 C11
- VCCIO34 B14
- VCCIO35 B12
- VCCIO36 A14
- VCCIO37 A13
- VCCIO38 A12
- VCCIO39 A11
- VCCIO40 J23

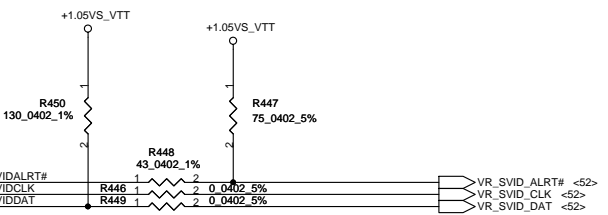
8.5A

+1.05VS\_VTT

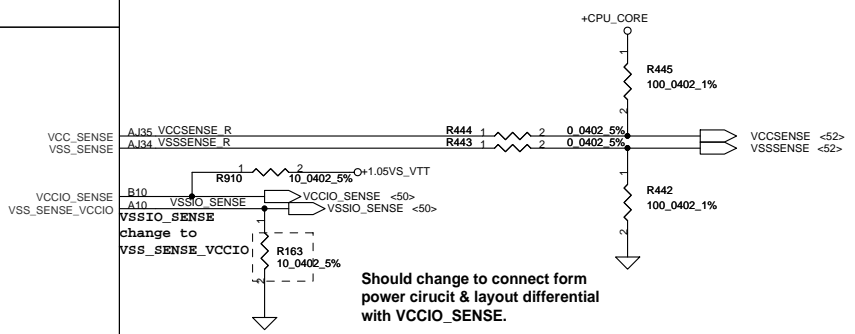
**CORE SUPPLY**

**SVID**

**SENSE LINES**



Place the PU resistors close to CPU



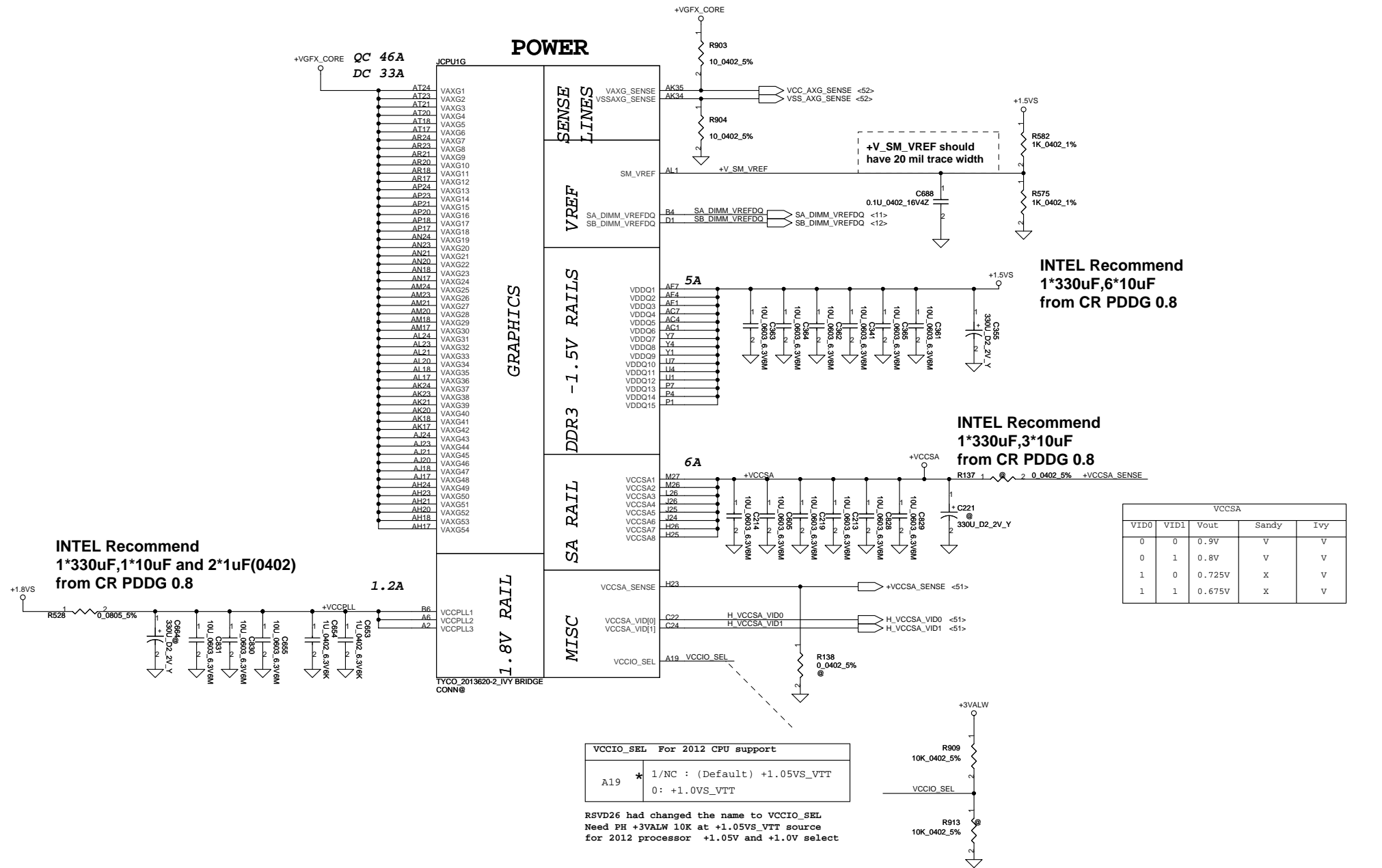
Should change to connect form power circuit & layout differential with VCCIO\_SENSE.

TYCO\_2013620-2\_IVY BRIDGE CONN@

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Document Number	4019ID
Date	Friday, January 06, 2012
Sheet	8 of 60





**INTEL Recommend**  
**1\*330uF, 1\*10uF and 2\*1uF(0402)**  
**from CR PDDG 0.8**

**INTEL Recommend**  
**1\*330uF, 6\*10uF**  
**from CR PDDG 0.8**

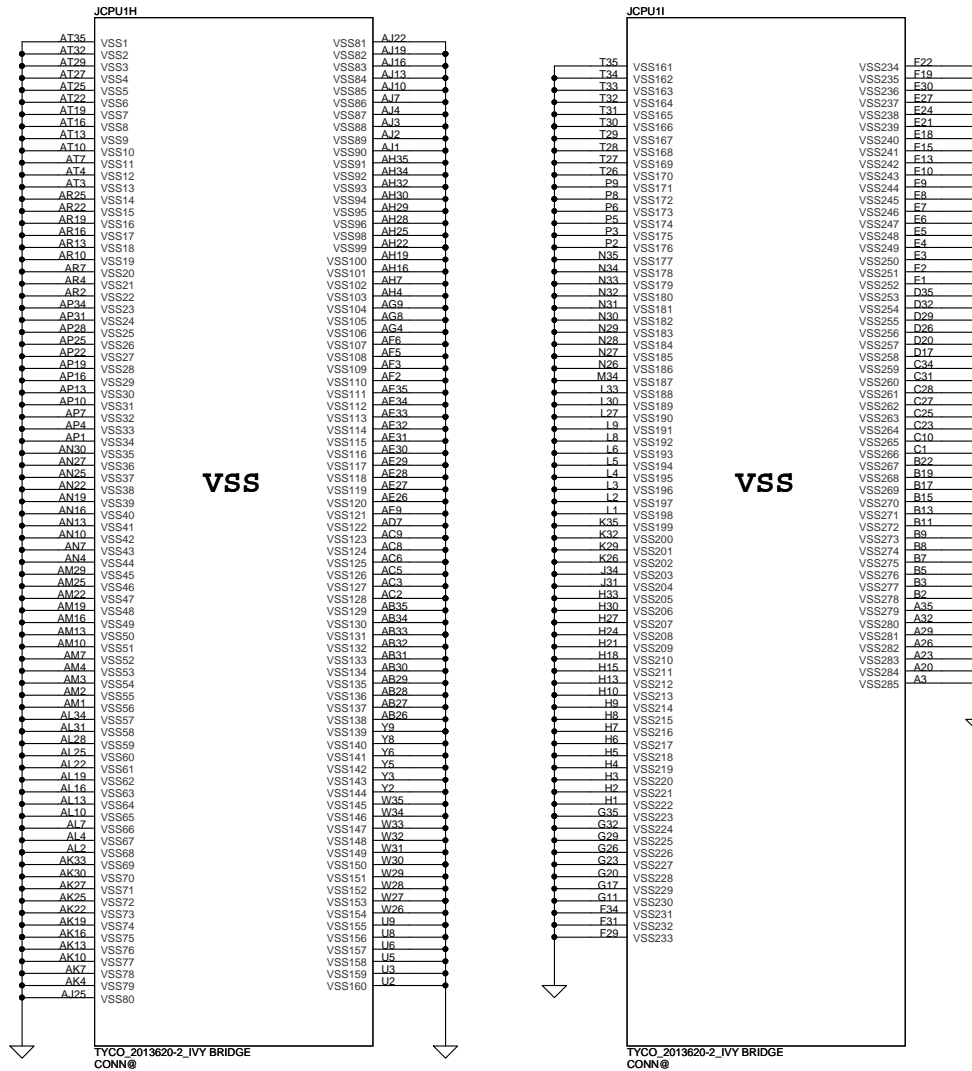
**INTEL Recommend**  
**1\*330uF, 3\*10uF**  
**from CR PDDG 0.8**

VCCSA				
VID0	VID1	Vout	Sandy	Ivy
0	0	0.9V	V	V
0	1	0.8V	V	V
1	0	0.725V	X	V
1	1	0.675V	X	V

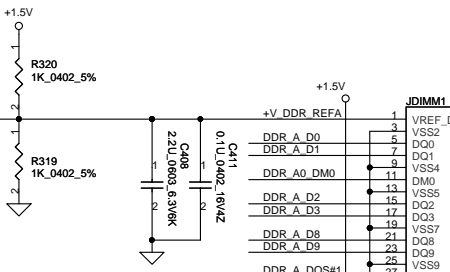
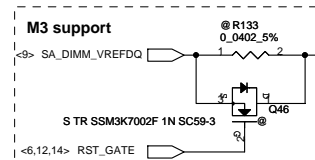
<b>VCCIO_SEL For 2012 CPU support</b>	
A19	* 1/NC : (Default) +1.05VS_VTT 0: +1.0VS_VTT

RSVD26 had changed the name to VCCIO\_SEL  
 Need PH +3VALW 10K at +1.05VS\_VTT source  
 for 2012 processor +1.05V and +1.0V select

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				Rev B
				Sheet 9 of 60



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				4019ID	B
Date: Friday, January 06, 2012				Sheet	10 of 60



All VREF traces should have 10 mil trace width

<6> DDRA\_CKE0\_DIMMA

<6> DDR\_A\_BS2

<6> SA\_CLK\_DDR0

<6> SA\_CLK\_DDR#0

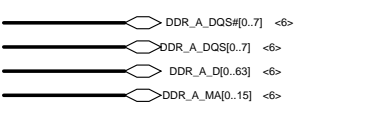
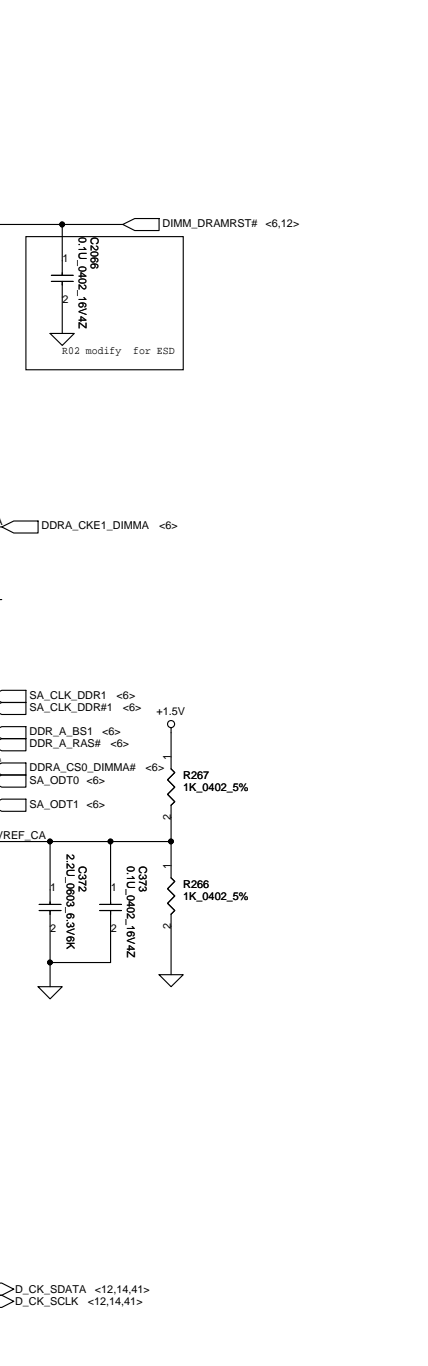
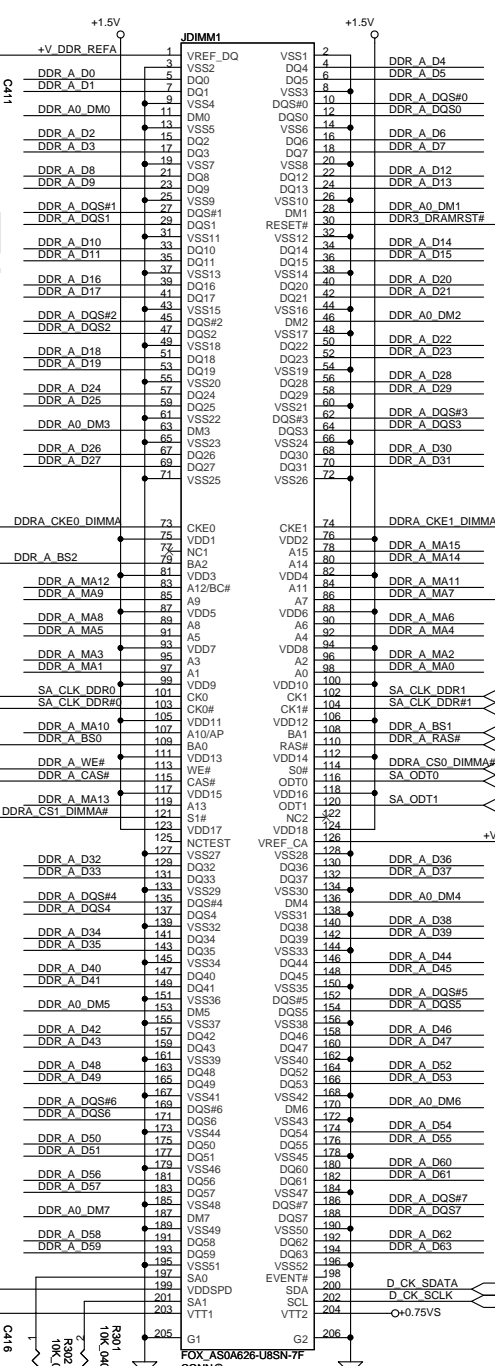
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<6> DDR\_A\_WE#

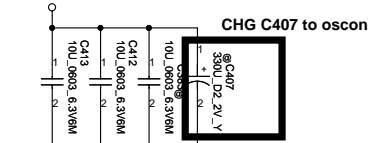
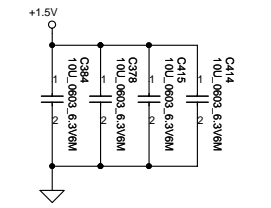
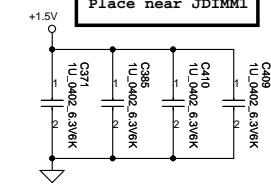
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<6> DDRA\_CS1\_DIMMA#

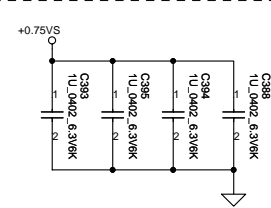
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**DIMM\_1 Reserve H:8mm**



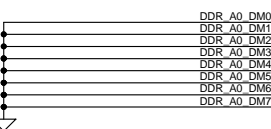
Layout Note:  
Place near JDIMM1



CHG C407 to oscon



Layout Note:  
Place near JDIMM1.203,204

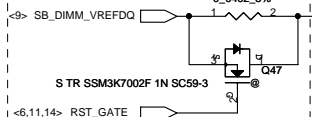


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Issued Date	2011/06/02	Deciphered Date
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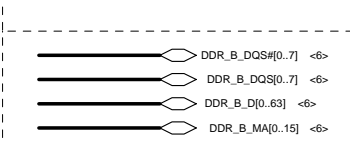
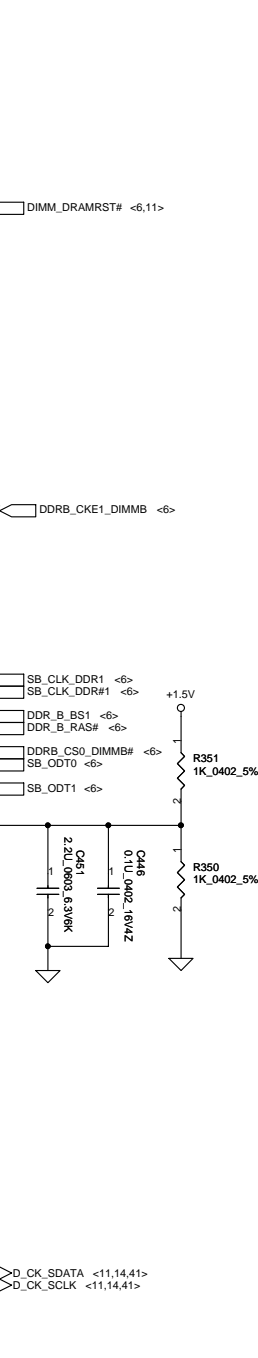
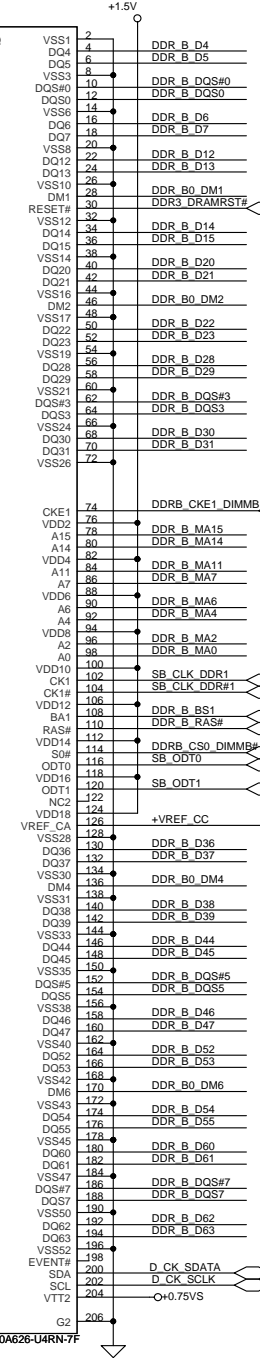
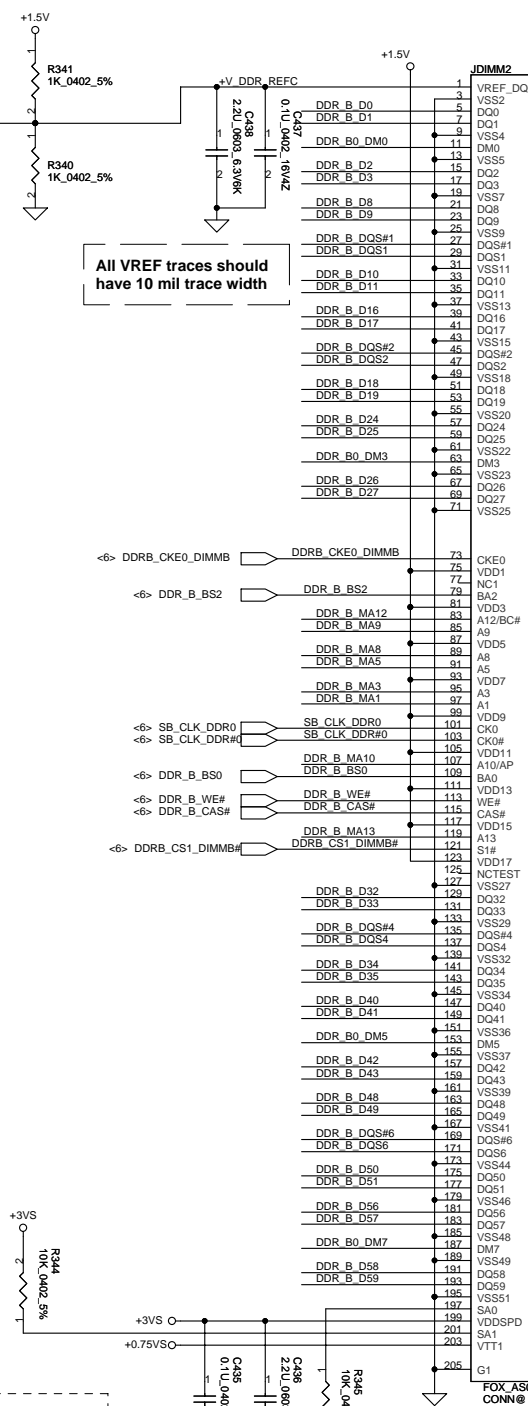
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<b>SCHMATIC, MB A7912</b>	
Title	Rev
Document Number	B
4019ID	
Date: Friday, January 06, 2012	Sheet 11 of 60

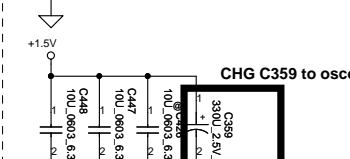
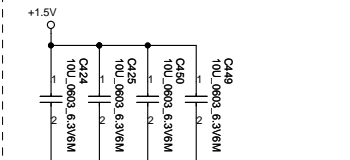
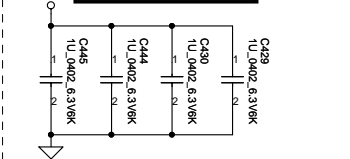
**M3 support**



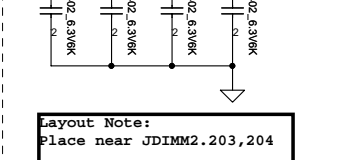
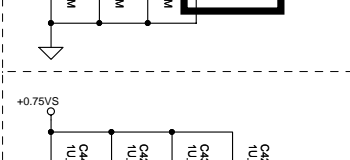
All VREF traces should have 10 mil trace width



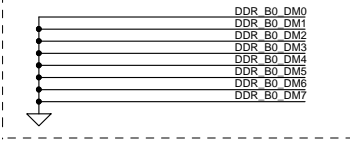
Layout Note:  
Place near JDIMM2



CHG C359 to oscon

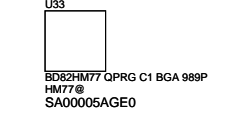
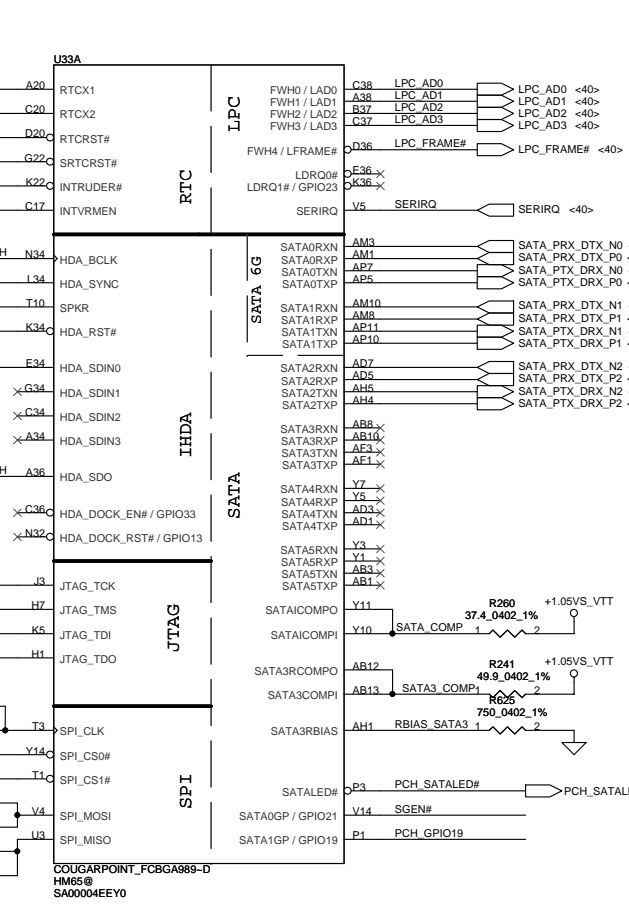
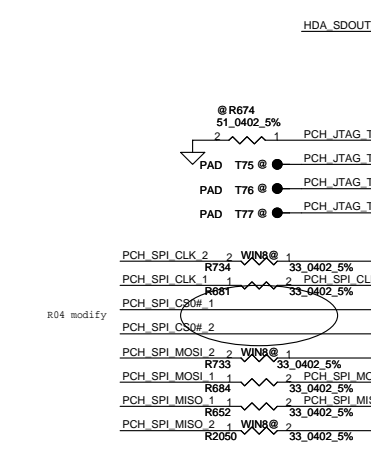
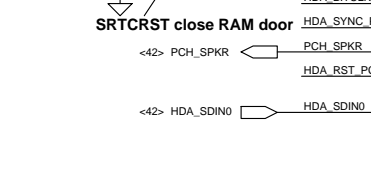
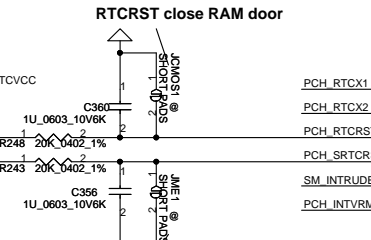
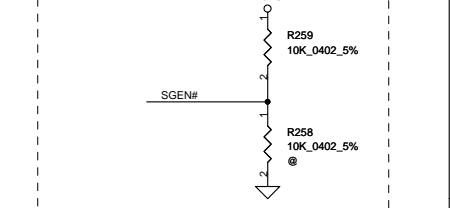
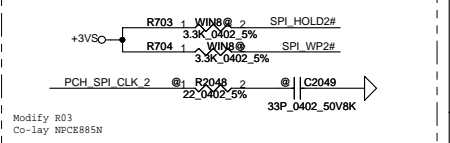
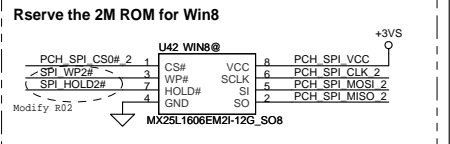
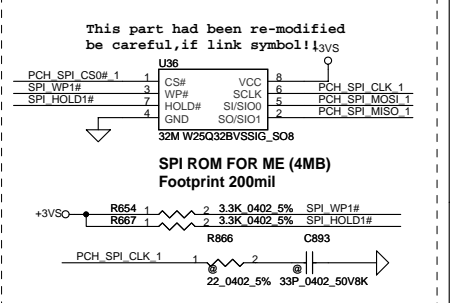
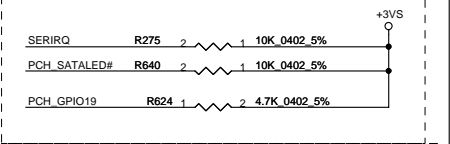
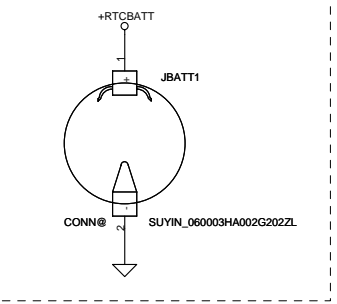
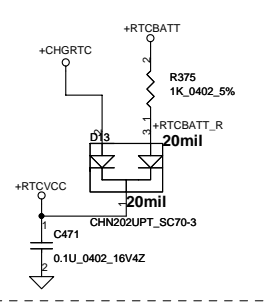
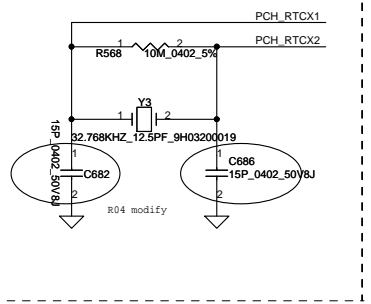
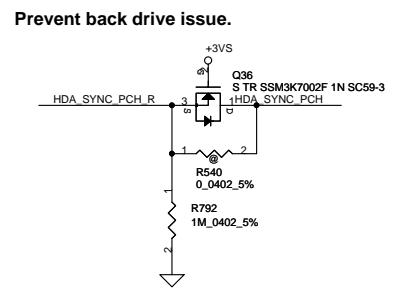
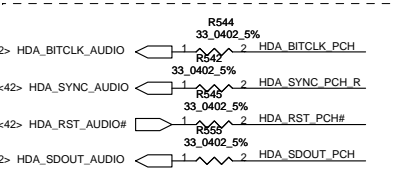
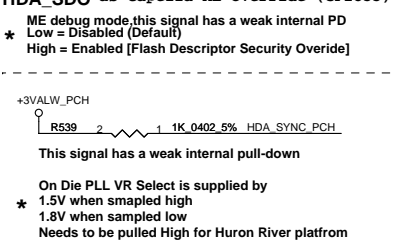
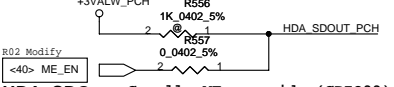
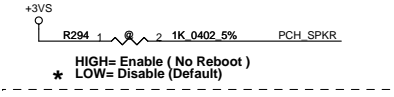
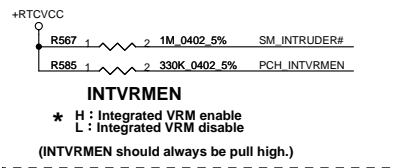


Layout Note:  
Place near JDIMM2.203,204



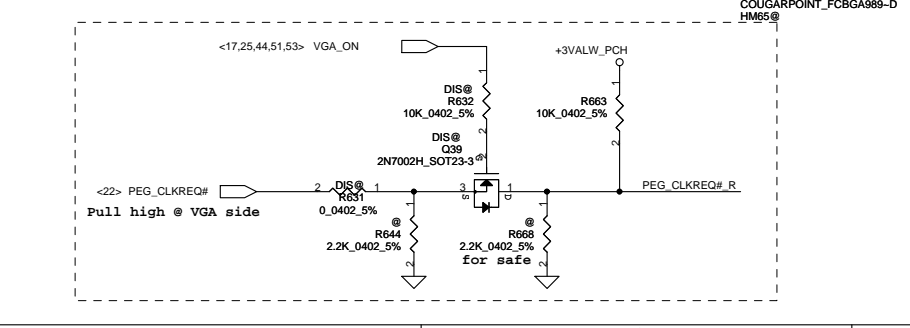
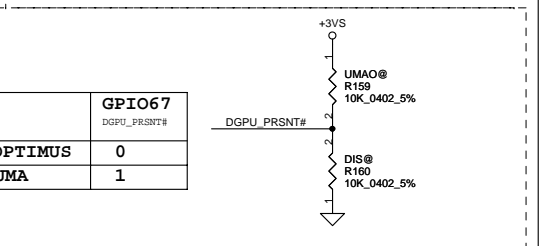
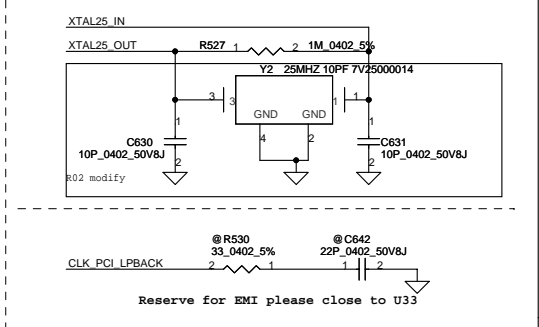
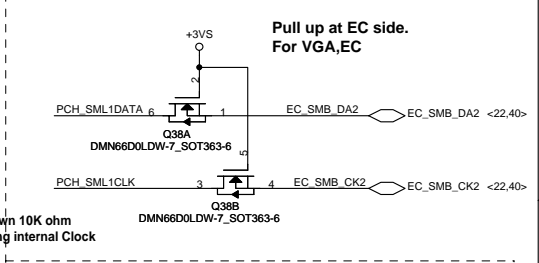
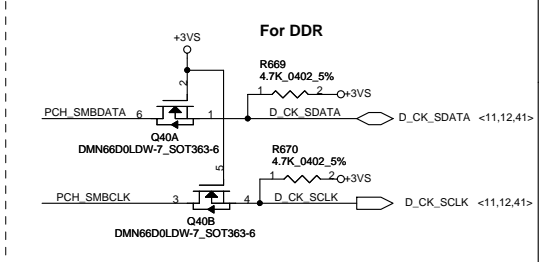
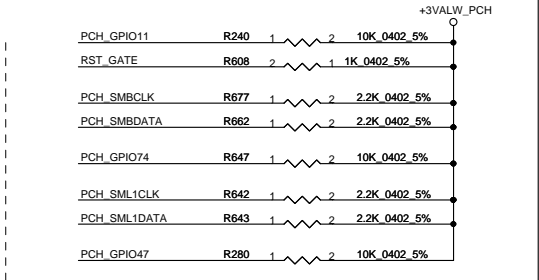
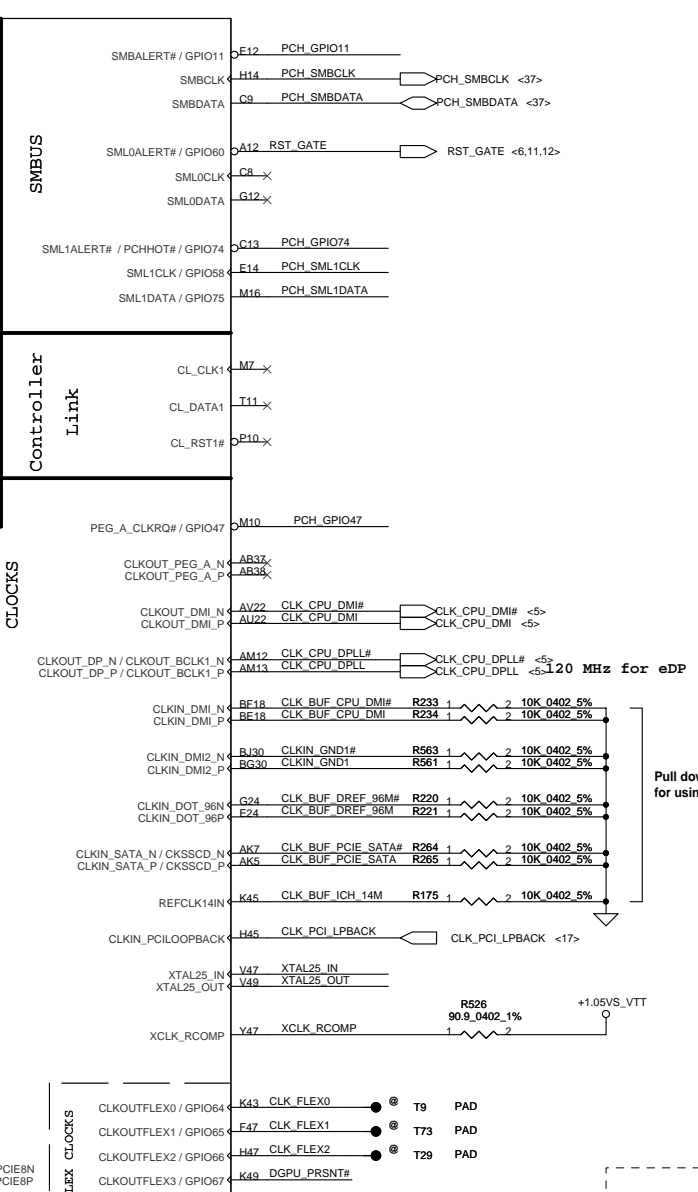
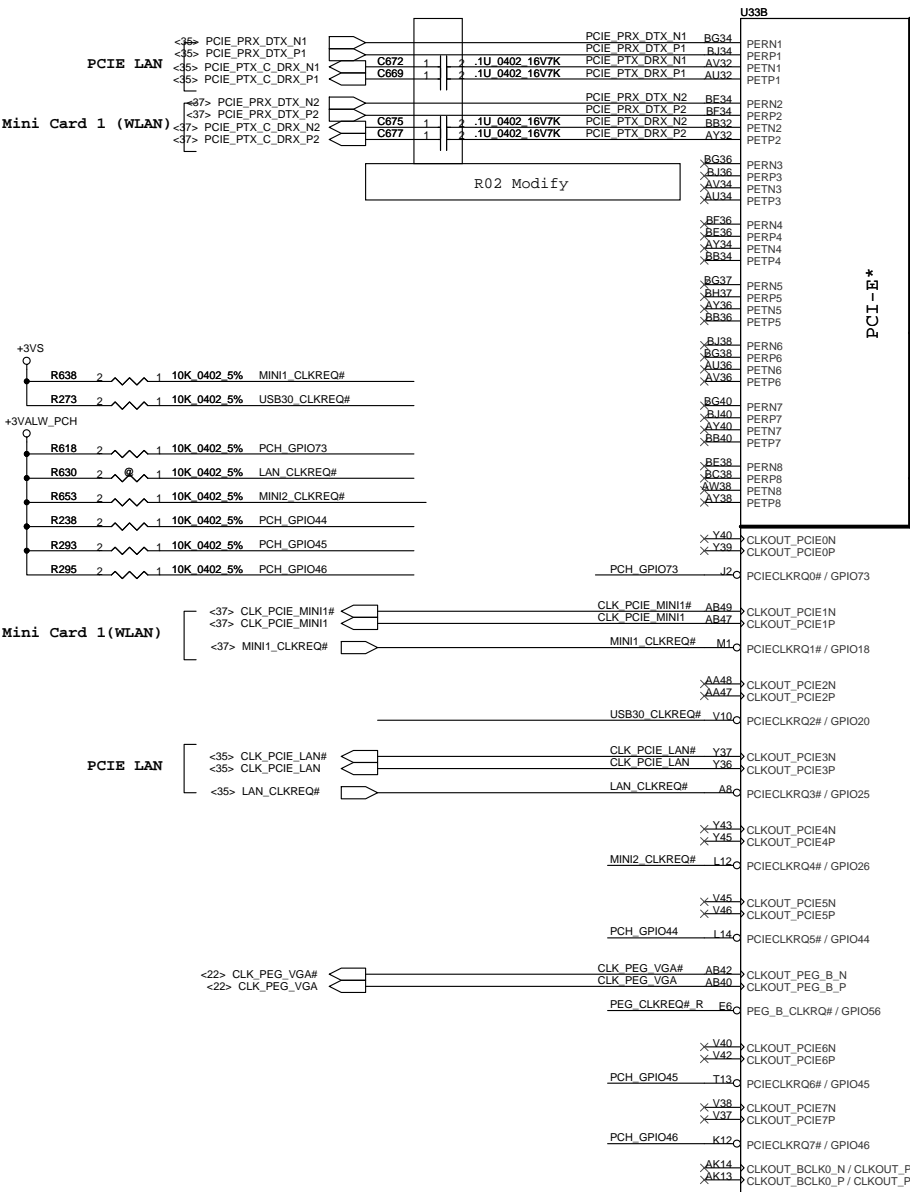
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**DIMM\_2 Reserve H:4mm**

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Date: Friday, January 06, 2012				Sheet 12 of 60



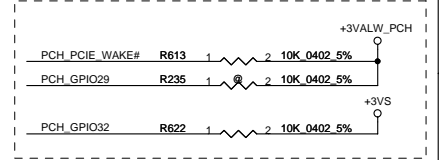
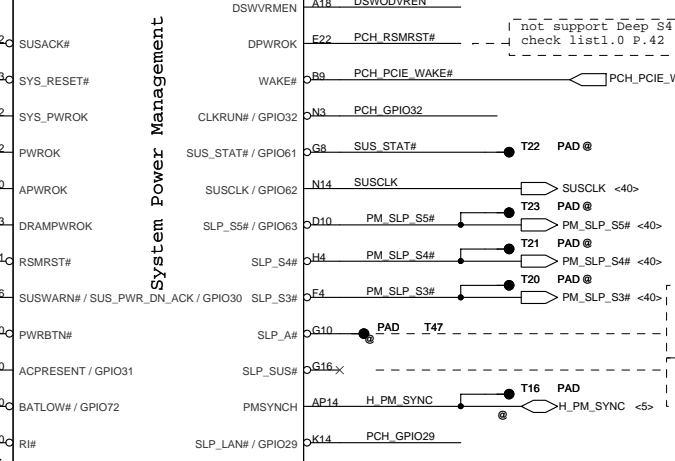
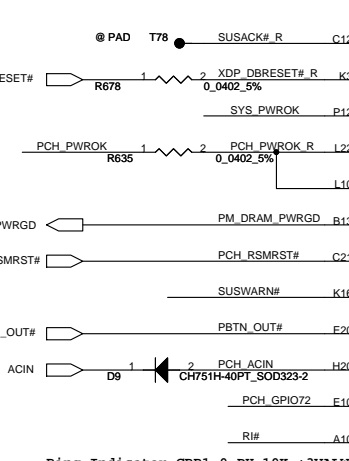
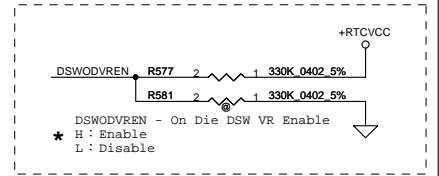
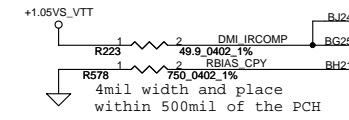
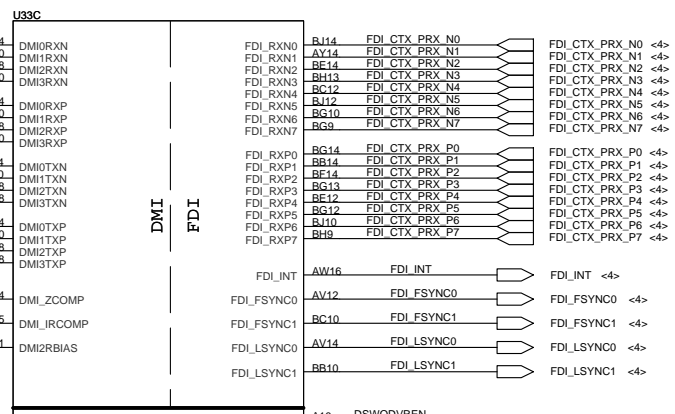
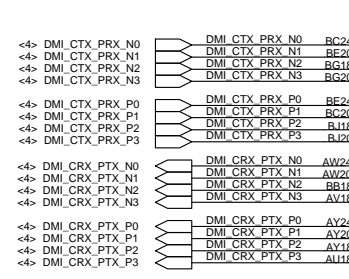
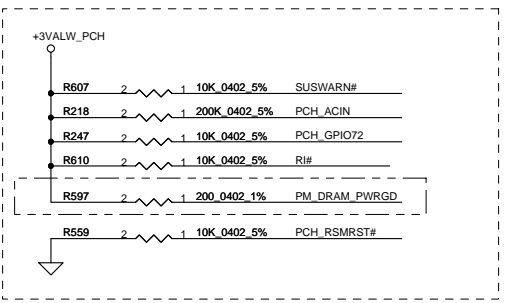
GPIO21		
SGEN#		
Switchable GPU	0	
*Non-Switchable	1	
Boot BIOS Strap		
Boot BIOS	GPIO51	GPIO19
LPC	0	0
Reserved	0	1
-	1	0
* SPI	1	1

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				Date:	Friday, January 06, 2012	Sheet 13 of 60



	<b>GPIO67</b>
	DGPU_PRSNTR#
<b>DIS,OPTIMUS</b>	0
<b>UMA</b>	1

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<b>Date:</b>	Friday, January 06, 2012	<b>Sheet</b>	14	<b>Rev</b>	B



not support AMT APWROK can mux with PWROK (check list1.0 P.40)

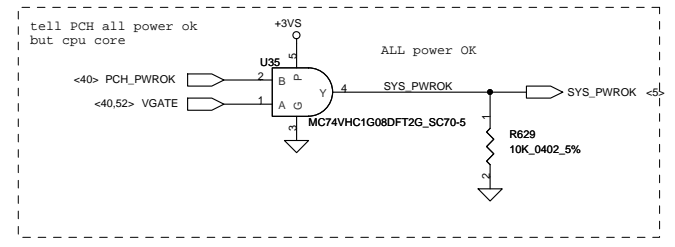
not support Deep S4,S5 DPWROK mux with PWROK check list1.0 P.42

Can be left NC when IAMT is not support on the platform

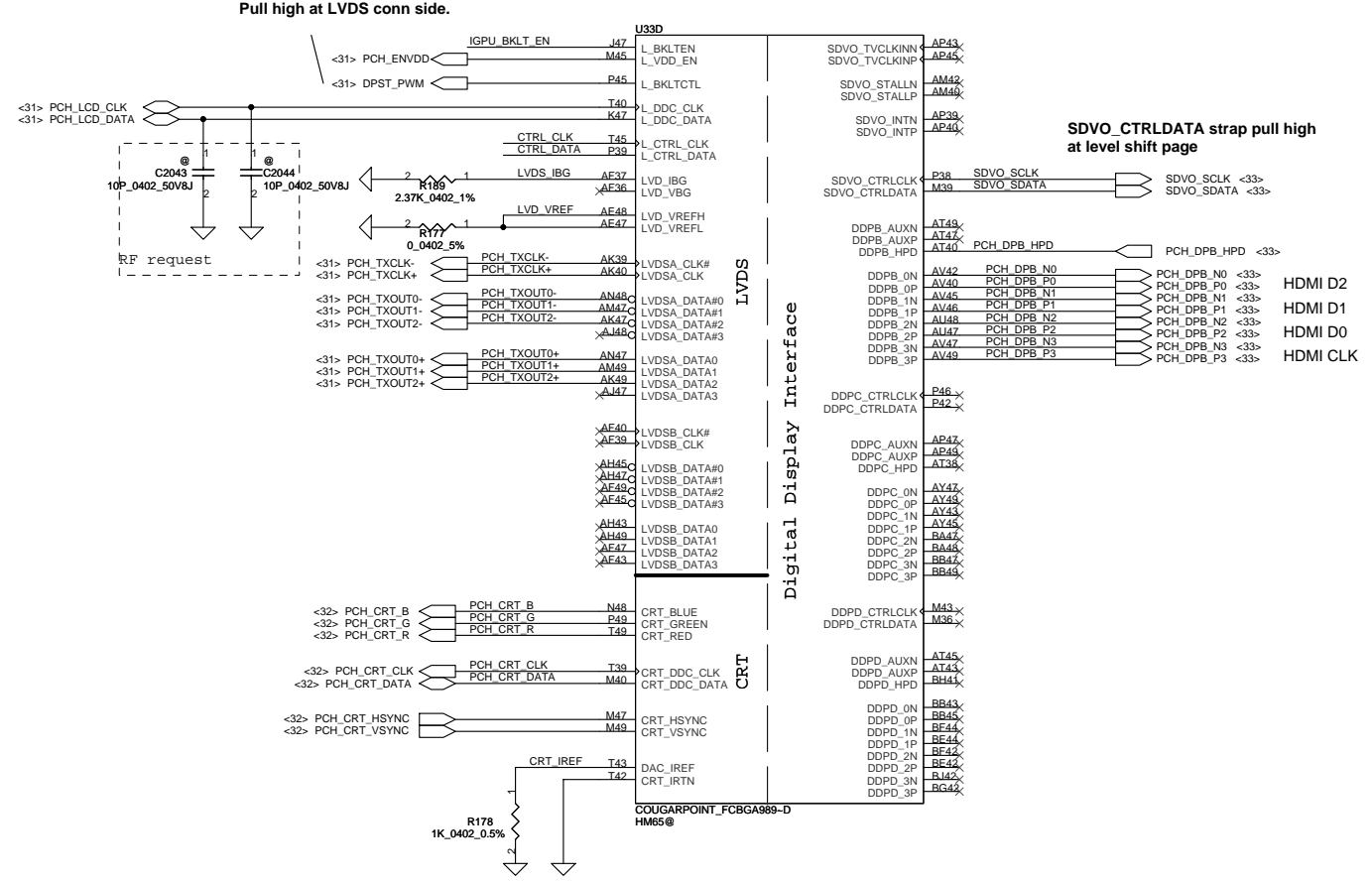
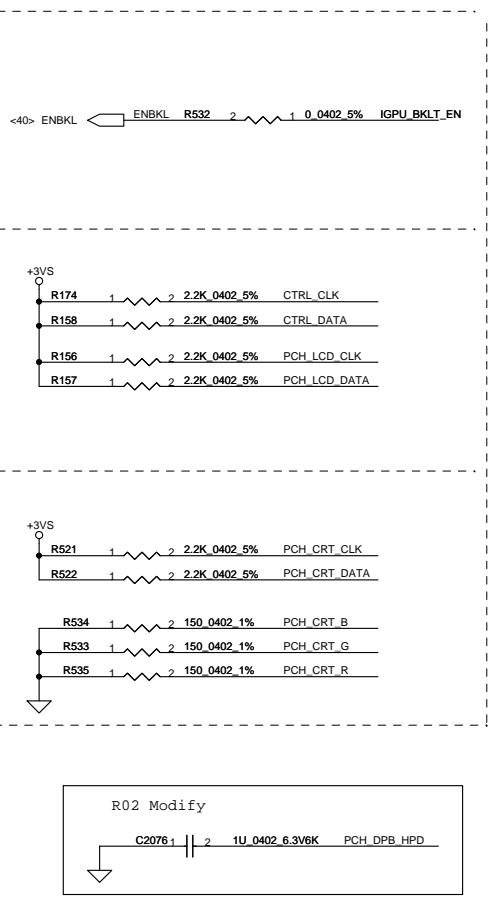
not support Deep S4,S5 can NC PCH EDS1.2 P.74

Ring Indicator CRB1.0 PH 10K +3VALW

COUGARPOINT\_FCBGA989-D HM65@

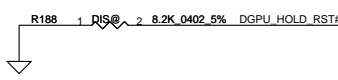
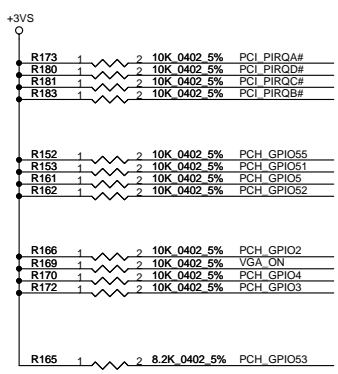


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				4019ID
				Rev B
				Date: Friday, January 06, 2012
				Sheet 15 of 60



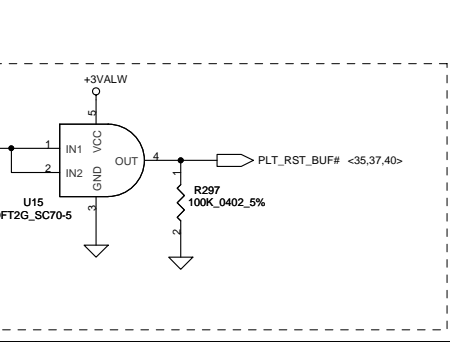
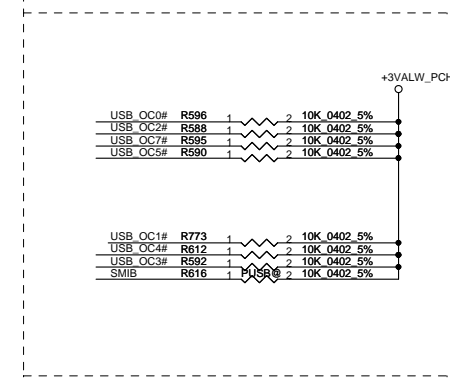
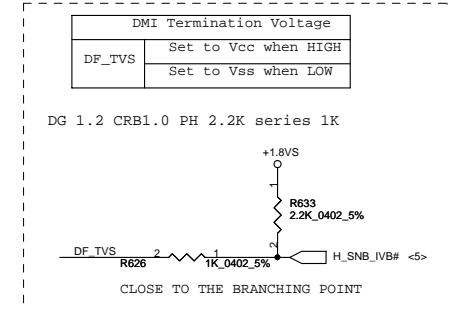
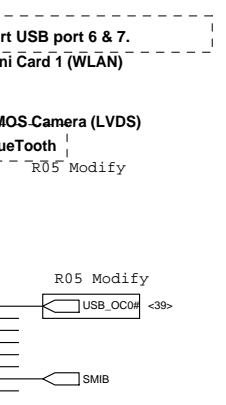
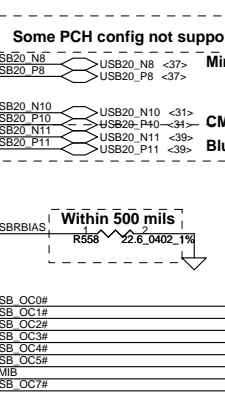
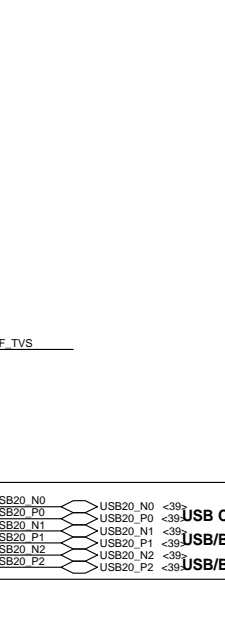
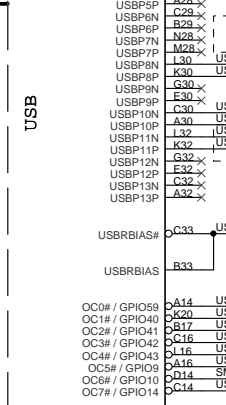
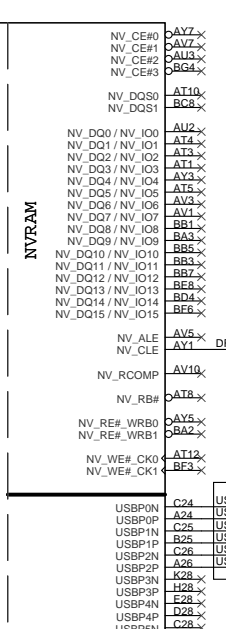
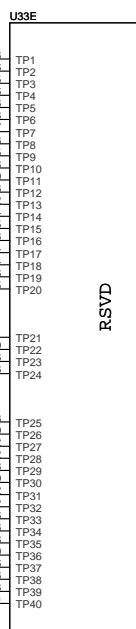
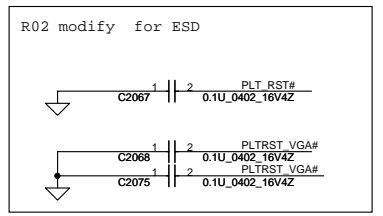
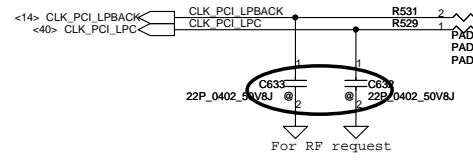
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**GPIO51 Internal pull high**

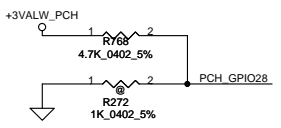
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Bit11	Bit10	Destination
0	1	Reserved
1	0	PCI
1	1	SPI
0	0	LPC



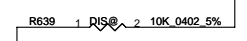
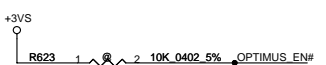
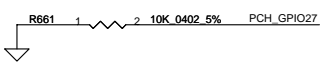
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				4019ID
				Rev B
				Date: Friday, January 06, 2012
				Sheet 17 of 60

HDA\_SYNC PH(PLL =+1.5VS)  
 GPIO28  
 On-Die PLL Voltage Regulator  
 This signal has a weak internal pull up

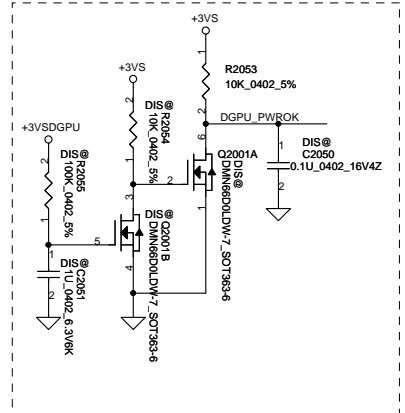
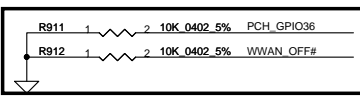
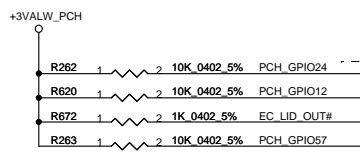
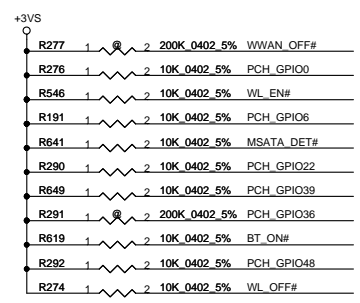
\* H : On-Die voltage regulator enable  
 L : On-Die PLL Voltage Regulator disable



Deep S4,S5 wake event signal  
 RTC alarm,Power BTN,GPIO27  
 PCH\_GPIO27 (Have internal Pull-High)  
 Deep S4,S5 wake event signal  
 No use PD to GND Check list1.0 P.70

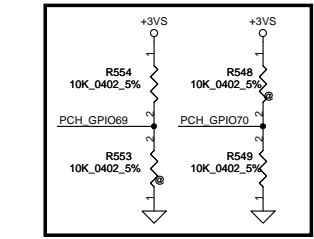
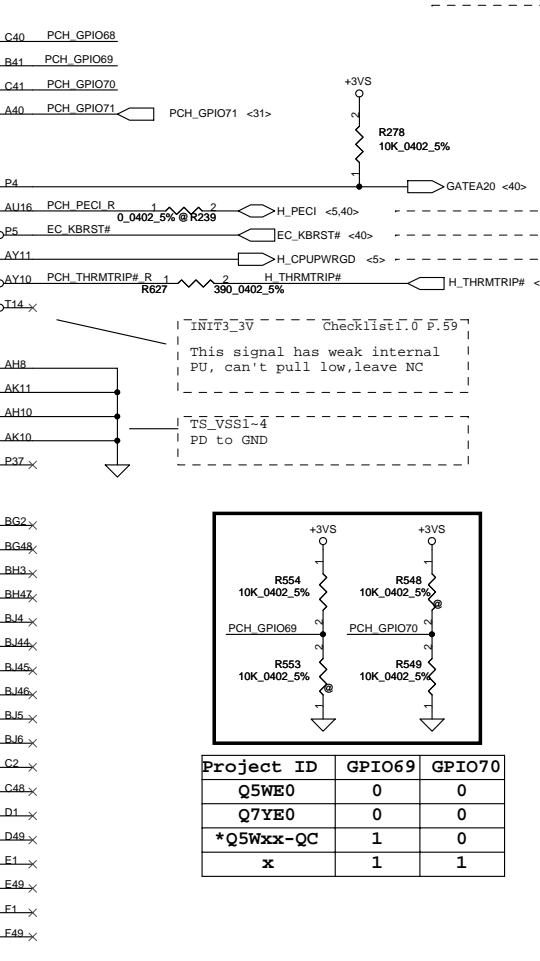
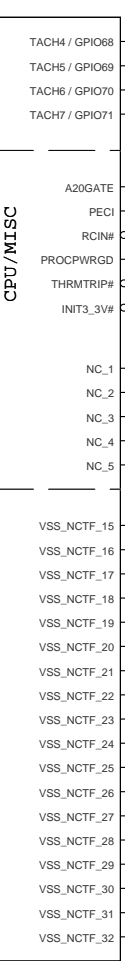
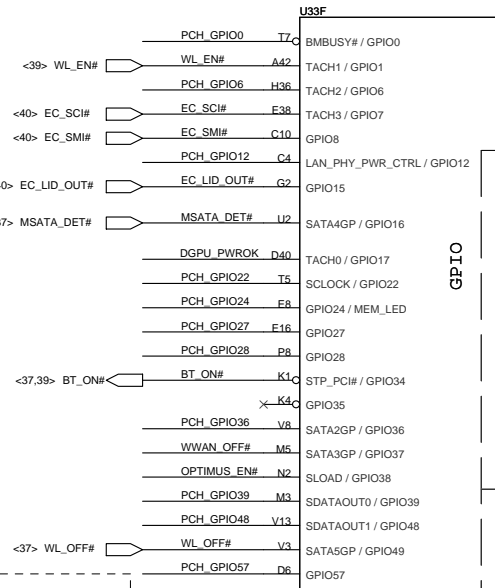


	GPIO38
	OPTIMUS_EN#
* OPTIMUS	0
DIS Only	1

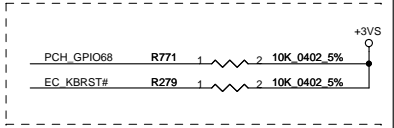


GPIO24 Unmultiplexed  
 NOTE: GPIO24 configuration register bits are not cleared by CP9h reset event.  
 CRB1.0 PH10K to +3VALW

GPIO36/GPIO37 is Strap functionality that requires internal pull down to be sampled at rising PWROK. When uses as SATA2GP/SATA3GP for mechanical presence detect -use an external pull up 150K-200K ohm to Vcc3\_3  
 When used as GP input -ensure GPI is not driven high during strap sampling window  
 When Unused as GPIO or SATA\*GP -use 8.2K-10K pull-down  
 check list page 47



Project ID	GPIO69	GPIO70
Q5WE0	0	0
Q7YE0	0	0
*Q5Wxx-QC	1	0
x	1	1



PECI\_CPU-EC  
 CTRL+ALT+DEL  
 non CPU power ok  
 130 degree  
 shut down

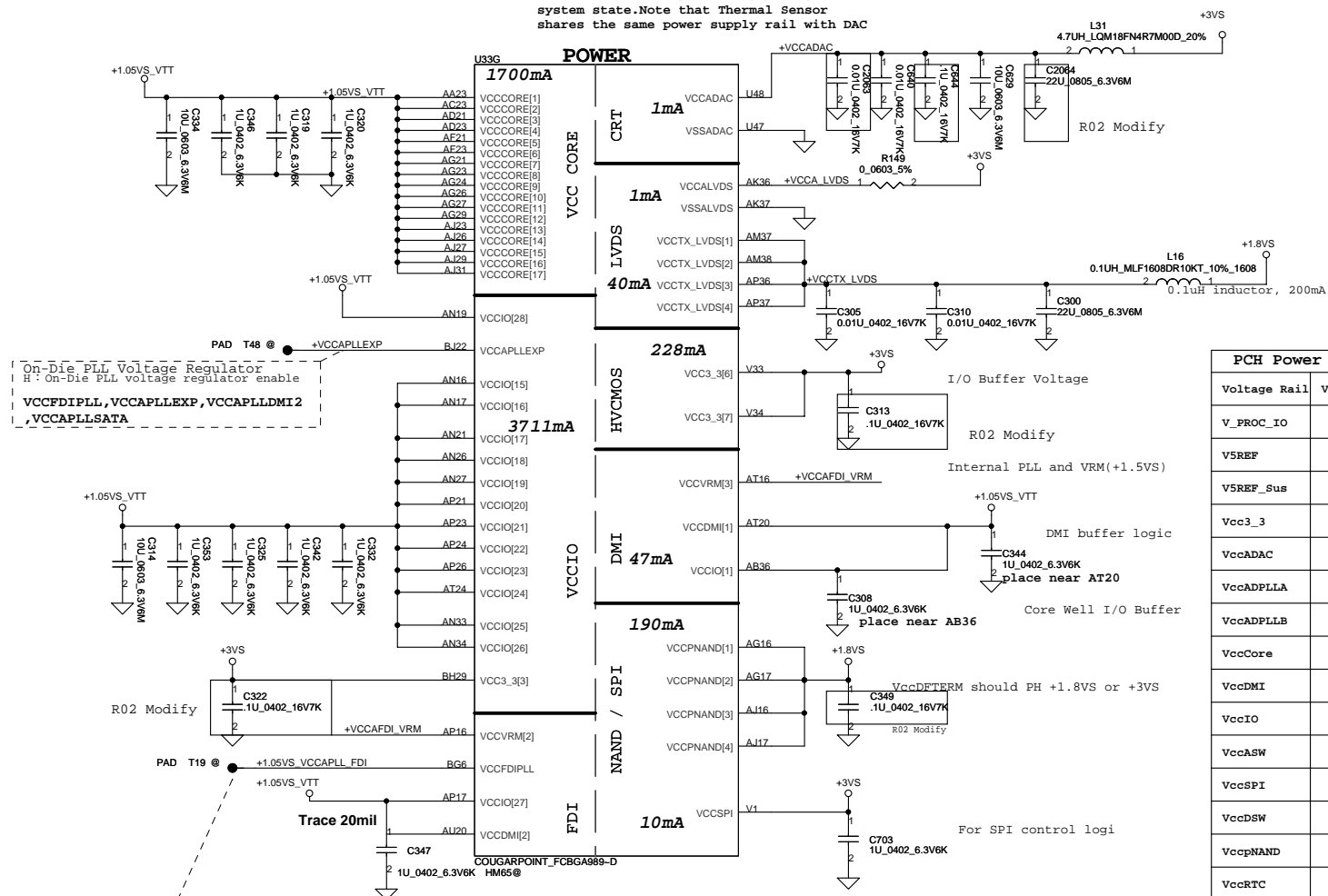
INIT3\_3V Check list 1.0 P.59  
 This signal has weak internal PU, can't pull low, leave NC  
 TS\_VSS1-4  
 PD to GND

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		2012/06/02

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Compal Electronics, Inc.		
Title	SCHEMATIC_MB A7912	
Document Number	4019ID	
Date	Friday, January 06, 2012	Sheet 18 of 61

+VCCADAC should be powered up during S0 system state. Note that Thermal Sensor shares the same power supply rail with DAC



On-Die PLL Voltage Regulator  
H: On-Die PLL voltage regulator enable  
VCCFDIPLL, VCCAPLLEXP, VCCAPLLDMI2, VCCAPLLSATA

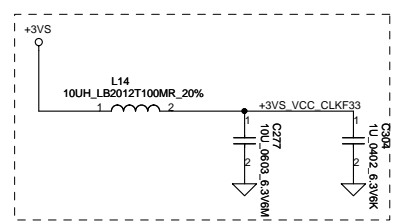
GPIO28  
On-Die PLL Voltage Regulator  
H: On-Die PLL voltage regulator enable  
VCCFDIPLL, VCCAPLLEXP, VCCAPLLDMI2

+1.5VS  
R257 0.0603 5% +VCCAFDI\_VRM  
+VCCAFDI\_VRM

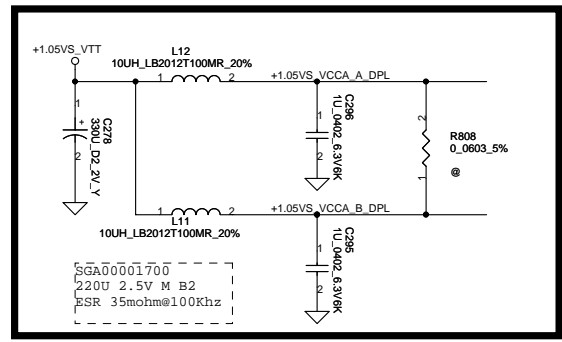
VCCVRM=>1.5V FOR MOBILE  
VCCVRM=>1.8V FOR DESKTOP  
VCCVRM = 160mA detal waiting for newest spec  
HDA\_SYNC PH(PLL =+1.5VS)

PCH Power Rail Table			
Voltage Rail	Voltage	S0 Iccmax Current(A)	
V_PROC_IO	1.05	0.001	Processor I/F
V5REF	5	0.001	PCH Core Well Reference Voltage
V5REF_Sus	5	0.001	Suspend Well Reference Voltage
Vcc3_3	3.3	0.266	I/O Buffer Voltage
VccADAC	3.3	0.001	Display DAC Analog Power. This power is supplied by the core well.
VccADPLLA	1.05	0.08	Display PLL A power
VccADPLLB	1.05	0.08	Display PLL B power
VccCore	1.05	1.3	Internal Logic Voltage
VccDMI	1.05	0.042	DMI Buffer Voltage
VccIO	1.05	2.925	Core Well I/O buffers
VccASW	1.05	1.01	1.05 V Supply for Intel R Management Engine and Integrated LAN
VccSPI	3.3	0.02	3.3 V Supply for SPI Controller Logic
VccDSW	3.3	0.003	3.3v supply for Deep S4/S5 well
VccpNAND	1.8	0.19	1.8V power supply for DF_TV5
VccRTC	3.3	6 uA	Battery Voltage
VccSus3_3	3.3	0.266	Suspend Well I/O Buffer Voltage
VccSusHDA	3.3 / 1.5	0.01	High Definition Audio Controller Suspend Voltage
VccVRM	1.8 / 1.5	0.16	1.8 V Internal PLL and VRMs (1.8 V for Desktop)
VccCLKDMI	1.05	0.02	DMI Clock Buffer Voltage
VccSSC	1.05	0.095	Spread Modulators Power Supply
VccDIFFCLKN	1.05	0.055	Differential Clock Buffers Power Supply
VccALVDS	3.3	0.001	Analog power supply for LVDS (Mobile Only)
VccTX_LVDS	1.8	0.06	Analog power supply for LVDS (Mobile Only)

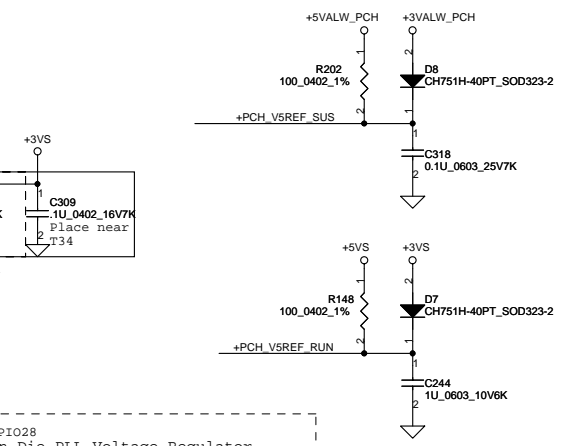
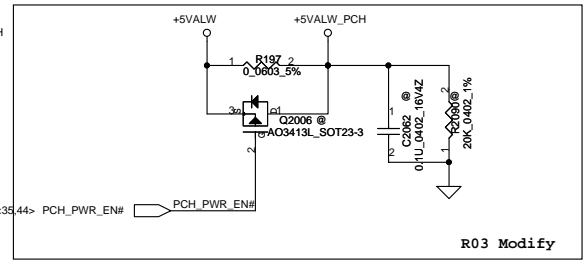
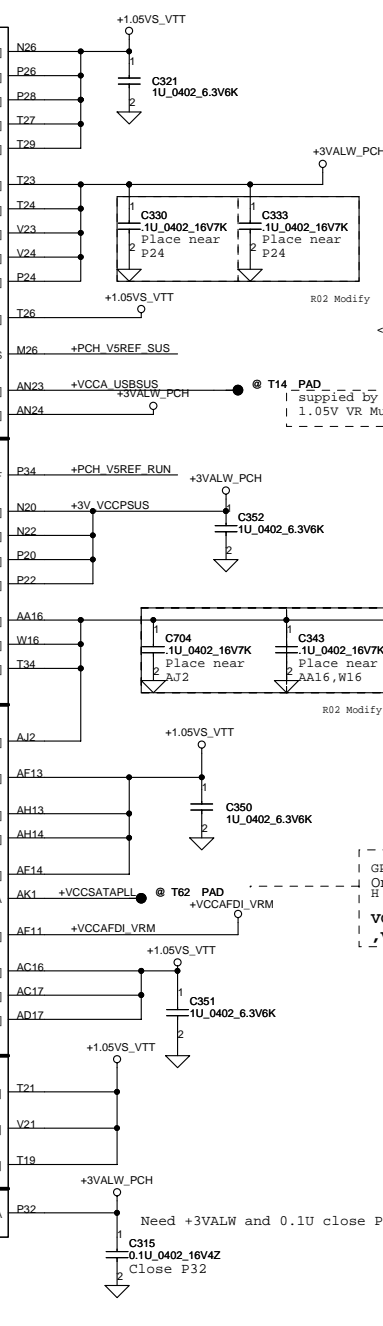
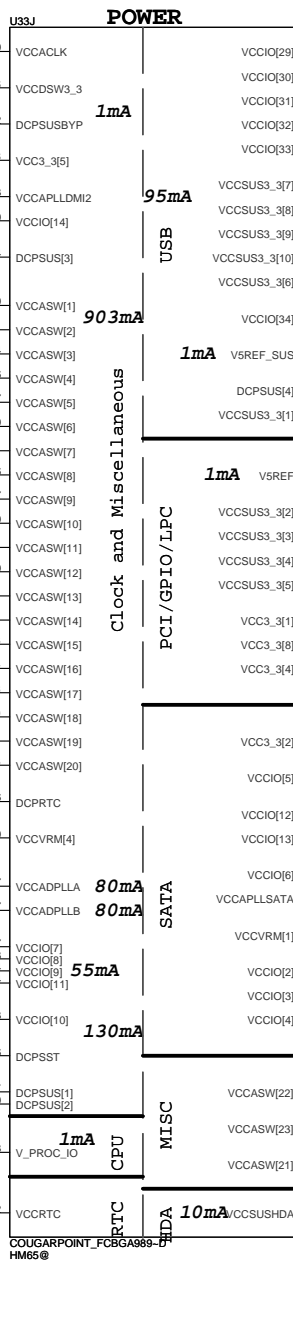
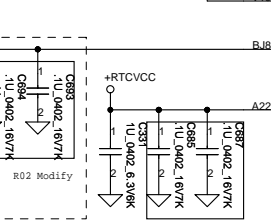
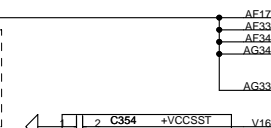
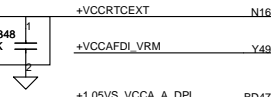
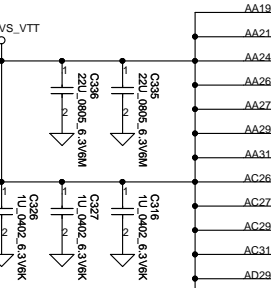
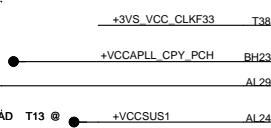
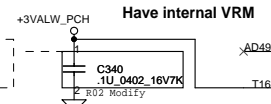
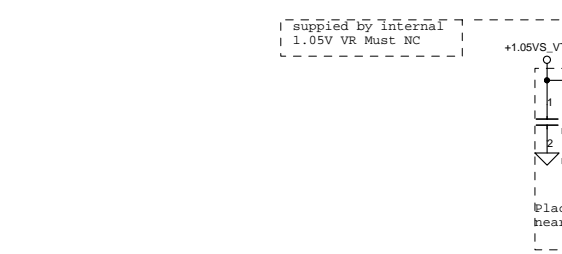
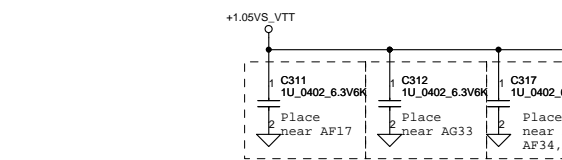
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GPIO28  
On-Die PLL Voltage Regulator  
H: On-Die PLL voltage regulator enable  
VCCFDIPLL, VCCAPLLEXP, VCCAPLLDMI2, VCCAPLLSATA



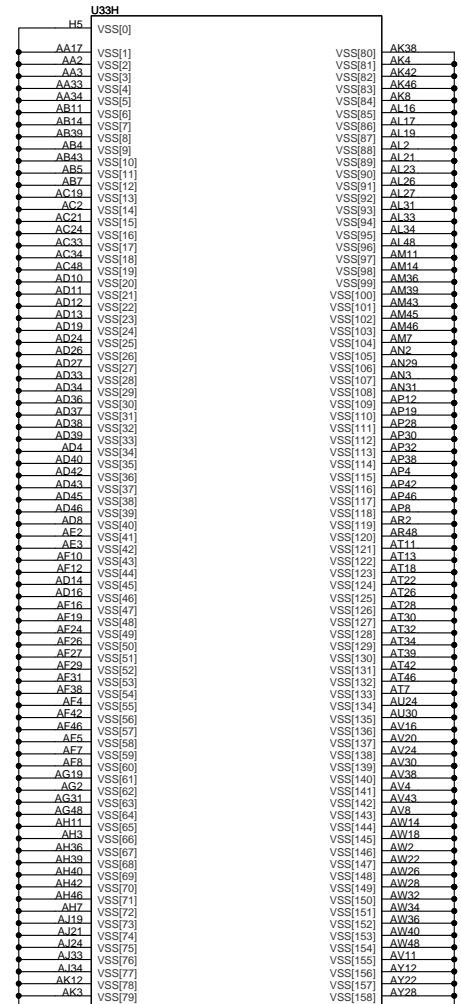
SGA0001700  
220U 2.5V M B2  
ESR 35mohm@100Khz



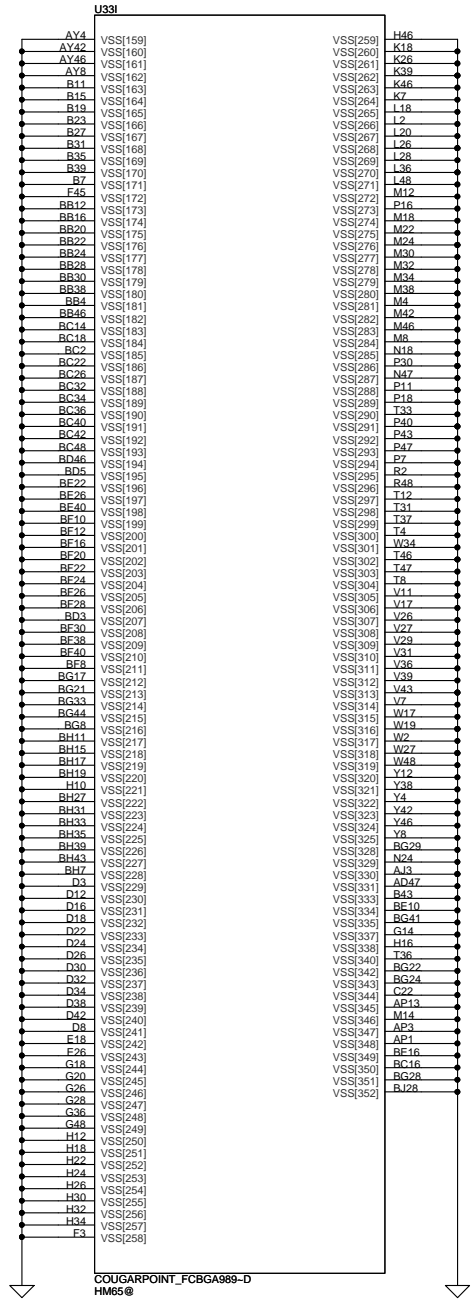
GPIO28  
On-Die PLL Voltage Regulator  
H: On-Die PLL voltage regulator enable  
VCCFDIPLL, VCCAPLLEXP, VCCAPLLDMI2, VCCAPLLSATA

VCC3\_3 = 266mA detail waiting for newest spec  
VCCDMI = 42mA detail waiting for newest spec

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Date: Friday, January 06, 2012				Sheet 20 of 60

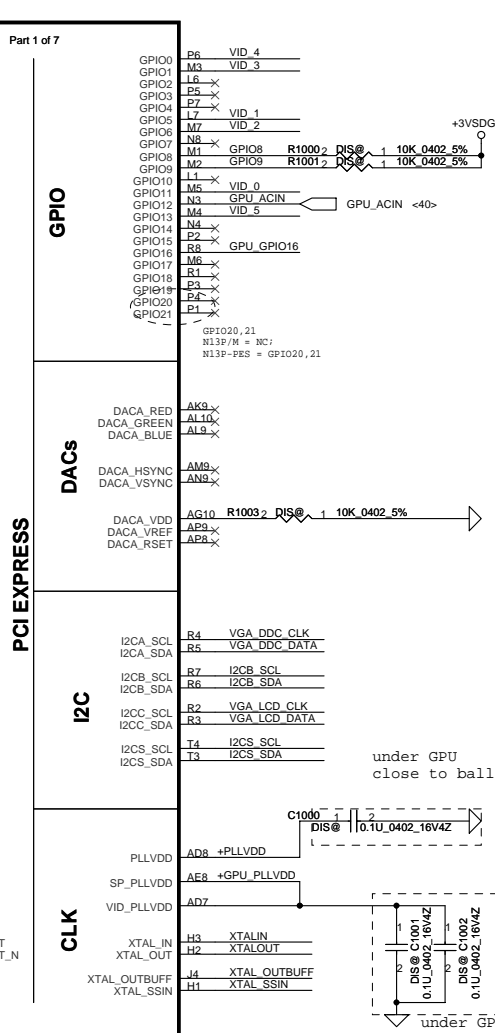
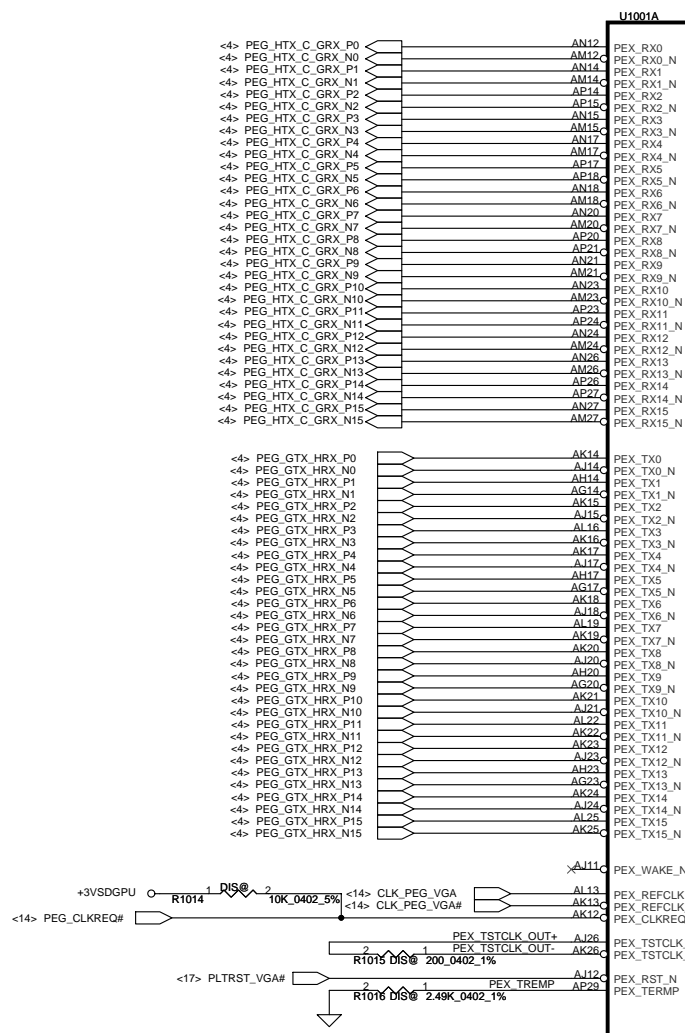


COUGARPOINT\_FCBGA989-D  
HM65@



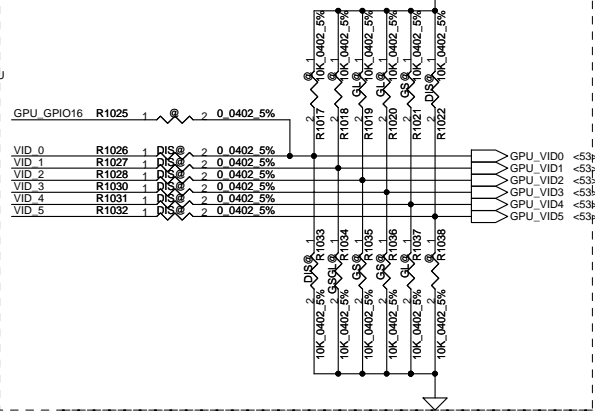
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HM65@

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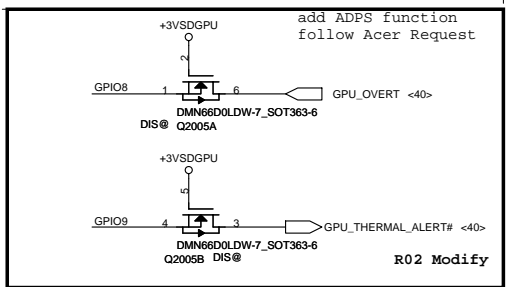


**04/06 : Add 6bit VID Function.**

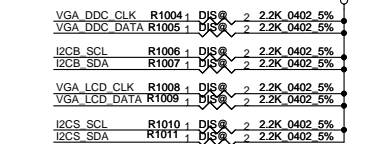
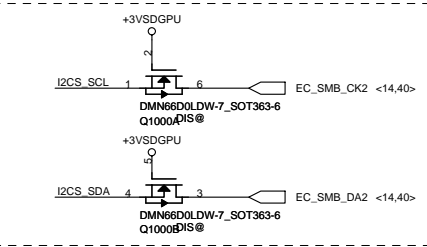
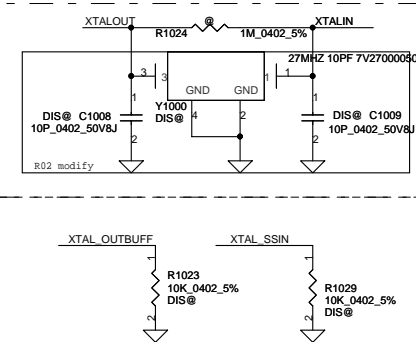
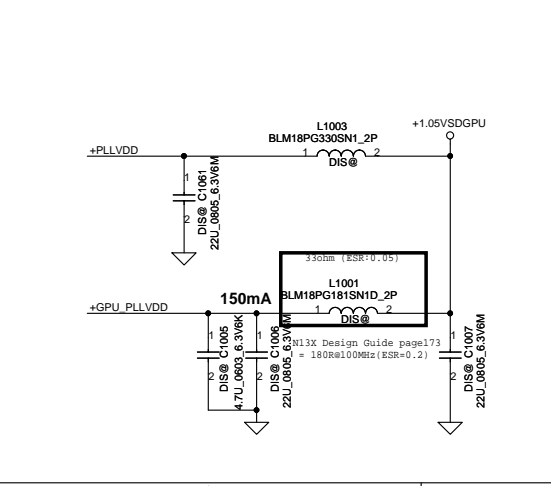
for GS4, the boot voltage is 0.975V  
for GV4, the boot voltage is 0.85V



R02 Modify  
EC control ACIN



GPIO	I/O	USAGE
GPIO0	O	GPU_VID4
GPIO1	O	GPU_VID3
GPIO2	O	LCD_BL_PWM
GPIO3	O	LCD_VCC
GPIO4	O	LCD_BLEN
GPIO5	O	GPU_VID1
GPIO6	O	GPU_VID2
GPIO7	O	3D Vision
GPIO8	I/O	OVERT
GPIO9	I/O	ALERT
GPIO10	O	MEM_VREF_CTL
GPIO11	O	MEM_VDD_CTL(PES) GPU_VID0(Real N13P)
GPIO12	I	PWR_LEVEL
GPIO13	O	THERM_LOAD_STEP_DOWN
GPIO14	I	HPD_AB
GPIO15	I	HPD_C
GPIO16	O	THERM_LOAD_STEP_UP
GPIO17	I	HPD_D
GPIO18	I	HPD_E
GPIO19	I	HPD_F
GPIO20		Reserved
GPIO21		Reserved
GPIO22	I/O	SLI_RASTER_SYNC
GPIO23	O	SLI_SWAPRDY
GPIO24		



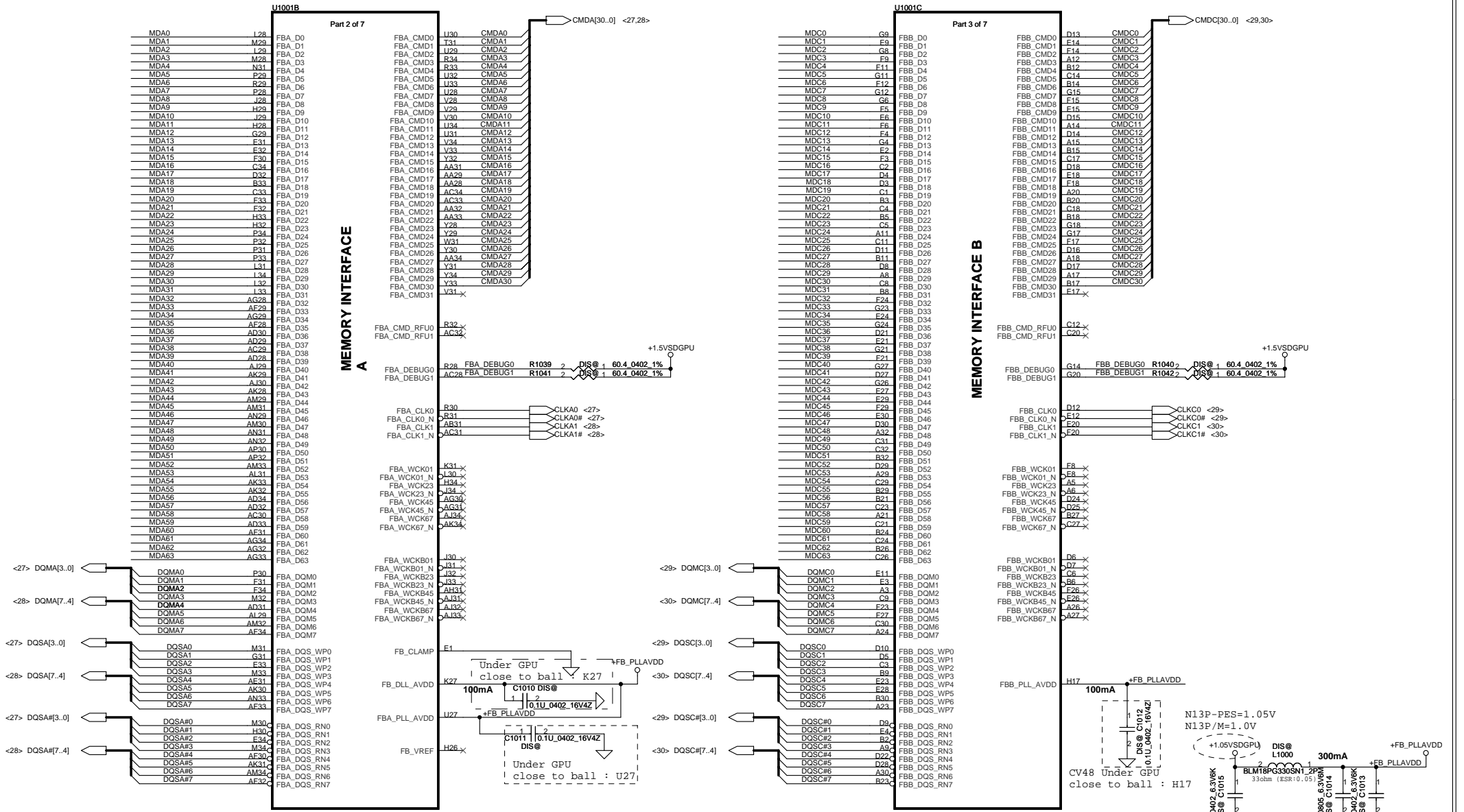
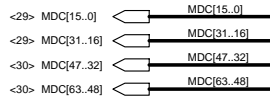
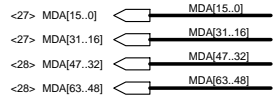
U1001  
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GS@  
SA000051880

U1001  
N13P-GL-A1 FCBGA 908P  
GL@  
SA000051A00

U1001  
N13M-GS FCBGA 908P  
GM@  
SA000057F20

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Date	Friday, January 06, 2012	Sheet	22	of 60

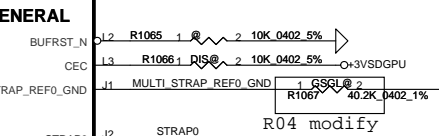
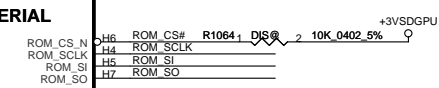
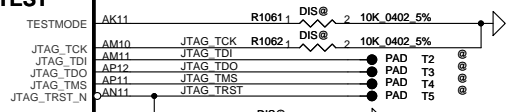
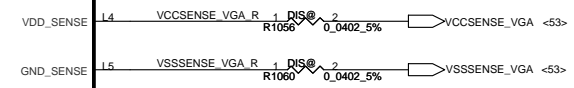
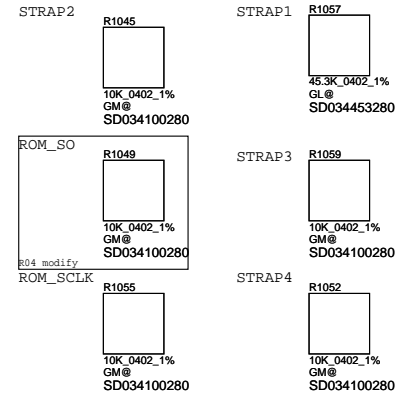
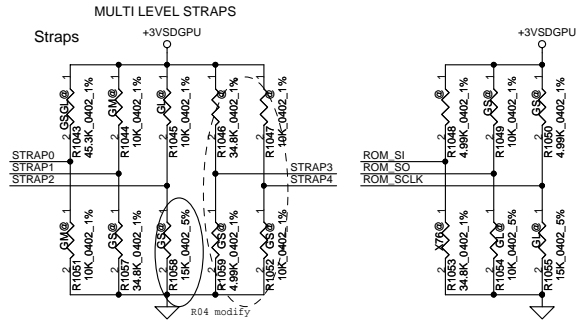
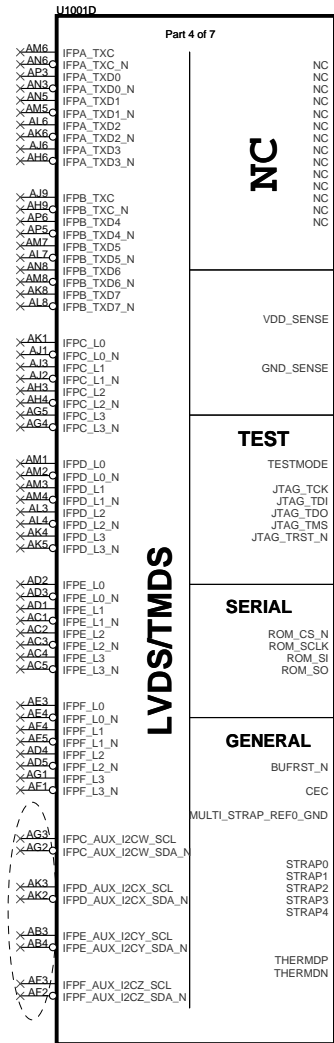
# VRAM Interface



N13P-PES-A1\_FCBGA908  
GF108@

N13P-PES-A1\_FCBGA908  
GF108@

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				4019ID	Rev B
Date:	Friday, January 06, 2012	Sheet	23	of 60	



For N13P-GS(ES) strap table

GPU	Frenq.	Memory Size	Memory Config	strap0	strap1	strap2	strap3	strap4	ROM_SI	ROM_SO	ROM_SCLK
N13P-GS	900 MHz	128M* 16* 8 2GB	Hynix SA00003YO20	R PU 45K	R PD 35K	R PD 15K	R PD 5K	R PD 10K	R PD 35K	R PU 10K	R PU 5K
N13P-GS	900 MHz	64M* 16* 8 1GB	Hynix SA000041S40	R PU 45K	R PD 35K	R PD 15K	R PD 5K	R PD 10K	R PD 15K	R PU 10K	R PU 5K

For N13P-GL(QS) strap table

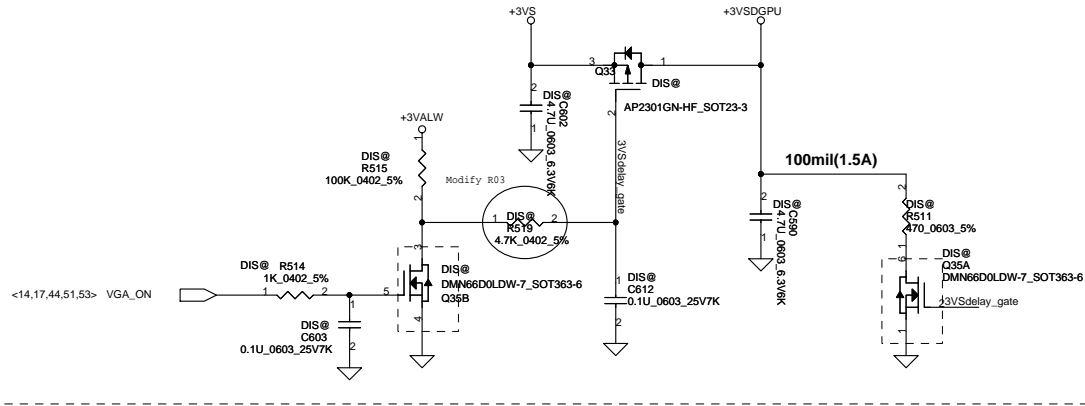
GPU	Frenq.	Memory Size	Memory Config	strap0	strap1	strap2	strap3	strap4	ROM_SI	ROM_SO	ROM_SCLK
N13P-GS	900 MHz	128M* 16* 8 2GB	Hynix SA00003YO20	R PU 45K	R PD 45K	R PU 10K	n/a	n/a	R PD 35K	R PD 10K	R PD 15K
N13P-GS	900 MHz	64M* 16* 8 1GB	Hynix SA000041S40	R PU 45K	R PD 45K	R PU 10K	n/a	n/a	R PD 15K	R PD 10K	R PD 15K

For N13M-GS(QS) strap table

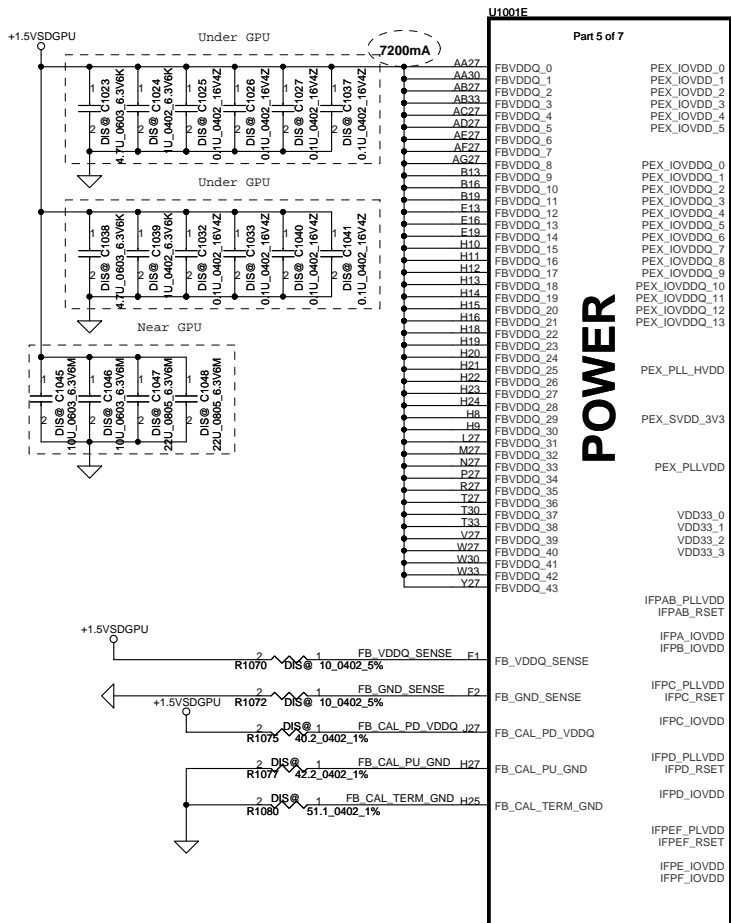
GPU	Frenq.	Memory Size	Memory Config	strap0	strap1	strap2	strap3	strap4	ROM_SI	ROM_SO	ROM_SCLK
N13M-GS	900 MHz	128M* 16* 8 2GB	Hynix SA00003YO20	R PD 10K	R PU 10K	R PU 10K	R PD 10K	R PD 10K	R PD 10K	R PU 10K	R PD 10K



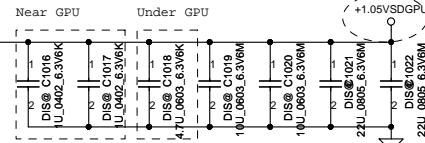
**+3VS to +3VSDGPU for GPU**



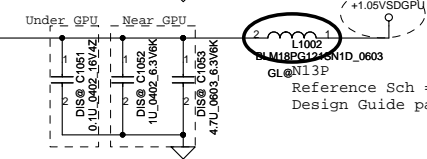
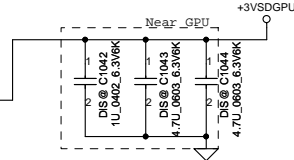
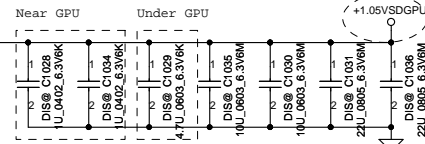
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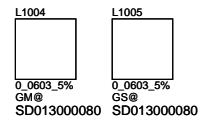
N13P-PES-A1\_FCBGA908  
GF108@



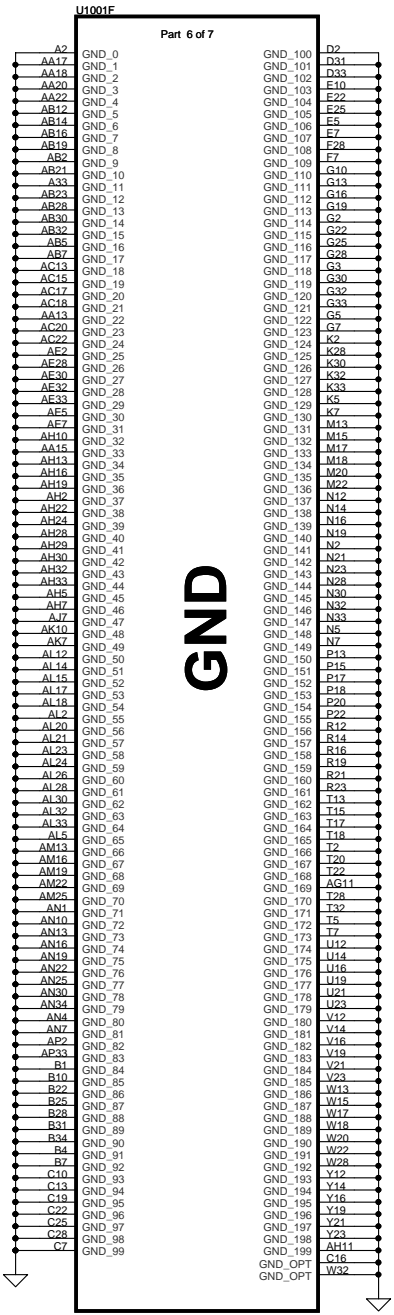
2700 mA  
total 2700mA  
Design guide page.68



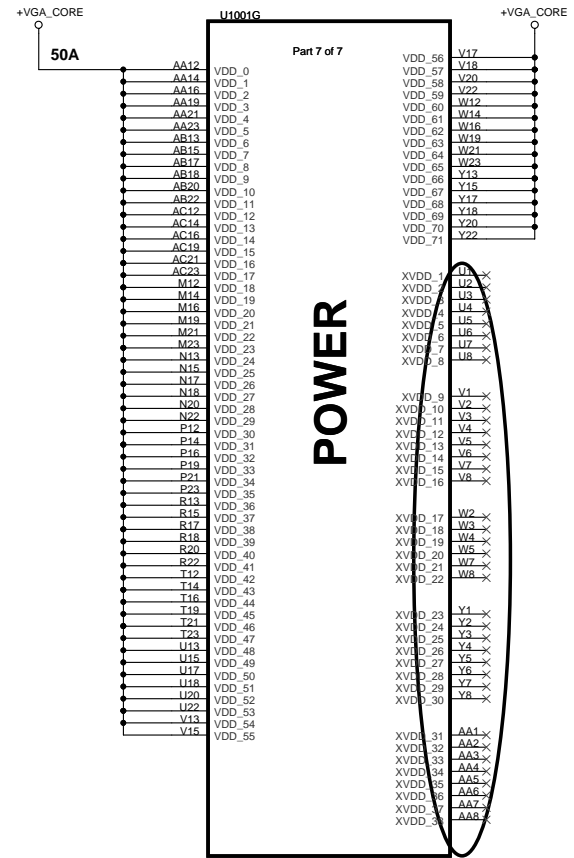
Reference Sch = 300R@100MHz  
Design Guide page69 未定義



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Date: Friday, January 06, 2012				4019ID	
Sheet 25 of 60				Rev B	



N13P-PES-A1\_FCBGA908  
GF108@



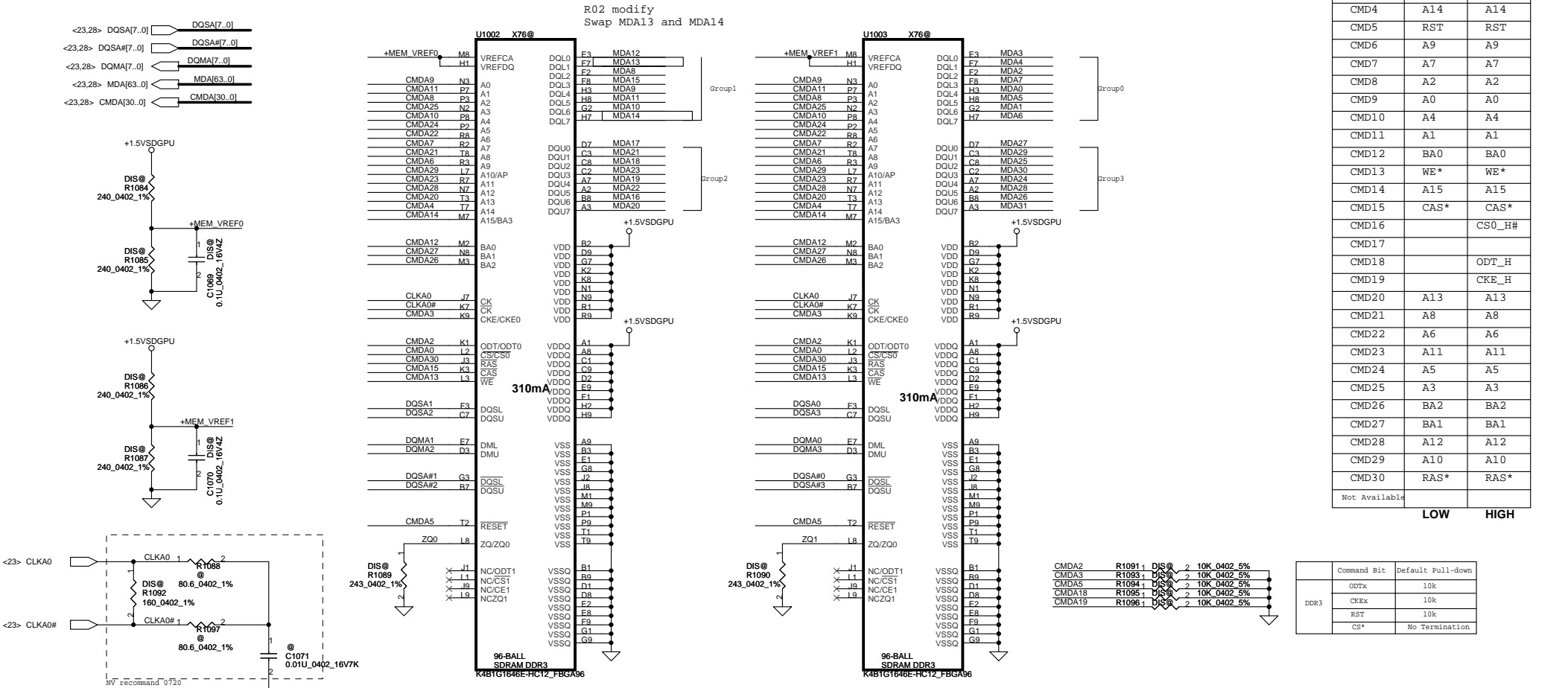
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GF108@

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Date: Friday, January 06, 2012				Rev B
Sheet 26 of 60				

# VRAM DDR3 chips (1GB)

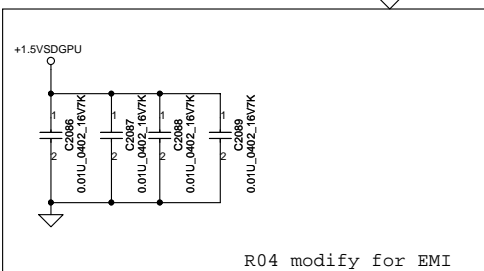
64Mx16 DDR3 \*8==>1GB  
128Mx16 DDR3 \*8==>2GB

Mode D Address	0..31	32..63
CMD0	CS0_L#	
CMD1		
CMD2	ODT_L	
CMD3	CKE	
CMD4	A14	A14
CMD5	RST	RST
CMD6	A9	A9
CMD7	A7	A7
CMD8	A2	A2
CMD9	A0	A0
CMD10	A4	A4
CMD11	A1	A1
CMD12	BA0	BA0
CMD13	WE*	WE*
CMD14	A15	A15
CMD15	CAS*	CAS*
CMD16		CS0_H#
CMD17		
CMD18		ODT_H
CMD19		CKE_H
CMD20	A13	A13
CMD21	A8	A8
CMD22	A6	A6
CMD23	A11	A11
CMD24	A5	A5
CMD25	A3	A3
CMD26	BA2	BA2
CMD27	BA1	BA1
CMD28	A12	A12
CMD29	A10	A10
CMD30	RAS*	RAS*
Not Available	LOW	HIGH



Command Bit	Default Pull-down
ODT#	10k
CKE	10k
RST	10k
CS*	No Termination

Samsung : SA000035700 (S IC D3 64Mx16 K4W1G1646E-HC12 FBGA 96P)  
Hynix : SA000032400 (S IC D3 64Mx16 H5TQ1G63BFR-12C FBGA 1.5V)



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Date:	Friday, January 06, 2012	Sheet	27	of 60

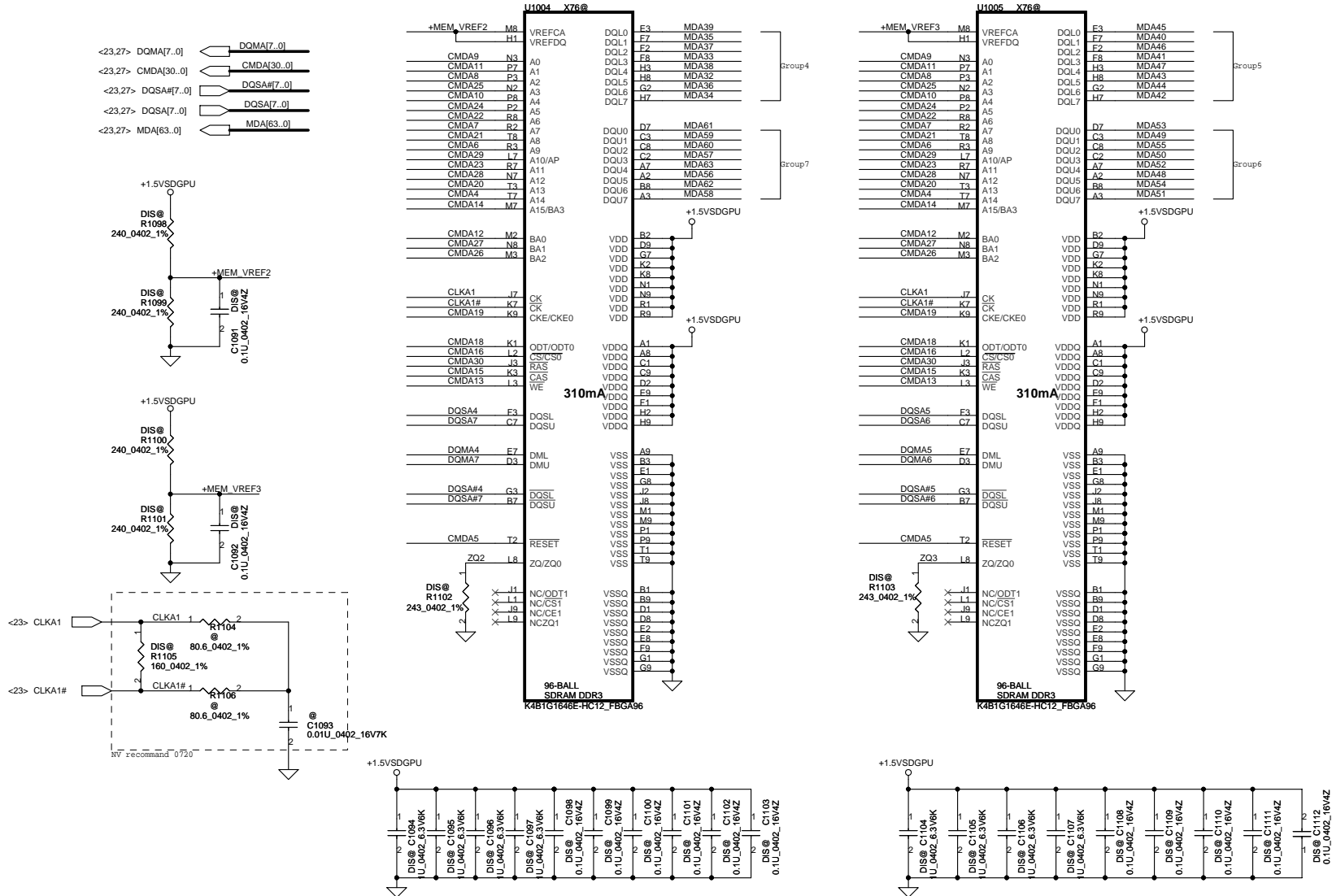
# VRAM DDR3 chips (1GB)

64Mx16 DDR3 \*8==>1GB

128Mx16 DDR3 \*8==>2GB

Mode D Address	0..31	32..63
CMD0	CS0_L#	
CMD1		
CMD2	ODT_L	
CMD3	CKE	
CMD4	A14	A14
CMD5	RST	RST
CMD6	A9	A9
CMD7	A7	A7
CMD8	A2	A2
CMD9	A0	A0
CMD10	A4	A4
CMD11	A1	A1
CMD12	BA0	BA0
CMD13	WE*	WE*
CMD14	A15	A15
CMD15	CAS*	CAS*
CMD16		CS0_H#
CMD17		
CMD18		ODT_H
CMD19		CKE_H
CMD20	A13	A13
CMD21	A8	A8
CMD22	A6	A6
CMD23	A11	A11
CMD24	A5	A5
CMD25	A3	A3
CMD26	BA2	BA2
CMD27	BA1	BA1
CMD28	A12	A12
CMD29	A10	A10
CMD30	RAS*	RAS*

Not Available  
LOW HIGH

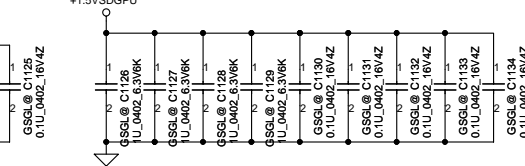
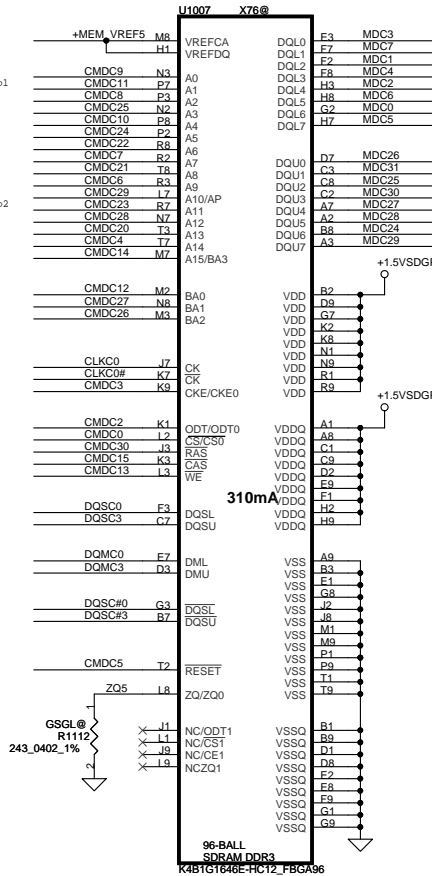
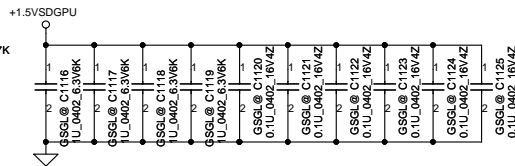
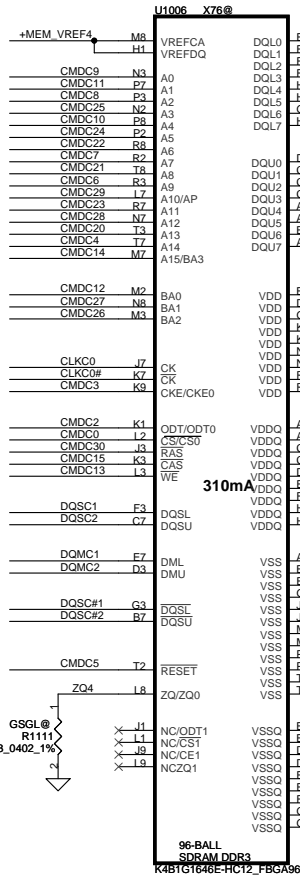
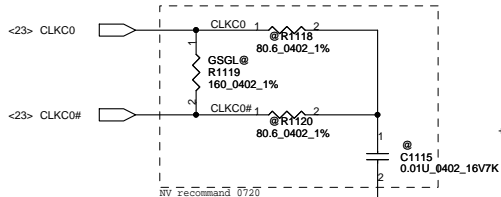
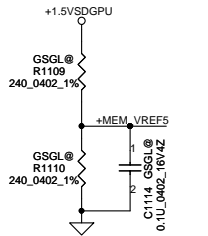
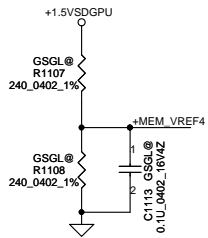
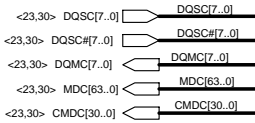


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# VRAM DDR3 chips (1GB)

64Mx16 DDR3 \*8==>1GB

128Mx16 DDR3 \*8==>2GB



Mode D Address	0..31	32..63
CMD0	CS0_L#	
CMD1		
CMD2	ODT_L	
CMD3	CKE	
CMD4	A14	A14
CMD5	RST	RST
CMD6	A9	A9
CMD7	A7	A7
CMD8	A2	A2
CMD9	A0	A0
CMD10	A4	A4
CMD11	A1	A1
CMD12	BA0	BA0
CMD13	WE*	WE*
CMD14	A15	A15
CMD15	CAS*	CAS*
CMD16		CS0_H#
CMD17		
CMD18		ODT_H
CMD19		CKE_H
CMD20	A13	A13
CMD21	A8	A8
CMD22	A6	A6
CMD23	A11	A11
CMD24	A5	A5
CMD25	A3	A3
CMD26	BA2	BA2
CMD27	BA1	BA1
CMD28	A12	A12
CMD29	A10	A10
CMD30	RAS*	RAS*
Not Available		

LOW HIGH

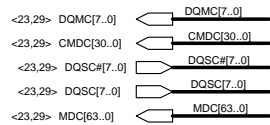
Command Bit	Default Pull-down
ODTx	10k
CKEx	10k
RST	10k
CS*	No Termination

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Title: <b>Compal Secret Data</b> Document Number: <b>4019ID</b> Date: Friday, January 06, 2012   Sheet 29 of 60	

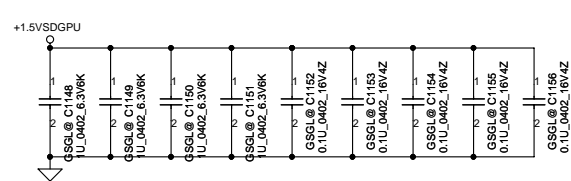
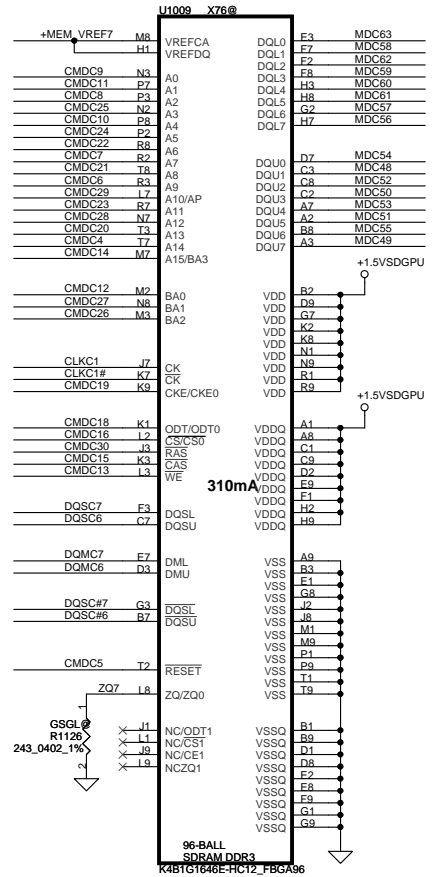
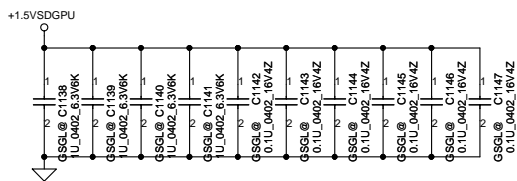
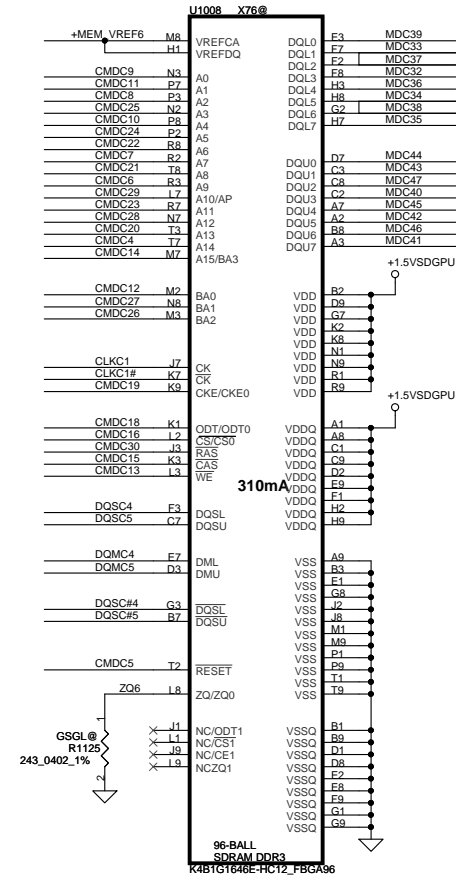
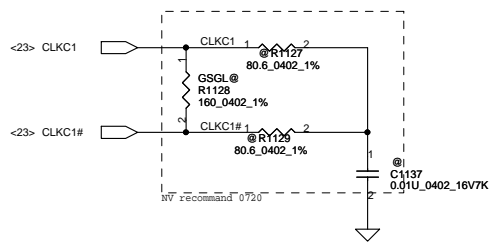
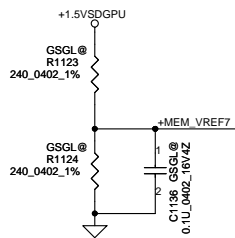
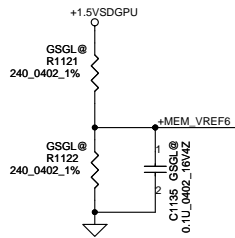
# VRAM DDR3 chips (1GB)

64Mx16 DDR3 \*8==>1GB

128Mx16 DDR3 \*8==>2GB

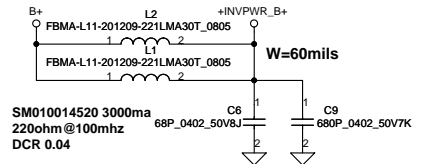
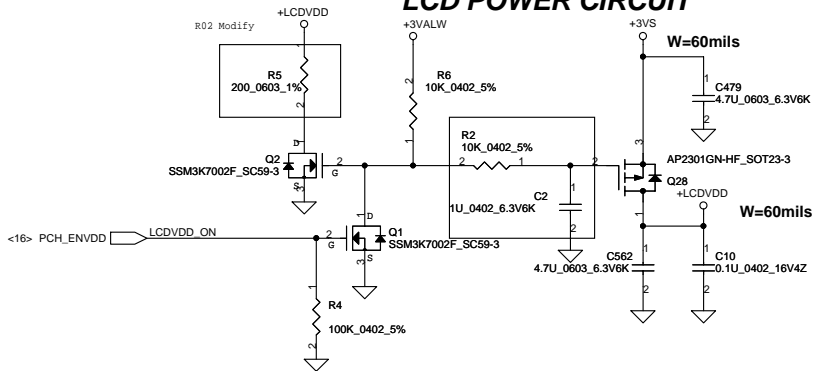


R02 modify  
Swap MDC37 and MDC38

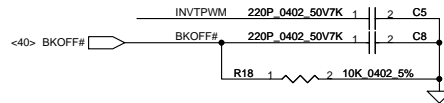
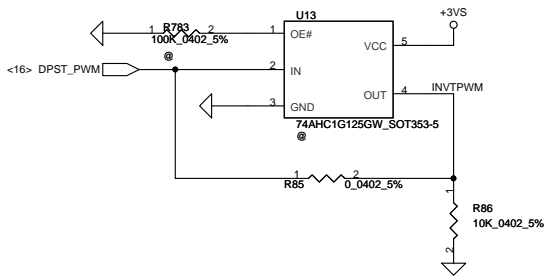
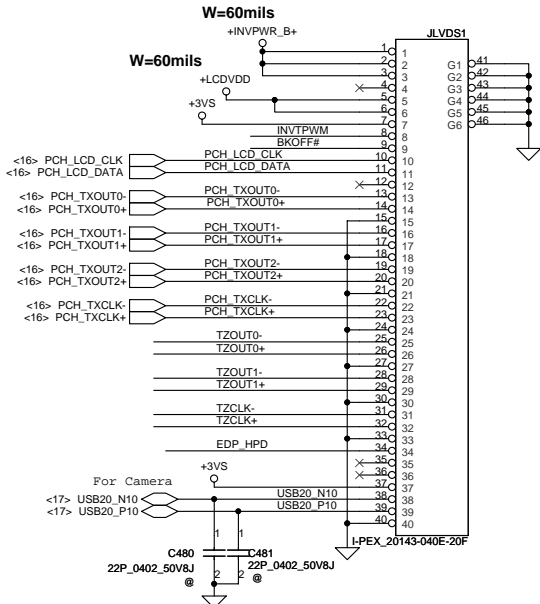


Mode D Address	0..31	32..63
CMD0	CS0_L#	
CMD1		
CMD2	ODT_L	
CMD3	CKE	
CMD4	A14	A14
CMD5	RST	RST
CMD6	A9	A9
CMD7	A7	A7
CMD8	A2	A2
CMD9	A0	A0
CMD10	A4	A4
CMD11	A1	A1
CMD12	BA0	BA0
CMD13	WE*	WE*
CMD14	A15	A15
CMD15	CAS*	CAS*
CMD16		CS0_H#
CMD17		
CMD18		ODT_H
CMD19		CKE_H
CMD20	A13	A13
CMD21	A8	A8
CMD22	A6	A6
CMD23	A11	A11
CMD24	A5	A5
CMD25	A3	A3
CMD26	BA2	BA2
CMD27	BA1	BA1
CMD28	A12	A12
CMD29	A10	A10
CMD30	RAS*	RAS*
Not Available		
	LOW	HIGH

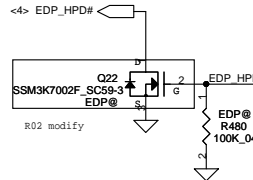
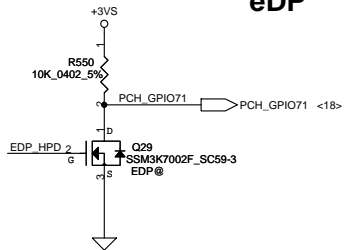
### LCD POWER CIRCUIT



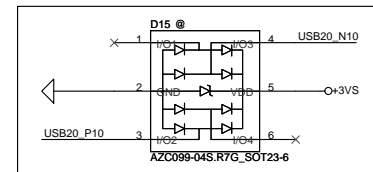
### LCD/LED PANEL Conn.



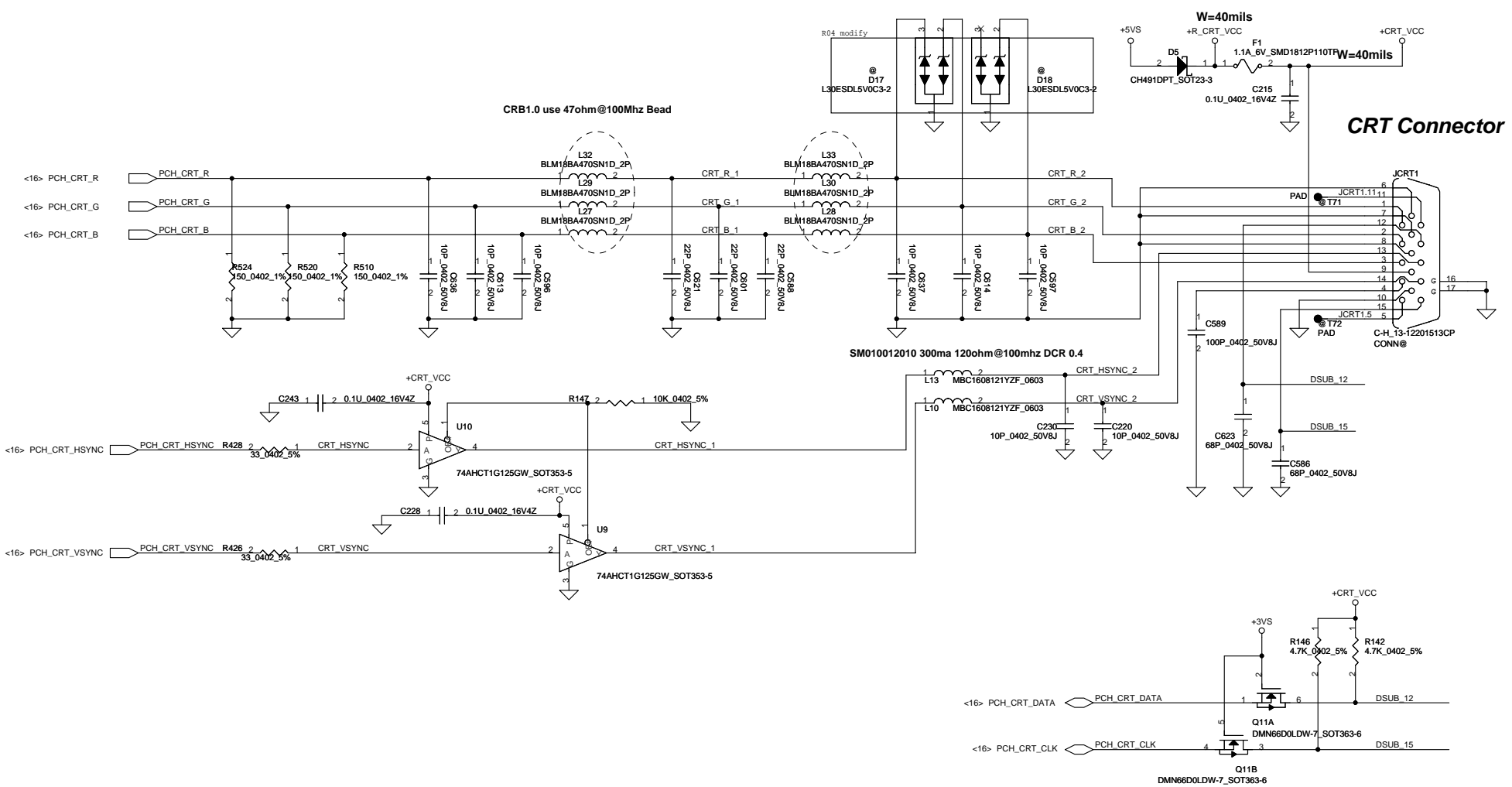
### eDP



<4> EDP_TXP0	1U_0402_16V7K	1	2	EDP@ C910	TZOUT0+
<4> EDP_TXN0	1U_0402_16V7K	1	2	EDP@ C911	TZOUT0-
<4> EDP_TXP1	1U_0402_16V7K	1	2	EDP@ C912	TZOUT1+
<4> EDP_TXN1	1U_0402_16V7K	1	2	EDP@ C913	TZOUT1-
<4> EDP_AUXP	1U_0402_16V7K	1	2	EDP@ C914	TZCLK+
<4> EDP_AUXN	1U_0402_16V7K	1	2	EDP@ C915	TZCLK-

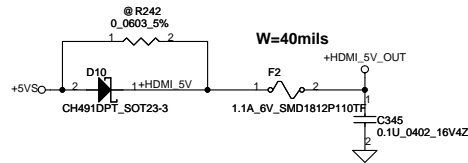


	<b>GPIO71</b>
	PCH_GPIO71
<b>eDP</b>	0
<b>LVDS</b>	1

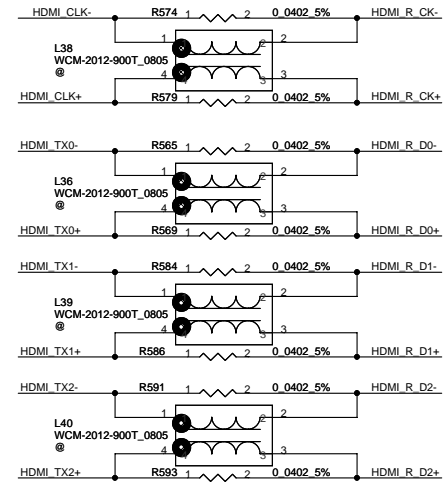


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				4019ID	B
Date: Friday, January 06, 2012				Sheet	32 of 60

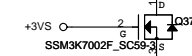
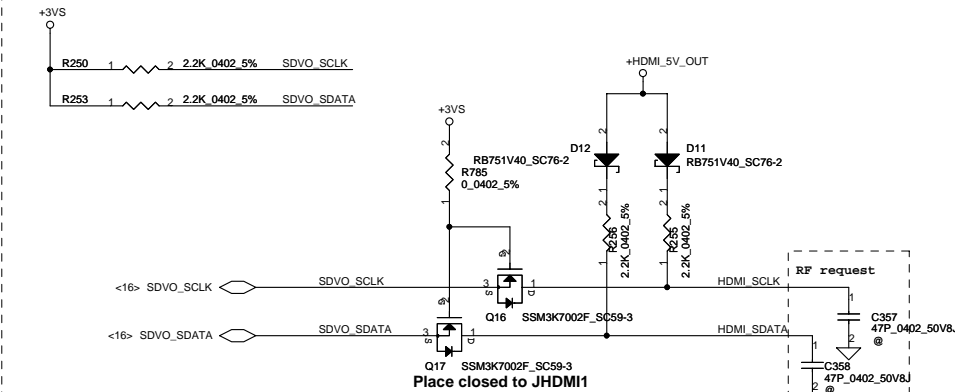
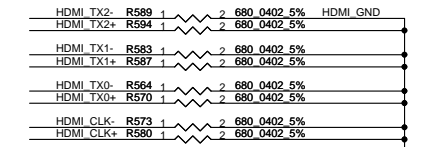
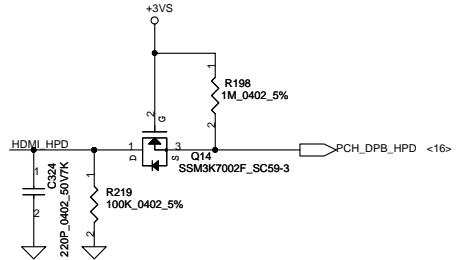




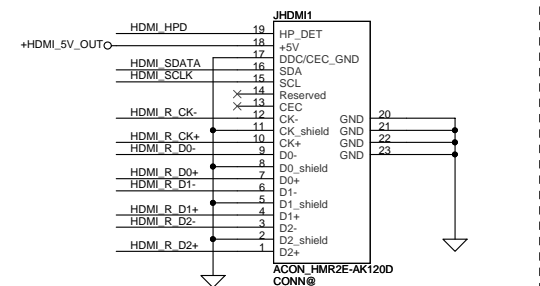
SM070001310 400ma 90ohm@100mhz DCR 0.3



<16> PCH_DPB_N0	C280	2	1	.1U_0402_16V7K	HDMI TX2-
<16> PCH_DPB_P0	C281	2	1	.1U_0402_16V7K	HDMI TX2+
<16> PCH_DPB_N1	C283	2	1	.1U_0402_16V7K	HDMI TX1-
<16> PCH_DPB_P1	C282	2	1	.1U_0402_16V7K	HDMI TX1+
<16> PCH_DPB_N2	C287	2	1	.1U_0402_16V7K	HDMI TX0-
<16> PCH_DPB_P2	C286	2	1	.1U_0402_16V7K	HDMI TX0+
<16> PCH_DPB_N3	C285	2	1	.1U_0402_16V7K	HDMI CLK-
<16> PCH_DPB_P3	C284	2	1	.1U_0402_16V7K	HDMI CLK+



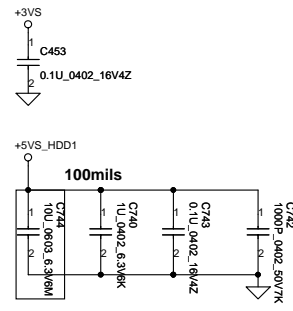
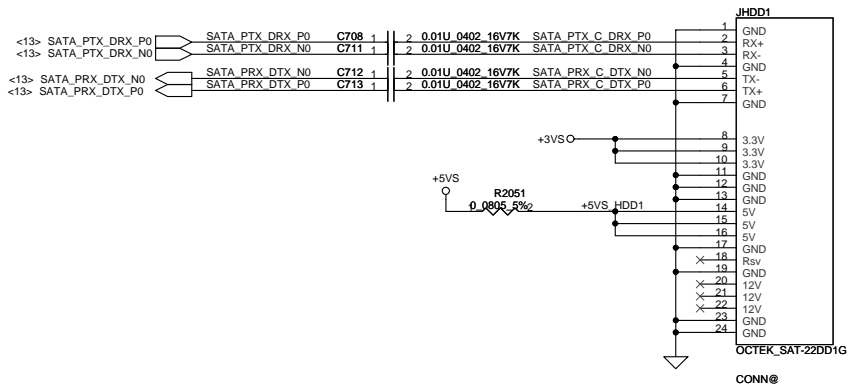
HDMI connector



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			Date:	Friday, January 06, 2012	Sheet 33 of 60

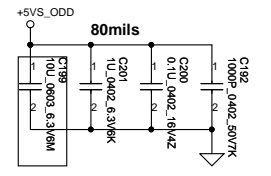
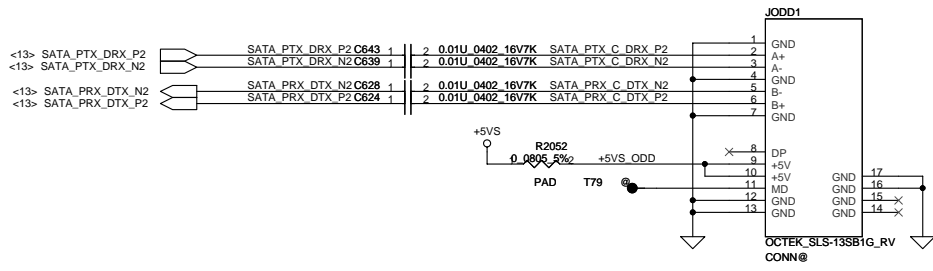
### SATA HDD1 Conn.

CL 4.0 mm



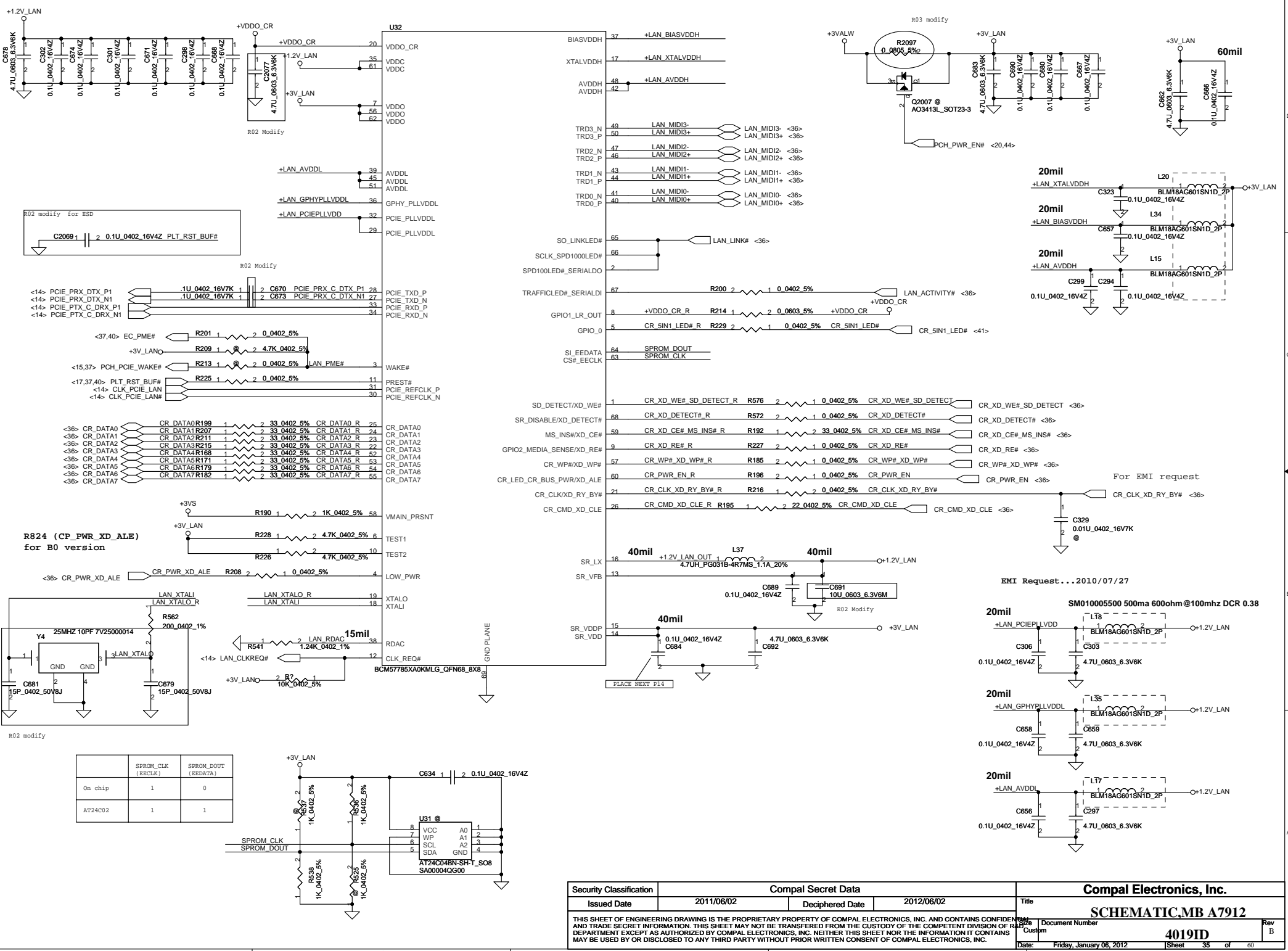
R02 Modify

### SATA ODD Conn.



R02 Modify

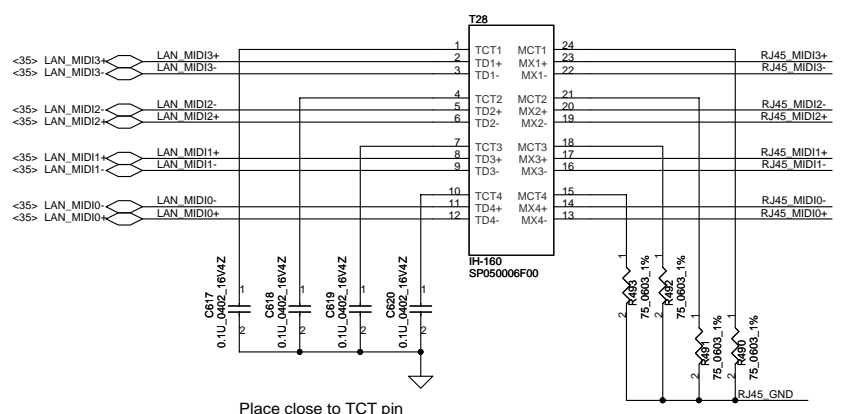
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Issued Date	2011/06/02	Deciphered Date	2012/06/02	Title	SCHMATIC,MB A7912
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				4019ID	B
				Date: Friday, January 06, 2012	Sheet 34 of 60



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		2012/06/02

Compal Electronics, Inc.		Title	
Document Number		<b>SCHMATIC, MB A7912</b>	
Date: Friday, January 06, 2012		Rev B	
Sheet 35 of 60		4019ID	

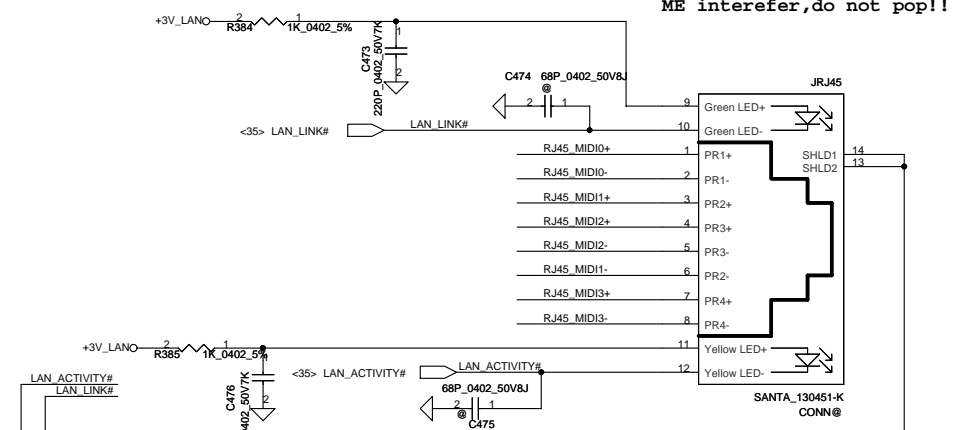
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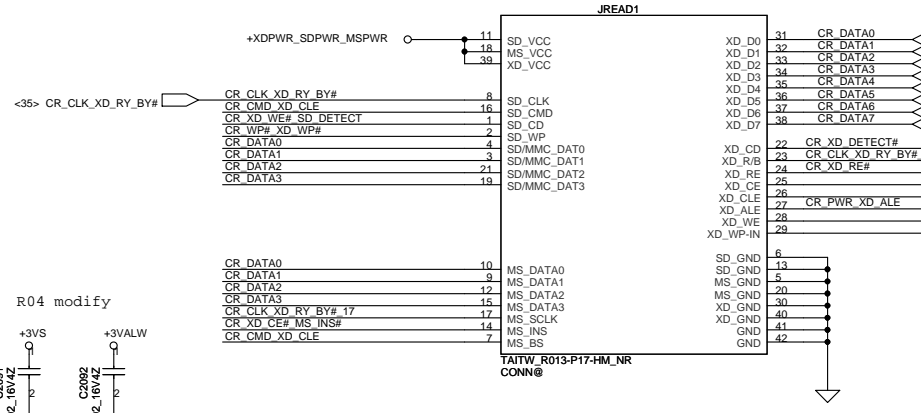
BOTH HAND: S X'FORM\_ GST5009-D LF LAN, SP050006B00  
 TIMAG:S X'FORM\_IH-160 LAN , SP050006F00

### LAN Connector

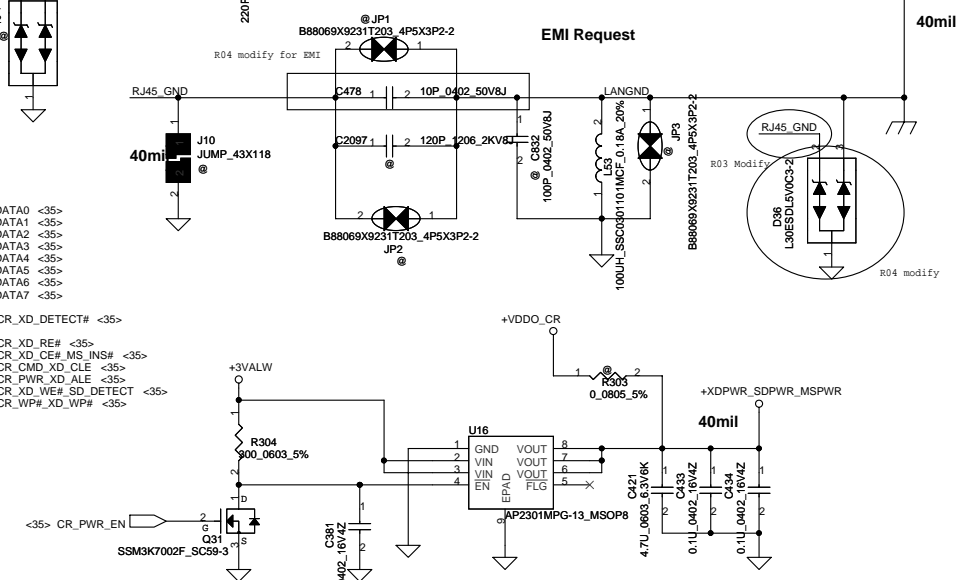
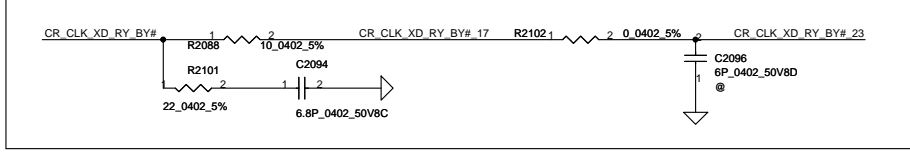
C474, C475 and D14  
 ME interfere, do not pop!!



### Card Reader Connector

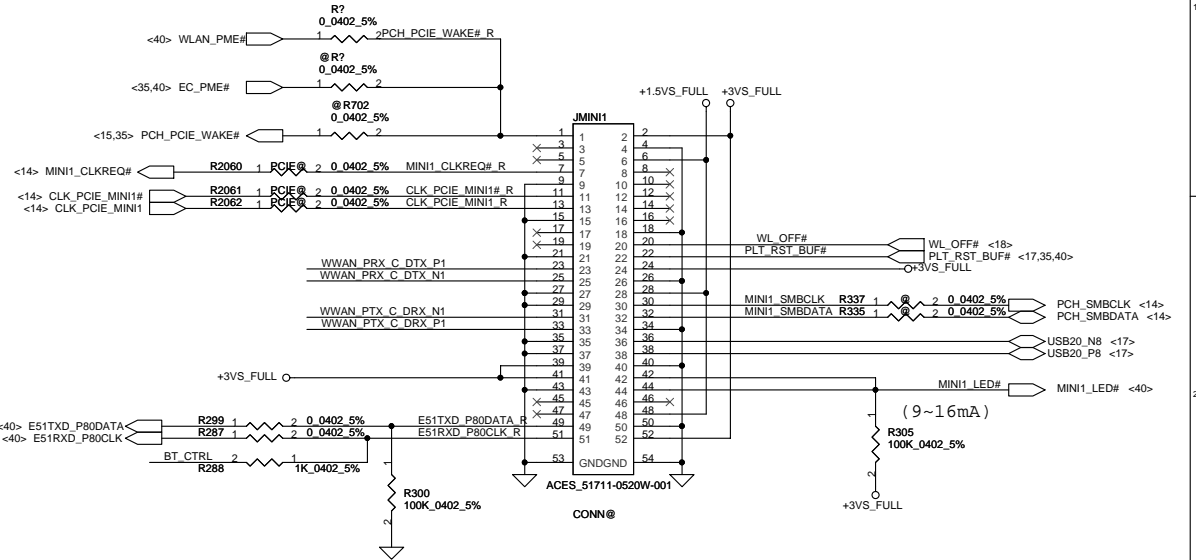
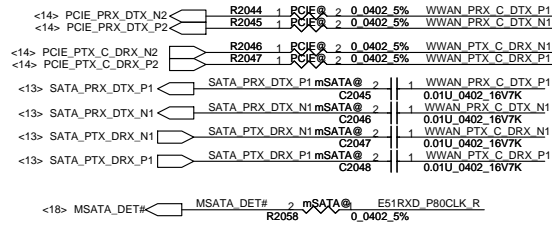
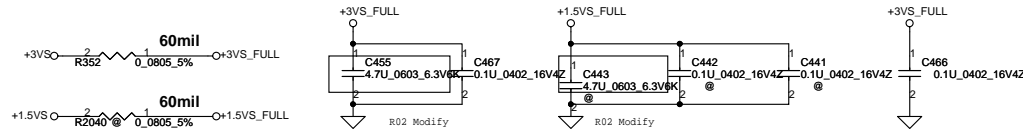


R02 modify for SD3.0 issue



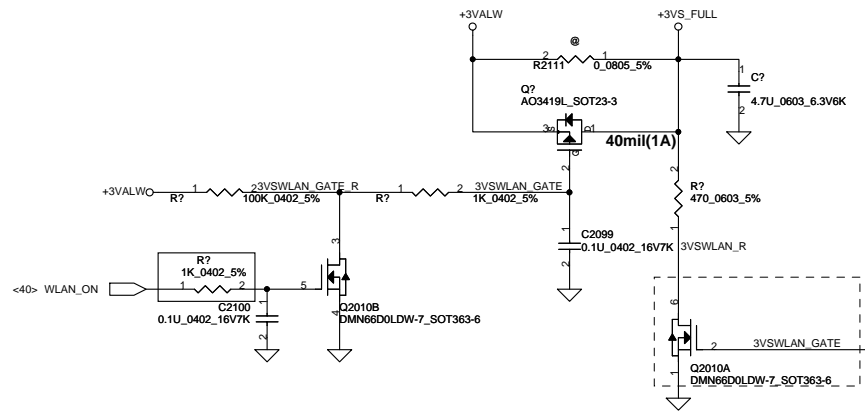
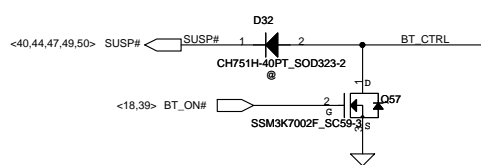
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				Rev B
				Sheet 36 of 60

# For Wireless LAN or MSATA

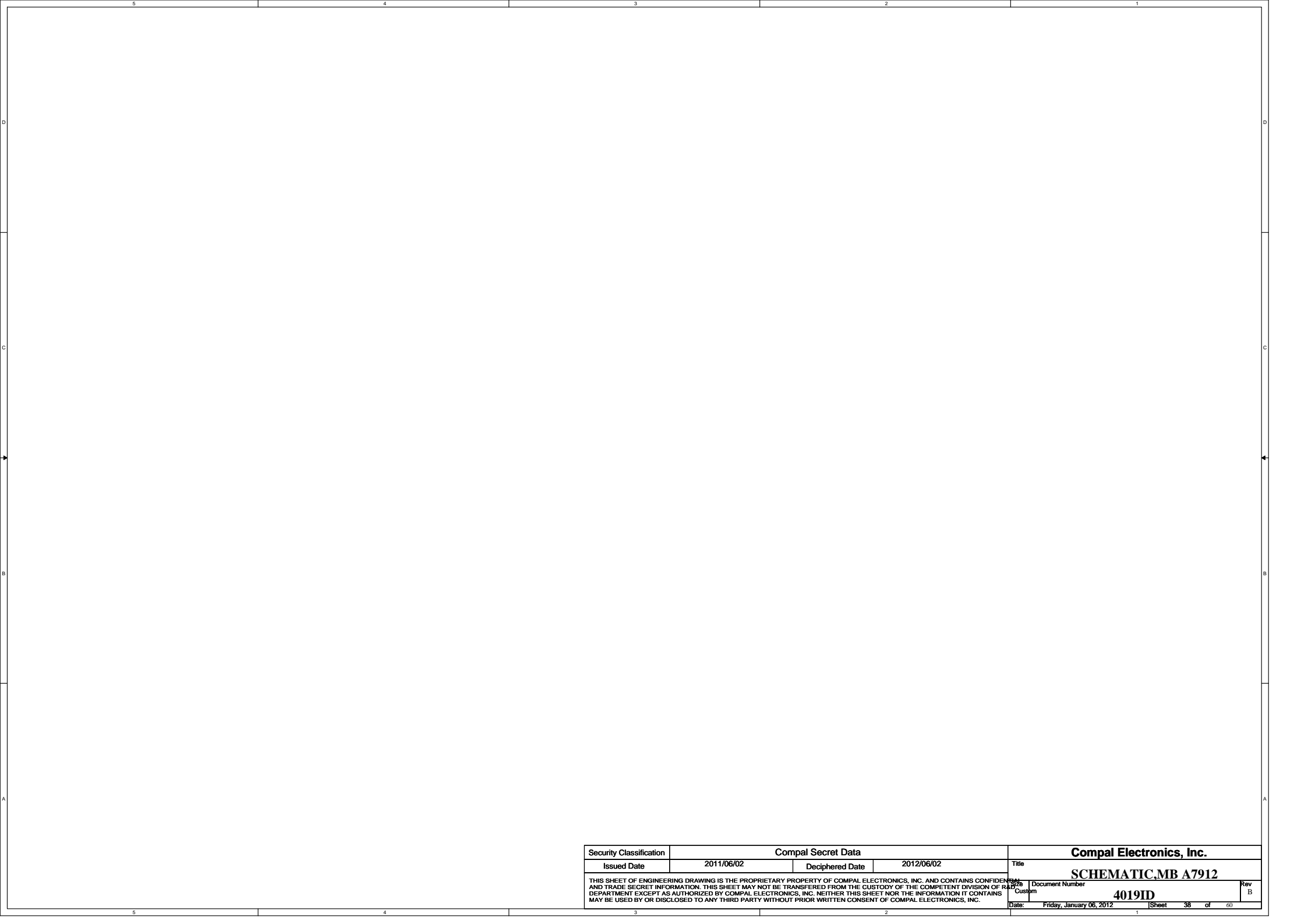


### WLAN&BT Combo module circuits

	BT on module Enable	BT on module Disable
BT_CTRL	H	L
BT_ON#	L	H

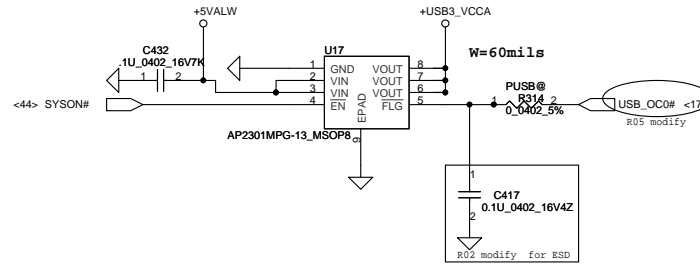
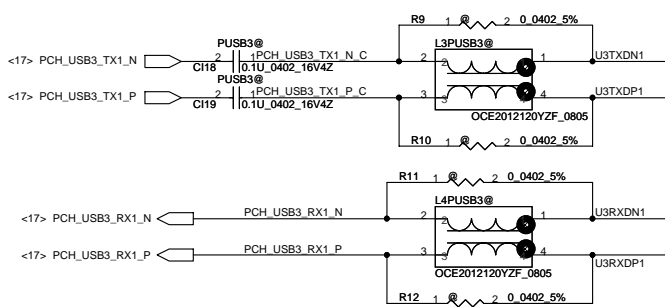


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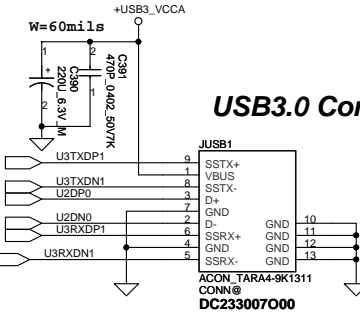
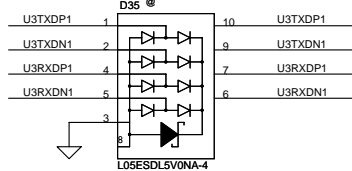


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				Custom	4019ID	B
				Date:	Friday, January 06, 2012	Sheet 38 of 61

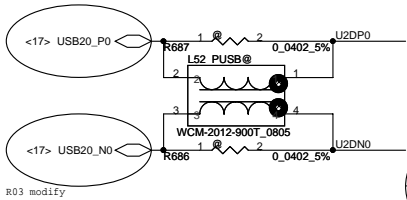
Default use PCH side USB3.0 signal



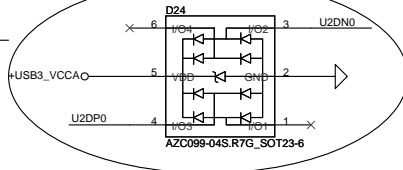
For ESD request



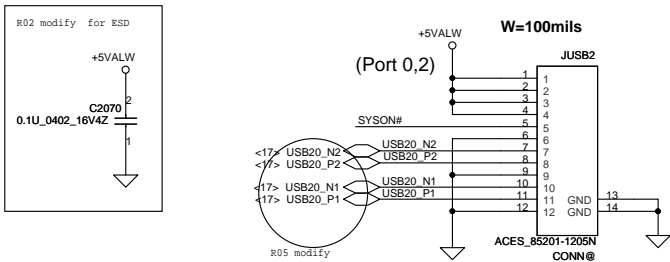
USB3.0 Conn.



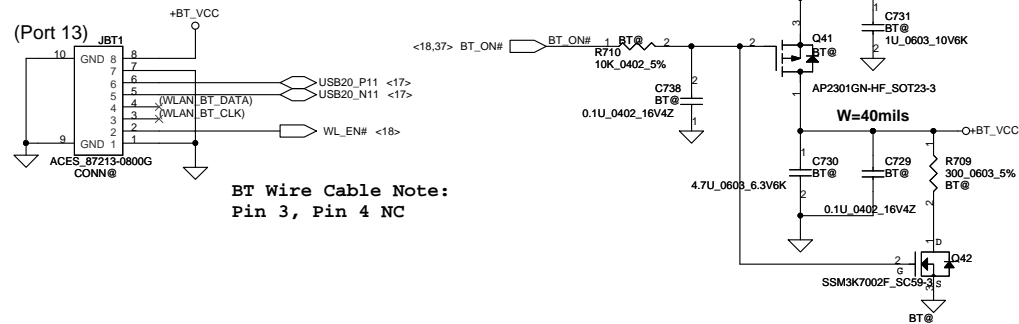
For USB2.0 ESD request



USB/B Conn.

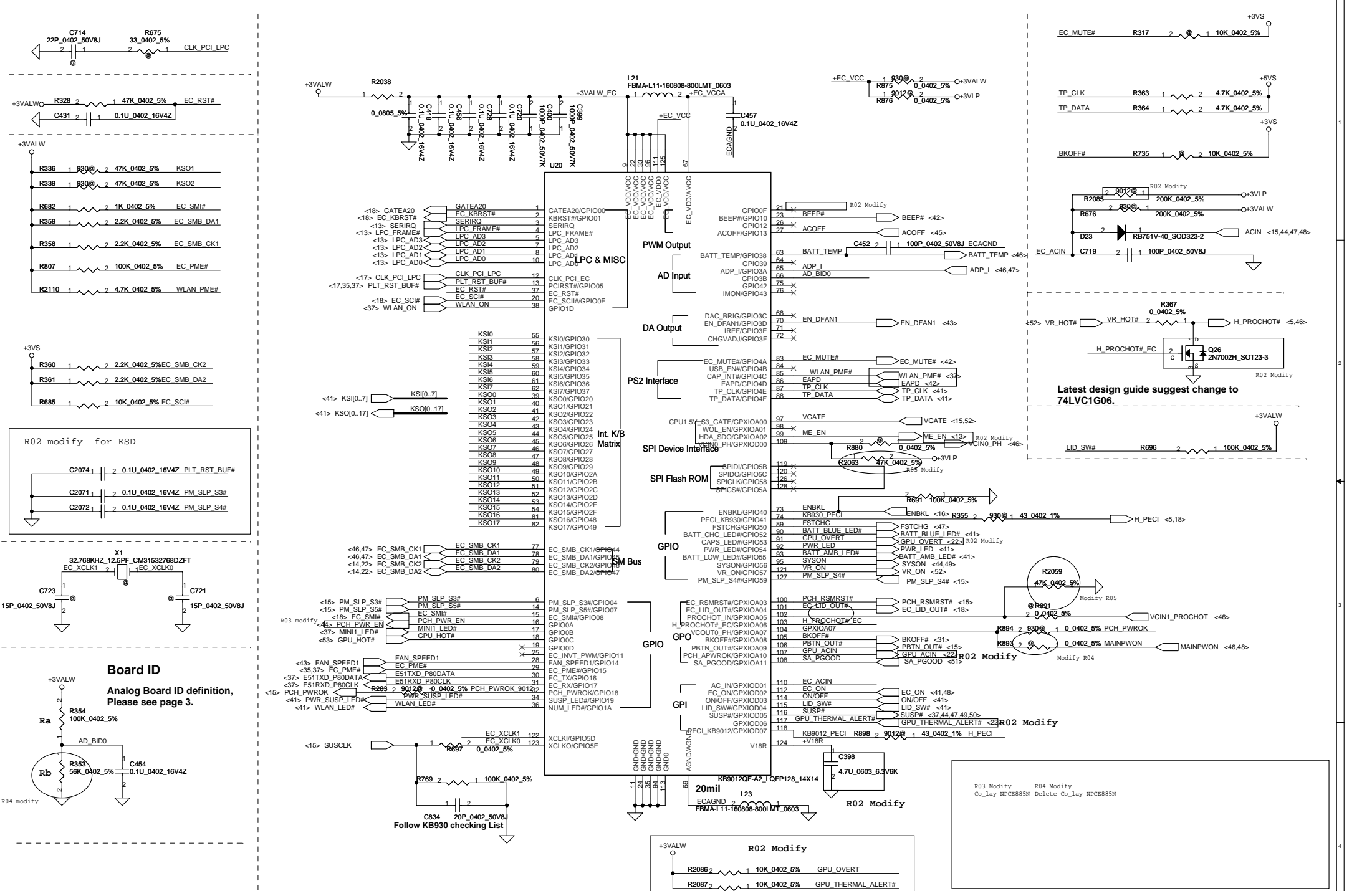


BT Conn.



BT Wire Cable Note:  
Pin 3, Pin 4 NC

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Date:	Friday, January 06, 2012	Sheet	39	of 60		

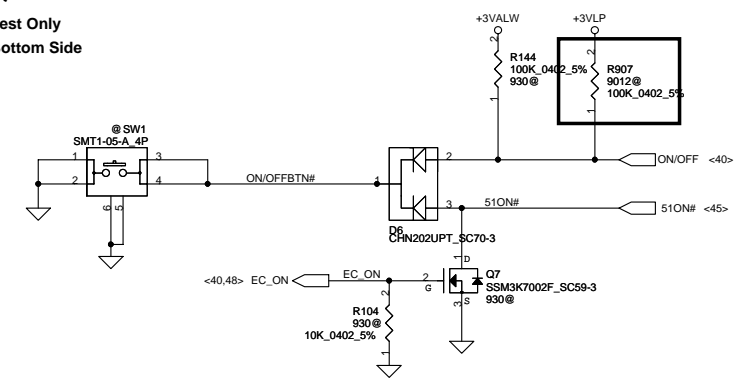


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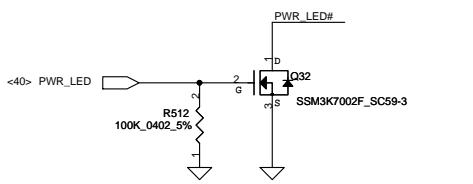
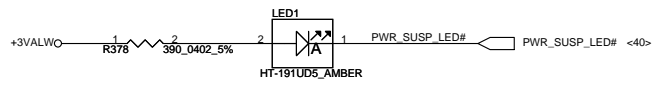
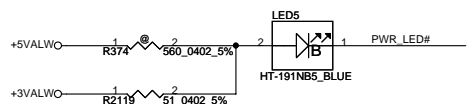
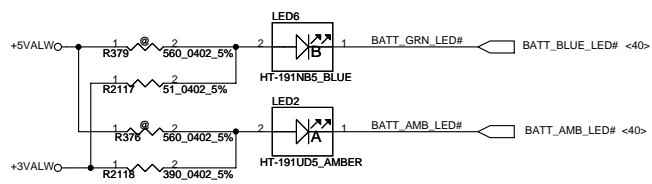
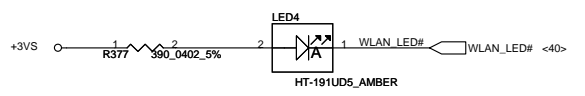
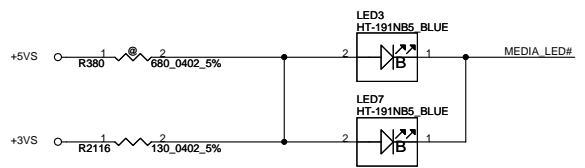
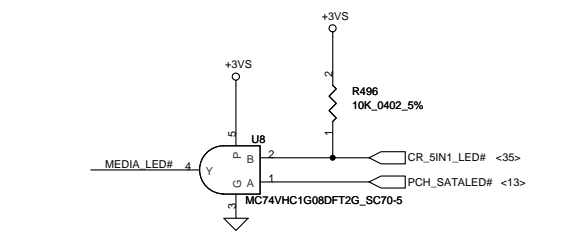
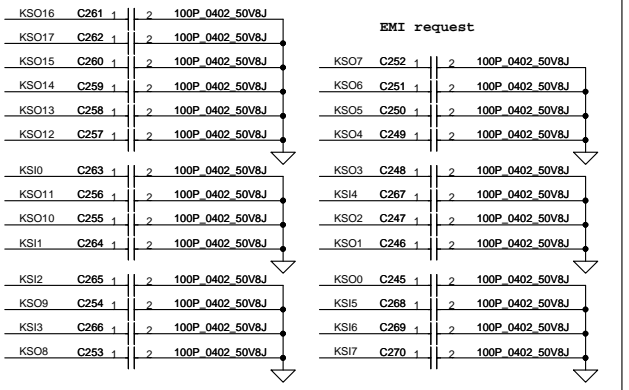
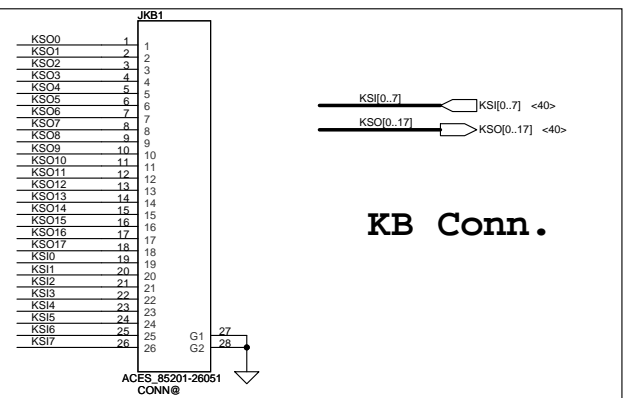


# ON/OFF BTN

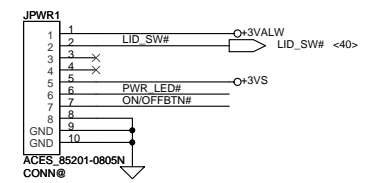
Test Only  
Bottom Side



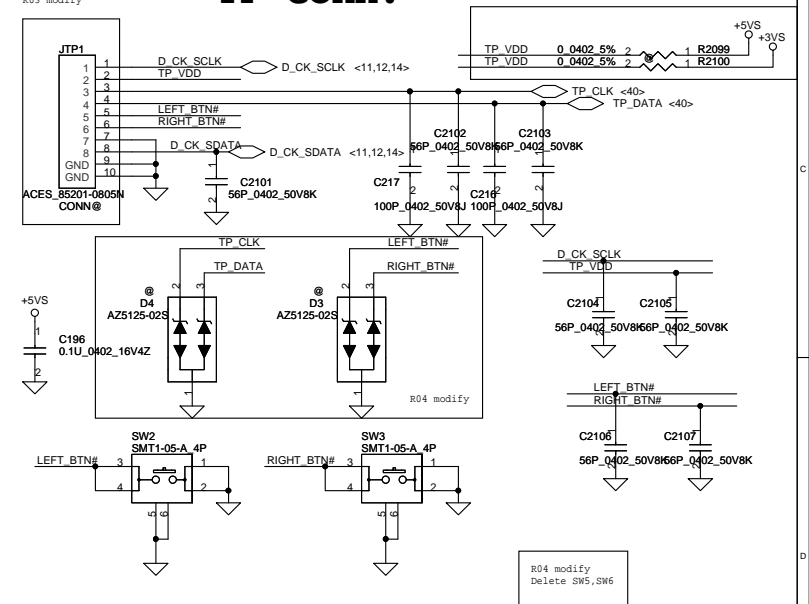
## KB Conn.



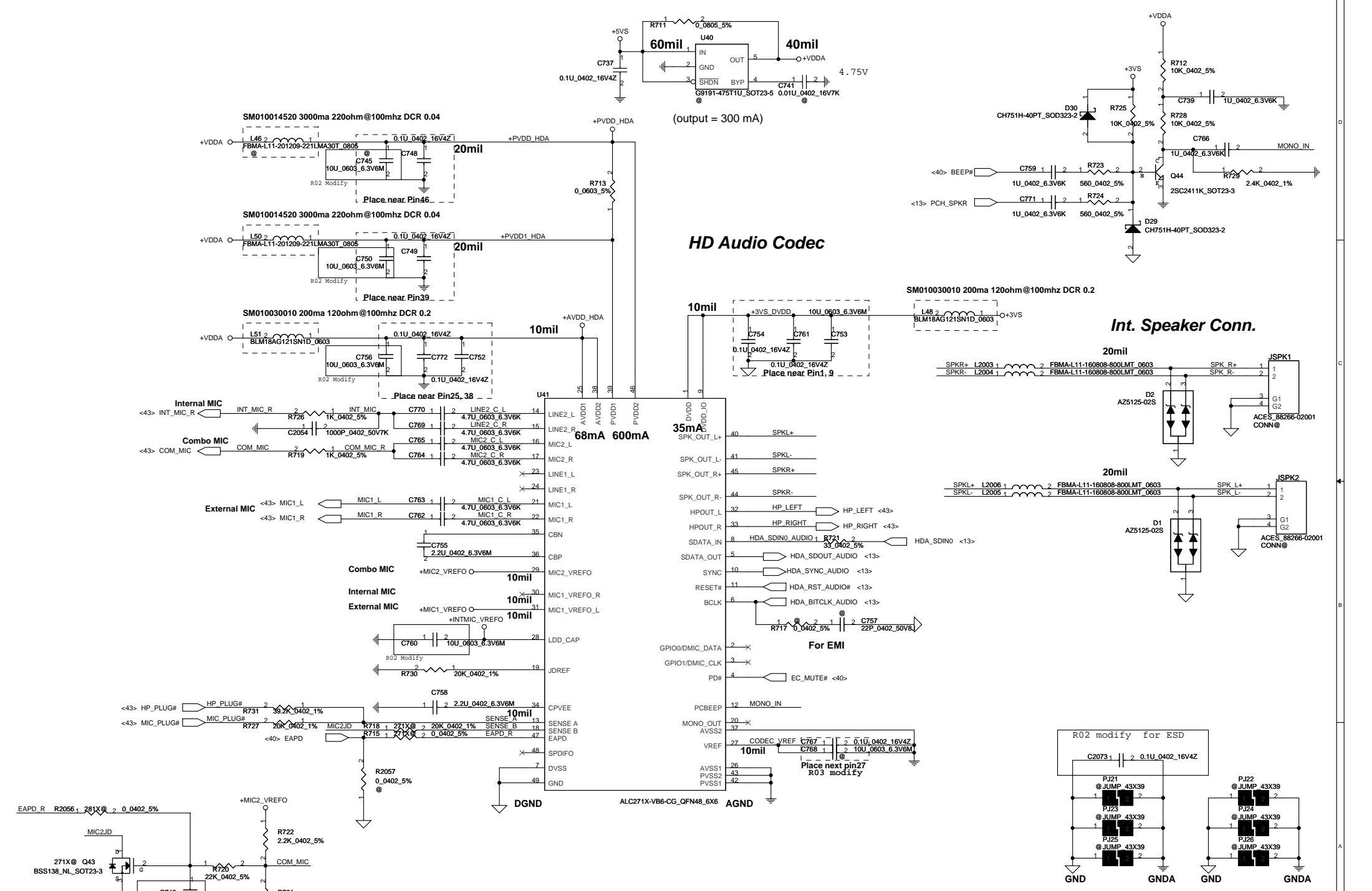
## PWR/B



## TP Conn.



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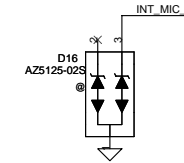
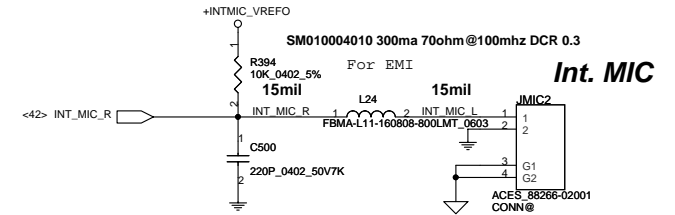
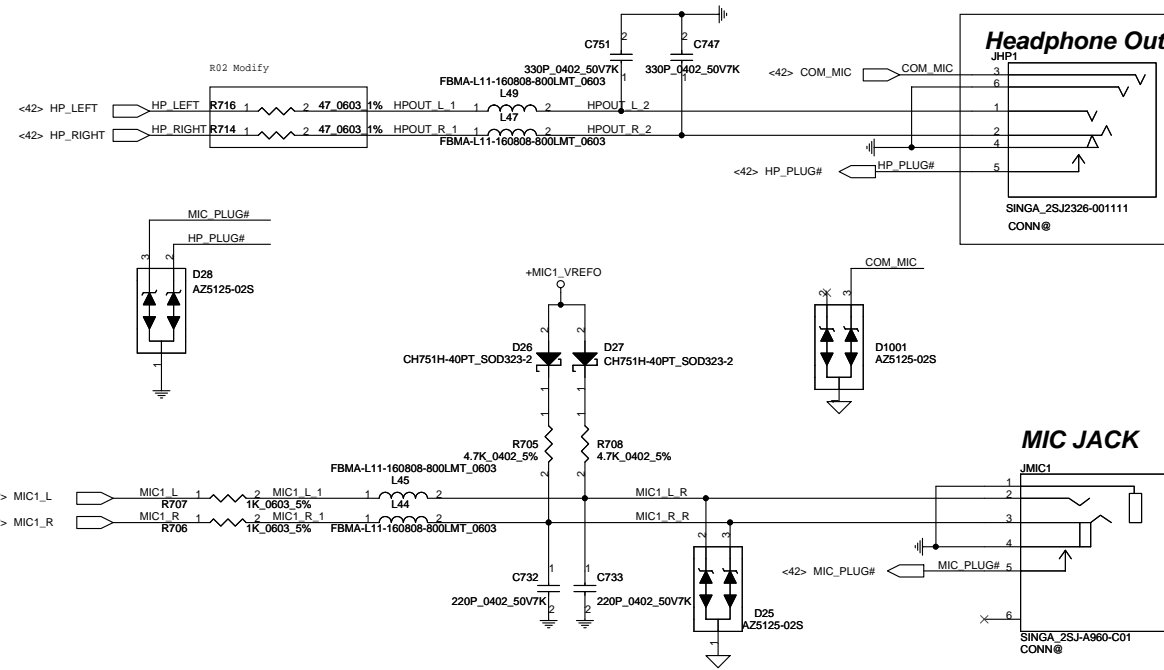


**HD Audio Codec**

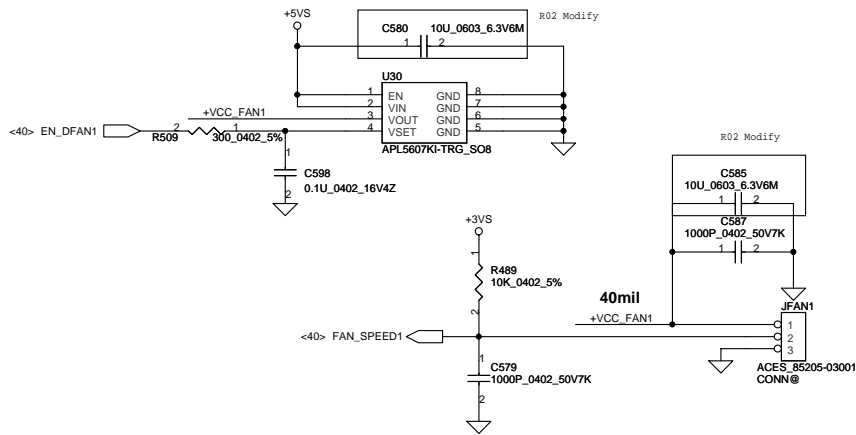
**Int. Speaker Conn.**

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Date: Friday, January 06, 2012				Rev B	
Sheet 42 of 60				4019ID	

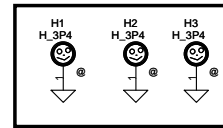
Singatron 2SJ2326  
DC021007151



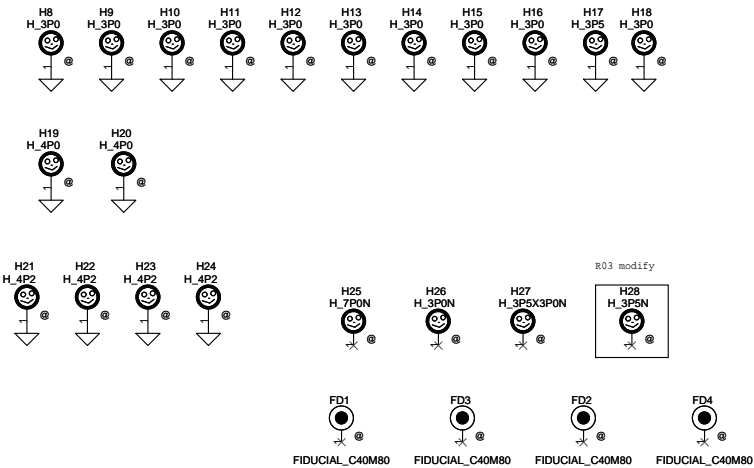
FAN1 Conn



FAN Stand-Off



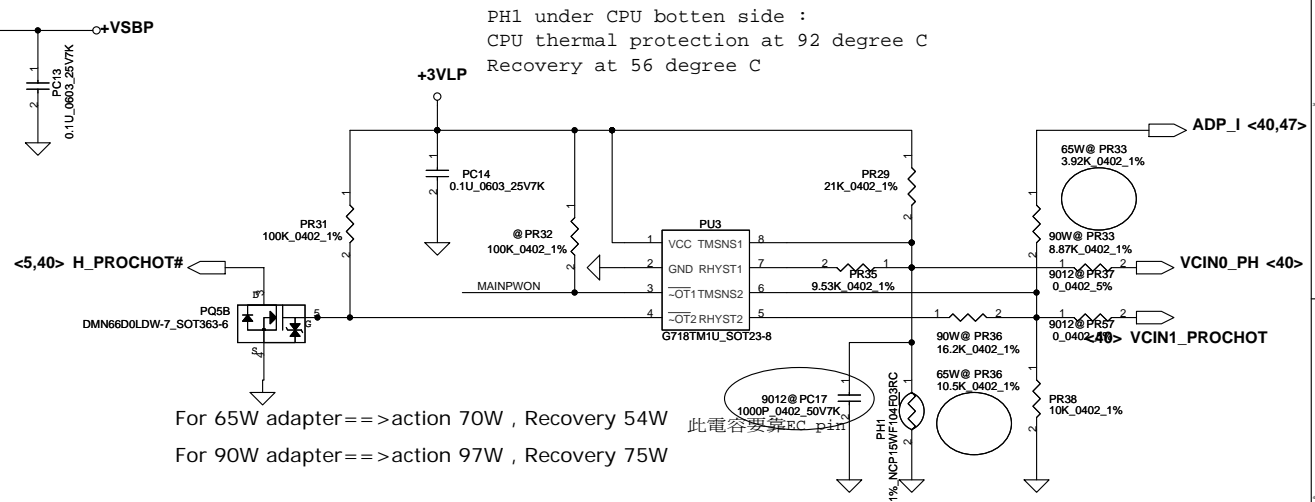
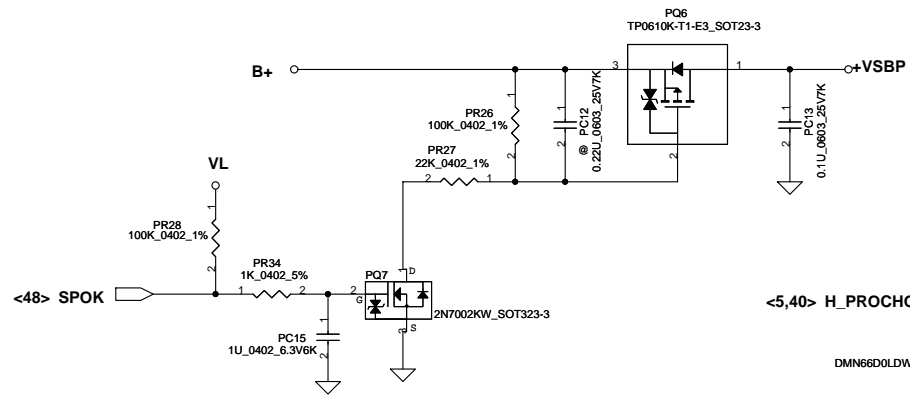
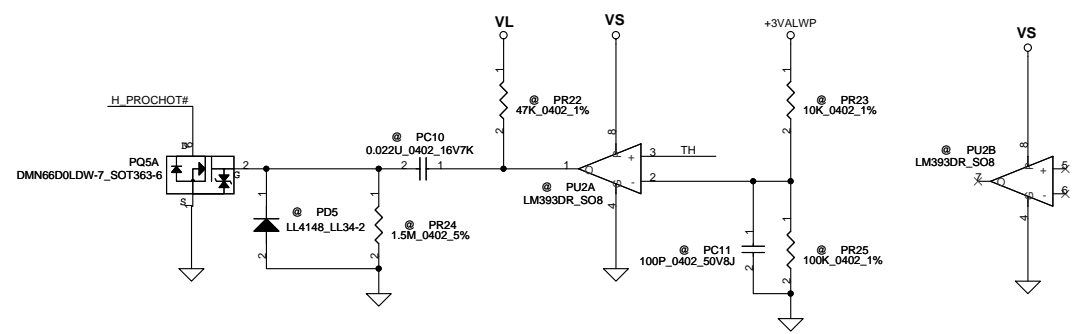
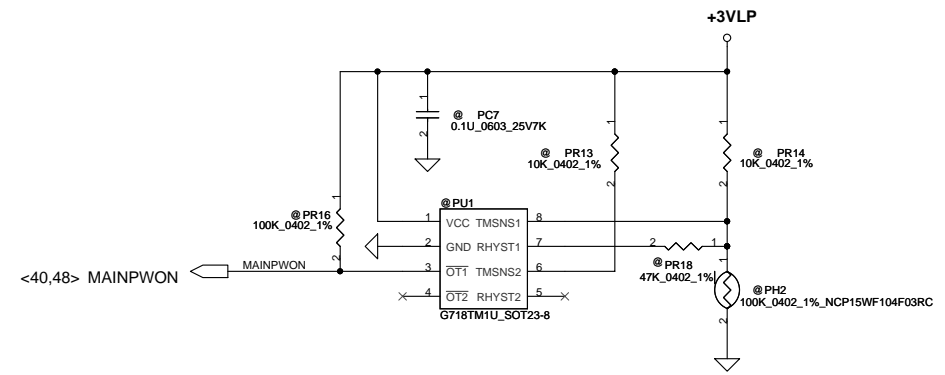
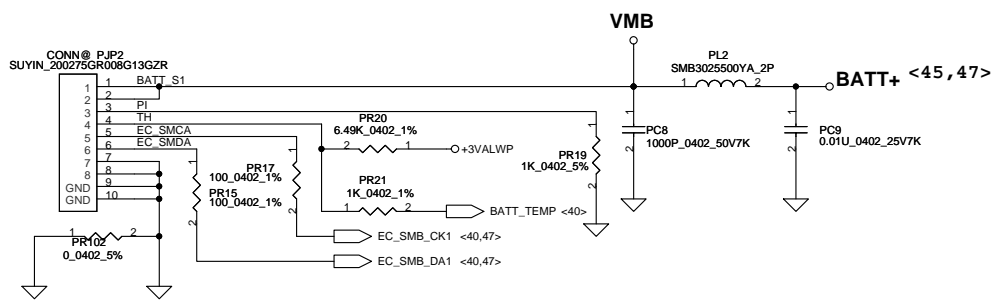
USB3 Stand-Off



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				4019ID	B
Date: Friday, January 06, 2012				Sheet	43 of 60

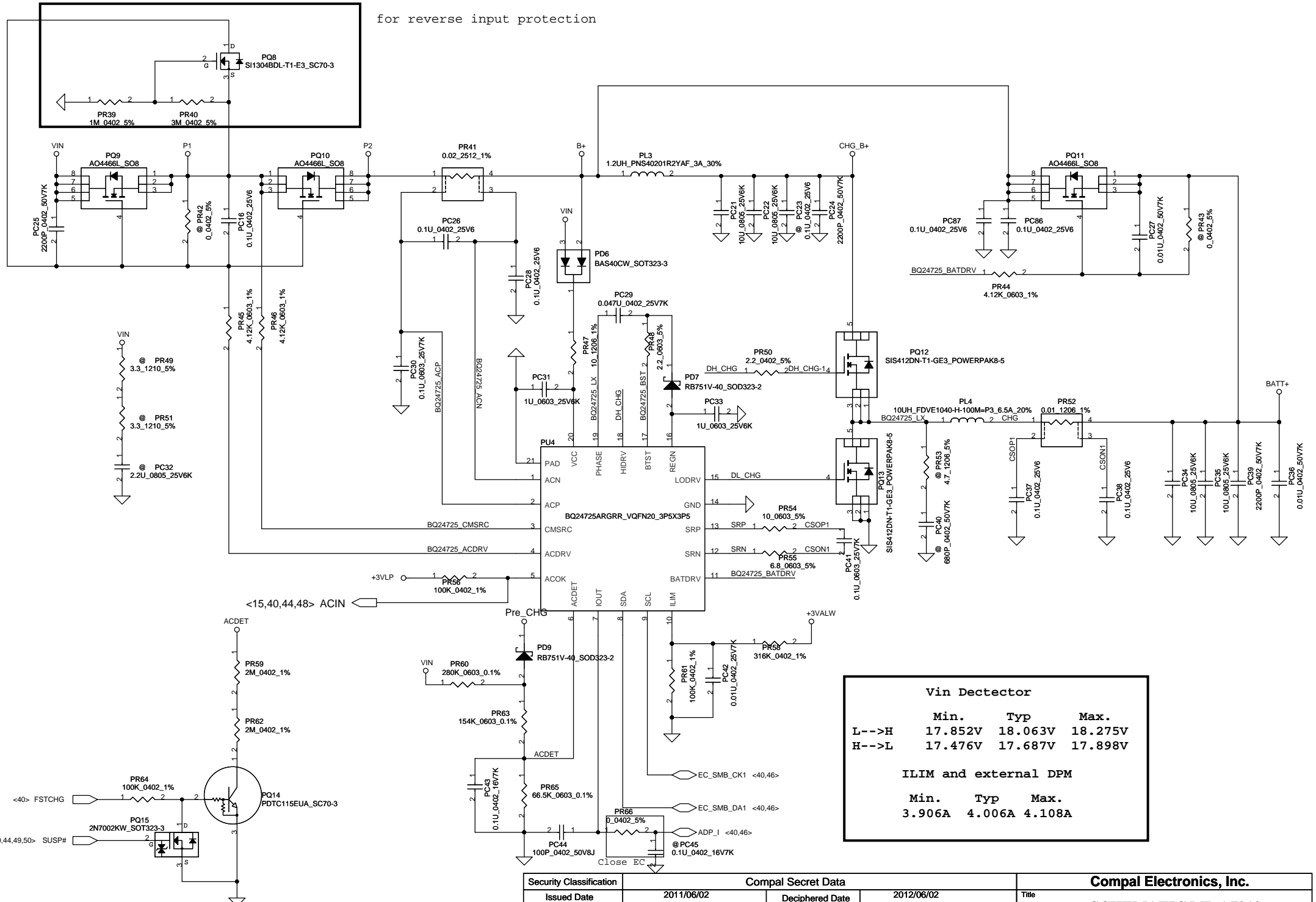






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				4019ID	B
Date: Friday, January 06, 2012				Sheet	46 of 60

for reverse input protection



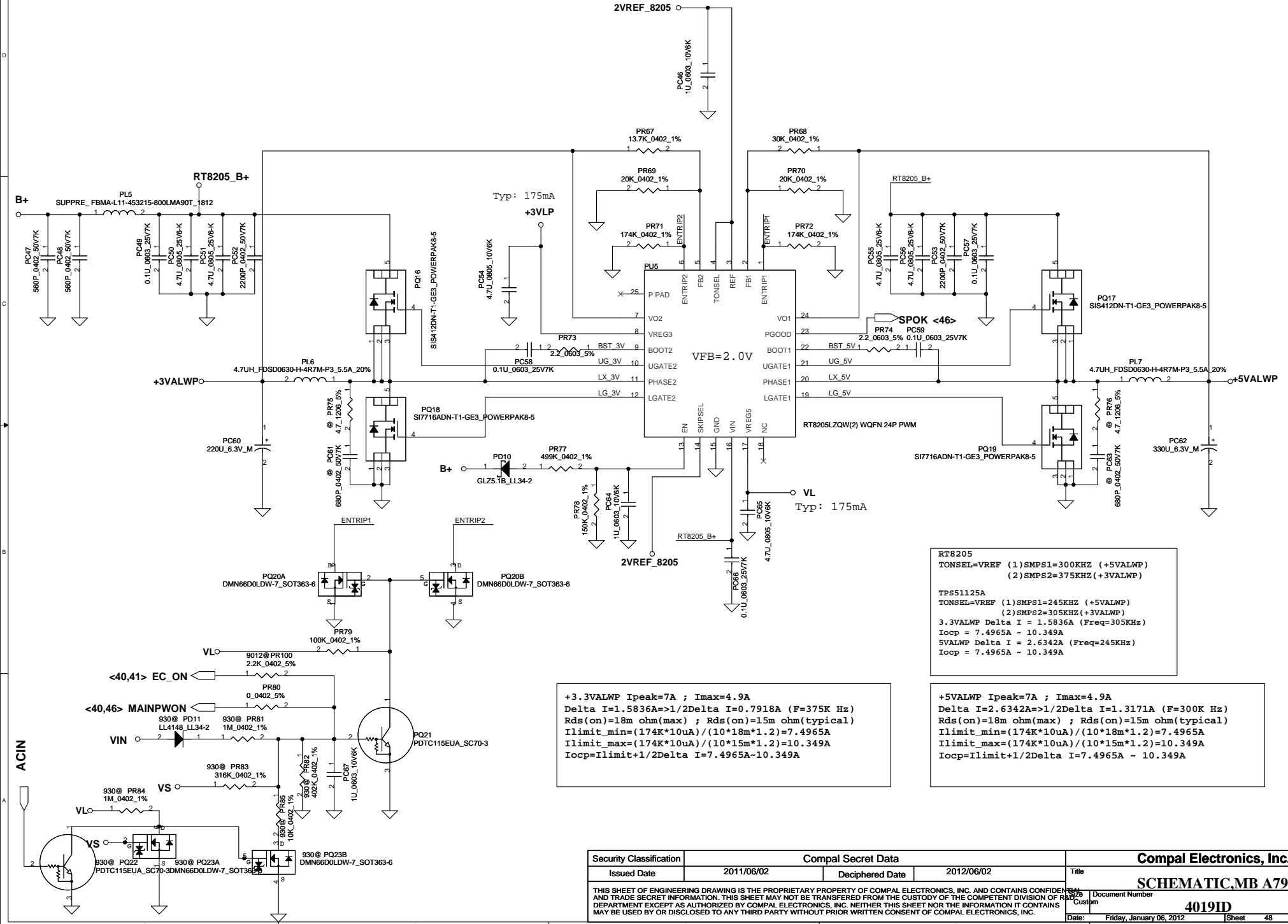
Vin Detector			
	Min.	Typ	Max.
L-->H	17.852V	18.063V	18.275V
H-->L	17.476V	17.687V	17.898V

ILIM and external DPM			
	Min.	Typ	Max.
	3.906A	4.006A	4.108A

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Size	Document Number	Rev			
Custom	4019ID	B			
Date:	Friday, January 06, 2012	Sheet	47	of	60

Note:  
 Use TPS51125 IC can remove RTC refernece LDO  
 Use TPS51427 IC must keep RTC refernece LDO



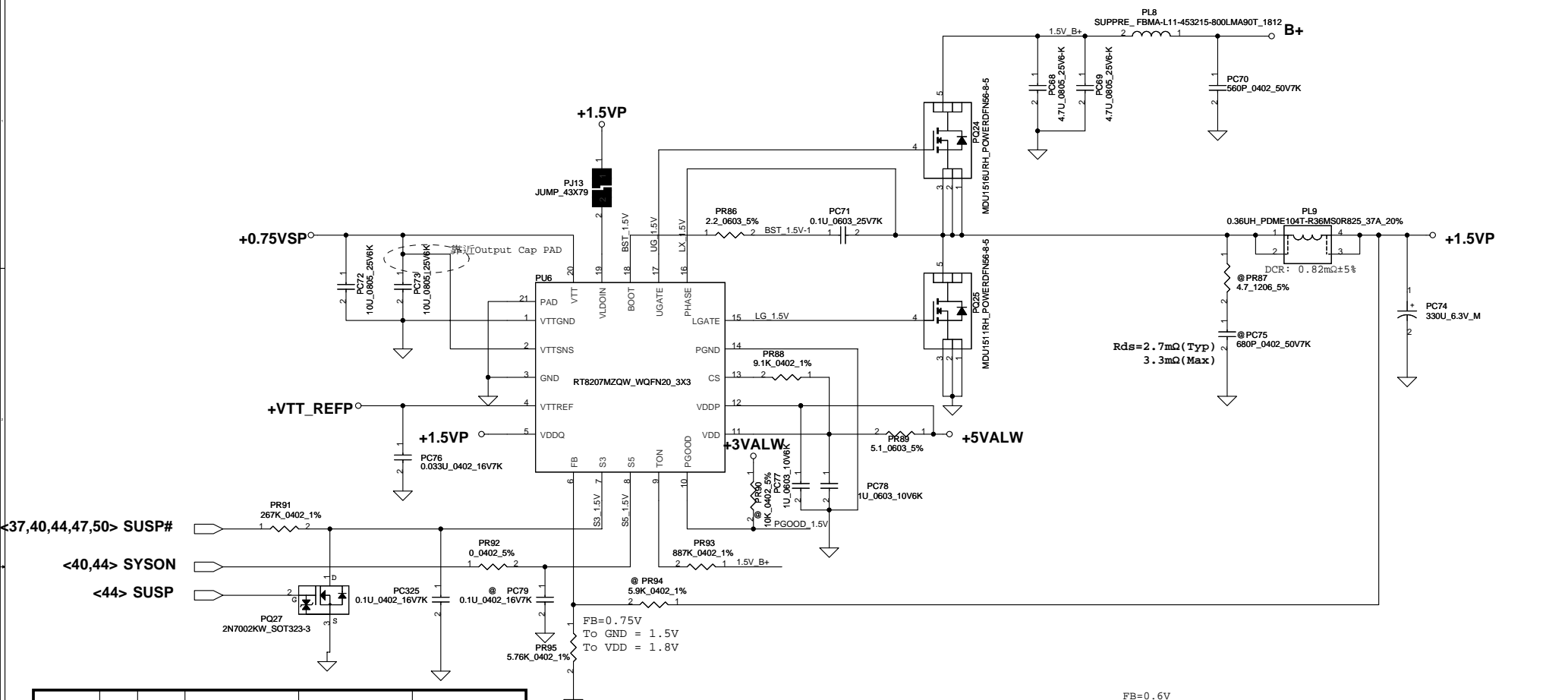
+3.3VALWP Ipeak=7A ; Imax=4.9A  
 $\Delta I = 1.5836A > 1/2 \Delta I = 0.7918A$  (F=375K Hz)  
 $R_{ds(on)} = 18m \text{ ohm(max)} ; R_{ds(on)} = 15m \text{ ohm(typical)}$   
 $I_{limit\_min} = (174K * 10uA) / (10 * 18m * 1.2) = 7.4965A$   
 $I_{limit\_max} = (174K * 10uA) / (10 * 15m * 1.2) = 10.349A$   
 $I_{ocp} = I_{limit} + 1/2 \Delta I = 7.4965A - 10.349A$

**RT8205**  
 TONSEL=VREF (1) SMPS1=300KHZ (+5VALWP)  
 (2) SMPS2=375KHZ (+3VALWP)  
  
**TPS51125A**  
 TONSEL=VREF (1) SMPS1=245KHZ (+5VALWP)  
 (2) SMPS2=305KHZ (+3VALWP)  
 3.3VALWP  $\Delta I = 1.5836A$  (Freq=305KHZ)  
 $I_{ocp} = 7.4965A \sim 10.349A$   
 5VALWP  $\Delta I = 2.6342A$  (Freq=245KHZ)  
 $I_{ocp} = 7.4965A \sim 10.349A$

+5VALWP Ipeak=7A ; Imax=4.9A  
 $\Delta I = 2.6342A > 1/2 \Delta I = 1.3171A$  (F=300K Hz)  
 $R_{ds(on)} = 18m \text{ ohm(max)} ; R_{ds(on)} = 15m \text{ ohm(typical)}$   
 $I_{limit\_min} = (174K * 10uA) / (10 * 18m * 1.2) = 7.4965A$   
 $I_{limit\_max} = (174K * 10uA) / (10 * 15m * 1.2) = 10.349A$   
 $I_{ocp} = I_{limit} + 1/2 \Delta I = 7.4965A \sim 10.349A$

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Date:	Friday, January 06, 2012	Sheet	48 of 60

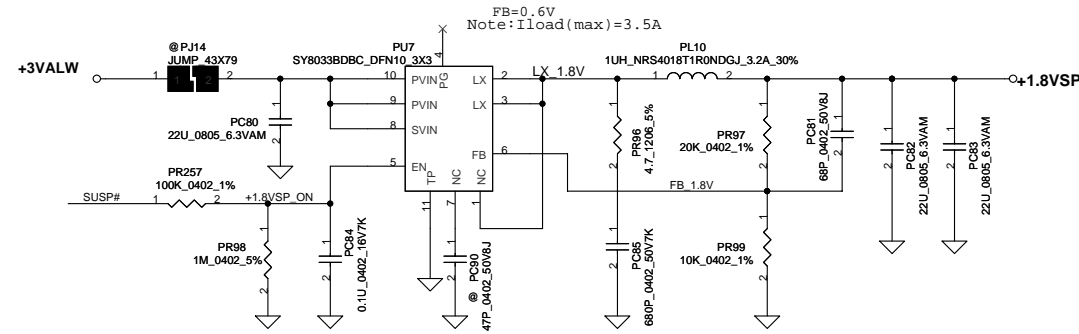




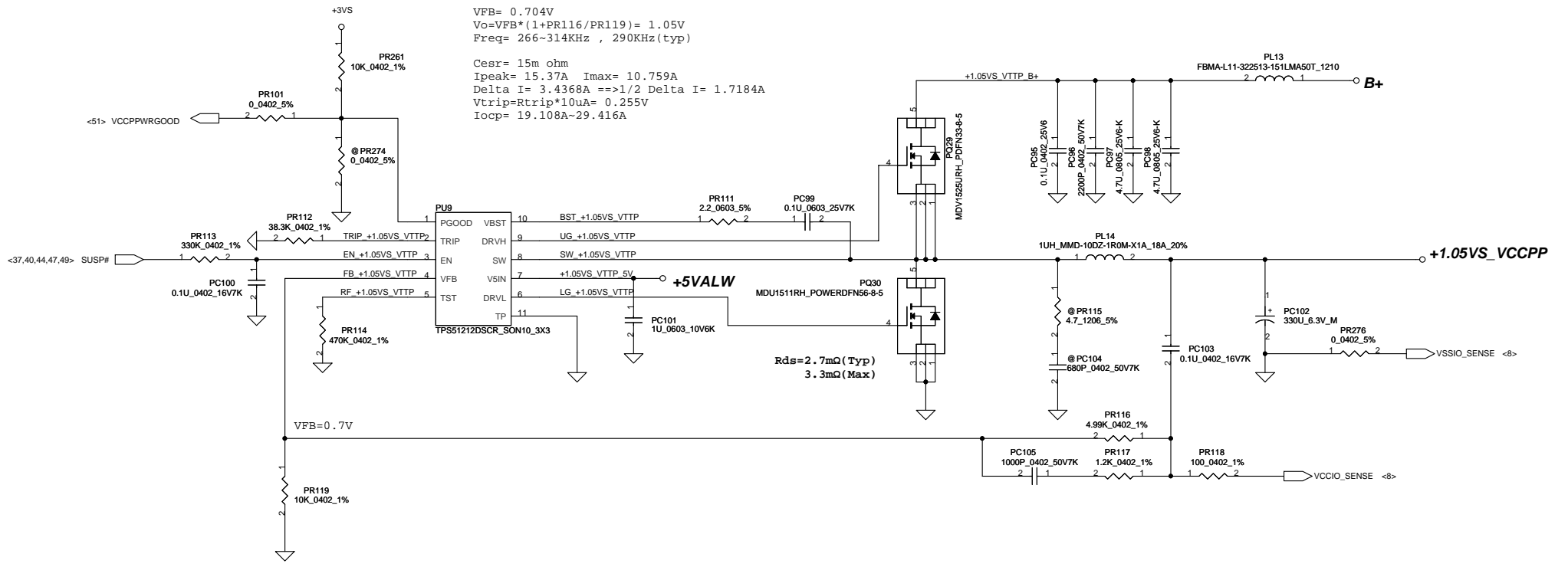
<37,40,44,47,50> SUSP#  
 <40,44> SYSON  
 <44> SUSP

STATE	S3	S5	1.5VP	VTT_REFP	0.75VSP
S0	Hi	Hi	On	On	On
S3	Lo	Hi	On	On	Off (Hi-Z)
S4/S5	Lo	Lo	Off (Discharge)	Off (Discharge)	Off (Discharge)

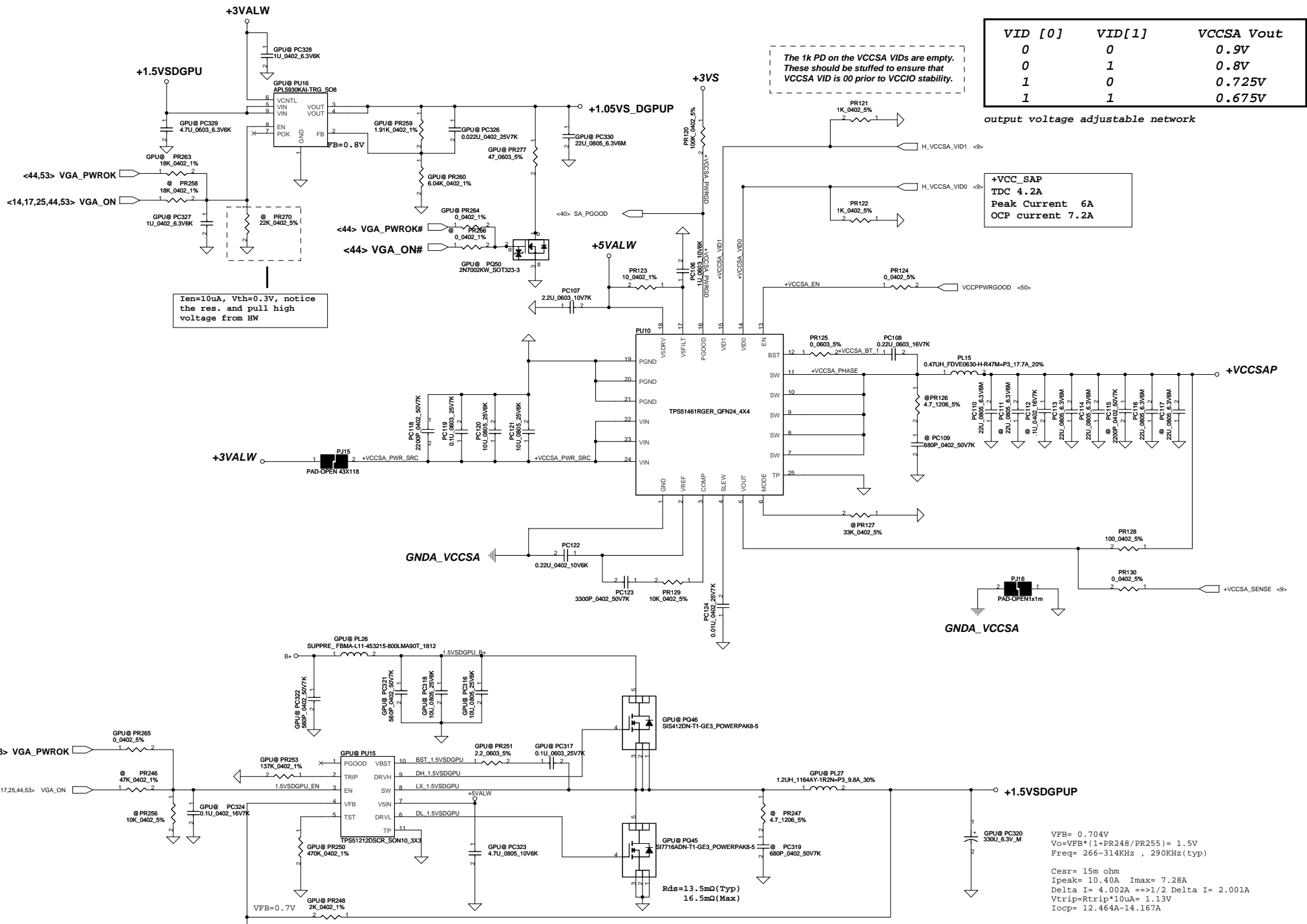
Note: S3 - sleep ; S5 - power off



Notice: Internal resistance about 500K on 2nd EN pin



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				Rev B



The 1k PD on the VCCSA VIDs are empty. These should be stuffed to ensure that VCCSA VID is 00 prior to VCCIO stability.

VID [0]	VID[1]	VCCSA Vout
0	0	0.9V
0	1	0.8V
1	0	0.725V
1	1	0.675V

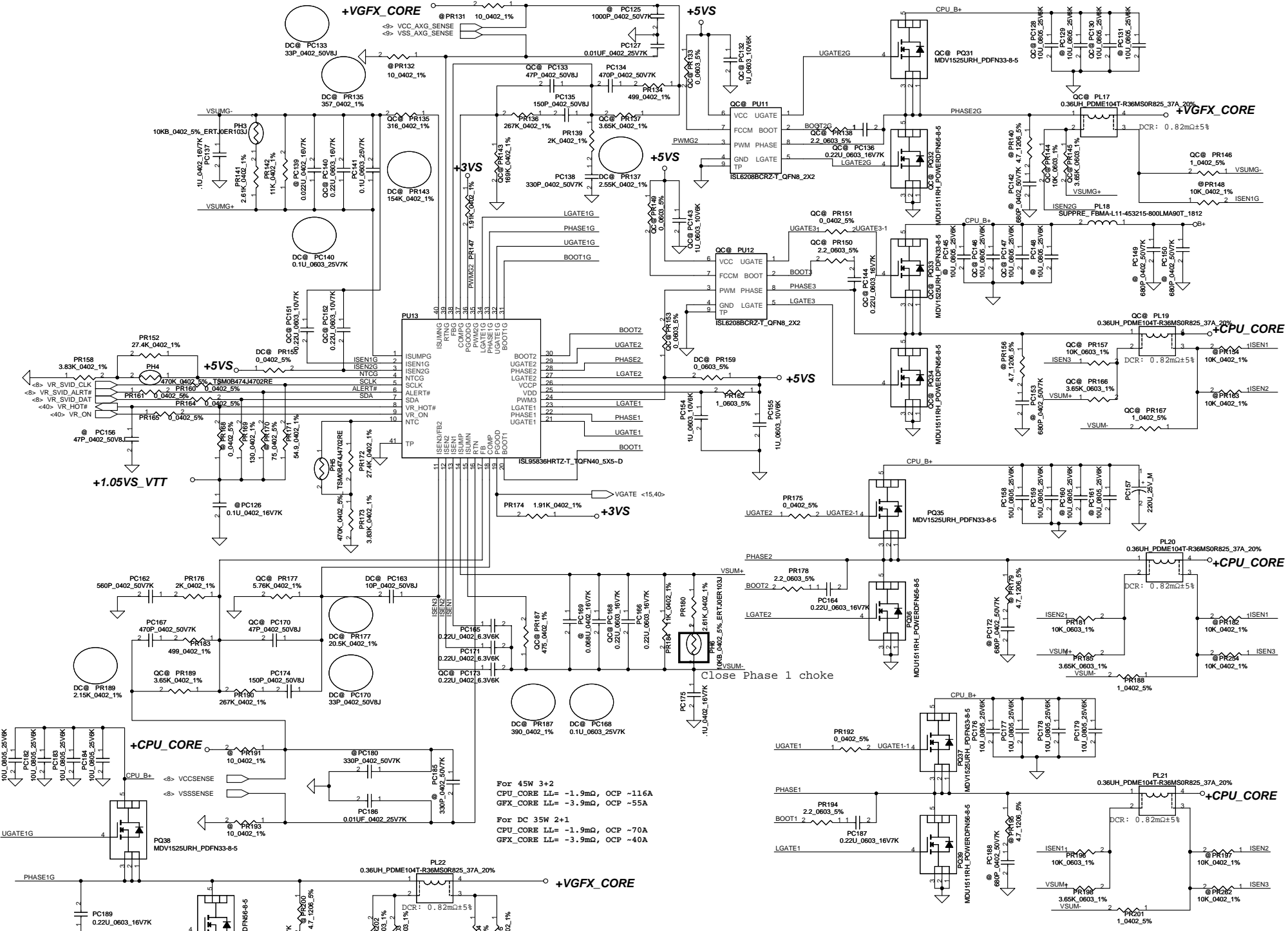
output voltage adjustable network

+VCC\_SAP  
TDC 4.2A  
Peak Current 6A  
OCP current 7.2A

Ien=10uA, Vth=0.3V, notice the res. and pull high voltage from HW

VFB= 0.704V  
Vo=VFB\*(1+PR248/PR255) = 1.5V  
Freq= 266-314KHz , 290KHz(typ)  
Cesr= 15m ohm  
Ipeak= 10.40A Imax= 7.28A  
Delta I= 4.002A ==>1/2 Delta I= 2.001A  
Vtrip=Rtrip\*10uA= 1.13V  
Iocp= 12.464A-14.167A

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		C	4019ID
		Date:	Friday, January 06, 2012
		Sheet	51 of 60



For 45W 3+2  
 CPU\_CORE LL = -1.9mΩ, OCP -116A  
 GFX\_CORE LL = -3.9mΩ, OCP -55A

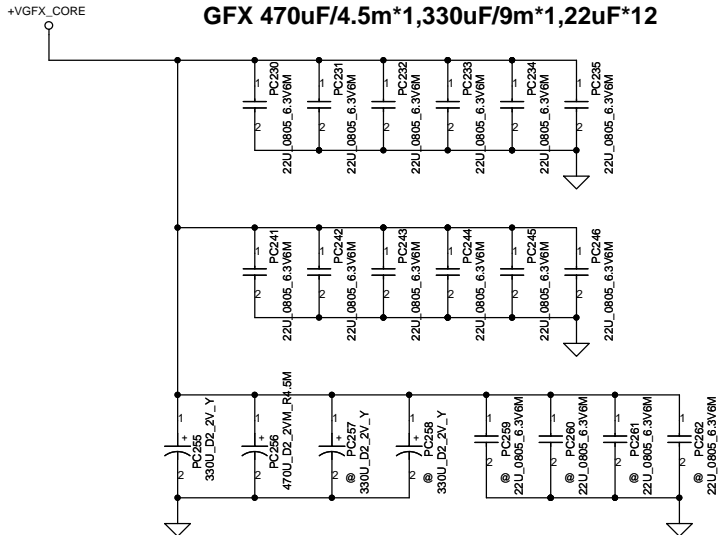
For DC 35W 2+1  
 CPU\_CORE LL = -1.9mΩ, OCP -70A  
 GFX\_CORE LL = -3.9mΩ, OCP -40A

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Issued Date	2011/06/02	Deciphered Date	2012/06/02	Title
				<b>SCHEMATIC_MB A7912</b>
				Document Number
				<b>4019ID</b>
				Rev
				B
Date: Friday, January 06, 2012				Sheet 52 of 60

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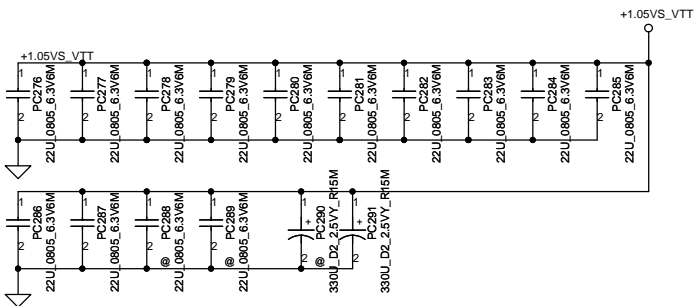
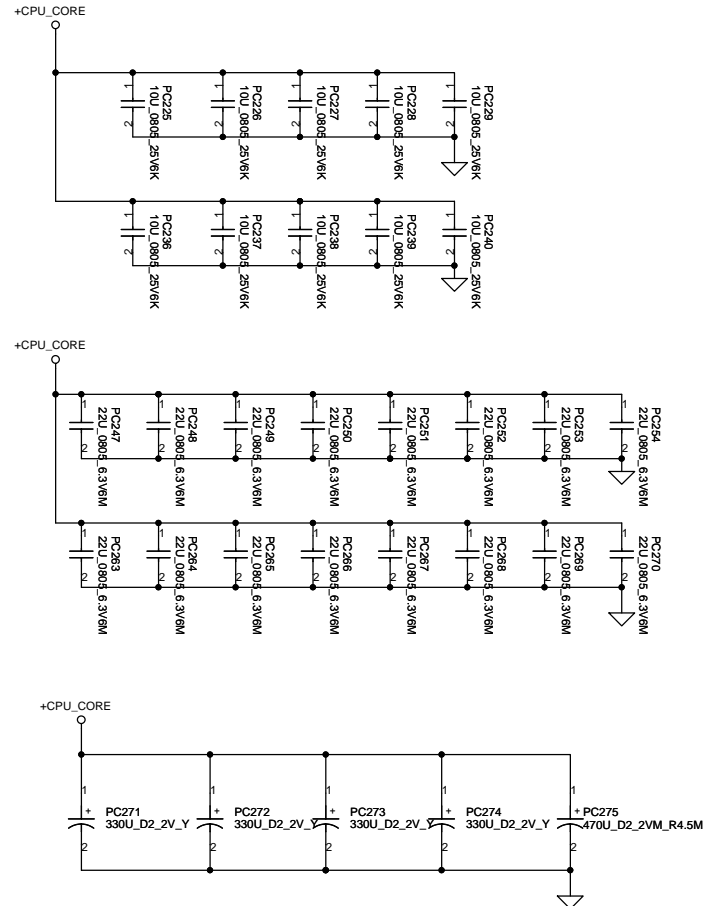


**PWR Rule**  
**CPU 330uF/9m \*5,22uF \*16,10uF\*10**  
**GFX 470uF/4.5m\*1,330uF/9m\*1,22uF\*12**



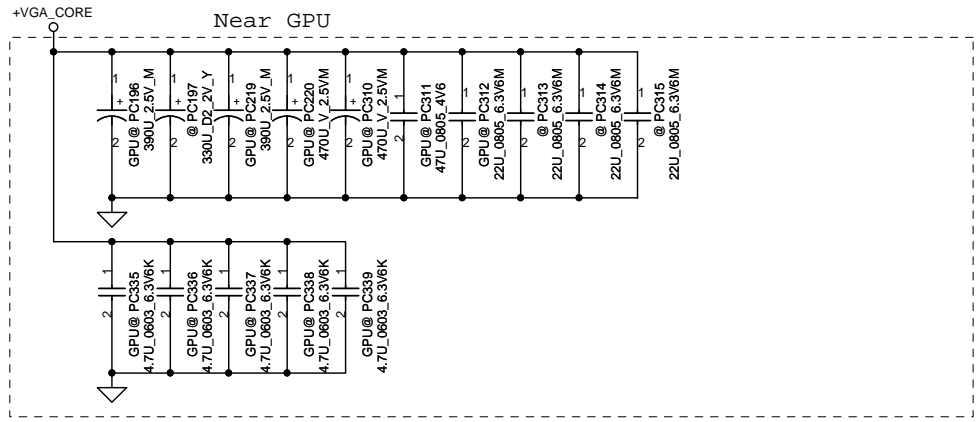
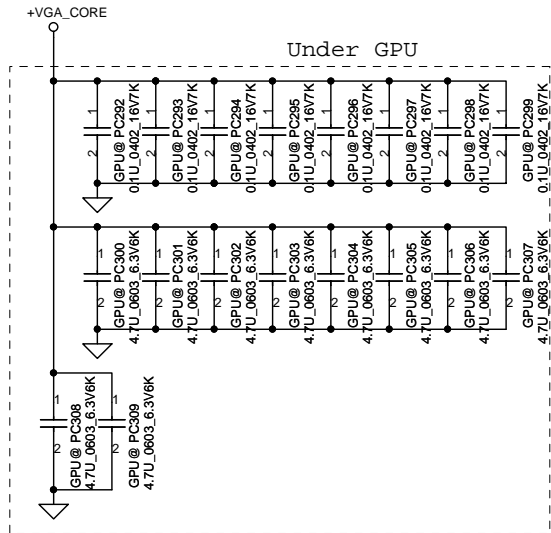
**Vaxg**

- Can connect to GND if motherboard only supports external graphics and if GFX VR is not stuffed in a common motherboard design,
- VAXG can be left floating in a common motherboard design (Gfx VR keeps VAXG from floating) if the VR is stuffed



**INTEL Recommend**  
**3\*330uF(1 in other page),12\*22uF, 5 no stuff**  
**from PDDG 1.0**

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				Schematic_MB A7912	
				Customer	
				4019ID	
				Date	
				Friday, January 06, 2012	
				Sheet 54 of 60	
				Rev B	



Security Classification	Compal Secret Data		Compal Electronics, Inc.	
Issued Date	2011/06/02	Deciphered Date	2012/06/02	Title
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Date: Friday, January 06, 2012			Document Number	Rev
			4019ID	B
Sheet 55 of 60				

Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	Date	Phase
1	S3 sequence @ DC	Meet Intel sequence SPEC		49	Change RP91 to 267K	2011 1208	DVT
2	1.5VSDGPU lose	Improve FB pin anit-noise		51	Change RP248 to 2K, PR255 to 1.74K, PR253 to 137K	2011 1208	DVT
3	Cut-in SMT memo			52	Add PC182, PC184	2011 1208	DVT
4		Standard design			Change PR138, PR150, PR178, PR194, RP205 , PR235 to 2.2		
5	Vth has risk			51	Change PU16 from G971 to APL5930	2011 1212	DVT
6		Enable select		51	Add PR266	2011 1217	DVT
7	Cut-in EMI solution			53	Add PC88, PC89, PC91	2011 1221	DVT
8							
9							
10							
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Issued Date	2011/06/02	Deciphered Date	2012/06/02	Title
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Date: Friday, January 06, 2012				Rev B
Sheet 56 of 60				



Item	Fixed Issue	Reason for change	Rev.	PG#	Modify List	Date	Phase
1							
2							
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Issued Date	2011/06/02	Deciphered Date	2012/06/02	Title	SCHEMATIC_MB A7912			
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				Date:	Friday, January 06, 2012		Sheet	57

Item	Page#	Title	Date	Request Owner	Issue Description	Solution Description	Rev.
1	P.40.13		9/7	EC	Change th HDA_SDO to ME_EN		0.2
2	P.40		9/7	HW	Add R2085 ,change the EC_ACIN pull high to +3VLP		0.2
3	P.37		9/7	HW	Add f11009 USB3.0 TX coupling capacitor (c2060,c2061)		0.2
4	P.38.39.40		9/7	HW	Add USB chargeaer schematic(C2060.C2061.R2077~R2084,R2065~R2072)		0.2
5	P.22.40		9/7	HW	Follow ABO request,add ADPS function(Q2005),R2086.R2087)		0.2
6	P.20		9/7	HW	<del>Add +5VALW TO +5VALW_PCH schematic(Q2006.C2062.R2088)</del>		0.2
7	P.44		9/7	HW	<del>Add +3VALW TO +3VALW_PCH schematic(U2006,R2073~R2076,C2056~C2059,Q2003,Q2004)</del>		0.2
8	P.43		9/7	HW	For FSOV spec,Chang R714,R716 from 75ohm to 47ohm.		0.2
9	P.13		9/7	HW	For WIN8,Change R681.R651.R684.R652 to 33ohm		0.2
10	P.44		9/7	HW	Delete C817,Change C826 from D2 size to B2 size		0.2
11	P.17.37		9/7	HW	Follow chief river common design, please chang Mini-Card 2(port 11) to port 9		0.2
12	P.38		9/7	HW	Delete +1.5V to +1.05V_V128 Transfer(U2002.R2002.R2003.R2005.C2002.C2003.C2005.R2008)		0.2
13	P.38		9/7	HW	Delete USB3.0 EEPROM(U2004.R2035.R2034.C2039)		0.2
14	P.37		9/7	HW	Reserve Mini-Card 2		0.2
15	P.19		9/7	HW	F2 flick issue on projector P5202 D-sub Add C2063.C2064		0.2
16	P.22.40		9/8	HW	Change VGA GPIO12 of dGPU connection to EC controlled for the power limited usage Add EC pin 107-->GPU ACIN		0.2
17	P41		9/14	HW	Add SW5.SW6 for EG project.		0.2
18	P27.30		9/14	HW	Swap MDC37 and MDC38 Swap MDA13 and MDA14		0.2
19	P06.11.17.35. P39.40.42		9/14	HW	For ESD request Add C2065~C2075		0.2
20	P16		9/16	HW	For HDMI PCH_DPB_HPD noise Add C2076		0.2
21	P31		9/16	HW	For LVDS power sequence Change R5 from 300 to 200 ohm Change R2 from 1k to 10k ohm change C2 from 0.047uF to 1uF		0.2
22	P18		9/16	HW	Delete PCH test ponit(T31~T46,T49~T61,T63~T65)		0.2
23	P21,40		9/19	HW	Change Q22,Q26 from SB000008J10 to SB000009080		0.2
24	P14,22,35,38		9/19	HW	For Crystal Change Y2 ,Y4 from SJ10000DJ00 to SJ10000E800 Change Y1000 from SJ10000DK00 to SJ100009700 Change C630,C631,C2019,C2028,C1008,C1009 to 10pF Change C681,C679 to 15pF		0.2

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Issued Date	2011/06/02	Deciphered Date	2012/06/02	Title
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				4019ID
				Rev B
				Date: Friday, January 06, 2012
				Sheet 58 of 60

Item	Page#	Title	Date	Request Owner	Issue Description	Solution Description	Rev.
25	P.44		9/20	EMI	For EMI request (Add C2079~C2084)		0.2
26	P.36		9/20	HW	For SD3.0 issue (Add R2088.R2089)		0.2
27	P.20		10/17	HW	Add +5VALW TO +5VALW_PCH schematic(Q2006.C2062.R2090)		0.3
28	P.44		10/17	HW	Add +3VALW TO +3VALW_PCH schematic(U2006,R2073~R2076,C2056~C2059,Q2003,Q2004)		0.3
29	P.40		10/17	HW	Board ID error. Add R353.		0.3
30	P.40		10/17	HW	Board ID 0.3. Change R353 to 18K		0.3
31	P.17,39		10/17	HW	Follow Intel's suggestion; Change USB3.0 from port 2 to port 1 Change USB2.0 from port 0,1 to port 2,9		0.3
32	P.18		10/18	HW	Support eDP GPIO71-->0 (eDP) GPIO71-->1 (LVDS)		0.3
33	P.13.40		10/25	HW	Co_lay NPCE885N Delete U38,C722,R690,R695,C727 Add C2085,R2091~R2096		0.3

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Issued Date	2011/06/02	Deciphered Date	2012/06/02	Title	SCHEMATIC,MB A7912	
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				Custom	4019ID	B
Date:	Friday, January 06, 2012			Sheet	59	of 60

Item	Page#	Title	Date	Request Owner	Issue Description	Solution Description	Rev.
43	P.41		11/16	ME		Delete SW5,SW6, Pop SW2,SW3	0.4
44	P.05		11/16	HW	BUF_CPU_RST# noise	Add C2090	0.4
45	P.35		11/17	HW	LAN SPROM on Chip	De-pop U31,R537 Pop R538	0.4
46	P.36		11/17	EMI		Change C478 to 10P_50V	0.4
47	P.13		11/17	HW	RTC issue	Change C682,C686 to 15P	0.4
48	P.31,32,41		11/17	ESD		De-pop D3,D4,D17,D18,D15 Pop D24,D36	0.4
49	P.40		11/17	HW		De-pop R891,R893	0.4
50	P.24		11/21	HW		N13P_GS Change strap2 to PD 15k Change strap4 to PD 10k	0.4
51	P.13		11/21	HW		Chip Select Change R651,R2049 to 0ohm	0.4
52	P.13,40		11/21	HW		Delete NPCE885N (R2091.R2092.R2094.R2095.R2096,R698, R699,R692,C2085)	0.4
53	P.45		11/22	HW		Change +1.05VSDGPU JUMP size PJ19 change to 43x118	0.4
55	P.35,36		11/23	HW		Card Reader Change R216 to 22 ohm Change R2088 to 47ohm Change R2089 to 22 ohm Add C2091-C2093 Change R525,R536,R537,R538 to 1k	0.4
56	P.13		11/23	HW		Delete R2093,R2049,R651(0ohm)	0.4
57	P.13		11/23	HW		Change N13P-GS to SA000051880 Change U33 to SA00005AG00	0.4
58	P.35, P36		11/23	HW		Del C2093, R222, R2089, net(CR_CLK_XD_RY_BY#_23) Add R2101, C2094	0.4
59	P.36		11/24	HW		ADD R2102, C2096 for EMI ISSUE	0.4

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Date:	Friday, January 06, 2012	Sheet	60	of	60

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