Hummingbird2_CR
DIS/UMA/Muxless Schematics Document
IVY and Sandy Bridge
Intel PCH

DY :None Installed
DIS:DIS installed
DIS_Muxless :BOTH DIS or Muxless installed
DIS_PX:BOTH DIS or PX installed
DIS_PX_Muxless:DIS or PX or Muxless installed.
Muxless: Muxless installed.(PX4.0)
PX:MUX installed.(PX3.0)
PX_Muxless:BOTH PX or Muxless installed.
UMA:UMA installed
UMA_Muxless:BOTH UMA or Muxless installed
UMA_PX_Muxless:UMA or PX or Muxless installed

ANNIE: ONLY FOR ANNIE solution.
PSL: KBC795 PSL circuit for 10mW solution installed.
10mW: External circuit for 10mW solution installed.
65W: for 65W adaptor installed.
90W: for 90W adaptor installed.

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: Cover Page
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Date: Tuesday, April 17, 2012 | Sheet 1 of 102

Project code : 91.4th01.001
PCB P/N :
Revision : -2

Hummingbird2_CR Block Diagram

SYSTEM DC/DC APL5916KAI 48	
INPUTS	OUTPUTS
1D05V_PWR	0D85V_S0

CPU DC/DC NCP6131S52MNR 42~43	
INPUTS	OUTPUTS
DCBATOUT	VCC_CORE

SYSTEM DC/DC UP6128PQDD 45	
INPUTS	OUTPUTS
DCBATOUT	1D05V_VTT

SYSTEM DC/DC UP6183PQAG 41	
INPUTS	OUTPUTS
DCBATOUT	5V_AUX_S5 3D3V_AUX_S5 5V_S5 3D3V_S5

SYSTEM DC/DC UP6165BQKF 46	
INPUTS	OUTPUTS
DCBATOUT	1D5V_S3 0D75V_S0 DDR_VREF_S3

SYSTEM DC/DC NCP5911MNTBG 44	
INPUTS	OUTPUTS
DCBATOUT	VCC_GFXCORE_PWR

VGA RT8208BGQW 92	
INPUTS	OUTPUTS
DCBATOUT	VGA_CORE

TI CHARGER BQ24745RHDR 40	
INPUTS	OUTPUTS
DCBATOUT	BT+

SYSTEM DC/DC RT9025 47	
INPUTS	OUTPUTS
3D3V_S0	1D8V_S0

SYSTEM DC/DC RT9025-25PSP 93	
INPUTS	OUTPUTS
1D5V_S3	1V_VGA_S0
3D3V_S5	1D8V_VGA_S0

Switches	
INPUTS	OUTPUTS
1D5V_S3	1D5V_VGA_S0
3D3V_S0	3D3V_VGA_S0

PCB LAYER

L1:Top L4:Signal
L2:VCC L5:GND
L3:Signal L6:Bottom

Intel CPU
SNB/ IVB
FSB: 1066 MHz
4,5,6,7,8,9,10,11,12,13

RAM x 8 (x8)

DDRIII 1066/1333 Channel A

FDIx4x2

DMIx4

HDMI 51

LCD 49

HDMI

LVDS(Single Channel)

Intel
PCH HM77
Cougar Point
14 USB 2.0/1.1 ports
ETHERNET (10/100/1000Mb)
High Definition Audio
SATA ports (6)
PCIE ports (8)
LPC I/F
ACPI 1.1
17,18,19,20,21,22,23,24,25,26

FPC

FFC

MINI Board

PCI-E x1
USB x1

Mini-Card
802.11a/b/g

SATA x1

M-SATA

Charger signal

Charger Circuit

Left Side:
USB 3.0x 2

USB3.0 x 2

USB2.0 x 3

CAMERA 49

FFC

Card Reader Board

USB 2.0 x 1

CardReader
RTS5129

SD/MMC

AZALIA

SPI

LPC Bus

SATA x1

HDD 56

Internal Digital MIC

HP1

Azalia CODEC
ALC271X-VB3
29

Flash ROM
8MB 60

LPC debug port 71

KBC
NUVOTON
NPCE885P 27

SMBus

2CH SPEAKER

Touch PAD 69

Int. KB 69

Thermal
ENE P2800 28

Fan 28

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Title		
Block Diagram		
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PCH Strapping

Huron River Schematic Checklist Rev.0_7

Name	Schematics Notes
SPKR	**Reboot option at power-up** **Default Mode:** Internal weak Pull-down. **No Reboot Mode with TCO Disabled:** Connect to Vcc3_3 with 8.2-kΩ - 10-kΩ weak pull-up resistor.
INIT3_3V#	Weak internal pull-up. Leave as "No Connect".
GNT3#/GPIO55 GNT2#/GPIO53 GNT1#/GPIO51	GNT[3:0]# functionality is not available on Mobile. Mobile: Used as GPIO only Pull-up resistors are not required on these signals. If pull-ups are used, they should be tied to the Vcc3_3power rail.
SPI_MOSI	**Enable Danbury:** Connect to Vcc3_3 with 8.2-k? weak pull-up resistor. **Disable Danbury:** Left floating, no pull-down required.
NV_ALE	**Enable Danbury:** Connect to +NVRAM_VCCQ with 8.2-kohm weak pull-up resistor [CRB has it pulled up with 1-kohm no-stuff resistor] **Disable Danbury:** Leave floating (internal pull-down)
NC_CLE	DMI termination voltage. Weak internal pull-up. Do not pull low.
HAD_DOCK_EN# /GPIO[33]	Low (0) - Flash Descriptor Security will be overridden. Also, when this signals is sampled on the rising edge of PWROK then it will also disable Intel ME and its features. High (1) - Security measure defined in the Flash Descriptor will be enabled. Platform design should provide appropriate pull-up or pull-down depending on the desired settings. If a jumper option is used to tie this signal to GND as required by the functional strap, the signal should be pulled low through a weak pull-down in order to avoid asserting HDA_DOCK_EN# inadvertently. Note: CRB recommends 1-kohm pull-down for FD Override. There is an internal pull-up of 20 kohm for DA_DOCK_EN# which is only enabled at boot/reset for strapping functions.
HDA_SDO	Weak internal pull-down. Do not pull high. Sampled at rising edge of RSMRST#.
HDA_SYNC	Weak internal pull-down. Do not pull high. Sampled at rising edge of RSMRST#.
GPIO15	Low (1) - Intel ME Crypto Transport Layer Security (TLS) cipher suite with no confidentiality High (1) - Intel ME Crypto Transport Layer Security (TLS) cipher suite with confidentiality Note : This is an un-muxed signal. This signal has a weak internal pull-down of 20 kohm which is enabled when PWROK is low. Sampled at rising edge of RSMRST#. CRB has a 1-kohm pull-up on this signal to +3.3VA rail.
GPIO8	GPIO8 on PCH is the Integrated Clock Enable strap and is required to be pulled-down using a 1k +/- 5% resistor. When this signal is sampled high at the rising edge of RSMRST#, Integrated Clocking is enabled, When sampled low, Buffer Through Mode is enabled.
GPIO27	**Default = Do not connect (floating)** High(1) = Enables the internal VccVRM to have a clean supply for analog rails. No need to use on-board filter circuit. Low (0) = Disables the VccVRM. Need to use on-board filter circuits for analog rails.

Processor Strapping

Huron River Schematic Checklist Rev.0_7

Pin Name	Strap Description	Configuration (Default value for each bit is 1 unless specified otherwise)	Default Value
CFG[2]	**PCI-Express Static Lane Reversal**	**1:** Normal Operation. **0:** Lane Numbers Reversed 15 -> 0, 14 -> 1, ...	1
CFG[4]		**1:** Disabled - No Physical Display Port attached to Embedded DisplayPort. **0:** Enabled - An external Display Port device is connectd to the EMBEDDED display Port	0
CFG[6:5]	**PCI-Express Port Bifurcation Straps**	11 : 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	11
CFG[7]	**PEG DEFER TRAINING**	**1:** PEG Train immediately following xxRESETB de assertion **0:** PEG Wait for BIOS for training	1

POWER PLANE	VOLTAGE	Voltage Rails ACTIVE IN	DESCRIPTION
5V_S0 3D3V_S0 1D8V_S0 1D5V_S0 1D05V_VTT 0D85V_S0 0D75V_S0 VCC_CORE VCC_GFXCORE 1D8V_VGA_S0 3D3V_VGA_S0 1V_VGA_S0	5V 3.3V 1.8V 1.5V 1.05V 0.95 - 0.85V 0.75V 0.35V to 1.5V 0.4 to 1.25V 1.8V 3.3V 1V	S0	CPU Core Rail Graphics Core Rail
5V_USBX_S3 1D5V_S3 DDR_VREF_S3	5V 1.5V 0.75V	S3	
BT+ DCBATOUT 5V_S5 5V_AUX_S5 3D3V_S5 3D3V_AUX_S5	6V-14.1V 6V-14.1V 5V 5V 3.3V 3.3V	All S states	AC Brick Mode only
3D3V_LAN_S5	3.3V	WOL_EN	Legacy WOL
3D3V_AUX_KBC	3.3V	DSW, Sx	ON for supporting Deep Sleep states
3D3V_AUX_S5	3.3V	G3, Sx	Powered by Li Coin Cell in G3 and +V3ALW in Sx

PCIE Routing

LANE1	Mini Card2(WWAN)
LANE2	Mini Card1(WLAN)
LANE3	Card Reader
LANE4	Onboard LAN
LANE5	USB3.0
LANE6	Intel GBE LAN
LANE7	Dock
LANE8	New Card

SATA Table

SATA	
Pair	Device
0	HDD1
1	HDD2
2	N/A
3	N/A
4	ODD
5	ESATA

USB Table

Pair	Device
0	Touch Panel / 3G SIM
1	USB Ext. port 1 (HS)
2	Fingerprint
3	BLUETOOTH
4	Mini Card2 (WWAN)
5	CARD READER
6	X
7	X
8	USB Ext. port 4 / E-SATA /USB CHARGER
9	USB Ext. port 2
10	EDP CAMERA
11	Mini Card1 (WLAN)
12	CAMERA
13	New Card

SMBus ADDRESSES

I² C / SMBus Addresses Device	Ref Des	HURON RIVER ORB Address	Hex	Bus
EC SMBus 1 Battery CHARGER				BAT_SCL/BAT_SDA BAT_SCL/BAT_SDA BAT_SCL/BAT_SDA
EC SMBus 2 PCH eDP				SML1_CLK/SML1_DATA SML1_CLK/SML1_DATA SML1_CLK/SML1_DATA
PCH SMBus SO-DIMMA (SPD) SO-DIMMB (SPD) Digital Pot G-Sensor MINI				PCH_SMBDATA/PCH_SMBCLK PCH_SMBDATA/PCH_SMBCLK PCH_SMBDATA/PCH_SMBCLK PCH_SMBDATA/PCH_SMBCLK PCH_SMBDATA/PCH_SMBCLK PCH_SMBDATA/PCH_SMBCLK

Elpida 1600 4G DS3 NONSSD 65W

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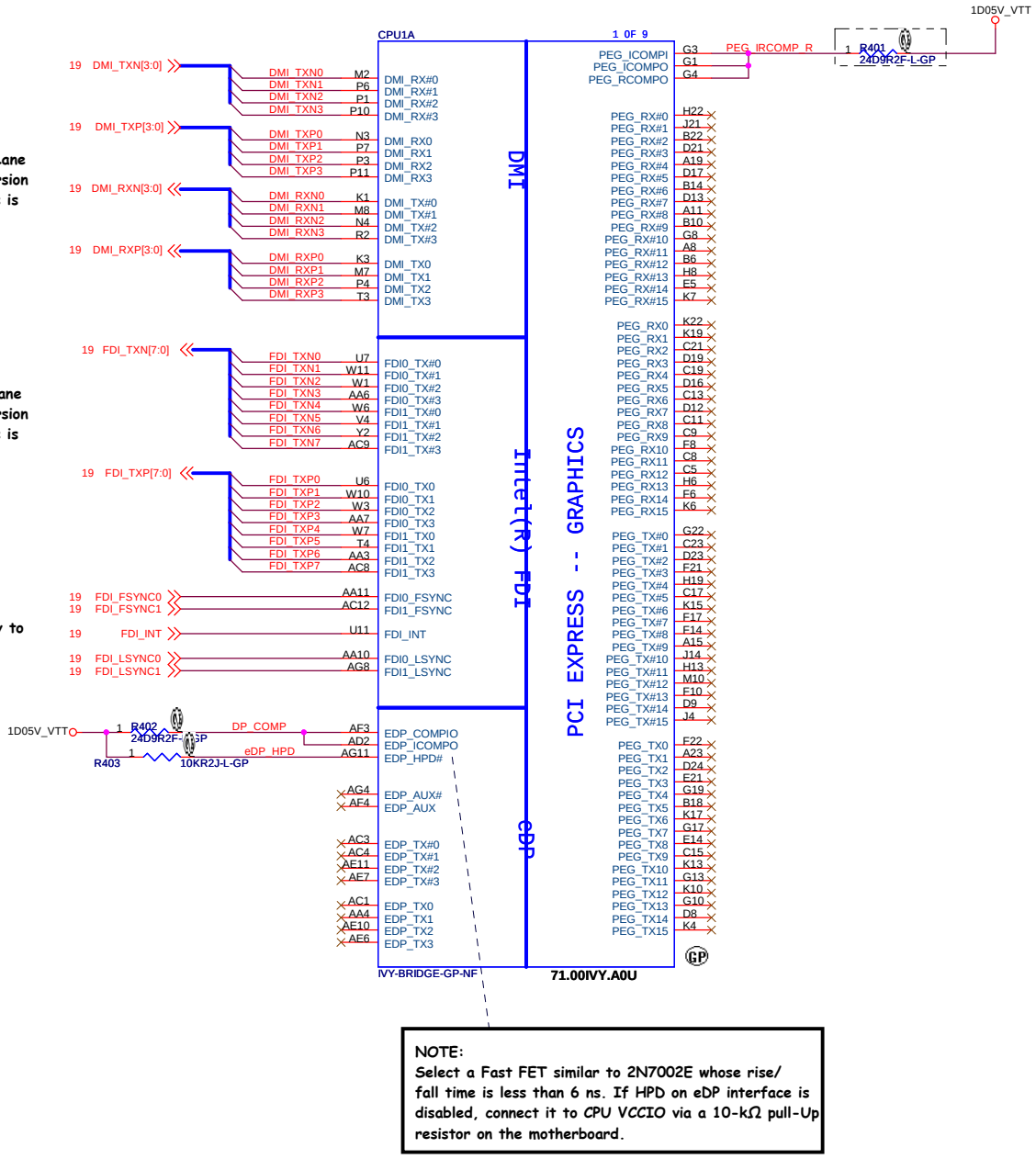
SSID = CPU

Signal Routing Guideline:
PEG_ICOMPO keep W/S=12/15 mils and routing length less than 500 mils.
PEG_ICOMPI & PEG_RCOMPO keep W/S=4/15 mils and routing length less than 500 mils.



Note:
Intel DMI supports both Lane Reversal and polarity inversion but only at PCH side. This is enabled via a soft strap.

Note:
Intel FDI supports both Lane Reversal and polarity inversion but only at PCH side. This is enabled via a soft strap.

Note:
Lane reversal does not apply to FDI sideband signals.

NOTE:
Select a Fast FET similar to 2N7002E whose rise/ fall time is less than 6 ns. If HPD on eDP interface is disabled, connect it to CPU VCCIO via a 10-kΩ pull-Up resistor on the motherboard.

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Title: CPU (PCIE/DMI/FDI)		
Size: A3	Document Number: Hummingbird2_CR	Rev: -2
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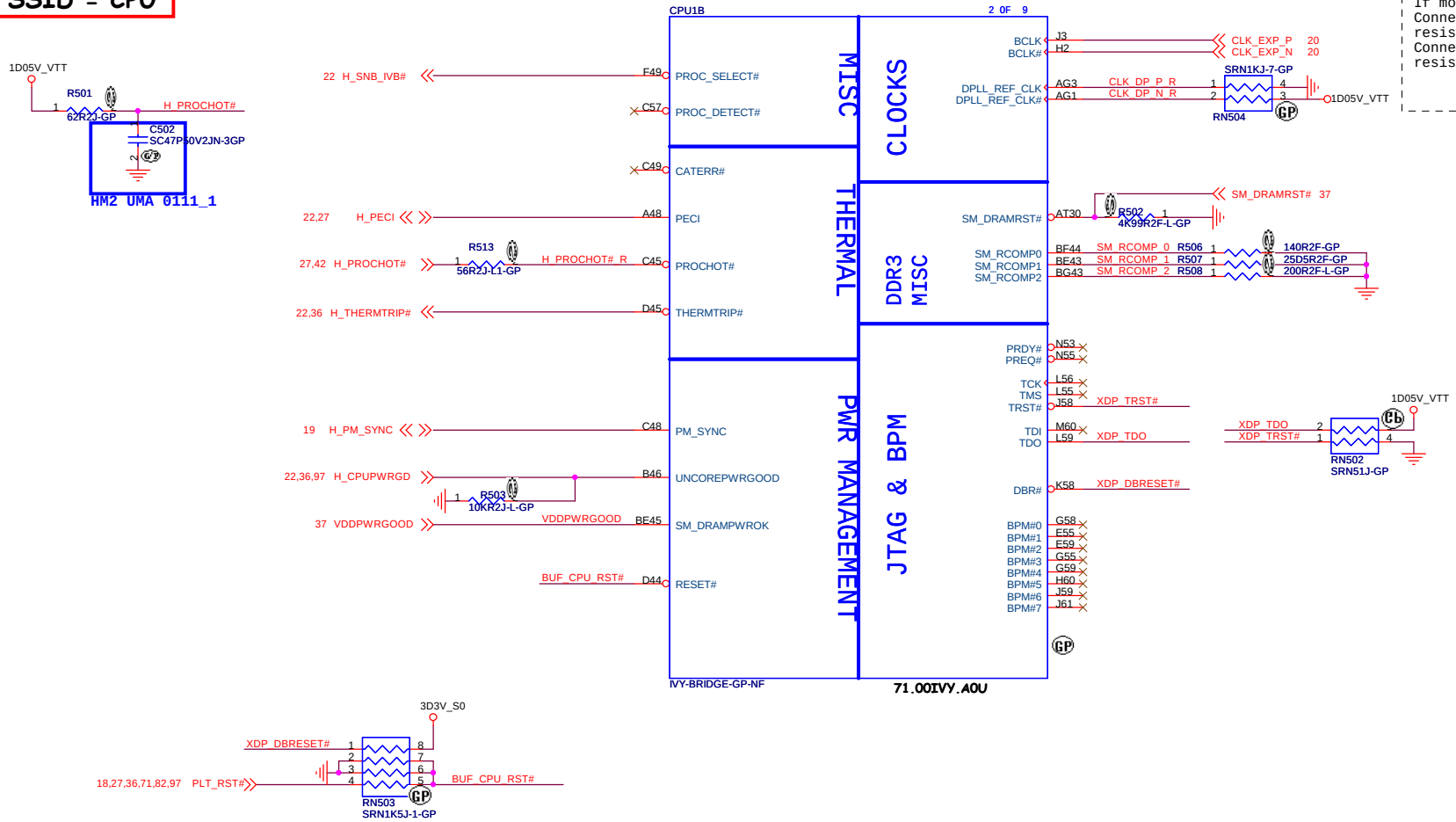
SSID = CPU

Disabling Guidelines:
If motherboard only supports external graphics or without eDP
Connect DPLL_REF_SSCLK on Processor to GND through 1K +/- 5%
resistor.
Connect DPLL_REF_SSCLK# on Processor to VCCP through 1K +/- 5%
resistorpower (~15 mW) may be wasted.



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Title: CPU (THERMAL/CLOCK/PM)

Size	Document Number	Rev
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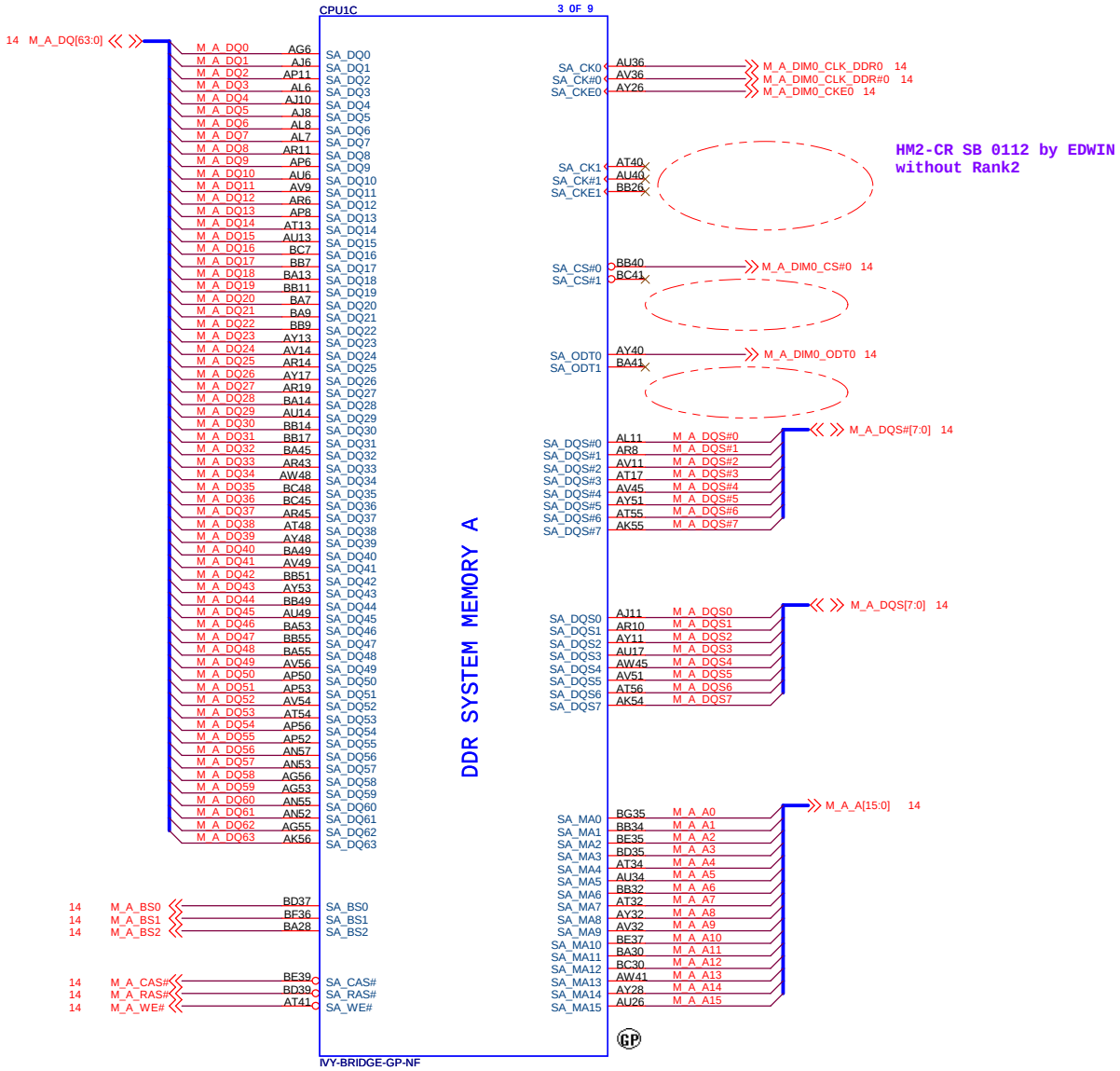
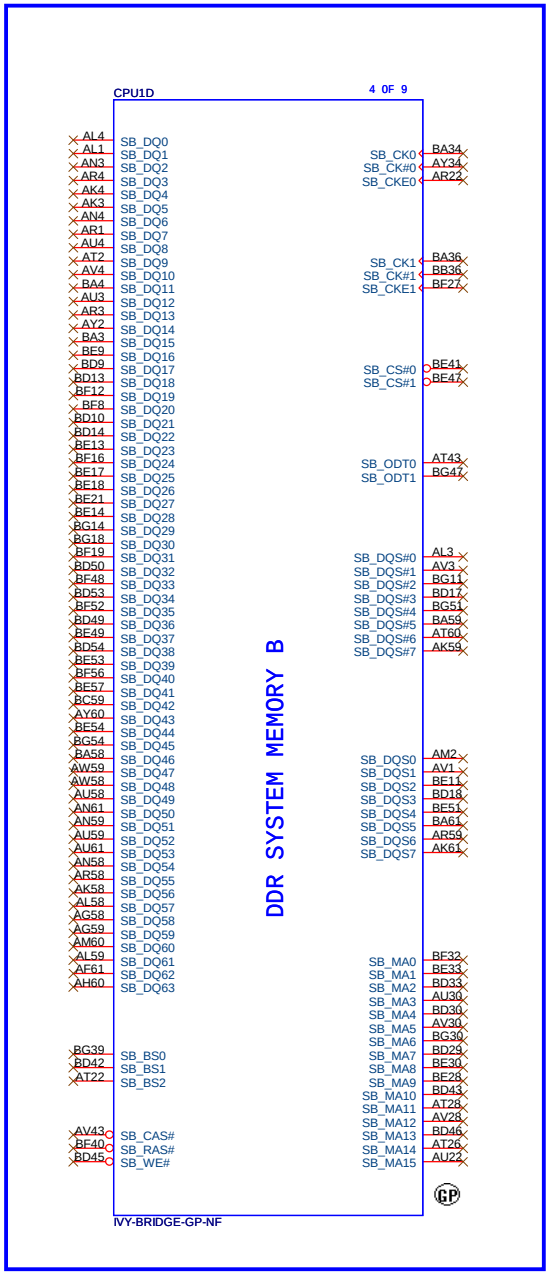
SSID = CPU

HM2 UMA 0110_1





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Title: CPU (DDR)		
Size: A3	Document Number: Hummingbird2_CR	Rev: -2
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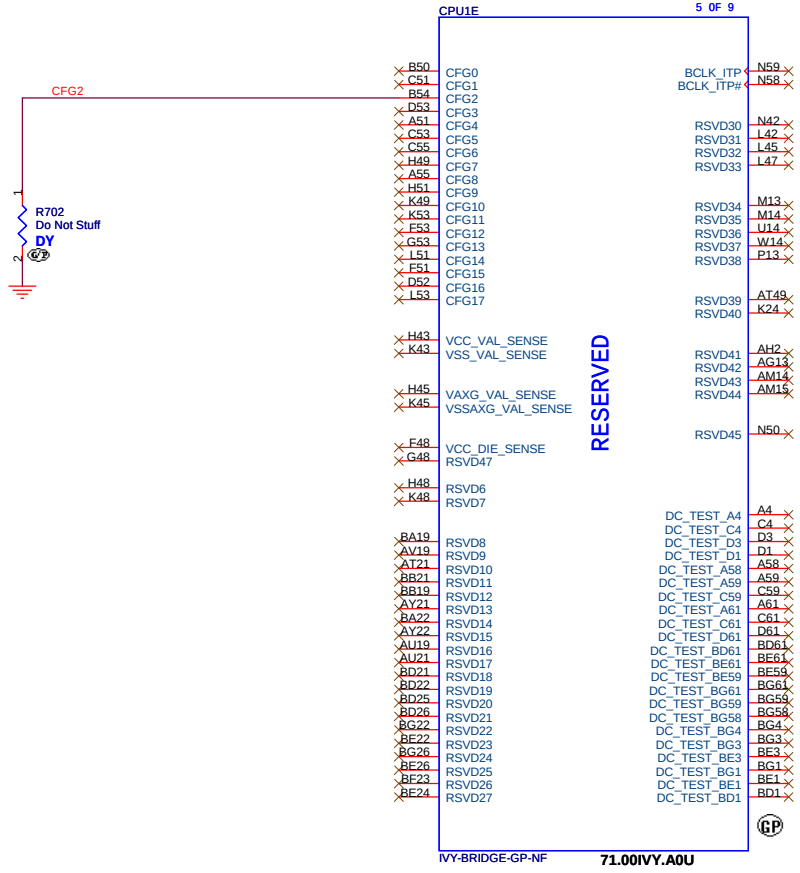
SSID = CPU



Pin Name	Strap Description	Configuration (Default value for each bit is 1 unless specified otherwise)	Default Value
CFG[0]		Connect a series 1 kOhms resistor on the critical CFG[0 trace in a manner which does not introduce any stubs to CFG[0] trace. Route as needed from the opposite side of this series isolation resistor to the debug port. ITP will drive the net to GND.	
CFG[2]	PCIe Static x16 Lane Numbering Reversal.	1: Normal Operation; Lane # definition matches socket pin map definition 0:Lane Reversed	0
CFG[4]	Display Port Presence strap	1:Disabled - No Physical Display Port attached to Embedded DisplayPort No connect for disable 0:Enabled - An external Display Port device is connected to the Embedded Display Port Pull-down to GND through a 1KΩ ± 5% resistor to enable port	0
CFG[6:5]	PCI-Express Port Bifurcation Straps	00 = 1 x 8, 2 x 4 PCI Express 01 = reserved 10 = 2 x 8 PCI Express 11 = 1 x 16 PCI Express	00
CFG[17:7]	Reserved configuration lands. A test point may be placed on the board for these lands.		

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Title: CPU (RESERVED)

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SSID = CPU

POWER

6 OF 9

ULV:17W
Iccmax:33A
ICC_TDC:25A

Iccmax:8.5A
ICC_TDC:8.5A

CPU1F

CORE SUPPLY

PEG IO AND DDR IO

QUIET RAILS

SVID

SENSE LINES

IVY-BRIDGE-GP-NF

71.00IVY.A0U

VCC_CORE

1D05V_VTT

DY

	PIn BC22	CPU
1.05V	H	SNB
1V	L	IVB

1.05V_VTT Power rail

CPU EDS desing guide Rev change 1 V to 1.05V

PROCESSOR 1.05V Quiet rail for DDR block (BGA only)
+V1.05S_VCCPQE should be short to +V1.05S_VCCP_DDR_R on board

HM2-CR -1 0215 by EDWIN

Place near processor

Place near processor

Layout Note: 2.2u Cap place under CPU

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Title: CPU (VCC_CORE)

Size: A2 | Document Number: Hummingbird2_CR | Rev: -2

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SSID = CPU

POWER

7 OF 9

CPU1G

Routing Guideline:
Power from DDR_VREF_S3 and +V_SM_VREF_CNT should have 10 mils trace width.

GRAPHICS

Iccmax:18A(GT1)
ICC_TDC:12A(GT1)

VCC_GFXCORE

C919 SC1U10V2KX-1GP
C940 SC1U10V2KX-1GP
C941 SC1U10V2KX-1GP
C942 SC1U10V2KX-1GP
C943 SC1U10V2KX-1GP
C949 SC1U10V2KX-1GP
C950 SC1U10V2KX-1GP

C911 SC1U10V2KX-1GP
C912 SC1U10V2KX-1GP
C913 SC1U10V2KX-1GP
C914 SC1U10V2KX-1GP
C915 Do Not Stuff
C916 Do Not Stuff
C917 Do Not Stuff
C918 Do Not Stuff

DY DY DY DY

VAXG1 AA46
VAXG2 AB47
VAXG3 AB50
VAXG4 AB51
VAXG5 AB52
VAXG6 AB53
VAXG7 AB55
VAXG8 AB56
VAXG9 AB58
VAXG10 AB59
VAXG11 AC61
VAXG12 AD47
VAXG13 AD48
VAXG14 AD50
VAXG15 AD51
VAXG16 AD52
VAXG17 AD53
VAXG18 AD55
VAXG19 AD56
VAXG20 AD58
VAXG21 AD59
VAXG22 AE46
VAXG23 N45
VAXG24 P47
VAXG25 P48
VAXG26 P50
VAXG27 P51
VAXG28 P52
VAXG29 P53
VAXG30 P55
VAXG31 P56
VAXG32 P61
VAXG33 T48
VAXG34 T58
VAXG35 T59
VAXG36 T61
VAXG37 U46
VAXG38 V47
VAXG39 V48
VAXG40 V50
VAXG41 V51
VAXG42 V52
VAXG43 V53
VAXG44 V55
VAXG45 V56
VAXG46 V58
VAXG47 V59
VAXG48 W50
VAXG49 W51
VAXG50 W52
VAXG51 W53
VAXG52 W55
VAXG53 W56
VAXG54 W61
VAXG55 Y48
VAXG56 Y61

VREF

SM_VREF AY43 +V_SM_VREF_CNT → +V_SM_VREF_CNT 37

SA_DIMM_VREFDQ BE7 M_VREF_DQ_DIMM0_C
SB_DIMM_VREFDQ BG7 M_VREF_DQ_DIMM1_C

RN901 SRN1KJ-7-GP

DDR3 - 1.5V RAILS

VDDQ1 AJ28
VDDQ2 AJ33
VDDQ3 AJ36
VDDQ4 AJ40
VDDQ5 AL30
VDDQ6 AL34
VDDQ7 AL38
VDDQ8 AL42
VDDQ9 AM33
VDDQ10 AM36
VDDQ11 AM40
VDDQ12 AN30
VDDQ13 AN34
VDDQ14 AN38
VDDQ15 AR26
VDDQ16 AR28
VDDQ17 AR30
VDDQ18 AR32
VDDQ19 AR34
VDDQ20 AR36
VDDQ21 AR40
VDDQ22 AV41
VDDQ23 AW26
VDDQ24 BA40
VDDQ25 BB28
VDDQ26 BG33

1D5V_S0

Iccmax:5A

C934 SC100D603V8MX-L-GP
C933 SC100D603V8MX-L-GP
C932 SC100D603V8MX-L-GP
C931 SC100D603V8MX-L-GP
C965 SC100D603V8MX-L-GP
C958 SC100D603V8MX-L-GP
C930 Do Not Stuff
C957 Do Not Stuff

DY DY

C935 SC1U10V2KX-1GP
C936 SC1U10V2KX-1GP
C937 SC1U10V2KX-1GP
C938 SC1U10V2KX-1GP
C939 SC1U10V2KX-1GP
C952 SC1U10V2KX-1GP
C953 SC1U10V2KX-1GP
C954 SC1U10V2KX-1GP
C955 SC1U10V2KX-1GP
C956 SC1U10V2KX-1GP

QUIET RAILS

VCCDQ1 AM28
VCCDQ2 AN26

+1.5S_VCCD_Q

R909 Do Not Stuff
C948 SC1U6D3V2KX-L-1-GP

HM2-CR -1 0215 by EDWIN

PROCESSOR DDR 1.5V QUIET RAIL (BGA only)
+V1.5S_VCCD_Q should be short to +V1.5S_VCCDDQ on board

1D05V_VTT

R903 Do Not Stuff DY
R905 Do Not Stuff DY
R904 10KR2J-L-GP
R910 10KR2J-L-GP

VCCSA_VID0 48
VCCSA_VID1 48

SENSE LINES

VCC_GFXCORE

R906 100R2F-L1-GP-U
R907 100R2F-L1-GP-U

42 VCC_AXG_SENSE
42 VSS_AXG_SENSE

VCC_AXG_SENSE F45
VSS_AXG_SENSE G45

VAXG_SENSE
VSSAXG_SENSE

1.8V RAIL

1D8V_S0

ICC_MAX:1.2A

C928 SC10D603V8MX-L-GP
C929 SC1U10V2KX-1GP

VCCPLL1 BB3
VCCPLL2 BC1
VCCPLL3 BC4

SENSE LINES

VDDQ_SENSE BC43 TP_VDDQ_SENSE
VSS_SENSE_VDDQ BA43 TP_VDDQ_VSS

TP901 Do Not Stuff
TP902 Do Not Stuff

SA RAIL

0D85V_S0

ICC_MAX:4A

C927 SC1U10V2KX-1GP
C951 SC1U10V2KX-1GP
C944 SC1U10V2KX-1GP
C960 SC1U10V2KX-1GP
C921 SC10D603V8MX-L-GP
C923 SC10D603V8MX-L-GP

VCCSA1 L17
VCCSA2 L21
VCCSA3 N16
VCCSA4 N20
VCCSA5 N22
VCCSA6 P17
VCCSA7 P20
VCCSA8 R16
VCCSA9 R18
VCCSA10 R21
VCCSA11 U15
VCCSA12 V16
VCCSA13 V17
VCCSA14 V18
VCCSA15 V21
VCCSA16 W20

SENSE LINES

VCCSA_SENSE U10 → VCCSA_SENSE 48

R912 100R2F-L1-GP-U

VCCSA VID lines

VCCSA_VID0 D48 VCCSA_VID0
VCCSA_VID1 D49 VCCSA_VID1

VID0	VID1	VCCSA ULV
L	L	0.9V
L	H	0.85V
H	L	0.775V
H	H	0.75V

IVY-BRIDGE-GP-NF

71.00IVY.A0U

Elpida 1600 4G DS3 NONSSD 65W

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21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
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Title: CPU (VCC_GFXCORE)

Size: A3 | Document Number: Hummingbird2_CR | Rev: -2

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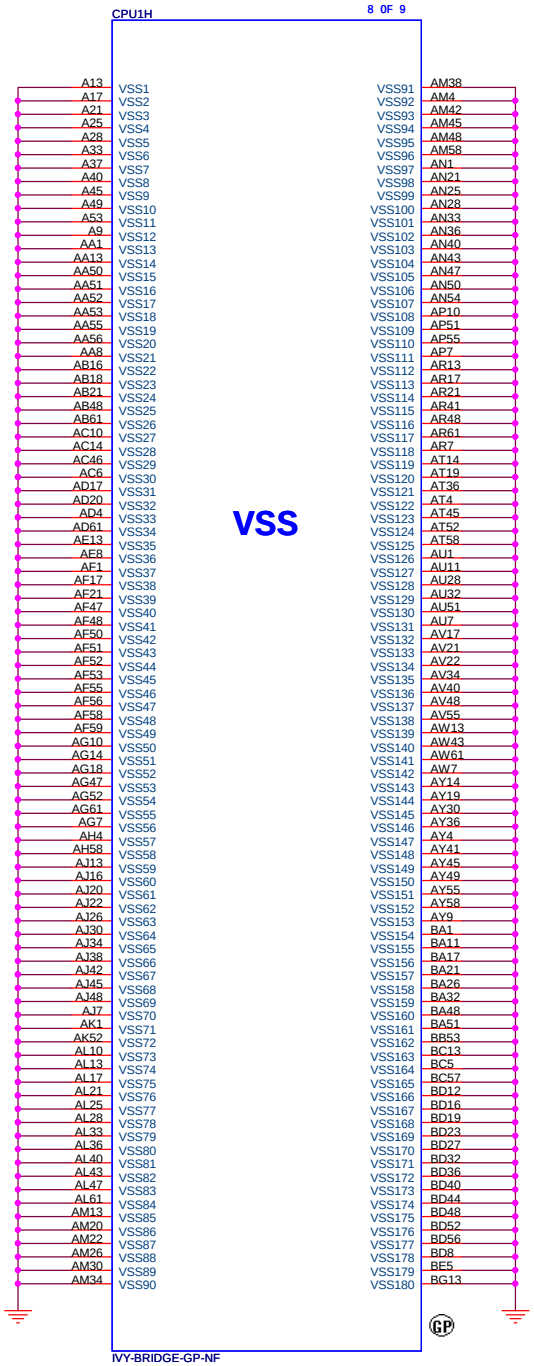
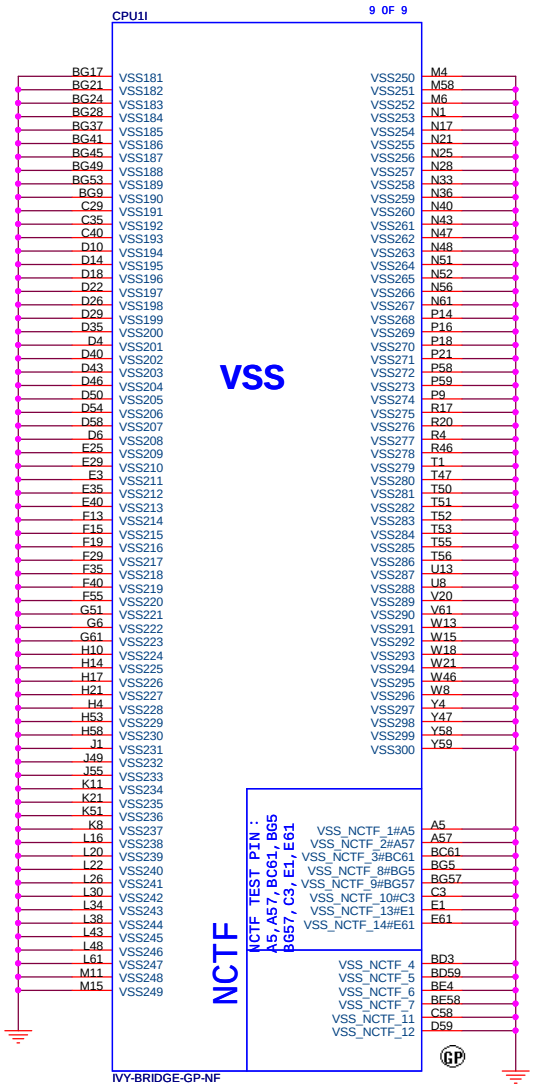
SSID = CPU





Elpida 1600 4G DS3 NONSSD 65W

緯創資通	**Wistron Corporation** 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
Title: *CPU (VSS)*		
Size: A3	Document Number: *Hummingbird2_CR*	Rev: *-2*
Date: Tuesday, April 17, 2012	Sheet 10 of 100	

Blanking

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: XDP

Size: A4 | Document Number: Hummingbird2_CR | Rev: -2

Date: Tuesday, April 17, 2012 | Sheet 11 of 102

(Blanking)

Elpida 1600 4G DS3 NONSSD 65W

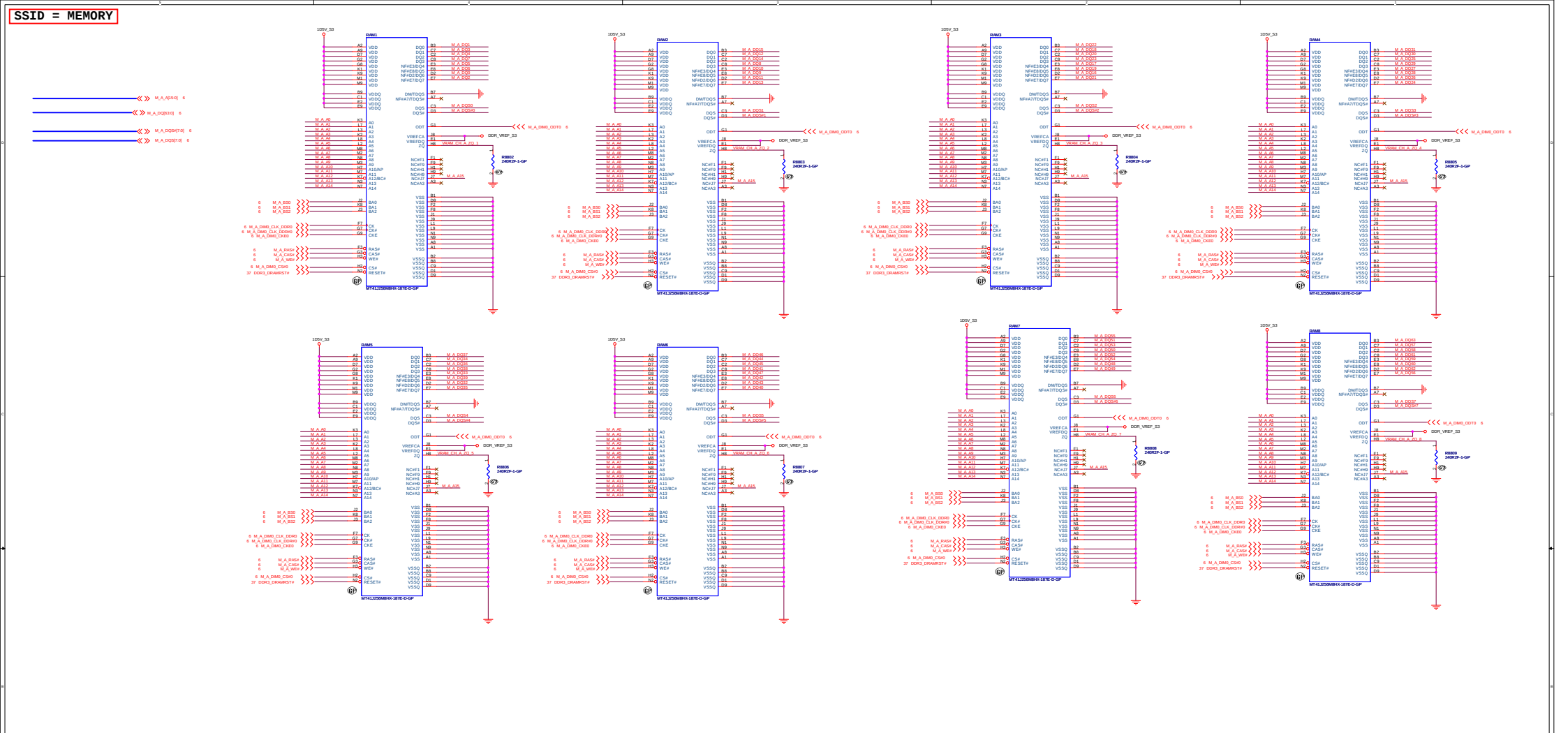
緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: ***Reserved***		
Size: A4	Document Number: **Hummingbird2_CR**	Rev: **-2**
Date: Tuesday, April 17, 2012	Sheet 12 of 102	

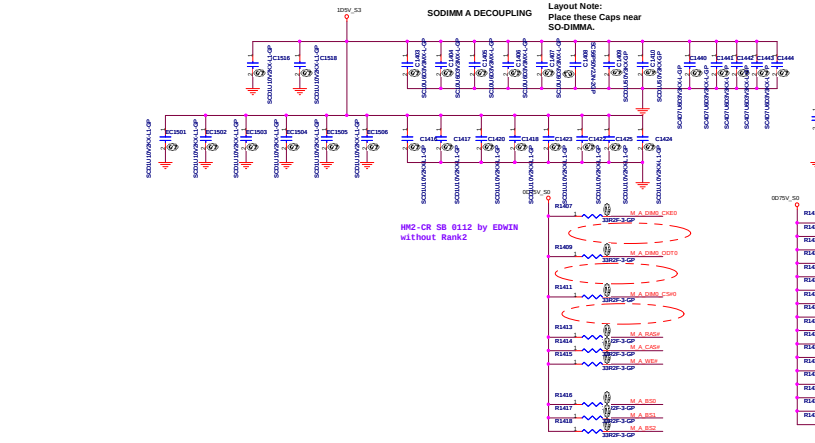
(Blanking)

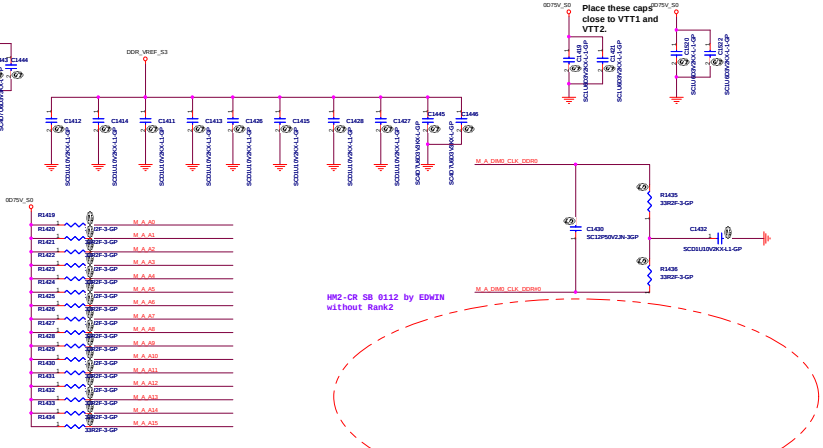
Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: ***Reserved***		
Size: A4	Document Number: **Hummingbird2_CR**	Rev: **-2**
Date: Tuesday, April 17, 2012	Sheet 13 of 102	

SSID = MEMORY







HM2-CR SB 0112 by EDWIN
Remove SPD ROM

Elpida 1600 4G DS3 NONSSD 65W

Wistron Corporation 緯創資通 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.			
Title: DDR3-SODIMM1			
Size: A1	Document Number: Hummingbird2_CR		Rev: -2
Date: Tuesday, April 17, 2012		Sheet 14 of 100	

SSID = MEMORY

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***DDR3-SODIMM2***

Size	Document Number	Rev
Custom	Hummingbird2_CR	-2

Date: Tuesday, April 17, 2012 Sheet 15 of 102

(Blanking)

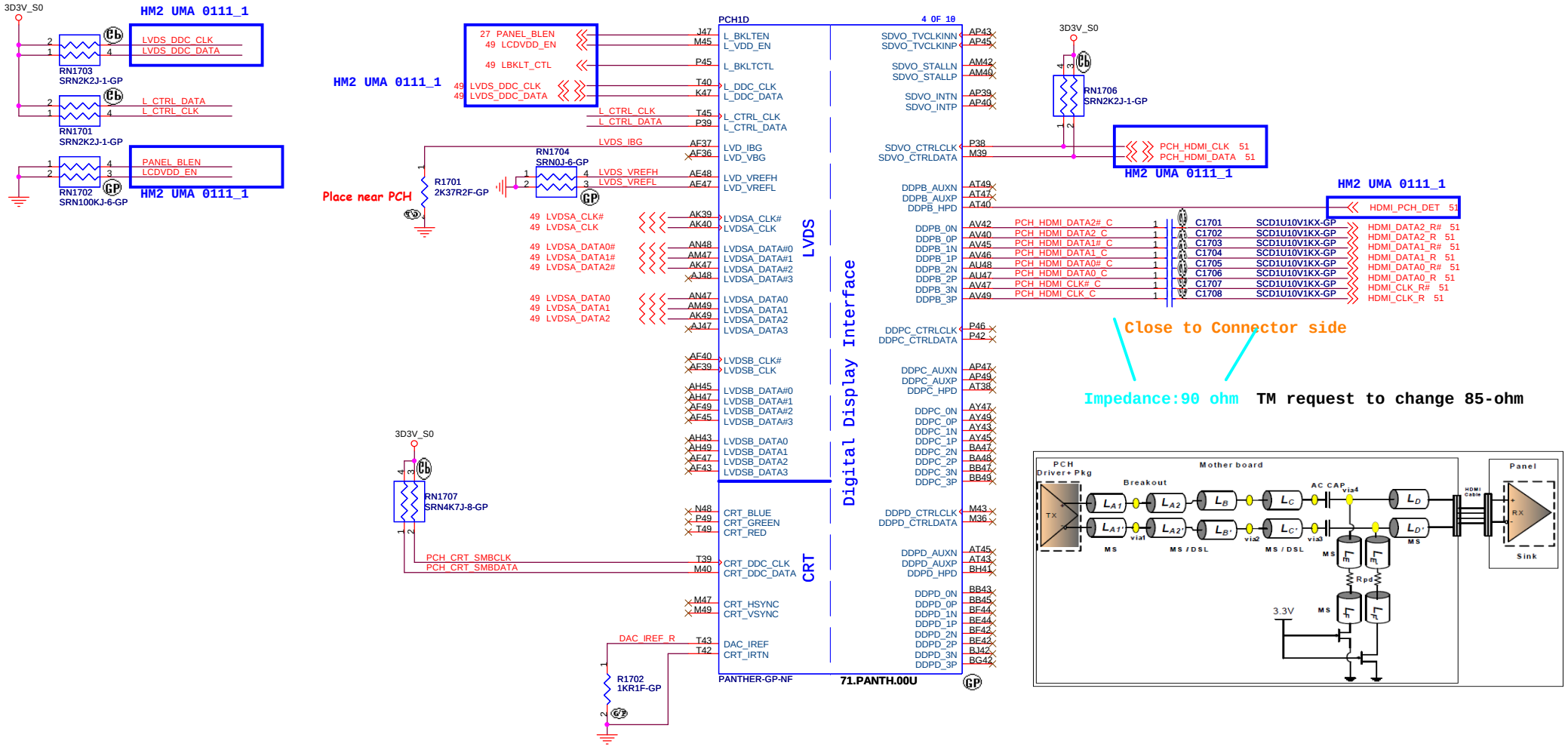
Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***DDR3-SODIMM2***

Size	Document Number	Rev
A4	Hummingbird2_CR	-2

Date: Tuesday, April 17, 2012 Sheet 16 of 102



Elpida 1600 4G DS3 NONSSD 65W

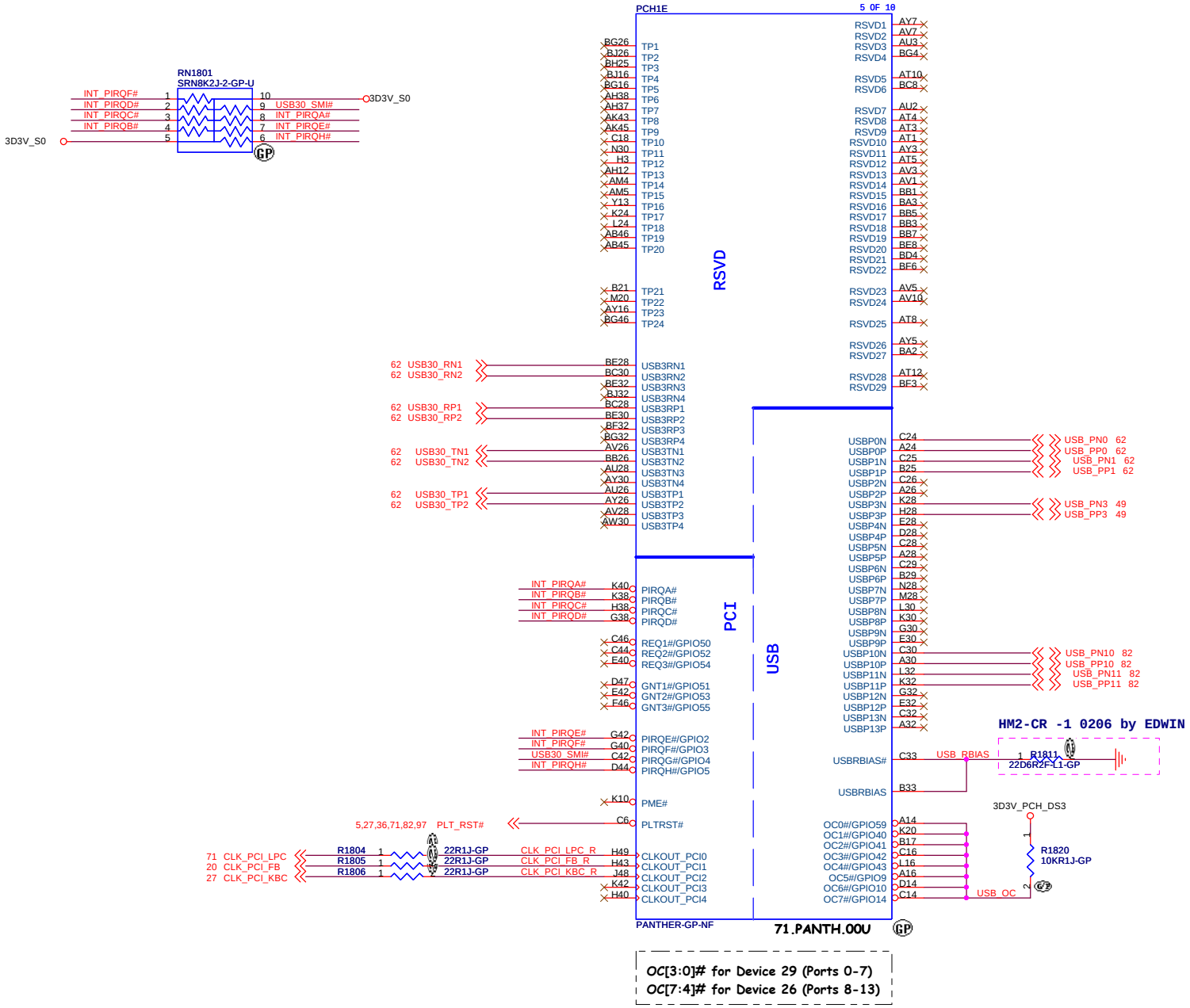
緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: **PCH (LVDS/CRT/DDI)**

Size	Document Number	Rev
A3	Hummingbird2_CR	-2

Date: Tuesday, April 17, 2012 Sheet 17 of 100

SSID = PCH



USB Table

Pair	Device
0	USB3.0 Ext. port 1
1	USB3.0 Ext. port 2 (Charger)
2	NC
3	BT
4	NC
5	
6	X
7	X
8	
9	
10	Card Reader
11	Mini Card1 (WLAN)
12	CAMERA

USB 2.0 Overcurrent Pin Default Usage

Pin	Default Port Mapping	Pin	Default Port Mapping
OC0#	Port 0, Port 1	OC4#	Port 8, Port 9
OC1#	Port 2, Port 3	OC5#	Port 10, Port 11
OC2#	Port 4, Port 5	OC6#	Port 12, Port 13
OC3#	Port 6, Port 7	OC7#	Not Used

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

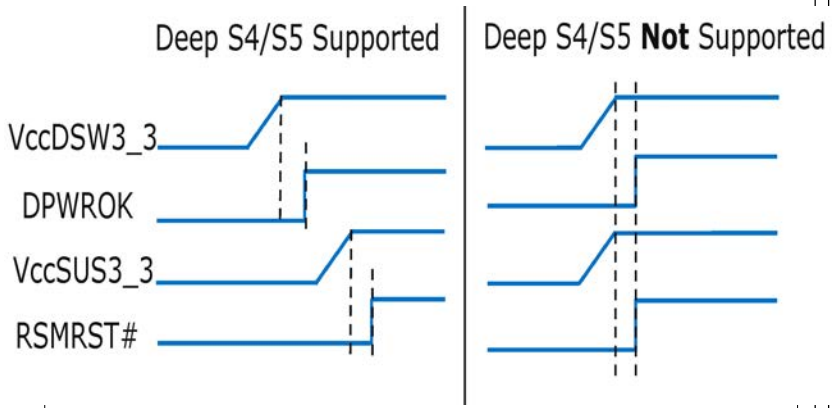
Title: PCH (PCI/USB/NVRAM)

Size: A3 | Document Number: Hummingbird2_CR | Rev: -2

Date: Tuesday, April 17, 2012 | Sheet 18 of 100

SSID = PCH

Signal Routing Guideline:
DMI_ZCOMP keep W=4 mils and routing length less than 500 mils.
DMI_IRCOMP keep W=4 mils and routing length less than 500 mils.



For platforms not supporting Deep S4/S5
1.VccSUS3_3 and VccDSW3_3 will rise at the same time (connected on board)
2.DPWROK and RSMRST# will rise at the same time (connected on board)
3.SLP_SUS# and SUSACK# are left as 'no connect'
4.SUSWARN# used as SUSPWRDNACK/GPIO30

PCH1C — 3 OF 10 — DMI / FDI / System Power Management — PANTHER-GP-NF — 71.PANTH.00U

DMI_RXN[3:0] → DMI0RXN, DMI1RXN, DMI2RXN, DMI3RXN
DMI_RXP[3:0] → DMI0RXP, DMI1RXP, DMI2RXP, DMI3RXP
DMI_TXN[3:0] → DMI0TXN, DMI1TXN, DMI2TXN, DMI3TXN
DMI_TXP[3:0] → DMI0TXP, DMI1TXP, DMI2TXP, DMI3TXP
FDI_TXN[7:0] ← FDI_RXN0..7
FDI_TXP[7:0] ← FDI_RXP0..7
FDI_INT, FDI_FSYNC0, FDI_FSYNC1, FDI_LSYNC0, FDI_LSYNC1

1D05V_VTT
R1901 49D9R1F-GP DMI_COMP_R → DMI_ZCOMP, DMI_IRCOMP
R1902 750R2F-GP RBIAS_CPY → DMI2RBIAS

R1926 DY Do Not Stuff SYS_PWROK
R1904 100KR1J-GP PWROK
27 PM_SUSACK# → PM_SUSACK# → SUSACK#
3D3V_S0 R1905 10KR1J-GP SYS_RESET# → SYS_RESET#
36 SYS_PWROK → SYS_PWROK
27,42 S0_PWR_GOOD → R1924 Do Not Stuff PWROK → PWROK
37 PM_DRAM_PWRGD ← DRAMPWROK
PM_RSMRST# → RSMRST#
27 PM_SUSWARN# ← PM_SUSWARN# ← SUSWARN#/SUSPWRDNACK/GPIO30
27,97 PM_PWRBTN# → PWRBTN#
27 AC_PRESENT → ACPRESENT/GPIO31
BATLOW# → BATLOW#/GPIO72
PM_RI# → RI#

DSWVRMEN ← A18 DSWODVREN
DPWROK ← E22 PCH_DPWROK
WAKE# ← B9 PCIE_WAKE#
CLKRUN#/GPIO32 → N3 PM_CLKRUN# 27
SUS_STAT#/GPIO61 → G8
SUSCLK/GPIO62 → N14 PCH_SUSCLK_KBC 27
SLP_S5#/GPIO63 → D10
SLP_S4# → H4 PM_SLP_S4# 27,46
SLP_S3# → F4 PM_SLP_S3# 27,36
SLP_A# → G10
SLP_SUS# → G16 PM_SLP_SUS# 27,80
PMSYNCH → AP14 H_PM_SYNC 5
SLP_LAN#/GPIO29 → K14

Non DS3
R1910 Do Not Stuff PM_RSMRST#
R1911 DX Do Not Stuff RTC_AUX_S5
R1920 DS3 0R1J-GP KBC_DPWROK 27
R1930 10KR1J-GP DS3

DSWODVREN - On Die DSW VR Enable	
HIGH	Enabled (DEFAULT)
LOW	Disabled

RTC_AUX_S5
R1917 330KR1F-GP
DSWODVREN R1918 DY Do Not Stuff

3D3V_S5
R1925 DY Do Not Stuff AC_PRESENT
R1928 DY Do Not Stuff PM_SLP_SUS#

3D3V_AUX_S5
R1909 Do Not Stuff 3V_5V_POK_C NONDS3
R1916 10KR1J-GP
3V_5V_POK_# Q1901 2N7002KDW-GP 84.2N702.A3F 2nd = 84.DM601.03F
R1912 1KR1J-GP PM_RSMRST# → RSMRST#_KBC 27
R1922 Do Not Stuff NONDS3 3V_5V_POK 41
R1921 0R1J-GP DS3 PM_SLP_SUS#

HM2-CR -1 0206 by EDWIN
3D3V_S0
PM_CLKRUN# R1919 8K2R2J-3-GP

3D3V_PCH_DS3
R1927 DY Do Not Stuff PM_SUSACK#
R1929 DY Do Not Stuff PM_SUSWARN#
RN1901 SRN10KJ-L-GP PCIE_WAKE# PM_RI#
R1923 10KR1J-GP BATLOW#
R1908 100KR1J-GP PM_RSMRST#

PCIE_WAKE#
CRB : 1K
CEKLT: 10K

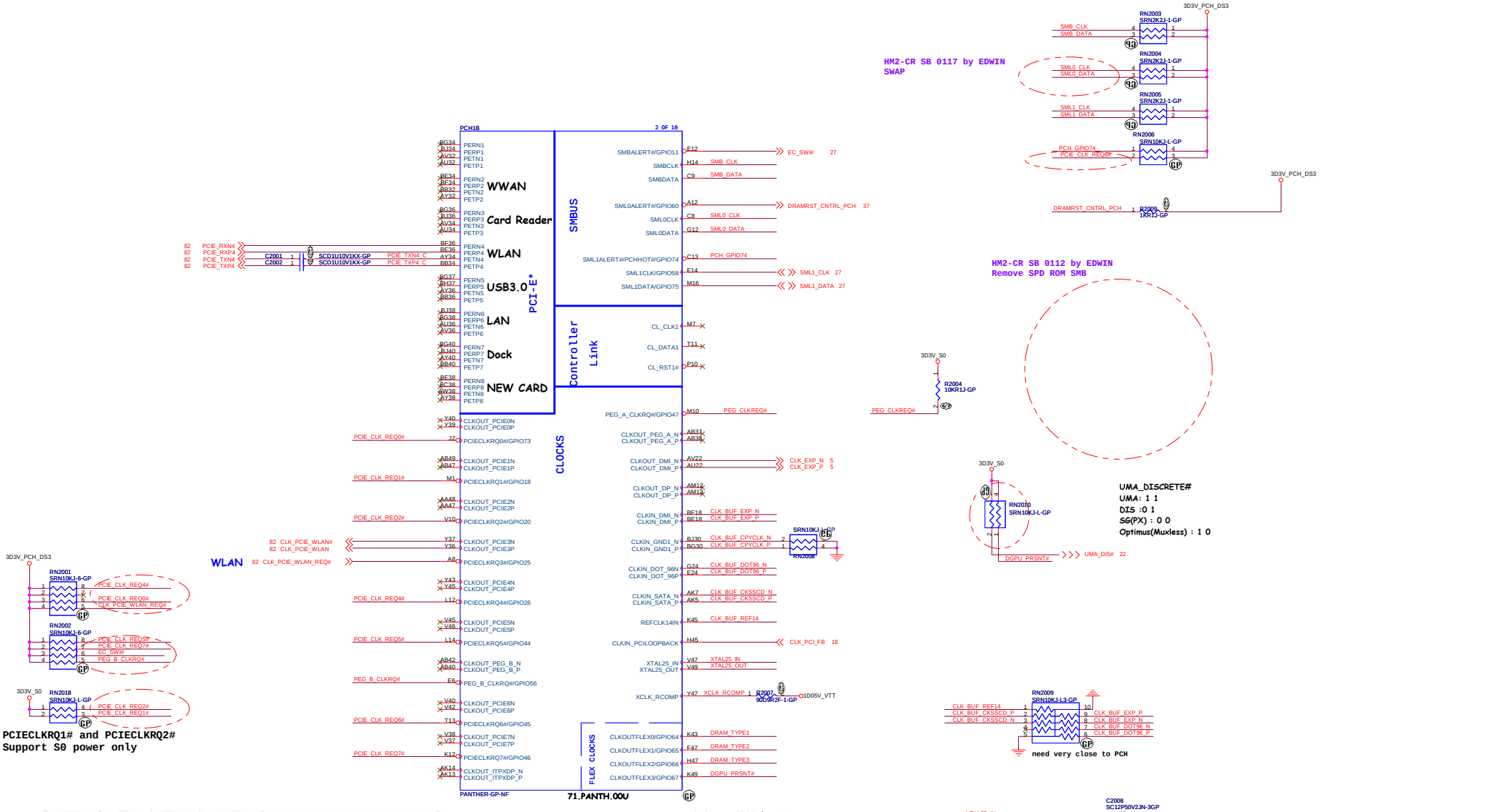
PM_RSMRST#
CRB : PL 10K
ANNIE : PL 100K

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: **PCH (DM I/FDI/PM)**
Size: A3 | Document Number: Hummingbird2_CR | Rev: -2
Date: Tuesday, April 17, 2012 | Sheet 19 of 100

SSID = PCH



PCIECLKRQ1# and PCIECLKRQ2#
Support S0 power only

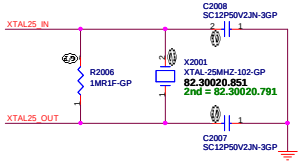
WLAN 82 CLK_PCIE_WLAN_REQ#

HM2-CR SB 0117 by EDWIN
SWAP

HM2-CR SB 0112 by EDWIN
Remove SPD ROM SMB

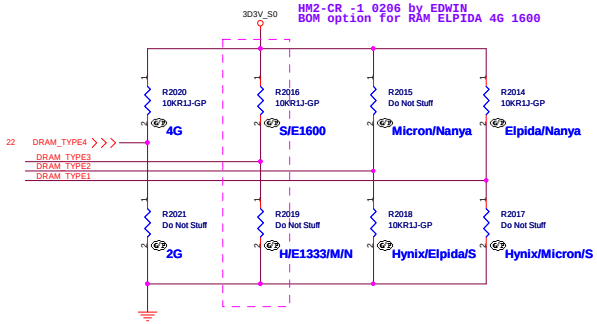
UMA_DISCRETE#
UMA: 1 1
DIS :0 1
SG(PX) : 0 0
Optimus(Muxless) : 1 0

need very close to PCH



GPIO48 DRAM_Type4	GPIO66 DRAM_Type3	GPIO65 DRAM_Type2	GPIO64 DRAM_Type1	Status
0	0	0	0	HYNIX 2G (LAB SMT)
0	0	0	1	ELPIDA 2G (LAB SMT)
0	0	1	0	Micron 2G
0	0	1	1	NANYA 2G
0	1	0	0	Samsung 2G
0	1	0	1	
0	1	1	0	
0	1	1	1	
1	0	0	0	HYNIX 4G
1	0	0	1	ELPIDA 4G 1333 EDJ4208BASE-DJ-F (ENG SMT)
1	0	1	0	Micron 4G (ENG SMT)
1	0	1	1	NANYA 4G
1	1	0	0	Samsung 4G
1	1	0	1	ELPIDA 4G 1600 EDJ4208BBBG-GN-F (ENG SMT)
1	1	1	0	
1	1	1	1	

HM2-CR -1 0206 by EDWIN
BOM option for RAM ELPIDA 4G 1600



Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: **PCH (PCI-E/SMBUS/CLOCK/CL)**

Size: A2 | Document Number: Hummingbird2_CR | Rev: -2

Date: Tuesday, April 17, 2012 | Sheet 20 of 100

SSID = PCH

RTC_X1
RTC_X2
X2101
X-32D768KHZ-34GPU
82.30001.661
2nd = 82.30001.B21
C2101 SC6P50V2CN-1GP
C2102 SC6P50V2CN-1GP
R2101 10MR1F-GP

RTC_AUX_S5
R2120 20KR2F-L-GP
R2125 20KR2F-L-GP
C2103 SC1U10V3KX-L1-GP

INTVRMEN- Integrated SUS 1.05V VRM Enable
High - Enable internal VRs
Low - Enable external VRs

SA 技術通報

27 RTCRST_ON
RTCRST_ON
Q2102
2N7002K-2-GP
84.2N702.J31
2ND = 84.2N702.031
R2117 2K2R1J-GP
R2118 10KR1J-1-GP
C2104 SCU10V3KX-L1-GP
G2101 Do Not Stuff

RTC_AUX_S5
R2104 1MR1F-GP
R2105 330KR1F-GP
RTC Reset

PCH1A 1 OF 10

RTC_X1	A20	RTCX1	RTC
RTC_X2	C20	RTCX2	
RTC_RST#	D20	RTCRST#	
SRTC_RST#	G22	SRTCRST#	
SM_INTRUDER#	K22	INTRUDER#	
PCH_INTVRMEN	C17	INTVRMEN	
HDA_BITCLK	N34	HDA_BCLK	IHDA
HDA_SYNC	L34	HDA_SYNC	
29 HDA_SPKR	T10	SPKR	
HDA_RST#	K34	HDA_RST#	
29 HDA_SDIN0	E34	HDA_SDIN0	
	G34	HDA_SDIN1	
	C34	HDA_SDIN2	
	A34	HDA_SDIN3	
27 ME_UNLOCK R2107 1KR1J-GP HDA_SDOUT	A36	HDA_SDO	
	C36	HDA_DOCK_EN#/GPIO33	
	N32	HDA_DOCK_RST#/GPIO13	
R2121 4K7R1J-GP PCH_JTAG_TCK_BUF	J3	JTAG_TCK	JTAG
	H7	JTAG_TMS	
	K5	JTAG_TDI	
	H1	JTAG_TDO	
27,60 SPI_CLK_R R2108 33R1J-GP PCH_SPI_CLK	T3	SPI_CLK	SPI
27,60 SPI_CS0#_R R2109 33R1J-GP PCH_SPI_CS0#	Y14	SPI_CS0#	
	T1	SPI_CS1#	
27,60 SPI_SI_R R2110 33R1J-GP PCH_SPI_SI	V4	SPI_MOSI	
27,60 SPI_SO_R	U3	SPI_MISO	

PANTHER-GP-NF
71.PANTH.00U

		FWH0/LAD0	LPC
		FWH1/LAD1	
		FWH2/LAD2	
		FWH3/LAD3	
	D36	FWH4/LFRAME#	
	E36	LDRQ0#	
LDRQ1# R2119 10KR1J-GP	K36	LDRQ1#/GPIO23	
	V5	SERIRQ	
	AM3	SATA0RXN	SATA 6G
	AM1	SATA0RXP	
	AP7	SATA0TXN	
	AP5	SATA0TXP	
	AM10	SATA1RXN	
	AM8	SATA1RXP	
	AP11	SATA1TXN	
	AP10	SATA1TXP	
	AD7	SATA2RXN	SATA
	AD5	SATA2RXP	
	AH5	SATA2TXN	
	AH4	SATA2TXP	
	AB8	SATA3RXN	
	AB10	SATA3RXP	
	AF3	SATA3TXN	
	AF1	SATA3TXP	
	Y7	SATA4RXN	
	Y5	SATA4RXP	
	AD3	SATA4TXN	
	AD1	SATA4TXP	
	Y3	SATA5RXN	
	Y1	SATA5RXP	
	AB3	SATA5TXN	
	AB1	SATA5TXP	
	Y11	SATAICOMPO	
SATA_COMP R2112 37D4R2F-GP	Y10	SATAICOMPI	
	AB12	SATA3RCOMPO	
SATA3_COMP R2113 49D9R1F-GP	AB13	SATA3COMPI	
RBIAS_SATA3 R2114 750R2F-GP	AH1	SATA3RBIAS	
SATA_LED# 22	P3	SATALED#	
SATA_DET#0	V14	SATA0GP/GPIO21	
Strap pin ,Internal PU	P1	SATA1GP/GPIO19	

LPC_AD[0..3] 27,71
LPC_AD0 LPC_AD1 LPC_AD2 LPC_AD3
LPC_FRAME# 27,71
INT_SERIRQ 27
3D3V_S0
SATA_RXN0 56
SATA_RXP0 56
SATA_TXN0 56
SATA_TXP0 56
HDD1
SATA_RXN1 82
SATA_RXP1 82
SATA_TXN1 82
SATA_TXP1 82
mSATA
1D05V_VTT

Flash Descriptor Security Overide	
HDA_SDOUT	Low = Default High = Enable

+3VS_+1.5VS_HDA_IO
R2102 Do Not Stuff DY HDA_SDOUT

PLL ODVR VOLTAGE	
HDA_SYNC	Low = 1.8V (Default) High = 1.5V

+3VS_+1.5VS_HDA_IO
R2103 1KR1J-GP HDA_SYNC

29 HDA_CODEC_SYNC DY R2122 Do Not Stuff HDA_SYNC
29 HDA_CODEC_SDOUT R2123 33R1J-GP HDA_SDOUT
29 HDA_CODEC_RST# RN2102 HDA_RST#
29 HDA_CODEC_BITCLK HDA_BITCLK
SRN33J-5-GP

5V_S0
Q2101
2N7002K-2-GP
84.2N702.J31
2ND = 84.2N702.031
HDA_CODEC_SYNC
HDA_SYNC_R R2124 33R1J-GP HDA_SYNC

HM2-CR SB 0117 by EDWIN
Swap

22 S_GPIO
RN2103
S_GPIO
INT_SERIRQ
SATA_DET#0
SRN10KJ-GP
3D3V_S0

HDA_SYNC:
This strap is sampled on rising edge of RSMRST# and is used to sample 1.5V VccVRM supply mode.
1K external pull-up resistor is required on this signal on the board.
Signal may have leakage paths via powered off devices(Audio Codec)
and hence contend with the external pull-up.
A blocking FET is recommended in such a case to isolate HDA_SYNC from the Audio Codec device until after the Strap sampling is complete.

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: PCH (SPI/RTC/LPC/SATA/IHDA)
Size: A3 | Document Number: Hummingbird2_CR | Rev: -2
Date: Tuesday, April 17, 2012 | Sheet 21 of 100

SSID = PCH

Note:
For PCH debug with XDP, need to NO STUFF R2218

PCH1F 6 OF 10

PCH:no Turbo control via PECI

KBC(Recommended):EC collect all thermal data and Performs Turbo power control

Pass Word Clear

HM2-CR SB 0117 by EDWIN request by layout

HM2-CR 1229_2

Internal Pull Down

Internal PU

FDI TERMINATION VOLTAGE OVERRIDE(Reserved)	
FDI_OVRVLTG (GPIO37)	LOW - Tx, Rx terminated to same voltage (DC Coupling Model DEFAULT)

DMI TERMINATION VOLTAGE OVERRIDE(Reserved)	
DMI_OVRVLTG (GPIO36)	LOW - Tx, Rx terminated to same voltage (DC Coupling Model DEFAULT)

Integrated Clock Chip Enable(Reserved)	
ICC_EN# (GPIO8)	HIGH- DISABLED [DEFAULT]
	LOW - ENABLED

PLL ON DIE VR ENABLE	
PLL_ODVR_EN (GPIO28)	HIGH- DISABLED [DEFAULT]
	LOW - ENABLED

Elpida 1600 4G DS3 NONSSD 65W

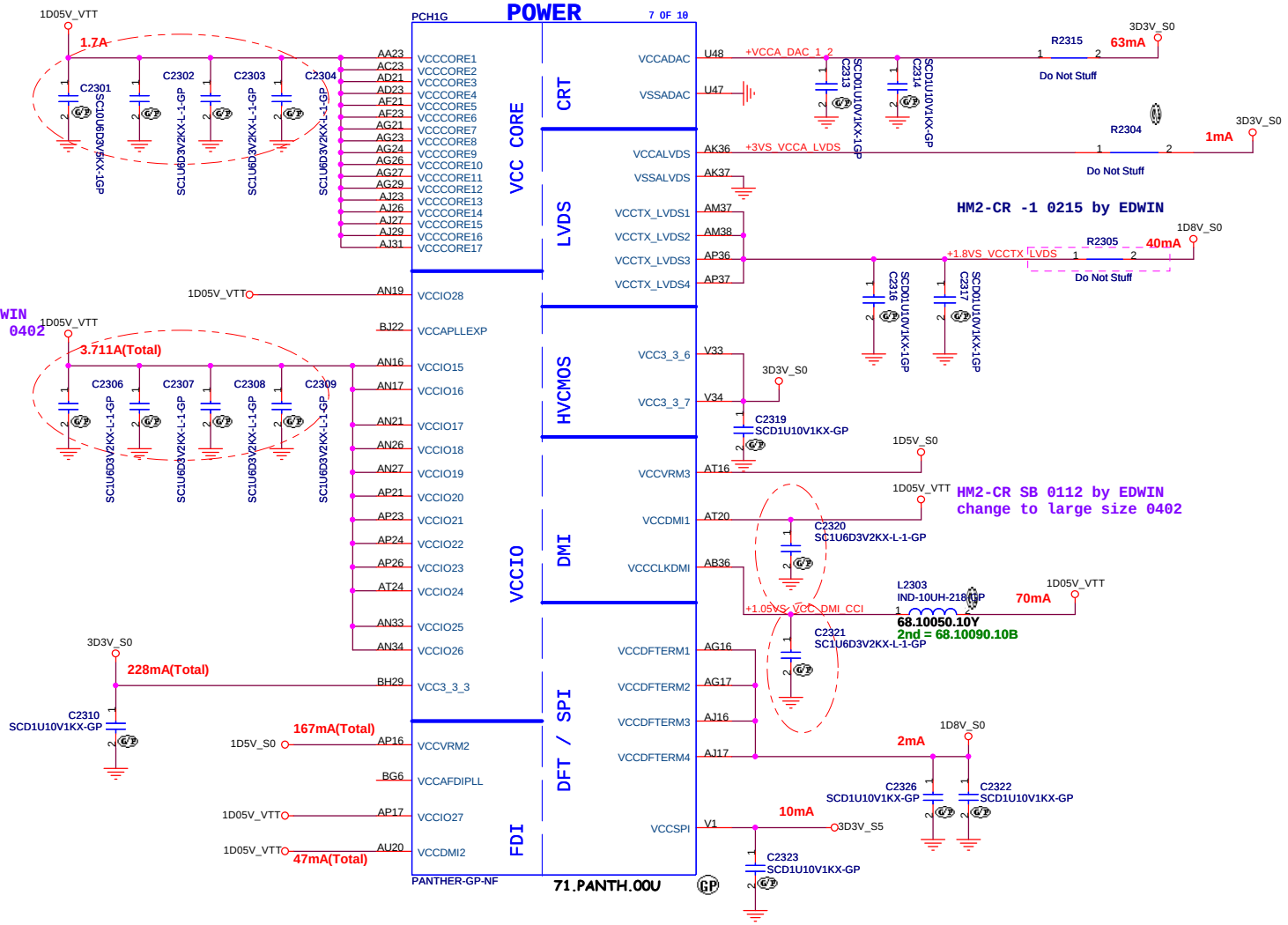
Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.

Title: PCH (GPIO/CPU)

Size: A3 | Document Number: Hummingbird2_CR | Rev: -2

Date: Tuesday, April 17, 2012 | Sheet 22 of 100

HM2-CR SB 0112 by EDWIN
change to large size 1u 0402 10u 0805



HM2-CR SB 0112 by EDWIN
change to large size 0402

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title	PCH (POWER1)	
Size A3	Document Number Hummingbird2_CR	Rev -2
Date: Tuesday, April 17, 2012	Sheet 23 of 100	

SSID = PCH

POWER

PCH1J

10 OF 10

USB

Clock and Miscellaneous

PCI/GPIO/LPC

SATA

MISC

CPU

RTC

HDA

PANTHER-GP-NF

71.PANTH.00U

HM2-CR SB 0112 by EDWIN
change to large size 1u 0402 10u 0603

HM2-CR SB 0112 by EDWIN
change to large size 1u 0402

HM2-CR SB 0112 by EDWIN
change to large size 1u 0402

HM2-CR SB 0112 by EDWIN
change to large size 1u 0603

HM2-CR SB 0112 by EDWIN
change to large size 1u 0402

HM2-CR SB 0112 by EDWIN
change to large size 1u 0402

HM2-CR SB 0113 by EDWIN

stuff or not

Va	Vb	Power-Up Requirement	Power-Down Requirement
V5REF_SUS	VCCSUS3_3	a) VCCSREF_SUS must be powered up before VCCSUS3_3 or after VCCSUS3_3 within 0.7 V. b) If VCCSREF_SUS is more than VCCSUS3_3 by 3 V, then the duration of this condition needs to be less than 20 ms.	a) V5REF_SUS must be powered down after VCCSUS3_3 or before VCCSUS3_3 within 0.7 V.
V5REF	VCC3_3	a) V5REF must be powered up before VCC3_3 or after VCC3_3 within 0.7 V. b) For power up, if VCC5REF is more than VCC3_3 by 3 V, then the duration of this condition needs to be less than 20 ms	a) V5REF must be powered down after VCC3_3 or before VCC3_3 within 0.7 V.

VccVRM	Internal PLL and VRMs (1.5V for Mobile)
VccVRM	1.8 V Internal PLL and VRMs (1.8 V for Desktop)

HM2-CR -1 0215 by EDWIN

Elpida 1600 4G DS3 NONSSD 65W

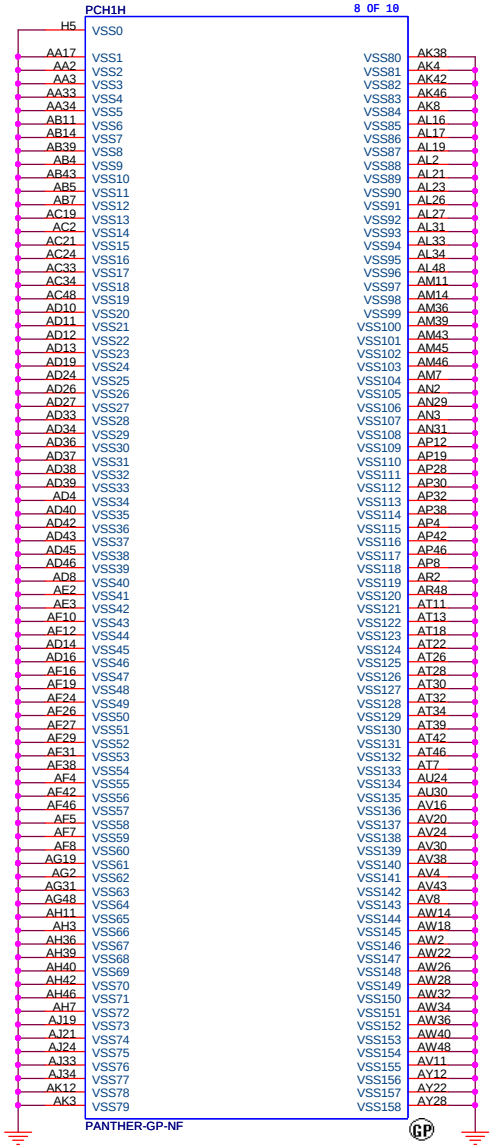
Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

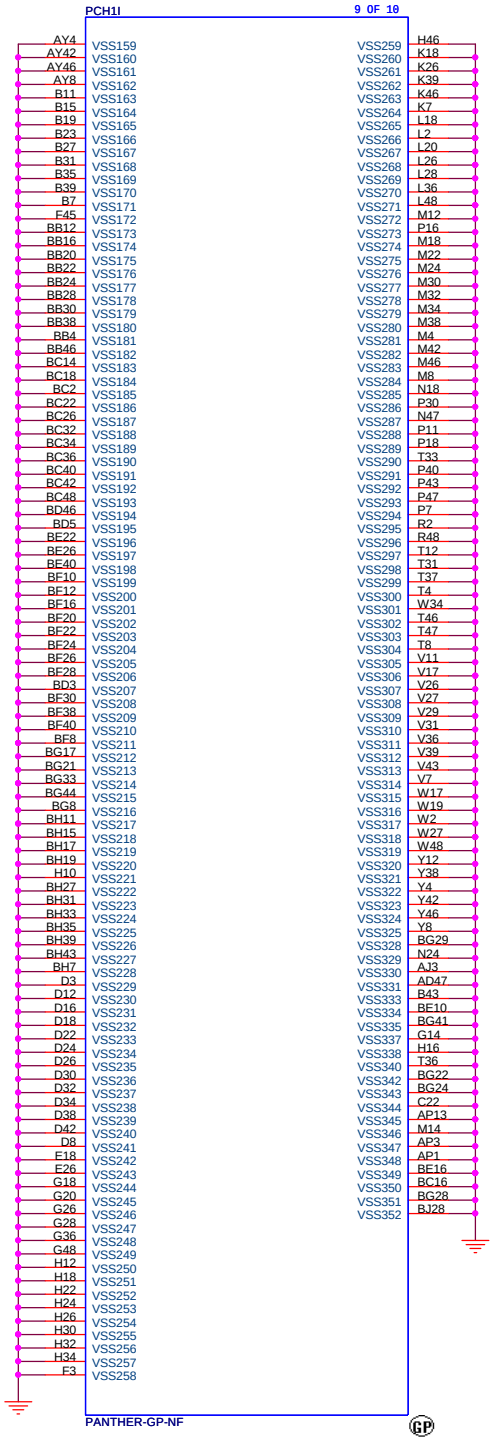
Title: PCH (POWER2)

Size: A3 | Document Number: Hummingbird2_CR | Rev: -2

Date: Tuesday, April 17, 2012 | Sheet 24 of 100

SSID = PCH





Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: **PCH (VSS)**

Size	Document Number	Rev
A3	Hummingbird2_CR	-2

Date: Tuesday, April 17, 2012 Sheet 25 of 100

Blanking

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
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Taipei Hsien 221, Taiwan, R.O.C.

Title: ***Clock(colay)***

Size	Document Number	Rev
A4	**Hummingbird2_CR**	**-2**

Date: Tuesday, April 17, 2012 Sheet 26 of 102

SSID = KBC

SSID = KBC

HM2-CR 0102 by EDWIN
For deep sleep sequence

HM2-CR -2 0208 by EDWIN
follow -1
HM2-CR -1 0215 by EDWIN
IOAC

HM2-CR SB 0113 by EDWIN
Remove C-sensor

HM2-CR 0117 by EDWIN
GPIO

HM2-CR -2 0208 by EDWIN
IOAC

71.00885.A0G

HM2-CR 1229_1

DS3

NONDS3

HM2-CR 1229_2

HM2-CR 0117 by EDWIN
GPIO

EC_GPIO47 High Active

84.2N702.131
2ND = 84.2N702.031

Term	Default	Active	Descriptor
AC_IN# (input)	High	Low	KBC internal have a pull high R via VCC_0 , just connection AC_IN# signal directly when you plug-in AC than assert a low signal for this pin .
AD_OFF(output)	High	Low	AD_OFF signal will high to low when AC_IN# was low , or KBC_PWRBTN# was low, AD_OFF take control PMOS that offer VCC to KBC
KBC_PWRBTN# (input)	High	Low	KBC internal have a pull high R via VCC_0 ,just connection KBC_PWRBTN# signal directly when you press power btn and assert a low signal for this pin .

HM2-CR -1 0206 by EDWIN

FAE suggest

HM2-CR -1 0206 by EDWIN

HM2-CR -2 0206 by EDWIN
IOAC

45W_60W#
High: 65W / Low 40W
DISCRETE#
High: UMA / Low: Muxless

HM2-CR -1 0216 by EDWIN

0604 Modify:
Add Pull Down 100k ohm at F_SDI
for Power Consumption Concern.

HM2-CR 1229_1

HM2-CR -1 0206 by EDWIN

Non PSL SOLUTION
(Power Switch Control Logic)

HM2-CR -1 0215 by EDWIN

EC GPIO standard PH/PL

0604 Modify:
RN2704 pull-Low 10K Resistor to DY
on BLUETOOTH_EN.

PCB VERSION A/D(PIN64)	PULL-LOW RESISTOR	PULL-HIGH RESISTOR	VOLTAGE
SA	100.0K	10.0K	3.0V
SB	100.0K	20.0K	2.75V
SC	100.0K	33.0K	2.48V
-1	100.0K	47.0K	2.24V
-1M	100.0K	64.9K	2.0V
-2	100.0K	76.8K	1.87V
-3	100.0K	100K	1.65V
-3M	100.0K	143.0K	1.358V
-1M For PCH B3	100.0K	174.0K	1.204V

ADT_TYPE A/D(PIN65)	PULL-LOW RESISTOR	PULL-HIGH RESISTOR	VOLTAGE
65W	N/A	100.0K	3.3V
90W	100.0K	N/A	0V
30W	10.0K	100.0K	0.3V
40W	20.0K	100.0K	0.55V
120W	33.0K	100.0K	0.82V
Reserved	47.0K	100.0K	1.06V
Reserved	64.9K	100.0K	1.3V

Elpida 1600 4G DS3 NONSSD 65W

Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

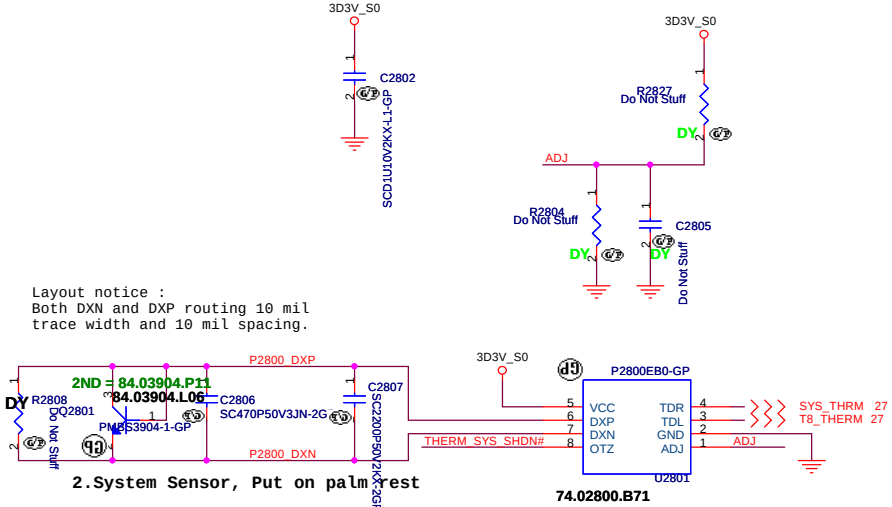
Title: KBC ENE 9016

Size: A2 | Document Number: Hummingbird2_CR | Rev: -2

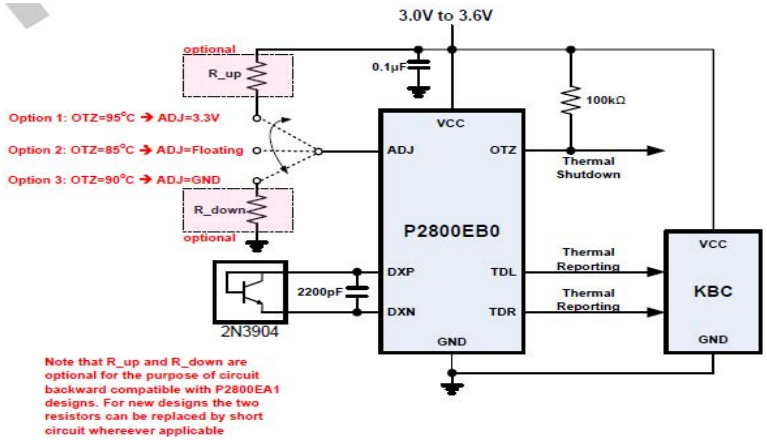
Date: Tuesday, April 17, 2012 | Sheet 27 of 100

SSID = Thermal

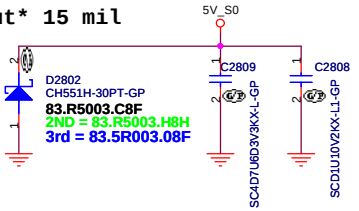
Thermal sensor P2800

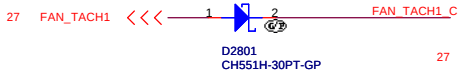


[Rev B]

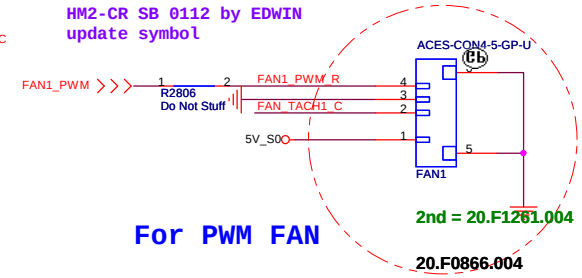


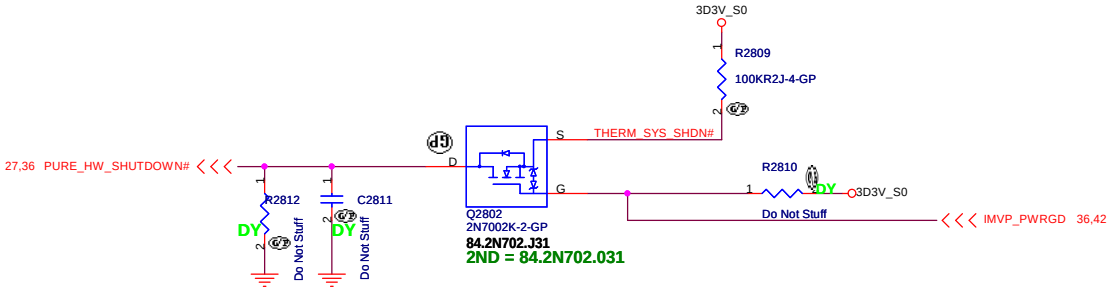
Layout 15 mil





HM2-CR SB 0112 by EDWIN
update symbol





Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***Thermal P2800/Fan Controllor P2793***

Size	Document Number	Rev
A3	Hummingbird2_CR	-2

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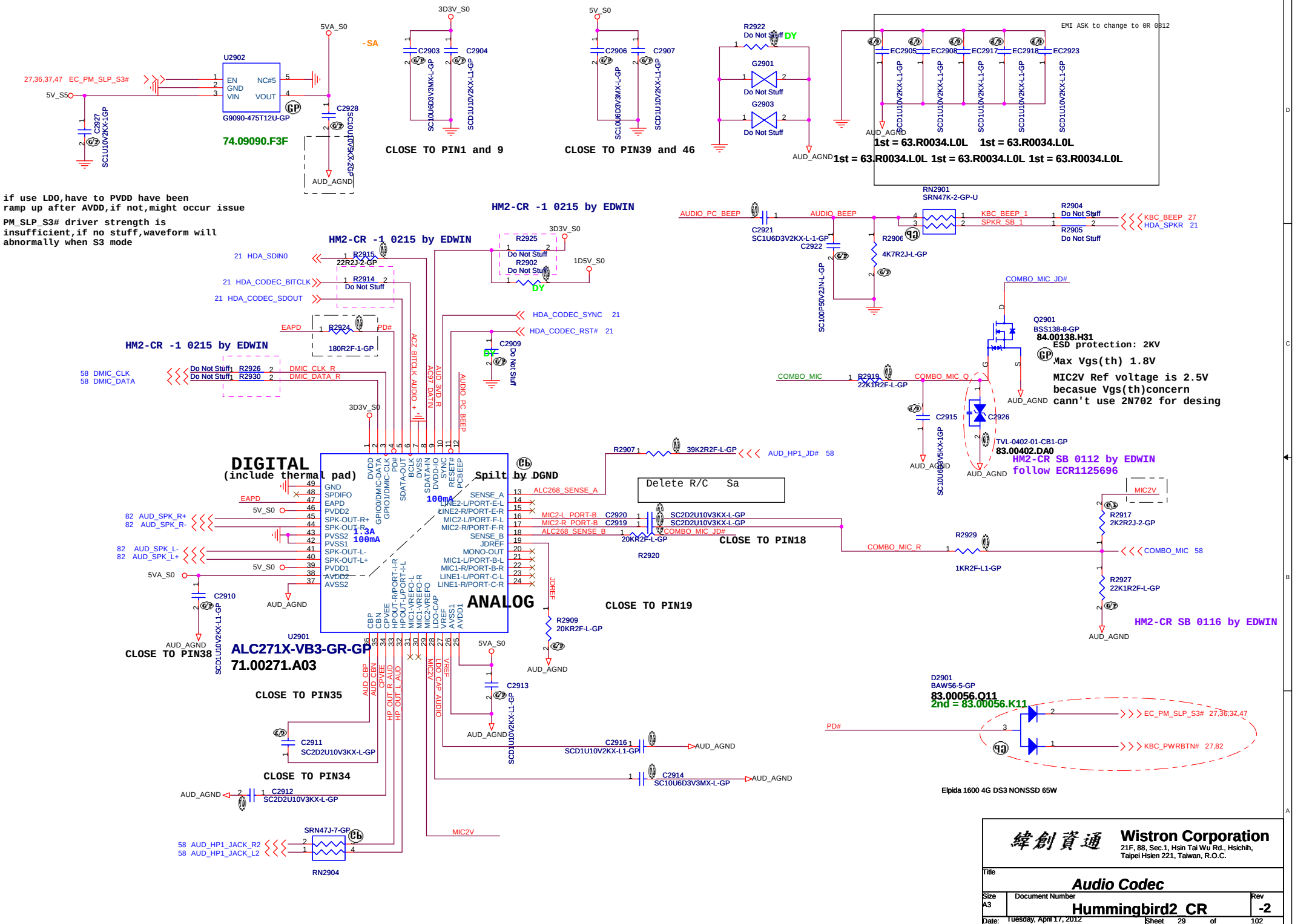
5VA_S0
-SA
U2902
27,36,37,47 EC_PM_SLP_S3#
5V_S5
EN
GND
VIN
NC#5
VOUT
G9090-475T12U-GP
74.09090.F3F
C2927
SC1U10V2KX-1GP
C2928
SC10U10V5KX-2GP
AUD_AGND
3D3V_S0
C2903
C2904
SC10U6D3V3MX-L-GP
SCD1U10V2KX-L1-GP
CLOSE TO PIN1 and 9
5V_S0
C2906
C2907
CLOSE TO PIN39 and 46
R2922
Do Not Stuff
DY
G2901
G2903
EMI ASK to change to 0R 0812
EC2905
EC2908
EC2917
EC2918
EC2923
1st = 63.R0034.L0L
if use LDO,have to PVDD have been
ramp up after AVDD,if not,might occur issue
PM_SLP_S3# driver strength is
insufficient,if no stuff,waveform will
abnormally when S3 mode
HM2-CR -1 0215 by EDWIN
21 HDA_SDIN0
R2915
22R2J-2-GP
21 HDA_CODEC_BITCLK
R2914
21 HDA_CODEC_SDOUT
EAPD
R2924
PD#
180R2F-1-GP
R2925
R2902
1D5V_S0
HDA_CODEC_SYNC 21
HDA_CODEC_RST# 21
C2909
58 DMIC_CLK
58 DMIC_DATA
R2926
R2930
DMIC_CLK_R
DMIC_DATA_R
AC97_BCLK_AUDIO
AUDIO_PC_BEEP
DIGITAL
(include thermal pad)
Spilt by DGND
100mA
1.3A
82 AUD_SPK_R+
82 AUD_SPK_R-
82 AUD_SPK_L-
82 AUD_SPK_L+
C2910
U2901
ALC271X-VB3-GR-GP
71.00271.A03
ANALOG
CLOSE TO PIN38
CLOSE TO PIN35
CLOSE TO PIN34
CLOSE TO PIN18
CLOSE TO PIN19
R2907
39K2R2F-L-GP
AUD_HP1_JD# 58
Delete R/C Sa
ALC268_SENSE_A
MIC2-L_PORT-B
MIC2-R_PORT-B
ALC268_SENSE_B
C2920
C2919
SC2D2U10V3KX-L-GP
20KR2F-L-GP
R2920
COMBO_MIC_JD#
R2909
20KR2F-L-GP
JDREF
C2913
C2911
C2912
C2916
C2914
SC10U6D3V3MX-L-GP
SRN47J-7-GP
RN2904
58 AUD_HP1_JACK_R2
58 AUD_HP1_JACK_L2
MIC2V
RN2901
SRN47K-2-GP-U
AUDIO_PC_BEEP
AUDIO_BEEP
C2921
SC1U6D3V2KX-L-1-GP
C2922
SC100P50V2JN-L-GP
R2906
4K7R2J-L-GP
KBC_BEEP_1
SPKR_SB_1
R2904
Do Not Stuff
R2905
KBC_BEEP 27
HDA_SPKR 21
COMBO_MIC_JD#
Q2901
BSS138-8-GP
84.00138.H31
ESD protection: 2KV
Max Vgs(th) 1.8V
MIC2V Ref voltage is 2.5V
becasue Vgs(th)concern
cann't use 2N702 for desing
COMBO_MIC
R2919
22K1R2F-L-GP
COMBO_MIC_Q
C2915
C2926
TVL-0402-01-CB1-GP
83.00402.DA0
HM2-CR SB 0112 by EDWIN
follow ECR1125696
R2929
1KR2F-L1-GP
COMBO_MIC_R
R2917
2K2R2J-2-GP
R2927
22K1R2F-L-GP
COMBO_MIC 58
HM2-CR SB 0116 by EDWIN
D2901
BAW56-5-GP
83.00056.O11
2nd = 83.00056.K11
PD#
EC_PM_SLP_S3# 27,36,37,47
KBC_PWRBTN# 27,82
Elpida 1600 4G DS3 NONSSD 65W
緯創資通
Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.
Title
Audio Codec
Size A3
Document Number
Hummingbird2_CR
Rev -2
Date: Tuesday, April 17, 2012
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AUDIO OP AMPLIFIER

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Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation** 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: ***Audio AMP***		
Size: A4	Document Number: **Hummingbird2_CR**	Rev: **-2**
Date: Tuesday, April 17, 2012	Sheet 30 of 102	

Blanking

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: *AR8158*		
Size: A3	Document Number: Hummingbird2 CR	Rev: -2
Date: Tuesday, April 17, 2012	Sheet 31 of 102	

Card reader move to small board

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: ***RTS5159 (CARD READER)***		
Size: A4	Document Number: **Hummingbird2_CR**	Rev: **-2**
Date: Tuesday, April 17, 2012	Sheet 32 of 102	

(Blanking)

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***Reserved***

Size	Document Number	Rev
A4	Hummingbird2_CR	-2

Date: Tuesday, April 17, 2012 Sheet 33 of 102

(Blanking)

Elpida 1600 4G DS3 NONSSD 65W

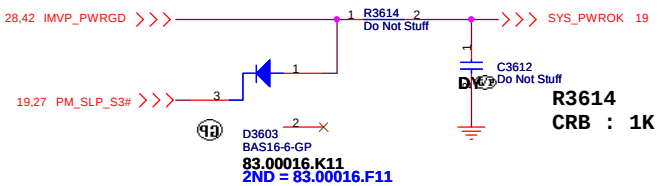
緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: ***Reserved***		
Size: A4	Document Number: **Hummingbird2_CR**	Rev: **-2**
Date: Tuesday, April 17, 2012	Sheet 34 of 102	

Blanking

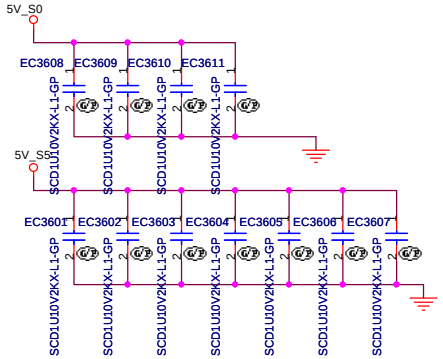
Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: *USB 3.0 Controller*		
Size: A3	Document Number: Hummingbird2_CR	Rev: -2
Date: Tuesday, April 17, 2012	Sheet 35 of 102	

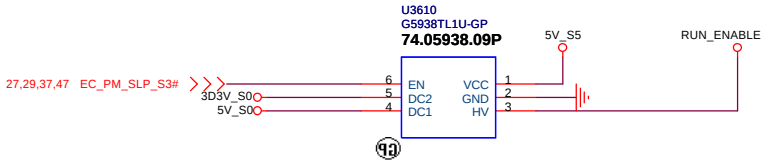
Power Sequence

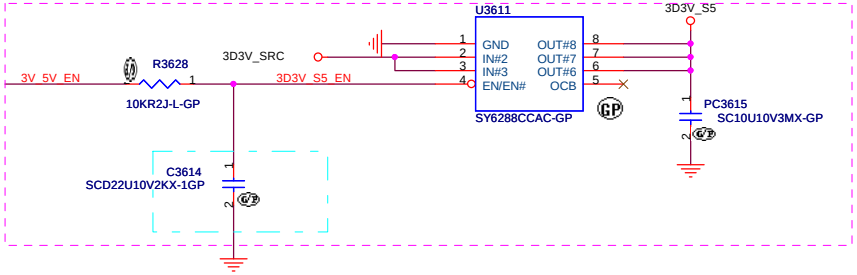


R3614
CRB : 1K

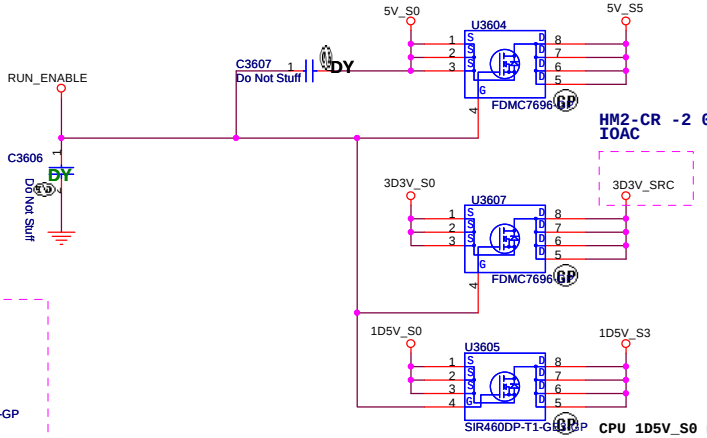


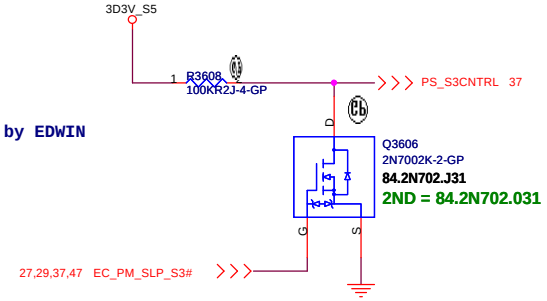
ANNIE Run Power

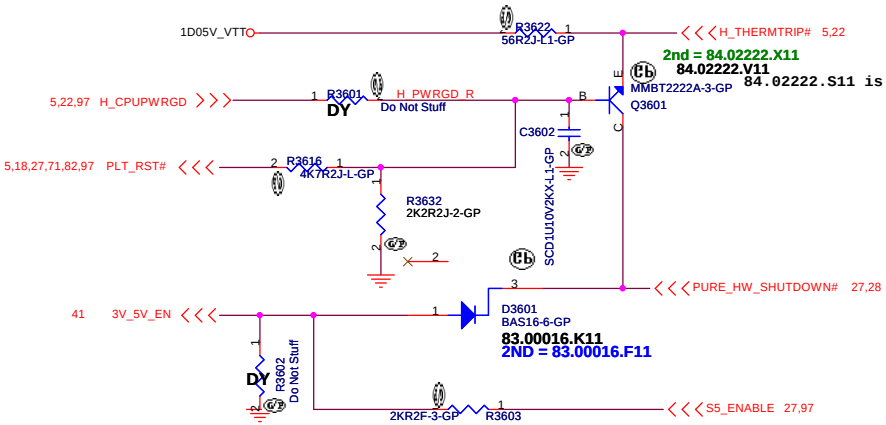




Modify the MOS package for placement







Elpida 1600 4G DS3 NONSSD 65W

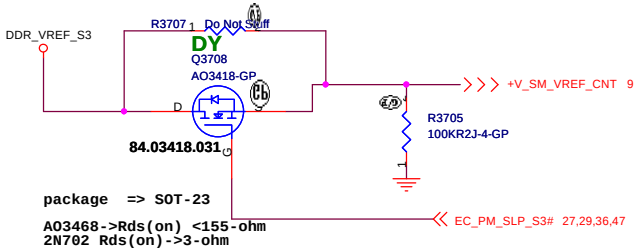
緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: **Power Plane Enable**

Size	Document Number	Rev
A3	Hummingbird2_CR	-2

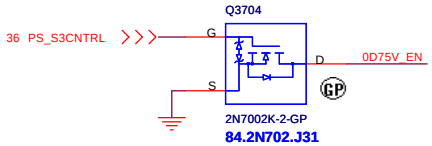
Date: Tuesday, April 17, 2012 Sheet 36 of 102

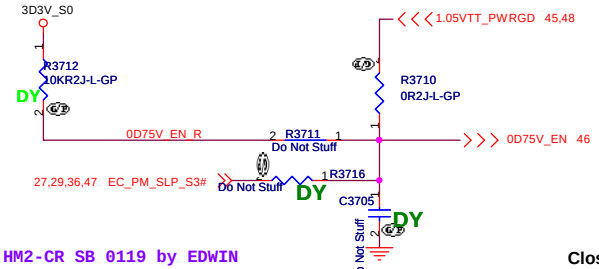
Close to CPU
S3 Power Reduction Circuit Processor VREF_DQ Implementation



package => SOT-23

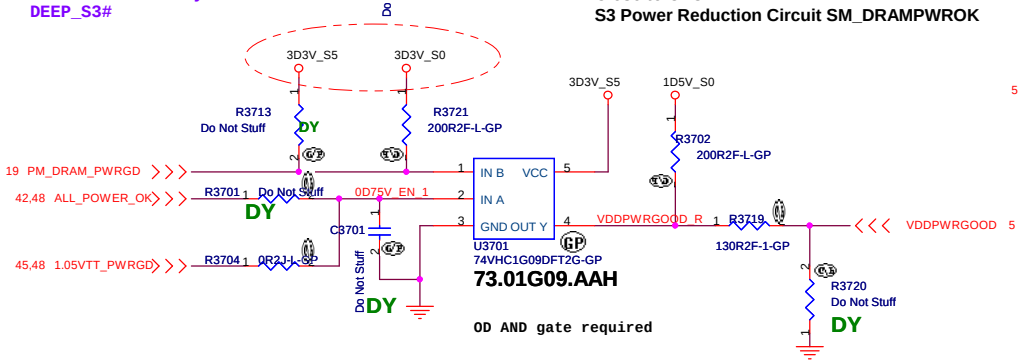
AO3468->Rds(on) <155-ohm
2N702 Rds(on)->3-ohm





HM2-CR SB 0119 by EDWIN
DEEP_S3#

Close to CPU
S3 Power Reduction Circuit SM_DRAMPWROK

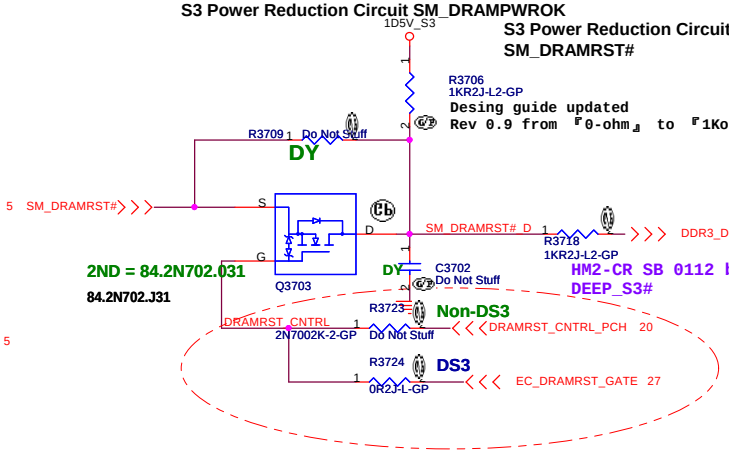


OD AND gate required

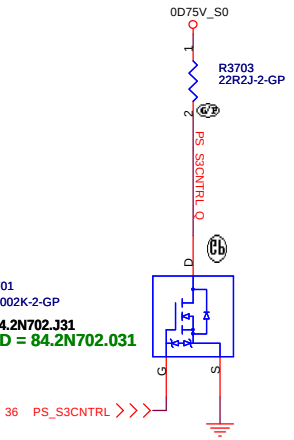
For U3701 not OD AND gate
R3719 to 64.15015.6DL
R3720 to 64.75005.6DL
R3702 to DY

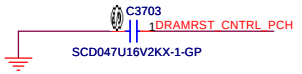
Close to CPU
S3 Power Reduction Circuit SM_DRAMPWROK

S3 Power Reduction Circuit
SM_DRAMRST#



Close to DIMM
S3 Power Reduction Circuit SM_DRAMPWROK





SM_DRAMPWROK must have a maximum of 15ns rise or fall time
over VDDQ * 0.55± 200mV and the edge must be monotonic

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: **ADAPTER**

Size	Document Number	Rev
A3	Hummingbird2_CR	-2

Date: Tuesday, April 17, 2012 Sheet 37 of 102

Move to small board

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***DCIN JACK***

Size	Document Number	Rev
A4	**Hummingbird2_CR**	-2

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Move to small board

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***BATT CONN***

Size	Document Number	Rev
A4	**Hummingbird2_CR**	**-2**

Date: Tuesday, April 17, 2012 Sheet 39 of 102

Move to small board

Elpida 1600 4G DS3 NONSSD 65W

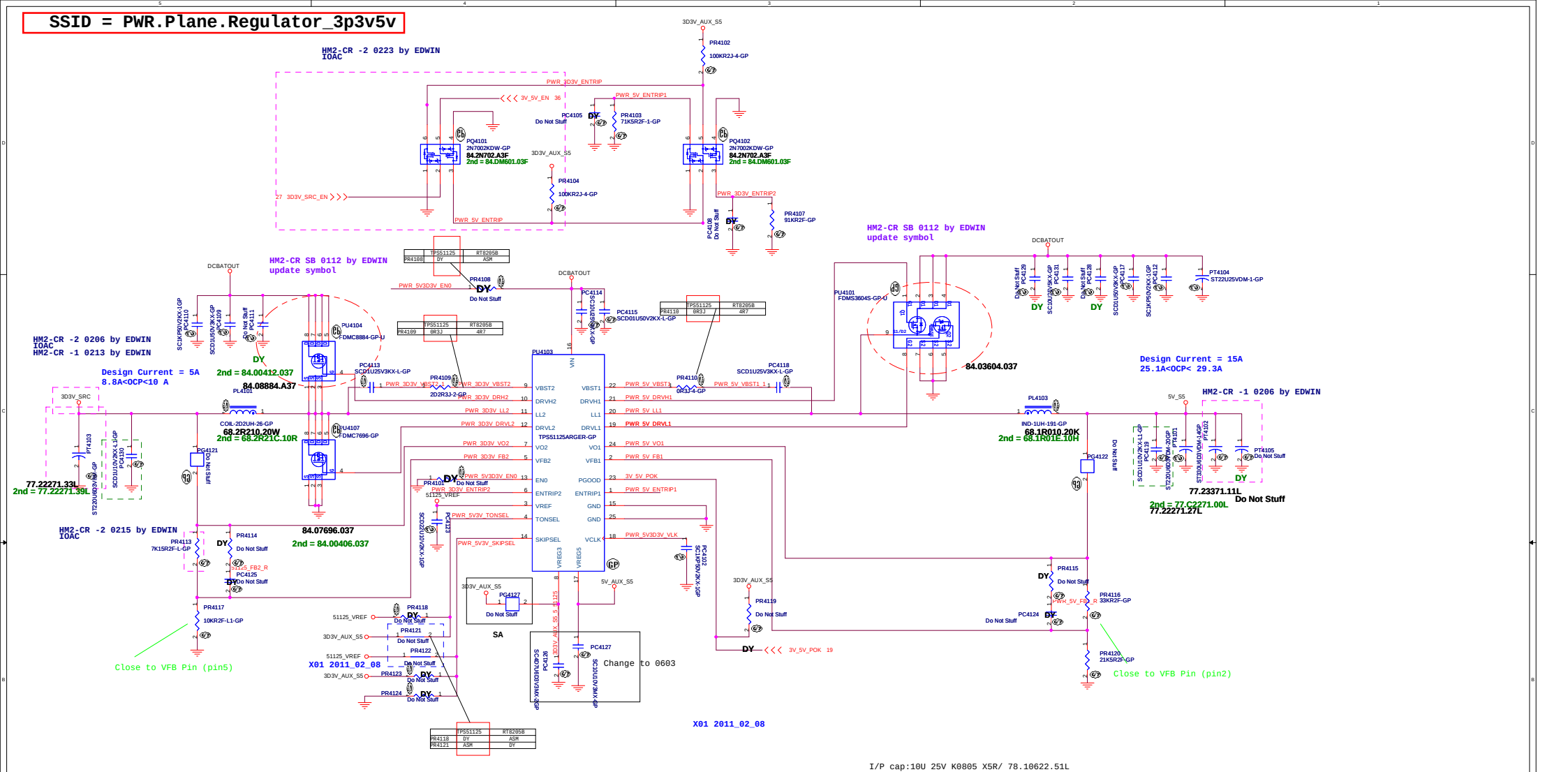
緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: CHARGER BQ24745

Size	Document Number	Rev
A3	Hummingbird2 CR	-2

Date: Tuesday, April 17, 2012 Sheet 40 of 102

SSID = PWR.Plane.Regulator_3p3v5v



I/P cap: 10U 25V K0805 X5R/ 78.10622.51L
Inductor: 2.2U PCMC063T-2R2MN Cyntec 18mohm/20mohm Isat =10Arms 68.2R210.20B
O/P cap: ST220U6D3VDM-20GP 25mOhm / 77.22271.27L
H/S: FDMC8884-GP / 22mOhm/30mOhm@4.5Vgs / 84.08884.A37
L/S: FDMC7692-GP / 9.5mOhm/11.5mOhm@4.5Vgs / 84.07692.A37

I/P cap:10U 25V K0805 X5R/ 78.10622.51L
Inductor: 1.50UH PCMC104T-1R5 Cyntec 3.8mohm/4.2mohm Isat =33Arms 68.1R510.10J
O/P cap: ST220U6D3VDM-20GP 25mOhm / 77.22271.27L
H/S: SIR172DP-T1-GE3-GP / 10.3mOhm/12.4mOhm@4.5Vgs / 84.00172.037
L/S: SIR460DP-T1-GE3-GP / 4.9mOhm/6.1mOhm@4.5Vgs / 84.00460.037

SKIPSEL	VREG3 or VREG5	VREF(2V)	GND
Operating Mode	OOA Auto Skip	Auto Skip	PWM only

EN0	Open	820kΩ to GND	GND
Operating Mode	enable both LDOs, VCLK on and ready to turn on switcher channels	enable both LDOs, VCLK off and ready to turn on switcher channels	disable all circuit

TPS51125:

TONSEL	CH1	CH2
GND	200kHz	265kHz
VREF	245kHz	305kHz
VREG3	300kHz	375kHz
VREG5	365kHz	460kHz

RT8205B:

TONSEL	CH1	CH2
GND	200kHz	250kHz
VREF	300kHz	375kHz
VREG3	365kHz	460kHz
VREG5	365kHz	460kHz

Elpida 1600 4G DS3 NONSSD 65W

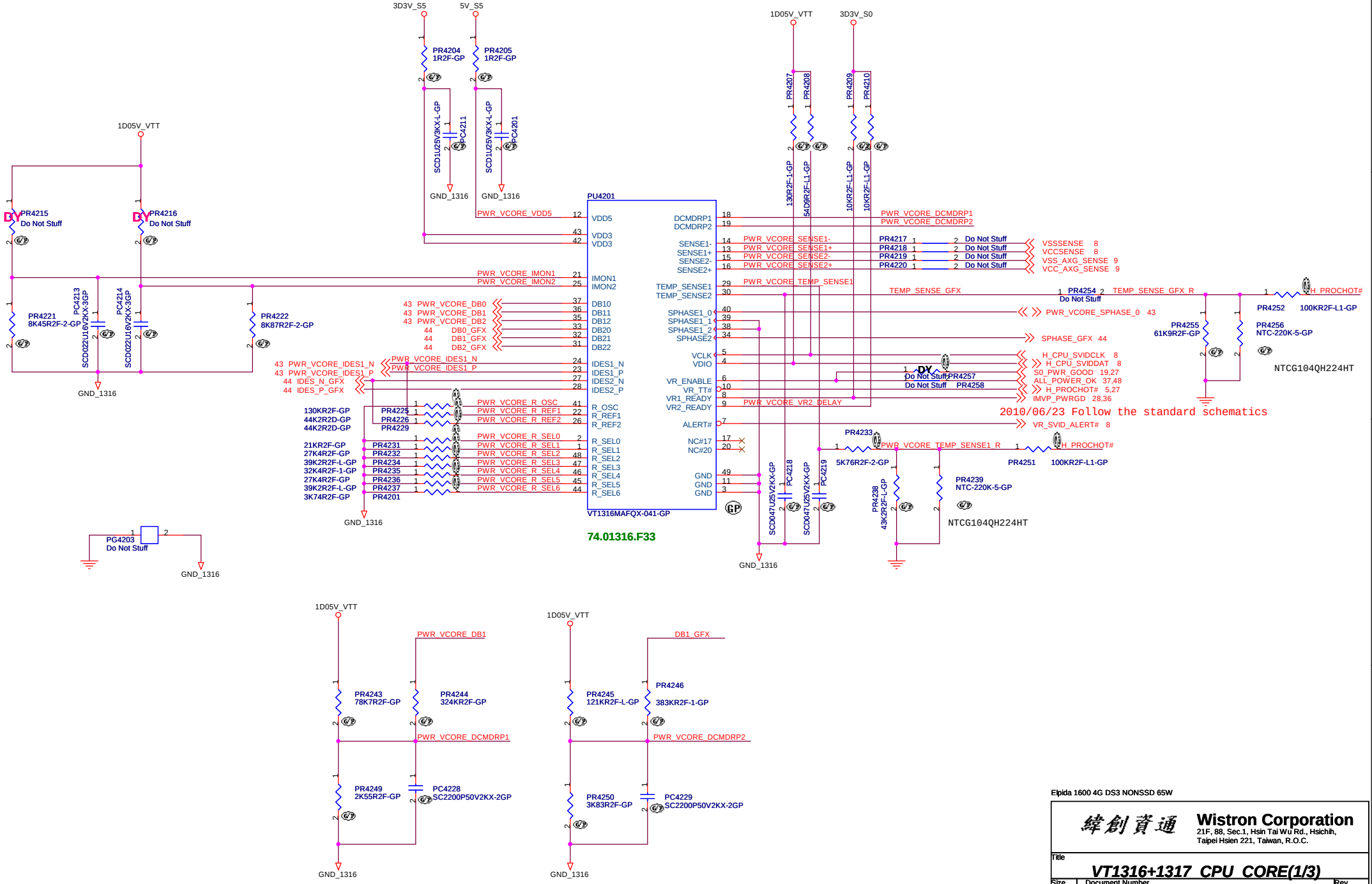
Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: TPS51125A_5V/3D3V

Size: Custom | Document Number: Hummingbird2_CR | Rev: -2

Date: Tuesday, April 17, 2012 | Sheet 41 of 102

SSID = CPU.Regulator



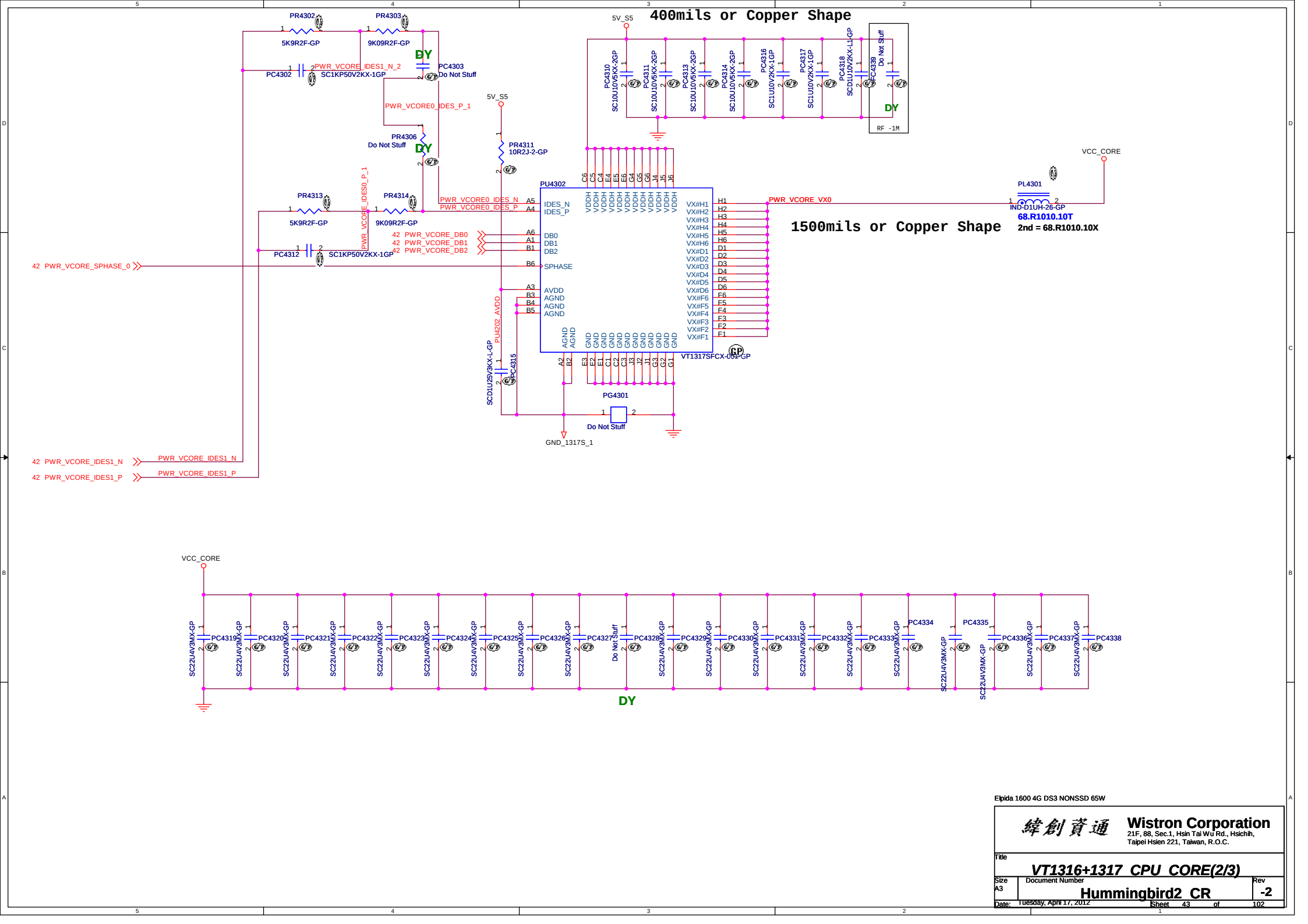
Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***VT1316+1317 CPU CORE(1/3)***

Size	Document Number	Rev
A3	**Hummingbird2 CR**	-2

Date: Tuesday, April 17, 2012 Sheet 42 of 102



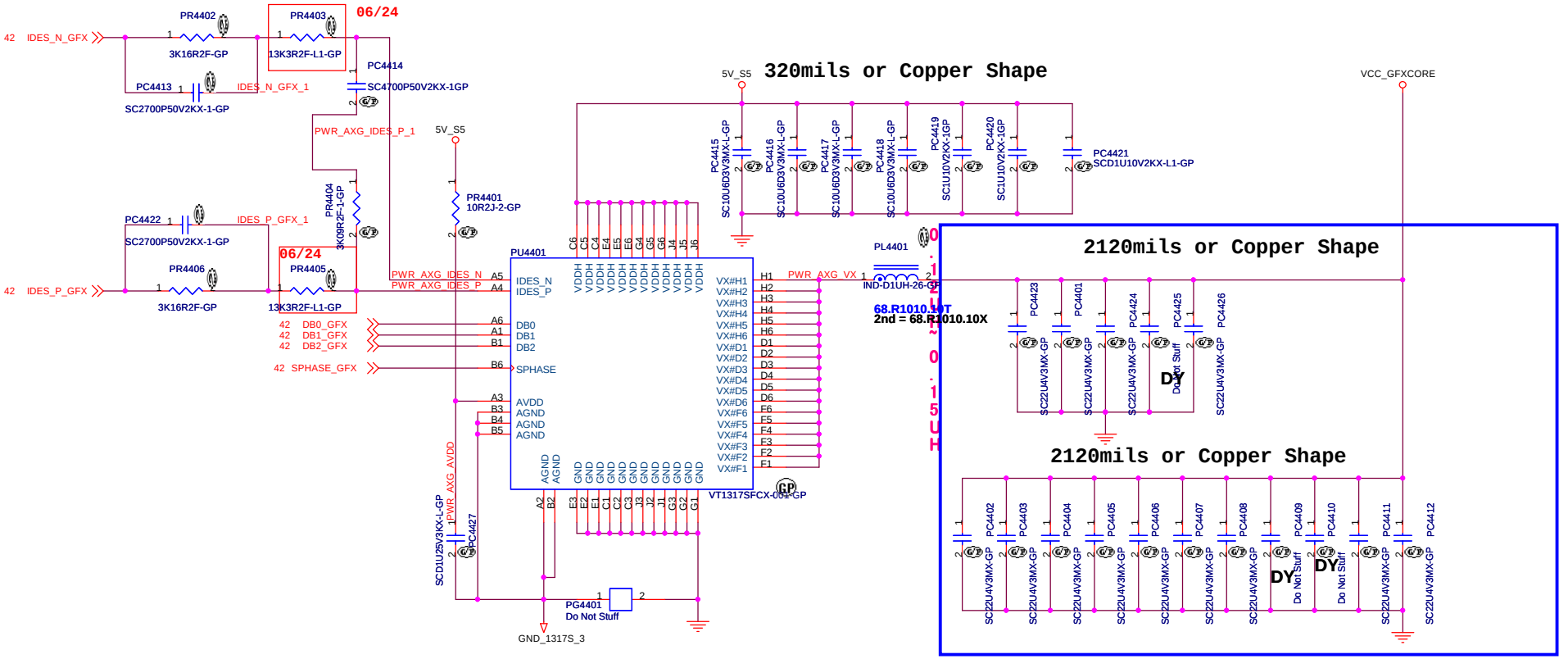
Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: *VT1316+1317 CPU CORE(2/3)*

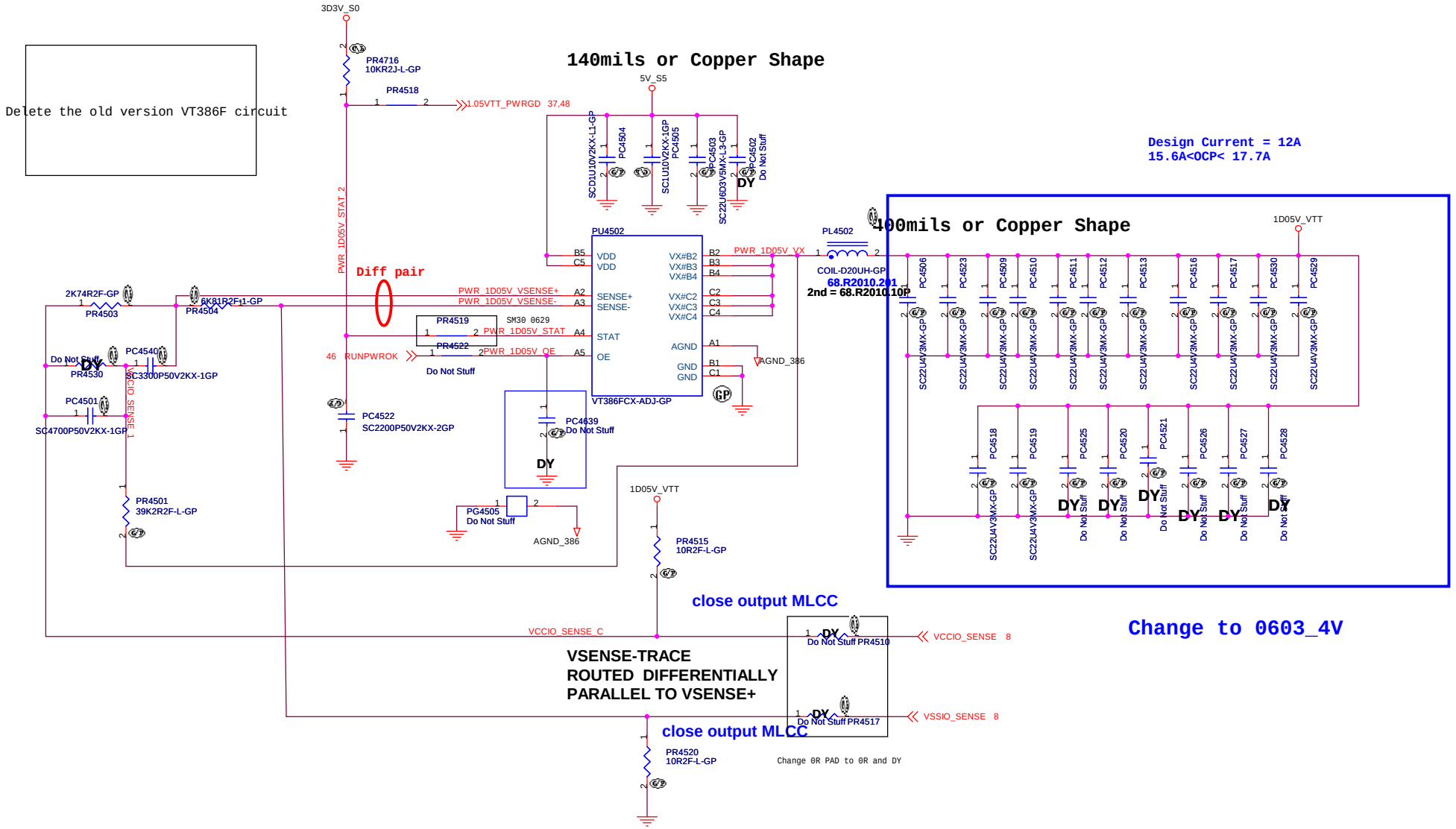
Size	Document Number	Rev
A3	Hummingbird2 CR	-2

Date: Tuesday, April 17, 2012 Sheet 43 of 102



Elpida 1600 4G DS3 NONSSD 65W

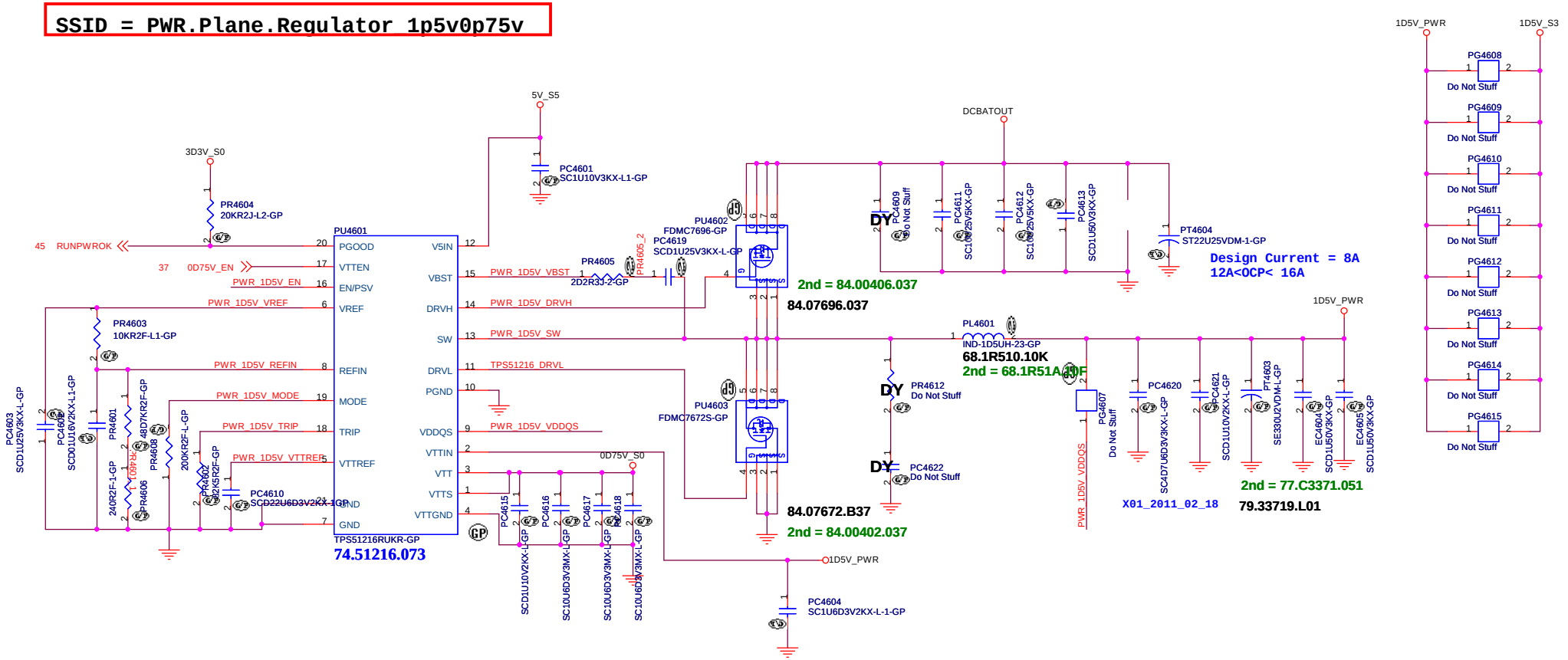
緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: *VT1316+1317 CPU CORE(3/3)*		
Size: A3	Document Number: Hummingbird2 CR	Rev: -2
Date: Tuesday, April 17, 2012	Sheet 44 of 102	



Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: VT386 +1.05V VTT		
Size: A3	Document Number: Hummingbird2 CR	Rev: -2
Date: Tuesday, April 17, 2012	Sheet 45 of 102	

SSID = PWR.Plane.Regulator 1p5v0p75v

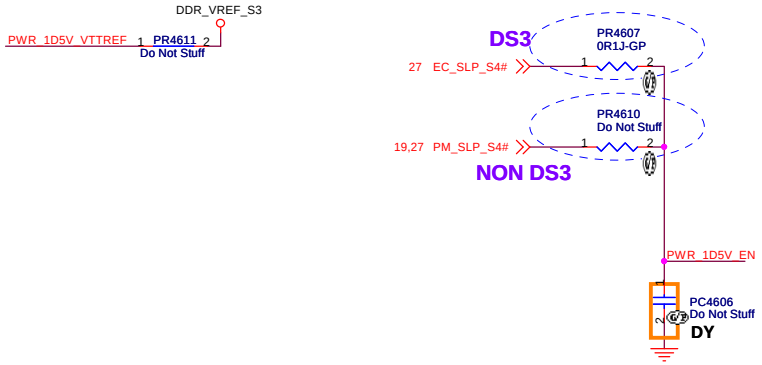


I/P cap: 10U 25V K0805 X5R/ 78.10622.51L
Inductor: IND-1D5UH-23-GP 14mohm/15mohm Isat =18Arms 68.1R510.10K
O/P cap: SE330U2VDM-L-GP 9mOhm / 79.33719.L01
H/S: SIS412DN-T1-GE3-GP / 24mOhm/30mOhm@4.5Vgs / 84.00412.037
L/S: SI7716ADN-T1-GE3-GP / 13.5mOhm/16.5mOhm@4.5Vgs / 84.07716.037

State	S3	S5	VDDR	VTTREF	VTT
S0	Hi	Hi	On	On	On
S3	Lo	Hi	On	On	Off(Hi-Z)
S4/S5	Lo	Lo	Off	Off	Off

MODE

PR5003	Frequency	Discharge Mode
200k ohm	400kHz	Tracking Discharge
100k ohm	300kHz	
68k ohm	300kHz	Non-tracking Discharge
47k ohm	400kHz	

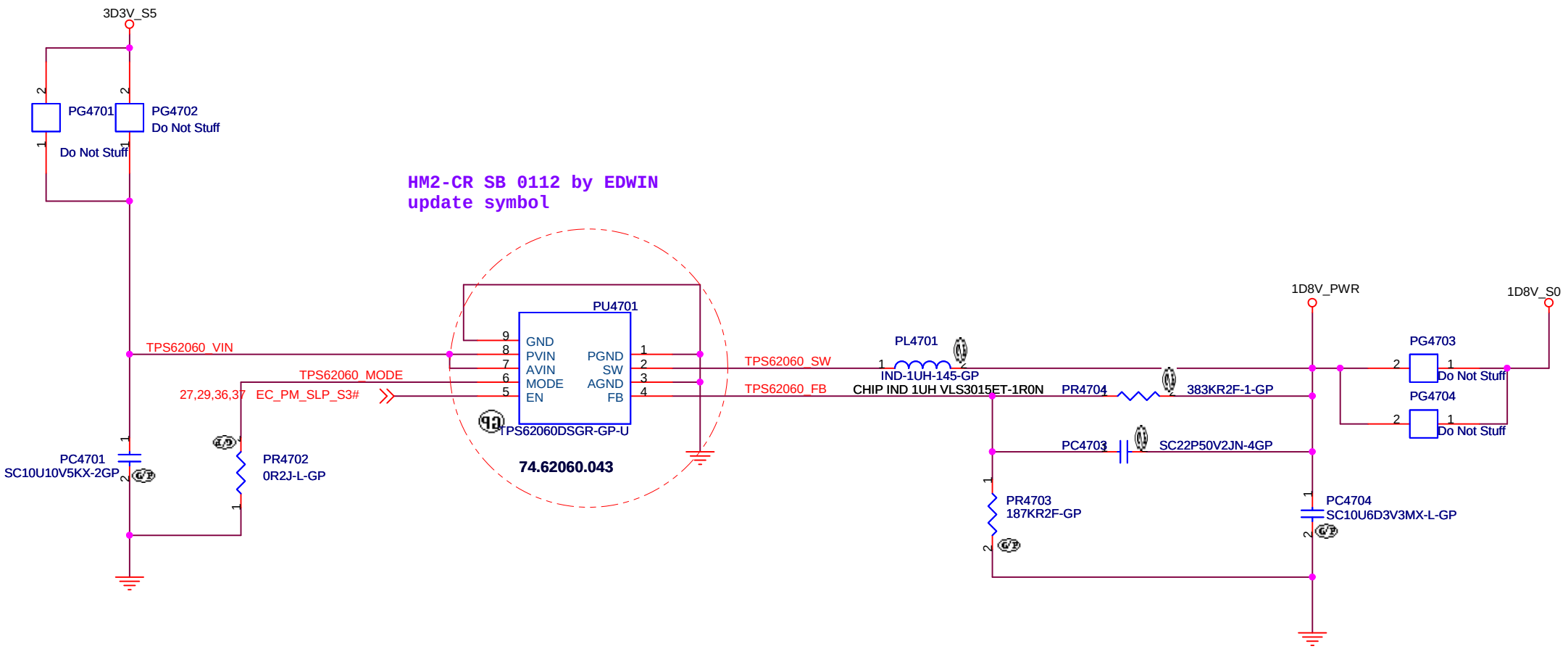


Elpida 1600 4G DS3 NONSSD 65W

Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: TPS51116 +1.5V SUS
Size: A3
Document Number: Hummingbird2 CR
Rev: -2
Date: Tuesday, April 17, 2012
Sheet 46 of 102

SSID = PWR.Plane.Regulator_1p8v



Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

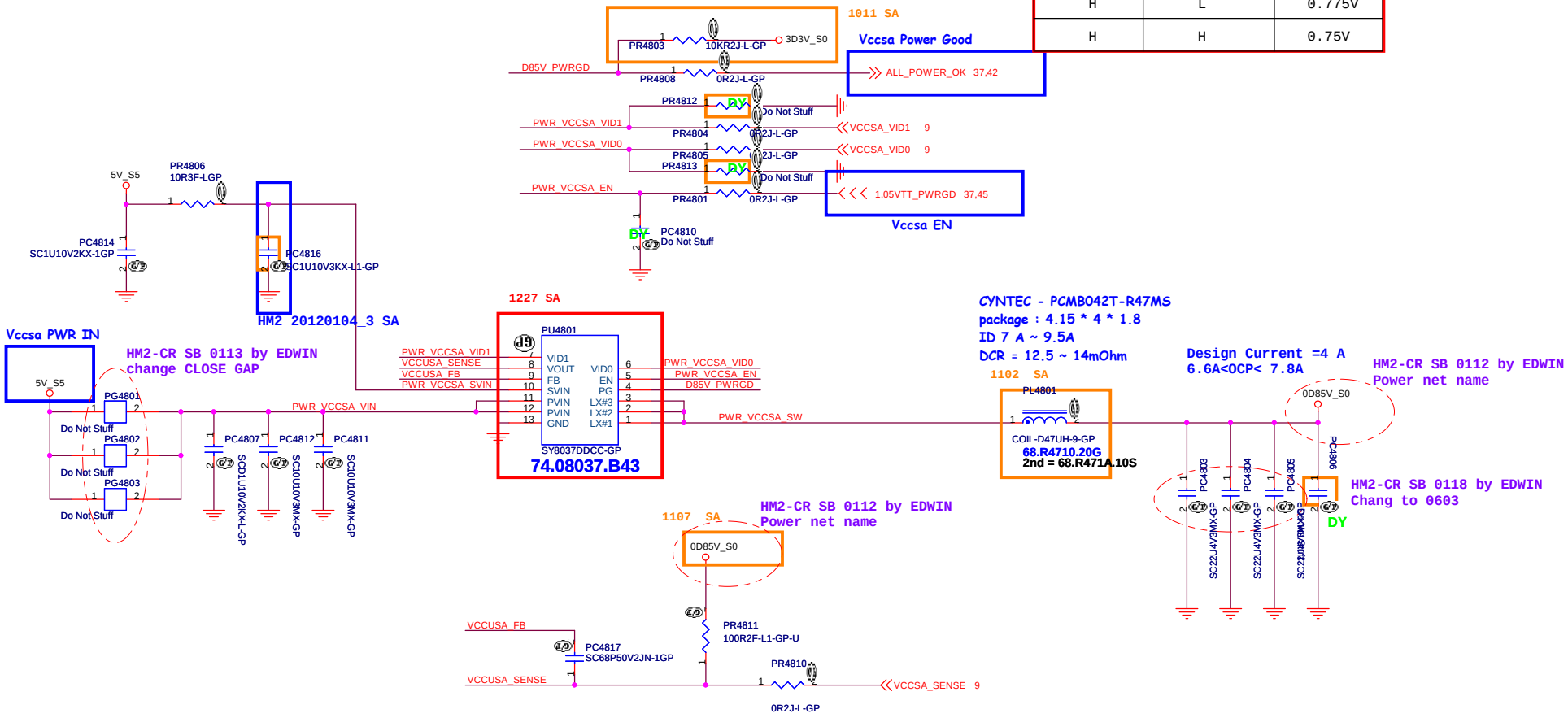
Title: ***DC CONVERTER_1D8V***

Size	Document Number	Rev
A4	Hummingbird2_CR	-2

Date: Tuesday, April 17, 2012 Sheet 47 of 102

SY8037 for VCCSA

VID0	VID1	VCCSA ULV
L	L	0.9V
L	H	0.85V
H	L	0.775V
H	H	0.75V



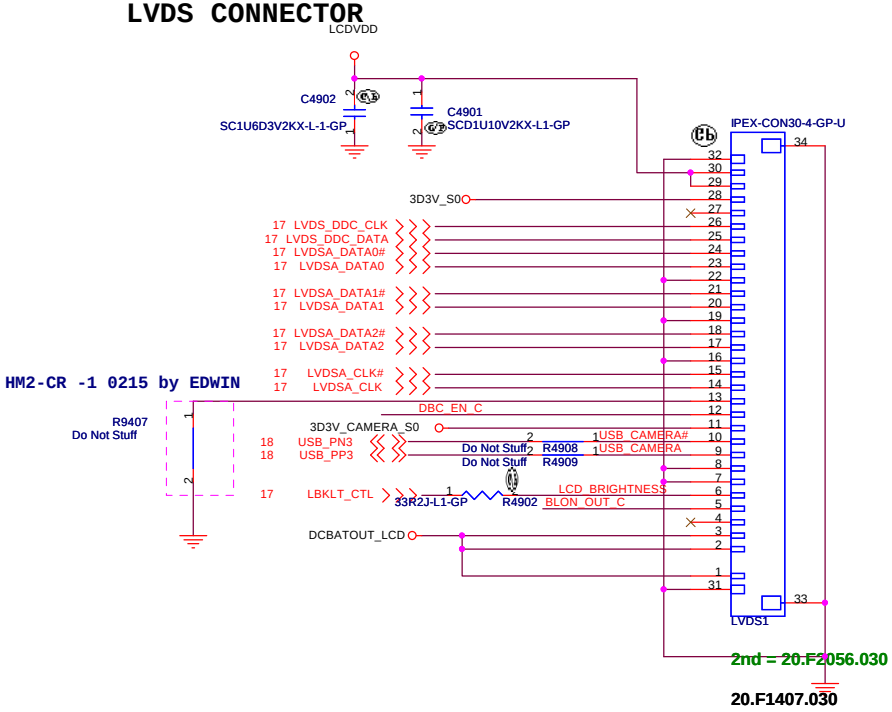
Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: TPS51461_VCCSA		
Size: A3	Document Number: Hummingbird2_CR	Rev: -2
Date: Tuesday, April 17, 2012	Sheet 48 of 102	

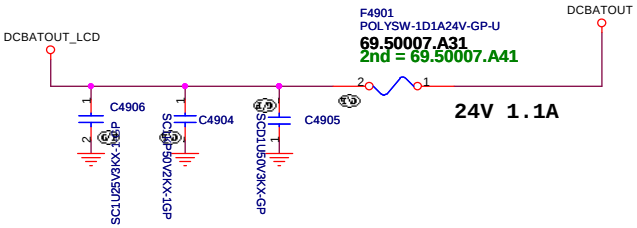
SSID = VIDEO

Reverse the pin define becasue of cable issue

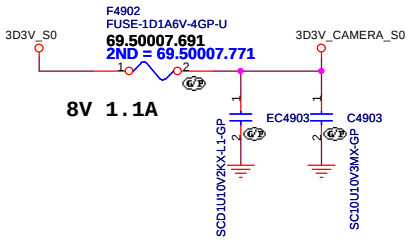
LVDS CONNECTOR



INVERTER POWER

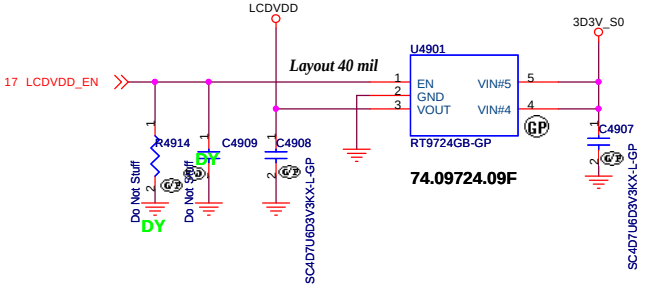


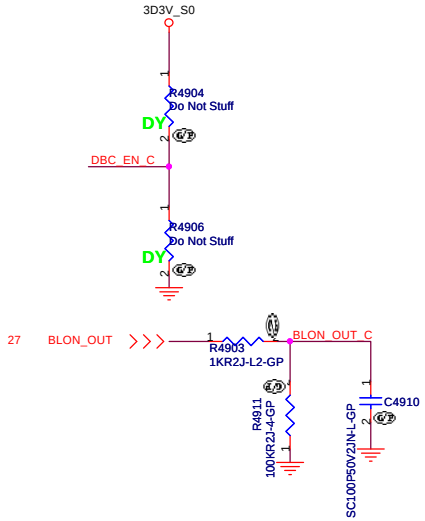
Camera Power



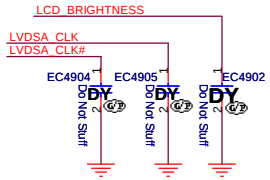
SSID = VIDEO

LCD POWER for ANNIE





For EMI request
Close to LVDS connector



Elpida 1600 4G DS3 NONSSD 65W

Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: LCD Connector

Size	Document Number	Rev
A3	Hummingbird2_CR	-2

Date: Tuesday, April 17, 2012 Sheet 49 of 102

Pull High 5V Design on CRT Board

CRT DDCDATA & DDCCLK level shift

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: CRT Connector

Size	Document Number	Rev
A3	Hummingbird2_CR	-2

Date: Tuesday, April 17, 2012 Sheet 50 of 102

SSID = VIDEO

HDMI Level Shifter & CONNECTOR

17 HDMI_CLK_R#
17 HDMI_CLK_R
17 HDMI_DATA0_R#
17 HDMI_DATA0_R
17 HDMI_DATA1_R#
17 HDMI_DATA1_R
17 HDMI_DATA2_R#
17 HDMI_DATA2_R

Close to HDMI Connector

HDMI_CLK_R#
HDMI_CLK_R
HDMI_DATA0_R#
HDMI_DATA0_R
HDMI_DATA1_R#
HDMI_DATA1_R
HDMI_DATA2_R#
HDMI_DATA2_R

RN5114
SRN499F-GP
RN5115
SRN499F-GP

Intel desging suggestion Stuff 680-ohm,
CRB board stuff 618-ohm
TM said that following JE40_HR stuff 499-ohm

HDMI_PLL_GND

Q5105
2N7002K-2-GP
84.2N702.J31
2ND = 84.2N702.031

5V_S0

HDMI1
SKT-HDMI25-GP-GP

HDMI_DATA2_R
HDMI_DATA2_R#
HDMI_DATA1_R
HDMI_DATA1_R#
HDMI_DATA0_R
HDMI_DATA0_R#
HDMI_CLK_R
HDMI_CLK_R#
DDC_CLK_HDMI
DDC_DATA_HDMI
5V_HDMI

2nd = 22.10296.311
3rd = 22.10296.501
22.10296.271

5V_S0
F5101
FUSE-1D1A6V-4GP-U
69.50007.691
8V 1.1A
2nd = 69.50007.771

FC5101
Do Not Stuff
DY

HPD_HDMI_CON

3D3V_S0
84.03904.L06
2ND = 84.03904.P11
Q5102
PMBS3904-1-GP
HDMI_HPD_B
R5111
150KR2J-L1-GP
R5110
Do Not Stuff
DY

R5128
HDMI_DET
0R2J-L-GP
HDMI_PCH_DET 17
R5112
10KR2J-L-GP

Close to Level Shift

3D3V_S0
RN5101
SRN2K2J-1-GP

17 PCH_HDMI_CLK
17 PCH_HDMI_DATA

DDC_CLK_HDMI
DDC_DATA_HDMI

Q5104
2N7002KDW-GP
84.2N702.A3F
2nd = 84.DM601.03F

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: HDMI Level Shifter/Connector
Size: A3
Document Number: Hummingbird2_CR
Rev: -2
Date: Tuesday, April 17, 2012
Sheet 51 of 102

LED BACKLIGHT CONVERTER POWER

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: eDP

Size	Document Number	Rev
A3	Hummingbird2_CR	-2

Date: Tuesday, April 17, 2012 Sheet 52 of 102

(Blanking)

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation** 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: ***S-VIDEO***		
Size: A4	Document Number: **Hummingbird2_CR**	Rev: **-2**
Date: Tuesday, April 17, 2012	Sheet 53 of 102	

(Blanking)

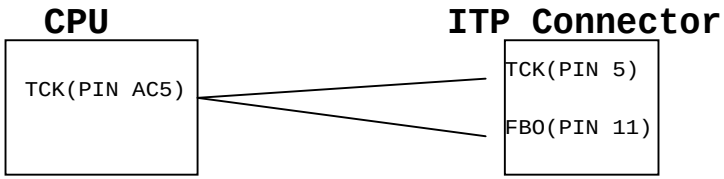
Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: ***Reserved***		
Size: A4	Document Number: **Hummingbird2_CR**	Rev: **-2**
Date: Tuesday, April 17, 2012	Sheet 54 of 102	

SSID = User.Interface

ITP Connector

H_CPURST# use pull-up Resistor close ITP connector 500 mil (max), others place near CPU side.

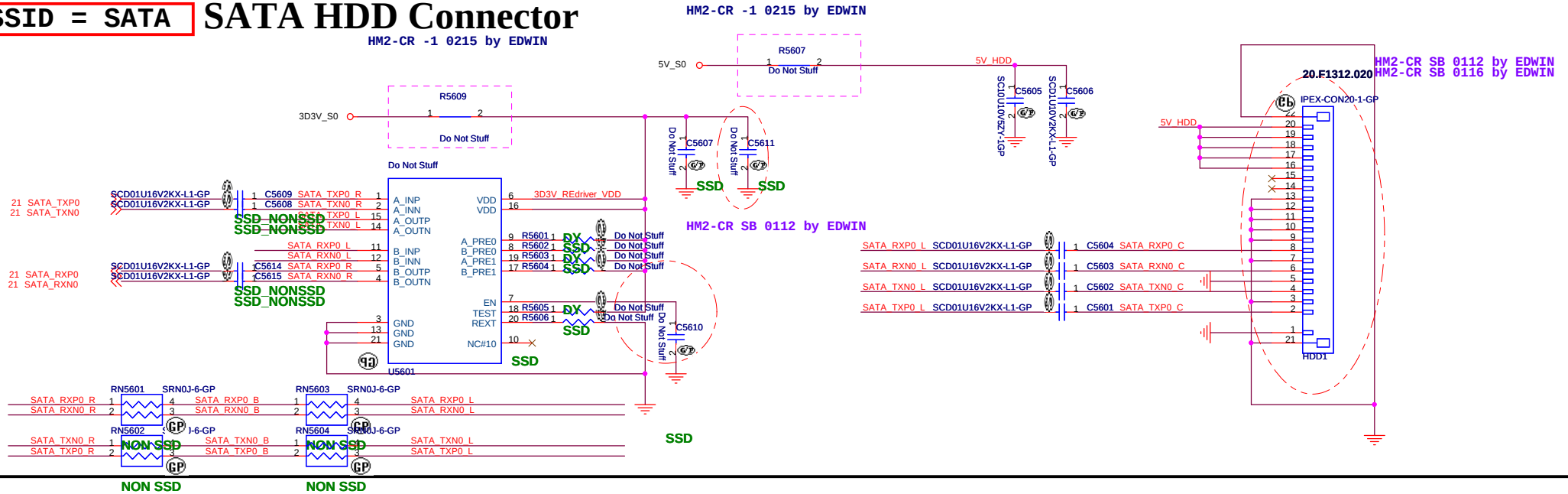


Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: ITP		
Size: A4	Document Number: Hummingbird2_CR	Rev: -2
Date: Tuesday, April 17, 2012	Sheet 55 of 102	

SSID = SATA

SATA HDD Connector



ODD Connector

Without ODD

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: HDD/ODD		
Size: A3	Document Number: Hummingbird2_CR	Rev: -2
Date: Tuesday, April 17, 2012	Sheet 56 of 102	

ESATA Power

USB CHARGER

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: *E-SATA/USB CHARGER*

Size	Document Number	Rev
A3	Hummingbird2_CR	-2

Date: Tuesday, April 17, 2012 Sheet 57 of 102

SSID = AUDIO

HM2-CR SB 0112 by EDWIN
update symbol

LOUT1
AUDIO-JK300-GP
22.10270.D31
this symbol is not correct

COMBO_MIC_C
AUD_HP1_JD#
AUD_HP1_JACK_R1
AUD_HP1_JACK_L1
AUD_AGND
0R2J-L-GP
R5821
COMBO_MIC
COMBO_MIC 29
AUD_HP1_JD# 29
L5801
BLM18BD601SN1D-GP
68.00082.531
AUD_HP1_JACK_R2 29
L5802
BLM18BD601SN1D-GP
68.00082.531
AUD_HP1_JACK_L2 29
EC5801
Do Not Stuff
DY
EC5815
EC5813
MLVS0603M04-1-GP
AUD_AGND

3D3V_S0
R5828
Do Not Stuff
DY
HM2-CR -1 0220 by EDWIN
DMIC1
29 DMIC_DATA
29 DMIC_CLK
DATA
CLK
GND
GND
POWER
L/R
MICROPHONE-52-GP
C5810
SCD1U10V2KX-L1-GP
R5829
Do Not Stuff

3D3V_S0
Do Not Stuff
DMIC2
Do Not Stuff
DY

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: Audio Jack		
Size: A4	Document Number: Hummingbird2_CR	Rev: -2
Date: Tuesday, April 17, 2012	Sheet 58 of 102	

1.route on bottom as differential pairs.
2.Tx+/Tx- are pairs. Rx+/Rx- are pairs.
3.No vias, No 90 degree bends.
4.pairs must be equal lengths.
5.6mil trace width,12mil separation.
6.36mil between pairs and any other trace.
7.Must not cross ground moat,except
RJ-45 moat.

Without LAN

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

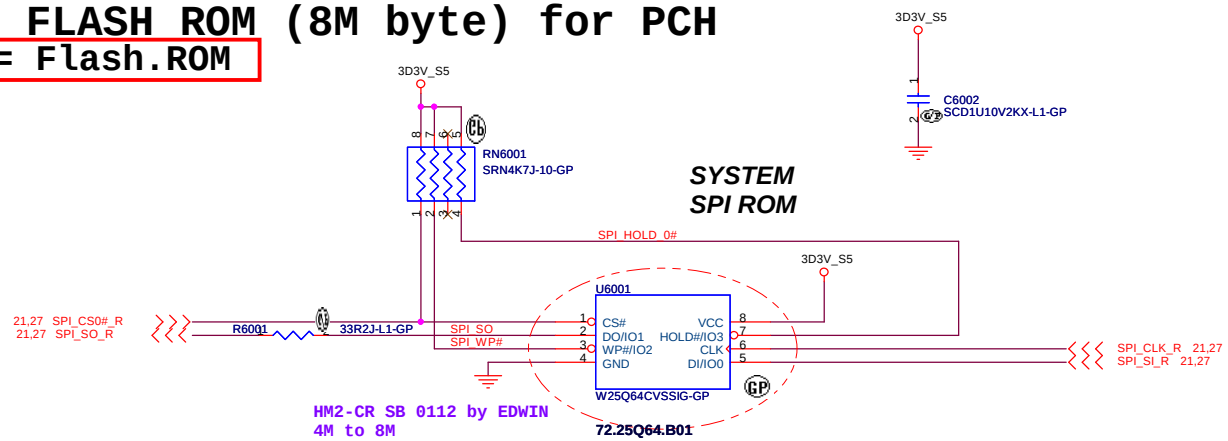
Title: LAN CONNECTOR

Size	Document Number	Rev
A4	Hummingbird2_CR	-2

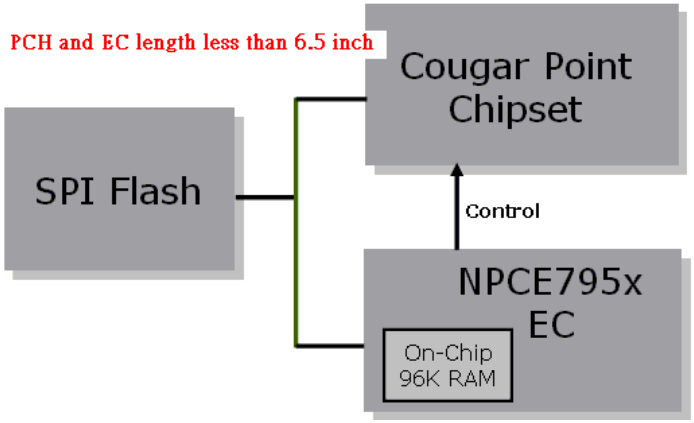
Date: Tuesday, April 17, 2012 Sheet 59 of 102

SPI FLASH ROM (8M byte) for PCH

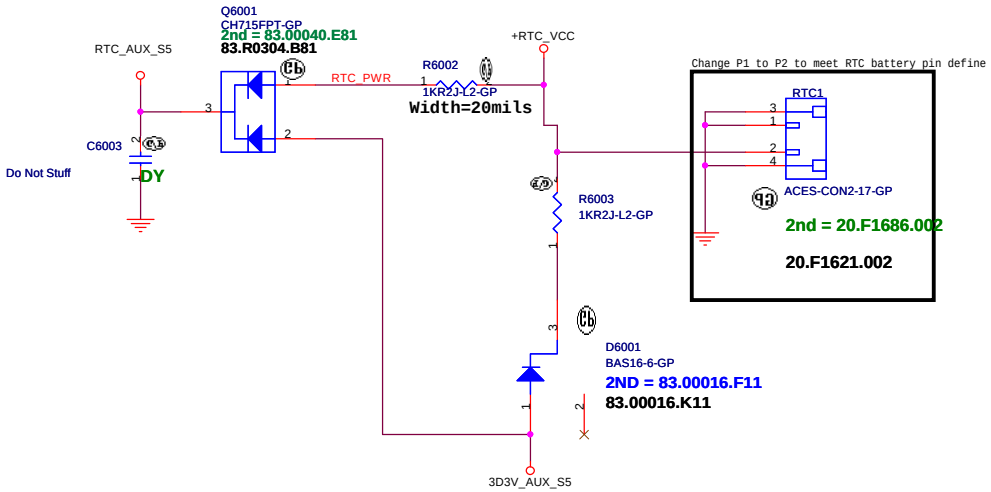
SSID = Flash.ROM



SPI ROM Equal length need to less than 500mil
SPI ROM Equal length need to less than 500mil



SSID = RBATT



RTC battery charger sircuit

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: *Flash/RTC*		
Size: A3	Document Number: Hummingbird2 CR	Rev: -2
Date: Tuesday, April 17, 2012	Sheet 60 of 102	

SSID = USB

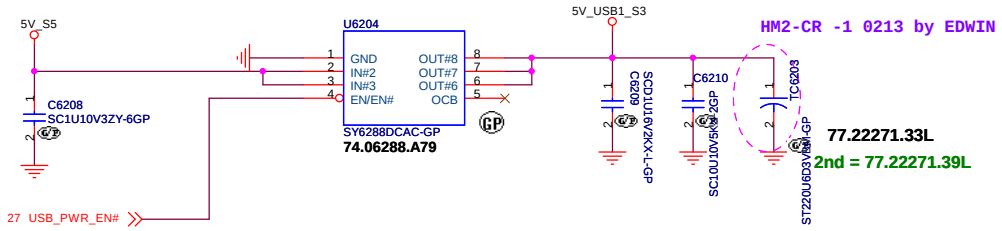
Elpida 1600 4G DS3 NONSSD 65W

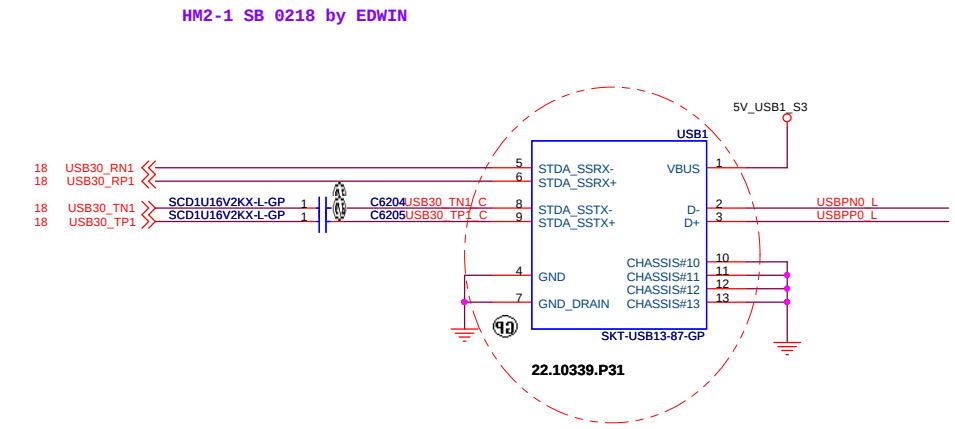
緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

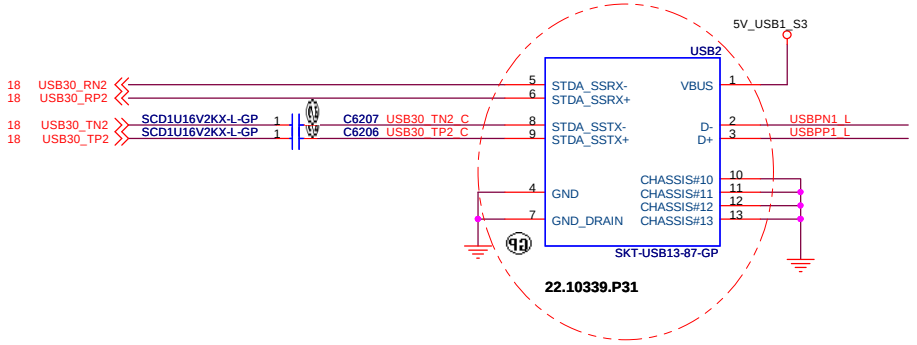
Title: ***USB Power SW***

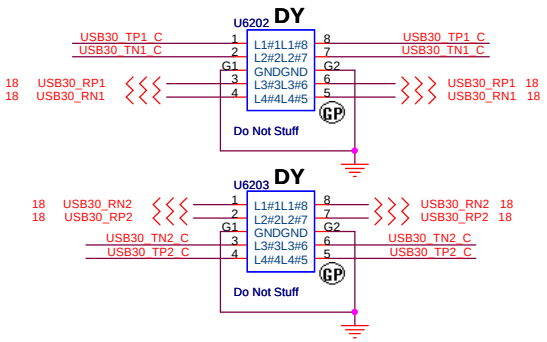
Size	Document Number	Rev
A3	Hummingbird2_CR	-2

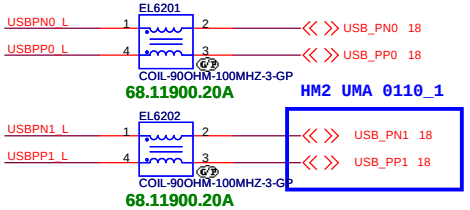
Date: Tuesday, April 17, 2012 Sheet 61 of 102











USB 3.0 Connector Pin definition		
1	POWER	
2	USB 2.0 D-	
3	USB 2.0 D+	
4	GND	
5	StdA_SSRX-	SuperSpeed RX
6	StdA_SSRX+	
7	GND	
8	StdA_SSTX-	SuperSpeed TX
9	StdA_SSTX+	

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: USB 3.0 Port

Size: A3 | Document Number: Hummingbird2_CR | Rev: -2

Date: Tuesday, April 17, 2012 | Sheet 62 of 100

SSID = User.Interface

Bluetooth Module conn.

Without BT

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

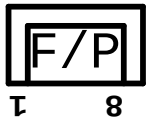
Title: ***Bluetooth***

Size	Document Number	Rev
A4	Hummingbird2_CR	-2

Date: Tuesday, April 17, 2012 Sheet 63 of 102

Finger printer

JE40 delete FP function



Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: ***RESERVED***		
Size: A4	Document Number: **Hummingbird2_CR**	Rev: **-2**
Date: Tuesday, April 17, 2012	Sheet 64 of 102	

SSID = Wireless

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***MINICARD(WLAN)/ITP CONN***

Size	Document Number	Rev
A4	Hummingbird2_CR	-2

Date: Tuesday, April 17, 2012 Sheet 65 of 102

SSID = Wireless

Blanking

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***WWAN Connector***

Size	Document Number	Rev
A4	Hummingbird2_CR	-2

Date: Tuesday, April 17, 2012 Sheet 66 of 102

Blanking

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***M-SATA***

Size	Document Number	Rev
A4	Hummingbird2_CR	-2

Date: Tuesday, April 17, 2012 Sheet 67 of 102

SSID = User.Interface

Move to power board

for factory test

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: LED Bard/Power Button

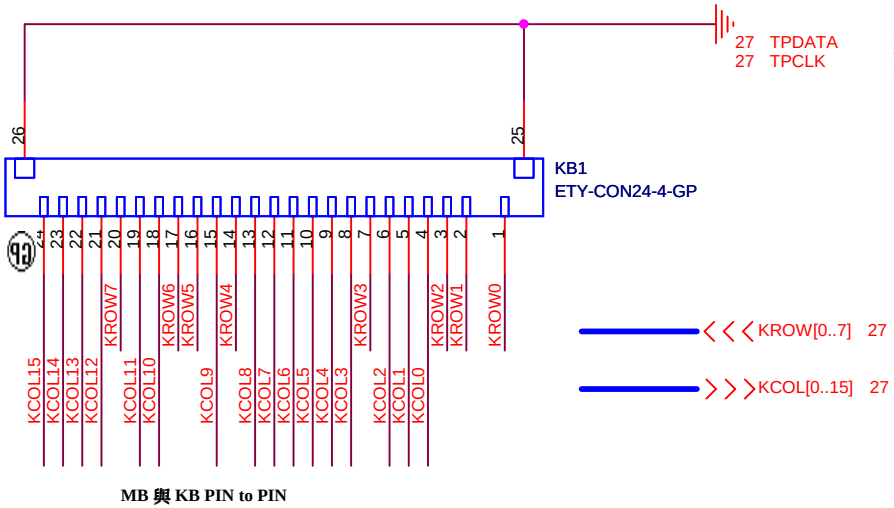
Size	Document Number	Rev
Custom	Hummingbird2_CR	-2

Date: Tuesday, April 17, 2012 Sheet 68 of 102

TOUCH PAD

SSID = KBC

Internal KeyBoard Connector

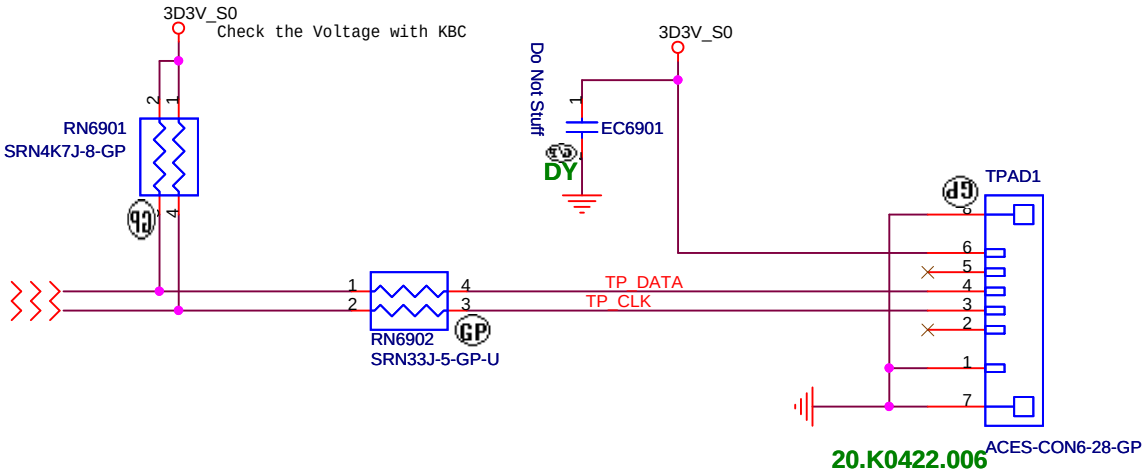


MB 與 KB PIN to PIN

1 K/B 26

Change KB from 下接觸 to 上接觸

KB Pin define need to check again



Change back to 1mm pin pitch connector

Switch the pin order SA

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***Key Board/Touch Pad***

Size	Document Number	Rev
A4	**Hummingbird2 CR**	-2

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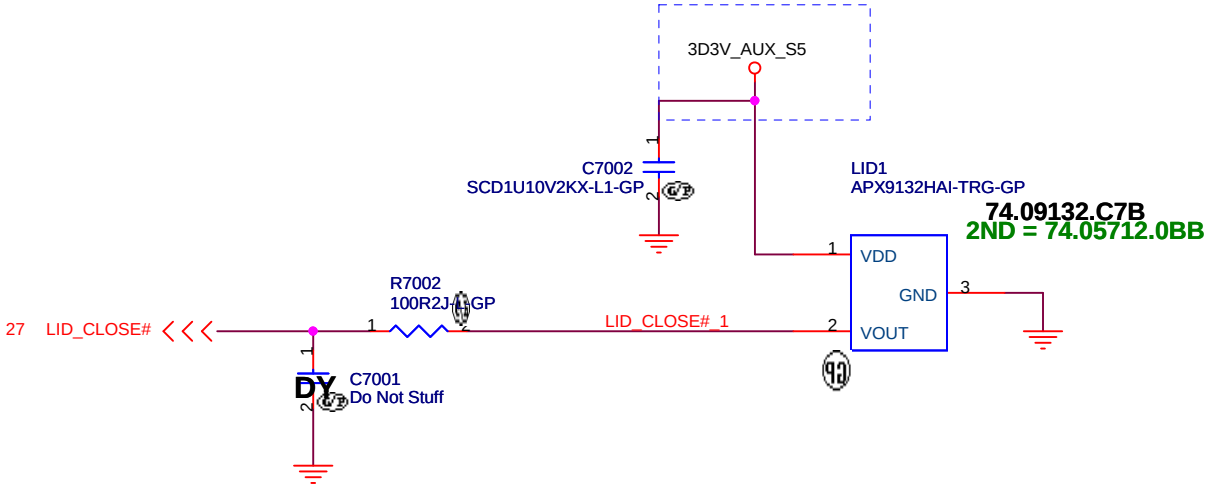
Change from 3D3V_AUX_KBC to 3D3V_AUX_S5



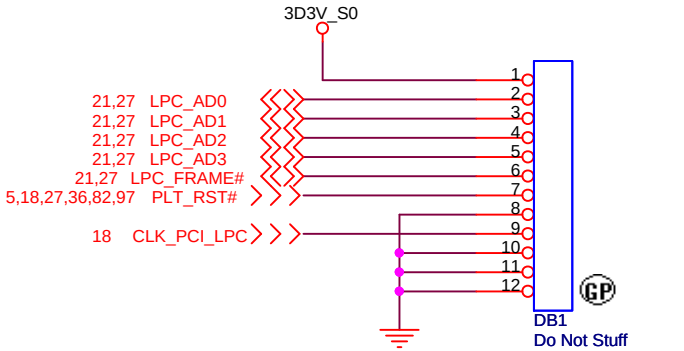
Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***Hall Sensor***

Size	Document Number	Rev
A4	**Hummingbird2_CR**	-2

Date: Tuesday, April 17, 2012 Sheet 70 of 102



Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***Dubug connector***

Size	Document Number	Rev
A4	**Hummingbird2_CR**	**-2**

Date: Tuesday, April 17, 2012 Sheet 71 of 102

(Blanking)

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: ***Reserved***		
Size: A4	Document Number: **Hummingbird2_CR**	Rev: **-2**
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(Blanking)

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: ***Reserved***		
Size: A4	Document Number: **Hummingbird2_CR**	Rev: **-2**
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SD/XD/MS Card Reader

Card reader move to small board

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: *CARD Reader CONN*		
Size: A4	Document Number: Hummingbird2_CR	Rev: -2
Date: Tuesday, April 17, 2012	Sheet 74 of 102	

SSID = ExpressCard

+1.5V_CARD Max. 650mA, Average 500mA.
+3.3V_CARD Max. 1300mA, Average 1000mA
+3.3V_CARDAUX Max. 275mA

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***New Card***

Size	Document Number	Rev
A3	Hummingbird2_CR	-2

Date: Tuesday, April 17, 2012 Sheet 75 of 102

(Blanking)

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation** 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: ***Reserved***		
Size: A4	Document Number: **Hummingbird2_CR**	Rev: **-2**
Date: Tuesday, April 17, 2012	Sheet 76 of 102	

(Blanking)

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation** 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: ***Reserved***		
Size: A4	Document Number: **Hummingbird2_CR**	Rev: **-2**
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(Blanking)

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: ***Reserved***		
Size: A4	Document Number: **Hummingbird2_CR**	Rev: **-2**
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SSID = User.Interface

Free Fall Sensor

Note
- no via, trace, under the sensor (keep out area around 2mm)
- stay away from the screw hole or metal shield soldering joints
- design PCB pad based on our sensor LGA pad size (add 0.1mm)
- solder stencil opening to 90% of the PCB pad size
- mount the sensor near the center of mass of the NB as possible as you can

Delete G Sensor Function

Note
(1) Keep all signals are the same trace width. (included VDD, GND).
(2) No VIA under IC bottom.

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
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Title: *Free Fall Sensor*

Size	Document Number	Rev
A4	Hummingbird2_CR	-2

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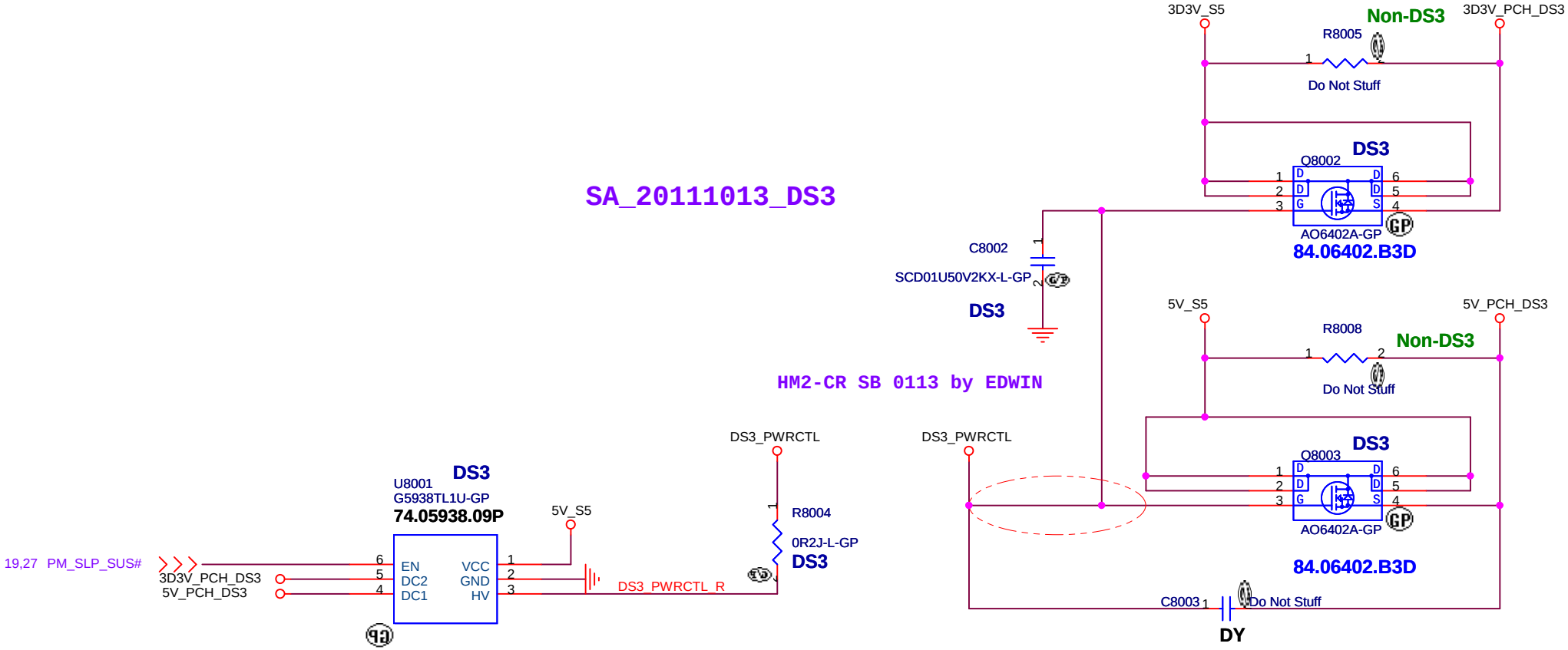
SA_20111013_DS3

HM2-CR SB 0113 by EDWIN



Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***Reserved***

Size	Document Number	Rev
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(Blanking)

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation** 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: ***Reserved***		
Size: A4	Document Number: **Hummingbird2_CR**	Rev: **-2**
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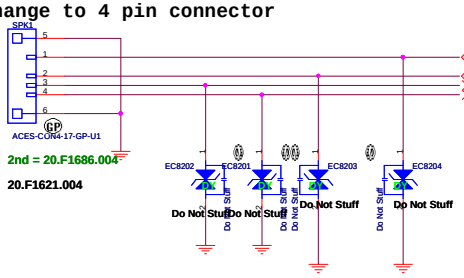
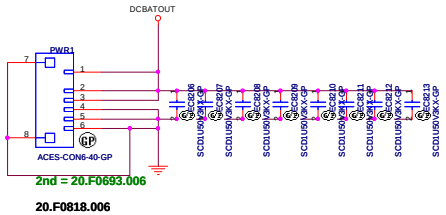
Change to 4 pin connector



2nd = 20.F1686.004

20.F1621.004

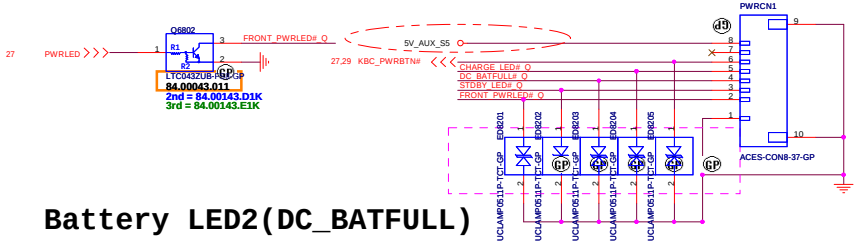
Change the connection



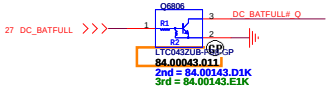
2nd = 20.F0693.006

20.F0818.006

HM2-CR SB 0113 by EDWIN

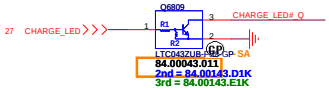


Battery LED2(DC_BATFULL)

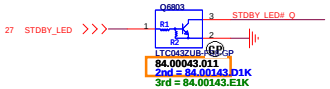


HM2-CR -1 0220 by EDWIN
for EMI request

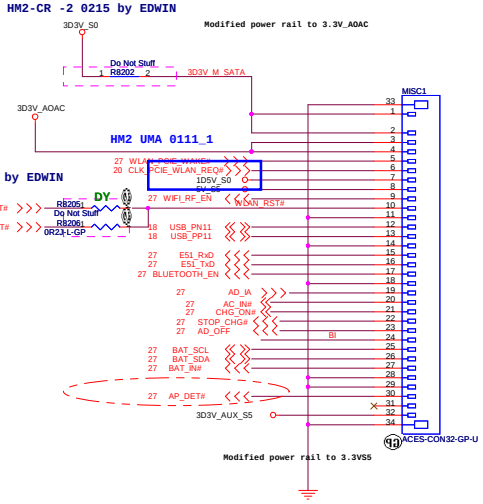
Battery LED1(CHARGE)



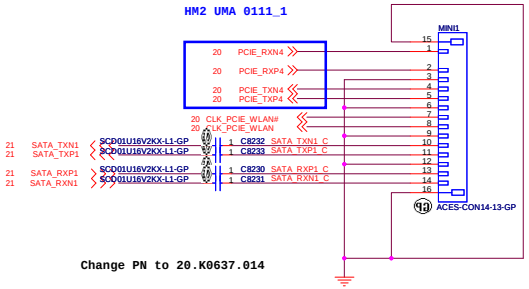
Power STDBY_LED



HM2-CR -2 0215 by EDWIN

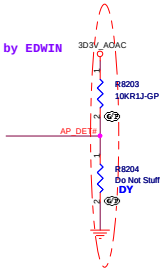


HM2 UMA 0111_1

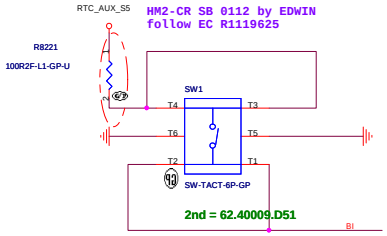


Change PN to 20.K0637.014

HM2-CR SB 0118 by EDWIN

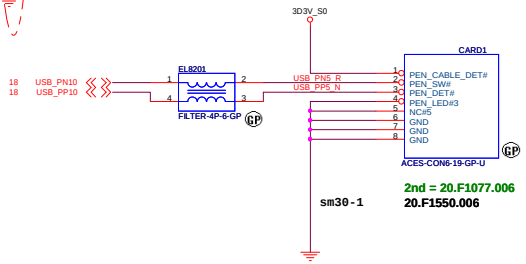


HM2-CR SB 0112 by EDWIN
follow EC R1119625



2nd = 62.40009.D51

62.40009.B71



2nd = 20.F1077.006

20.F1550.006

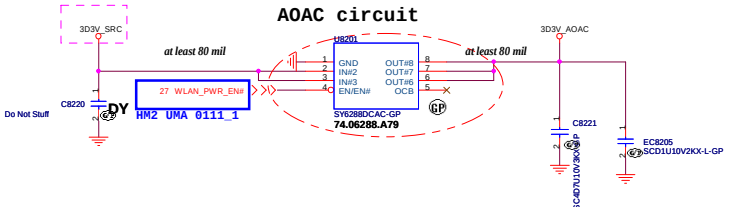
sm30-1

HM2-CR -2 0206 by EDWIN
IOAC

HM2-CR SB 0118 by EDWIN
Change solution as SM30

HM2-CR -1 0206 by EDWIN
Remove 2nd source

AOAC circuit



Implement the battery reset function

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: IO Board Connector

Size: A2 | Document Number: Hummingbird2_CR | Rev: -2

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Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: GPU_PCIE/STRAPPING(1/5)		
Size: A2	Document Number: Hummingbird2_CR	Rev: -2
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Elpida 1600 4G DS3 NONSSD 65W

緯創資通

Wistron Corporation

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title

GPU Memory(2/5)

Size	Document Number	Rev
Custom	Hummingbird2_CR	-2
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Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: GPU_DP/LVDS/CRT/GPIO(3/5)		
Size: Custom	Document Number: Hummingbird2_CR	Rev: -2
Date: Tuesday, April 17, 2012	Sheet 85 of 102	

Elpida 1600 4G DS3 NONSSD 65W

緯創資通	**Wistron Corporation** 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
File	***GPU_POWER(4/5)***	
Size A1	Document Number **Hummingbird2_CR**	Rev -2
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Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: GPU_DPPWR/GND(5/5)

Size	Document Number	Rev
A3	Hummingbird2_CR	-2

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Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***GPU-VRAM1,2 (1/4)***

Size	Document Number	Rev
Custom	**Hummingbird2_CR**	**-2**

Date: Tuesday, April 17, 2012 Sheet 88 of 102

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***GPU-VRAM3,4 (2/4)***

Size	Document Number	Rev
Custom	Hummingbird2_CR	-2
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Elpida 1600 4G DS3 NONSSD 65W

緯創資通

Wistron Corporation

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***GPU-VRAM5,6 (3/4)***

Size	Document Number	Rev
Custom	Hummingbird2_CR	-2
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Elpida 1600 4G DS3 NONSSD 65W

緯創資通

Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title

GPU-VRAM7,8 (4/4)

Size	Document Number	Rev
Custom	**Hummingbird2_CR**	-2

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Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title: ***RT8208B +VGA CORE***		
Size: Custom	Document Number: **Hummingbird2 CR**	Rev: **-2**
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Blanking

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: *DISCRETE VGA POWER*

Size	Document Number	Rev
A4	Hummingbird2_CR	-2

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LVDS Channel A

Blanking

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: *LVDS_Switch*

Size	Document Number	Rev
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Blanking

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: *CRT_Switch*

Size: A4 | Document Number: Hummingbird2_CR | Rev: -2

Date: Tuesday, April 17, 2012 | Sheet 95 of 102

SSID = SDIO

Blanking

Elpida 1600 4G DS3 NONSSD 65W

緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: TOUCH PANEL

Size	Document Number	Rev
A4	Hummingbird2_CR	-2

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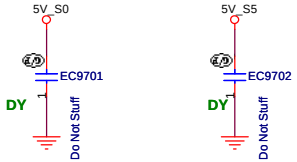
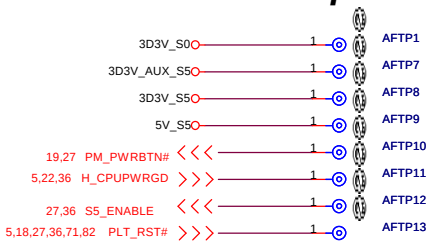
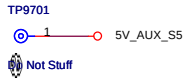
HM2-CR SB 0117 by EDWIN
request by EMI

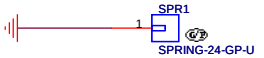


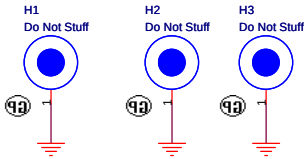
Check test point



Test Point放在Dimm Door打開可量測處

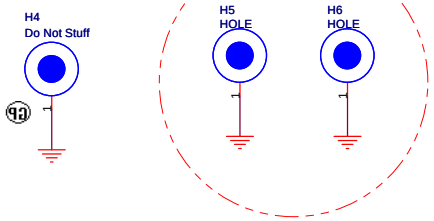




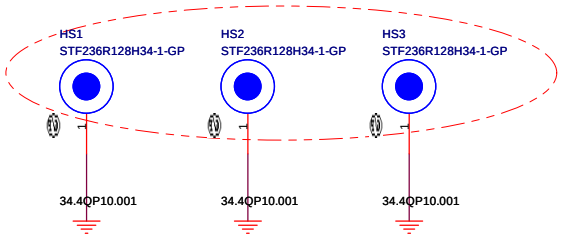


HM2-CR SB 0112 by EDWIN
Part Number change

HM2-CR SB 0112 by EDWIN
update symbol



HM2-CR -1 0220 by EDWIN
Part Number change



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Title: UNUSED PARTS/EMI Capacitors

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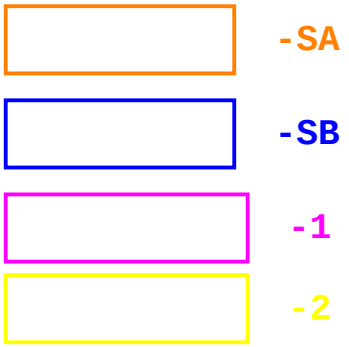
(1) change U6001 to socket 62.10089.001

(2) change SW_L1 and SW_R1 PN to 『62.40089.221』

(3) KI.G6501.001 / IC BD82HM65 SLH9D MM#908753 B2 FCBGA 989
KI.G6501.004 / IC BD82HM65 SLJ4P MM#914377 B3 FCBGA989P

(4)U3101 change PN to 71.08158.M02
(5)DM2 1st -> change PN to 62.10024.G01
(6) IMIC1 =>82.40012.001
(7) RJ1 =>22.10177.J71
(8) CPU1 =>1st change PN to 62.10055.321
(9) USB2 =>1st change PN to22.10218.G01 -> only Lab stage



[Lab] S01G ==>1st
S02G ==>2nd(NEC Cap)

Coin Battery:
1st:23.20068.001
2nd:23.22063.001

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Title: Change History

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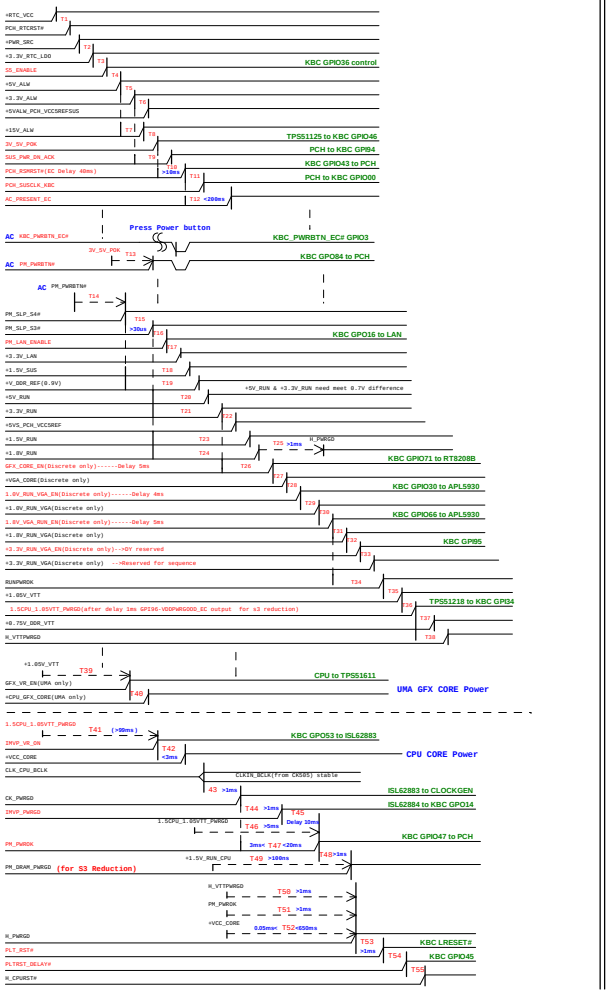
Intel-Power Up Sequence

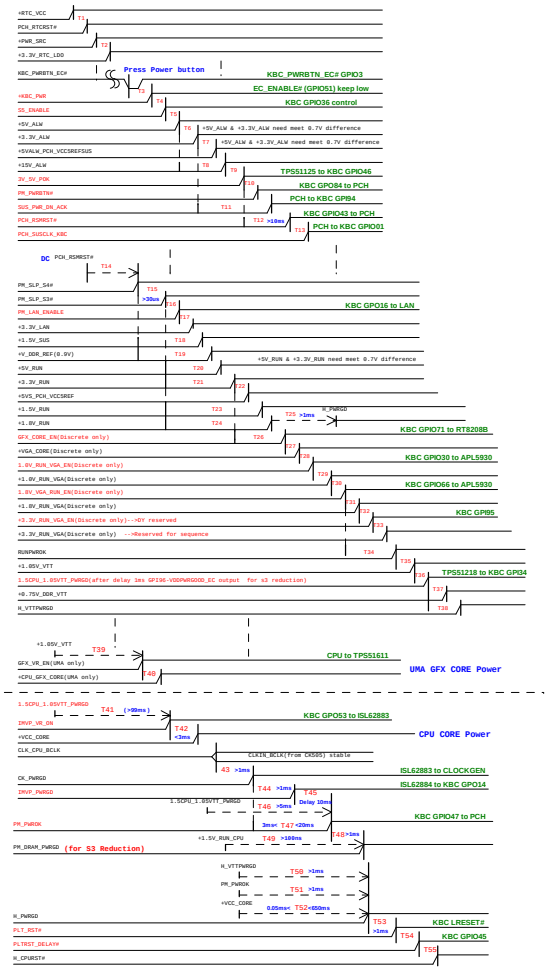
(AC mode)

red word: KBC GPIO

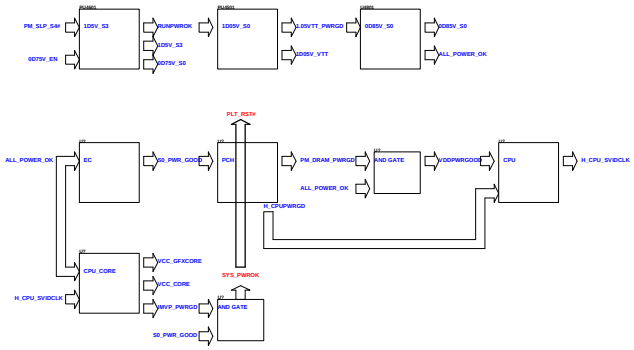


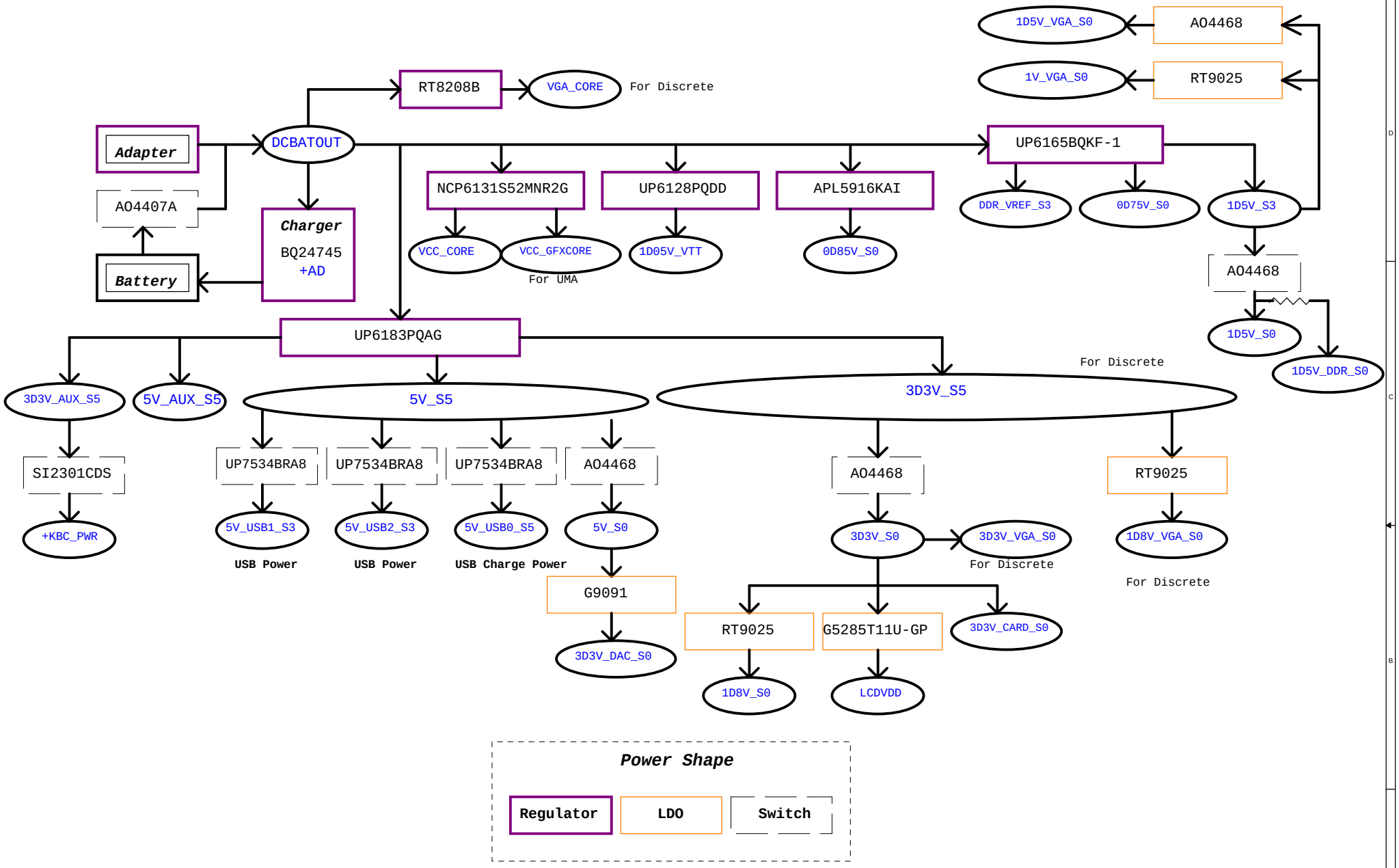
(DC mode)

red word: KBC GPIO



Power Sequence





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Title: **Power Block Diagram**

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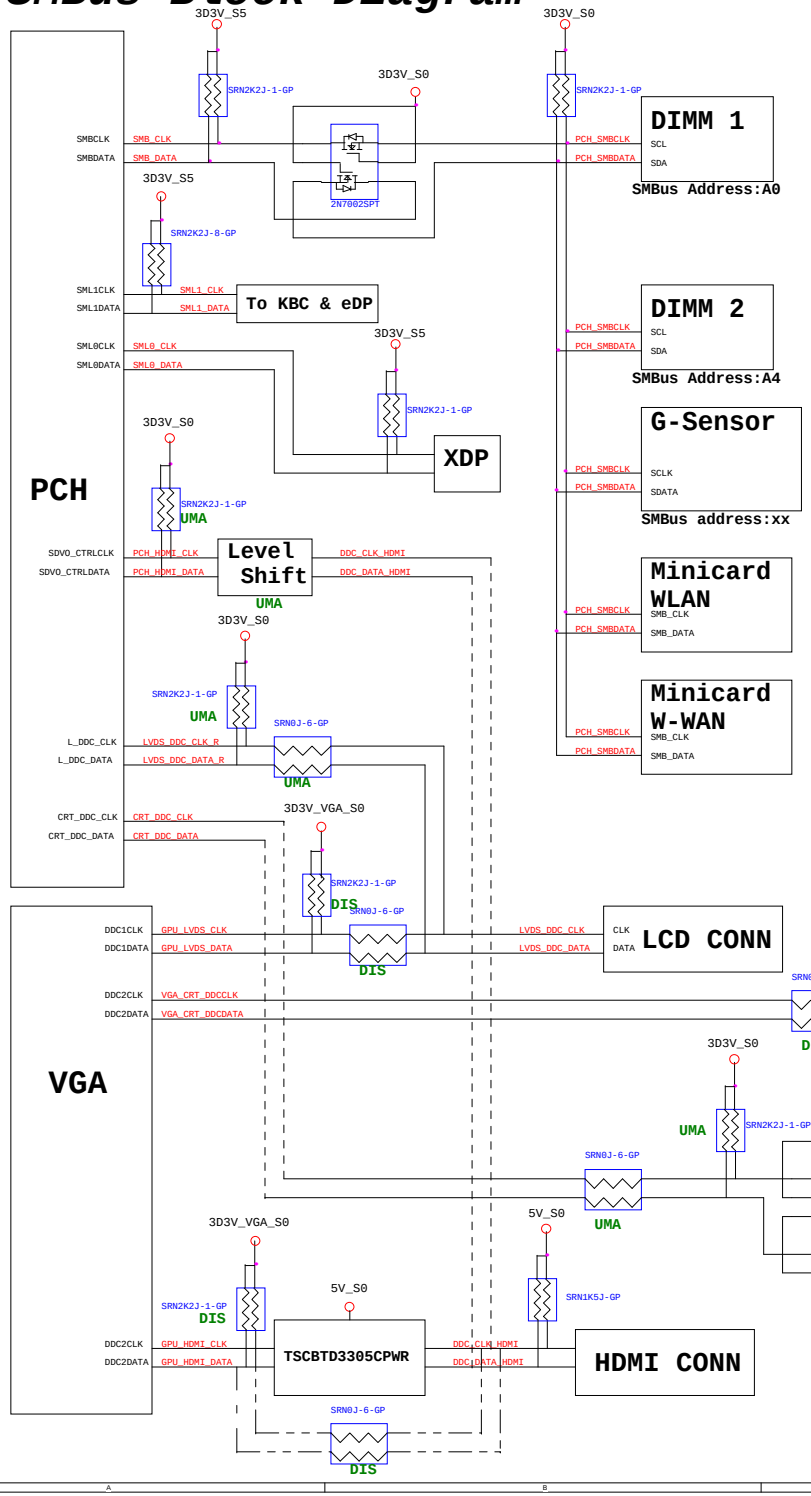
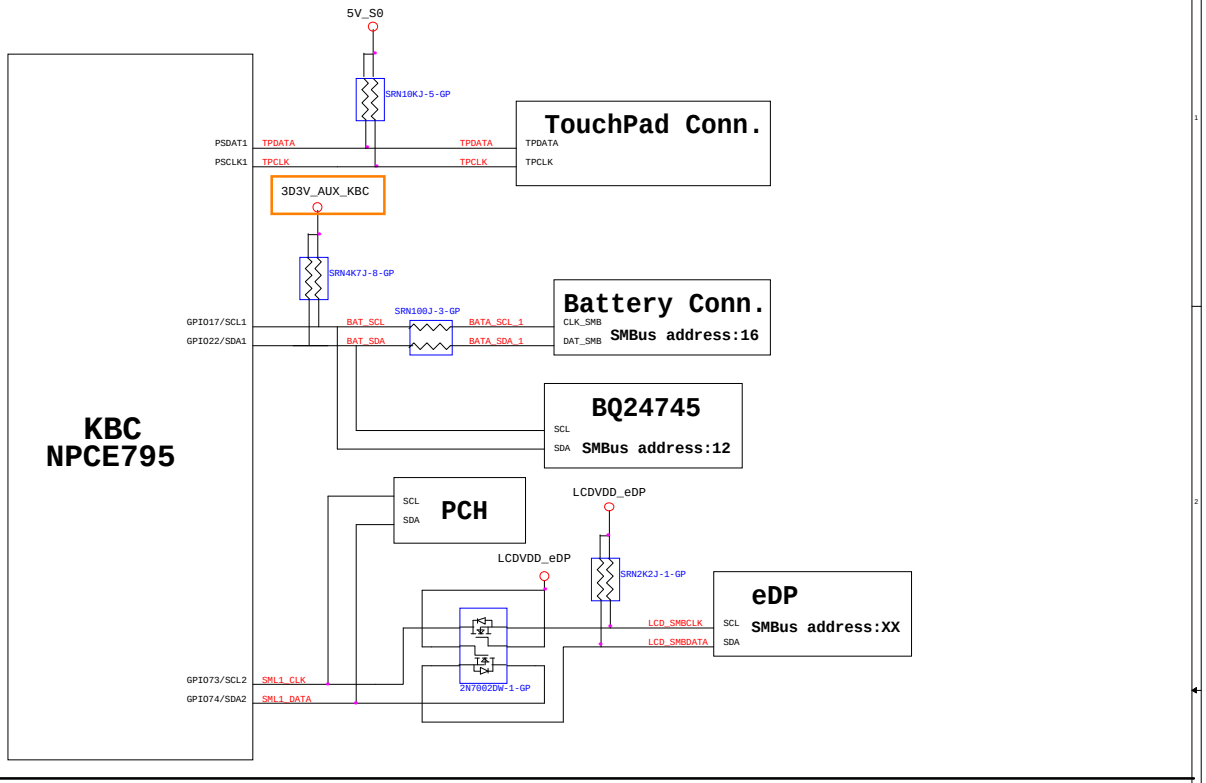
PCH SMBus Block Diagram



KBC SMBus Block Diagram



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Title	SMBUS Block Diagram
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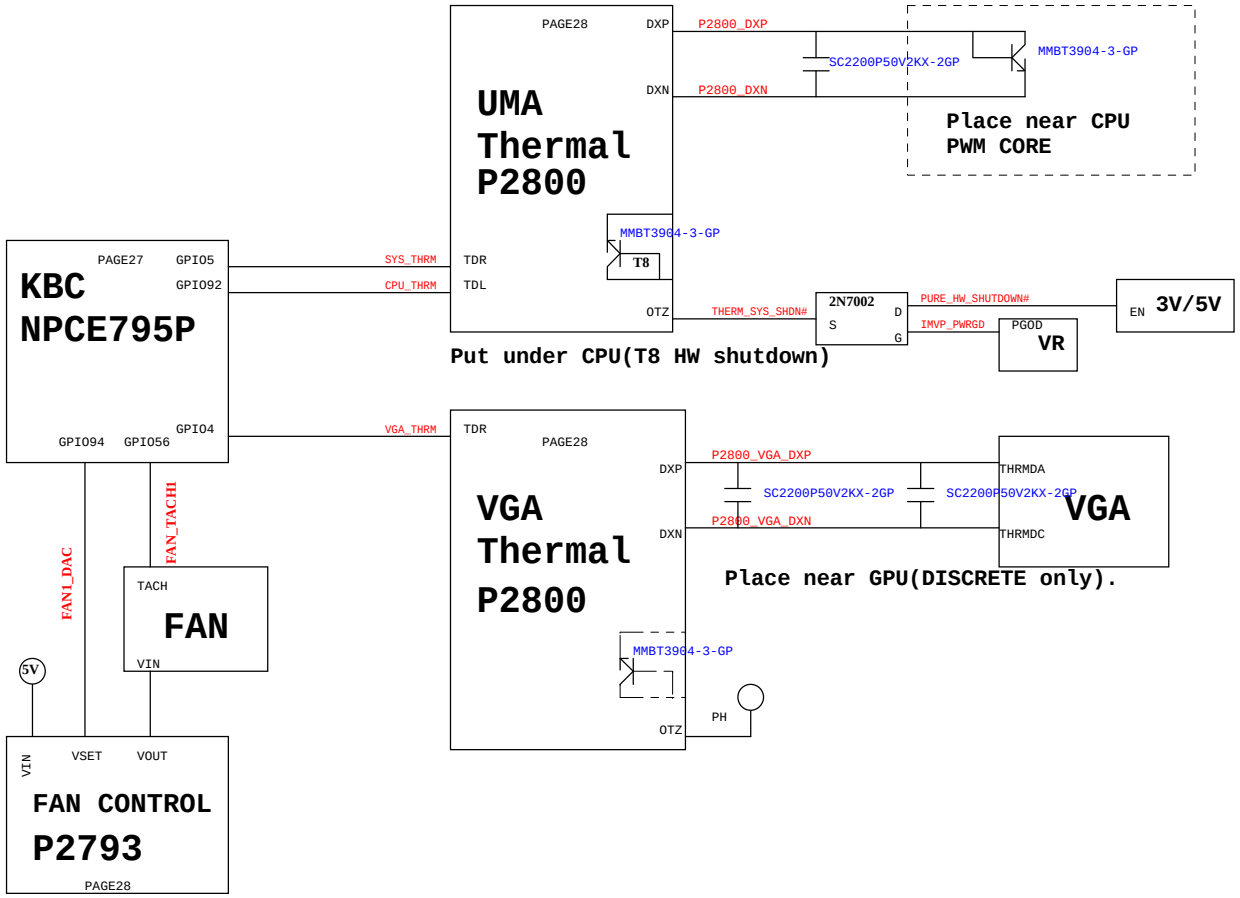
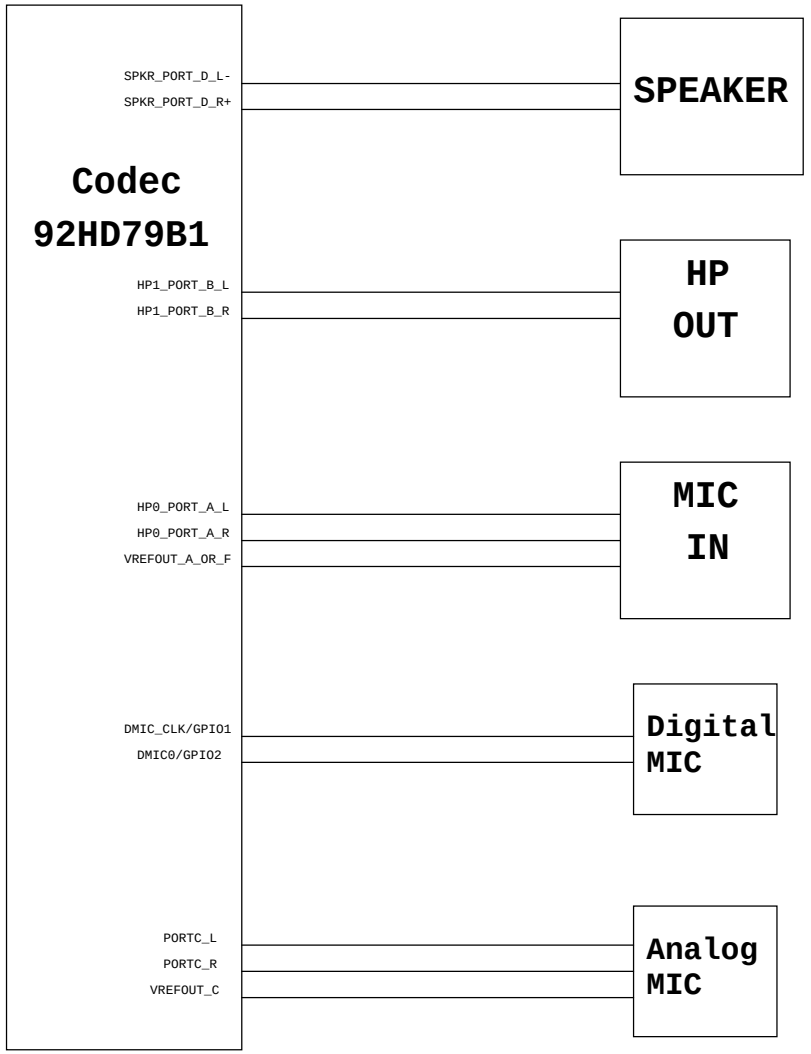
Thermal Block Diagram



Audio Block Diagram



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Title: *Thermal/Audio Block Diagram*		
Size: Custom	Document Number: Hummingbird2_CR	Rev: -2
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