

JUL'31

Clock Generator  
MLF68 15

Intel  
Penryn LV/ULV SFF  
Processor 3, 4

Thermal  
Sensor  
LM26 5

ITP  
Conn. 6

# Caramel-1 Block Diagram

07251-2-0731

Project Code: 91.4Y401.001  
PCB(Raw Card):

## PCB Layer Stackup

L1:TOP  
L2:Signal 1  
L3:GND  
L4:Signal 2  
L5:VCC  
L6:GND  
L7:Signal 3  
L8:BOTTOM

## Battery Charger/Selector

ADP3808 43

INPUTS	OUTPUTS
DOCK_PWR20_F	M-BAT-PWR S-BAT-PWR

## System DC/DC

TPS51221 49

VINT20	VCC5M VCC3M
--------	----------------

## CPU DC/DC

VT1311 50

VINT20	VCCCPUCORE
--------	------------

## GMCH GFX CORE

VT451&VT450 51

VINT20	VCCGFXCORE
--------	------------

## VCC1R05AMT/VCC1R5A

VT351 52, 53

VCC5V_OUT	VCC1R05AMT VCC1R5A
-----------	-----------------------

## VCC0R75AMT

MAX1510 54

VCC1R5A	VCC0R75AMT
---------	------------

## VCC1R8B

BD3550 55

VCC3M	VCC1R8B
-------	---------

## VCC1R05AUX/1R8AUX

BD3550 56

VCC3M	VCC1R05AUX VCC1R8AUX
-------	-------------------------

&lt;Variant Name&gt;

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Taipei Hsien 221, Taiwan, R.O.C.

Title

## Block Diagram

Size  
A3

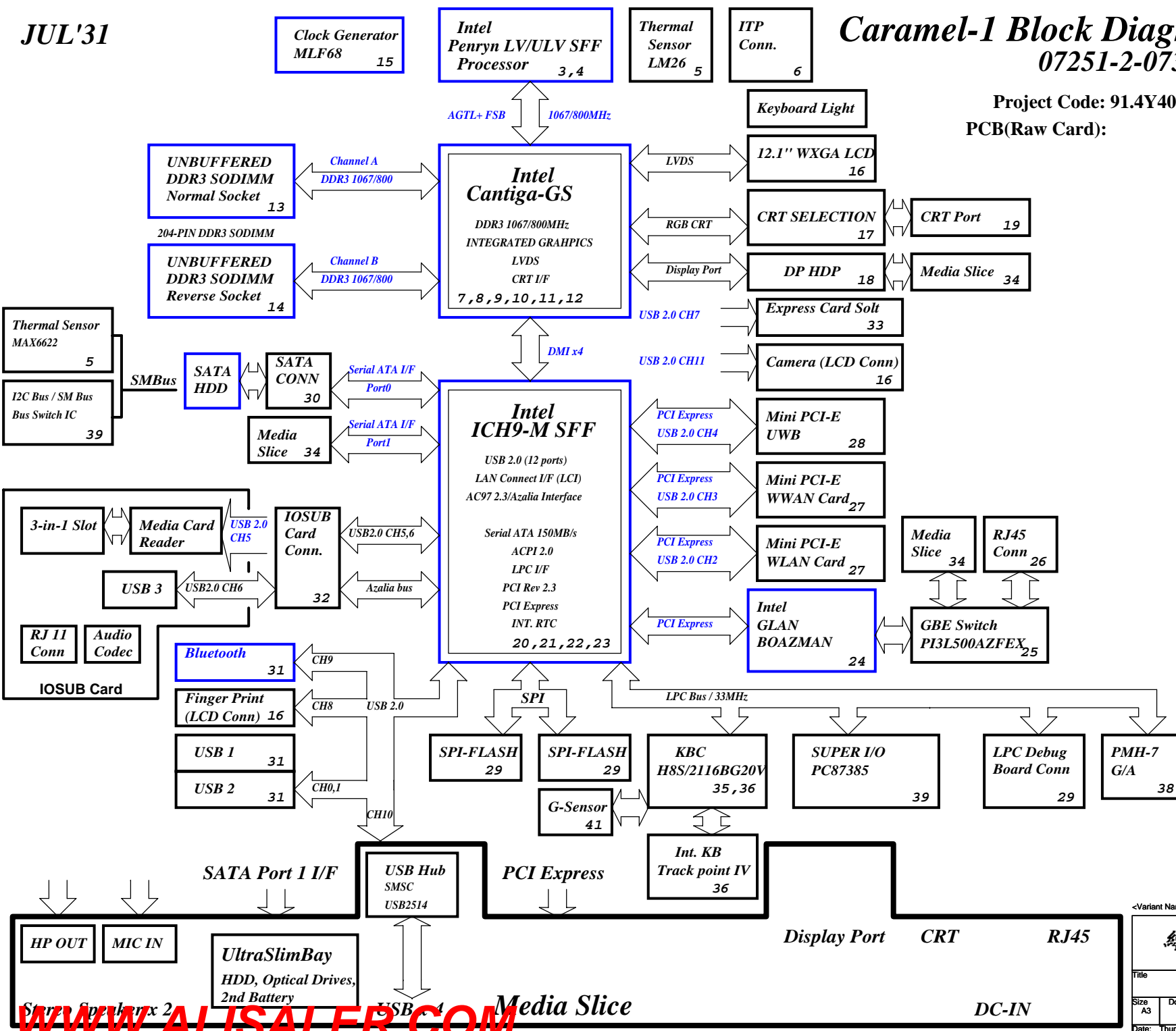
Document Number

Caramel-1

Rev  
2

Date: Thursday, July 31, 2008

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HP OUT MIC IN  
UltraSlimBay  
HDD, Optical Drives,  
2nd Battery  
SATA Port 1 I/F  
USB Hub  
SMSC  
USB2514  
PCI Express  
Media Slice  
DC-IN

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## RESISTOR

Symbol name	Value	Tolerance (J: 5%, F: 1%, D: 0.5%, B: 0.1 %)	Rating 0402=> 1/16W, 25V 0603 => 1/16W, 75V 0805 => 1/10W, 100V	Size 2=>0402, 3=>0603, 5=>0805, 6=>1206, 0=>1210
10KR3	10K Ohm	If no letter, it means J: 5%	1/16W, 75V	0603
33D3R5	33.3 Ohm	If no letter, it means J: 5%	1/10W, 100V	0805
1KR3F	1K Ohm	F: 1%	1/16W, 75V	0603

The naming rule is value + R + size + tolerance  
 For the value, it can be read by the number before R. (R means resistor)  
 For the tolerance, it can be read from the last letter.  
 For the rating, we don't show on the symbol name.  
 For the size, R2=>0402, R3=>0603, R5=>0805,....

## CAPACITOR

Symbol name	Value	Tolerance (M: +/-20, K: +/-10, Z: +80/-20)	Rating	Size 2=>0402, 3=>0603, 5=>0805, 6=>1206, 0=>1210
SCD1U10V2MX-1	0.1uF	M/X5R	10V	0402
SC10U6D3V5MX	10uF	M/X5R	6.3V	0805
SC2D2U16V5ZY	2.2uF	Z/Y5V	16V	0805

The naming rule is

Capacitor type + value + rating + size + tolerance + material

SCD1U10V2MX-1

SC=> SMT Ceramic, TC=> POS cap or SP cap

D1U => 0.1uF

10V => the voltage rating is 10V

2=> 0402, 3=>0603, 5=>0805

M=>tolerance M, K, Z

X=> X7R/X5R, Y=> Y5V

-1 => symbol version, nonsense to EE characteristic

## PLANAR\_ID[3..0]

ICH8-M GPIOn	39	38	37	36	Planar ID Version	Planar PCB Version
PLANAR_IDn	3	2	1	0		
	0	0	0	0	Caramel-1 Pre-DV/DV	SA
	0	0	0	1	Caramel-1 SIV	SB
	0	0	1	0	Caramel-1 SIT	SC
	0	0	1	1	Caramel-1 SVT	
	0	1	0	0		
	0	1	0	1		
	0	1	1	0		
	0	1	1	1		

## EC HISTORY

[illegible]

## PCI TABLE

DEVICE	IDSEL	IRQ (Default)	REQ# / GNT#
MINIPCI SLOT	AD18	F, G	REQ# 3/ GNT#
CARDBUS R5C811	AD16	SERIRQ	REQ#0 / GNT#
USB UHCI	AD29	A, C, D	
USB 2.0 EHCI	AD29	H	
DMI-to-PCI/ AC97 Modem/ AC97 Audio	AD30	B B	
LPC Bridge IDE SATA SMBus	AD31	C C B	
PCI Express	AD28	A, B, C, D	

<Variant Name>

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Title	Date	Page
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Title	Date	Page
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Title	Date	Page

## Reference

Size	Document Number
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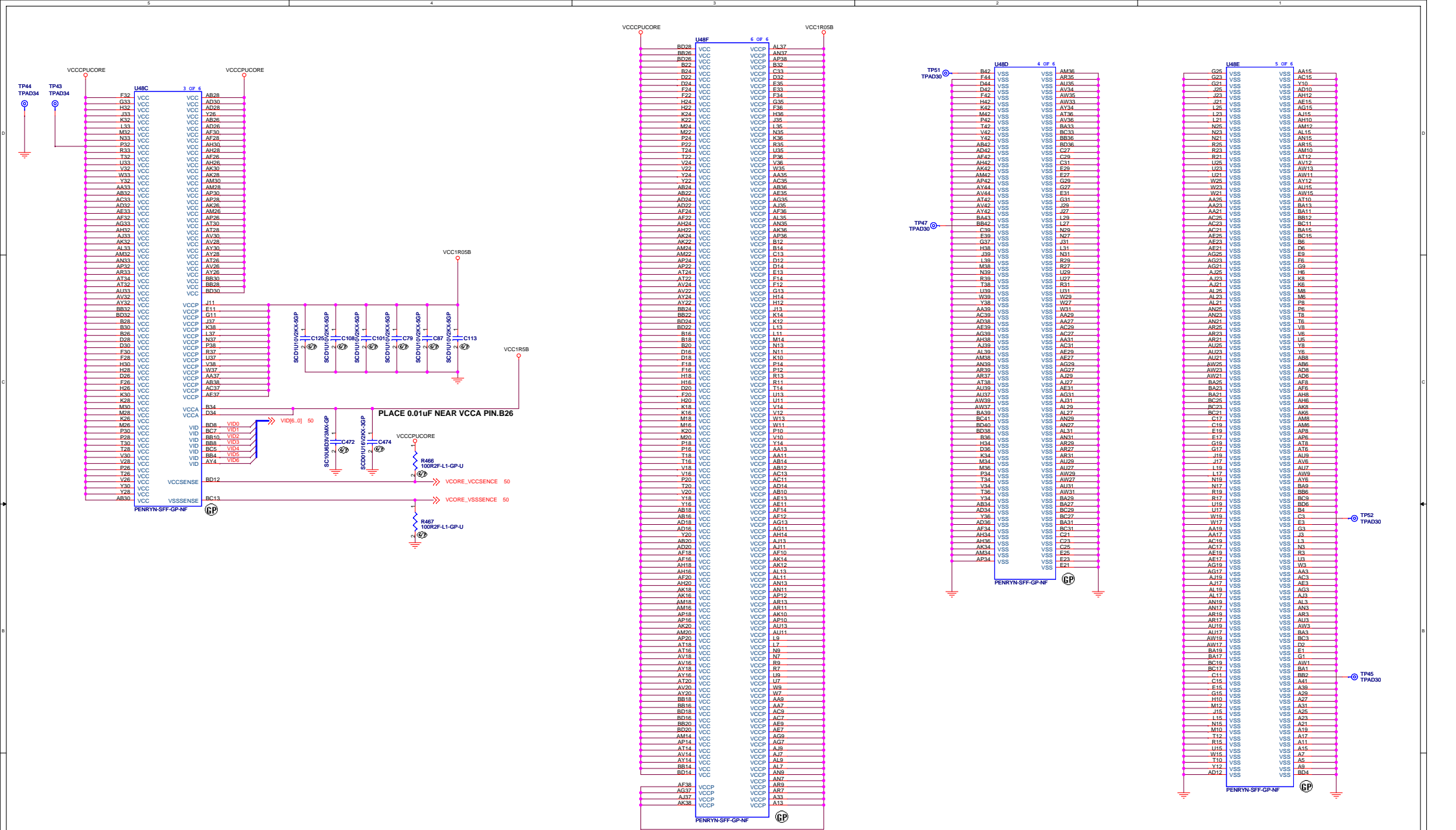
### **Caramel-1**

Rev  
2

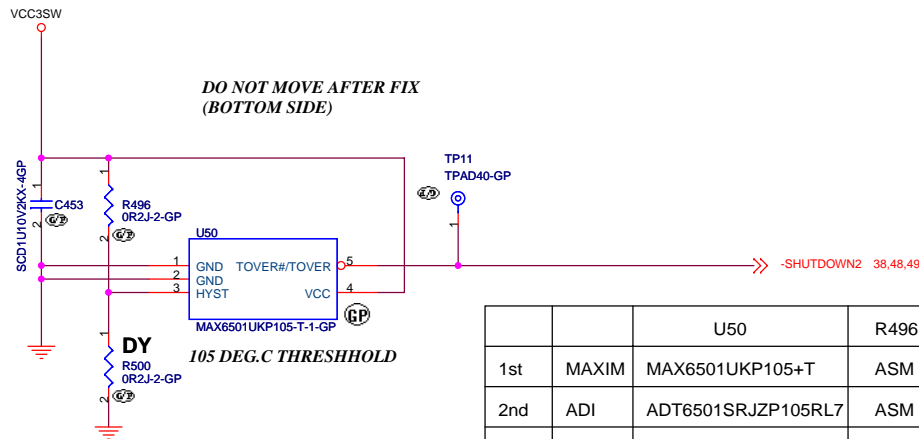
Date: Thursday, July 31, 2008

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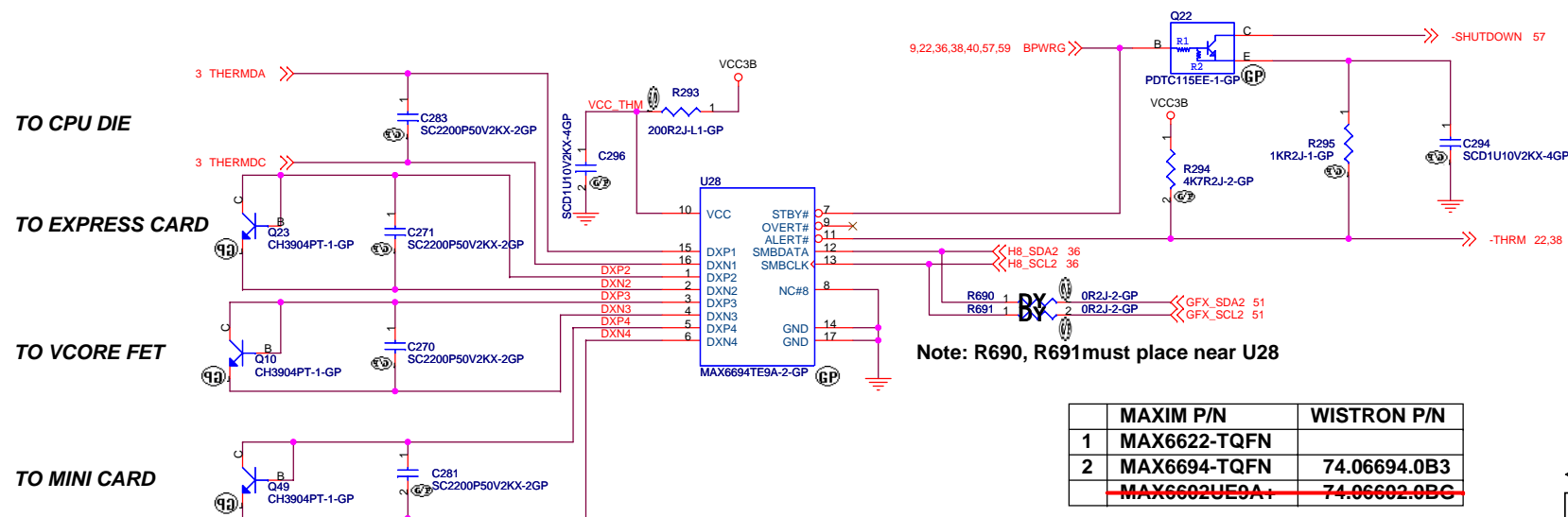




# Thermal Sensor for CPU



**THESE CAPS MUST BE PLACED AS CLOSE AS POSSIBLE TO MAX6602**



	MAXIM P/N	WISTRON P/N
1	MAX6622-TQFN	
2	MAX6694-TQFN	74.06694.0B3
	<del>MAX6602UE9A-1</del>	<del>74.06602.0B3</del>

**Layout Comment :**

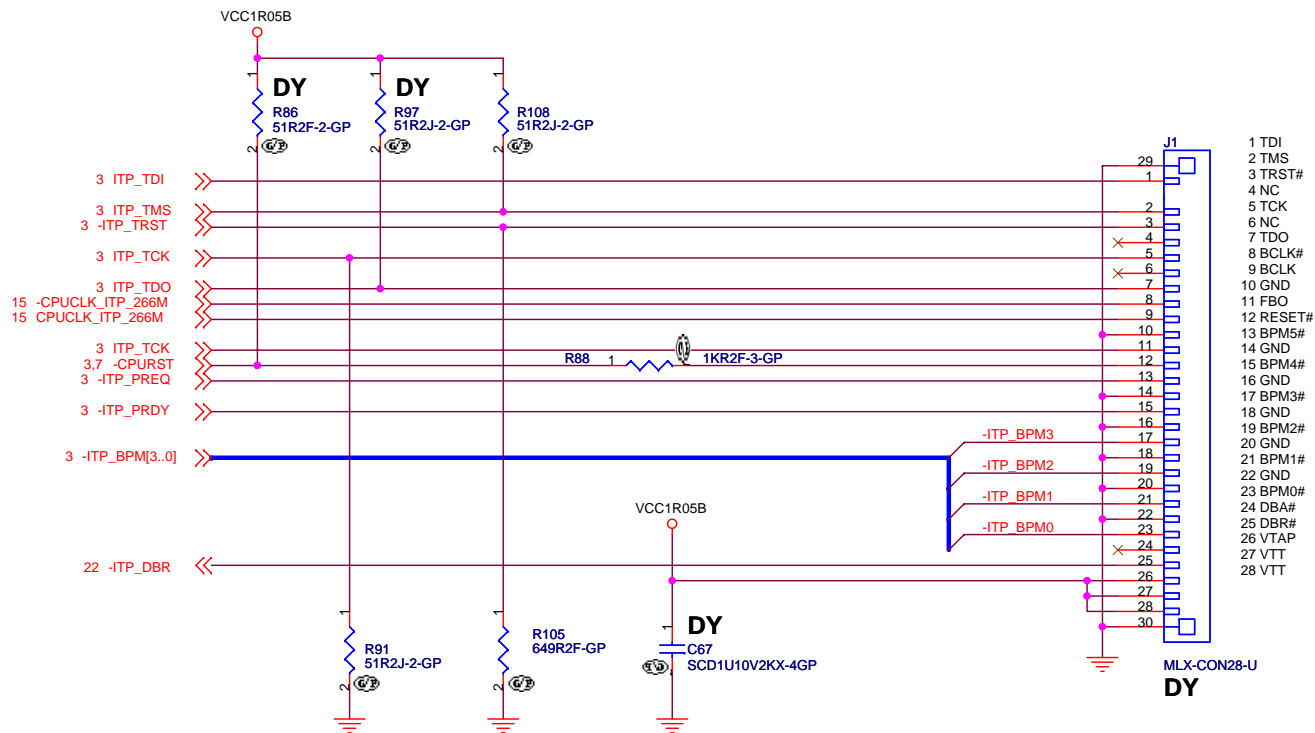
- (1) Thermal sensor trace lines should not be overlapped with other high frequency trace lines in other layers.
- (2) Also, it should not be overlapped with large amplitude trace lines either.

**PLACE UNDER PC-CARD SLOT**  
H8 I2C Bus 2 ADDRESS : 9AH  
TEST PAD FOR BOARD MFG TEST

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<Variant Name>

<b>緯創資通 Wistron Corporation</b>		21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
<b>THERMAL SENSOR</b>			
Size A3	Document Number	<b>Caramel-1</b>	Rev 2
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- 1 TDI
- 2 TMS
- 3 TRST#
- 4 NC
- 5 TCK
- 6 NC
- 7 TDO
- 8 BCLK#
- 9 BCLK
- 10 GND
- 11 FBO
- 12 RESET#
- 13 BPM5#
- 14 GND
- 15 BPM4#
- 16 GND
- 17 BPM3#
- 18 GND
- 19 BPM2#
- 20 GND
- 21 BPM1#
- 22 GND
- 23 BPM0#
- 24 DBA#
- 25 DBR#
- 26 VTAP
- 27 VTT
- 28 VTT

(\*1) TCK SIGNAL IS BRANCHED AT CPU's PIN

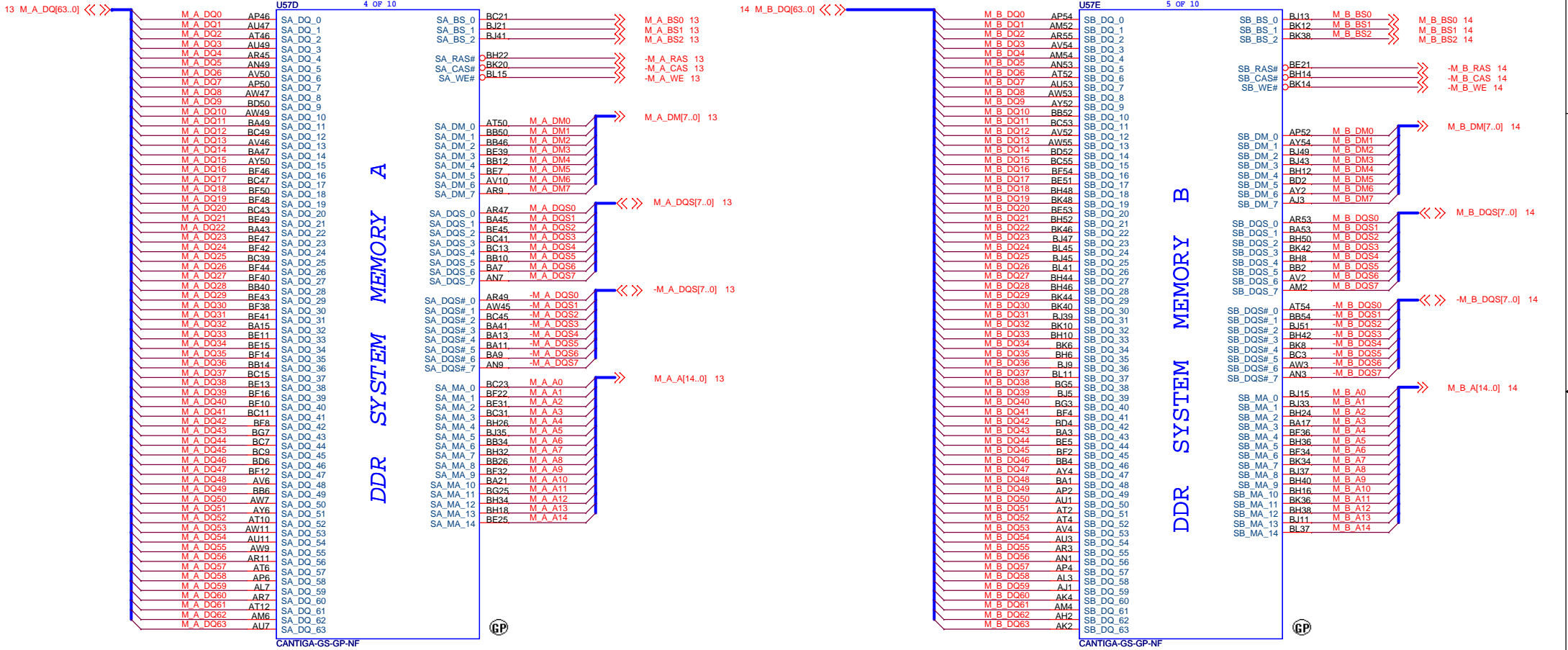
(\*2) CPURST# SIGNAL IS BRANCHED AT GMCH's PIN

Ref Des	For ITP-XDP
J1	NO_ASM-->ASM
C67	NO_ASM-->ASM
R88	NO_ASM-->1K 5% ASM
R105	ASM (No Change)
R86	ASM-->NO_ASM
R97	ASM (No Change)
R91	ASM-->51 5% ASM
R108	ASM-->51 5% ASM

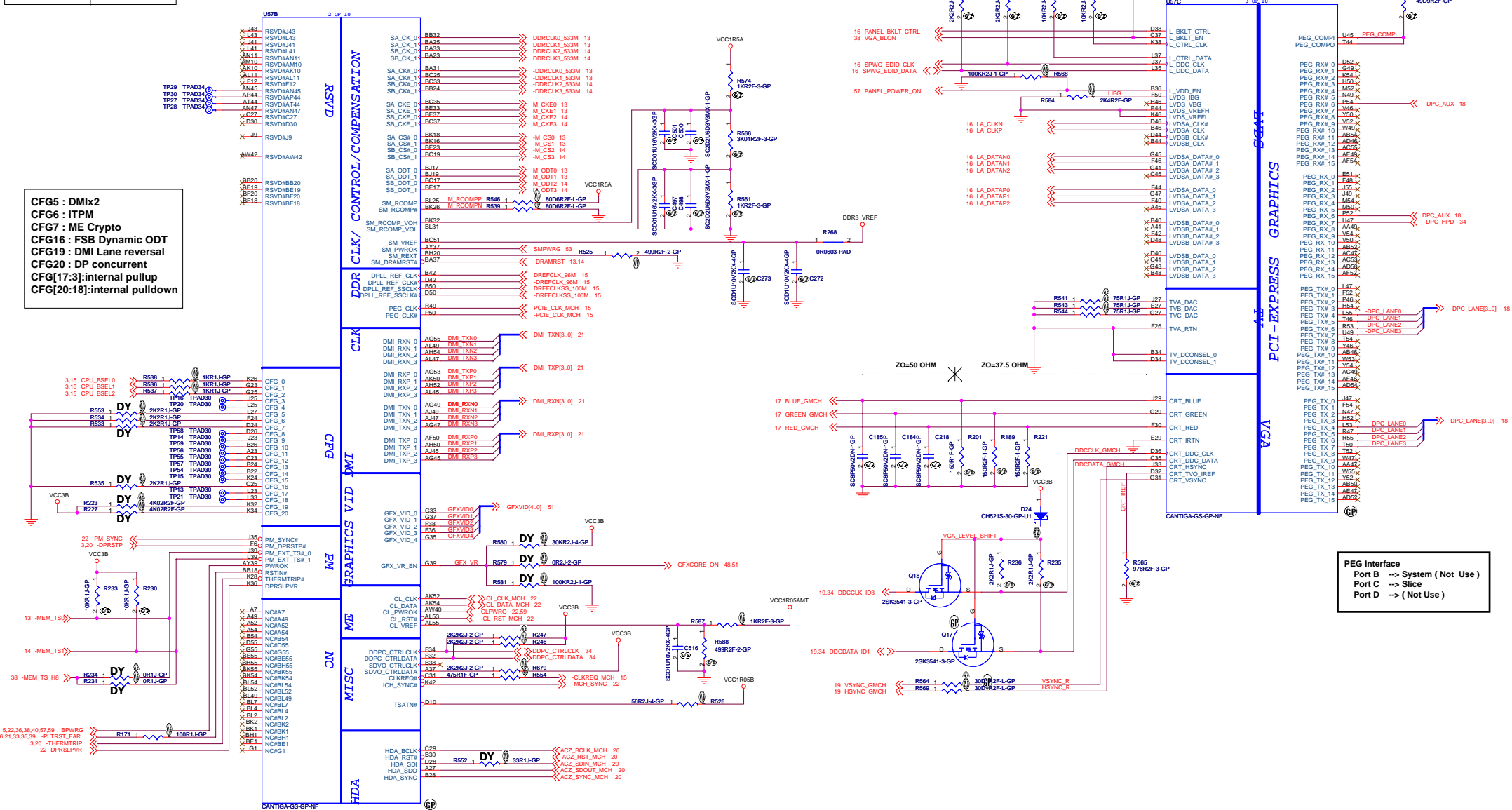
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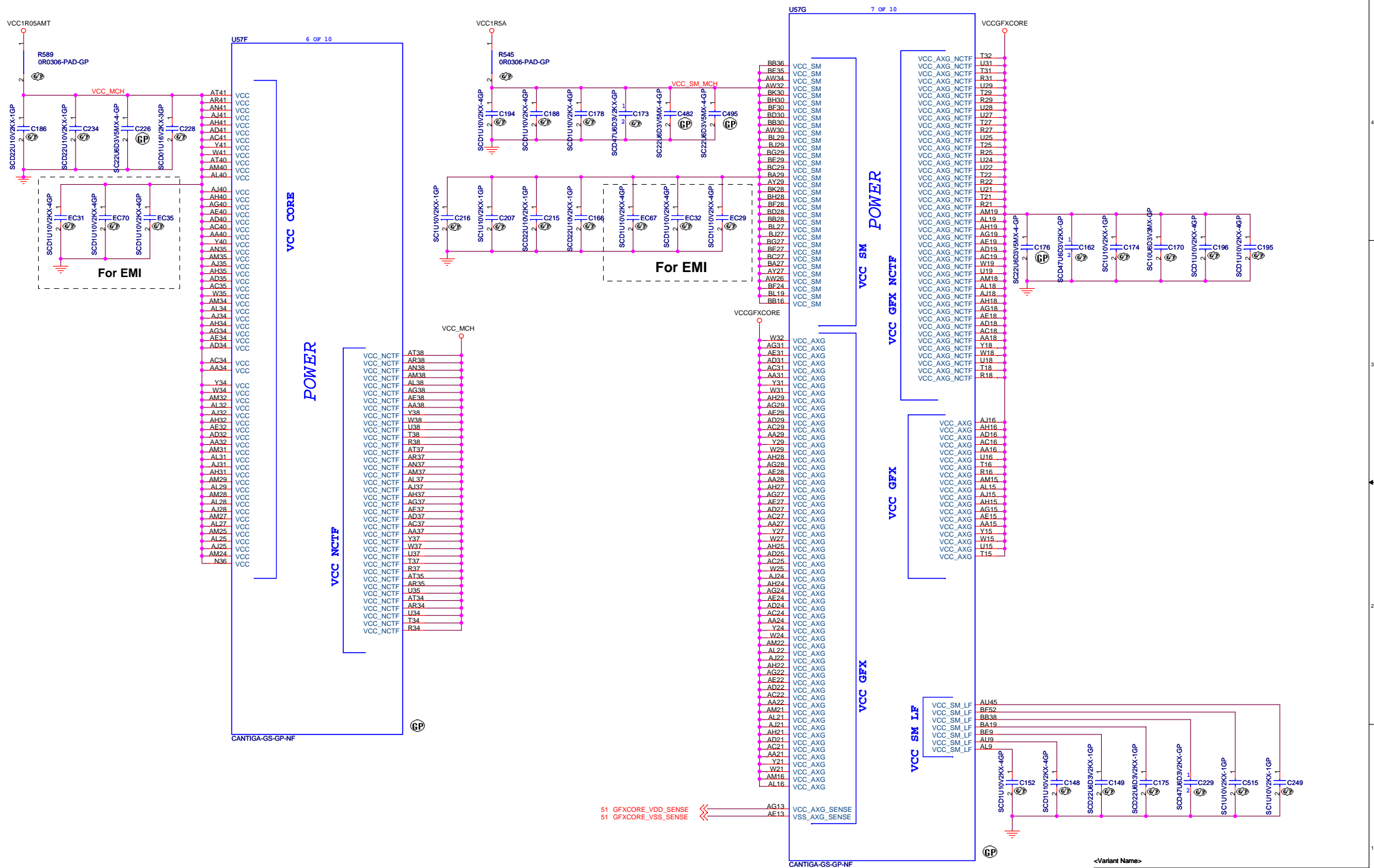
<b>緯創資通</b>		<b>Wistron Corporation</b> 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
Title <b>ITP_XDP CONN</b>			
Size Custom	Document Number <b>Caramel-1</b>		Rev <b>2</b>
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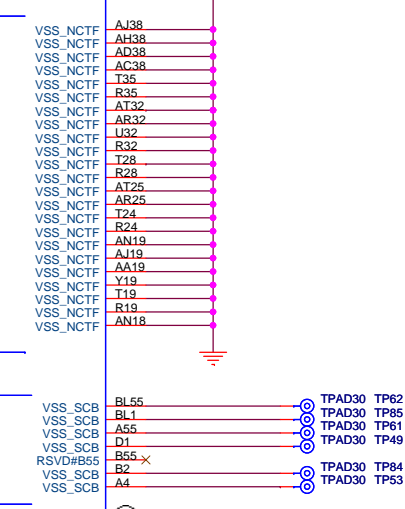
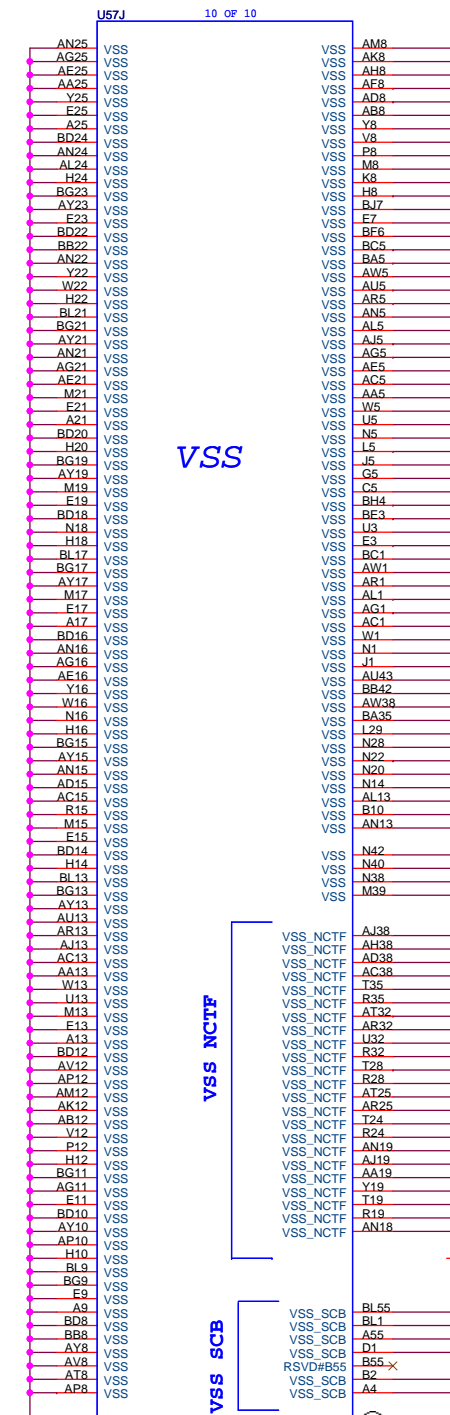
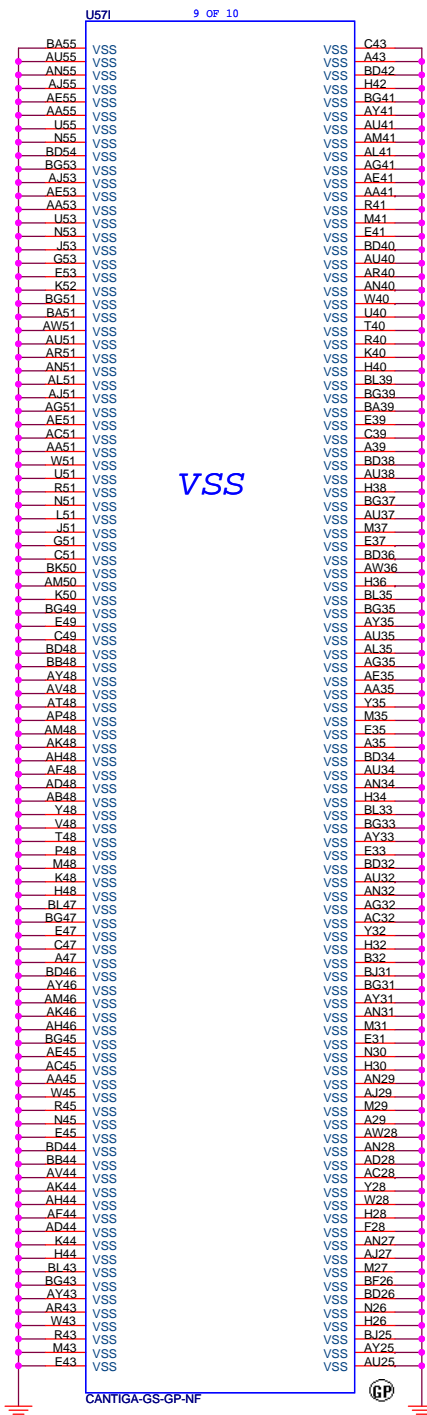


RESERVED#AN45	ME_JTAG_TCK
RESERVED#AP44	ME_JTAG_TDI
RESERVED#AT44	ME_JTAG_TDO
RESERVED#AN47	ME_JTAG_TMS









<Variant Name>

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Title

Cantiga-GS (6/6):GND

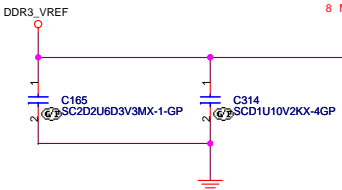
Size A3 Document Number

Caramel-1

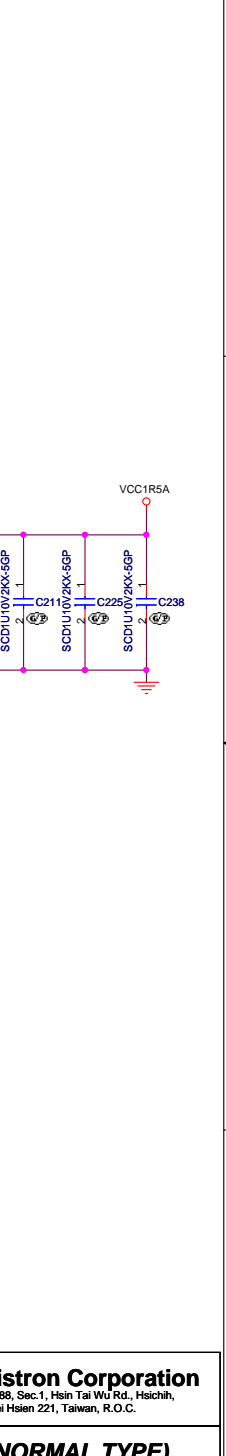
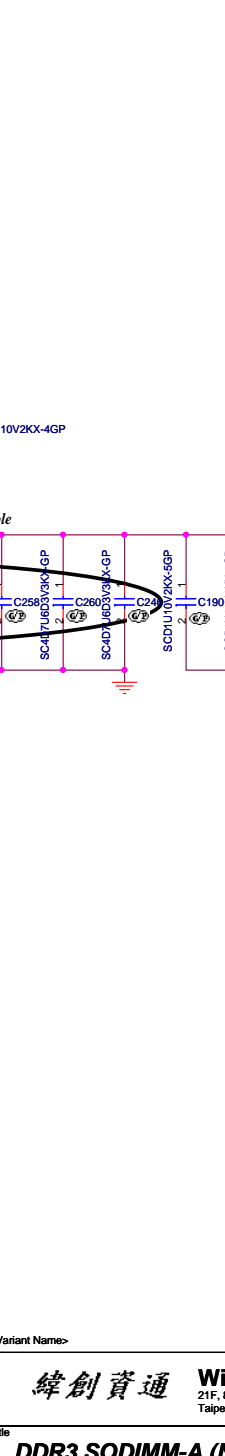
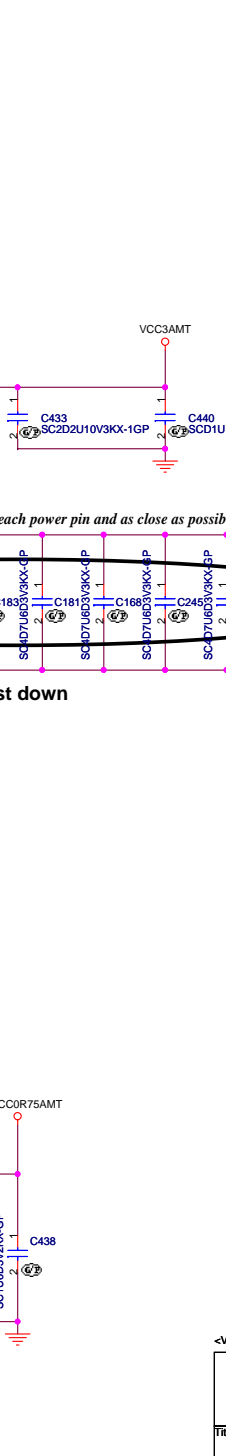
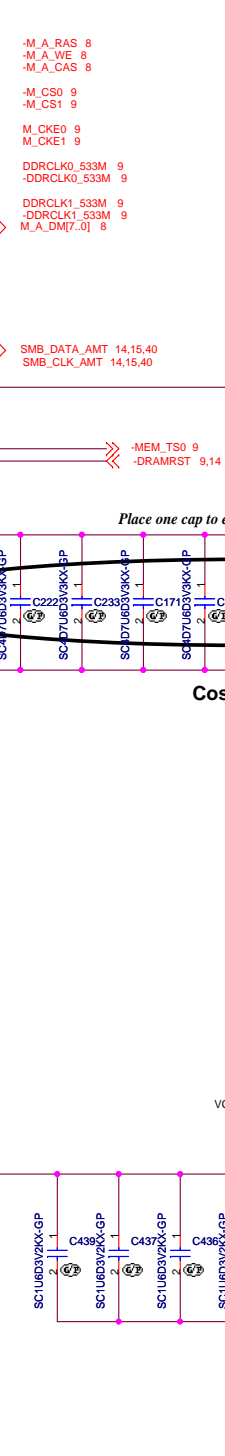
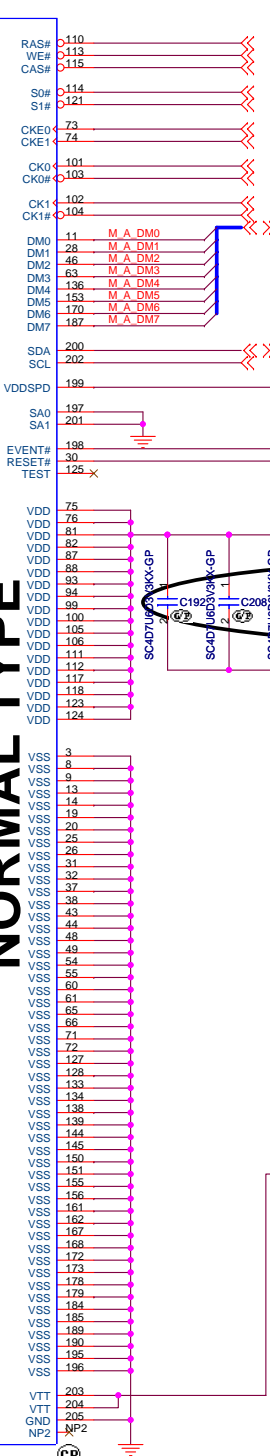
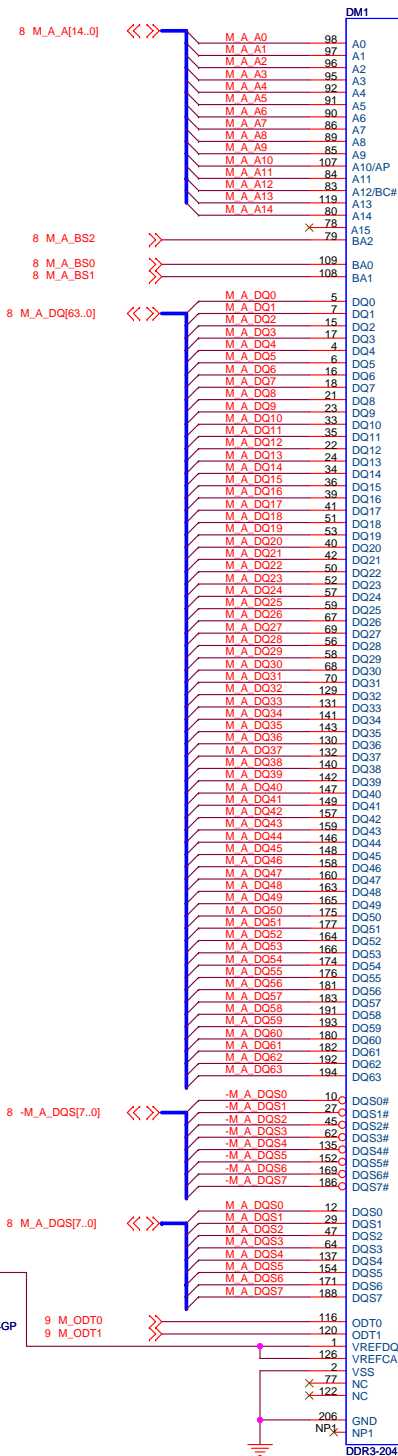
Rev 2

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# NORMAL TYPE

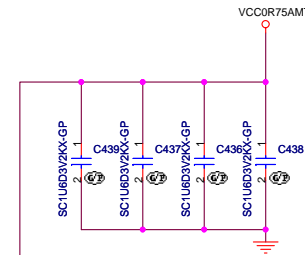


Place caps close to pin1 as possible



Place one cap to each power pin and as close as possible

Cost down



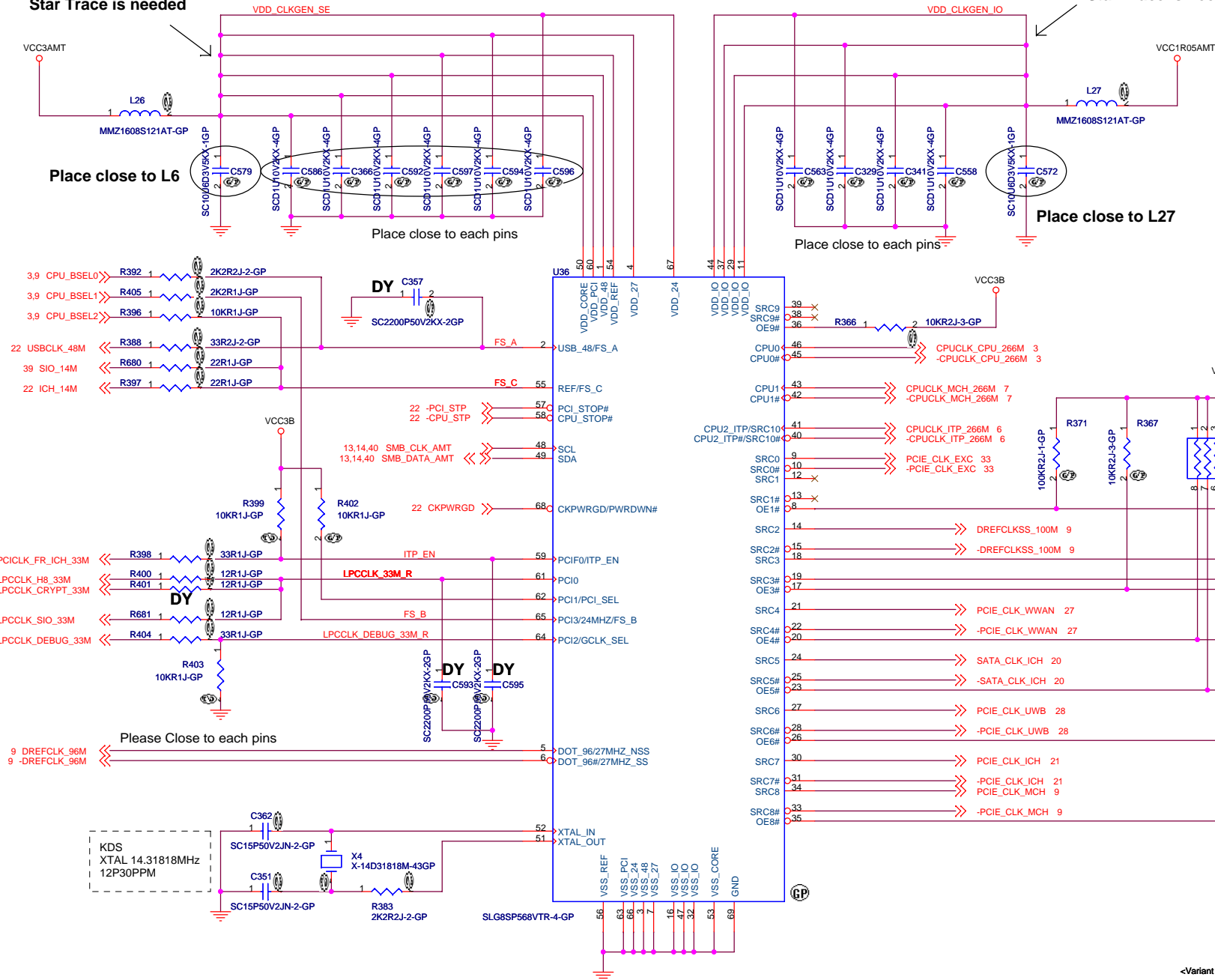
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<b>緯創資通 Wistron Corporation</b> 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
<b>Title</b> <b>DDR3 SODIMM-A (NORMAL TYPE)</b>	
<b>Size</b> Custom	<b>Document Number</b> <b>Caramel-1</b>
<b>Date:</b> Thursday, July 31, 2008	<b>Rev</b> 2
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Star Trace is needed

Star Trace is needed



SERC#	OE#	DEVICE
0		EXPRESS
1	OE1#	SLICE
2		GFX
3	OE3#	WLAN
4	OE4#	WWAN
5	OE5#	SATA
6	OE6#	UWB
7		ICH
8	OE8#	MCH
9	OE9#	Reserved
10		ITP

[Source Cadidate]		
SILEGO	SLG8SP568V	71.08568.C03

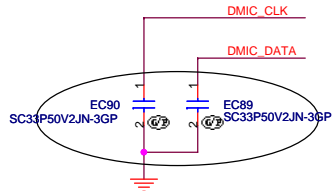
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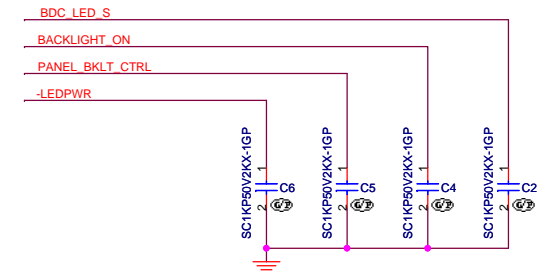
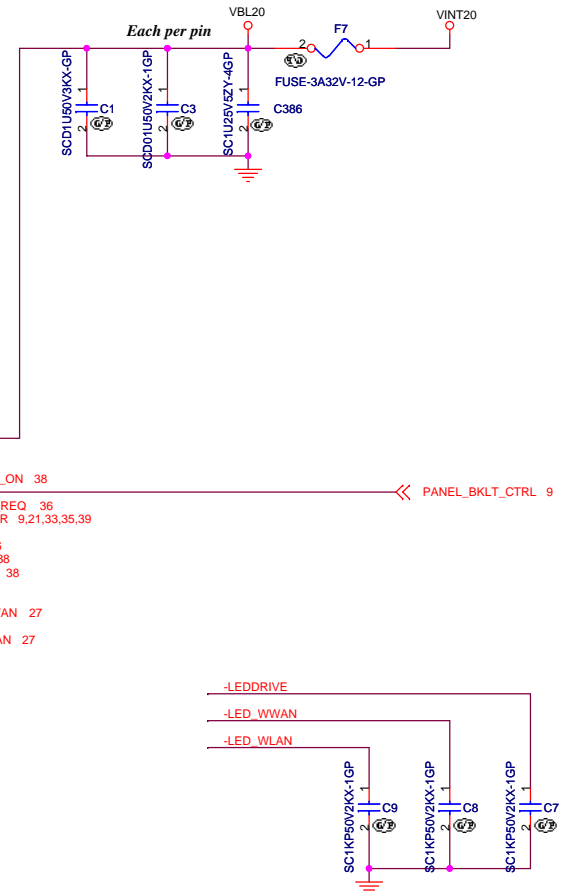
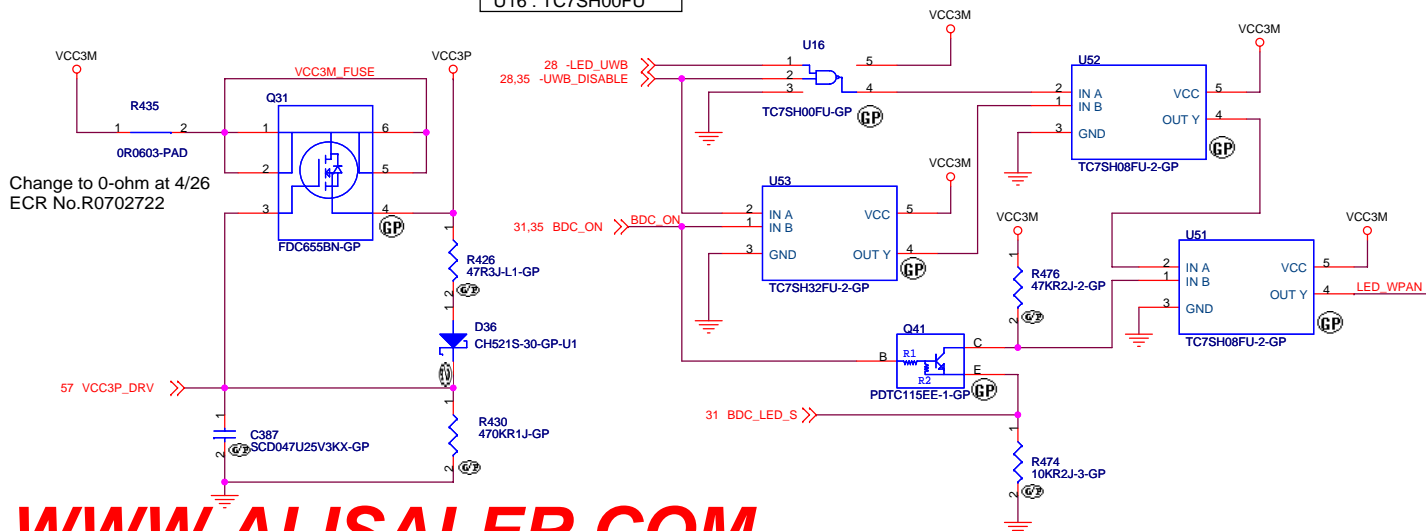
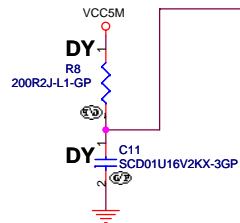
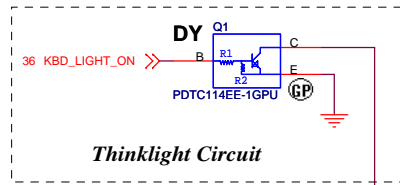
Title		
CLOCK GEN(CK505)		
Size A3	Document Number	Rev 2
Date: Thursday, July 31, 2008		Sheet 15 of 62

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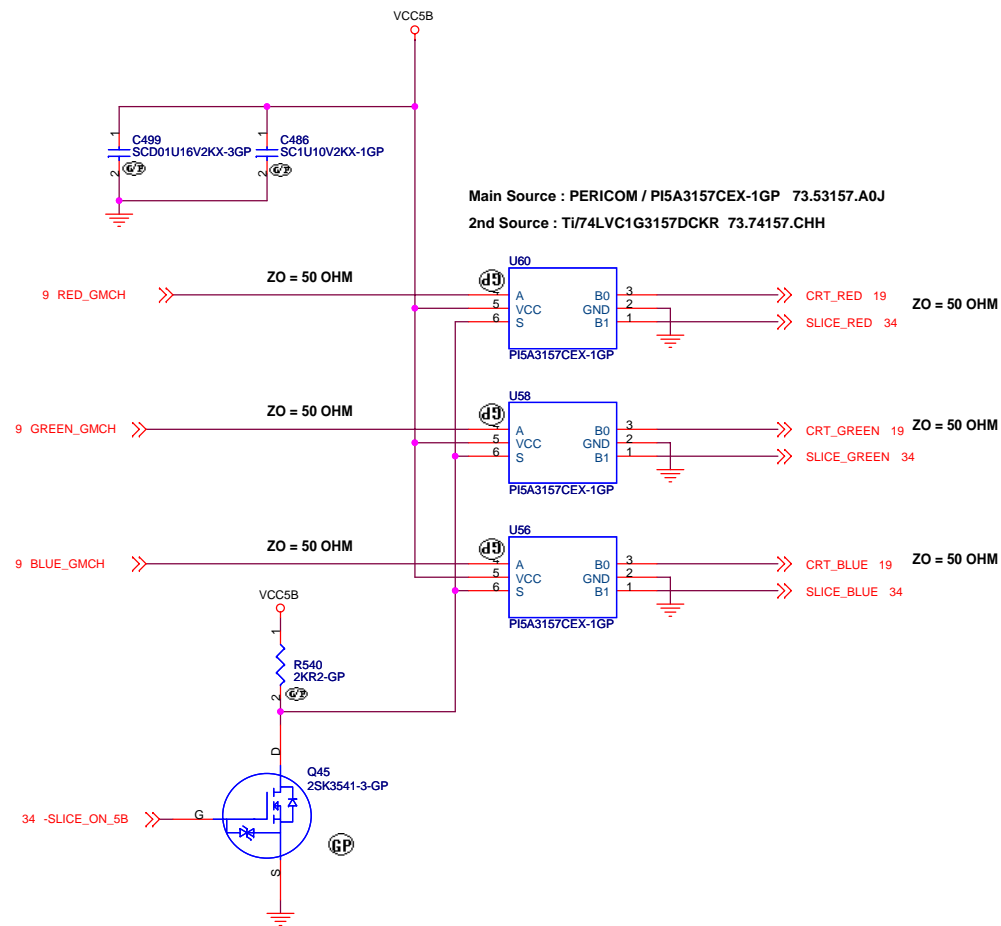
**R19, R18, R2, R3, R4, R14, R5 and R16 will be removed after SDV evaluation.**



## Wide Pattern



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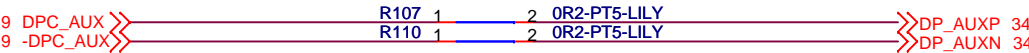
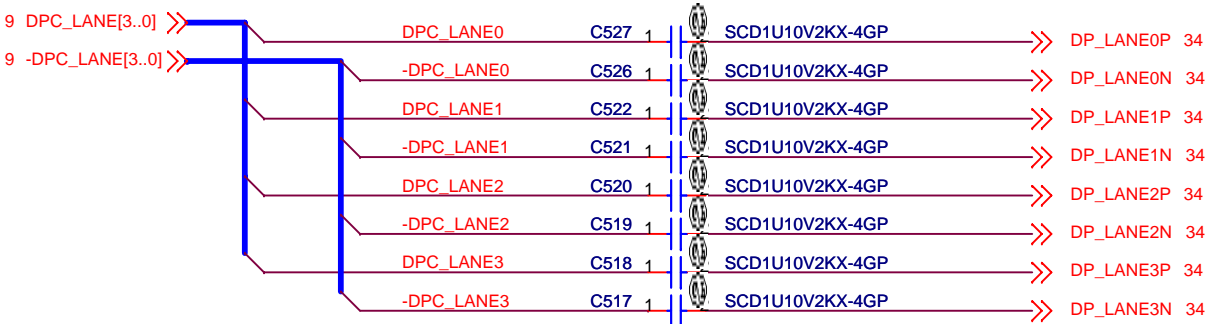


<Variant Name>

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Title			<b>CRT SELECTOR</b>	
Size	Document Number	Caramel-1		Rev
A3				2
Date:	Thursday, July 31, 2008	Sheet	17	of 62

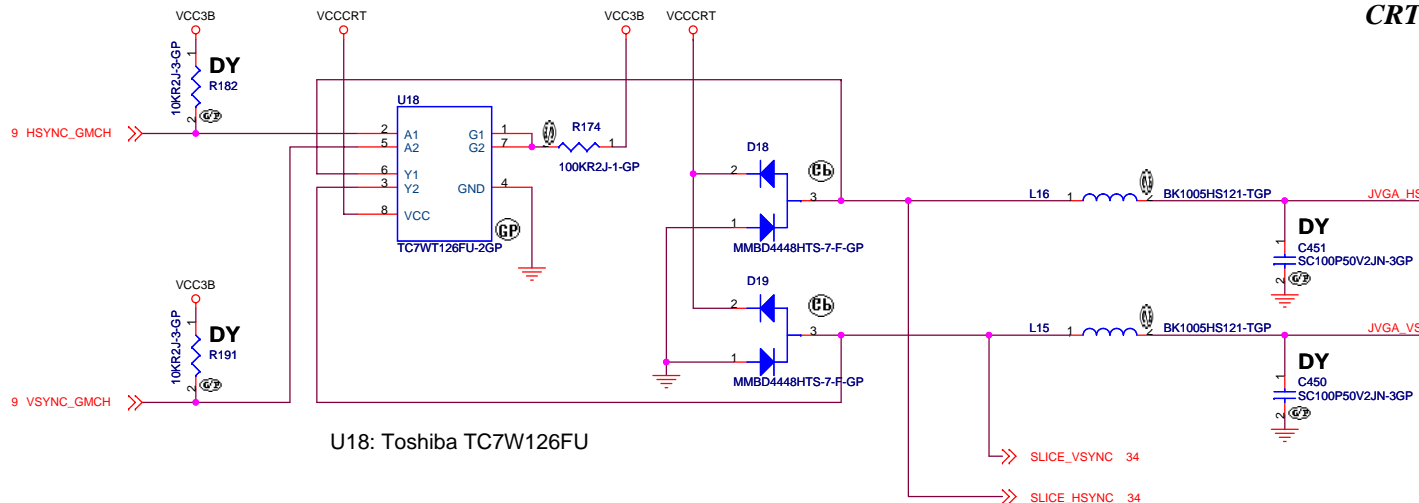
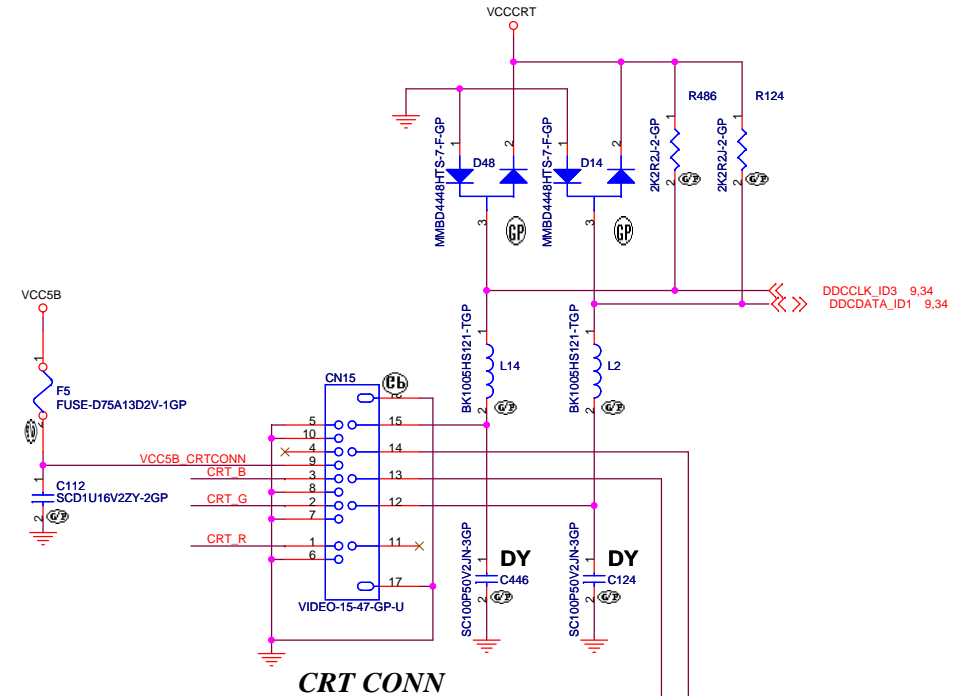
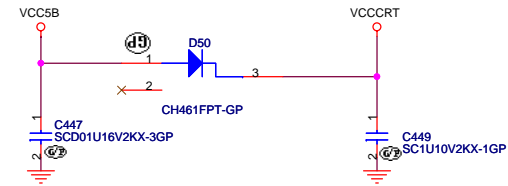
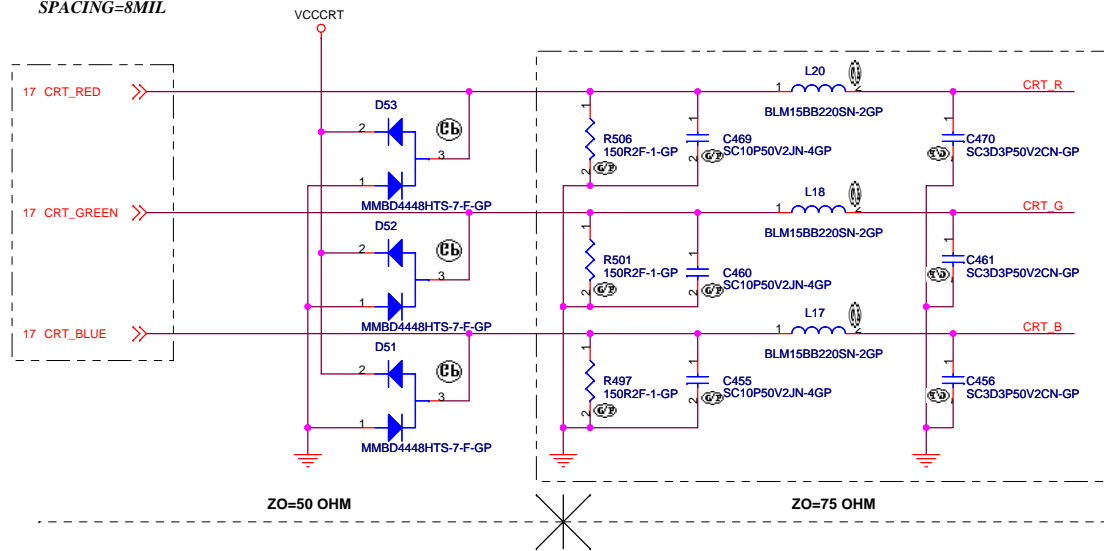
System DP: GMCH to SLICE Connector



<Variant Name>

緯創資通			Wistron Corporation		
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Title					
Display Port AC Coupling					
Size		Document Number			Rev
A4		Caramel-1			2
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GND GUARDING  
EACH SIGNAL WIDTH DEPENDS ON ZO(TRACE IMPEDANCE)  
SPACING=8MIL

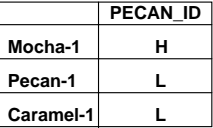


U18: Toshiba TC7W126FU

Title		EXT CRT INTERFACE	
Size	Document Number	Caramel-1	
A3			Rev 2
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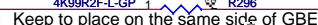
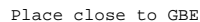






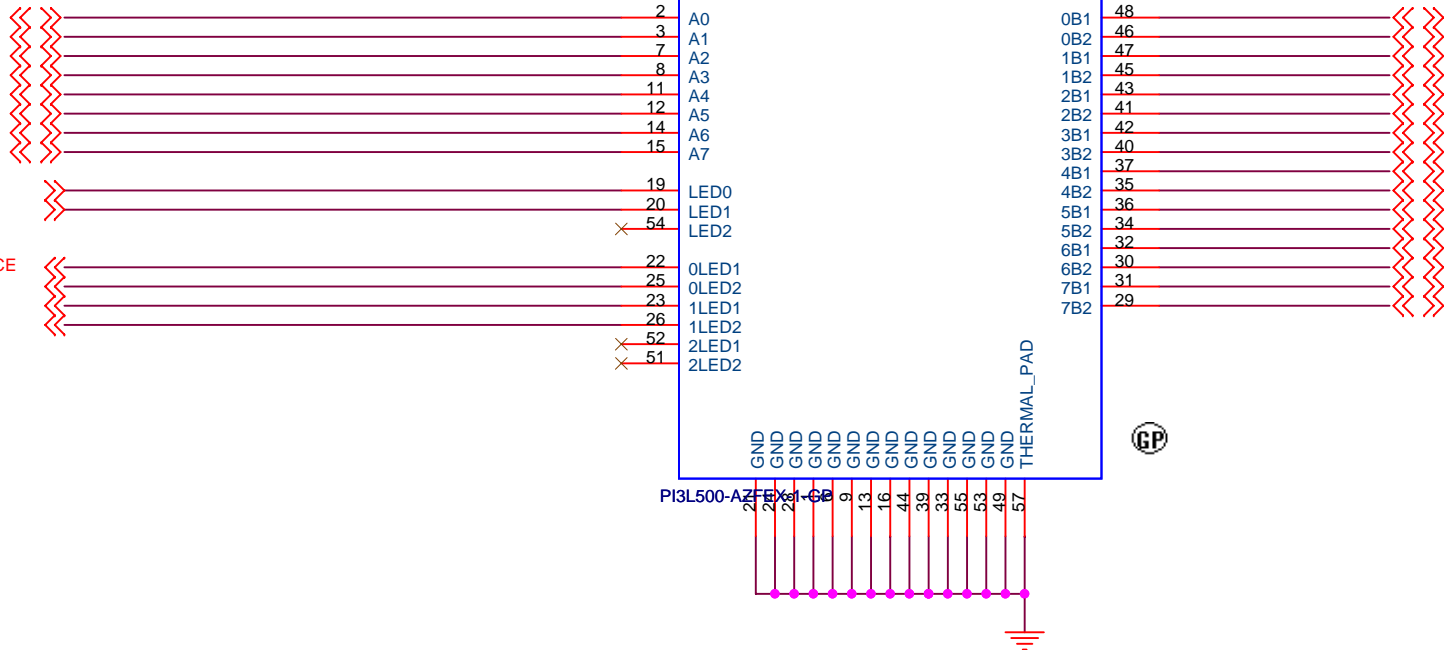
Title			
<b>ICH9-M SFF (3/4):PM/SMB/GPIO</b>			
Size	Document Number	Rev	
Custom	<b>Caramel-1</b>	<b>2</b>	
Date:	Thursday, July 31, 2008	Sheet 22 of	62






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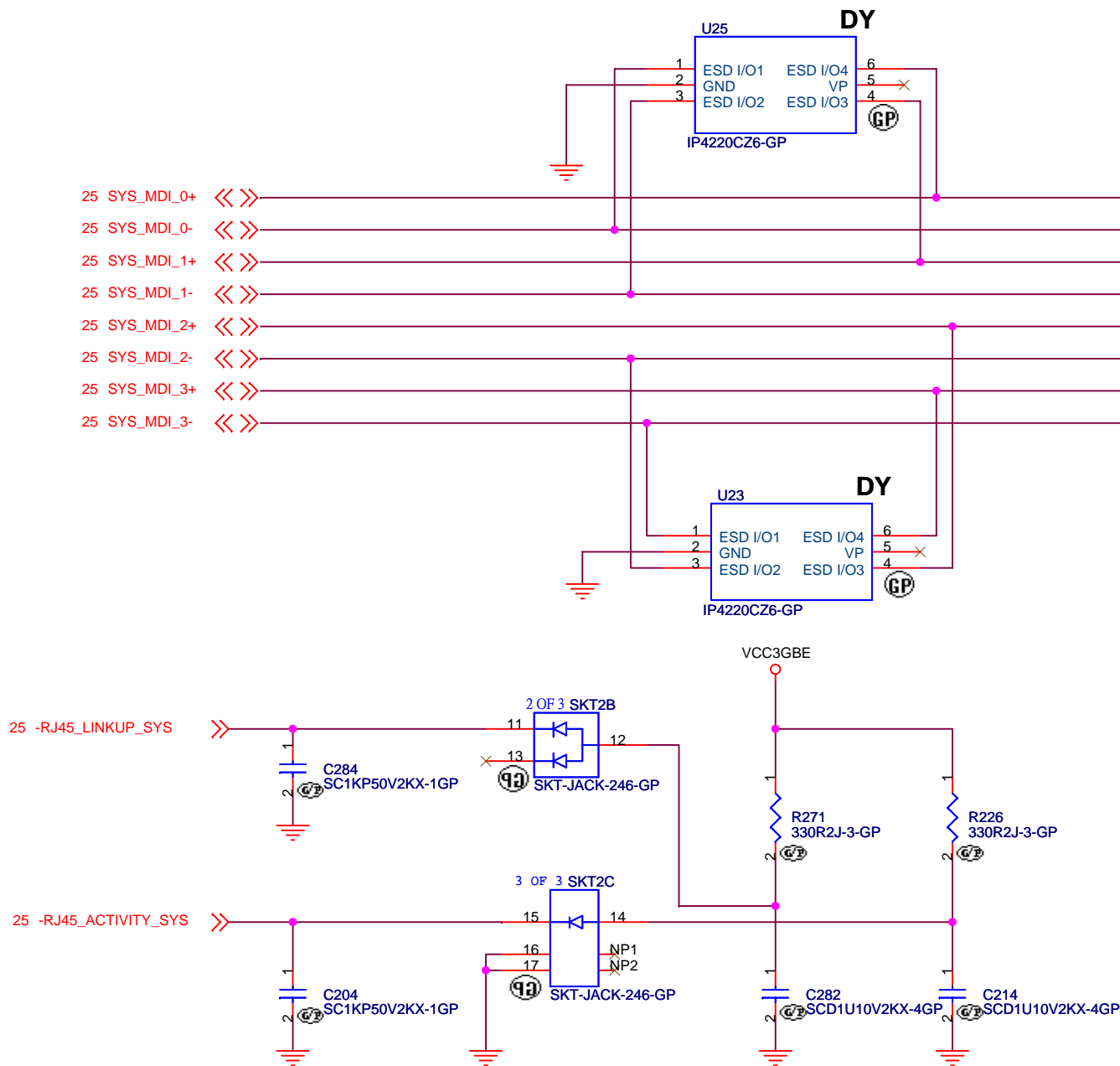
24 MDI\_0+  
24 MDI\_0-  
24 MDI\_1+  
24 MDI\_1-  
24 MDI\_2+  
24 MDI\_2-  
24 MDI\_3+  
24 MDI\_3-  
  
24 -RJ45\_ACTIVITY  
24 -RJ45\_LINKUP  
  
34 -RJ45\_ACTIVITY\_SLICE  
26 -RJ45\_ACTIVITY\_SYS  
34 -RJ45\_LINKUP\_SLICE  
26 -RJ45\_LINKUP\_SYS



		Vendor P/N	Wistron P/N
1st	Pericom	PI3L500AZFEX	73.3L500.003
2nd	TI	TS3L500AERHUR	73.3L500.A0V
3rd	MAXIM	MAX4927ETN+	74.04927.073

<Variant Name>

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<b>GBE LAN SW</b>	
Title Size A4	Document Number <b>Caramel-1</b>
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Rev 2	



<Variant Name>

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Title

**RJ45 CONN**

Size  
A4

Document Number

**Caramel-1**

Rev  
**2**

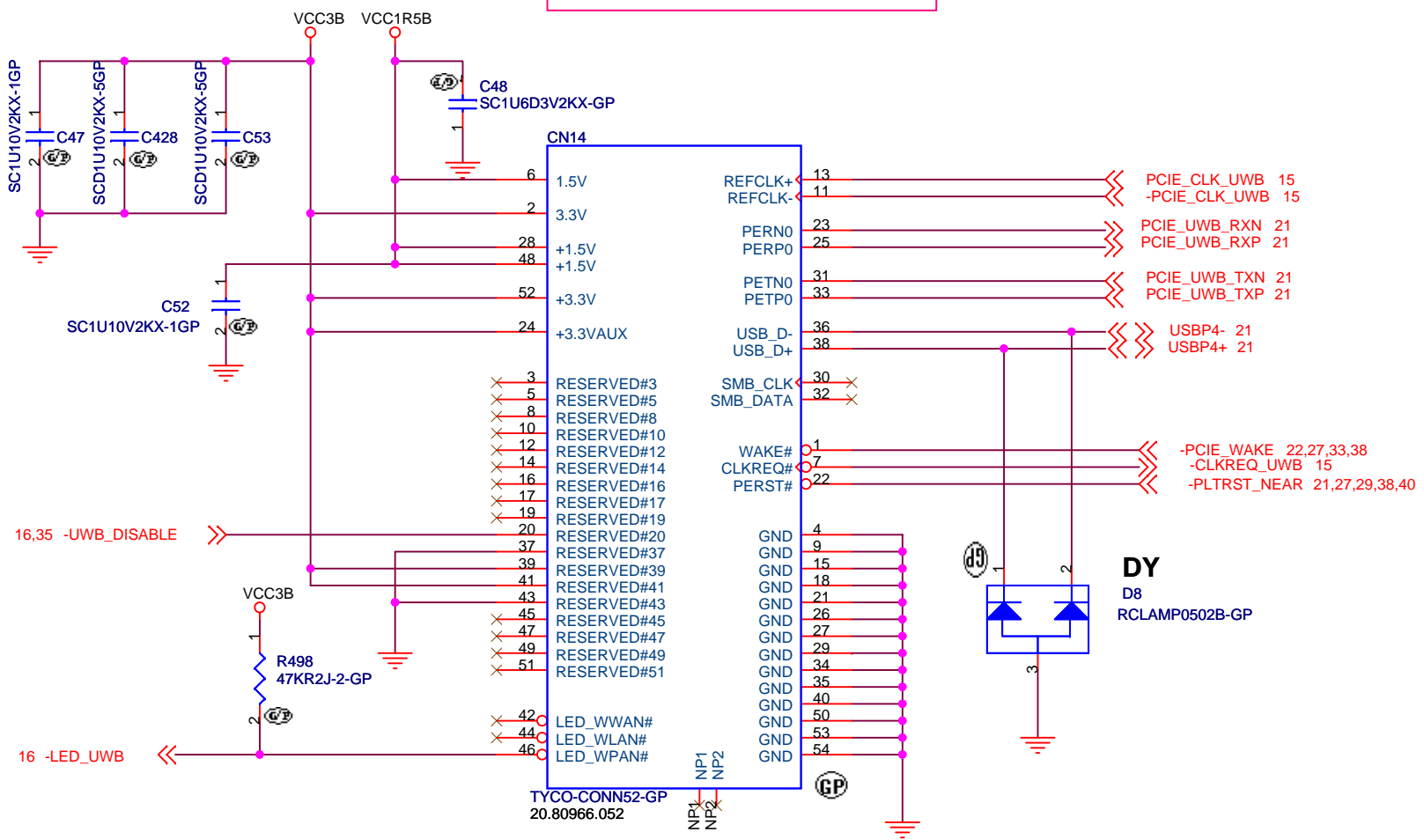
Date: Thursday, July 31, 2008

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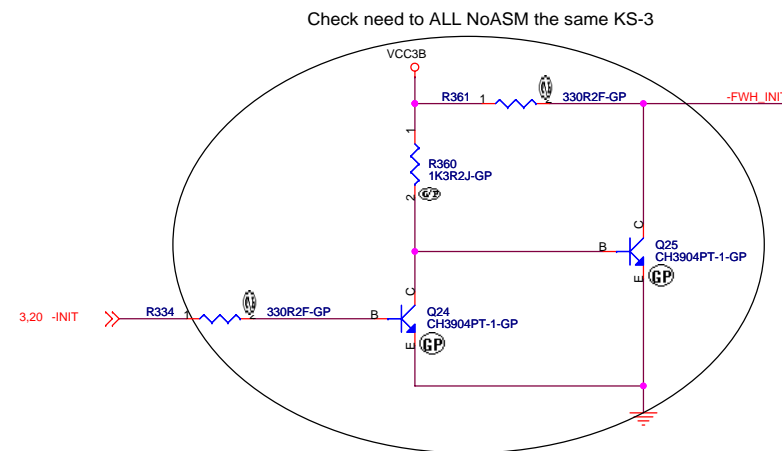
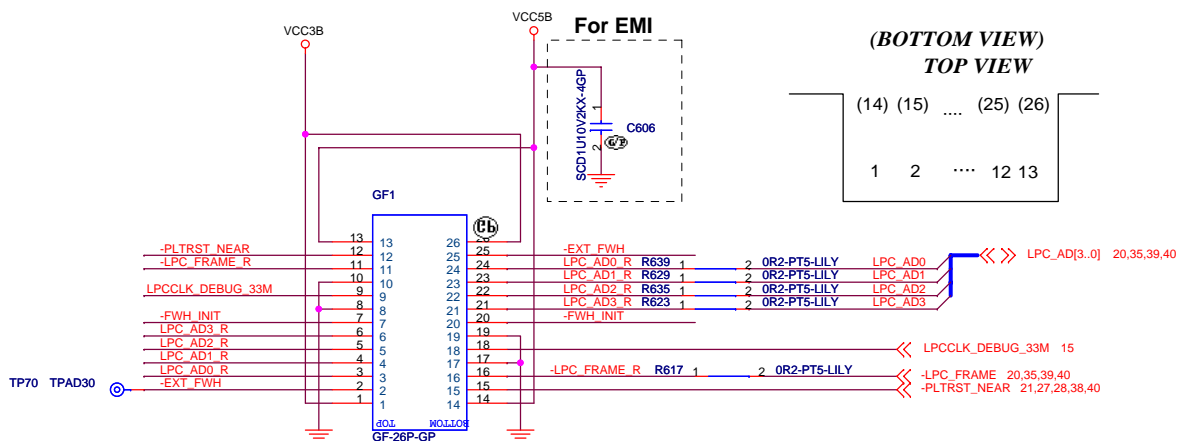
CN14  
1st: 20.80966.052(TYCO)  
2st:

16,35 -UWB\_DISABLE

16 -LED\_UWB

DY  
D8  
RCLAMP0502B-GP

# Golden Finger for Debug Board



64Mbit SPI FLASH :

Macronix MX25L6405DZNI-12G: 72.25640.B01

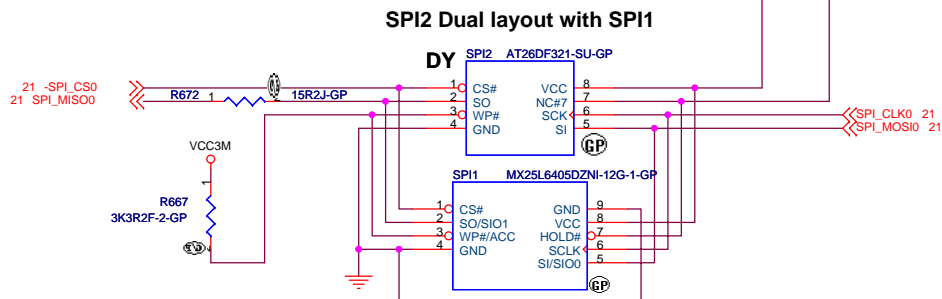
Winbond W25X64VZEIG

ATMEL XXXXXX

32Mbit SPI FLASH :

ATMEL/AT26DF321-SU:72.26321.A01

MXIC/MX25L3205DM2I-12G:72.25325.A01



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SO8 and WSON8 are both supported!

<Variant Name>

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Title

**SPI**

Size  
A3

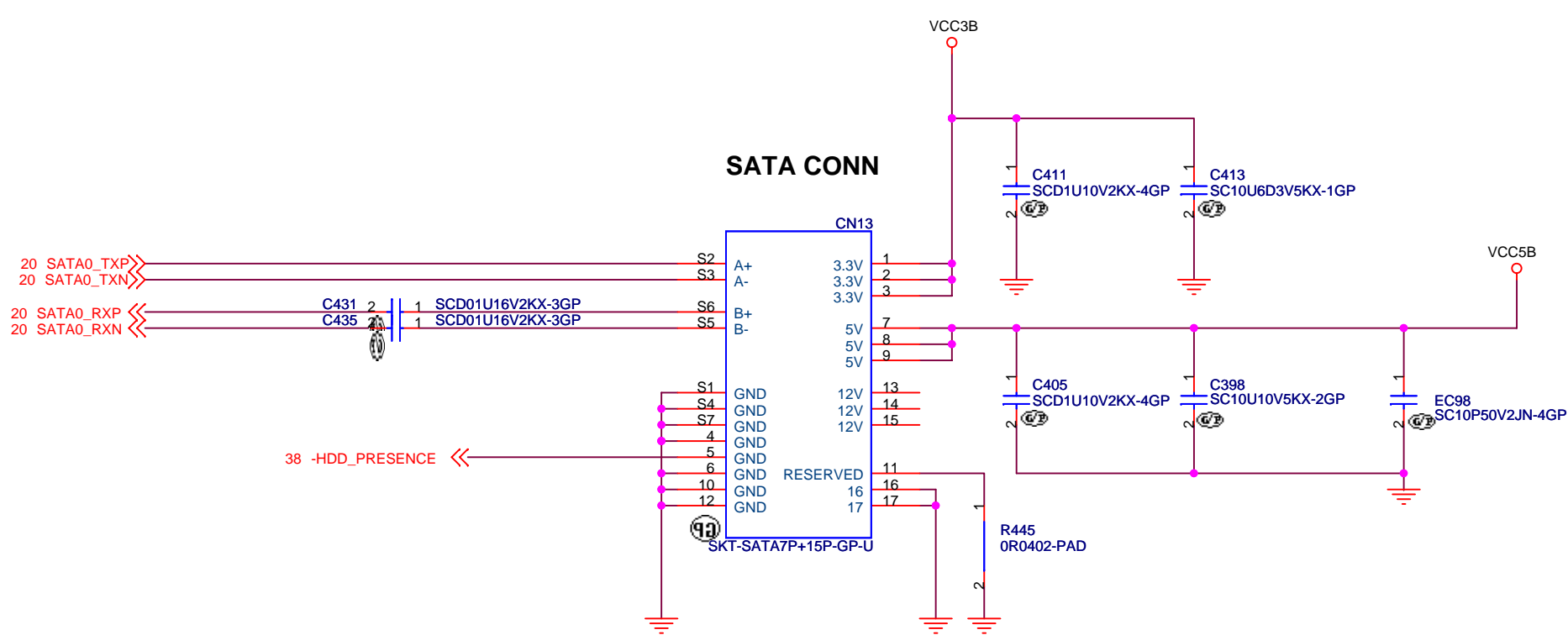
Document Number

**Caramel-1**

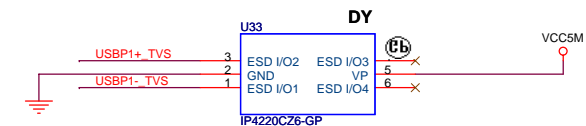
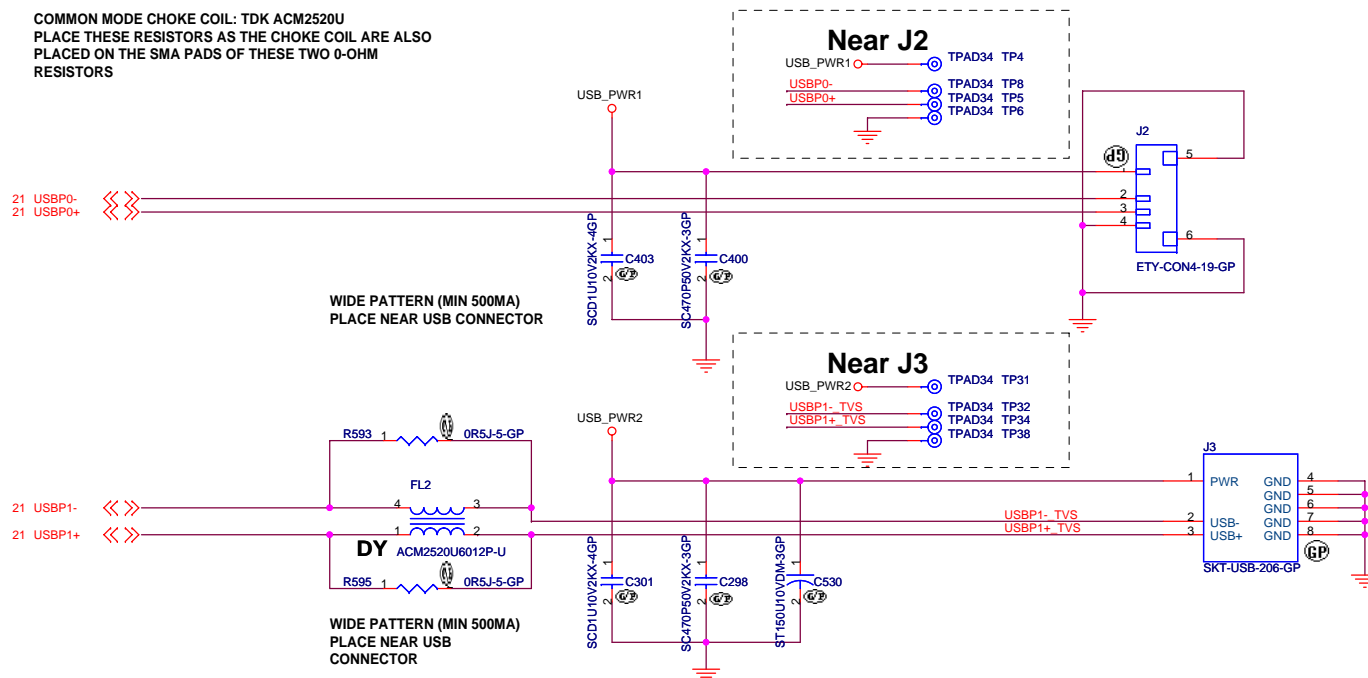
Rev  
2

Date: Thursday, July 31, 2008

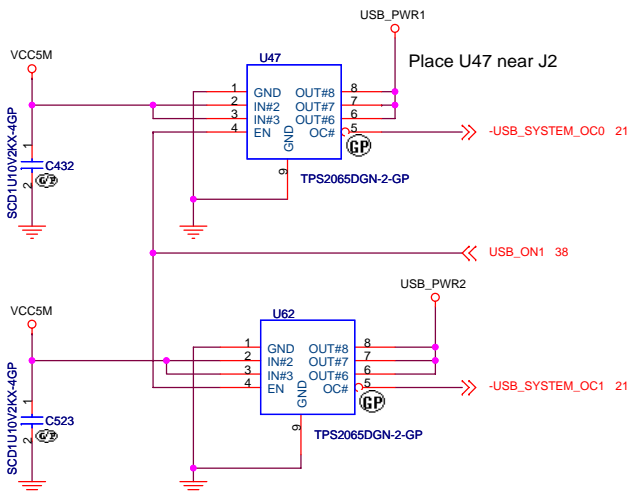
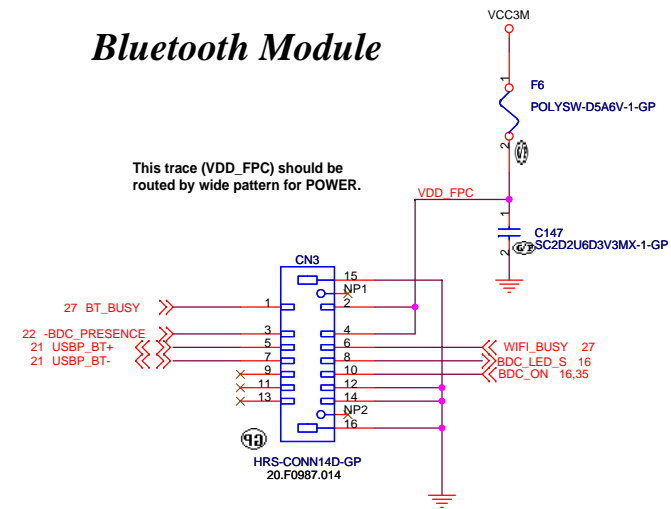
Sheet 29 of 62



COMMON MODE CHOKE COIL: TDK ACM2520U  
PLACE THESE RESISTORS AS THE CHOKE COIL ARE ALSO  
PLACED ON THE SMA PADS OF THESE TWO 0-OHM  
RESISTORS



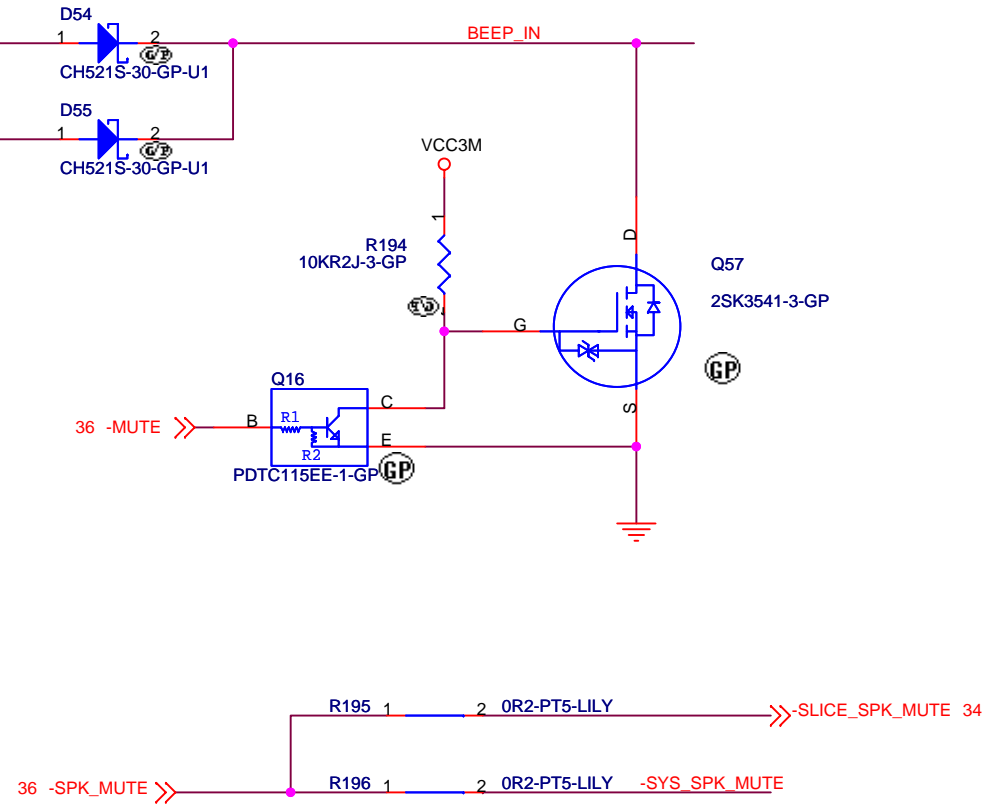
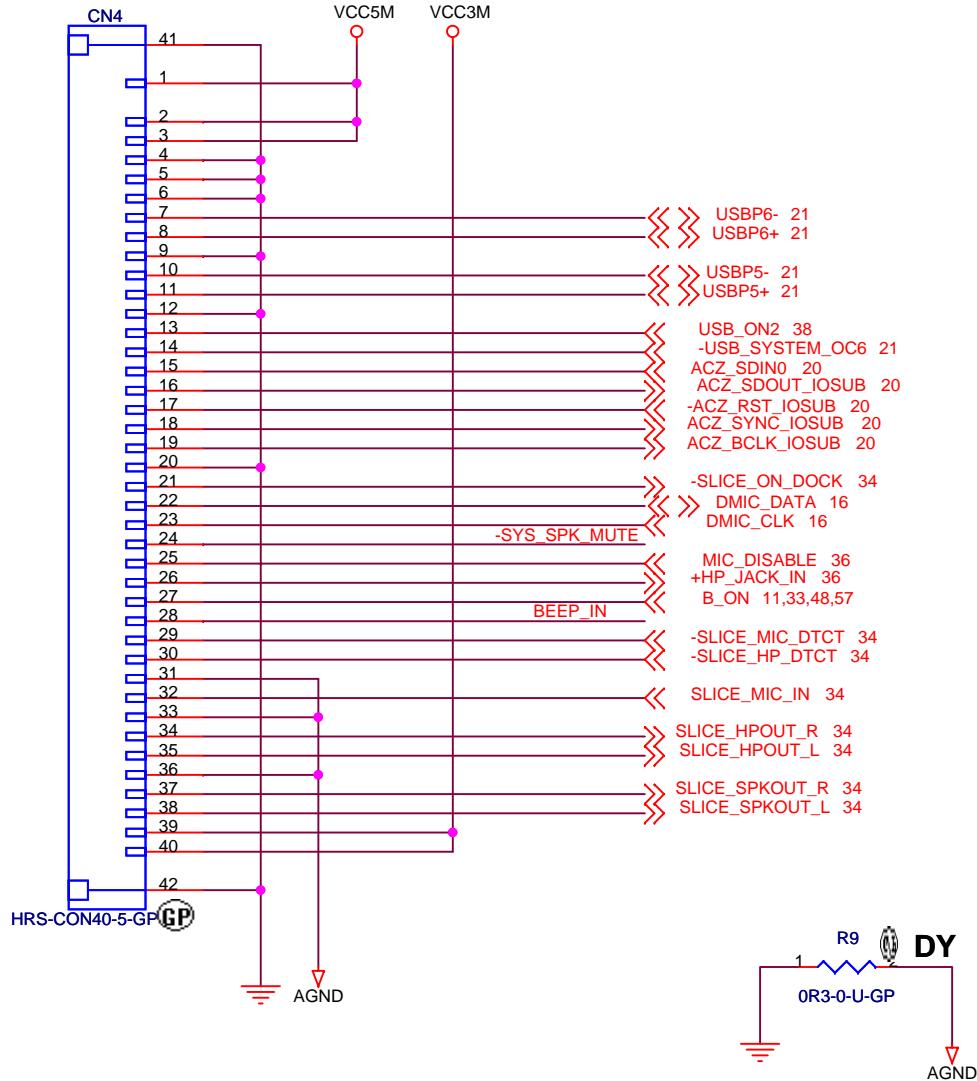
## Bluetooth Module



	TI P/N	WISTRON P/N
1	TPS2065DGN-GP	74.02065.079
2	TPS2065DGN-1-GP	74.02065.A79

<Variant Name>

<b>緯創資通 Wistron Corporation</b> 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
Title	
<b>USB POWER / CONNECTOR</b>	
Size	Document Number
A3	Caramel-1
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<Variant Name>

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Title

**SUB-CARD CONNECTOR**

Size  
A4

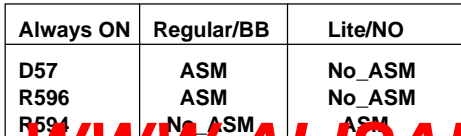
Document Number

**Caramel-1**

Rev  
2

Date: Thursday, July 31, 2008


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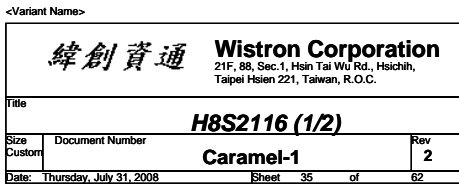
Always ON	REG	LITE/BB/NO
U64	ASM	No_ASM
R598	No_ASM	ASM
R597	No_ASM	ASM

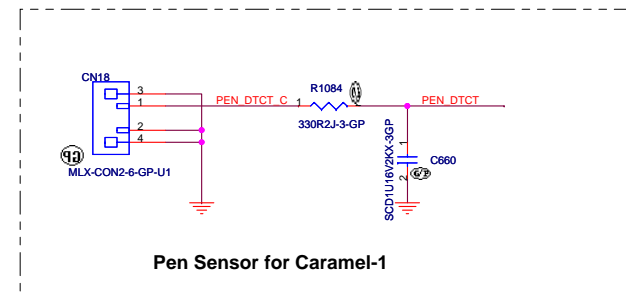
**0.65A**

U64  
1st PI3USB10MZK (73.3US10.A03)

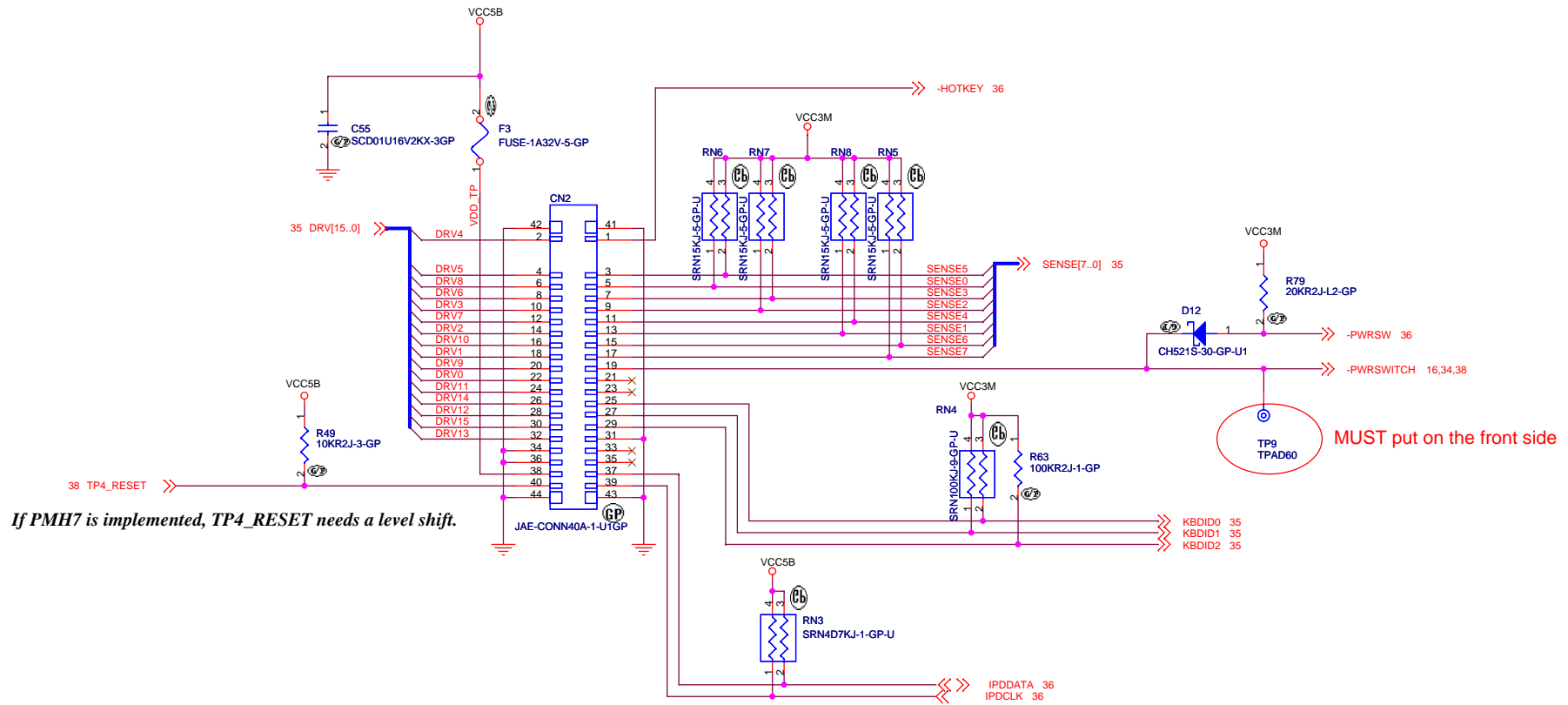
<div> <div>  <div> <div>緯創資通</div> <div>Wistron Corporation</div> <div>21F, 88, Sec. 1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.</div> </div> </div> </div>		
<div> <div>Title</div> <div>Express Card Slot/PWR</div> </div>		
<div> <div>Size</div> <div>A3</div> </div>	<div> <div>Document Number</div> <div>Caramel-1</div> </div>	<div> <div>Rev</div> <div>2</div> </div>
<div> <div>Date: Thursday, July 31, 2008</div> </div>		<div> <div>Sheet 33 of 62</div> </div>



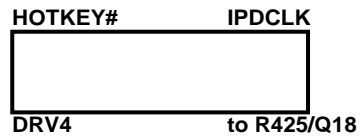




## Keyboard Connector



***If PMH7 is implemented, TP4\_RESET needs a level shift.***



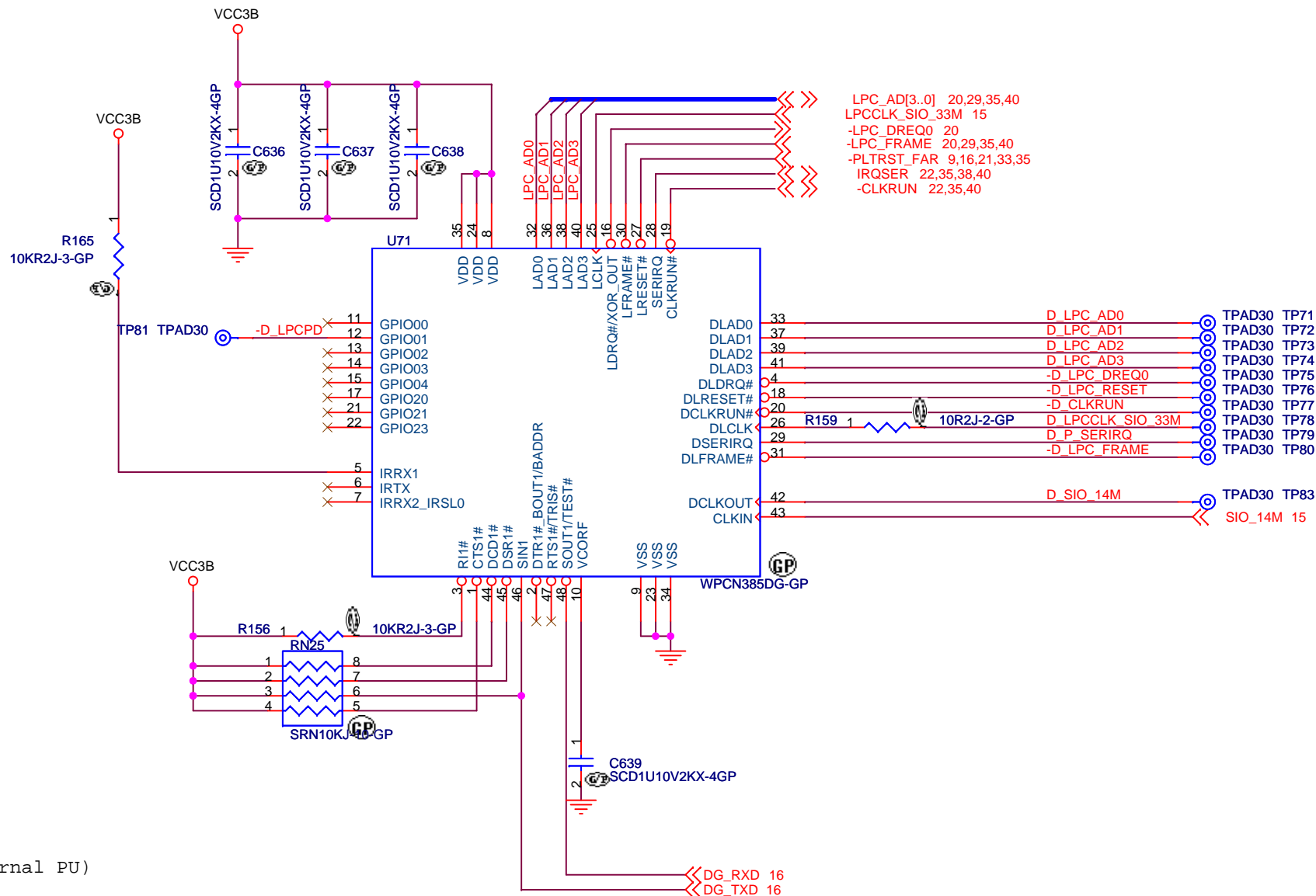
### Keyboard Connector Top View



Always ON	AO_ID[1..0]
NO	11B
Lite	10B
Lite & BB	01B
Regular	00B

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Title			
<b>MISC G/A (PMH-7)</b>			
Size	Document Number		Rev
Custom	<b>Caramel-1</b>		<b>2</b>
Date:	Thursday, July 31, 2008	Sheet 38 of	62



Power On strap pin

Pin2 : Base I/O address

NC : 164E/164F (Internal PU)

PD : 2E/2F

Pin31 : LPC Switch function

NC : Switch Enable(controlle by DLCON bit)

PD : Switch Disable(forced to be Disconnected)

Pin47 : Tristate

NC : Normal Operation

PD : All pins floting

Pin48 : Test

NC : Normal Operation

PD : Test mode

<Variant Name>

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Title

**WPCN385SDG**

Size  
A4

Document Number

**Caramel-1**

Rev  
**2**

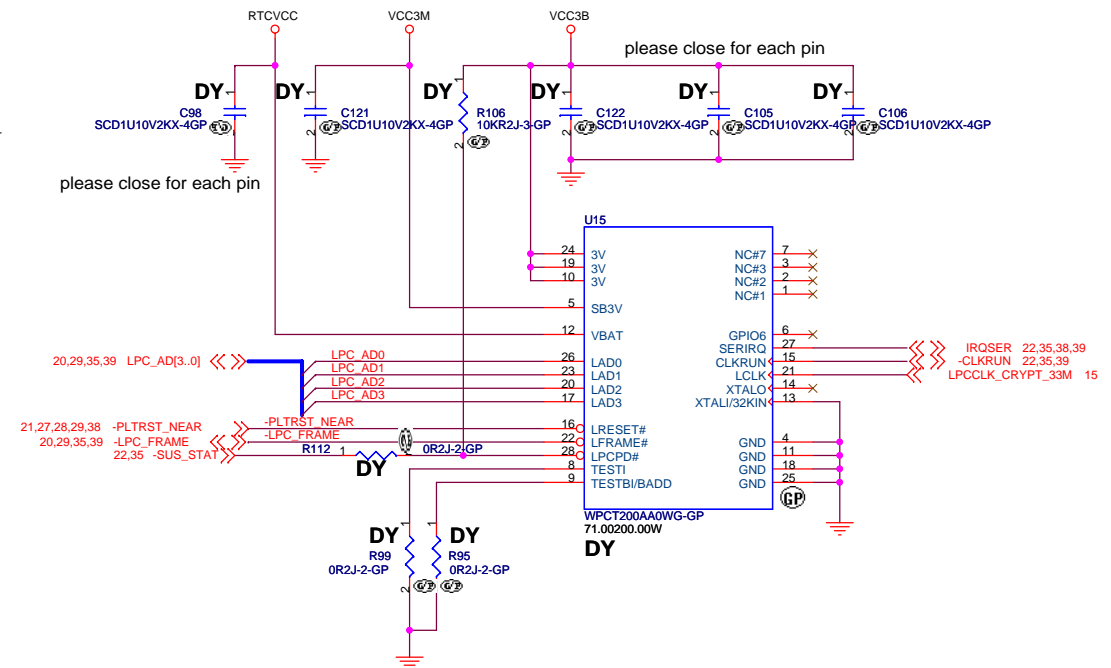
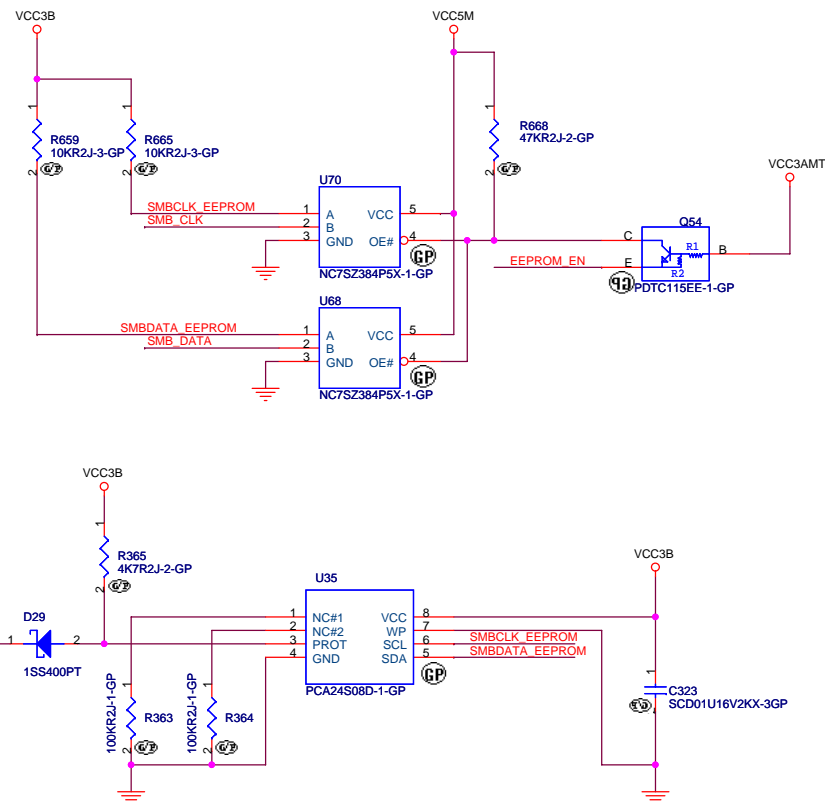
Date: Thursday, July 31, 2008

Sheet 39

of

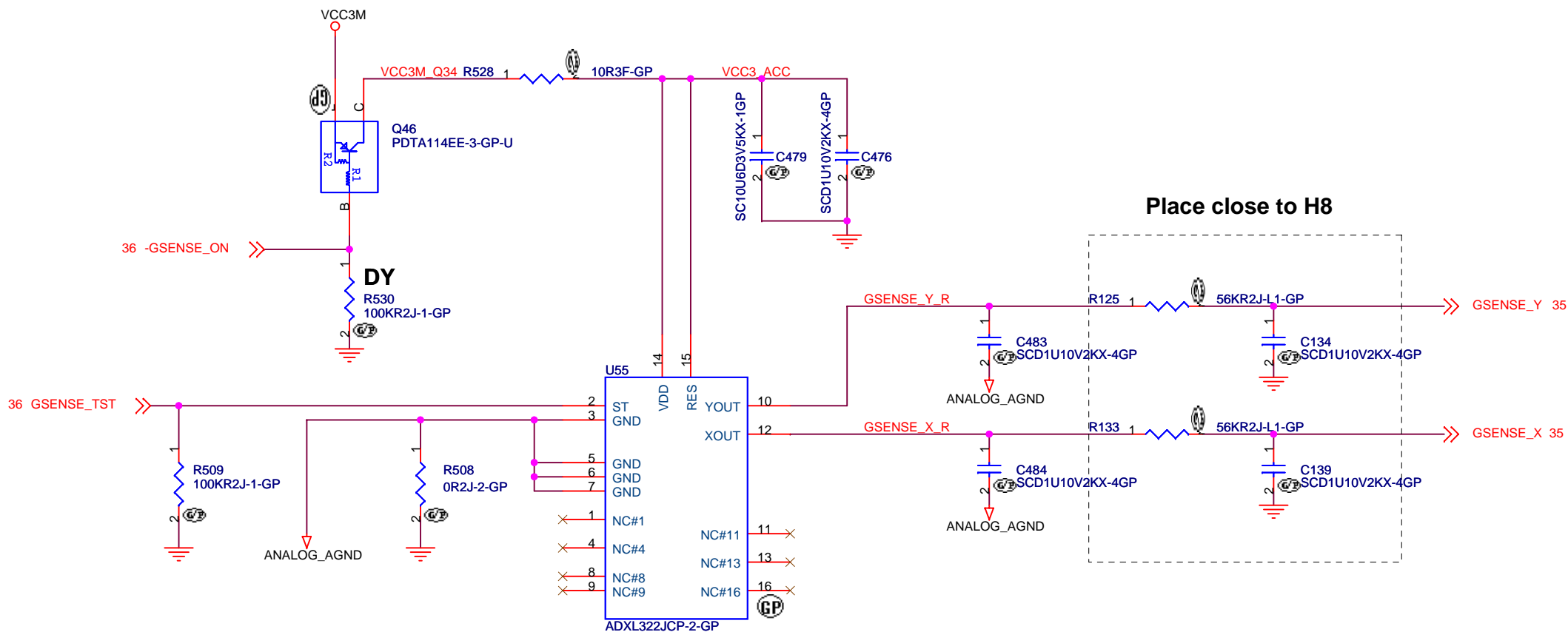
62

*TCPA*



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Primary : ADI ADXL322  
 2nd : STMicro LIS244AL  
 3rd : STMicro LIS34AL: 74.00034.0BZ

#### Layout Comment :

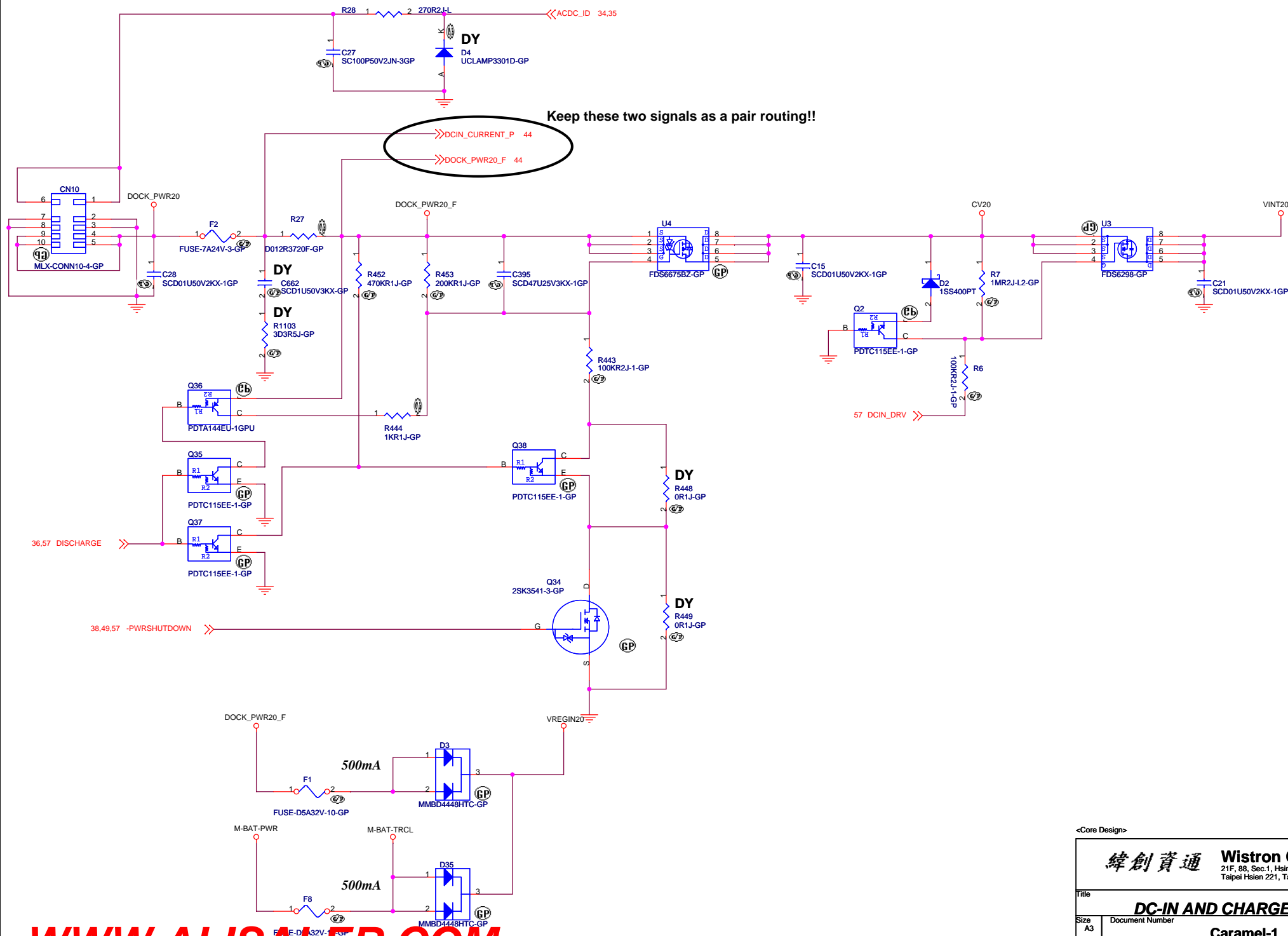
- (1) Place C483, C484, Q46, R528, R530, C479, C476, R509, R508 close to U55.
- (2) Avoid routing under DCDC switching area.

Width = 6 mil & Spacing = 10 mil  
 for three Output traces

	ADXL322	
	LIS244AL	No Accel
	LIS34AL	
R530	NO_ASM	ASM
R509	ASM	ASM
All other	ASM	NO_ASM

<Core Design>

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Title	
<b>G-SENSOR</b>	
Size A4	Document Number <b>Caramel-1</b>
Date: Thursday, July 31, 2008	Rev <b>2</b>
Sheet 42 of 62	



<Core Design>

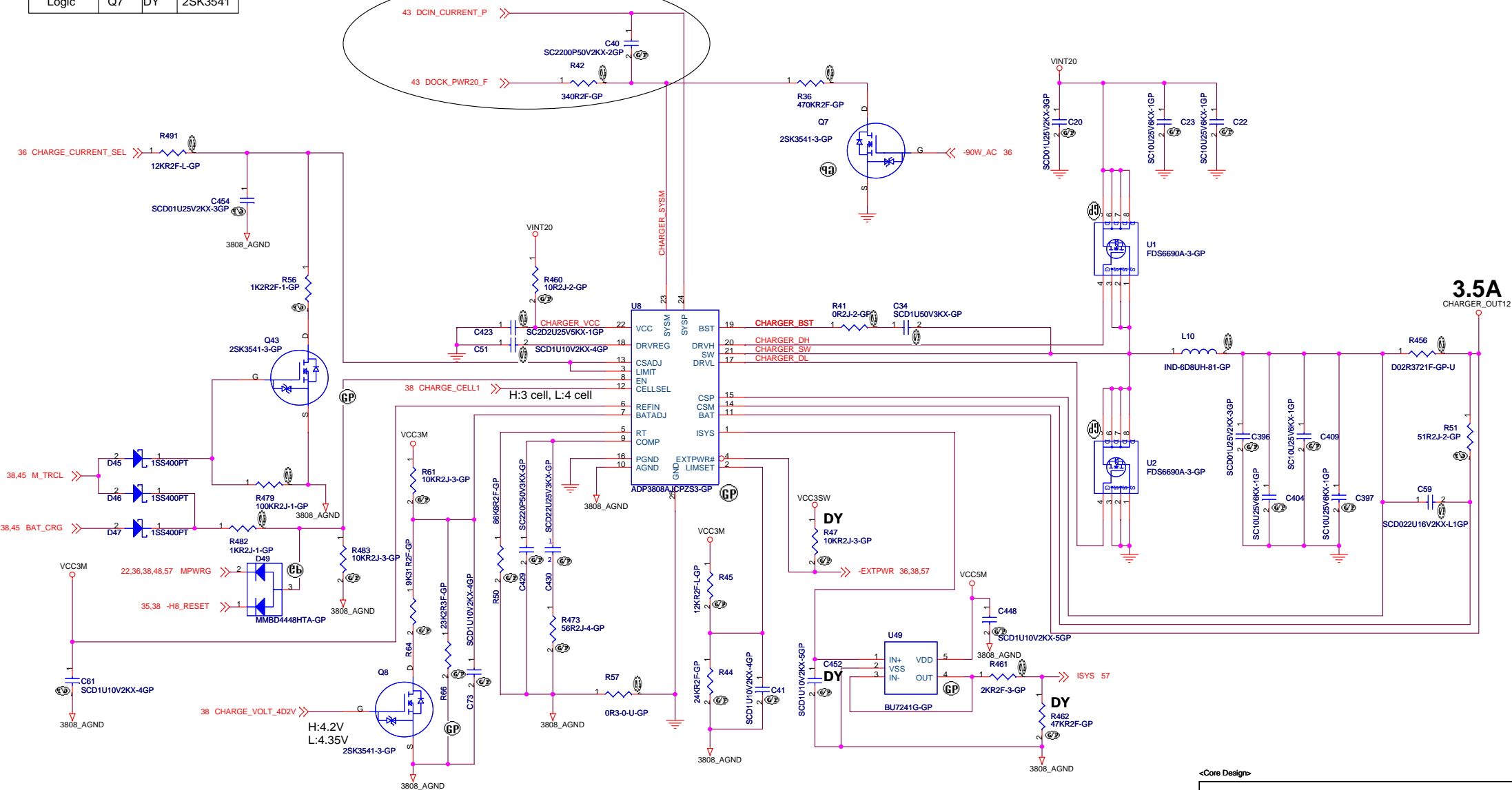
**緯創資通** Wistron Corporation  
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Title		
<b>DC-IN AND CHARGER (1/2)</b>		
Size	Document Number	Rev
A3		2
Date: Thursday, July 31, 2008		Sheet 43 of 62

90W, 65W, auto selection mode

MAX Power Setting	65W	90W
-90W_AC	R36 DY	470K
Logic	Q7 DY	2SK3541

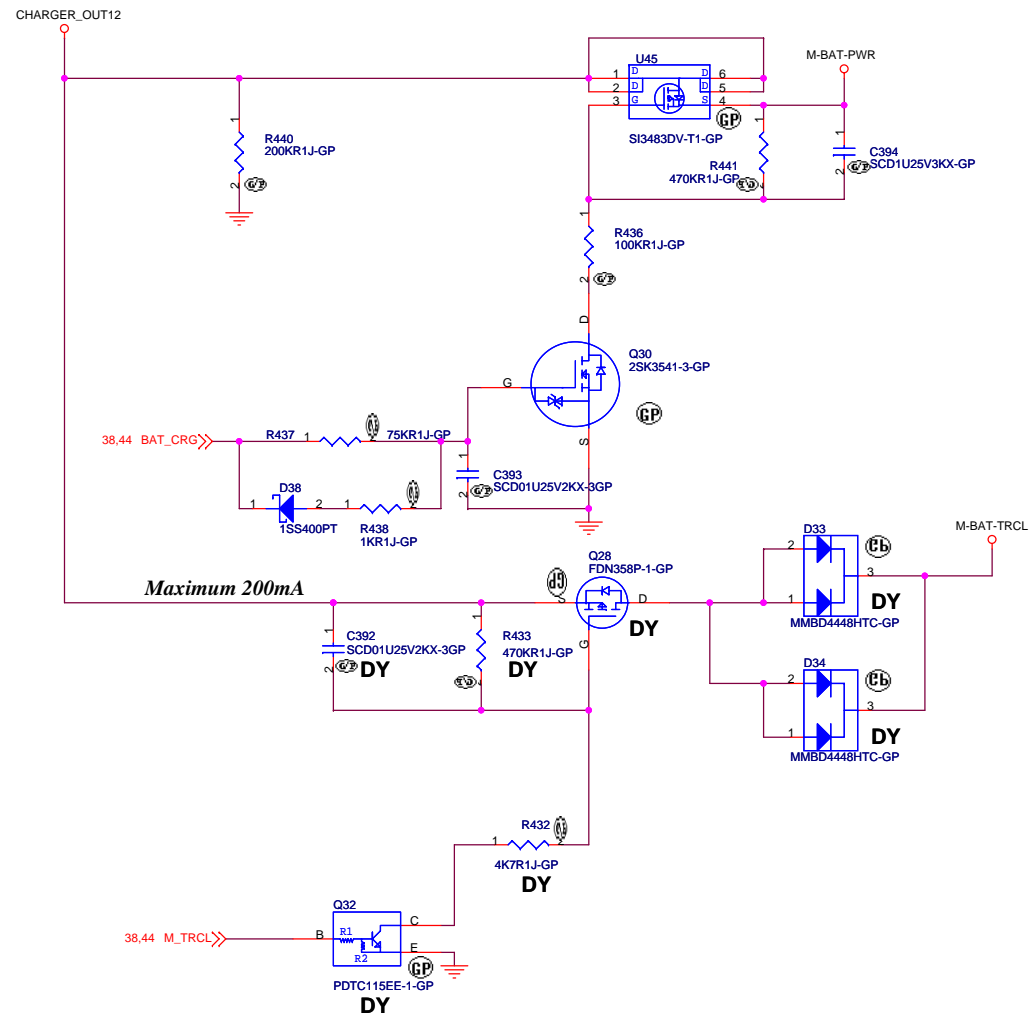
Keep these two signals as a pair routing !!



<Core Design>

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Taipei Hsien 221, Taiwan, R.O.C.

Title			
DC-IN AND CHARGER (2/2)			
Size	Document Number	Rev	
Custom		2	
Date:	Thursday, July 31, 2008	Sheet	44 of 62

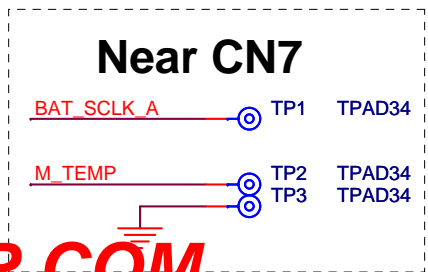
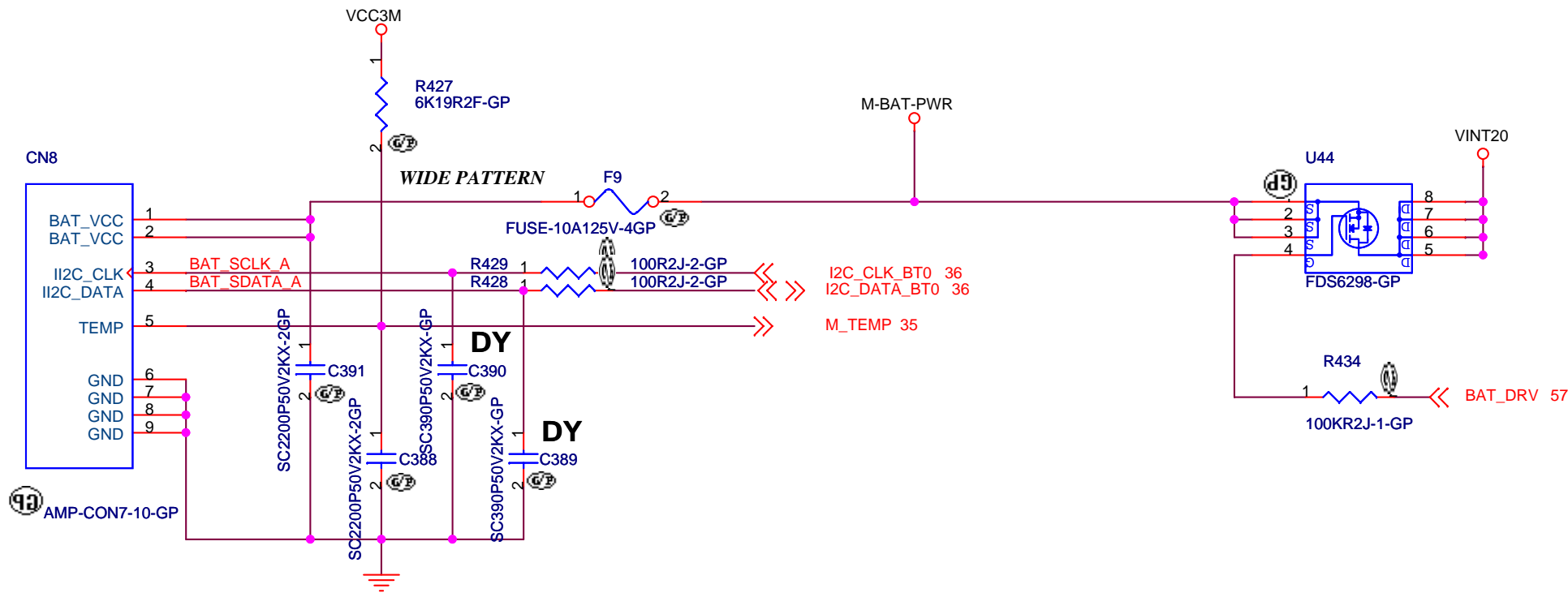


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Taipei Hsien 221, Taiwan, R.O.C.

Title		
<b>CHARGER SELECT</b>		
Size A3	Document Number <b>Caramel-1</b>	Rev <b>2</b>
Date: Thursday, July 31, 2008	Sheet 45	of 62

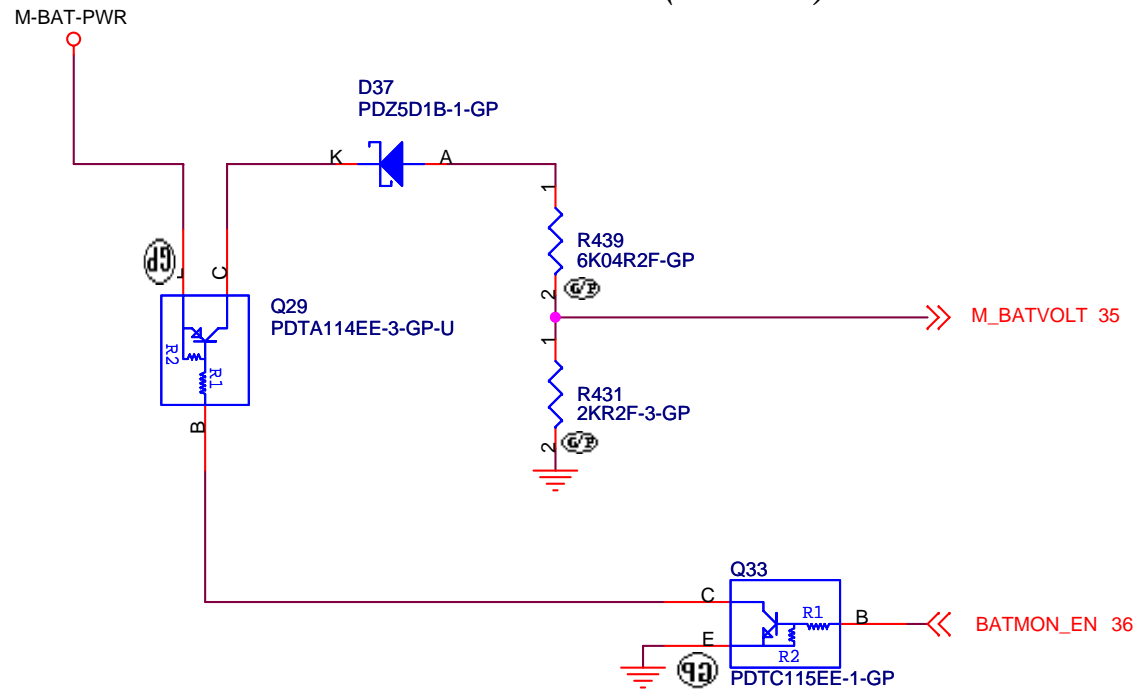


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		21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
Title			
<div>BATTERY INPUT</div>			
Size A	Document Number		Rev
	Caramel-1		2
Date:	Thursday, July 31, 2008	Sheet 46 of	62

$$V_{OUT} = 0.249 (V_{BAT} - 5)$$



<Core Design>

緯創資通

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Title

**BATTERY MONITOR**

Size  
A

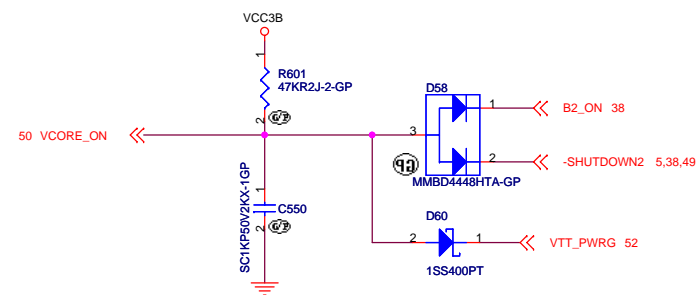
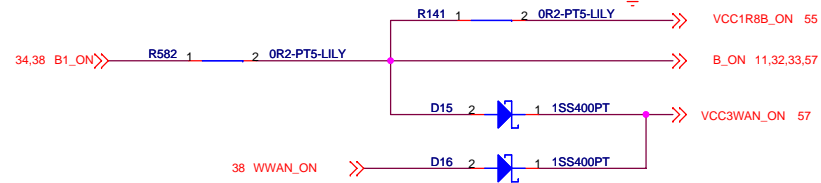
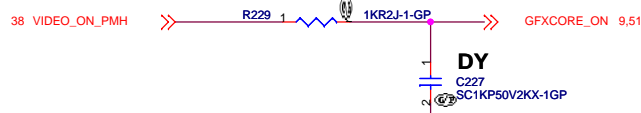
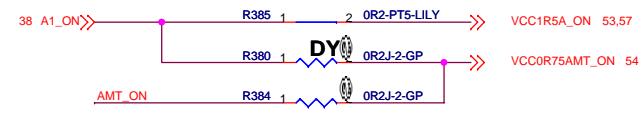
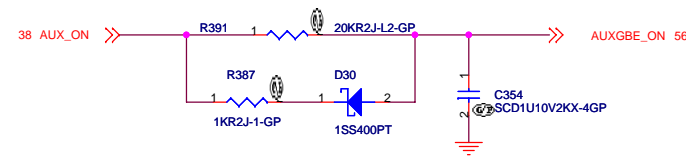
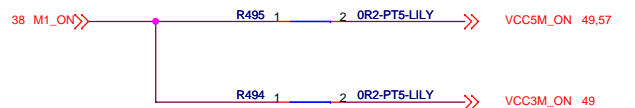
Document Number

**Caramel-1**

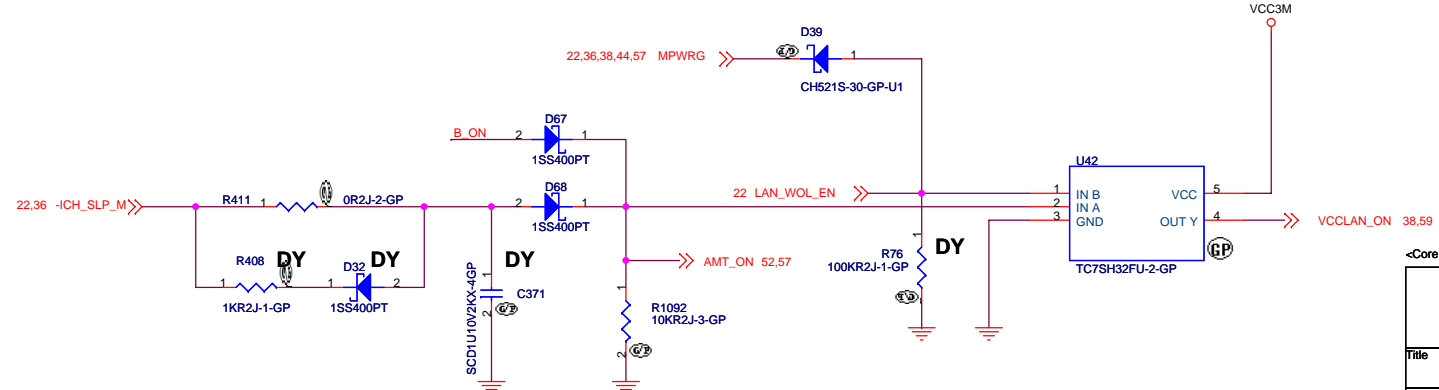
Rev  
**2**

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Always ON	Enable	Disable
D15	ASM	No_ASM
D16	ASM	No_ASM



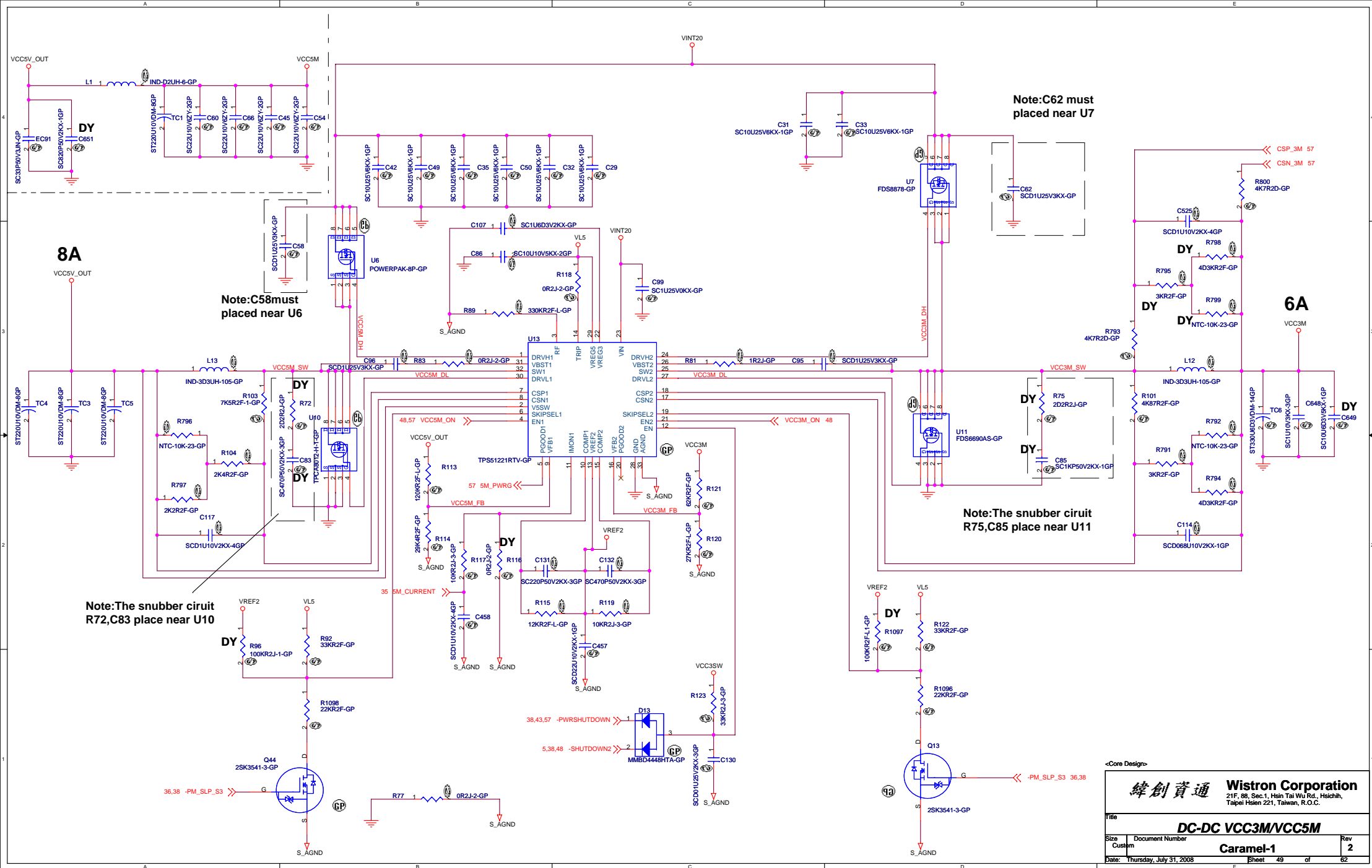
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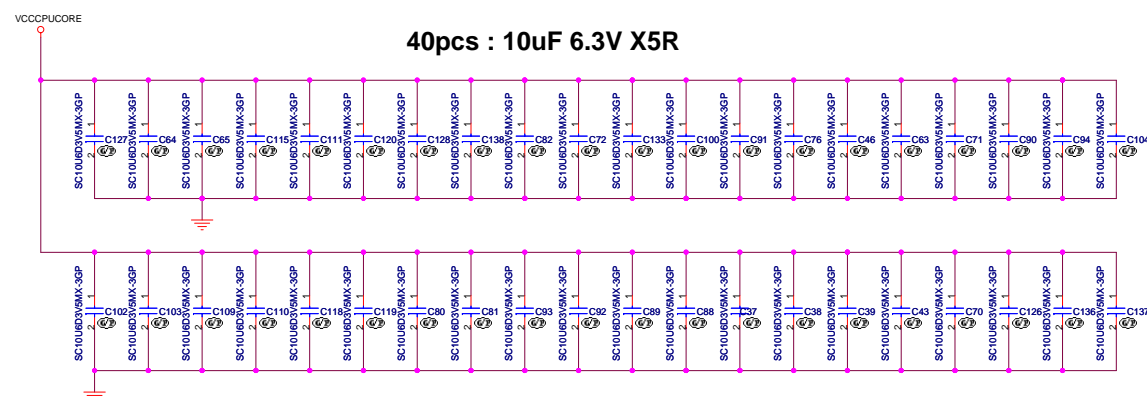
**緯創資通** Wistron Corporation  
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 Taipei Hsien 221, Taiwan, R.O.C.

Title: **POWER SEQUENCE**

Size: A3 Document Number: **Caramel-1** Rev: 2

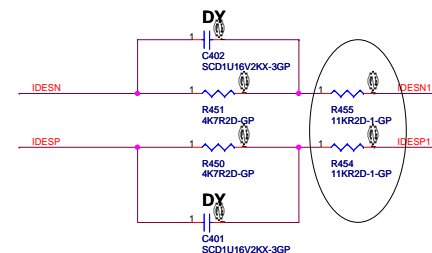
Date: Thursday, July 31, 2008 Sheet: 48 of 62



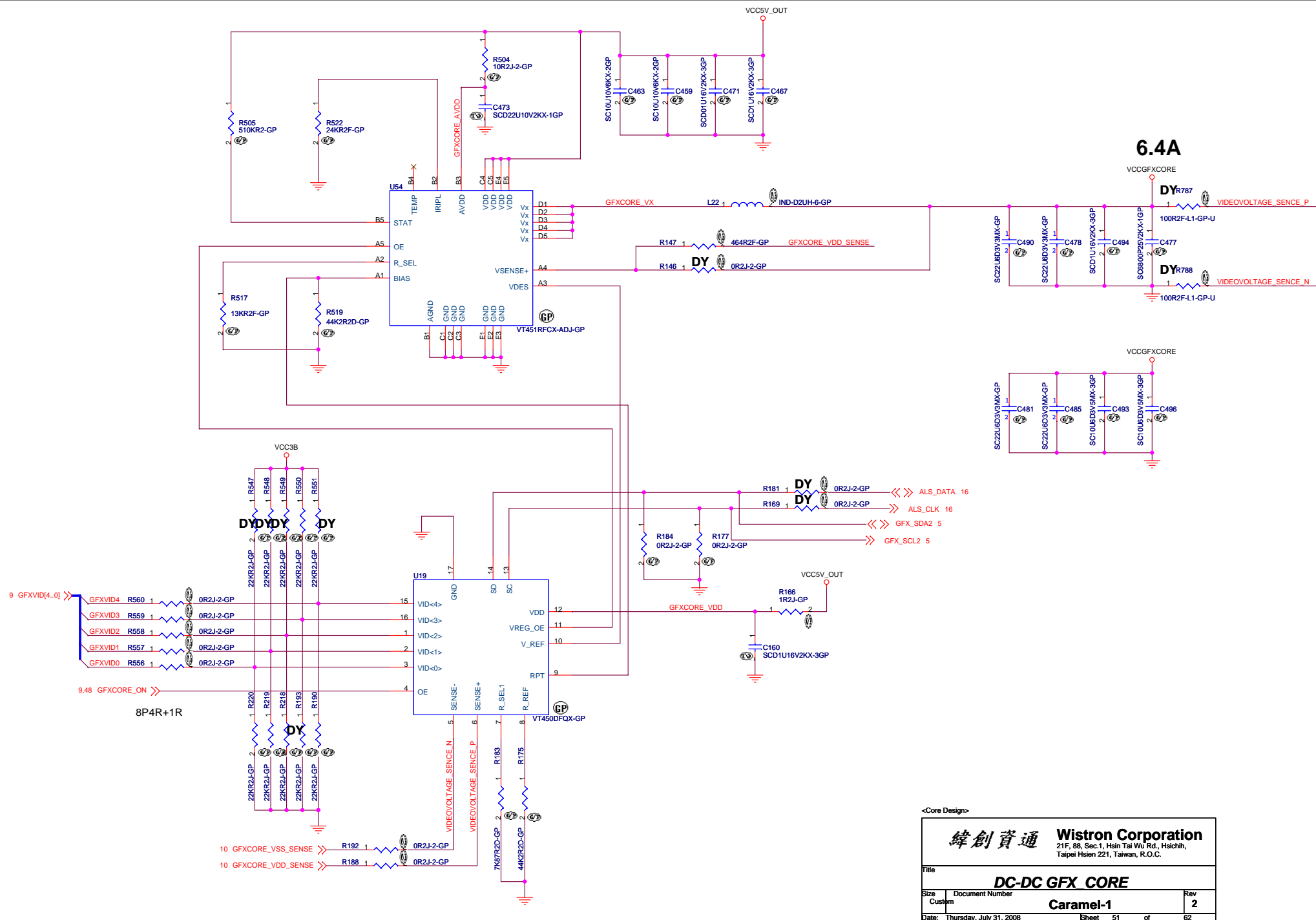


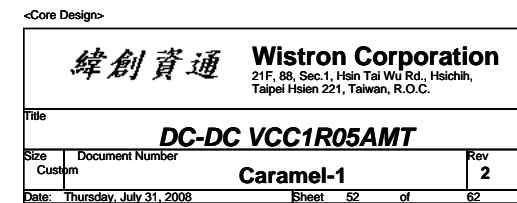
Note1: UVLO\_ext not use.  
Note2: L2 and Cout value.  
Subject to optimize.

	Pre DV	DV
R455	12.1k ohm	11k ohm
R454	12.1k ohm	11k ohm

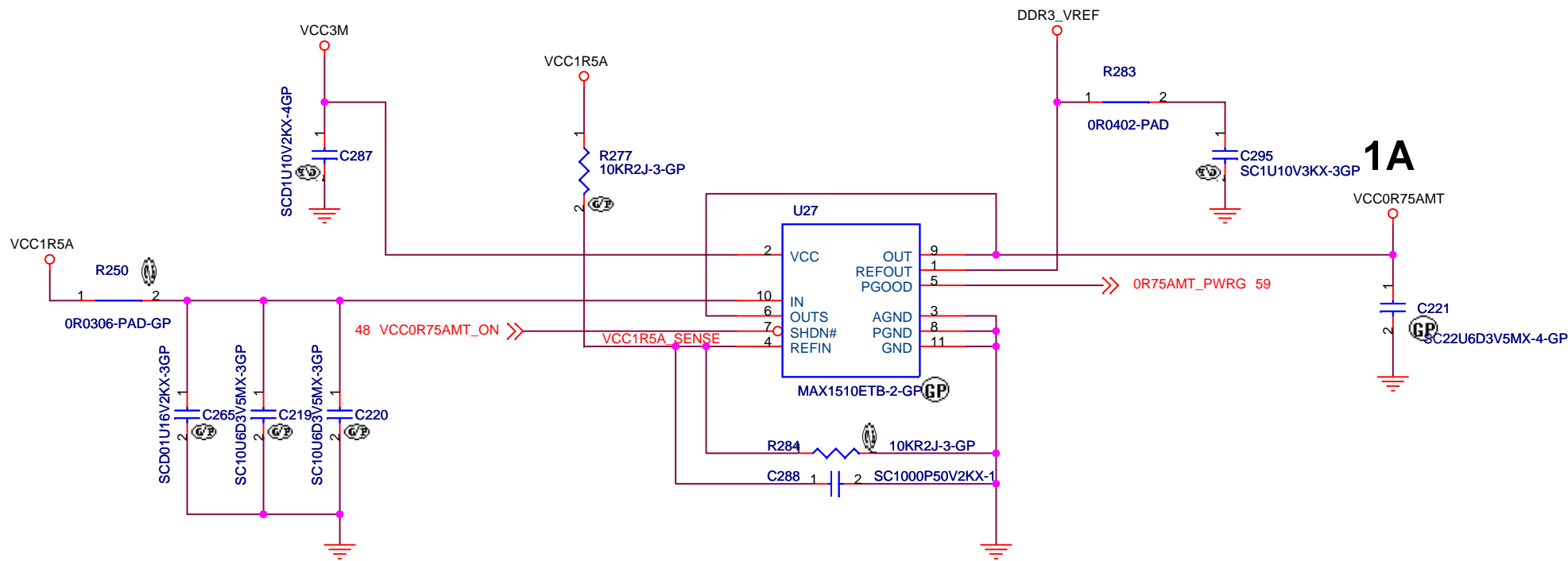


<b>緯創資通</b>		<b>Wistron Corporation</b> 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
Title			
<b>DC-DC VCCCPUCORE LV/ULV</b>			
Size	Document Number		Rev
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<Core Design>

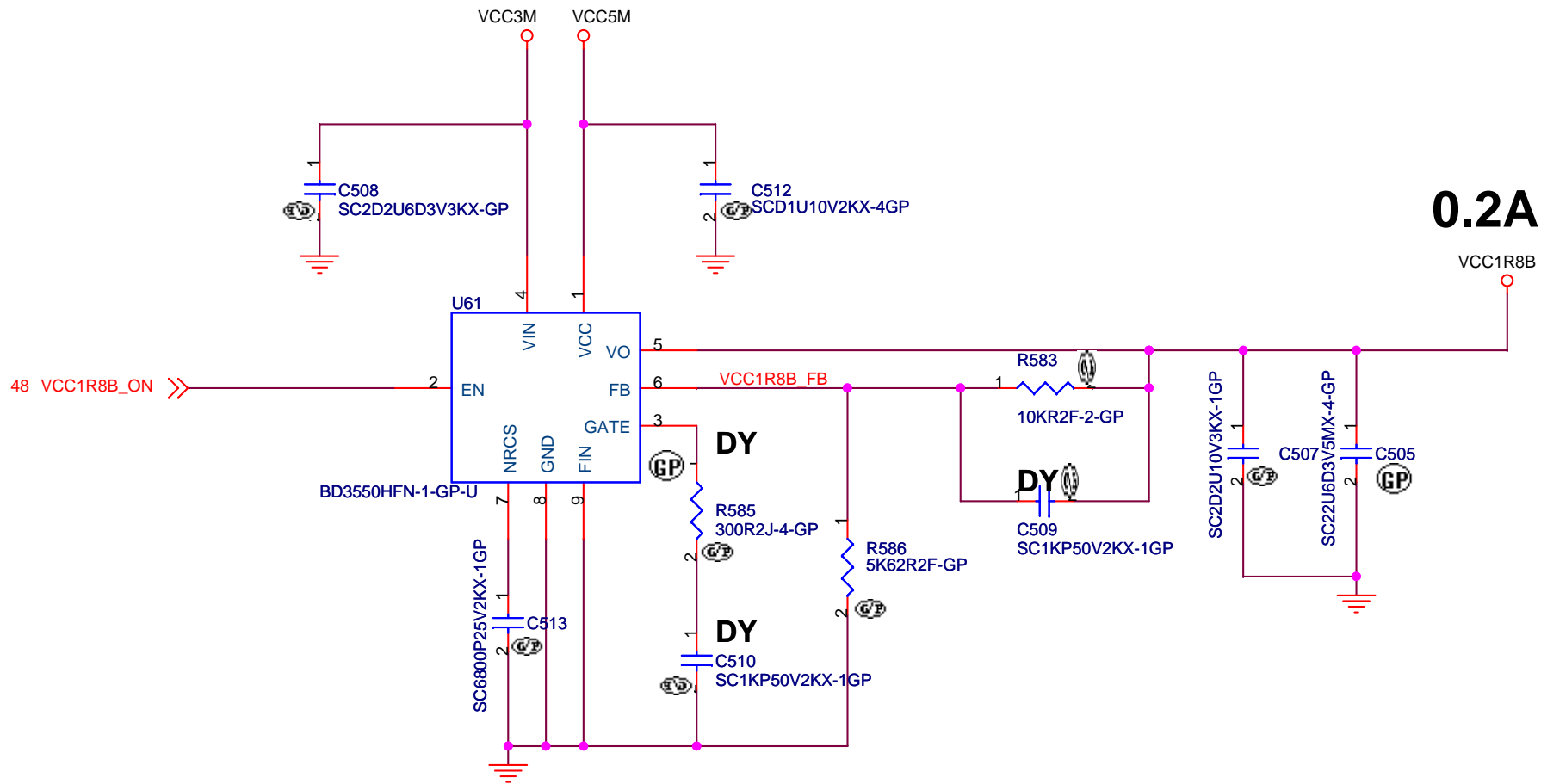
緯創資通

**Wistron Corporation**

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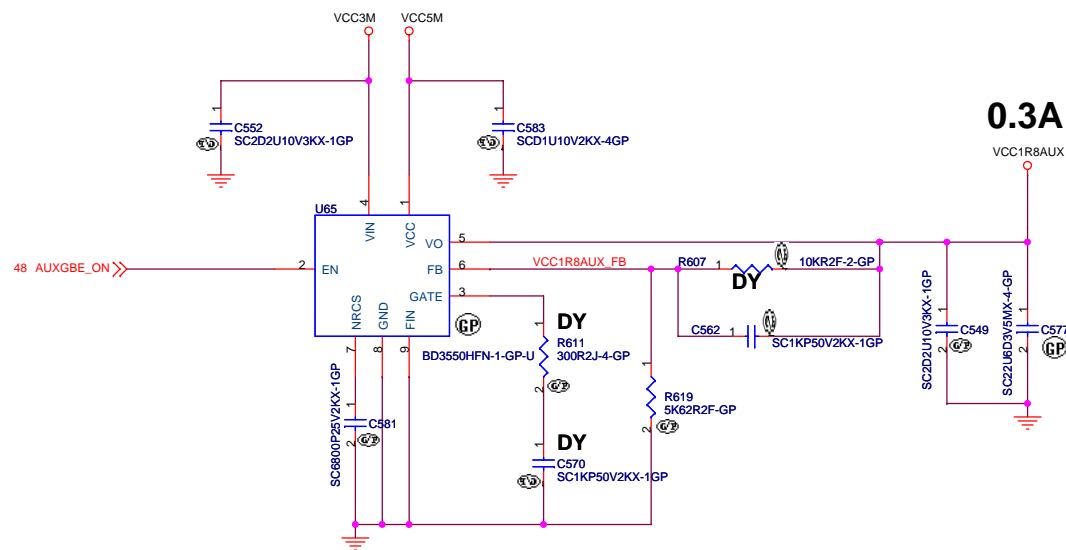
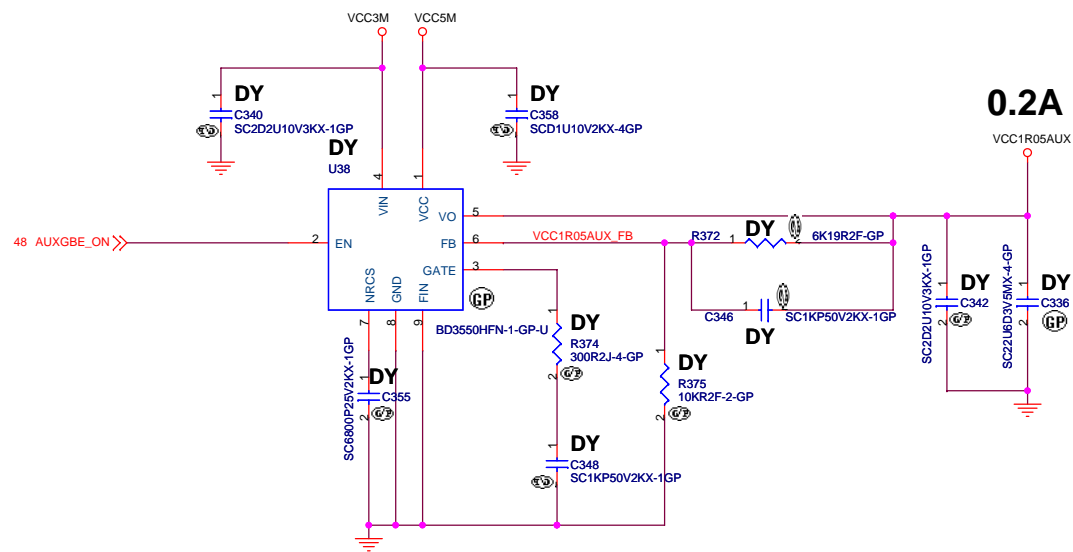
Title **DC-DC VCC0R75AMT**

Size A4	Document Number <b>Caramel-1</b>	Rev <b>2</b>
Date: Thursday, July 31, 2008	Sheet 54 of 62	



<Core Design>

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Title <div>DC-DC VCC1R8B</div>	
Size A	Document Number <div>Caramel-1</div>
Date: Thursday, July 31, 2008	Sheet 55 of 62

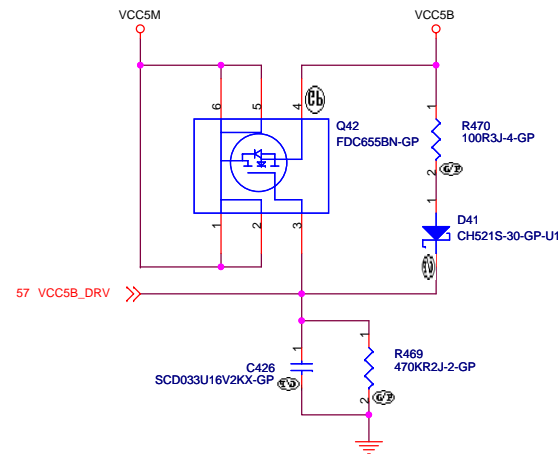
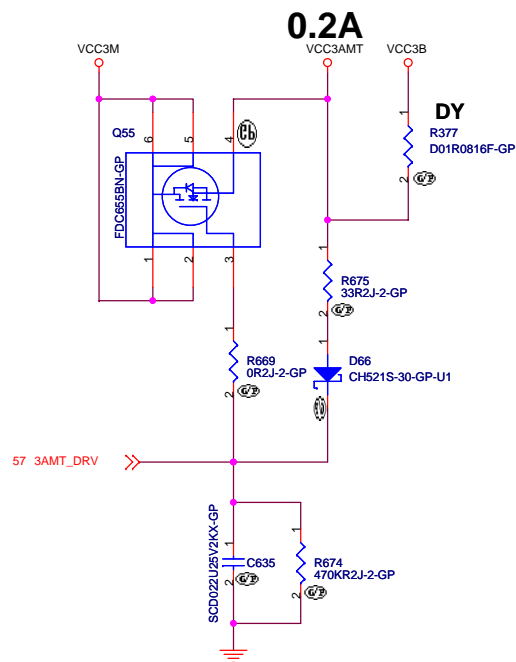


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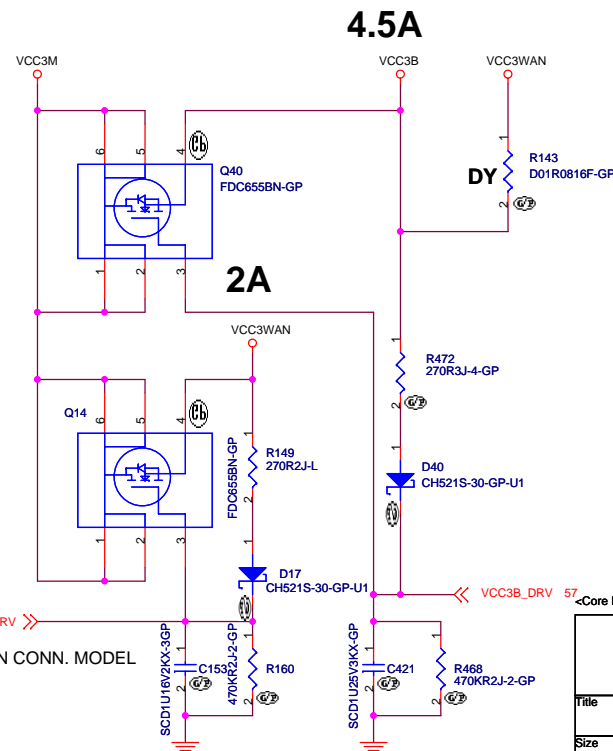
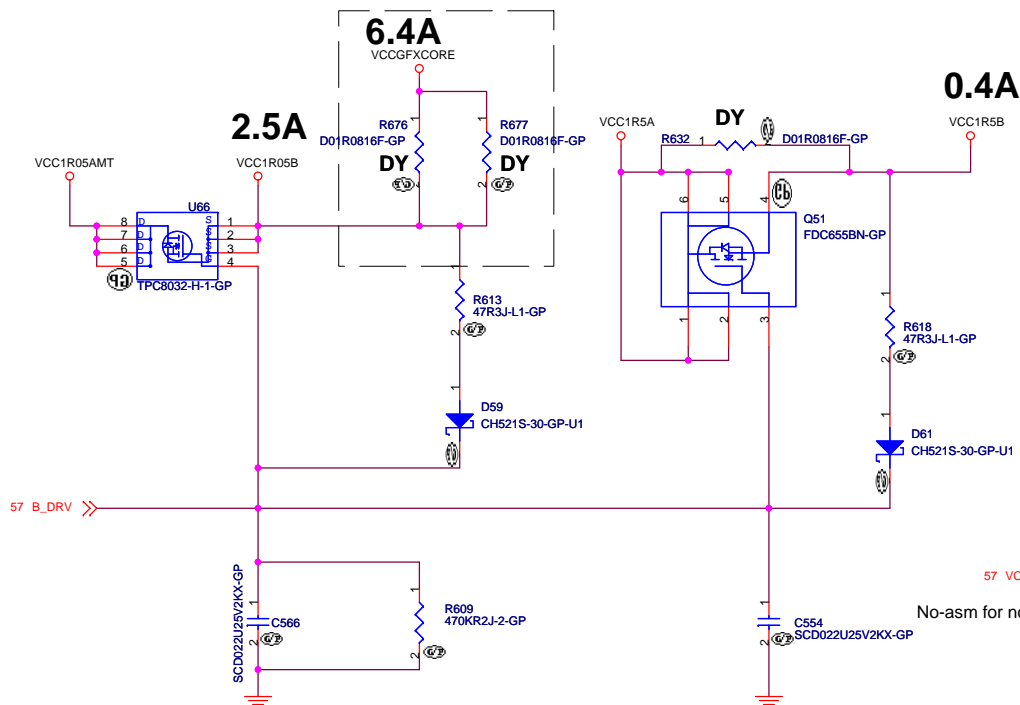
緯創資通 Wistron Corporation  
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Taipei Hsien 221, Taiwan, R.O.C.

Title		DC-DC VCC1R05AUX/VCC1R8AUX	
Size	A3	Document Number	Caramel-1
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Place near VCCGFXCORE logic

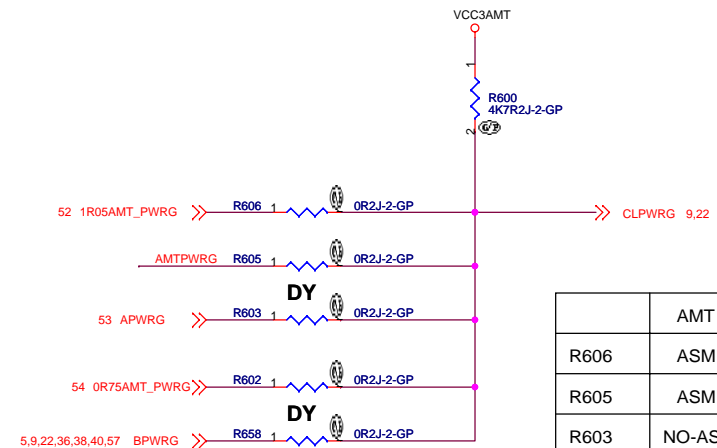
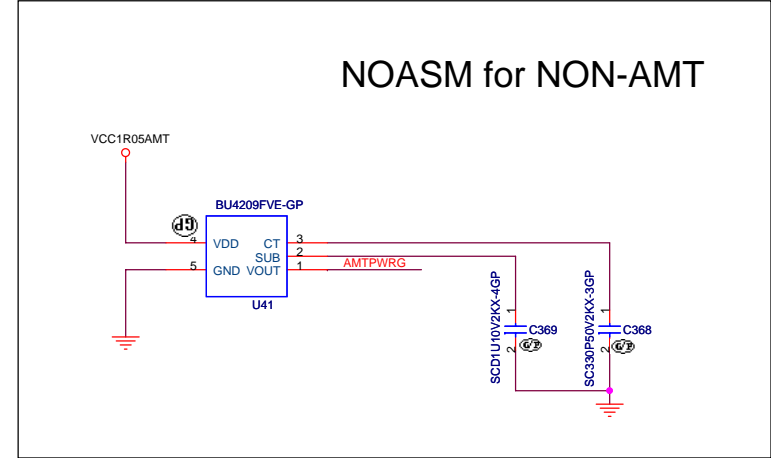
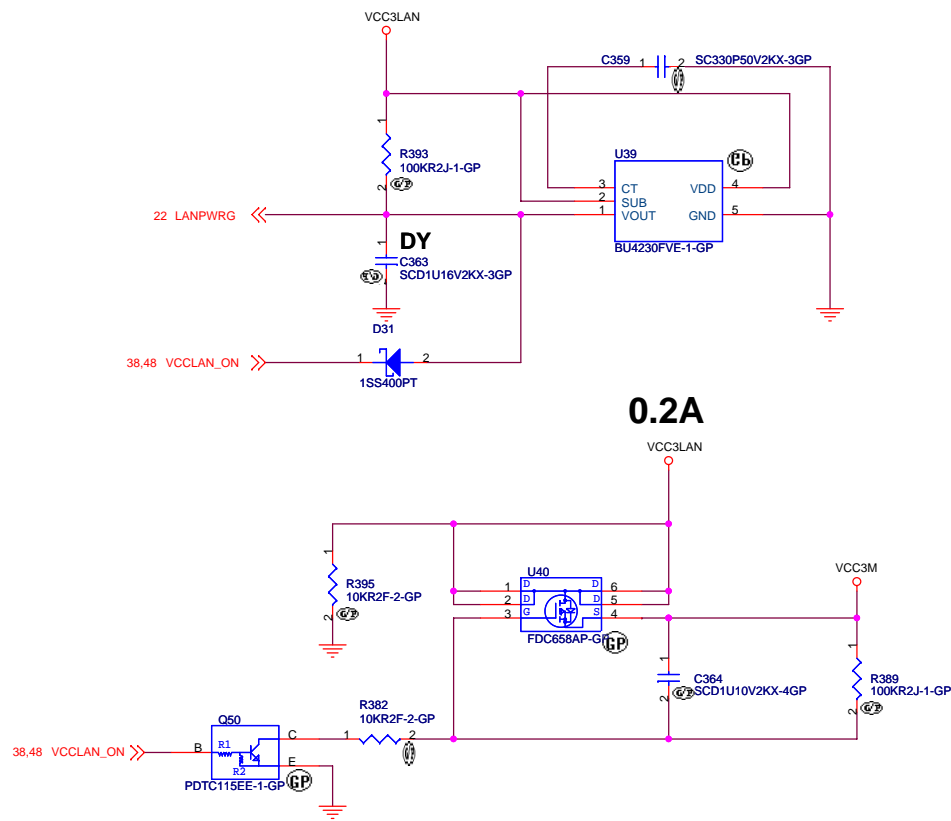


Always ON	Enable	Disable
Q14	ASM	No_ASM
R149	ASM	No_ASM
D17	ASM	No_ASM
R160	ASM	No_ASM
C153	ASM	No_ASM
R143	No_ASM	ASM

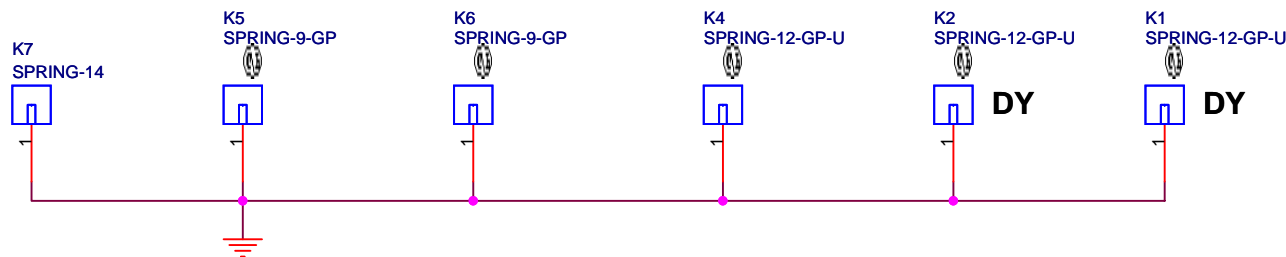
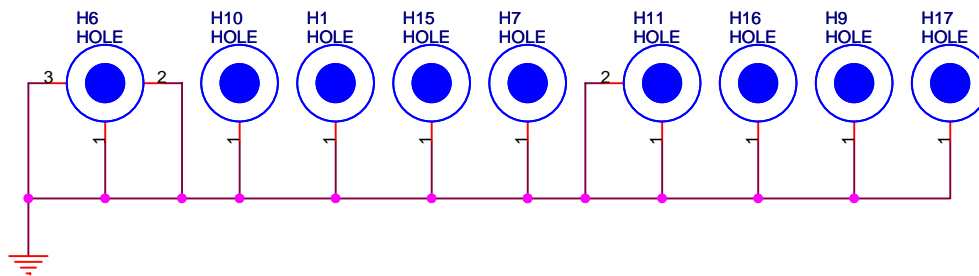
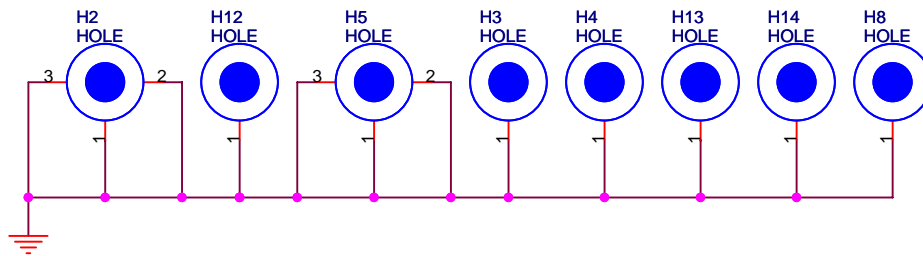
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LOAD SW 1		
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	AMT	NON-AMT
R606	ASM	NO-ASM
R605	ASM	NO-ASM
R603	NO-ASM	NO-ASM
R602	ASM	NO-ASM
R600	ASM	NO-ASM
R658	NO-ASM	ASM



<Core Design>

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Title

**HOLES/GND/PADS**

Size  
A4

Document Number

**Caramel-1**

Rev  
**2**

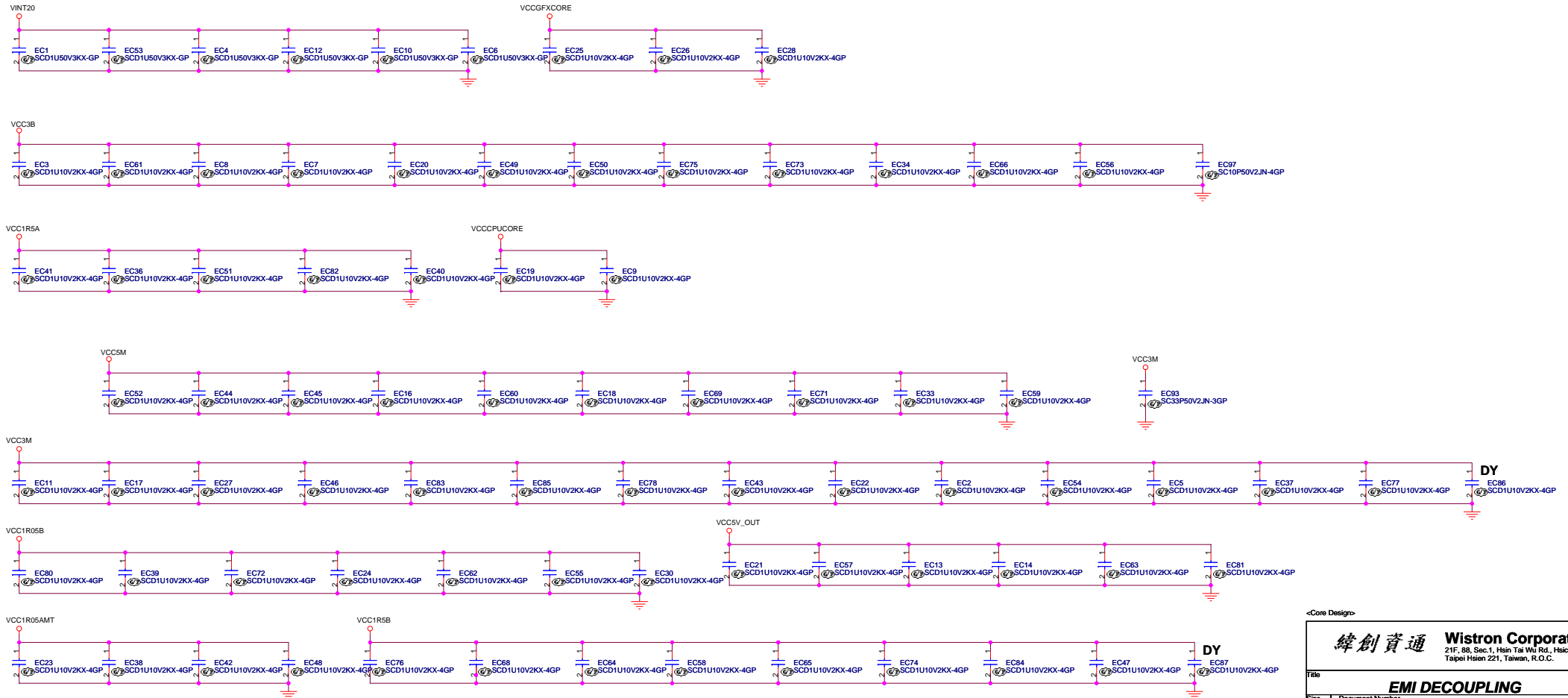
Date: Thursday, July 31, 2008

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Comparison chart for AMT function

Item	Page	Location Netname	AMT	NON_AMT	Modify	Note
1	22	U37	ICH9-M Enhanced	ICH9-M		
	22	R424	NO_ASM	ASM		
	24	U30	BOAZMAN 82567LM			
	29	SPI1	64Mbit			
	49	R411	ASM	NO_ASM		
	52	R636	ASM	NO_ASM		
	59	R603	ASM	NO_ASM		
		R605	ASM	NO_ASM		
		R606	ASM	NO_ASM		
	58	R377	NO_ASM	ASM		
		Q55	ASM	NO_ASM		
		R669	ASM	NO_ASM		
		R675	ASM	NO_ASM		
		D66	ASM	NO_ASM		
		C635	ASM	NO_ASM		
		R674	ASM	NO_ASM		
		U66	ASM	NO_ASM		
		R613	ASM	NO_ASM		
		D59	ASM	NO_ASM		
		C566	ASM	NO_ASM		
		R609	ASM	NO_ASM		

### *Long power trace EMI decoupling caps*



&lt;Core Design&gt;

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1	Title
---	-------

Size	Document Number
------	-----------------

Custom

## EMI DECOUPLING

### Caramel-1

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