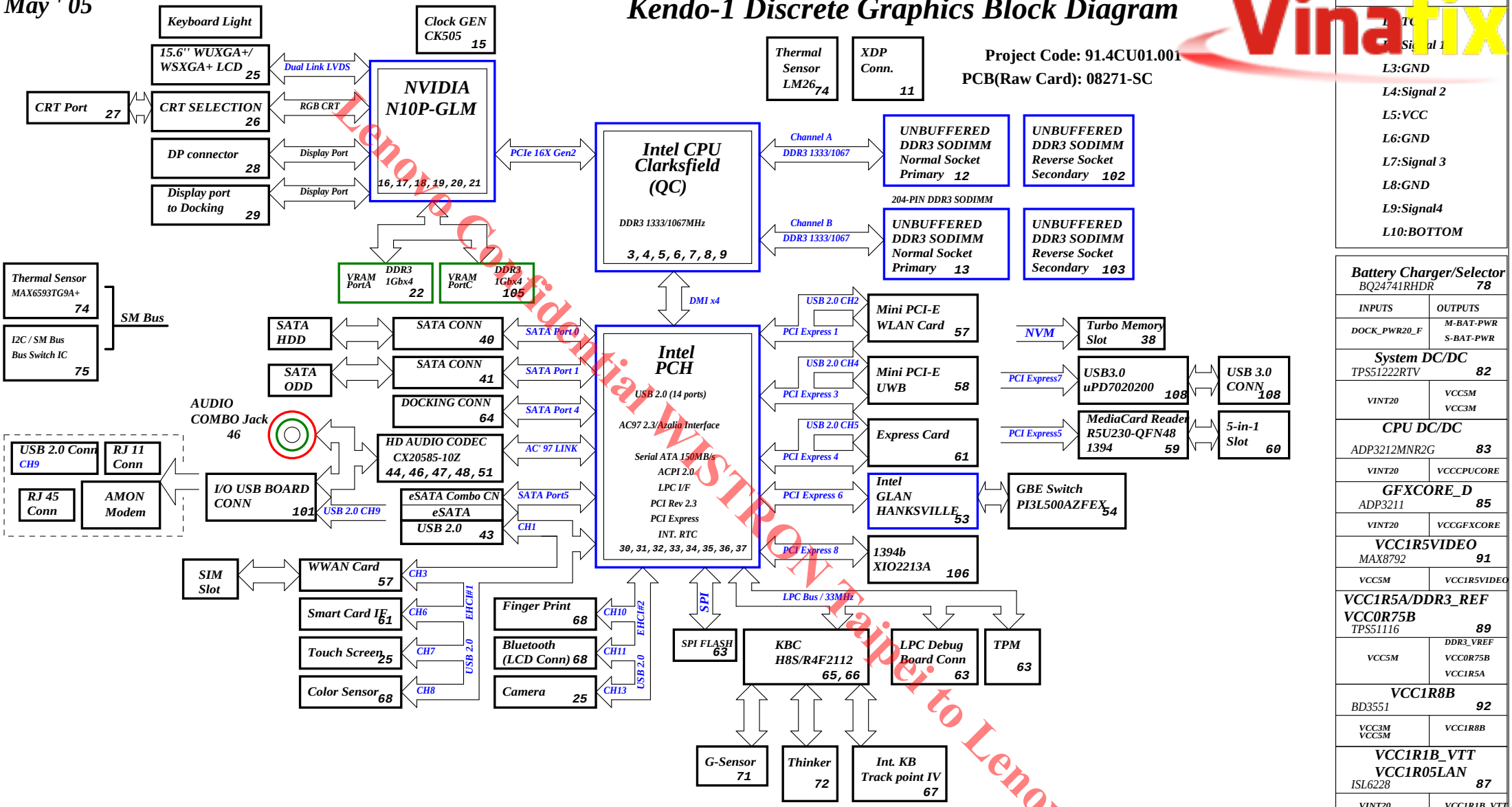
May ' 05

Kendo-1 Discrete Graphics Block Diagram

Project Code: 91.4CU01.001
PCB(Raw Card): 08271-SC



PCB La... Stackup
L1:TO...
L2:Signal 1
L3:GND
L4:Signal 2
L5:VCC
L6:GND
L7:Signal 3
L8:GND
L9:Signal4
L10:BOTTOM

Battery Charger/Selector BQ24741RHDR 78

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

System DC/DC TPS51222RTV 82

VINT20	VCC5M VCC3M

CPU DC/DC ADP3212MNR2G 83

VINT20	VCCCPUCORE

GFXCORE_D ADP3211 85

VINT20	VCCGFXCORE

VCC1R5VIDEO MAX8792 91

VCC5M	VCC1R5VIDEO

VCC1R5A/DDR3_REF VCC0R75B TPS51116 89

VCC5M	DDR3_VREF VCC0R75B VCC1R5A

VCC1R8B BD3551 92

VCC3M VCC5M	VCC1R8B

VCC1R1B_VTT VCC1R05LAN ISL6228 87

VINT20 VCC5M	VCC1R1B_VTT VCC1R05LAN

<Variant Name>

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

Title: Block Diagram
Size: Custom | Document Number: Kendo-1 WS | Rev: SC
Date: Tuesday, May 05, 2009 | Sheet 1 of 109

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 Ceremic, 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]

PCH GPIOn	39	38	37	36	Planar ID Version	Planar PCB Version
PLANAR_IDn	3	2	1	0		
	0	0	0	0	SDV	SA
	0	0	0	1	SDV-R	SB
	0	0	1	0	SIV	SC
	0	0	1	1		
	0	1	0	0		
	0	1	0	1		
	0	1	1	0		
	0	1	1	1		

EC HISTORY

Stage	Date	EC No.	Page	Note
SIV	0413	001-018		EC_21_DIS_SIV_090413
SIV	0420	019-033		EC_21_DIS_SIV_090420
SIV	0424	034-044		EC_21_DIS_SIV_090424
SIV	0429	045-067		EC_21_DIS_SIV_090429

PCI TABLE

DEVICE	IDSEL	IRQ (Default)	REQ# / GNT#
MINIPCI SLOT	AD18	F, G	REQ# 3/ GNT#3
CARDBUS R5C811	AD16	SERIRQ	REQ#0 / GNT#0
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	

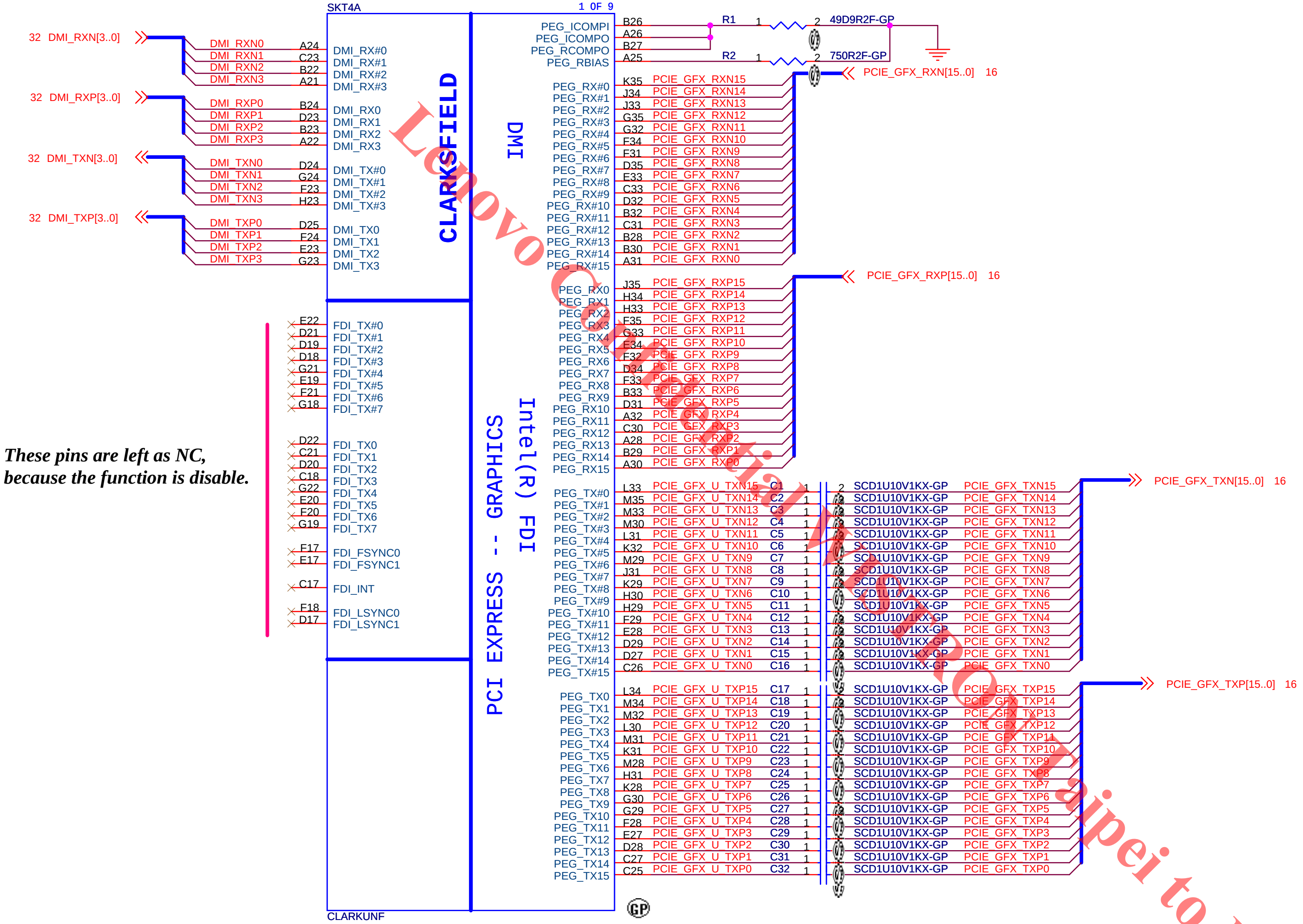
<Variant Name>

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

Title: EC HISTORY

Size: A3 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 2 of 109



<Variant Name>

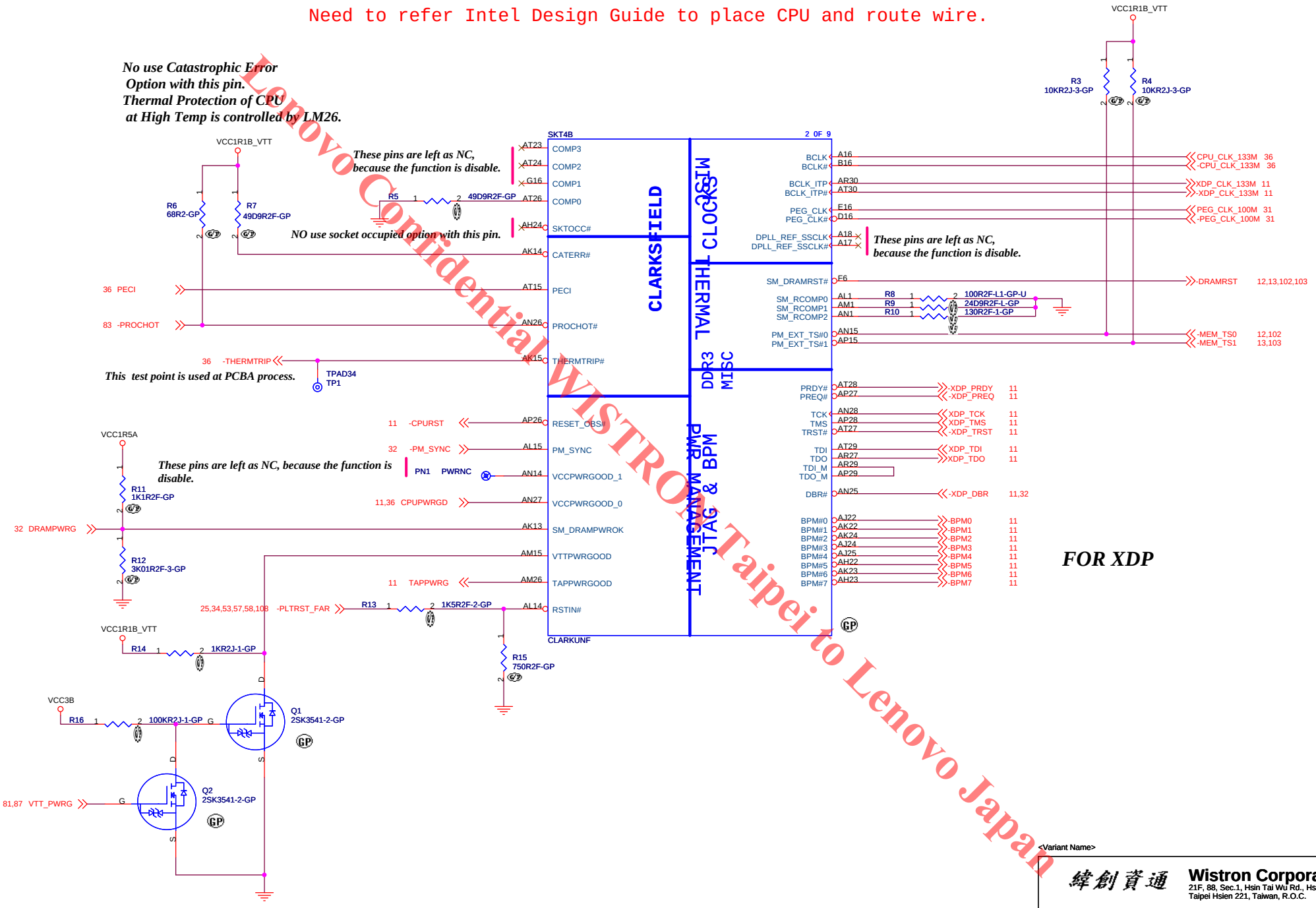
緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***CPU(1/7):DMI/PEG/FDI***

Size	Document Number	Rev
A3	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 — Sheet 3 of 109

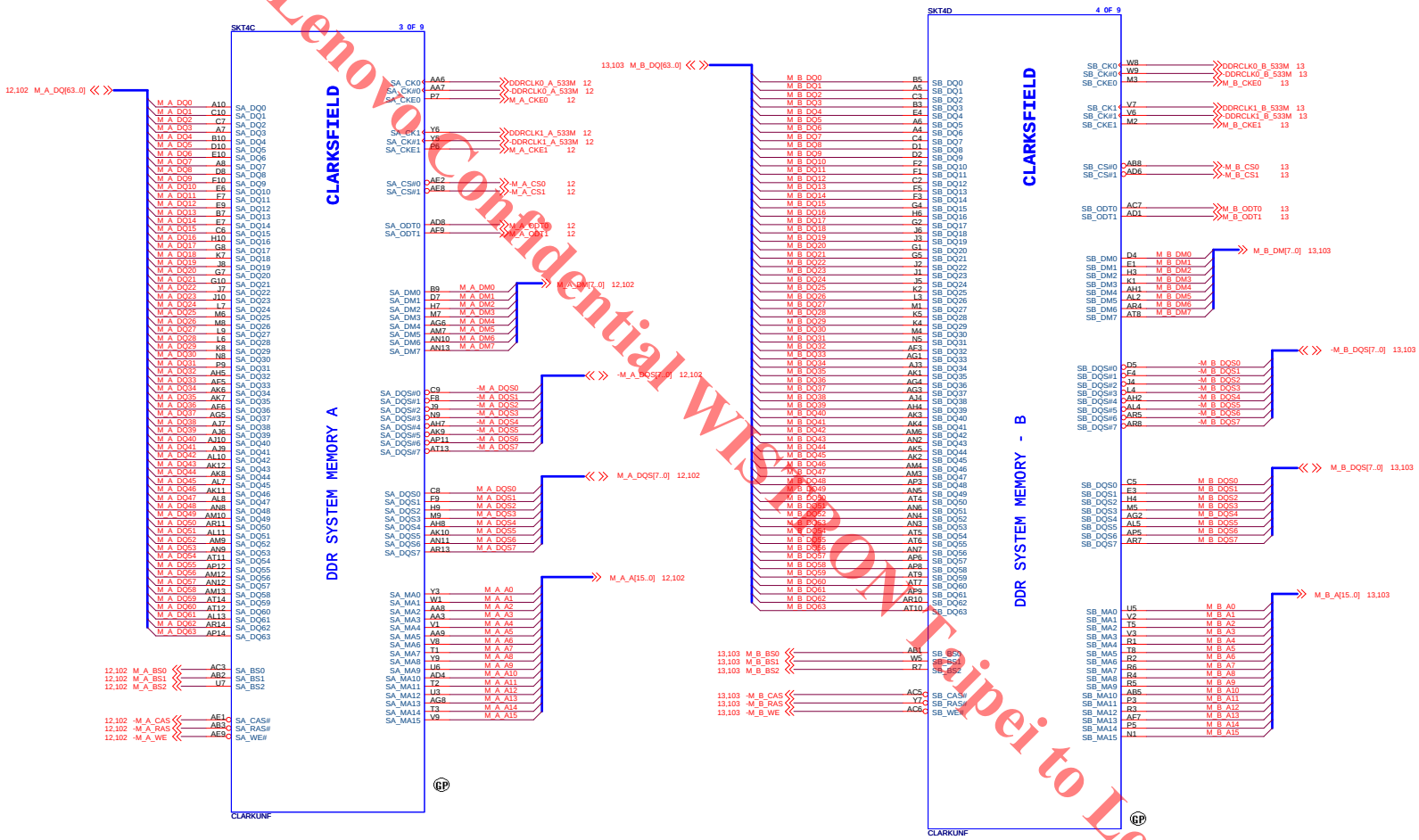
Need to refer Intel Design Guide to place CPU and route wire.



<Variant Name>

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

Title: CPU (2/7):CLK/MISC/JTAG
Size: A3 | Document Number: Kendo-1 WS | Rev: SC
Date: Tuesday, May 05, 2009 | Sheet 4 of 109



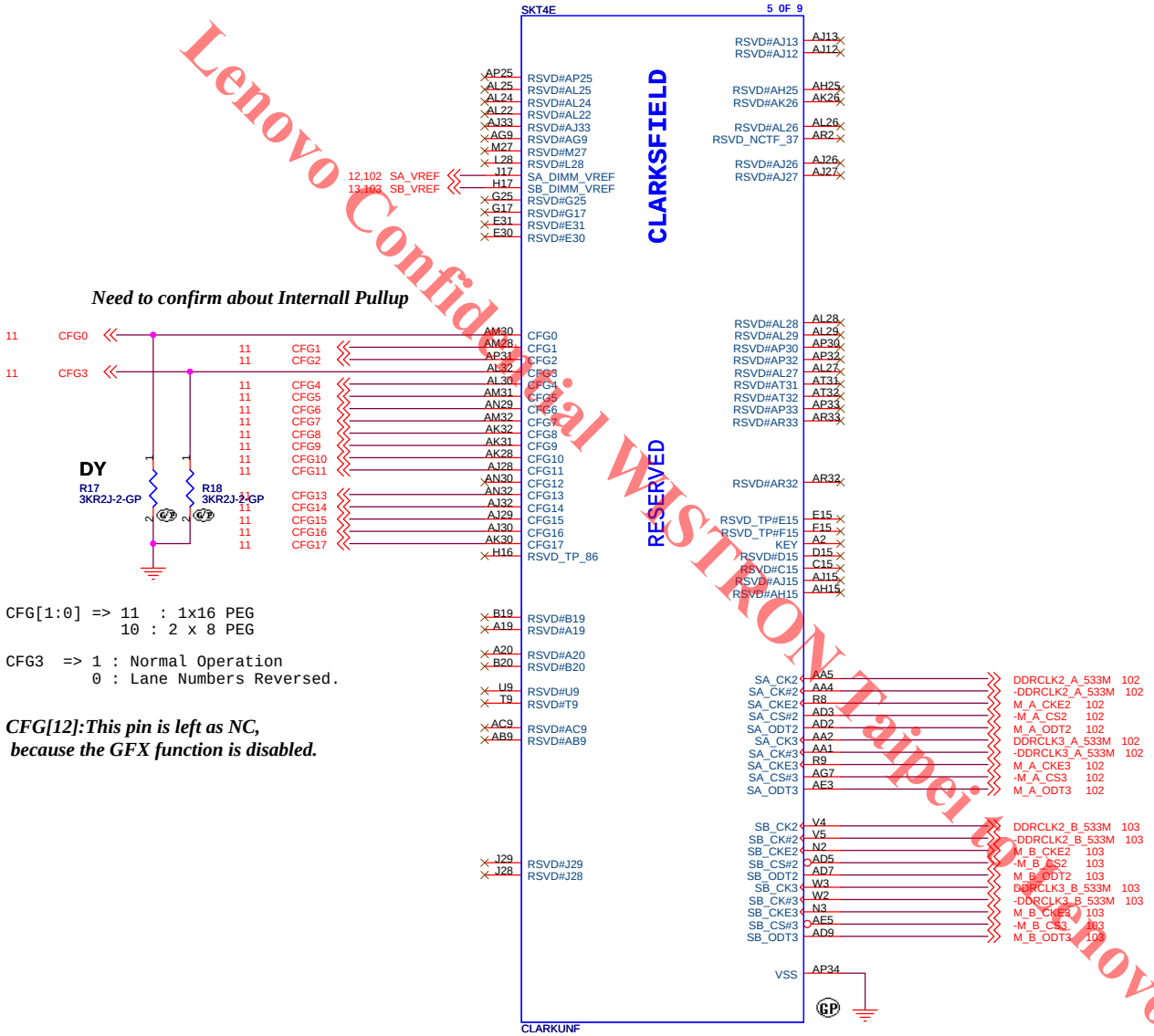
緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

<variant_name>

Title: CPU(3/7): DDR3 CH-A/CH-B

Size: A2 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 5 of 109



<Variant Name>

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

Title: CPU(4/7): CFG/RSVD

Size: A3 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 6 of 109

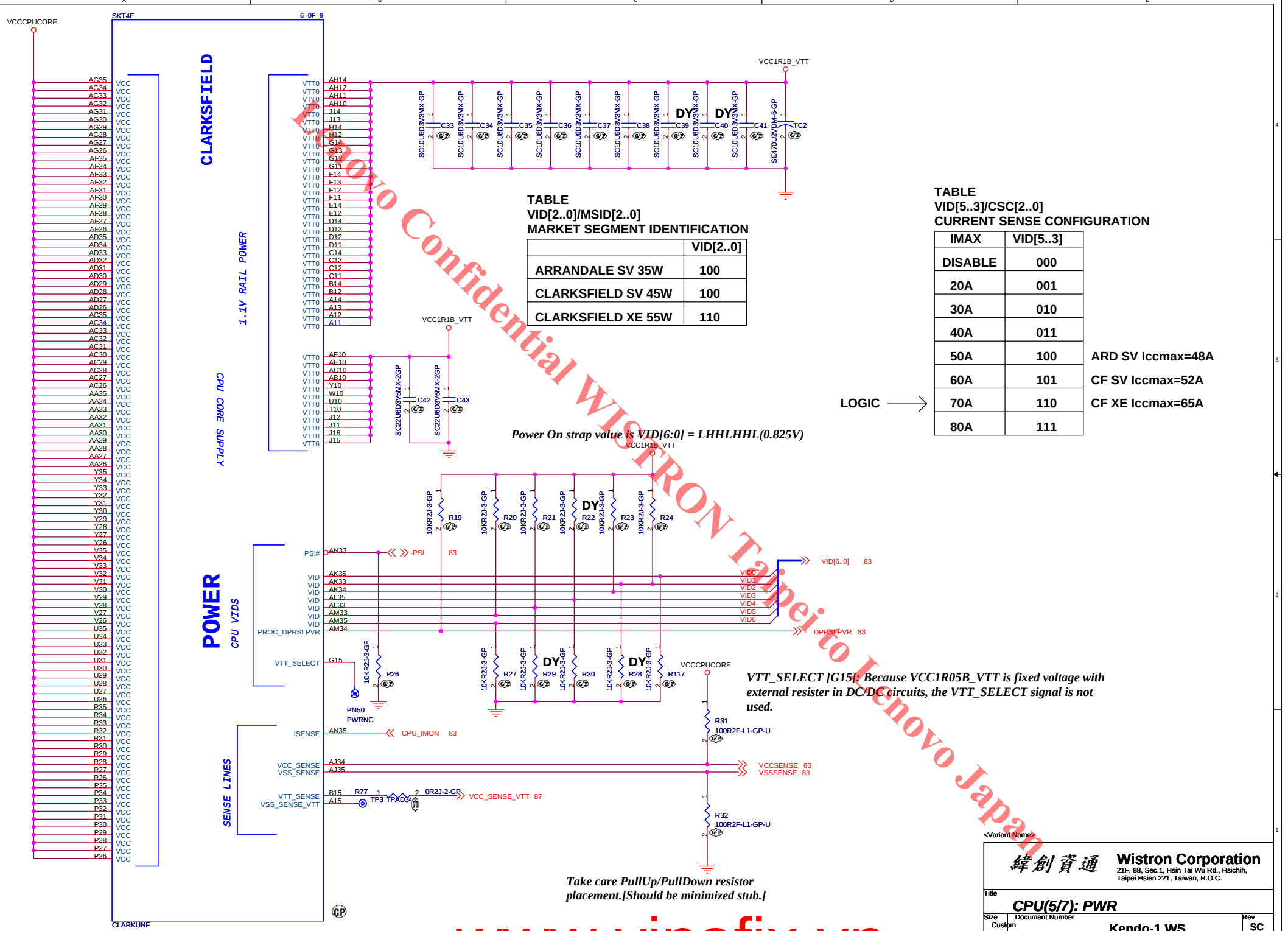


TABLE
VID[2..0]/MSID[2..0]
MARKET SEGMENT IDENTIFICATION

	VID[2..0]
ARRANDALE SV 35W	100
CLARKSFIELD SV 45W	100
CLARKSFIELD XE 55W	110

TABLE
VID[5..3]/CSC[2..0]
CURRENT SENSE CONFIGURATION

IMAX	VID[5..3]	
DISABLE	000	
20A	001	
30A	010	
40A	011	
50A	100	ARD SV Iccmax=48A
60A	101	CF SV Iccmax=52A
70A	110	CF XE Iccmax=65A
80A	111	

Power On strap value is VID[6:0] = LHHLHHL(0.825V)

VTT_SELECT [G15]: Because VCC1R05B_VTT is fixed voltage with external resister in DC/DC circuits, the VTT_SELECT signal is not used.

Take care PullUp/PullDown resistor placement.[Should be minimized stub.]

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

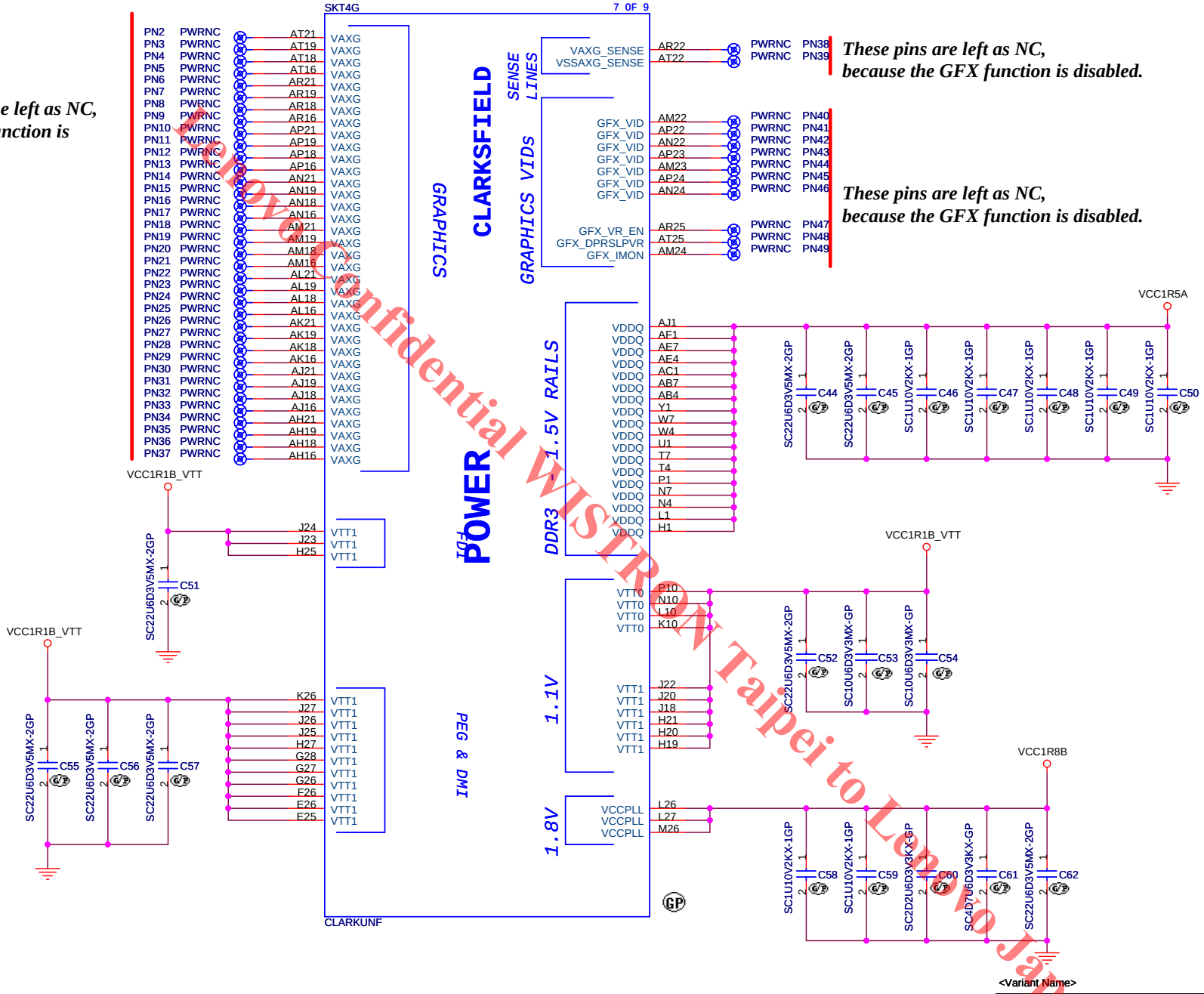
<Variant Name>

Title: CPU(5/7): PWR
Size: Custom | Document Number: Kendo-1 WS | Rev: SC
Date: Tuesday, May 05, 2009 | Sheet 7 of 109

These pins should be left as NC, because the GFX function is disabled.

These pins are left as NC, because the GFX function is disabled.

These pins are left as NC, because the GFX function is disabled.



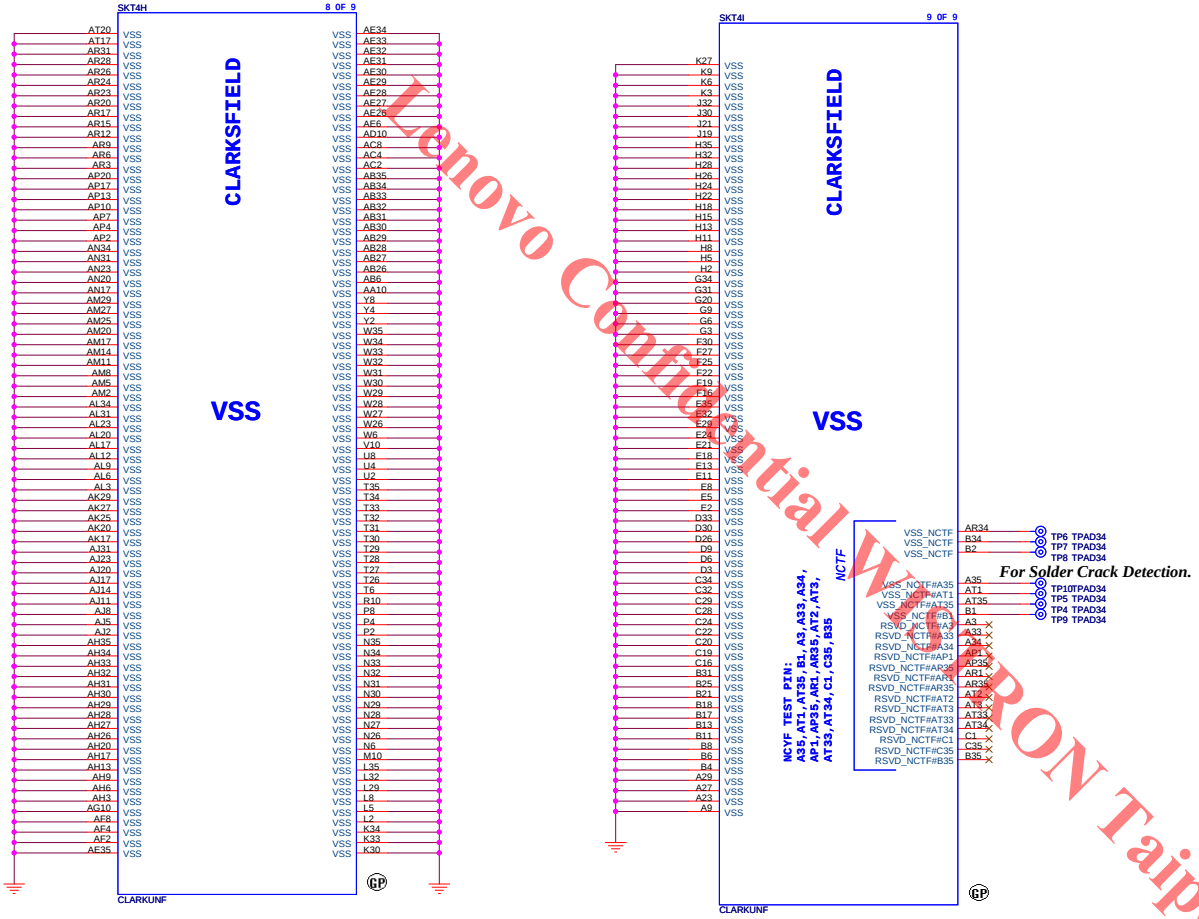
Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

<Variant Name>

Title: CPU(6/7): GFX/PWR

Size: Custom | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 8 of 109



For Solder Crack Detection.

<Variant Name>

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

Title: CPU(7/7): GND

Size	Document Number	Rev
C	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 9 of 109

BLANK

<Variant Name>

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

Title: BLANK

Size: A3 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 10 of 109

Please see Intel debug port Guidelines 385422

PCH PIN	REF DES	PCH ES1 JTAG		PCH ES2 JTAG		MP	
		ENABLE	DISABLE	ENABLE	DISABLE	ENABLE	DISABLE
TDO	R40	NO_ASM	NO_ASM	200	NO_ASM	NO_ASM	NO_ASM
	R53	NO_ASM	NO_ASM	100	NO_ASM	NO_ASM	NO_ASM
	R515	NO_ASM	NO_ASM	NO_ASM	NO_ASM	51	NO_ASM
TMS	R37	200	NO_ASM	200	NO_ASM	NO_ASM	NO_ASM
	R51	100	NO_ASM	100	NO_ASM	NO_ASM	NO_ASM
	R510	NO_ASM	NO_ASM	NO_ASM	NO_ASM	51	NO_ASM
TDI	R38	200	20K	200	NO_ASM	NO_ASM	NO_ASM
	R52	100	10K	100	NO_ASM	NO_ASM	NO_ASM
	R506	NO_ASM	NO_ASM	NO_ASM	NO_ASM	51	NO_ASM
TCK	R50	51	51	51	51	51	51
TRST#	R35	20K	NO_ASM	NO_ASM	NO_ASM	NO_ASM	NO_ASM
	R49	10K	NO_ASM	NO_ASM	NO_ASM	NO_ASM	NO_ASM
	R498	NO_ASM	NO_ASM	NO_ASM	NO_ASM	NO_ASM	NO_ASM

LOGIC

Use these jumper, if pin count is overflow.

I2C Interface does not use.

XDP Present function does not use.

Short cut usage.

DEBUG Interface for Processor.

Short cut usage.

TCK needs external pull up not pull down.

DEBUG Interface for PCH.

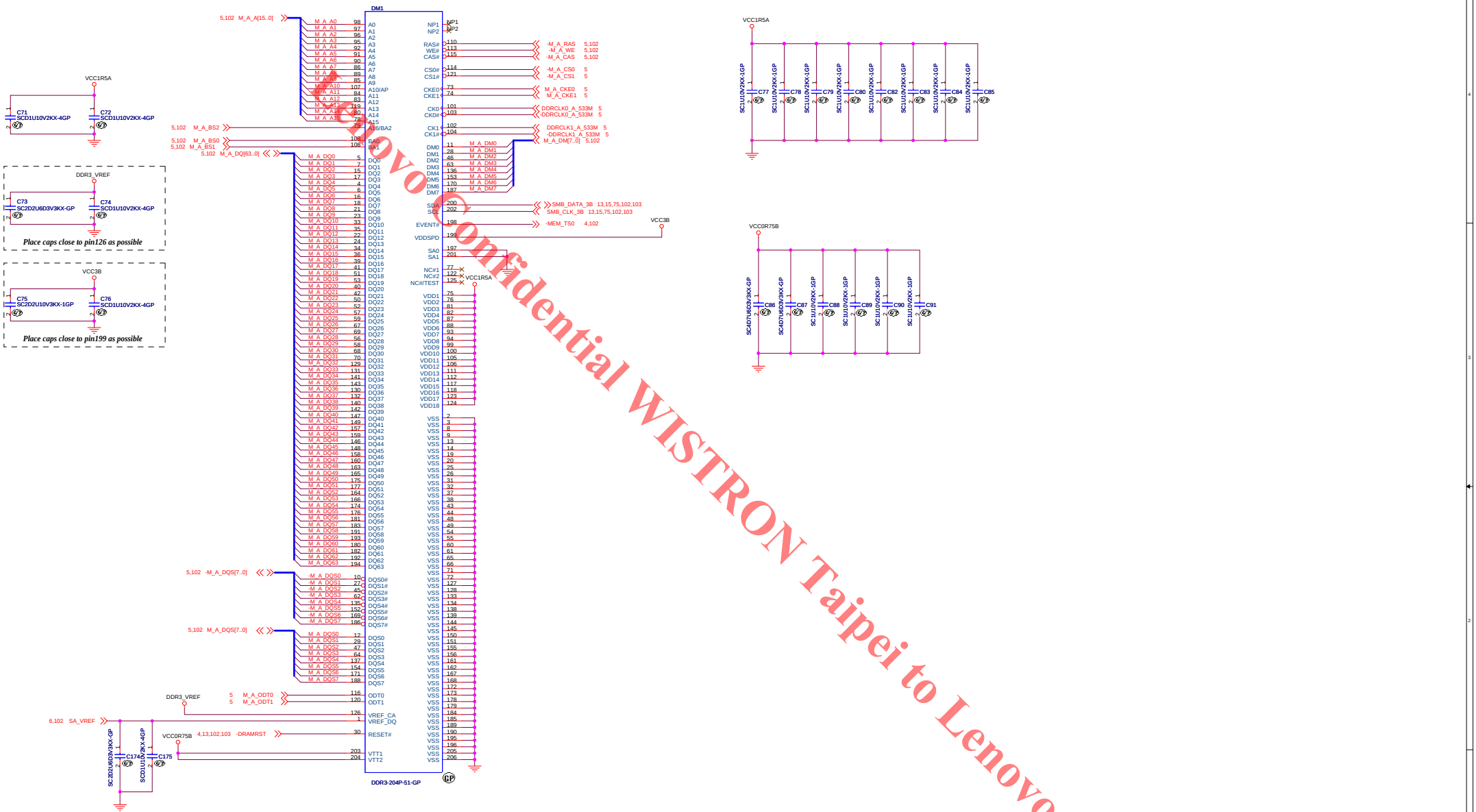
<Variant Name>

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

Title: XDP CONNECTOR

Size: A2 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 11 of 109

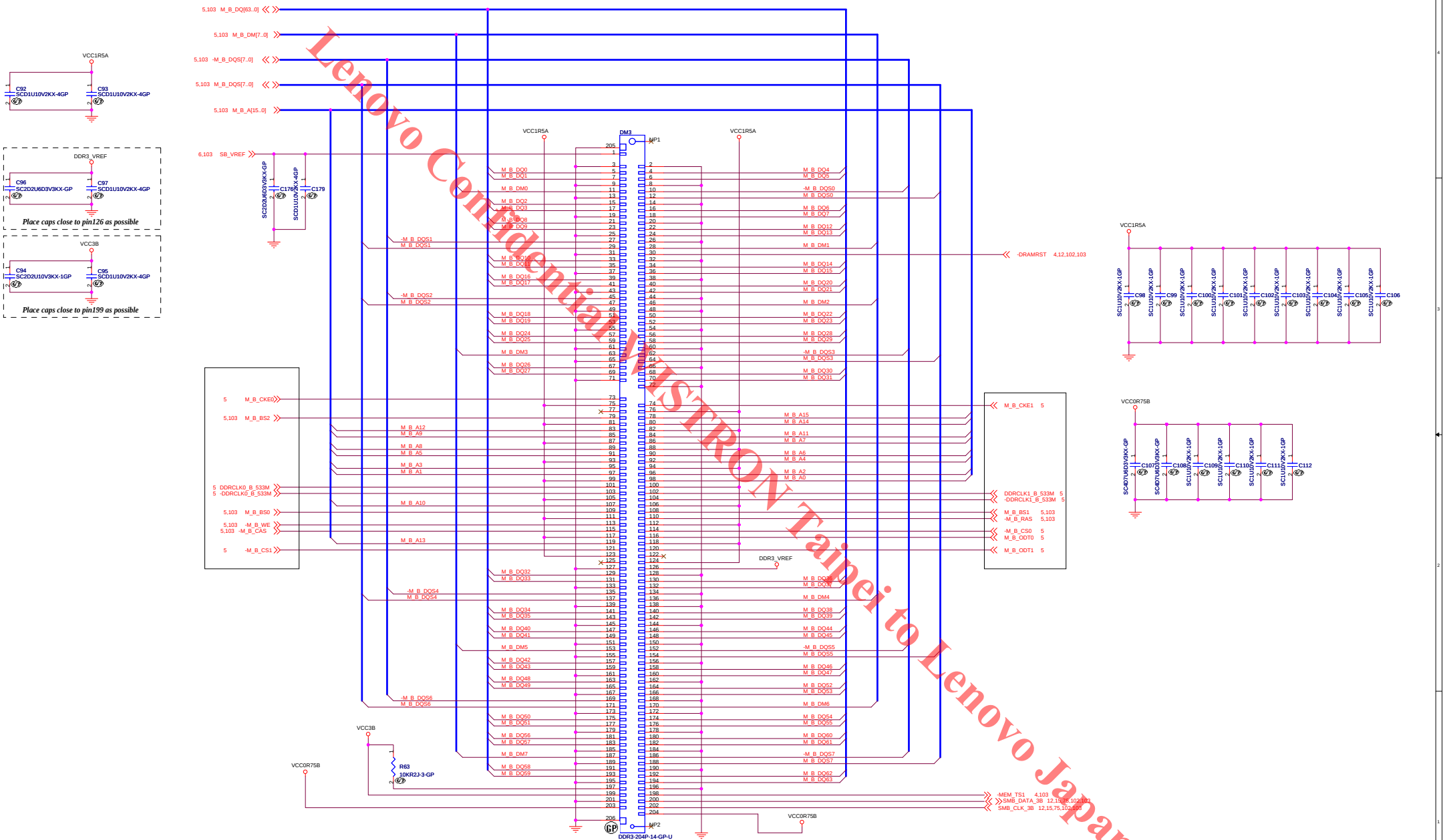


緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: DDR3 SODIMM_CH-A_Primary

Size: A2 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 12 of 109



SPD Address : 51h

This connector should be placed on far side from CPU.

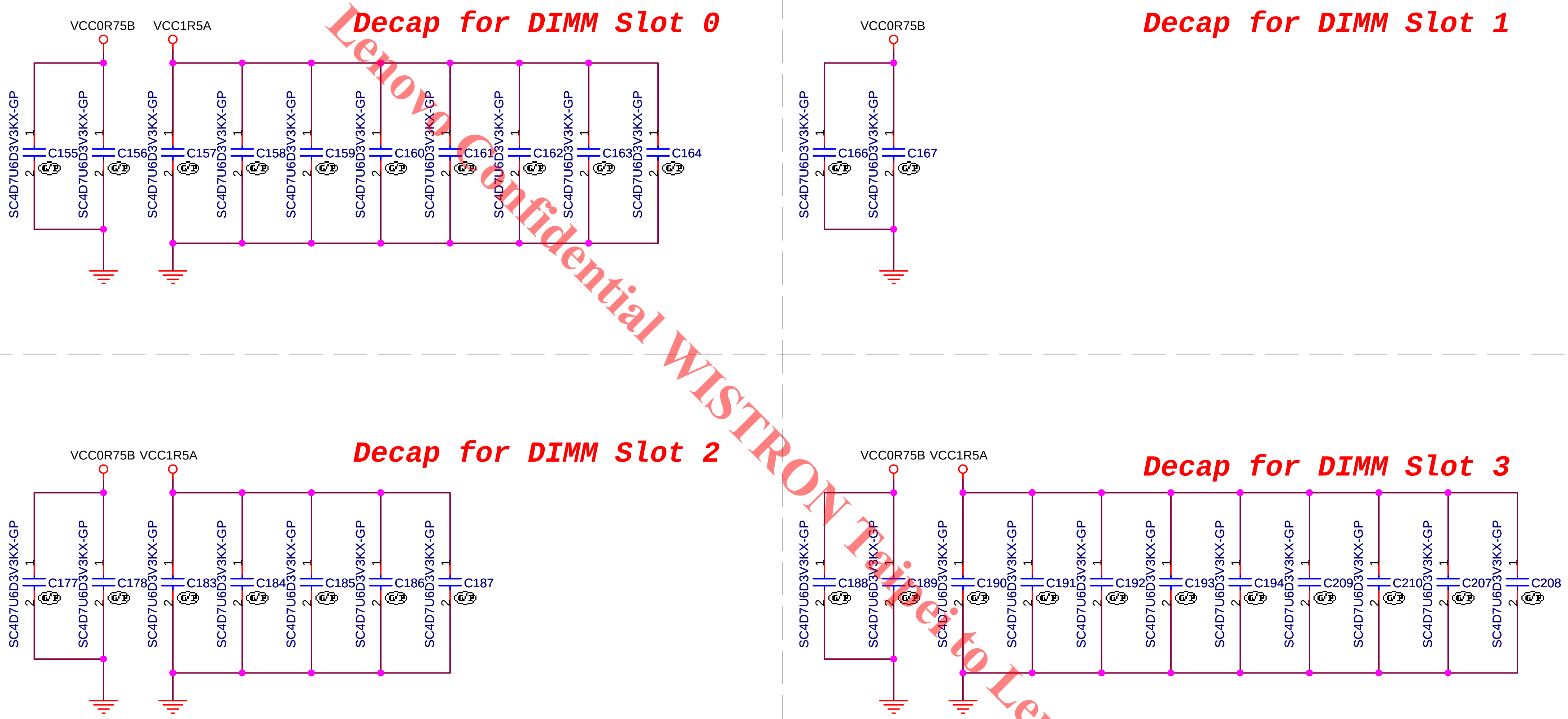
<Variant Name>

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

Title: DDR3 SODIMM_CH-B_Primary

Size: A2 | Document Number: Kendo-1 WS | Rev: SC

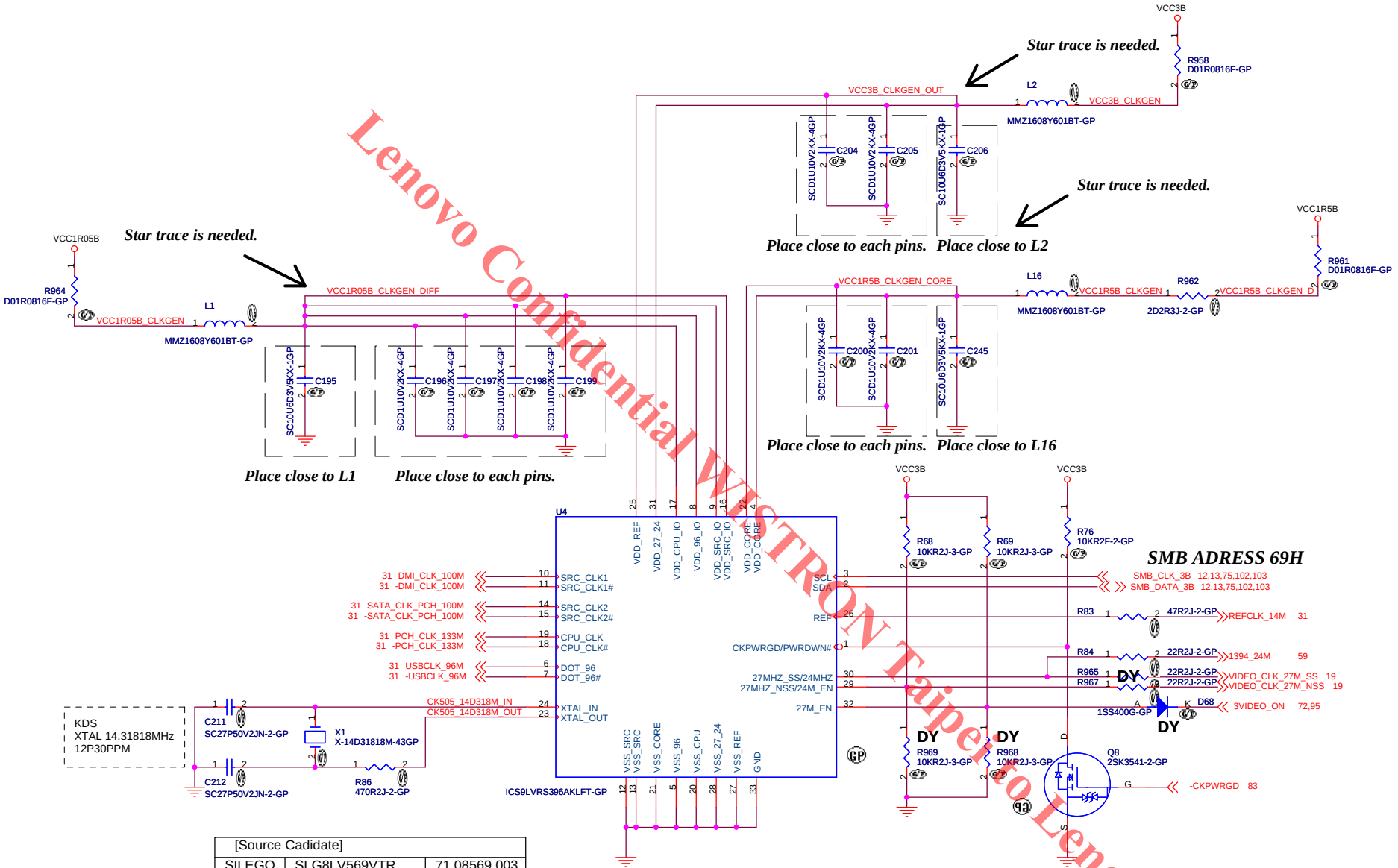
Date: Tuesday, May 05, 2009 | Sheet 13 of 109



<Variant Name>

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

Title	DECAP For DIMMs	
Size A4	Document Number Kendo-1 WS	Rev SC
Date: Tuesday, May 05, 2009	Sheet 14 of 109	



[Source Cadidate]		
SILEGO	SLG8LV569VTR	71.08569.003
IDT	IC9LVRS396AKLF-T	71.09396.003
REALTEK	RTM890N-634-GRT	71.00890.003

KDS Recommended Conditions:
Normal Frequency: 14.318180MHz.
Frequency Tolerance: +/- 30ppm.
Load Frequency: 12pF.
Effective Series Resistance: 50-ohm.
Effective Shunt Capacitancce: 7pF.

IDT Recommended Conditions:
Normal Frequency: 14.318MHz.
Frequency Tolerance: +/- 30ppm.
Load Frequency: 20pF.
Effective Shunt Capacitance: 5pF.

Realtek Recommended Conditions:
Normal Frequency: 14.318MHz.
Frequency Tolerance: +/- 50ppm.
Load Frequency: 10 ~ 32 pF.
Effective Series Resistance: 40-ohm max.
Effective Shunt Capacitance: 7pF.

Silego Recommended Conditions:
Normal Frequency: 14.31818MHz.
Frequency Tolerance: +/- 30ppm.
Load Frequency: 20 pF.
Effective Shunt Capacitance: 5pF.

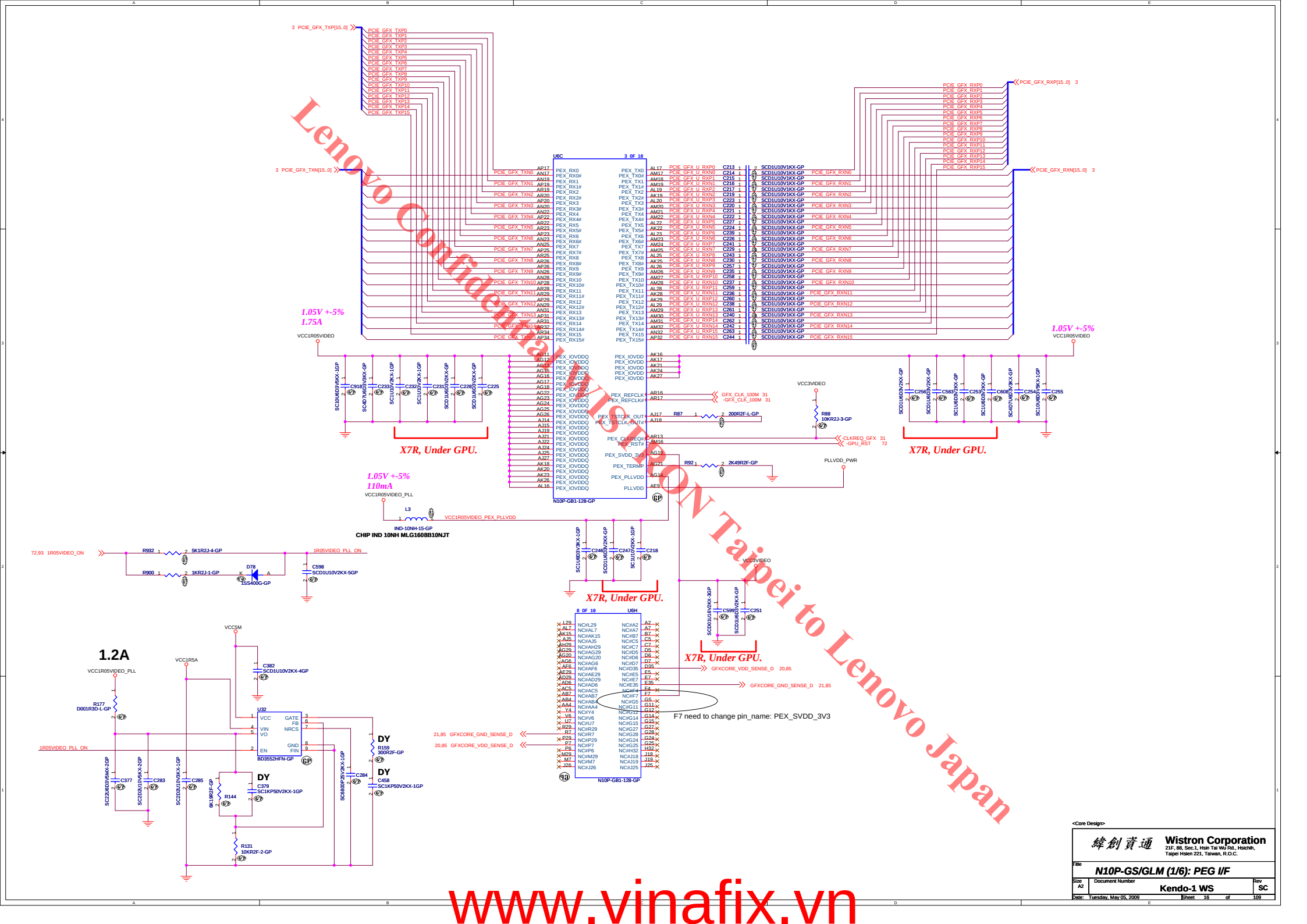
<Variant Name>

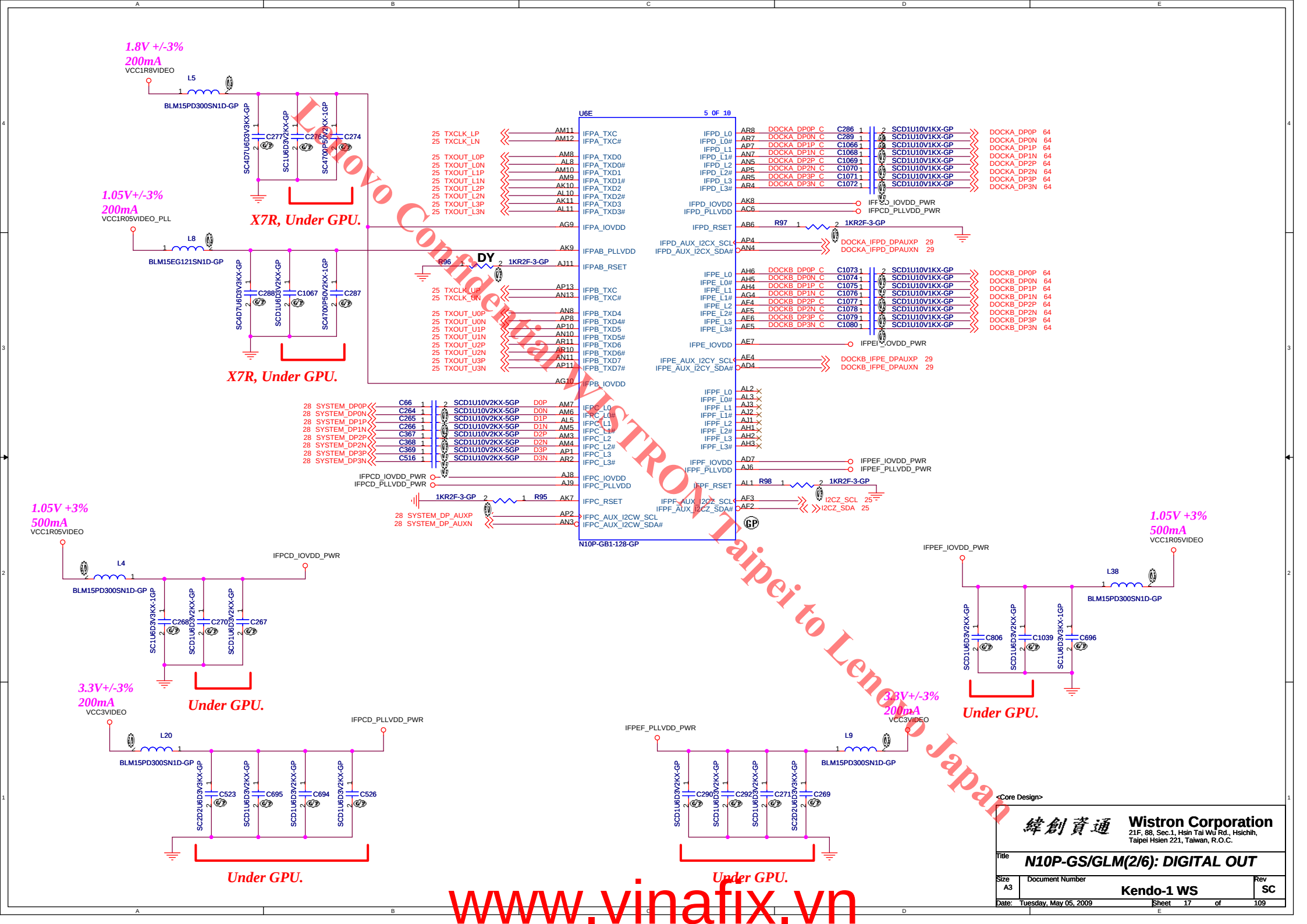
緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

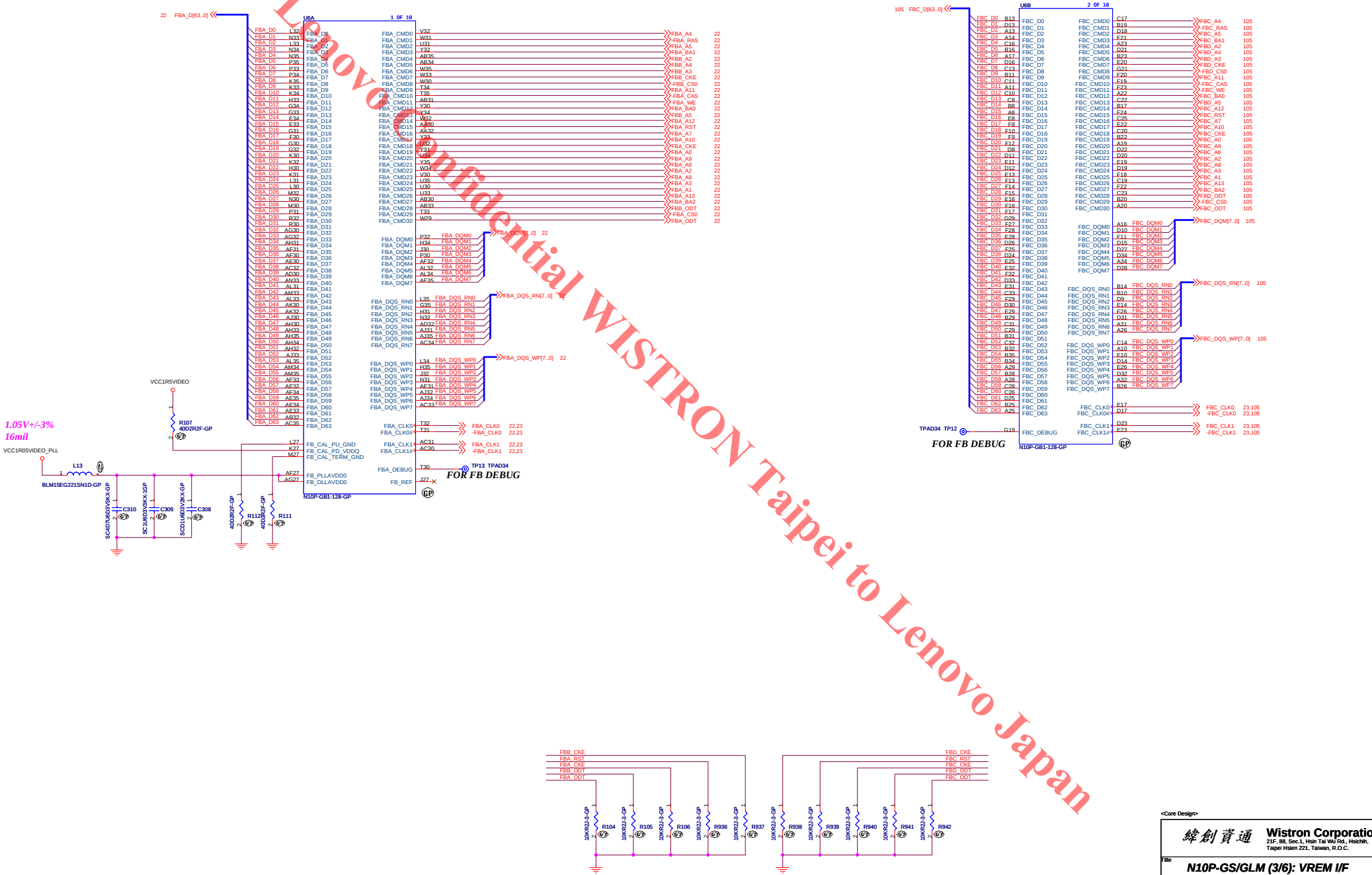
Title: **CLOCK GEN**

Size	Document Number	Rev
A3	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 15 of 109




1.8V +/-3%
200mA
VCC1R8VIDEO
L5
BLM15PD300SN1D-GP
SC4D7U6D3V3KX-GP
SC1U6D3V2KX-GP
SC470P50V2KX-1GP
C277
C276
C274
1.05V+/-3%
200mA
VCC1R05VIDEO_PLL
L8
BLM15EG121SN1D-GP
SC4D7U6D3V3KX-GP
SC1U6D3V2KX-GP
SC470P50V2KX-1GP
C288
C1067
C287
X7R, Under GPU.
X7R, Under GPU.
U6E
5 OF 10
N10P-GB1-128-GP
IFPA_TXC
IFPA_TXC#
IFPA_TXD0
IFPA_TXD0#
IFPA_TXD1
IFPA_TXD1#
IFPA_TXD2
IFPA_TXD2#
IFPA_TXD3
IFPA_TXD3#
IFPA_IOVDD
IFPAB_PLLVDD
IFPAB_RSET
IFPB_TXC
IFPB_TXC#
IFPB_TXD4
IFPB_TXD4#
IFPB_TXD5
IFPB_TXD5#
IFPB_TXD6
IFPB_TXD6#
IFPB_TXD7
IFPB_TXD7#
IFPB_IOVDD
IFPC_L0
IFPC_L0#
IFPC_L1
IFPC_L1#
IFPC_L2
IFPC_L2#
IFPC_L3
IFPC_L3#
IFPC_IOVDD
IFPC_PLLVDD
IFPC_RSET
IFPC_AUX_I2CW_SCL
IFPC_AUX_I2CW_SDA#
IFPD_L0
IFPD_L0#
IFPD_L1
IFPD_L1#
IFPD_L2
IFPD_L2#
IFPD_L3
IFPD_L3#
IFPD_IOVDD
IFPD_PLLVDD
IFPD_RSET
IFPD_AUX_I2CX_SCL
IFPD_AUX_I2CX_SDA#
IFPE_L0
IFPE_L0#
IFPE_L1
IFPE_L1#
IFPE_L2
IFPE_L2#
IFPE_L3
IFPE_L3#
IFPE_IOVDD
IFPE_AUX_I2CY_SCL
IFPE_AUX_I2CY_SDA#
IFPF_L0
IFPF_L0#
IFPF_L1
IFPF_L1#
IFPF_L2
IFPF_L2#
IFPF_L3
IFPF_L3#
IFPF_IOVDD
IFPF_PLLVDD
IFPF_RSET
IFPF_AUX_I2CZ_SCL
IFPF_AUX_I2CZ_SDA#
DOCKA_DP0P_C
DOCKA_DP0N_C
DOCKA_DP1P_C
DOCKA_DP1N_C
DOCKA_DP2P_C
DOCKA_DP2N_C
DOCKA_DP3P_C
DOCKA_DP3N_C
DOCKB_DP0P_C
DOCKB_DP0N_C
DOCKB_DP1P_C
DOCKB_DP1N_C
DOCKB_DP2P_C
DOCKB_DP2N_C
DOCKB_DP3P_C
DOCKB_DP3N_C
SCD1U10V1KX-GP
DOCKA_IFPD_DPAUXP
DOCKA_IFPD_DPAUXN
DOCKB_IFPE_DPAUXP
DOCKB_IFPE_DPAUXN
I2CZ_SCL
I2CZ_SDA
IFPD_IOVDD_PWR
IFPD_PLLVDD_PWR
IFPEI_IOVDD_PWR
IFPEF_IOVDD_PWR
IFPEF_PLLVDD_PWR
R97
R98
R96
R95
1KR2F-3-GP
DY
TXCLK_LP
TXCLK_LN
TXCLK_UP
TXCLK_UN
TXOUT_L0P
TXOUT_L0N
TXOUT_L1P
TXOUT_L1N
TXOUT_L2P
TXOUT_L2N
TXOUT_L3P
TXOUT_L3N
TXOUT_U0P
TXOUT_U0N
TXOUT_U1P
TXOUT_U1N
TXOUT_U2P
TXOUT_U2N
TXOUT_U3P
TXOUT_U3N
SYSTEM_DP0P
SYSTEM_DP0N
SYSTEM_DP1P
SYSTEM_DP1N
SYSTEM_DP2P
SYSTEM_DP2N
SYSTEM_DP3P
SYSTEM_DP3N
SYSTEM_DP_AUXP
SYSTEM_DP_AUXN
C66
C264
C265
C266
C367
C368
C369
C516
SCD1U10V2KX-5GP
D0P
D0N
D1P
D1N
D2P
D2N
D3P
D3N
1.05V +3%
500mA
VCC1R05VIDEO
L4
BLM15PD300SN1D-GP
IFPCD_IOVDD_PWR
SC1U6D3V3KX-1GP
SCD1U6D3V2KX-GP
C268
C270
C267
Under GPU.
3.3V+/-3%
200mA
VCC3VIDEO
L20
BLM15PD300SN1D-GP
IFPCD_PLLVDD_PWR
SC2D2U6D3V3KX-GP
SCD1U6D3V2KX-GP
C523
C695
C694
C526
Under GPU.
1.05V +3%
500mA
VCC1R05VIDEO
L38
BLM15PD300SN1D-GP
IFPEF_IOVDD_PWR
SCD1U6D3V2KX-GP
SC1U6D3V3KX-1GP
C806
C1039
C696
Under GPU.
3.3V+/-3%
200mA
VCC3VIDEO
L9
BLM15PD300SN1D-GP
IFPEF_PLLVDD_PWR
SCD1U6D3V2KX-GP
SC2D2U6D3V3KX-GP
C290
C292
C271
C269
Under GPU.
Lenovo Confidential WISTRON Taipei to Lenovo Japan
www.vinafix.vn
<Core Design>
緯創資通
Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.
Title
N10P-GS/GLM(2/6): DIGITAL OUT
Size
A3
Document Number
Kendo-1 WS
Rev
SC
Date: Tuesday, May 05, 2009
Sheet 17 of 109



<Core Design>

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

Title: N10P-GS/GLM (3/6): VREM I/F

Size: A2 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 18 of 109

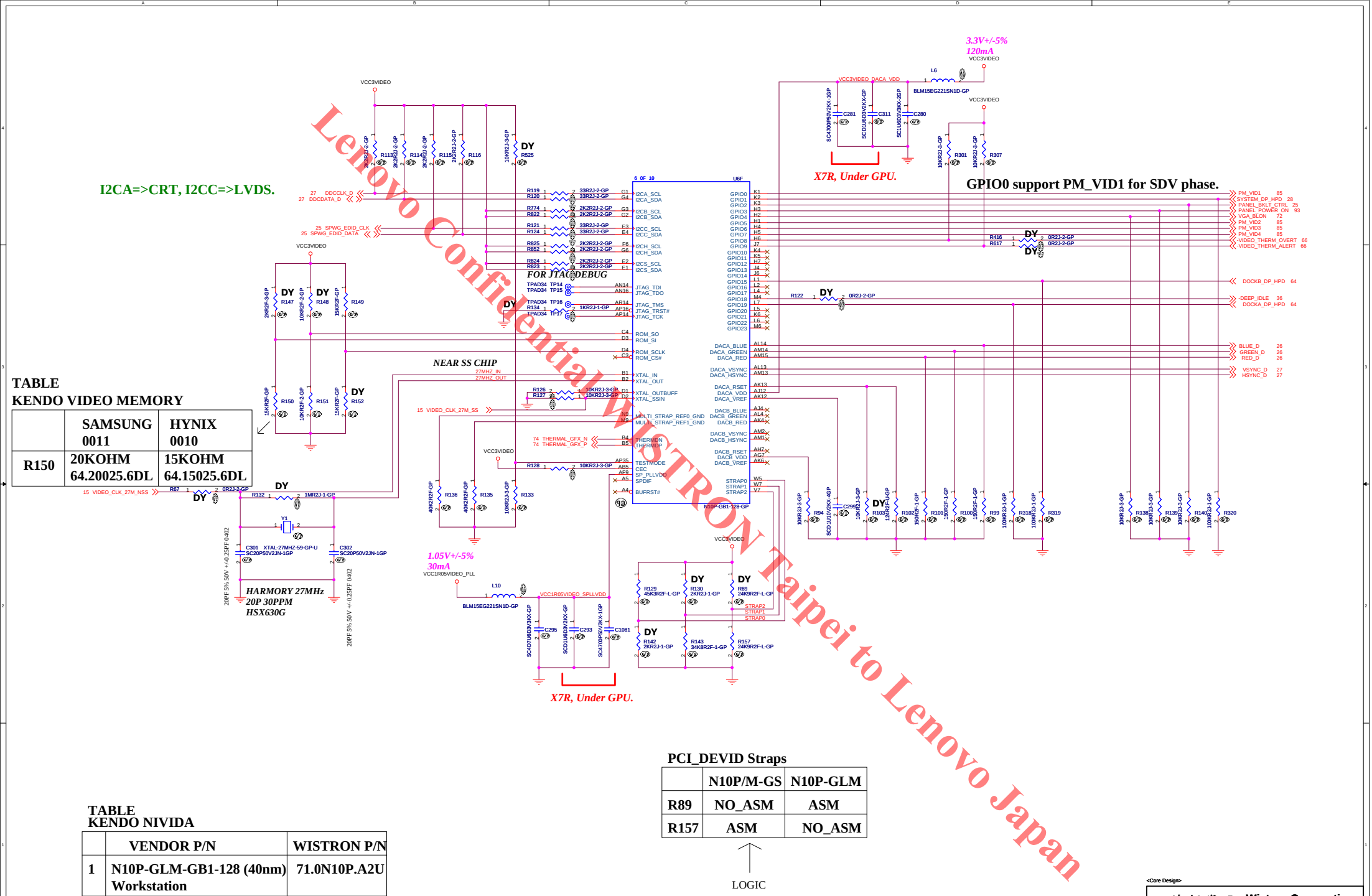


TABLE
KENDO VIDEO MEMORY

	SAMSUNG 0011	HYNIX 0010
R150	20KOHM 64.20025.6DL	15KOHM 64.15025.6DL

TABLE
KENDO NIVIDA

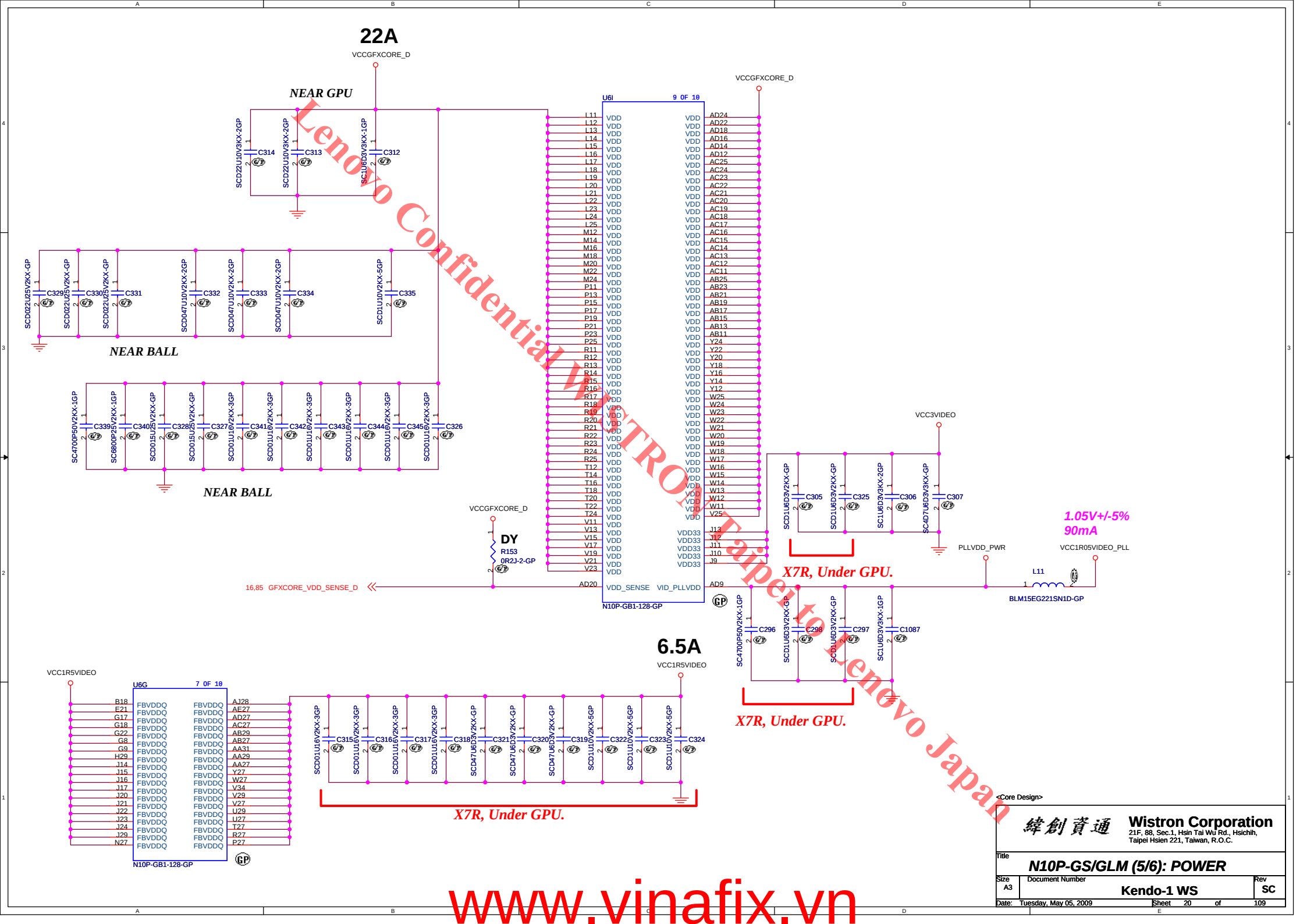
	VENDOR P/N	WISTRON P/N
1	N10P-GLM-GB1-128 (40nm) Workstation	71.0N10P.A2U
2	N10P-GS-GB1-128 (40nm) Discrete	71.0N10P.B2U

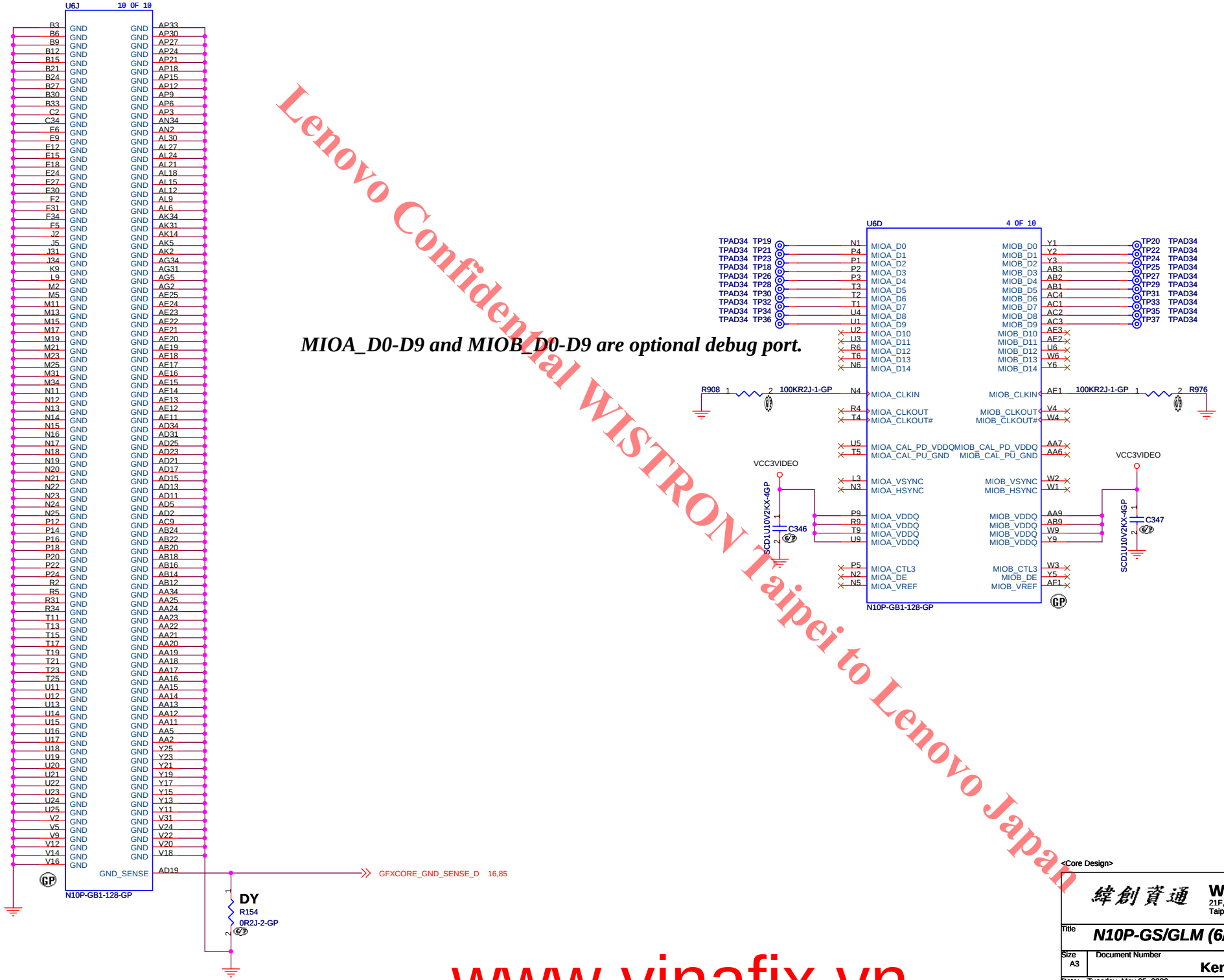
PCI_DEVID Straps

	N10P/M-GS	N10P-GLM
R89	NO_ASM	ASM
R157	ASM	NO_ASM

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

Title: N10P-GS/GLM (4/6): GPIO
Size: A2 | Document Number: Kendo-1 WS | Rev: SC
Date: Tuesday, May 05, 2009 | Sheet 19 of 109





MIOA_D0-D9 and MIOB_D0-D9 are optional debug port.

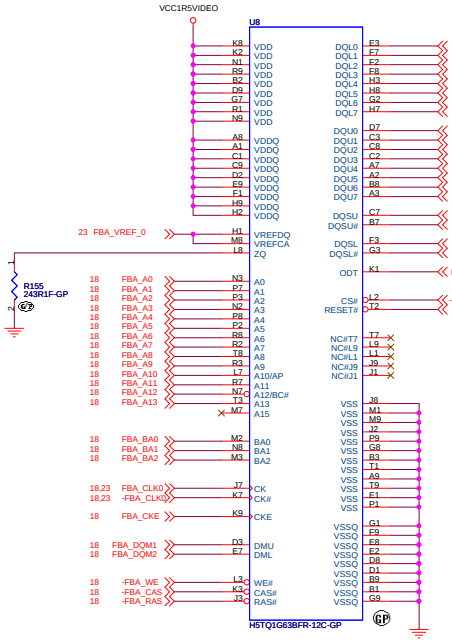
緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

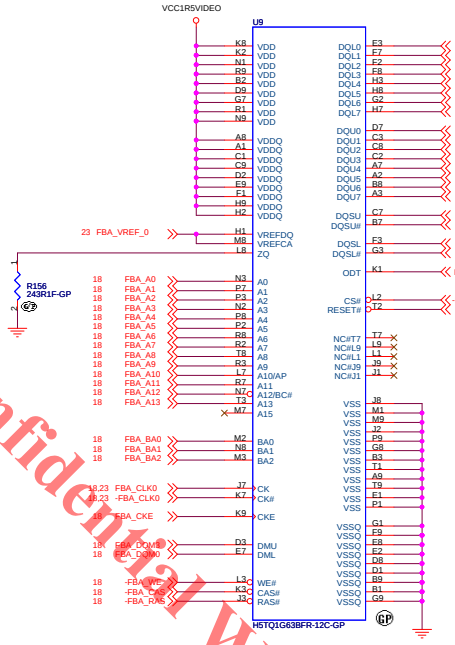
<Core Design>

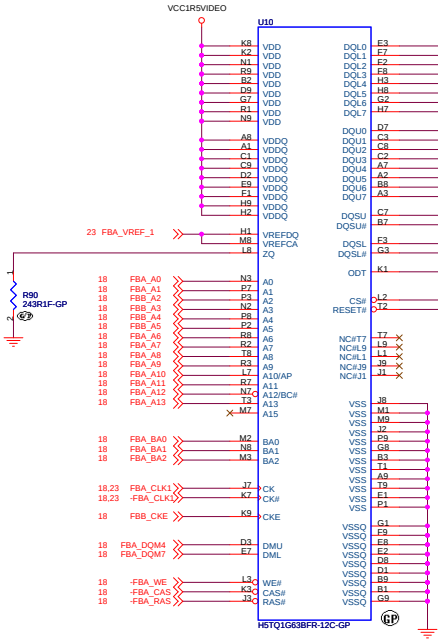
Title: N10P-GS/GLM (6/6): GND

Size: A3 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 21 of 109





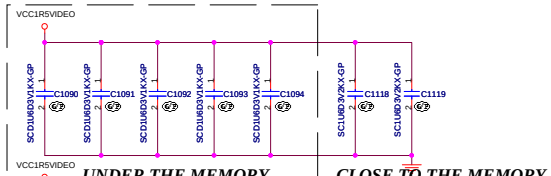


Need to Check the DDR3 VDD Current rating.

FB CMD mapping Mode A-N10x

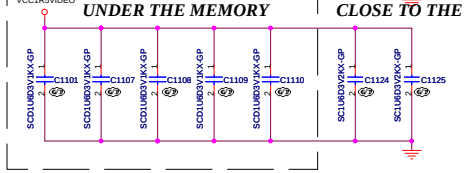
DDR3 Power consumption 1.5V@800MHz
Hynix :IDD4W=220.4mA
Samsung :IDD7=150.4mA (calcurated)

FOR U8

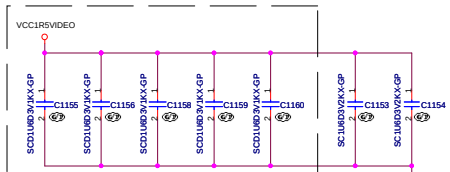


UNDER THE MEMORY ***CLOSE TO THE MEMORY***

FOR U9

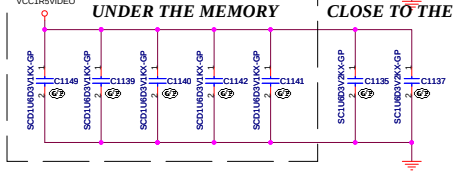


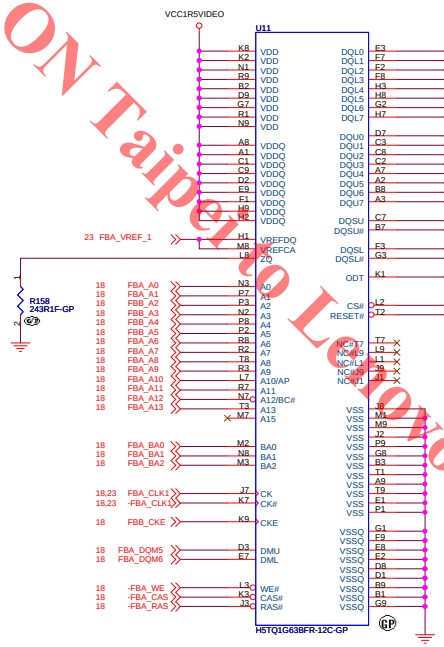
FOR U10



UNDER THE MEMORY ***CLOSE TO THE MEMORY***

FOR U11





VIDEO FRAME BUFFER PORT A

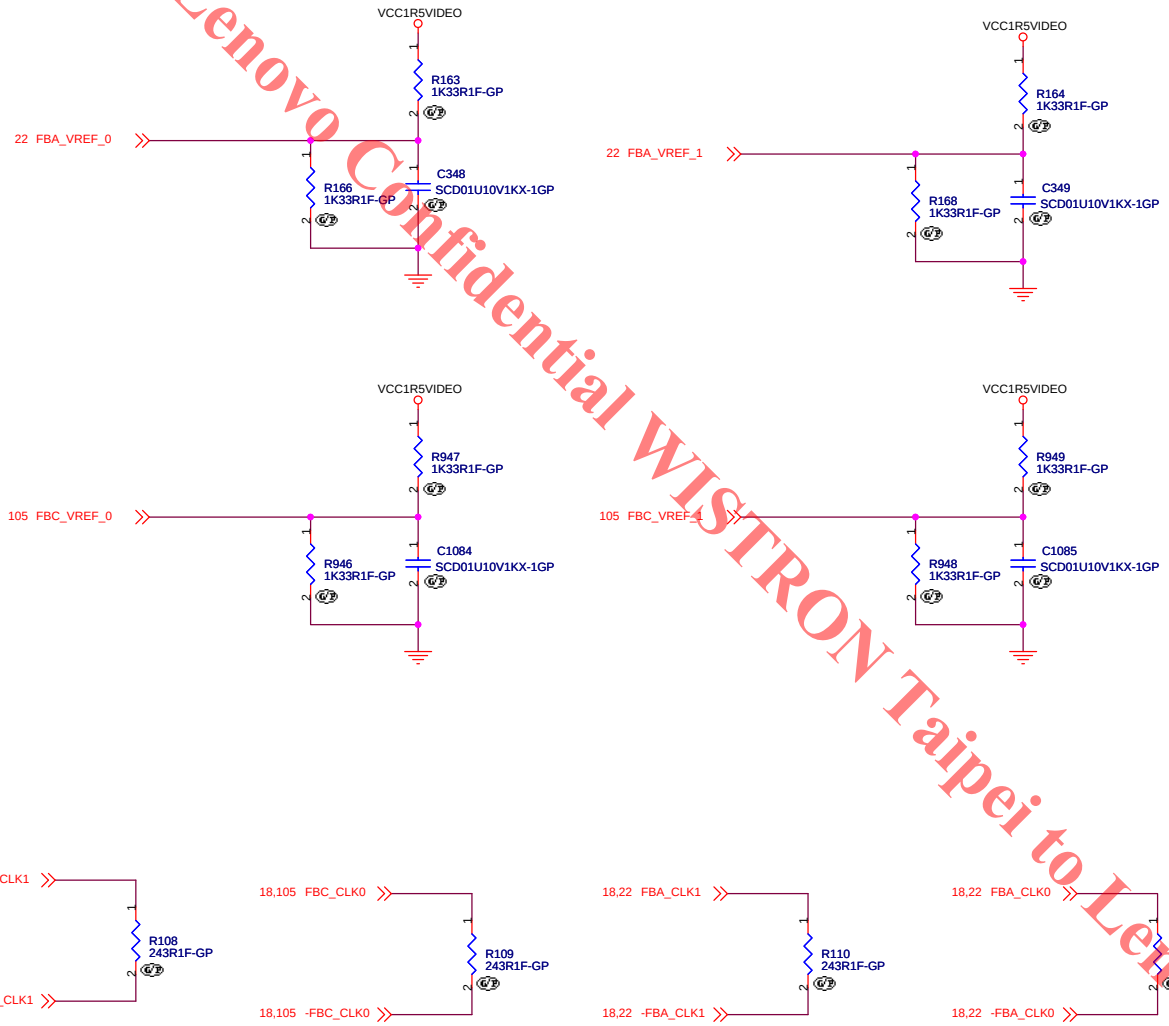
<Core Design>

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

Title: ***VRAM CHANNEL-A***

Size: A2 | Document Number: **Kendo-1 WS** | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 22 of 109



FBCLK Termination

<Core Design>

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

Title: DYNAMIC MEMORY TERMINATION

Size	Document Number	Rev
A3	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 23 of 109

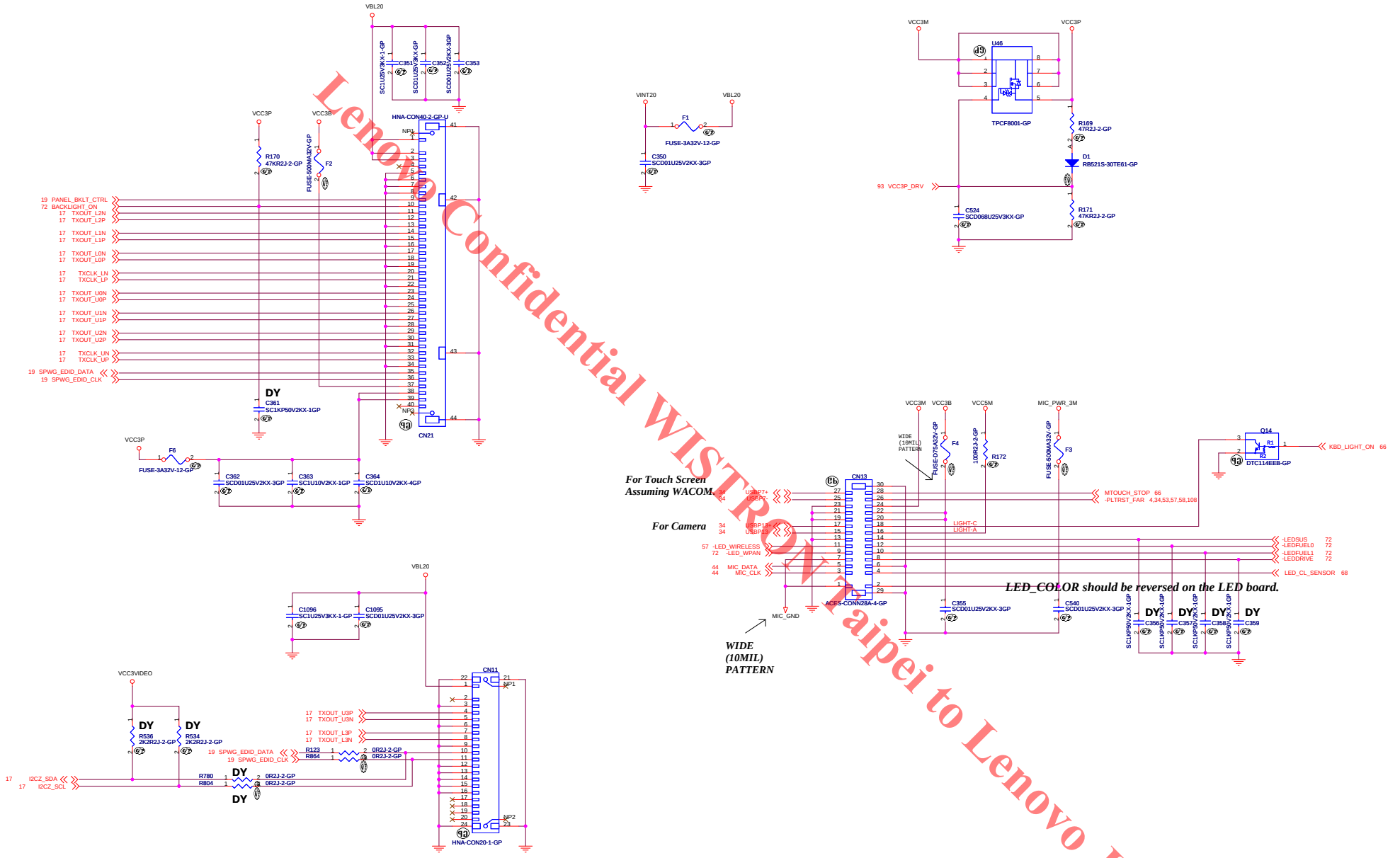
BLANK

<Variant Name>

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

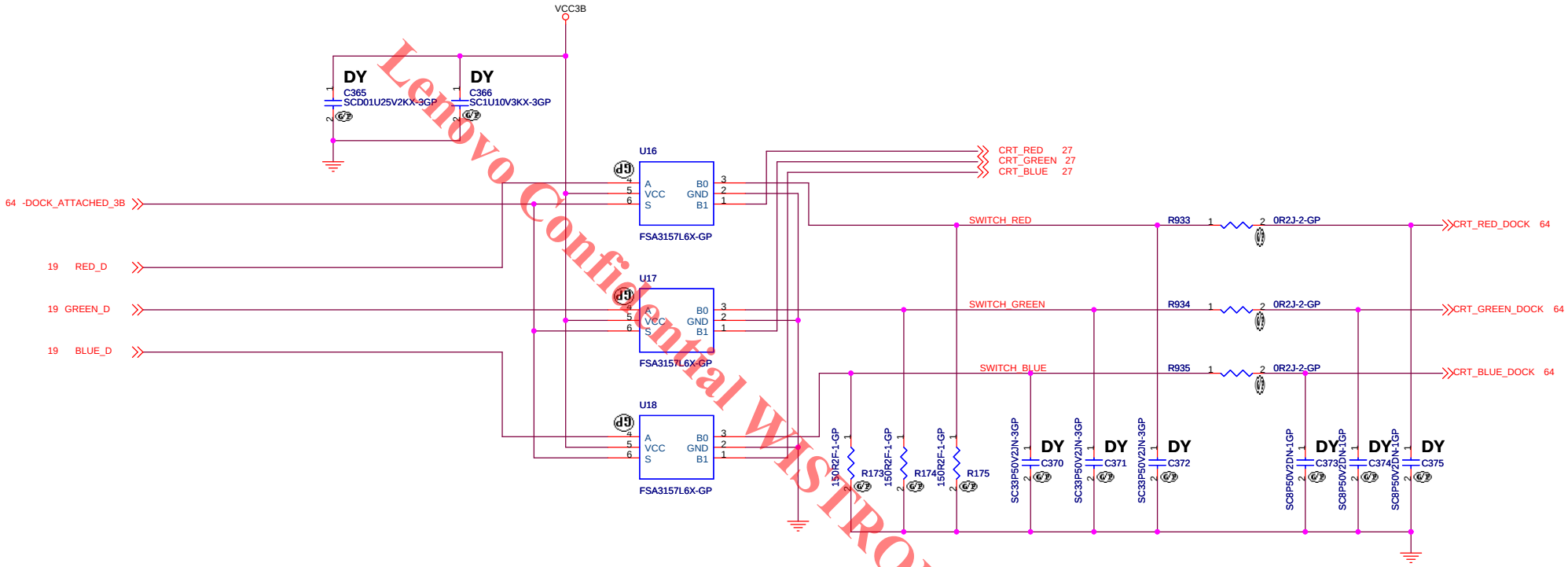
Title: BLANK		
Size: A3	Document Number: Kendo-1 WS	Rev: SC
Date: Tuesday, May 05, 2009	Sheet 24 of 109	

LCD / Inverter Connector



<Variant Name>

緯創資通 Wistron Corporation	21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.
Title	LCD CONNECTOR
Size A2	Document Number: Kendo-1 WS
Rev	SC
Date: Tuesday, May 05, 2009	Sheet 25 of 109



	Supplier	Vendo P/N	WISTRON P/N
1	FAIRCHILD	FSA3157L6X-GP	73.03157.G0H
2	ONSEMI	NLASB3157MTR2G	73.03157.003
3	TI	SN74LVC1G3157DRYR	73.03157.H0H

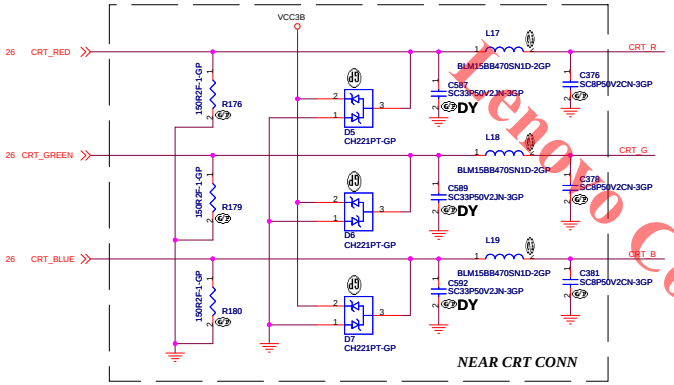
<Variant Name>

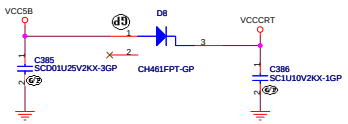
緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

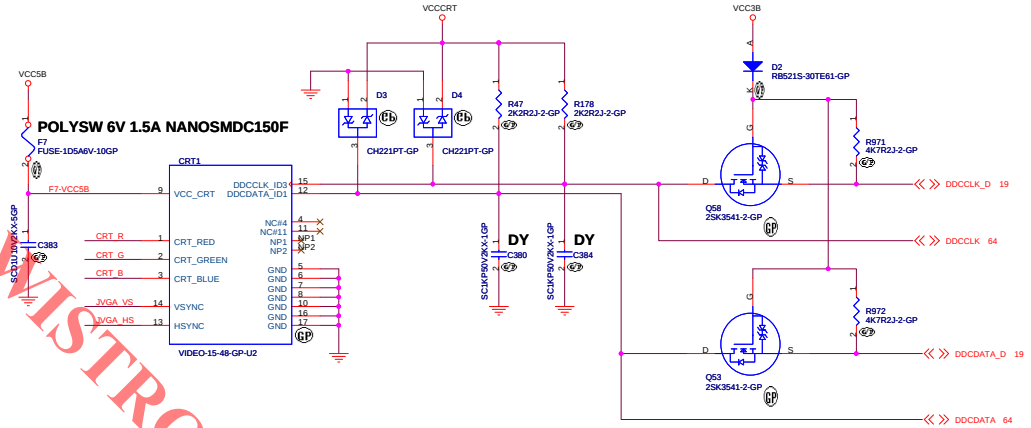
Title: ***RGB SWITCH***

Size: A3 | Document Number: **Kendo-1 WS** | Rev: SC

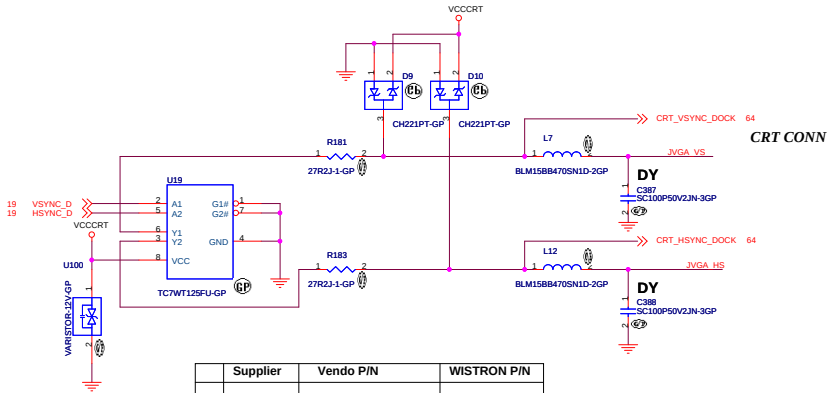
Date: Tuesday, May 05, 2009 | Sheet 26 of 109







To avoid leak current from a monitor.



	Supplier	Vendo P/N	WISTRON P/N
1	TOSHIBA	TC7WT125FU-GP	73.7W125.007
2	TI	SN74LVC2G125DCTR	73.2G125.007

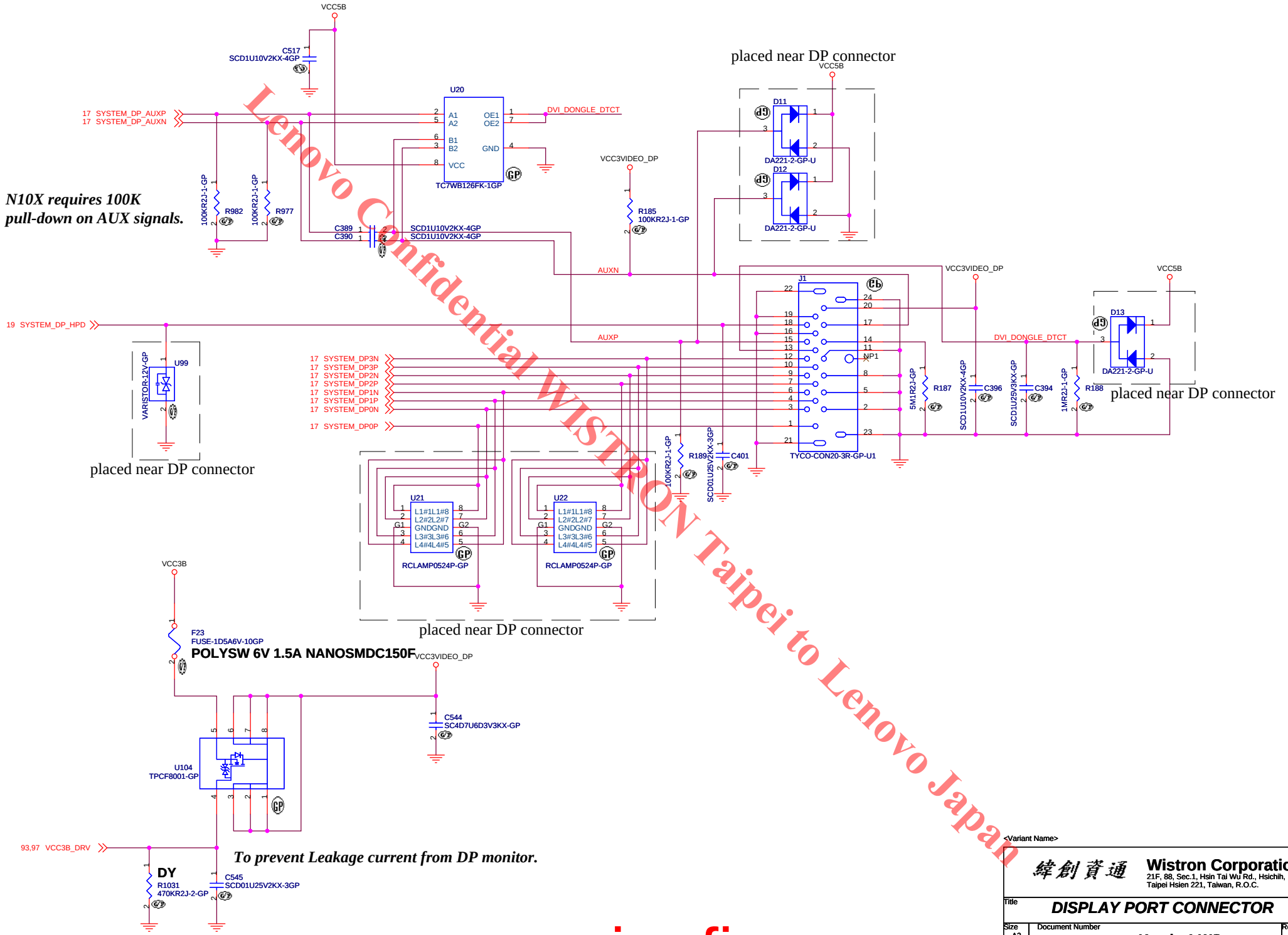
<Variant Name>

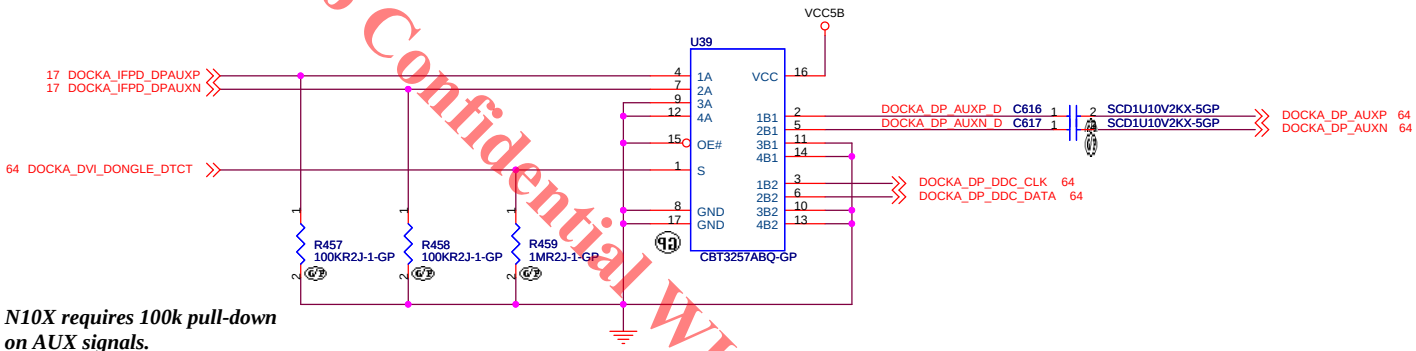
緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: EXT CRT INTERFACE

Size	Document Number	Rev
A2	Kendo-1 WS	SC

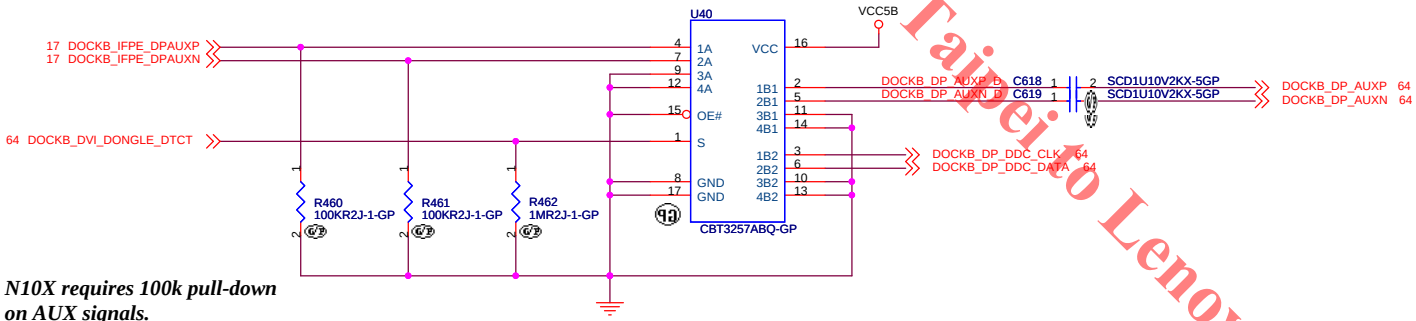
Date: Tuesday, May 05, 2009 Sheet 27 of 109





N10X requires 100k pull-down on AUX signals.

		U27, U39. U40	Wistron part number
1	NXP	CBT3257ABQ-GP	73.03257.A03
2	OnSemi	74FST3257MNTWG-GP	73.5A121.00H



N10X requires 100k pull-down on AUX signals.

INPUTS		INPUT/OUTPUT	FUNCTION
OE#	S	A	
L	L	B1	A port = B1 port
L	H	B2	A port = B2 port
H	X	Z	Disconnect

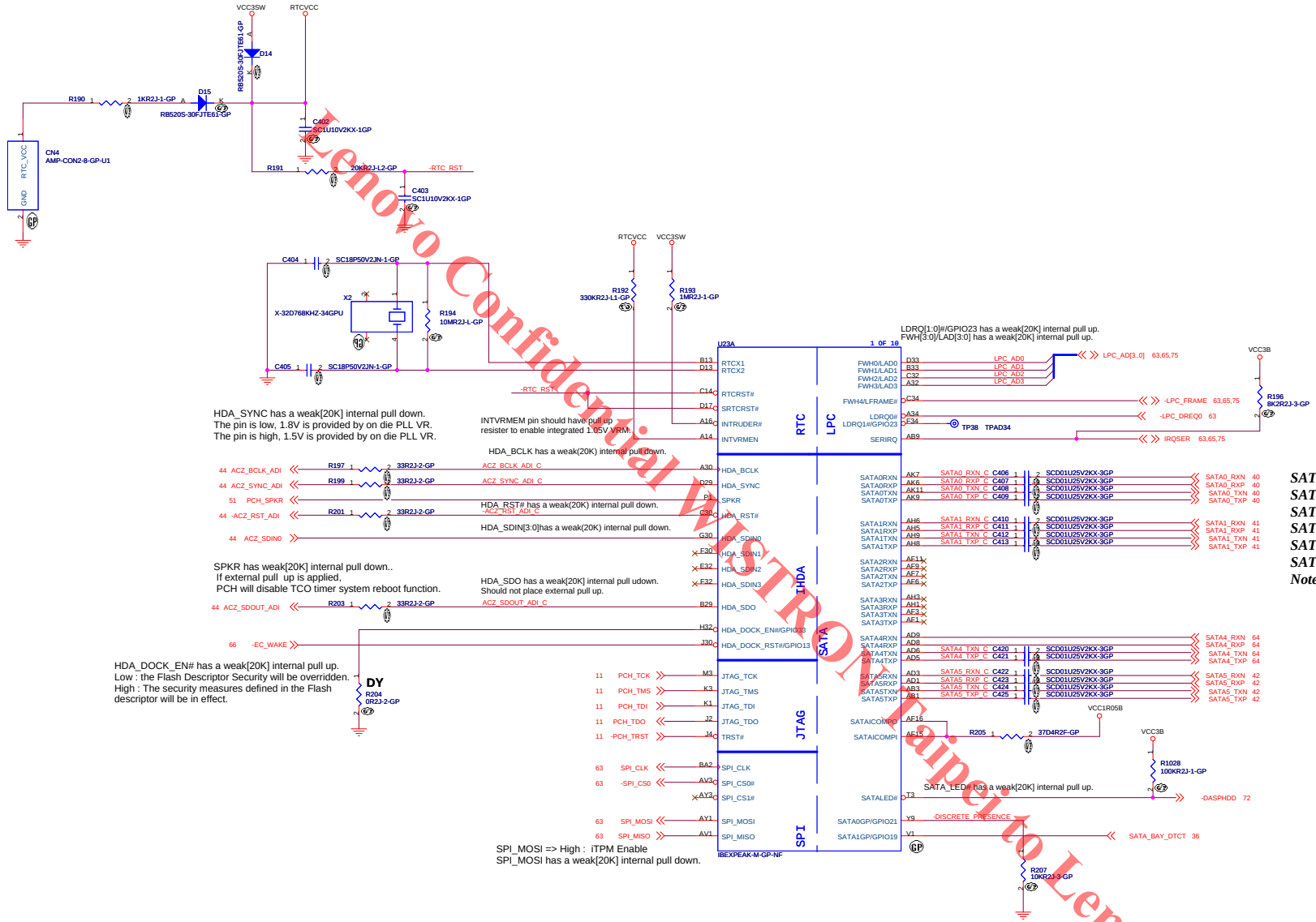
<Variant Name>

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

Title: ***DISPLAY PORT MUX***

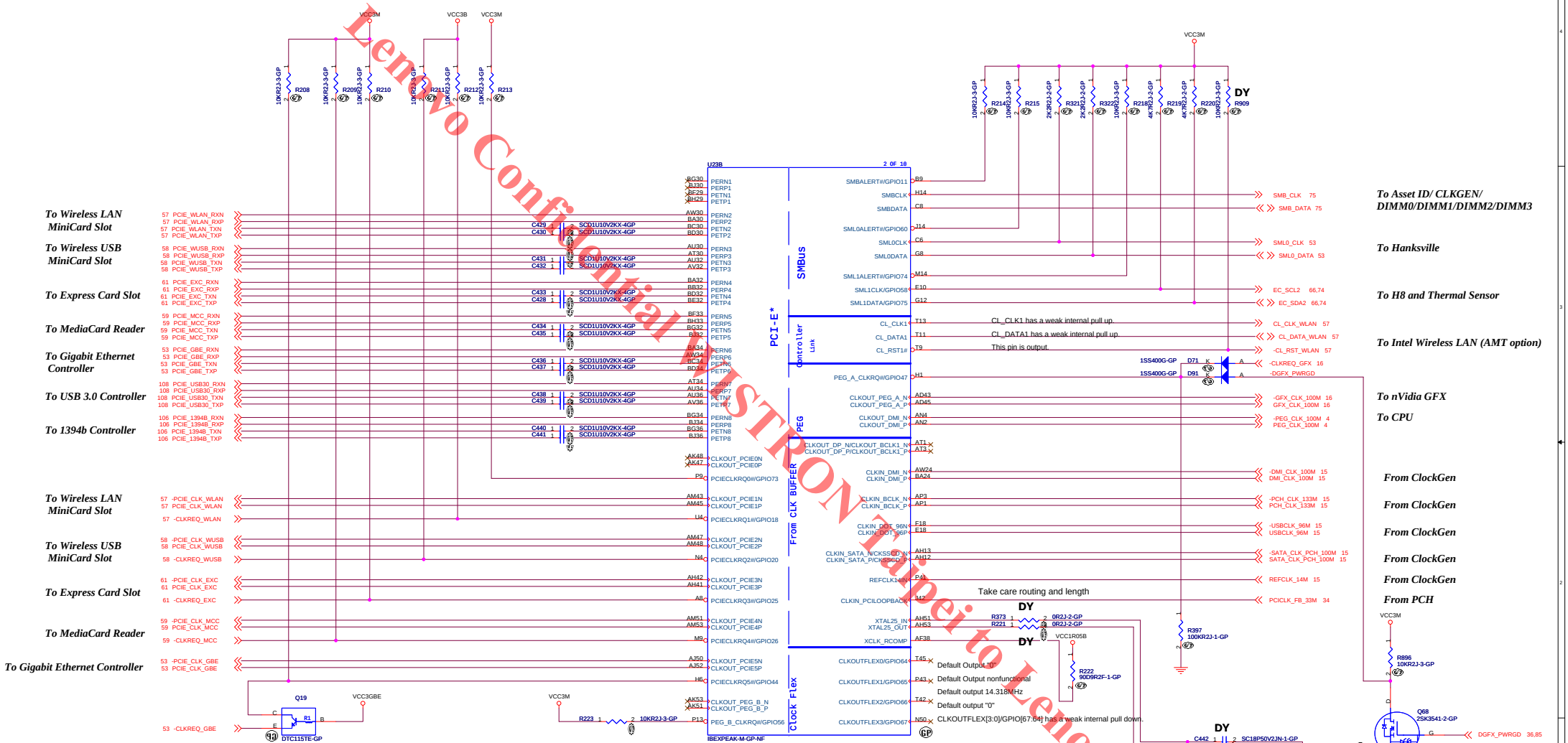
Size	Document Number	Rev
A3	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 29 of 109



SATA0: To HDD Bay
SATA1: To ODD Bay
SATA2: Reserved
SATA3: Reserved
SATA4: To Docking Connector
SATA5: To eSATA Combo Connector
Note: SATA4 and SATA5 support Multiplier

緯創資通	**Wistron Corporation** 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.
Title	***PCH (1/8):HDA/JTAG/SATA***
Size: A2	Document Number: **Kendo-1 WS** Rev: **SC**
Date: Tuesday, May 05, 2009	Sheet 30 of 109



	Supplier	Vendo P/N	WISTRON P/N
1	KDS	DSX321G 25M 18P 30PPM	82.30020.B11
2	H.ELE	HSX321S 25M 18P 30PPM	82.30020.B21

KDS Recommended Conditions:
Normal Frequency: 25MHz.
Frequency Tolerance: +/- 30ppm.
Load Frequency: 18pF.
Effective Series Resistance: 50-ohm.
Effective Shunt Capacitancce: 2pF.

HELE Recommended Conditions:
Normal Frequency: 25MHz.
Frequency Tolerance: +/- 30ppm.
Load Frequency: 18pF.
Effective Series Resistance: 50-ohm.
Effective Shunt Capacitancce: 2pF.

Intel Recommended Conditions:
Normal Frequency: 25MHz.
Frequency Tolerance: +/- 30ppm.
Load Frequency: 18pF.
Effective Series Resistance: 50-ohm.
Effective Shunt Capacitancce: 6pF.

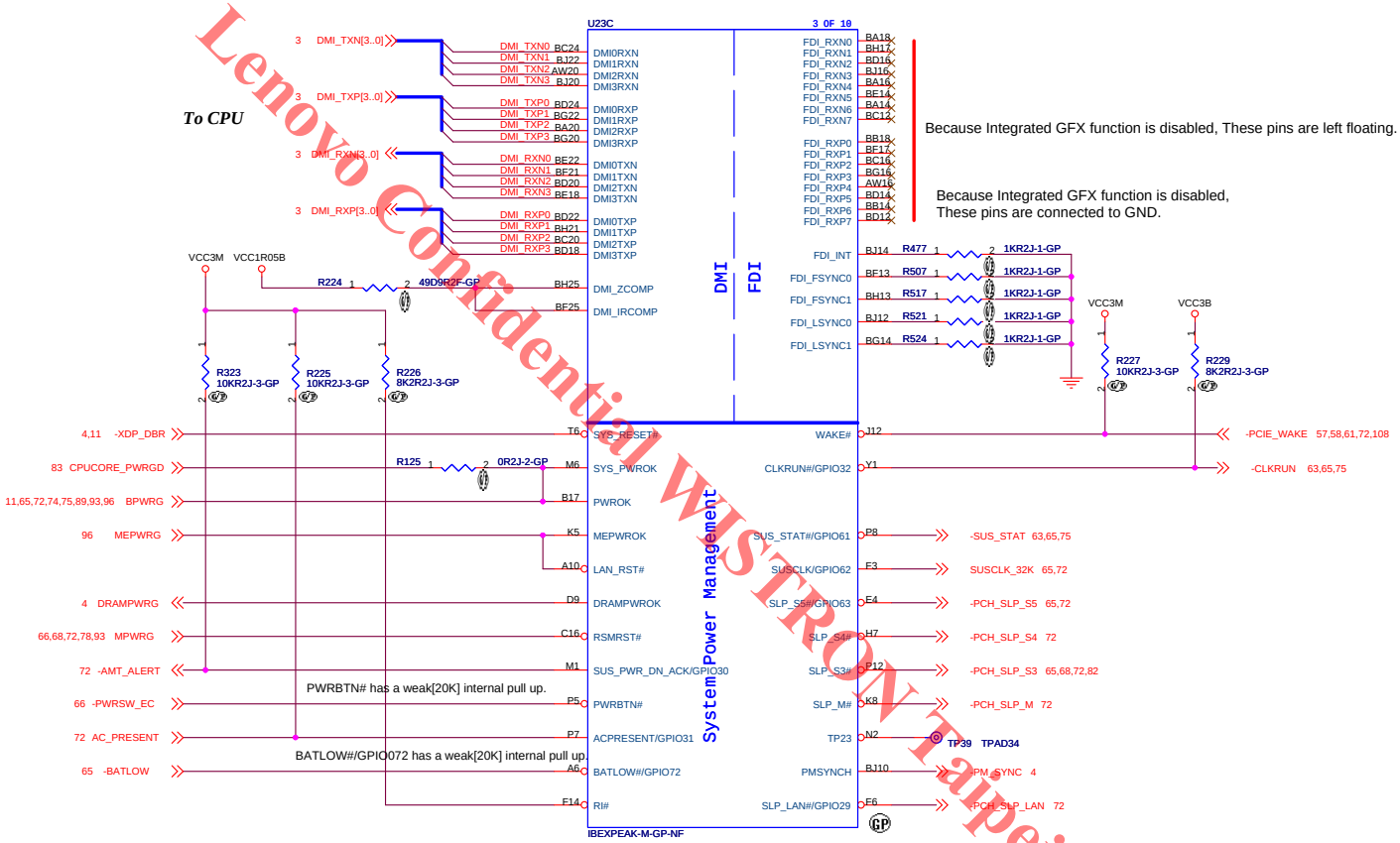
<Variant Name>

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

Title: PCH(2/8):PCIE/SMBUS/CLK

Size	Document Number	Rev
A2	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 31 of 109



<Variant Name>

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

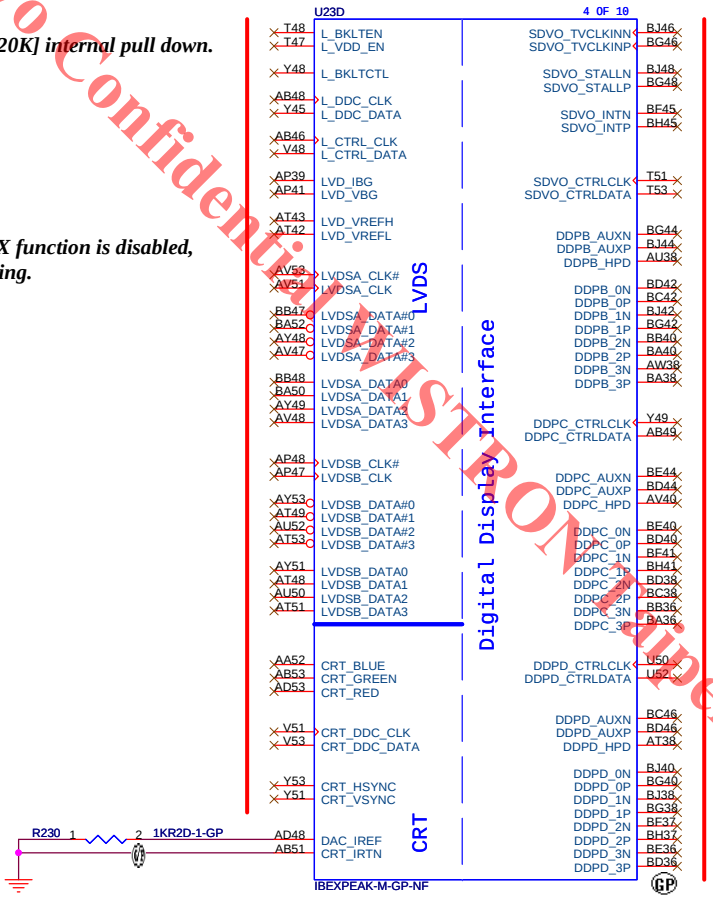
Title: PCH (3/8):DMI/FDI/PM

Size	Document Number	Rev
Custom	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 32 of 109

L_DDC_DATA has a weak[20K] internal pull down.

Because Integrated GFX function is disabled,
These pins are left floating.



SDVO_CTRLDATA/SDVO_CTRLCLK has a weak[20K] internal pull down.

Because Integrated GFX function is disabled,
These pins are left floating.

DDP[D:C]_CTRLCLK has a weak[10K] internal pull down.
DDP[D:C]_CTRLDATA has a weak[20K] internal pull down.

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

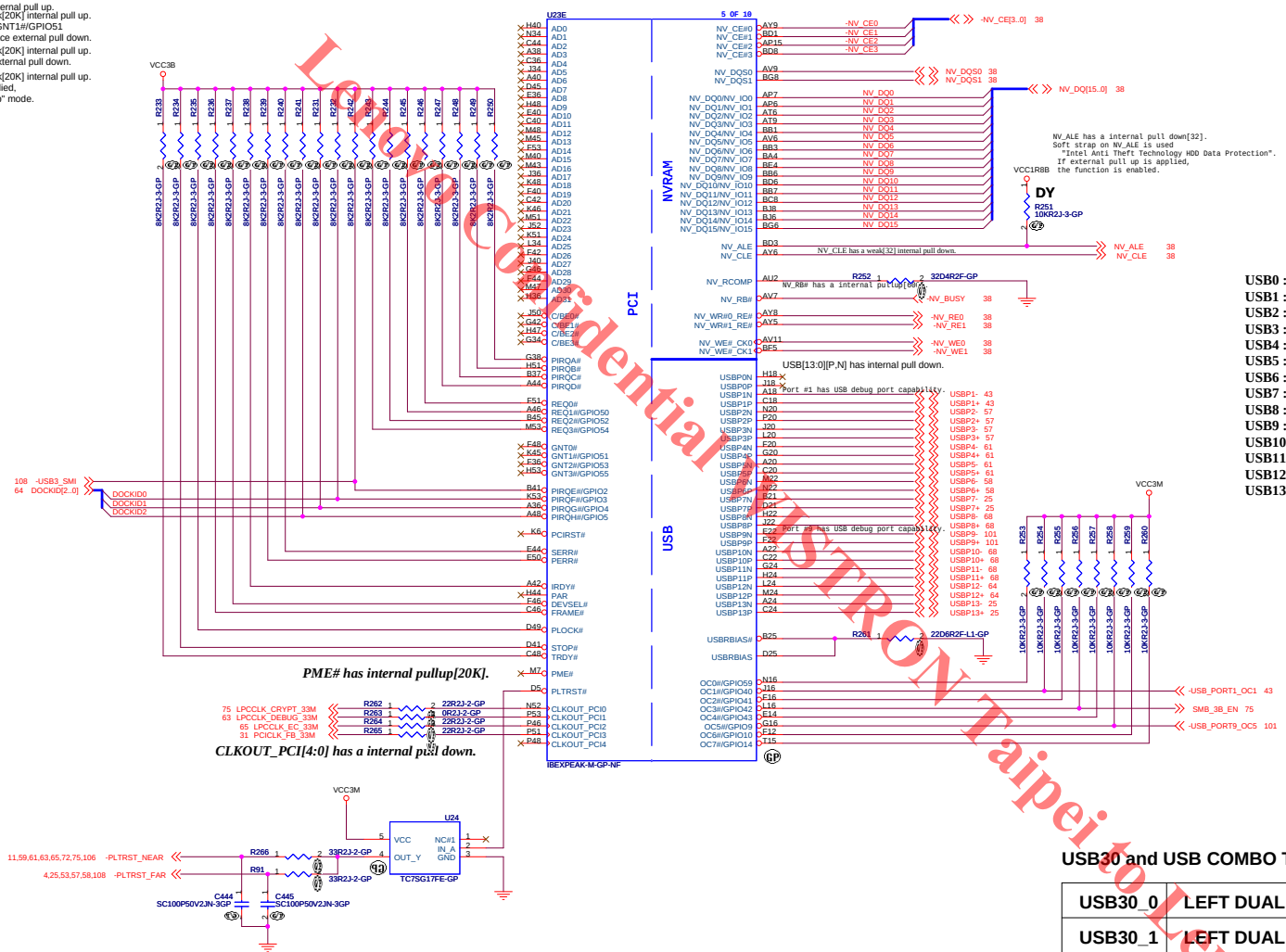
Title: PCH (4/8):LVDS/CRT/DDI

Size: A3 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 33 of 109

Because PCI IF is not used, ADx.C/BEx and GNTx are left as NC.

GNT0# has a weak[20K] internal pull up.
GNT1#/GPIO51 has a weak[20K] internal pull up.
To use SPI IF flash BIOS, GNT1#/GPIO51
and GNT0# should not place external pull down.
GNT2#/GPIO53 has a weak[20K] internal pull up.
This pin should not have external pull down.
GNT3#/GPIO55 has a weak[20K] internal pull up.
If external pull down is applied,
PCH will be "topblock swap" mode.

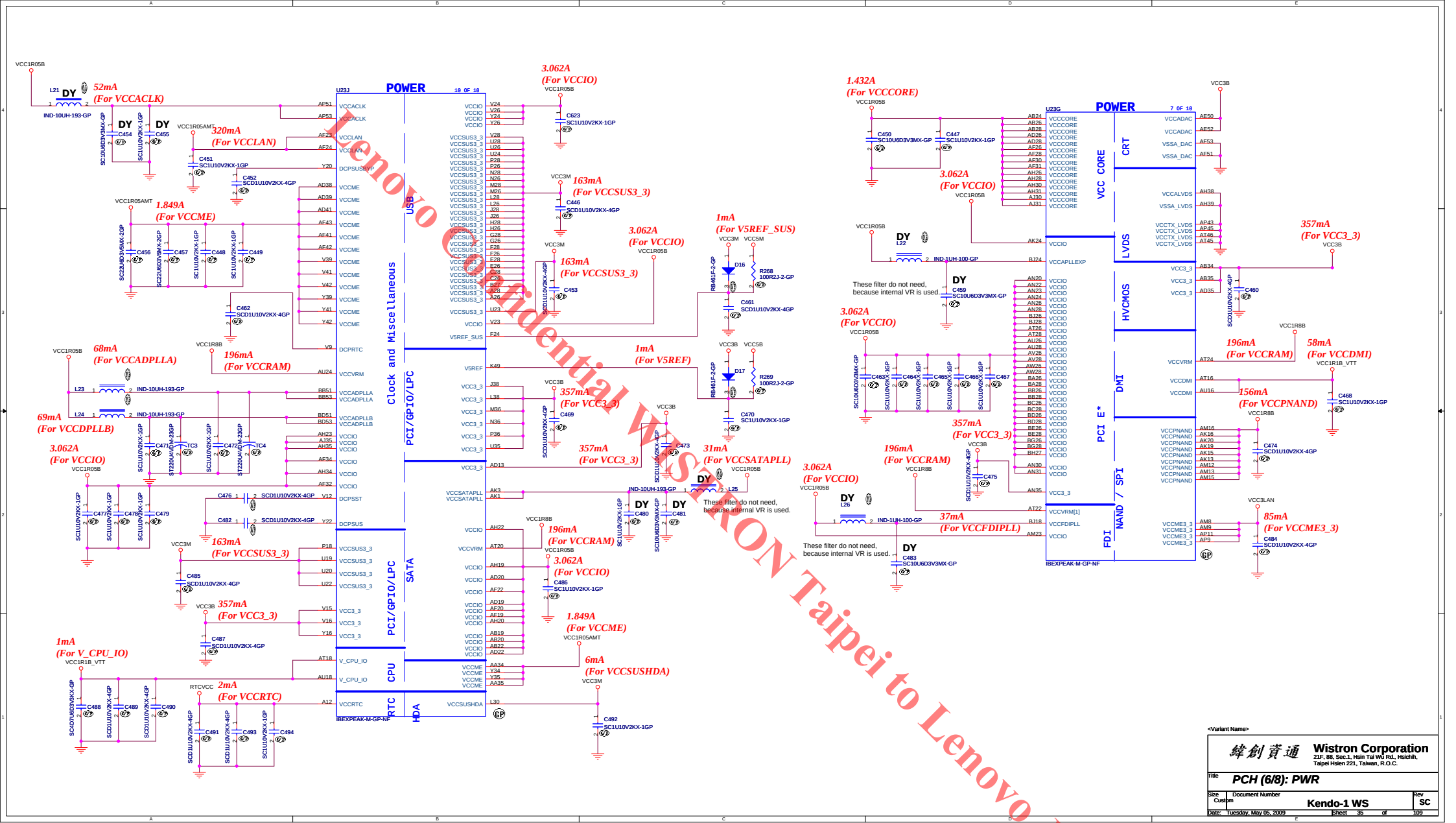


USB0 :Reserved
USB1 : To System onboard USB port(eSATA combo)
USB2 : To WiMAX/WLAN Mini Card Slot
USB3 : To WWAN Mini Card Slot
USB4 : To Smart Card I/F
USB5 : To Express Card Slot
USB6 : To WUSB Mini Card Slot
USB7 : To Touch Screen
USB8 : To Color Sensor
USB9 : To System Subcard USB port
USB10: To FPR
USB11:To Bluetooth
USB12:To Docking
USB13:To Camera

USB30 and USB COMBO Table

USB30_0	LEFT DUAL CONN	USB30_ON0	-USB30_OC0
USB30_1	LEFT DUAL CONN	USB30_ON1	-USB30_OC1
USBP1	LEFT COMBO CONN	USB_ON1	-USB_PORT1_OC1
USBP9	RIGHT SUB CARD	USB_ON2	-USB_PORT9_OC5

緯創資通	Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.		
Title	PCH (5/8):PCI/USB/NVM		
Size A2	Document Number Kendo-1 WS		Rev SC
Date: Tuesday, May 05, 2009		Sheet 34 of 109	



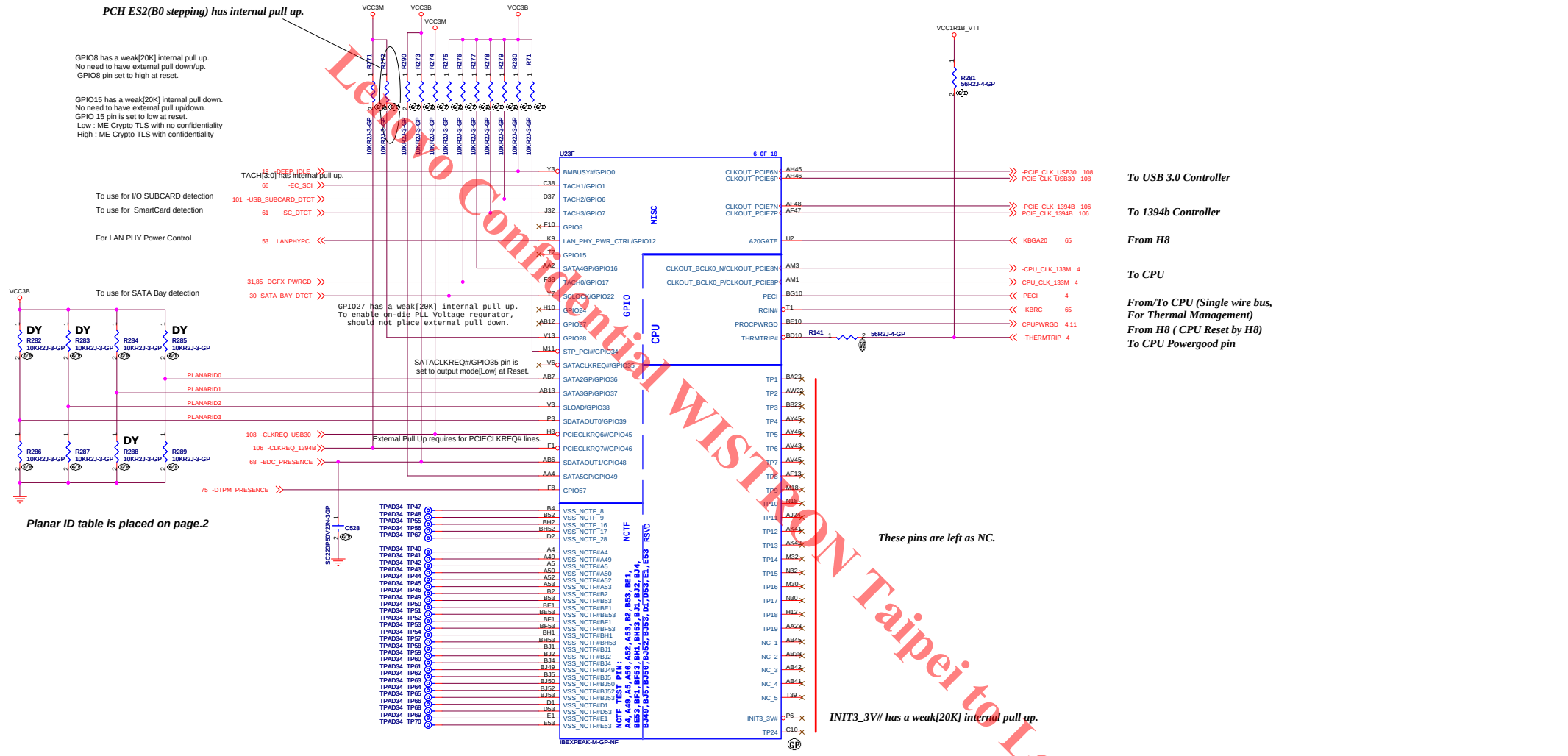
<Variant Name>

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

Title: PCH (6/8): PWR

Size: Custom | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 35 of 109



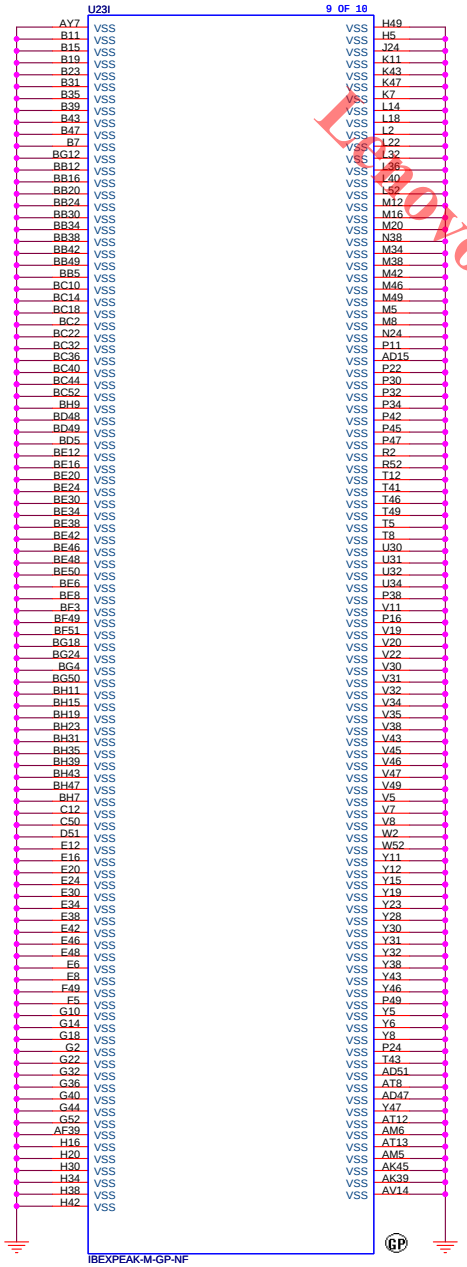
<Variant Name>

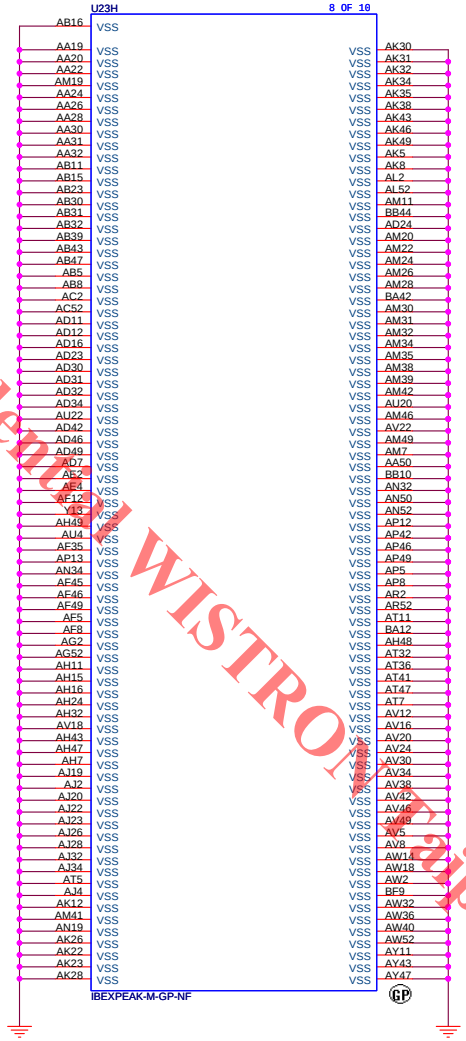
緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: PCH (7/8):GPIO/NTCF/RSVD

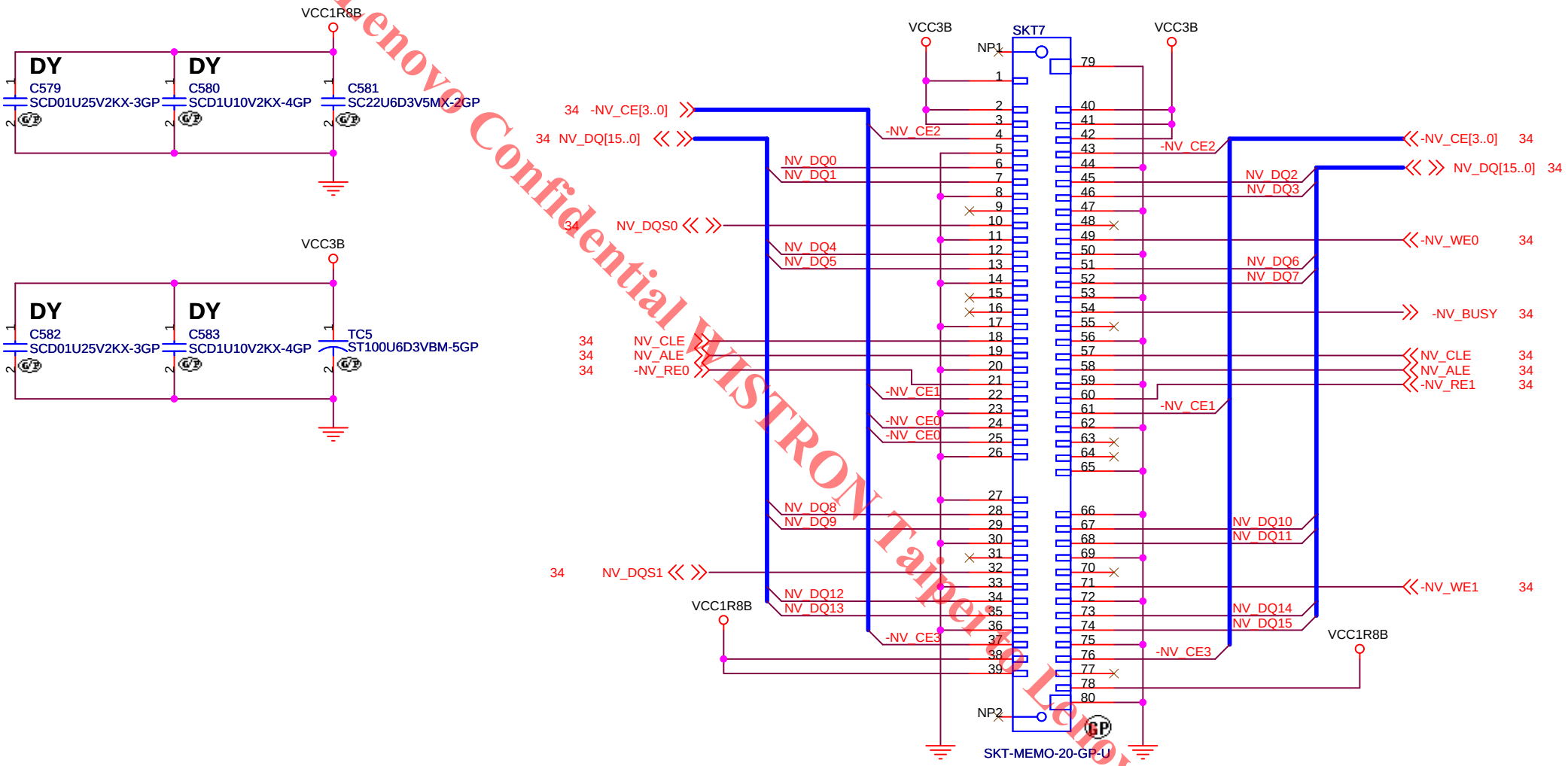
Size: A2 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 36 of 109





緯創資通	Wistron Corporation 21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
Title	PCH (8/8):GND	
Size: Custom	Document Number: Kendo 1 WS	Rev: SC
Date: Tuesday, May 05, 2009	Sheet 87 of 109	



<Variant Name>

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

Title

TURBO MEMORY SLOT

Size	Document Number	Rev
A4	Kendo-1 WS	SC

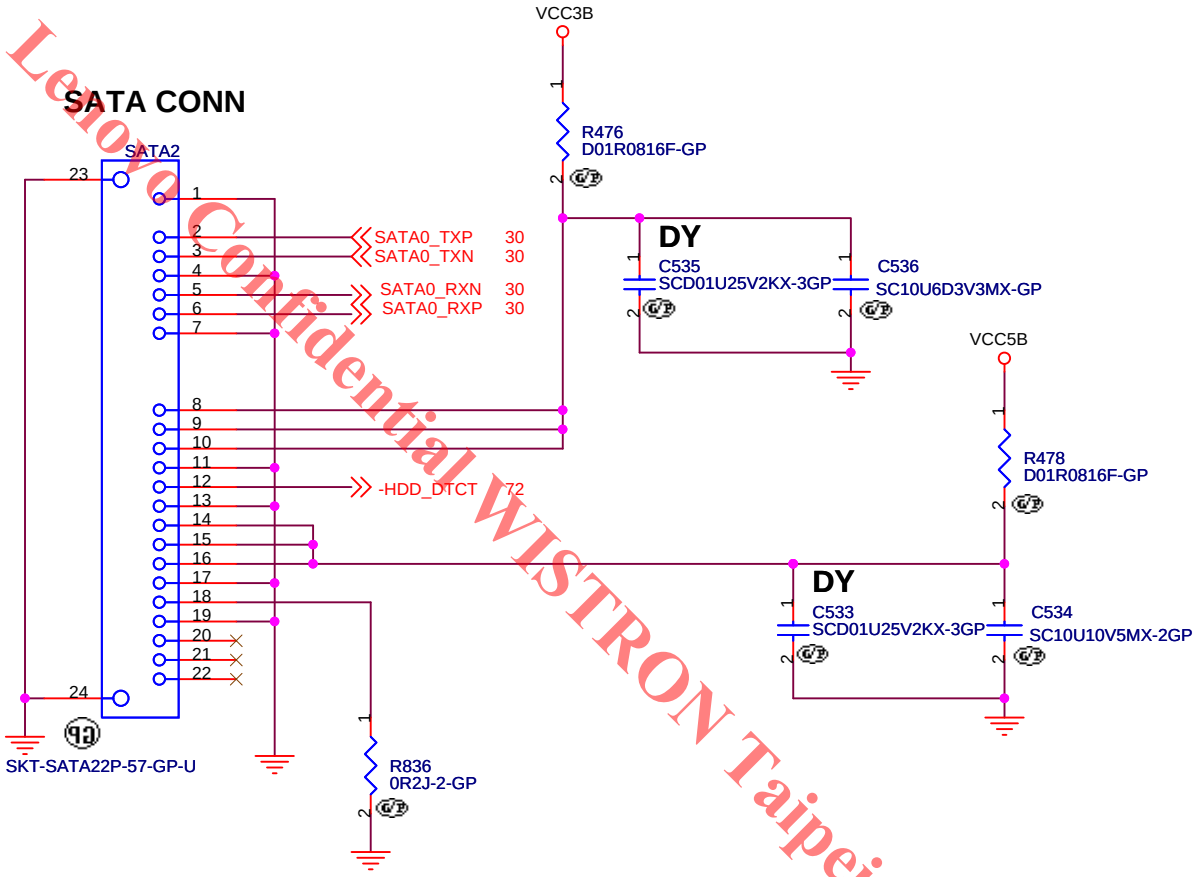
Date: Tuesday, May 05, 2009 Sheet 38 of 109

BLANK

<Variant Name>

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

Title: BLANK		
Size: A3	Document Number: Kendo-1 WS	Rev: SC
Date: Tuesday, May 05, 2009	Sheet 39 of 109	



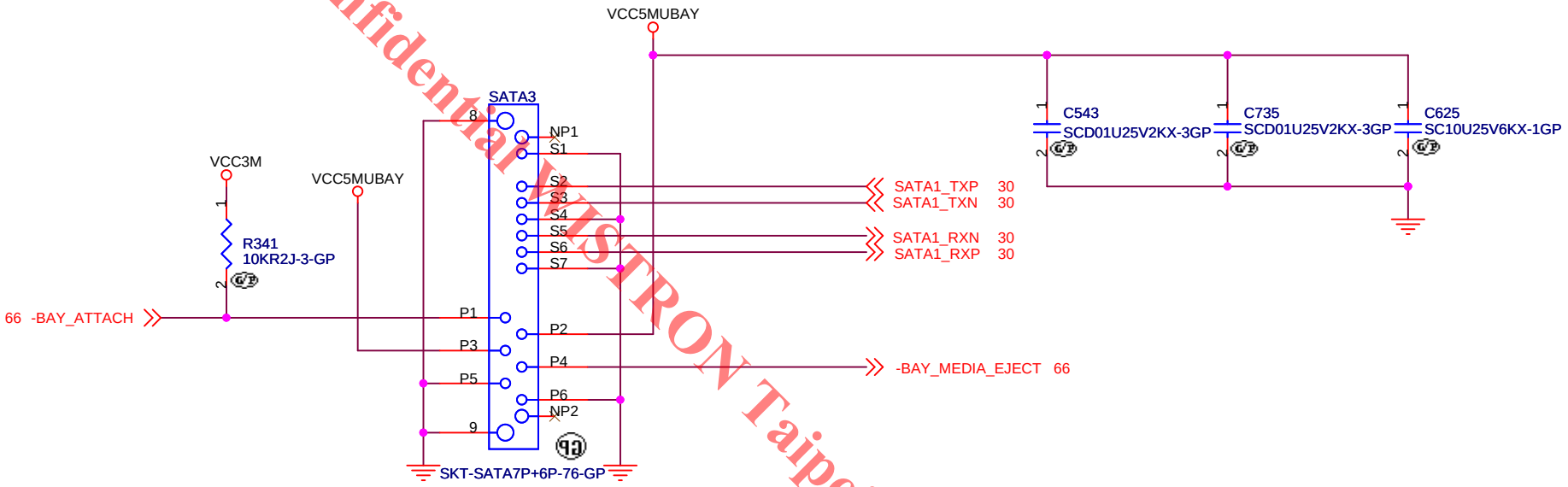
<Variant Name>

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

Title: **SATA HDD CONN**

Size	Document Number	Rev
A4	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 40 of 109



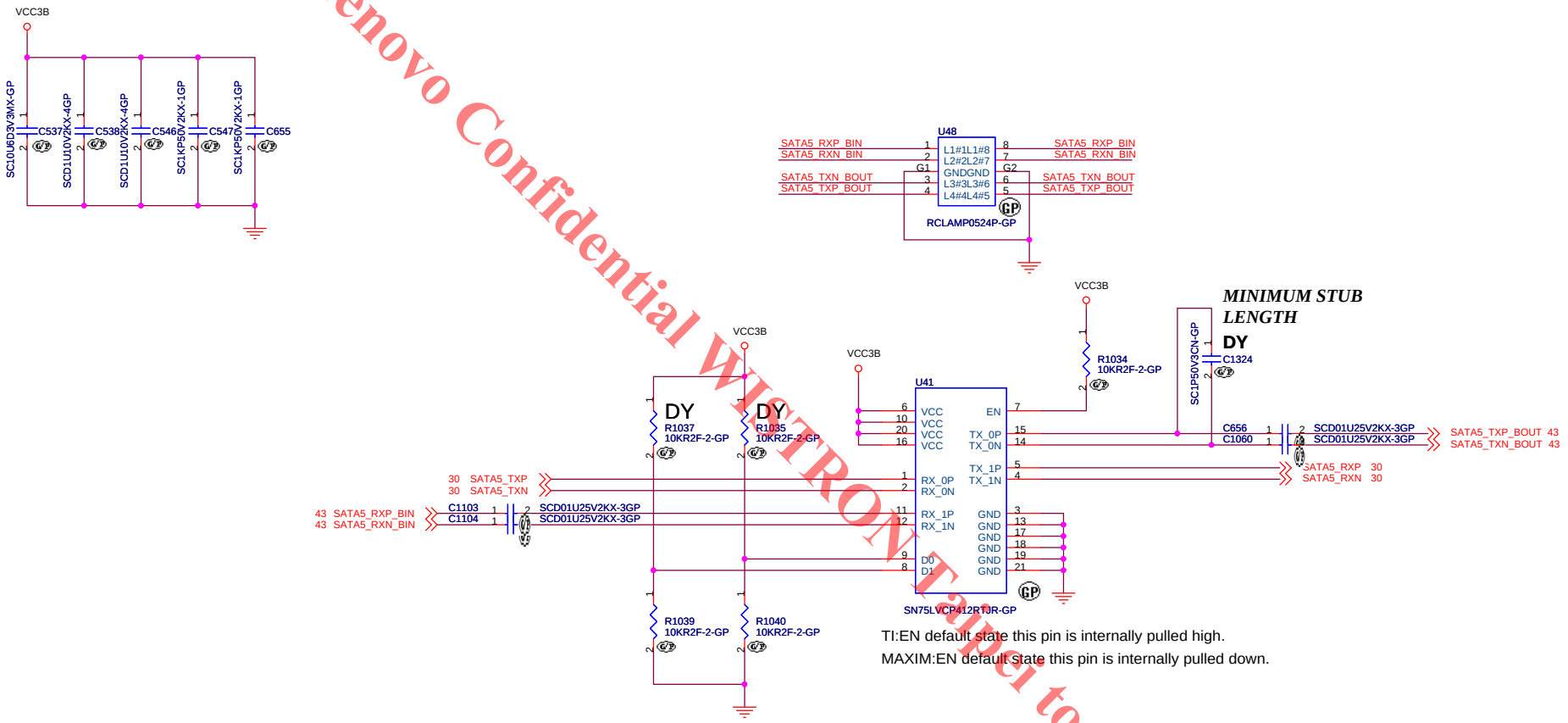
<Variant Name>

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

Title: **SATA BAY I/F CONN**

Size	Document Number	Rev
A4	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 41 of 109



TABLE

EN	D0	D1	CH - 0	CH - 1
0	X	X	STANDBY	STANDBY
1	0	0	STANDARD	STANDARD
1	1	0	BOOST	STANDARD
1	0	1	STANDARD	BOOST
1	1	1	BOOST	BOOST

← LOGIC

		U41	Wistron part number
1	TI	SN75LVCP412RTJR-GP	71.75412.003
2	MAXIM	MAX4951CTP-T-GP	71.04951.A03

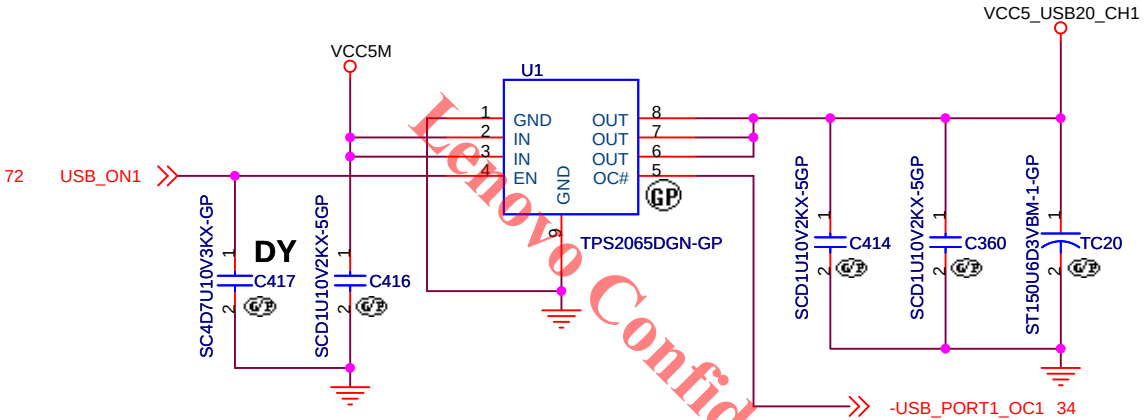
<Core Design>

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

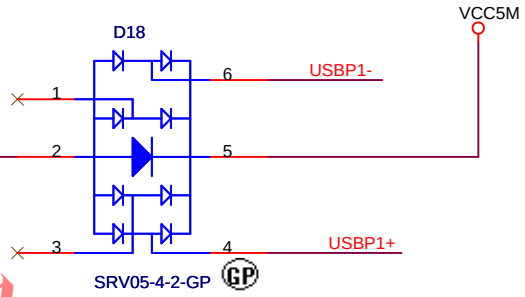
Title: **ESATA CONNECTOR**

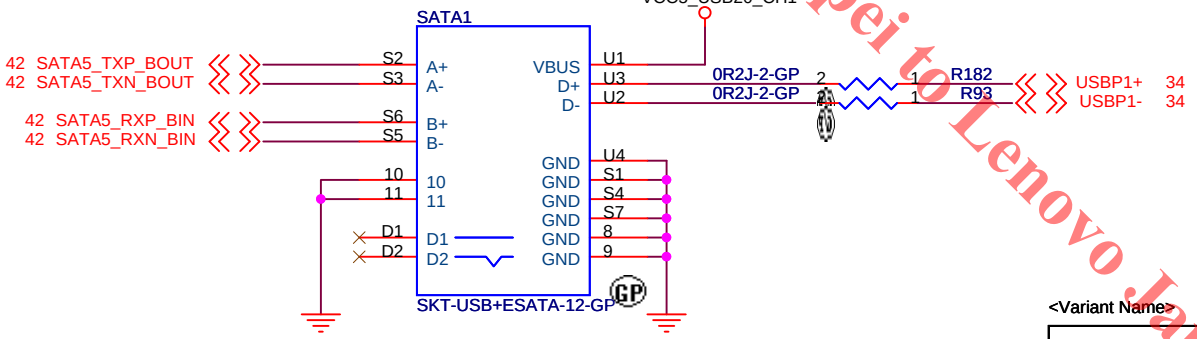
Size: A3 | Document Number: **Kendo-1 WS** | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 42 of 109



	Supplier	Vendo P/N	WISTRON P/N
1	TI	TPS2065DGN-GP	74.02065.079
2	TI	TPS2065DGN-1-GP	74.02065.A79
3	ROHM	BD8014FVJ-GP	74.08014.07G





eSATA Combo

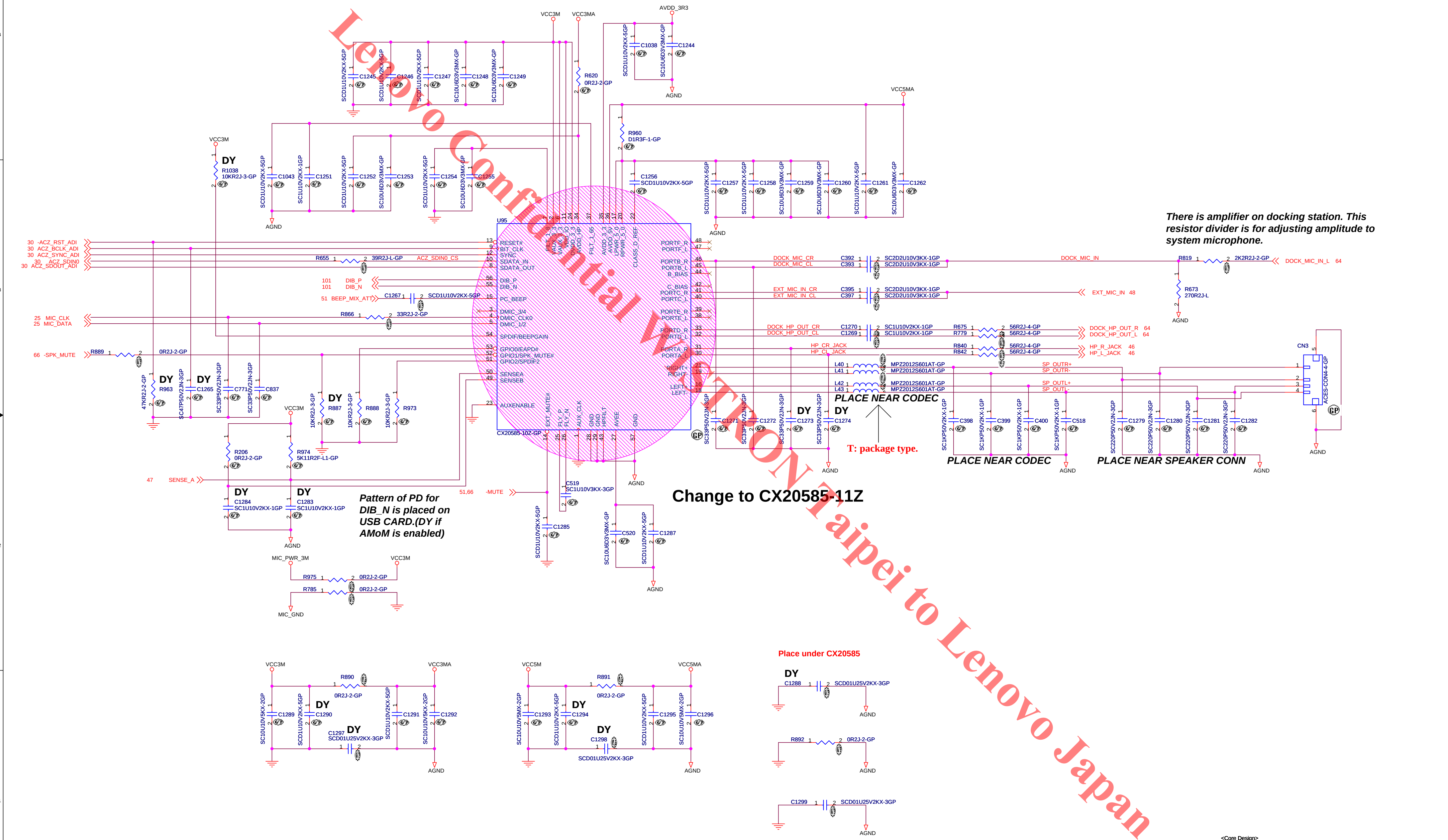
<Variant Name>

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/ CONN**

Size	Document Number	Rev
A4	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 43 of 109



<Core Design>

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

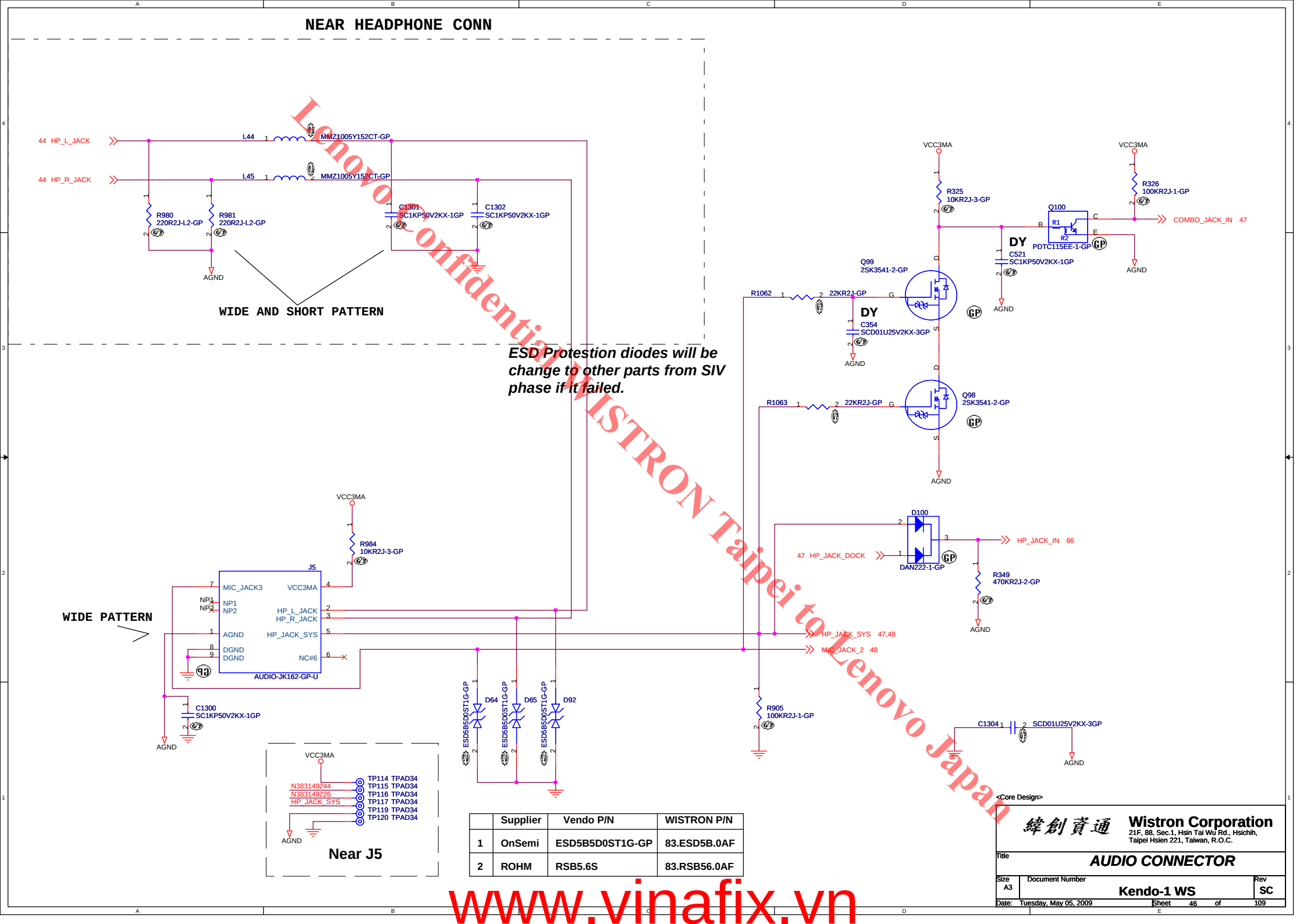
Title	AUDIO CX20585	
Size A2	Document Number Kendo-1 WS	Rev SC
Date: Tuesday, May 05, 2009	Sheet 44 of 109	

BLANK

<Variant Name>

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

Title: BLANK		
Size: A3	Document Number: Kendo-1 WS	Rev: SC
Date: Tuesday, May 05, 2009	Sheet 45 of 109	



	Supplier	Vendo P/N	WISTRON P/N
1	OnSemi	ESD5B5D0ST1G-GP	83.ESD5B.0AF
2	ROHM	RSB5.6S	83.RSB56.0AF

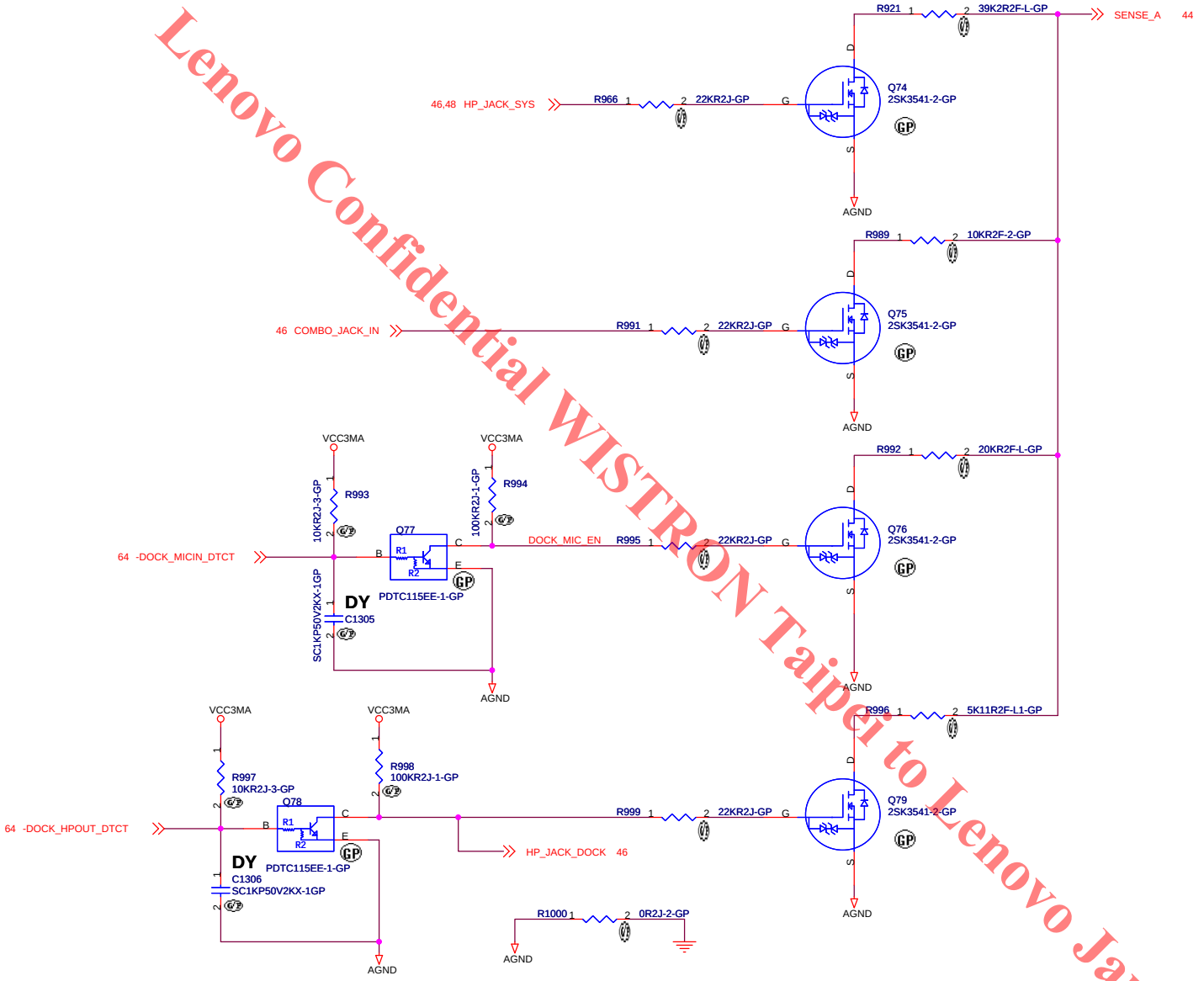
<Core Design>

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

Title: ***AUDIO CONNECTOR***

Size: A3 | Document Number: **Kendo-1 WS** | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 46 of 109



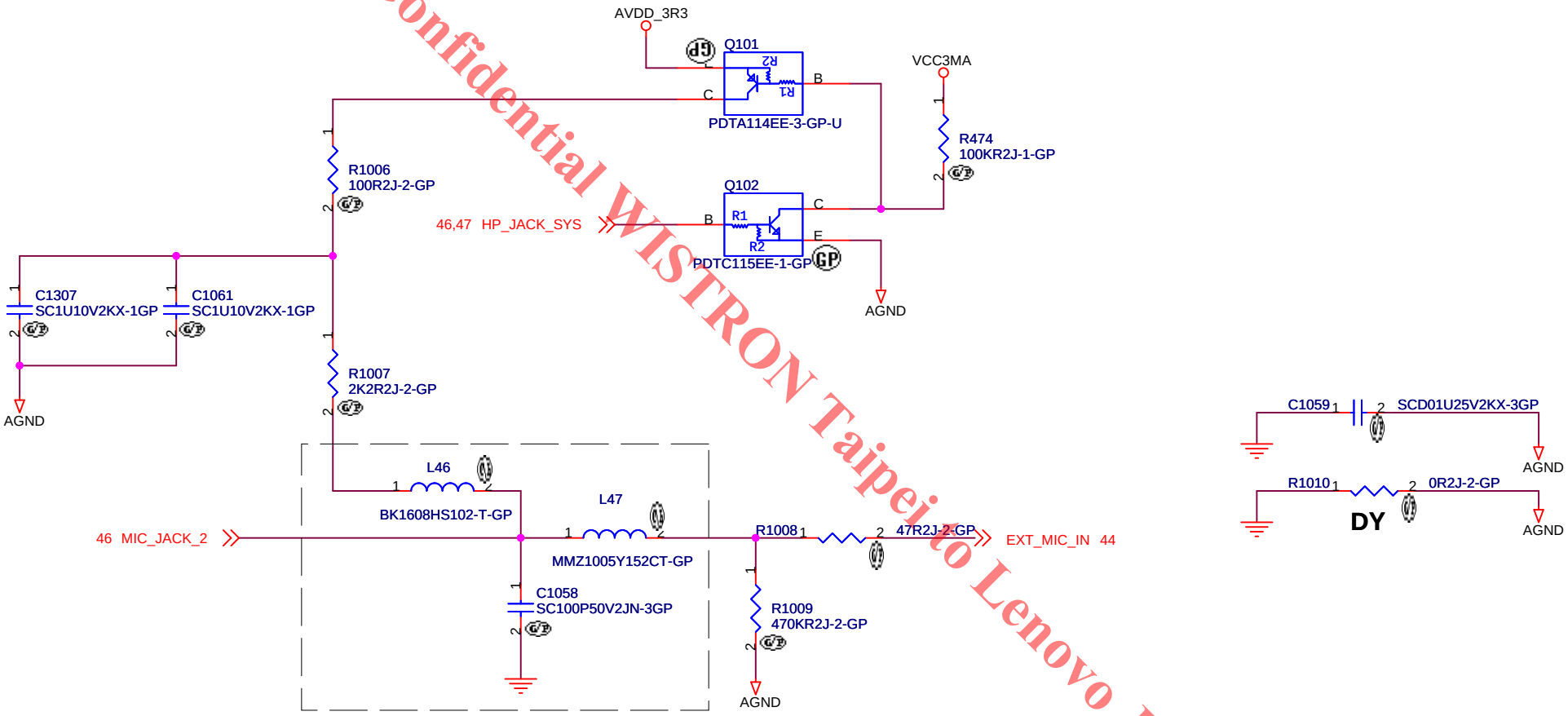
緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

<Core Design>

Title: AUDIO JACK SENSE

Size: A3 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 47 of 109



<Core Design>

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

Title: **AUDIO EXT MIC I/F**

Size	Document Number	Rev
A4	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 48 of 109

BLANK

<Variant Name>

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

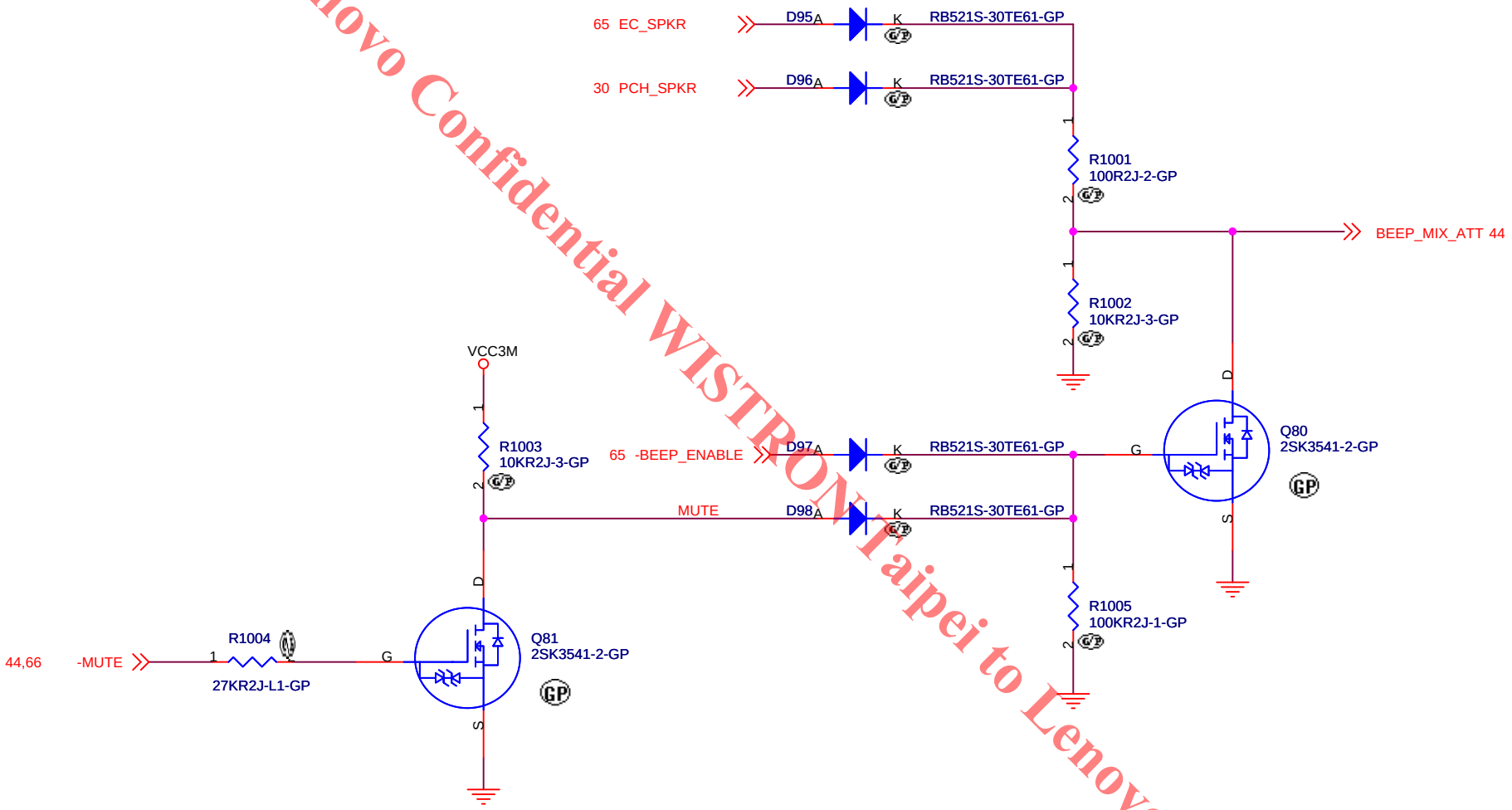
Title: BLANK		
Size: A3	Document Number: Kendo-1 WS	Rev: SC
Date: Tuesday, May 05, 2009	Sheet 49 of 109	

BLANK

<Variant Name>

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

Title	BLANK	
Size: A3	Document Number: Kendo-1 WS	Rev: SC
Date: Tuesday, May 05, 2009	Sheet 50 of 109	



<Core Design>

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

Title
BEEP CONTROL

Size	Document Number	Rev
A4	Kendo-1 WS	SC

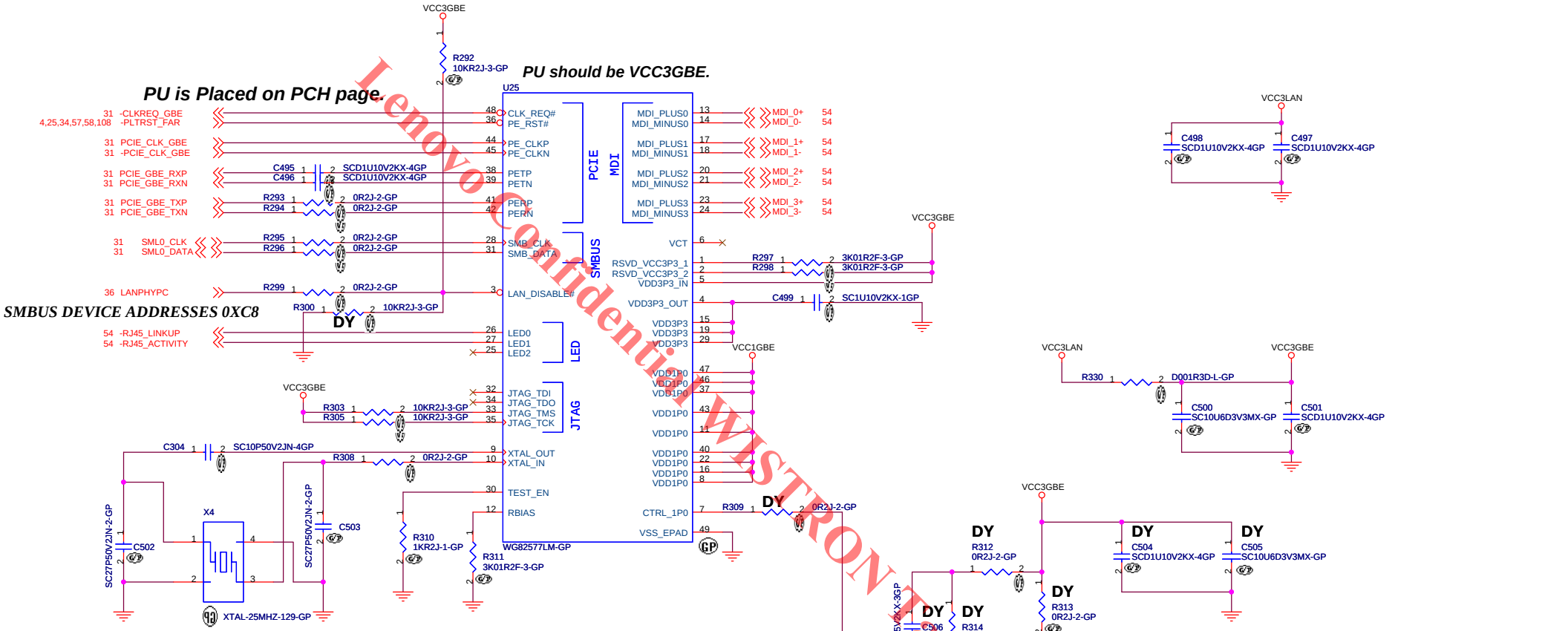
Date: Tuesday, May 05, 2009 Sheet 51 of 109

BLANK

<Variant Name>

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

Title: BLANK		
Size: A3	Document Number: Kendo-1 WS	Rev: SC
Date: Tuesday, May 05, 2009	Sheet 52 of 109	



	Supplier	Vendo P/N	WISTRON P/N
1	KDS	DSX321G 25M 18P 30PPM	82.30020.B11
2	H.ELE	HSX321S 25M 18P 30PPM	82.30020.B21

KDS Recommended Conditions:
Normal Frequency: 25MHz.
Frequency Tolerance: +/- 30ppm.
Load Frequency: 18pF.
Effective Series Resistance: 50-ohm.
Effective Shunt Capacitancce: 2pF.

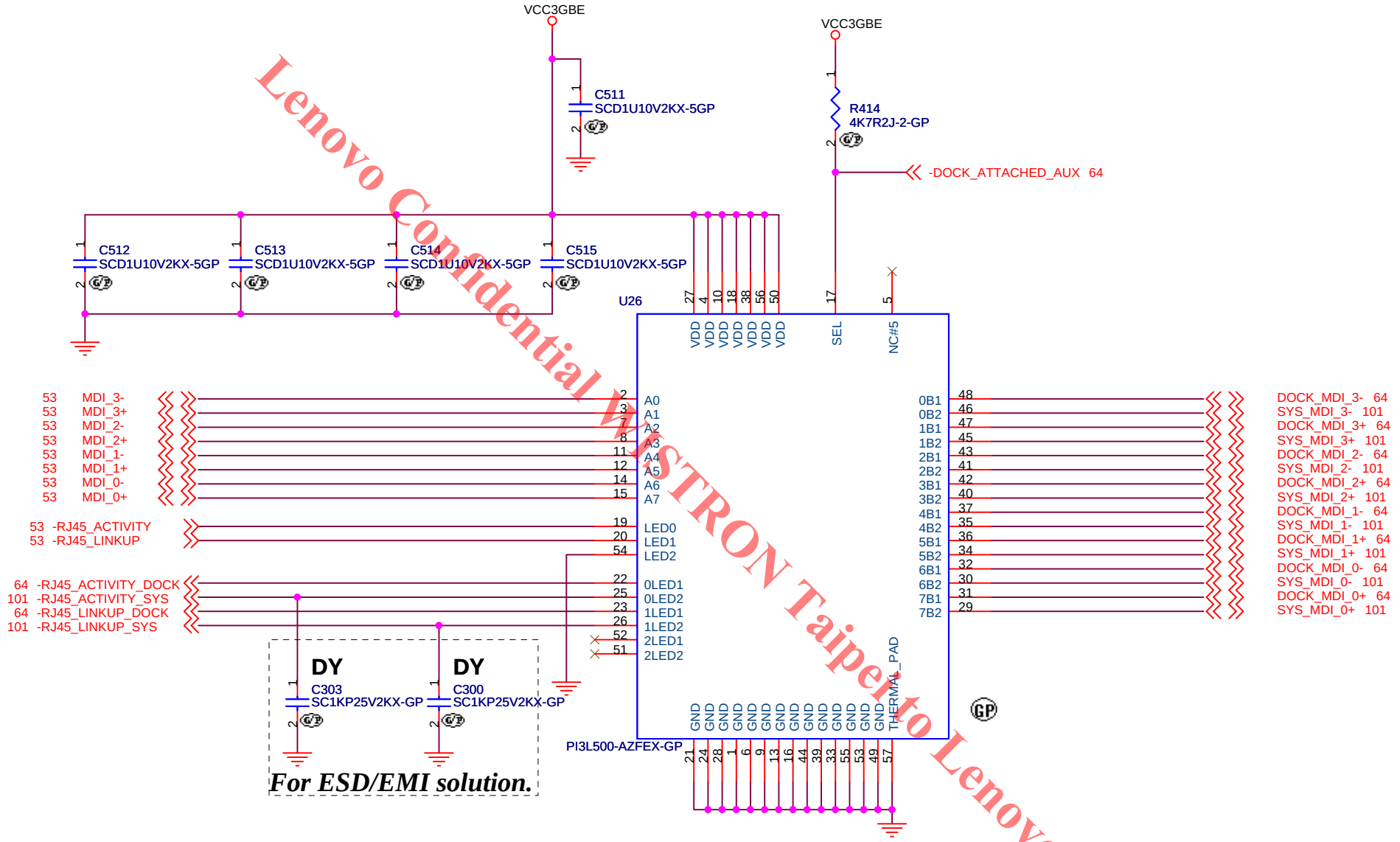
HELE Recommended Conditions:
Normal Frequency: 25MHz.
Frequency Tolerance: +/- 30ppm.
Load Frequency: 18pF.
Effective Series Resistance: 50-ohm.
Effective Shunt Capacitancce: 2pF.

Intel Recommended Conditions:
Normal Frequency: 25MHz.
Frequency Tolerance: +/- 30ppm.
Load Frequency: 18pF.
Effective Series Resistance: 50-ohm.
Effective Shunt Capacitancce: 6pF.

<Variant Name>

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

Title: GBE HANKSVILLE
Size: A3 | Document Number: Kendo-1 WS | Rev: SC
Date: Tuesday, May 05, 2009 | Sheet 53 of 109



[Source Cadidate]				
1st	Pericom	PI3L500AZFEX	73.3L500.003	41R0539AA
2nd	TI	TS3L500AERHUR	73.3L500.A0V	41R0539BA

<Variant Name>

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

Title: **GBE LAN SW**

Size: A4 | Document Number: **Kendo-1 WS** | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 54 of 109

BLANK

<Variant Name>

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

Title: BLANK		
Size: A3	Document Number: Kendo-1 WS	Rev: SC
Date: Tuesday, May 05, 2009	Sheet 55 of 109	

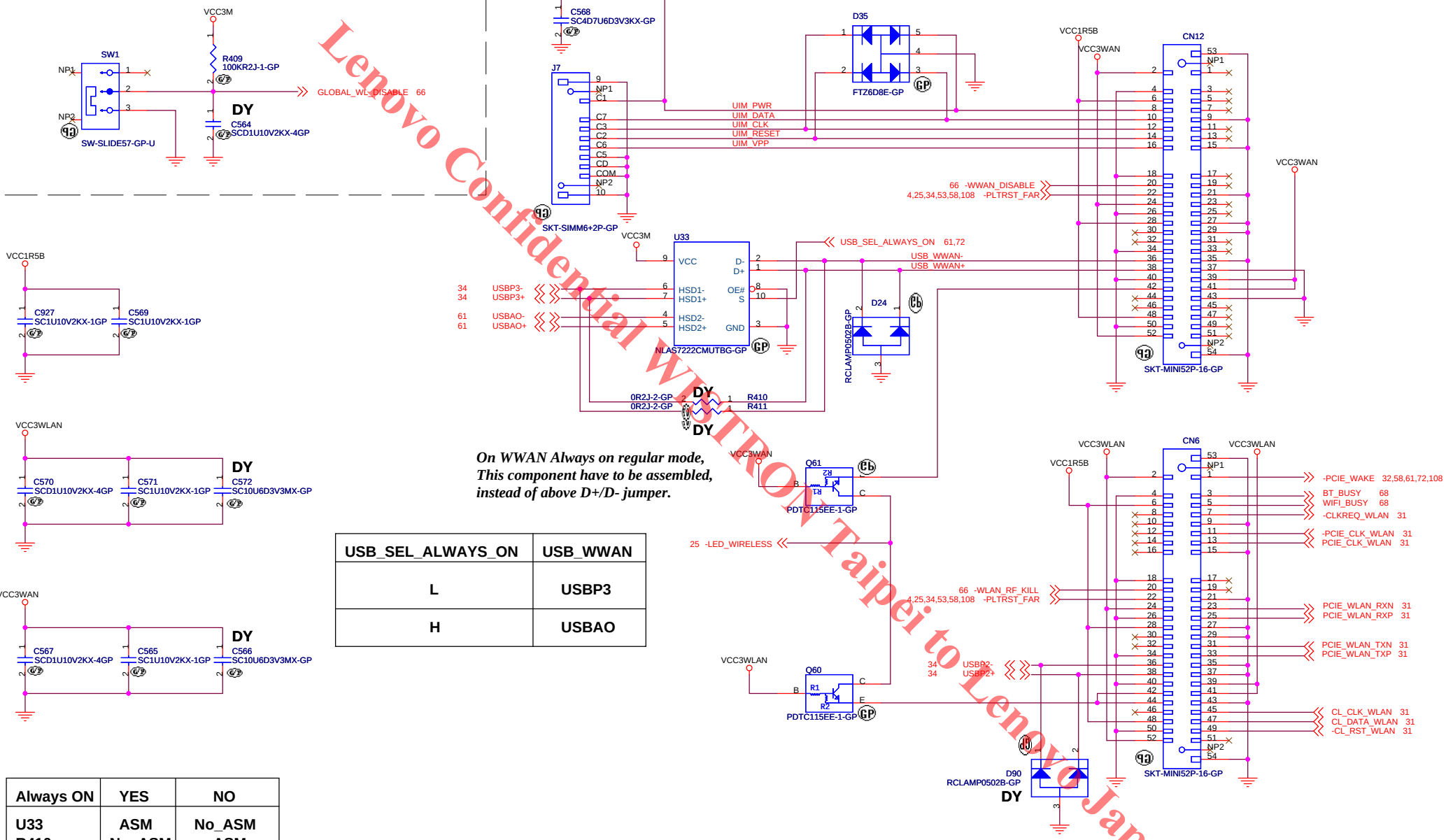
BLANK

<Variant Name>

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

Title: BLANK		
Size: A3	Document Number: Kendo-1 WS	Rev: SC
Date: Tuesday, May 05, 2009	Sheet 56 of 109	

WIRELESS DISABLE SWITCH



On WWAN Always on regular mode, This component have to be assembled, instead of above D+/D- jumper.

USB_SEL_ALWAYS_ON	USB_WWAN
L	USBP3
H	USBAO

Always ON	YES	NO
U33	ASM	No_ASM
R410	No_ASM	ASM
R411	No_ASM	ASM

LOGIC

<Variant Name>

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

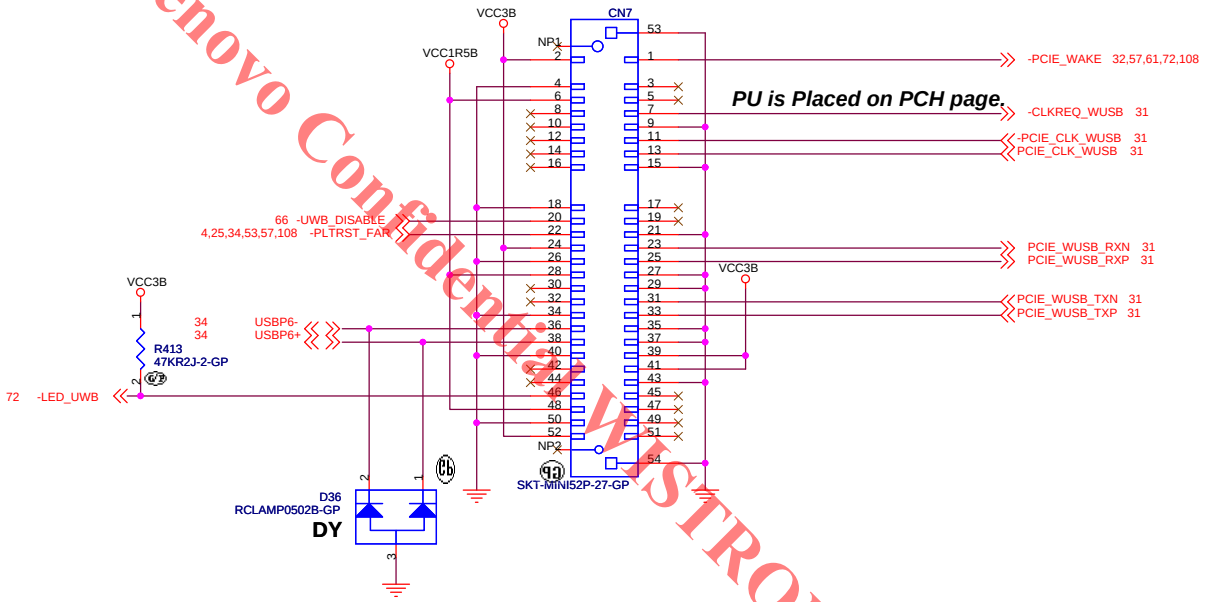
Title: **PCIE MINI CARD SLOT (1/2)**

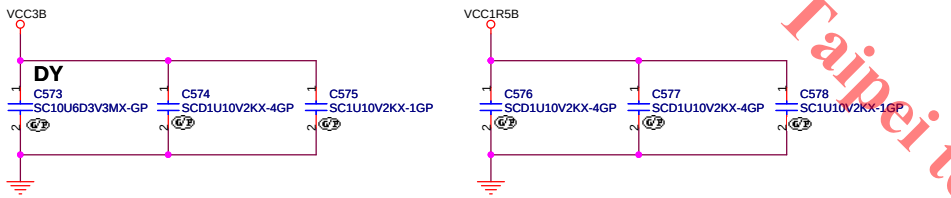
Size	Document Number	Rev
A3	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 57 of 109

HALF MINI CARD FOR WUSB

7.0H CONNECTOR





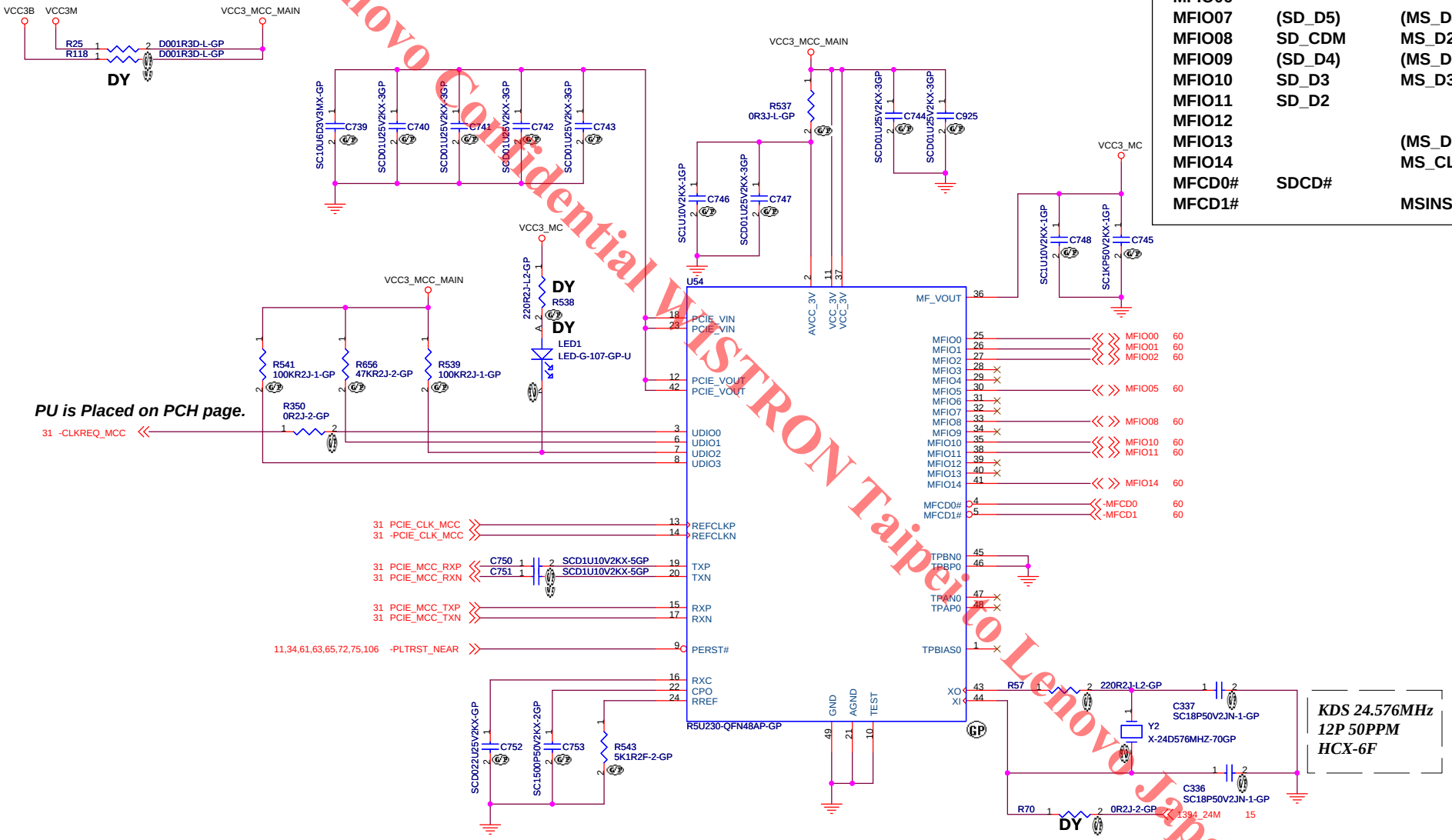
<Variant Name>

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

Title	PCIE MINI CARD SLOT (2/2)	
Size A3	Document Number Kendo-1 WS	Rev SC
Date: Tuesday, May 05, 2009	Sheet 58 of 109	

MEDIA I/F	SD/MMC	MEMORYSTICK	XD
MFIO00	SDWP#	MSBS	XD_D7
MFIO01	SD_D1		XD_D6
MFIO02	SD_D0	MS_D1	XD_D5
MFIO03	(SD_D7)		XD_D4
MFIO04	(SD_D6)	(MS_D5)	XD_D3
MFIO05	SD_CLK	MS_D0	XD_D2
MFIO06			XD_D1
MFIO07	(SD_D5)	(MS_D4)	XD_D0
MFIO08	SD_CDM	MS_D2	XD_WP#
MFIO09	(SD_D4)	(MS_D6)	XD_WE#
MFIO10	SD_D3	MS_D3	XD_ALE
MFIO11	SD_D2		XD_CLE
MFIO12			XD_CE#
MFIO13		(MS_D7)	XD_RE#
MFIO14		MS_CLK	XD_R/B
MFCD0#	SDCD#		XDCD0#
MFCD1#		MSINS#	XDCD1#

	Vendor P/N	Wistron P/N
LED1	LTST-S270KGKT	83.00270.B70
	SML-A10MTT86	83.00A10.070



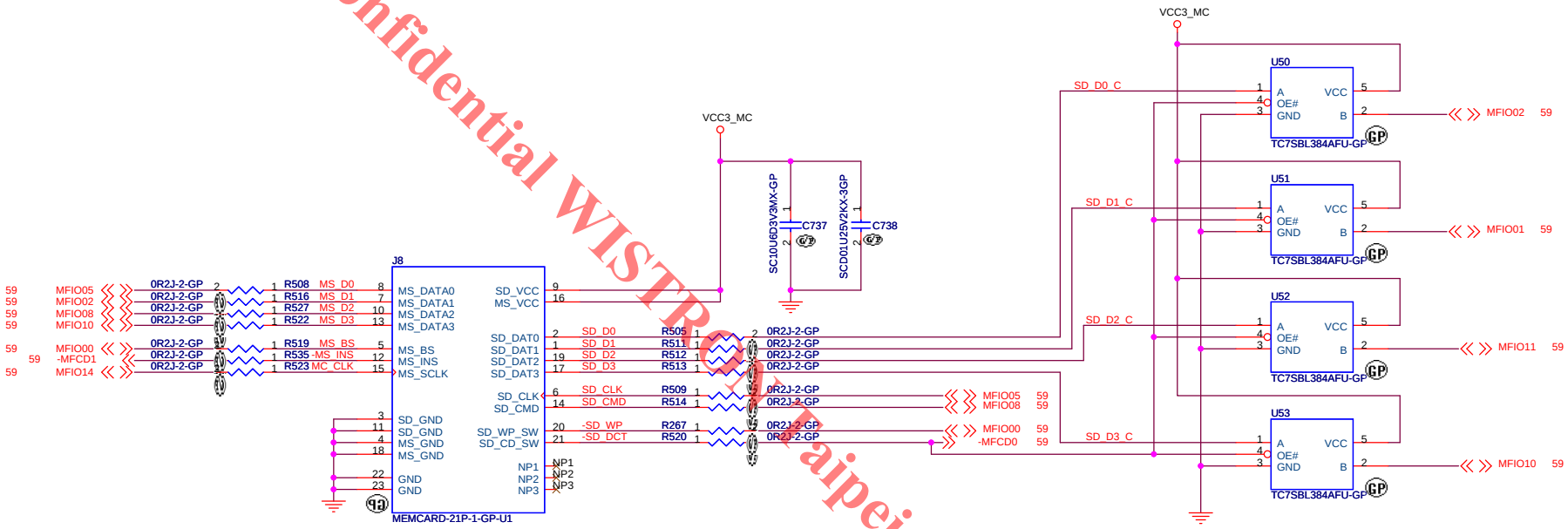
Richo Recommended Conditions:
Normal Frequency: 24.576MHz
Frequency Tolerance: +/- 50ppm.
Load Capacitance: 10pF.
Effective Series Resistance: 50-ohm.
Effective Shunt Capacitance: 7pF.

KDS Recommended Conditions:
Normal Frequency: 24.576MHz
Frequency Tolerance: +/- 30ppm.
Load Capacitance: 12pF+/-0.2.
Effective Series Resistance: 50-ohm.
Effective Shunt Capactiance: 7pF.

<Variant Name>

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

Title: 1394/MEDIA CARD CONTROLLER
Size: A3 | Document Number: Kendo-1 WS | Rev: SC
Date: Tuesday, May 05, 2009 | Sheet 59 of 109



		U50, U51, U52, U53	Wistron part number
1	TOSHIBA	TC7SBL384AFU-GP	73.7S384.007
2	NXP	74LVC1G384GW	73.1G384.AHH
3	TI	TS5A3167DCKR	74.53167.A9F

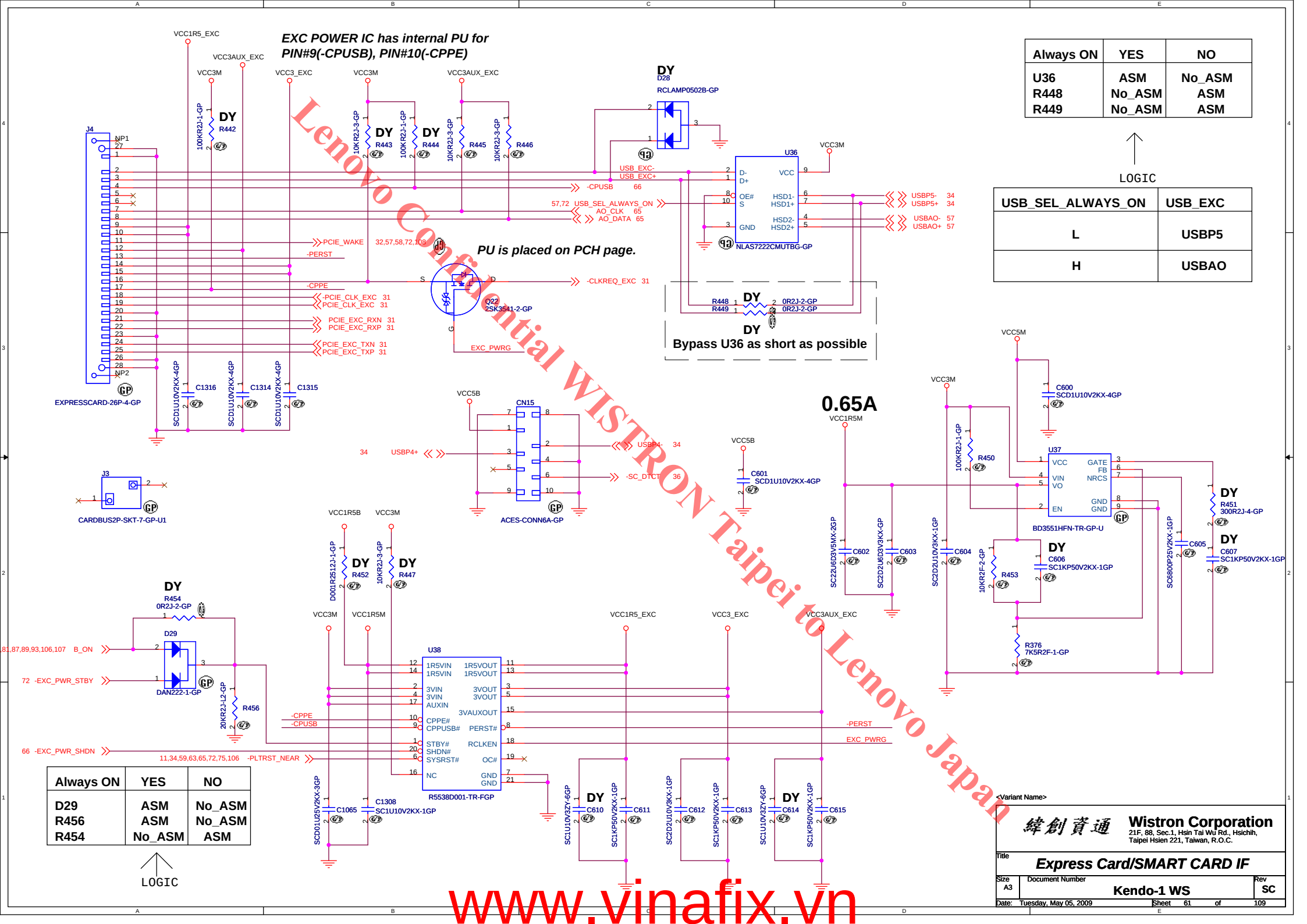
<Variant Name>

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

Title: ***MEDIA CARD INTERFACE***

Size: A3 | Document Number: **Kendo-1 WS** | Rev: **SC**

Date: Tuesday, May 05, 2009 | Sheet 60 of 109


EXC POWER IC has internal PU for PIN#9(-CPUSB), PIN#10(-CPPE)
PU is placed on PCH page.
Bypass U36 as short as possible
0.65A
Lenovo Confidential WISTRON Taipei to Lenovo Japan
www.vinafix.vn
LOGIC
LOGIC
Always ON | YES | NO
U36 | ASM | No_ASM
R448 | No_ASM | ASM
R449 | No_ASM | ASM
USB_SEL_ALWAYS_ON | USB_EXC
L | USBP5
H | USBAO
Always ON | YES | NO
D29 | ASM | No_ASM
R456 | ASM | No_ASM
R454 | No_ASM | ASM
Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.
Express Card/SMART CARD IF
Kendo-1 WS
Tuesday, May 05, 2009
61 of 109

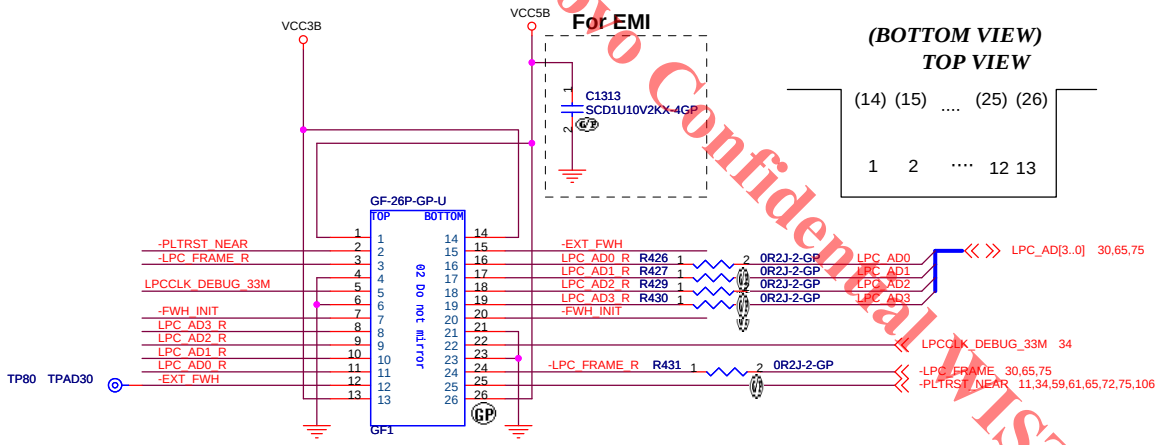
BLANK

<Variant Name>

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

Title	BLANK	
Size: A3	Document Number: Kendo-1 WS	Rev: SC
Date: Tuesday, May 05, 2009	Sheet 62 of 109	

Golden Finger for Debug Board



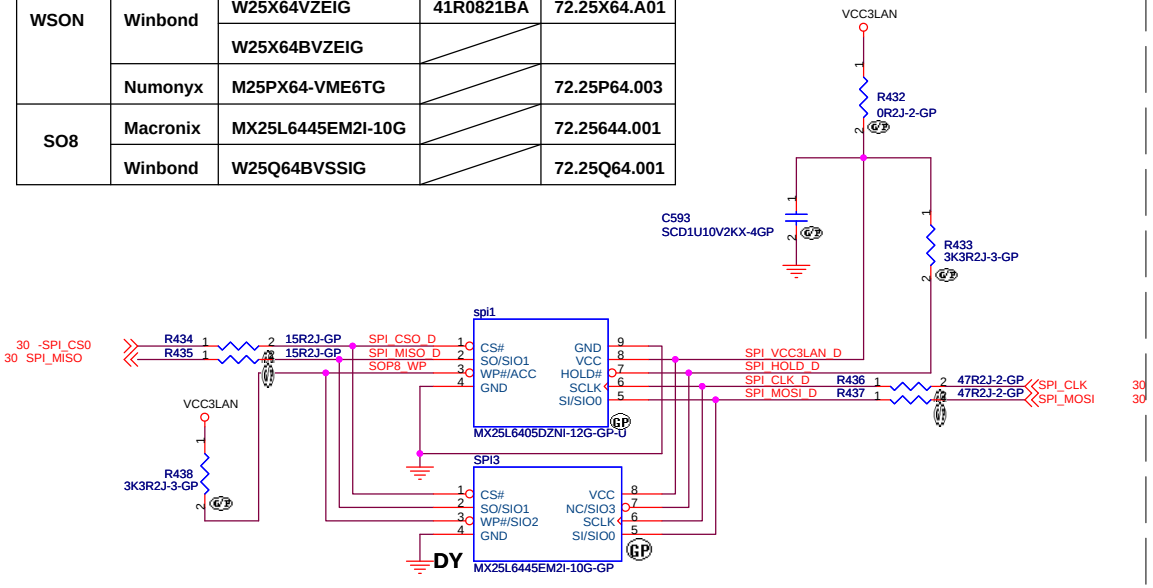
(BOTTOM VIEW)
TOP VIEW

(14) (15) .... (25) (26)

1 2 .... 12 13

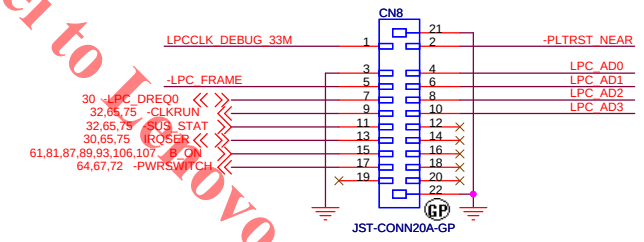
64Mbit SPI FLASH :

Package	Supplier	Vendor P/N	Lenovo P/N	Wistron P/N
WSON	Macronix	MX25L6405DZNI-12G	41R0821AA	72.25640.B01
	Winbond	W25X64VZEIG	41R0821BA	72.25X64.A01
		W25X64BVZEIG		
	Numonyx	M25PX64-VME6TG		72.25P64.003
SO8	Macronix	MX25L6445EM2I-10G		72.25644.001
	Winbond	W25Q64BVSSIG		72.25Q64.001



Dual foot print for WSON and SO8.

Lenovo Debug Tool IF.



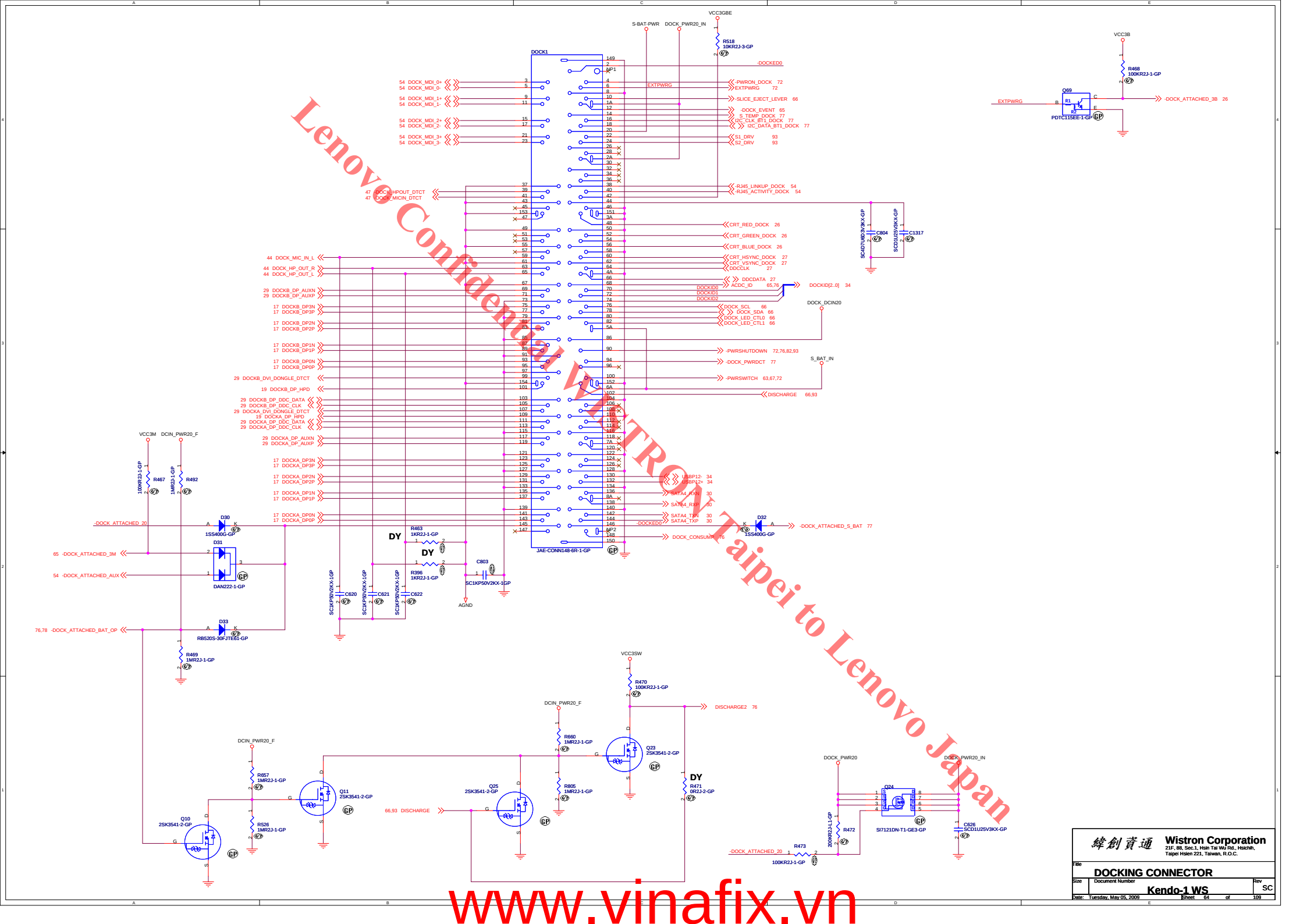
<Variant Name>

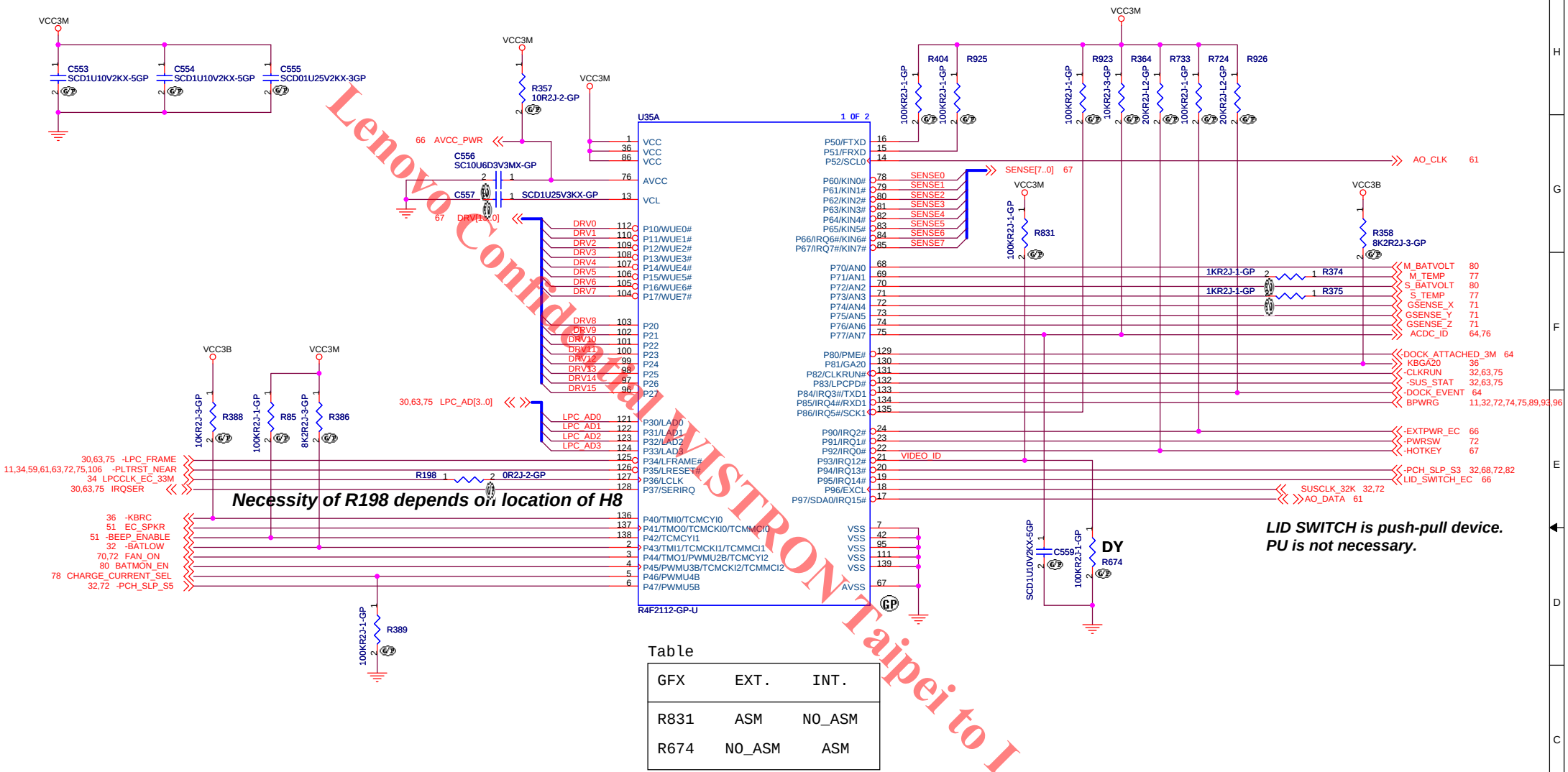
緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: **SPI FLASH**

Size: A3 | Document Number: **Kendo-1 WS** | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 63 of 109



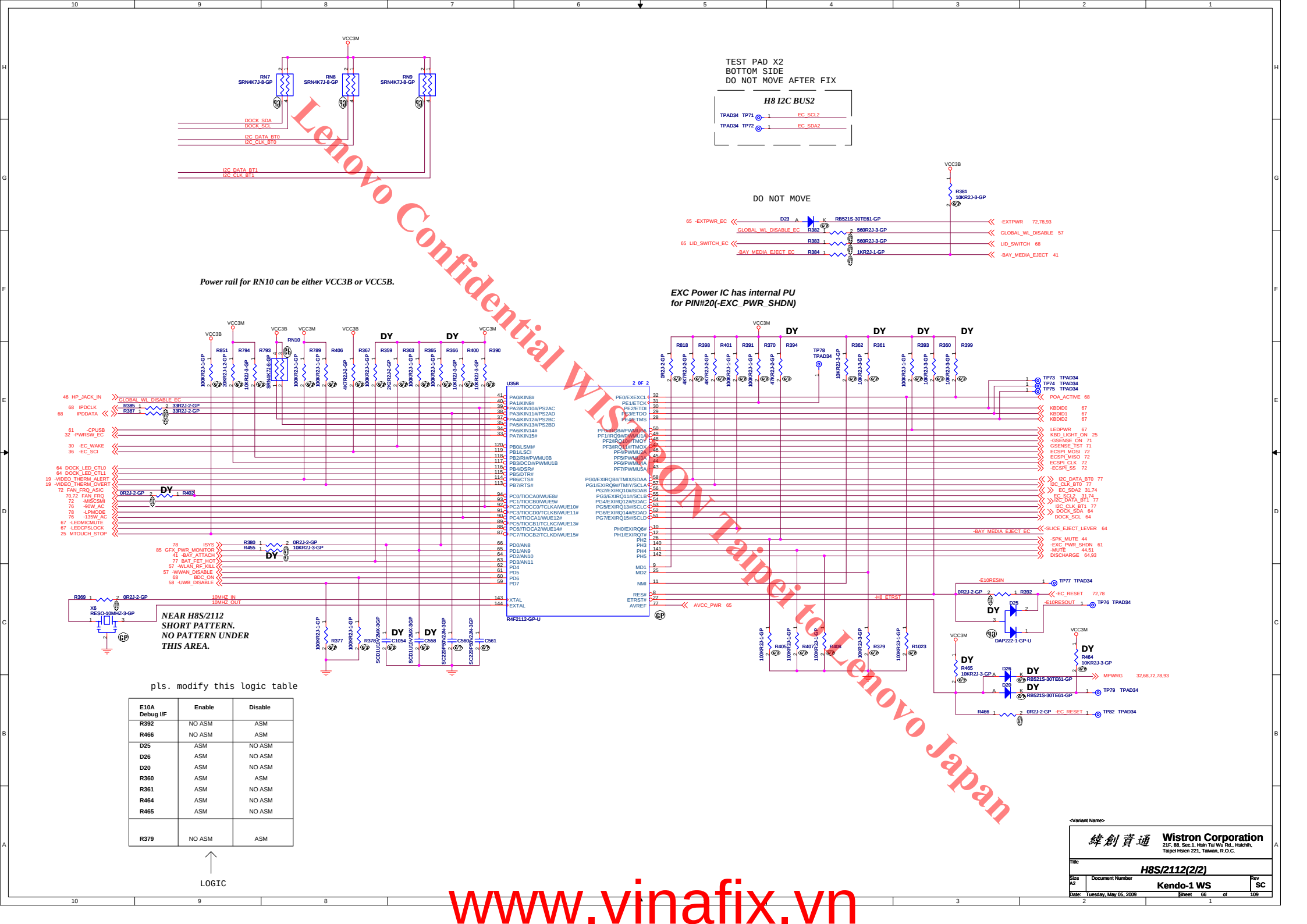


<Variant Name>
Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

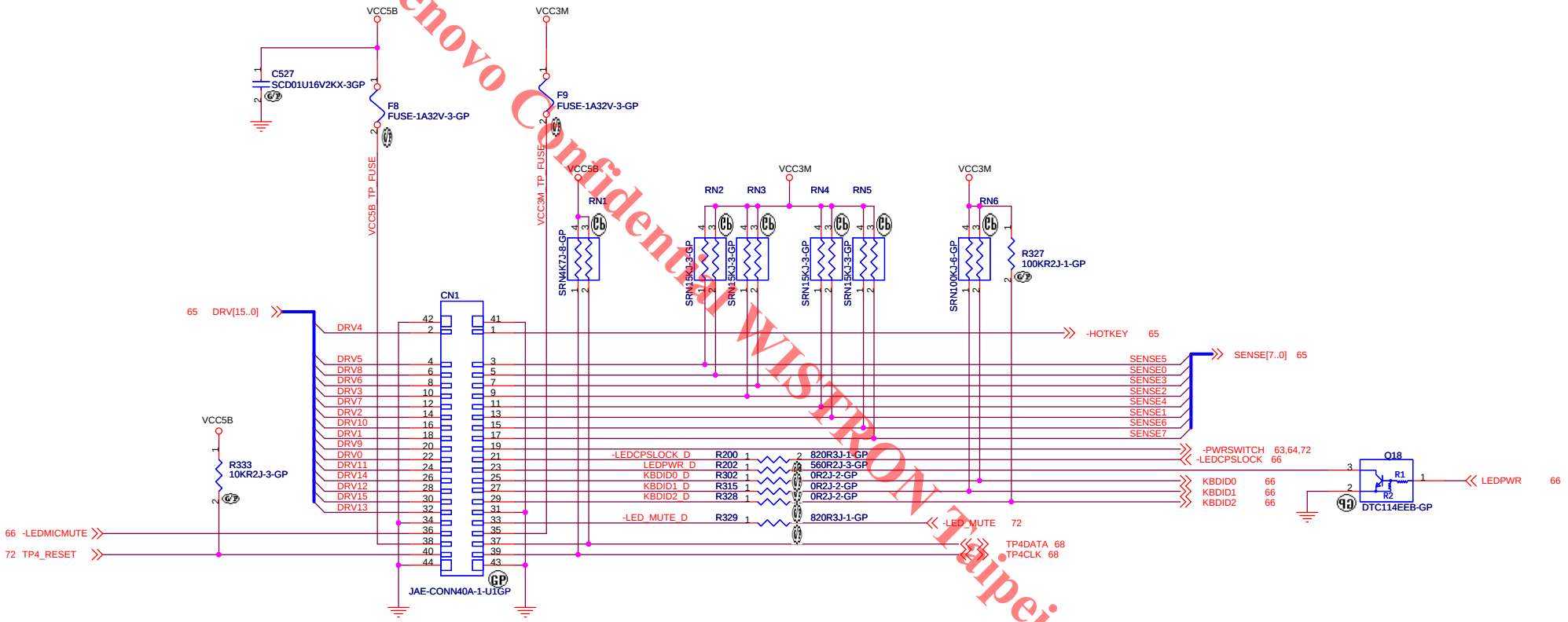
Title: H8S/2112 (1/2)

Size: A3 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 65 of 109



Keyboard Connector



HOTKEY# **IPDCLK**

DRV4 **to R425/Q18**

Keyboard Connector Top View

Near CN1

-PWRSWITCH TP81 TPAD60

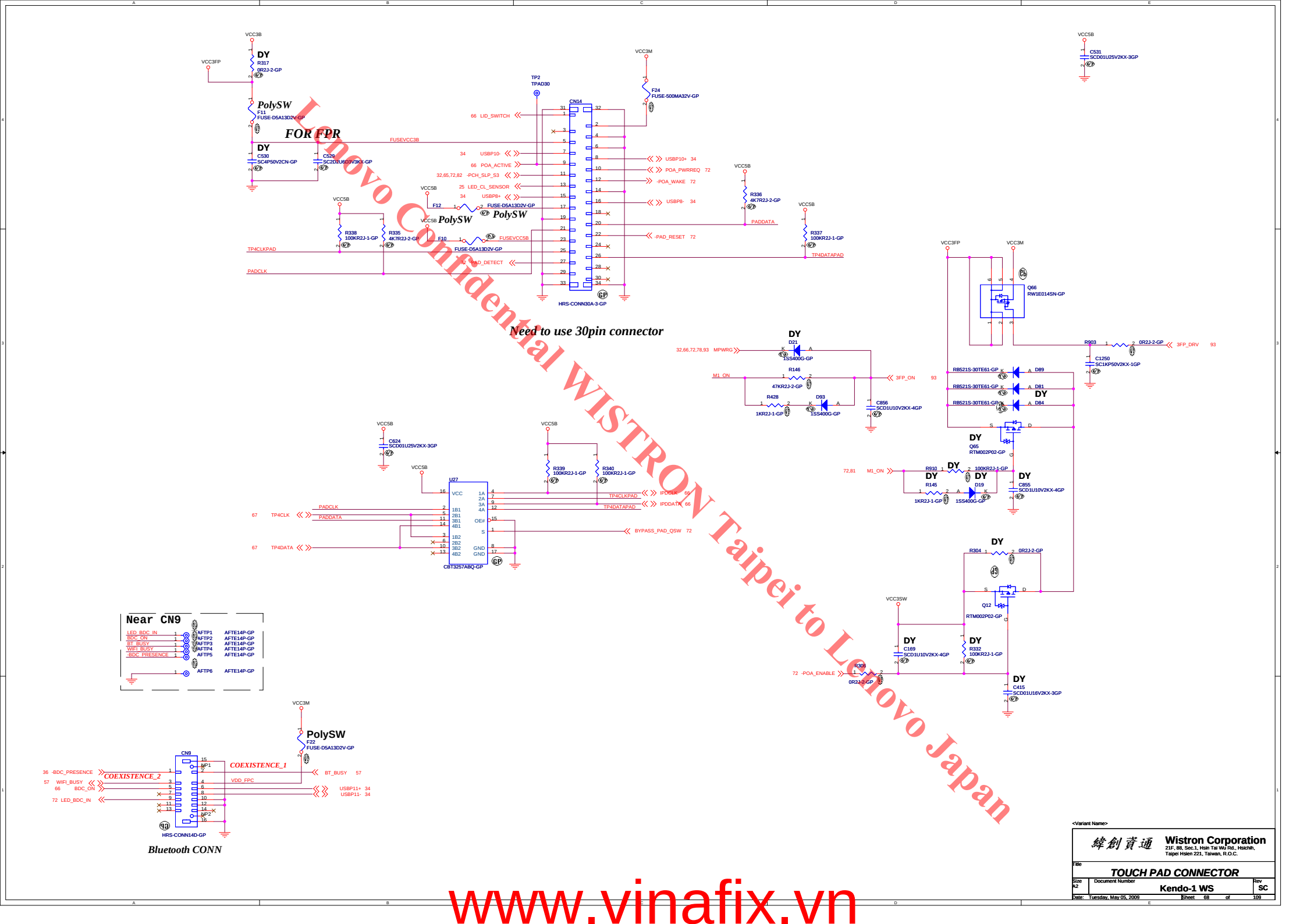
<Variant Name>

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

Title: **KEYBOARD CONN**

Size	Document Number	Rev
A3	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 67 of 109

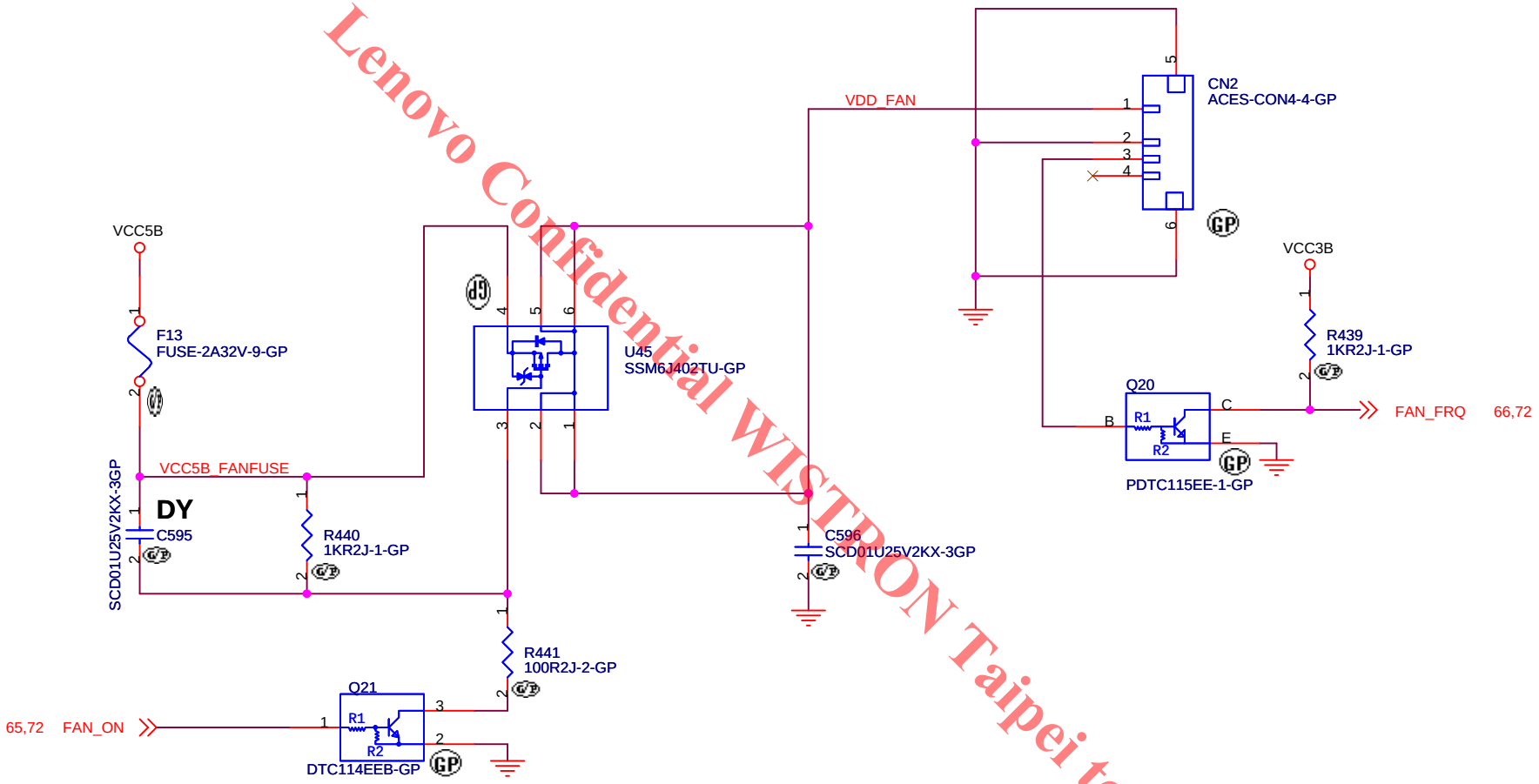


BLANK

<Variant Name>

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

Title: BLANK		
Size: A3	Document Number: Kendo-1 WS	Rev: SC
Date: Tuesday, May 05, 2009	Sheet 69 of 109	



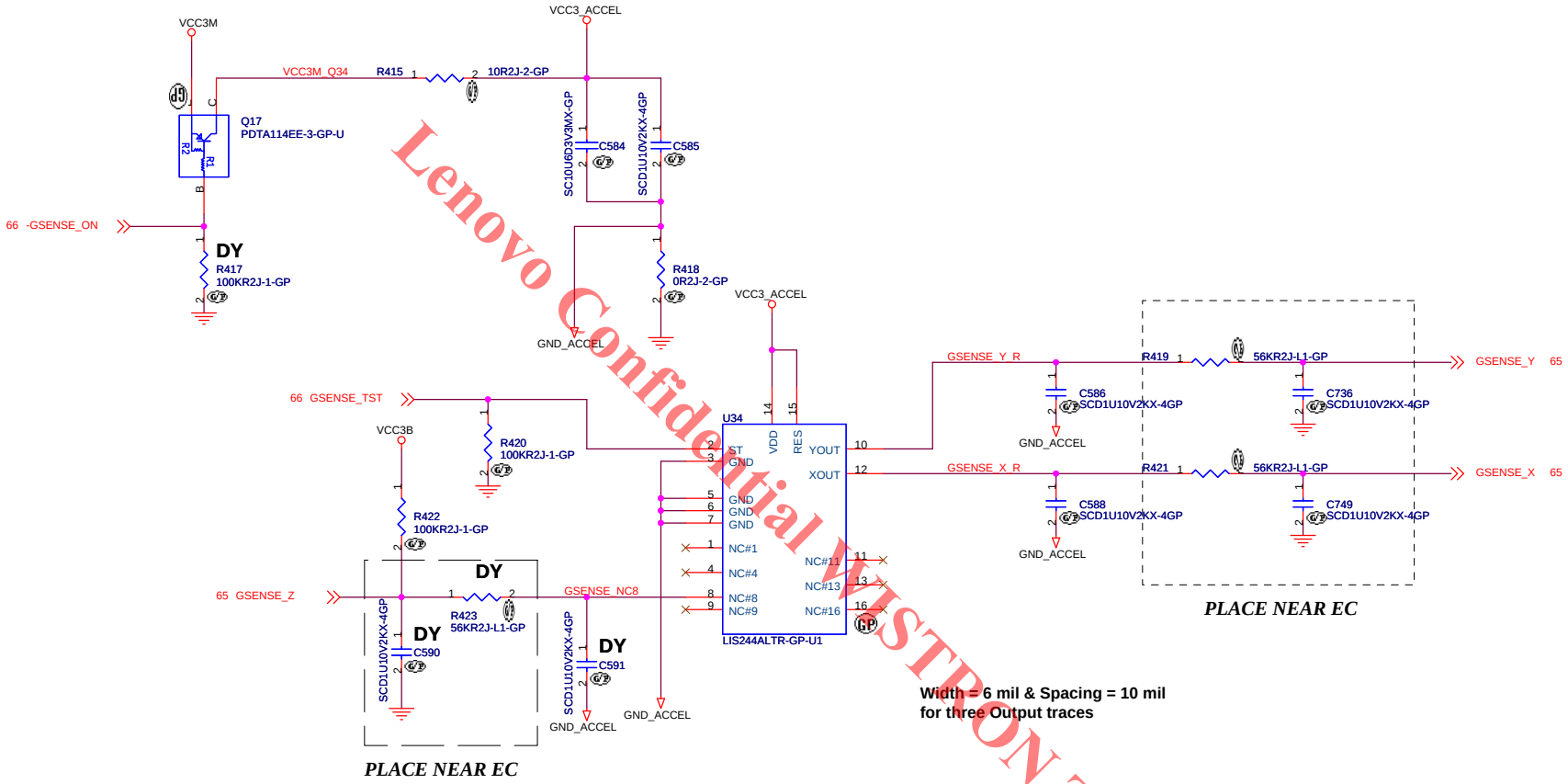
<Core Design>

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

Title: ***FAN CONTROL***

Size	Document Number	Rev
A4	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 70 of 109



	LIS244AL LIS34AL	NO ACC.
R417	NO-ASM	ASM
R420	ASM	ASM
U34	ASM	NO-ASM
Q17	ASM	NO-ASM
R415	10-OHM	NO-ASM
C585	ASM	NO-ASM
C584	ASM	NO-ASM
C586	ASM	NO-ASM
C588	ASM	NO-ASM
R419	56K	NO-ASM
C736	ASM	NO-ASM
R421	56K	NO-ASM
C749	ASM	NO-ASM
C591	NO-ASM	NO-ASM
R423	NO-ASM	NO-ASM
C590	NO-ASM	NO-ASM
R422	ASM	ASM

Layout Comment :

(1) Place C586, C588, Q17, R415, R417, C584, C585, R420 close to U34.

(2) Avoid routing under DCDC switching area.

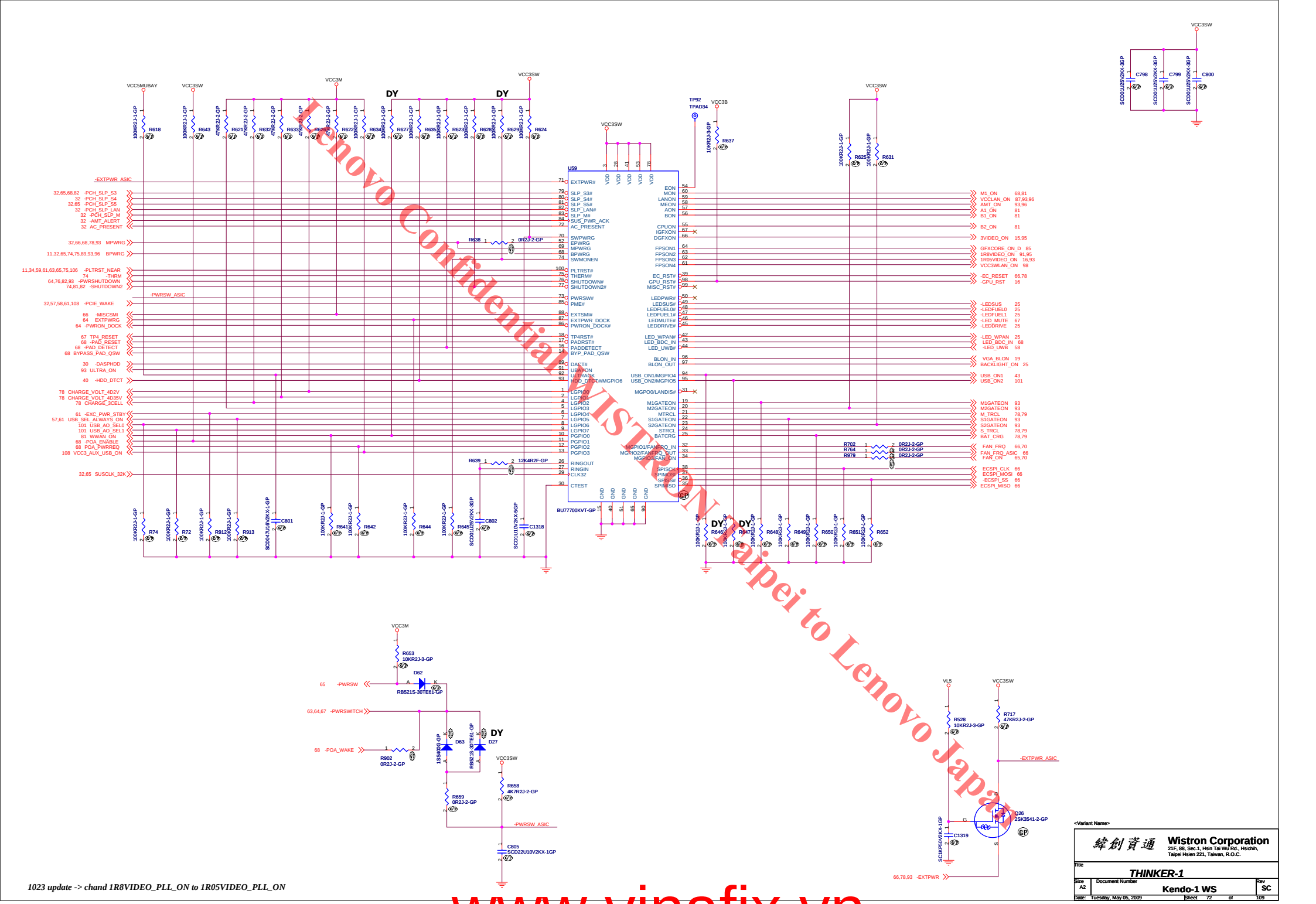
<Core Design>

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

Title: **G-SENSOR**

Size: A3 | Document Number: **Kendo-1 WS** | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 71 of 109



1023 update -> chand 1R8VIDEO_PLL_ON to 1R05VIDEO_PLL_ON

<Variant Name>

緯創資通 Wistron Corporation	21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.
Title	THINKER-1
Size A2 / Document Number	Kendo-1 WS / Rev SC
Date: Tuesday, May 05, 2009	Sheet 72 of 109

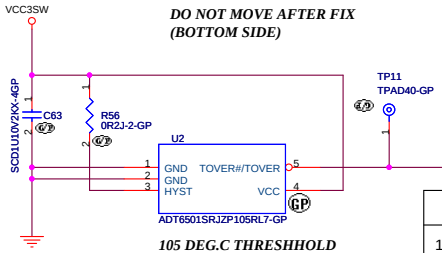
BLANK

<Variant Name>

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

Title: BLANK		
Size: A3	Document Number: Kendo-1 WS	Rev: SC
Date: Tuesday, May 05, 2009	Sheet 73 of 109	

Thermal Sensor for CPU

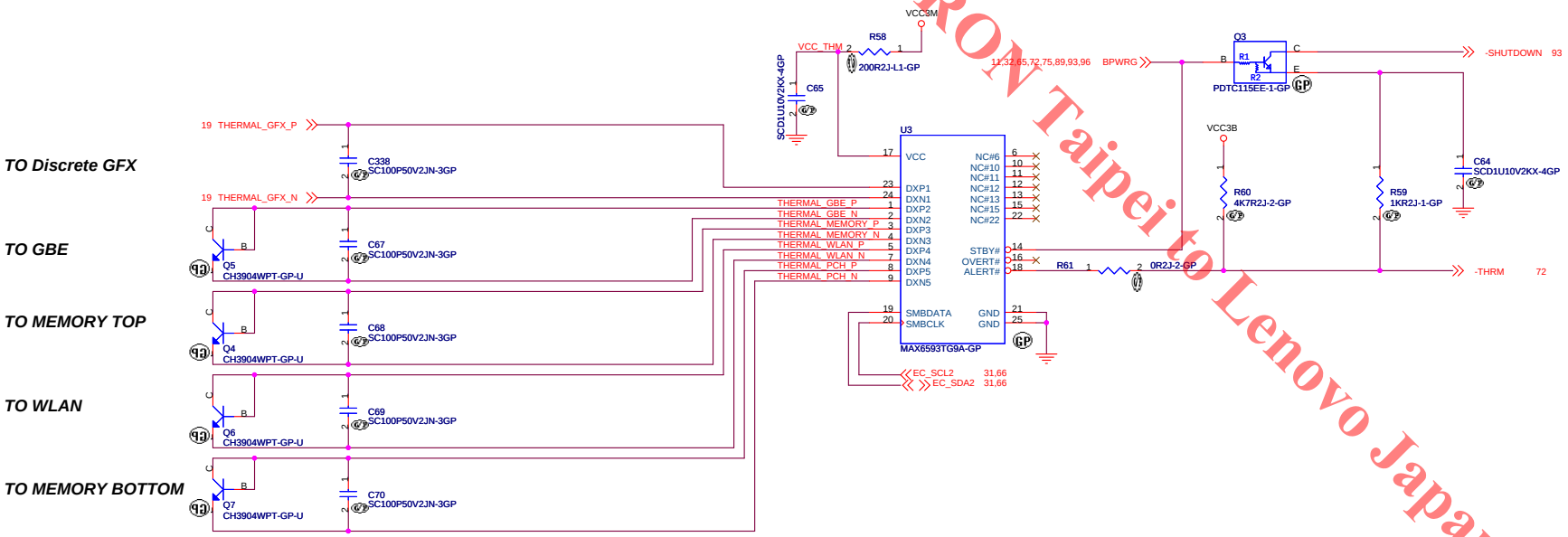


DO NOT MOVE AFTER FIX
(BOTTOM SIDE)

105 DEG.C THRESHHOLD

		U2	R56
1	NS	LM26	NO_ASM
2	MAXIM	MAX6519	NO_ASM
3	ADI	ADT6501SRJZP105RL7	ASM
4	MAXIM	MAX6501UKP105+1	ASM
5	ROHM	BDE1055G	ASM

THESE CAPS MUST BE PLACED AS
CLOSE AS POSSIBLE TO MAX6593



TO Discrete GFX

TO GBE

TO MEMORY TOP

TO WLAN

TO MEMORY BOTTOM

MAX6593TG9A+
Remote 1: Discrete GFX Address 01h.
Remote 2: GigaBitEthernet Address 02h.
Remote 3: SODIMM Top Address 03h.
Remote 4: Wireless LAN Slot Address 04h.
Remote 5: SODIMM Bottom Address 07h.
Local: BASE Cover (Under PCH) Address 05h.

H8 I2C Bus 2 ADDRESS : 4DH
TEST PAD FOR TOOLING MFG TEST

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.

<Variant Name>

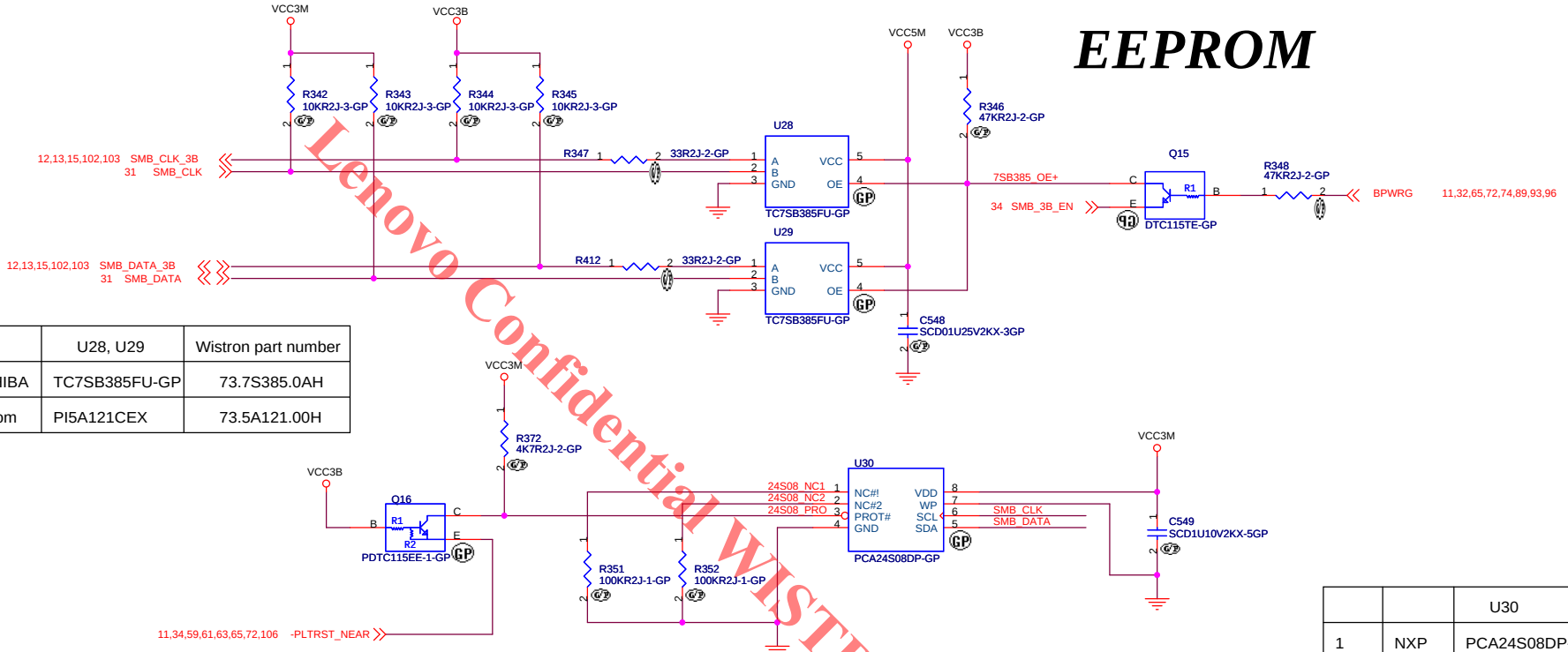
緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***THERMAL SENSOR***

Size: Custom | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 74 of 109

EEPROM

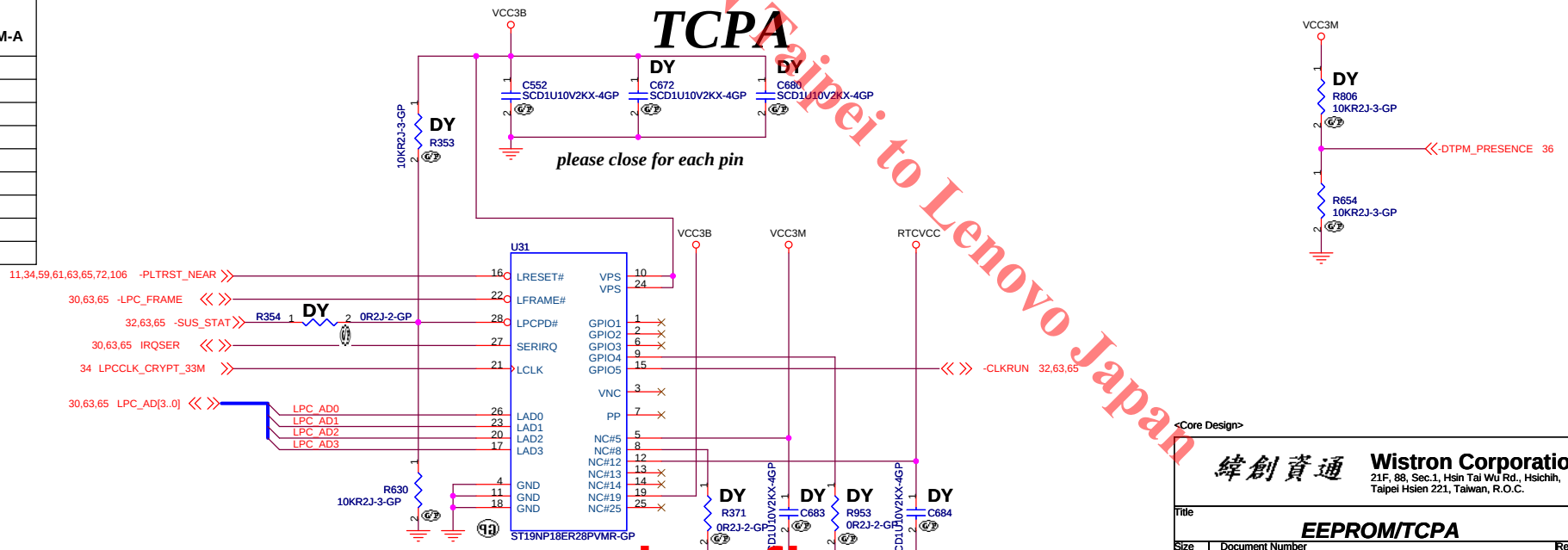


		U28, U29	Wistron part number
1	TOSHIBA	TC7SB385FU-GP	73.7S385.0AH
2	Pericom	PI5A121CEX	73.5A121.00H

		U30	Wistron part number
1	NXP	PCA24S08DP-GP	72.24S08.00Q
2	ROHM	BUL08-1FVJ-W	72.BUL08.00Q

TCPA

	NO TPM	ST Micro ST19NP18-TPM-A
U31	NO_ASM	ASM
C552	NO_ASM	ASM
C672	NO_ASM	NO_ASM
R354	NO_ASM	ASM
R371	NO_ASM	NO_ASM
R953	NO_ASM	NO_ASM
R353	NO_ASM	NO_ASM
R806	ASM	NO_ASM
R654	NO_ASM	ASM



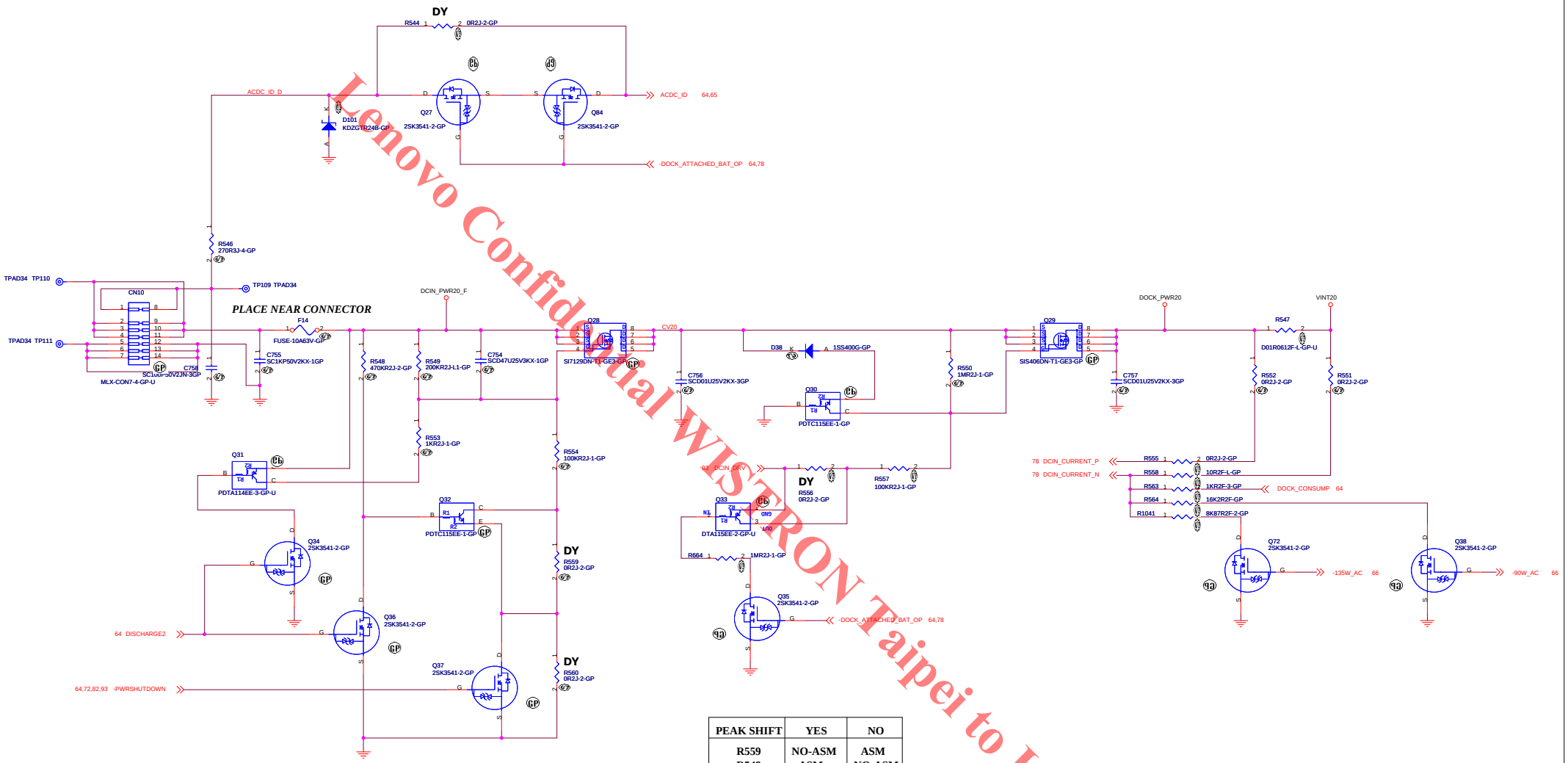
<Core Design>

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

Title: EEPROM/TCPA

Size: A3 | Document Number: Kendo-1 WS | Rev: SC

Date: Wednesday, May 06, 2009 | Sheet 75 of 109



PEAK SHIFT	YES	NO
R559	NO-ASM	ASM
R548	ASM	NO-ASM
Q32	ASM	NO-ASM
Q36	ASM	NO-ASM

LOGIC

AC -135W AC TABLE

AC Adapter	#135W_AC	#90W_AC
135W	L	L
90W	H	L
65W	H	H

LOGIC

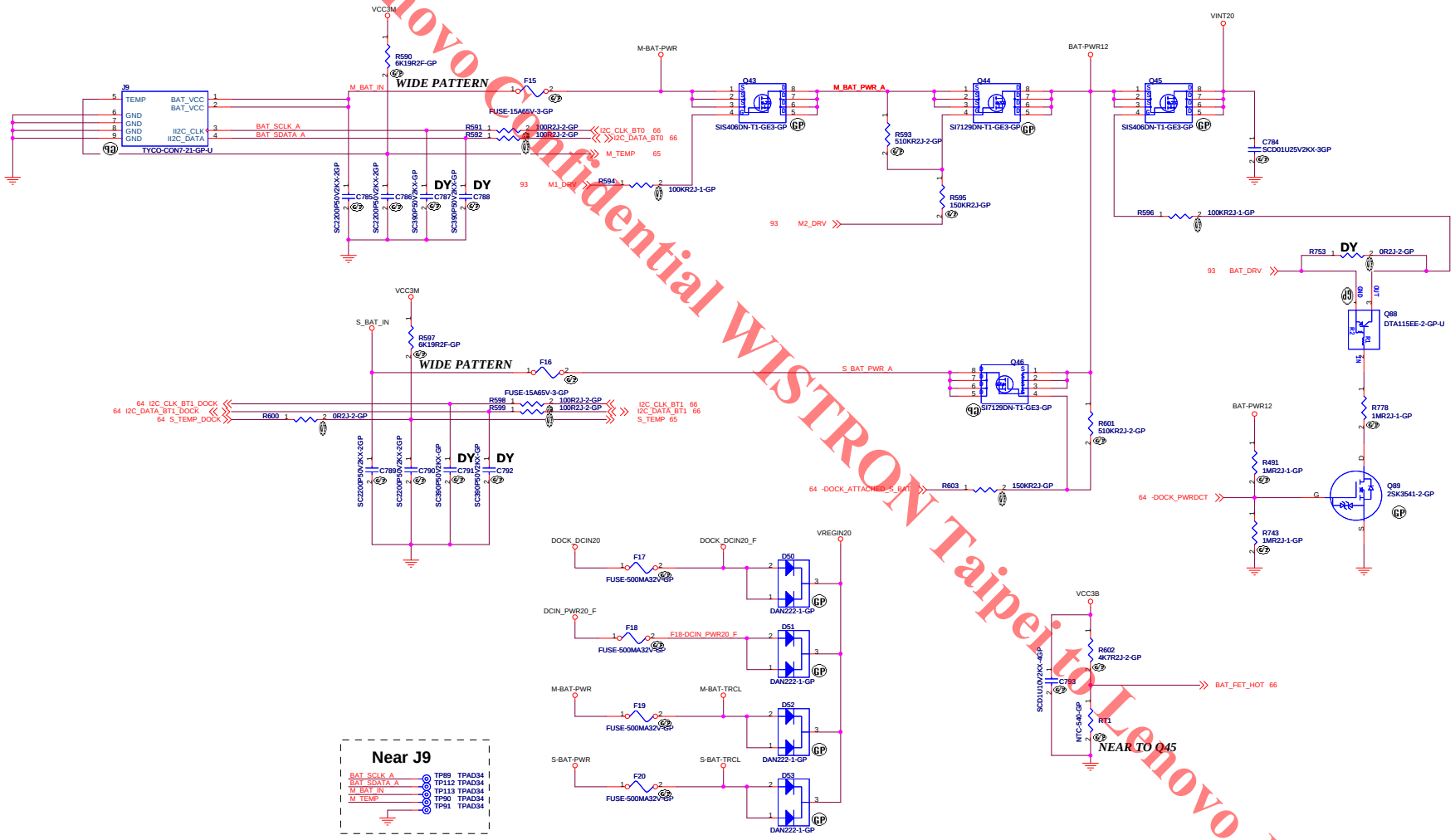
<Core Design>

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

Title: DC-IN

Size	Document Number	Rev
A2	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 76 of 109



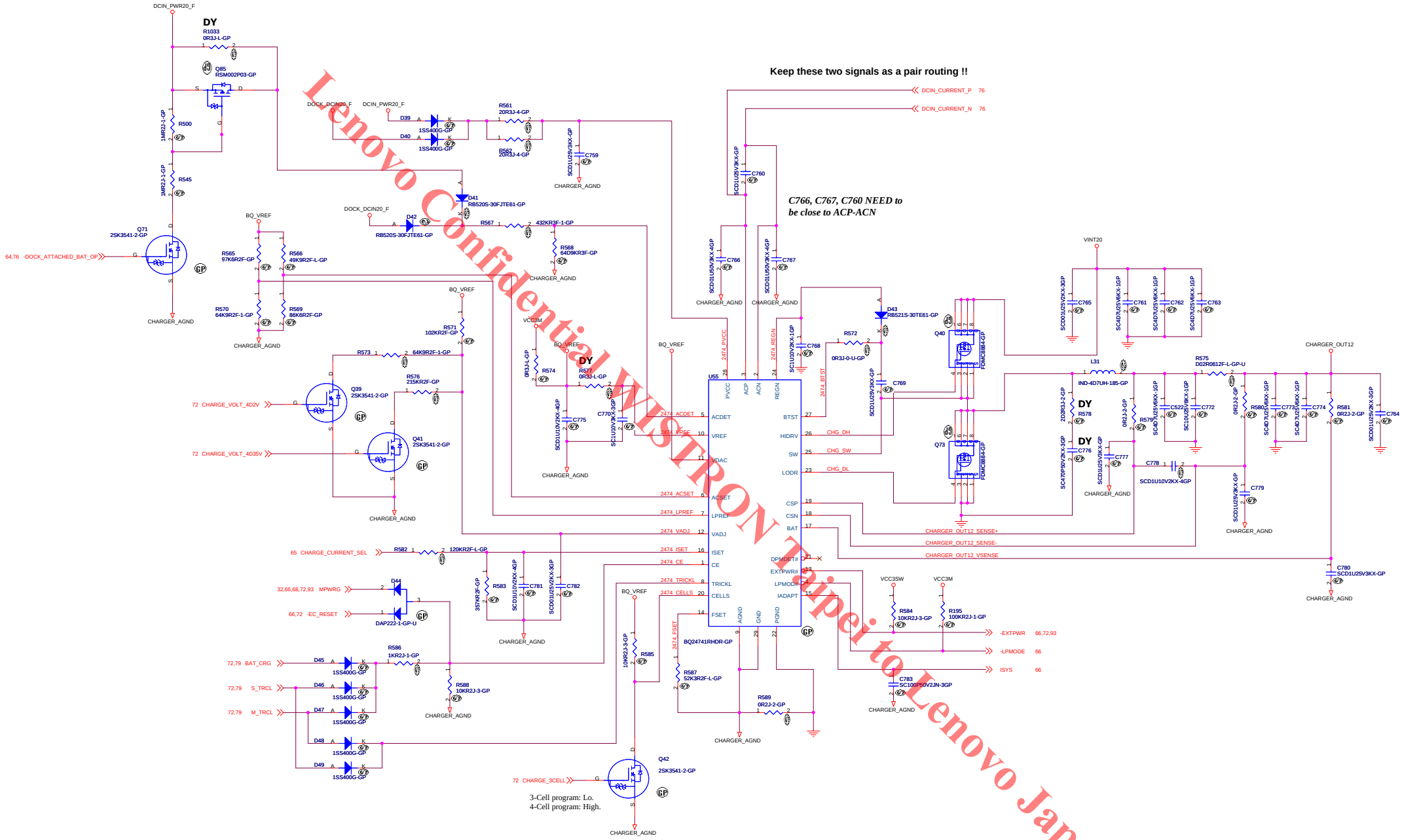
<Core Design>

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

Title: BATTERY INPUT

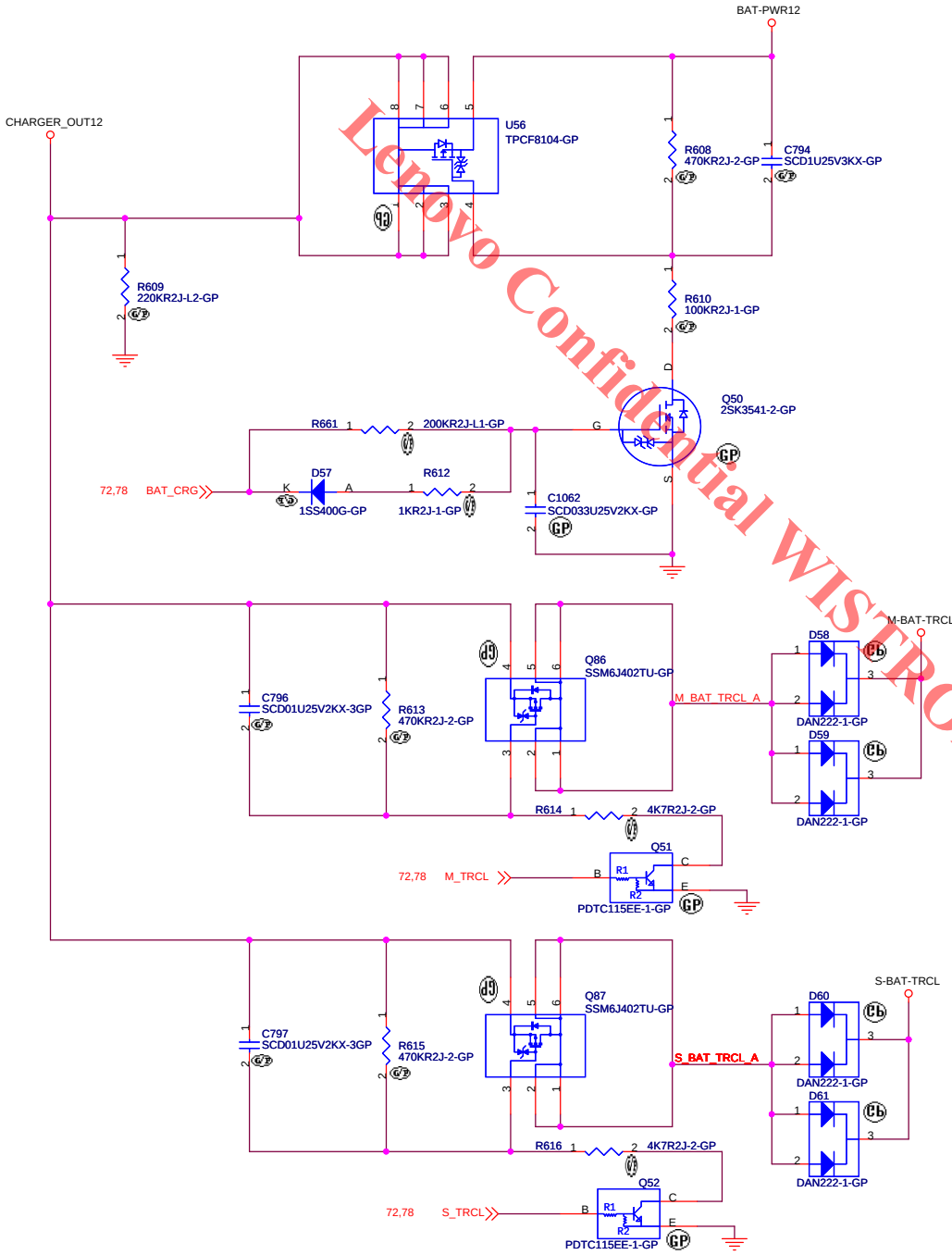
Size: A2 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 77 of 109



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

<Core Design>
Title: BATTERY CHARGER (BQ24741)
Size: A2 | Document Number: Kendo-1 WS | Rev: SC
Date: Tuesday, May 05, 2009 | Sheet 78 of 109



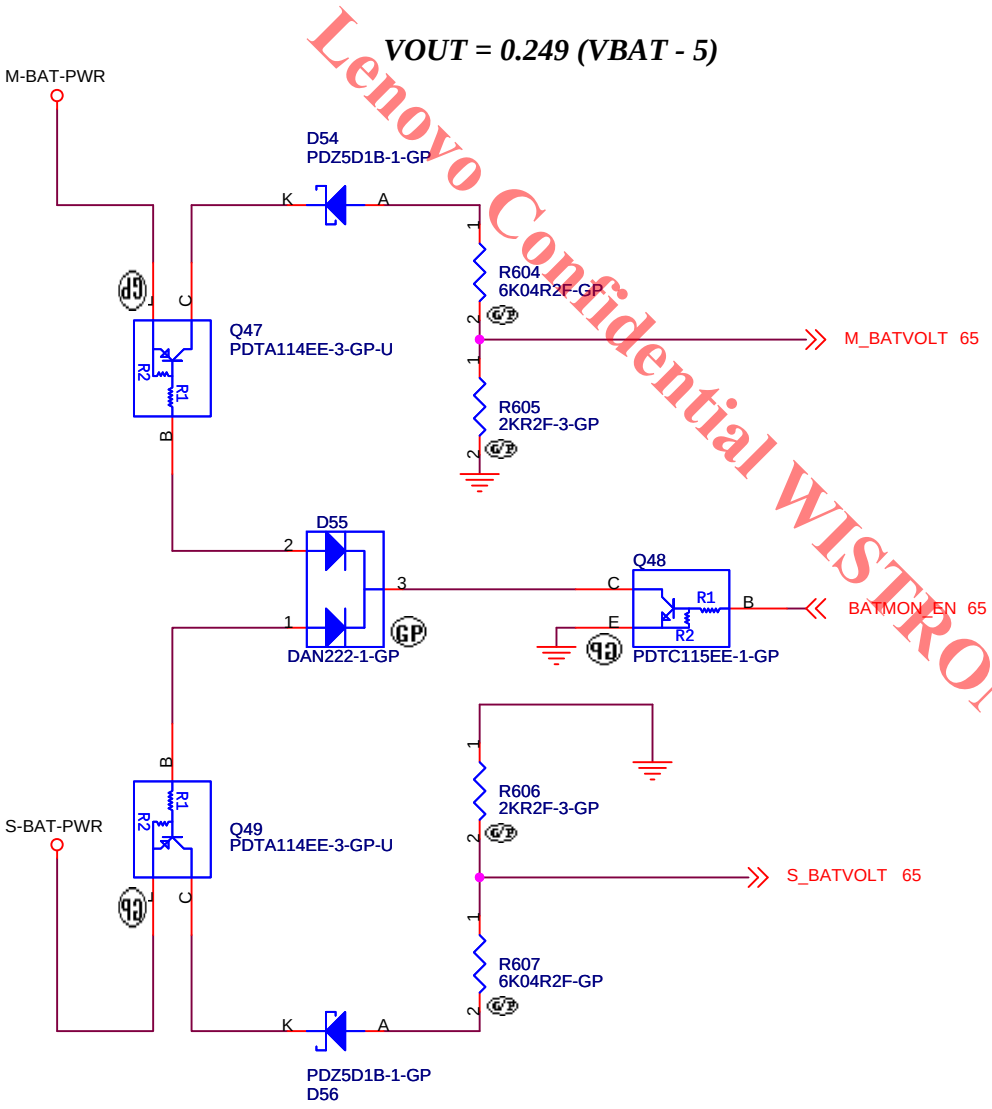
<Core Design>

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

Title: **CHARGER SELECT**

Size	Document Number	Rev
A3	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 79 of 109



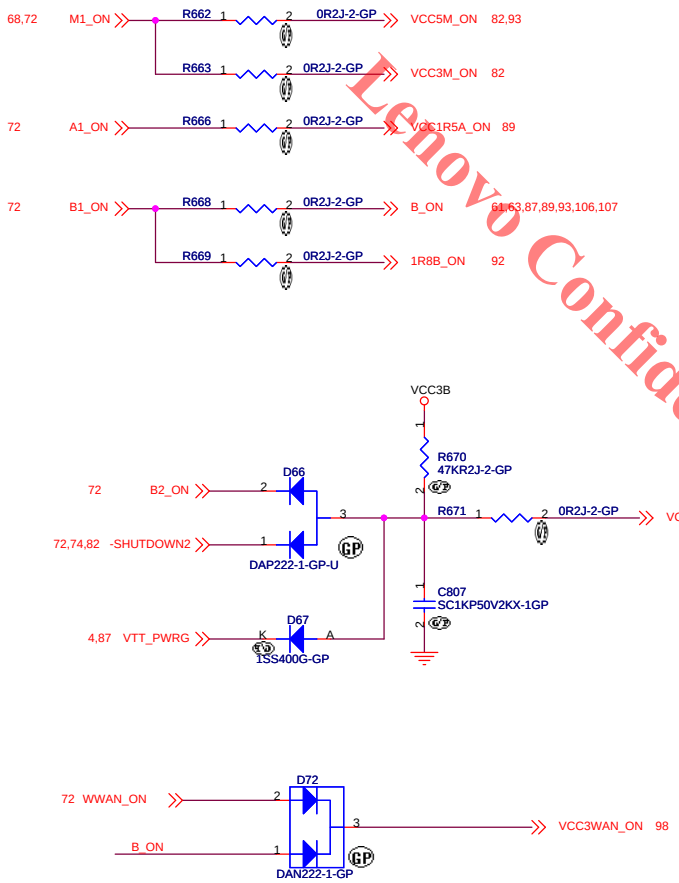
<Core Design>

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

Title
BATTERY MONITOR

Size	Document Number	Rev
A4	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 80 of 109



Table

ALWAYS ON	YES	NO
D72	ASM	NO_ASM

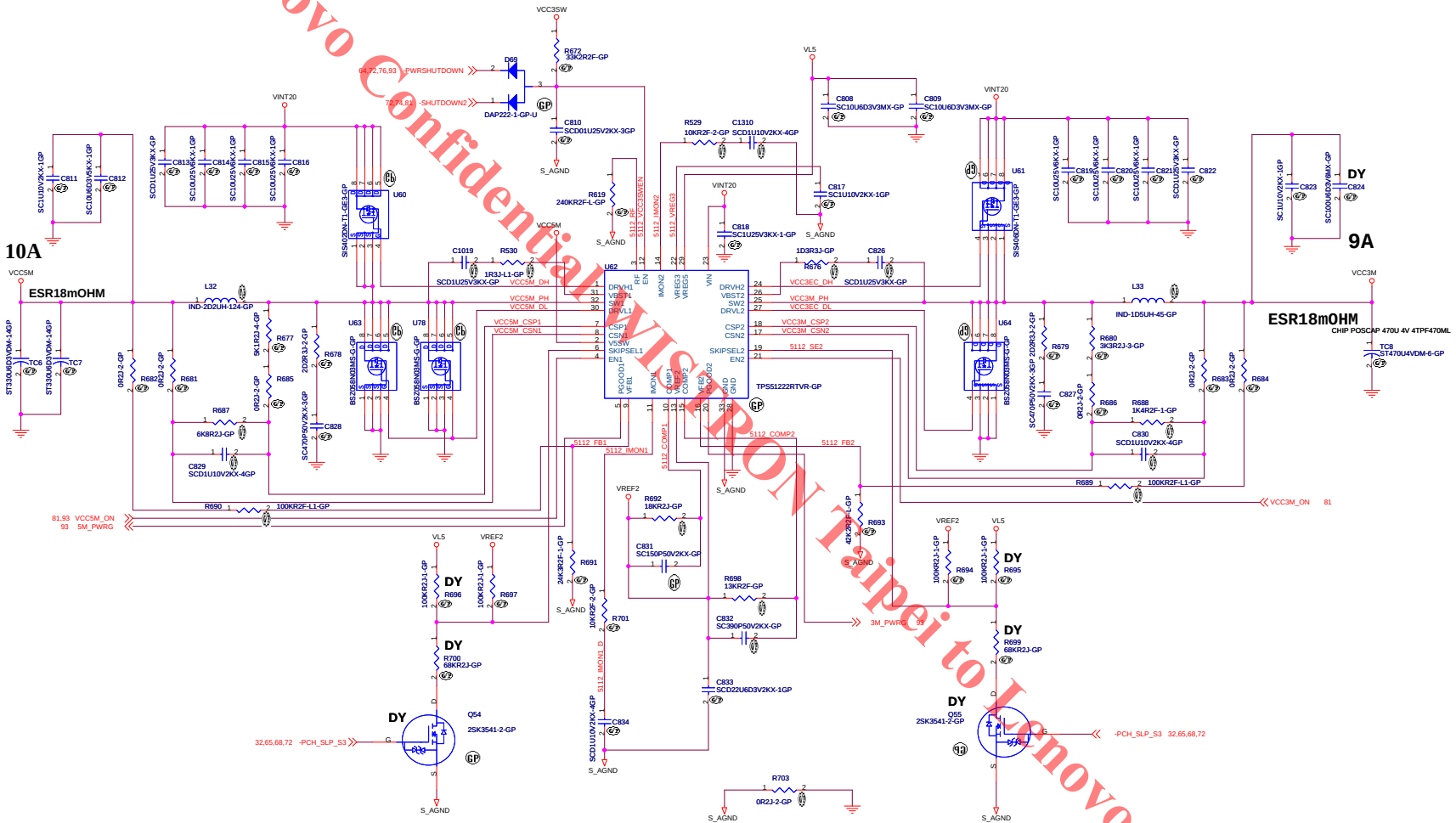
<Core Design>

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

Title: ***POWER SEQUENCE***

Size: A3 | Document Number: **Kendo-1 WS** | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 81 of 109



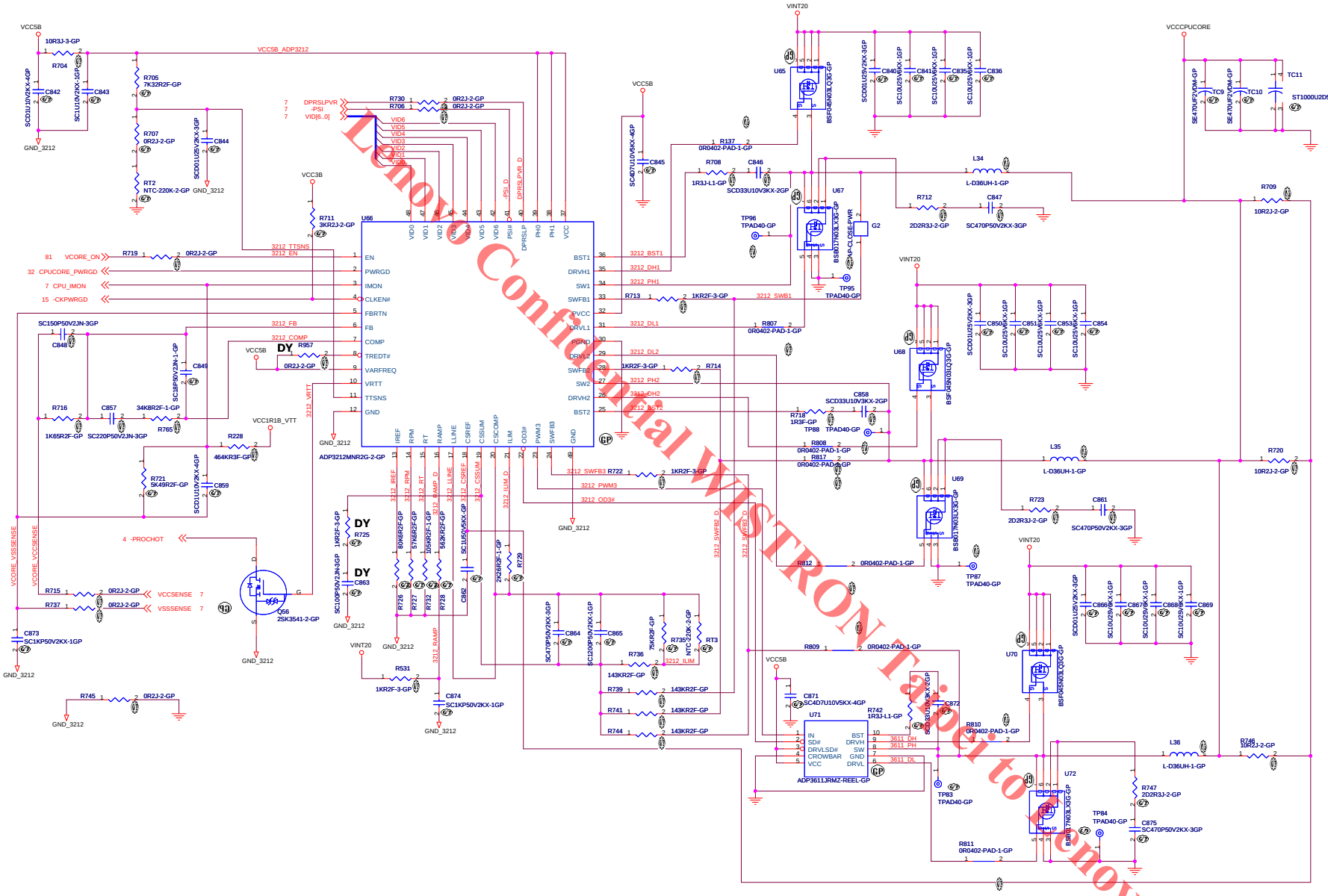
<Core Design>

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

Title: DC/DC VCC5M/VCC3M

Size	Document Number	Rev
A2	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 82 of 109



	XE	SV
R739	143K	121K
R741	143K	121K
R744	143K	121K
R729	2.26K	2.15K
R721	5.49K	5.23K
R228	464K	442K
TC9	ASM	NO_ASM
TC10	ASM	NO_ASM

<Core Design>

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

Title: DC/DC VCCCPUCORE

Size: A2 | Document Number: Kendo-1 WS | Rev: SC

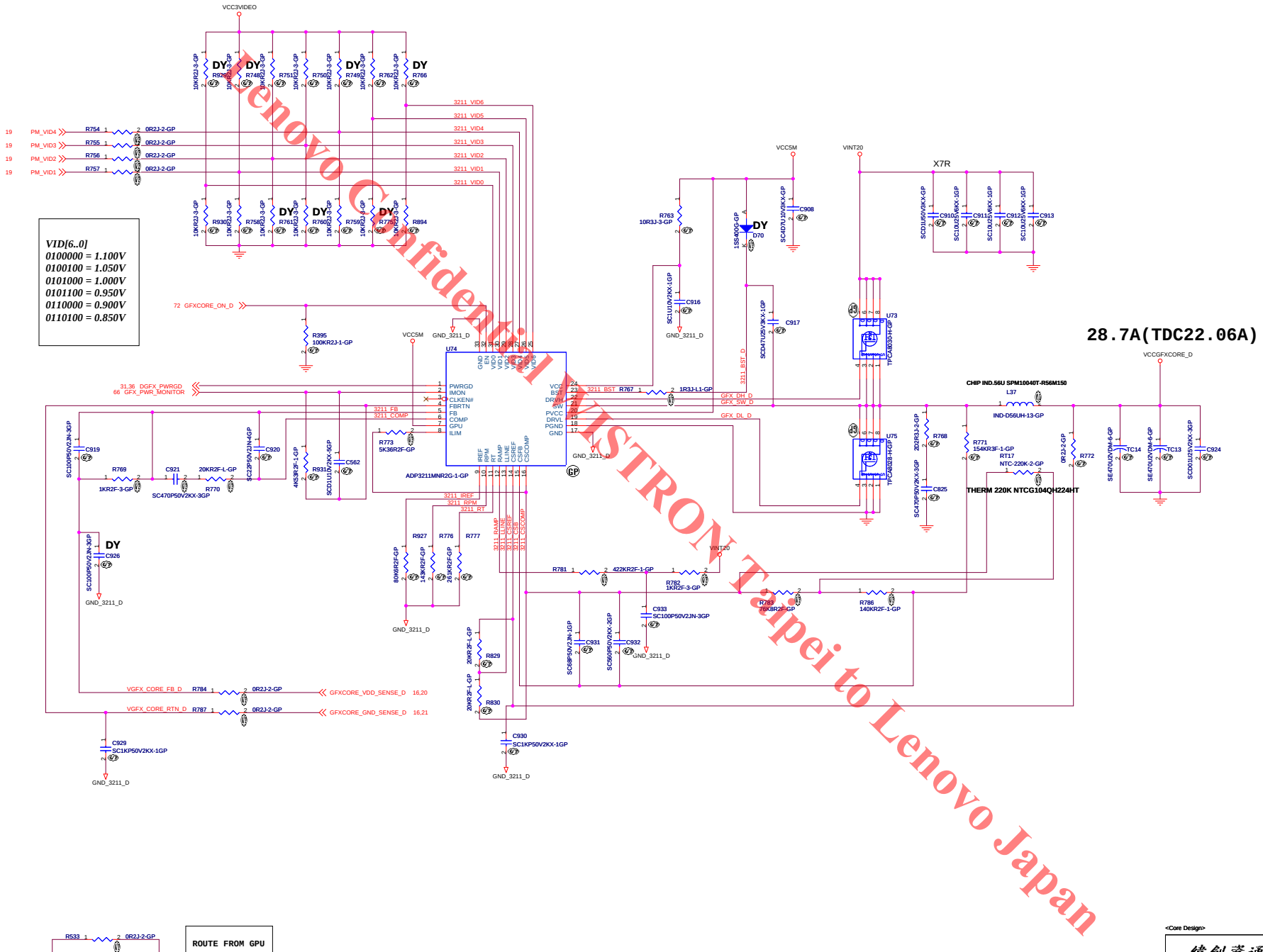
Date: Tuesday, May 05, 2009 | Sheet 83 of 109

BLANK

<Variant Name>

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

Title: BLANK		
Size: A3	Document Number: Kendo-1 WS	Rev: SC
Date: Tuesday, May 05, 2009	Sheet 84 of 109	



<Core Design>

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

Title: DC-DC GFXCORE_D

Size: A2 | Document Number: Kendo-1 WS | Rev: SC

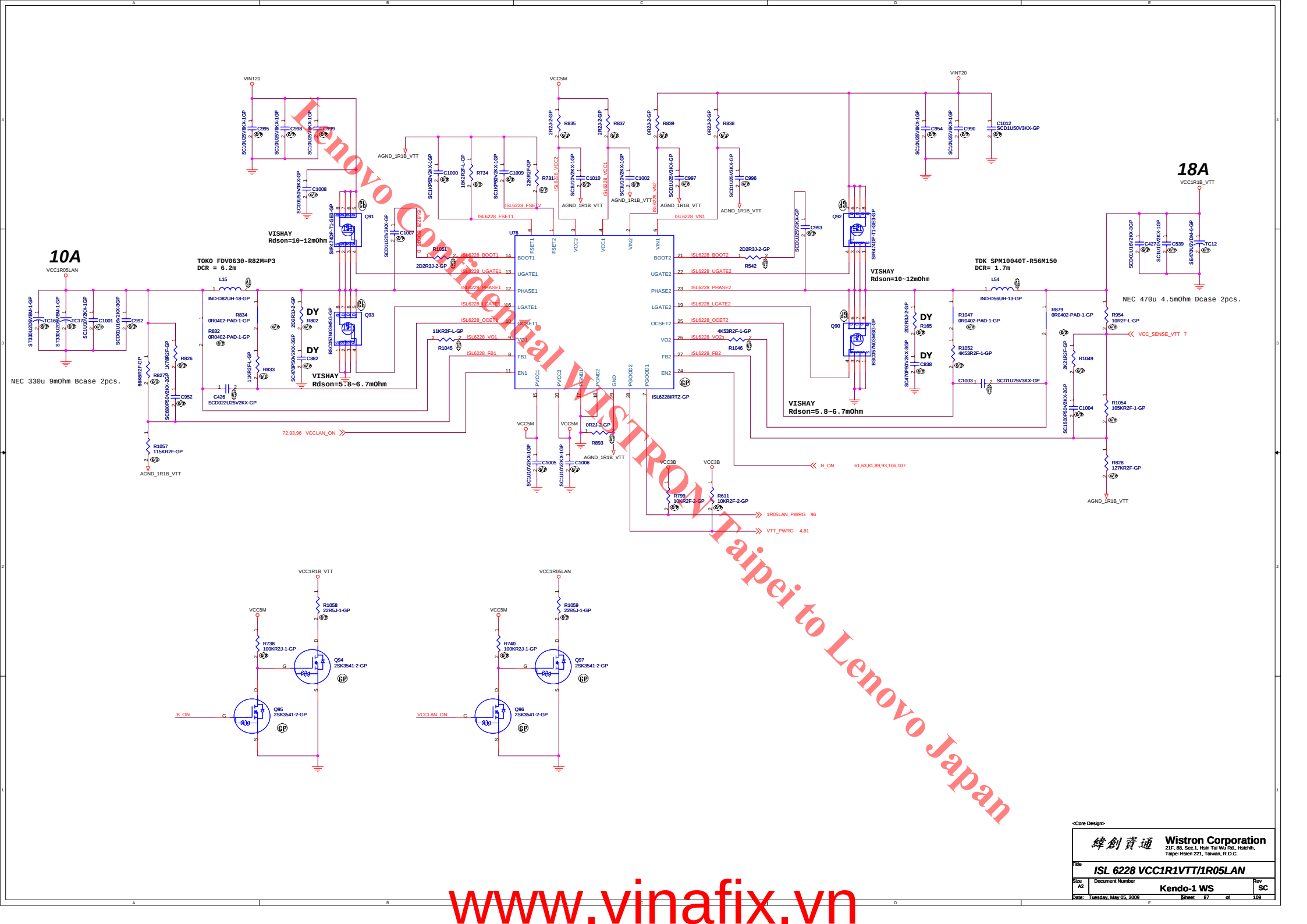
Date: Tuesday, May 05, 2009 | Sheet 85 of 109

BLANK

<Variant Name>

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

Title	BLANK	
Size: A3	Document Number: Kendo-1 WS	Rev: SC
Date: Tuesday, May 05, 2009	Sheet 86 of 109	



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

Title: ISL 6228 VCC1R1VTT/1R05LAN

Size: A2 | Document Number: Kendo-1 WS | Rev: SC

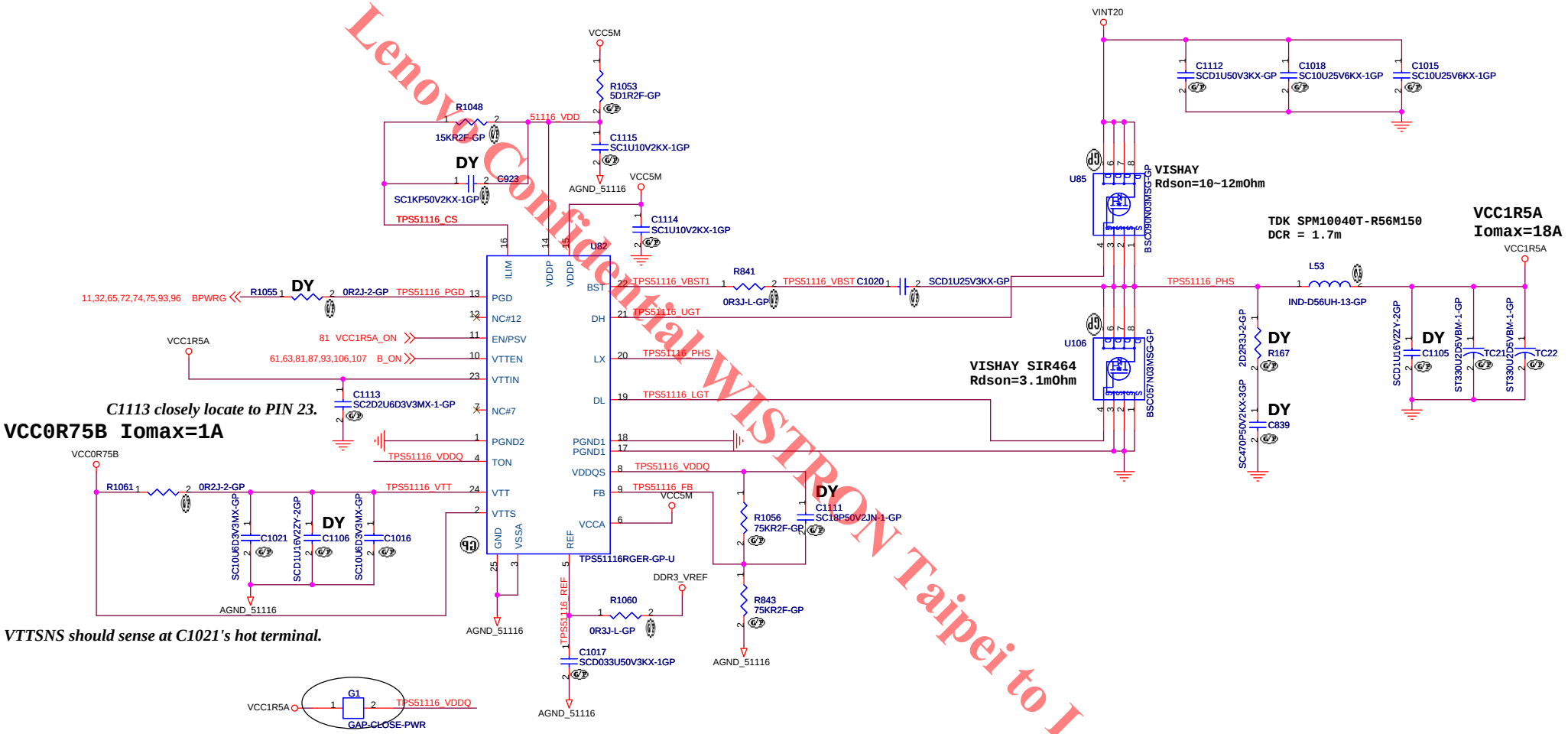
Date: Tuesday, May 05, 2009 | Sheet 87 of 109

BLANK

<Variant Name>

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

Title	BLANK	
Size: A3	Document Number: Kendo-1 WS	Rev: SC
Date: Tuesday, May 05, 2009	Sheet 88 of 109	



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

<Core Design>

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

Title: DC-DC VCC0R75B

Size: A3 | Document Number: Kendo-1 WS | Rev: SC

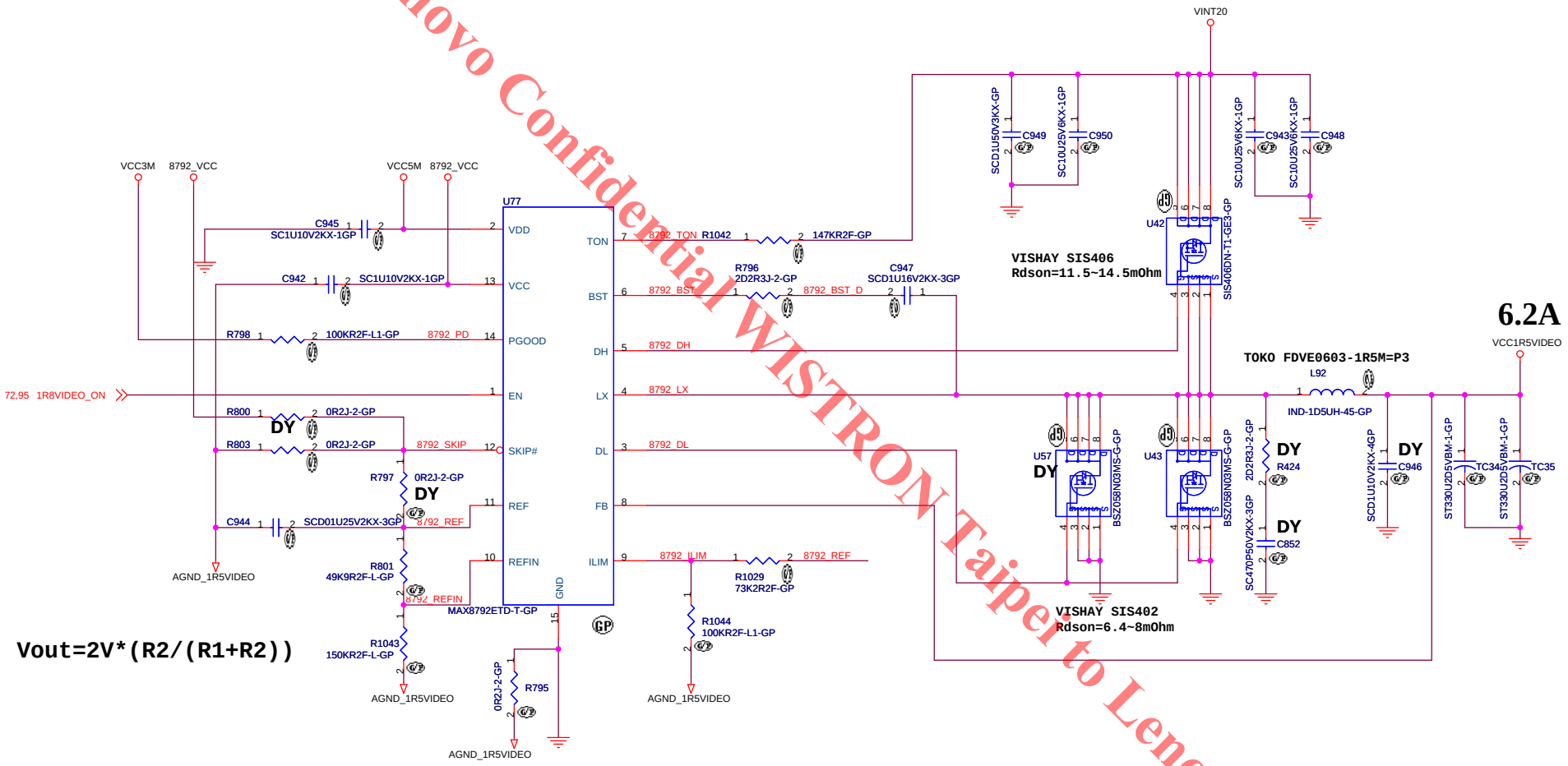
Date: Tuesday, May 05, 2009 | Sheet 89 of 109

BLANK

<Variant Name>

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

Title: BLANK		
Size: A3	Document Number: Kendo-1 WS	Rev: SC
Date: Tuesday, May 05, 2009	Sheet 90 of 109	



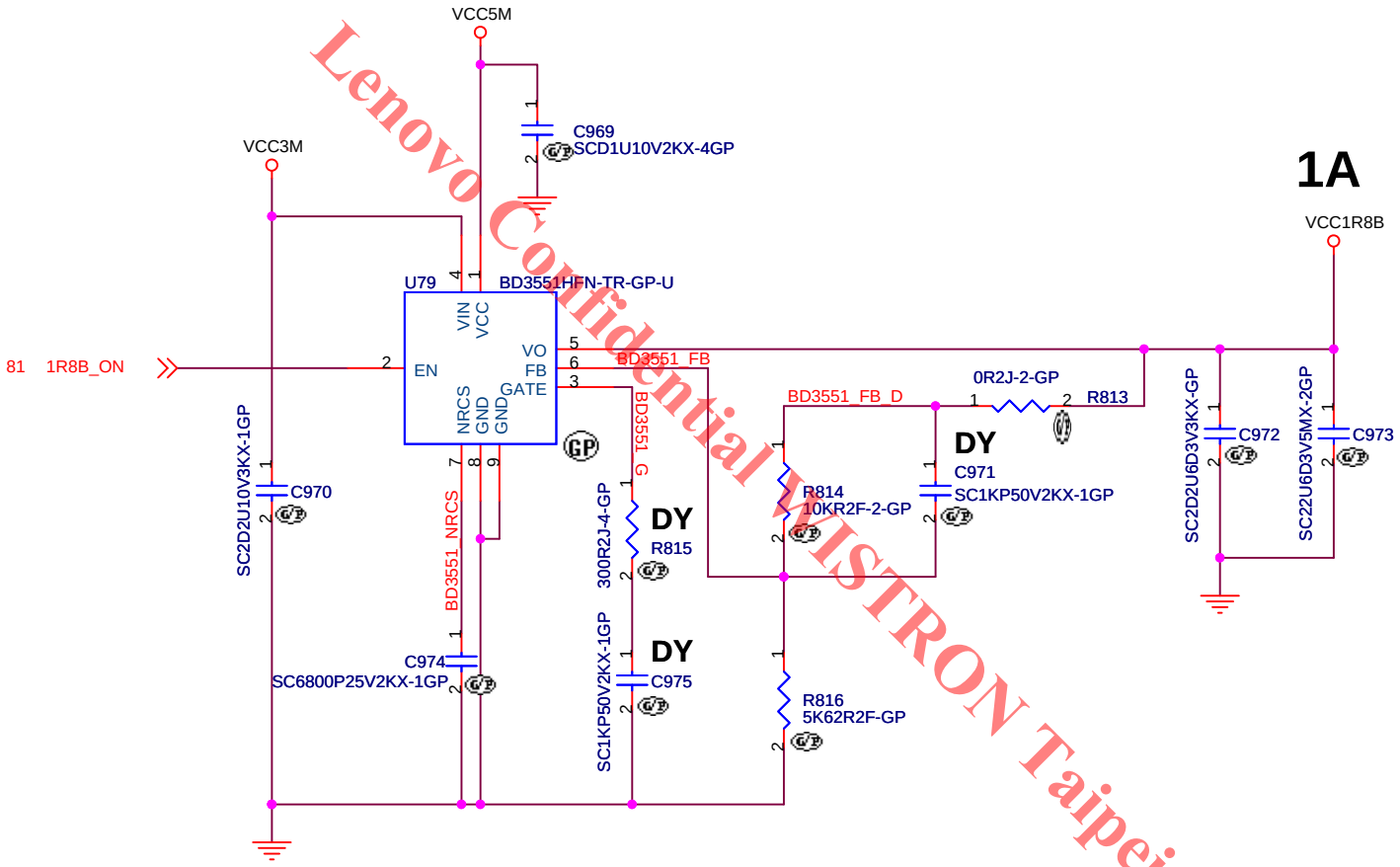
<Core Design>

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

Title: DC-DC VCC1R5VIDEO

Size	Document Number	Rev
A3	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 91 of 109



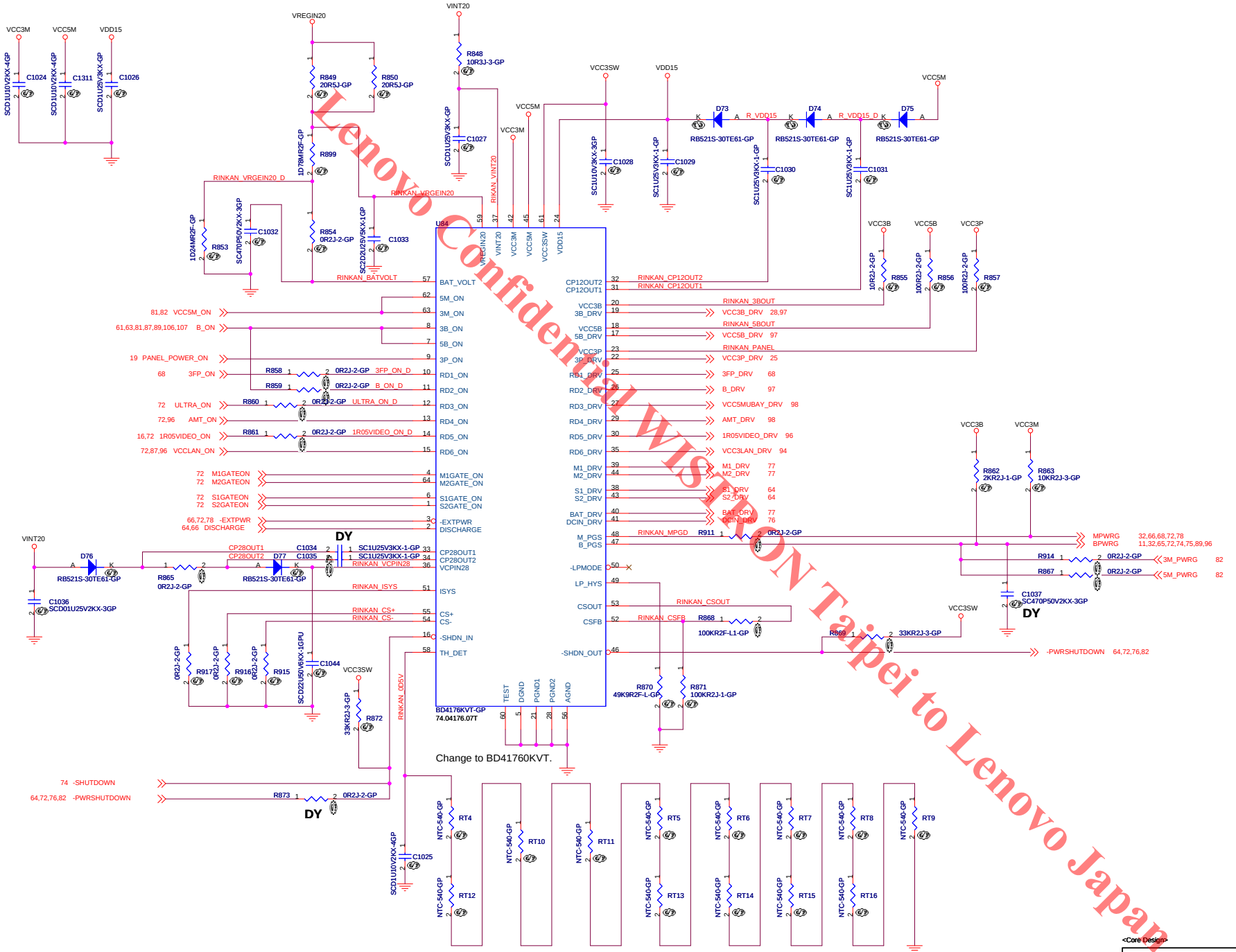
<Core Design>

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

Title: DC-DC VCC1R8B

Size	Document Number	Rev
A4	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 92 of 109

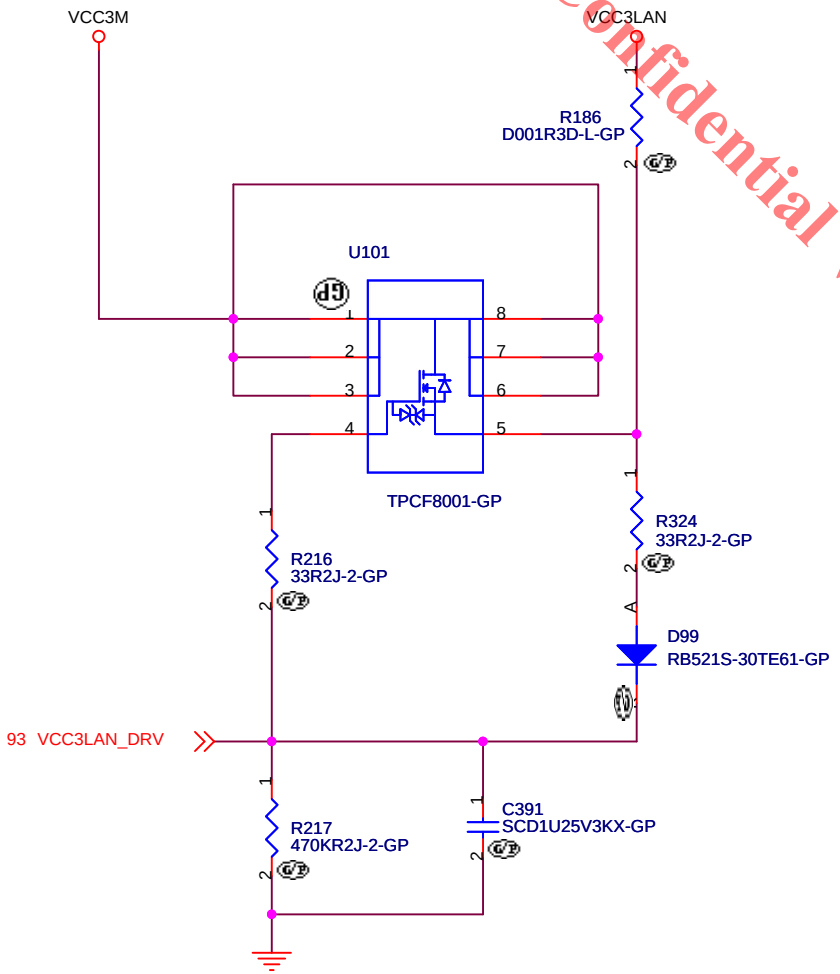


<Core Design>
緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: DC/DC RINKAN-2

Size: Custom | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 93 of 109



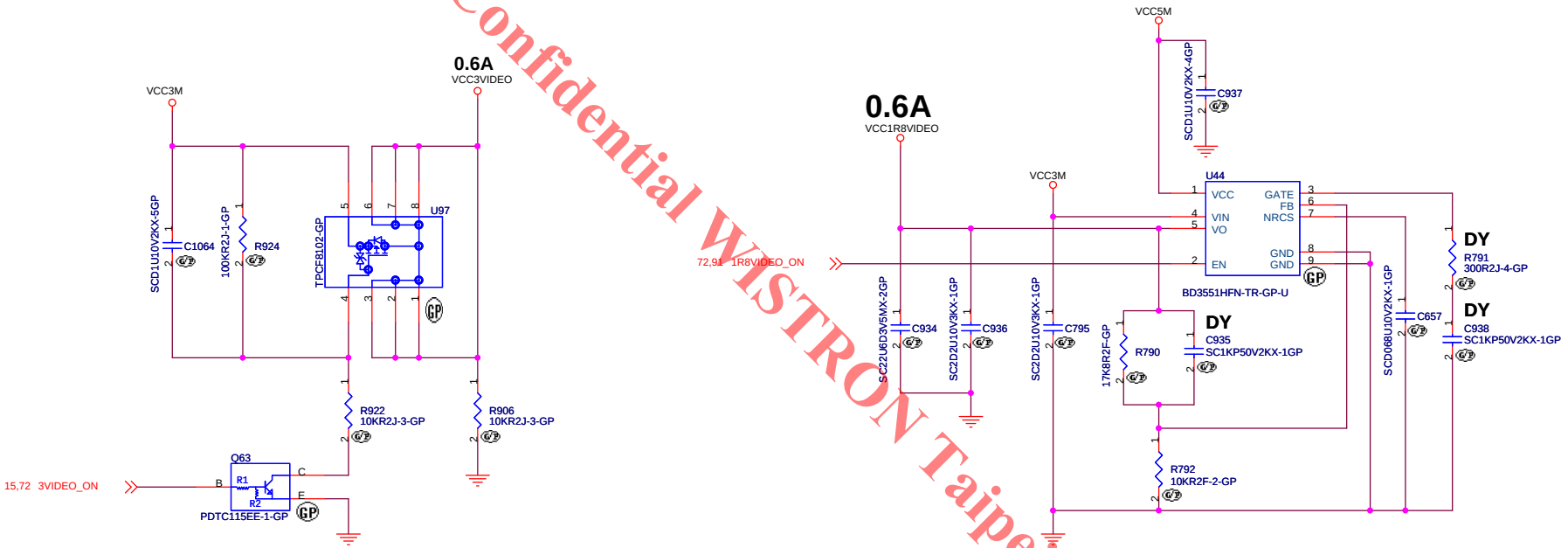
<Core Design>

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

Title: LOAD SW LAN & LANPWRG

Size	Document Number	Rev
A4	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 94 of 109



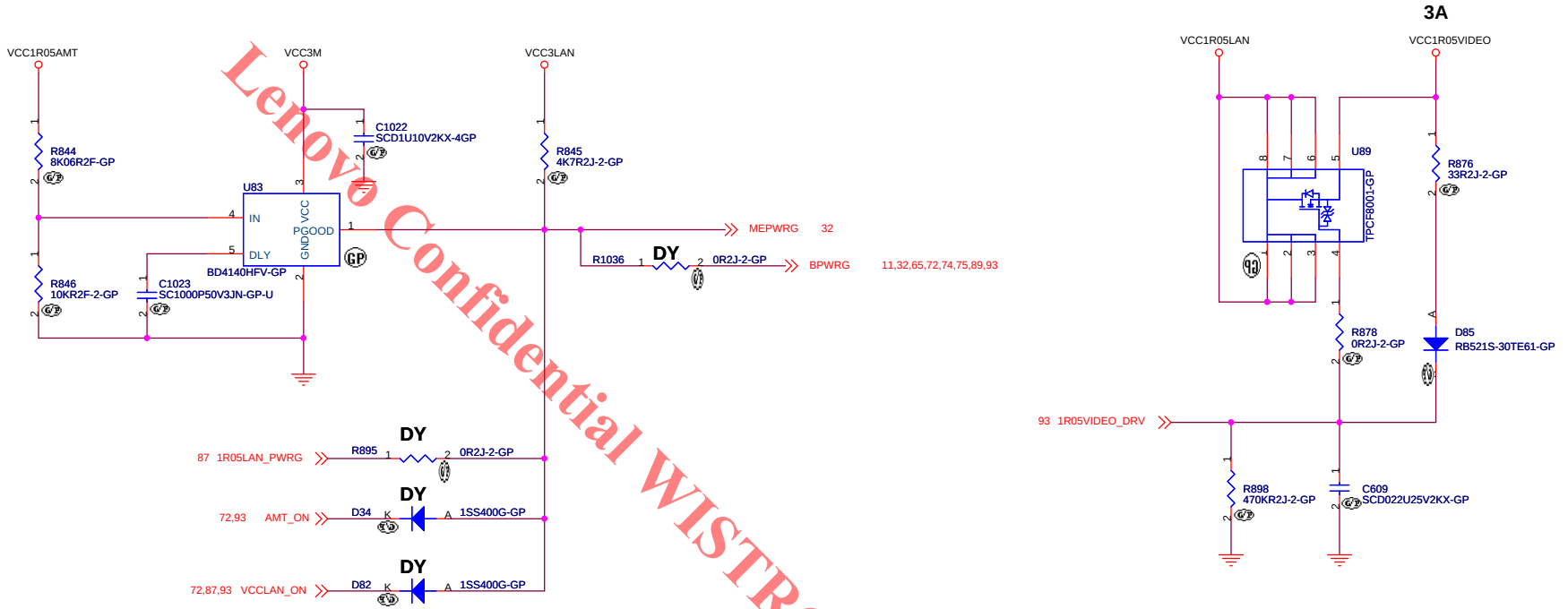
<Core Design>

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

Title: LOAD SW VIDEO

Size: A3 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 95 of 109



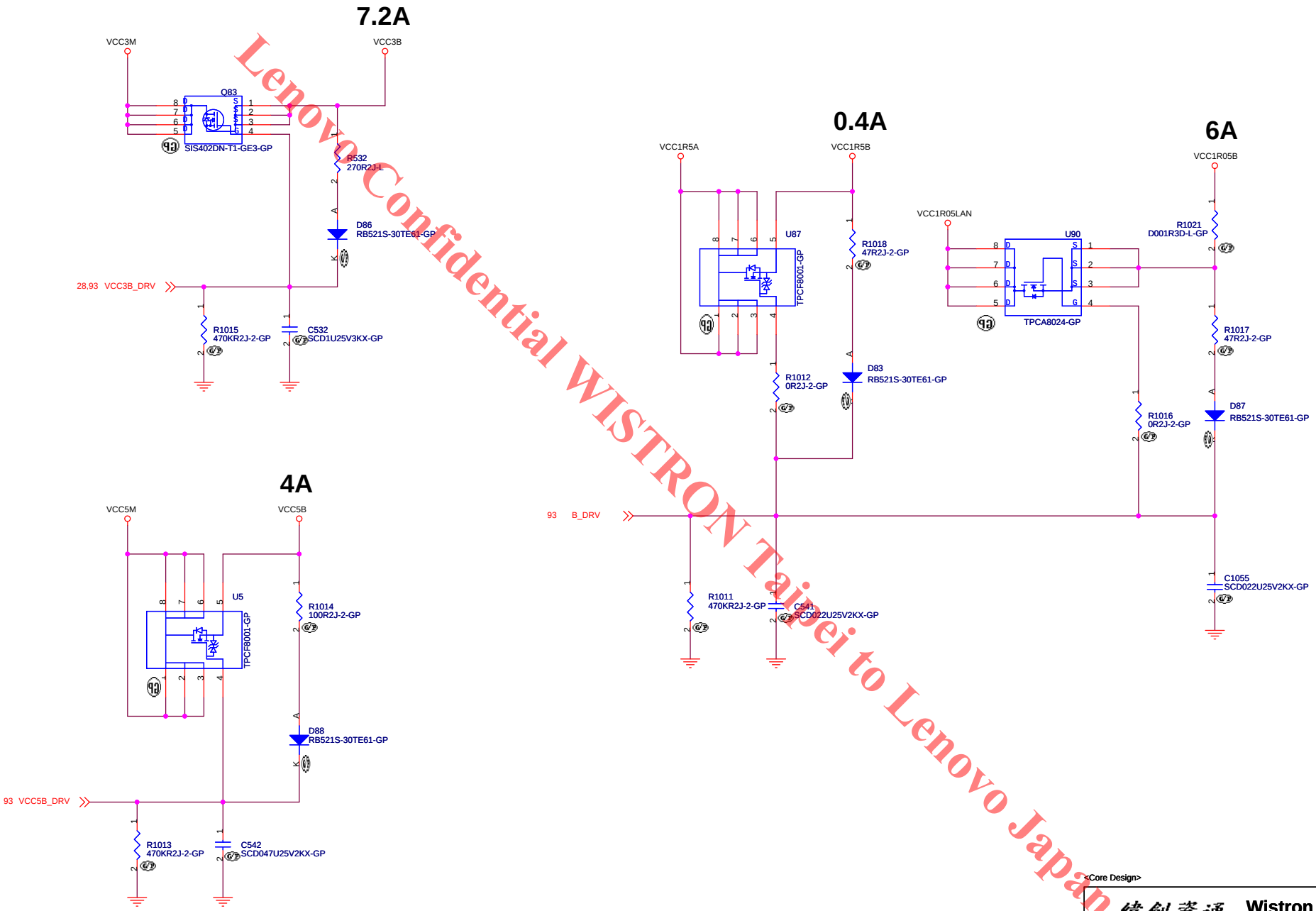
<Core Design>

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

Title: SW AMT/MEPWRG

Size: A3 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 96 of 109



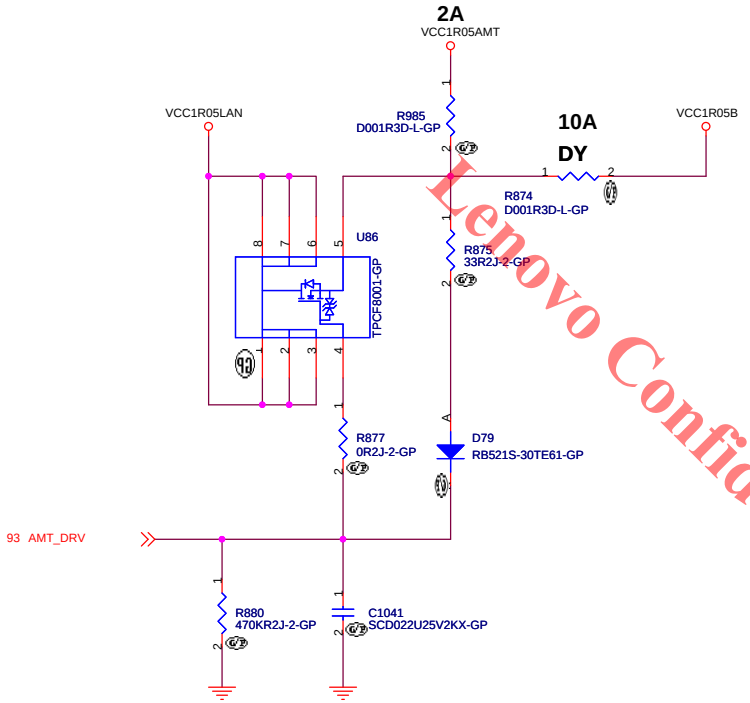
<Core Design>

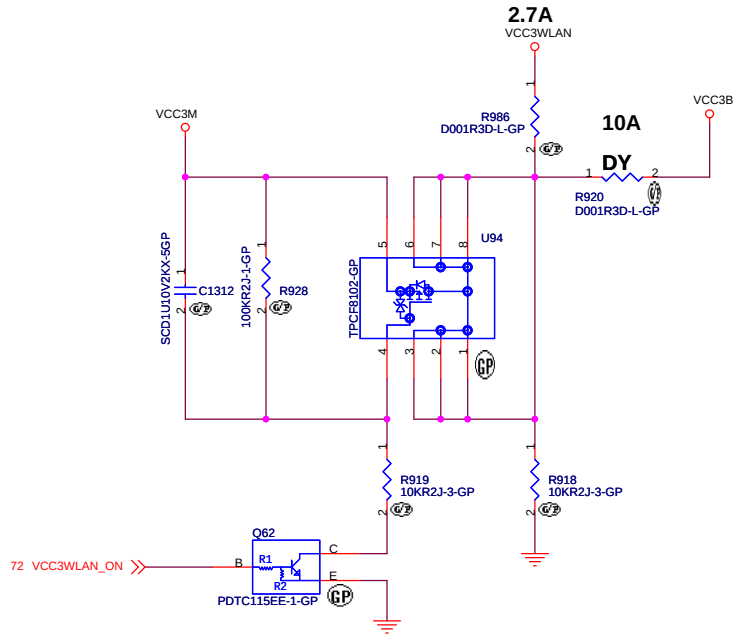
Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

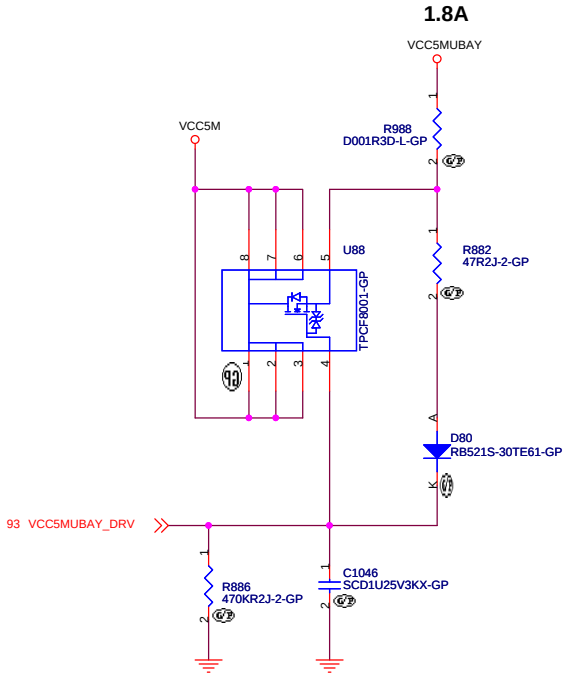
Title: LOAD SW B

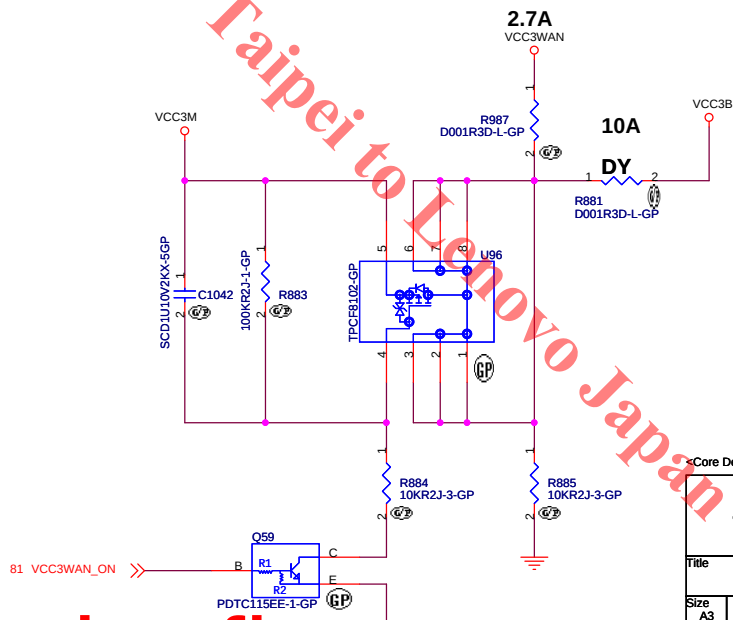
Size: A3 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 97 of 109









	REG/LITE	BB/NO
R881	NO-ASM	ASM
Q70	ASM	NO-ASM
R885	ASM	NO-ASM
R883	ASM	NO-ASM
C1042	ASM	NO-ASM
R884	ASM	NO-ASM
Q59	ASM	NO-ASM

<Core Design>

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

Title: **LOAD SW VCC5MBAY**

Size: A3 | Document Number: **Kendo-1 WS** | Rev: SC

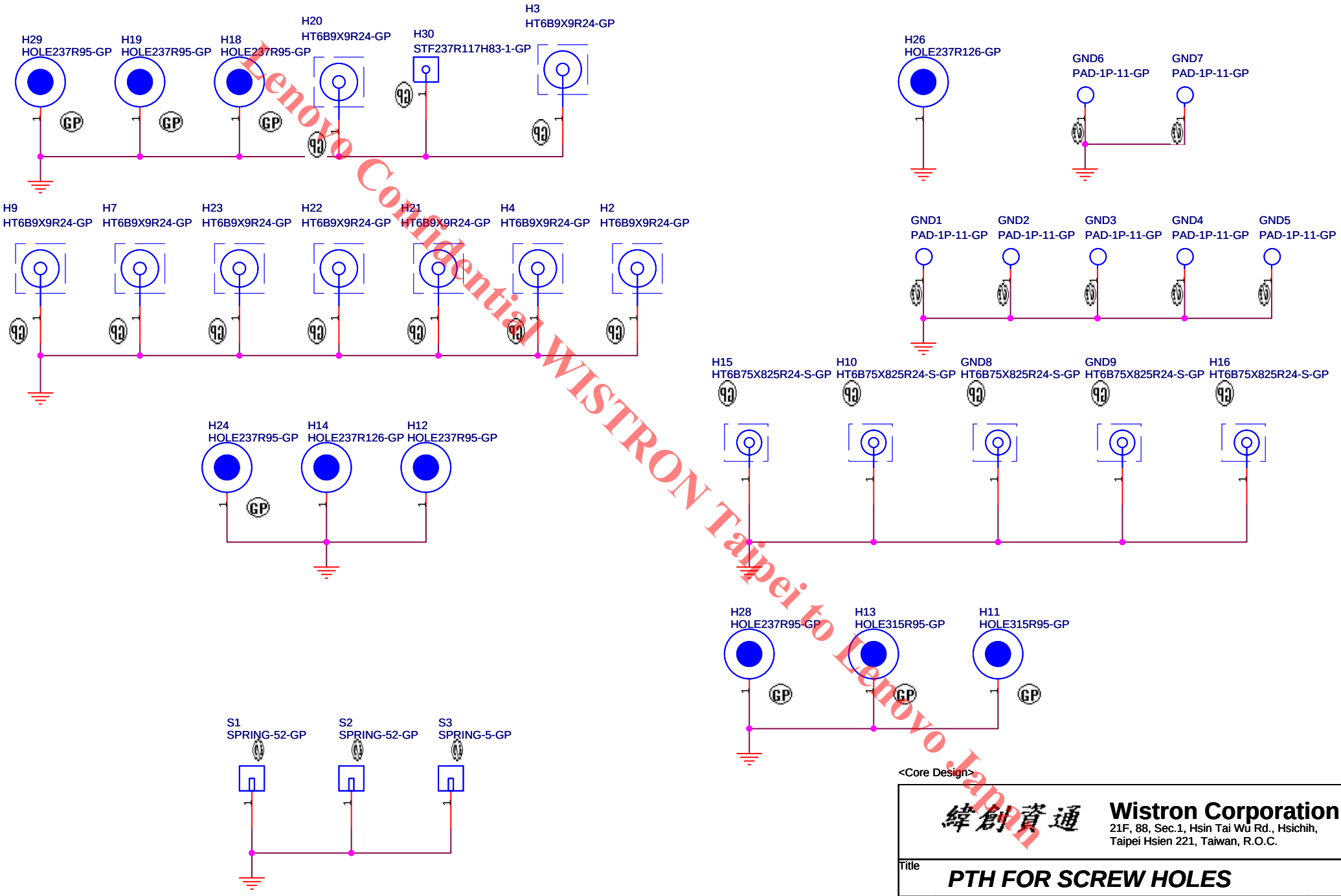
Date: Tuesday, May 05, 2009 | Sheet 98 of 109

BLANK

<Variant Name>

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

Title: BLANK		
Size: A3	Document Number: Kendo-1 WS	Rev: SC
Date: Tuesday, May 05, 2009	Sheet 99 of 109	



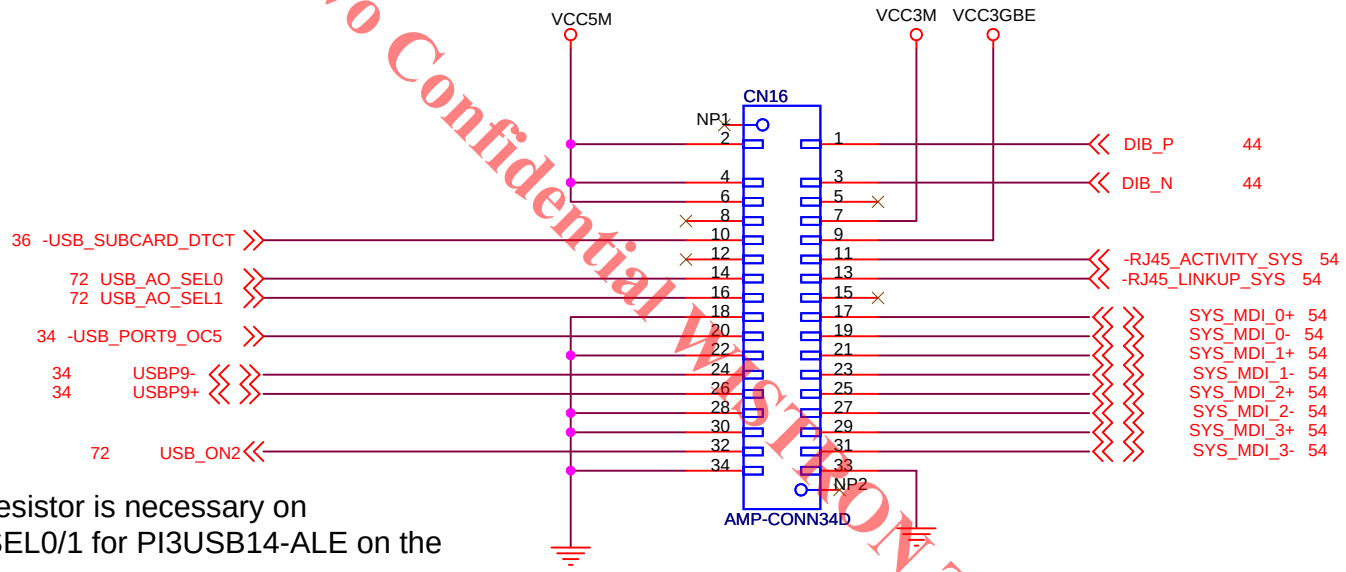
<Core Design>

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

Title
PTH FOR SCREW HOLES

Size	Document Number	Rev
A4	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 100 of 109



Pull-down resistor is necessary on USB_AO_SEL0/1 for PI3USB14-ALE on the USB BRD.

Change Pin order and pin number to 34.

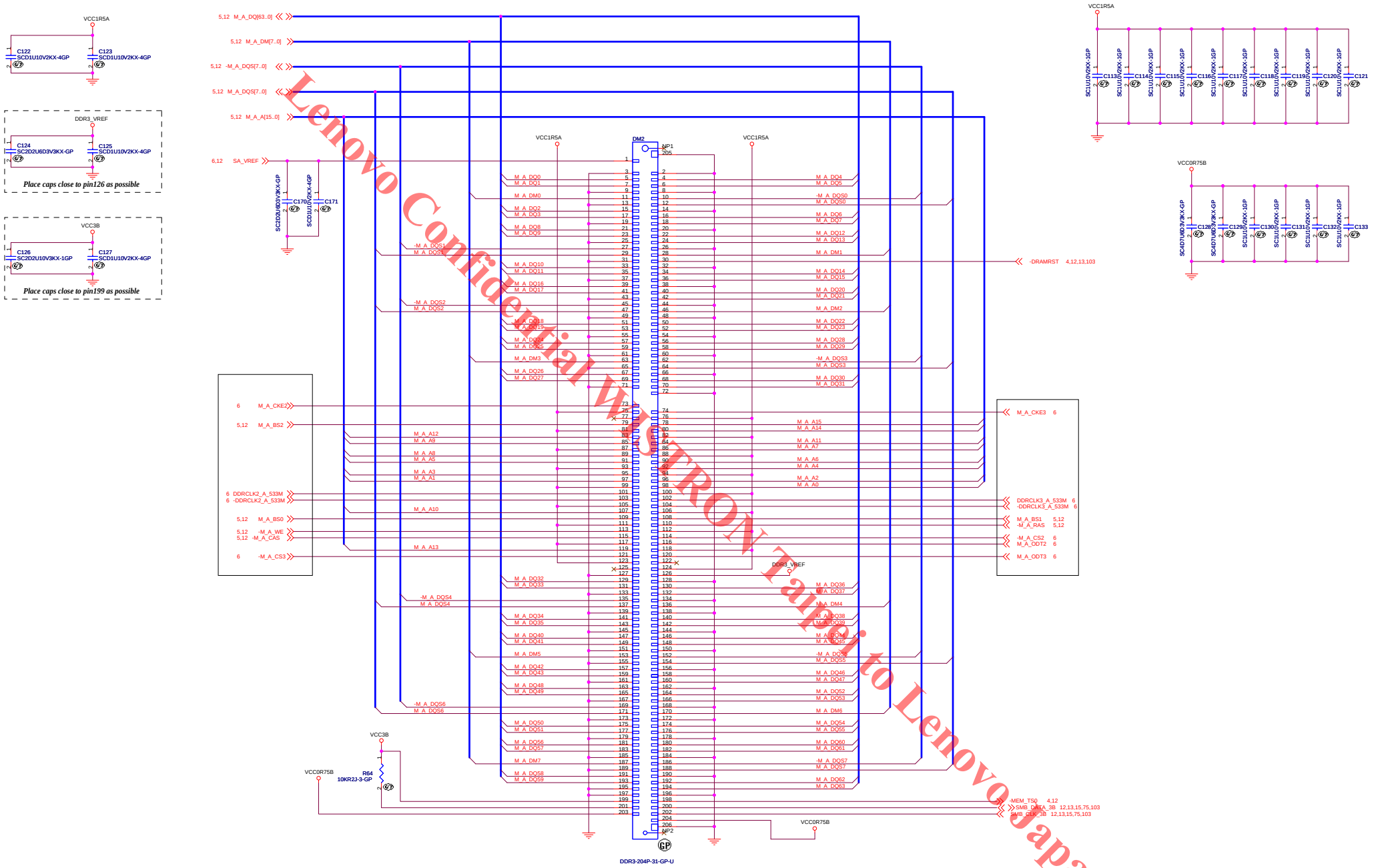
<Variant Name>

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

Title: ***USB BOARD CONN***

Size	Document Number	Rev
A4	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 101 of 109



SPD Address : 52h

This connector should be placed on near side from CPU.

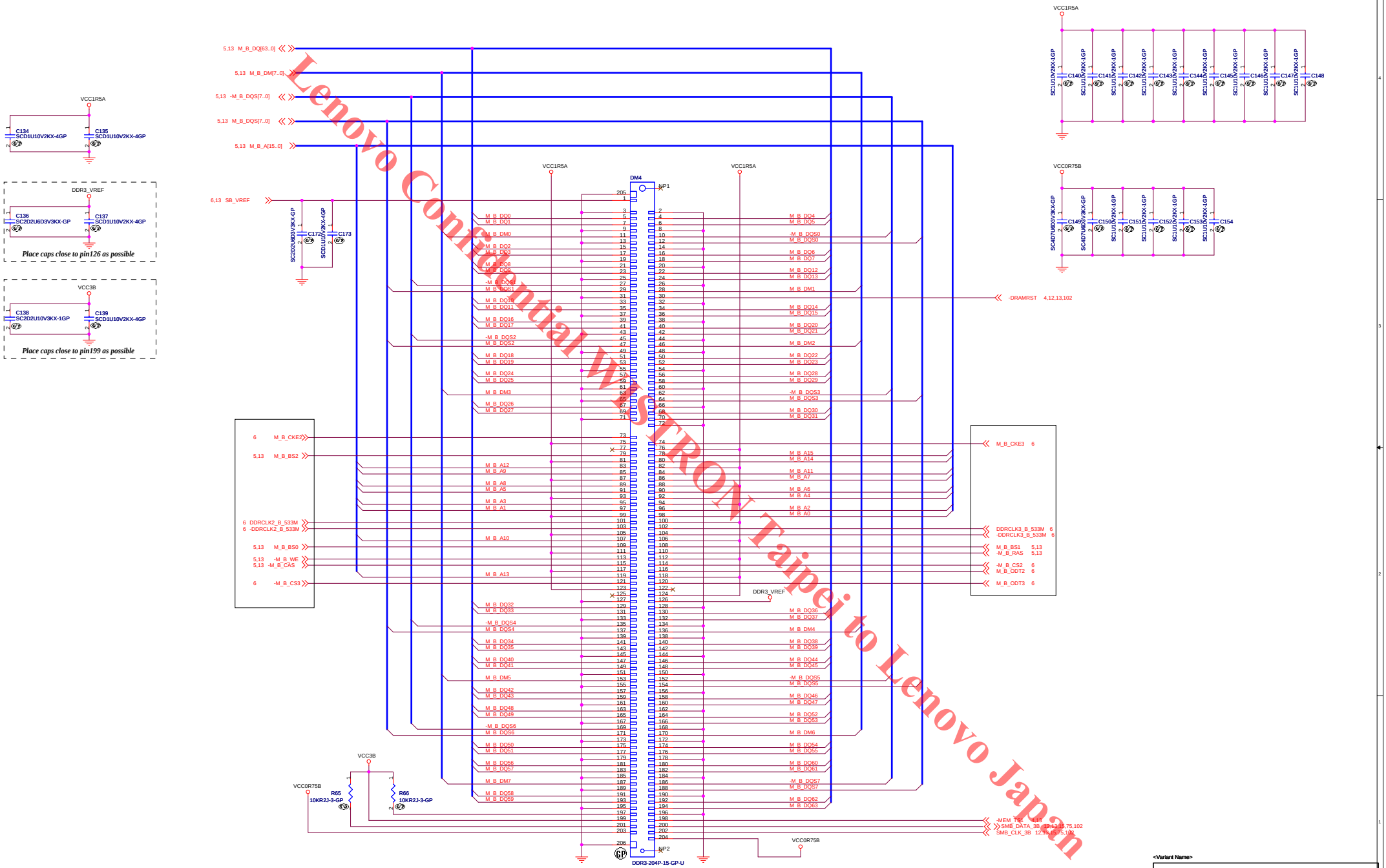
<Variant Name>

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

Title: ***DDR3 SODIMM_CH-A_Secondary***

Size	Document Number	Rev
A2	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 102 of 109



SPD Address : 53h

This connector should be placed on near side from CPU.

<Variant Name>

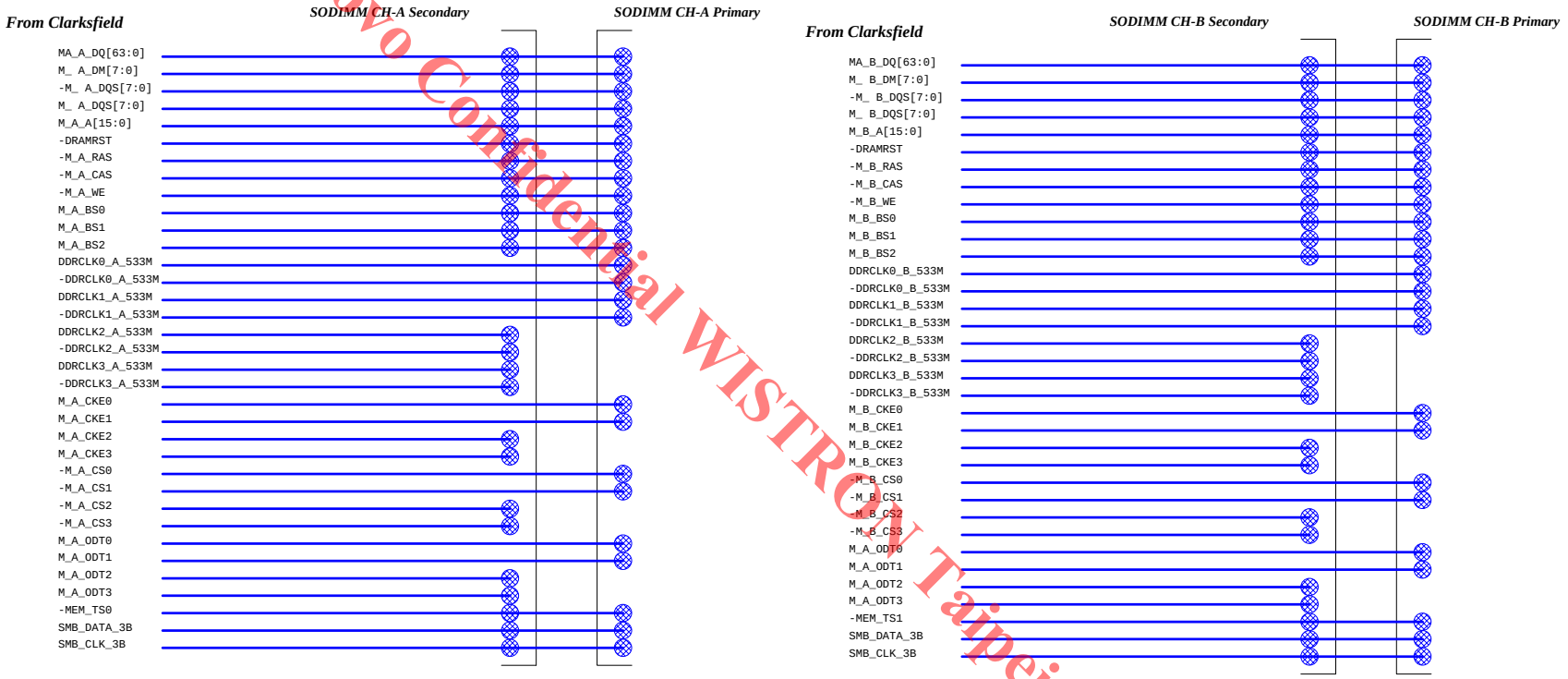
緯創資通 Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: DDR3 SODIMM_CH-B_Secondary

Size: A2 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 103 of 109

SODIMM should be installed on CH0 Primary at first.



SODIMM IIC Address :
CH-A Primary : 50h
CH-B Primary : 51h
CH-A Secondary : 52h
CH-B Secondary : 53h

Pin1 on SODIM connector (VREF_DQ) only conects to DDR Voltage divider.
Clarksfield H17/J17 is left.

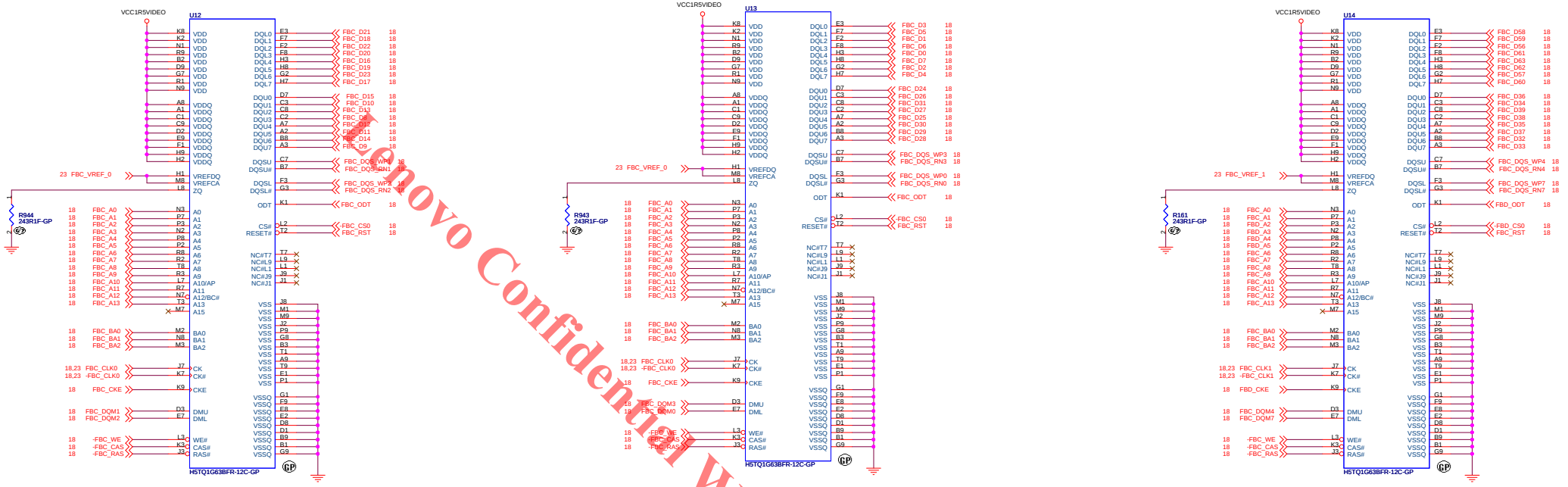
<Variant Name>

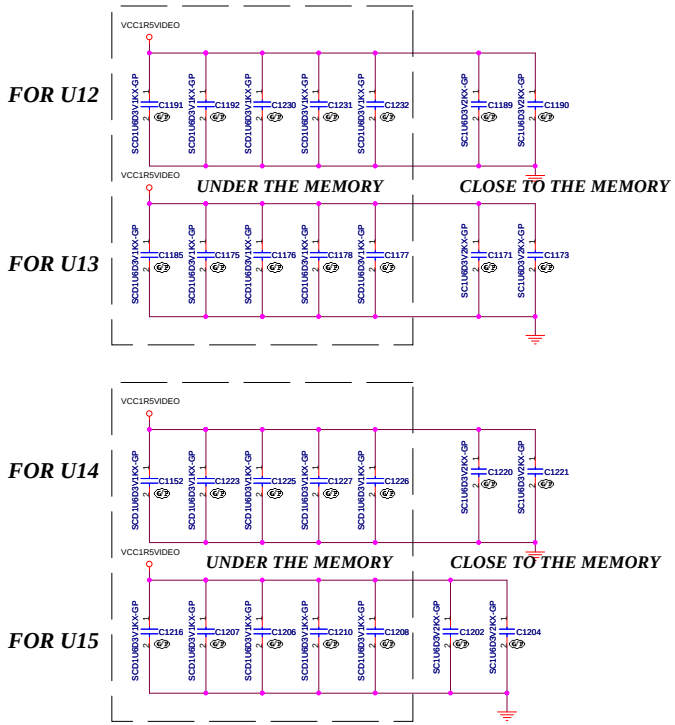
緯創資通 **Wistron Corporation**
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: ***SODIMM CONFIGURATION***

Size	Document Number	Rev
A2	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 104 of 109





VIDEO FRAME BUFFER PORT C

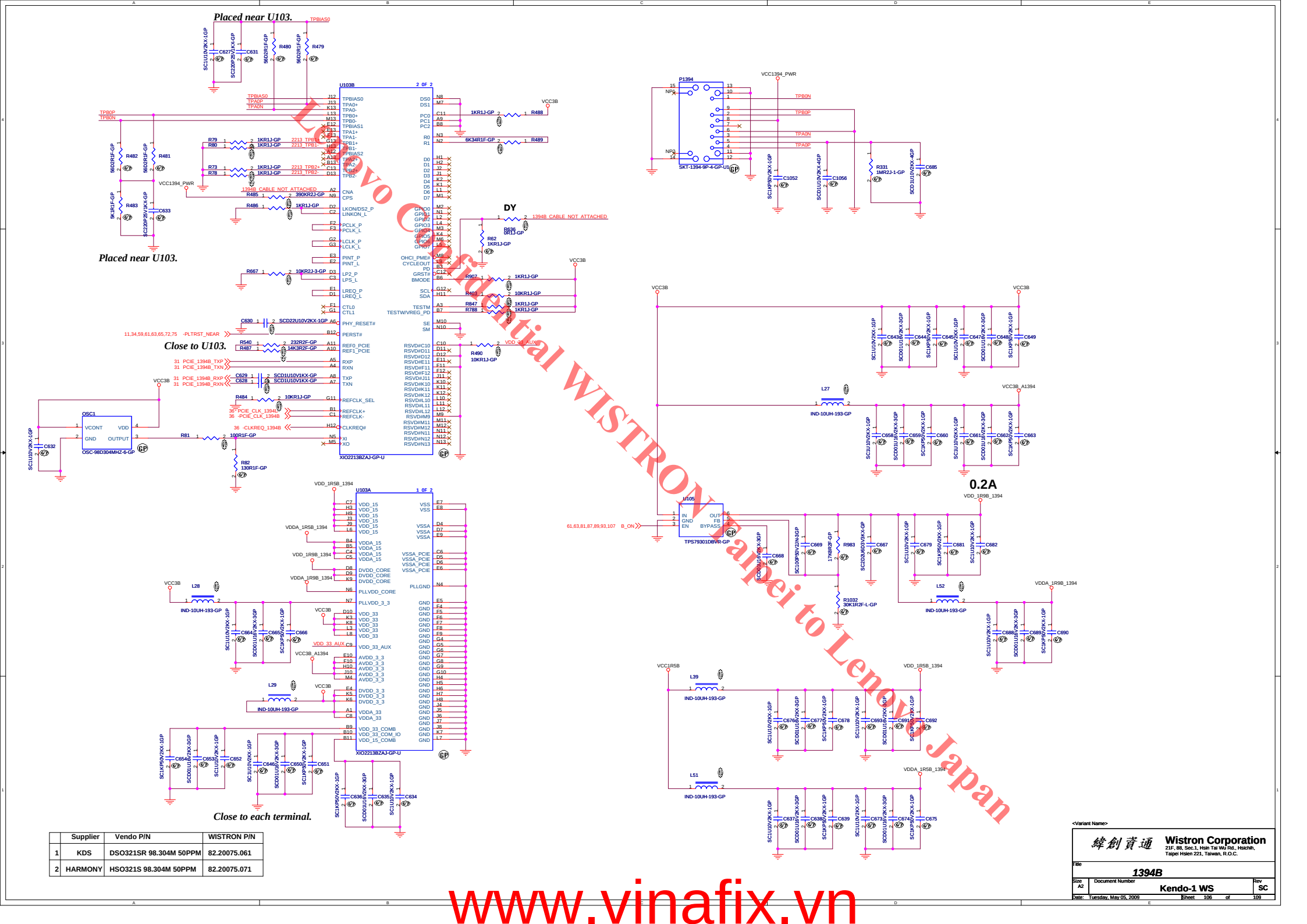
<Core Design>

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

Title: VRAM CHANNEL-C

Size: A2 | Document Number: Kendo-1 WS | Rev: SC

Date: Tuesday, May 05, 2009 | Sheet 105 of 109

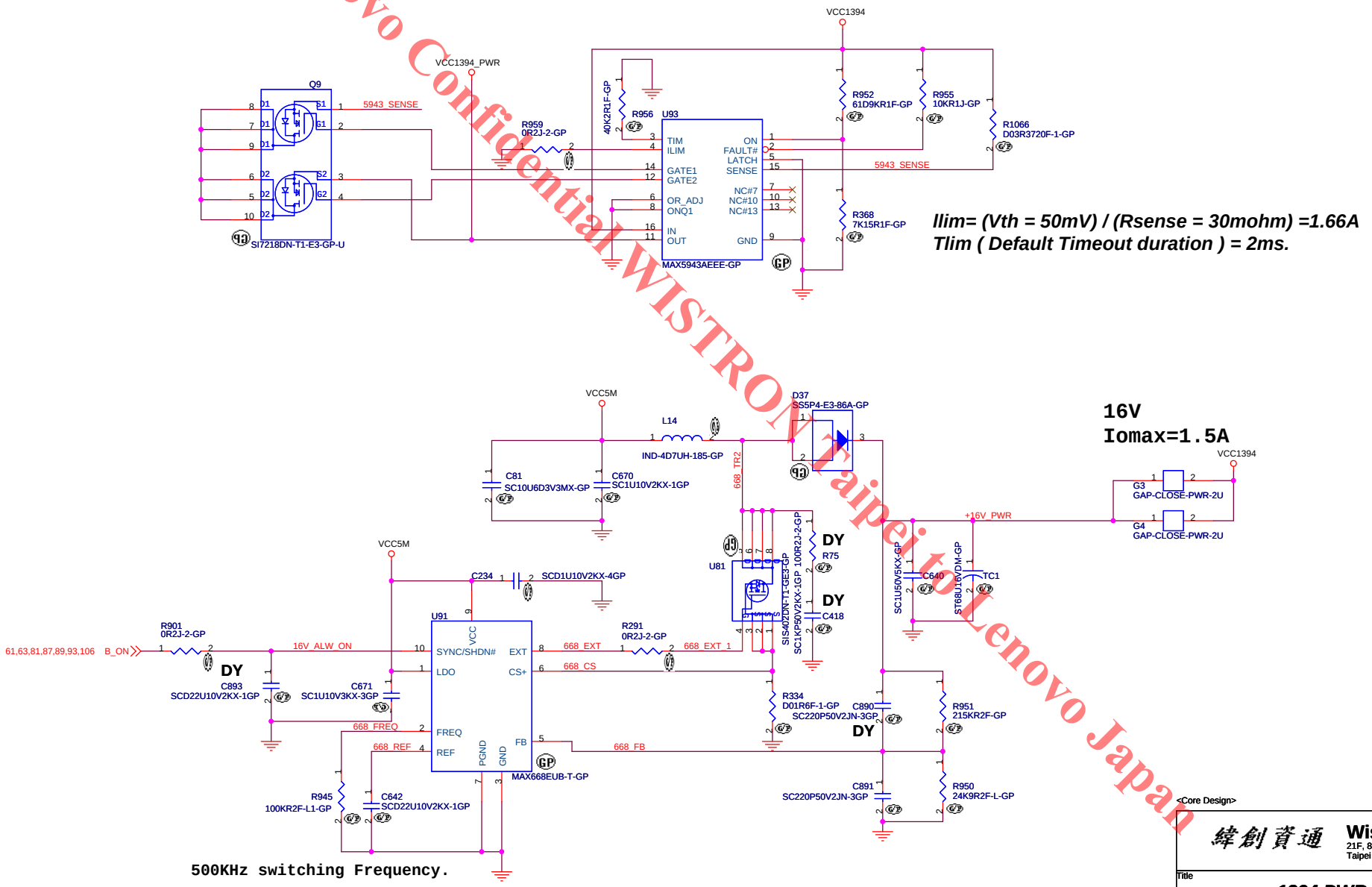


	Supplier	Vendo P/N	WISTRON P/N
1	KDS	DSO321SR 98.304M 50PPM	82.20075.061
2	HARMONY	HSO321S 98.304M 50PPM	82.20075.071

<Variant Name>

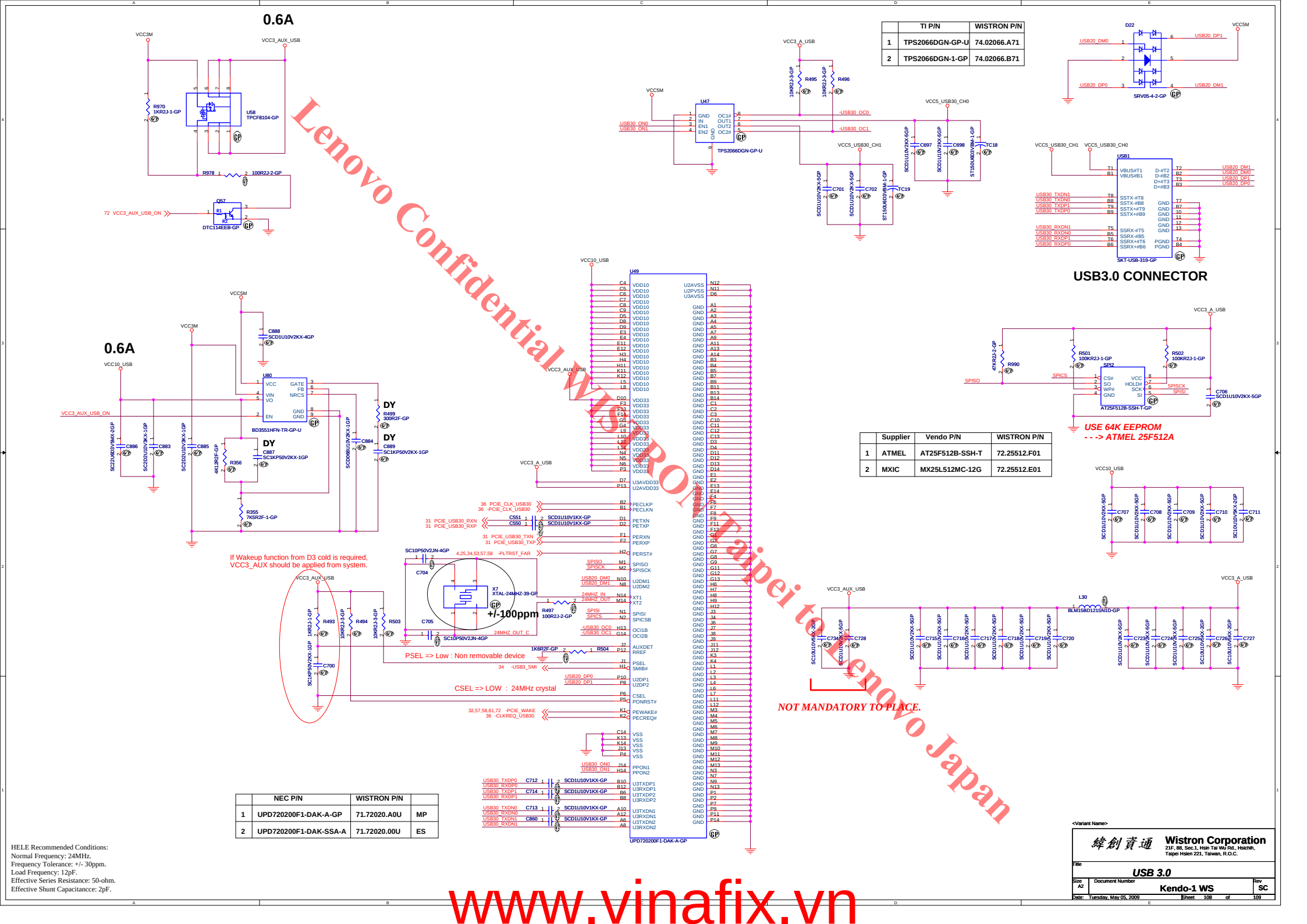
Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: 1394B
Size: A2 | Document Number: Kendo-1 WS | Rev: SC
Date: Tuesday, May 05, 2009 | Sheet 106 of 109



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

<Core Design>
Title: 1394 PWR
Size: A3
Document Number: Kendo-1 WS
Rev: SC
Date: Tuesday, May 05, 2009
Sheet 107 of 109


0.6A
VCC3M
VCC3_AUX_USB
U58
TPCF8104-GP
R970
1KR2J-1-GP
R978
100R2J-2-GP
Q57
DTC114EEB-GP
72 VCC3_AUX_USB_ON
TI P/N
WISTRON P/N
1 TPS2066DGN-GP-U 74.02066.A71
2 TPS2066DGN-GP-1-GP 74.02066.B71
U47
TPS2066DGN-GP-U
R495
R496
-USB30_OC0
-USB30_OC1
USB30_ON0
USB30_ON1
VCC5_USB30_CH0
VCC5_USB30_CH1
D22
SRV05-4-2-GP
USB20_DM0
USB20_DP0
USB20_DP1
USB20_DM1
USB1
SKT-USB-319-GP
USB3.0 CONNECTOR
0.6A
U80
BD3551HFN-TR-GP-U
VCC3_AUX_USB_ON
DY
R499
300R2F-GP
C888
SCD1U10V2KX-4GP
U49
UPD720200F1-DAK-A-GP
If Wakeup function from D3 cold is required,
VCC3_AUX should be applied from system.
X7
XTAL-24MHZ-39-GP
+/-100ppm
PSEL => Low : Non removable device
CSEL => LOW : 24MHz crystal
R497
100R2J-2-GP
R504
1K6R2F-GP
SPI2
AT25F512B-SSH-T-GP
R501
100KR2J-1-GP
R502
100KR2J-1-GP
R990
47KR2J-1-GP
SPISO
SPISCK
SPICS
USE 64K EEPROM
- - -> ATMEL 25F512A
Supplier
Vendo P/N
WISTRON P/N
1 ATMEL AT25F512B-SSH-T 72.25512.F01
2 MXIC MX25L512MC-12G 72.25512.E01
NOT MANDATORY TO PLACE.
L30
BLM15BD121SN1D-GP
NEC P/N
WISTRON P/N
1 UPD720200F1-DAK-A-GP 71.72020.A0U MP
2 UPD720200F1-DAK-SSA-A 71.72020.00U ES
HELE Recommended Conditions:
Normal Frequency: 24MHz.
Frequency Tolerance: +/- 30ppm.
Load Frequency: 12pF.
Effective Series Resistance: 50-ohm.
Effective Shunt Capacitance: 2pF.
Lenovo Confidential WISTRON Taipei to Lenovo Japan
www.vinafix.vn
<Variant Name>
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
Size A2
Document Number
Kendo-1 WS
Rev SC
Date: Tuesday, May 05, 2009
Sheet 108 of 109

Long power trace EMI decoupling caps

<Core Design>

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

Title: *EMI DECOUPLING*

Size	Document Number	Rev
Custom	Kendo-1 WS	SC

Date: Tuesday, May 05, 2009 Sheet 109 of 109