First International Computer, Inc

Portable Computer Group HW Department

Board name : MotherBoard Schematic

Project : AMD S1 + MCP67MD + NB8M-SE

Version : 0.1

Initial Date : 10/25/2006

Confidential

Manager Sign by : Avery Lee

Drawing by : Ahsing Huang

Total confirm by :Adam Cho

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Title: PTT50 (FIC)

Size: C | Document Number: TITLE | Rev: 0.1

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1. Schematic Page Description :

FIC Schematic Ver : 0.1

2. PCI BUS Description :

IDSEL	CHIP
AD22	1394 VIA VT6311S

PCIINT	CHIP
IRQA	——
IRQB	——
IRQC	1394 VIA VT6311S
IRQD	——

BUSMASTER

REQ	CHIP
REQ0 / GNT0	——
REQ1 / GNT1	1394 VIA VT6311S
REQ2 / GNT2	——
REQ3 / GNT3	——
REQ4 / GNT4	——

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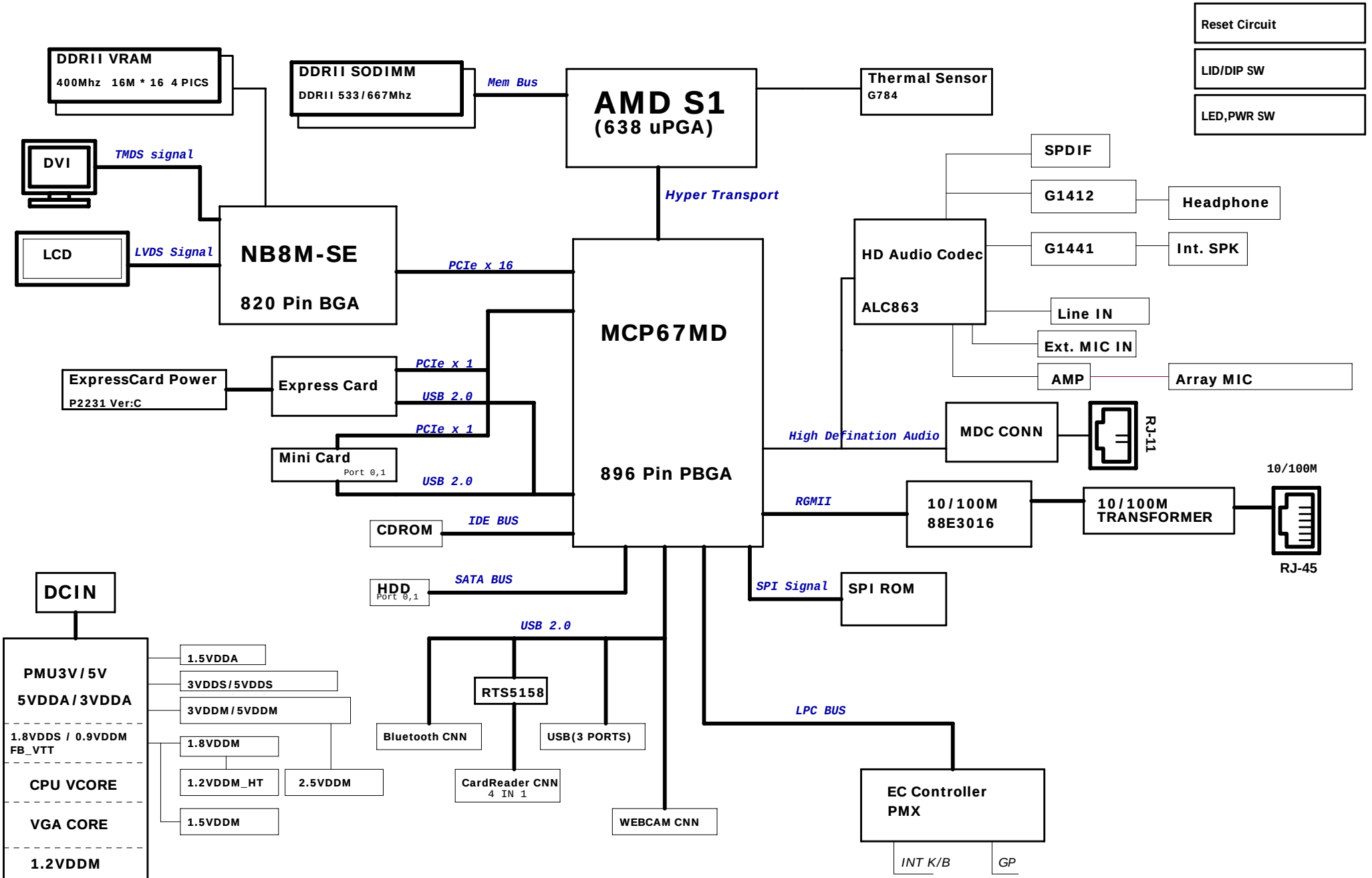

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4. Net name Description :

Voltage Rails

DCIN	Primary DC system power supply
PMU5V	5.0V always on power rail by LATCH or ACIN
PMU3V	3.3V always on power rail by LATCH or ACIN
5VDDA	5.0V always on power rail by DCON or PSUSC0
3VDDA	3.3V always on power rail by DCON or PSUSC0
1.5VDDA	1.5V always on power rail by DCON or PSUSC0
1.8VDDS	1.8V power rail
1.2VDDA	1.2V always on power rail by 3VDDA
0.9VDDM	0.9V DDR Termination Voltage
5VDDM	5.0V suspend power rail
3VDDM	3.3V suspend power rail
2.5VDDM	2.5V suspend power rail
1.5VDDM	1.5V suspend power rail
VDD_CORE	Core Voltage for VGA
VCPU_CORE	Core Voltage for CPU
1.2VDDM	VCC For CPU & NB
+1.2VHT	VCC For CPU & NB Hyper Transport

Part Naming Conventions

C = Capacitor
CN = Connector
D = Diode
F = Fuse
L = Inductor
Q = Transistor
R = Resistor
RP = Resistor Pack
U = Arbitrary Logic Device
Y = Crystal and Osc

Net Name Suffix

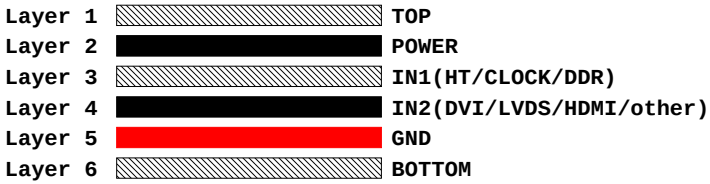
0 = Active Low signal

Signal Conditioning

_D_ = Damped (by a resistor)
_Q_ = Isolated (by a Q-switch)
_L_ = Filtered (by an inductor or bead)

5.Board Stack up Description

PCB Layers



Impedance Based On a Six-Layer Stack-Up

Interface	Impedance
PCI-Express HT signals	60 Ohm +/- 10% SE 93 Ohm +/- 10% differential
RGMII, SATA, IFP/TMDS, HDMI	55 Ohm +/- 10% SE 100 Ohm +/- 10% differential
USB	50 Ohm +/- 10% SE 90 Ohm +/- 10% differential
All other interfaces	60 Ohm +/- 10% SE

6.Schematic modify Item and History :

V0.1 --> V0.2

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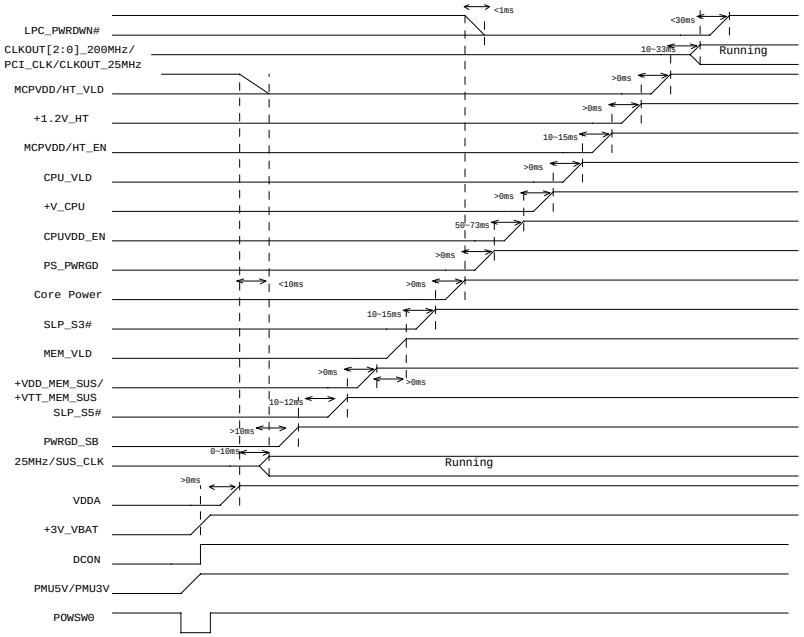
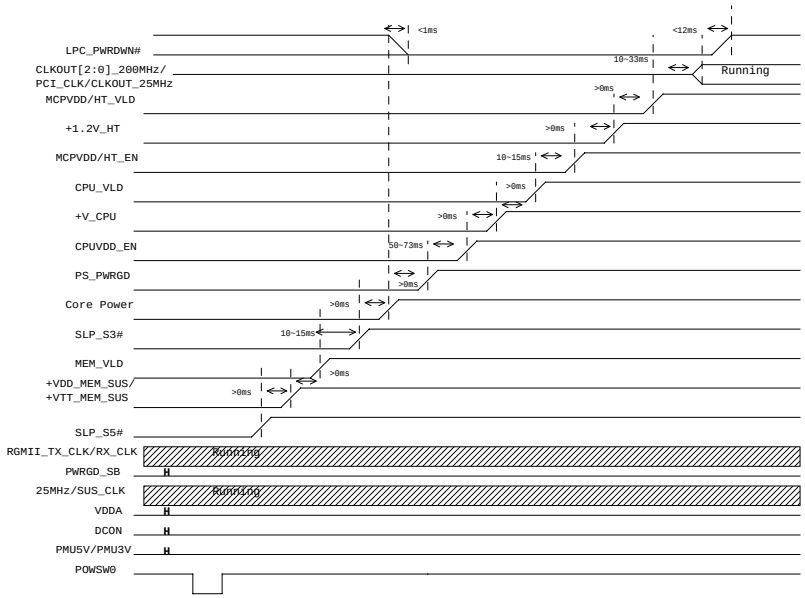
7. power on & off & S3 Sequence :

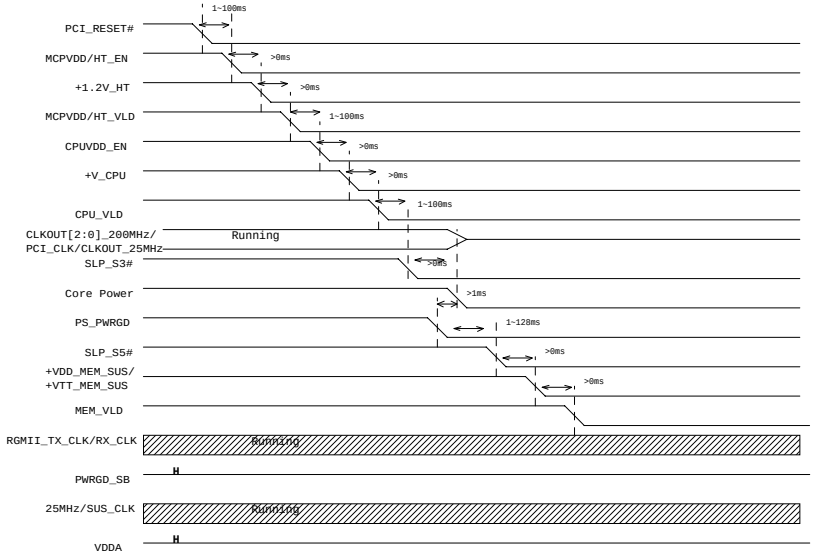
G3-to-S0 Power-Up Sequence



S3/S4/S5 to S0 Resume Sequence



S3/S4/S5 Power-Down Sequence



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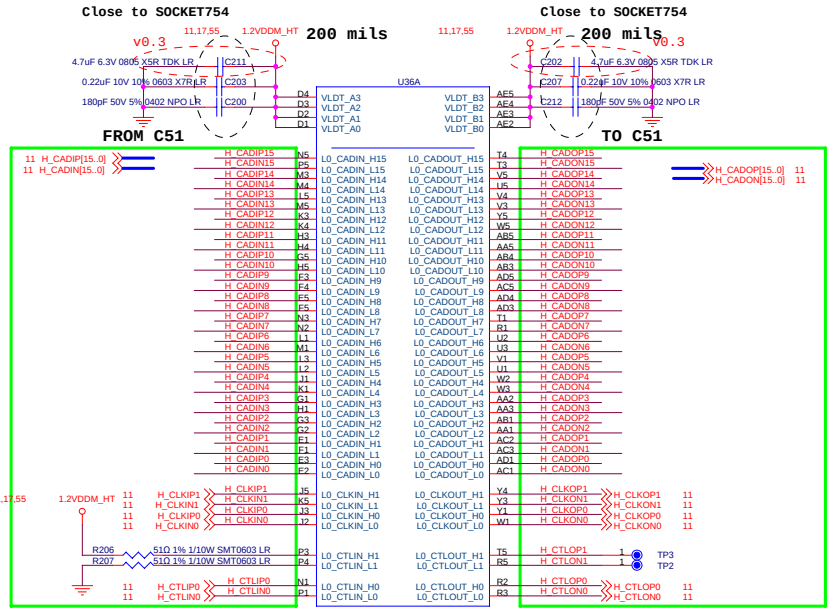
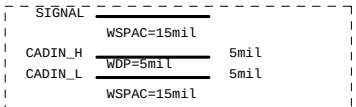
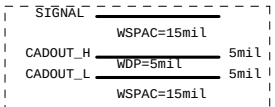
ClawHammer HT Interface

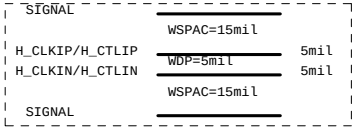


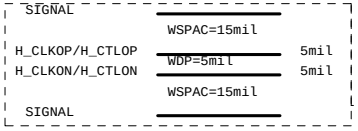
HT BUS General Routing Rules:

1. HT BUS is easy to route,and uses minmal board space.
2. HT BUS length must be greater than 1" and less than 12.0".
3. All CAD/CTL/CLK within a clock group must route at same layer.
4. HT BUS is Ground-referenced differential link.
5. Differential pair length matching within 30 mils.
6. CAD_H to CAD_L length matching within 30 mils.
7. CAD to CAD length matching within 120 mils.
8. CAD to CLK length matching within 60 mils.
9. CLK to CLK length matching within 600 mils(max).
10. CAD/CAD# and CTL/CTL# shall be treated identically within a clock group.









LAYOUT: Route 2.5VCCA approx. 50mil wide and 500mils long.(Reference to ground)

Route as Diff 5/7/5/20

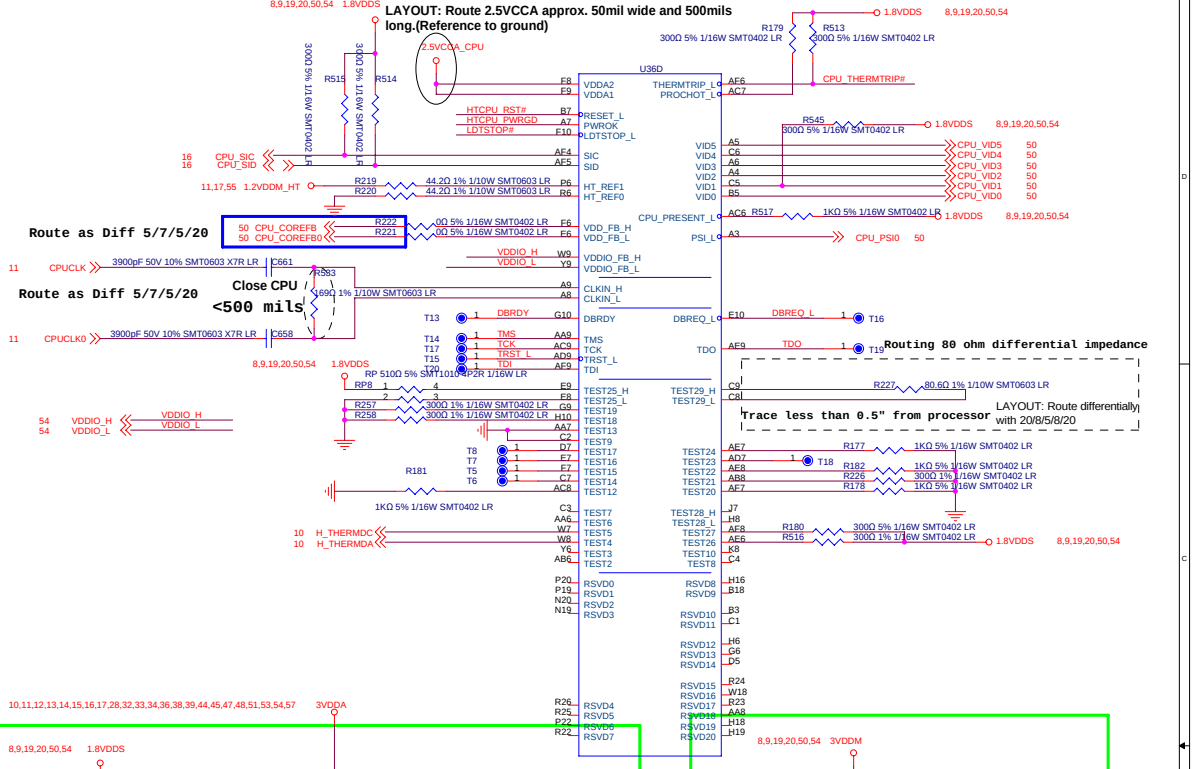
Close CPU / <500 mils

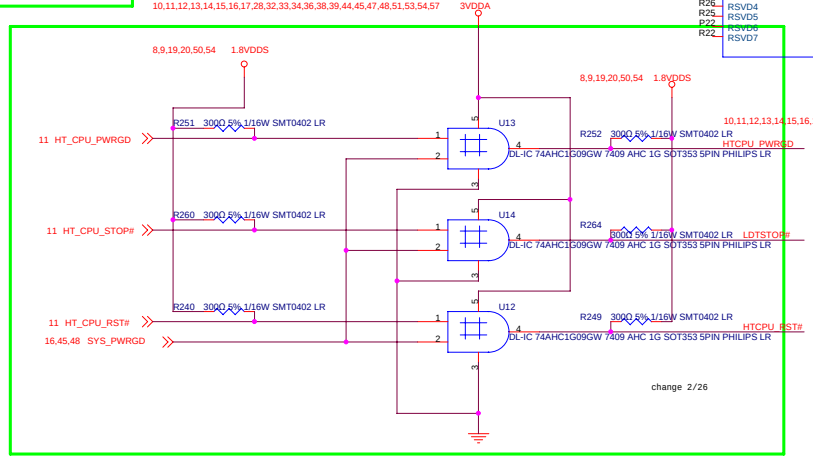
Route as Diff 5/7/5/20

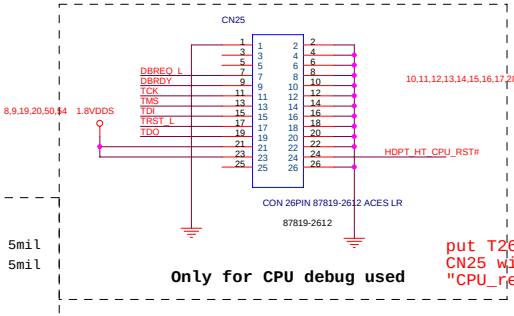
Routing 80 ohm differential impedance

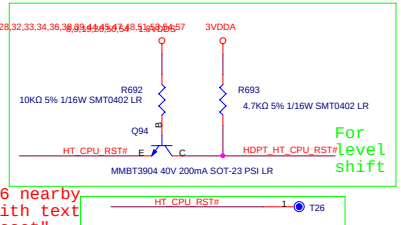
Trace less than 0.5" from processor

LAYOUT: Route differentially with 20/8/5/8/20









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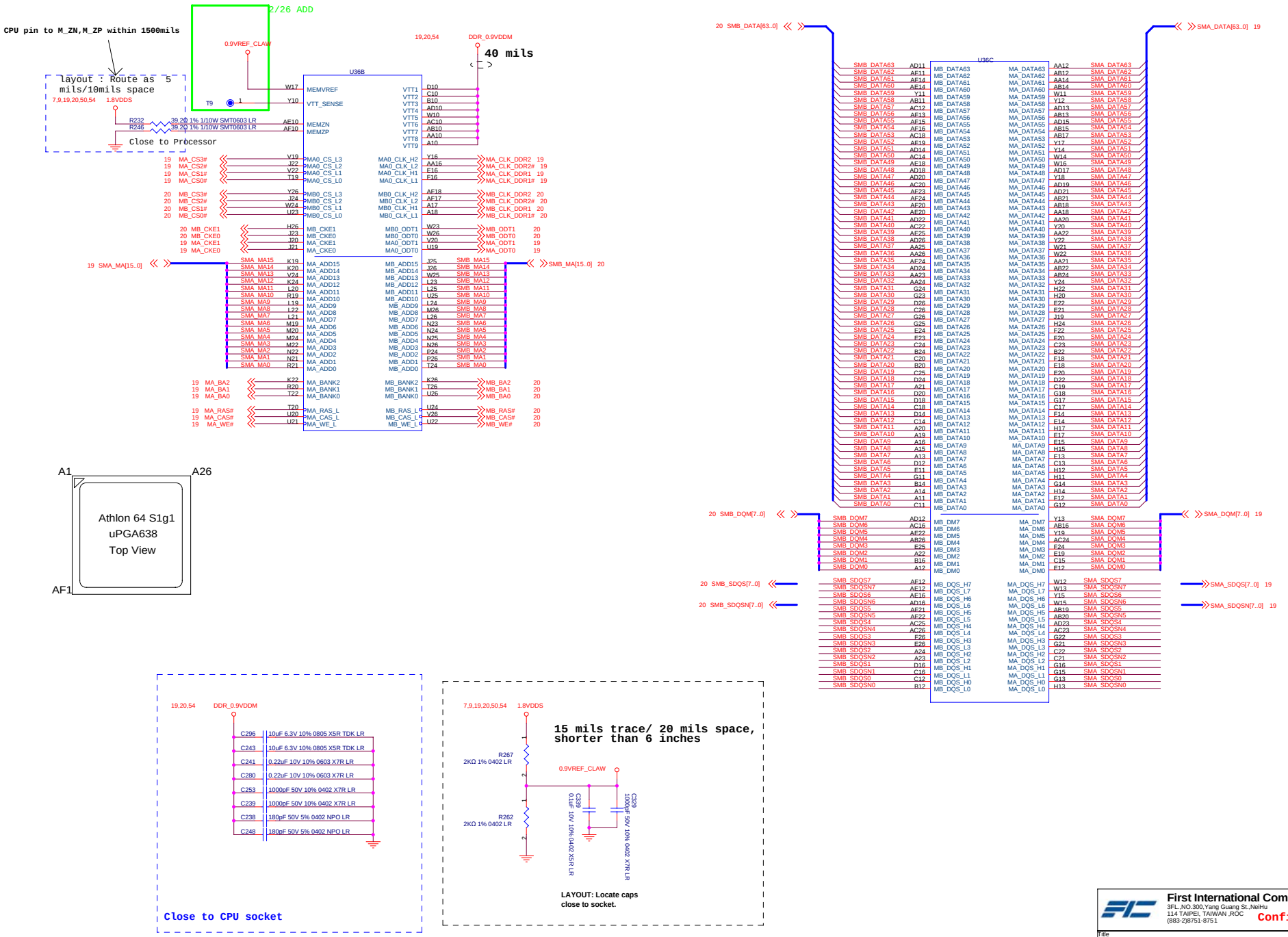
Clawhammer DDR Interface



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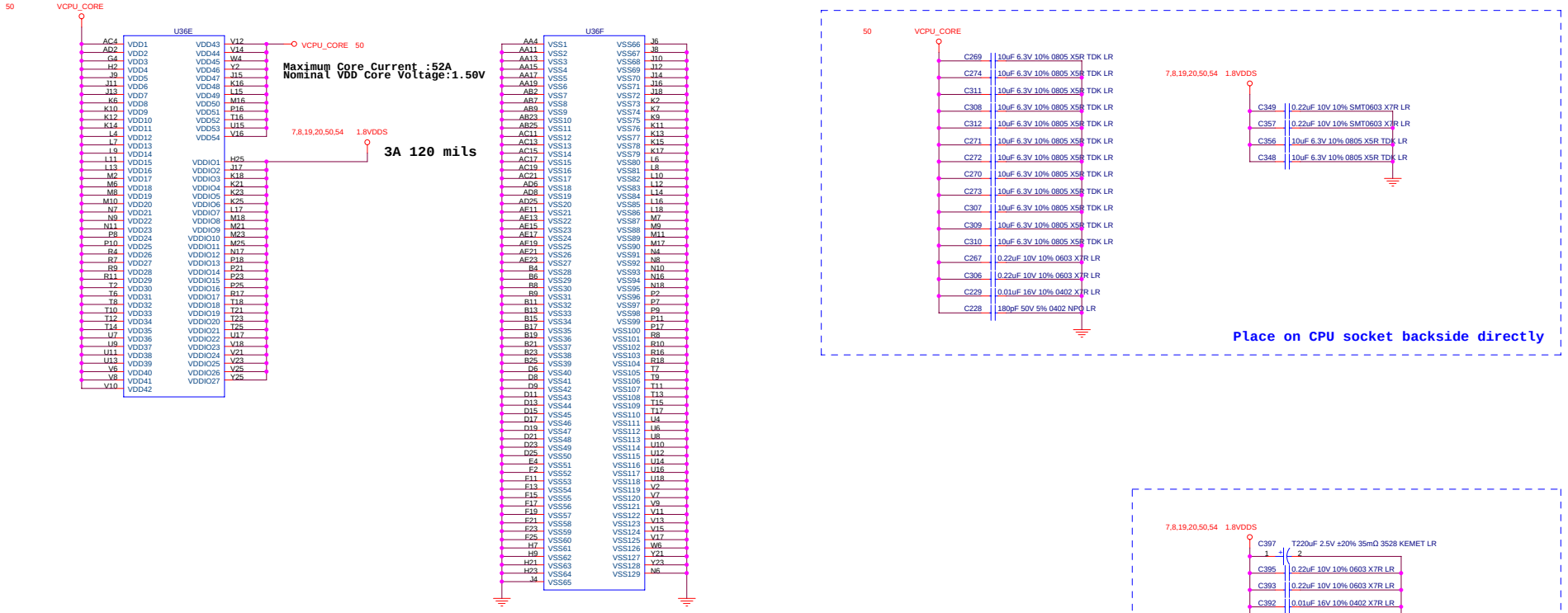

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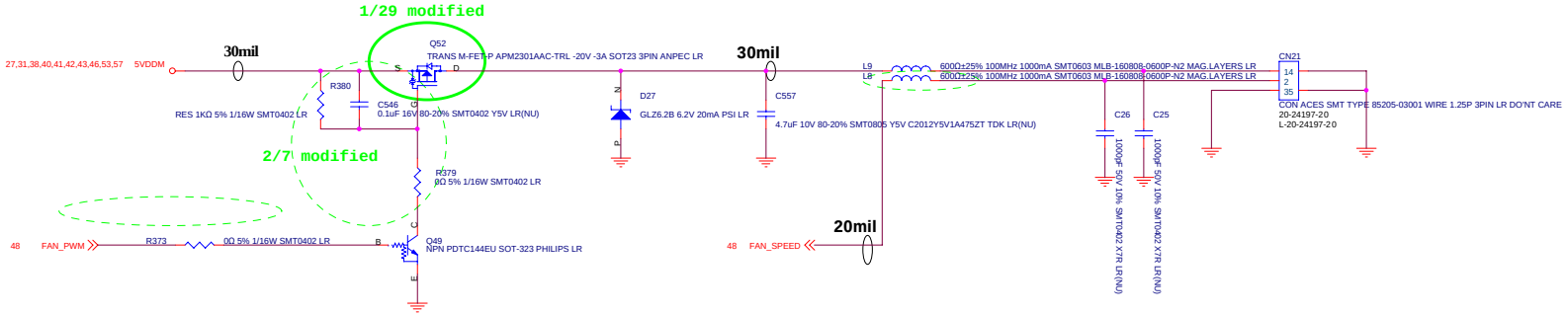
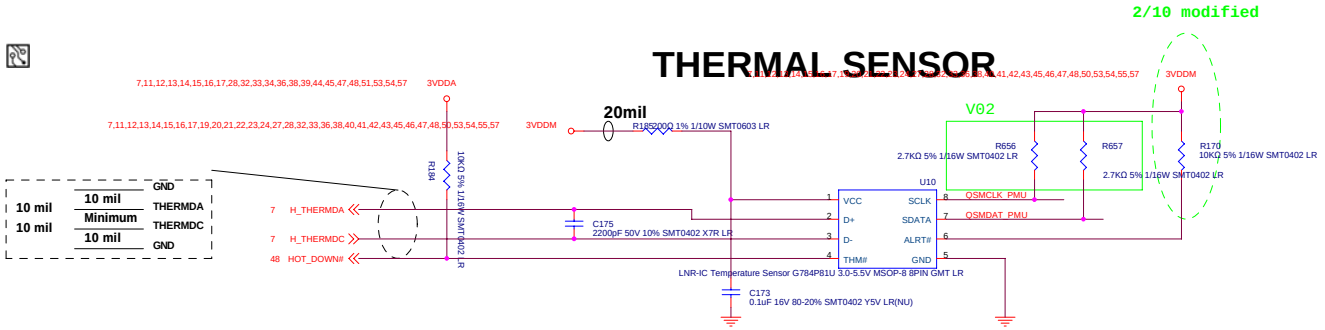
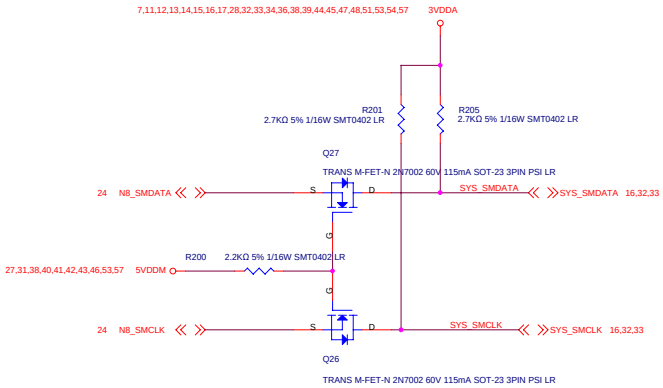
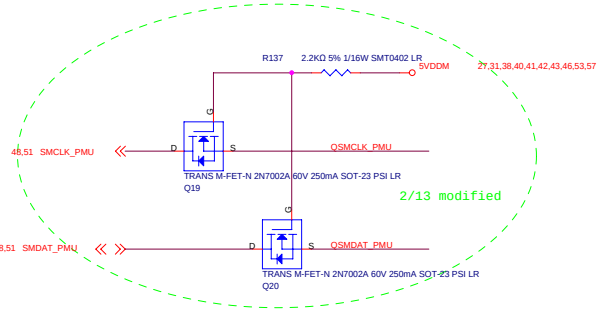
FAN Control



THERMAL SENSOR







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Title	PTT50 (FIC)	
Size C	Document Number CPU Thermal/Fan CNN	Rev 0.1
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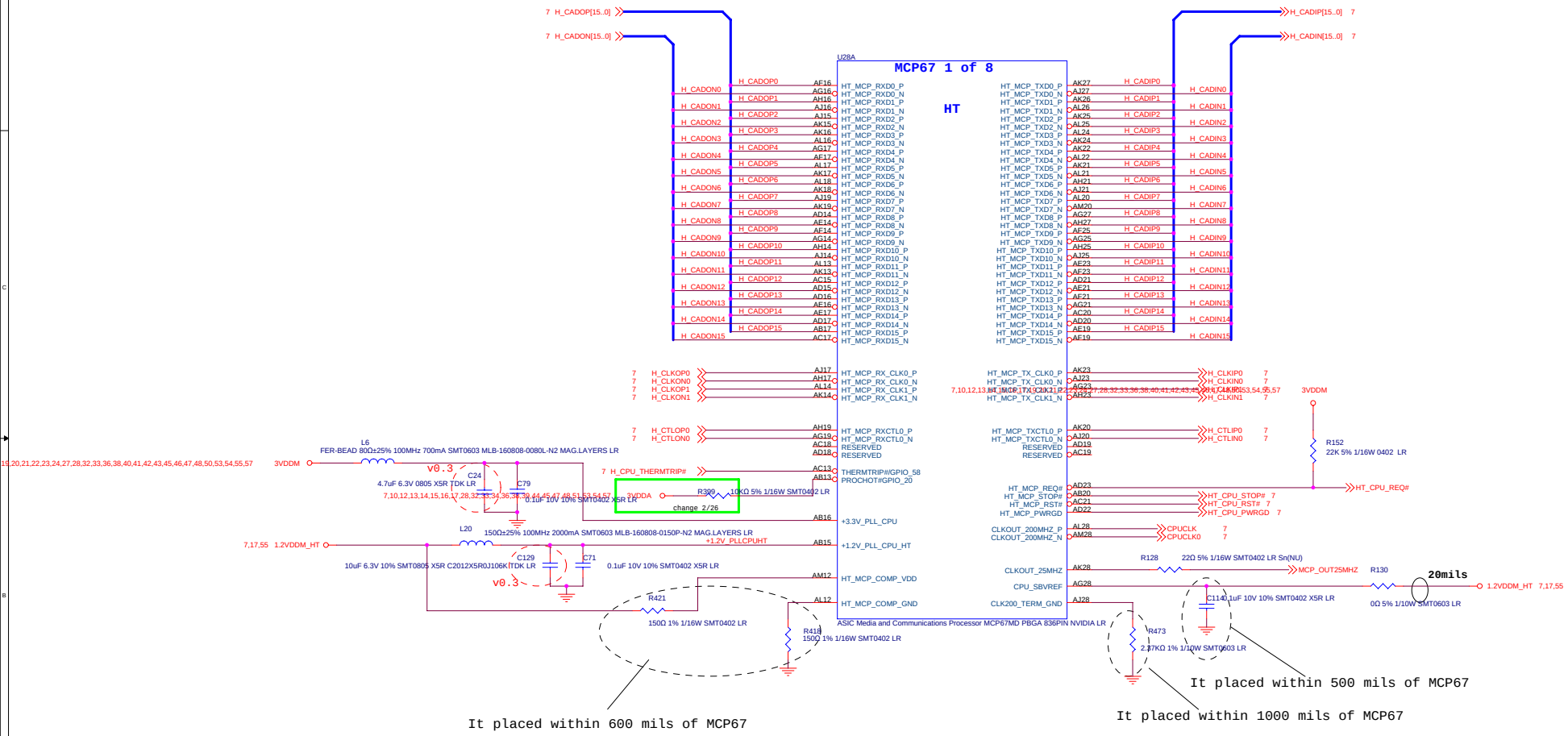

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Size C	Document Number MCP67 HT (1/8)	Rev 0.1
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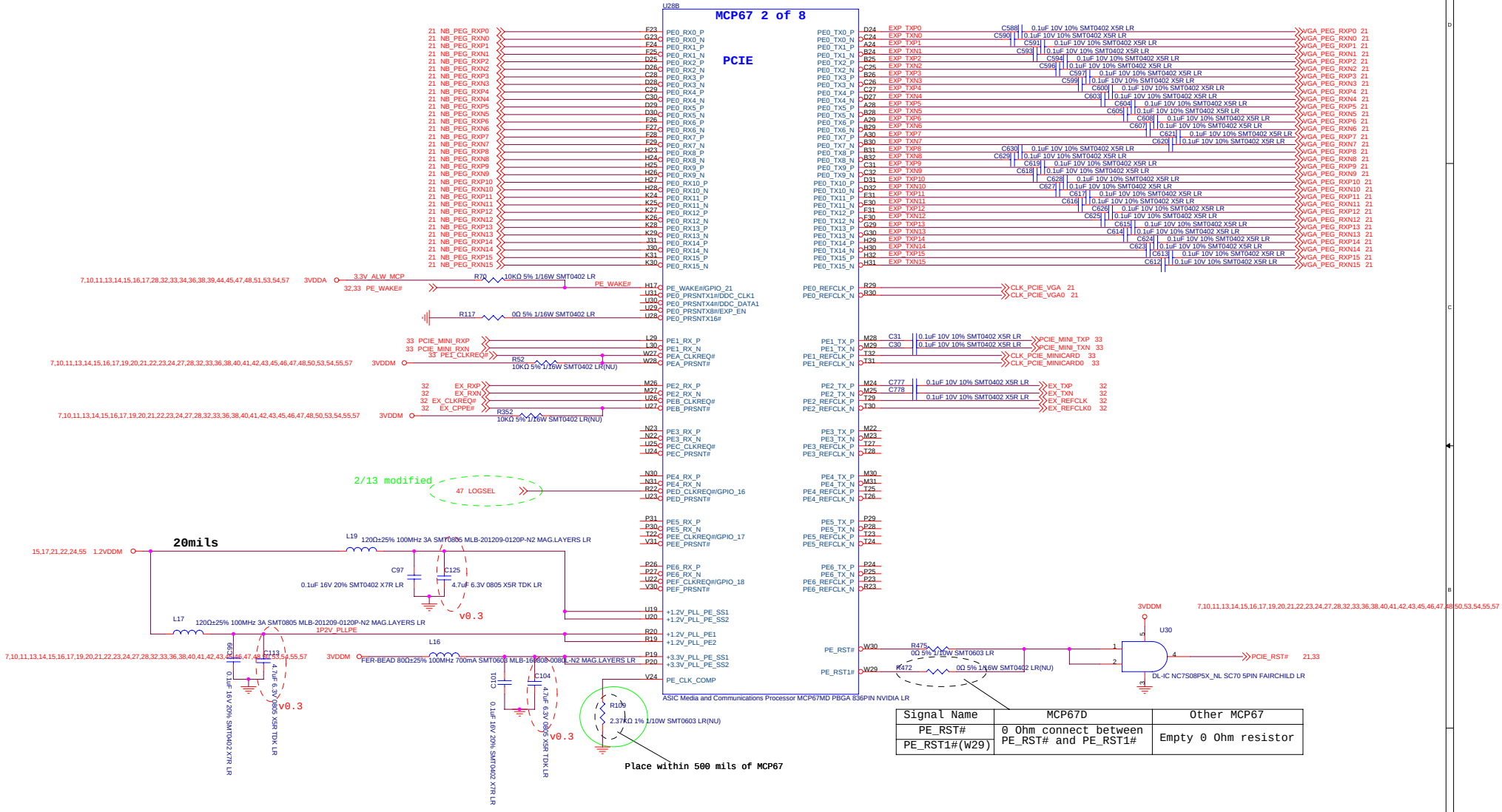

Signal Name	MCP67D	Other MCP67
PE_RST#	0 Ohm connect between PE_RST# and PE_RST1#	Empty 0 Ohm resistor
PE_RST1#(W29)		

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Title: PTT50 (FIC)			
Size: C	Document Number: MCP67 PCIE (2/8)		Rev: 0.1
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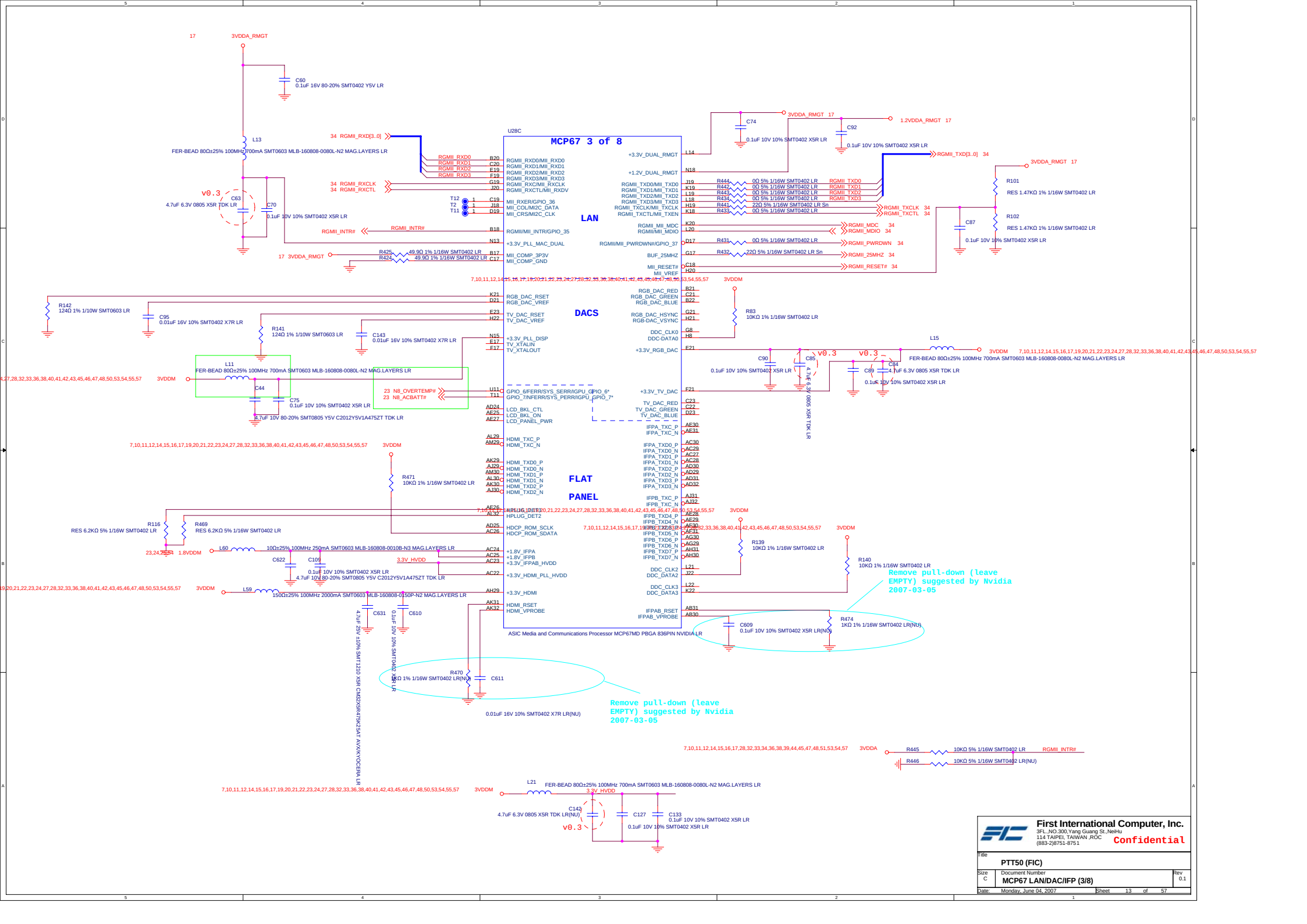
MCP67 3 of 8
LAN
DACS
FLAT PANEL
ASIC Media and Communications Processor MCP67MD PBGA 836PIN NVIDIA LR
Remove pull-down (leave EMPTY) suggested by Nvidia 2007-03-05
Remove pull-down (leave EMPTY) suggested by Nvidia 2007-03-05
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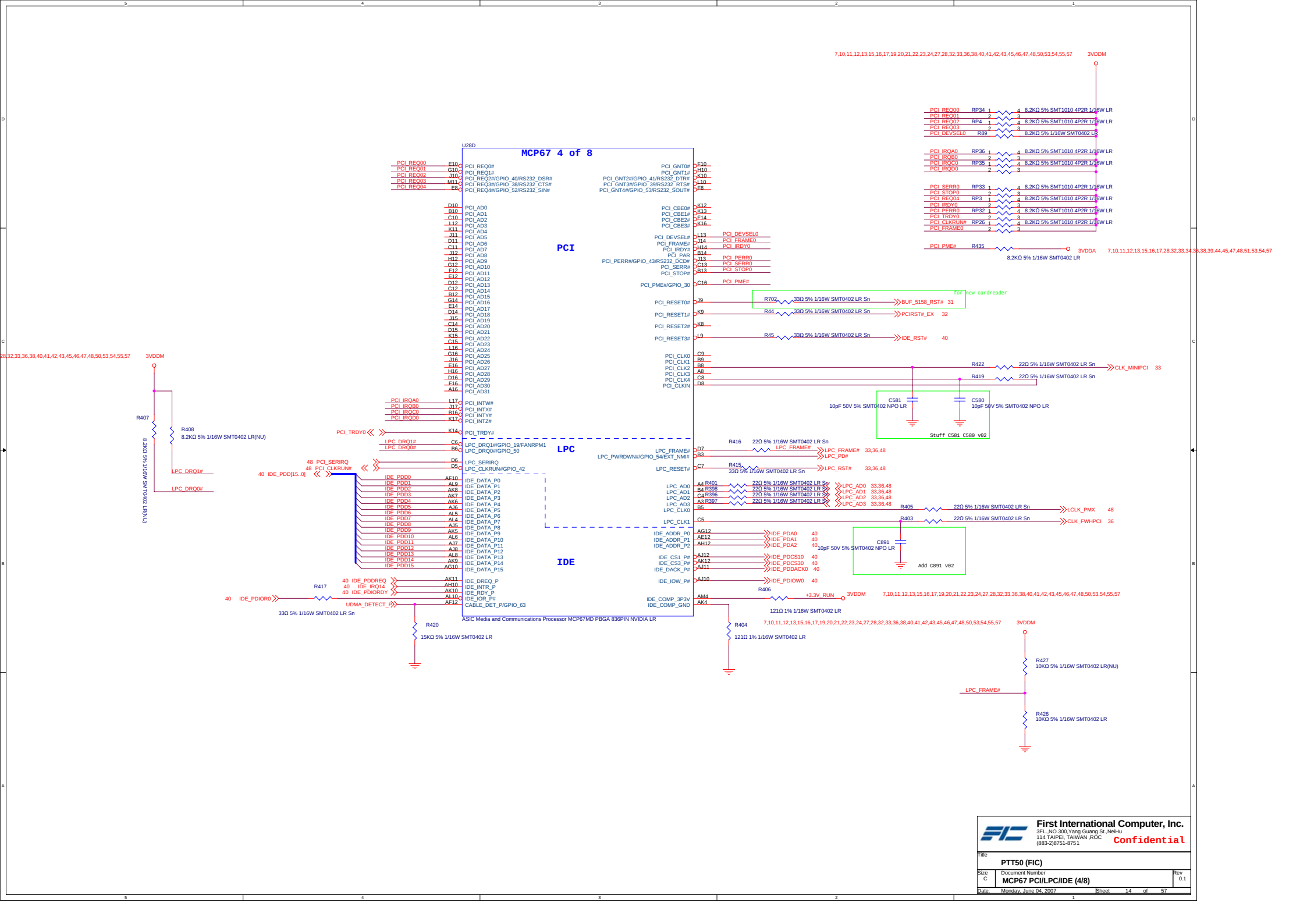
PTT50 (FIC)
MCP67 LAN/DAC/IFP (3/8)
Monday, June 04, 2007


MCP67 4 of 8
U28D
PCI
LPC
IDE
ASIC Media and Communications Processor MCP67MD PBGA 836PIN NVIDIA LR
PCI_REQ0#
PCI_REQ1#
PCI_REQ2#/GPIO_40/RS232_DSR#
PCI_REQ3#/GPIO_38/RS232_CTS#
PCI_REQ4#/GPIO_52/RS232_SIN#
PCI_GNT0#
PCI_GNT1#
PCI_GNT2#/GPIO_41/RS232_DTR#
PCI_GNT3#/GPIO_39/RS232_RTS#
PCI_GNT4#/GPIO_53/RS232_SOUT#
PCI_AD0
PCI_AD1
PCI_AD2
PCI_AD3
PCI_AD4
PCI_AD5
PCI_AD6
PCI_AD7
PCI_AD8
PCI_AD9
PCI_AD10
PCI_AD11
PCI_AD12
PCI_AD13
PCI_AD14
PCI_AD15
PCI_AD16
PCI_AD17
PCI_AD18
PCI_AD19
PCI_AD20
PCI_AD21
PCI_AD22
PCI_AD23
PCI_AD24
PCI_AD25
PCI_AD26
PCI_AD27
PCI_AD28
PCI_AD29
PCI_AD30
PCI_AD31
PCI_CBE0#
PCI_CBE1#
PCI_CBE2#
PCI_CBE3#
PCI_DEVSEL#
PCI_FRAME#
PCI_IRDY#
PCI_PAR
PCI_PERR#/GPIO_43/RS232_DCD#
PCI_SERR#
PCI_STOP#
PCI_PME#/GPIO_30
PCI_RESET0#
PCI_RESET1#
PCI_RESET2#
PCI_RESET3#
PCI_CLK0
PCI_CLK1
PCI_CLK2
PCI_CLK3
PCI_CLK4
PCI_CLKIN
PCI_INTW#
PCI_INTX#
PCI_INTY#
PCI_INTZ#
PCI_TRDY#
LPC_DRQ1#/GPIO_19/FANRPM1
LPC_DRQ0#/GPIO_50
LPC_SERIRQ
LPC_CLKRUN#/GPIO_42
LPC_FRAME#
LPC_PWRDWN#/GPIO_54/EXT_NMI#
LPC_RESET#
LPC_AD0
LPC_AD1
LPC_AD2
LPC_AD3
LPC_CLK0
LPC_CLK1
IDE_DATA_P0
IDE_DATA_P1
IDE_DATA_P2
IDE_DATA_P3
IDE_DATA_P4
IDE_DATA_P5
IDE_DATA_P6
IDE_DATA_P7
IDE_DATA_P8
IDE_DATA_P9
IDE_DATA_P10
IDE_DATA_P11
IDE_DATA_P12
IDE_DATA_P13
IDE_DATA_P14
IDE_DATA_P15
IDE_ADDR_P0
IDE_ADDR_P1
IDE_ADDR_P2
IDE_CS1_P#
IDE_CS3_P#
IDE_DACK_P#
IDE_IOW_P#
IDE_DREQ_P
IDE_INTR_P
IDE_RDY_P
IDE_IOR_P#
CABLE_DET_P/GPIO_63
IDE_COMP_3P3V
IDE_COMP_GND
3VDDM
3VDDA
for new cardreader
Stuff C581 C580 v02
Add C891 v02
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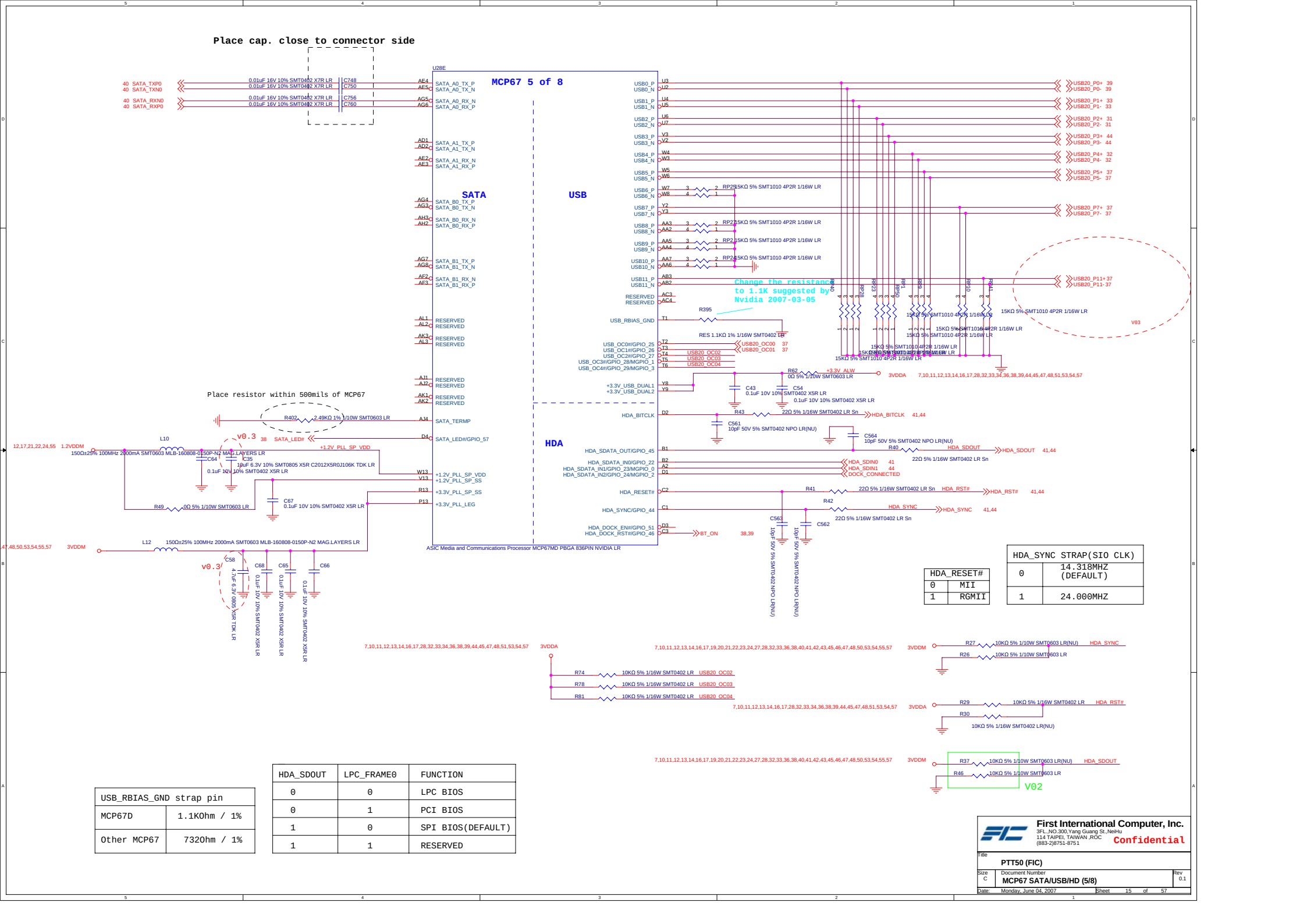
MCP67 PCI/LPC/IDE (4/8)
Monday, June 04, 2007



USB_RBIAS_GND strap pin	
MCP67D	1.1KOhm / 1%
Other MCP67	732Ohm / 1%

HDA_SDOUT	LPC_FRAME0	FUNCTION
0	0	LPC BIOS
0	1	PCI BIOS
1	0	SPI BIOS(DEFAULT)
1	1	RESERVED

HDA_RESET#	
0	MII
1	RGMII

HDA_SYNC STRAP(SIO CLK)	
0	14.318MHZ (DEFAULT)
1	24.000MHZ

V02

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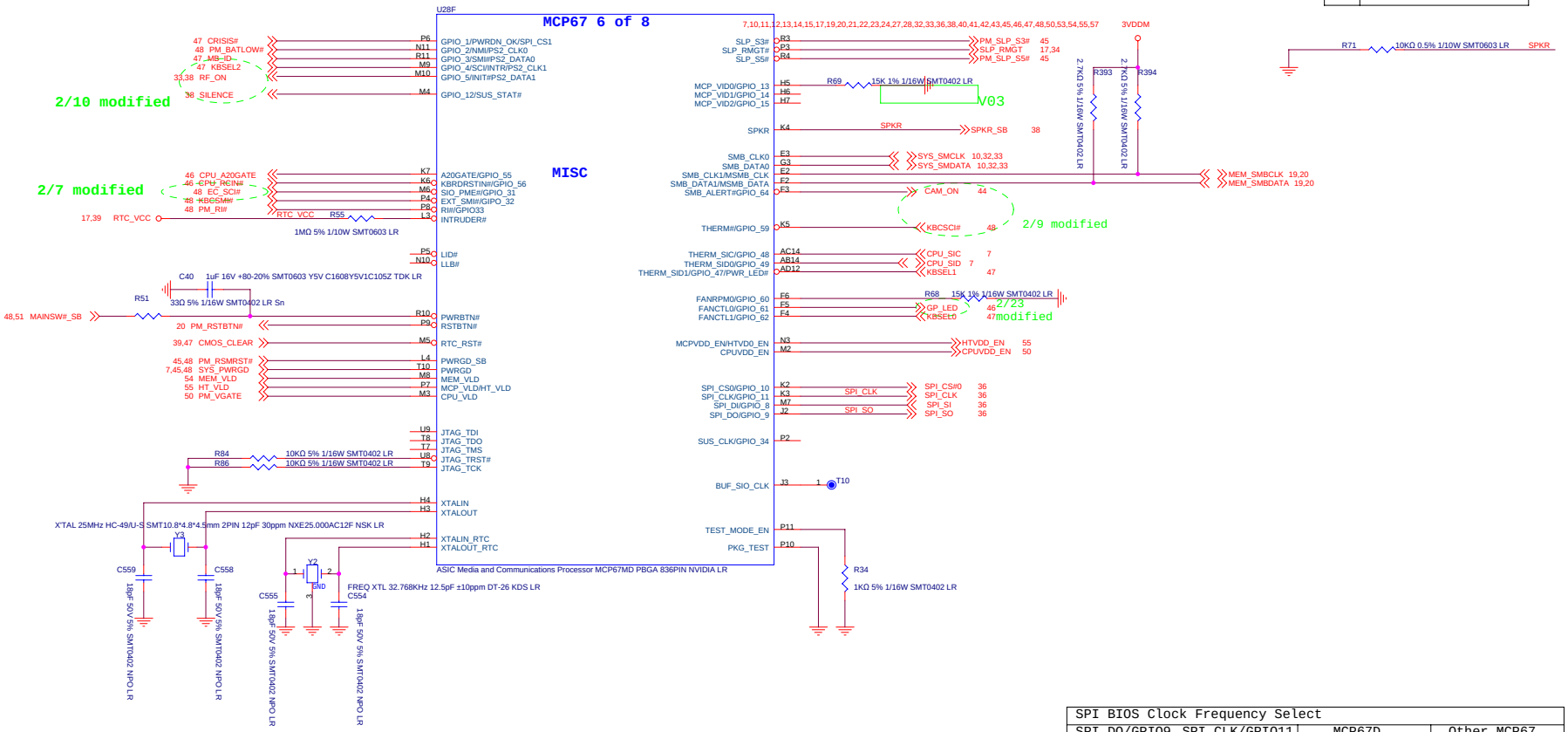
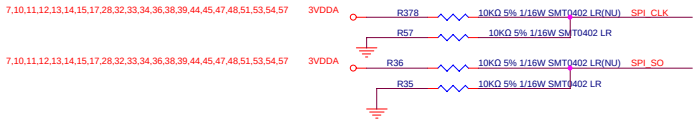
Boot Mode Select : SPKR	
0	USER Mode (DEFAULT)
1	SAFE Mode



SPI BIOS Clock Frequency Select		
SPI_DO/GPIO9 SPI_CLK/GPIO11	MCP67D	Other MCP67
00	500KHz	31MHz(default)
01	1.8MHz	42MHz
10	2.5MHz	25MHz
11	25MHz(default)	1MHz



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PTT50 (FIC)		
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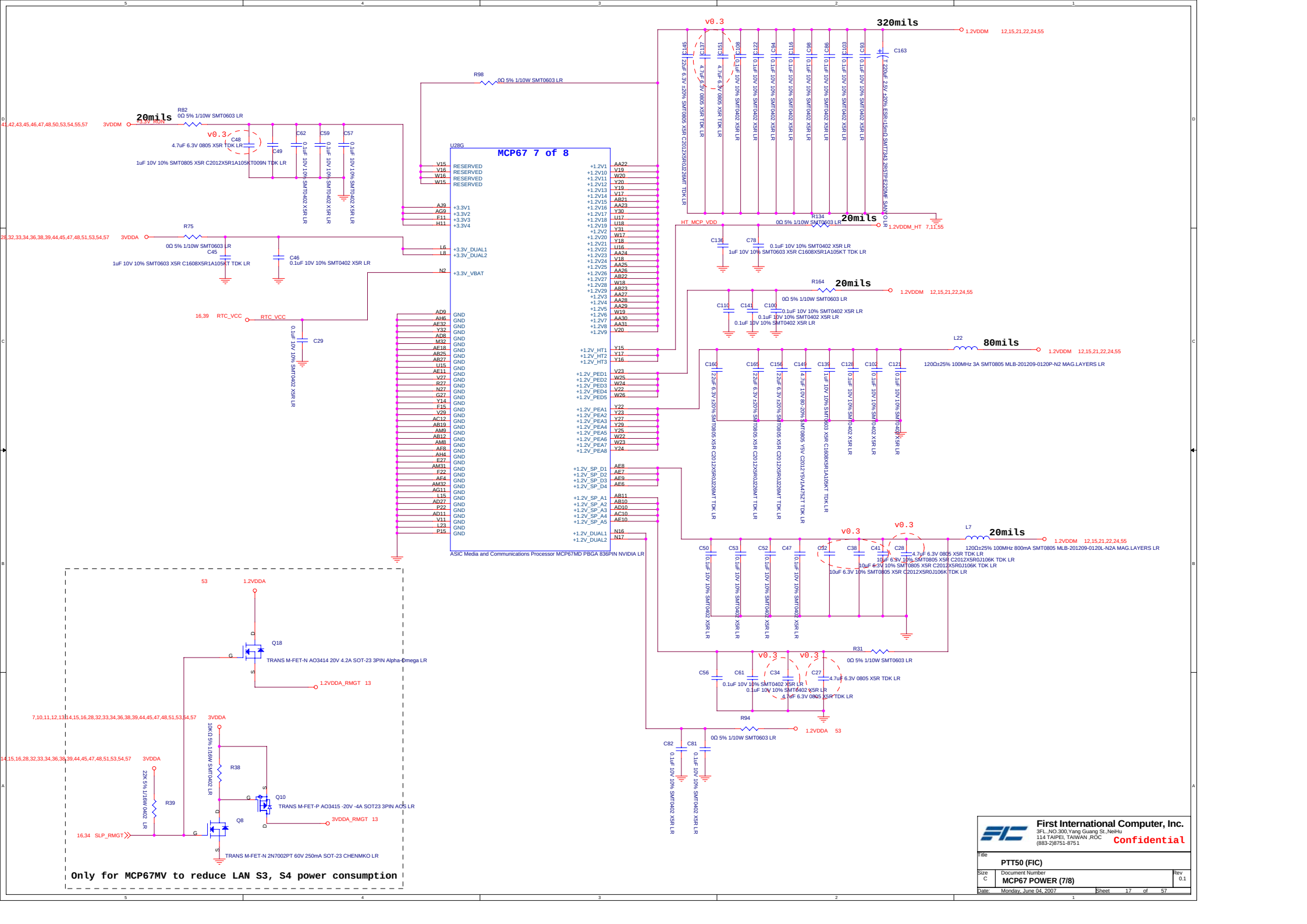

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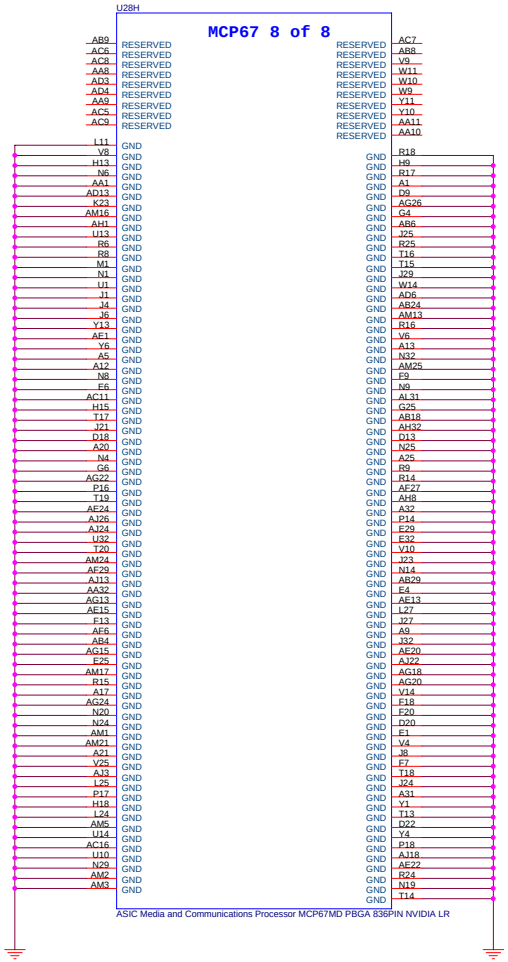

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Size: C | Document Number: MCP67 GND (8/8) | Rev: 0.1

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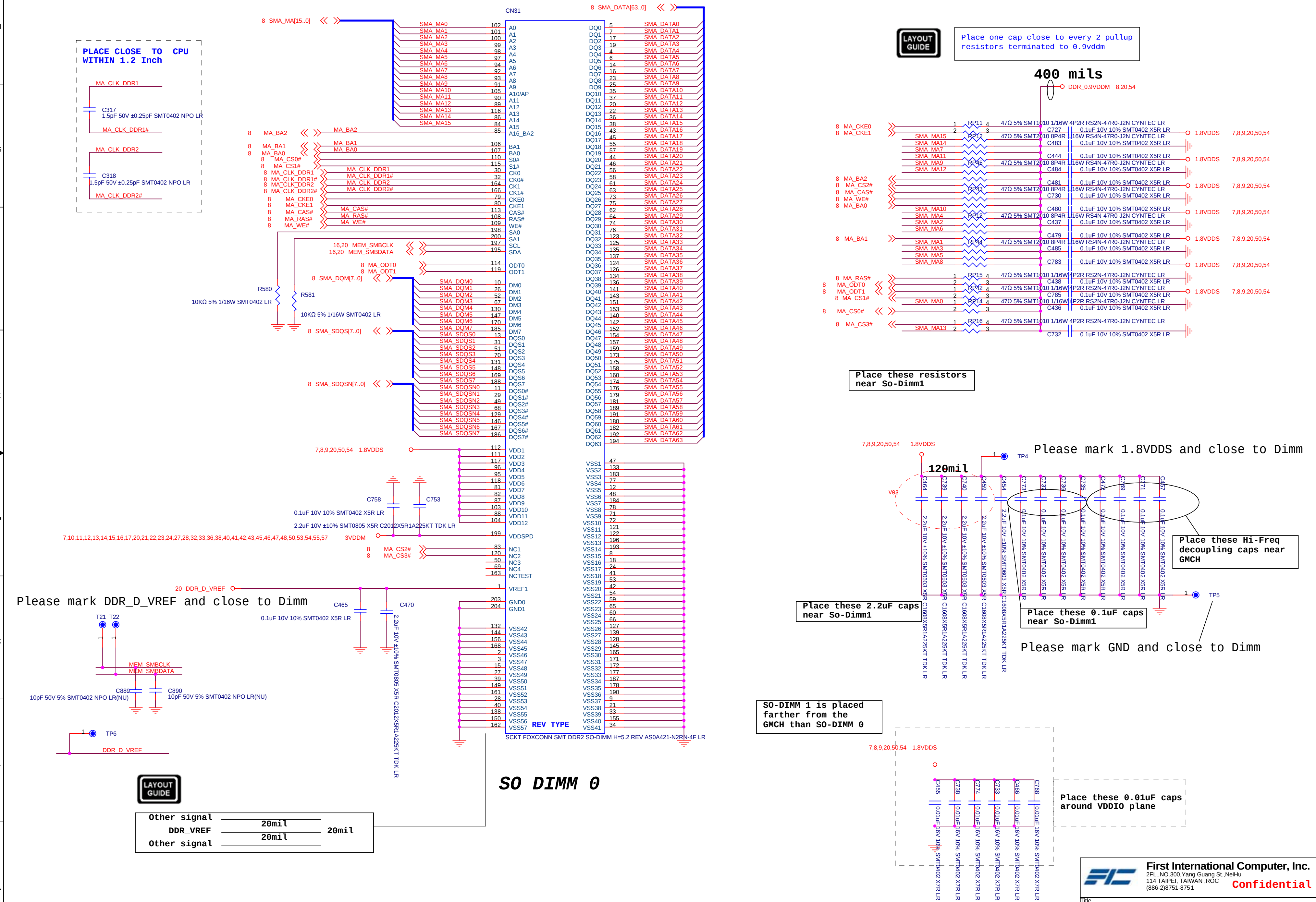
PLACE CLOSE TO CPU
WITHIN 1.2 Inch
MA_CLK_DDR1
C317
1.5pF 50V ±0.25pF SMT0402 NPO LR
MA_CLK_DDR1#
MA_CLK_DDR2
C318
1.5pF 50V ±0.25pF SMT0402 NPO LR
MA_CLK_DDR2#
8 SMA_MA[15..0]
SMA_MA0 … SMA_MA15
8 MA_BA2
8 MA_BA1
8 MA_BA0
8 MA_CS0#
8 MA_CS1#
8 MA_CLK_DDR1
8 MA_CLK_DDR1#
8 MA_CLK_DDR2
8 MA_CLK_DDR2#
8 MA_CKE0
8 MA_CKE1
8 MA_CAS#
8 MA_RAS#
8 MA_WE#
16,20 MEM_SMBCLK
16,20 MEM_SMBDATA
8 MA_ODT0
8 MA_ODT1
8 SMA_DQM[7..0]
SMA_DQM0 … SMA_DQM7
8 SMA_SDQS[7..0]
SMA_SDQS0 … SMA_SDQS7
8 SMA_SDQSN[7..0]
SMA_SDQSN0 … SMA_SDQSN7
R580
10KΩ 5% 1/16W SMT0402 LR
R581
10KΩ 5% 1/16W SMT0402 LR
CN31
A0 … A15, A10/AP, A16_BA2, BA1, BA0, S0#, S1#, CK0, CK0#, CK1, CK1#, CKE0, CKE1, CAS#, RAS#, WE#, SA0, SA1, SCL, SDA, ODT0, ODT1, DM0 … DM7, DQS0 … DQS7, DQS0# … DQS7#, VDD1 … VDD12, VDDSPD, NC1, NC2, NC3, NC4, NCTEST, VREF1, GND0, GND1, VSS1 … VSS57
DQ0 … DQ63
8 SMA_DATA[63..0]
SMA_DATA0 … SMA_DATA63
REV TYPE
SCKT FOXCONN SMT DDR2 SO-DIMM H=5.2 REV AS0A421-N2RN-4F LR
7,8,9,20,50,54 1.8VDDS
C758
C753
0.1uF 10V 10% SMT0402 X5R LR
2.2uF 10V ±10% SMT0805 X5R C2012X5R1A225KT TDK LR
7,10,11,12,13,14,15,16,17,20,21,22,23,24,27,28,32,33,36,38,40,41,42,43,45,46,47,48,50,53,54,55,57 3VDDM
8 MA_CS2#
8 MA_CS3#
20 DDR_D_VREF
Please mark DDR_D_VREF and close to Dimm
C465
C470
0.1uF 10V 10% SMT0402 X5R LR
2.2uF 10V ±10% SMT0805 X5R C2012X5R1A225KT TDK LR
T21 T22
MEM_SMBCLK
MEM_SMBDATA
C889
10pF 50V 5% SMT0402 NPO LR(NU)
C890
10pF 50V 5% SMT0402 NPO LR(NU)
TP6
DDR_D_VREF
LAYOUT GUIDE
Other signal 20mil
DDR_VREF 20mil
Other signal 20mil
SO DIMM 0
LAYOUT GUIDE
Place one cap close to every 2 pullup resistors terminated to 0.9vddm
400 mils
DDR_0.9VDDM 8,20,54
RP11 47Ω 5% SMT1010 1/16W 4P2R RS2N-47R0-J2N CYNTEC LR
RP12 47Ω 5% SMT2010 8P4R 1/16W RS4N-47R0-J2N CYNTEC LR
RP45 47Ω 5% SMT2010 8P4R 1/16W RS4N-47R0-J2N CYNTEC LR
RP43 47Ω 5% SMT2010 8P4R 1/16W RS4N-47R0-J2N CYNTEC LR
RP13 47Ω 5% SMT2010 8P4R 1/16W RS4N-47R0-J2N CYNTEC LR
RP44 47Ω 5% SMT2010 8P4R 1/16W RS4N-47R0-J2N CYNTEC LR
RP15 47Ω 5% SMT1010 1/16W 4P2R RS2N-47R0-J2N CYNTEC LR
RP42 47Ω 5% SMT1010 1/16W 4P2R RS2N-47R0-J2N CYNTEC LR
RP14 47Ω 5% SMT1010 1/16W 4P2R RS2N-47R0-J2N CYNTEC LR
RP16 47Ω 5% SMT1010 1/16W 4P2R RS2N-47R0-J2N CYNTEC LR
C727, C483, C444, C484, C481, C730, C480, C437, C479, C485, C783, C438, C785, C436, C732 0.1uF 10V 10% SMT0402 X5R LR
1.8VDDS 7,8,9,20,50,54
Place these resistors near So-Dimm1
Please mark 1.8VDDS and close to Dimm
TP4
120mil
V03
C464, C739, C740, C459, C454 2.2uF 10V ±10% SMT0603 X5R C1608X5R1A225KT TDK LR
C773, C737, C736, C735, C472, C769, C771, C457 0.1uF 10V 10% SMT0402 X5R LR
Place these Hi-Freq decoupling caps near GMCH
Place these 2.2uF caps near So-Dimm1
Place these 0.1uF caps near So-Dimm1
TP5
Please mark GND and close to Dimm
SO-DIMM 1 is placed farther from the GMCH than SO-DIMM 0
7,8,9,20,50,54 1.8VDDS
C455, C738, C774, C733, C466, C768 0.01uF 16V 10% SMT0402 X7R LR
Place these 0.01uF caps around VDDIO plane

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PLACE CLOSE TO CPU WITHIN 1.2 Inch

MB_CLK_DDR1 — C334 1.5pF 50V ±0.25pF SMT0402 NPO LR — MB_CLK_DDR1#

MB_CLK_DDR2 — C333 1.5pF 50V ±0.25pF SMT0402 NPO LR — MB_CLK_DDR2#

CN32

8 SMB_MA[15..0] — SMB_MA[15..0] — SMB_MA0 … SMB_MA15

8 SMB_DATA[63..0] — SMB_DATA0 … SMB_DATA63

8 MB_BA2 — MB_BA2

8 MB_BA1 — MB_BA1

8 MB_BA0 — MB_BA0

8 MB_CS0# — MB_CS1# — MB_CLK_DDR1 — MB_CLK_DDR1# — MB_CLK_DDR2 — MB_CLK_DDR2# — MB_CKE0 — MB_CKE1 — MB_CAS# — MB_RAS# — MB_WE#

7,10,11,12,13,14,15,16,17,19,21,22,23,24,27,28,32,33,36,38,40,41,42,43,45,46,47,48,50,53,54,55,57 — 3VDDM — R591 10KΩ 5% 1/16W SMT0402 LR

16,19 MEM_SMBCLK — 16,19 MEM_SMBDATA

8 MB_ODT0 — 8 MB_ODT1

8 SMB_DQM[7..0] — SMB_DQM0 … SMB_DQM7 — R595 10KΩ 5% 1/16W SMT0402 LR

8 SMB_SDQS[7..0] — SMB_SDQS0 … SMB_SDQS7

8 SMB_SDQSN[7..0] — SMB_SDQSN0 … SMB_SDQSN7

7,8,9,19,50,54 1.8VDDS — VDD1 … VDD12

C742 C741 — 0.1uF 10V 10% SMT0402 X5R LR — 2.2uF 10V ±10% SMT0603 X5R C1608X5R1A225KT TDK LR

7,10,11,12,13,14,15,16,17,19,21,22,23,24,27,28,32,33,36,38,40,41,42,43,45,46,47,48,50,53,54,55,57 — 3VDDM — VDDSPD

8 MB_CS2# — 8 MB_CS3# — NC1 NC2 NC3 NC4 NCTEST

19 DDR_D_VREF — 54 DDR_VREF — JP20 0Ω 5% 1/10W SMT0603 LR — VREF1

C446 C448 — 0.1uF 10V 10% SMT0402 X5R LR — 2.2uF 10V ±10% SMT0805 X5R C2012X5R1A225KT TDK LR

GND0 GND1

VSS1 … VSS57

STD TYPE

SCKT Foxconn Soft tray AS0A421-NZSN-4F DDR2 H5.2mm STD

T24 T23

16,19 MEM_SMBCLK — 16,19 MEM_SMBDATA

7,8,9,19,50,54 1.8VDDS — R303 10KΩ 1% 1/16W SMT0402 LR(NU) — T1 — R302 10KΩ 1% 1/16W SMT0402 LR(NU) — 16 PM_RSTBTN#

FOR DDR TEST (Near DDR Door)

LAYOUT GUIDE

Other signal — 20mil — DDR_VREF — 20mil — Other signal

SO DIMM 1

LAYOUT GUIDE

Place one cap close to every 2 pullup resistors terminated to 0.9vddm

400 mils

DDR_0.9VDDM 8,19,54

SMB_MA9 SMB_MA12 — RP18 RP17 RP21 RP30 RP29 RP28 RP27 RP26 RP25 RP24 RP23 RP22 RP20 — 47Ω 5% SMT1010 1/16W 4P2R RS2N-47R0-J2N CYNTEC LR

8 MB_CKE1 8 MB_CKE0 8 MB_BA2 8 MB_CS2# 8 MB_CS1# 8 MB_WE# 8 MB_CS0# — 47Ω 5% SMT2010 8P4R 1/16W RS4N-47R0-J2N CYNTEC LR

SMB_MA10 SMB_MA15 SMB_MA14 SMB_MA11 SMB_MA7 SMB_MA6 SMB_MA4 SMB_MA2 SMB_MA0 — 8 MB_ODT1 8 MB_CS3# 8 MB_CAS# 8 MB_BA0 8 MB_ODT0 — SMB_MA13 — 8 MB_BA1 8 MB_RAS# — SMB_MA5 SMB_MA8 — SMB_MA1 SMB_MA3

C442 C782 C445 C482 C729 C435 C441 C728 C781 C439 C731 C434 C443 C784 — 0.1uF 10V 10% SMT0402 X5R LR — 1.8VDDS — 7,8,9,19,50,54

120mil

7,8,9,19,50,54 1.8VDDS — C453 C471 C469 C775 C776 C458 C772 C456 C794 — 2.2uF 10V ±10% SMT0603 X5R C1608X5R1A225KT TDK LR — 0.1uF 10V 10% SMT0402 X5R LR

Place these 2.2uF caps near So-Dimm0

Place these 0.1uF caps near So-Dimm0

7,10,11,12,13,14,15,16,17,19,21,22,23,24,27,28,32,33,36,38,40,41,42,43,45,46,47,48,50,53,54,55,57 — 3VDDM

Place cloase to DIMMs

D44 D43 — DIODE SWITCHING BAV99 75V 150mA SOT-23 3PIN PSI LR

16,19 MEM_SMBCLK — 16,19 MEM_SMBDATA — MEM_SMBCLK — MEM_SMBDATA

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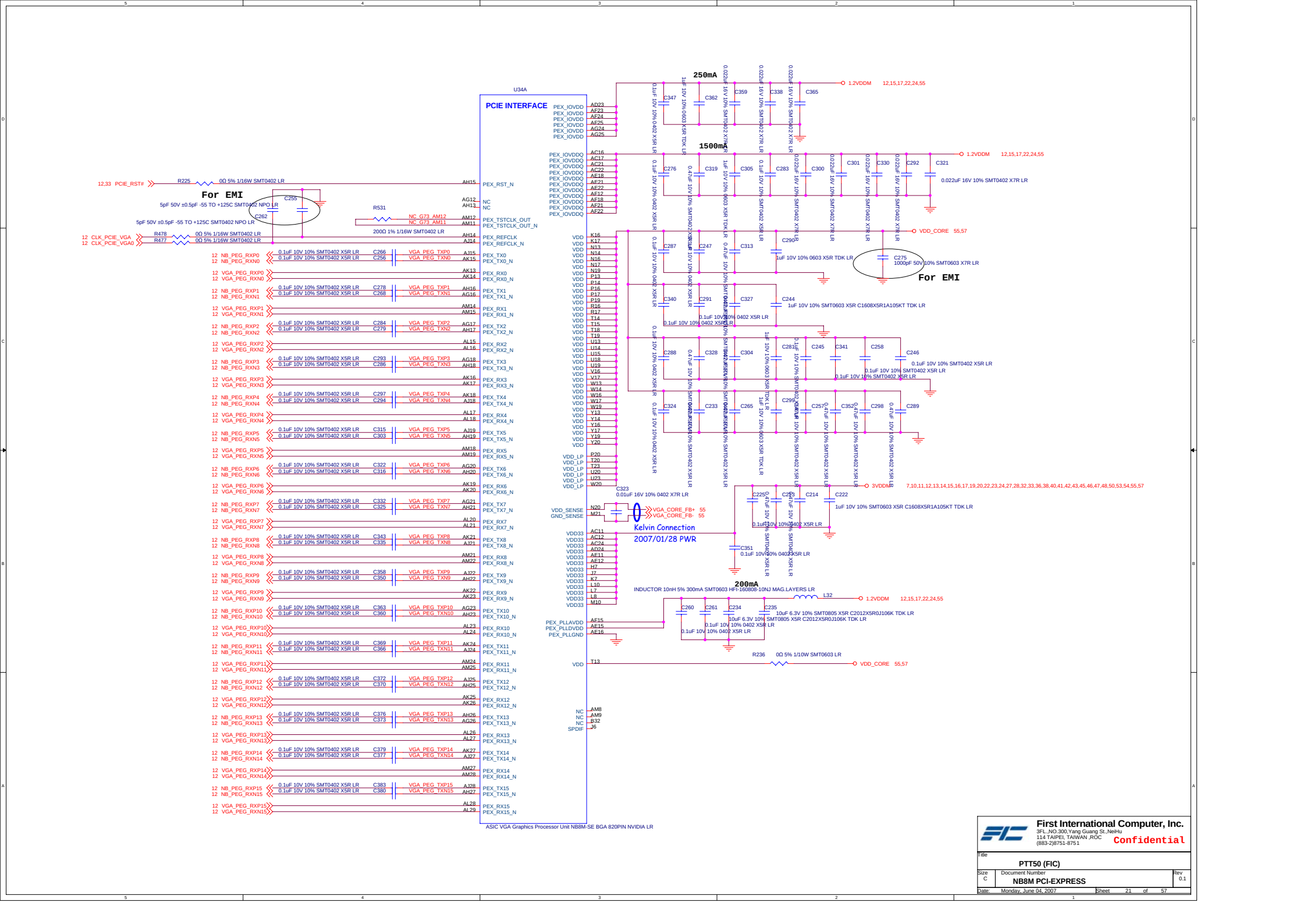
U34A
PCIE INTERFACE
ASIC VGA Graphics Processor Unit NB8M-SE BGA 820PIN NVIDIA LR
250mA
1500mA
200mA
For EMI
Kelvin Connection
2007/01/28 PWR
INDUCTOR 10nH 5% 300mA SMT0603 HFI-160808-10NJ MAG.LAYERS LR
1.2VDDM
3VDDM
VDD_CORE
VGA_CORE_FB+
VGA_CORE_FB-
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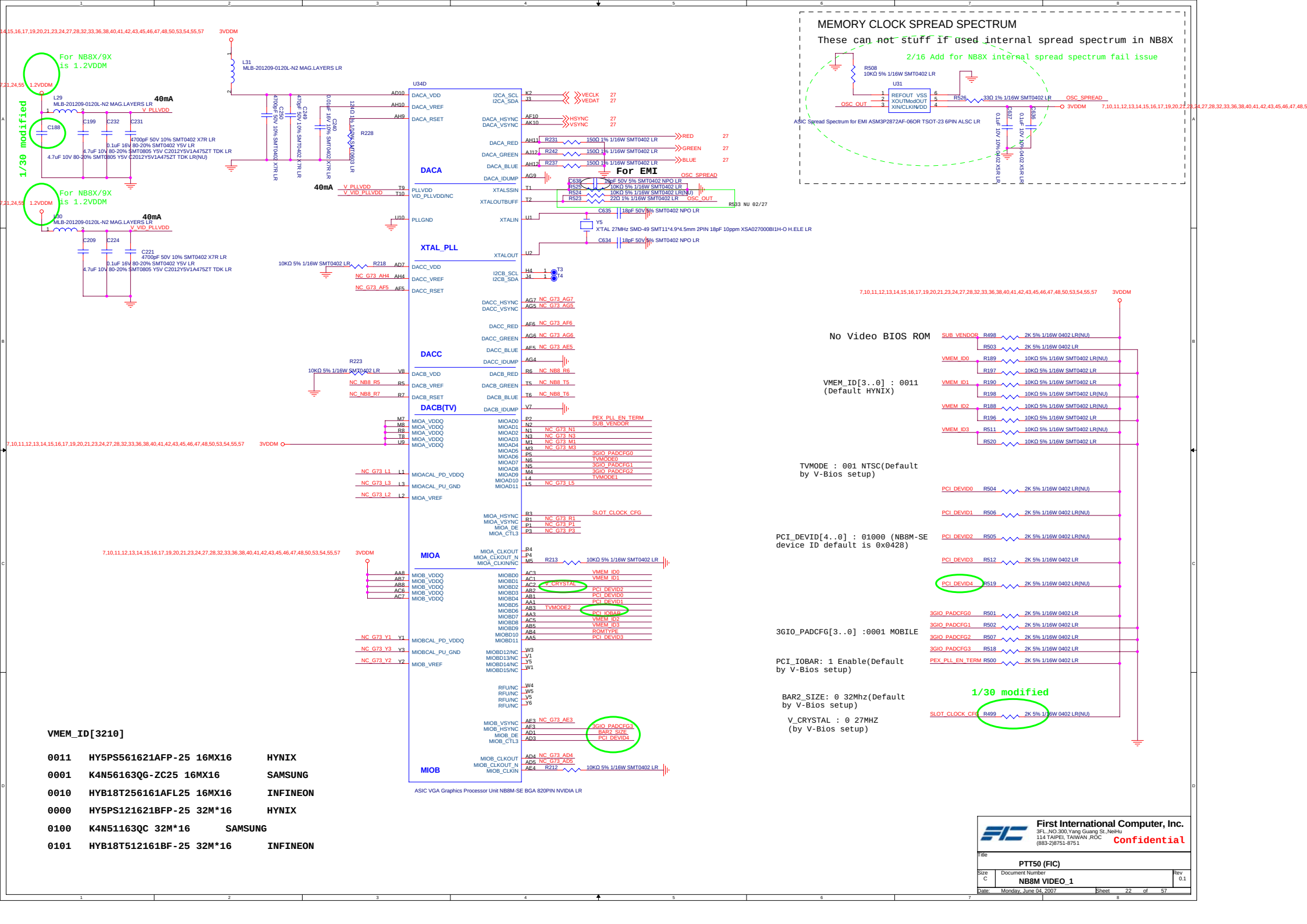
PTT50 (FIC)
NB8M PCI-EXPRESS
Monday, June 04, 2007


MEMORY CLOCK SPREAD SPECTRUM
These can not stuff if used internal spread spectrum in NB8X
2/16 Add for NB8X internal spread spectrum fail issue
ASIC Spread Spectrum for EMI ASM3P2872AF-06OR TSOT-23 6PIN ALSC LR
For NB8X/9X is 1.2VDDM
1/30 modified
For EMI
No Video BIOS ROM
VMEM_ID[3..0] : 0011 (Default HYNIX)
TVMODE : 001 NTSC(Default by V-Bios setup)
PCI_DEVID[4..0] : 01000 (NB8M-SE device ID default is 0x0428)
3GIO_PADCFG[3..0] :0001 MOBILE
PCI_IOBAR: 1 Enable(Default by V-Bios setup)
BAR2_SIZE: 0 32Mhz(Default by V-Bios setup)
V_CRYSTAL : 0 27MHZ (by V-Bios setup)
VMEM_ID[3210]
0011 HY5PS561621AFP-25 16MX16 HYNIX
0001 K4N56163QG-ZC25 16MX16 SAMSUNG
0010 HYB18T256161AFL25 16MX16 INFINEON
0000 HY5PS121621BFP-25 32M*16 HYNIX
0100 K4N51163QC 32M*16 SAMSUNG
0101 HYB18T512161BF-25 32M*16 INFINEON
ASIC VGA Graphics Processor Unit NB8M-SE BGA 820PIN NVIDIA LR
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PTT50 (FIC)
NB8M VIDEO_1
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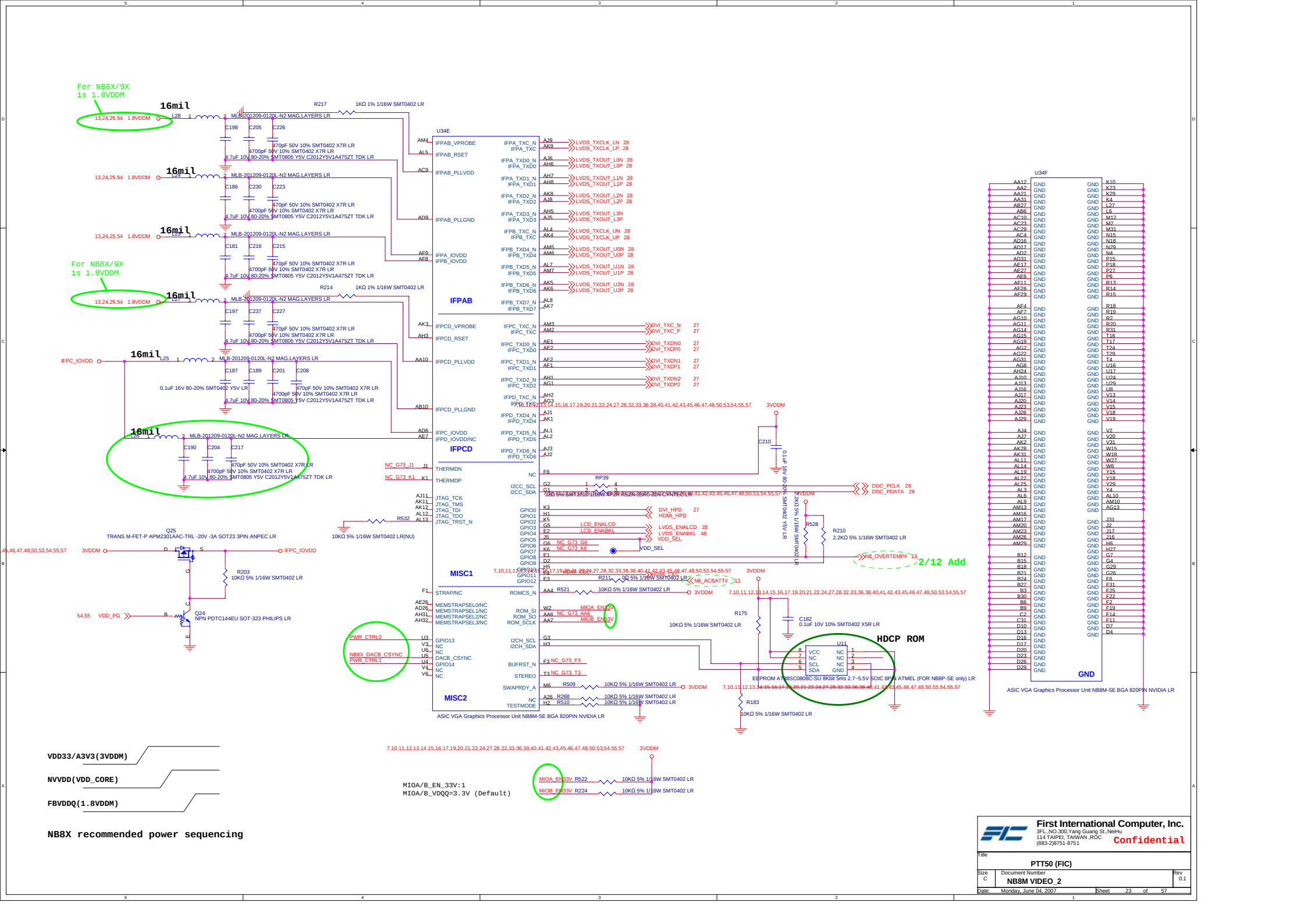
For NB8X/9X is 1.8VDDM
16mil
MLB-201209-0120L-N2 MAG.LAYERS LR
R217 1KΩ 1% 1/16W SMT0402 LR
U34E
IFPAB_VPROBE
IFPAB_RSET
IFPAB_PLLVDD
IFPAB_PLLGND
IFPAB_IOVDD
IFPB_IOVDD
IFPAB
IFPCD_VPROBE
IFPCD_RSET
IFPCD_PLLVDD
IFPCD_PLLGND
IFPC_IOVDD
IFPD_IOVDDD/NC
IFPCD
THERMDN
THERMDP
JTAG_TCK
JTAG_TMS
JTAG_TDI
JTAG_TDO
JTAG_TRST_N
MISC1
STRAP/NC
MEMSTRAPSEL0/NC
MEMSTRAPSEL1/NC
MEMSTRAPSEL2/NC
MEMSTRAPSEL3/NC
GPIO13
GPIO14
DACB_CSYNC
MISC2
ASIC VGA Graphics Processor Unit NB8M-SE BGA 820PIN NVIDIA LR
U34F
GND
ASIC VGA Graphics Processor Unit NB8M-SE BGA 820PIN NVIDIA LR
Q25
TRANS M-FET-P APM2301AAC-TRL -20V -3A SOT23 3PIN ANPEC LR
Q24
NPN PDTC144EU SOT-323 PHILIPS LR
10KΩ 5% 1/16W SMT0402 LR(NU)
HDCP ROM
EEPROM AT98SC0808C-SU 8Kbit 5ms 2.7~5.5V SOIC 8PIN ATMEL (FOR NB8P-SE only) LR
2/12 Add
VDD33/A3V3(3VDDM)
NVVDD(VDD_CORE)
FBVDDQ(1.8VDDM)
NB8X recommended power sequencing
MIOA/B_EN_33V:1
MIOA/B_VDQQ=3.3V (Default)
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PTT50 (FIC)
NB8M VIDEO_2
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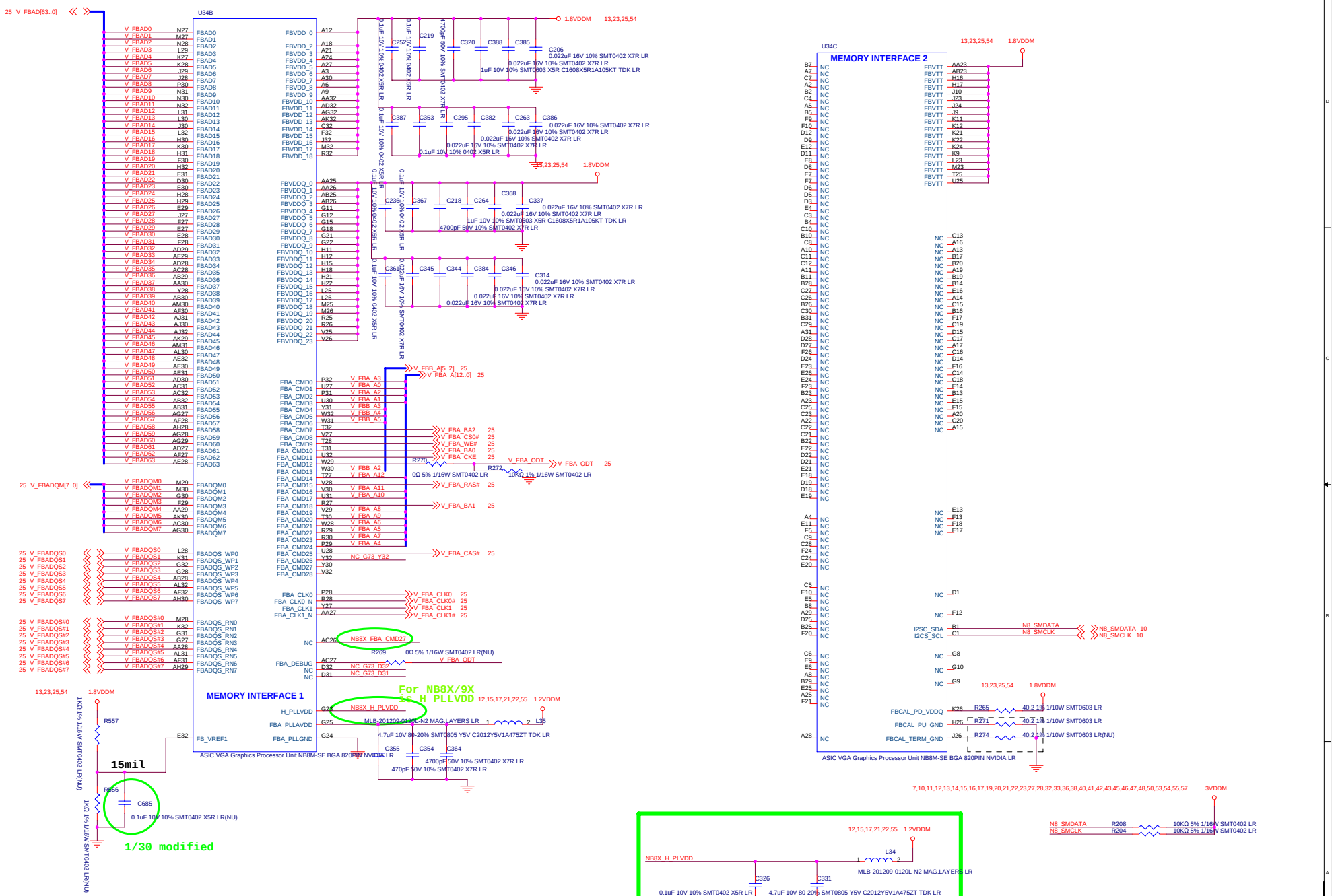
U34B
MEMORY INTERFACE 1
ASIC VGA Graphics Processor Unit NB8M-SE BGA 820PIN NVIDIA LR
U34C
MEMORY INTERFACE 2
ASIC VGA Graphics Processor Unit NB8M-SE BGA 820PIN NVIDIA LR
For NB8X/9X
15mil
1/30 modified
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PTT50 (FIC)
NB8M MEM CHANEL
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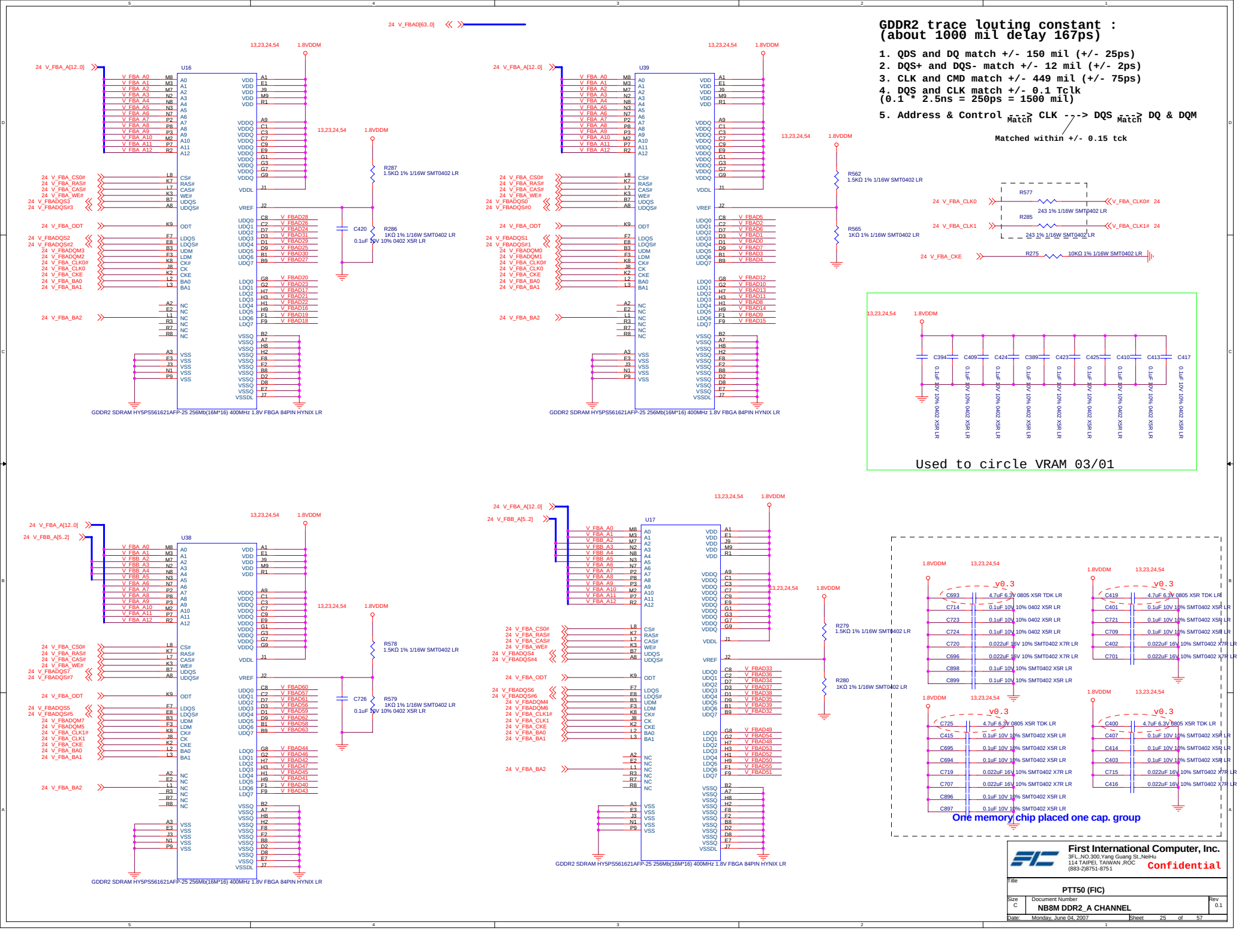
GDDR2 trace louting constant :
(about 1000 mil delay 167ps)
1. QDS and DQ match +/- 150 mil (+/- 25ps)
2. DQS+ and DQS- match +/- 12 mil (+/- 2ps)
3. CLK and CMD match +/- 449 mil (+/- 75ps)
4. DQS and CLK match +/- 0.1 Tclk
(0.1 * 2.5ns = 250ps = 1500 mil)
5. Address & Control ---> CLK ---> DQS ---> DQ & DQM
Match
Match
Matched within +/- 0.15 tck
U16
U39
U38
U17
GDDR2 SDRAM HY5PS561621AFP-25 256Mb(16M*16) 400MHz 1.8V FBGA 84PIN HYNIX LR
R287 1.5KΩ 1% 1/16W SMT0402 LR
R286 1KΩ 1% 1/16W SMT0402 LR
C420 0.1uF 10V 10% 0402 X5R LR
R562 1.5KΩ 1% 1/16W SMT0402 LR
R565 1KΩ 1% 1/16W SMT0402 LR
R577
R285
243 1% 1/16W SMT0402 LR
R275 10KΩ 1% 1/16W SMT0402 LR
Used to circle VRAM 03/01
R578 1.5KΩ 1% 1/16W SMT0402 LR
R579 1KΩ 1% 1/16W SMT0402 LR
C726 0.1uF 10V 10% 0402 X5R LR
R279 1.5KΩ 1% 1/16W SMT0402 LR
R280 1KΩ 1% 1/16W SMT0402 LR
One memory chip placed one cap. group
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PTT50 (FIC)
NB8M DDR2_A CHANNEL
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Title
PTT50 (FIC)

Size	Document Number	Rev
Custom	NB8M DDR2_C CHANNEL	0.1

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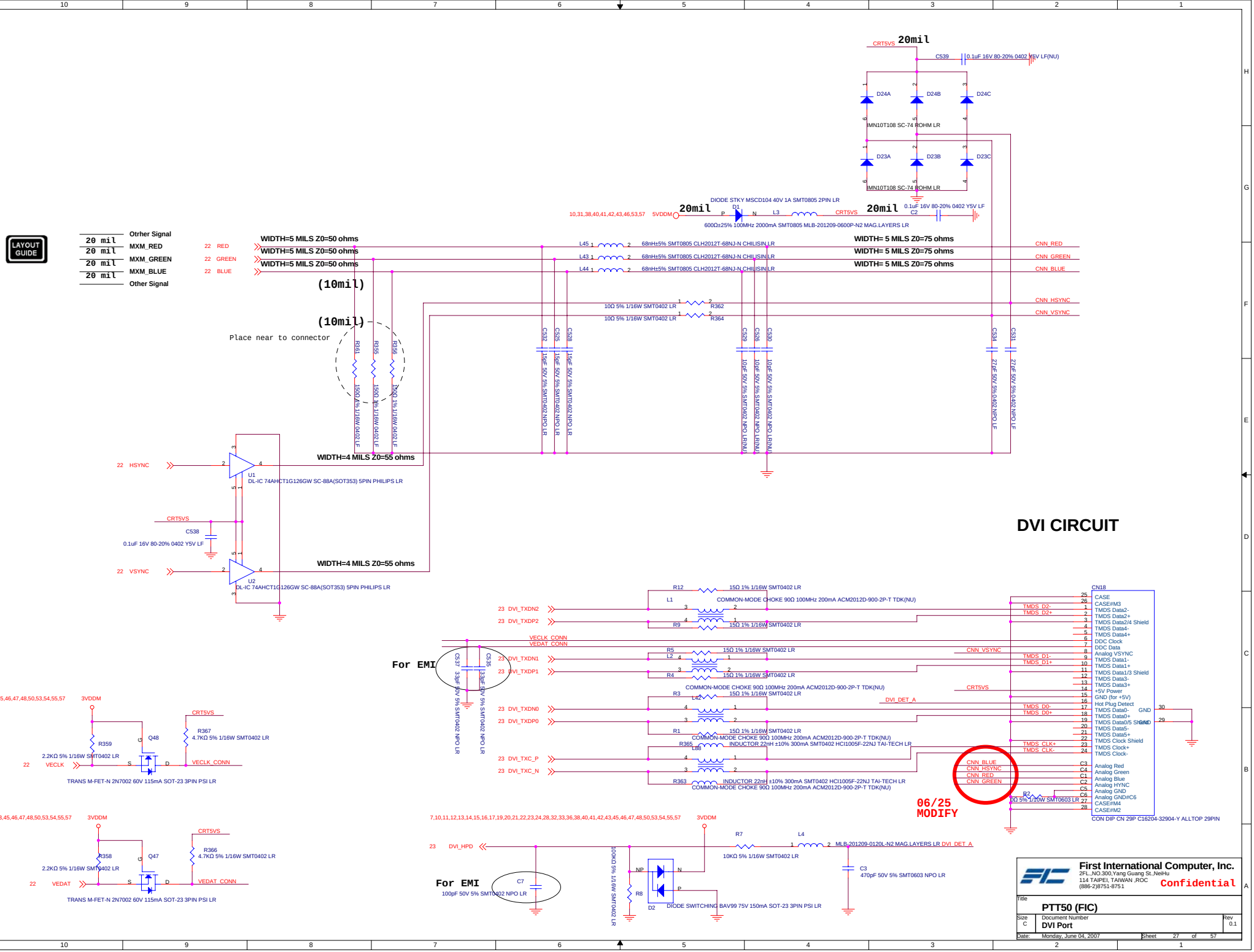
LAYOUT GUIDE
20 mil Othrer Signal
20 mil MXM_RED 22 RED
20 mil MXM_GREEN 22 GREEN
20 mil MXM_BLUE 22 BLUE
20 mil Other Signal
WIDTH=5 MILS Z0=50 ohms
WIDTH=5 MILS Z0=50 ohms
WIDTH=5 MILS Z0=50 ohms
(10mil)
(10mil)
Place near to connector
R361 150Ω 1% 1/16W 0402 LF
R355 150Ω 1% 1/16W 0402 LF
R356 150Ω 1% 1/16W 0402 LF
WIDTH=4 MILS Z0=55 ohms
WIDTH=4 MILS Z0=55 ohms
22 HSYNC
22 VSYNC
U1 DL-IC 74AHCT1G126GW SC-88A(SOT353) 5PIN PHILIPS LR
U2 DL-IC 74AHCT1G126GW SC-88A(SOT353) 5PIN PHILIPS LR
CRT5VS
C538 0.1uF 16V 80-20% 0402 Y5V LF
CRT5VS 20mil
C539 0.1uF 16V 80-20% 0402 Y5V LF(NU)
D24A D24B D24C
MN10T108 SC-74 ROHM LR
D23A D23B D23C
MN10T108 SC-74 ROHM LR
DIODE STKY MSCD104 40V 1A SMT0805 2PIN LR
10,31,38,40,41,42,43,46,53,57 5VDDM
20mil
20mil
C2 0.1uF 16V 80-20% 0402 Y5V LF
600Ω±25% 100MHz 2000mA SMT0805 MLB-201209-0600P-N2 MAG.LAYERS LR
L45 68nH±5% SMT0805 CLH2012T-68NJ-N CHILISIN LR
L43 68nH±5% SMT0805 CLH2012T-68NJ-N CHILISIN LR
L44 68nH±5% SMT0805 CLH2012T-68NJ-N CHILISIN LR
WIDTH= 5 MILS Z0=75 ohms
WIDTH= 5 MILS Z0=75 ohms
WIDTH= 5 MILS Z0=75 ohms
CNN_RED
CNN_GREEN
CNN_BLUE
10Ω 5% 1/16W SMT0402 LR R362
10Ω 5% 1/16W SMT0402 LR R364
CNN_HSYNC
CNN_VSYNC
C532 15pF 50V 5% SMT0402 NPO LR
C525 15pF 50V 5% SMT0402 NPO LR
C528 15pF 50V 5% SMT0402 NPO LR
C529 10pF 50V 5% SMT0402 NPO LR
C526 10pF 50V 5% SMT0402 NPO LR
C530 10pF 50V 5% SMT0402 NPO LR
C534 27pF 50V 5% 0402 NPO LF
C531 27pF 50V 5% 0402 NPO LF
DVI CIRCUIT
For EMI
C537 33pF 50V 5% SMT0402 NPO LR
C535 33pF 50V 5% SMT0402 NPO LR
R12 15Ω 1% 1/16W SMT0402 LR
L1 COMMON-MODE CHOKE 90Ω 100MHz 200mA ACM2012D-900-2P-T TDK(NU)
R9 15Ω 1% 1/16W SMT0402 LR
23 DVI_TXDN2
23 DVI_TXDP2
VECLK_CONN
VEDAT_CONN
R5 15Ω 1% 1/16W SMT0402 LR
L2 COMMON-MODE CHOKE 90Ω 100MHz 200mA ACM2012D-900-2P-T TDK(NU)
R4 15Ω 1% 1/16W SMT0402 LR
23 DVI_TXDN1
23 DVI_TXDP1
R3 15Ω 1% 1/16W SMT0402 LR
L42 COMMON-MODE CHOKE 90Ω 100MHz 200mA ACM2012D-900-2P-T TDK(NU)
R1 15Ω 1% 1/16W SMT0402 LR
23 DVI_TXDN0
23 DVI_TXDP0
R365 INDUCTOR 22nH ±10% 300mA SMT0402 HCI1005F-22NJ TAI-TECH LR
L88 COMMON-MODE CHOKE 90Ω 100MHz 200mA ACM2012D-900-2P-T TDK(NU)
R363 INDUCTOR 22nH ±10% 300mA SMT0402 HCI1005F-22NJ TAI-TECH LR
23 DVI_TXC_P
23 DVI_TXC_N
CRT5VS
DVI_DET_A
CN18
TMDS_D2-
TMDS_D2+
TMDS_D1-
TMDS_D1+
TMDS_D0-
TMDS_D0+
TMDS_CLK+
TMDS_CLK-
CNN_BLUE
CNN_HSYNC
CNN_RED
CNN_GREEN
R2 0Ω 5% 1/10W SMT0603 LR
CASE
CASE#M3
TMDS Data2-
TMDS Data2+
TMDS Data2/4 Shield
TMDS Data4-
TMDS Data4+
DDC Clock
DDC Data
Analog VSYNC
TMDS Data1-
TMDS Data1+
TMDS Data1/3 Shield
TMDS Data3-
TMDS Data3+
+5V Power
GND (for +5V)
Hot Plug Detect
TMDS Data0-
TMDS Data0+
TMDS Data0/5 Shield
TMDS Data5-
TMDS Data5+
TMDS Clock Shield
TMDS Clock+
TMDS Clock-
Analog Red
Analog Green
Analog Blue
Analog HYNC
Analog GND
Analog GND#C6
CASE#M4
CASE#M2
GND
GND
CON DIP CN 29P C16204-32904-Y ALLTOP 29PIN
06/25 MODIFY
43,45,46,47,48,50,53,54,55,57 3VDDM
R359 2.2KΩ 5% 1/16W SMT0402 LR
Q48
R367 4.7KΩ 5% 1/16W SMT0402 LR
22 VECLK
VECLK_CONN
TRANS M-FET-N 2N7002 60V 115mA SOT-23 3PIN PSI LR
42,43,45,46,47,48,50,53,54,55,57 3VDDM
R358 2.2KΩ 5% 1/16W SMT0402 LR
Q47
R366 4.7KΩ 5% 1/16W SMT0402 LR
22 VEDAT
VEDAT_CONN
TRANS M-FET-N 2N7002 60V 115mA SOT-23 3PIN PSI LR
7,10,11,12,13,14,15,16,17,19,20,21,22,23,24,28,32,33,36,38,40,41,42,43,45,46,47,48,50,53,54,55,57 3VDDM
23 DVI_HPD
For EMI
C7 100pF 50V 5% SMT0402 NPO LR
R7 10KΩ 5% 1/16W SMT0402 LR
L4 MLB-201209-0120L-N2 MAG.LAYERS LR
DVI_DET_A
C3 470pF 50V 5% SMT0603 NPO LR
100KΩ 5% 1/16W SMT0402 LR
R8
D2 DIODE SWITCHING BAV99 75V 150mA SOT-23 3PIN PSI LR
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Title
PTT50 (FIC)
Size C
Document Number
DVI Port
Rev 0.1
Date: Monday, June 04, 2007
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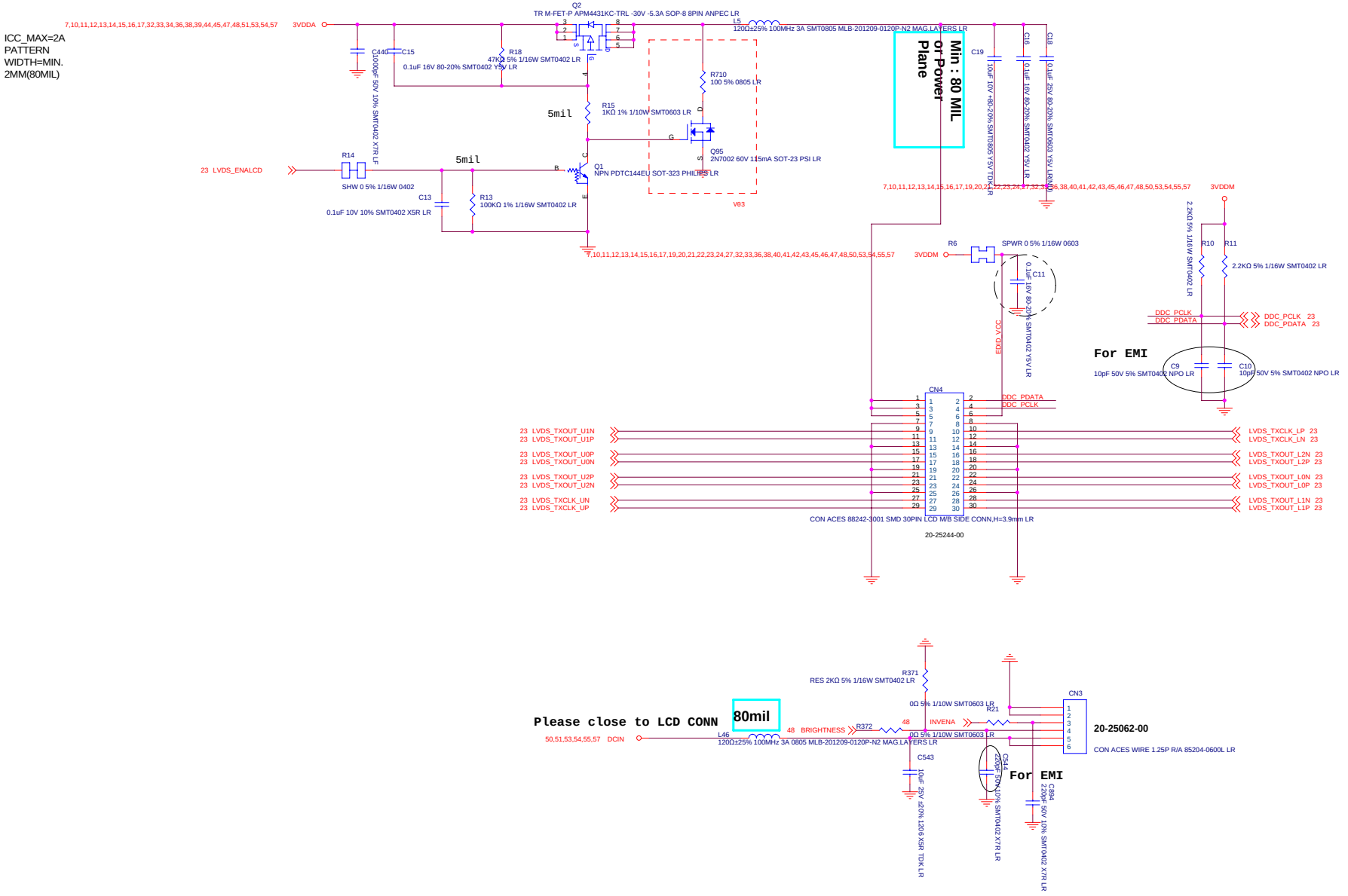

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Title	Orion A/AM(PB) MTN70/PTB72(FIC)	
Size: C	Document Number: LCD CNN	Rev: 0.1
Date: Monday, June 04, 2007	Sheet 28 of 57	

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Title: PTT50 (FIC)

Size: C | Document Number: HDMI CNN | Rev: 0.1

Date: Monday, June 04, 2007 | Sheet 29 of 57

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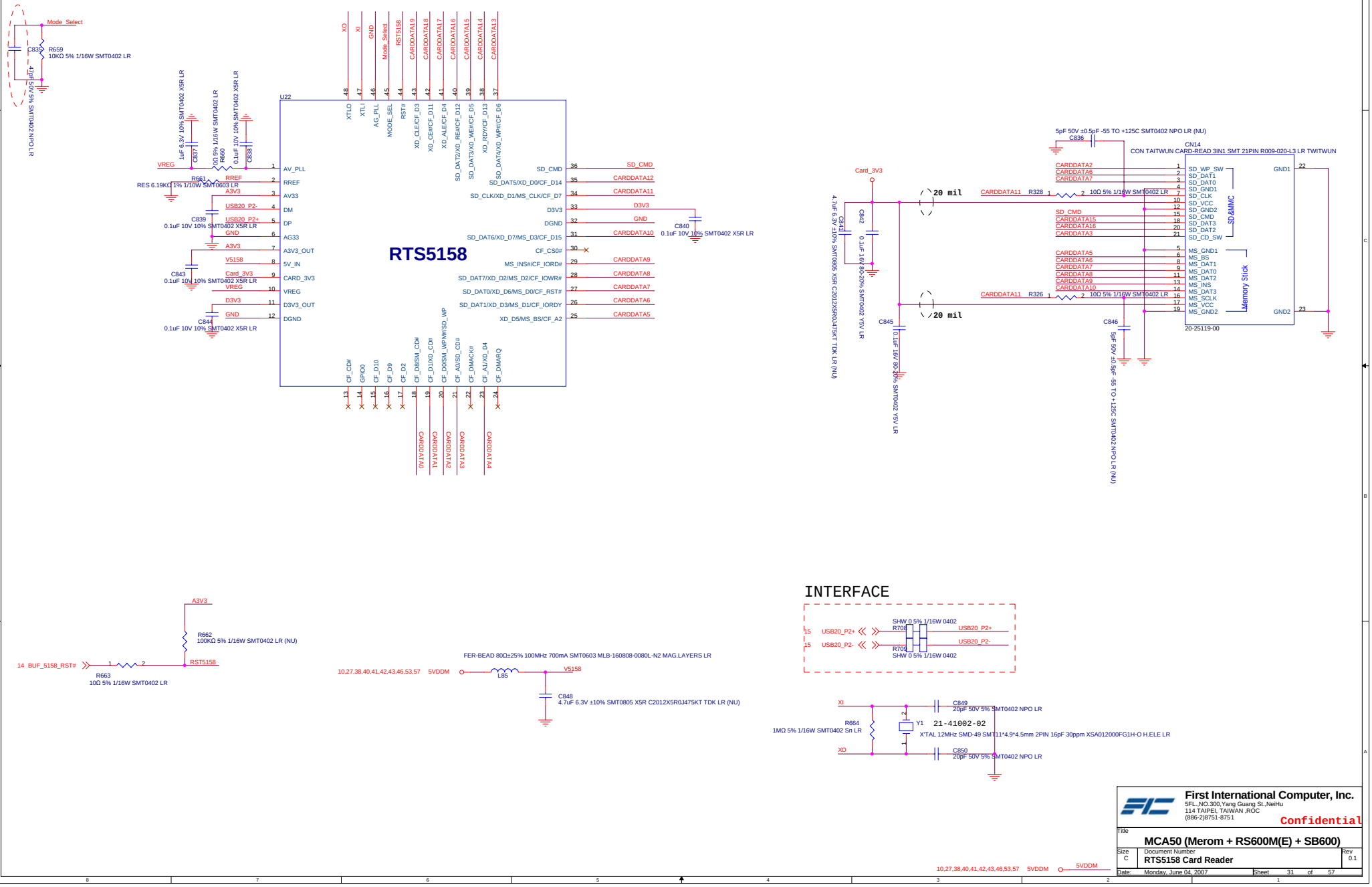
Title: PTT50 (FIC)

Size: C | Document Number: VIA VT6311S(1394) | Rev: 0.1

Date: Monday, June 04, 2007 | Sheet 30 of 57



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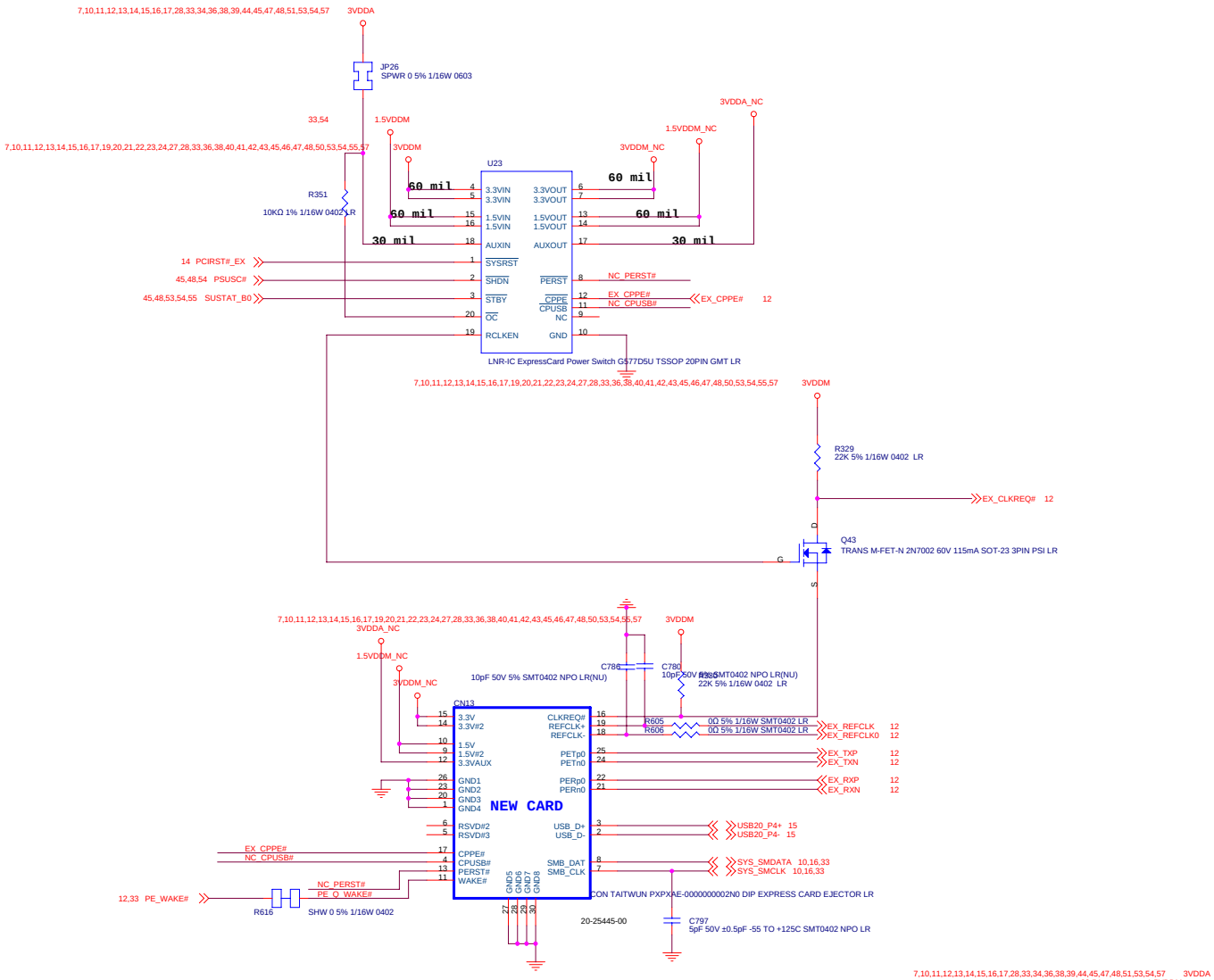
Title: MCA50 (Merom + RS600M(E) + SB600)

Size: C | Document Number: RTS5158 Card Reader | Rev: 0.1

Date: Monday, June 04, 2007 | Sheet 31 of 57



Express Card Ejector : 20-25445-00

Express Card Header : 20-25446-00

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Title: **PTT50 (FIC)**

Size	Document Number	Rev
C	New Card(express card)	0.1

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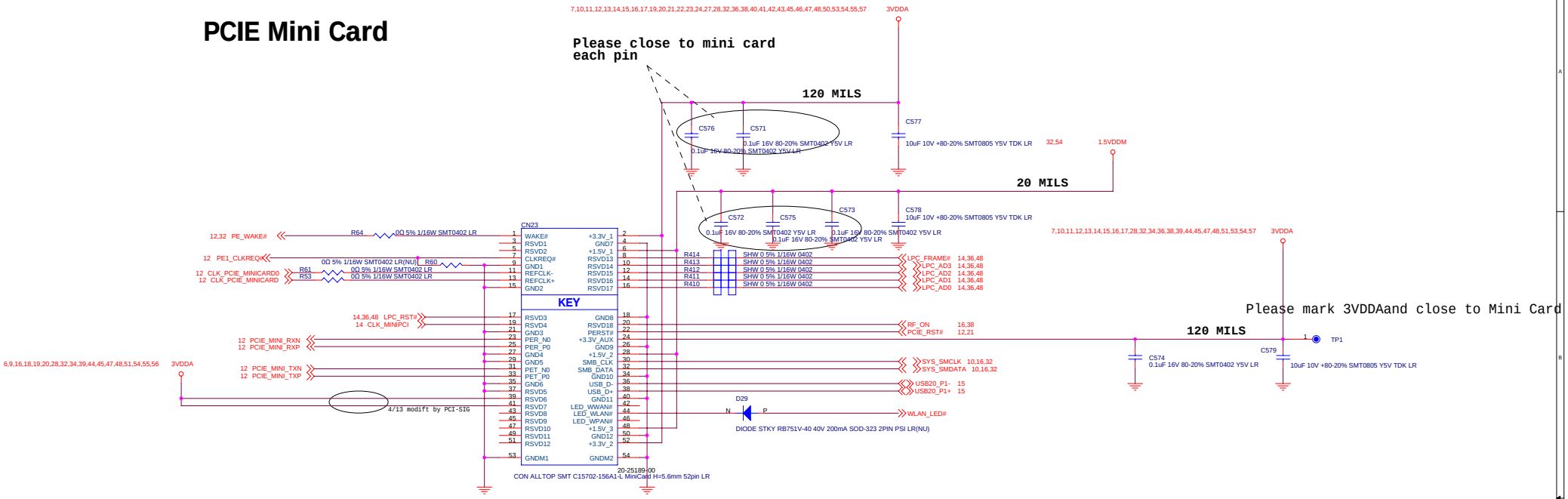
PCIE Mini Card



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Title: PTT50 (FIC)		
Size: C	Document Number: PCIE Mini Card	Rev: 0.1
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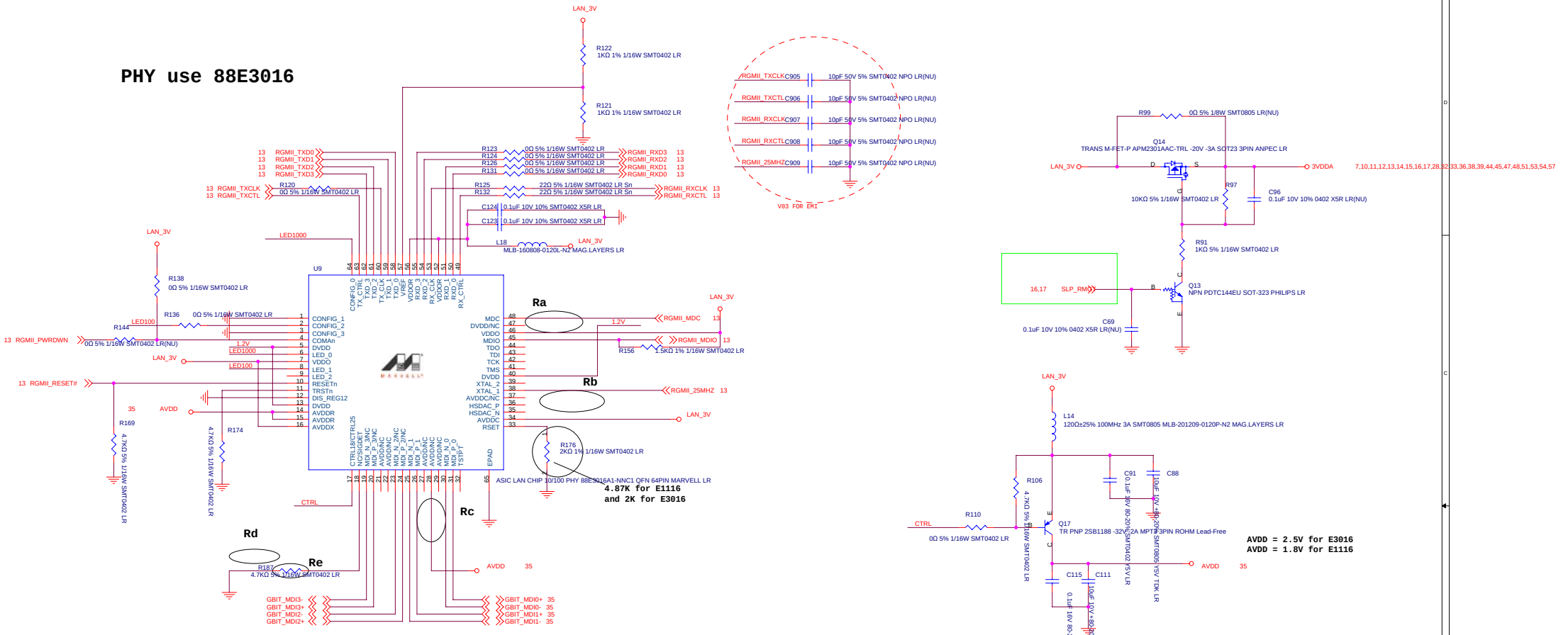
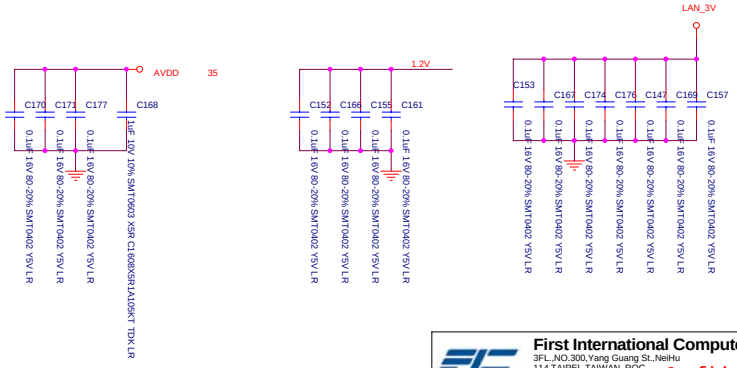
PHY use 88E3016



	for 88E3016	for 88E1116
Ra	NU	STUFF
Rb	NU	STUFF
Rc	STUFF	NU
Rd	NU	STUFF
Re	STUFF	NU



Layout Guide

1. The Lan Chip should be placed as close as possible to the transfer.
2. The resistor connected to RSET pin should be placed near to the Lan Chip,and away from signal traces(ex:MDI0+/-) and clock signals as far as possible.
3. The transfer should be placed as close as possible to the RJ45 connector.
4. The crystal should be placed far away from I/O ports and high frequency signal.
5. The termination resistors and capacitors should be placed closely to the Lan Chip.
6. The decoupling capacitors should be placed as close as posslble to the power pins,such that the distance from IC power pin to the capacitor is within 200mils.
7. Traces routed from the Lan Chip to the transfer,and to the RJ45 connector should be as short as possible.
8. The 10-12cm maximum lenghth between Lan Chip and transfer is achievable only when there's no interferences around.
9. All 4 pairs of the differential resister(49.9k) must close to Lan Chip,and make them(4pairs) as same as distant.
10. PLACE GND PLANE AS LARGE AS POSSIBLE
11. If power pins are next to each other and there is not much room to accommodate multipe capacitors,then the power pins can share the same capacitors.
12. It's important to separate digital signals from analog signals.If it is unavoidable to cross digtal signals with analong power do it at 90 degree angle.
13. The digital power plane should be separated from analog areas.
14. All analog decoupling capacitors should be placed as close to the IC as possible and the traces should be short.
15. The Lan Chip pin 1 facing the transformer,then you can make the signal shorter.

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Title	PTT50 (FIC)	
Size C	Document Number 10/100M PHY 88E3016	Rev 0.1
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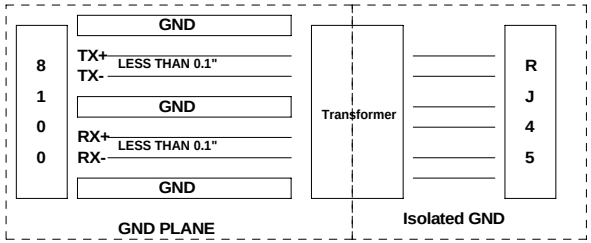
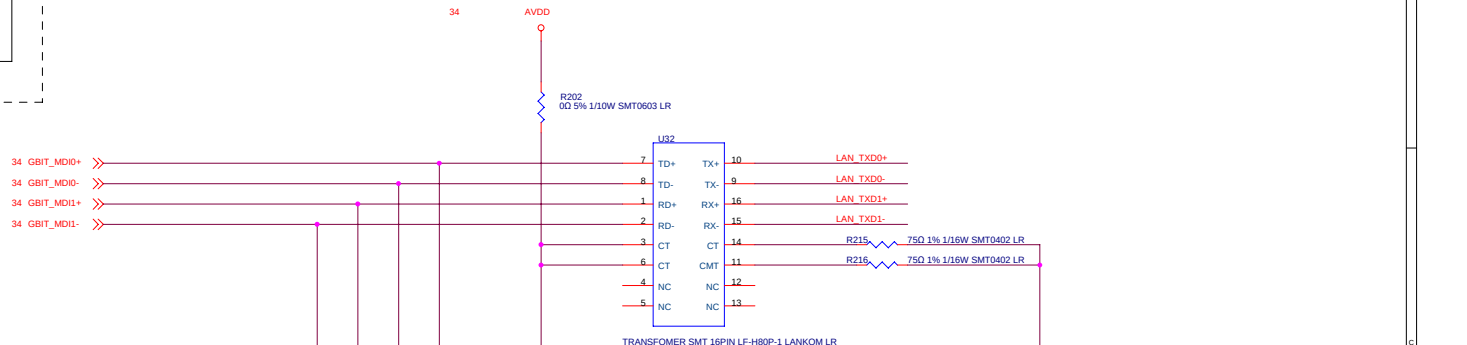
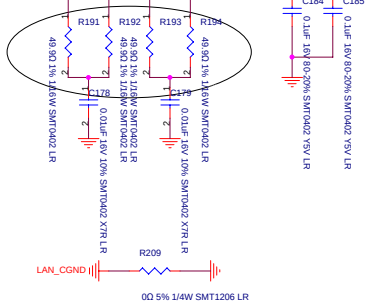
TX
RX

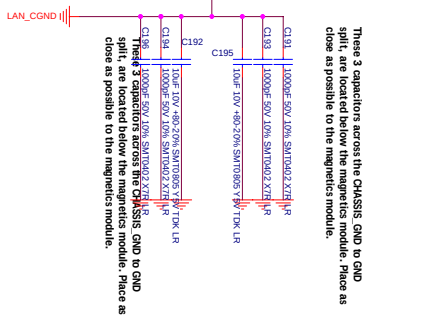
100 ohm ---> trace 4 mil , space 10 mil
50 mil space from other signals
Total Tace Length no more thans 4.8"
2 Differential pairs must have the same length

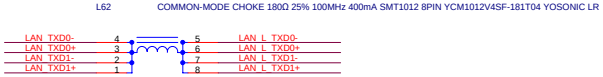


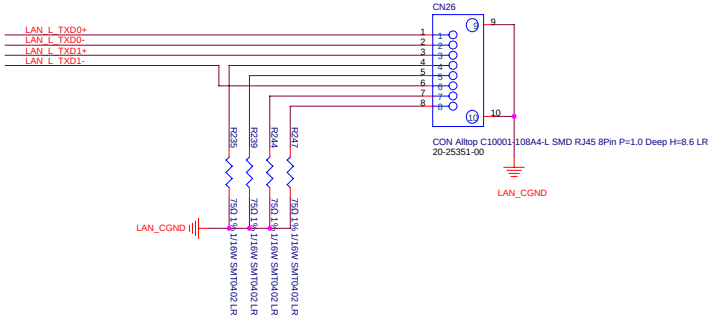


PLACE RC NETWORKS CLOSE TO PHY CHIP









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Size: C
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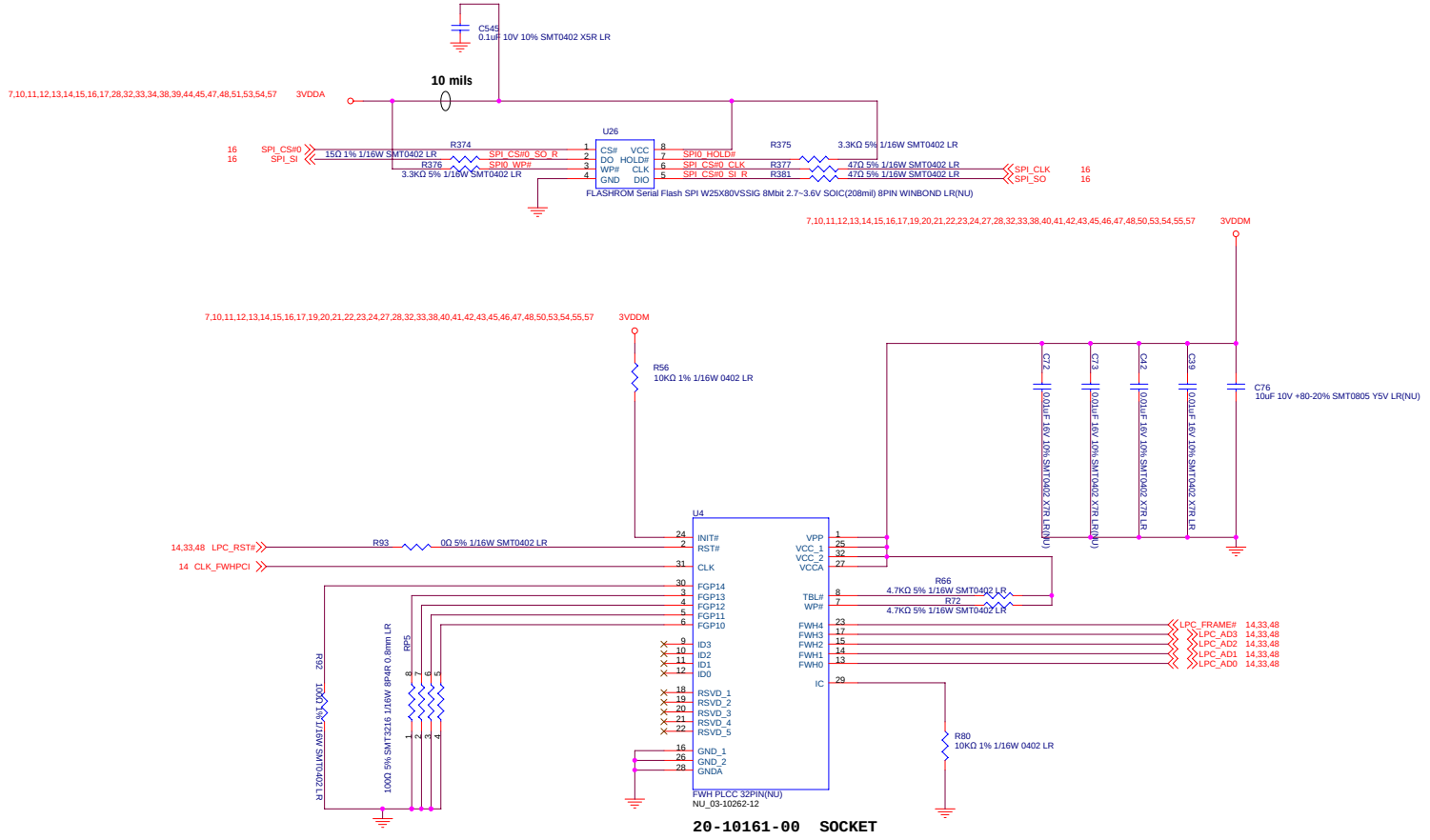
SPI Interface



20-10161-00 SOCKET

03-10262-12 Flash ROM PM49FL004TL-33JCE
4Mbit(512K*8) PMC LR

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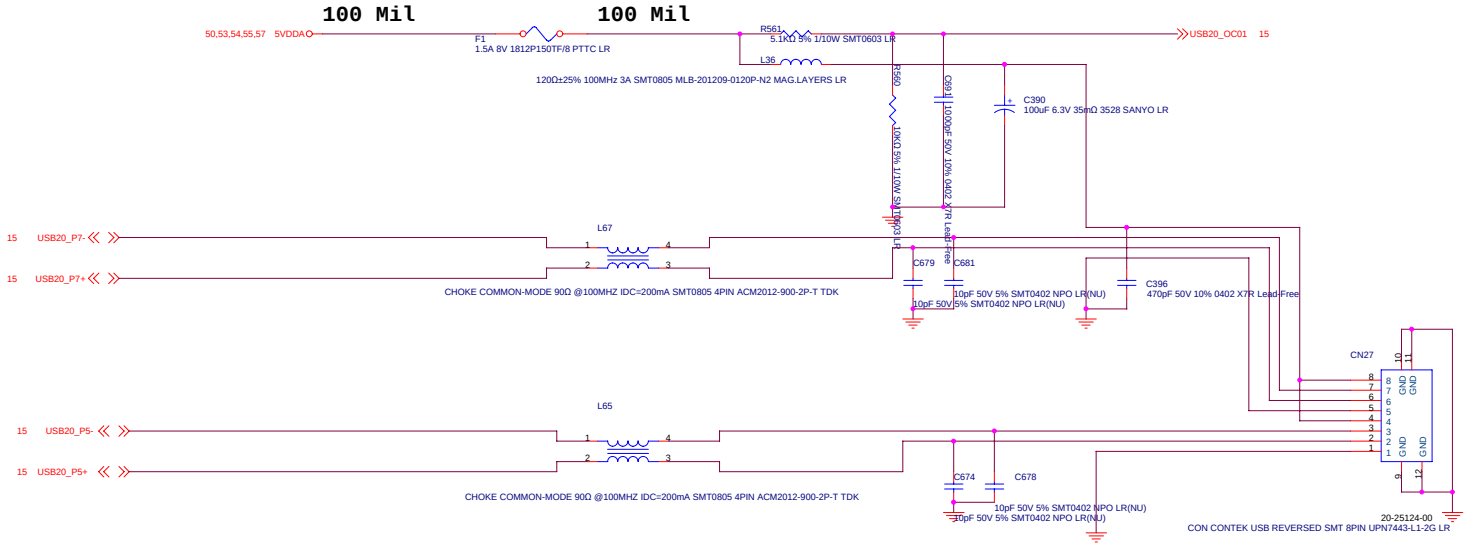
5 mil GND_POWER

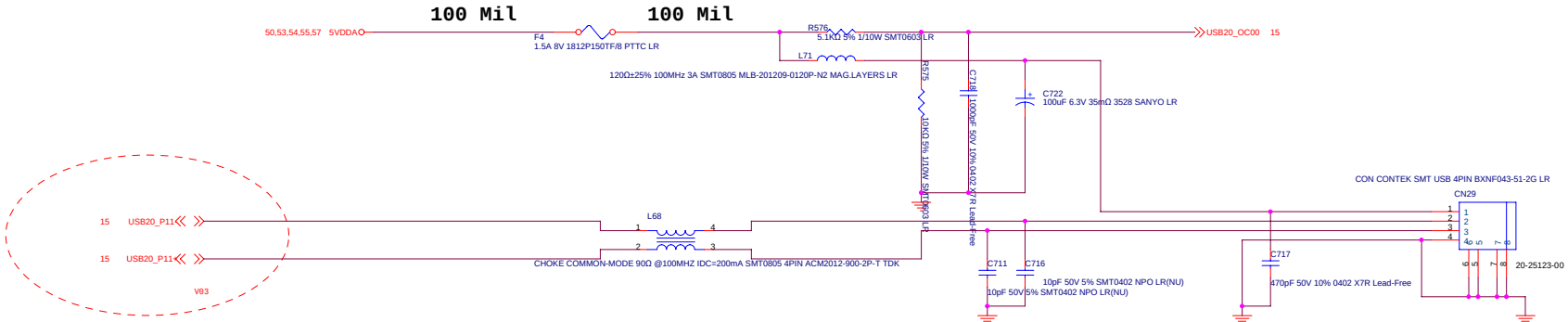
5 mil (10 mil) USB20_P+

5 mil (5 mil) USB20_P-

5 mil (10 mil) GND_POWER

USBP+/- must same length





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Title	Orion A/AM(PB) MTN70/PTB72(FIC)	
Size C	Document Number USB CNN	Rev 0.1
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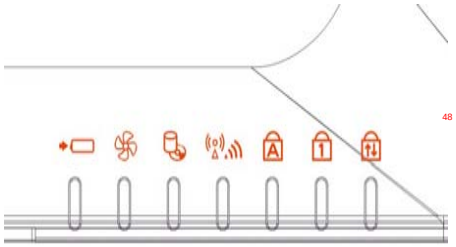
LED indicator control logic



CN5
CN 18PIN 88296-1801 ACES
88503-1801

R658 V03
PWR_LED_P
PWR_LED_N
LED_G
Q86
PDTC144EU SOT-323 PHILIPS LR

BUZZR

Q30
TRANS NPN MMBT2222A 40V 600mA SOT-23 3PIN PSI LR
R293
10KΩ 0.5% 1/10W SMT0603 LR
C429
1000pF 25V +80-20% SMT0603 Y5V LR
R292
47 1% 1/16W 0402 LR(NU)
BU1
BUZZER 30.0±4.5Ω 5V KSTG954RP/HA KINGSTATE LR

Wireless indicator

R644
R643
R642
R641
D17
D18
D19
D20
LED BLUE λp=470nm SMT0603 HT-191NBS HARVATEK LR
Q85
PDTC144EU SOT-323 PHILIPS LR
BAV70 75V 150mA SOT-23 PSI LR
D47
WIRELESS_ON
BT_ON
RF_ON
CAPS#
NUM#
SRLL#

v0.3
R640
R639
D14
LED Amber/Blue SMT0603 λp=609/468nm HT-297UD/CB HARVATEK LR
direction changed
Q84
PDTC144EU SOT-323 PHILIPS LR
CHGLED
Q83
PDTC144EU SOT-323 PHILIPS LR
LED_A
SILENCE
R638
D15
Q82
R645
D16
V02
CDROM_LED#
SATA_LED#
DIODE SWITCHING PS355NS 80V 100mA SMT0805 2PIN PSI LR

SW2
SWITCH 3PIN NSS507-212F-FAAG1T T-MEC LR

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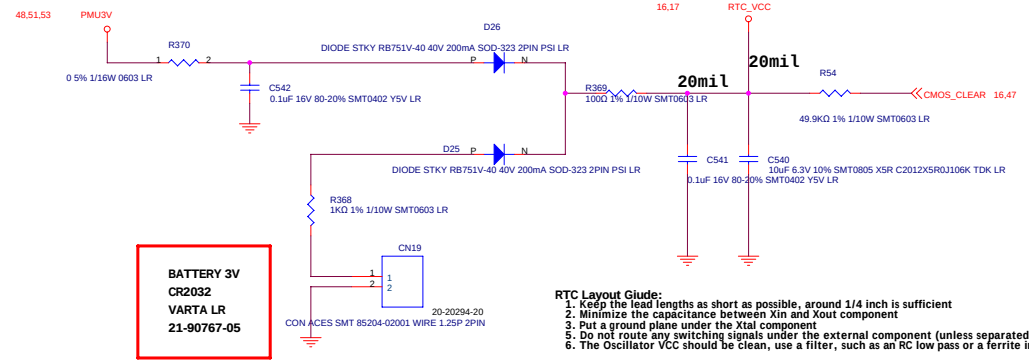
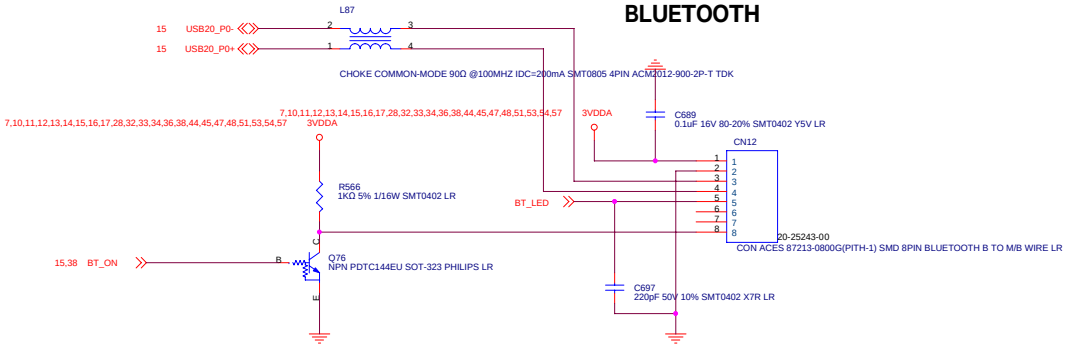
RTC Discharge Circuit



RTC Layout Giude:

1. Keep the lead lengths as short as possible, around 1/4 inch is sufficient
2. Minimize the capacitance between Xin and Xout component
3. Put a ground plane under the Xtal component
5. Do not route any switching signals under the external component (unless separated by a ground plane)
6. The Oscillator VCC should be clean, use a filter, such as an RC low pass or a ferrite inductor

BLUETOOTH



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Title	PTT50 (FIC)	
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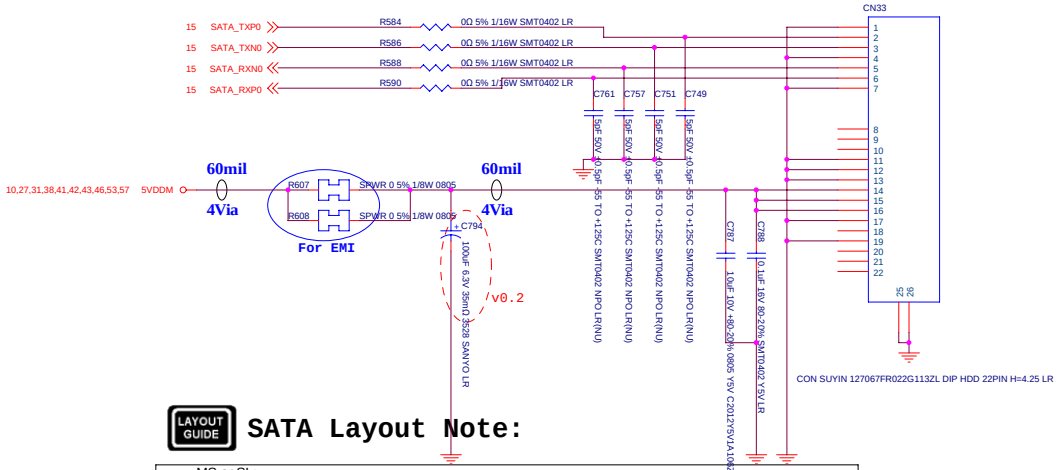
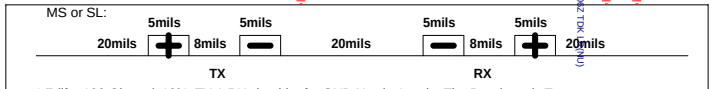
HDD I/F

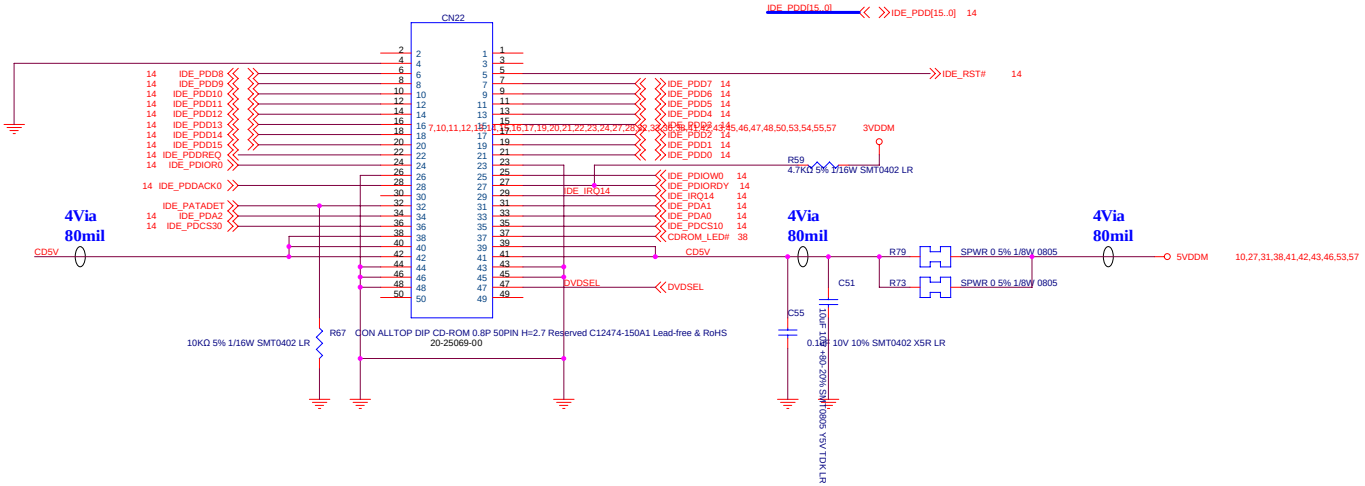


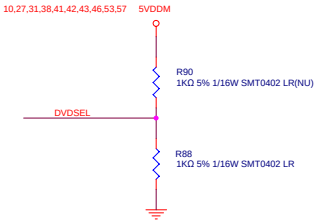
LAYOUT GUIDE **SATA Layout Note:**

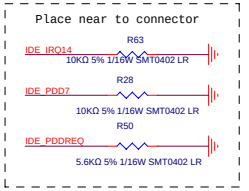


* Zdif = 100 Ohm +/- 10%. TX & RX should refer GND.No via & stubs.The Best layer is Top.
* TX/RX trace length < 2 inchs.
* TX+/- need matching trace ±10 mils length.
* RX+/- need matching trace ±10 mils length.
* SATA Pair to Pair Trace matching trace ±10 mils length.

CD-ROM CNN







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Title	PTT50 (FIC)	
Size C	Document Number SATA HD / CD-ROM CNN	Rev 0.1
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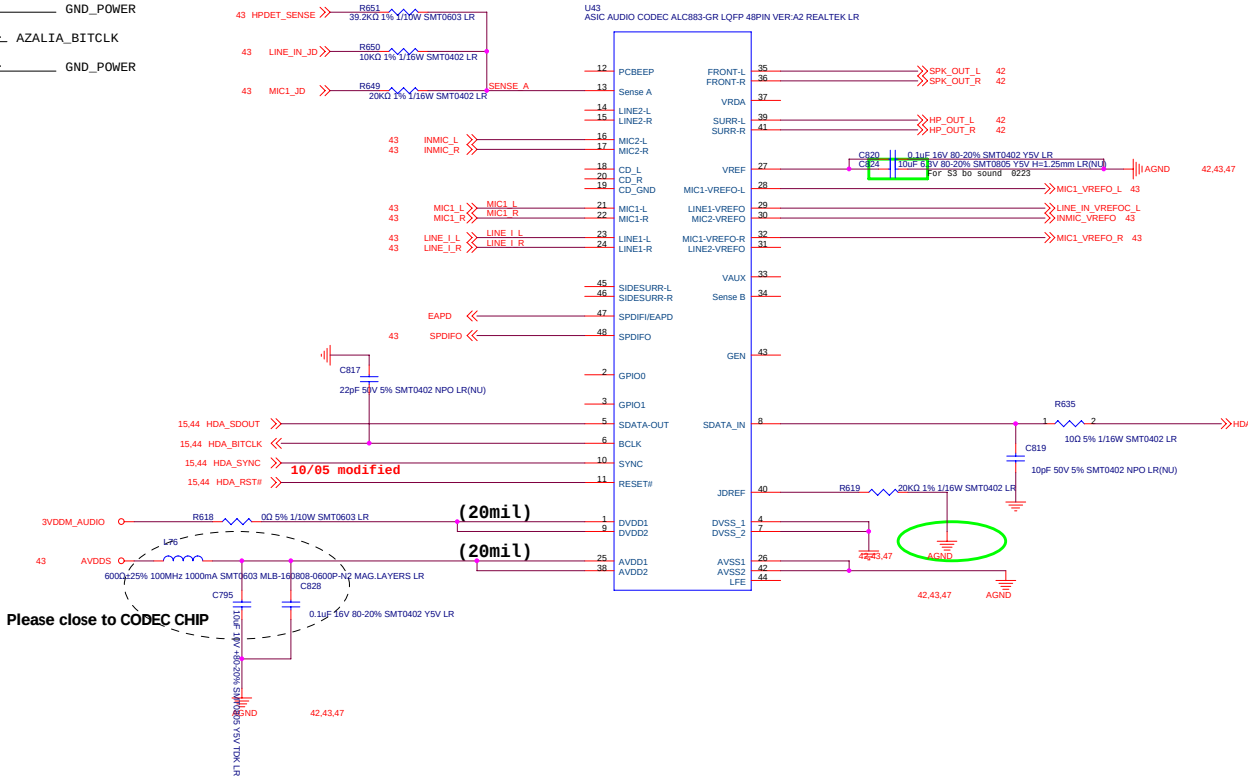
10mil GND_POWER
10mil 10mil AZALIA_PCBEEP
10mil 10mil GND_POWER

10mil GND_POWER
10mil 10mil AZALIA_BITCLK
10mil 10mil GND_POWER

10mil GND_POWER
10mil 10mil 14MCLK_AZALIA
10mil 10mil GND_POWER

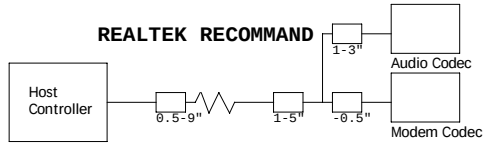
Layout guide :

1. Close to codec.
2. Realtek suggested that layout trace of the sense pin should away form any analog trace because sensing current might distorts the audio performance (The bottom lay is best choice).

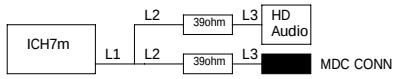


A_GND 10mil
SPK_OUT_R / HP_OUT_L 10mil
A_GND 10mil
SPK_OUT_R / HP_OUT_L 10mil
A_GND 10mil

REALTEK RECOMMAND



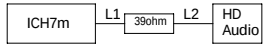
HD Audio-ACZ_SDOUT/ACZ_SYNC/ACZ_BITCLK/ACZ_RESET#



Trace Impedance	Routing Requirement	Trace Length
55 +/- 15%	4 on 7(stripline) 5 on 7(microstrip)	L1 = 0.5"~2.5" L2 <= 0.1" L3 = 1"~8"

*** L3 can be extened up to 15" if HD Audio docking is not used

HD Audio-ACZ_SDIN



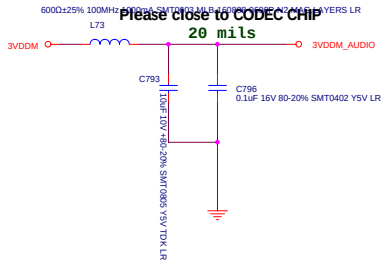
Trace Impedance	Routing Requirement	Trace Length
55 +/- 15%	4 on 7(stripline) 5 on 7(microstrip)	L1 = 0.1"~15" L2 <= 0.5"

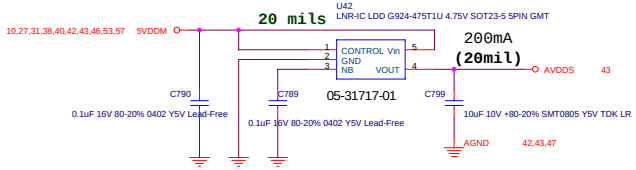
*** Breakout can be routed 4 on 4 up to 500 mils

AZALIA CODEC POWER

Layout guide :

1. The codec is partitioned into a digital and analog sections to help isolated noisy digital circuitry form quiet analog circuitry.
2. The layout separates the analog and digital planes with a 60 to 100 mils gap and connect them at one point beneath the codec with a 50 mils wide blink.
3. Never route digital traces or digital planes under the analog ground areas. Analog components should be located over analog planes (ground and power planes) and digital components should be located over digital planes.





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Title: PTT50 (FIC)
Size: C
Document Number: Azalia ALC268 Codec
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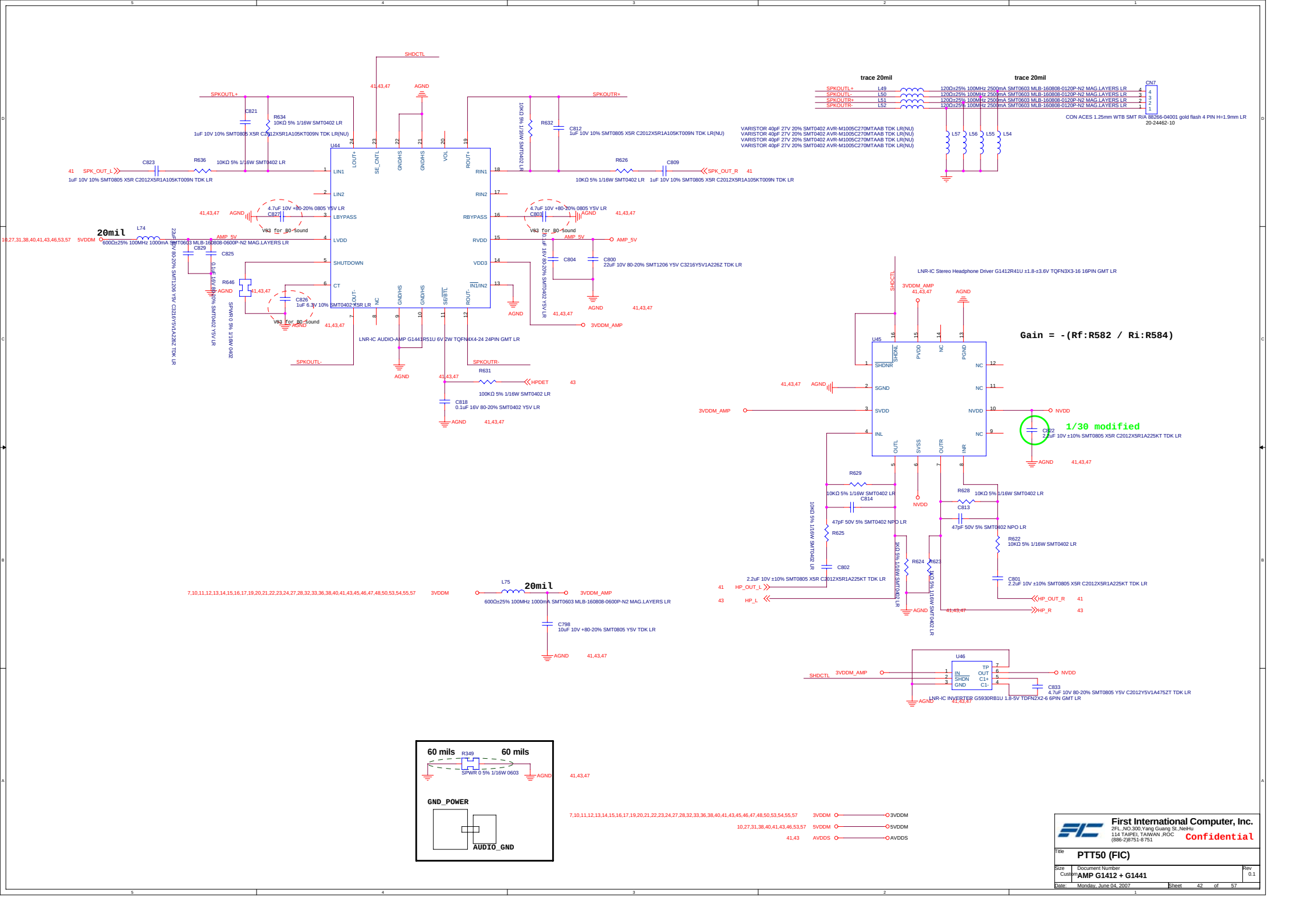

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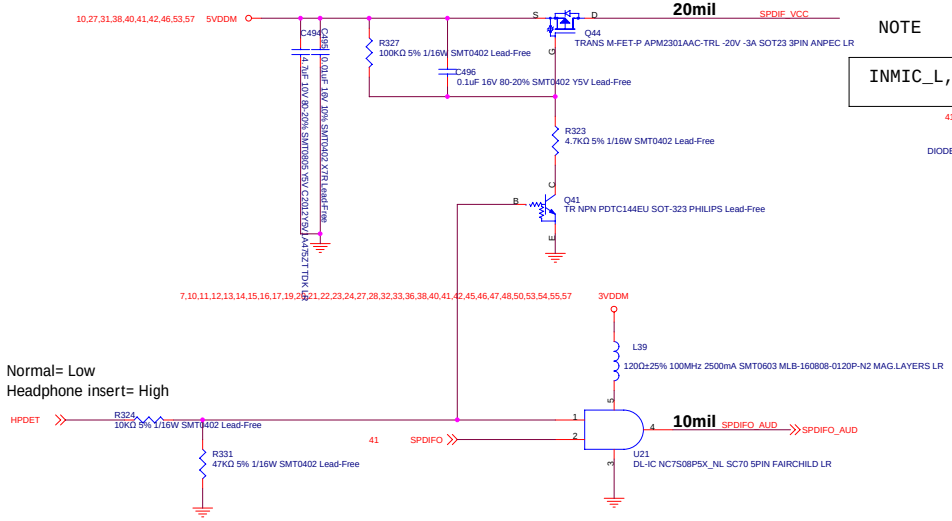
Title	PTT50 (FIC)
Size / Custom	Document Number: AMP G1412 + G1441
Rev	0.1
Date:	Monday, June 04, 2007
Sheet	42 of 57

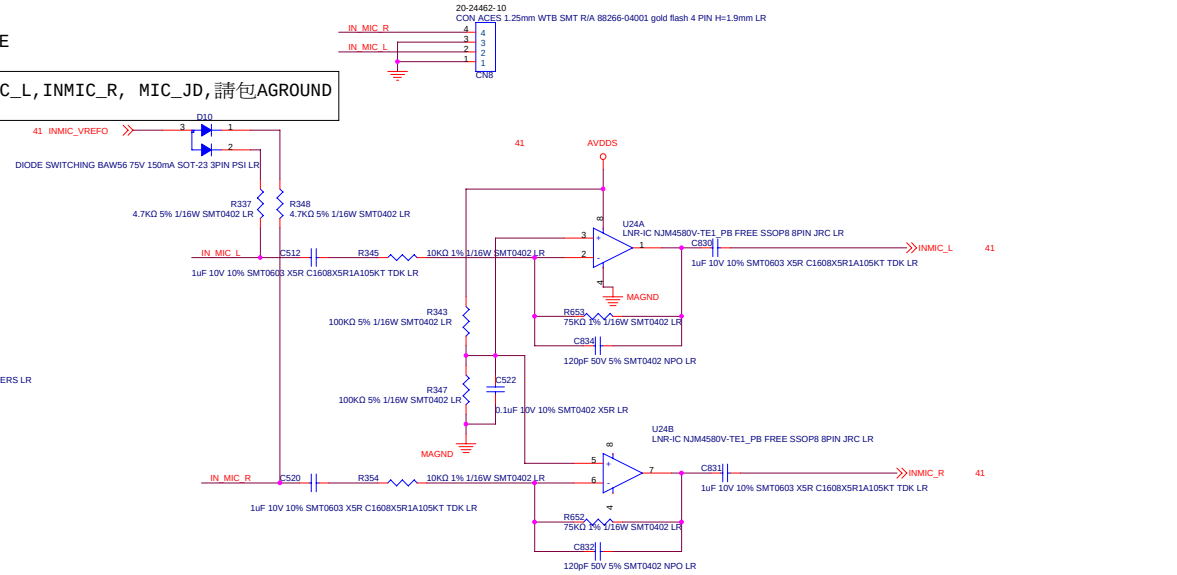
S/PDIF Power



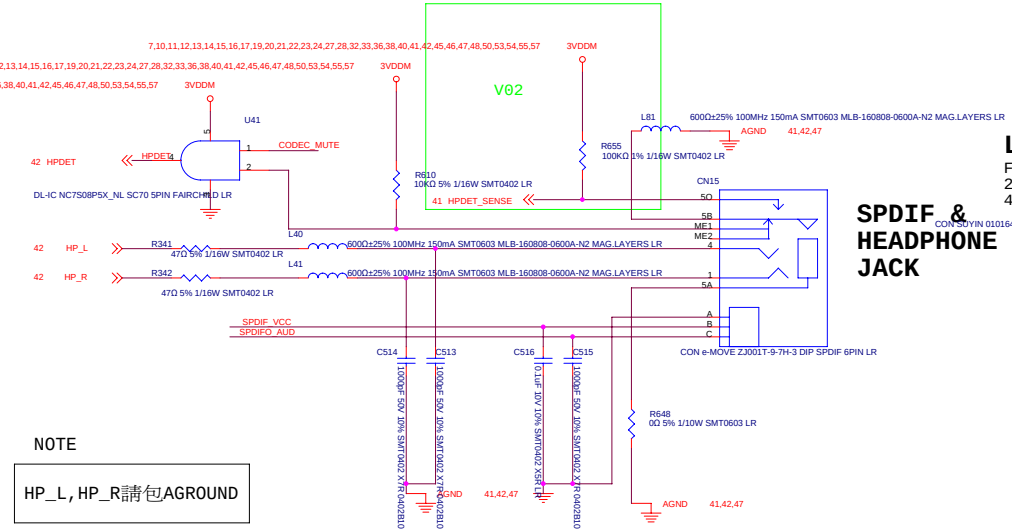
NOTE

INMIC_L,INMIC_R, MIC_JD,請包AGROUND

Internal arrary MIC

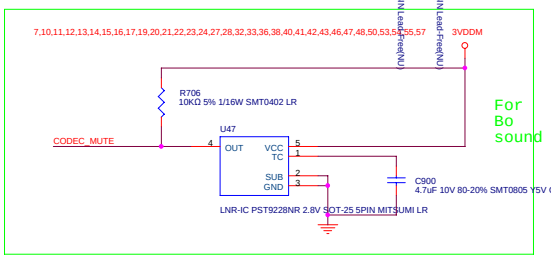


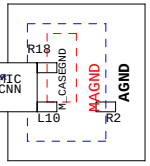
SPDIF & HEADPHONE JACK



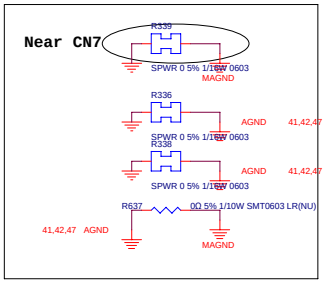
NOTE

HP_L,HP_R請包AGROUND





FOR EMI

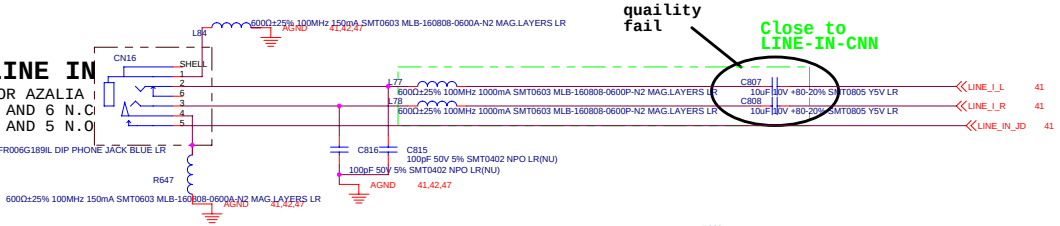


09/08 For Line_in quaility fail

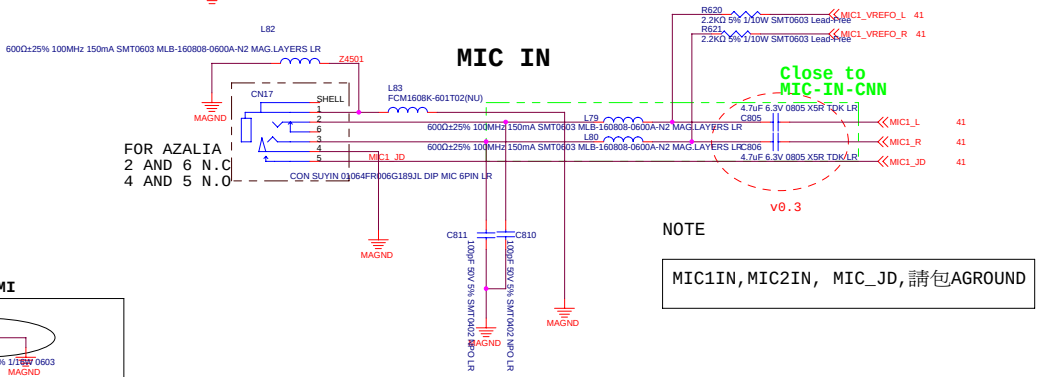
Close to LINE-IN-CNN

LINE IN

FOR AZALIA
2 AND 6 N.C
4 AND 5 N.O



MIC IN

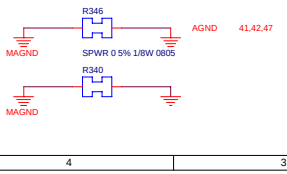


Close to MIC-IN-CNN

v0.3

NOTE

MIC1IN,MIC2IN, MIC_JD,請包AGROUND



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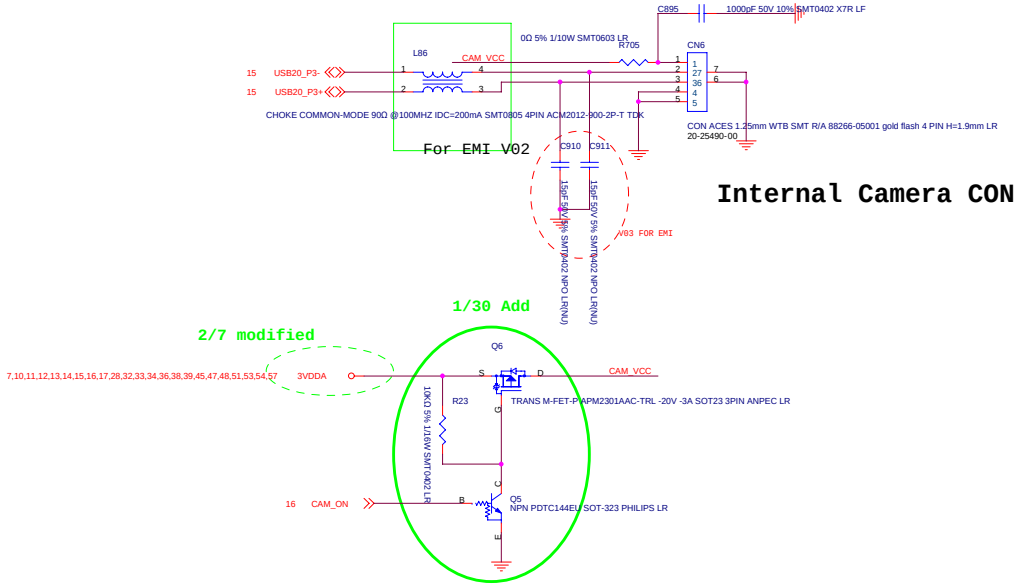
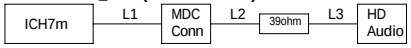


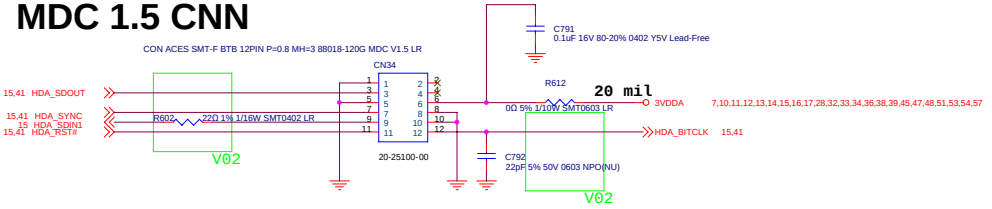
HD Audio-ACZ_SDIN (MDC Connector)



Trace Impedance	Routing Requirement	Trace Length
55 +/- 15%	4 on 7(stripline)	L1 = 0.1"~15" L2 = 0.5"~1.5" L3 = 0.5"

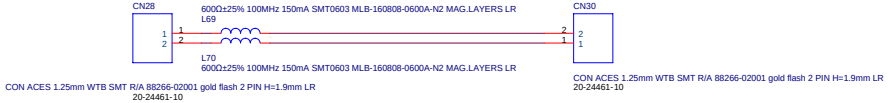
*** Breakout can be routed 4 on 4 up to 400 mils

MDC 1.5 CNN



FOR EMI Solution

Close



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Title: PTT50 (FIC)

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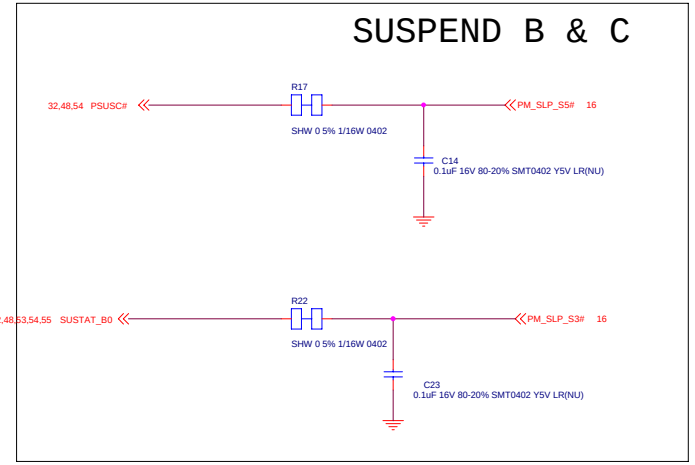
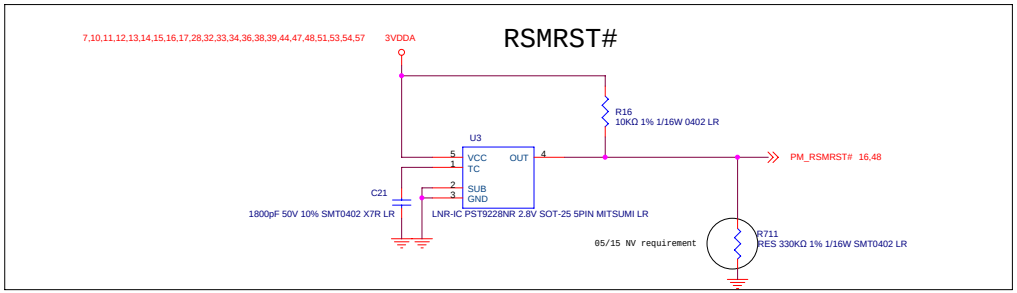
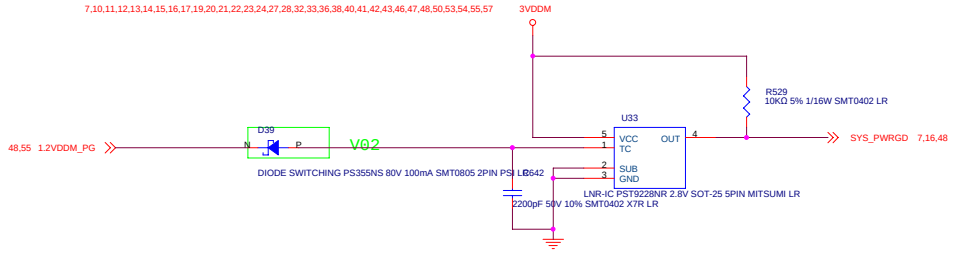


RESUME RESET





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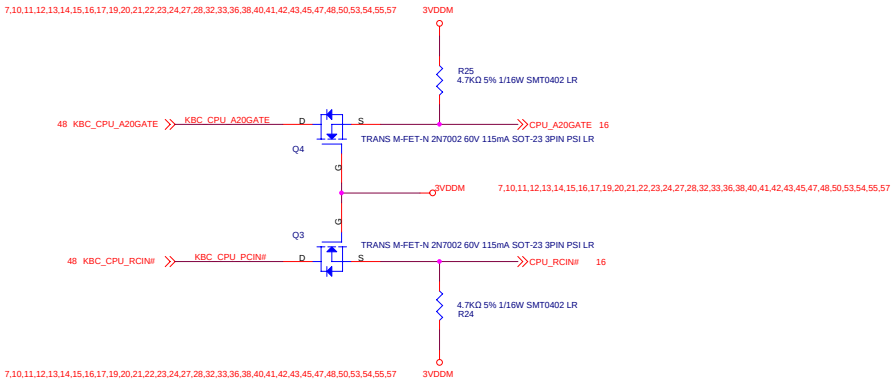

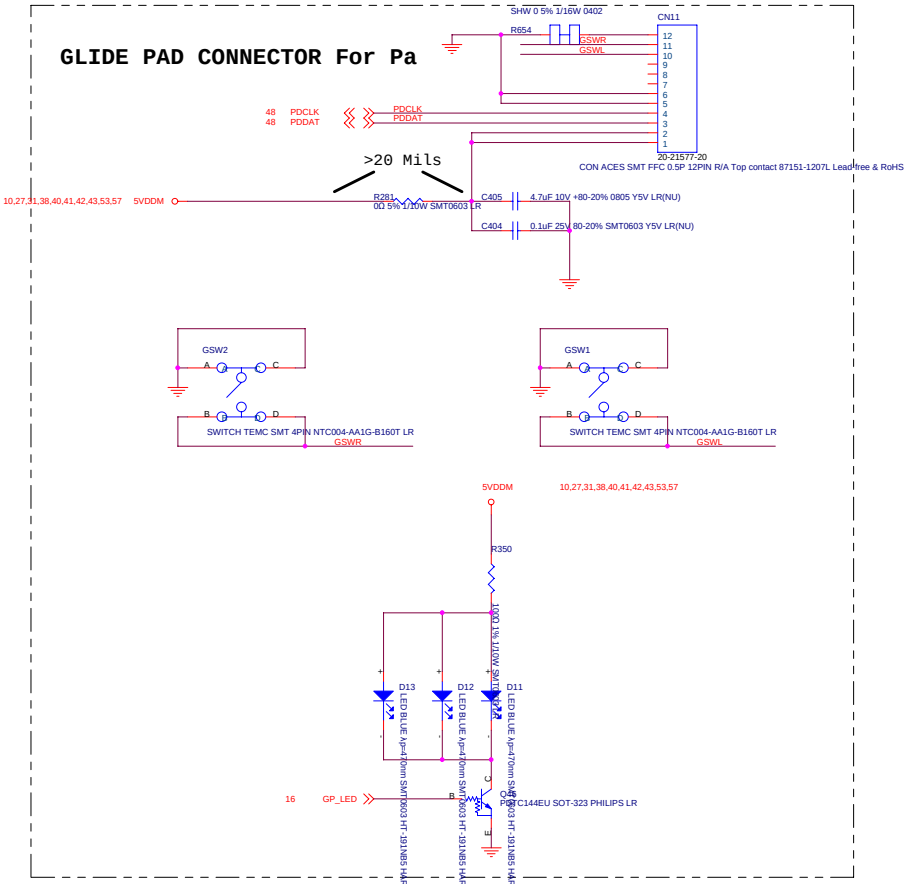

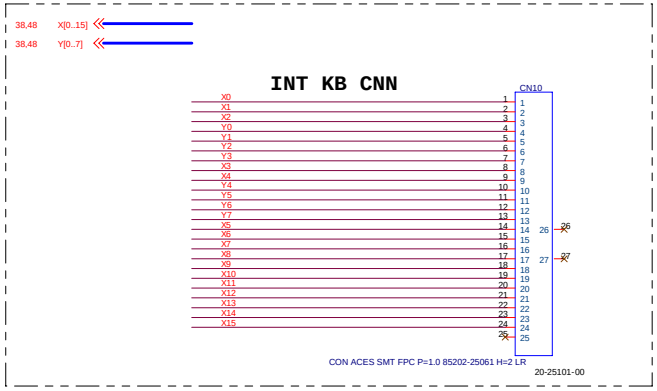

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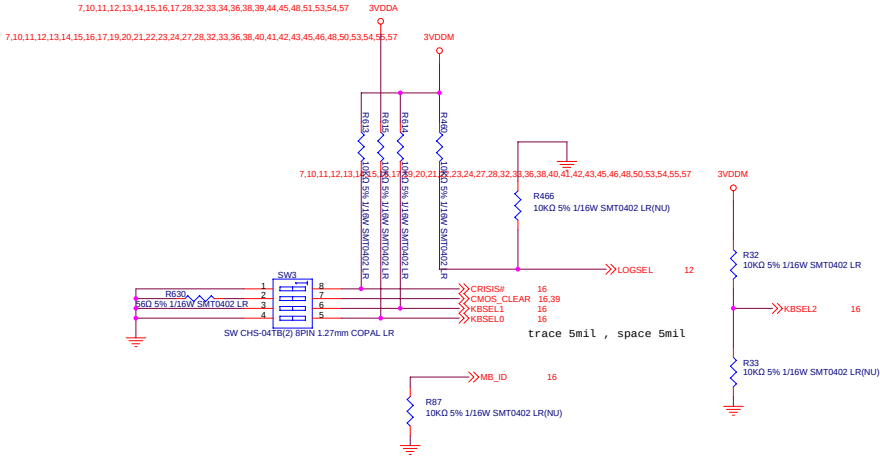
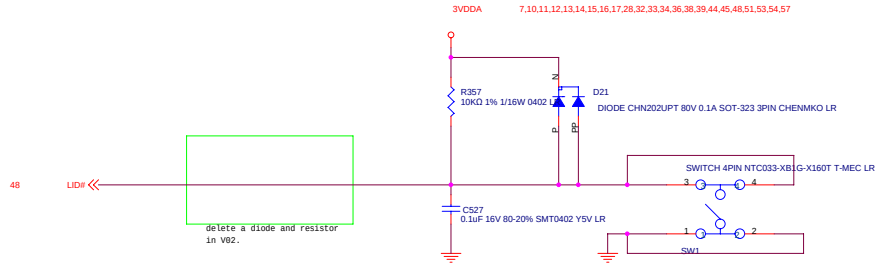
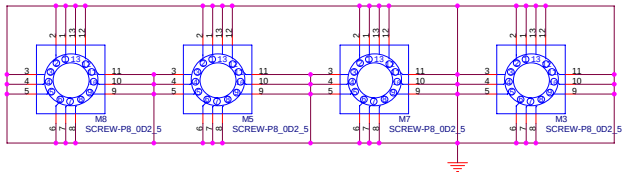
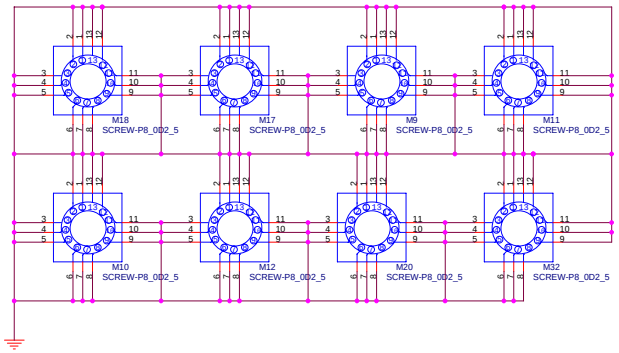
DIP SWITCH

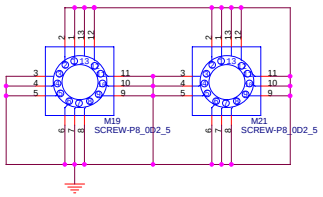


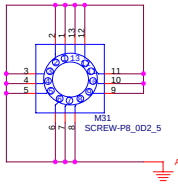
LID Switch

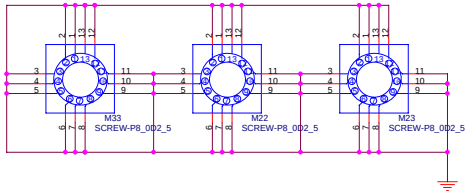


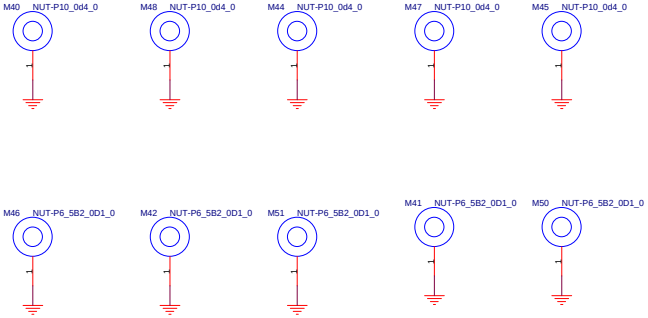


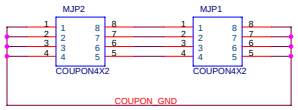


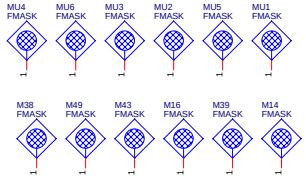


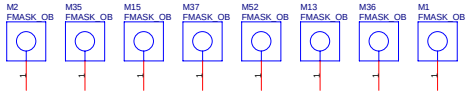


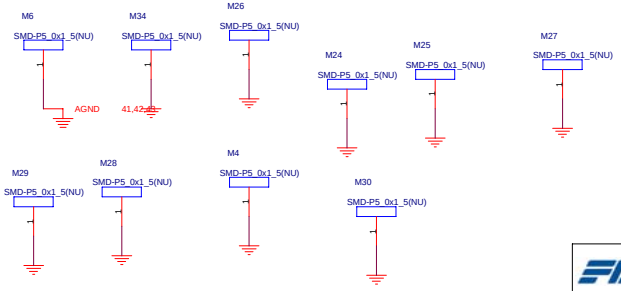












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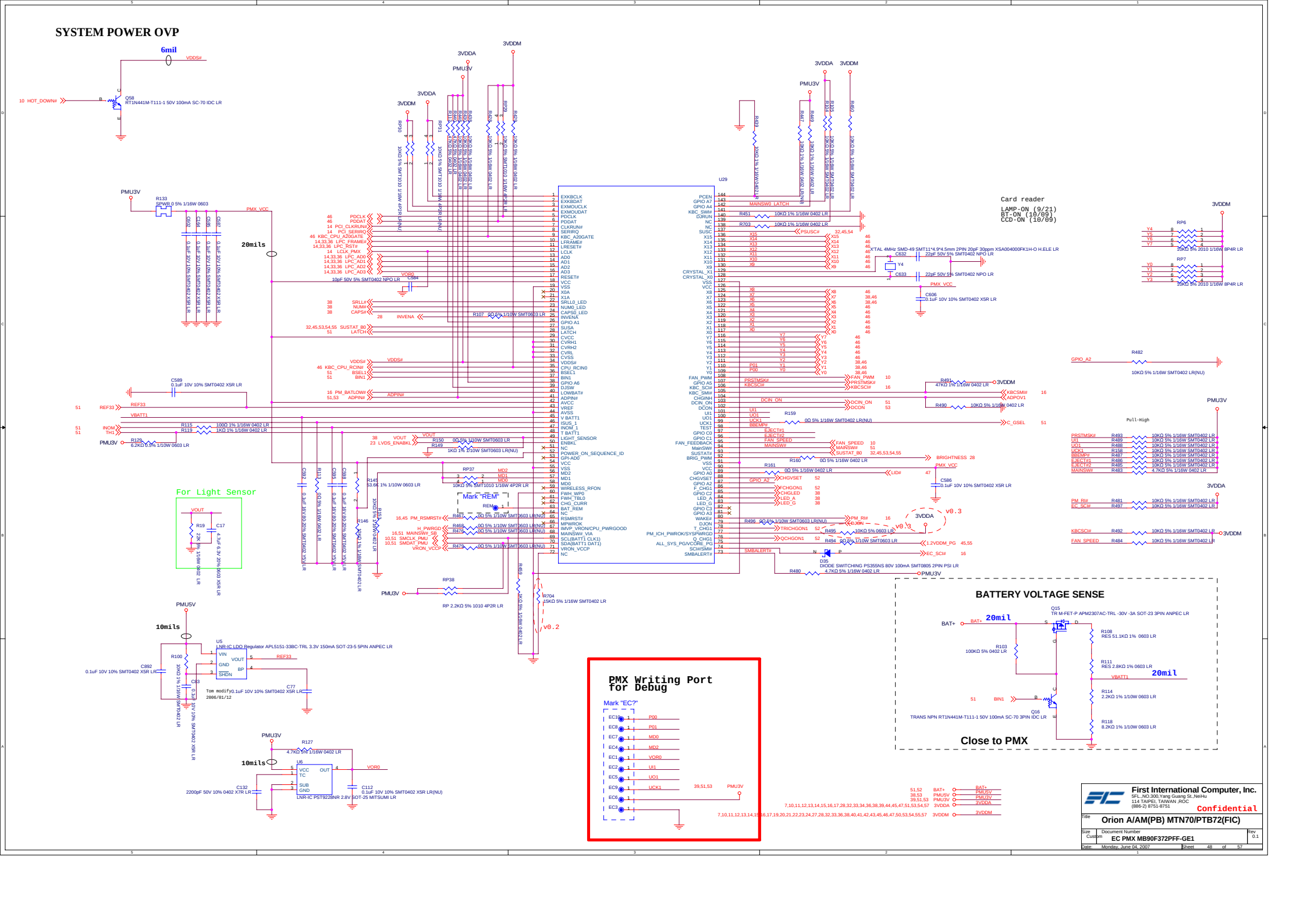
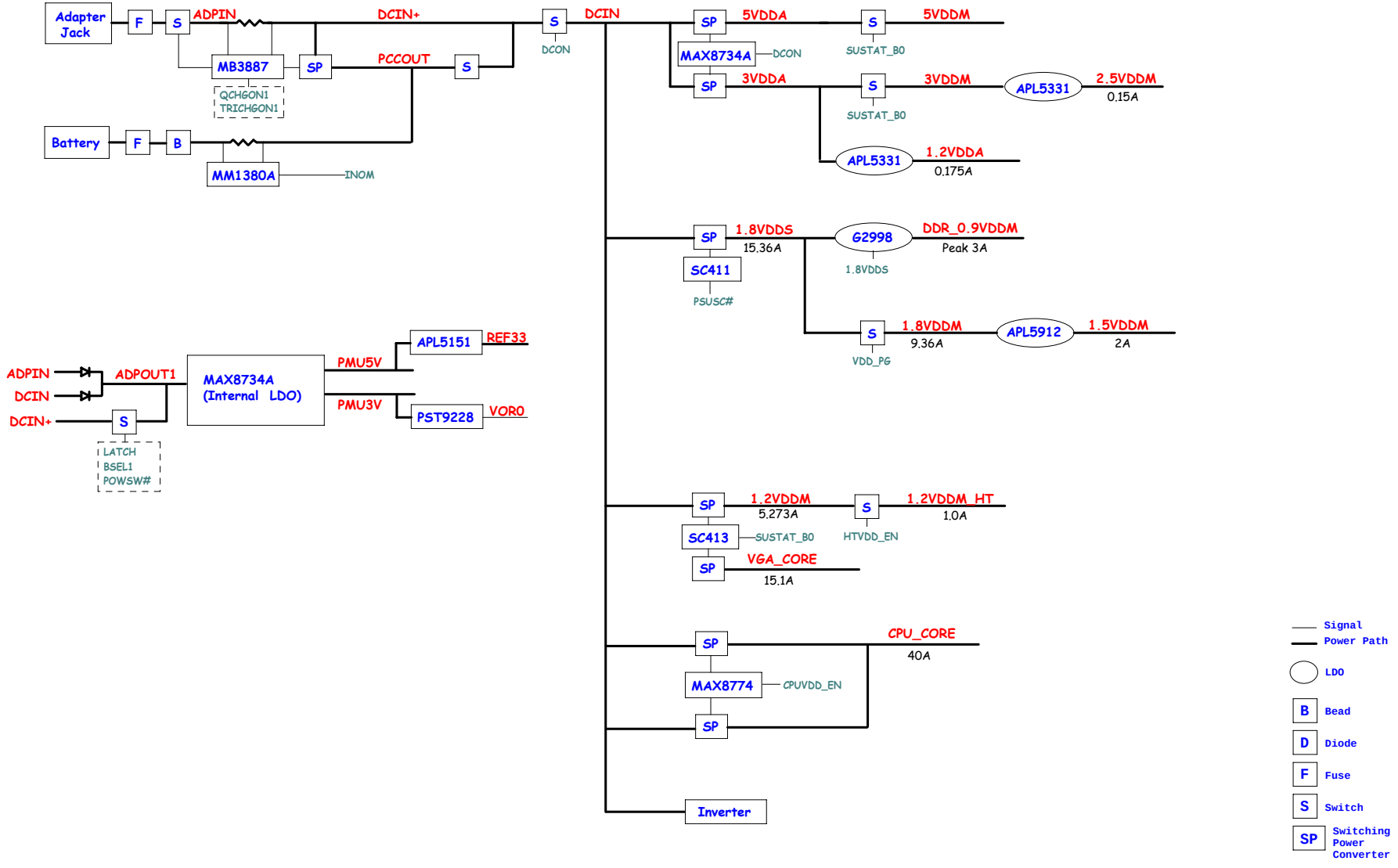
SYSTEM POWER OVP



PTT50 Power Block Diagram



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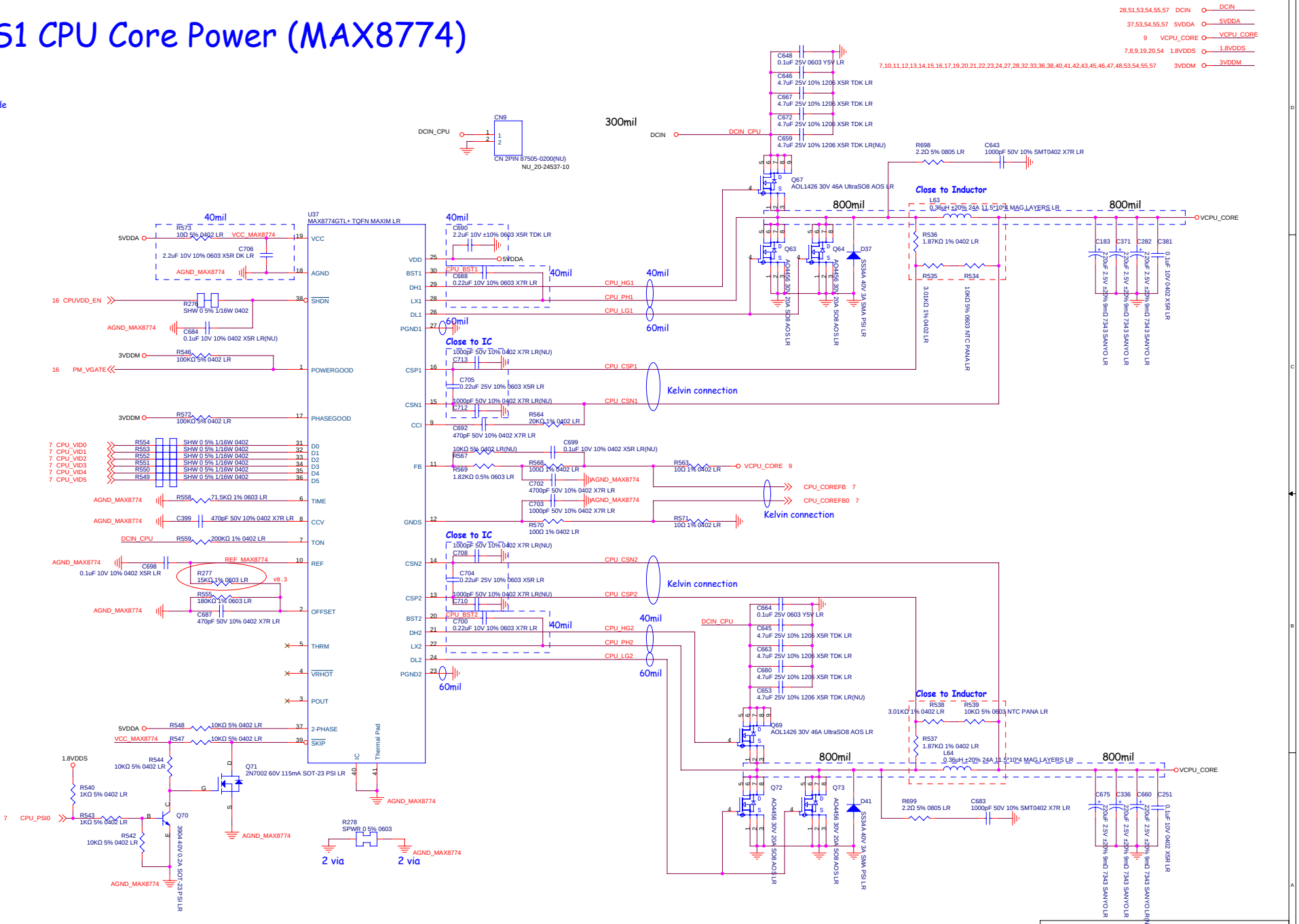
AMD K8S1 CPU Core Power (MAX8774)

#SKIP:
VCC: Dual Phase Force PWM Mode
REF: Dual Phase Skip Mode
GND: One Phase Skip Mode

#Switching frequency (Ton):
= 1/{16.26pF * (Rton+6.5k)}
Rton = 200k → 300kHz

#REF(2V):
1uF MLCC
maximum
to GND

#FB:
RFB=Rdroop/(Rsense*Gm(FB))
Gm(FB) Typ=600uS



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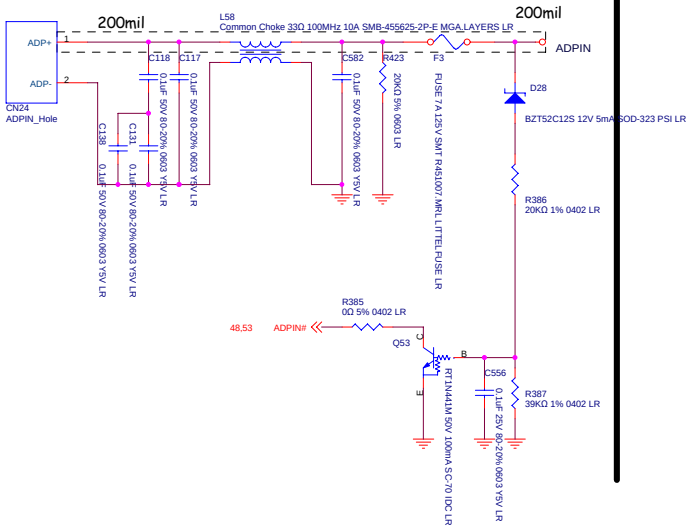
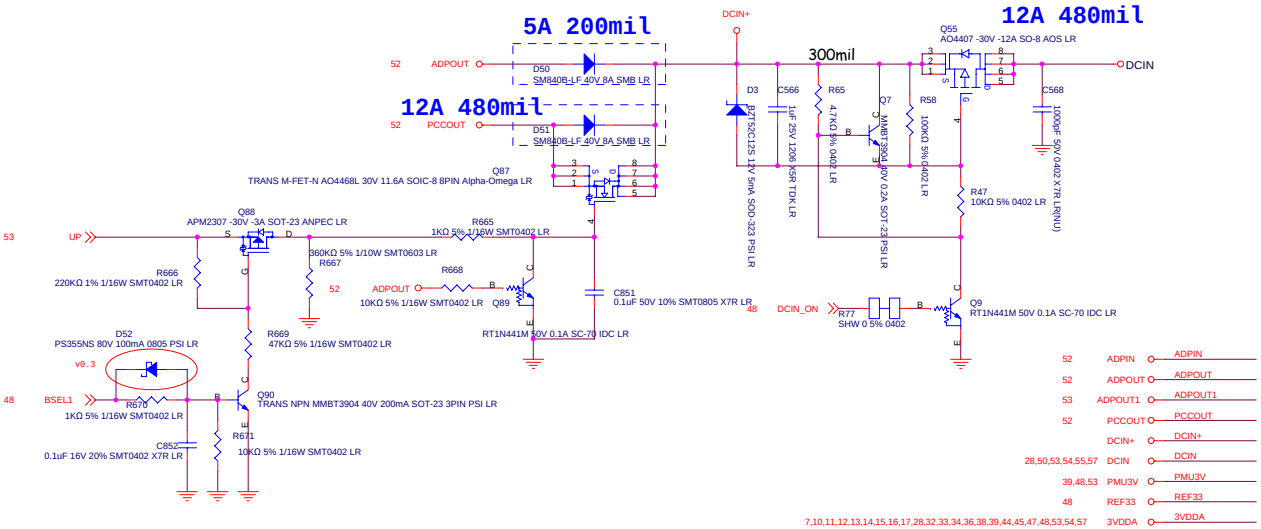
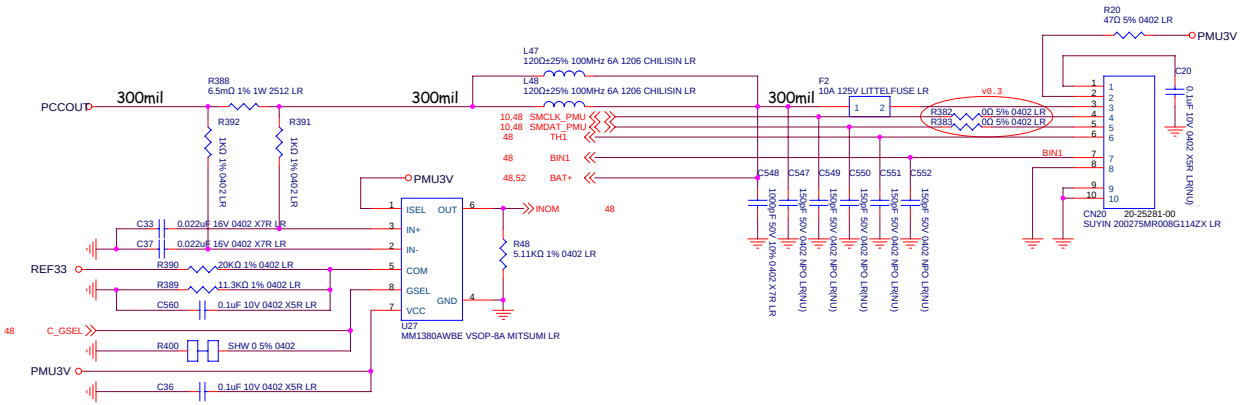
ADPIN



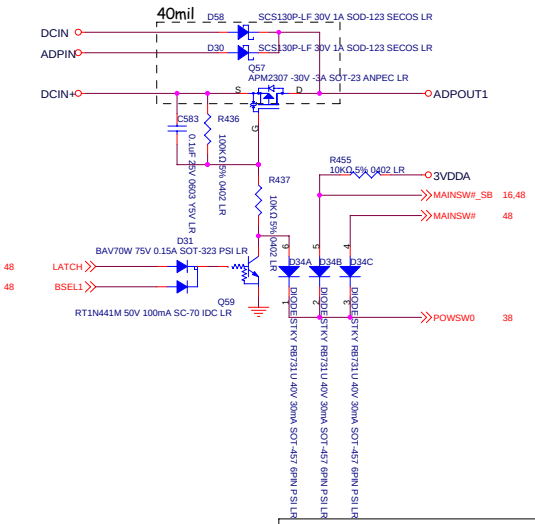
DCIN+ to DCIN



BATIN



ADPOUT1



PCHG PPMU

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Title

B

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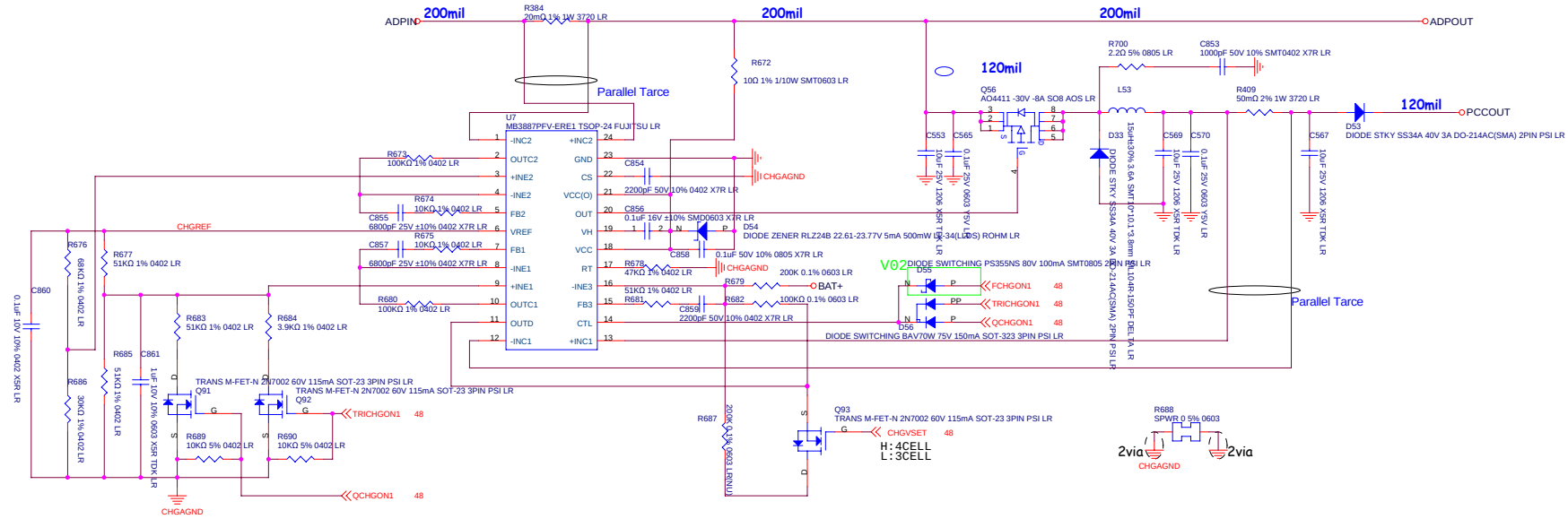
Charger



Total PWR = 85.52W(20V)

FCHG = 2.5A
QCHG = 1.67A
TCHG = 0.311A

51	ADPOUT	ADPOUT
51	ADPIN	ADPIN
51	PCCOUT	PCCOUT
48,51	BAT+	BAT+

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PCHG

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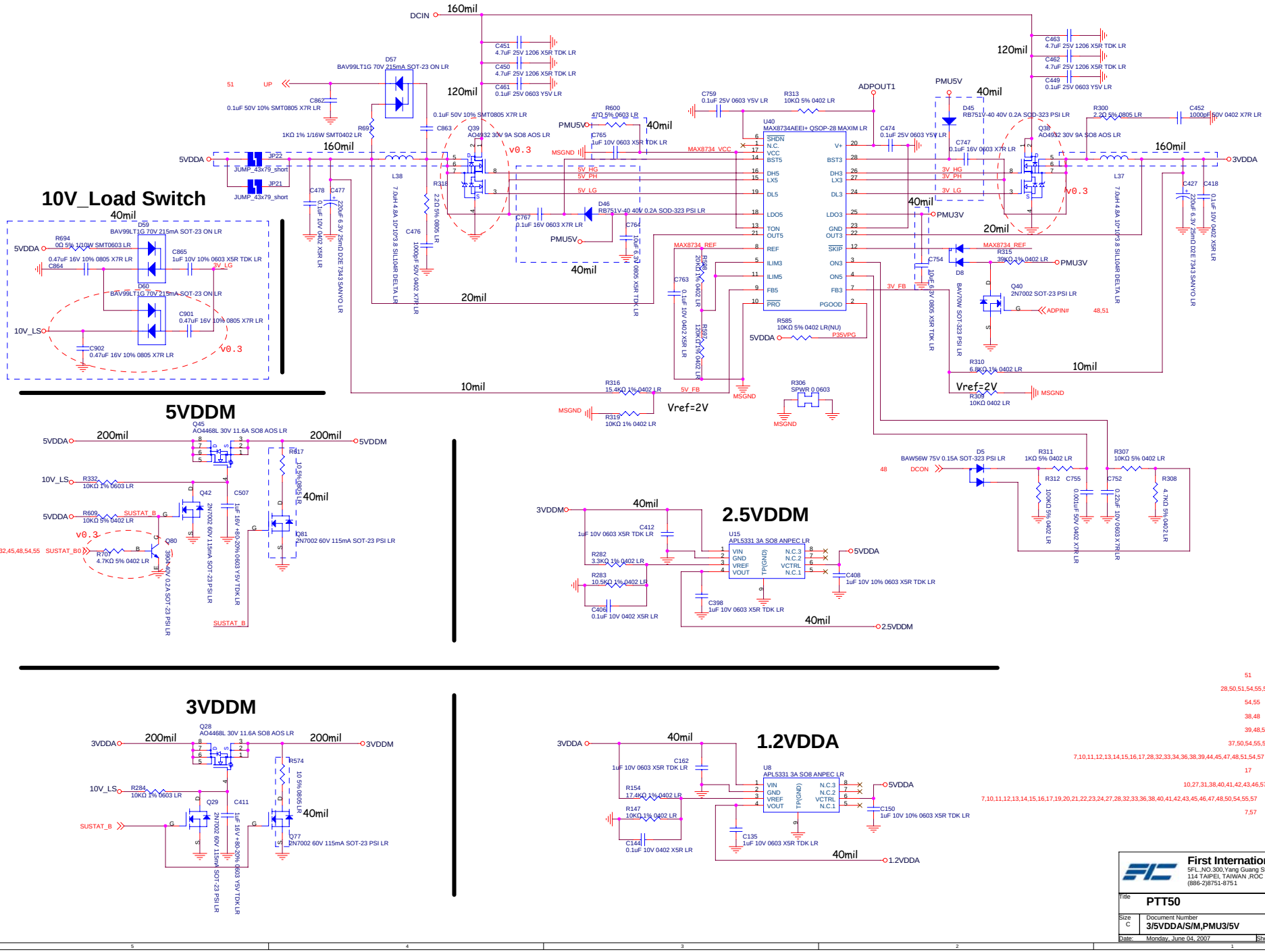
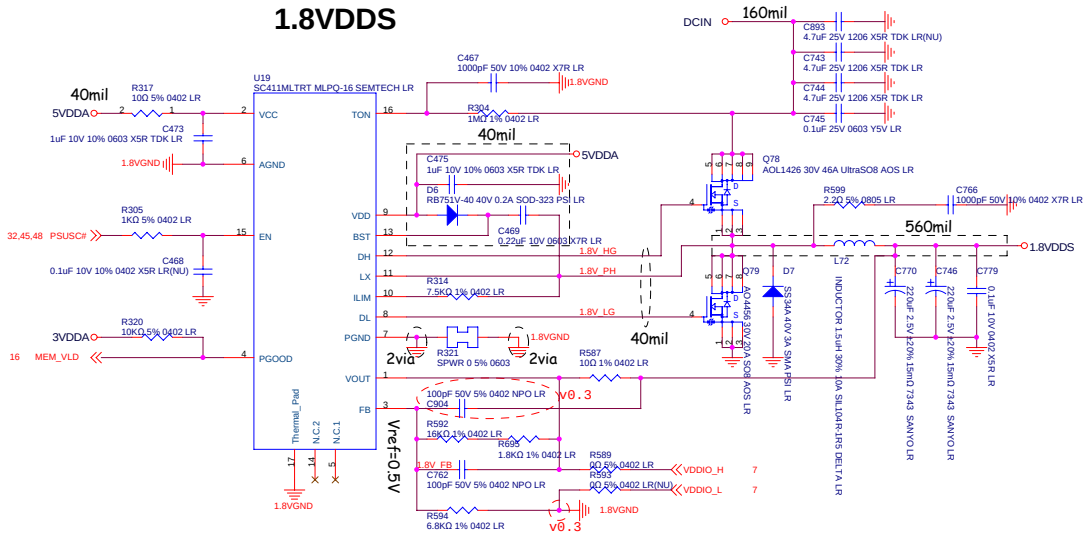
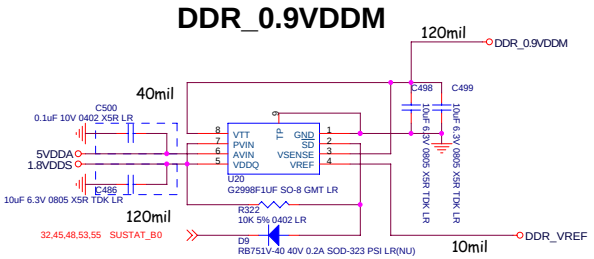
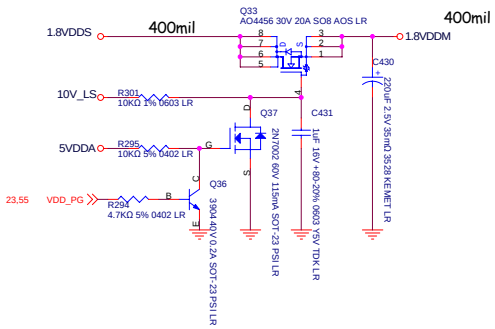
PMU5V/3V, 5VDDA/S/M, 3VDDA/S/M, 1.2VDDA, 2.5VDDM

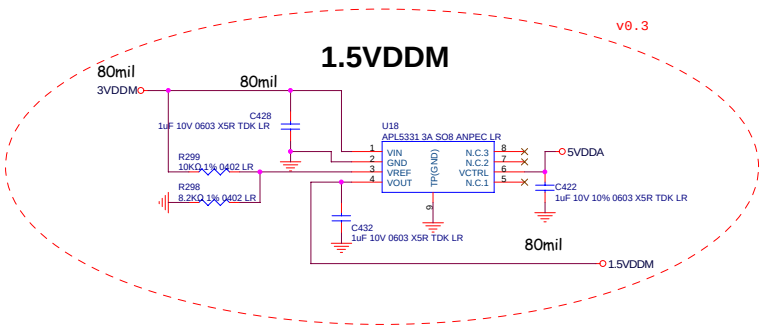


1.8VDDS/M, 0.9VDDM, 1.5VDDM









28,50,51,53,55,57 DCIN — DCIN
53,55 10V_LS — 10V_LS
37,50,53,55,57 5VDDA — 5VDDA
7,10,11,12,13,14,15,16,17,28,32,33,34,36,38,39,44,45,47,48,51,53,57 3VDDA — 3VDDA
7,8,9,19,20,50 1.8VDDS — 1.8VDDS
8,19,20 DDR_0.9VDDM — DDR_0.9VDDM
20 DDR_VREF — DDR_VREF
13,23,24,25 1.8VDDM — 1.8VDDM
VGADDR_0.9VDDM — VGADDR_0.9VDDM
VGADDR_VREF — VGADDR_VREF
7,10,11,12,13,14,15,16,17,19,20,21,22,23,24,27,28,32,33,36,38,40,41,42,43,45,46,47,48,50,53,55,57 3VDDM — 3VDDM
32,33 1.5VDDM — 1.5VDDM

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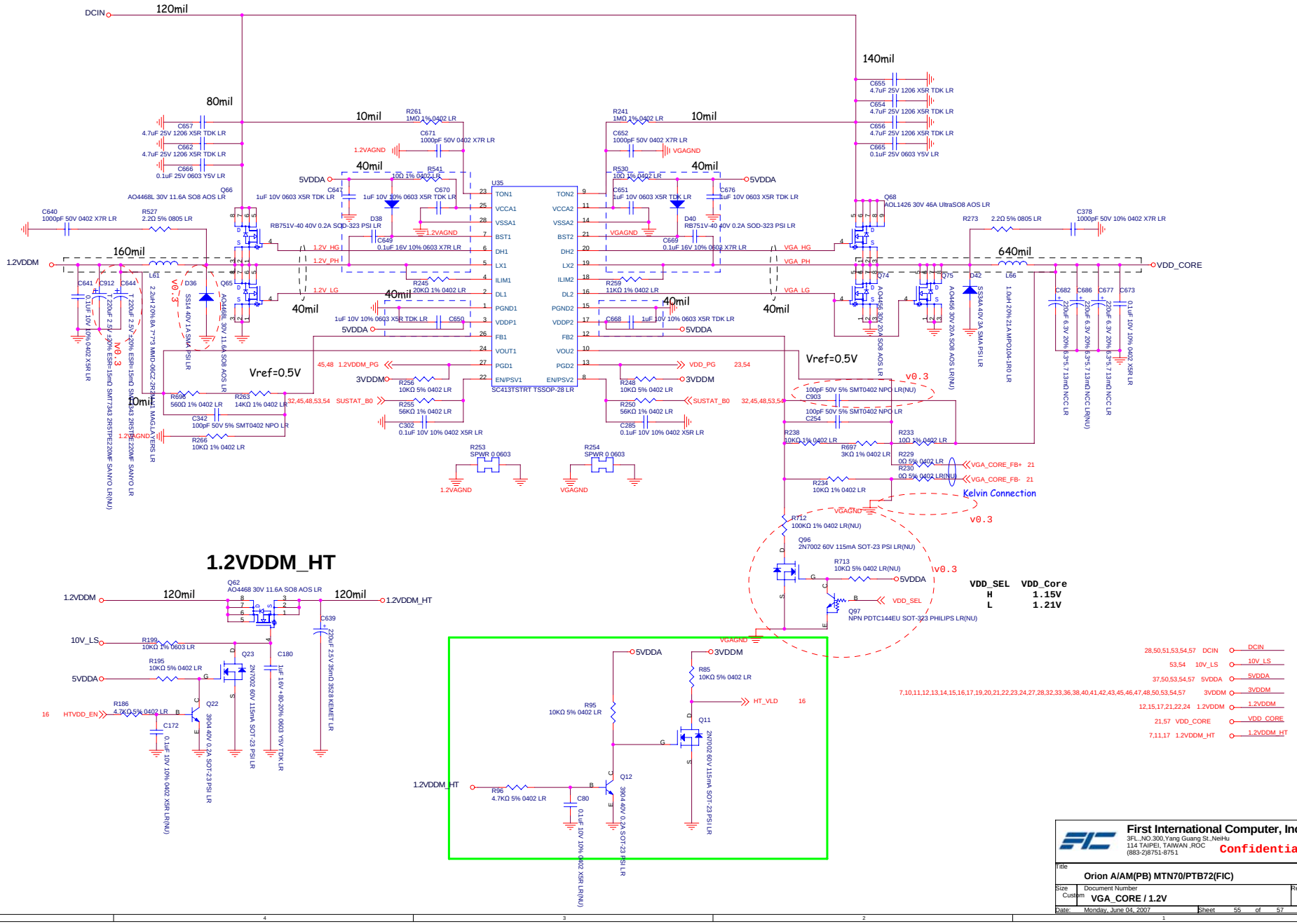
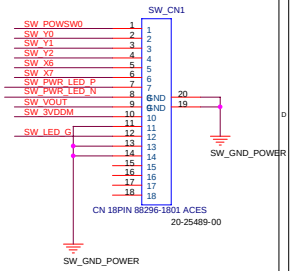
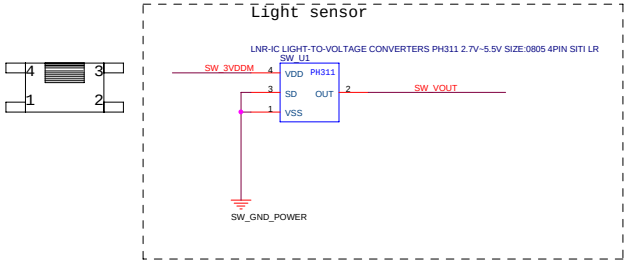
MCP67D Core Power / 1.2VDDM / HyperTransport Power

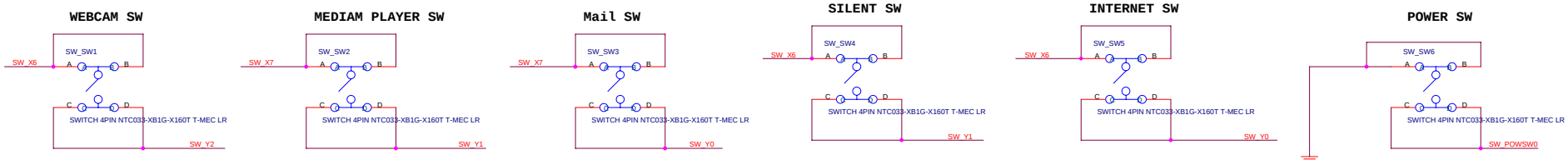


Switch Board



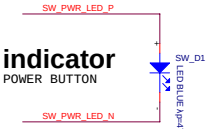


For MR040T w/ Hall sensor only



LEFT RIGHT

POSITION SEQUENCE	SW6	SW5	SW3	SW4	SW2	SW1



Power indicator
PUT UNDER POWER BUTTON

PCB : 50-71296-00/20/40
Name : PTT50 SW-B V0.1

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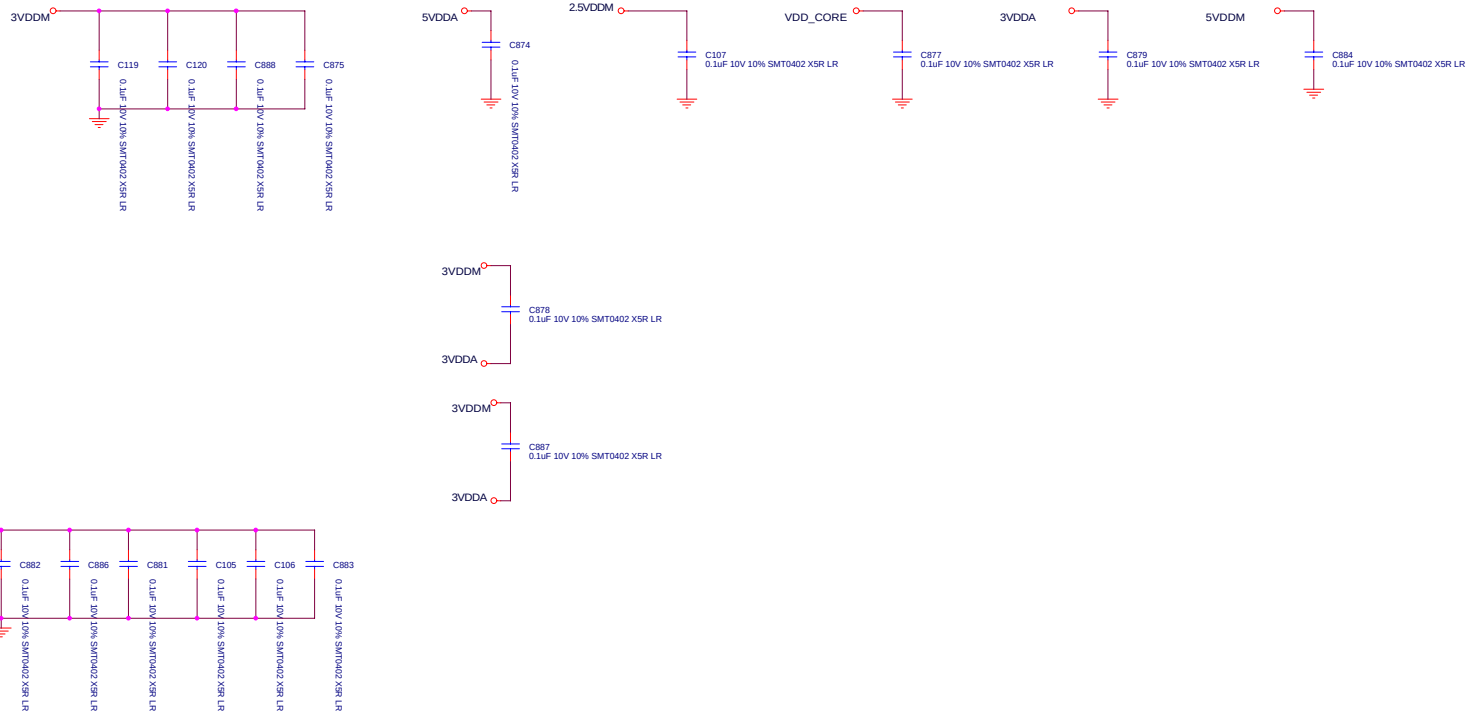

28,50,51,53,54,55 DCIN — DCIN

7,53 2.5VDDM — 2.5VDDM

7,10,11,12,13,14,15,16,17,19,20,21,22,23,24,27,28,32,33,36,38,40,41,42,43,45,46,47,48,50,53,54,55 3VDDM — 3VDDM

37,50,53,54,55 5VDDA — 5VDDA

21,55 VDD_CORE — VDD_CORE

7,10,11,12,13,14,15,16,17,28,32,33,34,36,38,39,44,45,47,48,51,53,54 3VDDA — 3VDDA

10,27,31,38,40,41,42,43,46,53 5VDDM — 5VDDM

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