Asrock INTEL G31M-VS Schematics Revision G/A 1.01

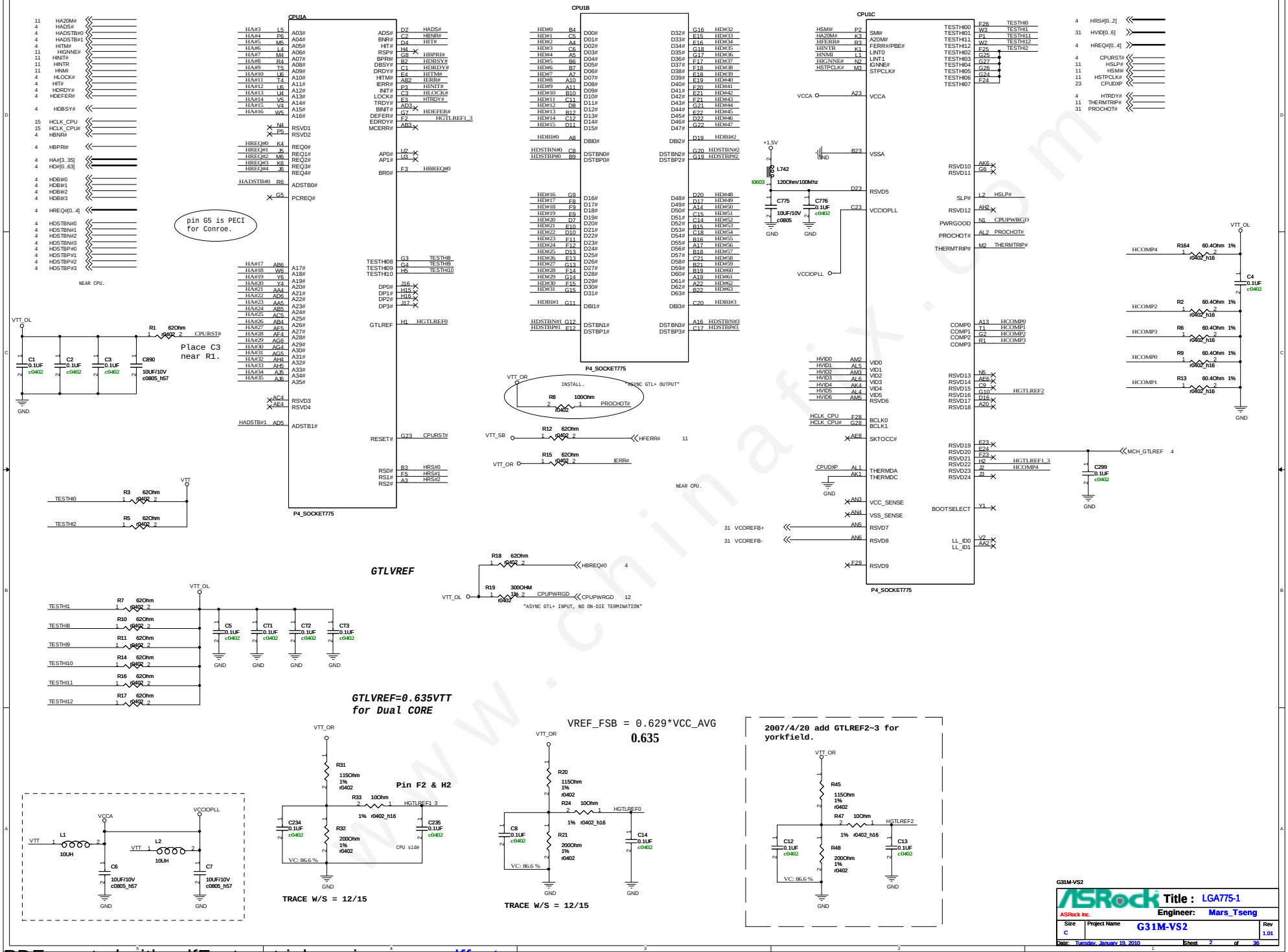
G31M-VS2

ASRock Title : COVER SHEET

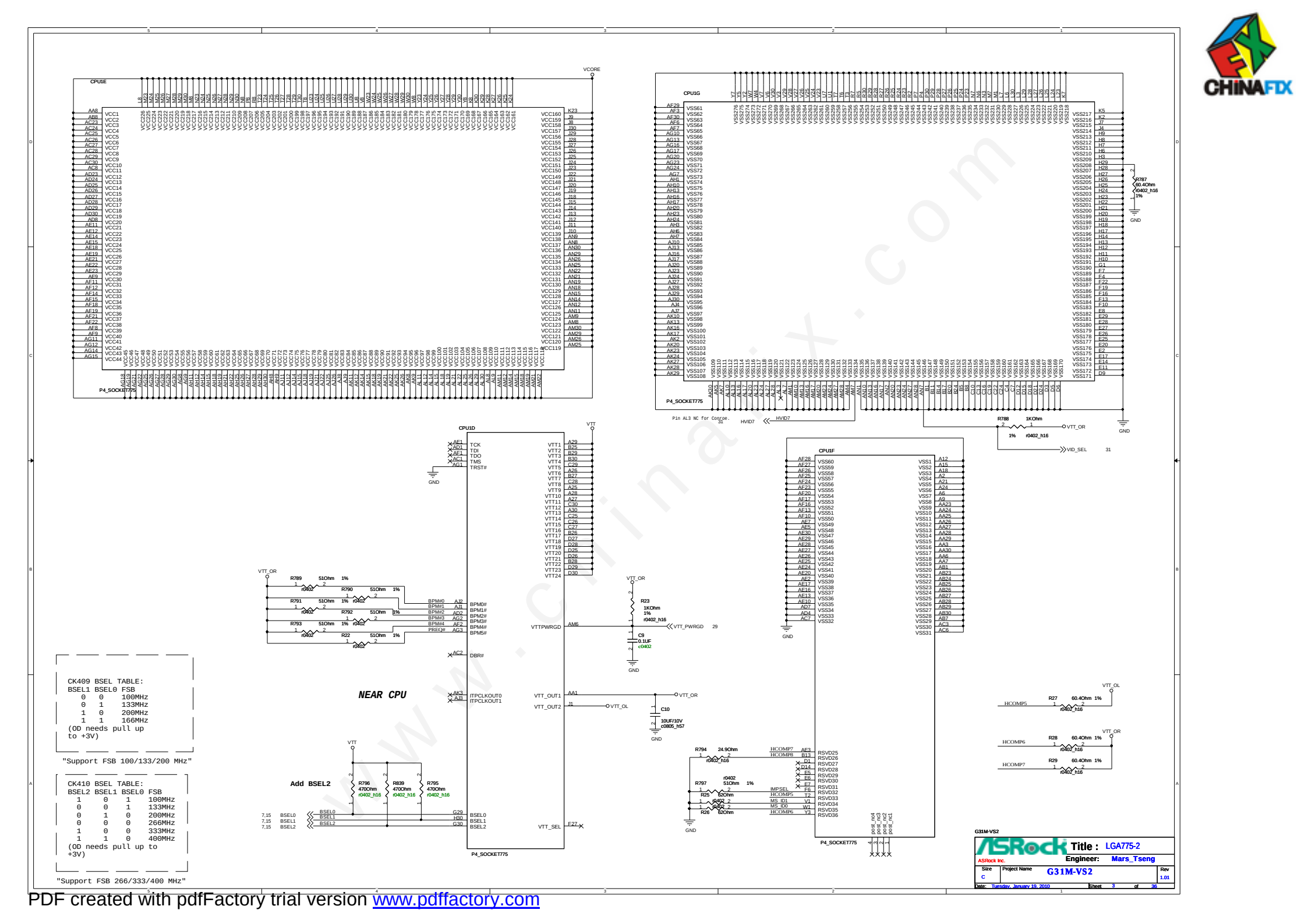
ASRock Inc. Engineer: Mars_Tseng

Size	Project Name	Rev
Custom	G31M-VS2	1.01

Date: Friday, January 15, 2010 Sheet 1 of 36



Title :	LGA775-1
Engineer:	Mars_Tseng
Project Name	G31M-VS2
Size	C
Rev	1.01
Date:	Tuesday, January 19, 2010
Sheet	2 of 36




```
CK409 BSEL TABLE:
BSEL1 BSEL0 FSB
  0     0     100MHz
  0     1     133MHz
  1     0     200MHz
  1     1     166MHz
(OD needs pull up
to +3V)
```

"Support FSB 100/133/200 MHz"

```
CK410 BSEL TABLE:
BSEL2 BSEL1 BSEL0 FSB
  1     0     1     100MHz
  0     0     1     133MHz
  0     1     0     200MHz
  0     0     0     266MHz
  1     0     0     333MHz
  1     1     0     400MHz
(OD needs pull up to
+3V)
```

"Support FSB 266/333/400 MHz"

G31M-VS2

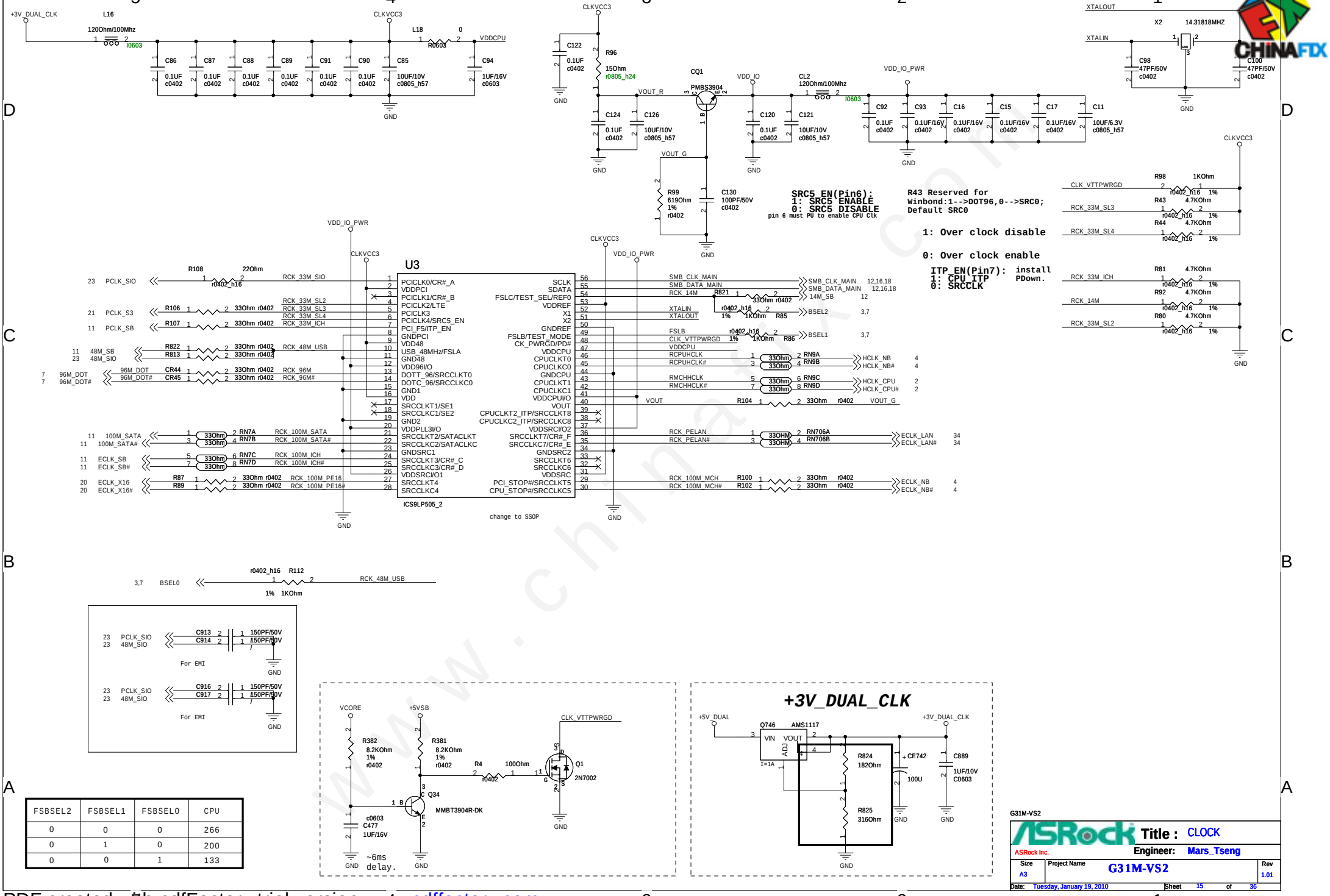
ASRock Inc.

Title : LGA775-2

Engineer: Mars_Tseng

Size	Project Name	Rev
C	G31M-VS2	1.01

Date: Tuesday, January 19, 2010 Sheet 3 of 36



FSBSEL2	FSBSEL1	FSBSEL0	CPU
0	0	0	266
0	1	0	200
0	0	1	133

G31M-VS2

ASRock Inc.

Title : CLOCK

Engineer: Mars_Tseng

Size	Project Name	Rev
A3	G31M-VS2	1.01

Date: Tuesday, January 19, 2010 Sheet 15 of 36

LF FootPrint

DDRII_1A

MAA_A0	188	A0	DQ63	236	MD_A62
MAA_A1	183	A1	DQ62	235	MD_A58
MAA_A2	63	A2	DQ61	230	MD_A61
MAA_A3	182	A3	DQ60	229	MD_A60
MAA_A4	61	A4	DQ59	117	MD_A59
MAA_A5	60	A5	DQ58	116	MD_A63
MAA_A6	180	A6	DQ57	111	MD_A57
MAA_A7	58	A7	DQ56	110	MD_A56
MAA_A8	179	A8	DQ55	227	MD_A55
MAA_A9	177	A9	DQ54	226	MD_A54
MAA_A10	70	A10/AP	DQ53	218	MD_A53
MAA_A11	57	A11	DQ52	217	MD_A52
MAA_A12	176	A12	DQ51	108	MD_A51
MAA_A13	196	A13	DQ50	107	MD_A50
MAA_A14	174	A14	DQ49	99	MD_A49
	X 173	A15	DQ48	98	MD_A48
			DQ47	215	MD_A47
RCK_DIMM_A2	220	CK2P	DQ46	214	MD_A46
RCK_DIMM_A2#	221	CK2N	DQ45	209	MD_A45
RCK_DIMM_A1	137	CK1P	DQ44	208	MD_A44
RCK_DIMM_A1#	138	CK1N	DQ43	96	MD_A43
RCK_DIMM_A0	185	CK0P	DQ42	95	MD_A42
RCK_DIMM_A0#	186	CK0N	DQ41	90	MD_A41
			DQ40	89	MD_A40
MCS_A1#	76	CS1#	DQ39	206	MD_A39
MCS_A0#	193	CS0#	DQ38	205	MD_A38
			DQ37	200	MD_A32
MCKE_A1	171	CKE1	DQ36	199	MD_A36
MCKE_A0	52	CKE0	DQ35	87	MD_A35
			DQ34	86	MD_A34
MBS_A2	54	A16/BA2	DQ33	81	MD_A33
MBS_A1	190	BA1	DQ32	80	MD_A37
MBS_A0	71	BA0	DQ31	159	MD_A26
			DQ30	158	MD_A29
SMB_DATA_MAIN	119	SDA	DQ29	153	MD_A28
SMB_CLK_MAIN	120	SCL	DQ28	152	MD_A31
			DQ27	40	MD_A30
	X 168	NC/CB7	DQ26	39	MD_A27
	X 167	NC/CB6	DQ25	34	MD_A25
	X 162	NC/CB5	DQ24	33	MD_A24
	X 161	NC/CB4	DQ23	150	MD_A23
	X 49	NC/CB3	DQ22	149	MD_A22
	X 48	NC/CB2	DQ21	144	MD_A21
	X 43	NC/CB1	DQ20	143	MD_A20
	X 42	NC/CB0	DQ19	31	MD_A19
			DQ18	30	MD_A18
	101	SA2	DQ17	25	MD_A17
	240	SA1	DQ16	24	MD_A16
	239	SA0	DQ15	141	MD_A15
			DQ14	140	MD_A14
			DQ13	132	MD_A13
			DQ12	131	MD_A12
			DQ11	22	MD_A11
			DQ10	21	MD_A10
MWE_A#	73	WE#	DQ9	13	MD_A9
MRAS_A#	192	RAS#	DQ8	12	MD_A8
MCAS_A#	74	CAS#	DQ7	129	MD_A7
			DQ6	128	MD_A6
MODT_A1	77	ODT1	DQ5	123	MD_A5
MODT_A0	195	ODT0	DQ4	122	MD_A4
			DQ3	10	MD_A3
	X 55	RC02	DQ2	9	MD_A2
	X 18	RESET#	DQ1	4	MD_A1
			DQ0	3	MD_A0
	X 164	DM8/DQS17P	DQS7P	114	MDQS_A7
	X 165	NC/DQS17N	DQS7N	113	MDQS_A7#
MDQM_A7	232	DM7/DQS16P	DQS6P	105	MDQS_A6
	X 233	NC/DQS16N	DQS6N	104	MDQS_A6#
MDQM_A6	223	DM6/DQS15P	DQS5P	93	MDQS_A5
	X 224	NC/DQS15N	DQS5N	92	MDQS_A5#
MDQM_A5	211	DM5/DQS14P	DQS4P	84	MDQS_A4
	X 212	NC/DQS14N	DQS4N	83	MDQS_A4#
MDQM_A4	202	DM4/DQS13P	DQS3P	37	MDQS_A3
	X 203	NC/DQS13N	DQS3N	36	MDQS_A3#
MDQM_A3	155	DM3/DQS12P	DQS2P	28	MDQS_A2
	X 156	NC/DQS12N	DQS2N	27	MDQS_A2#
MDQM_A2	146	DM2/DQS11P	DQS1P	16	MDQS_A1
	X 147	NC/DQS11N	DQS1N	15	MDQS_A1#
MDQM_A1	134	DM1/DQS10P	DQS0P	7	MDQS_A0
	X 135	NC/DQS10N	DQS0N	6	MDQS_A0#
MDQM_A0	125	DM0/DQS9P			
	X 126	NC/DQS9N			
	X 46	NC/DQS8P			
	X 45	NC/DQS8N			
	X 102	NC2	NP_NC1	X 241	
	X 68	NC1	NP_NC2	X 242	
	X 19	NC0	NP_NC3	X 243	

DDR_DIMM_240P

GND

CK_DIMM_A2	RCK_DIMM_A2
CK_DIMM_A2#	RCK_DIMM_A2#
CK_DIMM_A1	RCK_DIMM_A1
CK_DIMM_A1#	RCK_DIMM_A1#
CK_DIMM_A0	RCK_DIMM_A0
CK_DIMM_A0#	RCK_DIMM_A0#

SMB_DATA_MAIN
SMB_CLK_MAIN

D2C1 150PF/50V / GND

D2C2 150PF/50V / GND

Placed close to DIMM

MD_A[63..0] 5
MAA_A[14..0] 5
MBS_A[2..0] 5
MODT_A[1..0] 5
MDQM_A[7..0] 5
MCKE_A[1..0] 5
MCS_A0# 5
MCS_A1# 5

MWE_A# 5
MCAS_A# 5
MRAS_A# 5

CK_DIMM_A0 5
CK_DIMM_A0# 5
CK_DIMM_A1 5
CK_DIMM_A1# 5
CK_DIMM_A2 5
CK_DIMM_A2# 5

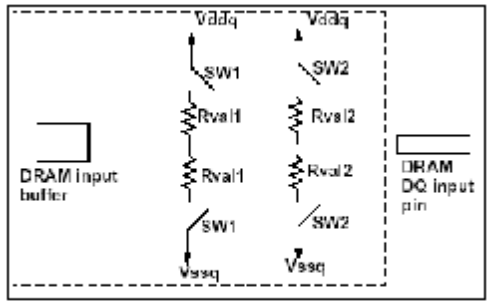
MDQS_A7# 5
MDQS_A7 5
MDQS_A6# 5
MDQS_A6 5
MDQS_A5# 5
MDQS_A5 5
MDQS_A4# 5
MDQS_A4 5
MDQS_A3# 5
MDQS_A3 5
MDQS_A2# 5
MDQS_A2 5
MDQS_A1# 5
MDQS_A1 5
MDQS_A0# 5
MDQS_A0 5

SMB_CLK_MAIN 12,15,18
SMB_DATA_MAIN 12,15,18

1.00 ODT On die Termination
1.Reduced DQ and DQS skew
2.Increased voltage margin
3.Reduced board area and BOM cost

There status Off,75,150 Ohm

ODT: On Die Termination



- Controlled by memory controller via ODT pin.
- Can be turned on/off in 2 cycles
- Provides active termination at the receiver interface.

G31M-VS2

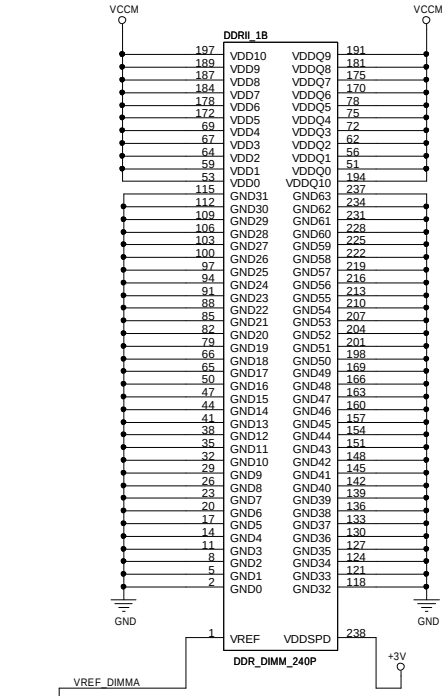
ASRock Inc.

Title : DDR2-CHA Control

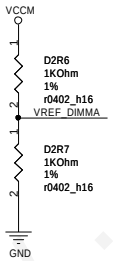
Engineer: Mars_Tseng

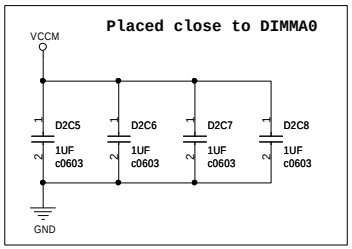
Size	Project Name	Rev
A3	G31M-VS2	1.01

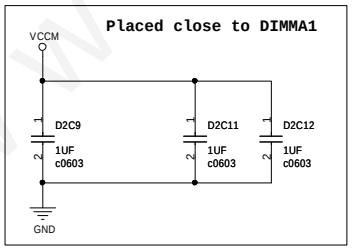
Date: Tuesday, January 19, 2010 Sheet 16 of 36



1.00
Close to
Connector







MAA_A[14..0] 5,16
MBS_A[2..0] 5,16
MWE_A# 5,16
MCAS_A# 5,16
MRAS_A# 5,16
MCS_A0# 5,16
MCS_A1# 5,16
MODT_A0 5,16
MODT_A1 5,16
MCKE_A0 5,16
MCKE_A1 5,16

1.00 DDR2 need termination signals :
CS#[3:0]
CKE[3:0]
ODT[3:0]
MA[13:0]
BS[2:0]
RAS#
CAS#
WE#

1.00 DDR2 Spec.
VDDQ 1.8V for DQ power
VDD 1.8V for power
VDDL 1.8V for DLL
power

G31M-VS2

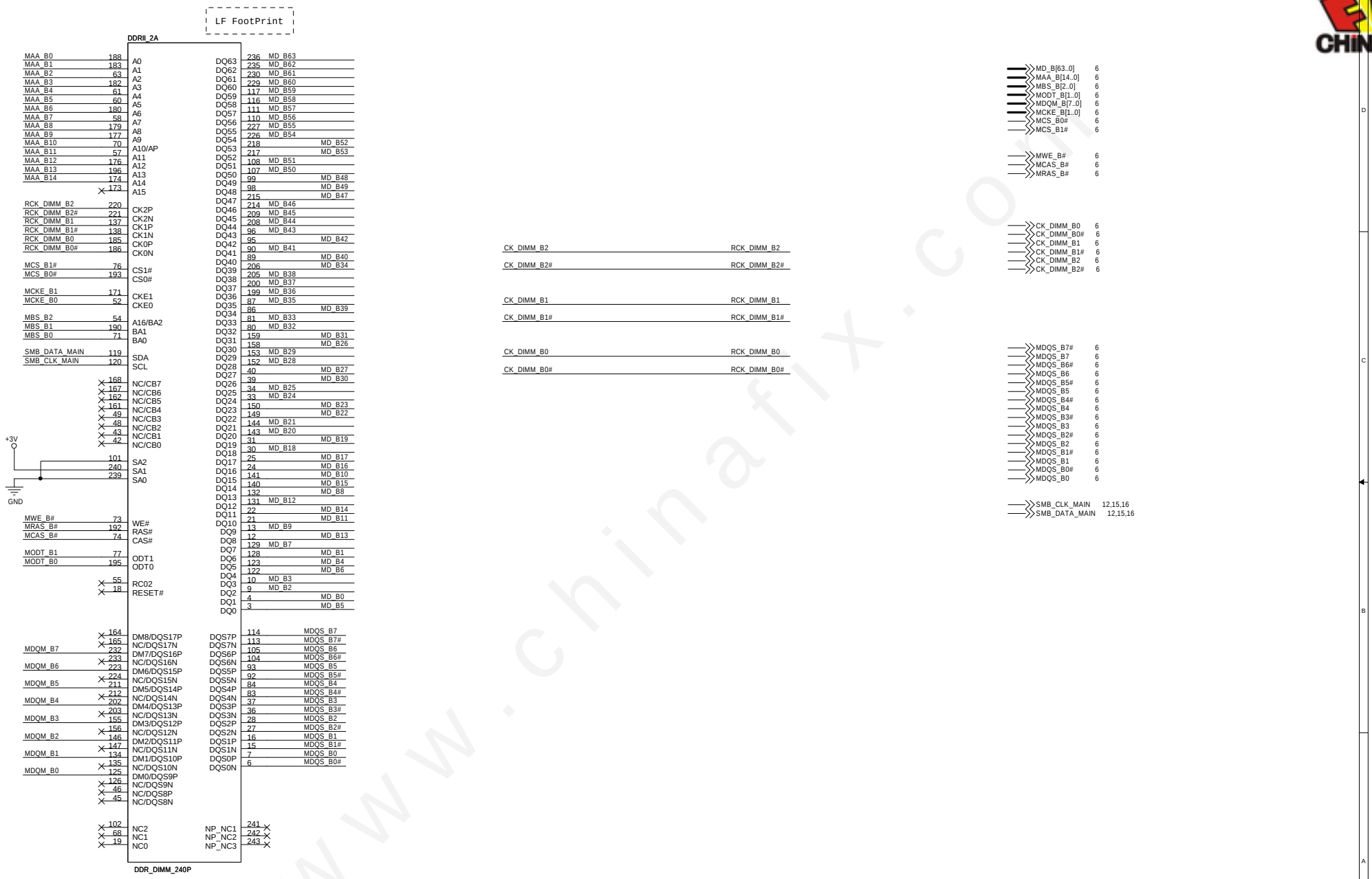
ASRock Inc.

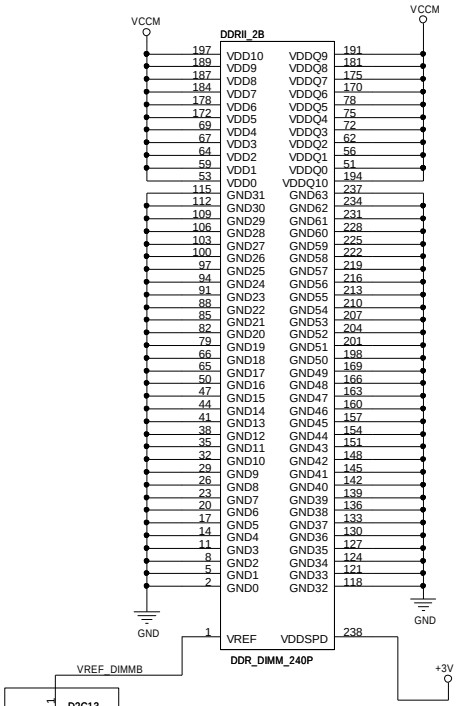
Title : DDR2-CHA Power

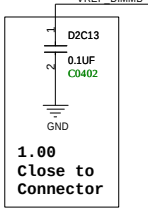
Engineer: Mars_Tseng

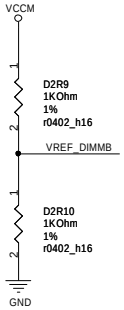
Size	Project Name	Rev
A3	G31M-VS2	1.01

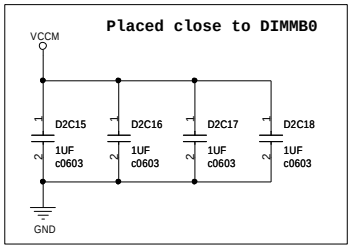
Date: Tuesday, January 19, 2010 Sheet 17 of 36

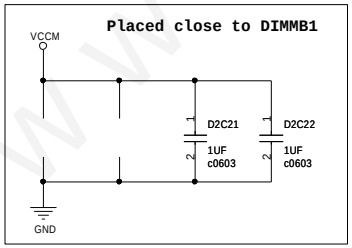










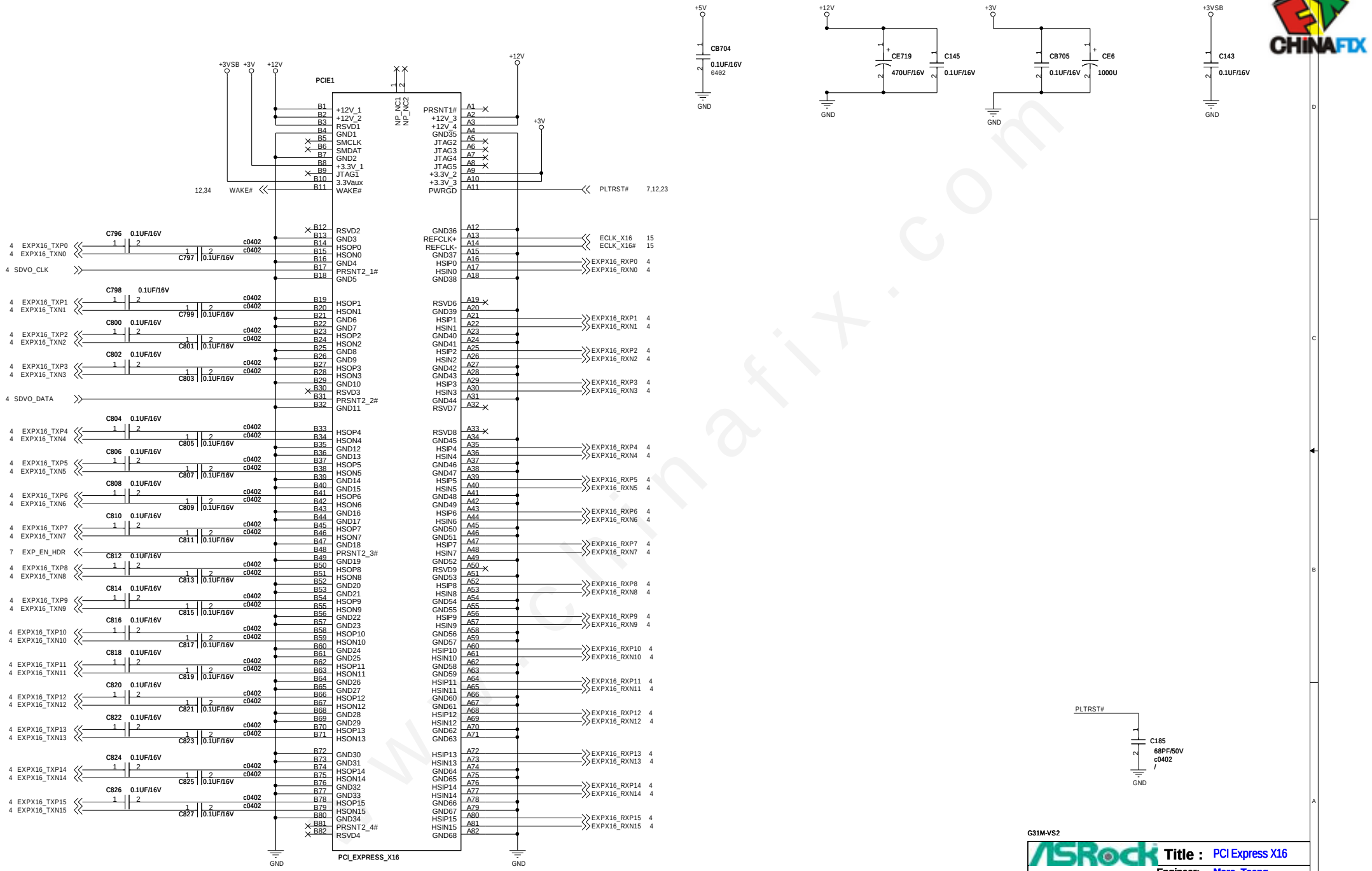


MAA_B[14..0] 6,18
MBS_B[2..0] 6,18
MWE_B# 6,18
MCAS_B# 6,18
MRAS_B# 6,18
MCS_B0# 6,18
MODT_B0 6,18
MCS_B1# 6,18
MODT_B1 6,18
MCKE_B0 6,18
MCKE_B1 6,18

1.00 DDR2 need termination signals :
CS#[3:0]
CKE[3:0]
ODT[3:0]
MA[13:0]
BS[2:0]
RAS#
CAS#
WE#

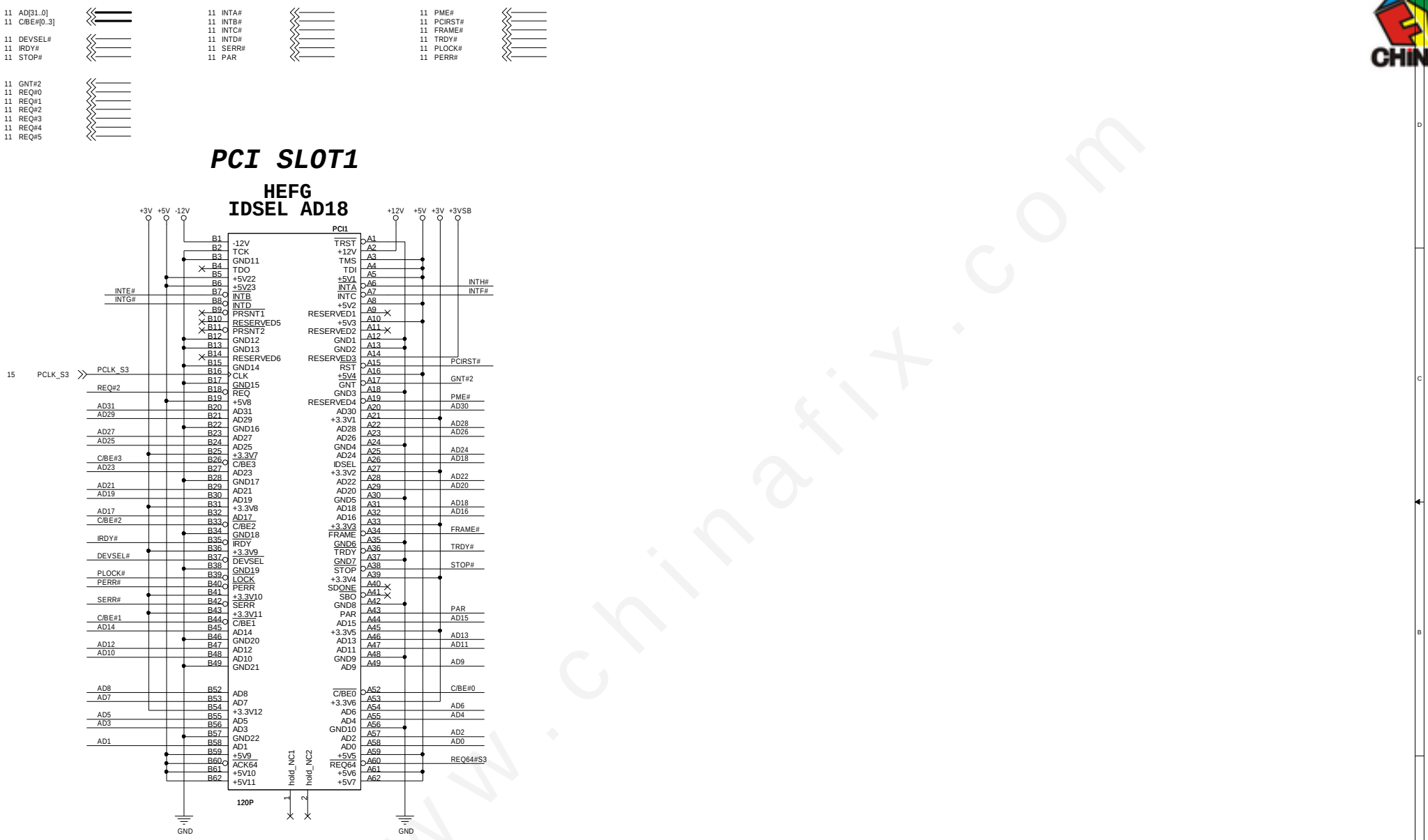
G31M-VS2

ASRock Inc.	Title : DDR2-CHB Power		
	Engineer: Mars_Tseng		
Size: A3	Project Name: G31M-VS2		Rev: 1.01
Date: Tuesday, January 19, 2010	Sheet 19 of 36		

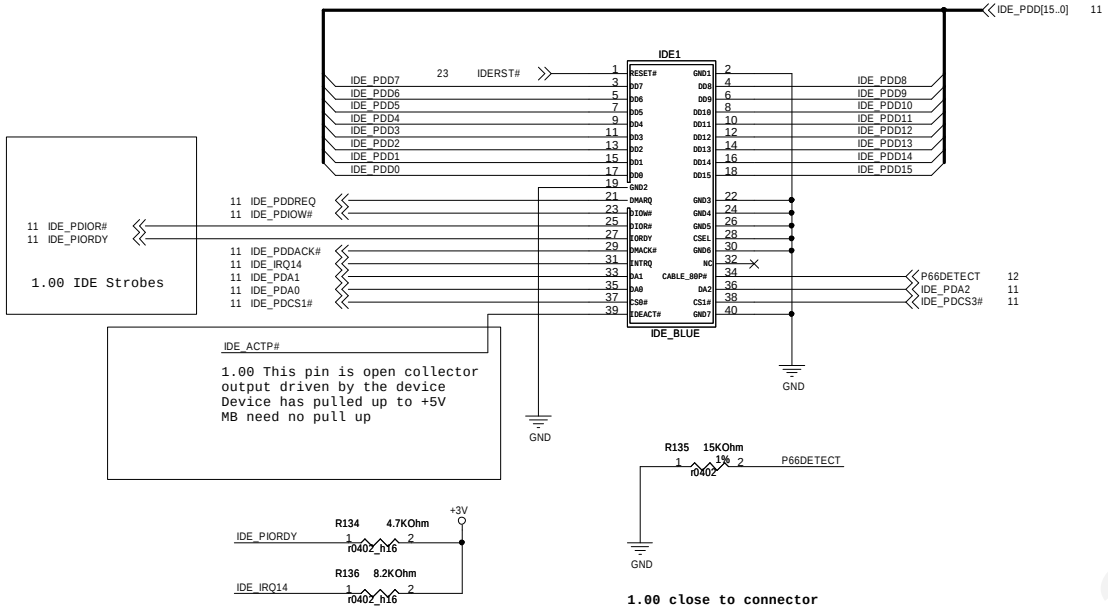


G31M-VS2

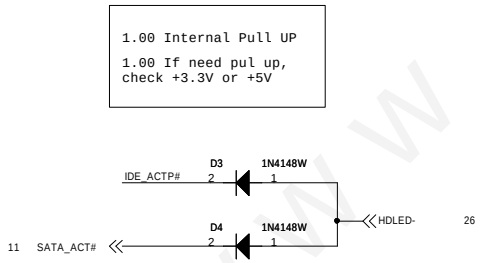
ASRock Inc.	Title : PCI Express X16		
	Engineer: Mars_Tseng		
Size: A3	Project Name: G31M-VS2		Rev: 1.01
Date: Tuesday, January 19, 2010	Sheet 20 of 36		



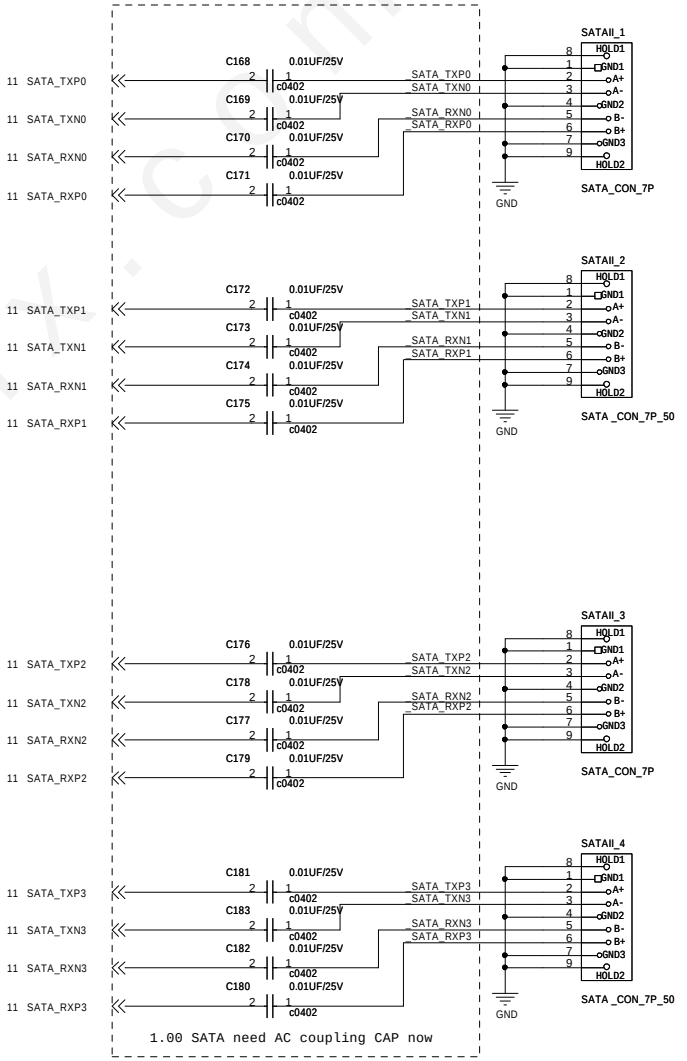
IDE



IDE & SATA LED



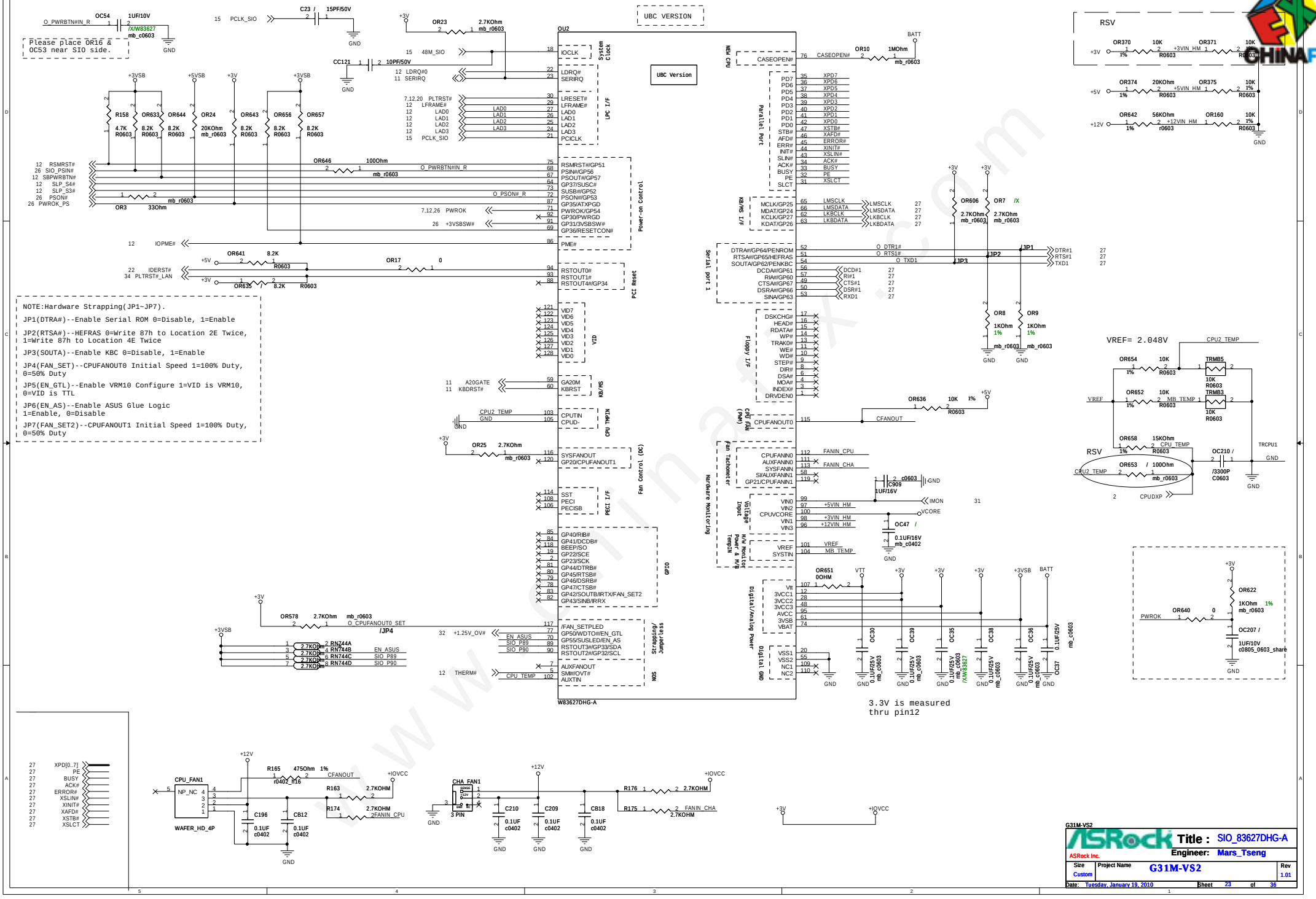
Serial ATA

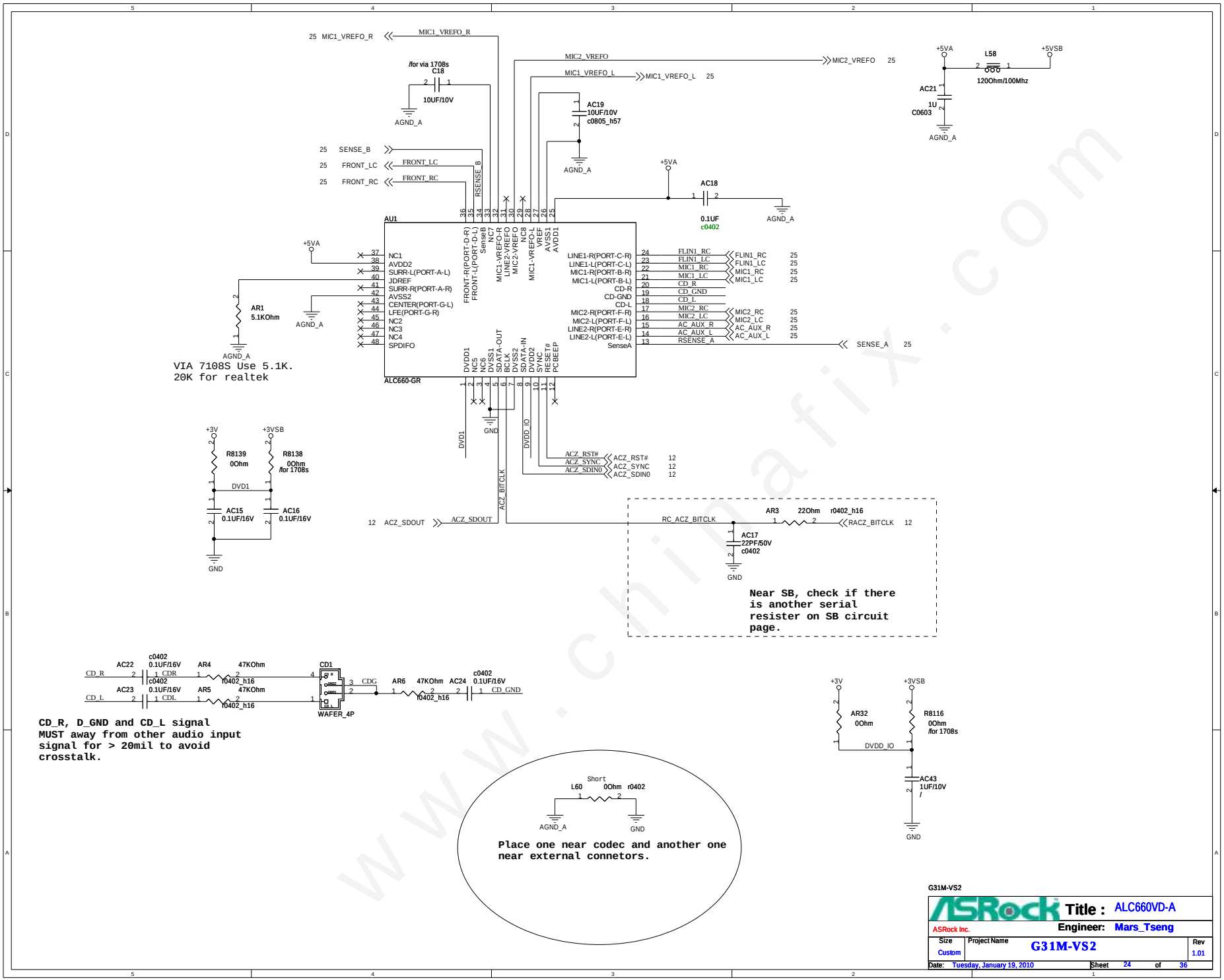


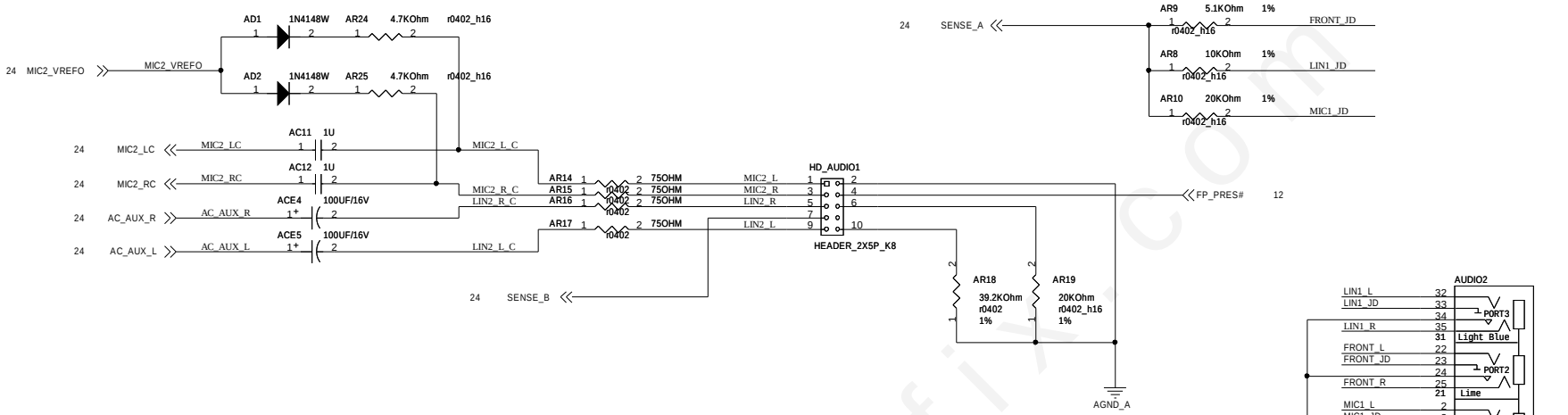
1.00 AC coupling CAP must minimize the placement mismatch within a differential pair.

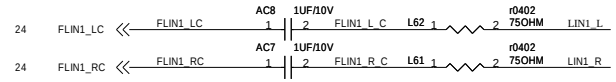
G31M-VS2

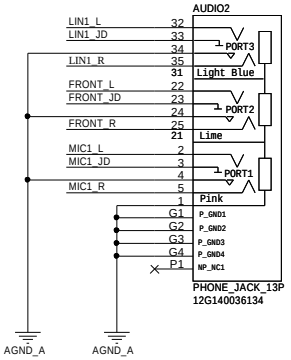
ASRock Inc.	Title : IDE & SATA		
	Engineer: Mars_Tseng		
Size: A3	Project Name: G31M-VS2		Rev: 1.01
Date: Tuesday, January 19, 2010	Sheet 22 of 36		

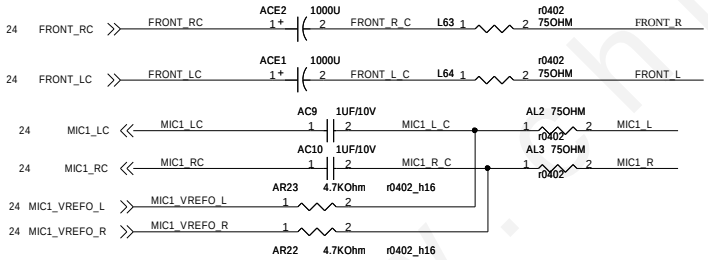


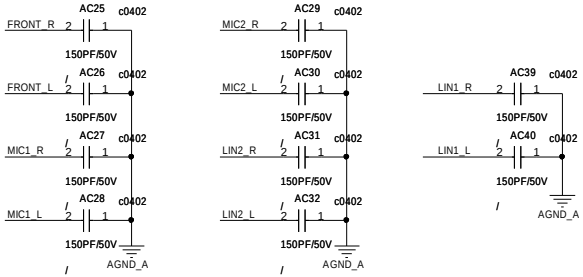






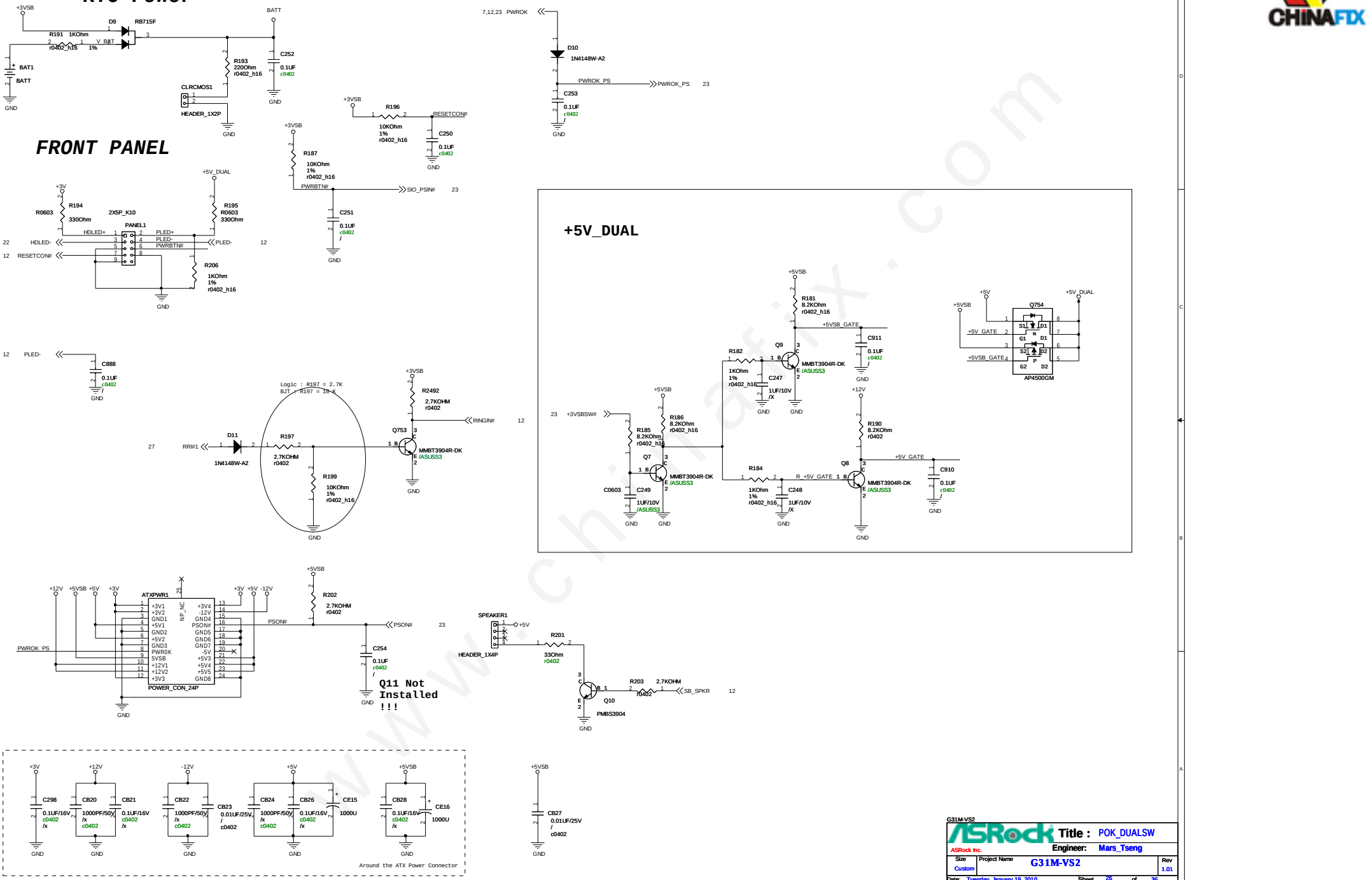




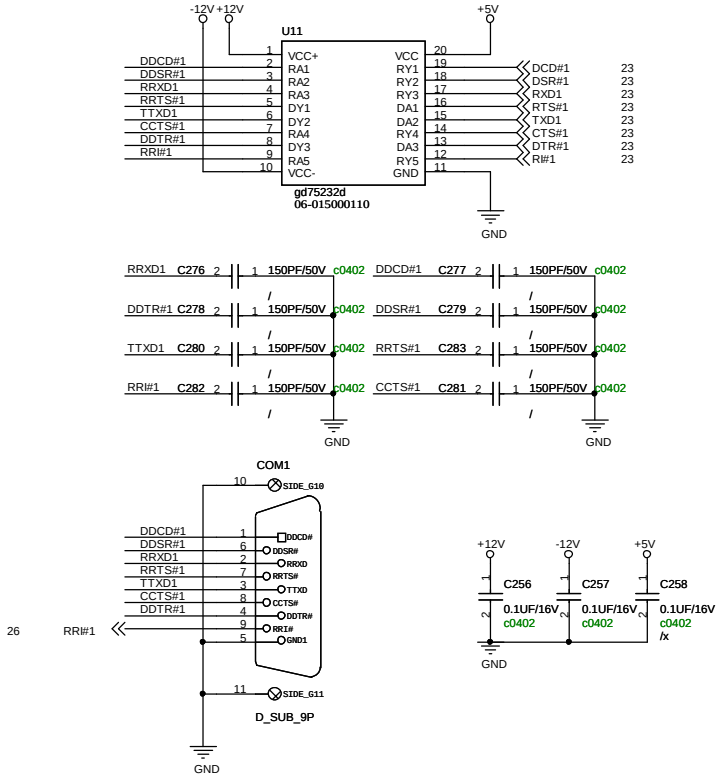


G31M-VS2

ASRock	Title :	ALC6600VD-B
ASRock Inc.	Engineer:	Mars_Tseng
Size: A3	Project Name: G31M-VS2	Rev: 1.01
Date: Tuesday, January 19, 2010	Sheet 25 of 36	

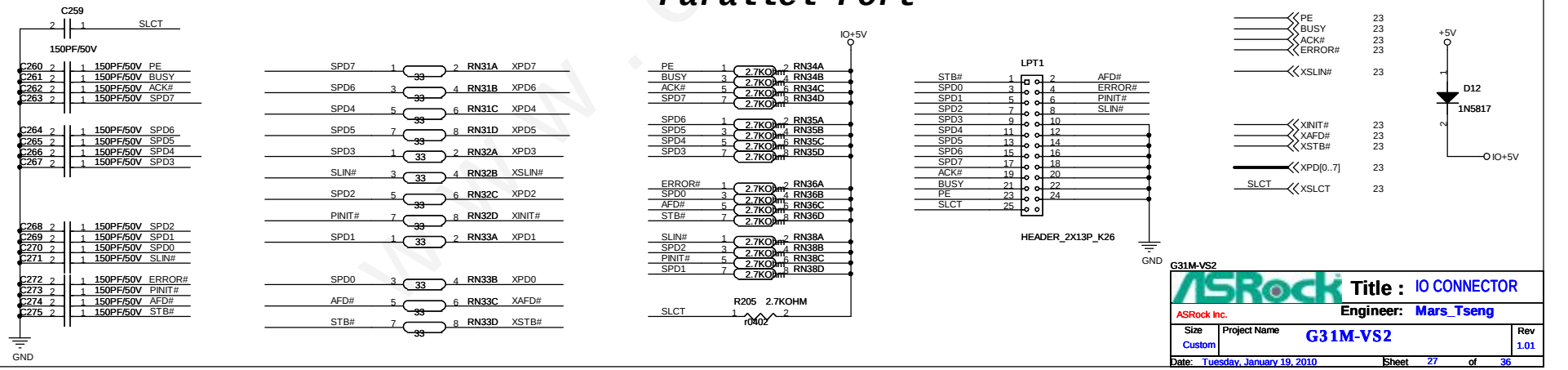


COM



KB/MOUSE

Parallel Port



G31M-VS2

ASRock Inc.

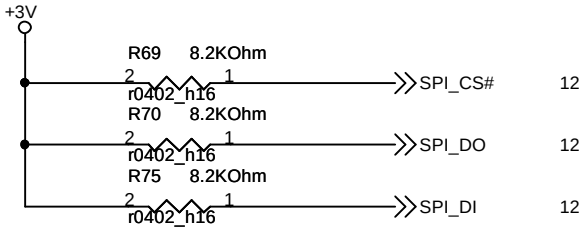
Title : IO CONNECTOR

Engineer: Mars_Tseng

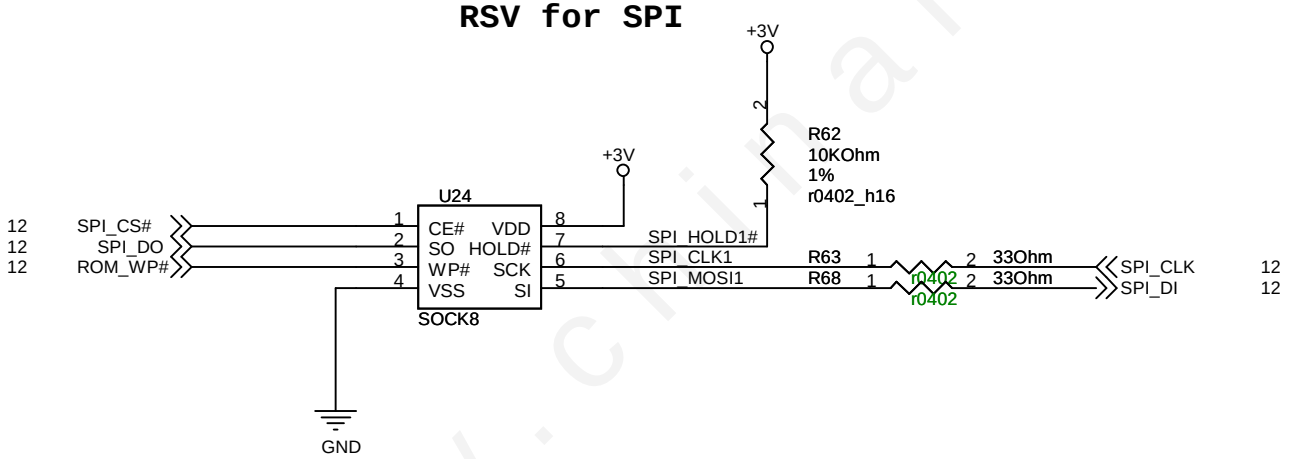
Size	Project Name	Rev
Custom	G31M-VS2	1.01

Date: Tuesday, January 19, 2010 Sheet 27 of 36

Serial
Peripheral
Interface



RSV for SPI



G31M-VS2

ASRock Inc.

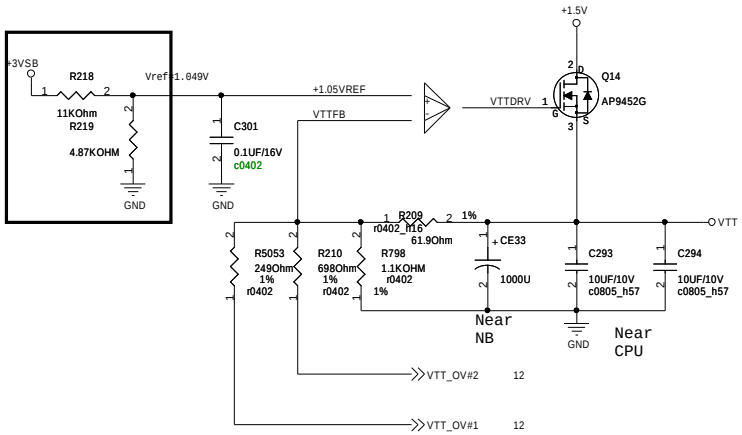
Title : SPI

Engineer: Mars_Tseng

Size	Project Name	Rev
A	G31M-VS2	1.01

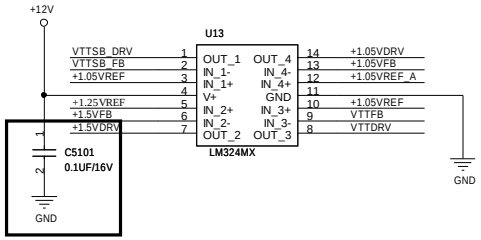
Date: Tuesday, January 19, 2010 Sheet 28 of 36

+1.5V to VTT

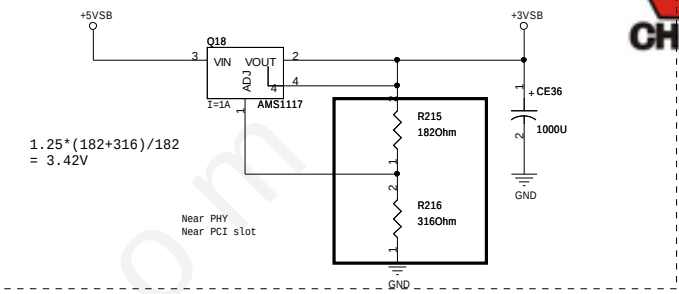


VTT_OV#1	VTT_OV#2	VTT
Input	Input	1.10
Input	Low	1.20
Low	Input	1.37
Low	Low	1.46

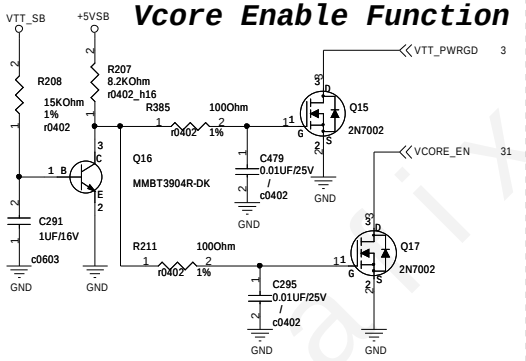
LM324



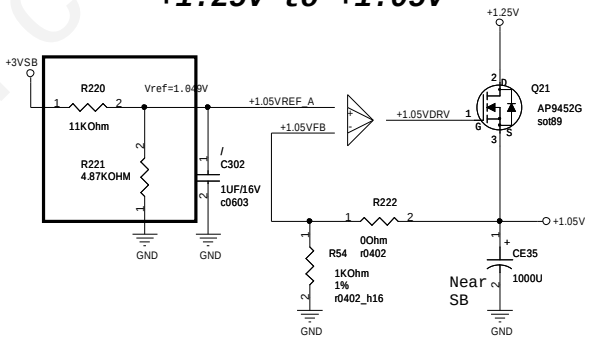
+5VSB to +3VSB



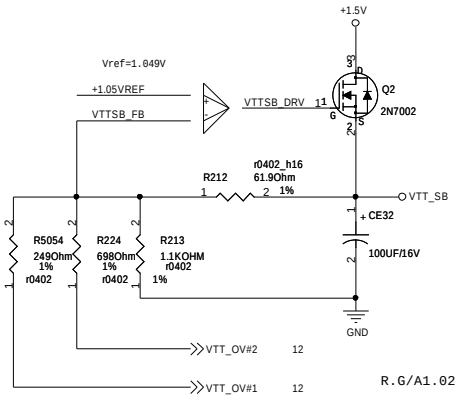
Vcore Enable Function

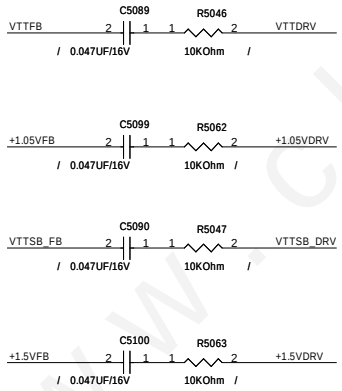


+1.25V to +1.05V

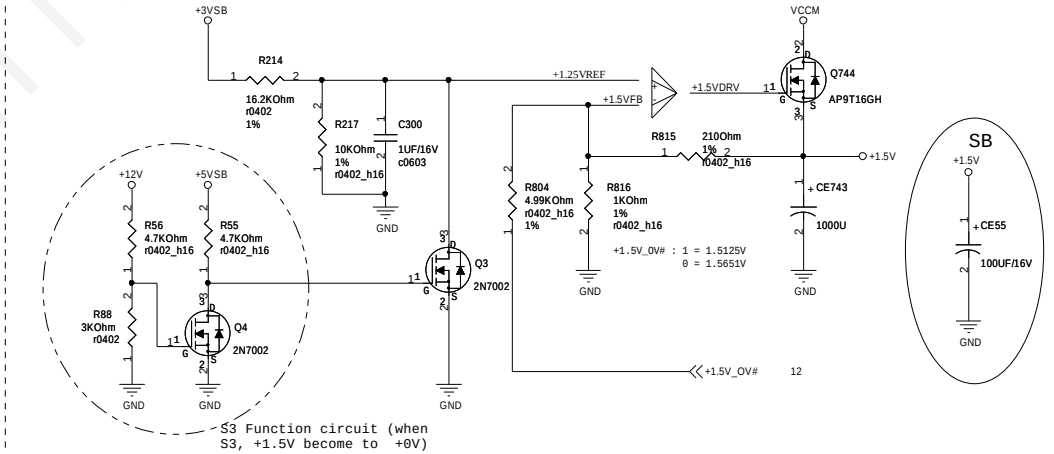


+1.5V to VTT_SB



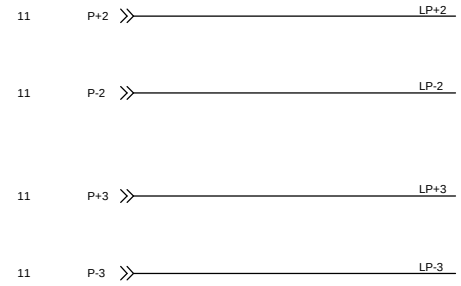


VCCM to +1.5V

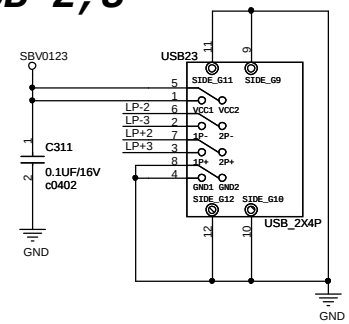


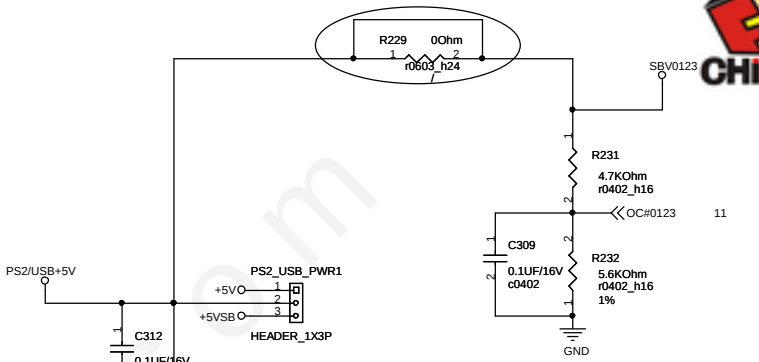
G31M-VS2

ASRock Inc.	Title : DC-DC POWER	
	Engineer: Mars_Tseng	
Size: A3	Project Name: G31M-VS2	Rev: 1.01
Date: Tuesday, January 19, 2010	Sheet 29 of 36	

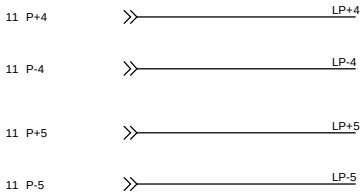


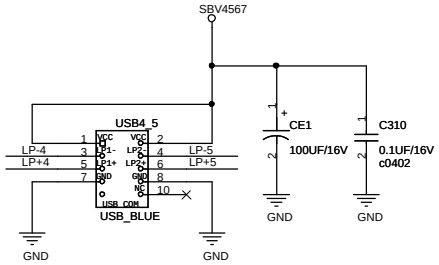
USB 2, 3

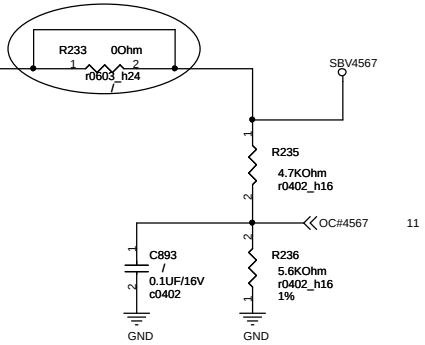


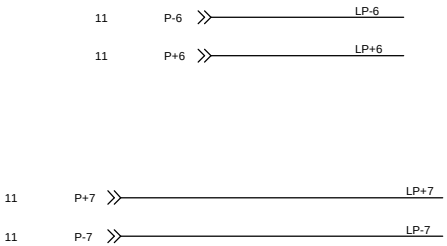


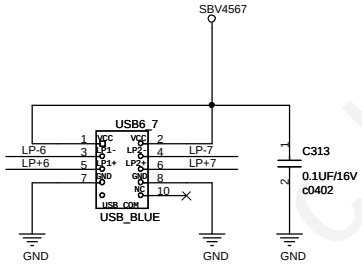
USB 4, 5





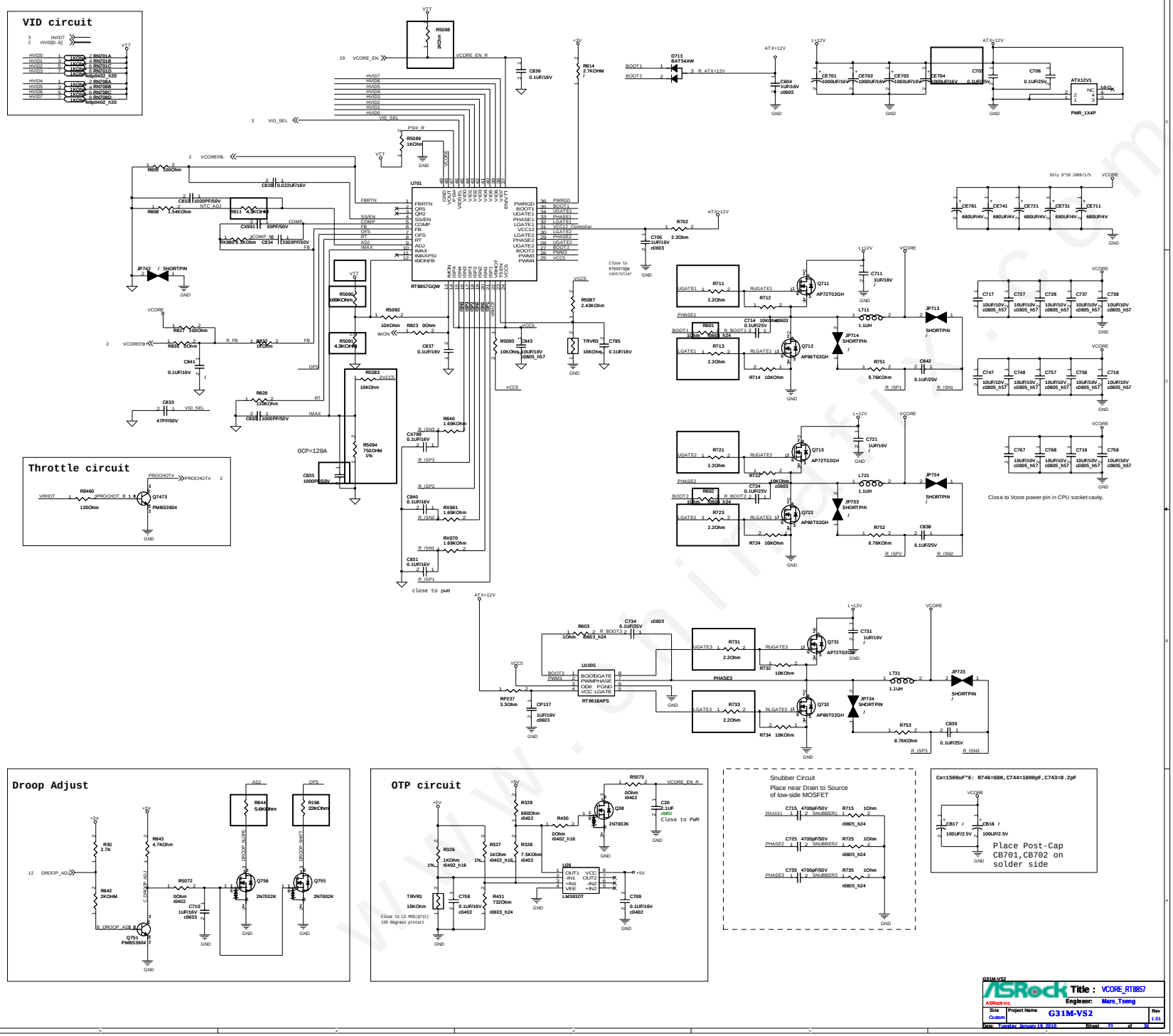


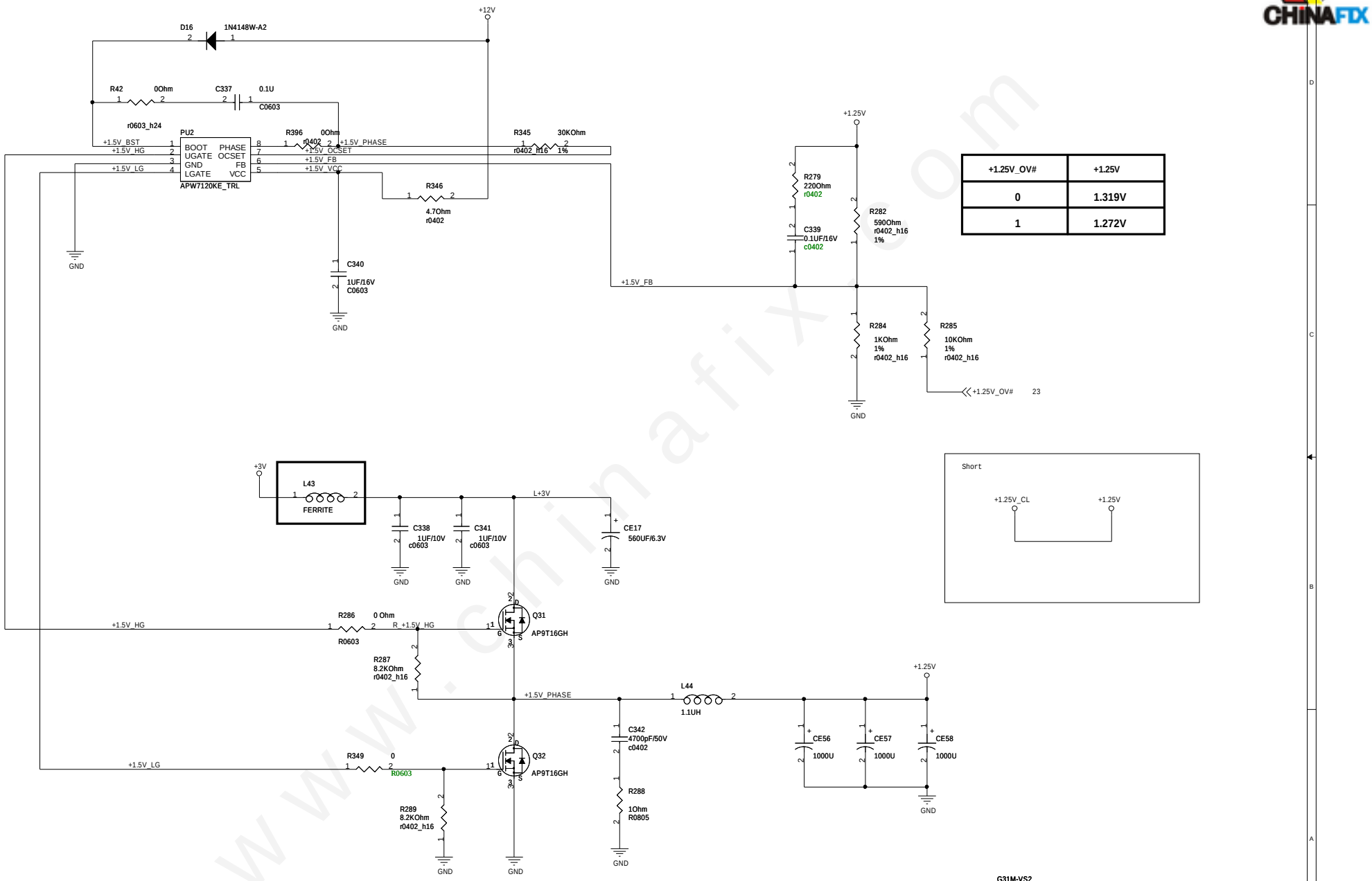




G31M-VS2

ASRock Inc.	Title : USB PORT	
	Engineer: Mars_Tseng	
Size: Custom	Project Name: G31M-VS2	Rev: 1.01
Date: Tuesday, January 19, 2010	Sheet 30 of 36	





+1.25V_OV#	+1.25V
0	1.319V
1	1.272V

G31M-VS2

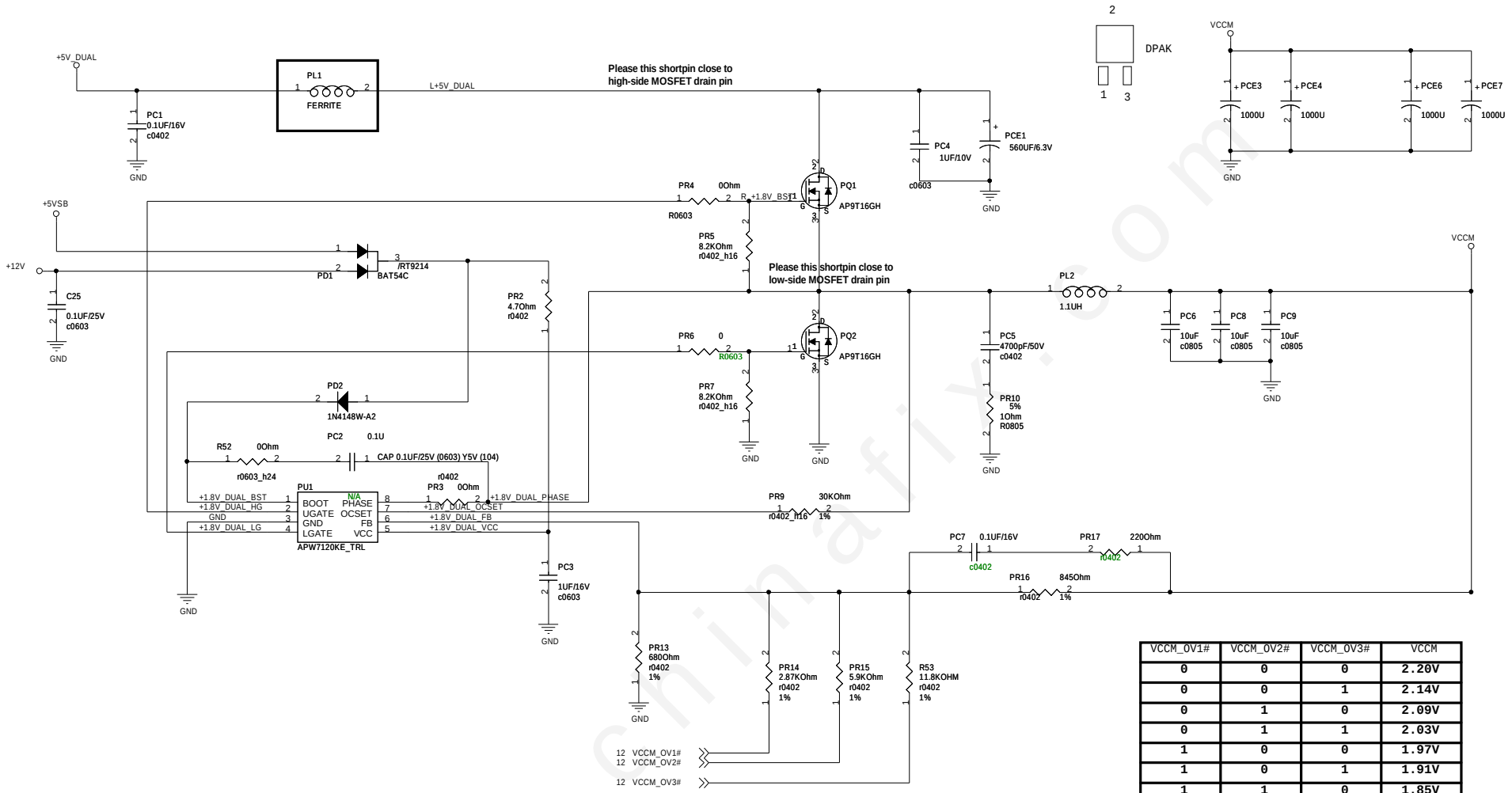
ASRock Inc.

Title : +1.25V

Engineer: Mars_Tseng

Size	Project Name	Rev
A3	G31M-VS2	1.01

Date: Tuesday, January 19, 2010 Sheet 32 of 36



VCCM_OV1#	VCCM_OV2#	VCCM_OV3#	VCCM
0	0	0	2.20V
0	0	1	2.14V
0	1	0	2.09V
0	1	1	2.03V
1	0	0	1.97V
1	0	1	1.91V
1	1	0	1.85V
1	1	1	1.79V

G31M-VS2

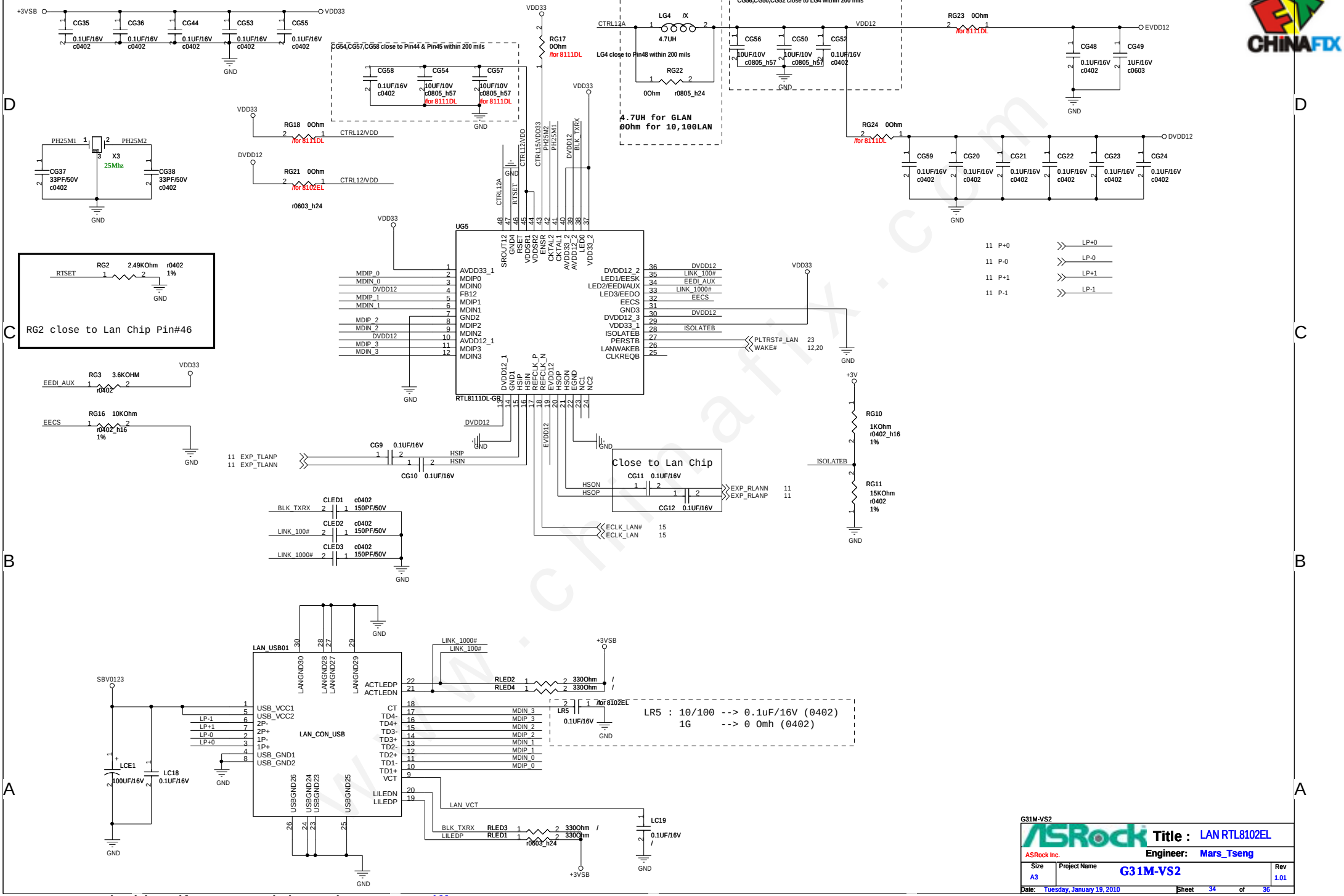
ASRock Inc.

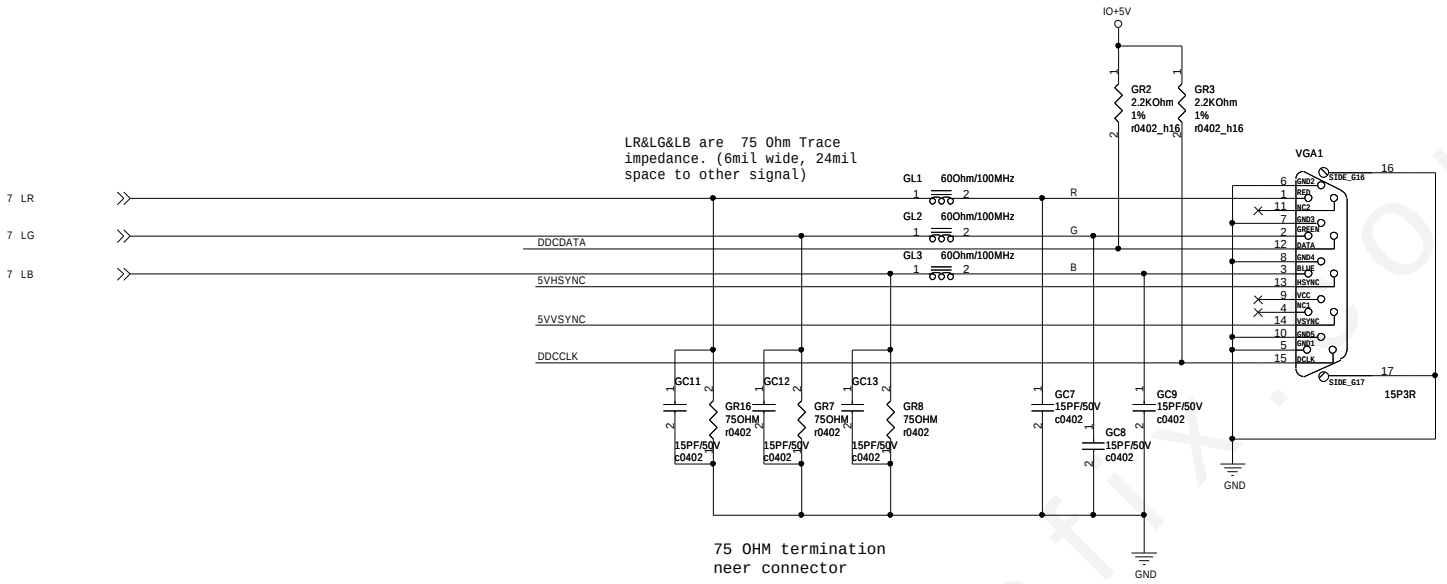
Title : +1.8V_Dual

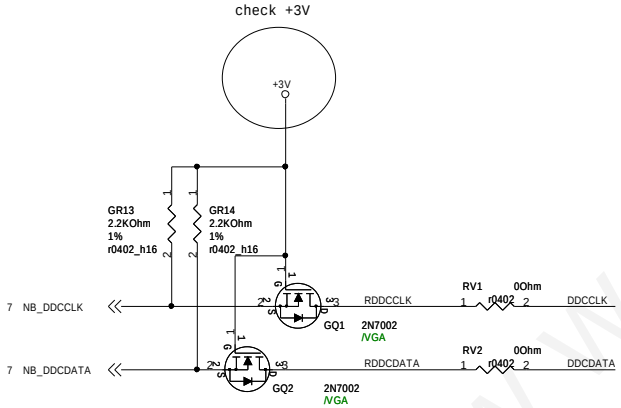
Engineer: Mars_Tseng

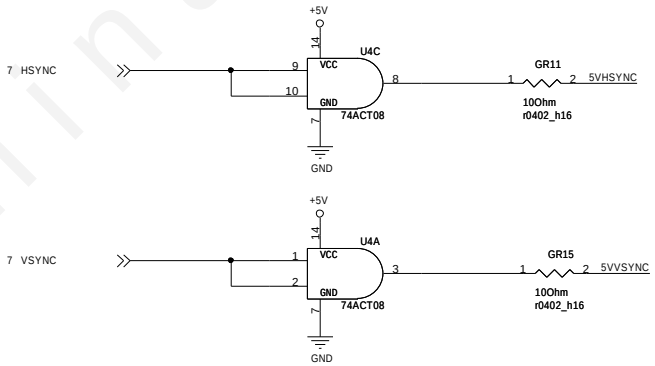
Size	Project Name	Rev
Custom	G31M-VS2	1.01

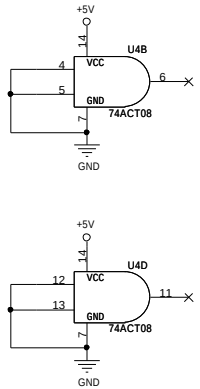
Date: Tuesday, January 19, 2010 Sheet 33 of 36











G31M-VS2

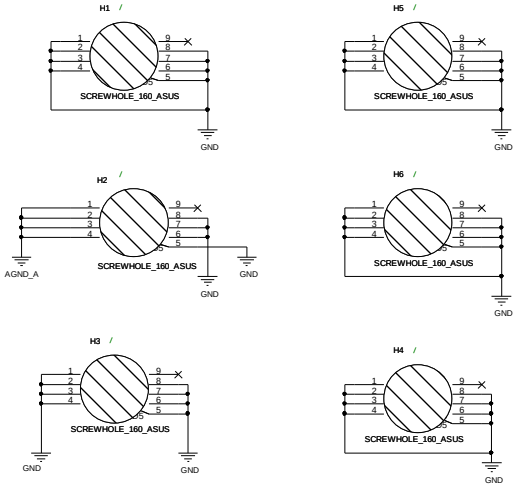
ASRock Inc.

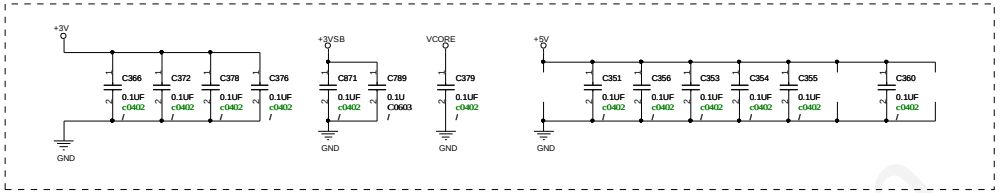
Title : VGA

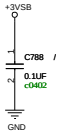
Engineer: Mars_Tseng

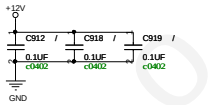
Size	Project Name	Rev
A3	G31M-VS2	1.01

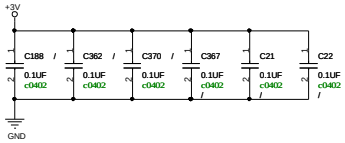
Date: Tuesday, January 19, 2010 Sheet 35 of 36

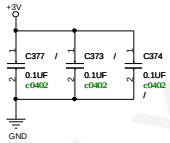


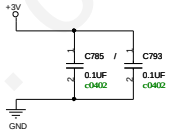


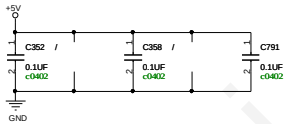


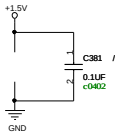


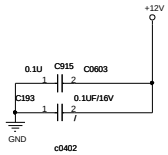


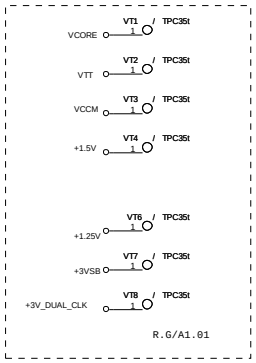












G31M-VS2

ASRock Inc.

Title : Mechanical

Engineer: Mars_Tseng

Size	Project Name	Rev
C	G31M-VS2	1.01

Date: Monday, January 18, 2010 Sheet 36 of 36