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# MS-A9281

Ver: 1.1

## CPU:

INTEL - Celeron 847

## System Chipset:

INTEL - NM70

## OnBoard Chipset:

HD Audio Codec:ALC887 CG

LAN:Realtek RTL8111E CG

SIO:FINTEK F71808AU

## Main Memory:

DDRIII (800/1066MHz) \* 1 (one Channel)

## Expansion Slots:

MINIPCI Express (X1) Slot \* 2

## PWM:

Controller:ISL95837HRZ (17W)

## Other:

SATA(SATA2-300MB/s) \*2

USB2.0 \*4 (Rear X 2 & Side X 2)

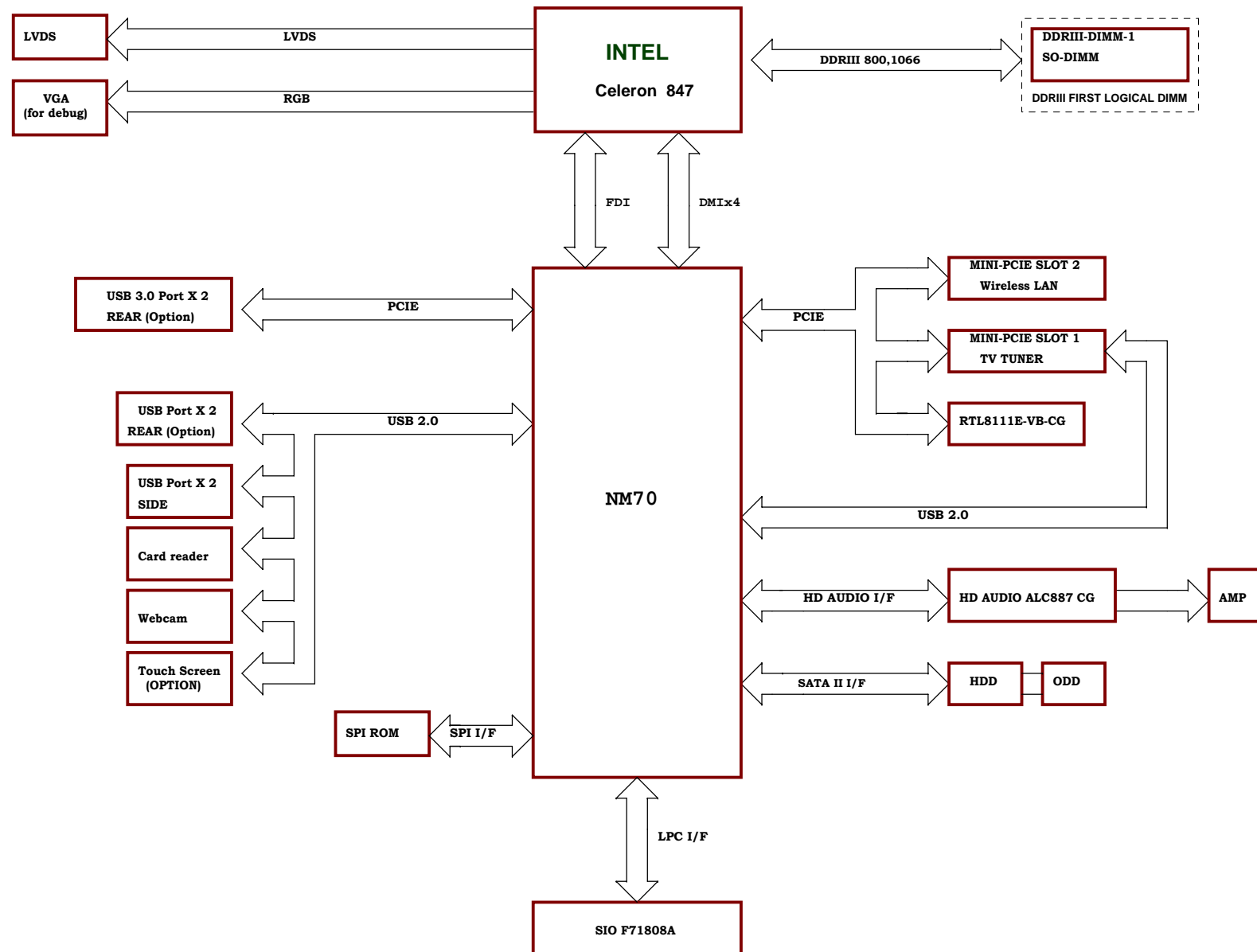
Card Reader (JUSB)

Webcam (JCAMERA1)



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MS-A9281			
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# MS-A9281 1.0





9 M\_A\_DQ[63:0]

CPU1C

M A DQ0 AG6 SA DQ[0]  
M A DQ1 AG6 SA DQ[1]  
M A DQ2 AP11 SA DQ[2]  
M A DQ3 AL6 SA DQ[3]  
M A DQ4 AL6 SA DQ[4]  
M A DQ5 AL6 SA DQ[5]  
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M A DQ7 AL6 SA DQ[7]  
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M A DQ9 AP6 SA DQ[9]  
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M A DQ12 AL6 SA DQ[12]  
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M A DQ15 AL13 SA DQ[15]  
M A DQ16 BC7 SA DQ[16]  
M A DQ17 BB7 SA DQ[17]  
M A DQ18 BA13 SA DQ[18]  
M A DQ19 BB11 SA DQ[19]  
M A DQ20 BA7 SA DQ[20]  
M A DQ21 BA9 SA DQ[21]  
M A DQ22 BB9 SA DQ[22]  
M A DQ23 AY13 SA DQ[23]  
M A DQ24 AY14 SA DQ[24]  
M A DQ25 AR14 SA DQ[25]  
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M A DQ31 BB17 SA DQ[31]  
M A DQ32 BA45 SA DQ[32]  
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M A DQ57 AN53 SA DQ[57]  
M A DQ58 AG56 SA DQ[58]  
M A DQ59 AG53 SA DQ[59]  
M A DQ60 AN55 SA DQ[60]  
M A DQ61 AN52 SA DQ[61]  
M A DQ62 AG55 SA DQ[62]  
M A DQ63 AK56 SA DQ[63]

DDR SYSTEM MEMORY A

SA\_CLK[0]  
SA\_CLK[0]  
SA\_CKE[0]

SA\_CLK[1]  
SA\_CLK[1]  
SA\_CKE[1]

SA\_CS#0  
SA\_CS#1

SA\_ODT[0]  
SA\_ODT[1]

SA\_DQS#0  
SA\_DQS#1  
SA\_DQS#2  
SA\_DQS#3  
SA\_DQS#4  
SA\_DQS#5  
SA\_DQS#6  
SA\_DQS#7

SA\_DQS#0  
SA\_DQS#1  
SA\_DQS#2  
SA\_DQS#3  
SA\_DQS#4  
SA\_DQS#5  
SA\_DQS#6  
SA\_DQS#7

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SA\_MA[2]  
SA\_MA[3]  
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SA\_MA[12]  
SA\_MA[13]  
SA\_MA[14]  
SA\_MA[15]

AU36  
AV36  
AY26

AT40  
AU40  
BB26

BB40  
BC41

AY40  
BA41

AL11  
AR8  
AV11  
AT17  
AV45  
AY51  
AT55  
AK55

AJ11  
AR10  
AU17  
AW45  
AV51  
AT56  
AK54

BC35  
BB34  
BE35  
BD35  
AT34  
AU34  
BB32  
AT32  
AY32  
AV32  
BE37  
BA30  
BC30  
AW41  
AY26  
AU26

M\_A\_CLK\_DDR0 9  
M\_A\_CLK\_DDR0 9  
M\_A\_CKE0 9

M\_A\_CLK\_DDR1 9  
M\_A\_CLK\_DDR1 9  
M\_A\_CKE1 9

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M\_A\_CS#1 9

M\_A\_ODT0 9  
M\_A\_ODT1 9

M\_A\_DQS#0 9  
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M\_A\_A11 9  
M\_A\_A12 9  
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M\_A\_A14 9  
M\_A\_A15 9

CPU1D

AL4  
AL1  
AN3  
AR4  
AK4  
AK3  
AN4  
AR1  
AU4  
AT2  
AV4  
BA4  
AU3  
AR3  
AY2  
BA3  
BE9  
BD9  
BD13  
BF12  
BF8  
BD10  
BD14  
BE13  
BE16  
BE17  
BE18  
BE21  
BE14  
BG14  
BG18  
BF17  
BD50  
BF48  
BD53  
BF52  
BD49  
BE49  
BD54  
BE53  
BE56  
BE57  
BC57  
AY60  
BE54  
BG54  
BA58  
AW59  
AU58  
AN61  
AN59  
AU59  
AU61  
AN58  
AR58  
AK58  
AL58  
AG58  
AG59  
AM60  
AL59  
AF61  
AH60

BC38  
BD42  
AT22

AV43  
BE40  
BD45

SB\_DQ[0]  
SB\_DQ[1]  
SB\_DQ[2]  
SB\_DQ[3]  
SB\_DQ[4]  
SB\_DQ[5]  
SB\_DQ[6]  
SB\_DQ[7]  
SB\_DQ[8]  
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SB\_DQ[62]  
SB\_DQ[63]

SB\_BS[0]  
SB\_BS[1]  
SB\_BS[2]

SB\_CAS#  
SB\_RAS#  
SB\_WE#

DDR SYSTEM MEMORY B

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SB\_CLK[0]  
SB\_CKE[0]

SB\_CLK[1]  
SB\_CLK[1]  
SB\_CKE[1]

SB\_CS#0  
SB\_CS#1

SB\_ODT[0]  
SB\_ODT[1]

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SB\_DQS#1  
SB\_DQS#2  
SB\_DQS#3  
SB\_DQS#4  
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SB\_DQS#6  
SB\_DQS#7

SB\_DQS#0  
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SB\_DQS#2  
SB\_DQS#3  
SB\_DQS#4  
SB\_DQS#5  
SB\_DQS#6  
SB\_DQS#7

SB\_MA[0]  
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SB\_MA[2]  
SB\_MA[3]  
SB\_MA[4]  
SB\_MA[5]  
SB\_MA[6]  
SB\_MA[7]  
SB\_MA[8]  
SB\_MA[9]  
SB\_MA[10]  
SB\_MA[11]  
SB\_MA[12]  
SB\_MA[13]  
SB\_MA[14]  
SB\_MA[15]

BA34  
AY34  
AR22

BA36  
BB36  
BE27

BE41  
BE45

AT49  
BG47

AL3  
AV3  
BG11  
BD17  
BG51  
BA59  
AT60  
AK59

AM2  
AV1  
BE11  
BD18  
BE51  
BA65  
AG59  
AK61

BE32  
BE33  
BD33  
AU39  
BD39  
AV30  
BG39  
BD23  
BE30  
BE28  
BD43  
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AV28  
BD46  
AT26  
AU22

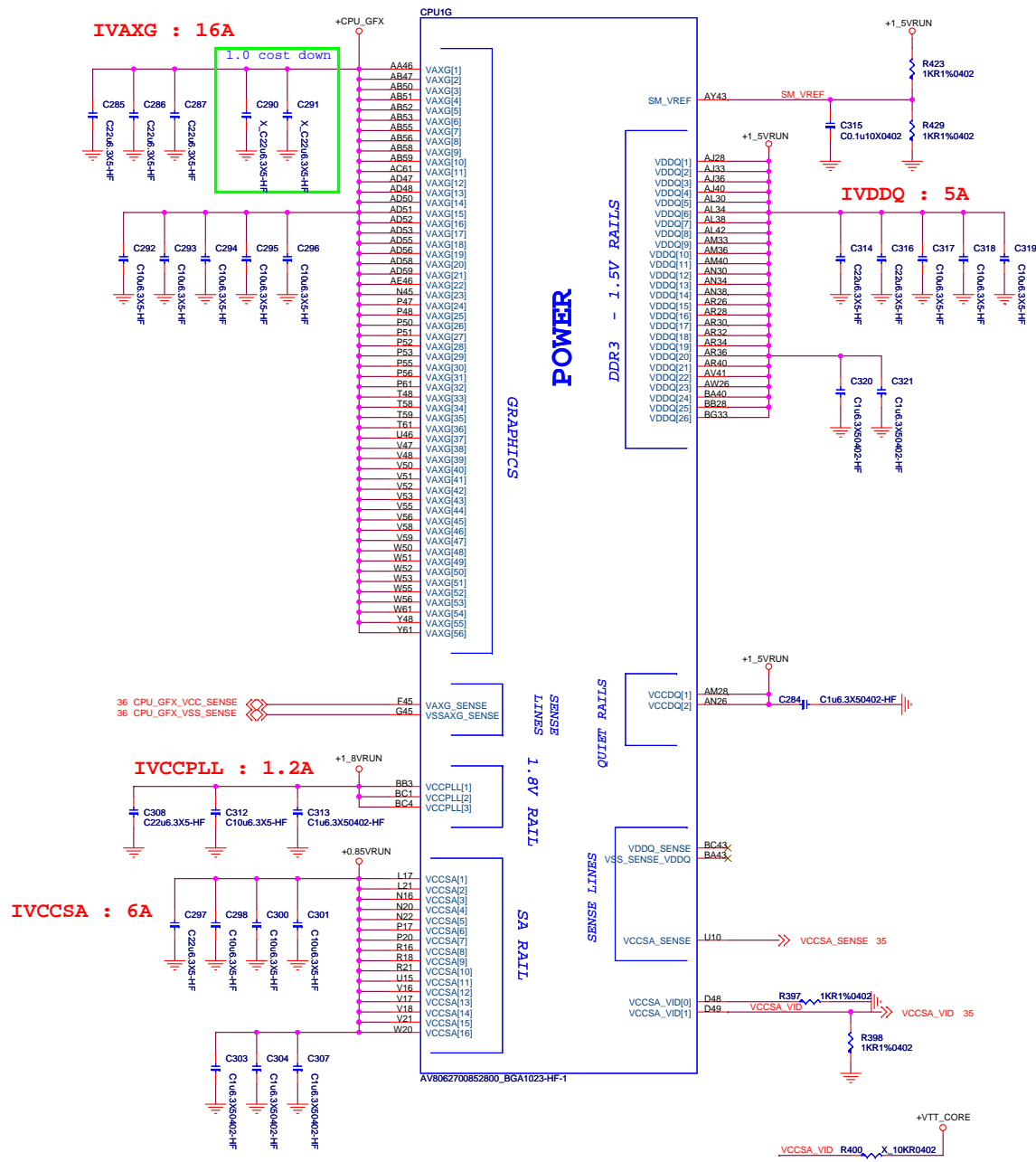
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AV8062700852800\_BGA1023-HF-1



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MS-A9281		
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PROCESSOR-2 (DDR3)		
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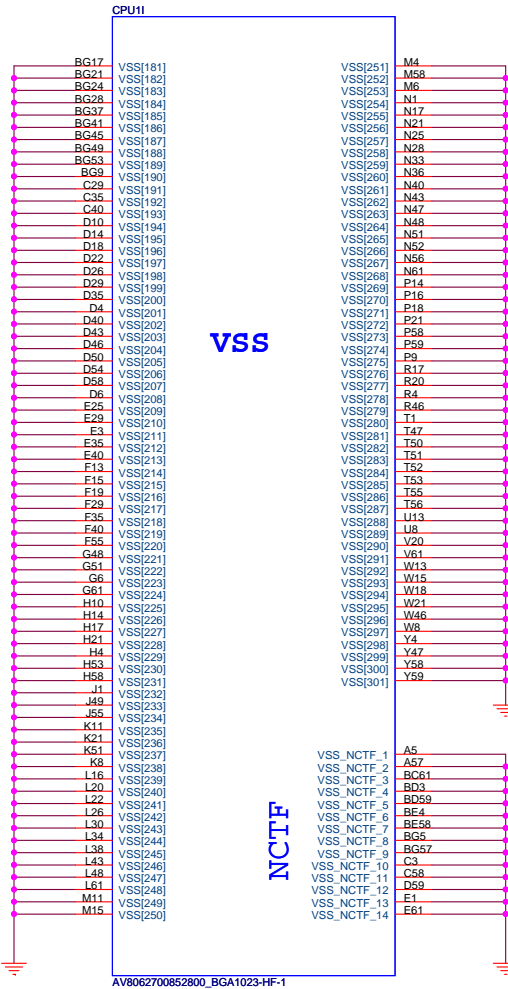
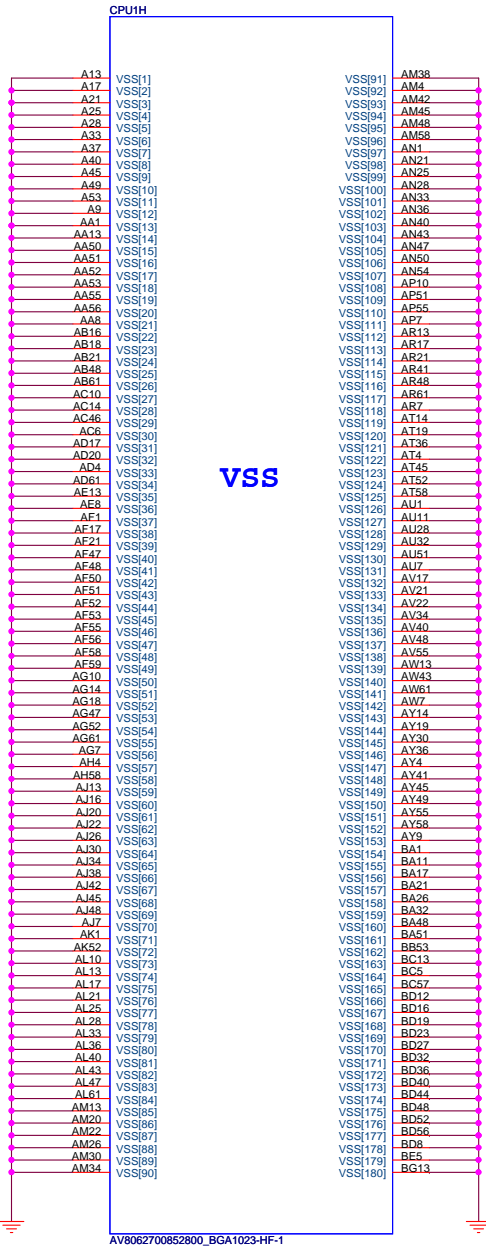




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**MS-A9281**

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Pull low for PCIe16 lane reversal.

R401 X 1KR0402 CFG2  
R402 X 1KR0402 CFG4  
R403 X 1KR0402 CFG5  
R404 X 1KR0402 CFG6  
R405 X 1KR0402 CFG7

		CPU1E	
X B50	CFG[0]	RSVD28	BE7
X C51	CFG[1]	RSVD29	BG7
B54	CFG[2]		
X D53	CFG[3]		
A51	CFG[4]	RSVD30	N42
C53	CFG[5]	RSVD31	L42
C55	CFG[6]	RSVD32	L45
H49	CFG[7]	RSVD33	L47
X A55	CFG[8]		
X H51	CFG[9]		
X K49	CFG[10]	RSVD34	M13
X K53	CFG[11]	RSVD35	M14
X E53	CFG[12]	RSVD36	U14
X G53	CFG[13]	RSVD37	W14
X L51	CFG[14]	RSVD38	P13
X E52	CFG[15]		
X D52	CFG[16]		
X L53	CFG[17]	RSVD39	AT49
		RSVD40	K24
X H43	VCC_VAL_SENSE		
X K43	VSS_VAL_SENSE	RSVD41	AH2
		RSVD42	AG13
X H45	VAXG_VAL_SENSE	RSVD43	AM14
X K45	VSSAXG_VAL_SENSE	RSVD44	AM15
X F48	VCC_DIE_SENSE	RSVD45	N50
X H48	RSVD6		
X K48	RSVD7		
		DC_TEST_A4	A4
		DC_TEST_C4	C4
		DC_TEST_D3	D3
BA19	RSVD8	DC_TEST_D1	D1
AV19	RSVD9	DC_TEST_A58	A58
AT21	RSVD10	DC_TEST_A59	A59
BB21	RSVD11	DC_TEST_C59	C59
BB19	RSVD12	DC_TEST_A61	A61
AY21	RSVD13	DC_TEST_C61	C61
BA22	RSVD14	DC_TEST_D61	D61
AY22	RSVD15	DC_TEST_BD61	BD61
AU19	RSVD16	DC_TEST_BE61	BE61
AU21	RSVD17	DC_TEST_BE59	BE59
BD21	RSVD18	DC_TEST_BG61	BG61
BD22	RSVD19	DC_TEST_BG59	BG59
BD25	RSVD20	DC_TEST_BG58	BG58
BD26	RSVD21	DC_TEST_BG4	BG4
BG22	RSVD22	DC_TEST_BG3	BG3
BE22	RSVD23	DC_TEST_BE3	BE3
BG26	RSVD24	DC_TEST_BG1	BG1
BE26	RSVD25	DC_TEST_BE1	BE1
BF23	RSVD26	DC_TEST_BD1	BD1
BE24	RSVD27		

AV8062700852800\_BGA1023-HF-1

CFG2 - PCI-Express Static Lane Reversal	
CFG2	1 :Normal Operation 0 :Lane Numbers Reversed 15 -> 0, 14 -> 1, ...

CFG4 - Display Port Presence	
CFG4	1:Disabled; No Physical Display Port attached to Embedded Display Port 0:Enabled; An external Display Port device is connected to the Embedded Display Port

PCI-Express Configuration Select	
CFG[5:6]	11:Default X16-device 1 functions 1 and 2 disabled 10: X8 X8-device 1 functions 1 enable, function2 disabled 01:Reserved--(device 1 functions 1disabled function2 enable 00: X8 X4 X4-device 1 functions 1 and 2 enable

PEG DEFER TRAINING	
CFG7	1 : (Default)PEG train immediately following xxRESETB de assertion 0 :PEG wait for BIOS for training



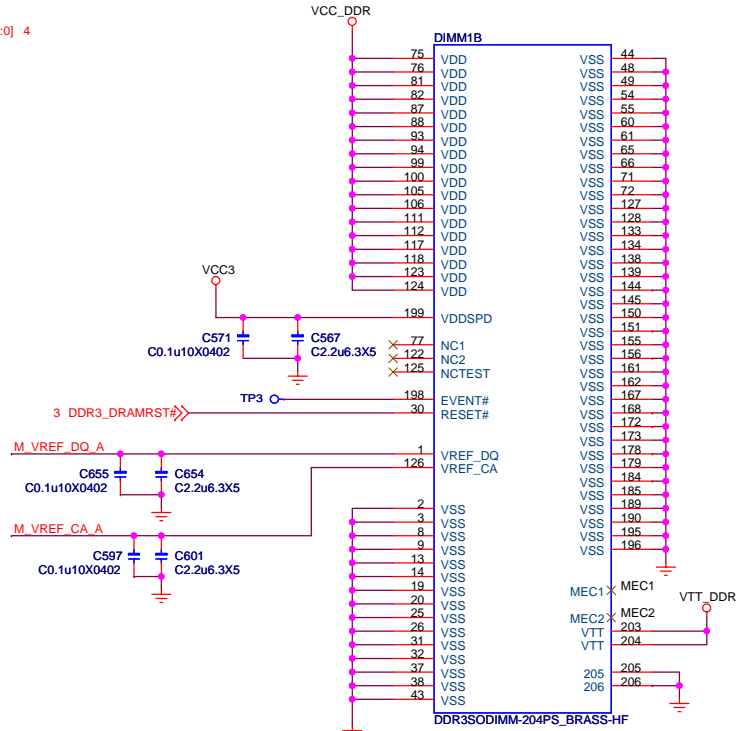
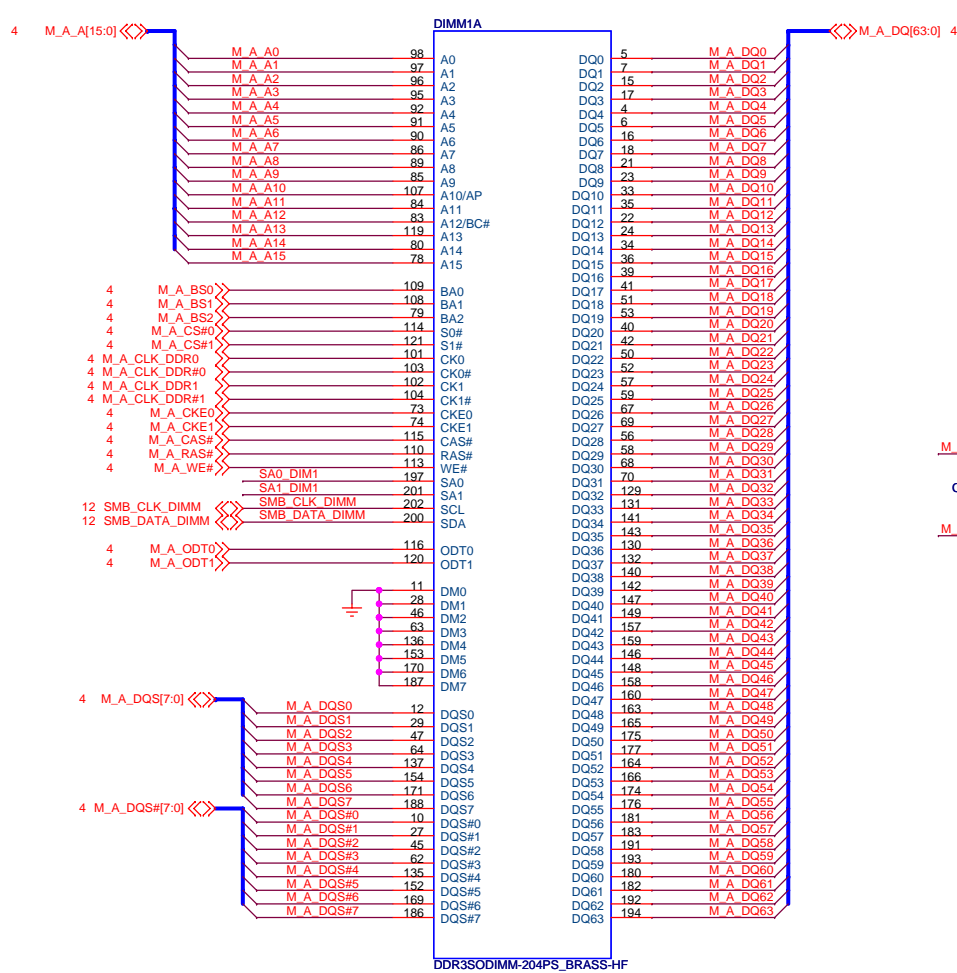
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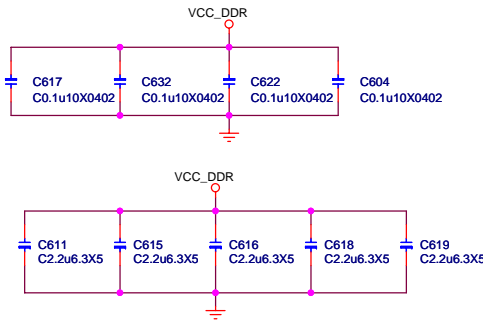


# SODIMM#A

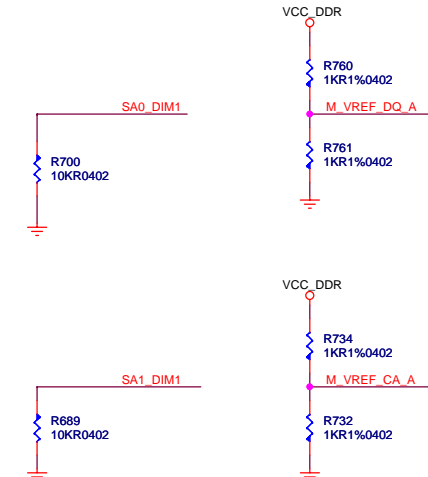
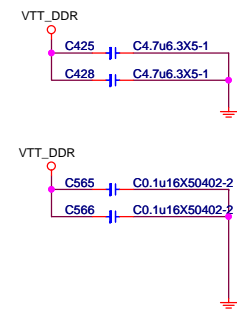


ADDRESS: 000  
0xA0

Layout note: Place capacitors between and near DDR connector if possible.



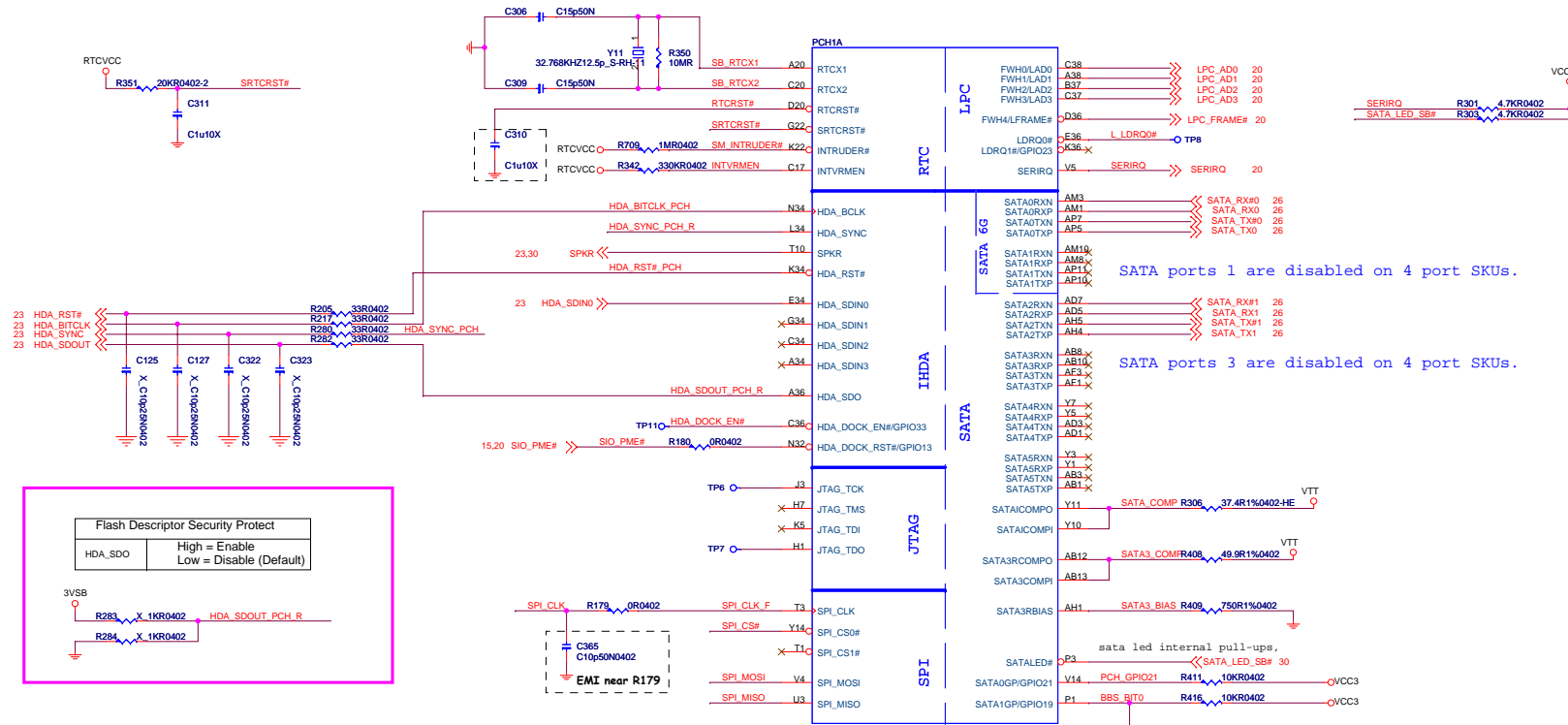
CHANNEL A V\_SM\_VTT DECOUPLING CAPS





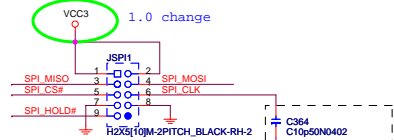
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MS-A9281		
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DDR III SODIMM 1		
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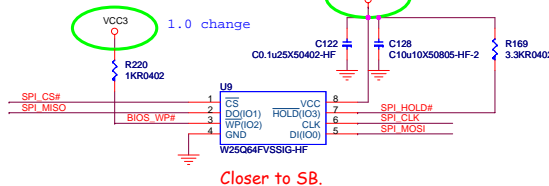


## SPI DEBUG PROT

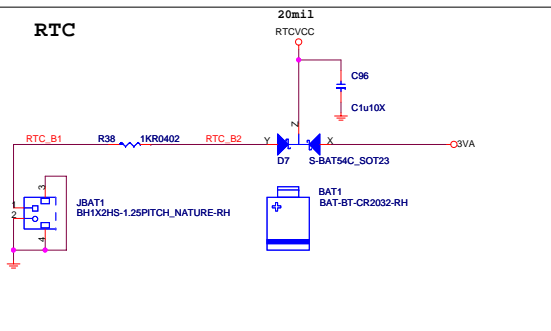
Place close to SPI ROM



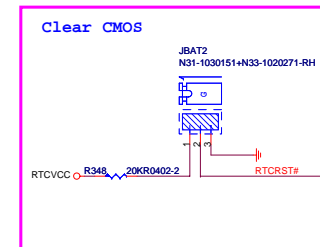
## SPI FLASH



## RTC

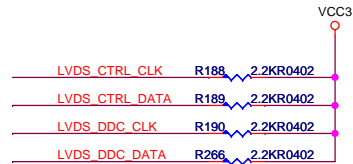


## Clear CMOS

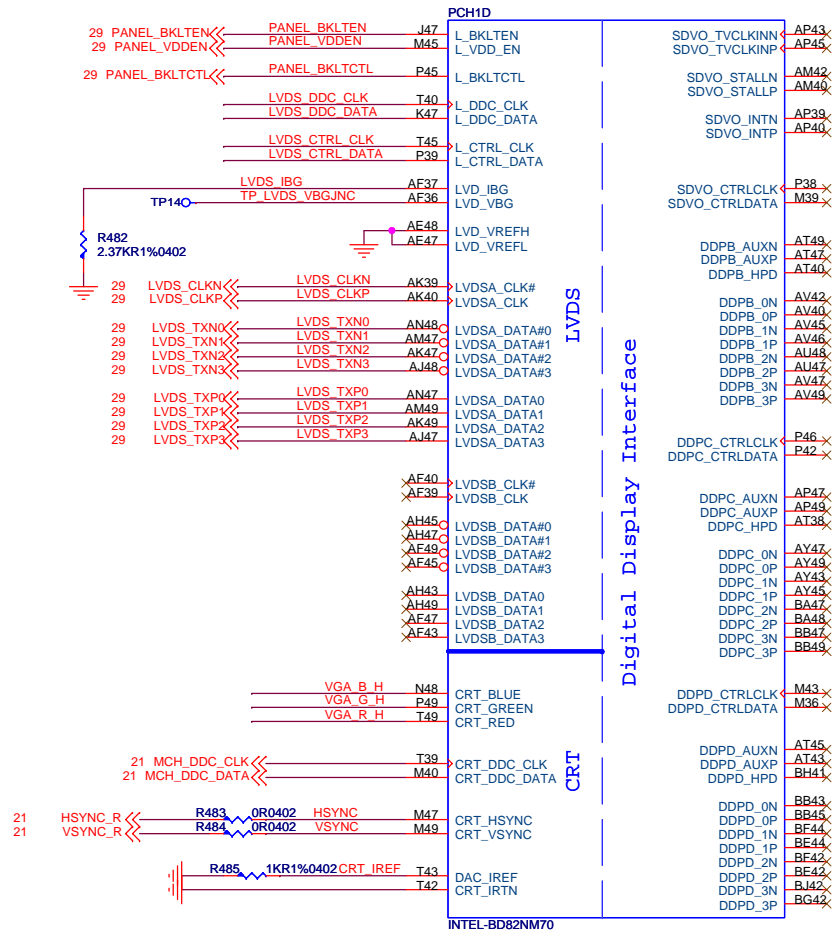
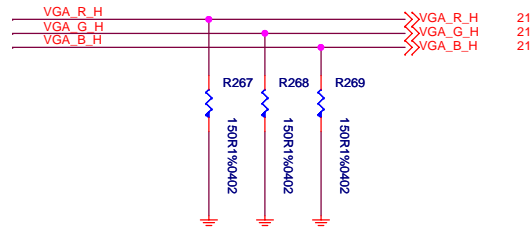








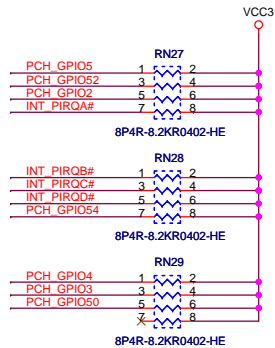
close to PCH



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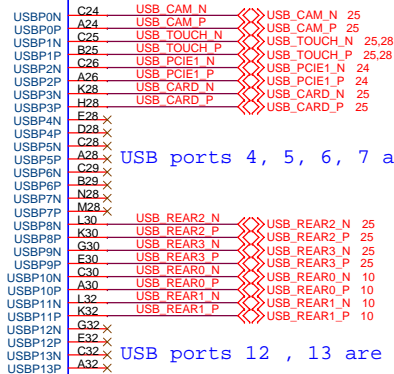
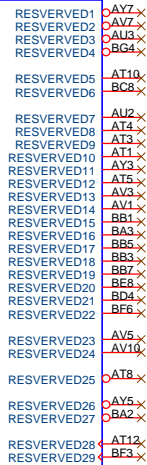
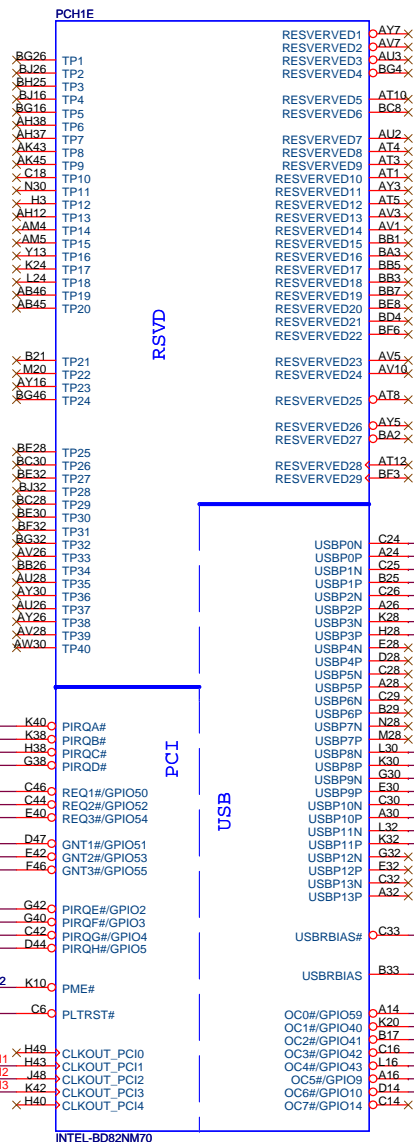
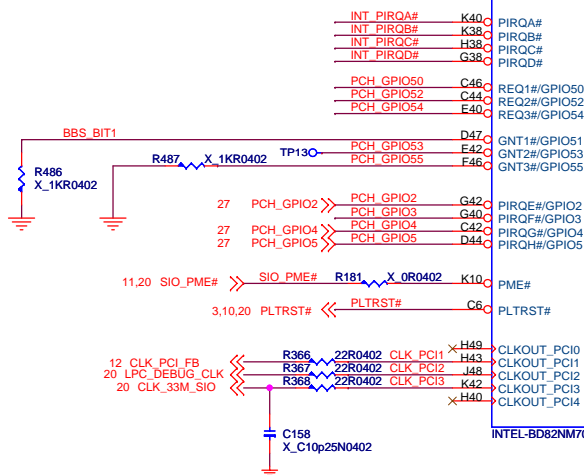
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A16 swap override Strap/Top-Block Swap Override jumper		
GNT#3	Low = A16 swap override/Top-Block Swap Override enabled High = Default	

Boot BIOS Strap		
BBS_BIT1	BBS_BIT0	Boot BIOS Location
0	0	LPC
0	1	Reserved (NAND)
1	0	—
1	1	SPI



USB ports 4, 5, 6, 7 are disabled on 8 port SKUs.

USB ports 12, 13 are disabled on 8 port SKUs.

Webcam  
Touch  
Mini PCIE1  
Card Reader

Side USB1  
Side USB2  
Rear USB1  
Rear USB2



MICRO-STAR INT'L CO.,LTD		
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PCH-5 (PCI/USB/NVRAM)		
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Integrated Clock Chip Enable	
ICC_EN	High: use CK505 (buffer through mode) intelnal pull high Low: use PCH (interated clock mode)

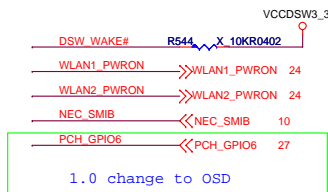
PLL ON DIE VR_ENABLE	
GPIO28	Internal pull high (Enable) Low: Disable

DMI termination voltage override	
GPIO36	Low-- TX,RX terminated to same voltage (DC coupling mode)default

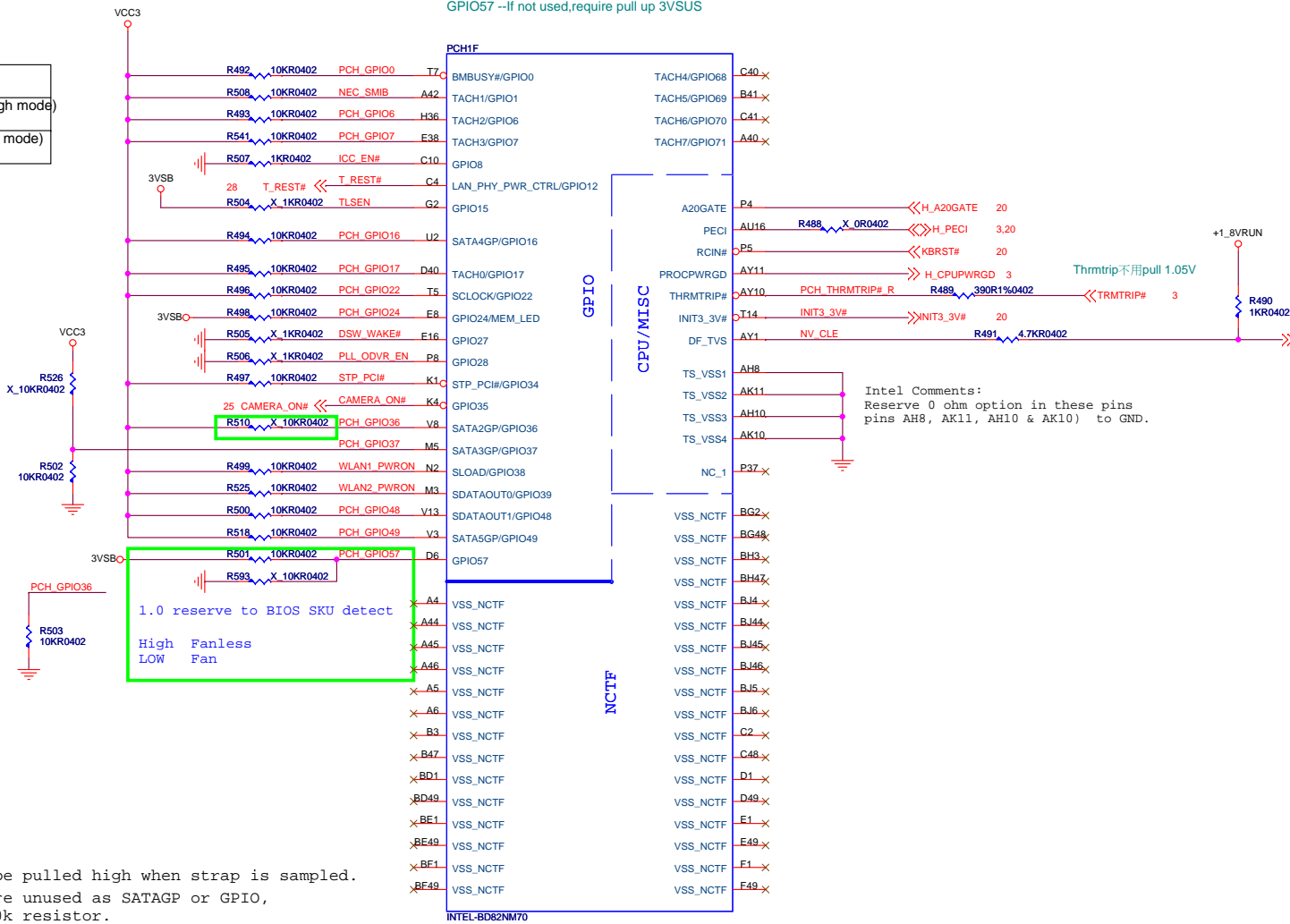
FDI termination voltage override	
GPIO37	Low-- TX,RX terminated to same voltage (DC coupling mode)default

GPIO36 --CRB connector to 3V

PCH EDS1.0:GP1036&37 should not be pulled high when strap is sampled.  
PCH EDS1.1:GP1036&37 when pins are unused as SATAGP or GPIO,  
terminate them to VSS via 8.2k-10k resistor.

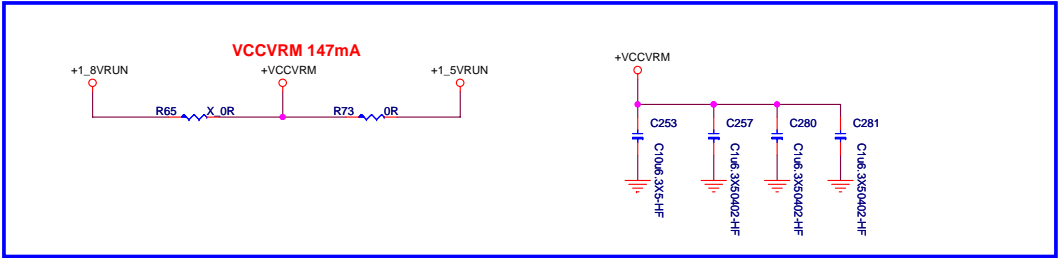


GPIO0 & 6 & 16 & 17 & 22 & 34 & 38 & 48 --If not used,require pull up 3VRUN  
GPIO57 --If not used,require pull up 3VSUS



DMI & FDI Termination Voltage	
NV_CLE	Set to VSS when LOW Set to VCC when High







PCH1H		
H6	VSS	
AA17	VSS	AK38
AA2	VSS	AK4
AA3	VSS	AK42
AA33	VSS	AK46
AA34	VSS	AK8
AB11	VSS	AL16
AB14	VSS	AL17
AB39	VSS	AL19
AB4	VSS	AL2
AB43	VSS	AL21
AB5	VSS	AL23
AC16	VSS	AL26
AC2	VSS	AL31
AC21	VSS	AL33
AC24	VSS	AL34
AC33	VSS	AL48
AC34	VSS	AM11
AC48	VSS	AM14
AD10	VSS	AM36
AD11	VSS	AM39
AD12	VSS	AM43
AD13	VSS	AM45
AD19	VSS	AM46
AD24	VSS	AM7
AD26	VSS	AN29
AD27	VSS	AN3
AD33	VSS	AN31
AD34	VSS	AP12
AD36	VSS	AP19
AD37	VSS	AP28
AD38	VSS	AP40
AD39	VSS	AP32
AD4	VSS	AP38
AD40	VSS	AP4
AD42	VSS	AP42
AD43	VSS	AP46
AD45	VSS	AP8
AD46	VSS	AR2
AD8	VSS	AR48
AE2	VSS	AT11
AE3	VSS	AT13
AE10	VSS	AT19
AE12	VSS	AT22
AD14	VSS	AT26
AD16	VSS	AT28
AE16	VSS	AT30
AE19	VSS	AT32
AF24	VSS	AT34
AF26	VSS	AT39
AF27	VSS	AT42
AF29	VSS	AT46
AF31	VSS	AT7
AF38	VSS	AV30
AF4	VSS	AV38
AF42	VSS	AV4
AF46	VSS	AV43
AF5	VSS	AV8
AF7	VSS	AW14
AF8	VSS	AW18
AG19	VSS	AW22
AG2	VSS	AW26
AG31	VSS	AW28
AG48	VSS	AW32
AH11	VSS	AW34
AH3	VSS	AW36
AH36	VSS	AW40
AH39	VSS	AW48
AH40	VSS	AX11
AH42	VSS	AY12
AH46	VSS	AY22
AH7	VSS	AY28
AJ19	VSS	
AJ21	VSS	
AJ24	VSS	
AJ33	VSS	
AJ34	VSS	
AK12	VSS	
AK3	VSS	

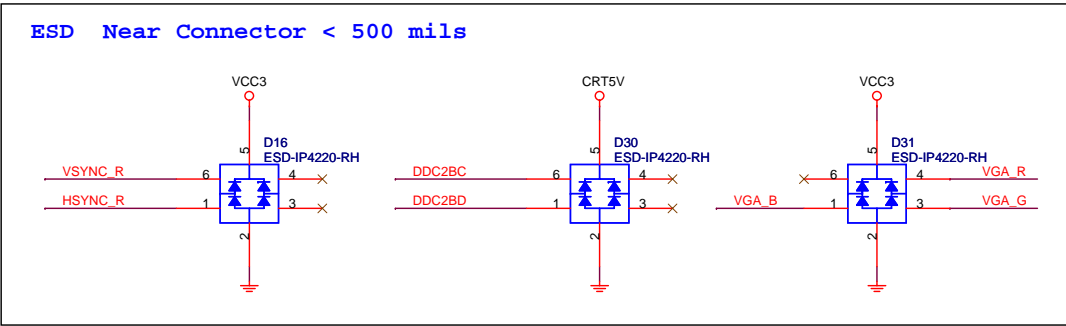
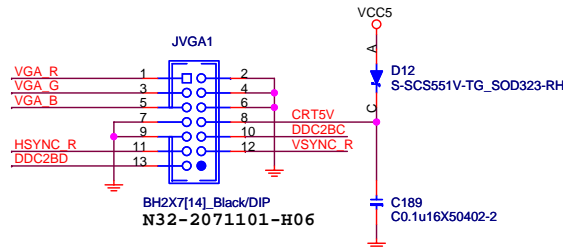
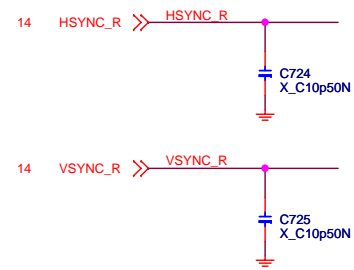
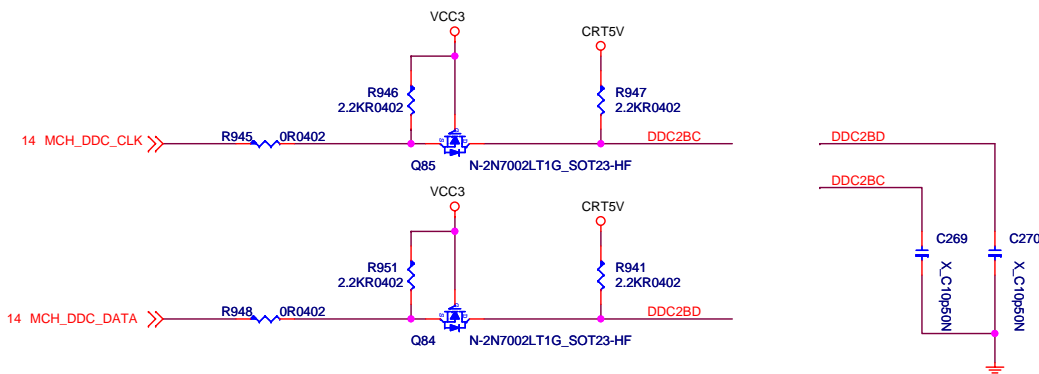
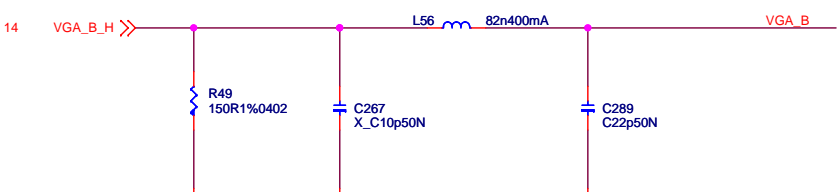
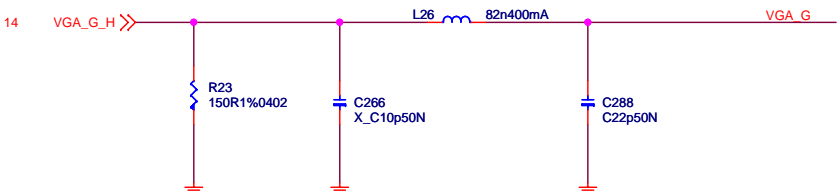
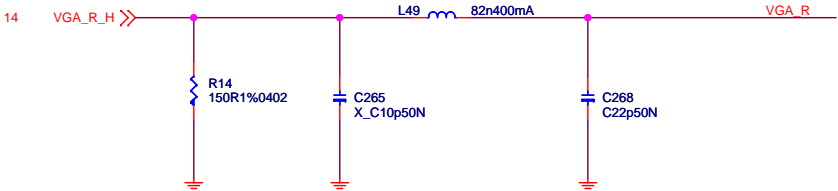
INTEL-BD2NM70

PCH1		
AY4	VSS	H46
AY42	VSS	K18
AY46	VSS	K26
AY8	VSS	K39
B11	VSS	K46
B15	VSS	K7
B19	VSS	L18
B23	VSS	L2
B27	VSS	L20
B31	VSS	L26
B35	VSS	L28
B39	VSS	L36
B7	VSS	L48
F46	VSS	M12
BB17	VSS	M16
BB16	VSS	M18
BB20	VSS	M22
BB22	VSS	M24
BB24	VSS	M30
BB29	VSS	M32
BB30	VSS	M34
BB38	VSS	M38
BB4	VSS	M4
BB46	VSS	M42
BC14	VSS	M46
BC18	VSS	M6
BC2	VSS	M18
BC22	VSS	P30
BC26	VSS	N47
BC32	VSS	P11
BC34	VSS	P18
BC36	VSS	T33
BC40	VSS	P40
BC42	VSS	P43
BC46	VSS	P47
BD46	VSS	P7
BD5	VSS	R2
BE22	VSS	R48
BE26	VSS	T12
BE40	VSS	T31
BF10	VSS	T37
BF12	VSS	T4
BF16	VSS	W34
BF20	VSS	T46
BF22	VSS	T47
BF24	VSS	T6
BF26	VSS	V11
BF28	VSS	V17
BD31	VSS	V26
BF30	VSS	V27
BF38	VSS	V29
BF40	VSS	V31
BF8	VSS	V36
BG17	VSS	V39
BG21	VSS	V43
BG33	VSS	V7
BG44	VSS	W17
BG8	VSS	W19
BH11	VSS	W2
BH15	VSS	W22
BH17	VSS	W48
BH19	VSS	Y12
H10	VSS	Y38
BH27	VSS	Y4
BH31	VSS	Y42
BH33	VSS	Y46
BH35	VSS	Y6
BH39	VSS	BG29
BH43	VSS	N24
BH7	VSS	A3
D3	VSS	AD47
D12	VSS	B43
D16	VSS	BE10
D22	VSS	BG41
D24	VSS	G14
D26	VSS	H16
D30	VSS	T36
D32	VSS	BG22
D34	VSS	BG24
D38	VSS	C22
D42	VSS	AP13
D8	VSS	M14
D8	VSS	AP3
E18	VSS	AP1
E26	VSS	BE16
G18	VSS	BC15
G20	VSS	BC28
G26	VSS	BJ28
G28	VSS	
G36	VSS	
G48	VSS	
H12	VSS	
H16	VSS	
H22	VSS	
H24	VSS	
H26	VSS	
H30	VSS	
H32	VSS	
H34	VSS	
F3	VSS	

INTEL-BD2NM70



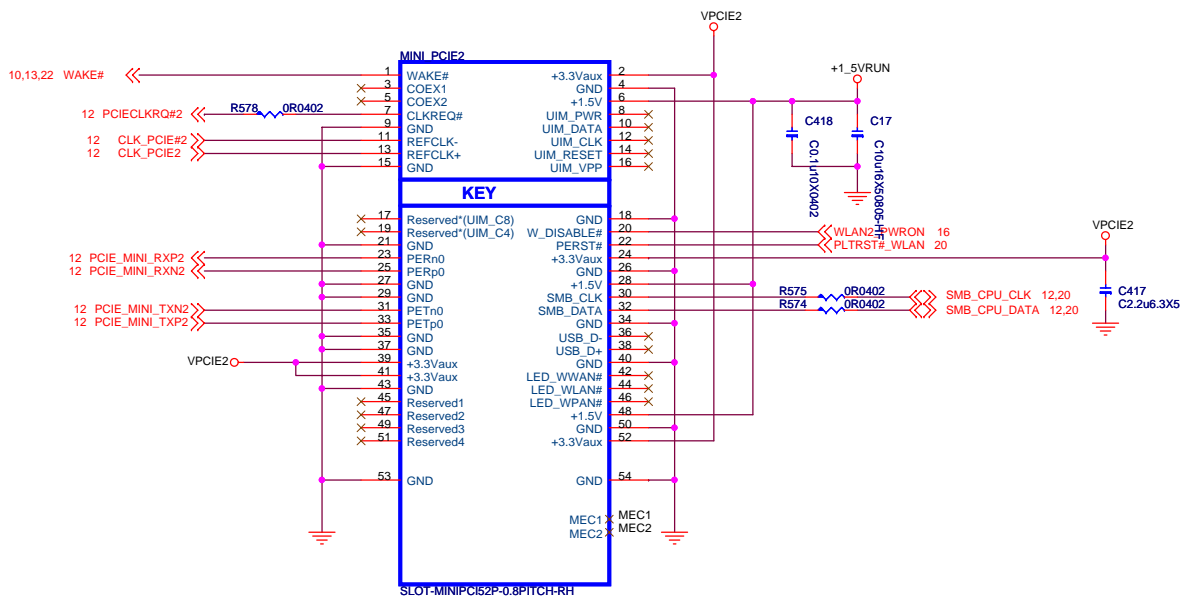
# VGA Output for Debug williy



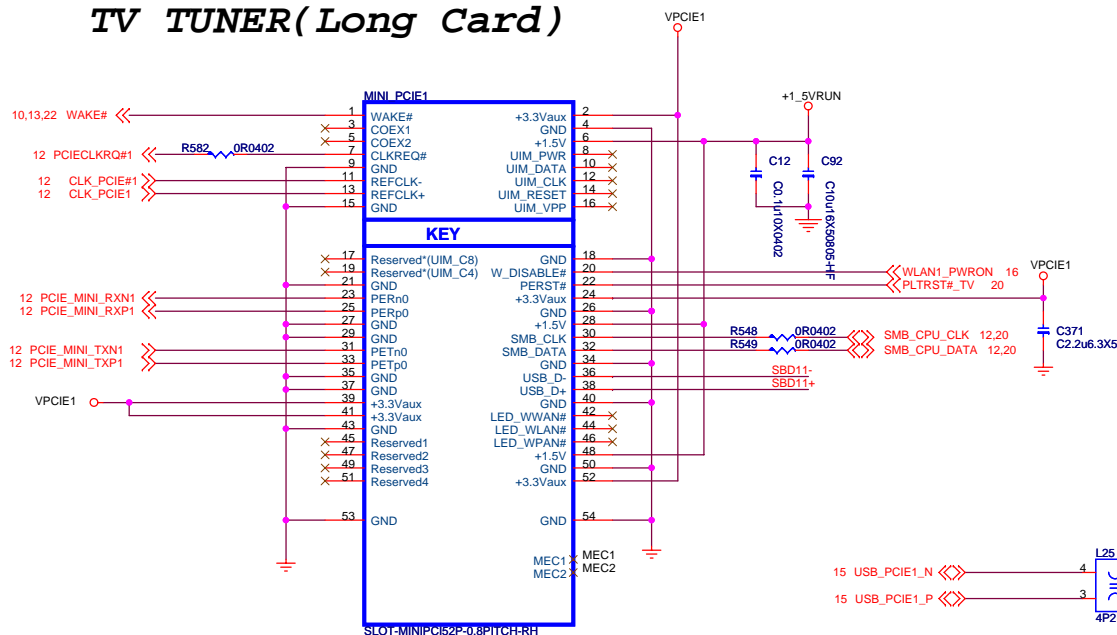




# Wireless LAN(Short Card)



# TV TUNER(Long Card)



N11-0520040-A81

PCI ExpressR  
Mini Card Electromechanical  
Specification  
Revision 1.2



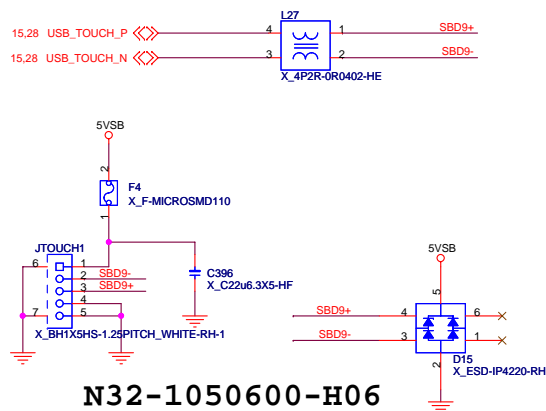
MICRO-STAR INT'L CO.,LTD

MS-A9281

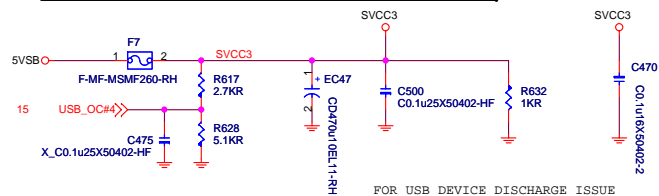
Size	Document Description	Rev
Custom	MINI-PCIE Slot	1.1
Date: Tuesday, December 18, 2012	Sheet 24 of 42	



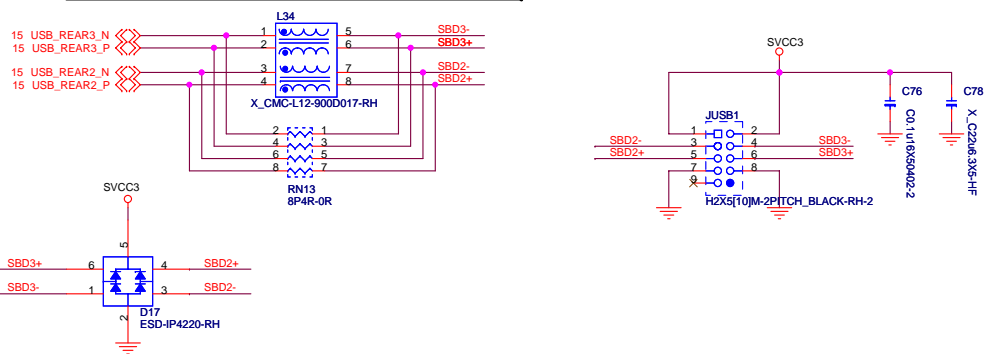
## Multi Touch ( Option )



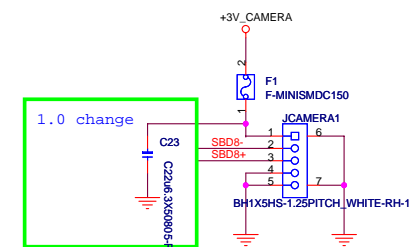
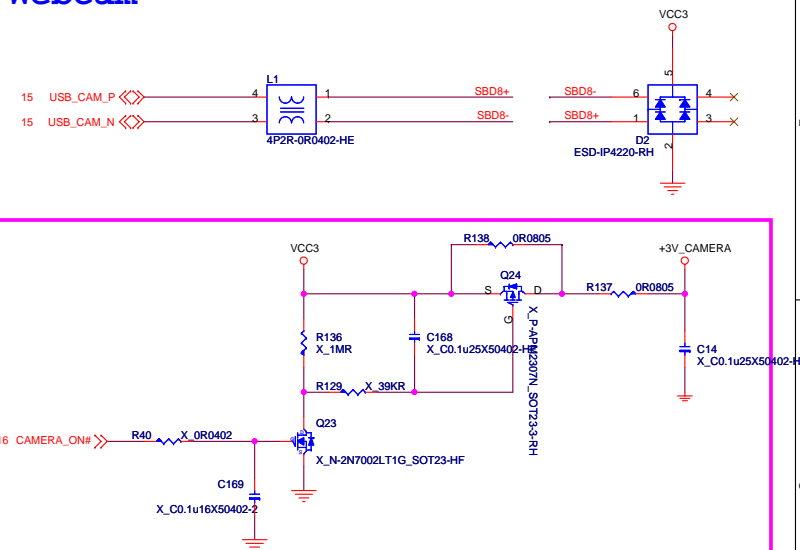
## POWER CIRCUIT FOR USB PORT 2,3 (REAR)



## SIDE PANEL USB CONNECTOR FOR USB PORT 2,3

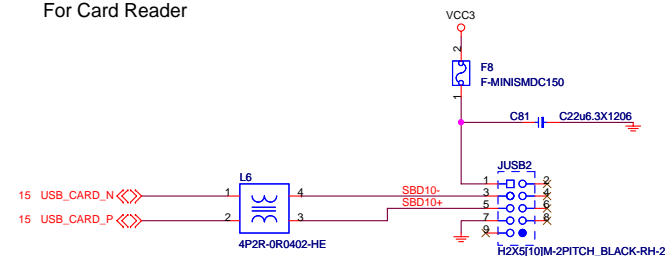


## Webcam



**N32-1050600-H06**

## For Card Reader

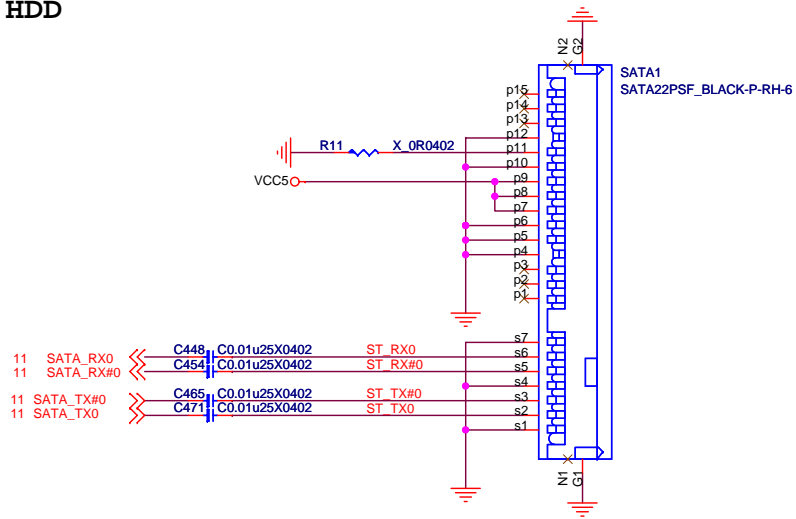


**MICRO-STAR INT'L CO.,LTD**

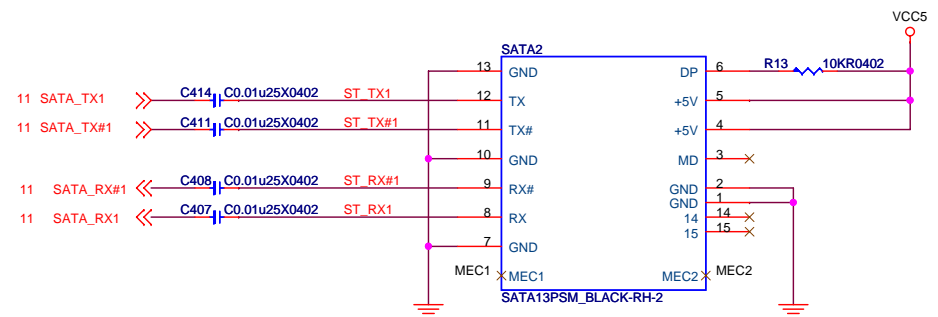
**MS-A9281**

Size	Document Description	Rev
Custom	USB / IR / TOUCH / WEBCAM	1.1
Date:	Tuesday, December 18, 2012	Sheet 25 of 42

## SATA HDD

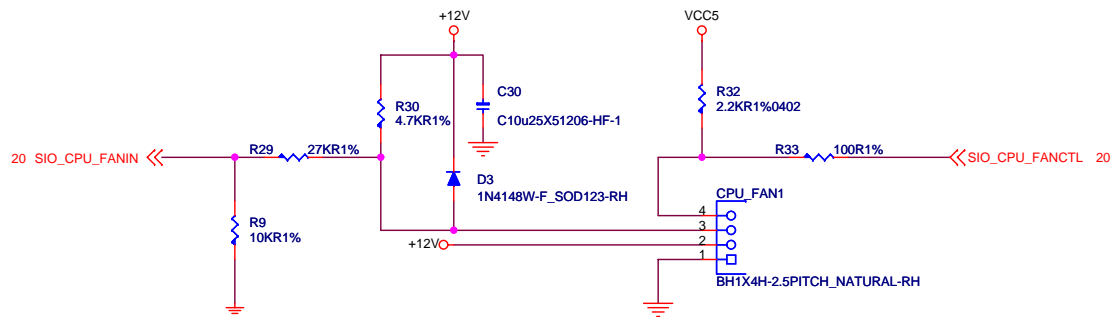


## SATA 0DD



1.0 Add

## CPU FAN

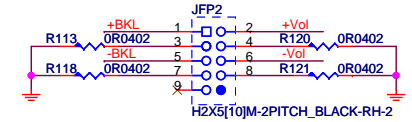
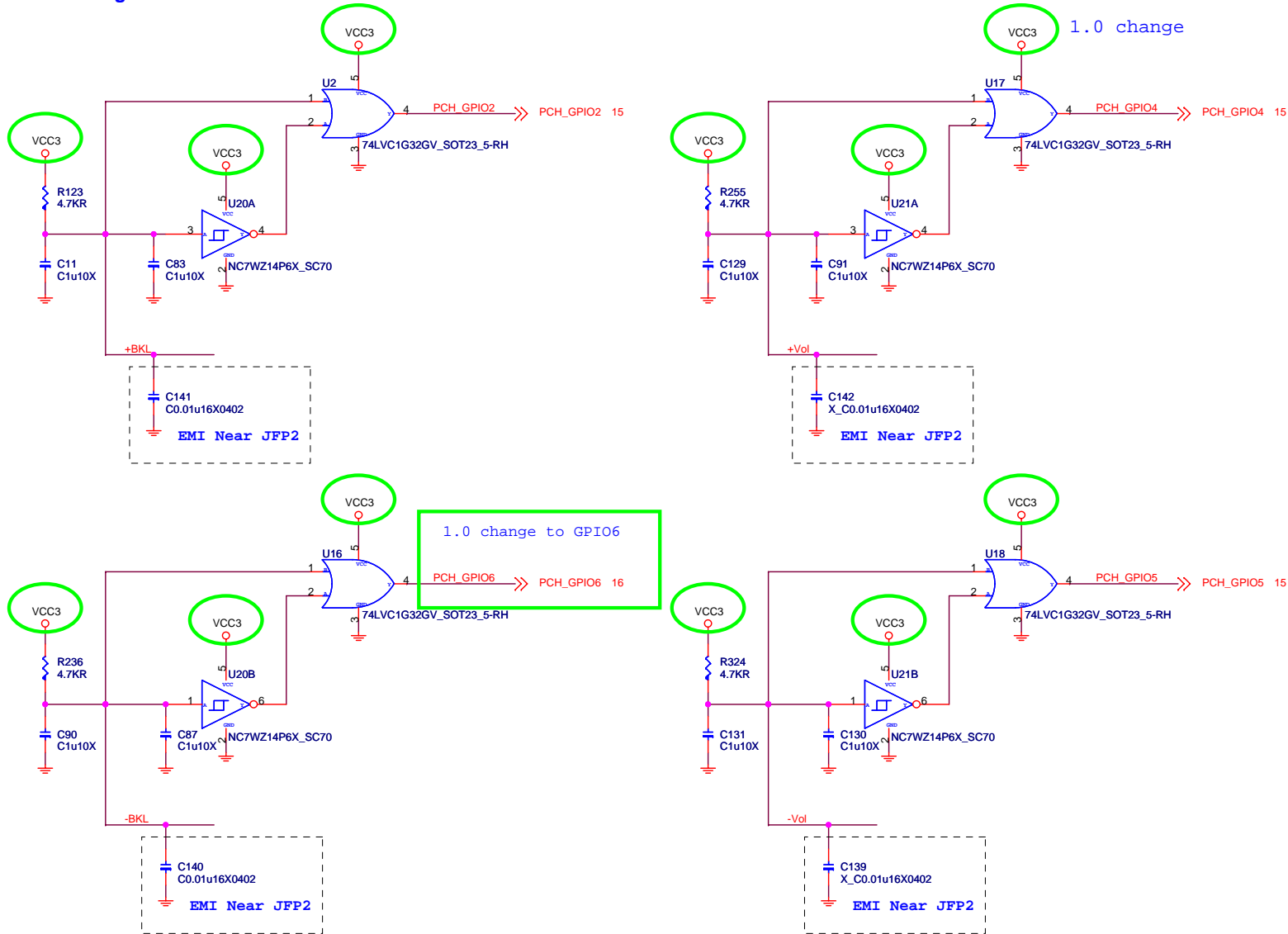


MICRO-STAR INT'L CO.,LTD

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Size	Document Description	Rev
Custom	SATA / FAN Control	1.1
Date: Tuesday, December 18, 2012	Sheet 26 of 42	

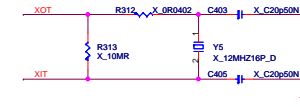
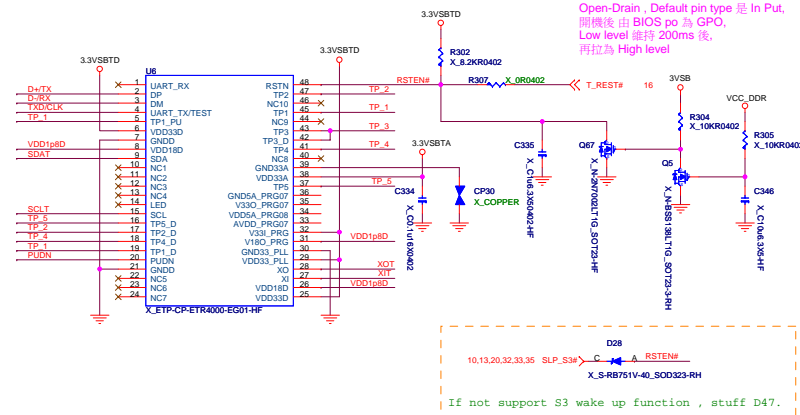
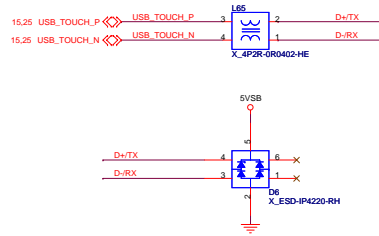
# Backlight and volume control



	MICRO-STAR INT'L CO.,LTD		
	MS-A9281		
	Size B	Document Description	Rev. 1.1
	OSD JFP2		
	Date: Tuesday, December 18, 2012		Sheet 27 of 42

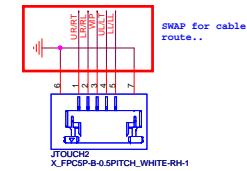
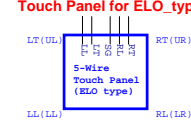
**Non TOUCH NO STUFF**

Low Speed USB D+/D-

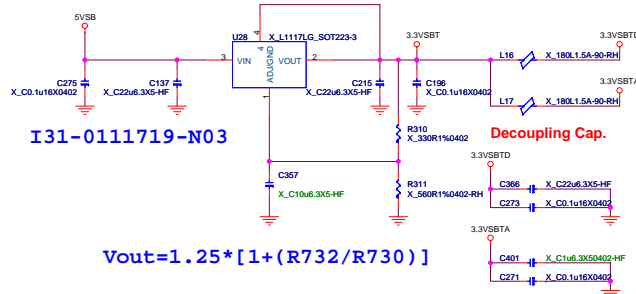


## Touch Panel

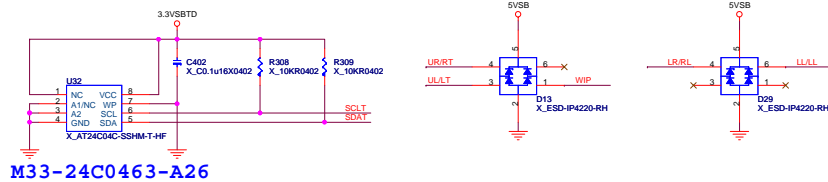
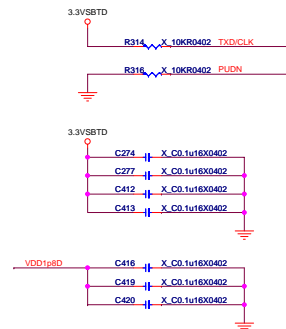
**(Option 1) 5-Wire Resistive**



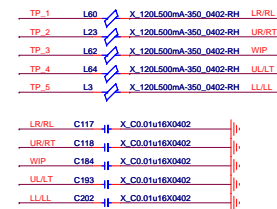
N5A-05F0020-H06



$$V_{out} = 1.25 * [1 + (R_{732}/R_{730})]$$

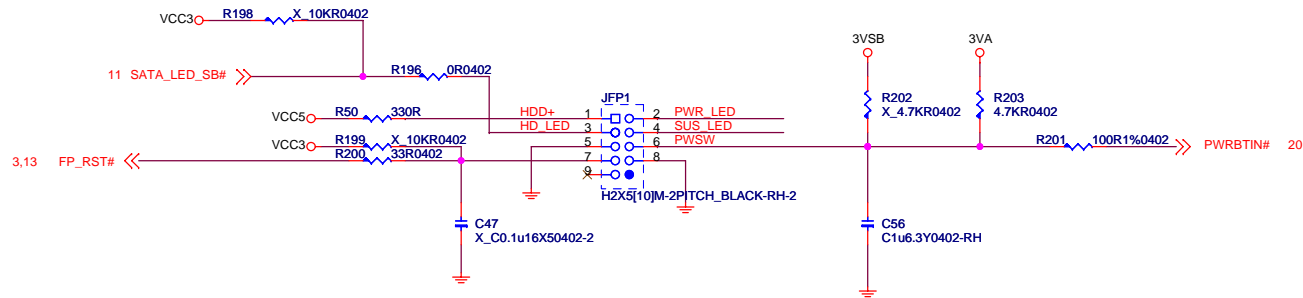


## EMI Suppressor

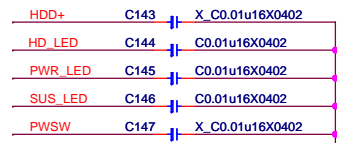




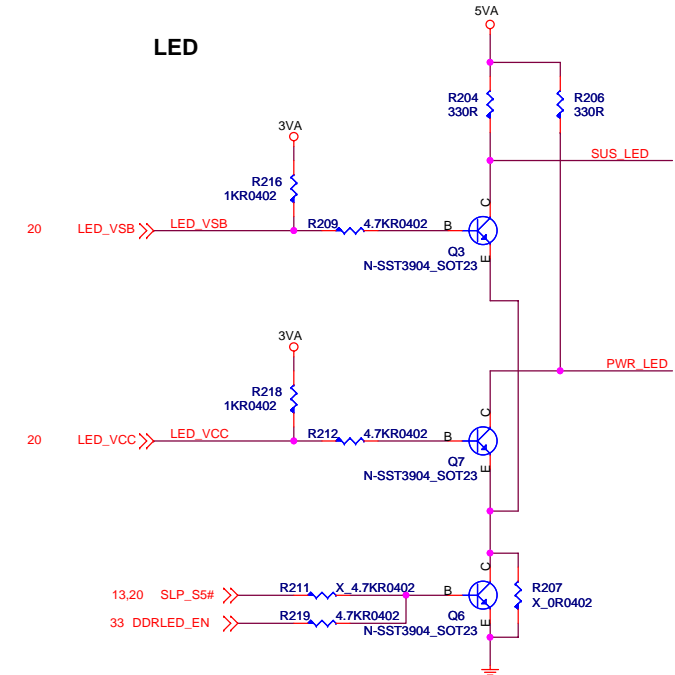
## INTEL/PB Front Panel Connector



### EMI Near JFP2

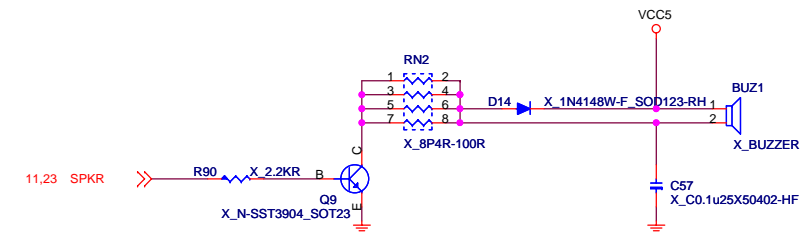


## LED



1.0 COST DOWN

## SPEAKER BLOCK

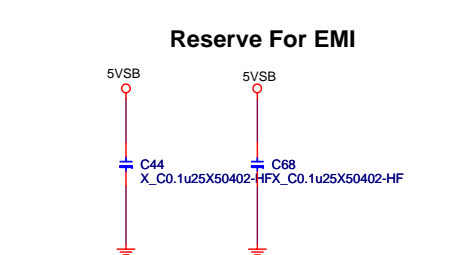
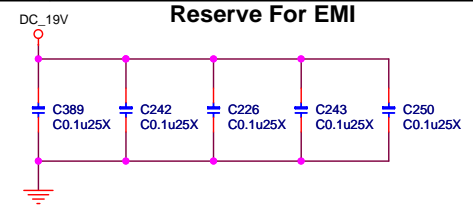
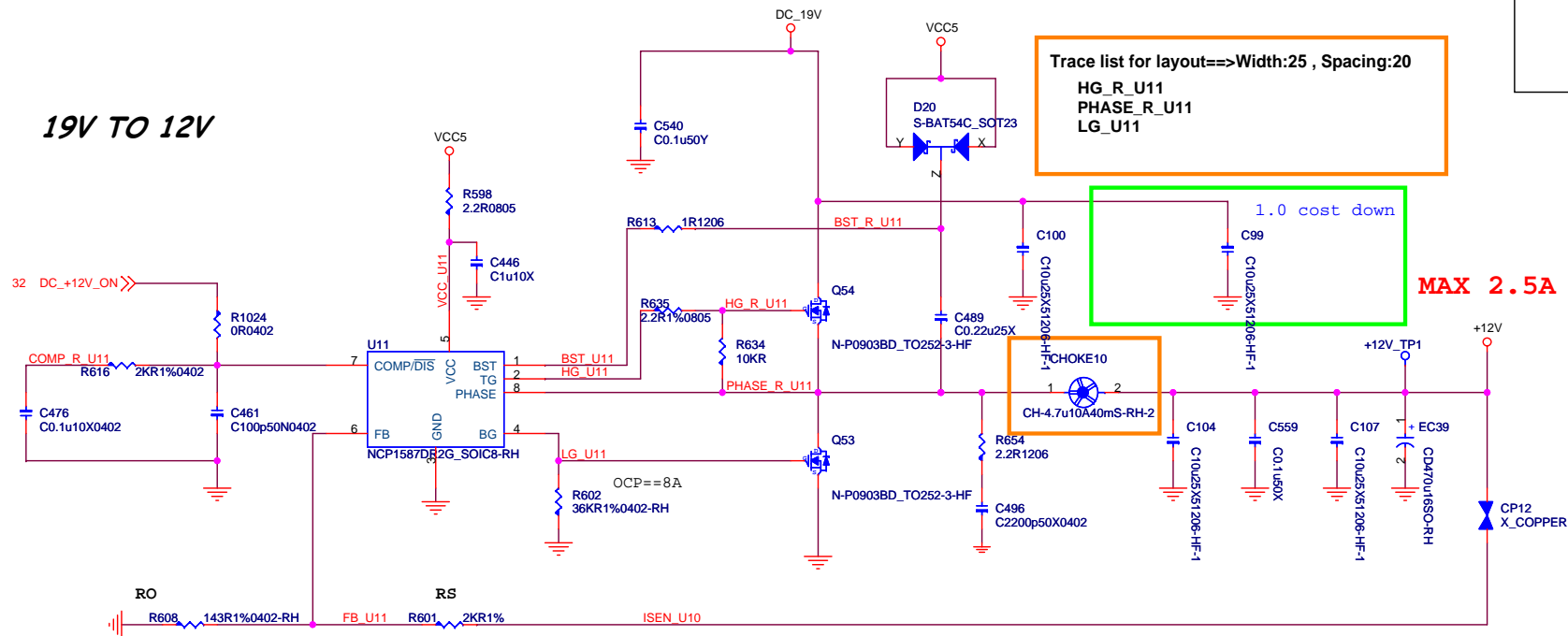


MICRO-STAR INT'L CO.,LTD

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Custom	Front Panel	1.1
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19V TO 12V



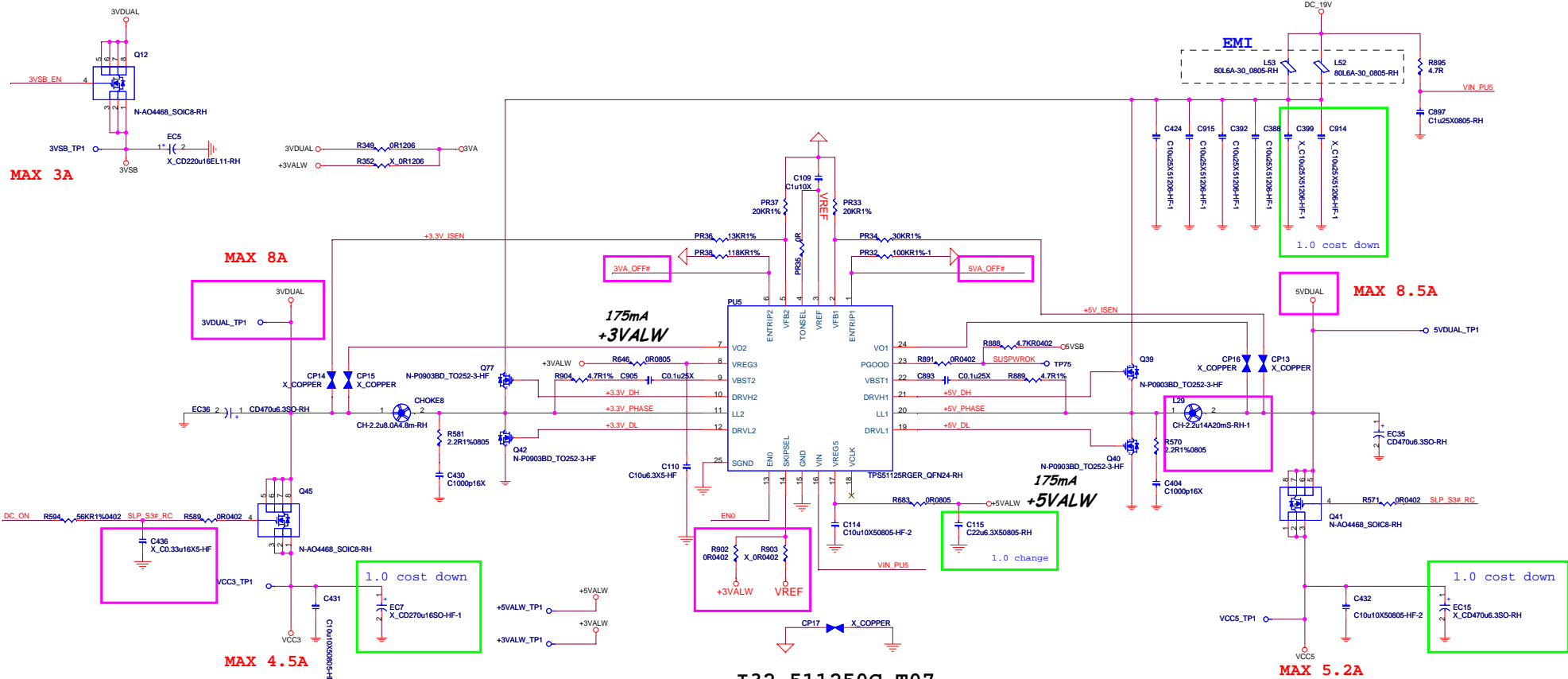
Trace list for layout==>Width:25 , Spacing:20  
HG\_R\_U11  
PHASE\_R\_U11  
LG\_U11

1.0 cost down

MAX 2.5A



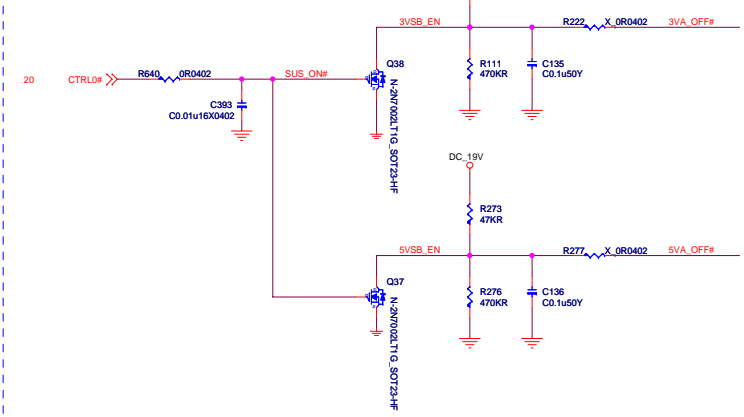
MICRO-STAR INT'L CO.,LTD		
MS-A9281		
Size Custom	Document Description DC19V/12V_REG	Rev 1.1
Date: Tuesday, December 18, 2012	Sheet 31	of 42



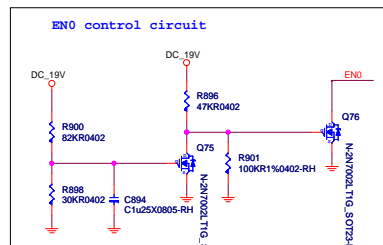
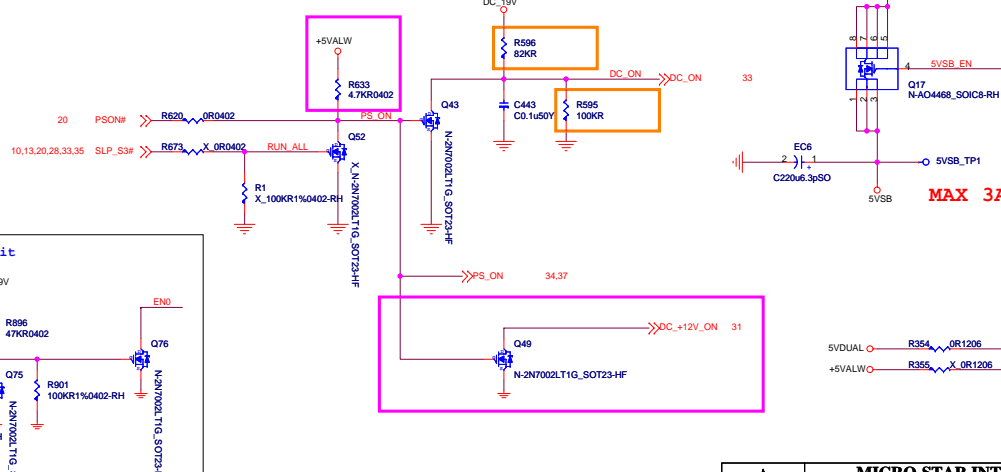
I32-511250C-T07

EUP Function.

High close 3VSB/5VSB

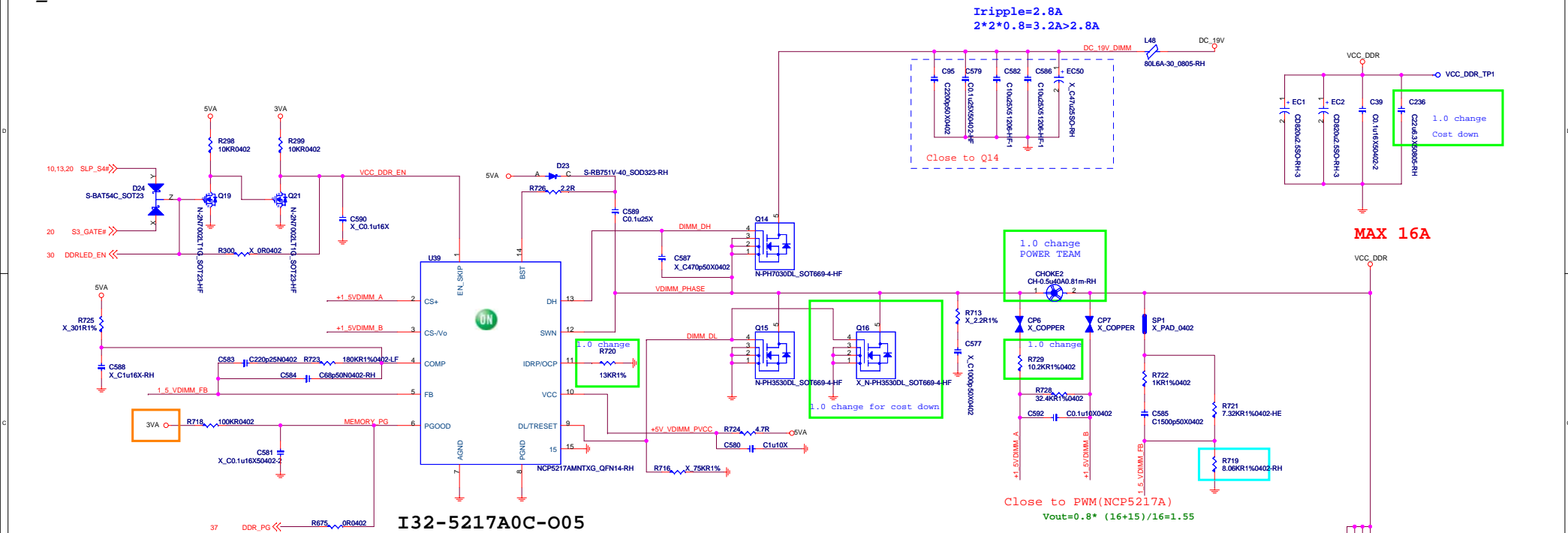


EN0 open: LDO on and turn on switcher channel



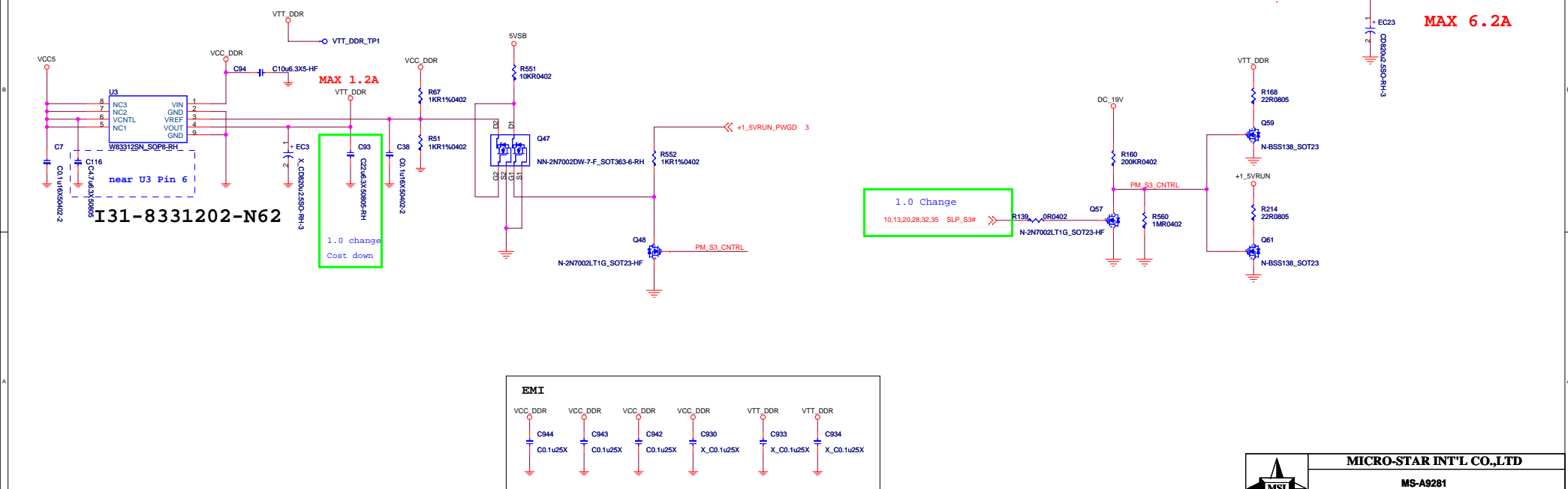


**VCC DDR**

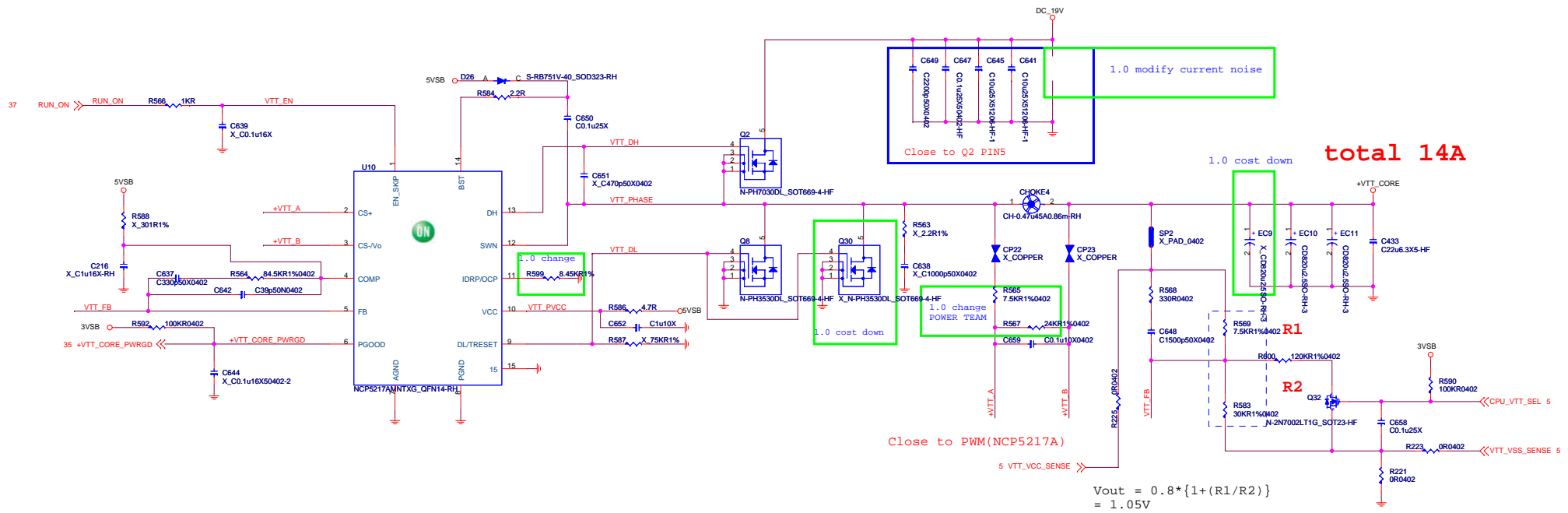


## VTT\_DDR

Current Max at 1.2A



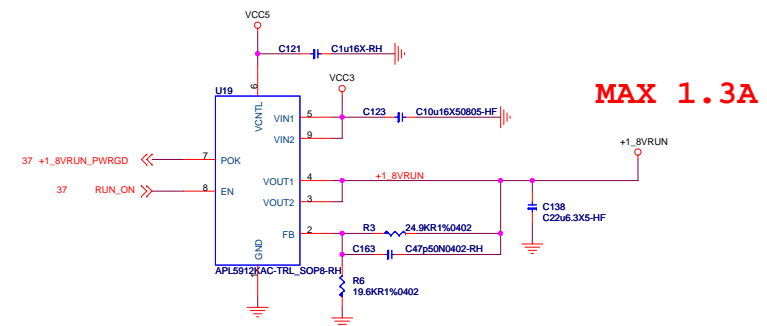
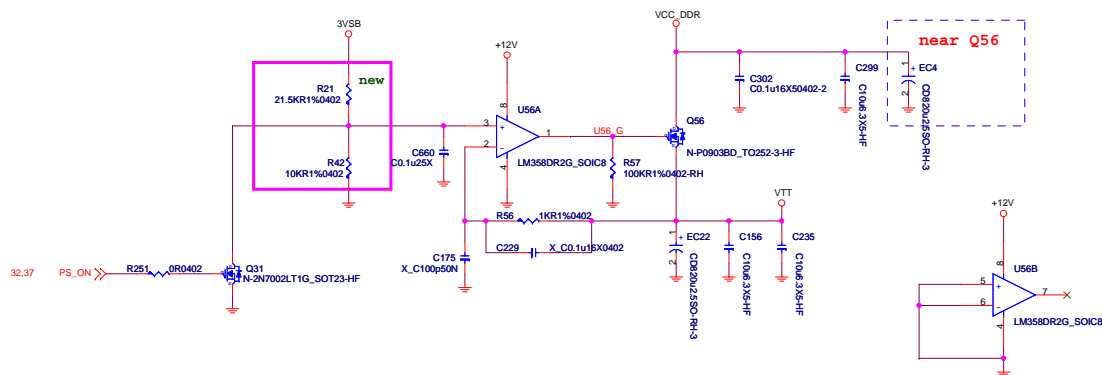
### ***+VTT\_CORE Power***



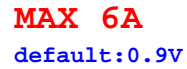
MAX 6.8A  
VTT=1.05 V TO PCH

```
H_VTTVID1=LOW, 1.0V
H_VTTVID1=HIGH, 1.05V
```

## VTT POWER



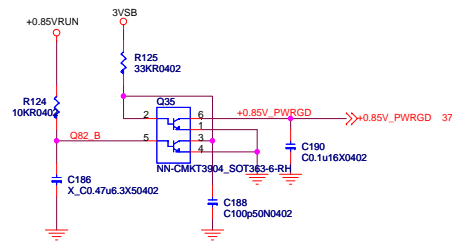
( 8 . 8A )

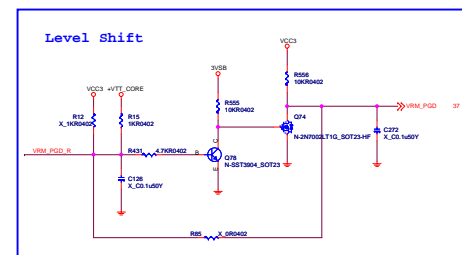
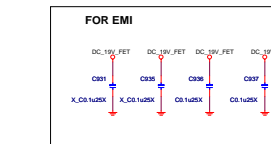
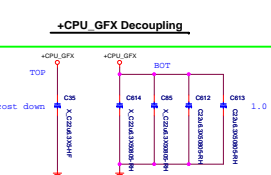
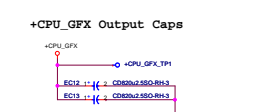
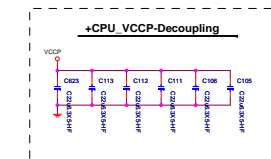
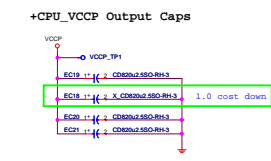


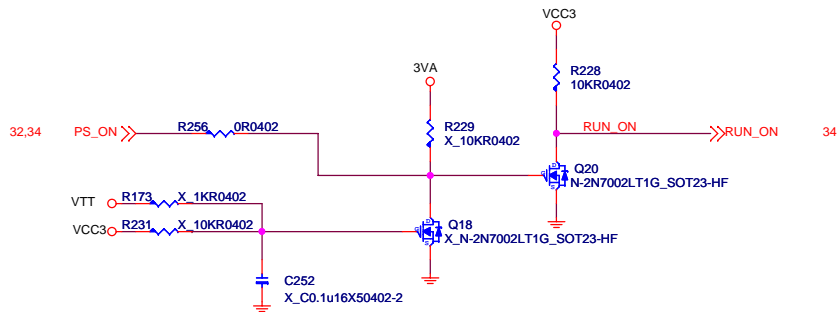
Max current : 6A

[illegible]

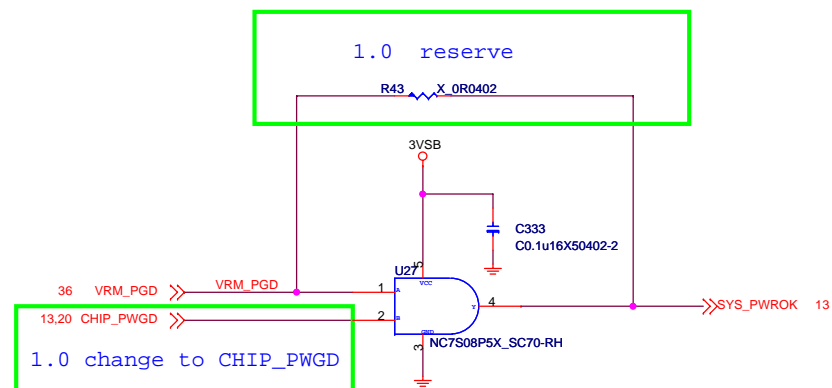
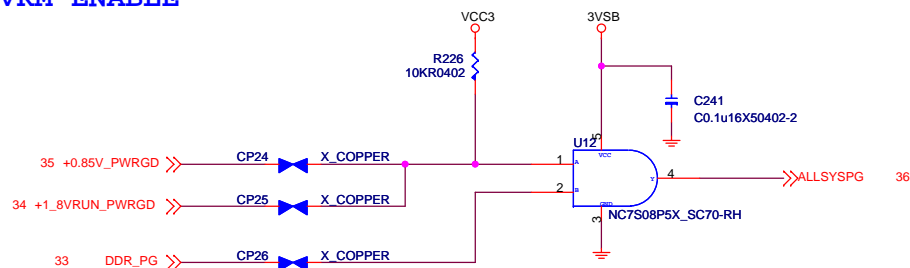
VCCSA\_VID=LOW, 0.9V  
VCCSA\_VID=HIGH, 0.85V







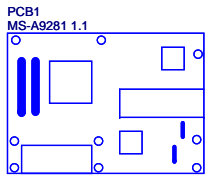
## VRM ENABLE



**MICRO-STAR INT'L CO.,LTD**

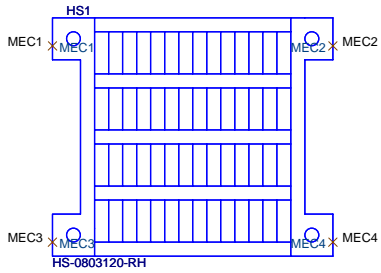
**MS-A9281**

Size Custom	Document Description <b>ACPI Controller</b>	Rev 1.1
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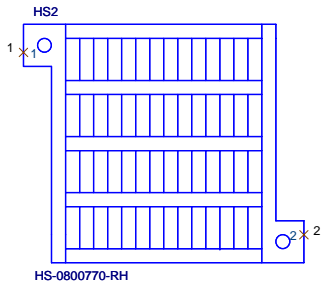


LABEL1  
**RESISTER**  
BIOS LABEL

## CPU Sink



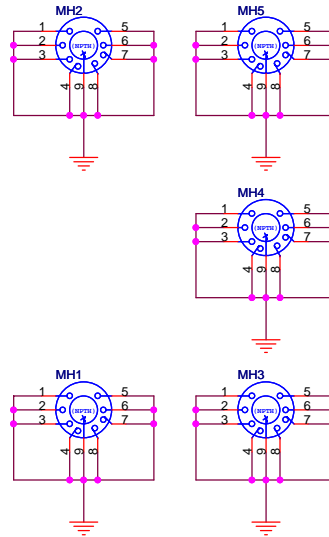
## PCH Sink



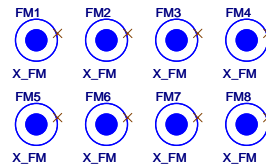
Single End 50ohm



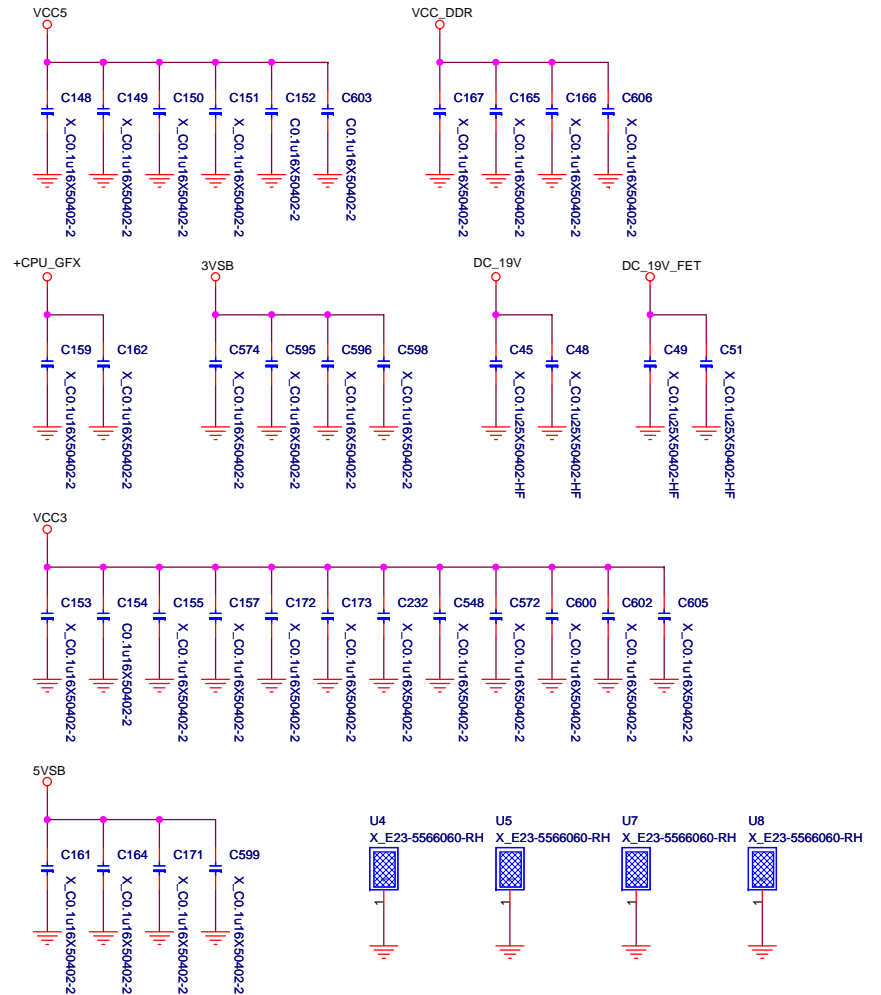
## Mounting Holes



## Optical Fiducial Marks-120



## EMI

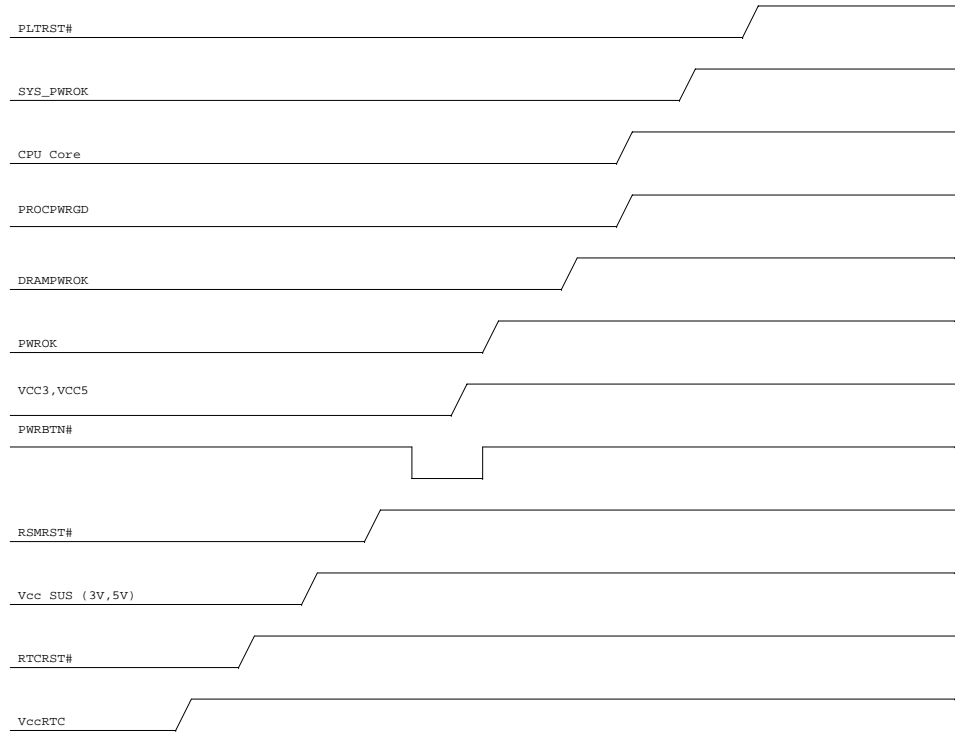


MICRO-STAR INT'L CO.,LTD

MS-A9281

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Power Sequencing and Reset Signal Timings ( NM 70 )



Celeron 847 (17W)		
Vcc CORE	-	33A
Vcc IO 1.05V	-	8.5A
VDDQ 1.5V	-	5A
Vcc SA 0.85V	-	6A
Vcc PLL 1.8V	-	1.2A
VAXG	-	16A

NM 70		
VccCore	-	1.73A
VccIO 1.05V	-	3.799A
VccASW 6704 mA	-	0.803A
Other	-	0.372A
Vcc3_3	-	0.252A
VccSus3_3	-	0.076A
+1_8VRUN 1.8V	-	0.042A
VccVRM 1.5V	-	0.147A
V5REF	-	0.001A
V5REF_Sus	-	0.001A
VccRTC	-	6uA

REALTEK/RTL8111E-VB		
3VSB -> VDD3	-	0.17A

HD Audio ALC887		
VCC3	-	0.012A
5VSB -> LDOVDD	-	0.05A

AMP TPA2008		
VCC5 -> PVCC	-	1.5A

3V  
Battery

NCP6151/6131		
VCCP	0.3V-1.52V	33A
+CPU_GFX	0V-1.52V	16A

NCP5217		
VCC_DDR	1.5V	16A

W83312SN		
VTT_DDR	0.75V	1.2A

N-AO4468		
+1_5VRUN	1.5V	6.147A

NCP5217		
+VTT_CORE	1.05V	14A

OP		
VTT	1.05V	6.704A

APL5912		
+1_8VRUN	1.8V	1.242A

N-AO4469		
+0.85VRUN	0.85V	6A

DDRIII x2 & TERMINATOR		
VTT_DDR	-	1.2A
VCC_DDR	-	4A

SATA HDD /SATA ODD		
VCC5	-	2A

(LVDS) LCD PANEL		
VCC5 -> LCD_VDD	-	1.5A
(IRUSH)	-	3A

USB 2.0 PORT X4		
5VSB -> SVCC1	-	2A
5VSB -> SVCC2	-	2A

Mini PCI-E slot x2		
VCC3	-	2.75A
3VSB	-	2.75A
1.5V -> +1_5VRUN	-	1A

Webcam		
	-	0.5A

Card Reader		
	-	0.3A

VCC5	VCC3
5.2A	4.5A
5VSB	3VSB
3A	3A
+5VALW	+3VALW
0.5A	0.5A
TI/TPS51125	

+12V
NCP1587DR2G
2A

+19V
ADAPTER

+12V CPU & SYS FAN
- 1A

INVETER
- 1A



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## 0A change to 1.0

01. Page 03 Modify TRMTRIP# circuit.
02. Page 03 DRAMRST# enable control pin change to SIO.
03. Page 05 Remove CAP & Change to 0805 for Cost down.
04. Page 06 Remove CAP for Cost down.
05. Page 09 DIMM1 CONNECTOR chang to N13-2040790-CK3 . ( cost down )
06. Page 10 change USB3.0 connector.
07. Page 10 reserve C43 for USB3.0 controller loss.
08. Page 10 Modify USB3.0 SPI ROM circuit.
09. Page 10 reserve USB2.0 SKU circuit.
10. Page 11 Change PCH SPI ROM POWER to VCC3.
11. Page 12 reserve PCH GPIO26 to USB3.0/2.0 SKU detect.
12. Page 16 reserve PCH GPIO57 to FAN SKU detect.
13. Page 16 Modify PCH\_GPIO36 Double pull high low R510 no stuff.
14. Page 20 Add about FAN circuit.
15. Page 20 Modify Temperature SENSING CIRCUIT.
16. Page 23 Change CAP to 0805 for Cost down.
17. Page 24 mini PCIE CONNECTOR change to N11-0520240-K06 . ( cost down )
18. Page 25 Change CAP to 0805 for Cost down.
19. Page 26 Add FAN circuit.
20. Page 27 OSD POWER change to VCC3
21. Page 27 Modify OSD circuit. ( GPIO3 change to GPIO6 )
22. Page 29 Change LVDS Connector.
23. Page 29 Panel Backlight Brightness Control change to PCH.
24. Page 30 Remove SPEAKER for Cost down.
25. Page 31 Remove CAP for Cost down.
26. Page 32 Remove CAP & change to 0805 for Cost down.
27. Page 33 Modify VCC\_DDR circuit. ( POWER TEAM )  
CHOK2 change to L04-05A7211-L65  
R720 change to 13K ohm  
R729 change to 10.2K ohm  
  
Change CAP to 0805 for Cost down.  
Remove Q16 for Cost down.

28. Page 34 Modify +VTT\_CORE POWER circuit. ( POWER TEAM )  
R565 change to 7.5 Kohm  
R567 change to 24K ohm  
R599 change to 8.45K ohm

Remove Q30 & CAP for Cost down & current noise.

29. Page 36 Modify CPU POWER circuit. ( POWER TEAM )  
R194 change to 1.82 Kohm  
R336 change to 3.9K ohm  
R36 change to 2.37K ohm  
R561 change to 2.37K ohm  
R54 change to 2.37K ohm

Remove CAP & change to 0805 for Cost down & current noise.

30. Page 37 Modify ACPI circuit.

31. New BOM for Touch : Cfg-USB3T OPT:B 11/08  
Cfg-USB2T OPT:C

## 1.1 change to 1.1

01. Page 29 LVDS connector change to N32-2200120-H06.

Panther Point (Mobile)									
GPIO	Alt Func	Type	POWER	SMI	TOL	DEFAULT	SIGNAL NAME	Pull up or Pull down	BIOS
GPIO0	BMBUSY#	I/O	CORE	Y	3.3V	GPI	PCH_GPIO0	Pull-up 10K to VCC3	No USE
GPIO1	Unmultiplexed	I/O	CORE	Y	3.3V	GPI	NEC_SMI#	Pull-up 10K to VCC3	USB3.0
GPIO2	PIRQE#	I/OD	CORE	Y	5V	GPI	PCH_GPIO2	Pull-up 8.2K to VCC3	+BKL
GPIO3	PIRQF#	I/OD	CORE	Y	5V	GPI	PCH_GPIO3	Pull-up 8.2K to VCC3	-BKL
GPIO4	PIRQG#	I/OD	CORE	Y	5V	GPI	PCH_GPIO4	Pull-up 8.2K to VCC3	+Vol
GPIO5	PIRQH#	I/OD	CORE	Y	5V	GPI	PCH_GPIO5	Pull-up 8.2K to VCC3	-Vol
GPIO6	Unmultiplexed	I/O	CORE	Y	3.3V	GPI	PCH_GPIO6	Pull-up 10K to VCC3	No USE
GPIO7	Unmultiplexed	I/O	CORE	Y	3.3V	GPI	PCH_GPIO7	Pull-up 10K to VCC3	No USE
GPIO8	Unmultiplexed	I/O	Suspend	Y	3.3V	GPO	ICC_EN	Pull-down	STRAP
GPIO9	OC5#	I/O	Suspend	Y	3.3V	Native	USB_OC5#	Pull-up 10K to 3VSB	OC5#
GPIO10	OC6#	I/O	Suspend	Y	3.3V	Native	USB_OC0#	Pull-up 10K to 3VSB	OC0#
GPIO11	SMBALERT#	I/O	Suspend	Y	3.3V	Native	PCH_GPIO11	Pull-up 10K to 3VSB	No USE
GPIO12	LAN_PHY_PWR_CTRL	I/O	Suspend	Y	3.3V	Native	T_REST#	N/A	T_REST#
GPIO13	HDA_DOCK_RST#	I/O	Suspend	Y	3.3V	GPI	SIO_PME#	Pull-up 4.7K to 3VSB	PME#
GPIO14	OC7#	I/O	Suspend	Y	3.3V	Native	NC	N/A	No USE
GPIO15	Unmultiplexed	I/O	Suspend	Y	3.3V	GPO	TLSEN	N/A	No USE
GPIO16	SATA4GP	I/O	CORE	N	3.3V	GPI	PCH_GPIO16	Pull-UP 10K to VCC3	No USE
GPIO17	Unmultiplexed	I/O	CORE	N	3.3V	GPI	PCH_GPIO17	Pull-up 10K to VCC3	No USE
GPIO18	PCIECLKRQ1#	I/O	CORE	N	3.3V	Native	PCIE_CLKREQ#1	Pull-up 10K to VCC3	PCIECLKREQ1#
GPIO19	SATA1GP	I/O	CORE	N	3.3V	GPI	BBS_BIT0	Pull-up 10K to VCC3	STRAP
GPIO20	PCIECLKRQ2# SMI#	I/O	CORE	N	3.3V	Native	PCIECLKREQ2#	Pull-up 10K to VCC3	PCIECLKREQ2#
GPIO21	SATA0GP	I/O	CORE	N	3.3V	GPI	PCH_GPIO21	Pull-up 10K to VCC3	No USE
GPIO22	SCLOCK	I/O	CORE	N	3.3V	GPI	PCH_GPIO22	Pull-up 10K to VCC3	No USE
GPIO23	LDRQ1#	I/O	CORE	N	3.3V	Native	NC	N/A	No USE
GPIO24	Unmultiplexed	I/O	Suspend	N	3.3V	GPO	PCH_GPIO24	Pull-up 10K to 3VSB	No USE
GPIO25	PCIECLKRQ3#	I/O	Suspend	N	3.3V	Native	PCIECLKREQ3#	Pull-up 10K to VCC3	PCIECLKREQ3#
GPIO26	PCIECLKRQ4#	I/O	Suspend	N	3.3V	Native	PCIECLKREQ4#	Pull-up 10K to 3VSB	No USE
GPIO27	Unmultiplexed	I/O	DSW	N	3.3V	GPI	DSW_WAKE#	Pull-up 10K to 3VA	No USE
GPIO28	Unmultiplexed	I/O	Suspend	N	3.3V	GPO	PLL_ODVR_EN	N/A	No USE
GPIO29	SLP_LAN#	I/O	Suspend	N	3.3V	Native	SLP_LAN#	Pull-up 10K to 3VSB	No USE
GPIO30	SUSWARN# SUSPWRDNACK	I/O	Suspend	N	3.3V	Native	SUS_WARN#	Pull-up 10K to 3VSB	SUS_WARN#
GPIO31	Unmultiplexed	I/O	DSW	N	3.3V	GPI	AC_PRESENT	Pull-up 10K to 3VA	No USE
GPIO32	only CLKRUN#	I/O	CORE	N	3.3V	Native	CLKRUN#	Pull-up 8.2K to VCC3	No USE
GPIO33	HDA_DOCK_EN#	I/O	CORE	N	3.3V	GPO	HDA_DOCK_EN#	N/A	No USE
GPIO34	STP_PCI#	I/O	CORE	N	3.3V	GPI	STP_PCI#	Pull-up 10K to VCC3	No USE
GPIO35	NMI#	I/O	CORE	N	3.3V	GPO	CAMERA_ON#	N/A	CAMERA_ON#
GPIO36	SATA2GP	I/O	CORE	N	3.3V	GPI	PCH_GPIO36	Pull-up 10K to VCC3	STRAP
GPIO37	SATA3GP	I/O	CORE	N	3.3V	GPI	PCH_GPIO37	Pull-down 10K	STRAP
GPIO38	SLOAD	I/O	CORE	N	3.3V	GPI	WLAN1_PWRON	Pull-up 10K to VCC3	WLAN1_PWRON
GPIO39	SDATAOUT0	I/O	CORE	N	3.3V	GPI	WLAN2_PWRON	Pull-up 10K to VCC3	WLAN2_PWRON
GPIO40	OC1#	I/O	Suspend	N	3.3V	Native	USB_OC0#	Pull-up 10K to 3VSB	OC0#
GPIO41	OC2#	I/O	Suspend	N	3.3V	Native	USB_OC0#	Pull-up 10K to 3VSB	OC0#
GPIO42	OC3#	I/O	Suspend	N	3.3V	Native	USB_OC0#	Pull-up 10K to 3VSB	OC0#
GPIO43	OC4#	I/O	Suspend	N	3.3V	Native	USB_OC4#	Pull-up about 3VSB	OC4#
GPIO44	PCIECLKRQ5#	I/O	Suspend	N	3.3V	Native	CHARGER_EN	Pull-up 10K to 3VSB	CHARGER_EN
GPIO45	PCIECLKRQ6#	I/O	Suspend	N	3.3V	Native	CHARGER_S0	Pull-up 10K to 3VSB	CHARGER_S0

GPIO	Alt Func	Type	POWER	SMI	TOL	DEFAULT	SIGNAL NAME	Pull up or Pull down	BIOS
GPIO46	PCIECLKRQ7#	I/O	Suspend	N	3.3V	Native	CHARGER_S1	Pull-up 10K to 3VSB	CHARGER_S1
GPIO47	PEG_A_CLKRQ#	I/O	Suspend	N	3.3V	Native	PEGACLKREQ#	Pull-up 10K to 3VSB	No USE
GPIO48	SDATAOUT1	I/O	CORE	N	3.3V	GPI	PCH_GPIO48	Pull-up 10K to VCC3	No USE
GPIO49	SATA5GP TEMP_ALERT#	I/O	CORE	N	3.3V	GPI	PCH_GPIO49	Pull-up 10K to VCC3	No USE
GPIO50	Unmultiplexed	I/O	CORE	N	5V	Native	PCH_GPIO50	Pull-up 8.2K to VCC3	No USE
GPIO51	Unmultiplexed	I/O	CORE	N	3.3V	Native	BBS_BIT1	N/A	STRAP
GPIO52	Unmultiplexed	I/O	CORE	N	5V	Native	PCH_GPIO52	Pull-up 8.2K to VCC3	No USE
GPIO53	Unmultiplexed	I/O	CORE	N	3.3V	Native	PCH_GPIO53	N/A	No USE
GPIO54	Unmultiplexed	I/O	CORE	N	5V	Native	PCH_GPIO54	Pull-up 10K to VCC3	No USE
GPIO55	Unmultiplexed	I/O	CORE	N	3.3V	Native	PCH_GPIO55	N/A	No USE
GPIO56	PEG_B_CLKRQ#	I/O	Suspend	N	3.3V	Native	PEGBCLKRQ#	Pull-up 10K to 3VSB	No USE
GPIO57	Unmultiplexed	I/O	Suspend	N	3.3V	GPI	PCH_GPIO57	Pull-up 10K to 3VSB	No USE
GPIO58	SML1CLK	I/O	Suspend	N	3.3V	Native	SML1_CLK	Pull-up 2.2K to 3VSB	SML1CLK
GPIO59	OC0#	I/O	Suspend	N	3.3V	Native	USB_OC0#	Pull-up 10K to 3VSB	OC0#
GPIO60	SML0ALERT#	I/O	Suspend	N	3.3V	Native	DRAMRST_CNTRL_PCH	Pull-up 10K to 3VSB	DEEP S3
GPIO61	SUS_SATA#	I/O	Suspend	N	3.3V	Native	NC	N/A	No USE
GPIO62	SUSCLK	I/O	Suspend	N	3.3V	Native	NC	N/A	No USE
GPIO63	SLP_S5#	I/O	Suspend	N	3.3V	Native	SLP_S5#	N/A	SLP_S5#
GPIO64	CLKOUTFLEX0	I/O	CORE	N	3.3V	Native	TP_CLK_FLEX0	N/A	No USE
GPIO65	CLKOUTFLEX1	I/O	CORE	N	3.3V	Native	TP_CLK_FLEX1	N/A	No USE
GPIO66	CLKOUTFLEX2	I/O	CORE	N	3.3V	Native	TP_CLK_FLEX2	N/A	No USE
GPIO67	CLKOUTFLEX3	I/O	CORE	N	3.3V	Native	TP_CLK_FLEX3	N/A	CLK_48M_SIO
GPIO68	Unmultiplexed	I/O	CORE	N	3.3V	GPI	NC	N/A	No USE
GPIO69	Unmultiplexed	I/O	CORE	N	3.3V	GPI	NC	N/A	No USE
GPIO70	Unmultiplexed	I/O	CORE	N	3.3V	Native	NC	N/A	No USE
GPIO71	Unmultiplexed	I/O	CORE	N	3.3V	Native	NC	N/A	No USE
GPIO72	BATLOW#	I/O	Suspend	N	3.3V	Native	PCH_GPIO72	Pull-up 10K to 3VSB	No USE
GPIO73	PCIECLKRQ0#	I/O	Suspend	N	3.3V	Native	LANCLKRQ#	Pull-up 10K to 3VSB	LANCLKRQ#
GPIO74	SML1ALERT# PCHHOT#	I/O	Suspend	N	3.3V	Native	PCH_GPIO74	Pull-up 10K to 3VSB	No USE
GPIO75	SML1DATA	I/O	Suspend	N	3.3V	Native	SML1_DATA	Pull-up 2.2K to 3VSB	SML1DATA