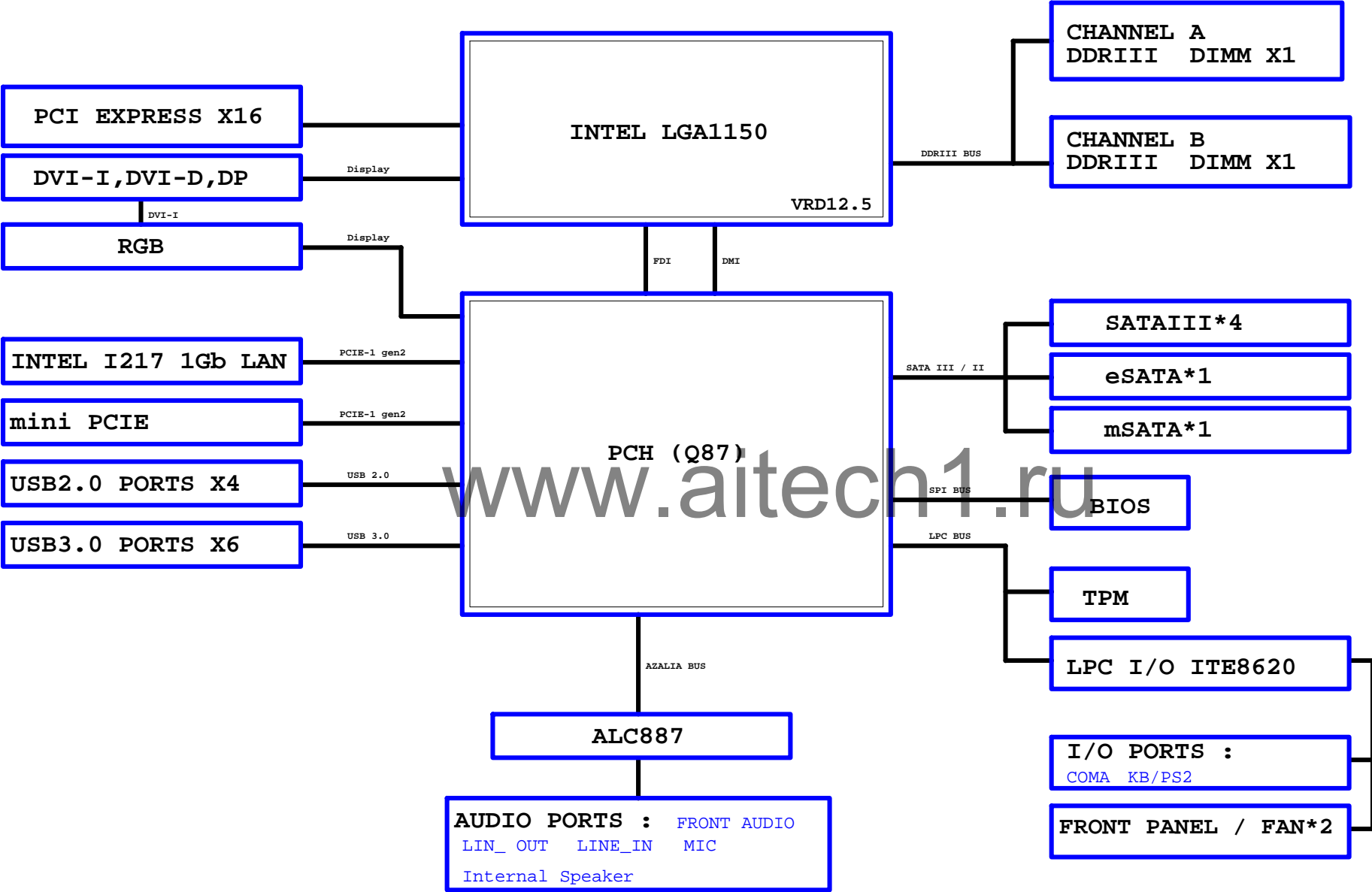


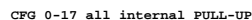
SHEET	TITLE
-------	-------

[illegible][illegible][illegible]

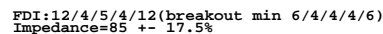
BLOCK DIAGRAM



(E)



(D)

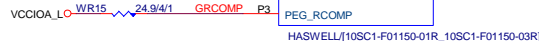


FDI TXP[0..1] >> FDI_TXP[0..1] (7)

FDI TXN[0..1] >> FDI_TXN[0..1] (7)

(C)

PCIEX16:16/5/5/5/16(breakout min 10/4/4/4/10)
Impedance=80 +- 17.5%



DMI:12/4/4/4/12(breakout min 8/4/4/4/8)

Impedance=85 +- 17.5%

PA_EXP_TXP[0..15]	»PA_EXP_TXP[0..15]	(12)
PA_EXP_TXN[0..15]	»PA_EXP_TXN[0..15]	(12)
PA_EXP_RXP[0..15]	»PA_EXP_RXP[0..15]	(12)
PA_EXP_RXN[0..15]	»PA_EXP_RXN[0..15]	(12)

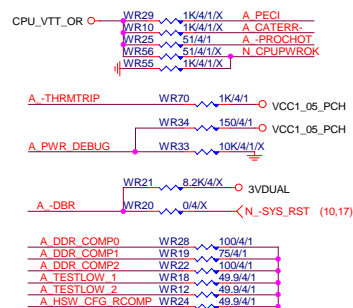
A_CPUREST
WBC3
1n4/X7R/50V/K

CPU SV



CPU_VTT_OR

WR14	51/4/1/X	A TMS
WR16	51/4/1/X	A TDO
WR17	51/4/1/X	A TDI
WR30	51/4/1	A -HPRDY
WR11	51/4/1	A TCK
WR9	51/4/1	A -TRST



A-THRMTRIP → N-THRMTRIP (9,13,15)

LGA1150 (A)

LGA1150A			
MAAA0	AU13	DDR0_MA0	DDR0_DQ0
MAAA1	AV16	DDR0_MA1	DDR0_DQ1
MAAA2	AU16	DDR0_MA2	DDR0_DQ2
MAAA3	AW17	DDR0_MA3	DDR0_DQ3
MAAA4	AU17	DDR0_MA4	DDR0_DQ4
MAAA5	AU18	DDR0_MA5	DDR0_DQ5
MAAA6	AV17	DDR0_MA6	DDR0_DQ6
MAAA7	AT18	DDR0_MA7	DDR0_DQ7
MAAA8	AU18	DDR0_MA8	DDR0_DQ8
MAAA9	AT19	DDR0_MA9	DDR0_DQ9
MAAA10	AW11	DDR0_MA10	DDR0_DQ10
MAAA11	AV19	DDR0_MA11	DDR0_DQ11
MAAA12	AU19	DDR0_MA12	DDR0_DQ12
MAAA13	AY10	DDR0_MA13	DDR0_DQ13
MAAA14	AT20	DDR0_MA14	DDR0_DQ14
MAAA15	AU21	DDR0_MA15	DDR0_DQ15
MODT_A0	AW10	DDR0_ODT0	DDR0_ODT1
MODT_A1	AY8	DDR0_ODT1	DDR0_ODT2
	AW9	DDR0_ODT2	DDR0_ODT3
	AW8	DDR0_ODT3	DDR0_ODT4
	AW33	DDR0_ECC0	DDR0_ECC1
	AW33	DDR0_ECC1	DDR0_ECC2
	AW31	DDR0_ECC2	DDR0_ECC3
	AW31	DDR0_ECC3	DDR0_ECC4
	AW33	DDR0_ECC4	DDR0_ECC5
	AT31	DDR0_ECC5	DDR0_ECC6
	AW31	DDR0_ECC6	DDR0_ECC7
	SBAA0	DDR0_BA0	DDR0_BA1
	SBAA1	DDR0_BA1	DDR0_BA2
	SBAA2	DDR0_BA2	DDR0_BA3
	CKEA0	DDR0_CKE0	DDR0_CKE1
	CKEA1	DDR0_CKE1	DDR0_CKE2
	CSA0	DDR0_CS_N0	DDR0_CS_N1
	CSA1	DDR0_CS_N1	DDR0_CS_N2
	DCLKA0	DDR0_CLK_P0	DDR0_CLK_P1
	DCLKA1	DDR0_CLK_P1	DDR0_CLK_P2
	DCLKA1	DDR0_CLK_P2	DDR0_CLK_P3
	RSVD	DDR0_RSVD	DDR0_RSVD
	SRASA	DDR0_RAS*	DDR0_RAS*
	SWEA	DDR0_WE*	DDR0_WE*
	SCASA	DDR0_CAS*	DDR0_CAS*
	DDR3_RST	DDR0_RESET*	DDR0_RESET*

HASWELL(10SC1-F01150-01R_10SC1-F01150-03R)

LGA1150 (B)

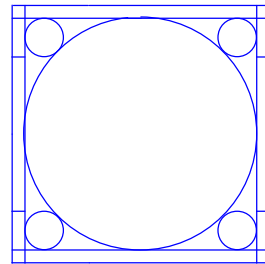
LGA1150B			
MAAB0	AL19	DDR1_MA0	DDR1_DQ0
MAAB1	AK23	DDR1_MA1	DDR1_DQ1
MAAB2	AM22	DDR1_MA2	DDR1_DQ2
MAAB3	AM23	DDR1_MA3	DDR1_DQ3
MAAB4	AP23	DDR1_MA4	DDR1_DQ4
MAAB5	AL23	DDR1_MA5	DDR1_DQ5
MAAB6	AV24	DDR1_MA6	DDR1_DQ6
MAAB7	AV25	DDR1_MA7	DDR1_DQ7
MAAB8	AW26	DDR1_MA8	DDR1_DQ8
MAAB9	AW25	DDR1_MA9	DDR1_DQ9
MAAB10	AP18	DDR1_MA10	DDR1_DQ10
MAAB11	AV26	DDR1_MA11	DDR1_DQ11
MAAB12	AR15	DDR1_MA12	DDR1_DQ12
MAAB13	AV27	DDR1_MA13	DDR1_DQ13
MAAB14	AY28	DDR1_MA14	DDR1_DQ14
MAAB15	AY28	DDR1_MA15	DDR1_DQ15
MODT_B0	AM17	DDR1_ODT0	DDR1_ODT1
MODT_B1	AL16	DDR1_ODT1	DDR1_ODT2
	AM16	DDR1_ODT2	DDR1_ODT3
	AK15	DDR1_ODT3	DDR1_ODT4
	AM26	DDR1_ECC0	DDR1_ECC1
	AM25	DDR1_ECC1	DDR1_ECC2
	AP26	DDR1_ECC2	DDR1_ECC3
	AL26	DDR1_ECC3	DDR1_ECC4
	AL25	DDR1_ECC4	DDR1_ECC5
	AR26	DDR1_ECC5	DDR1_ECC6
	AR25	DDR1_ECC6	DDR1_ECC7
	SBAB0	DDR1_BA0	DDR1_BA1
	SBAB1	DDR1_BA1	DDR1_BA2
	SBAB2	DDR1_BA2	DDR1_BA3
	CKEB0	DDR1_CKE0	DDR1_CKE1
	CKEB1	DDR1_CKE1	DDR1_CKE2
	CSB0	DDR1_CS_N0	DDR1_CS_N1
	CSB1	DDR1_CS_N1	DDR1_CS_N2
	DCLKB0	DDR1_CLK_P0	DDR1_CLK_P1
	DCLKB1	DDR1_CLK_P1	DDR1_CLK_P2
	DCLKB1	DDR1_CLK_P2	DDR1_CLK_P3
	RSVD	DDR1_RSVD	DDR1_RSVD
	SRASB	DDR1_RAS*	DDR1_RAS*
	SWEB	DDR1_WE*	DDR1_WE*
	VREF_DQA	DDR1_VREF_DQA	DDR1_VREF_DQA
	VREF_DQB	DDR1_VREF_DQB	DDR1_VREF_DQB

HASWELL(10SC1-F01150-01R_10SC1-F01150-03R)

Place in CPU bottom side



LGA1150 (CR)

CR
CPU RETENTION/X

LGA1150



COVER+BLACK NI

ILM_BP/1156/BKNI[12KRC-0F0001-61R_12KRC-0F0001-62R]

CPU

DIMM1

CHA

DIMM2

CHB

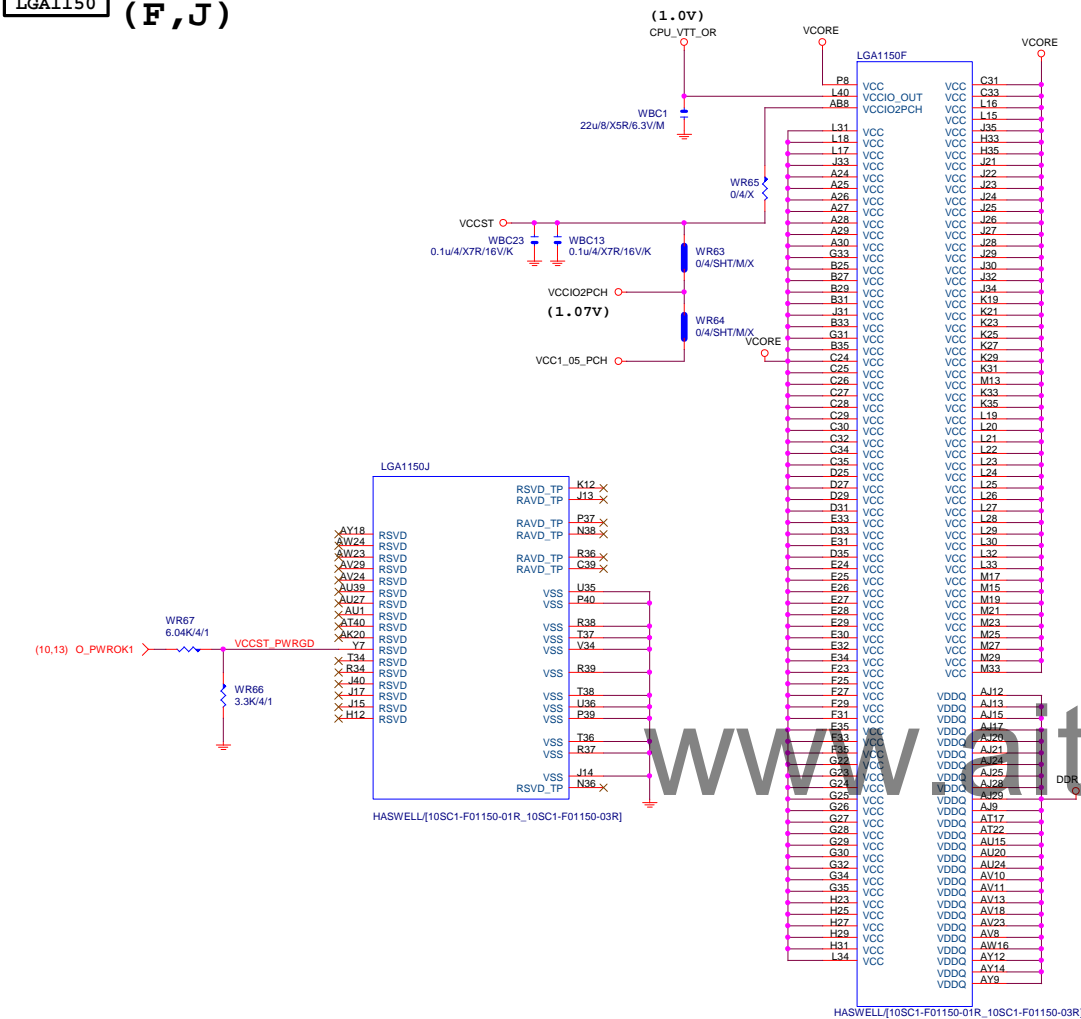
DDR BUS

(6) MODT_A[0..1]	MODT_A0_11
(6) MODT_B[0..1]	MODT_B0_11
(6) MDA[0..63]	MDA0_63
(6) MDB[0..63]	MDB0_63
(6) DQSA[0..7]	DQSA0_71
(6) -DQSA[0..7]	-DQSA0_71
(6) MAAA[0..15]	MAAA0_151
(6) MAAB[0..15]	MAAB0_151
(6) DQSB[0..7]	DQSB0_71
(6) -DQSB[0..7]	-DQSB0_71

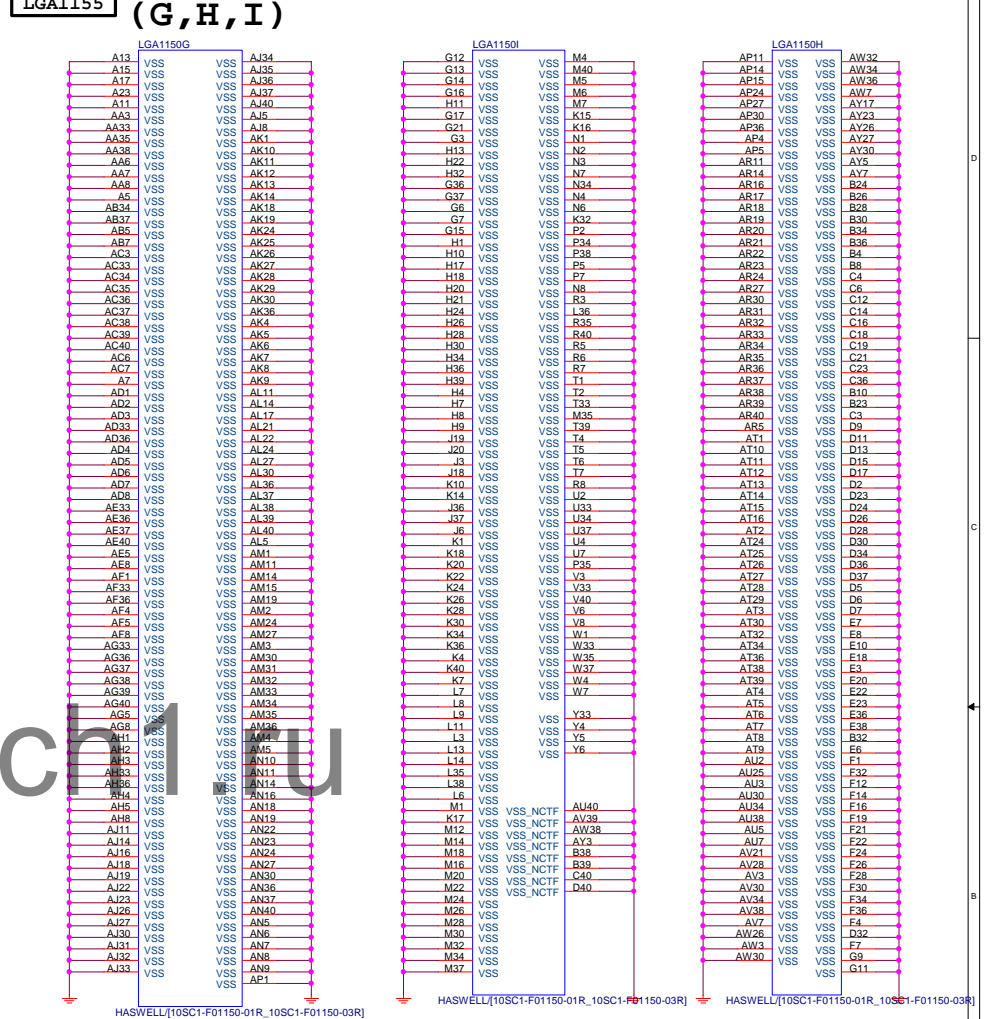
Gigabyte Technology

Title			
CPU LGA1156-B			
Size	Document Number	Rev	1.11
Custom	GA-Q87N		
Date:	Tuesday, November 19, 2013	Sheet	4 of 26

LGA1150 (F,J)

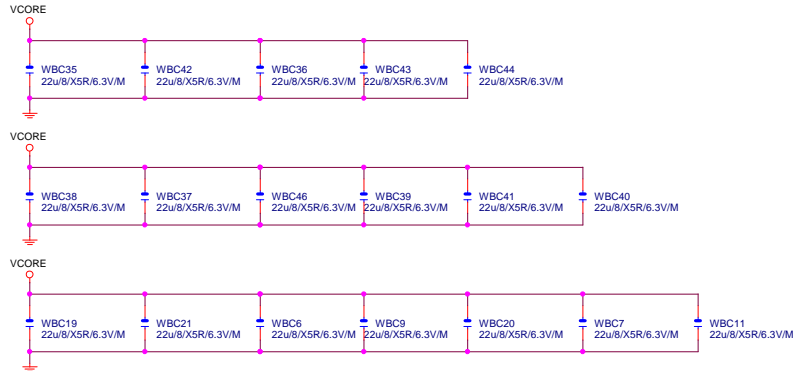


LGA1155 (G,H,I)



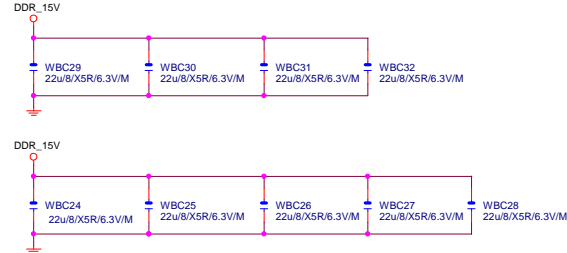
VCore CAP

(X18)



DDR CAP

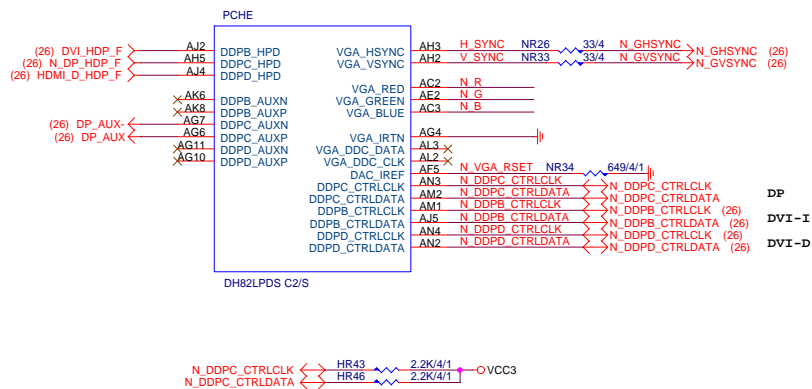
(x9)



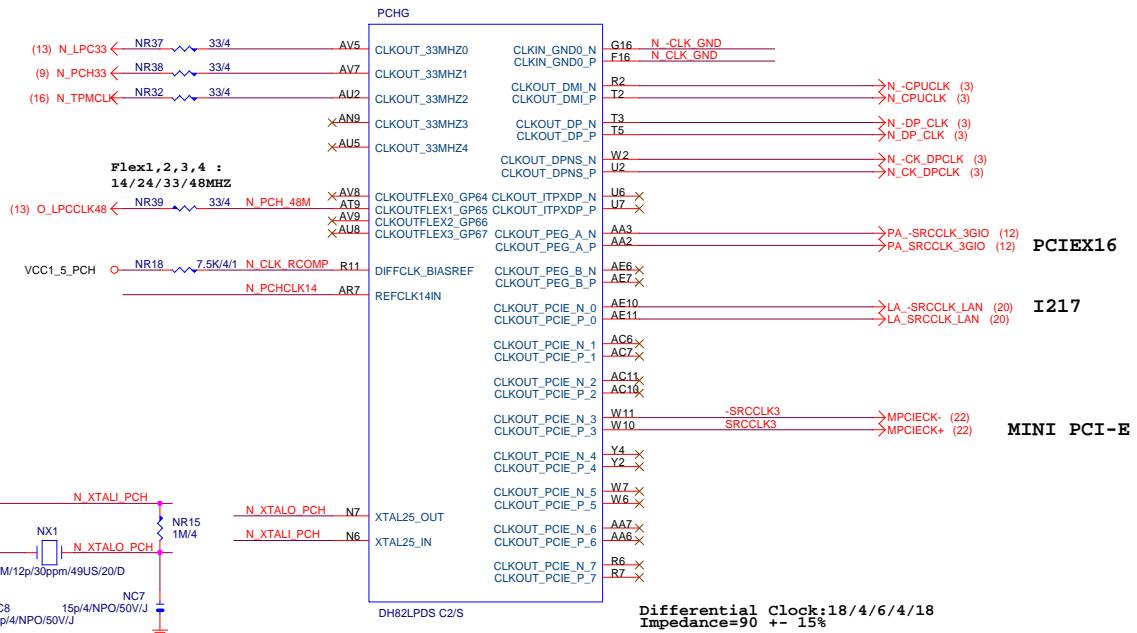
Gigabyte Technology

Title			
CPU LGA1150-C			
Size	Document Number	Rev	
Custom	GA-Q87N	1.1	
Date:	Tuesday, November 19, 2013	Sheet	5 of 26

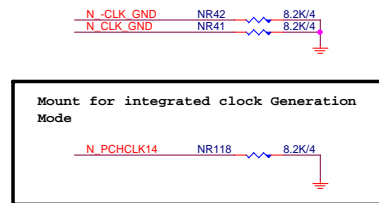
PCH (E)



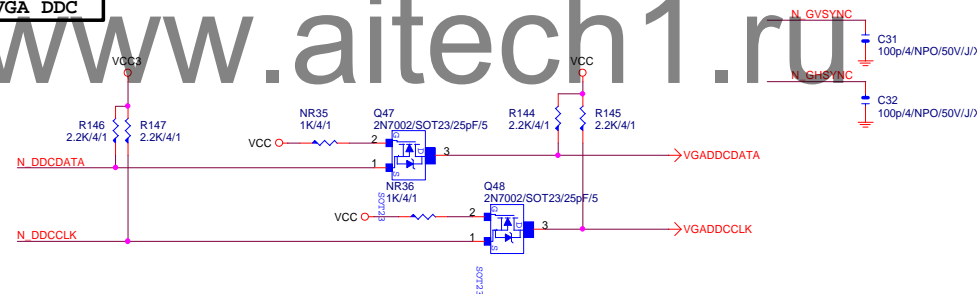
PCH (G)



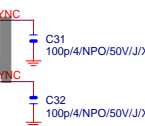
PCH CLK PD



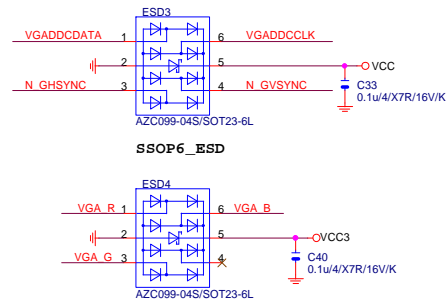
VGA DDC



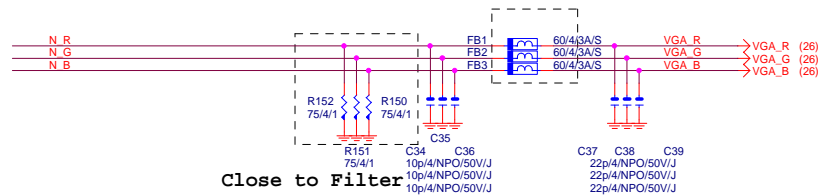
VGA CONNECTOR



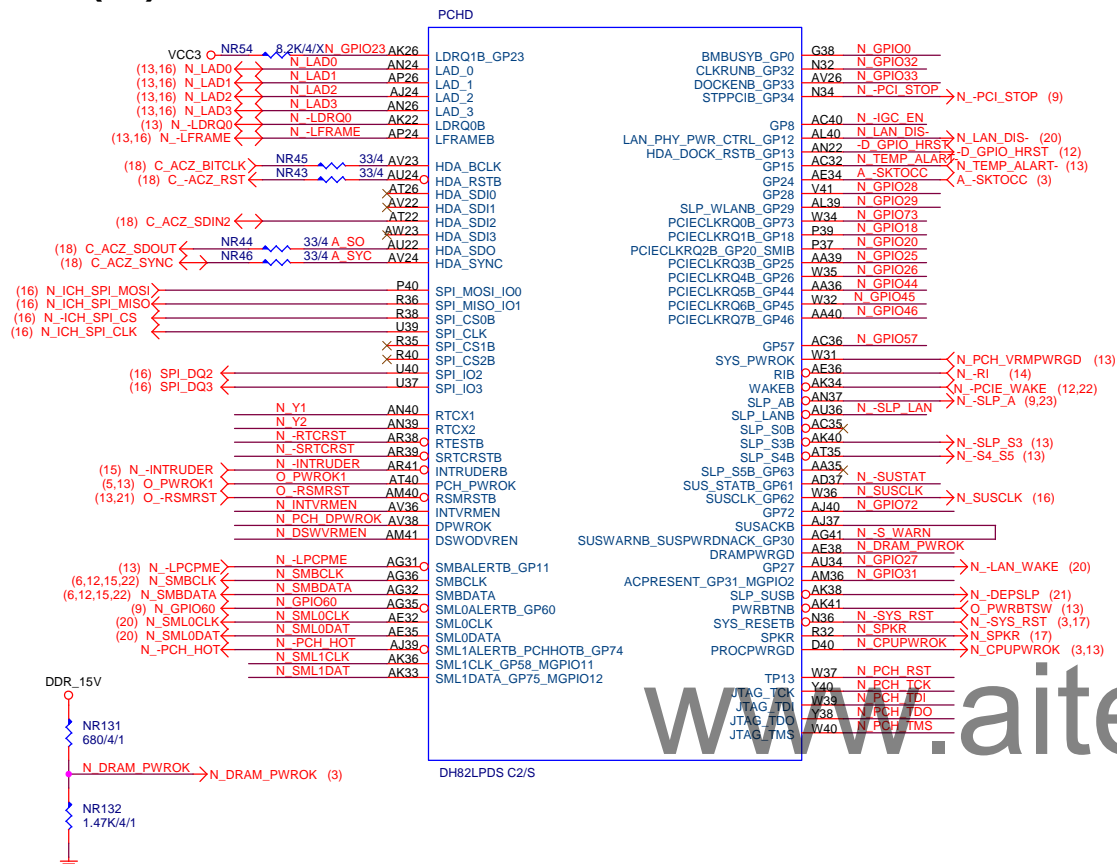
VGA ESD



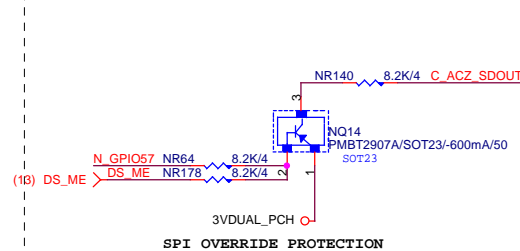
VGA DDC



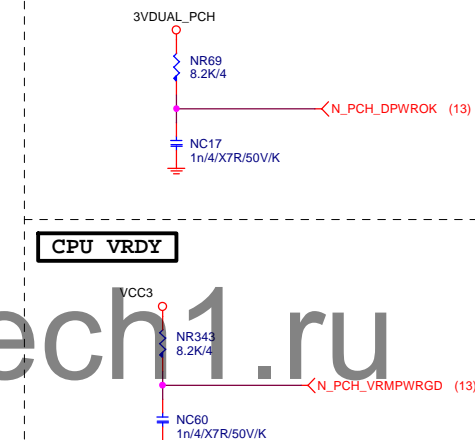
(D)



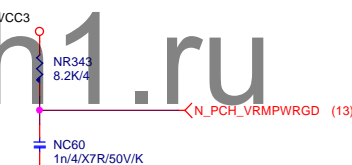
ACZ SDOUT



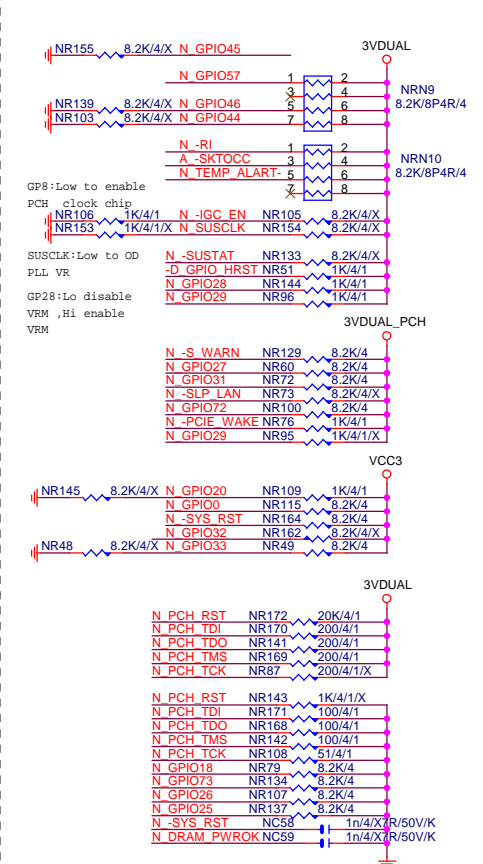
PCH DPWROK



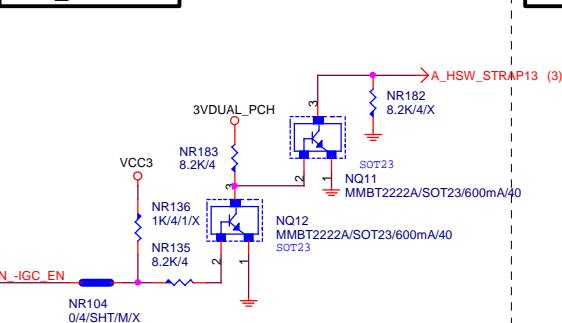
CPU VRDY



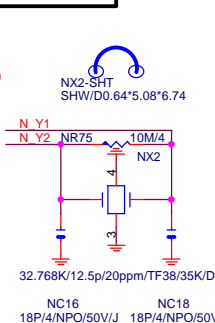
PCH	PU/PD
-----	-------



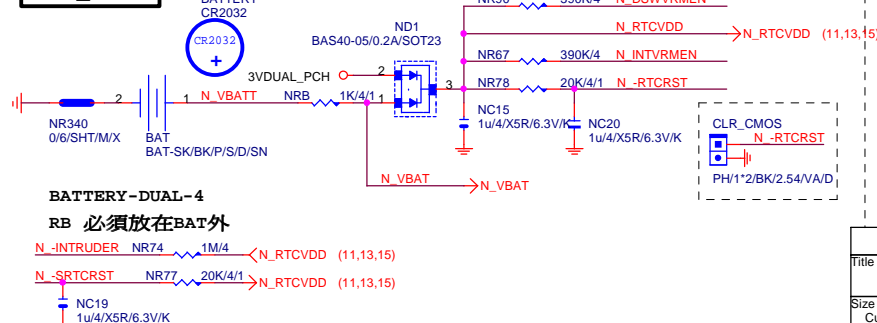
HSW_STRAP13



32.768KHZ



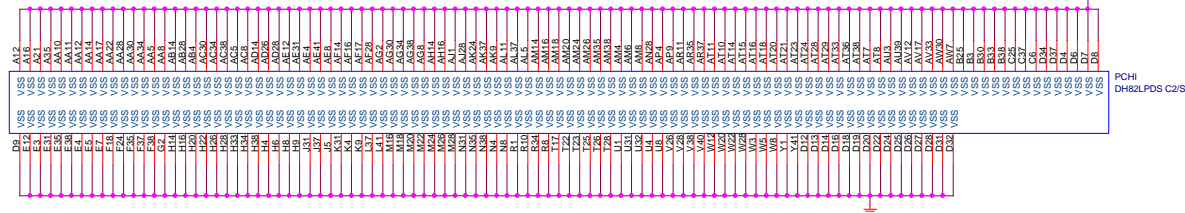
CLR_CMOS



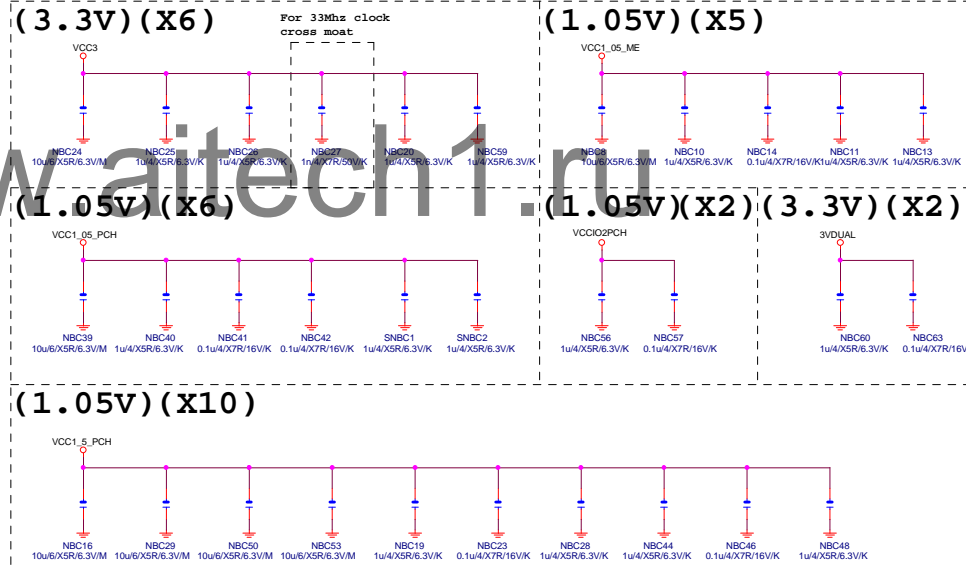
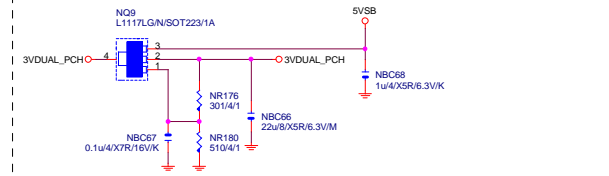
Gigabyte Technology

Title				PCH GPIO , CTRL , AUDIO			
Size	Document Number	GA-Q87N				Rev	1.1
Custom							
Date:	Tuesday, November 19, 2013	Sheet	10	of	26		

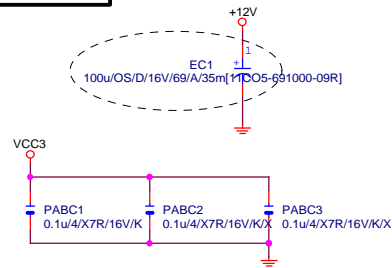
PCH (I)



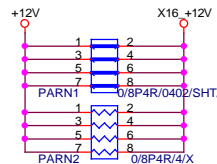
3VDUAL_PCH



PCIEX16 CAP



PCIEX16 PROTECT SHT

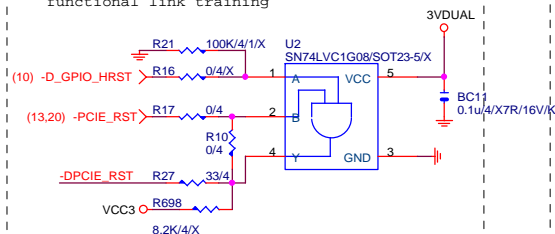


PCIEX16 AC CAP

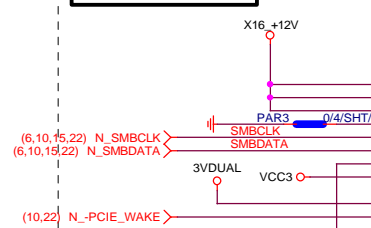
PA EXP TXP0	PAC5	0.22u/4/X5R/6.3V/K	PA EXP TXP0 C
PA EXP TXN0	PAC4	0.22u/4/X5R/6.3V/K	PA EXP TXN0 C
PA EXP TXP1	PAC6	0.22u/4/X5R/6.3V/K	PA EXP TXP1 C
PA EXP TXN1	PAC7	0.22u/4/X5R/6.3V/K	PA EXP TXN1 C
PA EXP TXP2	PAC8	0.22u/4/X5R/6.3V/K	PA EXP TXP2 C
PA EXP TXN2	PAC9	0.22u/4/X5R/6.3V/K	PA EXP TXN2 C
PA EXP TXP3	PAC10	0.22u/4/X5R/6.3V/K	PA EXP TXP3 C
PA EXP TXN3	PAC11	0.22u/4/X5R/6.3V/K	PA EXP TXN3 C
PA EXP TXP4	PAC12	0.22u/4/X5R/6.3V/K	PA EXP TXP4 C
PA EXP TXN4	PAC13	0.22u/4/X5R/6.3V/K	PA EXP TXN4 C
PA EXP TXP5	PAC14	0.22u/4/X5R/6.3V/K	PA EXP TXP5 C
PA EXP TXN5	PAC15	0.22u/4/X5R/6.3V/K	PA EXP TXN5 C
PA EXP TXP6	PAC16	0.22u/4/X5R/6.3V/K	PA EXP TXP6 C
PA EXP TXN6	PAC17	0.22u/4/X5R/6.3V/K	PA EXP TXN6 C
PA EXP TXP7	PAC19	0.22u/4/X5R/6.3V/K	PA EXP TXP7 C
PA EXP TXN7	PAC18	0.22u/4/X5R/6.3V/K	PA EXP TXN7 C
PA EXP TXP8	PAC20	0.22u/4/X5R/6.3V/K	PA EXP TXP8 C
PA EXP TXN8	PAC21	0.22u/4/X5R/6.3V/K	PA EXP TXN8 C
PA EXP TXP9	PAC22	0.22u/4/X5R/6.3V/K	PA EXP TXP9 C
PA EXP TXN9	PAC23	0.22u/4/X5R/6.3V/K	PA EXP TXN9 C
PA EXP TXP10	PAC24	0.22u/4/X5R/6.3V/K	PA EXP TXP10 C
PA EXP TXN10	PAC25	0.22u/4/X5R/6.3V/K	PA EXP TXN10 C
PA EXP TXP11	PAC26	0.22u/4/X5R/6.3V/K	PA EXP TXP11 C
PA EXP TXN11	PAC27	0.22u/4/X5R/6.3V/K	PA EXP TXN11 C
PA EXP TXP12	PAC28	0.22u/4/X5R/6.3V/K	PA EXP TXP12 C
PA EXP TXN12	PAC29	0.22u/4/X5R/6.3V/K	PA EXP TXN12 C
PA EXP TXP13	PAC30	0.22u/4/X5R/6.3V/K	PA EXP TXP13 C
PA EXP TXN13	PAC31	0.22u/4/X5R/6.3V/K	PA EXP TXN13 C
PA EXP TXP14	PAC32	0.22u/4/X5R/6.3V/K	PA EXP TXP14 C
PA EXP TXN14	PAC33	0.22u/4/X5R/6.3V/K	PA EXP TXN14 C
PA EXP TXP15	PAC34	0.22u/4/X5R/6.3V/K	PA EXP TXP15 C
PA EXP TXN15	PAC35	0.22u/4/X5R/6.3V/K	PA EXP TXN15 C

PA EXP RXP0.15] >>> PA_EXP_RXP[0.15] (3)
PA EXP RXN0.15] >>> PA_EXP_RXN[0.15] (3)
PA EXP TXP0.15] >>> PA_EXP_TXP[0.15] (3)
PA EXP TXN0.15] >>> PA_EXP_TXN[0.15] (3)

The auxiliary reset circuit is only required for PCIe Gen3 margining and functional link training



PCIEX16 SLOT



PA EXP TXP0 C
PA EXP TXN0 C
PA EXP TXP1 C
PA EXP TXN1 C
PA EXP TXP2 C
PA EXP TXN2 C
PA EXP TXP3 C
PA EXP TXN3 C
PA EXP TXP4 C
PA EXP TXN4 C
PA EXP TXP5 C
PA EXP TXN5 C
PA EXP TXP6 C
PA EXP TXN6 C
PA EXP TXP7 C
PA EXP TXN7 C
PA EXP TXP8 C
PA EXP TXN8 C
PA EXP TXP9 C
PA EXP TXN9 C
PA EXP TXP10 C
PA EXP TXN10 C
PA EXP TXP11 C
PA EXP TXN11 C
PA EXP TXP12 C
PA EXP TXN12 C
PA EXP TXP13 C
PA EXP TXN13 C
PA EXP TXP14 C
PA EXP TXN14 C
PA EXP TXP15 C
PA EXP TXN15 C

PCIESLOT-164DN-P

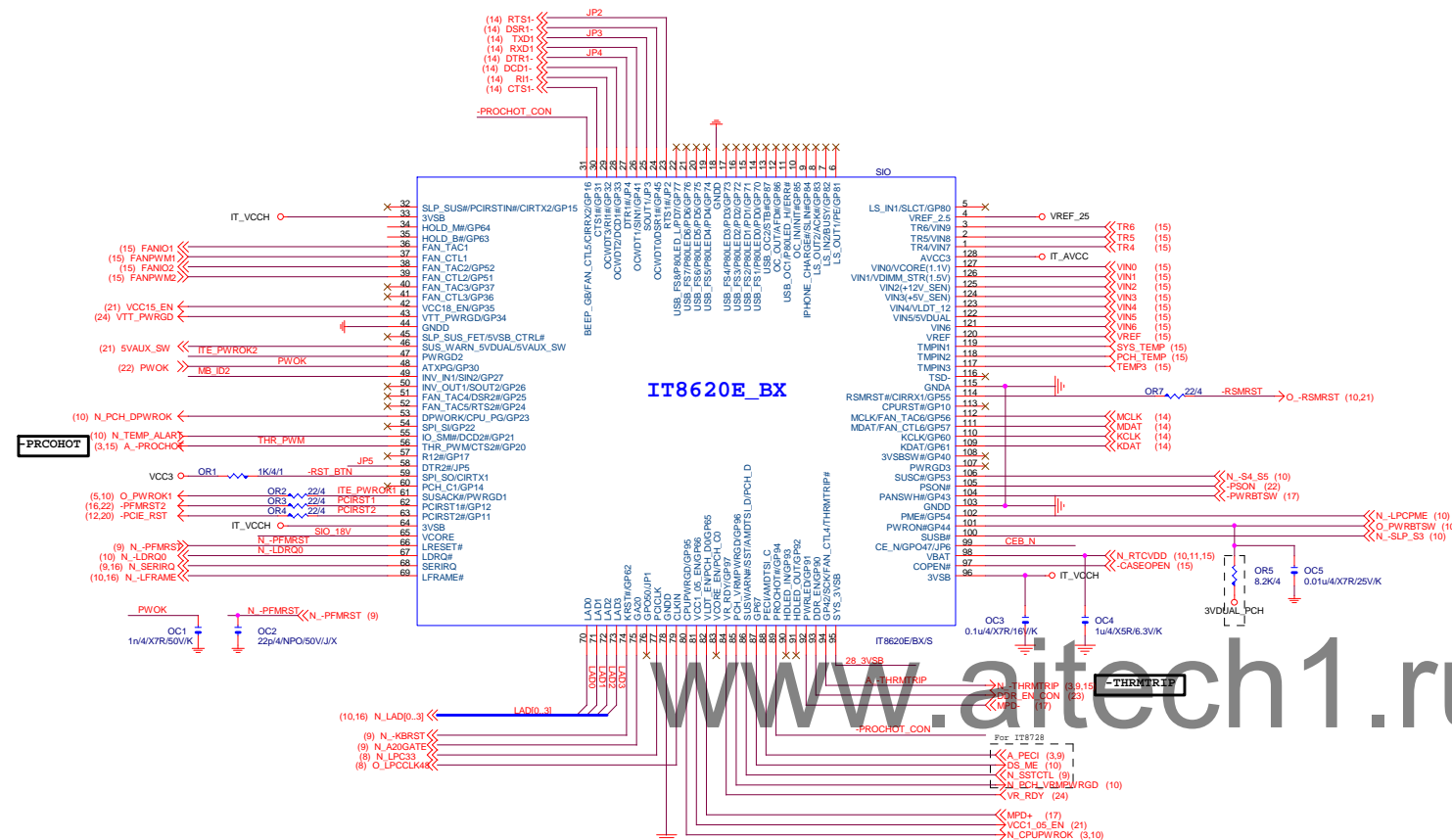


PCI-E/16X-164P/BK/LONG DOUBLE
BLACK CONNECTOR

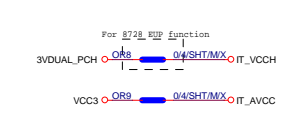
Gigabyte Technology

Title		
PCI EXPRESS * 16		
Size	Document Number	Rev
Custom	GA-Q87N	1.11
Date:	Tuesday, November 19, 2013	Sheet 12 of 26

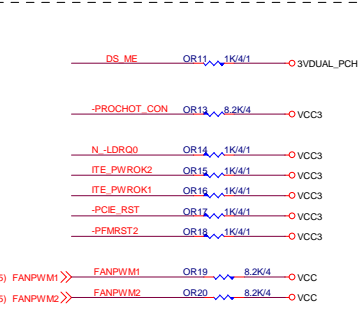
SIO IT8620



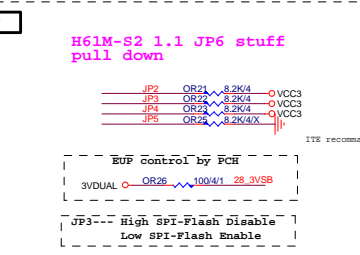
PWR SHT



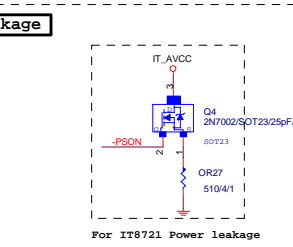
SIO PU



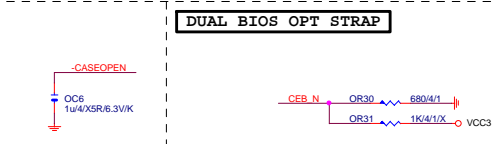
SIO STRAP



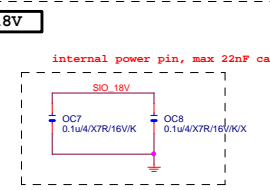
Power leakage



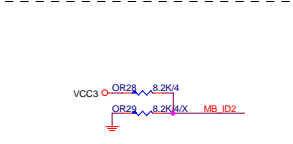
DUAL BIOS OPT STRAP



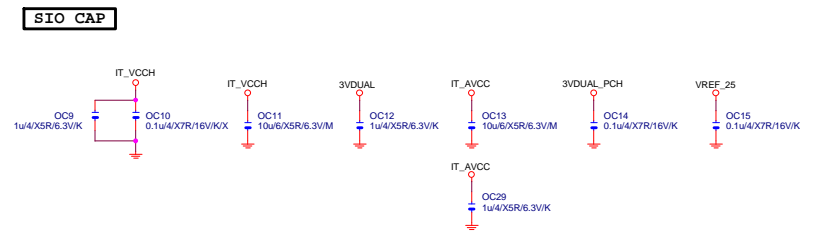
SIO_18V

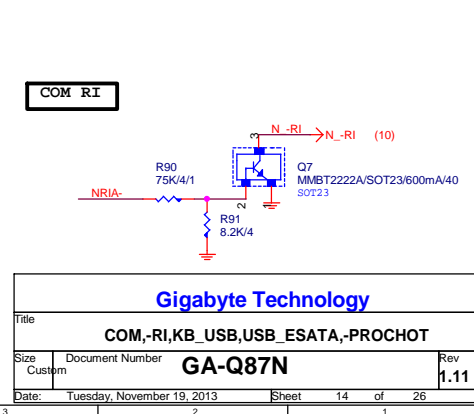
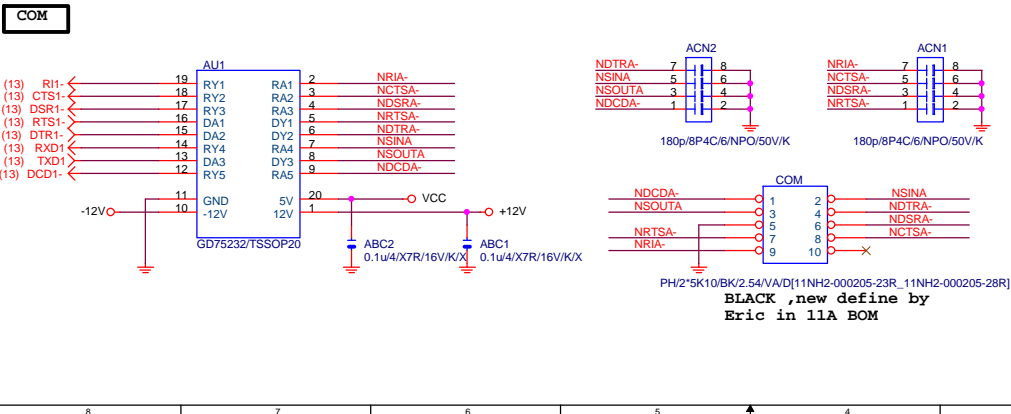
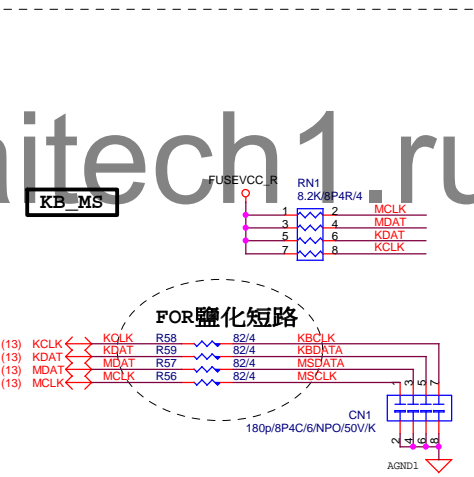
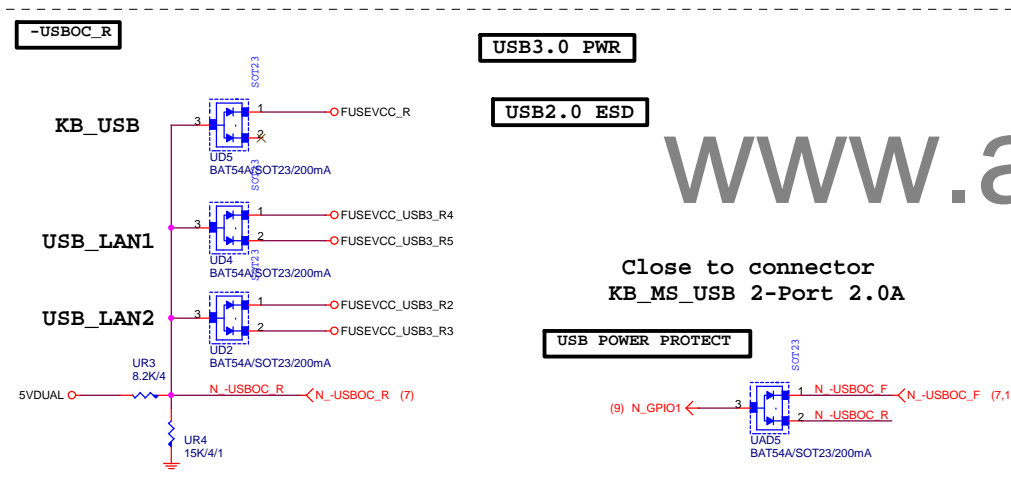
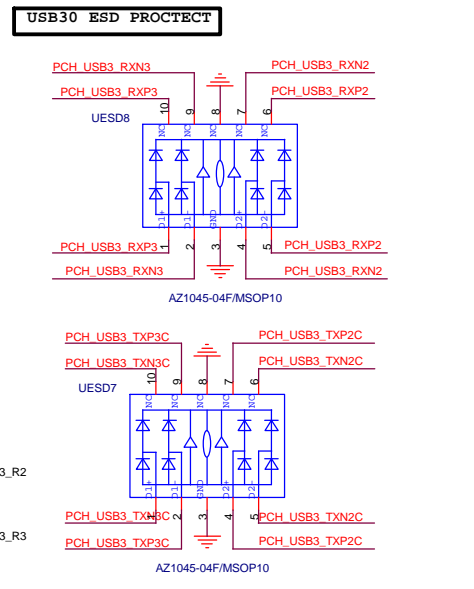
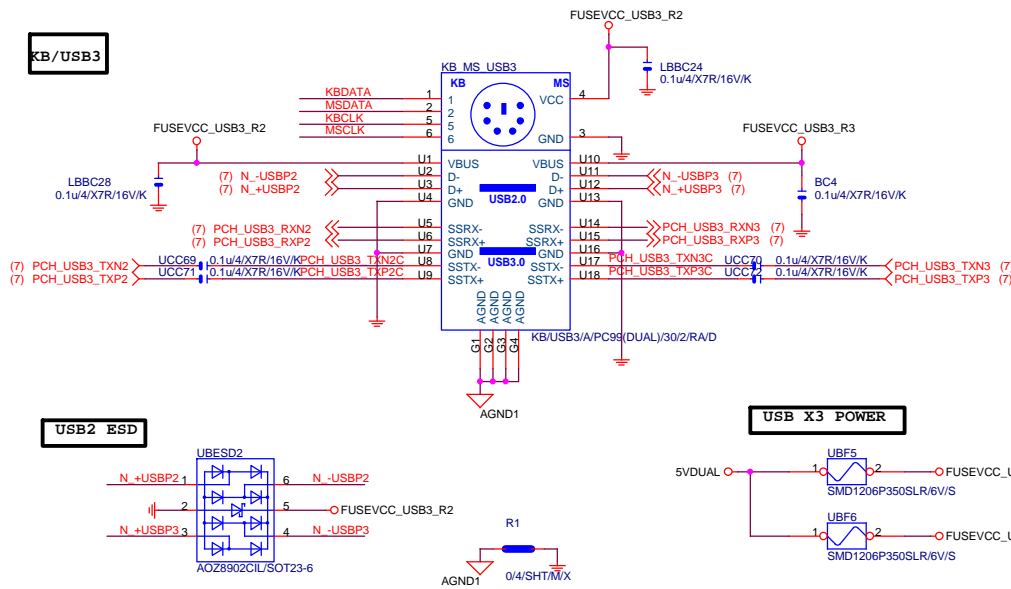


MB ID

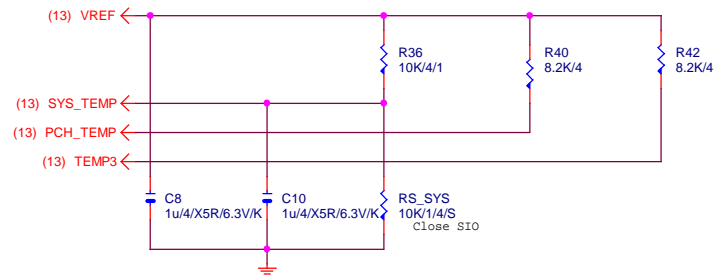


SIO CAP

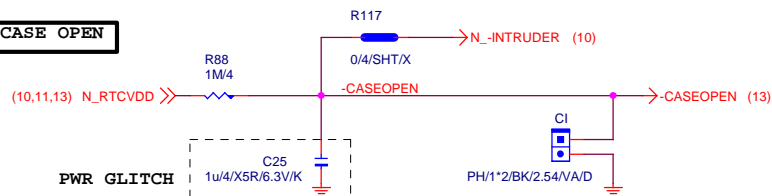




TEMP H/W MONITOR

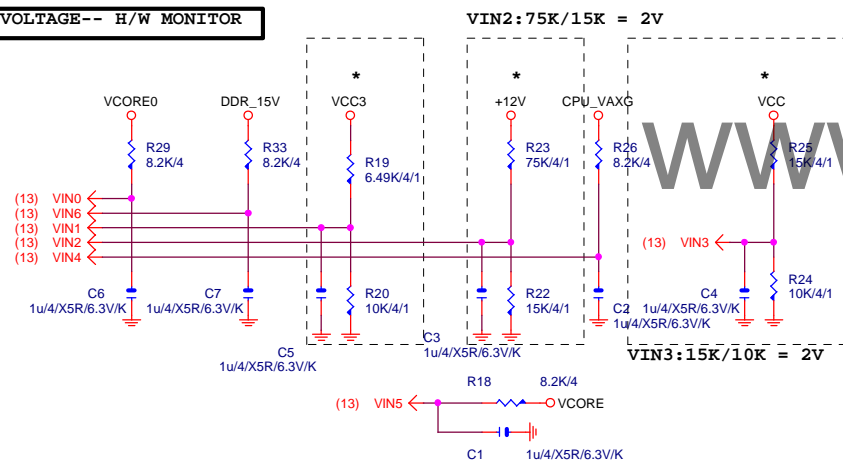


CASE OPEN

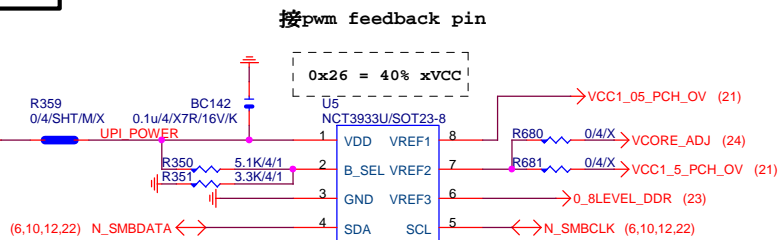


Case Open Circuits

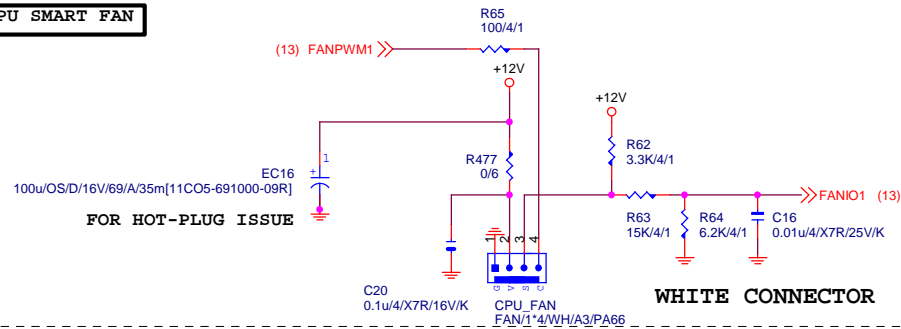
VOLTAGE-- H/W MONITOR



OV NCT3933

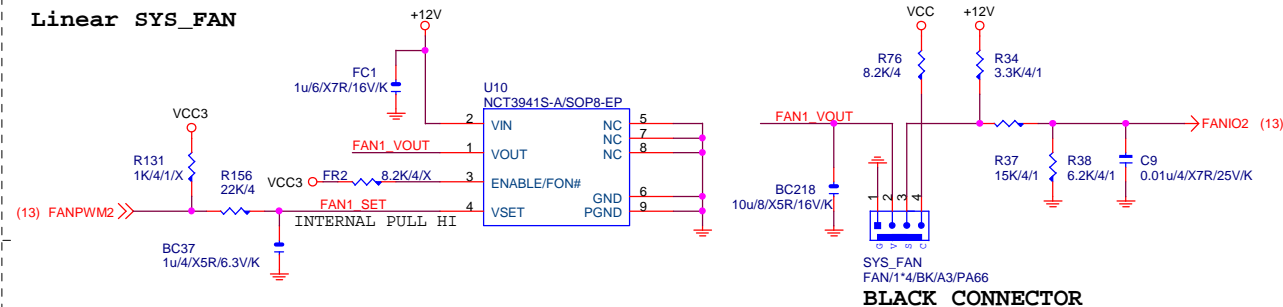


CPU SMART FAN

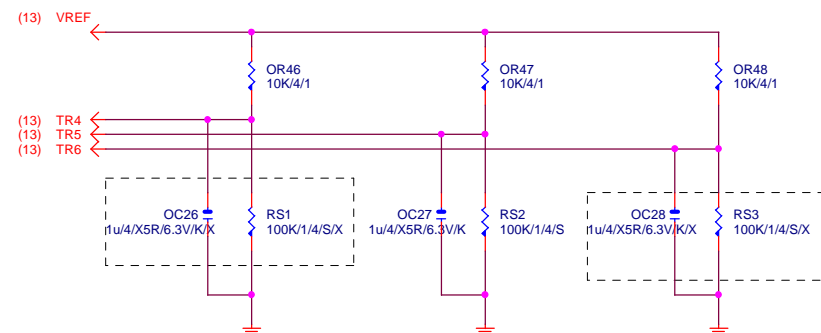
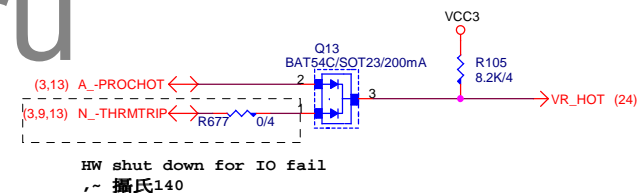


SYS SMART FAN

Linear SYS_FAN



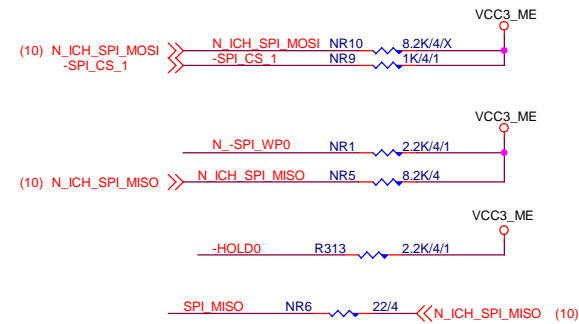
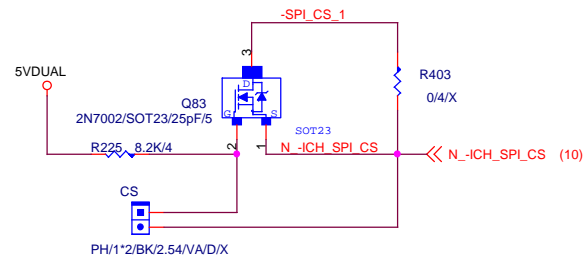
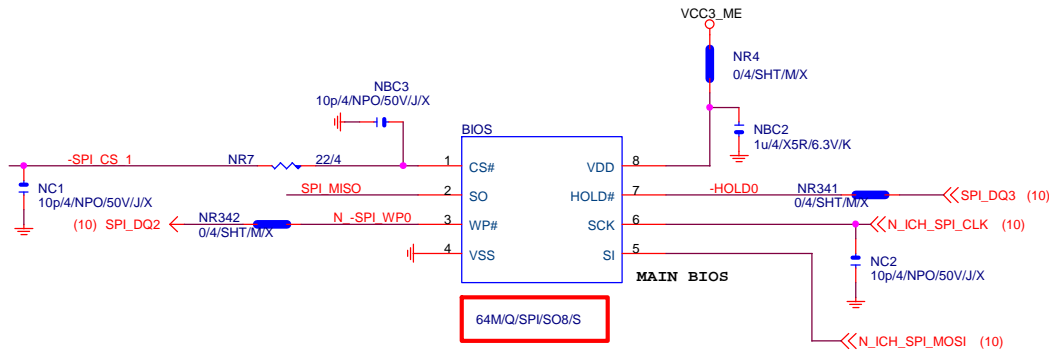
-PROHOT / -THERMTRIP



```
RS1、RS2、RS3 CLOSE CPU
VR MOSFET
Select the Hottest point
to setup
```

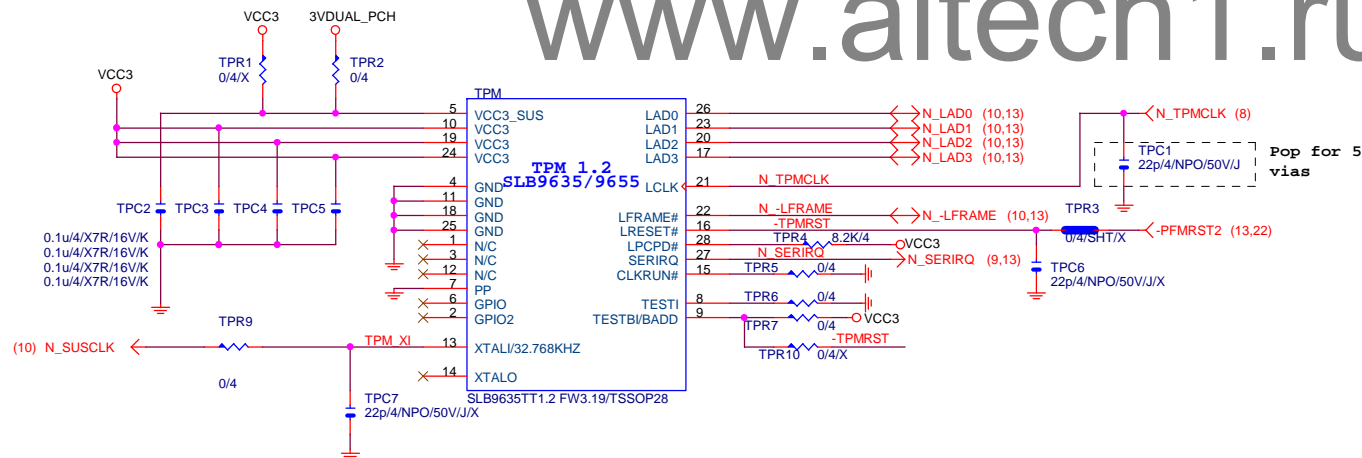
Gigabyte Technology

Title				HWM,FAN CTRL,OV			
Size	Document Number						Rev
Custom	GA-Q87N						1.11
Date:	Tuesday, November 19, 2013				Sheet	15	of 26



www.aitech1.ru

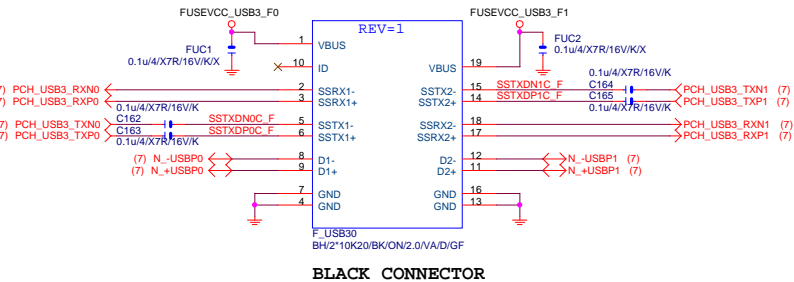
TPM



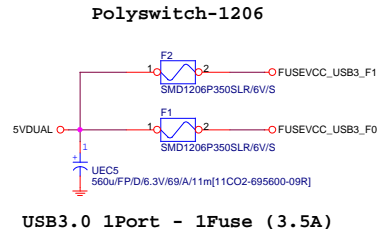
	SLB9635	SLB9655
TPR2, TPR4, TPR5, TPR6, TPR7, TPR9	MOUNT	N/A
TPR1, TPR10	N/A	MOUNT

Gigabyte Technology		
Title BIOS,TPM		
Size B	Document Number GA-Q87N	Rev 1.11
Date: Tuesday, November 19, 2013	Sheet 16	of 26

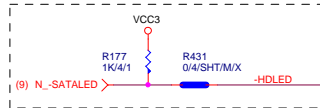
F_USB30



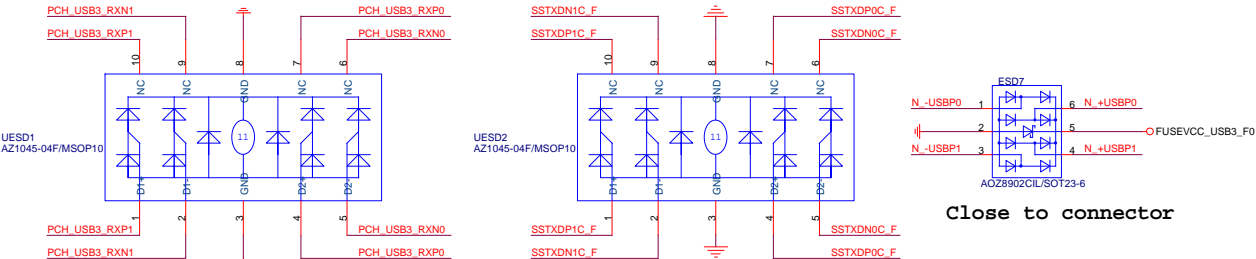
F_USB30 PWR



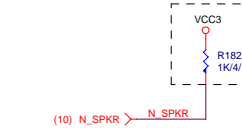
SATA LED



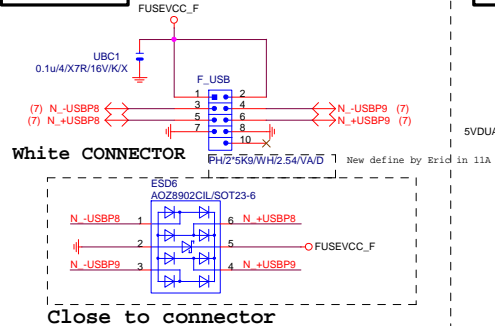
F_USB30 ESD PROTECT



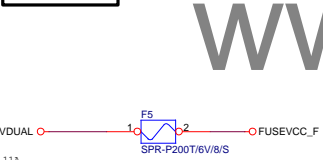
SPKR



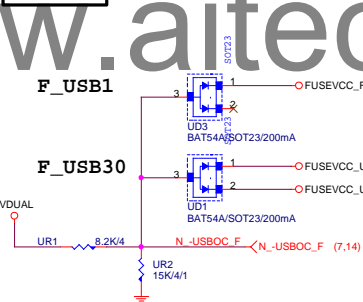
FRONT USB1



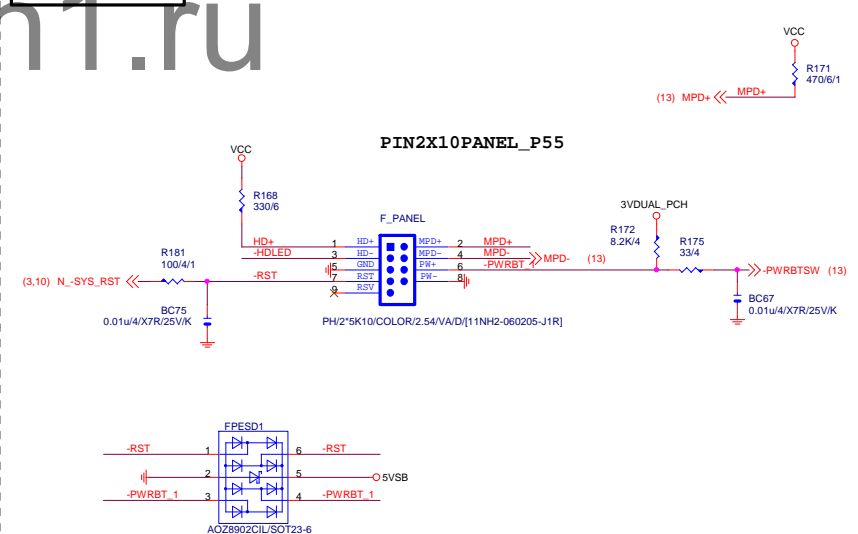
FUSEVCC_F



-USBOC_F

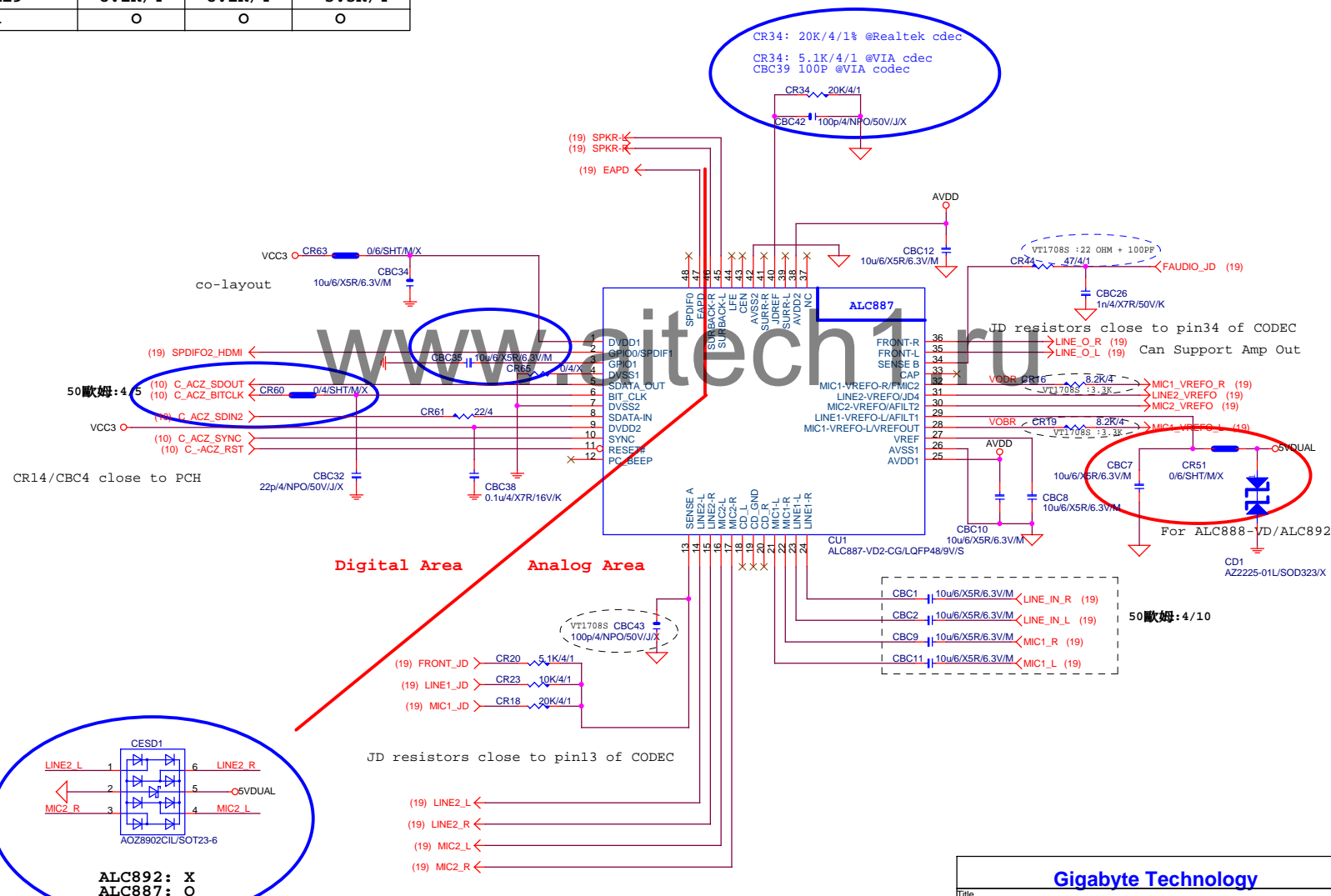


INTEL FRONT PANEL

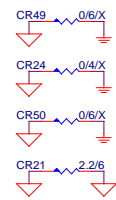


Gigabyte Technology			
FP,F_USB,USB PWR,SPKR,SATA LED			
GA-Q87N			
Size	Custom	Rev	1.11
Date:	Tuesday, November 19, 2013	Sheet	17 of 26

	ALC892	ALC887-VD2	VT1708S-CE
CR44/CBC26	47ohm+1nF	47ohm+1nF	22ohm+100P
CBC42/CBC43	X	X	100P/4
CR6/CR7/CR58/CR54/ CR67/CR68/CR69/CR70/ CR2/CR4	22K/4	22K/4	10K/4/1
CR5/CR8/CR1/CR14/ CR17/CR22/CR73/CR74/ CR13/CR11/CR57/CR53/ CR75/CR76/CR27/CR29	62 ohm	62 ohm	75 ohm
CR16/CR19	8.2K/4	8.2K/4	3.3K/4
CESD1	O	O	O

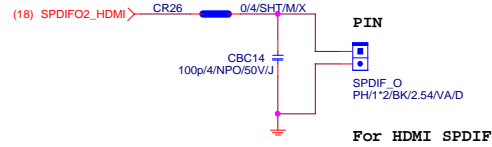


CODEC POWER/EMI PAD

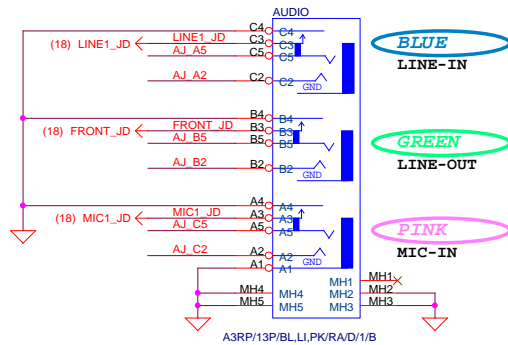


ADD CD2 For ESD PROTECT DIODE

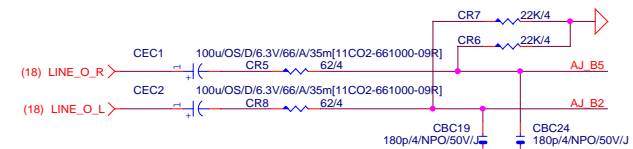
SPDIF_OUT



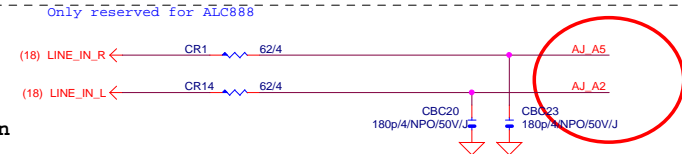
AZALIA JACK



LINE-OUT

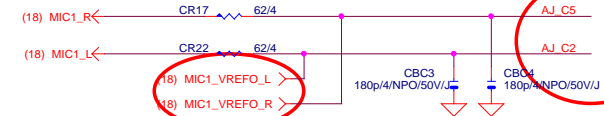


LINE-IN

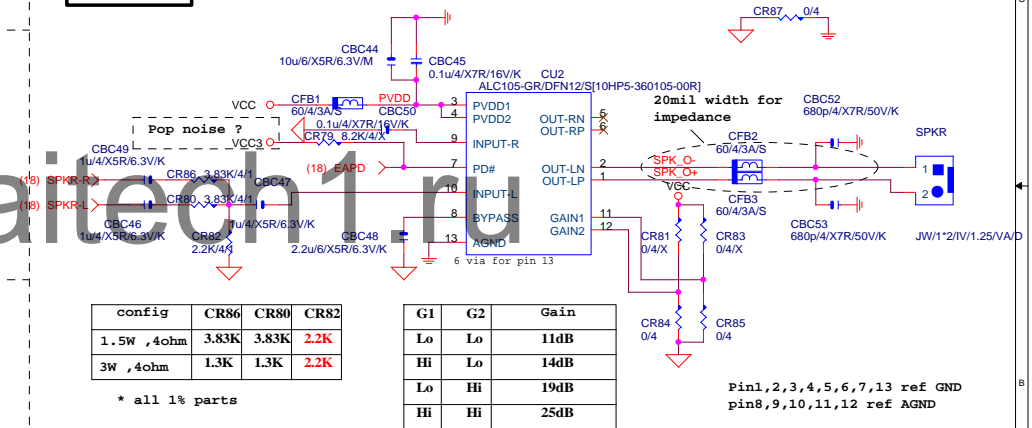
Verify MIC function
in LINE-in

For 889A/888

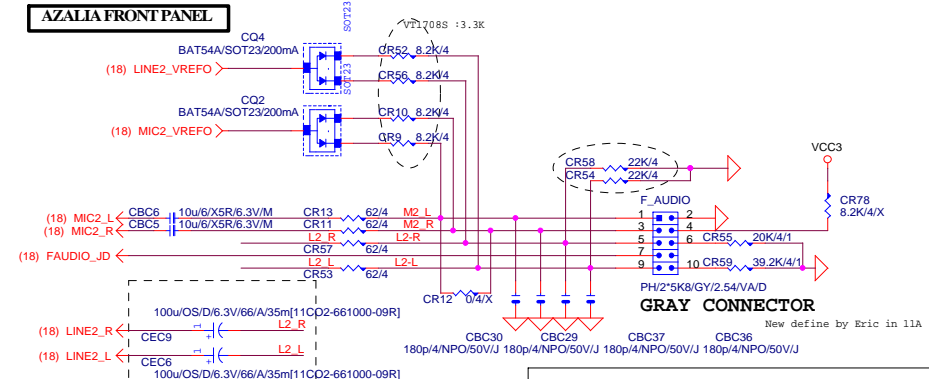
MIC-IN



MONO SPKR

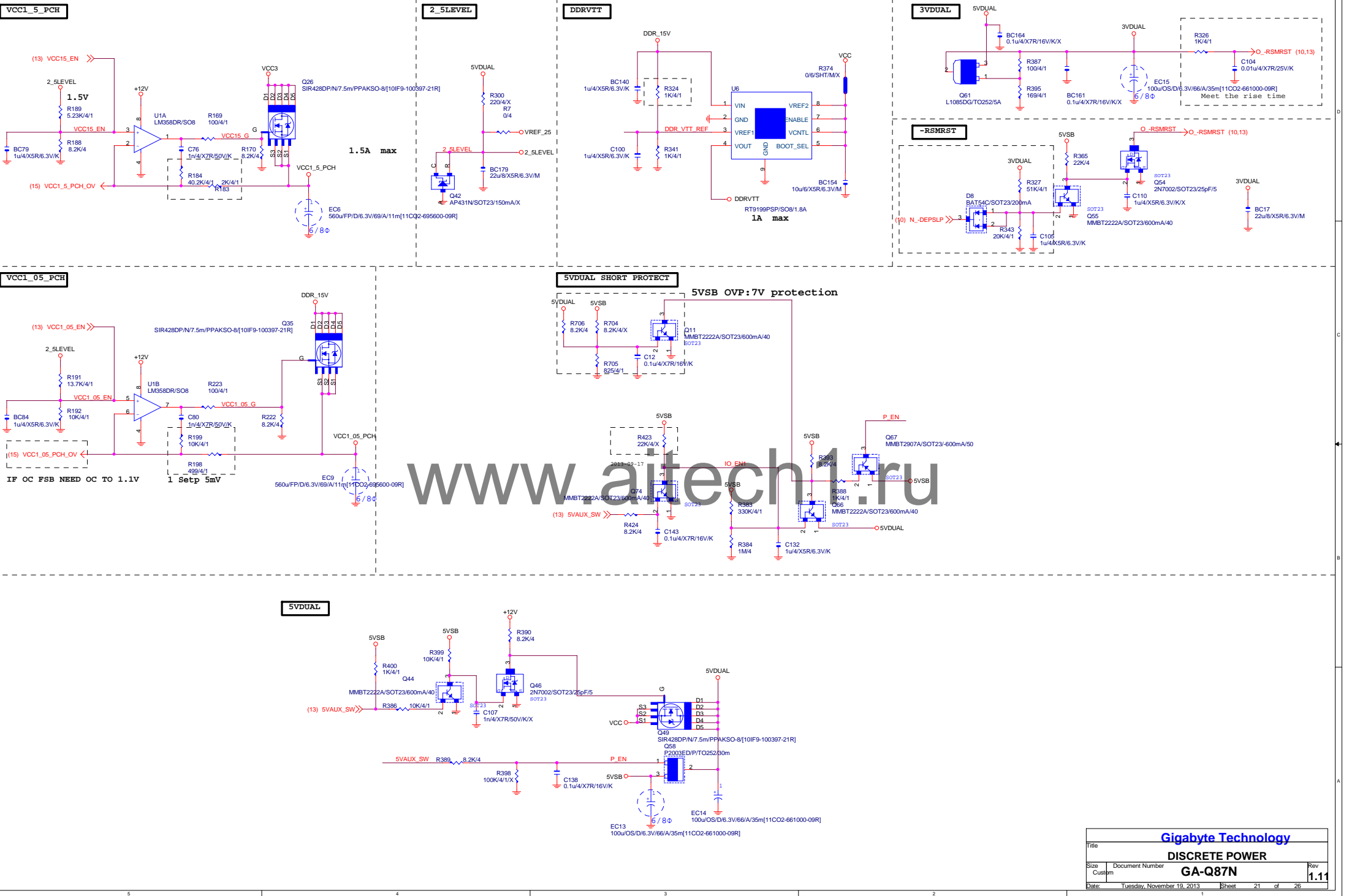


AZALIA FRONT PANEL

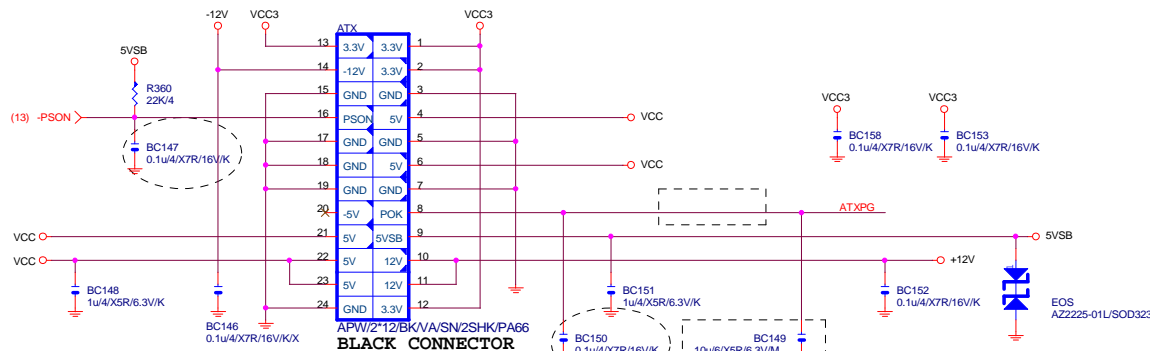


Gigabyte Technology

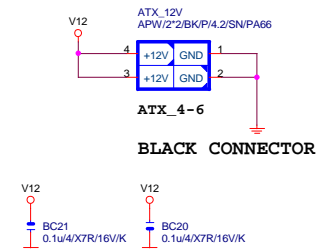
Title			
AUDIO JACK			
Size Custom	Document Number		Rev
	GA-Q87N		1.11
Date:	Tuesday, November 19, 2013	Sheet	19 of 26



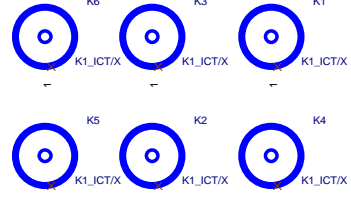
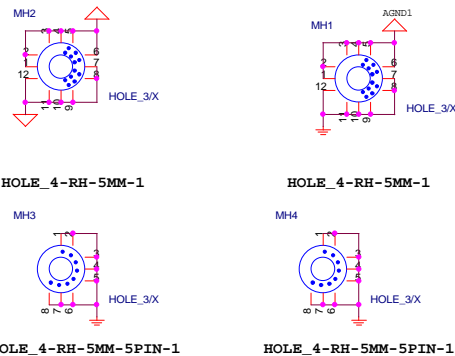
ATXX24 POWER CONNECTOR



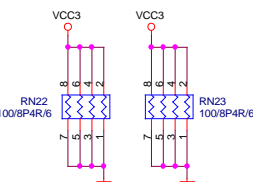
ATXX4 POWER CONNECTOR



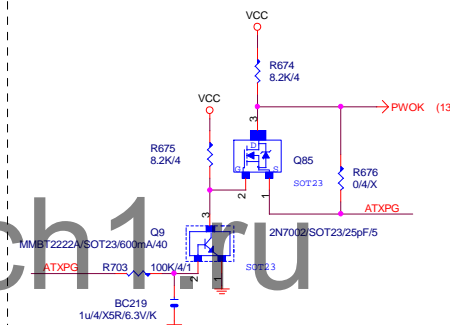
MB LOCATION



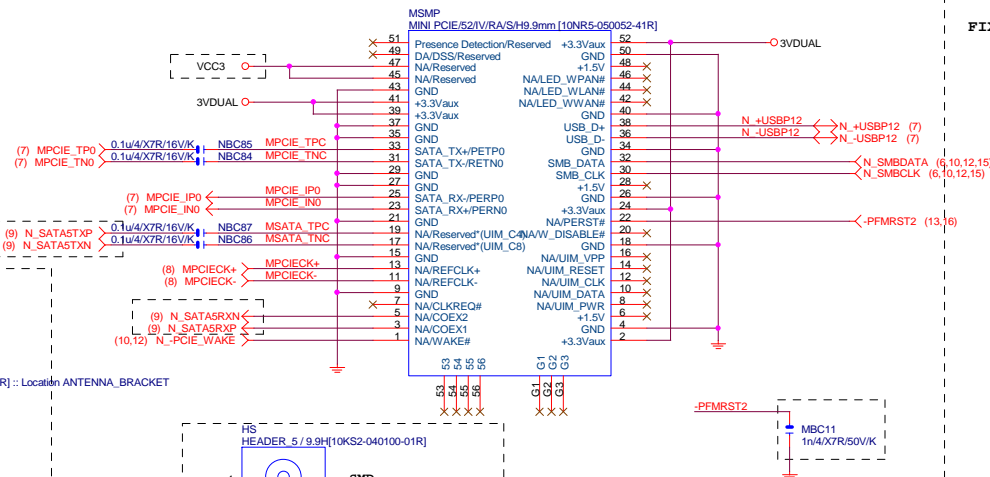
FIX PWR MINMUN LOAD



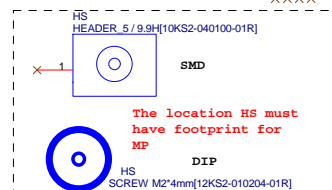
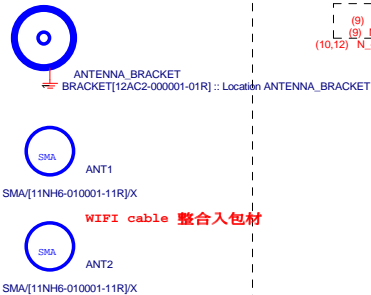
PWOK PATCH



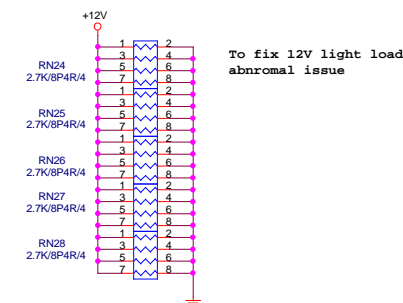
mini PCIE mSATA



WIFI ANTENNA



FIX PWR MINMUN LOAD



To fix 12V light load abnormal issue

Gigabyte Technology

ATX CONNECTOR

GA-Q87N

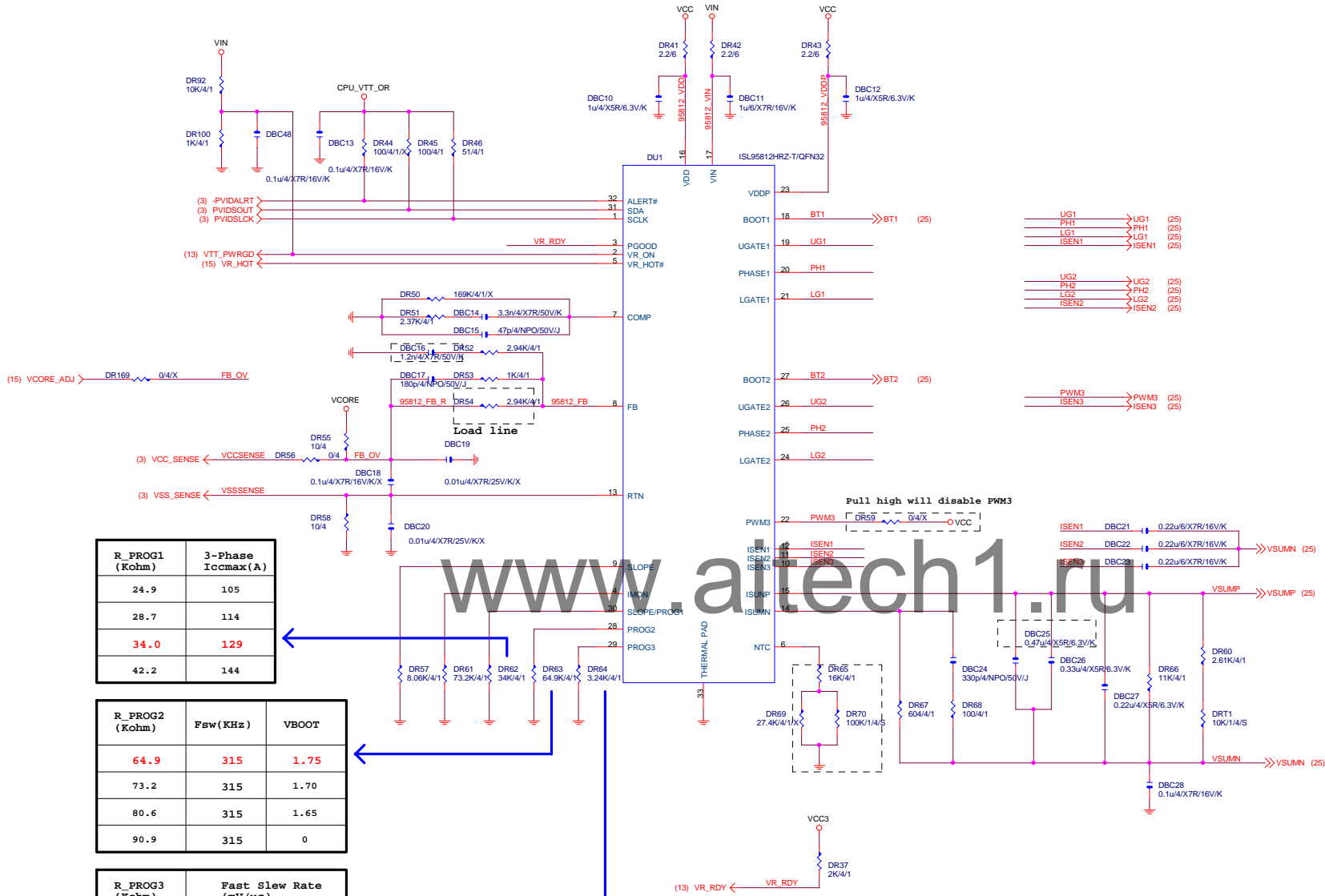
Title	Document Number	Rev
Size	Custom	1.11
Date: Tuesday, November 19, 2013	Sheet 22 of 26	

R_PROG1 (Kohm)	3-Phase Iccmax(A)
24.9	105
28.7	114
34.0	129
42.2	144

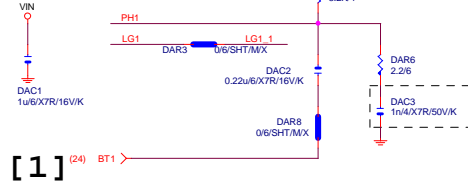
R_PROG2 (Kohm)	Fsw(KHz)	VBOOT
64.9	315	1.75
73.2	315	1.70
80.6	315	1.65
90.9	315	0

R_PROG3 (Kohm)	Fast Slew Rate (mV/us)
3.24	12
5.76	24
9.31	40
13.3	45

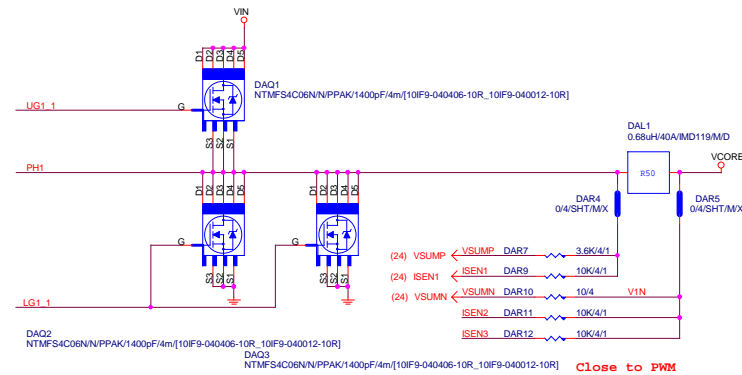
www.altech1.ru



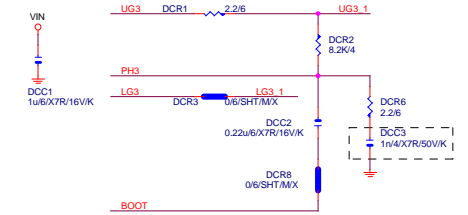
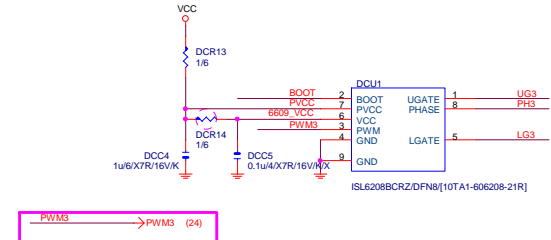
PHASE 1



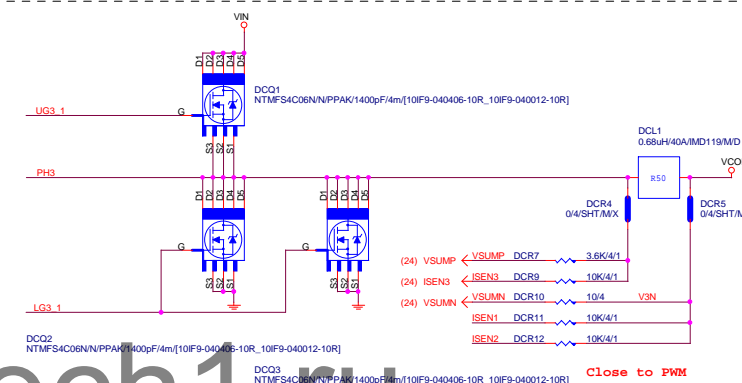
[1]



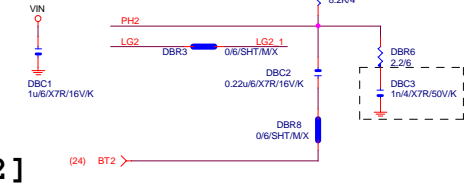
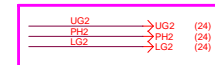
PHASE 3



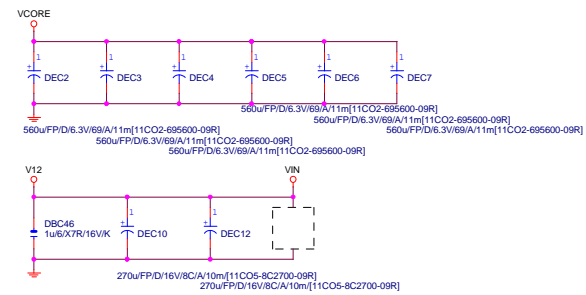
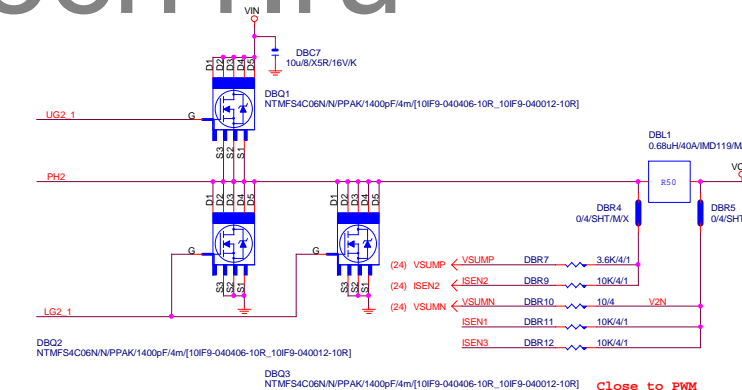
[3]



PHASE 2

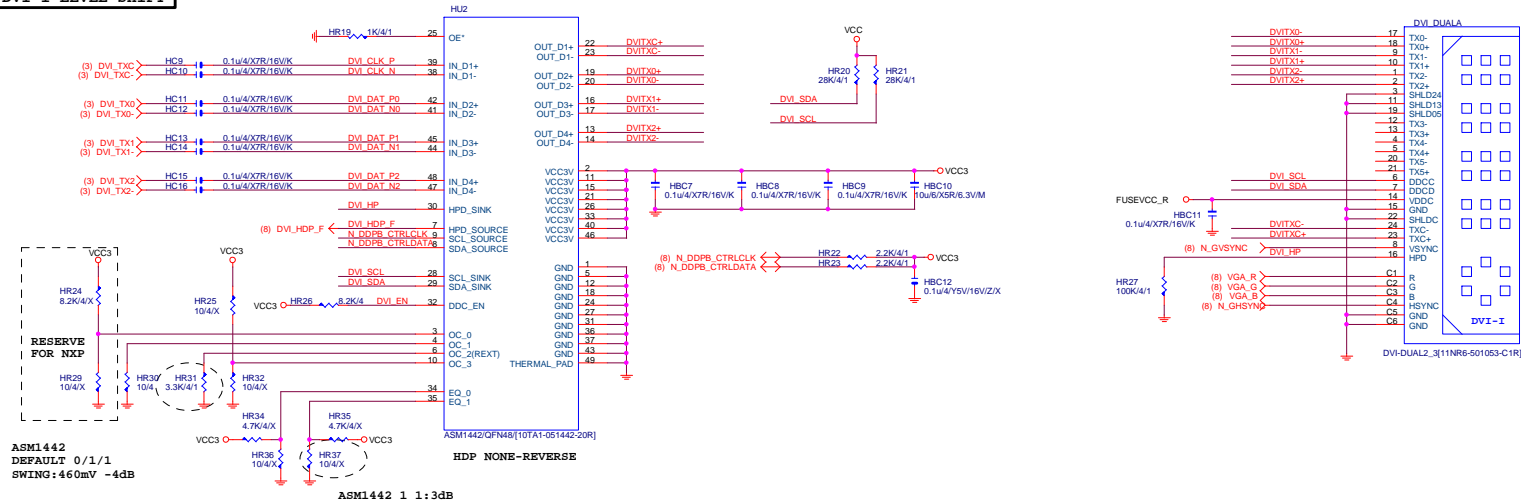


[2]

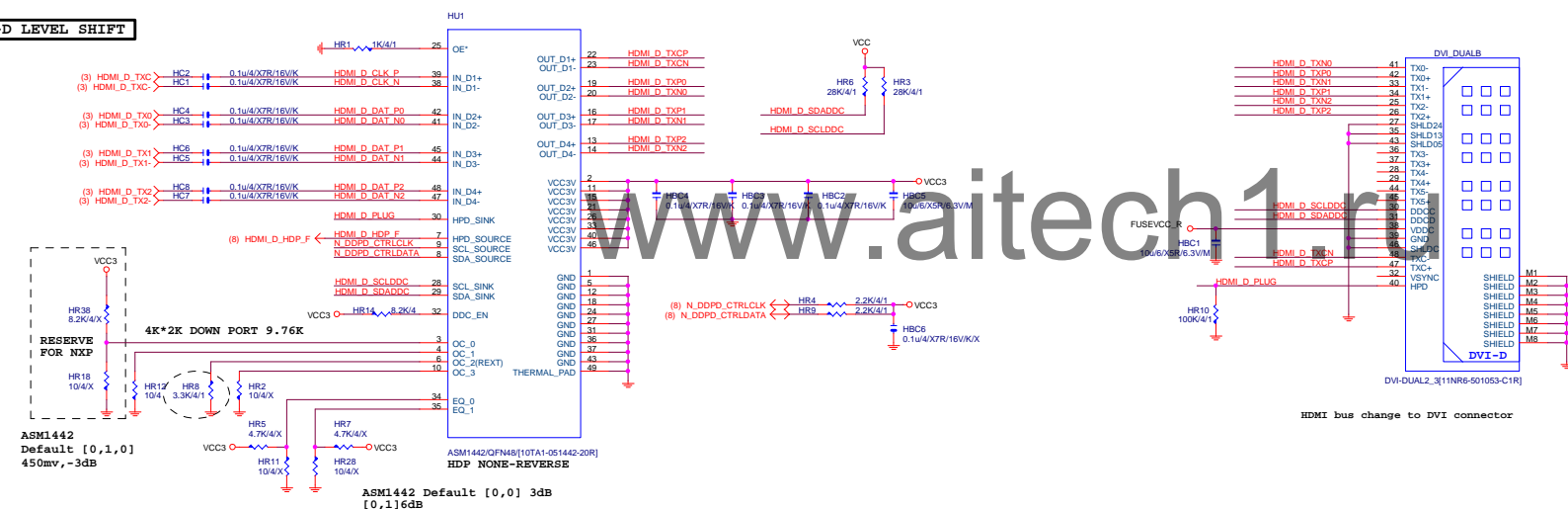


Gigabyte Technology			
Title		CPU CORE VR-2	
Size	Document Number	GA-Q87N	
Custom		Rev 1.11	
Date	Tuesday, November 19, 2013	Sheet	25 of 26

DVI-I LEVEL SHIFT



DVI-D LEVEL SHIFT



DP

