

GENE-9655

Intel® Core™ 2 Duo/Celeron® M (65nm)

Processors

Intel® 82574L for 10/100/1000Mbps

Type II CompactFlash™

4 COM, 6 USB2.0, Digital I/O

Mini PCI/ Mini Card

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Packing List

Before you begin installing your card, please make sure that the following materials have been shipped:

- 1700060157 Keyboard & Mouse Cable
- 1654929900 DVI-I to VGA Adapter
- 9657666600 Jumper Cap
- Cooler
- CD-ROM for manual (in PDF format) and drivers
- GENE-9655

If any of these items should be missing or damaged, please contact your distributor or sales representative immediately.

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Chapter

1

**General
Information**

1.1 Introduction

AAEON, a leading embedded boards manufacturer, is pleased to announce the debut of their new generation 3.5" SubCompact Board—GENE-9655. The GENE-9655 is a cutting-edge product that provides high performance and low power consumption in the embedded market.

GENE-9655 adopts the latest Intel® Core™ 2 Duo/ Celeron® M processors and the system memory is deployed with SODIMM DDRII 533/667 up to 2GB. In addition, Intel® 82574L supports two 10/100/100Base-TX that allows faster network connections. This model applies one Mini-PCI and one Mini Card expansions. Moreover, one SATA II and one Type II CompactFlash™ storages are configured on the GENE-9655. In addition to the diverse storages, GENE-9655 also equips six USB2.0, four COM, one keyboard/mouse ports for flexible I/O expansions. There are no more worries about installing many necessary devices to complete the functions of your system.

The display of GENE-9655 supports CRT/LCD, DVI/LCD simultaneous/ dual view displays and is up to 24-bit dual-channel LVDS. This brand new SubCompact board is developed to cater to the requirements of Automation, Medical, ticket machine, transportation, gaming, KIOSK, and POS/POI applications.

1.2 Features

- Intel® Core™ 2 Duo/ Celeron® M (65nm) Processors Up To 2.2 GHz
- Intel® GME965 + ICH8M
- SODIMM DDRII 533/667, Max. 2 GB
- Gigabit Ethernet x 2
- DVI-I or CRT (Optional), 24-bit Dual-channel LVDS LCD
- 2CH Audio
- SATA II x 1, CompactFlash™ x 1
- USB 2.0 x 6, COM x 4, 8-bit Digital I/O
- Mini-PCI x 1, Mini Card x 1
- +12V Only Operation
- Onboard Trusted Platform Module (Optional)

1.3 Specifications

System

- Processor Socket 478M or onboard
Intel® Core™ 2 Duo/ Celeron® M (65nm) Processors up to 2.2GHz, FSB 533/667/800MHz
- System Memory 200-pin DDRII SODIMM x 1, Max. 2GB (DDRII 533/667)
- Chipset Intel® GME965 + ICH8M
- I/O Chipset ITE8781
- Ethernet Intel® 82574L & 82566MM, 10/100/1000Base-TX, RJ-45 x 2
- BIOS Award Plug & Play SPI BIOS – 2MB Flash
- Wake On LAN Yes
- Watchdog Timer Generates a time-out system reset
- H/W Monitor Chipset Supports power supply voltages and temperature monitoring
- Expansion Interface Mini-PCI x 1, Mini Card x 1
- Trusted Platform Module (TPM) Infineon SLB 9635 TT 1.2 (Optional)
- Battery Lithium battery
- Power Requirement +12V, AT/ATX

- Power Consumption Intel® Core™ 2 Duo T7500 2.2 GHz, DDRII 667 2 GB, 4.12A @ +12V
- Board Size 5.75"(L) x 4"(W) (146mm x 101.6mm)
- Gross Weight 0.88 lb (0.4 kg)
- Operating Temperature 32°F~ 140°F (0°C ~ 60°C)
- Storage Temperature -40°F~ 176°F (-40°C ~ 80°C)
- Operating Humidity 0%~90% relative humidity, non-condensing

Display: Supports CRT/LCD, DVI/LCD simultaneous/dual view displays

- Chipset Intel® GME965 integrated
- Memory Shared system memory up to 384 MB/ DVMT4.0
- LCD Interface Up to 24-bit dual-channel LVDS
- Resolution Up to 1920x1440 for CRT; Up to 1920x1200 for LCD

I/O

- Storage SATA II x 1, Type II CompactFlash™ x 1
- Serial Port RS-232 x 3, RS-232/422/485 (auto flow) x 1
- USB Port USB2.0 x 6
- PS/2 Port Keyboard x 1, Mouse x 1

- Digital I/O Supports 8-bit (Programmable)
- Audio Line-in, Line-out, Mic-in, CD-in

Chapter

2

**Quick
Installation
Guide**

2.1 Safety Precautions

Warning!

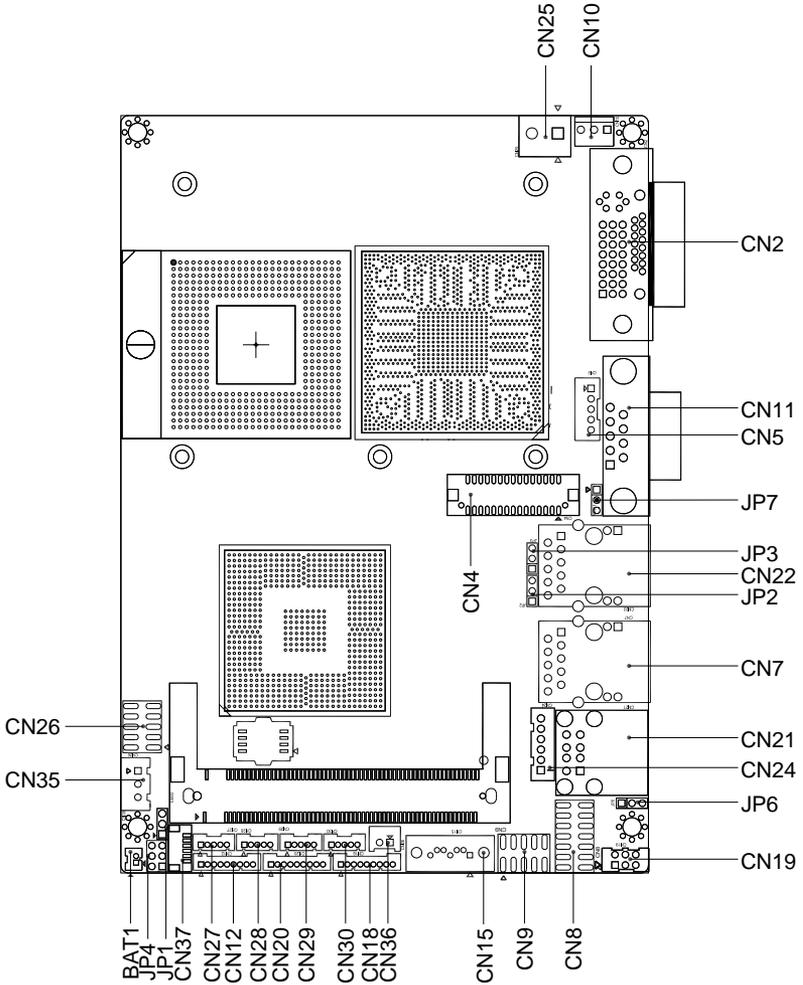
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Caution!

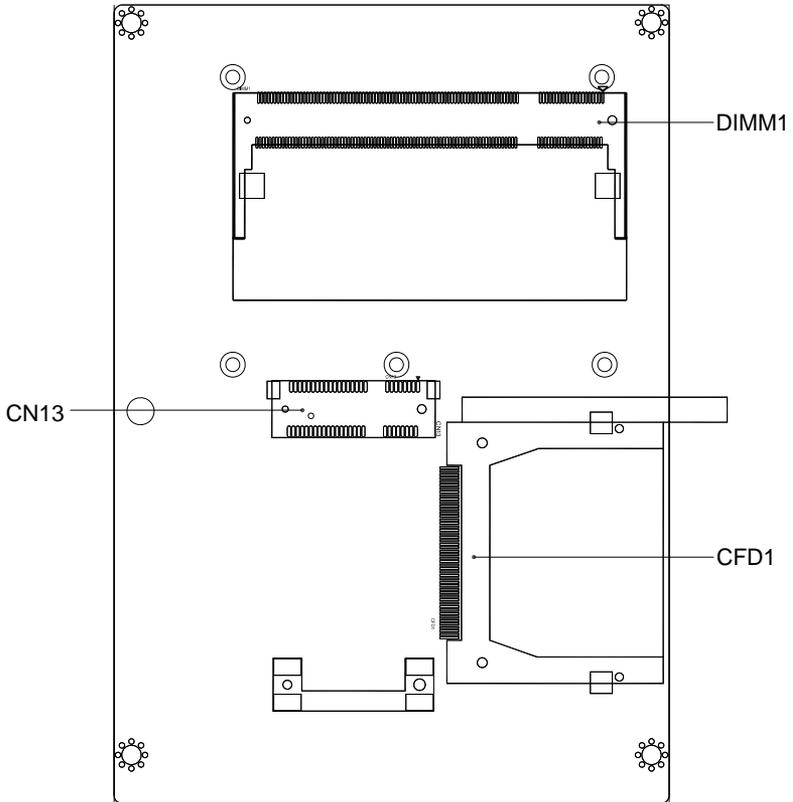
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

2.2 Location of Connectors and Jumpers

Component Side

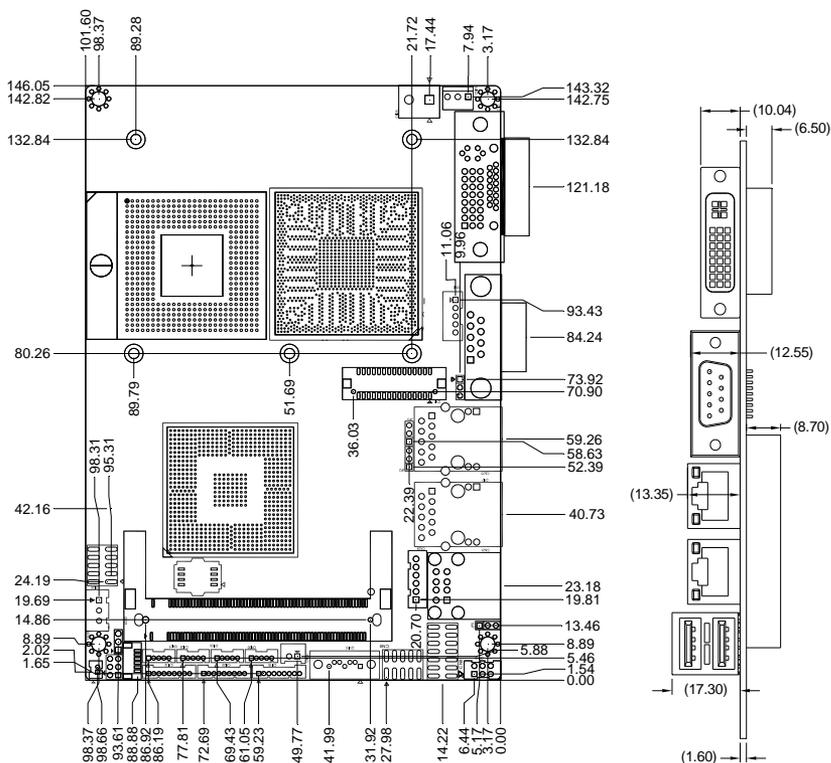


Solder Side

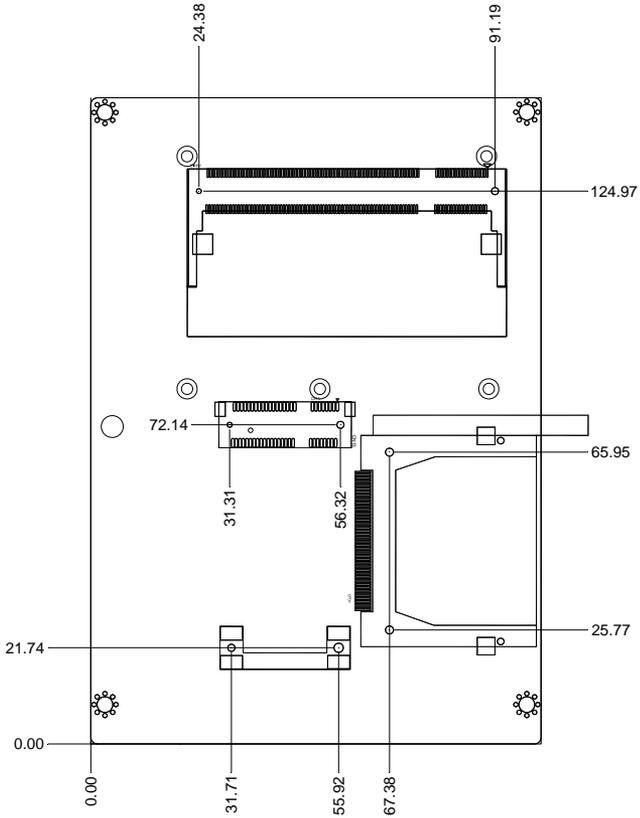


2.3 Mechanical Drawing

Component Side



Solder Side



2.4 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

Jumpers

Label	Function
JP1	Clear CMOS
JP2	LVDS LCD +5V/+3.3V Selection
JP3	LCD Backlight +5V/+12V Selection
JP4	COM2 +5V/+12V/Ring Selection
JP6	AT/ ATX Power Mode Selection
JP7	LCD Backlight Voltage / PWM Control Selection

2.5 List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

Connectors

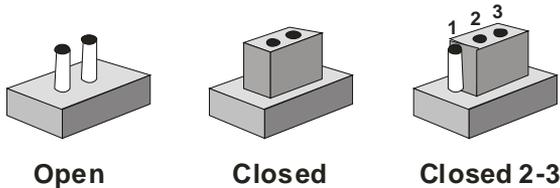
Label	Function
CN2	VGA / DVI Connector
CN4	LVDS LCD Connector
CN5	LCD Backlight Connector
CN7	LAN Connector
CN8	Audio Connector
CN9	Digital I/O Connector
CN10	Fan Connector
CN11	COM1 RS-232 Serial Port Connector
CN12	COM2 RS-232/422/485 Serial Port Connector
CN13	Mini Card Slot
CN15	Serial ATA Connector
CN18	COM3 RS-232 Serial Port Connector
CN19	PS/2 Keyboard/Mouse Connector
CN20	COM4 RS-232 Serial Port Connector
CN21	USB Connector
CN22	LAN Connector
CN24	+5V Standby Power Output w/PSON#/SMBus Connector
CN25	Power Input Connector
CN26	Front Panel Connector

CN27	USB Connector
CN28	USB Connector
CN29	USB Connector
CN30	USB Connector
CN36	+5V Output Connector for 2.5" SATA Hard Disk
CN37	UIM Connector for SIM
BAT1	Battery Connector
CFD1	CompactFlash Disk Connector
MPCI1	Mini-PCI Slot
DIMM1	DDRII SODIMM Connector

2.6 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip.

To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.



A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change.

Generally, you simply need a standard cable to make most connections.

2.7 Clear CMOS (JP1)

JP1	Function
1-2	Protected (Default)
2-3	Clear

2.8 LVDS LCD +5V/+3.3V Selection (JP2)

JP2	Function
1-2	+5V
2-3	+3.3V (Default)

2.9 LCD Backlight +5V/+12V Selection (JP3)

JP3	Function
1-2	+12V
2-3	+5V (Default)

2.10 COM2 Ring/+5V/+12V Selection (JP5)

JP5	Function
1-2	+12V
3-4	+5V
5-6	Ring (Default)

2.11 AT/ATX Power Mode Selection (JP6)

JP6	Function
1-2	AT (Default)
2-3	ATX

2.12 LCD Backlight Voltage / PWM Control Selection (JP7)

JP7	Function
1-2	Voltage Control (Default)
2-3	PWM Control

2.13 VGA/ DVI Display Connector (CN2)

Pin	Signal	Pin	Signal
1	DVI_TDC2#	2	DVI_TDC2
3	GND	4	DDCCLK
5	DDCDATA	6	DVI_CLK
7	DVI_DATA	8	VSYNC
9	DVI_TDC1#	10	DVI_TDC1
11	GND	12	N.C
13	N.C	14	+5V_DAC
15	GND	16	DVI_DET
17	DVI_TDC0#	18	DVI_TDC0
19	GND	20	N.C
21	N.C	22	GND
23	DVI_TLC	24	DVI_TLC#
25	GND	26	GND
27	N.C	28	N.C
29	DDCCLK	30	N.C
31	+5V_DAC	32	HSYNC
33	GREEN	34	GND
35	N.C	36	GND
37	GND	38	VSYNC
39	BLUE	40	GND
41	DDCDATA	42	RED
43	CRT_PLUG#		

C1	RED	C2	GREEN
C3	BLUE	C4	HSYNC
C5	GND	CG	GND

2.14 LVDS LCD Connector (CN4)

Note: For VLCD (pin 3, 7, 27), the max rating of each pin is 5V@0.5A

Pin	Name	Pin	Name
1	L_BKLT_EN	2	BKL_CON
3	VLCD	4	GND
5	LA_CLK#	6	LA_CLK
7	VLCD	8	GND
9	LA_DATA#_0	10	LA_DATA_0
11	LA_DATA#_1	12	LA_DATA_1
13	LA_DATA#_2	14	LA_DATA_2
15	LA_DATA#_3	16	LA_DATA_3
17	L_DDC_DATA	18	L_DDC_CLK
19	LB_DATA#_0	20	LB_DATA_0
21	LB_DATA#_1	22	LB_DATA_1
23	LB_DATA#_2	24	LB_DATA_2
25	LB_DATA#_3	26	LB_DATA_3
27	VLCD	28	GND
29	LB_CLK#	30	LB_CLK

2.15 LCD Backlight Connector (CN5)

Note: The max. rating of pin 1 is 12V@0.5A

Pin	Signal
1	VCC-Inverter
2	BKL_CON

3	GND
4	GND
5	INV_EN

2.16 Audio Connector (CN8)

Pin	Signal	Pin	Signal
1	MIC_L	2	MIC_R
3	GNDAUD	4	CD_GND
5	LIN_L	6	CD_L
7	LIN_R	8	CD_GND
9	GNDAUD	10	CD_R
11	LOUT_L	12	LOUT_R
13	GNDAUD	14	GNDAUD

2.17 Digital I/O Connector (CN9)

Note: The max. rating of Pin 1 ~ Pin 8 is 5V@8mA

The max. rating of Pin 9 is 5V@0.5A

This connector offers 4-pair of digital I/O functions and address is 2A0, 2A2, 2A4H. The pin definitions are illustrated below:

Pin	Signal	Pin	Signal
1	Port 1	2	Port 2
3	Port 3	4	Port 4
5	Port 5	6	Port 6
7	Port 7	8	Port 8
9	+5 Volt.	10	Ground

BIOS Setting	Connector Definition	Address	IT8781F GPIO
Port 8 @2A4h	Pin 8	GPIO Set 5 / Bit 2	U6 Pin 9 (GPIO 52)

Port 7 @2A4h	Pin 7	GPIO Set 5 / Bit 1	U6 Pin 10 (GPIO 51)
Port 6 @2A2h	Pin 6	GPIO Set 3 / Bit 7	U6 Pin 11 (GPIO 37)
Port 5 @2A2h	Pin 5	GPIO Set 3 / Bit 6	U6 Pin 12 (GPIO 36)
Port 4 @2A0h	Pin 4	GPIO Set 1 / Bit 4	U6 Pin 31 (GPIO 14)
Port 3 @2A0h	Pin 3	GPIO Set 1 / Bit 3	U6 Pin 32 (GPIO 13)
Port 2 @2A0h	Pin 2	GPIO Set 1 / Bit 2	U6 Pin 33 (GPIO 12)
Port 1 @2A0h	Pin 1	GPIO Set 1 / Bit 1	U6 Pin 34 (GPIO 11)

2.18 Fan Connector (CN10)

Pin	Signal
1	GND
2	+12V
3	Speed Sense

2.19 COM1 RS-232 Serial Port Connector (CN11)

Pin	Signal
1	DCDA
2	RXA
3	TXA
4	DTRA
5	GNDA
6	DSRA
7	RTSA
8	CTSA
9	RIA

2.20 COM2 RS-232/422/485 Serial Port Connector (CN12)

Pin	Signal
1	DCDB / 422 TX- / 485 D-
2	DSRB
3	RXB / 422 RX+
4	RTSB
5	TXB / 422 TX+ / 485 D+
6	CTSB
7	DTRB / 422 RX-
8	RIB
9	GND

2.21 COM3 RS-232 Serial Port Connector (CN18)

Pin	Signal
1	DCDC
2	DSRC
3	RXC
4	RTSC
5	TXC
6	CTSC
7	DTRC
8	RIC
9	GND

2.22 PS/2 Keyboard/Mouse Connector (CN19)

Pin	Signal	Pin	Signal
1	KBDAT	2	KBCLK

3	KB_GND	4	+5V_DUAL
5	MSDAT	6	MSCLK

2.23 COM4 RS-232 Serial Port Connector (CN20)

Pin	Signal
1	DCDD
2	DSRD
3	RXD
4	RTSD
5	TXD
6	CTSD
7	DTRD
8	RID
9	GND

2.24 +5V Standby Power Output w/PSON#/SMBus Connector (CN24)

Pin	Signal
1	SMBDAT_SBY
2	GND
3	SMBCLK_SBY
4	GND
5	PS_ON#
6	+5V_DUAL

2.25 Power Input Connector (CN25)

Pin	Signal
1	+12V_DUAL

2 GND

2.26 Front Panel (CN26)

Pin	Signal	Pin	Signal
1	Power On Button(-)	2	Power On Button(+)
3	IDE LED(-)	4	IDE LED(+)
5	External Buzzer(-)	6	External Buzzer(+)
7	Power LED(-)	8	Power LED(+)
9	Reset Switch(-)	10	Reset Switch(+)

2.27 USB Connector (CN27)

Pin	Signal
1	+5V_DUAL
2	USBD2-
3	USBD2+
4	GND
5	GND

2.28 USB Connector (CN28)

Pin	Signal
1	+5V_DUAL
2	USBD3-
3	USBD3+
4	GND
5	GND

2.29 USB Connector (CN29)

Pin	Signal
1	+5V_DUAL
2	USB4-
3	USB4+
4	GND
5	GND

2.30 USB Connector (CN30)

Pin	Signal
1	+5V_DUAL
2	USB5-
3	USB5+
4	GND
5	GND

2.31 +5V Output Connector for 2.5" SATA Hard Disk (CN36)

Note: The max. rating is 5V@1A

Pin	Signal
1	+5V
2	GND

2.32 UIM Connector for SIM (CN37)

Pin	Signal
1	UIM_PWR
2	UIM_RST
3	UIM_CLK

4	GND
5	UIM_VPP
6	UIM_DAT

2.33 CompactFlash Disk Connector (CFD1)

Pin	Signal	Pin	Signal
1	GND	26	Ground
2	SDD3	27	SDD11
3	SDD4	28	SDD12
4	SDD5	29	SDD13
5	SDD6	30	SDD14
6	SDD7	31	SDD15
7	SDCS#1	32	SDCS#3
8	GND	33	GND
9	GND	34	SDIOR#
10	GND	35	SDIOW#
11	GND	36	+3.3V
12	GND	37	IRQ15
13	+3.3V	38	+3.3V
14	GND	39	CSEL#
15	GND	40	N.C
16	GND	41	SEC_IDERST#
17	GND	42	SIORDY
18	SDA2	43	SDDREQ
19	SDA1	44	DACK#
20	SDA0	45	DASP#
21	SDD0	46	PDIAG#
22	SDD1	47	SDD8

SubCompact Board**GENE-9655**

23	SDD2	48	SDD9
24	N.C	49	SDD10
25	GND	50	GND

Below Table for China RoHS Requirements

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○
<p>O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。</p> <p>备注: 此产品所标示之环保使用期限, 系指在一般正常使用状况下。</p>						

Chapter

3

**Award
BIOS Setup**

3.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

Press <F1> to RESUME

Write down the message and press the F1 key to continue the boot up sequence.

System configuration verification

These routines check the current system configuration against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The CMOS memory has lost power and the configuration information has been erased.

The GENE-9655 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 Award BIOS Setup

Awards BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press immediately. This will allow you to enter Setup.

Standard CMOS Features

Use this menu for basic system configuration. (Date, time, IDE, etc.)

Advanced BIOS Features

Use this menu to set the advanced features available on your system.

Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system performance.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals. (Primary slave, secondary slave, keyboard, mouse etc.)

Power Management Setup

Use this menu to specify your settings for power management. (HDD power down, power on by ring, KB wake up, etc.)

Chapter

4

**Driver
Installation**

The GENE-9655 comes with an AutoRun CD-ROM that contains all drivers and utilities that can help you to install the driver automatically.

Insert the driver CD, the driver CD-title will auto start and show the installation guide. If not, please follow the sequence below to install the drivers.

Follow the sequence below to install the drivers:

- Step 1 – Install Chipset Driver
- Step 2 – Install VGA Driver
- Step 3 – Install LAN Driver
- Step 4 – Install Audio Driver
- Step 5 – Install TPM Driver

USB 2.0 Drivers are available for download using Windows® Update for both Windows® XP and Windows® 2000. For additional information regarding USB 2.0 support in Windows® XP and Windows® 2000, please visit www.microsoft.com/hwdev/usb/.

Please read instructions below for further detailed installations.

4.1 Installation:

Insert the GENE-9655 CD-ROM into the CD-ROM drive. And install the drivers from Step 1 to Step 5 in order.

Step 1 – Install Chipset Driver

1. Click on the **setp-01 ICH-8M INF** folder and double click on the **ininst911_autol.exe**
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 2 – Install VGA Driver

1. Click on the **setp-02 965GME VGA** folder and select the OS folder your system is
2. Double click on the **.exe** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 3 –Install LAN Driver

1. Click on the **setp-03 LAN** folder and select the **Windows** folder
2. Select the OS folder your system is
3. Double click on the **.exe** file located in each OS folder
4. Follow the instructions that the window shows
5. The system will help you install the driver automatically

Step 4 –Install Audio Driver

1. Click on the **setp-04 ALC888** folder and select the OS folder your system is
2. Double click on **Setup.exe** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 5 –Install TPM Driver

1. Click on the **step-05 TPM** folder and double click on the **Setup.exe**
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

PnP/PCI Configurations

This entry appears if your system supports PnP/PCI.

PC Health Status

This menu shows the voltage, temperature and fan speed of the system.

Load Fail-Safe Defaults

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.

Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While AWARD has designated the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

Set Supervisor/User Password

Use this menu to set Supervisor/User Passwords.

Save and Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

You can refer to the “AAEON BIOS Item Description.pdf” file in the CD for the meaning of each setting in this chapter.

Appendix

A

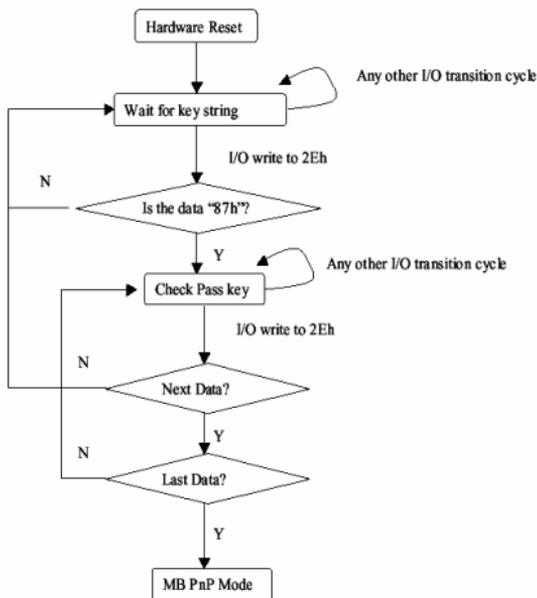
Programming the Watchdog Timer

A.1 Programming

GENE-9655 utilizes ITE 8781 chipset as its watchdog timer controller. Below are the procedures to complete its configuration and the AAEON initial watchdog timer program is also attached based on which you can develop customized program to fit your application.

Configuring Sequence Description

After the hardware reset or power-on reset, the ITE 8781 enters the normal mode with all logical devices disabled except KBC. The initial state (enable bit) of this logical device (KBC) is determined by the state of pin 121 (DTR1#) at the falling edge of the system reset during power-on reset.



There are three steps to complete the configuration setup: (1) Enter the MB PnP Mode; (2) Modify the data of configuration registers; (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

(1) Enter the MB PnP Mode

To enter the MB PnP Mode, four special I/O write operations are to be performed during Wait for Key state. To ensure the initial state of the key-check logic, it is necessary to perform four write operations to the Special Address port (2EH). Two different enter keys are provided to select configuration ports (2Eh/2Fh) of the next step.

	Address Port	Data Port
87h, 01h, 55h, 55h:	2Eh	2Fh

(2) Modify the Data of the Registers

All configuration registers can be accessed after entering the MB PnP Mode. Before accessing a selected register, the content of Index 07h must be changed to the LDN to which the register belongs, except some Global registers.

(3) Exit the MB PnP Mode

Set bit 1 of the configure control register (Index=02h) to 1 to exit the MB PnP Mode.

WatchDog Timer Configuration Registers

LDN	Index	R/W	Reset	Configuration Register or Action
All	02h	W	NA	Configure Control

07h	71h	R/W	00h	Watch Dog Timer Control Register
07h	72h	R/W	001s0000b	Watch Dog Timer Configuration Register
07h	73h	R/W	38h	Watch Dog Timer Time-out Value (LSB) Register
07h	74h	R/W	00h	Watch Dog Timer Time-out Value (MSB) Register

Configure Control (Index=02h)

This register is write only. Its values are not sticky; that is to say, a hardware reset will automatically clear the bits, and does not require the software to clear them.

Bit	Description
7-2	Reserved
1	Returns to the "Wait for Key" state. This bit is used when the configuration sequence is completed.
0	Resets all logical devices and restores configuration registers to their power-on states.

Watch Dog Timer 1, 2, 3 Control Register (Index=71h,81h,91h Default=00h)

Bit	Description
7	WDT Timeout Enable(WTE) 1: Disable. 0: Enable.
6	WDT Reset upon Mouse Interrupt(WRKMI) 0: Disable. 1: Enable.
5	WDT Reset upon Keyboard Interrupt(WRKBI) 0: Disable. 1: Enable.
4	Reserved
3-2	Reserved
1	Force Time-out(FTO) This bit is self-clearing.
0	WDT Status(WS) 1: WDT value reaches 0. 0: WDT value is not 0.

Watch Dog Timer 1, 2, 3 Configuration Register (Index=72h, 82h, 92h Default=001s0000b)

Bit	Description
7	WDT Time-out Value Select 1 (WTVS) 1: Second 0: Minute
6	WDT Output through KRST (Pulse) Enable(WOKE) 1: Enable 0: Disable
5	WDT Time-out value Extra select(WTVES) 1: 64ms x WDT Timer-out value (default = 4s) 0: Determined by WDT Time-out value select 1 (bit 7 of this register)
4	WDT Output through PWROK (Pulse) Enable(WOPE) 1: Enable 0: Disable During LRESET#, this bit is selected by JP7 power-on strapping option
3-0	Select interrupt level^{Note1} for WDT(SIL)

Watch Dog Timer 1,2,3 Time-Out Value (LSB) Register (Index=73h,83h,93h, Default=38h)

Bit	Description
7-0	WDT Time-out Value 7-0(WTV)

Watch Dog Timer 1,2,3 Time-Out Value (MSB) Register (Index=74h,84h,94h Default=00h)

Bit	Description
7-0	WDT Time-out Value 15-8(WTV)

A.2 ITE8781 Watchdog Timer Initial Program

```
.MODEL SMALL
.CODE
Main:
CALL Enter_Configuration_mode
CALL Check_Chip
mov cl, 7
call Set_Logic_Device
;time setting
mov cl, 10 ; 10 Sec
dec al
Watch_Dog_Setting:
;Timer setting
mov al, cl
mov cl, 73h
call Superio_Set_Reg
;Clear by keyboard or mouse interrupt
mov al, 0f0h
mov cl, 71h
call Superio_Set_Reg
;unit is second.
mov al, 0C0H
mov cl, 72h
```

```
call Superio_Set_Reg  
; game port enable  
mov cl, 9  
call Set_Logic_Device
```

```
Initial_OK:  
CALL Exit_Configuration_mode  
MOV AH,4Ch  
INT 21h
```

```
Enter_Configuration_Mode PROC NEAR  
MOV SI,WORD PTR CS:[Offset Cfg_Port]
```

```
MOV DX,02Eh  
MOV CX,04h  
Init_1:  
MOV AL,BYTE PTR CS:[SI]  
OUT DX,AL  
INC SI  
LOOP Init_1  
RET  
Enter_Configuration_Mode ENDP
```

```
Exit_Configuration_Mode PROC NEAR  
MOV AX,0202h
```

CALL Write_Configuration_Data

RET

Exit_Configuration_Mode ENDP

Check_Chip PROC NEAR

MOV AL,20h

CALL Read_Configuration_Data

CMP AL,87h

JNE Not_Initial

MOV AL,21h

CALL Read_Configuration_Data

CMP AL,81h

JNE Not_Initial

Need_Initial:

STC

RET

Not_Initial:

CLC

RET

Check_Chip ENDP

Read_Configuration_Data PROC NEAR

MOV DX,WORD PTR CS:[Cfg_Port+04h]

```
OUT DX,AL
MOV DX,WORD PTR CS:[Cfg_Port+06h]
IN AL,DX
RET
Read_Configuration_Data ENDP
```

```
Write_Configuration_Data PROC NEAR
MOV DX,WORD PTR CS:[Cfg_Port+04h]
OUT DX,AL
XCHG AL,AH
MOV DX,WORD PTR CS:[Cfg_Port+06h]
OUT DX,AL
RET
Write_Configuration_Data ENDP
```

```
Superio_Set_Reg proc near
push ax
MOV DX,WORD PTR CS:[Cfg_Port+04h]
mov al,cl
out dx,al
pop ax
inc dx
out dx,al
ret
Superio_Set_Reg endp.Set_Logic_Device proc near
```

```
Set_Logic_Device    proc    near
push ax
push cx
xchg al,cl
mov cl,07h
call Superio_Set_Reg
pop cx
pop ax
ret
Set_Logic_Device endp
```

```
;Select 02Eh->Index Port, 02Fh->Data Port
Cfg_Port DB 087h,001h,055h,055h
DW 02Eh,02Fh
```

END Main

Note: Interrupt level mapping

0Fh-Dh: not valid

0Ch: IRQ12

.

.

03h: IRQ3

02h: not valid

01h: IRQ1

00h: no interrupt selected

Appendix

B

I/O Information

B.1 I/O Address Map

Input/output (IO)	
00000000 - 0000000F	Direct memory access controller
00000000 - 00000CF7	PCI bus
00000010 - 0000001F	Motherboard resources
00000020 - 00000021	Programmable interrupt controller
00000022 - 0000003F	Motherboard resources
00000040 - 00000043	System timer
00000044 - 0000004D	Motherboard resources
00000050 - 0000005E	Motherboard resources
00000061 - 00000061	System speaker
00000062 - 00000063	Motherboard resources
00000065 - 0000006F	Motherboard resources
00000070 - 00000073	System CMOS/real time clock
00000074 - 0000007F	Motherboard resources
00000080 - 00000090	Direct memory access controller
00000091 - 00000093	Motherboard resources
00000094 - 0000009F	Direct memory access controller
000000A0 - 000000A1	Programmable interrupt controller
000000A2 - 000000BF	Motherboard resources
000000C0 - 000000CF	Direct memory access controller
000000E0 - 000000EF	Motherboard resources
000000F0 - 000000FF	Numeric data processor
000001F0 - 000001F7	Primary IDE Channel
00000274 - 00000277	ISAPNP Read Data Port
00000279 - 00000279	ISAPNP Read Data Port
00000290 - 0000029F	Motherboard resources
000002E8 - 000002EF	Communications Port (COM4)
000002F8 - 000002FF	Communications Port (COM2)
00000380 - 0000038B	Mobile Intel(R) 965 Express Chipset Family
000003C0 - 000003DF	Mobile Intel(R) 965 Express Chipset Family
000003E8 - 000003EF	Communications Port (COM3)
000003F6 - 000003F6	Primary IDE Channel
000003F8 - 000003FF	Communications Port (COM1)
00000400 - 000004BF	Motherboard resources
000004D0 - 000004D1	Motherboard resources
00000500 - 0000051F	Intel(R) ICH8 Family SMBus Controller - 283E
00000880 - 0000088F	Motherboard resources
00000A79 - 00000A79	ISAPNP Read Data Port
00000D00 - 0000FFFF	PCI bus
0000A000 - 0000AFFF	Intel(R) ICH8 Family PCI Express Root Port 2 - 2841
0000B000 - 0000BFFF	Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
0000BF00 - 0000BF1F	Intel(R) 82574L Gigabit Network Connection
0000C000 - 0000CFFF	Intel(R) ICH8 Family PCI Express Root Port 4 - 2845
0000E000 - 0000EFFF	Intel(R) ICH8 Family PCI Express Root Port 3 - 2843
0000F200 - 0000F20F	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
0000F300 - 0000F30F	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
0000F400 - 0000F403	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
0000F500 - 0000F507	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
0000F600 - 0000F603	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
0000F700 - 0000F707	Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
0000F800 - 0000F80F	Intel(R) ICH8M Ultra ATA Storage Controllers - 2850
0000F900 - 0000F91F	Intel(R) ICH8 Family USB Universal Host Controller - 2832
0000FA00 - 0000FA1F	Intel(R) ICH8 Family USB Universal Host Controller - 2831
0000FB00 - 0000FB1F	Intel(R) ICH8 Family USB Universal Host Controller - 2830
0000FC00 - 0000FC1F	Intel(R) ICH8 Family USB Universal Host Controller - 2835
0000FD00 - 0000FD1F	Intel(R) ICH8 Family USB Universal Host Controller - 2834
0000FE00 - 0000FE1F	Intel(R) 82566MM Gigabit Network Connection
0000FF00 - 0000FF07	Mobile Intel(R) 965 Express Chipset Family

B.2 1st MB Memory Address Map

Memory	
[00000000 - 0009FFFF]	System board
[000A0000 - 000BFFFF]	Mobile Intel(R) 965 Express Chipset Family
[000A0000 - 000BFFFF]	PCI bus
[000C0000 - 000DFFFF]	PCI bus
[000E0000 - 000EFFFF]	System board
[000F0000 - 000FFFFF]	System board
[00100000 - 3F6DFFFF]	System board
[3F6E0000 - 3F6FFFFF]	System board
[3F700000 - 3F7FFFFF]	System board
[3F750000 - FEBFFFFF]	PCI bus
[D0000000 - DFFFFFFF]	Mobile Intel(R) 965 Express Chipset Family
[E0000000 - EFFFFFFF]	Motherboard resources
[FD300000 - FD3FFFFF]	Mobile Intel(R) 965 Express Chipset Family
[FD700000 - FD7FFFFF]	Intel(R) ICH8 Family PCI Express Root Port 4 - 2845
[FD800000 - FD8FFFFF]	Intel(R) ICH8 Family PCI Express Root Port 4 - 2845
[FD900000 - FD9FFFFF]	Intel(R) ICH8 Family PCI Express Root Port 3 - 2843
[FDA00000 - FDAFFFFF]	Intel(R) ICH8 Family PCI Express Root Port 3 - 2843
[FDB00000 - FDBFFFFF]	Intel(R) ICH8 Family PCI Express Root Port 2 - 2841
[FDC00000 - FDCFFFFF]	Intel(R) ICH8 Family PCI Express Root Port 2 - 2841
[FDD00000 - FDDFFFFF]	Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
[FDE00000 - FDEFFFFF]	Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
[FDEC0000 - FDEFFFFF]	Intel(R) 82574L Gigabit Network Connection
[FDEFC000 - FDEFFFFF]	Intel(R) 82574L Gigabit Network Connection
[FDFC0000 - FDFDFFFF]	Intel(R) 82566MM Gigabit Network Connection
[FDFF4000 - FDFF7FFF]	Microsoft UAA Bus Driver for High Definition Audio
[FDFFC000 - FDFFC0FF]	Intel(R) ICH8 Family SMBus Controller - 283E
[FDFFD000 - FDFFD3FF]	Intel(R) ICH8 Family USB2 Enhanced Host Controller - 2836
[FDFFE000 - FDFFE3FF]	Intel(R) ICH8 Family USB2 Enhanced Host Controller - 283A
[FDFFF000 - FDFFFFFF]	Intel(R) 82566MM Gigabit Network Connection
[FEB00000 - FEBFFFFF]	Mobile Intel(R) 965 Express Chipset Family
[FEC00000 - FEC00FFF]	System board
[FED13000 - FED1FFFF]	System board
[FED20000 - FED3FFFF]	System board
[FED40000 - FED44FFF]	PCI bus
[FED45000 - FED9FFFF]	System board
[FEE00000 - FEE00FFF]	System board
[FFB00000 - FFB7FFFF]	System board
[FFB80000 - FFB8FFFF]	Intel(R) 82802 Firmware Hub Device

B.3 IRQ Mapping Chart

	Interrupt request (IRQ)
	(ISA) 0 System timer
	(ISA) 3 Communications Port (COM2)
	(ISA) 4 Communications Port (COM1)
	(ISA) 8 System CMOS/real time clock
	(ISA) 9 Microsoft ACPI-Compliant System
	(ISA) 10 Communications Port (COM4)
	(ISA) 11 Communications Port (COM3)
	(ISA) 13 Numeric data processor
	(ISA) 14 Primary IDE Channel
	(PCI) 5 Intel(R) ICH8 Family SMBus Controller - 283E
	(PCI) 16 Intel(R) 82574L Gigabit Network Connection
	(PCI) 16 Intel(R) ICH8 Family PCI Express Root Port 1 - 283F
	(PCI) 16 Intel(R) ICH8 Family USB Universal Host Controller - 2834
	(PCI) 16 Mobile Intel(R) 965 Express Chipset Family
	(PCI) 17 Intel(R) ICH8 Family PCI Express Root Port 2 - 2841
	(PCI) 18 Intel(R) ICH8 Family PCI Express Root Port 3 - 2843
	(PCI) 18 Intel(R) ICH8 Family USB Universal Host Controller - 2832
	(PCI) 18 Intel(R) ICH8 Family USB2 Enhanced Host Controller - 283A
	(PCI) 19 Intel(R) ICH8 Family PCI Express Root Port 4 - 2845
	(PCI) 19 Intel(R) ICH8 Family USB Universal Host Controller - 2831
	(PCI) 19 Intel(R) ICH8M 3 port Serial ATA Storage Controller - 2828
	(PCI) 20 Intel(R) 82566MM Gigabit Network Connection
	(PCI) 21 Intel(R) ICH8 Family USB Universal Host Controller - 2835
	(PCI) 22 Microsoft UAA Bus Driver for High Definition Audio
	(PCI) 23 Intel(R) ICH8 Family USB Universal Host Controller - 2830
	(PCI) 23 Intel(R) ICH8 Family USB2 Enhanced Host Controller - 2836

B.4 DMA Channel Assignments

	Direct memory access (DMA)
	4 Direct memory access controller

Appendix

C

Mating Connector

C.1 List of Mating Connectors and Cables

The table notes mating connectors and available cables.

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
CN4	LVDS Connector	HIROSE	DF13-30DS-1.25C	N/A	N/A
CN5	LVDS Inverter Connector	Molex	ZHR-5	Inverter Cable	1705050153
CN7	RJ-45 Ethernet#2 Connector	Neltron	7001-8P8C	N/A	N/A
CN8	Audio In/Out/CD-in and MIC Connector	Catch	052-D200-14 P	Audio Cable	1700140510
CN9	Digital I/O Connector	Neltron	2026B-10	N/A	N/A
CN10	System Fan Connector	Catch	1190-700-03 S	N/A	N/A
CN12	COM Port 2 Connector	Molex	51021-0900	UART Wafer Cable	1701090150
CN15	SATA Connector	Molex	67582-0000	SATA Cable	1709070500
CN18	COM Port 3 Connector	Molex	51021-0900	UART Wafer Cable	1701090150
CN19	Keyboard / Mouse Connector	Catch	A003-290	KB/MS Cable	1700060152
CN20	COM Port 4 Connector	Molex	51021-0900	UART Wafer Cable	1701090150
CN22	RJ-45 Ethernet#1 Connector	Neltron	7001-8P8C	N/A	N/A

CN24	External AUX Power and PS_ON#	Catch	2418HJ-06	ATX External 5VSB Cable	External AUX Power and PS_ON#
CN25	+12V Vin Connector	N/A	N/A	Power Cable	1702002010
CN27	USB Port 1 Connector	Molex	51021-0500	USB Wafer Cable	1700050207
CN28	USB Port 2 Connector	Molex	51021-0500	USB Wafer Cable	1700050207
CN29	USB Port 3 Connector	Molex	51021-0500	USB Wafer Cable	1700050207
CN30	USB Port 4 Connector	Molex	51021-0500	USB Wafer Cable	1700050207
CN35	External +5VSB Power Input and PS_ON#			ATX Cable	170220020B
CN36	+5Vout Connector	N/A	N/A	2 Pins For SATA Power	1702150155
CN37	UIM Connector	LIAN TAY	H746-06	UIM Cable	
BAT1	External RTC Connector	Molex	51021-0200	Battery Cable	175011901C