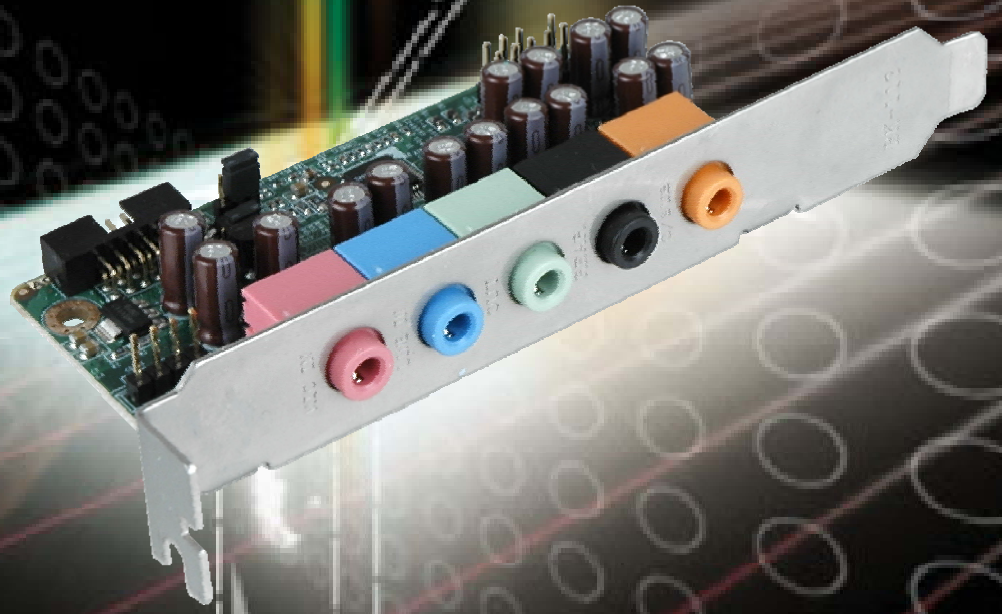




IEI Technology Corp.



**MODEL:
AC-KIT-888HD**

7.1 Channel High Definition Audio Module

User Manual

Rev. 1.00 – 15 June, 2011



Revision

Date	Version	Changes
15 June, 2011	1.00	Initial release

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Table of Contents

1 INTRODUCTION.....	1
1.1 INTRODUCTION.....	2
1.2 FEATURES.....	3
1.3 CONNECTORS	3
1.4 DIMENSIONS.....	4
1.5 TECHNICAL SPECIFICATIONS	5
2 PACKING LIST.....	6
2.1 ANTI-STATIC PRECAUTIONS	7
2.2 UNPACKING PRECAUTIONS.....	7
2.3 PACKING LIST.....	8
3 CONNECTORS	9
3.1 PERIPHERAL INTERFACE CONNECTORS.....	10
3.1.1 AC-KIT-888HD Layout.....	10
3.1.2 Peripheral Interface Connectors	10
3.1.3 Audio Connector	11
3.1.4 CD In Connector.....	12
3.1.5 Front Panel Connector	13
3.2 EXTERNAL PERIPHERAL INTERFACE CONNECTORS.....	14
4 INSTALLATION	15
4.1 ANTI-STATIC PRECAUTIONS	16
4.2 INSTALLATION CONSIDERATIONS.....	16
4.3 JUMPER SETTINGS	18
4.3.1 AVDD Power-on Select Jumper.....	19
4.3.2 DVDD Power-on Select Jumper	20
4.4 CHASSIS INSTALLATION.....	20
4.5 REALTEK HD AUDIO DRIVER (ALC888) INSTALLATION	23
5 7.1 SURROUND SOUND CONFIGURATION	24
5.1 INTRODUCTION.....	25

AC-KIT-888HD Audio Module

5.2 DRIVER INSTALLATION.....	25
5.3 7.1 SURROUND SOUND CONFIGURATION.....	25
5.3.1 <i>Accessing the Sound Effects Manager</i>	25
5.3.2 <i>7.1 Surround Sound Setup</i>	27
5.3.3 <i>Connect Devices to the Audio Module</i>	28
5.3.4 <i>Testing Speaker Configuration</i>	33
A HAZARDOUS MATERIALS DISCLOSURE	34
A.1 HAZARDOUS MATERIALS DISCLOSURE TABLE FOR IPB PRODUCTS CERTIFIED AS ROHS COMPLIANT UNDER 2002/95/EC WITHOUT MERCURY	35

List of Figures

Figure 1-1: AC-KIT-888HD.....	2
Figure 1-2: Connectors	3
Figure 1-3: AC-KIT-888HD Dimensions (mm)	4
Figure 3-1: Connectors and Jumpers.....	10
Figure 3-2: Audio Connector Location	11
Figure 3-3: CD In Connector Location.....	12
Figure 3-4: Front Panel Connector Location	13
Figure 4-1: AVDD Power-on Select Jumper Location.....	19
Figure 4-2: DVDD Power-on Select Jumper Location.....	20
Figure 4-3: Connect Audio Module to Motherboard	21
Figure 4-4: Connect Audio Module to CD	22
Figure 5-1: Sound Effect Manager Icon [Task Bar].....	25
Figure 5-2: Sound Effects Manager (ALC888)	26
Figure 5-3: 8 Channel Speaker Option	27
Figure 5-4: 7.1 Surround Sound Speaker Layout.....	28
Figure 5-5: Connected Device Screen.....	29
Figure 5-6: Front Speakers as Front Speaker Out	30
Figure 5-7: Side Speakers as Side Speaker Out.....	31
Figure 5-8: Rear Speakers as Rear Speaker Out.....	32
Figure 5-9: Center/Subwoofer Speakers as Center/Subwoofer Speaker Out	33

List of Tables

Table 1-1: AC-KIT-888HD Specifications.....	5
Table 2-1: Packing List.....	8
Table 3-1: Peripheral Interface Connectors.....	10
Table 3-2: Audio Connector Pinouts.....	11
Table 3-3: CD In Connector Pinouts.....	12
Table 3-4: Front Panel Connector Pinouts.....	14
Table 3-5: External Peripheral Interface Connectors.....	14
Table 4-1: Jumpers.....	18
Table 4-2: AVDD Power-on Select Jumper Settings.....	19
Table 4-3: DVDD Power-on Select Jumper Settings.....	20

Chapter

1

Introduction

1.1 Introduction

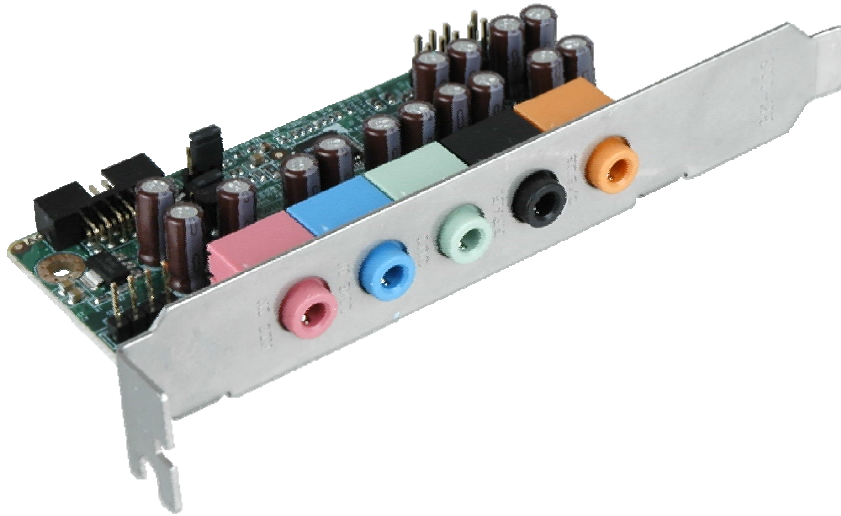


Figure 1-1: AC-KIT-888HD

The AC-KIT-888HD audio module is an audio interface card equipped with 7.1 surround sound capability. The AC-KIT-888HD audio module features a performance Realtek ALC888 audio codec chip, five input/output audio jacks, direct CD in header connection and optional I/O KIT multi-streaming pin header connection. With IEI's leading-edge technology and professionalism in industrial computing, the AC-KIT-888HD audio module is designed with high stability and state-of-the-art functionality to fulfill your needs.

AC-KIT-888HD Audio Module

1.2 Features

Some of the AC-KIT-888HD audio module features are listed below:

- Realtek ALC888 HD Audio Codec IC Supported
- Five audio jacks for microphone, 7.1+2 Channel High Definition Audio input and output
- High-performance 7.1+2 Channel High Definition Audio board are providing 7.1 sound playback and multiple streaming through the front panel stereo outputs
- Digital to Analog Converter (DAC) with 97dB signal to noise ratio (SNR)
- Analog to Digital Converter (ADC) with 90dB signal to noise ratio (SNR)
- All DACs support 44.1k/48k/96k/192kHz sample rate
- All ADCs support 44.1k/48k/96kHz sample rate
- Driver supports Windows 2000/2003/XP/VISTA/7 (32/64 bits), Linux (Ubuntu or Debian)

1.3 Connectors

The connectors on the AC-KIT-888HD are shown in the figure below.

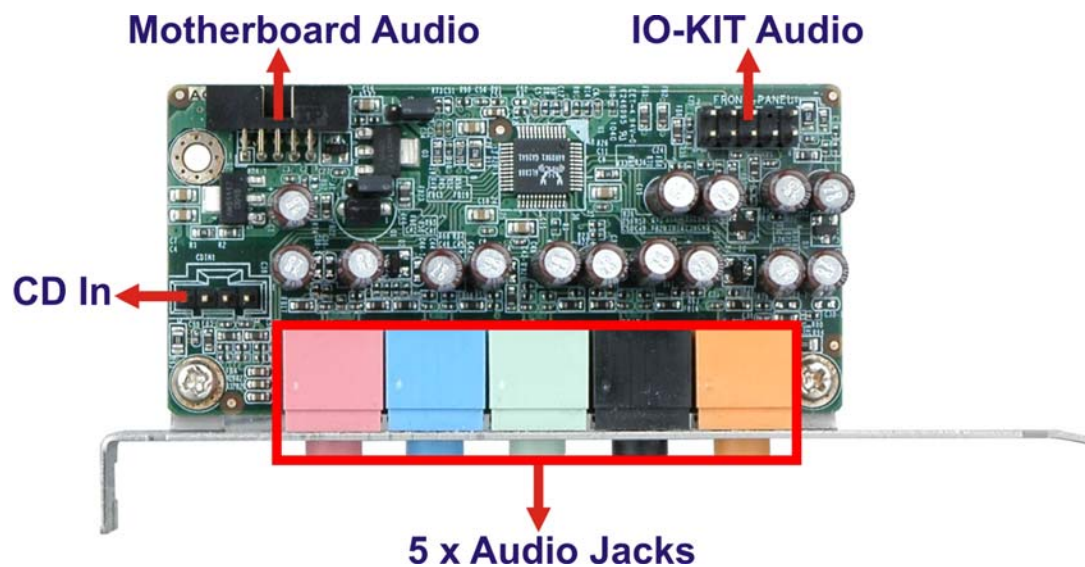


Figure 1-2: Connectors

1.4 Dimensions

The main dimensions of the AC-KIT-888HD are shown in the diagram below.

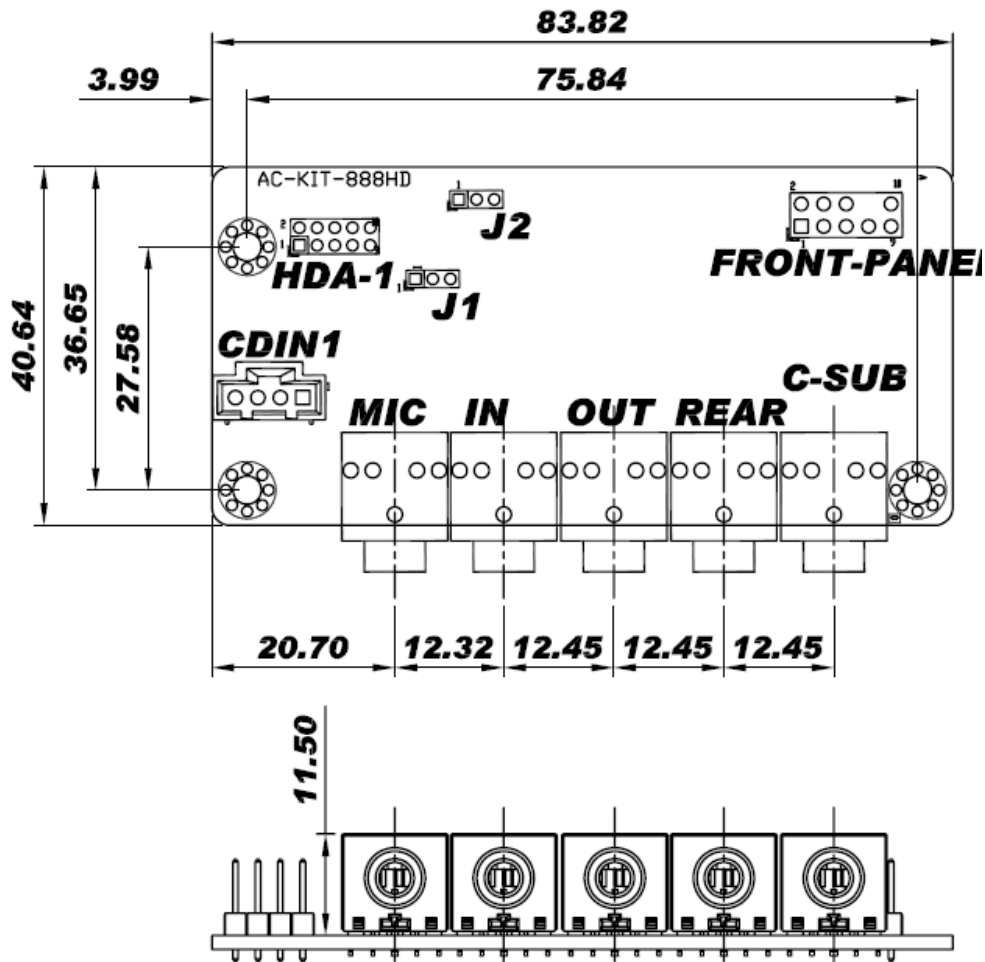


Figure 1-3: AC-KIT-888HD Dimensions (mm)

AC-KIT-888HD Audio Module

1.5 Technical Specifications

AC-KIT-888HD technical specifications are listed below.

Specification/Model	AC-KIT-888HD
Audio Codec IC	Realtek ALC888
Audio Input	Five Audio jacks CD pin header connector on-board
Sampling Rate	DACs support 44.1k/48k/96k/192kHz ADCs support 44.1k/48k/96kHz 16/20/24-bit S/PDIF-OUT supports 44.1k/48k/96k/192kHz 16/20/24-bit S/PDIF-IN supports 44.1k/48k/96kHz
7.1 Surround Sound	Yes
Two Multi-streaming Channels	Yes (with optional IO-KIT-MULTI-ST card)
Device Driver	Audio driver for Windows 2000/XP/Vista/7

Table 1-1: AC-KIT-888HD Specifications

Chapter

2

Packing List

AC-KIT-888HD Audio Module

2.1 Anti-static Precautions



WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- **Wear an anti-static wristband:** Wearing an anti-static wristband can prevent electrostatic discharge.
- **Self-grounding:** Touch a grounded conductor every few minutes to discharge any excess static buildup.
- **Use an anti-static pad:** When configuring any circuit board, place it on an anti-static mat.
- **Only handle the edges of the PCB:** Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the AC-KIT-888HD is unpacked, please do the following:

- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

2.3 Packing List



NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the AC-KIT-888HD was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

The AC-KIT-888HD is shipped with the following components:

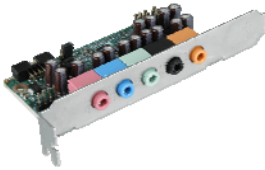



Quantity	Item and Part Number	Image
1	AC-KIT-888HD audio module c/w slot bracket	
1	Audio cable (P/N: 32100-121100-RS)	
1	Utility CD	
1	Quick Installation Guide	

Table 2-1: Packing List

Chapter

3

Connectors

3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

3.1.1 AC-KIT-888HD Layout

The figures below show all the connectors and jumpers.

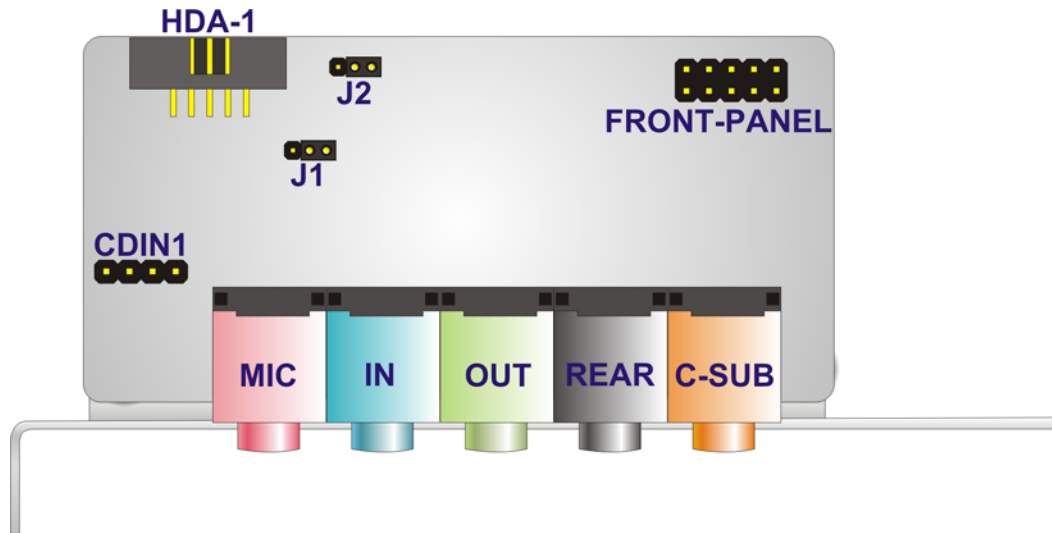


Figure 3-1: Connectors and Jumpers

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
Audio connector	10-pin box header	HDA-1
CD In connector	4-pin header	CDIN1
Front panel connector	10-pin header	FRONT-PANEL

Table 3-1: Peripheral Interface Connectors

AC-KIT-888HD Audio Module

3.1.3 Audio Connector

- CN Label:** HDA-1
- CN Type:** 10-pin box header (2x5)
- CN Location:** See **Figure 3-2**
- CN Pinouts:** See **Table 3-2**

Use the audio connector to connect the module to a motherboard audio connector.



Figure 3-2: Audio Connector Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	HDA_SYNC	2	HDA_BITCLK
3	HDA_SDOOUT	4	HDA_PCBEOP
5	HDA_SDIN	6	HDA_RST#
7	HDA_VCC	8	HDA_GND
9	HDA_+12V	10	HDA_GND

Table 3-2: Audio Connector Pinouts

3.1.4 CD In Connector

- CN Label:** CDIN1
- CN Type:** 4-pin header (1x4)
- CN Location:** See **Figure 3-3**
- CN Pinouts:** See **Table 3-3**

Use the CD in connector to connect the module to a CD player.

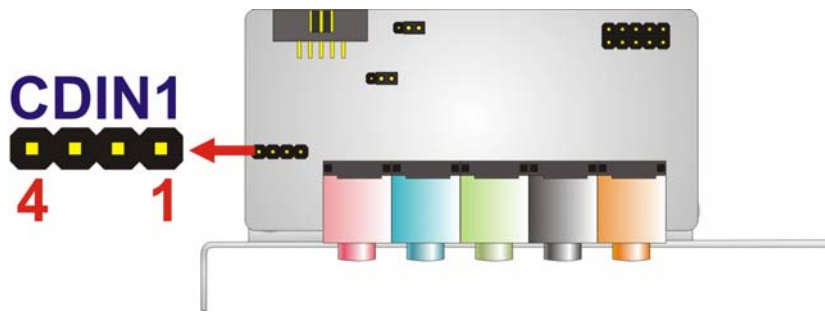


Figure 3-3: CD In Connector Location

PIN	DESCRIPTION
1	CD IN LEFT
2	CD-GND
3	CD-GND
4	CD IN RIGHT

Table 3-3: CD In Connector Pinouts

AC-KIT-888HD Audio Module

3.1.5 Front Panel Connector

CN Label:	FRONT-PANEL
CN Type:	10-pin header (2x5)
CN Location:	See Figure 3-4
CN Pinouts:	See Table 3-4



NOTE:

Do not connect the front panel connector to the any motherboard or chassis connectors.

The front panel connector is used to connect the module to IEI's optional **IO-KIT-MULTI-ST** audio module to enable multi-streaming audio.



Figure 3-4: Front Panel Connector Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	MIC2_LEFT	2	GND
3	MIC2_RIGHT	4	Presence
5	LINE_2_RIGHT	6	MIC2-JD
7	Sense	8	Key
9	LINE2_LEFT	10	LINE2-JD

Table 3-4: Front Panel Connector Pinouts

3.2 External Peripheral Interface Connectors

The table below lists the external peripheral interface connectors on the AC-KIT-888HD audio module and their functions.






Connector	Type	Label	Functions
 Orange	Audio jack	C-SUB	Center/Subwoofer Out (Default), Line-in, Front-out, Rear-out and Side-out
 Black	Audio jack	REAR	Rear-out (Default), Mic-in, Line-in, Center/Subwoofer Out, Front-out and Side-out
 Pink	Audio jack	MIC	Mic-in (Default), Line-in and Front-out, Center/Subwoofer Out, Side-out and Rear-out
 Blue	Audio jack	IN	Line-in (Default), Mic-in, Front-out, Center/Subwoofer Out, Side-out and Rear-out
 Green	Audio jack	OUT	Front-out (Default), Line-in, Rear-out, Center/Subwoofer Out and Side-out

Table 3-5: External Peripheral Interface Connectors

Chapter

4

Installation

4.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the AC-KIT-888HD may result in permanent damage to the AC-KIT-888HD and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the AC-KIT-888HD. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the AC-KIT-888HD or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- **Wear an anti-static wristband:** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- **Self-grounding:** - Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- **Use an anti-static pad:** When configuring the AC-KIT-888HD, place it on an anti-static pad. This reduces the possibility of ESD damaging the AC-KIT-888HD.
- **Only handle the edges of the PCB:-:** When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations



NOTE:

The following installation notices and installation considerations should be read and understood before installation. All installation notices must be strictly adhered to. Failing to adhere to these precautions may lead to severe damage and injury to the person performing the installation.

AC-KIT-888HD Audio Module



WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
 - The user manual provides a complete description of the AC-KIT-888HD installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
 - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the AC-KIT-888HD on an antistatic pad:
 - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the AC-KIT-888HD off:
 - When working with the AC-KIT-888HD, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the AC-KIT-888HD **DO NOT**:

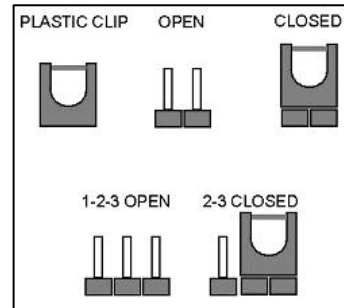
- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.3 Jumper Settings



NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.



The hardware jumpers must be set before installation. Jumpers are shown in **Table 4-1**.

Description	Label	Type
AVDD power-on select	J1	3-pin header
DVDD power-on select	J2	3-pin header

Table 4-1: Jumpers

AC-KIT-888HD Audio Module

4.3.1 AVDD Power-on Select Jumper

Jumper Label:	J1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-2
Jumper Location:	See Figure 4-1

This jumper allows the user to set the AVDD power for the audio module.

Setting	Description
Short 1-2	Select AVDD power by +5V
Short 2-3 (Default)	Select AVDD power by +12V to +5V

Table 4-2: AVDD Power-on Select Jumper Settings



Figure 4-1: AVDD Power-on Select Jumper Location

4.3.2 DVDD Power-on Select Jumper

Jumper Label:	J2
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-3
Jumper Location:	See Figure 4-2

This jumper allows the user to set the DVDD power for the audio module.

Setting	Description
Short 1-2	Select DVDD power by +1.5V
Short 2-3 (Default)	Select DVDD power by +3V

Table 4-3: DVDD Power-on Select Jumper Settings

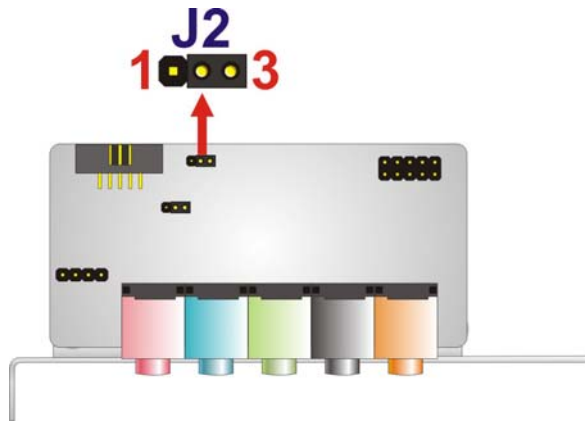


Figure 4-2: DVDD Power-on Select Jumper Location

4.4 Chassis Installation

Follow the steps below to install the AC-KIT-888HD audio module into a chassis.

- Step 1:** Turn off and disconnect the system from all power sources.
- Step 2:** Open the chassis to expose the rear panel slots.
- Step 3:** Remove the slot cover bracket from an unused slot on the chassis rear panel by removing its retention screw.

AC-KIT-888HD Audio Module

- Step 4:** Insert the AC-KIT-888HD audio module into the unused slot.
- Step 5:** Secure the AC-KIT-888HD audio module to the chassis with the previously removed retention screw.
- Step 6:** Find the audio cable that came with the AC-KIT-888HD audio module.
- Step 7:** Connect one end of the audio cable to the HDA-1 box header connector on the AC-KIT-888HD audio module.
- Step 8:** Connect the other end of the audio cable to the ten-pin audio connector on the system motherboard (see **Figure 4-3**).

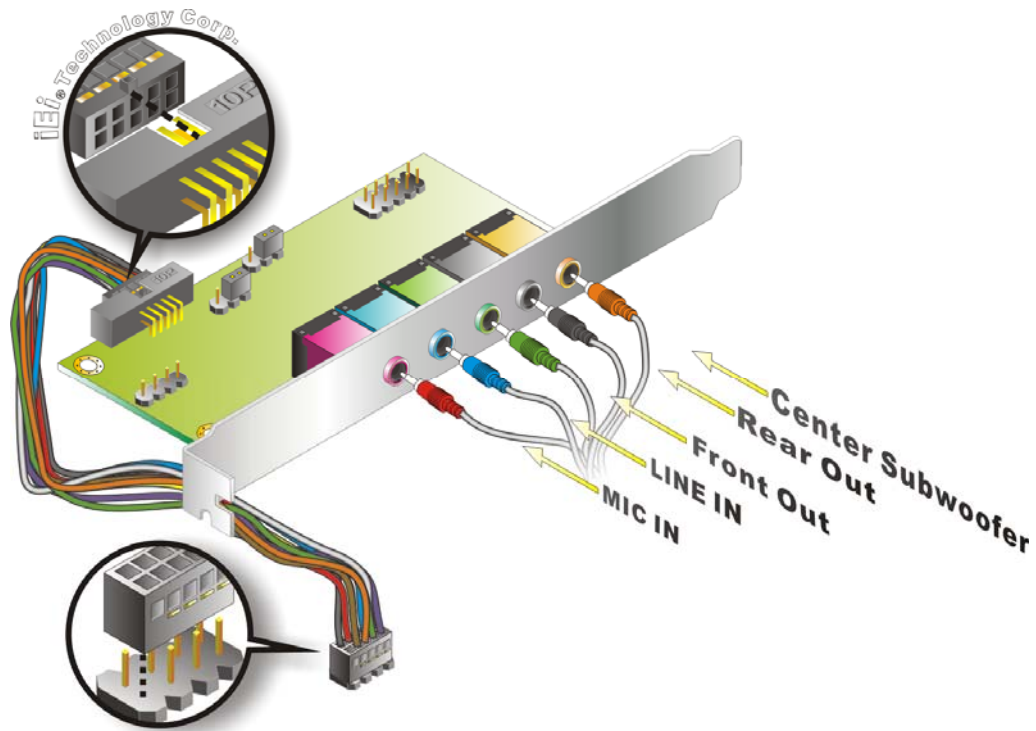


Figure 4-3: Connect Audio Module to Motherboard

Step 9: If applicable, connect the system CD drive to the CDIN1 4-pin header on the AC-KIT-888HD audio module (see **Figure 4-4**).

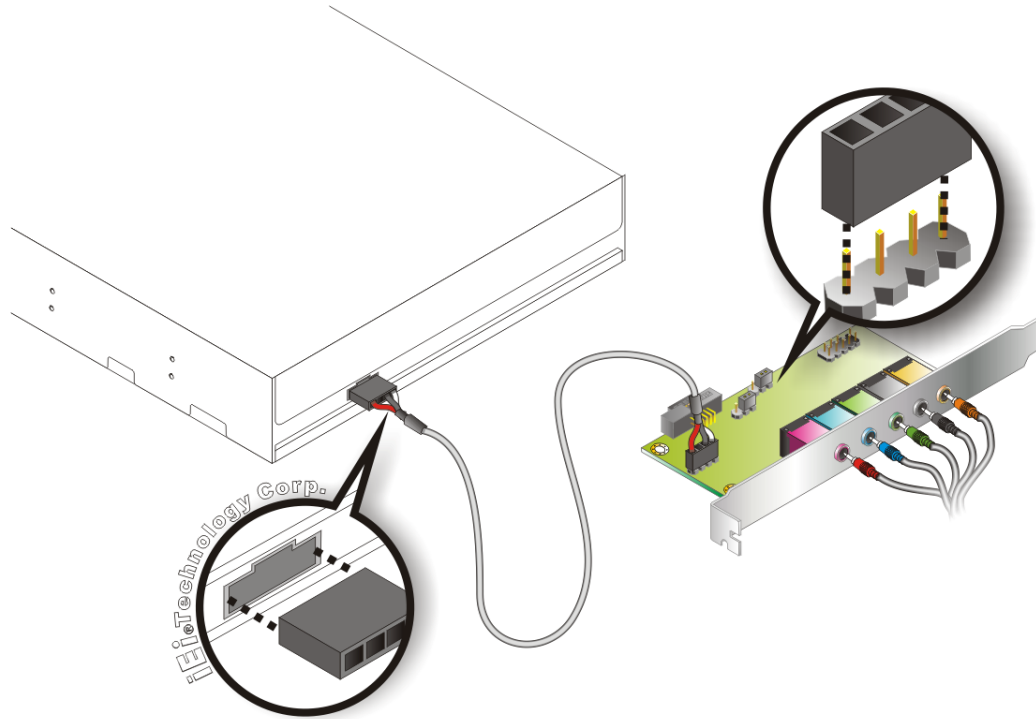


Figure 4-4: Connect Audio Module to CD

Step 10: Close the chassis, reconnect the power and turn on the system.

4.5 RealTek HD Audio Driver (ALC888) Installation

To install the Realtek High Definition (HD) Audio driver, please follow the steps below.

- Step 1:** Open Windows Control Panel.
- Step 2:** Double click the **System** icon.
- Step 3:** Double click the **Device Manager** tab.
- Step 4:** Double click the listed device that has question marks next to it. (This means Windows does not recognize the device).
- Step 5:** The **Device Driver Wizard** appears. Click **Next** to continue.
- Step 6:** Select “**Specify a Location**” in the **Locate Driver Files** window. Click **NEXT** to continue.
- Step 7:** Select “**X:\4-AUDIO\AC-KIT888HD\WIN**” directory in the location browsing window, where “**X:**” is the system CD drive.
- Step 8:** Click **OK** to continue. The driver is installed.
- Step 9:** A confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

Chapter

5

7.1 Surround Sound Configuration

AC-KIT-888HD Audio Module

5.1 Introduction

The AC-KIT-888HD audio module utilizes a Realtek ALC888 high definition audio chip and driver to achieve full 7.1 surround sound functionality.

5.2 Driver Installation

The following configuration assumes a Realtek ALC888 high definition audio driver has already been installed on the system. If a Realtek ALC888 high definition audio driver has not been installed on the system, please refer to **Section 4.5**.

5.3 7.1 Surround Sound Configuration

5.3.1 Accessing the Sound Effects Manager

Follow the steps below to access the Realtek ALC888 **Sound Effects Manager**.

Step 1: Click either:

- The Sound Effect Manager icon in the Notification Area of the system task bar (**Figure 5-1**), or
- The Sound Effect Manager icon in the Control Panel.



Figure 5-1: Sound Effect Manager Icon [Task Bar]

Step 2: The sound effect manager appears (Figure 5-2).



Figure 5-2: Sound Effects Manager (ALC888)

AC-KIT-888HD Audio Module

5.3.2 7.1 Surround Sound Setup

Follow the steps below to set up the **Sound Effects Manager** for 7.1 surround sound.

Step 1: Click the **Audio I/O** tab.

Step 2: From the dropdown list box, select **8CH Speaker** (Figure 5-3).



Figure 5-3: 8 Channel Speaker Option

Step 3: The following screen appears (**Figure 5-4**) showing the 7.1 surround sound speaker layout.



Figure 5-4: 7.1 Surround Sound Speaker Layout

5.3.3 Connect Devices to the Audio Module

The AC-KIT-888HD audio module has the ability to auto-detect devices plugged into the jacks. Also, each jack supports multiple kinds of input and output devices. Therefore, it is not always critical to note which kind of device should be plugged into any given jack.



NOTE:

Green and orange colored jacks do not support microphone functionality.

AC-KIT-888HD Audio Module

This section describes only one of many possible device configuration options to simulate the surround sound functionality of the audio module. Follow the steps below to connect devices to the audio module for surround sound.

Step 1: Connect the front speakers of a 7.1 surround sound system to the green audio jack of the AC-KIT-888HD audio module.

Step 2: The following screen appears (**Figure 5-5**) requesting identification of what was plugged into the jack.



Figure 5-5: Connected Device Screen

Step 3: Select **Front Speaker Out** as the device type and click **OK**.

Step 4: The following screen appears (**Figure 5-6**). In the **Analog Back Panel** section, there are left and right speaker icons with a green arrow pointing to the green jack icon. This indicates that speakers have been plugged into the green jack.



Figure 5-6: Front Speakers as Front Speaker Out



NOTE:

The jack icons in the **Front Panel** section of **Figure 5-6** are identified with other jacks when using multi-streaming audio channels.

Step 5: Connect the side speakers of a 7.1 surround sound system to the blue audio jack of the AC-KIT-888HD audio module and select **Side Speaker Out** (see **Figure 5-5**) as the device type and click **OK**.

AC-KIT-888HD Audio Module

Step 6: The following screen appears (**Figure 5-7**). In the **Analog Back Panel** section, there are left and right speaker icons with a blue arrow pointing to the blue jack icon. This indicates that speakers have been plugged into the blue jack.



Figure 5-7: Side Speakers as Side Speaker Out

Step 7: Connect the rear speakers of a 7.1 surround sound system to the black audio jack of the AC-KIT-888HD audio module and select **Rear Speaker Out** (see **Figure 5-5**) as the device type and click **OK**.

Step 8: The following screen appears (**Figure 5-8**). In the **Analog Back Panel** section, there are left and right speaker icons with a black arrow pointing to the black jack icon. This indicates that speakers have been plugged into the black jack.



Figure 5-8: Rear Speakers as Rear Speaker Out

Step 9: Connect the center speakers of a 7.1 surround sound system to the orange audio jack of the AC-KIT-888HD audio module and select **Center/Subwoofer Speaker Out** (see **Figure 5-5**) as the device type and click **OK**.

AC-KIT-888HD Audio Module

Step 10: The following screen appears (**Figure 5-9**). In the **Analog Back Panel** section, there are center/subwoofer speaker icons with an orange arrow pointing to the orange jack icon. This indicates that speakers have been plugged into the orange jack.



Figure 5-9: Center/Subwoofer Speakers as Center/Subwoofer Speaker Out

5.3.4 Testing Speaker Configuration

Follow the steps below to test that the speakers have been connected to the audio module and configured correctly.

- Step 1:** Click any speaker icon in the picture on the left of the Audio I/O tab. The driver generates a sound through the corresponding speaker connected to the audio module.
- Step 2:** Check the jack plug connections and speaker configurations if the speaker icon does not match the actual speaker.

Appendix

A

Hazardous Materials Disclosure

A.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

AC-KIT-888HD Audio Module

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

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)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。
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/T11363-2006 标准规定的限量要求。