

CREATIVE

CREATIVE TECHNOLOGY LTD

Sound Blaster[®] X-Fi[™]

Audio Card Model SB0770 / SB0772

Datasheet

Revision 1.2
July 2007

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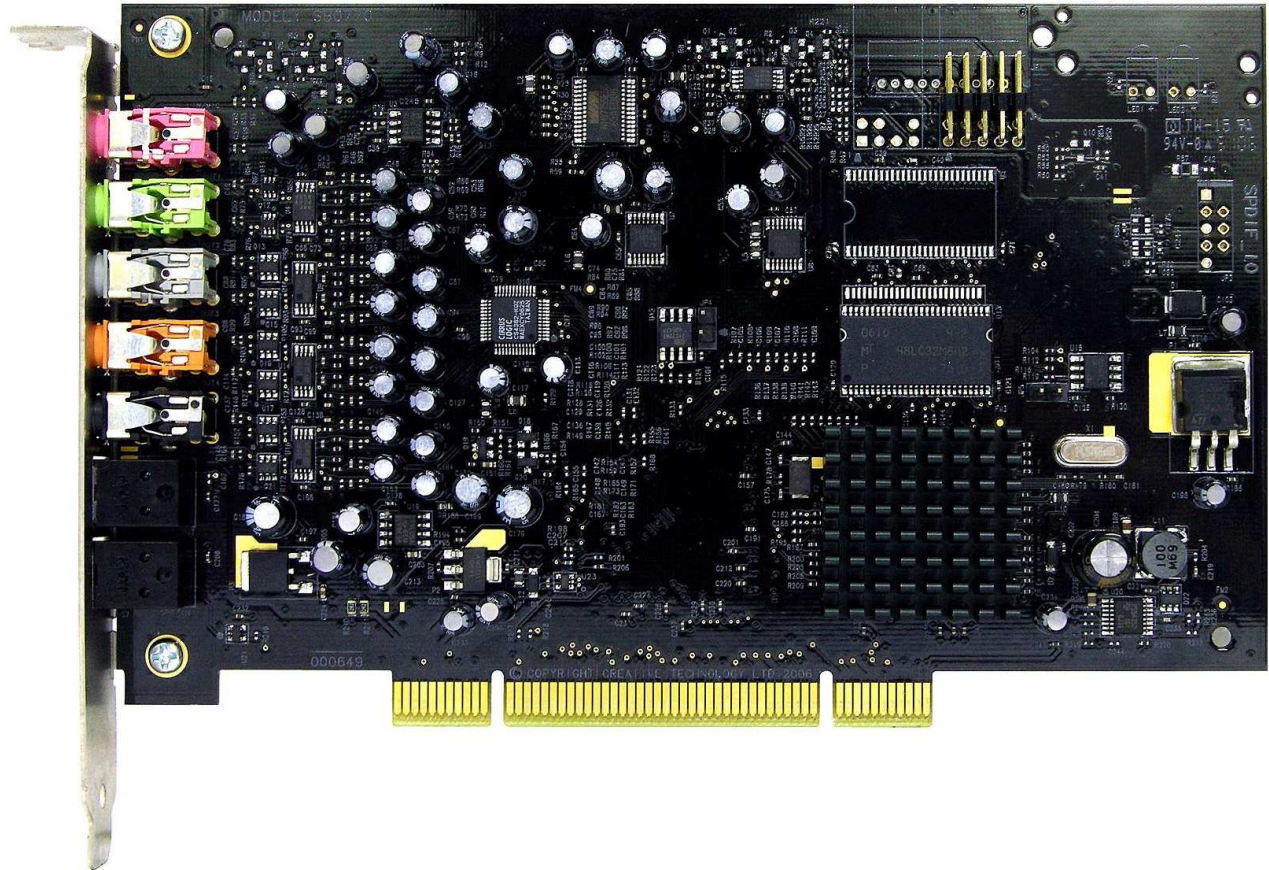


Figure1: SB X-Fi Audio Card

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Introduction

Creative Labs has a long heritage of providing top quality and leading edge audio solutions to the mass PC population with the Sound Blaster® range of both internal and external sound cards and devices.

It all began in 1981 with the founding of Creative Labs, although it would be another eight years before the Sound Blaster® card would be born. There have been many cards along the way; the Sound Blaster® 16 exploded onto the market and with the Sound Blaster® AWE32 everyone realized that a sound card could not only make “sounds” but also music. The Sound Blaster® Live! was a major leap forward bringing multi-channel audio and immense processing power to the audio platform and the Sound Blaster® Audigy® added more power and EAX® ADVANCED HD™ effects while also providing a quality of audio never experienced before.

Along the way Creative has reached out to a whole new audience with our USB Sound Blaster and PCMCIA Sound Blaster range of products. Now comes a truly revolutionary new product. It’s so revolutionary that the only comparison we have in terms of the leap forward being made is with Sound Blaster Live! back in 1998!

The Creative X-Fi processor is a truly revolutionary platform that delivers the new “Xtreme Fidelity” audio standard. It is revolutionary because of the raw power that it delivers (over 10,000 MIPS) generated from more than 51 million transistors! This is the equivalent to running 24 Sound Blaster Audigy cards in your PC all parallel processing audio! This incredible power allows us to deliver the Xtreme Fidelity audio standard, which unlike any other standard does not require you to do anything different than before or buy any new content. Sound Blaster X-Fi Fatal1ty Platinum as a revolutionary platform therefore delivers a whole host of revolutionary new features.

SB0770 is a new iteration of PCI Sound Blaster X-Fi that is designed to meet new requirement of Windows Vista. A new ASIC chip CA0112 is developed to meet the Microsoft Universal Audio Architecture (UAA)

initiative. With UAA compliant hardware, the product is able to “just work” (basic feature) with the class driver provided by the operating system.

SB0770 Configurations

The SB0770 is fully configurable as a professional quality audio product. The features shown in the table below are described in detail in the section as below. The SB0770 is basically available in the following configurations:

METAL BRACKET CONNECTORS	
LINE_IN/MIC_IN	3.5mm Stereo ✓Colour: Pink
LINE_OUT 1	3.5mm stereo ✓Colour: Lime
LINE_OUT 2	3.5mm Stereo ✓Colour: Grey
LINE_OUT 3	3.5mm Stereo ✓Colour: Light Orange
LINE_OUT 4	3.5mm Stereo ✓Colour: Black
Optical Out	Conventional Toslink Black housing, Grey shutter
Optical In	Conventional Toslink Black housing, Black shutter

ON BOARD HEADERS / CONNECTORS

HDAudio_FP	2x5 header
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System Requirements

In order to install the SB0770, the target system has to meet the following minimum requirements:

Creative Sound Blaster X-Fi card

Basic:

- Modern Mid to High end Processor from Intel and AMD.
- RAM – 512MB
- DVD-ROM Drive

OS supported:

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- Windows Vista 32-bit and 64-bit version.
- Windows XP 32-bit, 64-bit and Media Center Edition' version

protected digital audio content authored with DRM (Digital Rights Management) technology

- ASIO 2.0 with direct monitoring
- Accelerated ASIO for ultra low latency
- Enhanced SoundFont support of up to 24-bit resolution

SB0770 Features

PCI Bus Mastering

- PCI Specification up to Version 2.3 compliant
- Bus mastering reduces latency and speeds up system performance

Sound Blaster X-Fi Audio Processor

- Advanced hardware accelerated digital effects processing
- All new dedicated DSP capable of both time and frequency domain audio processing
- 128 3D voices with advanced 3D positional audio rendering algorithms
- Professional quality digital mixing and equalization maintaining 24-bit accuracy
- User-selectable Master Sampling Rate for bit-matched professional audio applications
- Ultra-high quality sample rate conversion for gaming and professional audio applications

Professional Digital Audio Processing

- 24-bit Analog-to-Digital conversion of analog inputs at 96 kHz sample rate
- 24-bit Digital-to-Analog conversion of digital sources at 96 kHz to analog 7.1 speaker output
- 24-bit Digital-to-Analog conversion of stereo digital sources at 192 kHz to stereo output
- 16-bit to 24-bit recording sampling rates: 8, 11.025, 16, 22.05, 24, 32, 44.1, 48 and 96 kHz
- ASIO 2.0 support at 16-bit/44.1kHz, 16-bit/48kHz, 24-bit/44.1kHz 24-bit/48kHz and 24-bit/96kHz
- Supports Sony/Philips Digital Interface (SPDIF) format of up to 24-bit/96 kHz quality
- SPDIF output at selectable sampling rate of 44.1, 48 or 96 kHz
- SPDIF output not available during playback of

Flexible Mixer Control

- Selectable input source or mixing of various audio sources for recording
- Adjustable master volume control
- Separate bass and treble control
- Front and rear balance control
- Muting, soloing and panning control for mixer sources

Mode Selector Control

- Three exclusive working modes (Entertainment Mode, Audio Creation Mode and Game Mode), optimized to perform key tasks within each category of usage

Entertainment Mode

For the digital music lover or the movie buff, this is the place to be – a one-stop console for experiencing extreme fidelity music and movie playback.

Audio Creation Mode

This mode offers Extreme Flexibility in a studio-style environment with powerful aux/insert effects routing and mixing.

Gaming Mode

Without a doubt, this is where a gamer's wildest fantasy comes true. Full-power gaming, extreme acceleration plus advanced 3D audio features

Creative MultiSpeaker Surround (CMSS)

- CMSS-3DSurround: Upmixes mono or stereo sources to 4, 5.1 or 7.1 channels

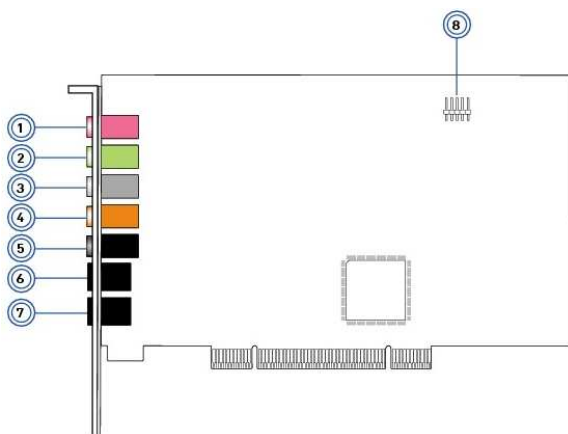
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- CMSS-3DHeadphone: Provides a multichannel playback experience over headphones for all types of content
- CMSS-3DVirtual: Provides a multichannel playback experience over two loudspeakers for all types of content
- CMSS-3DInteractive: Delivers multichannel 3D audio positioning for 3D games. Works in conjunction with CMSS-3DHeadphone and CMSS-3DVirtual to provide advanced 3D positional audio over headphones and two or four loudspeakers

THX Certification

- Sound Blaster X-Fi has received the prestigious THX Multimedia Certification award, making it the perfect choice for PC audiophiles seeking the very best music and movie experiences.

SB0770 Connections and Jumpers



The board consists of the following headers and connectors that support the connection of internal devices or hardware configuration changes:

FRONT_PANEL HDAudio_FP (8)

PIN ASSIGNMENTS		
PIN	SIGNAL	I/O
1	FP_MICIN	IN
2	GND	-
3	FP_VREFOUT	OUT
4	FP_DETECT	IN
5	FP_HPOUT_R	OUT
6	BP_MUTE_MIC	IN
7	GND	-
8	NC	-
9	FP_HPOUT_L	OUT
10	FP_HP_DETECT	IN

LINE_IN /MIC_IN Jack (1)

- ◆ Supports Microphone-In and Line-In connections. Connect one of the following to this jack:
 - ◆ analog devices like cassette players and other line-level sources
 - ◆ a dynamic or low-powered electret microphone

PIN	ANALOG OUT
1 (Tip)	Line-in(L) mux Mic-in
2 (Ring)	Line-in(R) mux Mic bias
3 (Sleeve)	Ground

LINE_OUT 1 Stereo jack (2)

- ◆ Connects to Front Left and Front Right inputs on powered analog speakers or an external amplifier for audio output.

PIN	ANALOG OUT
1 (Tip)	Front Left
2 (Ring)	Front Right
3 (Sleeve)	Gnd

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LINE_OUT 2 Stereo jack (3)

- ◆ Connects to Side Left, Side Right inputs on powered analog speakers or an external amplifier for audio output.

PIN	ANALOG OUT
1 (Tip)	Side Left
2 (Ring)	Side Right
3 (Sleeve)	Gnd

LINE_OUT 3 Stereo jack (4)

- ◆ Connects to Front Center, Subwoofer inputs on powered analog speakers, or an external amplifier for audio output.

PIN	ANALOG OUT
1 (Tip)	Center
2 (Ring)	Subwoofer
3 (Sleeve 1)	Gnd

LINE_OUT 4 Stereo jack (5)

- ◆ Connects to Rear Left, Rear Right inputs on powered analog speakers or an external amplifier for audio output.

PIN	ANALOG OUT
1 (Tip)	Rear Left
2 (Ring)	Rear Right
3 (Sleeve)	Gnd

Optical Out Jack (6)

- Connect your recording devices with optical connectors (for example, MiniDisc recorders, digital audio tape recorders or external hard disk recorders) to this jack

Optical In jack (7)

- Connect playback devices with optical connectors (for example, MiniDisc players, Digital Audio Tape players or DVD players) to this jack.

Analog Performance (Typical Values)

Reference signal is set at 1kHz
All the measurements are done at 24 bit 96KHz

sampling frequency.

Record & Playback Sampling Rates

Recording:	8.0	kHz
	11.025	kHz
	16.0	kHz
	22.05	kHz
	24.0	kHz
	32.0	kHz
	44.1	kHz
	48.0	kHz
	96.0	kHz
Playback:	Any arbitrary sampling rate <= 192kHz	
Line_In Full Scale Input	2.0	Vrms
Line_Out Full Scale Output	2.0	Vrms
Microphone Full Scale Input (without 20dB boost)	0.2	Vrms
Microphone Input Impedance	> 4.0K	ohms
Line_In Impedance	10K	ohms

WAVE - LINE_OUT @ 2V_{rms}, 1kHz

(Measured with bandlimited filter from 22Hz to 22kHz, A-Wtg Filter; 20kHz lowpass filter)

Signal To Noise Ratio (SNR)	109 (typ)	dB.
Total Harmonic Distortion + Noise (THD+N)	0.004 (typ.)	%

Power Consumption (typ.)

Vcc, nominal current	900	mA
+12V, nominal current	200	mA
-12V, nominal current	50	mA

Resolution

ADC & DAC	24	Bits
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Temperature Range

Operating	10 °C to 50 °C
Non-Operating	-40 °C to 65 °C

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