## **DATA SHEET**

**SN11116** 

**USB Six Channel Audio Controller** 

**Revision 1.0** 

Copyright ©2004, Sonix Technology Co., Ltd. All rights reserved.





#### 1. Description

**SONiX** SN11116 is an 6 channel USB audio controller. It supports 32KHz, 44.1KHz (which two need driver or application software support) and 48KHz sampling rate in digital recording; 48 KHz sampling in analog recording; and 48KHz in digital/analog audio playback. It is suitable on the application of low cost home theater applications. With AC3 convey on SPDIF capability, it can provide true 6 channel of AC3/DTS sounds from PC. With the capability to interface with remote control MCU, the system built by SN11116 can control the software on PC like PowerDVD or WinDVD via a remote controller (Sonix software might be required), turning the PC into a multimedia center.

In digital playback mode, it receives audio stream from PC via USB interface and transmits audio data according to the AES/EBU, IEC60958, S/PDIF consumer interface standards. Only R, L channel PCM audio in 5.1 channel can be conveyed, but it can transmit AC-3 data streams to AC-3 decoder to get 5.1 channel audio. In analog playback mode, it supports 6 channels Codec for analog playback.

In digital recording mode, it receives S/PDIF digital audio input and sends back to PC through USB. Three sampling rates; includes 32 KHz, 44.1 KHz and 48 KHz; are automatically locked internally. In analog recording mode, fixed 48 KHz sampling rate is supported by analog audio recording.

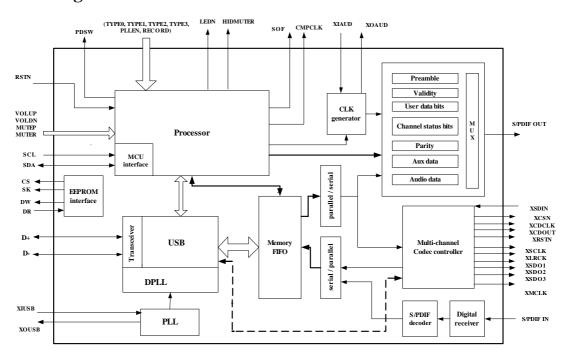
Totally one control pipe, two isochronous pipes, and one interrupt pipe are supported by SN11116.

#### 2. Ordering information

SN11116F: 64-pin LQFP (10x10x1.4 mm)



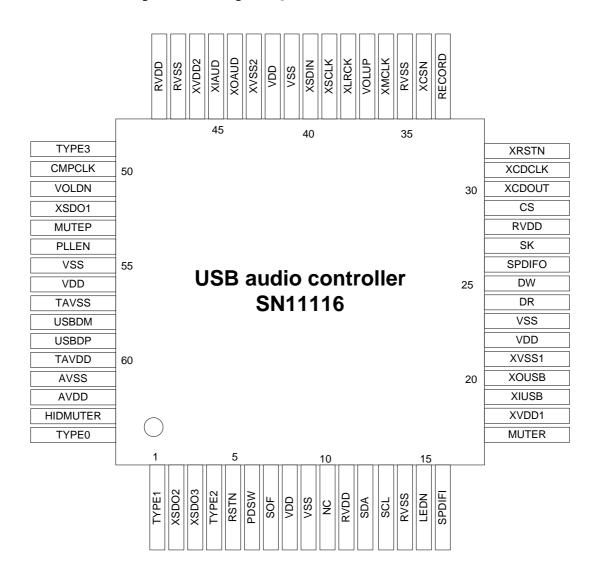
#### 3. Block diagram





#### 4. Pin description

#### **4.1** SN11116 pin chart (64-pin LQFP)



#### 4.2 pin assignment and description (64-pin LQFP)

Pin No.	Pin Name	Pin Type	Description
1	TYPE1	I, ST	Product type setting pin1
2	XSDO2	O, 4mA, SR	6 channel Codec serial data 2
3	XSDO3	O, 4mA, SR	6 channel Codec serial data 3
4	TYPE2	I, ST	Product type setting pin2



## **USB Six Channel Audio Controller**

5	RSTN	I, ST, PU	System reset pin, pull low to reset	
6	PDSW	O, 4mA, SR	Power down switch control 0: normal mode, 1: power down mode	
7	SOF	O, 4mA, SR	1	
8	VDD	P	USB SOF (Start of Frame) pin provides 1KHz signal	
9	VSS	P	Power pin Power pin	
10	NC	I I	1 ower pin	
11	RVDD	P	Power pin for pad	
12	SDA	I/O, 4mA, SR	Power pin for pad	
13	SCL	I, ST	Two wire serial port data pin for external MCU control	
14	RVSS	P	Two wire serial port clock pin for external MCU control	
15	LEDN		Power pin for pad	
		O, 8mA, SR	LED indicator pin, output low after power on reset, toggle during operation	
16	SPDIFI	I, ST	Input pin for SPDIF signal	
17	MUTER	I, ST	Recording mute, edge trigger with 64ms de-bouncing circuit	
18	XVDD1	P	Power pin for USB external crystal	
19	XIUSB	I	6 MHz clock osc pin for USB PLL	
20	XOUSB	0	6 MHz clock osc pin for USB PLL	
21	XVSS1	P	Power pin for USB external crystal	
22	VDD	P	Power pin	
23	VSS	P	Power pin	
24	DR	I, ST	EEPROM data input	
			Fixing this pin to H or L sets USB vendor ID to SONiX USB vendor ID (hex	
2.7		0 4 4 97	0C45); PU or PD is used for different product ID	
25	DW	O, 4mA, SR	EEPROM data output	
26	SPDIFO	O, 8mA, SR	SPDIF data output	
27	SK	O, 4mA, SR	EEPROM clock pin	
28	RVDD	P	Power pin for pad	
29	CS	O, 4mA, SR	EEPROM chip select	
30	XCDOUT	O, 4mA, SR	6 channel serial Codec control data	
31	XCDCLK	O, 4mA, SR	6 channel serial Codec control clock	
32	XRSTN	O, 4mA, SR	6 channel Codec reset	
33	RECORD	I, ST	Recording function enable (=1)	
34	XCSN	O, 4mA, SR	6 channel Codec chip select	
35	RVSS	P	Power pin for pad	
36	XMCLK	O, 8mA, SR	6 channel Codec master clock (12.288MHz)	
37	VOLUP	I, ST	Volume up control, edge trigger with 64ms de-bouncing circuit	
38	XLRCK	O, 4mA, SR	6 channel Codec L/R clock	
39	XSCLK	O, 4mA, SR	6 channel Codec serial clock (3.072 MHz)	
40	XSDIN	I, ST	6 channel Codec serial data input	
41	VSS	P	Power pin	
42	VDD	P	Power pin	
43	XVSS2	P	Power pin for external crystal	
44	XOAUD	O	12.288 MHz Crystal output	
45	XIAUD	I, ST	12.288 MHz Crystal input / connected to PLL VCO output	
46	YVDD2	D	Power pin for external existal	



### **USB Six Channel Audio Controller**

47	RVSS	P	Power pin for pad	
48	RVDD	P	Power pin for pad	
49	TYPE3	I, ST	Product type setting pin3	
50	CMPCLK	O, 4mA, SR	PLL comparator input	
51	VOLDN	I, ST	Volume down control, edge trigger with 64ms de-bouncing circuit	
52	XSDO1	O, 4mA, SR	6 channel Codec serial data 1	
53	MUTEP	I, ST	Playback mute control pin, edge trigger with 64ms de-bouncing circuit	
54	PLLEN	I, ST	Use PLL (=1) or Crystal at XIAUD pin	
55	VSS	P	Power pin	
56	VDD	P	Power pin	
57	TAVSS	P	Power pin for USB transceiver	
58	USBDM	I/O	USB data minus	
59	USBDP	I/O	USB data plus	
60	TAVDD	P	Power pin for USB transceiver	
61	AVSS	P	Power pin for PLL	
62	AVDD	P	Power pin for PLL	
63	HIDMUTER	O, 8mA, SR	Playback mute led indicator	
64	TYPE0	I, ST	Product type setting pin0	

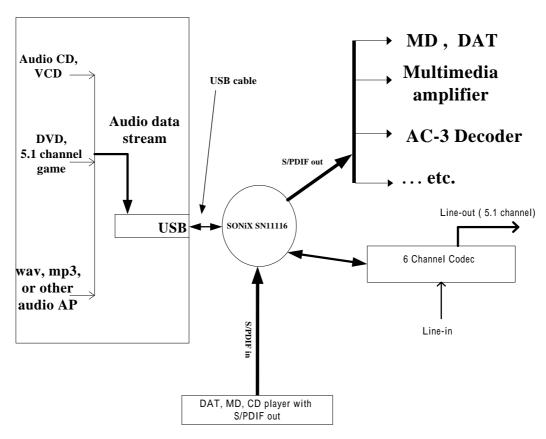
\*\* All input pin are 5 volt tolerance, TTL level and Schmitt trigger All output pins are slew rate control

 $I-input\ pin\ ,\ O-output\ pin\ ,\ P-power\ pin\ ,\ ST-Schmitt\ trigger\ ,\ SR-slew\ rate$  control,  $PU/PD-pull\ up\ or\ pull\ down$ 

## 5. Application example

#### 5.1 Application example

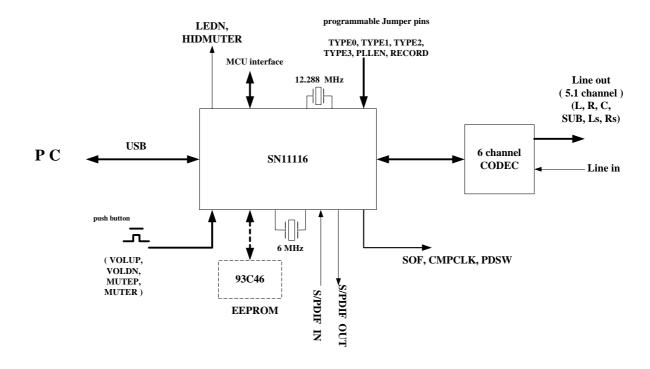
#### PC or NoteBook



#### 5.2 Brief application circuit chart



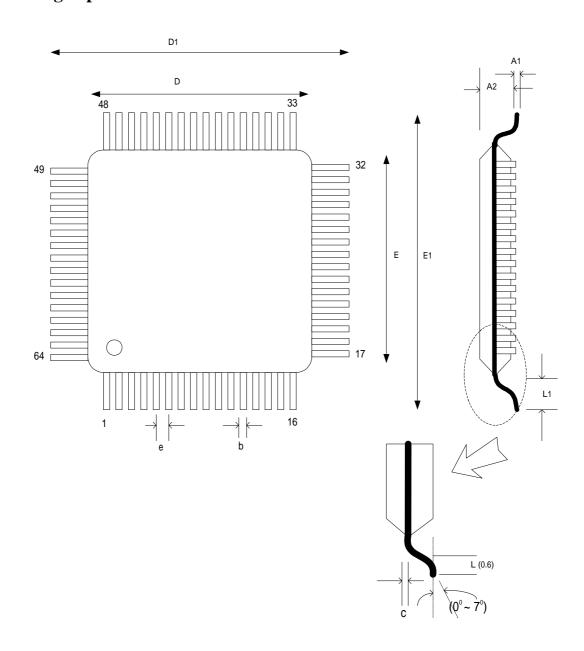
### **USB Six Channel Audio Controller**



<sup>\*</sup> detail application circuit is available by customer request



## 6. Package Specification



64-pin LQFP package

Lead Count	Body Size			
64	D	Е	D1	E1
	10.00	10.00	12.00	12.00



## **USB Six Channel Audio Controller**

Stand-off	Body Thk	Lead Length	Lead Width	Lead Thk	Lead Pitch
A1	A2	L1	b	С	e
0.10	1.40	1.00	0.24	0.125	0.50

Unit: mm



## Data Sheet

**SN11116** 

## **USB Six Channel Audio Controller**

## **Revision History**

Revision	Revision Date	Description of changes
Revision V1.0	March 19, 2003	Initial release.

SN11116



#### **USB Six Channel Audio Controller**

#### **DISCLAIMER**

The information appearing in this publication is believed to be accurate. However, this publication could contain technical inaccuracies or typographical errors. The reader should not assume that this publication is error-free or that it will be suitable for any particular purpose. SONiX makes no warranty, express, statutory implied or by description in this publication or other documents which are referenced by or linked to this publication.

In no event shall SONiX be liable for any special, incidental, indirect or consequential damages of any kind, or any damages whatsoever, including, without limitation, those resulting from loss of use, data or profits, whether or not advised of the possibility of damage, and on any theory of liability, arising out of or in connection with the use or performance of this publication or other documents which are referenced by or linked to this publication.

This publication was developed for products offered in Taiwan. SONiX may not offer the products discussed in this document in other countries. Information is subject to change without notice. Please contact SONiX or its local representative for information on offerings available. Integrated circuits sold by SONiX are covered by the warranty and patent indemnification provisions stipulated in the terms of sale only. The application circuits illustrated in this document are for reference purposes only. SONIX DISCLAIMS ALL WARRANTIES, INCLUDING THE WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PURPOSE. SONIX reserves the right to halt production or alter the specifications and prices, and discontinue marketing the Products listed at any time without notice. Accordingly, the reader is cautioned to verify that the data sheets and other information in this publication are current before placing orders.

Products described herein are intended for use in normal commercial applications. Applications involving unusual environmental or reliability requirements, e.g. military equipment or medical life support equipment, are specifically not recommended without additional processing by SONIX for such application.



#### **Contact Information**

#### Main Office

Address: 9F, No. 8 Lane 32, Hsien Chen 5<sup>th</sup> St. Chupei City,

Hsinchu, Taiwan R.O.C. Tel: 886-3-551 0520 Fax: 886-3-551 0523 Http://www.sonix.com.tw

#### Taipei Office

Address: 15F-2, No. 171, Song Ted Road, Taipei,

Taiwan R.O.C.

Tel: 886-2-2759 1980 Fax: 886-2-2759 8180

#### Hon Kong Office

Address: Flat 3 9/F Energy Plaza 92 Granville Road,

Tsimshatsui Ease Kowloon.

Tel: 852-2723 8086 Fax: 852-2723 9179