DATA SHEET

SN11116

USB Six Channel Audio Controller

Revision 1.0

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SONiX

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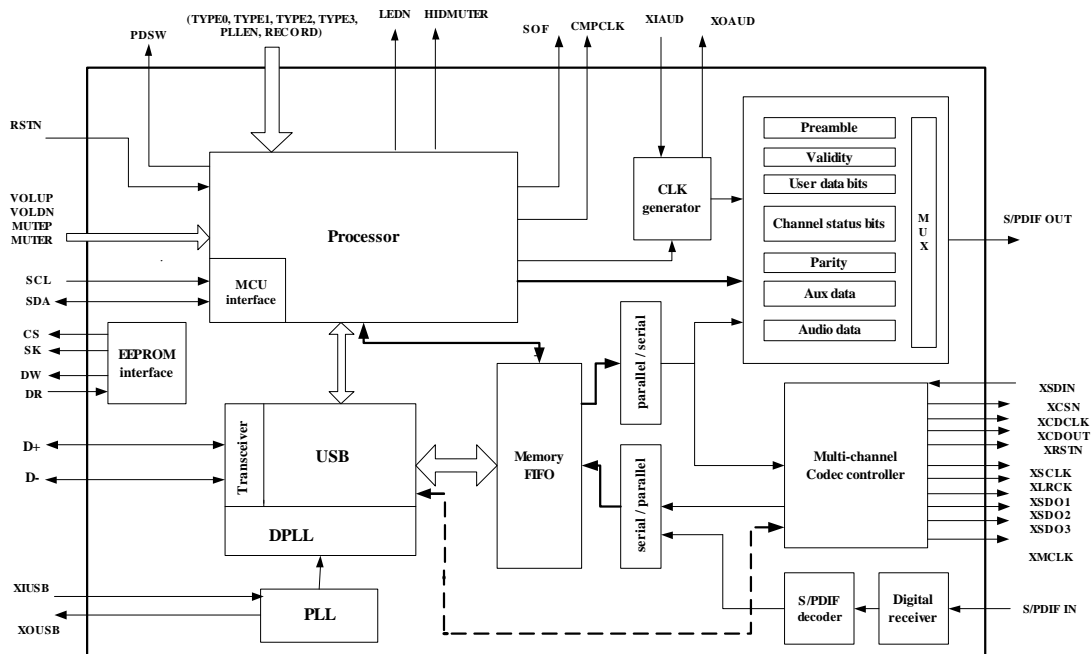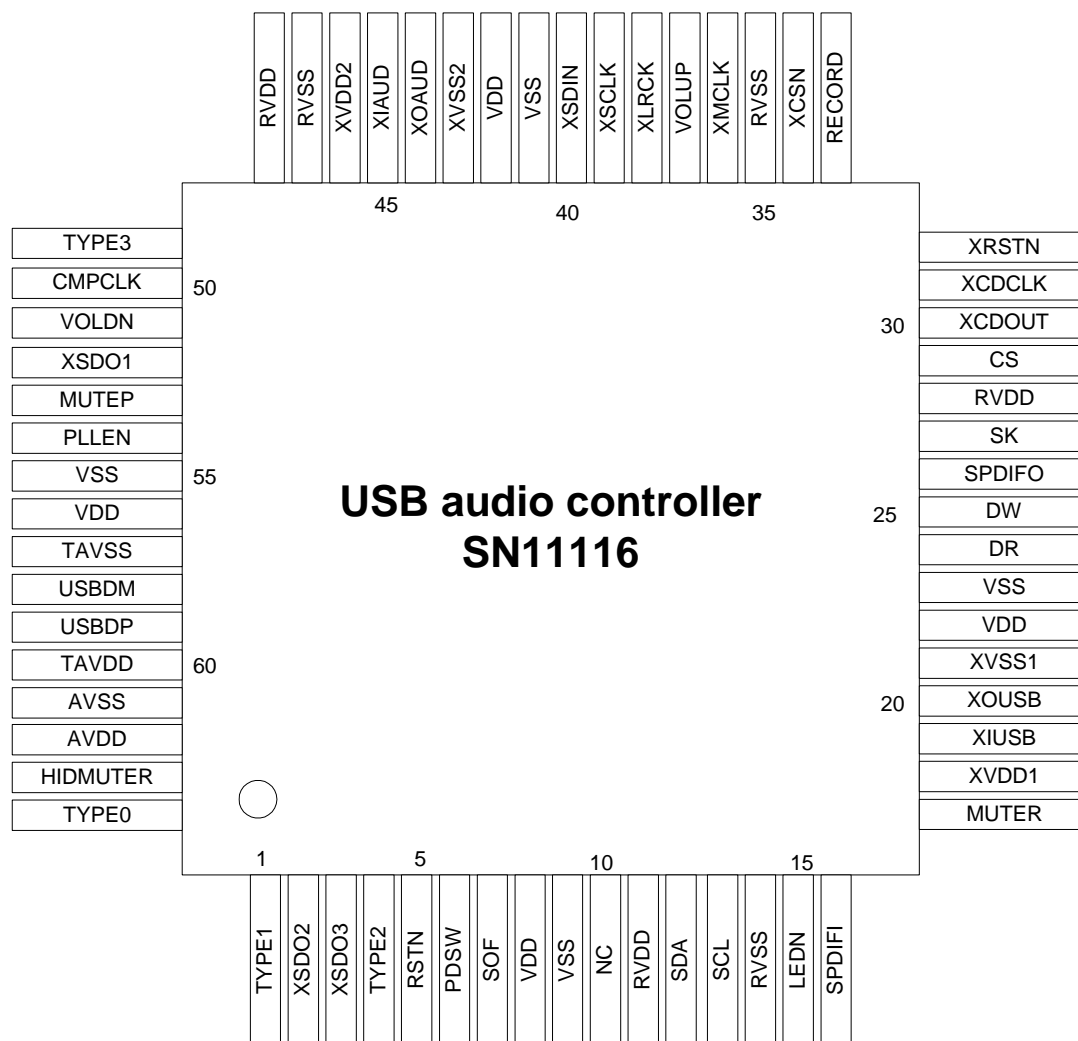SN11116F : 64-pin LQFP (10x10x1.4 mm)

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

3

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	USB SOF (Start of Frame) pin provides 1KHz signal
8	VDD	P	Power pin
9	VSS	P	Power pin
10	NC		
11	RVDD	P	Power pin for pad
12	SDA	I/O, 4mA, SR	Two wire serial port data pin for external MCU control
13	SCL	I, ST	Two wire serial port clock pin for external MCU control
14	RVSS	P	Power pin for pad
15	LEDN	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	O	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 $0C45$); 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	XVDD2	P	Power pin for external crystal

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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

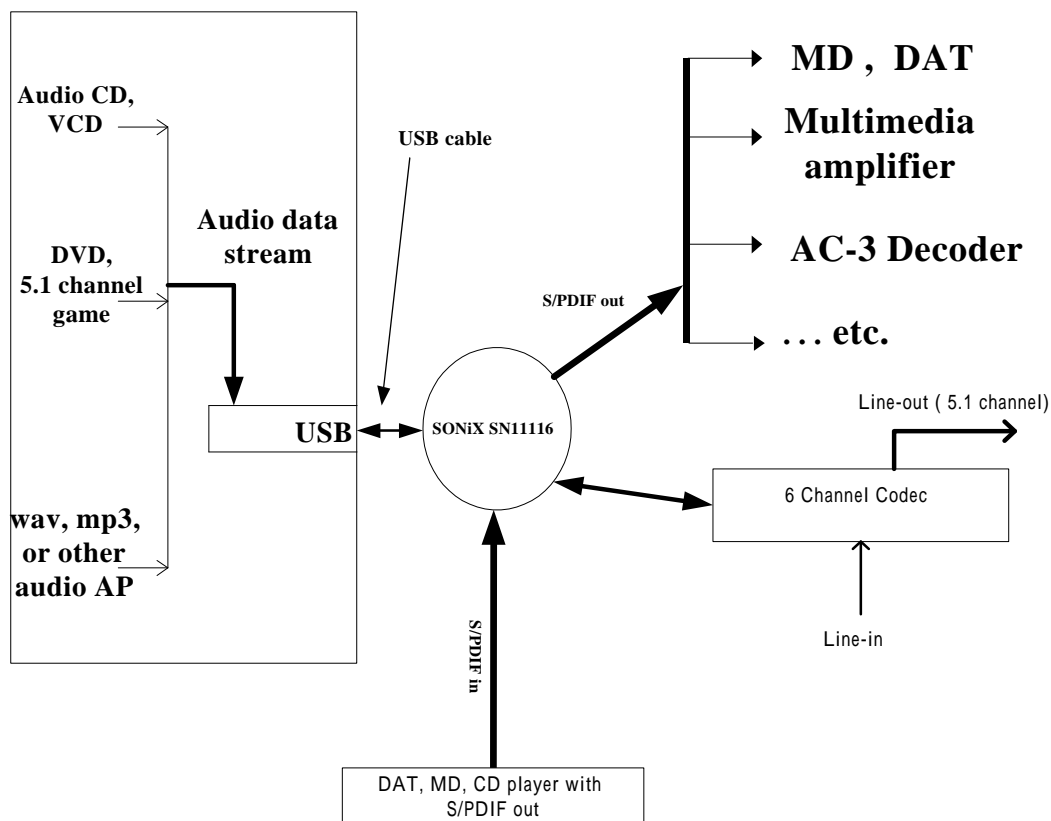** All input pin are 5 volt tolerance, TTL level and Schmitt trigger

   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
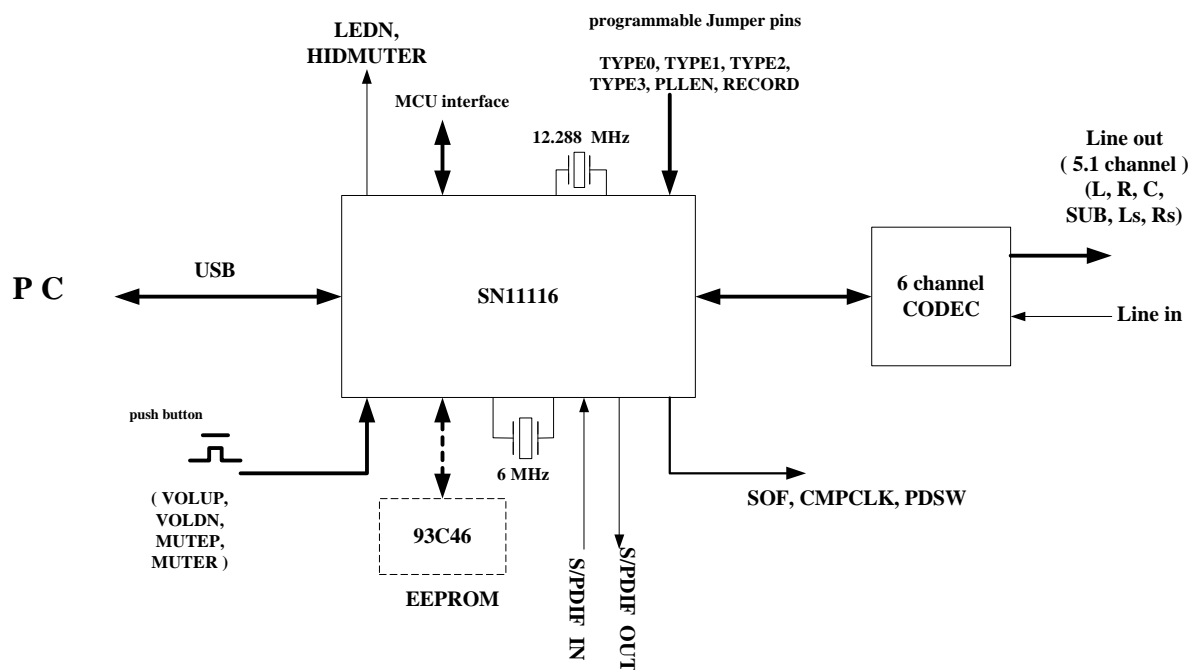
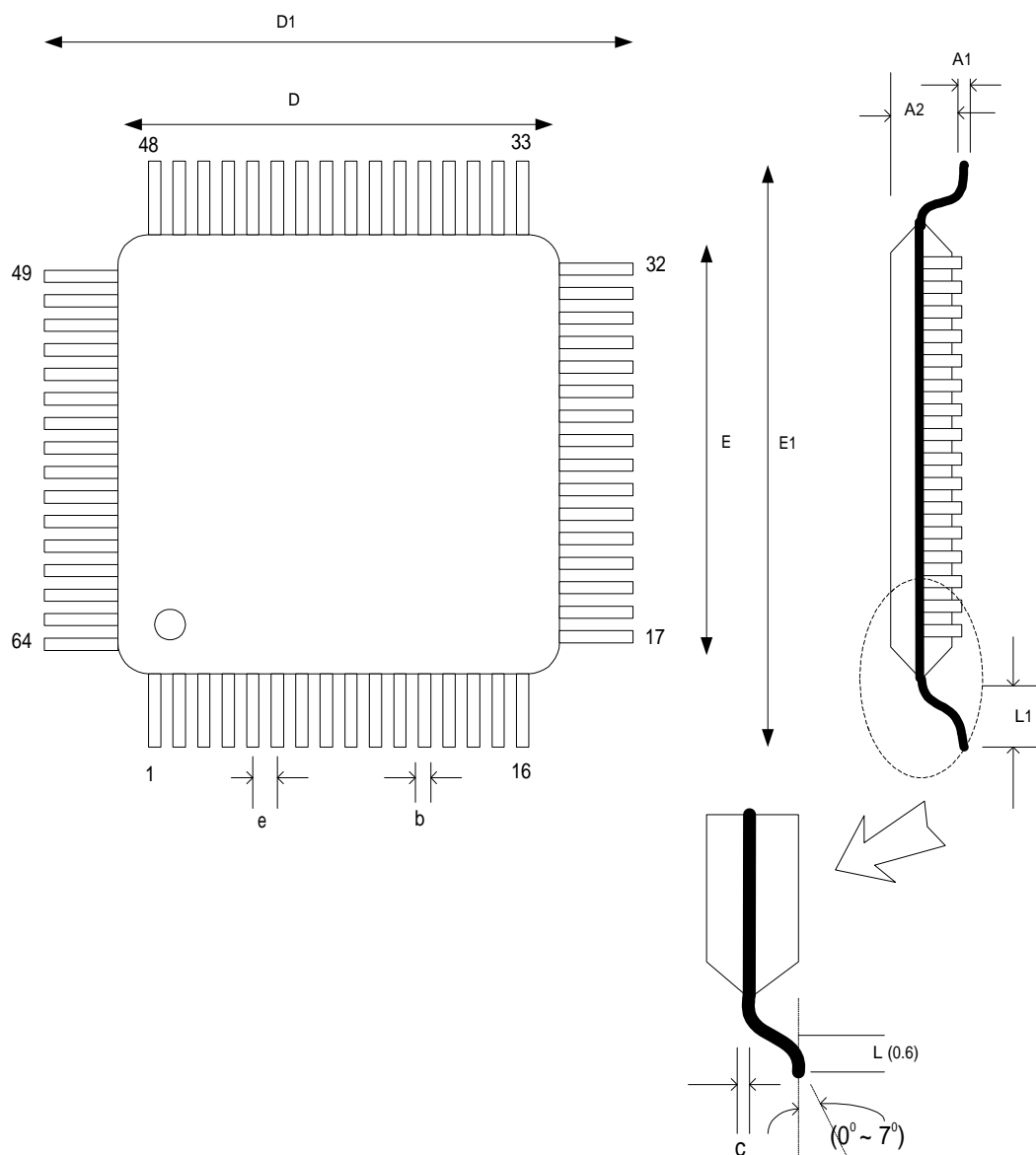## 5. Application example
5.1   Application example

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PC or NoteBook

5.2 Brief application circuit chart

LEDN,
HIDMUTER

programmable Jumper pins

TYPE0, TYPE1, TYPE2,
TYPE3, PLLEN, RECORD

MCU interface

12.288 MHz

Line out
(5.1 channel)
(L, R, C,
SUB, Ls, Rs)

P C   USB   SN11116   6 channel
CODEC

Line in

push button

6 MHz

(VOLUP,
VOLDN,
MUTEP,
MUTER)

93C46

SOF, CMPCLK, PDSW

EEPROM   S/PDIF IN   S/PDIF OUT

* detail application circuit is available by customer request

6. Package Specification

64-pin LQFP package

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

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

Unit : mm

Revision History

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

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