STEREO AUDIO CODEC WITH USB INTERFACE, SINGLE-ENDED ANALOG INPUT/OUTPUT AND S/PDIF

PRODUCT PREVIEW

FEATURES

- **PCM2900: Without S/PDIF**
- **PCM2902: With S/PDIF**
- **On-Chip USB Interface:**
  - **With Full-Speed Transceivers**
  - **Fully Compliant with USB 1.1 Specification**
  - **Certified by USB-IF**
  - **Partially Programmable Descriptors[1]**
  - **USB Adaptive Mode for Playback**
  - **USB Asynchronous Mode for Record**
  - **Bus Powered**
- **16-Bit Delta Sigma ADC and DAC**
- **Sampling Rate:**
  - **DAC: 32, 44.1, 48 kHz**
  - **ADC: 8, 11.025, 16, 22.05, 32, 44.1, 48 kHz**
- **On-Chip Clock Generator:**
  - **With Single 12-MHz Clock Source**
- **Single Power Supply: 5 V TYP (V_{BUS})**
- **Stereo ADC**
  - **Analog Performance at V_{BUS} = 5 V:**
  - **THD+N = 0.01%**
  - **SNR = 89 dB**
  - **Dynamic Range = 89 dB**
  - **Decimation Digital Filter**
  - **Passband Ripple = ±0.05 dB**
  - **Stopband Attenuation = −65 dB**
  - **Single-Ended Voltage Input**
  - **Anti-Aliasing Filter Included**
  - **Digital LCF Included**
- **Stereo DAC Analog Performance at V_{BUS} = 5 V:**
  - **THD+N = 0.005%**
  - **SNR = 96 dB**

- **Dynamic Range = 93 dB**
  - **Oversampling Digital Filter**
  - **Passband Ripple = ±0.1 dB**
  - **Stopband Attenuation = −43 dB**
  - **Single-Ended Voltage Output**
  - **Analog LPF Included**
- **Multi Functions:**
  - **HID Volume ± Control and Mute Control**
  - **Suspend Flag**
- **Package: 28-Pin SSOP, Lead-Free Product**

APPLICATIONS

- **USB Audio Speaker**
- **USB Headset**
- **USB Monitor**
- **USB Audio Interface Box**

DESCRIPTION

The PCM2900/2902 is Texas Instruments single-chip USB stereo audio CODEC with USB 1.1 compliant full-speed protocol controller and S/PDIF (only PCM2902). The USB protocol controller works with no software code, but the USB descriptors can be modified in some areas (ex. vender ID/product ID). The PCM2900/2902 employs a USB data tracking system named sampling period adaptive controlled tracking (SpAct™), which is TI's audio clock recovery architecture. The on-chip analog PLLs with the SpAct enables independent playback and record sampling rates with low clock jitters.

Clocked by SpAct™

Input signal is reclocked with the patented <u>S</u>ampling <u>p</u>eriod <u>A</u>daptive <u>c</u>ontrolled <u>t</u>racking system for maximum quality.

![Warning triangle icon] Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

[1]The descriptor can be modified by changing a mask.

SpAct is a trademark of ???????.

This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

PIN ASSIGNMENTS

PCM2900
SSOP PACKAGE
(TOP VIEW)

Left Pin	#	#	Right Pin
D+	1	28	$\overline{\text{SSPND}}$
D–	2	27	V_{DDI}
V_{BUS}	3	26	DGND
DGNDU	4	25	TEST1
HID0	5	24	TEST0
HID1	6	23	V_{CCXI}
HID2	7	22	AGNDX
SEL0	8	21	XTI
SEL1	9	20	XTO
V_{CCCI}	10	19	V_{CCP2I}
AGNDC	11	18	AGNDP
$V_{IN}L$	12	17	V_{CCP1I}
$V_{IN}R$	13	16	$V_{OUT}L$
V_{COM}	14	15	$V_{OUT}R$

PCM2902
SSOP PACKAGE
(TOP VIEW)

Left Pin	#	#	Right Pin
D+	1	28	$\overline{\text{SSPND}}$
D–	2	27	V_{DDI}
V_{BUS}	3	26	DGND
DGNDU	4	25	DOUT
HID0	5	24	DIN
HID1	6	23	V_{CCXI}
HID2	7	22	AGNDX
SEL0	8	21	XTI
SEL1	9	20	XTO
V_{CCCI}	10	19	V_{CCP2I}
AGNDC	11	18	AGNDP
$V_{IN}L$	12	17	V_{CCP1I}
$V_{IN}R$	13	16	$V_{OUT}L$
V_{COM}	14	15	$V_{OUT}R$

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