



TDA19977A_TDA19977B

Triple input HDMI 1.4a compliant receiver interface with equalizer (up to 1080p for HDTV, and UXGA for PC formats)

Product description

The TDA19977A; TDA19977B is a three input HDMI 1.4a compliant receiver with embedded EDID memory. The built-in auto-adaptive equalizer, improves signal quality and allows the use of cable lengths of up to 25 m which are laboratory tested with a 0.5 mm (24 AWG) cable at 2.05 gigasamples per second. The HDCP (TDA19977A only) key set is stored in non-volatile OTP (One Time Programmable) memory for maximum security. In addition, the TDA19977A; TDA19977B is delivered with software drivers to ease configuration and use.

The TDA19977A; TDA19977B supports:

- TV resolutions:
 - 480i (1440 × 480i at 60 Hz), 576i (1440 × 576i at 50 Hz) to HDTV (up to 1920 × 1080p at 50/60 Hz)
 - WUXGA (1920 × 1200p at 60 Hz) reduced blanking format
- PC resolutions:
 - VGA (640 × 480p at 60 Hz) to UXGA (1600 × 1200p at 60 Hz)
- Deep Color mode in 10-bit and 12-bit (up to 205 MHz TMDS clock)
- Gamut boundary description
- IEC 60958/IEC 61937, OBA (One Bit Audio), DST (Direct Stream Transfer) and HBR (High Bit Rate) stream

The TDA19977A; TDA19977B includes:

- An enhanced PC and TV format recognition system
- Generation of a $128/256/512 \times f_s$ system clock allowing the use of simple audio DACs without an integrated PLL (such as the UDA1334BTS)
- An embedded oscillator (an external crystal can also be used)
- Improved audio clock generation using an external reference clock
- OBA (as used in SACD), DST and HBR stream support

The TDA19977A; TDA19977B converts HDMI streams with or without HDCP (TDA19977A only) into RGB or YCbCr digital signals. The YCbCr digital output signal can be 4:4:4 or 4:2:2 semi-planar format based on the ITU-R BT.601 standard or 4:2:2 based on the ITU-R BT.656 format. The device can adjust the output timing of the video port by altering the values of $t_{su(Q)}$ and $t_{h(Q)}$. In addition, all settings are controllable using the I²C-bus.

Features

- Complies with the HDMI 1.4a, DVI 1.0, CEA-861-D and HDCP (TDA19977A only) 1.4 standards
- Three independent HDMI inputs, up to the HDMI frequency of 205 MHz
- Embedded auto-adaptive equalizer on all HDMI links
- EDID memory: 253 shared bytes and three bytes dedicated to each HDMI input
- Supports color depth processing (8-bit, 10-bit or 12-bit per color)
- Color gamut metadata packet with interrupt on each update, readable via the I²C-bus
- Up to four S/PDIF or I2S-bus outputs (eight channels) at a sampling rate up to 192 kHz with IEC 60958/IEC 61937 stream
- HBR audio stream up to 768 kHz with four demultiplexed S/PDIF or I2S-bus outputs
- HBR streams (compatible with DTS-HD master audio and Dolby TrueHD up to eight channels due to HBR packet for stream with a frame rate up to 768 kHz) support
- DSD and DST audio stream up to six DSD channels output for SACD with DST audio packet support
- Channel status decoder supports multi-channel reception
- Improved audio clock generation using an external reference clock
- System/master clock output ($128/256/512 \times f_s$) enables the use of the UDA1334BTS
- The HDMI interface supports:
 - All HDTV formats up to 1920 × 1080p at 50/60 Hz and WUXGA (1920 × 1200p at 60 Hz) with support for reduced blanking
 - 3D formats including all primary formats up to 1920 × 1080p at 30 Hz Frame Packing and 1920 × 1080p at 60 Hz Top-and-Bottom
 - PC formats up to UXGA (1600 × 1200p at 60 Hz)
- Embedded oscillator (an external crystal can be used)
- Frame and field detection for interlaced video signal
- Sync timing measurements for format recognition
- Improved system for measurements of blanking and video active area allowing an accurate recognition of PC and TV formats
- HDCP (TDA19977A only) with repeater capability
- Embedded non-volatile memory storage of HDCP (TDA19977A only) keys
- Programmable color space input signal conversion from RGB-to-YCbCr or YCbCr-to-RGB
- Output formats: RGB 4:4:4, YCbCr 4:4:4, YCbCr 4:2:2 semi-planar based on the ITU-R BT.601 standard and YCbCr 4:2:2 ITU-R BT.656
- 8-bit, 10-bit or 12-bit output formats selectable using the I²C-bus (8-bit and 10-bit only in 4:4:4 format)
- I²C-bus adjustable timing of video port ($t_{su(Q)}$ and $t_{h(Q)}$)
- Downsampling-by-two with selectable filters on Cb and Cr channels in 4:2:2 mode
- Internal video and audio pattern generator
- Controllable using the I²C-bus; 5 V tolerant and bit rate up to 400 kbit/s
- DDC-bus inputs 5 V tolerant and bit rate up to 400 kbit/s
- LV-TTL outputs
- Power-down mode
- CMOS process

- 1.8 V and 3.3 V power supplies
- Lead-free (Pb) HLQFP144 package

Applications

- HDTV
- High-end TV
- YCbCr or RGB HI-Speed video digitizer
- Home theater amplifier
- Projector, plasma and LCD TV
- DVD recorder
- Rear projection TV
- AVR and HDMI splitter

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