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Security Surveillance IC Solutions

TW2837
4-Channel Video and Audio Controller
For Security Applications
*Pin to Pin compatible with TW2835

Techwell TW2837

The TW2837 is an improved version of TW2835 with four high quality NTSC/PAL video decoders, dual color display controllers and dual video encoders. The device includes four built-in analog anti-aliasing filters, four 10-bit ADCs, a proprietary digital gain/clamp controller, a high quality Y/C separator to reduce cross noise, and a high performance free scaler. The TW2837 has four built-in motion, blind and night detectors and a flexible video display/record/playback controller supporting basic display and MUX functions. The device also has an enhanced 256-color OSD that can display bitmap, single box, 2D array box, and mouse pointer. The built-in channel ID CODEC allows auto decoding and displaying during playback, and the additional scaler on the playback supports multi-cropping function of the same field or frame image. The TW2837 has two NTSC/PAL video encoders with three 10-bit DACs that can support composite and S-video outputs. The TW2837 also has an improved audio CODEC which has four audio ADCs and one DAC. A built-in audio controller can generate digital outputs for recording/mixing and accept digital input for playback. The TW2837 can be configured up to 8/16 channel video controller using chip-to-chip cascade connection. TW2837 is pin-to-pin compatible to TW2835.

Target Applications

- Analog QUAD/MUX System
- 4/8/16 Channel DVR System
- Car Rear Vision System
- Hair Shop System
- Dental Care System

New Features

- Improved video decoder with adaptive 4H comb filters for all NTSC and PAL standards
- An enhanced OSD with 256 color look up table and supports OSD Block Move, Block Fill and Bitmap Burst Write functions to enhance the OSD buffer write performance
- PCM 8/16-bit and u-Law/A-Law 8-bit for audio word length
- Additional audio PLL for accurate 8KHz/16KHz sampling rate
- Programmable audio sample rates: 8, 16, 32, 44.1 and 48kHz
- Video field locked audio sample support
- Audio master/slave I2S interface for playback and record

Video Decoder

- Accepts all NTSC(M/N/4.43)/PAL (B/D/G/H/I/K/L/M/N/60) standards with auto detection
- Integrated four video analog anti-aliasing filters and 10 bit CMOS ADCs
- IF compensation filter for improvement of color demodulation
- Color Transient Improvement (CTI)
- Automatic white peak control
- Programmable hue, saturation, contrast, brightness and sharpness
- High performance horizontal and vertical scaler for each path including playback input
- Supports ITU-R BT.656 format or time multiplexed output with 54MHz or 108MHz
- Auto cropping / strobe for playback input with Channel ID decoder
- Supports four channel full D1 record mode

Dual Video Encoders

- Dual path digital outputs with ITU-R BT.656 standard
- Dual path analog outputs with all analog NTSC/PAL standards
- Programmable bandwidth of luminance and chrominance signal for each path
- Three 10-bit video CMOS DACs

Dual Video Controllers

- Support full triplex function with 4ch live, 4ch playback display and 4ch record output
- Analog/Digital channel ID CODEC for record and playback application
- Support adaptive median filter for Record
- Supports pseudo 8 channel and/or dual page mode
- Horizontal/Vertical mirroring for each channel
- Last image captured when video-loss detected
- Auto sequence switch with 128 queues and/or manual switch by interrupt for record path
- Channel skip in auto sequence switch for record path when video-loss detected
- Image enhancement for zoomed or still image in display path
- High performance 2X zoom to horizontal and vertical direction for display path
- Extendable up to 8/16 channel video controller using cascade connection
- Quad MUX switch with 32 queues and/or manual control by interrupt for record path
- 256 color bitmap OSD overlay with 720x480 in NTSC / 720x588 resolution in PAL
- Four programmable single boxes and four 2D arrayed boxes overlay
- Mouse pointer overlay
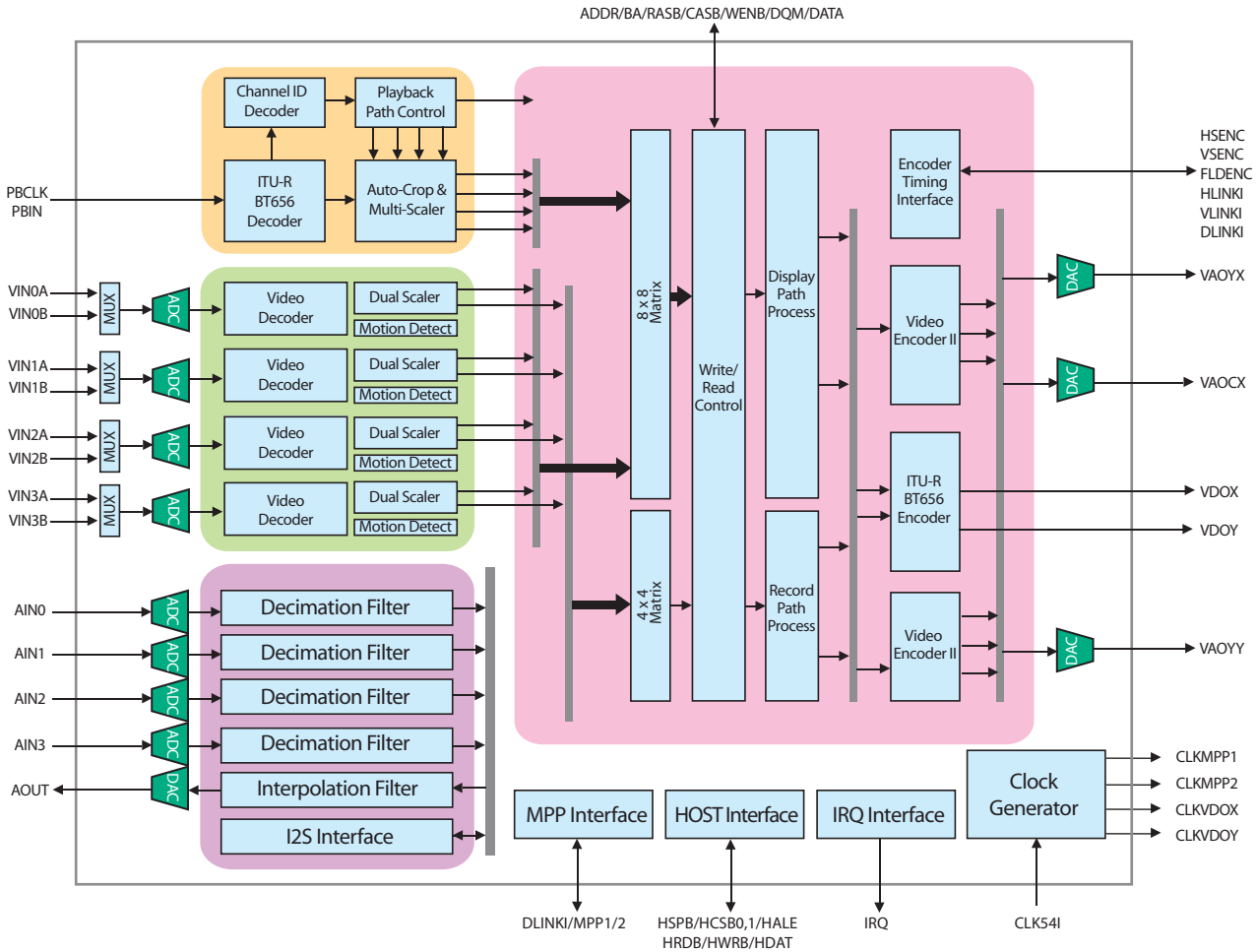
Audio CODEC

- Integrated four audio ADCs and one audio DAC
- Provides multi-channel audio mixed analog output
- Supports a standard I2S interface for record output and playback input
- PCM 8/16 bit and u-Law/A-Law 8bit for audio word length
- Programmable audio sample rate that covers popular frequencies of 8/16/32/44.1/48kHz

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TW2837 Block Diagram

ADDR/BA/RASB/CASB/WENB/DQM/DATA

Channel ID Decoder
Playback Path Control
ITU-R BT656 Decoder
Auto-Crop & Multi-Scaler

PBCLK
PBIN

HSENC
VSENC
FLDENC
HLINKI
VLINKI
DLINKI

Encoder Timing Interface

VIN0A VIN0B — MUX — ADC — Video Decoder — Dual Scaler / Motion Detect
VIN1A VIN1B — MUX — ADC — Video Decoder — Dual Scaler / Motion Detect
VIN2A VIN2B — MUX — ADC — Video Decoder — Dual Scaler / Motion Detect
VIN3A VIN3B — MUX — ADC — Video Decoder — Dual Scaler / Motion Detect

8 x 8 Matrix
Write/Read Control
Display Path Process
Record Path Process
4 x 4 Matrix

Video Encoder II
ITU-R BT656 Encoder
Video Encoder II

DAC — VAOYX
DAC — VAOCX
VDOX
VDOY
DAC — VAOYY

AIN0 — ADC — Decimation Filter
AIN1 — ADC — Decimation Filter
AIN2 — ADC — Decimation Filter
AIN3 — ADC — Decimation Filter
AOUT — DAC — Interpolation Filter
I2S Interface

MPP Interface
HOST Interface
IRQ Interface
Clock Generator

CLKMPP1
CLKMPP2
CLKVDOX
CLKVDOY

DLINKI/MPP1/2
HSPB/HCSB0,1/HALE HRDB/HWRB/HDAT
IRQ
CLK54I

About Techwell

Techwell is a fabless semiconductor company that designs, markets and sells mixed signal integrated circuits in the security surveillance, automotive infotainment, and consumer markets. Founded in 1997, we currently have over 160 employees and are headquartered in San Jose, California, with additional R&D and sales activities in South Korea, Japan, Taiwan and China. NASDAQ: TWLL

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