# TW8809

## Low Cost Video Format Converter

The TW8809 is a low cost video format converter that can take either analog CVBS or 24-bit digital RGB format video and output these signals in ITU-R.656 format. The video sources can be scaled and deinterlaced, so that the ITU-R BT.656 output is already formatted to the desired resolution and in progressive format. In addition, the TW8809 has built-in OSD and image enhancement capabilities.

## Applications

- Rear seat entertainment
- Radio head unit

## Features

### Analog Video Decoder

- NTSC (M, 4.43) and PAL (B, D, G, H, I, M, N, N combination), PAL (60), SECAM with automatic format detection
- Selectable differential or single-ended CVBS input
- Supports two differential or 4 single-ended CVBS inputs
- 10-bit ADC and analog clamping circuit
- Fully programmable static gain or automatic gain control for the Y or CVBS channel
- Programmable white peak control for the Y or CVBS channel
- High quality adaptive 2D comb filter for both NTSC and PAL inputs
- PAL delay line for color phase error correction
- Image enhancement with 2D dynamic peaking and CTI
- Digital subcarrier PLL for accurate color decoding
- Digital horizontal PLL and advanced synchronization processing for VCR playback and weak signal performance
- Programmable hue, brightness, saturation, contrast and sharpness

### Digital Input

- Supports YCbCr/RGB 24-bit input
- Supports both BT.656 and BT.601 video formats
- Supports input resolutions up to 720p

### Digital Output

- ITU-R BT.656 compatible YCbCr (4:2:2) output format
- Progressive ITU-R BT.656 output format for both interlaced and progressive inputs
- Output resolution up to SVGA (pseudo BT.656)

### On Screen Display

- 256 font RAM and 512 display RAM
- Four windows font OSD with bordering/shadowing
- 1/2/3/4 bits/pixel
- Supports variable width (12/16), height (2~32)

### Image Processing

- High quality scaler with both up/down and nonlinear scaling support
- Panorama/water-glass scaling
- Built-in 2D deinterlacing function
- Programmable hue, brightness, saturation, contrast and sharpness
- Programmable cropping of input video and graphics
- Independent RGB gain and offset controls
- Programmable 8-bit Gamma correction for each color
- Operates in frame sync mode
- Black/white stretch

### Clock Generation

- Spread spectrum clock
- Selectable modulation frequency and spread width

### Power Management

- Supports functional based independent power-down
- 1.8/3.3V operation

### Miscellaneous

- Short-to-battery detection test
- Short-to-ground detection test
- Supports 2-wire serial bus interface
- Single 27MHz crystal
- 56 lead QFN (with wettable flanks)
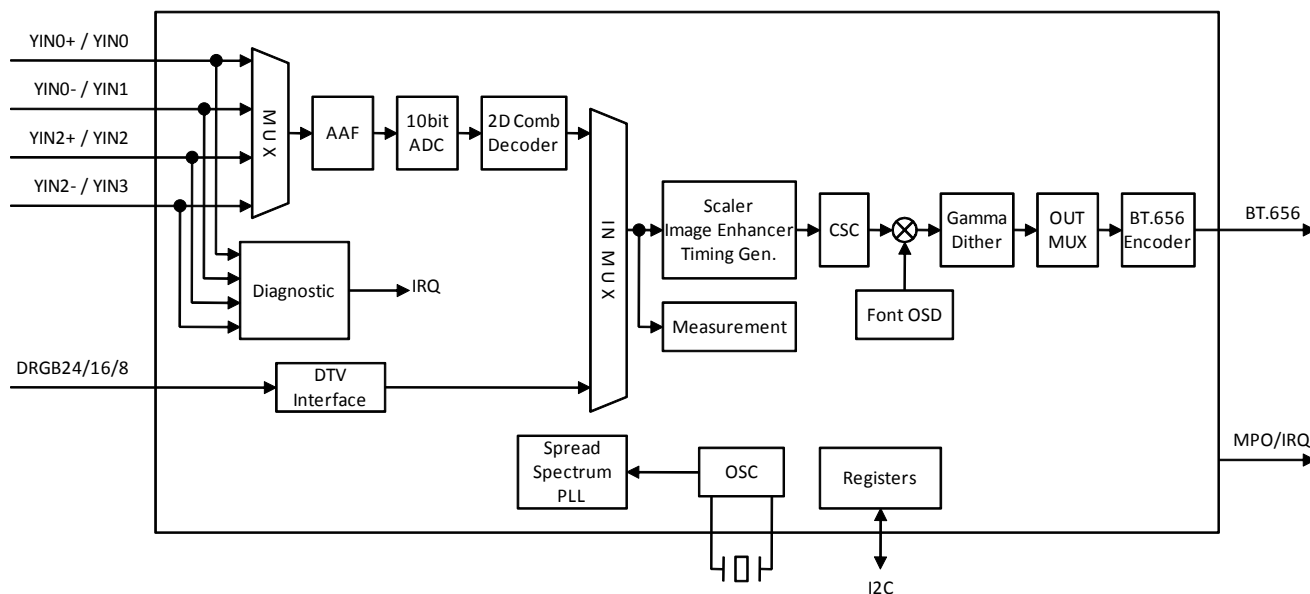- TW8809AT-NA2-GR is AEC-Q100 qualified

## TW8809 Functional Block Diagram



**FIGURE 1. TW8809 FUNCTIONAL BLOCK DIAGRAM**