Sound Terminal[™] for flat-panel TVs

STA369BWS combines a F3X power stage with digital audio processing



STA369BWS: A single-chip solution designed for flat-panel TVs and digital-audio applications.

The STA369BWS brings together audio power and processing with the ultimate speaker compensation technology. This product is a step forward in ST's commitment to the digital-audio market and implements new sound enhancements, including a multiband dynamic range compressor (MDRC). Safety is ensured with an embedded turn-on short-circuit detection and a run/time automatic diagnostic circuitry (STSpeakersafe).

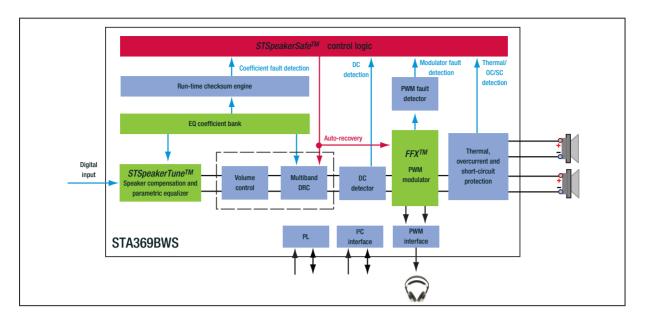
The STA369BWS is a green power and eco-compatible device with 90% efficiency and assembled in a halogen-free package.

Key features

- Wide supply voltage range: 4.5 to 21.5 V
- I²C with selectable device address
- 2-channel I²S input data interface
- FFX® 100 dB SNR and dynamic range
- Selectable output up to 100% modulation index
- 32 kHz to 192 kHz input sample rate
- Thermal overload and short-circuit protection
- Turn-on short-circuit protection
- 576x frequency sampling input mode support for video compatibility
- Digital gain/attenuation: +48 dB to -80 dB in 0.125 dB steps
- Soft volume update with programmable ratio
- Channel independent postscale
- Input channel mapping
- Advanced AM interference frequency switching and noise suppression modes

- DRC (dynamic range compression)
 - Standard DRC
 - Advanced DRC (EqDRC)
 - Dual-band DRC (B2DRC)
- Bass/treble tone control
- 8x 28-bit user-programmable biquads (EQ) per channel
- 3 memory banks prestore coefficients with automatic checksum computation
- Run-time automatic diagnostic circuitry for fail-proof operation
- 3 power output configurations
 - 2 channels of ternary PWM (stereo mode) 2x 20 W
 - 3 channels (left and right using binary and woofer using ternary): 2x 9 W + 1x 20 W
 - 2 channels of ternary PWM: 2x 20 W + stereo lineout ternary/PWM driver
- Additional headphone output





The STA369BWS is a single-chip solution with a 2.1 channel digital audio processor and binary/ternary F3X modulation amplifier stage. It offers 3 memory banks for different equalization settings and seamless audio streaming during channel and audio source change. The STA369BWS includes additional DSP features for high-end applications, such a DRC, postscaler for configurable output power rate, 2.1 channel audio processor and 3 different output configurations at a supply voltage ranging from 4.5 to 21.5 V. In modern audio systems, the loudspeaker has become the weakest part of the audio amplification chain, both in terms of performances and sound efficiency. This is even more true in the latest generation of flat-panel TVs with LED backlight, which further reduces the overall thickness. Loudspeakers used in such systems, as well as in other miniaturized handheld sound equipment (PMPs, smartphones), require state-of-the-art protection

technology. This is what STSpeakerSafe is for. It allows you to squeeze the highest sound quality and power from any loudspeaker in the safest way, preventing speaker damage and so preserving its original performances over time. STSpeakerSafe includes the latest advanced technology for thermal, overcurrent or overvoltage protection. It can precisely limit the power delivered in the different frequency ranges using a multiband dynamic range compressor. Moreover auto-diagnostic and auto-protection systems prevent any DC signal from damaging the loudspeaker and immediately warn the host system about any abnormal condition.

This device is eco-compatible, being assembled in a halogen free package.

Reference design and APWorkbench

To simplify test of the STA369BWS features and enable faster development, ST provides a comprehensive reference design along with the APWorkbench integrated development environment.

APWorkbench offers:

- Integrated register and coefficient viewer
- Computer-aided filter shaping
- Comprehensive device configuration file
- Quickly recallable preset memories
- Script file support



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