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Dual, High-Voltage 2.2A Analog Pulser

MAX14807

General Description

The MAX14807 dual, high-voltage (HV) 2.2A analog pulser generates HV arbitrary waveforms or pulses for driving piezoelectric transducers in ultrasound systems, and requires no external transformer. The device features both analog and digital modes of operation. In analog mode, the device amplifies low-voltage differential analog signals to a high-voltage waveform up to $220V_{P-P}$ in the ultrasound frequency range. In digital mode, the device generates a low-voltage (LV) continuous-wave Doppler (CWD) signal or a trilevel HV pulse from low-voltage digital inputs.

The MAX14807 features a gain-selectable (28dB or 40dB) differential amplifier and a Class AB push-pull output stage for analog mode operation. The differential amplifier boosts the low-voltage differential signal to HV single-ended signal. The bias current of the Class AB output stage is set by an external resistor. The device has a 25Ω active clamp to ensure a low-impedance path to GND as soon as the HV burst is over. The MAX14807 also features a trilevel digital transmitter for digital mode operation. The digital transmitter can be used in operating modes such as CWD, color flow mode (CFM), and pulsed-wave Doppler (PWD) where pulse shaping is not required, but efficiency and phase noise are the main constraints.

A transmit/receive function allows the analog amplifier to enter a low-power mode during receive time to minimize power consumption. Transition between transmit and receive (and vice versa) can be done online during the vector acquisition. Output glitches during transmit/receive commutation are minimized. The MAX14807 features a power off mode to reduce power consumption. In power off mode, both the analog and digital transmitters are in high impedance. The MAX14807 has a bilevel thermal protection. When the die temperature exceeds the thresholds (+120°C or +162°C typ), the corresponding open-drain output asserts.

The MAX14807 is available in a 64-pin (10mm x 10mm), TQFP exposed-pad package and is specified over the -40°C to +85°C extended temperature range.

Applications

- Ultrasound Medical Imaging
- Cleaning Equipment
- Flaw Detection
- Piezoelectric Drivers
- Test Equipment

Benefits and Features

- Saves Space—Optimized for High-Channel-Count Systems
  - Dual Integrated Channels with Independent High-Voltage Supplies Eliminate the Need for External Transformers
- High Performance—Designed to Enhanced Image Quality
  - 15MHz Power Bandwidth
  - -54dB (typ) THD for Second and Third Harmonic at 5MHz (Analog Mode)
  - Low-Phase Noise (-120dBc/Hz in Analog Mode, 156dBc/Hz in Digital Mode)
  - Class AB Output Programmable Output Bias Current
  - Analog Class AB Amplifier with $220V_{P-P}$ Capability
- Low-Power Modes Maximize System Power Savings
  - RT_ Feature Reduces Power Consumption in Analog Mode
  - Programmable Output Stage Current in Analog Mode
  - Digital Mode Available for Doppler Operative Modes

***Ordering Information* appears at end of data sheet.**

***Typical Application Circuit* appears at end of data sheet.**

19-6482; Rev 0; 10/12

One Analog Way, Wilmington, MA 01887 U.S.A. | Tel: 781.329.4700 |

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