MAX2082

Low-Power, High-Performance Octal Ultrasound Transceiver with Integrated AFE, Pulser, T/R Switch, and CWD Beamformer

Industry's Only Ultrasound Transceiver Saves 40% Power and Increases Reliability by Replacing Thousands of Discrete Components

NDA Required. Request Full Data Sheet

Overview

Description

The MAX2082 is the industry’s first fully integrated octal ultrasound transceiver. The device is optimized for high-channel count, high performance portable and cart-based ultrasound systems. The easy-to-use transceiver allows the user to achieve high-end 2D and Doppler imaging capability using substantially less space and power.

The transceiver transmitters are high-performance, 3-level 2A pulsers capable of generating high-voltage pulses up to ±105V.

The highly compact receiver with T/R switch, LNA, input coupling and feedback capacitors, variable gain amplifier (VGA), anti-aliasing filter (AAF), analog-to-digital converter (ADC), and digital highpass filter (HPF) achieves an ultra-low noise figure with $R_S = R_{IN} = 200\Omega$ at a very low 131mW per channel power dissipation at 50Msps. The receive channel has been optimized for second harmonic imaging with -66dBFS second harmonic distortion performance at f_{RF} = 5MHz over the full gain range. The full receive channel exhibits an exceptional 76dBFS SNR at 5MHz with a 2MHz bandwidth.

Separate mixers for each channel are made available for optimal CWD sensitivity yielding an impressive 149dBc/Hz dynamic range per channel at 1kHz offset from the 1.25MHz carrier.

The MAX2082 octal ultrasound front-end is available in a small 10mm x 23mm CSBGA package and specified over a 0°C to +70°C temperature range.

Key Features

- Minimizes PCB Area and Design Cost
  - 8 Full Channels of HV Pulser, T/R-Switch, LNA Input and Feedback Coupling Caps, LNA, VGA, AAF, CWD Mixers, 12-Bit ADC, and Digital HPF in a Small 10mm x 23mm CSBGA Package
- Integrated HV Pulser for Simpler System Design
  - High Voltage 3 Level Pulsers (Up to ±105V) with Active Return to Zero and Internal Power-Supply Drivers for Reduced External Components
  - Programmable Pulser Current Capability from 0.5A to 2A for Reduced Power Consumption in Lower Voltage Transmit Modes Like CWD
  - Extremely Low Propagation Delay Pulsers (18ns) with Excellent Rise and Fall Matching for Excellent THD2 Performance (-43dBc at 5MHz)
- Integrated High-Performance Receiver Improves System Sensitivity
  - Ultra-Low Full-Channel Receiver Noise Figure of 2.8dB at $R_{IN} = R_S = 200\Omega$ (Without T/R Switch)
  - High Dynamic Range Receiver with 76dBFS SNR at f_{IN} = 5MHz and 2MHz Bandwidth
  - Ultra-Low Power Receiver (131mW Per Channel)

Applications/Uses

- Ultrasound Imaging