

# BOS0614 Four-Channel Piezo Haptic Driver with Integrated Sensing

## 1 Features

- Four-Channel 60 V Low Power Piezo Driver
  - Drives up to four actuators simultaneously
  - Energy Recovery
  - Small Solution Footprint
- Advanced Piezo Sensing Interface
  - 10 kSps Sample Rate
  - 100  $\mu$ s Detection Latency
  - Zero Power Sensing for Wake-up
  - Automatic Handling of Customized Press and Release Haptic Feedback
  - 220  $\mu$ V Force Sensing Resolution
- Integrated Digital Front End with I3C/I<sup>2</sup>C
  - 1024 Samples FIFO
  - 2 kB RAM Waveform Memory
  - Waveform Synthesizer (WFS)
  - 1.2 V to 1.8 V Digital I/O Supply
  - State Retention in SLEEP Mode
- Four GPIOs
  - Open-Drain / Push-Pull
  - Mechanical Button Replacement
  - External Trigger Inputs
- Fast Start-Up Time
- Wide Input Voltage Range of 3 V to 5.5 V

## 2 Applications

- Smartphones
- Seamless User Interface
- Human-Machine Interface

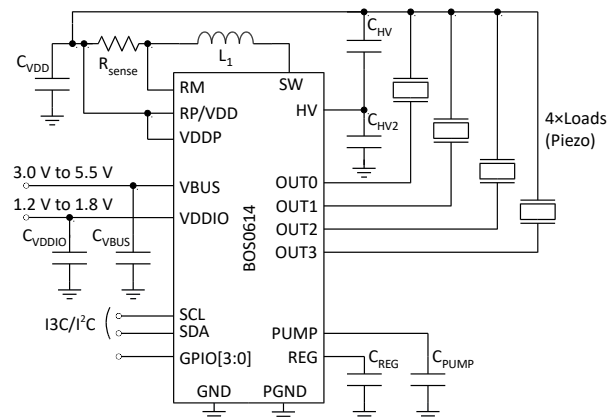


Figure 1: Simplified schematic

## 3 Description

The BOS0614 is a multi-channel piezo haptic driver based on Boréas’ patented CapDrive™ technology. It can drive up to four piezo actuators simultaneously at 60 V. Its Zero Power Sensing (ZPS) capabilities enables the replacement of mechanical buttons in many applications.

The internal 10 kSps sensing interface allows programming of custom press and release haptic feedback on each channel. When detection conditions are met, the BOS0614 can automatically play the programmed haptic feedback and send a notification via four GPIOs within 100  $\mu$ s. The active-low open-drain configuration of the outputs enable generating signals identical to mechanical buttons for easy integration in a legacy system.

The four GPIOs can be used as an external trigger and connected directly to the outputs of a touch controller to achieve low latency haptic feedback.

Data and configuration can be communicated easily to the BOS0614 through its two-wire MIPI I3C interface. MIPI I3C is backward compatible with I<sup>2</sup>C for easy integration in most systems. A flexible deep FIFO interface enables the continuous streaming of the digital waveform data for playback or to transmit burst data for more bandwidth efficiency. The interface also integrates a waveform synthesizer and 2 kB RAM waveform memory to generate HD haptic waveforms with minimum communication bandwidth enabling two waveform generation modes: RAM Playback and RAM Synthesis.

Various safety systems protect the BOS0614 from damage in case of a fault.

Table 1: Product information

PART NUMBER	DESCRIPTION
<b>BOS0614CW</b>	WLCSP 30B 2.1mm x 2.5mm

See section 11 for ordering information.

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