BOS1211 Scalable Piezo Haptic Controller with Waveform Synthesizer

1 Features

- AEC-Q100 Grade 2 Qualified
- Scalable Low Power Piezo Controller
  - Designed for TDK PowerHap 120 V Actuator Portfolio
  - Drives up to 4 µF
  - Energy Recovery
  - Small Solution Footprint
- Integrated Digital Front End with SPI
  - 1024-Samples Internal FIFO
  - 2-kB RAM Waveform Memory
  - Waveform Synthesizer
  - 1.8 V to 5.0 V Digital I/O Supply
- Piezo Sensing Interface
- Multi-Actuator Synchronization
- Fast Start-Up Time of 500 µs
- Connects to 12 V Power Bus
- Offered in a Wettable Flank QFN-24 Package

2 Applications

- Display Haptics
- Button Replacement
- Human Machine Interface

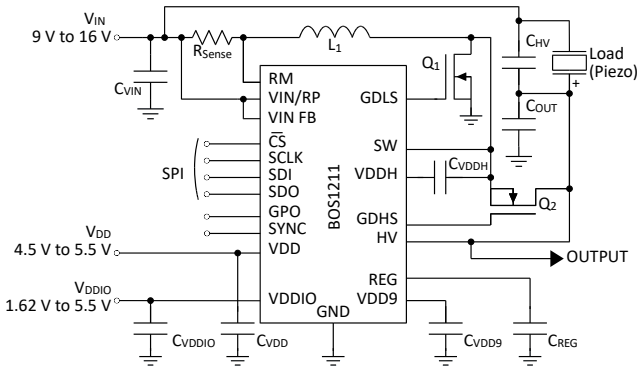


Figure 1: Simplified schematic

3 Description

The BOS1211 is a scalable piezo haptic controller based on our patented CapDrive™ technology. It can drive TDK's PowerHap 120 V piezo actuators or similar loads with up to 120 V HD haptic low distortion waveforms and operates from a 12 V supply voltage. The BOS1211 integrates a digital interface, low-side and high-side NMOS gate drivers for buck-boost conversion and piezo sensing capability.

The BOS1211 plays waveforms through its digital front-end and SPI interface. A flexible deep FIFO interface enables the user to continuously stream the digital waveform data for playback or to transmit burst data. 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.

The digital front-end gives access to many internal registers to optimize performance. The BOS1211 features a piezo sensing interface that can detect a pressure applied on the piezo actuator, play automatic haptic waveform feedback, and notify the host of the event.

The high-speed SPI enables the device to share a common communication bus for a multi-actuator system. The pin SYNC synchronizes multiple controllers in the same system to have waveforms phase delay within less than 2 µs.

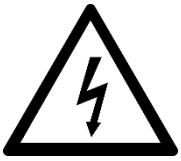
Safety systems protect the device from damage in case of a fault.

Table 1: Product information

PART NUMBER	DESCRIPTION
BOS1211AQ	QFN 24L 4.0mm x 4.0mm

4 Notice and Warning

Warning High Voltage



For safety, this integrated circuit must be used by qualified and skilled personnel familiar with all applicable safety standards.

ESD Caution

This integrated circuit is ESD (Electrostatic Discharge) sensitive. Therefore, proper ESD precautions and procedures are recommended for handling and installation to avoid damage.

Boréas Technologies Datasheet Status:

Advance Information Datasheet:	Design Data
Preliminary Information Datasheet:	Prototype information
Final Datasheet:	Production information