

Zivix LLC

Educating and Empowering Musicians with Electronic Instruments Featuring Maxim Battery Management ICs



Zivix's newest Jamstik is a battery-powered, MIDI-capable electric guitar that will allow guitarists to produce and record music seamlessly with MIDI.

Zivix is changing the musical landscape, one electronic instrument at a time. Based in Minneapolis, Minnesota, the company aims to inspire, educate, and empower musicians by making it easier to learn how to play an instrument and create music. Its Jamstik+ and Jamstik 7 app-connected smart guitars have sensors in the fretboard, allowing users to see their fingers on a screen in real-time via the Jamstik companion apps—instantly removing the guesswork and barriers that come with learning to play.

Challenge

- Create guitar application with long battery life and accurate battery state-of-charge (SOC) data

Solution

- MAX14636
- MAX14699
- MAX8903C
- MAX17260
- MAX38643
- MAX38902E

Benefits

- Faster design prototyping
- Longer battery life
- More accurate battery SOC data
- More accurate detection of user interaction with guitar

The portable format makes the Jamstiks great travel guitars, and users can even play silently with a pair of headphones plugged into their mobile device. Because the Jamstiks are also versatile MIDI controllers, they are compatible with hundreds of music apps and digital audio workstations (DAWs). So once players learn the basics, they can use their new guitar skills to create and record music with virtually any sound they can think of. "It's exciting," Bobcat Cox, the company's chief technology officer, says of working at Zivix. "We are getting people involved in learning music in a simple and approachable way." Users don't have to find their way to their lessons, or explain to their teacher why they didn't practice. Zivix's instruments provide a self-paced, self-guided approach with instant feedback.



"The Maxim team has saved some mistakes that would have led to extra prototyping cycles. We expect our finished guitar will have long battery life and provide accurate data on remaining charge."

Bobcat Cox, Chief Technology Officer, Zivix

CUSTOMER SUCCESS STORY: ZIVIX

Challenges

Before long, Zivix recognized a demand among more seasoned guitar players to have a MIDI output connected to their instrument. The company is now developing a full-size, battery-powered, MIDI-capable electric guitar. To create this new device, Zivix has four key challenges to overcome:

1. Be able to charge the instrument's Li-ion battery via USB and drive the indicator LEDs without requiring the microprocessor to be on
2. Allow users to charge the guitar while using it
3. Provide accurate battery life data
4. Be able to hand-solder the chips into their design via pins on the side

Solution and Benefits

Cox and his team evaluated battery-management and power-management ICs from various vendors, and determined that Maxim chips would meet their stringent criteria. In addition, the team appreciates the support from the Maxim applications engineer, who helped guide them to the right parts for their design. For their new guitar application, Zivix is using:

- **MAX14636** USB charger detector
- **MAX14699** high-accuracy, surge-protected overvoltage protector
- **MAX8903C** 2A 1-cell Li+ DC-DC charger for USB and adapter power
- **MAX17260** 5.1µA 1-cell fuel gauge with ModelGauge m5 EZ and optional high-side current sensing. Notes Cox, "It's super accurate as far as telling the life remaining in the battery."
- **MAX38643** nanoPower buck converter with 330nA of quiescent current. Says Cox, "The buck converter's low quiescent current enables a long life when the product is sitting on the shelf and not in use." He added that its efficiency while in use as well as small size also make the device ideal for their design.
- **MAX38902E** low-noise 500mA LDO linear regulator. Less noise in the analog sensing circuit should contribute to more accurate detection of the player's interaction with the guitar, Cox explained.

As the Zivix team works on developing its guitar MIDI controller, the Maxim applications engineer continues to provide support, quickly reviewing schematics and answering questions before prototyping. "The Maxim team has saved some mistakes that would have led to extra prototyping cycles," said Cox. "With the battery management and power management ICs in our design, we expect our finished guitar will have long battery life and provide accurate data on remaining charge." And with this, Zivix will continue to educate and empower musicians of all skill levels.

Learn more at www.maximintegrated.com