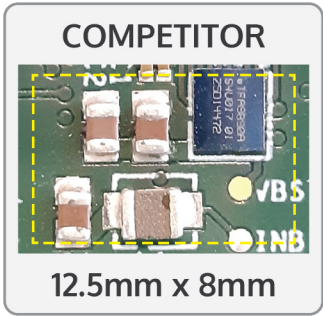


# THE ES8018 SABRE® SMART POWER AMPLIFIER

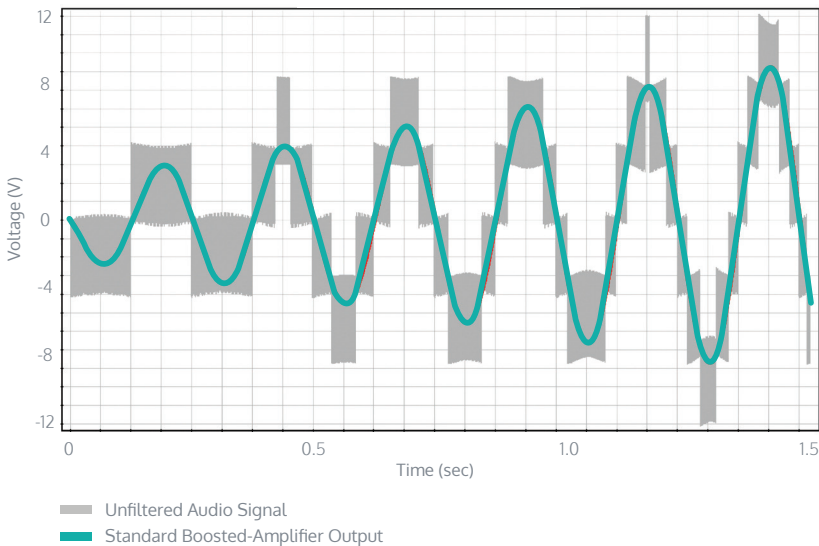
Designed to boost the audio quality and efficiency of phones, tablets, wireless speakers, and watches, the ES8018 combines major advances in amplifier design with advanced speaker-protection algorithms. It is based on patented 7-level Class-D amplifier technology that offers improved efficiency and lower EMI than standard amplifiers. The product uses a voltage-tripling capacitive boost that generates up to three times the battery supply without the use of a bulky and expensive inductor. These advances are coupled with the legendary sound quality of SABRE DACs and advanced audio-processing algorithms from the audio experts at ESS. The result of this combination of advanced technologies is that system makers can design small and cost-effective solutions that deliver amazing audio quality from micro speakers.

### Inductorless, voltage-tripling, capacitive boost

- Boost output voltage to 3X power supply, 15V max
- No inductor required:
  - 36% less board space
  - Low solution cost
  - Thinner solution
- No look-ahead required for boost turn-on
- No wasted power switching boost on/off
- Auto-compensation for battery discharge

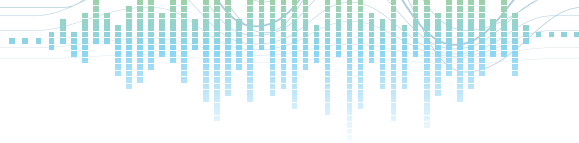


MLCD Amplifier Output

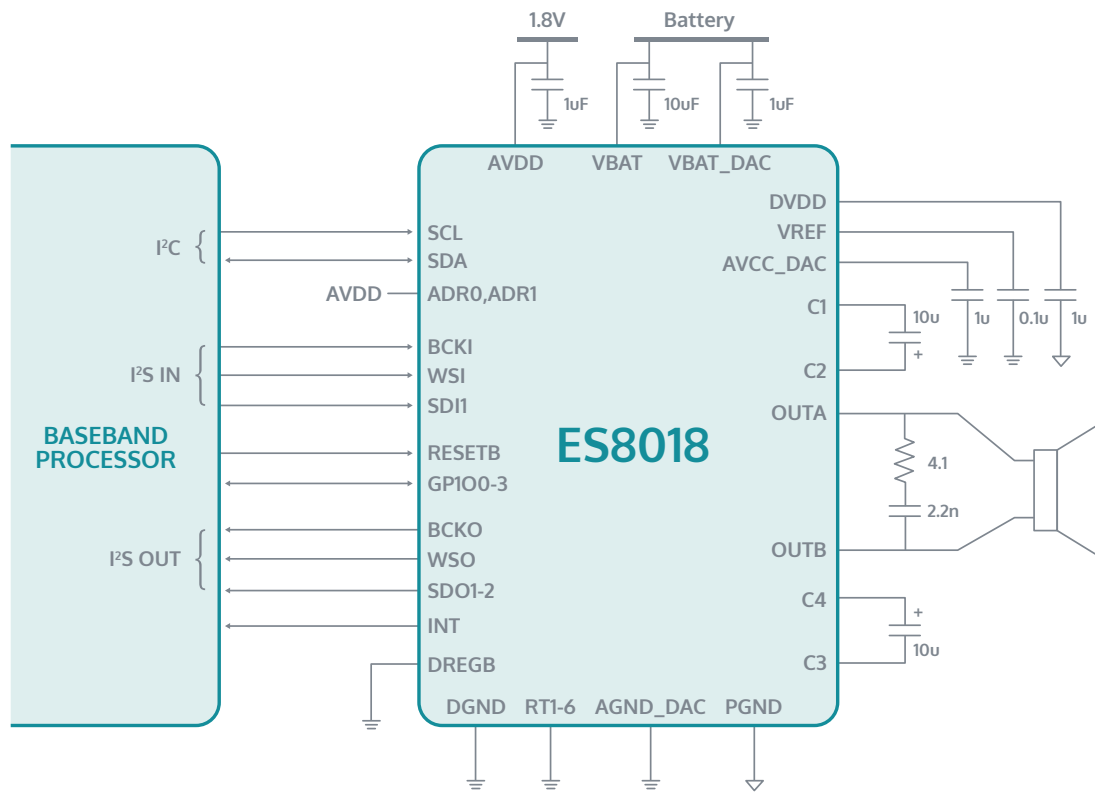


### Multi-Level Class-D (MLCD) amplifier

- 7 discrete voltage levels allows for 6 switching patterns that track the output
- Improves efficiency in real-world conditions
- Lower EMI radiation without losing efficiency

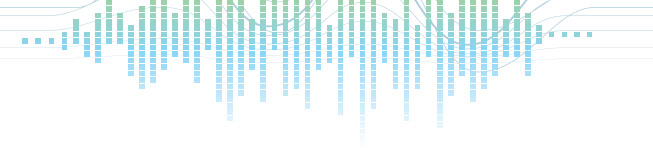


Features	Benefits
SABRE™ DAC Audio Quality	Better than +100dB SNR
Multi-Level Class-D Driver	6 Watts Power Output (8 ohms, 10%) Improved efficiency in normal operation
Inductorless Voltage-Tripling Boost Circuit	No Inductor required Output voltage booted 3X power supply (15V Max) Reduced EMI
Embedded DSP	Easy use, compatible with all cellular chipsets No software integration
Adaptive Speaker Protection with integrated IV sensing	Ensures safe speaker operation under all conditions Brown-out protection prevents battery overload
Multi-Band Dynamic-Range Compressor (DRC)	5 separate tuning bands give improved audio-quality with minimal artifacts
Dedicated Receiver Mode	Low-Noise Mode for nearfield use True-Stereo or Receiver-Stereo solutions



Typical Application Circuit

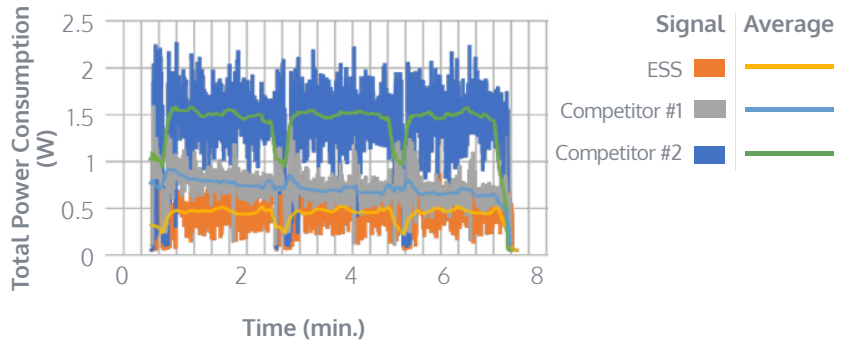
For information about samples or product datasheets, please contact your local [ESS Sales Representative](#).



## 40% less power consumption in the real world

The combination of the Voltage-Tripling boost and MLCD amplifier offer system efficiency over the competing, inductive boost designs. Inductive switching requires the boost to stay active to deliver only the occasional peak in the audio signal. While active, the inductive boost drains power, reducing the efficiency of the real system. Shutting off an inductive boost requires additional signal latency to allow for the required look-ahead to prevent missing a peak. The patented Voltage-Tripling boost in the ES8018 is on-demand power, generated by high-frequency capacitive switching.

Comparison of total power consumption during audio playback

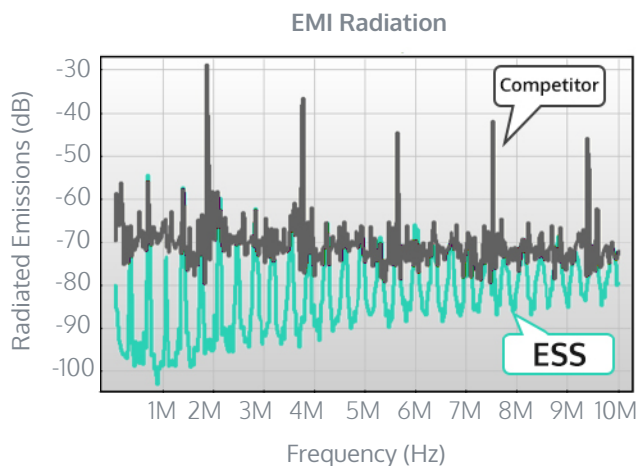


Test description: power consumption measured on actual demo boards with Keithly Battery Simulator while playing full audio test track (Hotel California) with similar audio output power.

## Less radiated energy (less EMI) than Class-D solutions

ESS's new MLCD offers a major step forward in reducing EMI radiation for Smart Amplifiers. The unique design uses a switching pattern that tracks the output waveform, effectively switching only 1/6 of the full output swing at any time. As an example, a Class-D amplifier with a 12V-boost voltage in a bridged configuration would see a full 24V instantaneously across the speaker on each transition, no matter what state of the signal output. This event causes a significant amount of radiation to be emitted that can interfere with the radios that are located close by. In contrast, the MLCD amplifier is able to deliver the same output power and would see only 4V on any switch; the full 24V swing would be delivered across several switching cycles. The result emits greatly reduced EMI levels.

Typically, Class-D amplifiers introduce a slope control feature to slow down the speed of the transition to lessen the amount of EMI. Slowing the transition directly reduces the efficiency of the switching. The slower the switch, the lower the efficiency. Of course, the efficiency headline for an amplifier is with the slope control off. MLCD amplifiers do not need to make this trade-off. They can maintain both high efficiencies and low EMI.



Competing smart-amplifiers generate additional EMI radiation in the inductive DC/DC stage. ESS unique Voltage-Tripling Boost lowers EMI as well. The Voltage Tripler also divides the peak voltage over multiple components and well as operating at a significantly higher frequency.

The result is a major reduction in overall system performance for EMI, allowing for easier placement of the audio system and requiring less shielding of any nearby antenna.

### About ESS Technology

For more than three decades ESS Technology has been on the cutting edge of audio technology. A privately held fabless semiconductor company, ESS Technology designs and markets high-performance analog and HiFi audio devices for mobile, consumer, automotive, and professional audiophile systems. The company was founded in 1984 and today ESS Technology is best known for its SABRE series of high-performance audio products. For more information visit <http://www.esstech.com>.