

GS-EVB-AUD-BOOST₁-GS

210W Audio Boost Converter Power Source

GS-EVB-AUD-BOOST₂-GS

300W Audio Boost Converter Power Source

Technical Manual



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DANGER

DO NOT TOUCH THE BOARD WHEN IT IS ENERGIZED AND ALLOW ALL COMPONENTS TO DISCHARGE COMPLETELY PRIOR HANDLING THE BOARD.

HIGH VOLTAGE CAN BE EXPOSED ON THE BOARD WHEN IT IS CONNECTED TO POWER SOURCE. EVEN BRIEF CONTACT DURING OPERATION MAY RESULT IN SEVERE INJURY OR DEATH.

Please sure that appropriate safety procedures are followed. This evaluation kit is designed for **engineering evaluation in a controlled lab environment and should be handled by qualified personnel ONLY**. Never leave the board operating unattended.

**WARNING**

Some components can be hot during and after operation. **There is NO built-in electrical or thermal protection on this evaluation kit.** The operating voltage, current, and component temperature should be monitored closely during operation to prevent device damage.

**CAUTION**

This product contains parts that are susceptible to damage by electrostatic discharge (ESD). Always follow ESD prevention procedures when handling the product.

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1 GS-EVB-AUD-BOOST-GS Description

1.1 Introduction

This technical manual highlights the features and benefits of GaN Systems high voltage audio boost converter reference design for manufacturers of stand-alone mono, stereo, and multi-channel automotive and marine amplifiers. GaN Systems GS-EVB-AUD-BOOST1-GS is a 210-watt continuous / 300-watt peak power source and GaN Systems GS-EVB-AUD-BOOST2-GS is a 300-watt continuous / 500-watt peak power source. These two complete audio boost converter solutions include wide-range DC supply voltage input, 9VDC to 16VDC operation and are load dump compatible with differential-primary-drive transformer topology.

1.2 Purpose

The purpose of these evaluation boards is to provide a complete comprehensive GaN audio boost converter solution design for optimized sound quality, efficiency, size, and cost while enabling audio design engineers create premium audio products more quickly at affordable prices while reducing time to market.

1.3 Common Features of GS-EVB-AUD-BOOST-GS

- Complete Stand-alone Dual-Rail audio boost converter
- Load dump compatible with differential-primary-drive transformer topology
- Wide range DC supply voltage input of 9VDC to 16VDC operation
- Dual- GaN transformer-coupled topology
- Regulated boost converter w/ graceful current limit
- Complete integrated non-intrusive short circuit protection, thermal protection, and Over-Current protection
- Complete integrate non-intrusive Over-Voltage and Under-Voltage protection
- Integrated Remote Power-On 'Enable'
- Easy Integration with companion Class D Amplifier solutions [GS-EVM-AUD-AMPOL1-GS](#) , [GS-EVM-AUD-AMPCL1-GS](#), [GS-EVB-AUD-AMP2-GS](#)
- Output stages with 100V Enhancement Mode GaN Transistors [GS61008P](#)

1.4 Features of GS-EVB-AUD-BOOST1-GS

- 210W Continuous Duty
- 300W Peak Power
- +/- 26VDC Dual-Rail Output

1.5 Features of GS-EVB-AUD-BOOST2-GS

- 300W Continuous Duty
- 500W Peak Power
- +/- 32VDC Dual-Rail Output

1.6 Common Benefits of GS-EVB-AUD-BOOST-GS

- Complete Boost Converter system design
- Serve smaller and more efficient Class-D audio systems
- Reduction in system size and weight
- Reduce time to market for Automotive and Marine markets' design engineers
- Safe and stable design with graceful protection features against harmful failures
- Reliable design with Auto recovery features
- Optimization for cost
- Easy Integration with 200-watt turnkey open loop digital and closed loop analog Class-D Amplifier modules and boards
- The properties of GaN allow for high current, high voltage breakdown and high switching frequency. GaNPX small packaging of GS61008P enables low inductance & low thermal resistance and provides very high efficiency power switching.



Figure 1 GS-EVB-AUD-BOOST-GS Evaluation Board

2 Technical Specifications

2.1 General Performance Data of GS-EVB-BOOST1-GS

Parameter	Min.	Typ.	Max.	Unit	Notes
Output Voltage	-	2 x 26	-	VDC	Connector J2
Output Short-Circuit Current	-	12	-	A	

2.2 General Performance Data of GS-EVB-BOOST2-GS

Parameter	Min.	Typ.	Max.	Unit	Notes
Output Voltage	-	2 x 32	-	VDC	Connector J2
Output Short-Circuit Current	-	12	-	A	

3 PCB Layout and Boards' Connections

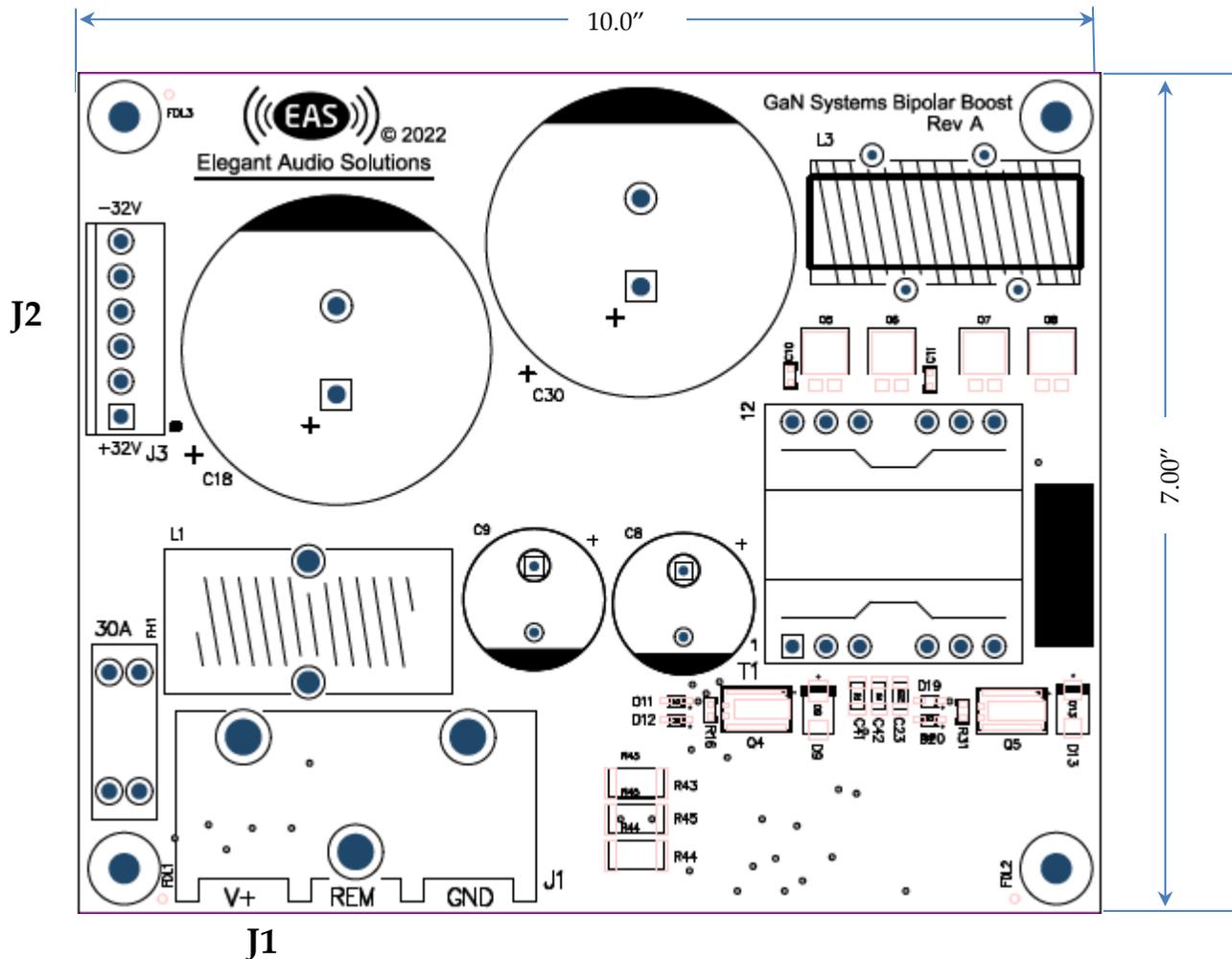


Figure 2 PCB Layout and Module Connections

4 Companion Class D Amplifier solutions

4.1 Description

GaN Systems Complete Boost Converter system design is easily integrated with GS-EVM-AUD-AMPOL1-GS which is 50W per Channel x 4 into 8Ω turnkey open loop Digital Class-D Amplifier Module. Easy integration is also possible with GS-EVM-AUD-AMPCL1-GS which is 200W per Channel x 2 into 8Ω turnkey closed loop Analog Class-D Amplifier Module, and GS-EVB-AUD-AMP2-GS which 200W per channel x 2 into 8Ω Stereo Class-D Amplifier Evaluation Board.

4.2 Features and Benefits

- Complete Stand-alone high-performance Class-D Audio Amplifier Modules
- Enables smaller and more efficient Class-D audio systems
- Superior sounding and very high audio quality
- Closest audio signal to the sound source
- Reduction in system size and weight
- Reduction in heat flow
- Safe and stable design with graceful protection features against harmful failures
- Reliable design with Auto recovery features
- Optimization for cost
- Easy attachment to Chassis
- Digital or Analog integrated PS Audio Input
- Digital or Analog integrated S/PDIF Coaxial Audio & Auxiliary Inputs
- +/- 32V_{DC} Power Supply requirement
- Fully programmable and integrated DSP solution
- SNR & DR higher than 114dB
- THD+N less than 0.01%
- No heat sink required
- Efficiency higher than 96%
- Guarded handling of complex and low impedance loads



Figure 3
GS-EVM-AUD-AMPOL1-GS



Figure 4
GS-EVM-AUD-AMPCL1-GS

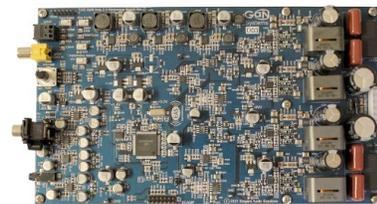


Figure 5
GS-EVB-AUD-AMP2-GS

5 Ordering Information

The ordering information are listed in Table 1 below:

[Where to buy | GaN Systems](#)

Table 1 P/N and Description

PART NUMBER	DESCRIPTION
GS-EVB-AUD-BOOST1-GS	Power Source: 210W Audio Boost Converter 9-16VDC Input, +/-26VDC Dual-Rail Output
GS-EVB-AUD-BOOST2-GS	Power Source: 300W Audio Boost Converter 9-16VDC Input, +/- 32VDC Dual-Rail Output
GS-EVM-AUD-AMPOL1-GS	Amplifier: 50W per Channel x 4 into 8Ω Turnkey Open Loop Digital Class-D Amplifier Module
GS-EVM-AUD-AMPCL1-GS	Amplifier: 200W per Channel x 2 into 8Ω Turnkey Closed Loop Analog Class-D Amplifier Module
GS-EVB-AUD-AMP2-GS	Amplifier: 200W per channel x 2 into 8Ω Stereo Class-D Amplifier Evaluation Board
GS61008P	100V, 90A, GaN E-mode, GaNPX® package, Bottom-side cooled
GS-065-011-2-L	650V, 11A, GaN E-mode, 8x8 PDFN, Bottom-side cooled
GS-065-030-2-L	650V, 30A, GaN E-mode, 8x8 PDFN, Bottom-side cooled

Evaluation Board/Kit Important Notice

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