

PRODUCT BRIEF

Mono Class D Audio Subsystem with Earpiece Driver, Ground Referenced Headphone Amplifiers, Speaker Protection and No Clip with Clip Control

General Description

The LM49151 is a fully integrated audio subsystem designed for portable handheld applications such as cellular phones. The LM49151 combines a 1.25W mono E²S class D amplifier, 125mW Class AB earpiece driver, 42mW/channel stereo ground referenced headphone drivers, volume control, input mixer/multiplexer, and speaker protection into a single device.

The LM49151 class D speaker amplifier features National's unique Automatic Level Control (ALC) that provides both a I²C programmable no-clip feature with Clip Controls and speaker protection. The E²S (Enhanced Emission Suppression) class D amplifier features a patented, ultra low EMI PWM architecture that significantly reduces RF emissions while preserving audio quality and efficiency while delivering 1.25W into an 8Ω load with <1% THD+N with a 5V supply. The 42mW/channel headphone drivers feature National's ground referenced architecture that creates a ground-referenced output from a single supply, eliminating the need for bulky and expensive DC-blocking capacitors, saving space and minimizing system cost.

The LM49151 features separate volume controls for the loud-speaker and headphone inputs. Mode selection, shutdown control, and volume are controlled through an I²C compatible interface. The LM49151's superior click and pop suppression eliminates audible transients on power-up/down and during shutdown.

Notice: This document is not a full datasheet. For more information regarding this product or to order samples please contact your local National Semiconductor sales office or visit <http://www.national.com/support/dir.html>

Key Specifications

■ Output power at $V_{DD} = 3.3V$		
THD+N $\leq 1\%$		
LS Mode, $R_L = 8\Omega$		520mW (typ)
HP Mode, $R_L = 32\Omega$		40mW (typ)
■ Output power at $V_{DD} = 5V$		
THD+N $\leq 1\%$		
LS Mode, $R_L = 8\Omega$		1.25W (typ)
HP Mode, $R_L = 32\Omega$		42mW (typ)
■ Output Offset		
LS Mode 15		6mV (typ)
HP Mode 15		2mV (typ)

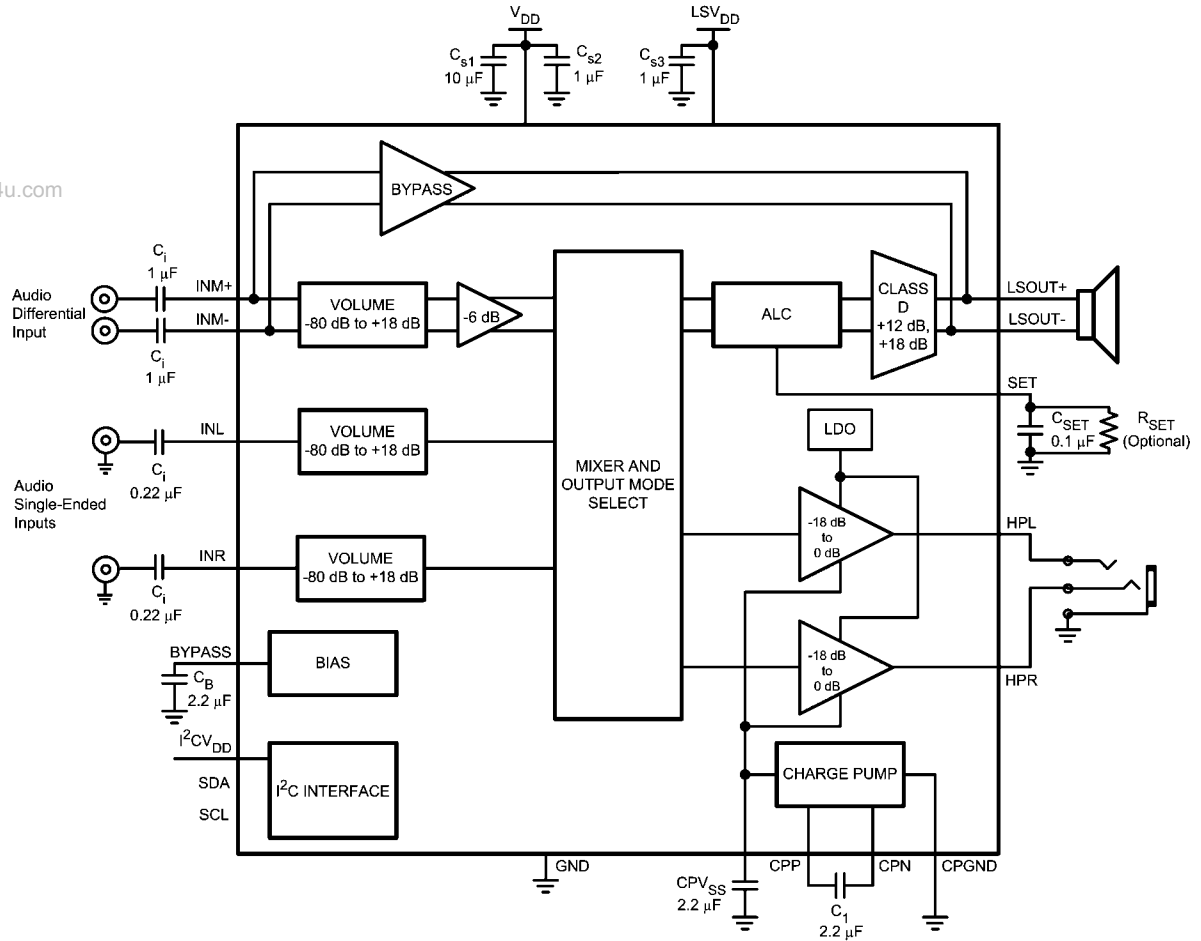
Features

- E²S class D amplifier
- Ground referenced outputs — eliminates output coupling capacitors
- I²C programmable No Clip Function with Clip Control
- Voltage limiter speaker protection
- I²C volume and mode Control
- Ear Piece Amplifier
- Advanced click-and-pop suppression
- Low supply current
- Micro-power shutdown
- 20-bump micro SMD package

Applications

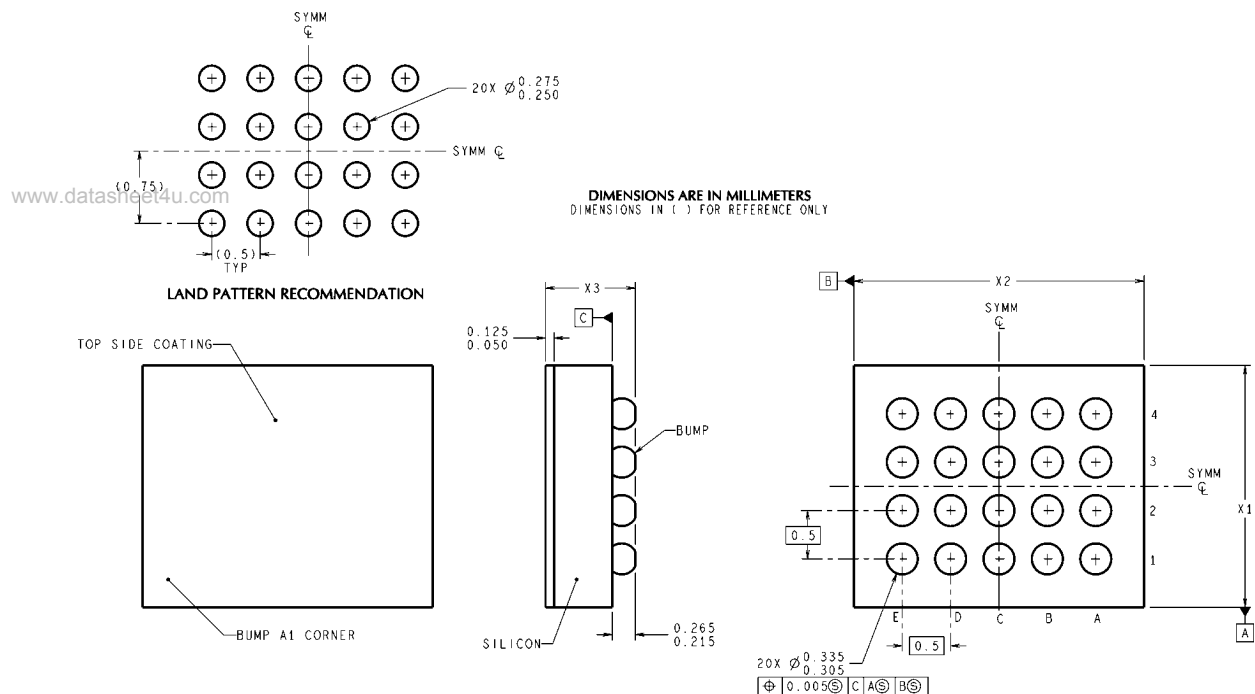
- Mobile Phones
- PDAs
- Notebook PCs
- Portable Electronics Devices
- MP3 Players

Typical Application



30092557

FIGURE 1. Typical Audio Amplifier Application Circuit

Physical Dimensions inches (millimeters) unless otherwise noted

TLA20XXX (Rev D)

micro SMD Package
Order Number LM49151TL
NS Package Number TLA20GDA
 $X_1 = 2.149\text{mm}$, $X_2 = 2.568\text{mm}$, $X_3 = 0.6\text{mm}$

Notes

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LDOs	www.national.com/ldo	Quality and Reliability	www.national.com/quality
LED Lighting	www.national.com/led	Feedback/Support	www.national.com/feedback
Voltage Reference	www.national.com/vref	Design Made Easy	www.national.com/easy
PowerWise® Solutions	www.national.com/powerwise	Solutions	www.national.com/solutions
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