TPA3100D2 Mono Amplifier Configuration

Yang Boon Quek   *HPL Audio Power Amplifiers*

ABSTRACT

This application report presents two methods of configuring the TPA3100D2 as a mono amplifier.

Contents

List of Figures

List of Tables

1   Single-Channel Configuration

The TPA3100D2 can be configured as a mono amplifier by using only one channel. Besides using less external components, the single channel can be used to operate above the rated 20-W output power.

1.1   Circuit Implementation

- Power BOTH channels but leave LOUTN and LOUTP floating.
- Remove the VCLAMPL capacitor. Do not tie VCLAMPL to VCLAMPR.
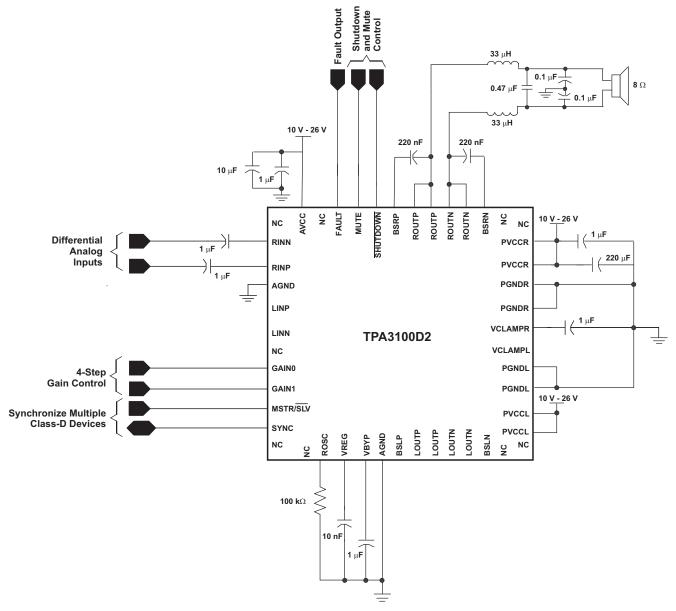- Remove BSLP and BSLN capacitors and leave LINP and LINN terminals floating.

Figure 1. Single-Channel Configuration

1.2 *Higher Output Power (Single Channel)*

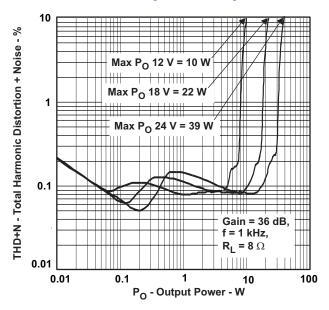Higher output power is achieved as shown in Figure 2 and Figure 3.

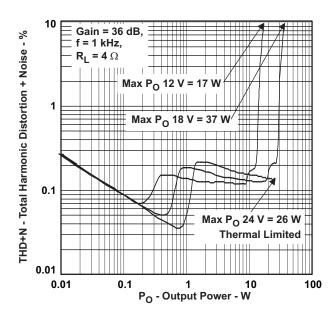**Figure 2. THD+N Versus Po (Gain = 36 dB, Frequency = 1 kHz, R_L = 8 Ω)**

Figure 3. THD+N Versus Po (Gain = 36 dB, Frequency = 1 kHz, R_L = 4 Ω)

2   Paralleled Outputs Configuration

Another configuration of the TPA3100D2 as a mono amplifier is to parallel the left and right output channels. This can achieve significantly higher output power and better efficiency than the single-channel configuration.

The biggest drawback of the paralleled outputs configuration is the required use of two additional high-current-rated inductors.

2.1 Circuit Implementation

As both audio channels of the TPA3100D2 are designed to be operated independently, tying the outputs together results in a large current draw, and the device short-circuit protection is activated. Thus, a low-pass LC filter is placed between each output and the speaker as shown in Figure 4. Use the recommended L and C values as discussed in the applications report *Class-D LC Filters* (SLOA119).
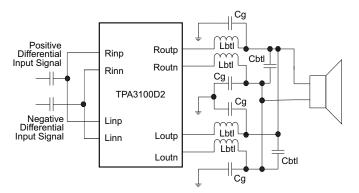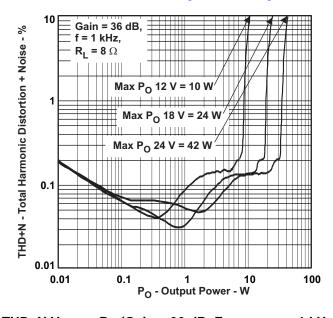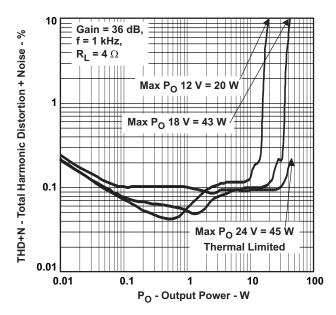

Figure 4. Paralleled Outputs Configuration

Note that the effective load resistance on each channel is equal to two times the speaker impedance.

Table 1. Recommended Filter Component Values

Rspeaker	Lbtl	Cbtl	Cg
4 Ω	33 µH	0.47 µF	0.1 µF
8 Ω	60 µH	0.22 µF	0.022 µF

2.2 Higher Output Power (Paralleled Outputs)

Higher output power can be achieved as shown in Figure 5 and Figure 6.

Figure 5. THD+N Versus Po (Gain = 36 dB, Frequency = 1 kHz, R_L = 8 Ω)

Figure 6. THD+N Versus Po (Gain = 36 dB, Frequency = 1 kHz, R_L = 4 Ω)

The paralleled output configuration is most effective at Vcc=24 V and Rspeaker = 4 Ω. For any other Vcc and Rspeaker, the paralleled output configuration provides only marginal increase in output power while increasing the total cost and PCB board space.

IMPORTANT NOTICE