**EE6350: Class-D Audio Amplifier Datasheet**

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1. **Features**
* 1.8 V Operating voltage
* Efficiency > 80%
* 80 mA (rms) output stage drive strength
* Output power of 50 mW
* Short-circuit protection
* ESD protection

1. **Applications**
* Portable audio devices
* PC audio systems
1. **General Description**

The amplifier is a single-channel, efficient, class-D audio power amplifier for driving stereo speakers in a half-bridge configuration. It is designed to drive 8**Ω**speaker with a gain of two. The chip can accept an analog signal as well as a pulse width modulated (PWM) signal from a microcontroller as an audio input.

1. **Block Diagram**

Fig.1 shows the simplified block diagram of the class-D amplifier.

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Fig. 1 Block diagram

The analog input signal flows into an integrator then compared with a triangular wave. The output of the comparator is PWM wave, and goes into the timing control block to create a dead time between the signal for the PMOS and NMOS of the output stage. Thus the time which both the NMOS and PMOS are conducted is limited and the power is reduced.

1. **Pin Configuration**

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Fig. 2 Pin-out of the chip

|  |  |  |  |
| --- | --- | --- | --- |
| **PIN NAME** | **PIN NUMBER** | **I/O** | **DISCRIPTION** |
| Vss | 1 | I | Connect to power ground |
| Vss | 2 | I | Connect to power ground |
| SigIn | 3 | I | Audio signal input |
| FbIn | 4 | I | Connect to the feedback resistor |
| Vdd | 5 | P | Connect to power supply |
| Vdd | 6 | P | Connect to power supply |
| BufEn | 7 | I | Enable signal for the entire chip |
| Vref | 8 | I | Reference voltage of the integrator |
| PWMIn | 9 | I | PWM audio signal input |
| Vss | 10 | P | Connect to power ground |
| Vss | 11 | P | Connect to power ground |
| PWMEn | 12 | I | Enable signal of PWM signal |
|  SigOut | 15 | O | Amplified signal out |
| SigOut | 16 | O | Amplified signal out |
| SigOut | 17 | O | Amplified signal out |
| SigOut | 18 | O | Amplified signal out |
| TrOut | 22 | I/O | External triangle wave input/Internal Triangle wave test |
| ComOut | 23 | O | Comparator output |
| TrBP | 24 | I | Enable signal for triangle wave  |
| Vdd | 27 | P | Connect to power supply |
| Vdd | 28 | P | Connect to power supply |

1. **Application diagram**

Figure 3 shows the application level connection for the Class D Amplifier chip. L and C2 formed a second-order low-pass filter and C3 is the decoupling capacitor. The recommended values are L=33 uH, C2= 220 nF, and C3= 470 uF.



Fig. 3 Application diagram