

# 1-watt BTL audio amplifier

Source: Philips Semiconductors Preliminary Specification

The TDA8581(T) from Philips Semiconductors is a 1-watt Bridge Tied Load (BTL) audio power amplifier capable of delivering 1 watt output power into an 8-Ω load at THD (total harmonic distortion) of 10% and using a 5-V power supply. The schematic shown here combines the functional diagram of the TDA8551 with its typical application circuit. The gain of the amplifier can be set by the digital volume control input. At the highest volume setting, the gain is 20 dB. Using the MODE pin the device can be switched to one of three modes: standby (MODE level between  $V_p$  and  $V_p-0.5$  V), muted (MODE level between 1 V and  $V_p-1.4$  V) or normal (MODE level less than 0.5 V). The TDA8551 is protected by an internal thermal shutdown protection mechanism.

The total voltage loss for both MOS transistors in the complementary output stage is less than 1 V. Using a 5-V supply and an 8-Ω loudspeaker, an output power of 1 watt can be delivered.

The volume control has an attenuation range of between 0 dB and 80 dB in 64 steps set by the 3-state level at the UP/DOWN pin: *floating*: volume remains unchanged; *negative pulses*: decrease volume; *positive pulses*: increase volume. Each pulse at the Up/DOWN pin causes a change in gain of  $80/64 = 1.25$  dB (typical value). When the supply voltage is first connected, the attenuator is set

to 40 dB (low volume), so the gain of the total amplifier is then -20 dB. Some positive pulses have to be applied to the UP/DOWN pin to achieve listening volume. The graph shows the THD as a function of output power. The maximum quiescent current consumption of the amplifier is specified at 10 mA, to which should be added the current resulting from the output offset voltage divided by the load impedance.

(984092-1, Gb)

