



NXP dual-channel  
high power Class-D  
amplifiers TDF8599x  
for automotive and  
transportation

## Bring concert hall-like sound into the vehicle

Operating with a maximum output power of 145 W, these highly dynamic stereo Class-D amplifiers for in-car entertainment deliver a superior audio experience, while increasing energy efficiency and lowering the temperature.

### KEY FEATURES

- ▶ Leading sound performance
  - No pop noise from DC offset voltage
  - Suitable for 1 to 8  $\Omega$  speakers
  - Differential inputs for reduced noise
- ▶ Very high efficiency
  - TDF8599A: supply voltage = 8 to 35 V, max stereo output = 135 W / 4  $\Omega$
  - TDF8599B: supply voltage = 8 to 24 V, max stereo output = 70 W / 4  $\Omega$
  - TDF8599C: supply voltage = 8 to 48 V, max stereo output = 145 W / 8  $\Omega$
  - Spread spectrum
- ▶ Best-in-class EMI performance
  - Phase staggering
  - BD modulation
  - Frequency hopping
  - SOI technology
- ▶ Ultra-efficient operation
  - Low quiescent current per channel
- ▶ Control and diagnostic functions
  - I<sup>2</sup>C-bus clip detection
  - Hardware-controlled thermal foldback and protection
- ▶ AEC-Q100 qualified
- ▶ Small HSOP36 package (SOT851-2)

### TARGET APPLICATIONS

- ▶ Automotive head units
- ▶ Automotive sound systems
- ▶ Consumer HiFi docking station or sound bars
- ▶ Public announce system

These dual-channel Class-D amplifiers deliver the very high level of sound quality required by today's advanced in-car entertainment systems. In stereo mode, with a maximum supply voltage of 48 V, the maximum output power is up to 145 W. In mono mode, the amplifier can go even higher (up to 250 W), to support applications such as high-end subwoofer systems.

The increased energy efficiency of these amplifiers means heat dissipation can be reduced significantly when driving at high output powers.

All amplifiers are produced in Silicon-On-Insulator (SOI) BCD MOS technology and, as a result, deliver superior EMC performance and minimize interference levels.



All amplifier are fully qualified according to the automotive quality standard AEC -Q100 and available in a small space saving HSOP36 package.

As with all of NXP’s automotive amplifiers, all devices are controlled via the I<sup>2</sup>C-bus. This enables smart diagnostics for assembly, service, and general operating functions. During system assembly, for example, connections can be checked to ensure that all connectors and speakers are properly connected. The diagnostics can also be used during fault analysis, when the audio application is serviced, to identify

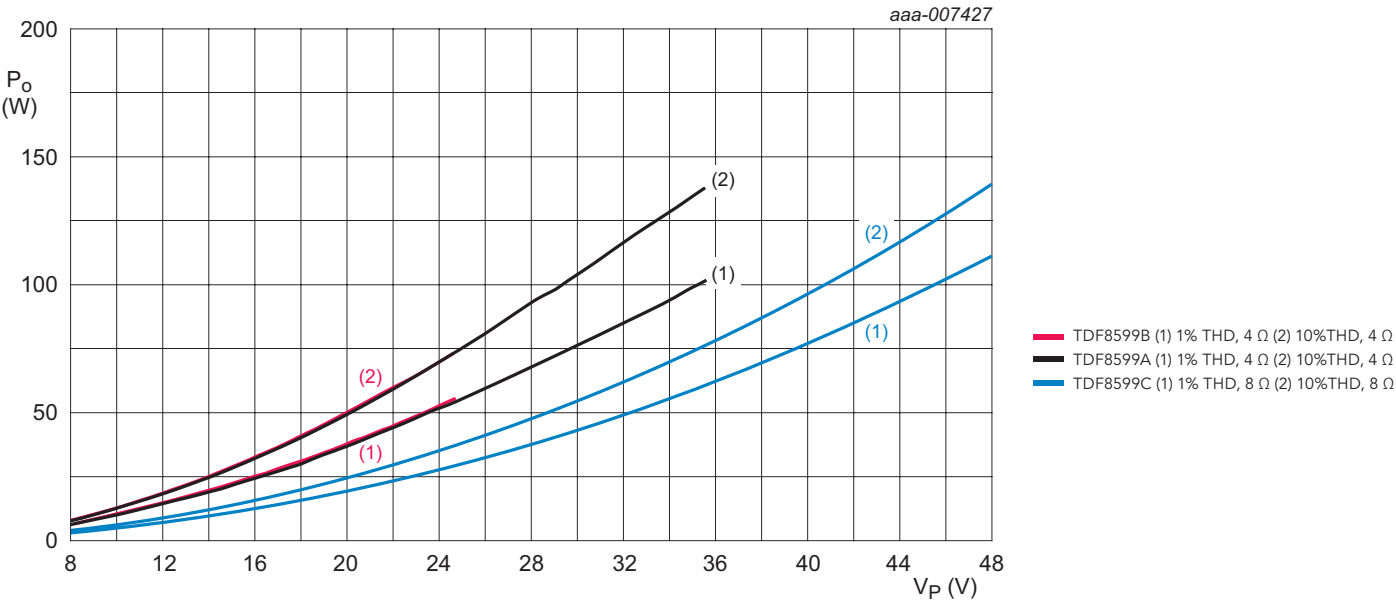
problems such as a disconnected tweeter or a short to ground. During normal operations, the diagnostics can be used to avoid overstress and/or damage.

PROVEN EXPERIENCE

NXP is an established supplier in the automotive market, building on decades of experience. We support all the functions necessary for a car radio, from the antenna to the speakers, with a special emphasis on operational quality. We reduce the total cost of the system while delivering robust performance and excellent EMC ratings.

Output power versus supply voltage

P<sub>o</sub> vs. V<sub>p</sub>, R<sub>L</sub>=4 Ω (TDF8599A and TDF8599B), 8 Ω (TDF8599C), f = 1kHz.



Selection guide

| Product number | Channels | Supply voltage | Load dump | Maximum output power (stereo) | I <sup>2</sup> C | Watchdog timer | Package |
|----------------|----------|----------------|-----------|-------------------------------|------------------|----------------|---------|
| TDA8599ATH     | 2        | 8 to 35 V      | 50 V      | 135 W                         | Yes              | Yes            | HSOP36  |
| TDA8599BTH     | 2        | 8 to 24 V      | 50 V      | 70 W                          | Yes              | Yes            | HSOP36  |
| TDF8599CTH     | 2        | 8 to 48 V      | 50 V      | 145 W                         | Yes              | Yes            | HSOP36  |