



## NXP single digital-loop Class-D amplifiers TDF853x

# Class-D amplifiers for an A+ audio experience

Equipped with a single digital-feedback loop, these ultra-performance Class-D amplifiers reduce system cost in automotive applications while delivering unparalleled sound quality.

### KEY FEATURES

- ▶ Three, four, or five 2 or 4  $\Omega$  load Class-D BTL channels
- ▶ Two BTL channels can combine to drive 1  $\Omega$
- ▶ Feedback after low-pass filter for lower BOM cost and better audio quality
- ▶ Operation voltage from 5.5 V to 18 V (optional 25 or 45)
- ▶ Digital input in TDM/I<sup>2</sup>S format to ensure easy board layout
- ▶ Line-driver mode to drive an external amplifier via direct loudspeaker cable
- ▶ Quality in accordance with AEC-Q100
- ▶ Diagnostic
  - Startup diagnostic for AC and DC coupled loads
  - Supply voltage feedback with 8-bit resolution
  - Selectable clip detection
  - Selectable diagnostic information on DIAG pins
  - IEEE 1194.1-compliant, board-level boundary scan
  - DC output offset diagnostics
- ▶ Protection
  - Independent output current per channel with selectable thresholds
  - Load dump protection (50 V)
  - Over- and undervoltage protection
  - Thermal fold-back and thermal protection

- ▶ Interleaved power stages (optional) for improved EMC and reduced output-filter cost/complexity

### TARGET APPLICATIONS

- ▶ Automotive head-unit radio
- ▶ Automotive sound systems
- ▶ Automotive-engine sound design

The NXP TDF853x family is a series of ultra-efficient Class-D amplifiers that create a seamless audio experience in vehicles that support 5.5 V stop- start requirements.

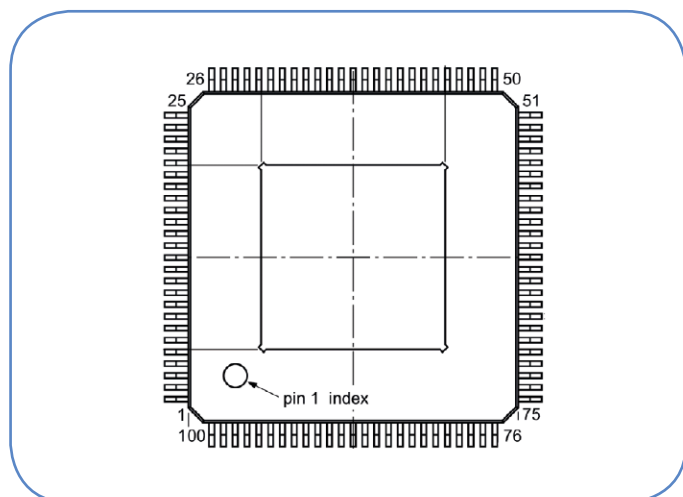
Ideally suited for use in active noise-cancellation systems, these amplifiers also fit head units and sound systems, and can be used to generate ambient and/or engine sounds in electric vehicles.

The output power per channel varies with the supply voltage. The devices support up to 18 or 25 V, with 45 V to drive the loudspeaker.

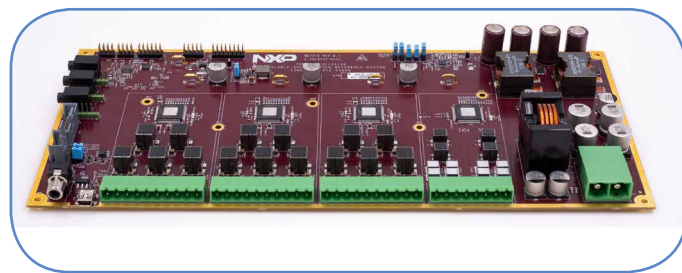
The TDF8531 has three channels, the TDF8532 has four channels, and the TDF8534 has five channels. The TDF8536 has four 45 V channels.



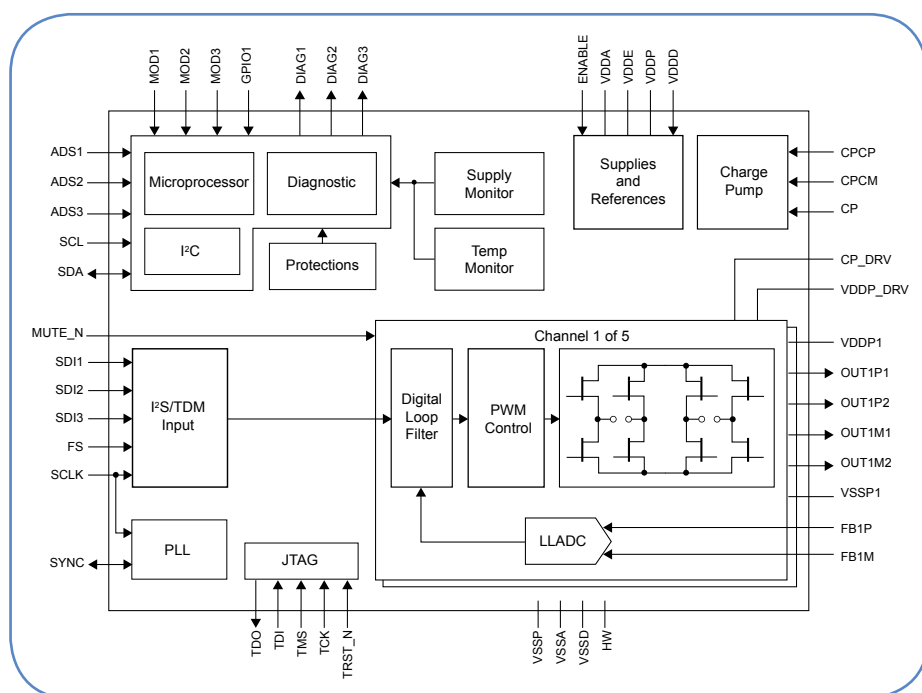
## HLQFP100 PACKAGE



## TDF853X CLASS-D AMPLIFIER REFERENCE DESIGN



## TDF853X BLOCK DIAGRAM



## SELECTION GUIDE

| Type       | Channel | Supply       | Max output power | THD+N / Noise         | Parallel Mode | Idle Power Dissipation | Interleaved Mode |
|------------|---------|--------------|------------------|-----------------------|---------------|------------------------|------------------|
| TDF8531HH  | 3       | 5.5 V – 25 V | 3 x 80 W         | 0.005 %<br>26 $\mu$ V | Yes           | 2.1 W                  | Key Code         |
| TDF8532HH  | 4       | 5.5 V – 25 V | 4 x 80 W         | 0.02 %<br>26 $\mu$ V  | Yes           | 2.8 W                  | Key Code         |
| TDF8532BHH | 4       | 5.5 V – 18 V | 4x 70 W          | 0.005 %<br>42 $\mu$ V | –             | 2.8 W                  | –                |
| TDF8534HH  | 5       | 5.5 V – 25 V | 5 x 80 W         | 0.005 %<br>26 $\mu$ V | Yes           | 3.5 W                  | Key Code         |
| TDF8534BHH | 5       | 5.5 V – 18 V | 5x 70 W          | 0.02 %<br>42 $\mu$ V  | –             | 3.5 W                  | –                |
| TDF8536HH  | 4       | 5.5 V – 45 V | 4 x 140 W        | 0.005 %<br>48 $\mu$ V | Yes           | 3.0W                   | Included         |