

Product Brief

Automotive BiCD Power Amplifier ICs

Highlights

- Designed for 4-channel automotive audio applications
- Broad family with many different feature options
- Class AB circuits with bridge-tied load output configuration
- High power, low distortion for great-sounding audio
- BiCMOS process with pure complementary P-channel and N-channel DMOS output stages
- Reduced $R_{DS(ON)}$ and single-stage amplifier circuits for improved slew rates, bandwidth, and distortion
- High-efficiency option for reduced power consumption
- Built-in diagnostics detect faults like shorts or opens
- Protection against thermal overload, output short circuits, DC offset
- High reliability
- 25-pin HZIP package

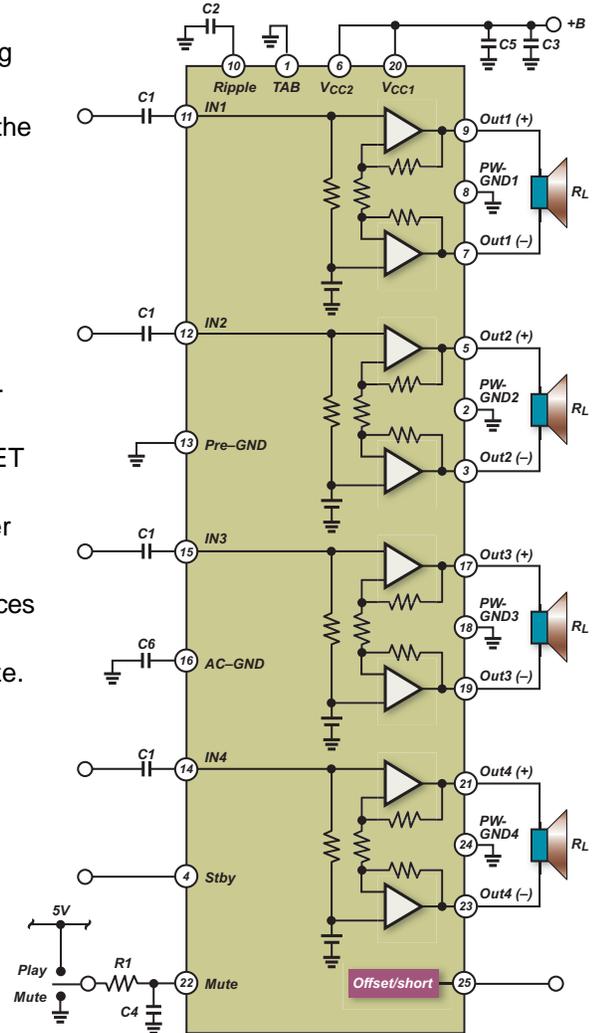
Description

The Toshiba BiCD 4-channel power amplifier IC products meet the demanding reliability and quality requirements of automotive audio applications. All ICs in the series have four sets of BTL outputs, but have different ancillary features to fit a range of requirements.

Key Technologies

- BiCMOS circuits combine the speed, accuracy and low noise of bipolar junction transistors with the high current capacity and ease of control of MOSFET transistors. The Toshiba BiCD process adds DMOS FETs, enabling high power delivery with low noise and distortion.
- Toshiba's enhanced BiCD process reduces the $R_{DS(ON)}$ of the output FETs to minimize power loss while reducing size.
- Toshiba's innovative single-stage amplifier circuit greatly improves noise performance and bandwidth of the devices, without the risk of oscillation typical of other single-stage designs.
- High efficiency class KB (keyed BTL) topology consumes 50% less power than class AB for typical signal levels, yet can deliver high dynamic peak power.

Typical IC-TB2923HQ



	Bipolar	BiCD	Enhanced BiCD
High Efficiency Class KB	TA8270 Series	TB2905 Series	Planned Series
I ² C Controlled		TB2902 Series	TB2932HQ Series
Standalone	TA825x/6x Series	TB2901 Series	TB2921HQ Series

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Features	TB29xx													
	01	02	03	04	05	06	12	13	17	21	23	26	32	34
50W	●		●		●			●	●		●			
45W				●		●								
43W		●					●					●	●	●
2Ω Drive	●	●			●		●			●	●		●	●
26 dB Gain	●		●		●	●		●	●	●	●	●		
26/12 dB Gain		●		●			●						●	
34/26 dB Gain						●								●
I ² C Interface		●					●						●	●
Self-diagnostics		●					●						●	●
Tweeter diagnostics		●					●						●	●
Clip detect		●			●		●	●					●	●
DC offset detect		●	●		●	●	●		●		●	●	●	●
Low-V _{CC} detect		●					●						●	●
Thermal shutdown	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Internal mute/standby		●					●						●	●
External mute control	●		●	●	●	●	●	●	●	●	●	●		
External standby control	●		●	●	●	●	●	●		●	●	●		
Ultra-low standby	●		●	●	●	●	●	●		●	●	●		
AC GND	●		●	●	●	●		●		●	●	●	●	
High-side switch	●									●				
Reduced on-resistance									●	●	●	●	●	
Single-stage circuit									●	●	●	●	●	
High-efficiency class-KB					●									
Multi-output regulator									●					

Color Key: Red = Enhanced BiCD process; Blue = Class-KB design

Feature Guide Glossary

- 50W/45W/43W per channel: (EIAJ @ 15.2V V_{CC})
- Ultra-low standby current: 1-2 μA
- 2-ohm drive: for low-impedance loads and higher-quality sound
- 12/26/34 dB gain: choices allow matching amps to sources
- I²C interface: allows host MCU to control mute/standby, diagnostics
- Internal mute/standby: host MCU can control amp state via I²C
- External mute/standby: input pins allowing amp to be muted and shut down
- AC GND: helps screen out system noise
- Self-diagnostics: check for shorts, opens by "reading" state of current flow and voltage at outputs
- Tweeter diagnostics: read current/voltage state at high frequency (20 KHz)
- Clip detect: alerts host MCU to clipping
- DC offset detect: alerts host MCU to DC offset condition
- Low-V_{CC} detect: mutes amp when V_{CC} drops too low, preempting pop noise
- Thermal shutdown: mutes amp when temperature threshold is crossed

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