TAS2562 6-W Boosted Class-D Audio Amplifier with IV Sense

1 Features

- High Performance Class-D Amplifier
  - 6 W 1% THD+N (4 Ω at 3.6 V)
  - 5 W 1% THD+N (8 Ω at 3.6 V)
- 15 µVrms A-Weighted Idle Channel Noise
- 112.5dB SNR at 1% THD+N (8 Ω)
- 100dB PSRR with 200 mV_{PP} ripple at 20 - 2 kHz
- 83 % Efficiency at 1 W (8 Ω, VBAT = 4.2 V)
- < 1 µA HW Shutdown VBAT Current
- Speaker Voltage and Current Sense
- VBAT Tracking Peak Voltage Limiter with Brown Out Prevention
- 8 kHz to 192 kHz Sample Rates
- Flexible User Interfaces
  - I^2S/TDM: 8 Channels (32-bit / 96 kHz)
  - I^2C: 4 selectable Addresses
- MCLK Free Operation
- Low Pop and Click
- Advanced Brown-Out Prevention
- Power Supplies
  - VBAT: 2.7 V to 5.5 V
  - VDD: 1.65 V to 1.95 V
- Spread-Spectrum Low EMI Mode
- Thermal and Over Current Protection
- 36-Ball, 0.4 mm pitch, DSBGA Package

2 Applications

- Mobile Phone
- Tablets
- Bluetooth Speakers
- Consumer Audio Devices

3 Description

The TAS2562 is a digital input Class-D audio amplifier optimized for efficiently driving high peak power into small loudspeaker applications. The Class-D amplifier is capable of delivering 6W of peak power into a 4 Ω load at a battery voltage of 4.2 V.

Integrated speaker voltage and current sense provides for real time monitoring of the loudspeakers. This permits pushing peak SPL while keeping speakers in the safe operation area. A battery tracking peak voltage limiter with brown out prevention optimizes amplifier headroom over the entire charge cycle preventing system shutdowns.

Up to four devices can share a common bus via I^2S/TDM + I^2C interfaces.

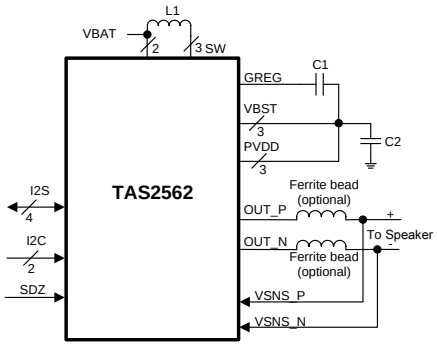
The TAS2562 device is available in a 36-ball, 0.4 mm pitch CSP for a compact PCB footprint.

Device Information(1)

PART NUMBER	PACKAGE	BODY SIZE (NOM)
TAS2562	DSBGA	2.41 mm × 2.43 mm

(1) For all available packages, see the orderable addendum at the end of the data sheet.

Simplified Schematic



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An IMPORTANT NOTICE at the end of this data sheet addresses availability, warranty, changes, use in safety-critical applications, intellectual property matters and other important disclaimers. ADVANCE INFORMATION for pre-production products; subject to change without notice.

4 Device and Documentation Support

4.1 Community Resources

The following links connect to TI community resources. Linked contents are provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's Terms of Use.

TI E2E™ Online Community ***TI's Engineer-to-Engineer (E2E) Community.*** Created to foster collaboration among engineers. At e2e.ti.com, you can ask questions, share knowledge, explore ideas and help solve problems with fellow engineers.

Design Support ***TI's Design Support*** Quickly find helpful E2E forums along with design support tools and contact information for technical support.

4.2 Trademarks

E2E is a trademark of Texas Instruments.

4.3 Electrostatic Discharge Caution

These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

4.4 Glossary

SLYZ022 — *TI Glossary*.

This glossary lists and explains terms, acronyms, and definitions.

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5 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

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PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
PTAS2562YFPR	ACTIVE	DSBGA	YFP	36	3000	TBD	Call TI	Call TI	-40 to 85		Samples
TAS2562YFPR	PREVIEW	DSBGA	YFP	36	3000	TBD	Call TI	Call TI	-40 to 85		
TAS2562YFPT	PREVIEW	DSBGA	YFP	36	250	TBD	Call TI	Call TI	-40 to 85	TAS2-SA	

(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

(2) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".
RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.
Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

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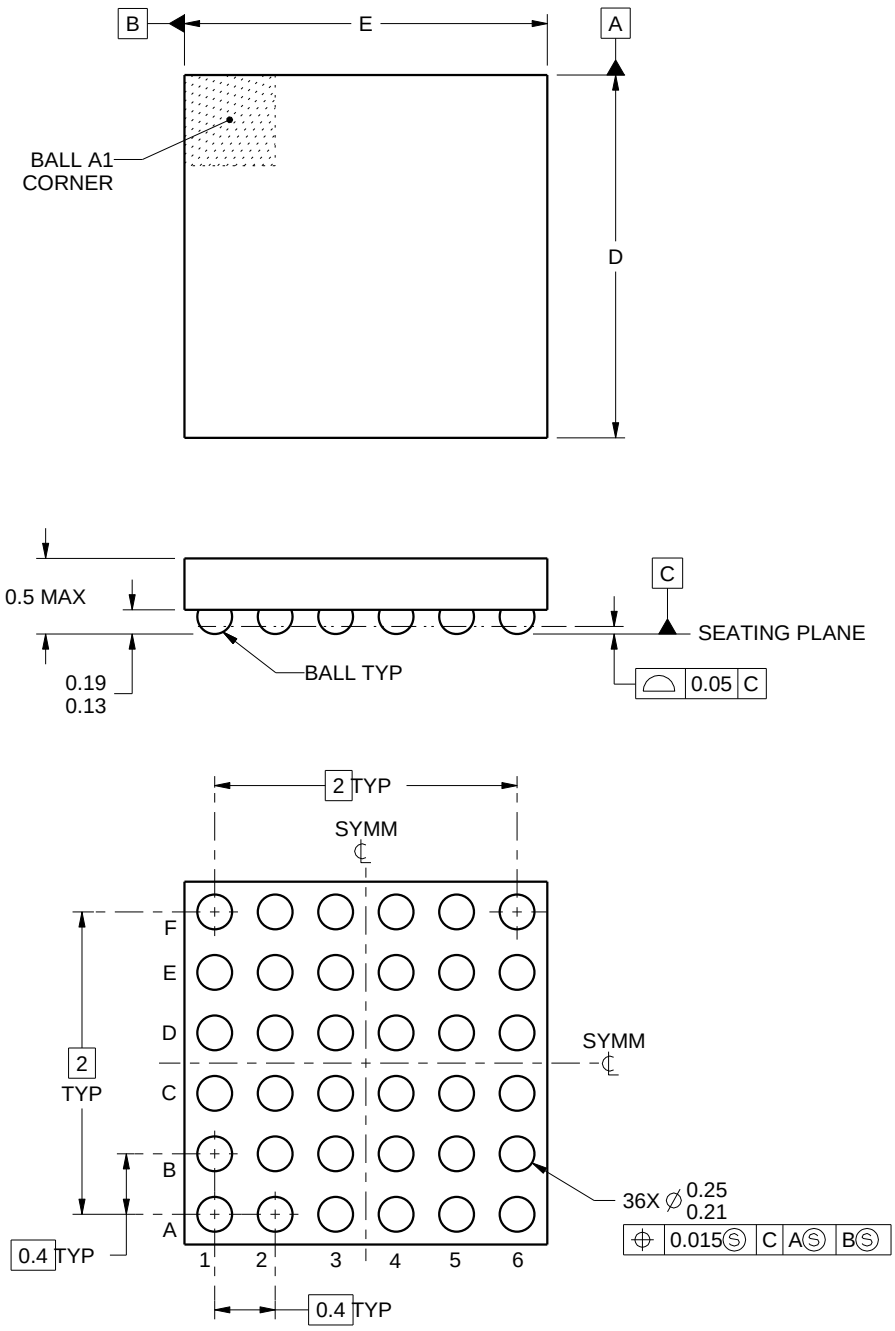
PACKAGE OUTLINE

YFP0036

DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



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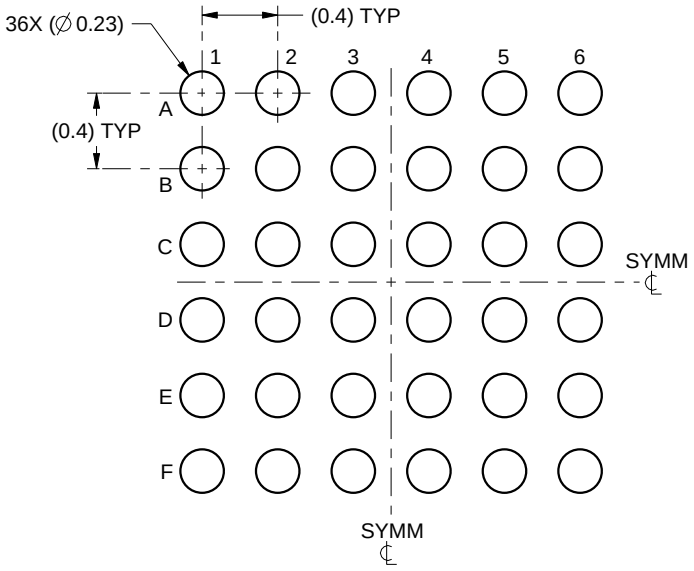
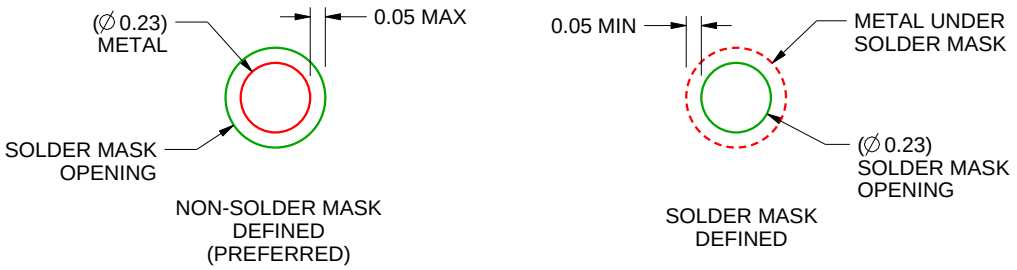
NOTES:

1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.



LAND PATTERN EXAMPLE
SCALE:25X



SOLDER MASK DETAILS
NOT TO SCALE

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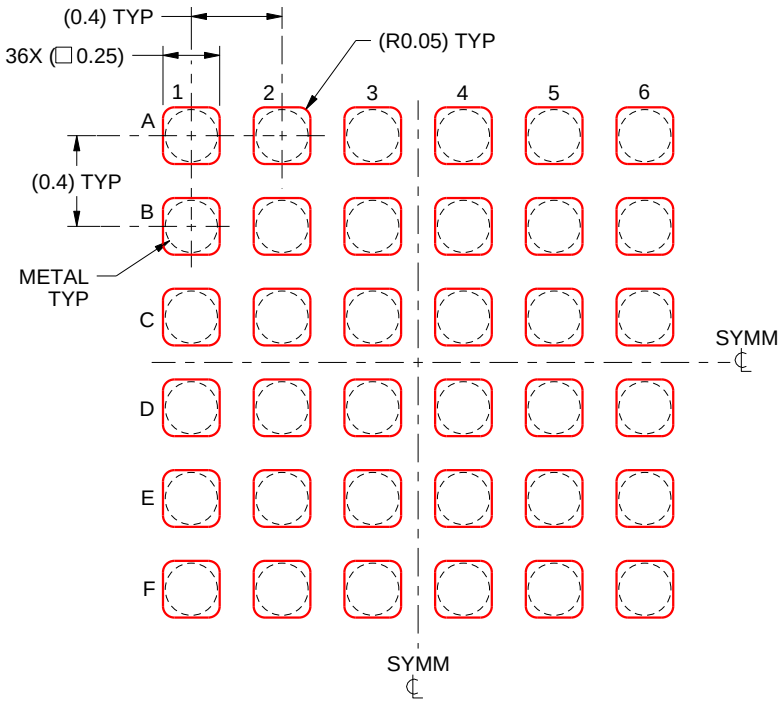
NOTES: (continued)

3. Final dimensions may vary due to manufacturing tolerance considerations and also routing constraints.
For more information, see Texas Instruments literature number SNVA009 (www.ti.com/lit/snva009).



SOLDER PASTE EXAMPLE
BASED ON 0.1 mm THICK STENCIL
SCALE:30X

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NOTES: (continued)

4. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release.

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