TEXAS INSTRUMENTS
TAS6422E-Q1
ZHCSM93 – OCTOBER 2020

TAS6422E-Q1 具有负载突降保护和 I²C 诊断功能的 45W、2MHz 数字输入 2 通道汽车用 D 类音频放大器

Texas Instruments Burr-Brown Audio

ADVANCE INFORMATION

1 特性

- 符合面向汽车应用的 AEC-Q100 标准
  - 温度等级 1：–40°C 至 +125°C T_A
- 高级负载诊断
  - 直流诊断功能，无需输入时钟即可执行
  - 交流诊断功能，可通过阻抗和相位响应实现高频扬声器检测
- 可轻松满足 CISPR25-L5 EMC 规范
- 音频输入
  - 输入采样率：44.1kHz、48kHz、96kHz
  - 输入格式：16 位至 32 位 I²S 和 TDM
- 音频输出
  - 最高可达 2.1MHz 的输出开关频率
- 在 4Ω 负载、14.4V BTL 条件下的音频性能
  - 输出功率为 1W 时，THD+N < 0.02%
  - 42μV_{RMS} 输出噪声
  - –90dB 串扰
- 负载诊断功能
  - 开路和短路输出负载
  - 输出至电池短路或接地短路
  - 线路输出检测能力高达 6kΩ
  - 独立于主机运行
- 保护
  - 输出电流限制和短路保护
  - 40V 负载突降
  - 可承受接地开路和电源开路
  - 直流失调电压
  - 温度过高
  - 欠压和过压
- 常规运行
  - 4.5V 至 26.4V 电源电压
  - I²C 控制，具有 4 个地址选项
  - 锁存或非锁存削波检测

2 应用

- 汽车音响主机
- 汽车外部放大器

3 说明

TAS6422E-Q1 器件是一款采用 2.1MHz PWM 开关频率的双通道数字输入 D 类音频放大器，以非常小的 PCB 尺寸实现成本优化的解决方案，可针对启停事件在低至 4.5V 的电压下全面运行，并可在高达 40kHz 的音频带宽下提供出色的音质。

器件增加了 EMI 管理特性（包括展频）以帮助应对系统级 EMI 挑战。

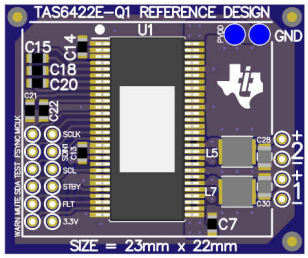
输出开关频率既可以设置为高于调幅 (AM) 频带，以消除 AM 频带干扰并降低输出滤波需求及成本；也可以设置为低于 AM 频带，以优化器件效率。

该器件内置负载诊断功能，用于检测和诊断误接的输出，以及检测交流耦合型高频扬声器，从而帮助缩短制造过程中的测试时间。

器件信息

器件型号	封装(1)	封装尺寸（标称值）
TAS6422E-Q1	HSSOP (56)	18.41mm × 7.49mm

(1) 如需了解所有可用封装，请参阅数据表末尾的可订购产品附录。



PCB 区域

4 Revision History

注：以前版本的页码可能与当前版本的页码不同

DATE	REVISION	NOTES
October 2020	*	Initial release.

5 Device and Documentation Support

5.1 Documentation Support

5.2 Related Documentation

For related documentation see the following:

- *PurePath™ Console 3* Graphical Development Suite
- TAS6422E-Q1 EVM User's Guide (SLOU541)

5.3 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. In the upper right corner, click on *Alert me* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

5.4 支持资源

TI E2E™ 支持论坛是工程师的重要参考资料，可直接从专家获得快速、经过验证的解答和设计帮助。搜索现有解答或提出自己的问题可获得所需的快速设计帮助。

链接的内容由各个贡献者“按原样”提供。这些内容并不构成 TI 技术规范，并且不一定反映 TI 的观点；请参阅 TI 的《使用条款》。

5.5 Trademarks

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5.6 静电放电警告

静电放电 (ESD) 会损坏这个集成电路。德州仪器 (TI) 建议通过适当的预防措施处理所有集成电路。如果不遵守正确的处理和安装程序，可能会损坏集成电路。

ESD 的损坏小至导致微小的性能降级，大至整个器件故障。精密的集成电路可能更容易受到损坏，这是因为非常细微的参数更改都可能会导致器件与其发布的规格不相符。

5.7 术语表

TI 术语表	本术语表列出并解释了术语、首字母缩略词和定义。

6 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.

ADVANCE INFORMATION

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
TAS6422EQDKQRQ1	ACTIVE	HSSOP	DKQ	56	1000	RoHS & Green	NIPDAU	Level-3-260C-168 HR	-40 to 125	TAS 6422E	Samples

(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.

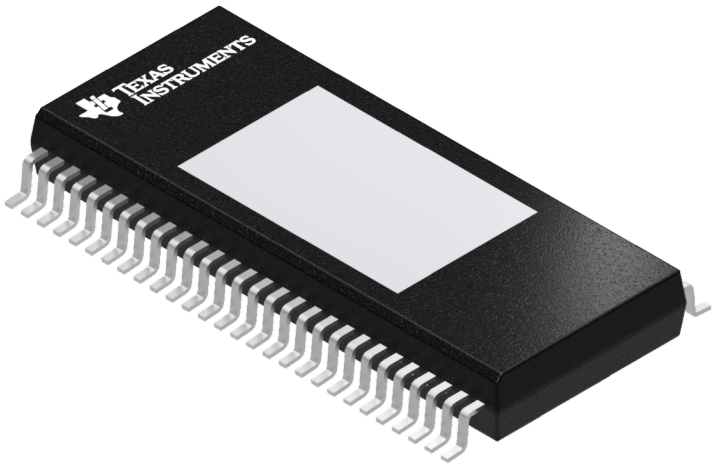
(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

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

DKQ 56 PowerPAD™ SSOP - 2.34 mm max height

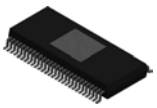
PLASTIC SMALL OUTLINE



Images above are just a representation of the package family, actual package may vary.
Refer to the product data sheet for package details.

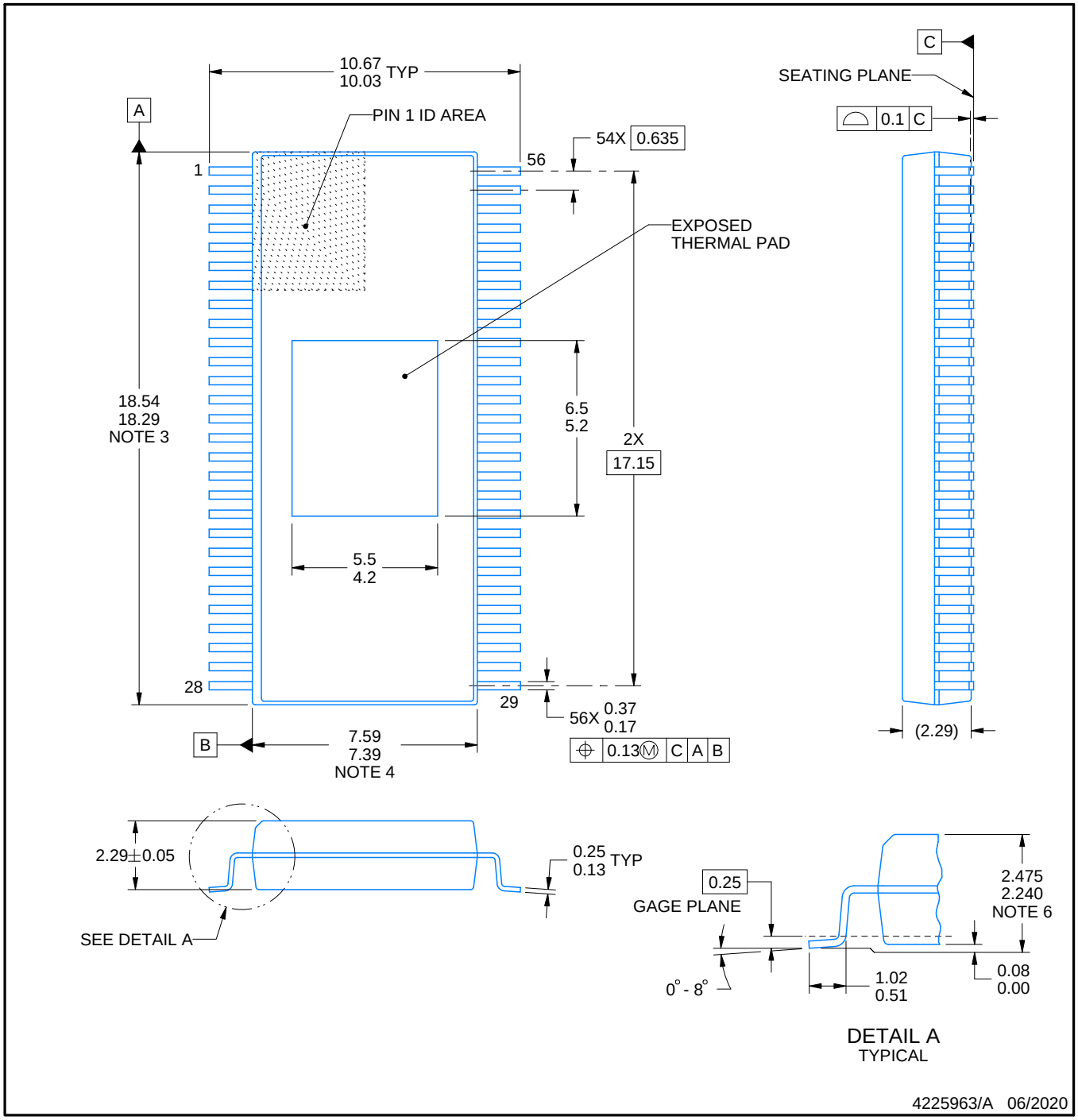
PACKAGE OUTLINE

DKQ0056C



PowerPAD™ HSSOP - 2.475 mm max height

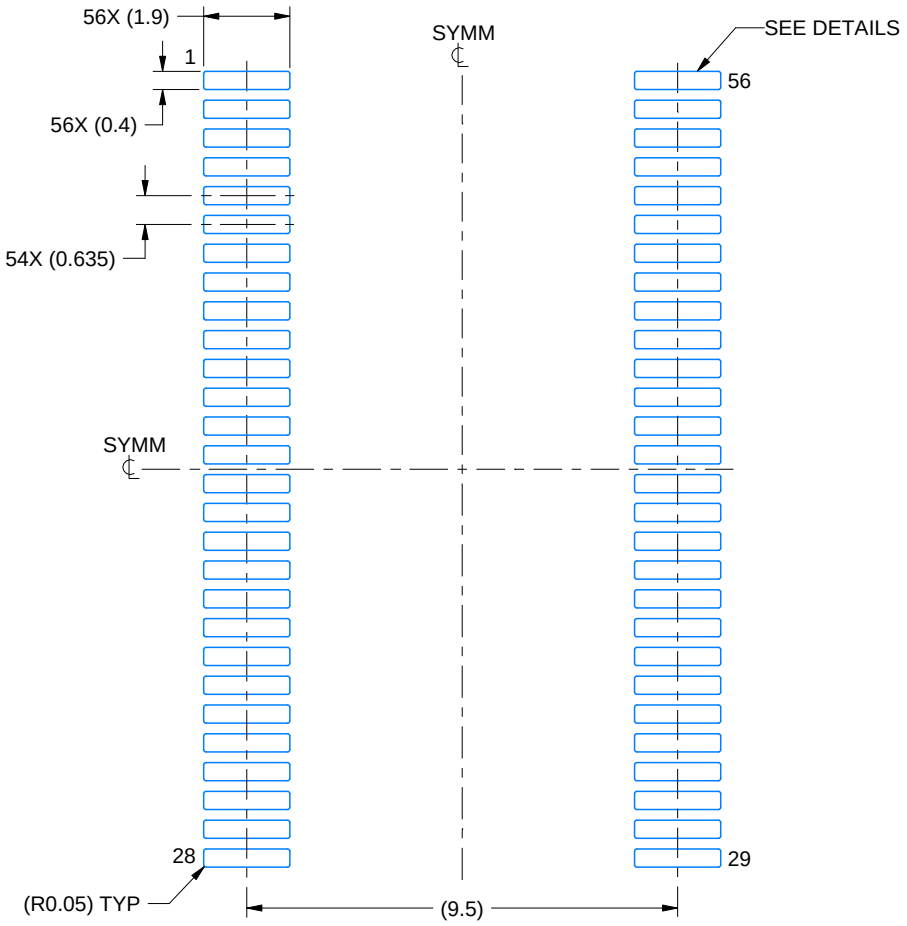
PLASTIC SMALL OUTLINE



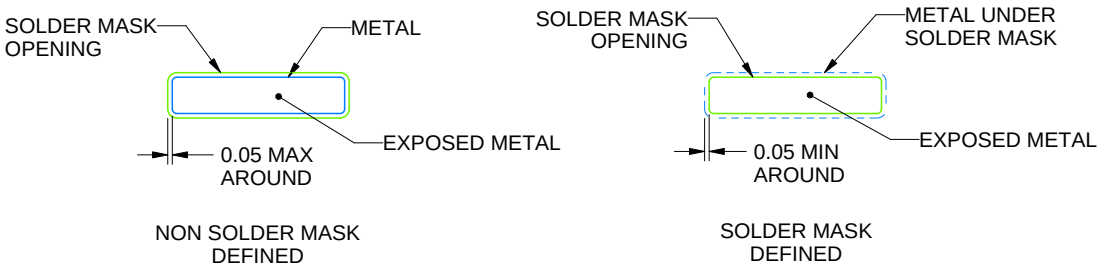
PowerPAD is a trademark of Texas Instruments.

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.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm per side.
5. The exposed thermal pad is designed to be attached to an external heatsink.
6. For clamped heatsink design, refer to overall package height above the seating plane as 2.325 +/- 0.075 and molded body thickness dimension.



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE:6X



SOLDER MASK DETAILS
NOT TO SCALE

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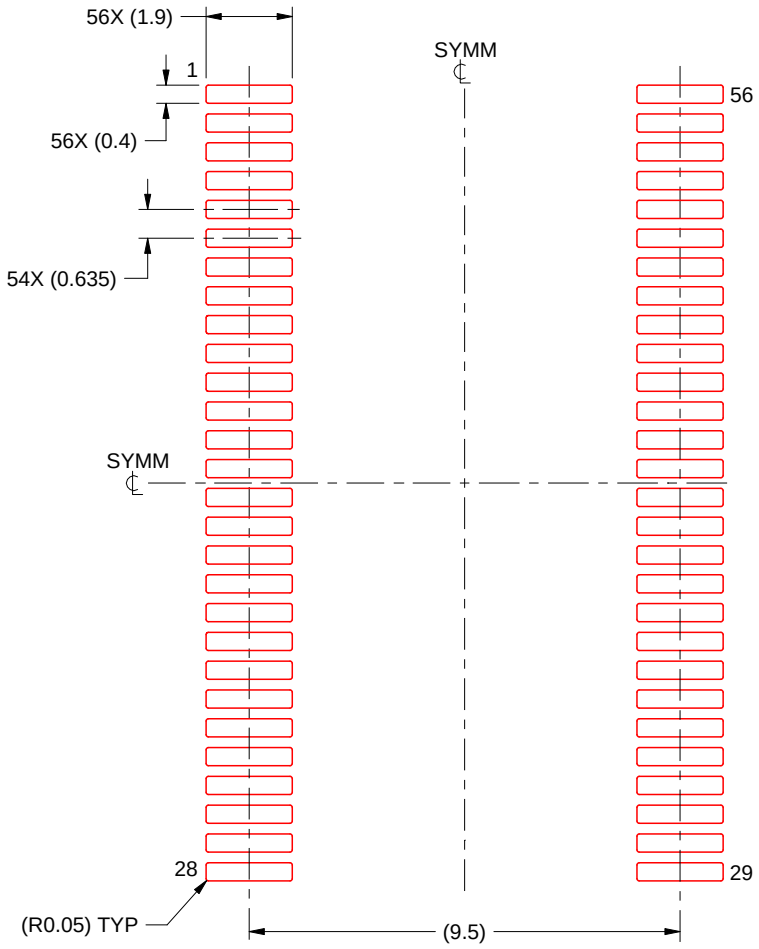
NOTES: (continued)

7. Publication IPC-7351 may have alternate designs.
8. Solder mask tolerances between and around signal pads can vary based on board fabrication site.
9. Size of metal pad may vary due to creepage requirement.



SOLDER PASTE EXAMPLE
BASED ON 0.125 MM THICK STENCIL
SCALE:6X

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NOTES: (continued)

10. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
11. Board assembly site may have different recommendations for stencil design.

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