

TS3USBCA4 USB Type-C SBU Multiplexer with MIC/AGND

1 Features

- USB Type-C™ 4:1 (TS3USBCA420) and 3:1 (TS3USBCA410) Multiplexer (MUX) for Analog Audio MIC/AGND, DisplayPort AUX, and Other Signals
- General Purpose MUX for 0 to 3.6 V Differential or Single-ended Signals
- Ultra Low R_{ON} of 60 m Ω for the AGND Connections for Low Crosstalk Performance
- Low Total Harmonic Distortion (THD)
- High Bandwidth Channels up to 500 MHz
- Supports Both Pin and I²C Configuration
- Supports Operation from Either 3.3-V \pm 10% Regulated Supply, or 2.4 to 5.5 V Battery
- Industrial Temperature Range: –40°C to 85°C TS3USBCA420I and TS3USBCA410I
- Commercial Temperature Range: 0°C to 70°C TS3USBCA420 and TS3USBCA410
- 1.8 mm x 2.6 mm, 16-pin, 0.4 mm Pitch QFN package

2 Applications

- Tablets
- Notebooks
- Desktops
- Gaming Consoles
- VR modules

3 Description

The TS3USBCA4 is a passive 4:1 (TS3USBCA420) and 3:1 (TS3USBCA410) MUX supporting various types of differential or single-ended signals on the SBU1/SBU2 terminals of a USB Type-C connector to different interfaces. Those signals can be differential DisplayPort auxiliary (AUX), analog audio MIC and AGND, PCIe differential clock, or any other supported generic differential or single-ended signals.

The audio path features ultra-low ON-state resistance (R_{ON}), low crosstalk and excellent total harmonic distortion (THD). The break-before-make feature prevents signal distortion during signal transfer from one channel to another. The high-speed paths support bandwidth as high as 500 MHz to provide adequate support for DisplayPort AUX, PCIe clock, and other similar signals. Together with low power consumption, these features make this device suitable for portable audio applications.

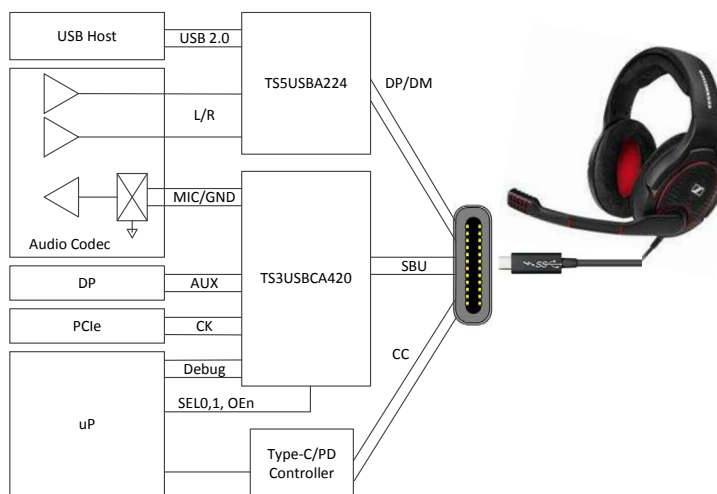
The TS3USBCA4 wide supply range from 2.4 V to 5.5 V gives users the flexibility of powering it from a single-cell battery, a 3.3-V regulator, or VBUS. It also provides options for both commercial and industrial temperature ranges.

Device Information⁽¹⁾

PART NUMBER	PACKAGE	BODY SIZE (NOM)
TS3USBCA4	UQFN (16)	1.80 mm x 2.60 mm

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

Simplified Schematic



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4 Device and Documentation Support

4.1 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.

4.2 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.

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4.3 Trademarks

E2E is a trademark of Texas Instruments.

USB Type-C is a trademark of USB Implementers Forum.

4.4 Electrostatic Discharge Caution



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

4.5 Glossary

[SLYZ022](#) — *TI Glossary*.

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

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.

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
XTS3USBCA410RSVR	ACTIVE	UQFN	RSV	16	3000	TBD	Call TI	Call TI	0 to 70		Samples
XTS3USBCA420RSVR	ACTIVE	UQFN	RSV	16	3000	TBD	Call TI	Call TI	0 to 70		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.

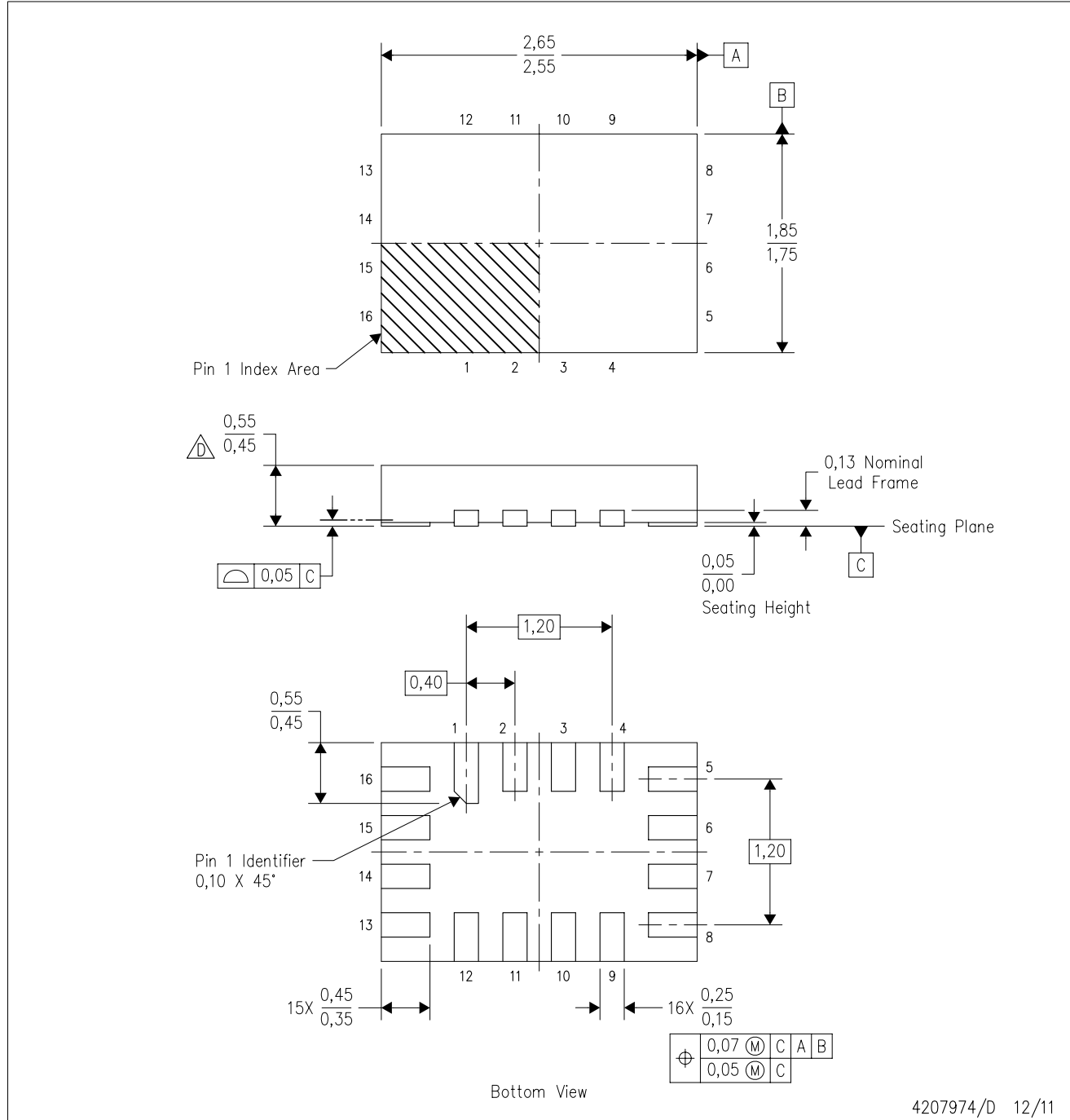
(6) Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

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RSV (R-PUQFN-N16)

PLASTIC QUAD FLATPACK NO-LEAD



4207974/D 12/11

- NOTES:
- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
 - B. This drawing is subject to change without notice.
 - C. QFN (Quad Flatpack No-Lead) package configuration.
- This package complies to JEDEC MO-288 variation UFHE, except minimum package thickness.

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