

# DP3T SWITCH WITH IMPEDANCE DETECTION MICRO-USB SWITCH TO SUPPORT USB, UART, AUDIO, AND CHARGER DETECTION

Check for Samples: [TSU5611](#)

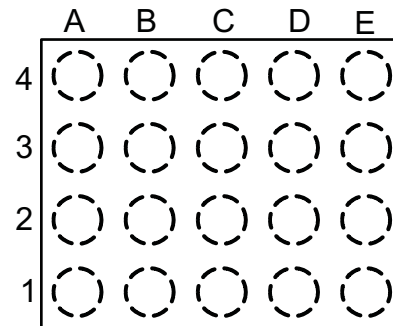
## FEATURES

- **Compatible Accessories**
  - USB Data Cable
  - UART Cable
  - Charger (Dedicated Charger or Host/Hub Charger)
  - Stereo Headset With Mic
- **Integrated LDOs for VREF and Mic Bias**
- **USB and UART Path Supports USB 2.0 High Speed**
- **Audio Path Provides Negative Rail Support and Click/Pop Reduction**
- **Supports Factory Test Mode**
- **1.8-V Compatible I<sup>2</sup>C Interface**
- **ESD Performance Tested Per JESD 22**
  - 1500-V Human-Body Model (A114-B, Class II)
  - 1000-V Charged-Device Model (C101)

## APPLICATIONS

- **Cell Phones & Smart Phones**
- **Tablet PCs**
- **Digital Cameras & Camcorders**
- **GPS Navigation Systems**
- **Micro USB Interface with USB/UART**

YZP PACKAGE  
TOP VIEW



## DESCRIPTION

The TSU5611 is designed to interface the cellular phone UART, USB, and audio chips with external peripherals via a micro-USB connector. The switch features impedance detection for identification of various accessories that are attached through DP and DM of the micro-USB port. When an accessory is plugged into the micro-USB port, the switch uses a detection mechanism to identify the accessory (see the State Machine for details). It will then switch to the appropriate channel—data, audio, or UART.

The TSU5611 has an I2C interface for communication with the cellular phone baseband or applications processor. An interrupt is generated when anything plugged into the micro-USB is detected. Another interrupt is generated when the device is unplugged.

## ORDERING INFORMATION<sup>(1)</sup>

T <sub>A</sub>	PACKAGE <sup>(2)</sup>		ORDERABLE PART NUMBER	TOP-SIDE MARKING
–40°C to 85°C	WSCP–YZP (0.5-mm pitch)	Tape and Reel	TSU5611YZPR	A7

(1) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI Web site at [www.ti.com](http://www.ti.com).

(2) Package drawings, thermal data, and symbolization are available at [www.ti.com/packaging](http://www.ti.com/packaging).



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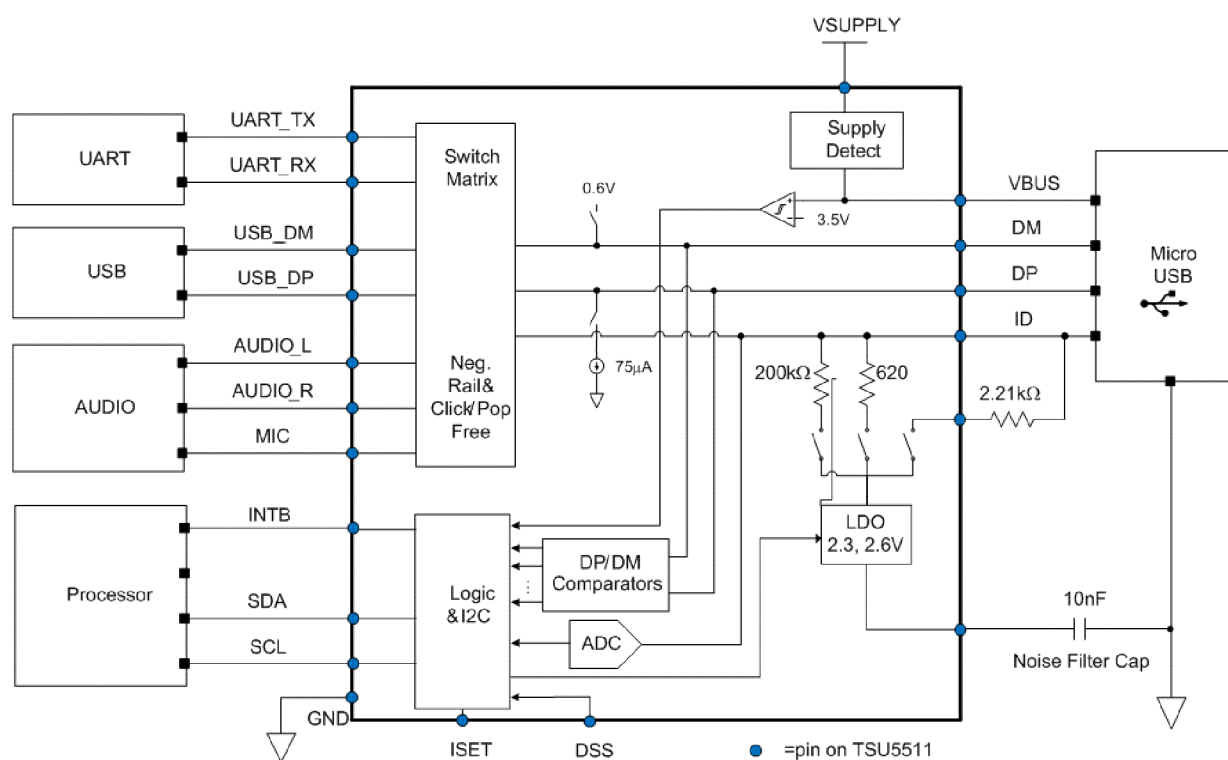


These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

## SUMMARY OF TYPICAL CHARACTERISTICS

	USB PATH	UART PATH	AUDIO PATH	MIC PATH
Number of switches	1	1	1	1
ON-state resistance (r <sub>ON</sub> )	5 $\Omega$	5 $\Omega$	3 $\Omega$	8.8 $\Omega$
ON-state resistance match ( $\Delta$ r <sub>ON</sub> )	1 $\Omega$	1 $\Omega$	1.1 $\Omega$	N/A
ON-state resistance flatness (r <sub>ON</sub> (flat))	0.24 $\Omega$	0.24 $\Omega$	0.1 $\Omega$	0.5 $\Omega$
Turn-on/turn-off time (t <sub>ON</sub> /t <sub>OFF</sub> )	1 ms	1 ms	1 ms	1 ms
Bandwidth (BW)	830 MHz	830 MHz	788 MHz	573 MHz
OFF isolation (OISO)	–22 dB	–22 dB	–75 dB	–100 dB
Crosstalk (XTALK)	–40 dB	–40 dB	–50 dB	–50 dB
Total harmonic distortion (THD)	N/A	N/A	0.05%	0.0017%
Leakage current (I <sub>NO</sub> (OFF)/I <sub>NC</sub> (OFF))	100 nA	100 nA	100 nA	100 nA
Package options	YZP package, 0.5-mm pitch			

## APPLICATION BLOCK DIAGRAM



To request a full data sheet, please send an email to:  
[signal-switches@list.ti.com](mailto:signal-switches@list.ti.com)

## PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package   Pins	Package qty   Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
<a href="#">TSU5611YZPR</a>	Active	Production	DSBGA (YZP)   20	3000   LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 85	A7
TSU5611YZPR.B	Active	Production	DSBGA (YZP)   20	3000   LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 85	A7

<sup>(1)</sup> **Status:** For more details on status, see our [product life cycle](#).

<sup>(2)</sup> **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

<sup>(3)</sup> **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

<sup>(4)</sup> **Lead finish/Ball material:** Parts 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.

<sup>(5)</sup> **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

<sup>(6)</sup> **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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## TAPE AND REEL INFORMATION



\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
TSU5611YZPR	DSBGA	YZP	20	3000	180.0	8.4	1.99	2.49	0.56	4.0	8.0	Q1

## TAPE AND REEL BOX DIMENSIONS

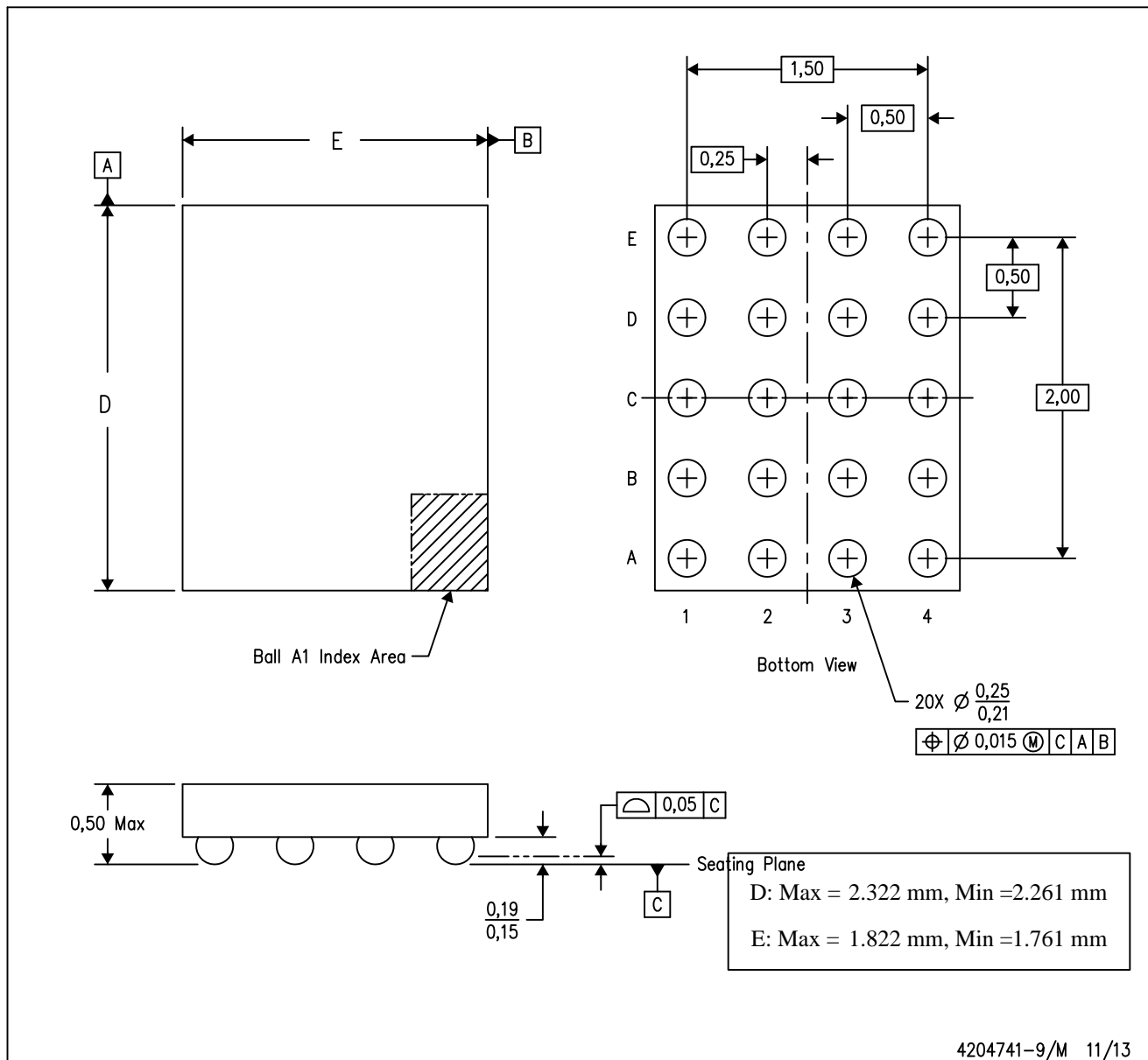


\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TSU5611YZPR	DSBGA	YZP	20	3000	182.0	182.0	20.0

YZP (R-XBGA-N20)

DIE-SIZE BALL GRID ARRAY



- 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. NanoFree™ package configuration.

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