MCPC Compatible USB Port Multimedia Switch
Supports USB, UART, Audio, ID, MIC, and Load Switch

Check for Samples: **TSU6721**
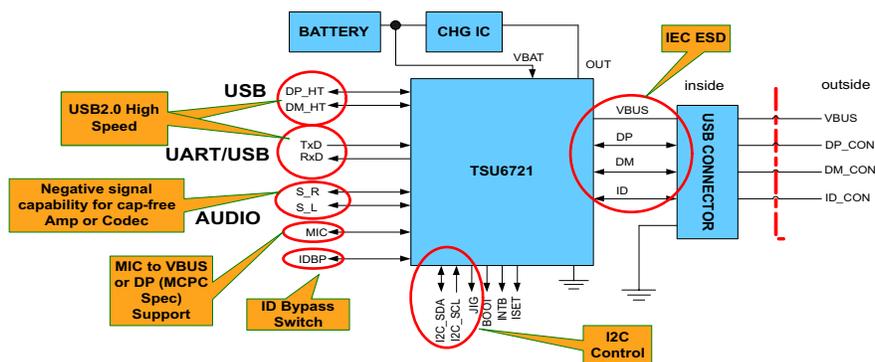
FEATURES

- **Switch Matrix**
  - **USB and UART Switch support USB 2.0 HS**
  - **Audio Switch with Negative Signal Capability**
  - **ID Bypass Switch**
  - **VBUS to MIC Switch**
  - **DP to MIC Switch to Support MCPC**
- **Load Switch**
  - **100 mΩ Load Switch**
  - **OTG Support**
  - **28 V VBUS Rating with Over-voltage Protection**
  - **Programmable Overcurrent Limiter/Protection**
- **Charger Detection**
  - **USB BCDv1.2 compliant**
  - **VBUS Detection**
  - **Data Contact Detection**
  - **Primary and Secondary Detection**
- **Compatible Accessories**
  - **USB Chargers (DCP, CDP)**
  - **Apple Charger**
  - **USB Data Port**
  - **Audio Headset with MIC and Remote**
  - **Docking Support**
  - **Factory Cable**

- **Surge Protection on VBUS/DP/DM**
  - **USB Connector Pins Without External Component**
- **Additional Features**
  - **I2C Interface with Host Processor**
  - **Switches Controlled by Automatic Detection or Manual Control**
  - **Interrupts Generated for Plug/Unplug**
  - **Decoupling FET Switch to VBUS Added to Reduce Degradation on MIC Line**
  - **Support Control Signals used In Manufacturing (JIG, BOOT)**
- **ESD Performance Tested Per JESD 22**
  - **4000-V Human-Body Model (A114-B, Class II)**
  - **1500-V Charged-Device Model (C101)**
- **IEC ESD Performance**
  - **±6 kV Contact Discharge (IEC 61000-4-2) for VBUS/DP/DM/ID to GND**

APPLICATIONS

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

APPLICATION DIAGRAM

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of the Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

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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.

ORDERING INFORMATION

T$_A$	PACKAGE[1]		ORDERABLE PART NUMBER[2]	TOP-SIDE MARKING[3]
–40°C to 85°C	WCSP 0.4-mm pitch – YFP	Tape and Reel	TSU6721YFPR	_ _ _-B8L

(1) Package drawings, thermal data, and symbolization are available at www.ti.com/packaging.

(2) 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.

(3) YFP: The actual top-side marking has three preceding characters to denote year, month, and sequence code, and one following character to designate the wafer fab/assembly site. Pin 1 identifier indicates solder-bump composition (1 = SnPb, ● = Pb-free).

DESCRIPTION

TSU6721 is a high performance USB port multimedia switch featuring automatic switching and accessory detection. The device connects a common USB port to pass audio, USB data, charging, On The Go (OTG) and factory mode signals. The audio path has negative signal capability includes left (mono/stereo), right (stereo) as well as microphone signals. Furthermore, TSU6721 is compatible with the MCPC specification.

TSU6721 features impedance detection which supports the detection of various accessories that are attached through DP, DM and ID pins of the USB connector. The switch is controlled by automatic switching or manually through I^{2}C.

TSU6721 has an integrated low resistive Load Switch that is used to isolate the charger from the external connector. OverVoltage Protection and programmable OverCurrent Limiter/Protection are additional features included to the Load Switch.

The charger detection satisfies USB charger specification v1.2. In addition to DCP, CDP and SDP, the device also detects Apple Chargers.

Power for this device is supplied through VBAT of the system or through VBUS when attached. TSU6721 supports factory mode testing when a USB/UART JIG cable is used in development and manufacturing.
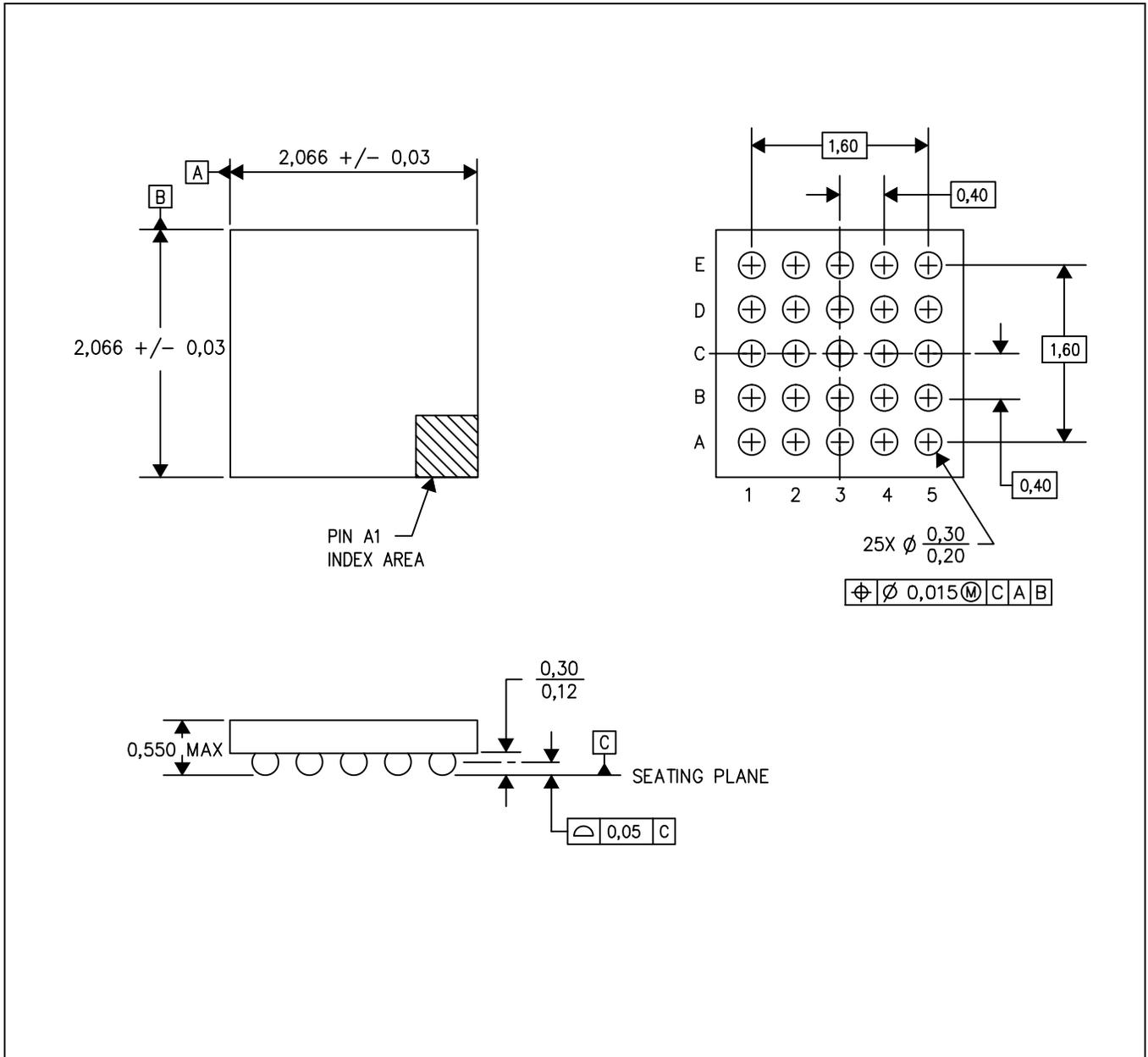
Product Folder Links :*TSU6721*

BLOCK DIAGRAM
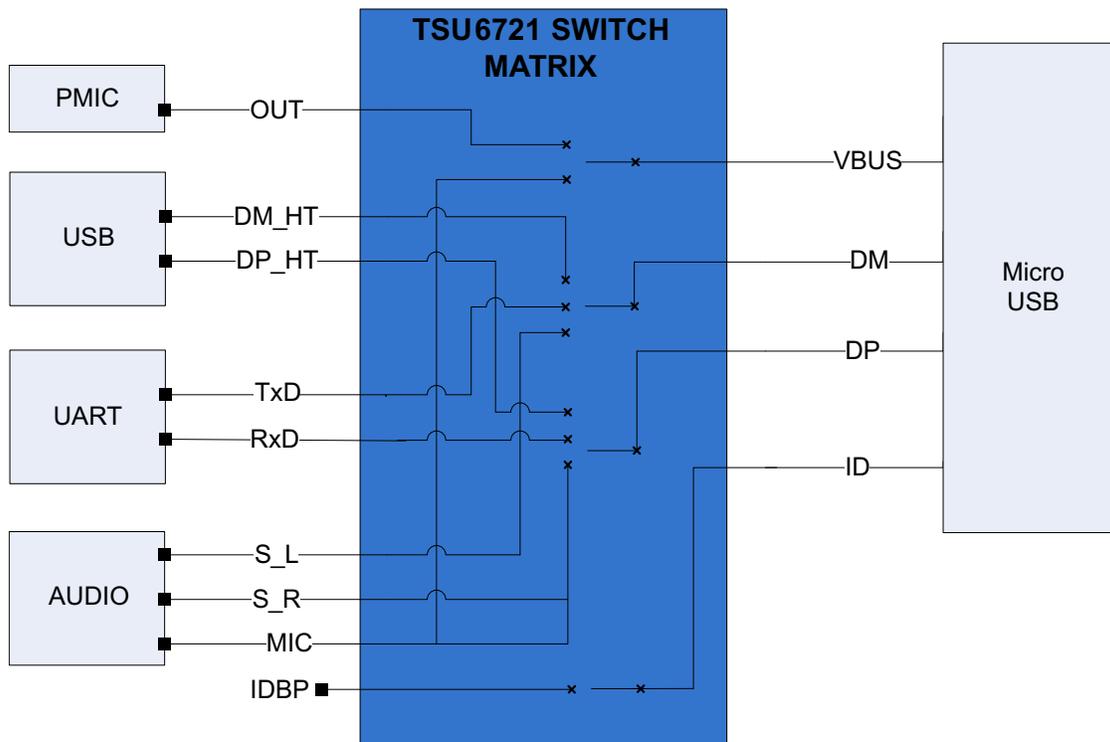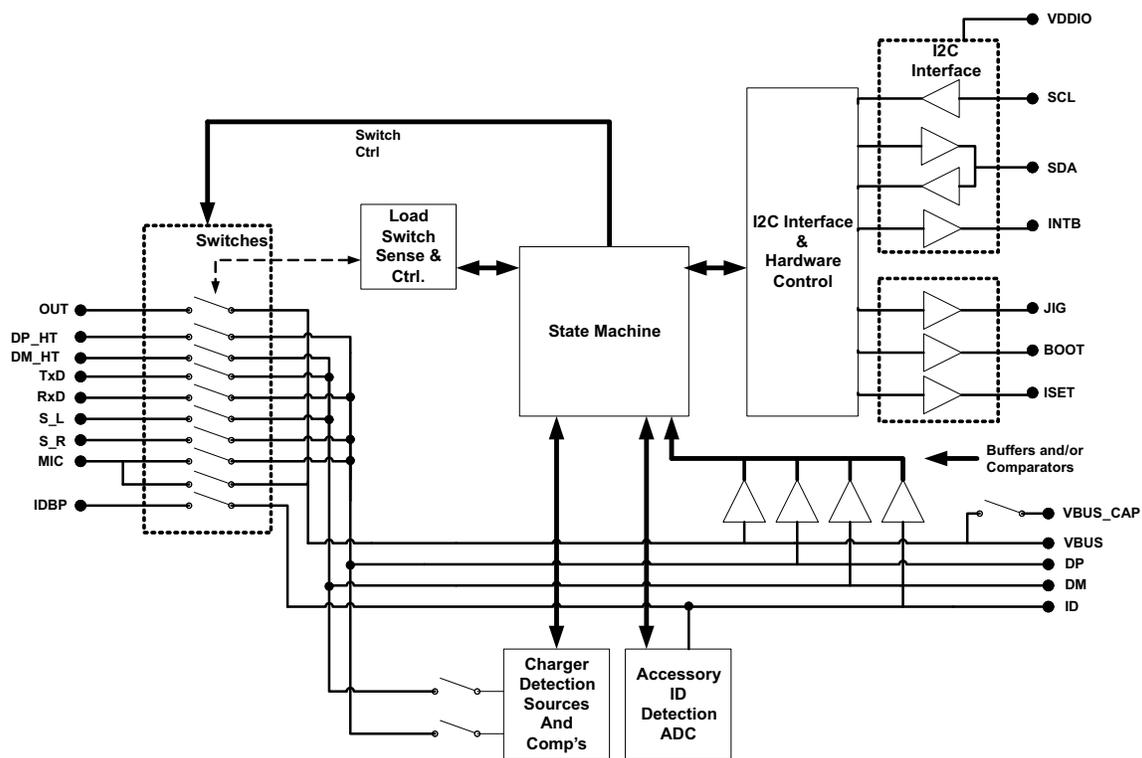
To request a full data sheet, please send an email to:

signal-switches@ti.com

TSU6721YFP (S−XBGA−N25)   DIE−SIZE BALL GRID ARRAY

2,066 +/− 0,03

A

B

2,066 +/− 0,03

PIN A1
INDEX AREA

1,60

0,40

E
D
C
B
A

1   2   3   4   5

1,60

0,40

25X ∅ $\frac{0,30}{0,20}$

⊕ | ∅ 0,015 Ⓜ | C | A | B

$\frac{0,30}{0,12}$

0,550 MAX

SEATING PLANE

⌒ | 0,05 | C

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.
         D.   This package contains Pb−free balls.

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18-Mar-2013

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Op Temp (°C)	Top-Side Markings (4)	Samples
TSU6721YFPR	PREVIEW	DSBGA	YFP	25		Green (RoHS & no Sb/Br)	SNAGCU	Level-1-260C-UNLIM	-40 to 85	B8	

(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) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.
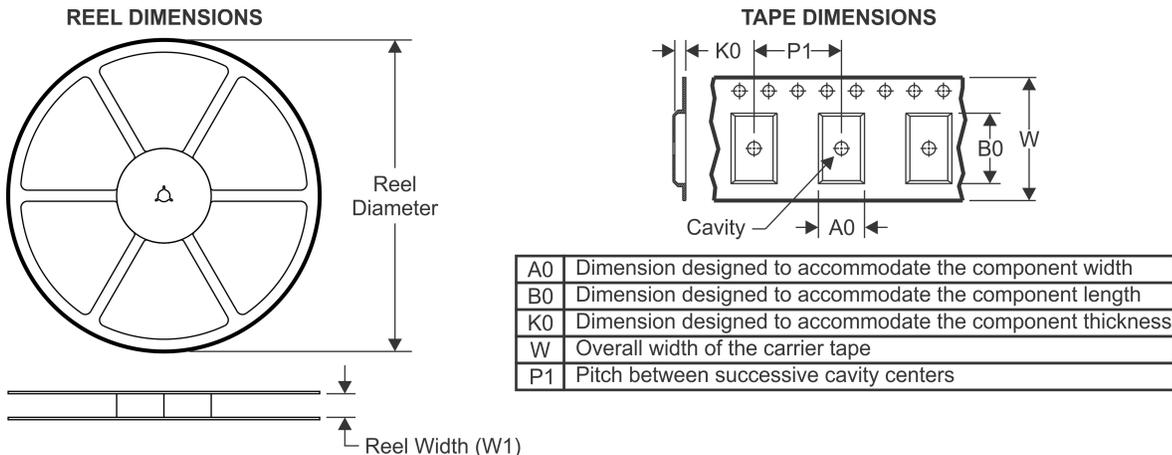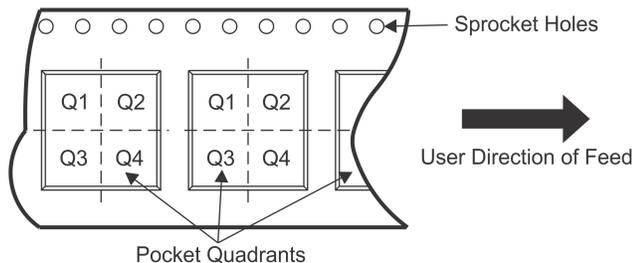**Green (RoHS & no Sb/Br):** TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

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

(4) Only one of markings shown within the brackets will appear on the physical device.

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PACKAGE MATERIALS INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS

TAPE DIMENSIONS

A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE

*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
TSU6721YFPR	DSBGA	YFP	25	0	180.0	8.4	2.17	2.17	0.57	4.0	8.0	Q1

PACKAGE MATERIALS INFORMATION

TAPE AND REEL BOX DIMENSIONS
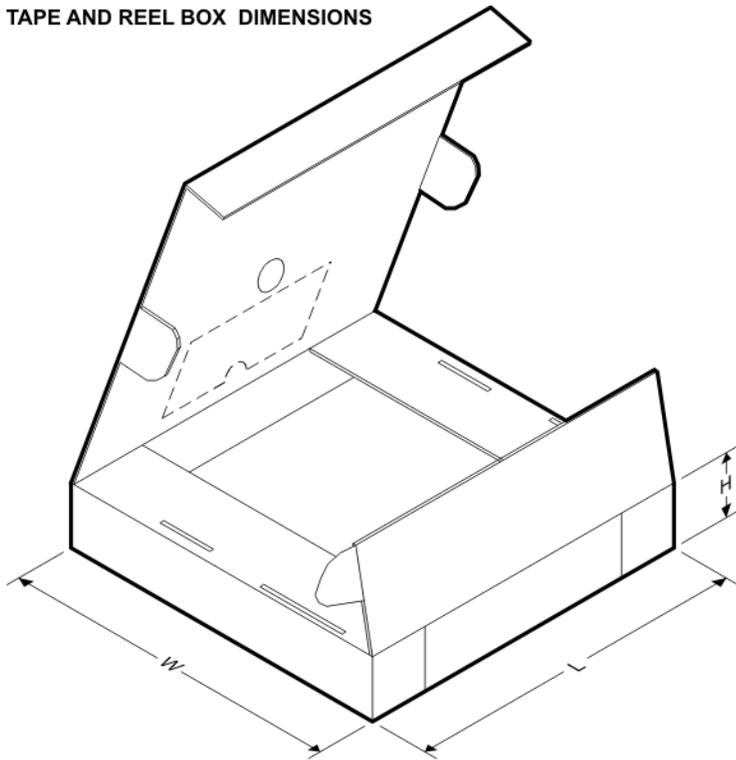
*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TSU6721YFPR	DSBGA	YFP	25	0	210.0	185.0	35.0

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