SP4T SWITCH WITH IMPEDANCE DETECTION MICRO-USB SWITCH TO SUPPORT USB, UART, AUDIO, AND VIDEO

Check for Samples: TSU6712

FEATURES

- **Detection is Compatible to CEA-936A (4-Wire Protocol, UART Interface)**
- **USB Path Supports USB 2.0 High Speed**
- **Support Control Signals (USB, UART JIG) Used in Manufacturing (JIG, BOOT)**
- **Interrupt for Attach and Detach Accessory**
- **Compatible Accessories**
  - **USB Cable, UART Cable, TV Out Cable**
  - **Mono, Stereo Headset**
  - **Remote Controller for DMB**
  - **Car Kit – CEA-936A**
  - **Charging + TV Out**
  - **Charging + Stereo Headset**
- **ESD Performance Tested Per JESD 22**
  - **1500-V Human-Body Model (A114-B, Class II)**
  - **1000-V Charged-Device Model (C101)**
- **ESD Performance DP/DM/ID/VBUS to GND**
  - **±6-kV Contact Discharge (IEC 61000-4-2)**
- **Surge Protection on VBUS, DP and DM USB Connector Pins.**

APPLICATIONS

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

RVC PACKAGE
(TOP VIEW)

	1	2	3	4	5
A	INTB	VDDIO	ISET	OUT	VBUS
B	D +	SDA	S_L	MIC	DM
C	D -	SCL	V_L	S_R	DP
D	VBAT	IDBP	V_R	VIDEO	ID
E	RxD	TxD	BOOT	JIG	GND

DESCRIPTION

The TSU6712 is a multiple SP4T switch with impedance detection. The switch features impedance detection, which supports the detection of various accessories that are attached through DP and DM. The detection is based on the impedance values of the accessories as defined in Table 1. The TSU6712 is fully controlled using I^2C and enables USB data, stereo and mono audio, video, microphone, and UART data to use a common connector port.

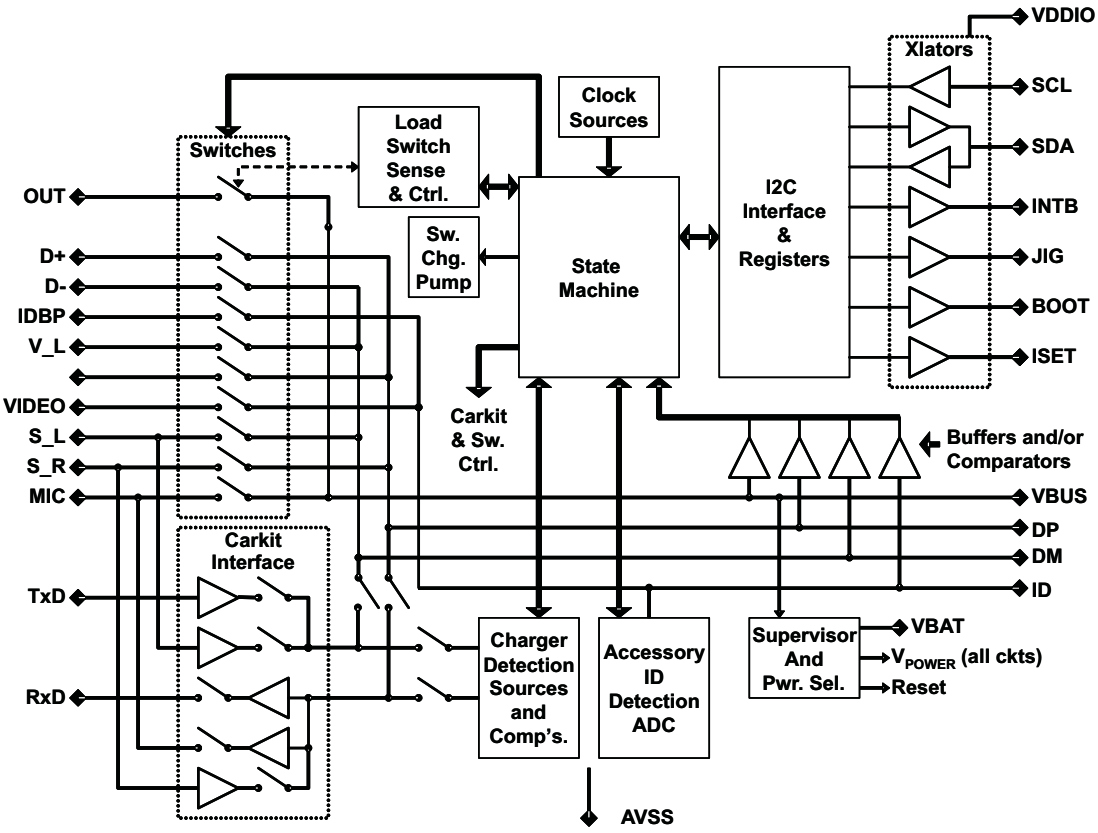
Power for this device is supplied through VBAT of the system or through VBUS when attached. The switch can be controlled through I^2C. JIG and BOOT pins are used when a USB, UART JIG cable is used to test during development and manufacturing.

Table 1. ORDERING INFORMATION(1)

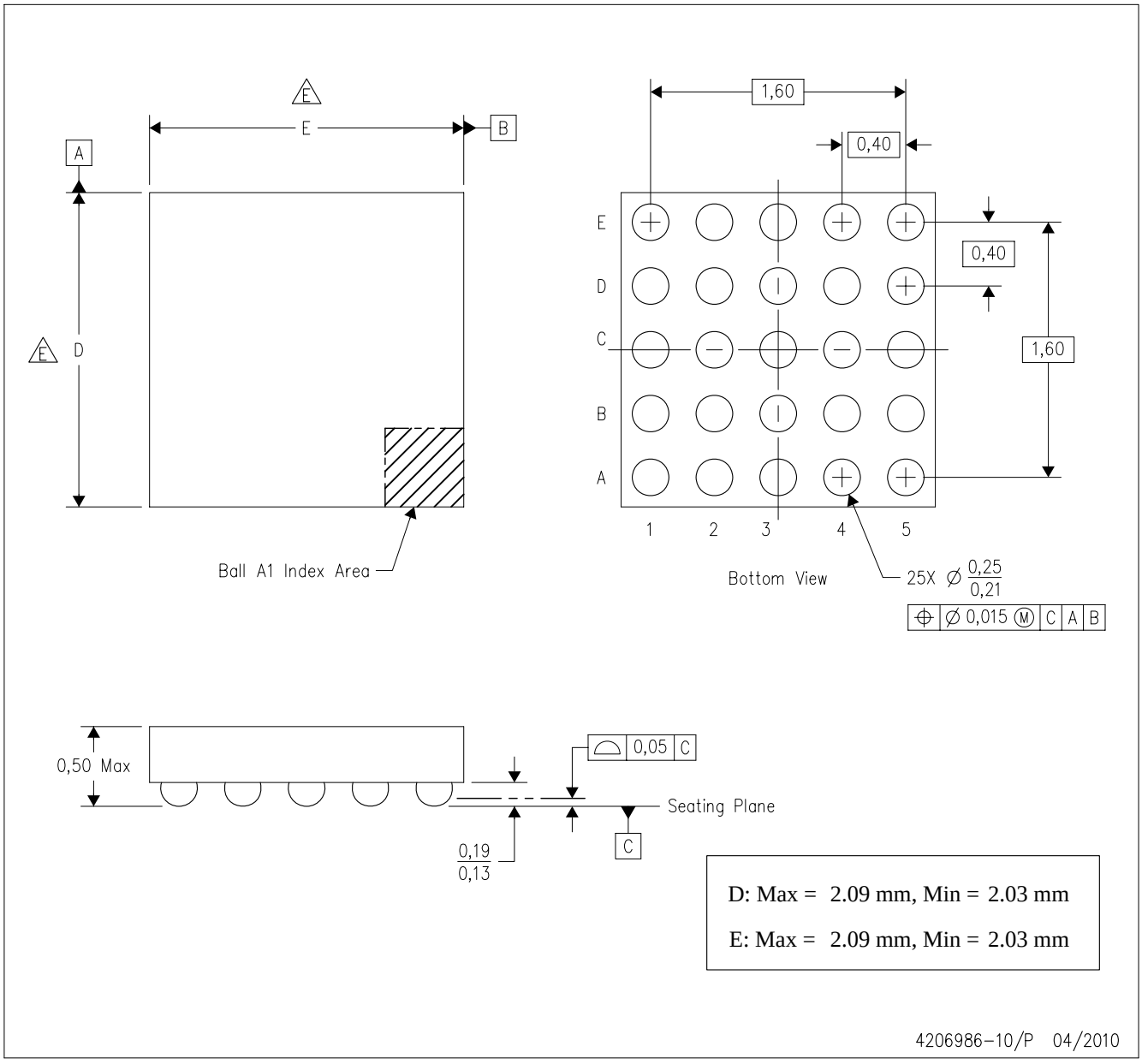
T_A	PACKAGE(2)		ORDERABLE PART NUMBER	TOP-SIDE MARKING
–40°C to 85°C	WCSP 0.4-mm pitch – YFP	Tape and reel	TSU6712YFPRB	56N(3)

(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.
(2) Package drawings, thermal data, and symbolization are available at www.ti.com/packaging.
(3) Last 3 letters of the top-side marking. The top-side marking is 6 letters. First 3 letters indicate manufacturing date and lot number.

APPLICATION BLOCK DIAGRAM



YFP (S–XBGA–N25) 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.
D. This is a Pb–free solder ball design.
E. Devices in this YFP package can have dimensions D and E ranging from 1.94 to 2.10. To determine the exact package size of a particular device, Refer to the device Data Sheet or contact a local TI representative.

NanoFree is a trademark of Texas Instruments.

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

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)	Device Marking (4/5)	Samples
TSU6712YFPRB	ACTIVE	DSBGA	YFP	25	3000	Green (RoHS & no Sb/Br)	SNAGCU	Level-1-260C-UNLIM	-40 to 85	56N	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) 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)

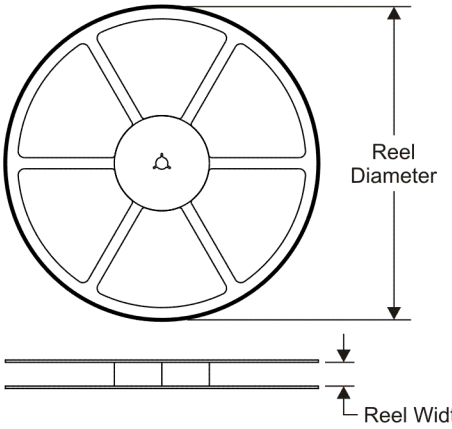
(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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

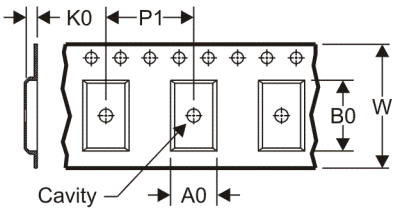
(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

TAPE AND REEL INFORMATION

REEL DIMENSIONS

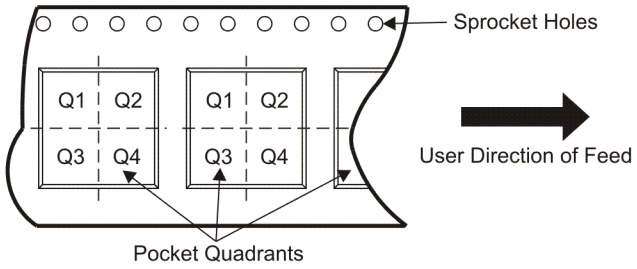


TAPE DIMENSIONS



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

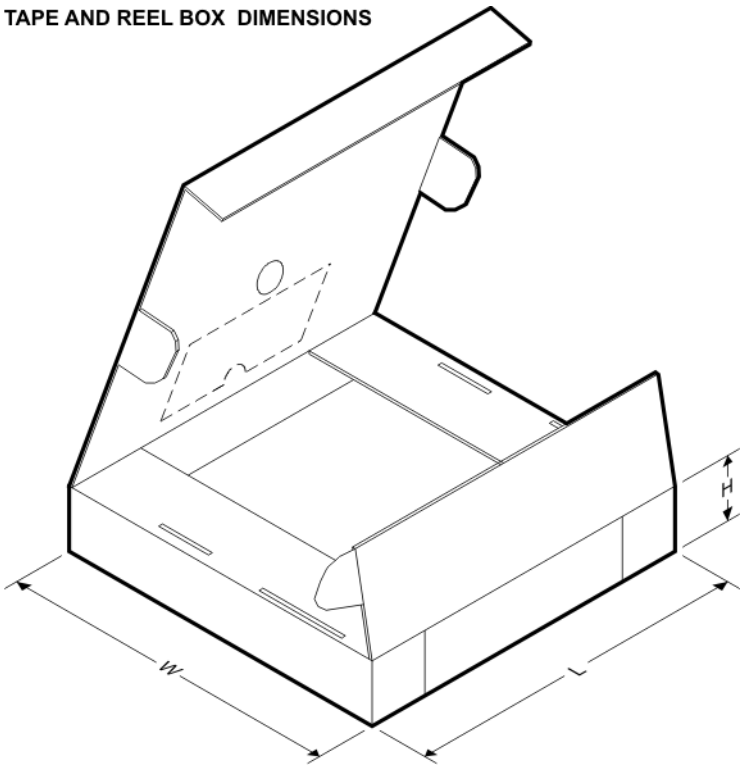
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*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
TSU6712YFPRB	DSBGA	YFP	25	3000	178.0	9.2	2.19	2.19	0.62	4.0	8.0	Q1

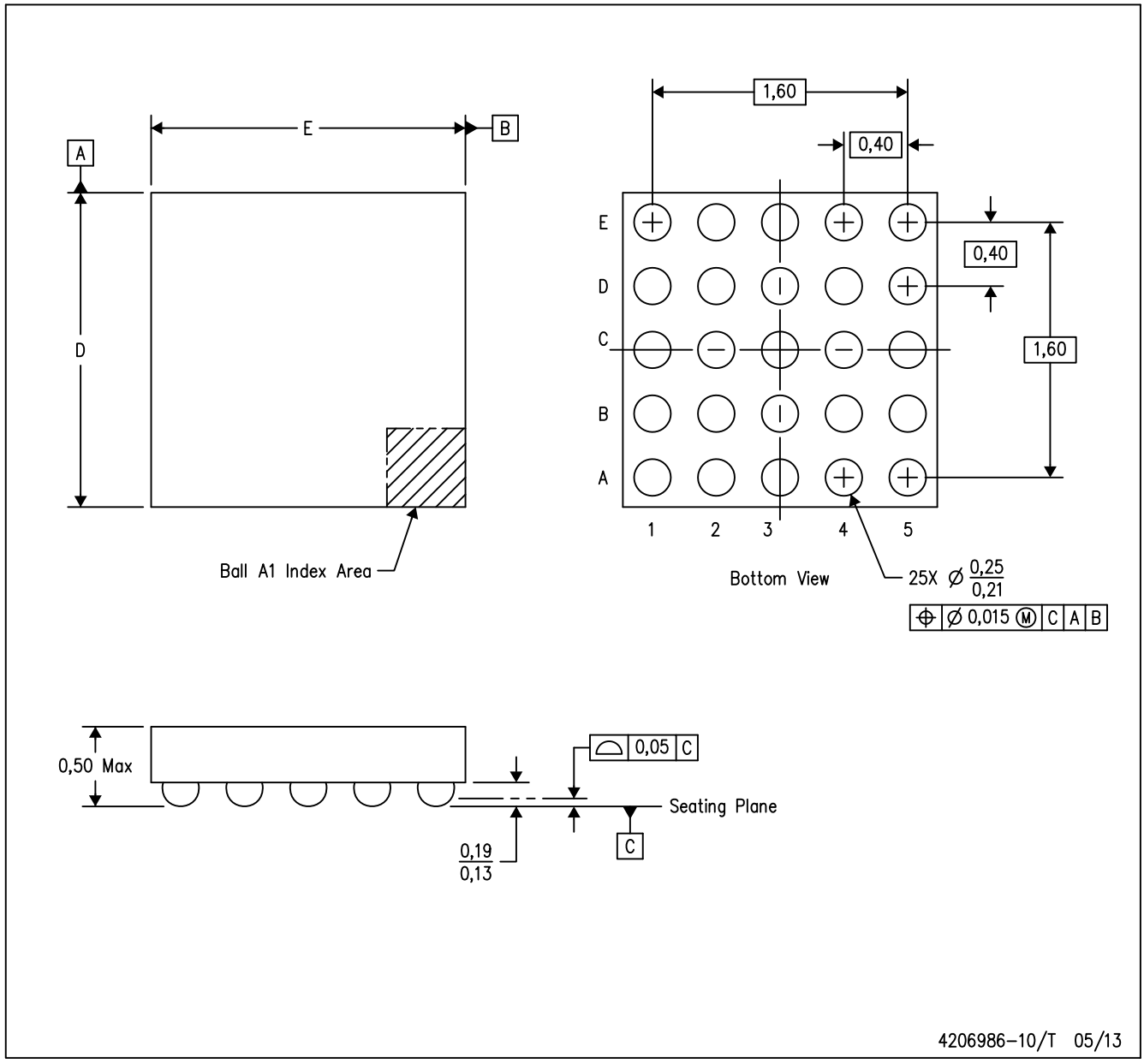
TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TSU6712YFPRB	DSBGA	YFP	25	3000	220.0	220.0	35.0

YFP (S–XBGA–N25) 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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