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TSB42AA4
TSB42AA4I
TSB42AB4, TSB42AB4I
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(ceLynx) IEEE 1394-a Consumer Electronics Link Layer Controller

FEATURES

- **DTCP content protection (TSB42AA4 only). A separate document explains the DTCP hardware errata for TSB42AA4. It is available upon request to DTLA licensees only.**
- **Interfaces directly to industry standard 400-, 200-, and 100-Mbps physical layer devices, including Texas Instruments TSB41LV0X and TSB41AXX family of physical layer devices**
- **Compliant with IEEE 1394-1995 and IEEE 1394a–2000 standards**
- **MPEG2 time stamp-based release, as described in IEC 61883-4**
- **High-speed data interface (HSDI):**
  - **Byte-wide or serial mode**
  - **Two independent HSDI ports**
  - **Bidirectional**
  - **Several control modes for a variety of applications**
  - **Connects seamlessly to common MPEG2 decoder chipsets**
- **16-bit microprocessor interface supports Motorola 68000/68020-style bus**
- **Large 8K-byte FIFO can be configured up to eight independent Tx or Rx FIFOs**

- **8K-byte FIFO supports the following data types:**
  - **DVB MPEG2 transport streams (IEC 61883-4)**
  - **DirecTV™ transport streams**
  - **DV program streams (IEC 61883-2)**
  - **Asynchronous streams**
  - **Support for external processor DMA**
- **Programmable data-/space-available indications for flow control; *almost full* and *almost empty* indicators**
- **Supports bus manager functions and automatic 1394 self-ID verification**
- **Interrupt driven to minimize host polling**
- **Single 3.3-V supply**
- **Separate async acknowledge buffer decreases the ack-tracking burden on host**
- **JTAG interface to support post-assembly scan of device I/O**
- **Bus holder isolation**
- **Embedded support for DTCP content protection:**
  - **Two M6 baseline ciphers (one per HSDI port)**
  - **Random number generator in hardware**
  - **SHA-1 secure hash algorithm in hardware**
  - **Authentication key cipher in hardware**
- **Optional auto-configuration for MPEG2/DV transmit and receive functions**
- **PID filtering and packet insertion for MPEG2 transport stream**

DESCRIPTION

Consumer Electronics Link (ceLynx) is a high-performance 1394 link layer device designed specifically to support advanced consumer electronics applications, particularly those applications which require the transmission of Moving Picture Expert Group 2 (MPEG2) transport streams and encryption/decryption of those streams across a 1394 network. The device supports both digital video broadcasting (DVB) and DirecTV™ type MPEG2 streams using the digital transmission content protection method (DTCP) method of encryption, as well as digital video (DV) encoded streams. The ceLynx supports both the IEC 61883 standard for DVB and DV streams over 1394 and the 1394 Trade Association standard for DirecTV over 1394.

The ceLynx is also versatile enough to handle asynchronous data and asynchronous streams. A key feature of the ceLynx is its ability to handle multiple data type streams simultaneously; the user may transport DVB, DirecTV, DV data streams, and asynchronous data *simultaneously*. The ceLynx can also support multiple streams of the same data type simultaneously, (for example, transmit or receive two DVB transport streams or two DV streams).

The ceLynx is full duplex, allowing simultaneous playback and recording of audio/video data. Full duplex support also includes the capability of using the DTCP method, simultaneously using the two embedded M6 cipher modules. The large internal 8-Kbyte FIFO is very flexible, allowing the user to partition it into eight independent first in first out (FIFOs) and allowing the user to determine the exact configuration of each of these FIFOs to fit the application. Advanced features have been added to support program ID (PID) filtering and packet insertions.

The ceLynx is also designed to interface seamlessly with popular MPEG2 decoder chipsets. This decreases the design-in effort of customers when using these popular chipsets.

NOTE:

This product is for high-volume CE applications only. For a complete datasheet or more information contact support@ti.com.

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
TSB42AB4PDT	ACTIVE	TQFP	PDT	128	90	RoHS & Green	NIPDAU	Level-3-260C-168 HR	0 to 70	TSB42AB4 F731992D	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.
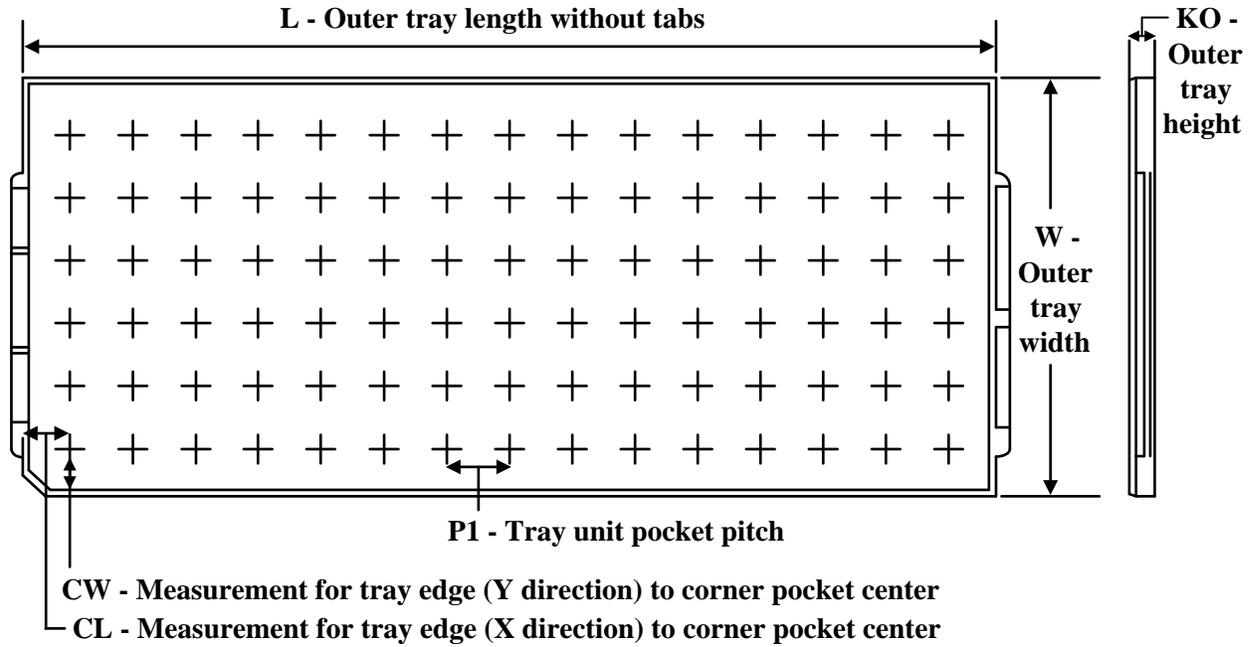
(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(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.

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TRAY

L - Outer tray length without tabs

KO - Outer tray height

W - Outer tray width

P1 - Tray unit pocket pitch

CW - Measurement for tray edge (Y direction) to corner pocket center

CL - Measurement for tray edge (X direction) to corner pocket center

Chamfer on Tray corner indicates Pin 1 orientation of packed units.

*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	Unit array matrix	Max temperature (°C)	L (mm)	W (mm)	K0 (µm)	P1 (mm)	CL (mm)	CW (mm)
TSB42AB4PDT	PDT	TQFP	128	90	6 X 15	150	315	135.9	7620	15.4	20.3	21

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