

(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.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

DiracTV is a trademark of Hughes Communications, Inc..

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/ Ball Finish	MSL Peak Temp ⁽³⁾	Samples (Requires Login)
TSB42AA4IPDT	ACTIVE	TQFP	PDT	128		TBD	Call TI	Call TI	
TSB42AA4PDT	NRND	TQFP	PDT	128		TBD	Call TI	Call TI	
TSB42AA4PDTG4	NRND	TQFP	PDT	128		TBD	Call TI	Call TI	
TSB42AB4IPDT	NRND	TQFP	PDT	128		TBD	Call TI	Call TI	
TSB42AB4PDT	ACTIVE	TQFP	PDT	128	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-3-260C-168 HR	
TSB42AB4PDTG4	ACTIVE	TQFP	PDT	128	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-3-260C-168 HR	

⁽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)

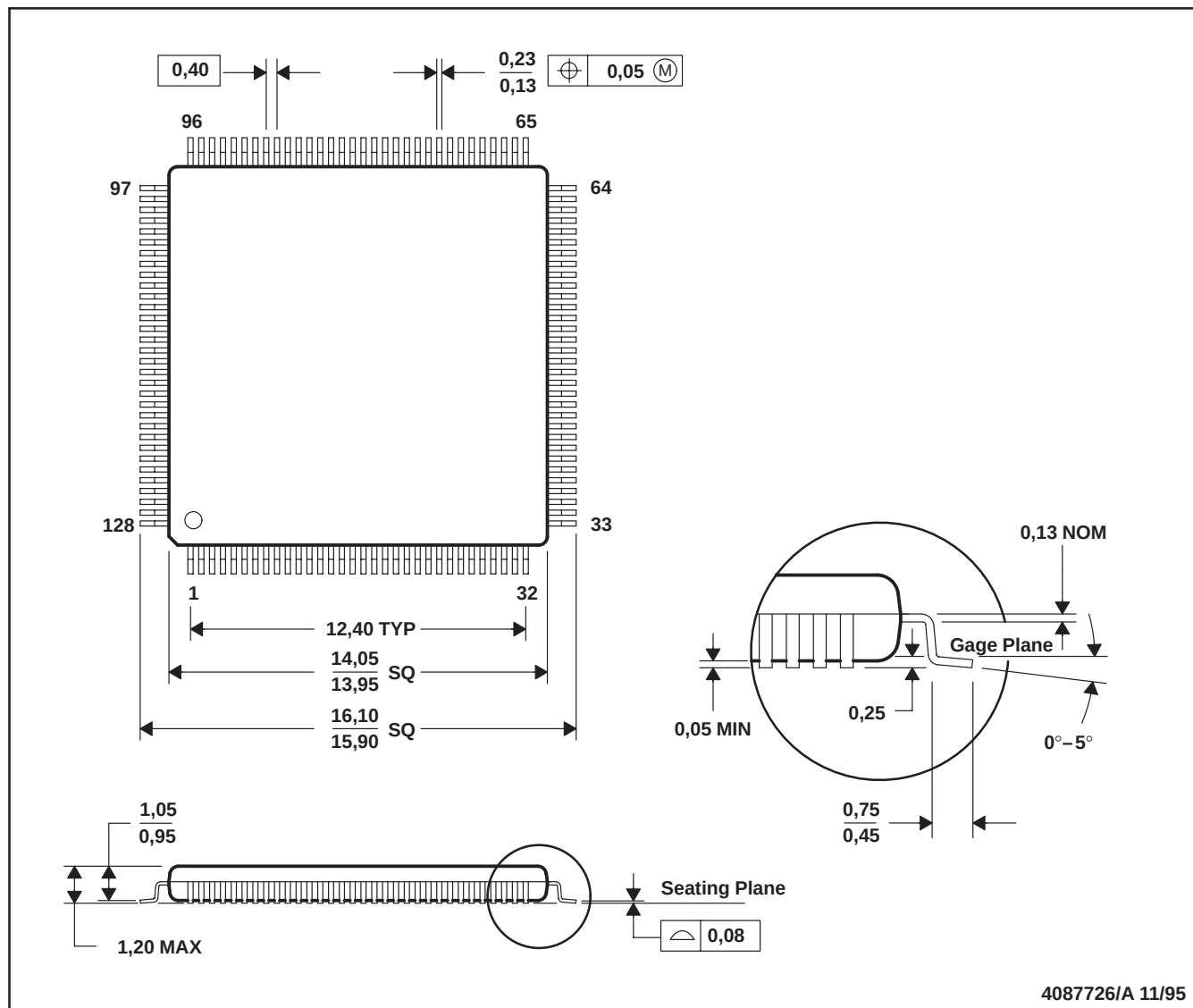
⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

Important Information and Disclaimer: The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

PDT (S-PQFP-G128)

PLASTIC QUAD FLATPACK



- NOTES: A. All linear dimensions are in millimeters.
 B. This drawing is subject to change without notice.

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products

Audio	www.ti.com/audio
Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DLP® Products	www.dlp.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
RF/IF and ZigBee® Solutions	www.ti.com/lprf

Applications

Communications and Telecom	www.ti.com/communications
Computers and Peripherals	www.ti.com/computers
Consumer Electronics	www.ti.com/consumer-apps
Energy and Lighting	www.ti.com/energy
Industrial	www.ti.com/industrial
Medical	www.ti.com/medical
Security	www.ti.com/security
Space, Avionics and Defense	www.ti.com/space-avionics-defense
Transportation and Automotive	www.ti.com/automotive
Video and Imaging	www.ti.com/video
Wireless	www.ti.com/wireless-apps

TI E2E Community Home Page

e2e.ti.com

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2011, Texas Instruments Incorporated