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## Video Signal Processor With IEEE-1394 Link Layer Controller

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### FEATURES

- **Compatible With 1394 Trade Association's Digital Camera Specification, Draft 1.04**
- **1394a Link Layer Controller With 400 Mbits/s Capability**
- **Support for Several CCD Sensors**
  - Sony ICX084AK, ICX098AK
  - Sharp LZ24BP
  - Texas Instruments TC237
- **Integrated CCD (Charge-Coupled Device) and CDS (Correlated Double Sampling) Pulse Timer With Programmable Pulse Skew**
- **Video Controls**
  - **Brightness (Auto/Manual)**
  - **Exposure (Auto/Manual)**
  - **Sharpness (Manual)**
  - **Saturation (Manual)**
  - **White Balance (Auto/Manual)**
  - **Gamma (Manual)**
  - **Backlight Compensation (Manual)**
- **Three Stepper Motor Controls for Focus/Zoom/Tilt or Other Motorized Functions**
- **EEPROM Interface**

- **Programmable Status/Test Terminals**
- **Seamlessly Connects to TI's 1394 Physical Layer Devices**

### APPLICATIONS

- **PC Video Camera**
- **Video Conferencing**
- **Video Capture**
- **Still Picture Capture**
- **Set-Top Boxes**
- **Video Phone**
- **Gaming**
- **Webcam**
- **Robotics**
- **Security**

### DESCRIPTION

The TSB15LV01 is a video signal processor integrated with a 1394 link layer controller. It is designed to be the center of a host-controlled, full-motion color camera when coupled with a 1394 PHY, CCD sensor and driver, analog front end, and an external EEPROM device. A camera based on the TSB15LV01 is compliant with the IEEE 1394a standard and the 1394 Trade Association's Digital Camera specification, Draft 1.04.

The TSB15LV01 offers the advantage of 24-bit true-color digital video processing. This gives superior video quality at higher sustained data rates. Isochronous transfer of the video data and asynchronous control of the camera are accomplished via the 1394 high-speed serial bus, operating at data rates of up to 400 Mbits/s. This bus allows noncompressed full-motion digital video at rates of 30 frames/sec. Use of this serial connection eliminates the need for expensive video capture cards. The chipset supports the YUV 4:1:1, YUV 4:2:2, YUV 4:4:4, and RGB 24-bit formats.

The video signal processor (VSP) portion of the device incorporates proprietary digital image processing techniques, implemented with an advanced digital signal processing (DSP) ASIC. These techniques enable a camera to achieve excellent color accuracy and resolution. The use of a custom advanced CMOS ASIC process allows for both the advanced digital image processing techniques and for advanced color space conversion. This allows the multiple output formats required for a multipurpose video conferencing camera. Use of this advanced, low-power CMOS process also enables the camera to be powered by a notebook computer operating on battery power. The device is designed to work with CCDs that have a pixel resolution of 640(H) y 480(V). This resolution meets the VGA square pixel standards.



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The 1394 link layer controller is capable of up to 400 Mbits/s operation and is compatible with both the IEEE 1394–1995 and 1394a standards. The TSB15LV01 implements all registers and address space required by the 1394 Trade Association's Digital Camera specification, Draft 1.04 (hereafter referred to as the Digital Camera Specification).

The device supports packet speeds of up to 400 Mbits/s, but the maximum bandwidth consumed by the device is 200 Mbits/s. This means that a TSB15LV01-based camera leaves at least 200 Mbits/s available to other functions.

**NOTE:**

This product is for high-volume PC applications only. For a complete datasheet or more information contact [support@ti.com](mailto:support@ti.com).

**PACKAGING INFORMATION**

Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	Eco Plan <sup>(2)</sup>	Lead/ Ball Finish	MSL Peak Temp <sup>(3)</sup>	Samples (Requires Login)
TSB15LV01IPFC	NRND	TQFP	PFC	80		TBD	Call TI	Call TI	
TSB15LV01PFC	ACTIVE	TQFP	PFC	80	96	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-4-260C-72 HR	
TSB15LV01PFCG4	ACTIVE	TQFP	PFC	80	96	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-4-260C-72 HR	

<sup>(1)</sup> 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.

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**TBD:** The Pb-Free/Green conversion plan has not been defined.

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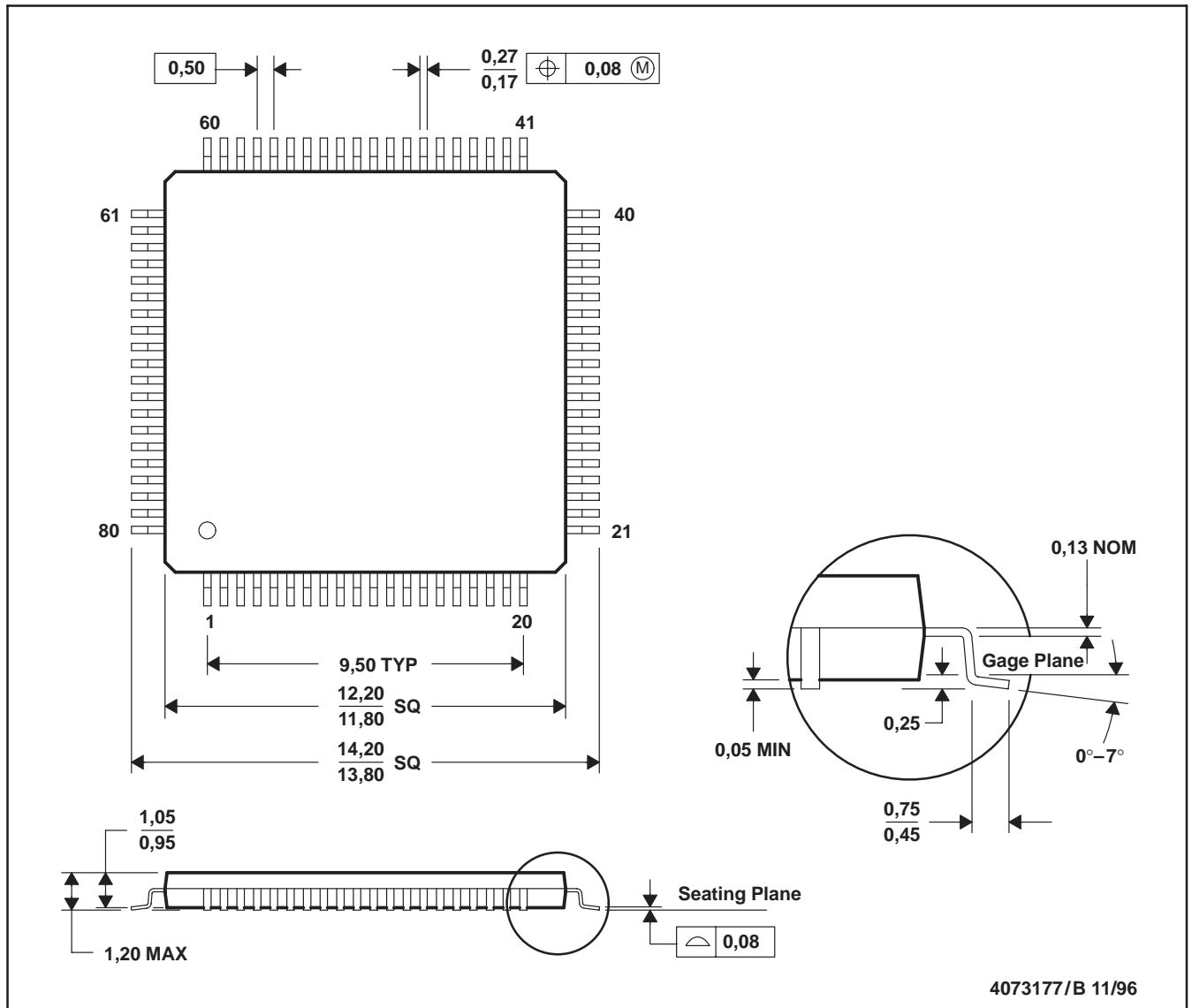
<sup>(3)</sup> MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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PFC (S-PQFP-G80)

PLASTIC QUAD FLATPACK



- NOTES: A. All linear dimensions are in millimeters.  
 B. This drawing is subject to change without notice.  
 C. Falls within JEDEC MS-026

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