

TSB41LV03/03A to TSB41AB3 Transition Document

TI 1394 Application Group

In May 2000 Texas Instruments will release to production the TSB41AB3PFP three-port physical layer (PHY). This part is an upgrade to the current three-port PHYs, the TSB41LV03 (data sheet, literature number SLLS317) and the TSB41LV03A (data sheet, literature number SLLS364).

Texas Instruments recommends that the TSB41LV03 not be considered for new designs, and that all new designs use the TSB41LV03A or the TSB41AB3. Existing designs may continue to use the TSB41LV03/03A, but may want to consider transitioning to the TSB41AB3.

The TSB41AB3 offers advantages over the existing TSB41LV03 and TSB41LV03A:

- The TSB41AB3PFP is pin-compatible with the TSB41LV03PFP and TSB41LV03APFP.
- All items described in the TSB41LV03 errata (literature number SLLS316) have been corrected.
- The TSB41AB3 has lower active and idle power consumption (as much as 90% lower current than the TSB41LV03) and as much as 40% lower current than the TSB41LV03A.
- The TSB41AB3, like the TSB41LV03A, has an ultra low-power mode of less than 150 μ A when no ports are active.
- The TSB41AB3, like the TSB41LV03A, is fully 1394a–2000 compliant including the extended TPbias mode to accommodate older model DV camcorder hot-plug connectivity. The extended TPbias is not included in the TSB41LV03 design.
- The TSB41AB3 and the TSB41LV03A both have failsafe circuitry that senses sudden loss of power to the device and disables its ports. This ensures that the device does not load the port of the connected device on the other end of the cable and blocks any leakage path from the port back to the device power plane. The circuit is not present in the TSB41LV03.
- The TSB41AB3 has a 1394a compliant common-mode noise filter on the incoming bias detect circuit to filter out cross-talk noise.
- The TSB41AB3 uses a single, standard value 6.34-k Ω \pm 1% resistor between R0 and R1 instead of the 6.3-k Ω \pm 0.5% resistor used in the TSB41LV03/03A device.

The TSB41AB3 and TSB41LV03A are pin-compatible with the TSB41LV03. However, circuit modifications can be made to save components and/or increase functionality with the TSB41AB3 and TSB41LV03A. The changes that can be made are as follows:

- The 128 k Ω resistor on the $\overline{\text{RESET}}$ pin can be removed to reduce power consumption as it is not needed for the TSB41AB3 or the TSB41LV03A. This resistor is required on the TSB41LV03.
- The 1 k Ω resistor to GND on the SE pin is optional. The resistor is recommended on the TSB41AB3 and TSB41LV03A to enable future enhancement.

- When connecting the PHY LPS input pin to the link LPS output pin for non-isolated applications, the pullup resistor on the LPS signal is not needed for the TSB41LV03, TSB41LV03A, or the TSB41AB3 devices. The pulldown resistor is required but may be changed from a 1 k Ω resistor for the TSB41LV03 to a resistor ranging from 1 k Ω to 10 k Ω when using the TSB41LV03A or the TSB41AB3. For isolation applications, the TSB41LV03APFP (literature number SLLS364) and the TSB41AB3 (literature number SLLS418) data sheets describe the proper pullup/pulldown combinations.

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