TSER4905 4K DSI to V^{3}Link Bridge Serializer

1 Features

- Single or dual port MIPI DSI receiver
  - Compliant to D-PHY v1.2 and DSI v1.3.1
  - Packed 16/18/24/30-bit RGB and 16-bit YCbCr
  - Loosely packed 18-bit RGB and 20-bit 4:2:2
  - 1 clock lane and 1-4 configurable data lanes per D-PHY Port
  - Up to 2.5 Gbps/lane with skew calibration
  - Supports data lane swap and polarity inversion
  - Supports both burst and non-burst mode
  - SuperFrame Unpacking Capability
  - Suitable for 4K @ 60 Hz video resolution
- V^{3}Link Enhanced Video interface
  - Supports 10.8/6.75/3.375 Gbps per channel; Up to 21.6 Gbps over dual channels
  - Coax/STP interconnect support
  - Port Splitting to enable Y-cable interfaces
- Ultra-low latency control channel
  - Two I2C up to 1MHz (up to 3.4 MHz for local bus access)
  - High speed GPIOs
- Compatibility
  - V^{3}Link Video and V^{3}Link Enhanced Video product families
  - V^{3}Link Vision product family
- Security and diagnostics
  - Voltage and temperature monitoring
  - Line Fault Detection
  - BIST and pattern generation
  - CRC and error diagnostics
  - Unique ID for counterfeit protection
  - ECC on control bits
- Advanced link robustness and EMC control
  - Data scrambling
  - Spread spectrum clocking generation (SSCG)
- Low power operation
  - 1.8-V and 1.1-V dual power supply
- Qualifications
  - ISO 10605 and IEC 61000-4-2 ESD compliant
  - 64 pin QFN Wettable flanks 9 mm x 9 mm
  - Temperature Range: −20°C to +85°C

2 Applications

- High Resolution Display:
  - Operating room displays
  - Seatback entertainment displays
  - High resolution HMI

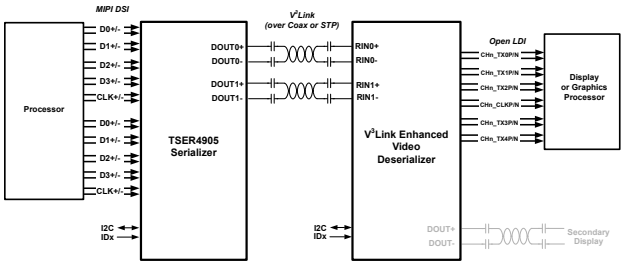
3 Description

TSER4905 is a MIPI DSI to V^{3}Link bridge device. In conjunction with an V^{3}Link deserializer, the chipset provides a high-speed serialized interface over low-cost 50Ω coax or STP cables. The TSER4905 is a D-PHY v1.2 compliant device that serializes a MIPI DSI input supporting video resolutions including 4K with 30-bit color depth. The V^{3}Link interface supports video and audio data transmission and full duplex control, including I2C and GPIO data over a single channel or dual channels. Consolidation of video data and control over two V^{3}Link lanes reduces the interconnect size and weight and simplifies system design. EMI is minimized by the use of low voltage differential signaling, data scrambling, SSCG, and randomization. This device can operate either in V^{3}Link Mode or V^{3}Link Enhanced Video Mode. In V^{3}Link Enhanced Video Mode, the device supports V^{3}Link Enhanced Video output over a single coax/STP cable operating up to 10.8 Gbps line rate or Dual Coax/STP cable operating up to 21.6 Gbps line rate, supporting 4K+ resolutions. In V^{3}Link mode, the devices supports up to 720p and 1080p resolutions with 24-bit color depth over a single/dual link. In Vision compatible mode, the device is interoperable with V^{3}Link Vision deserializers supporting resolutions up to 8MP+/40fps.

Device Information

PART NUMBER	PACKAGE (1)	BODY SIZE (NOM)
TSER4905	VQFN (64)	9.00 mm × 9.00 mm

(1) For all available packages, see the orderable addendum at the end of the data sheet.



Simplified Application Diagram

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
TSER4905RTDR	ACTIVE	VQFN	RTD	64	2000	RoHS & Green	Call TI | NIPDAUAG	Level-3-260C-168 HR	-20 to 85	TSER4905	Samples
TSER4905RTDT	ACTIVE	VQFN	RTD	64	250	RoHS & Green	Call TI | NIPDAUAG	Level-3-260C-168 HR	-20 to 85	TSER4905	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.

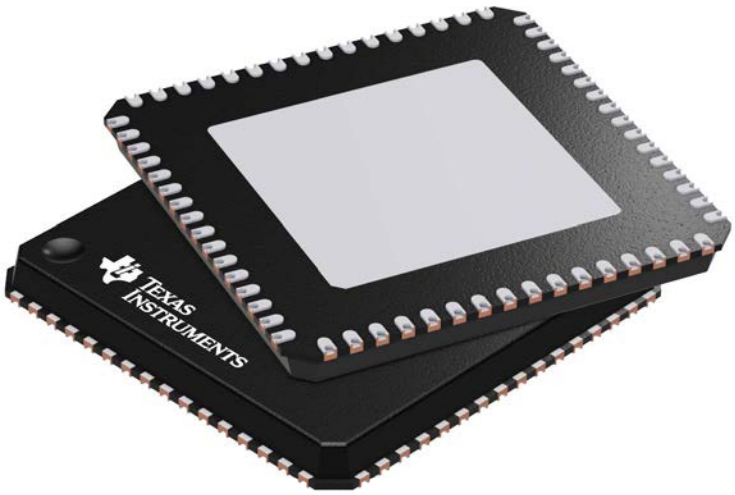
(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(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.

GENERIC PACKAGE VIEW

RTD 64 VQFNP - 0.9 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



Images above are just a representation of the package family, actual package may vary.
Refer to the product data sheet for package details.

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265