





**TSER9615** SNLS740A - NOVEMBER 2023 - REVISED NOVEMBER 2023

# TSER9615 V<sup>3</sup>Link<sup>TM</sup> 7.55 Gbps Serializer MIPI CSI-2 Interface for High-Speed, High-Resolution Cameras, RADAR, and Other Sensors

#### 1 Features

- 7.55 Gbps (6 Gbps video payload) serializer supports high-speed sensors including 8 MP+ imagers
- Supports 3 data rates: 7.55 Gbps, 3.775 Gbps and 1.8875 Gbps.
- Power-over-Coax (PoC) compatible transceiver
- Single MIPI D-PHY port with 4 lanes
  - Compliant to MIPI D-PHY v2.1
  - 1 Clock lane and 1, 2 or 4 configurable data lanes
  - Up to 1.5 Gbps/lane
  - Supports polarity pin inversion (p/n)
  - Up to 16 virtual channels
- Single port MIPI CSI-2 receiver
  - Compliant to MIPI CSI-2 v2.1
  - Supports multiple data types and multiexposure
- Advanced data protection and diagnostics including CRC data protection, sensor data integrity check, I<sup>2</sup>C write protection, voltage and temperature measurement, programmable alarm and line fault detection
- Flexible programmable output clock generator
- Supports single-ended coaxial cable and shieldedtwisted-pair (STP) cable
- Ultra-low latency bidirectional I2C and GPIO control channel enables ISP control from ECU
- Single 1.8 V power supply
- Compatible with all V<sup>3</sup>Link Vision / Enhanced Vision deserializers
- Pin-to-pin compatible with the TSER953 serializer

## 2 Applications

- **Appliances**
- Video surveillance
- Elevators and escalators
- Industrial robots
- Machine vision
- Patient monitoring and diagnostics
- **Imaging**

## 3 Description

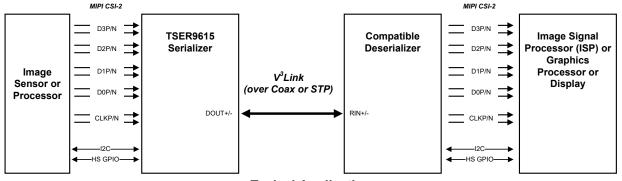
The TSER9615 serializer is part of TI's V<sup>3</sup>Link Enhanced Vision family and is designed to support ultra-high-speed data sensors including 8MP+ Imagers, satellite RADAR, LIDAR, and time-of-flight (ToF) sensors. The serializer delivers an 7.55 Gbps forward channel and an ultra-low latency, 47.1875 Mbps bidirectional control channel and supports power over a single coax (PoC) or STP cable. When the TSER9615 is used in Enhanced Vision mode, it provides the possibility to select between three data rates: 7.55 Gbps, 3.775 Gbps and 1.8875 Gbps. The TSER9615 features advanced data protection and diagnostic features. Together with a companion deserializer, the TSER9615 delivers precise multicamera sensor clock and sensor synchronization.

The TSER9615 is qualified with a wide temperature range of -20°C to 85°C. The serializer comes in a small 5 mm × 5 mm VQFN package for spaceconstrained sensor applications.

### **Device Information**

PART NUMBER	PACKAGE (1)	BODY SIZE (NOM)				
TSER9615	VQFN (32)	5.00 mm × 5.00 mm				

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



**Typical Application** 



## **4 Device and Documentation Support**

#### 4.1 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. Click on *Notifications* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

## 4.2 Support Resources

TI E2E<sup>™</sup> support forums are an engineer's go-to source for fast, verified answers and design help — straight from the experts. Search existing answers or ask your own question to get the quick design help you need.

Linked content is provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's Terms of Use.

#### 4.3 Trademarks

TI E2E<sup>™</sup> is a trademark of Texas Instruments.

All trademarks are the property of their respective owners.

#### 4.4 Electrostatic Discharge Caution



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

#### 4.5 Glossary

TI Glossary

This glossary lists and explains terms, acronyms, and definitions.

Copyright © 2023 Texas Instruments Incorporated Product Folder Links: *TSER9615* 

www.ti.com 9-Nov-2025

#### PACKAGING INFORMATION

Orderable part number	Status	Material type	Package   Pins	Package qty   Carrier	RoHS	Lead finish/ Ball material	MSL rating/ Peak reflow	Op temp (°C)	Part marking
	(1)	(2)			(3)	(4)	(5)		(6)
TSER9615RHBR	Active	Production	VQFN (RHB)   32	3000   LARGE T&R	Yes	NIPDAU	Level-3-260C-168 HR	-20 to 85	T9615
TSER9615RHBR.A	Active	Production	VQFN (RHB)   32	3000   LARGE T&R	Yes	NIPDAU	Level-3-260C-168 HR	-20 to 85	T9615
TSER9615RHBT	Active	Production	VQFN (RHB)   32	250   SMALL T&R	Yes	NIPDAU	Level-3-260C-168 HR	-20 to 85	T9615
TSER9615RHBT.A	Active	Production	VQFN (RHB)   32	250   SMALL T&R	Yes	NIPDAU	Level-3-260C-168 HR	-20 to 85	T9615

<sup>(1)</sup> Status: For more details on status, see our product life cycle.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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.

<sup>(2)</sup> Material type: When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

<sup>(3)</sup> RoHS values: Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

<sup>(4)</sup> Lead finish/Ball material: Parts 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.

<sup>(5)</sup> MSL rating/Peak reflow: The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

<sup>(6)</sup> Part marking: There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

## **PACKAGE MATERIALS INFORMATION**

www.ti.com 30-Nov-2023

## TAPE AND REEL INFORMATION





A0	Dimension designed to accommodate the component width
В0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

#### QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



#### \*All dimensions are nominal

Device	Package Type	Package Drawing		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
TSER9615RHBR	VQFN	RHB	32	3000	330.0	12.4	5.3	5.3	1.1	8.0	12.0	Q2
TSER9615RHBT	VQFN	RHB	32	250	180.0	12.4	5.3	5.3	1.1	8.0	12.0	Q2

## **PACKAGE MATERIALS INFORMATION**

www.ti.com 30-Nov-2023



## \*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TSER9615RHBR	VQFN	RHB	32	3000	367.0	367.0	35.0
TSER9615RHBT	VQFN	RHB	32	250	210.0	185.0	35.0

5 x 5, 0.5 mm pitch

PLASTIC QUAD FLATPACK - NO LEAD



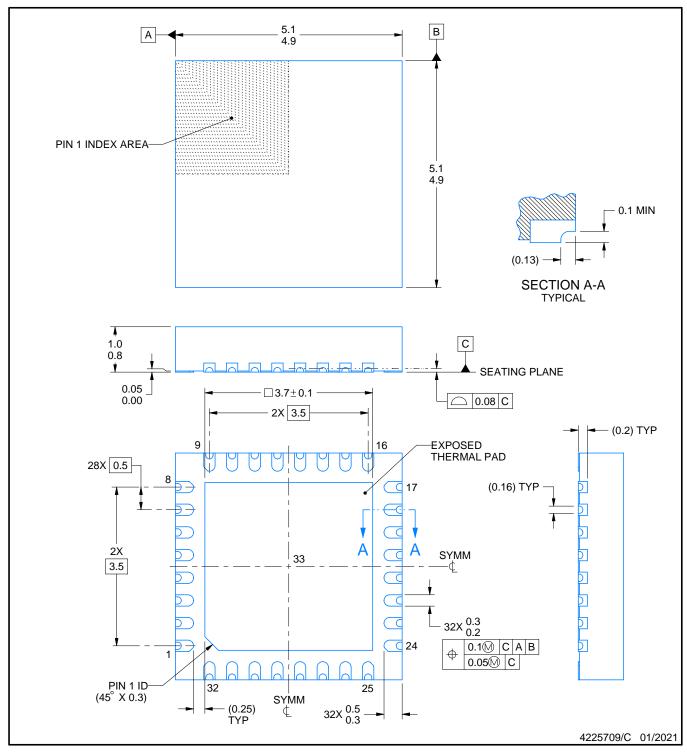
Images above are just a representation of the package family, actual package may vary. Refer to the product data sheet for package details.

4224745/A





PLASTIC QUAD FLATPACK - NO LEAD



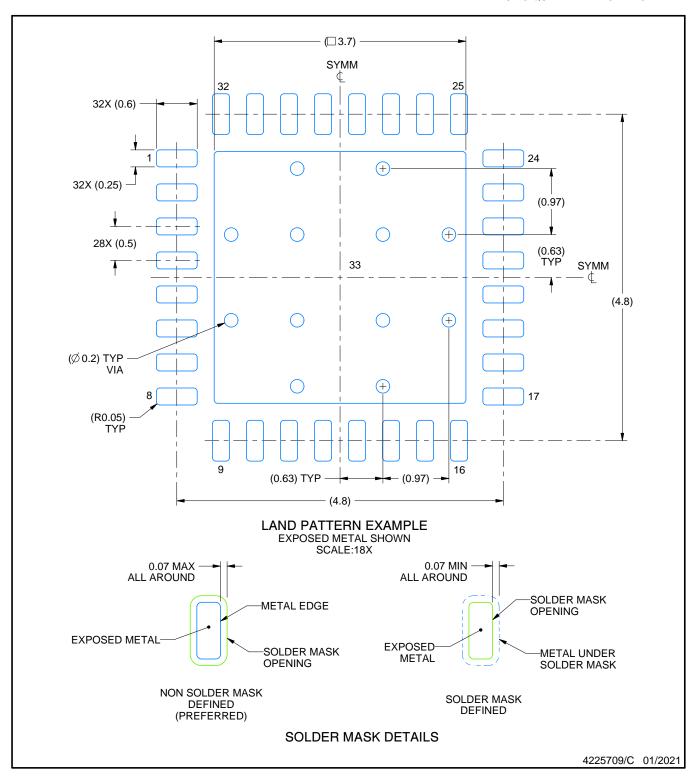
#### NOTES:

- 1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.

  2. This drawing is subject to change without notice.
- 3. The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.



PLASTIC QUAD FLATPACK - NO LEAD

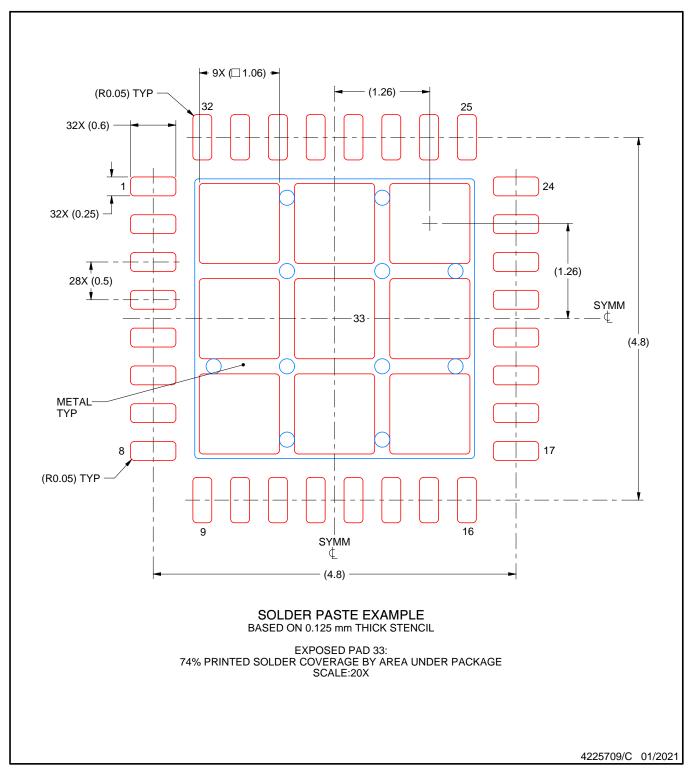


NOTES: (continued)

- 4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slua271).
- Vias are optional depending on application, refer to device data sheet. If any vias are implemented, refer to their locations shown on this view. It is recommended that vias under paste be filled, plugged or tented.



PLASTIC QUAD FLATPACK - NO LEAD



NOTES: (continued)

6. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.



#### IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), 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 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, TI's General Quality Guidelines, 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. Unless TI explicitly designates a product as custom or customer-specified, TI products are standard, catalog, general purpose devices.

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

Copyright © 2025, Texas Instruments Incorporated

Last updated 10/2025