

## DS90UB913A-Q1/DS90UB914A-Q1 25-100MHz 10/12-Bit DC-Balanced FPD-Link III Serializer and Deserializer with Bidirectional Control Channel

Check for Samples: [DS90UB913A-Q1](#), [DS90UB914A-Q1](#)

### FEATURES

- 25 MHz to 100 MHz input pixel clock support
- Coaxial or single differential pair interconnect
- Programmable data payload:
  - 10-bit payload up to 100MHz
  - 12-bit payload up to 75MHz
- Continuous Low Latency Bidirectional control interface channel with I2C support @400kHz
- 2:1 Multiplexer to choose between two input images
- Embedded clock with DC Balanced coding to support AC-coupled interconnects
- Capable of driving up to 15m coaxial or 20m shielded twisted-pair cables
- Receive Equalizer automatically adapts for changes in cable loss
- 4 dedicated General Purpose Input (GPI)/ Output (GPO)
- LOCK output reporting pin and @SPEED BIST diagnosis feature to validate link integrity
- 1.8V, 2.8V or 3.3V compatible parallel inputs on Serializer
- Single power supply at 1.8V
- ISO 10605 and IEC 61000-4-2 ESD Compliant
- Automotive grade product: AEC-Q100 Grade 2 qualified
- Temperature range –40°C to +105°C
- Small serializer footprint (5mm x 5mm)
- EMI/EMC Mitigation - Deserializer
  - Programmable Spread Spectrum (SSCG) outputs.
  - Receiver staggered outputs

### APPLICATIONS

- Front or rear view camera for collision mitigation
- Surround view for parking assistance

### DESCRIPTION

The DS90UB913A-Q1/DS90UB914A-Q1 chipset offers a FPD-Link III interface with a high-speed forward channel and a bidirectional control channel for data transmission over a single coaxial cable or differential pair. The DS90UB913A-Q1/914A-Q1 chipset incorporates differential signaling on both the high-speed forward channel and bidirectional control channel data paths. The serializer/deserializer pair is targeted for connections between imagers and video processors in an ECU (Electronic Control Unit). This chipset is ideally suited for driving video data requiring up to 12-bit pixel depth plus two synchronization signals along with bidirectional control channel bus.

The deserializer features a multiplexer allow selection between two input imagers, one active at a time. The primary video transport converts 10-bit or 12-bit data to a single high-speed serial stream, along with a separate low latency bidirectional control channel transport that accepts control information from an I2C port and is independent of video blanking period.

Using TI's embedded clock technology allows transparent full-duplex communication over a single differential pair, carrying asymmetrical bidirectional control channel information in both directions. This single serial stream simplifies transferring a wide data bus over PCB traces and cable by eliminating the skew problems between parallel data and clock paths. This significantly saves system cost by narrowing data paths that in turn reduce PCB layers, cable width, and connector size and pins. In addition, the Deserializer inputs provide adaptive equalization to compensate for loss from the media over longer distances. Internal DC balanced encoding/decoding is used to support AC-Coupled interconnects. The DS90UB913A-Q1 serializer is offered in a 32-pin LLP package and the DS90UB914A-Q1 deserializer is offered in a 48-pin LLP package.



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.

**PACKAGING INFORMATION**

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
DS90UB913ATRTRVQR1	PREVIEW	WQFN	RTV	32	1000	Green (RoHS & no Sb/Br)	CU SN	Level-3-260C-168 HR	-40 to 105	UB913AQ	
DS90UB913ATRVTQT1	PREVIEW	WQFN	RTV	32	250	Green (RoHS & no Sb/Br)	CU SN	Level-3-260C-168 HR	-40 to 105	UB913AQ	
DS90UB914ATRHSRQ1	PREVIEW	WQFN	RHS	48	1000	TBD	Call TI	Call TI	-40 to 105		
DS90UB914ATRHSQT1	PREVIEW	WQFN	RHS	48	250	TBD	Call TI	Call TI	-40 to 105		

(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.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

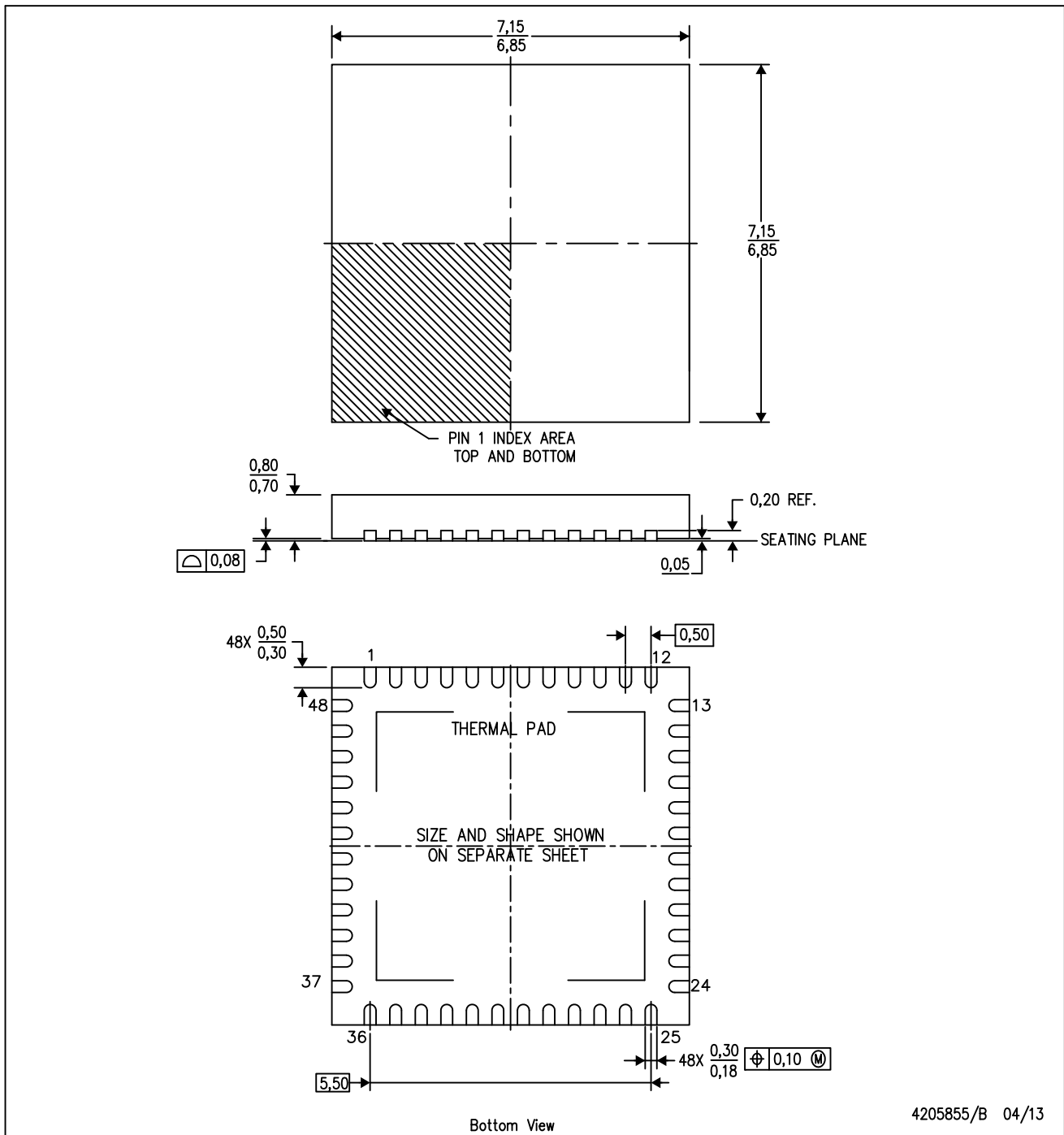
(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

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RHS (S-PWQFN-N48)

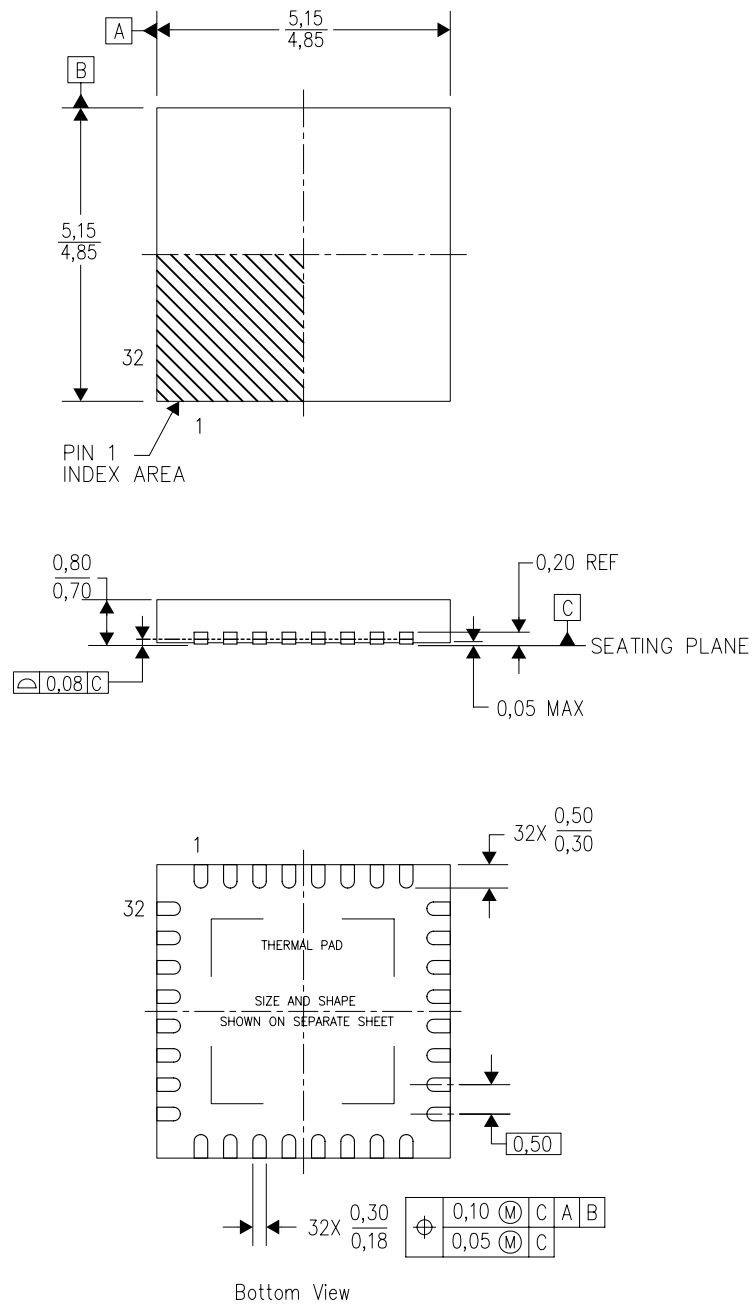
PLASTIC QUAD FLATPACK NO-LEAD



- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Quad Flatpack, No-leads (QFN) package configuration.
  - D. The package thermal pad must be soldered to the board for thermal and mechanical performance.
  - E. See the additional figure in the Product Data Sheet for details regarding the exposed thermal pad features and dimensions.
  - F. Falls within JEDEC MO-220.

RTV (S-PWQFN-N32)

PLASTIC QUAD FLATPACK NO-LEAD



4206245/C 10/11

- NOTES:
- All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5-1994.
  - This drawing is subject to change without notice.
  - Quad Flatpack, No-Leads (QFN) package configuration.
  - The package thermal pad must be soldered to the board for thermal and mechanical performance.
  - See the additional figure in the Product Data Sheet for details regarding the exposed thermal pad features and dimensions.
  - Falls within JEDEC MO-220.

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