DS100TB211
PRODUCT BRIEF Low Power, Dual Lane Thunderbolt Retimer

Check for Samples: DS100TB211

FEATURES

- **Dual Lane (4 channels, bi-directional)**
- **Typical Power Dissipation (EQ+CDR+DE): 500 mW**
- **Locks to 10.3125 Gbps with 64b/66b encoding**
- **Fast lock CDR without reference clock**
- **Internal loopback: host and cable side**
- **Adaptive equalization up to 34 dB boost at 5 GHz**
- **Adjustable transmit V_{OD} : 600 to 1200 mVp-p**
- **Adjustable transmit de-emphasis to -12 dB**
- **Programmable output polarity inversion**
- **Input signal detection, CDR lock detection/indicator**
- **On-chip Eye Monitor (EOM), PRBS generator**
- **Single 2.5 V ±5% power supply**
- **I2C/SMBus based register configuration**

APPLICATIONS

- **Active cable assembly for Thunderbolt: 2m+, 40-AWG**
- **Thunderbolt docking stations and accessories**

DESCRIPTION

The DS100TB211 is a dual lane low power bi-directional retimer with integrated signal conditioning for Thunderbolt cable and peripheral applications. The DS100TB211 includes a fully adaptive input Continuous Time Linear Equalizer (CTLE), clock and data recovery (CDR) and output de-emphasis (DE) driver to ensure an error free operation over 2m+ of thin, inexpensive 40-AWG copper cable with multiple connectors. Each channel of the DS100TB211 independently locks to serial data of 10.3125 Gbps (64b/66b encoded) without the need for an external reference clock - This simplifies system design and lowers overall cost.

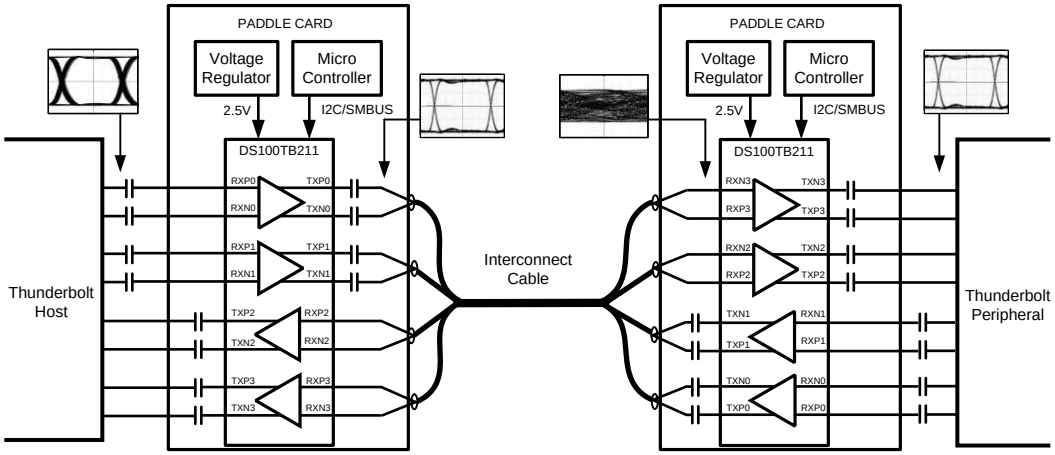
Advanced cable diagnostic features such as on-chip receiver eye processing on each of the input channel reduce manufacturing cost and time. Offered in a tiny 5mm x 5mm QFN package and powered using a single 2.5v power supply, the DS100TB211 consumes less than 250 mW per bi-directional lane and can be implemented on a 6-layer paddle card board design. The programmable settings can be applied easily using the I2C/SMBus interface.

Notice: This document is not a full datasheet. For more information regarding this product or to order samples please contact your local Texas Instruments sales office or visit http://www.ti.com

PRODUCT PREVIEW

These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

Typical Application Diagram



PRODUCT PREVIEW

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)	Top-Side Markings (4)	Samples
DS100TB211SQ/NOPB	PREVIEW	WQFN	RSB	40	1000	TBD	Call TI	Call TI			
DS100TB211SQE/NOPB	PREVIEW	WQFN	RSB	40	250	TBD	Call TI	Call TI			
DS100TB211SQX/NOPB	PREVIEW	WQFN	RSB	40	4500	TBD	Call TI	Call TI			

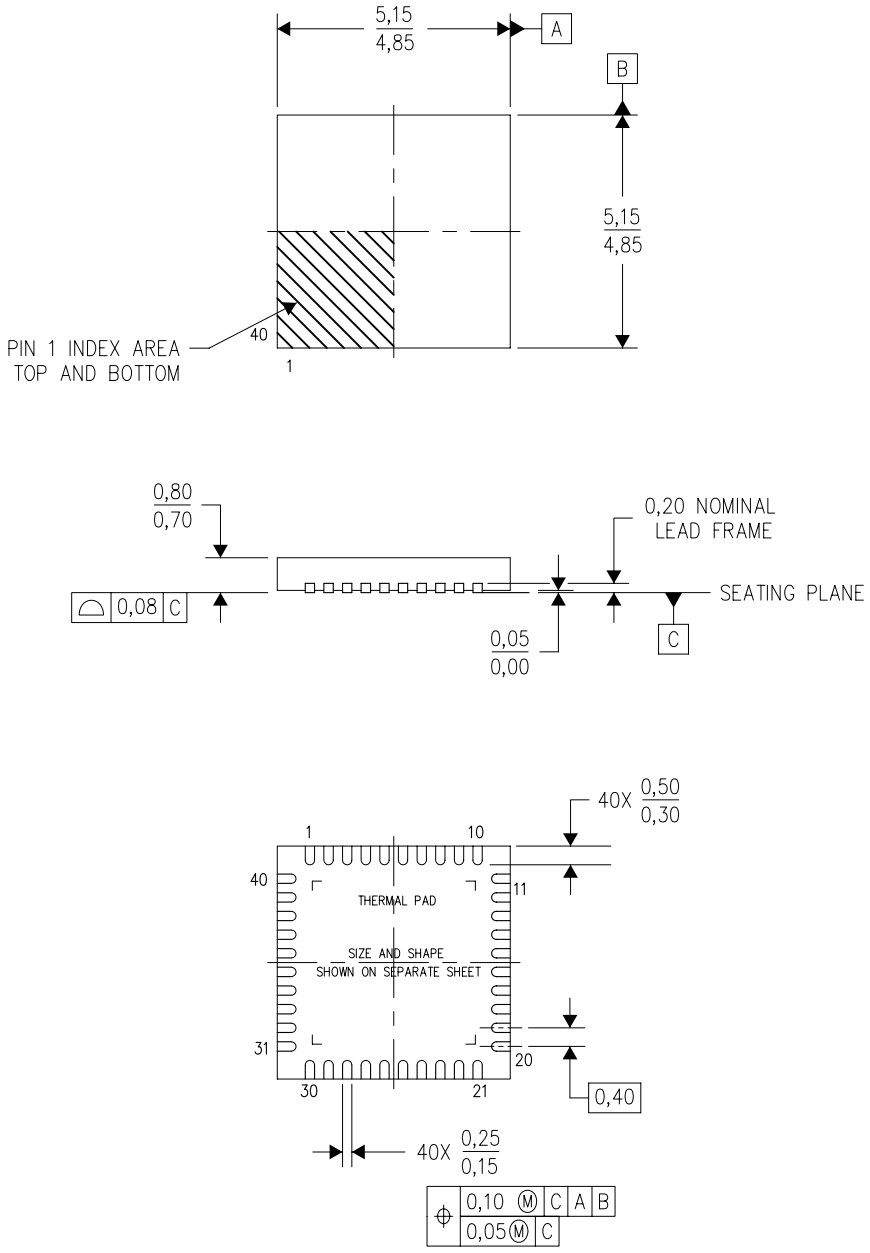
(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, 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) Only one of markings shown within the brackets will appear on the physical device.

RSB (S–PWQFN–N40) PLASTIC QUAD FLATPACK NO–LEAD



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NOTES:
A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M–1994.
B. This drawing is subject to change without notice.
C. QFN (Quad Flatpack No–Lead) 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.

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