SN65DP141 DisplayPort Linear Redriver

1 Features

- Supports VESA DisplayPort 1.3, and eDP 1.4
- Quad Channel Linear Redriver Supporting Data Rates up to 12 Gbps including DisplayPort RBR, HBR, HBR2 and HBR3
- Protocol Agnostic
- Transparent to DP Link Training
- Position Independent on the Link Suitable for Source, Sink and Cable Applications
- 15-dB Analog Equalization at 6 GHz
- Output Linear Dynamic Range: 1200 mV
- Bandwidth: >20 GHz
- Better than 16-dB Return Loss at 6 GHz
- 2.5-V or 3.3-V ±5% Single Power Supply Option
- Low Power Consumption with 80 mW per channel at 2.5 V V_{CC}
- GPIO or I^2C Control

2 Applications

- Tablets
- Notebooks
- Desktops
- Docking Stations

3 Description

The SN65DP141 is an asynchronous, protocol-agnostic, low latency, four-channel linear equalizer optimized for use up to 12 Gbps and compensates for losses due to board traces and cables.

The device is transparent to DisplayPort (DP) link training such a way that a DP source and a sink can perform effective link training overcoming traditional “aux snooping” re-drivers’ shortcomings. Additionally, the device is position independent. It can be placed inside source, cable or sink effectively providing a “negative loss” component to the overall link budget. Linear equalization inside SN65DP141 also increases link margin when used with a receiver implementing Decision Feedback Equalization (DFE).

SN65DP141 allows independent channel control for equalization, gain, dynamic range using both I^2C and GPIO configurations.

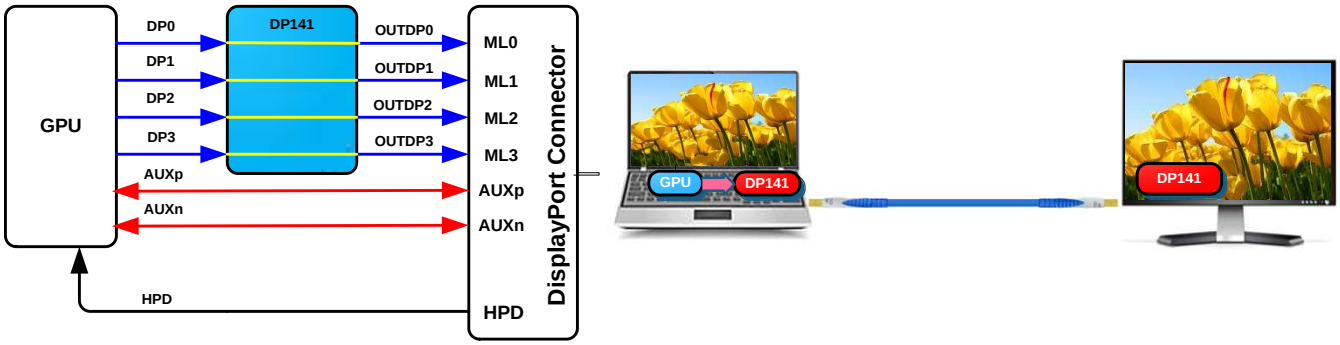
Device Information(1)

PART NUMBER	PACKAGE	BODY SIZE (NOM)
SN65DP141	WQFN (38)	7.00 mm x 5.00 mm

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

PRODUCT PREVIEW

Simplified Schematic



4 Device and Documentation Support

4.1 Community Resources

The following links connect to TI community resources. Linked contents are 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.

TI E2E™ Online Community ***TI's Engineer-to-Engineer (E2E) Community.*** Created to foster collaboration among engineers. At e2e.ti.com, you can ask questions, share knowledge, explore ideas and help solve problems with fellow engineers.

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4.2 Trademarks

E2E is a trademark of Texas Instruments.
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4.3 Electrostatic Discharge Caution

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.

4.4 Glossary

SLYZ022 — *TI Glossary*.

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

5 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
SN65DP141RLJR	PREVIEW	WQFN	RLJ	38	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-3-260C-168 HR	-40 to 85	DP141	
SN65DP141RLJT	PREVIEW	WQFN	RLJ	38	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-3-260C-168 HR	-40 to 85	DP141	

(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.

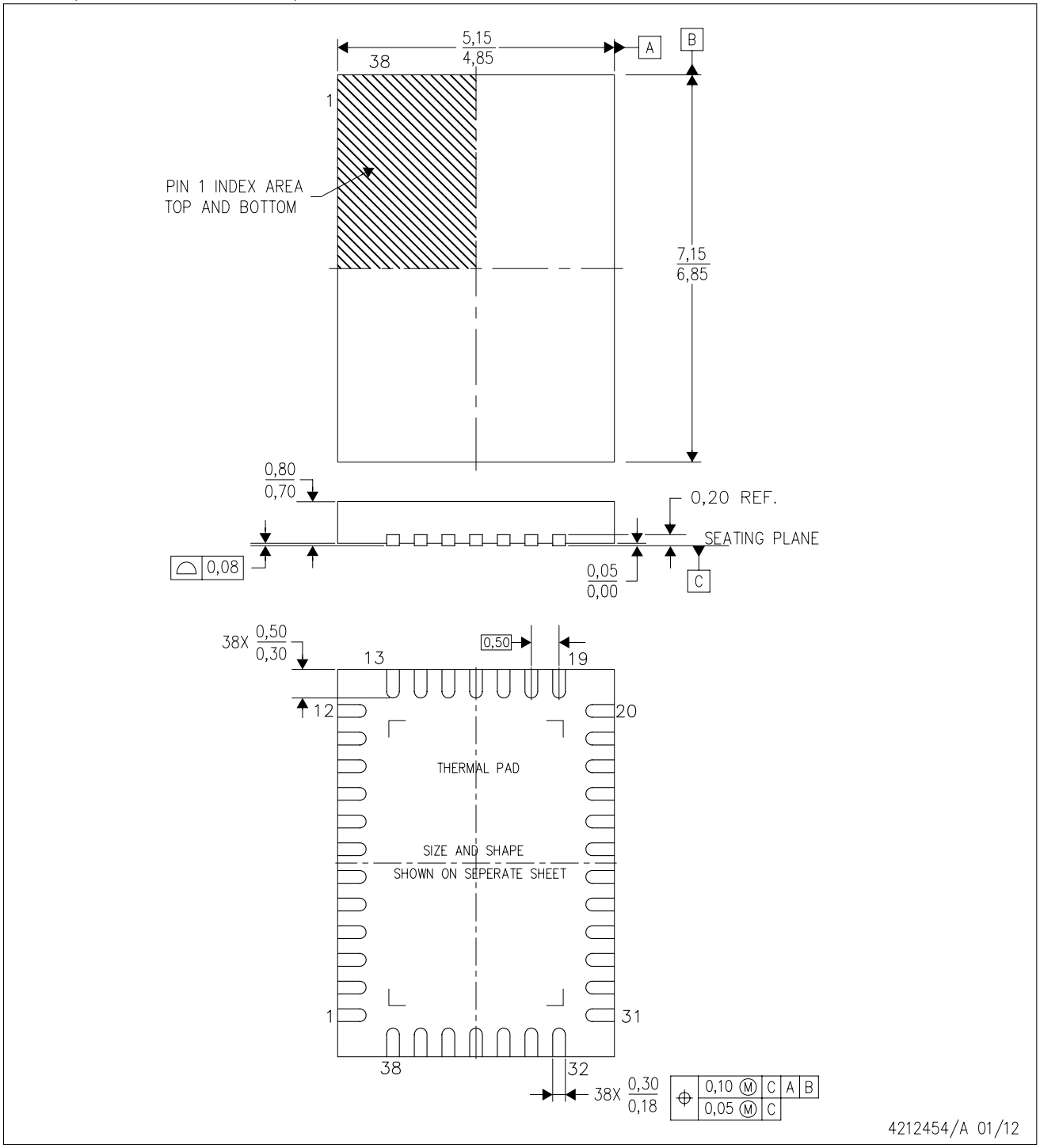
(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(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.

(6) Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

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.

RLJ (R–PWQFN–N38) PLASTIC QUAD FLATPACK NO–LEAD



NOTES:
A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5–1994.
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.

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