

**PI2DPT821**

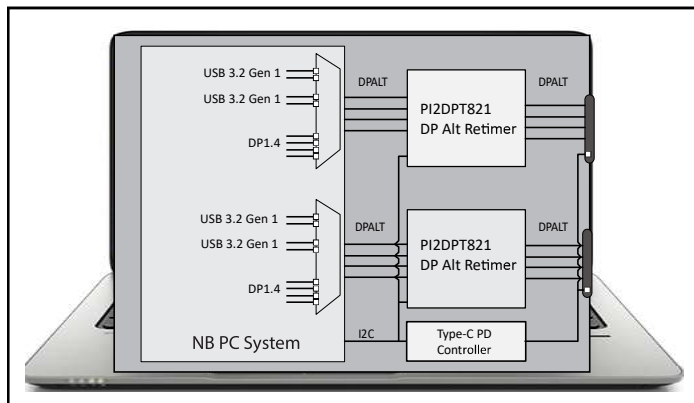
**DP-Alt Type-C 8.1Gbps Retimer with Adaptive Equalizer, Low-latency, Aux/SBU Switch with 1.8V Single Power Supply**

**Features**

- Compliant for USB 5Gbps / DP1.4 8.1Gbps standard
- DP Alt standard mode support; DP 4-lane, USB 1 lane/DP 2 lane, USB 2 lane Retimer normal / flip insertion
- -18dB at 4.05GHz channel loss compensation
- Low Latency < 1ns.
- Adaptive Continuous Time Linear Equalizer (CTLE)
- No reference clock design.
- Rx termination detection for power saving control
- Selectable adjustment of 2-taps transmitter.
- Single power supply of 1.8±90mV.
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. “Green” Device (Note 3)
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative.  
<https://www.diodes.com/quality/product-definitions/>

**Application(s)**

- Source Devices : Tablets, Smart Phones, Notebooks, Desktops, All-In-One PCs



**Figure 1-1 DP Alt Type-C Connectors inside PC**

**Description**

The DIODES™ PI2DPT821 is a bit level Retimer with receiver adaptive CTLE and transmitter 2-tap equalization which can compensate channel loss up to -18dB for 4.05GHz signal transmission. It supports DP1.4 and USB 3.2 Gen 1 standards for USB Type-C® DP ALT mode operation. The operation configurations are programmable via I2C interface to select 4-lane DP, 2-lane DP/1 lane USB 3.2 Gen 1, 1 or 2 lane USB 3.2 Gen 1.

To achieve good power saving management, this device uses the common 1.8v Vdd power supply. It complies with USB link power management states for active mode (U0) and power saving mode (U1, U2, U3). USB Rx detection monitors the plug condition of the TX terminals continuously.

Under Displayport operation, the AUX Listener will monitor the AUX communication for data rate, lane count, swing & pre-emphasis setting and power saving D3 mode setting. The SINK side HPD connection signal is set via I2C register by the system PD controller. The integrated AUX/SBU switch switches the Displayport AUX+/- pins and the Type-C SBU1/SBU2 pins automatically.

With the merit of the bit level Retimer design, PI2DPT821 has very low latency from signal input to output (< 1ns) that serves good interoperability among various USB and DP devices.

**Ordering Information**

Ordering Number	Package Code	Package Description
PI2DPT821XEAE	XEA	32-pin, X1-QFN2845-32 (2.85x4.5mm), 0.4mm pitch, 0.45mm height

**Notes:**

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, “Green” and Lead-free.
3. Halogen- and Antimony-free “Green” products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. E = Pb-free and Green
5. X suffix = Tape/Reel