Fully Bi-directional USB4 Re-Timer with multi-protocol support for PC and Peripheral Applications

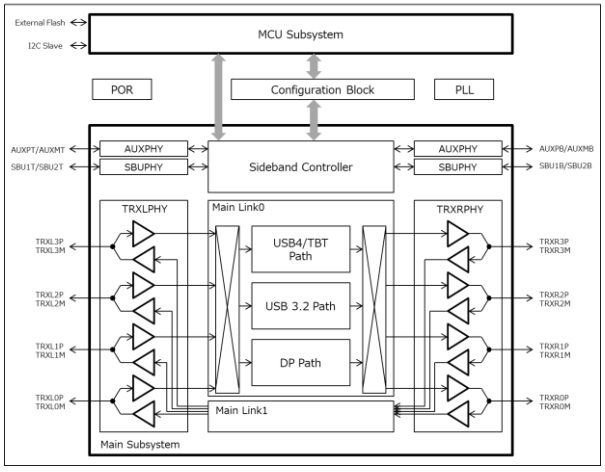
KM864741 is multi-protocol bidirectional Re-Timer for USB Type-C® connector, which can transmit and receive up to 40 Gb/s. It can support the USB4®, Thunderbolt™ 3 compatibility, USB 3.2, DisplayPort™ 2.1, and DisplayPort™ Alt Mode, so can be used as a PC Re-Timer solution that supports USB4 backward compatibility and peripheral standards. The receiving end is equipped with an adaptive equalizer that can compensate for signal loss up to 35 dB, and the transmitting end is equipped with an emphasis circuit that can compensate for up to 15 dB. This relaxes the restrictions on the placement of USB Type-C connectors and CPU, therefore, allows customers to flexibly design mother boards and provides good interoperability.

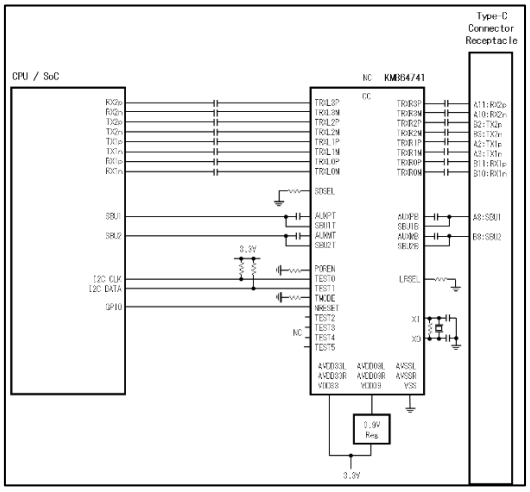
Features

- Multi-protocol compatible USB Type-C 40Gb/s bidirectional Re-Timer
- Supporting standards
  - USB4 Gen2, Gen3 (20Gb/s, 40Gb/s)
  - USB 3.2 Gen1x1, Gen1x2, Gen2x1, Gen2x2
  - DP 2.1 (UHBR20, UHBR13.5, UHBR10, HBR3, HBR2, HBR, RBR)
  - Alternate Mode (USB3.2 + DP 2.1)
  - Thunderbolt 3 Compatibility (10.3125Gb/s, 20.625Gb/s)
- Multi-protocol high-speed differential receiver
  - Maximum 35dB continuous time adaptive equalizer plus decision feedback adaptive equalizer
  - Lane swap / bit inversion function
- Multi-protocol high-speed differential transmitter
  - Maximum 15dB TX De-Emphasis
  - Amplitude adjustment function
  - De-Skew function
  - Lane swap function
- Built-in 32bit MCU (Note : External mode setting is required)
- Eye Monitor with on-chip reception diagnostic function
- Signal Generator function using system clock (SYSCLK)
- Built-in SBU pull-up/pull-down resistor
- I2C slave function
- Flexible slave address selection
- SBU path through function
- Low power consumption
- 0.9V Power supply:
  Digital power supply / Analog power supply
- 3.3V Power supply:
  IO power supply / Analog power supply
- Package: BGA 69pin, 5 x 5mm, 0.5mm pitch
- ESD: HBM 2kV

Application

- USB Type-C Upstream Port
- USB Type-C Downstream Port





Related Products

Part Number	Description
KM864742	Fully Bi-directional USB4 Re-Timer with multi-protocol support for Cable Applications

Important Notice

Nuvoton Products are neither intended nor warranted for usage in systems or equipment, any malfunction or failure of which may cause loss of human life, bodily injury or severe property damage. Such applications are deemed, "Insecure Usage".

Insecure usage includes, but is not limited to: equipment for surgical implementation, atomic energy control instruments, airplane or spaceship instruments, the control or operation of dynamic, brake or safety systems designed for vehicular use, traffic signal instruments, all types of safety devices, and other applications intended to support or sustain life.

All Insecure Usage shall be made at customer's risk, and in the event that third parties lay claims to Nuvoton as a result of customer's Insecure Usage, customer shall indemnify the damages and liabilities thus incurred by Nuvoton.

Please note that all data and specifications are subject to change without notice.
All the trademarks of products and companies mentioned in this datasheet belong to their respective owners.

Organization names, company names, product or service names, etc. listed on this Datasheet are registered trademarks or trademarks of each company or organization.