

## Product Overview

### NB7NPQ7022M: 3.3 V USB 3.1 Dual Channel High Gain Linear Redriver

For complete documentation, see the data sheet.

The NB7NPQ7022M is a 3.3 V dual channel, high gain, redriver for USB 3.1 Gen 1 and USB 3.1 Gen 2 applications that supports both 5 Gbps and 10 Gbps data rates. Signal integrity degrades from PCB traces, transmission cables, and inter-symbol interference (ISI). The NB7NPQ7022M compensates for these losses by engaging varying levels of equalization at the input receiver, and flat gain amplification on the output transmitter. The Flat Gain and Equalization are controlled by four level control pins. Each channel has a set of independent control pins to make signal optimization possible.

After power up, the NB7NPQ7022M periodically checks both of the TX output pairs for a receiver connection. When the receiver is detected on both channels the RX termination becomes enabled and the NB7NPQ7022M is set to perform the redriver function. The NB7NPQ7022M comes in a small 3 x 3 mm UQFN16 package and is specified to operate across the entire industrial temperature range of -40°C to 85°C.

### Features

- 3.3 V  $\pm$  5% Power Supply
- Low Power Consumption: 114mA in Active mode
- Supports USB 3.1 Gen 1 and USB 3.1 Gen 2 Data Rates
- Automatic Receiver Termination Detection
- Integrated Input and Output Termination
- Independent, Selectable Equalization and Flat Gain
- Hot-Plug Capable
- Small 3 x 3 x 0.5 mm UQFN16 Package, Flow Through Design that ease PCB layout
- Operating Temperature Range: -40C to 85C

### Applications

- USB3.1 Type-C and Type-A Signal Routing
- Mobile Phone and Tablet
- Computer and Laptop
- Docking Station and Dongle
- Active Cable, Back Planes

### End Products

- Mobile Phone and Tablet
- Computer and Laptop
- Docking Station and Dongle
- Active Cable, Back Planes
- Gaming Console, Smart T.V.

### Part Electrical Specifications

| Product          | Compliance             | Status | Type          | Channels | Input / Output Ratio | Input Level | Output Level | V <sub>CC</sub> Typ (V) | t <sub>jitter</sub> RMS Typ (ps) | t <sub>skew(differential)</sub> Max (ps) | t <sub>pd</sub> Typ (ns) | t <sub>tr</sub> & t <sub>fr</sub> Max (ps) | f <sub>max</sub> Clock Typ (MHz) | f <sub>max</sub> Data Typ (Mbps) | Package Type |
|------------------|------------------------|--------|---------------|----------|----------------------|-------------|--------------|-------------------------|----------------------------------|--|--------------------------|--|----------------------------------|----------------------------------|--------------|
| NB7NPQ7022MMUTXG | Pb-free<br>Halide free | Active | Signal Driver | 2        | 1:1                  | CML         | CML          | 3.3                     | N/A                              | N/A                                      | 0.1                      | 30   | N/A                              | 10000                            | UQFN-16      |

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