

## Product Overview

### NB7VPQ16M: Pre-Emphasis Copper / Cable Driver, 12.5 Gbps, Programmable, 1.8 V / 2.5 V, with Selectable Equalizer Receiver

For complete documentation, see the data sheet.

The NB7VPQ16M is a high performance single channel programmable Pre-Emphasis CML Driver with an Equalizer Receiver, signal enhancer, that operates up to 12.5 Gbps with a 1.8 V or 2.5 V power supply. When placed in series with a Data/Clock path, the NB7VPQ16M inputs will compensate the degraded signal transmitted across a FR4 PCB backplane or cable interconnect. Therefore, the serial data rate is increased by reducing Inter-Symbol Interference, ISI, caused by losses in copper interconnect or long cables. The Pre-Emphasis buffer is controlled using a serial bus via the SDIN, Serial Data In, and SCLKIN, Serial Clock In, control inputs and contains circuitry which provides sixteen programmable Pre-Emphasis settings to select the optimal output compensation level. These selectable output levels will handle various backplane lengths and cable lines. The first four SDIN bits, D3:D0, will digitally select 0dB through 12dB of de-emphasis. For cascaded applications, the shifted SDIN and SCLKIN signals are presented at the SDOOUT and SCLKOUT pins. The 5th-bit, LSB, of the serial data bits allows for enabling the equalization function of the receiver. The differential Data/Clock inputs incorporate a pair of internal 50-ohm termination resistors, in a 100-ohm center-tapped configuration, via the VT pin and will accept LVPECL, CML or LVDS logic levels. This feature provides transmission line termination on-chip, at the receiver end, eliminating external components.

## Features

- Maximum Input Data Rate > 12.5 Gbps
- Maximum Input Clock Frequency > 8 GHz
- Drives Up To 18-inches of FR4
- (16) Programmable Output De-emphasis Levels; 0 dB through 12 dB
- 200 ps typical Propagation Delay
- Differential CML Outputs, 400 mV peak-to-peak, typical (PE = 0 dB)
- Operating Range:  $V_{CC} = 1.71 \text{ V to } 2.625 \text{ V}$ ,  $GND = 0 \text{ V}$
- Internal Output Termination Resistors, 50-ohm
- $-40^{\circ}\text{C to } +85^{\circ}\text{C}$  Ambient Operating Temperature

## Applications

- FR4 Input Equalization
- Selectable Output Preemphasis

## End Products

- Printed Circuit Backplanes
- Routers and Switches

## Part Electrical Specifications

Product	Compliance	Status	Type	Channels	Input / Output Ratio	Input Level	Output Level	$V_{CC}$ Typ (V)	$t_{jitter, R_{MS}}$ Typ (ps)	$t_{skew(c-to-g)}$ Max (ps)	$t_{pd}$ Typ (ns)	$t_{R}$ & $t_{F}$ Max (ps)	$f_{max, Clock}$ Typ (MHz)	$f_{max, Data}$ Typ (Mbps)	Package Type	
NB7VPQ16MMNG	Pb-free	Active	Signal Driver	1	1:1	LVD	CML	1.8	0.1		0.2	50	8000	14000	QFN-16	
	Halide free					S		2.5								
						ECL										
						CML										

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