

# NB7L1008MNGEVB

## NB7L1008MNG Evaluation Board User's Manual



ON Semiconductor®

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### EVAL BOARD USER'S MANUAL

#### Introduction

The NB7L1008 is a high performance differential 1:8 Clock/Data fanout buffer that operates up to 12 Gbps/7 GHz with a 2.5 V or 3.3 V power supply. ON Semiconductor has developed a “universal” QFN-32 evaluation board and configured it for the NB7L1008. This evaluation board was designed to provide a flexible and convenient platform to quickly evaluate, characterize and verify the operation of the NB7L1008.

This evaluation board manual contains:

- Information on the NB7L1008 Evaluation Board
- Test and Measurement Setup Procedures

This manual should be used in conjunction with the device datasheet, which contains full technical details on the device specifications and operation.

#### Board Layout

The NB7L1008 Evaluation Board provides a high bandwidth, 50-Ω controlled impedance environment and is implemented in one layer.

#### Layer Stack

L1 (Rogers)

High-performance SMA connectors are provided for all high-speed input & output signal access.

#### Evaluation Board Assembly Instructions

The QFN-32 evaluation board is designed for characterizing devices in a 50-Ω laboratory environment using high bandwidth equipment.

#### Output Loading/Termination

*LVPECL Outputs*

**Table 1. DIFFERENTIAL INPUTS DRIVEN SINGLE – ENDED** (Notes 1 & 2)

Symbol	Characteristic	Min	Typ	Max	Unit
$V_{IH}$	Single – Ended Input High Voltage	$V_{th} + 75$	–	$V_{CC}$	mV
$V_{IL}$	Single – Ended Input Low Voltage	$V_{EE}$	–	$V_{th} - 100$	mV
$V_{th}$	Input Threshold Reference Voltage Range	$V_{EE} + 1100$	–	$V_{CC} - 100$	mV
$V_{ISE}$	Single – Ended Input Voltage ( $V_{IH} - V_{IL}$ )	200	–	1200	mV

1.  $V_{th}$ ,  $V_{IH}$ ,  $V_{IL}$  and  $V_{ISE}$  parameters must be complied with simultaneously.
2.  $V_{th}$  is applied to the complementary input when operating in single-ended mode.

**Table 2. DIFFERENTIAL INPUTS DRIVEN DIFFERENTIALLY (IN, INB)** (Note 3)

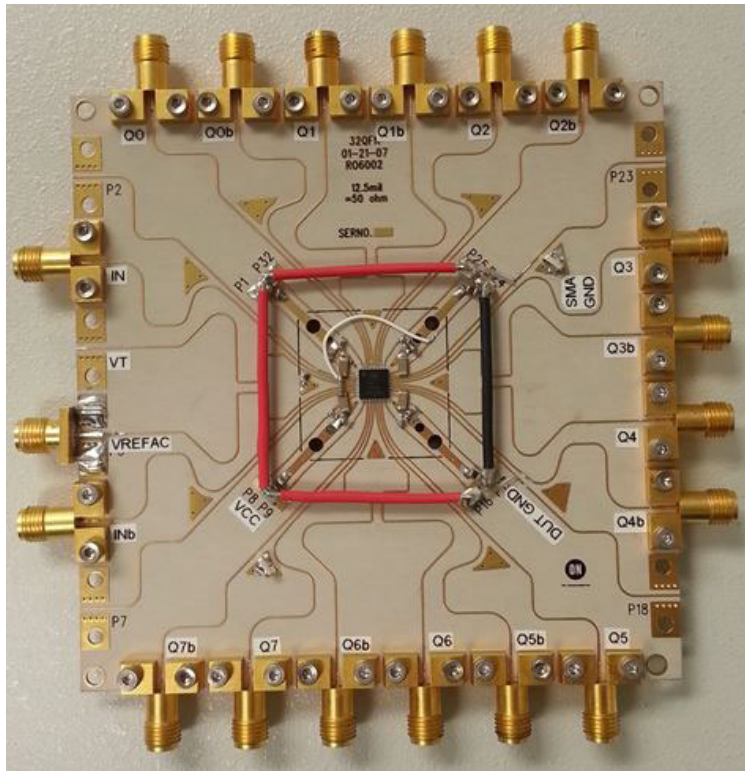
Symbol	Characteristic	Min	Typ	Max	Unit
$V_{IHD}$	Differential Input High Voltage	$V_{EE} + 1100$	–	$V_{CC}$	mV
$V_{ILD}$	Differential Input Low Voltage	$V_{EE}$	–	$V_{IHD} - 100$	mV
$V_{ID}$	Differential Input Voltage ( $V_{IHD} - V_{ILD}$ )	100	–	1200	mV
$I_{IH}$	Input High Current	–150	40	+150	μA
$I_{IL}$	Input Low Current	–150	5	+150	μA

3.  $V_{IHD}$ ,  $V_{ILD}$ ,  $V_{ID}$  and  $V_{CMR}$  parameters must be complied with simultaneously.

If the input signals to the NB7L1008 require termination, internal 50-Ω resistors are provided via the VT pin and grounded using a SMA grounding plug then and should be stimulated with the appropriate voltage levels.

NOTE: For this evaluation board, VT is connected to ground, thus it can only be used for LVPECL inputs.

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**Figure 1. Test Board**

1. Connect the appropriate power supplies to  $V_{CC}$ , DUTGND.
2. Connect a signal generator to the input SMA connectors. Setup input signal levels according to the device data sheet.

3. Connect a test measurement device to the device's output SMA connectors.

NOTE: The test measurement device must contain 50- $\Omega$  termination.

**Table 3. NB7L1008, LVPECL INPUTS AND LVPECL OUTPUTS**

Device Pin Power Supply Connector	Power Supply
$V_{CC}$	$V_{CC} = 2\text{ V}$
50 $\Omega$ Input	$VT = 0\text{ V}$
DUTGND	$DUTGND = V_{EE} = -0.5\text{ V}$ (for 2.5 V) and $-1.3\text{ V}$ (for 3.3 V)

**Table 4. NB7L1008, CML INPUTS AND LVPECL OUTPUTS**

Device Pin Power Supply Connector	Power Supply
$V_{CC}$	$V_{CC} = 2\text{ V}$
50 $\Omega$ Input	$VT = V_{CC}$
DUTGND	$DUTGND = V_{EE} = -0.5\text{ V}$ (for 2.5 V) and $-1.3\text{ V}$ (for 3.3 V)

**Table 5. NB7L1008, LVDS INPUTS AND LVPECL OUTPUTS**

Device Pin Power Supply Connector	Power Supply
$V_{CC}$	$V_{CC} = 2\text{ V}$
50 $\Omega$ Input	$VT = \text{Open}$
DUTGND	$DUTGND = V_{EE} = -0.5\text{ V}$ (for 2.5 V) and $-1.3\text{ V}$ (for 3.3 V)

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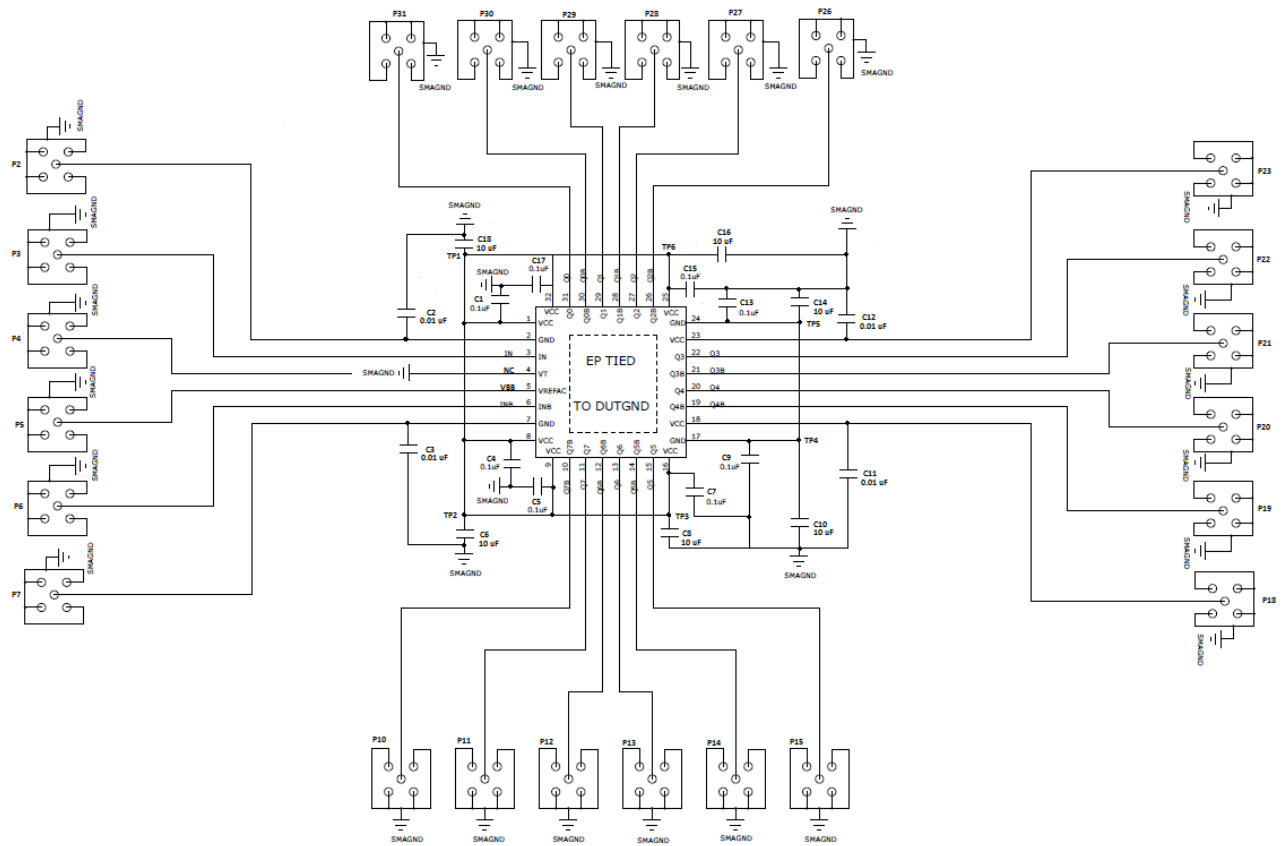


Figure 2. Schematic Drawing

Table 6. BILL OF MATERIALS

Components	Manufacturer	Description	Manufacturer Part Number	Web Site
SMA Connector	Rosenberger	High Performance SMA Connector, Side Launch, Gold Plated	32K243-40ME3	<a href="http://www.rosenberger.de">http://www.rosenberger.de</a> <a href="http://www.rosenbergerna.com">http://www.rosenbergerna.com</a>
SMA Connector	Johnson-Emerson	SMA Connector, Side Launch, Gold Plated	142-0701-801	<a href="http://www.digikey.com">http://www.digikey.com</a>
Surface Mount Test Points	Keystone*	SMT Compact Test Point	5016	<a href="http://www.keylco.com">http://www.keylco.com</a>
Chip Capacitor	AVC Corporation*	0603 0.1 $\mu$ F $\pm$ 10%	0603C104KAT2A	<a href="http://www.avxcorp.com">http://www.avxcorp.com</a>
Chip Capacitor	Kemet	1206 0.01 $\mu$ F $\pm$ 10%	C1206C103K5RACTU	<a href="http://www.newark.com">http://www.newark.com</a>
Chip Capacitor	TDK	0603 0.1 $\mu$ F $\pm$ 10%	C3216X5R1H106K160AB	<a href="http://www.newark.com">http://www.newark.com</a>
Evaluation Board	ON Semiconductor	QFN 32 Evaluation Board – 2-Layer		<a href="http://www.onsemi.com">http://www.onsemi.com</a>
Device Samples	ON Semiconductor	NB7L1008MNG		<a href="http://www.onsemi.com">http://www.onsemi.com</a>

\*Components are available through most distributors, i.e. [www.newark.com](http://www.newark.com), [www.Digikey.com](http://www.digikey.com)

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