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.

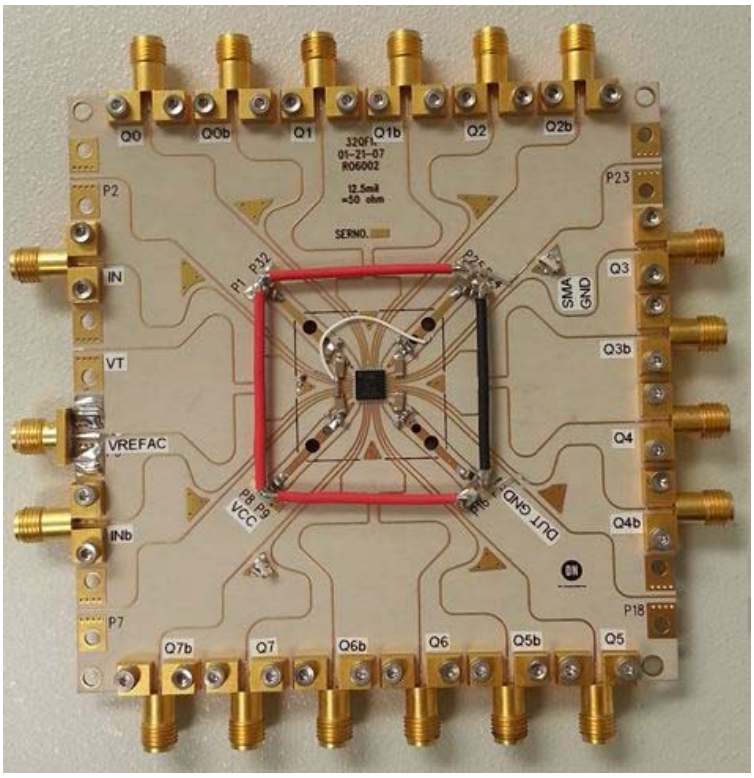

Figure 1. Test Board

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-Ω termination.

Table 3. NB7L1008, LVPECL INPUTS AND LVPECL OUTPUTS

Device Pin Power Supply Connector	Power Supply
V_{CC}	V_{CC} = 2 V
50 Ω Input	VT = 0 V
DUTGND	DUTGND = V_{EE} = −0.5 V (for 2.5 V) and −1.3 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 V
50 Ω Input	VT = V_{CC}
DUTGND	DUTGND = V_{EE} = −0.5 V (for 2.5 V) and −1.3 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 V
50 Ω Input	VT = Open
DUTGND	DUTGND = V_{EE} = −0.5 V (for 2.5 V) and −1.3 V (for 3.3 V)

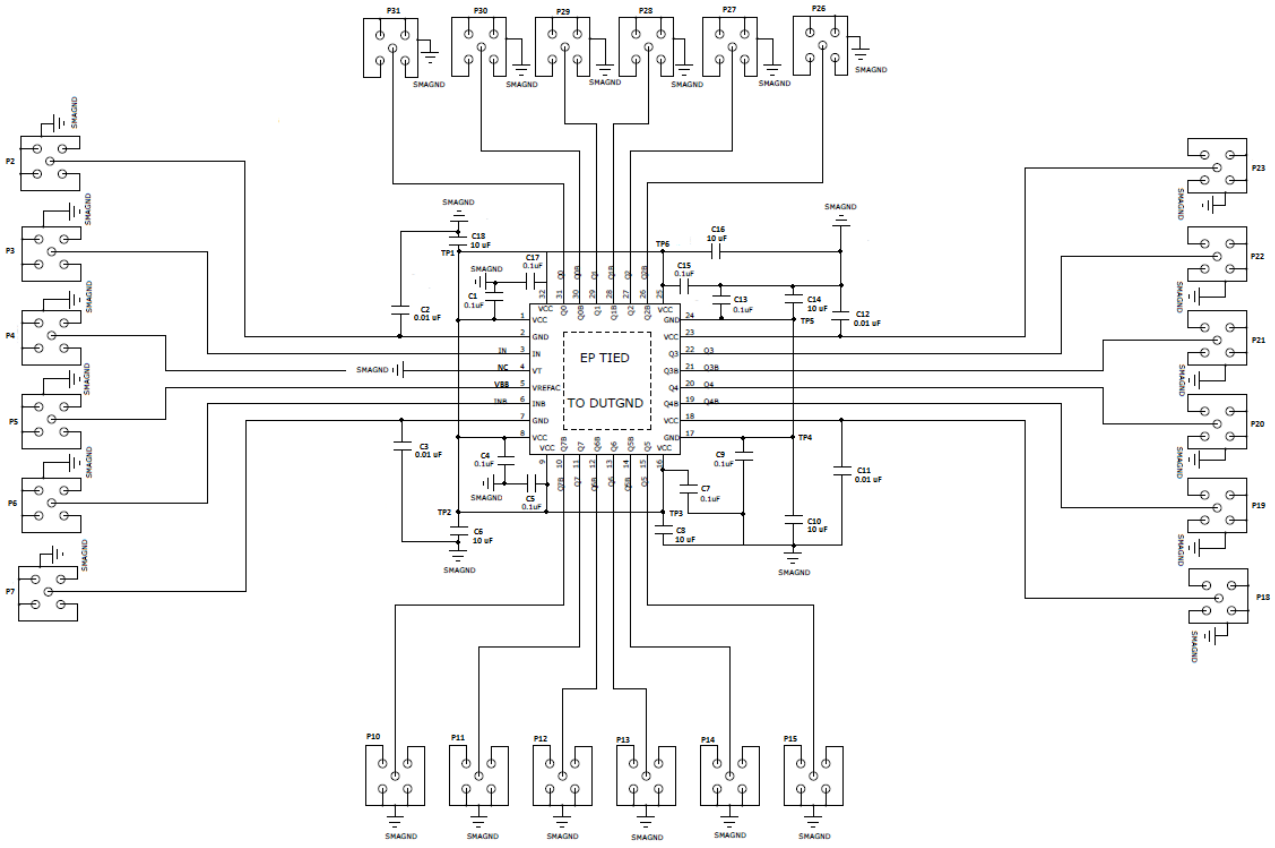

Figure 2. Schematic Drawing

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	http://www.rosenberger.de http://www.rosenbergerna.com
SMA Connector	Johnson-Emerson	SMA Connector, Side Launch, Gold Plated	142-0701-801	http://www.digikey.com
Surface Mount Test Points	Keystone*	SMT Compact Test Point	5016	http://www.keylco.com
Chip Capacitor	AVC Corporation*	0603 0.1 μF ±10%	0603C104KAT2A	http://www.avxcorp.com
Chip Capacitor	Kemet	1206 0.01 μF ±10%	C1206C103K5RACTU	http://www.newark.com
Chip Capacitor	TDK	0603 0.1 μF ±10%	C3216X5R1H106K160AB	http://www.newark.com
Evaluation Board	ON Semiconductor	QFN 32 Evaluation Board	NB7VQ1006MMNGEVB	http://www.onsemi.com
Device Samples	ON Semiconductor	NB7L1008	Various	http://www.onsemi.com

*Components are available through most distributors, i.e. www.newark.com, www.Digikey.com

PUBLICATION ORDERING INFORMATION

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Literature Distribution Center for ON Semiconductor
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