

## NB3L208K Evaluation Board User's Manual



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### Introduction

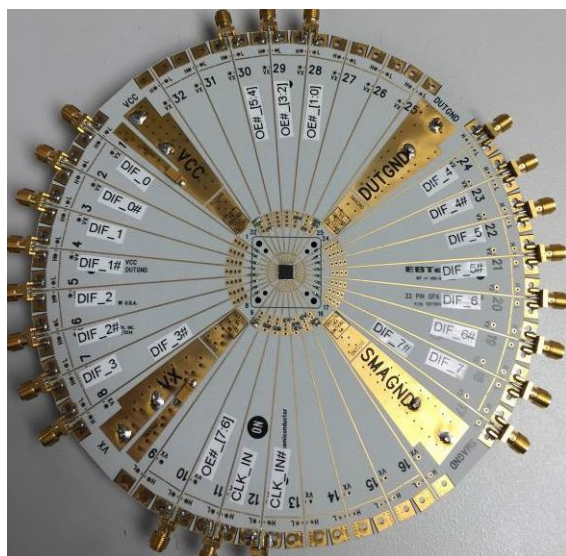
The NB3L208K is a differential 1:8 Clock fanout buffer with High-speed Current Steering Logic (HCSL) outputs. Inputs can directly accept differential LVPECL, LVDS and HCSL signals. Single-ended LVPECL, HCSL, LVCMOS, or LVTTL levels are accepted with a proper external  $V_{TH}$  reference supply. These signals will be translated to HCSL and eight identical copies of Clock will be distributed, operating up to 350 MHz.

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

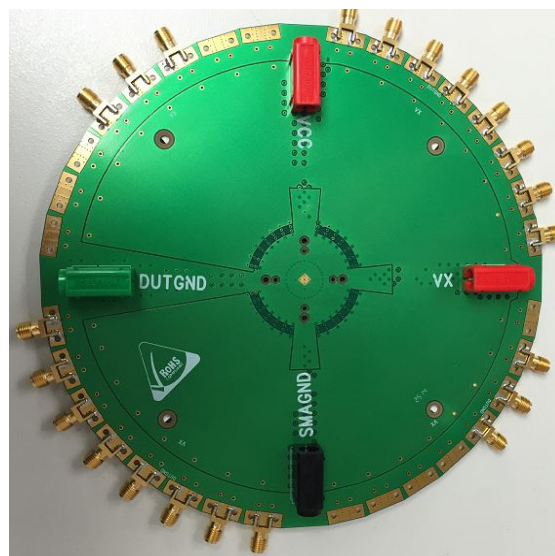
### EVAL BOARD USER'S MANUAL

This evaluation board manual contains:

- Information on the NB3L208K Evaluation Board
- Block Diagram and Board Schematic
- Assembly Instructions
- Test and Measurement Setup Procedures
- Bill of Materials



Top View



Bottom View

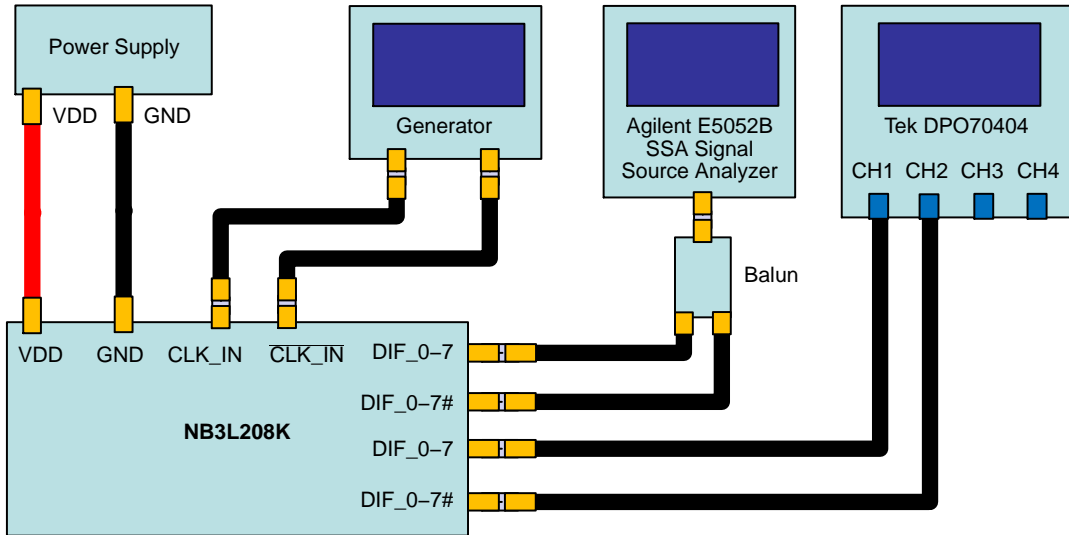
Figure 1. NB3L208KMNGEVB Top and Bottom View

QUICK START LAB SET-UP USER'S GUIDE

Equipment Required

1. DC Power Supply
2. Oscilloscope
3. Phase Noise Analyzer
4. Connectors for DC Power Supply
5. 50-Ω SMA Connectors for I/Os

Block Diagram



Note: Balun Connected to Outputs Only during Phase Noise Testing.

Figure 2. Time and Frequency Domain Block Diagram

Power Supplies

Each VDD, VDD\_0 (VX on board), GND\_0 (DUTGND on board) and SMAGND power supply has a separate side-launch banana jack located on bottom side of the test board (as shown in Figure 1).

HCSL Outputs

HCSL outputs are typically loaded and terminated with a series resistor ( $R_{SERIES}$ ) = 33-Ω and 50-Ω to ground. This can be easily accomplished by connecting the HCSL outputs to the 50-Ω internal impedance in the oscilloscope. There are on-board  $R_{SERIES}$  = 33-Ω termination resistors installed for each HCSL output.

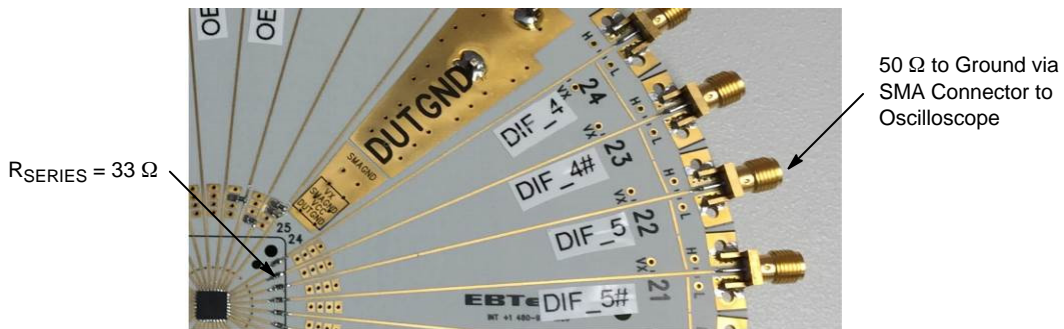


Figure 3. Set-Up for HCSL Output

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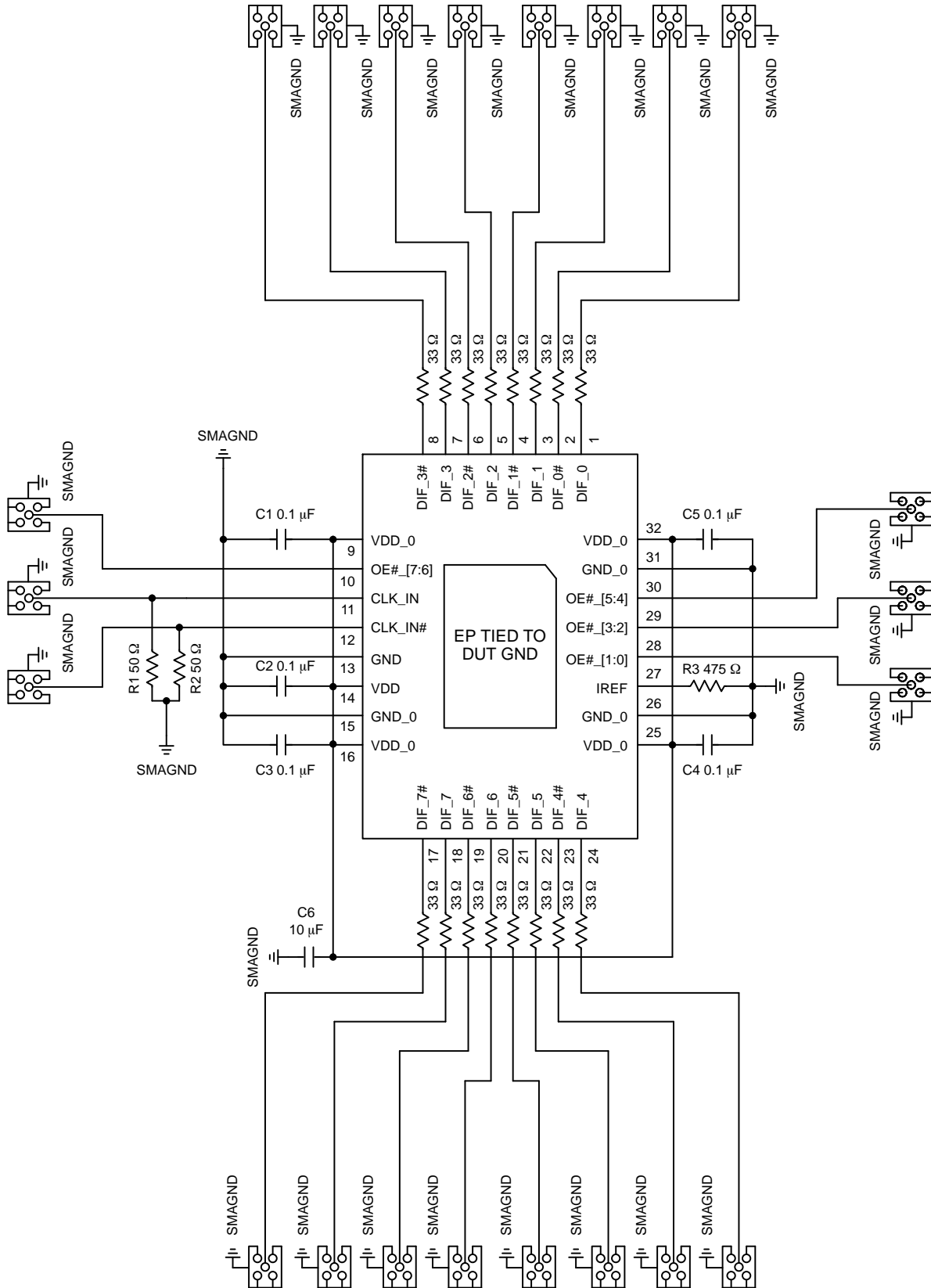


Figure 4. NB3L208KEVB Schematic

### Test and Measurement Setup Procedures

1. Connect VDD and VDD\_0 (VX on board) of the NB3L208K to DC source with power supply cables (do not turn power on, yet).
2. Connect SMAGND and DUTGND to the appropriate DC source. For differential HCSL inputs, both SMAGND and DUTGND are connected together.
3. Connect the outputs of the generator to the CLK\_IN & CLK\_IN# inputs with 50- $\Omega$  connectors. For phase noise test, low noise generator is required to ensure the best additive RMS Phase jitter of the DUT.
4. Connect the DIF\_n/DIF\_n# outputs to the appropriate oscilloscope channel. The board does not have 50- $\Omega$  output termination, thus use of the probes with 50- $\Omega$  termination is required.

### Power-Up Sequence

1. Turn on DUT power supply.
2. Setup the generator  $V_{IH}$ ,  $V_{IL}$  levels to set up the inputs to desired inputs levels, i.e differential LVPECL, LVDS, and HCSL signals or Single-ended LVPECL, HCSL, LVCMOS, or LVTTL. For differential HCSL inputs,  $V_{IL} = 0$  V and  $V_{IH} = 700$  mV.
3. Monitor DIF\_n/DIF\_n# outputs on oscilloscope.


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## BILL OF MATERIALS

**Table 1. NB3L208KMNGEV B BILL OF MATERIALS**

Component	Qty.	Description	Manufacturer	Part Number	Web Site
SMA Connector	22	Edge Mount	Johnson	142-0711-821	
Banana Jack Connector	2	Red – Side Launch	Deltron	571-0500	Mouser #164-6219
Banana Jack Connector	1	Black – Side Launch	Deltron	571-0100	Mouser #164-6218
Banana Jack Connector	1	Green – Side Launch	Deltron		Mouser
Chip Resistor	9	0-Q 0603	Vishay	CRCW06030000Z0EA	Digi-Key 541-0.0GTR-ND
Chip Resistor	16	33-Q 0402	Panasonic	ERJ-2RKF33R0X	Digi-Key ERJ-2RKF33R0X
Chip Resistor	4	50-Q, 0603	Vishay	FC0603E50R0BTBST1	Digi-Key FC0603-50BFTR-ND
Chip Resistor	1	475-Q 0603	Vishay	TNPW0603475RBEEA	Digi-Key 541-2027-2-ND
Capacitor	2	10 $\mu$ F $\pm$ 10%, Case "C" 25 V or 16 V	KEMET	T491C106K025AT T491C106K016AS	
Chip Capacitor	5	0.1 $\mu$ F $\pm$ 10%, 0603	AVX	0603C104KAT2A	<a href="http://www.avx.com">www.avx.com</a> Digi-Key 478-1129-1-ND
Stand-Off	4	Standoff, 4-40 1/4 $\times$ 5/8	Keystone	1808	Digi-Key 1808K-ND
Screw	4	Screw, 4-40 $\times$ 0.25, PHP	Building Fasteners	PMS 440 0025 PH	Digi-Key H342-ND
Evaluation Board	1	NB3L208KEVB QFN-32 Evaluation Board	ON Semiconductor	NB3L208KEVB	
Device Under Test	1	DUT	ON Semiconductor	NB3L208K	<a href="http://www.onsemi.com">www.onsemi.com</a>

NOTE: 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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