NB3N65027DTGEVB

NB3N65027 Evaluation Board User's Manual

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EVAL BOARD USER'S MANUAL

Device Name: NB3N65027DT (QSOP20)
Board Name: NB3N65027DTGEVB

Introduction

NB3N65027 device is a 3.3 V Programmable 3 PLL Clock Synthesizer with 6 LVTTL / LVCMOS Outputs w/OE. ON Semiconductor has developed an evaluation board NB3N65027DTGEVB for the NB3N65027 in 20L QSOP (150 mil) package. The evaluation board NB3N65027DTGEVB is offered as a convenience for the customers interested in performing their own engineering assessment on the general performance of NB3N65027.

This evaluation board manual contains:

- Information on 20L QSOP (150 mil) Evaluation Board
- Evaluation board Circuit Schematic
- Bill of Materials

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

Description

Evaluation board for testing NB3N65027 in 20L QSOP (150 mil) is a 2" x 2", 4 layer board with dedicated VDD and GND planes.

The top and bottom view of the assembled Evaluation board is shown in Figure 1 and Figure 2. Top and bottom view of the bare printed circuit board (PCB) is shown in Figure 3 and Figure 4.

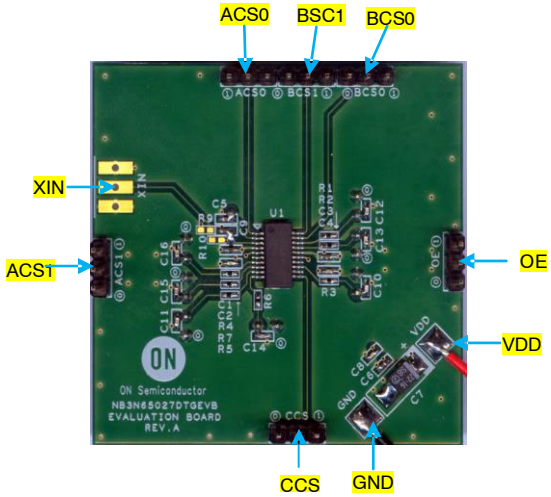

Figure 1. Evaluation Board top View

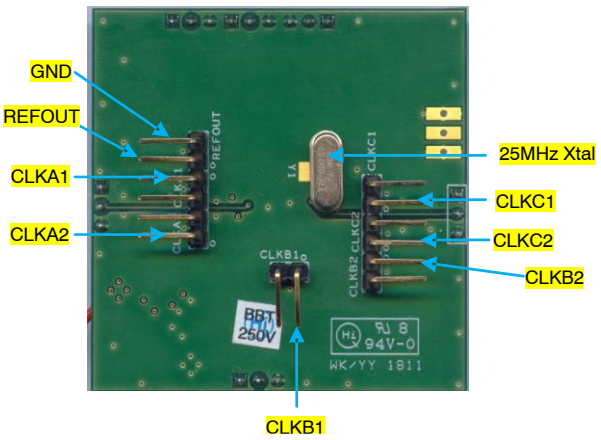

Figure 2. Evaluation Board Bottom View

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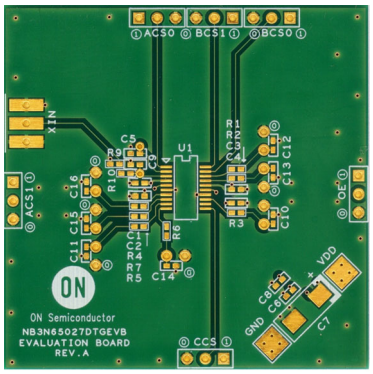

Figure 3. Evaluation Board top View (Bare PCB)

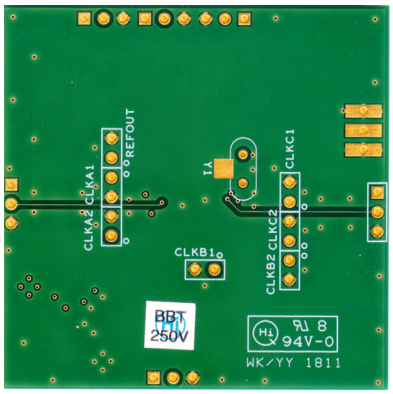

Figure 4. Evaluation Board bottom View (Bare PCB)

The Schematic of the Evaluation board is shown in Figure 5. The bill of material for the Evaluation board is shown in Table 1.

Test and Measurement Set−up and Procedure

Power supply is fed to the board through VDD and GND terminals. C6, C7, and C8 are the decoupling capacitors for the power supply into the board. Decoupling capacitors C1 and C2 are provided close to the device on VDD1, while C3 and C4 are provided close to device on VDD2 respectively.

Crystal Y1, capacitors C5 and C9 provide the crystal interface to the device at X1 and X2. The values of C5 and C9 are chosen based on the load capacitance (CL) of the crystal used. When Crystal interface is used, XIN, R9 and R10 are not mounted.

When crystal interface is not used, clock can be fed from an external source using XIN and R10. R9 is used for output termination of the clock source.

The state of signal Output Enable (OE) is controlled through 3−pin through hole header OE.

The state of control pins ACS0, ACS1, BCS0, BCS1 and CCS are controlled through 3−pin through hole headers of the same name. The selected states of the signals determine the output clocks on CLKA1, CLKA2, CLKB1, CLKB2, CLKC1, and CLKC2 as per the clock selection table.

Output clocks REFOUT, CLKA1, CLKA2, CLKB1, CLKB2, CLKC1, and CLKC2 can be monitored at 2−pin through hole headers REFOUT, CLKA1, CLKA2, CLKB1, CLKB2, CLKC1, and CLKC2 respectively, provided close to device.

Resistors R1 ~ R7 are the Series terminating resistors on the output clocks.

The general performance of NB3N65027 on the evaluation board can be tested using the list of instruments mentioned in the manual.

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NB3N65027DTGEVB EVALUATION BOARD SCHEMATIC

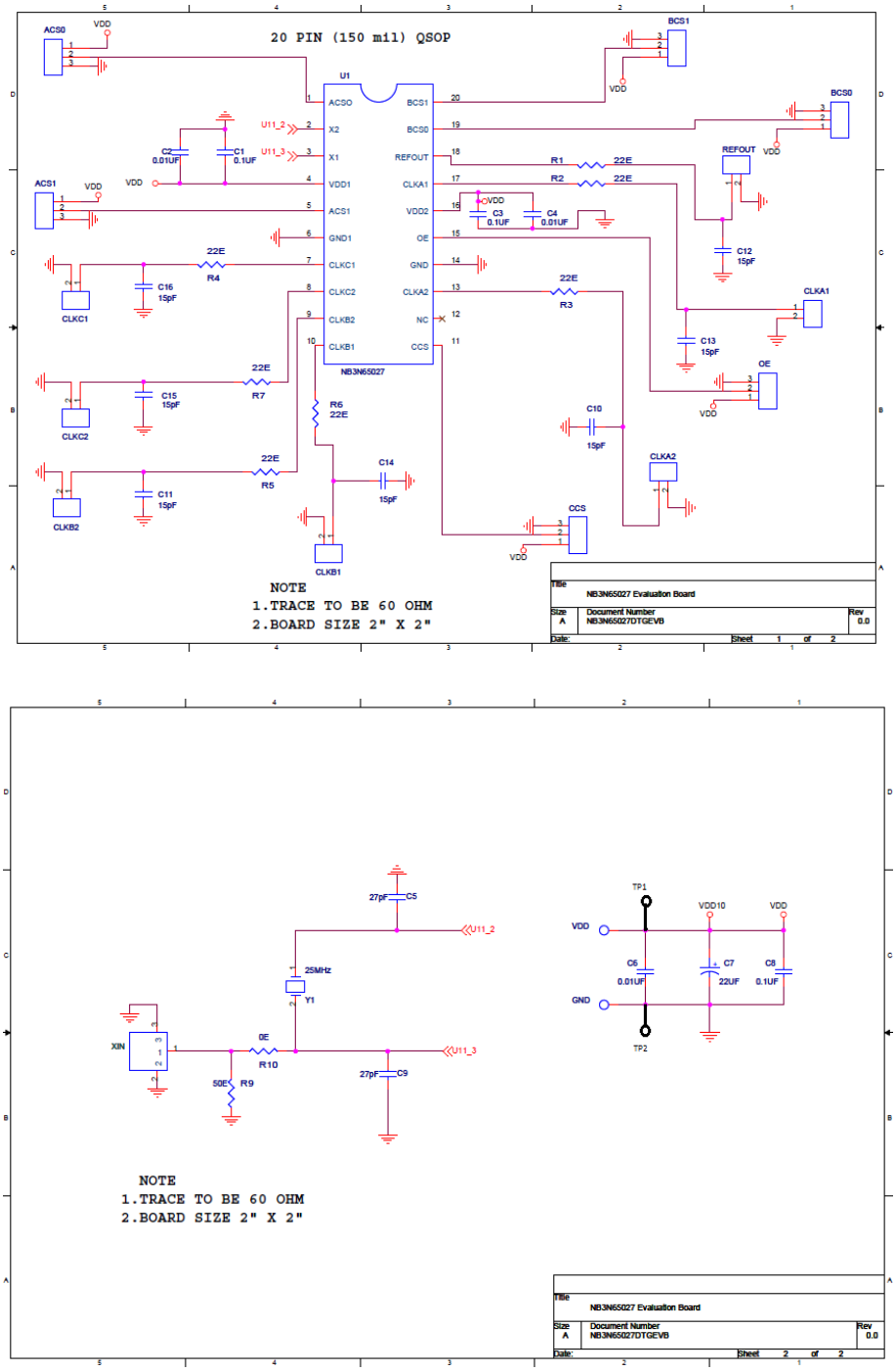

Figure 5. NB3N65027DTGEVB Evaluation Board Schematic

LIST OF INSTRUMENTS

1. Signal Generator: Agilent 81110A (or equivalent) if Input Clock is from External Source
2. Oscilloscope: Tektronix TDS7704B (or equivalent)
3. Probes: P7260, 6GHz single ended Active Probe
4. Power Supply: Agilent 6624A DC (or equivalent)
5. Digital Voltmeter: Agilent 34410A or 34401 (or equivalent)

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BILL OF MATERIAL

Table 1. NB3N65027DTGEVB EVALUATION BOARD REV. A BILL OF MATERIAL

Item	Qty	Reference	Part	Description	Size	Vendor	Vendor Part Number	Remarks
1	6	BCS1, ACS1, OE, CCS, BCS0, ACS0	3 Pin Header	Through Hole HEADER	2.54 mm	Samtec	TSW−116−11−G−S	
2	7	CLKA1, CLKA2, CLKB1, CLKB2, CLKC1, CLKC2, REFOUT	2 Pin Header	Through Hole HEADER	2.54 mm	Samtec	TSW−116−11−G−S	
3	3	C1,C3,C8	0.1 μF	CAP 0.1 μF 16 V 5% 0402 SMD	0402	Walsin	0402B104K160CT	
4	3	C2,C4,C6	0.01 μF	CAP 0.01 μF 50 V 5% 0402 SMD	0402	Walsin	0402B103K500CT	
5	2	C5,C9	27 pF	CAP 27 pF 50 V 5% 0402 SMD	0402	Walsin	0402N270J500LT	
6	1	C7	22 μF	CAP 22 μF 16 V 5% 6032 SMD	6032	AVX	TAJC226K016R	
7	7	C10, C11, C12, C13, C14, C15, C16	15 pF	CAP 15 pF 50 V 5% 0402 SMD	0402	Walsin	0402N150J500LT	
8		VDD,GND						
9	7	R1,R2,R3,R4, R5,R6,R7	22E	RES 22 Ω 1/16W 5% 0402 SMD	0402	Walsin	WR04X220JTL	
10	1	R9	50E	RES 50 Ω 1/16W 5% 0402 SMD	0402	Walsin	WR04X500JTL	DNP
11	1	R10	0E	RES 0 Ω 1/16W 0402 SMD	0402	Walsin		DNP
12	1	U1	NB3N65027	NB3N65027 20L QSOP Device	QSOP_20	ON Semicondcutor	NB3N65027DTR2G	
13	1	XIN	SMA	4 Pin SMA Jack		Samtec	SMA−J−P−H−ST−TH1	
14	1	Y1	Crystal	25 MHz, 2 pin Crystal	Crystal_ HC45U or UM1 or equivalent	Andhra Electronics Limited	UM12GH3G118P025M000000	
15	2	TP1, TP2	Test Point	Miniature SMT Test Point	2.7 mm x 1 mm x 1.5 mm	DigiKey	5015KTR−ND	

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