

NB3N65027DTGEVB

NB3N65027 Evaluation Board User's Manual



ON Semiconductor®

<http://onsemi.com>

Device Name: NB3N65027DT (QSOP20)
Board Name: NB3N65027DTGEVB

EVAL BOARD USER'S MANUAL

Introduction

NB3N65027 device is a 3.3 V Programmable 3 PLL Clock Synthesizer with 6 LVTTTL / LVC MOS 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.

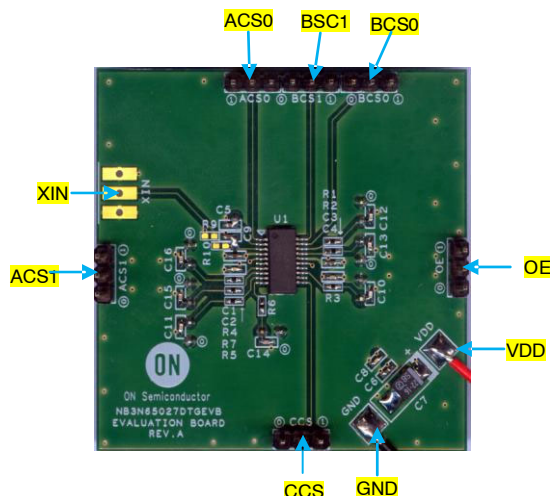


Figure 1. Evaluation Board top View

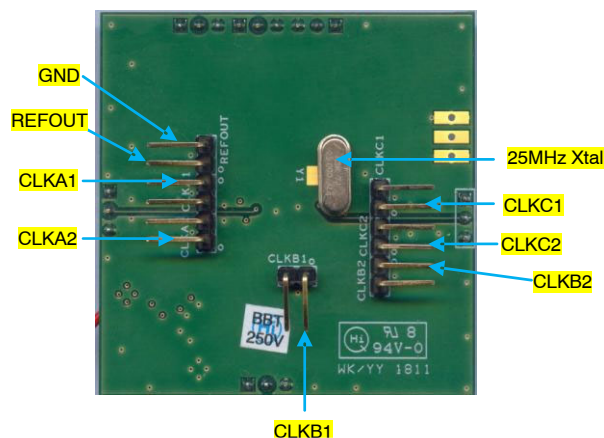


Figure 2. Evaluation Board Bottom View

NB3N65027DTGEVB

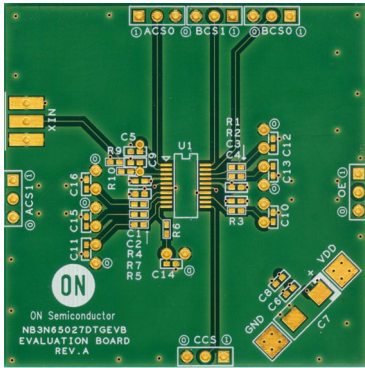


Figure 3. Evaluation Board top View (Bare PCB)

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.

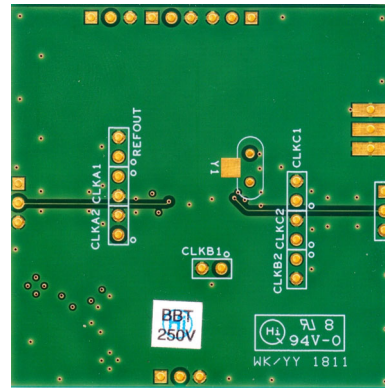


Figure 4. Evaluation Board bottom View (Bare PCB)

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.

NB3N65027DTGEVB

NB3N65027DTGEVB EVALUATION BOARD SCHEMATIC

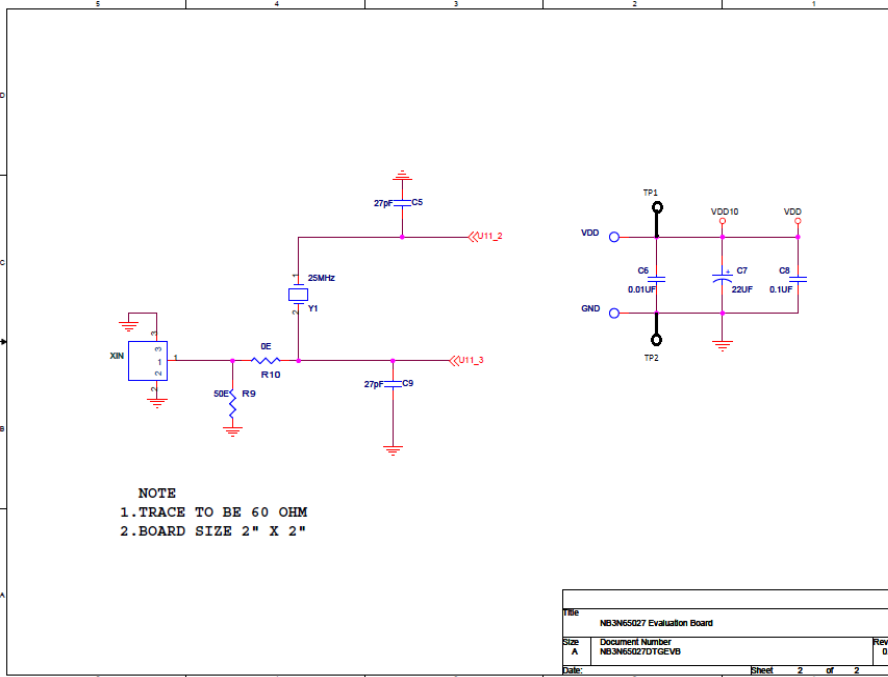
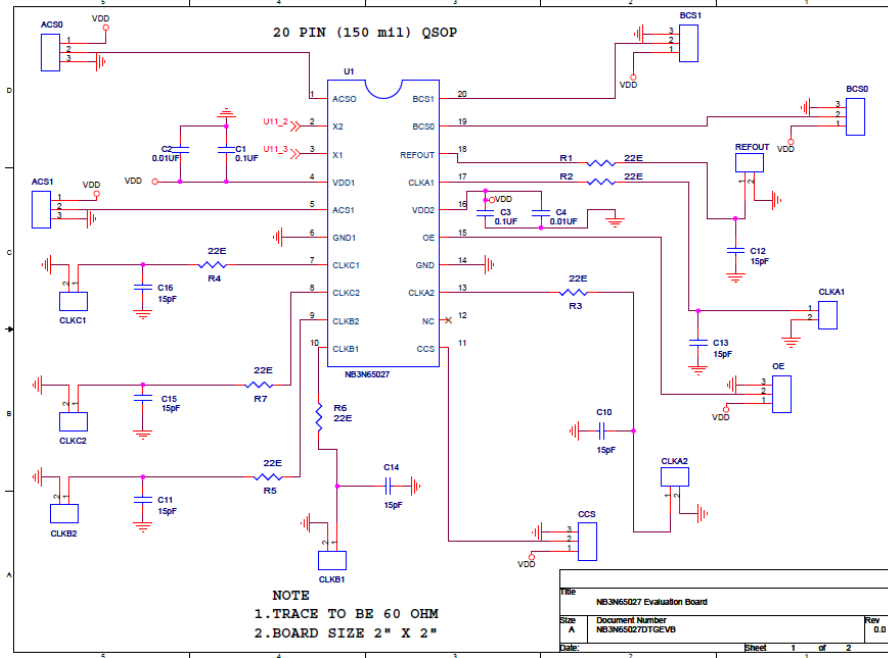


Figure 5. NB3N65027DTGEVB Evaluation Board Schematic

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)

NB3N65027DTGEVB

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 μ F	CAP 0.1 μ F 16 V 5% 0402 SMD	0402	Walsin	0402B104K160CT	
4	3	C2,C4,C6	0.01 μ F	CAP 0.01 μ F 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 μ F	CAP 22 μ F 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 Semiconductor	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	

ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

The evaluation board/kit (research and development board/kit) (hereinafter the "board") is not a finished product and is as such not available for sale to consumers. The board is only intended for research, development, demonstration and evaluation purposes and should as such only be used in laboratory/development areas by persons with an engineering/technical training and familiar with the risks associated with handling electrical/mechanical components, systems and subsystems. This person assumes full responsibility/liability for proper and safe handling. Any other use, resale or redistribution for any other purpose is strictly prohibited.

The board is delivered "AS IS" and without warranty of any kind including, but not limited to, that the board is production-worthy, that the functions contained in the board will meet your requirements, or that the operation of the board will be uninterrupted or error free. ON Semiconductor expressly disclaims all warranties, express, implied or otherwise, including without limitation, warranties of fitness for a particular purpose and non-infringement of intellectual property rights.

ON Semiconductor reserves the right to make changes without further notice to any board.

You are responsible for determining whether the board will be suitable for your intended use or application or will achieve your intended results. Prior to using or distributing any systems that have been evaluated, designed or tested using the board, you agree to test and validate your design to confirm the functionality for your application. Any technical, applications or design information or advice, quality characterization, reliability data or other services provided by ON Semiconductor shall not constitute any representation or warranty by ON Semiconductor, and no additional obligations or liabilities shall arise from ON Semiconductor having provided such information or services.

The boards are not designed, intended, or authorized for use in life support systems, or any FDA Class 3 medical devices or medical devices with a similar or equivalent classification in a foreign jurisdiction, or any devices intended for implantation in the human body. Should you purchase or use the board for any such unintended or unauthorized application, you shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the board.

This evaluation board/kit does not fall within the scope of the European Union directives regarding electromagnetic compatibility, restricted substances (RoHS), recycling (WEEE), FCC, CE or UL, and may not meet the technical requirements of these or other related directives.

FCC WARNING – This evaluation board/kit is intended for use for engineering development, demonstration, or evaluation purposes only and is not considered by ON Semiconductor to be a finished end product fit for general consumer use. It may generate, use, or radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to part 15 of FCC rules, which are designed to provide reasonable protection against radio frequency interference. Operation of this equipment may cause interference with radio communications, in which case the user shall be responsible, at its expense, to take whatever measures may be required to correct this interference.

ON Semiconductor does not convey any license under its patent rights nor the rights of others.

LIMITATIONS OF LIABILITY: ON Semiconductor shall not be liable for any special, consequential, incidental, indirect or punitive damages, including, but not limited to the costs of requalification, delay, loss of profits or goodwill, arising out of or in connection with the board, even if ON Semiconductor is advised of the possibility of such damages. In no event shall ON Semiconductor's aggregate liability from any obligation arising out of or in connection with the board, under any theory of liability, exceed the purchase price paid for the board, if any.

For more information and documentation, please visit www.onsemi.com.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Email Requests to: orderlit@onsemi.com

ON Semiconductor Website: www.onsemi.com

TECHNICAL SUPPORT

North American Technical Support:

Voice Mail: 1 800-282-9855 Toll Free USA/Canada

Phone: 011 421 33 790 2910

Europe, Middle East and Africa Technical Support:

Phone: 00421 33 790 2910

For additional information, please contact your local Sales Representative

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[onsemi:](#)

[NB3N65027DTGEVB](#)