NB3L03

2.8 V, High Precision 1:3 Clock Fanout Buffer

ON Semiconductor®

http://onsemi.com

WLCSP6
FC SUFFIX
CASE 567HJ

Description

The NB3L03 is a low−skew, low jitter 1:3 clock fanout buffer, ideal for use in portable end−equipment, such as mobile phones or tablet applications. The MCLK_IN pin has an integrated AC coupling capacitor and will directly accept a square or sine wave clock input, such as a temperature compensated crystal oscillator (TCXO). The minimum acceptable input amplitude of the sine wave is 800 mV peak−to−peak. The NB3L03 is offered in a 0.4 mm pitch 6−ball, wafer−level chip−scale package (WLCSP) (0.77 mm x 1.17 mm).

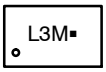
Features

- 800 mV Single Ended Outputs
- Low Additive Phase Jitter
- Ultra Small Package: 0.4 mm Pitch WLCSP6 (0.77 mm x 1.17 mm)
- Exceeds JEDEC ESD Standards: 4000 V HBM, 200 V MM
- Industrial Temperature Range: −40°C to +85°C
- These are Pb−Free Devices

PIN DESCRIPTIONS

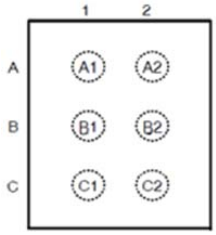
Ball No.	Name	I/O	Description
A1	V_{DD}	I	Power Supply Voltage
A2	CLK_OUT1	O	Clock Output 1
B1	MCLK_IN	I	Master Clock Input
B2	CLK_OUT3	O	Clock Output 3
C1	GND	−	Ground
C2	CLK_OUT2	O	Clock Output 2

MARKING DIAGRAM



L3 = Specific Device Code
M = Date Code
▪ = Pb−Free Package

PINOUT DIAGRAM



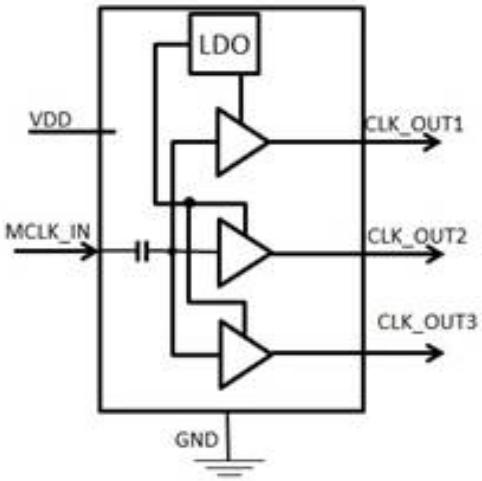


Figure 1. Simplified Block Diagram

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.

Table 1. MAXIMUM RATINGS

Symbol	Parameter	Condition	Min	Max	Unit
	Voltage Range (Note 1)	MCLK_IN,CLK_OUT1, CLK_OUT2, CLK_OUT3	-0.3	V_{DD} + 0.3	V
IO	Continuous Output Current	CLK_OUT1/2/3		±20	mA
T_J	Operating Junction Temperature Range		−40	150	°C
T_{stg}	Storage Temperature Range		−55	150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. All voltage values are with respect to network ground terminal.

Table 2. ATTRIBUTES

Characteristic		Value
ESD Protection	Human Body Model	>4 kV
	Machine Model	>200 V
Moisture Sensitivity	WLCSP6	Level 1
Maximum Soldering Temperature for Lead−free Devices Using a Lead−free Solder Paste		260
Flammability Rating Oxygen Index: 28 to 34		UL 94 V−0 @ 0.125 in
Transistor Count		149
Meets or Exceeds JEDEC Spec EIA/JESD78 IC Latchup Test II		

Table 3. ELECTRICAL CHARACTERISTICS (T_A = −40°C to +85°C)

Symbol	Characteristic	Min	Typ	Max	Unit
V_{DD}	Supply Voltage	2.3	2.8	3.465	V
V_{IN}	Input Voltage p-p	800		V_{DD}	mV
V_{OUT}	Output Voltage p-p	0.8	1.0	1.2	V
$I_{DDdynamic}$	Dynamic Current at 26 MHz (Notes 2 and 3)		5.0	6.5	mA
F_{IN}	MCLK_IN Frequency Range with 800 mV input p−p	10	26	52	MHz
t_{PD}	MCLK_IN to CLK_OUT_n Propagation Delay, input = 1 Vp−p @ 26 MHz	2.0	4.0	6.5	ns
DC	CLK_OUT_n Duty Cycle	45	50	55	%
t_{jit}	Additive Phase Jitter @ 12 kHz to 20 MHz, F_{IN} = 26 MHz @ 800 mV input p−p, input t_r/t_f < 1 ns		171		fs
t_r/t_f	Output Rise Time 20%-80% with 10 pF Load, V_{IN} = 800 mVp−p, 26 MHz, input slew rate < 1 ns/V	0.5	0.8	1.4	ns
t_{sk}	Channel to Channel Skew		10	30	ps
V_{oh}	High Level Output (V_{oh}−V_{ol} not to exceed V_{OUT})	0.8	1.0	1.2	V
V_{ol}	Low Level Output (V_{oh}−V_{ol} not to exceed V_{OUT})		0		V

2. I_{DD} dynamic specified with no load on outputs.
3. Input amplitude 1.2 V p−p.

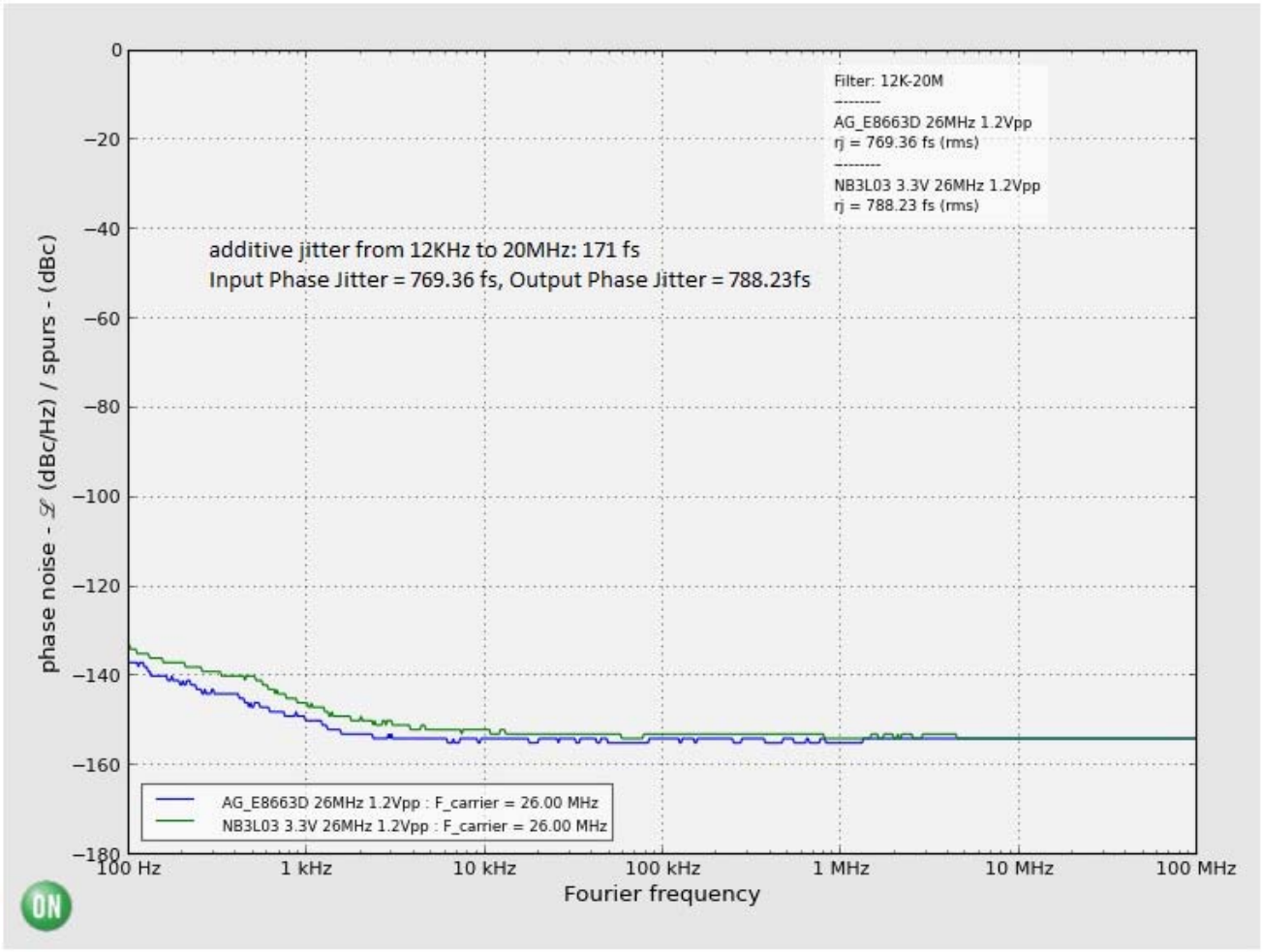


Figure 2. Typical Phase Jitter @ 26 MHz, INT Range (12 kHz to 20 MHz)

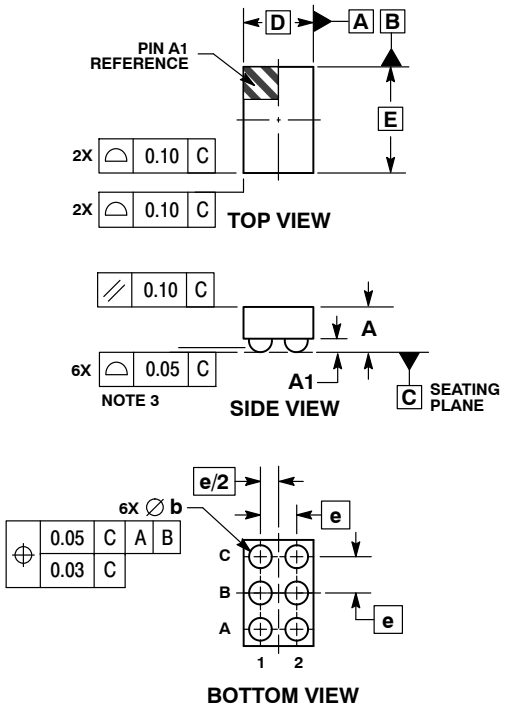
ORDERING INFORMATION

Device	Package	Shipping†
NB3L03FCT2G	WLCSP6 (Pb−Free)	3000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

PACKAGE DIMENSIONS

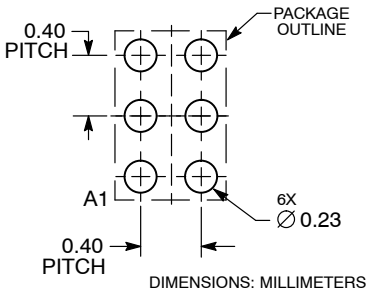
WLCSP6, 1.17x0.77
CASE 567HJ
ISSUE O



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. COPLANARITY APPLIES TO SPHERICAL CROWNS OF SOLDER BALLS.

	MILLIMETERS	
DIM	MIN	MAX
A	---	0.50
A1	0.13	0.17
b	0.21	0.25
D	0.77 BSC	
E	1.17 BSC	
e	0.40 BSC	

RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81−3−5817−1050

ON Semiconductor Website: **www.onsemi.com**

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative