

# 3.3 V/5 V, 50 MHz to 200 MHz PECL Clock Synthesizer

## NB4N507A

NOTE: Some of the devices on this data sheet have been  
**DISCONTINUED**. Please refer to the table on page 6.

Free Package (EJWSevAw"18E6WgijAAqSsEBAQQtVtX5AXqtW21(4X0aA1RhG4QsbIAAqSGG"71x55AXqtW21(4X0aA1RhG4QsbIAA

# NB4N507A

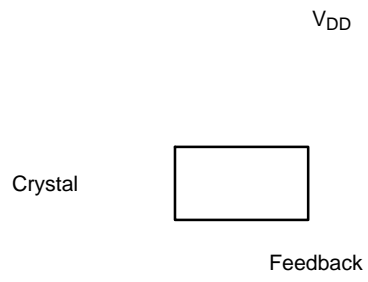


Figure 2. NB4N507A Logic Diagram

# NB4N507A

**Table 3. PIN DESCRIPTION**

Pin # SOIC-16	Name	I/O	Description
1	X1/CLK	Crystal Input	Crystal or Clock Input
2,3	V <sub>DD</sub>	Power Supply	Positive Supply Voltage (3.0 V to 5.5 V)
4	S1	Tri-Level Input	Multiplier Select Pin; When Left Open, Defaults to V <sub>DD</sub> ÷ 2
5,6	GND	Power Supply	Negative Supply Voltage
7,10,11,12, 15	NC	No Connect	Pin 10 does not require an external resistor. The NB4N507A will function with or without a resistor on Pin 10.
8	CLKOUT	PECL Output*	Non-inverted differential PECL clock output.
9	CLKOUT	PECL Output*	Inverted differential PECL clock output.
13	OE	(LV)CMOS/(LV)TTL Input	Output Enable for the CLKOUT/CLKOUT Outputs. Outputs are enabled when HIGH or when left open; OE pin has internal pullup resistor. Disables both outputs when LOW. CLKOUT goes LOW, CLKOUT goes HIGH.
14	S0	Tri-Level Input	Multiplier Select Pin; When Left Open, Defaults to V <sub>DD</sub> ÷ 2
16	X2	Crystal Input	Crystal Input

\*The PECL Outputs are 15 mA open collector and must be DC loaded and AC terminated. See Figures 4, 5 and 6.

**Table 4. ATTRIBUTES**

Characteristics	Value
ESD Protection Human Body Model	> 1 kV
Machine Model	> 150 V
Charged Device Model	> 1 kV
Moisture Sensitivity, Indefinite Time Out of Drypack (Note 1)	Level 1
Flammability Rating Oxygen Index: 28 to 34	UL 94 V-0 @ 0.125 in
Transistor Count	1145 Devices
Meets or exceeds JEDEC Spec EIA/JESD78 IC Latchup Test	

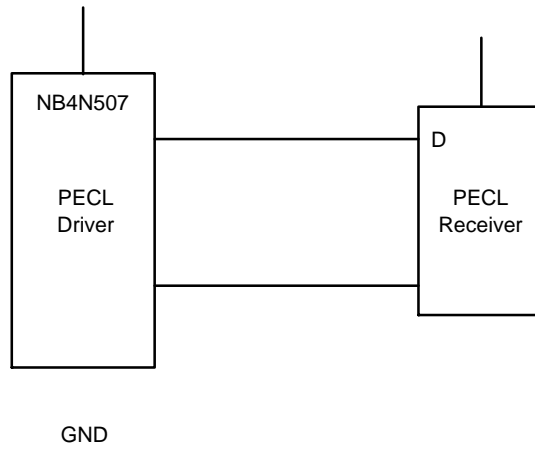
1. For additional information, see Application Note AND8003/D.

**Table 5. MAXIMUM RATINGS**

Symbol	Parameter	Condition 1	Condition 2	Rating	Unit
V <sub>CC</sub>	Positive Power Supply	GND = 0 V		6	V
V <sub>I</sub>	Input Voltage			GND - 0.5 ≤ V <sub>I</sub> ≤ V <sub>DD</sub> + 0.5	V
T <sub>A</sub>	Operating Temperature Range				



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## APPLICATIONS INFORMATION

**High Frequency Differential PECL Oscillators:** The NB4N507A, along with a low frequency fundamental mode crystal, can build a high frequency differential PECL output oscillator. For example, a 10 MHz crystal connected to the NB4N507A with the 12X output selected (S1 = 0, S0 = 1) produces a 120 MHz PECL output clock.

### Crystal Oscillator Input Interface

The NB4N507A features an integrated crystal oscillator to minimize system implementation costs. The oscillator circuit is a parallel resonant circuit and thus, for optimum performance, a parallel resonant crystal should be used.

As the oscillator is somewhat sensitive to loading on its inputs, the user is advised to mount the crystal as close to the NB4N507A as possible to avoid any board level parasitics. Surface mount crystals are recommended, but not required.

**High Frequency VCXO:** The bandwidth of the PLL is guaranteed to be greater than 10 kHz. This means that the PLL will track any modulation on the input with a frequency of less than 10 kHz. By using this property, a low frequency VCXO can be built. The output can then be multiplied by the NB4N507A, thereby producing a high frequency VCXO.

**High Frequency TCXO:** Extending the previous application, an inexpensive, low frequency TCXO can be built and the output frequency can be multiplied using the NB4N507A.

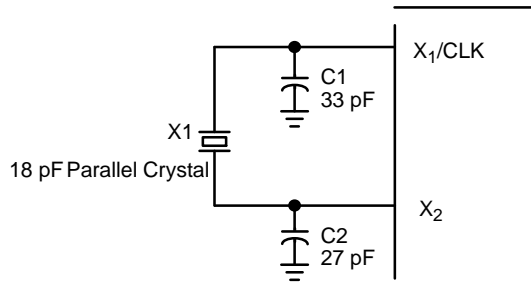


Figure 7. Crystal Input Interface

## NB4N507A

### Resource Reference of Application Notes

- AN1405/D** – ECL Clock Distribution Techniques
- AN1406/D** – Designing with PECL (ECL at +5.0 V)
- AN1503/D** – ECLinPS™ I/O SPiCE Modeling Kit
- AN1504/D** – Metastability and the ECLinPS Family
- AN1568/D** – Interfacing Between LVDS and ECL
- AN1672/D** – The ECL Translator Guide
- AND8001/D** – Odd Number Counters Design
- AND8002/D** – Marking and Date Codes
- AND8020/D** – Termination of ECL Logic Devices
- AND8066/D** – Interfacing with ECLinPS
- AND8090/D** – AC Characteristics of ECL Devices

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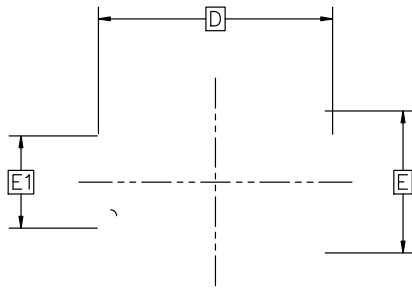


**SOIC-16 9.90x3.90x1.37 1.27P**  
CASE 751B  
ISSUE M

DATE 18 OCT 2024

- 3. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD PROTRUSION.
- 4. MAXIMUM MOLD PROTRUSION 0.17

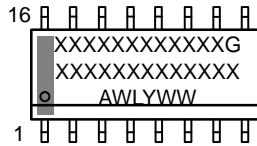
b DIMENSION AT MAXIMUM MATE      nm TOTAL IN EXCESS OF THE



TOP VIEW

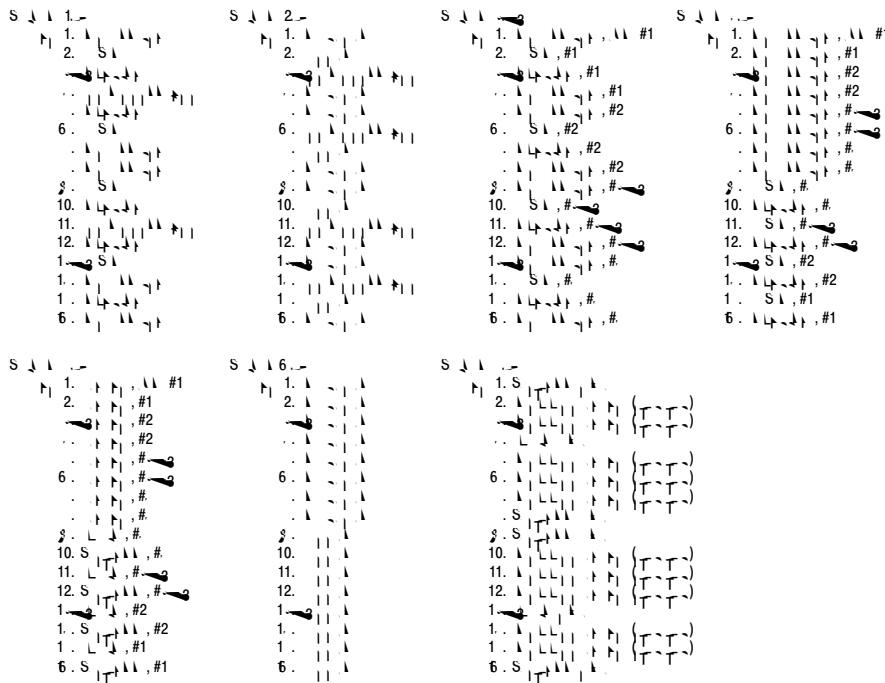


**GENERIC  
MARKING DIAGRAM\***



XXXXX = Specific Device Code  
A = Assembly Location  
WL = Wafer Lot  
Y = Year  
WW = Work Week  
G = Pb Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.



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