



ELECTRONICS, INC.  
44 FARRAND STREET  
BLOOMFIELD, NJ 07003  
(973) 748-5089  
<http://www.nteinc.com>

## **NTE4041**

### **Integrated Circuit**

### **CMOS, Quad True/Complement Buffer**

### **14-Lead DIP Type Package**

#### **Description:**

The NTE4041 is a quad true/complement buffer in a 14-Lead DIP type package consisting of N-Channel and P-Channel units having low channel resistance and high current (sourcing and sinking) capability. This device is intended for use as a buffer, line driver, or CMOS-to-TTL driver. It can be used as an ultra-low power resistor-network driver for A/D and D/A conversion, as a transmission-line-driver, and in other applications where high noise immunity and low power dissipation are primary design requirements.

#### **Features:**

- Balanced Sink and Source Current: Approximately 4 Times Standard "B" Drive
- Equalized Delay to True and Complementary Outputs
- Maximum Input Current of 1 $\mu$ A at 18V over Full Package Temperature Range: 100nA at 18V and +25°C
- 5V, 10V, and 15V Parametric Ratings

#### **Applications:**

- High Current Source/Sink Driver
- CMOS-to-DTL/TTL Converter Buffer
- Display Driver
- MOS Clock Driver
- Resistor Network Driver (Ladder or Weighted R)
- Buffer
- Transmission Line Driver

#### **Absolute Maximum Ratings:**

DC Supply Voltage Range (Voltages referenced to  $V_{SS}$ ),  $V_{DD}$  ..... -0.5 to +20.0V  
Input Voltage Range (All Inputs) ..... -0.5 to  $V_{DD} + 0.5V$   
DC Input Current (Any One Input) .....  $\pm 10mA$   
Power Dissipation (Per Package),  $P_D$   
    For  $T_A = -55^\circ$  to  $+100^\circ C$  ..... 500mW  
    For  $T_A = +100^\circ$  to  $+125^\circ C$  ..... Derate Linearity at 12mW/ $^\circ C$  to 200mW  
Device Dissipation (Per Output Transistor)  
    For  $T_A =$  Full Package Temperature Range ..... 100mW  
Operating Temperature Range,  $T_A$  .....  $-55^\circ$  to  $+125^\circ C$   
Storage Temperature Range,  $T_{stg}$  .....  $-65^\circ$  to  $+150^\circ C$   
Lead Temperature (During Soldering, 10sec max),  $T_L$  .....  $+265^\circ C$

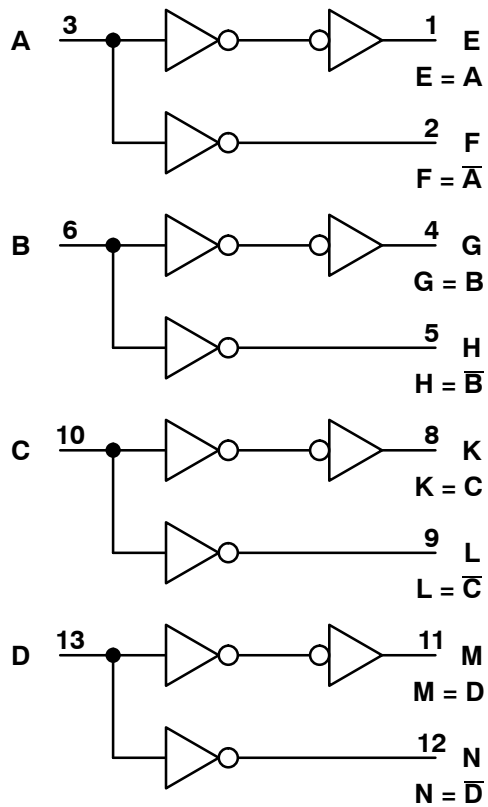
**Recommended Operating Conditions:**DC Supply Voltage (For  $T_A$  = Full Package Temperature Range) ..... 3 to 18V**Static Electrical Characteristics:**

Characteristic	Conditions			Limits at Indicated Temperature (°C)							Units
	V <sub>O</sub> (V)	V <sub>IN</sub> (V)	V <sub>DD</sub> (V)	–55°C	–40°C	+85°C	+125°C	+25°C			
								Min.	Typ.	Max.	
Quiescent Device Current I <sub>DD</sub> Max	–	0,5	5	1.0	1.0	30	30	–	0.02	1.0	μA
	–	0,10	10	2.0	2.0	60	60	–	0.02	2.0	μA
	–	0,15	15	4.0	4.0	120	120	–	0.02	4.0	μA
	–	0,20	20	20	20	600	600	–	0.04	20	μA
Output Low (Sink) Current I <sub>OL</sub> Min.	0.4	0,5	5	2.1	1.8	1.3	1.2	1.6	3.2	–	mA
	0.5	0,10	10	6.25	5.6	4.0	3.5	5.0	10.0	–	mA
	1.5	0,15	15	24	23	15.5	13	19	38	–	mA
Output High (Source) Current I <sub>OH</sub> Min.	4.6	0,5	5	–2.1	–1.8	–1.3	–1.2	–1.6	–3.2	–	mA
	2.5	0,5	5	–8.4	–6.7	–5.3	–4.6	–6.4	–12.8	–	mA
	9.5	0,10	10	–6.25	–5.6	–4.0	–3.5	–5.0	–10.0	–	mA
	13.5	0,15	15	–24	–23	–15.5	–13	–19	–38	–	mA
Output Voltage Low–Level V <sub>OL</sub> Max.	–	5	5	0.05				–	0	0.05	V
	–	10	10	0.05				–	0	0.05	V
	–	15	15	0.05				–	0	0.05	V
Output Voltage High–Level V <sub>OH</sub> Min.	–	5	5	4.95				4.95	5	–	V
	–	10	10	9.95				9.95	10	–	V
	–	15	15	14.95				14.95	15	–	V
Input Low Voltage V <sub>IL</sub> Max.	0,5,4,5	–	5	1.0				–	–	1.0	V
	1,9	–	10	2.0				–	–	2.0	V
	1,5,13,5	–	15	2.5				–	–	2.5	V
Input High Voltage V <sub>IH</sub> Min.	0,5,4,5	–	5	4.0				4.0	–	–	V
	1,9	–	10	8.0				8.0	–	–	V
	1,5,13,5	–	15	12.5				12.5	–	–	V
Input Current, I <sub>IN</sub> Max.	–	0,18	18	±0.1	±0.1	±1.0	±1.0	–	±10 <sup>–5</sup>	±0.1	μA

**Dynamic Electrical Characteristics:** ( $T_A$  = +25°C,  $C_L$  = 50pF,  $R_L$  = 200kΩ,  $t_r$  and  $t_f$  = 20ns unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Propagation Delay Time from	$t_{PHL}$ or $t_{PLH}$	$V_{DD}$ = 5V	–	60	120	ns
		$V_{DD}$ = 10V	–	35	70	ns
		$V_{DD}$ = 15V	–	25	50	ns
Transition Time	$t_{THL}$ or $t_{TLH}$	$V_{DD}$ = 5V	–	40	80	ns
		$V_{DD}$ = 10V	–	20	40	ns
		$V_{DD}$ = 15V	–	15	30	ns
Input Capacitance	$C_{IN}$	Any Input	–	15.0	22.5	pF

Logic Diagram



$V_{DD} = \text{Pin14}$   
 $V_{SS} = \text{Pin7}$

Pin Connection Diagram

