



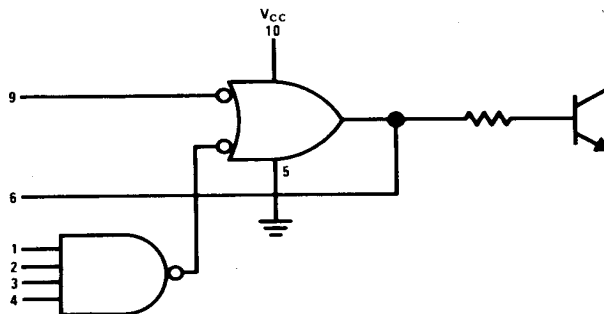
# 033643 055663 033643 **DH0016CN, DH0017CN, DH0018CN High Voltage High Current Drivers**

## General Description

This high-voltage, high-current driver family consists of hybrid integrated circuits which provide a wide range of output currents and output voltages. Applications include driving lamps, relays, cores, and other devices requiring up to 500 mA and

withstanding voltages up to 100V. Logic flexibility is provided through a 4-input NAND gate, a NOR input and an input which bypasses the gating and connects to the base of the output transistor.

## Logic Diagram



## Ordering Information

| NSC DESIGNATION | PACKAGE | OUTPUT CHARACTERISTICS   |         |
|-----------------|---------|--------------------------|---------|
|                 |         | Maximum Standoff Voltage | Current |
| DH0016CN        | N10B    | 70V                      | 250 mA  |
| DH0017CN        | N10B    | 50 V                     | 500 mA  |
| DH0018CN        | N10B    | 100V                     | 500 mA  |

**Absolute Maximum Ratings**

|                             |                          |
|-----------------------------|--------------------------|
| $V_{CC}$                    | 8V                       |
| Input Voltage               | 8V                       |
| Collector Voltage           | DH0016CN 70V             |
|                             | DH0017CN 50V             |
|                             | DH0018CN 100V            |
| Output Surge Current        | DH0016CN 1.0A            |
|                             | DH0017CN & DH0018CN 2.0A |
| Power Dissipation           | 455mW                    |
| Operating Temperature Range | 0°C to +70°C             |
| Storage Temperature         | -65°C to +150°C          |

**Electrical Characteristics**

| TEST NO. | PIN 1    | PIN 2    | PIN 3    | PIN 4    | PIN 5 | PIN 6     | PIN 7 | PIN 8     | PIN 9    | PIN 10    | SENSE    | LIMITS    |           |
|----------|----------|----------|----------|----------|-------|-----------|-------|-----------|----------|-----------|----------|-----------|-----------|
|          |          |          |          |          |       |           |       |           |          |           |          | MIN       | MAX       |
| 2        | $V_{IH}$ | $V_{IH}$ | $V_{IH}$ | $V_{IH}$ | GND   |           | GND   | $I_{OL1}$ |          | $V_{CC}$  | $V_8$    |           | $V_{OL1}$ |
| 3        | $V_{IL}$ |          |          |          | GND   |           | GND   | $I_{OL1}$ | $V_{IL}$ | $V_{CC}$  | $V_8$    |           | $V_{OL1}$ |
| 4        |          | $V_{IL}$ |          |          | GND   |           | GND   | $I_{OL1}$ | $V_{IL}$ | $V_{CC}$  | $V_8$    |           | $V_{OL1}$ |
| 5        |          |          | $V_{IL}$ |          | GND   |           | GND   | $I_{OL1}$ | $V_{IL}$ | $V_{CC}$  | $V_8$    |           | $V_{OL1}$ |
| 6        |          |          |          | $V_{IL}$ | GND   |           | GND   | $I_{OL1}$ | $V_{IL}$ | $V_{CC}$  | $V_8$    |           | $V_{OL1}$ |
| 7        | $V_{IL}$ |          |          |          | GND   | $I_{OL2}$ |       |           |          | $V_{CC}$  | $V_6$    |           | $V_{OL2}$ |
| 8        |          | $V_{IL}$ |          |          | GND   | $I_{OL2}$ |       |           |          | $V_{CC}$  | $V_6$    |           | $V_{OL2}$ |
| 9        |          |          | $V_{IL}$ |          | GND   | $I_{OL2}$ |       |           |          | $V_{CC}$  | $V_6$    |           | $V_{OL2}$ |
| 10       |          |          |          | $V_{IL}$ | GND   | $I_{OL2}$ |       |           |          | $V_{CC}$  | $V_6$    |           | $V_{OL2}$ |
| 11       |          |          |          | GND      | GND   | $I_{OL2}$ |       |           | $V_{IH}$ | $V_{CC}$  | $V_6$    |           | $V_{OL2}$ |
| 12       | $V_R$    | GND      | GND      | GND      | GND   |           |       |           |          | $V_{CC}$  | $I_1$    |           | $I_R$     |
| 13       | GND      | $V_R$    | GND      | GND      | GND   |           |       |           |          | $V_{CC}$  | $I_2$    |           | $I_R$     |
| 14       | GND      | GND      | $V_R$    | GND      | GND   |           |       |           |          | $V_{CC}$  | $I_3$    |           | $I_R$     |
| 15       | GND      | GND      | GND      | $V_R$    | GND   |           |       |           |          | $V_{CC}$  | $I_4$    |           | $I_R$     |
| 16       |          |          |          |          | GND   |           |       |           | $V_R$    | $V_{CC}$  | $I_9$    |           | $I_R$     |
| 17       | $V_F$    | $V_R$    | $V_R$    | $V_R$    | GND   |           |       |           |          | $V_{CC}$  | $I_1$    |           | $-I_F$    |
| 18       | $V_R$    | $V_F$    | $V_R$    | $V_R$    | GND   |           |       |           |          | $V_{CC}$  | $I_2$    |           | $-I_F$    |
| 19       | $V_R$    | $V_R$    | $V_F$    | $V_R$    | GND   |           |       |           |          | $V_{CC}$  | $I_3$    |           | $-I_F$    |
| 20       | $V_R$    | $V_R$    | $V_R$    | $V_F$    | GND   |           |       |           |          | $V_{CC}$  | $I_4$    |           | $-I_F$    |
| 21       |          |          |          | GND      | GND   |           |       |           | $V_F$    | $V_{CC}$  | $I_9$    |           | $-I_F$    |
| 22       |          |          |          |          | GND   |           | GND   |           |          | $V_{CC}$  | $V_6$    | $V_{OH1}$ |           |
| 23       | GND      |          |          |          | GND   | $I_{OL3}$ | GND   | $V_{OX}$  |          | $V_{CC}$  | $I_8$    |           | $I_{OX}$  |
| 24       |          |          |          |          | GND   |           |       |           |          | $V_{PD}$  | $I_{10}$ |           | $I_{PD}$  |
| 25       | GND      |          |          |          | GND   |           |       |           | GND      | $V_{MAX}$ | $I_{10}$ |           | $I_{MAX}$ |

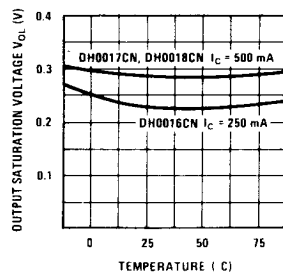
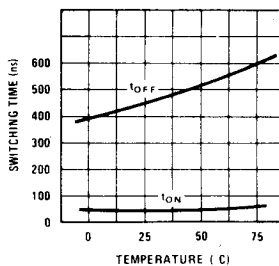
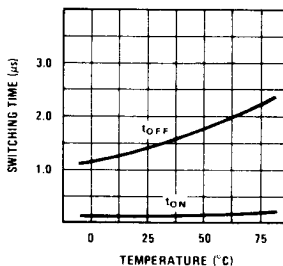
**Forcing Functions**

| SYMBOL                         | 0°C  | +25°C | +70°C | UNITS |
|--------------------------------|------|-------|-------|-------|
| $V_{CC}$                       | 5.0  | 5.0   | 5.0   | V     |
| $V_{PD}$                       |      | 5.0   |       | V     |
| $V_{MAX}$                      |      | 8.0   |       | V     |
| $V_{IL}$                       | 0.85 | 0.85  | 0.85  | V     |
| $V_{IH}$                       | 1.9  | 1.8   | 1.6   | V     |
| $V_R$                          | 4.5  | 4.5   | 4.5   | V     |
| $V_F$                          | 0.45 | 0.45  | 0.45  | V     |
| $V_{OX}$ (DH0016CN)            |      | 70    | 70    | V     |
| $V_{OX}$ (DH0017CN)            |      | 50    | 50    | V     |
| $V_{OX}$ (DH0018CN)            |      | 100   | 100   | V     |
| $I_{OL1}$ (DH0017CN, DH0018CN) | 500  | 500   | 500   | mA    |
| $I_{OL1}$ (DH0016CN)           | 250  | 250   | 250   | mA    |
| $I_{OL2}$                      | 16   | 16    | 16    | mA    |
| $I_{OL3}$                      |      | 8.0   |       | mA    |

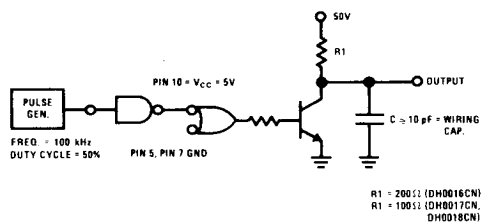
## Test Limits

| SYMBOL    | 0 °C | +25 °C | +70 °C | UNITS   |
|-----------|------|--------|--------|---------|
| $V_{OL1}$ | 0.6  | 0.6    | 0.6    | V       |
| $V_{OL2}$ | 0.45 | 0.45   | 0.45   | V       |
| $V_{OHI}$ | 1.95 | 1.85   | 1.65   | V       |
| $I_R$     |      | 60     | 60     | $\mu A$ |
| $-I_F$    | 1.6  | 1.6    | 1.6    | mA      |
| $I_{OX}$  |      | 5.0    | 200    | $\mu A$ |
| $I_{PD}$  |      | 12.2   |        | mA      |
| $I_{MAX}$ |      | 10     |        | mA      |

Typical Output Voltages vs Temperature

Typical Switching Times  $I_C = 250$  mA  
DH0016CNTypical Switching Times  $I_C = 500$  mA  
DH0017CN, DH0018CN

## Switching Time Test Circuit



## Switching Time Waveform

