

## HX4428-S/HX4428-P

### Dual 1.5A-Peak Low-Side MOSFET Drivers

#### General Description

The HX4426/4427/4428 series of dual low-side MOSFET drivers are manufactured on a BiCMOS/DMOS process, providing efficient power usage and high reliability. These drivers translate input logic levels from TTL or CMOS to output voltage levels that swing within 25 mV of the positive supply or ground. This is in contrast to bipolar devices, which can only swing to within 1V of the supply. The HX4426/4427/4428 drivers are available in three configurations: dual inverting, dual non-inverting, and one inverting plus one non-inverting output. They are designed to replace the HX426/427/428 and HX1426/1427/1428, offering improved electrical performance and ruggedness.

The HX4426/4427/4428 drivers are highly durable, capable of withstanding up to 500 mA of reverse current (either polarity) without latching and up to 5V noise spikes (either polarity) on the ground pins. These drivers are primarily intended for driving power MOSFETs, but are also suitable for driving other loads that require low-impedance, high peak current, and fast switching time. Other potential applications include driving heavily loaded clock lines, coaxial cables, or piezoelectric transducers. It is important to note that the total driver power dissipation must not exceed the package's limits. For high power and narrow pulse applications, see HX4126/4127/4128.

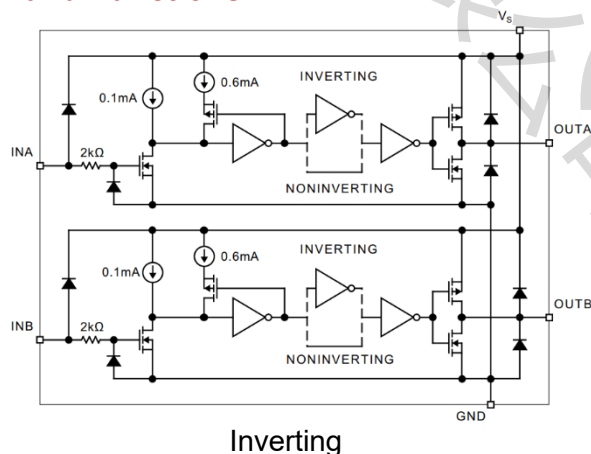
#### Features

- 1.5A-Peak Output Current
- Latch-Up Protected to >500 mA Reverse Current
- 4.5V to 18V Operating Range
- Switches 1000 pF in 25 ns
- Low Quiescent Supply Current
  - 4 mA at Logic 1 Input
  - 400  $\mu$ A at Logic 0 Input
- Matched Rise and Fall Times
- 7 $\Omega$  Output Impedance
- <40 ns Typical Delay
- Logic-Input Protection to -5V
- Logic-Input Threshold Independent of Supply Voltage
- 6 pF Typical Equivalent Input Capacitance
- 25 mV Max. Output Offset from Supply or Ground

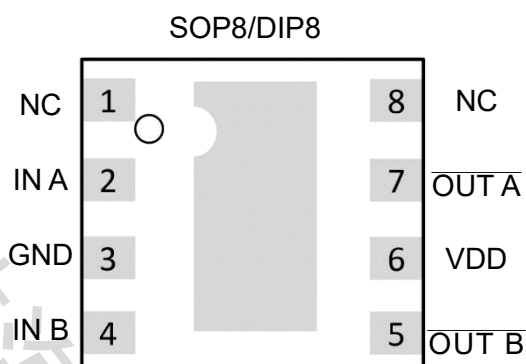
#### Applications

- MOSFET Driver
- Piezoelectric Transducer Driver
- Coax Cable Driver
- Clock Line Driver

#### Pin Configuration and Functions



Functional Block Diagram



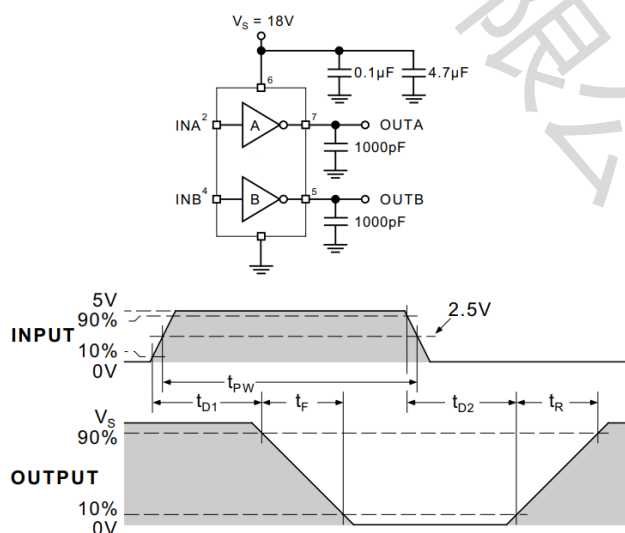
**Pin Diagram**

| ELECTRICAL CHARACTERISTICS |                 |                  |            |              |       |
|----------------------------|-----------------|------------------|------------|--------------|-------|
| Parameter                  | Sym.            | Min.             | Typ.       | Max.         | Units |
| <b>Input</b>               |                 |                  |            |              |       |
| Logic 1 Input Voltage      | V <sub>IH</sub> | 2.4              | 1.4        | —            | V     |
|                            |                 | <b>2.4</b>       | <b>1.5</b> | —            |       |
| Logic 0 Input Voltage      | V <sub>IL</sub> | —                | 1.1        | 0.8          | V     |
|                            |                 | —                | <b>1.0</b> | <b>0.8</b>   |       |
| Input Current              | I <sub>IN</sub> | <b>-1</b>        | —          | <b>1</b>     | μA    |
| <b>Output</b>              |                 |                  |            |              |       |
| High Output Voltage        | V <sub>OH</sub> | V <sub>S</sub> - | —          | —            | V     |
| Low Output Voltage         | V <sub>OL</sub> | —                | —          | <b>0.025</b> | V     |
| Output Resistance          | R <sub>O</sub>  | —                | 6          | 10           | Ω     |
|                            |                 | —                | <b>8</b>   | <b>12</b>    |       |
| Peak Output Current        | I <sub>PK</sub> | —                | <b>1.5</b> | —            | A     |
| Latch-Up Protection        | I               | <b>&gt;500</b>   | —          | —            | mA    |
| <b>Switching Time</b>      |                 |                  |            |              |       |
| Rise Time                  | t <sub>r</sub>  | —                | 18         | 30           | ns    |
|                            |                 | —                | <b>20</b>  | <b>40</b>    |       |
| Fall Time                  | t <sub>f</sub>  | —                | 15         | 20           | ns    |
|                            |                 | —                | <b>29</b>  | <b>40</b>    |       |
| Delay Time                 | t <sub>D1</sub> | —                | 17         | 30           | ns    |
|                            |                 | —                | <b>19</b>  | <b>40</b>    |       |
| Delay Time                 | t <sub>D2</sub> | —                | 23         | 50           | ns    |

| ELECTRICAL CHARACTERISTICS (CONTINUED) |      |      |      |      |       |
|--|------|------|------|------|-------|
| Parameter                              | Sym. | Min. | Typ. | Max. | Units |
| Pulse Width                            | tPW  | 400  | —    | —    | ns    |
| <b>Power Supply</b>                    |      |      |      |      |       |
| Power Supply Current                   | IS   | 0.6  | 1.4  | 4.5  | mA    |
|  |      | —    | 1.5  | 8    |       |
| Power Supply Current                   | IS   | —    | 0.18 | 0.4  | mA    |
|  |      | —    | 0.19 | 0.6  |       |

| TEMPERATURE SPECIFICATIONS         |                |     |     |      |      |
|------------------------------------|----------------|-----|-----|------|------|
| <b>Temperature Ranges</b>          |                |     |     |      |      |
| Maximum Junction Temperature       | T <sub>J</sub> | —   | —   | +150 | °C   |
| Storage Temperature Range          | T <sub>S</sub> | -65 | —   | +150 | °C   |
| Lead Temperature                   | —              | —   | —   | +300 | °C   |
| Junction Operating Temperature     | T <sub>J</sub> | 0   | —   | +70  | °C   |
| Junction Operating Temperature     | T <sub>J</sub> | -40 | —   | +85  | °C   |
| <b>Package Thermal Resistances</b> |                |     |     |      |      |
| Thermal Resistance, PDIP 8-Ld      | θJA            | —   | 130 | —    | °C/W |
| Thermal Resistance, PDIP 8-Ld      | θJC            | —   | 42  | —    | °C/W |
| Thermal Resistance, SOIC 8-Ld      | θJA            | —   | 120 | —    | °C/W |
| Thermal Resistance, SOIC 8-Ld      | θJC            | —   | 75  | —    | °C/W |
| Thermal Resistance, MSOP 8-Ld      | θJA            | —   | 250 | —    | °C/W |

## Application Informa



Switching Time Test Circuit

## Disclaimer

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