élantec
HIGH PERFORMANCE ANALOG INTEGRATED CIRCUITS

# EL7501C
## 100V High Side Driver

## Features
- 100V High Side Voltage
- Rail to Rail Output
- 1 MHz Operation
- 1.0A Peak Current
- Matched Rise and Fall Times
- Direct Coupled
- No Start Up Ambiguity

## Applications
- Uninterruptible Power Supplies
- DC-DC Converters
- Motor Control
- Power MOSFET Driver

## Ordering Information

| Part No. | Temp. Range | Package | Outline # |
|---|---|---|---|
| EL7501CN | −40°C to +85°C | 8-Pin P-Dip | MDP0031 |
| EL7501CS | −40°C to +85°C | 8-Lead SO | MDP0027 |

## General Description
The EL7501 provides a low cost solution to many high side drive applications. The EL7501 is DC coupled so there are no start up problems associated with AC coupled schemes. The EL7501 is driven by user supplied complementary signals.

## Connection Diagram

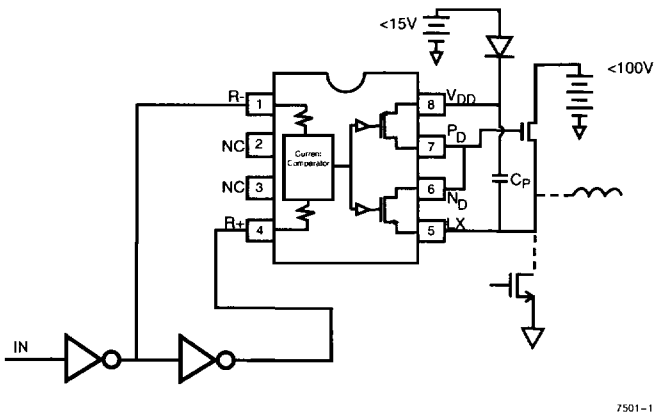
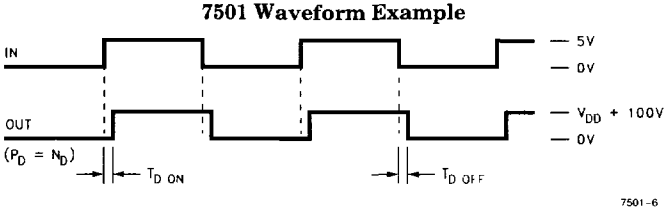



Figure 1

7501 Waveform Example



## Absolute Maximum Ratings ($T_A$ = 25°C)

| | | | | |
|---|---|---|---|---|
| Supply ($V_{DD}$ or LX to R− or R+) | 100V | Ambient Operating Temperature | | −40°C to +85°C |
| Supply ($V_{DD}$ to LX) | 16.5V | Storage Temperature Range | | −65°C to +150°C |
| Output Pins | −0.3V below GND, +0.3V above $V_{DD}$ | Operating Junction Temperature | | 125°C |
| | | Power Dissipation | SOIC | 570 mW |
| Peak Output Current | 2A | | PDIP | 1050 mW |

**Important Note:**
**All parameters having Min/Max specifications are guaranteed. The Test Level column indicates the specific device testing actually performed during production and Quality inspection. Elantec performs most electrical tests using modern high-speed automatic test equipment, specifically the LTX77 Series system. Unless otherwise noted, all tests are pulsed tests, therefore $T_J = T_C = T_A$.**

| Test Level | Test Procedure |
|---|---|
| I | 100% production tested and QA sample tested per QA test plan QCX0002. |
| II | 100% production tested at $T_A$ = 25°C and QA sample tested at $T_A$ = 25°C, $T_{MAX}$ and $T_{MIN}$ per QA test plan QCX0002. |
| III | QA sample tested per QA test plan QCX0002. |
| IV | Parameter is guaranteed (but not tested) by Design and Characterization Data. |
| V | Parameter is typical value at $T_A$ = 25°C for information purposes only. |

## DC Electrical Characteristics ($T_A$ = 25°C, $V_{DD}$ = 15V, $C_{LOAD}$ = 1000 pF, unless otherwise specified)

| Parameter | Description | Test Conditions | Min. | Typ. | Max. | Test Level | Units |
|---|---|---|---|---|---|---|---|
| **Input/Output** | | | | | | | |
| $V_{DIFF\ (Min)}$ | Minimum Differential Input Signal to Switch Output | | 1.0 | | | I | V |
| $I_{DS\ OFF}$ | Output Leakage | $GND < V_{OUT} < V_{DD}$ | −10.0 | 0.2 | +10.0 | I | µA |
| $R_{OH}$ | Pull-up Resistance | $I_{OUT}$ = −100 mA | | 5.0 | 10.0 | I | Ω |
| $R_{OL}$ | Pull-down Resistance | $I_{OUT}$ = +100 mA | | 5.0 | 10.0 | I | Ω |
| $I_{PK}$ | Peak Output Current | | | 1.0 | | IV | A |
| $I_{DC}$ | Continuous Output Current Source/Sink | | 50.0 | | | IV | mA |
| **Power Supply** | | | | | | | |
| $I_{DD}$ | Supply Current into $V_{DD}$ | | | | 4.0 | I | mA |
| $V_{DD}$ | Operating Voltage | | 4.5 | | 15.0 | I | V |

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# EL7501C
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## AC Electrical Characteristics ($T_A$ = 25°C, $V_{DD}$ = 15V, $C_{LOAD}$ = 1000 pF, unless otherwise specified)

| Parameter | Description | Test Conditions | Min. | Typ. | Max. | Test Level | Units |
|---|---|---|---|---|---|---|---|
| **Switching Characteristics** | | | | | | | |
| $t_R$ | Rise Time | $C_L$ = 500 pF<br>$C_L$ = 1000 pF | | 15.0<br>20.0 | 40.0 | IV | ns |
| $t_F$ | Fall Time | $C_L$ = 500 pF<br>$C_L$ = 1000 pF | | 15.0<br>20.0 | 40.0 | IV | ns |
| $t_{D\ OFF}$ | Turn Off Delay Time | | | 90.0 | 140.0 | IV | ns |
| $t_{D\ ON}$ | Turn On Delay Time | | | 90.0 | 140.0 | IV | ns |

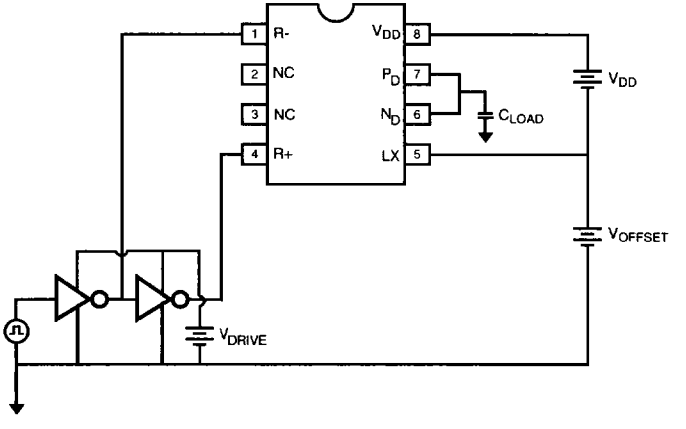



**Figure 2. EL7501 Test Circuit**

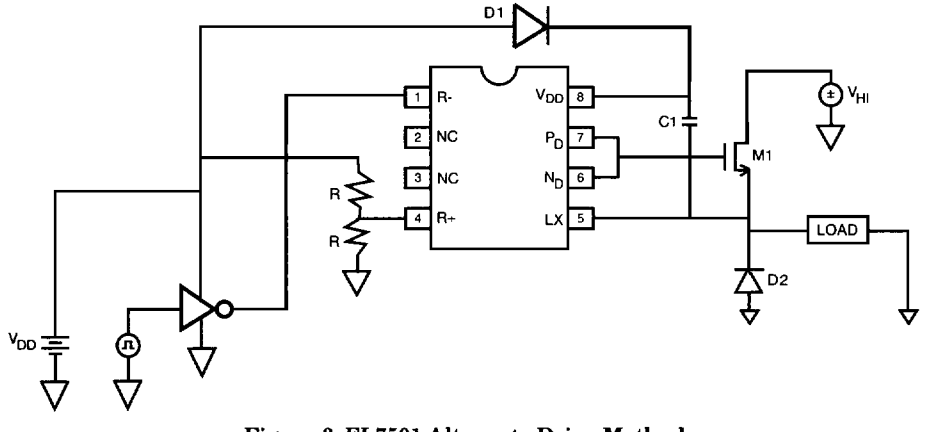
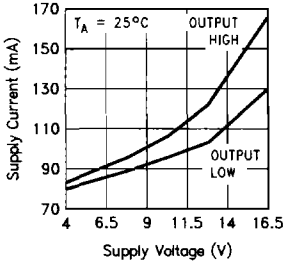


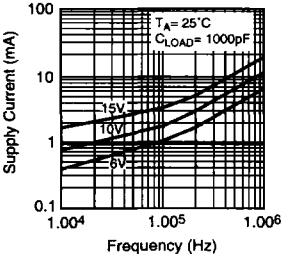

**Figure 3. EL7501 Alternate Drive Method**

## Typical Performance Curves

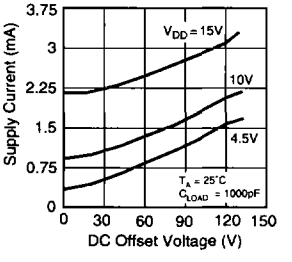
**Quiescent Supply Current vs Supply Voltage**



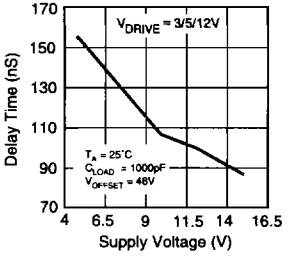

**Average Supply Current vs Voltage and Frequency**



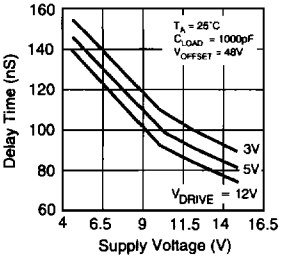

**Supply Current vs DC Offset Voltage and $V_{DD}$**



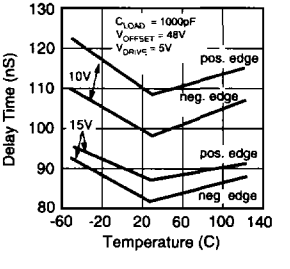

**Output Rising Edge Delay Time vs Supply Voltage and Drive Voltage**




**Output Falling Edge Delay Time vs Supply Voltage and Drive Voltage**




**Delay Time vs Temperature and Supply Voltage**

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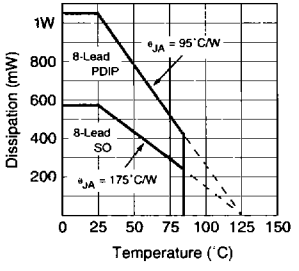
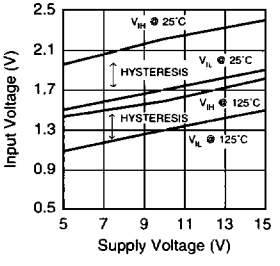
# EL7501C
## 100V High Side Driver

## Typical Performance Curves — Contd.

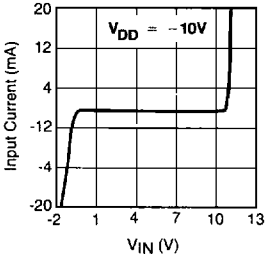
**Max. Power/ Derating Curves 8-Pin Package**



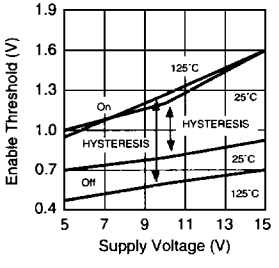

**Input Threshold vs Supply Voltage**



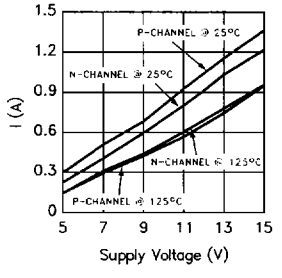

**Input Current vs Input Voltage**



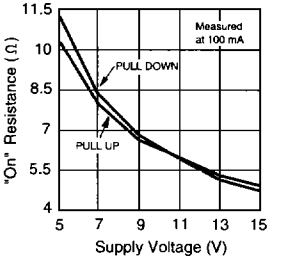

**Enable Threshold vs Supply Voltage**



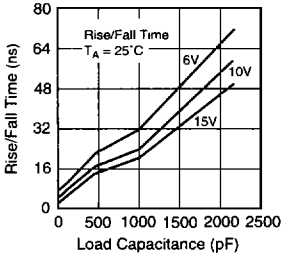

**Peak Drive vs Supply Voltage**



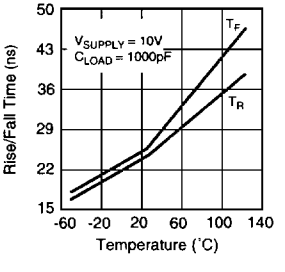

**"On" Resistance vs Supply Voltage**




**Rise/Fall Time vs Load and Supply**




**Rise/Fall Time vs Temperature**

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