

Features

- 100V High Side Voltage
- Programmable Delay
- Direct Coupled
- No Start Up Ambiguity
- Rail to Rail Output
- 1 MHz Operation
- Shutdown Function
- 1.0 Amp Peak Current
- Improved Response Times
- Matched Rise and Fall Times
- Low Supply Current
- Low Output Impedance
- Low Input Capacitance

Applications

- Uninterruptible Power Supplies
- Distributed Power Systems
- IGBT Drive
- DC-DC Converters
- Motor Control
- Power MOSFET Drive
- Switch Mode Power Supplies

Ordering Information

Part No.	Temp. Range	Package	Outline #
EL7761CN	-40°C to +85°C	16-Pin P-DIP	MDP0031
EL7761CS	-40°C to +85°C	16-Pin SOIC	MDP0027*

*Contact factory

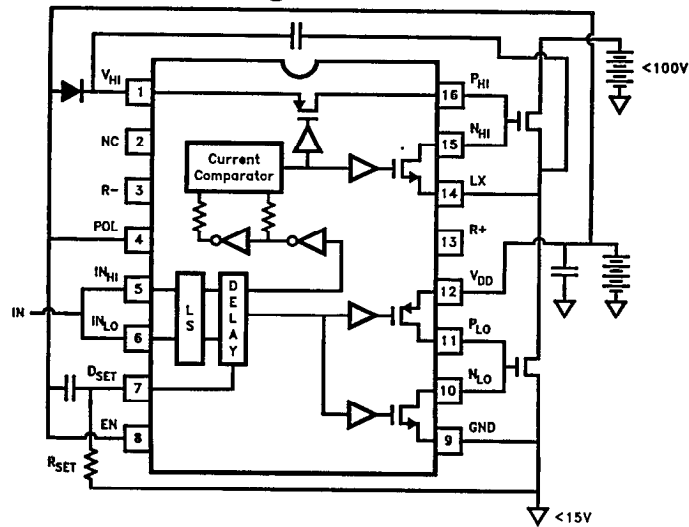
	POL	Polarity
Low Side	GND	Inverting
	V _{DD}	Non-Inverting
Hi Side	X	Inverting

General Description

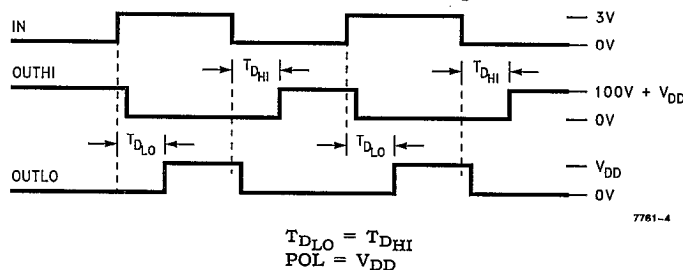
The EL7761 provides a low cost solution to many half bridge applications. The EL7761 is DC coupled so that there are no start up problems associated with AC coupled schemes. A single resistor from D_{SET} to GND provides "dead time" programmability. Shorting D_{SET} to V_{DD} gives the shortest delay (~100 ns).

The POL pin controls the polarity of the low side driver. The polarity of the upper driver is always inverting. The EN pin, when low, forces the high and low side outputs into their low state.

Connection Diagram - Rev. B



EL7761 Waveform Example



August 1994 Rev A

EL7761C

100V Half Bridge Driver

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$)

Supply (V_{HI} to GND)	100V	Storage Temperature Range	-65°C to $+150^\circ\text{C}$
Supply (V_{DD} to GND)	16.5V	Ambient Operating Temperature	-40°C to $+85^\circ\text{C}$
Input Pins	-0.3V below GND, $+0.3\text{V}$ above V_{DD}	Operating Junction Temperature	125°C
Peak Current per Output	2A	Power Dissipation	SOIC 1100 mW PDIP 1800 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 $T_A = 25^\circ\text{C}$ and QA sample tested at $T_A = 25^\circ\text{C}$, 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 $T_A = 25^\circ\text{C}$ for information purposes only.

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

Parameter	Description	Test Conditions	Min	Typ	Max	Test Level	Units
Input/Output							
V_{IH}	Logic "1" Input Voltage		3.0	2.4		I	V
I_{IH}	Logic "1" Input Current			0.1	10.0	I	μA
V_{IL}	Logic "0" Input Voltage			1.8	0.8	I	V
I_{IL}	Logic "0" Input Current			0.1	10.0	I	μA
V_{HVS}	Input Hysteresis			0.5		V	V
V_{ENH}	Enable Threshold	Positive Edge	2.8	1.6		I	V
V_{ENL}	Disable Threshold	Negative Edge		0.9	0.6	I	V
V_{ENHYS}	Enable Hysteresis			0.7		V	V
$I_{DS\ OFF}$	Output Leakage	$GND \leq V_{OUT} \leq V_{DD}$	-10.0	0.2	10.0	I	μA
R_{OH}	Pull-up Resistance	$I_{OUT} = -100\text{ mA}$		5.0	10.0	I	Ω
R_{OL}	Pull-down Resistance	$I_{OUT} = +100\text{ mA}$		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

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100V Half Bridge Driver

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

Parameter	Description	Test Conditions	Min	Typ	Max	Test Level	Units
Power Supply							
I_{DD}	Supply Current into V_{DD}	$R_{SET} = 5.1\text{k}$		6.0	10.0	I	mA
I_{HI}	Supply Current into V_{HI}			2.0	4.0	I	mA
$I_{DD\ OFF}$	Supply Current into V_{DD}	$V_{EN} = 0.6\text{V}$			750.0	I	uA
V_{DD}	Operating Voltage		4.5		15.0	I	V

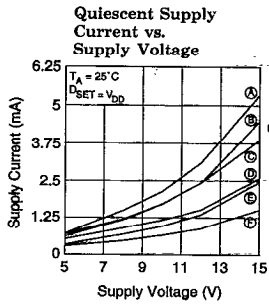
AC Electrical Characteristics ($T_A = 25^\circ\text{C}$, $V_{DD} = 15\text{V}$, $C_{LOAD} = 1000\text{pF}$, unless otherwise specified)

Parameter	Description	Test Conditions	Min	Typ	Max	Test Level	Units
Switching Characteristics							
t_R	Rise Time	$C_L = 500\text{pF}$ $C_L = 1000\text{pF}$		15.0 20.0	40.0	IV	ns
t_F	Fall Time	$C_L = 500\text{pF}$ $C_L = 1000\text{pF}$		15.0 20.0	40.0	IV	ns
$t_{D\ ON\ HI}$	High Side Turn On Delay Time	$D_{SET} = V_{DD}$ $R_{SET} = 5.1\text{k}$ $R_{SET} = 400\text{k}$	50.0 75.0 750.0	100.0 125.0 1150.0	150.0 200.0 1500.0	IV I I	ns
$t_{D\ ON\ LO}$	Low Side Turn On Delay Time	$D_{SET} = V_{DD}$ $R_{SET} = 5.1\text{k}$ $R_{SET} = 400\text{k}$	50.0 75.0 750.0	100.0 125.0 1150.0	150.0 200.0 1500.0	IV I I	ns
$t_{D\ OFF\ HI}$	High Side Turn Off Delay Time	$D_{SET} = V_{DD}$		100.0	150.0	IV	ns
$t_{D\ OFF\ LO}$	Low Side Turn Off Delay Time	$D_{SET} = V_{DD}$		100.0	150.0	IV	ns
$t_{D\ MISMATCH}$	High to Lo Side Turn On Delay Mismatch	$R_{SET} = 400\text{k}$			± 10.0	I	%

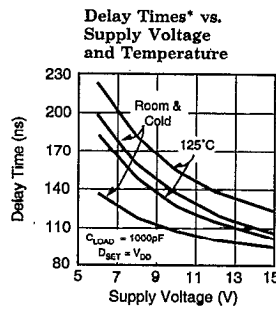
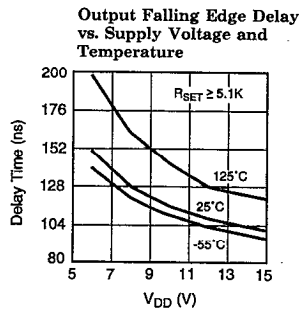
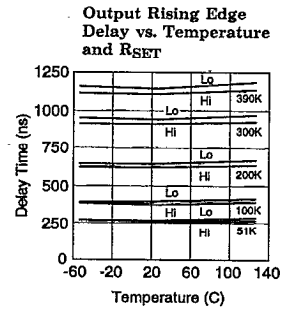
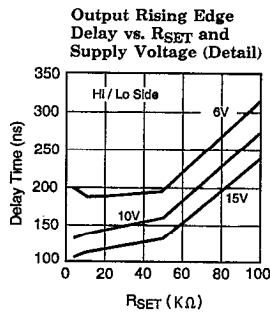
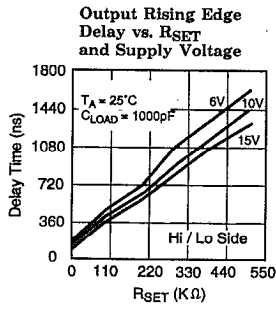
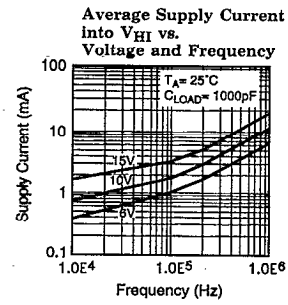
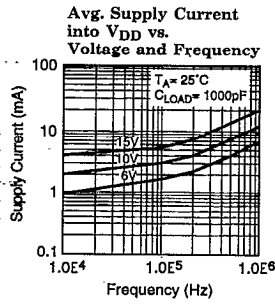
EL7761C

100V Half Bridge Driver

Typical Performance Curves



Curve	Condition
(a)	$V_{IN} = 0V, POL = 0V$
(b)	$V_{IN} = 0V, POL = 0V$
(c)	$V_{IN} = V_{DD}, POL = 0V$
(d)	$V_{IN} = V_{DD}, POL = V_{DD}$
(e)	$V_{IN} = V_{DD}, POL = 0V$



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*Minimum Rising and Falling Edge Delay Times

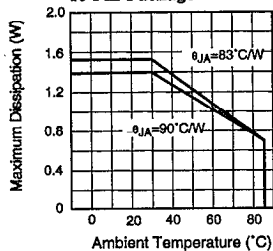
EL7761C

100V Half Bridge Driver

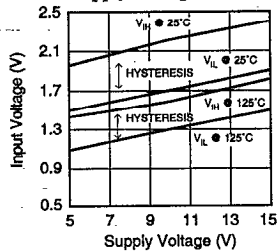
EL7761C

Typical Performance Curves — Contd.

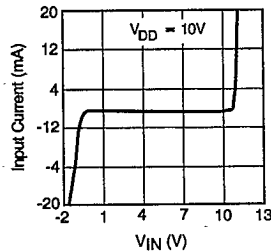
Max. Power/Derating Curves
16 Pin Package



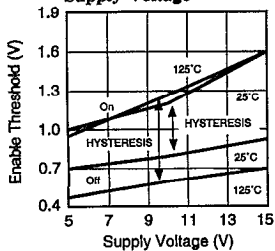
Input Threshold vs. Supply Voltage



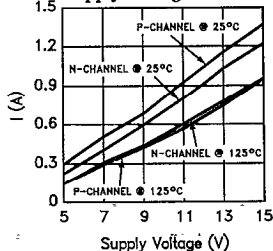
Input Current vs. Input Voltage



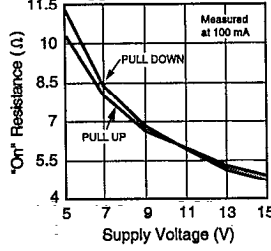
Enable Threshold vs. Supply Voltage



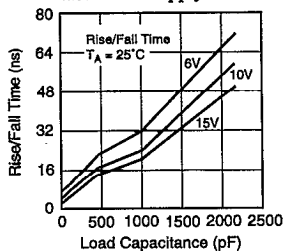
Peak Drive vs. Supply Voltage



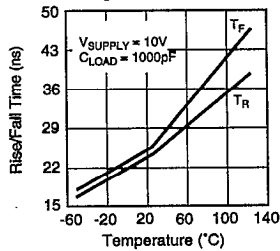
"On" Resistance vs. Supply Voltage



Rise/Fall Time vs. Load and Supply



Rise/Fall Time vs. Temperature



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