

## Features

- Comparatively low cost
- 3-State output
- 3V and 5V Input compatible
- Clocking speeds up to 10MHz
- 20ns Switching/delay time
- 4A Peak drive
- Isolated drains
- Low output impedance— $2.5\Omega$
- Low quiescent current—5mA
- Wide operating voltage—4.5V–16V
- Isolated P-channel device
- Separate ground and  $V_L$  pins

## Applications

- Loaded circuit board testers
- Digital testers
- Level shifting below GND
- IGBT drivers
- CCD drivers

## Ordering Information

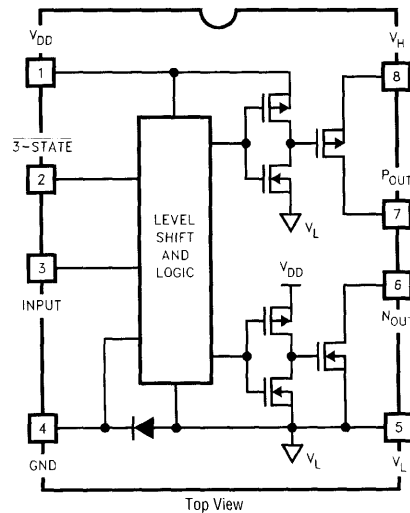
Part No.	Package	Tape & Reel	Outline #
EL7154CN	PDIP-8	-	MDP0031
EL7154CS	SO-8	-	MDP0027
EL7154CS-T7	SO-8	7 in	MDP0027
EL7154CS-T13	SO-8	13 in	MDP0027

## General Description

The EL7154C 3-state pin driver is particularly well suited for ATE and level shifting applications. The 4A peak drive capability, makes the EL7154C an excellent choice when driving high speed capacitive lines.

The p-channel MOSFET is completely isolated from the power supply, providing a high degree of flexibility. Pin (7) can be grounded, and the output can be taken from pin (8) when a "source follower" output is desired. Then n-channel MOSFET has an isolated drain, but shares a common bus with pre-drivers and level shifter circuits. This is necessary to ensure that the nchannel device can turn off effectively when  $V_L$  goes below GND. In some power-FET and IGBT applications, negative drive is desirable to insure effective turn-off. The EL7154C can be used in these applications by returning  $V_L$  to a moderate negative potential.

## Connection Diagrams



Manufactured under U.S. Patent Nos. 5,334,883, #5,341,047, #5,352,578, #5,352,389, #5,351,012, #5,374,898

### Absolute Maximum Ratings (T<sub>A</sub> = 25 °C)

Supply (V <sub>DD</sub> to V <sub>L</sub> ; V <sub>H</sub> -V <sub>L</sub> ; V <sub>H</sub> to GND), V+ to V <sub>H</sub>	16.5V	Storage Temperature Range	-65°C to +150°C
V <sub>L</sub> to GND	-5V	Ambient Operating Temperature	-40°C to +85°C
Input Pins	-0.3V below V <sub>L</sub> to +0.3V above V <sub>DD</sub>	Operating Junction Temperature	125°C
Peak Output Current	4A	Power Dissipation	
		SO	570 mW
		PDIP	1050 mW

#### Important Note:

All parameters having Min/Max specifications are guaranteed. Typ values are for information purposes only. Unless otherwise noted, all tests are at the specified temperature and are pulsed tests, therefore: T<sub>J</sub> = T<sub>C</sub> = T<sub>A</sub>

### DC Electrical Characteristics

T<sub>A</sub> = 25°C, V<sub>DD</sub> = +12V, V<sub>H</sub> = +12V, V<sub>L</sub> = -3V, unless otherwise specified

Parameter	Description	Test Conditions	Min	Typ	Max	Units
<b>Input</b>						
V <sub>IH</sub>	Logic "1" Input Voltage		2.4			V
I <sub>IH</sub>	Logic "1" Input Current	V <sub>IH</sub> = V <sub>DD</sub>		0.1	10	μA
V <sub>IL</sub>	Logic "0" Input Voltage				0.6	V
I <sub>IL</sub>	Logic "0" Input Current	V <sub>IL</sub> = 0V		0.1	10	μA
V <sub>HVS</sub>	Input Hysteresis			0.3		V
<b>Output</b>						
R <sub>OH</sub>	Pull-Up Resistance	I <sub>OUT</sub> = -100mA		1.5	4	Ω
R <sub>OL</sub>	Pull-Down Resistance	I <sub>OUT</sub> = +100mA		2	4	Ω
I <sub>OUT</sub>	Output Leakage Current	V <sub>DD</sub> /GND		0.2	10	μA
I <sub>PK</sub>	Peak Output Current	Source Sink		4.0 4.0		A
I <sub>DC</sub>	Continuous Output Current	Source/Sink	200			mA
<b>Power Supply</b>						
I <sub>S</sub>	Power Supply Current	Inputs = V <sub>DD</sub>		1	2.5	mA
V <sub>S</sub>	Operating Voltage		4.5		16	V
I <sub>G</sub>	Current to GND (Pin 4)			1	10	μA
I <sub>H</sub>	Off Leakage at V <sub>H</sub>	Pin 8 = 0V		1	10	μA

# EL7154C

High Speed, Monolithic Pin Driver

## AC Electrical Characteristics

$T_A = 25^\circ\text{C}$  unless otherwise specified

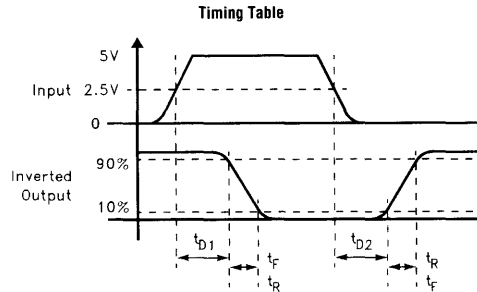
Parameter	Description	Test Conditions	Min	Typ	Max	Units
<b>Switching Characteristics (<math>V_{DD} = V_H = 12\text{V}</math>; <math>V_L = -3\text{V}</math>)</b>						
$t_R$	Rise Time	$C_L = 100\text{pF}$		4	25	ns
		$C_L = 2000\text{pF}$		20		
$t_F$	Fall Time	$C_L = 100\text{pF}$		4	25	ns
		$C_L = 2000\text{pF}$		20		
$t_{D-1}$	Turn-Off Delay Time	$C_L = 2000\text{pF}$		20	25	ns
$t_{D-2}$	Turn-On Delay Time	$C_L = 2000\text{pF}$		10	25	ns
$t_{D-1}$	3-State Delay				25	ns
$t_{D-2}$	3-State Delay				25	ns

## Truth Table

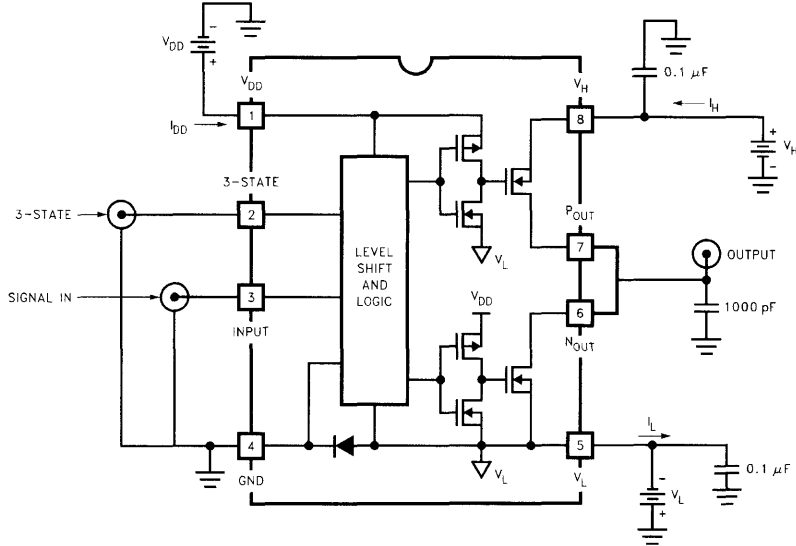
3-State	Input	$P_{OUT}$	$N_{OUT}$
0	0	Open	Open
0	1	Open	Open
1	0	HIGH	Open
1	1	Open	LOW

## Nominal Operating Voltage Range

Pin	Min	Max
$V_L$	-3	0
$V_{DD}-V_L$	5	15
$V_H-V_L$	2	15
$V_{DD}-V_H$	-0.5	15
$V_{DD}$	5	15



Standard Test Configuration

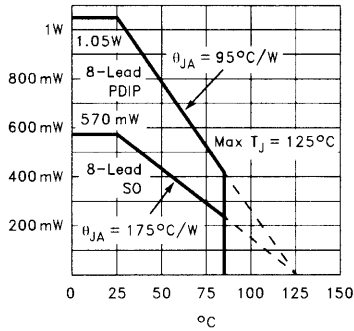


# EL7154C

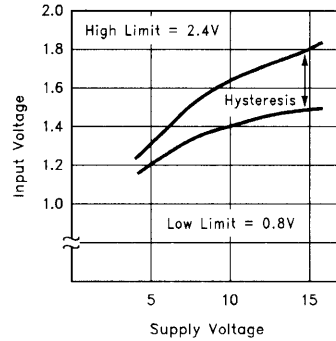
High Speed, Monolithic Pin Driver

## Typical Performance Curves

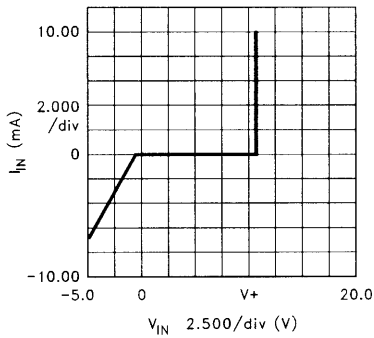
Max Power/Derating Curves



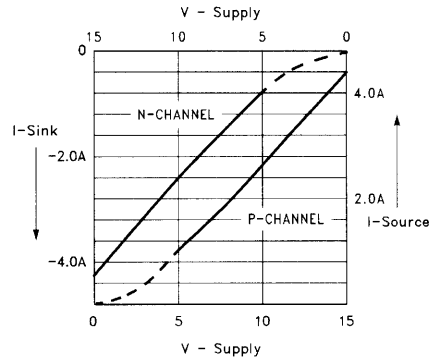
Switch Threshold vs Supply Voltage



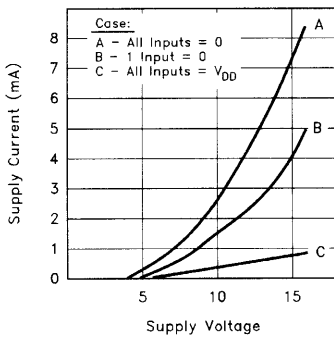
Input Current vs Voltage



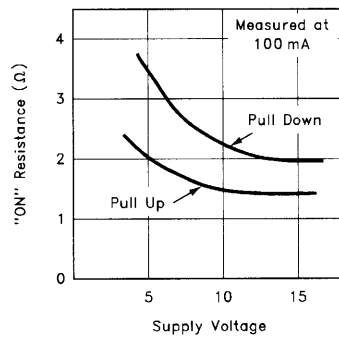
Peak Drive vs Supply Voltage



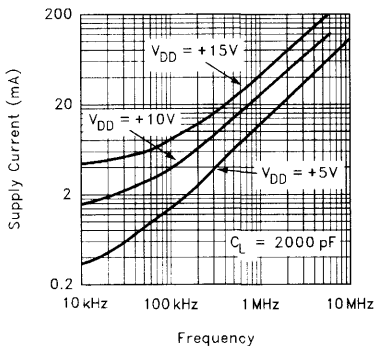
Quiescent Supply Current



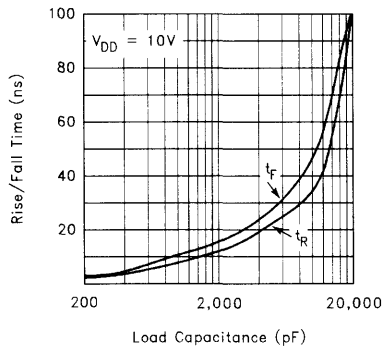
"ON" Resistance vs Supply Voltage



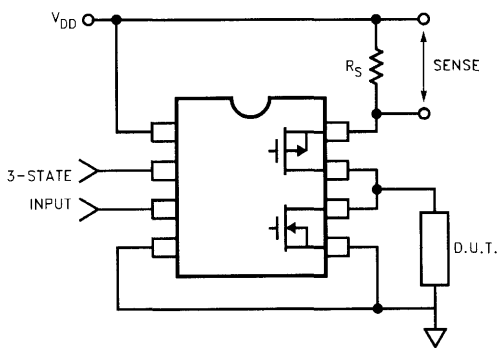
**Average Supply Current vs Voltage and Frequency**



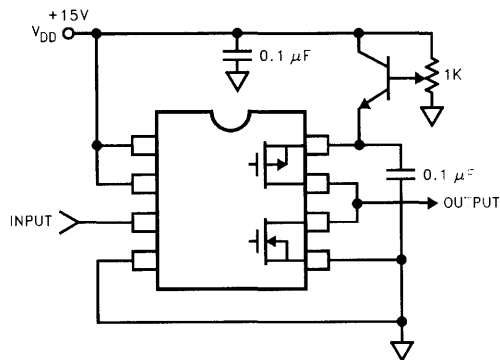
**Rise/Fall Time vs Load**



**Pin Driver**



**Adjustable Amplitude Pulse Generator**



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High Speed, Monolithic Pin Driver

