

Features

- Comparatively low cost
- 3-State output
- 3V and 5V Input compatible
- Clocking speeds up to 10 MHz
- 20 ns Switching/delay time
- 4A Peak drive
- Isolated drains
- Low output impedance— 2.5Ω
- Low quiescent current—5 mA
- 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.	Temp. Range	Pkg.	Outline #
EL7154CN	-40°C to +85°C	8-Pin P-DIP	MDP0031
EL7154CS	-40°C to +85°C	8-Pin SOIC	MDP0027

Nominal Operating Voltage Range

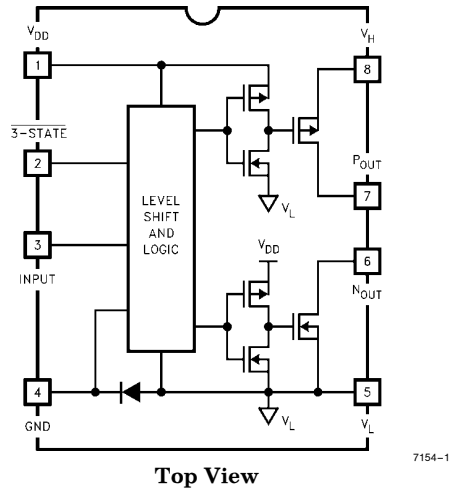
Pin	Min	Max
V_L	-3	0
$V_{DD}-V_L$	5	15
V_H-V_L	2	15
$V_{DD}-V_H$	-0.5	15
V_{DD}	5	15

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 n-channel 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 EL7154 can be used in these applications by returning V_L to a moderate negative potential.

Connection Diagram



Truth Table

3-State	Input	POUT	NOUT
0	0	Open	Open
0	1	Open	Open
1	0	HIGH	Open
1	1	Open	LOW

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

Note: All information contained in this data sheet has been carefully checked and is believed to be accurate as of the date of publication; however, this data sheet cannot be a "controlled document". Current revisions, if any, to these specifications are maintained at the factory and are available upon your request. We recommend checking the revision level before finalization of your design documentation.

EL7154C

High Speed, Monolithic Pin Driver

Absolute Maximum Ratings

Supply (V_{DD} to V_L ; V_H-V_L , V_H to GND), V+ to V_H	16.5V	Ambient Operating Temperature	-40°C to +85°C
V_L to GND	-5V	Operating Junction Temperature	125°C
Input Pins	-0.3V below V_L to +0.3V above V_{DD}	Power Dissipation	570 mW
Peak Output Current	4A	SOIC	1050 mW
Storage Temperature Range	-65°C to +150°C	PDIP	

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

$T_A = 25^\circ\text{C}$, $V_{DD} = +12\text{V}$, $V_H = +12\text{V}$, $V_L = -3\text{V}$, unless otherwise specified

Parameter	Description	Test Conditions	Min	Typ	Max	Test Level	Units
Input							
V_{IH}	Logic "1" Input Voltage		2.4			I	V
I_{IH}	Logic "1" Input Current	$V_{IH} = V_{DD}$		0.1	10	I	μA
V_{IL}	Logic "0" Input Voltage				0.6	I	V
I_{IL}	Logic "0" Input Current	$V_{IL} = 0\text{V}$		0.1	10	I	μA
V_{HVS}	Input Hysteresis			0.3		V	V
Output							
R_{OH}	Pull-Up Resistance	$I_{OUT} = -100\text{ mA}$		1.5	4	I	Ω
R_{OL}	Pull-Down Resistance	$I_{OUT} = +100\text{ mA}$		2	4	I	Ω
I_{OUT}	Output Leakage Current	V_{DD}/GND		0.2	10	I	μA
I_{PK}	Peak Output Current	Source Sink		4.0 4.0		V	A
I_{DC}	Continuous Output Current	Source/Sink	200			I	mA
Power Supply							
I_S	Power Supply Current	Inputs = V_{DD}		1	2.5	I	mA
V_S	Operating Voltage		4.5		16	I	V
I_G	Current to GND (Pin 4)			1	10	I	μA
I_H	Off Leakage at V_H	Pin 8 = 0V		1	10	I	μA

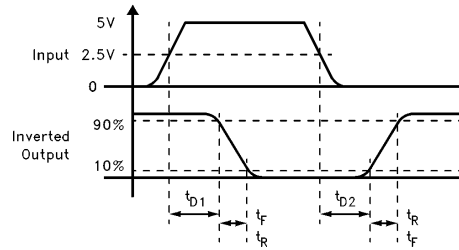
EL7154C

High Speed, Monolithic Pin Driver

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

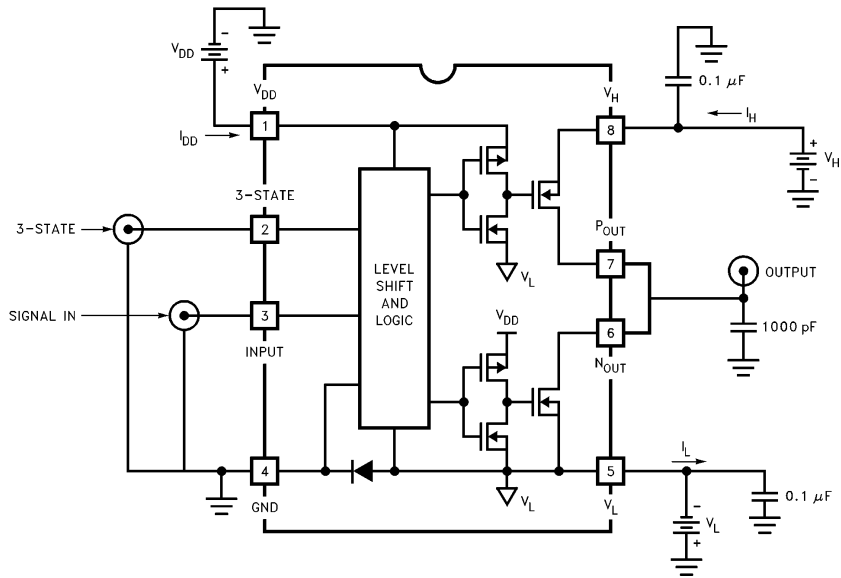
Parameter	Description	Test Conditions	Min	Typ	Max	Test Level	Units
Switching Characteristics ($V_{DD} = V_H = 12\text{V}$; $V_L = -3\text{V}$)							
t_R	Rise Time	$C_L = 100\text{ pF}$ $C_L = 2000\text{ pF}$		4 20	25	IV	ns
t_F	Fall Time	$C_L = 100\text{ pF}$ $C_L = 2000\text{ pF}$		4 20	25	IV	ns
t_{D-1}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

Timing Table



7154-2

Standard Test Configuration

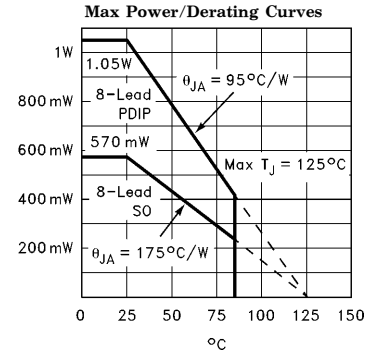


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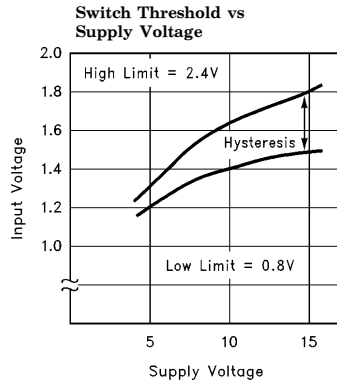
EL7154C

High Speed, Monolithic Pin Driver

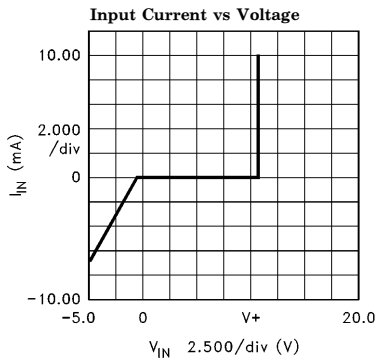
Typical Performance Curves



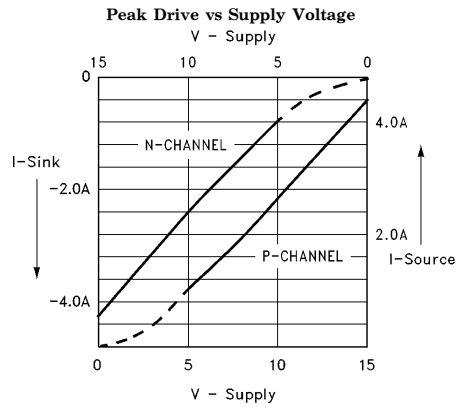
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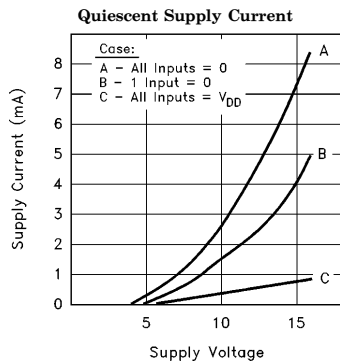
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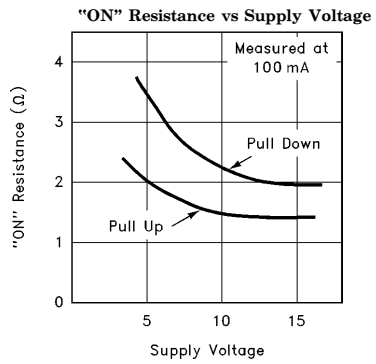
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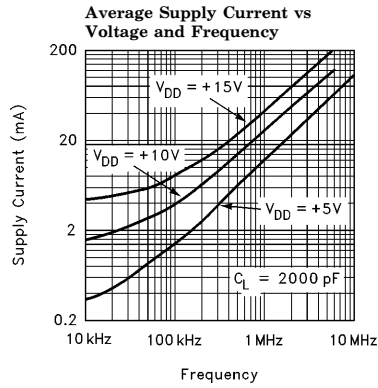


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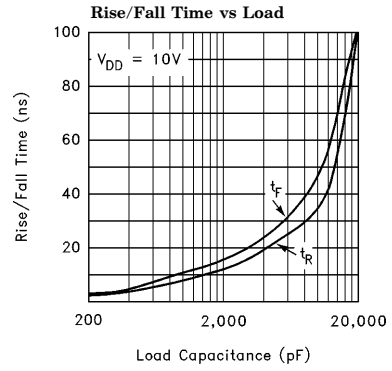
EL7154C

High Speed, Monolithic Pin Driver

Typical Performance Curves — Contd.

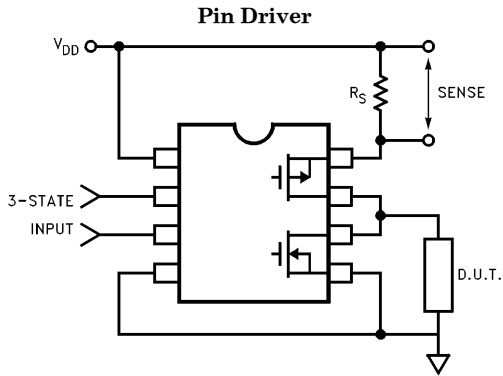


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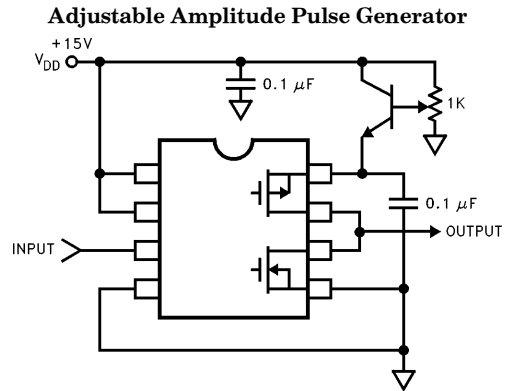


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Typical Applications



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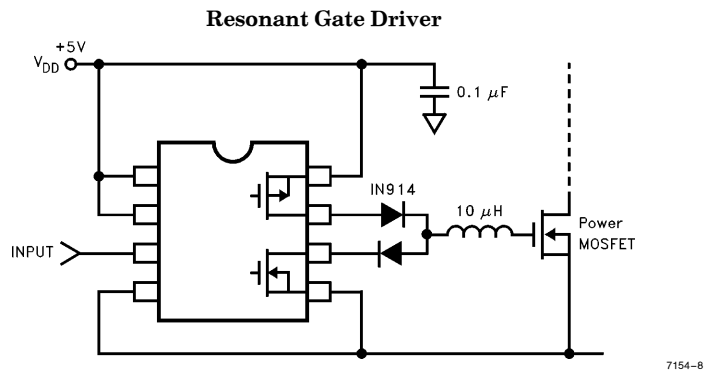
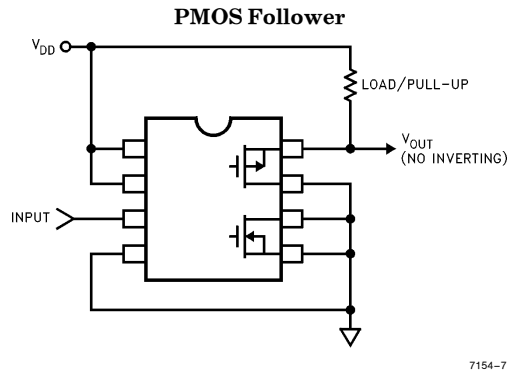
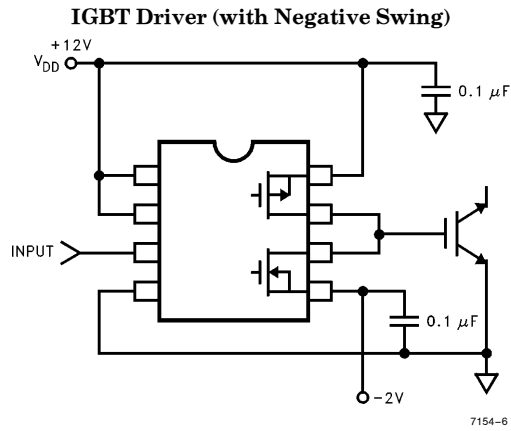


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EL7154C

High Speed, Monolithic Pin Driver

Typical Applications — Contd.



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EL7154C

High Speed, Monolithic Pin Driver

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HIGH PERFORMANCE ANALOG INTEGRATED CIRCUITS

Elantec, Inc.
1996 Tarob Court
Milpitas, CA 95035
Telephone: (408) 945-1323
(800) 333-6314
Fax: (408) 945-9305
European Office: 44-71-482-4596

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