élantec
HIGH PERFORMANCE ANALOG INTEGRATED CIRCUITS

EL7412C

High Speed, Four Channel Power MOSFET Drivers

Features

- Excellent response times
- Matched rise and fall times
- Reduced clock skew
- Low output impedance
- Low input capacitance
- High noise immunity
- Improved clocking rate
- Low supply current
- Wide operating voltage range

Applications

- Full bridge drivers
- Clock/line drivers
- CCD Drivers
- Ultra-sound transducer drivers
- Power MOSFET drivers
- Switch mode power supplies
- Class D switching amplifiers
- Ultrasonic and RF generators
- Pulsed circuits

Ordering Information

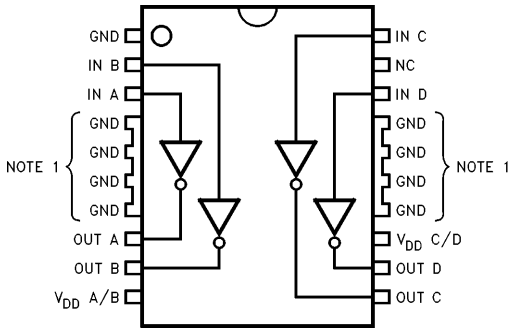
Part No.	Temp. Range	Pkg.	Outline #
EL7412CM	−40°C to +85°C	20 Lead Thermal SOL	MDP0027

General Description

The EL7412C contains (4) high performance matched drivers. These very high speed drivers are capable of delivering peak currents of 2.0 amps into highly capacitive loads and are ideally suited for "Full bridge" and ultrasound applications. The high speed performance is achieved by means of a proprietary "Turbo-Driver" circuit that speeds up input stages by tapping the wider voltage swing at the output. Improved speed and drive capability are enhanced by matched rise and fall delay times. The matched delays maintain the integrity of input-to-output pulse-widths to reduce timing errors and clock skew problems. This improved performance is accompanied by a 10 fold reduction in supply currents over bipolar drivers, yet without the delay time problems commonly associated with CMOS devices. Dynamic switching losses are minimized with non-overlapped drive techniques.

Connection Diagram

20 Lead Thermal SOL Package



7412–1

Note 1: Pins 4–7 and 14–17 are electrically connected.

Manufactured under U.S. Patent Nos. 5,334,883, #5,331,047

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.

©1994 Elantec, Inc.

Absolute Maximum Ratings

Supply (V+ to Gnd)	16.5V	Operating Junction Temperature	125°C
Input Pins	−0.3V to +0.3V above V^+	Power Dissipation	
Combined Peak Output Current	8A	20-Pin "Batwing" SOIC	1500 mW
Storage Temperature Range	−65°C to +150°C		
Ambient Operating Temperature	−40°C to +85°C		

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 unless otherwise specified

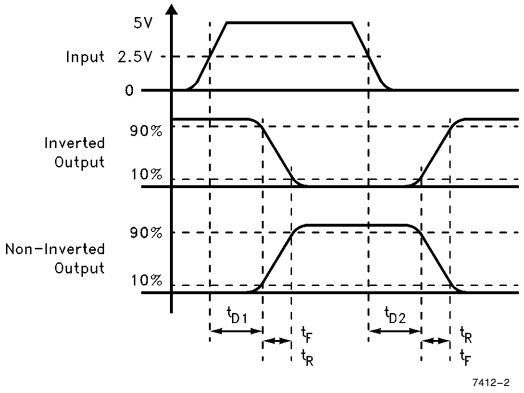
Parameter	Description	Test Conditions	Min	Typ	Max	Test Level	Units
Input							
V_{IH}	Logic "1" Input Voltage		2.4			I	V
I_{IH}	Logic "1" Input Current	@V_{DD}		0.1	10	I	μA
V_{IL}	Logic "0" Input Voltage				0.8	I	V
I_{IL}	Logic "0" Input Current	@0V		0.1	10	I	μA
V_{HVS}	Input Hysteresis			0.3		V	V
Output							
R_{OH}	Pull-Up Resistance	I_{OUT} = −100 mA		3	6	I	Ω
R_{OL}	Pull-Down Resistance	I_{OUT} = +100 mA		4	6	I	Ω
I_{PK}	Peak Output Current	Source Sink		2 2		IV	A
I_{DC}	Continuous Output Current	Source/Sink	100			I	mA
Power Supply							
I_S	Power Supply Current	Inputs High		2	5	I	mA
V_S	Operating Voltage		4.5		15	I	V

TD is 3.1in

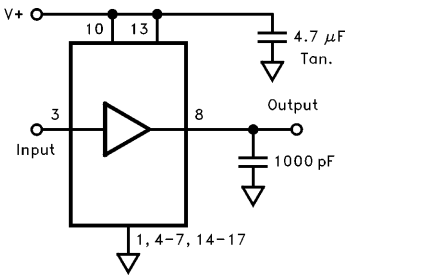
AC Electrical Characteristics T_A = 25°C, V = 15V unless otherwise specified

Parameter	Description	Test Conditions	Min	Typ	Max	Test Level	Units
Switching Characteristics							
t_R	Rise Time	C_L = 500 pF C_L = 1000 pF		7.5 10	 20	IV	ns
t_F	Fall Time	C_L = 500 pF C_L = 1000 pF		10 13	 20	IV	ns
t_{D1}	Turn-On Delay Time	See Timing Table		18	25	IV	ns
t_{D2}	Turn-Off Delay Time	See Timing Table		20	25	IV	ns

Timing Table

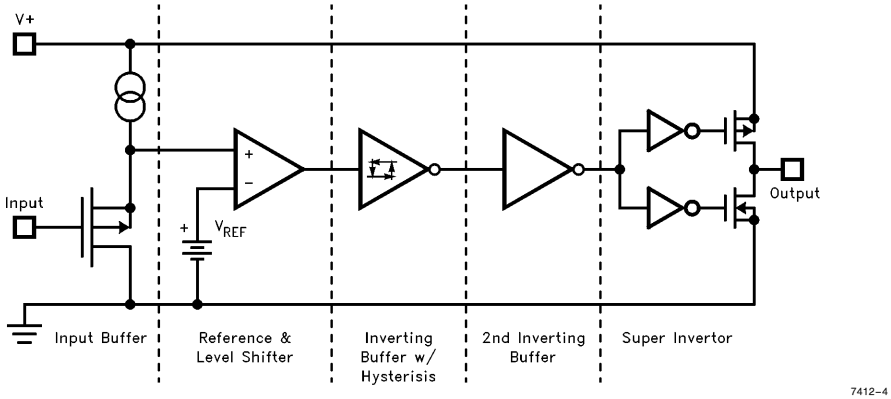


Standard Test Configuration



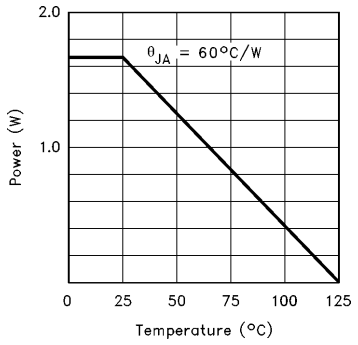
Pins 2, 18, 20 connected to V_{DD}

Simplified Schematic



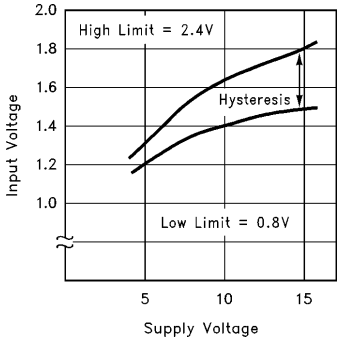
Typical Performance Curves

Max Power/Derating Curves



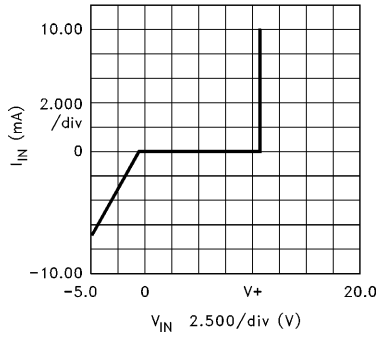
7412-5

Switch Threshold vs Supply Voltage



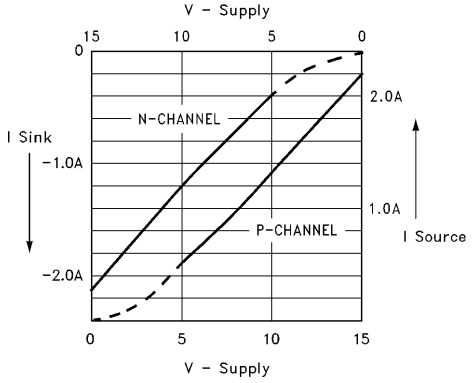
7412-6

Input Current vs Voltage



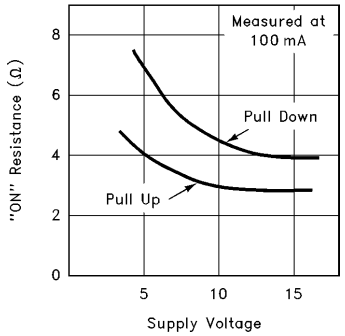
7412-7

Peak Drive vs Supply Voltage



7412-8

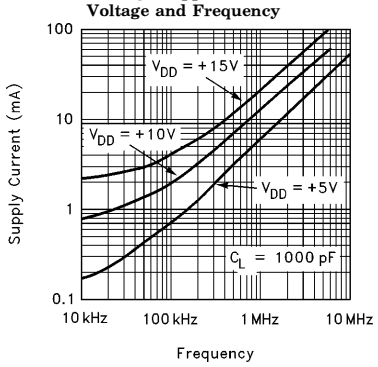
"ON" Resistance vs Supply Voltage



7412-10

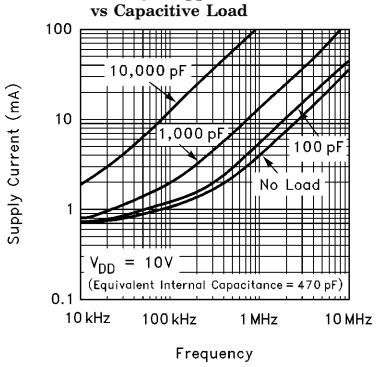
Typical Performance Curves — Contd.

Average Supply Current vs Voltage and Frequency



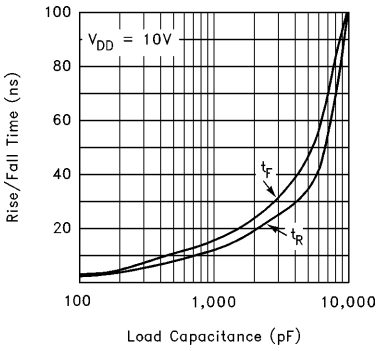
7412-11

Average Supply Current vs Capacitive Load



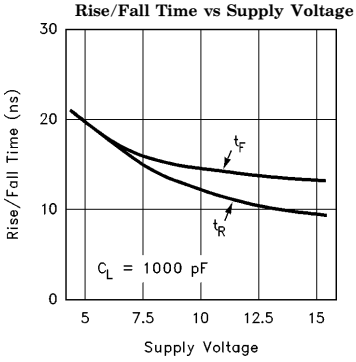
7412-12

Rise/Fall Time vs Load



7412-13

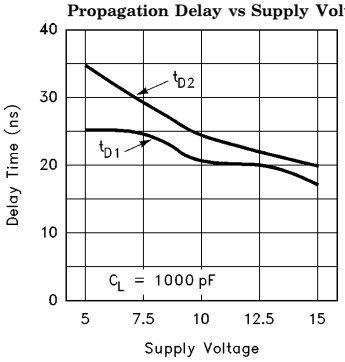
Rise/Fall Time vs Supply Voltage



7412-14

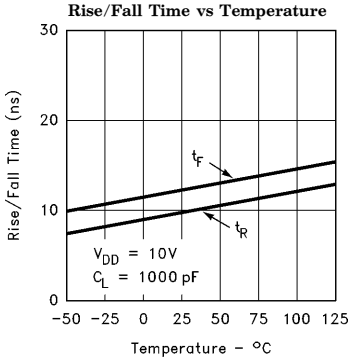
Typical Performance Curves — Contd.

Propagation Delay vs Supply Voltage



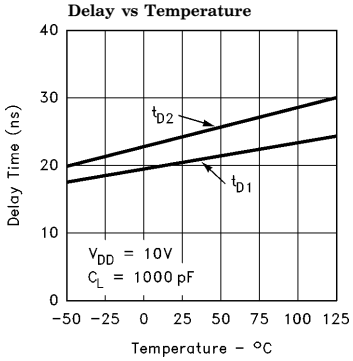
7412-15

Rise/Fall Time vs Temperature



7412-16

Delay vs Temperature



7412-17

BLANK

EL7412C
High Speed, Four Channel Power MOSFET Drivers

General Disclaimer

Specifications contained in this data sheet are in effect as of the publication date shown. Elantec, Inc. reserves the right to make changes in the circuitry or specifications contained herein at any time without notice. Elantec, Inc. assumes no responsibility for the use of any circuits described herein and makes no representations that they are free from patent infringement.

élantec
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

WARNING — Life Support Policy

Elantec, Inc. products are not authorized for and should not be used within Life Support Systems without the specific written consent of Elantec, Inc. Life Support systems are equipment intended to support or sustain life and whose failure to perform when properly used in accordance with instructions provided can be reasonably expected to result in significant personal injury or death. Users contemplating application of Elantec, Inc. products in Life Support Systems are requested to contact Elantec, Inc. factory headquarters to establish suitable terms & conditions for these applications. Elantec, Inc.'s warranty is limited to replacement of defective components and does not cover injury to persons or property or other consequential damages.

January 1996 Rev B

Printed in U.S.A.