

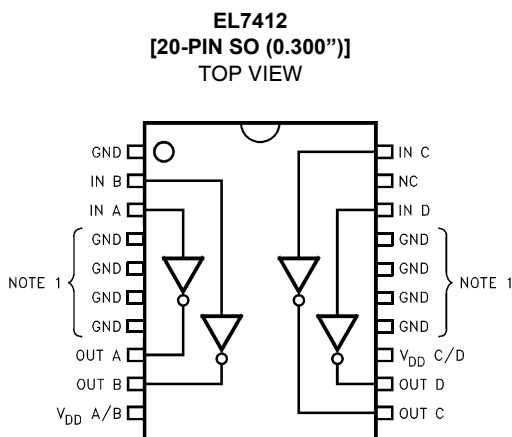
EL7412

High Speed, Four Channel Power MOSFET Drivers

FN7287
Rev 1.00
August 26, 2004

The EL7412 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.

Pinout



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

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

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
- Pb-free available

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 NUMBER | PACKAGE | TAPE & REEL | PKG. DWG. # |
|-----------------------------|---------------------------------|-------------|-------------|
| EL7412CM | 20-Pin SO (0.300") | - | MDP0027 |
| EL7412CM-T13 | 20-Pin SO (0.300") | 13" | MDP0027 |
| EL7412CMZ (See Note) | 20-Pin SO (0.300") (Pb-free) | - | MDP0027 |
| EL7412CMZ-T13 (See Note) | 20-Pin SO (0.300") (Pb-free) | 13" | MDP0027 |

NOTE: Intersil Pb-free products employ special Pb-free material sets; molding compounds/die attach materials and 100% matte tin plate termination finish, which is compatible with both SnPb and Pb-free soldering operations. Intersil Pb-free products are MSL classified at Pb-free peak reflow temperatures that meet or exceed the Pb-free requirements of IPC/JEDEC J-Std-020C.

Absolute Maximum Ratings (T_A = 25°C)

Supply (V+ to Gnd) 16.5V
 Input Pins -0.3V to +0.3V above V+
 Combined Peak Output Current8A
 Storage Temperature Range -65°C to +150°C

Ambient Operating Temperature -40°C to +85°C
 Operating Junction Temperature 125°C
 Power Dissipation See Curves

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

IMPORTANT NOTE: All parameters having Min/Max specifications are guaranteed. Typical values are for information purposes only. Unless otherwise noted, all tests are at the specified temperature and are pulsed tests, therefore: T_J = T_C = T_A

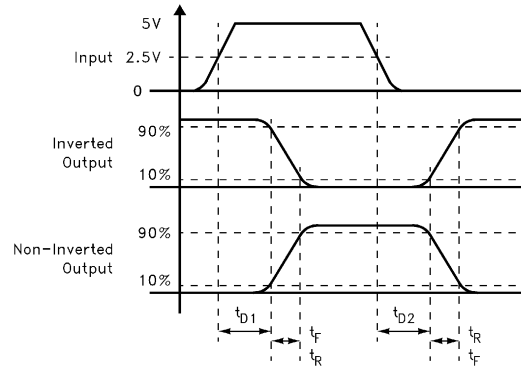
DC Electrical Specifications T_A = 25°C, V_{DD} = 15V unless otherwise specified

| PARAMETER | DESCRIPTION | TEST CONDITIONS | MIN | TYP | MAX | UNITS |
|---------------------|---------------------------|---------------------------|-----|--------|-----|-------|
| INPUT | | | | | | |
| V _{IH} | Logic "1" Input Voltage | | 2.4 | | | V |
| I _{IH} | Logic "1" Input Current | @V _{DD} | | 0.1 | 10 | μA |
| V _{IL} | Logic "0" Input Voltage | | | | 0.8 | V |
| I _{IL} | Logic "0" Input Current | @0V | | 0.1 | 10 | μA |
| V _{HVS} | Input Hysteresis | | | 0.3 | | V |
| OUTPUT | | | | | | |
| R _{OH} | Pull-Up Resistance | I _{OUT} = -100mA | | 3 | 6 | Ω |
| R _{OL} | Pull-Down Resistance | I _{OUT} = +100mA | | 4 | 6 | Ω |
| I _{PK} | Peak Output Current | Source Sink | | 2 2 | | A |
| I _{DC} | Continuous Output Current | Source/Sink | 100 | | | mA |
| POWER SUPPLY | | | | | | |
| I _S | Power Supply Current | Inputs High | | 2 | 5 | mA |
| V _S | Operating Voltage | | 4.5 | | 15 | V |

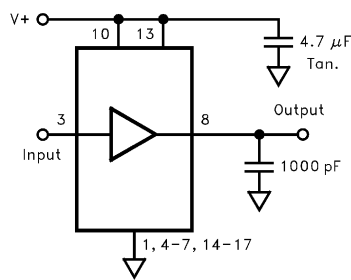
AC Electrical Specifications T_A = 25°C, V = 15V unless otherwise specified

| PARAMETER | DESCRIPTION | TEST CONDITIONS | MIN | TYP | MAX | UNITS |
|----------------------------------|---------------------|---|-----|-----------|-----|-------|
| SWITCHING CHARACTERISTICS | | | | | | |
| t _R | Rise Time | C _L = 500pF C _L = 1000pF | | 7.5 10 | 20 | ns |
| t _F | Fall Time | C _L = 500pF C _L = 1000pF | | 10 13 | 20 | ns |
| t _{D1} | Turn-On Delay Time | See Timing Table | | 18 | 25 | ns |
| t _{D2} | Turn-Off Delay Time | See Timing Table | | 20 | 25 | ns |

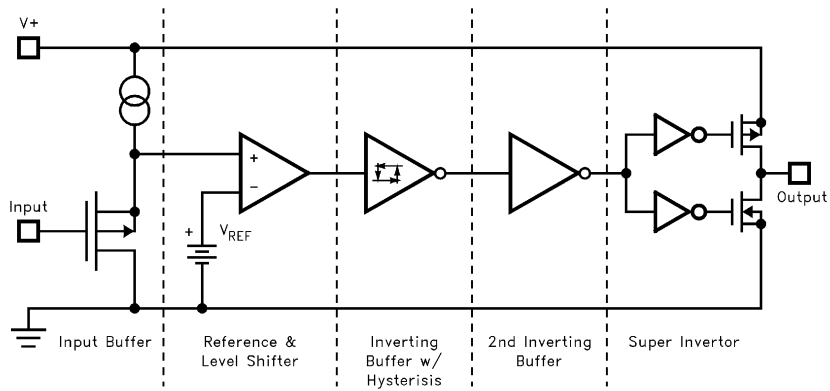
Timing Table



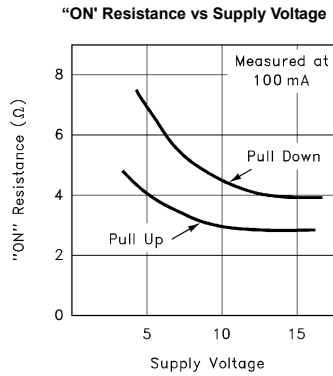
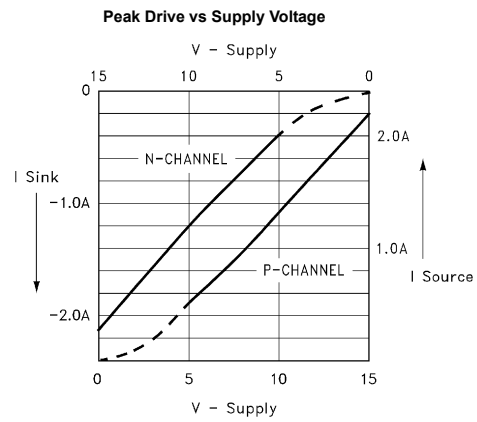
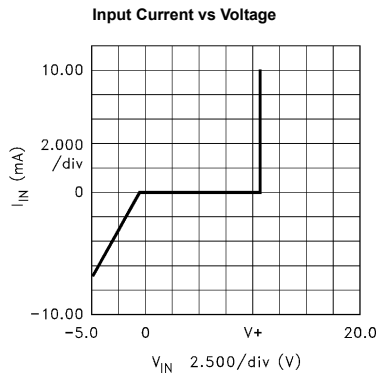
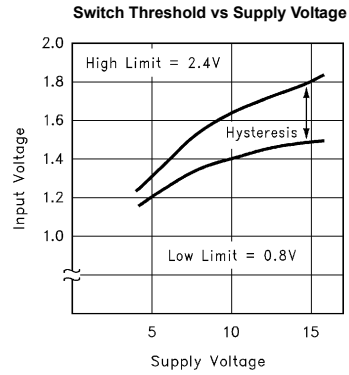
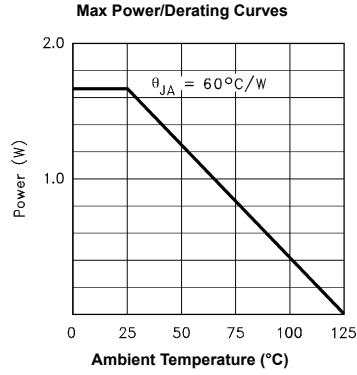
Standard Test Configuration



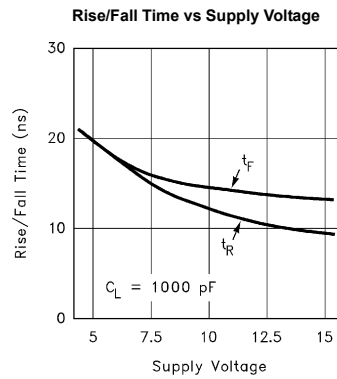
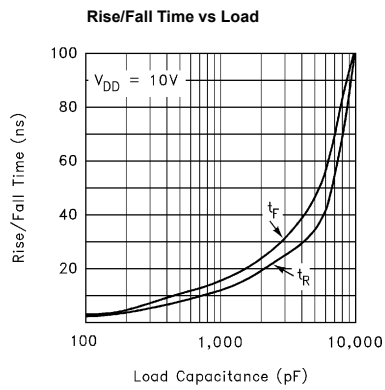
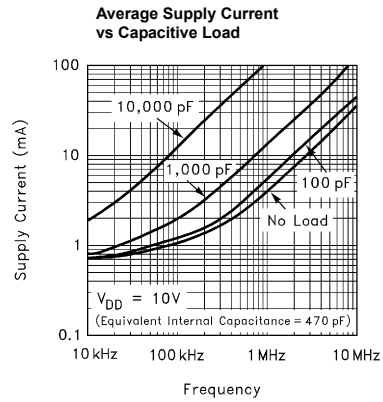
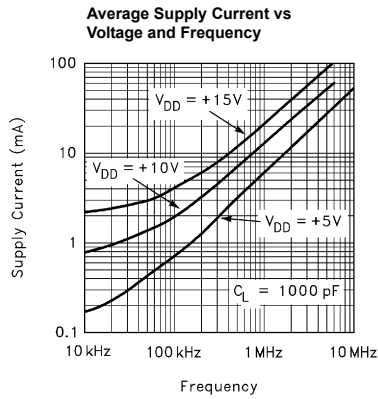
Simplified Schematic



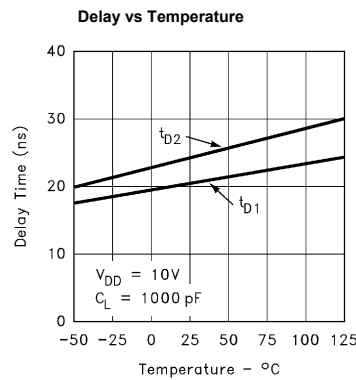
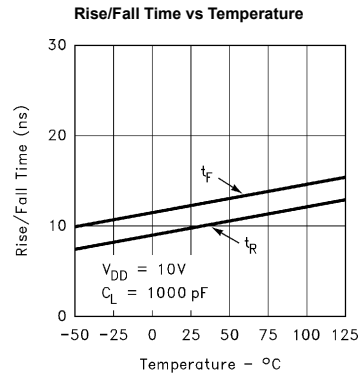
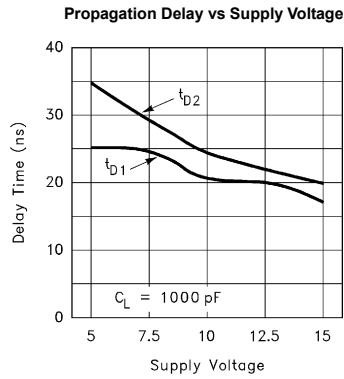
Typical Performance Curves



Typical Performance Curves (Continued)



Typical Performance Curves (Continued)



© Copyright Intersil Americas LLC 2004. All Rights Reserved.
All trademarks and registered trademarks are the property of their respective owners.

For additional products, see www.intersil.com/en/products.html

Intersil products are manufactured, assembled and tested utilizing ISO9001 quality systems as noted in the quality certifications found at www.intersil.com/en/support/qualandreliability.html

Intersil products are sold by description only. Intersil may modify the circuit design and/or specifications of products at any time without notice, provided that such modification does not, in Intersil's sole judgment, affect the form, fit or function of the product. Accordingly, the reader is cautioned to verify that datasheets are current before placing orders. Information furnished by Intersil is believed to be accurate and reliable. However, no responsibility is assumed by Intersil or its subsidiaries for its use; nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Intersil or its subsidiaries.

For information regarding Intersil Corporation and its products, see www.intersil.com