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EL7412

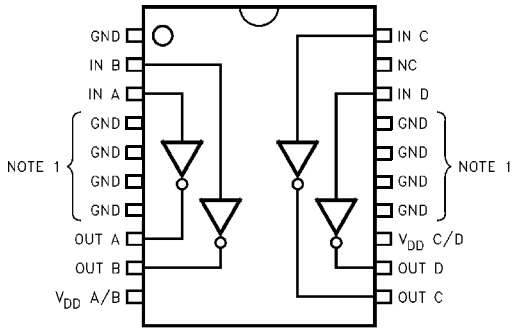
High Speed, Four Channel Power MOSFET Drivers

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

EL7412
[20-PIN SO (0.300”)]
TOP VIEW



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 Current. 8A
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: $T_J = T_C = T_A$

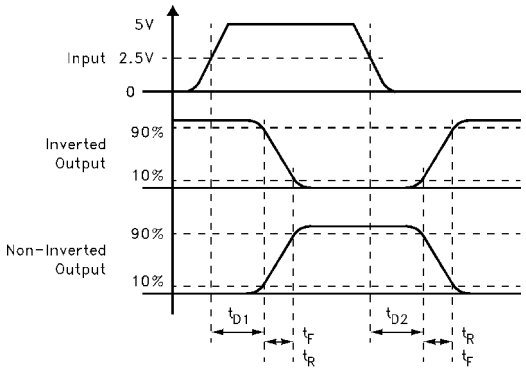
DC Electrical Specifications T_A = 25°C, V_{DD} = 15V unless otherwise specified

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

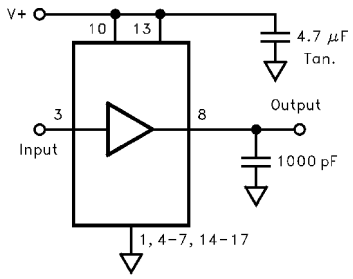
AC Electrical Specifications T_A = 25°C, V = 15V unless otherwise specified

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

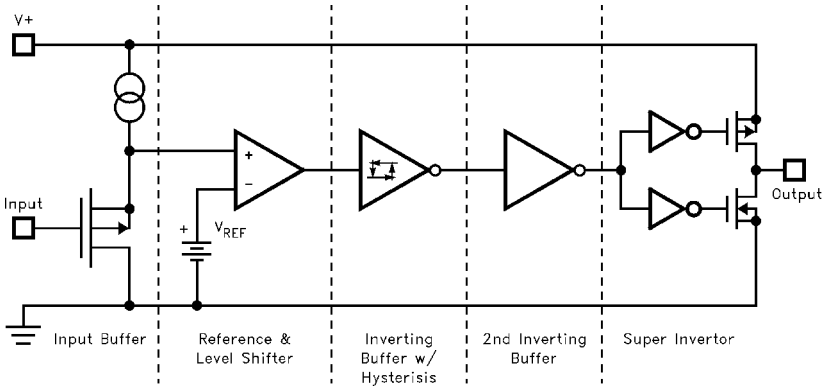
Timing Table



Standard Test Configuration

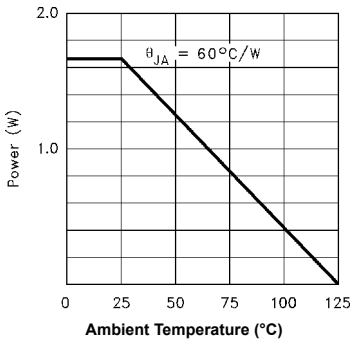


Simplified Schematic

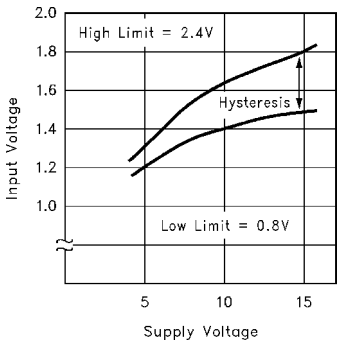


Typical Performance Curves

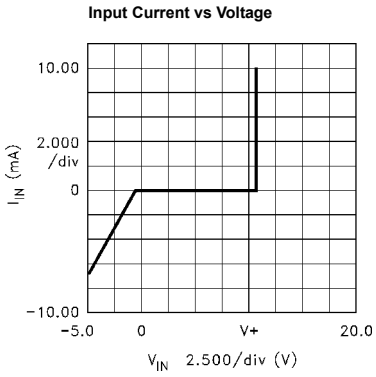
Max Power/Derating Curves



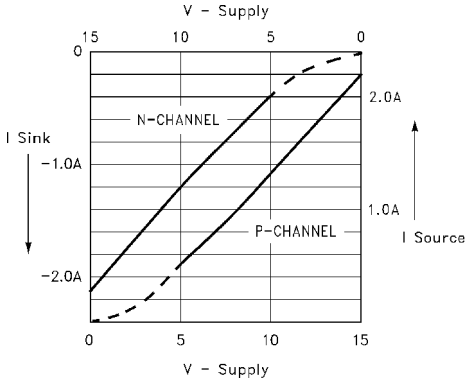
Switch Threshold vs Supply Voltage



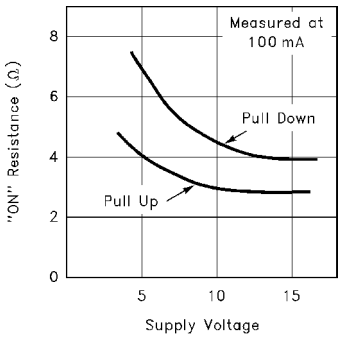
Input Current vs Voltage



Peak Drive vs Supply Voltage

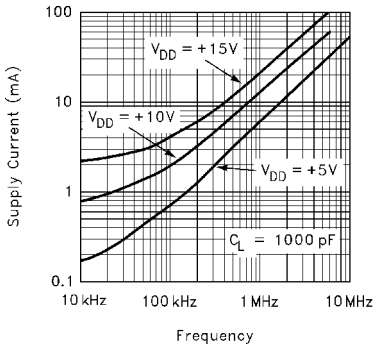


"ON" Resistance vs Supply Voltage

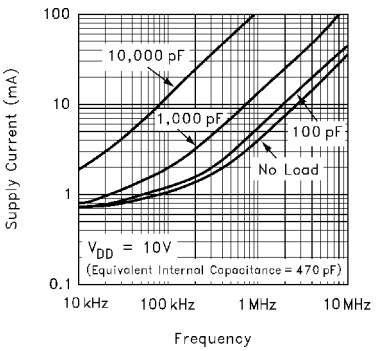


Typical Performance Curves (Continued)

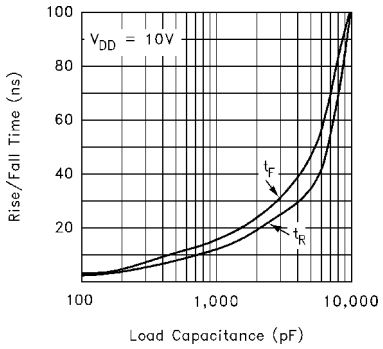
Average Supply Current vs Voltage and Frequency



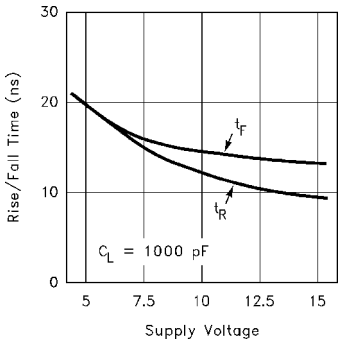
Average Supply Current vs Capacitive Load



Rise/Fall Time vs Load

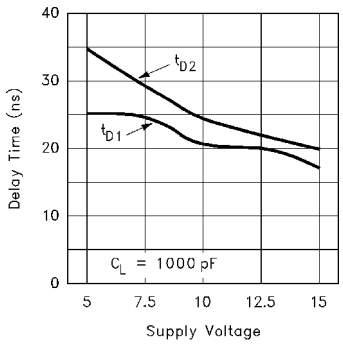


Rise/Fall Time vs Supply Voltage

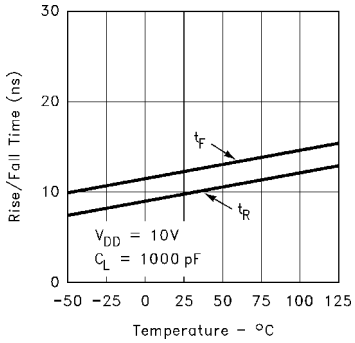


Typical Performance Curves (Continued)

Propagation Delay vs Supply Voltage



Rise/Fall Time vs Temperature



Delay vs Temperature