élantec
HIGH PERFORMANCE ANALOG INTEGRATED CIRCUITS

EL7202C/7212C/7222C

High Speed, Dual Channel Power MOSFET Drivers

Features

- Industry standard driver replacement
- Improved 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

- 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

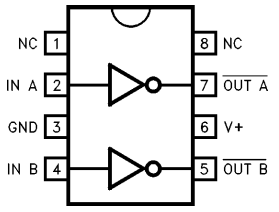
Part No.	Temp. Range	Pkg.	Outline #
EL7202CN	−40°C to +85°C	8-Pin P-DIP	MDP0031
EL7202CS	−40°C to +85°C	8-Pin SO	MDP0027
EL7212CN	−40°C to +85°C	8-Pin P-DIP	MDP0031
EL7212CS	−40°C to +85°C	8-Pin SO	MDP0027
EL7222CN	−40°C to +85°C	8-Pin P-DIP	MDP0031
EL7222CS	−40°C to +85°C	8-Pin SO	MDP0027

General Description

The EL7202C/EL7212C/EL7222C ICs are matched dual-drivers ICs that improve the operation of the industry standard DS0026 clock drivers. The Elantec Versions are very high speed drivers capable of delivering peak currents of 2.0 amps into highly capacitive loads. 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. These 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 Diagrams

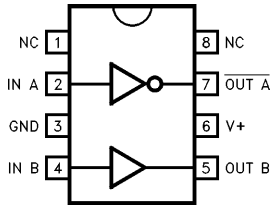
EL7212C



7202–1

Inverting Drivers

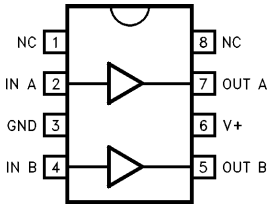
EL7222C



7202–2

Complementary Drivers

EL7202C



7202–3

Non-Inverting Drivers

Manufactured under U.S. Patent Nos. 5,334,883, #5,341,047

January 1996 Rev. B

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	4A	SOIC	570 mW
Storage Temperature Range	−65°C to +150°C	PDIP	1050 mW
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 = 15V unless otherwise specified

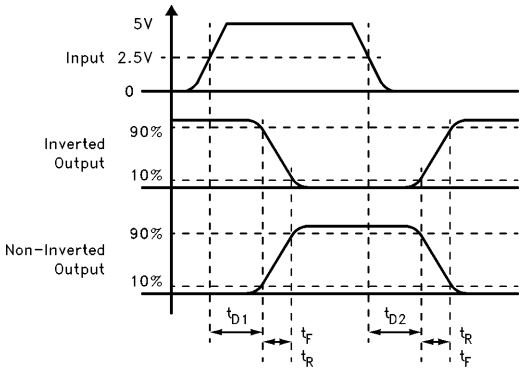
Parameter	Description	Test Conditions	Min	Typ	Max	Test Level	Units
Input							
V_{IH}	Logic "1" Input Voltage		2.4			I	V
I_{IH}	Logic "1" Input Current	@V+		0.1	10	I	µA
V_{IL}	Logic "0" Input Voltage				0.8	I	V
I_{IL}	Logic "0" Input Current	@0V		0.1	10	I	µA
V_{HVS}	Input Hysteresis			0.3		V	V
Output							
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/7202 Inputs High/7212 Inputs High/7222		4.5 1 2.5	7.5 2.5 5.0	I I I	mA
V_S	Operating Voltage		4.5		15	I	V

TD is 3.3in

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

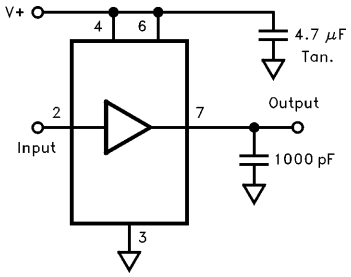
Parameter	Description	Test Conditions	Min	Typ	Max	Test Level	Units
Switching Characteristics							
t_R	Rise Time	C_L = 500 pF C_L = 1000 pF		7.5 10	 20	IV	ns
t_F	Fall Time	C_L = 500 pF C_L = 1000 pF		10 13	 20	IV	ns
t_{D1}	Turn-On Delay Time	See Timing Table		18	25	IV	ns
t_{D2}	Turn-Off Delay Time	See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

Timing Table



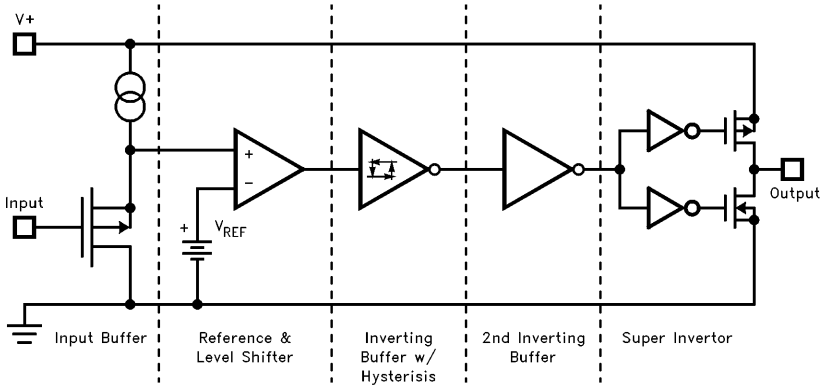
7202-4

Standard Test Configuration



7202-19

Simplified Schematic

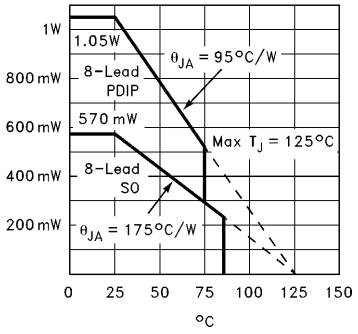


7202-5

TD is 1.5in

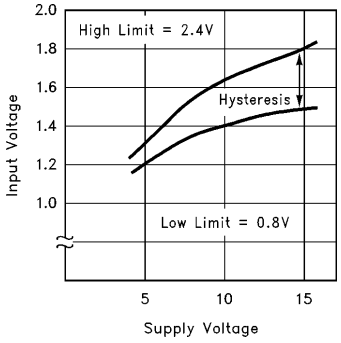
Typical Performance Curve

Max Power/Derating Curves



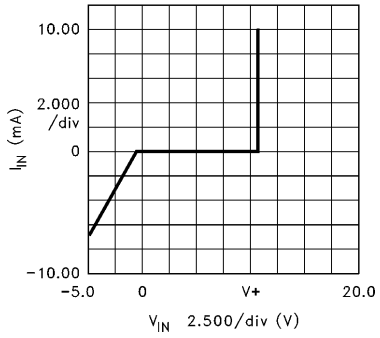
7202-6

Switch Threshold vs Supply Voltage



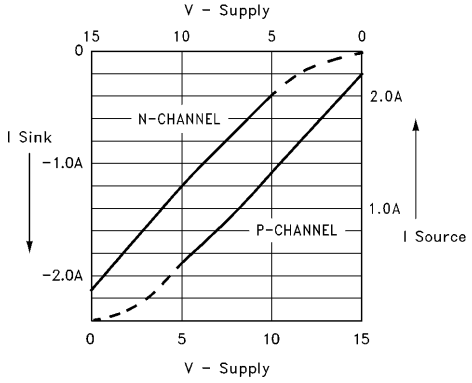
7202-7

Input Current vs Voltage



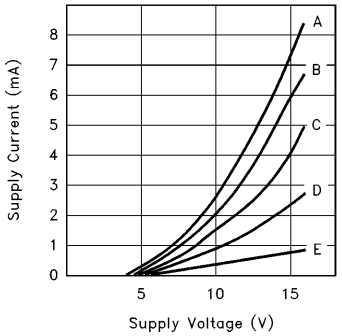
7202-8

Peak Drive vs Supply Voltage



7202-9

Quiescent Supply Current

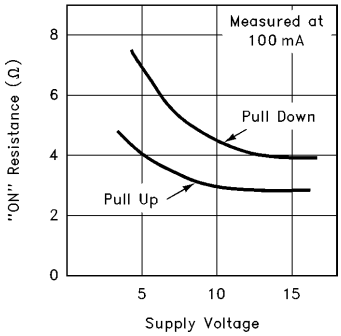


CASE:

Device	Input Level	Curve
EL7202	GND	A
EL7202	GND, V+	B
EL7202	V+	C
EL7212	GND	C
EL7212	GND, V+	D
EL7212	V+	E
EL7222	GND	B
EL7222	GND, V+	C
EL7222	V+	D

7202-10

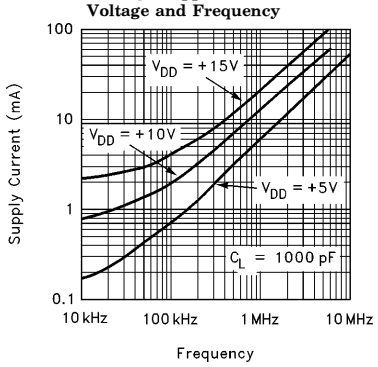
"ON" Resistance vs Supply Voltage



7202-11

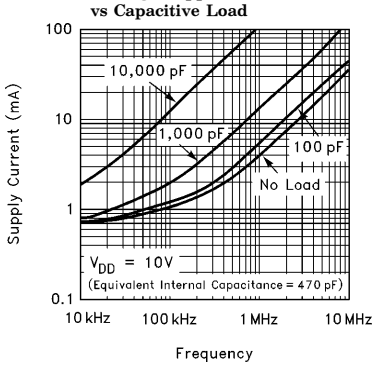
Typical Performance Curve — Contd.

Average Supply Current vs Voltage and Frequency



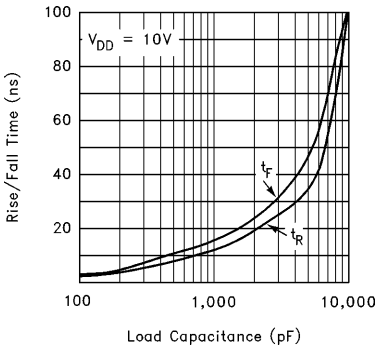
7202–12

Average Supply Current vs Capacitive Load



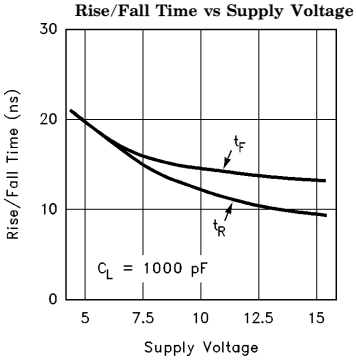
7202–13

Rise/Fall Time vs Load



7202–14

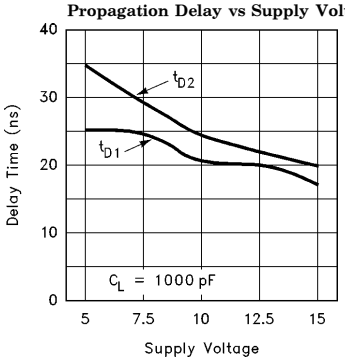
Rise/Fall Time vs Supply Voltage



7202–15

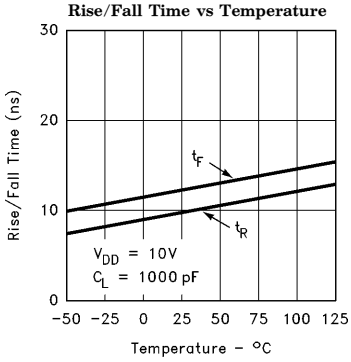
Typical Performance Curve — Contd.

Propagation Delay vs Supply Voltage



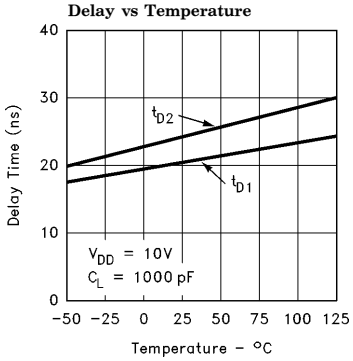
7202-16

Rise/Fall Time vs Temperature



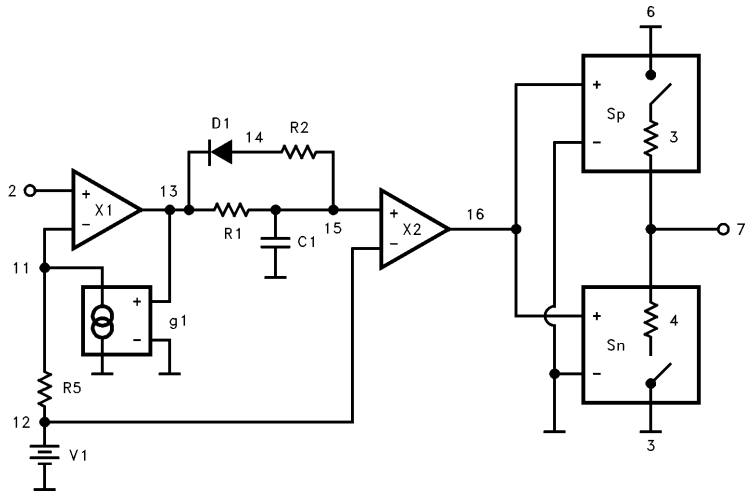
7202-17

Delay vs Temperature



7202-18

EL7212 Macro Model



7202–20

```
**** EL7212 model ****
*                input
*                |          gnd
*                |          |          Vsupply
*                |          |          |          Vout
.subckt M7212  2          3          6          7
V1 12 3 1.6
R1 13 15 1k
R2 14 15 5k
R5 11 12 100
C1 15 3 43.3 pF
D1 14 13 dmod
X1 13 11 2 3 comp1
X2 16 12 15 3 comp1
sp 6 7 16 3 spmod
sn 7 3 16 3 snmod
g1 11 0 13 0 938µ
.model dmod d
.model spmod vswitch ron=3 roff=2meg von=1 voff=1.5
.model snmod vswitch ron=4 roff=2meg von=3 voff=2
.ends M7212
.subckt comp1 out inp inm vss
e1 out vss table { (v(inp) –v(inm))* 5000} = (0,0) (3.2,3.2)
Rout out vss 10meg
Rinp inp vss 10meg
Rinm inm vss 10meg
.ends comp1
```

TD is 3.6in

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