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

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

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

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.
### Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply (V+ to Gnd)</td>
<td>16.5V</td>
</tr>
<tr>
<td>Input Pins</td>
<td>−0.3V to +0.3V above V+</td>
</tr>
<tr>
<td>Combined Peak Output Current</td>
<td>4A</td>
</tr>
<tr>
<td>Storage Temperature Range</td>
<td>−65°C to +150°C</td>
</tr>
<tr>
<td>Ambient Operating Temperature</td>
<td>−40°C to +85°C</td>
</tr>
<tr>
<td>Operating Junction Temperature</td>
<td>125°C</td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>570 mW</td>
</tr>
<tr>
<td>PDIP</td>
<td>1050 mW</td>
</tr>
</tbody>
</table>

### 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 Levels and Procedures

<table>
<thead>
<tr>
<th>Test Level</th>
<th>Test Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>100% production tested and QA sample tested per QA test plan QCX0002.</td>
</tr>
<tr>
<td>II</td>
<td>100% production tested at $T_A = 25°C$ and QA sample tested at $T_A = 25°C$,</td>
</tr>
<tr>
<td></td>
<td>$T_{MAX}$ and $T_{MIN}$ per QA test plan QCX0002.</td>
</tr>
<tr>
<td>III</td>
<td>QA sample tested per QA test plan QCX0002.</td>
</tr>
<tr>
<td>IV</td>
<td>Parameter is guaranteed (but not tested) by Design and Characterization Data.</td>
</tr>
<tr>
<td>V</td>
<td>Parameter is typical value at $T_A = 25°C$ for information purposes only.</td>
</tr>
</tbody>
</table>

### DC Electrical Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Test Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Test Level</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$V_{IH}$</td>
<td>Logic &quot;1&quot; Input Voltage</td>
<td></td>
<td>2.4</td>
<td>I</td>
<td>V</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td>$I_{IH}$</td>
<td>Logic &quot;1&quot; Input Current</td>
<td>@V+</td>
<td>0.1</td>
<td>10</td>
<td>I</td>
<td>$\mu$A</td>
<td></td>
</tr>
<tr>
<td>$V_{IL}$</td>
<td>Logic &quot;0&quot; Input Voltage</td>
<td></td>
<td>0.8</td>
<td>I</td>
<td>V</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td>$I_{IL}$</td>
<td>Logic &quot;0&quot; Input Current</td>
<td>@0V</td>
<td>0.1</td>
<td>10</td>
<td>I</td>
<td>$\mu$A</td>
<td></td>
</tr>
<tr>
<td>$V_{HVS}$</td>
<td>Input Hysteresis</td>
<td></td>
<td>0.3</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R_{OH}$</td>
<td>Pull-Up Resistance</td>
<td>$I_{OUT} = -100 mA$</td>
<td>3</td>
<td>6</td>
<td>I</td>
<td>$\Omega$</td>
<td></td>
</tr>
<tr>
<td>$R_{OL}$</td>
<td>Pull-Down Resistance</td>
<td>$I_{OUT} = +100 mA$</td>
<td>4</td>
<td>6</td>
<td>I</td>
<td>$\Omega$</td>
<td></td>
</tr>
<tr>
<td>$I_{PK}$</td>
<td>Peak Output Current</td>
<td>Source/Sink</td>
<td>2</td>
<td></td>
<td>IV</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>$I_{DC}$</td>
<td>Continuous Output Current</td>
<td>Source/Sink</td>
<td>100</td>
<td></td>
<td>I</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>Power Supply</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_S$</td>
<td>Power Supply Current</td>
<td>Inputs High/7202</td>
<td>4.5</td>
<td>7.5</td>
<td>I</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inputs High/7212</td>
<td>1</td>
<td>2.5</td>
<td>I</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inputs High/7222</td>
<td>2.5</td>
<td>5.0</td>
<td>I</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>$V_S$</td>
<td>Operating Voltage</td>
<td></td>
<td>4.5</td>
<td>15</td>
<td>I</td>
<td>V</td>
<td></td>
</tr>
</tbody>
</table>
**AC Electrical Characteristics** \( T_A = 25^\circ C, V = 15V \) unless otherwise specified

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Test Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Test Level</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>( t_R )</td>
<td>Rise Time</td>
<td>( C_L = 500 ) pF ( 1000 ) pF</td>
<td>7.5</td>
<td>10</td>
<td>20</td>
<td>IV</td>
<td>ns</td>
</tr>
<tr>
<td>( t_F )</td>
<td>Fall Time</td>
<td>( C_L = 500 ) pF ( 1000 ) pF</td>
<td>10</td>
<td>13</td>
<td>20</td>
<td>IV</td>
<td>ns</td>
</tr>
<tr>
<td>( t_{D1} )</td>
<td>Turn-On Delay Time</td>
<td>See Timing Table</td>
<td>18</td>
<td>25</td>
<td></td>
<td>IV</td>
<td>ns</td>
</tr>
<tr>
<td>( t_{D2} )</td>
<td>Turn-Off Delay Time</td>
<td>See Timing Table</td>
<td>20</td>
<td>25</td>
<td></td>
<td>IV</td>
<td>ns</td>
</tr>
</tbody>
</table>
EL7202C/EL7212C/EL7222C
High Speed, Dual Channel Power MOSFET Drivers

Typical Performance Curve

Max Power/Derating Curves

Switch Threshold vs Supply Voltage

Input Current vs Voltage

Peak Drive vs Supply Voltage

Quiescent Supply Current

"ON" Resistance vs Supply Voltage
Typical Performance Curve — Contd.

Average Supply Current vs Voltage and Frequency

- $V_{DD} = +15V$
- $V_{DD} = +10V$
- $V_{DD} = +5V$

Average Supply Current vs Capacitive Load

- $V_{DD} = 10V$
- Equivalent Internal Capacitance = 470 pF

Rise/Fall Time vs Load

- $V_{DD} = 10V$

Rise/Fall Time vs Supply Voltage

- $C_L = 1000 pF$
Typical Performance Curve — Contd.

- **Propagation Delay vs Supply Voltage**
  - $C_L = 1000 \, \text{pF}$
  - $v_{CC} = 10 \, \text{V}$

- **Rise/Fall Time vs Temperature**
  - $v_{CC} = 10 \, \text{V}$
  - $C_L = 1000 \, \text{pF}$

- **Delay vs Temperature**
  - $v_{CC} = 10 \, \text{V}$
  - $C_L = 1000 \, \text{pF}$
EL7202C/EL7212C/EL7222C
High Speed, Dual Channel Power MOSFET Drivers

EL7212 Macro Model

**** EL7212 model ****
* input
* | | ground
* | | 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
el out vss table \( (v(inp) - v(inm)) \times 5000 \) \((0,0) (3.2,3.2)\)
Rout out vss 10meg
Rinp inp vss 10meg
Rinm inm vss 10meg
.ends comp1
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