This note shows that Pericom’s ALVCH16244 is well balanced, well controlled, and much quieter than competing ALVCH16244s (see Table 1). With 20pF loading and no series resistor, the ALVCH16244 (Figure 1), with one bit switching, has a negligible undershoot compared to the competing part (Figure 2) which is 1.99V. Also with one bit switching, Pericom’s part has 373mV of overshoot which is 1/3 less than the competing part which has 996mV of overshoot. With 20pF loading and no series resistor, Pericom’s ALVCH16244 (Figure 3) has a ground bounce of less than 320mV compared to the competing part (Figure 4) which is 1.0V with ringback of 540mV.

Propagation delay for Pericom’s ALVCH16244 is the same as the competing part with all 16 bits switching, 20pF loading, and no series resistor. With one bit switching, Pericom’s ALVCH16244 has almost the same propagation delay as the competition with 20pF loading and no series resistor.

Pericom’s ALVCH16244 has 1.64ns of rise time and 1.20ns of fall time when all bits are switching and 1.20ns of rise time and 1.04ns of fall time when one bit is switching. The competitive ALVCH16244 has faster edge rates that contribute to the higher ground bounce.

Table 1. Direct Comparison of Pericom to Competitive Parts

<table>
<thead>
<tr>
<th></th>
<th>All 16 Bits Switching</th>
<th>One Bit Switching</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PERICOM</td>
<td>Competition</td>
</tr>
<tr>
<td>Propagation Delay</td>
<td>2.60ns</td>
<td>2.60ns</td>
</tr>
<tr>
<td>Rise Time</td>
<td>1.64ns</td>
<td>1.36ns</td>
</tr>
<tr>
<td>Fall Time</td>
<td>1.20ns</td>
<td>800ps</td>
</tr>
<tr>
<td>Overshoot</td>
<td>373mV</td>
<td>996mV</td>
</tr>
<tr>
<td>Undershoot</td>
<td>+320mV</td>
<td>+755mV</td>
</tr>
<tr>
<td>Ground Bounce</td>
<td>+320mV</td>
<td>+755mV</td>
</tr>
</tbody>
</table>

Figure 1. Pericom’s ALVCH16244 Undershoot
(Output follows input smoothly with undershoot of 650mV and no ringback.)
Figure 2. Competition’s ALVCH16244 Undershoot
(Competing part undershoot is 1.99V, three times that of Pericom’s part and with 540mV ringback.)

Figure 3. Pericom’s ALVCH16244 Ground Bounce
(Pericom’s ALVCH16244 Ground Bounce is ±320mV max., three times less than the competing part.)
Figure 4. Competition’ ALVCH16244 Ground Bounce

(Ground bounce has a swing of 1.75V, three time bigger than Pericom’s part.)

Pericom’s ALVCH16244

Input

Output

Input

Output

Competition’s ALVCH16244

Overshoot

Input

Output

Overshoot

Input

Output

Above figures shows that propagation delay is the same (2.60ns) for Pericom’s part and the Competing part when all 16 bits are switching with less overshoot and 20pF of loading and no series resistor.

Pericom’s ALVCH16244

Input

Output

Input

Output

Competition’s ALVCH16244

Overshoot

Input

Output

Overshoot

Input

Output

Above figures show that Pericom’s part has 1.64ns of Rise Time whereas the competing part has 1.36ns of Rise Time when all 16 bits are switching. The Pericom part demonstrates less overshoot. The figures on the next page show the fall time of 1.20ns for Pericom’s part and 800ps for a competitive part with all bits switching. The Pericom part demonstrates less undershoot.
Conclusion: Pericom’s ALVCH16244 has a one third the overshoot, undershoot and ground bounce with the same propagation delay as the competing ALVCH16244. Pericom’s part is well balanced, well controlled and much quieter without compromising rise/fall time and propagation delay.