1. General description

The 74HC253; 74HCT253 is a dual 4-bit multiplexer, each with four binary inputs (nI0 to nI3), an output enable input (nOE) and shared select inputs (S0 and S1). One of the four binary inputs is selected by the select inputs and routed to the output nY. A HIGH on nOE causes the outputs to assume a high-impedance OFF-state. Inputs include clamp diodes. This enables the use of current limiting resistors to interface inputs to voltages in excess of VCC.

2. Features and benefits

- Non-inverting data path
- 3-state outputs interface directly with system bus
- Complies with JEDEC standard no. 7A
- Common select inputs
- Separate output enable inputs
- Input levels:
  - For 74HC253: CMOS level
  - For 74HCT253: TTL level
- ESD protection:
  - HBM JESD22-A114F exceeds 2000 V
  - MM JESD22-A115-A exceeds 200 V
- Multiple package options
- Specified from −40 °C to +85 °C and from −40 °C to +125 °C

3. Applications

- Data selectors
- Data multiplexers
4. Ordering information

Table 1. Ordering information

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package</th>
<th>Temperature range</th>
<th>Name</th>
<th>Description</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>74HC253D</td>
<td>SO16</td>
<td>–40 °C to +125 °C</td>
<td>74HC253</td>
<td>plastic small outline package; 16 leads; body width 3.9 mm</td>
<td>SOT109-1</td>
</tr>
<tr>
<td>74HCT253D</td>
<td>SSOP16</td>
<td>–40 °C to +125 °C</td>
<td>74HCT253</td>
<td>plastic shrink small outline package; 16 leads; body width 5.3 mm</td>
<td>SOT338-1</td>
</tr>
</tbody>
</table>

5. Functional diagram

Fig 1. Logic symbol

Fig 2. Functional diagram
6. Pinning information

6.1 Pinning

Fig 3. Logic diagram

Fig 4. Pin configuration SO16

Fig 5. Pin configuration SSOP16
6.2 Pin description

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1OE, 2OE</td>
<td>1, 15</td>
<td>output enable inputs (active LOW)</td>
</tr>
<tr>
<td>S0, S1</td>
<td>14, 2</td>
<td>data select inputs</td>
</tr>
<tr>
<td>1I0, 1I1, 1I2, 1I3</td>
<td>6, 5, 4, 3</td>
<td>data inputs source 1</td>
</tr>
<tr>
<td>1Y</td>
<td>7</td>
<td>multiplexer output source 1</td>
</tr>
<tr>
<td>GND</td>
<td>8</td>
<td>ground (0 V)</td>
</tr>
<tr>
<td>2I0, 2I1, 2I2, 2I3</td>
<td>10, 11, 12, 13</td>
<td>data inputs source 2</td>
</tr>
<tr>
<td>VCC</td>
<td>16</td>
<td>supply voltage</td>
</tr>
</tbody>
</table>

7. Functional description

Table 3. Function table[1]

<table>
<thead>
<tr>
<th>select inputs</th>
<th>data inputs</th>
<th>output enable</th>
<th>output</th>
</tr>
</thead>
<tbody>
<tr>
<td>S0</td>
<td>S1</td>
<td>nI0</td>
<td>nI1</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>L</td>
<td>L</td>
<td>L</td>
<td>X</td>
</tr>
<tr>
<td>L</td>
<td>L</td>
<td>H</td>
<td>X</td>
</tr>
<tr>
<td>H</td>
<td>L</td>
<td>X</td>
<td>L</td>
</tr>
<tr>
<td>H</td>
<td>L</td>
<td>X</td>
<td>H</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>H</td>
<td>H</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>H</td>
<td>H</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

[1] H = HIGH voltage level; L = LOW voltage level; X = don’t care; Z = high-impedance OFF-state.

8. Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to GND (ground = 0 V).

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCC</td>
<td>supply voltage</td>
<td>-0.5</td>
<td>+7.0</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>IiK</td>
<td>input clamping current</td>
<td>$V_i &lt; -0.5 , \text{V}$ or $V_i &gt; V_{CC} + 0.5 , \text{V}$</td>
<td>$-, \text{I}^1$</td>
<td>$\pm 20$</td>
<td>mA</td>
</tr>
<tr>
<td>IOK</td>
<td>output clamping current</td>
<td>$V_O &lt; -0.5 , \text{V}$ or $V_O &gt; V_{CC} + 0.5 , \text{V}$</td>
<td>$\text{I}^1$</td>
<td>$\pm 50$</td>
<td>mA</td>
</tr>
<tr>
<td>IO</td>
<td>output current</td>
<td>$-0.5 , \text{V} &lt; V_O &lt; V_{CC} + 0.5 , \text{V}$</td>
<td>-</td>
<td>$\pm 35$</td>
<td>mA</td>
</tr>
<tr>
<td>ICC</td>
<td>supply current</td>
<td>-</td>
<td>70</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>IGND</td>
<td>ground current</td>
<td>-70</td>
<td>-</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>Tstg</td>
<td>storage temperature</td>
<td>-65</td>
<td>+150</td>
<td>°C</td>
<td></td>
</tr>
</tbody>
</table>
Table 4. Limiting values...continued
In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to GND (ground = 0 V).

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>total power dissipation</td>
<td>( T_{\text{amb}} = -40 , ^{\circ}\text{C} ) to +125 ( ^{\circ}\text{C} )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SO16 package</td>
<td>[2]</td>
<td>-500</td>
<td>mW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SSOP16 package</td>
<td>[3]</td>
<td>-500</td>
<td>mW</td>
<td></td>
</tr>
</tbody>
</table>

[1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

[2] \( P_{\text{tot}} \) derates linearly with 8 mW/K above 70 \( ^{\circ}\text{C} \).

[3] \( P_{\text{tot}} \) derates linearly with 5.5 mW/K above 60 \( ^{\circ}\text{C} \).

9. Recommended operating conditions

Table 5. Recommended operating conditions
Voltages are referenced to GND (ground = 0 V).

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>74HC253</th>
<th>74HCT253</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Min</td>
<td>Typ</td>
<td>Max</td>
</tr>
<tr>
<td>( V_{\text{CC}} )</td>
<td>supply voltage</td>
<td></td>
<td>2.0</td>
<td>5.0</td>
<td>6.0</td>
</tr>
<tr>
<td>( V_{\text{I}} )</td>
<td>input voltage</td>
<td>( V_{\text{CC}} )</td>
<td>0</td>
<td>-</td>
<td>( V_{\text{CC}} )</td>
</tr>
<tr>
<td>( V_{\text{O}} )</td>
<td>output voltage</td>
<td>( V_{\text{CC}} )</td>
<td>0</td>
<td>-</td>
<td>( V_{\text{CC}} )</td>
</tr>
<tr>
<td>( T_{\text{amb}} )</td>
<td>ambient temperature</td>
<td></td>
<td>-40</td>
<td>-</td>
<td>+125</td>
</tr>
<tr>
<td>( \Delta t/\Delta V )</td>
<td>input transition rise and fall rate</td>
<td>( V_{\text{CC}} = 2.0 , V )</td>
<td>-</td>
<td>-</td>
<td>625</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( V_{\text{CC}} = 4.5 , V )</td>
<td>-</td>
<td>1.67</td>
<td>139</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( V_{\text{CC}} = 6.0 , V )</td>
<td>-</td>
<td>-</td>
<td>83</td>
</tr>
</tbody>
</table>

10. Static characteristics

Table 6. Static characteristics
At recommended operating conditions; voltages are referenced to GND (ground = 0 V).

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>25 (^{\circ}\text{C})</th>
<th>-40 (^{\circ}\text{C}) to +85 (^{\circ}\text{C})</th>
<th>-40 (^{\circ}\text{C}) to +125 (^{\circ}\text{C})</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Min</td>
<td>Typ</td>
<td>Max</td>
<td>Min</td>
</tr>
</tbody>
</table>

74HC253

| \( V_{\text{IH}} \) | HIGH-level input voltage | \( V_{\text{CC}} = 2.0 \, V \) | 1.5 | 1.2 | -   | 1.5 | -   | -   |  V |
|                     |                           | \( V_{\text{CC}} = 4.5 \, V \) | 3.15 | 2.4 | -   | 3.15 | -   | -   |  V |
|                     |                           | \( V_{\text{CC}} = 6.0 \, V \) | 4.2  | 3.2 | -   | 4.2  | -   | -   |  V |
| \( V_{\text{IL}} \) | LOW-level input voltage | \( V_{\text{CC}} = 2.0 \, V \) | -   | 0.8 | 0.5 | -   | 0.5 | -   |  V |
|                     |                           | \( V_{\text{CC}} = 4.5 \, V \) | -   | 2.1 | 1.35 | - | 1.35 | -   |  V |
|                     |                           | \( V_{\text{CC}} = 6.0 \, V \) | -   | 2.8 | 1.8 | -   | 1.8 | -   |  V |
| \( V_{\text{OH}} \) | HIGH-level output voltage | \( V_{\text{I}} = V_{\text{IH}} \) or \( V_{\text{IL}} \) | 1.9  | 2.0 | 1.9 | -   | 1.9 | -   |  V |
|                     |                           | \( I_{\text{O}} = -20 \, \mu A; V_{\text{CC}} = 2.0 \, V \) | 4.4  | 4.5 | 4.4 | -   | 4.4 | -   |  V |
|                     |                           | \( I_{\text{O}} = -20 \, \mu A; V_{\text{CC}} = 4.5 \, V \) | 5.9  | 6.0 | 5.9 | -   | 5.9 | -   |  V |
|                     |                           | \( I_{\text{O}} = -6.0 \, mA; V_{\text{CC}} = 4.5 \, V \) | 3.98 | 4.32 | 3.84 | - | 3.7 | -   |  V |
|                     |                           | \( I_{\text{O}} = -7.8 \, mA; V_{\text{CC}} = 6.0 \, V \) | 5.48 | 5.81 | 5.34 | - | 5.2 | -   |  V |
Table 6. Static characteristics ...continued
At recommended operating conditions; voltages are referenced to GND (ground = 0 V).

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>25 °C</th>
<th>-40 °C to +85 °C</th>
<th>-40 °C to +125 °C</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Min</td>
<td>Typ</td>
<td>Max</td>
<td>Min</td>
</tr>
<tr>
<td>VOL</td>
<td>LOW-level output voltage</td>
<td>( V_I = V_{IH} ) or ( V_{IL} )</td>
<td>( I_O = 20 \ \mu A; \ V_{CC} = 2.0 \ \text{V} )</td>
<td>- 0</td>
<td>0.1</td>
<td>- 0.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>( I_O = 20 \ \mu A; \ V_{CC} = 4.5 \ \text{V} )</td>
<td>- 0</td>
<td>0.1</td>
<td>- 0.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>( I_O = 20 \ \mu A; \ V_{CC} = 6.0 \ \text{V} )</td>
<td>- 0</td>
<td>0.1</td>
<td>- 0.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>( I_O = 6.0 \ \text{mA}; \ V_{CC} = 4.5 \ \text{V} )</td>
<td>- 0.15</td>
<td>0.26</td>
<td>- 0.33</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>( I_O = 7.8 \ \text{mA}; \ V_{CC} = 6.0 \ \text{V} )</td>
<td>- 0.16</td>
<td>0.26</td>
<td>- 0.33</td>
</tr>
<tr>
<td>Ii</td>
<td>input leakage current</td>
<td>( V_I = V_{CC} ) or GND; ( V_{CC} = 6.0 \ \text{V} )</td>
<td>- -</td>
<td>±0.1</td>
<td>- ±1.0</td>
<td>- ±1.0</td>
</tr>
<tr>
<td>Ioz</td>
<td>OFF-state output current</td>
<td>( V_I = V_{IH} ) or ( V_{IL} ); ( V_O = V_{CC} ) or GND; ( V_{CC} = 6.0 \ \text{V} )</td>
<td>- -</td>
<td>±0.5</td>
<td>- ±5.0</td>
<td>- ±10.0</td>
</tr>
<tr>
<td>Icc</td>
<td>supply current</td>
<td>( V_I = V_{CC} ) or GND; ( I_O = 0 \ \text{A} ); ( V_{CC} = 6.0 \ \text{V} )</td>
<td>- -</td>
<td>8.0</td>
<td>- 80</td>
<td>- 160</td>
</tr>
<tr>
<td>Ci</td>
<td>input capacitance</td>
<td>-</td>
<td>3.5</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
</tbody>
</table>

74HCT253

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>25 °C</th>
<th>-40 °C to +85 °C</th>
<th>-40 °C to +125 °C</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Min</td>
<td>Typ</td>
<td>Max</td>
<td>Min</td>
</tr>
<tr>
<td>VH</td>
<td>HIGH-level input voltage</td>
<td>( V_I = V_{IH} ) or ( V_{IL} ); ( V_{CC} = 4.5 \ \text{V} ) to ( 5.5 \ \text{V} )</td>
<td>2.0</td>
<td>1.6</td>
<td>- 2.0</td>
<td>- 2.0</td>
</tr>
<tr>
<td>VL</td>
<td>LOW-level input voltage</td>
<td>( V_I = V_{IH} ) or ( V_{IL} ); ( V_{CC} = 4.5 \ \text{V} ) to ( 5.5 \ \text{V} )</td>
<td>-</td>
<td>1.2</td>
<td>0.8</td>
<td>- 0.8</td>
</tr>
<tr>
<td>VOH</td>
<td>HIGH-level output voltage</td>
<td>( V_I = V_{IH} ) or ( V_{IL} ); ( V_{CC} = 4.5 \ \text{V} )</td>
<td>( I_O = -20 \ \mu A )</td>
<td>4.4</td>
<td>4.5</td>
<td>- 4.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>( I_O = -6 \ \text{mA} )</td>
<td>3.98</td>
<td>4.32</td>
<td>- 3.84</td>
</tr>
<tr>
<td>VOL</td>
<td>LOW-level output voltage</td>
<td>( V_I = V_{IH} ) or ( V_{IL} ); ( V_{CC} = 4.5 \ \text{V} )</td>
<td>( I_O = 20 \ \mu A )</td>
<td>-</td>
<td>0.1</td>
<td>- 0.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>( I_O = 6.0 \ \text{mA} )</td>
<td>- 0.15</td>
<td>0.26</td>
<td>- 0.33</td>
</tr>
<tr>
<td>Ii</td>
<td>input leakage current</td>
<td>( V_I = V_{CC} ) or GND; ( V_{CC} = 5.5 \ \text{V} )</td>
<td>- -</td>
<td>±0.1</td>
<td>- ±1.0</td>
<td>- ±1.0</td>
</tr>
<tr>
<td>Ioz</td>
<td>OFF-state output current</td>
<td>( V_I = V_{IH} ) or ( V_{IL} ); ( V_O = V_{CC} ) or GND; ( V_{CC} = 5.5 \ \text{V} )</td>
<td>- -</td>
<td>±0.5</td>
<td>- ±5.0</td>
<td>- ±10</td>
</tr>
<tr>
<td>Icc</td>
<td>supply current</td>
<td>( V_I = V_{CC} ) or GND; ( I_O = 0 \ \text{A} ); ( V_{CC} = 5.5 \ \text{V} )</td>
<td>- -</td>
<td>8.0</td>
<td>- 80</td>
<td>- 160</td>
</tr>
<tr>
<td>ΔIcc</td>
<td>additional supply current</td>
<td>( V_I = V_{CC} ) (- 2.1 \ \text{V} ); other inputs at ( V_{CC} ) or GND; ( V_{CC} = 4.5 \ \text{V} ) to ( 5.5 \ \text{V} ); ( I_O = 0 \ \text{A} )</td>
<td>per input pin; 1In, 2In inputs</td>
<td>40</td>
<td>144</td>
<td>- 180</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>per input pin; nOE input</td>
<td>110</td>
<td>396</td>
<td>- 495</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>per input pin; Sn input</td>
<td>110</td>
<td>396</td>
<td>- 495</td>
</tr>
<tr>
<td>Ci</td>
<td>input capacitance</td>
<td>-</td>
<td>3.5</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
</tbody>
</table>
## 11. Dynamic characteristics

Table 7. Dynamic characteristics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>25 °C</th>
<th>-40 °C to +85 °C</th>
<th>-40 °C to +125 °C</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Typ</td>
<td>Max</td>
<td>Max</td>
<td>Max</td>
</tr>
<tr>
<td>74HC253</td>
<td>propagation delay</td>
<td>1ln to 1Y or 2ln to 2Y: see Figure 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>V\textsubscript{CC} = 2.0 V</td>
<td>55</td>
<td>175</td>
<td>220</td>
<td>265 ns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V\textsubscript{CC} = 4.5 V</td>
<td>20</td>
<td>35</td>
<td>44</td>
<td>53 ns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V\textsubscript{CC} = 5.0 V; C\textsubscript{L} = 15 pF</td>
<td>17</td>
<td>-</td>
<td>-</td>
<td>- ns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V\textsubscript{CC} = 6.0 V</td>
<td>16</td>
<td>30</td>
<td>37</td>
<td>45 ns</td>
</tr>
<tr>
<td></td>
<td>enable time</td>
<td>n\text{OE} to nY; see Figure 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>V\textsubscript{CC} = 2.0 V</td>
<td>58</td>
<td>175</td>
<td>220</td>
<td>265 ns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V\textsubscript{CC} = 4.5 V</td>
<td>21</td>
<td>35</td>
<td>44</td>
<td>53 ns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V\textsubscript{CC} = 5.0 V; C\textsubscript{L} = 15 pF</td>
<td>18</td>
<td>-</td>
<td>-</td>
<td>- ns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V\textsubscript{CC} = 6.0 V</td>
<td>17</td>
<td>30</td>
<td>37</td>
<td>45 ns</td>
</tr>
<tr>
<td></td>
<td>disable time</td>
<td>n\text{OE} to nY; see Figure 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>V\textsubscript{CC} = 2.0 V</td>
<td>41</td>
<td>150</td>
<td>190</td>
<td>225 ns</td>
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<tr>
<td></td>
<td></td>
<td>V\textsubscript{CC} = 4.5 V</td>
<td>15</td>
<td>30</td>
<td>38</td>
<td>45 ns</td>
</tr>
<tr>
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<td></td>
<td>V\textsubscript{CC} = 6.0 V</td>
<td>12</td>
<td>26</td>
<td>33</td>
<td>38 ns</td>
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<tr>
<td></td>
<td>transition time</td>
<td>see Figure 6</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>V\text{CC} = 2.0 V</td>
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<td>60</td>
<td>75</td>
<td>90 ns</td>
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<tr>
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<td></td>
<td>V\text{CC} = 4.5 V</td>
<td>5</td>
<td>12</td>
<td>15</td>
<td>18 ns</td>
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<td></td>
<td></td>
<td>V\text{CC} = 6.0 V</td>
<td>4</td>
<td>10</td>
<td>13</td>
<td>15 ns</td>
</tr>
<tr>
<td></td>
<td>power dissipation capacitance</td>
<td>per multiplexer; V\text{I} = GND to V\text{CC}</td>
<td>55</td>
<td>-</td>
<td>-</td>
<td>- pF</td>
</tr>
<tr>
<td>74HCT253</td>
<td>propagation delay</td>
<td>1ln to 1Y or 2ln to 2Y; see Figure 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>V\text{CC} = 4.5 V</td>
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<td>38</td>
<td>48</td>
<td>57 ns</td>
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<td></td>
<td></td>
<td>V\text{CC} = 5.0 V; C\text{L} = 15 pF</td>
<td>17</td>
<td>-</td>
<td>-</td>
<td>- ns</td>
</tr>
<tr>
<td></td>
<td>enable time</td>
<td>n\text{OE} to nY; see Figure 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>V\text{CC} = 4.5 V</td>
<td>22</td>
<td>40</td>
<td>50</td>
<td>60 ns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V\text{CC} = 5.0 V; C\text{L} = 15 pF</td>
<td>19</td>
<td>-</td>
<td>-</td>
<td>- ns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V\text{CC} = 6.0 V</td>
<td>14</td>
<td>30</td>
<td>38</td>
<td>45 ns</td>
</tr>
</tbody>
</table>
### 12. Waveforms

Fig 6. Propagation delays input (Sn, 1ln, 2ln) to output (nY) and output (nY) transition times
Measurement points are given in Table 8.

$V_{OL}$ and $V_{OH}$ are typical voltage output levels that occur with the output load.

**Fig 7.** 3-state output enable and disable times

<table>
<thead>
<tr>
<th>Type</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$V_M$</td>
<td>$V_M$</td>
</tr>
<tr>
<td>74HC253</td>
<td>0.5$V_{CC}$</td>
<td>0.5$V_{CC}$</td>
</tr>
<tr>
<td>74HCT253</td>
<td>1.3 V</td>
<td>1.3 V</td>
</tr>
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</table>
Measurement points are given in Table 8 and test data is given in Table 9.

Definitions test circuit:
- $R_T = \text{Termination resistance should be equal to output impedance } Z_o \text{ of the pulse generator.}$
- $C_L = \text{Load capacitance including jig and probe capacitance.}$
- $R_L = \text{Load resistor.}$

**Fig 8. Test circuit for measuring switching times**

<table>
<thead>
<tr>
<th>Type</th>
<th>Input</th>
<th>$t_{r, t_f}$</th>
<th>Load</th>
<th>Switch position</th>
</tr>
</thead>
<tbody>
<tr>
<td>74HC253</td>
<td>$V_{CC}$</td>
<td>6 ns</td>
<td>50 pF</td>
<td>1 k$\Omega$</td>
</tr>
<tr>
<td>74HCT253</td>
<td>3 V</td>
<td>6 ns</td>
<td>50 pF</td>
<td>1 k$\Omega$</td>
</tr>
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</table>
13. Package outline

SO16: plastic small outline package; 16 leads; body width 3.9 mm

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**Fig 9. Package outline SOT109-1 (SO16)**

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<tr>
<th>UNIT</th>
<th>A max.</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>Bp</th>
<th>c</th>
<th>D(1)</th>
<th>E(1)</th>
<th>e</th>
<th>Hx</th>
<th>L</th>
<th>Lp</th>
<th>Q</th>
<th>V</th>
<th>W</th>
<th>Y</th>
<th>Z(1)</th>
<th>θ</th>
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<tbody>
<tr>
<td>mm</td>
<td>1.75</td>
<td>0.25</td>
<td>1.45</td>
<td>0.25</td>
<td>0.49</td>
<td>0.25</td>
<td>0.98</td>
<td>10.0</td>
<td>4.0</td>
<td>1.27</td>
<td>6.2</td>
<td>1.05</td>
<td>0.7</td>
<td>0.7</td>
<td>0.3</td>
<td>8°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>inches</td>
<td>0.069</td>
<td>0.010</td>
<td>0.057</td>
<td>0.01</td>
<td>0.019</td>
<td>0.014</td>
<td>0.010</td>
<td>0.0075</td>
<td>0.39</td>
<td>0.38</td>
<td>0.16</td>
<td>0.010</td>
<td>0.244</td>
<td>0.041</td>
<td>0.039</td>
<td>0.028</td>
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Note

1. Plastic or metal protrusions of 0.15 mm (0.006 inch) maximum per side are not included.

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SSOP16: plastic shrink small outline package; 16 leads; body width 5.3 mm

![Package Outline SOT338-1](image_url)

**Fig 10. Package outline SOT338-1 (SSOP16)**

### DIMENSIONS (mm are the original dimensions)

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<th>A&lt;sub&gt;1&lt;/sub&gt;</th>
<th>A&lt;sub&gt;2&lt;/sub&gt;</th>
<th>A&lt;sub&gt;3&lt;/sub&gt;</th>
<th>D&lt;sup&gt;(1)&lt;/sup&gt;</th>
<th>E&lt;sup&gt;(1)&lt;/sup&gt;</th>
<th>e</th>
<th>H&lt;sub&gt;E&lt;/sub&gt;</th>
<th>L</th>
<th>L&lt;sub&gt;p&lt;/sub&gt;</th>
<th>Q</th>
<th>v</th>
<th>w</th>
<th>y</th>
<th>Z&lt;sup&gt;(1)&lt;/sup&gt;</th>
<th>θ</th>
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<td>mm</td>
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<td>0.21</td>
<td>1.80</td>
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<td>0.20</td>
<td>6.4</td>
<td>5.4</td>
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<td>0.65</td>
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<td>7.6</td>
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Note
1. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

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14. Abbreviations

Table 10. Abbreviations

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<td>CMOS</td>
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<td>Device Under Test</td>
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<tr>
<td>ESD</td>
<td>ElectroStatic Discharge</td>
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<td>HBM</td>
<td>Human Body Model</td>
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<tr>
<td>MM</td>
<td>Machine Model</td>
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15. Revision history

Table 11. Revision history

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16. Legal information

16.1 Data sheet status

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<td>This document contains the product specification.</td>
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[1] Please consult the most recently issued document before initiating or completing a design.
[2] The term 'short data sheet' is explained in section "Definitions".
[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nexperia.com.

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74HC253; 74HCT253  Dual 4-input multiplexer; 3-state
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17. Contact information

For more information, please visit: http://www.nexperia.com

For sales office addresses, please send an email to: salesaddresses@nexperia.com
## 18. Contents

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