The SN74141 is a second-generation BCD-to-decimal decoder designed specifically to drive cold-cathode indicator tubes. This decoder demonstrates an improved capability to minimize switching transients in order to maintain a stable display.

Full decoding is provided for all possible input states. For binary inputs 10 through 15, all the outputs are off. Therefore, the SN74141, combined with a minimum of external circuitry, can use these invalid codes in blanking leading- and/or trailing-edge zeros in a display. The ten high-performance, n-p-n output transistors have a maximum reverse current of 50 microamperes at 55 volts.

Low-forward-impedance diodes are also provided for each input to clamp negative-voltage transitions in order to minimize transmission-line effects. Power dissipation is typically 80 milliwatts. The SN74141 is characterized for operation over the temperature range of 0°C to 70°C.

<table>
<thead>
<tr>
<th>INPUT</th>
<th>OUTPUT ON¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>L</td>
<td>L</td>
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<td>L</td>
<td>L</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
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<tr>
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<td>H</td>
</tr>
<tr>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>H</td>
<td>H</td>
</tr>
</tbody>
</table>

H = high level, L = low level
1 All other outputs are off

PRODUCTION DATA
This document contains information current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

TTL DEVICES

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absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MIN</th>
<th>NOM</th>
<th>MAX</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage, VCC (see Note 1)</td>
<td>4.75</td>
<td>5</td>
<td>5.25</td>
<td>V</td>
</tr>
<tr>
<td>Input voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current into any output (off-state)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating free-air temperature range</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temperature range</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE 1: Voltage values are with respect to network ground terminal.

recommended operating conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MIN</th>
<th>NOM</th>
<th>MAX</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage, VCC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Off-state output voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating free-air temperature, TA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>TEST CONDITIONS†</th>
<th>MIN</th>
<th>TYP ‡</th>
<th>MAX</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vih</td>
<td></td>
<td>2</td>
<td>V</td>
<td></td>
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<tr>
<td>VIL</td>
<td></td>
<td>0.8</td>
<td>V</td>
<td></td>
<td></td>
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<td>Vlk</td>
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<td>-1.5</td>
<td>V</td>
<td></td>
<td></td>
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<tr>
<td>VQon</td>
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<td>2.5</td>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VQoff</td>
<td></td>
<td>60</td>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ioff</td>
<td></td>
<td>50</td>
<td>µA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IOff</td>
<td></td>
<td>-50</td>
<td>µA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ii</td>
<td></td>
<td>1</td>
<td>mA</td>
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<td></td>
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<td>IH</td>
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<td>40</td>
<td>µA</td>
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<td></td>
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<tr>
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<td>80</td>
<td>µA</td>
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<td>ICC</td>
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<td>mA</td>
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<td>mA</td>
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</tr>
</tbody>
</table>

†For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
‡This typical value is at VCC = 5 V, TA = 25°C.
NOTE 2: ICC is measured with all inputs grounded and outputs open.

schematics of inputs and outputs

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