HT7700

Key & Touch Linear Dimmer

Features

- High noise immunity CMOS technology
- Operating voltage: 9V–12V
- High sensitivity and stability
- Polarity insensitive with AC line
- Minimum external components
- Two types of input (Touch-Sense/Key-Trigger) in one chip

Applications

- Light control

General Description

The HT7700 series is a CMOS fabricated LSI in an 8-lead DIP package. It is designed to control the brightness of an incandescent lamp by changing the triggering angles of the TRIAC with a touch sense input or a key trigger input. For the key trigger type, if the key is pressed more than 0.7 seconds, the brightness will decrease smoothly until the key is released. If the key is continually held down, the lamp will eventually turn off. But if the key is pressed less than 0.7 seconds, the lamp will switch between the “ON” and “OFF” states.

For the touch sense type, the first touch will emit the brightest light. The second touch will make it fade away gradually. The third touch will maintain the level of brightness. The fourth will turn it off completely.

There are four types of processor in the series, namely Key-Trigger (7700A,50Hz), Key-Trigger (7700B,60Hz), Touch-Sense (7700C,50Hz), and Touch-Sense (7700D,60Hz).

Pin Assignment

Key-trigger-type
HT7700A (50Hz)
HT7700B (60Hz)
- 8 DIP

Touch-sense type
HT7700C (50Hz)
HT7700D (60Hz)
- 8 DIP

21th July ’97
**Pad Coordinates**

<table>
<thead>
<tr>
<th>Pad No.</th>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-51.21</td>
<td>25.11</td>
</tr>
<tr>
<td>2</td>
<td>-51.21</td>
<td>17.06</td>
</tr>
<tr>
<td>3</td>
<td>-51.26</td>
<td>0.50</td>
</tr>
<tr>
<td>4</td>
<td>-17.53</td>
<td>-47.41</td>
</tr>
<tr>
<td>5</td>
<td>0.38</td>
<td>-47.41</td>
</tr>
<tr>
<td>6</td>
<td>51.12</td>
<td>-1.8</td>
</tr>
<tr>
<td>7</td>
<td>51.66</td>
<td>8.46</td>
</tr>
<tr>
<td>8</td>
<td>51.21</td>
<td>47.34</td>
</tr>
<tr>
<td>9</td>
<td>43.11</td>
<td>47.34</td>
</tr>
<tr>
<td>10</td>
<td>-8.80</td>
<td>47.18</td>
</tr>
</tbody>
</table>

Chip size: $116 \times 108$ (mil)$^2$

* The IC substrate should be connected to VSS in the PCB layout artwork.

**Block Diagram**
Pad Description

<table>
<thead>
<tr>
<th>Pad No.</th>
<th>Pad Name</th>
<th>I/O</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FB</td>
<td>I</td>
<td>Feedback signal to control the sink current of SENSOR pin</td>
</tr>
<tr>
<td>2</td>
<td>VSS</td>
<td>I</td>
<td>Negative power supply</td>
</tr>
<tr>
<td>3</td>
<td>TRIG</td>
<td>O</td>
<td>Trigger output to drive the TRIAC</td>
</tr>
<tr>
<td>4</td>
<td>OSC2</td>
<td>O</td>
<td>Oscillator output</td>
</tr>
<tr>
<td>5</td>
<td>OSC1</td>
<td>I</td>
<td>Oscillator input</td>
</tr>
<tr>
<td>6</td>
<td>VDD</td>
<td>I</td>
<td>Positive power supply</td>
</tr>
<tr>
<td>7</td>
<td>FSEL</td>
<td>I</td>
<td>For 50Hz or 60Hz select (open=60Hz, internal pull low)</td>
</tr>
<tr>
<td>8</td>
<td>ZC</td>
<td>I</td>
<td>Line frequency 60Hz or 50Hz input for zero crossing</td>
</tr>
<tr>
<td>9</td>
<td>KEY</td>
<td>I</td>
<td>Key input (internal pull high)</td>
</tr>
<tr>
<td>10</td>
<td>SENSE</td>
<td>I</td>
<td>Touch sense input</td>
</tr>
</tbody>
</table>

Absolute Maximum Rating*

Supply Voltage .............................................. -0.3V to 13V  
Input Voltage ............................................ VSS-0.3V to VDD+0.3V  
Storage Temp .............................................. -50°C to 125°C  
Operating Temp ........................................... 0°C to 70°C  

*Note: Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only. Functional operation of this device at these or any other conditions above those indicated in the operational sections of this specification is not implied and exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Electrical Characteristics  
(Ta=25°C)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDD</td>
<td>Operating Voltage</td>
<td>VDD Conditions</td>
<td>9</td>
<td>12</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>IDD</td>
<td>Operating Current</td>
<td>9V No load</td>
<td>1</td>
<td>2</td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>FOSC</td>
<td>System Frequency</td>
<td>9V R_OSC=62kΩ</td>
<td>320</td>
<td></td>
<td></td>
<td>kHz</td>
</tr>
<tr>
<td>IOL</td>
<td>TRIG Sink Current</td>
<td>9V V_OH=0.9V</td>
<td>14</td>
<td></td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>IOH</td>
<td>TRIG Driver Current</td>
<td>9V V_OH=8.1V</td>
<td>-0.2</td>
<td></td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>VIH</td>
<td>&quot;H&quot; Input Voltage</td>
<td>-</td>
<td>0.8VDD</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>VIL</td>
<td>&quot;L&quot; Input Voltage</td>
<td>-</td>
<td>0.2VDD</td>
<td></td>
<td></td>
<td>V</td>
</tr>
</tbody>
</table>
Functional Description

Key trigger type (HT7700A, HT7700B)  Touch sense type (HT7700C, HT7700D)

POWER ON

Lamp Turns Off

KEY="LOW"

Y

Key-Trig > 0.7sec

N

Light Brightest

Light Brightest

Light Decrease

KEY="LOW"

N

Y

Lamp Turns Off

Y

KEY="LOW"

N

Light Hold

KEY="LOW"

Y

Key-Trig > 0.7sec

N

Touch ?

Y

Light Brightest

N

Touch ?

Y

Light Decrease

KEY="LOW"

N

Y

Lamp Turns Off

Y

Key-Trig > 0.7sec

N

Touch ?

Y

Light Hold

N

Touch ?

N

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Application Circuit

Key trigger input

* The IC substrate should be connected to VSS in the PCB layout artwork.
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