QTI Line Sensor
(#550-27401)

Introduction

The Parallax QTI sensor uses a QRD1114 infrared (IR) reflective sensor to determine the reflectivity of the surface below it. When the QTI sensor is over a dark surface, the reflectivity is very low; when the QTI is over a light surface, the reflectivity is very high and will cause a different reading from the sensor.

Features

- Phototransistor Output
- No contact surface sensing
- Unfocused for sensing diffused surfaces
- Compact Package
- Daylight filter on sensor

Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Rating</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>$T_{OPR}$</td>
<td>-40 to +85</td>
<td>Celsius</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>$T_{STG}$</td>
<td>-40 to +85</td>
<td>Celsius</td>
</tr>
<tr>
<td>Lead Temperature (Solder Iron)(2,3)</td>
<td>$T_{SOL-I}$</td>
<td>240 for 5 sec</td>
<td>Celsius</td>
</tr>
<tr>
<td>Lead Temperature (Solder Flow)(2,3)</td>
<td>$T_{SOL-F}$</td>
<td>260 for 10 sec</td>
<td>Celsius</td>
</tr>
<tr>
<td>Emitter</td>
<td>$I_F$</td>
<td>50</td>
<td>mA</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>$V_R$</td>
<td>5</td>
<td>V</td>
</tr>
<tr>
<td>Power Dissipation (1)</td>
<td>$P_D$</td>
<td>100</td>
<td>mW</td>
</tr>
<tr>
<td>Collector-Emitter Voltage</td>
<td>$V_{CEO}$</td>
<td>30</td>
<td>V</td>
</tr>
<tr>
<td>Emitter-Collector Voltage</td>
<td>$V_{ECO}$</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>Power Dissipation (1)</td>
<td>$P_D$</td>
<td>100</td>
<td>mW</td>
</tr>
</tbody>
</table>
Kit Packing List

1. This manual
2. QTI sensor unit

Setting Up

Description

The QTI sensor is activated by placing 5 V (Vdd) on the W pin. This will cause current to flow through the 470 ohm resistor to the LED side of the QRD1114. IR light reflecting of the surface below will cause a change in the ability for the current to flow through the phototransistor side of the QRD1114. The transistor, in effect, behaves like an IR controlled resistance.

Demonstration Programs

```
' -----[ Title ]------------------------------------------
' Mini-Sumo 3.1 : Line Sensor Test
' {$STAMP BS2}
' -----[ I/O Definitions ]--------------------------------
LineSnsrPwr  CON  10 ' line sensor power
LineSnsrIn   CON  9 ' line sensor input
```
' -----[ Constants ]--------------------------------------
ClrEOL CON 11 ' clear to end of line (DEBUG)

' -----[ Variables ]--------------------------------------
Sense VAR Word ' sensor raw reading

' -----[ Main Code ]--------------------------------------
----------------------
Read_Sensor:
HIGH LineSnsrPwr ' activate sensor
HIGH LineSnsrIn ' discharge QTI cap
PAUSE 1
RCTIME LineSnsrIn, 1, Sense ' read sensor value
LOW LineSnsrPwr ' deactivate sensor

Display:
DEBUG Home
DEBUG "Sensor ", CR
DEBUG "-----", CR
DEBUG DEC Sense, ClrEOL
PAUSE 100
GOTO Read_Sensor

Dimensions

PCB Length: 1"
Overall Length: 1 ¼"
PCB Width: 3/8"
Thickness: 5/16"

Trouble Shooting Tips

Make sure that the QTI sensor is properly installed by matching up the pins. The “B”
connects to Vss. The “R” connects to pin 9 of the BASIC Stamp and the “W” connects
to pin 10 of the BASIC Stamp.

BASIC Stamp support:
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