

# IS31SE5100 8-CH CAPACITIVE TOUCH SENSOR

## DESCRIPTION

The IS31SE5100 is an ultra low power, fully integrated solution for capacitive touch applications with up to 8 surfaces. The chip allows electrodes to project sense fields through any dielectric such as glass or plastic. On-chip calibration logic continuously monitors the environment and automatically adjusts on-and-off threshold levels to prevent false sensor activation.

The IS31SE5100 is fully programmable via a 400kHz I2C serial bus protocol.

## FEATURES

- Supply voltage from 2.7V to 5.5V
- I2C interface, 1.8V/2.8V is allowed
- Auto offset compensation
- Fully integrated sense controller with eight capacitive touch inputs
- Interrupt driven output
- Adjustable sensitivity with external capacitor or by internal register
- Low power consumption
- ESD HBM 8kV
- IC controller in QFN-24 (4mm × 4mm)

## QUICK START

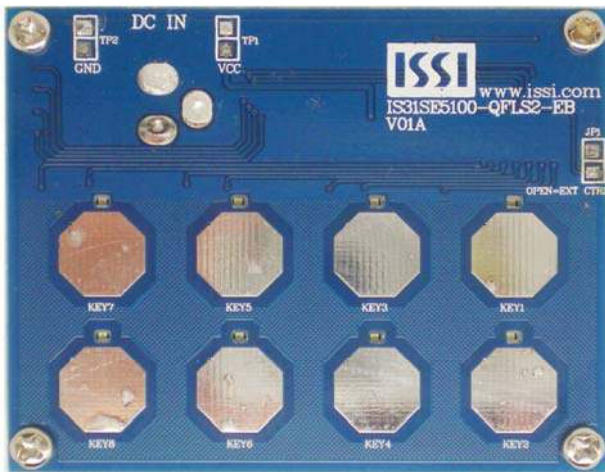


Figure 1: Photo of IS31SE5100 Evaluation Board

## RECOMMENDED EQUIPMENT

- 5.0V, 500mA power supply

## ABSOLUTE MAXIMUM RATINGS

- ≤ 5.5V power supply

**Caution: Do not exceed the conditions listed above, otherwise the board will be damaged.**

## PROCEDURE

The IS31SE5100 evaluation board is fully assembled and tested. Follow the steps listed below to verify board operation.

**Caution: Do not turn on the power supply until all connections are completed.**

- 1) Connect the ground lead of the power supply to the EVB GND terminal and the positive lead to the EVB VCC terminal. Or use the connector (DC IN) with a power adaptor: jack size 3.5mm x 1.35mm.
- 2) Turn on the power supply and pay attention to the supply current. If the current exceeds 100mA, please check for a circuit fault.

## EVALUATION BOARD OPERATION

This evaluation board is controlled by a pre-programmed P89LPC922 (80C51 core).

IS31SE5100 evaluation board has 8 touch surfaces designed on a 2mm thick acrylic board to induce a dielectric. Each touch surface has an associated LED that will light when the corresponding surface area is touched.

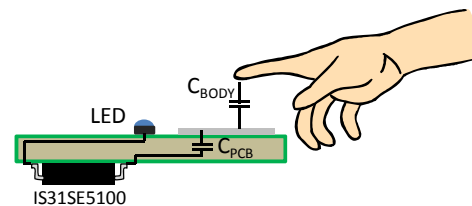


Figure 2: Capacitance Detection

The capacitance ( $C_{\text{BODY}}$ ) of an approaching finger increases as it approaches the sense area. The IS31SE5100 detects this increase in capacitance and turns on the associated LED.

## SOFTWARE SUPPORT

Please refer to the integrated program.

*Please refer to the datasheet for more information.*

# IS31SE5100 8-CH CAPACITIVE TOUCH SENSOR

## ORDERING INFORMATION

| Part No.            | Temperature Range          | Package           |
|---------------------|----------------------------|-------------------|
| IS31SE5100-QFLS2-EB | -40°C ~ +85°C (Industrial) | QFN-24, Lead-free |

Table1: Ordering Information

For pricing, delivery, and ordering information, please contact Lumissil's analog marketing team at [analog@lumissil.com](mailto:analog@lumissil.com) or (408) 969-6600.

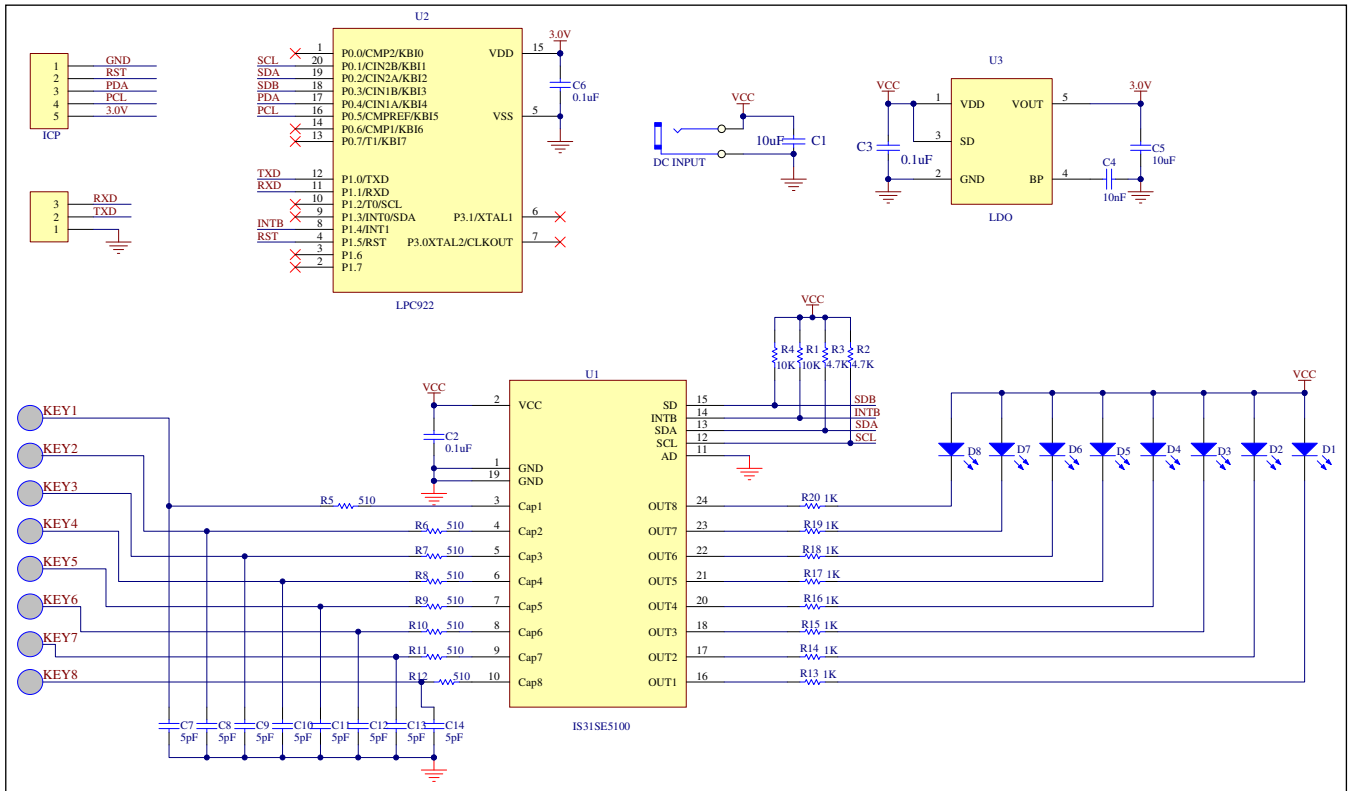


Figure 3: IS31SE5100 Application Schematic

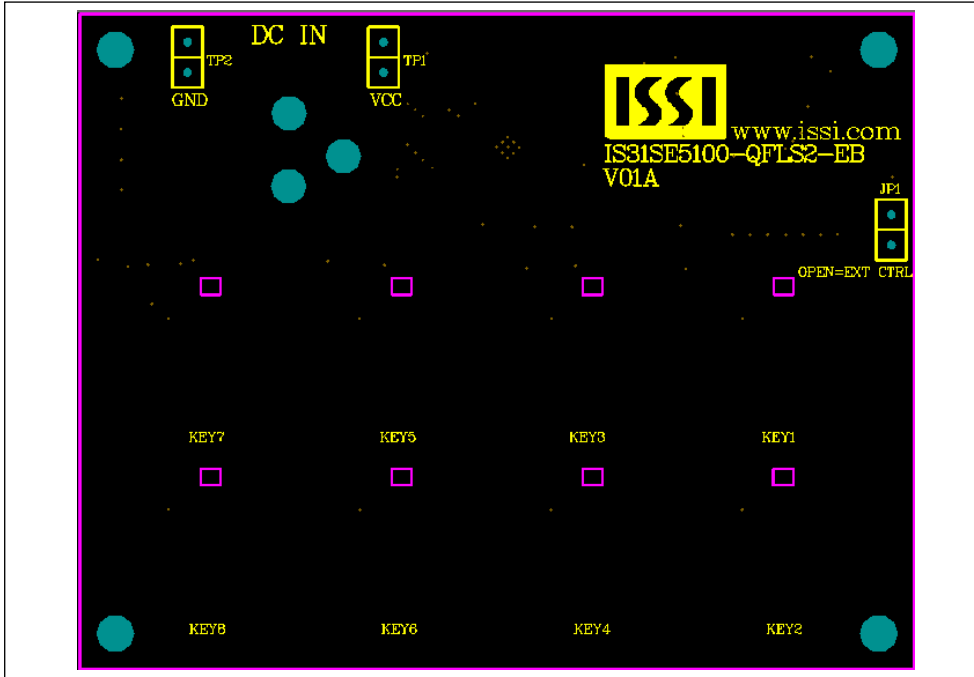
## IS31SE5100 8-CH CAPACITIVE TOUCH SENSOR

### Bill of Materials

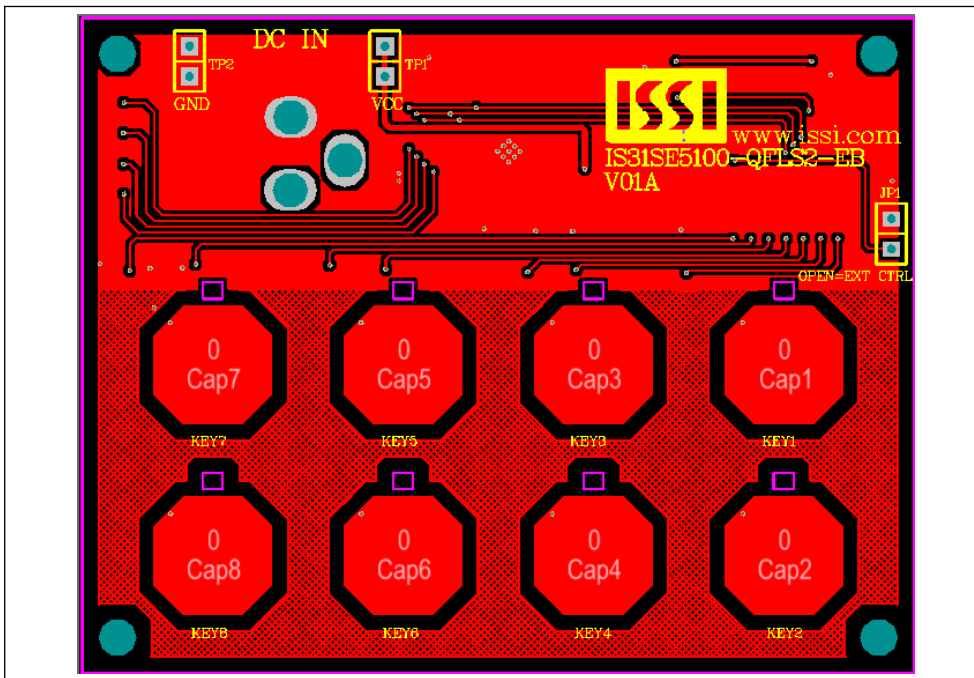
| Name         | Symbol   | Description             | Qty. | Supplier  | Part No.                  |
|--------------|----------|-------------------------|------|-----------|---------------------------|
| Touch Sensor | U1       | Capacitive touch sensor | 1    | Lumissil  | IS31SE5100                |
| MCU          | U2       | Microcontroller         | 1    | NXP       | LPC922                    |
| LDO          | U3       | Low-dropout regulator   | 1    | PAM       | PAM3101                   |
| Diodes       | D1~D8    | Diode,LED blue,SMD      | 8    | Everlight | 19-217/BHC-ZL1M2<br>RY/3T |
| Resistors    | R1,R4    | RES,10k,1/16W,±5%,SMD   | 2    |           |                           |
| Resistors    | R2~R3    | RES,4.7k,1/16W,±5%,SMD  | 2    |           |                           |
| Resistors    | R5~R12   | RES,510,1/16W,±5%,SMD   | 8    |           |                           |
| Resistors    | R13~R20  | RES,1k,1/16W,±5%,SMD    | 8    |           |                           |
| Capacitors   | C1,C5    | CAP,10µF,16V,±20%,SMD   | 2    |           |                           |
| Capacitors   | C2,C3,C6 | CAP, 0.1µF,16V,±20%,SMD | 3    |           |                           |
| Capacitor    | C4       | CAP,10nF,16V,±20%,SMD   | 1    |           |                           |

*Bill of Materials, refer to Figure 3 above.*

**IS31SE5100 8-CH CAPACITIVE TOUCH SENSOR**



*Figure 4: Board Component Placement Guide -Top Layer*



*Figure 5: Board PCB Layout- Top Layer*

# IS31SE5100 8-CH CAPACITIVE TOUCH SENSOR

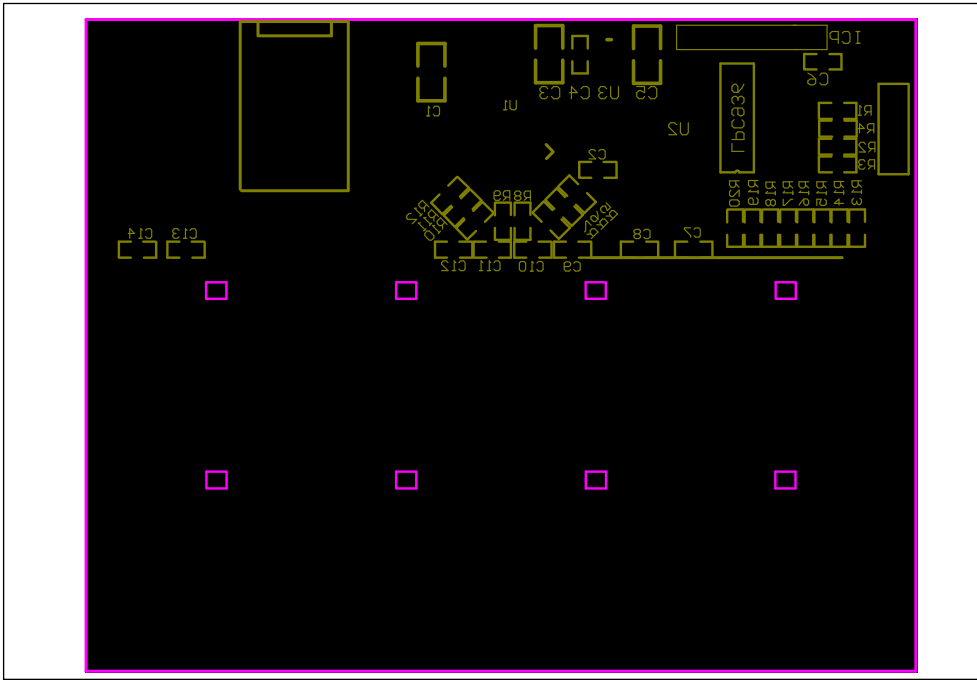


Figure 6: Board Component Placement Guide -Bottom Layer

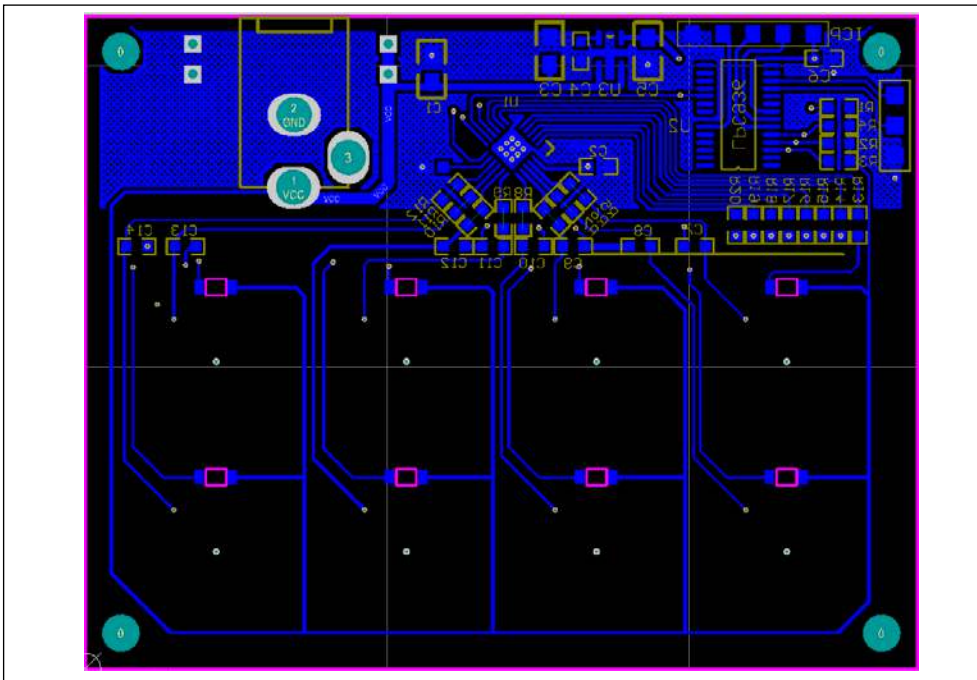


Figure 7: Board PCB Layout-Bottom Layer

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