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

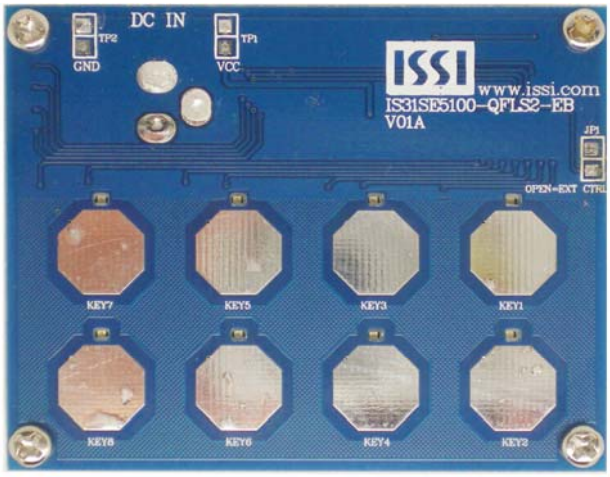

Figure 1: Photo of IS31SE5100 Evaluation Board

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.

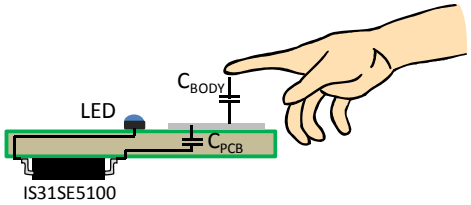

Figure 2: Capacitance Detection

The capacitance (C_{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.

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 contacts Lumissil's analog marketing team at analog@Lumissil.com or (408) 969-6600.

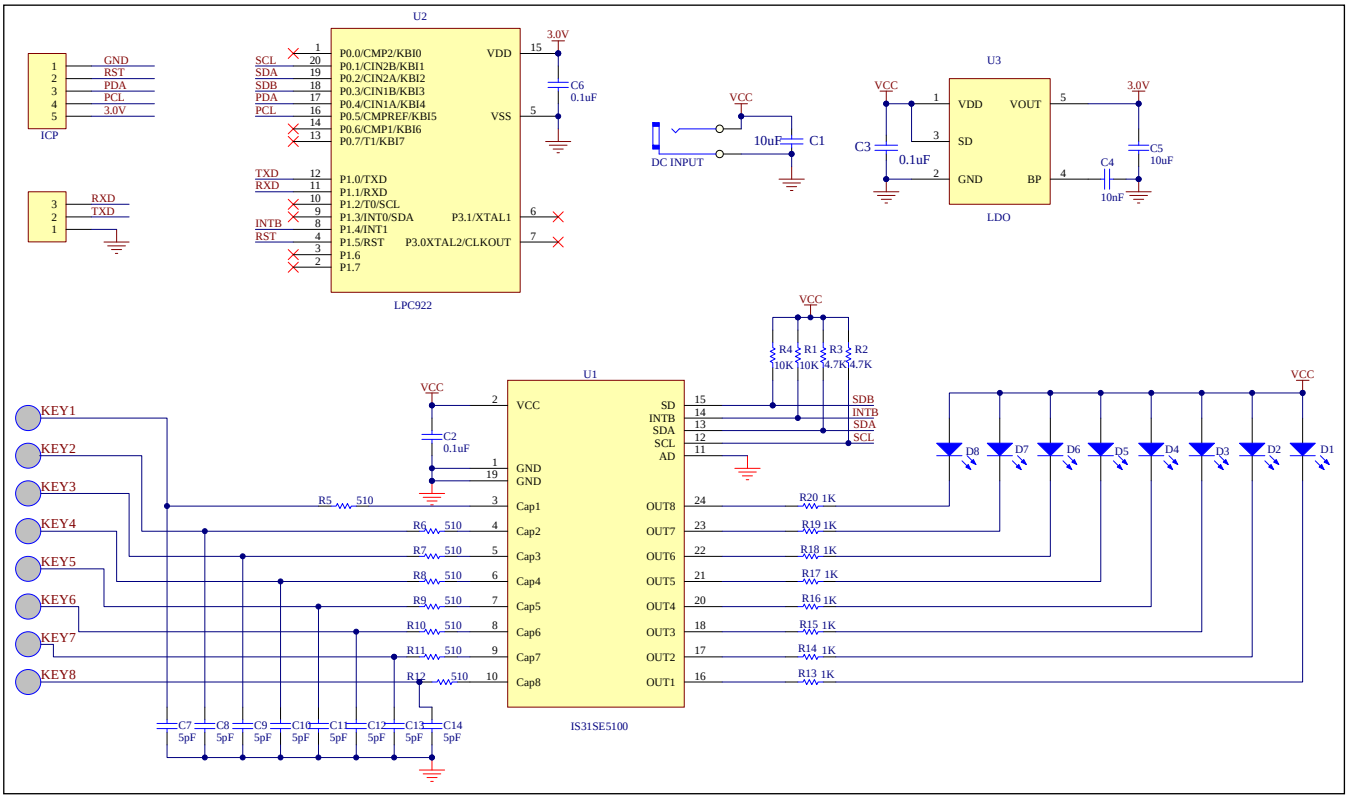

Figure 3: IS31SE5100 Application Schematic

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 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.

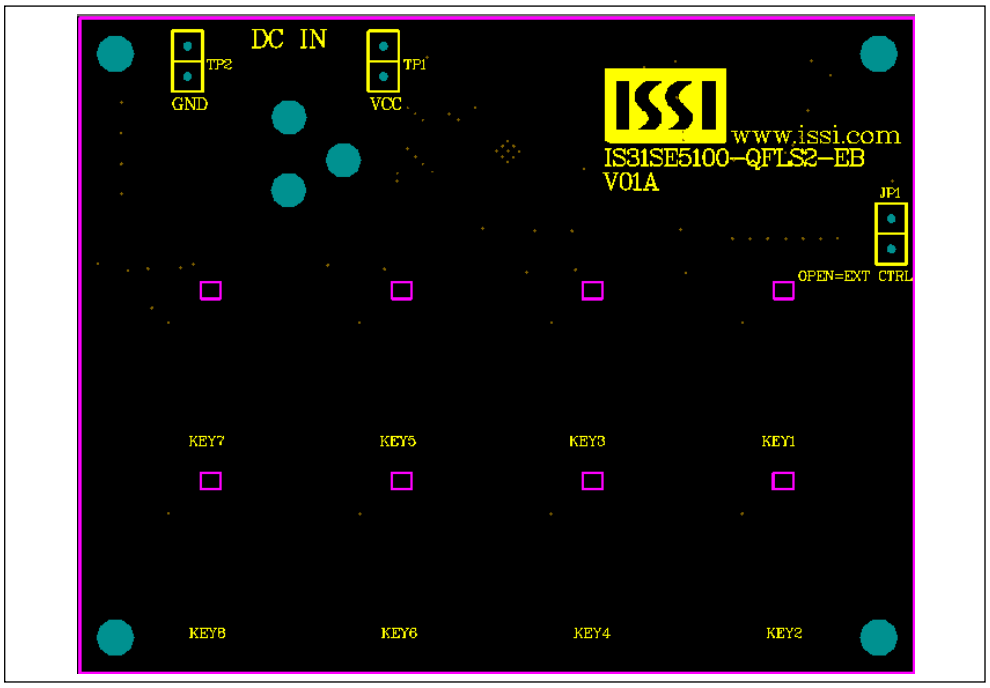

Figure 4: Board Component Placement Guide -Top Layer

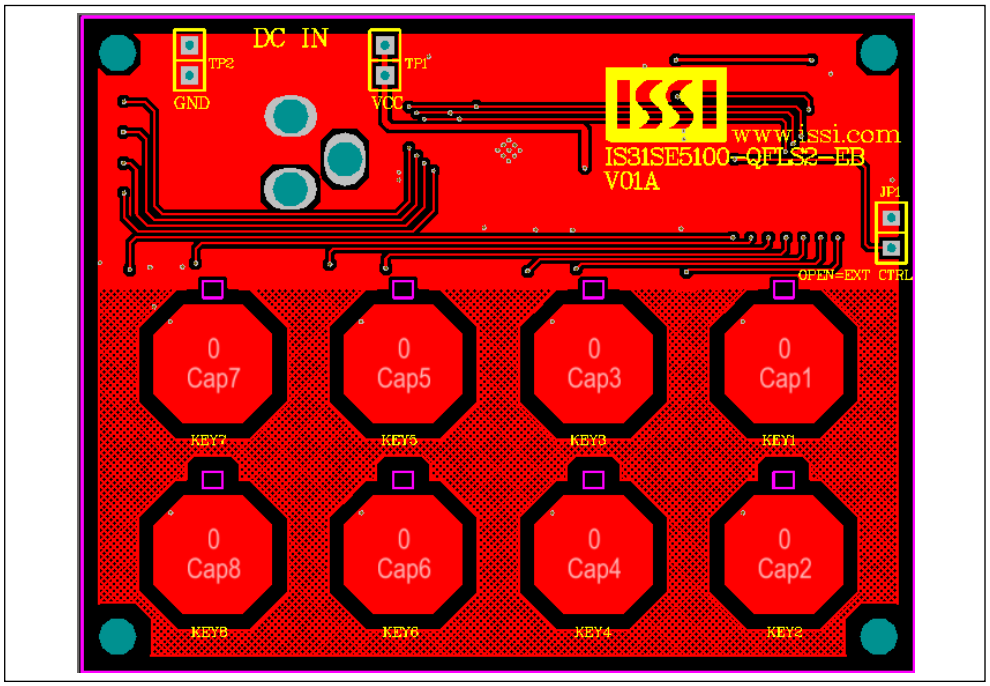

Figure 5: Board PCB Layout- Top Layer