

MGC3130

Sensor Module 95x60 mm V0.2

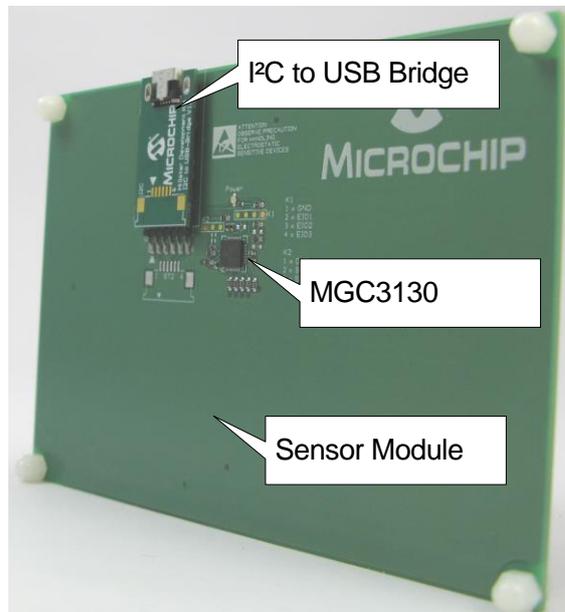
Specification

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Concept

The Sensor Module is designed to allow a rapid prototyping of Microchip's MGC3130 3D Tracking and Gesture Controller into various applications. The module consists of a 4-layer PCB with embedded frame electrodes and MGC3130 reference circuitry. It can be connected to an application host via a 6 pin connector including I²C, Reset and 3.3V power. The connector fits to the Hillstar I²C to USB Bridge and the combination of both allows a connection of the GestIC Sensor Module to a PC running Microchip's Aurea PC software.

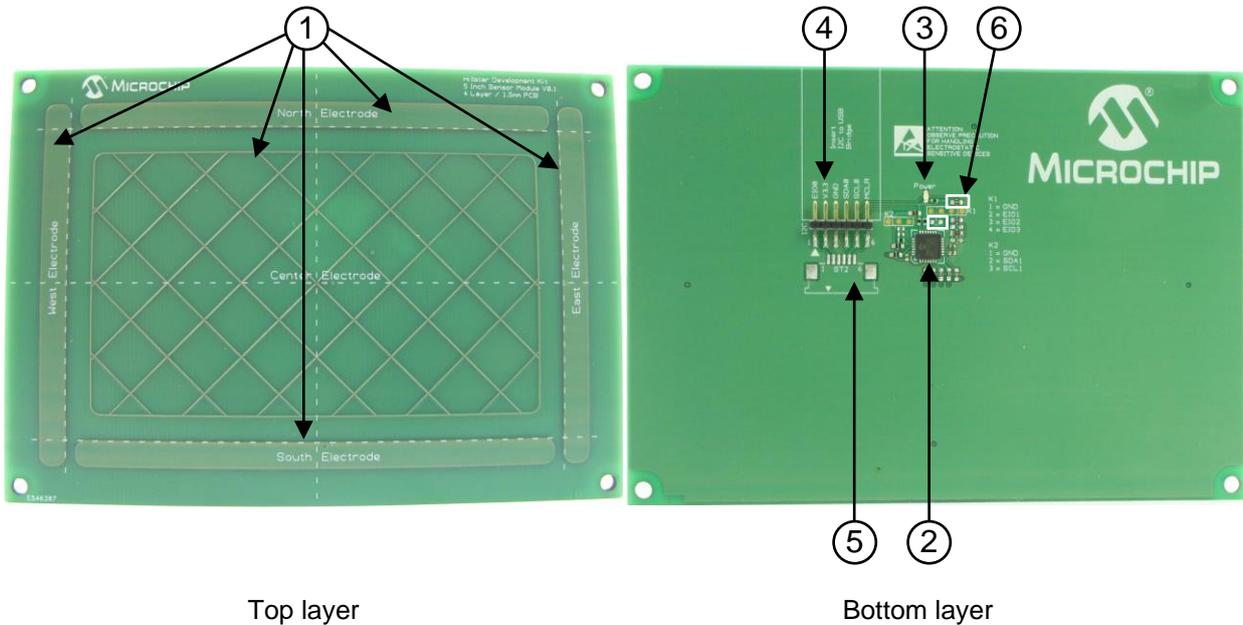


Hardware Description

- Module size: 120x85mm
- Sensitive area: 95x60mm
- Mounting: 4 holes; 3,2mm (114x79mm)

Key elements:

1. 5 RX Electrodes (North, South, West, East, Center)
2. MGC3130 3D Tracking and Gesture Controller
3. Status LED (power)
4. 2mm data connector: 6 pin header for data communication and power supply
5. Mounting option for 1mm FPC connector: 6 pin FPC for data communication and power supply
6. Interface Select to change I²C device address



Electrode Design

The 95x60 mm Sensor Module integrates one Transmit (Tx) and a set of five Receive (Rx) electrodes (North, South, West, East, Center), which are placed in the top layer and the third layer of the PCB. An additional ground layer is placed underneath the Tx electrode and shields the electrode's back from external influences.

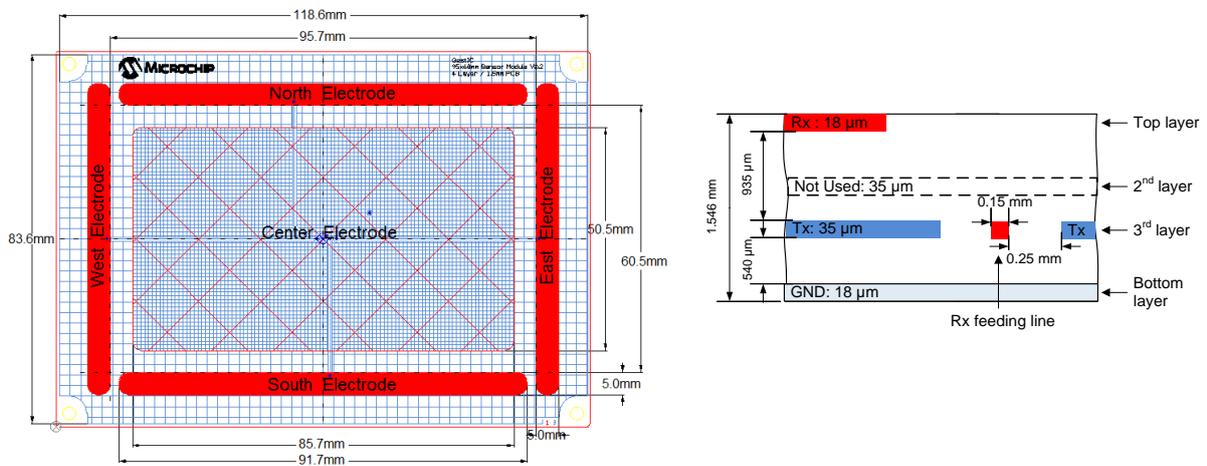
The electrode PCB is based on a 4-layer FR4 PCB design. 3 functional layers are used:

Layer 1 (Top): Rx electrodes

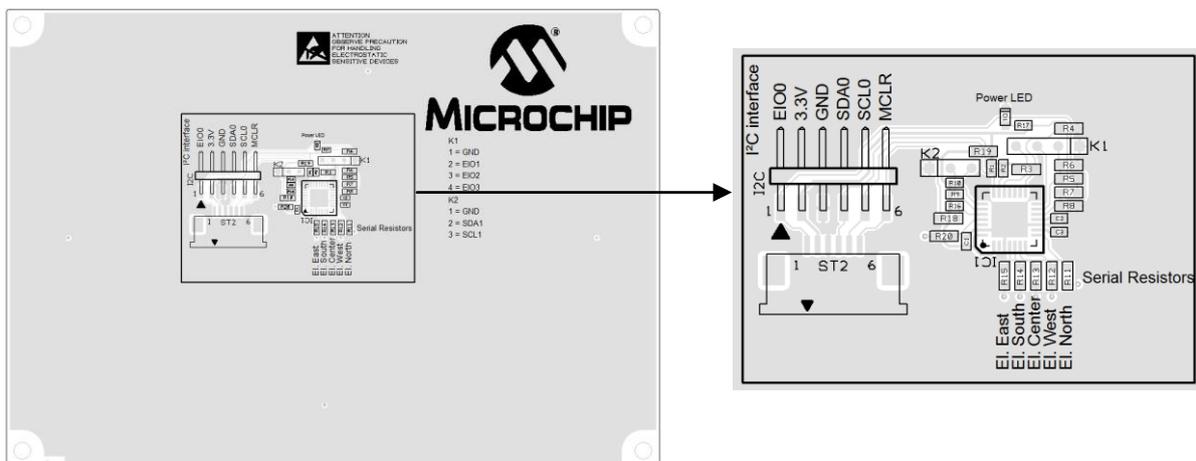
Layer 3: Tx electrode and Rx feeding lines

Layer 4 (Bottom): MGC3130 circuitry embedded in GND layer

The center electrode is cross hatched by 5%. The Tx electrode is solid copper.



Assembly Drawing



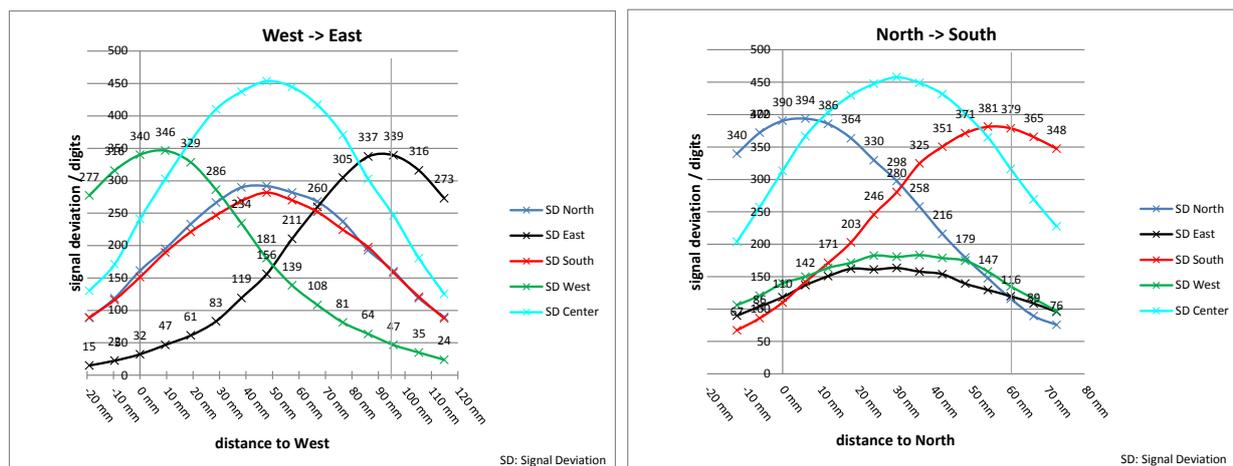
Integration Notes

- The I²C slave address is set to 0x42 by default mounting (R3 = n.p., R4 = 10kΩ). The address can be changed to 0x43 by putting the Interface Select 2 (IS2) pin high (R3 = 10kΩ, R4 = n.p.).
- I²C interface lines SDA and SCL are pulled up with 1.8kΩ (R1, R2).
- Transfer Status line (EIO0) is pulled up with 10kΩ (R7).
- Electrode Mapping:

Electrode	North	East	South	West	Center
Rx Channel	Rx4	Rx0	Rx1	Rx3	Rx2

Sensitivity Profile

Sensitivity profile from west to east and from north to south recorded with a 40x40x70 mm copper hand brick in 30 mm distance (for details please refer to MGC3130 – Design Guide - DS40001716).



Electrode Capacities

Electrode capacities determined using Aurea V0.4.20.

Channel	North	East	South	West	Center
C _{RxGND}	12 pF	13 pF	11 pF	9 pF	12 pF
C _{RxTx}	20 pF	17 pF	20 pF	17 pF	62 pF

$$C_{TxGND} = 815 \text{ pF}$$