



Internal CO2 Sensor for Automotive Applications

NDIR CO2 Single Channel, Diffusion Sampling Method

The Telaire Internal Carbon Dioxide (CO2) Sensor is a nondispersive infrared (NDIR) CO2 sensor that implements a single channel diffusion sampling method for automotive HVAC applications, including automatic fresh air control and safety sensing for CO2 refrigerants.

Along with the patented ABC Logic™ lifetime calibration warranty, its low power consumption, compact design and simple product integration, make this an affordable gas sensing solution.



Benefits

- **Safety** - Measure and control in-cabin CO2 levels to prevent driver drowsiness.
- **Energy Savings** - Reduce variations in heating and cooling in-cabin through demand control ventilation



Applications

- **Automotive HVAC** - In-cabin air quality and comfort control.
- **CO2 refrigerant leak detection**



Features

- **ABC Logic™** - Lifetime calibration warranty
- **Lin 2.0 output**
- **Low power consumption**
- **Selectable power modes**
- **Mode-based sampling rate**
- **Compact design**
- **Wide temperature range**

Internal CO2 Sensor Specifications

General Performance:

This sensor implements an algorithm to self-calibrate to its ambient environment. The sensor uses readings during fresh air conditions to make the correction. ABC Logic corrects for a variety of use factors including transitions to new environments, change in altitudes, mishandling and aging of the sensor. Data for the algorithm is gathered during normal use of the sensor and corrections are implemented every 504 hours of continuous use.

Accuracy and Measurement Range:

- 400 to 5,000 ppm CO2: +/-200 ppm
- 5,000 ppm to 4% CO2: +/- 10% of the reading
- 4% to 6.5%: accuracy not specified
- Temperature Dependence (outside 0C to 50C): +/- 0.5% of the reading

Measurement and Sample Rate Characteristics:

- Active Mode: 5 seconds sample rate
- Low Power Mode: 15 seconds sample rate
- Sleep Mode: 5 minute sample rate
- Warm-up mode: 5 seconds after power up
- Warm-up time to full accuracy: 2 minutes

Mechanical

Enclosure

- PBT GF15 Black

Weight

- 5g

Conformal Coating

- Electronic components are conformal coated.

Environmental:

Operating Temperature Range

- -40°C to + 90°C

Storage Temperature Range

- -40°C to +110°C

Relative Humidity

- 0-95% non-condensing

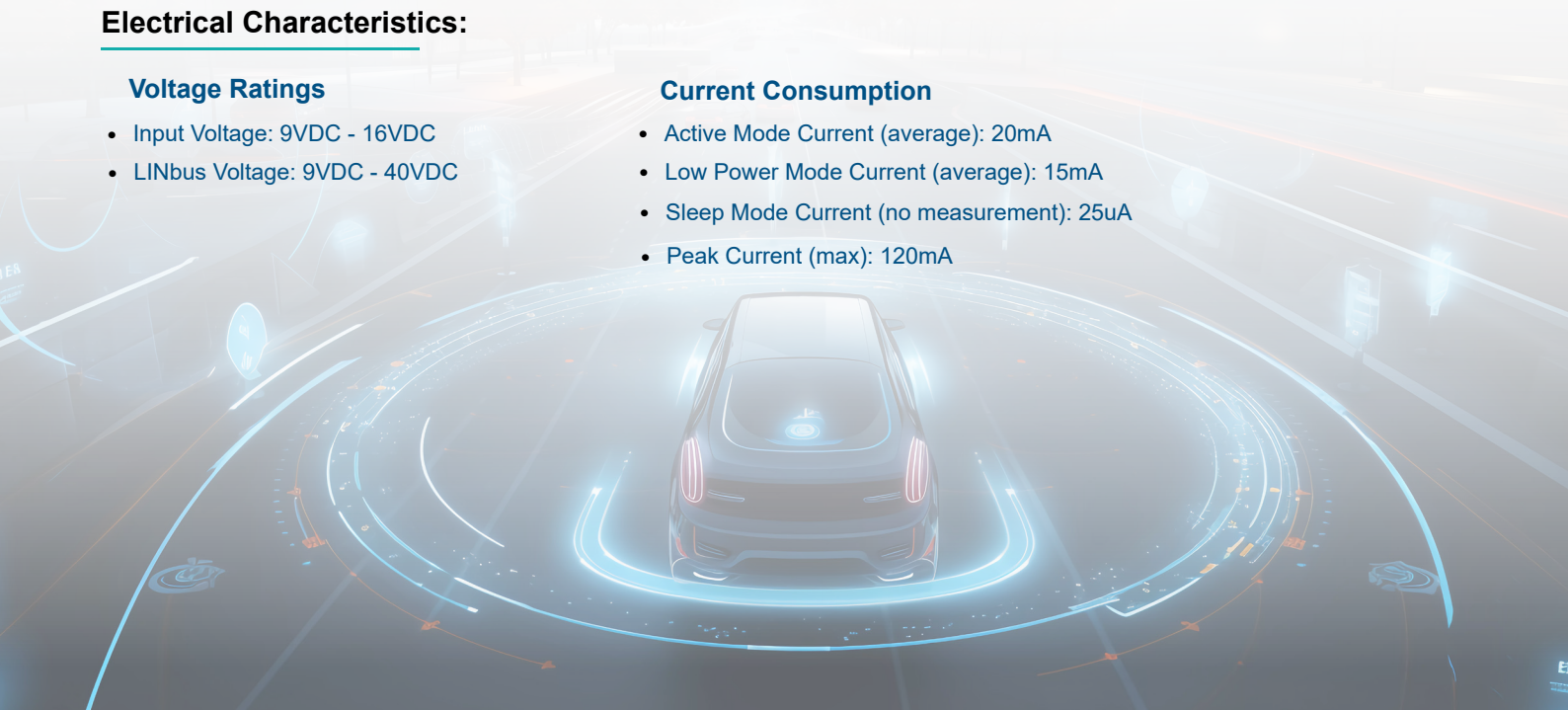
Electrical Characteristics:

Voltage Ratings

- Input Voltage: 9VDC - 16VDC
- LINbus Voltage: 9VDC - 40VDC

Current Consumption

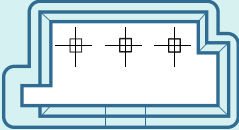
- Active Mode Current (average): 20mA
- Low Power Mode Current (average): 15mA
- Sleep Mode Current (no measurement): 25uA
- Peak Current (max): 120mA



Internal CO2 Sensor Specifications (cont.)

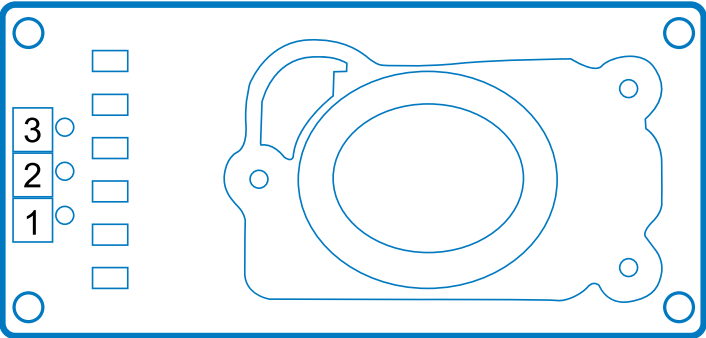
Cable and Connector

Connection

| | | |
|----------------------|---|---|
| Mating Connectors | TE AMP 4-1718346-1 | |
| Socket Configuration |  | 1 ~ Ground (Common) 2 ~ LIN 3 ~ Supply +V |
| PCB Pads | 1 ~ Supply +V (Square pad) 2 ~ LIN 3 ~ Ground (Common) | |

| Part No. | Sampling Method | Range | Feature |
|-------------|-----------------|--------------|-------------------------|
| T6743-40K-E | Diffusion | 0-40,000 ppm | Sensor with Enclosure |
| T6743-40K | Diffusion | 0-40,000 ppm | No Enclosure, PCBA only |


Pin layout



LIN Interface


The sensor implements a LIN interface defined by a generic LDF file.

LIN Output Signals




Carbon Dioxide

CO2 Concentration: 1 ppm Resolution




Alarm Output

Limit-based threshold alarm signal with hysteresis.




Error Response

Indicates when a node or frame error is detected.



Diagnostics

Flag used to indicate a diagnostic issue to the host.



Device Ready

Indicates when the sensor is ready to take a measurement.