

## Product brief

# TLE4999C8



## XENSIV™ magnetic position sensors – programmable dual channel linear Hall sensor with fast SPC interface for high precision applications

It is developed in full compliance with ISO 26262 by means of two sensor elements included within one monolithic silicon design.

In order to fulfill the state-of-the-art safety requirements on system level and enable ASIL D system developments the sensor cells are designed in a complementary way. Their signals follow two independent analog paths. Each signal path has its own digital signal processing unit to ensure maximum independency – redundancy, respectively.

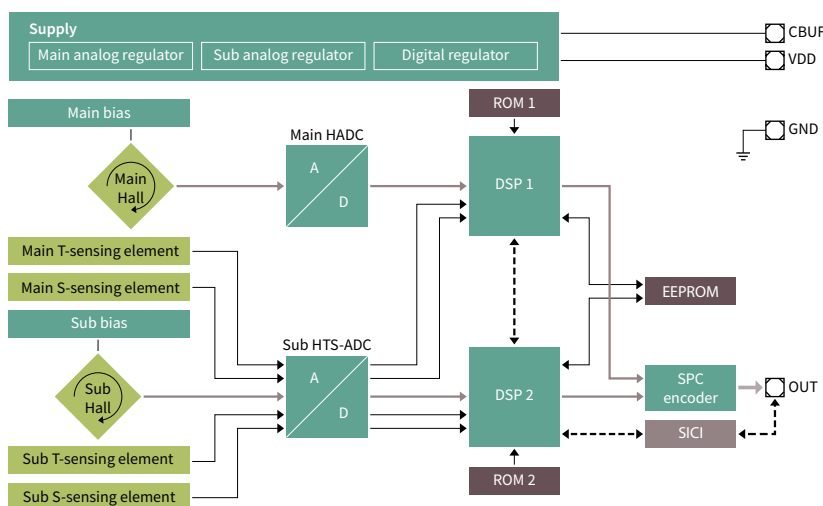
The sensor offers a multi-point calibration with up to 9 selectable set points for enhanced linearization of the output signal. For an easy and flexible adaptation to non-linearity of magnetic circuit design, the chip provides 5 different calibration characteristics.

TLE4999C features a digital Short-PWM-Code (SPC) interface, with a bus-capability for up to 4 sensor ICs on a single data output. The communication interface with min. 0.5  $\mu$ s unit time guarantees a fast transmission of complete 2 channel data signal in less than 500  $\mu$ s. The additionally implemented frameholder circuit enables the synchronicity of multiple sensors (e.g. in combination of angle sensors) via a SPC bus.

The chip offers a 12, 14 and 16 Bit resolution of the output signal, ensuring highest flexibility and superior noise performance.

Highest accuracy over a wide temperature range and lifetime is achieved by an integrated digital temperature- and stress-compensation. The chip is available in a thin 8-pin SMD single sensor package.

### Simplified block diagram TLE4999C8



[www.infineon.com/linear-hall](http://www.infineon.com/linear-hall)



RoHS



ISO 26262  
compliant



### Key features

- > Fully ISO 26262 compliant, supports ASIL D systems
- > < 2 percent sensitivity drift, < 100  $\mu$ T offset drift over temperature and life time specification
- > Integrated digital temperature- and stress-compensation
- > Fast digital SPC interface with a unit time down to 0.5  $\mu$ s
- > Multi-point calibration with up to 9 linearization set points

### Key benefits

- > High diagnostic coverage, ISO 26262-compliance and dual sensor cell integration enable development of fail operational systems
- > Multi-point calibration for better fit into various magnetic circuit designs
- > Easy system integration due to programmability of several sensor parameters

### Key applications

#### Automotive safety critical applications

- > Electric Power Steering

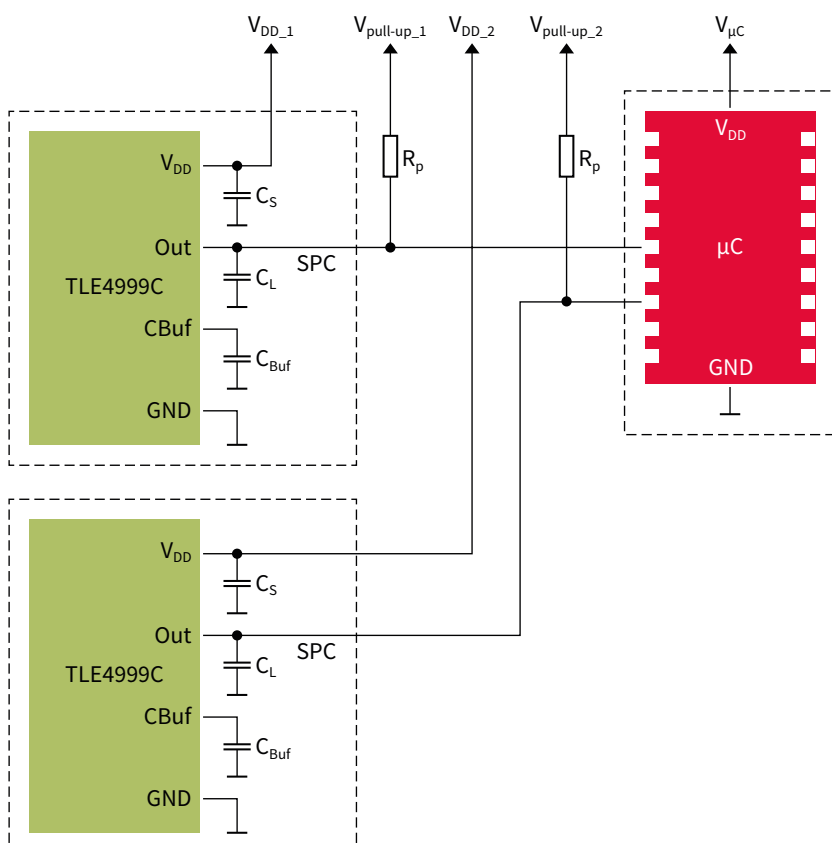
#### Linear Movement position sensing

- > Pedal position
- > Electric throttle control
- > Seat rail adjustment
- > Headlight adjustment

#### Industrial applications

- > Small home appliances
- > Joystick applications

## Application circuit



Unit time	0.5 – 1 μs	1.05 – 2 μs	2.05 – 3 μs
CL	1 nF	2.2 nF	3.9 nF
CS	100 nF	100 nF	100 nF
CBuf	68 nF	68 nF	68 nF

Pull-up resistor	Min.	Typ.	Max.
Rp	1.45 kΩ	2.20 kΩ	10 kΩ

Voltages	Min.	Typ.	Max.
V <sub>DD</sub>	4.5 V	–	5.5 V
V <sub>pull-up</sub>	3.0 V	–	5.5 V

## Infineon ISO 26262 dual channel linear Hall product portfolio

Sales name	Technology	Interface	Magnetic linear range [mT]	Sensitivity	Sensitivity drift [%]	Gain	Magnetic offset drift [μT] <sup>1)</sup>	ISO 26262	Ordering code	Package
TLE4997A8D	Hall	Analog ratiometric	50, 100, 200	±60 mV/mT default for 100 mT range, with gain 1.5	±3	±4	<±400	Ready	SP000902760	TDSO-8
TLE4998P8D	Hall	Digital interface PWM	50, 100, 200	±48LSB12/mT default for 100 mT range, with gain 1.5	±2	±4	<±400	Ready	SP000902776	TDSO-8
TLE4998S8D	Hall	Digital interface SENT							SP000902784	
TLE4998C8D	Hall	Digital interface SPC							SP000902768	
TLE4999I3	Hall	Digital interface PSi5	12.5, 25	±147.5LSB13/mT default for 25 mT range, with gain 1.5	±2	±5	<±100/ <±200 <sup>2)</sup>	Compliant	SP001689862	SSO-3-12
TLE4999C8	Hall	Digital interface SPC	25, 50	±36.875LSB12/mT default for in 50 mT range, with gain 1.0	±2	±5	<±100/ <±200 <sup>2)</sup>	Compliant	SP002662500	TDSO-8-1

1) Maximum over drift over temperature and life time

2) Main channel/sub channel

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