



## Product brief

# XENSIV™ – 3D magnetic sensor family

TLE/TLI/TLV493D for automotive, industrial and consumer markets

Infineon's 3D magnetic sensor family TLE/TLI/TLV493D offers accurate three dimensional sensing with extremely low-power consumption. Within its small package the sensor provides direct measurement of the x-, y-, and z components of a magnetic field.

Thus the sensor family is ideally suited for the measurement of

- > 3 dimensional movement within a magnetic field
- > Linear slide movement
- > 360° angle rotation (end of shaft and out of shaft)
- > Joystick movement

The TLE/TLI/TLV493D sensors provide a contactless position sensing alternative to applications which traditionally use mechanical or optical solutions. The system size for these applications can be reduced as magnetic threshold stability over temperature provides a highly accurate and more robust solution for those systems.

TLE493D-W2B6/P2B6 and TLI493D-W2BW are available in 4 different variants ending with A0, A1, A2 or A3. The underlying feature is the so called Bus mode configuration of this device. It's possible to connect up to 4 sensors to one I<sup>2</sup>C bus. The specific addressing is then done via 4 different variants.

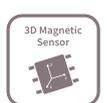
Infineon's sensor provides a standard 2-wire digital I<sup>2</sup>C communication interface, which enables a bi-directional communication between the sensor and microcontroller. The sensors keep the highest quality standard and environmental regulations.

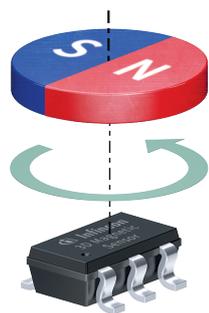
### Key applications

- > Consumer and industry
  - Joystick e.g. finger, thumb and gaming paddles
  - E-meters e.g. anti-tampering
  - Mobile camera lens position sensing for focus and zoom
  - Control elements e.g. white goods, multifunction knob
- > Automotive
  - Control elements for infotainment/navigation systems, air conditions, multi-functional steering wheels or light switches
  - Top column module, e.g. direction indicator, wiper control
  - Gear stick position sensing

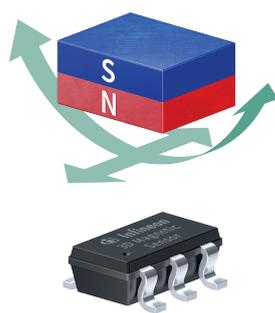
### Key features

- > 3-dimensional magnetic field sensing (Bx, By and Bz)
- > Integrated temperature sensing
- > Low-current consumption
  - 7 nA in power down mode
  - 10 µA in low power operation at 24 Hz
- > 2.8 to 3.5 V operating supply voltage
- > Digital output via 2-wire standard I<sup>2</sup>C interface
- > Bx, By and Bz linear magnetic field measurement up to ±160 mT
- > 12-bit data resolution for each measurement direction
- > Sensitivity 7.7 to 30.8 LSB12/mT
- > Sample rate 0.05 ... 7.8 kHz
- > TSOP6/WLB-5 package
- > Operating temperature range from -40°C to 125°C

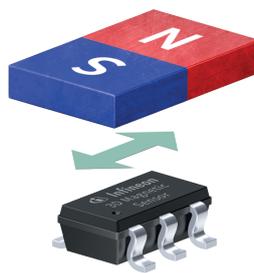




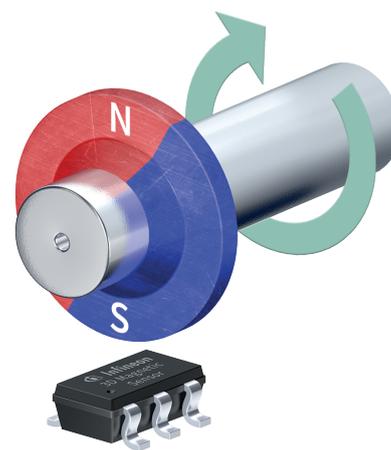
Rotation movement



3D movement



Linear movement



Out of shaft

Product summary

Parameter	TLV493D-A1B6	TLV493D-A2BW	TLI493D-A2B6	TLE493D-A2B6	TLE493D-W2B6	TLE493D-P2B6	TLI493D-W2BW	Units
Supply voltage	2.9 to 3.5	2.8 to 3.5	2.8 to 3.5	2.8 to 3.5	2.8 to 3.5	2.8 to 3.5	2.8 to 3.5	V
Typ. supply current – power down	7.0	7.0	7.0	7.0	7.0	7.0	7.0	nA
Typ. supply current – fast mode	3.7	3.4	3.4	3.4	3.4	3.4	3.4	mA
Minimum usable magnetic linear range	±130	±50, ±100 or ±160	±50, ±100 or ±160	mT				
Magnetic sensitivity	10.2	7.7/15.4/30.8	7.7/15.4	7.7/15.4	7.7/15.4	7.7/15.4	7.7/15.4/30.8	LSB <sub>12</sub> /mT
x to y channel matching drift	±9	±5	±3.5	±3.5	±3.5	±1.9	±3.5	%
x/y to z channel matching drift	±15	±20	±15	±15	±15	±12	±15	%
Temperature range	-40 to 125	-20 to 85	-40 to 105	-40 to 125	-40 to 125	-40 to 125	-40 to 125	°C

Type	Additional features	Qualification	Packing unit	Ordering code
TLV493D-A1B6	Low power	JESD47	3K pcs	SP001286056
TLI493D-A2B6	Low power	JESD47	3K pcs	SP0001689844
TLI493D-W2BW A0 TLI493D-W2BW A1 TLI493D-W2BW A2 TLI493D-W2BW A3	Pb-free and halogen free package	JESD47	4K pcs	SP005409809 SP005409807 SP005409905 SP005409903
TLI493D-W2BW A0 TLI493D-W2BW A1 TLI493D-W2BW A2 TLI493D-W2BW A3	Pb-free and halogen free package	JESD47	15K pcs	SP005409964 SP005409966 SP005409968 SP005409970
TLE493D-A2B6	Low power	AEC-Q100	3K pcs	SP001689848
TLE493D-W2B6 A0 TLE493D-W2B6 A1 TLE493D-W2B6 A2 TLE493D-W2B6 A3	Low power and wake up function	AEC-Q100/ ISO 26262 ready	3K pcs	SP001605334 SP001605340 SP001605344 SP001605348
TLE493D-P2B6 A0 TLE493D-P2B6 A1 TLE493D-P2B6 A2 TLE493D-P2B6 A3	Low power and wake up function	AEC-Q100/ ISO 26262 ready	3K pcs	SP005557415 SP005557413 SP005557411 SP005557408
TLV493D-A2BW	Pb-free and halogen free package	JESD47	15K pcs	SP005542151

Published by  
Infineon Technologies AG  
81726 Munich, Germany

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