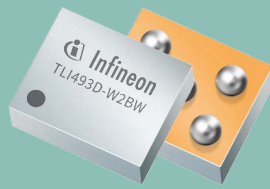
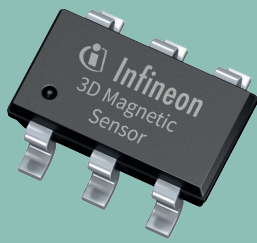




**THE DATASHEET OF
TLE493DW2B6A1HTSA1**





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 I²C bus. The specific addressing is then done via 4 different variants.

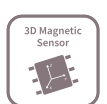
Infineon's sensor provides a standard 2-wire digital I²C communication interface, which enables a bi-directional communication between the sensor and microcontroller. The sensors keep the highest quality standard and environmental regulations.

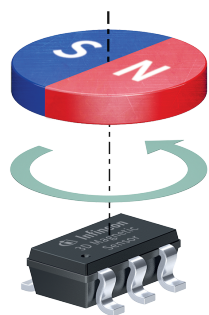
Key applications

- > 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

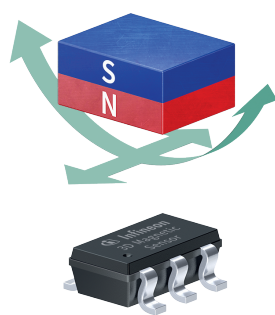
Key features

- > 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 I²C 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

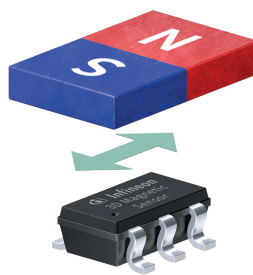




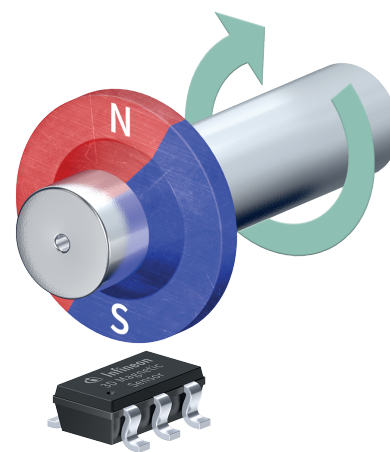
Rotation movement



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 | ±100 or ±160 | ±100 or ±160 | ±100 or ±160 | ±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 ₁₂ /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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