

- Vibration-tolerant tilt sensor
- Thermal compensation
- Designed for dynamic applications
- Dual-axis – pitch and roll
- Dual sensing per axis for error detection
- 12Vdc or 24Vdc supply
- J1939 CANbus output
- IP67 enclosure
- Integrated Deutsch DT04 connector



The VTS2021 is a dual-axis, vibration-tolerant tilt sensor that offers an optimal combination of performance, safety and cost in dynamic applications, such as industrial vehicles.

IMU technology and fast-acting software algorithms filter out disturbances caused by vibration and vehicle motion, to provide output stability without the measurement delays usually associated with heavily-damped, alternative sensing methods.

Each measurement axis has two sensing elements, which are constantly compared to ensure correct operation. If an error is detected, the condition is communicated to the host electronics; so allowing a safe situation to be assumed.

Each output signal is calibrated to account for thermal drift, ensuring accuracy over the operating temperature range.

Powered from a voltage supply range of 6-48Vdc, the sensor provides output data over CANbus using J1939 protocol with a choice of baud and frame rates.

The sealed design offers exceptional levels of performance with respect to water, dust, shock, vibration and temperature, meaning the sensor is ideal for use in hostile, on- and off-highway vehicle environments. Electrical connection is via an integrated 4-pin Deutsch DT04 connector.

SPECIFICATIONS

SUPPLY

SUPPLY VOLTAGE	6-48Vdc unregulated
SUPPLY CURRENT	<40mA at 12Vdc
SUPPLY REVERSE POLARITY PROTECTION	Up to -48Vdc
SHORT-CIRCUIT PROTECTION	Yes, all connections to all connections
OVER-VOLTAGE PROTECTION	Up to 60Vdc at ambient temperature
POWER-ON SETTLEMENT	<500ms

OUTPUT

LINEARITY	<±2%
RESOLUTION	16 bit output (1 bit = 0.0055°)
OUTPUT NOISE	±2 bits (±0.011°)
REPEATING ACCURACY	≤2% of full scale range
THERMAL DRIFT	<0.5° over operating temperature

EMC DATA

RF IMMUNITY	ISO 11452-2, 100V/m, 80-3000MHz frequency range, 80%AM, 1kHz sine
POWER FREQUENCY FIELD IMMUNITY	EN61000-4-8, 30A/m, 50 and 60Hz
CONDUCTED IMMUNITY	ISO 11452-4, 100mA, 10kHz-400MHz frequency range, 80%AM, 1kHz sine
ELECTROSTATIC DISCHARGE	ISO10605, ±15kV contact, ±25kV air discharge
RADIATED EMISSIONS	CISPR 25, 30 – 300MHz and 300 – 1000MHz
TRANSIENT PROTECTION	ISO7637-2, pulses 1-5

MECHANICAL

MAXIMUM OPERATING SPEED	250°/s maximum rate of change of tilt that can be detected
WEIGHT	<150g

ENVIRONMENTAL

OPERATING TEMPERATURE RANGE	-40°C to 85°C in accordance with BS EN 60068-2-14
STORAGE TEMPERATURE RANGE	-50°C to 90°C in accordance with BS EN 60068-2-1 and BS EN 60068-2-2
THERMAL SHOCK	-40°C to 85°C in accordance with BS EN 60068-2-14
SEALING	Sensor body IP69K, IP67 Deutsch connector IP67 when fully mated
VIBRATION	BS EN 60068-2-64, 14.7gn rms, 20-2000Hz random
SHOCK	BS EN 60068-2-27, 50g, 11ms, 3 shocks per axis (9 total)
DROP TEST	1m drop onto concrete
MTTF _D	> 385 years
SALT SPRAY	EN 60068-2-52 test Kb severity 2 (48 hrs)
CHEMICAL RESISTANCE	Hydraulic oil, diesel fuel, gasoline/petrol, ethylene glycol, hydrochloric acid, phosphoric acid, isopropyl alcohol, ether, calcium chloride, magnesium chloride, potassium chloride, sodium hydroxide, calcium hydroxide, ammonium hydroxide, AdBlue, herbicide,, fertilizer, urea nitrogen, insect repellent
HUMIDITY	EN60068-2-30 (65°C, 93%RH)

All values recorded at room temperature of 23°C, unless otherwise stated