



# SN-9250 9-Axis IMU

SNS-9250

9-axis inertial module — 16 g accelerometer, 2000 °/s gyroscope and 3-axis magnetometer with an on-chip motion engine, in a 3 × 3 × 0.9 mm LGA-14 package.

## 1 KEY FEATURES

- 3-axis accel ( $\pm 2/\pm 4/\pm 8/\pm 16$  g) + 3-axis gyro ( $\pm 250\dots\pm 2000$  °/s) + magnetometer
- On-chip motion engine: step counter, tilt, orientation, tap
- 1.5 KB FIFO with watermark IRQ for always-on, low-duty logging
- I<sup>2</sup>C (up to 1 MHz) and SPI (up to 10 MHz) digital interfaces
- Two programmable interrupt pins (INT1/INT2)
- VDD 1.71–3.6 V, VDDIO 1.2–3.6 V independent rails

## 2 ELECTRICAL & PERFORMANCE

| PARAMETER           | CONDITION                | TYP              |
|---------------------|--------------------------|------------------|
| Supply current      | Accel+Gyro on, 1 kHz ODR | 0.75 mA          |
| Accel low-power     | Accel only, 50 Hz        | 18 µA            |
| Sleep current       | All off, regs retained   | 3 µA             |
| Max ODR             | Accel / Gyro             | 8 kHz            |
| Gyro noise density  | —                        | 3.8 mdps/<br>√Hz |
| Accel noise density | —                        | 90 µg/√Hz        |
| Accel sensitivity   | ±16 g range              | 2048<br>LSB/g    |
| Gyro sensitivity    | ±2000 °/s range          | 16.4 LSB/<br>°/s |
| ZRO (gyro)          | 25 °C                    | ±1 °/s           |

## 3 OPERATING & COMPLIANCE

|                       |                                      |
|-----------------------|--------------------------------------|
| Operating temperature | -40 °C to +85 °C                     |
| Package               | LGA-14, 3 × 3 × 0.9 mm, 0.5 mm pitch |
| MSL                   | Level 1 (JEDEC J-STD-020)            |
| ESD (HBM)             | ±2 kV                                |

RoHS 3

REACH

Halogen-free

## 4 DIGITAL INTERFACE

I<sup>2</sup>C 7-bit address **0x6A** (SDO/AD0 low) or **0x6B** (SDO/AD0 high). Fixed device identity in WHO\_AM\_I (0x0F) = **0x92**. In SPI mode the same SDO/AD0 pin is the serial data output; mode 3 (CPOL=1, CPHA=1), MSB first.

|                            |                              |
|----------------------------|------------------------------|
| I <sup>2</sup> C address   | 0x6A / 0x6B (AD0-selectable) |
| WHO_AM_I value             | 0x92                         |
| I <sup>2</sup> C max clock | 1 MHz (Fast-mode Plus)       |
| SPI max clock              | 10 MHz, mode 3               |
| Word order                 | Little-endian, MSB first     |

## 5 REGISTER MAP (SELECTED)

| ADDR | NAME        | FUNCTION                          |
|------|-------------|-----------------------------------|
| 0x0F | WHO_AM_I    | Device ID (0x92, read-only)       |
| 0x10 | CTRL1_XL    | Accel ODR + full-scale            |
| 0x11 | CTRL2_G     | Gyro ODR + full-scale             |
| 0x22 | OUTX_L_G    | Gyro X low byte (burst start)     |
| 0x28 | OUTX_L_XL   | Accel X low byte                  |
| 0x3A | FIFO_STATUS | FIFO level + watermark flag       |
| 0x58 | TAP_CFG     | Motion engine / interrupts enable |

Burst reads auto-increment the address pointer; read 12 bytes from 0x22 to fetch gyro + accel in one transaction.

## 6 RECOMMENDED LAYOUT

- 100 nF + 10 nF decoupling on VDD; 100 nF on VDDIO, close to pins.
- Keep the package away from board flexure; symmetric copper under the pad.
- Magnetometer: keep > 5 mm from switching regulators and speakers.

**Mock document.** The SN-9250, “SENSAE” and the register values above are fictional and exist only for the Skdwn Industrial Knowledge Center demo — illustrative, not a real product. Attached so the Skdwn IKC assistant can answer detail questions (e.g. “what’s the I<sup>2</sup>C address?”) straight from the datasheet.

