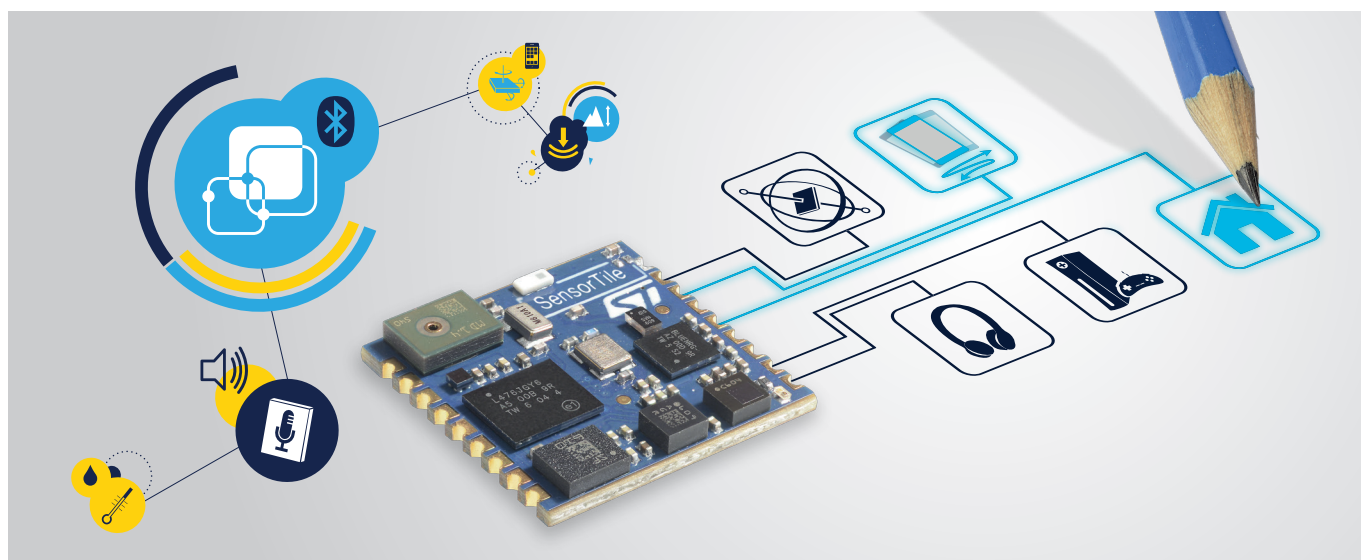# SensorTile
# An IoT design lab on the tip of a pencil



## An integrated development platform engineered for makers

SensorTile is a tiny, square-shaped IoT module that packs powerful processing capabilities leveraging an 80 MHz STM32L476 ultra-low power microcontroller and Bluetooth Low Energy connectivity based on our BlueNRG network processor as well as a wide spectrum of motion and environmental MEMS sensors, including a microphone. SensorTile can snugly fit into your IoT hub or sensor network node and be at the core of your own solution.

The STEVAL-STLKT01V1 development kit comes with a set of cradle boards enabling hardware scalability as well as software and firmware libraries and tools. Alongside its ready-to-use app, SensorTile is a real IoT design lab.
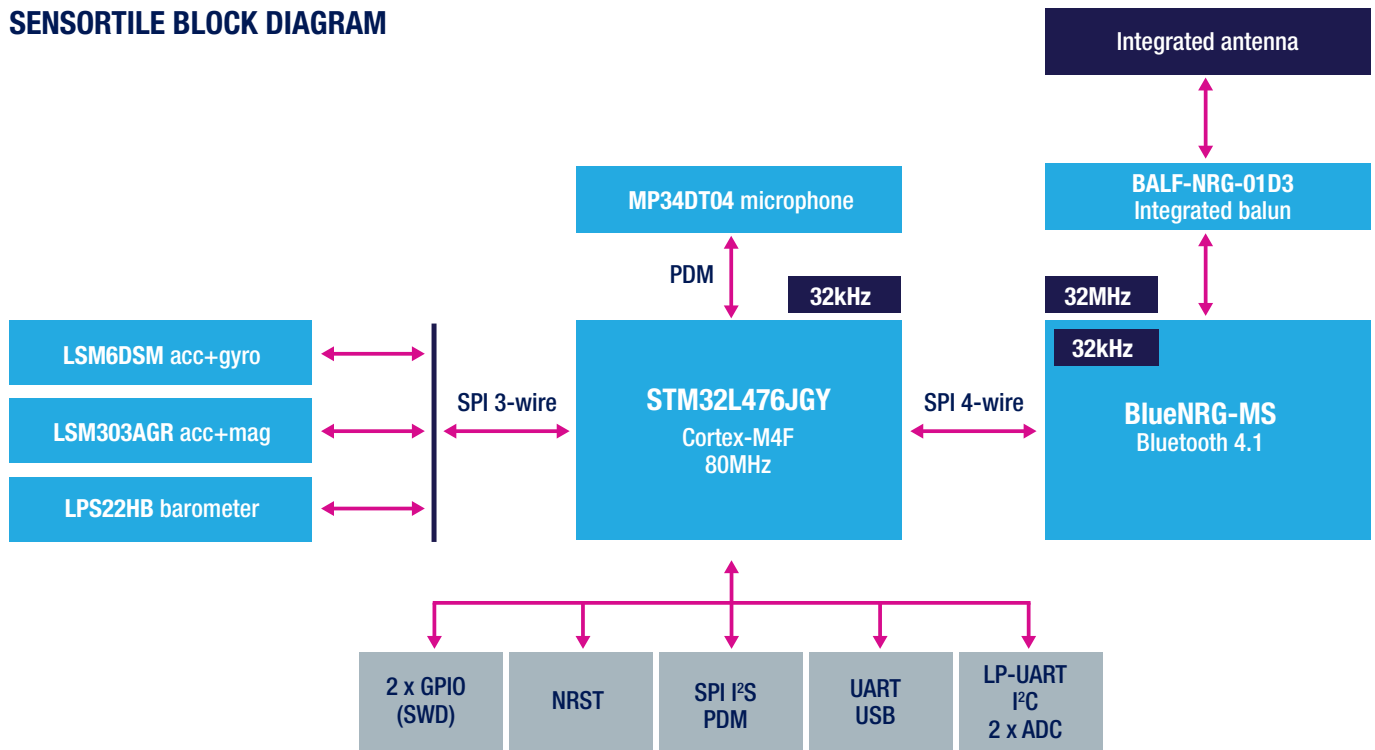
### KEY FEATURES & BENEFITS

- Integrated sensor node that is ready out-of-the-box for fast and effective prototyping
- FCC (ID: S9NSTILE01) and IC (IC: 8976C-STILE01) certified
- Very small 13.5 x 13.5 mm footprint can be soldered or plugged onto a PCB to add remote sensor and connectivity capability to any IoT design right away
- Rich set of motion and environmental sensors provides a universal platform that can be easily scaled up or down
- Ultra-low-power yet powerful STM32L4 microcontroller enables highly demanding applications
- Comprehensive set of firmware and software libraries and tools enables the easiest path to product development
- Supports OTA firmware upgrades
- Apps and SDK for easy iOS and Android development

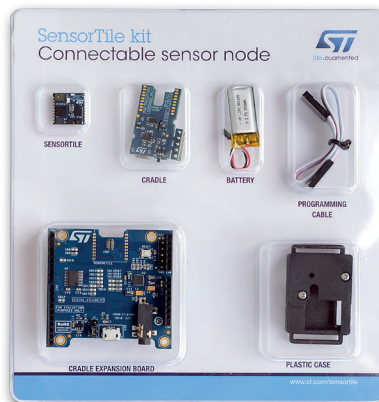### KEY APPLICATIONS
Internet of Things

- Smart Industry
- Smart City
- Smart Home
- Smart Things

## SENSORTILE BLOCK DIAGRAM

```
                                                    ┌──────────────────────┐
                                                    │   Integrated antenna  │
                                                    └──────────────────────┘
                                                              ↕
                    ┌────────────────────┐          ┌──────────────────────┐
                    │ MP34DT04 microphone│          │   BALF-NRG-01D3       │
                    └────────────────────┘          │   Integrated balun    │
                              ↕ PDM                  └──────────────────────┘
                          [32kHz]                              ↕
┌──────────────────┐  ┌──────────────────────┐   [32MHz]  ┌──────────────────────┐
│ LSM6DSM acc+gyro │  │                      │            │ [32kHz]               │
└──────────────────┘  │    STM32L476JGY      │            │   BlueNRG-MS          │
┌──────────────────┐  │    Cortex-M4F        │  SPI 4-wire│   Bluetooth 4.1       │
│ LSM303AGR acc+mag│  │    80MHz             │            │                       │
└──────────────────┘  │                      │            └──────────────────────┘
┌──────────────────┐  └──────────────────────┘
│ LPS22HB barometer│       SPI 3-wire
└──────────────────┘
```

| 2 x GPIO (SWD) | NRST | SPI I²S PDM | UART USB | LP-UART I²C 2 x ADC |

## SENSORTILE DEVELOPMENT KIT

- SensorTile module
- SensorTile cradle expansion board with audio DAC, USB port, STM32-Nucleo and Arduino UNO R3 connectors. Quickly expand its capabilities or tap into a wide selection of STM32 Nucleo development and expansion boards. Can also be used for programming via the on-board SWD connector.
- 100 mAh Li-Ion battery
- Plastic box for housing SensorTile, cradle and battery



- SWD programming cable
- SensorTile cradle with battery charger, humidity and temperature sensor, SD memory card slot and USB port. Provides storage, power management and wire connectivity capabilities to enable stand-alone use of a SensorTile soldered on it. Can also be used for programming via a break-away SWD connector.

## HARDWARE AND SOFTWARE RESOURCES

| Ordering code | Description |
|---|---|
| STEVAL-STLKT01V1 | SensorTile development kit |
| STSW-STLKT01 | Basic firmware application for STEVAL-STLKT01V1 |
| FP-SNS-ALLMEMS1 | STM32 ODE function pack for Bluetooth Low Energy and sensor software expansion for STM32Cube |
| FP-SNS-MOTENV1 | Bluetooth Low Energy and sensors software expansion for STM32Cube |
| BLUEMICROSYSTEM1 | Bluetooth Low Energy and sensors software expansion for STM32Cube |
| BLUEMICROSYSTEM2 | Bluetooth Low Energy and sensors software expansion for STM32Cube |
| BlueMS | BlueMS Application for Android and iOS |
| BlueST-SDK | Bluetooth Low Energy and Sensors Technology Software Development Kit (SDK) |

STEVAL-STLKT01V1