

# Radar – precise motion sensing

## 24GHz industrial radar

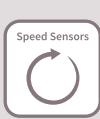


### What is new in the world of sensing?

- › Infineon recently launched the market's **smallest 24GHz industrial radar** chip solution, BGT24LTR11N16
- › Small form factor and reduced power enables **new markets and applications**
- › Wide range of applications ranging from **smart lighting** motion detection to multicopter **collision avoidance**
- › Released alongside Sense2GoL demoboard to enable customer designs

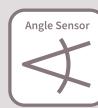
Markets			
Street and office lighting	Home automation	Robotics	UAV/multicopter
<ul style="list-style-type: none"><li>› Presence and motion detection</li><li>› Collision detection</li><li>› Presence and motion detection</li><li>› Collision detection and avoidance</li><li>› Surveillance/security</li><li>› HVAC control</li><li>› Automatic doors</li><li>› Landing sensor (altimeter)</li><li>› Presence and motion detection</li><li>› Vacuum cleaner</li><li>› Height control</li><li>› Sanitary</li></ul>			
Industry 4.0, IoT, and UAV applications			

### What data can you get with our radar sensor?



#### Speed/velocity

- › Derived from Doppler shift in frequency



#### Angle/direction to target

- › Derived from phase difference at the antennas



#### Range/distance to target

- › Derived from the time of travel of the RF waves



#### 3D position of object

- › Derived from combining information from multiple receive channels



Enabling **soft landings**, **collision avoidance** and **height control**

Providing light seamlessly through **smart motion detection**

Conserving energy through **smart street lighting** applications

Utilising **direction of travel** to only open doors when necessary

### Benefits of radar

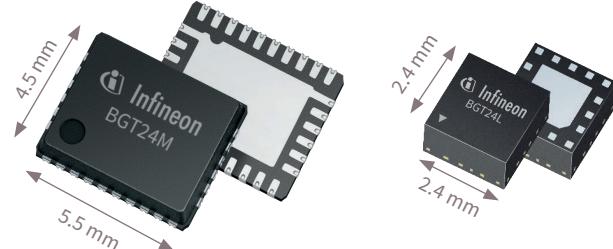
- › Increased range/coverage
- › Adjustable sensitivity
- › Resistance to harsh weather conditions
- › Protects privacy

- › Small Form factor enabling smart designs
- › More than just "Motion" detection
- › Measure speed, angle, and distance too
- › Adaptable according to application needs

# XENSIV™ 24GHz radar sensor ICs

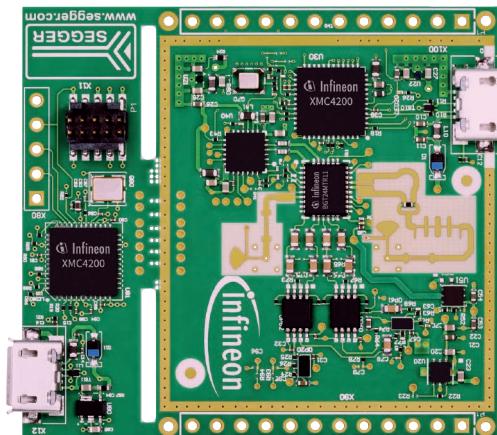
## BGT24M/L family of MMIC chips

Product	Configuration	Key benefits
BGT24MTR11	1Tx + 1Rx	32 pin leadless RoHs compliant VQFN package
BGT24MR2	2Rx	Twin receiver
BGT24MTR12	1Tx + 2Rx	On chip power and temperature sensors
BGT24LTR11	1Tx + 1Rx	Low power consumption



## XENSIV™ 24GHz demoboards

### Distance2Go development kit



#### Kit contents

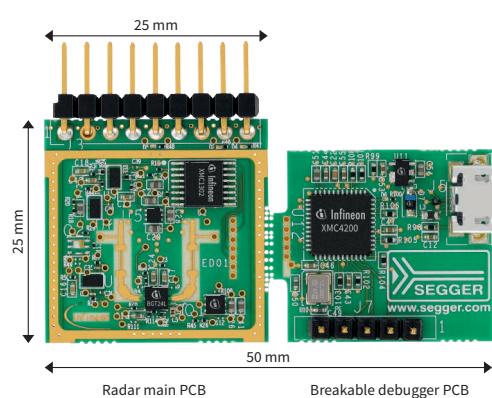
- › 24GHz demo board
- › User's manual
- › SW GUI to operate kit
- › FMCW FW and SW1)  
(also available as source code)
- › Doppler FW and SW1)  
(also available as source code)
- › Schematic and bill-of-materials of module

#### Distance2Go key features

- › Capability to detect distance of multiple targets
- › Capability to detect motion, speed and direction of movement (approaching or retreating)
- › Very small form-factor (4.5 x 3.6 cm) 24 GHz ISM band module that can be used as a development kit or mounted as a daughter board in a system
- › BGT24MTR11 – 24 GHz highly integrated RF MMIC
- › XMC4200 ARM® Cortex®-M4 – 32-bit industrial microcontroller
- › Debug over cortex 10 pin debug connector
- › Integrated multiple element patch antennas

[www.infineon.com/D2G](http://www.infineon.com/D2G)

### Sense2GoL demoboard



#### Kit contents

- › User manual
- › Firmware for motion detection
- › SW GUI for radar signal observation
- › PCB schematic and gerber files

#### Sense2GoL key features

- › BGT24LTR11 – 24GHz highly integrated low-power MMIC
- › XMC1302 ARM® Cortex®-M0 – 32-bit industrial microcontroller
- › Multiple integrated patch antennas available  
(default 1 x 4 with FOV = 28° x 80°)
- › Segger debugger breakoff board for reprogramming

[www.infineon.com/S2GL](http://www.infineon.com/S2GL)