



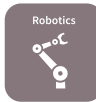

Radar – precise motion sensing

24GHz industrial radar

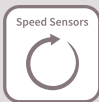


What is new in the world of sensing?

- > Infineon recently launched the market's **smallest** 24GHz industrial radar chip solution, BGT24LTR11N16
- > New 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 new Sense2GoL demoboard to enable customer designs

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

What data can you get with our radar sensor?



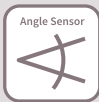
Speed/velocity

- > Derived from Doppler shift in frequency



Range/distance to target

- > Derived from measurement of electromagnetic wave



Angle/direction to target

- > Derived from phase difference at the antennas



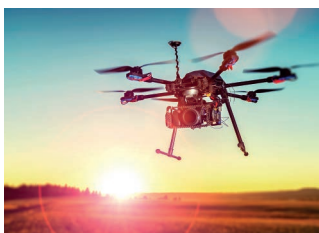
Position of object

- > Derived from FMCW (Frequency-Modulated Continuous-Wave radar)

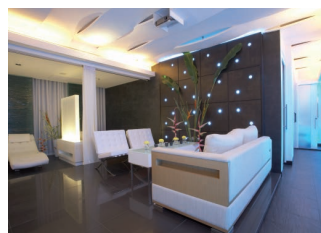


Benefits of radar

- > **Accuracy** – configurable to high level of precision up to 50 m for humans and 150 m for cars
- > **Sensitivity** – much finer movement detection than PIR (e.g. occupancy sensor application for people in room typing on keyboard → cannot be detected by PIR; respiration sensitivity → **down to 2 mm** movement)
- > **Size** – smallest and most cost effective chip solution in market
- > **Speed** – radar differentiates between moving and stationary objects (FMCW)
- > **Resistance** – operational within wide range of atmospheric variations (e.g. temperature changes, humidity, dust, etc.)



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



Providing light seamlessly through **smart motion detection**



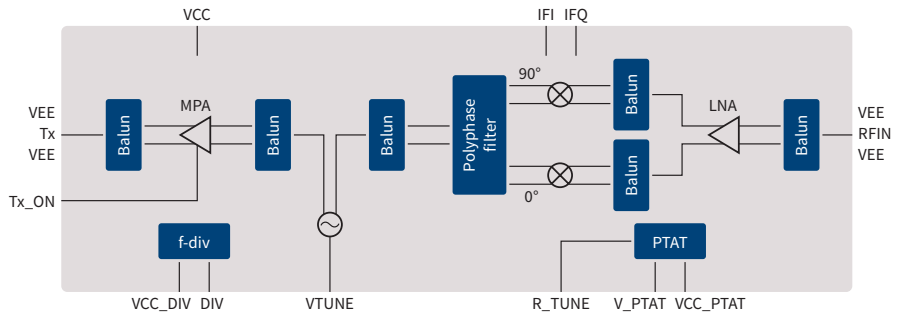
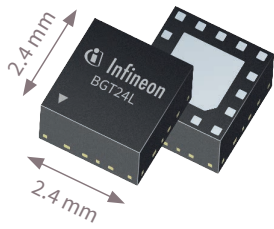
Conserving energy through **smart street lighting** applications



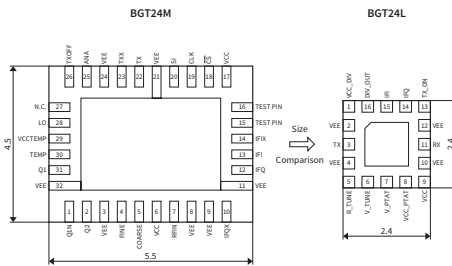
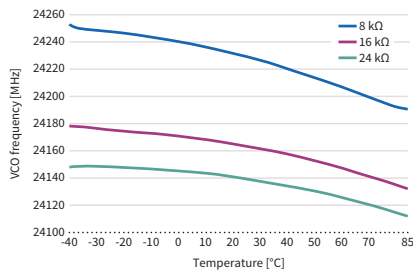
Utilising **direction of travel** to only open doors when necessary

BGT24LTR11N16 – technical insights

Block diagram



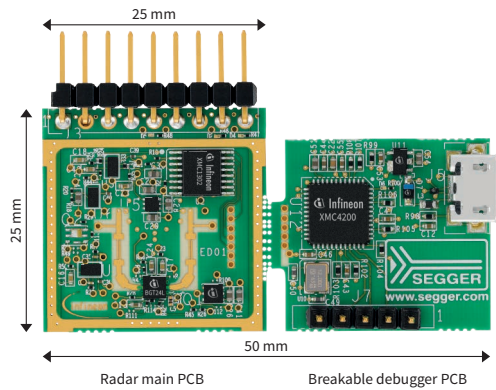
The VCO frequency is kept within the ISM band using the internal PTAT circuit, no external PLL or tuning circuitry required for frequency stabilization. The frequency band can be shifted using an external tuning resistor.



Easy to use design tools

- › Chip evaluation board to perform basic measurements with the chip (EVAL_BGT24LTR11_BOARD)
- › Demo kit to get a feel for motion detection using 24GHz radar sensing (Sense2GoL)
- › Complete datasheets and applications notes available to kick start your design

New – Sense2GoL demoboard



Kit contents

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

Key features of the new Sense2GoL demoboard

- › 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

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