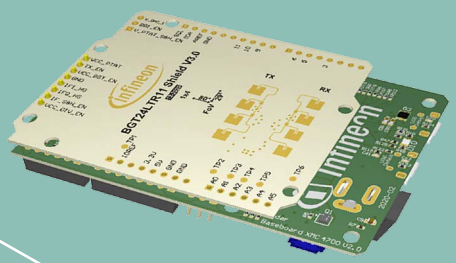


Product brief

Distance2GoL

XENSIV™ 24GHz demo platform for the BGT24LTR11

The Distance2GoL radar system is a demo platform for Infineon's 24GHz silicon-germanium (SiGe) BGT24LTR11 radar transceiver. The Distance2GoL consists of two boards – the microcontroller board with the XMC4700 (RADAR BB XMC4700) and a radar frontend board (BGT24LTR11 Shield), which features a 4 x 1 array antenna for the transmitter and receiver sections. It is also shielded with a metal cover and absorber material to get the best RF performance.

The heart of the Distance2GoL module is the highly integrated BGT24LTR11 MMIC, which is a radar transceiver operating from 24.00 to 24.25 GHz. In order to keep the output frequency within the ISM band and generate the frequency ramp, the tuning voltage is software-controlled via a digital-to-analog converter in the microcontroller unit. The concept is a software-based closed loop to periodically measure the frequency and tune the VCO accordingly for frequency control and ramp generation. Thus, an external hardware PLL is omitted which saves cost, power and PCB space.

The Distance2GoL showcases a low-power solution for long range motion sensing and range detection with 24GHz radar. It additionally allows direction of movement, proximity as well as real presence sensing. The smart tracking algorithm enables reliable one-dimensional tracking of a human target despite possible clutter or stationary targets around. Hence, the Distance2GoL demo platform addresses various **indoor and outdoor applications** including:

- Smart home devices
- Lighting systems
- Unmanned Aerial Vehicles (UAV) such as drones
- Security systems from commercial surveillance to low-power IP cameras
- HVAC products like smart air conditioners
- Smart sanitary facilities (e.g. smart toilets)

The Distance2GoL is compliant with all FCC & ETSI requirements, which accelerates the certification process for an end product on customer side. This system is designed to allow customers to carry out prototyping, system integrations as well as initial product feature evaluations very quickly for the BGT24LTR11 radar chipset.

www.infineon.com

Key features & figures

The Distance2GoL combines the BGT24LTR11 RF transceiver with the XMC4700 32-bit ARM® Cortex® M4 MCU.

- User configurable detection range up to 15 m for human target
- Detects distance and velocity of closest human or moving target
- Low power consumption due to duty cycling options
- Small form factor (4.5 x 3.6 cm)
- Micro-strip patch antennas with 10 dBi gain and 29°/80° field of view

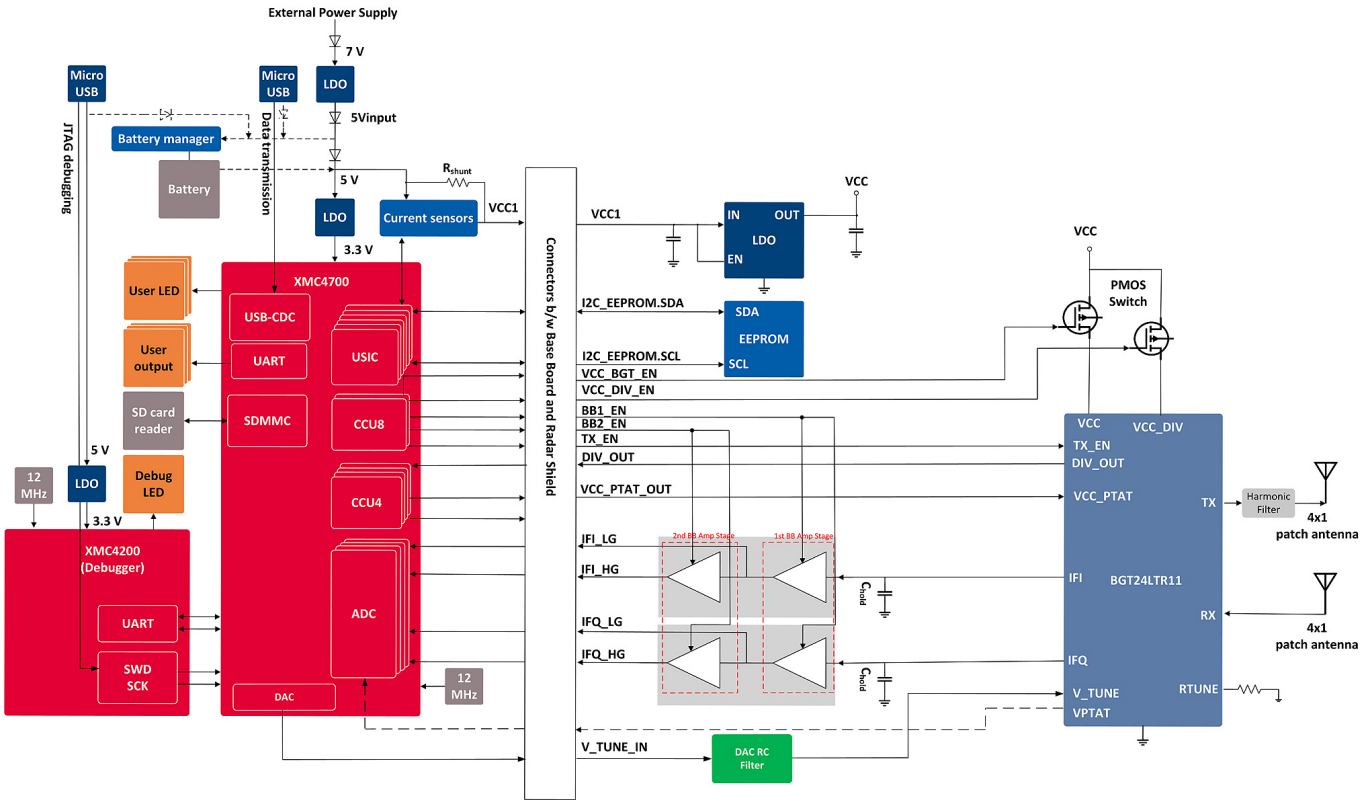
Key benefits

- Software-controlled FMCW for power saving, reduced costs and less PCB space
- Smart algorithm enables reliable one-dimensional tracking
- Operates in harsh environments and detects through non-metallic materials
- FCC & ETSI compliant
- Compatible with Arduino for ease of use and fast prototyping

Distance2GoL

XENSIV™ 24GHz demo platform for the BGT24LTR11 radar transceiver

Block diagram – the Distance2GoL is based on Infineon's 24GHz radar system platform



The BGT24LTR11 MMIC provides the I/Q IF output signals through single-ended terminals, which are amplified by the base band section for the digital part. Frequency stability is provided by the CCU of the XMC4700 which measures the MMIC divider output and regulates the VCO tuning voltage V_{TUNE} accordingly via the DAC. V_{PTAT} is a built-in voltage source, which is Proportional to Absolute Temperature (PTAT) and delivers the VCO tuning voltage for initial calibration. The LDOs regulate the voltage, the EEPROM stores the board identifier information and the PMOS switch enables the low power duty cycling of the MMIC. The two-stage amplifier, amplifies the I/Q signals from the BGT24LTR11 for the digital part. The radar baseboard XMC4700 is designed with Arduino compatible headers to ease prototyping and integration with other Arduino shields to form a compelling application.

OPN: DEMODISTANCE2GOLTOBO1

Published by
Infineon Technologies AG
81726 Munich, Germany

Document number: B132-I1148-V1-7600-EU-EC
Date: 03 / 2021