Datasheet
Arduino Radar Shield V1.0™

Arduino UNO Q-compatible whield With 61 GHz CW Doppler radar sensor and 6-DOF IMU

Version *preprod.* — 05.10.2026

PRODUCT FAMILY

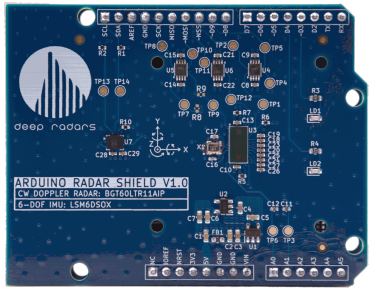
Arduino Shield

APPLICATIONS

- Vibration measurement
- Vital signs monitoring
- Touchless / gesture-based interfaces
- Occupancy monitoring

DESCRIPTION

Arduino Radar Shield V1.0™ is an Arduino UNO Q compatible board, with 61 GHz *continuous-wave* (CW) Doppler radar and 6-axis *inertial measurement unit* (IMU). The Arduino Radar Shield V1.0™ is an evaluation module intended for development and testing purposes only. It is not approved for resale.



Top view of the Arduino Radar Shield V1.0™.

USE CASES

Typical applications include contactless presence detection in dusty/dark environments, vibration monitoring in industrial and civil applications, contact-free switches for public installations (ticket machines, automatic doors, light switches) and indoor presence sensing for smart-building automation.

Key features

- 61 GHz CW Doppler radar with *antenna-in-package* (AIP) technology
- 6-axis IMU for self-motion compensation
- Performance unaffected by lighting conditions or common hand coverings

Other hardware compatibilities

- **NOT compatible** with Arduino Uno or other Arduino products
- compatible with any STM Nucleo board

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1. Technical Specifications

Arduino Radar Shield V1.0™ is an evaluation module based on: a) Infineon Technologies' BGT60LTR11AIP chip [1], a 61 GHz radar front-end with CW Doppler modulation and 1 *transmitting* (TX) and 1 *receiving* (RX) antennas, and; b) ST Microelectronics' LSM6DSOX chip [2], a 6-axis *micro-electro-mechanical systems* (MEMS) IMU.

Table 1: Key electrical, mechanical, and environmental specifications of the board.

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
Radar						
transmit frequency		f_{t}	61.0	61.25	61.5	GHz
sampling frequency		f_{s}	0	–	4	kHz
detection range		R	0.2	4.0	8.0	m
output power (EIRP)		P_{out}	–	–	10.0	dBm
IMU						
full-scale acceleration range		a_{range}	± 2	–	± 16	g
full-scale angular range		θ_{range}	± 125	–	± 2000	dps
Mechanical Outlines						
outline dimensions	compare to drawing on p. 4	height length width	15.0 68.5 53.5	20.0 68.5 53.5	25.0 68.5 53.5	mm
Power supply						
supply voltage		V_{CC}	5	–	24	V
supply current	@12V	I_{CC}	–	??	–	mA
Environment						
operating temperature		T_{OP}	-20	–	61	°C
storage temperature		T_{STG}	-40	–	85	°C

For further information and specifications please refer to the BGT60LTR11AIP datasheet [1] or LSM6DSOX datasheet [2].

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3. Mechanical Drawing

All dimensions are expressed in millimeters (mm) unless otherwise noted. Drawings are schematic and not to scale.

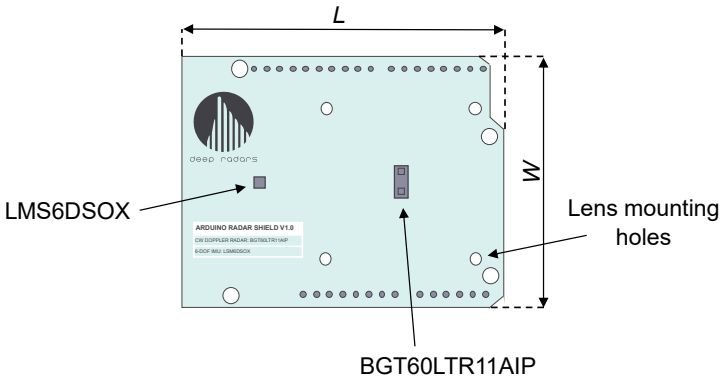

Figure 1: Mechanical drawing of the front view.

DIMENSIONS SUMMARY

Length (L)	68.5 mm ± 0.1 mm
Width (W)	53.5 mm ± 0.1 mm
Shield mounting holes	2× Ø 4 mm, see Fig. 1
Lens mounting holes	2× Ø 2.5 mm, see Fig. 1

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4. Array description

Arduino Radar Shield V1.0™ leverages the BGT60LTR11AIP from Infineon Technologies GmbH, a compact 61 GHz CW Doppler radar sensor [1]. Antennas are realised directly on the chip package, with a distance of 4.70 mm, as shown in Fig. 2.

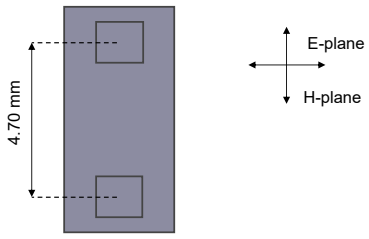
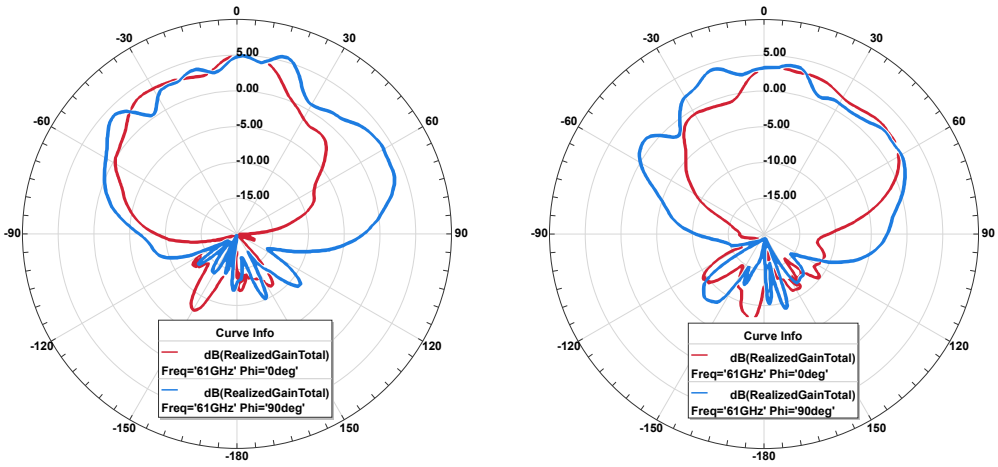


Figure 2: Antenna dimensions.

The FOV has been evaluated through numerical simulation, and the resulting radiation pattern is shown in Fig. 3. Based on the obtained radiation pattern, the FOV, defined by the -3 dB beamwidth, is approximately $\pm 60°$ in the E-plane and $\pm 35°$ in the H-plane for both the TX and RX [3].



(a) TX – H/E plane at f = 61 GHz (b) RX – H/E plane at f = 61 GHz

Figure 3: Radiation pattern [3].

INTEGRATION NOTES

The radar module may be enclosed by a protective enclosure (*radome*). The following requirements should be considered for the radome design:

- The enclosure material should have low dielectric losses at the operating frequency to minimize attenuation of the radar signal.
- The enclosure geometry, particularly in the area above the antennas, should be as uniform as possible and avoid abrupt changes in thickness or shape (e.g., 3D printing should be avoided).
- The distance between the radar front-end and the inner surface of the radome should be an integer multiple of half the free-space wavelength. For a nominal operating frequency of 61 GHz, the recommended distance is therefore 2.46 mm or a multiple thereof (e.g., 4.91 mm, 7.37 mm, or 9.83 mm).

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- The radome thickness should preferably be an integer multiple of half the wavelength inside the enclosure material and should be kept as thin as practical.

For any further details please refer to [4].

4. Interface and Software

Arduino Radar Shield V1.0™ is compatible only with Arduino UNO Q.

WARNING: do not use the shield on Arduino Uno or other Arduino products.

The complete software library, as well as its user manual, is available under direct request to customerservice@deepradars.com.

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5. Usage

The Arduino Radar Shield V1.0™ is a 61 GHz radiofrequency device based on a CW Doppler radar architecture. The module is intended for vibration measurement and presence-sensing applications.

The module operates by transmitting a sinusoidal signal and receiving the echoes reflected by objects within the radar FOV. The received signals are processed to estimate the frequency of vibration, direction of the target and its velocity. The module should be installed with a clear field of view toward the area to be monitored. Objects or structures located close to the antenna, particularly metallic or highly reflective surfaces, may affect the radar response and should be considered during system integration.

The Arduino Radar Shield V1.0™ should be operated only within the electrical, mechanical, and environmental limits specified in this document. The module must be supplied with the specified supply voltage and should not be operated outside the specified operating temperature range.

Interference and Multiple-Device Operation

The Arduino Radar Shield V1.0™ is an active radiofrequency transmitter and may interfere with other radar sensors or radiofrequency devices operating in the same or adjacent frequency bands. Conversely, other radiofrequency transmitters may affect the performance of the Arduino Radar Shield V1.0™. The possibility of interference should therefore be considered during system design and installation.

Particular attention is required when multiple radar modules are installed in close proximity or when several modules have overlapping fields of view. Simultaneous operation of multiple CW Doppler radars may result in mutual interference, potentially causing false detections, degraded detection performance, increased noise, or reduced measurement accuracy. Where possible, radar modules should be physically separated and arranged so that their antenna fields of view do not directly overlap. The distance and relative orientation between modules should be determined according to the specific application and validated under representative operating conditions.

Interference may also occur when the Arduino Radar Shield V1.0™ is installed close to other 60 GHz-band radar sensors, high-frequency electronic equipment, or reflective structures. Systems requiring reliable operation in environments with multiple radiofrequency transmitters should be evaluated for electromagnetic compatibility and coexistence before deployment.

Frequency bands

The 61 GHz frequency range includes frequencies designated for *industrial, scientific and medical* (ISM) applications in several regulatory regions. However, the ISM designation and the permitted operating frequency range are subject to applicable national and regional regulations. The frequency range available from the radar hardware may be wider than the portion of the spectrum that is permitted for use in a specific jurisdiction. In particular, the 500 MHz frequency range supported by the device must not be interpreted as a blanket authorization to operate over the entire range.

The operating frequency, transmitted bandwidth, output power, duty cycle, and other radiofrequency parameters must therefore be configured and used only within the limits applicable to the intended country or region. Compliance with applicable radiofrequency, electromagnetic compatibility, and spectrum regulations is the responsibility of the system integrator and/or final equipment manufacturer.

Before deploying the Arduino Radar Shield V1.0™, always refer to the applicable national and regional regulations, frequency-allocation plans, and radio equipment requirements.

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The most restrictive applicable requirements shall be observed. Where multiple radar devices are operated simultaneously, the complete system should also be evaluated for electromagnetic compatibility and mutual interference under the intended installation conditions.

The information provided in this document does not replace the applicable laws, regulations, certifications, or approval requirements. The user and system integrator are responsible for ensuring that the final product and its operation comply with all applicable regulatory requirements.

6. Regulatory Compliance

Arduino Radar Shield V1.0™ is not FCC/CE compliant and is therefore intended for evaluation purposes only. It must not be resold, integrated into a final product, or installed as a standalone product. The module is intended solely for evaluation, experimentation, development, and testing purposes.

! ESD Information

This evaluation module is sensitive to damage from ESD. Normal precautions as usually applied to CMOS devices are sufficient when handling the device. Avoid touching the signal and output pins before soldering or plugging the device into a host board.

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7. References

[1] Infineon Technologies GmbH. BGT60LTR11AIP datasheet. [Online]. Available: https://www.infineon.com/assets/row/public/documents/24/49/infineon-bgt60ltr11saip-datasheet-en.pdf

[2] ST Microelectronics NV. LSM6DSOX datasheet. [Online]. Available: https://www.st.com/resource/en/datasheet/lsm6dsox.pdf

[3] Infineon Technologies GmbH. BGT60LTR11AIP radar reference shield. [Online]. Available: https://www.infineon.com/assets/row/public/documents/24/44/infineon-ug170807-ref-bgt60ltr11aip-m0-board-usermanual-en.pdf

[4] ——. AN091611: Radome design guide for XENSIV BGT60LTR11AIP 60 GHz radar sensor. [Online]. Available: https://www.infineon.com/gated/infineon-an091611-bgt60ltr11aip-radome-design-guide-applicationnotes-en_e69fc7b3-0b37-4735-b72e-00f20fe1d18f

8. Document Revision History

This datasheet contains the technical specifications of the described product. Changes to the specification must be made in written form. All previous versions of this document are no longer valid.

VERSION	DATE	COMMENT
preprod.	05.10.2026	Initial release of the datasheet during preproduction

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