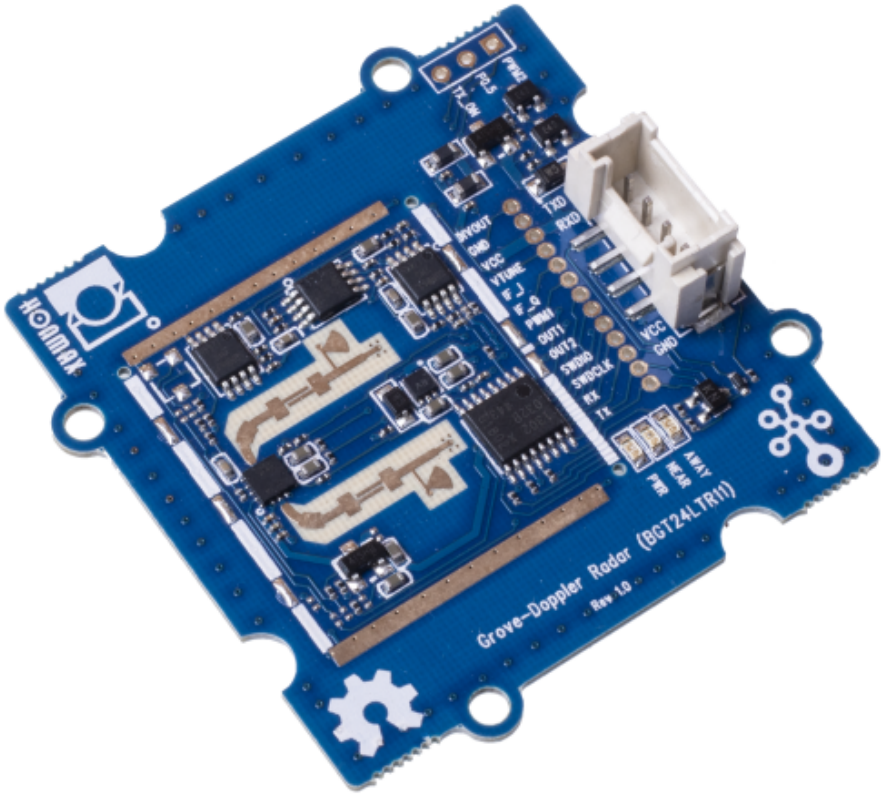
Grove - Doppler Radar (BGT24LTR11) - 24GHz Transceiver



PRODUCT DETAILS

Features

- The first radar-based sensor in the Grove Family
- Compact size for easy deployment
- Light-weight design, suitable for UAV applications
- Low power consumption for prolonged usage
- 24GHz Transceiver MMIC for high-precision measurements of movement and speed
- Fast response using electromagnetic waves
- ESD protection to avoid system failures caused by ESD strikes
- High penetration which allows it to be deployed behind an object
- Maintains operation through harsh weather conditions (temperature, light, dust, rain)

Description

How would you build a system that could calculate the distance towards an object or detect whether there is motion present?

Normally you would use an Ultrasonic or LiDAR Sensor for distance measurement and PIR Motion Sensor for motion detection.

What if we told you there is an all-in-one module that could do all these functions more precisely and also perform functions such as velocity detection of moving objects and angle detection of objects. Would you believe it?

We were tired of using these traditional modules for motion-sensing applications and wanted to deliver you a better solution, integrating new technologies.

Well...For the first time in the history of Grove, we are very excited to bring you a Grove Module based on Radar Technology!

This is the Grove – Doppler Radar.

The Grove – Doppler Radar is based on the BGT24LTR11 Silicon Germanium MMIC which is a 24GHz radar transceiver. It is driven by an XMC1302 MCU based on Arm® Cortex®-M0. This comes in a compact package and runs on very low power, providing high-precision measurements.

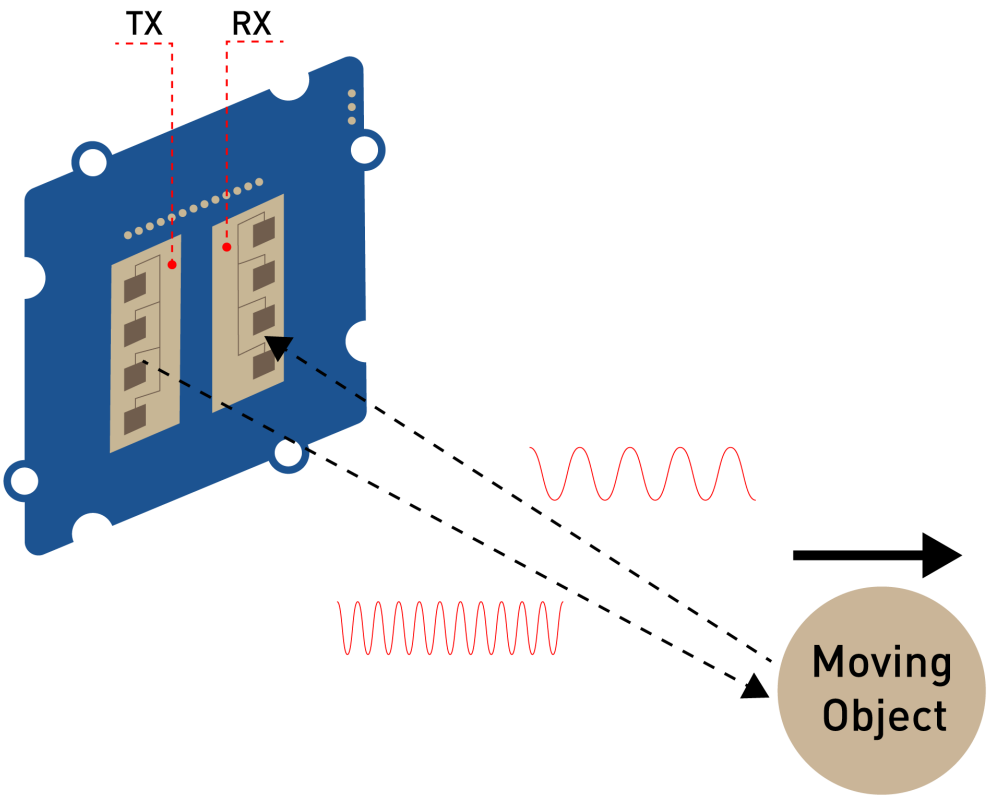
The high frequency of this module allows for high penetration though objects and therefore this module does not need to be exposed outside when deploying, but rather behind an object. This, in turn, is extremely useful in security systems. Also, this is able to operate in harsh weather conditions such as high temperatures, dust, and rain.

How Does Doppler Radar Technology Work in This Module?

Doppler radar works by sending a beam of electromagnetic radiation waves from the transmitter (TX Antenna), with a precise frequency, at a moving object.

Once the electromagnetic radiation wave comes in contact with an object, it travels back towards the receiver (RX Antenna). However, when the wave got reflected from the moving object, the wave now has a different frequency compared to the original frequency, it emitted.

Then the change in this frequency can be used to calculate the velocity of the moving object. We also provide you with a built-in function getSpeed() which helps you easily get the moving speed of the object you are targeting. Detailed information can be found on the product's wiki page.

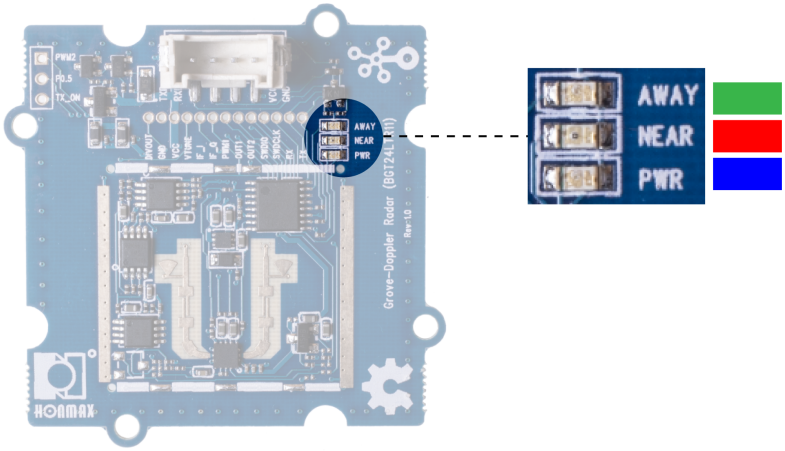


More Possibilities for Advanced Users

The Grove – Doppler Radar module is designed so that the pinouts are broken out from the MCU and the MMIC to enable advanced users to tinker with this module.

Also, the onboard LED indicators can help users to identify whether the objects are moving towards or away from the module. When the object moves towards the radar, it indicates "NEAR" and when the object moves away from the radar, it shows "AWAY".

All in all, we believe that the Grove – Doppler Radar will open you to a whole new world of possibilities!



Specifications

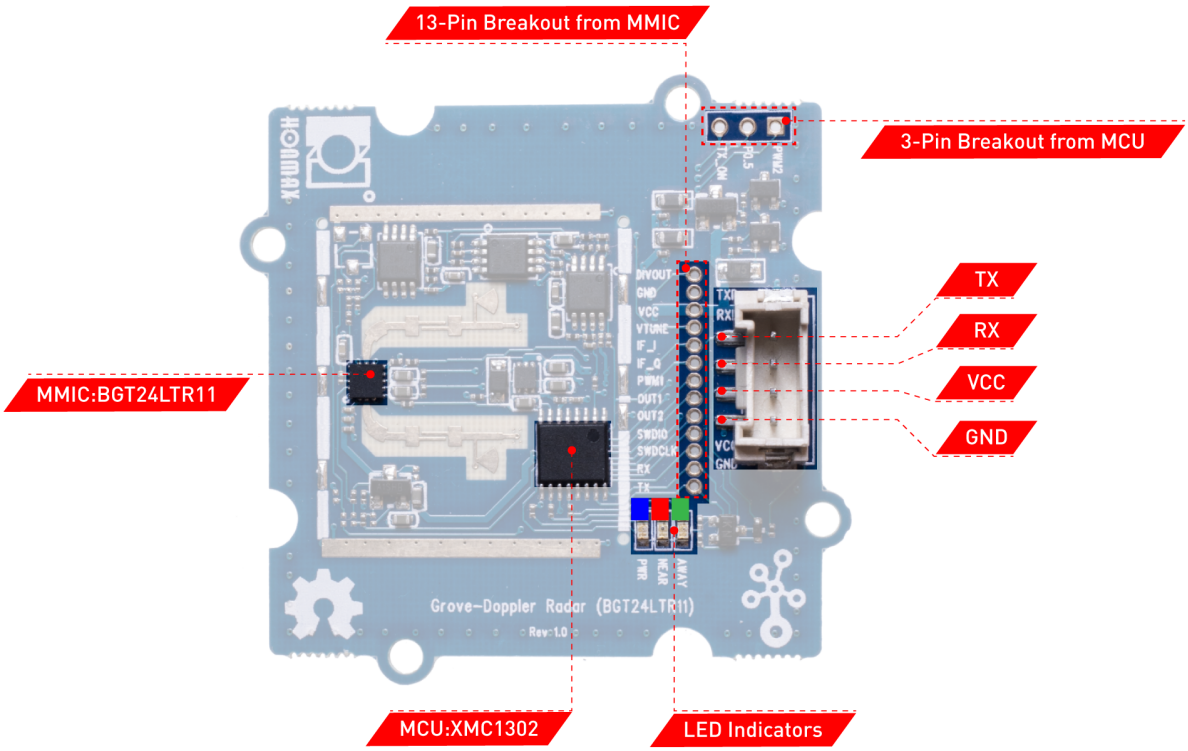
MMIC	BGT24LTR11
MCU	XMC1302 Arm® Cortex®-M0

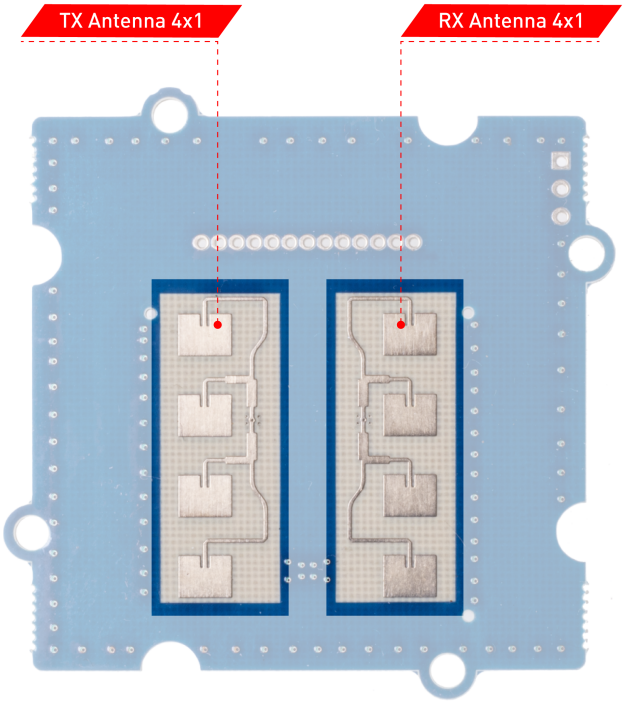
Transmission Frequency	Min: 24GHz
	Typical: 21.125GHz
	Max: 24.25GHz
Output Power (EIRP)	7dBm @ 25°C
Update Time	300ms
Communication Interface	UART (115200)
Detection Distance	10m @ 0dBsm
Standard Detection Field	65° / horizontal (-6dB)
	22° / vertical (-6dB)
Supply Voltage	3.3-5V
Weight	5g

Applications

- Smart Home
- Smart Building
- Automatic Door
- Lighting Control
- Industrial Robotics
- Intruder Alarm Systems
- UAV

Hardware Overview





Parts List

- 1 x Grove - Doppler Radar
- 1 x Grove Cable

ECCN/HTS

HSCODE	8529905000

UPC