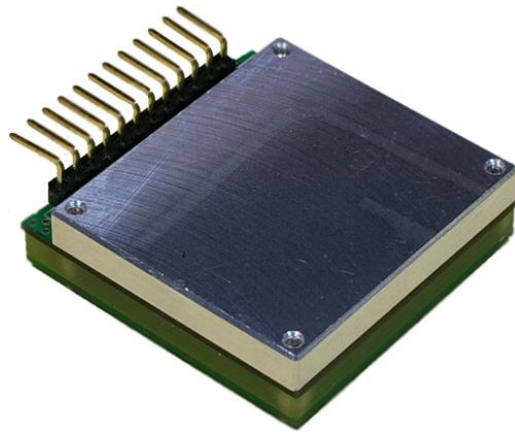


Bio Radar

(2.45GHz Doppler Directional Sensor)



2.45GHz Doppler Directional Sensor is designed for motion/speed/ directional detection application where its sensitivity is very important.

The sensor is constructed with a high performance **circular polarized microstrip antenna, T/R diplexer, a balanced mixer (I/Q demodulator for dual channel I/Q signals) and a high performance oscillator with a PLL circuit.** The excellent frequency stability of a PLL oscillator enhances Doppler detection at low IF frequency and circular polarization waveform improves reception ability for various Radar targets. The dual channel I/Q signal provides target moving direction (approaching or receding) information of the target while detecting speed.

Bio Radar

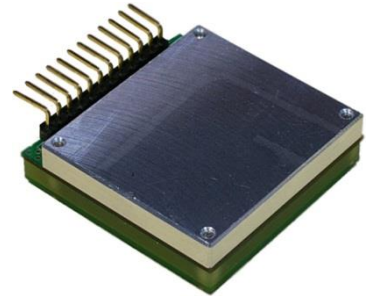
(Doppler sensor)

Main Feature

- circular polarized antenna
- A balanced I/Q demodulator for dual channel I/Q signals
- A high performance PLL oscillator
- Detection of target moving direction (approaching or receding)
- Compact size

Applications

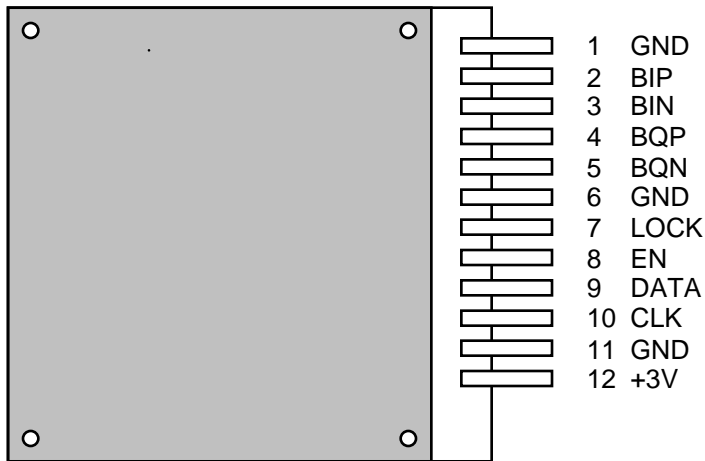
- Microwave-PIR motion detector
- Automotive Radar
- Directional sensor
- Intrusion alarm
- Automatic door opener
- Speed measurement
- Contact less vibration measurement
- Traffic signal actuator
- Automatic illumination system
- Medical instruments



Specification

Parameters	Specifications			Condition
	Min	Typ	Max	
Center Frequency		2.45 GHz		
Operating Voltage	+2.7V	+3V	+3.3V	
Current Consumption		170mA		@ +3V
Transmitter Output Power		8 dBm		
Frequency Stability			±2 ppm	
Phase Noise	@100 Hz		-75dBc/Hz	
	@1 kHz		-85dBc/Hz	
	@10 kHz		-88dBc/Hz	
	@100 kHz		-88dBc/Hz	
	@1 MHz		-108dBc/Hz	
Harmonic/Spur Emission		-30dBc		
Antenna Polarization	RHCP (Transmitter)			
	LHCP (Receiver)			
Antenna Beamwidth (-3dB)	Azimuth		120°	
	Elevation		120°	
Antenna Gain		+3dBi		
RF Interface	Annular Ring Microstrip Patch Antenna			
Output Interface	quadrature I/Q signal			
Operating Temperature	-30 ° C		80 ° C	
Weight	30g			
Dimension	40 X 40 X 11.7 mm			Exclude the I/O pins

Pin Map



#	Name	I/O	Description
1	GND		Ground
2	BIP	O*	Positive in-phase IF output
3	BIN	O*	Negative in-phase IF output
4	BQP	O*	Positive quadrature IF output
5	BQN	O*	Negative quadrature IF output
6	GND		Ground
7	LOCK	O**	PLL lock detect
8	EN	I**	PLL Load Enable, CMOS Input. When EN is high, the data stored in the shift registers is loaded into one of the four latches; the latch is selected using the control bits.
9	DATA	I**	PLL Serial Data Input. The serial data is loaded MSB first; the two LSBs are the control bits. This input is a high impedance CMOS input.
10	CLK	I**	PLL Serial Clock Input. The serial clock is used to clock in the serial data to the registers. The data is latched into the shift register on the CLK rising edge. This input is a high impedance CMOS input.
11	GND		Ground
12	+3V	I	Positive Power Supply for the Sensor Module.

(Note)

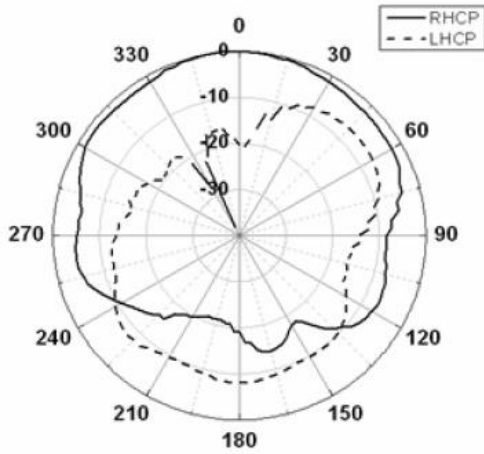
* Balanced quadrature demodulator output

* IF output impedance is 500Ω (Differential IFI and IFQ output impedance)

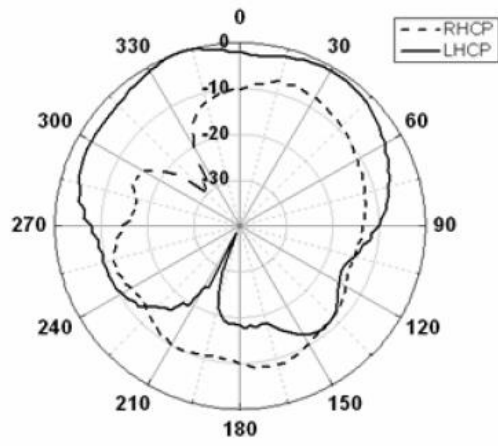
** Internal PLL control port (for PLL programming)

** PLL Programming : refer to the ADF4153 datasheet (Analog Devices)

Radiation Pattern

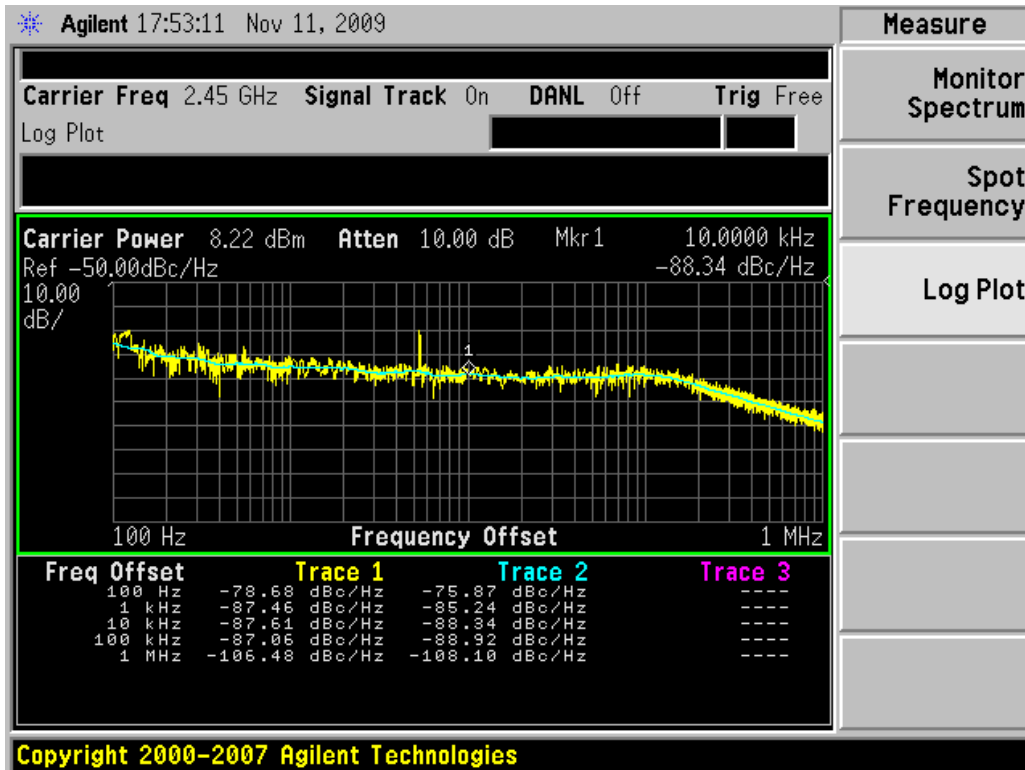


Transmitter Mode



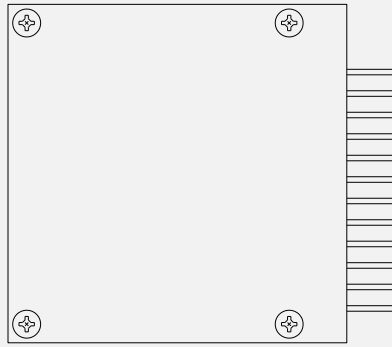
Receiver Mode

Phase Noise (Typical)

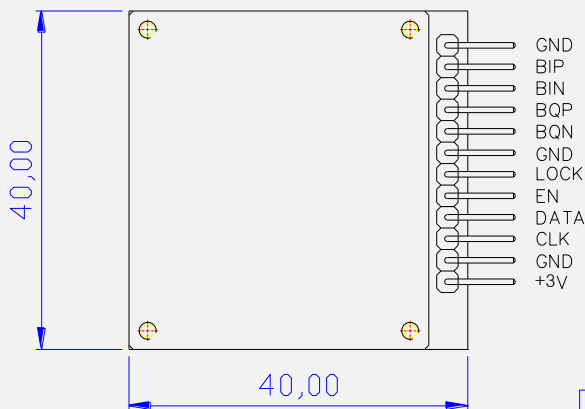


Mechanical Drawing

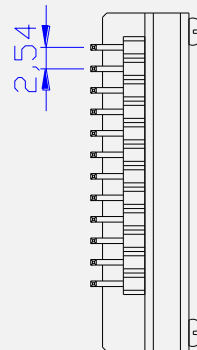
(Antenna side)



(Component side)



GND
BIP
BIN
BQP
BQN
GND
LOCK
EN
DATA
CLK
GND
+3V



Unit : mm