

1. Introduction:

GH100 Series of microwave motion sensor modules are X-Band Doppler transceiver front-end module. These modules are designed for movement detection. They can be used in intruder alarms, occupancy modules and other innovative gadgets.

This Application Note highlights some important points when designing-in GH100 module. Most of the points are also applicable to other models in this series.

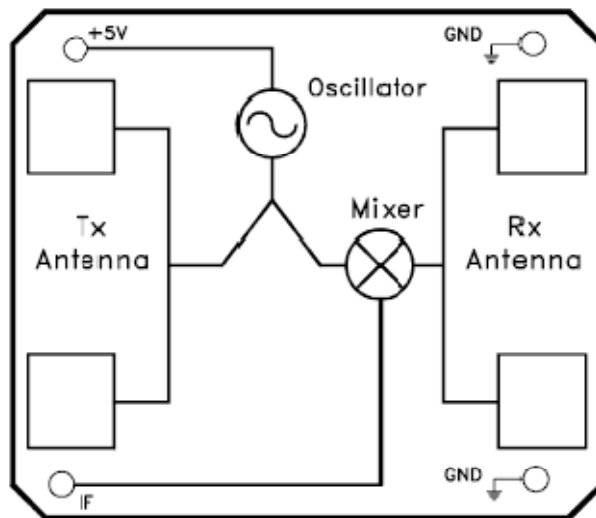
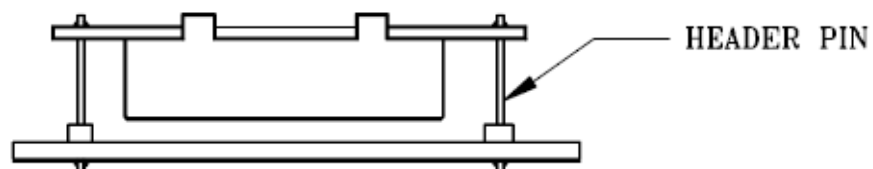


Diagram A: Block Diagram

2. Mounting:

Header Pins can be used to connect the terminals (+5V, IF, GND) to the amplifier circuit as well as mounting support. Other mounting methods may be used. Wave-soldering of the module onto PCBA is possible but processes has to be evaluated to prevent deterioration. No-cleaning process is recommended. Avoid applying pressure or stresses to the chassis of the module. It may cause deterioration to performance



3. Power Supply:

The module operates at +5 Vdc for Continuous wave (CW) operation (see Annex 1). The module can be powered by +5V low duty cycle pulsed trains in order to reduce its power consumption. Sample & Hold circuit at the IF output is required for pulse operation (see Annex 2).

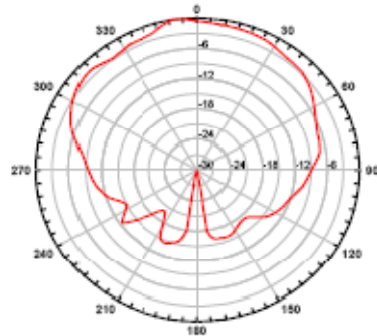
4. Transmit Frequency:

The transmit frequency and power of the module is set by factory. There is no user adjustable part in this device.

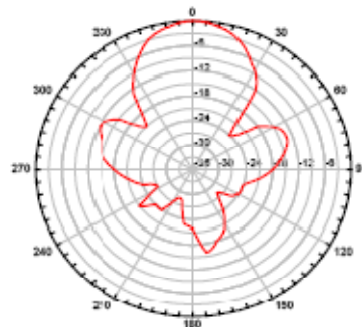
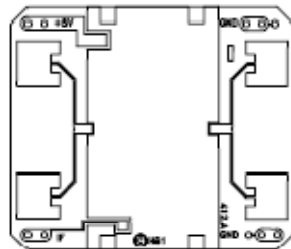
The module is a low power radio device (LPRD) or intended radiator. Local radio communication authority regulates use of such a device. Though user license may be exempted, type approval of equipment or other regulation compliance may be required. Annex 3 shown the allocated frequency in some countries.

5. Radiation Pattern:

The module to be mounted with the antenna patches facing to the desired detection zone. The user may vary the orientation of the module to get the best coverage. The radiation patterns of the antenna and their half power beam width are shown in below diagram..

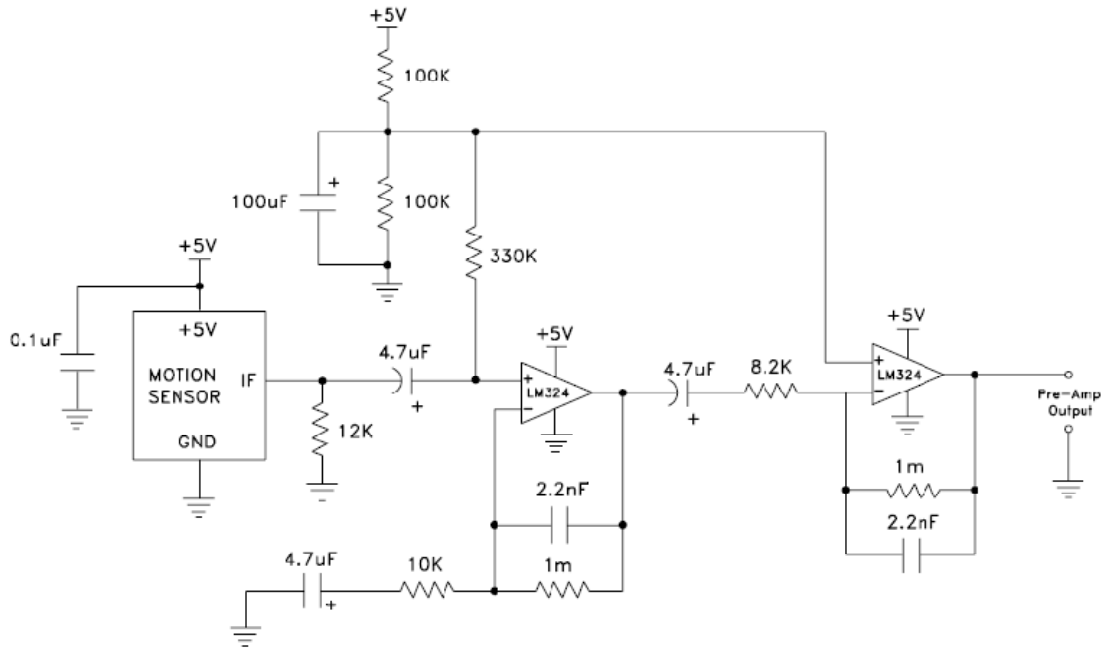


Azimuth

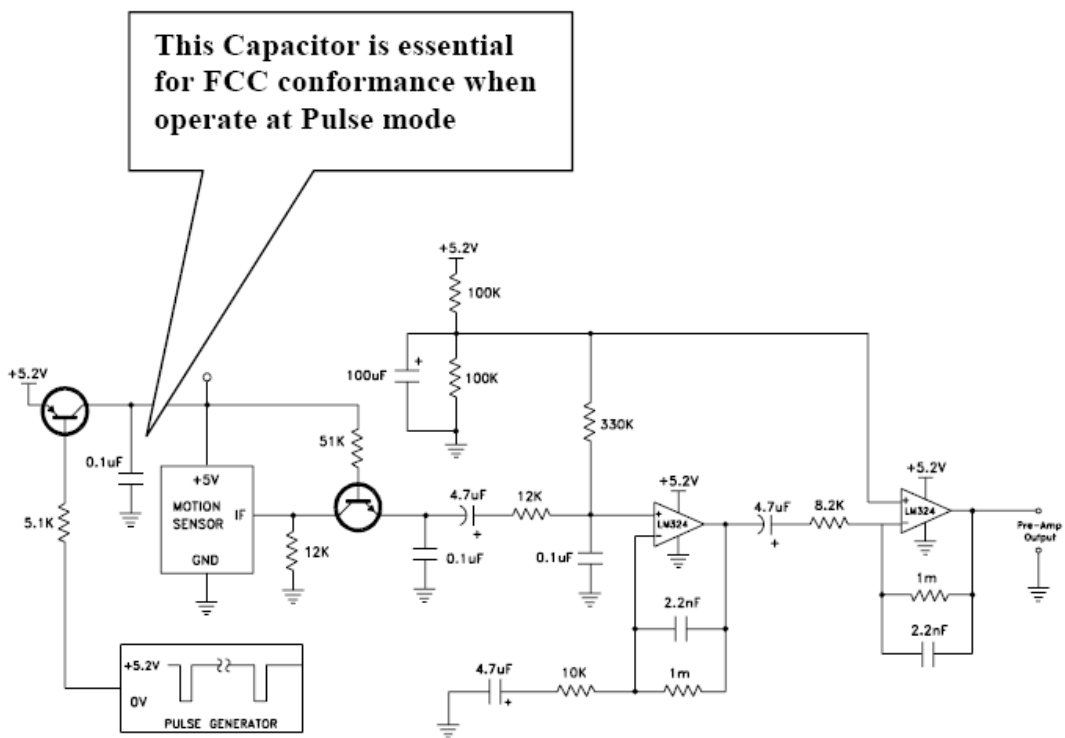


Elevation

Annex 1: Amplifier Circuit(CWoperation)



Annex 2: Amplifier Circuit (Pulse operation, PRF =2 KHz, Duty Cycle = 4%)



Electrical Characteristics

Transmitter

Frequency : 10.525GHz

Frequency Setting Accuracy : 3MHz

Power Output (Min.) : 13dBm EIRP

Operating Voltage : +5V \pm 0.25V

Operating Current (CW) : 60mA max.

: 45mA typ.

Harmonic Emissions : < -7.3dBm

Pulse Mode Operation

Average Current (5% DC) : 2mA typ.

Pulse Width (Min.) : 5 μ Sec

Duty Cycle (Min.) : 1%

Receiver

Sensitivity (10dB S/N ratio) : -86dBm

Noise : 10 μ V

(Both in 3Hz to 80Hz bandwidth)

Antenna

Gain : 8dBi

-3dB Beamwidth

E Plane : 72°

H Plane : 36°

Mechanical Characteristics

Weight : 9 grams

Tab Connections : 0.1" spacing

Power/Temp. Coefficient (over operating temp. range) : 3dB

Frequency/Temp. Coefficient (over operating temp. range) : 6.5MHz

Operating Temperature : -10°C to +55°C

Storage Temperature : -30°C to +70°C

Technical Specifications

Outline diagram

(All dimensions in mm)

