

X-Band Doppler Motion Detector Units

Model Numbers MDU6220



Key Features

- Low Cost
- High Sensitivity
- I/Q mixers
- Patch Antenna
- Small and Flat Profile
- Rugged, reliable construction
- Low Power consumption
- RoHS compliant
- Meets EN 300 440

Applications

- Intrusion Alarms (Room, Vehicle)
- Automatic Door Openers
- Speed Measurement
- Collision Avoidance
- Traffic Control
- Presence Sensing

The Microwave Solutions MDU6220 Motion Detector Unit is an X-Band microwave transceiver that utilises the Doppler shift phenomenon to "sense" motion. The unit is supplied with a high gain/narrow beam antenna array and an integral microwave amplifier between the antenna and receiver making it suitable for long range focussed detection.

The unit, contained in a lightweight plastic housing, features a dielectric resonator stabilised FET oscillator, which provides stable operation over a broad temperature range in either CW or low duty cycle pulse mode, a low noise RF amplifier and a pair of orthogonal balanced mixers for enhanced sensitivity and direction sensing capability.

Operation

The basic principle of operation consists of detecting the frequency shift between a transmitted and a received signal reflected back from a moving object within the field of view of the unit.

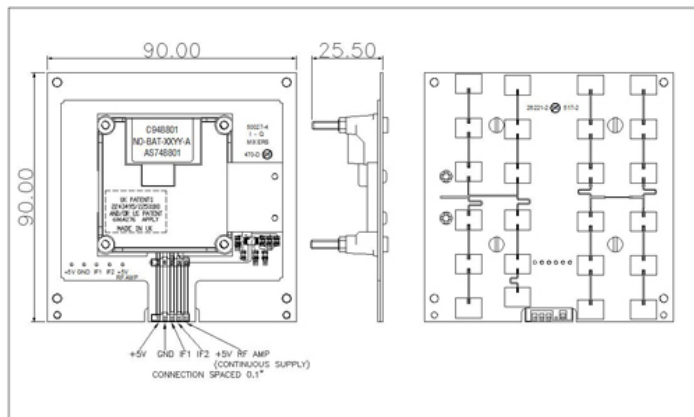
The MDU6220 unit produces two low level output signals which can be amplified and processed to provide an audible or visual alarm. These signals are nominally orthogonal in phase and the direction of the detected target can be determined from the lead/lag between the two outputs. The unit employs low cost surface mount manufacturing techniques which are field proven as being rugged and reliable.

Available Modules

Model	Country	Frequency	Comments	Order Code
MDU 6220	Rep. of Ireland	10.410 GHz	Meets EN 300 440	C948871
	Holland, Belgium USA Canada etc	10.525GHz	Meets EN 300 440	C948802
	UK	10.587 GHz	Meets EN 300 440	C948801

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Electrical Characteristics

Transmitter

Frequency	See table over
Frequency Setting Accuracy	3 MHz
Power Output (Min.)	20 dBm EIRP
Operating Voltage	+5 V $\pm$ 0.25 V
Operating Current (CW)	60mA (max)
	40mA (typ)
Harmonic Emissions	<-30dBm

Pulse Mode Operation (transmitter)

Average Current (5% DC)	2 mA typ.
Pulse Width (Min.)	5 μ secs
Duty Cycle (Min)	1%

Receive Amplifier (must operate continuously)

Operating Voltage	+5 V $\pm$ 0.25 V
Operating Current (CW)	15mA (max), 10mA (typ)
Nominal gain	10dB
Noise figure	<3dB

Receiver (Bandwidth DC - ~3KHz)

Sensitivity (for a 10 dB S/N ratio)	-100 dBm
Noise (measured in a 3Hz - 80Hz bandwidth)	< 10 μ V

Antenna : standard

Gain	16 dBi
-3 dB Beamwidth	
E Plane/H Plane	12°/36°

Mechanical Characteristics

Weight	25 g
Tab Connections	0.1" spacing
Metallisation	Sn+Ni+Cu
	JEDEC JESD97 (e2)

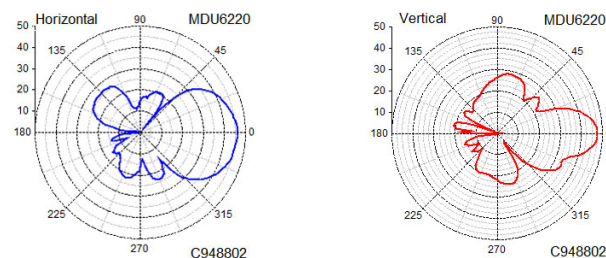
Environmental Characteristics

RoHS Compliant	
Power/Temp. Coefficient (over operating temp. range)	3 dB
Frequency/Temp. Coefficient (over operating temp. range)	15 MHz
Operating Temperature	-10° C to +55° C
Storage Temperature	-30° C to +70° C

NOTES Detection range is dependent on size and reflectivity of target and S/N ratio. Doppler shift at 10.525GHz is 70 Hz per m/s target velocity.

Unit functions over - 30° C to +70° C, but performance may be degraded above +55° C

Coverage Pattern



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