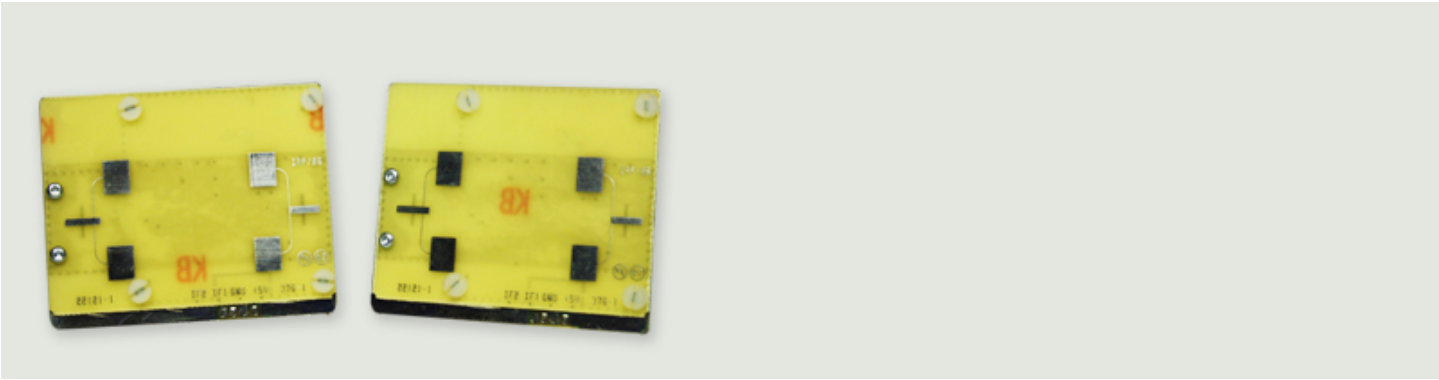
X-Band Doppler Motion Detector Units
Model Numbers MDU2120



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 MDU2120 (Motion Detector Unit) is an X-Band microwave transceiver that utilises the Doppler shift phenomenon to "sense" motion.

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 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 MDU2120 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 and employs low cost surface mount manufacturing techniques which are field proven as being rugged and reliable.

Available Modules

Model	Country	Frequency	Comments	Order Code
MDU2120	UK	10.587 GHz	Meets EN 300 440	**C947801**
MDU2120	Belgium, Holland, Italy	10.525 GHz	Meets EN 300 440	**C947802**
MDU2120	USA	10.525GHz	Meets FCC Part 15 indoors	**C947603**

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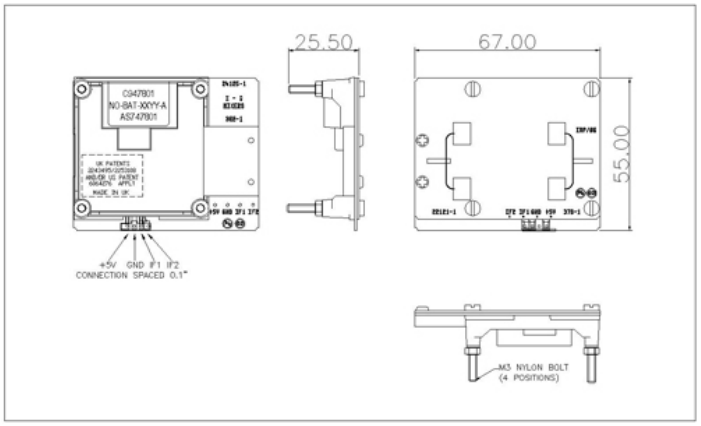


Electrical Characteristics

Transmitter

Frequency	See table over
Frequency Setting Accuracy	3 MHz
Power Output (Min.)	10 dBm EIRP
Operating Voltage	+5 V ± 0.25 V
Operating Current (CW)	60mA (max)
	40mA (typ)
Harmonic Emissions	<-30dBm

Pulse Mode Operation

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

Receiver 3Hz to 80Hz bandwidth

Sensitivity (10 dB S/N ratio)	-83 dBm
Noise	< 10 µV

Antenna

Gain	8 dBi
-3 dB Beamwidth	
E Plane	72°
H Plane	36°

Mechanical Characteristics

Weight	13 g
Tab Connections	0.1" spacing
Metallisation	Sn+Ni+Cu
	JEDEC JESD97 (e2)

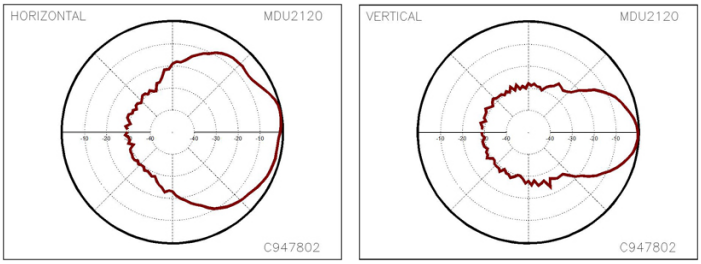
Environmental Characteristics

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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