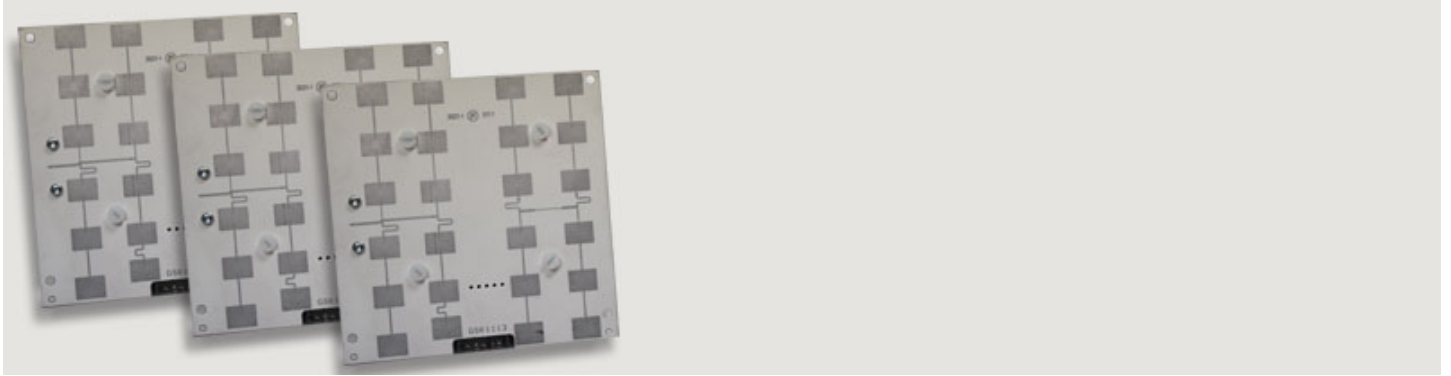


## X-Band Doppler Motion Detector Units

### 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 v1.3.1

#### 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.

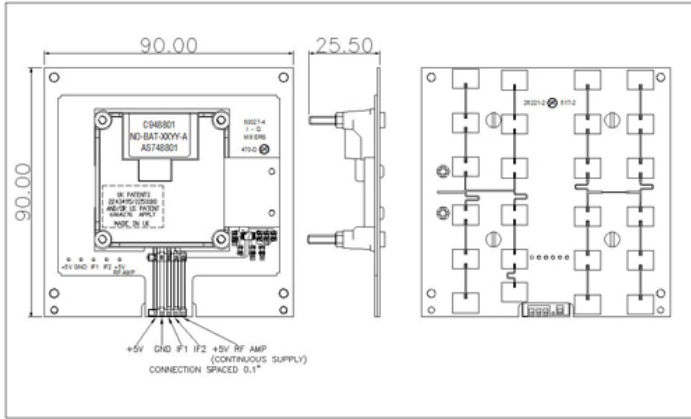
The MDU6220 unit produces two low level output signals which can be amplified and processed to provide an audible or visual alarm. These signals are nominally orthogonal in phase and the direction of the detected target can be determined from the lead/lag between the two outputs. The unit employs low 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 R&TTE Directive | C948871    |
|          | Holland, Belgium USA Canada etc | 10.525GHz  | Meets R&TTE Directive | C948802    |
|          | UK                              | 10.587 GHz | Meets R&TTE Directive | C948801    |

# X-Band Doppler Motion Detector Units

## Model Numbers MDU6220



### 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 |

### 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)<br>40mA (typ) |
| Harmonic Emissions         | <-30dBm                  |

#### Pulse Mode Operation (transmitter)

|                         |              |
|-------------------------|--------------|
| Average Current (5% DC) | 2 mA typ.    |
| Pulse Width (Min.)      | 5 $\mu$ 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 $\mu$ V |

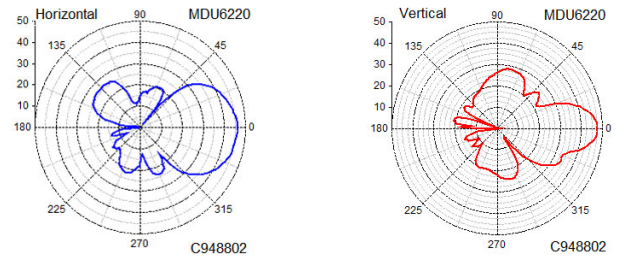
#### Antenna : standard

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

**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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