# WAVEGUIDE TRANSCEIVERS

***Fixed Frequency***

# MDU19xx Series

## *Features*

- Low cost
- Standard Waveguide output
- Rugged, Reliable Construction
- Low Power Consumption
- High Sensitivity

## *Description*

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

The unit, contained in a rugged diecast housing, features a dielectric resonator stabilized FET oscillator, which provides stable operation over a broad temperature range in either CW or low duty cycle pulse mode. The unit is available as a “transmit only” unit, with a single mixer or with a pair of orthogonal mixers for direction sensing applications.

## *Applications*

- Traffic Control
- Automatic Door Openers
- Speed Measurement
- Direction of motion detection
- Energy Management Systems
- Sports Radar Guns

This document only gives a general description of the product and shall not form part of any contract.
Microwave Solutions pursue a policy of continuous product improvement and reserve the right from time to time to amend the specifications of products.

Copyright © 2008
Rev: 2009-02-10

***Microsemi***
***Microwave Products***
75 Technology Drive, Lowell, MA. 01851, 978-442-5600, Fax: 978-937-3748



Downloaded from: http://www.datasheetcatalog.com/

## 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 MDU1900 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 ascertained from the lead/lag between the two outputs

The MDU1910 unit produces a single low level output signal which can be amplified and processed to provide an audible or visual alarm.

The MST1950 unit includes the transmitter only and can be used with a separate receiver as one end of a microwave link.

All the units employ low cost surface mount manufacturing techniques which are field proven as being rugged

**Electrical Characteristics**

Transmitter

| | | |
|---|---|---|
| Operating Voltage | : | +5V ±0.25V |
| Operating Current (CW) | : | 60mA max. |
| | : | 50mA typ. |
| Frequency | : | see table |
| Frequency Setting Accuracy | : | 3MHz |
| Frequency Pushing (Max) | : | 3MHz/V |
| Power Output | | |
| MDU1900/MDU1910 | : | +7dBm (Typ) |
| MDU1900/MDU1910 | : | +10dBm (Typ) |
| Power Variation | : | 3dB/v (Max) |
| Harmonic Emissions | : | < -7dBm |

Pulse Mode Operation

| | | |
|---|---|---|
| Average Current (5% DC) | : | 2mA typ. |
| Pulse Width (Min.) | : | 5µSec Duty |
| Cycle (Min.) | : | 1% |

Receiver

| | | |
|---|---|---|
| Output Signal* | : | >1000µV p-p Noise |
| | : | <150µV p-p |

(Both in 3Hz to 80Hz bandwidth)

* With standard test system

Output Connection

| | | |
|---|---|---|
| Waveguide | : | WG16/WR90/R100 |
| Waveguide Flange | : | UBR100 |

**Mechanical Characteristics**

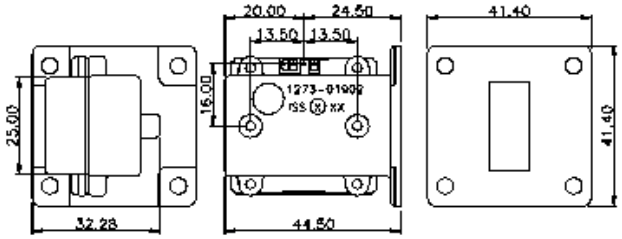
| | | |
|---|---|---|
| Weight | : | 85 grams |
| Tab Connections | : | 0.1" spacing |

**Environmental Characteristics**

| | | |
|---|---|---|
| Power Drift (over operating temp. range) | : | 3dB |
| Frequency Drift (over operating temp. range) | : | 10MHz Operating |
| Temperature | : | -10ºC to +55ºC Storage |
| Temperature | : | -30ºC to +70ºC |

NOTES Detection range is dependent on size and reflectivity of target and S/N ratio Doppler shift at 10.587GHz is 31Hz/m.p.h. Unit functions over -30ºC to +70ºC with reduced performance

**Outline Drawing**




| Model | Application | Order Code | Frequency | Comments |
|---|---|---|---|---|
| MDU1900 | Dual Orthogonal Mixers | C950503<br>C950501 | 10.525GHz<br>10.587GHz | Holland, Belgium, Italy, USA<br>UK |
| MDU1910 | Single Mixer | C960503<br>C960501 | 10.525GHz<br>10.587GHz | Holland, Belgium, Italy, USA<br>UK |
| MST1950 | Transmit Only | C970503<br>C970501 | 10.525GHz<br>10.587GHz | Holland, Belgium, Italy, USA<br>UK |

Copyright © 2008


**Microsemi**
*Microwave Products*
75 Technology Drive, Lowell, MA. 01851, 978-442-5600, Fax: 978-937-3748



Downloaded from: http://www.datasheetcatalog.com/