Gunn Transceivers
Fixed Frequency

**Features**
- Low Cost
- Direction-of-Motion Sensing
- High-Volume Design
- Various Output Power Levels
- Dual-Channel Output
- Pulsed DC Input Voltage
- Low-Power Consumption

**Applications**
- Automatic Door Openers
- Intrusion Alarm Systems
- Speed Radars
- Presence Sensing
- Traffic Control Systems
- Level Sensing

**Description**
Microsemi’s waveguide output transceivers are a reliable source of microwave power for speed and motion detection applications. The transceivers are a fully integrated module, with a Gunn diode mounted in the cavity for the transmitter and one or two Schottky barrier diodes in the receiver. An IF output is generated whose frequency is proportional to the target’s velocity. With the two-mixer design, the direction-of-motion is obtained as a phase difference between the two IF outputs.

**Specifications @ 25°C**

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Description</th>
<th>Operating Frequency (GHz)</th>
<th>Output Power (mW)</th>
<th>Typ. Freq. Drift/ Temperature (KHz/°C)</th>
<th>Nominal Sensitivity (dBC)</th>
<th>Typ. Mixer Phasing (Degrees)</th>
<th>Typ. Operating Voltage (V&lt;sub&gt;DC&lt;/sub&gt;)</th>
<th>Max. Operating Current (mA)</th>
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</thead>
<tbody>
<tr>
<td><strong>X Band Transceivers</strong></td>
<td></td>
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<td></td>
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<tr>
<td>MO86728</td>
<td>Single IF Output</td>
<td>10.525</td>
<td>5 Min.</td>
<td>450</td>
<td>-95</td>
<td>-</td>
<td>+7.5 to +8.5</td>
<td>150</td>
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<tr>
<td>MO86735</td>
<td>Dual IF Output</td>
<td>10.525</td>
<td>5 Min.</td>
<td>450</td>
<td>-95</td>
<td>75–105</td>
<td>8.5</td>
<td>200</td>
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<tr>
<td><strong>K Band Transceivers</strong></td>
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<tr>
<td>MO9061</td>
<td>Single IF Output</td>
<td>24.125</td>
<td>5 Min.</td>
<td>1000</td>
<td>-92</td>
<td>-</td>
<td>5</td>
<td>100</td>
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<tr>
<td>MO9062</td>
<td>Dual IF Output</td>
<td>24.125</td>
<td>5 Min.</td>
<td>1000</td>
<td>-92</td>
<td>50–130</td>
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<td>100</td>
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<td>MO9081</td>
<td>Pulsed DC, Dual IF Output</td>
<td>24.125</td>
<td>10–20</td>
<td>1000</td>
<td>-90</td>
<td>50–130</td>
<td>+6 to +8</td>
<td>100</td>
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<tr>
<td>MO9082</td>
<td>Pulsed DC, Dual IF Output</td>
<td>24.125</td>
<td>10–20</td>
<td>1000</td>
<td>-90</td>
<td>50–130</td>
<td>+6 to +8</td>
<td>100</td>
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<tr>
<td>MO9300</td>
<td>Single IF Output</td>
<td>24.125</td>
<td>2–5</td>
<td>750</td>
<td>-90</td>
<td>-</td>
<td>+4 to +6</td>
<td>250</td>
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<tr>
<td>MO9062-22</td>
<td>Dual IF Output</td>
<td>24.125</td>
<td>5 Min.</td>
<td>1000</td>
<td>-90</td>
<td>75–105</td>
<td>5</td>
<td>100</td>
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<tr>
<td>MO9096</td>
<td>Dual IF Output, with Microstrip Planar Antenna</td>
<td>24.125</td>
<td>8 Min.</td>
<td>1000</td>
<td>-90</td>
<td>60–120</td>
<td>+3.5 to +6.5</td>
<td>220</td>
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<tr>
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<td>MO9402</td>
<td>Dual IF Output</td>
<td>35.5</td>
<td>5 Min.</td>
<td>1500</td>
<td>-90</td>
<td>75–105</td>
<td>+3.5 to +6.0</td>
<td>300</td>
</tr>
</tbody>
</table>

Other frequencies and power levels available upon request. Operating temperature is -30°C to +70°C. Storage temperature is -40°C to +85°C.
Gunn Transceivers
Voltage Controlled

MO87127 - MO9140

Features

- Electronic Frequency Control
- High Doppler Sensitivity Levels
- Low AM and FM Noise Levels
- Direction-of-Motion Sensing
- Compact Size
- Pulsed Transceivers Available

Applications

- FM Doppler Radar Systems
- Altimeters
- Police Radars
- Intrusion Alarm Systems
- Traffic Control Systems
- Automotive Collision Avoidance Systems

Description

Microsemi’s voltage controlled transceivers provide affordable frequency-modulated microwave power at fixed frequencies. The varactor tuning of the transceiver permits carrier frequency modulation for ranging information. These are CW transceivers; pulsed microwave transceivers are available on request.

Specifications @ 25°C

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Frequency (GHz)¹</th>
<th>Min. Output Power (mW)</th>
<th>Frequency Drift/ Temperature (KHz/°C)</th>
<th>Nominal Sensitivity (dBC)</th>
<th>Min. Electronic Tuning Range (MHz)</th>
<th>Tuning Voltage ( (V_{DC}) )</th>
<th>Operating Voltage ( (V_{DC}) )</th>
<th>Typ. Operating Current (mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X Band Voltage Controlled Transceivers</td>
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<td></td>
<td></td>
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<tr>
<td>MO87127-1</td>
<td>10.30</td>
<td>10</td>
<td>400</td>
<td>-110</td>
<td>40</td>
<td>+1 to +20</td>
<td>+8 to +10</td>
<td>200</td>
</tr>
<tr>
<td>MO87127-2</td>
<td>10.30</td>
<td>20</td>
<td>400</td>
<td>-110</td>
<td>40</td>
<td>+1 to +20</td>
<td>+8 to +10</td>
<td>600</td>
</tr>
<tr>
<td>MO87127-3</td>
<td>10.30</td>
<td>35</td>
<td>400</td>
<td>-110</td>
<td>40</td>
<td>+1 to +20</td>
<td>+8 to +10</td>
<td>600</td>
</tr>
<tr>
<td>K Band Voltage Controlled Transceivers</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MO9071</td>
<td>24.125</td>
<td>5</td>
<td>1000</td>
<td>-90</td>
<td>50</td>
<td>+1 to +20</td>
<td>5</td>
<td>150</td>
</tr>
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<td>MO9072²</td>
<td>24.125</td>
<td>5</td>
<td>1000</td>
<td>-90</td>
<td>50</td>
<td>+1 to +20</td>
<td>5</td>
<td>150</td>
</tr>
<tr>
<td>MO87849</td>
<td>24.125</td>
<td>5</td>
<td>500</td>
<td>-95</td>
<td>150</td>
<td>+0.5 to +20</td>
<td>+5 to +8</td>
<td>400</td>
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<tr>
<td>MO87930</td>
<td>24.125</td>
<td>5 to 10</td>
<td>500</td>
<td>-95</td>
<td>350</td>
<td>0 to +9</td>
<td>+5 to +8</td>
<td>400</td>
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<tr>
<td>Ka Band Voltage Controlled Transceivers</td>
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<td></td>
<td></td>
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<tr>
<td>MO9410-1</td>
<td>35.5 ± 0.1</td>
<td>7.5</td>
<td>1000</td>
<td>-90</td>
<td>100</td>
<td>+1 to +20</td>
<td>3.5–6.0</td>
<td>350</td>
</tr>
<tr>
<td>MO9410-2</td>
<td>34.7 ± 0.1</td>
<td>7.5</td>
<td>1000</td>
<td>-90</td>
<td>100</td>
<td>+1 to +20</td>
<td>3.5–6.0</td>
<td>350</td>
</tr>
<tr>
<td>MO9410-3</td>
<td>33.8 ± 0.1</td>
<td>7.5</td>
<td>1000</td>
<td>-90</td>
<td>100</td>
<td>+1 to +20</td>
<td>3.5–6.0</td>
<td>350</td>
</tr>
</tbody>
</table>

1. All X Band transceivers have built-in circulators.
2. MO9072 has dual IF output.

Other frequencies and power levels available upon request. Operating temperature is -30°C to +70°C.

Storage temperature is -40°C to +85°C.
**Gunn Oscillators**

**MO8651 - MO9205**

**Fixed Frequency**

**Features**
- Low Cost
- Small Size
- Low Power Consumption
- High-Volume Design
- Pulsed DC Input Voltage Available

**Applications**
- Speed Radar
- Intrusion Alarm Systems
- Braking Systems
- Industrial Measurement
- Level Sensing

**Description**
Microsemi’s waveguide output Gunn oscillators are an inexpensive and reliable source of microwave power. The oscillators are designed to suppress spurious signal and harmonic frequencies. Their low-power consumption makes them very useful as local oscillators in microwave receivers.

**Specifications @ 25°C**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Operating Frequency (GHz)</th>
<th>Output Power (mW)</th>
<th>Typ. Frequency Drift/Temperature (KHz/°C)</th>
<th>Typ. Operating Voltage (V&lt;sub&gt;DC&lt;/sub&gt;)</th>
<th>Max. Operating Current (mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>X Band Oscillators</strong></td>
<td></td>
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<tr>
<td>MO86751A</td>
<td>10.525</td>
<td>10 Min.</td>
<td>350</td>
<td>8.5</td>
<td>200</td>
</tr>
<tr>
<td>MO86751B</td>
<td>10.525</td>
<td>25 Min.</td>
<td>350</td>
<td>+9.0 to +10.0</td>
<td>500</td>
</tr>
<tr>
<td>MO86751C</td>
<td>10.525</td>
<td>50 Min.</td>
<td>350</td>
<td>+9.0 to +10.0</td>
<td>600</td>
</tr>
<tr>
<td>MO86751D</td>
<td>10.525</td>
<td>100 Min.</td>
<td>350</td>
<td>+9.0 to +10.0</td>
<td>800</td>
</tr>
<tr>
<td><strong>K Band Oscillators</strong></td>
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<tr>
<td>MO86790</td>
<td>24.125</td>
<td>5 Min.</td>
<td>1000</td>
<td>5</td>
<td>100</td>
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<tr>
<td>MO86791</td>
<td>24.15</td>
<td>10–20</td>
<td>555</td>
<td>+3.5 to +6.5</td>
<td>250</td>
</tr>
<tr>
<td>MO86790</td>
<td>24.15</td>
<td>40–100</td>
<td>555</td>
<td>+5.0 to +8.0</td>
<td>1000</td>
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<tr>
<td><strong>K Band Oscillators — Pulsed</strong></td>
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<tr>
<td>MO9080</td>
<td>24.125</td>
<td>11–20 Peak</td>
<td>1000</td>
<td>+6.0 to +7.0</td>
<td>300 Peak</td>
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<td><strong>Ka Band Oscillators</strong></td>
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</tr>
<tr>
<td>MO86797</td>
<td>35.5</td>
<td>15–25</td>
<td>1400</td>
<td>+3.0 to +6.0</td>
<td>450</td>
</tr>
<tr>
<td>MO9205</td>
<td>35.5</td>
<td>15–30</td>
<td>800</td>
<td>5</td>
<td>400</td>
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</table>

Other frequencies and power levels available upon request.
Operating temperature is -30°C to +70°C.
MO9080 pulse width= 10 microseconds duty = 50%.
Gunn Oscillators

MO87108 - MO9405

Voltage Controlled

Features
- Low Cost
- High-Volume Design
- Various Output Power Levels
- Pulsed DC Input Voltage
- Low-Power Consumption
- FM CW Operation

Applications
- Intrusion Alarm Systems
- Speed Radar
- Presence Sensing
- Traffic Control
- Level Sensing
- Weather Radar
- Amateur Communications

Description
Microsemi’s voltage controlled Gunn oscillators are designed to provide an affordable, frequency-modulated microwave power at a discrete frequency. The varactor tuning of the oscillator permits carrier frequency modulation for ranging information.

Specifications @ 25°C

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Frequency (GHz)</th>
<th>Typ. Output Power (mW)</th>
<th>Freq. Drift/ Temperature (KHz/°C)</th>
<th>Min. Electronic Tuning Range (MHz)</th>
<th>Tuning Voltage (V&lt;sub&gt;DC&lt;/sub&gt;)</th>
<th>Operating Voltage (V&lt;sub&gt;DC&lt;/sub&gt;)</th>
<th>Max. Operating Current (mA)</th>
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</thead>
<tbody>
<tr>
<td>X Band Voltage Controlled Oscillators</td>
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<tr>
<td>MO87108-1</td>
<td>10.300</td>
<td>15</td>
<td>400</td>
<td>40</td>
<td>+1 to +20</td>
<td>+8.0 to +10.0</td>
<td>200</td>
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<tr>
<td>MO87108-2</td>
<td>10.300</td>
<td>25</td>
<td>400</td>
<td>40</td>
<td>+1 to +20</td>
<td>+8.0 to +10.0</td>
<td>600</td>
</tr>
<tr>
<td>MO87108-3</td>
<td>10.300</td>
<td>40</td>
<td>400</td>
<td>40</td>
<td>+1 to +20</td>
<td>+8.0 to +10.0</td>
<td>600</td>
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<tr>
<td>MO87603B</td>
<td>9.405</td>
<td>7–25</td>
<td>450</td>
<td>63–100</td>
<td>0 to +13</td>
<td>+10.5</td>
<td>200</td>
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<td>K Band Voltage Controlled Oscillators</td>
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<td>MO9070</td>
<td>24.125</td>
<td>3</td>
<td>1000</td>
<td>25</td>
<td>+2 to +10</td>
<td>+5.0</td>
<td>100</td>
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<tr>
<td>MO87828-1</td>
<td>21.500</td>
<td>10</td>
<td>300</td>
<td>40</td>
<td>0 to +15</td>
<td>+5.0 to +8.0</td>
<td>400</td>
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<tr>
<td>MO87828-2</td>
<td>22.100</td>
<td>10</td>
<td>300</td>
<td>40</td>
<td>0 to +15</td>
<td>+5.0 to +8.0</td>
<td>400</td>
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<tr>
<td>MO87828-3</td>
<td>22.700</td>
<td>10</td>
<td>300</td>
<td>40</td>
<td>0 to +15</td>
<td>+5.0 to +8.0</td>
<td>400</td>
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<tr>
<td>MO87828-4</td>
<td>23.300</td>
<td>10</td>
<td>300</td>
<td>40</td>
<td>0 to +15</td>
<td>+5.0 to +8.0</td>
<td>400</td>
</tr>
<tr>
<td>MO87827-1</td>
<td>21.500</td>
<td>60</td>
<td>300</td>
<td>30</td>
<td>0 to +10</td>
<td>+5.0 to +8.0</td>
<td>1400</td>
</tr>
<tr>
<td>MO87827-2</td>
<td>22.100</td>
<td>60</td>
<td>300</td>
<td>30</td>
<td>0 to +10</td>
<td>+5.0 to +8.0</td>
<td>1400</td>
</tr>
<tr>
<td>MO87827-3</td>
<td>22.700</td>
<td>60</td>
<td>300</td>
<td>30</td>
<td>0 to +10</td>
<td>+5.0 to +8.0</td>
<td>1400</td>
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<tr>
<td>MO87827-4</td>
<td>23.300</td>
<td>60</td>
<td>300</td>
<td>30</td>
<td>0 to +10</td>
<td>+5.0 to +8.0</td>
<td>1400</td>
</tr>
<tr>
<td>Ka Band Voltage Controlled Oscillators</td>
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<tr>
<td>MO9405-1</td>
<td>34.000</td>
<td>15</td>
<td>1250</td>
<td>100</td>
<td>+1 to +20</td>
<td>+4.0 to +6.0</td>
<td>350</td>
</tr>
</tbody>
</table>

Other frequencies and power levels available upon request. Operating temperature is -30°C to +70°C.
Performance Characteristics
Gunn Oscillators

MO8651-MO9205  Fixed Frequency

MO86751 Series Frequency and Power vs. Temperature

MO9060 Frequency and Power vs. Temperature

MO9060 and MO86751 Series Typical Phase Noise Performance

MO87108-MO9405  Voltage Controlled

MO87108 Series VCO Frequency and Power /Tuning Voltage

MO9070 Series VCO Frequency and Power /Tuning Voltage
Features

- Models from 18–110 GHz
- Low Insertion Loss
- Good Temperature Performance
- Small Size
- Low Cost

Description

Microsemi’s Miniature Ferrite Isolators are H-Plane, Y-Junction devices with similar performance specifications to standard size isolators. Models are available from 18–110 GHz and feature low insertion loss and high isolation within the specified bandwidth. MMI series isolators are useful in improving the stability of microwave oscillators and amplifiers by projecting matched impedance across the frequency and preventing reverse and reflected power from adversely affecting performance.

Specifications @ 25°C

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Freq, GHz</th>
<th>Waveguide</th>
<th>Min. Bandwidth (%)</th>
<th>Min. Isolation (dB)</th>
<th>Max. Insertion Loss</th>
<th>Max. SWR (In &amp; Out)</th>
<th>Max. Average Power (Watts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMI42595T</td>
<td>18.0–26.5</td>
<td>WR-42</td>
<td>10</td>
<td>20</td>
<td>0.3</td>
<td>1.30</td>
<td>40</td>
</tr>
<tr>
<td>MMI28599T</td>
<td>26.5–40.0</td>
<td>WR-28</td>
<td>10</td>
<td>20</td>
<td>0.4</td>
<td>1.30</td>
<td>30</td>
</tr>
<tr>
<td>MMI22599T</td>
<td>33.0–50.0</td>
<td>WR-22</td>
<td>8</td>
<td>20</td>
<td>0.5</td>
<td>1.30</td>
<td>20</td>
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<tr>
<td>MMI19599T</td>
<td>40.0–60.0</td>
<td>WR-19</td>
<td>7</td>
<td>18</td>
<td>0.6</td>
<td>1.35</td>
<td>5</td>
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<tr>
<td>MMI10599T</td>
<td>75.0–110.0</td>
<td>WR-10</td>
<td>2</td>
<td>18</td>
<td>0.7</td>
<td>1.30</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Operating temperature range: -10 to +60°C except: -10°C to +50°C for MI10599.
Waveguide Detectors

MO86561 - MO86571

Features
- Low Cost
- Rugged Housings
- Low Noise
- High Sensitivity

Applications
- Moisture Measurement
- Microwave Counters
- Liquid Level Indicators
- Flow/No Flow Sensors
- Microwave Perimeter Protection

Specifications @ 25°C

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Center Frequency (GHz)</th>
<th>Minimum Detectable Signal (dBm)¹</th>
<th>RF Bandwidth (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MO86571</td>
<td>10.525</td>
<td>-45</td>
<td>300</td>
</tr>
<tr>
<td>MO86561</td>
<td>24.150</td>
<td>-45</td>
<td>300</td>
</tr>
</tbody>
</table>

¹. Video amplifier: 1 MHz bandwidth, 2 dB noise figure, 100 KΩ input resistance. Other frequencies and power levels available upon request. Operating temperature is -30°C to +70°C. Storage temperature is -40°C to +85°C.

Description
Microsemi’s MO86561 and MO86571 waveguide detectors consist of selected Schottky barrier diodes assembled in a rugged housing suitable for use in industrial applications as a RF detector.

Typical Performance Characteristics

Frequency = 24.125 GHz.
Iₓ = 0 µA.
K-Band Waveguide Modulator
MO9207

Features
- Waveguide Assembly
- High Modulation Depth
- GaAs PIN Diode
- Low Drive Voltage
- For Low Cost Commercial Applications

Specifications @ 25°C
- Insertion Loss: 1.5 dB Typ. @ 20 mA
- Modulation Depth: >90% Typ.
- Frequency of Operation: 24.125 GHz
- RF Bandwidth: 200 MHz
- Modulation Rate: 1 Hz–100 kHz
- Drive Voltage: 1.3 V @ 20 mA, Typ.

Description
Microsemi’s MO9207 K-band modulator with integral GaAs PIN diode is designed for testing Doppler transceivers on the bench and in the field. Various radar cross sections may be simulated by attaching different size horn antennas to the modulator.

Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>-30°C to +70°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°C to +85°C</td>
</tr>
<tr>
<td>Drive Current</td>
<td>50 mA</td>
</tr>
</tbody>
</table>

Modulator Driver
The modulation driver should be current limited to 50 mA pulse current. For a drive current of 20 mA from a 50-ohm modulator operating at 5 volts a 120-ohm resistor should be inserted in series with the PIN diode.

Typical Performance Characteristics

Positive drive is applied to the solder pin on top of unit. Ground is any metallic contact on the waveguide.
Dimensions
GUNN Transceiver/Voltage Controlled

**MO87127-1, 2, 3**

![Diagram of MO87127](image1)

**MO87930, MO87849**

![Diagram of MO87930](image2)

**MO9071, MO9072**

![Diagram of MO9071](image3)

**MO9410-1, 2, 3**

![Diagram of MO9410](image4)

Dimensions are in inches.
Dimensions

**GUNN Oscillators/Fixed Frequency**

**MO86790, MO86791**

- Dimensions are in inches (mm).
- Gunn Bias
- Ground Pin
- To Mate With UG595/U WR42 Waveguide
- 1.60 Max. (40.64)
- 0.800 Max. (20.32)
- 0.900 Max. (22.86)

**MO86797**

- Dimensions are in inches (mm).
- To Mate With UG599/U WR-28 Waveguide
- 1.08 Max. (27.43)
- 0.70 Max. (19.3)

**MO9060, MO9080**

- Dimensions are in inches.
- Mounting Hole Pattern Mates With UG 595/U Flange
- 0.114
- 0.240
- 0.830
- 0.405
- 0.670
- 0.200
- 0.755
- 0.880
- 0.640
- 0.550
- 0.200
- 0.103 Min. 0.107 Max.

**MO9205**

- Dimensions are in inches.
- Electrolytic Capacitor
- PN 3601
- Mechanical Tune
- 0.75
- 0.500 Ref.
- 0.510 Ref.
- 0.200
- 0.550
- 0.290
- 0.530 Ref.
- 0.500 Ref.
- 0.22 C’Sink Far Side
- 4 Holes
- Flange Mates To WR-28 Waveguide With UG599/U Flange
- 1.07
- 0.60
- 0.85

**MO86751-A, B, C, D**

- Dimensions are in inches.
- R.F. Output To Mate With UG-39/U, WR 90 Waveguide
- 1.62
- 1.218
- 1.280
- 1.62
- 0.30 Max.
- 0.15
- 0.50
- 0.70
- 1.62
- 0.172

Dimensions are in inches.

Dimensions are in inches.

Dimensions are in inches.

Dimensions are in inches.

Dimensions are in inches.

Dimensions are in inches.
GUNN Oscillators/Voltage Controlled

MO87108

MO87603B

MO87827

MO87828

MO9070

MO9405

Dimensions are in inches (mm).

Dimensions are in inches.

Dimensions are in inches.

Dimensions are in inches.
Dimensions

**Miniature Ferrite Isolators**

![Diagram of Miniature Ferrite Isolators]

**Ordering Information.**

<table>
<thead>
<tr>
<th>Model Number</th>
<th>MMI</th>
<th>28</th>
<th>599</th>
<th>T</th>
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<tr>
<td>Model</td>
<td>WR</td>
<td>WR</td>
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<td>WG size</td>
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<td>WR-22</td>
<td>WR-19</td>
<td>WR-10</td>
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<td>Flange</td>
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<td>0.50/2.7</td>
<td>0.50/2.7</td>
<td>1.00/25.4</td>
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<tr>
<td>Through-hole Flange Holes</td>
<td>1.50/38.1</td>
<td>125/31.8</td>
<td>125/31.8</td>
<td>1.20/30.5</td>
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</tbody>
</table>

MMI isolator part numbers are designated by indicating the center frequency and waveguide size and flange type. For example, the MMI22599T at 33.5 GHz indicates WR22 waveguide, UG599/U-M flange with threaded holes at 33.5 GHz center frequency. For a through-hole flange the part number is MMI22599.
**Waveguide Detectors**

**MO86561**

- Dimensions are in inches (mm).

**MO86571**

- Dimensions are in inches (mm).

**K-Band Waveguide Modulator**

**MO9207**

- Dimensions are in inches (mm).

Flange mates with UG-595/U WR-42. Delivered with grounded buss wire for ESD protection.
<table>
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<tr>
<td>Fixed Frequency Gunn Oscillators</td>
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<td>Voltage Controlled Gunn Oscillators</td>
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<td>Miniature Ferrite Isolators</td>
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<tr>
<td>Waveguide Detectors</td>
<td>8</td>
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<tr>
<td>K-Band Waveguide Modulator</td>
<td>9</td>
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</table>

<table>
<thead>
<tr>
<th>Product Dimensions</th>
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<tbody>
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<td>Voltage Controlled Gunn Transceivers</td>
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<td>Fixed Frequency Gunn Oscillators</td>
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<tr>
<td>Voltage Controlled Gunn Oscillators</td>
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<tr>
<td>Miniature Ferrite Isolators</td>
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<tr>
<td>Waveguide Detectors</td>
<td>15</td>
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