

Voltage Controlled Oscillator Transceiver

10.525 GHz

MA87728-MO1

V3.00

Features

- Inexpensive X-band Transceiver
- Can be FM Modulated
- 10 mW Transmitter Power
- Sensitivity -95 dBc
- Rugged Mechanical Construction
- Can be Directly Connected to a Horn Antenna

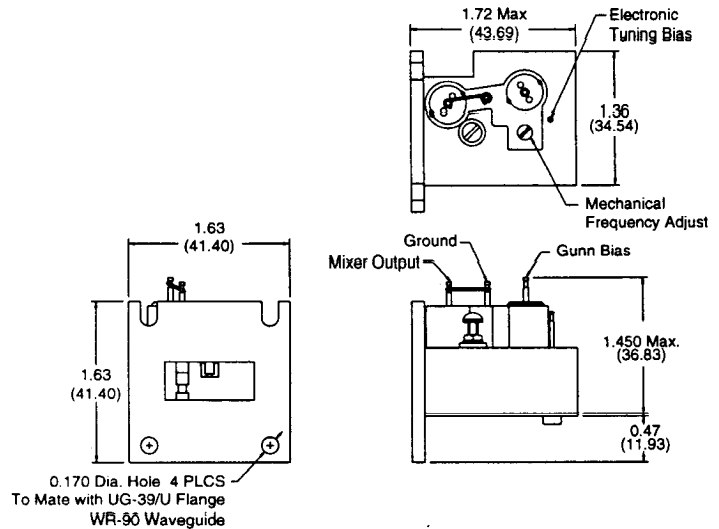
Description

The MA87728-MO1 varactor tuned X-band Gunn oscillator/transceiver is useful for low power commercial FM Doppler radar systems. This transceiver has a varactor tuned Gunn VCO with at least 50 MHz electronic frequency tuning; and a mixer diode incorporated into the compact waveguide package. The Doppler return is available at the mixer's pin. This low cost transceiver can be used to measure range, direction, or motion. If the transceiver's frequency is constant and the "target" is moving away or toward the antenna, it will produce a Doppler frequency shift of the transmitted signal. This received (audio/video) signal will have a frequency shift proportional to the velocity of the target.

Range can be measured by FM modulating the frequency of the transmitter and comparing the returned frequency with the transmitters. The change in frequency is proportional to the range of the "target".

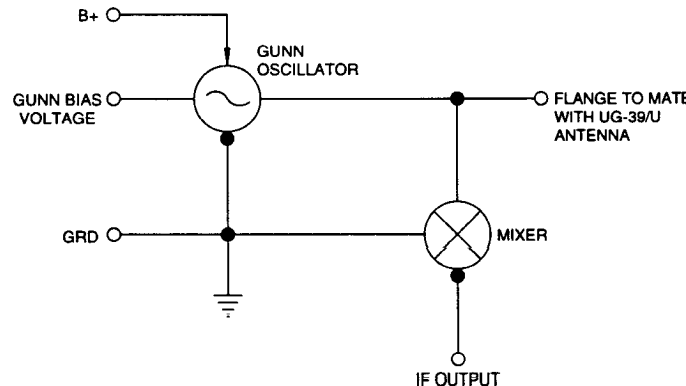
The MA87728-MO1 transceiver can be factory modified to operate at other frequencies from 9.4 GHz to 10.6 GHz to meet the allowed frequency requirements of countries other than the US. These transceivers can be factory modified to have other electronic tuning ranges and/or to have a negative tuning voltage.

The MA87728-MO1 X-band transceiver is useful for motion, distance, or range measurement applications. The applications include altimeters, blind landing systems, docking radars, vehicle control, collision avoidance, direction monitoring, intrusion alarms and industrial non-contacting control systems.



For mixer protection from static discharge remove the shorting wire from the mixer pin to the ground pin only after all soldering and handling has been completed.

Block Diagram



Specifications @ 25°C

Parameter	Symbol	Units	Specifications
Frequency Range (Mechanical Tuning) ¹	F	GHz	10.525 ±25 MHz
Power Output (-30°C to +70°C)	P _{OUT}	mW	5 Min. to 10 Typ.
Min. Detectable Return Signal ²	SENS	dBc	-95 Min.
Electronic Tuning Range	F TUNING	MHz	50 Min.
Tuning Voltage (Varactor)	V _{OP} /VARACTOR	VDC	+1.0 to +20.0 Min./Max.
Voltage Operating Range (Gunn) ³	V _{OP} /GUNN	VDC	+8.0
Operating Current (Gunn) (-30°C to +70°C)	I _{OP}	mA	150 Typ., 200 Max.
Startup Current (Gunn) (-30°C to +70°C)	I _{TH}	mA	240 Max.
Change Frequency vs. Temperature ⁴	ΔF/ΔT	MHz	±25 MHz
Recommended Output Load Parameter	LOAD (SWR)	SWR	1.5:1 Max.
Operating Temperature Range (Ambient) ⁵	T _{OP}	°C	-30 to +70
IF Frequency Bandwidth	F _{IF}	Hz	10 Hz to 3 KHz Min.
Recommended DC Return (Mixer Diode)		Ohms	1000
Waveguide Size/Flange			WR-90, UG-39/U
IF Connector (Mixer)			Solder Pin

1. Factory set

2. See Application Note M556 on "Sensitivity Measurement Techniques" for minimum detectable return signal measurement.

3. Operating voltage is factory specified and marked on each transceiver. The transceiver must be operated at that voltage ±0.25 V.

4. The frequency reference is the frequency at 25°C. The temperature range is -30° to +70°C.

5. The ambient temperature is defined as the air temperature.

6. A 1 to 10 microfarad capacitor is required between the Gunn bias pin and ground to suppress low frequency bias circuit oscillations.