



**EIMAC**  
A Division of Varian Associates  
SAN CARLOS, CALIFORNIA

**EM1320**  
**MAGNETICALLY SHIELDED**  
**VOLTAGE TUNABLE**  
**MAGNETRON**  
**1000 - 2000 Mc**  
**100 mw**

## DESCRIPTION

The EM1320 Voltage Tunable Magnetron Oscillator delivers at least 100 mw over the frequency range of 1000-2000 mc. This miniature magnetically shielded oscillator is ideally suited for applications requiring compact lightweight packaging. Its unique magnetic circuit results in negligible external magnetic field and permits the tube to contact other ferromagnetic materials with no degradation in performance.

## FEATURES

- Magnetically Shielded
- Light Weight
- Linear Voltage Tuning
- Small Size
- Flat Power Output
- Rugged



## TYPICAL PERFORMANCE

### ELECTRICAL

|                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |              |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------|
| Frequency Range           | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1000-2000 Mc |
| Anode Voltage             | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 920-1840 V   |
| Cathode Current           | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1-6 mA       |
| Typical Power Output      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 200 mw       |
| Anode FM Sensitivity      | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 Mc/Volt    |
| Injection Anode Voltage   | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 200 Volts    |
| Injection Anode Current   | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 mA       |
| Heater Voltage (AC or DC) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 6.3 Volts    |
| Heater Current (AC or DC) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.9 Amp      |
| Load Impedance            | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 50 Ohm       |
| Load VSWR                 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.1:1        |
| Power Variation           | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ±1 db        |

### MECHANICAL

|                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |              |
|-----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------|
| Operating Position    | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | Any          |
| Cooling               | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | Conduction   |
| Electrical Connection | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | Flying Leads |
| RF Output Coupling    | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | TNC Female   |
| Weight                | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.5 lbs.     |

### MAXIMUM RATINGS\*

|                         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |            |
|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|------------|
| Anode Voltage           | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2200 Volts |
| Cathode Current         | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 12 mA      |
| Injection Anode Voltage | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 500 Volts  |
| Injection Anode Current | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 mA       |
| Load VSWR               | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3:1        |

\*Damage to the tube may occur if maximum ratings are exceeded.

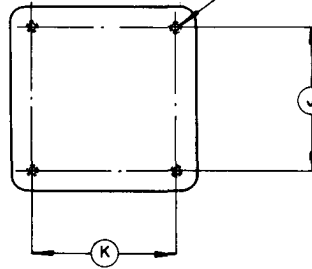
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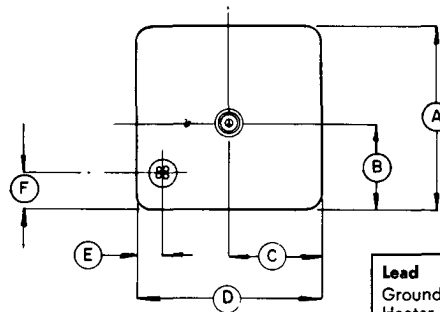
**NOTES:**

1. The operating frequency is a function of the anode voltage; therefore any voltage ripple on the anode supply appears as frequency modulation on the RF output.
2. The heater supply may be either alternating or direct current. If direct current is used, the heater connections *must* be connected to the negative terminal of the heater supply.
3. Cooling—To insure optimum tube performance, the magnet shell should be maintained below 70° C.
4. Temperature Stability — The permanent magnet of the shielded VTM has been temperature stabilized to minimize frequency changes caused by variations in the magnet temperature. The temperature/frequency coefficient for the shielded VTM is 0.008% of the operating frequency per degree centigrade. A positive change in temperature will always produce a positive change in frequency.

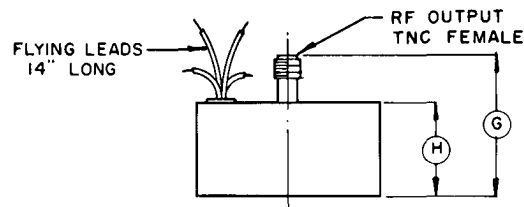
10-32 UNF 3/8 DEEP (4 HOLES)



| DIMENSIONS IN INCHES |       |       |      |
|----------------------|-------|-------|------|
| DIMENSIONAL DATA     |       |       |      |
| REF.                 | MIN.  | MAX.  | NOM. |
| A                    |       | 3.050 |      |
| B                    | 1.200 | 1.800 |      |
| C                    | 1.300 | 1.700 |      |
| D                    |       | 3.050 |      |
| E                    | .300  | .500  |      |
| F                    | .700  | .900  |      |
| G                    |       | 2.300 |      |
| H                    |       | 1.525 |      |
| J                    | 2.320 | 2.380 |      |
| K                    | 2.320 | 2.380 |      |



| Lead            | Color Code |
|-----------------|------------|
| Ground          | Black      |
| Heater          | Blue       |
| Heater Cathode  | Red        |
| Injection Anode | White      |



**CHARACTERISTIC CURVES**  
Typical Performance Values

