EIMAC
A Division of Varian Associates
SAN CARLOS, CALIFORNIA

Tentative Data

EM1051

TRAVELING WAVE TUBE

8.0 to 12.0 GHz
3 Watts Min.
30 db Gain

TENTATIVE DATA FOR EIMAC EM1051 TRAVELING WAVE TUBE

The EIMAC EM1051 is a very rugged, light weight power-amplifier traveling wave tube designed to operate under severe environmental extremes of shock, vibration, altitude and temperature. The EM1051 utilizes ceramic and metal construction and is focused by a fully temperature-compensated periodic permanent magnet array. This tube will provide a minimum output power of 3 watts CW over the frequency range of 8.0 to 12.0 GHz with a nominal small signal gain of 30 db.

The integral heat sink/mounting flange allows operation to ambient temperatures of +85°C without additional cooling. Flexible leads provide electrical connections to the tube.

GENERAL CHARACTERISTICS

ELECTRICAL

Cathode: Unipotential, oxide coated	
Minimum Heating Time	60 seconds
Heater: Voltage	6.3 volts
Current	0.6 amperes
Noise Figure	25 to 34 decibels
Minimum Tangential Sensitivity (Broadband)	—50 dbm
Minimum Saturated Output Power	3 watts
Frequency Range	8.0 to 12.0 gigahertz
Input and Output Impedence	50 ohms nominal

MECHANICAL

Operating Position	Any
RF Input Coupling	Type N Female Coaxial Fitting
RF Output Coupling	Type N Female Coaxial Fitting
Focusing	Periodic Permanent Magnet
Cooling	Passive Heat Sink
Maximum Overall Dimensions	See Outline Drawing
Net Weight (Including Magnets)	2.5 Pounds

MAXIMUM RATINGS

DC Beam Voltage*	3500 volts
DC Focus Electrode Voltage*:	
Negative with respect to Cathode	50 volts
DC Cathode Current	30 milliamperes

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TYPICAL OPERATING CHARACTERISTICS

Frequency	8.0 to 12.0 gigahertz
Minimum Output Power	3.0 watts
Small Signal Gain	30 decibels
DC Beam Voltage*	3300 volts
DC Cathode Current	28 milliamperes
DC Focus Electrode Voltage*	—40 volts
DC Focus Electrode Current	0 milliamperes

*All voltages referred to cathode.

APPLICATION

Cooling: The EM1051 is designed to be heat sink cooled by means of the mounting available and integral with the tube and PPM structure. Under environmental conditions normally encountered in military equipments, additional cooling will not be required.

Cathode: The heater voltage should be maintained within ±5 per cent of the rated value of 6.3 volts if variations in performance are to be minimized and best tube life obtained.

Helix: The helix, collector and anode are internally connected to the tube body and are operated at the same potential. Therefore, it is often convenient to operate these elements at chassis potential, with the cathode and focus electrode at appropriate negative potentials. The cathode potential should be maintained within ±1 per cent to insure proper operation.

Focus Electrode: The focus electrode power supply must be regulated within ±2 per cent to minimize variations in performance.

Special Applications: For any additional information concerning this tube or its application, write to Microwave Product Manager, EIMAC, Division of Varian, 301 Industrial Way, San Carlos, Calif.

ENVIRONMENTAL

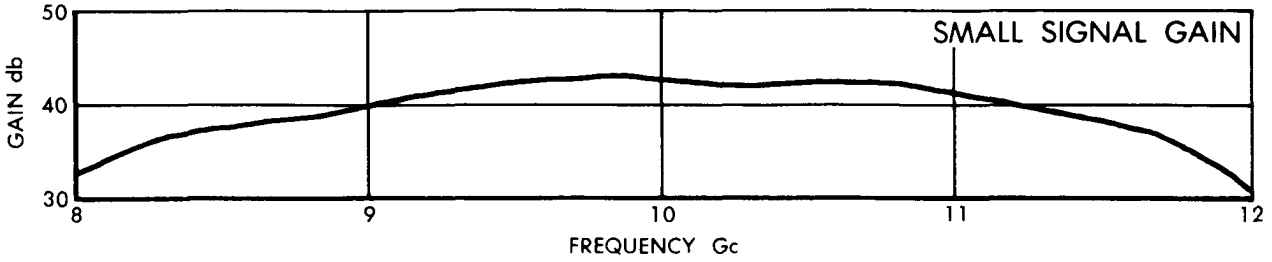
The EM1051 conforms generally with MIL-E-5272C, "Environmental Testing, Aeronautical and Associated Equipment, General Specification for," and MIL-E-5400, "Electronic Equipment, Aircraft, General Specification for," Class II.

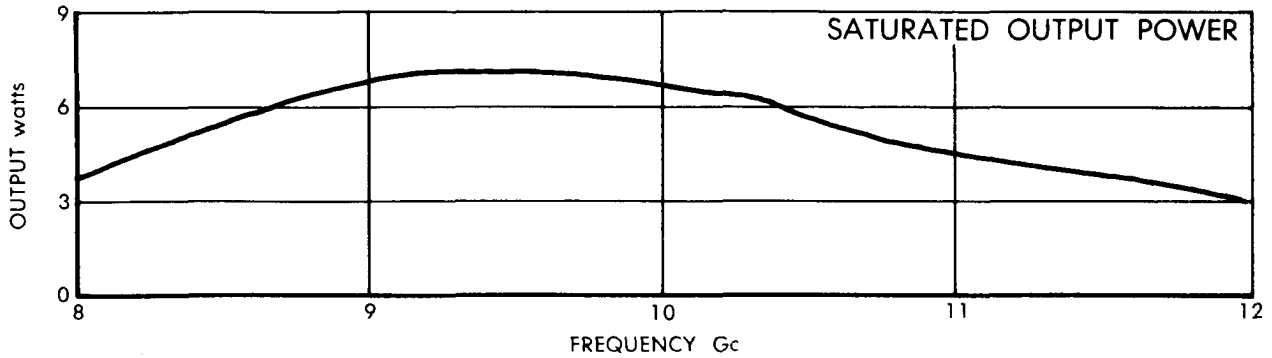
Vibration	10 g to 2000 Hz (Curve A of Proc. XII, MIL-E-5272C)
Shock	25 g, 11 ±1 ms
Acceleration	Sustained, 25 g's
Temperature	—54°C to +85°C
Altitude	70,000 ft.

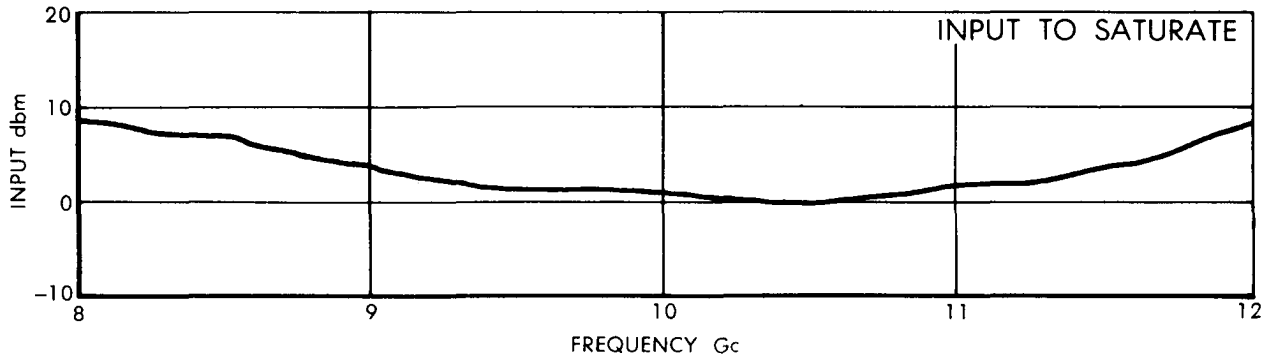
Note: This data should not be used for final equipment design.

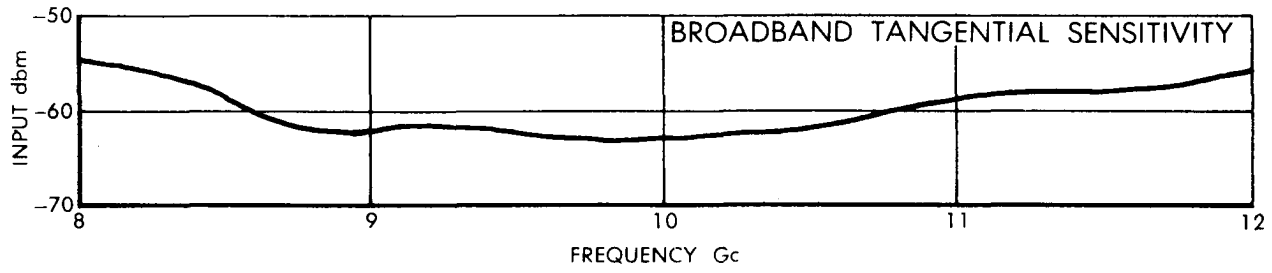
EM-1051 TYPICAL OPERATING CHARACTERISTICS

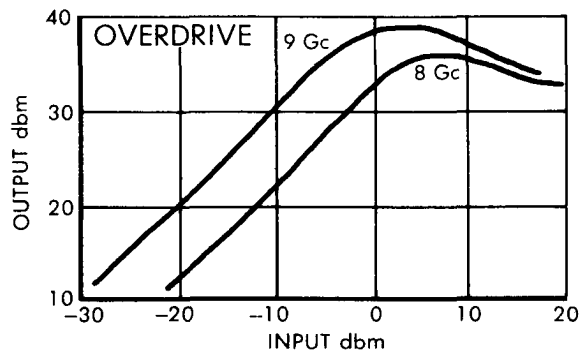
ANODE VOLTAGE	3300 Vdc	FOCUS VOLTAGE	−40 Vdc
CATHODE CURRENT	28 mAdc	FILAMENT VOLTAGE	6.3 Vac

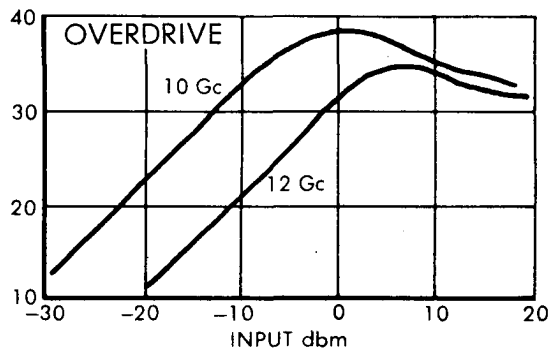




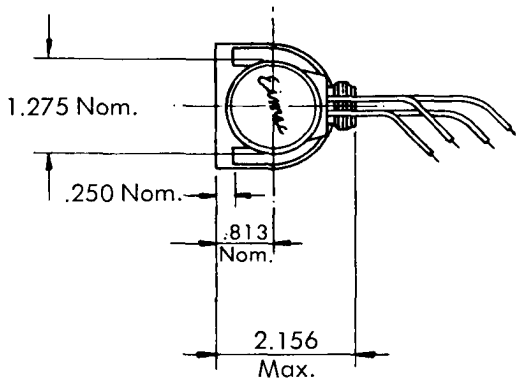
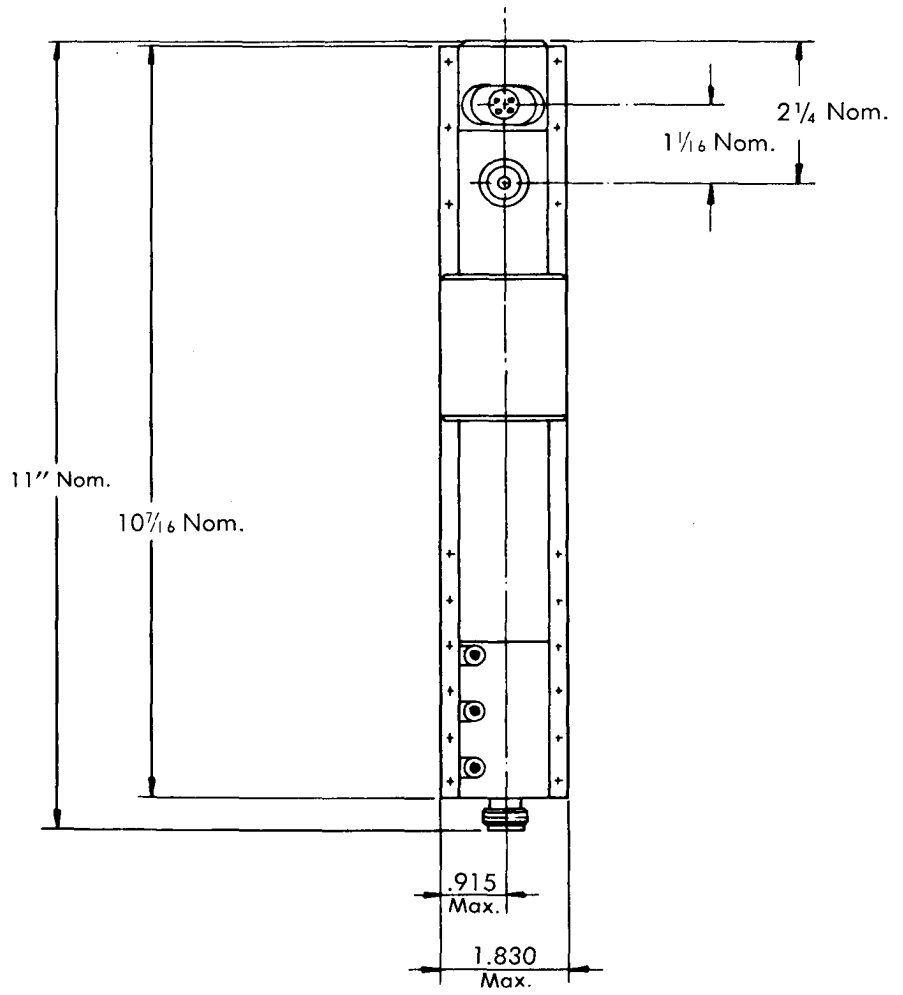








EM-1051

CONNECTIONS

1. HEATER —BROWN
2. CATHODE HEATER—YELLOW
3. FOCUS ELECTRODE —GREEN
4. BODY GROUND —BLACK