



**EITEL-McCULLOUGH, INC.**  
SAN CARLOS, CALIFORNIA

**TENTATIVE DATA**  
**EM-1015**  
**TRAVELING WAVE TUBE**  
**4.0 to 8.0 Gc.**  
**3 Watts Min.**  
**60 db Gain**

**TENTATIVE DATA FOR EIMAC EM-1015 TRAVELING WAVE TUBE**

The Eimac EM-1015 is a very rugged, light weight power amplifier traveling wave tube designed to operate under severe environmental extremes of shock, vibration, altitude and temperatures. The EM-1015 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 4.0 to 8.0 Gc with a nominal small signal gain of 60 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 . . . . .	4.0 to 8.0 gigacycles
Input and Output Impedance . . . . .	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) . . . . .	4.5 Pounds

**MAXIMUM RATINGS**

D-C BEAM VOLTAGE* . . . . .	2600 VOLTS
D-C FOCUS ELECTRODE VOLTAGE:*	
NEGATIVE WITH RESPECT TO CATHODE . . . . .	50 VOLTS
D-C CATHODE CURRENT . . . . .	40 MILLIAMPERES



TYPICAL OPERATING CHARACTERISTICS

Frequency . . . . .	4.0 to 8.0 gigacycles
Minimum Output Power . . . . .	3.0 watts
Small Signal Gain . . . . .	60 decibels
D-C Beam Voltage* . . . . .	2550 volts
D-C Cathode Current . . . . .	35 milliamperes
D-C Focus Electrode Voltage* . . . . .	-40 volts
D-C Focus Electrode Current . . . . .	0 milliamperes

\*All voltages referred to cathode.

APPLICATION

**Cooling:** The EM-1015 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  $\pm 5$  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  $\pm 1\%$  to insure proper operation.

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

**Special Applications:** For any additional information concerning this tube or its application, write to Microwave Product Manager, Eitel-McCullough, Inc., San Carlos, California.

ENVIRONMENTAL

The EM-1015 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 cps (Curve A of Proc. XII, MIL-E-5272C)

**Shock:** 25 g, 11  $\pm$  1 ms

**Acceleration:** Sustained, 25 g's

**Temperature:** -54°C to + 85°C

**Altitude:** 70,000 ft.

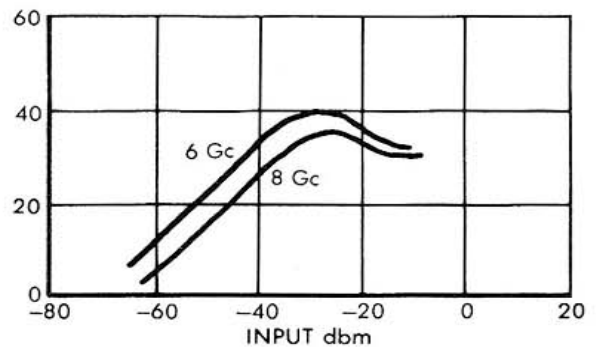
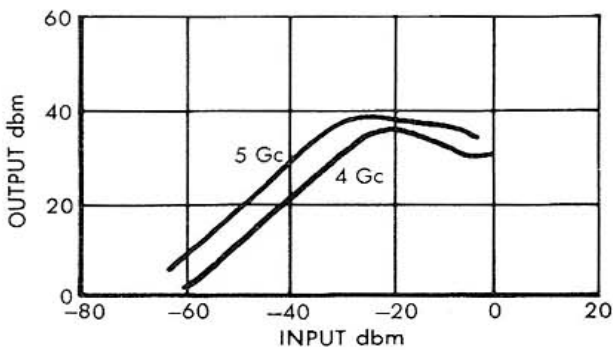
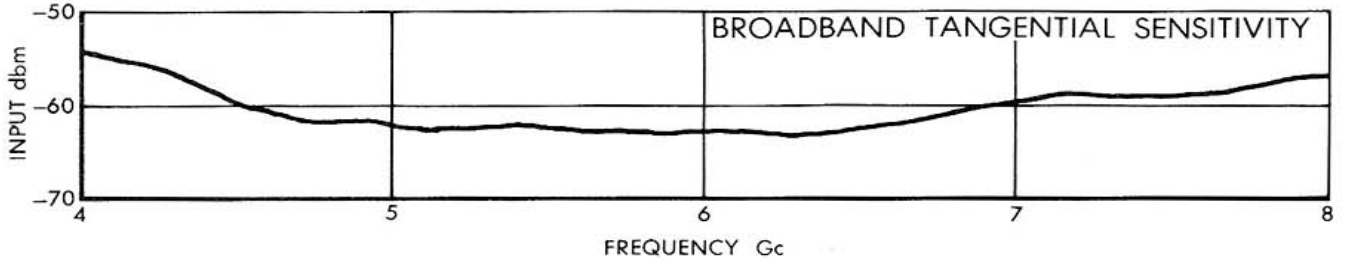
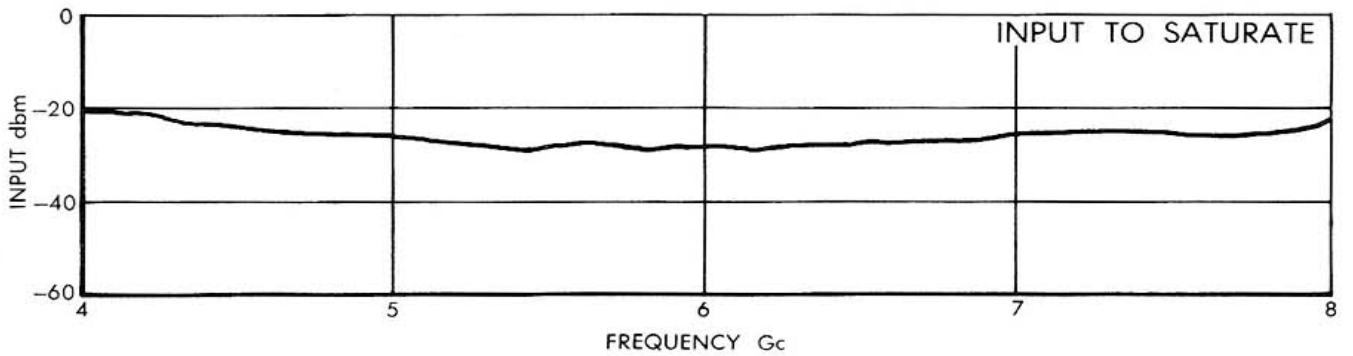
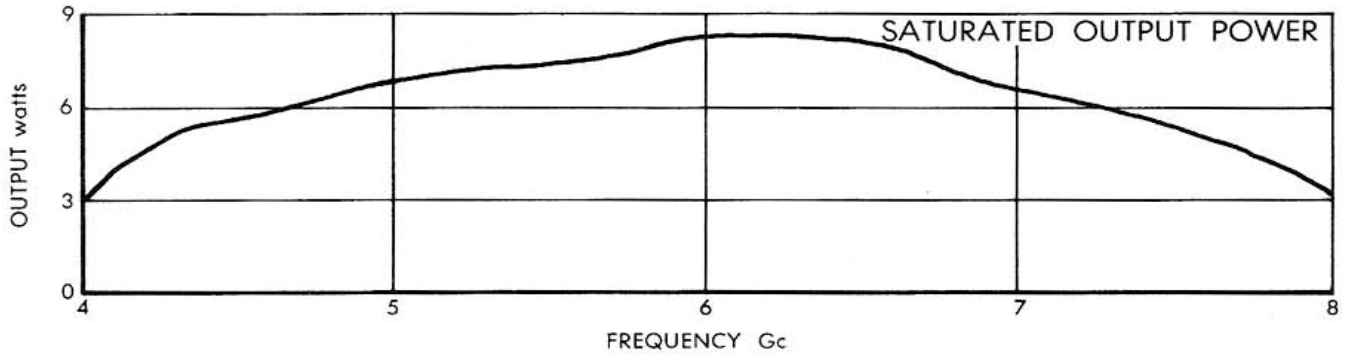
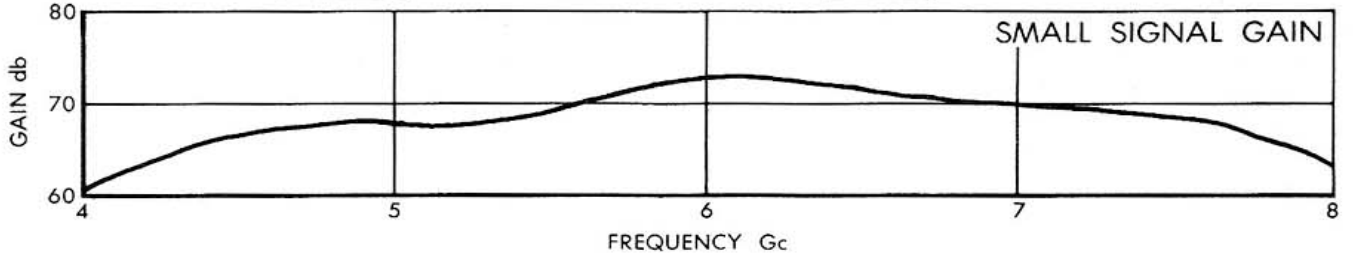
NOTE: This data should not be used for final equipment design.



### EM-1015 TYPICAL OPERATING CHARACTERISTICS

ANODE VOLTAGE  $\frac{2550 \text{ Vdc}}{}$   
CATHODE CURRENT  $\frac{35 \text{ mAdc}}{}$

FOCUS VOLTAGE  $\frac{-40 \text{ Vdc}}{}$   
FILAMENT VOLTAGE  $\frac{6.3 \text{ V}}{}$





EM-1015

# EM-1015

## CONNECTIONS

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

