

## EITEL-MCCULLOUGH, INC. SAN CARLOS, CALIFORNIA

8198 EM-778

TRAVELING WAVE TUB
5.0 to 11.0 Gc.
1 Watt Min.
60 db Gain

### TENTATIVE DATA FOR EIMAC EM-778 TRAVELING WAVE TUBE

The Eimac 8198/EM-778 is a ruggedized, ceramic and metal, periodic permanent magnet focused, power-amplifier traveling wave tube. It is capable of delivering a minimum CW output power of one watt throughout the frequency range of 5.0 to 11.0 gigacycles with a nominal small signal gain of 60 decibels. The 8198/EM-778 is designed to operate under severe environmental extremes of shock, vibration, temperature and altitude such as encountered in airborne applications.



The use of temperature compensated permanent magnets allows the 8198/EM-778 to be operated over a wide temperature range without degradation of performance. Flexible leads provide electrical connections to the tube.

## **GENERAL CHARACTERISTICS**

#### **ELECTRICAL** Cathode: Unipotential, oxide coated Minimum Heating Time . . 60 seconds 6.3 volts Heater: Voltage . . . . . . . . 0.6 amperes 25 to 34 decibels -50 dbm Noise Figure . . . Minimum Tangential Sensitivity (Broadband) . . . Minimum Saturated Output Power . . . . 1 watt . . . 5.0 to 11.0 gigacycles 50 ohms nominal MECHANICAL Operating Position . . . Any Type N Female Coaxial Fitting RF Output Coupling . . . . . Type N Female Coaxial Fitting 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\* 3000 VOLTS D-C FOCUS ELECTRODE VOLTAGE\*: 40 VOLTS NEGATIVE WITH RESPECT TO CATHODE . D-C CATHODE CURRENT . . . . . . 25 MILLIAMPERES

# TYPICAL OPERATING CHARACTERISTICS

Frequency									5.0 to 11.0	gigacycles
Minimum Output Po									1.0	watt
Small Signal Gain	•		•		•	•	•		60	decibels
D-C Beam Voltage*		•						•		volts
D-C Cathode Curren	Γ.	•	•	•	•	•	•	•	23	milliamperes
D-C Focus Electrode										volts
D-C Focus Electrode	Curre	ent		•	•	•	•		0	milliamperes

<sup>\*</sup>All voltages referred to cathode.

#### APPLICATION

**Cooling:** The EM-778 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-778 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)

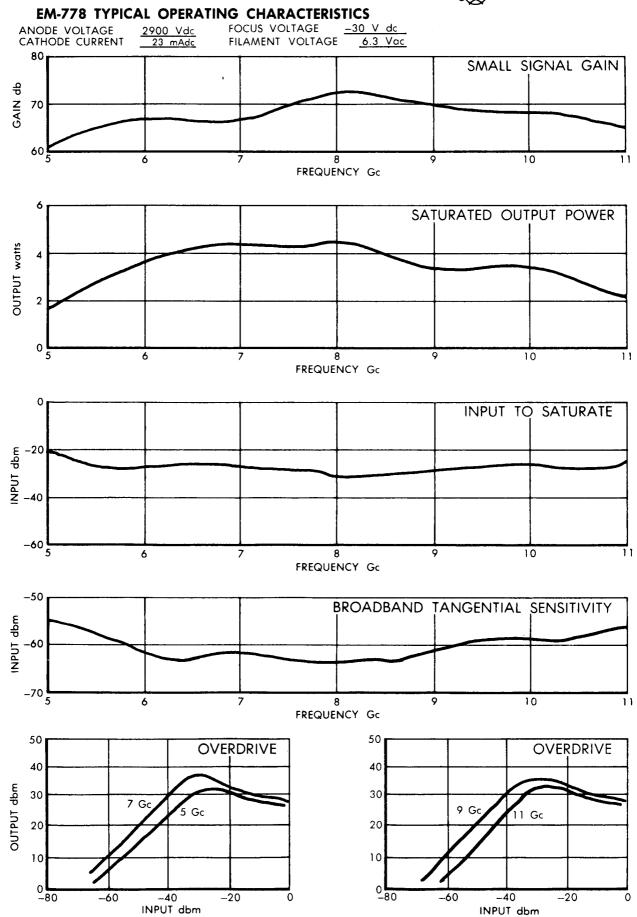
**Shock:** 25 g,  $11 \pm 1$  ms

Acceleration: Sustained, 25 g's

Temperature:  $-54^{\circ}$ C to  $+85^{\circ}$ C

Altitude: 70,000 ft.

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



# CONNECTIONS

1. HEATER

-BROWN

2. CATHODE HEATER—YELLOW

3. FOCUS ELECTRODE —GREEN

4. BODY GROUND —BLACK

