

These ratings represent those of current samples of this type. Refer to the Objective Technical Information sheet for design-objective ratings.

This technical information is proprietary and is furnished only as a service to customers.

ZM-3128

TRAVELING-WAVE TUBE

5 Milliwatts CW Output
25 db Gain

8000-12,000 Megacycles
Less Than 13 db Noise Figure

Periodic-Permanent-Magnet

The ZM-3128 is a ruggedized, low-noise, broadband traveling-wave tube for use in the 8000-to-12,000-megacycle frequency range. It has a noise figure of less than 13 decibels across the entire band with a CW power output of 5 milliwatts.

The tube is of metal-ceramic construction and is supplied as a completely packaged assembly which includes a periodic-permanent-magnet focusing structure, connectors and housing. The entire assembly weighs approximately 3.5 pounds.

The broad bandwidth, low noise, high gain, freedom from tuning adjustments and rugged construction are important features for application in military systems. It is particularly useful as the input tube for radar receivers, when its low noise and protection to the crystal mixer are decided advantages. Other applications include electronic countermeasures equipment, microwave relay systems, and radiometry.

Since this tube is periodic-permanent-magnet focused, it is well suited to applications requiring close physical spacing with magnetic materials or other tubes.

ELECTRICAL

	Minimum	Bogey	Maximum	
Frequency	8000		12,000	Megacycles
Heater				
Voltage	—	6.3		Volts
Current	—	—	0.4	Ampere
A heater-voltage regulation of ± 2 percent is recommended to realize optimum gain and noise figure.				
Focusing Method - Periodic Permanent Magnet				
Noise Figure †, maximum	—	12	13	Decibels
Small-signal Gain	25	—		Decibels
Saturated Power Output	—	5.0		Milliwatts
Collector Dissipation	—	—	1.0	Watt
Impedance, Coaxial	—	—	50	Ohms
Input, VSWR	—	—	2.5 to 1	
Output, VSWR	—	—	2.5 to 1	

MECHANICAL

Mounting Position - Any			
Connectors			
DC Socket - Winchester M9P (or equivalent)			
Collector - Winchester PM 1 PLS (or equivalent)			
RF Connectors, Coaxial			
Input - Type-N, Female			
Output - Type N, Female			
Over-all Dimensions			
Length		10.20	Inches
Width		2.60	Inches
Height		3.30	Inches
Weight (Complete Assembly), approximate		3.5	Pounds

THERMAL

Cooling - Convection

ENVIRONMENTAL

Shock (energized)	30 G for 11 milliseconds on each of three mutually perpendicular axes.
Vibration (operating)	0.060 inch double amplitude from 5 to 15 cycles per second, 0.036 inch double amplitude from 15 to 55 cycles per second, and 5 G from 55 to 2000 cycles per second with sweep over 5 to 2000 cycles per second for 100 minutes on each of three mutually perpendicular axes (Refer to Fig. 1 of MIL-E-5272 C).
Humidity (non-operating)	MIL-E-5272 C, Paragraph 4.4.1 (Procedure I); i.e., non-operating tube in 95 percent relative humidity atmosphere for 10 days with temperature cycled slowly from approximately 30 C to 71 C each day.
Acoustic noise (operating)	135 decibels, 25 to 12,000 cycles per second random noise.
Altitude (operating)	100,000 feet mean sea level.
Operating temperature, ambient ‡	-65 to +100 C

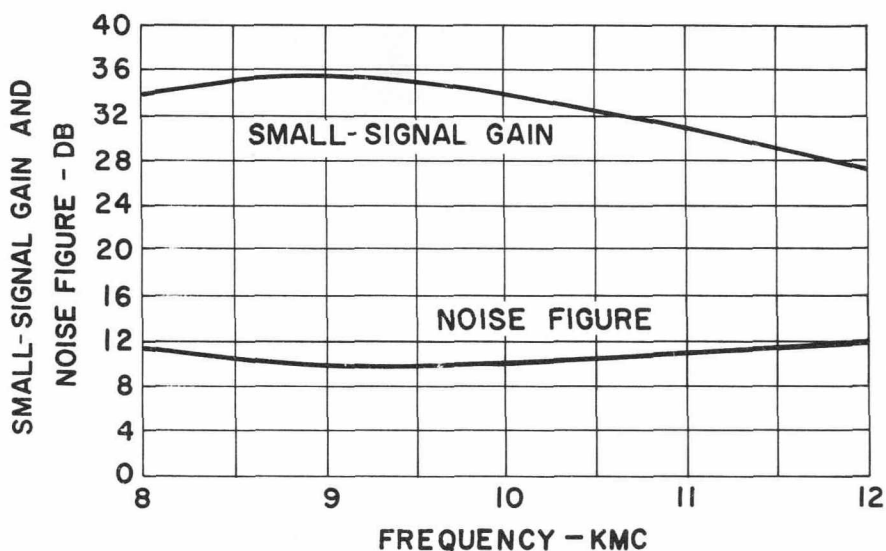
TYPICAL OPERATING CONDITIONS**

	Minimum	Bogey	Maximum	
Electrode - No. 1 (Grid) Voltage	0		-50	Volts
Electrode - No. 2 (Anode) Voltage	40		75	Volts
Electrode - No. 3 Voltage	50		200	Volts
Electrode - No. 4 Voltage	75		400	Volts
Helix				
Voltage	720		850	Volts
Current			100	Microamperes
Collector Voltage	950		1100	Volts
Cathode Current	650		850	Microamperes

† An improved noise figure is possible when this tube is optimized for a narrow frequency band. If requirements exist for an improved noise figure over a narrow band, consult the nearest Power Tube Department sales office.

** All voltages may be isolated from ground; i.e., it is not necessary to operate the cathode, helix, collector, or any other electrode at ground potential. Voltages shown are measured with respect to cathode. For minimum noise and optimum gain characteristics, voltages should be adjusted to values specified on data sheet accompanying each tube.

‡ From -65 to 0 C, the noise figure may increase by 1.5 decibels and the gain may decrease by 3.5 decibels.



M9P CONNECTIONS	
TUBE ELEMENT	PIN
HEATER	E
CATHODE-HEATER	J
ELECTRODE 1	A
ELECTRODE 2	D
ELECTRODE 3	F
ELECTRODE 4	K
HELIX	H

