

# Traveling-Wave Tubes

ZM-3231  
ZM-3289  
ZM-3290

## Technical Information

- MEDIUM POWER
- K<sub>u</sub> - BAND
- PPM FOCUSING

### RF PERFORMANCE

| Tube Type | Frequency Range (Gc) | Min. CW Saturated Power Output (watts) | Minimum Small Signal Gain (db) | Minimum Saturated Gain (db) | Maximum Noise Figure (db) | VSWR (max) | Data Group |
|-----------|----------------------|----------------------------------------|--------------------------------|-----------------------------|---------------------------|------------|------------|
| ZM-3231   | 12.0 - 18.0          | 5                                      | 35                             | 30                          | 30                        | 2.5        | 1          |
| ZM-3289   | 12.0 - 15.4          | 10                                     | 35                             | 30                          | 30                        | 2.0        | 2          |
| ZM-3290   | 11.0 - 20.0          | 1                                      | 30                             | 25                          | 30                        | 3.0        | 1          |

### FEATURES

high gain  
broad bandwidth  
periodic permanent magnet focusing  
metal-ceramic construction  
military environments  
lightweight  
air cooling  
grid control

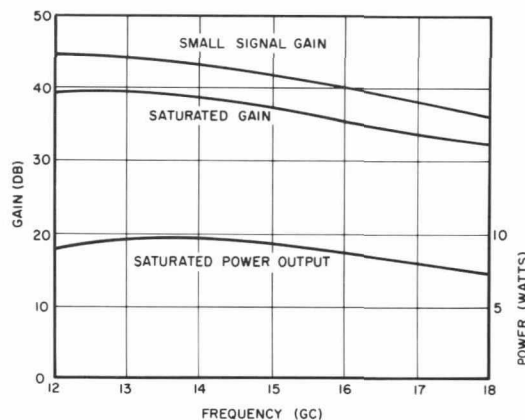
### APPLICATIONS

radar  
ecm  
communications  
instrumentation  
radiometry

### MECHANICAL & MISCELLANEOUS

Mounting position ..... Any  
Weight, lb. .... 2  
Overall length, in. .... 9  
Cooling ..... Forced Air  
Flow, cfpm# ..... 30  
Max. Inlet air temp. °C ..... 90  
Min. air press. in ft. (alt.) .... 10,000  
Connectors  
RF input ..... UG-419/U  
RF output ..... UG-419/U  
DC ..... Flying leads

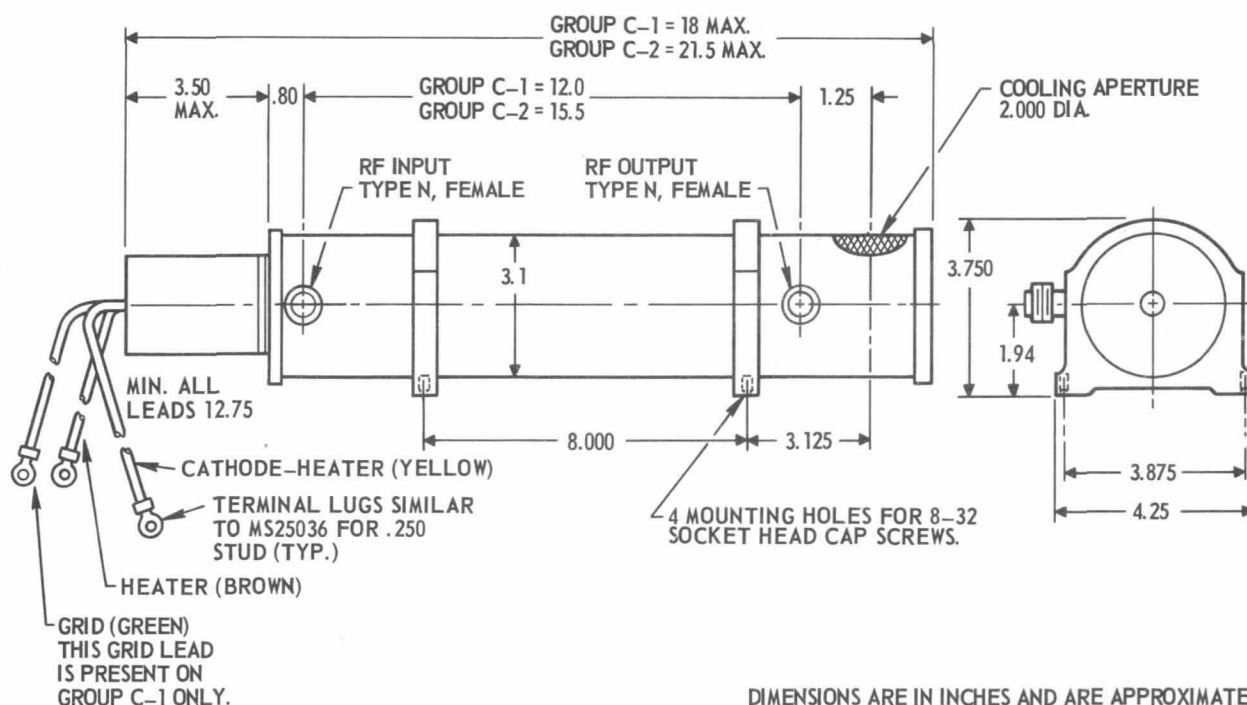
### TYPICAL CHARACTERISTICS



# OPERATING CONDITIONS \*†

| Data Group           | C-1          | C-2        |
|----------------------|--------------|------------|
| Htr. dc.....         | 6.0 to 6.6   | 6.0 to 6.6 |
| Htr. amp (max.)..... | 3.0          | 3.0        |
| Cath. kv dc**, with  |              |            |
| resp. to anode ..... | -15 to -18   | -15 to -17 |
| Peak cath. amp       |              |            |
| (max).....           | 5.0          | 4.5        |
| Grid-bias vdc, with  |              |            |
| resp. to cath. ....  | -300 to -400 | ---        |
| Grid swing vdc, with |              |            |
| resp. to grid-bias   |              |            |
| voltage .....        | 700 to 900   | ---        |
| Peak grid amp        |              |            |
| (max).....           | 1.0          | ---        |

## OUTLINE



DIMENSIONS ARE IN INCHES AND ARE APPROXIMATE.

## NOTES

- † Duty of ZM-3133 is 0.002 when forced-air cooling is used. With liquid cooling on collector and body, duty can be increased to 0.01.
  - # Duty of ZM-3282 is 0.002 when forced air cooling is used. With liquid cooling on collector and body, duty can be increased to 0.01. Convection cooling of collector may be used at duty cycle of 0.0008.
  - \* For the performance ratings specified, voltages should be adjusted to values specified by instructions accompanying each tube. These values will be within the ranges given above.
  - † The cathode voltage may be set at various values between -15 to -18 kv to obtain different power and gain characteristics.
  - \*\* The anode, collector, and circuit are connected to the tube package which must be grounded when the tube is installed.
- These data are subject to change without notice.