



## engineering data service

6493

## MECHANICAL DATA

|                                  |                                   |
|----------------------------------|-----------------------------------|
| Envelope                         | Metal Capsule                     |
| Power Connector                  | Winchester PM6Pl                  |
| RF Connectors                    | Type N Jackl                      |
| Focusing                         | Electromagnetic Solenoid Required |
| Cooling <sup>2</sup>             | Forced Air                        |
| Mounting Position                | Any                               |
| Tube Weight (Approx.)            | 1 lb                              |
| Solenoid Weight (Approx.):       |                                   |
| Military (Aluminum foil-wound)   | 7 lbs                             |
| Non-Military (Copper wire-wound) | 18 lbs                            |

## QUICK REFERENCE DATA

Traveling-wave Amplifier  
Full Octave Coverage  
2.0 to 4.0 Gc  
Over 10 mW Power Output  
Over 35 db Small Signal  
Gain  
CW or Pulsed  
Suitable for Airborne  
Applications

ELECTRICAL DATA<sup>3</sup>

## HEATER CHARACTERISTICS

|                      |               |
|----------------------|---------------|
| Voltage              | 6.3 ± 10% V   |
| Current (at 6.3 V)   | 0.64 - 0.96 A |
| Minimum Preheat Time | 1 Minute.     |

## RATINGS (Absolute Maximum)

|                          |               |
|--------------------------|---------------|
| Helix, Collector Voltage | 510 Vdc       |
| Grid 1 Voltage           | 0 to -175 Vdc |
| Grid 2 Voltage           | 510 Vdc       |
| Cathode Current          | 5 mAdc        |
| CW RF Input              | 1 W           |

TYPICAL OPERATION<sup>4</sup>Conditions

|                                                 |               |
|-------------------------------------------------|---------------|
| Frequency                                       | 2.0 to 4.0 Gc |
| Magnetic Focusing Field Density                 | 285 Gauss     |
| Minimum Uniform Length                          | 11 Inches     |
| Helix, Collector Voltage (Approx.) <sup>5</sup> | 450 Vdc       |
| Grid 1 Voltage                                  | 0 Vdc         |
| Voltage to Gate-Off (55 db Insertion Loss)      | -80 Vdc       |
| Grid 2 Voltage (Approx.) <sup>5</sup>           | 300 Vdc       |

Characteristics

|                                   | Min. | Max. |      |
|-----------------------------------|------|------|------|
| Cathode Current                   | -    | 4.5  | mAdc |
| Grid 1 Current                    | -    | 0.3  | mAdc |
| Grid 2 Current                    | -    | 0.2  | mAdc |
| Small Signal Gain (-40 dbm Input) | 35   | 45   | db   |
| Small Signal Gain Variation       | -    | ±3   | db   |
| Fine-Grain Variation of Gain      |      |      |      |
| for any 100-Mc Segment            | -    | ±2   | db   |
| Noise Power Output <sup>6</sup>   | -    | 0.03 | mW   |
| Saturation Power Output           | 10   | -    | mW   |

CIRCUIT DESIGN INFORMATION<sup>7</sup>

|                                   |                |
|-----------------------------------|----------------|
| Helix Voltage Range               | 400 to 500 Vdc |
| Grid 1 Voltage Range              | 0 to -170 Vdc  |
| Grid 2 Voltage Range <sup>8</sup> | 190 to 500 Vdc |

## POWER CONNECTIONS

- A. Grid 1
- B. Grid 2
- C. Helix
- D. Heater, Cathode
- E. Heater
- F. Capsule, Collector

SYLVANIA ELECTRIC  
PRODUCTS INC.

MICROWAVE DEVICE OPERATIONS  
Mountain View, California

January 10, 1961

SYLVANIA

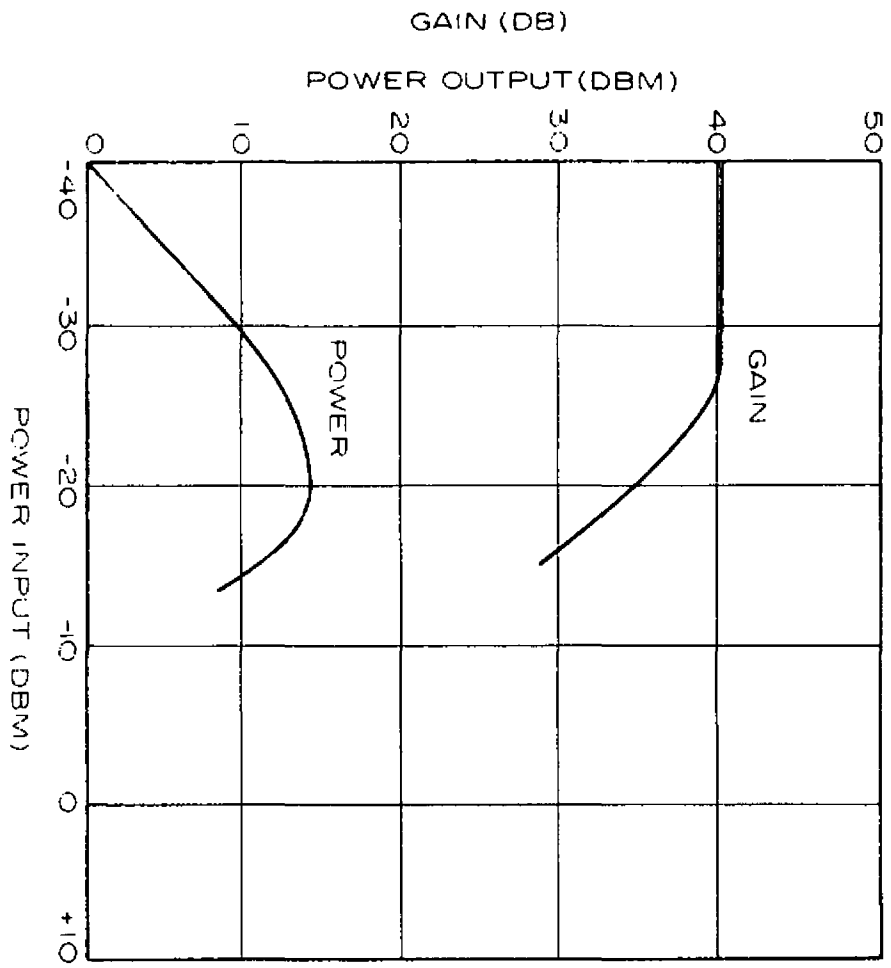
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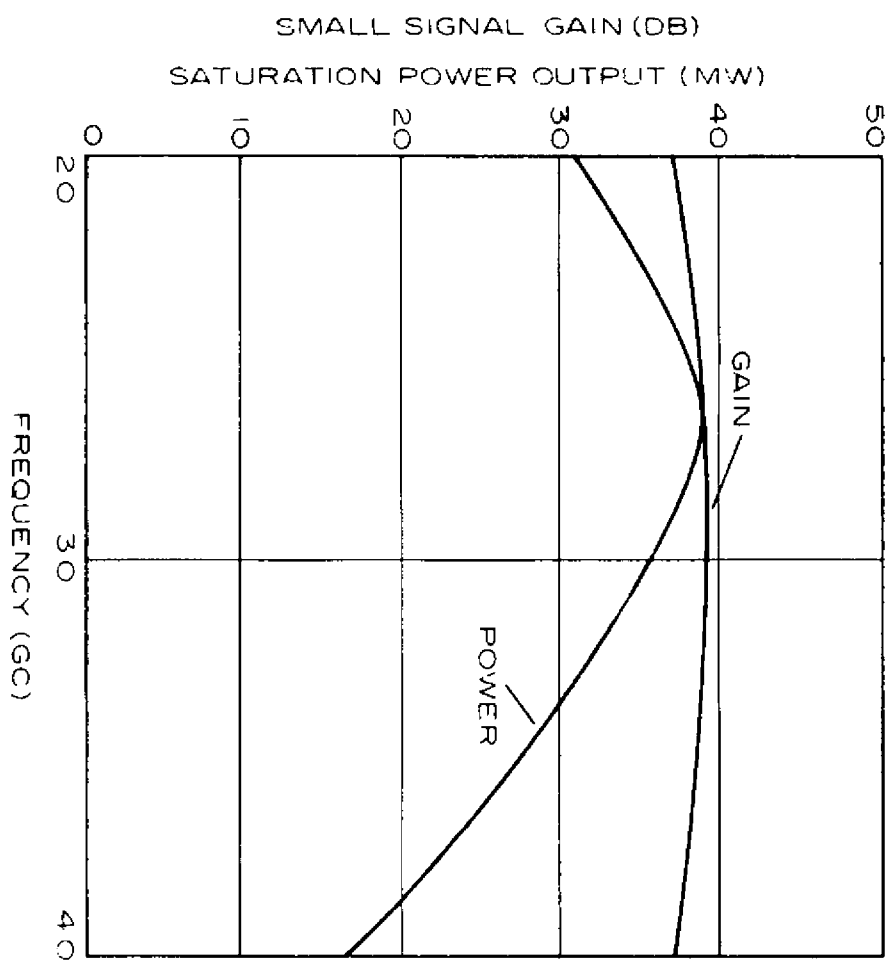
NOTES:

1. Alternative connectors supplied on request.
2. In addition to the cooling air requirements for the solenoid used with this tube it is recommended that at least 0.04 lbs/min of less than 100°F cooling air be passed along this tube.
3. All voltages given are with respect to cathode except where specified otherwise. Any one of pins A, B, C, D, or E may be connected to pin F which, for safety, should be grounded.
4. The quoted tube performance is for operation in a Sylvania-approved solenoid. Additional information will be supplied on request.
5. This voltage should be set to the value stated on the data sheet supplied with each tube.
6. As measured by a broadband bolometer with a frequency response from 0.5 to 10.0 Gc.
7. Ranges include values required as a result of initial spread in tube characteristics as well as those to accommodate changes throughout life.
8. For initial setup, it is desirable that grid 2 voltage be adjustable upward from zero.

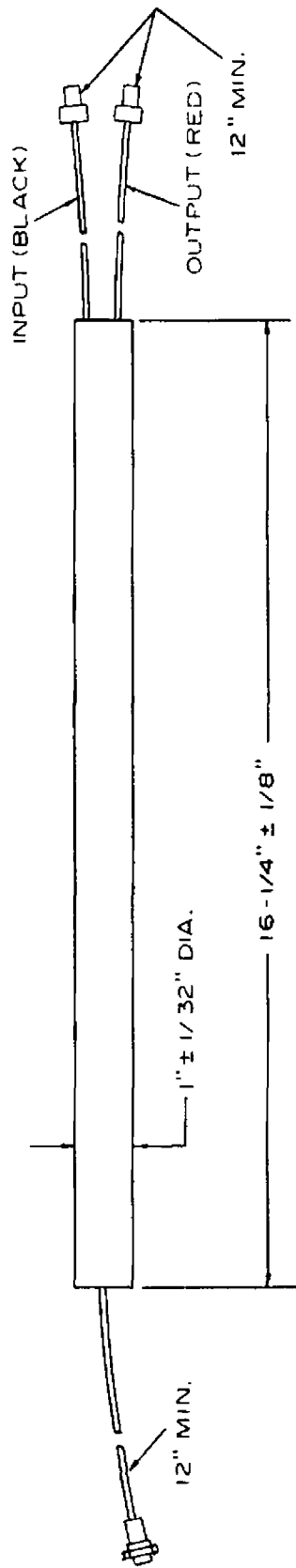
TYPICAL PERFORMANCE CHARACTERISTICS



Type 6493



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