



SYLVANIA

engineering data service

6698

MECHANICAL DATA

Envelope	Metal Capsule
Power Connectors	Birnbach # 404 ¹
RF Connectors	Type TNC Plug ¹
Focusing	Electromagnetic
Cooling ²	Forced Air
Mounting Position	Any
Tube Weight (Approx.)	2 lbs
Solenoid Weight (Approx.):	
Military (Aluminum foil-wound)	29 lbs
Non-Military (Copper wire-wound)	46 lbs

QUICK REFERENCE DATA

Traveling-wave Amplifier
Full Octave Coverage
2.0 to 4.0 Gc
Over 1 kw Peak Power
Output
Suitable for Airborne
Applications

ELECTRICAL DATA³

HEATER CHARACTERISTICS

Voltage	6.3 ± 10%	V
Current (at 6.3 V)	1.7 - 2.7	A
Minimum Preheat Time	2	Minutes

RATINGS (Absolute Maximum)

Peak Positive Grid 1 Voltage	500	v
Grid 1 Bias Voltage (Absolute Minimum)	-40	Vdc
Collector, Helix, and Grid 2 Voltage	10,000	Vdc
Peak Cathode Current	2.2	a
Peak Helix Current	250	ma
Peak Grid 1 Current	300	ma
Peak Grid 2 Current	150	ma
Collector Dissipation	225	W
Duty Factor	0.016	
Pulse Width	12	μs
CW RF Input ⁴	10	W
Collector Seal Temperature	250	°C

TYPICAL OPERATION⁵Conditions

Frequency	2.0 to 4.0	Gc
Magnetic Focusing Field Density	1160	Gausses
Minimum Uniform Length	6	Inches
Peak Grid 1 Voltage (Approx.) ⁶	300	v
Grid 1 Bias Voltage	-60	Vdc
Collector, Helix, and Grid 2 Voltage (Approx.) ⁶	8000	Vdc
Duty Factor	0.01	
Pulse Width	10	μs

Characteristics

	Min.	Max.	
Peak Cathode Current	-	2	a
Peak Helix Current	-	200	ma
Peak Grid 1 Current	-	250	ma
Peak Grid 2 Current	-	100	ma
Saturation Power Output	1000	-	w

POWER CONNECTIONS

Heater	Brown
Heater, Cathode	Yellow
Grid 1	Green
Grid 2	Blue
Collector	Red
Helix	Center
	Conductor of
	RF Cables

SYLVANIA ELECTRIC
PRODUCTS INC.

MICROWAVE DEVICE OPERATIONS
Mountain View, California

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Page 1 of 3

ELECTRICAL DATA (Cont'd)

<u>Characteristics</u>	<u>Min.</u>	<u>Max.</u>
Small Signal Gain (+13 dbm Input)	35	- db
Saturation Gain	25	- db
Insertion Loss (Grid 1 at -60 Vdc)	45	- db

CIRCUIT DESIGN INFORMATION^{7,8}

Peak Grid 1 Voltage Range ⁹	240 to 420 v
Collector, Helix, and Grid 2 Voltage Range	6500 to 9000 Vdc

When this tube is operated with grid pulsing, the effective impedance of the grid 1 circuit between pulses must be less than 1000 ohms.

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 0.6 lbs/min of less than 100° cooling air be directed along this tube.
3. All voltages are with respect to cathode. For personnel safety, the collector, helix, center conductor of RF cables, and grid 2 should be operated at ground potential and the solenoid case and other equipment associated with the operation of the tube should be heavily bonded to ground. Good grounding to the outer conductors of the tube RF cables should be provided by the associated equipment. The tube RF connectors should NOT be disconnected while lethal potentials are present. In addition, all conventional high voltage safety precautions in circuit design and use should be exercised to safeguard personnel, circuitry, and the tube.
4. When RF is applied to the input of this tube the output should be connected to a load.
5. The quoted tube performance is for operation in a Sylvania-approved solenoid. Additional information will be supplied on request.
6. Specific recommended operating voltage values supplied with each tube.
7. Ranges include values required as a result of initial spread of tube characteristics as well as those to accommodate changes throughout life.
8. For initial setup only, these voltages should be adjustable from zero upward. Suggested turn-on sequence is as follows:
 1. Solenoid current.
 2. Heater voltage. Wait 2 minutes before proceeding.
 3. Grid 1 bias voltage.
 4. Collector, helix, and grid 2 voltage.
 5. Grid 1 pulse voltage.
9. Peak grid 1 voltage range specified is with respect to cathode. Total output voltage from pulser should be greater by the amount of bias (60 Vdc).

