OBJECTIVE FOR DEVELOPMENTAL TYPE

Z-5387*

PLANAR TRIODE

The Z-5387 is a high-mu, metal-and-ceramic planar triode for use at very-high and ultra-high frequencies in grounded-grid, Class C CW or pulsed, power-amplifier, oscillator, or frequency-multiplier circuits. In such service it will operated from the low frequencies to above 3000 megacycles. Cooling of the tube envelope is accomplished by conduction from the contact circuit members with sufficient additional forced air to limit the maximum temperature at 250 C.

The tube has an oxide-coated indirectly-heated cathode of planar-electrode construction. The metal-and-ceramic envelope holds concentricity to extremely close limits. The strength inherent in the structural design allows shock-testing at 400 g. Graduated-diameter disk seals assure maximum efficiency in the use of cavity and parallel-line circuits with the resultant desirable features of both low lead inductances and electrode isolation. Radio-frequency losses in the tube are kept to a minimum by the special techniques and materials used. Other features of the tube are high transconductance and low interelectrode capacitances.

GENERAL

Electrical				
Cathode-Indirectly Heated				
Heater Voltage, dependent upon operating conditions+			6.3	Volts
Heater Current			1.05	Amperes
Cathode Heating Time, minimum			1.0	Minutes
	Minimum	Bogey	Maximum	
Transconductance, I_p = 75 ma, Ep = 600 volts	22,000	24,800	27,500	Micromhos
Amplification Factor	75	95	115	
Direct Interelectrode Capacitances				
With External Shield, Heater Voltage = 0 volts				
Grid to Plate	1.89	2.01	2.13	pf
Grid to Cathode	6.0	6.5	7.00	pf
Plate to Cathode, maximum	0.018	0.023	0.029	pf

GENERAL (Continued)

Mechanical
- Mounting Position - Any
  - Only Anode Flange to be used as a Socket Stop and Clamp
- Net Weight, approximate — 2 — Ounces

Thermal
- Cooling
  - Anode and Anode Seal-Conduction and Forced Air
  - Grid and Cathode Seals-Conduction and Forced Air
- Maximum Temperature of Any Seal Under Any Condition+ — 250 — C

MAXIMUM RATINGS

Plate-Pulsed Oscillator and Amplifier - Class C

Maximum Ratings
Absolute-Maximum Values

Peak Pulse-Plate-Supply Voltage	3500	Volts
Pulse Length	6	Microseconds
Duty Factor	0.0033	
Negative DC Grid Voltage	150	Volts
Positive Peak Grid Voltage	250	Volts
Negative Peak Grid Voltage	750	Volts
Plate Dissipation	10	Watts
Grid Dissipation	2.0	Watts
Average Plate Current	10	Milliamperes
Peak Plate Current	3.0	Amperes
Average Grid Current	5.0	Milliamperes
Frequency	3000	Megacycles

Absolute-Maximum ratings are limiting values of operating and environmental conditions applicable to any electron tube of a specified type as defined by its published data and should not be exceeded under the worst probable conditions.

The tube manufacturer chooses these values to provide acceptable serviceability of the tube, making no allowance for equipment variations, environmental variations, and the effects of changes in operating conditions due to variations in the characteristics of the tube under consideration and of all other electron devices in the equipment.

The equipment manufacturer should design so that initially and throughout life no absolute-maximum value for the intended service is exceeded with any tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of the tube under consideration and of all other electron devices in the equipment.

CHARACTERISTICS AND TYPICAL OPERATION

Amplifier - 1100 Megacycles

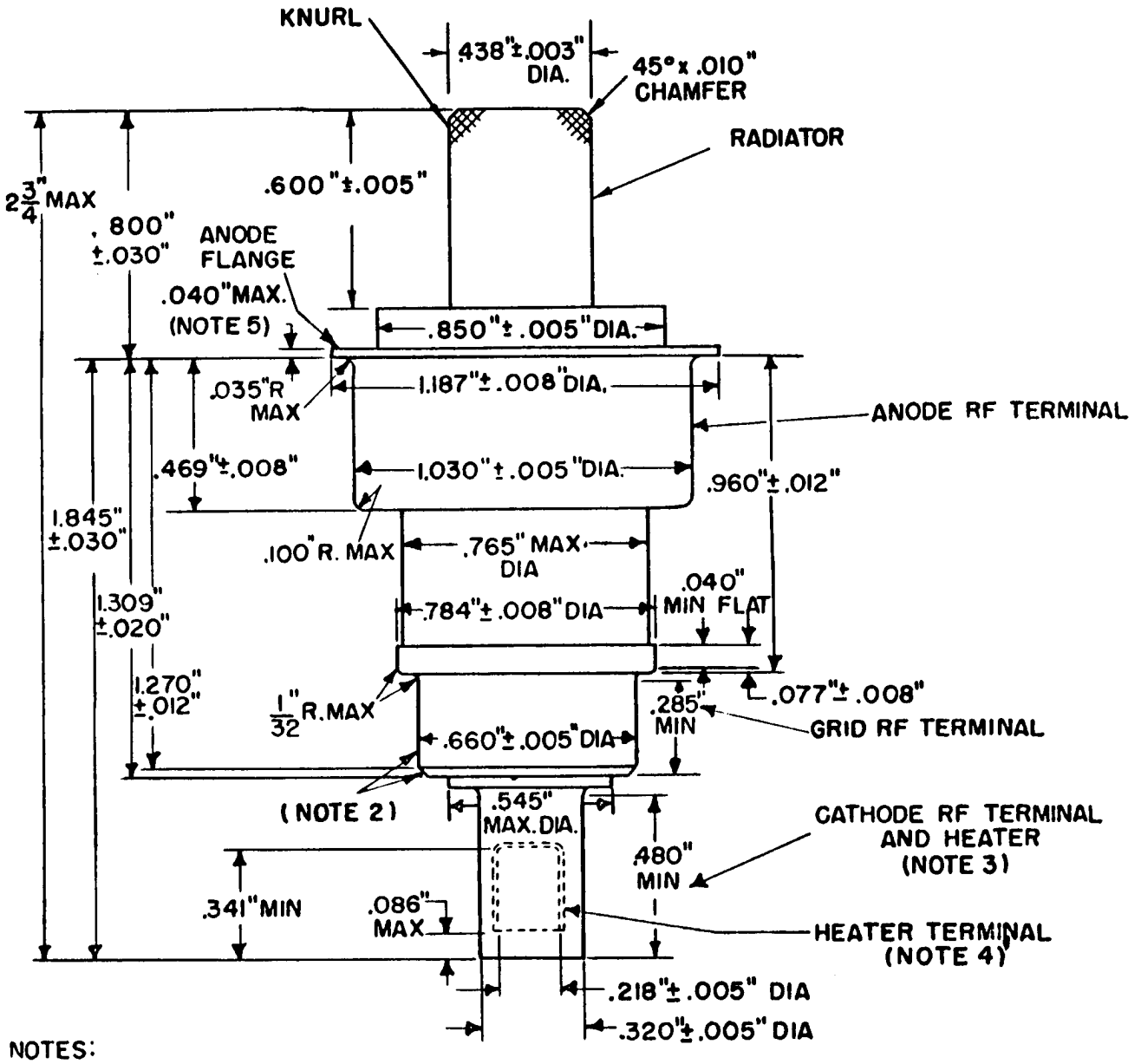
Heater Voltage	6.0	Volts
DC Plate Voltage	1700	Volts
DC Grid Voltage	-45	Volts
Pulse Length	3.5	Microseconds
Duty Factor	0.001	
Peak Plate Current	1.9	Amperes
Peak Grid Current	1.1	Amperes
Driving Power during Pulse, approximate	400	Watts
Peak Useful Power Output, approximate	1500	Watts

* Publication of these data does not obligate the General Electric Company to manufacture a tube with these characteristics.

\+ The Z-5387 operates at frequencies where it is necessary to consider transit-time effects of the electron current. The principal effects influencing tube operation are the decrease in power output and operating efficiency with increase in frequency, and the bombardment and heating of the cathode by electrons from the region of the grid which can be severe enough to result in short tube life and erratic operation. Operating frequency, circuit design and adjustment, grid bias, and grid current contribute to the degree of cathode bombardment. There is an optimum heater voltage which will maintain the cathode at the correct operating temperature for a particular set of operating conditions. If the conditions of operation result in appreciable cathode back heating, it may be necessary to start dynamic tube operation at normal heater voltage followed by a reduction of heater voltage to the proper value. A maximum variation of plus or minus five percent in heater voltage is recommended where extended tube life is a factor. Under all other conditions, the variation in heater voltage should not exceed plus or minus ten percent. For application above 400 megacycles, recommendations are to be obtained from the tube manufacturer regarding the heater voltage to be used under a specific set of operating conditions.

‡ Where long life and reliable operation are important, lower tube envelope temperatures should be used.

2/19/63 (B)
Supersedes 4/22/60 (B)



NOTES:

1. External metal parts (except radiator) plated with 30 msi of copper and /or silver.
2. Solder not to extend radially beyond grid RF terminal.
3. Total indicated runout of the grid-contact surface and the cathode-contact surface with respect to the anode shall not exceed 0.020"
4. Total indicated runout of the cathode-contact surface with respect to the heater-contact surface shall not exceed 0.012".
5. Only this flange to be used as a socket stop and clamp.