



engineering TUBE DATA

F-6804
POWER TRIODE



Components Division

DESCRIPTION

The F-6804 is a three electrode tube designed for use as a radio frequency amplifier, oscillator, or Class B modulator. The anode is forced air cooled and is capable of dissipating 25 kilowatts during Continuous Commercial Service. The cathode is a thoriated tungsten filament of free hung design and filament excitation of 3-phase wye is required. Maximum ratings apply up to 22 megacycles.

ELECTRICAL

Filament Voltage, line to line	11.0 volts
Filament Current, per phase	190 amperes
Filament Starting Current	600 amperes
Filament Heating Time	15 seconds
Amplification Factor	
$E_c = -100$ v. $I_b = 2.0$ amperes	40
Peak Cathode Current, Note 1	100 amperes
Direct Inter-electrode Capacitances	
Grid-Plate	37 μf
Grid-Filament	75 μf
Plate-Filament	2.2 μf

MECHANICAL

Mounting Position Vertical, anode down
Air Flow Through Radiator

The tabulation listed below indicates the required flow of incoming air, through the radiator, for the various plate dissipation values. Cooling air to be applied before the application of filament power and to continue for 3 minutes after removal of filament power;

Percentage of Maximum Rated Plate Dissipation for each Class of Service	100% rating	80% rating	60% rating
Air Flow	1800	1450	1100 min. cfm
Static Pressure	2.2	1.5	.85 in. of water

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MECHANICAL (continued)

Radiator Temperature measured on the core at end away from incoming air	180 °C, max.
Glass Temperature at hottest part - Note 2	180 °C, max.
Net Weight, approx, Accessories	225 pounds
Terminal Connector (6 required)	RT-52578
Connector Wrench (2 required)	RT-52843

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

Audio Frequency Power Amplifier and Modulator--Class B

Maximum Ratings, Absolute Values

D-C Plate Voltage	19,000 volts
Max. Signal D-C Plate Current, Note 3	9 amperes
Max. Signal Plate Input, Note 3	150 kilowatts
Plate Dissipation, Note 3	25 kilowatts

Typical Operation

(Unless otherwise specified, values are for two tubes)

D-C Plate Voltage	10,000 volts
D-C Grid Voltage	-220 volts
Peak A-F Grid-to-Grid Voltage	820 volts
Zero Signal D-C Plate Current	.6 amperes
Max. Signal D-C Plate Current	5.8 amperes
Effective Load Resistance, Plate-to-Plate	3600 ohms
Max. Signal Driving Power, approx.	820 watts
Max. Signal Power Output, approx.	37 kilowatts

Plate-Modulated Radio-Frequency Power Amplifier--Class C Telephony

(Carrier conditions per tube for use with a maximum modulation factor of 1.0)

Maximum Ratings, Absolute Values

D-C Plate Voltage	14,000 volts
D-C Grid Voltage	-3,000 volts
D-C Plate Current	12 amperes
D-C Grid Current	1.5 amperes
Plate Input	85 kilowatts
Plate Dissipation	20 kilowatts

Typical Operation

D-C Plate Voltage	10,000	14,000 volts
D-C Grid Voltage	-750	-900 volts
Peak R-F Grid Voltage	1360	1,500 volts
D-C Plate Current	6.6	5.7 amperes
D-C Grid Current	.9	.9 amperes
Driving Power, approximate	1.2	1.3 kilowatts
Power Output, approximate	50	50 kilowatts

Radio-Frequency Power Amplifier and Oscillator--Class C Telegraphy
(Key down conditions per tube without amplitude modulation) Note 4

Maximum Ratings, Absolute Values

D-C Plate Voltage, Note 5	17,500 volts
D-C Grid Voltage	-3,000 volts
D-C Plate Current	15 amperes
D-C Grid Current	1.5 amperes
Plate Input	125 kilowatts
Plate Dissipation	25 kilowatts

Typical Operation

D-C Plate Voltage	10,000 volts
D-C Grid Voltage	-1,000 volts
Peak R-F Grid Voltage	1,675 volts
D-C Plate Current	6.4 amperes
D-C Grid Current, approximate	1.1 amperes
Driving Power, approximate	1.7 kilowatts
Power Output, approximate	50 kilowatts

Ratings versus Frequency

Maximum ratings apply up to 22 megacycles. The tube may be operated at higher frequencies provided the maximum values of plate voltage and power input are reduced according to the tabulation below (other maximum ratings are the same as shown above). Special attention should be given to adequate ventilation of the bulb at these frequencies.

Frequency	22	30	40 megacycles
Percentage of Maximum Rated Plate Voltage & Plate Input	100	80	50 per cent

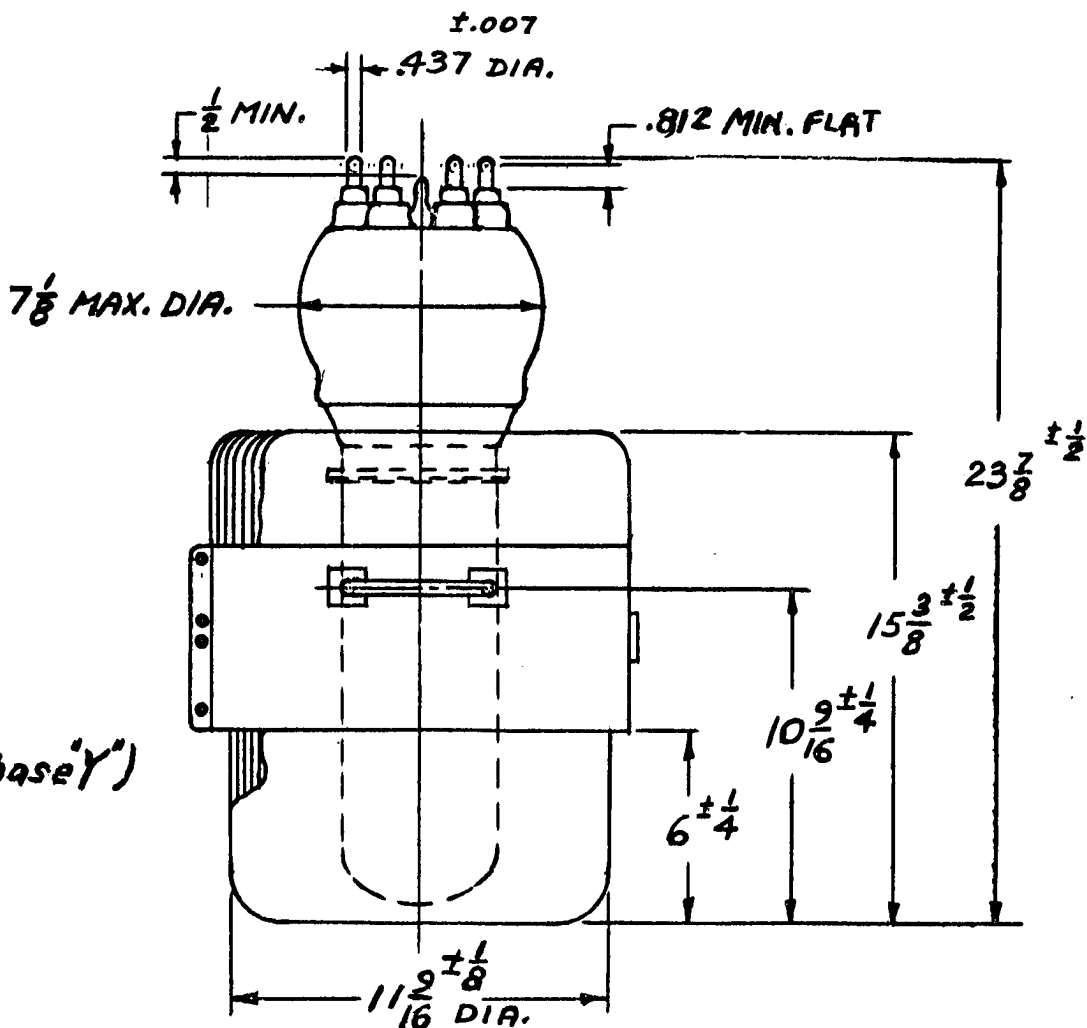
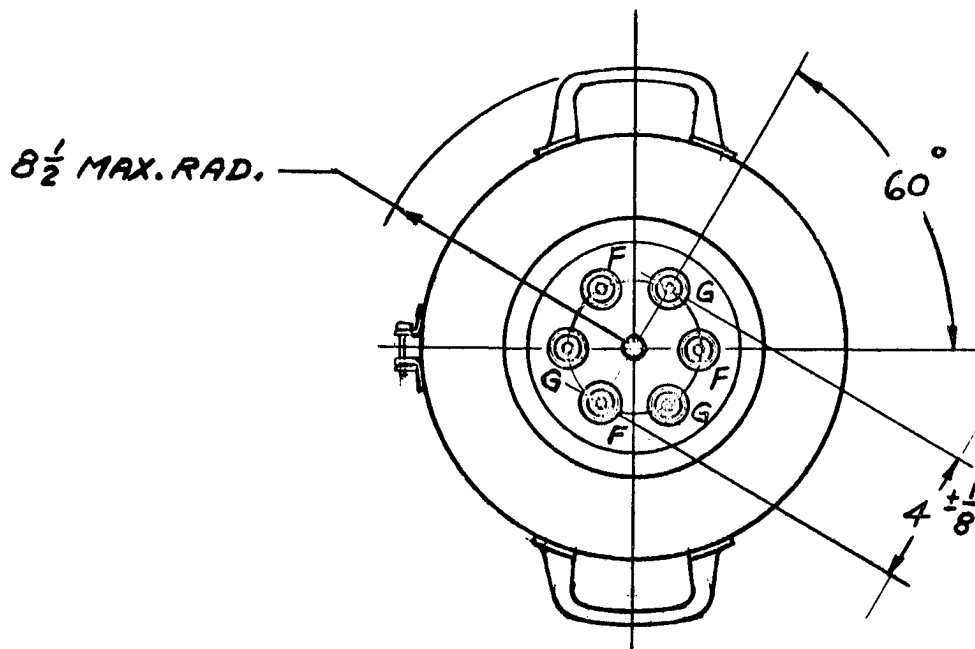
For tube characteristic curves, refer to F-5918A catalog sheet.

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- Note 1: Represents maximum usable cathode current (plate current plus grid current) for any condition of operation.
- Note 2: Operation at frequencies above 2 mc may require air flow onto the dish center in order to hold the temperature of the seals and dish below 180°C. This flow may be obtained by deflection of the anode cooling air or by means of a separate blower.
- Note 3: Averaged over any audio frequency cycle of sine-wave form.
- Note 4: Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of carrier conditions.
- Note 5: The tube may be operated up to 19,000 d-c plate voltage at frequencies of 2 mc or less.



TERMINALS
BLACK GRID
YELLOW FIL. (3 phase "Y")

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FEDERAL TYPE-F-6804

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