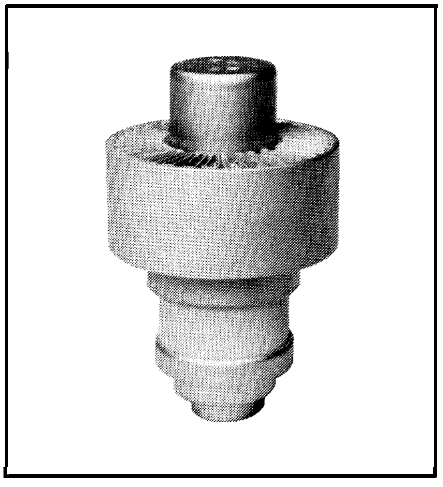
8226
Beam Power Tube



- 340 Watts CW Power Output at 400 Hz
  105 Watts CW Power Output at 1215 Hz
- CERMOLOX®
- Ruggedized
- Matrix-Type Cathode
- Forced-Air Cooled

BURLE 8226 is a compact, forced-air cooled, UHF beam power tube designed for aircraft and mobile applications in which dependable performance under severe shock and vibration is essential. For that reason, the tube is built with an axial ceramic pin which rigidly holds grid No.1, grid No.2, and cathode in fixed positions with respect to each other. The tube features Cermolox construction, a matrix-type unipotential oxide-coated cathode, and an integral heater.

To assure compliance with the environmental requirements, sample tubes are subjected to 50 g-1 millisecond and 500 g-3/4 millisecond shock tests and to vibration frequencies from 5 to 500 Hertz at up to 10 g.

The tube is rated as an RF power amplifier and oscillator in Class C telegraphy service, and as an RF power amplifier in Class C FM telephony service. The 8226 may also be useful in a variety of other applications such as frequency multipliers, AF power amplifiers or modulators, linear RF power amplifiers in AM, single-sideband or UHF television service.

This datasheet gives application information unique to BURLE-8226. Information contained in the following publications will help to assure longer tube life and safe operation:

TP-105 Applications Guide for BURLE Power Tubes.

TP-118 Applications Guide for Forced-Air Cooling of BURLE Power Tubes

TP-122 Screen-Grid Current Loading and Bleeder Considera tions.

For copies of these publications, contact your BURLE representative or write BURLE INDUSTRIES, INC., Tube Products Division, 1000 New Holland Avenue, Lancaster, PA 17601-5688.

General Data

Electrical

Heater, for Matrix-Type Oxide-Coated Unipotential Cathode:		
Voltage (AC or DC)	6.3	V
Current at 6.3 volts	3.2	A
Minimum heating time	60	S
Mu-Factor, Grid No.2 to Grid No.1 for anode volts = 250, Grid No.2 volts = 250 and anode ma = 100	18	
Direct Interelectrode Capacitances:[1]		
Grid No.1 to anode	0.065 max.	pF
Grid No.1 to cathode & heater	15	pF
Anode to cathode & heater	0.019 max.	pF
Grid No.1 to grid No.2	20	pF
Grid No.2 to anode	3.2	pF
Grid No.2 to cathode & heater	1.30 max.	pF

Mechanical

Operating Position	Any
Overall Length	2.710" max.
Greatest Diameter	1.640" max.
Weight (Approx.).	4 oz
For operation up to 400 MHz, Socket including Grid No.2 Bypass Capacitor	Erie[2] 9819-000 or equivalent
Grid No.2 Bypass Capacitor	Erie[2]2929-001, or equivalent
For operation at high frequencies	See Preferred Mounting Arrangement (Figure 2)

Thermal

Anode, Grid No.2, Grid No.1, Cathode, and Heater Temperature	250 max.	°C
Radiator Core Temperature	250 max.	°C

See measurement points on Dimensional Outline (Figure 12).

BURLE Electron Tubes

Air Flow:

Through radiator - Adequate air flow to limit the radiator core temperature to 250 °C should be delivered by a blower through the radiator before and during the application of anode, grid No.2, and grid No.1 voltages. Typical values of air flow directed through the radiator versus anode dissipation are shown in **Figure 1**.

To Anode,' Grid No.2, Grid No.1, Cathode, and Heater Terminals - A sufficient quantity of air should be directed at the heater terminal and allowed to flow past each of these terminals so that their temperature does not exceed the specified maximum value of 250°C.

During Standby Operation - Cooling air is not usually required when only heater voltage is applied to the tube. Anode power, grid No.2 power, heater power, and air flow may be removed simultaneously.

RF Power & Oscillator - Class C Telegraphy RF Power Amplifier and Class C FM Telephony

Maximum CCS Ratings, Absolute-Maximum Values

Voltage	2500	V
DC Grid No.2 Voltage	400	V
DC Grid No.1 Voltage	-200	V
DC Anode Current	250	mA
DC Grid No.1 Current	30	mA
Grid No.2 Dissipation	10	W
Anode Dissipation	300	W

Typical CCS Operation

In Cathode-Drive at 400 MHz.		
Voltage	2500	V
DC Grid No.2 Voltage	250	V
DC Grid No.1 Voltage[3]	-15	V
DC Anode Current	250	mA
DC Grid No.2 Current	2	mA
DC Grid No.1 Current	15	mA
Driver Power Output (Approx.)[4]	5	W
Output-Circuit Efficiency	90	%
Useful Power Output	340[5]	W
In Cathode-Drive Circuit at 1215 MHz.		
Voltage	1250	V
DC Grid No.2 Voltage	300	V
DC Grid No.1 Voltage[3]	-30	V
DC Anode Current	250	mA
DC Grid No.2 Current	1	mA
DC Grid No.1 Current	7	mA
Driver Power Output (Approx.)[4]	10	W
Output-Circuit Efficiency	60	%
Useful Power Output	105[5]	W

Maximum Circuit Values

Grid No.1 Circuit Resistance	30,000	ohms
Grid No.2 Circuit Impedance	10,000	ohms

Notes

1. Measured with special shield adaptor.
2. Erie Specialty Products, Inc., 645 West 11 th Street, Erie, PA 16512.
3. Obtained preferably from fixed supply and grid No.1 resistor. Sufficient voltage should be provided from fixed supply to protect the tube in case of drive loss.
4. Driver power output includes circuit losses and is the actual power measured at the input to the grid circuit. It will vary depending upon the frequency of operation and the circuit used.
5. Measured in a typical coaxial-cavity circuit.
6. With 6.3 volts AC or DC on heater.
7. With DC anode voltage of 2500 volts, DC grid No.2 voltage of 300 volts, and DC grid No.1 voltage adjusted to give a DC anode current of 120 ma.
8. With DC anode voltage of 2500 volts, DC grid No.2 voltage of 400 volts, and DC grid No.1 voltage adjusted to give a DC anode current of 2.5 ma.
9. Under conditions with tube at 20° to 30 °C without any voltages applied to the tube, the resistance between the two electrodes is measured with a 200 volt Megger-type ohmmeter having an internal impedance of 1 .O megohm.
10. In a single-tube, cathode-driven coaxial-cavity class C amplifier circuit at 400 MHz and for conditions with 5.7 volts AC or DC on heater, DC anode voltage of 2500 volts and driver power output of 5 watts, DC grid No.2 voltage of 250 volts, grid No.1 voltage and tuning circuit are adjusted for maximum power output with anode current not to exceed 250 ma and grid No.1 current not to exceed 20 ma.

Characteristics Range Values

	Min.	Max.	
Heater Current[6]	2.90	3.55	amp
Direct Interelectrode Capacitances:			
Grid No.1 to anode[1]	-	0.065	pF
Grid No. 1 to cathode & heater	13.5	16.5	pF
Anode to cathode & heater[1]	-	0.019	pF
Grid No.1 to grid No.2[1]	16.8	22.2	pF
Grid No. 2 to anode[1]	2.7	3.7	pF
Grid No. 2 to cathode & heater[1]	-	1.30	pF
Grid No. 1 Voltage[6,7-6.5]	-20.5	V	
Grid No.1 Cutoff Voltage[6,8]	-	-65	V
Reverse Grid No.1 Current[6,7]	-	-20	uA
Grid No. 2 Current[6,7]	-8	+ 2	mA
Interelectrode Leakage Resistance:			
Between anode and all other electrodes[9]	10		megohm
Between any two electrodes except anode[9]	1		megohm
Useful Power Output[10]	300		W

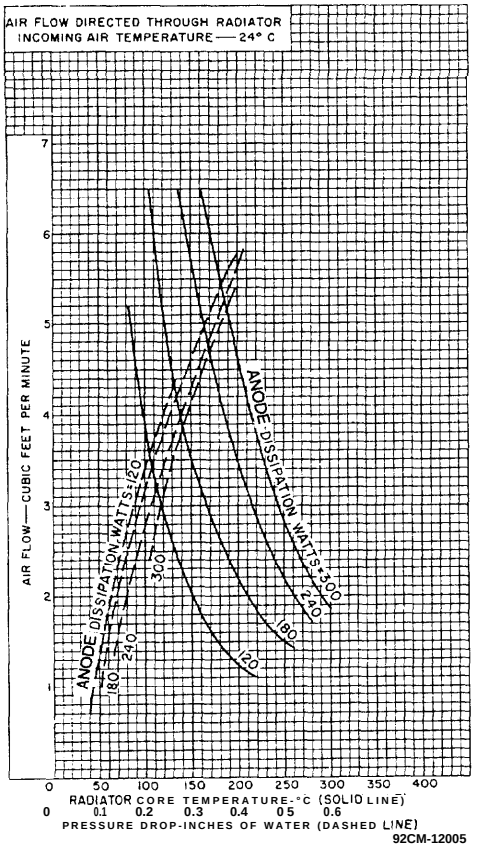
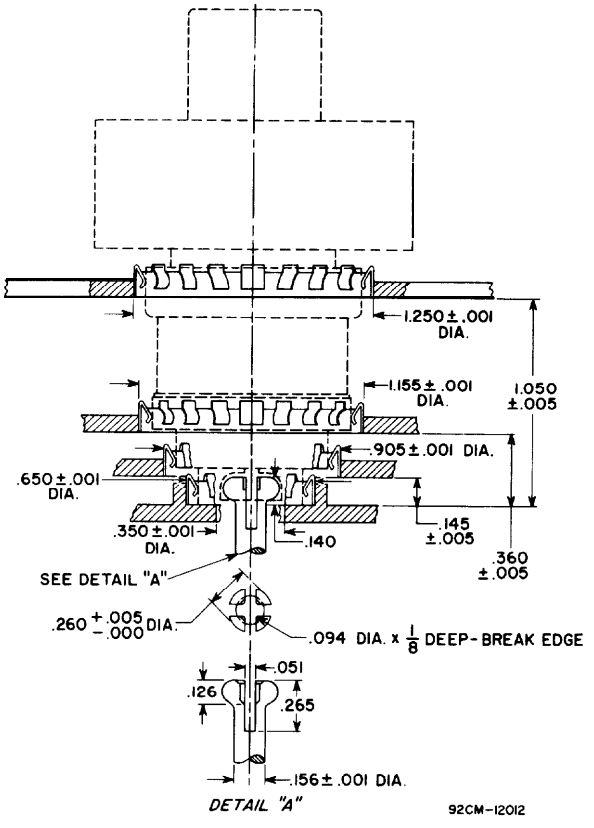


Figure 1 - Typical Cooling Requirements for Type 8226. (at sea level)



Note A: All Dimensions in Inches.

Note B: All Finger Stock No. 97-380 made by Instrument Specialties Co., P.O. Box A, Delaware WaterGap, PA 18327.

Figure 2 • Preferred Mounting Arrangement for Type 8228 and Layout of Associated Contacts.

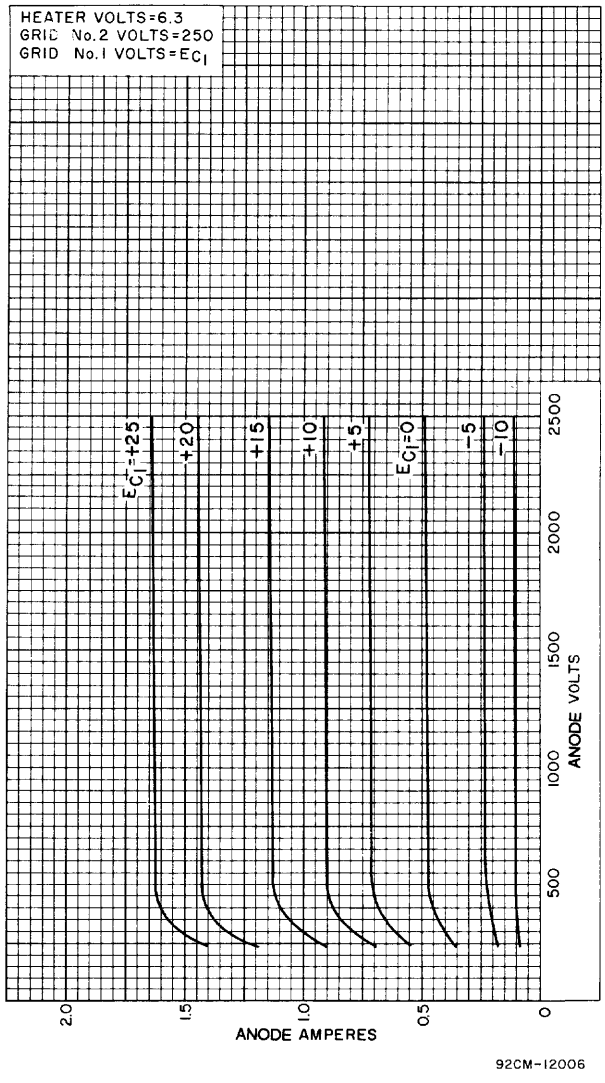


Figure 3 - Typical Anode Characteristics of Type 8226 at a Constant Grid No.2 Voltage of 250 Volts.

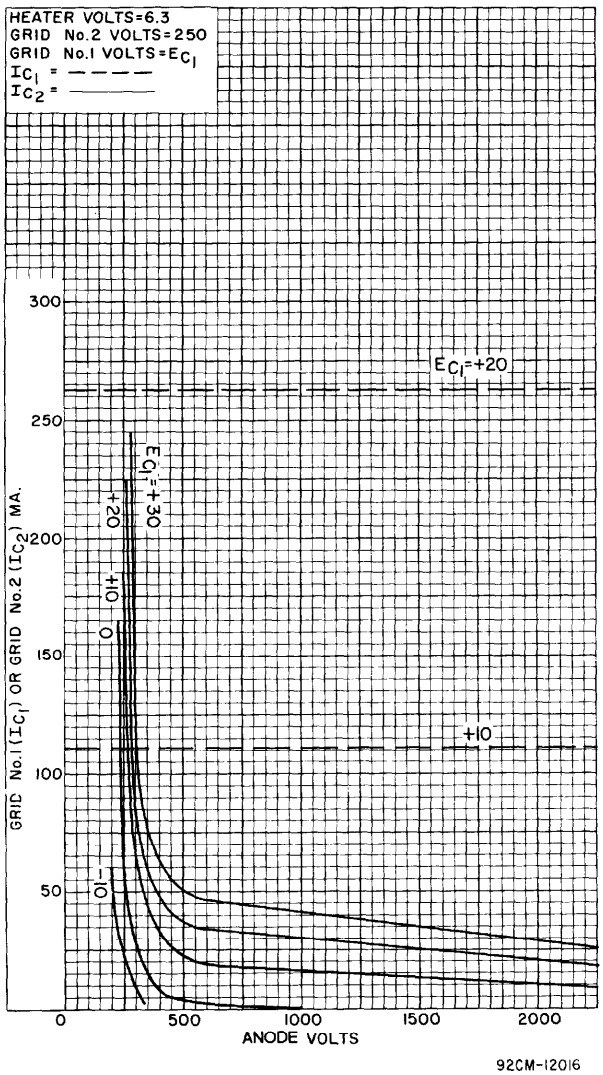


Figure 4 - Typical Characteristics of Type 8226 at a Constant Grid No. 2 Voltage of 250 Volts.

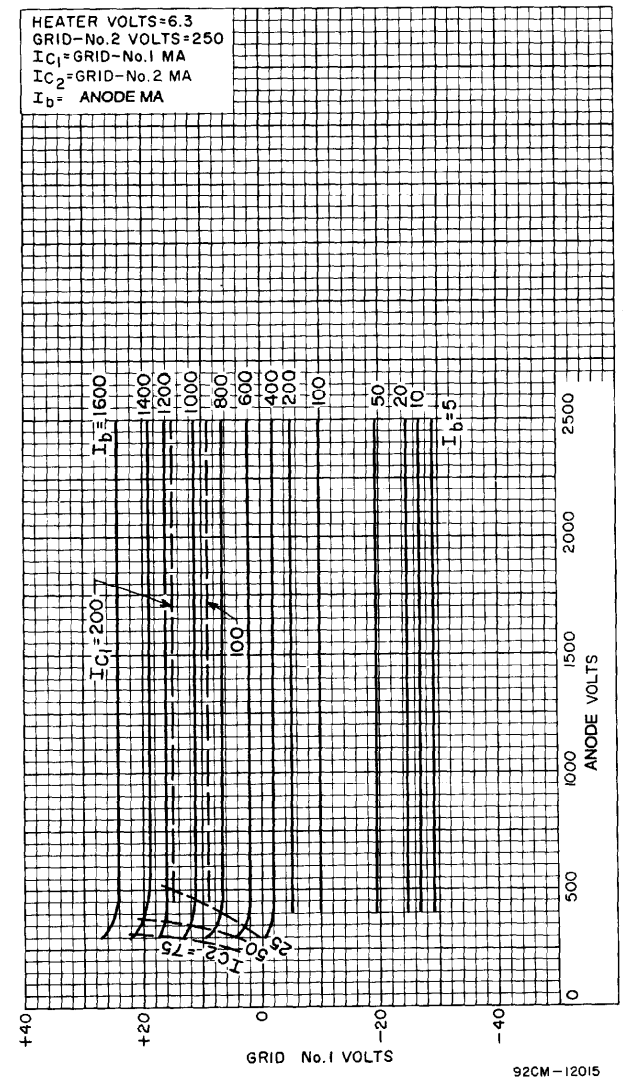


Figure 5 - Typical Constant - Current Characteristics of Type 8226 at a Constant Grid No.2 Voltage of 250 Volts.

Warning - Personal Safety Hazards
Electrical Shock - Operating voltages applied to this device present a shock hazard.

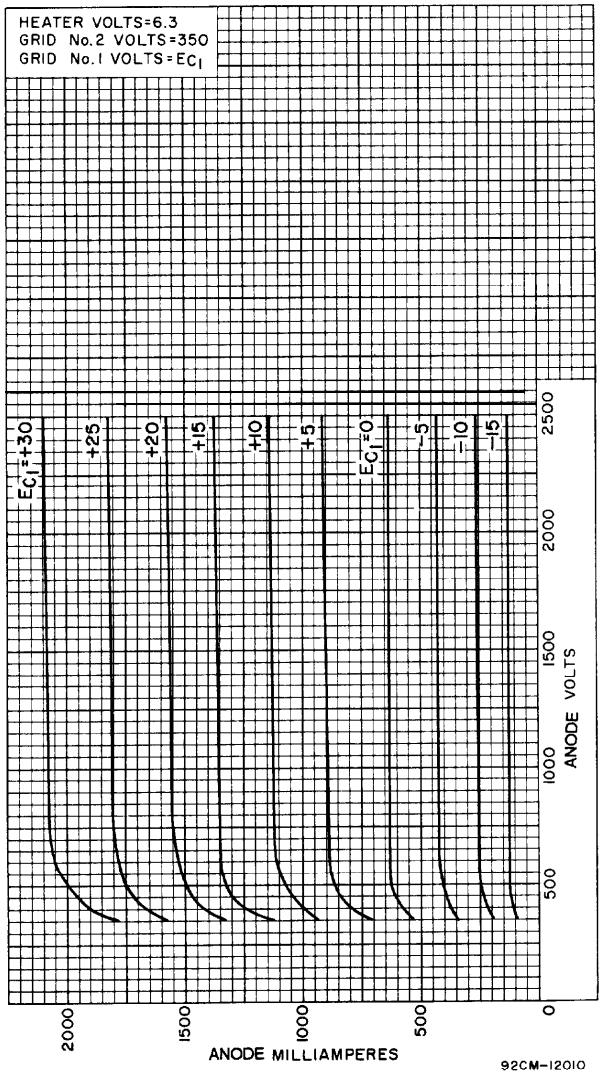


Figure 6 - Typical Anode Characteristics of Type 8226 at a Constant Grid No.2 Voltage of 350 Volts.

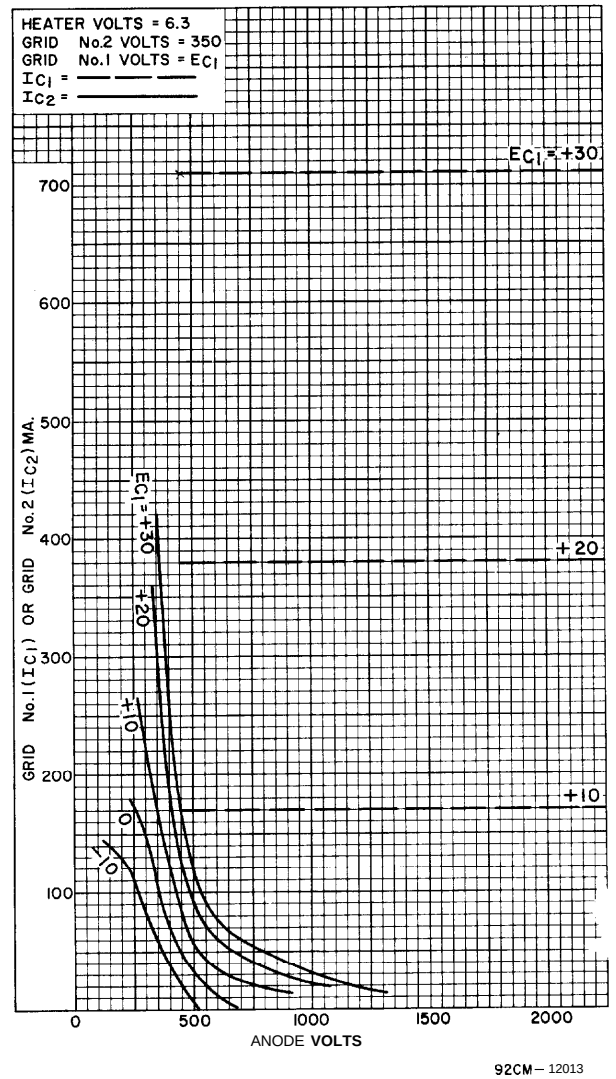


Figure 7 - Typical Characteristics of Type 8226 at a Constant Grid No.2 Voltage of 350 Volts.

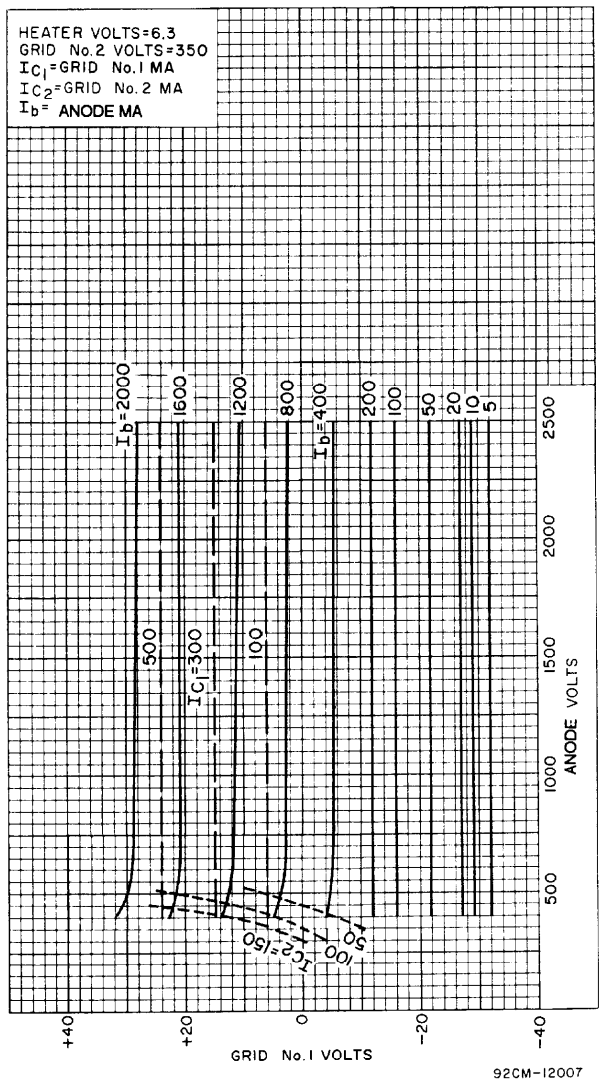


Figure 8 - Typical Constant - Current Characteristics of Type 8226 at a Constant Grid No.2 Voltage of 350 volts.

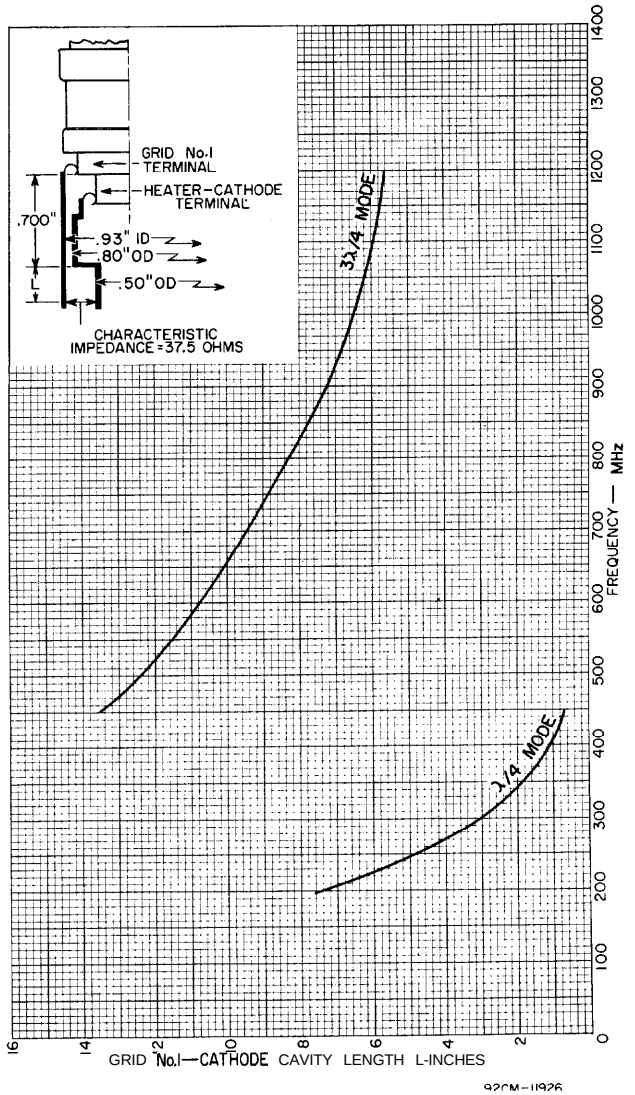


Figure 9 - Grid No. 1 - Cathode Tuning Curves.

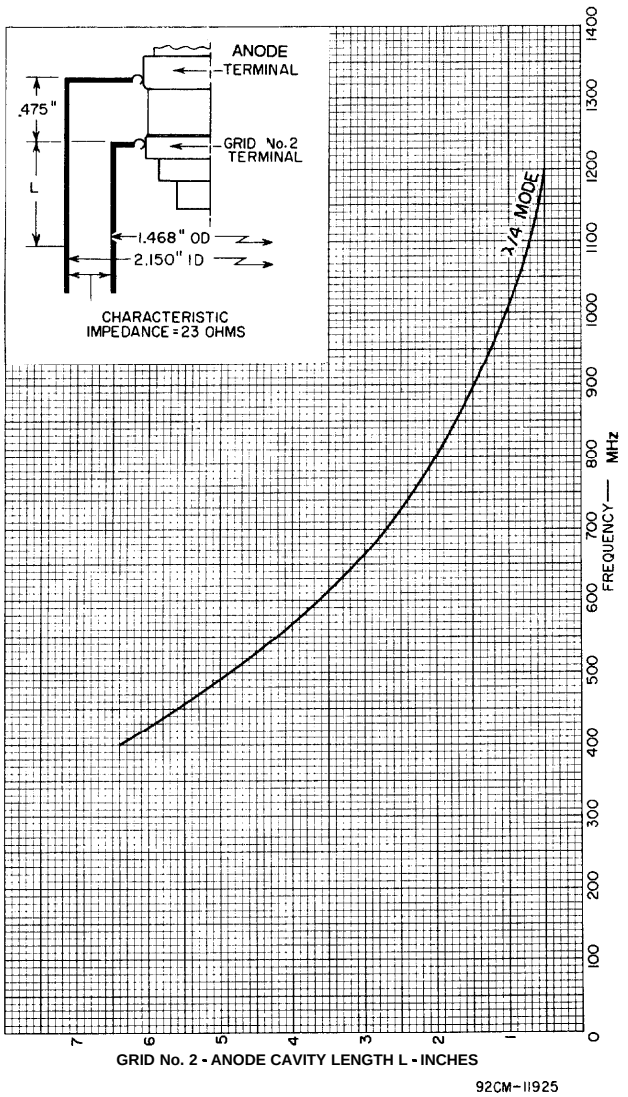


Figure 10 ▪ Grid No. 2 ▪ Anode Tuning Curve.

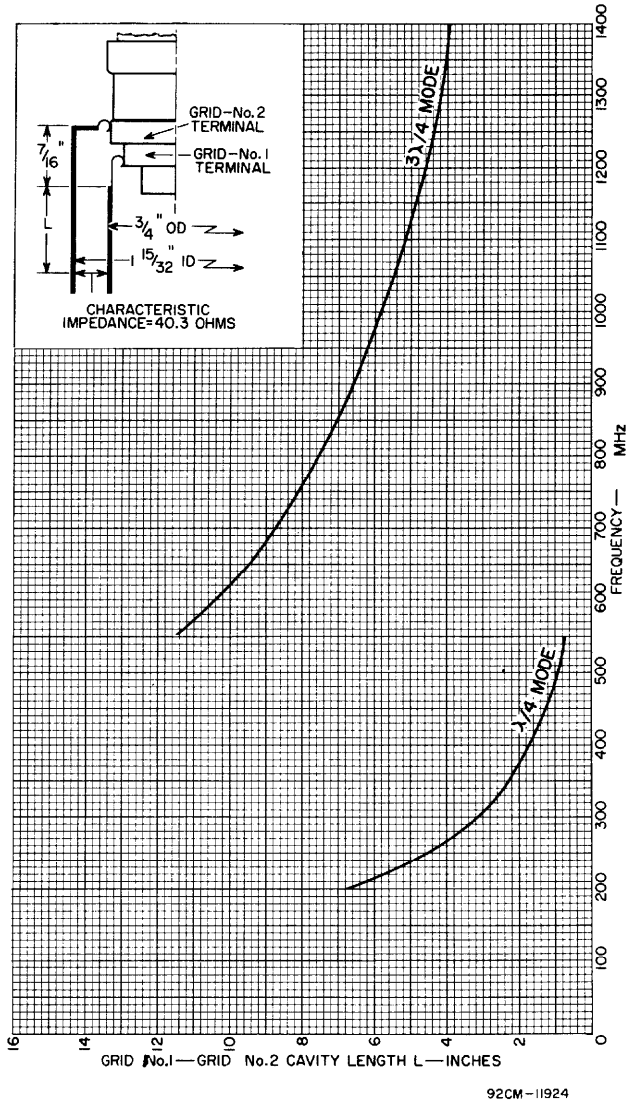
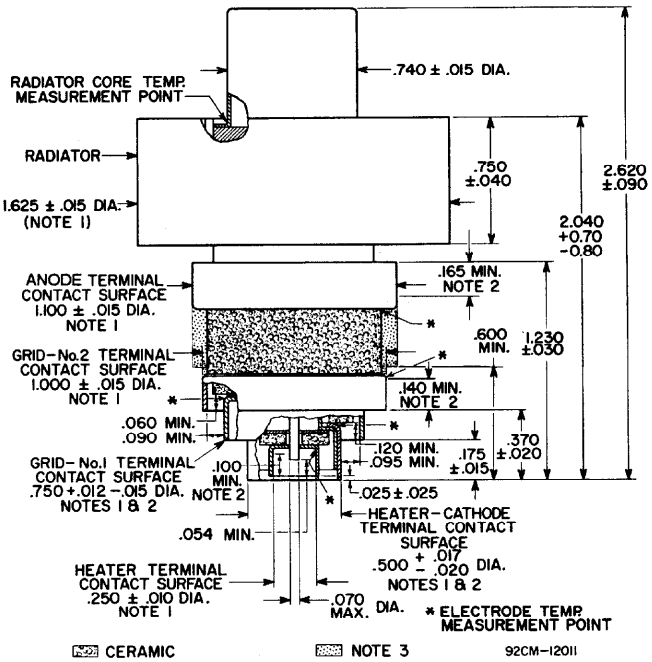


Figure 11 ▪ Grid No. 1 ▪ Grid No.2 Tuning Curves.



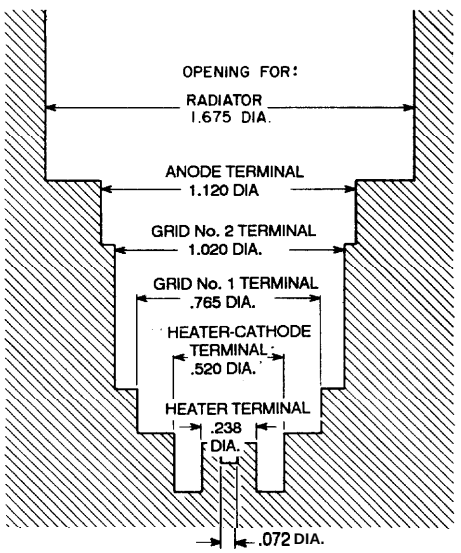
All Dimensions in Inches.

Note 1: See Figure 13 for the maximum diametrical space required by the 8226 based upon the diameter and eccentricity of radiator band and of each ring terminal.

Note 2: The diameter of the terminal is held to the indicated value only over the contact surface length. The contact surface length of the heater-cathode and Grid No.1 terminals extends from the edge of its terminal to the plane coincident with the edge of the adjacent larger terminal.

Note 3: Keep all stippled regions clear. Do not allow contacts or circuit components to protrude into these annular regions.

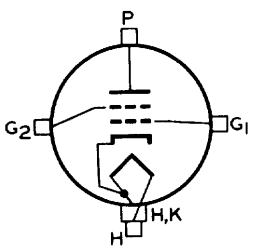
Figure 12 -Dimensional Outline



Note 1: All Dimensions in inches.

Note 2: See Dimensional Outline for Vertical Dimensions.

Figure 13 - Maximum Diametrical Space Requirement for the 6226.



G_1 - Grid No.1 Terminal Contact Surface (Adjacent to Cathode & Heater Terminal Contact Surface)

G_2 - Grid No.2 Terminal Contact Surface (Adjacent to Grid No.1 Terminal Contact Surface)

H - Heater Terminal Contact Surface (Within Cathode &Heater Terminal Contact Surface)

H,K - Cathode & Heater Terminal Contact Surface (End Opposite Air-Cooled Radiator)

P - Anode Terminal Contact Surface (Adjacent to Air-Cooled Radiator)

Figure 14 -Terminal Connections

For additional information call I-800-366-2875. In Europe call 44-93-276-5666.

BURLE INDUSTRIES, INC., Tube Products Division
1000 New Holland Ave., Lancaster, PA 17601-5688 U.S.A.

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