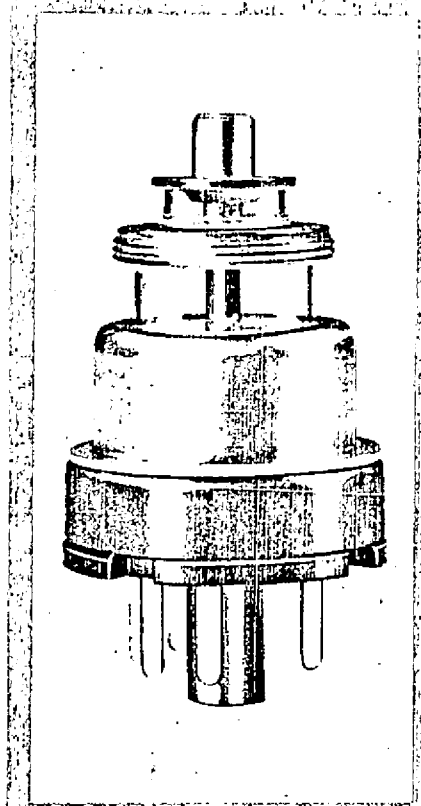
Amperex® ELECTRONIC CORPORATION

HICKSVILLE, L. I., N. Y., 11802

TUBE TYPE
8108

The Amperex 8108 is a disc seal triode designed for use as a CW amplifier, oscillator, frequency doubler or frequency tripler to frequencies over 6000 Mc/sec. The 8108 delivers a saturation power of more than 2 watts with an operating voltage of only 180 volts. Amplifier gain of 19 db or more can be achieved. In suitable cavity circuits the 8108 can operate at full power with sink cooling or free-air convection cooling. Life expectancy is 10,000 hours.



GENERAL CHARACTERISTICS

MECHANICAL

Dimensions	see outline drawing
Base	Octal
Mounting Position[1]	any
Mounting Torque[2]	8.7 lbs. in. min. 13.0 lbs. in. max.
Seal Temperatures	
Anode[3]	150°C max.
Grid[3]	75°C max.
Cathode[3]	75°C max.
Accessories	
Torque Wrench	S-32140

ELECTRICAL

Heater Voltage	6.3 volts ac or dc parallel supply
Heater Current	0.735 amps
Direct Interelectrode Capacitances[4]	
Anode to Grid	1.4 pf
Anode to Cathode	0.035 pf
Grid to Cathode	3.0 pf

	Min.	Nom.	Max.	Typ.
Anode Voltage	--	180	--	180 volts
Anode Current	--	60	--	30 ma
Negative Grid Voltage	0	1.25	2.5	2.8 volts
Transconductance	16,000	24,000	--	18,000 μmhos
Amplification Factor	33	43	52	43

[1] Special attention should be paid to the mounting of the tube in those cases where it is used in portable equipment. Shocks, especially in a direction perpendicular to the axis of the tube should be avoided.

[2] The tube should be screwed into the circuit by means of a key with a torque within the limits specified. The key should fit in the notches of the tube base, the pins of the base being left free. See Accessories.

[3] A low velocity air flow may be necessary. The equipment designer is cautioned that differential cooling of one side of the cathode grid or grid anode glass either by use of excessive cooling air directed from one side or by poorly dispersed cooling air can result in damage to the glass and loss of the tube.

[4] Measured with 6.3 volts on the heater under conditions where no cathode current is drawn.

from JEDEC release #4524, Dec. 9, 1963,
and release #4524A, April 6, 1964

Amperex

MAXIMUM RATINGS, ABSOLUTE VALUES

Anode Voltage (Cut-Off Condition)	500 volts
Anode Voltage	300 volts
Anode Dissipation	12.5 ~~125~~ watts
Negative Grid Voltage	50 volts
Positive Grid Voltage	5 volts
Grid Current	10 ma
Grid Dissipation	200 milliwatts
Grid Input Power (f = 4000 Mc) (Grounded Grid Circuit)	1 watt
Cathode Current	70 ma
Cathode-Heater Voltage	50 volts
Heater Voltage	6.3±2% volts
Peak Negative Grid Voltage	100 volts
Peak Positive Grid Voltage	20 volts

MAXIMUM CIRCUIT VALUES

External Cathode-Heater Resistance	20,000 ohms
External Grid Lead Resistor[5]	3,000 ohms

TYPICAL CHARACTERISTICS AS AMPLIFIER (Frequency = 4000 Mc)

Anode Supply Voltage, E_{bb} (See Figure 1)	200	200 volts
Grid Supply Voltage, E_{cc} (See Figure 1)	+20	+20 volts
Cathode Resistor[6]	--	--
Anode Current	60	30 ma
Bandwidth[7]	50	50 Mc
Power Output (Power Gain = 8 db)		
Typical	1.8	-- watts
Minimum	1.5	-- watts
Power Output (Power Gain = 6 db)		
Typical	--	0.9 watt
Minimum	--	0.35 watt
Power Gain (Power Input = 1 mw)		
Typical	13	13 db
Minimum	10	10 db

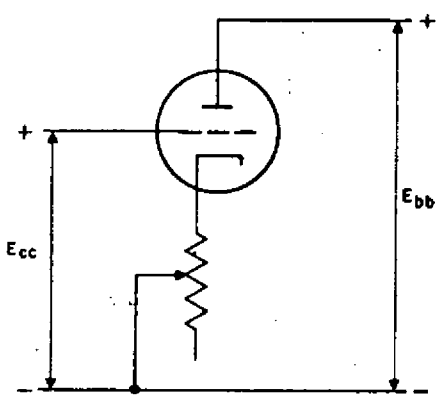


FIGURE 1. RECOMMENDED DC CIRCUIT

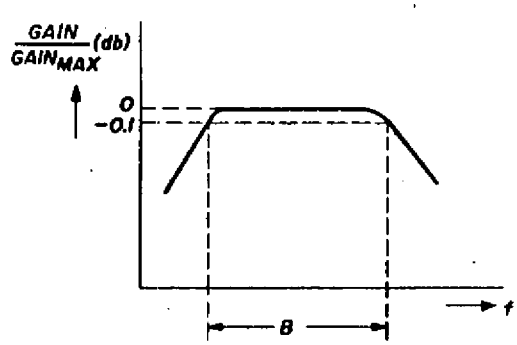


FIGURE 2. BANDWIDTH CHARACTERISTICS

[5] This value can be multiplied by the dc inverse feedback factor to a maximum of 25,000 ohms.
[6] A variable resistor of 500 ohms maximum (at an anode current of 60 ma) or 1000 ohms maximum (at an anode current of 30 ma) is to be used. It should be adjusted for the desired anode current. See Figure 1.
[7] The quoted value is the bandwidth between the 0.1 db points of the flattened response curve. See Figure 2.

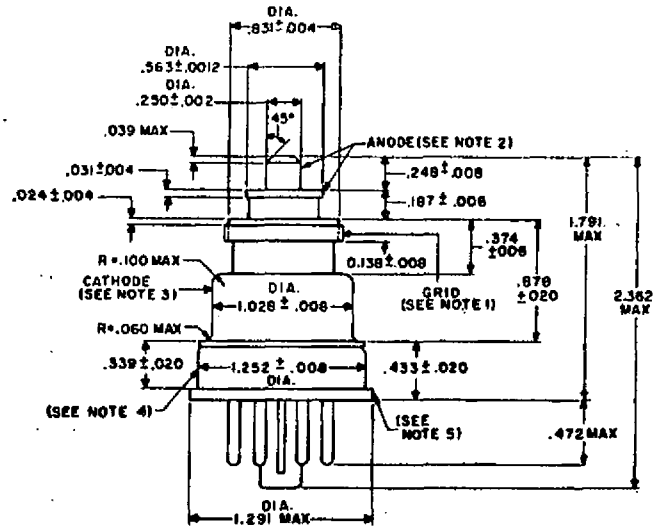


FIGURE 3

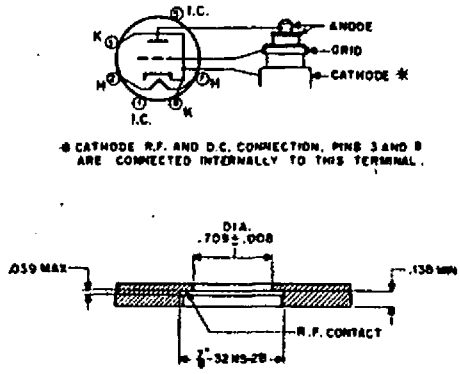


FIGURE 4. RECOMMENDED MOUNT

NOTES: OUTLINE DRAWING (FIGURES 3 AND 4)

Thread of the Grid Disc and of Recommended Mount
32 turns per inch
Thread angle = 60°

	Minor Diameter	Major Diameter	Pitch Diameter	
Figure 3	$0.835^{+0}_{-0.006}$	$0.874^{+0}_{-0.006}$	$0.854^{+0}_{-0.0035}$	inches
Figure 4	$0.847^{+0}_{-0.006}$	0.874 min.	$0.858^{+0}_{-0.0047}$	inches

Note 1: The eccentricities are given with respect to the axis of the threaded hole (see Figure 4) in which the tube is screwed firmly against the flange, the inner diameter of which is 0.709 inches.

Note 2: Eccentricity of the axis of the anode = 0.006 inches maximum.

Note 3: Eccentricity of the axis of the cathode = 0.008 inches maximum.

Note 4: The tolerance of the eccentricity of the axis of the base is such, that this base fits into a hole with a diameter of 1.280 inches, provided this hole is correctly centered with respect to the axis of the hole of Figure 4.

Note 5: The tolerance of the eccentricity of the axis of the base flange is such, that this flange fits into a hole with a diameter of 1.319 inches, provided this hole is correctly centered with respect to the axis of the hole of Figure 4.

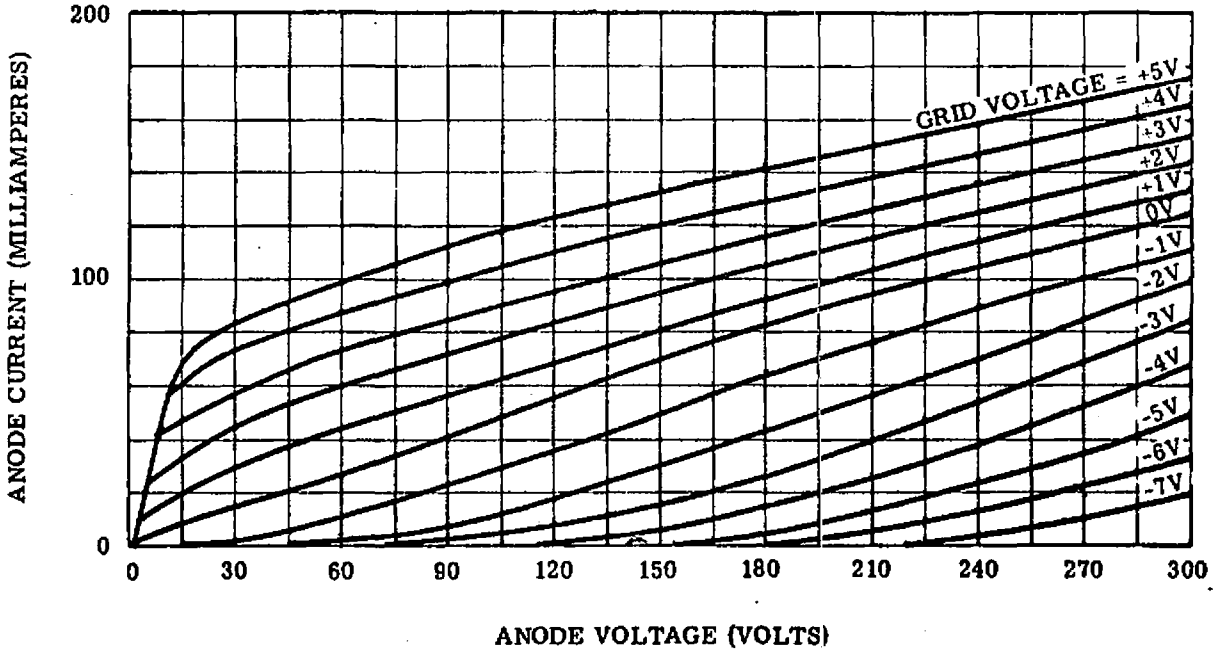


FIGURE 5. ANODE CHARACTERISTICS

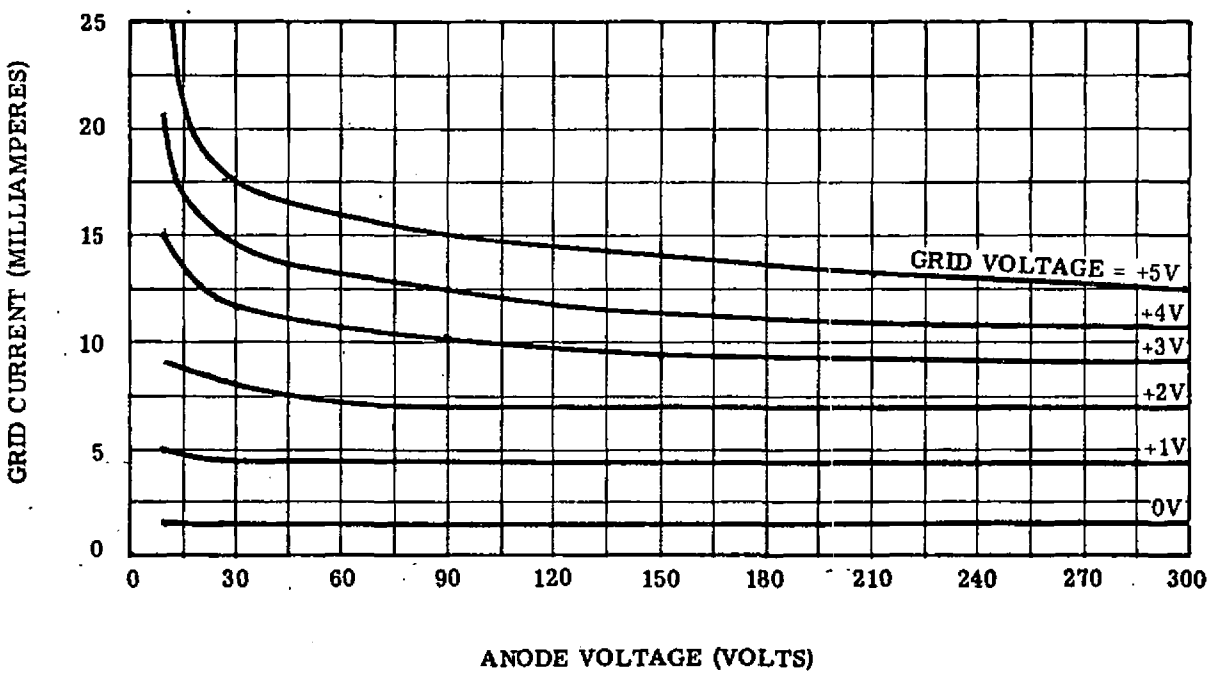


FIGURE 6. GRID-ANODE TRANSFER CHARACTERISTICS

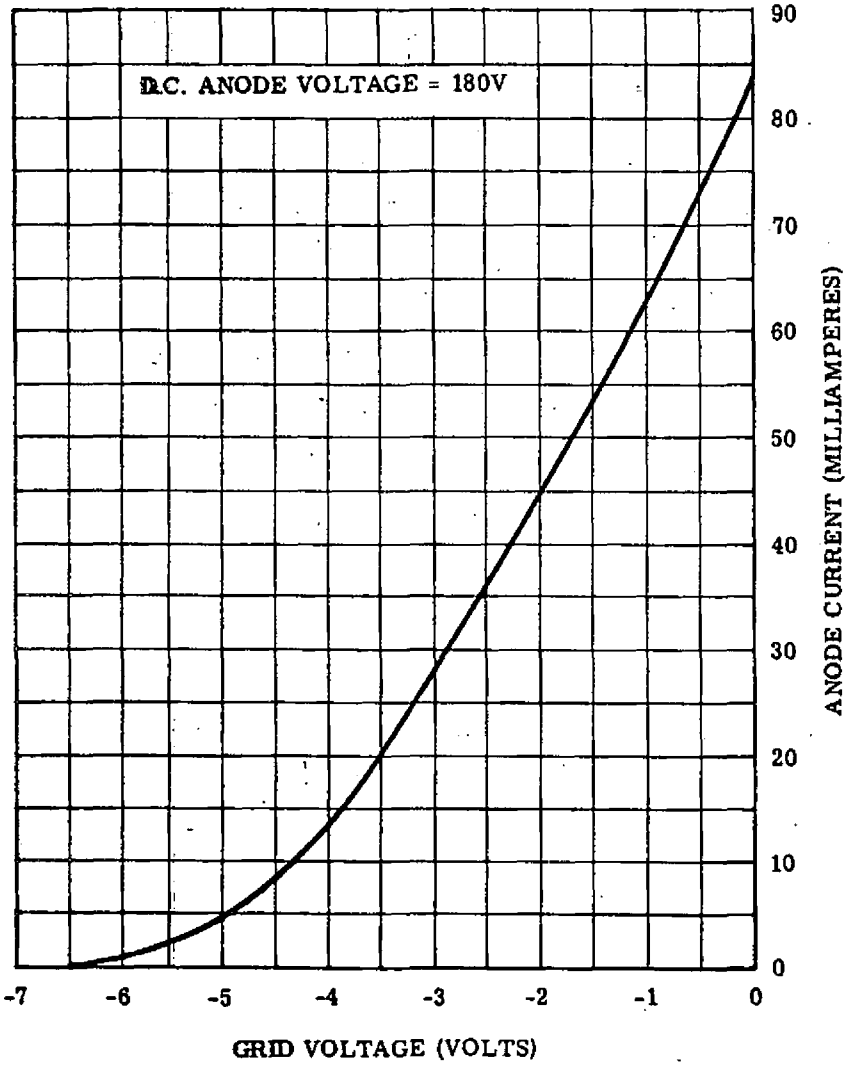


FIGURE 7. TRANSFER CHARACTERISTICS

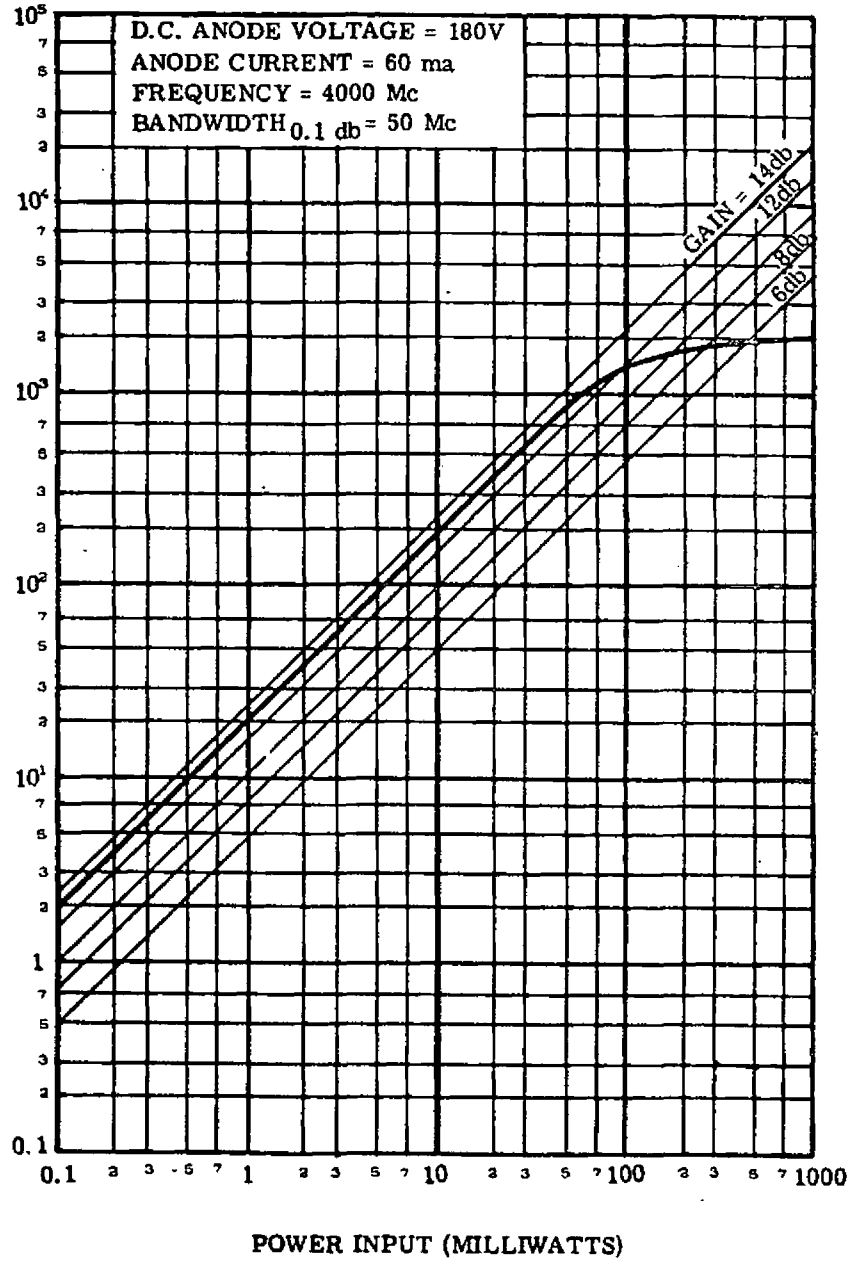


FIGURE 8. POWER GAIN