

AmpereX

3-500Z

High-MU Power Triode

- Heavy Graphite anode for high intermittent overload capabilities.
- A Zirconium coated anode to absorb gas for longer life.

GENERAL DATA^{Note 1}

Electrical:

Filament-Thoriated Tungsten

Voltage 5.0 ±0.25 V

Current, at 5.0 volts 14.6 A

Characteristics:

Amplification Factor (average) 130

Direct Interelectrode Capacitances (grounded filament)²

Input 8.3 pF

Output 0.07 pF

Feedback 4.7 pF

Direct Interelectrode (grounded grid)^{Note 2}

Input 8.3 pF

Output 4.7 pF

Feedback 0.07 pF

Frequency of Maximum Rating:

CW 110 MHz

Mechanical:

Maximum Overall Dimensions:

Length 6.10 in; 154.94 mm

Diameter 3.44 in; 87.33 mm

Mounting Position

Vertical, base down or up

Maximum Operating Temperature:

Plate Seal 225 °C

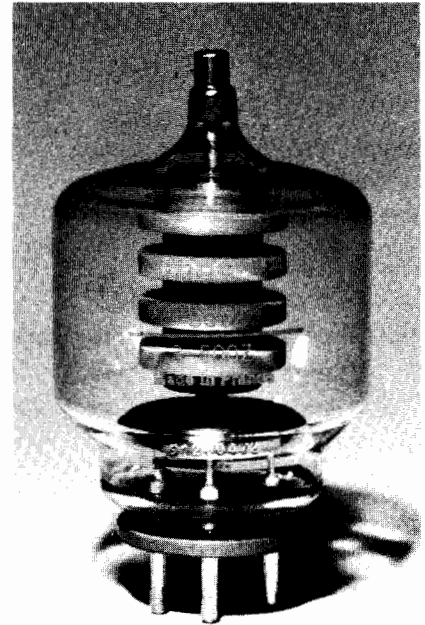
Base Seals 200 °C

Cooling

Radiation and forced air

Base

5 Pin Special



Notes:

1. Characteristics and operating values are based upon performance tests. These figures may change without notice as the result of additional data or product refinement. Richardson Electronics, Ltd. should be consulted before using this information for final equipment design.

2. In Shielded Fixture.

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Amperex

3-500Z

RADIO FREQUENCY LINEAR AMPLIFIER

Cathode Driven
Class AB2

LIMITING VALUES (Absolute Limits)

Frequency f	up to 110	MHz
Anode Voltage V_a	max. 4000	Vdc
Anode Current I_a	max. 400	mAdc
Anode Dissipation P_a	max. 500	W
Grid Dissipation P_g	max. 20	W

OPERATING CONDITIONS

	1500		2500		3500		Vdc
	Single Tone	Two Tone	Single Tone	Two Tone	Single Tone	Two Tone	
Anode Voltage V_a	1500		2500		3500		Vdc
Cathode grid Voltage V_{kg}	0		0		+15		Vdc
Anode Current (zero signal) I_{a0}	65		130		53		mAdc
Anode Current I_a	400	260	400	280	400	262	mAdc
Grid Current I_g	130	80	120	70	108	58	mAdc
Anode Input Power P_{ia}	600		1000		1400		W
Anode Output Power P_o (CW or PEP)	330		600		890		W
Driving Power (max. signal) P_{dr}	49		46		46		W
Intermodulation Products IMP (3rd order)	-46		-33		-40		db
Resonant Load Impedance	1600		3450		5000		Ohms
Driving Impedance	94		100		115		Ohms

Note: Currents listed correspond to SSB or "2-tone" average current at peak of signal envelope.

RADIO FREQUENCY LINEAR POWER AMPLIFIER OR OSCILLATOR

Grid Driven, Cathode Driven
Class AB2 and Class C telegraphy or FM

LIMITING VALUES (Absolute Limits)

Frequency f	up to 110	MHz
Anode Voltage V_a	max. 4000	Vdc
Anode Current I_a	max. 350	mAdc
Anode Dissipation P_a	max. 500	W
Grid Dissipation P_g	max. 20	W

OPERATING CONDITIONS

	GRID DRIVEN		CATHODE DRIVEN		
	3000	3500	3000	3500	
Anode Voltage V_a	3000	3500	3000	3500	Vdc
Grid Voltage V_g	-10	-75	-10	-75	Vdc
Anode Current I_a	350	300	333	350	mAdc
Grid Current I_g	115	115	108	118	mAdc
Athode Grid Peak V_{ksp} (RF Voltage)	110	187	95	200	V
Anode Input Power P_{ia}	1050	1050	1000	1225	W
Anode Dissipation P_a	330	200	300	305	W
Anode Output Power P_o	720	850	700	920	W
Resonant Load Impedance	4200	5700	4800	5500	Ohms
Driving Power (approx.) P_{dr}	14	22	35	89	W

PLATE MODULATED RADIO FREQUENCY POWER AMPLIFIER

Grid Driven

Class C telephony (carrier conditions)

LIMITING VALUES (Absolute Limits)

Anode Voltage	V_a	3000	Vdc
Anode Current	I_a	0.275	Adc
Anode Dissipation	P_a	330	W(1)
Grid Dissipation	P_g	20	W(2)

(1) Corresponds to 500W at 100% sine-wave modulation

(2) Average, with or without modulation

OPERATING CONDITIONS

Frequency	f	30	MHz
Anode Voltage	V_a	3000	Vdc
Grid Voltage	V_{kg}	-100	Vdc
Anode Current	I_a	275	mAdc
Grid Current	I_g	120	mAdc
Anode Input Power	P_{ia}	825	W
Anode Output Power	P_o	640	W
Anode Dissipation	P_a	185	W
Peal RF Grid Voltage	V_{gp}	200	V
Driving Power	P_{dr}	25	W

AUDIO FREQUENCY POWER AMPLIFIER OR MODULATOR

Grid Driven, (CW)

Class AB2

Limiting Values (Absolute Limits per tube)

Anode Voltage	V_a	4000	Vdc
Anode Current	I_a	400	mAdc
Anode Dissipation	P_a	500	W
Grid Dissipation	P_g	20	W

OPERATING CONDITIONS (carrier conditions)

Anode Voltage	V_a	3000	Vdc
Grid Voltage	V_g	0	Vdc
Anode Current (zero signal)	I_{a0}	300	mAdc
Anode Current (max. signal)	I_a	770	mAdc
Grid Current (max. signal)	I_g	244	mAdc
Peal Grid Voltage (per. tube)	V_{kcp}	100	V
Anode Input Power	P_{ia}	2310	W
Anode Dissipation (max. signal)	P_a	890	W
Anode Output Power	P_o	1420	W
Resonant Load Impedance	R_{aa}	8600	Ohms
Peak Driving Power	P_{dtp}	25	W(1)

(1) Nominal drive power is 1/2 peak driving power.

**HIGH-LEVEL MODULATED RADIO FREQUENCY AMPLIFIER
PULSE WIDTH MODULATION**

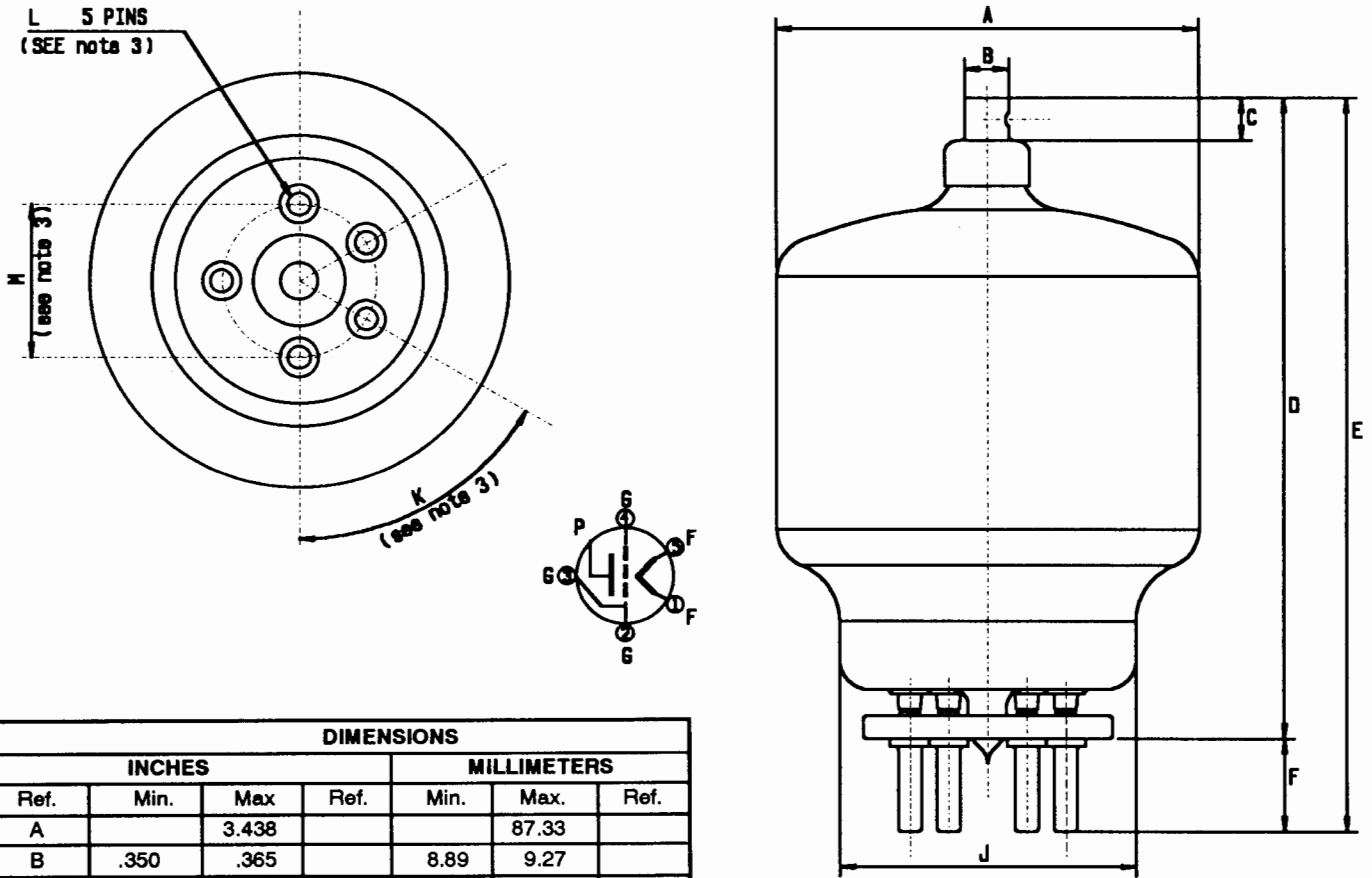
Grid Driven

LIMITING VALUES (Absolute Limits)	RF AMPLIFIER SWITCHING MODULATOR		
Anode Voltage V_a	4	10	kVdc
Grid Voltage V_g	-200	-200	Vdc
Anode Current I_a	400	400	mA _{dc}
Anode Dissipation P_a	500	500	W
Grid Dissipation P_g	20	20	W

OPERATING CONDITIONS (carrier conditions)	RF AMPLIFIER SWITCHING MODULATOR		
Anode Voltage V_a	3	9	kVdc
Grid Voltage V_{kg}	-85	-120	Vdc
Anode Current I_a	250	180	mA _{dc}
Grid Current I_g	170	125	mA _{dc}
Output Power P_o	550	1500	W

Note: These conditions assume rectangular drive waveform and a third harmonic, high-efficiency "Tyler" circuit.

Figure 1 - Mechanical Outline



DIMENSIONS						
INCHES			MILLIMETERS			
Ref.	Min.	Max.	Ref.	Min.	Max.	Ref.
A		3.438			87.33	
B	.350	.365		8.89	9.27	
C	.328	.359		8.33	9.12	
D		5.200			132.1	
E	5.500	5.100		139.7	154.94	
F	.700			17.78		
J		2.500			63.5	
K			60°			60°
L	.185	.191		4.7	4.85	
M			1.250			31.75

MECHANICAL DATA:

Net Mass: 7.0 oz; 198.5g

NOTES:

- 1-Ref. Dimensions are for info only.
- 2- Metric equivalents are based on 1 inch = 25.4 mm. (to the nearest 0.01mm).
- 3- Base pins L can be freely inserted into a gage 6.35 mm (1/4 inch) thick with holes diameters 5.18 mm (.204 inch) located by the given dimensions K and M.

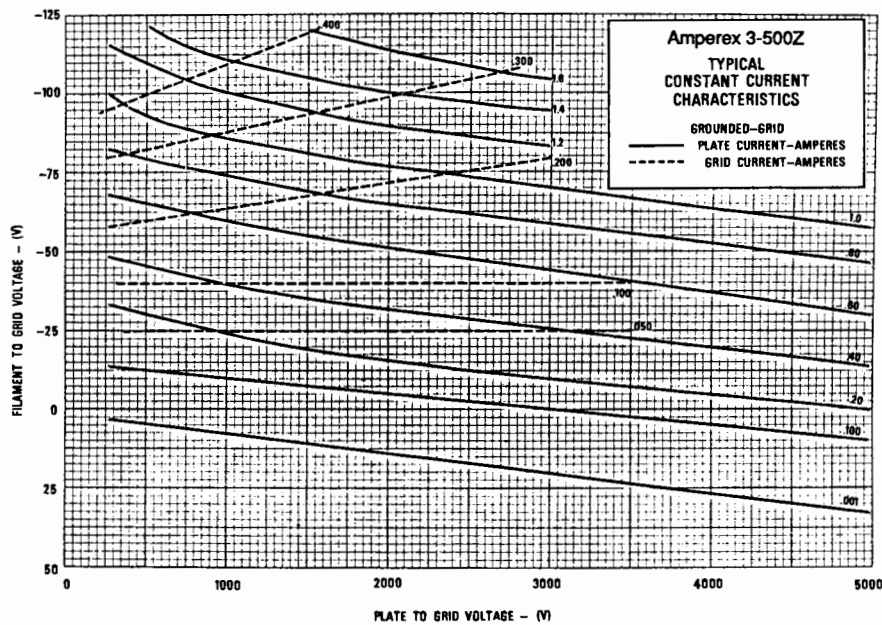
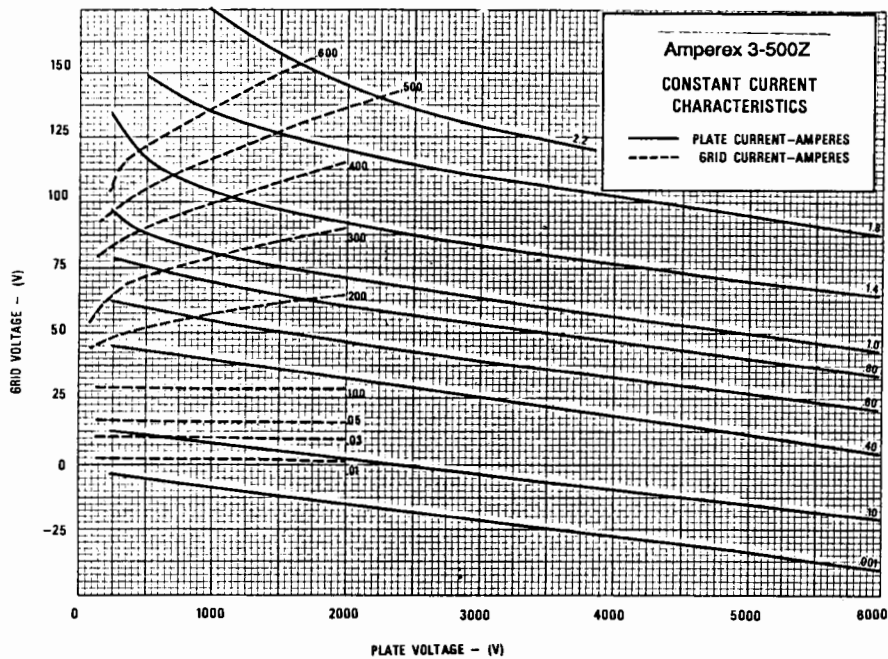


Figure 2 - Constant Current Characteristics

Richardson Electronics, Ltd. acquired Philips Electronics' transmitting tube operation in 1988. Richardson Electronics continues to manufacture these high quality electron tubes under the Amperex name.

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