

CERAMIC VELOCITRON* TUBES

7506/ZV1012	500 to 3,000 mc
7505/ZV1010	700 to 3,000 mc
7049/ZV1009	1,500 to 6,000 mc

Extremely rugged. Maximum heat, shock and vibration resistance.



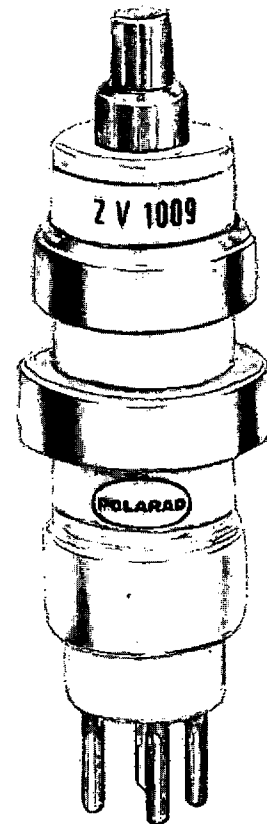
APPLICATIONS

An integrated family of rugged Velocitron*† reflex klystrons for cw, fm, or pulse operation in an external cavity.

- *In microwave signal generators:* Output power is adequate for generators providing more than 0 dbm output. Velocitrons permit fm, pulse, and cw signal generation.
- *In microwave signal sources:* Suitable for use as a low power transmitter in antenna radiation patterns, standing wave, and impedance measurements.
- *In spectrum analyzers:* Provides low incidental fm in panoramic displays due to their low microphonics and high frequency stability.
- *In microwave receivers:* Ideal for local oscillator operation in receivers with AFC because of their frequency control characteristics.

FEATURES

- Maximum shock and vibration resistance achieved by all-ceramic construction.
- Maximum heat resistance. Guaranteed for operation up to 250°C seal temperature. No cooling necessary.
- Interchangeable. All three klystrons use same power supplies and mechanical fittings.
- Virtually non-microphonic characteristics provided by rugged internal construction.
- Can be operated cw, pulsed, and fm.
- Low distortion fm.
- Breakage in handling minimized.
- 7505/ZV1010 replaces commercial klystrons 5837 and 6BM6; 7049/ZV1009 replaces 5836 and 6BL6.



Velocitron*† Type 7049/ZV1009

*Trade Mark Registered
†Manufactured under Western Electric Patents

MECHANICAL DATA

CONNECTIONS:

ELECTRICAL DATA

Seal Temperature _____ 250 degrees C max.



Decay Time 0.1 microsecond

Note: Specifications subject to change without notice.

CERAMIC VELOCITRON* TUBES

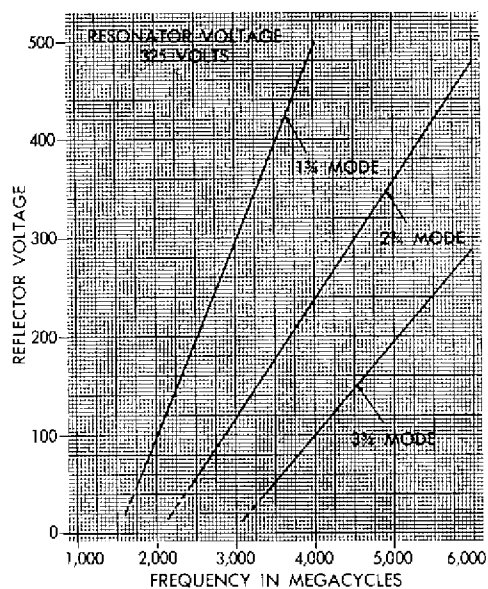


Figure 2. Typical Reflector Voltage vs. Frequency
Type 7049/ZV1009

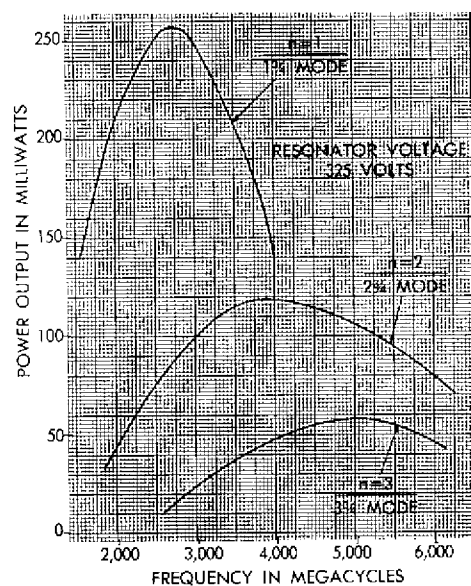


Figure 3. Typical Curve of Power Characteristics
Type 7049/ZV1009

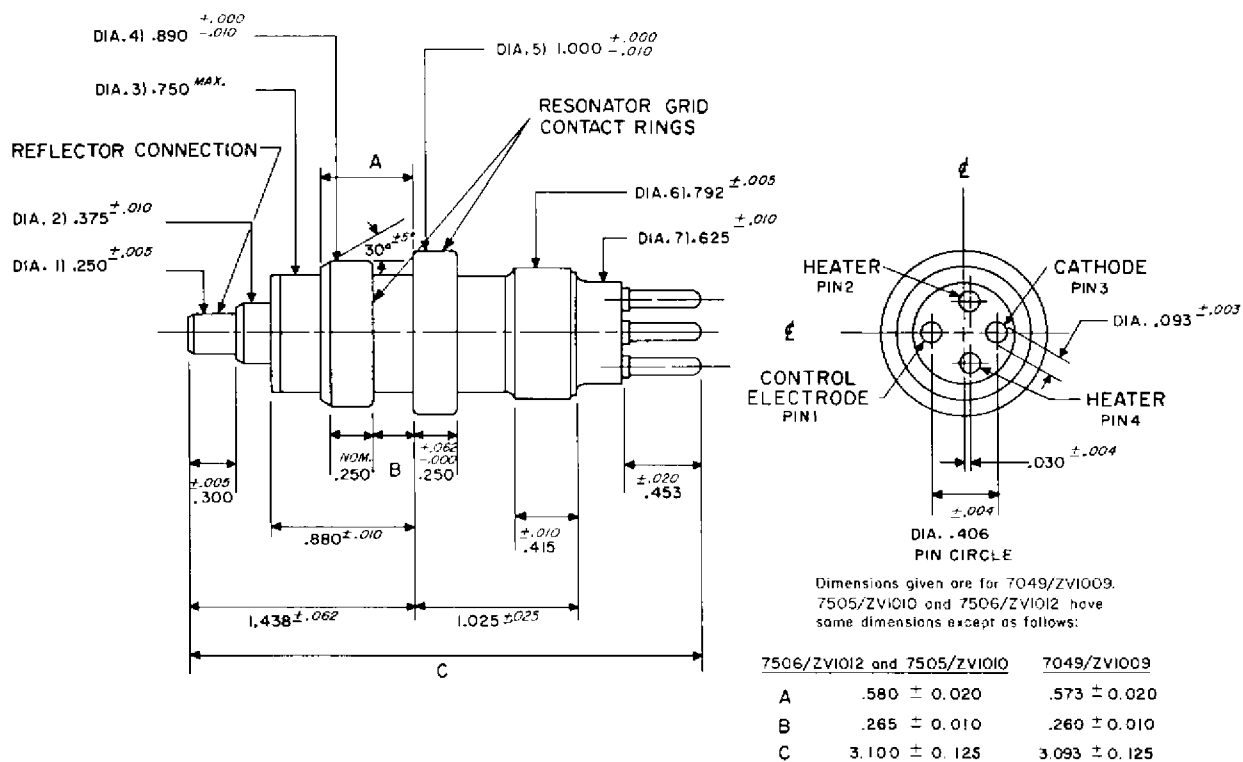


Figure 4. Outline Drawing

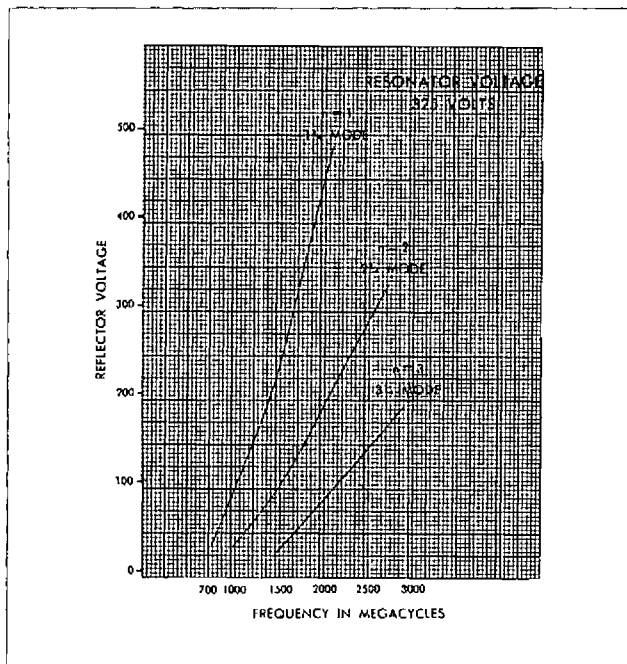


Figure 5. Typical Reflector Voltage vs. Frequency
Type 7505/ZV1010

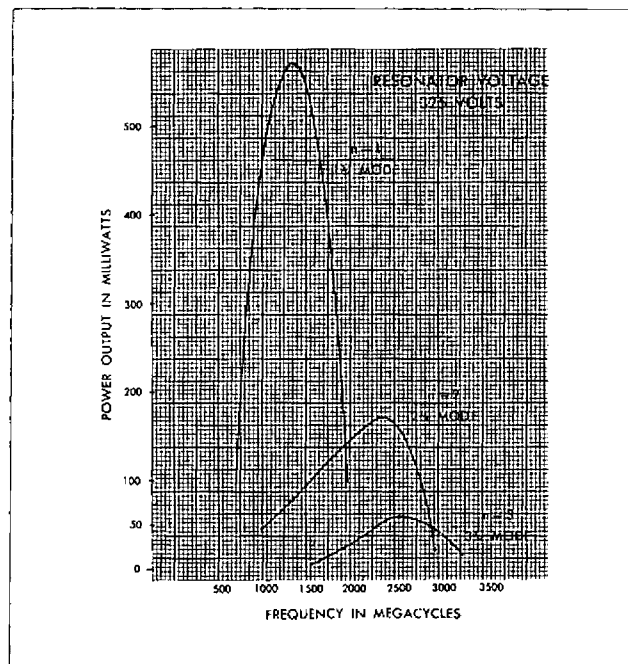


Figure 6. Typical Curve of Power Characteristics
Type 7505/ZV1010

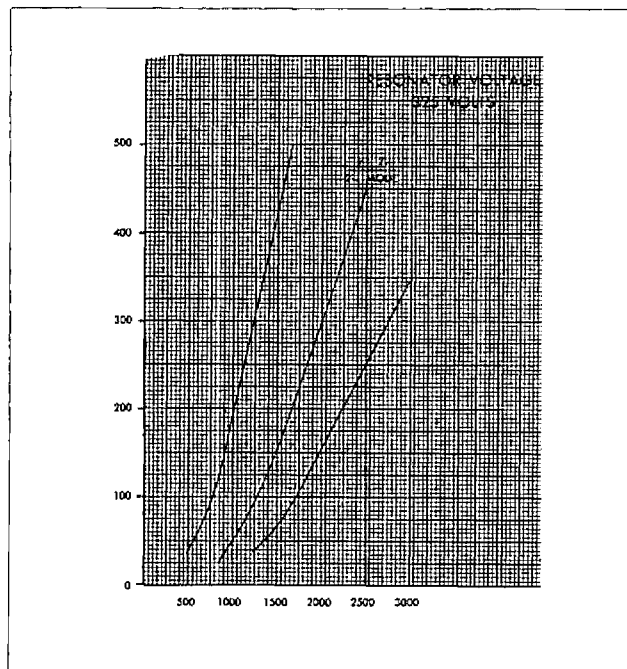


Figure 7. Typical Reflector Voltage vs. Frequency
Type 7506/ZV1012

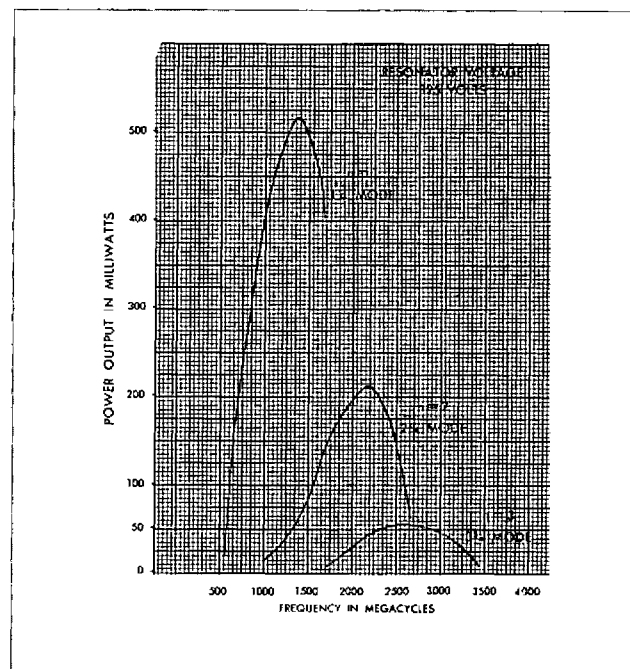


Figure 8. Typical Curve of Power Characteristics
Type 7506/ZV1012

CERAMIC VELOCITRON* TUBES



8052/ZV1011 4.0 to 11.0 kmc

Extremely rugged. Maximum heat, shock and vibration resistance.

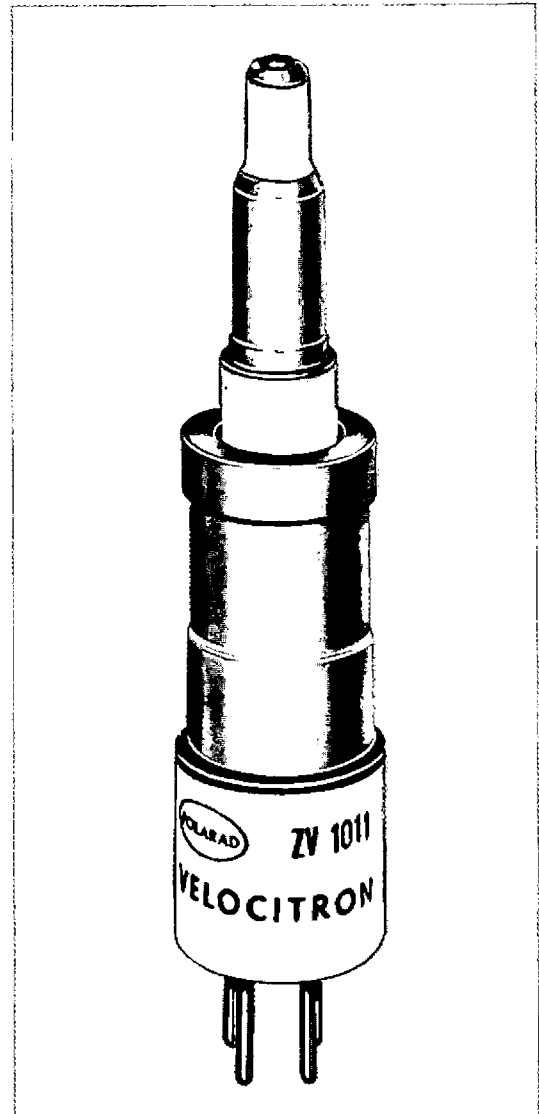
APPLICATIONS

Part of an integrated family of rugged Velocitron® reflex klystrons for cw, fm or pulse operation in an external cavity.

- *In microwave signal generators:* Output power is adequate for generators providing more than 0 dbm output. Velocitrons permit fm, pulse and cw signal generation.
- *In microwave signal sources:* Suitable for use as a low power transmitter in antenna radiation patterns, standing wave and impedance measurements.
- *In spectrum analyzers:* Provides low incidental fm in panoramic displays due to their low microphonics and high frequency stability.
- *In microwave receivers:* Ideal for local oscillator operation in receivers with afc because of their frequency control characteristics.

FEATURES

- Maximum shock and vibration resistance achieved by all-ceramic and metal construction.
- Maximum heat resistance. Guaranteed for operation up to 250°C seal temperature. No cooling necessary.
- Virtually non-microphonic characteristics provided by rugged internal construction.
- Can be operated cw, pulsed and fm.
- Low distortion fm.
- Breakage in handling minimized.
- 8052/ZV1011 replaces commercial klystrons 5721, 6390, and QK-823.



Velocitron* Type 8052/ZV1011

*Registered Trade Mark

POLARAD ELECTRONICS CORPORATION 43-20 34th St., Long Island City 1, N. Y. • EXeter 2-4500

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from JEDEC release #3848, Aug. 20, 1962

SPECIFICATIONS

MECHANICAL DATA

Base A4-76, Peewee 4 Pin, fits Amphenol #78-545 socket or equivalent.
 Cap Require Ucinite #152005 mating plug or equivalent.
 Cooling Convection and conduction. Contact rings make direct contact with metallic parts of the external cavity.
 Mounting Position Any.

CONNECTIONS:

Pin 1 Control Electrode
 Pin 2 Heater
 Pin 3 Cathode
 Pin 4 Heater
 Lower Contact Ring 1st Resonator Grid
 Upper Contact Sleeve 2nd Resonator Grid
 Cap Reflector

ELECTRICAL DATA

HEATER CHARACTERISTICS:

Heater Voltage, AC or DC 6.3 ± 0.5 volts.
 Heater Current 680 ma.

RATINGS (Absolute Values):

Resonator Voltage 1250 volts dc max.
 Resonator Current 22 ma dc max.

Reflector Voltage -800 volts dc max. to -35 volts dc min.
 Control Electrode Voltage +20 to -150 volts dc max.
 Control Electrode Current 6 ma dc max.
 Heater-Cathode Voltage ± 45 volts dc max.
 Power Input 28 watts max.
 Seal Temperature 250 degrees C max.

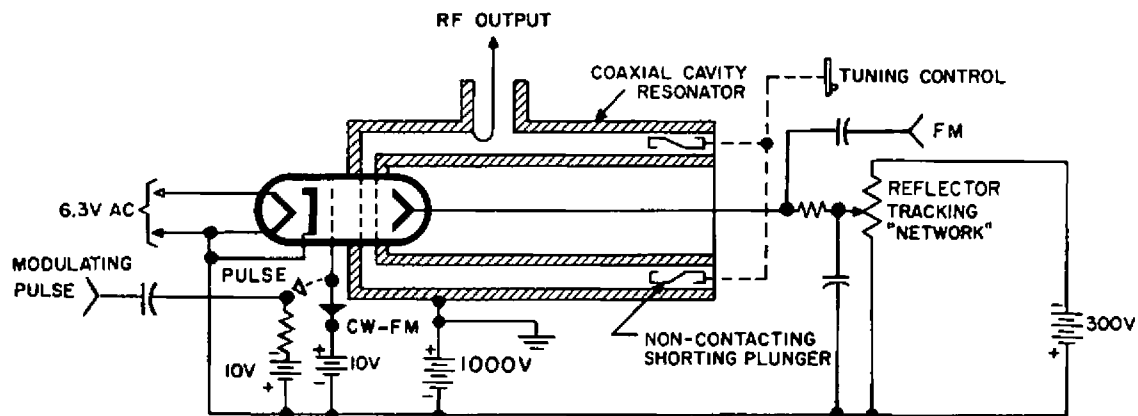


Figure 1. CW, FM or Pulse-Modulated Oscillator Circuit, Using a Velocitron Ceramic Reflex Klystron

TYPICAL OPERATION AS A CW OSCILLATOR

Reflector Mode	1 3/4	2 3/4	4 3/4
Cavity Mode	3/4	3/4	3/4
Frequency	2.5 KMC	6.0 KMC	10.5 KMC
Resonator Voltage	1200 volts	1200 volts	1200 volts
Anode Current	24 ma	24 ma	24 ma
Reflector Voltage (Approx.)	-300 volts	-300 volts	-300 volts
Control Electrode Voltage (Full Power Output)	+10 volts	-10 volts	-10 volts
Power Output Cutoff Voltage	-5 volts	-5 volts	-5 volts
Electronic Tuning Range (Between Half Power Points)	6 mc	6 mc	6 mc

TYPICAL OPERATION AS A PULSE-MODULATED OSCILLATOR:

The tubes can be pulse modulated over most of the cw frequency range. The general conditions are the same as for cw operation except as shown below.

Control Electrode Voltage.....-10 volts
 Pulse Modulation Voltage.....+20 volts
 Pulse Repetition Rate limited only by capabilities of external modulator.
 Minimum Pulse Duration 0.5 microsecond
 Rise Time 0.1 microsecond
 Decay Time 0.1 microsecond

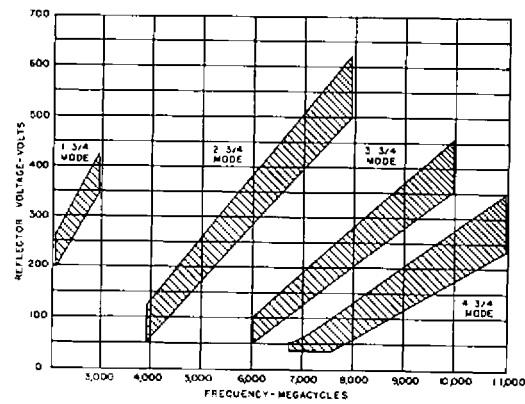


Figure 2. Typical Reflector Voltage vs. Frequency Characteristics

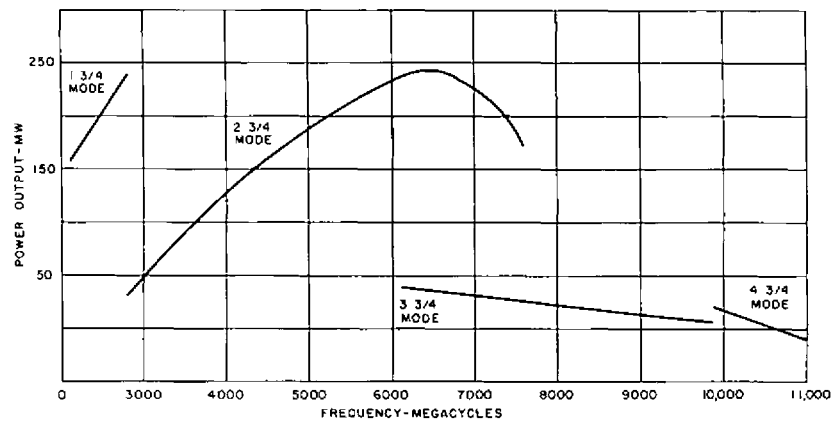


Figure 3. Typical Power Output vs. Frequency Characteristics

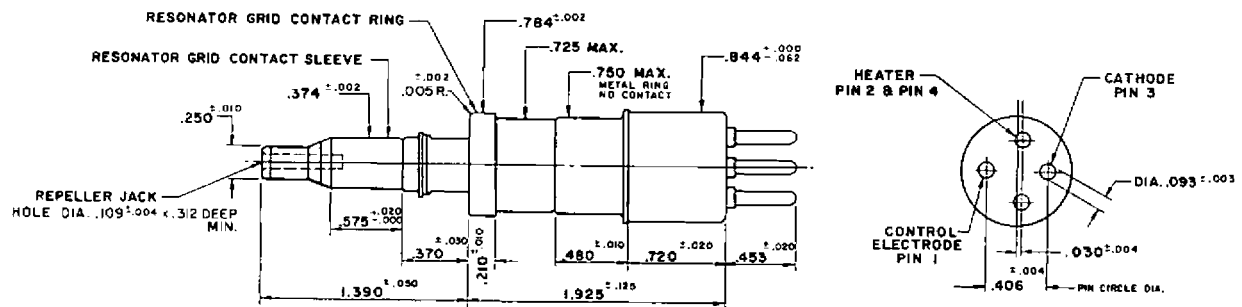


Figure 4. Outline Drawing

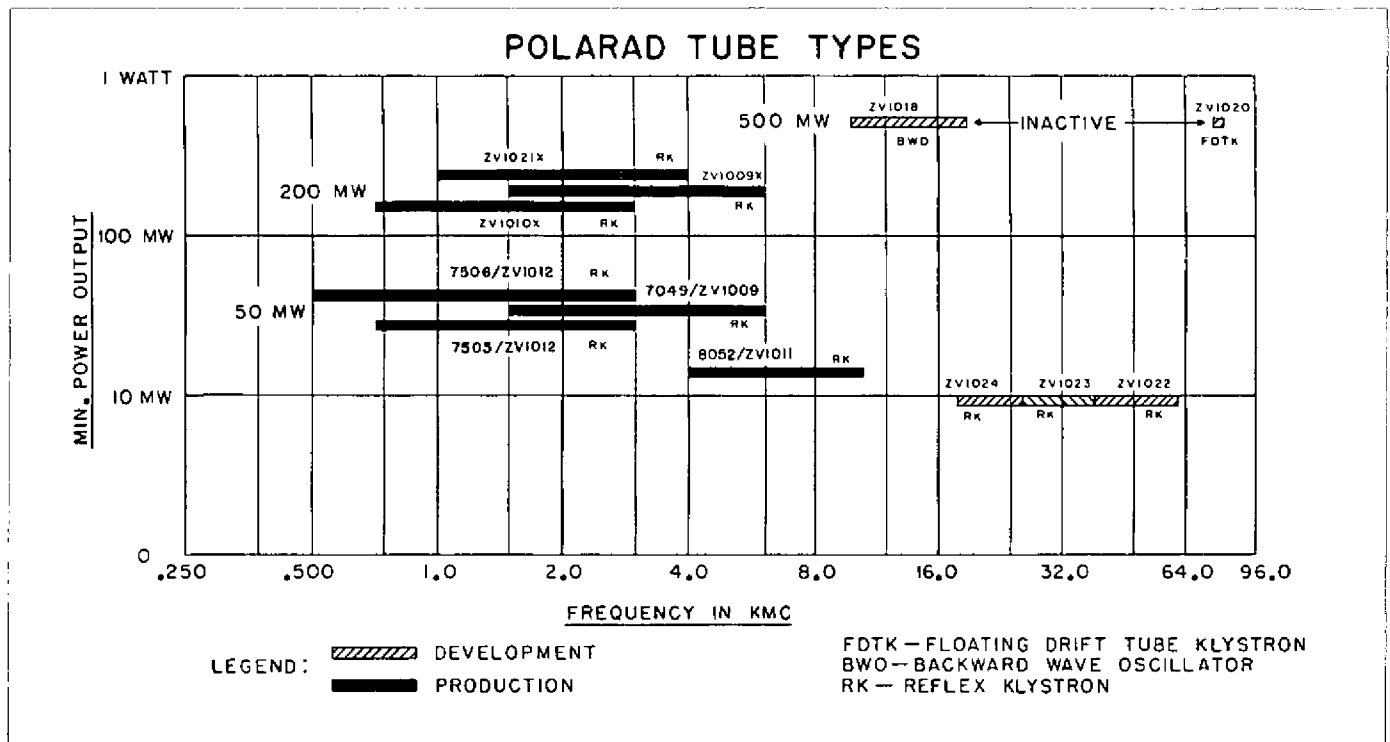


Figure 5. Frequency vs. Power Output



CERAMIC VELOCITRON* TUBES

8336/ZV 1010X 950 to 2,800 mc

8337/ZV 1021X 1,000 to 4,000 mc

8335/ZV 1009X 1,700 to 5,000 mc

200 mw minimum output.
Master Oscillator & Driver Tube.

Extremely rugged. Maximum heat,
shock and vibration resistance.



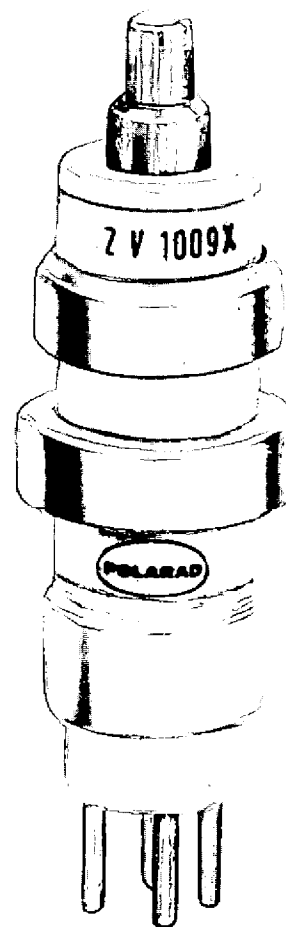
APPLICATIONS

An integrated family of rugged higher power Velocitron*† reflex klystrons for cw, FM or pulse operation in an external cavity.

- *In microwave signal generators:* Output power is adequate for generators providing more than 20 dbm output. Velocitrons permit FM, pulse and cw signal generation.
- *In microwave signal sources:* Suitable for use as a low power transmitter in antenna radiation patterns, standing wave and impedance measurements.
- *In microwave transmitters:* Provides low incidental FM in panoramic displays due to their low microphonics and high frequency stability. Provides sufficient master oscillator power for 100 w to 10 kw output systems.
- *In microwave receivers:* Ideal for local oscillator operation in receivers with AFC because of their frequency control characteristics.
- Reduces 3 stage system to 2 stages.

FEATURES

- Maximum shock and vibration resistance achieved by all-ceramic construction.
- Maximum heat resistance. Guaranteed for operation up to 250°C seal temperature. No cooling necessary.
- Interchangeable. All three klystrons use same power supplies and mechanical fittings.
- Virtually non-microphonic characteristics provided by rugged internal construction.
- Can be operated cw, pulsed and FM.
- Low distortion FM.
- Breakage in handling minimized.



Velocitron*† Type ZV1009X

*Trade Mark Registered
†Manufactured under Western Electric Patents

POLARAD ELECTRONICS CORPORATION 43-20 34th St., Long Island City 1, N. Y.

Tel. EXeter 2-4600

from JEDEC release #3848, Aug. 20, 1962

MECHANICAL DATA

Base A4-76, Peewee 4 Pin.

Cap C1-3, skirted miniature.

Cooling Convection and conduction.
Contact rings make direct peripheral
contact with metallic parts of the
external cavity.

Mounting Position Any.

Pin 1		Control Electrode
Pin 2		Heater
Pin 3		Cathode
Pin 4		Heater
Lower Contact Ring		1st Resonator Grid
Upper Contact Ring		2nd Resonator Grid
Cap		Reflector

Heater Voltage, AC or DC.....6.3 $\pm$ 0.5 volts.
Heater Current 1.1 amp

Resonator Voltage 500 volts dc max.
Resonator Current 60 ma dc max.

Reflector Voltage—700 volts dc max. to 0 volts dc min.
 Control Electrode Voltage+20 to —150 volts dc max.
 Control Electrode Current 12 ma dc max.
 Heater-Cathode Voltage ± 45 volts dc max.
 Power Input 30 watts max.
 Seal Temperature 250 degrees C max.



	ZV 1021X	ZV 1010X	ZV 1009X
Reflector Mode	1¾	1¾	2¾
Cavity Mode	¼	¼	¾
Frequency	2500 mc	1500 mc	3200 mc
Resonator Voltage	420 volts	420 volts	420 volts
Cathode Current	45 ma	45 ma	45 ma
Reflector Voltage (Approx.)	—400 volts	—200 volts	—120 volts
Control Electrode Voltage	+10 volts	+10 volts	+10 volts
(Full Power Output)			
Power Output Cutoff Voltage.....	+3 volts	+3 volts	+3 volts
Electronic Tuning Range	6 mc	6 mc	6 mc
(Between Half Power Points)			

The tubes can be pulse modulated over most of the cw frequency range. The general conditions are the same as for cw operation except as shown below.

Control Electrode Voltage.....10 volts
Pulse Modulation Voltage....+20 volts
Pulse Repetition Rate limited only by capabilities
of external modulator.
Minimum Pulse Duration 0.5 microsecond
Rise Time 0.1 microsecond
Decay Time 0.1 microsecond

CERAMIC VELOCITRON* TUBES

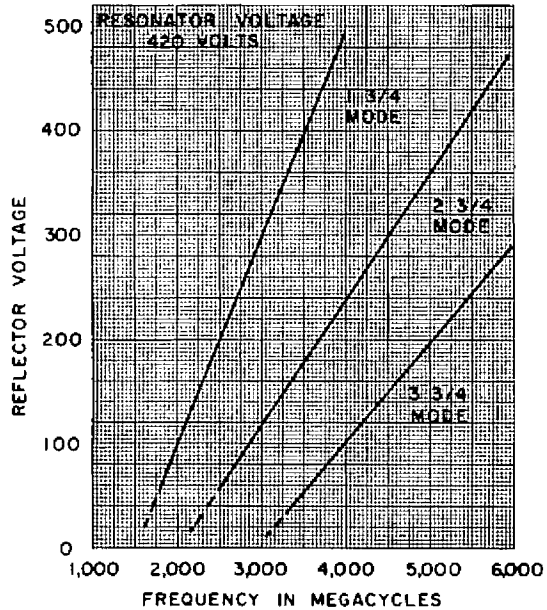


Figure 2. Typical Reflector Voltage vs. Frequency
Model ZV 1009X

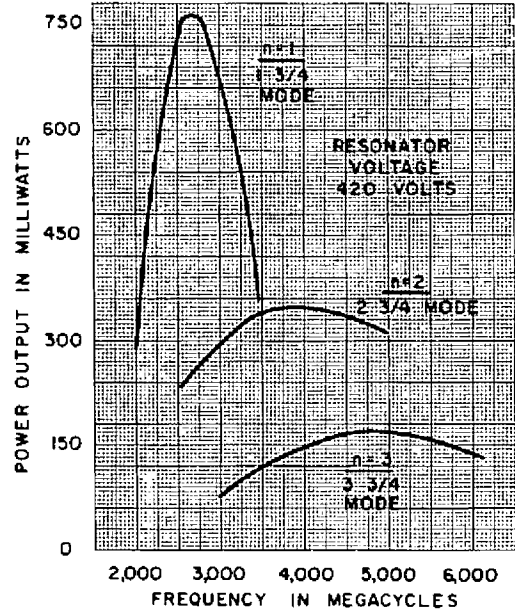


Figure 3. Typical Curve of Power Characteristics
Model ZV 1009X

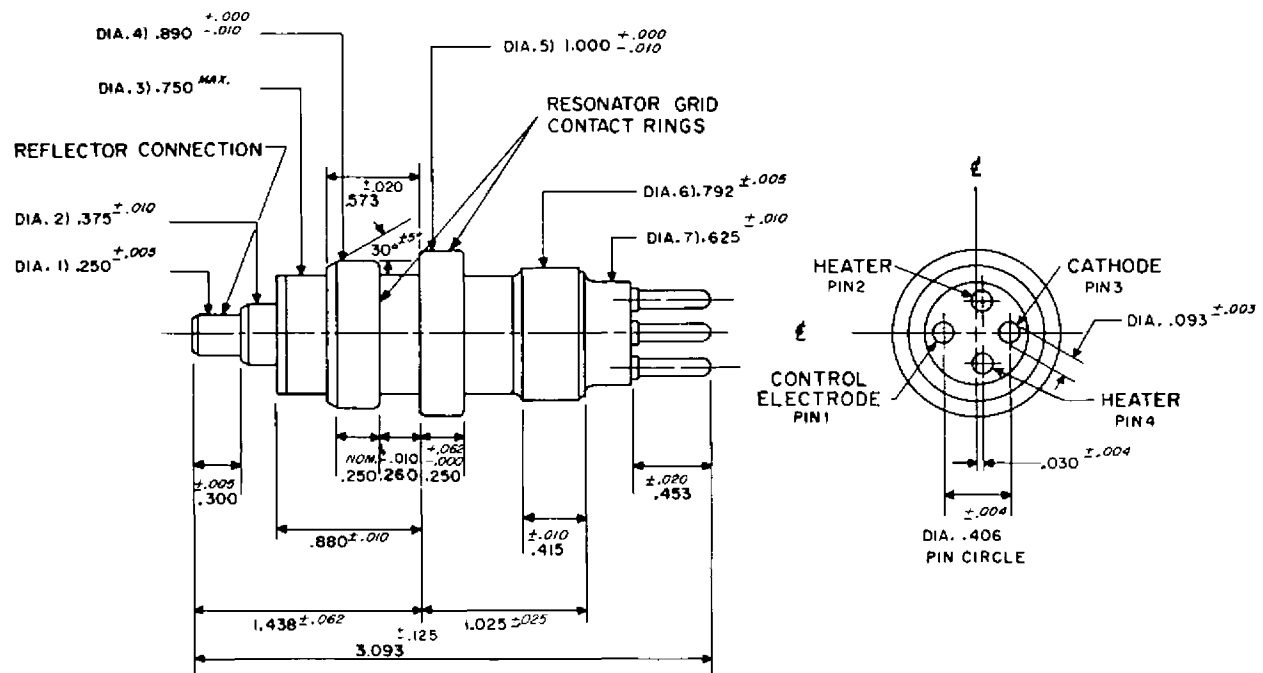


Figure 4. Outline Drawing

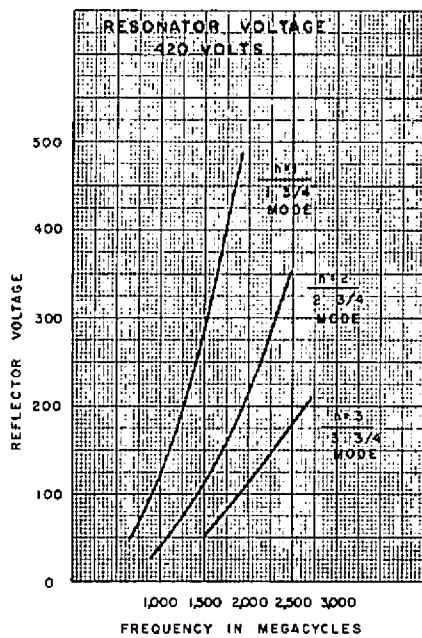


Figure 5. Typical Reflector Voltage vs. Frequency
Model ZV 1010X

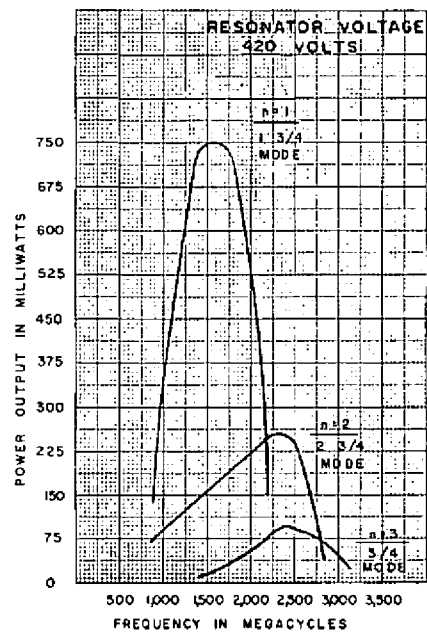


Figure 6. Typical Curve of Power Characteristics
Model ZV 1010X

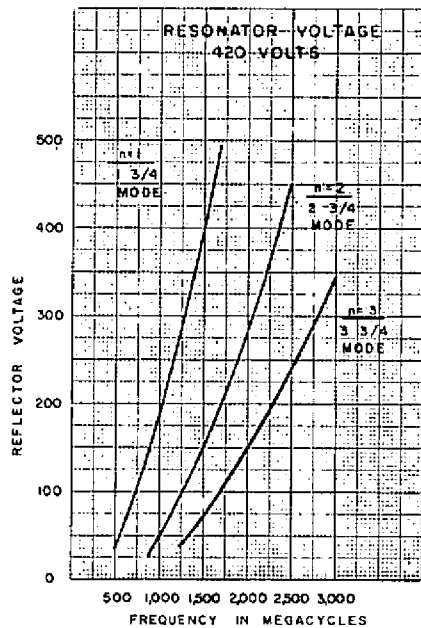


Figure 7. Typical Reflector Voltage vs. Frequency
Model ZV 1021X

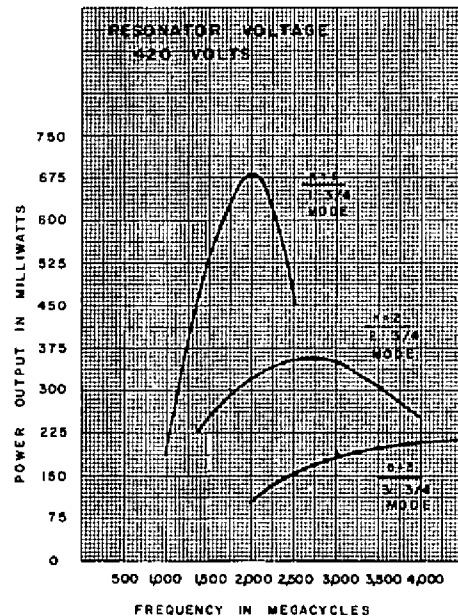


Figure 8. Typical Curve of Power Characteristics
Model ZV 1021X