



varian
solid state division

TECHNICAL DATA

VKA-7010

Series
TWO-CAVITY
KLYSTRON OSCILLATORS
26.5-40.0 GHz
10 W

DESCRIPTION

VKA-7010 two-cavity klystron oscillators are fixed-frequency, high-power sources for a wide variety of general purpose applications. They are ideal for use in antenna range measuring equipment and other Ka-band test equipment. Each tube delivers a CW output of at least

10 watts at a single specified frequency in the range of 26.5 to 40.0 gigahertz. Careful design and selection of materials insure outstanding frequency and power stability. The VKA-7010 can be furnished either in a liquid-cooled or conduction-cooled configuration.

ABSOLUTE RATINGS¹

	Min	Max
Resonator Voltage	---	3300 Vdc
Heater Voltage	6.0	6.6 V
Tube Body Temperature ^{2,3}	---	125 °C

GENERAL CHARACTERISTICS⁴

ELECTRICAL

Frequency Coverage	26.5 to 40.0 GHz
Output Power, min	10 W
Resonator Voltage	3000 Vdc
Resonator Current, typ	85 mAdc
Heater Voltage	6.3 V
Heater Current, typ	0.75 A

PHYSICAL

Dimensions	See Outline Drawing
Weight, approximate	
VKA-7010A	1.5 lb
VKA-7010B	2.2 lb
Mounting Position	Any
Cooling ^{2,3}	Liquid or Conduction
RF Output	Flange mates with UG-599/U

TYPICAL OPERATING CONDITIONS⁴

Frequency, ± 25 MHz	35 GHz
Output Power, matched load	10 W
Resonator Voltage	3000 Vdc
Resonator Current	85 mAdc
Temperature Coefficient	200 kHz/°C
Resonator Voltage Modulation	
Coefficient, ΔE_{rs} of ± 30 Vdc ...	100 kHz/V

RANGE VALUES FOR EQUIPMENT DESIGN⁵

	Min	Max
Resonator Voltage	2800	3200 Vdc
Resonator Current	50	90 mAdc
Temperature Coefficient ...	---	300 kHz/°C
Resonator Voltage		
Modulation Coefficient ...	75	150 kHz/V
Heater Current, at 6.3 V ...	---	0.8 A

NOTES:

1. Ratings should not be exceeded under continuous or transient conditions. A single rating may be the limitation and simultaneous operation at more than one rating may damage the tube. Equipment design should limit voltage and environmental variations so that the ratings will never be exceeded.
2. Maximum allowable tube body temperature is 125°C. If a heat sink is used it must be bolted metal-to-metal. For maximum life, the temperature of the tube body should not exceed 100°C.

3. For the liquid cooled tube, the flow rate should be at least 1 pt/min. A protective interlock should remove the beam voltage if the tube body temperature exceeds the maximum rating.
4. Characteristics and operating values are based on performance tests. These figures may change without notice as a result of additional data or product refinement. Varian Associates should be consulted before using this information for equipment design.
5. These values are acceptance limits for the VKA-7010. Equipment design should allow for these variations.

OPERATING HAZARDS

Read the following and take all necessary precautions to protect personnel. Safe operating conditions are the responsibility of the equipment designer and the user.

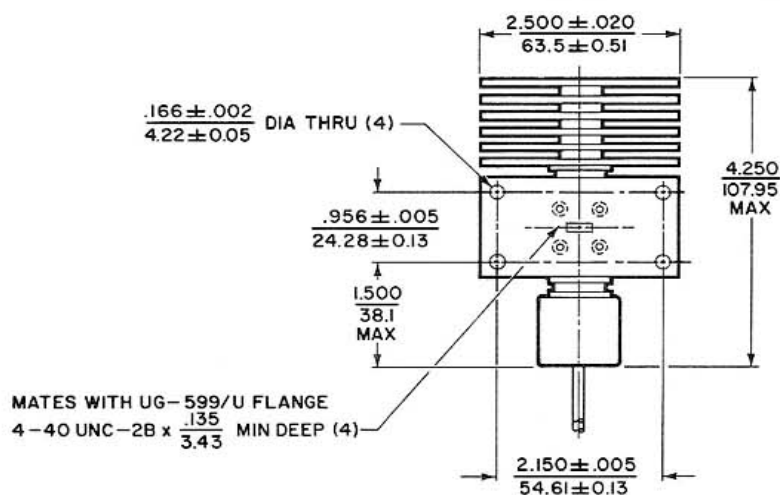
High Voltage. This tube operates at voltages which can be deadly. Equipment must be designed so personnel cannot come in contact with operating voltages. Enclose high-voltage circuits and terminals and provide fail-safe interlocking switch circuits to open the primary circuits of the power supply and to discharge high-voltage condensers whenever access is required.

Microwave Radiation. Exposure of the human body to microwave radiation in excess of 1 milliwatt per

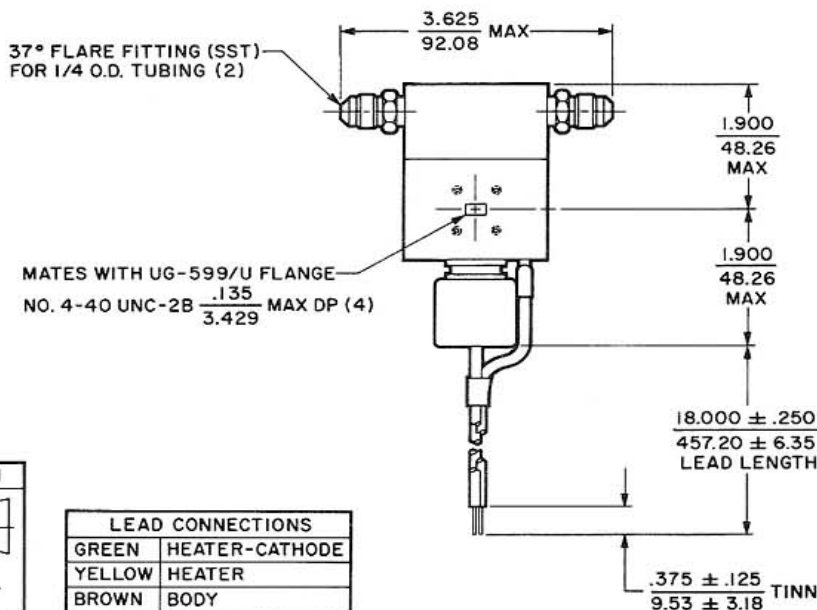
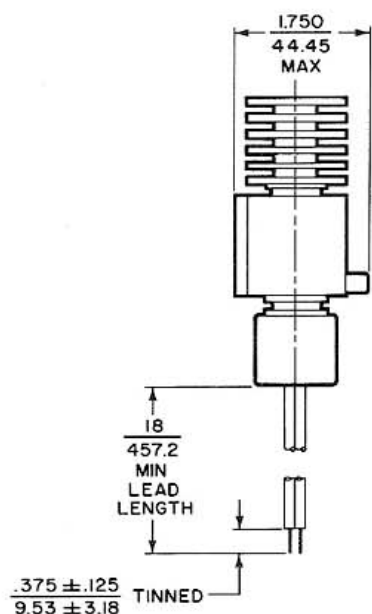
square centimeter is unsafe and can result in blindness or other injury. Personnel must be fully protected from the microwave energy which radiates from this device. All output connections, waveguide flanges, and gaskets must be r-f leakproof and properly engaged. Never operate this device without a microwave-energy-absorbing load attached. Personnel must be prevented from looking into open waveguides or antennas while such a device is energized. (Ref. Proc. IRE, Vol. 49, No. 2, pp. 427-447, Feb. 1961).

Equipment must be designed to fully safeguard all personnel from these hazards. Labels and caution notices must be provided on equipment and in manuals clearly warning of those hazards which cannot be avoided.

OUTLINE DRAWINGS



VKA-7010A



VKA-7010B

