varian
palo alto tube division

TECHNICAL DATA

4K3SN

CW KLYSTRON AMPLIFIER

2.80-3.05 GHz
1 kW

DESCRIPTION

The 4K3SN is a four-cavity klystron amplifier for use in communication equipment operating between 2.80 and 3.05 gigahertz. It delivers a CW output of at least 1 kilowatt at any frequency within its 250-megahertz tuning range. The 4K3SN employs permanent magnet focusing and requires forced-air cooling.

MAXIMUM RATINGS[1]

Beam Voltage	8 kVdc
Beam Current	0.675 Adc
Collector Dissipation	4.25 kW
Heater Surge Current	9 A
Cathode Seal Temperature	175 °C
Load VSWR[2]	2:1

GENERAL CHARACTERISTICS[3]

ELECTRICAL

Frequency Range	2.80 to 3.05 GHz
Heater Voltage	6.0 V
Heater Current, typical	4.5 A
Heater Warm-up Time, minimum	3 min
Focusing[4]	Permanent Magnet

PHYSICAL

Dimensions	See Outline Drawing
Weight, approximate	85 lb
Mounting Position	Vertical, cathode down
Cooling[5]	Forced Air
Collector Air Flow	200 ft^3/min
Pressure Drop, at 200 ft^3/min	2.25 in-H_2O
Torque, cavity tuners, max	12 lb-in
Connectors	See Outline Drawing

TYPICAL OPERATING CONDITIONS[3]

	High Efficiency Tuned
Frequency	2.856 GHz
Output Power	1.1 kW
Drive Power	100 mW
Gain	40.4 dB
Bandwidth, 3-dB	5 MHz
Beam Voltage	6.5 kVdc
Beam Current	0.46 Adc
Load VSWR	1.1:1

RANGE VALUES FOR EQUIPMENT DESIGN[6]

	Min	Max
Beam Voltage	---	7.5 kVdc
Beam Current	---	0.59 Adc
Heater Voltage	5.7	6.3 V
Heater Current	---	5 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. Although the tube will withstand a load VSWR of 2:1, the load VSWR must be 1.1:1 or less to produce an output of 1 kilowatt or more.
3. 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.
4. Magnetic materials should be at least 6 inches from the magnet; other magnet, 12 inches.
5. At ambient temperatures above 55°C or at pressures below 0.67 atmosphere, forced-air cooling may be required on the body and cathode seals.
6. These values are acceptance limits for the 4K3SN. Equipment design should allow for these variations.

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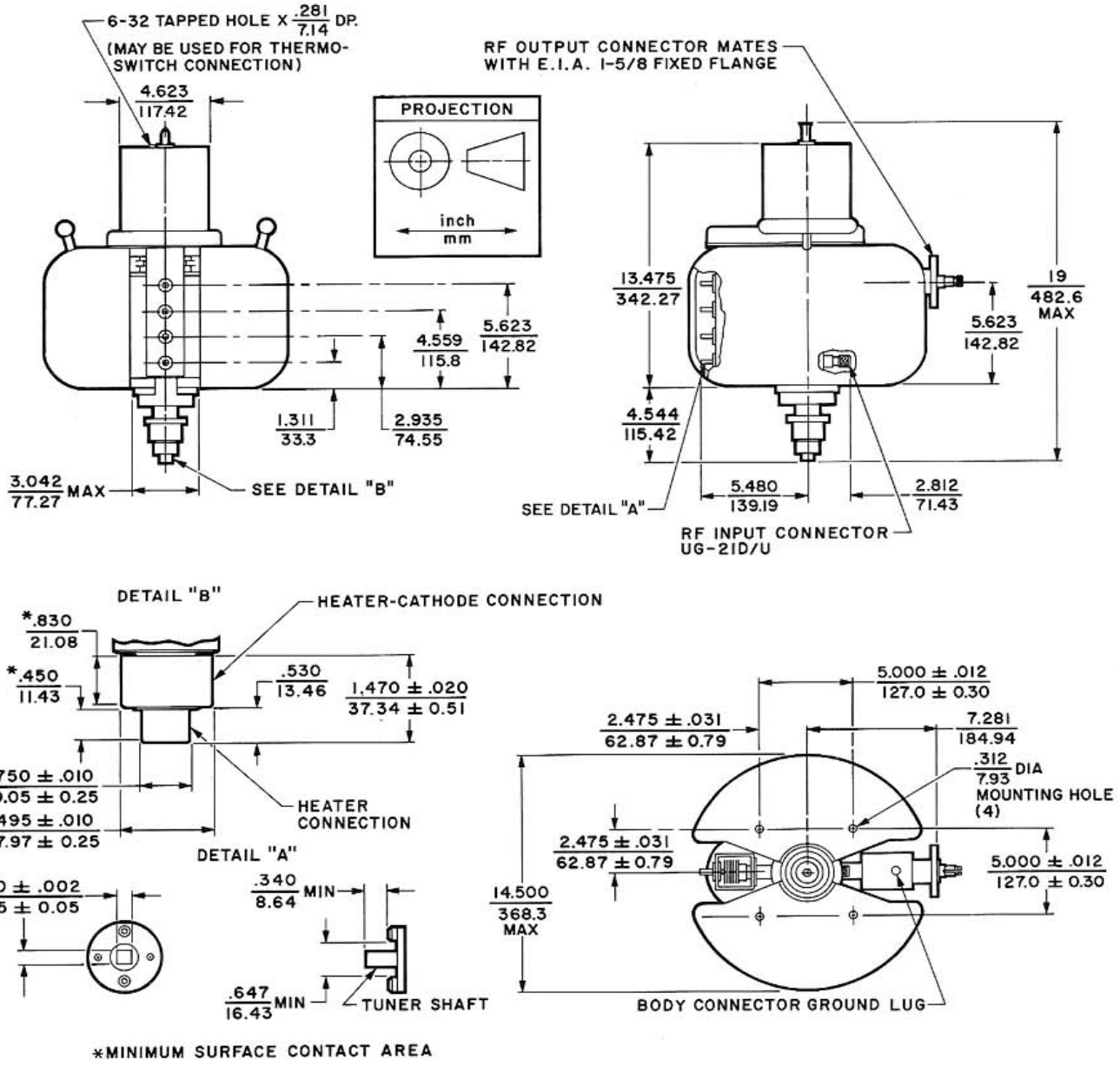
OUTLINE DRAWING



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 capacitors 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 input and output r-f 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.