



varian
palo alto tube division

TECHNICAL DATA

4K3SJ

CW KLYSTRON AMPLIFIER

1.7-2.4 GHz
1 kW

DESCRIPTION

The 4K3SJ is a four-cavity klystron amplifier for use in communication equipment operating between 1.7 and 2.4 gigahertz. It delivers a CW output of at least 1 kilowatt at any frequency within its 700-megahertz tuning range. It is ideal for use in applications where light weight and compactness are essential. The 4K3SJ employs permanent magnet focusing and requires forced air for collector cooling.

MAXIMUM RATINGS¹

Beam Voltage	7 kVdc
Beam Current	0.6 Adc
Collector Dissipation	4 kW
Heater Surge Current	15 A
Cathode Seal Temperature	150 °C
Load VSWR ²	2:1

GENERAL CHARACTERISTICS³

ELECTRICAL

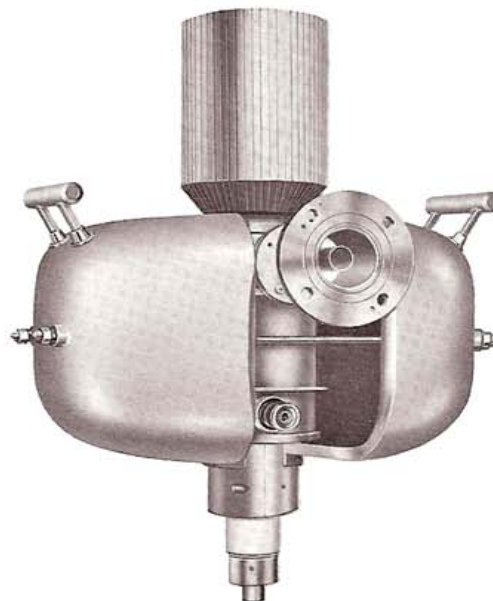
Frequency Range	1.7 to 2.4 GHz
Heater Voltage	6.0 V
Heater Current, typical	4.5 A
Heater Warm-up Time, minimum	3 min
Focusing ⁴	Permanent Magnet

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 ₂ O
Torque, cavity tuners, max	12 lb-in
Connectors	See Outline Drawing

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 not be possible. 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



TYPICAL OPERATING CONDITIONS³

Broadband Tuned

Frequency	1.7	2.4 GHz
Output Power	1.06	1.03 kW
Drive Power	60	90 mW
Gain	42.3	40.6 dB
Bandwidth, 3-dB	4	6 MHz
Beam Voltage	6.0	6.2 kVdc
Beam Current	0.54	0.56 Adc
Load VSWR	1.1:1	1.1:1

RANGE VALUES FOR EQUIPMENT DESIGN⁶

	Min	Max
Beam Voltage	---	6.8 kVdc
Beam Current	---	0.59 Adc
Heater Voltage	5.7	6.3 V
Heater Current	---	5 A

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 kept at least 6 inches from the magnet; other magnets, 12 inches.
5. At ambient temperatures above 55°C or at pressures below 0.67 atmosphere, forced-air cooling of the body and cathode seals may be required.
6. These values are acceptance limits for the 4K3SJ. 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 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.

OUTLINE DRAWING

