

DOUBLE-RESONATOR KLYSTRON

KB9-150W

Frequency: 'X' band, mechanically tunable.

Power output: 180W min at 10Gc/s.

Construction: Double resonator, water-cooled.

This data should be read in conjunction with GENERAL OPERATIONAL RECOMMENDATIONS – MICROWAVE DEVICES which precede this section of the handbook.

FREQUENCY RANGE 8.6 to 10 Gc/s

Mechanical tuning is effected by two calibrated controls.

CATHODE

Indirectly heated

| | | |
|-------|-----|----|
| V_h | 6.3 | V |
| I_h | 800 | mA |

Heating time. The heater voltage should be applied at least 3 minutes before the application of h.t. voltage.

MOUNTING POSITION Any

Two 2BA holes are provided in the resonator block to facilitate mounting and to prevent the whole weight of the valve being placed on the waveguide flange.

COOLING

Maximum temperature of outlet water 40 °C

Two water jackets are used, one surrounding the two resonators, the other the collector. When the two jackets are connected in series to a common water supply the inlet must be on the collector side. Rate of flow should be $> 1/2$ gal/min and < 1 gal/min.

LIMITING VALUES (absolute ratings)

| | | |
|--|-----|----|
| Maximum collector and resonators voltage | 10 | kV |
| Maximum collector and resonators dissipation | 2.0 | kW |
| Maximum collector current | 250 | mA |
| Maximum negative grid voltage | 250 | V |
| Maximum positive grid voltage | 20 | V |
| Maximum standing wave ratio | 1.5 | |

TYPICAL OPERATION

Principal Mode (Mode A)

| | | | | |
|----------------------------------|-------|-------|------|------|
| Frequency | 8.6 | 9.3 | 10 | Gc/s |
| Resonators/collector voltage | 5.5 | 7.3 | 9.2 | kV |
| Grid Voltage | -50 | -50 | -50 | V |
| Collector current | 96 | 145 | 200 | mA |
| Power input | 0.53 | 1.1 | 1.8 | kW |
| Resonators/collector dissipation | 0.488 | 0.958 | 1.63 | kW |
| Average power output | 40 | 100 | 210 | W |
| Power output | >30 | >80 | >180 | W |

Mode B

| | | | | |
|----------------------------------|--|--|-----|------|
| Frequency | | | 9.3 | Gc/s |
| Resonators/collector voltage | | | 4.3 | kV |
| Grid voltage | | | -50 | V |
| Collector current | | | 65 | mA |
| Power input | | | 280 | W |
| Resonators/collector dissipation | | | 262 | W |
| Power output | | | >18 | W |

OPERATING NOTES

1. To ensure good frequency and amplitude stability the resonators and collector voltages should be taken from a stabilised supply; the voltage variation should not exceed $\pm 10V$ (i.e. approximately 0.1%) if a frequency stability of 1 : 100,000 is to be maintained.
2. For the safety of personnel it is advisable to operate with the positive pole of the h.t. supply earthed.
3. For mobile applications anti-vibration mounting is recommended, to avoid undesirable amplitude or phase modulation.
4. The tube must be shielded from strong external magnetic fields.
5. The number of mechanical tuning operations extending below about 9Gc/s or above 9.5Gc/s should be limited to 100, to avoid damage to the flexible diaphragm; between these frequencies there need be no limitations.

WEIGHT

| | |
|-----------------------|--|
| Valve only | { 5 lb 3 oz 2.35 kg |
| Shipping weight | { 9 lb 11 oz 4.4 kg |
| Dimensions of packing | { 197 × 203 × 248 mm 7.75 × 8.0 × 9.75 in |

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