



varian
eastern tube division

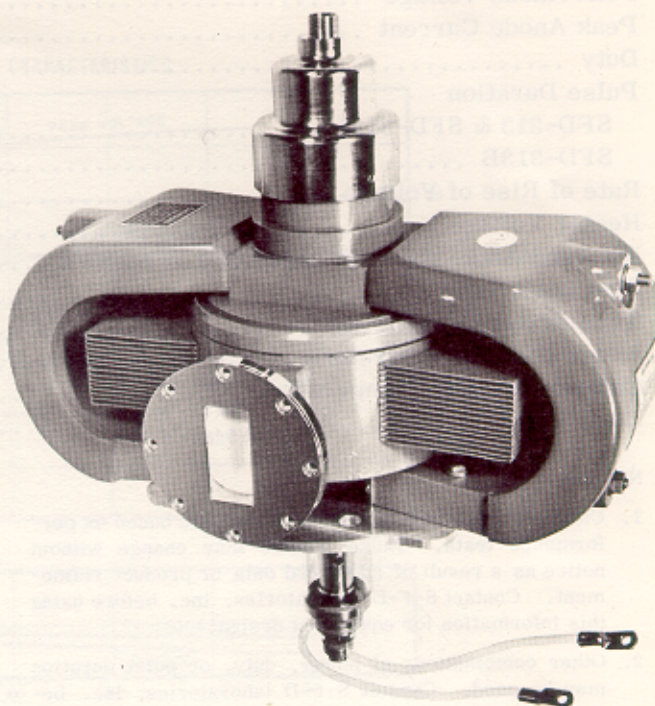
TECHNICAL DATA

**SFD-313
SFD-313A
SFD-313B**

**PULSED CEM®
COAXIAL MAGNETRON**

DESCRIPTION

SFD-313, SFD-313A, and SFD-313B are mechanically-tuned CEM Coaxial Magnetrons for use in long-range search and tracking radars. The SFD-313 was the first megawatt-level tunable magnetron available in C band. Each type delivers a peak output of at least 1 megawatt over its entire tunable range and is ideal for remotely-tuned systems. The SFD-313 is tunable from 5.45 to 5.825 gigahertz and both the SFD-313A and SFD-313B have an extended range of 5.4 to 5.9 gigahertz. In addition to its wide tuning range, the SFD-313B can operate at pulse widths up to 3 microseconds. Each of these magnetrons can be supplied with threaded inserts for mounting; simply add the suffix "-1" when ordering. These magnetrons provide reliable performance even after long standby periods. Proven field life is over 1500 hours.



FEATURES

- High average and peak power
- Long life
- Exceptional frequency stability
- Excellent stability under intermittent operation
- SFD-313B has 3-microsecond pulse capability

GENERAL CHARACTERISTICS¹

ELECTRICAL

Frequency Range	
SFD-313	5.45-5.825 GHz
SFD-313A	5.40-5.90 GHz
SFD-313B	5.40-5.90 GHz
Power Output, min	1 MW
Heater, standby	
Voltage	5.0 V
Current	19.0 A
Warm-up Time, min	300 s
Pulling Factor, 1.5:1 VSWR, max ..	6 MHz
Pushing Factor, max	50 kHz/A

MECHANICAL

Dimensions	See Outline Drawing
Weight	57 lb
Mounting Position	Any
Cooling	Forced Air
Air Flow, min	100 ft ³ /min
Output Waveguide	Mates with modified UG-148B/U Flange
Cathode Connector	Flying Leads
Tuner	Shaft mates with S.S. White RY 18-2 flexible shaft
Dynamic Torque, max	50 oz-in

OPERATING CONDITIONS AND RATINGS

	Typical Operation ^{1,2}	Absolute Ratings ³	
		Min	Max
Peak Power Output	1100	---	--- kW
Peak Power Input	2200	---	2500 kW
Average Power Input	2200	---	2500 W
Peak Anode Voltage	36.5	---	38 kV
Peak Anode Current	60	20	65 A
Duty	0.001	---	0.0011
Pulse Duration			
SFD-313 & SFD-313A	1.0	0.2	2.0 μ s
SFD-313B	3.0	0.2	3.3 μ s
Rate of Rise of Voltage	---	50	100 kV/ μ s
Heater Voltage	2.5	---	7.5 V
RF Bandwidth, at worst phase of 1.5:1 VSWR	1.2/tpc	---	--- MHz
Side Lobe Ratio	12	---	--- dB
Temperature Coefficient	-0.20	---	--- MHz/ $^{\circ}$ C
Anode Block Temperature	---	---	115 $^{\circ}$ C
Cathode Bushing Temperature	---	---	270 $^{\circ}$ C
Load VSWR	1.05:1	---	1.5:1

NOTES:

1. Characteristics and operating values are based on performance tests. These figures may change without notice as a result of additional data or product refinement. Contact S-F-D laboratories, inc. before using this information for equipment design.
2. Other combinations of power, duty, or pulse duration may be used. Consult S-F-D laboratories, inc. be-

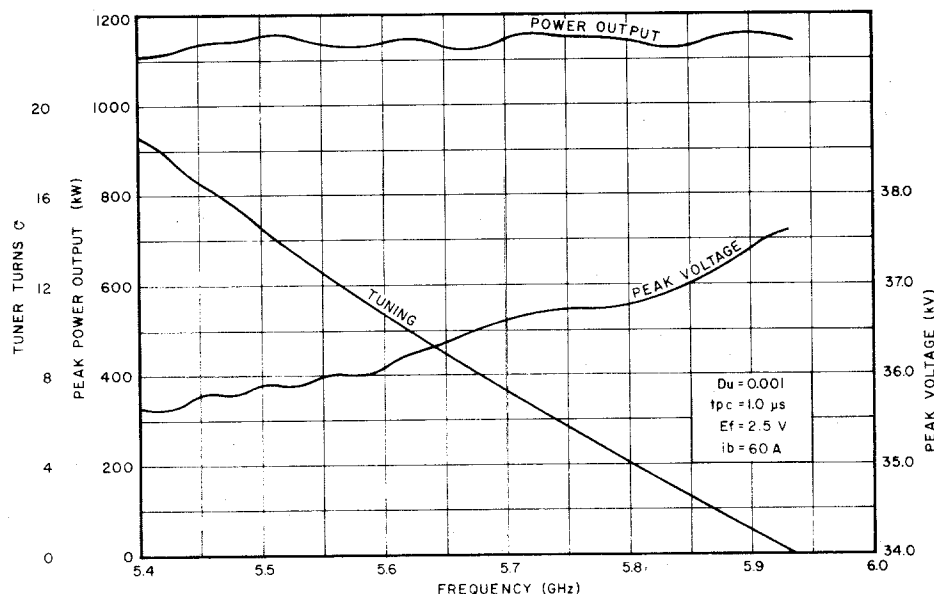
fore operating these tubes at conditions other than those indicated above.

3. 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.

CHARACTERISTIC CURVES

Typical performance values

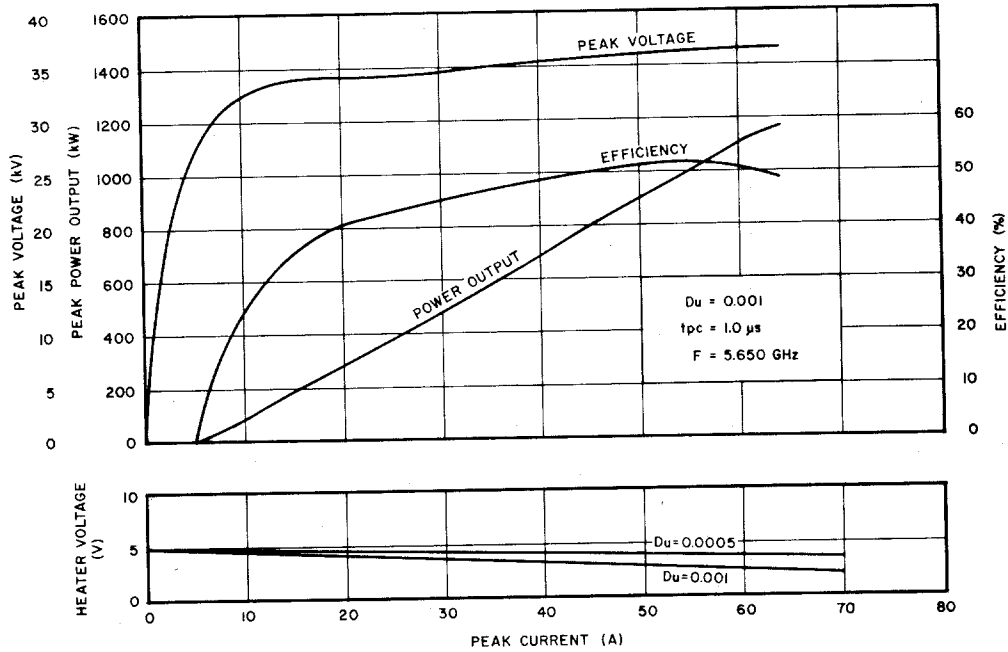
FREQUENCY CHARACTERISTICS



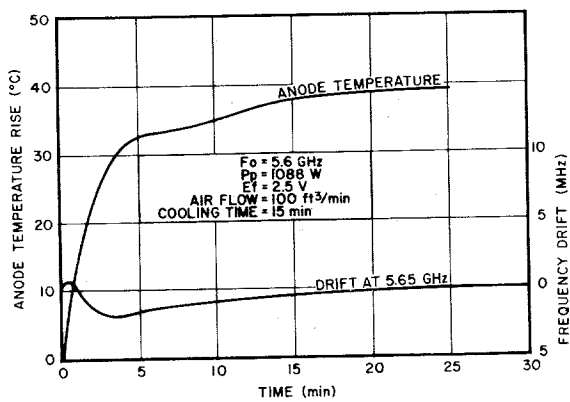
CHARACTERISTIC CURVES

Typical performance values

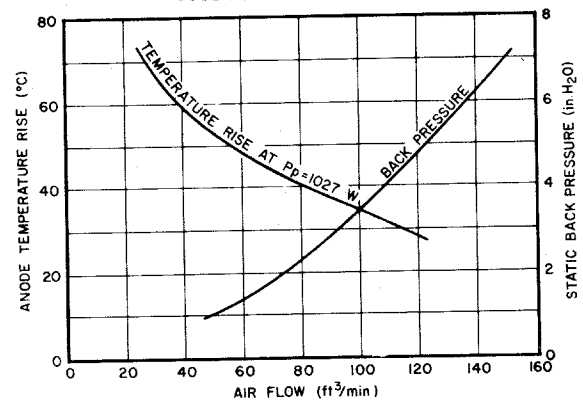
PERFORMANCE CHARACTERISTICS



THERMAL DRIFT CHARACTERISTICS

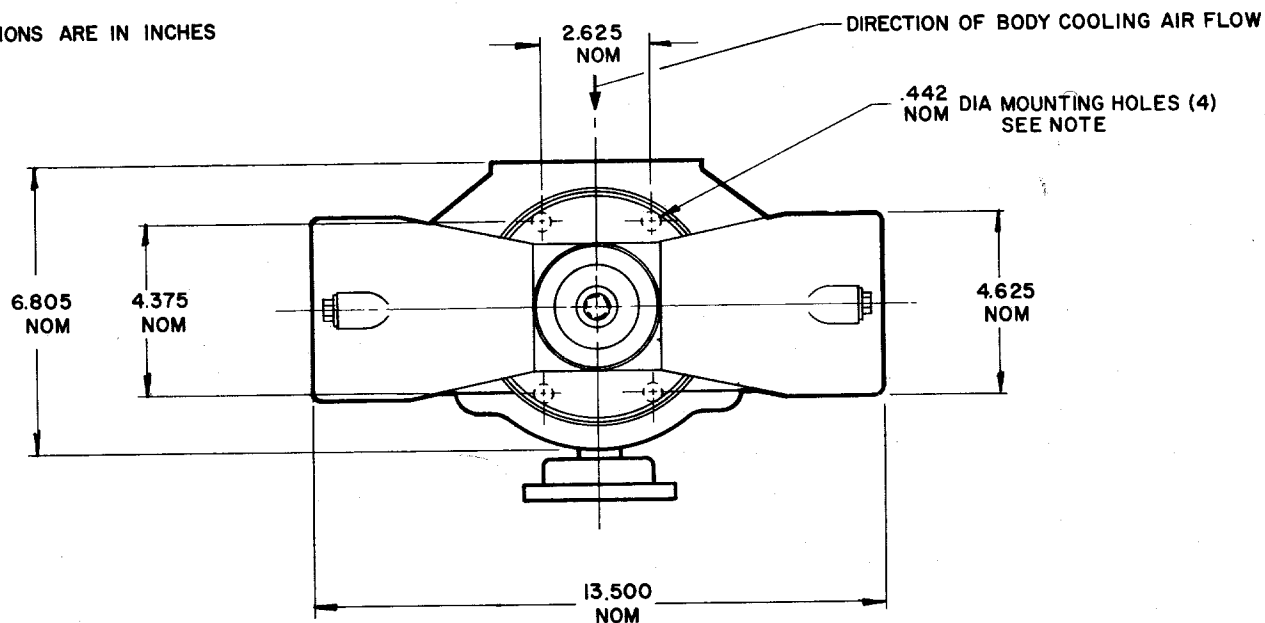


COOLING CHARACTERISTICS



OUTLINE DRAWING

DIMENSIONS ARE IN INCHES



NOTE:
EACH MODEL CAN BE
SUPPLIED WITH 3/8 -16
THREADED INSERTS.
ORDER BY ADDING THE
SUFFIX "-I" TO THE TYPE
NUMBER.

