ITT ELECTRON TECHNOLOGY
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F-7214
RADIAL BEAM POWER TRIODE

DESCRIPTION

The F-7214 is a metal and ceramic forced-air-cooled tetrode designed for use as a pulsed rf amplifier at frequencies up to 1215 MHz. Its uses include operation in compact aircraft, mobile and stationary equipment, in telemetry applications requiring pulse coding, in accelerators and in applications requiring high rf-pulsepower, extreme ruggedness and compact size. The unipotential cathode is of the oxide coated matrix type and the anode radiator assembly features integral brazed construction. Internal processing is especially rigorous and includes a double vacuum exhaust procedure that permits higher temperature degassing of internal elements.

Electrical Characteristics	Min.	Nom.	Max.
Heater Voltage (1)		5.5	6.0 Volts
Heater Current at 5.5 Volts	16.3		13.2 Amp
Heater Starting Current			55 Amp.
Cathode Warm Up Time	5		Minutes
Grid Voltage (Ib=.015A Eb=2500V Ec2=1000V)			--100 Volts
Screen Current (ib=40a Eb=2500V Ec2=1000V tp=16us prr=60sec)	—.020		+.012 Amp
Amplification Factor (Grid Screen) (Ib=.60A Eb=2500V Ec2=600V)	8		24
Direct Interelectrode Capacitances			
Grid to Plate (2)			.17 pf
Grid to Cathode-Heater	37		46 pf
Plate to Cathode-Heater (2 & 3)			.017 pf
Grid to Screen	46		62 pf
Screen to Plate	14.6		17.8 pf
Screen to Cathode-Heater (3)			1.4 pf

Mechanical Characteristics	
Mounting Position	Any
Type of Cooling	Forced Air
Maximum Plate Core and Seal Temperature (4)	250°C.
Net Weight (approx.)	2 lbs.
Vibration	
Low Frequency (5)	500 mv
High Frequency (6)	

1. Under combined high frequency and high duty factor conditions, transit time effects will affect cathode temperature, the heater may be operated at the lowest voltage that will give stable performance.
2. Measured with an 8" OD, 3" ID flat metal shield, located in the plane of and connected to the screen terminal.
3. Measured with an 8" OD, 2⅜" ID flat metal shield located in the plane of and connected to the grid terminal.
4. A temperature sensitive lacquer is convenient for this measurement.
5. Per MIL-E-1E test method 1031.
   Ebb=450V Ec2=300V Ec/Ib=.010A Rp=2000 ohms
6. Per MIL-E-1E test method 1031.
7. Maximum ratings are limiting values above which the serviceability of the tube may be impaired with respect to life and satisfactory performance and should not be exceeded-under the worst probable conditions.

PULSE RF AMPLIFIER

Maximum Ratings

For frequencies up to 1215 Mc and for a maximum "on" time of 10us in any 1000us interval.

Peak Positive Pulse Plate Voltage	10,000 Volts
D-C Plate Voltage	5,000 Volts
D-C or Peak Positive—Pulse Screen Voltage	1,200 Volts
D-C Grid Voltage	—300 Volts
D-C Plate Current During Pulse	18 Amp
D-C Plate Current	0.2 Amp
Screen Dissipation (average)	50 Watts
Grid Dissipation (average)	30 Watts
Plate Dissipation (average)	1,500 Watts

Typical Operation

Class C cathode drive with rectangular wave shape pulses, duty factor of .01, pulse duration of 10us and a frequency of 1215 Mc.

D-C Plate Voltage	4,500 Volts
D-C Screen Voltage	1,000 Volts
D-C Grid Voltage	—80 Volts
D-C Plate Current During Pulse	11 Amp
D-C Plate Current	.11 Amp
D-C Screen Current	.005 Amp
D-C Grid Current	.010 Amp
Driver Power Output at Peak of Pulse (approx.)	4,500 Watts
Useful Power Output at Peak of Pulse (approx.)	20,000 Watts

Typical Operation

Class C cathode drive with pulsed plate and screen voltages, rectangular wave shape pulses, duty factor of .01, pulse duration of 10us and a frequency of 1215 Mc.

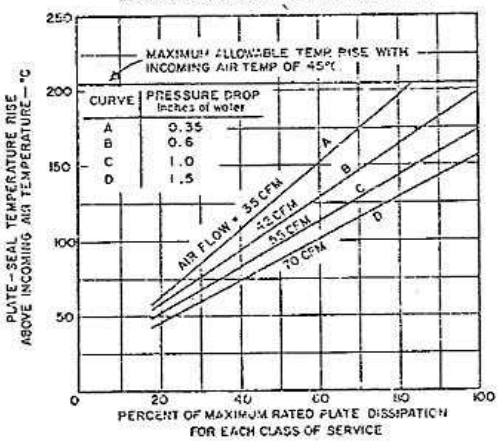
Peak Positive-Pulse Plate Voltage	9,000	10,000 Volts
Peak Positive-Pulse Screen Voltage	1,000	1,000 Volts
D-C Grid Voltage	—80	—80 Volts
D-C Plate Current During Pulse	16	18 Amp
D-C Plate Current	.16	.18 Amp
D-C Screen Current	.008	.009 Amp
D-C Grid Current	.014	.016 Amp
Driver Power Output at Peak of Pulse (approx.)	10,000	11,000 Watts
Useful Power Output at Peak of Pulse (approx.)	50,000	65,000 Watts

DIMENSIONAL DATA (IN INCHES)

DIM.	MIN.	MAX.
A Dia.	3.69	3.75
B	.850	
C	.22	
D	2.15	2.23
E	2.71	2.85
F	3.14	3.34
G	1.160	1.165
H	.79	.85
J	.22	
K	.43	.49
L	.34	.40
M	.115	
N	.175	.225
P	.135	
Q Dia.		.725
R Dia.	1.710	
S Dia.	2.307	
T	.200	
U	.250	
V Dia.	3.010	
W	.105	
X Dia.	3.210	

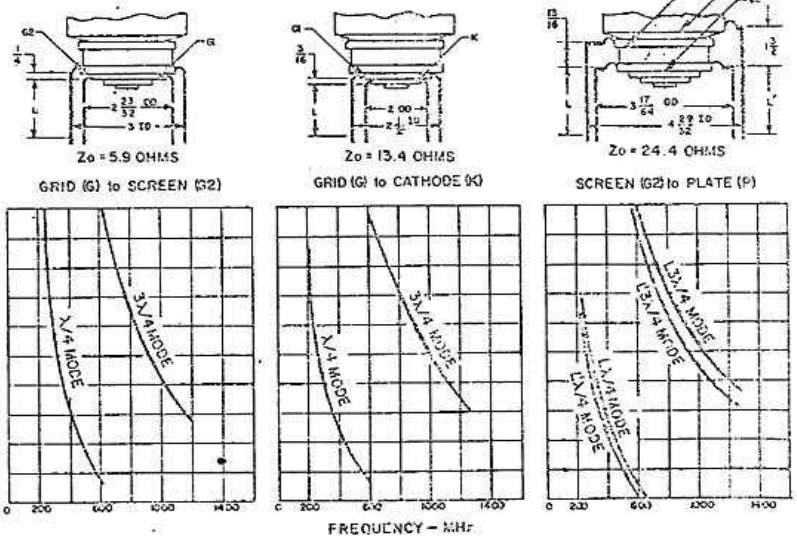
TYPICAL COOLING CHARACTERISTICS

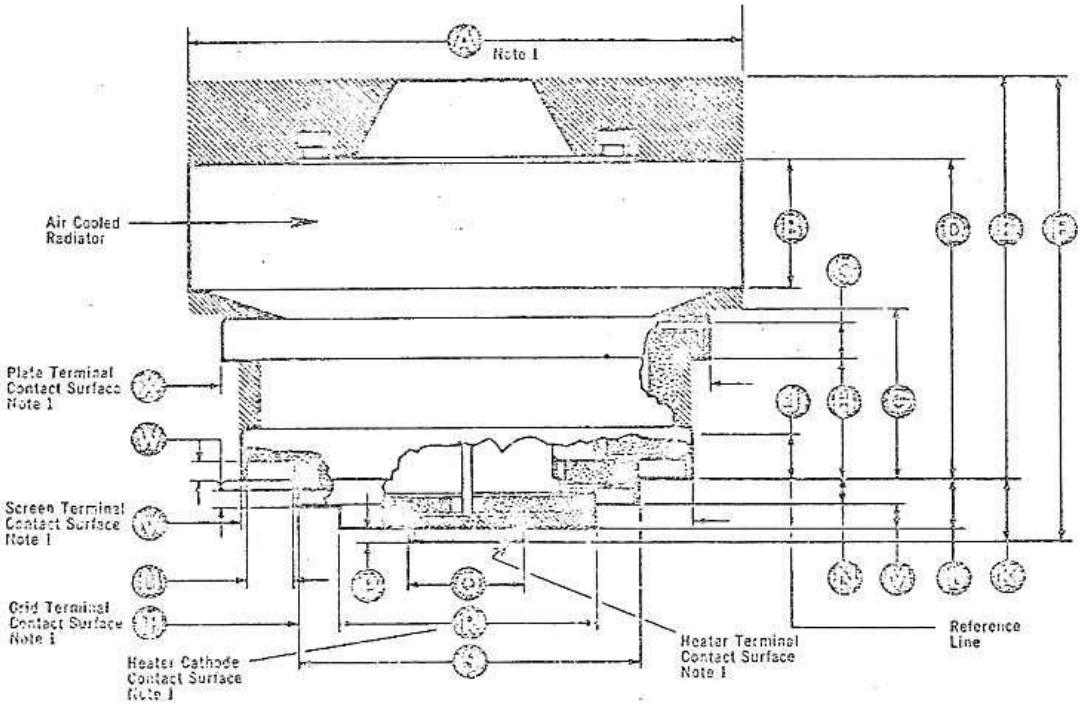
AIR FLOW THROUGH RADIATOR IN EITHER DIRECTION
MAXIMUM PLATE-SEAL TEMPERATURE 250°C.

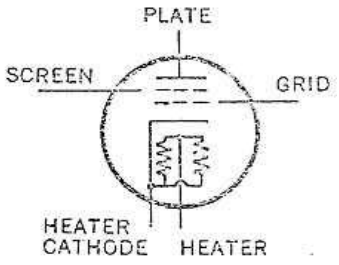


Standby Operation: Cooling Air is required when only heater voltage is applied to the tube.

Shutdown Operation: Air flow should continue for several minutes after all power to the tube is removed.







Accessories
Socket.....57282

HATCHED REGION NOTE 2

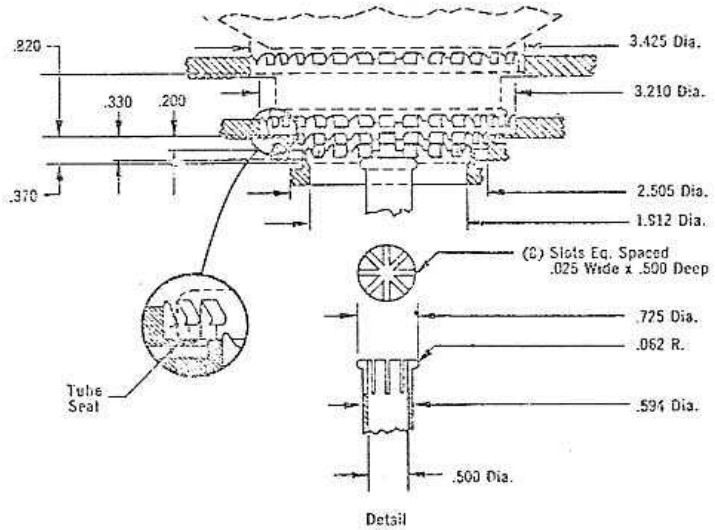
CERAMIC INSULATOR

Note 1. Concentricity between the various diameters is such that the tube will enter a gauge having suitably spaced concentric apertures and posis of the following diameters:

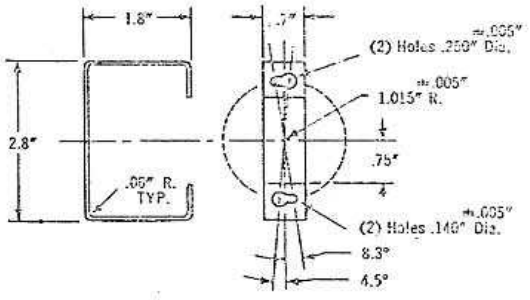
A. Radiator Band	3.7805
B. Plate Terminal	3.2605
C. Screen Terminal	3.0603
D. Grid Terminal	2.3375
E. Heater-Cathode Terminal	1.7445
F. Heater Terminal	0.6945

Note 2. Keep all hatched regions clear. Do not allow contacts or circuit components to protrude into these annular volumes. Diameters of hatched areas above Air-Cooled Radiator, Plate Terminal Contact Surface, and Screen Terminal Contact Surface shall not be greater than its associated diameter.

PREFERRED MOUNTING ARRANGEMENT



TUBE EXTRACTOR



NOTES:
1. Material — 1/16" thk. Cold Rolled Steel
2. Slot Between Holes
3. Round All Edges

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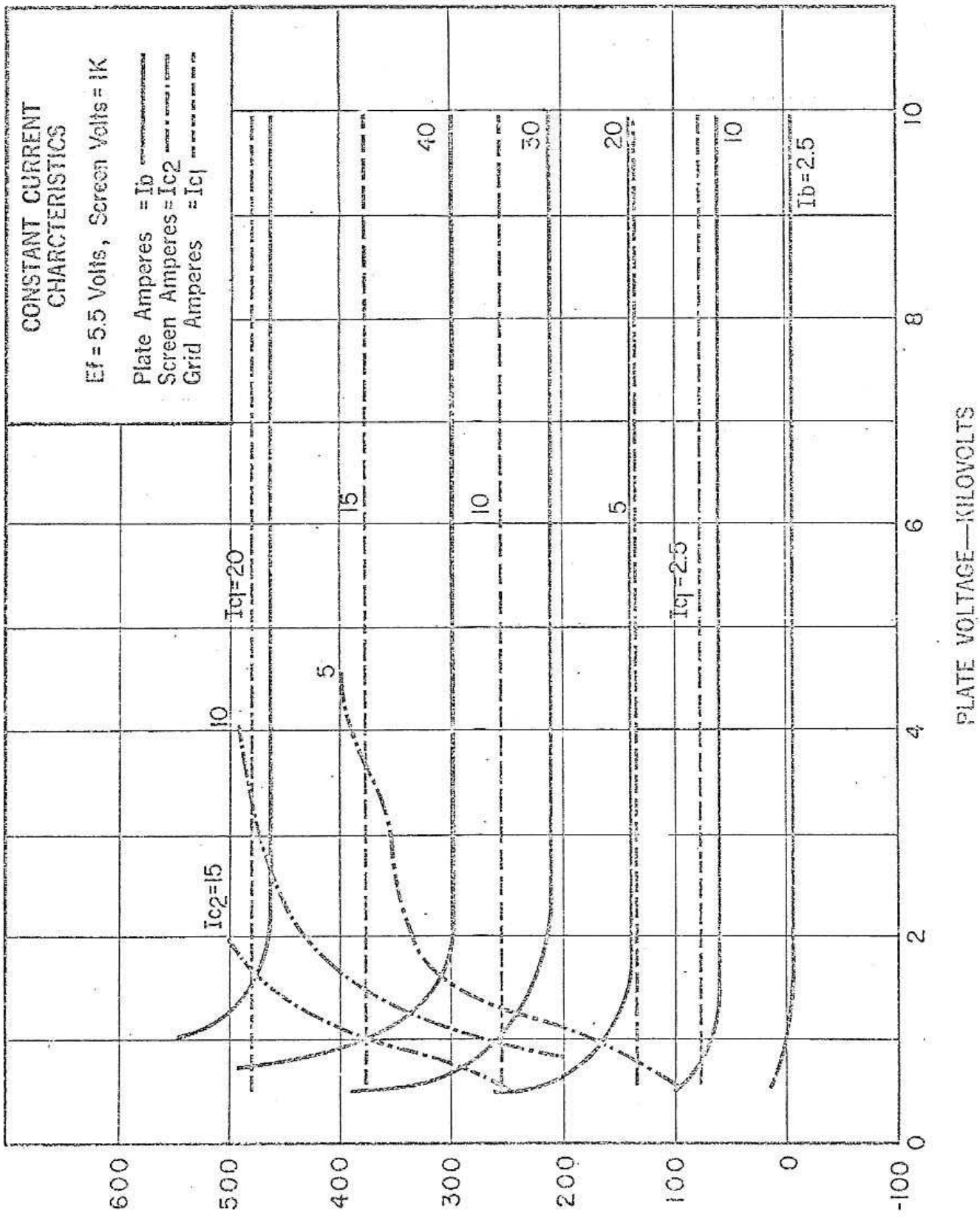

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