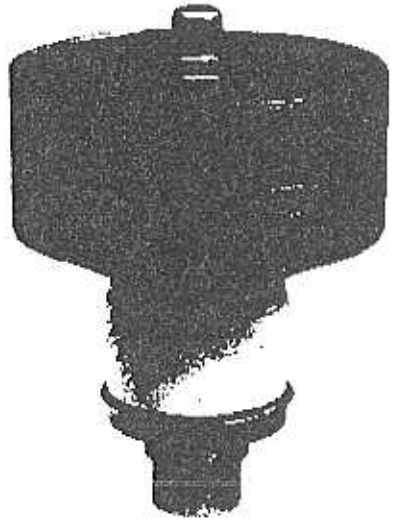
TECHNICAL DATA

YU-148
HIGH-MU
TRIODE

YU148/3CX6000A7

The **EIMAC YU-148** high mu, forced air cooled, power triode provides relatively high power output as an amplifier, oscillator or modulator at low plate voltages. The tube has a low inductance cylindrical filament stem structure which readily becomes part of a linear filament tank circuit for VHF operation. The grid provides good shielding between the input and output circuits for grounded grid applications and conveniently terminates in a ring between the plate and filament terminals.



GENERAL CHARACTERISTICS[1]

ELECTRICAL

Filament: Thoriated Tungsten

Voltage	7.0 ± 0.35 Volts
Current @ 7 Volts	78 Amperes
Amplification Factor (Average)	200

Direct Interelectrode Capacitance (Grounded Filament)[2]

Cin	42 pF
Cout	0.28 pF
Cgp	24.5 pF

Direct Interelectrode Capacitance (Grounded Grid)[2]

Cin	42 pF
Cout	24.5 pF
Cgp	0.28 pF

[1]Characteristics and operating values are based upon performance tests. These figures may change without notice as a result of additional data or product refinement. **Varian EIMAC** should be consulted before using this information for final equipment design.

[2]Capacitance values are for a cold tube as measured in a special shielded fixture, in accordance with Electronic Industries Association Standard RS-191.

varian®
eimac salt lake division

1678 South Pioneer Road / Salt Lake City, Utah 84104 / (801) 972-5000

Effective 3/15/89

Printed in USA

RADIO-FREQUENCY POWER AMPLIFIER
Class C Telegraphy or FM, Cathode Driven

TYPICAL OPERATION AT 108 MHZ

Plate Voltage	4800	5700	6000	Vdc
Grid Voltage	0	0	-100	Vdc
Plate Current	2.30	2.50	2.56	Adc
Grid Current	.32	.33	.48	Adc
Peak RF Cathode Voltage[1]	215	224	340	Volts
Plate Dissipation	3200	4100	3900	Watts
Useful Output Power[1]	8,000	10,000	12,000	Watts
Driving Power[1]	500	600	800	Watts
Load Impedance	1200	1300	1200	Ohms
Drive Impedance	50	49	77	Ohms

[1]Approximate value.

ABSOLUTE MAXIMUM RATINGS:

DC Plate Voltage	7,000 Volts
DC Plate Current	3.5 Amperes
Plate Dissipation	6,000 Watts
Grid Dissipation	225 Watts

APPLICATION

MECHANICAL

COOLING - The maximum temperature rating for the anode core and the ceramic/metal seal area of this tube is 250°C, and sufficient forced air cooling must be provided to assure operation at safe tube temperatures. Tube life is usually prolonged if cooling in excess of absolute minimum requirements is provided, for cooler tube temperatures.

Minimum air flow requirements to maintain anode core and ceramic/metal seal areas below 225°C at sea level with an air inlet temperature of 40°C are tabulated for air flow in the base-to-anode and anode-to-base directions. At higher ambient temperatures, frequencies above 30 MHz, or at higher altitudes, a greater quantity of air will be required.

With air flowing in a base-to-anode direction, and with the specified air also flowing past the base section of the tube, no additional base cooling of either type is normally required. With air flowing in an anode-to-base direction, additional cooling air directed into the filament stem structure, between the inner and outer filament terminals, in the amount of 5 cfm minimum, directed by an appropriate air nozzle or pipe is required.

It is suggested that temperatures, especially in the base area of the tube, be monitored in any new installation to ensure proper cooling. Temperatures may be measured with any of the available temperature sensing paint or crayon materials.

Cooling 50 C° Ambient

Anode to Base Air Flow		
Watt	CFM	In of Water
4500	250	1.0
5000	300	1.2

Base to Anode Air Flow		
Watt	CFM	In of Water
5000	142	0.22
6000	205	0.4

ELECTRICAL

FILAMENT OPERATION - The rated filament voltage, as measured at the filament terminals, should be 7.0 Volts, with maximum allowable variation due to line fluctuations of from 6.65 to 7.35 Volts.

INTERLOCKS - An interlock device should be provided to ensure that cooling air flow is established before application of electrical power, including the heater. The circuit should be so arranged that RF drive cannot be applied in the absence of normal plate voltage.

INPUT CIRCUIT - When operated as a grounded grid rf amplifier, the use of a matching network in the cathode circuit is recommended. For best results with a single ended amplifier, and depending on the application it is suggested the network have a "Q" of at least 5, and higher if possible.

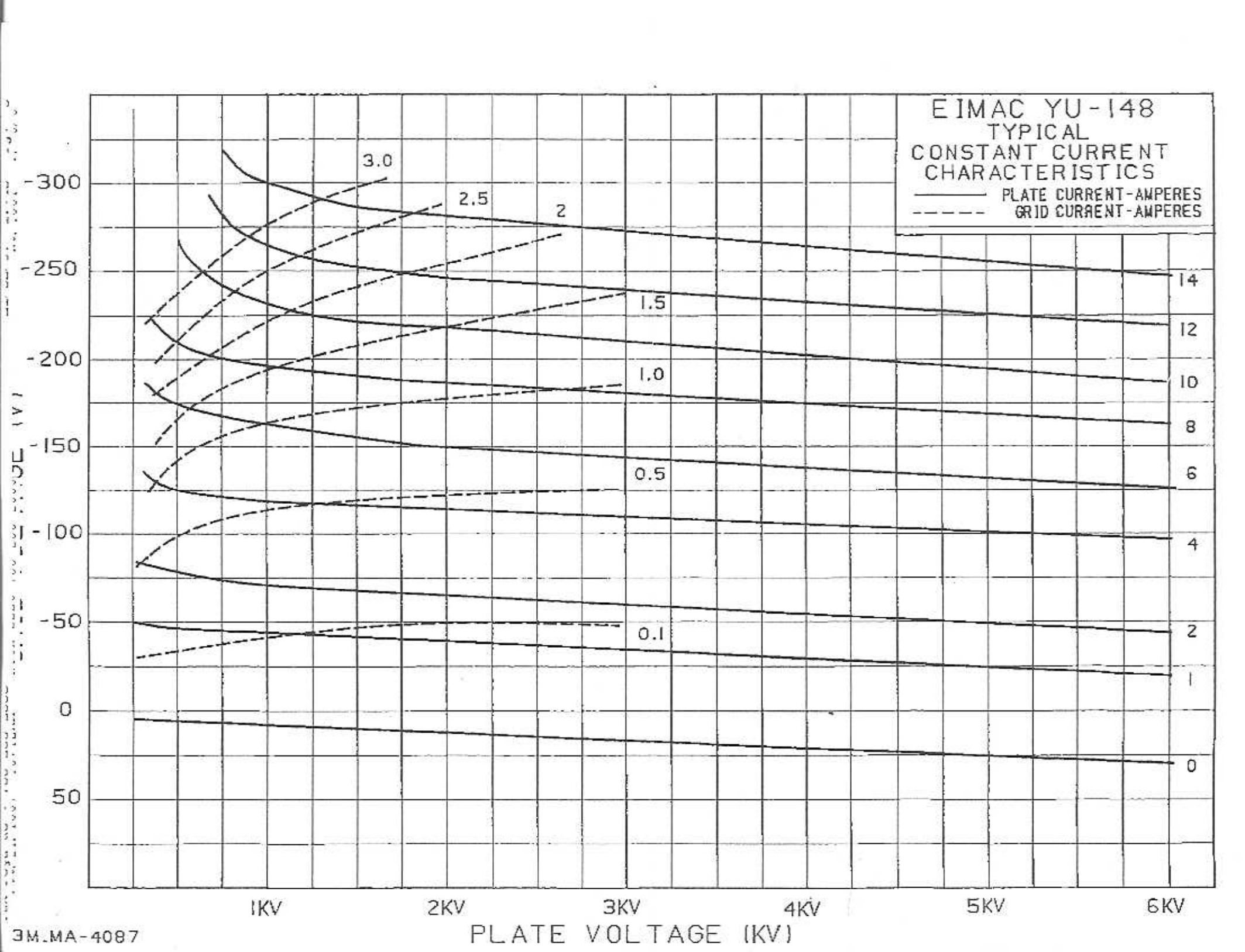
FAULT PROTECTION - It is good practice to protect the tube from internal damage caused by an internal arc which may occur at high anode voltage.

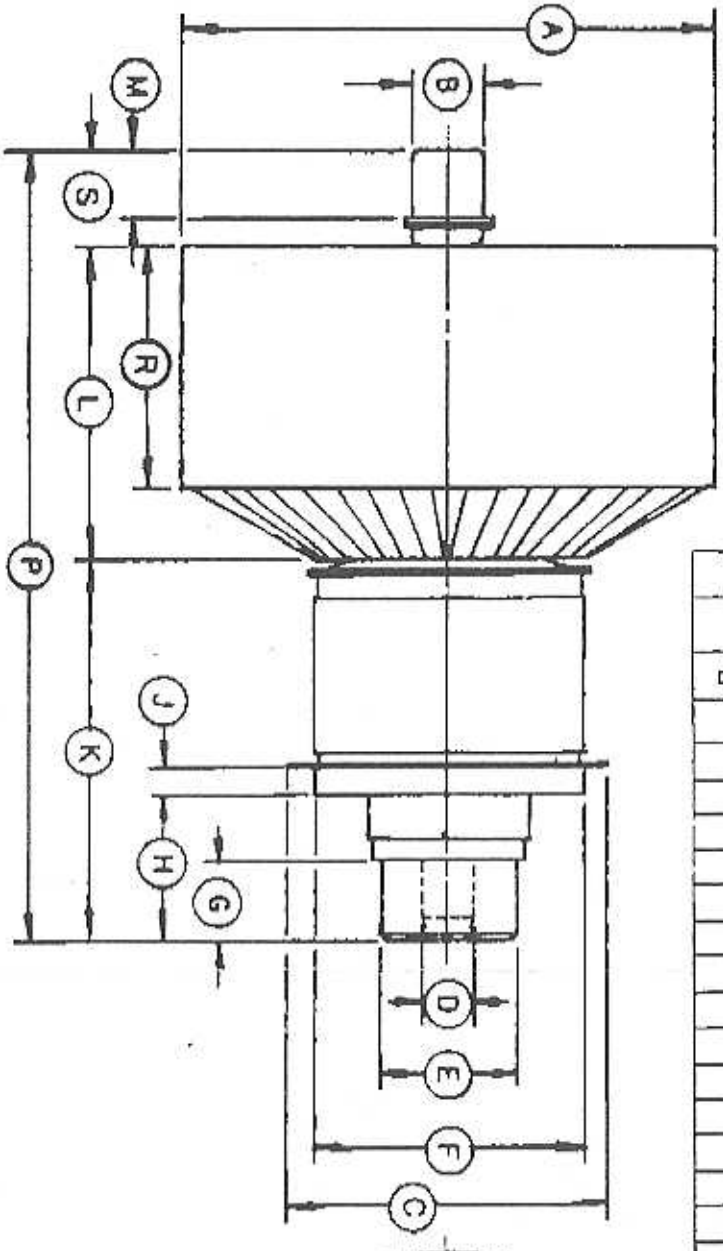
RF RADIATION - Exposure to strong rf fields should be avoided, even at relatively low frequencies. The dangers of rf radiation are more severe at UHF and microwave frequencies and can cause serious bodily and eye injuries. CARDIAC PACEMAKERS MAY BE AFFECTED.

HOT SURFACES - When the tube is used in air and air cooled, external surfaces of the tube may reach temperatures up to 200 degrees C and higher. In addition to the anode, the cathode insulator and cathode/heater surfaces may remain hot for an extended time after the tube is shut off. To prevent serious burns, take care to avoid any bodily contact with these surfaces both during, and for a reasonable cool down period after, tube operation.

CAUTION - HIGH VOLTAGE - *Operating voltage for the YU-148 can be deadly, so the equipment must be designed properly and operating precautions must be followed. Design equipment so that no one can come in contact with high voltages. All equipment must include safety enclosures for high voltage circuits and terminals, with interlock switches to open the primary circuits of the power supply and to discharge high voltage capacitors whenever access doors are opened. Interlock switches must not be bypassed or "cheated" to allow operation with access doors open. Always remember that* ***HIGH VOLTAGE CAN KILL.***

SPECIAL APPLICATIONS - If it is desired to operate this tube under conditions different from those given here, write to the Power Grid Tube Marketing Department, Varian EIMAC, 1678 South Pioneer Road, Salt Lake City, UT 84104, for information and recommendations.


EIMAC YU-148
TYPICAL
CONSTANT CURRENT
CHARACTERISTICS
PLATE CURRENT-AMPERES
GRID CURRENT-AMPERES
3.0
2.5
2
1.5
1.0
0.5
0.1
14
12
10
8
6
4
2
1
0
-300
-250
-200
-150
-100
-50
0
50
1KV
2KV
3KV
4KV
5KV
6KV
PLATE VOLTAGE (KV)
3M-MA-4087



DIMENSIONAL DATA						
	INCHES			MILLIMETERS		
DIM.	MIN.	MAX.	REF.	MIN.	MAX.	REF.
A	6.000	6.125		152.4	155.58	
B	781	.843		19.8	21.4	
C		3.625			92.1	
D	.615	.635		15.6	16.1	
E	1.490	1.510		37.8	38.4	
F	2.990	3.010		75.9	76.4	
G	512	.937		20.6	23.8	
H	1.375	1.625		34.9	41.3	
J	375	.437		9.5	11.1	
K	3.875	4.250		98.4	107.9	
L		3.325			84.5	
M	.687	.812		17.5	20.6	
P	8.000	9.000		203.2	228.6	
R					65.1	65.1
S	1.000	1.125		25.4	28.6