

Tetrode

GL-51038



**PULSED SERVICE
GROUNDED-GRID OPERATION**

**FORCED-AIR COOLED
METAL AND CERAMIC**

INTEGRAL RADIATOR

The GL-51038 is a small-size, four-electrode transmitting tube especially designed for RF grid-pulsed or plate-and-screen pulsed amplifier service at L-band frequencies. This tetrode is particularly well suited for use in airborne or ground-based radar equipment.

long life and reliability, long pulse width, high peakpower and high gain, broad-banding capability, and resistance to shock and vibration.

The tube is capable of providing useful output at frequencies up to approximately 1500 megacycles.

These together with such design factors as an oxide-coated cathode, coaxial elements, and metal-ceramic construction make the tube well adapted to application in modern systems where high performance and reliability are important.

Features of the GL-51038 include

Electrical

	Minimum	Bogey	Maximum	
Heater Voltage (See Note 1)	-	6.3	6.8	Volts
Heater Current	-	5.6	-	Amperes
Cathode Heating Time	1	-	-	Minute
Direct Interelectrode Capacitances*				
Input	-	24	-	$\mu\mu f$
Output	-	9	-	$\mu\mu f$

Mechanical

Mounting Position - Any				
Net Weight			0.8	Pounds

Thermal

Cooling - Forced Air †				
Radiator ‡				
Plate Dissipation	600	400	-	Watts
Air Flow, 45 C incoming air temperature, at sea level	9	4.5	-	Min Cubic Feet per Minute
Static Pressure, approximate	0.5	0.2	-	Inches-Water
Anode Hub Temperature Δ			250	Max C
Seals				
Screen and Control Grid, approximate			1	Cubic Foot per Minute
Heater and Cathode, approximate			1	Cubic Foot per Minute
Ceramic Temperature at any Point			200	Max C

Note 1: Because the temperature of the cathode is increased by back bombardment of electrons at UHF, required heater voltage for optimum life decreases with increasing frequency. The amount of heater-voltage reduction is dependent on operating conditions. However, this voltage should not be less than 5.5 volts.

RADIO - FREQUENCY POWER AMPLIFIER - CLASS B

Maximum Ratings

Plate- and Screen-Grid Pulsed, 500 Megacycles

DC Plate Voltage, during pulse	10	Kilovolts
DC Plate Current, during pulse	10	Amperes
DC Grid-No. 2 Voltage, during pulse	2000	Volts
DC Grid-No. 2 Input	15	Watts
Plate Dissipation	500	Watts
DC Grid-No. 1 Voltage, not pulsed	-175	Volts
DC Grid-No. 1 Current, during pulse	2.5	Amperes
Pulse Width	15	Microseconds
Duty Factor	0.0012	

Typical Operation

Grounded-grid Circuit, 500 Megacycles, 1/4 λ Output Circuit

DC Plate Voltage, during pulse	9	Kilovolts
DC Grid-No. 2 Voltage, during pulse	1400	Volts
DC Grid-No. 1 Voltage, not pulsed	-125	Volts
Peak RF Plate Voltage	7000	Volts
Peak RF Grid Voltage	300	Volts
DC Plate Current, during pulse	9.2	Amperes
DC Grid-No. 1 Current, during pulse	1.1	Amperes
DC Grid-No. 2 Current, during pulse	0.47	Amperes
Driving Power at Tube, during pulse	2.6	Kilowatts
Power Output, during pulse (useful)	52	Kilowatts
Pulse Width	15	Microseconds
Duty Factor	0.001	

RADIO - FREQUENCY POWER AMPLIFIER - CLASS C

Maximum Ratings

Pulsed Drive, 1250 Megacycles

DC Plate Voltage	5	Kilovolts
DC Plate Current, during pulse	6	Amperes
DC Grid-No. 2 Voltage	1.1	Kilovolts
DC Grid-No. 2 Input	5	Watts
DC Grid-No. 1 Voltage	-225	Volts
DC Grid-No. 1 Current	1.5	Amperes
Plate Dissipation	500	Watts
Pulse Width	15	Microseconds
Duty Factor	0.01	

Typical Operation

Grounded-grid Circuit at 1100 Megacycles, 3/4 λ Output Circuit

DC Plate Voltage **	4.8	Kilovolts
DC Plate Current, during pulse	4.2	Amperes
DC Grid-No. 2 Voltage	1	Kilovolt
DC Grid-No. 2 Current, during pulse	100	Milliamperes
DC Grid-No. 1 Voltage	-200	Volts
DC Grid-No. 1 Current, during pulse	200	Milliamperes
Driving Power at Tube, during pulse	1.5	Kilowatts
Power Output, during pulse (useful)	11	Kilowatts
Pulse Width	15	Microseconds
Duty Factor	0.01	

* Control grid connected directly to screen grid.

† Forced air cooling should be applied during the application of any voltages.

§ Provision must be made for unobstructed passage of cooling air through the radiator fins, and between the anode terminal and adjacent portion of the radiator.

Δ Measured at the base of the radiator and adjacent to the plate terminal.

◆ Maximum average value.

♥ For applications that require longer pulses or higher duty refer to the tube manufacturer for recommendations.

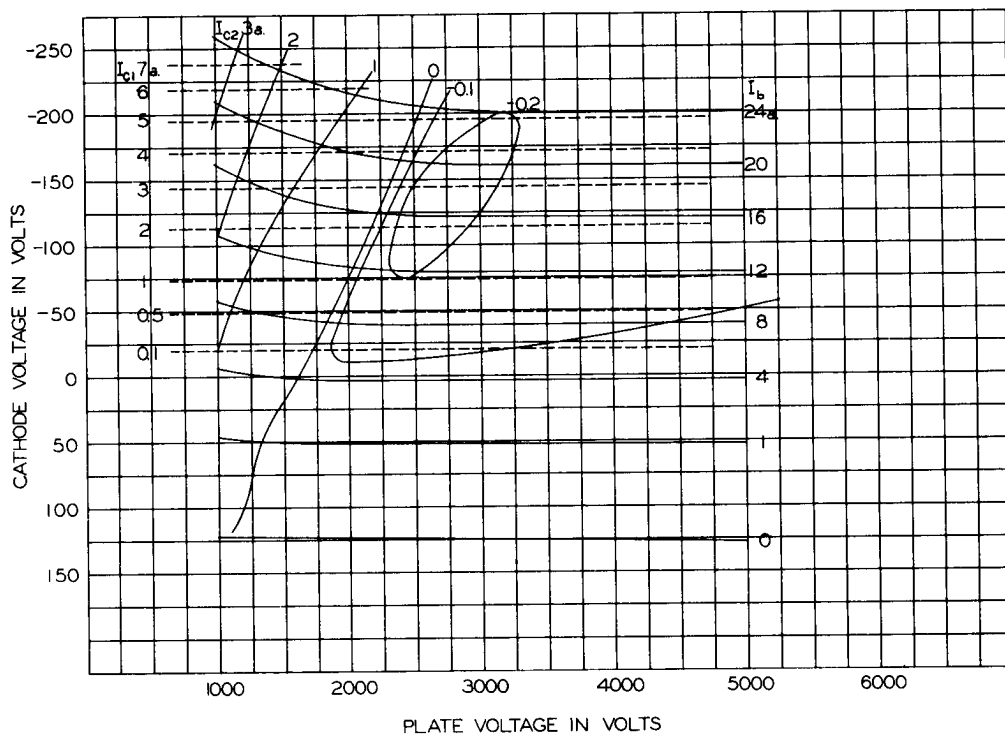
◇ Pulse duration measured between points at 70 percent of peak value. The peak value is defined as the maximum value of a smooth curve through the average of the fluctuations over the top portion of the pulse.

∅ Maximum ratio of on-time to elapsed time during any 12.5-millisecond period.

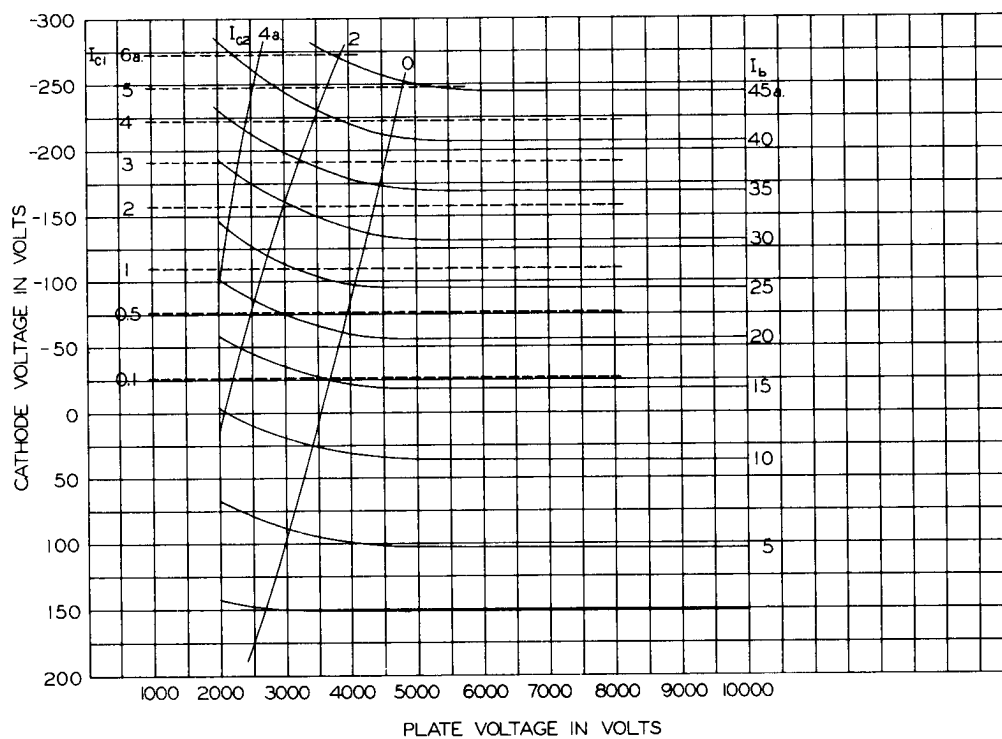
∅∅ Maximum ratio of on-time to elapsed time during any 1.5-millisecond period.

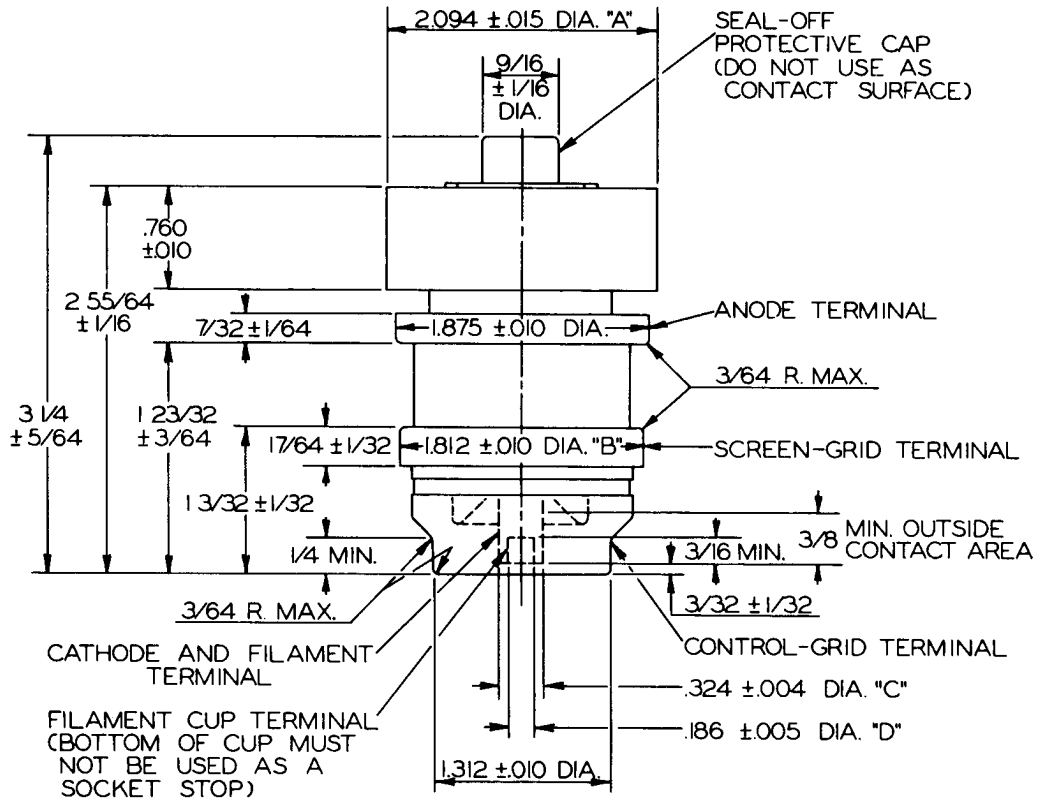
** A minimum surge-limiting resistance of 50 ohms must be placed between the plate of the tube and the B+ power supply at steady-state voltages greater than 3.5 kilovolts.

CONSTANT CURRENT CHARACTERISTIC
 SCREEN VOLTAGE = 1000 VOLTS
 ALL VOLTAGES REFERENCED TO CONTROL GRID



CONSTANT CURRENT CHARACTERISTIC
 SCREEN VOLTAGE = 2000 VOLTS
 ALL VOLTAGES REFERENCED TO CONTROL GRID





CONCENTRICITIES:

The following total indicator readings are measured with respect to a centerline determined by the centers of the anode terminal and control grid terminal.

- Diameter A - 0.030 inches
- Diameter B - 0.016 inches
- Diameter C - 0.036 inches
- Diameter D - 0.042 inches

Total indicator reading of filament cup terminal diameter (D) measured with respect to center of cathode and filament terminal diameter (C) - 0.016 inches.