



DESCRIPTION AND RATING

FOR GROUNDED-GRID OSCILLATOR AND AMPLIFIER SERVICE

Metal and Ceramic Low Interelectrode Capacitances
High Transconductance Shock Resistant

100 Watts Plate Dissipation

The 2C39-B is a metal-and-ceramic, high- μ triode designed for use as a grounded-grid oscillator or amplifier at frequencies as high as 2500 megacycles.

Features of the 2C39-B include planar electrode construction, high plate dissipation capability, excellent electrode isolation, low radio-frequency losses, high transconductance, and low interelectrode capacitances.

GENERAL

ELECTRICAL

Cathode—Coated Unipotential
Heater Characteristics and Ratings
Heater Voltage, AC or DC * Volts
Heater Current at $E_f = 6.3$ volts 1.03† Amperes
Direct Interelectrode Capacitances‡
Grid to Plate: (g to p) 2.01 pf
Grid to Cathode: (g to k) 6.5 pf
Plate to Cathode: (p to k) 0.023 pf

MECHANICAL

Mounting Position—Any—Only Plate Flange to Be Used as a Socket Stop and Clamp
Net Weight, approximate 2 Ounces
Cooling
Plate and Plate Seal—Conduction and Forced Air
Grid and Cathode Seals—Conduction and Forced Air
Recommended Air Flow Cowling—157-JAN
Recommended Air Flow on Plate Radiator at Sea Level
Incoming Air Temperature 25C, Plate Dissipation
100 Watts 12.5 Cubic Feet Per Minute

MAXIMUM RATINGS

ABSOLUTE-MAXIMUM VALUES

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR—CLASS C TELEGRAPHY

Key-Down Conditions per Tube Without Amplitude Modulation§
Heater Voltage* 4.5 to 6.3 Volts
DC Plate Voltage 1000 Volts
Negative DC Grid Voltage 150 Volts
Peak Positive RF Grid Voltage 30 Volts
Peak Negative RF Grid Voltage 400 Volts
DC Grid Current 50 Milliampères
DC Cathode Current 125 Milliampères
Plate Dissipation 100 Watts
Grid Dissipation 2.0 Watts
Envelope Temperature at Hottest Point ¶ 250 C

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR—CLASS C TELEPHONY

Carrier Conditions per Tube For Use With a Maximum Modulation Factor of 1.0
Heater Voltage* 4.5 to 6.3 Volts
DC Plate Voltage¶ 600 Volts
Negative DC Grid Voltage 150 Volts
Peak Positive RF Grid Voltage 30 Volts
Peak Negative RF Grid Voltage 400 Volts
DC Grid Current 50 Milliampères
DC Cathode Current 100 Milliampères
Plate Dissipation 70 Watts
Grid Dissipation 2.0 Watts
Envelope Temperature at Hottest Point ¶ 250 C

CHARACTERISTICS AND TYPICAL OPERATION

AVERAGE CHARACTERISTICS

Heater Voltage.....	6.3	Volts
Plate Voltage.....	600	Volts
Grid Voltage△.....		Volts
Amplification Factor.....	95	
Transconductance.....	24800	Micromhos
Plate Current.....	75	Milliamperes

* The equipment designer should design the equipment so that heater voltage is centered at some value within the range of 4.5 to 6.3 volts. Heater voltage variations about the center value should be kept as small as practical and should not, in any case, exceed $\pm 5\%$. The optimum center value of heater voltage depends on the cathode current and on other parameters of circuit design and operation. For specific recommendations, contact your General Electric tube sales representative.

† Heater current of a bogey tube at $E_f = 6.3$ volts.

RADIO FREQUENCY OSCILLATOR—CLASS C

Frequency.....	500	2500	Megacycles
Heater Voltage.....	6.0	5.0	Volts
DC Plate Voltage.....	900	900	Volts
DC Plate Current.....	90	90	Milliamperes
DC Grid Current.....	30	27	Milliamperes
DC Grid Voltage.....	-40	-22	Volts
Useful Power Output.....	40	17	Watts

‡ Measured in a special shielded socket.

§ Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115 percent of the carrier conditions.

* Where long life and reliable operation are important, lower envelope temperatures should be used.

¶ For modulation factors less than 1.0, a higher d-c plate voltage may be used if the sum of the peak positive audio voltage and the d-c plate voltage does not exceed 1200 volts.

△ Adjusted for $I_b = 75$ milliamperes.

INITIAL CHARACTERISTICS LIMITS

	Min.	Bogey	Max.	
Heater Current				
$E_f = 6.3$ volts.....	950	1030	1100	Milliamperes
Grid Voltage				
$E_f = 6.3$ volts, $E_b = 600$ volts, $I_b = 75$ ma.....	-1.3	-2.5	-3.5	Volts
Grid Voltage				
$E_f = 6.3$ volts, $E_b = 600$ volts, $I_b = 1.0$ ma.....	-7.0	-9.5	-15	Volts
Transconductance				
$E_f = 6.3$ volts, $E_b = 600$ volts, E_c adjusted for $I_b = 75$ ma.....	22000	24800	27500	Micromhos
Amplification Factor				
$E_f = 6.3$ volts, $E_b = 600$ volts, E_c adjusted for $I_b = 75$ ma.....	75	95	115	
Negative Grid Current				
$E_f = 6.3$ volts, $E_b = 600$ volts, E_c adjusted for $I_b = 75$ ma.....			3.0	Microamperes
Interelectrode Leakage Resistance				
$E_f = 6.3$ volts, Polarity of applied d-c interelectrode voltage is such that no cathode emission results				
Grid to Cathode at 500 volts d-c.....	50			Megohms
Interelectrode Capacitances				
Grid to Plate: (g to p).....	1.89	2.01	2.13	Picofarads
Grid to Cathode: (g to k).....	6.0	6.5	7.0	Picofarads
Plate to Cathode: (p to k).....	0.018	0.023	0.029	Picofarads

Absolute-Maximum ratings are limiting values of operating and environmental conditions applicable to any electron tube of a specified type as defined by its published data and should not be exceeded under the worst probable conditions.

The tube manufacturer chooses these values to provide acceptable serviceability of the tube, making no allowance for equipment variations, environmental variations, and the effects of changes in operating conditions due to variations in the characteristics of the tube under consideration and of

all other electron devices in the equipment.

The equipment manufacturer should design so that initially and throughout life no absolute-maximum value for the intended service is exceeded with any tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of the tube under consideration and of all other electron devices in the equipment.

The tubes and arrangements disclosed herein may be covered by patents of General Electric Company or others. Neither the disclosure of any information herein nor the sale of tubes by General Electric Company conveys any license under patent claims covering combinations of tubes with other devices or

elements. In the absence of an express written agreement to the contrary, General Electric Company assumes no liability for patent infringement arising out of any use of the tubes with other devices or elements by any purchaser of tubes or others.

SPECIAL PERFORMANCE TESTS

DEGRADATION RATE TESTS

Min. Max.

Oscillator Power Output

Tubes are tested for power output as an oscillator under the following conditions:

$E_f = 5.0$ volts; $F = 2500$ MC, min.; $E_b = 1000$ volts; $I_b = 90$

ma. 15 Watts

Low Pressure Voltage Breakdown Test

Statistical sample tested for voltage breakdown at a pressure of 27 mm Hg. Tubes shall not give visual evidence of flashover when 1000 volts RMS, 60 cps, is applied between the plate and grid terminals.

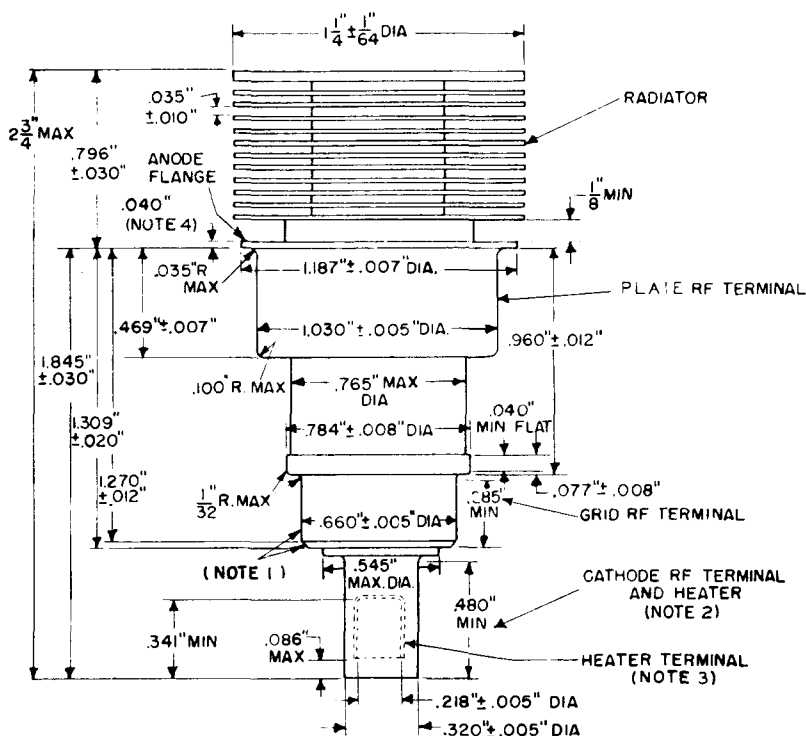
Shock

Statistical sample subjected to 5 input accelerations of approximately 400 G and 1.0 milliseconds duration in each of four positions. The accelerating forces are applied by the Navy-type, High Impact (flyweight) Shock Machine.

500-Hour Life Test

Statistical sample operated for 500 hours as an oscillator to evaluate changes in power output with life.

PHYSICAL DIMENSIONS

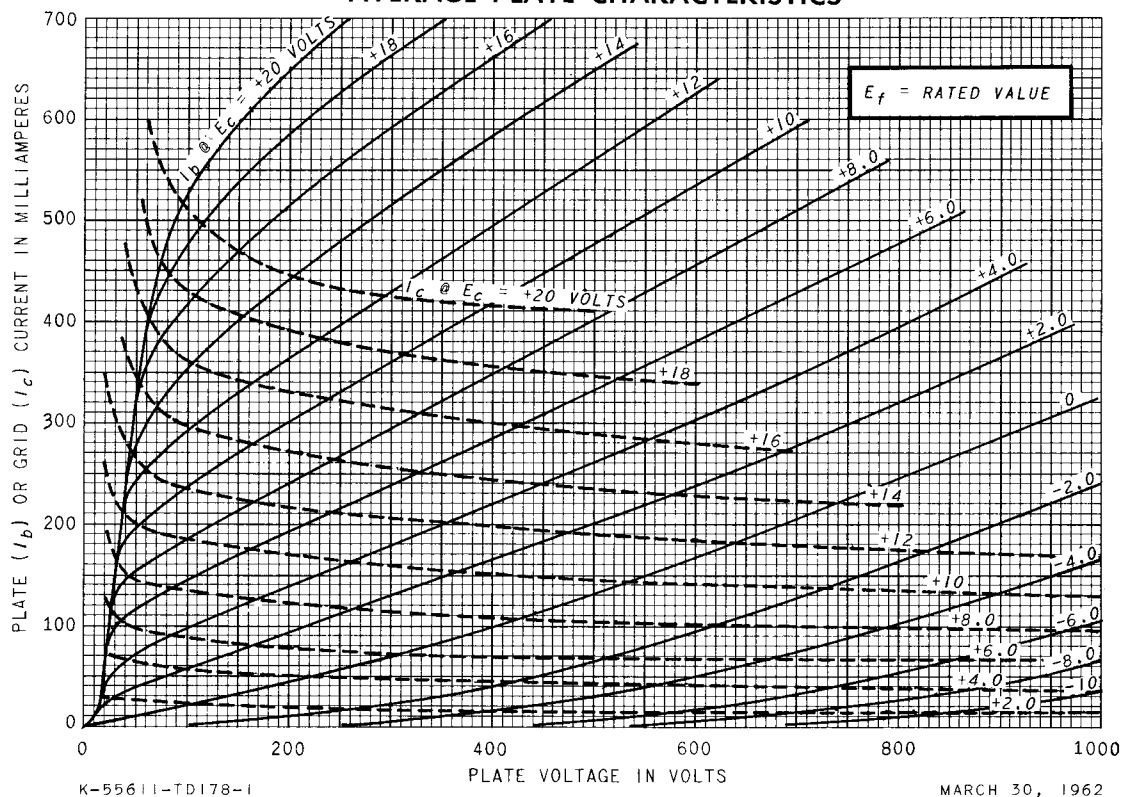


NOTES:

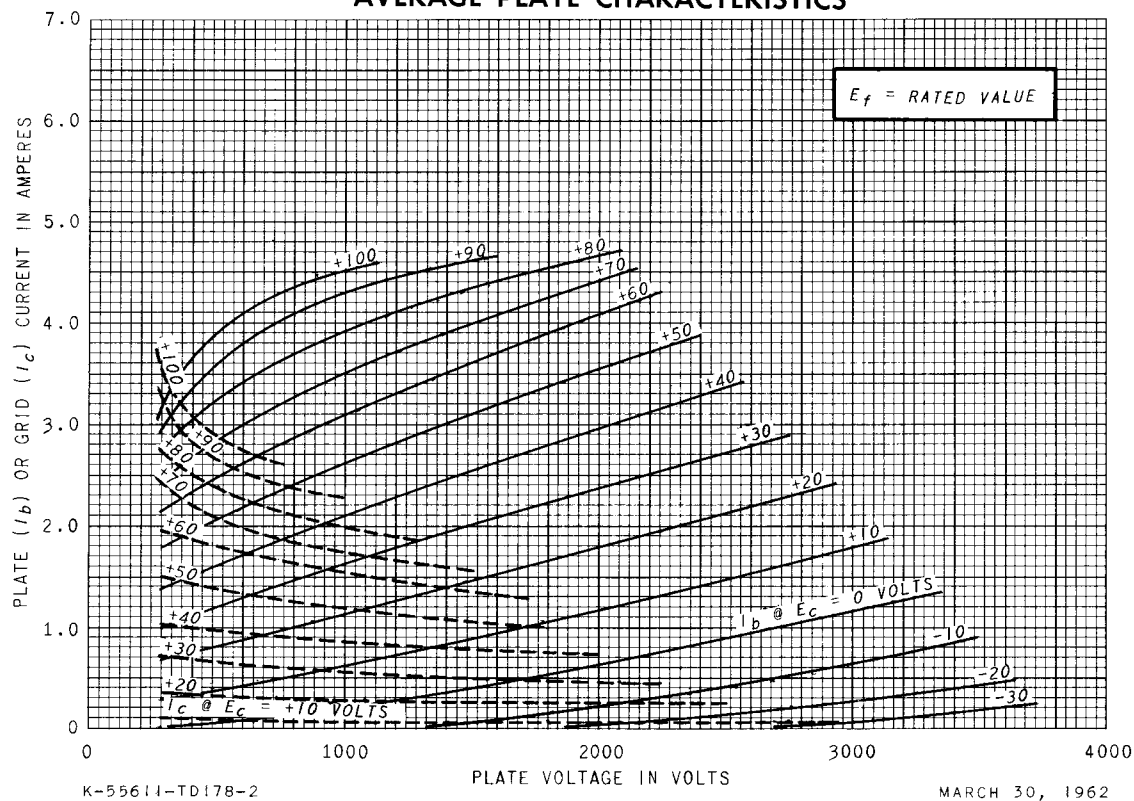
1. Solder not to extend radially beyond grid RF terminal.
2. Total indicated runout of the grid-contact surface and the cathode-contact surface with respect to the anode shall not exceed 0.020".
3. Total indicated runout of the cathode-contact surface with respect to the heater-contact surface shall not exceed 0.012".
4. Only this flange to be used as a socket stop and clamp.

* New pages 3 to 6 supersede old pages 3 and 4 dated 12-61.

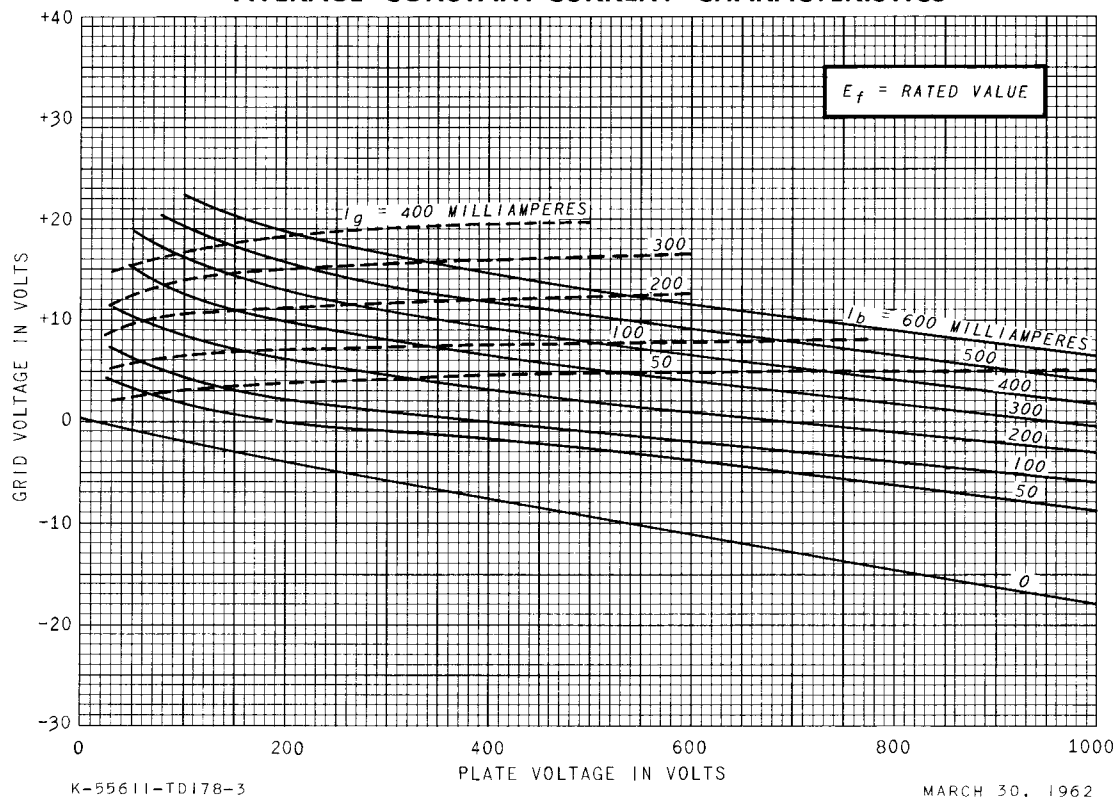
AVERAGE PLATE CHARACTERISTICS



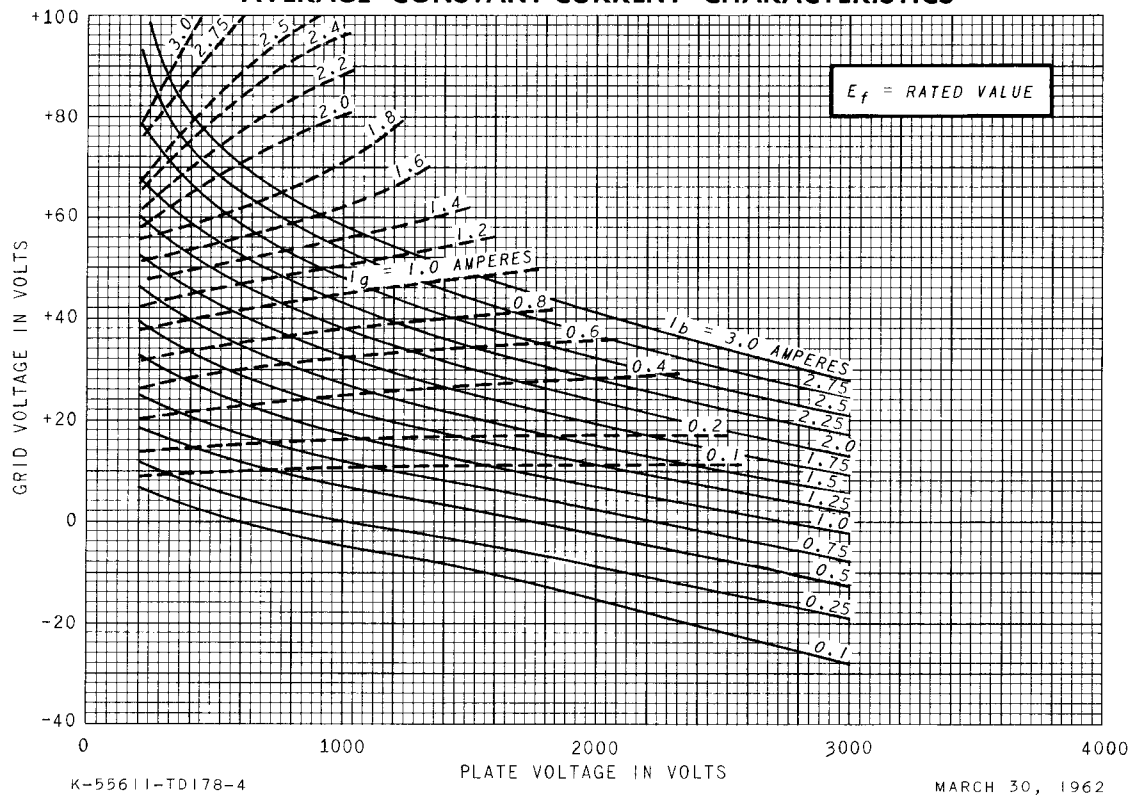
AVERAGE PLATE CHARACTERISTICS



AVERAGE CONSTANT-CURRENT CHARACTERISTICS



AVERAGE CONSTANT-CURRENT CHARACTERISTICS



RECEIVING TUBE DEPARTMENT

GENERAL  **ELECTRIC**

Owensboro, Kentucky