

METAL-CERAMIC TRIODE

DESCRIPTION AND RATING

The 8082 is a high-mu triode of ceramic-and-metal planar construction primarily intended for use as an oscillator in the ultra-high-frequency range.

GENERAL

ELECTRICAL

Cathode—Coated Unipotential

Heater Characteristics and Ratings

Heater Voltage, AC or DC† 6.3 ± 0.3 Volts

Heater Current‡ 0.24 Amperes

Direct Interelectrode Capacitances§

Grid to Plate: (g to p) 1.3 pf

Input: g to (h+k) 1.8 pf

Output: p to (h+k) 0.032 pf

Heater to Cathode: (h to k) 1.5 pf

MECHANICAL

Mounting Position—Any ¶

MAXIMUM RATINGS

ABSOLUTE-MAXIMUM VALUES

Plate Voltage 250 Volts

Positive DC Grid Voltage 0 Volts

Negative DC Grid Voltage 50 Volts

Peak Negative Grid Voltage 50 Volts

Plate Dissipation 1.0 Watt

DC Grid Current 2.2 Milliamperes

DC Cathode Current 11 Milliamperes

Peak Cathode Current 40 Milliamperes

Heater-Cathode Voltage

Heater Positive with Respect to Cathode 50 Volts

Heater Negative with Respect to Cathode 50 Volts

Grid-Circuit Resistance 10000 Ohms

Envelope Temperature at Hottest Point# 250 C

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.

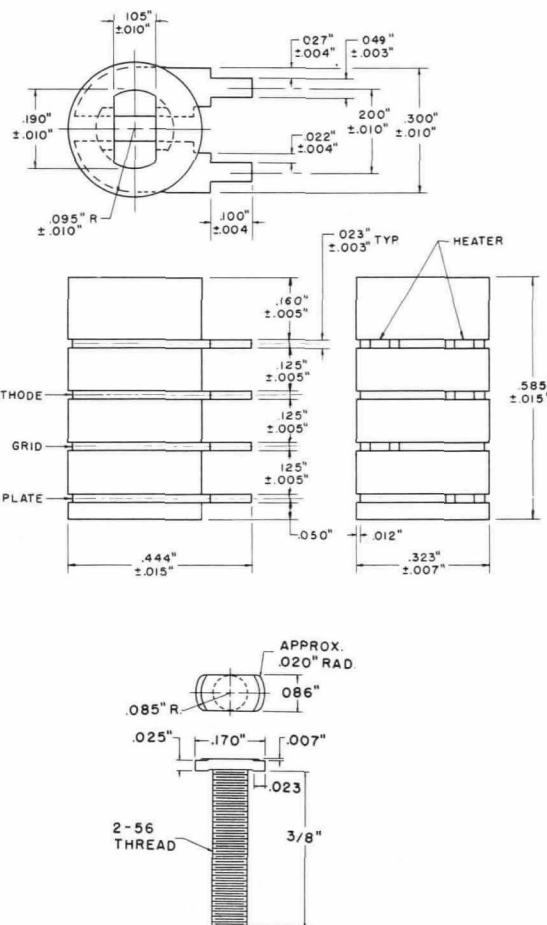
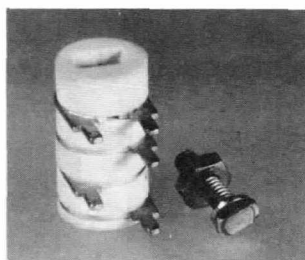
The tube manufacturer chooses these values to provide acceptable serviceability of the tube, making no allowance for equipment variations, environmental variations, and the effects of changes in operating conditions due to variations in the characteristics of the tube under consideration and of

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.



CHARACTERISTICS AND TYPICAL OPERATION

AVERAGE CHARACTERISTICS

Table with 3 columns: Parameter, Value 1, Value 2. Rows include Plate Voltage, Grid Voltage, Cathode-Bias Resistor, Amplification Factor, Transconductance, and Plate Current.

UHF OSCILLATOR SERVICE

Table with 2 columns: Parameter, Value. Rows include Plate Voltage, Grid Resistor, Plate Current, Frequency, Grid Current, and Power Output.

FOOTNOTES

- † The equipment designer should design the equipment so that heater voltage is centered at the specified bogey value, with heater supply variations restricted to maintain heater voltage within the specified tolerance.
- ‡ Heater current of a bogey tube at Ef=6.3 volts.
- § Without external shield.
- ¶ One method of mounting the 8082 is to use a stainless-steel "T" bolt (see drawing) to attach the mounting base of the tube to a chassis or circuit board. The "T" bolt should be inserted in the slot in the base of the tube, turned 90 degrees, and attached to the chassis or circuit board with a 2-56 nut and lock washer. Torque used to tighten the nut should not exceed 3 inch-pounds.
- # Operation below the rated maximum envelope temperature is recommended for applications requiring the longest possible tube life. The 8082 is also capable of operation at envelope temperatures much higher than the rated maximum value. For specific recommendations concerning higher temperature operation, contact your General Electric tube sales representative.

SPECIAL PERFORMANCE TESTS

Table with 3 columns: Min., Bogey, Max. Row 1: Grid Recovery, Change in Average Plate Current, 0.6 Milliamperes. Row 2: Peak Plate Current Backswing, 1.0 Milliamperes.

Tubes with poor grid recovery affect circuit operation when the grid is driven positive by a pulse of signal or noise, somewhat as if a parallel RC circuit were in series with the grid. This effect may occur in tubes of any type, but is unimportant in many applications. In the majority of 8082 tubes the effect is negligible, but to eliminate the few in which it may be excessive, tubes are tested under the following conditions: Ef=6.3 volts, Ebb=250 volts, RL=0.01 meg, Ec adjusted for Ib=3.0 ma.

Upon application to the grid of a 5-volt positive pulse (prf=60 pps, duty factor=0.0012) the change in average plate current is noted, and the peak plate current backswing is measured. The following diagram shows qualitatively the plate current-time relationship for a tube (with poor grid recovery) subjected to this test.

PLATE CURRENT VS. TIME
—GRID-RECOVERY TEST

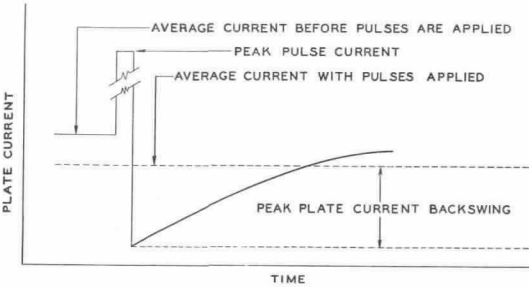


Table with 3 columns: Min., Bogey, Max. Row 1: Pulse Cathode Current, Ef=6.3 volts, Eb=150 volts, Ec=-10 volts. Grid is driven 7 volts positive with a pulse having a prf of 1000 pps and a duty factor of 0.01, 90 Milliamperes.

Low Pressure Voltage Breakdown Test
Statistical sample tested for voltage breakdown at a pressure of 8mm Hg, to simulate an altitude of 100,000 feet. Tubes shall not give visual evidence of flashover or corona when 300 volts RMS, 60 cps, is applied between the plate and grid terminals.

DEGRADATION RATE TESTS

Fatigue

Statistical sample vibrated for a total of six hours, three hours in each of two planes, at a peak acceleration of 10G. Frequency is continuously varied from 30 cps to 2000 cps and back to 30 cps, with a period of ten minutes. Tubes are mounted by T-bolt with 3 inch-pounds torque, and operated during the test with $E_f = 6.3$ volts, $E_b = 150$ volts, and $R_k = 82$ ohms. Following the test, tubes are evaluated for low frequency vibrational output, heater-cathode leakage, and heater current.

Shock

Statistical sample subjected to 5 impact accelerations of approximately 450G in each of four positions. The accelerating forces are applied by the Navy-type, High Impact (flyweight) Shock Machine using a 30° hammer angle. Tubes are operated during the test with $E_f = 6.3$ volts, $E_b = 150$ volts, $E_{hk} = +100$ volts, and $R_k = 82$ ohms. Following the test, tubes are evaluated for low frequency vibrational output, heater-cathode leakage, and heater current.

Stability Life Test

The statistical sample subjected to the Dynamic Life Test is evaluated for percent change in zero-bias transconductance of individual tubes, from the initial reading to readings following 2 hours and 20 hours of the life test.

Survival Rate Life Test

The combined statistical samples subjected to the Dynamic and Pulse Life Tests are evaluated for shorted and open elements following approximately 100 hours of life test.

Dynamic Life Test

Statistical sample operated, with a 60 cps grid signal, at maximum rated DC grid current and cathode current for a period of 1000 hours. Heater voltage is cycled (on $1\frac{3}{4}$ hours, off $\frac{1}{4}$ hour). Tubes are evaluated, following 500 and 1000 hours of life test, for shorted or open elements, heater current, zero-bias transconductance, heater-cathode leakage, and interelectrode leakage resistance.

Pulse Life Test

Statistical sample operated with 120 ma peak cathode current, 0.01 duty factor, for 1000 hours. Heater voltage is cycled (on $1\frac{3}{4}$ hours, off $\frac{1}{4}$ hour). Tubes are evaluated, following 500 and 1000 hours of life test, for shorted or open elements, heater current, pulse emission, heater-cathode leakage, and interelectrode leakage resistance.

Interface Life Test

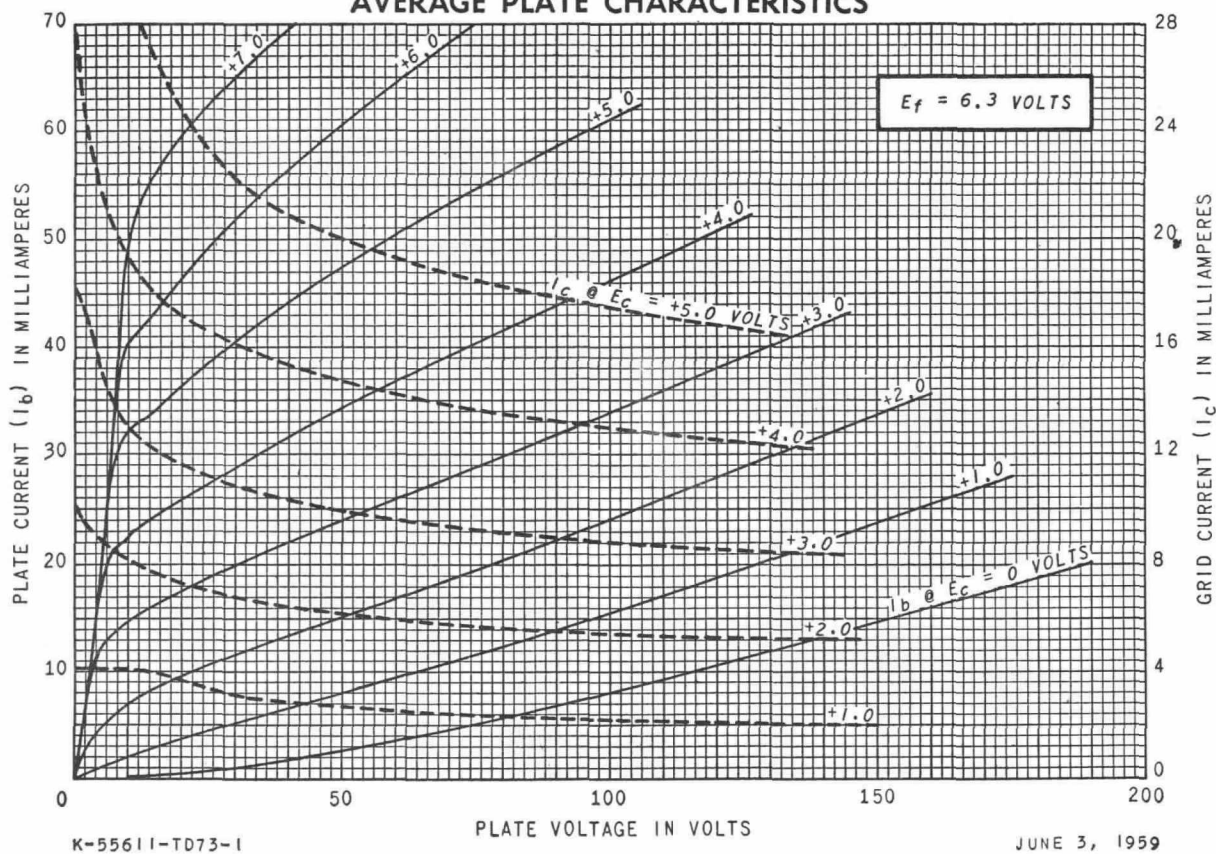
Statistical sample operated for 1000 hours with $E_f = 6.6$ volts, no other voltages applied, and evaluated for cathode interface resistance following the life test.

Heater-Cycling Life Test

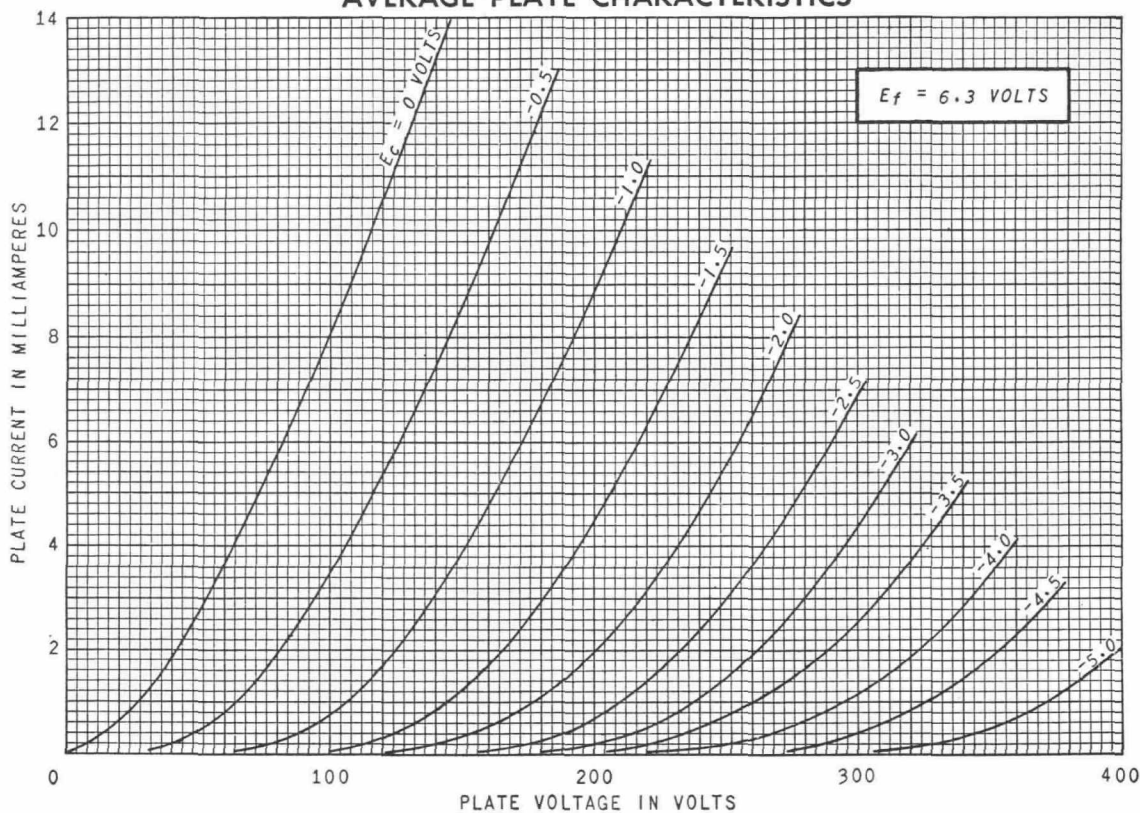
Statistical sample operated for 2000 cycles minimum to evaluate and control heater-cathode defects. Conditions of test include $E_f = 7.0$ volts cycled for one minute on and one minute off, $E_b = E_c = 0$ volts, and $E_{hk} = 70$ volts with heater positive with respect to cathode. Following this test tubes are evaluated for open heaters, heater-cathode shorts, and heater-cathode leakage current.

Note: The conditions for some of the indicated tests have deliberately been selected to aggravate tube failures for test and evaluation purposes. In no sense should these conditions be interpreted as suitable circuit operating conditions.

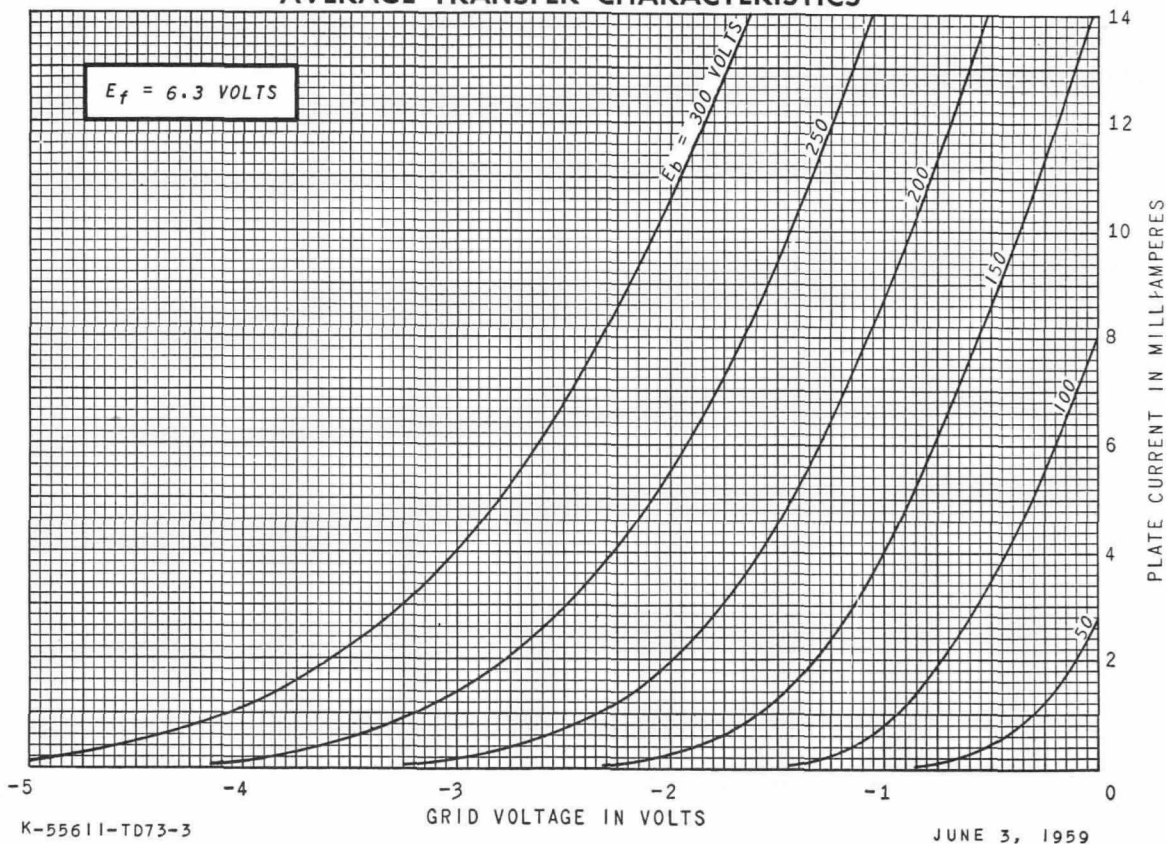
AVERAGE PLATE CHARACTERISTICS



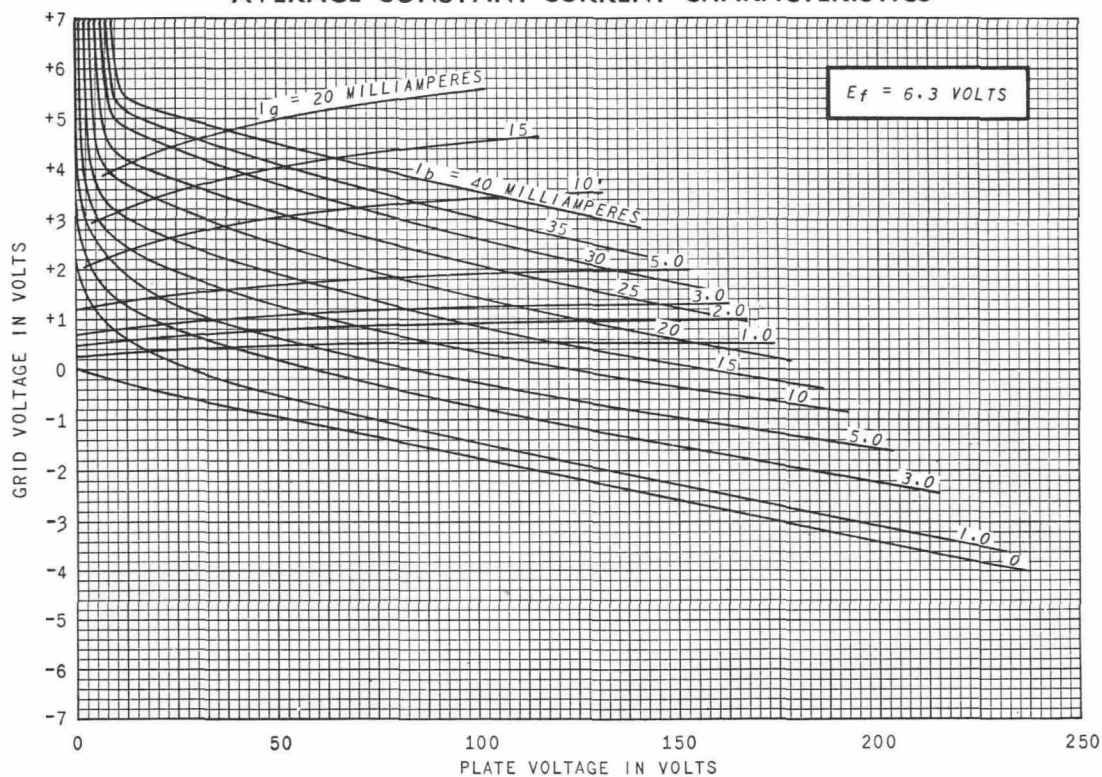
AVERAGE PLATE CHARACTERISTICS



AVERAGE TRANSFER CHARACTERISTICS



AVERAGE CONSTANT-CURRENT CHARACTERISTICS



RECEIVING TUBE DEPARTMENT
GENERAL ELECTRIC
Owensboro, Kentucky