SYLVANIA

engineering data service

5908

MECHANICAL DATA

Bulb	T-3
Base	E8-10, Subminiature Button Flexible Leads
Outline	JETEC 3-1
Basing	8DC
Cathode	Coated Unipotential
Mounting Position	Any

RATINGS[1] (Absolute Maximum)

Impact Acceleration	450 G
Uniform Acceleration	1000 G
Fatigue (Vibrational Acceleration for Extended Periods)	2.5 G
Bulb Temperature	220° C
Altitude	80000 Ft.

ELECTRICAL DATA

HEATER CHARACTERISTICS

	Min.	Bogey	Max.	
Heater Voltage[2]	25.2	26.5	27.8	V
Heater Current		150		mA

DIRECT INTERELECTRODE CAPACITANCES

	Shielded[3]	Unshielded	
Grid No. 1 to Plate	0.06	0.08 μμf	Max.
Grid No. 1 to All Other Elements	4.0	4.0 μμf	
Grid No. 1 to Grid No. 3	0.26	0.26 μμf	Max.
Grid No. 3 to All Other Elements	4.6	4.6 μμf	
Grid No. 3 to Plate	1.9	2.0 μμf	Max.
Plate to All Other Elements	4.6	3.2 μμf	

RATINGS[1 & 4] (Absolute Maximum)

Plate Voltage	55 Vdc
Grid No. 2 Voltage	55 Vdc
DC Grid No. 3 Voltage	
Negative Value	55 Vdc
DC Grid No. 1 Voltage	
Positive Value	0 Vdc
Negative Value	55 Vdc
Grid No. 3 Current	1.5 mAdc
Grid No. 1 Current	1.5 mAdc
Cathode Current	10.0 mAdc
Heater-Cathode Voltage	
Heater Positive with Respect to Cathode	100 v
Heater Negative with Respect to Cathode	100 v
Grid No. 1 Circuit Resistance	2.4 Meg

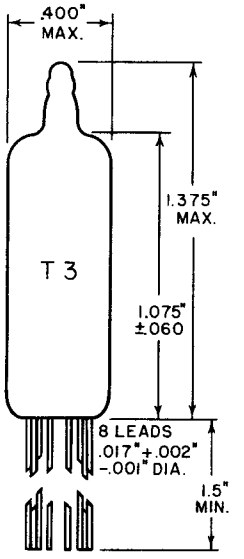
CHARACTERISTICS[5]

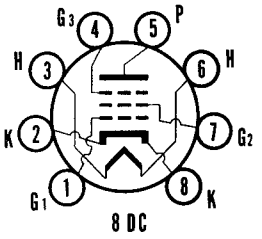
	Amplifier	Mixer	
Plate Voltage	26.5	26.5	Vdc
Grid No. 2 Voltage	26.5	26.5	Vdc
Grid No. 3 Voltage	0	0	Vdc
Grid No. 3 Voltage	0	10	Vac
Grid No. 1 Resistor	2.2	2.2	Meg
Plate Current	3.3	2.1	mAdc
Grid No. 2 Current	2.0	2.4	mAdc
Transconductance, Grid No. 1 to Plate	2200	—	μmhos
Transconductance, Grid No. 3 to Plate	550	—	μmhos

QUICK REFERENCE DATA

The Premium Subminiature Type 5908 is a sharp cutoff, dual control pentode designed to operate from a 26.5 volt heater and B supply. This type is particularly useful as a mixer at frequencies up to 400 mc, but may also be used in gating and other applications at low frequencies.

The type 5908 is designed for operation under conditions of severe shock, vibration, high temperature and high altitude, and is manufactured and inspected to meet the applicable MIL-E-I specification for reliable operation.





SYLVANIA ELECTRIC PRODUCTS INC.

RADIO TUBE DIVISION
EMPORIUM, PA.

Prepared and Released By The TECHNICAL PUBLICATIONS SECTION EMPORIUM, PENNSYLVANIA

AUGUST, 1957

CHARACTERISTICS[5] (Continued)

	Amplifier	Mixer
Plate Resistance	31000	65000 Ohms
Conversion Transconductance Direct Transformer Input	—	1000 μmhos
Grid No. 1 Voltage for Ib = 10 μa (approx.)	-5	— Vdc
Grid No. 3 Voltage for Ib = 10 μa (approx.)	-7	— Vdc

NOTES:

1. *Limitations beyond which normal tube performance and tube life may be impaired.*
2. *Tube life and reliability of performance are directly related to the degree of regulation of the heater voltage to its center rated value of 26.5 volts.*
3. *External shield of 0.405 inch diameter connected to cathode.*
4. *Values shown are as registered with RETMA.*
5. *All voltages referred to ground.*

ACCEPTANCE CRITERIA

Test Conditions

Heater Voltage	26.5 V	Grid No. 3 Voltage (Tie to Cathode)	0 Vdc
Plate Voltage	26.5 Vdc	Grid No. 1 Resistor	2.2 Meg
Grid No. 2 Voltage	26.5 Vdc		

For the purposes of inspection, use applicable reliable paragraphs of MIL-E-1 and Inspection Instructions for Electron Tubes.

MIL-E-1 Ref.	Tests	Limits Min.	Limits Bogey	Limits Max.	Units
Production Tests					
4.10.8	Heater Current	40	45	50	mA
4.10.6.1	Grid Current: Ec2 = Eb = 50 Vdc; Ec1 = -1.5 Vdc; Rg1 = 0.1 Meg	0	—	-0.3	μAdc
4.10.4.1	Plate Current (1):	2.4	3.3	4.6	mAdc
4.10.4.1	Plate Current (2): Ec1 = -5 Vdc; Rg1 = 0	0	—	100	μAdc
4.10.4.3	Grid No. 2 Current	0.8	2.0	3.4	mAdc
4.10.9	Transconductance (1): Smg1p Cg1 = 1 μf	1800	2200	2600	μmhos
Special Design Tests					
4.9.5.3	Subminiature Lead Fatigue:	4	—	—	Arcs
4.9.19.2	Vibration : F = 40 cps; G = 15; Cg1 = 1 μf; Rp = 10,000 Ohms	—	—	100	mVac
4.10.15	Heater-Cathode Leakage Ehk = +100 Vdc	0	—	10	μAdc
	Ehk = -100 Vdc	0	—	10	μAdc

ACCEPTANCE CRITERIA (Continued)

MIL-E-1 Ref.	Tests	Limits Min.	Limits Bogey	Limits Max.	Units
Special Design Test (Continued)					
4.8	Insulation of Electrode Eg1 — All = -100 Vdc; Ef = 26.5 V	100	—	—	Meg.
4.10.4.1	Plate Current (3): Ec3 = -7.0 Vdc; Ec1 = 0; Rg1 = 0	0	—	50	μAdc
4.10.3.2	AF Noise: Esig = 70 mVac; Rg2 = 1000 Ohms; Rp = 0.2 Meg; Ebb = 100 Vdc; Ecc2 = 19 Vdc	—	—	17	VU
Design Tests					
4.10.9	Transconductance (2): Smg1p Ef = 24.0 V; Cg1 = 1 μf	1600	—	—	μmhos
4.10.9	Transconductance (3): Smg3p Cg1 = 1 μf	300	550	1000	μmhos
4.10.14	Capacitance: With 0.405 In. Dia. Shield Tied to Cathode				
	Cg1p	—	—	0.06	μμf
	Cg3p	—	—	1.90	μμf
	Cg1g3	—	—	0.26	μμf
	Cg1-all	3.5	—	4.5	μμf
	Cg3-all	4.1	—	5.1	μμf
	Cp-all	4.1	—	5.1	μμf
Degradation Tests					
4.9.20.5	Shock: Note 1 Hammer Angle = 30°	—	—	—	
4.9.20.6	Fatigue: Note 1				
-----	Post Shock and Fatigue Test End Points:				
	Vibration	—	—	200	mVac
	Heater-Cathode Leakage	0	—	20	μAdc
	Transconductance (1)	1500	—	—	μmhos
Acceptance Life Tests					
4.11.7	Heater Cycling Life Test: Ef = 29.0 V; 1 min. on, 4 min. off; Ehk = 140 Vac; Eb = Ec1 = Ec2 = Rg1 = 0	2500	—	—	Cycles
4.11.5	Intermittent Life Test: Note 2 Rg1 = 2.2 Meg; Ehk = +200 Vdc; TA = 175°C	500	—	—	Hours
4.11.4	Intermittent Life Test End Points				
	Transconductance (1)	1300	—	—	μmhos
	Heater-Cathode Leakage	0	—	30	μAdc
	Grid Current	—	—	-0.9	μAdc

ACCEPTANCE CRITERIA NOTES:

1: Acceptance sampling procedure shall be in accordance with Section 5, Item 5.2 of the Inspection Instructions for Electron Tubes.

2: At the conclusion of the five hundred hour life test, the average life of the life test group shall be not less than four hundred fifty hours. Life test sample size shall be ten tubes. Provision for release of tubes prior to completion of life test on a reduced basis as specified in Par. 4.3.1.3 of the Inspection Instructions for Electron Tubes shall not apply.

APPLICATION DATA

The Premium Subminiature Type 5908 is a sharp cutoff dual control pentode designed to operate directly from a 26.5 volt supply.

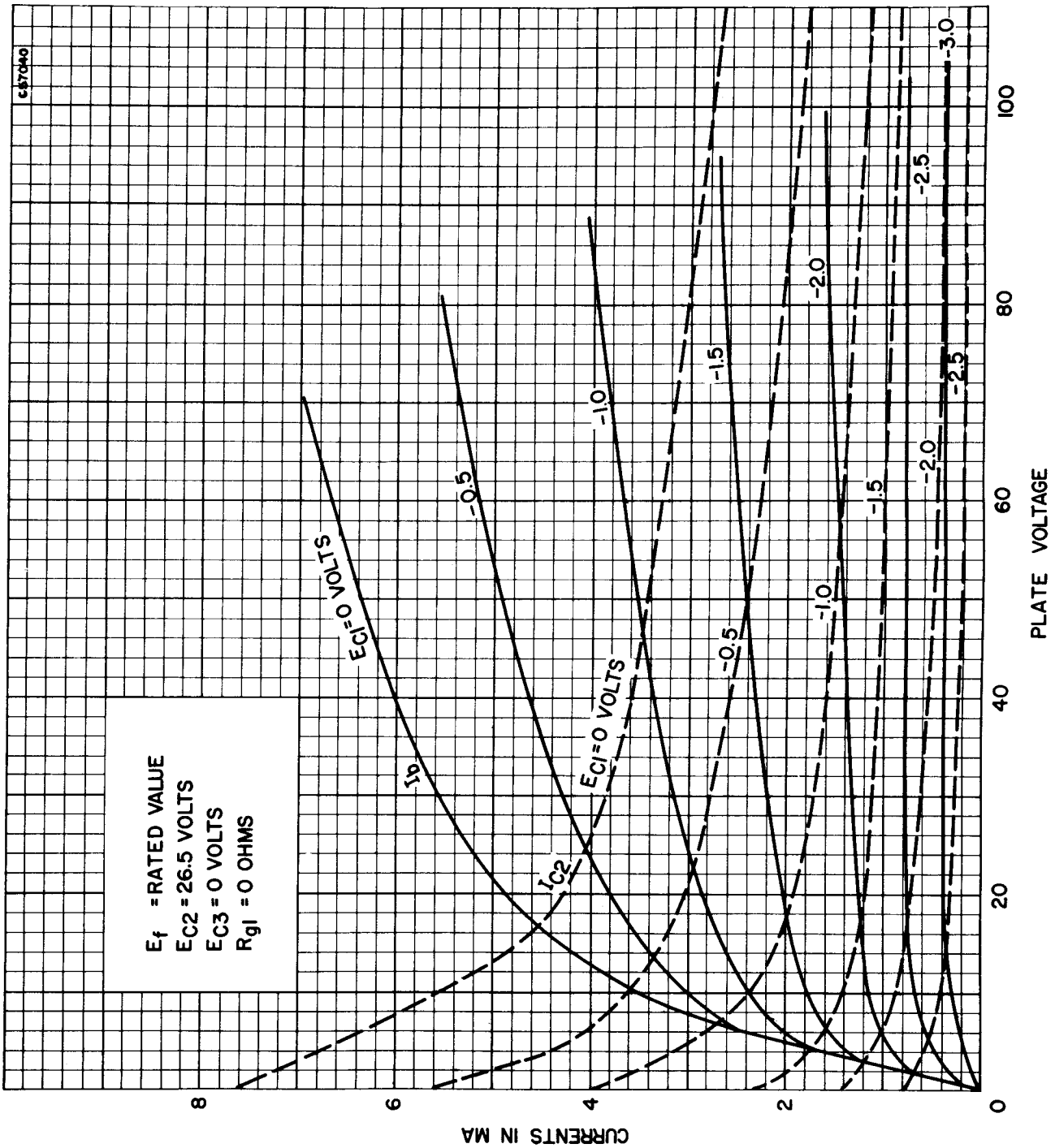
Both No. 1 and No. 3 grids have sharp cutoff characteristics and are intended for control purposes thus making the 5908 particularly useful in a variety of gated amplifier applications, as well as mixer service at frequencies up to 400 mc.

When used as a uhf mixer, with the oscillator voltage applied to the No. 3 grid, it is recommended that cathode bias be used rather than grid-leak bias since a positive grid current may be encountered at high frequencies. At low frequencies it is preferable to use a 2.2 megohm grid resistor to obtain bias.

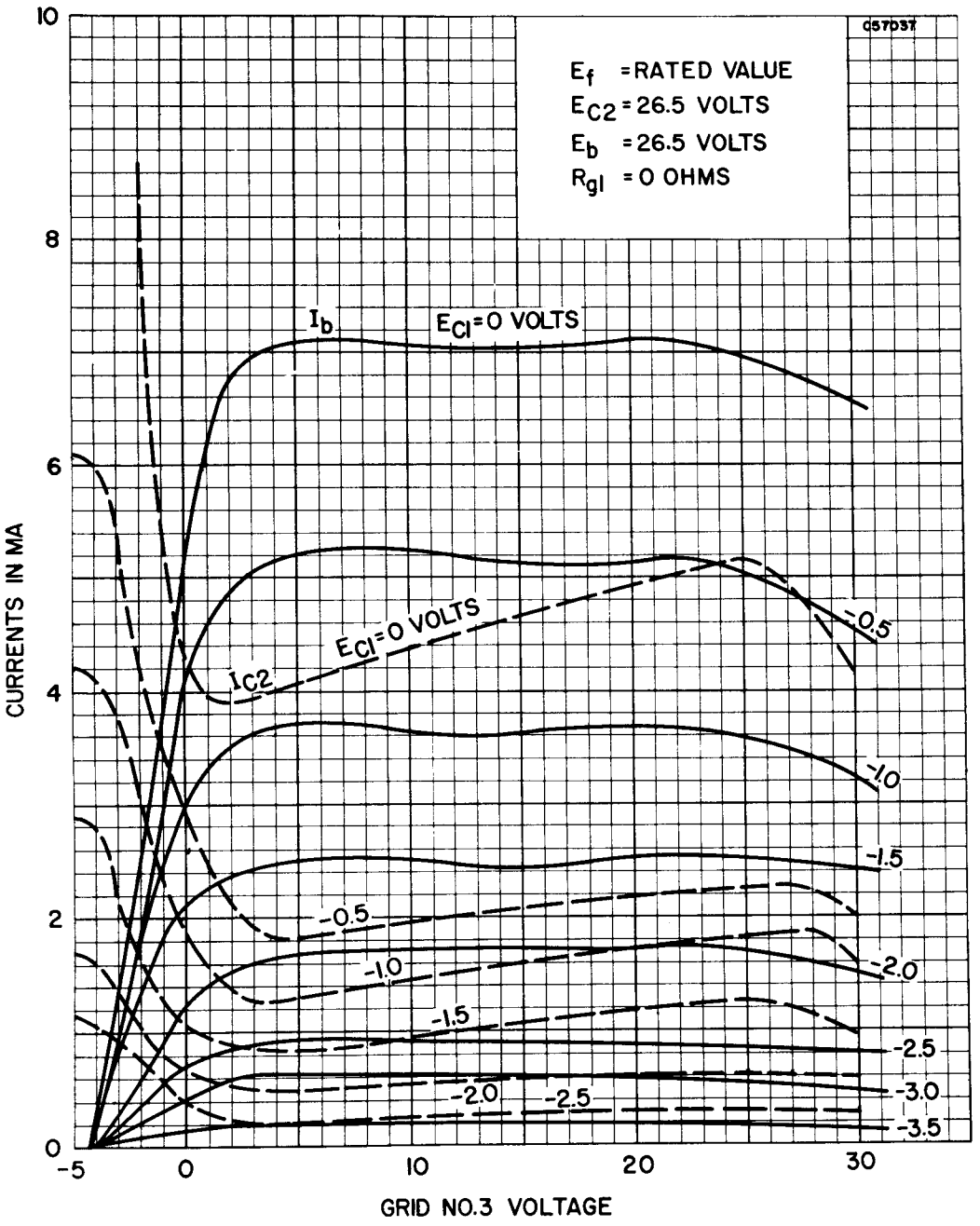
The 5908 is manufactured and inspected to meet the applicable MIL-E-1 specification for reliability. Life expectancy is described by the life tests, specified on the attached pages and/or individual MIL-E-1 specifications. The actual life expectancy of the tubes in an operating circuit is affected by both the operating and environmental conditions involved. Likewise, the life tests specified indicate performance under certain operating criteria to a set of specified end points. Performance at conditions other than those specified can usually be estimated only roughly as giving better or poorer life expectancy.

When operated under conditions common to on-off control applications the tube exhibits freedom from the development of interface resistance. The heater-cathode construction is designed to withstand intermittent operation.

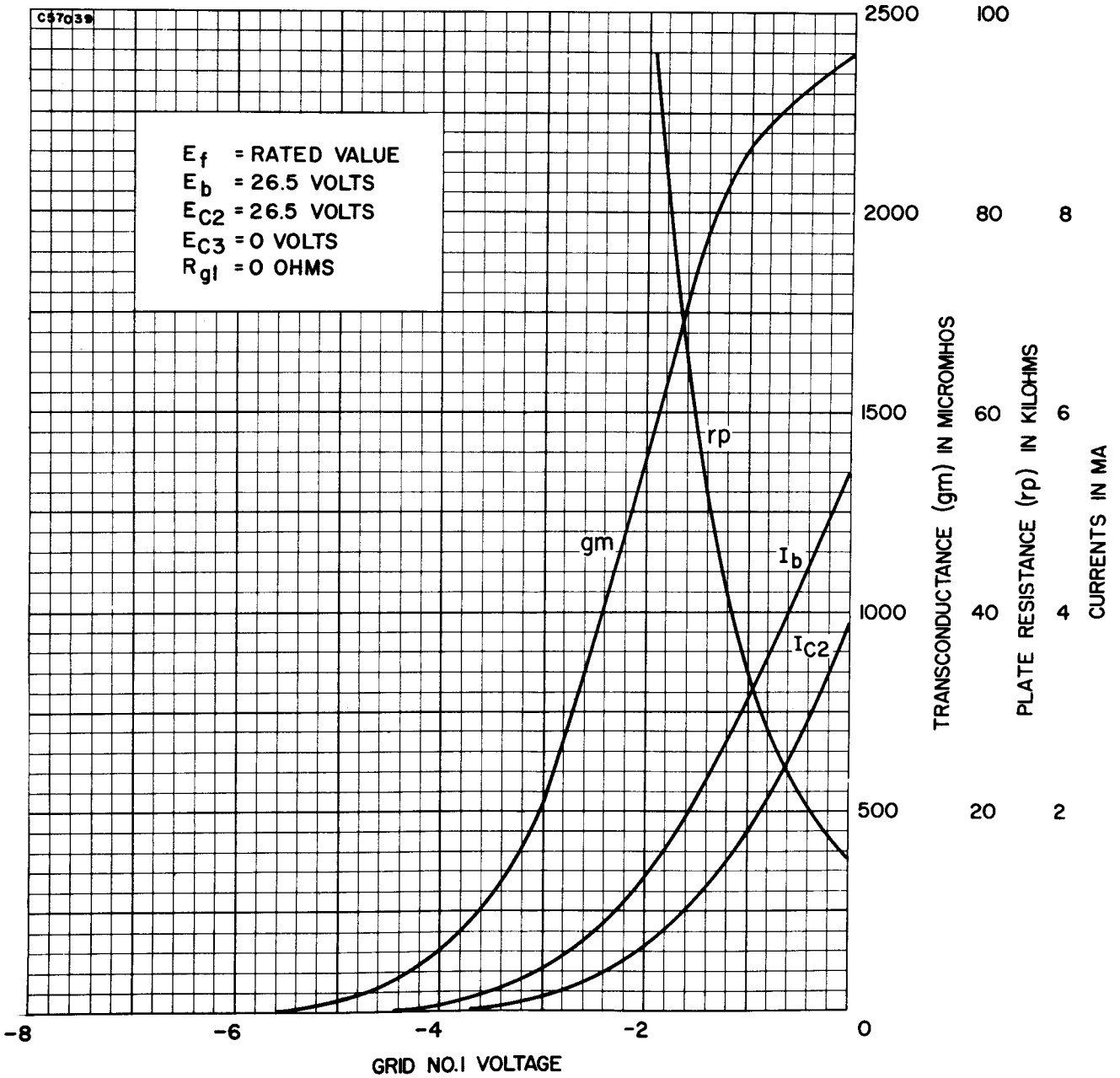
AVERAGE PLATE CHARACTERISTICS



AVERAGE PLATE CHARACTERISTICS



AVERAGE TRANSFER CHARACTERISTICS



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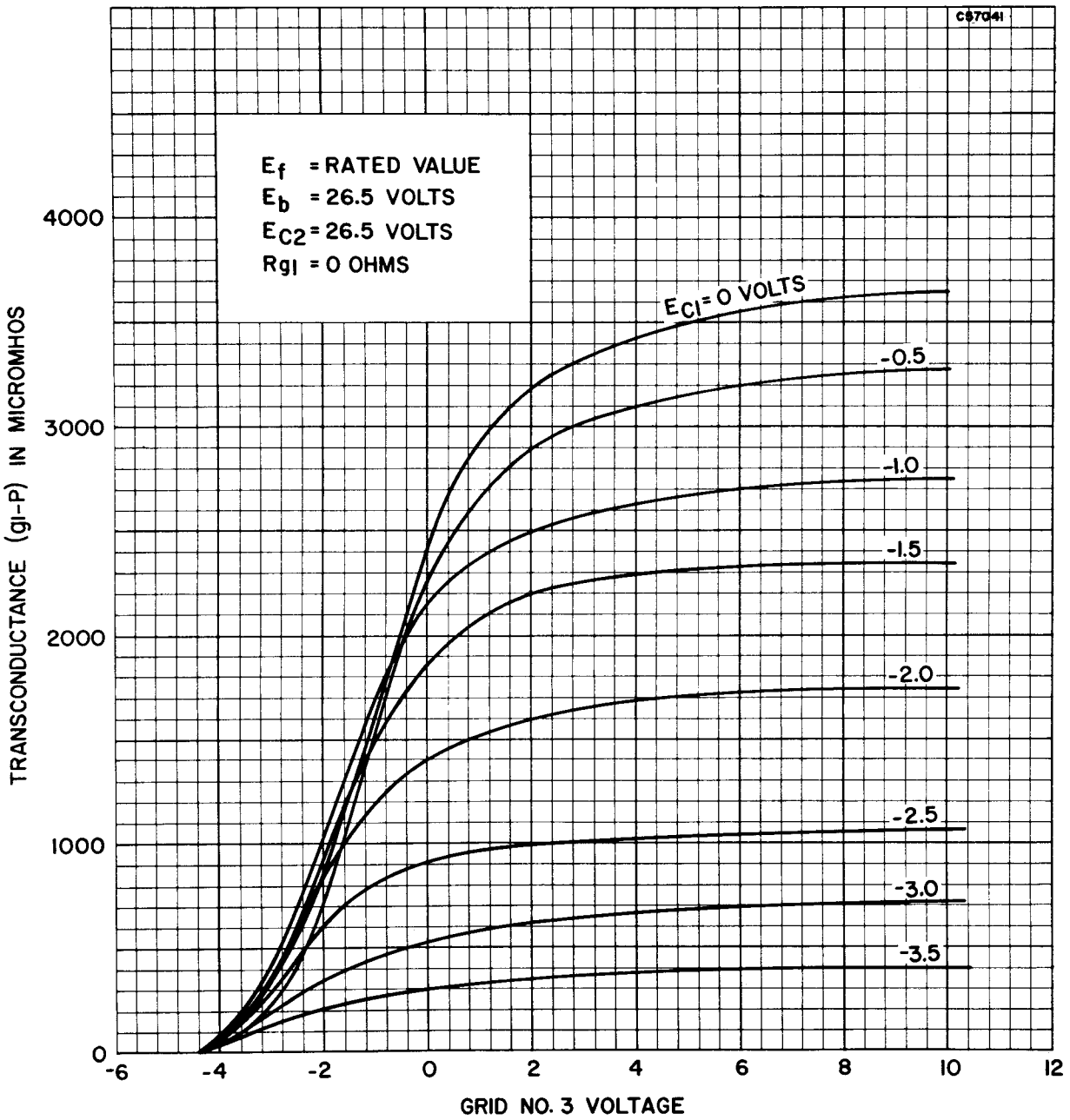

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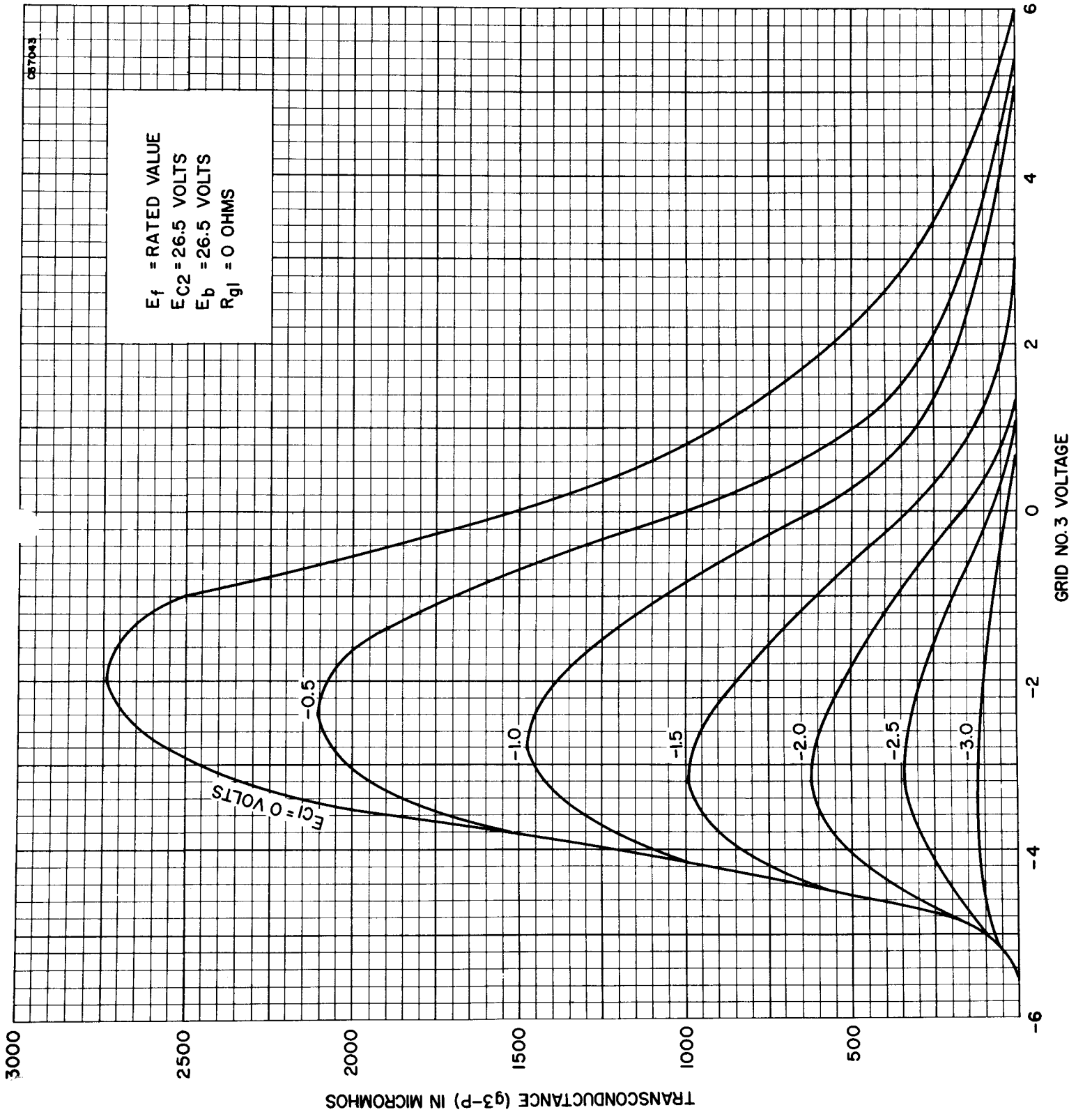
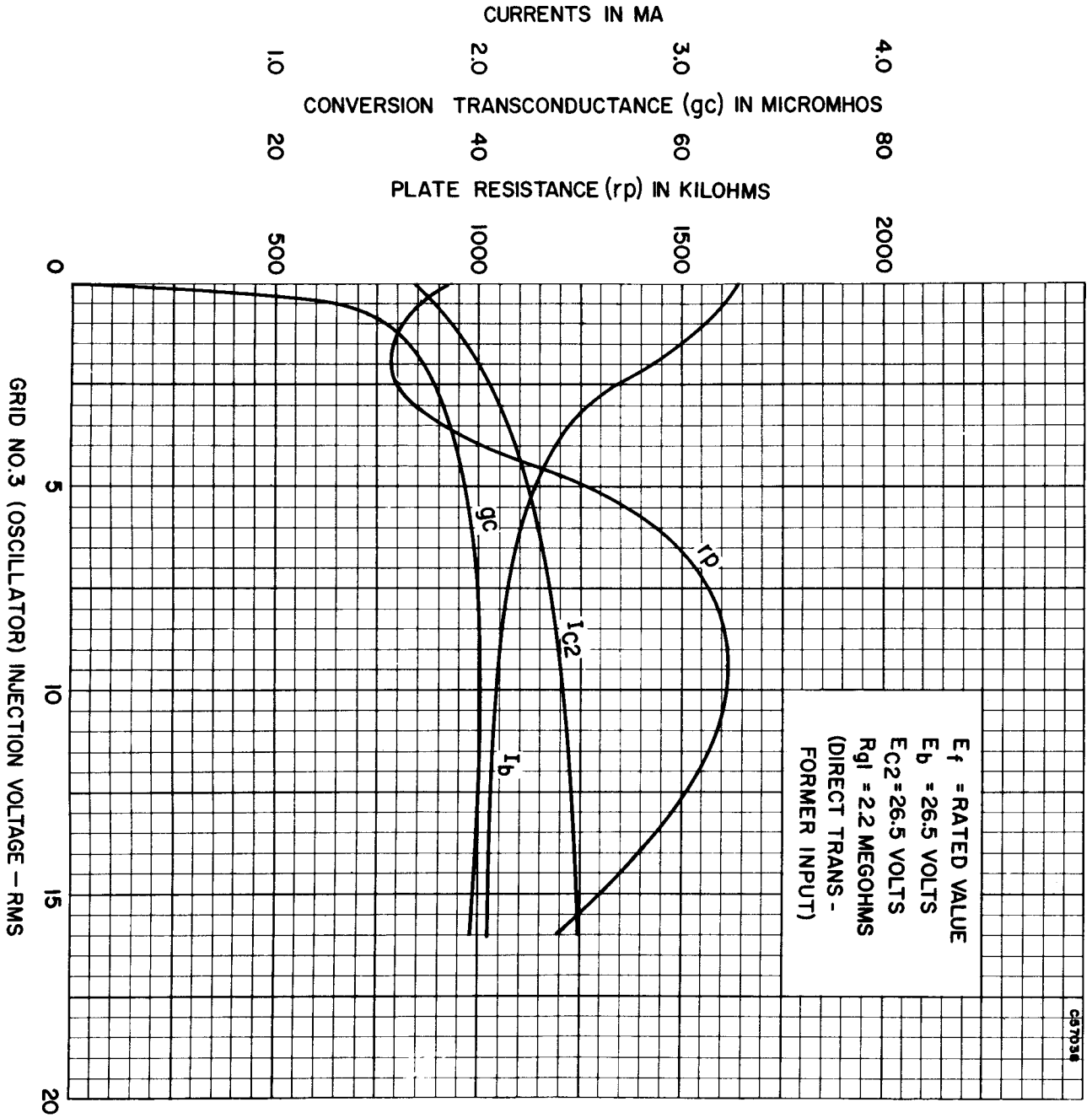


AVERAGE CONVERSION CHARACTERISTICS



AVERAGE CONVERSION CHARACTERISTICS