

SPECIAL QUALITY OUTPUT PENTODE

M8082

Special quality output pentode for use in equipment where mechanical vibration and shocks are unavoidable and where statistically controlled major electrical characteristics are required.

This data should be read in conjunction with the GENERAL NOTES – SPECIAL QUALITY VALVES which precede this section of the handbook, and the index numbers are used to indicate where reference should be made to a specific note.

HEATER

V_h^1	6.3	V
I_h	200	mA

MOUNTING POSITION

Any

CAPACITANCES² (measured with an external shield)

C_{in}	3.8	pF
C_{out}	6.5	pF
C_{a-g1}	< 300	mpF

CHARACTERISTICS³

V_a	250	V
V_{g2}	250	V
I_a	16	mA
I_{g2}	2.3	mA
g_m	2.5	mA/V
r_a	130	kΩ
I_{g1-g2}	12	
R_k	0	Ω
V_{g1}	-13.5	V

ABSOLUTE MAXIMUM RATINGS⁴

f max.	100	Mc/s
$V_{a(b)}$ max.	550	V
V_a max.	300	V
p_a max.	4.75	W
$V_{g2(b)}$ max.	550	V
V_{g2} max.	275	V
p_{g2} max.	800	mW
$-V_{g1}$ max.	110	V
V_{g1-g2} max.	300	V
I_{g1} max.	3.3	mA
I_k max.	23	mA
R_{g1-k} max. (fixed bias)	220	kΩ
V_{h-k} max.	150	V
Maximum acceleration (continuous operation)	2.5	g
Maximum shock (short duration)	500	g
T_{bulb} max.	180	°C

TEST CONDITIONS (unless otherwise specified)

TESTS

GROUP A

Insulation

a-rest, g_2 -rest measured at $\sim 300V$
 g_1 -rest measured at $\sim 100V$

Reverse control-grid current

R_{g1} max. = 500k Ω

GROUP B

Heater current

Heater to cathode leakage current

V_{h-k} = 100V cathode alternately
positive and negative

V_{h-k} = 100V cathode positive

Anode current

Screen-grid current

Mutual conductance

Group quality level¹⁰

V_h (V)	$V_{a(b)}$ (V)	V_{g2-e} (V)	V_{g1-e} (V)	R_k (Ω)	Individuals ⁶		R_{g1} (Ω)	C_k (μF)	Lot average ⁷		Lot standard deviation ⁸ Max.
6.3	250	250	0	740	Bogey ⁹	Min.	Max.	1000	Min.	Max.	
			A.Q.L. ⁵ (%)								
			0.25	—	100	—	—	—	—	—	M Ω
			0.25	—	—	0.5	—	—	—	—	μA
			0.65	—	184	216	—	—	—	—	mA
			0.65	—	—	10	—	—	—	—	μA
			{ 0.65	15	12	18	—	—	3.0	—	μA
			—	—	—	—	—	13.9	16.1	—	mA
			{ 0.65	2.0	1.3	2.7	—	—	—	0.86	mA
			—	—	—	—	—	1.74	2.26	—	mA
			{ 0.65	2.55	1.95	3.15	—	—	—	0.2	mA
			—	—	—	—	—	—	—	—	mA/V
			1.0	—	—	—	—	2.33	2.77	—	0.17 mA/V

GROUP C

Anode current. $V_{g1-e} = -50V$	2.5	—	—	—	—	—	μA
Change in mutual conductance. $V_h = 5.7V$	2.5	—	—	—	—	—	%
Reverse control-grid current. $V_h = 6.9V$, $V_{a-e} = 300V$, $V_{g2-e} = 235V$	2.5	—	—	—	—	—	μA
Microphonic noise at the anode at 50c/s 2.0g min. peak acceleration, $V_{a(b)} = 250V$, $R_a = 2k\Omega$, $V_{g2-e} = 250V$.	2.5	—	—	—	—	—	mV (r.m.s.)
Group quality level ¹⁰	6.5	—	—	—	—	—	—

GROUP D

Glass strain test ^{11A} . No applied voltages	6.5	—	—	—	—	—	—
Base strain test ¹² . No applied voltages	6.5	—	—	—	—	—	—
Capacitances (shielded). No applied voltages	6.5	—	—	—	—	—	—
C_{in}	—	—	3.5	5.0	—	—	pF
C_{out}	—	—	5.8	7.2	—	—	pF
C_{a-g1}	—	—	—	300	—	—	mpF
Amplification factor (μ_{g1-g2})	6.5	—	10	14	—	—	—

TESTS	A.Q.L. ⁵ (%)	Individuals ⁶		Lot average ⁷		Lot standard deviation ⁸ Max.
GROUP E						
Fatigue ¹⁴						
V _h = 6.9V, 1 minute on, 3 minutes off. No other voltages applied, 5g min. peak acceleration, f = 170c/s, for 33 hours in each of 3 mutually perpendicular planes.						
Post fatigue tests						
Heater to cathode leakage current. V _{h-k} = ± 100V	2.5	—	—	20	—	— μA
Reverse control-grid current R _{g1} max = 500kΩ	2.5	—	—	1.0	—	— μA
Mutual conductance	2.5	—	1.8	3.2	—	— mA/V
Microphonic noise as in group C	2.5	—	—	25	—	— mV (r.m.s.)
Sub-group quality level ¹⁰	4.0	—	—	—	—	—
Shock ¹⁵						
No applied voltages, 500g						
Post shock tests						
Heater to cathode leakage current. V _{h-k} = ± 100V	2.5	—	—	20	—	— μA
Reverse control-grid current R _{g1} max = 500kΩ	2.5	—	—	1.0	—	— μA
Mutual conductance	2.5	—	1.8	3.2	—	— mA/V
Microphonic noise as in group C	2.5	—	—	25	—	— mV (r.m.s.)
Sub-group quality level ¹⁰	4.0	—	—	—	—	—

	A.Q.L. ⁵ (%)	Min.	Max.
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Dynamic life test 100 hours

Running conditions as a trebler. $V_b = 300V$,
decoupling resistor = $1.0k\Omega$
 $I_a + I_{g2} = 20mA$, $I_{g1} = 1.6mA$, $f = 70$ to $75Mc/s$
 $P_{out} = 900mW$

Dynamic life test end point

Change in P_{out}	—	—	20	%
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GROUP G

Valves are held for 28 days and retested for
Inoperatives¹⁶

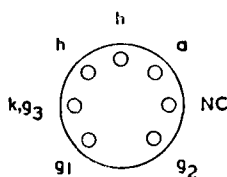
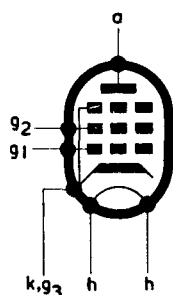
0.5	—	—
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Reverse control-grid current.

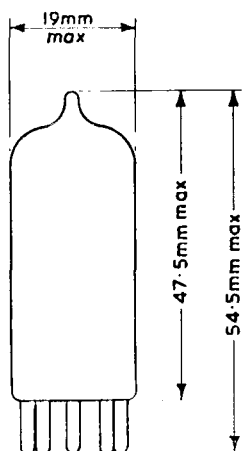
R_{g1} max. = $500k\Omega$

0.5	—	0.75	μA
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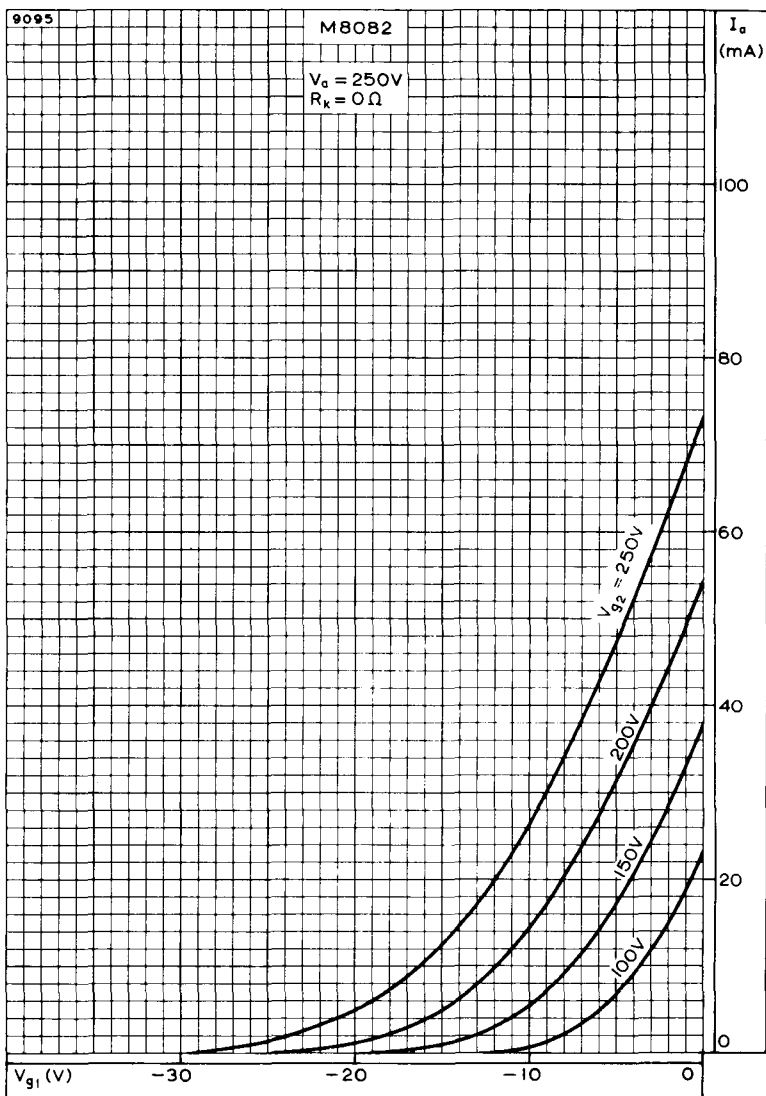
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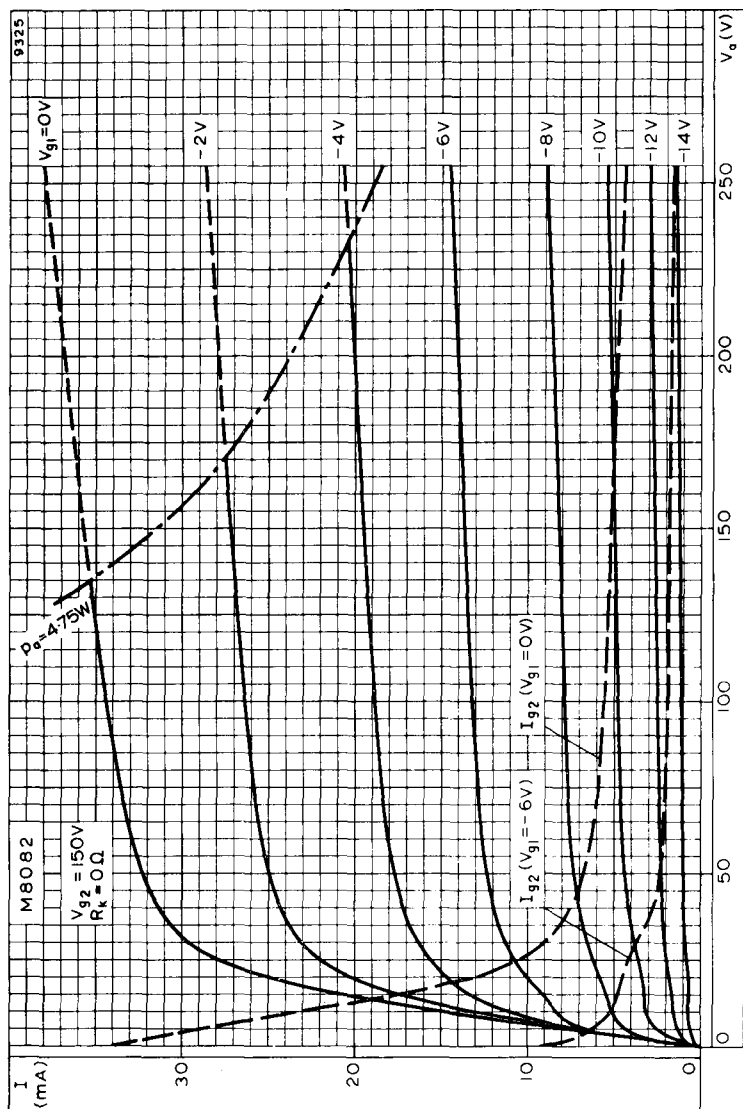
B7G Base



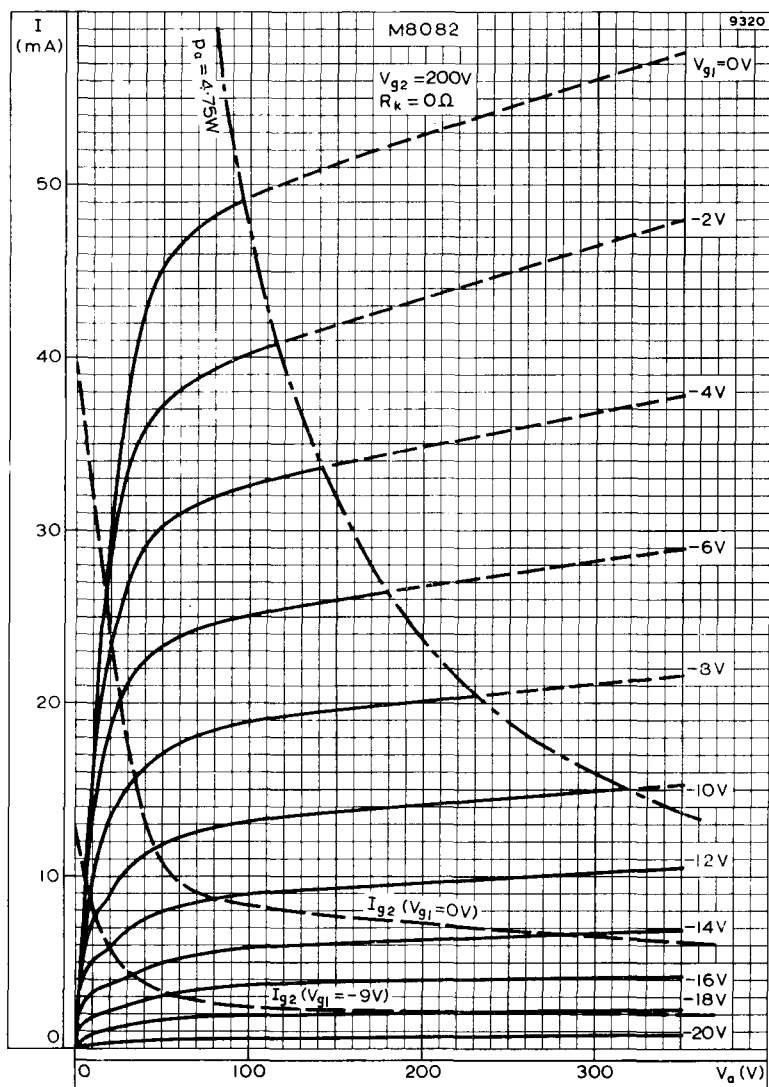
The bulb and base dimensions of this valve are in accordance with BS448, Section B7G



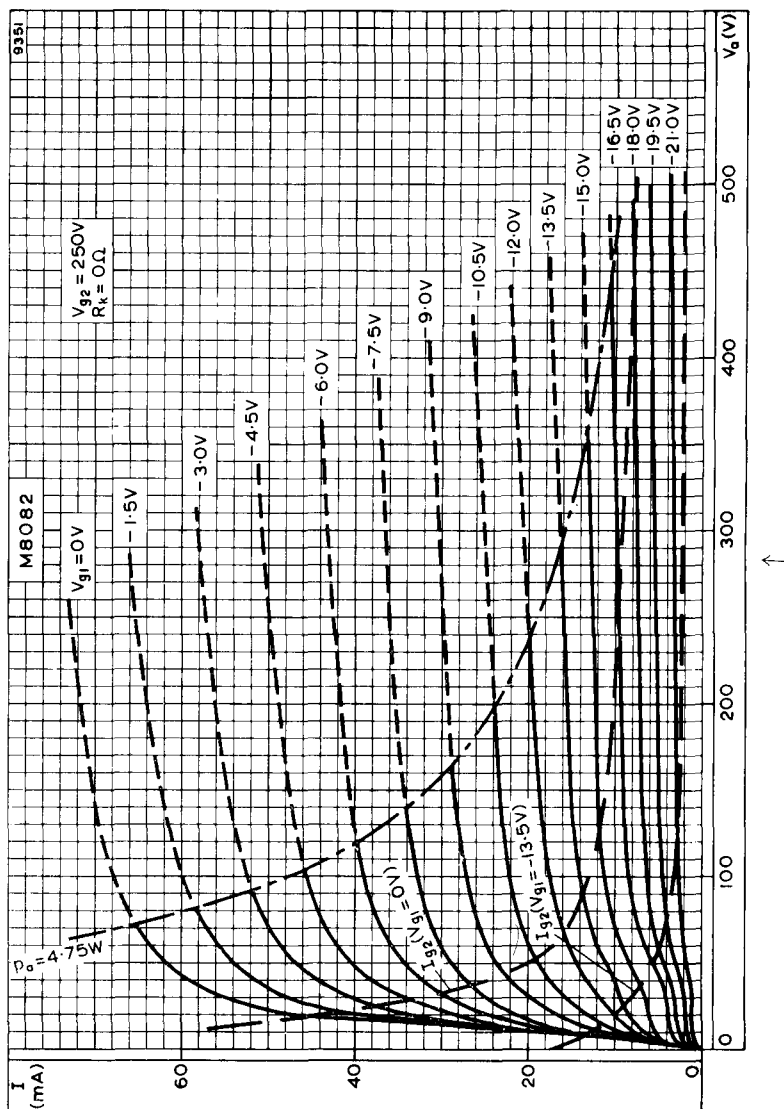
ANODE CURRENT PLOTTED AGAINST CONTROL-GRID VOLTAGE WITH
SCREEN-GRID VOLTAGE AS PARAMETER



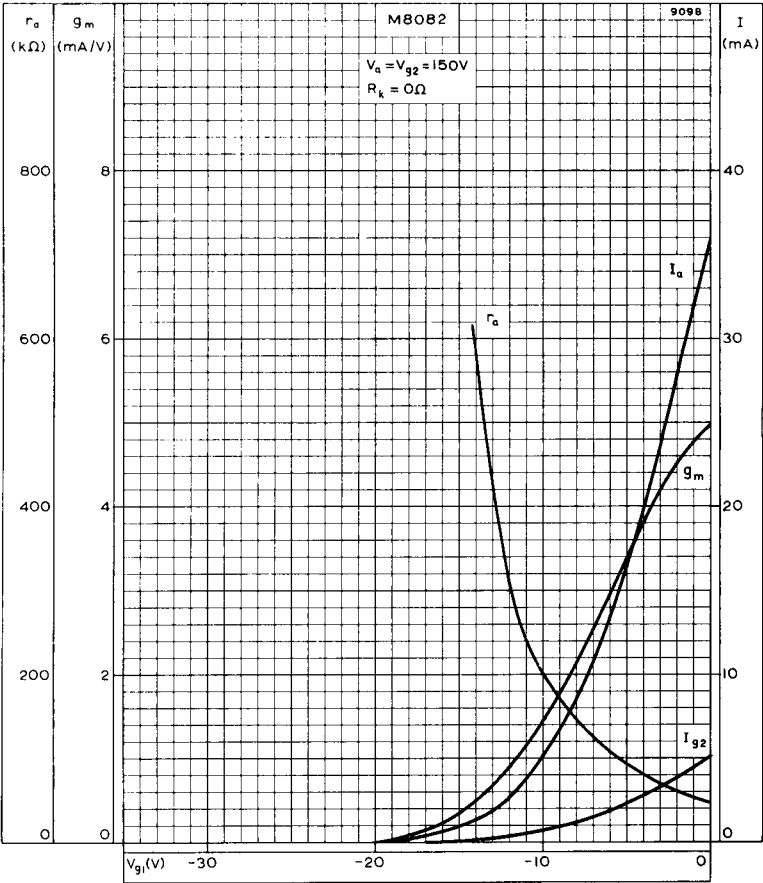
ANODE AND SCREEN-GRID CURRENTS PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. $V_{g2} = 150V$



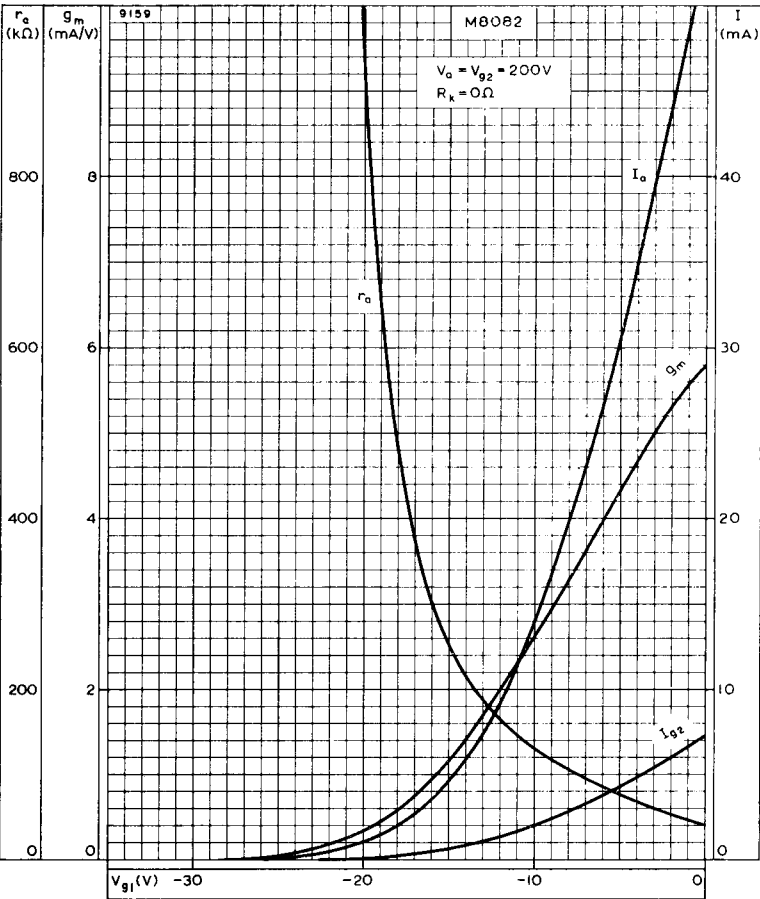
ANODE AND SCREEN-GRID CURRENTS PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. $V_{g2} = 200V$



ANODE AND SCREEN-GRID CURRENTS PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. $V_{g2} = 250V$

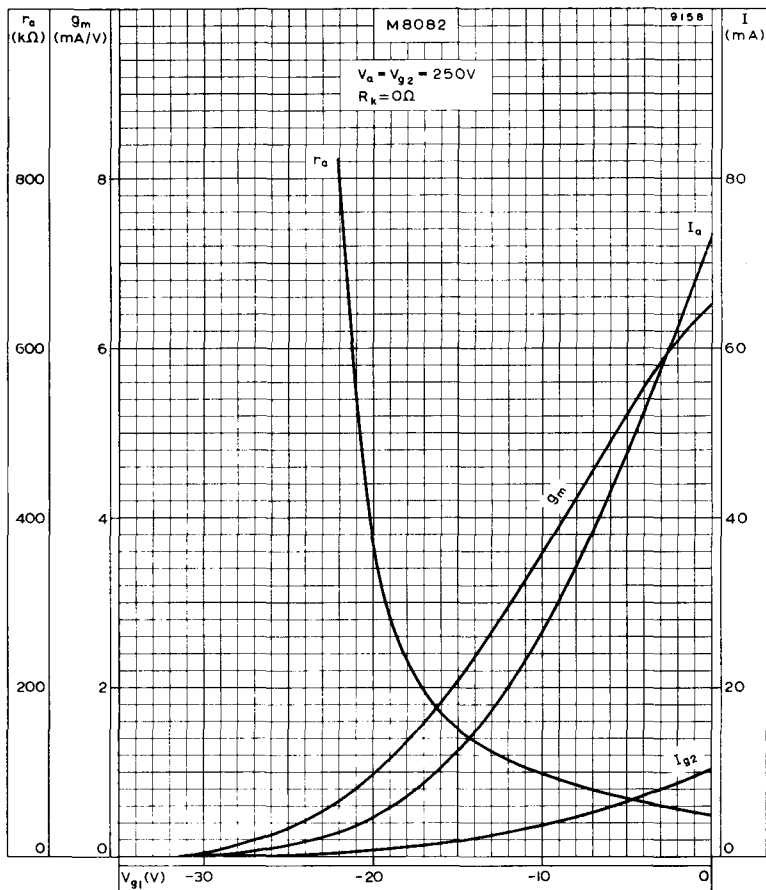


ANODE AND SCREEN-GRID CURRENTS, MUTUAL CONDUCTANCE AND ANODE IMPEDANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE

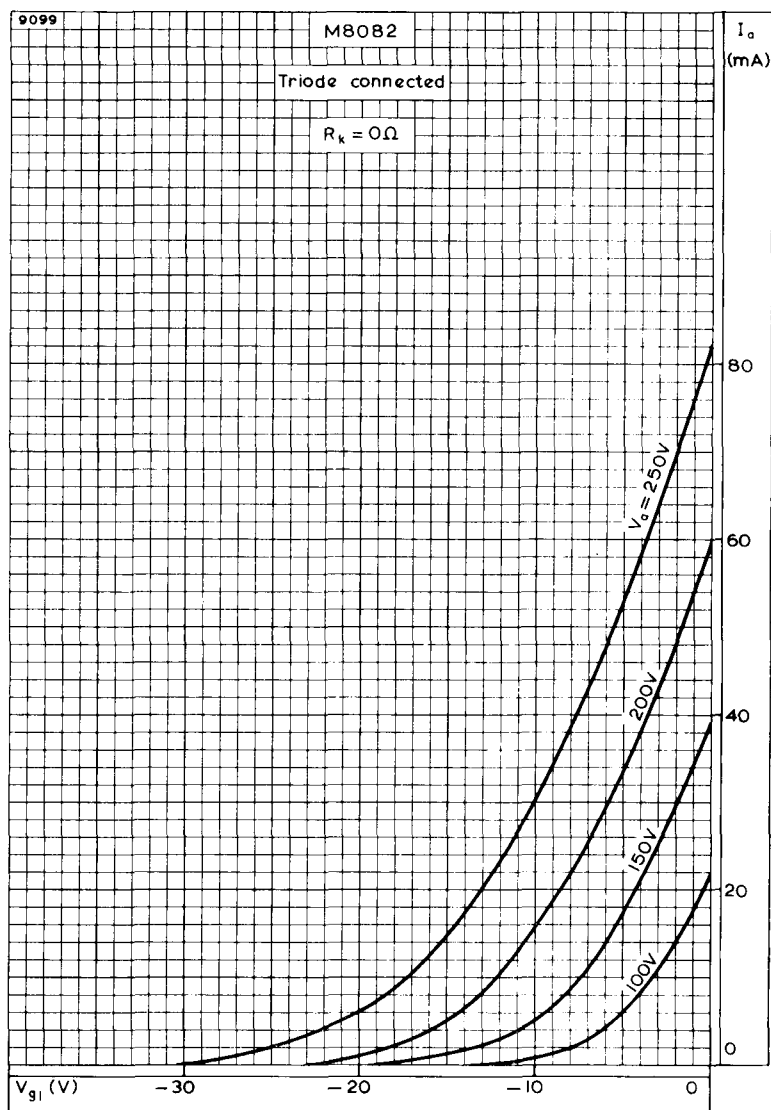


ANODE AND SCREEN-GRID CURRENTS, MUTUAL CONDUCTANCE AND ANODE IMPEDANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE.
 $V_a = V_{g2} = 200V$

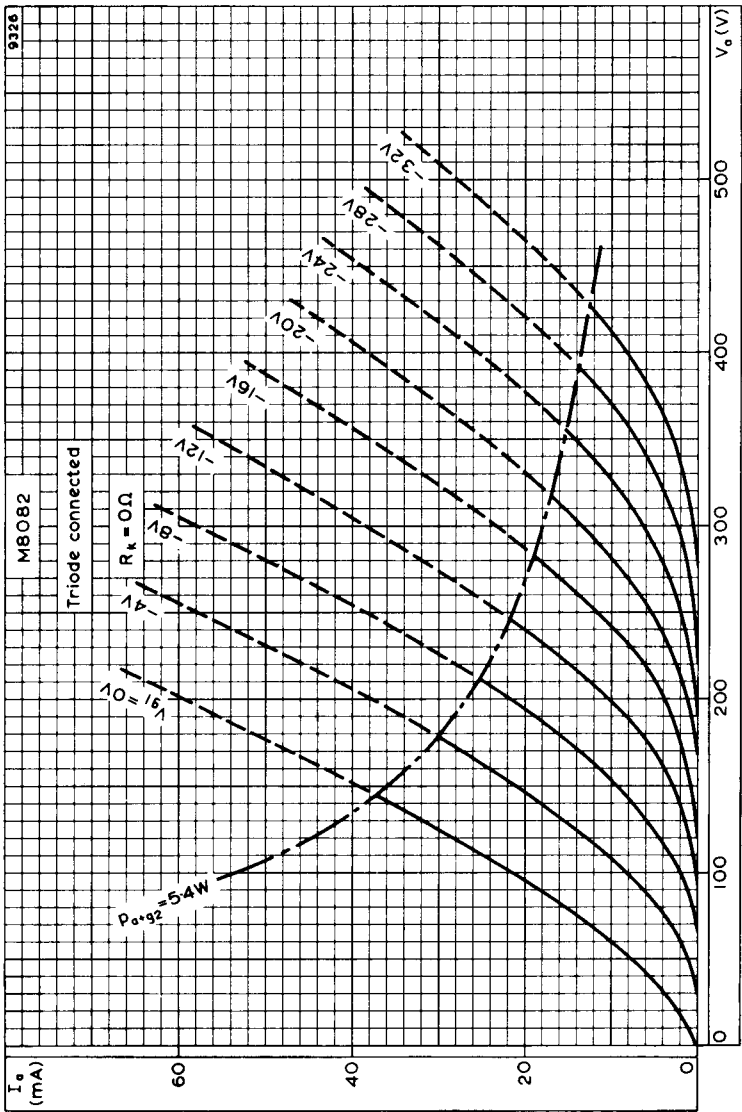




ANODE AND SCREEN-GRID CURRENTS, MUTUAL CONDUCTANCE AND ANODE IMPEDANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE.
 $V_a = V_{g2} = 250V$



ANODE CURRENT PLOTTED AGAINST CONTROL-GRID VOLTAGE WITH
ANODE VOLTAGE AS PARAMETER, WHEN TRIODE CONNECTED



ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-
GRID VOLTAGE AS PARAMETER, WHEN TRIODE CONNECTED