

Special quality r.f. 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	300	mA

MOUNTING POSITION

Any

CAPACITANCES² (measured with an external shield)

C_{in}	7.1	pF ←
C_{out}	3.4	pF ←
C_{a-g1}	<10	mpF

CHARACTERISTICS³

V_a	250	V
V_{g3}	0	V
V_{g2}	250	V
I_a	10	mA
I_{g2}	2.6	mA
V_{g1}	-2.0	V
g_m	7.6	mA/V
r_a	>500	kΩ
μ_{g1-g2}	70	
R_k	0	Ω

LIMITING VALUES⁴ (absolute ratings)

$V_{a(b)} \text{ max.}$	550	V
$V_a \text{ max.}$	300	V
$p_a \text{ max.}$	3.0	W
$V_{g2(b)} \text{ max.}$	450	V ←
$V_{g2} \text{ max.}$	300	V
$p_{g2} \text{ max.}$	900	mW
$-V_{g1} \text{ max.}$	55	V
$I_k \text{ max.}$	16.5	mA
$R_{g1-k} \text{ max.}$	500	kΩ ←
$V_{h-k} \text{ max.}$	150	V
Maximum acceleration (continuous operation)	2.5	g
Maximum shock (short duration)	500	g
$T_{bulb} \text{ max.}$	200	°C

TEST CONDITIONS (unless otherwise specified)

V_h (V)	V_{a-e} (V)	V_{g3-k} (V)	V_{g2-e} (V)	V_{g1-e} (V)	R_k (Ω)	R_{g1} (Ω)	C_k (μF)
6.3	250	0	250	0	160	0	1000
TESTS							
GROUP A							
Insulation							
a-rest, g_2 -rest measured at -300V							
g_1 -rest measured at -100V							
Reverse control-grid current							
R_{g1} max. = 500k Ω							
GROUP B							
Heater current							
Heater to cathode leakage current							
V_{h-k} = 100V cathode negative							
V_{h-k} = 100V cathode positive							
Anode current							
Screen-grid current							
Mutual conductance							
Group quality level ¹⁰							



GROUP C

Anode current. $V_{g1-e} = -8.0V$	2.5	—	—	100	—	—	μA
Reverse control-grid current. $V_{g1-e} = -50V$	2.5	—	—	1.0	—	—	μA
Change in mutual conductance. $V_h = 5.7V$	2.5	—	—	15	—	—	%
Reverse control-grid current. $V_h = 6.9V$, $V_{a-e} = 300V$, $V_{g2-e} = 300V$, $R_k = 250\Omega$	2.5	—	—	1.0	—	—	μA
Microphonic noise at the anode at 50c/s and 2.0g min. peak acceleration, $V_b = 250V$, $R_a = 2k\Omega$, $R_k = 0\Omega$, $V_{g1} = -2V$	2.5	—	—	15	—	—	mV (r.m.s.)
Group quality level ¹⁰	6.5	—	—	—	—	—	—

GROUP D

Glass strain test ^{1,1A} . No applied voltages	6.5	—	—	—	—	—	—
Base strain test ¹² . No applied voltages	6.5	—	—	—	—	—	—
Capacitances (shielded). No applied voltages	6.5	—	—	—	—	—	—
C_{in}	—	—	6.5	8.7	—	—	pF
C_{out}	—	—	2.75	3.75	—	—	pF
C_{a-g1}	—	—	—	10	—	—	mpF
Grid 3 cut-off voltage $V_{g1-e} = -3.5V$, $I_a = 50\mu A$	6.5	—	-70	-120	—	—	V
Amplification factor (μ_{g1-g2})	—	—	60	89	—	—	—

TESTS

GROUP E

Fatigue¹⁴

$V_h = 6.9V$, 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.

$V_{h-k} = \pm 100V$

Reverse control-grid current.

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

Mutual conductance

Microphonic noise as in group C

Sub-group quality level¹⁰

Shock¹⁵

No applied voltages, 500g

Post shock tests

Heater to cathode leakage current.

$V_{h-k} = \pm 100V$

Reverse control-grid current.

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

Mutual conductance

Microphonic noise as in group C

Sub-group quality level¹⁰

A.Q.L. ⁵ (%)	Individuals ⁶		Lot average ⁷		Lot standard deviation ⁸ Max.
	Bogey ⁹	Min.	Min.	Max.	
2.5	—	—	—	—	μA
2.5	—	—	—	—	μA
2.5	—	5.5	—	—	mA/V
2.5	—	—	—	—	mV
4.0	—	—	—	—	(r.m.s.)
2.5	—	—	—	—	μA
2.5	—	—	—	—	μA
2.5	—	5.5	—	—	mA/V
2.5	—	—	—	—	mV
4.0	—	—	—	—	(r.m.s.)



GROUP F

Stability life test¹⁴

Running conditions. $R_{g1} = 100k\Omega \pm 20\%$,
 $R_k = 180\Omega \pm 10\%$, $V_{h-k} = 100V$ (cathode
 negative)

Stability life test end point

Change in mutual conductance after 1 hour 1.0 — — — — %

Intermittent life test

Sub-group (a)

Inoperatives ¹⁶	..	..	..	..	..	{ 500 hours 1000 hours	2.5 4.0	—	—	Max.	—
Heater current	..	..	..	..	..	{ 500 hours 1000 hours	2.5 4.0	275	325	mA	—
Heater to cathode leakage current. $V_{h-k} = \pm 100V$	..	..	..	..	..	{ 500 hours 1000 hours	2.5 4.0	—	20	μA	—
Reverse control-grid current. $R_{g1} \text{ max} = 500k\Omega$	..	..	..	..	..	{ 500 hours 1000 hours	2.5 4.0	—	0.75	μA	—
Mutual conductance	..	..	..	..	..	{ 500 hours 1000 hours	2.5 4.0	5.2	9.25	mA/V	—
Average change in mutual conductance	..	..	..	..	..	500 hours	—	4.9	9.25	mA/V	—
								—	10	%	—

Sub-group (b)

Anode current	..	..	..	..	..	{ 500 hours 1000 hours	4.0 6.5	6.8	12.2	mA	—
Insulation as in group A	..	..	..	..	..	{ 500 hours 1000 hours	4.0 6.5	50	—	$M\Omega$	—
Group quality level ¹⁰	..	..	..	..	..	{ 500 hours 1000 hours	6.5 10	30	—	$M\Omega$	—

GROUP G

A.Q.L.⁵
(%)

Min. Max.

Valves are held for 28 days and retested for

Inoperatives¹⁶

Reverse control-grid current.

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

0.5

—

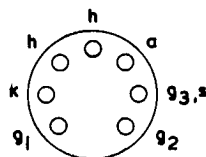
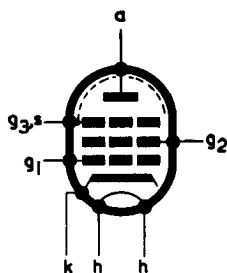
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0.5

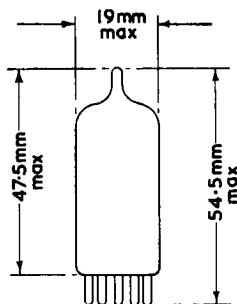
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0.75 μA

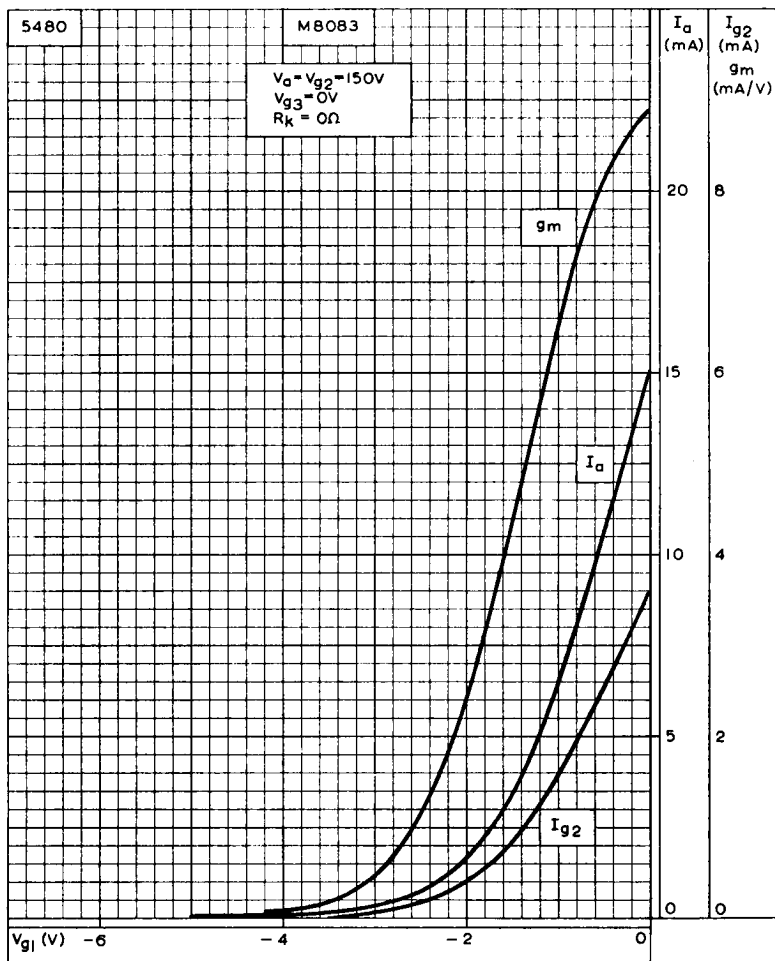
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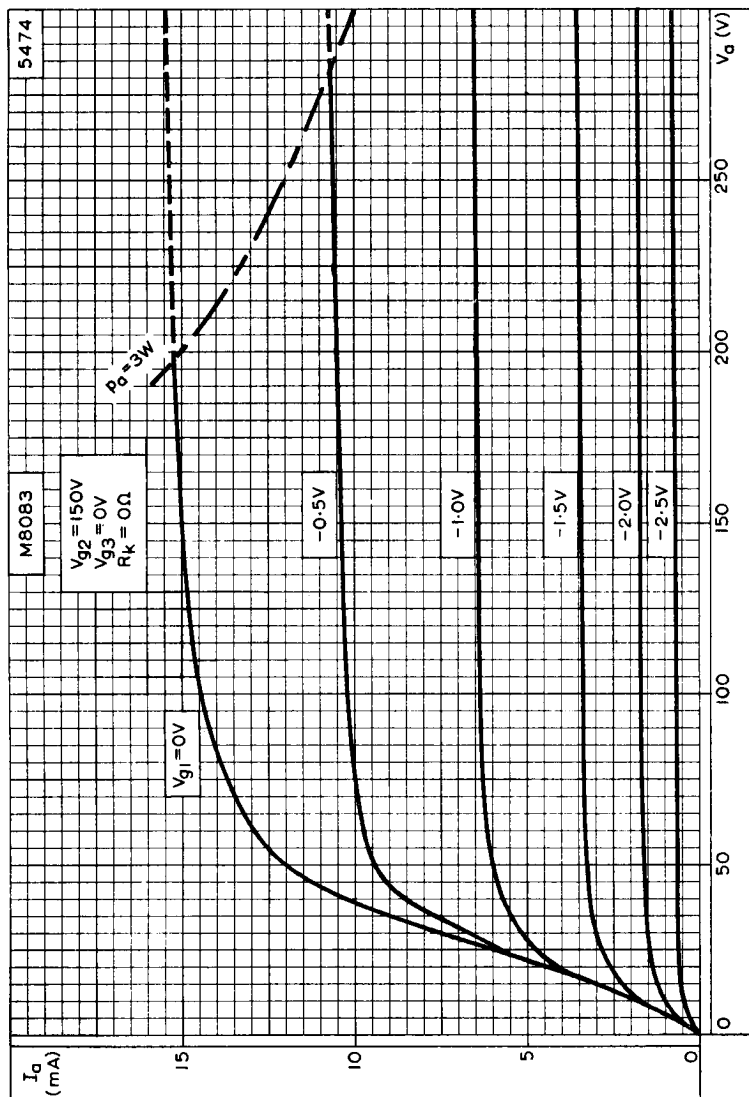
B7G Base



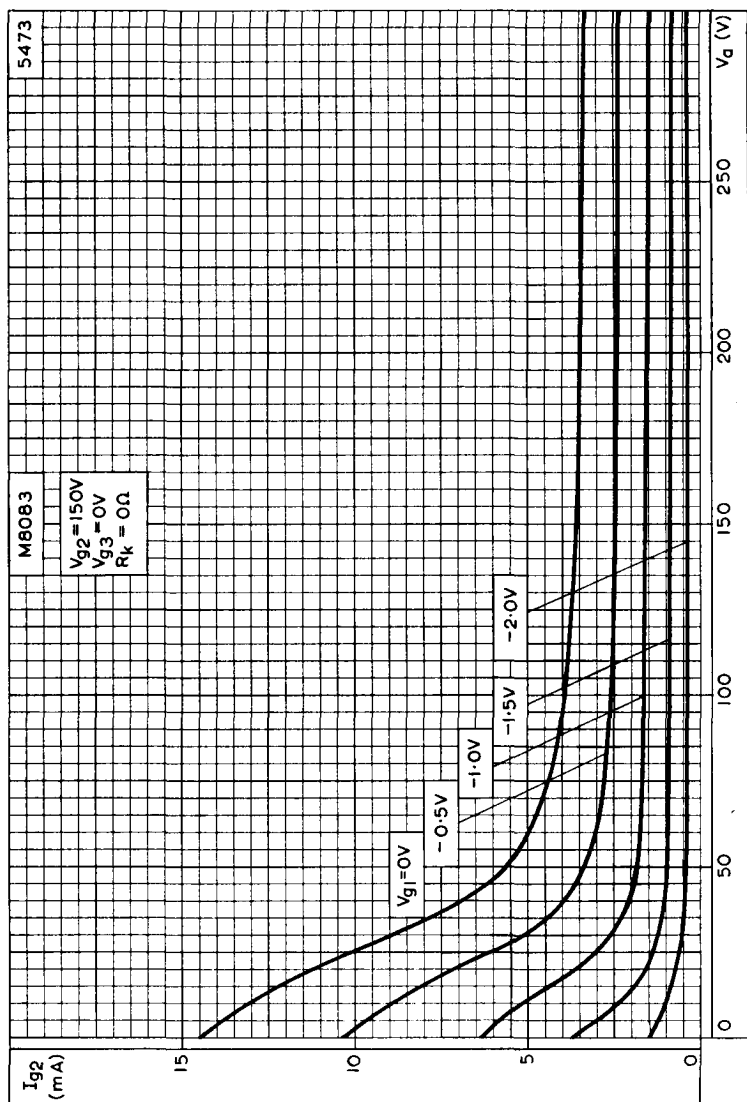
The bulb and base dimensions of this valve are in accordance with BS448, Section B7G



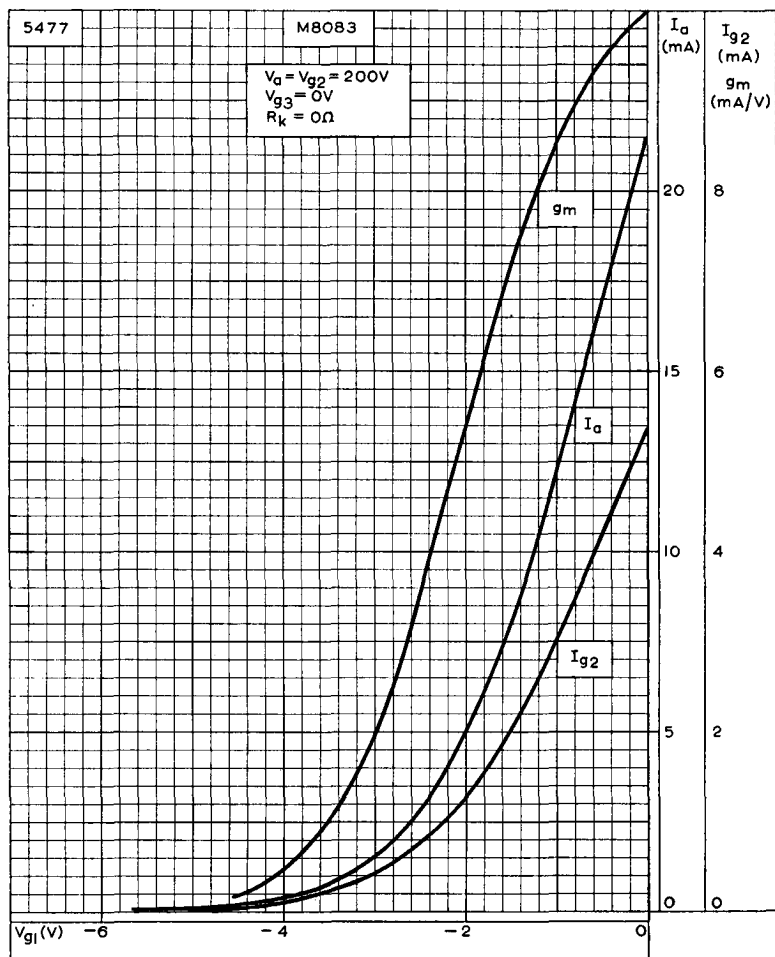
ANODE CURRENT, SCREEN-GRID CURRENT AND MUTUAL CONDUCTANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE. $V_a = V_{g2} = 150V$



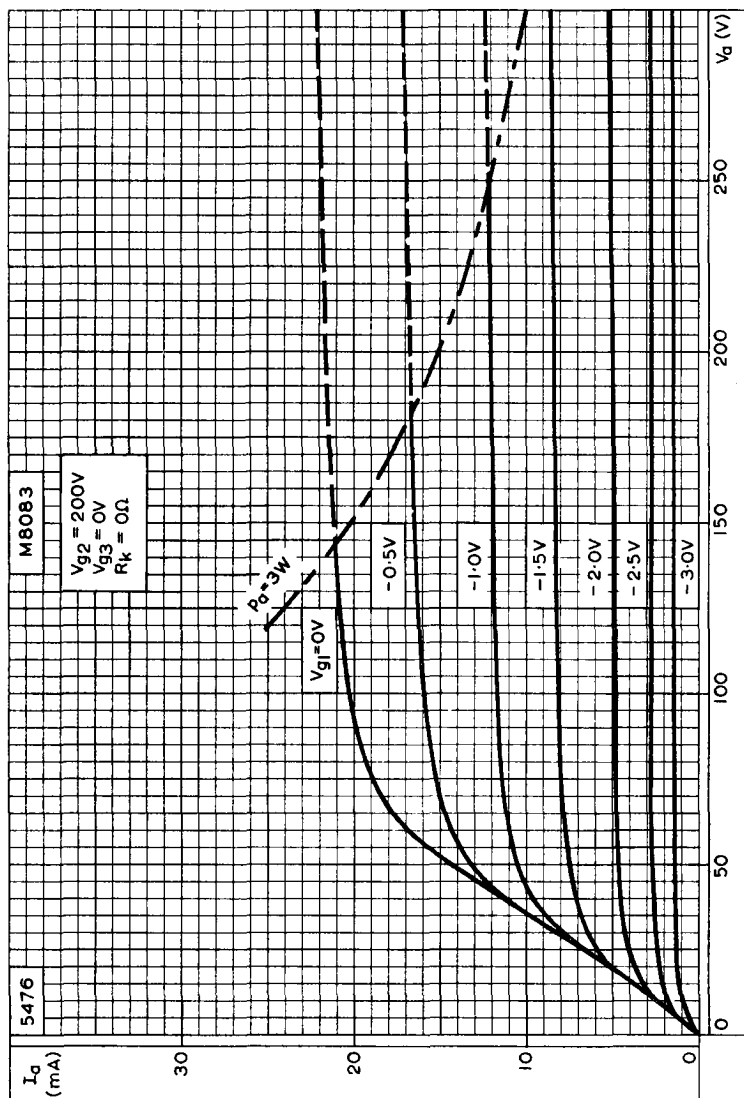
ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. $V_{g2} = 150V$



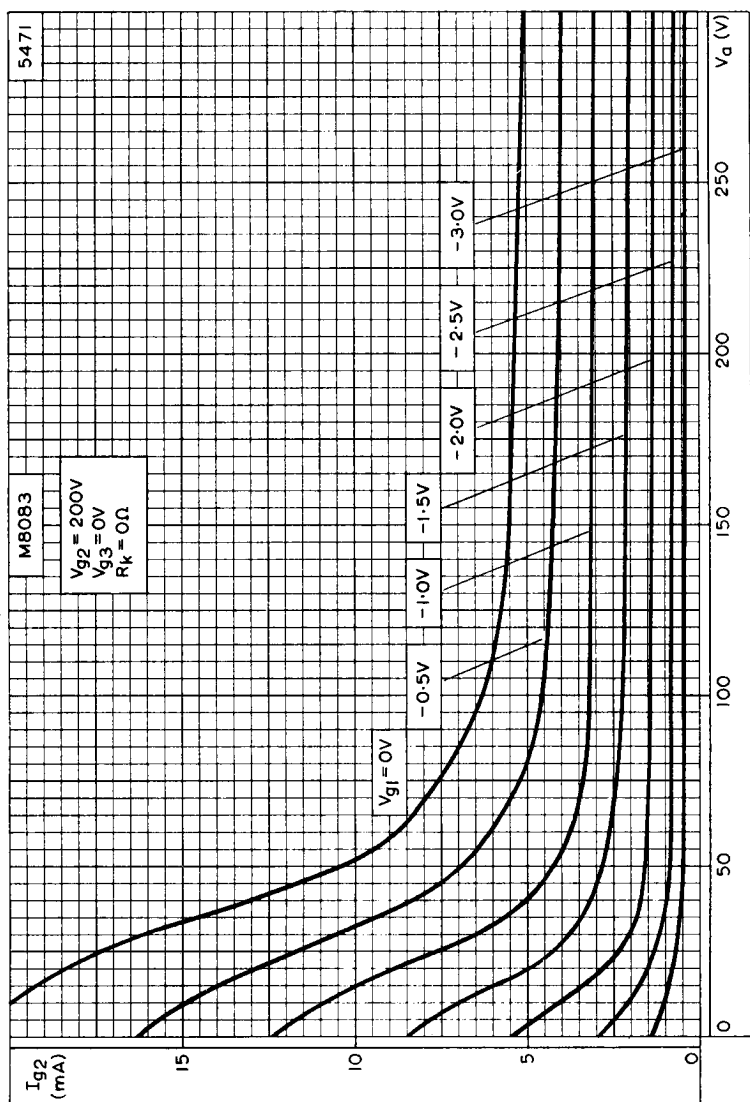
SCREEN-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. $V_{g2} = 150V$



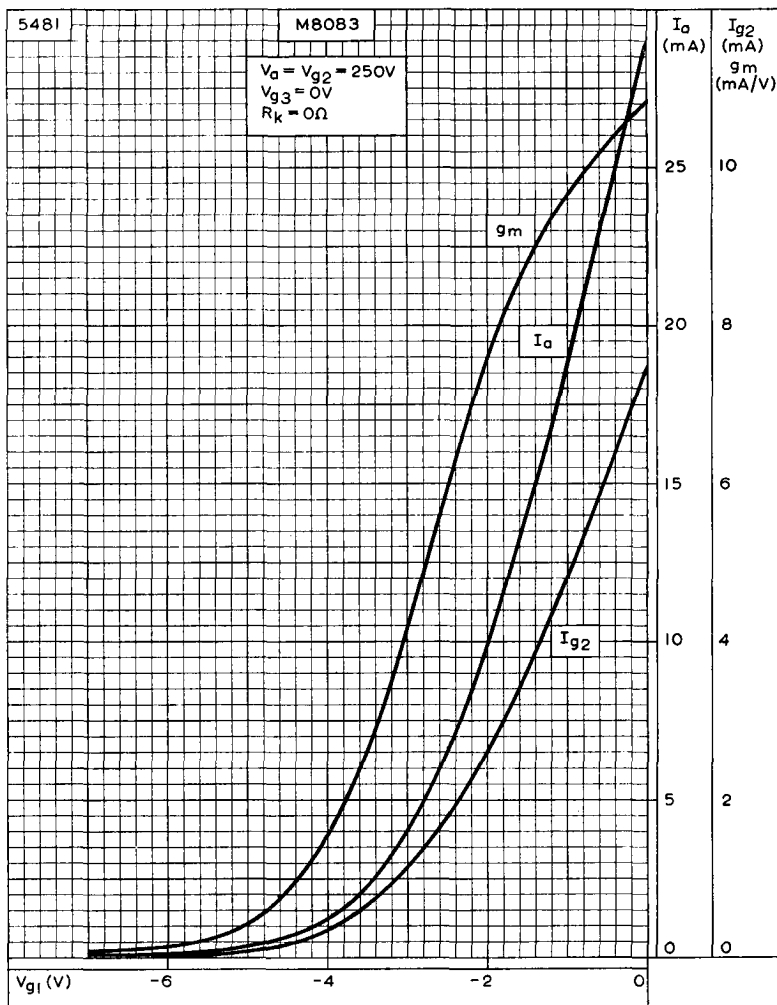
ANODE CURRENT, SCREEN-GRID CURRENT AND MUTUAL CONDUCTANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE. $V_a = V_{g2} = 200V$



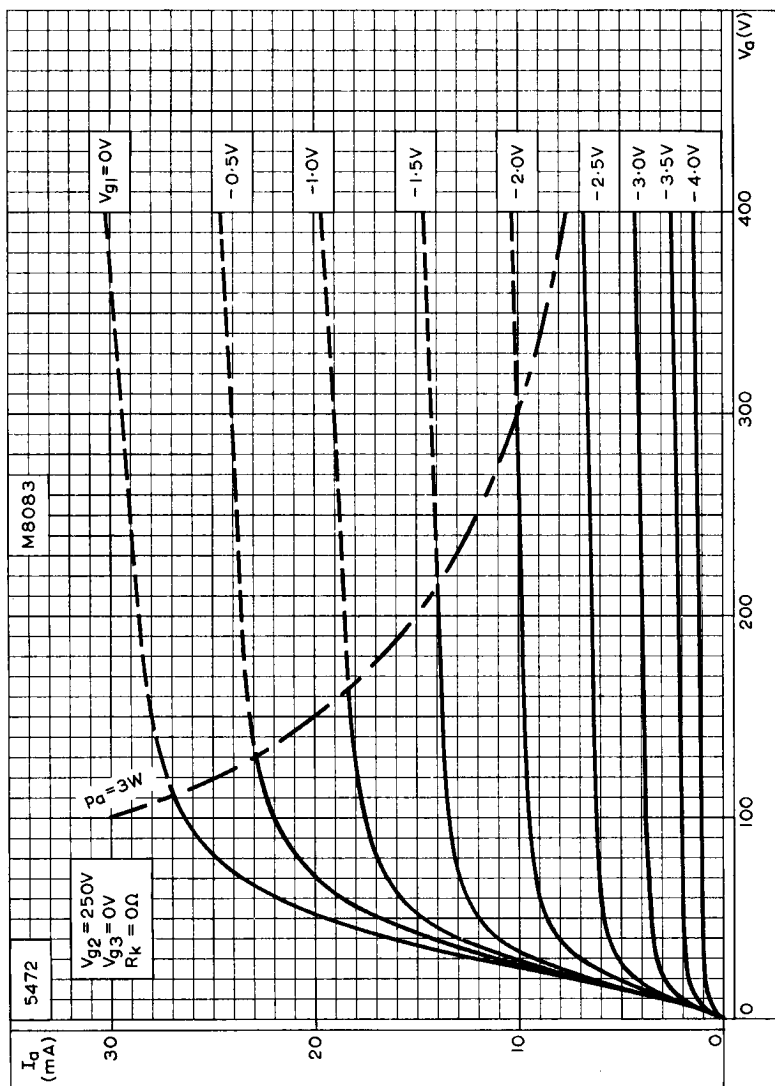
ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH
 CONTROL-GRID VOLTAGE AS PARAMETER. $V_{g2} = 200V$



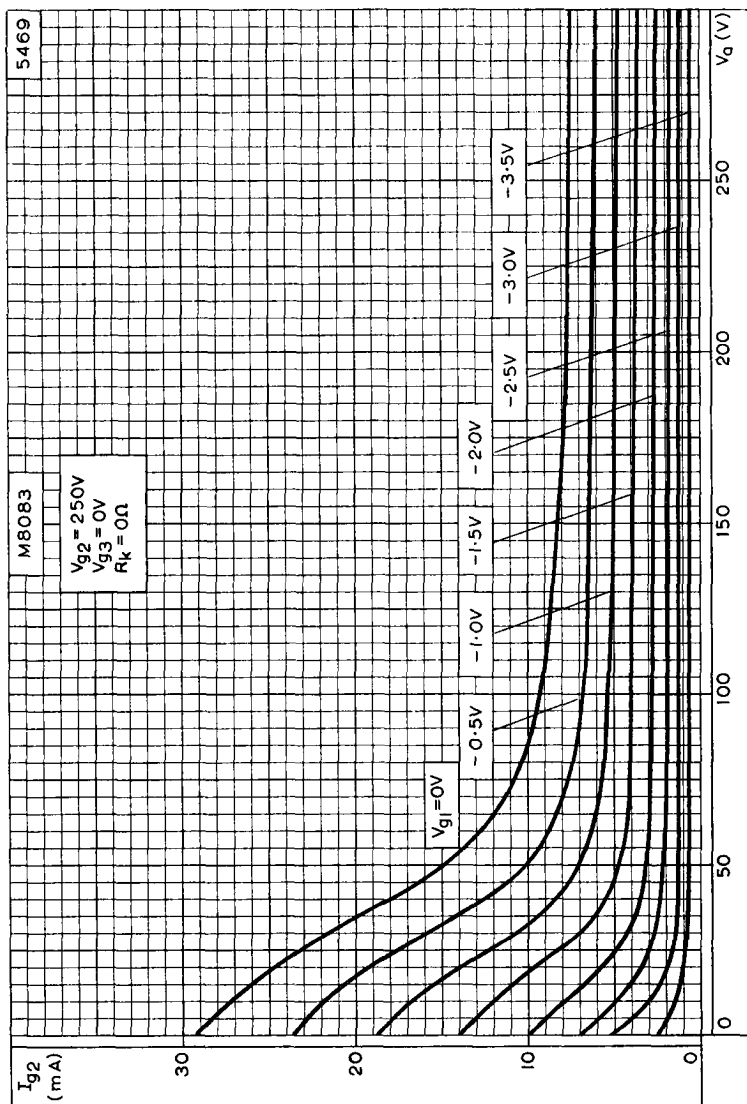
SCREEN-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. $V_{g2} = 200V$



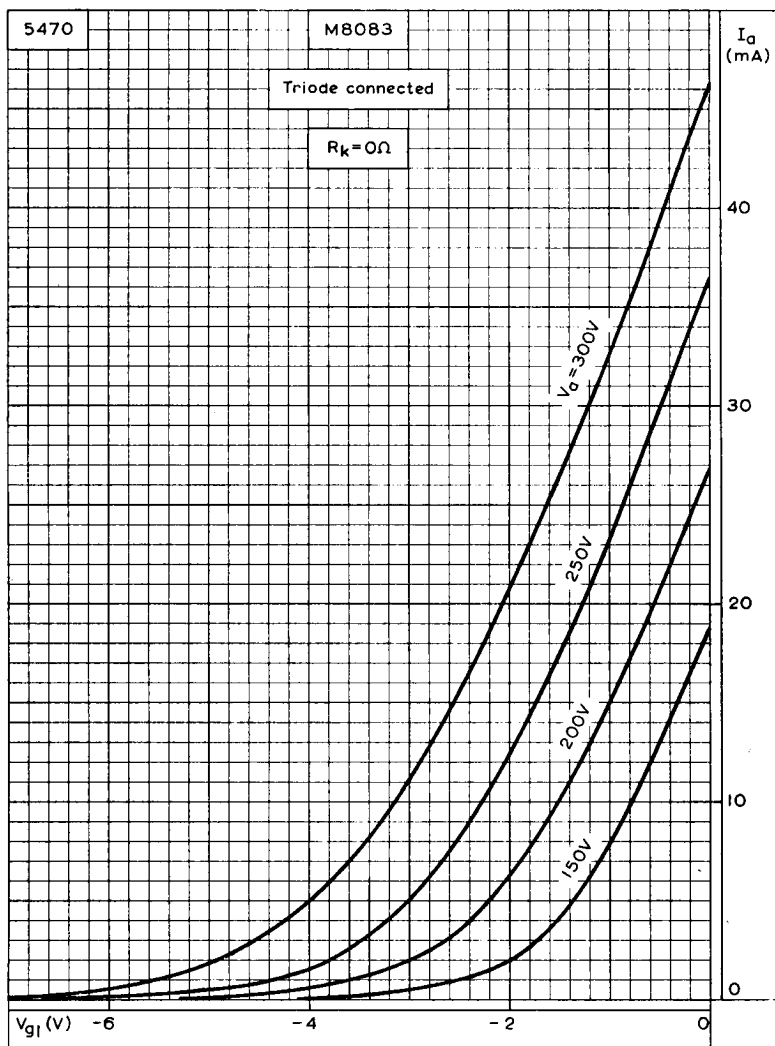
ANODE CURRENT, SCREEN-GRID CURRENT AND MUTUAL CONDUCTANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE. $V_a = V_{g2} = 250V$



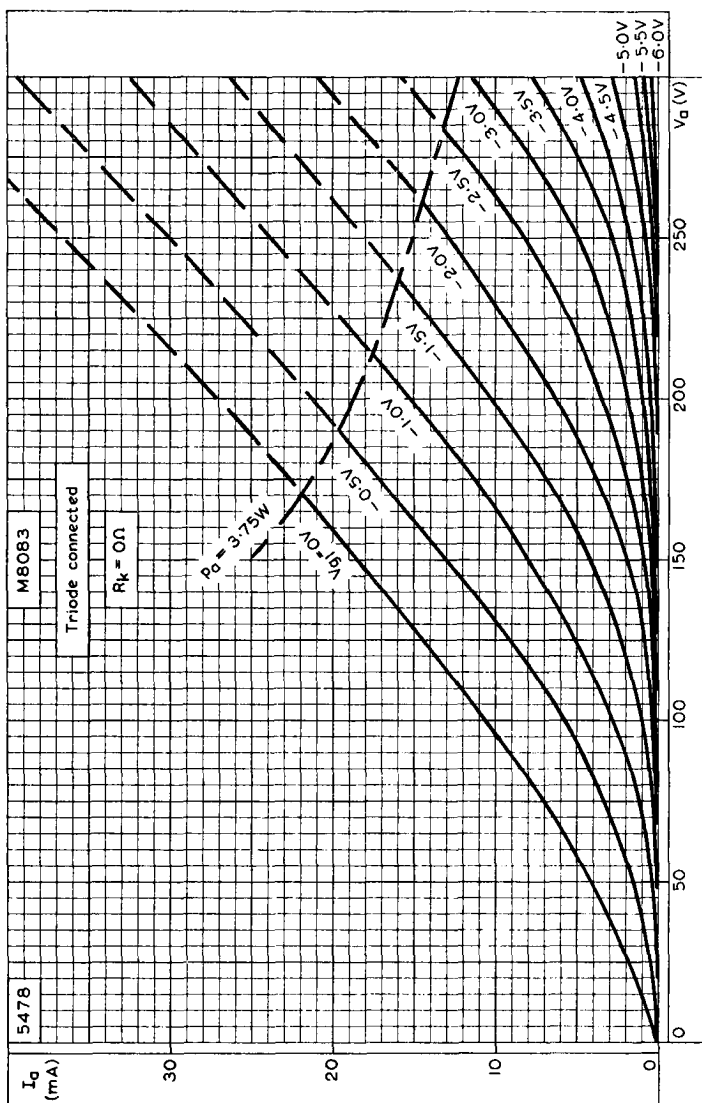
ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. $V_{g2} = 250V$



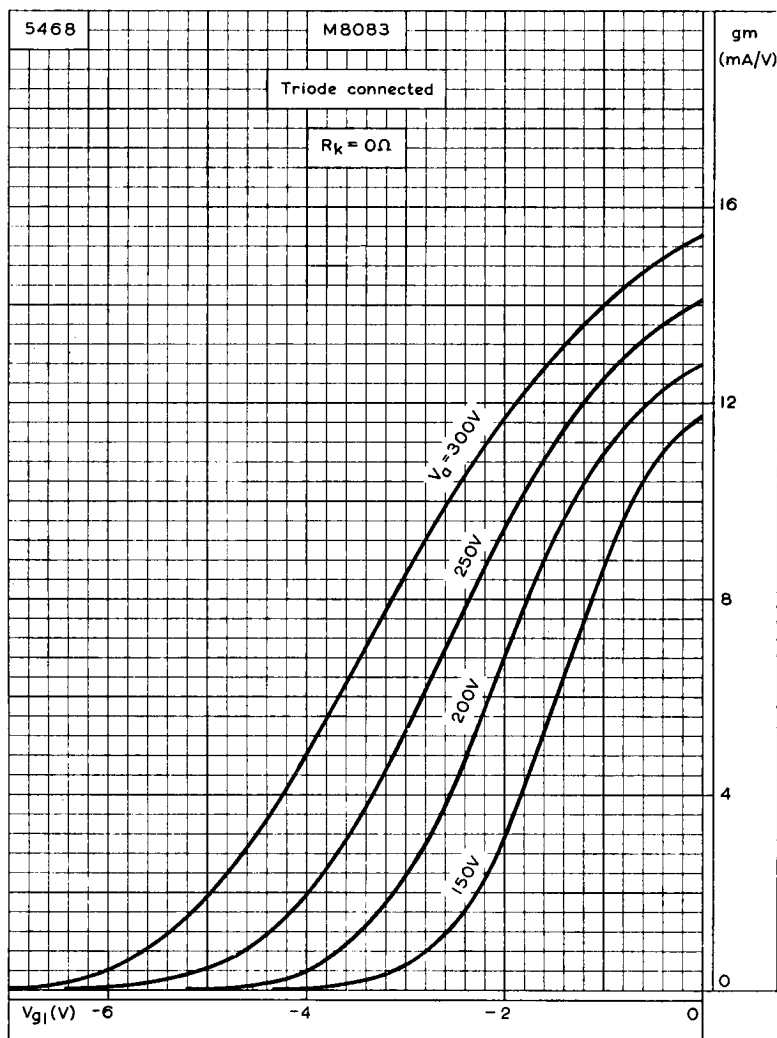
SCREEN-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. $V_{g2} = 250V$



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



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