SPECIAL QUALITY R.F. PENTODE

M8083

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

CAPACITANCES[2] (measured with an external shield)

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

CHARACTERISTICS[3]

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 VALUES[4] (absolute ratings)

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

M8083

SPECIAL QUALITY R.F. PENTODE

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	A.Q.L.[5] (%)	Individuals[6] Bogey[9]	Individuals[6] Min.	Individuals[6] Max.	Lot average[7] Min.	Lot average[7] Max.	Lot standard deviation[8] Max.	
GROUP A								
Insulation a-rest, g_2-rest measured at −300V g_1-rest measured at −100V	0.25	—	100	—	—	—	—	MΩ
Reverse control-grid current R_{g1} max. = 500kΩ	0.25	—	—	0.5	—	—	—	μA
GROUP B								
Heater current	0.65	—	275	325	—	—	—	mA
Heater to cathode leakage current V_{h-k} = 100V cathode negative	0.65	—	—	10	—	—	—	μA
V_{h-k} = 100V cathode positive	0.65	—	—	10	—	—	—	μA
	—	—	—	—	—	2.0	—	μA
Anode current	0.65	9.85	7.5	12.2	—	—	—	mA
	—	—	—	—	8.7	11	0.91	mA
Screen-grid current	0.65	2.6	1.8	3.4	—	—	—	mA
	—	—	—	—	—	3.0	—	mA
Mutual conductance	0.65	7.6	6.0	9.25	—	—	—	mA/V ←
	—	—	—	—	6.81	8.43	0.63	mA/V
Group quality level[10]	1.0	—	—	—	—	—	—	

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[11A]. 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	A.Q.L.[5] (%)	Individuals[6] Bogey[9]	Min.	Max.	Lot average[7] Min.	Max.	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	—	5.5	9.25	—	—	—	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	—	5.5	9.25	—	—	—	mA/V
Microphonic noise as in group C	2.5	—	—	25	—	—	—	mV (r.m.s.)
Sub-group quality level[10]	4.0	—	—	—	—	—	—	

GROUP F

Stability life test[14]

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

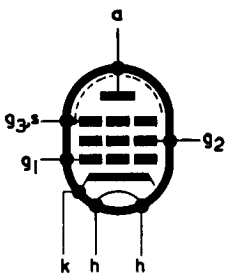
Change in mutual conductance after 1 hour	1.0	—	—	10	—	—	—	%

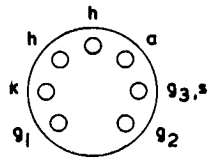
Intermittent life test		*A.Q.L.*[5] (%)	*Min.*	*Max.*	
Sub-group (a)					
Inoperatives[16]	500 hours	2.5	—	—	
	1000 hours	4.0	—	—	
Heater current	500 hours	2.5	275	325	mA
Heater to cathode leakage current. $V_{h-k} = \pm 100V$	500 hours	2.5	—	20	μA
	1000 hours	4.0	—	20	μA
Reverse coutrol-grid current. R_{g1} max = 500kΩ	500 hours	2.5	—	0.75	μA
	1000 hours	4.0	—	1.0	μA
Mutual conductance	500 hours	2.5	5.2	9.25	mA/V
	1000 hours	4.0	4.9	9.25	mA/V
Average change in mutual conductance	500 hours	—	—	10	%
Sub-group (b)					
Anode current	500 hours	4.0	6.8	12.2	mA
	1000 hours	6.5	5.25	—	mA
Insulation as in group A	500 hours	4.0	50	—	MΩ
	1000 hours	6.5	30	—	MΩ
Group quality level[10]	500 hours	6.5	—	—	
	1000 hours	10	—	—	

M8083 SPECIAL QUALITY R.F. PENTODE

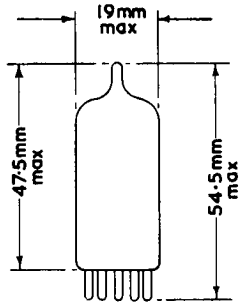
GROUP G	A.Q.L.[5] (%)	Min.	Max.	
Valves are held for 28 days and retested for				
Inoperatives[16]	0.5	—	—	
Reverse control-grid current. R_{g1}max = 500kΩ	0.5	—	0.75	μA

3594

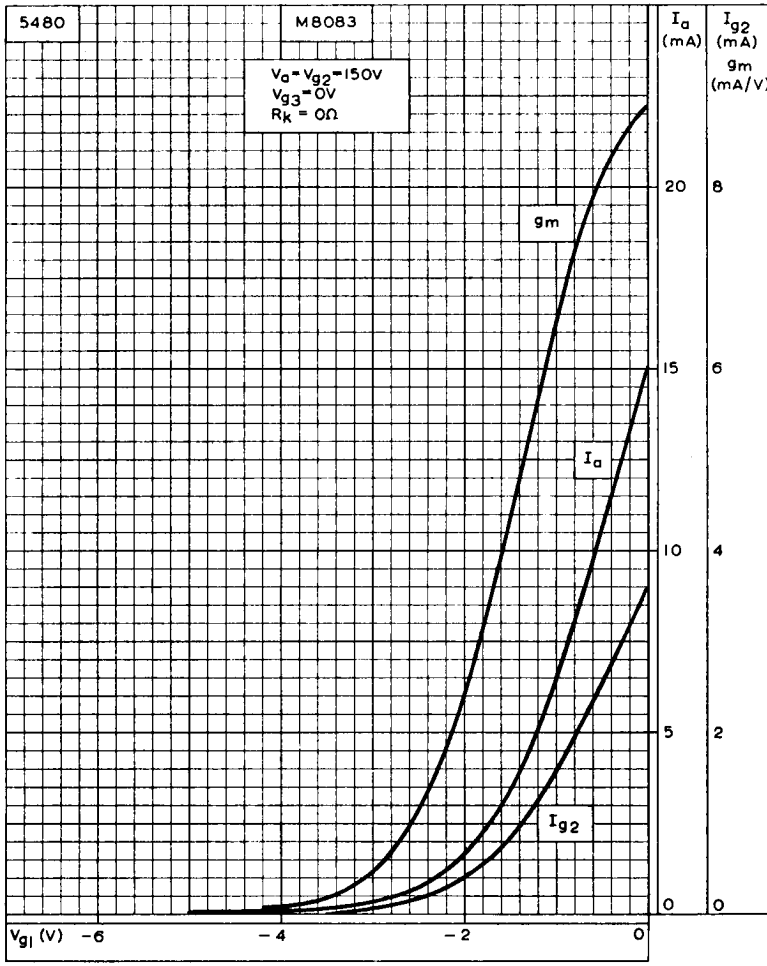




B7G Base



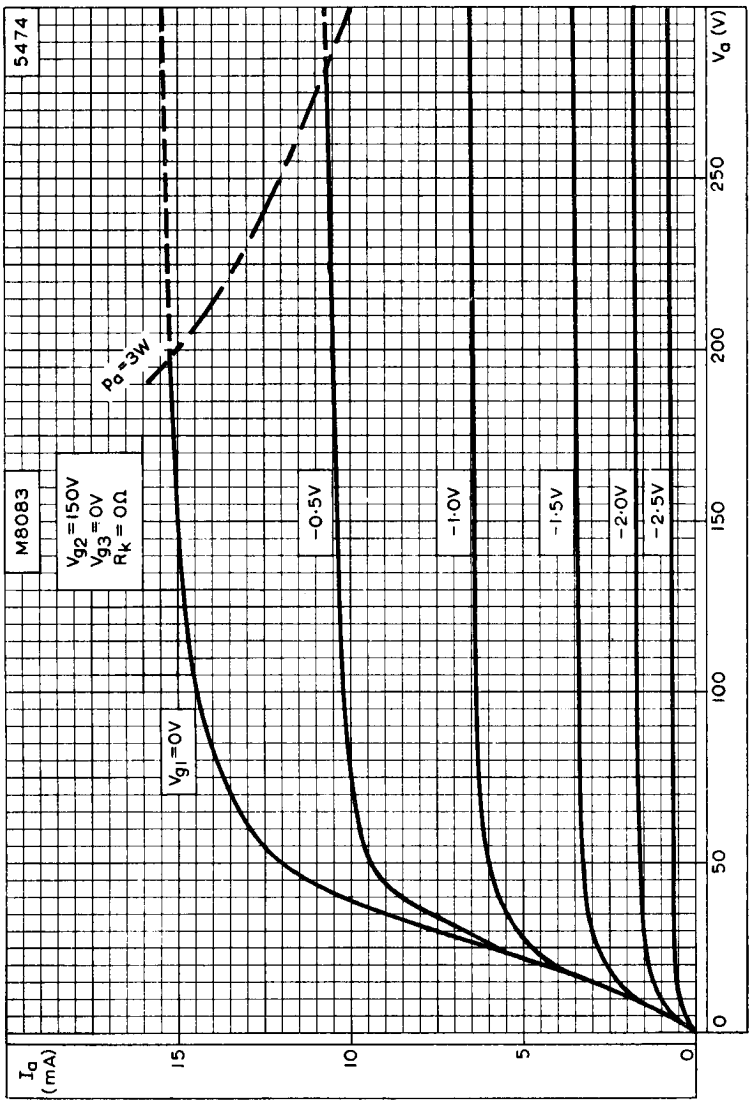
The bulb and base dimensions of this valve are in accordance with BS448, Section B7G



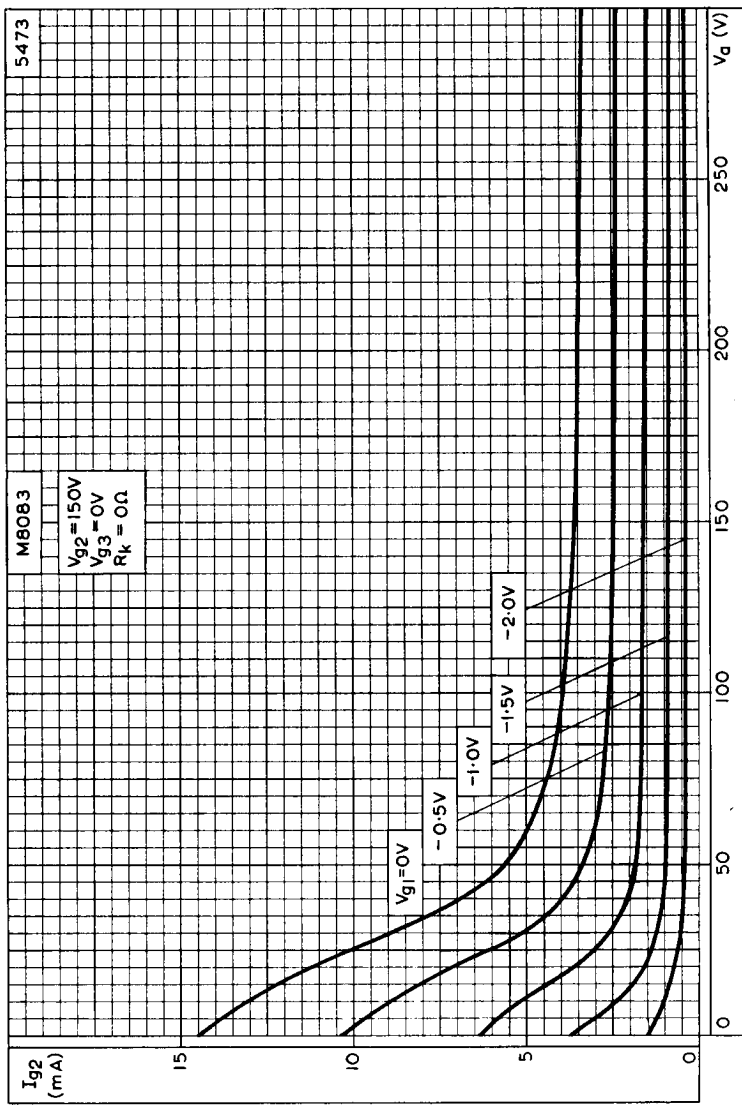
ANODE CURRENT, SCREEN-GRID CURRENT AND MUTUAL CONDUCTANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE. $V_a = V_{g2} = 150V$

M8083

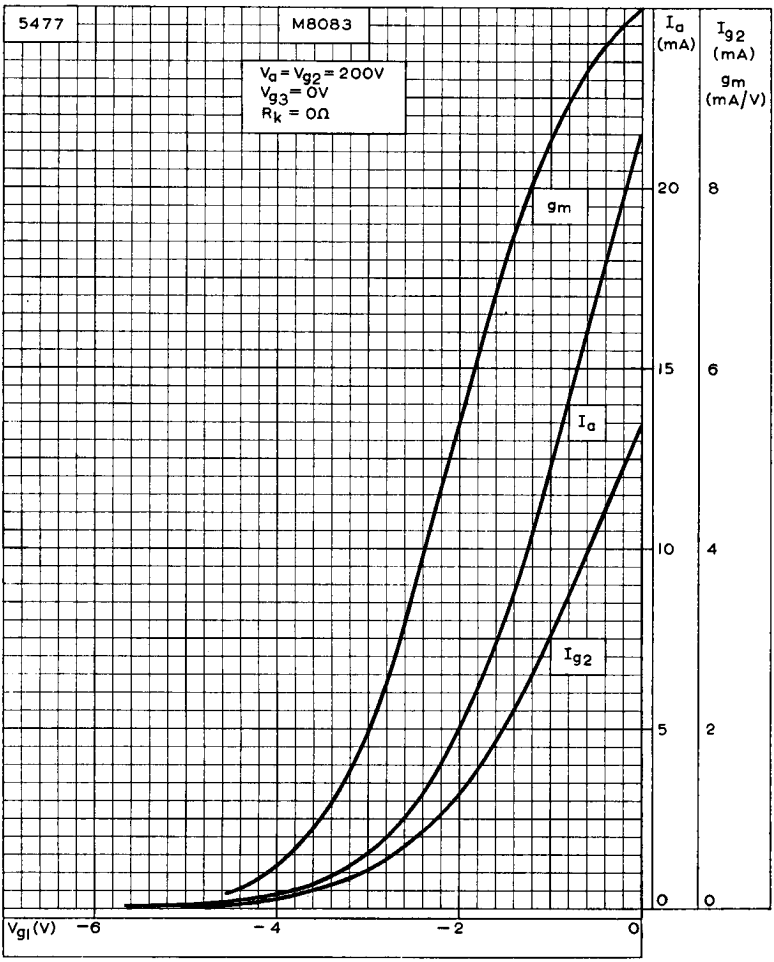
SPECIAL QUALITY R.F. PENTODE



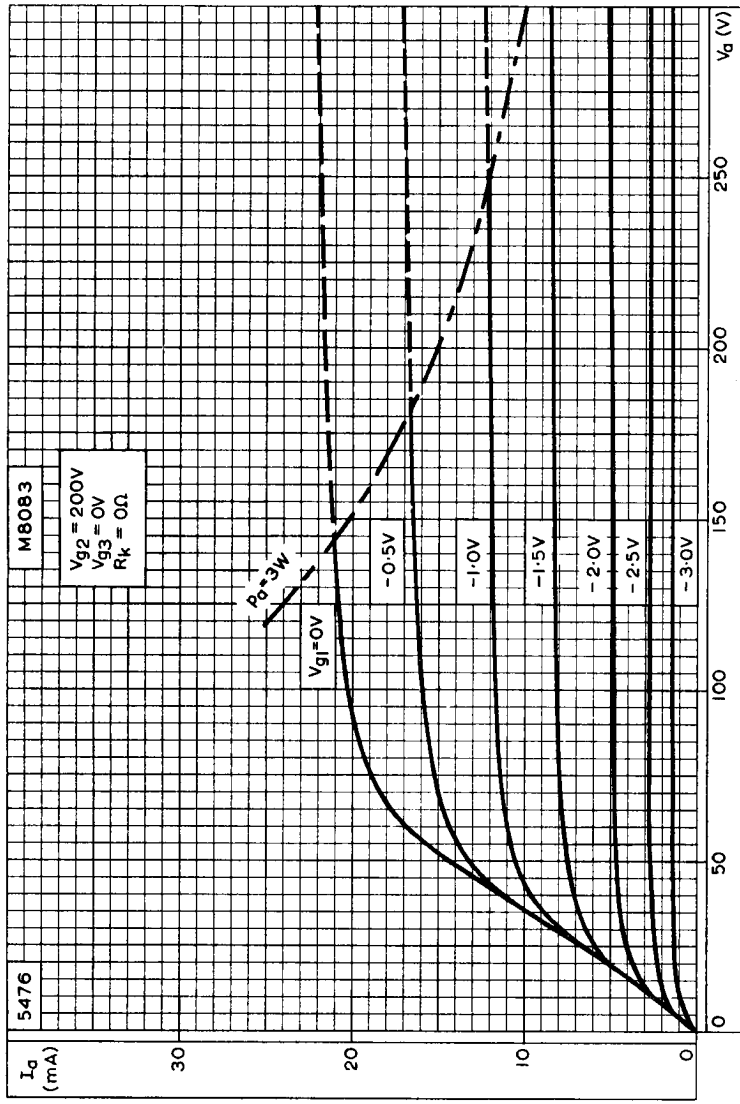
ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. V_{g2} = 150V



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



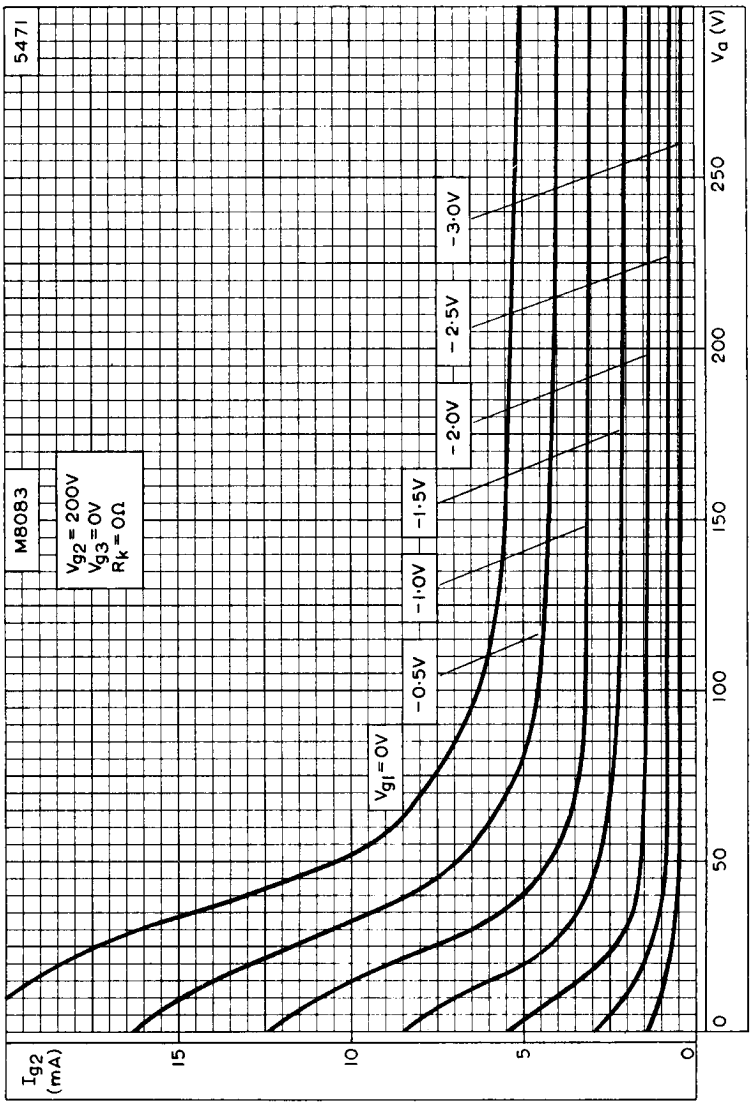
ANODE CURRENT, SCREEN-GRID CURRENT AND MUTUAL CONDUCTANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE. $V_a = V_{g2} = 200V$



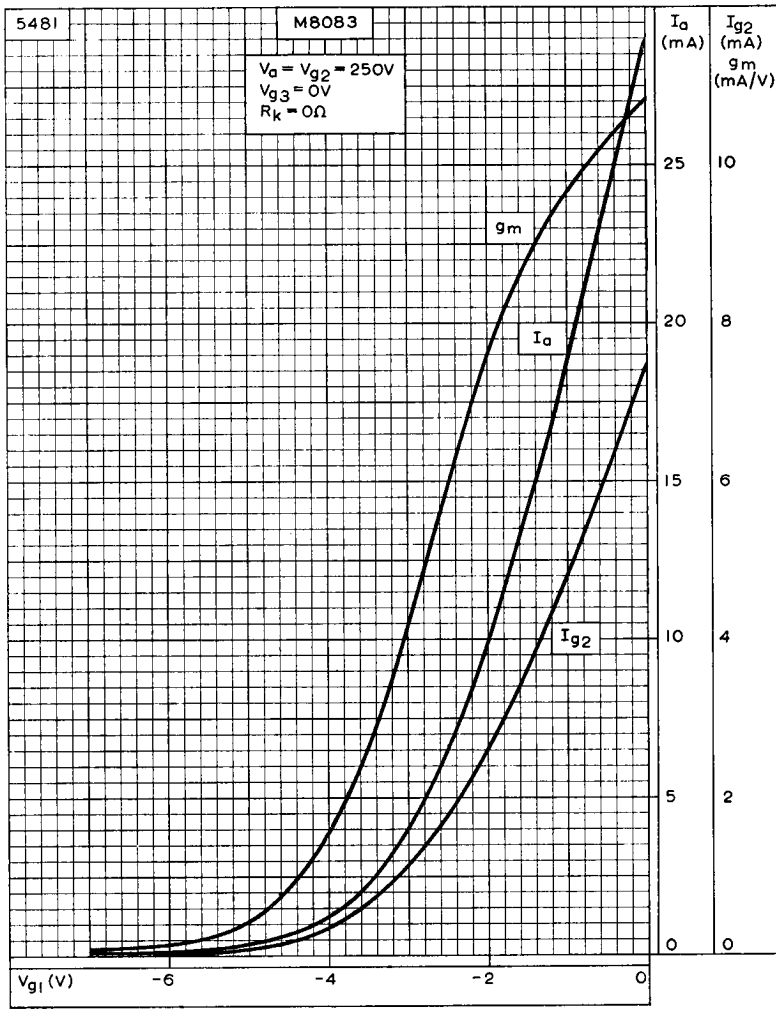
ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. V_{g2} = 200V

M8083

SPECIAL QUALITY R.F. PENTODE



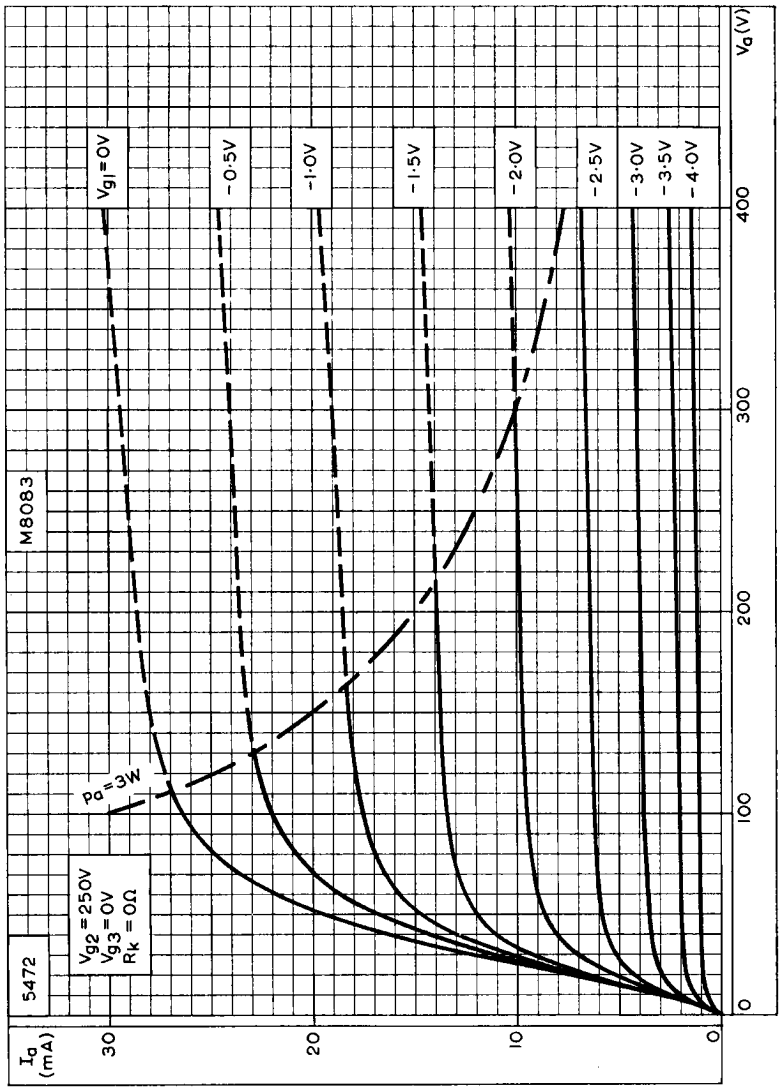
SCREEN-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. V_{g2} = 200V



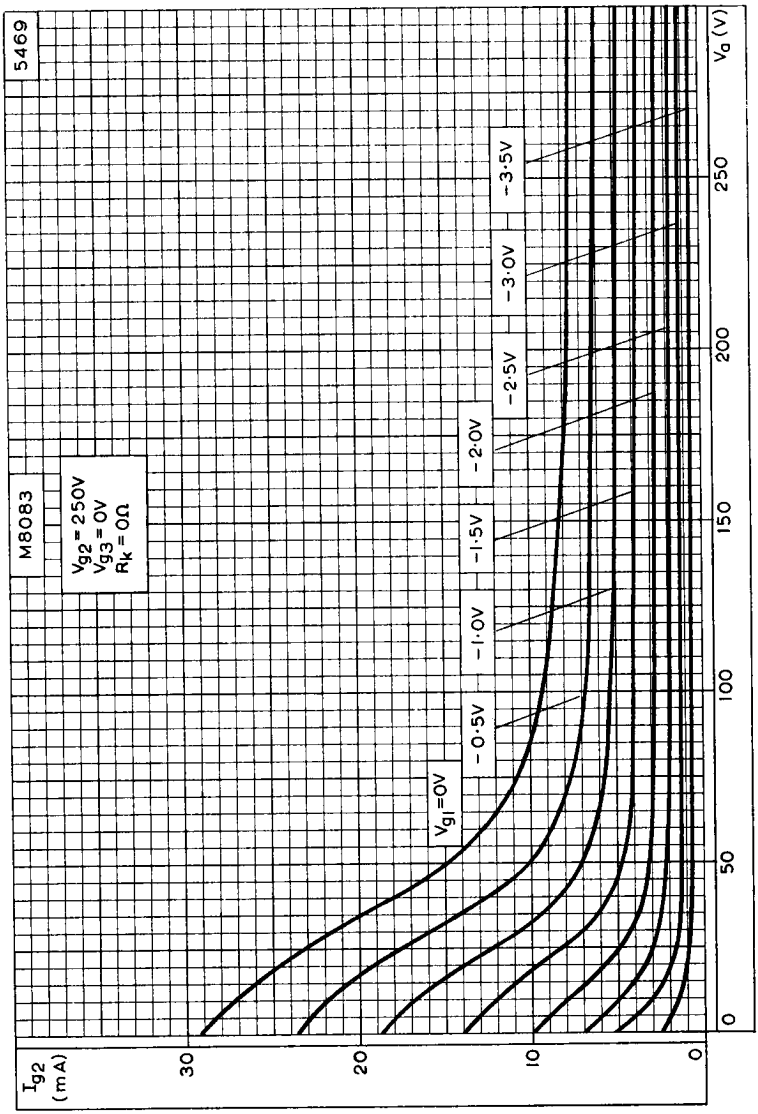
ANODE CURRENT, SCREEN-GRID CURRENT AND MUTUAL CONDUCTANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE. $V_a = V_{g2} = 250V$

M8083

SPECIAL QUALITY R.F. PENTODE



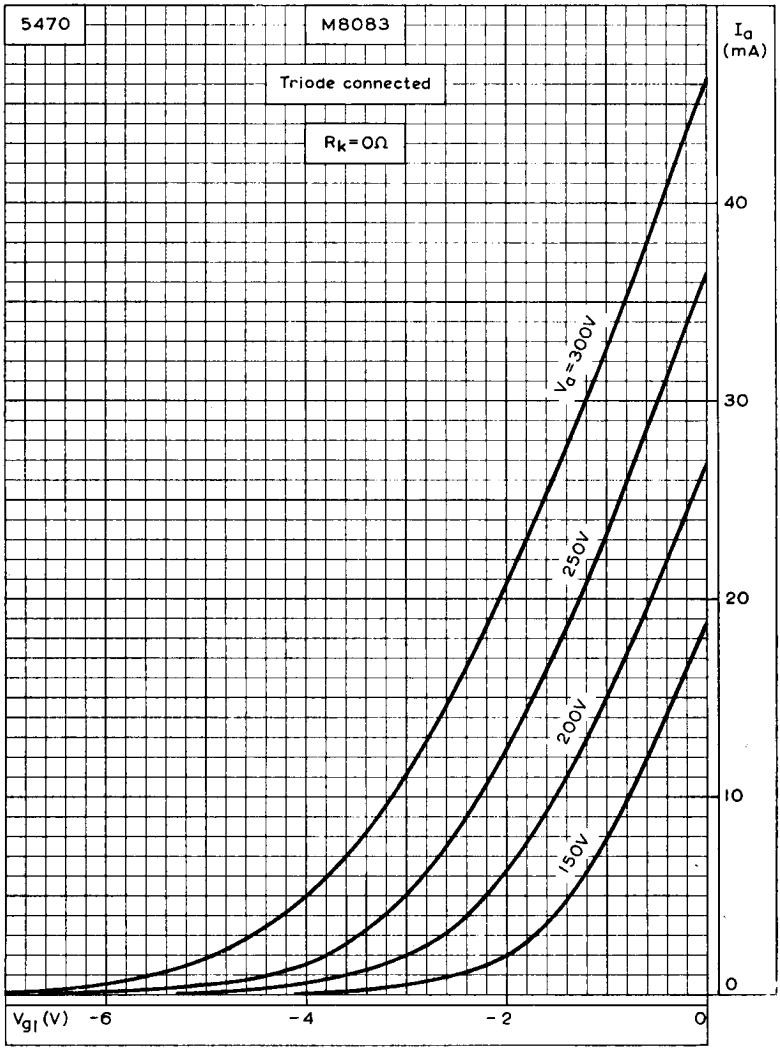
ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. V_{g2} = 250V



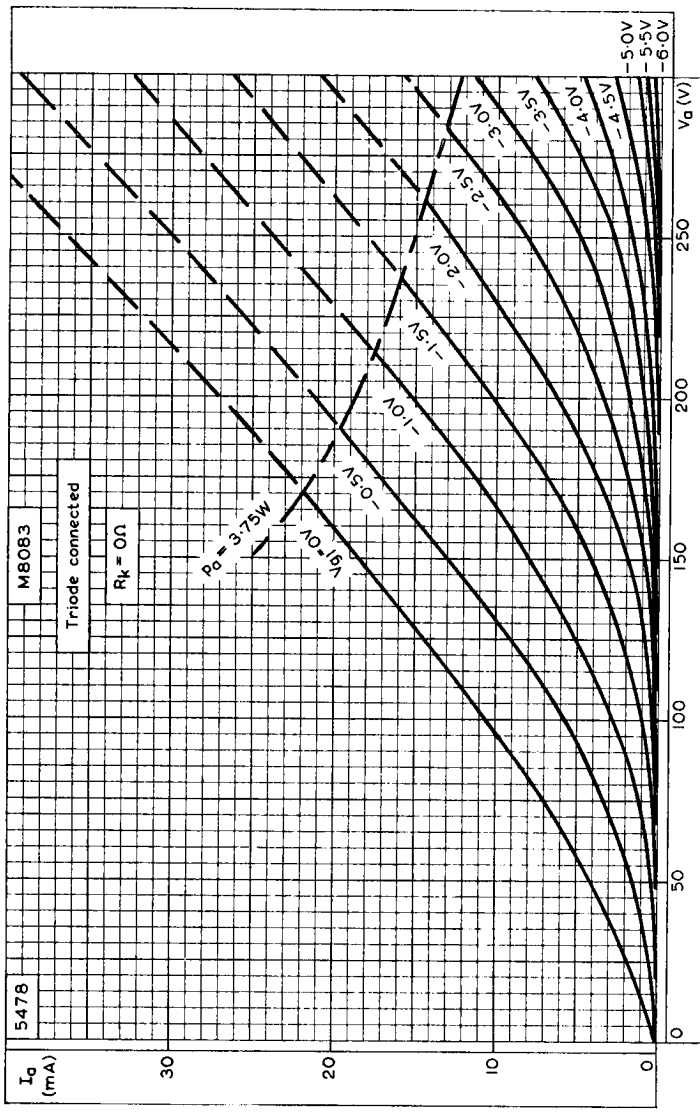
SCREEN-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. V_{g2} = 250V

M8083

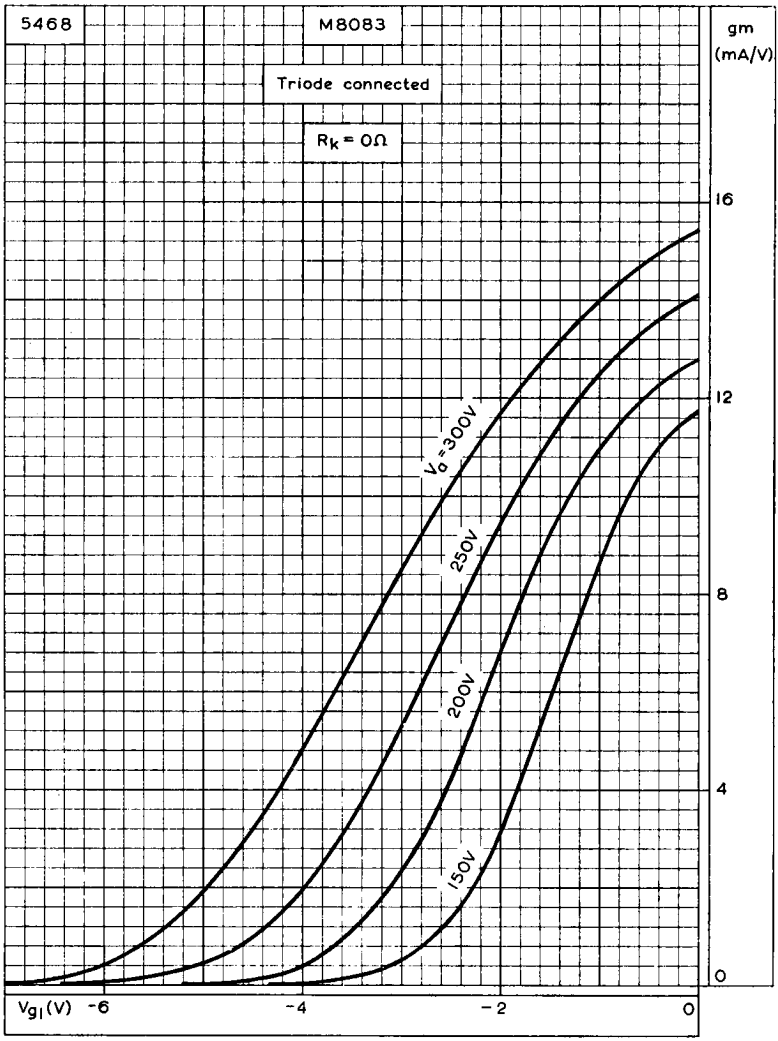
SPECIAL QUALITY R.F. PENTODE



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