

SPECIAL QUALITY OUTPUT PENTODE

E81L

*Special quality output pentode designed for use
in telephone equipment.*

This data should be read in conjunction with 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

Suitable for series or parallel operation a.c. or d.c.

V_h^1	6.3	V
I_h	375	mA

The maximum variation of heater current at $V_h = 6.3V$ is $\pm 20mA$. In order to achieve a useful valve life with the heater in a series connected chain, the absolute maximum variation of heater current due to voltage fluctuations and component tolerances should be $< \pm 1.5\%$.

CAPACITANCES²

C_{a-g1}	< 0.02	pF
C_{in}	11.5 ± 0.8	pF
C_{out}	6.5 ± 0.6	pF
C_{g1-h}	< 0.2	pF
C_{h-k}	4.2	pF
$C_{in} (I_k = 25mA)$	14.3	pF

CHARACTERISTICS³

V_{a-k}	210	V
V_{g3-k}	0	V
V_{g2-k}	210	V
R_k	120	Ω
$*I_a$	20 ± 3.0	mA
$*I_{g2}$	5.3 ± 1.2	mA
$*g_m$	11 ± 1.5	mA/V
r_a	300	k Ω
r_a min.	200	k Ω
μ_{g1-g2}	36	
R_{eq} (r.f.)	1.2	k Ω
$*-I_{g1}$ max.	0.5	μA
$V_{g1} (I_{g1} = +0.3\mu A)$	< -1.1	V

*To allow for valve deterioration during life, circuits should be designed to function with a valve in which one or more of these characteristics have changed to the following values:

I_a	≤ 13.5	mA
I_{g2}	≤ 3.1	mA
g_m	≤ 7.8	mA/V
$-I_{g1} (R_{g1} = 100k\Omega)$	≤ 1.0	μA

OPERATING CONDITIONS

As a pre-amplifier

V_{a-k}	210	V
V_{g3-k}	0	V
V_{g2-k}	210	V
R_k	180	Ω
R_a	20	k Ω
I_a	15	mA
I_{g2}	4.0	mA
V_{out}/V_{in}	172	

As an output valve

V_{a-k}	210	V
V_{g3-k}	0	V
V_{g2-k}	210	V
R_k	120	Ω
R_a	15	k Ω
I_a	20	mA
I_{g2}	5.3	mA
$P_{out} (D_{tot} = 5\%)$	1.0	W
$V_{in(r.m.s.)}$	0.9	V

INSULATION

Between heater and cathode

V_h	6.3	V
V_{h-k}	120	V
Series resistor	1.0	M Ω
Leakage current	< 24	μ A

Between any two arbitrary electrodes

> 30 M Ω

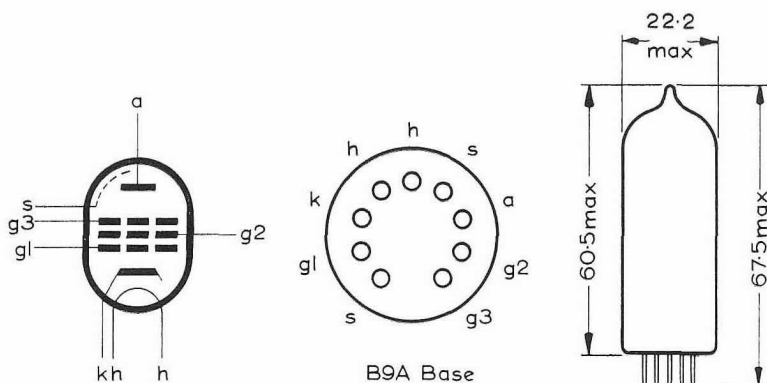
LIMITING VALUES¹ (design centre ratings)

$V_{a(b)}$ max.	550	V
V_a max.	210	V
p_a max.	4.5	W
V_{g2, b_1} max.	550	V
V_{g2} max.	210	V
p_{g2} max.	1.2	W
I_k max.	30	mA
R_{g1-k} max. (cathode bias)	500	k Ω
R_{g1-k} max. (fixed bias)	250	k Ω
V_{h-k} max.	120	V
R_{h-k} max.	20	k Ω
T_{bulb} max.	170	$^{\circ}$ C

OPERATING NOTES

The hum voltage referred to g_1 has a maximum value of 200 μ V r.m.s. at 50c/s with a grid leak of 1.0M Ω .



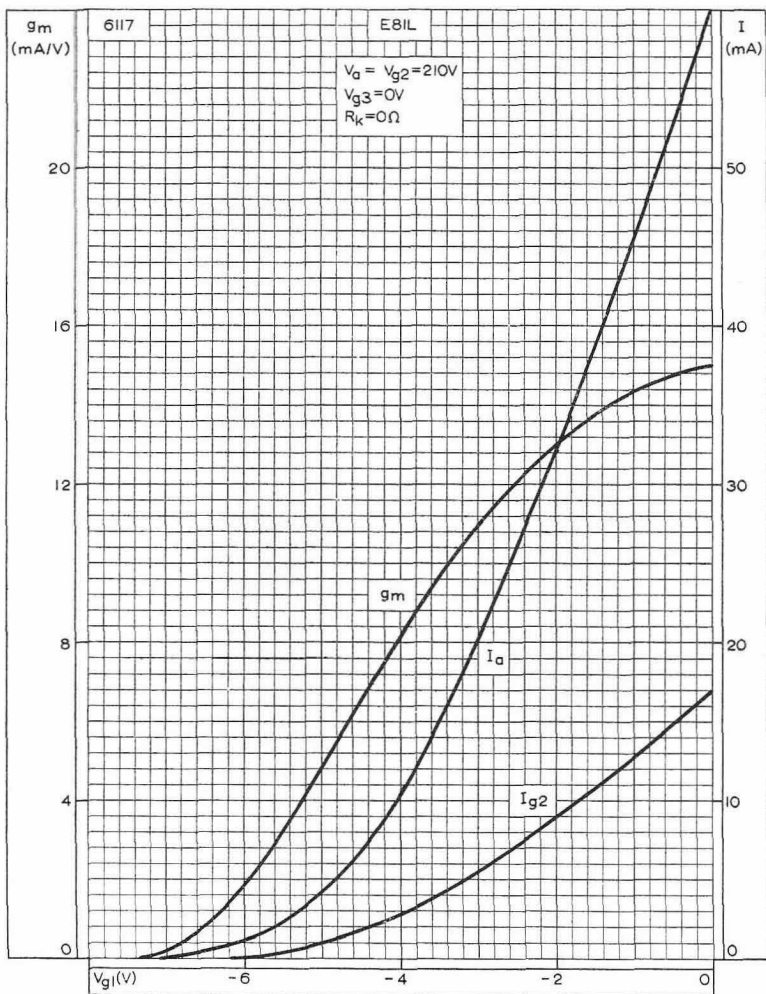


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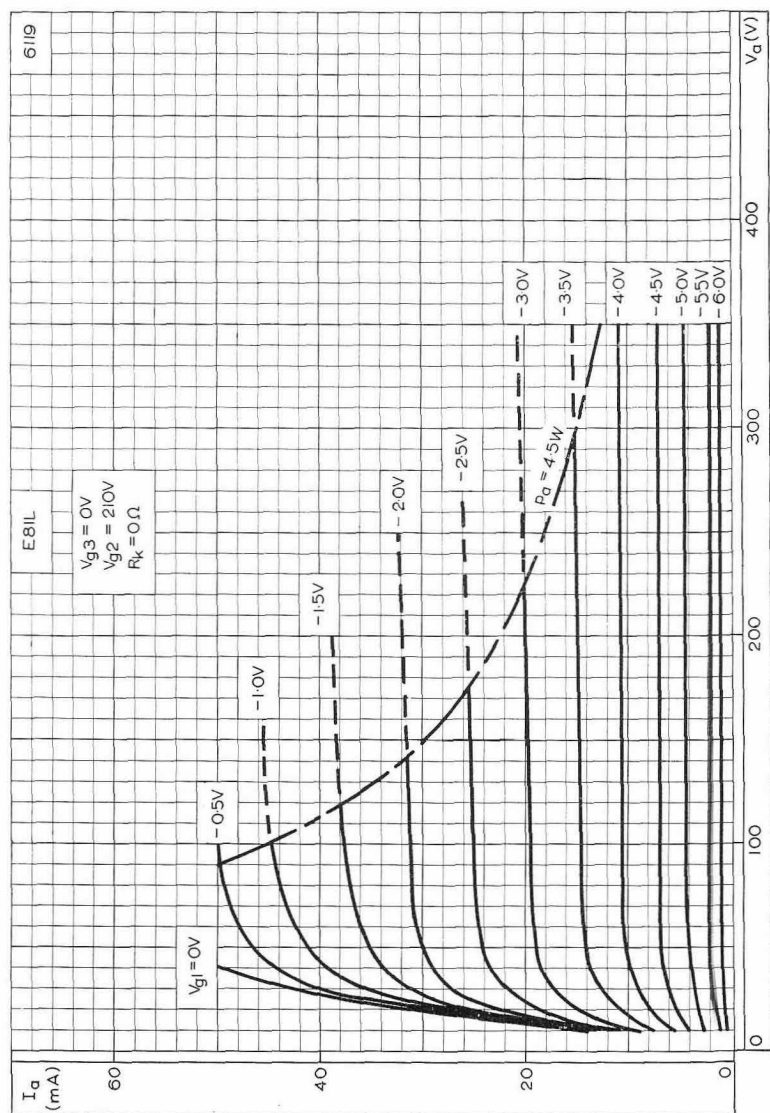
All dimensions in mm

The bulb and base dimensions of this valve are in accordance with BS448, Section B9A

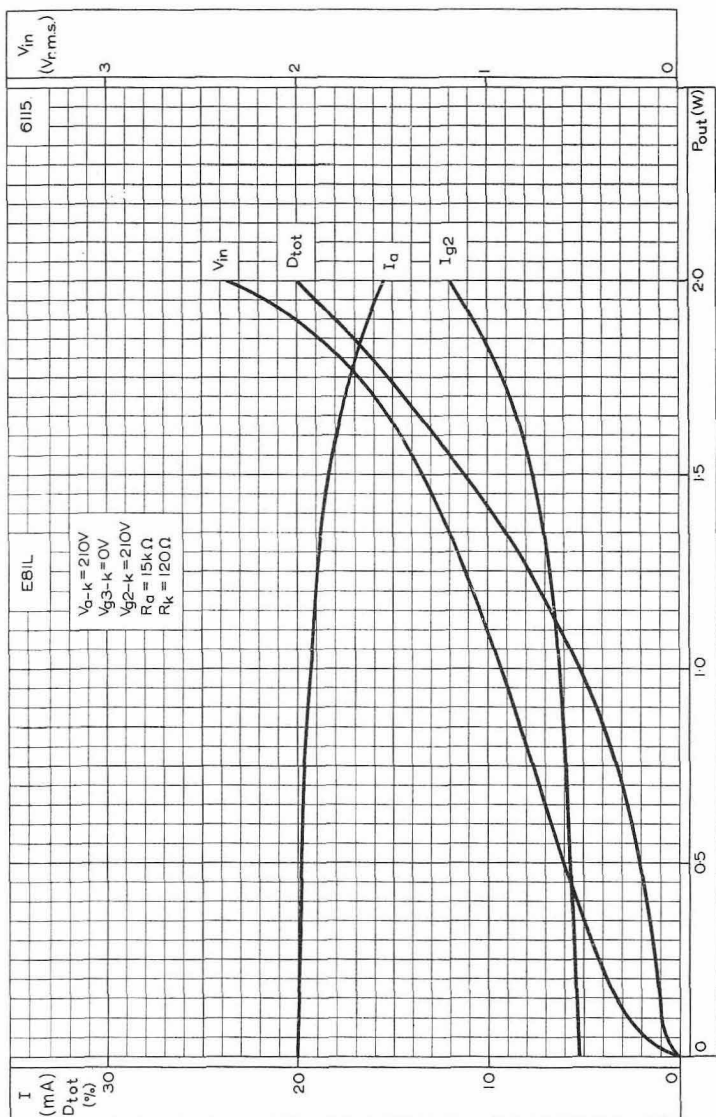




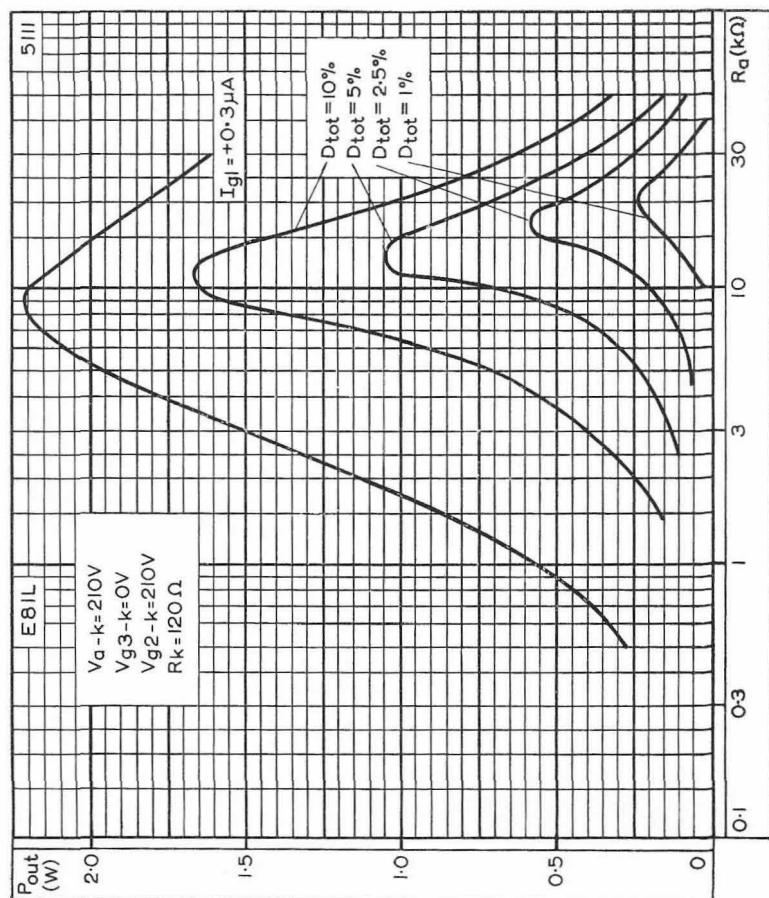
ANODE CURRENT, SCREEN-GRID CURRENT AND MUTUAL
CONDUCTANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE



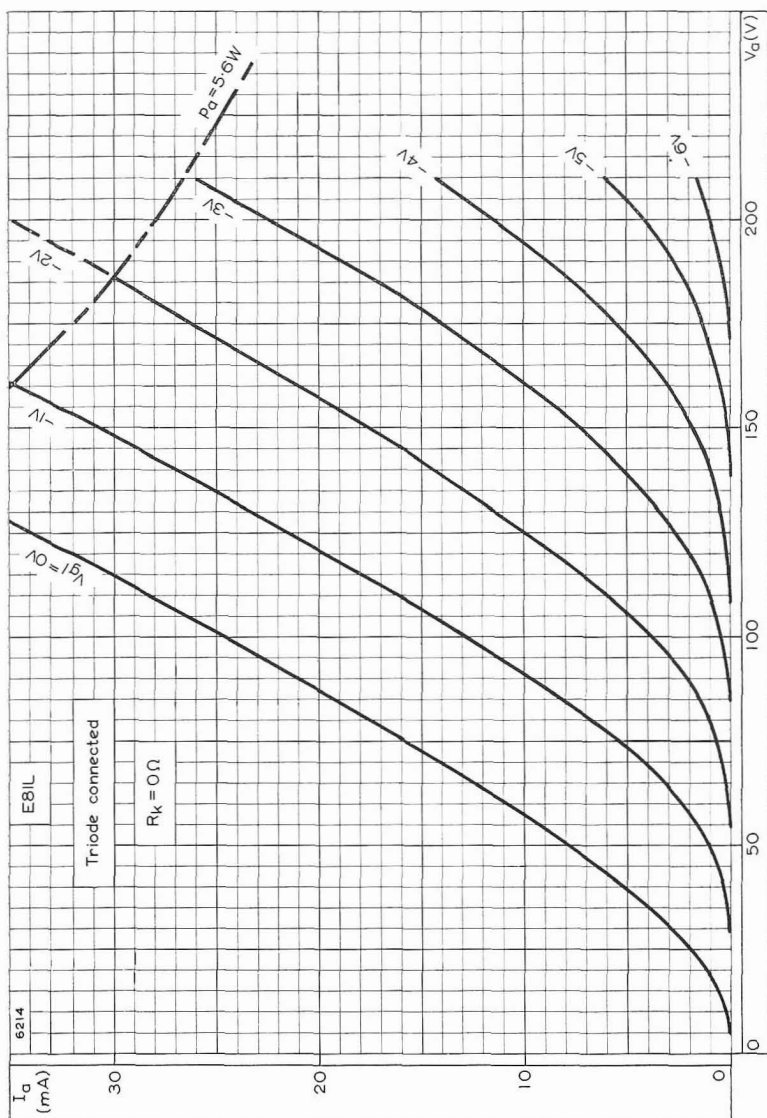
ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH
CONTROL-GRID VOLTAGE AS PARAMETER



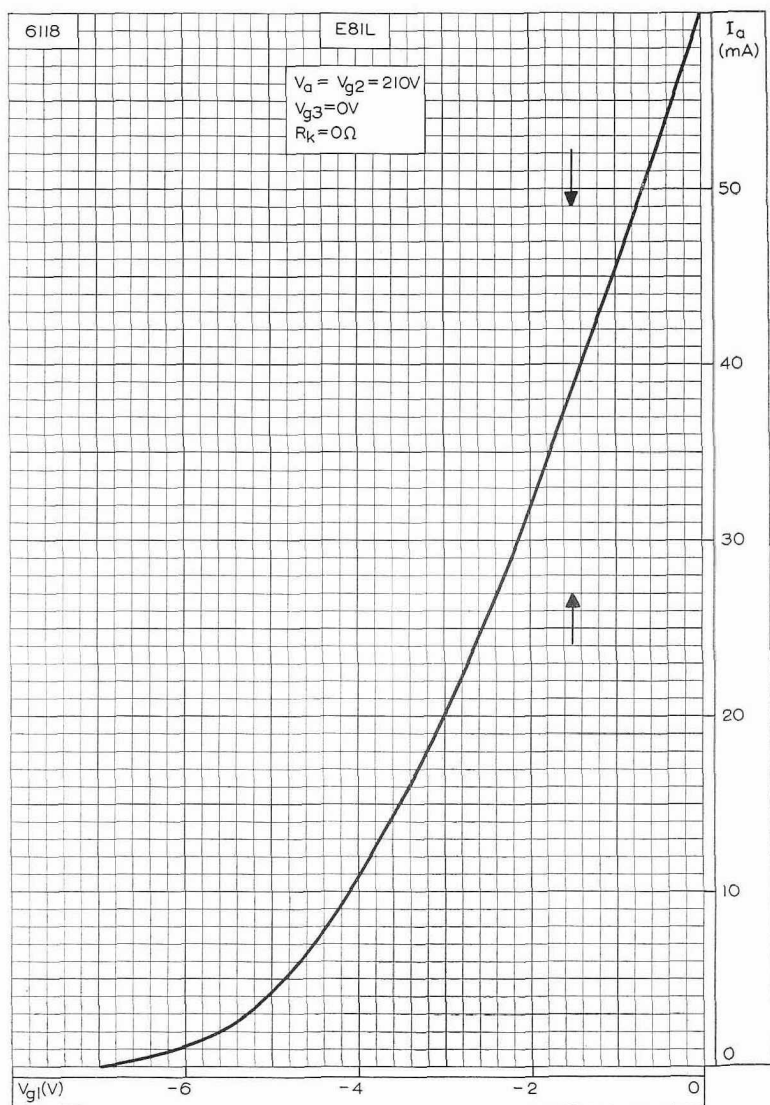
PERFORMANCE OF E81L AS CLASS 'A' AMPLIFIER



POWER OUTPUT PLOTTED AGAINST ANODE LOAD



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



ANODE CURRENT PLOTTED AGAINST CONTROL-GRID VOLTAGE
WITH INDICATION OF INITIAL SPREAD