

Special quality subminiature r.f. pentode for use in equipment where high ambient temperatures, mechanical vibration and shocks are unavoidable and where statistically controlled major electrical characteristics are required.

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

V_{h1}	6.3	V
I_h	150	mA

MOUNTING POSITION

Any

Note—Direct soldered connections to the leads of this valve must be at least 5mm from the seal and any bending of the valve leads must be at least 1.5mm from the seal.

CAPACITANCES² (measured with external shield)

C_{a-g1}	< 20	mpF
C_{a-g3}	< 1.1	pF
C_{g1-g3}	< 150	mpF
$C_{in(g1)}$	4.0	pF
$C_{in(g3)}$	3.7	pF
C_{out}	3.4	pF

CHARACTERISTICS³

V_a	100	V
V_{g3}	0	V
V_{g2}	100	V
V_{g1}	-1.4	V
I_a	5.3	mA
I_{g2}	4.1	mA
$g_{m(g1-a)}$	3.2	mA/V
$g_{m(g3-a)}$	1.15	mA/V
μ_{g1-g2}	25	←
R_k	0	Ω
$V_{g1} (I_a < 100\mu A)$	-7.5	V
$V_{g3} (I_a < 100\mu A)$	-8.0	V

LIMITING VALUES⁴ (absolute ratings)

V_h max.	6.6	V
V_h min.	6.0	V
$V_{a(b)}$ max.	330	V
V_a max.	165	V
p_a max.	550	mW
+ V_{g3} max.	30	V
$V_{g2(b)}$ max.	310	V
V_{g2} max.	155	V
p_{g2} max.	450	mW
I_{g2} max.	7.0	mA
+ V_{g1} max.	0	V←
- V_{g1} max.	55	V
I_k max.	16	mA
V_{h-k} max.	200	V
R_{g1-k} max.	1.1	M Ω
Maximum acceleration (continuous operation)	2.5	g
Maximum shock (short duration)	500	g
T_{bulb} max.	220	$^{\circ}C$



TEST CONDITIONS (unless otherwise specified)

V_h (V)	V_{a-e} (V)	V_{g2-e} (V)	V_{g1-e} (V)	V_{g3-k} (V)	R_k (Ω)	C_k (μ F)	V_{h-k} (V)
6.3	100	100	0	0	150	1000	0

TESTS

A.Q.L. ⁵	Individuals ⁶	Lot average ⁷	Lot standard deviation ⁸
(%)	Min.	Min.	Max.

GROUP A

Heater current	{ 0.65 —	150	140	160	—	144	156	—	4.2
Heater-to-cathode leakage current $V_{h-k} = \pm 100V$	0.65	—	—	5.0	—	—	—	—	μ A
Reverse grid current $R_{g1} = 1.0M\Omega$	0.65	—	0	0.3	—	—	—	—	μ A
Anode current	{ 0.65 —	5.3	3.7	6.9	—	4.6	6.0	—	mA mA
Anode current $V_{g1} = -7.5V, R_k = 0\Omega$	0.65	—	—	100	—	—	—	—	μ A
Mutual conductance	{ 0.65 —	3.2	2.7	4.0	—	2.9	3.5	—	mA/V 0.31 mA/V
Sub-group quality level ¹⁰	1.0	—	—	—	—	—	—	—	—
Inoperatives ¹⁶	0.4	—	—	—	—	—	—	—	—

	A.Q.L. ⁵ (%)	Individuals ⁶		Lot average ⁷		Lot standard deviation ⁸ Max.
		Bogey ⁹	Min.	Max.	Min.	
GROUP C						
Lead fragility test ^{13B} 4 arcs	2.5	—	—	—	—	—
Fatigue¹⁴						
$V_h = 6.3V$. No other voltages applied. 2.5g min. peak acceleration, fixed frequency $f = 25c/s$ min. 60c/s max. for 32 hours in each of 3 mutually perpendicular planes						
Post fatigue tests						
Heater-to-cathode leakage current	} 6.5 {	—	—	—	—	—
$V_{h-k} = \pm 100V$		—	—	—	—	μA
Change in mutual conductance		—	—	—	—	$\frac{\%}{mV}$
Microphonic noise as in group B		—	—	—	—	(r.m.s.)
Shock¹⁵						
$V_{h-k} = 100V$ (cathode negative), $R_{g1} = 100k\Omega$, 500g						
Post shock tests						
Heater-to-cathode leakage current	} 20 {	—	—	—	—	—
$V_{h-k} = \pm 100V$		—	—	—	—	μA
Change in mutual conductance		—	—	—	—	$\frac{\%}{mV}$
Microphonic noise as in group B		—	—	—	—	(r.m.s.)
Glass strain test ^{11B} . No applied voltages	6.5	—	—	—	—	—

GROUP D

Heater cycling life test

$V_h = 7.0V$ 1 minute on, 4 minutes off
 $V_{h-k} = 140V_{r.m.s.}$ (continuous). No other applied voltages

2.5

Stability life test¹⁴

Running conditions $R_{g1} = 1.0M\Omega$,
 $V_{h-k} = 200V$ (cathode negative), $T_{ambient} =$
 Room temperature

Stability life test end points

Change in mutual conductance after 1 hour 1.0 15 %

Survival rate life test¹⁴

Running conditions $R_{g1} = 1.0M\Omega$,
 $V_{h-k} = 200V$ (cathode negative),
 $T_{ambient} =$ Room temperature

Survival rate life test end points (100 hours)

Inoperatives¹⁶ 0.65
 Mutual conductance 1.0 2.35 %

A.Q.L.⁵ (%) Min. Max.

Intermittent life test

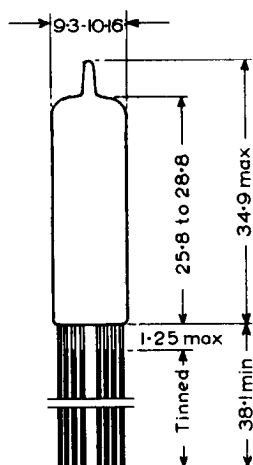
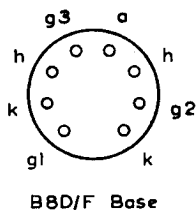
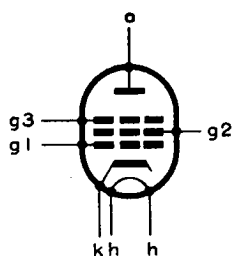
Running conditions, $R_{g1} = 1.0M\Omega$,
 $V_{h-k} = 200V$ (cathode negative),
 $T_{bulb} \text{ min} = 220^\circ C$

Intermittent life test end points (500 hours)

Inoperatives¹⁶
 Heater current
 Heater-to-cathode leakage current $V_{h-k} = \pm 100V$
 Reverse grid current $R_{g1} = 1.0M\Omega$
 Change in mutual conductance (individuals)
 Change in mutual conductance $V_h = 5.7V$
 Insulation as in group B
 Average change in mutual conductance
 Sub-group quality level¹⁰

4.0 6.5 6.5 4.0 4.0 6.5 6.5
 138 164 10 0.9 20 15 15
 mA μA μA % $M\Omega$ %

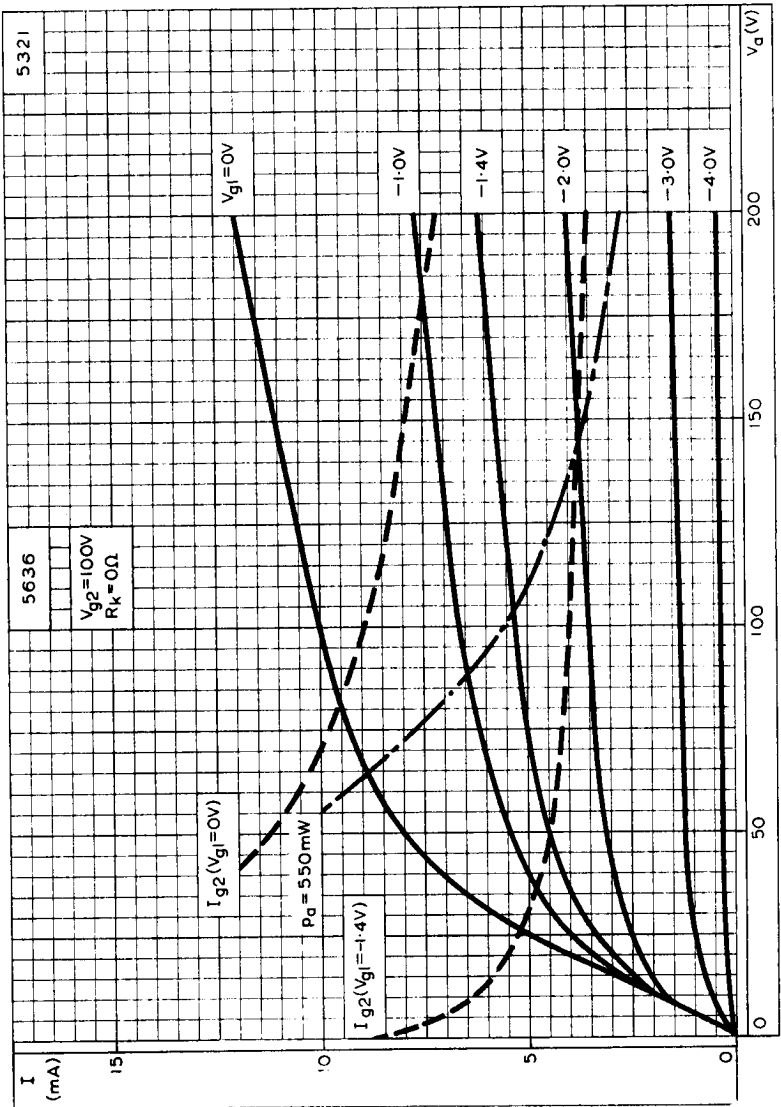




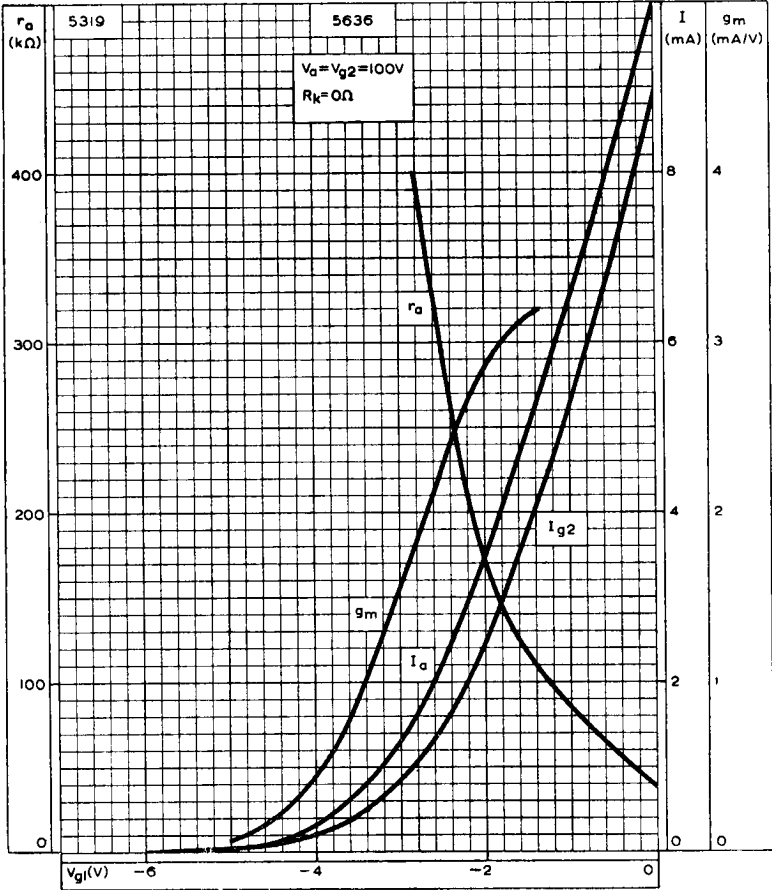
5325

All dimensions in mm

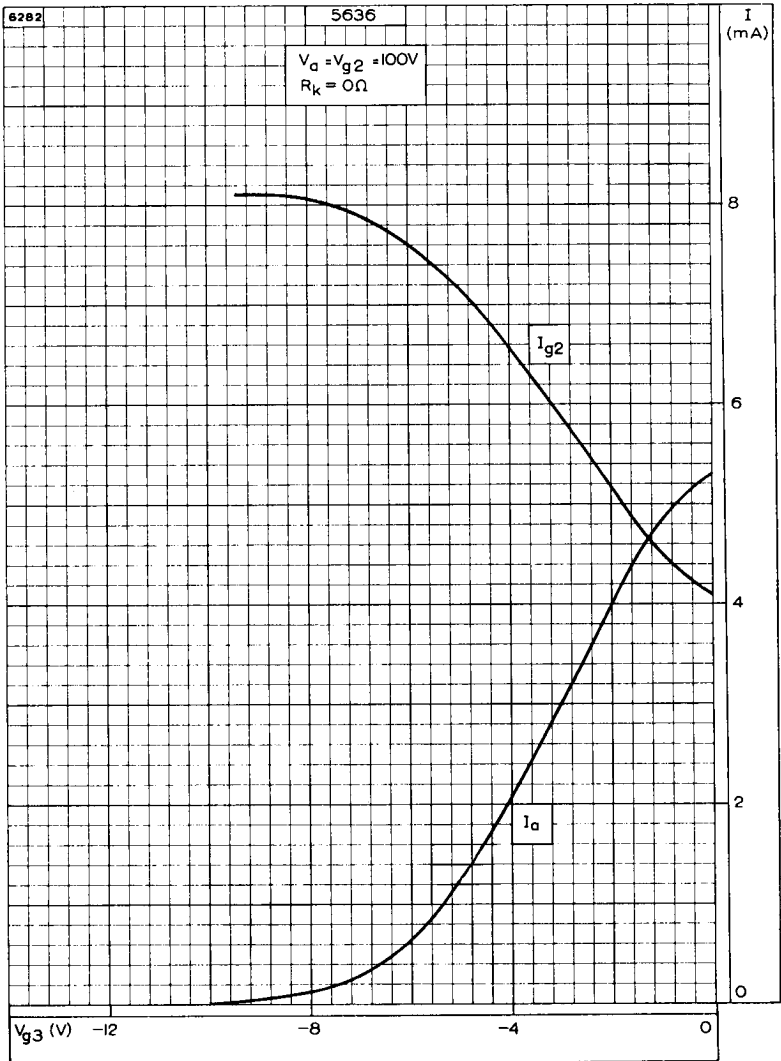
The bulb and base dimensions of this valve are in accordance with BS.448, Section B8D/F.



ANODE AND SCREEN-GRID CURRENTS PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER

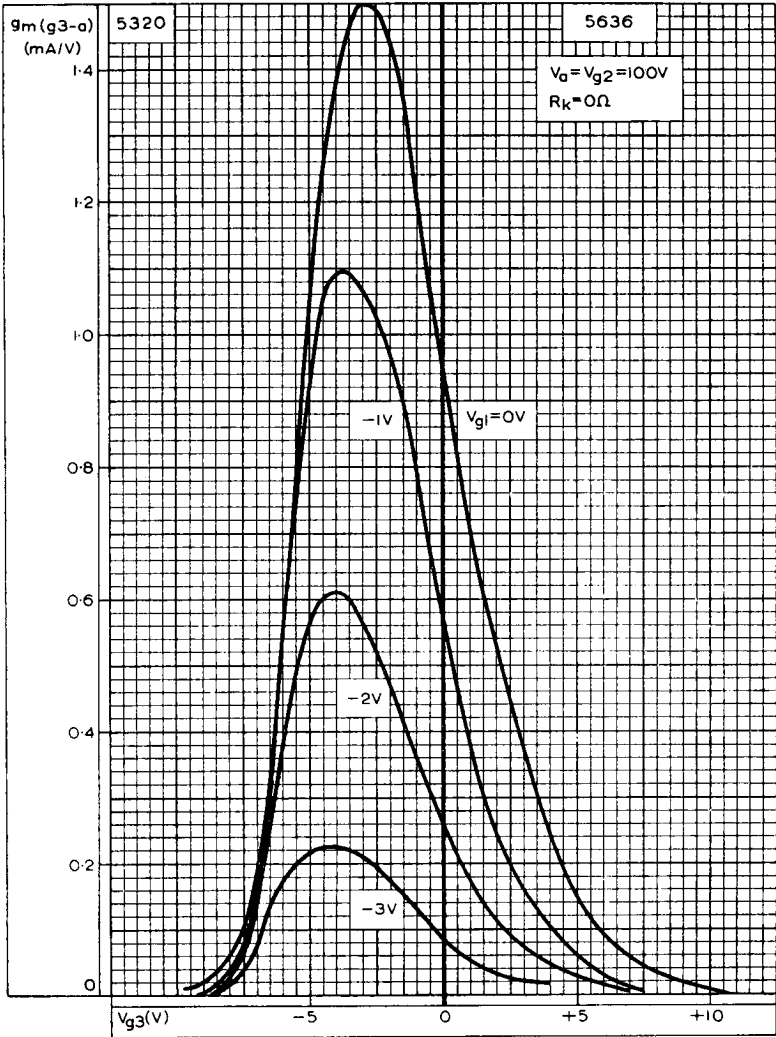


ANODE AND SCREEN-GRID CURRENTS, MUTUAL CONDUCTANCE AND ANODE IMPEDANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE



ANODE AND SCREEN-GRID CURRENTS PLOTTED AGAINST SUPPRESSOR-GRID VOLTAGE





MUTUAL CONDUCTANCE (g_{3-a}) PLOTTED AGAINST SUPPRESSOR-GRID VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER