

SPECIAL QUALITY R.F. POWER TRIODE

M8080

Special quality power triode for use as an r.f. power amplifier or oscillator 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 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	150	mA

CAPACITANCES² (measured without an external shield)

C_{in}	1.5	pF
C_{out}	1.2	pF
C_{a-g}	1.4	pF

CHARACTERISTICS³

V_a	250	V
I_a	10.5	mA
V_g	-8.5	V
g_m	2.2	mA/V
μ	17	
r_a	7.7	k Ω
R_k	0	Ω

LIMITING VALUES⁴ (absolute ratings)

f max.	150	Mc/s
$V_{a(b)}$ max.	550	V
V_a max.	330	V
p_a max.	3.8	W
$-V_g$ max.	110	V
I_g max.	5.5	mA
I_k max.	21	mA
R_{g-k} max. (cathode bias)	1.0	M Ω
R_{g-k} max. (fixed bias)	250	k Ω
V_{h-k} max.	150	V
Maximum acceleration (continuous operation)	2.5	g
Maximum shock (short duration)	500	g
T_{bulb} max.	170	$^{\circ}$ C

TEST CONDITIONS (unless otherwise specified)

V_h	V_a	V_g	R_k	V_{h-k}
(V)	(V)	(V)	(Ω)	(V)
6.3	250	-8.5	0	0

TESTS

A.Q.L. ⁵	Individuals ⁶	Lot average ⁷	Lot standard deviation ⁸
(%)	Bogey ⁹	Min.	Max.

GROUP A

Insulation

a-rest measured at -300V

g-rest measured at -100V

Reverse grid current, R_{g1} max. = 500k Ω

0.25	100	—	—	M Ω
0.25	100	—	—	M Ω
0.25	—	—	—	μ A

GROUP B

Heater current

Heater cathode leakage current

V_{h-k} = 100V (cathode negative)

V_{h-k} = 100V (cathode positive)

Anode current

Mutual conductance

Group quality level¹⁰

0.65	138	162	—	—	mA
0.65	—	—	—	—	—
—	—	10	—	—	μ A
—	—	10	—	3.0	μ A
{ 0.65	10.5	6.5	14.5	—	mA
{ —	—	—	—	9.0	mA
{ 0.65	2.2	1.75	2.65	—	mA/V
{ —	—	—	—	2.0	mA/V
1.0	—	—	—	—	0.157

GROUP C

Anode current. $V_g = -30V$	2.5	—	—	50	—	—	—	μA
Reverse grid current. $V_h = 6.9V, V_{a-e} = 250V$ $V_{g-e} = 0V, R_k = 810\Omega$	2.5	—	—	1.0	—	—	—	μA
Microphonic noise at the anode at 50c/s and 2.5g min. peak acceleration. $V_b = 250V$, $R_a = 2k\Omega, V_{g-e} = 0V, R_k = 810\Omega$, $C_k = 1000\mu F$	2.5	—	—	7.0	—	—	—	mV (r.m.s.)
Group quality level ¹⁰	6.5	—	—	—	—	—	—	—

GROUP D

Glass strain test ^{11,13} . No applied voltages	6.5	—	—	—	—	—	—	—
Base strain test ¹² . No applied voltages	6.5	—	—	—	—	—	—	—
Capacitances (unshielded). No applied voltages; pin 2 connected to pin 7	6.5	—	—	—	—	—	—	—
C_{in}	—	—	1.35	2.25	—	—	—	pF
C_{out}	—	—	0.98	1.62	—	—	—	pF
C_{a-g}	—	—	1.2	2.0	—	—	—	pF
Mutual conductance. $V_a = 100V, V_g = 0V$	6.5	3.25	2.5	4.0	2.82	3.68	—	mA/V mA/V
Change of mutual conductance. $V_a = 100V$, $V_g = 0V, V_h = 5.7V$	6.5	—	—	15	—	—	—	%
Amplification factor	6.5	17	15.5	18.5	16.15	17.85	0.66	—
Power oscillation. $V_a = 300V, R_g = 8.5k\Omega$, $f = 150Mc/s$	4.0	—	1.8	—	—	—	—	W

TESTS

GROUP E

Fatigue^{1,4}

$V_h = 6.9V$, 1 minute on 3 minutes off.
No other voltages applied, 5g min. peak acceleration, $f = 170 \pm 5c/s$ for 33 hours in each of 3 mutually perpendicular planes

Post fatigue tests

Heater to cathode leakage current

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

Reverse grid current

$$R_g \text{max.} = 500k\Omega$$

Mutual conductance

Microphonic noise as in group C

Shock^{1,5}

No applied voltages, 500g

Post shock tests

Heater to cathode leakage current

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

Reverse grid current

$$R_g \text{max.} = 500k\Omega$$

Mutual conductance

Microphonic noise as in group C

A.Q.L. ⁵ (%)	Individuals ⁶		Lot average ⁷		Lot standard deviation ⁸ Max.
	Bogey ⁹	Min.	Max.	Min.	
2.5	—	—	20	—	μA
2.5	—	—	1.0	—	μA
2.5	—	1.6	2.65	—	mA/V
2.5	—	—	15	—	mV (r.m.s.)
2.5	—	—	20	—	μA
2.5	—	—	1.0	—	μA
2.5	—	1.6	2.65	—	mA/V
2.5	—	—	15	—	mV (r.m.s.)

TESTS

GROUP F

Stability life test^{1,4}

Running conditions. $V_{a-e} = 250V$, $R_k = 500\Omega$,
 $V_{h-k} = 150V$ (cathode negative)

Stability life test end point

Change in mutual conductance after 1 hour 1.0 — — — — — 0.0

Intermittent life test

Running conditions. $V_{a-e} = 250V$, $R_k = 500\Omega$,
 $V_{h-k} = 150V$ (cathode negative)

Intermittent life test end points

Sub-group (a)

Inoperatives^{1,6}

Heater current

Heater to cathode leakage current

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

Reverse grid current. R_g max. = 500k Ω

Mutual conductance

Average change in mutual conductance

Sub-group (b)

Anode current

Insulation as in group A

Group quality level¹⁰

A.Q.L. ⁵ (%)	Min.	Max.
2.5	—	—
4.0	—	—
2.5	138	162
2.5	—	20
4.0	—	20
2.5	—	0.5
4.0	—	0.5
2.5	1.6	2.65
4.0	1.5	2.65
—	—	15
4.0	5.5	14.5
6.5	5.0	14.5
4.0	50	—
6.5	30	—
6.5	—	—
10	—	—

{ 500 hours	{ 500 hours	{ 500 hours	{ 500 hours
{ 1000 hours	{ 1000 hours	{ 1000 hours	{ 1000 hours
{ 500 hours	{ 500 hours	{ 500 hours	{ 500 hours
{ 1000 hours	{ 1000 hours	{ 1000 hours	{ 1000 hours
{ 500 hours	{ 500 hours	{ 500 hours	{ 500 hours
{ 1000 hours	{ 1000 hours	{ 1000 hours	{ 1000 hours

mA
 μ A
 μ A
 μ A
mA/V
mA/V
0.0

mA
mA
M Ω
M Ω



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GROUP G

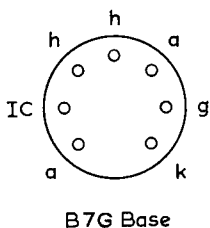
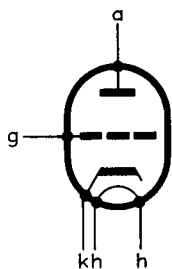
Valves are held for 28 days and retested for

Inoperatives¹⁶

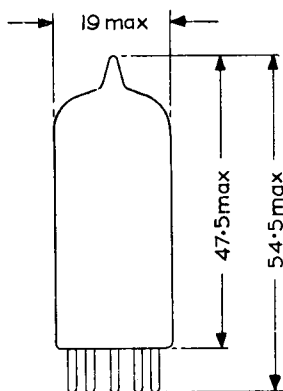
Reverse grid current. R_g max. = 500k Ω

A.Q.L. ⁵ (%)	Min.	Max.	
0.5	—	—	
0.5	—	0.5	μ A

5606



All dimensions in mm



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