

SPECIAL QUALITY DOUBLE DIODE

M8212

Special quality double diode with separate cathodes and internal screening between sections for use in equipment where mechanical vibrations 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 specific note.

HEATER

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

V_h^1	6.3	V
I_h	300	mA

CAPACITANCES² (measured with an external shield)

$C_{a'-k'+h+s+s}$	3.2	pF
$C_{a''-k''+h+s+s}$	3.2	pF
$C_{k'-a'+h+s+s}$	3.9	pF
$C_{k''-a''+h+s+s}$	3.9	pF
$C_{a'-a''}$	<26	mpF

LIMITING VALUES⁴ (absolute ratings) each section

P.I.V. max.	360	V
I_a max.	10	mA
$i_{a(pk)}$ max.	60	mA
$i_{a(surge)}$ max.	350	mA
V_{h-k} max.	360	V
Maximum acceleration (continuous operation)	2.5	g
Maximum shock (short duration)	500	g
T_{bulb} max.	165	°C

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TEST CONDITIONS (unless otherwise specified)

V_h	$V_{a(r.m.s.)}$	R_{load}	C
(V)	(V)	(k Ω)	(μ F)
6.3	165	11	8.0

TESTS

A.Q.L.⁵

Individuals⁶

Lot average⁷

Lot standard
deviation⁸

(%)

Bogey⁹

Min.

Max.

Min.

Max.

Max.

GROUP A

Insulation

a-rest, screen-rest measured at -300V

0.25

—

100

—

—

—

—

M Ω

GROUP B

Heater current

0.65

—

275

325

—

—

—

mA

Heater to cathode leakage current

0.65

—

—

—

—

—

—

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

—

—

—

5.0

—

—

—

μ A

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

—

—

—

5.0

—

—

—

μ A

Output current

0.65

18

16

—

—

—

—

mA

Emission $V_a = 10V$

0.65

—

40

—

—

—

—

mA

Group quality level¹⁰

1.0

—

—

—

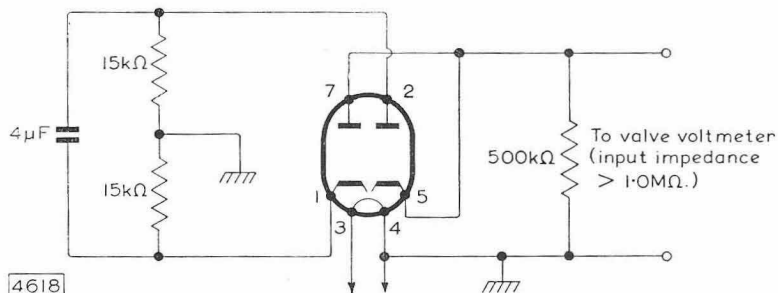
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**GROUP C**

Anode current. $V_a = 0V$, $R_a = 40k\Omega$	2.5	—	2.0	20	—	—	—	μA
Anode current difference between sections $V_a = 0V$, $R_a = 40k\Omega$	2.5	—	—	5.0	—	—	—	μA
Change in emission $V_h = 5.7V$, $V_a = 7.0V$	2.5	—	—	15	—	—	—	%
Hum $V_h = 7.0V$ Tested in circuit shown below	2.5	—	—	10	—	—	—	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	—	—	—	—	—	—	
$C_{a'-a''}$	—	—	—	26	—	—	—	mpF
$C_{a'-k'+h+s+s}$	—	—	2.4	4.0	—	—	—	pF
$C_{a''-k''+h+s+s}$	—	—	2.4	4.0	—	—	—	pF
$C_{k'-a'+h+s+s}$	—	—	2.5	5.0	—	—	—	pF ←
$C_{k''-a''+h+s+s}$	—	—	2.5	5.0	—	—	—	pF ←

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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.

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

Output current

A.Q.L. ⁵	Individuals ⁶			Lot average ⁷		Lot standard deviation ⁸	
(%)	Bogey ⁹	Min.	Max.	Min.	Max.	Max.	
2.5	—	—	15	—	—	—	μA
2.5	—	14	—	—	—	—	mA

Shock¹⁵

No applied voltages, 500g

Post shock tests

Heater to cathode leakage current.

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

Output current

Group quality level¹⁰

2.5	—	—	15	—	—	—	μA
2.5	—	14	—	—	—	—	mA
6.5	—	—	—	—	—	—	

GROUP F

Intermittent life test

The valve is connected in a full wave rectifier circuit with a load resistor of $11k\Omega$ and a reservoir capacitor of $8\mu F$. The supply impedance is adjusted so that the peak anode current is not less than 60mA for a nominal valve, the total output current being approximately 18mA.

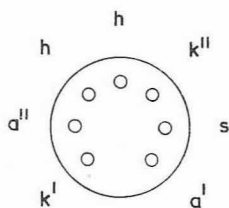
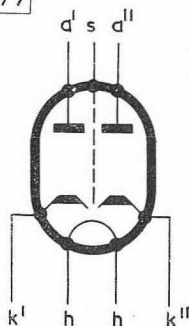
The cathode to heater voltage is provided by the output voltage in series with 117Vr.m.s.

										A.Q.L. ⁵ (%)	Min.	Max.		
Intermittent life test end points														
Sub-group (a)														
Inoperatives ¹⁶	..	..	..	..	..	..	..	..	{	500 hours	2.5	—	—	
										1000 hours	4.0	—	—	
Heater current	..	..	..	..	..	..	..	..	{	500 hours	2.5	275	325	mA
										1000 hours	4.0	275	325	mA
Heater to cathode leakage current. $V_{h-k} = \pm 100V$	..	..						..	{	500 hours	2.5	—	10	μA
								..		1000 hours	4.0	—	10	μA
Emission $V_a = 10V$	..	..	..	..	..	..	..	..	{	500 hours	2.5	35	—	mA
								..		1000 hours	6.5	30	—	mA
Sub-group (b)														
Change in emission $V_h = 5.7V$, $V_a = 7.0V$	..	..	..	..	..	..	..	..		500 hours	4.0	—	20	%
Anode current $V_a = 0V$, $R_a = 40k\Omega$	..	..	..	..	..	..	..	..		500 hours	4.0	1.0	20	μA
Insulation as in group A	..	..	..	..	..	..	..	..	{	500 hours	4.0	50	—	M Ω
								..		1000 hours	6.5	50	—	M Ω
Group quality level ¹⁰	..	..	..	..	..	..	..	..	{	500 hours	6.5	—	—	
								..		1000 hours	10	—	—	
GROUP G														
Valves are held for 28 days and retested for Inoperatives ¹⁶											0.5	—	—	

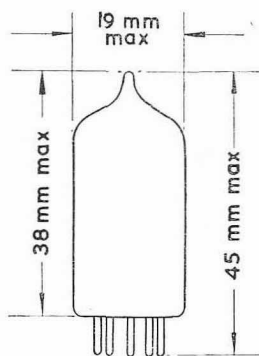
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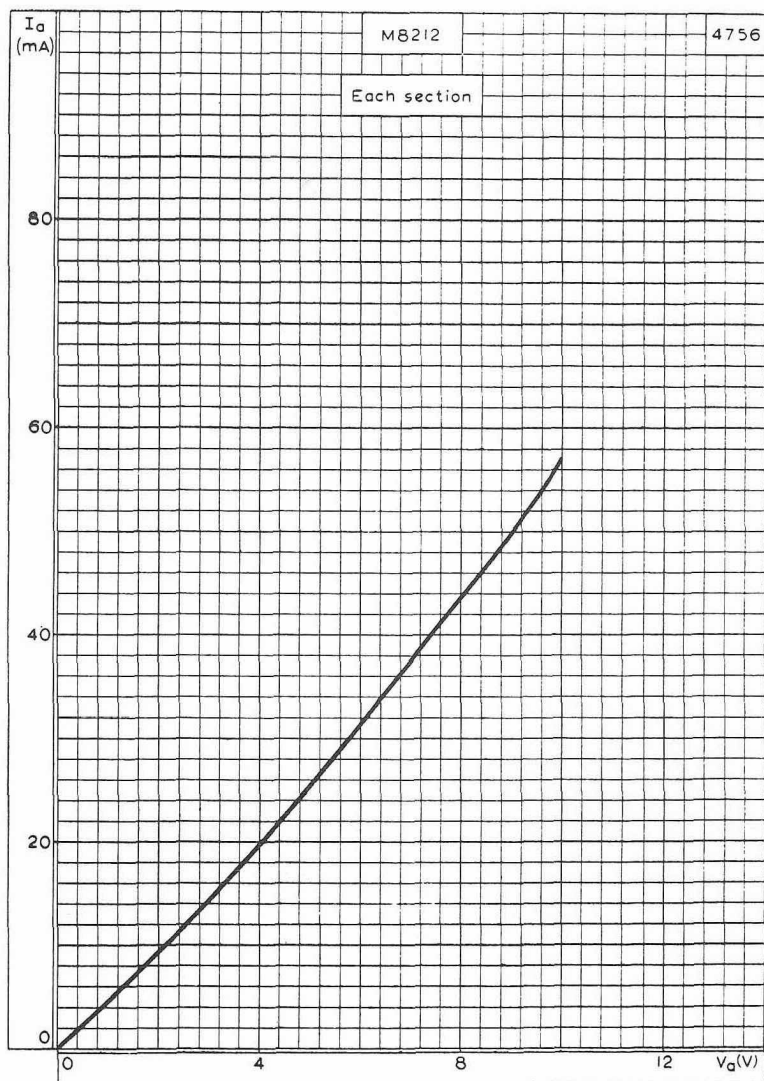
3577



B7G Base



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



ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE

