SPECIAL QUALITY DOUBLE DIODE

M8079

Special quality miniature double diode with separate cathodes and internal screening between sections 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 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	300	mA

CAPACITANCES[2] (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 VALUES[4] (absolute ratings) each section

P.I.V. max.	460	V
I_a max.	10	mA
$i_{a(pk)}$ max.	60	mA
V_{h-k} max.	360	V
$V_{in(r.m.s.)}$ max.	165	V
R_{lim} min. (per anode)	600	Ω
Maximum acceleration (continuous operation)	2.5	g
Maximum shock (short duration)	500	g
T_{bulb} max.	165	°C

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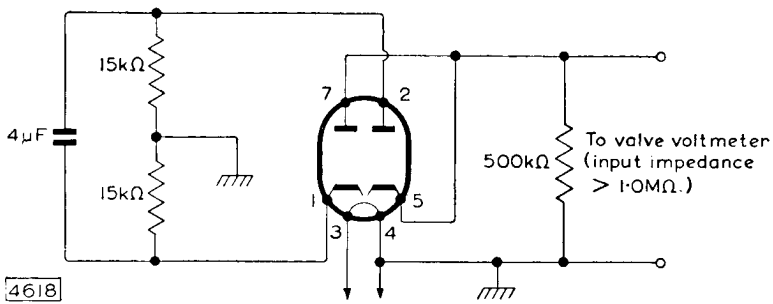
TEST CONDITIONS (unless otherwise specified)

V_h (V)	$V_{a(r.m.s.)}$ (V)	R_{load} (kΩ)	C (μF)
6.3	165	11	8.0

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, screen-rest measured at –300V	0.25	—	100	—	—	—	—	MΩ
GROUP B								
Heater current	0.65	—	275	325	—	—	—	mA
Heater to cathode leakage current	0.65	—	—	—	—	—	—	
V_{h-k} = 100V (cathode negative)	—	—	—	5.0	—	—	—	μA
V_{h-k} = 100V (cathode positive)	—	—	—	5.0	—	—	—	μA
Output current	0.65	18	16	—	—	—	—	mA
Emission V_a = 10V	0.65	—	40	—	—	—	—	mA
Group quality level[10]	1.0	—	—	—	—	—	—	

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
$C_{a'-k'+h+s+g}$	—	—	2.4	4.0	—	—	—	pF
$C_{a''-k''+h+s+g}$	—	—	2.4	4.0	—	—	—	pF
$C_{k'-a'+h+s+g}$	—	—	2.5	5.0	—	—	—	pF ←
$C_{k''-a''+h+s+g}$	—	—	2.5	5.0	—	—	—	pF ←

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 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	—	—	15	—	—	—	μA
Output current	2.5	—	14	—	—	—	—	mA
Microphonic noise measured at the cathode with both sections in parallel. 50c/s, 2.0g min. peak acceleration, R_k = 4.7kΩ, I_a = 20mA	2.5	—	—	5.0	—	—	—	mV (r.m.s.)
Shock[15]								
No applied voltages, 500g								
Post shock tests								
Heater to cathode leakage current. V_{h-k} = ±100V	2.5	—	—	15	—	—	—	μA
Output current	2.5	—	14	—	—	—	—	mA
Microphonic noise (conditions as above)	—	—	—	5.0	—	—	—	mV (r.m.s.)

GROUP F

Intermittent life test

The valve is connected in a full-wave rectifier circuit with a load resistor of 11kΩ and a reservoir capacitor of 8μF. 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.

Intermittent life test end points		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	—	10	μA
	1000 hours	4.0	—	10	μA
Emission $V_a = 10V$	500 hours	2.5	35	—	mA
	1000 hours	4.0	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	—	MΩ
	1000 hours	6.5	50	—	MΩ
Group quality level[10]	500 hours	6.5	—	—	
	1000 hours	10	—	—	

GROUP G

Valves are held for 28 days and retested for Inoperatives[14]	0.5	—	—	

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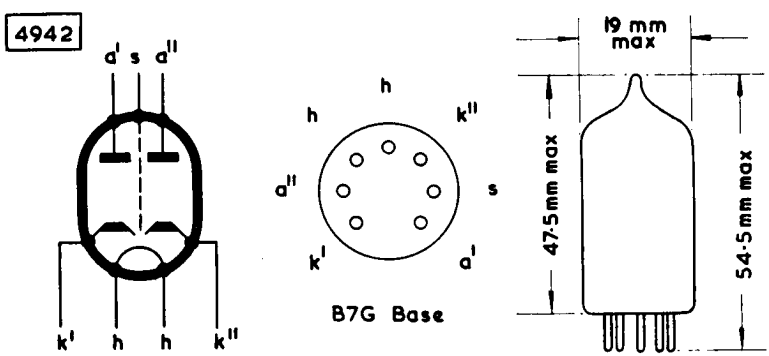
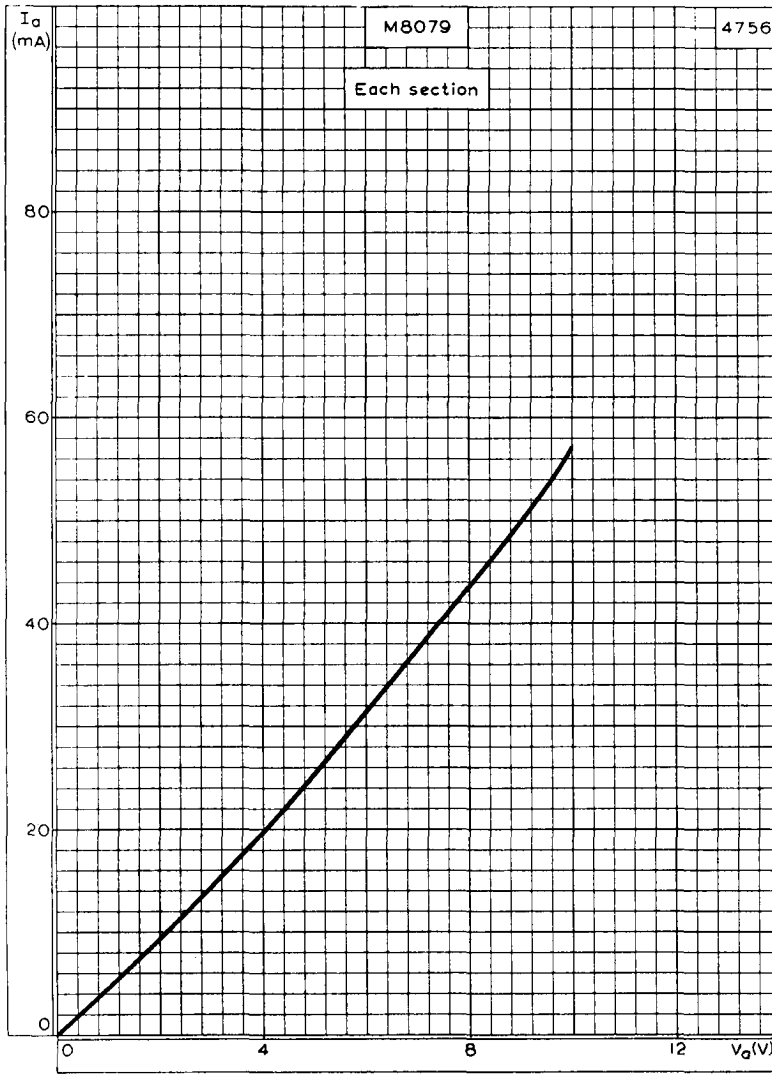


The bulb and base dimensions of this valve are in accordance with BS448, Section B7G



ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE