

SPECIAL QUALITY U.H.F. TRIODE

5718

Special quality subminiature medium- μ triode for use as an oscillator at frequencies up to 500Mc/s 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_h	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 without external shield)

C_{a-g}	1.3	pF
C_{in}	2.3	pF
C_{out}	800	mpF

CHARACTERISTICS³

V_a	100	V
V_g	-1.3	V
I_a	8.5	mA
g_m	5.8	mA/V
r_a	4.7	k Ω
μ	27	
R_{lk}	0	Ω
$V_g(I_a < 100\mu A)$	-7.0	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.	900	mW
$+V_g$ max.	0	V ←
$-V_g$ max.	55	V
I_a max.	22	mA
I_g max.	5.5	mA
R_{g-k} max.	1.2	M Ω
V_{h-k} max.	200	V
Maximum acceleration (continuous operation)	2.5	g
Maximum shock (short duration)	500	g
T_{bulb} max.	220	°C

TEST CONDITIONS (unless otherwise specified)

V_h	V_{a-e}	V_{g-e}	R_k	C_k	V_{h-k}
(V)	(V)	(V)	(Ω)	(μF)	(V)
6.3	100	0	150	1000	0

TESTS

A.Q.L.⁵Individuals⁶Lot average⁷Lot standard
deviation⁸
Max.

(%)

Bogey⁹

Min.

Max.

Min.

Max.

GROUP A

Heater current

{ 0.65
—

150

140

160

—
144—
156— mA
4.2 mA

Heater-to-cathode leakage current

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

0.65

—

—

5.0

—

—

— μA Reverse grid current $R_g = 1.0M\Omega$ $V_{a-e} = 150V, R_k = 380\Omega$

0.65

—

0

0.4

—

—

— μA

Anode current

{ 0.65
—

8.5

6.0

11

—
7.5—
9.5— mA
1.1 mAAnode current $V_g = -7.0V, R_k = 0\Omega$

0.65

—

—

100

—

—

— μA

Mutual conductance

{ 0.65
—

5.8

4.8

6.8

—
5.4—
6.2— mA/V
0.4 mA/VSub-group quality level¹⁰

1.0

—

—

—

—

—

—

Inoperatives¹⁶

0.4

—

—

—

—

—

—

GROUP B

Insulation

a-rest, measured at -300V	} 2.5 {	—	100	—	—	—	MΩ
g-rest, measured at -100V		—	100	—	—	—	MΩ

Anode current $V_g = -4V$, $R_k = 0\Omega$	2.5	—	20	—	—	—	μA
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Change in mutual conductance $V_h = 5.7V$	2.5	—	—	10	—	—	%
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Reverse grid current $V_h = 7.5V$, $V_{g-e} = -7.0V$ $R_g = 1.0M\Omega$. Measured after 5 minutes pre-heat under standard test conditions, except $V_h = 7.5V$, $R_g = 1.0M\Omega$	2.5	—	0	0.4	—	—	μA
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†A.F. noise at anode, $R_g = 100k\Omega$, $R_a = 10k\Omega$ $V_g = -4V$, $R_k = 0\Omega$	2.5	—	—	50	—	—	mV
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Amplification factor	6.5	—	23	31	—	—	—
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Power oscillation $f = 500Mc/s$, $V_a = 150V$, R_g adjusted to give $I_a = 20mA$	6.5	—	600	—	—	—	mW
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Capacitances² (unshielded). No applied voltages

C_{in}	—	—	1.6	2.8	—	—	pF
C_{out}	—	—	500	900	—	—	mpF
C_{a-g}	—	—	1.1	1.8	—	—	pF

Low pressure voltage breakdown

Pressure = $55 \pm 5mmHg$ Voltage = $300V_{r.m.s.}$ No other applied voltages

6.5	—	—	—	—	—	—	—
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Microphonic noise at the anode at 50c/s, 15g min peak acceleration, $R_a = 10k\Omega$	2.5	—	—	25	—	—	mV (r.m.s.)
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†The valve is tapped with a specified hammer and the output observed on a meter of specified dynamic response.

TESTS

A.Q.L.⁵

(%)

Individuals⁶Bogey⁹

Min.

Max.

Lot average⁷

Min.

Max.

Lot standard deviation⁸

Max.

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

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

Change in mutual conductance

Microphonic noise as in group B

{ 6.5 {

— — 15
— — 15
— — 100— — —
— — —
— — — μA
%
mV**Shock¹⁵** $V_{h-k} = 100V$ (cathode negative), $R_g = 100k\Omega$, 500g**Post shock tests**

Heater-to-cathode leakage current

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

Change in mutual conductance

Microphonic noise as in group B

{ 20 {

— — 15
— — 15
— — 100— — —
— — —
— — — μA
%
mVGlass strain test^{11B}. No applied voltages

6.5

— — — — — —

Heater cycling life test

2.5

Stability life test¹⁴

Stability life test end points

Change in mutual conductance after 1 hour 1.0

Survival rate life test¹⁴

Survival rate life test end points (100 hours)

Inoperatives ¹⁶	0.65
Mutual conductance	1.0

Intermittent life test

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

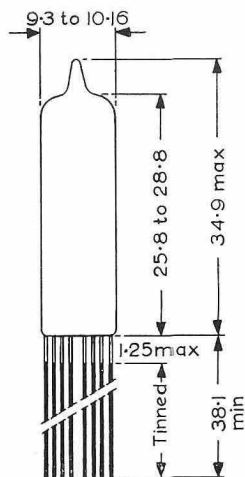
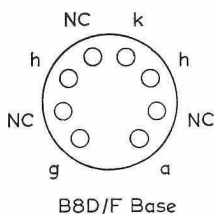
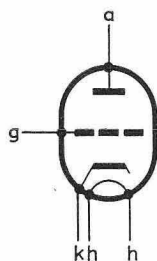
Intermittent life test end points (500 hours)

Inoperatives ¹⁶	2.5	—	—	
Heater current	4.0	138	164	mA
Heater-to-cathode leakage current $V_{h-k} = \pm 100V$	4.0	—	10	μA
Reverse grid current $R_g = 1.0M\Omega$	2.5	0	0.6	μA
Change in mutual conductance (individuals)	2.5	—	20	%
Change in mutual conductance $V_h = 5.7V$	4.0	—	15	%
Insulation as in group B.	4.0	50	—	$M\Omega$
Average change in mutual conductance	—	—	15	%
Sub-group quality level ¹⁰	10	—	—	

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SPECIAL QUALITY U.H.F. TRIODE

5604



All dimensions in mm

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