T1687

ASSOCIATED ELECTRICAL INDUSTRIES LIMITED
Applications Laboratory
Radio & Electronic Components Division
Brimsdown, Enfield, Middlesex.

Subject: General

Date: 1st February, 1960
TDS No. 6-S2P20-0-1

VALVE TYPE S2P20 JEDEC Type 7973

DIMENSIONS		mm
OVERALL LENGTH	MAX	67.5
DIAMETER	MAX	22.2
SEATED HEIGHT	MAX	60.5

TYPE	Special Quality Beam Tetrode
CATHODE	Directly heated
USE	R.F. Power Amplifier up to 100Mc/s where dependable performance is required under shock and vibration conditions.

RATING.Δ

				NOTE
Filament Voltage	(V)	2.5	5.0	
Filament Current	(A)	0.46	0.23	
Maximum Anode Dissipation	(W)	5		
Maximum Screen Dissipation	(W)	2		
Maximum Anode Voltage	(V)	150		
Maximum Screen Voltage	(V)	150		
Maximum Operating Frequency	(Mc/s)	100		
Maximum Shock (short duration)	(g)	500		
Maximum Acceleration (continuous operation)	(g)	2.5		

NOTES :-

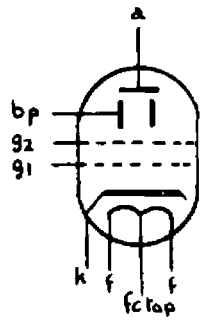
CAPACITANCES PF

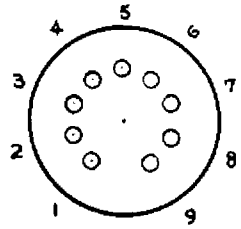
ELECTRODES		*			
g1	TO	E	8.5		
a	TO	E	6.6		
a	TO	g1	<.017		
	TO				
	TO				
	TO				
	TO				
	TO				
	TO				
	TO				

The symbol 'E' denotes the electrodes of any second valve section and the remaining earthy potential electrodes of the section under measurement. h & H joined to cathode unless otherwise stated. Measurements with valve cold.

BASE E9-1 Bulb T6½ CAP

PIN	ELECTRODE
1	a
2	NC
3	bp
4	f
5	f+
6	g2
7	g1
8	bp
9	fc tap





VIEW OF FREE END

MOUNTING POSITION :- Unrestricted

Basing 9L

TYPICAL OPERATION.

Filament Voltage	(V)	5
Anode Voltage	(V)	150
Screen Voltage	(V)	150
Control Grid Voltage	(V)	-10
Beam Plates Voltage	(V)	0
Anode Current	(mA)	28
Screen Current	(mA)	2
Mutual Conductance	(mA/V)	4.3

from JEDEC release #3143, Feb. 13, 1961

* Interelectrode capacitances in fully shielded socket without can and skirt.
Δ All limiting values are Absolute Values not Design Centres.

PSTG - CR4097 - VX6137

◄— INDICATES A CHANGE SINCE PREVIOUS ISSUE.

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JEDEC Type 7973

Subject: General

Date: 28th January, 1960
TDS No. 6-S2P20-0-2

TYPICAL OPERATION AS CLASS C POWER AMPLIFIER AT 70 Mc/s

Anode Voltage	(V)	150
Screen supply voltage	(V)	150
Screen feed resistor	(kΩ)	3.9
Anode Current	(mA)	40
Control grid Current	(mA)	1
Control grid voltage	(V)	-22
Grid bias resistor	(kΩ)	22
R.F. Power output (min)	(W)	2.4

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JEDEC Type 7973

Subject: Limits of Characteristics ΔΔ

Date: 29th January, 1960
TDS No. 6-32P20-0-3

Test	Conditions $V_{f(dc)}$ (V)	V_a* (V)	V_{g2}* (V)	V_{g1}* (V)	V_{bp}* (V)	Life Period	Limits Min	Limits Max	Units
Filament Current	5	-	-	-	-	Initial	0.21	0.25	A
Anode Current	5	150	150	-10	0	Initial	21	35	mA
Screen Current	5	150	150	-10	0	Initial	-	4	mA
Mutual Conductance	5	150	150	-10	0	Initial	3.2	5.4	mA/V
Grid No.1 Cut-off Voltage(I_a=2mA)	5	150	150	-	0	Initial	-	-25	V
Peak Anode Current† $V_{a(b)}$ =120V, R_L= 320Ω, V_{sig}=20V r.m.s, R_{g1}=22kΩ	5	-	120	-	0	Initial 250 hrs	110 100	- -	mA mA
Change in Peak Anode Current	4.5	-	120	-	0	Initial	-	25	mA
Change in Peak Anode Current	5	-	120	-	0	Initial to 1 hr	-	20	%
Reverse Grid Current	5	150	150	-10	0	Initial 250hrs	- -	2 4	μA μA
Interelectrode Leakage Resistance									
V_{g1} to all =-100V	0	-	-	-	-	Initial	-	100	MΩ
						250hrs	-	50	MΩ
V_{g2} to all =-300V	0	-	-	-	-	Initial	-	100	MΩ
						250hrs	-	50	MΩ
V_a to all =-300V	0	-	-	-	-	Initial	-	100	MΩ
						250hrs	-	50	MΩ
V_{bp} to all =-300V	0	-	-	-	-	Initial	-	100	MΩ
						250hrs		50	MΩ
Vibration Noise Output Voltage Δ $V_{a(b)}$ =150V, R_L =2kΩ	5	-	150	-10	0	Initial	-	500	mV r.m.s
Life Test Conditions									
Adjust Grid No1 Voltage to give I_a=33mA	5V rms	150	150	-	0				
Capacitances Measured in fully shielded socket, without can and skirt.	Electrodes			g1 to E			6.5	10.5	pF
				a to E			5.6	7.6	pF
				a to g1			-	0.17	pF

* Voltages measured with respect to filament negative (pin 4)

† All power supplies shall have negligible impedance to operating frequency. Grid signal impedance shall be less than 5 ohms: voltage sinusoidal.

Δ Preheat for 15 mins before test at Anode Current test conditions.

ΔΔ The test limits are for guidance in equipment design. The quality is controlled statistically to ensure that only a small percentage are outside these limits. The quality control levels are related to the importance of the characteristic being tested.

PSM9 - VX6137 - CV4097

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JEDEC Type 7973

Subject: Special Tests.

Date: 1st February, 1960
TDS No. 6-82P20-0-5

SPECIAL TESTS

Glass Envelope Strain Test

A statistical sample is tested to control glass quality. No voltages are applied to the electrodes.

The valves are completely immersed in boiling water at a temperature between 97°C and 100°C for 15 seconds and then immediately plunged into ice cold water for 5 seconds. The valves are then examined for glass cracks.

Base Strain Test.

A statistical sample is tested to control base strain. No voltages are applied to the electrodes.

The pins of the valves are forced over a specified cone, valves and cones are then completely submerged in boiling water at a temperature between 97°C and 100°C for 10 seconds. The valves and cones are allowed to cool to room temperature on a wooden support before examining for glass cracks.

Fatigue Tests

A statistical sample is tested to control heater failures and other mechanical defects. The heaters are successively run at 5V rms for 1 minute and switched off for 3 minutes, no other voltages applied.

The valves are rigidly mounted on a vibrating machine and vibrated for at least 100 hours, for not less than 30 hours in each of 3 mutually perpendicular planes at a frequency of 170 c/s with a minimum peak acceleration of 5 g.

Shock Test

A statistical sample is tested to control mechanical defects likely to be caused by shock. No voltages are applied to the electrodes.

The valves are subjected to 5 blows of approximately 500 g acceleration in each of 4 directions.

Holding Period Inoperatives Control.

After completing the test specification the valves are held for at least 28 days and are then retested to ensure that there has been no deterioration on storage.