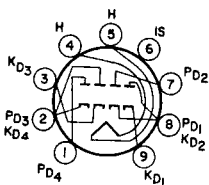


Refer to chart at end of section.

6JU8

## 6JU8A

8JU8A



9PQ

## QUADRUPLE DIODE

Miniature type used in phase-detector and noise-immune color-killer circuits of color television receivers, and in bridge-matrixing circuits in FM stereo multiplex equipment. **Outlines section, 6B**; requires miniature 9-contact socket. Units 1 and 2 are shielded from units 3 and 4 to minimize coupling between the series-

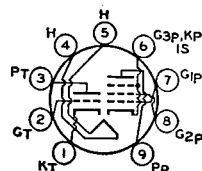
connected pairs of diodes. Type 8JU8A is identical with type 6JU6A except for heater ratings.

Heater Voltage (ac/dc)	6JU8A 6.3	8JU8A 8.4	volts
Heater Current	0.6	0.45	ampere
Heater Warm-up Time	—	11	seconds
Peak Heater-Cathode Voltage	±300 max	±300 max	volts
Direct Interelectrode Capacitances (Approx.):			
Plate of Unit No.1 and Cathode of Unit No.2 to Cathode of Unit No.1		1.8	pF
Plate of Unit No.1 and Cathode of Unit No.2 to Plate of Unit No.2		2.2	pF
Plate of Unit No.2 to Heater and Internal Shield		0.62	pF
Plate of Unit No.3 and Cathode of Unit No.4 to Cathode of Unit No.3		1.9	pF
Plate of Unit No.3 and Cathode of Unit No.4 to Plate of Unit No.4		2.2	pF
Plate of Unit No.4 to Heater and Internal Shield		0.94	pF
Cathode of Unit No.1 to Heater and Internal Shield		1.8	pF
Cathode of Unit No.3 to Heater and Internal Shield		1.9	pF
<b>MAXIMUM RATINGS (Design-Center Values, Each Diode Unit)</b>			
Peak Inverse Plate Voltage		300	volts
Peak Plate Current		54	mA
Average Output Current		9	mA
<b>CHARACTERISTIC, Instantaneous Value (Each Unit)</b>			
Plate Current for plate voltage of 10 volts		60	mA

## HIGH-MU TRIODE— SHARP-CUTOFF PENTODE

## 6JV8

8JV8



9DX

Miniature type used in television receiver applications, particularly those having low-voltage "B" supplies. The triode unit is used in sound-if, keyed-age, sync-separator, sync-amplifier, and noise-suppression circuits. The pentode unit is especially useful as a video amplifier tube. **Outlines section, 6E**; requires miniature 9-contact socket. Type 8JV8 is identical with type 6JV8 except for heater ratings.

Heater Voltage (ac/dc)	6JV8 6.3	8JV8 8.5	volts
Heater Current	0.6	0.45	ampere
Heater Warm-up Time (Average)	11	11	seconds
Heater-Cathode Voltage:			
Peak value	±200 max	±200 max	volts
Average value	100 max	100 max	volts
Direct Interelectrode Capacitances (Approx.):			
Triode Unit:			
Grid to Plate		2.2	pF
Grid to Cathode and Heater		3	pF
Plate to Cathode and Heater		2	pF
Pentode Unit:			
Grid No.1 to Plate		0.08 max	pF
Grid No.1 to Cathode, Heater, Grid No.2, Grid No.3, and Internal Shield		8	pF

Plate to Cathode, Heater, Grid No.2, Grid No.3, and Internal Shield .....	3.2	pF
Pentode Grid No.1 to Triode Plate .....	0.012 max	pF
Pentode Plate to Triode Plate .....	0.24 max	pF

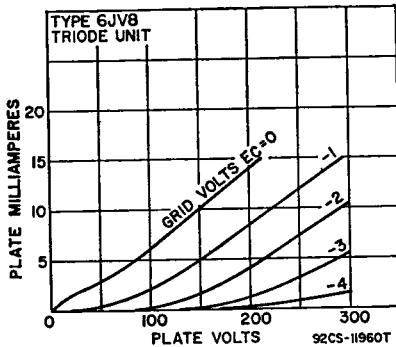
**Class A<sub>1</sub> Amplifier**

MAXIMUM RATINGS (Design-Maximum Values)		Triode Unit	Pentode Unit		
Plate Voltage .....		330	330	volts	
Grid-No.2 (Screen-Grid) Voltage .....		—	330	volts	
Grid-No.1 (Control-Grid) Voltage:					
Positive-bias value .....		0	0	volts	
Negative-bias value .....		50	50	volts	
Plate Dissipation .....		1.1	4	watts	
Grid-No.2 Input .....		—	1.7	watts	
CHARACTERISTIC		Triode Unit	Pentode Unit		
Plate Voltage .....	200	60	125	200	volts
Grid-No.2 Voltage .....	—	200	125	200	volts
Grid-No.1 Voltage .....	-2	0	-1	-2.9	volts
Amplification Factor .....	70	—	—	—	
Plate Resistance (Approx.) .....	0.0175	—	0.1	0.15	megohm
Transconductance (Approx.) .....	4000	—	11500	10700	μmhos
Plate Current .....	4	51*	22	22	mA
Grid-No.2 Current .....	—	14*	4	4	mA
Grid-No.1 Voltage (Approx.) for plate current of 20 μA .....	-5	—	-5.5	-9	volts

**MAXIMUM CIRCUIT VALUES**

Grid-No.1-Current Resistance:				
For fixed-bias operation .....		0.5	0.25	megohm
For cathode-bias operation .....		1	1	megohm

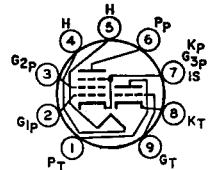
\* This value can be measured by a method involving a recurrent waveform such that the maximum ratings of the tube will not be exceeded.



**6JW8/  
ECF802**

5JW8  
6LX8/LCF802  
9JW8/PCF802

**MEDIUM-MU TRIODE—  
SHARP-CUTOFF PENTODE**



9AE

Miniature type used as horizontal-oscillator and frequency-control tube in color and black-and-white television receivers. Outlines section, 6B; requires miniature 9-contact socket. Types 5JW8, 6LX8/LCF802 and 9JW8/PCF802 are identical with type 6JW8/ECF802 except for heater ratings.

	5JW8	6JW8/ ECF802	6LX8/ LCF802	9JW8/ PCF802	
Heater Voltage (ac/dc) ..	4.7	6.3	6	9	volts
Heater Current .....	0.6	0.43	0.45	0.3	ampere
Heater Warm-up Time (Average) .....	11	—	—	—	seconds
Heater-Cathode Voltage:					
Peak value .....	±200 max	±200 max	±200 max	±200 max	volts
Average value .....	100 max	100 max	100 max	100 max	volts

**Class A<sub>1</sub> Amplifier**

**MAXIMUM RATINGS (Design-Maximum Values)**

	Triode Unit	Pentode Unit	
Plate Supply Voltage	550	550	volts
Plate Voltage	250	250	volts
Grid-No.2 (Screen-Grid) Supply Voltage	—	550	volts
Grid-No.2 Voltage	—	250	volts
Peak Cathode Current*	—	50	mA
Cathode Current	10	15	mA
Plate Dissipation	1.4	1.2	watts
Grid-No.2 Input	—	0.8	watts
Input Impedance at 60 Hz	50	300	kohms

**CHARACTERISTICS**

Plate Voltage	200	100	volts
Grid-No.2 Voltage	—	100	volts
Grid-No.1 (Control-Grid) Voltage	—2	—1	volts
Mu Factor, Grid-No.1 to Grid-No.2	—	47	—
Amplification Factor	70	—	—
Input Resistance	0.2	0.4	megohm
Transconductance	3500	5500	μmhos
Plate Current	3.5	6	mA
Grid-No.2 Current	—	1.7	mA
Plate Current:			
For grid-No.1 voltage of 0 volts	—	12.5	mA
For grid current of 10 μA	10	—	mA
Grid-No.2 Current for grid-No.1 voltage of 0 volts	—	3.5	mA
Grid-No.1 Voltage:			
For grid-No.1 current of +0.3 μA	—1.3	—1.3	volts
For plate and grid-No.2 voltage of 200 volts and plate current of 10 μA	—	—16	volts

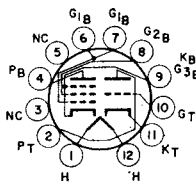
**MAXIMUM CIRCUIT VALUES**

Grid-No.1-Circuit Resistance:			
For fixed-bias operation	—	0.56	megohm
For cathode-bias operation	3	1	megohms

\* With a maximum duty factor of 0.30 and maximum pulse duration of 30 microseconds.

Refer to chart at end of section.

**6JZ6**



**12DZ**

heater ratings.

**MEDIUM-MU TRIODE—  
POWER PENTODE**

**6JZ8**

13JZ8, 17JZ8, 24JZ8,  
25JZ8

Duodecar type used in combined vertical-deflection-oscillator and vertical-deflection-amplifier applications in television receivers. Outlines section, 8C; requires duodecar 12-contact socket. Types 13JZ8, 17JZ8, 24JZ8, and 25JZ8 are identical with type 6JZ8 except for

	6JZ8	13JZ8	17JZ8	24JZ8	25JZ8	
Heater Voltage (ac/dc)	6.3	12.7	16.8	24.2	25.2	volts
Heater Current	1.2	0.6	0.45	0.315	0.3	amperes
Heater Warm-up Time	—	11	11	11	—	seconds
Heater-Cathode Voltage:						
Peak value	±200 max	±200 max	±200 max	±200 max	±200 max	volts
Average value	100 max	100 max	100 max	100 max	100 max	volts

**Class A<sub>1</sub> Amplifier**

**CHARACTERISTICS**

	Triode Unit	Beam Power Unit		
Plate Voltage	150	45	120	volts
Grid-No.2 (Screen-Grid) Voltage	—	110	110	volts
Grid-No.1 (Control-Grid) Voltage	—5	0	—8	volts
Amplification Factor	20	—	—	—
Plate Resistance (Approx.)	8500	—	11700	ohms
Transconductance	2350	—	7100	μmhos
Plate Current	5.5	122*	46	mA
Grid-No.2 Current	—	16.5*	3.5	mA
Grid-No.1 Voltage (Approx.) for plate current of 10 μA	—10	—	—	volts

Grid-No.1 Voltage (Approx.) for plate current of 100  $\mu$ A ..... — — —25 volts

\* This value can be measured by a method involving a recurrent waveform such that the maximum ratings of the tube will not be exceeded.

**Vertical-Deflection Oscillator and Amplifier**

For operation in a 525-line, 30-frame system

	Triode Unit Oscillator	Beam Power Unit Amplifier	
<b>MAXIMUM RATINGS</b> (Design-Maximum Values)			
DC Plate Voltage .....	250	250	volts
Peak Positive-Pulse Plate Voltage# .....	—	2000	volts
DC Grid-No.2 Voltage .....	—	200	volts
Peak Negative-Pulse Grid-No.1 Voltage .....	400	150	volts
Peak Cathode Current .....	70	245	mA
Average Cathode Current .....	20	70	mA
Plate Dissipation* .....	1	7	watts
Grid-No.2 Input .....	—	1.8	watts

**MAXIMUM CIRCUIT VALUES**

Grid-No.1-Circuit Resistance:			
For fixed-bias operation .....	1	1	megohm
For cathode-bias operation .....	2.2	2.2	megohms

# Pulse duration must not exceed 15% of a vertical scanning cycle (2.5 milliseconds).

\* A bias resistor or other means is required to protect the tube in absence of excitation.

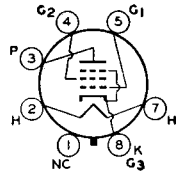
**6K5GT**

Refer to chart at end of section.

**6K6GT**

**POWER PENTODE**

Glass octal type used in output stage of radio receivers and, triode-connected, as a vertical-deflection amplifier in television receivers. This type may be supplied with pin No.1 omitted. **Outlines section, 13D**; requires octal socket. This tube, like other power-handling tubes, should be adequately ventilated.



**7S**

Heater Voltage (ac/dc) .....	6.3	volts
Heater Current .....	0.4	ampere
Heater-Cathode Voltage:		
Peak value .....	$\pm 200$ max	volts
Average value .....	100 max	volts
Direct Interelectrode Capacitances (Approx.):		
Grid No.1 to Plate .....	0.5	pF
Grid No.1 to Cathode, Heater, Grid No.2, and Grid No.3 .....	5.5	pF
Plate to Cathode, Heater, Grid No.2, and Grid No.3 .....	6	pF

**Class A<sub>1</sub> Amplifier**

**MAXIMUM RATING** (Design-Center Values)

Plate Voltage .....	315	volts
Grid-No.2 (Screen-Grid) Voltage .....	285	volts
Plate Dissipation .....	8.5	watts
Grid-No.2 Input .....	2.8	watts

**TYPICAL OPERATION**

Plate Voltage .....	100	250	315	volts
Grid-No.2 Voltage .....	100	250	250	volts
Grid-No.1 (Control-Grid) Voltage .....	-7	-18	-21	volts
Peak AF Grid-No.1 Voltage .....	7	18	21	volts
Zero-Signal Plate Current .....	9	32	25.5	mA
Maximum-Signal Plate Current .....	9.5	33	28	mA
Zero-Signal Grid-No.2 Current .....	1.6	5.5	4.0	mA
Maximum-Signal Grid-No.2 Current .....	3	10	9	mA
Plate Resistance (Approx.) .....	104000	90000	110000	ohms
Transconductance .....	1500	2300	2100	$\mu$ mos
Load Resistance .....	12000	7600	9000	ohms
Total Harmonic Distortion .....	11	11	15	per cent
Maximum-Signal Power Output .....	0.35	3.4	4.5	watts

TYPICAL PUSH-PULL OPERATION (Values are for two tubes)		Fixed Bias	Cathode Bias	
Plate Supply Voltage		285	285	volts
Grid-No.2 Supply Voltage		285	285	volts
Grid-No.1 Voltage		-25.5	—	volts
Cathode-Bias Resistor		—	400	ohms
Peak AF Grid-No.1-to-Grid-No.1 Voltage		51	51	volts
Zero-Signal Plate Current		55	55	mA
Maximum-Signal Plate Current		72	61	mA
Zero-Signal Grid-No.2 Current		9	9	mA
Maximum-Signal Grid-No.2 Current		17	13	mA
Effective Load Resistance (Plate-to-plate)		12000	12000	ohms
Total Harmonic Distortion		6	4	per cent
Maximum-Signal Power Output		10.5	9.8	watts

**CHARACTERISTICS (Triode Connection)\***

Plate Voltage		250	volts
Grid-No.1 Voltage		-18	volts
Plate Current		37.5	mA
Transconductance		2700	μmhos
Amplification Factor		6.8	
Plate Resistance (Approx.)		2500	ohms
Grid-No.1 Voltage (Approx.) for plate current of 0.5 mA		-48	volts

**MAXIMUM CIRCUIT VALUES**

Grid-No.1-Circuit Resistance:			
For fixed-bias operation		0.1	megohm
For cathode-bias operation		0.5	megohm

\* Grid-No.2 connected to plate.

**Vertical Deflection Amplifier (Triode Connection)\***

For operation in a 525-line, 30-frame system

**MAXIMUM RATINGS**

DC Plate Voltage		315	volts
Peak Positive-Pulse Plate Voltage# (Absolute maximum)		1200 <sup>°</sup>	volts
Peak Negative-Pulse Grid-No.1 Voltage		250	volts
Peak Cathode Current		75	mA
Average Cathode Current		25	mA
Plate Dissipation		7	watts

**MAXIMUM CIRCUIT VALUE**

Grid-No.1-Circuit Resistance, for cathode-bias operation		2.2	megohms
----------------------------------------------------------	--	-----	---------

\* Grid No.2 connected to plate.

# Pulse duration must not exceed 15% of a vertical scanning cycle (2.5 milliseconds).

° Under no circumstances should this absolute value be exceeded.

Refer to chart at end of section.

**6K7  
6K7G  
6K7GT**

Refer to chart at end of section.

**6K8  
6K8G  
6K8GT**

Refer to chart at end of section.

**6K11  
6K11/6Q11**