

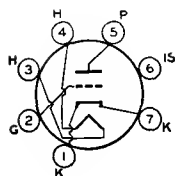
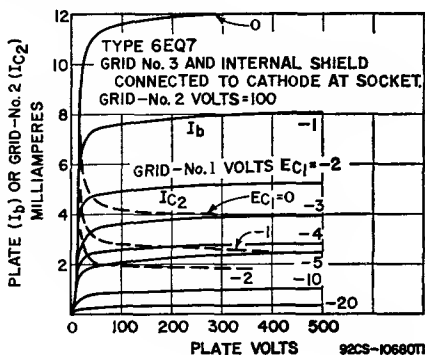
Grid-No.2 (Screen-Grid) Supply Voltage	300	volts
Grid-No.2 Voltage	See curve page 98	
Grid-No.1 (Control-Grid) Voltage:		
Positive-bias value	0	volts
Negative-bias value	50	volts
Plate Dissipation	3	watts
Grid-No.3 Input	0.2	watt
Grid-No.2 Input:		
For grid-No.2 voltages up to 150 volts	0.6	watt
For grid-No.2 voltages between 150 and 300 volts	See curve page 98	
Bulb Temperature (At hottest point)	150	°C

CHARACTERISTICS

Plate Voltage	100	volts
Grid No.3	Connected to cathode at socket	
Internal Shield	Connected to cathode at socket	
Grid-No.2 Voltage	100	volts
Grid-No.1 Supply Voltage	0	volts
Grid-No.1 Resistor (Bypassed)	2.2	megohms
Plate Resistance (Approx.)	0.25	megohm
Transconductance	3800	μ mhos
Plate Current	9	mA
Grid-No.2 Current	3.5	mA
Grid-No.1 Voltage (Approx.) for transconductance of 40 μ mhos	-20	volts

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

Plate Current	1	mA
CHARACTERISTICS, Instantaneous Value		
Tube Voltage Drop for plate current of 2 mA	10	volts

**7FP****HIGH-MU TRIODE****6ER5****2ER5, 3ER5**

Miniature type with frame grid used in vhf tuners of color and black-and-white television receivers. Outlines section, 5C; requires miniature 7-contact socket. Types 2ER5 and 3ER5 are identical with type 6ER5 except for heater ratings.

Heater Voltage (ac/dc)	2.3	2.8	6.3	volts
Heater Current	0.6	0.45	0.18	ampere
Peak Heater-Cathode Voltage	±100 max	±100 max	±100 max	volts
Direct Interelectrode Capacitances:				
Grid to Plate	0.38	0.36		pF
Grid to Cathode, Heater, and Internal Shield	4.4	4.4		pF
Plate to Cathode, Heater, and Internal Shield	3	4		pF
Grid to Heater	0.28 max	0.28 max		pF
Plate to Cathode	0.24	0.24		pF
Cathode to Grid	3.1	3.1 Δ		pF
Heater to Cathode	2.5	2.5 Δ		pF

* With external shield connected to cathode except as noted.

Δ With external shield connected to ground.

Class A₁ Amplifier

MAXIMUM RATINGS (Design-Center Values)

Plate Voltage	250	volts
Grid Voltage, Negative-bias value	50	volts
Cathode Current	20	mA
Plate Dissipation	2.2	watts

CHARACTERISTICS

Plate Voltage	200	volts
Grid Voltage	-1.2	volts
Amplification Factor	80	
Plate Resistance (Approx.)	8000	ohms
Transconductance	10500	μ mhos
Plate Current	10	mA
Grid Voltage (Approx.) for transconductance of 500 μ mhos	-3.8	volts
Grid Voltage (Approx.) for transconductance of 100 μ mhos	-5.6	volts

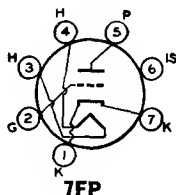
MAXIMUM CIRCUIT VALUE

Grid-Circuit Resistance	1	megohm
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6ES5

HIGH-MU TRIODE

Miniature type used as grounded-cathode rf amplifier in vhf television receivers. Outlines section, 5C; requires miniature 7-contact socket.



7FP

Heater Voltage (ac/dc)	6.3	volts	
Heater Current	0.2	ampere	
Peak Heater-Cathode Voltage	±100 max	volts	
Direct Interelectrode Capacitances:	Unshielded	Shielded	
Grid to Plate	0.5 max	0.5 max	pF
Grid to Cathode, Heater, and Internal Shield	3.2	3.2	pF
Plate to Cathode, Heater, and Internal Shield	3.2	4	pF

Class A₁ Amplifier

MAXIMUM RATINGS (Design-Maximum Values)

Plate Voltage	250	volts
Grid Voltage, Positive-bias value	0	volts
Cathode Current	22	mA
Plate Dissipation	2.2	watts

CHARACTERISTICS

Plate Voltage	200	volts
Grid Voltage	-1	volt
Amplification Factor	75	
Plate Resistance (Approx.)	8000	ohms
Transconductance	9000	μ mhos
Plate Current	10	mA
Grid Voltage (Approx.) for plate current of 100 μ A	-6	volts

MAXIMUM CIRCUIT VALUE

Grid-Circuit Resistance	1	megohm
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6ES8

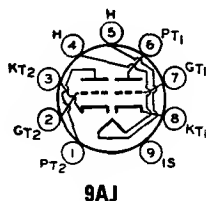
Refer to chart at end of section.

6ES8/
ECC189

4ES8/XCC189

VARIABLE-MU TWIN TRIODE

Miniature type used as cascode-type amplifier in tuners of television receivers. Outlines section, 6B; requires miniature 9-contact socket. Type 4ES8/XCC189 is identical with type 6ES8/ECC189 except for heater ratings.



9AJ

	4ES8/ XCC189	6ES8/ECC189	
Heater Voltage (ac/dc)	4	6.3	volts
Heater Current	0.6	0.365	ampere
Heater Warm-up Time (Average)	11	—	seconds