



5691, 5692, 5693

SPECIAL RED TUBES

The present "Special Red Tubes" include a high- μ twin triode, 5691; a medium- μ twin triode, 5692; and a sharp-cutoff pentode, 5693. They are for industrial applications where 10 000-hour life, rigid construction, uniformity, and stability are paramount. The electrical characteristics, of the 5691, 5692, and 5693 are very similar to those of the 6SL7-GT, 6SN7-GT, and 6SJ7, respectively.

• RCA - 5691 •

HIGH-MU TWIN TRIODE

RCA-5691 is a high- μ twin triode designed and manufactured for critical industrial applications. In such service, it is particularly useful as a voltage amplifier.



In addition to the features illustrated on page 8 this type has its heaters for the two triode units connected in series so that failure of either heater in bridge circuits makes both units inoperative.

The 5691 is similar to the 6SL7-GT except that it has twice the heater current (0.6 ampere). It is recommended as a replacement for the 6SL7-GT only where provision for the increased heater current can be made, only where the operating conditions are within the ratings of 5691, and only where long life, rigid construction, extreme uniformity, and exceptional stability are needed. If the 5691 is operated at the higher maximum ratings of the 6SL7-GT, the full advantages of the 5691 will not be obtained.

GENERAL DATA

Electrical:

Heater, Pure Tungsten, for Unipotential Cathodes:

Voltage (AC or DC)	6.3 \pm 5%*	Volts
Current	0.6	Amp

Direct Interelectrode Capacitances:^o

	Min.	Av.	Max.	
Triode Unit No. 1—				
Grid to Plate	3.1	3.6	4.1	$\mu\mu\text{f}$
Grid to Cathode	1.9	2.4	2.9	$\mu\mu\text{f}$
Plate to Cathode	1.8	2.3	2.8	$\mu\mu\text{f}$
Triode Unit No. 2—				
Grid to Plate	3.1	3.6	4.1	$\mu\mu\text{f}$
Grid to Cathode	2.2	2.7	3.2	$\mu\mu\text{f}$
Plate to Cathode	2.1	2.6	3.1	$\mu\mu\text{f}$
Plate of Triode Unit No. 1 to Plate of Triode Unit No. 2..	0.31	0.35	0.39	$\mu\mu\text{f}$

*May deviate \pm 10% from rated value provided such deviation occurs for less than 2% of the operating time.
^oWith no external shield.

GENERAL DATA (Cont'd)

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-7/8"
Maximum Seated Length	2-5/16"
Maximum Diameter	1-9/32"
Bulb	T-9
Base	Short Intermediate-Shell Octal 8-Pin, with External Barriers, Non-Hygroscopic

INDUSTRIAL SERVICE

Includes applications such as dc and audio amplifiers

Values are for Each Unit

Maximum Ratings, Absolute Values:

DC PLATE VOLTAGE	275 max.	Volts
DC PLATE SUPPLY VOLTAGE	330 max.	Volts
GRID VOLTAGE:		
Negative bias range	-1* min. to -100 max.	Volts
Negative peak value	-200 max.	Volts
DC GRID CURRENT	2 max.	Ma
DC CATHODE CURRENT	10 max.	Ma
PLATE DISSIPATION	1 max.	Watt
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	Volts
Heater positive with respect to cathode	100 max.	Volts
AMBIENT TEMPERATURE RANGE	-55 to +90	°C
Maximum Circuit Value (for any operating condition):		
Grid-Circuit Resistance	2 max.	Meg

Characteristics and Range Values:

	Heater Volts, 6.3; Plate Volts, 250; Grid Volts, —2			
	Min.	Av.	Max.	
Heater Current	0.58	0.6	0.62	Amp
Heater-Cathode Current with heater-cathode voltage of \pm 100 volts	—	—	5	μa
Plate Current	1.7	2.3	2.9	Ma
Plate Current for grid voltage of -5.5 volts	—	—	15	μa
Difference in Plate Current between triode units	—	—	0.6	Ma
Reverse Grid Current	—	—	0.2	μa
Amplification Factor	60	70	80	
Plate Resistance	—	44000	—	Ohms
Transconductance	1300	1600	1900	μmhos

*For resistance-coupled amplifier applications, the negative bias may be as low as -0.5 volt.



5691

Typical Operation—Resistance-Coupled Amplifier (Each Triode Unit):

Plate-Supply Voltage	90			180			300			Volts
Plate Load Resistor.....	0.1	0.22	0.47	0.1	0.22	0.47	0.1	0.22	0.47	Megohm
Grid Resistor (of following stage).....	0.22	0.47	1.0	0.22	0.47	1.0	0.22	0.47	1.0	Megohm
Cathode Resistor.....	4700	7400	14400	2600	4600	9000	2180	3970	7550	Ohms
Cathode Bypass Capacitor†.....	2.1	1.3	0.7	2.8	1.6	0.9	3.1	1.8	1	μf
Blocking Capacitor‡.....	0.014	0.0065	0.0035	0.014	0.0065	0.0035	0.014	0.0065	0.0035	μf
Peak Output Voltage†.....	9	13	17	30	37	44	59	76	88	Volts
Voltage Gain.....	27	35§	40§	33¶	42¶	46¶	36¶	45¶	50¶	

†This peak output voltage is obtained across the grid resistor of the following stage at any frequency within the flat region of the output vs frequency curve, and is for the condition where the signal level is adequate to swing the grid of the resistance-coupled amplifier tube to the point where its grid starts to draw current.

‡At an output voltage of 4 volts rms.

¶The cathode bypass capacitors and blocking capacitors have been chosen to give output voltages at 100 cps (f₁) which are equal to 0.8 of the mid-frequency value. For any other value of (f₁), multiply the values of cathode bypass and blocking capacitors by 100/f₁.

||At an output voltage of 3 volts rms.
 ¶At an output voltage of 5 volts rms.

DIMENSIONAL OUTLINE and SOCKET CONNECTIONS
 for the 5691 are the same as those shown
 on page 5 for the 5692

