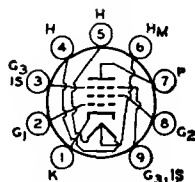


12GN7A SHARP-CUTOFF PENTODE

Miniature type with frame grid used as video-amplifier tube in color and black-and-white television receivers. Outlines section, 6E; requires miniature 9-contact socket. Heater: volts, 6.3 (parallel), 12.6 (series); amperes, 0.6 (parallel), 0.3 (series); warm-up time (average), 11 seconds, maximum heater-cathode volts, ± 200 peak, 100 average.



9BF

Class A₁ Amplifier

MAXIMUM RATINGS (Design-Maximum Values)

Plate Voltage	400	volts
Grid-No.2 (Screen-Grid) Supply Voltage	330	volts
Grid-No.2 Voltage	See curve page 98	volts
Grid-No.1 (Control-Grid) Voltage, Positive-bias value	0	volts
Plate Dissipation	11.5	watts
Grid-No.2 Input:		
For grid-No.2 voltages up to 165 volts	1.5	watts
For grid-No.2 voltages between 165 and 330 volts	See curve page 98	

CHARACTERISTICS

Plate Supply Voltage	50	250	volts
Grid-No.2 Supply Voltage	125	150	volts
Grid-No.1 Voltage	0	0	volts
Cathode-Bias Resistor	—	56	ohms
Plate Resistance (Approx.)	—	0.05	megohm
Transconductance	—	36000	μ mhos
Plate Current	70*	28	mA
Grid-No.2 Current	24*	6.5	mA
Grid-No.1 Voltage (Approx.) for plate current of 100 μ A	—	—5.7	volts

MAXIMUM CIRCUIT VALUE

Grid-No.1-Circuit Resistance	0.25	megohm
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* This value can be measured by a method involving a recurrent waveform such that the maximum ratings of the tube will not be exceeded.

12GT5

Refer to chart at end of section.

12GT5A

Refer to chart at end of section.

12GW6/12DQ6B

Refer to type 6GW6/6DQ6B.

12H6

Refer to chart at end of section.

12HE7

Refer to type 38HE7.

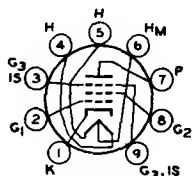
12HG7

12HG7/

12GN7A

SHARP-CUTOFF PENTODE

Neonovial types with frame grid used as video amplifier in color and black-and-white television receivers. Outlines section, 10C; require 9-contact neonovial socket.



9BF

Heater Arrangement:	Series	Parallel	
Heater Voltage (ac/dc)	12.6	6.3	volts
Heater Current	0.26	0.52	ampere
Heater-Cathode Voltage:			
Peak value		±200 max	volts
Average value		100 max	volts
Direct Interelectrode Capacitances:			
Grid No.1 to Plate		0.15 max	pF
Grid No.1 to Cathode, Heater, Grid No.2, Grid No.3, and Internal Shield		14 max	pF
Plate to Cathode, Heater, Grid No.2, Grid No.3, and Internal Shield		4.4 max	pF

Class A₁ Amplifier

MAXIMUM RATINGS (Design-Maximum Values)

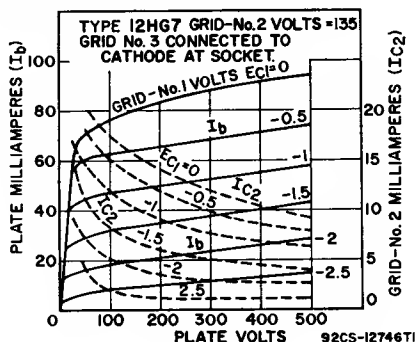
Plate Voltage	400	volts
Grid-No.2 (Screen-Grid) Supply Voltage	330	volts
Grid-No.2 Voltage	See curve page 98	
Grid-No.1 (Control-Grid) Voltage, Positive-bias value	0	volts
Plate Dissipation	10	watts
Grid-No.2 Input:		
For Grid-No.2 voltages up to 165 volts	1	watt
For Grid-No.2 voltages between 165 and 330 volts	See curve page 98	

CHARACTERISTICS

Plate Supply Voltage	300	volts
Grid No.3 (Suppressor Grid)	Connected to cathode at socket	
Grid-No.2 Supply Voltage	135	volts
Grid No.1	Connected to negative end of cathode resistor	
Cathode Resistor	47	ohms
Plate Resistance (Approx.)	60000	ohms
Transconductance	32000	μmhos
Plate Current	31	mA
Grid-No.2 Current	4.8	mA
Grid-No.1 Voltage (Approx.) for plate current of 100 μA	-4.5	volts

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.1	megohm
For cathode-bias operation	0.25	megohm



Refer to chart at end of section.

12J5GT

Refer to chart at end of section.

12J7GT

Refer to chart at end of section.

12J8

Refer to chart at end of section.

12JB6

Refer to type 6JB6A.

12JB6A

Refer to type 6JN6.

12JN6

Refer to chart at end of section.

12JN8

Refer to type 6JQ6.

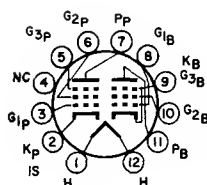
12JQ6

12JT6	Refer to chart at end of section.
12JT6A	Refer to type 6JT6A.
12K5	Refer to chart at end of section.
12K7GT	Refer to chart at end of section.
12K8	Refer to chart at end of section.
12KL8	Refer to chart at end of section.
12L6GT	Refer to chart at end of section.
12MD8	Refer to type 6MD8.
12Q7GT	Refer to chart at end of section.
12R5	Refer to chart at end of section.
12S8GT	Refer to chart at end of section.
12SA7	
12SA7GT	Refer to chart at end of section.
12SC7	Refer to chart at end of section.
12SF5	
12SF5GT	Refer to chart at end of section.
12SF7	Refer to chart at end of section.
12SG7	Refer to chart at end of section.
12SH7	Refer to chart at end of section.
12SJ7	
12SJ7GT	Refer to chart at end of section.
12SK7	
12SK7GT	Refer to chart at end of section.
12SL7GT	Refer to type 6SL7GT.
12SN7GT	Refer to chart at end of section.
12SN7GTA	Refer to type 6SN7GTB.
12SQ7	
12SQ7GT	Refer to chart at end of section.
12SR7	
12SR7GT	Refer to chart at end of section.
12T10	Refer to type 6T10.
12U7	Refer to chart at end of section.
12V6GT	Refer to type 6V6.
12W6GT	Refer to type 6W6GT.
12X4	Refer to type 6X4.
12Z3	Refer to chart at end of section.
13CW4	Refer to type 6CW4.
13DE7	Refer to type 6DE7.

Refer to type 6DR7.	13DR7
Refer to type 6EM7.	13EM7/15EAY
Refer to type 6FD7.	13FD7
Refer to type 6FM7.	13FM7
Refer to chart at end of section.	13GB5
Refer to type 6GB5/EL500.	13GB5/XL500
Refer to type 6GF7A.	13GF7A
Refer to chart at end of section.	13J10

BEAM POWER TUBE— SHARP-CUTOFF PENTODE

13V10



12EZ

Duodecar type used as combined FM detector and audio-frequency output amplifier in television receivers. The beam power unit is used in af output stages and the pentode unit as an FM detector. Outlines section, 8C; requires duodecar 12-contact socket. Heater: volts (ac/dc), 13.2; amperes, 0.45; average warm-up time, 11 seconds; maximum heater-cathode volts, ± 200 peak, 100 average.

Beam Power Unit as Class A₁ Amplifier

MAXIMUM RATINGS (Design-Maximum Values)

Plate Voltage	165	volts
Grid-No.2 (Screen-Grid) Voltage	150	volts
Cathode Current	65	mA
Plate Dissipation	6.5	watts
Grid-No.2 Input	1.8	watts

TYPICAL OPERATION

Plate Voltage	145	volts
Grid-No.2 Voltage	125	volts
Grid-No.1 (Control-Grid) Voltage	—6	volts
Peak AF Grid-No.1 Voltage	6	volts
Zero-Signal Plate Current	34	mA
Maximum-Signal Plate Current	36	mA
Zero-Signal Grid-No.2 Current	2.2	mA
Maximum-Signal Grid-No.2 Current	5.5	mA
Plate Resistance (Approx.)	0.058	megohm
Transconductance	6400	μ mhos
Load Resistance	3000	ohms
Total Harmonic Distortion (Approx.)	7	per cent
Maximum-Signal Power Output	1.5	watts

MAXIMUM CIRCUIT VALUES

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

Pentode Unit as Class A₁ Amplifier

CHARACTERISTICS

Plate Supply Voltage	150	volts
Grid-No.3 (Suppressor-Grid) Voltage	0	volts
Grid-No.2 (Screen-Grid) Supply Voltage	100	volts
Cathode-Bias Resistor	560	ohms
Plate Resistance (Approx.)	0.15	megohm
Transconductance, Grid No.1 to Plate	1000	μ mhos
Transconductance, Grid No.3 to Plate	400	μ mhos
Plate Current	1.3	mA
Grid-No.2 Current	2	mA
Grid-No.1 Voltage (Approx.) for plate current of 10 μ A	—4.5	volts
Grid-No.3 Voltage (Approx.) for plate current of 10 μ A	—4.5	volts