

Pentode—Beam Power Tube

DUODECAR TYPE

For Combined Limiter, Discriminator, and Audio Power
Output Applications in FM Radio and TV Receivers

ELECTRICAL CHARACTERISTICS

Bogey Values

Heater Voltage	E_h	6.3	V
Heater Current	I_h	0.950	A
Direct Interelectrode Capacitances			
Without external shield			
<i>Pentode Unit:</i>			
G _{1p} to G _{3p}	c_{g1-g3}	0.009	pF
G _{1p} to (K _p + I _s , P _p , G _{3p} , G _{2p} , H) . . .	c_{g1-all}	4.4	pF
G _{3p} to (K _p + I _s , P _p , G _{2p} , G _{1p} , H) . . .	c_{g3-all}	3.2	pF
<i>Beam Power Unit:</i>			
G _{1b} to P _b	c_{g1-p}	0.22	pF
Input: G _{1b} to (K _B + G _{3B} , G _{2B} , H) . . .	c_i	11	pF
Output: P _B to (K _B + G _{3B} , G _{2B} , H) . . .	c_o	7.5	pF

Pentode Unit

For the following characteristics, see Conditions

Transconductance, Grid No.1 to Plate.	g_m	-	-	360	μ mho
Transconductance, Grid No.3 to Plate.	$g_m(g3-p)$	-	-	700	μ mho
DC Plate Current	I_b	-	5	-	mA
DC Grid-No.2 Current	I_{c2}	4.5	-	-	mA
Cutoff DC Grid-No.1 Voltage for $I_b = 20 \mu A$	$E_{c1(co)}$	-	-	-4	V
Cutoff DC Grid-No.3 Voltage for $I_b = 20 \mu A$	$E_{c3(co)}$	-	-	-4	V

Conditions

Heater Voltage	E_h	Bogey value			V
DC Plate Voltage	E_b	135	135	135	V
DC Grid-No.3 Voltage	E_{c3}	4	4	0	V
DC Grid-No.2 Supply Voltage.	E_{cc2}	-	280	280	V
DC Grid-No.2 Voltage	E_{c2}	75	-	-	V
DC Grid-No.1 Voltage	E_{c1}	0	0	0	V
Grid-No.2 Resistor	R_{g2}	-	33	33	k Ω

Beam Power Unit

For the following characteristics, see Conditions

Plate Resistance (Approx.)	r_p	100	k Ω
Transconductance	g_m	6500	μ mho
DC Plate Current	I_b	35	mA
DC Grid-No.2 Current	I_{c2}	3	mA

Conditions

Heater Voltage	E_h	Bogey value		V
DC Plate Voltage	E_b	250		V
DC Grid-No.2 Voltage	E_{c2}	250		V
DC Grid-No.1 Voltage	E_{c1}	-8		V

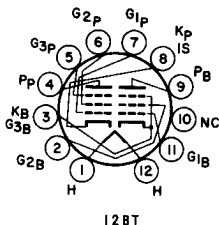


MECHANICAL CHARACTERISTICS

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2.375 in
Maximum Seated Length	2.000 in
Maximum Diameter	1.188 in
Dimensional Outline (JEDEC 9-58)	See General Section
Envelope	JEDEC T9
Base	Small-Button Duodecar 12-Pin (JEDEC E12-70)

TERMINAL DIAGRAM (Bottom View)

- Pin 1-Heater
 Pin 2-Beam Power Grid No.2
 Pin 3-Beam Power Cathode,
 Beam Power Grid No.3
 Pin 4-Pentode Plate
 Pin 5-Pentode Grid No.3
 Pin 6-Pentode Grid No.2
 Pin 7-Pentode Grid No.1
 Pin 8-Pentode Cathode,
 Internal Shields
 Pin 9-Beam Power Plate
 Pin 10-No Internal Connection
 Pin 11-Beam Power Grid No.1
 Pin 12-Heater



DESIGN-MAXIMUM RATINGS

Pentode Unit for FM and TV Limiter and Discriminator Service; Beam Power Unit for Audio Power Output Service

		Pentode Unit	Beam Power Unit	
DC Plate Supply Voltage.	E_{bb}	330	-	V
DC Plate Voltage	E_b	-	275	V
DC Grid-No.2 (Accelerator-Grid) Supply Voltage.	E_{cc2}	330	-	V
DC Grid-No.2 (Screen-Grid) Voltage	E_{c2}	-	275	V
Peak Positive-Pulse Grid-No.1 (Limiter-Grid) Voltage	e_{c1m}	60	-	V
Heater-Cathode Voltage:				
Peak	e_{hkm}	±200	±200	V
DC	E_{hk}	100	100	V
Heater Voltage (AC or DC).	E_h	← 5.7 to 6.9 →		
Average Cathode Current.	$I_{k(av)}$	13	-	mA
Grid-No.2 Input.	P_{g2}	-	2	W
Plate Dissipation.	P_b	-	10	W

MAXIMUM CIRCUIT VALUES

Beam Power Unit

Grid-No.1-Circuit Resistance:	$R_{g1(ckt)}$	
For fixed-bias operation	-	0.25 MΩ
For cathode-bias operation	-	0.5 MΩ



TYPICAL OPERATION

Beam Power Unit

		Bogey value	
Heater Voltage	E_h		V
DC Plate Voltage	E_b	250	V
DC Grid-No.2 Voltage	E_{c1}	250	V
DC Grid-No.1 Voltage	E_{c2}	-8	V
Peak AF Grid-No.1 Voltage	e_{c1m}	8	V
Plate Resistance (Approx.)	r_p	100	k Ω
Transconductance	g_m	6500	μ mho
Zero-Signal Plate Current	I_b	35	mA
Maximum-Signal Plate Current	I_b	39	mA
Zero-Signal Grid-No.2 Current	I_{c2}	3	mA
Maximum-Signal Grid-No.2 Current	I_{c2}	13	mA
Load Resistance	R_L	5000	Ω
Total Harmonic Distortion		8.5	%
Maximum-Signal Power Output	P_o	4.2	W

