

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

Pentode Unit:

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

Beam Power Unit:

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 mo
Transconductance, Grid No.3 to Plate.	$g_m(g_{3-p})$	-	-	700	μ mo
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 mo
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

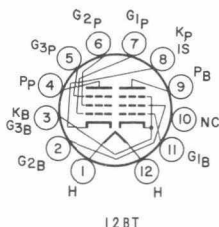


MECHANICAL CHARACTERISTICS

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	$\longleftrightarrow$ 5.7 to 6.9 $\longleftrightarrow$		V
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 M Ω
For cathode-bias operation	-	0.5 M Ω



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	$k\Omega$
Transconductance	g_m	6500	μmho
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



