

## 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	$\mu$ mho
Transconductance, Grid No.3 to Plate. . . . .	$g_m(g_{3-p})$	- -	700	$\mu$ 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 $\Omega$

#### Beam Power Unit

For the following characteristics, see Conditions

Plate Resistance (Approx.) . . . . .	$r_p$	100	k $\Omega$
Transconductance . . . . .	$g_m$	6500	$\mu$ 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



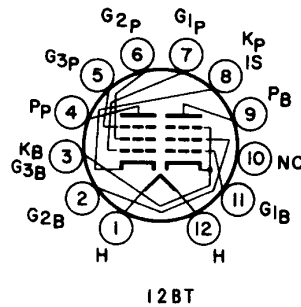
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## MECHANICAL CHARACTERISTICS

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 →		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 MΩ
For cathode-bias operation . . . . .	-	0.5 MΩ



TYPICAL OPERATION

*Beam Power Unit*

Heater Voltage . . . . .	$E_h$	Bogey value	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	$\mu mho$
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	$\Omega$
Total Harmonic Distortion. . . . .		8.5	%
Maximum-Signal Power Output. . . . .	$P_o$	4.2	W

