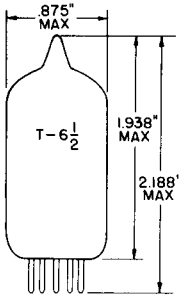
TUNG-SOL

TRIODE-TETRODE

MINIATURE TYPE

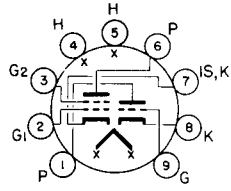


GLASS BULB
SMALL-BUTTON NOVAL
9 PIN BASE E9-1
OUTLINE DRAWING
JEDEC 6-2

UNIPOTENTIAL CATHODE

HEATER
6.3 VOLTS 450±30 MA.
AC OR DC

ANY MOUNTING POSITION



BOTTOM VIEW
BASING DIAGRAM
JEDEC 9GE

THE 6CQ8 IS A MEDIUM-MU TRIODE AND SHARP CUTOFF TETRODE IN THE 9 PIN MINIATURE CONSTRUCTION. IT MAY BE USED IN A WIDE VARIETY OF APPLICATIONS IN BLACK AND WHITE AND COLOR TELEVISION RECEIVERS, PARTICULARLY AS A COMBINED VHF OSCILLATOR AND MIXER IN TUNERS OF SUCH RECEIVERS UTILIZING AN INTERMEDIATE FREQUENCY IN THE ORDER OF 40 MC. THE TETRODE UNIT IS INTENDED FOR USE AS A MIXER TUBE, BUT IT IS ALSO USEFUL AS A VIDEO INTERMEDIATE-FREQUENCY AMPLIFIER TUBE AND AS A SOUND INTERMEDIATE FREQUENCY AMPLIFIER TUBE. THE TRIODE UNIT IS SUITABLE FOR USE NOT ONLY AS A VHF OSCILLATOR, BUT ALSO AS A PHASE SPLITTER, SYNC-CLIPPER, SYNC-SEPARATOR, AND RF AMPLIFIER. THERMAL CHARACTERISTICS OF THE HEATER ARE CONTROLLED SUCH THAT HEATER VOLTAGE SURGES DURING THE WARM-UP CYCLE ARE MINIMIZED PROVIDED IT IS USED WITH OTHER TYPES WHICH ARE SIMILARLY CONTROLLED.

DIRECT INTERELECTRODE CAPACITANCES

	WITHOUT EXTERNAL SHIELD	WITH[A] EXTERNAL SHIELD	
TRIODE UNIT:			
GRID TO PLATE	1.8	1.8	pf
GRID TO CATHODE & HEATER	2.7	2.7	pf
PLATE TO CATHODE AND HEATER	0.4	1.2	pf
TETRODE UNIT:			
GRID #1 TO PLATE (MAX.)	0.019	0.015	pf
GRID #1 TO CATHODE & I.S., GRID #2 & HEATER	5.0	5.0	pf
PLATE TO CATHODE & I.S., GRID #2 & HEATER	2.5	3.3	pf
TETRODE PLATE TO TRIODE PLATE (MAX.)	0.07	0.01	pf
HEATER TO CATHODE	3.0	3.0[B]	pf

CONTINUED ON FOLLOWING PAGE

TUNG-SOL

CONTINUED FROM PRECEDING PAGE

RATINGS

INTERPRETED ACCORDING TO DESIGN MAXIMUM SYSTEM ←

CONVERTER SERVICE

	TRIODE UNIT AS OSC.	TETRODE UNIT AS MIXER	
MAXIMUM PLATE VOLTAGE	330 ←	330 ←	VOLTS
MAXIMUM GRID #2 SUPPLY VOLTAGE	---	330 ←	VOLTS
MAXIMUM GRID #2 (SCREEN-GRID) VOLTAGE	---	SEE FIGURE #2	
MAXIMUM GRID #1 (CONTROL-GRID) VOLTAGE:			
POSITIVE BIAS VALUE	0	0	VOLTS
MAXIMUM PLATE DISSIPATION	3.1 ←	3.2 ←	WATTS
MAXIMUM GRID #2 INPUT:			
→ FOR GRID #2 VOLTAGES UP TO 165 VOLTS	---	0.7 ←	WATT
→ FOR GRID #2 VOLTAGES BETWEEN 165 & 300V.	---	SEE FIGURE #2	
MAXIMUM GRID #1 INPUT	0.55 ←	---	WATT
MAXIMUM PEAK HEATER-CATHODE VOLTAGE:			
HEATER NEGATIVE WITH RESPECT TO CATHODE	200	200	VOLTS
HEATER POSITIVE WITH RESPECT TO CATHODE[C]	200	200[C]	VOLTS
HEATER WARM-UP TIME (APPROX.)*	11.0		SECONDS

MAXIMUM CIRCUIT VALUES

	TRIODE UNIT	TETRODE UNIT	
GRID #1 CIRCUIT RESISTANCE:			
FOR CATHODE-BIAS OPERATION (MAX.)	1.0	1.0	MEGOHM
FOR FIXED-BIAS OPERATION (MAX.)	0.5	0.25	MEGOHM

TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

CLASS A_1 AMPLIFIER

	TRIODE UNIT	TETRODE UNIT	
PLATE SUPPLY VOLTAGE	125	125	VOLTS
GRID #2 SUPPLY VOLTAGE	---	125	VOLTS
GRID #1 VOLTAGE	---	-1	VOLT
CATHODE-BIAS RESISTOR	56	---	OHMS
AMPLIFICATION FACTOR	40	---	
PLATE RESISTANCE (APPROX.)	5 000	140 000	OHMS
TRANSCONDUCTANCE	8 000	5 800	μMHOS
GRID #1 VOLTAGE (APPROX.)			
FOR PLATE CURRENT OF 100 μAMP	-7	-7	VOLTS
PLATE CURRENT	15	12	MA.
GRID #2 CURRENT	---	4.2	MA.

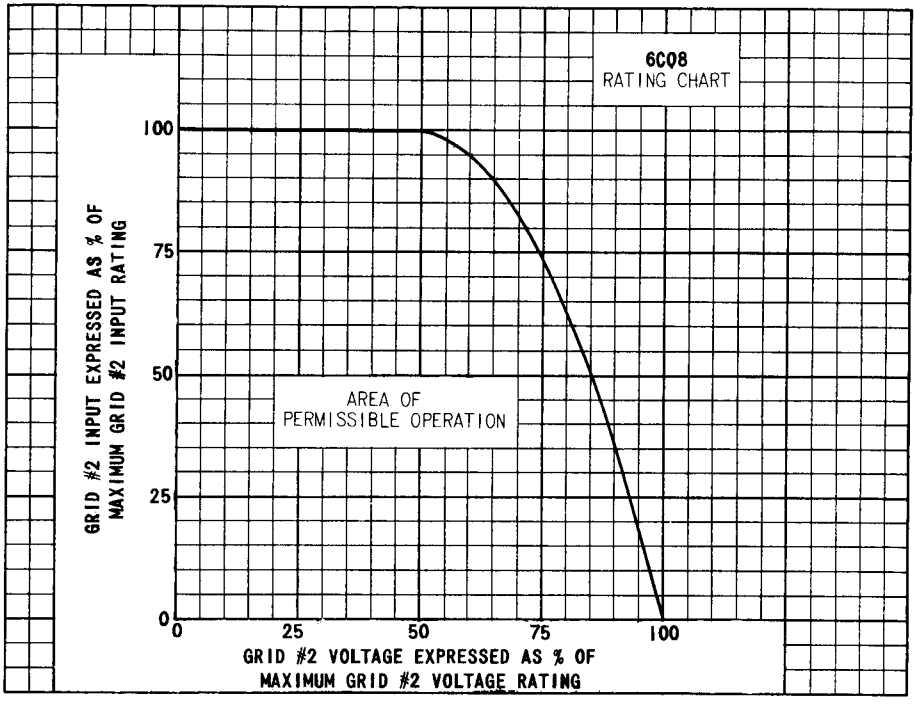
[A] WITH EXTERNAL SHIELD #315 CONNECTED TO CATHODE OF UNIT UNDER TEST.

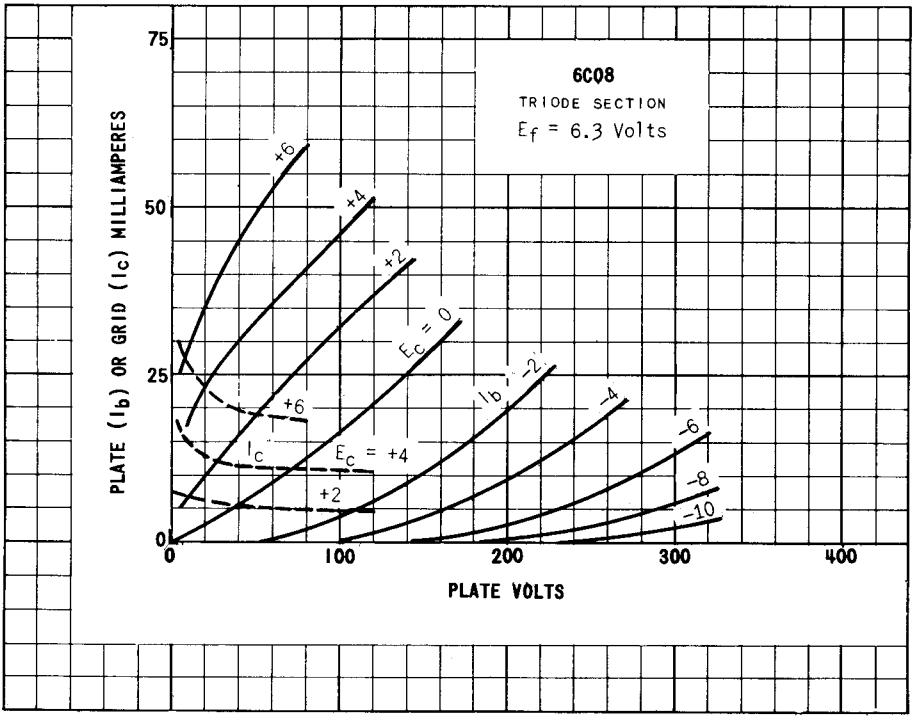
[B] WITH EXTERNAL SHIELD #315 CONNECTED TO GROUND.

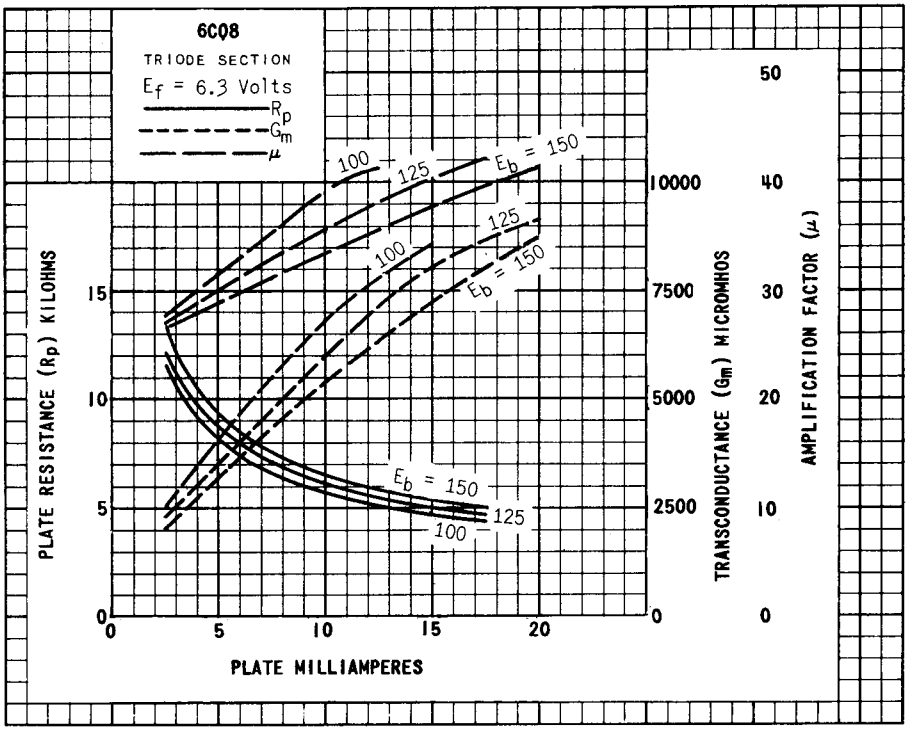
[C] THE DC COMPONENT MUST NOT EXCEED 100 VOLTS.

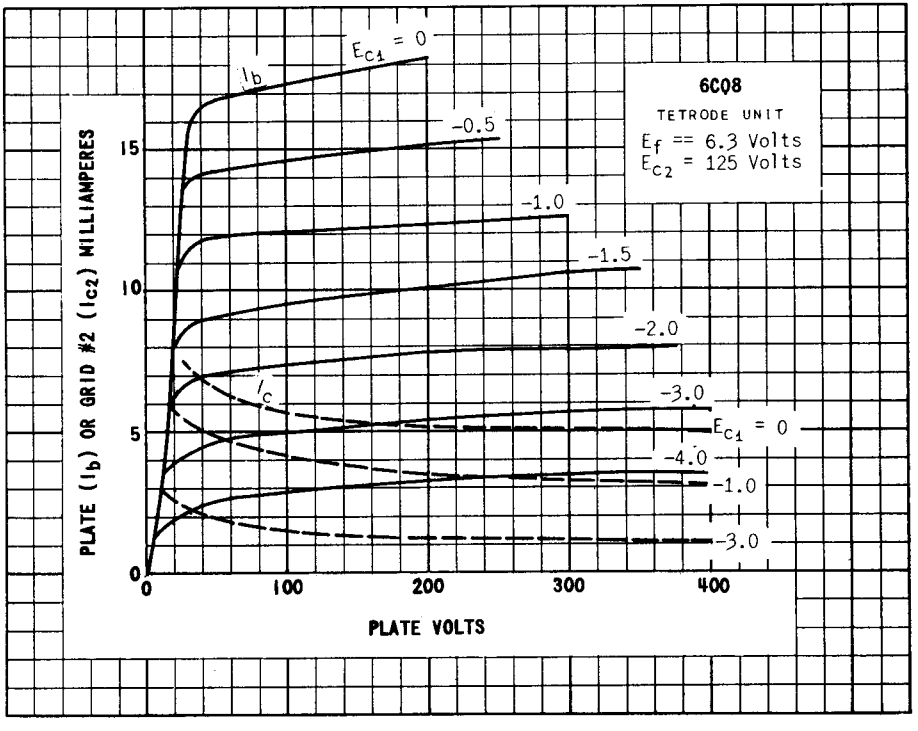
* HEATER WARM-UP TIME IS DEFINED AS THE TIME REQUIRED FOR THE VOLTAGE ACROSS THE HEATER TO REACH 80% OF ITS RATED VOLTAGE AFTER APPLYING 4 TIMES RATED HEATER VOLTAGE TO A CIRCUIT CONSISTING OF THE TUBE HEATER IN SERIES WITH A RESISTANCE OF VALUE 3 TIMES THE NOMINAL HEATER OPERATING RESISTANCE.

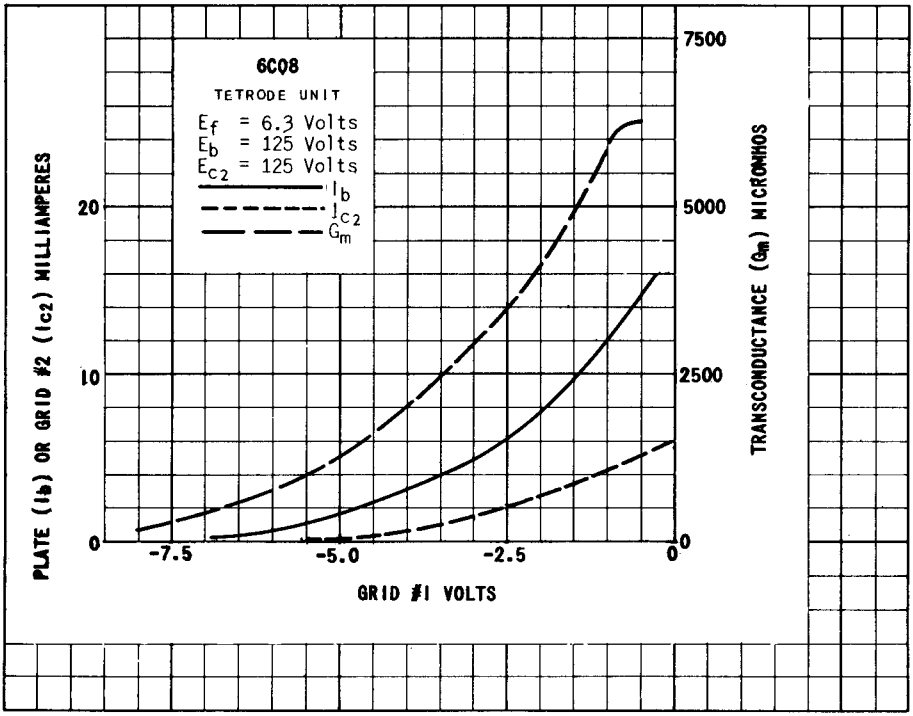
→ INDICATES A CHANGE.






6CQ8
TRIODE SECTION
E_f = 6.3 Volts
R_p
G_m
μ
100
125
E_b = 150
PLATE RESISTANCE (R_p) KILOHMS
TRANSCONDUCTANCE (G_m) MICROMHOS
AMPLIFICATION FACTOR (μ)
PLATE MILLIAMPERES
0
5
10
15
20
2500
5000
7500
10000
30
40
50


6CQ8
TETRODE UNIT
E_f = 6.3 Volts
E_{c_2} = 125 Volts
E_{c_1} = 0
I_b
I_c
-0.5
-1.0
-1.5
-2.0
-3.0
-4.0
PLATE (I_b) OR GRID #2 (I_{c_2}) MILLIAMPERES
PLATE VOLTS
0
100
200
300
400
5
10
15


6CQ8
TETRODE UNIT
E_f = 6.3 Volts
E_b = 125 Volts
E_{c_2} = 125 Volts
I_b
I_{c_2}
G_m
PLATE (I_b) OR GRID #2 (I_{c_2}) MILLIAMPERES
TRANSCONDUCTANCE (G_m) MICROMHOS
GRID #1 VOLTS
0
10
20
2500
5000
7500
-7.5
-5.0
-2.5
0