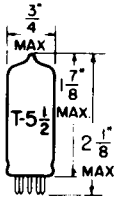
TUNG-SOL

HEPTODE

MINIATURE TYPE

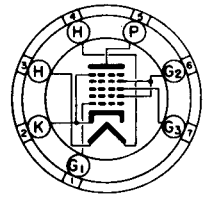


GLASS BULB

COATED UNIPOTENTIAL CATHODE

HEATER
4.2 VOLTS 0.45 AMP.
AC OR DC

ANY MOUNTING POSITION



BOTTOM VIEW
MINIATURE BUTTON
7 PIN BASE
7CM

THE 4CS6 IS A MINIATURE DUAL CONTROL PENTAGRID TUBE INTENDED FOR USE IN SYNC SEPARATOR CIRCUITS. IN THESE CIRCUITS IT PROVIDES IMPROVED NOISE IMMUNITY. BOTH CONTROL GRIDS HAVE SHARP CUT-OFF CHARACTERISTICS. 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 – APPROX.

GRID #1 TO PLATE: G_1 TO P (MAX.)	0.05	μμf
GRID #3 TO PLATE: G_3 TO P (MAX)	0.36	μμf
#1 INPUT: G_1 TO (H+K+G_2+$G_{3\&5}$)	5.5	μμf
#3 INPUT: G_3 TO (H+K+G_1+$G_{2\&5}$)	7.0	μμf
OUTPUT: P TO (H+K+G_1+G_2+$G_{3\&5}$)	7.5	μμf
COUPLING: G_1 TO G_3 (MAX.)	0.22	μμf

RATINGS

INTERPRETED ACCORDING TO DESIGN CENTER SYSTEM

DESIGN CENTER VALUES

HEATER VOLTAGE	4.2	VOLTS
MAXIMUM HEATER-CATHODE VOLTAGE:		
HEATER NEGATIVE		
TOTAL DC AND PEAK	200	VOLTS
HEATER POSITIVE		
DC	100	VOLTS
TOTAL DC AND PEAK	200	VOLTS
MAXIMUM PLATE VOLTAGE	300	VOLTS
MAXIMUM GRID #2 & #4 VOLTAGE	100	VOLTS
MAXIMUM GRID #2 & #4 SUPPLY VOLTAGE	300	VOLTS
MAXIMUM PLATE DISSIPATION	1.0	WATT
MAXIMUM GRID #2 & #4 DISSIPATION	1.0	WATT
MAXIMUM CATHODE CURRENT	14	MA.
MAXIMUM GRID #1 CIRCUIT RESISTANCE	0.47	MEGOHM
MAXIMUM GRID #3 CIRCUIT RESISTANCE	2.2	MEGOHMS
HEATER WARM-UP TIME*	11.0	SECONDS

*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.

CONTINUED ON FOLLOWING PAGE

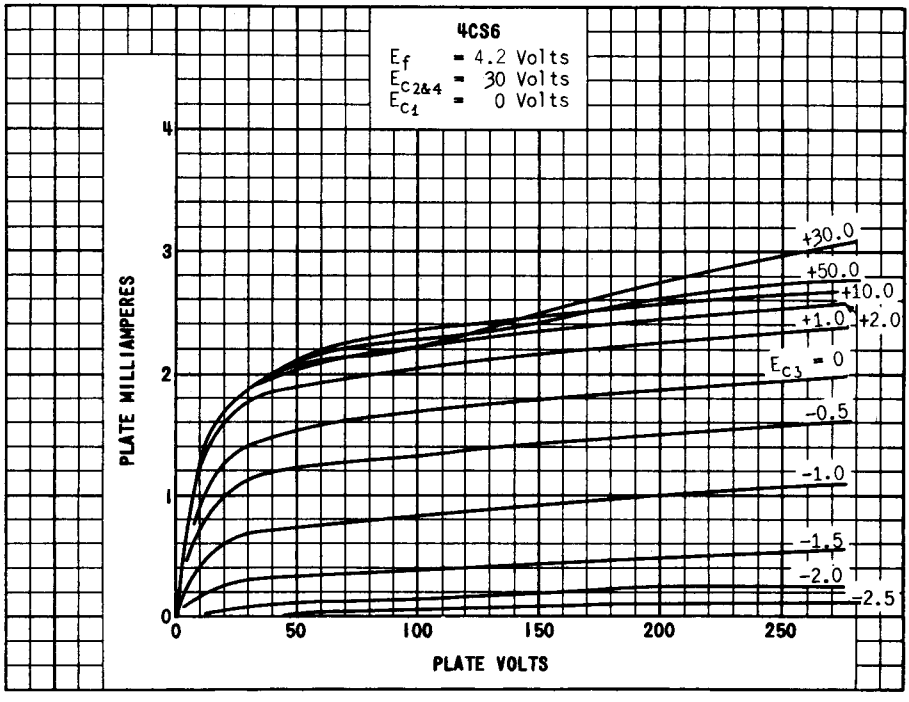
TUNG-SOL

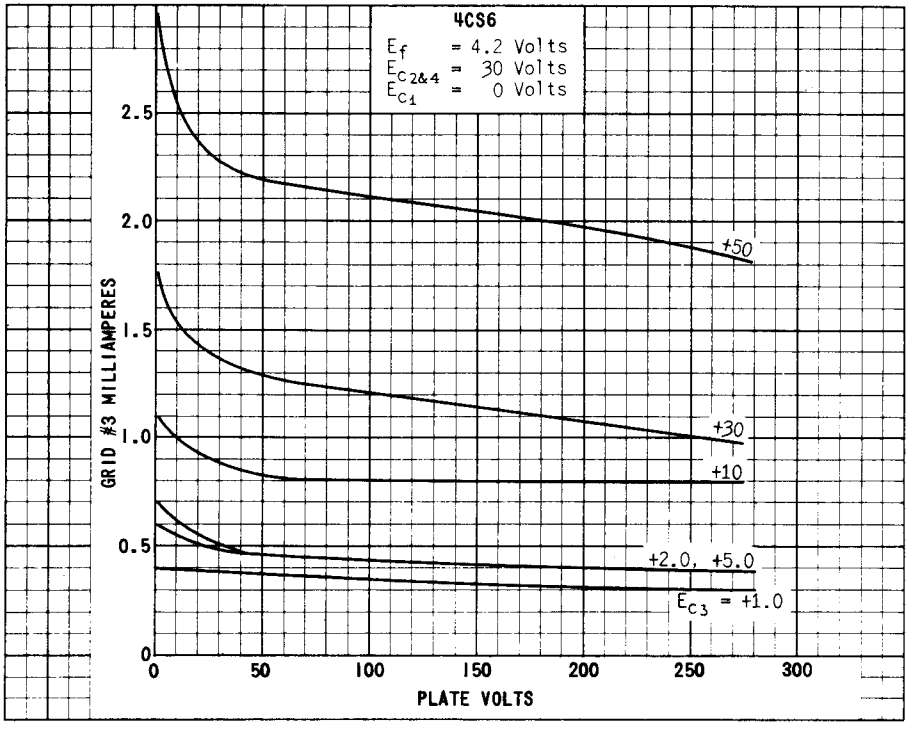
CONTINUED FROM PRECEDING PAGE

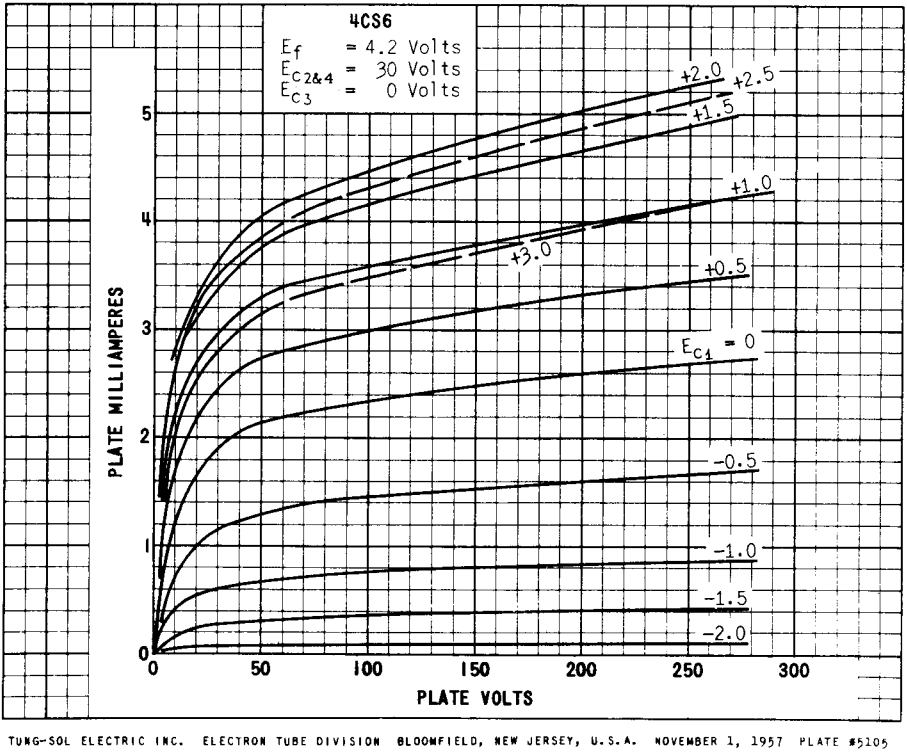
TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

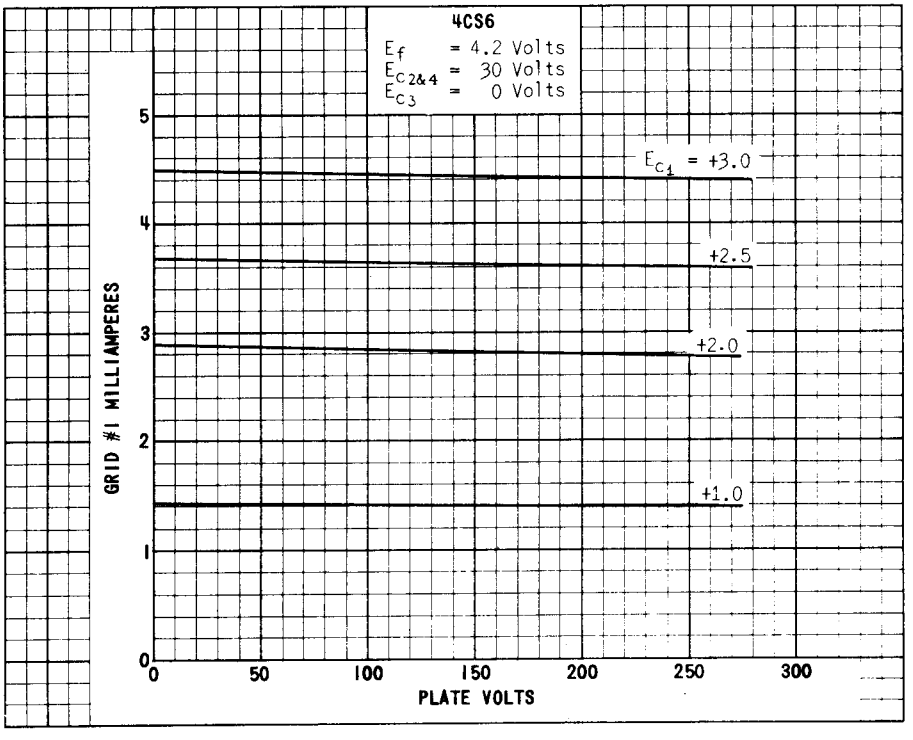
CLASS A_1 AMPLIFIER

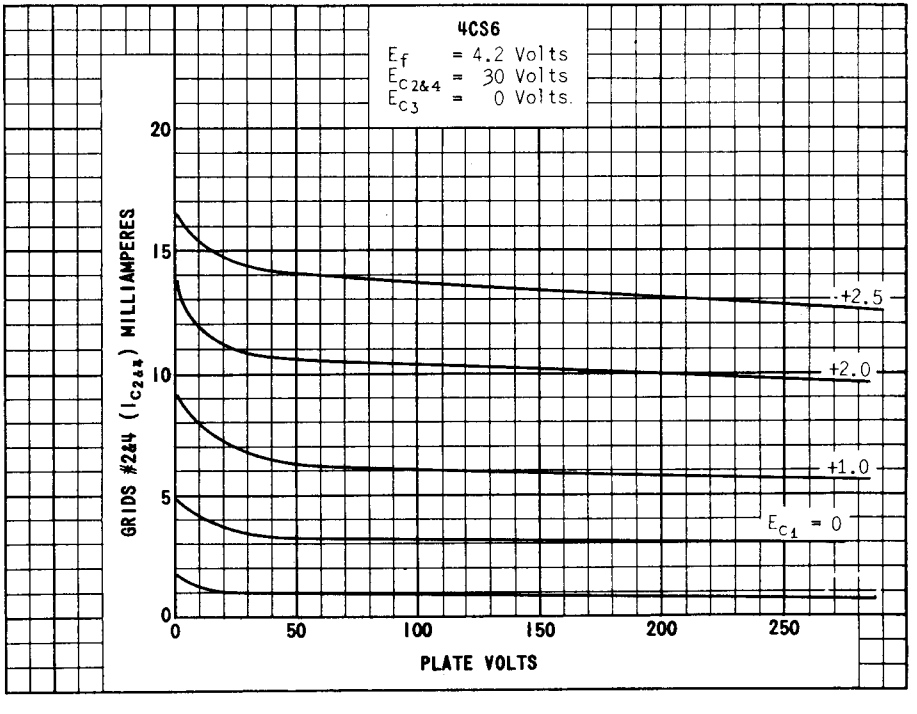
HEATER VOLTAGE	4.2	4.2	4.2	VOLTS
HEATER CURRENT	0.45	0.45	0.45	AMP.
PLATE VOLTAGE	10	100	100	VOLTS
GRID #2 & #4 VOLTAGE	30	30	30	VOLTS
GRID #1 VOLTAGE	0	0	-1	VOLTS
GRID #3 VOLTAGE	0	-1	0	VOLTS
PLATE CURRENT	2.0	0.8	1.0	MA.
GRID #2 & #4 CURRENT	4.5	5.5	1.3	MA.
TRANSCONDUCTANCE (MEASURED BETWEEN GRID #1 AND PLATE)	---	---	1 100	μMHOS
TRANSCONDUCTANCE (MEASURED BETWEEN GRID #3 AND PLATE)	---	500	---	μMHOS
PLATE RESISTANCE (APPROX.)	---	0.7	1.0	MEGOHM
GRID #1 VOLTAGE (APPROX.) FOR I_b=50 μA	---	---	-2.5	VOLTS
GRID #3 VOLTAGE (APPROX.) FOR I_b=50 μA	---	-2.2	---	VOLTS

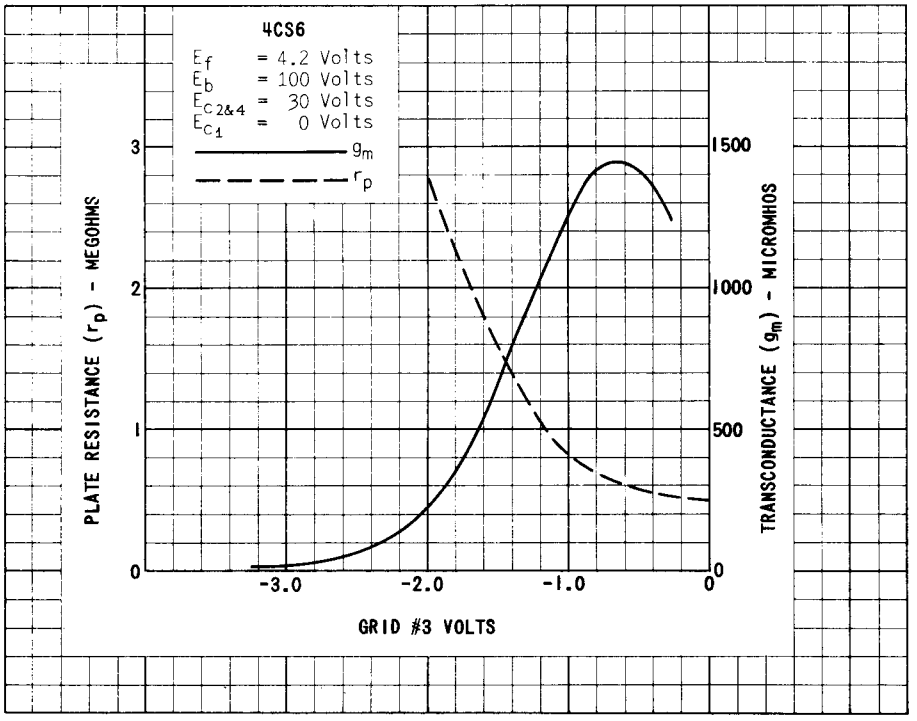


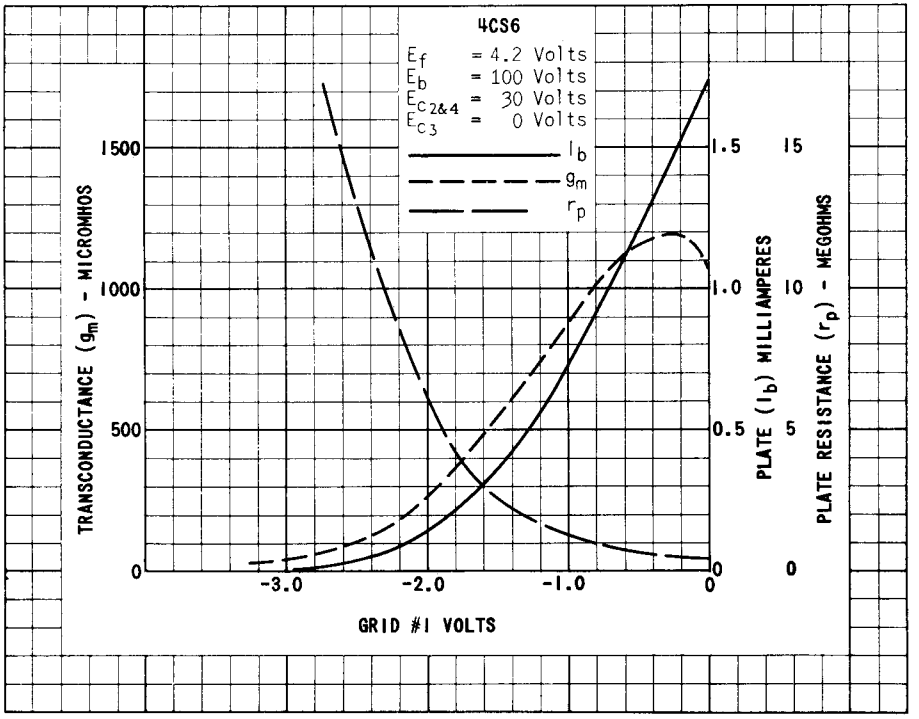

4CS6
E_f = 4.2 Volts
$E_{c2\&4}$ = 30 Volts
E_{c1} = 0 Volts
GRID #3 MILLIAMPERES
PLATE VOLTS
0
0.5
1.0
1.5
2.0
2.5
50
100
150
200
250
300
+50
+30
+10
+2.0, +5.0
E_{c3} = +1.0


4CS6
E_f = 4.2 Volts
$E_{c2\&4}$ = 30 Volts
E_{c3} = 0 Volts
PLATE MILLIAMPERES
PLATE VOLTS
0
1
2
3
4
5
50
100
150
200
250
300
+2.0
+2.5
+1.5
+1.0
+3.0
+0.5
E_{c1} = 0
-0.5
-1.0
-1.5
-2.0

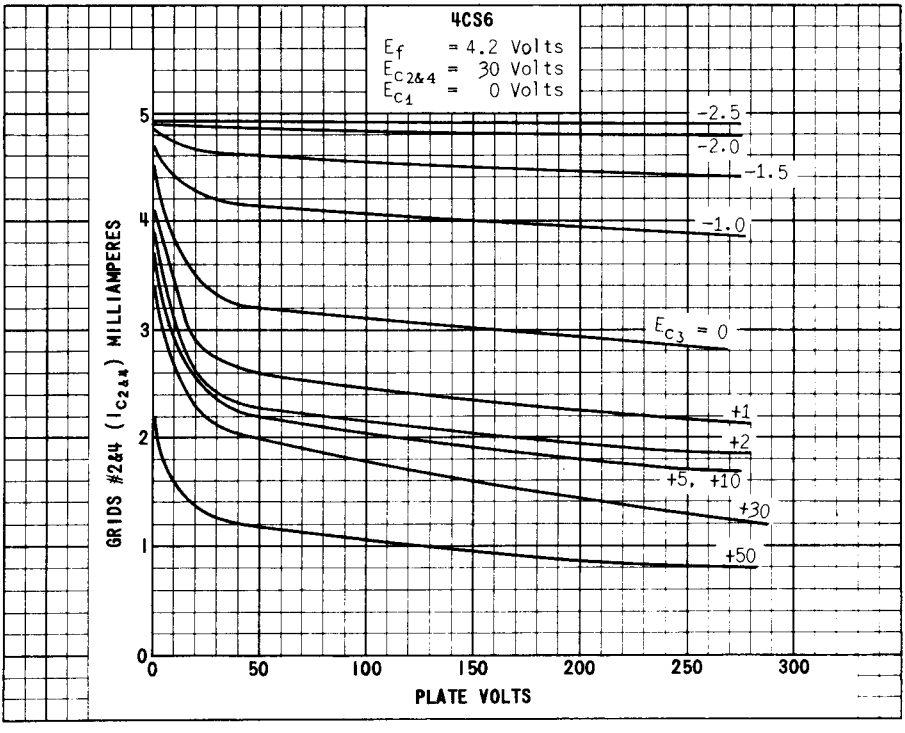

4CS6
E_f = 4.2 Volts
$E_{c2\&4}$ = 30 Volts
E_{c3} = 0 Volts
E_{c1} = +3.0
+2.5
+2.0
+1.0
GRID #1 MILLIAMPERES
PLATE VOLTS
0
1
2
3
4
5
0
50
100
150
200
250
300


4CS6
E_f = 4.2 Volts
$E_{c2\&4}$ = 30 Volts
E_{c3} = 0 Volts.
+2.5
+2.0
+1.0
E_{c1} = 0
GRIDS #2&4 ($I_{c2\&4}$) MILLIAMPERES
PLATE VOLTS
0
5
10
15
20
0
50
100
150
200
250


4CS6
E_f = 4.2 Volts
E_b = 100 Volts
$E_{c2\&4}$ = 30 Volts
E_{c1} = 0 Volts
g_m
r_p
PLATE RESISTANCE (r_p) - MEGOHMS
TRANSCONDUCTANCE (g_m) - MICROMHOS
GRID #3 VOLTS
0
1
2
3
500
1000
1500
-3.0
-2.0
-1.0
0


4CS6
E_f = 4.2 Volts
E_b = 100 Volts
$E_{c2\&4}$ = 30 Volts
E_{c3} = 0 Volts
I_b
g_m
r_p
TRANSCONDUCTANCE (g_m) - MICROMHOS
PLATE (I_b) MILLIAMPERES
PLATE RESISTANCE (r_p) - MEGOHMS
GRID #1 VOLTS
0
500
1000
1500
0.5
1.0
1.5
5
10
15
-3.0
-2.0
-1.0
0

4CS6


4CS6
E_f = 4.2 Volts
$E_{c2\&4}$ = 30 Volts
E_{c_1} = 0 Volts
GRIDS #2&4 ($I_{c2\&4}$) MILLIAMPERES
PLATE VOLTS
0
50
100
150
200
250
300
1
2
3
4
5
-2.5
-2.0
-1.5
-1.0
E_{c_3} = 0
+1
+2
+5, +10
+30
+50