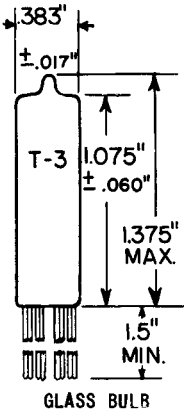
TUNG-SOL



GLASS BULB

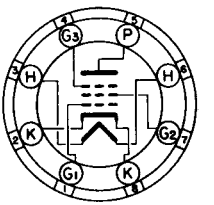
PENTODE

SUBMINIATURE TYPE

COATED UNIPOTENTIAL CATHODE

HEATER
6.3 VOLTS 0.15 AMP.
AC OR DC

ANY MOUNTING POSITION



BOTTOM VIEW
SUBMINIATURE BUTTON
8 FLEXIBLE LEADS
8DC

THE 5636 IS A SUBMINIATURE DUAL-CONTROL PENTODE CAPABLE OF OPERATION OVER A RANGE OF FREQUENCIES FROM AF TO UHF. THE DUAL-CONTROL CHARACTERISTIC MAKES POSSIBLE ITS USE IN SUCH APPLICATIONS AS CONVERTER, MODULATOR, PHANTASTRON, AND GATING SERVICE, AS WELL AS SINGLE CONTROL USAGE SUCH AS AF, IF, AND RF AMPLIFIERS, MIXERS, ETC. CONTROLS ON THE PRODUCT AVERAGE FOR SUCH CHARACTERISTICS AS HEATER CURRENT, PLATE CURRENT, AND TRANSCONDUCTANCE OFFER GREATER ASSURANCE TO THE EQUIPMENT DESIGNER THAT THESE CRITICAL CHARACTERISTICS WILL REMAIN WELL-CENTERED. AS THE TUBE MUST BE ABLE TO WITHSTAND SEVERE MECHANICAL TESTS TO MEET THE TEST SPECIFICATIONS, THE 5636 IS ESPECIALLY SUITABLE FOR USE IN MILITARY AND INDUSTRIAL EQUIPMENT WHICH MAY BE SUBJECTED TO SEVERE SHOCK AND VIBRATION, SUCH AS AIRBORNE COMMUNICATIONS EQUIPMENT.

DIRECT INTERELECTRODE CAPACITANCES

	WITH SHIELD[A]	WITHOUT SHIELD	
MAXIMUM GRID #1 TO PLATE	0.020	0.030	μμf
MAXIMUM GRID #3 TO PLATE	1.10	1.10	μμf
MAXIMUM GRID #1 TO GRID #3	0.15	0.17	μμf
GRID #1 TO ALL OTHER ELECTRODES (RATED)	4.0	4.0	μμf
MINIMUM	3.5	---	μμf
MAXIMUM	4.5	---	μμf
GRID #3 TO ALL OTHER ELECTRODES (RATED)	4.0	3.8	μμf
MINIMUM	3.5	---	μμf
MAXIMUM	4.5	---	μμf
PLATE TO ALL OTHER ELECTRODES (RATED)	3.4	1.9	μμf
MINIMUM	2.9	---	μμf
MAXIMUM	3.9	---	μμf

RATINGS

ABSOLUTE MAXIMUM VALUES

HEATER VOLTAGE	6.3±5%	VOLTS
MAXIMUM HEATER-CATHODE VOLTAGE	±200	VOLTS
MAXIMUM DC PLATE VOLTAGE	165	VOLTS
MAXIMUM DC GRID #2 VOLTAGE	155	VOLTS
MAXIMUM POSITIVE GRID #3 VOLTAGE	30	VOLTS
MAXIMUM NEGATIVE GRID #1 VOLTAGE	55	VOLTS
MAXIMUM PLATE DISSIPATION	0.55	WATT
MAXIMUM GRID #2 DISSIPATION	0.45	WATT
MAXIMUM PLATE CURRENT	11	mA
MAXIMUM GRID #2 CURRENT	7.0	mA
MAXIMUM BULB TEMPERATURE	220	°C
LIFE EXPECTANCY		
30°C AMBIENT TEMPERATURE	5 000	HOURS
175°C AMBIENT TEMPERATURE	1 000	HOURS

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TUNG-SOL

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TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS[B]

DUAL CONTROL AMPLIFIER

HEATER VOLTAGE	6.3	6.3	VOLTS
HEATER CURRENT	0.15	0.15	AMP.
DC PLATE VOLTAGE	100	100	VOLTS
DC GRID #1 VOLTAGE	0	0	VOLTS
DC GRID #2 VOLTAGE	100	100	VOLTS
DC GRID #3 VOLTAGE	-1	CATHODE POTENTIAL	
CATHODE RESISTOR	150	150	OHMS
PLATE CURRENT	4.0	5.3	mA
GRID #2 CURRENT	5.8	3.6	mA
GRID #1 TRANSCONDUCTANCE	1 950	3 200	μMHOS
GRID #3 TRANSCONDUCTANCE	950	500	μMHOS
PLATE RESISTANCE	0.05	0.11	MEGOHM
GRID #1 VOLTAGE FOR I_b = 10 μA.	---	-7.5	VOLTS
GRID #3 VOLTAGE FOR I_b = 10 μA.	-8.0	---	VOLTS
NOISE OUTPUT VOLTAGE (MAX.)[C]	---	60	mV

MIXER

HEATER VOLTAGE		6.3	VOLTS
HEATER CURRENT		0.15	AMP.
DC PLATE VOLTAGE		100	VOLTS
DC GRID #2 VOLTAGE		100	VOLTS
GRID #3 VOLTAGE:			
DC		0	VOLTS
AC		15	VOLTS
CATHODE RESISTOR		150	OHMS
PLATE CURRENT		3.5	mA.
GRID #2 CURRENT		5.7	mA
PLATE RESISTANCE		320 000	OHMS
CONVERSION TRANSCONDUCTANCE		1 280	μMHOS

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

E_f = 6.3V; E_b = 100Vdc; E_{c1} = 0Vdc; E_{c2} = 100Vdc; E_{c3} = 0Vdc; E_{hk} = 0V; R_k = 150 Ohms
(EXCEPT AS MODIFIED BELOW)

	INITIAL				500 HOUR LIFE TEST		
	INDIVIDUAL MIN.	INDIVIDUAL MAX.	PROD. MIN.	AVERAGE MAX.	INDIVIDUAL MIN.	INDIVIDUAL MAX.	
HEATER CURRENT	140	160	144	156	138	164	mA.
HEATER CATHODE LEAKAGE (E_{hk}=±100V.)	---	±5.0	---	---	---	±10	μAdc
GRID #1 CURRENT (R_{g1} =1.0 MEGOHM)	0	-0.3	---	---	0	-0.9	μAdc
PLATE CURRENT	3.7	6.9	4.6	6.0	---	---	mA
GRID #1 TRANSCONDUCTANCE	2700	4000	2900	3500	---	20[D]	PERCENT
					---	15[E]	PERCENT
CUT-OFF PLATE CURRENT (E_{c1} = -7.5; R_K = 0	0	100	---	---	---	---	μAdc
INSULATION OF ELECTRODES[F]							
GRID #1 TO ALL	100	---	---	---	50	---	MEGOHMS
PLATE TO ALL	100	---	---	---	50	---	MEGOHMS
GRID #2 CURRENT	2.8	5.4	---	---	---	---	mA
GRID #1 EMISSION[G] (E_f = 7.5V; E_{c1} =-7.5V;[G] R_K = 0; R_{g1} = 1.0 MEG.)	0	-0.5	---	---	---	---	μAdc
Δ GRID #1 TRANSCONDUCTANCE (E_f = 5.7V.)	---	15	---	---	---	15	PERCENT
GRID #3 TRANSCONDUCTANCE (E_{c3} = -1.0V.)	500	1800	---	---	---	---	μMHOS

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TUNG-SOL

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SPECIAL REQUIREMENTS

	MINIMUM	MAXIMUM	
AF NOISE[H] (Esig = 70mVac Ec2 = 19V, Rp = 0.2 MEG.; Rg1= 9.1 MEG; Rg2 = 1000 , Ck = 1000μf.	---	17	VU
LOW PRESSURE VOLTAGE BREAKDOWN[J] (PRESSURE = 55 +5mm Hg; VOLTAGE = 300VAC	---	---	
VARIABLE FREQUENCY VIBRATION[K] (F = 10CPS-4G TO F = 50CPS - 10G)	---	---	
LOW FREQUENCY VIBRATION[L] (F = 40 CPS; G = 15; Rp = 10K; Ck = 1,000μf)	---	60	mVac
SUBMINIATURE LEAD FATIGUE[M]	4	---	ARCS
SHOCK[N] (HAMMER ANGLE =30°; Ehk = +100V; Rg1 =0.1MEG)	---	---	
VIBRATIONAL FATIGUE[P] (G = 2.5; FIXED FREQUENCY; F = 25 MIN-60 MAX.)	---	---	
POST SHOCK & VIBRATION FATIGUE TEST END POINTS			
LOW FREQUENCY VIBRATION	---	200	mVac
HEATER CATHODE LEAKAGE	---	±20	μA.
Δ TRANSCONDUCTANCE (1) OF INDIVIDUAL TUBES	---	20	PERCENT
1 HOUR STABILITY LIFE TEST (Ehk= + 200V; Rg1 = 1.0 MEG.)	---	---	
STABILITY LIFE TEST END POINTS			
Δ GRID #1 TRANSCONDUCTANCE OF INDIVIDUAL TUBES	---	15	PERCENT
100 HOUR SURVIVAL RATE LIFE TEST (STABILITY LIFE TEST CONDITION OR EQUIVALENT)	---	---	
SURVIVAL RATE LIFE TEST END POINTS			
(GRID #1 TRANSCONDUCTANCE	2350	---	μMHOS
HEATER CYCLING LIFE TEST (Ef = 7.0V; 1 MIN. ON - 4 MIN. OFF; Ehk = 140Vac; Ec1 = Ec2 = Ec3 = Eb = 0)	2500		CYCLES

NOTES

[A] WITH SHIELD OF 0.405" INSIDE DIAMETER CONNECTED TO CATHODE.

[B] ALL VOLTAGES ARE REFERENCED TO THE NEGATIVE END OF THE CATHODE RESISTOR.

[C] ACROSS PLATE RESISTOR OF 10,000 OHMS, WITH APPLIED VIBRATIONAL ACCELERATION OF 15 G. AT NO CYCLES PER SECOND.

[D] SINGLE TUBE CHANGE IN TRANSCONDUCTANCE FROM INITIAL READING.

[E] AVERAGE CHANGE IN TRANSCONDUCTANCE.

[F] SEE MIL-E-1C 4.8.2

[G] PRIOR TO THIS TEST TUBES SHALL BE PREHEATED FOR A PERIOD OF 5 MINUTES UNDER CONDITIONS LISTED BELOW. TEST IMMEDIATELY AFTER PREHEATING. THREE MINUTE TEST IS NOT ALLOWED. GRID EMISSION SHALL BE THE LAST TEST ON THE SAMPLE SELECTED FOR THE GRID EMISSION TEST. Ef = 7.5 V, Ec1 = 0 Vdc, Ec2 = 100 Vdc, Ec3 = 0 Vdc, Eb = 100 Vdc, Rk = 150 OHMS, Rg1 = 1.0 MEG.

[H] SEE MIL-E-1C 4.10.3.2

[J] THERE SHALL BE NO EVIDENCE OF ARCING OR CORONA BETWEEN ANODE PINS AND ADJACENT PINS WITH NO OTHER VOLTAGES APPLIED.

[K] SEE MIL-E-1C 4.9.20.3 NO VOLTAGES -POST SHOCK AND VIBRATIONAL FATIGUE TEST END POINTS APPLY.

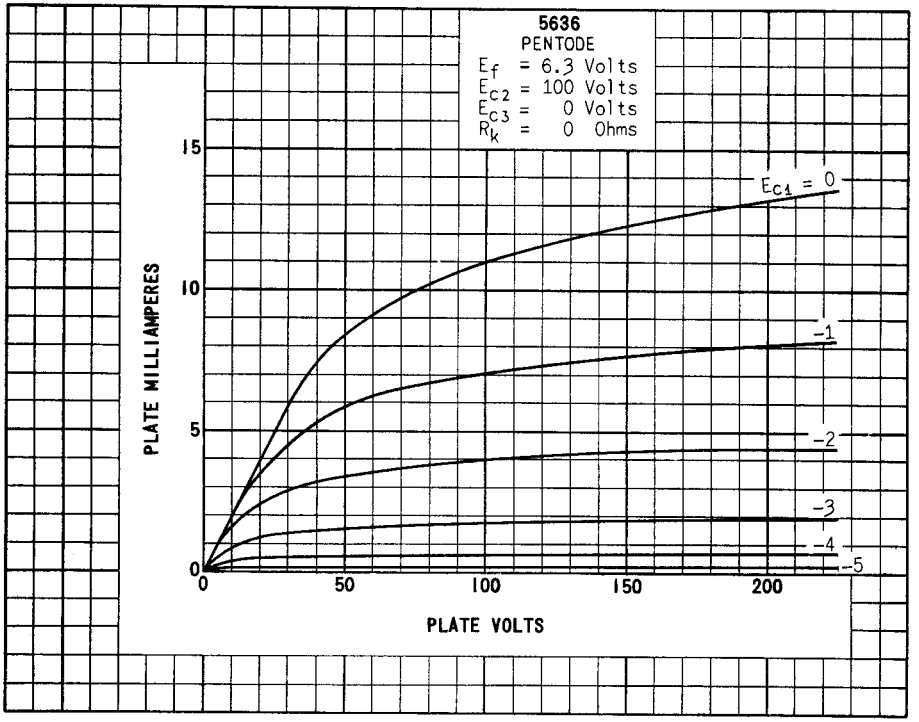
[L] SEE MIL-E-1C 4.9.19.1

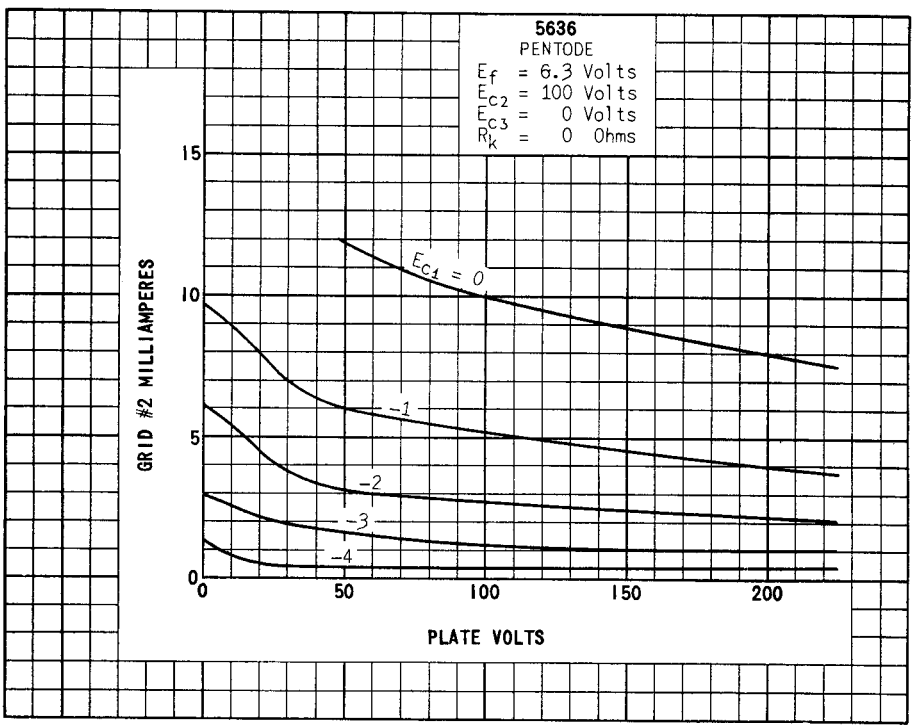
[M] SEE MIL-E-1C 4.9.5.3

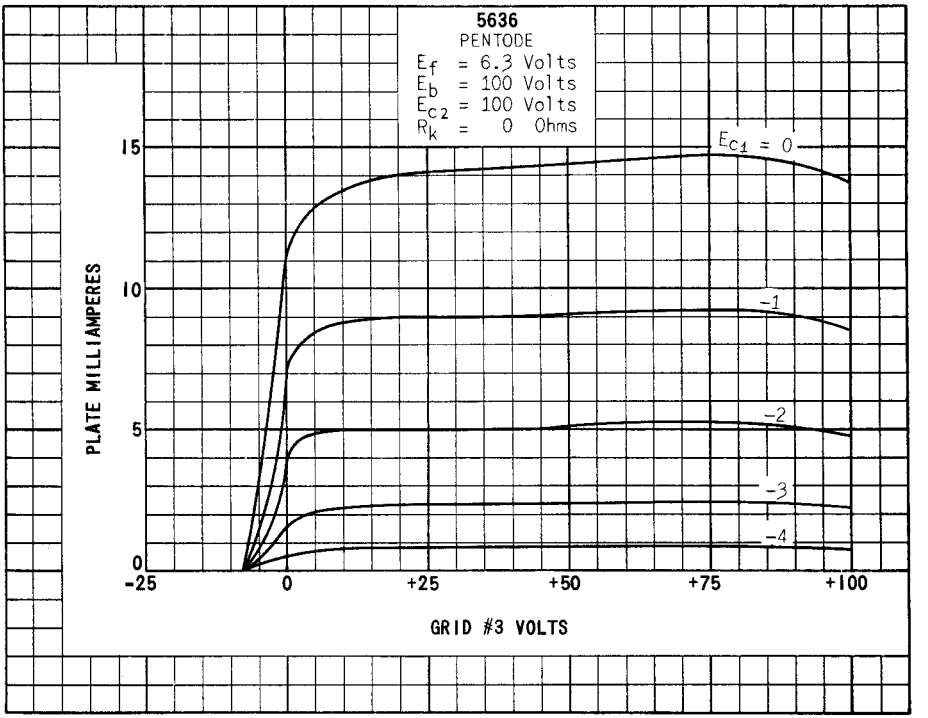
[N] SEE MIL-E-1C 4.9.20.5

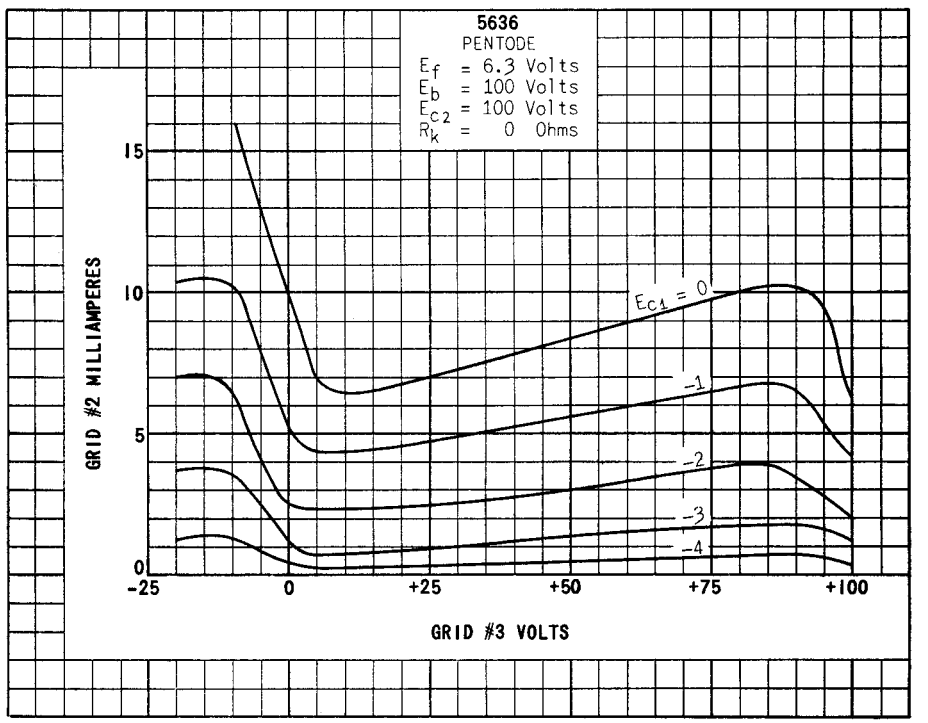
[P] SEE MIL-E-1C 4.9.20.6

5636
PREMIUM TUBE

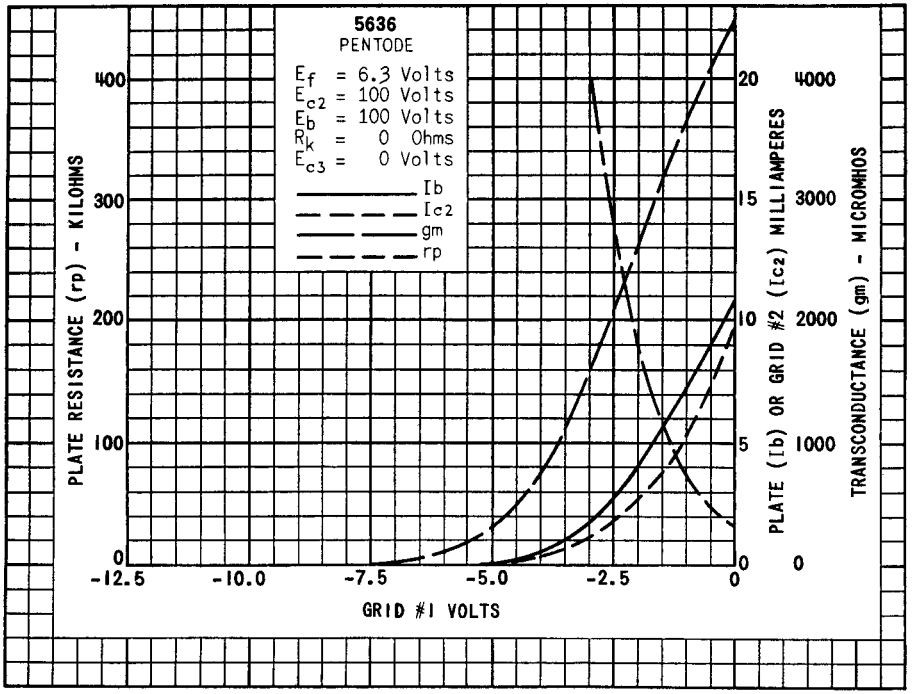


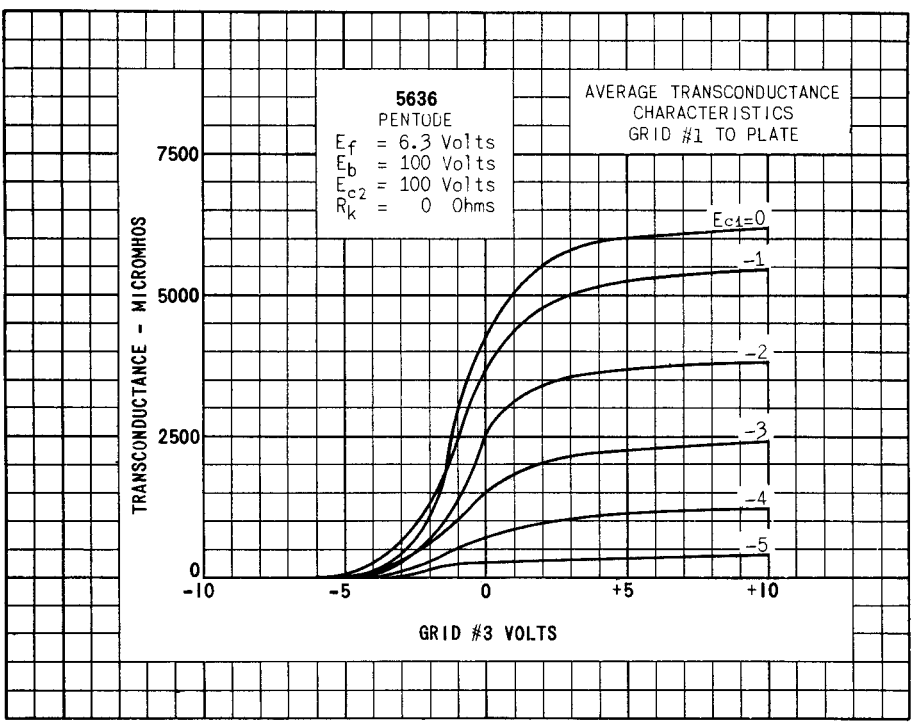


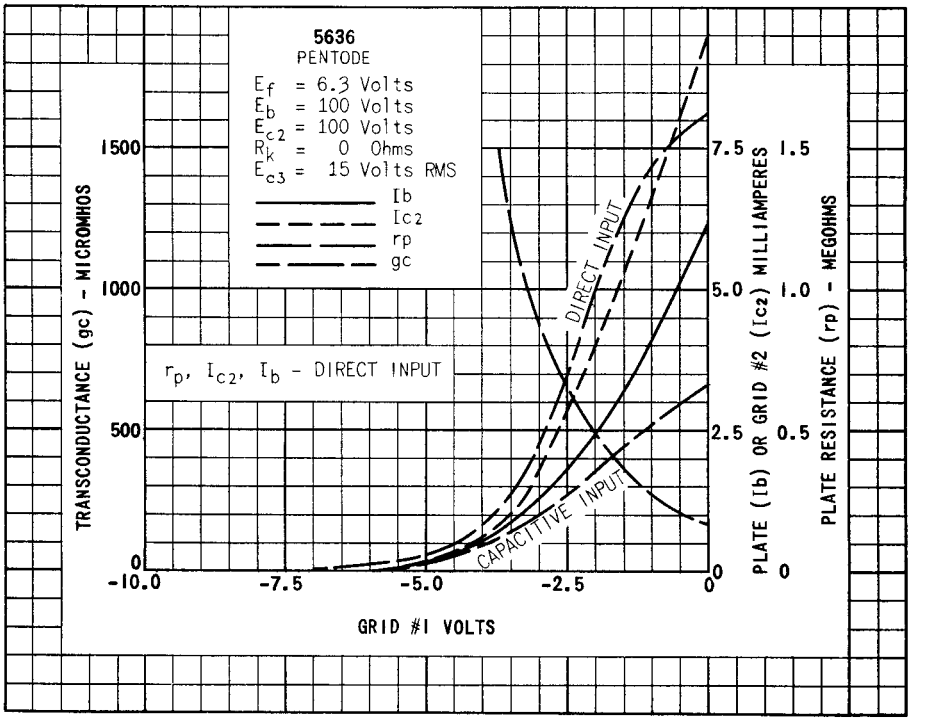

5636
PENTODE
E_f = 6.3 Volts
E_b = 100 Volts
E_{c2} = 100 Volts
R_k = 0 Ohms
E_{c1} = 0
-1
-2
-3
-4
PLATE MILLIAMPERES
0
5
10
15
-25
0
+25
+50
+75
+100
GRID #3 VOLTS

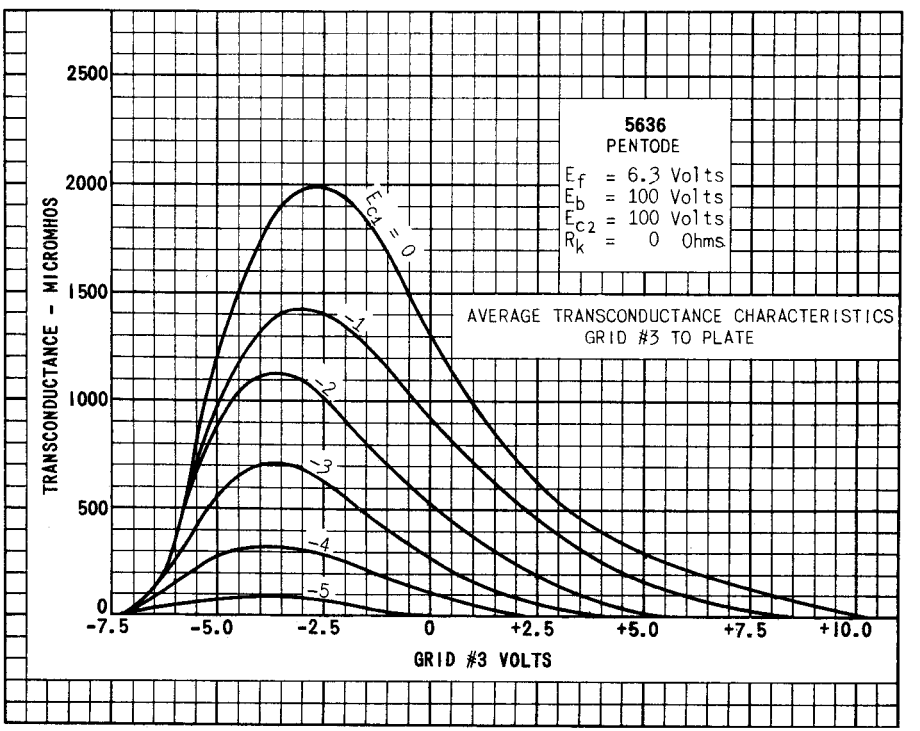

5636
PENTODE
E_f = 6.3 Volts
E_b = 100 Volts
E_{c2} = 100 Volts
R_k = 0 Ohms
E_{c1} = 0
-1
-2
-3
-4
GRID #2 MILLIAMPERES
0
5
10
15
-25
0
+25
+50
+75
+100
GRID #3 VOLTS

5636
PREMIUM TUBE






5636
PENTODE
E_f = 6.3 Volts
E_b = 100 Volts
E_{c2} = 100 Volts
R_k = 0 Ohms
E_{c3} = 15 Volts RMS
Ib
Ic2
rp
gc
r_p, I_{c2}, I_b - DIRECT INPUT
DIRECT INPUT
CAPACITIVE INPUT
TRANSCONDUCTANCE (gc) - MICROMHOS
PLATE (Ib) OR GRID #2 (Ic2) MILLIAMPERES
PLATE RESISTANCE (rp) - MEGOHMS
GRID #1 VOLTS
1500
1000
500
0
7.5
5.0
2.5
0
1.5
1.0
0.5
0
-10.0
-7.5
-5.0
-2.5
0


5636
PENTODE
E_f = 6.3 Volts
E_b = 100 Volts
E_{c2} = 100 Volts
R_k = 0 Ohms
AVERAGE TRANSCONDUCTANCE CHARACTERISTICS
GRID #3 TO PLATE
E_{c1} = 0
-1
-2
-3
-4
-5
TRANSCONDUCTANCE - MICROMHOS
GRID #3 VOLTS
2500
2000
1500
1000
500
0
-7.5
-5.0
-2.5
0
+2.5
+5.0
+7.5
+10.0

5636
PREMIUM TUBE