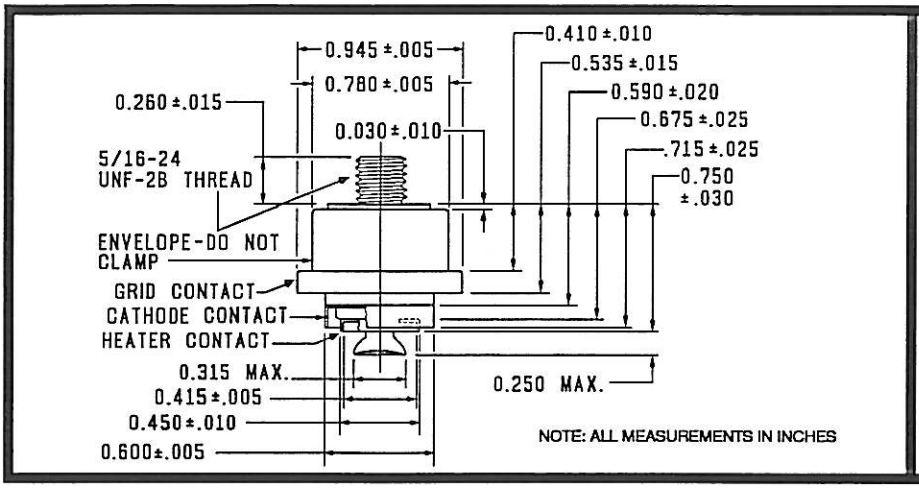


PL-8536

High-Mu Planar Triode

The PL-8536 is a ruggedized, ceramic/metal, high-mu planar triode. It is designed to be used in radio transmitting applications from low frequency to 3 GHz, as a grid pulsed, plate pulsed, or CW oscillator, a frequency multiplier, or as an amplifier.

In addition to low interelectrode capacitance, high transconductance, and high mu, the PL-8536 is designed to assure frequency stable operation, even under conditions of adverse ambient temperature and varying plate dissipation. The tube also makes use of a Phormat type cathode which consists of an indirectly heated disc with an oxide coating impregnated in a nickel matrix. This construction,, in combination with proper plate series impedance, reduces voltage-surge induced cathode failures to a minimum.

ELECTRICAL CHARACTERISTICS

Heater Voltage	6.0	Volts
Heater Current	1.00	Ampere
Minimum Cathode Heating Time	75	Seconds
Amplification Factor	80	
Transconductance (J_k = 200 mA/cm²)	30,000	μmhos
Interelectrode Capacitance (Without Heater Voltage)		
Grid-Plate	1.65	pF
Grid-Cathode	7.5	pF
Plate-Cathode (maximum)	.040	pF

MECHANICAL CHARACTERISTICS

Base	Special Coaxial	
Maximum Overall Dimensions		
Length	1.35	Inches
Diameter	0.95	Inches
Net Weight	20	Grams
Mounting Position	Any	
Cooling	Conduction and Convection	
Maximum Operation Temperature (Anode Core and Seals)	250°C	

PENTA LABORATORIES, INC.

LOS ANGELES, CALIFORNIA

PL-8536

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

Pulse Modulator or Pulse Amplifier
Maximum Ratings

DC Plate Voltage	2500	Volts
Peak Plate Voltage	3500	Volts
DC Grid Voltage	-150	Volts
Instantaneous Peak Grid-Cathode Voltage		
Grid Negative to Cathode	-750	Volts
Grid Positive to Cathode	100	Volts
DC Plate Current	100	mA
Pulse Cathode Current	5	Amperes
Average Plate Dissipation*	10	Watts
Average Grid Dissipation	1.5	Watts
Pulse Duration	6	μs
Duty Factor	.0033	

Grid Pulsed RF Oscillator or Amplifier – Class C
Maximum Ratings

DC Plate Voltage	2500	Volts
DC Grid Voltage	-150	Volts
Instantaneous Peak Grid-Cathode Voltage		
Grid Negative to Cathode	-750	Volts
Grid Positive to Cathode	250	Volts
Average Plate Current	10	mA
Average Grid Current	5	mA
Average Plate Dissipation*	10	Watts
Average Grid Dissipation	1.5	Watts
Pulse Duration	6	μs
Duty Factor	.0033	
Frequency	3	GHz

Typical Operation

Frequency	1.1	GHz
Filament Voltage	6.0	Volts
Pulse Duration	3.5	μs
Duty Factor	.001	
DC Grid Voltage	1700	Volts
DC Plate Voltage	-45	Volts
Peak Plate Current from DC Supply	1.9	Ampere
Peak Grid Current from Pulse Supply	1.1	Ampere
Approximate Driving Power During Pulse	400	Watts
Approximate Useful Peak Power Output	2	kw

* Greater dissipation will be possible with the PL-8536 when the tube is installed in an appropriately designed heat sink

PL-8536

Plate Pulsed RF Oscillator or Amplifier – Class C
Maximum Ratings

Peak Pulse Supply	3500	Volts
DC Grid Voltage	-150	Volts
Instantaneous Peak Grid-Cathode Voltage		
Grid Negative to Cathode	-750	Volts
Grid Positive to Cathode	250	Volts
Average Plate Current	10	mA
Average Grid Current	5	mA
Pulse Plate Current	3	Amperes
Average Plate Dissipation*	10	Watts
Average Grid Dissipation	1.5	Watts
Pulse Duration	6	μs
Duty Factor	.0033	
Frequency	3	GHz

Typical Operation

Frequency	2.5	GHz
Filament Voltage	5.8	Volts
Pulse Duration	5	μs
Duty Factor	.0030	
Peak Plate Pulse Supply Voltage	3500	Volts
Peak Plate Current From Pulse Supply	3.0	Amperes
Average Plate Current	9.0	mA
Average Grid Current	3.0	mA
Approximate Useful Peak Power Output	2.0	kw

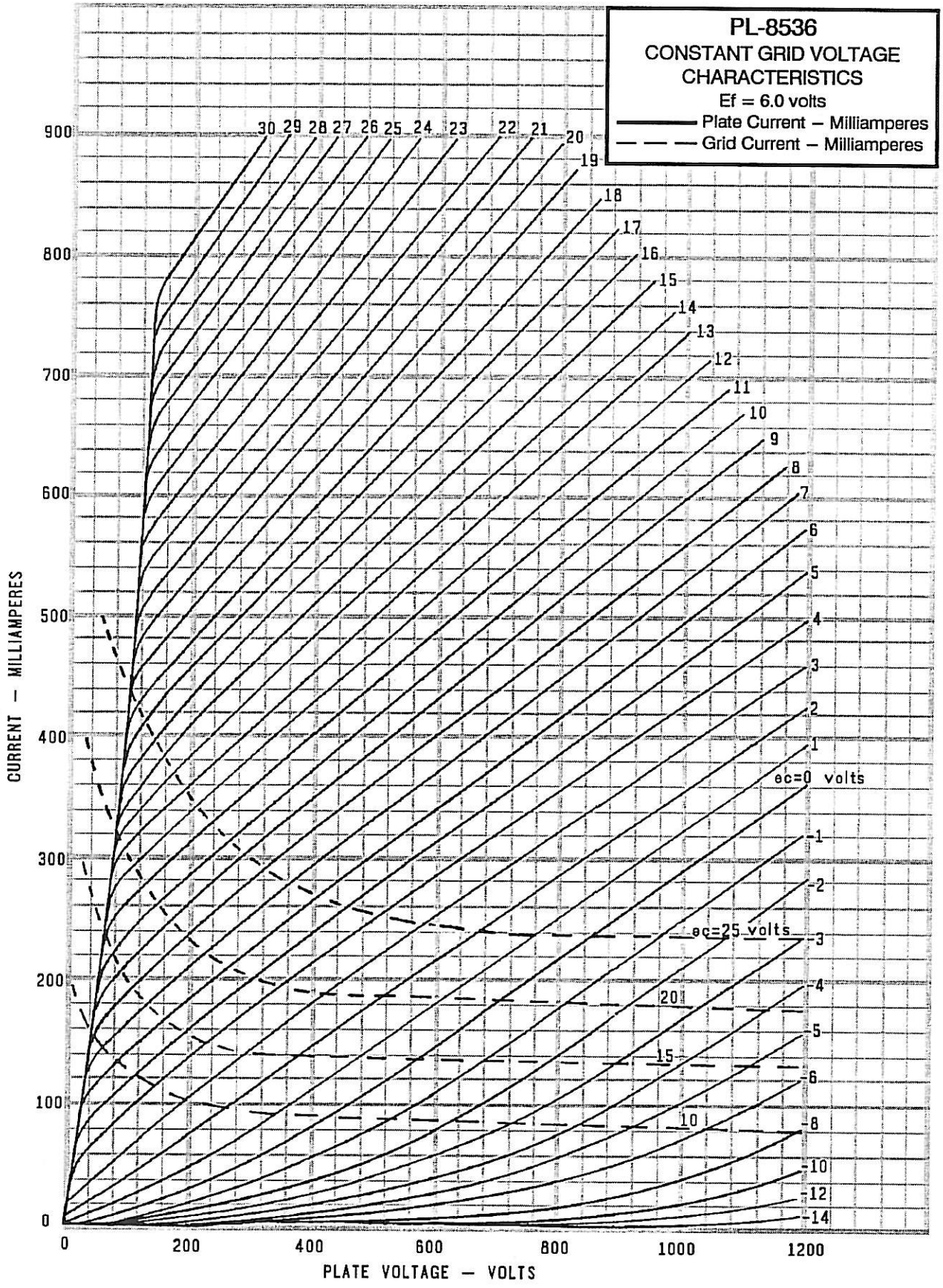
CW RF Power Oscillator and Amplifier – Class C
Maximum Ratings

DC Plate Voltage	2500	Volts
DC Grid Voltage	-150	Volts
Instantaneous Peak Grid-Cathode Voltage		
Grid Negative to Cathode	-400	Volts
Grid Positive to Cathode	30	Volts
DC Plate Current	150	mA
DC Grid Current	45	mA
Plate Dissipation*	10	Watts
Grid Dissipation	1.5	Watts
Frequency	2.5	GHz

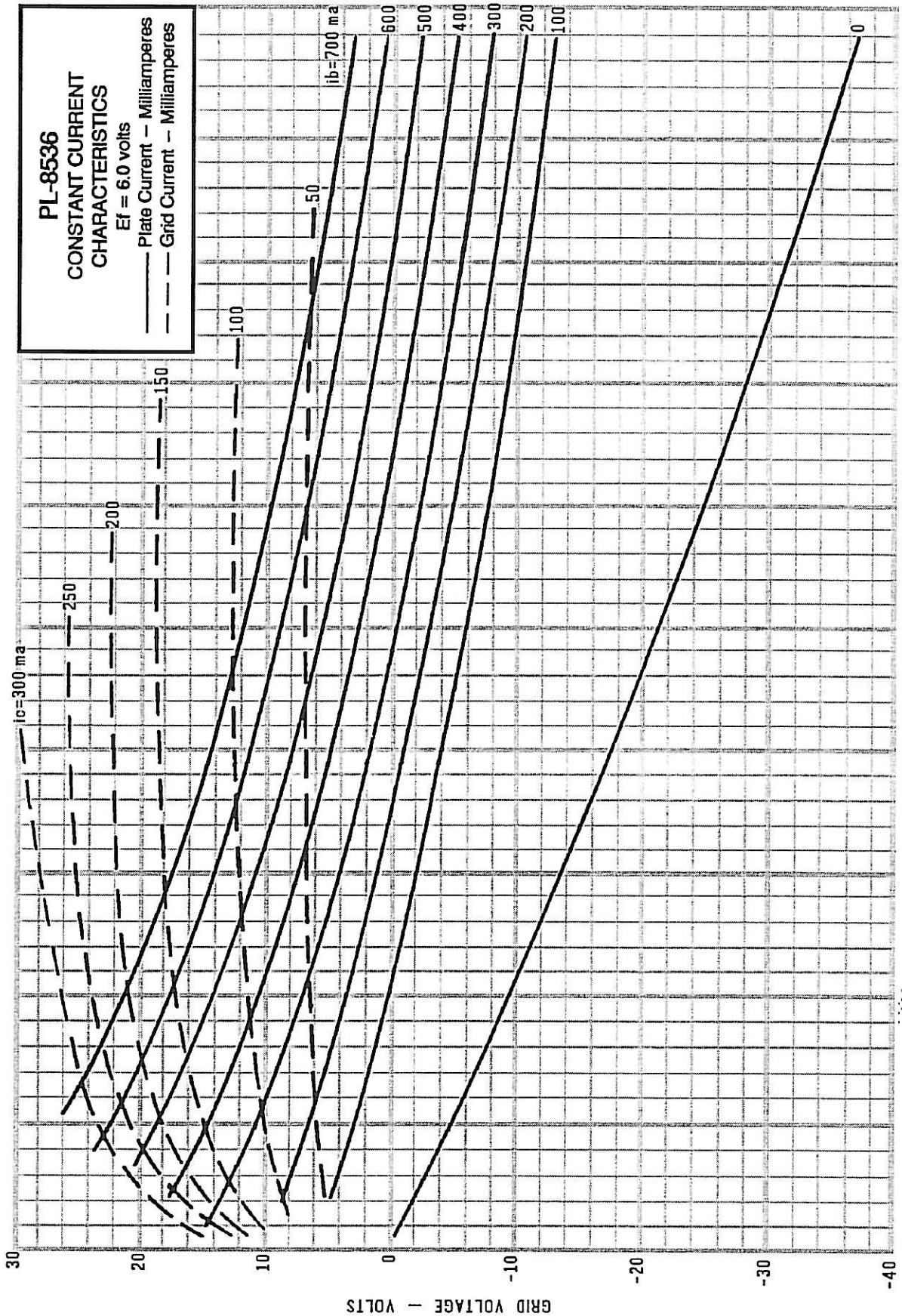
Typical Operation

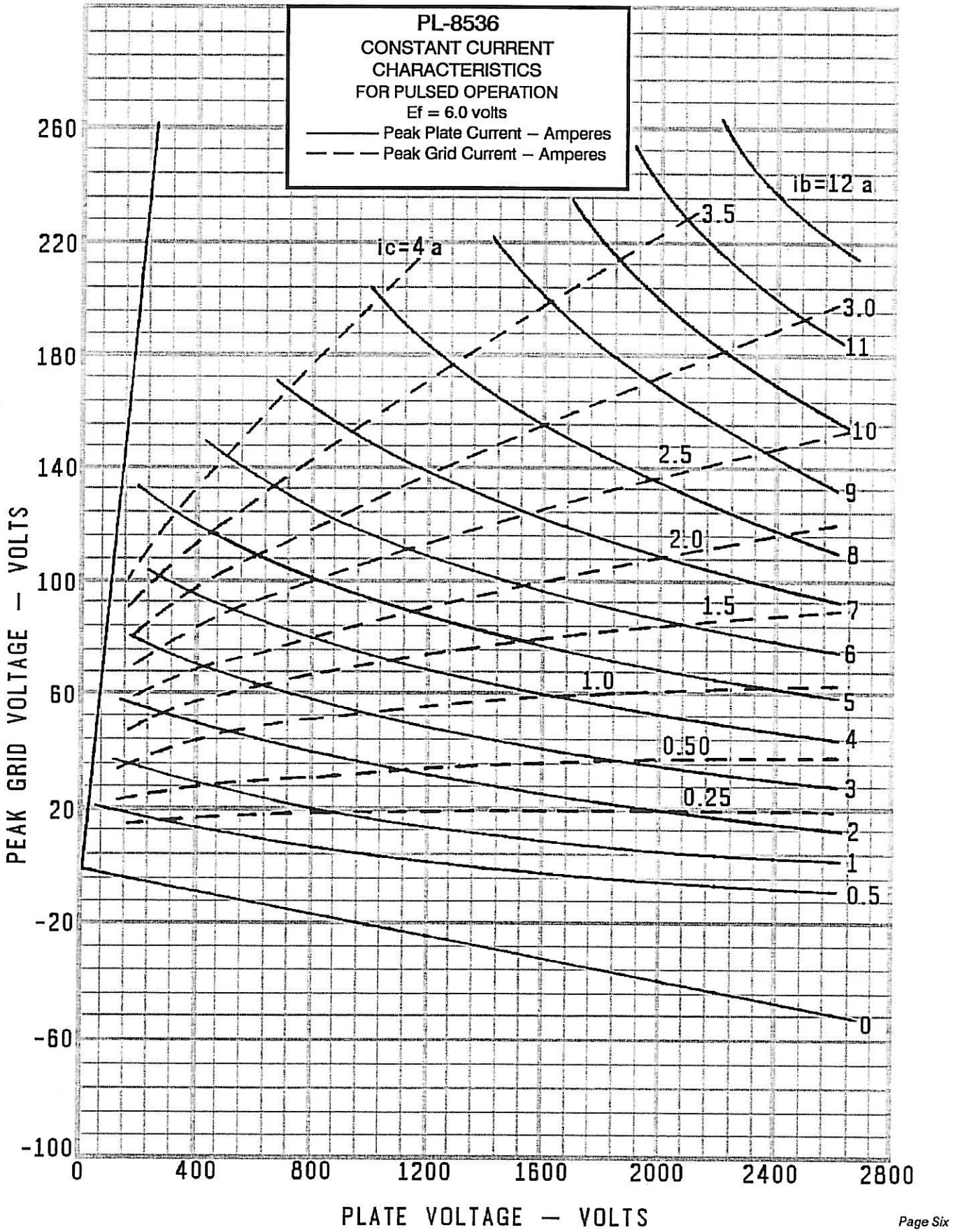
Frequency	500 MHz	2.3 GHz	
Filament Voltage	6.0	5.0	Volts
DC Plate Voltage	900	1000	Volts
DC Grid Voltage	-40	-40	Volts
DC Plate Current	90	150	mA
Approximate DC Grid Current	30	30	mA
Approximate Driving Power	6	6	Watts
Useful Power Output	40	40	Watts
Gain	- - -	15	db

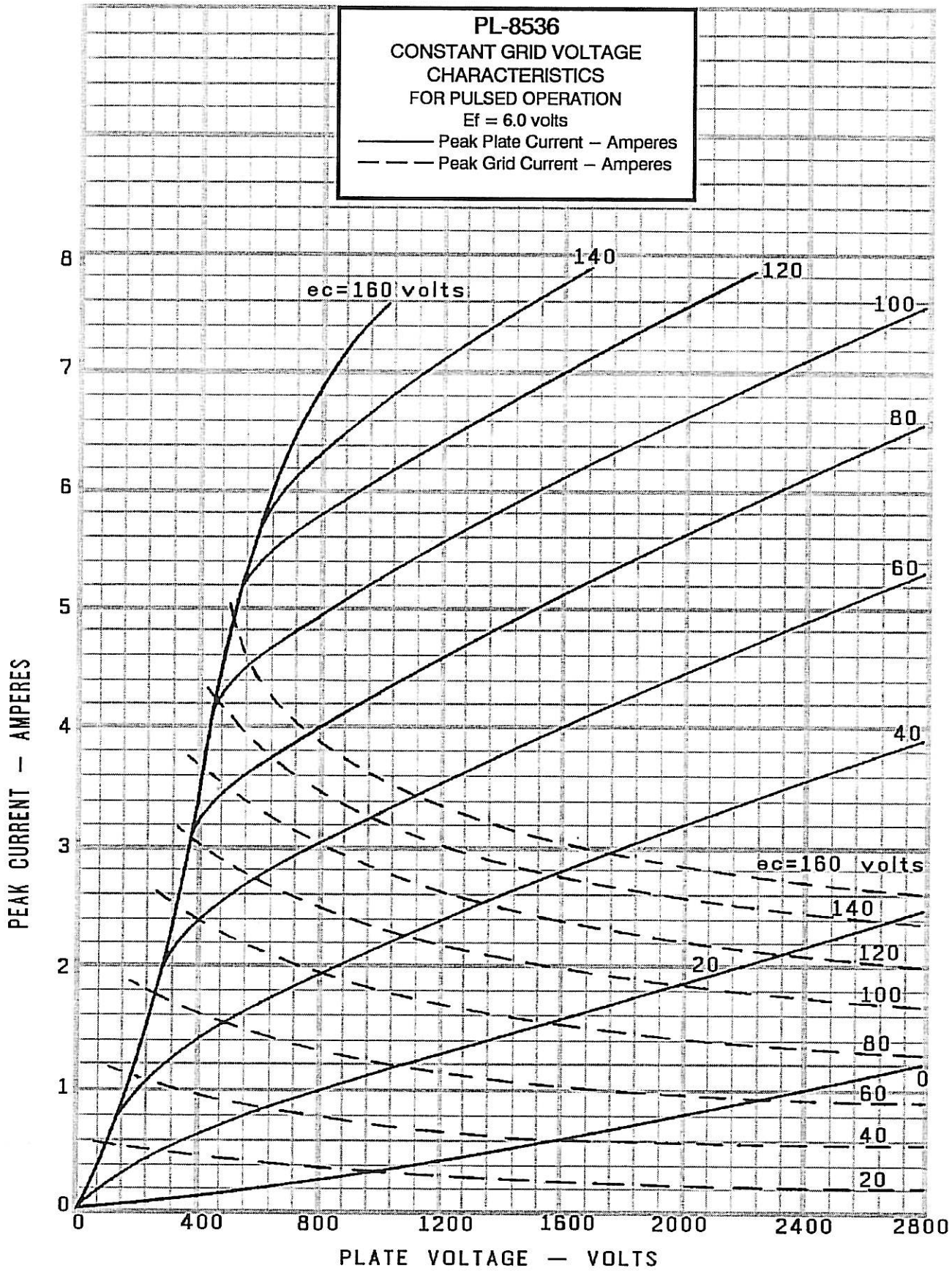
PL-8536


PL-8536
CONSTANT GRID VOLTAGE
CHARACTERISTICS
Ef = 6.0 volts
Plate Current – Milliamperes
Grid Current – Milliamperes
CURRENT – MILLIAMPERES
PLATE VOLTAGE – VOLTS
0
100
200
300
400
500
600
700
800
900
0
200
400
600
800
1000
1200
30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
ec=0 volts
-1
-2
ec=25 volts
-3
-4
20
-5
15
-6
-8
10
-10
-12
-14

PL-8536


PL-8536
CONSTANT CURRENT
CHARACTERISTICS
Ef = 6.0 volts
Plate Current – Milliamperes
Grid Current – Milliamperes
ib=700 ma
600
500
400
300
200
100
50
0
ic=300 ma
250
200
150
100
30
20
10
0
-10
-20
-30
-40
0
400
800
1200
1600
2000
PLATE VOLTAGE — VOLTS
GRID VOLTAGE — VOLTS


PL-8536
CONSTANT CURRENT
CHARACTERISTICS
FOR PULSED OPERATION
Ef = 6.0 volts
Peak Plate Current – Amperes
Peak Grid Current – Amperes
ib=12 a
ic=4 a
3.5
3.0
11
10
2.5
9
2.0
8
1.5
7
6
1.0
5
0.50
4
0.25
3
2
1
0.5
0
260
220
180
140
100
60
20
-20
-60
-100
0
400
800
1200
1600
2000
2400
2800
PEAK GRID VOLTAGE – VOLTS
PLATE VOLTAGE – VOLTS


PL-8536
CONSTANT GRID VOLTAGE
CHARACTERISTICS
FOR PULSED OPERATION
Ef = 6.0 volts
Peak Plate Current – Amperes
Peak Grid Current – Amperes
ec=160 volts
140
120
100
80
60
40
20
0
ec=160 volts
140
120
100
80
60
40
20
0
PEAK CURRENT – AMPERES
PLATE VOLTAGE – VOLTS
0
400
800
1200
1600
2000
2400
2800
1
2
3
4
5
6
7
8