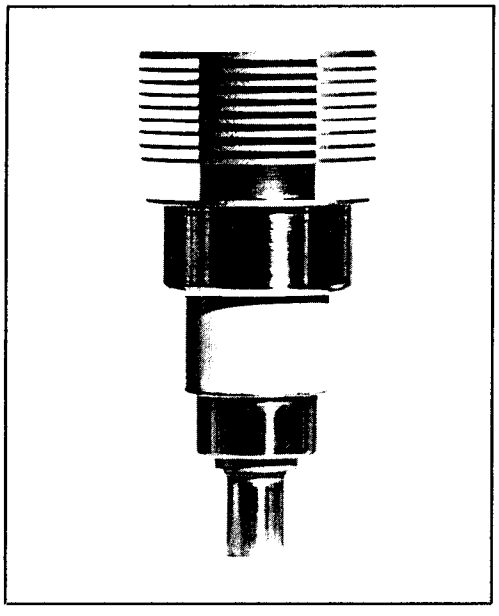
ISSUED 5-64



ML-8533

UHF Planar Triode
35 kw Pulse Power
5 kw RF Pulse Power
Phormat Cathode

MACHLETT
ELECTRON TUBE SPECIALIST

DESCRIPTION

The ML-8533 is a high-mu planar triode designed for use as a grid-pulsed or plate-pulsed oscillator, frequency multiplier, power amplifier or as a switch tube at high plate voltages. The tubes will deliver useful output at frequencies as high as 3 Gc. Noteworthy differences in this tube as compared to similar tube types are an extended grid-cathode insulator and a special cathode design, permitting operation with up to 8000 Vdc plate voltage. Other features include low interelectrode capacitance, high transconductance, great mechanical strength and capability for sustained, reliable operation at elevated temperatures.

Compact metal-and-ceramic coaxial construction makes the tubes well suited for operation in line-type circuits at lower frequencies as well as in cavity resonators at the higher frequencies. The cathode is an indirectly heated disc with an oxide coating impregnated in a nickel matrix. The unique matrix construction (in combination with proper plate series impedance) reduces to a minimum failures of the cathode due to voltage surges thereby further increasing the reliability of this tube. The anode of the ML-8533 is cooled by forced air.

GENERAL CHARACTERISTICS

Electrical

Heater Voltage (AC or DC)	6.3 ±5%	V
Heater Current at 6.3 volts	1.3	A
Heater Heating Time, minimum	60	sec
Amplification Factor, Cutoff	90	
Amplification Factor, Dynamic	145	
Transconductance	30000	μmhos
Interelectrode Capacitances, without Heater Voltage		
Grid-Plate	1.65	pf
Grid-Cathode	8.0	pf
Plate-Cathode, maximum	.06	pf

Mechanical

Mounting Position	Optional	
Type of Cooling	Forced-air	
Maximum Anode Temperature	250	°C
Net Weight	2.5	oz

MAXIMUM RATINGS

Pulse Modulator or Pulse Amplifier

Maximum Ratings, Absolute Values

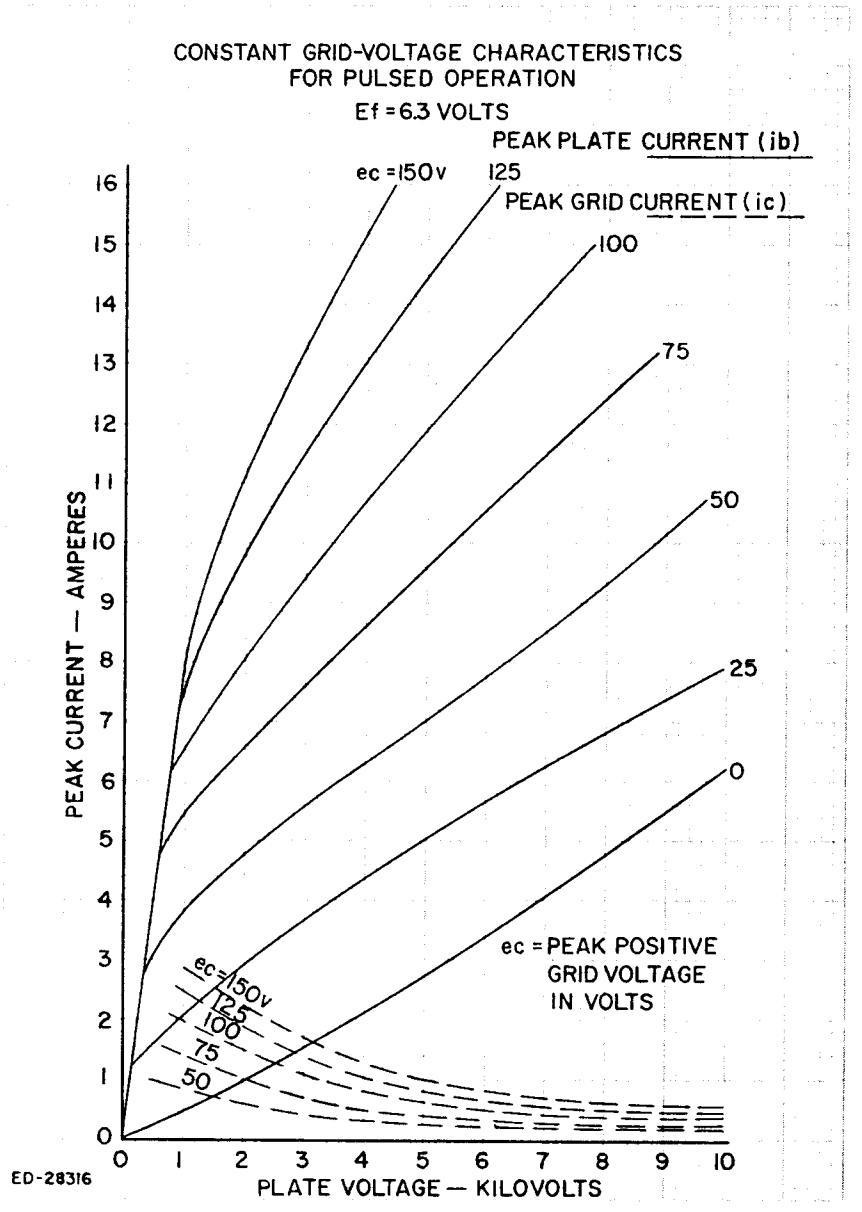
DC Plate Voltage	8	kV
Peak Plate Voltage	10	kv
DC Grid Voltage	−150	V
Instantaneous Peak Grid-Cathode Voltage		
Grid negative to cathode	−750	v
Grid positive to cathode	250	v
DC Plate Current	150	mA
Peak Plate Current from Pulse Supply	5	a
Average Plate Dissipation (Forced-Air Cooling)	100	W
Average Grid Dissipation	1.5	W
Pulse Duration	6	μs†
Duty Factor	0.0033	†

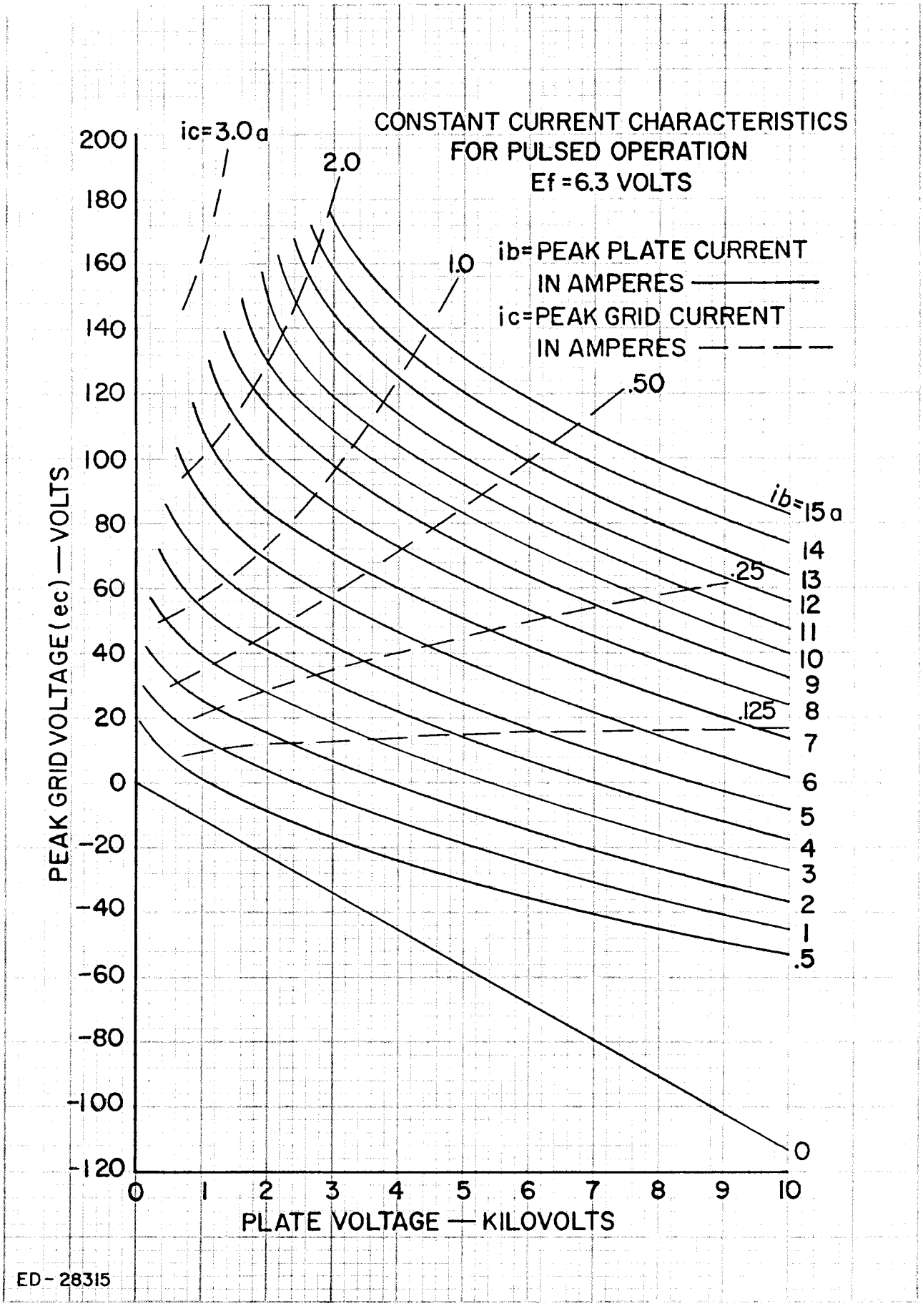
Grid-Pulsed or Plate-Pulsed RF Oscillator and Amplifier — Class C

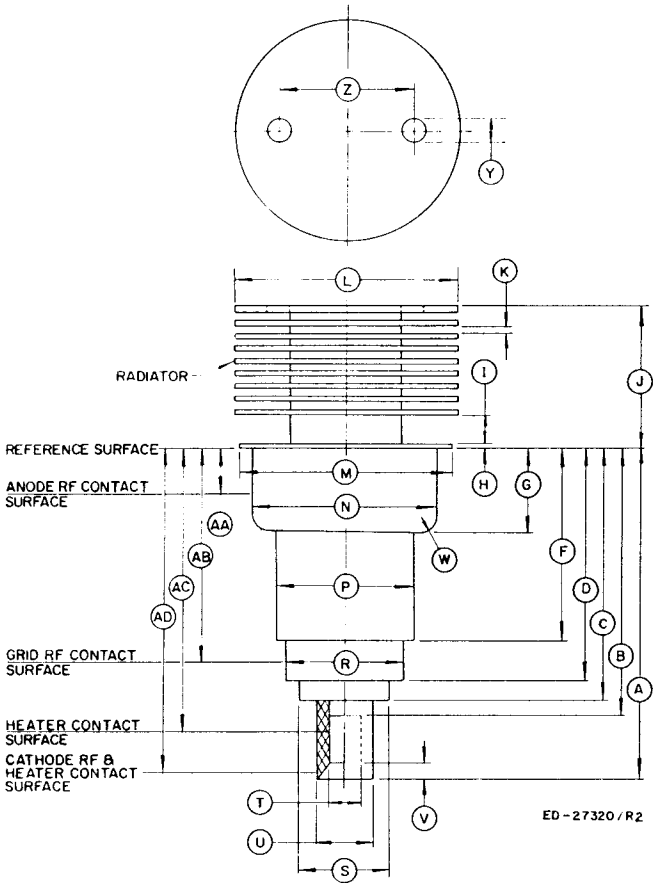
Maximum Ratings, Absolute Values

Frequency	3	Gc
DC Plate Voltage	8	kV*
DC Grid Voltage	−150	V
Instantaneous Peak Grid-Cathode Voltage		
Grid negative to cathode	−750	v
Grid positive to cathode	250	v
Average Plate Current	16	mA
Average Grid Current	6	mA
Peak Plate Current from DC Supply	5	a
Average Plate Dissipation (Forced-Air Cooling)	100	W
Average Grid Dissipation	1.5	W
Pulse Duration	6	μs†
Duty Factor	0.0033	†

†For applications requiring longer pulse duration or higher duty factors, consult the Machlett Engineering Department.
*Plate pulsed operation — peak plate voltage — to 10 kv.




CONSTANT CURRENT CHARACTERISTICS
FOR PULSED OPERATION
Ef = 6.3 VOLTS
ib = PEAK PLATE CURRENT IN AMPERES
ic = PEAK GRID CURRENT IN AMPERES
ic=3.0 a
2.0
1.0
.50
.25
.125
ib=15 a
14
13
12
11
10
9
8
7
6
5
4
3
2
1
.5
0
200
180
160
140
120
100
80
60
40
20
0
-20
-40
-60
-80
-100
-120
0 1 2 3 4 5 6 7 8 9 10
PEAK GRID VOLTAGE (ec) — VOLTS
PLATE VOLTAGE — KILOVOLTS
ED-28315



DIMENSIONS FOR OUTLINE

Ref.	Inches			Notes
	Minimum	Nominal	Maximum	
A	1.815		1.875	
AA	.035	.198	.361	1, 5
AB	1.185	1.225	1.265	2, 5
AC	1.534	1.631	1.728	3, 5, 6
AD	1.475	1.645	1.815	4, 6
B	—		1.534	
C	—		1.475	
D	1.289		1.329	
F	.970		1.010	
G	.462		.477	
H	—		.040	
I	.125		.185	
J	.766		.826	
K	.025		.046	
L	1.234		1.264	
M	1.180		1.195	
N	1.025		1.035	
P	.752		.792	
R	.655		.665	
S	—		.545	
T	.213		.223	
U	.315		.325	
V	—		.086	
W	—		.100	
Y	.105		.145	
Z	.650		.850	

NOTES

1. Anode rf contact surface and reference dimension for eccentricity measurements.
2. Grid rf contact surface and reference dimension for eccentricity measurements.
3. Heater contact surface and reference dimension for eccentricity measurements.
4. Heater and cathode rf contact surface and reference dimension for eccentricity measurements.
5. The total indicated runout of the anode and grid contact surface with respect to the cathode contact surface will not exceed .020 inch.
6. The total indicated runout of the cathode contact surface with respect to the heater contact surface will not exceed .012 inch.

THE MACHLETT LABORATORIES, INC.
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