

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- μ 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 \pm 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 μ mhos |
| 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 $^{\circ}$ 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 μ s† |
| Duty Factor | 0.0033 † |

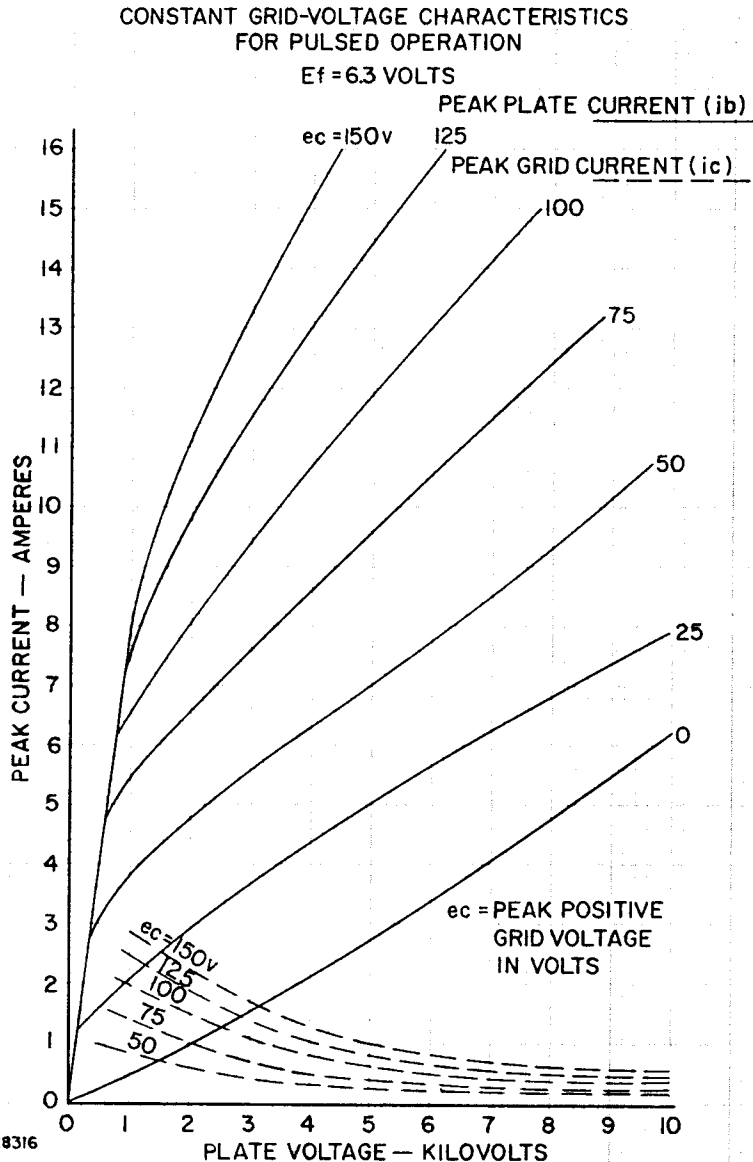
Grid-Pulsed or Plate-Pulsed RF Oscillator and Amplifier — Class C

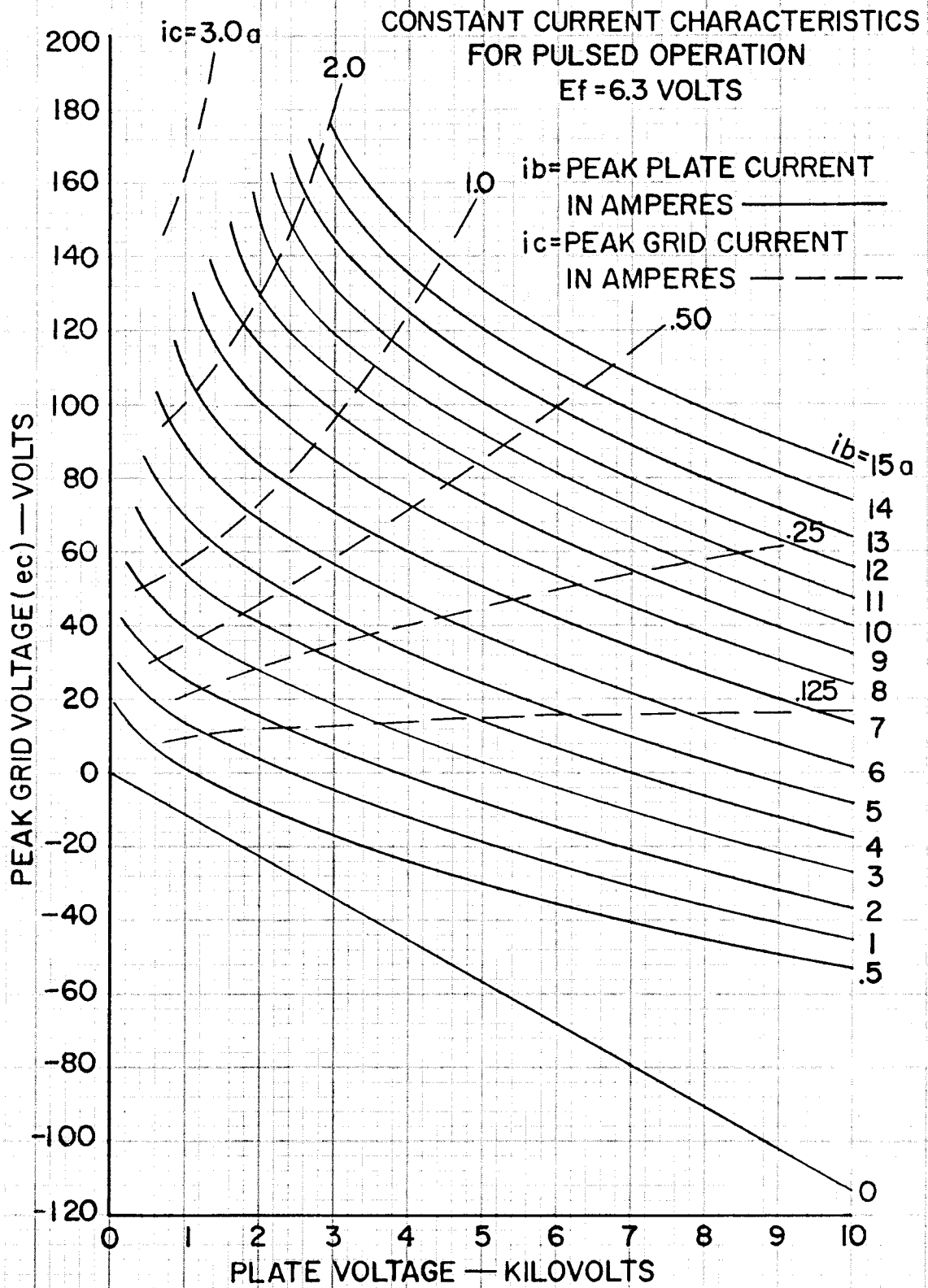
Maximum Ratings, Absolute Values

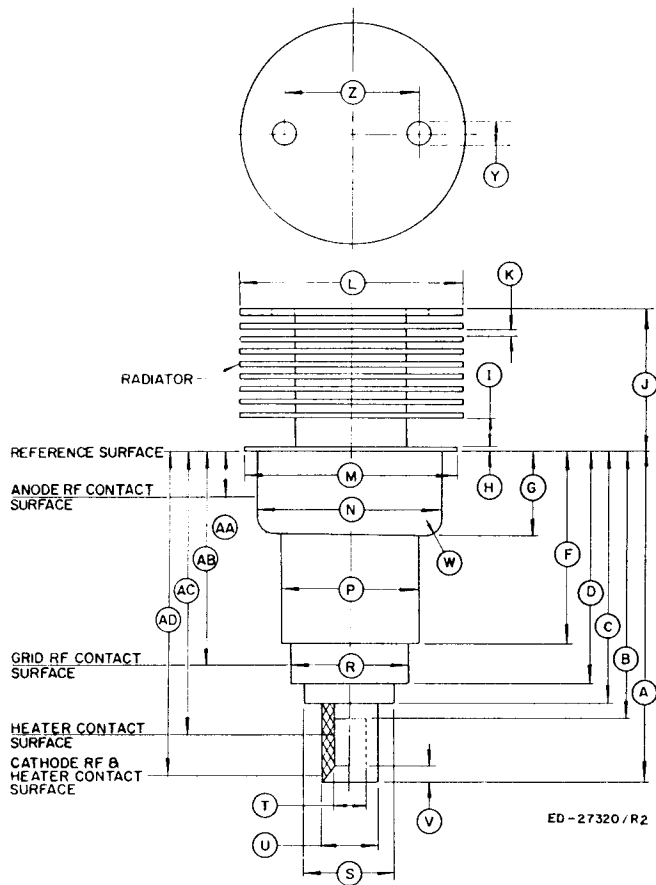
| | |
|--|------------|
| Frequency | 3 Gc |
| DC Plate Voltage | 8 kV* |
| DC Grid Voltage | -150 V |
| Instantaneous Peak Grid-Cathode Voltage | |
| Grid negative to cathode | -750 v |
| Grid positive to cathode | 250 v |
| Average Plate Current | 16 mA |
| Average Grid Current | 6 mA |
| Peak Plate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







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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