5946

Power Triode

FORCED-AIR COOLED **GROUNDED-GRID TYPE**

For UHF Plate-Pulsed Oscillator and Amplifier Service

GENERAL DATA

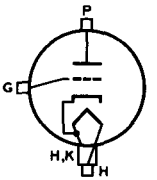
Electrical: ←

Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3	volts
Current	3.4	amp
Minimum heating time	1	minute
Amplification Factor	25	
Direct Interelectrode Capacitances:		
Grid to plate	6.0	pf
Grid to cathode	11.0	pf
Plate to cathode[a]	0.19 max.	pf

Mechanical:

Operating Position	Any
Overall Length	3-5/16" ± 3/32"
Diameter	1.750" ± 0.010"
Weight (Approx.)	8 oz ←
Radiator	Integral part of tube
Mounting	Special

Terminal Diagram (See *Dimensional Outline*):



P – Plate
G – Grid

K – Cathode
H – Heater

Thermal:

Air Flow:

The specified air flow for various plate dissipations, as indicated in the tabulation below, should be delivered by a blower onto the respective terminals and seals, and through the radiator before and during the application of any voltages. Heater power, plate power, and air may be removed simultaneously.

Plate Dissipation	150	200	250	watts
Min. Air Flow	5.7	10	16	cfm
Static Pressure	0.16	0.4	0.85	in. of water

The above flow and pressure values are for condition with radiator temperature held constant at 135° C rise above ambient temperature. The air flow must be adequate to limit the temperature of the radiator, grid terminal, cathode terminal, and seals to their respective maximum values.

Radiator Temperature (Measured on core at end adjacent to plate ring)	180 max.	°C
Grid-Terminal Temperature	150 max.	°C

← Indicates a change.

Cathode-Terminal Temperature.	150 max.	°C
Seal Temperature (Plate, grid, and cathode) .	150 max.	°C

PLATE-PULSED OSCILLATOR & AMPLIFIER — Class C

Maximum Ratings, *Absolute-Maximum Values:*

For maximum "on" time[b] *of*	*10 μsec*	*100 μsec*	
PEAK POSITIVE-PULSE PLATE-SUPPLY VOLTAGE.	7500 max.	7500 max.	volts
PEAK NEGATIVE-PULSE GRID-BIAS VOLTAGE	600 max.	600 max.	volts
PEAK PLATE CURRENT FROM PULSE SUPPLY	4.5 max.	3.5 max.	amp
PEAK RECTIFIED GRID CURRENT . .	1 max.	0.75 max.	amp
DC PLATE CURRENT.	0.045 max.	0.250 max.	amp
DC GRID CURRENT	0.010 max.	0.070 max.	amp
→ PLATE INPUT	340 max.	340 max.	watts
PLATE DISSIPATION	250 max.	250 max.	watts

Typical Operation with Rectangular Wave Shape in Oscillator Circuit at 1250 Mc:

With duty factor[c] *of 0.01*

Peak Positive-Pulse Plate-Supply Voltage.	5500	7500	volts
Peak Negative-Pulse Grid-Bias Voltage	375	500	volts
Cathode Resistor[d]	100	100	ohms
Peak RF Grid Voltage.	625	850	volts
Peak Plate Current From Pulse Supply	3.5	4.5	amp
Peak Rectified Grid Current	0.25	0.5	amp
DC Plate Current.	0.035	0.045	amp
DC Grid Current	0.0025	0.005	amp
Useful Power Output at Peak of Pulse[e] (Approx.)	8000	14000	watts

[a] With external shield connected to grid.

[b] *"ON" time* is defined as the sum of the durations of all the individual pulses which occur during the interval of 1000 microseconds. *Pulse duration* is defined as the time interval between the two points on the pulse at which the instantaneous value is 70 per cent of the peak value. The *peak value* is defined as the maximum value of a smooth curve through the average of the fluctuations over the top portion of the pulse.

[c] Duty factor is the product of pulse duration and repetition rate. For variable pulse durations and pulse repetition rates, the duty factor is defined as the ratio of time "on" to total elapsed time in any 500-microsecond interval.

[d] It is recommended that the entire bias be obtained from a cathode resistor. In certain applications, partial grid-resistor bias may be used.

[e] The power output at peak of pulse is obtained from the average power output using the duty factor of the peak power output pulse. This procedure is necessary since the power output pulse duty factor may be less than the applied voltage pulse duty factor because of a delay in the start of rf power output.

→ Indicates a change.

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN ←

	Note	Min.	Max.	
Heater Current	1	3.05	3.75	amp
Amplification Factor	1,2	18	32	
Grid-Plate Capacitance	-	5.6	6.6	pf
Grid-Cathode Capacitance	-	10.5	12.5	pf
Plate-Cathode Capacitance	3	0.12	0.26	pf
Plate Voltage	1,4	500	850	volts
Plate Voltage	1,5	690	1140	volts
Grid Voltage	1,6	-	-165	volts
Peak Cathode Current	1,7	12	-	amp
Useful Power Output at Peak of Pulse	1,8	12	-	kw

Note 1: With 6.3 volts on heater.

Note 2: With dc grid voltage of -15 volts, and dc plate voltage adjusted to give dc plate current of 250 milliamperes.

Note 3: With external shield connected to grid terminal.

Note 4: With dc grid voltage of -10 volts, and dc plate voltage adjusted to give dc plate current of 250 milliamperes.

Note 5: With dc grid voltage of -20 volts, and dc plate voltage adjusted to give dc plate current of 250 milliamperes.

Note 6: With dc plate voltage of 1600 volts, and dc grid voltage adjusted to give dc plate current of 1 milliampere.

Note 7: Represents the maximum value of cathode current (Plate current and grid current) for the tube under any condition of operation.

Note 8: With peak positive-pulse plate-supply voltage of 7500 volts, cathode-bias resistor of 100 ± 10 per cent ohms, peak plate current from pulse supply of 4.5 amperes, peak rectified grid current of 0.5 ampere, duty factor of 0.01, and frequency of 1250 Mc.

MAXIMUM RATINGS vs OPERATING FREQUENCY

OPERATING FREQUENCY Mc	MAXIMUM PERMISSIBLE PERCENTAGE OF MAXIMUM RATED PLATE VOLTAGE & PLATE INPUT
	Plate-Pulsed Oscillator and Amplifier Service
1300	100
2000	75

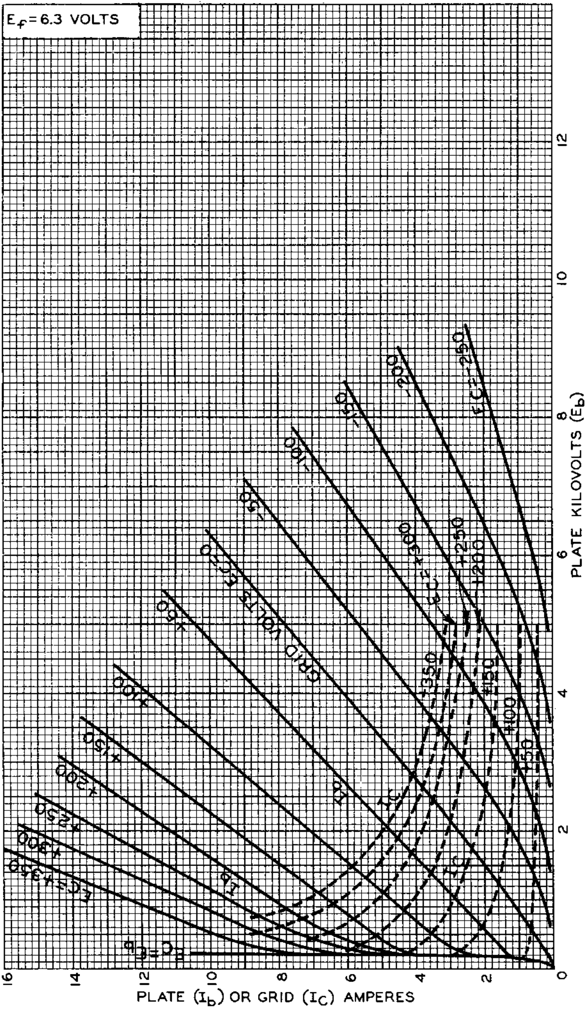
DIMENSIONAL OUTLINE and MOUNTING ARRANGEMENT shown under Type 6161 also apply to the 5946

OPERATING NOTES

Rated heater voltage should be applied for at least one minute to allow the cathode to reach normal operating temperature before voltages are applied to the other electrodes. In circuits where the plate is grounded and the negative pulse is applied to the cathode, the heater supply must be insulated to withstand the peak-positive-pulse plate-supply voltage, and it should also present a minimum amount of capacitance loading to the pulse-supply source.

← Indicates a change.

AVERAGE CHARACTERISTICS



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