

DESCRIPTION

The F-8146 and F-8147 are general purpose metal and ceramic triodes for use as amplifiers, oscillators or Class B modulators under CW or pulsed conditions. The F-8146 has a water-cooled anode capable of dissipating 40 kilowatts. The F-8147 has a forced air-cooled, copper anode-radiator assembly of brazed construction capable of 20 kilowatts.

ELECTRICAL

Filament Voltage	11 volts	Amplification Factor	17
Filament Current	155 amperes	$E_c = -50$ volts; $I_b = 3$ amperes	
Filament Starting Current	500 amperes	Direct Inter-Electrode Capacitance	
Filament Cold Resistance	.008 ohms	Grid-Plate	53 $\mu\mu f$
		Grid-Filament	58 $\mu\mu f$
		Plate-Filament	3.0 $\mu\mu f$

MECHANICAL

Mounting Position	Vertical, anode up or down	Water Jacket Pressure	
Ceramic and Seal Temperature, max. (see Notes 1 and 2)	250°C	Drop	18 10 5 psi
		Air Flow (Note 3)	- 1000 600 300 cfm
		Static Air Pressure	- 8 3 1 inches of water
Plate Dissipation	F-8146 40 30 20 F-8147 20 15 10 Kilowatts	Net Weight, approx.	8.5 22 lbs.
Water Flow	20 15 10 gpm		

Note 1: Auxiliary air flow of up to 120 cfm may be required to limit the ceramic and seal temperature to less than the 250°C max.

Note 2: A Temperature sensitive lacquer manufactured by the Tempil Corporation, 132 W. 22nd St., New York 11, N. Y. is convenient for this measurement.

Note 3: Maximum incoming air temperature, 45°C.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

(Values apply to both tubes unless otherwise specified)

Audio-Frequency Power Amplifier and Modulator - Class B

Maximum Ratings, Absolute Values

D-C Plate Voltage	11,000 volts	Plate Dissipation §	
Maximum Signal D-C Plate Current §	8 amperes	F-8146	40 kilowatts
Maximum Signal Plate Input §		F-8147	20 kilowatts
	F-8146 80 kilowatts		
	F-8147 60 kilowatts		

Typical Operation

(Unless otherwise specified, values are for two tubes)

D-C Plate Voltage	F-8146 10,500 F-8147 8,500	volts	Effective Load Resistance, Plate-to-Plate	1,330 1,400 ohms
D-C Grid Voltage	-600 -520	volts	Maximum Signal Driving Power, approx.	50 110 watts
Peak A-F Grid-to-Grid Voltage	1,800 1,740	volts	Maximum Signal Power Output, approx.	95 70 kilowatts
Peak A-F Plate-to-Plate Voltage	16,000 14,000	volts		
Zero Signal D-C Plate Current	1.8 1.2	amperes		
Maximum Signal D-C Plate Current	15.2 12.8	amperes		

Radio-Frequency Power Amplifier - Class B

(Carrier conditions per tube for use with a maximum modulator factor of 1.0)

Maximum Ratings, Absolute Values

D-C Plate Voltage	11,000 volts	Plate Input	F-8146 60 kilowatts
D-C Plate Current	6 amperes	Plate Dissipation	F-8147 30 kilowatts
			F-8146 40 kilowatts
			F-8147 20 kilowatts

Typical Operation		F-8146	F-8146						
D-C Plate Voltage		10,500	8,500	volts	D-C Plate Current	4.5	5.7	amperes	
D-C Grid Voltage		-550	-460	volts	D-C Grid Current	0	0	amperes	
Peak R-F Grid Voltage		600	520	volts	R-F Load Resistance	550	380	ohms	
Peak R-F Plate Voltage		4,000	3,500	volts	Driving Power, approx. †	200	575	watts	
					Power Output, approx.	14.5	16	kilowatts	

Plate-Modulated Radio-Frequency Power Amplifier – Class C Telephony
(Carrier conditions per tube for use with a maximum modulation factor of 1.0)

Maximum Ratings, Absolute Values				Typical Operation			
D-C Plate Voltage		8,500	volts	D-C Plate Voltage	8,000	volts	
D-C Grid Voltage		-2,000	volts	D-C Grid Voltage	-1,400	volts	
D-C Plate Current		6	amperes	Peak R-F Grid Voltage	2,120	volts	
D-C Grid Current		.8	amperes	Peak R-F Plate Voltage	7,000	volts	
Plate Input		55	kilowatts	D-C Plate Current	5.6	amperes	
Plate Dissipation	F-8146	26	kilowatts	D-C Grid Current	.6	amperes	
	F-8147	13	kilowatts	R-F Load Resistance	680	ohms	
				Driving Power, approx.	1,250	watts	
				Power Output, approx.	36	kilowatts	

Radio-Frequency Power Amplifier and Oscillator – Class C Telephony
(Key down conditions per tube without amplitude modulation †)

Maximum Ratings, Absolute Values				Typical Operation			
D-C Plate Voltage		11,000	volts		Cathode Drive		Grid Drive
D-C Grid Voltage		-2,000	volts	D-C Plate Voltage	7,500	10,500	9,500
D-C Plate Current		8	amperes	D-C Grid Voltage	-800	-1,500	-1,200
D-C Grid Current		.8	amperes	Peak R-F Grid Voltage	1,300	2,050	1,750
Plate Input		80	kilowatts	Peak R-F Plate Voltage	6,000	9,000	8,000
Plate Dissipation	F-8146	40	kilowatts	D-C Plate Current	7.5	6.7	7.8
	F-8147	20	kilowatts	D-C Grid Current	.45	.40	.45
				R-F Load Resistance	460	735	570
				Driving Power, approx.	9,000	770	760
				Power Output, approx.	47	55	55

RATINGS VERSUS FREQUENCY

Maximum ratings apply up to 50 megacycles. The tube may be operated at higher frequencies provided the maximum values of plate voltage and power input are reduced according to the tabulation below (other maximum ratings are the same above). Special attention should be given to adequate ventilation of the ceramics and seals at these frequencies.

Frequency	50	110	megacycles
Percentage of Maximum Rated Plate Voltage and Plate Input	100	70	per cent

PULSE SERVICE OPERATIONS

In pulse r-f amplifier service, it is possible to operate the tube under conditions not permissible in CW operation. Because of the wide variety of operating conditions, it is advisable that tube operation recommendations be obtained from our Engineering Department for specific conditions.

MODULATOR TUBE – PULSED OPERATION

Maximum Ratings, Absolute Values				Typical Operation			
D-C Plate Voltage	18	Kilovolts		D-C Plate Voltage	16	kilovolts	
Peak Plate Voltage (instantaneous)	20	Kilovolts		Pulse Plate Current	120	amperes	
D-C Grid Voltage	-2500	volts		D-C Grid Voltage	-1500	volts	
Peak Positive Grid Voltage	4000	volts		Pulse Grid Current	20	amperes	
Pulse Cathode Current	220	amperes		Pulse Positive Grid Voltage	+1500	volts	
Grid Dissipation	800	watts		Duty Factor	.003		
Pulse Length	2000	μsec.		Pulse Length	10	μsec.	
				Plate Output Voltage	13.5	kilovolts	
				Pulse Output Power	1.6	mw	

Additional information for specific applications can be obtained from the:

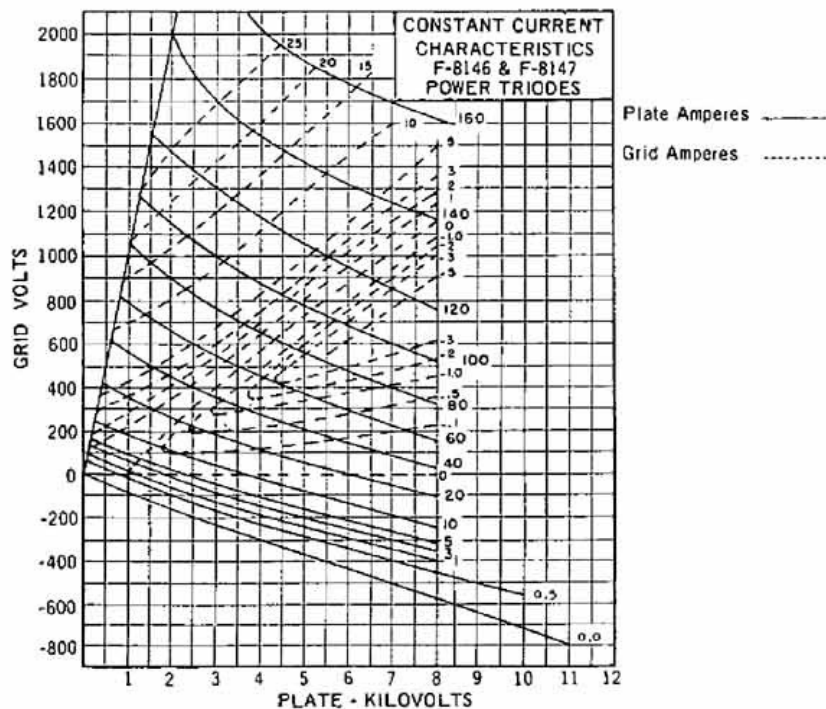
ITT Electron Tube Division
Applications Section
P.O. Box 104
Clifton, New Jersey

* Formerly our D-1030A & B.

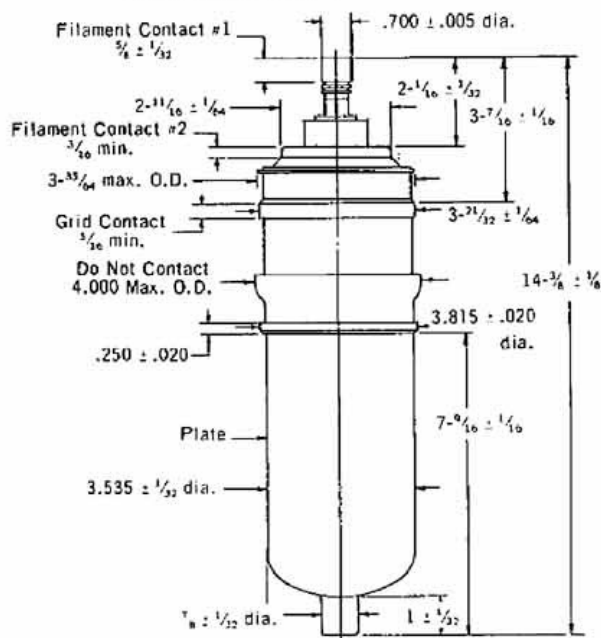
§ Averaged over any audio-frequency cycle of sine-wave form.

† At crest of audio frequency cycle with modulation factor of 1.0

‡ Modulation essentially negative may be used if the position peak of the envelope does not exceed 115 per cent of the carrier conditions.



NOTE: Contact areas are to be concentric within .025".

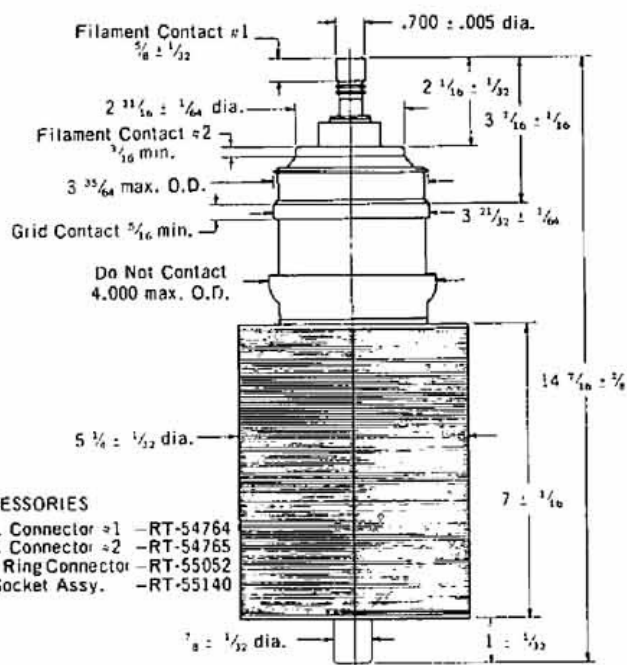


ACCESSORIES:

Filament Connector #1 - RT-54764
 Filament Connector #2 - RT-54765
 Grid Connector - RT-55052
 Water Jacket - RT-55070

**OUTLINE
F-8146 POWER TRIODE**

NOTE: Contact areas are to be concentric within .025".



ACCESSORIES

Fila. Connector #1 - RT-54764
 Fila. Connector #2 - RT-54765
 Grid Ring Connector - RT-55052
 All Socket Assy. - RT-55140

**OUTLINE
F-8147 POWER TRIODE**