



ELECTRONIC TUBE REFERENCE

23431

Power - Triode (over 1000V 100W) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
TRIODE

Rugged coaxial general-purpose transmitting triode for RF applications. Machlett describes low-inductance RF electrode terminals and high-dissipation construction, with operation at very high plate voltage for demanding industrial radio-frequency service.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	14.5 V / 450 A	PARALLEL HEATER	— / —
HEATING	Direct	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Triode	
AMPLIFICATION FACTOR	45
MAXIMUM PLATE VOLTAGE	20000 V
MAXIMUM PLATE DISSIPATION	175000 W
<i>Promoted fields populated from explicitly published ratings/characteristics; service-specific data retained as parameters.</i>	

Refer to Machlett price list. When ordering specify: The ML-23431 is a general-purpose triode suitable Filament Starting for various rf applications. The rugged coaxial Current, maximum: 1,200 amps mounting structure provides high-dissipation, low- Filament Cold inductance rf electrode terminals. The tube is rated Resistance: 0.0035 ohm at 20 kvdc plate voltage (maximum) in CW opera-

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1971 Machlette Laboratories

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1971 MACHLETTE LABORATORIES

Section 1 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Filament Voltage	14.5 V	Filament Voltage: 14.5 volts
Filament Current	450 A	Filament Current: 450 amps
for various rf applications. The rugged coaxial Current, maximum	1200 A	for various rf applications. The rugged coaxial Current, maximum: 1,200 amps
inductance rf electrode terminals. The tube is rated Resistance	0.0035	inductance rf electrode terminals. The tube is rated Resistance: 0.0035 ohm
at	20 kV	at 20 kvdc plate voltage (maximum) in CW opera-
tion. Maximum ratings apply at frequencies up to Amplification Factor	45 mA	tion. Maximum ratings apply at frequencies up to Amplification Factor: 45
Published value	30 MHz	30 MHz. Useful power output can be obtained at Interelectrode
frequencies up	110 MHz	frequencies up 110 MHz with reduced ratings. Capacitances:
capable of dissipating [1]	175 kW	capable of dissipating 175 kW. Envelope construc- 175 kW Dissipation,
capable of dissipating [2]	175 kW	capable of dissipating 175 kW. Envelope construc- 175 kW Dissipation,
Water Temperature [1]	70	Water Temperature: 70°C (158 °F)
Water Temperature [2]	158	Water Temperature: 70°C (158 °F)
When operating at peak voltage in excess of	15	When operating at peak voltage in excess of 15 kV,
sure within which the tube is used. Instructions for Temperature [1]	165	sure within which the tube is used. Instructions for Temperature: 165°C (329 °F)

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
sure within which the tube is used. Instructions for Temperature [2]	329	sure within which the tube is used. Instructions for Temperature: 165°C (329 °F)
Gamma Ray Protection for Energies up to	10 mA	Gamma Ray Protection for Energies up to 10 MeV.” higher frequencies or high ambient temperatures, additional air
DC Plate Voltage	20000	DC Plate Voltage 20000 V surge currents.
DC Grid Voltage	1500	DCGridVoltage - 1500 V
DC Plate Current	35	DCPlateCurrent 35 A
DC Grid Current	40 mA	DCGridCurrent 40 A In circuits where high transient voltages may be
Plate Dissipation	175 kW	Plate Dissipation 175 kW developed due to a shorted load or other fault,
DC Plate Voltage [1]	20000	DC Plate Voltage 20000 V 16000 V
DC Plate Voltage [2]	16000	DC Plate Voltage 20000 V 16000 V
DCGridVoltage [1]	-1000	DCGridVoltage —1000 V -900 V electrodes.
DCGridVoltage [2]	-900	DCGridVoltage —1000 V -900 V electrodes.
Peak RF Grid Voltage [1]	1680	Peak RF Grid Voltage 1680 v 1550 v References:
Peak RF Grid Voltage [2]	1550	Peak RF Grid Voltage 1680 v 1550 v References:
Peak RF Plate Voltage [1]	17400	Peak RF Plate Voltage 17400 v 13000 v 1. W.N. Parker and M.V. Hoover, “Gas Tubes Protect High
Peak RF Plate Voltage [2]	13000	Peak RF Plate Voltage 17400 v 13000 v 1. W.N. Parker and M.V. Hoover, “Gas Tubes Protect High
Peak RF Plate Voltage [3]	1	Peak RF Plate Voltage 17400 v 13000 v 1. W.N. Parker and M.V. Hoover, “Gas Tubes Protect High
DCPiateCurrent [1]	29	DCPiateCurrent 29 A 29.3 A Power Transmitters,” Electronics, 29, 144, January 1956.
DCPiateCurrent [2]	29.3	DCPiateCurrent 29 A 29.3 A Power Transmitters,” Electronics, 29, 144, January 1956.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DCPlateCurrent [3]	29	DCPlateCurrent 29 A 29.3 A Power Transmitters," Electronics, 29, 144, January 1956.
DCPlateCurrent [4]	144	DCPlateCurrent 29 A 29.3 A Power Transmitters," Electronics, 29, 144, January 1956.
DCPlateCurrent [5]	1956	DCPlateCurrent 29 A 29.3 A Power Transmitters," Electronics, 29, 144, January 1956.
DCGridCurrent [1]	34	DCGridCurrent 34 A 32A 2. H.D. Doolittle, "High Power Hydrogen Thyratrons," Cathode
DCGridCurrent [2]	32	DCGridCurrent 34 A 32A 2. H.D. Doolittle, "High Power Hydrogen Thyratrons," Cathode
DCGridCurrent [3]	2	DCGridCurrent 34 A 32A 2. H.D. Doolittle, "High Power Hydrogen Thyratrons," Cathode
" RF Load Resistance [1]	330 ohm	" RF Load Resistance..... 330 ohms 2.50 ohms Press, 1, 6, 1954.
" RF Load Resistance [2]	2.5 ohm	" RF Load Resistance..... 330 ohms 2.50 ohms Press, 1, 6, 1954.
" RF Load Resistance [3]	1 ohm	" RF Load Resistance..... 330 ohms 2.50 ohms Press, 1, 6, 1954.
" RF Load Resistance [4]	6 ohm	" RF Load Resistance..... 330 ohms 2.50 ohms Press, 1, 6, 1954.
" RF Load Resistance [5]	1954 ohm	" RF Load Resistance..... 330 ohms 2.50 ohms Press, 1, 6, 1954.
Driving Power, approximate [1]	6 mA	Driving Power, approximate 6 kW 4.8 kW
Driving Power, approximate [2]	4.8 mA	Driving Power, approximate 6 kW 4.8 kW
Power Output, approximate [1]	440 mA	Power Output, approximate 440 kW 340 kW
Power Output, approximate [2]	340 mA	Power Output, approximate 440 kW 340 kW
Frequencyin Megahertz [1]	30	Frequencyin Megahertz..... 30 70 110
Frequencyin Megahertz [2]	70	Frequencyin Megahertz..... 30 70 110
Frequencyin Megahertz [3]	110	Frequencyin Megahertz..... 30 70 110
Percent Maximum Rated Plate Voltage [1]	100 mA	Percent Maximum Rated Plate Voltage 100 80 60

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Percent Maximum Rated Plate Voltage [2]	80 mA	Percent Maximum Rated Plate Voltage 100 80 60
Percent Maximum Rated Plate Voltage [3]	60 mA	Percent Maximum Rated Plate Voltage 100 80 60
e dA0	0	e dA00 - /GRID- CURRENT
ML [1]	23431	ML-23431 HIGH POWER GENERAL % ED-990692 : * WATER COOLING CHARACTERISTICS :
ML [2]	990692	ML-23431 HIGH POWER GENERAL % ED-990692 : * WATER COOLING CHARACTERISTICS :

TUBE TINKER

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