

High-power transmitting tetrode designed for RF power amplification, linear amplification, oscillation, modulation, or frequency multiplication.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	15 V / 400 A	PARALLEL HEATER	— / —
HEATING	Direct	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Tetrode	
AMPLIFICATION FACTOR	5
MAXIMUM PLATE VOLTAGE	18000 V
MAXIMUM PLATE DISSIPATION	175000 W
Promoted ratings/characteristics mapped from printed headings; device/service-specific values retained in parameters.	

The ML-8785 and ML-8786 are general purpose tetrodes axial grid and cathode mounting structures provide low- capable of 350 kW continuous output as a Class C amplifier inductance, high-dissipation rf terminals. The cathode con- or oscillator. The ML-8785 is provided with a vapor-cooled sists of sturdy thoriated-tungsten filaments. Low-loss alumina anode; the ML-8786 is water-cooled. ceramics are used for all insulation members. during continuous operation and substantially higher power Useful power output can be obtained at higher frequencies during momentary overloads or intermittent operation. Co- with an appropriate reduction in ratings. Filament VOItage coocoooeioeiiiiieeeeeie e 15.0 Vçt +For peak cathode currents in excess of 375 A, filament volt-

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 · Tetrode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Published value	12	12.0 Mw Pulsed
capable of	350 kW	capable of 350 kW continuous output as a Class C amplifier inductance, high-dissipation rf terminals. The cathode con-
Filament VOItage coocoooeioeiiiiieeeeeie e [1]	15	Filament VOItage coocoooeioeiiiiieeeeeie e 15.0 Vøt +For peak cathode currents in excess of 375 A, filament volt-
Filament VOItage coocoooeioeiiiiieeeeeie e [2]	375	Filament VOItage coocoooeioeiiiiieeeeeie e 15.0 Vøt +For peak cathode currents in excess of 375 A, filament volt-
Filament Current [1]	400	Filament Current 400 A age must be 15.5 V.
Filament Current [2]	15.5	Filament Current 400 A age must be 15.5 V.
Filament Starting Current, maximum ccoervienreennn,	1000 mA	Filament Starting Current, maximum ccoervienreennn, 1000 A .
Filament Cold Resistance cccooooiieeiiieiiieies	43	Filament Cold Resistance cccooooiieeiiieiiieies .0043 ohm *The given water cooling characteristics apply for typical RE
Amplification Factor, Control Grid to Screen Grid, approx	5	Amplification Factor, Control Grid to Screen Grid, approx. 5 and AF operation as given in this data sheet. In specialized

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Control Grid to Plate	6.5 mA	Control Grid to Plate ... 6.5 pf plate currents, electron beaming may occur requiring in-
e	240 mA	e 240 pf creased water flow rates for cooling. Consult the Machler
SE::: g::: ::: gfiiéé [1]	128 mA	SE::: g::: ::: gfiiéé 128 1}:\$ ** Air flow should be distributed to maintain a uniform tem-
SE::: g::: ::: gfiiéé [2]	1 mA	SE::: g::: ::: gfiiéé 128 1}:\$ ** Air flow should be distributed to maintain a uniform tem-
Control Grid to Cathode [1]	96 MHz	Control Grid to Cathode ... 96 MHz seals. At frequencies above 30 MHz, additional air flow
Control Grid to Cathode [2]	30 MHz	Control Grid to Cathode ... 96 MHz seals. At frequencies above 30 MHz, additional air flow
Water flow on anode for [1]	175 kW	Water flow on anode for 175 kW dissipation, min. 46 gpm*
Water flow on anode for [2]	46 kW	Water flow on anode for 175 kW dissipation, min. 46 gpm*
Maximum outgoing water temperature	70 mA	Maximum outgoing water temperature 70 °C WARNING: This electron tube when operated at peak voltages
Maximum Envelope Temperature cccool	200 mA	Maximum Envelope Temperature cccool. 200 °C unless adequately shielded by the enclosure within which the
Air Flow on Insulators and Seals, approx. cceooreenn	500 cfm	Air Flow on Insulators and Seals, approx. cceooreenn. 500 cfm** tube is used. Instructions for protective installation are given
ACCESSORIES Peak AF Screen-Grid Voltage for	100	ACCESSORIES Peak AF Screen-Grid Voltage for 100%
Peak RF Control-Grid Voltage [1]	910	Peak RF Control-Grid Voltage 910 910
Peak RF Control-Grid Voltage [2]	910	Peak RF Control-Grid Voltage 910 910

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DC Plate Current ..., [1]	20.8	DC Plate Current ..., 20.8 19.0
DC Plate Current ..., [2]	19	DC Plate Current ..., 20.8 19.0
Screen-Grid Connector cc.oovvevevivierieioe e F [1]	27220	Screen-Grid Connector cc.oovvevevivierieioe e F- 27220 DC Control-Grid Current 1.7 1.7
Screen-Grid Connector cc.oovvevevivierieioe e F [2]	1.7	Screen-Grid Connector cc.oovvevevivierieioe e F- 27220 DC Control-Grid Current 1.7 1.7
Screen-Grid Connector cc.oovvevevivierieioe e F [3]	1.7	Screen-Grid Connector cc.oovvevevivierieioe e F- 27220 DC Control-Grid Current 1.7 1.7
Vapor-Cooling Jacket, Vapor-Up System (ML [1]	8785	Vapor-Cooling Jacket, Vapor-Up System (ML-8785) P-27899 Peak Fundamental RF Plate Current ... 34 34
Vapor-Cooling Jacket, Vapor-Up System (ML [2]	-27899	Vapor-Cooling Jacket, Vapor-Up System (ML-8785) P-27899 Peak Fundamental RF Plate Current ... 34 34
Vapor-Cooling Jacket, Vapor-Up System (ML [3]	34	Vapor-Cooling Jacket, Vapor-Up System (ML-8785) P-27899 Peak Fundamental RF Plate Current ... 34 34
Vapor-Cooling Jacket, Vapor-Up System (ML [4]	34	Vapor-Cooling Jacket, Vapor-Up System (ML-8785) P-27899 Peak Fundamental RF Plate Current ... 34 34
Vapor-Cooling Jacket, Vapor-Down System (ML [1]	8785	Vapor-Cooling Jacket, Vapor- Down System (ML-8785) P- 28903 Load Impedance o., 265 323
Vapor-Cooling Jacket, Vapor-Down System (ML [2]	28903	Vapor-Cooling Jacket, Vapor- Down System (ML-8785) P- 28903 Load Impedance o., 265 323
Vapor-Cooling Jacket, Vapor-Down System (ML [3]	265	Vapor-Cooling Jacket, Vapor- Down System (ML-8785) P- 28903 Load Impedance o., 265 323

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Vapor-Cooling Jacket, Vapor-Down System (ML [4])	323	Vapor-Cooling Jacket, Vapor-Down System (ML-8785) P-28903 Load Impedance o., 265 323
Driving Power, approximate [1]	1430 mA	Driving Power, approximate 1430 1430
Driving Power, approximate [2]	1430 mA	Driving Power, approximate 1430 1430
Plate Output Power [1]	153	Plate Output Power 153 187
Plate Output Power [2]	187	Plate Output Power 153 187
Two-Tube DOLly ocooiiiiic s e \$ [1]	-16096	Two-Tube DOLly ocooiiiiic s e \$-16096 Plate Dissipation ... 55 60
Two-Tube DOLly ocooiiiiic s e \$ [2]	55	Two-Tube DOLly ocooiiiiic s e \$-16096 Plate Dissipation ... 55 60
Two-Tube DOLly ocooiiiiic s e \$ [3]	60	Two-Tube DOLly ocooiiiiic s e \$-16096 Plate Dissipation ... 55 60
OPERATING CONDITIONS DC Plate Voltage o	18	OPERATING CONDITIONS DC Plate Voltage o 18
(Continucus Commercial Service) DC Screen-Grid Voltage	2500	(Continucus Commercial Service) DC Screen-Grid Voltage ... 2500
DC Control-Grid Voltage	-1200	DC Control-Grid Voltage —1200
Screen-Grid Dissipation	3000	Screen-Grid Dissipation ... 3000
OTHERWISE SPECIFIED Control-Grid Dissipationt	1000	OTHERWISE SPECIFIED Control-Grid Dissipationt ... 1000
RF Power Amplifier or Oscillator Plate Dissipationd,	175	RF Power Amplifier or Oscillator Plate Dissipationd, 175
DC Plate Voltage [1]	16	DC Plate Voltage ... 16 16
DC Plate Voltage [2]	16	DC Plate Voltage ... 16 16
Key-down condition per tube without DC Screen-Grid Voltage [1]	1500	Key-down condition per tube without DC Screen-Grid Voltage 1500 1500
Key-down condition per tube without DC Screen-Grid Voltage [2]	1500	Key-down condition per tube without DC Screen-Grid Voltage 1500 1500

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
amplitude modulation.§ DC Control-Grid Voltage [1]	-400	amplitude modulation.§ DC Control-Grid Voltage —400 —400
amplitude modulation.§ DC Control-Grid Voltage [2]	-400	amplitude modulation.§ DC Control-Grid Voltage —400 —400
Maximum Ratings, Absolute Values Peak AF Driving Voltage, per tube [1]	400 mA	Maximum Ratings, Absolute Values Peak AF Driving Voltage, per tube ... 400 575
Maximum Ratings, Absolute Values Peak AF Driving Voltage, per tube [2]	575 mA	Maximum Ratings, Absolute Values Peak AF Driving Voltage, per tube ... 400 575
Zero-Signal DC Plate Current [1]	5	Zero-Signal DC Plate Current 5 6
Zero-Signal DC Plate Current [2]	6	Zero-Signal DC Plate Current 5 6
DC Plate Voltage cccccoomeervenirininiiea	18	DC Plate Voltage cccccoomeervenirininiiea 18 kV
Maximum-Signal DC Plate Current [1]	32 mA	Maximum-Signal DC Plate Current 32 62
Maximum-Signal DC Plate Current [2]	62 mA	Maximum-Signal DC Plate Current 32 62
DC Screen-Grid Voltage	2500	DC Screen-Grid Voltage ... 2500 V
DC Control-Grid Voltage	-1200	DC Control-Grid Voltage — 1200 V
Current ioooieeeeeee e [1]	2	Current ioooieeeeeee e 2.0 4.2
Current ioooieeeeeee e [2]	4.2	Current ioooieeeeeee e 2.0 4.2
Screen-Grid Dissipation	3000	Screen-Grid Dissipation 3000 W
Control-Grid Dissipation	1000	Control-Grid Dissipation .. . 1000 W
Plate Dissipation cccocoviviveviiiiiiiiceeenenn	175 kW	Plate Dissipation cccocoviviveviiiiiiiiceeenenn 175 kW
Driving Power c.ccccccsoernnnnn [1]	0	Driving Power c.ccccccsoernnnnn. 0 167

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Driving Power c.cccccc0oernnnnn [2]	167	Driving Power c.cccccc0oernnnnn. 0 167
Typical Operation Load Resistance, plate-to-plate [1]	1080	Typical Operation Load Resistance, plate-to-plate 1080 630
Typical Operation Load Resistance, plate-to-plate [2]	630	Typical Operation Load Resistance, plate-to-plate 1080 630
DC Plate Voltage c..oovoevveren [1]	16	DC Plate Voltage c..oovoevveren 16 18 kV Plate Dissipation, per tube 92 170
DC Plate Voltage c..oovoevveren [2]	18	DC Plate Voltage c..oovoevveren 16 18 kV Plate Dissipation, per tube 92 170
DC Plate Voltage c..oovoevveren [3]	92	DC Plate Voltage c..oovoevveren 16 18 kV Plate Dissipation, per tube 92 170
DC Plate Voltage c..oovoevveren [4]	170	DC Plate Voltage c..oovoevveren 16 18 kV Plate Dissipation, per tube 92 170
Peak RF Plate Voltage [1]	13.5 mA	Peak RF Plate Voltage ... 13.5 15.5 kv Maximum-Signal Plate Qutput Power 338 658
Peak RF Plate Voltage [2]	15.5 mA	Peak RF Plate Voltage ... 13.5 15.5 kv Maximum-Signal Plate Qutput Power 338 658
Peak RF Plate Voltage [3]	338 mA	Peak RF Plate Voltage ... 13.5 15.5 kv Maximum-Signal Plate Qutput Power 338 658
Peak RF Plate Voltage [4]	658 mA	Peak RF Plate Voltage ... 13.5 15.5 kv Maximum-Signal Plate Qutput Power 338 658
DC Screen-Grid Voltage [1]	1500	DC Screen-Grid Voltage ... 1500 1500 V
DC Screen-Grid Voltage [2]	1500	DC Screen-Grid Voltage ... 1500 1500 V
DC Control-Grid Voltage [1]	-900	DC Control-Grid Voltage —900 —1000 V
DC Control-Grid Voltage [2]	-1000	DC Control-Grid Voltage —900 —1000 V

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Peak RF Control-Grid Voltage [1]	1170	Peak RF Control-Grid Voltage 1170 1300 v
Peak RF Control-Grid Voltage [2]	1300	Peak RF Control-Grid Voltage 1170 1300 v
DC Screen-Grid Current [1]	2	DC Screen-Grid Current ... 2.0 20 A
DC Screen-Grid Current [2]	20	DC Screen-Grid Current ... 2.0 20 A
DC Control-Grid Current [1]	38 mA	DC Control-Grid Current 38 42 A Maximum Ratings
DC Control-Grid Current [2]	42 mA	DC Control-Grid Current 38 42 A Maximum Ratings
Peak Fundamental RF Plate Current [1]	43	Peak Fundamental RF Plate Current ... 43 45 a DC Plate Voltage ccccooooiiiiiiiiiiiiiee 18
Peak Fundamental RF Plate Current [2]	45	Peak Fundamental RF Plate Current ... 43 45 a DC Plate Voltage ccccooooiiiiiiiiiiiiiee 18
Peak Fundamental RF Plate Current [3]	18	Peak Fundamental RF Plate Current ... 43 45 a DC Plate Voltage ccccooooiiiiiiiiiiiiiee 18
Load Impedance [1]	314 ohm	Load Impedance ... 314 345 ohms DC Screen-Grid Voltage ... 2750
Load Impedance [2]	345 ohm	Load Impedance ... 314 345 ohms DC Screen-Grid Voltage ... 2750
Load Impedance [3]	2750 ohm	Load Impedance ... 314 345 ohms DC Screen-Grid Voltage ... 2750
Driving Power, approximate [1]	420 mA	Driving Power, approximate 420 510 W DC Control-Grid Voltage ... —1200
Driving Power, approximate [2]	510 mA	Driving Power, approximate 420 510 W DC Control-Grid Voltage ... —1200
Driving Power, approximate [3]	-1200 mA	Driving Power, approximate 420 510 W DC Control-Grid Voltage ... —1200



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