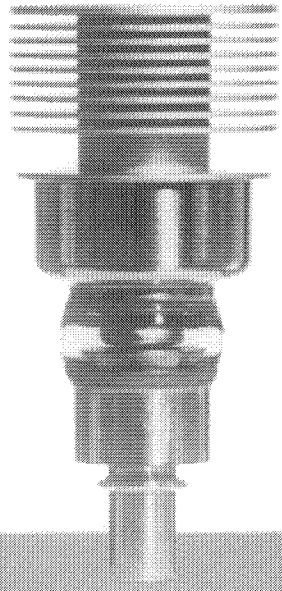


ML-2C39WA

Ruggedized structure. General purpose application.

DESCRIPTION

The **ML-2C39WA** is a ruggedized high-mu triode of planar-electrode type designed specifically for use as an oscillator, frequency multiplier or power amplifier in radio transmitting service at frequencies up to 2500 Mc.

The **ML-2C39WA** is interchangeable with the **ML-2C39A.** This tube retains the desirable high mu, high transconductance characteristics of the **ML-2C39A** together with its low interelectrode capacitances and compact, rugged ring-seal construction.

The **ML-2C39WA** is the result of an intensive development program with respect to the proper selection and processing of tube materials, particularly with regard to the cathode, to provide improved life, reliability and stability of operation. This tube is manufactured and tested to close tolerances to insure consistent and uniform tube performance.

GENERAL CHARACTERISTICS

Electrical

Heater Voltage	6.0	Volts†
Heater Current (AC or DC) at 6.0 Volts	1.0	Amp
Heater Heating Time, minimum	60	secs
Amplification Factor	100	
Transconductance (I_b = 70 mA, E_b = 600 v)	25,000	μmhos
Interelectrode Capacitances (without heater voltage)		
Grid-Plate	2.0	μμf
Grid-Cathode	6.60	μμf
Plate-Cathode, maximum	0.035	μμf
Frequency for Maximum Ratings	2500	Mc

Mechanical

Mounting Position	Optional	
Type of Cooling	Forced Air*	
Maximum Anode Temperature	200	°C
Net Weight	2.0	oz.

†See Application Note, page 16, for optimum heater voltage.

*See Application Notes, page 16 and also air cooling curves, page 83.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

R-F Power Amplifier and Oscillator

Key-down conditions per tube without amplitude modulation‡

Maximum Ratings, Absolute Values

D-C Plate Voltage	1000	volts
D-C Grid Voltage	−150	volts
D-C Cathode Current	125	mA
D-C Grid Current§	50	mA
Peak Positive R-F Grid-Cathode Voltage	30	volts
Peak Negative R-F Grid-Cathode Voltage	−400	volts
Plate Dissipation† (Forced-air Cooling)	100	watts
Grid Dissipation	2	watts

Typical Operation

Power Amplifier, Grid Separation Circuit — 500 Mc

D-C Plate Voltage	900	volts
D-C Grid Voltage	−40	volts
D-C Plate Current	90	mA
D-C Grid Current, Approximate	30	mA
Driving Power, Approximate	6	watts
Useful Power Output	40	watts

R-F Oscillator — 2500 Mc

D-C Plate Voltage	900	volts
D-C Grid Voltage, Approximate	−22	volts
D-C Plate Current	90	mA
D-C Grid Current	10	mA
Useful Power Output	17	watts

Plate Modulated R-F Power Amplifier Class C Telephony

Carrier conditions per tube for use with a maximum modulation factor of 1.0.

Maximum Ratings, Absolute Values

D-C Plate Voltage*	600	volts
D-C Grid Voltage	−150	volts
D-C Cathode Current	100	mA
D-C Grid Current§	50	mA
Peak Positive R-F Grid Voltage	30	volts
Peak Negative R-F Grid Voltage	−400	volts
Plate Dissipation† (Forced-air Cooling)	70	watts
Grid Dissipation	2	watts

Characteristic Range Values for Equipment Design

	Min.	Max.	
Filament Current at 6.0 volts	0.90	1.05	amps
Cut-off bias (Note 1)	—	−15	volts
Grid-Plate Capacitance (Note 2)	1.86	2.16	$\mu\mu f$
Grid-Cathode Capacitance (Note 2)	5.60	7.60	$\mu\mu f$

Note 1 — Measured at 1 mA of plate current and a plate voltage of 600 volts.

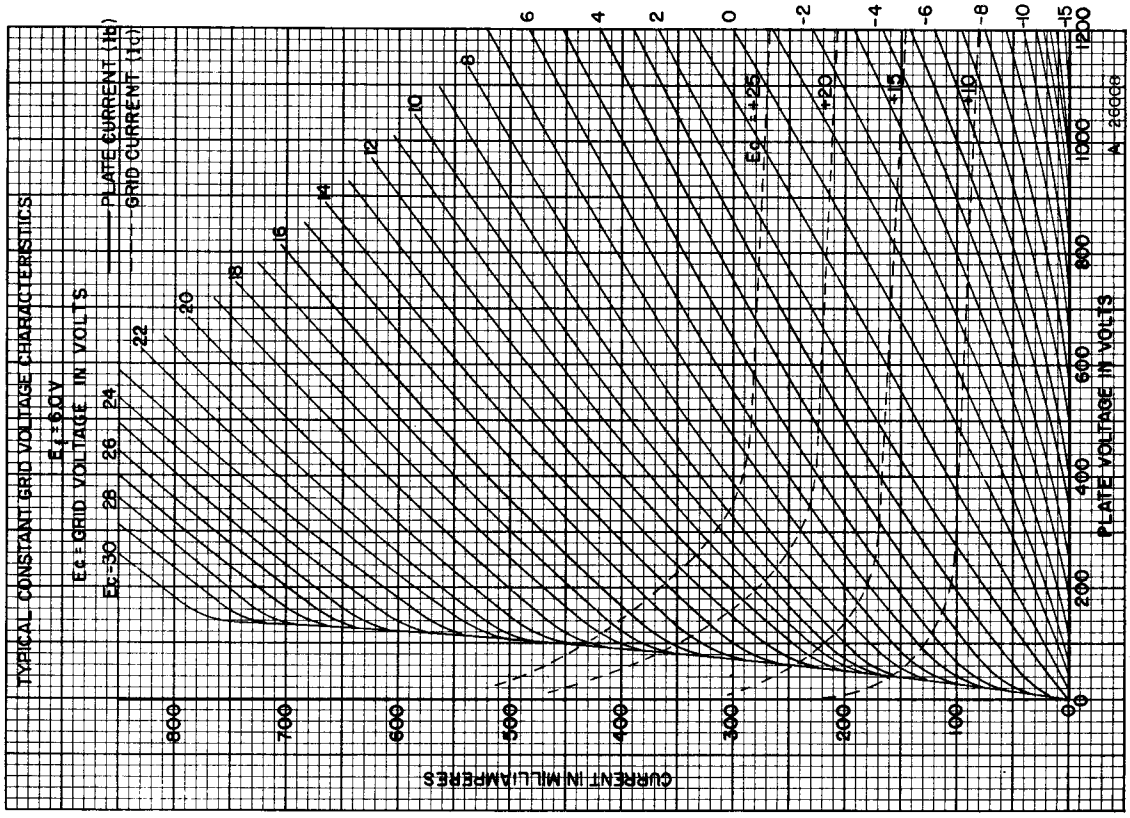
Note 2 — Capacitance measurements are with the tube cold.

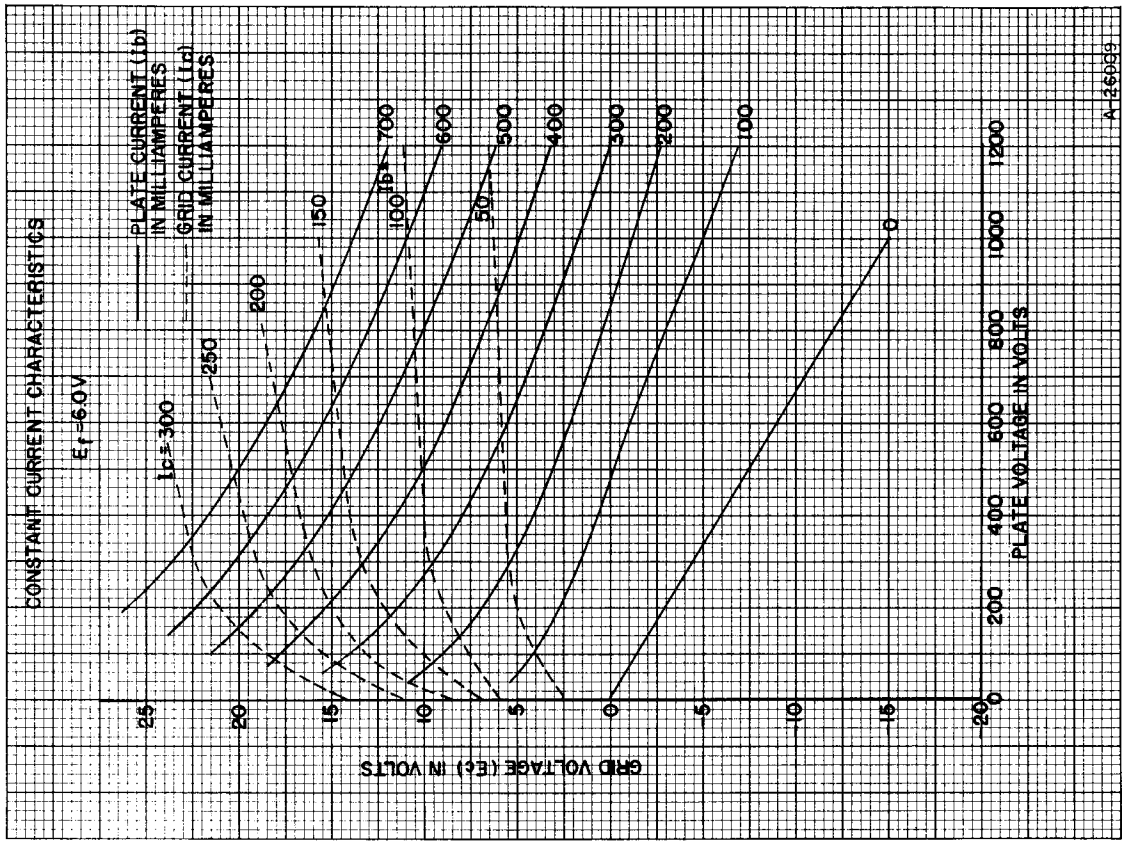
‡Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of the carrier conditions.

§See "Application Notes" on "Determination of Proper Grid Drive".

†Refer to "Cooling" under "Application Notes".

*For modulation factors less than 1.0, a higher d-c plate voltage may be used if the sum of the peak audio voltage and the d-c plate voltage does not exceed 1200 volts.

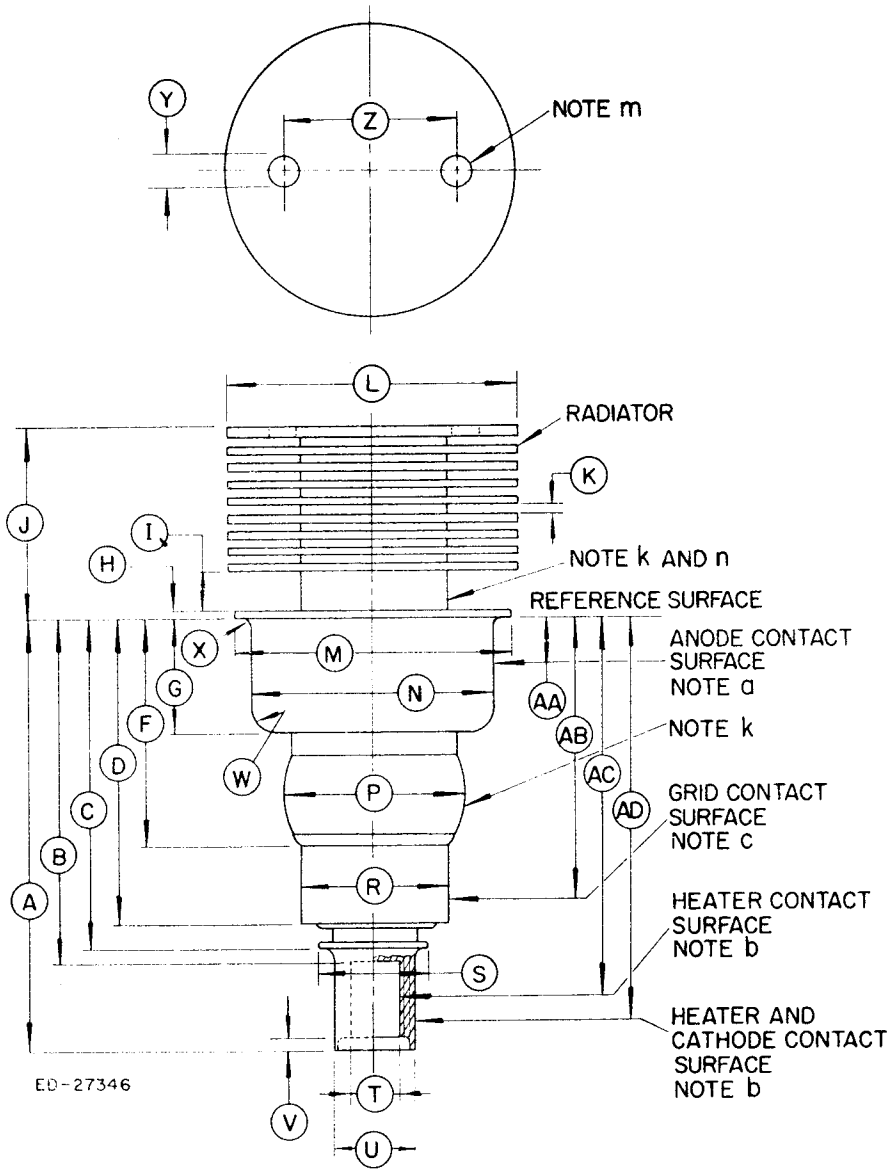

TYPICAL CONSTANT GRID VOLTAGE CHARACTERISTICS
Ef = 6.0V
Ec = GRID VOLTAGE IN VOLTS
PLATE CURRENT (Ib)
GRID CURRENT (Ic)
CURRENT IN MILLIAMPERES
PLATE VOLTAGE IN VOLTS
A-26668


CONSTANT CURRENT CHARACTERISTICS
Ef = 6.0V
PLATE CURRENT (Ib) IN MILLIAMPERES
GRID CURRENT (Ic) IN MILLIAMPERES
GRID VOLTAGE (Ec) IN VOLTS
PLATE VOLTAGE IN VOLTS
A-26669

OUTLINE AND DIMENSIONS

DIMENSIONS A ML-2C39A, ML-2C39WA, ML-2C41, ML-322, ML-7209, and ML-7210

DIMENSIONS B ML-322



DIMENSIONS FOR OUTLINE (INCHES)

	DIMENSIONS A		DIMENSIONS B	
Ref.	Min.	Max.	Min.	Max.
A	1.815	1.875	1.788	1.858
B	—	1.534	—	1.517
C	—	1.475	—	1.458
D	1.289	1.329	1.252	1.292
F	—	0.980	—	1.000
G	0.462	.477	.459	.479
H	—	.040	—	.040
I	.125	.185	.125	—
J	.766	.826	.736	.826
K	.025	.046	.015	—
L	1.234	1.264	1.235	1.265
M	1.180	1.195	1.788	1.199
N	1.025	1.035	1.021	1.039
P	—	0.812	—	.812
R	0.655	0.665	.652	.668
S	—	.545	—	.545
T	0.213	.223	.213	.223
U	.315	.325	.312	.328
V	—	.086	—	.086
W	—	.100	—	.100
X	—	.035	.105	.145
Y	.105	.145	.650	.850
Z	.650	.850		

DIMENSIONS FOR ELECTRODE CONTACT AREA (INCHES)

DIMENSIONS A

Ref.	Dimensions	Contact
AA	0.198 ± 0.163	Anode
AB	1.225 ± .040	Grid
AC	1.631 ± .097	Heater
AD	1.645 ± .170	Cathode

DIMENSIONS B

Ref.	Dimension	Contact
AA	0.195 ± .163	Anode
AB	1.210 ± .040	Cathode & Heater
AC	1.610 ± .092	Heater
AD	1.623 ± .165	Cathode & Heater

NOTES

a. The total indicated runout of the anode contact surface with respect to the cathode contact surface will not exceed 0.020 inch, except ML-322; 0.030 inch, ML-322.

b. The total indicated runout of the cathode contact surface with respect to the heater contact surface will not exceed 0.012 inch, except ML-322; 0.018 inch, ML-322.

c. The total indicated runout of the grid contact surface with respect to the cathode contact surface will not exceed 0.020 inch. Does not apply to ML-322.

k. Do not clamp or locate on this surface.

m. Hole provided for tube extractor through top fin only.

n. Measure anode shank temperature here.