SHIELDED GRID TRIODE ML-6544

The ML-6544 is a shielded-grid triode designed primarily for use as a switch tube in hard-tube pulse modulators for radar applications. It delivers a peak pulse power output of one megawatt with less than 10 kW of driving power. The tube incorporates a beam electrode structure to minimize driving power. This design avoids the fine-wire grids usually used in tetrodes and provides a rugged structure. The shield grid is strapped to the cathode internally and protects the cathode from transient arcs. These features provide a tube which operates much more stably at high voltages than hard-tube modulators of earlier design. The high amplification factor coupled with low grid current result in unusually low driving power requirements. Additionally, the input and output circuits are isolated so that feedback capacitance is small. The cathode is a unipotential oxide-coated type. The anode is forced-air cooled and is capable of dissipating 1 kW with an air flow of 80 cfm.

CHARACTERISTICS[1]

ELECTRICAL

Filament:		
Voltage	6.0 ± 5%	V
Current at 6.0 Volts	60	A
Filament Starting Current (maximum)	300	A
Cathode Warm-up Time	10	Min
Interelectrode Capacitances		
Grid-Plate, maximum	4	pF
Grid-Filament	260	pF
Plate-Filament	40	pF
Amplification Factor (average)	90	
Strapped Resonant Frequency, Grid to cathode, approx.:	63.5	Mc

MECHANICAL:

Overall Dimensions:	
Length	8.625 Inches
Diameter	5.135 Inches
Net Weight (approx.)	13 lbs
Mounting Postition (Support tube by anode radiator only)	Any
Cooling	Forced Air †
Air flow on anode (at 45°C and 14.7 psi ambiant atmospheric pressure)	80 cfm*
Static pressure, Inches of Water	0.3
Air flow on grid radiator, minimum	5 cfm
Maximum incoming air temperature	75° C
Maximum glass temperature	175° C †
Base	Coaxial

[1] Characteristics and operating values are based upon performance tests. These figures may change without notice as the result of additional data or product refinement. CPI Eimac Division should be consulted before using this information for final equipment design.

Capacitance values are for a cold tube as measured in a special shielded fixture in accordance with Electronic Industries Association Standard RS-191.

† Sufficient air cooling must be provided to keep glass seal temperatures at less than 175°C under all conditions of operation.

* For air-flow requirements at other temperatures and pressures, consult the CPI/Eimac Applications Engineering Dept.

The values listed above represent specified limits for the product and are subject to change. The data should be used for basic information only. Formal, controlled specifications may be obtained from CPI for use in equipment design.

For information on this and other CPI products, visit our website at: **www.cpii.com**, or contact: CPI MPP, Eimac Operation, 607 Hansen Way, Palo Alto, CA 94303

TELEPHONE: 1(800) 414-8823. **FAX:** (650) 592-9988 | **EMAIL:** powergrid@cpii.com

SHIELDED GRID TRIODE ML-6544

PULSE MODULATOR OR PULSE AMPLIFIER

ABSOLUTE MAXIMUM RATINGS:

D-C PLATE VOLTAGE	20	kV
PEAK PLATE VOLTAGE	25	kv
D-C GRID VOLTAGE	-600	volts
PEAK POSITIVE GRID VOLTAGE	1500	volts
PEAK NEGATIVE GRID VOLTAGE	-1500	volts
PULSE CATHODE CURRENT	75	amp
D-C PLATE CURRENT	600	mA
GRID DISSIPATION	25	watts
PLATE DISSIPATION	1.0	kW
PULSE DURATION	25	µsec*
DUTY FACTOR	.03*	

TYPICAL OPERATION:

D-C PLATE VOLTAGE	18	kV
D-C GRID VOLTAGE	-250	volts
PULSE POSITIVE GRID VOLTAGE	1200	volts
PULSE PLATE CURRENT	65	amp
PULSE GRID CURRENT	7	amp
PULSE DRIVING POWER	12	kW
PULSE POWER OUTPUT	1.0	Mw
PLATE OUTPUT VOLTAGE	15.5	kV
DUTY FACTOR	.003	

* For applications requiring longer pulse duration or higher duty factors, consult the CPI/Eimac Applications Engineering Dept.

WARNING: Operation of this tube may produce x-rays. Adequate rayproof shielding must therefore be provided in the equipment.

OPERATING HAZARDS

Proper use and safe operating practices with respect to power tubes are the responsibility of equipment manufacturers and users of such tubes. All persons who work with and are exposed to power tubes, or equipment that utilizes such tubes, must take precautions to protect themselves against possible serious bodily injury. DO NOT BE CARELESS AROUND SUCH PRODUCTS.

The operation of this tube may involve the following hazards, any one of which, in the absence of safe operating practices and precautions, could result in serious harm to personnel.

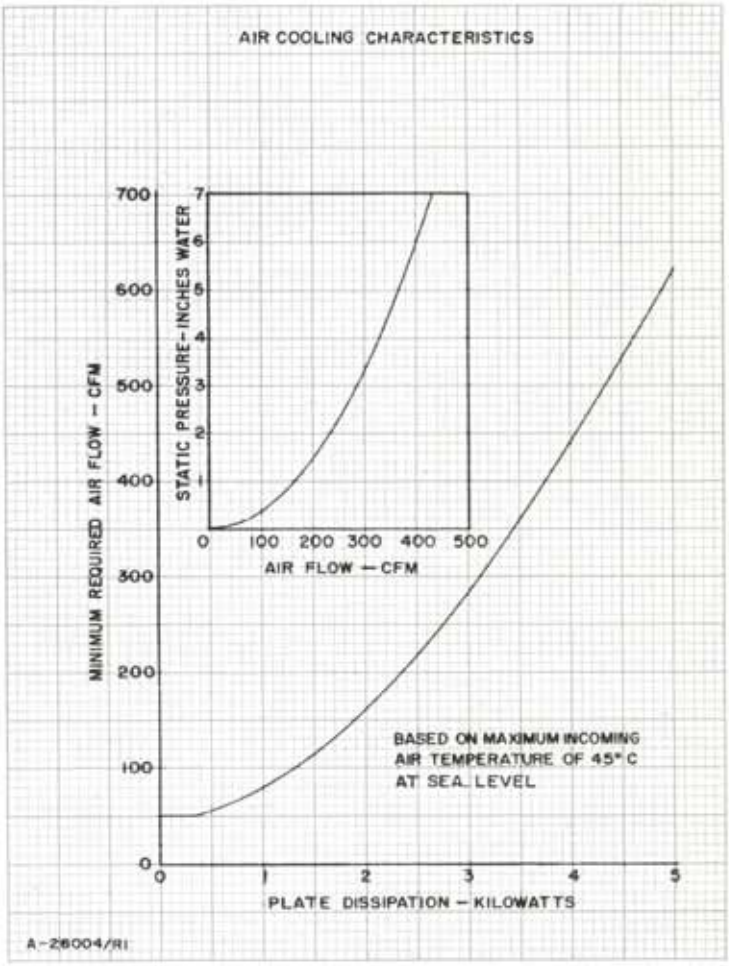
HIGH VOLTAGE – Normal operating voltages can be deadly. Remember the HIGH VOLTAGE CAN KILL.

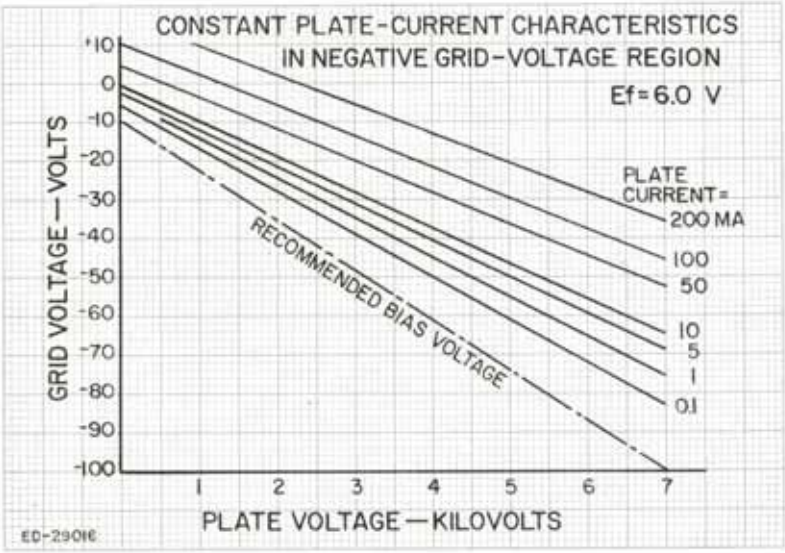
LOW-VOLTAGE HIGH-CURRENT CIRCUITS - Personal jewelry, such as rings, should not be worn when working with filament contacts or connectors as a short circuit can produce very high current and melting, resulting in severe burns.

RF RADIATION – Exposure to strong rf fields should be avoided, even at relatively low frequencies. CARDIAC PACEMAKERS MAY BE AFFECTED.

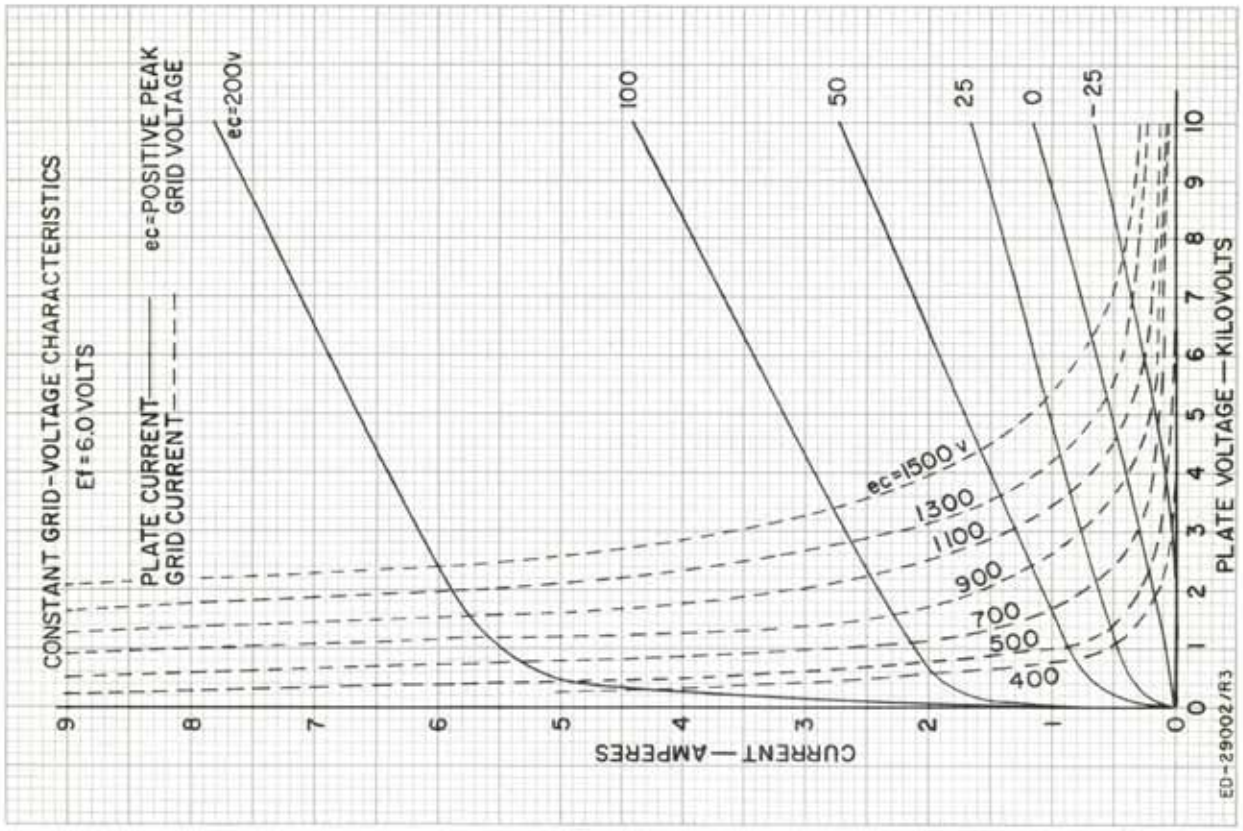
HOT SURFACES – Surfaces of tubes can reach temperatures of several hundred °C and cause serious burns if touched for several minutes after all power is removed.

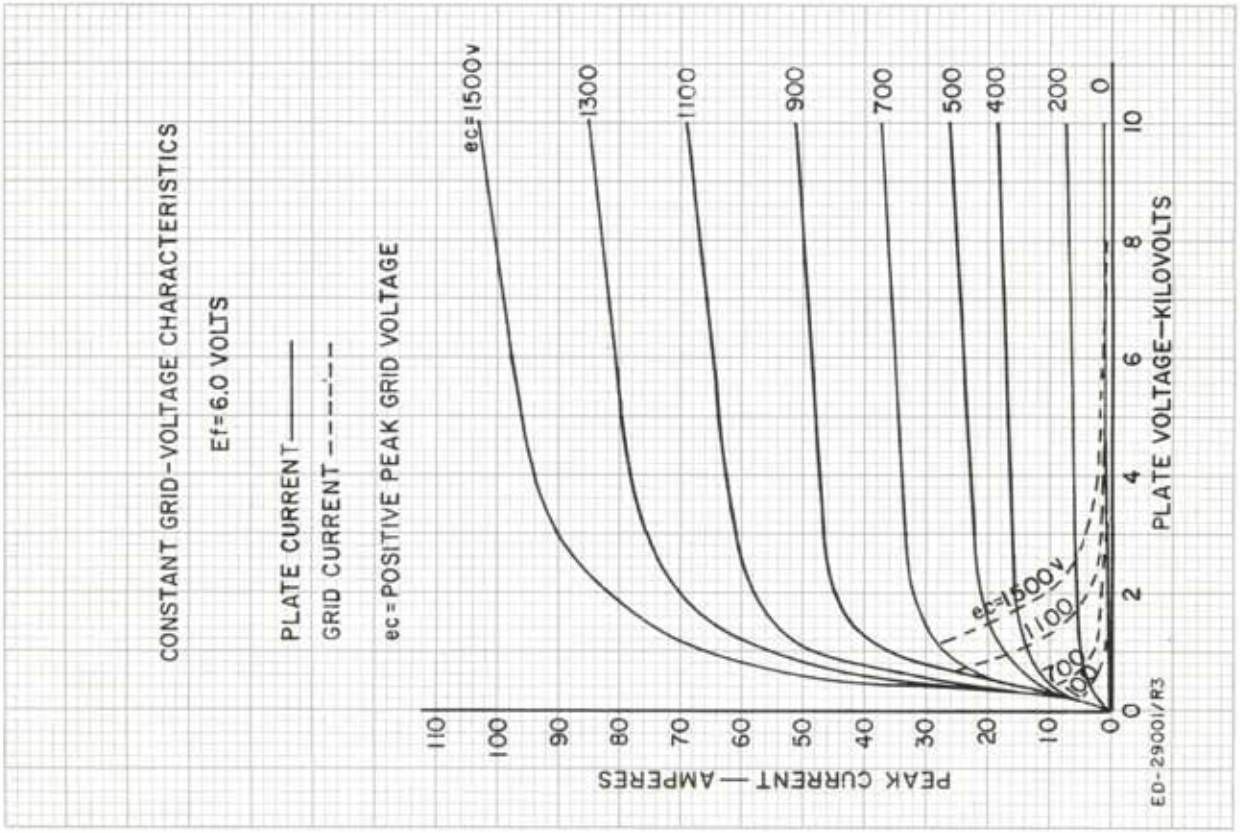
SHIELDED GRID TRIODE ML-6544



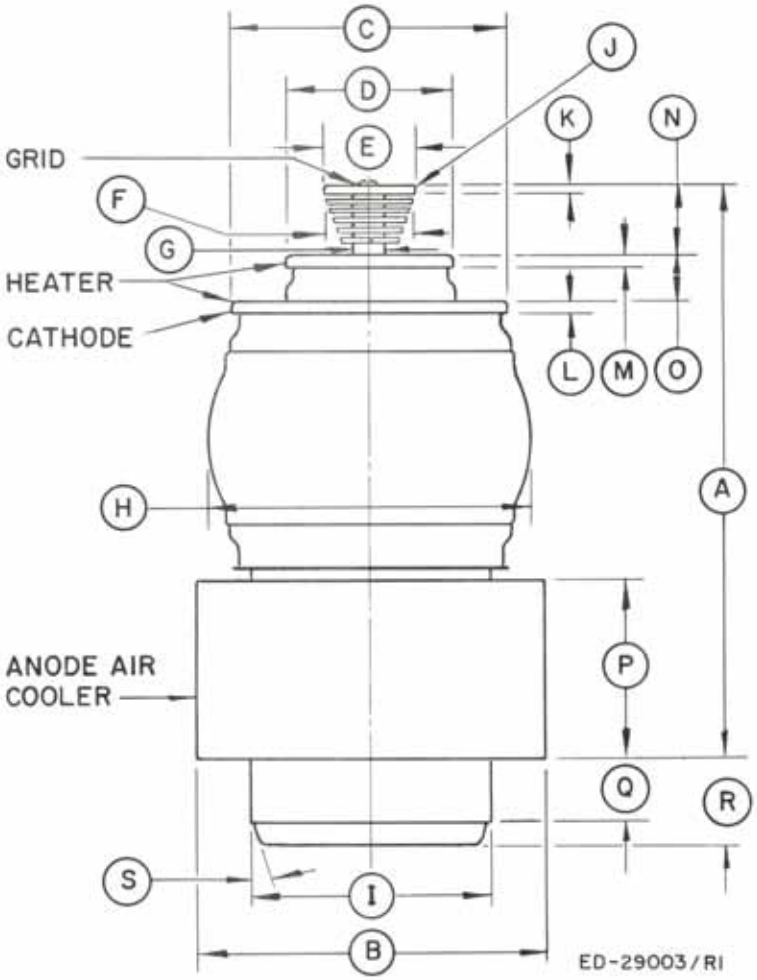


SHIELDED GRID TRIODE
ML-6544





SHIELDED GRID TRIODE
ML-6544



DIMENSIONS FOR OUTLINE OF ML-6544

Ref.	Inches			Notes
	Minimum	Nominal	Maximum	
A			8 5/8	
B	5.075	5.125	5.135	
C	4 3/64	4 1/16	4 5/64	
D	2 27/64	2 7/16	2 29/64	
E	1.370	1.375	1.380	
F			1 5/16	
G			1 1/16	
H			4 3/8	
I			3 9/16	
J	3/32			radius
K	.135	.140	.145	
L	11/64	3/16	13/64	
M	11/64	3/16	13/64	
N	31/32	1 1/32	1 3/32	
O	5/8	11/16	3/4	
P	2 9/16	2 5/8	2 11/16	
Q			15/16	
R			1 3/4	
S	20			degrees